CPC COOPERATIVE PATENT CLASSIFICATION

H ELECTRICITY

(NOTE omitted)

H01 ELECTRIC ELEMENTS

(NOTES omitted)

H01L SEMICONDUCTOR DEVICES NOT COVERED BY CLASS H10 (use of semiconductor

devices for measuring <u>G01</u>; resistors in general <u>H01C</u>; magnets, inductors or transformers <u>H01F</u>; capacitors in general <u>H01G</u>; electrolytic devices <u>H01G 9/00</u>; batteries or accumulators <u>H01M</u>; waveguides, resonators or lines of the waveguide type <u>H01P</u>; line connectors or current collectors <u>H01R</u>; stimulated-emission devices <u>H01S</u>; electromechanical resonators <u>H03H</u>; loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers <u>H04R</u>; electric light sources in general <u>H05B</u>; printed circuits, hybrid circuits, casings or constructional details of electrical apparatus, manufacture of assemblages of electrical components <u>H05K</u>; use of semiconductor devices in circuits having a particular application, see the subclass for the application)

NOTES

- 1. This subclass is residual to class <u>H10</u>.
- 2. This subclass covers:
 - a. semiconductor devices for rectifying, amplifying, oscillating or switching; their constructional details or arrangements; their assemblies or integrated devices; their manufacture or treatment;
 - semiconductor devices sensitive to radiation; their constructional details or arrangements; their assemblies or integrated devices; their manufacture or treatment;
 - c. semiconductor devices for light emission; their constructional details or arrangements; their assemblies or integrated devices; their manufacture or treatment;
 - d. processes or apparatus for the manufacture or treatment of semiconductor or solid-state devices where the type of device is not listed under bullets a to c, above, or not essential;
 - constructional details or arrangements of semiconductor or solid-state devices not covered by class <u>H10</u> and not specific to types of devices listed under bullets a to c, above;
 - f. packaging or assembling of semiconductor or solid-state devices covered by this subclass or by class H10.
- 3. In this subclass, the following terms or expressions are used with the meaning indicated:
 - "wafer" means a slice of semiconductor or crystalline substrate material, which can be modified by impurity diffusion (doping), ion implantation or epitaxy, and whose active surface can be processed into arrays of discrete components or integrated circuits;
 - "solid state body" means the body of material within which, or at the surface of which, the physical effects characteristic of the device occur;
 - "electrode" is a region in or on the body of the device (other than the solid state body itself), which exerts an electrical influence on the solid state body, irrespective of whether or not an external electrical connection is made thereto. An electrode may include several portions and the term includes metallic regions which exert influence on the solid state body through an insulating region (e.g. capacitive coupling) and inductive coupling arrangements to the body. The dielectric region in a capacitive arrangement is regarded as part of the electrode. In arrangements including several portions, only those portions which exert an influence on the solid state body by virtue of their shape, size, or disposition or the material of which they are formed are considered to be part of the electrode. The other portions are considered to be "arrangements for conducting electric current to or from the solid state body" or "interconnections between solid state components formed in or on a common substrate", i.e. leads;
 - "device" means an electric circuit element; where an electric circuit element is one of a plurality of elements formed in or on a common substrate; it is referred to as a "component";
 - "complete device" is a device in its fully assembled state which may or may not require further treatment, e.g.
 electroforming, before it is ready for use but which does not require the addition of further structural units;
 - "parts" includes all structural units which are included in a complete device;
 - "container" is an enclosure forming part of the complete device and is essentially a solid construction in which the body of
 the device is placed, or which is formed around the body without forming an intimate layer thereon. An enclosure which
 consists of one or more layers formed on the body and in intimate contact therewith is referred to as an "encapsulation";
 - "integrated circuit" is a device where all components, e.g. diodes or resistors, are built up on a common substrate and form the device including interconnections between the components;
 - "assembly" of a device is the building up of the device from its constructional units; the term covers the provision of fillings in containers.

H01L (continued)

- 4. In this subclass, both the process or apparatus for the manufacture or treatment of a device and the device itself are classified, whenever both of these are described sufficiently to be of interest.
- 5. Attention is drawn to Note (3) after the title of section C, which Note indicates to which version of the Periodic Table of chemical elements the CPC refers. In this subclass, the system used is the 8 group system, indicated by Roman numerals in the Periodic Table thereunder.

WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

H01L 21/203	covered by	H01L 21/02631
H01L 21/205	covered by	H01L 21/0262
H01L 21/208	covered by	H01L 21/02623
H01L 21/301	covered by	H01L 21/30
H01L 21/36 - H01L 21/368	covered by	H01L 21/02107
H01L 21/58	covered by	H01L 24/80
H01L 21/66	covered by	H01L 22/00
H01L 21/98	covered by	H01L 25/50

- 2. {In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}
- 3. Due to the ongoing developments in class <u>H10</u> and related subclasses, the information displayed in notes, references and definitions of this subclass may not be entirely accurate. For each specific subject matter referred to in this subclass, users are invited to consult the relevant place in class <u>H10</u> and to consider the class <u>H10</u> information as correct, in case of conflict.

21/00 Processes or apparatus adapted for the manufacture or treatment of semiconductor or solid state devices or of parts thereof

NOTE

{Due to the ongoing developments in class $\underline{H10}$ and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited to consult the relevant place in class $\underline{H10}$ and to consider the class $\underline{H10}$ information as correct, in case of conflict}

21/02 • Manufacture or treatment of semiconductor devices or of parts thereof

21/02002 . . {Preparing wafers}

NOTES

- {This group <u>covers</u> processes for manufacturing wafers prior to the fabrication of any device, i.e. between the sawing of ingots (covered by <u>B28D</u>) and the cleaning of substrates (covered by <u>H01L 21/02041</u>). }
- 2. {This group does not cover:
 - simple use of grinding or polishing machines B24B
 - thermal smoothening H01L 21/324.}

21/02005	• • • {Preparing bulk and homogeneous wafers}
21/02008	• • • {Multistep processes}
21/0201	• • • • {Specific process step}
21/02013	• • • • • {Grinding, lapping}
21/02016	• • • • {Backside treatment}
21/02019	{Chemical etching}
21/02021	• • • • {Edge treatment, chamfering}
21/02024	• • • • • {Mirror polishing}
21/02027	{Setting crystal orientation}
21/0203	• • • {Making porous regions on the surface}
21/02032	{by reclaiming or re-processing}
21/02035	{Shaping}

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21/02041 . . {Cleaning}
21/02043 . . . {Cleaning before device manufacture, i.e.
                 Begin-Of-Line process}
21/02046 . . . . {Dry cleaning only (<u>H01L 21/02085</u> takes
                   precedence)}
21/02049 . . . . { with gaseous HF}
21/02052 . . . . {Wet cleaning only (<u>H01L 21/02085</u> takes
                    precedence)}
21/02054 . . . . {combining dry and wet cleaning steps
                    (<u>H01L 21/02085</u> takes precedence)}
21/02057 . . . {Cleaning during device manufacture}
          • • • {during, before or after processing of
21/0206
                    insulating layers}
21/02063 . . . . . {the processing being the formation of vias
                      or contact holes}
21/02065 . . . . . {the processing being a planarization of
                      insulating layers}
21/02068 . . . . {during, before or after processing of
                   conductive layers, e.g. polysilicon or
                    amorphous silicon layers}
21/02071 . . . . . {the processing being a delineation, e.g.
                      RIE, of conductive layers}
21/02074 . . . . {the processing being a planarization of
                      conductive layers}
21/02076 . . . {Cleaning after the substrates have been
                 singulated}
21/02079 . . . {Cleaning for reclaiming}
21/02082 . . . {product to be cleaned}
21/02085 . . . . {Cleaning of diamond}
21/02087 . . . . {Cleaning of wafer edges}
          • • • {Cleaning of wafer backside}
21/0209
21/02093 . . . {Cleaning of porous materials}
21/02096 . . . {only mechanical cleaning}
21/02098 . . . {only involving lasers, e.g. laser ablation}
21/02101 . . . {only involving supercritical fluids}
21/02104 . . {Forming layers (deposition in general <u>C23C</u>;
               crystal growth in general C30B)
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21/02107 . . . {Forming insulating materials on a substrate}

21/02109 {characterised by the type of layer, e.g. type of material, porous/non-porous, pre-cursors, mixtures or laminates}	21/02164 {the material being a silicon oxide, e.g. SiO_2 }
21/02112 {characterised by the material of the layer}	<u>NOTE</u>
	{ The formation of silicon oxide
NOTE {Layers comprising sublayers, i.e. multi-layers, are additionally classified in H01L 21/022; porous layers are additionally classified in H01L 21/02203.}	layers is classified in this group regardless of the precursor or of the process of formation; in case of explicit statements on doping, on rest-groups, or on material components
21/02115 {the material being carbon, e.g. alpha-C, diamond or hydrogen doped carbon}	seeH01L 21/02126 and subgroups; deposition of silicon oxide from organic precursors without
21/02118 {carbon based polymeric organic or inorganic material, e.g. polyimides, poly cyclobutene or PVC (polymers <u>per se C08G</u> , photoresist <u>per se G03F</u>)}	further statements on film composition is classified here and in H01L 21/02205 and subgroups. }
21/0212 {the material being fluoro carbon compounds, e.g.(CFx) n, (CHxFy) n or polytetrafluoroethylene}	21/02167 {the material being a silicon carbide not containing oxygen, e.g. SiC,
21/02123 {the material containing silicon}	SiC:H or silicon carbonitrides
21/02126 {the material containing Si, O, and at	(<u>H01L 21/02126</u> and <u>H01L 21/0214</u> take precedence)}
least one of H, N, C, F, or other non-metal elements, e.g. SiOC, SiOC:H or SiONC}	21/0217 { the material being a silicon nitride not containing oxygen, e.g. SixNy or SixByNz (H01L 21/02126 and
21/02129 {the material being boron or	H01L 21/0214 take precedence)}
phosphorus doped silicon oxides, e.g. BPSG, BSG or PSG}	21/02172 {the material containing at least one
	metal element, e.g. metal oxides,
NOTE	metal nitrides, metal oxynitrides or metal carbides (materials containing
{Halogen, e.g. fluorine, containing BPSG, PSG, BSG, and the like, are additionally	silicon <u>H01L 21/02123</u> ; metal silicates <u>H01L 21/02142</u>)}
classified in <u>H01L 21/02131</u> .}	21/02175 {characterised by the metal (H01L 21/02197 takes precedence)}
21/02131 {the material being halogen doped silicon oxides, e.g. FSG}	21/02178 { the material containing aluminium, e.g. Al ₂ O ₃ }
21/02134 {the material comprising hydrogen silsesquioxane, e.g. HSQ} 21/02137 {the material comprising alkyl	21/02181 { the material containing hafnium, e.g. HfO ₂ }
silsesquioxane, e.g. MSQ}	21/02183 { the material containing tantalum, e.g. Ta_2O_5 }
21/0214 {the material being a silicon oxynitride, e.g. SiON or SiON:H}	21/02186 { the material containing titanium, e.g. TiO_2 }
21/02142 {the material containing silicon and at least one metal element, e.g. metal silicate based insulators or metal	21/02189 {the material containing zirconium, e.g. ZrO ₂ }
silicon oxynitrides}	21/02192 { the material containing at least one rare earth metal element, e.g.
21/02145 {the material containing aluminium, e.g. AlSiOx}	oxides of lanthanides, scandium or yttrium}
21/02148 {the material containing hafnium, e.g. HfSiOx or HfSiON}	21/02194 {the material containing more than one metal element}
21/0215 {the material containing tantalum, e.g. TaSiOx}	21/02197 {the material having a perovskite structure, e.g. BaTiO ₃ }
21/02153 {the material containing titanium, e.g. TiSiOx}	21/022 { the layer being a laminate, i.e. composed of sublayers, e.g. stacks of alternating
21/02156 {the material containing at least one rare earth element, e.g. silicate of lanthanides, scandium or yttrium}	high-k metal oxides (adhesion layers or buffer layers <u>H01L 21/02304</u> , <u>H01L 21/02362</u>)}
21/02159 {the material containing zirconium, e.g. ZrSiOx}	21/02203 {the layer being porous} 21/02205 {the layer being characterised by the
21/02161 {the material containing more than one metal element}	precursor material for deposition} 21/02208 {the precursor containing a compound
•	comprising Si}
	21/02211 {the compound being a silane, e.g. disilane, methylsilane or chlorosilane}

21/02214 {the compound comprising silicon and oxygen}	from targets or heating of source material.}
NOTE {This group does not cover mixtures of a silane and oxygen.}	21/02266 {deposition by physical ablation of a target, e.g. sputtering, reactive sputtering, physical vapour deposition or pulsed laser deposition}
21/02216 {the compound being a molecule comprising at least one siliconoxygen bond and the compound	21/02269 {deposition by thermal evaporation (H01L 21/02293 takes precedence)} NOTE
having hydrogen or an organic group attached to the silicon or oxygen, e.g. a siloxane} 21/02219 {the compound comprising silicon and nitrogen}	{Subject matter relating to molecular beam epitaxy is classified in this group.}
NOTE	21/02271 {deposition by decomposition or
{This group does not cover mixtures of silane and nitrogen.}	reaction of gaseous or vapour phase compounds, i.e. chemical vapour deposition (H01L 21/02266 takes precedence)}
21/02222 {the compound being a silazane} 21/02225 {characterised by the process for the	21/02274 {in the presence of a plasma [PECVD]}
formation of the insulating layer} 21/02227 {formation by a process other than a deposition process}	21/02277 { the reactions being activated by other means than plasma or thermal, e.g. photo-CVD}
NOTE	21/0228 {deposition by cyclic CVD, e.g. ALD, ALE, pulsed CVD}
{Subject matter classified in the range of H01L 21/0223 - H01L 21/02249 is additionally classified in H01L 21/02249, H01L 21/02255 and	NOTE {Subject matter relating
HOTE 21/02249, HOTE 21/02233 and HOTE 21/02252, depending on the type of reaction. }	to cyclic plasma CVD is additionally classified in H01L 21/02274.}
21/0223 {formation by oxidation, e.g. oxidation of the substrate}	21/02282 { liquid deposition, e.g. spin-coating, solgel techniques, spray coating}
21/02233 {of the semiconductor substrate or a semiconductor layer}	21/02285 {Langmuir-Blodgett techniques}
21/02236 { group IV semiconductor}	21/02288 {printing, e.g. ink-jet printing (per se B41J)}
21/02238 { silicon in uncombined form, i.e. pure silicon}	21/0229 { liquid atomic layer deposition} 21/02293 { formation of epitaxial layers by a
21/02241 [III-V semiconductor]	deposition process (epitaxial growth per
21/02244 {of a metallic layer} 21/02247 {formation by nitridation, e.g.	se C30B)}
nitridation of the substrate}	NOTE
21/02249 {formation by combined oxidation and nitridation performed simultaneously}	{Formation of non-epitaxial layers by MBE, ALE, etc. is not covered by this group; for MBE
21/02252 {formation by plasma treatment, e.g. plasma oxidation of the substrate (after treatment of an insulating film by	seeH01L 21/02269; for ALE seeH01L 21/0228.}
plasma H01L 21/3105 and subgroups)} 21/02255 {formation by thermal treatment	21/02296 {characterised by the treatment performed before or after the formation of the layer (H01L 21/02227 and subgroups take precedence)}
21/02258 {formation by anodic treatment, e.g.	<u>NOTE</u>
anodic oxidation} 21/0226 {formation by a deposition process (per se C23C)}	{This group and subgroups only cover processes which are directly linked to the layer formation; routine anneals,
21/02263 {deposition from the gas or vapour phase}	i.e. thermal treatment without further features like a special atmosphere,
<u>NOTE</u>	presence of a plasma, thermally induced chemical reactions, change
{This group and subgroups also cover deposition methods in which the gas or vapour is produced	of phase (crystal structure) etc. are not classified here; for cleaning seeH01L 21/02041 and subgroups; for
by physical means, e.g. ablation	etching processes seeH01L 21/311 and

HUIL	
H01L 21/02296	
(continued) subgroups; for planariz	
seeH01L 21/31051 and	
for processes to repair of seeH01L 21/3105 and s	
section 21/3103 and s	{Subject matter relating to the
21/02299 • • • • • {pre-treatment}	cleaning processes for semiconductor
NOTE	devices in general is covered by
	<u>H01L 21/02041</u> and subgroups. }
{This group and substreatments to improv	
or change the surface	
fo}r etching see H01	
subgroups and H01L	
subgroups.	21/02345 {treatment by exposure to radiation, e.g.
21/02301 {in-situ cleaning}	visible light}
(2,	21/02348 {treatment by exposure to UV light}
<u>NOTE</u>	21/02351 {treatment by exposure to corpuscular
{Subject matter re	
cleaning processes devices in general	
H01L 21/02041 an	
<u>11012 21/02041</u> di	21/02356 {treatment to change the morphology of
21/02304 {formation of interme	diate layers, the insulating layer, e.g. transformation
e.g. buffer layers, laye	
adhesion, lattice mate barriers}	layery
21/02307 {treatment by exposure	21/02359 {treatment to change the surface groups
21/0231 {treatment by exposure the treatment by exposure the	of the instituting tayor,
electromagnetic radia	
light}	21/02365 • • • {Forming inorganic semiconducting materials
21/02312 {treatment by exposur	e to a gas or on a substrate}
vapour}	21/02367 {Substrates}
21/02315 { treatment by expo	sure to a plasma } 21/0237 {Materials}
21/02318 • • • • {post-treatment}	21/02373 {Group 14 semiconducting materials}
<u>NOTE</u>	21/02376 {Carbon, e.g. diamond-like carbon}
{This group only cov	ers processes 21/02378 {Silicon carbide}
that are part of the la	ver formation; 21/02381 {Silicon, silicon germanium,
treatments which are	* (1 1 11 1)
completion of the ins	
are covered by <u>H01L</u> subgroups. }	21/02389 {Nitrides}
subgroups. }	21/02392 {Phosphides}
21/02321 • • • • • {introduction of subst	ances into an 21/02395 {Arsenides}
already existing insula	ting layer 21/02398 {Antimonides}
(<u>H01L 21/02227</u> and precedence)}	subgroups take 21/024 {Group 12/16 materials}
	21/02403 {Oxides}
<u>NOTE</u>	21/02406 {Sulfides}
{Processes like the	introduction of 21/02409 {Selenides}
phosphorus into si	· · · · · · · · · · · · · · · · · · ·
diffusion, or dopin	
existing insulating by this group and s	
for the method of i	
seeH01L 21/02337	21/02/17 Charcogemac semiconducting
<u>H01L 21/02345</u> an	materials not being offices, e.g. ternary
21/02222 (introduction of one	21/0242 (Crystalline insulating materials)
21/02323 (introduction of ox 21/02326 (into a nitride lay	(Non arrestalling insulating materials
SiN to SiON	e.g. glass, polymers}
21/02329 {introduction of nit	rogen \ 21/02425 {Conductive materials, e.g. metallic
21/02332 {introduction of integral and oxide lay	ver e.g. changing silicides}
SiO to SiON}	21/02428 {Structure}
,	21/0243 {Surface structure}
	21/02433 {Crystal orientation}

21/02/26	01/02572
21/02436 {Intermediate layers between substrates and	21/02573 {Conductivity type}
deposited layers}	21/02576 {N-type}
21/02439 {Materials}	21/02579 {P-type}
21/02441 {Group 14 semiconducting materials}	21/02581 {Transition metal or rare earth
21/02444 {Carbon, e.g. diamond-like carbon}	elements}
21/02447 (Silicon carbide)	21/02584 {Delta-doping}
21/0245 (Silicon, silicon germanium,	21/02587 {Structure}
germanium}	21/0259 {Microstructure}
21/02452 {including tin}	21/02592 {amorphous}
21/02455 {Group 13/15 materials}	21/02595 {polycrystalline}
21/02458 {Nitrides}	21/02598 {monocrystalline}
21/02461 {Phosphides}	21/02601 (Manoparticles (fullerenes
21/02463 {Arsenides}	H10K 85/211)}
21/02466 {Antimonides}	21/02603 {Nanowires}
21/02469 {Group 12/16 materials}	21/02606 {Nanotubes (carbon nanotubes
	H10K 85/211)}
21/02472 {Oxides}	
21/02474 {Sulfides}	21/02609 {Crystal orientation}
21/02477 {Selenides}	21/02612 {Formation types}
21/0248 {Tellurides}	21/02614 {Transformation of metal, e.g. oxidation,
21/02483 {Oxide semiconducting materials	nitridation}
not being Group 12/16 materials, e.g.	21/02617 {Deposition types}
ternary compounds}	21/0262 (Reduction or decomposition of gaseous
21/02485 {Other chalcogenide semiconducting	compounds, e.g. CVD}
materials not being oxides, e.g. ternary	21/02623 • • • • • {Liquid deposition}
compounds}	21/02625 {using melted materials}
21/02488 {Insulating materials}	21/02628 {using solutions}
21/02491 {Conductive materials}	21/02631 (Physical deposition at reduced
21/02494 {Structure}	pressure, e.g. MBE, sputtering,
21/02496 {Layer structure}	evaporation}
21/02499 {Monolayers}	21/02634 {Homoepitaxy}
21/02502 {consisting of two layers}	21/02636 {Selective deposition, e.g.
21/02505 {consisting of two layers}	simultaneous growth of mono- and
	non-monocrystalline semiconductor
21/02507 {Alternating layers, e.g.	materials}
superlattice}	21/02639 {Preparation of substrate for selective
21/0251 {Graded layers}	deposition}
21/02513 {Microstructure}	21/02642 {Mask materials other than SiO ₂ or
21/02516 {Crystal orientation}	SiN}
21/02518 {Deposited layers}	21/02645 { Seed materials }
21/02521 {Materials}	21/02647 {Lateral overgrowth}
21/02524 {Group 14 semiconducting materials}	
21/02527 {Carbon, e.g. diamond-like carbon}	21/0265 {Pendeoepitaxy}
21/02529 {Silicon carbide}	21/02653 {Vapour-liquid-solid growth}
21/02532 (Silicon, silicon germanium,	21/02656 {Special treatments}
germanium}	21/02658 {Pretreatments (cleaning in general
21/02535 {including tin}	<u>H01L 21/02041</u>)}
21/02538 {Group 13/15 materials}	21/02661 {In-situ cleaning}
21/0254 {Nitrides}	21/02664 {Aftertreatments (planarisation in general
21/02543 {Phosphides}	<u>H01L 21/304</u>)}
	21/02667 {Crystallisation or recrystallisation of
21/02546 {Arsenides}	non-monocrystalline semiconductor
21/02549 {Antimonides}	materials, e.g. regrowth}
21/02551 {Group 12/16 materials}	21/02669 {using crystallisation inhibiting
21/02554 {Oxides}	elements}
21/02557 {Sulfides}	21/02672 {using crystallisation enhancing
21/0256 {Selenides}	elements}
21/02562 {Tellurides}	21/02675 {using laser beams}
21/02565 {Oxide semiconducting materials	21/02678 {Beam shaping, e.g. using a mask}
not being Group 12/16 materials, e.g.	21/0268 {Shape of mask}
ternary compounds}	21/02683 {Continuous wave laser beam}
21/02568 {Chalcogenide semiconducting	21/02686 {Pulsed laser beam}
materials not being oxides, e.g. ternary	
compounds}	21/02689 {using particle beams}
21/0257 {Doping during depositing}	21/02691 {Scanning of a beam}
. 1 0 0 1 0	

21/02/04		21/0455	(M.1; 1 1 ; 1
21/02694	{Controlling the interface between	21/0455	• • • {Making n or p doped regions or layers, e.g.
	substrate and epitaxial layer, e.g. by ion		using diffusion}
	implantation followed by annealing}	21/046	• • • • {using ion implantation}
21/02697	,		<u>NOTE</u>
21/027	Making masks on semiconductor bodies for		
	further photolithographic processing not		{Processes where ion implantation
	provided for in group H01L 21/18 or H01L 21/34		of boron and subsequent annealing
	{(photographic masks or originals per se		does not produce a p-doped region
	G03F 1/00; registration or positioning of		are classified elsewhere, e.g.
	photographic masks or originals <u>G03F 9/00;</u>		<u>H01L 21/0445</u> .}
	photographic cameras <u>G03B</u> ; control of position	21/0465	• • • • {using masks}
	<u>G05D 3/00</u>)}	21/047	{characterised by the angle between the
21/0271	• • • {comprising organic layers}	21/04/	ion beam and the crystal planes or the
21/0272	• • • { for lift-off processes }		main crystal surface}
21/0273	• • • • {characterised by the treatment of photoresist	21/0475	• • • • {Changing the shape of the semiconductor
	layers}	21/01/3	body, e.g. forming recesses, (etching of the
21/0274	• • • • {Photolithographic processes}		semiconductor body <u>H01L 21/302</u>)}
21/0275	• • • • { using lasers }	21/048	• • • • {Making electrodes}
21/0276	• • • • • { using an anti-reflective coating (anti-	21/0485	· · · · {Ohmic electrodes}
	reflective coating for lithography in	21/0403	{Conductor-insulator-semiconductor
	general <u>G03F 7/09</u>)}	21/049	electrodes, e.g. MIS contacts}
21/0277	• • • • {Electrolithographic processes}	21/0495	{Schottky electrodes}
21/0278	{Röntgenlithographic or X-ray		
	lithographic processes}	21/18	the devices having semiconductor bodies comprising elements of Group IV of
21/0279	{Ionlithographic processes}		the Periodic Table or $A_{III}B_V$ compounds
21/033	comprising inorganic layers		with or without impurities, e.g. doping
21/0331	• • • {for lift-off processes}		materials {(H01L 21/041 - H01L 21/0425,
21/0332	• • • • {characterised by their composition, e.g.		H01L 21/045 - H01L 21/048 take precedence)
	multilayer masks, materials}		
21/0334	• • • {characterised by their size, orientation,		<u>NOTE</u>
	disposition, behaviour, shape, in horizontal		This group covers also processes and
	or vertical plane}		apparatus which, by using the appropriate
21/0335	{characterised by their behaviour		technology, are clearly suitable for
	during the process, e.g. soluble masks,		manufacture or treatment of devices whose
	redeposited masks}		bodies comprise elements of Group IV of
21/0337	{characterised by the process involved		the Periodic Table or $A_{III}B_V$ compounds,
	to create the mask, e.g. lift-off masks,		even if the material used is not explicitly
	sidewalls, or to modify the mask, e.g. pre-		specified.
	treatment, post-treatment}	21/192	• • • {Intermixing or interdiffusion or disordering
21/0338	• • • • {Process specially adapted to improve the	21/182	of III-V heterostructures, e.g. IILD}
	resolution of the mask}	21/185	
21/04	• • the devices having potential barriers, e.g. a PN	21/103	iunction formation junction formation junction formation junction formation junction
	junction, depletion layer or carrier concentration	21/187	• • • • {by direct bonding}
	layer		
21/0405	• • • {the devices having semiconductor bodies	21/20	• • • Deposition of semiconductor materials on a substrate, e.g. epitaxial growth {solid phase
	comprising semiconducting carbon, e.g.		epitaxy}
	diamond, diamond-like carbon}	21/2003	• • • {characterised by the substrate}
	<u>NOTE</u>	21/2003	{Bonding of semiconductor wafers
		Z1/ZUU/	to insulating substrates or to
	{This group <u>covers</u> passivation.}		semiconducting substrates of to
21/041	• • • • {Making n- or p-doped regions}		an intermediate insulating layer
21/0415	{using ion implantation}		(H01L 21/2011 takes precedence;
21/0413	{Changing their shape, e.g. forming		bonding of semiconductor wafers to
21/072	recesses (etching of the semiconductor body		semiconductor wafers for junction
	H01L 21/302)}		formation <u>H01L 21/187</u>)}
21/0425	{Making electrodes}	21/2011	• • • • • { the substrate being of crystalline
21/043	{Ohmic electrodes}		insulating material, e.g. sapphire}
21/0435	{Schottky electrodes}	21/2015	{the substrate being of crystalline
21/0433	{Schottky electrodes}		semiconductor material, e.g. lattice
41/U 44	electrodes}		adaptation, heteroepitaxy}
21/0445	orectrodes j		- * * *
	the devices having semiconductor hodies		
21/UTTJ	{the devices having semiconductor bodies comprising crystalline silicon carbide}		
21/0443	 {the devices having semiconductor bodies comprising crystalline silicon carbide} {passivating silicon carbide surfaces} 		

21/22	Diffusion of impurity materials, e.g.	21/26 Bombardment with radiation
	doping materials, electrode materials,	{(<u>H01L 21/3105</u> takes precedence)}
	into or out of a semiconductor body, or between semiconductor regions;	21/2605 {using natural radiation, e.g. alpha, beta or gamma radiation}
	{Interactions between two or more impurities; Redistribution of impurities}	21/261 to produce a nuclear reaction transmuting
21/2205	• • • • {from the substrate during epitaxy,	chemical elements
21/2203	e.g. autodoping; Preventing or using	21/263 with high-energy radiation (<u>H01L 21/261</u> takes precedence)
	autodoping}	21/2633 {for etching, e.g. sputteretching}
21/221	• • • • {of killers}	21/2636 {for heating, e.g. electron beam heating}
21/2215	$\{ in A_{III}B_V compounds \}$	21/265 producing ion implantation
21/222	• • • • {Lithium-drift}	21/26506 {in group IV semiconductors}
21/2225	{Diffusion sources}	21/26513 (of electrically active species)
21/223	using diffusion into or out of a	21/2652 {Through-implantation}
	solid from or into a gaseous phase {(H01L 21/221 - H01L 21/222 take	21/26526 {Recoil-implantation}
	precedence; diffusion through an applied	21/26533 (of electrically inactive species in
	layer <u>H01L 21/225</u>)}	silicon to make buried insulating layers}
21/2233	{Diffusion into or out of $A_{III}B_{V}$	21/2654 $\{\text{in A}_{III}B_{V} \text{ compounds}\}$
	compounds}	21/26546 {of electrically active species}
21/2236	• • • • • {from or into a plasma phase}	21/26553 {Through-implantation}
21/225	using diffusion into or out of a solid from or into a solid phase, e.g. a doped oxide	21/2656 (characterised by the implantation
	layer {(<u>H01L 21/221</u> - <u>H01L 21/222</u> take	of both electrically active and
	precedence)}	inactive species in the same
21/2251	{Diffusion into or out of group IV	semiconductor region to be doped}
	semiconductors}	21/26566 {of a cluster, e.g. using a gas cluster ion beam}
	NOTE	2021/26573 {in diamond}
	{In groups	21/2658 {of a molecular ion, e.g. decaborane}
	H01L 21/2254 - H01L 21/2257	21/26586 {characterised by the angle between
	one should consider the main	the ion beam and the crystal planes or
	compositional parts of the applied	the main crystal surface}
	layer just before the diffusion step}	21/26593 {at a temperature lower than room temperature}
21/2252	• • • • • { using predeposition of impurities	21/266 using masks {(<u>H01L 21/26586</u> takes
	into the semiconductor surface, e.g. from a gaseous phase}	precedence)}
21/2253	• • • • • • {by ion implantation}	21/268 using electromagnetic radiation, e.g.
21/2254	{from or through or into an applied	laser radiation
	layer, e.g. photoresist, nitrides}	21/2683 {using X-ray lasers} 21/2686 {using incoherent radiation}
21/2255	• • • • • • { the applied layer comprising	21/28 Manufacture of electrodes on
	oxides only, e.g. P ₂ O ₅ , PSG,	semiconductor bodies using processes
24/22	H ₃ BO ₃ , doped oxides}	or apparatus not provided for in groups
21/2256	• • • • • • • {through the applied layer}	<u>H01L 21/20</u> - <u>H01L 21/268</u>
21/2257	{ the applied layer being silicon or silicide or SIPOS, e.g. polysilicon,	21/28008 {Making conductor-insulator-
	porous silicon}	semiconductor electrodes}
21/2258	{Diffusion into or out of $A_{III}B_{V}$	21/28017 { the insulator being formed after the semiconductor body, the semiconductor
	compounds}	being silicon}
21/228	• • • • using diffusion into or out of a solid from	
	or into a liquid phase, e.g. alloy diffusion	<u>NOTE</u>
	processes {(<u>H01L 21/221</u> - <u>H01L 21/222</u> take precedence)}	{This group <u>covers</u> deposition of
21/24	Alloying of impurity materials, e.g. doping	the insulators, including epitaxial insulators, and the conductors within
21/24	materials, electrode materials, with a	the same process or chamber.}
	semiconductor body {(H01L 21/182 takes	
	precedence)}	21/28026 {characterised by the conductor
21/242	{Alloying of doping materials with $A_{III}B_V$	(<u>H01L 21/28176</u> takes precedence)}
21/244	compounds}	<u>NOTE</u>
21/244	{Alloying of electrode materials} {with A _{III} B _V compounds}	{When the final conductor
21/248	{Apparatus specially adapted for the	comprises a superconductor,
21,210	alloying}	subject matter is not classified according to the subgroups
	• •	H01L 21/28035 - H01L 21/28097.
		$\frac{1101D \ 21/20033}{1101D \ 21/20071} = \frac{1101D \ 21/20071}{1101D \ 21/20071}.$

H01L

H01L 21/28026			
(continued)	Instead, it is classified in H01L 21/28026.}	21/28123	• {Lithography-related aspects, e.g. sub-lithography lengths; Isolation-related aspects, e.g.
21/28035	{the final conductor layer next to the insulator being silicon, e.g. polysilicon, with or without		to solve problems arising at the crossing with the side of the device isolation; Planarisation aspects}
	impurities (<u>H01L 21/28105</u> takes precedence)}	21/28132	• • {conducting part of electrode is difined by a sidewall spacer or a
	NOTE		similar technique, e.g. oxidation under mask, plating}
	{A very thin, e.g. silicon, adhesion or seed layer is not considered as the one next to the insulator.}	21/28141	is defined by a sidewall spacer, e.g. dummy spacer, or a similar technique, e.g. oxidation under
21/28044	 {the conductor comprising at least another non-silicon conductive layer} 	21/2815	mask, plating }• {part or whole of the electrode is a sidewall spacer or made
21/28052	the conductor comprising a silicide layer formed by the silicidation reaction of silicon		by a similar technique, e.g. transformation under mask, plating}
	with a metal layer (formed		{Making the insulator}
21/28061	by metal ion implantation <u>H01L 21/28044</u>)} • {the conductor comprising	21/28167	 {on single crystalline silicon, e.g. using a liquid, i.e. chemical oxidation}
22,20002	a metal or metal silicide formed by deposition, e.g. sputter deposition, i.e.	21/28176	 { with a treatment, e.g. annealing, after the formation of the definitive gate conductor}
	without a silicidation reaction (H01L 21/28052 takes precedence)}	21/28185	 { with a treatment, e.g. annealing, after the formation of the gate insulator and before the
	<u>NOTE</u>		formation of the definitive gate conductor}
	{To assess the coverage of groups H01L 21/28052 and H01L 21/28061, barrier layers, e.g. TaSiN, are not	21/28194	 {by deposition, e.g. evaporation, ALD, CVD, sputtering, laser deposition (H01L 21/28202 takes precedence)}
	considered. }	21/28202	{in a nitrogen-containing
21/2807	{the final conductor layer next to the insulator being Si or Ge or C and their alloys except Si}		ambient, e.g. nitride deposition, growth, oxynitridation, NH ₃ nitridation, N ₂ O oxidation, thermal nitridation, RTN, plasma
21/28079	{the final conductor layer next to the insulator being a single metal, e.g. Ta, W, Mo, Al}	21/28211	nitridation, RPN} • • {in a gaseous ambient using
21/28088	{the final conductor layer next to the insulator being a composite, e.g. TiN}		an oxygen or a water vapour, e.g. RTO, possibly through a layer (H01L 21/28194
21/28097	{the final conductor layer next to the insulator being a metallic		and H01L 21/28202 take precedence)}
21/28105	silicide} {the final conductor next to		NOTE {Thin oxidation layers used
01/00114	the insulator having a lateral composition or doping variation, or being formed laterally by more than one deposition step}		as a barrier layer or as a buffer layer, e.g. before the fomation of a high-k insulator, are classified here only if
21/28114	{characterised by the sectional shape, e.g. T, inverted-T}		important <u>per se</u> .}
	NOTE	21/2822	C implantation, before formation of
	{Documents are also classified in groups	21/28229	the insulator} • {by deposition of a layer,
	H01L 21/28035 - H01L 21/28105 when the composition is also relevant.}		e.g. metal, metal compound or poysilicon, followed by transformation thereof into an insulating layer}
		21/28238	• {with sacrificial oxide}

21/28247 { passivation or protection of the electrode, e.g. using re-oxidation}	21/302 to change their surface-physical characteristics or shape, e.g. etching,
21/28255 {the insulator being formed after the semiconductor body, the semiconductor belonging to Group IV and not being elemental silicon, e.g. Ge, SiGe, SiGeC}	polishing, cutting 21/304 Mechanical treatment, e.g. grinding, polishing, cutting {(H01L 21/30625) takes precedence)}
21/28264 {the insulator being formed after the	21/3043 {Making grooves, e.g. cutting}
semiconductor body, the semiconductor being a III-V compound}	21/3046 {using blasting, e.g. sand-blasting (H01L 21/2633 takes precedence)}
21/283 Deposition of conductive or insulating materials for electrodes {conducting electric current}	21/306 Chemical or electrical treatment, e.g. electrolytic etching (to form insulating layers H01L 21/31)
21/285 from a gas or vapour, e.g. condensation	21/30604 {Chemical etching}
21/28506 {of conductive layers}	21/30608 {Anisotropic liquid etching
21/28512 {on semiconductor bodies comprising elements of Group IV	$\frac{(\text{H01L 21/3063 takes precedence})}{\text{21/30612 } \dots \dots \text{Etching of } A_{\text{Im}}B_{\text{V}} \text{ compounds}}$
of the Periodic Table}	21/30617 {Anisotropic liquid etching}
21/28518 {the conductive layers	21/30621 {Vapour phase etching}
comprising silicides	21/30625 {With simultaneous mechanical
(<u>H01L 21/28537</u> takes precedence)}	treatment, e.g. mechanico-chemical polishing}
21/28525 {the conductive layers	21/3063 Electrolytic etching
comprising semiconducting	$21/30635$ {of $A_{III}B_V$ compounds}
material (<u>H01L 21/28518,</u> H01L 21/28537 take	21/3065 Plasma etching; Reactive-ion etching
precedence)}	21/30655 (comprising alternated and
21/28531 {Making of side-wall contacts}	repeated etching and passivation
21/28537 {Deposition of Schottky	steps, e.g. Bosch process} 21/308 using masks (H01L 21/3063,
electrodes}	H01L 21/3065 take precedence)
21/2855 {by physical means, e.g. sputtering, evaporation (H01L 21/28518 - H01L 21/28537 and H01L 21/28568 take	21/3081 {characterised by their composition, e.g. multilayer masks, materials}
precedence)}	21/3083 {characterised by their size,
21/28556 {by chemical means, e.g. CVD, LPCVD, PECVD, laser CVD	orientation, disposition, behaviour, shape, in horizontal or vertical
(<u>H01L 21/28518</u> - <u>H01L 21/28537</u>	plane} 21/3085 (characterised by their behaviour
and <u>H01L 21/28568</u> take precedence)}	21/3085 {characterised by their behaviour during the process, e.g. soluble masks, redeposited masks}
21/28562 {Selective deposition}	21/3086 (characterised by the process
21/28568 { the conductive layers comprising transition metals	involved to create the mask, e.g. lift-off masks, sidewalls,
(<u>H01L 21/28518</u> takes precedence)}	or to modify the mask, e.g. pre- treatment, post-treatment}
21/28575 {on semiconductor bodies	21/3088 {Process specially adapted to
$ comprising \ A_{III}B_V \ compounds \} $ 21/28581 { Deposition of Schottky}	improve the resolution of the
electrodes}	mask}
21/28587 {characterised by the sectional shape, e.g. T, inverted T}	21/31 to form insulating layers thereon, e.g. for masking or by using photolithographic
21/28593 {asymmetrical sectional shape}	techniques (encapsulating layers H01L 21/56); After treatment of these
21/288 from a liquid, e.g. electrolytic deposition	layers; Selection of materials for these layers
21/2885 {using an external electrical current,	21/3105 After-treatment
i.e. electro-deposition}	21/31051 {Planarisation of the insulating layers
21/30 Treatment of semiconductor bodies using	(H01L 21/31058 takes precedence)
processes or apparatus not provided for in groups <u>H01L 21/20</u> - <u>H01L 21/26</u>	21/31053 {involving a dielectric removal step}
(manufacture of electrodes thereon	21/31055 {the removal being a chemical
21/3003 {Hydrogenation or deuterisation, e.g. using atomic hydrogen from a plasma}	etching step, e.g. dry etching (etching per se H01L 21/311)}
21/3006 {of A _{III} B _V compounds}	
21/3000 • • • • • {or Allipy compounds}	

21/31056 {the removal being a selective		{Deposition using atomic layer
chemical etching step, e.g.	(Frozen)	deposition techniques [ALD]}
selective dry etching through a		• {of nano-laminates, e.g. alternating
mask}	(Frozen)	layers of Al203-Hf02}
21/31058 {of organic layers}		{composed of alternated layers or
21/311 Etching the insulating layers	(Frozen)	of mixtures of nitrides and oxides
{by chemical or physical means (H01L 21/31058 takes precedence)}		or of oxinitrides, e.g. formation of oxinitride by oxidation of nitride
21/31105 {Etching inorganic layers}		layers}
21/31111 {Exching inorganic layers}	21/3144	• {on silicon}
21/31116 {by chemical healis}	(Frozen)	· (on smeon)
	,	• {formed by deposition from a gas
21/31122	(Frozen)	or vapour}
21/31127 {Etching organic layers}	,	{Carbon layers, e.g. diamond-like
21/31133 {by chemical means}	(Frozen)	layers}
21/31138 {by dry-etching}	21/3147	{Epitaxial deposition of insulating
21/31144 {using masks}	(Frozen)	materials}
21/3115 Doping the insulating layers	21/3148	{Silicon Carbide layers}
21/31155 {by ion implantation}	(Frozen)	
21/312 Organic layers, e.g. photoresist	2021/3149	• {Langmuir-Blodgett techniques}
(Frozen) (H01L 21/3105, H01L 21/32 take	(Frozen)	
precedence; {photoresists per se G03C})	21/316	composed of oxides or glassy oxides
	(Frozen)	or oxide based glass
<u>WARNING</u>		WARNING
Groups <u>H01L 21/312</u> –		Group H01L 21/316 is no longer
$\underline{\text{H01L } 21/3128}$ are no longer used		used for the classification of
for the classification of documents		documents as of May 1, 2011.
as of May 1, 2011. The content of		The content of this group is
these groups is being reclassified into groups H01L 21/02107 –		being reclassified into groups
H01L 21/02326.		H01L 21/02107 – H01L 21/02326.
		Groups <u>H01L 21/02107</u> –
Groups <u>H01L 21/02107</u> – <u>H01L 21/02326</u> should be		H01L 21/02326 should be
considered in order to perform a		considered in order to perform a
complete search.		complete search.
complete search.	21/21/04	(D ::: 6
21/3121 {Layers comprising organo-silicon	21/31604 (<i>Frozen</i>)	• {Deposition from a gas or vapour (H01L 21/31691, H01L 21/31695
(Frozen) compounds}	(Frozen)	take precedence)}
21/3122 {layers comprising polysiloxane	21/31608	• • {Deposition of SiO ₂
(Frozen) compounds}	(Frozen)	(H01L 21/31625,
21/3124 {layers comprising hydrogen	(170,501)	H01L 21/31629 and
(Frozen) silsesquioxane}		H01L 21/31633 take
21/3125 {layers comprising silazane		precedence)}
(Frozen) compounds}	21/31612	• • {on a silicon body}
21/3127 {Layers comprising fluoro (Frozen) (hydro)carbon compounds, e.g.	(Frozen)	
(Frozen) (Hydro)carbon compounds, e.g. polytetrafluoroethylene}	21/31616	• • {Deposition of Al ₂ O ₃ }
21/3128 {by Langmuir-Blodgett techniques}	(Frozen)	
(Frozen)		• • • {on a silicon body}
21/314 Inorganic layers (<u>H01L 21/3105</u> ,	(Frozen)	
(Frozen) H01L 21/32 take precedence)	21/31625	
	(Frozen)	phosphorus doped silicon oxide,
WARNING	21/21620	e.g. BSG, PSG, BPSG}
Groups <u>H01L 21/314</u> –	21/31629 (<i>Frozen</i>)	• • {Deposition of halogen doped silicon oxide, e.g. fluorine doped
H01L 21/3185 are no longer used	(F104en)	silicon oxide, e.g. Huorine doped silicon oxide}
for the classification of documents as	21/31633	
of May 1, 2011. The content of these group is being reclassified into group	(Frozen)	silicon oxide, e.g. SiOC}
H01L 21/02107 – H01L 21/02326.	21/31637	(T) 1:1 CE : 1 : 1
	(Frozen)	e.g. Ta_2O_5 }
Groups <u>H01L 21/02107</u> – <u>H01L 21/02326</u> should be	21/31641	• • {Deposition of Zirconium oxides,
considered in order to perform a	(Frozen)	e.g. ZrO ₂ }
complete search.	21/21/45	
	21/31645	• • {Deposition of Hafnium oxides,
•	(Frozen)	• • {Deposition of Hafnium oxides, e.g. HfO ₂ }

21/3165 {formed by oxidation	21/3211 (Nitridation of silicon-containing
(Frozen) (H01L 21/31691, H01L 21/31695	layers}
take precedence)}	21/32115 {Planarisation}
21/31654 {of semiconductor materials, e.g.	21/3212 {by chemical mechanical
(Frozen) the body itself}	polishing [CMP]}
21/31658 {by thermal oxidation, e.g. of	21/32125 {by simultaneously passing
(Frozen) SiGe}	an electrical current, i.e.
21/31662 {of silicon in uncombined	electrochemical mechanical
(Frozen) form}	polishing, e.g. ECMP}
21/31666 {of AIII BV compounds}	21/3213 Physical or chemical etching
(Frozen)	of the layers, e.g. to produce
21/3167 {of anodic oxidation}	a patterned layer from a pre-
(Frozen)	deposited extensive layer
21/31675 {of silicon}	21/32131 {by physical means only}
(Frozen)	21/32132 {of silicon-containing layers}
21/31679 (of AIII BV compounds)	21/32133 {by chemical means only}
(Frozen)	21/32134 {by liquid etching only}
21/31683 (of metallic layers, e.g. Al	21/32135 {by vapour etching only}
(Frozen) deposited on the body, e.g.	21/32136 {using plasmas}
formation of multi-layer	21/32137 (of silicon-containing
insulating structures}	layers}
21/31687 {by anodic oxidation}	21/32138 {pre- or post-treatments, e.g.
(Frozen)	anti-corrosion processes}
21/31691 {with perovskite structure}	21/32139 {using masks}
(Frozen)	21/3215 Doping the layers
21/31695 (Deposition of porous oxides or	21/32155 {Doping polycristalline - or
(Frozen) porous glassy oxides or oxide based	amorphous silicon layers}
porous glass}	21/322 to modify their internal properties, e.g. to
21/318 composed of nitrides	produce internal imperfections
(Frozen) WARNING	21/3221 {of silicon bodies, e.g. for gettering}
	21/3223 {using cavities formed by hydrogen
Group H011 21/318 is no longer	21/3223 • • • • • Gushig cavides formed by flydrogen
Group H01L 21/318 is no longer	or noble gas ion implantation}
used for the classification of	
used for the classification of documents as of May 1, 2011.	or noble gas ion implantation}
used for the classification of documents as of May 1, 2011. The content of this group is	or noble gas ion implantation} 21/3225 {Thermally inducing defects using oxygen present in the silicon body for intrinsic gettering (H01L 21/3226
used for the classification of documents as of May 1, 2011.	or noble gas ion implantation} 21/3225 {Thermally inducing defects using oxygen present in the silicon body
used for the classification of documents as of May 1, 2011. The content of this group is being reclassified into groups H01L 21/02107 – H01L 21/02326.	or noble gas ion implantation} 21/3225 {Thermally inducing defects using oxygen present in the silicon body for intrinsic gettering (H01L 21/3226 takes precedence)}
used for the classification of documents as of May 1, 2011. The content of this group is being reclassified into groups H01L 21/02107 – H01L 21/02326. Groups H01L 21/02107 –	or noble gas ion implantation} 21/3225 {Thermally inducing defects using oxygen present in the silicon body for intrinsic gettering (H01L 21/3226 takes precedence)} NOTE
used for the classification of documents as of May 1, 2011. The content of this group is being reclassified into groups H01L 21/02107 – H01L 21/02326. Groups H01L 21/02326 should be	or noble gas ion implantation} 21/3225 {Thermally inducing defects using oxygen present in the silicon body for intrinsic gettering (H01L 21/3226 takes precedence)} NOTE {Gettering using both extrinsic and
used for the classification of documents as of May 1, 2011. The content of this group is being reclassified into groups H01L 21/02107 – H01L 21/02326. Groups H01L 21/02107 –	or noble gas ion implantation } 21/3225 {Thermally inducing defects using oxygen present in the silicon body for intrinsic gettering (H01L 21/3226 takes precedence) } NOTE {Gettering using both extrinsic and intrinsic gettering techniques is
used for the classification of documents as of May 1, 2011. The content of this group is being reclassified into groups H01L 21/02107 – H01L 21/02326. Groups H01L 21/02107 – H01L 21/02326 should be considered in order to perform a complete search.	or noble gas ion implantation} 21/3225 {Thermally inducing defects using oxygen present in the silicon body for intrinsic gettering (H01L 21/3226 takes precedence)} NOTE {Gettering using both extrinsic and intrinsic gettering techniques is classified in both H01L 21/3221
used for the classification of documents as of May 1, 2011. The content of this group is being reclassified into groups H01L 21/02107 – H01L 21/02326. Groups H01L 21/02326 should be considered in order to perform a complete search. 21/3185 {of siliconnitrides}	or noble gas ion implantation} 21/3225 {Thermally inducing defects using oxygen present in the silicon body for intrinsic gettering (H01L 21/3226 takes precedence)} NOTE {Gettering using both extrinsic and intrinsic gettering techniques is
used for the classification of documents as of May 1, 2011. The content of this group is being reclassified into groups H01L 21/02107 – H01L 21/02326. Groups H01L 21/02326 should be considered in order to perform a complete search. 21/3185 {of siliconnitrides}	or noble gas ion implantation } 21/3225 {Thermally inducing defects using oxygen present in the silicon body for intrinsic gettering (H01L 21/3226 takes precedence) } NOTE {Gettering using both extrinsic and intrinsic gettering techniques is classified in both H01L 21/3221
used for the classification of documents as of May 1, 2011. The content of this group is being reclassified into groups H01L 21/02107 – H01L 21/02326. Groups H01L 21/02326 should be considered in order to perform a complete search. 21/3185 {of siliconnitrides} (Frozen) 21/32 using masks	or noble gas ion implantation} 21/3225 {Thermally inducing defects using oxygen present in the silicon body for intrinsic gettering (H01L 21/3226 takes precedence)} NOTE {Gettering using both extrinsic and intrinsic gettering techniques is classified in both H01L 21/3221 and H01L 21/3225.}
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21/3247	• • • • { for altering the shape, e.g. smoothing the surface }	21/465 Chemical or electrical treatment, e.g. electrolytic etching (to form insulating
	WARNING	layers <u>H01L 21/469</u>)
	Group H01L 21/3247 is incomplete pending reclassification of documents from group H01L 21/324. Groups H01L 21/324 and H01L 21/3247 should be considered	21/467 using masks 21/469 to form insulating layers thereon, e.g. for masking or by using photolithographic techniques (encapsulating layers H01L 21/56); After-treatment of these layers
	in order to perform a complete search.	21/47 Organic layers, e.g. photoresist (H01L 21/475, H01L 21/4757 take precedence)
21/326	Application of electric currents or fields, e.g. for electroforming (H01L 21/20 - H01L 21/288 and	21/471 Inorganic layers (<u>H01L 21/475</u> , <u>H01L 21/4757</u> take precedence)
	H01L 21/302 - H01L 21/324 take precedence)	21/473 composed of oxides or glassy oxides or oxide based glass
21/34	the devices having semiconductor bodies	21/475 using masks
	not provided for in groups H01L 21/18,	21/4757 After-treatment
	H10D 48/04 and H10D 48/07, with or without	21/47573 {Etching the layer}
	impurities, e.g. doping materials	21/47576 {Doping the layer}
21/38	Diffusion of impurity materials, e.g. doping	21/4763 Deposition of non-insulating, e.g.
	materials, electrode materials, into or	conductive -, resistive -, layers on
	out of a semiconductor body, or between	insulating layers; After-treatment of
	semiconductor regions	these layers (manufacture of electrodes
21/383	using diffusion into or out of a solid from	H01L 21/28, {H01L 21/44})
	or into a gaseous phase	21/47635 {After-treatment of these layers}
21/385	using diffusion into or out of a solid from	21/477 Thermal treatment for modifying the properties of semiconductor
	or into a solid phase, e.g. a doped oxide	bodies, e.g. annealing, sintering
01/200	layer	(<u>H01L 21/38</u> - <u>H01L 21/449</u> and
21/388	or into a liquid phase, e.g. alloy diffusion processes	<u>H01L 21/461</u> - <u>H01L 21/475</u> take precedence)
21/40	Alloying of impurity materials, e.g. doping	21/479 Application of electric currents
	materials, electrode materials, with a semiconductor body	or fields, e.g. for electroforming (H01L 21/38 - H01L 21/449 and H01L 21/461 - H01L 21/475 take
21/42	Bombardment with radiation	precedence)
21/423	with high-energy radiation	21/48 Manufacture or treatment of parts, e.g.
21/425	producing ion implantation	containers, prior to assembly of the devices,
21/426	using masks	using processes not provided for in a single one
21/428	using electromagnetic radiation, e.g. laser radiation	of the groups <u>H01L 21/18 - H01L 21/326</u> or <u>H10D 48/04 - H10D 48/07</u>
21/44	Manufacture of electrodes on	<u>NOTE</u>
	semiconductor bodies using processes	
	or apparatus not provided for in groups	{In this group, the expression "treatment"
21/441	H01L 21/38 - H01L 21/428 Deposition of conductive or insulating	covers also the removal of leads from
21/441	materials for electrodes	parts.}
21/443	from a gas or vapour, e.g. condensation	21/4803 {Insulating or insulated parts, e.g.
21/445	from a liquid, e.g. electrolytic deposition	mountings, containers, diamond heatsinks
21/447	involving the application of pressure, e.g.	(H01L 21/4846 takes precedence; printed
£1/77 <i>1</i>	thermo-compression bonding	circuit boards H05K 1/00)}
21/449	involving the application of mechanical	21/4807 {Ceramic parts}
==	vibrations, e.g. ultrasonic vibrations	21/481 (Insulating layers on insulating parts, with
21/46	Treatment of semiconductor bodies using	or without metallisation}
	processes or apparatus not provided for	21/4814 {Conductive parts}
	in groups <u>H01L 21/428</u> (manufacture of	21/4817 {for containers, e.g. caps (<u>H01L 21/4871</u>
	electrodes thereon H01L 21/44)	takes precedence)}
21/461	to change their surface-physical	21/4821 {Flat leads, e.g. lead frames with or
	characteristics or shape, e.g. etching,	without insulating supports}
	polishing, cutting	21/4825 {Connection or disconnection of other
21/463	Mechanical treatment, e.g. grinding,	leads to or from flat leads, e.g. wires,
	ultrasonic treatment	bumps, other flat leads}
		21/4828 {Etching (etching for cleaning without patterning H01L 21/4835)}

21/4832	(Etching a tamonomy substrate often	21/563 {Encapsulation of active face of
21/4032	{Etching a temporary substrate after encapsulation process to form leads}	21/563 {Encapsulation of active face of flip-chip device, e.g. underfilling
21/4835	{Cleaning, e.g. removing of solder}	or underencapsulation of flip-chip,
21/4839	{Assembly of a flat lead with an	encapsulation preform on chip or
	insulating support, e.g. for TAB}	mounting substrate}
21/4842	{Mechanical treatment, e.g. punching,	21/565 {Moulds} 21/566 {Release layers for moulds, e.g. release
21/4946	cutting, deforming, cold welding}	21/566 {Release layers for moulds, e.g. release layers, layers against residue during
21/4846	{Leads on or in insulating or insulated substrates, e.g. metallisation	moulding}
	(H01L 21/4821 takes precedence;	21/568 {Temporary substrate used as
	metallisation of ceramics in general	encapsulation process aid (H01L 21/4832
	<u>C04B 41/51</u> ; printed circuits <u>H05K 3/00</u>)}	and H01L 21/566 take precedence)}
21/485	{Adaptation of interconnections, e.g.	21/60 Attaching {or detaching} leads or other conductive members, to be used for carrying
21/4853	engineering charges, repair techniques} {Connection or disconnection of other	current to or from the device in operation
21/4033	leads to or from a metallisation, e.g.	2021/60007 {involving a soldering or an alloying
	pins, wires, bumps}	process}
21/4857	• • • • • • {Multilayer substrates (multilayer	2021/60015 {using plate connectors, e.g. layer, film}
	metallisation on monolayer substrate	2021/60022 {using bump connectors, e.g. for flip
21/496	H01L 21/4846)}	chip mounting}
21/486	• • • • • {Via connections through the substrate with or without pins}	2021/6003 {Apparatus therefor} 2021/60037 {Right-up bonding}
21/4864	{Cleaning, e.g. removing of solder}	2021/60045 {Right-up bolding}
21/4867	(Applying pastes or inks, e.g.	connectors prior to bonding}
	screen printing (H01L 21/486 takes	2021/60052 {Oxide removing step, e.g. flux,
21/10=1	precedence)}	rosin}
21/4871	{Bases, plates or heatsinks}	2021/6006 {with temporary supporting member
21/4875	{Connection or disconnection of other leads to or from bases or plates}	not part of an apparatus, e.g. removable coating, film or substrate}
21/4878	{Mechanical treatment, e.g. deforming}	2021/60067 (Aligning the bump connectors with
21/4882	• • • • {Assembly of heatsink parts}	the mounting substrate}
21/4885	• • • • {Wire-like parts or pins (wire ball	2021/60075 (involving active alignment, i.e.
	formation <u>B23K 20/00</u> ; methods related to	by apparatus steering, e.g. using
	connecting semiconductor or other solid state bodies <u>H01L 24/00</u>)}	alignment marks, sensors} 2021/60082 {involving passive alignment, e.g.
21/4889	{Connection or disconnection of other	using surface energy, chemical
21/1009	leads to or from wire-like parts, e.g.	reactions, thermal equilibrium}
	wires}	2021/6009 (involving guiding structures, e.g.
21/4892	{Cleaning}	structures that are left at least partly
21/4896	{Mechanical treatment, e.g. cutting,	in the bonded product, spacers}
21/50	bending } Assembly of semiconductor devices	2021/60097 {Applying energy, e.g. for the soldering or alloying process}
21/30	using processes or apparatus not	2021/60105 {using electromagnetic radiation}
	provided for in a single one of the	2021/60112 {Coherent radiation, i.e. laser
	groups <u>H01L 21/18</u> - <u>H01L 21/326</u> or	beam}
	<u>H10D 48/04</u> - <u>H10D 48/07</u> {e.g. sealing of a cap to a base of a container}	2021/6012 {Incoherent radiation, e.g.
	•	polychromatic heating lamp} 2021/60127 {Induction heating, i.e. eddy}
	<u>NOTE</u>	currents}
	{Arrangements for connecting or	2021/60135 {using convection, e.g. reflow
	disconnecting semiconductor or other solid state bodies, or methods related thereto,	oven}
	other than those arrangements or methods	2021/60142 { with a graded temperature
	covered by the following subgroups, are	profile}
	covered by <u>H01L 24/00</u> .}	2021/6015 {using conduction, e.g. chuck heater, thermocompression}
21/52	Mounting semiconductor bodies in	2021/60157 {with a graded temperature
-1/52	containers	profile}
21/54	• • • Providing fillings in containers, e.g. gas	2021/60165 {using an electron beam}
· -	fillings	2021/60172 {using static pressure}
21/56	Encapsulations, e.g. encapsulation layers,	2021/6018 {Unidirectional static pressure}
21/561	coatings {Batch processing}	2021/60187 {Isostatic pressure, e.g. degassing using vacuum or pressurised
21/301	· · · · · [Buttern processing]	liquid}
		* *

2021/60195 {using dynamic pressure, e.g. ultrasonic or thermosonic bonding}	21/67005 • • {Apparatus not specifically provided for elsewhere (processes per se H01L 21/30,
2021/60202 { using a protective atmosphere, e.g. with forming or shielding gas } 2021/6021 { using an autocatalytic reaction }	H01L 21/46, H01L 23/00; simple temporary support means, e.g. using adhesives, electric or magnetic means H01L 21/68, H01L 21/302)}
2021/60217 {Using an autocatarytic reaction} 2021/60217 {Detaching bump connectors, e.g. after testing}	21/67011 • • {Apparatus for manufacture or treatment (processes H01L 21/30, H01L 21/46; for
2021/60225 {Arrangement of bump connectors prior to mounting}	production or after-treatment of single crystals or homogeneous polycrystalline material
2021/60232 { wherein the bump connectors are disposed only on the semiconductor chip}	(<u>H01L 21/67126</u> , <u>H01L 21/6715</u> take
2021/6024 {wherein the bump connectors are disposed only on the mounting substrate}	precedence)} 21/67023 • • • • {for general liquid treatment, e.g. etching followed by cleaning}
2021/60247 {wherein the bump connectors are disposed on both the semiconductor	21/67028 { for cleaning followed by drying, rinsing, stripping, blasting or the like }
chip and the mounting substrate, e.g. bump to bump}	21/67034 {for drying} 21/6704 {for wet cleaning or washing}
2021/60255 {wherein the bump connectors are provided as prepeg, e.g. are	21/67046 {using mainly scrubbing means, e.g. brushes}
provided in an insulating plate member} 2021/60262 {Lateral distribution of bump	21/67051 {using mainly spraying means, e.g. nozzles} 21/67057 {with the semiconductor substrates
connectors prior to mounting}	being dipped in baths or vessels}
2021/6027 { Mounting on semiconductor conductive members }	21/67063 {for etching} 21/67069 {for drying etching}
2021/60277 {involving the use of conductive	21/67075 {for wet etching}
adhesives}	21/6708 (using mainly spraying means, e.g.
2021/60285 {involving the use of mechanical auxiliary parts without the use of an alloying or soldering process, e.g. pressure contacts}	nozzles} 21/67086 { with the semiconductor substrates being dipped in baths or vessels}
2021/60292 {involving the use of an electron or laser beam}	21/67092 {Apparatus for mechanical treatment (or grinding or cutting, see the relevant groups in
21/603 involving the application of pressure,	subclasses <u>B24B</u> or <u>B28D</u>)}
e.g. thermo-compression bonding (H01L 21/607 takes precedence)	21/67098 {Apparatus for thermal treatment} 21/67103 {mainly by conduction}
21/607 involving the application of mechanical	21/67103 {mainly by conduction} 21/67109 {mainly by convection}
vibrations, e.g. ultrasonic vibrations	21/67115 {mainly by convection}
21/62 the devices having no potential barriers	21/67121 {Apparatus for making assemblies not
21/64 • Manufacture or treatment of solid state devices other than semiconductor devices, or of parts	otherwise provided for, e.g. package constructions}
thereof, not peculiar to a single device provided for in subclasses H10F, H10H, H10K or H10N 21/67 • Apparatus specially adapted for handling	21/67126 {Apparatus for sealing, encapsulating, glassing, decapsulating or the like (processes H01L 23/02, H01L 23/28)}
semiconductor or electric solid state devices during manufacture or treatment thereof; Apparatus	21/67132 {Apparatus for placing on an insulating substrate, e.g. tape}
specially adapted for handling wafers during manufacture or treatment of semiconductor or	21/67138 {Apparatus for wiring semiconductor or solid state device}
electric solid state devices or components {;	21/67144 • • • {Apparatus for mounting on conductive
Apparatus not specifically provided for elsewhere (processes per se H01L 21/30, H01L 21/46, H01L 23/00; simple temporary support means,	members, e.g. leadframes or conductors on insulating substrates}
e.g. using adhesives, electric or magnetic means <u>H01L 21/68</u> , <u>H01L 21/302</u> ; apparatus for	21/6715 {Apparatus for applying a liquid, a resin, an ink or the like (H01L 21/67126 takes
manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies	precedence)} 21/67155 • • • {Apparatus for manufacturing or treating in a plurality of work-stations}
and for methods related thereto <u>H01L 24/74;</u>)} NOTE	21/67161 {characterized by the layout of the process chambers}
{In this subgroup the term substrate designates a semiconductor or electric solid state device or	21/67167 {surrounding a central transfer chamber}
component, or a wafer.}	21/67173 {in-line arrangement}
	21/67178 {vertical arrangement}

21/67184 {characterized by the presence of more than one transfer chamber}	21/6732 {Vertical carrier comprising wall type elements whereby the substrates are horizontally
21/6719 {characterized by the construction of	supported, e.g. comprising sidewalls}
the processing chambers, e.g. modular processing chambers}	21/67323 {characterized by a material, a roughness, a coating or the like}
21/67196 {characterized by the construction of the transfer chamber}	21/67326 • • • {Horizontal carrier comprising wall type elements whereby the substrates are vertically
21/67201 {characterized by the construction of the	supported, e.g. comprising sidewalls}
load-lock chamber} 21/67207 {comprising a chamber adapted to a	21/6733 {characterized by a material, a roughness, a coating or the like}
particular process} 21/67213 {comprising at least one ion or	21/67333 {Trays for chips (magazine for components H05K 13/0084)}
electron beam chamber (coating by ion implantation C23C; ion or electron	21/67336 {characterized by a material, a roughness, a coating or the like}
beam tubes $\underline{H01J37/00}$)	21/6734 {specially adapted for supporting large square
21/67219 {comprising at least one polishing	shaped substrates (containers and packaging
chamber (polishing apparatuses <u>B24B</u>)}	elements for glass sheets <u>B65D 85/48</u> , transporting of glass products during their
21/67225 {comprising at least one lithography chamber (lithographic apparatuses	manufacture C03B 35/00)}
<u>G03F 7/00</u>)}	21/67343 {characterized by a material, a roughness, a
21/6723 {comprising at least one plating	coating or the like}
chamber (electroless plating apparatuses <u>C23C</u> , electroplating apparatuses	21/67346 {characterized by being specially adapted for supporting a single substrate or by comprising a
C25D)}	stack of such individual supports}
21/67236 {the substrates being processed being not	21/6735 {Closed carriers}
semiconductor wafers, e.g. leadframes or	21/67353 • • • { specially adapted for a single substrate}
chips}	21/67356 {specially adapted for containing chips, dies
21/67242 { Apparatus for monitoring, sorting or marking (testing or measuring during manufacture	or ICs} 21/67359 {specially adapted for containing masks,
H01L 22/00, marks per se H01L 23/544;	reticles or pellicles}
testing individual semiconductor devices	21/67363 {specially adapted for containing substrates
G01R 31/26)} 21/67248 {Temperature monitoring}	other than wafers (<u>H01L 21/67356</u> ,
21/67253 {Process monitoring}	H01L 21/67359 take precedence)} 21/67366 {characterised by materials, roughness,
monitoring}	coatings or the like (materials relating to an
21/67259 {Position monitoring, e.g. misposition	injection moulding process <u>B29C 45/00</u> ;
detection or presence detection} 21/67265 {of substrates stored in a container, a	chemical composition of materials
magazine, a carrier, a boat or the like	C08L 51/00)} 21/67369 {characterised by shock absorbing elements,
21/67271 {Sorting devices}	e.g. retainers or cushions}
21/67276 {Production flow monitoring, e.g. for	21/67373 {characterised by locking systems}
increasing throughput (program-control	21/67376 {characterised by sealing arrangements}
systems <u>per se G05B 19/00</u> , e.g. total factory control <u>G05B 19/418</u>)}	21/67379 {characterised by coupling elements,
21/67282 {Marking devices}	kinematic members, handles or elements to be externally gripped}
21/67288 {Monitoring of warpage, curvature, damage,	21/67383 {characterised by substrate supports}
defects or the like}	21/67386 {characterised by the construction of the
21/67294 {using identification means, e.g. labels on	closed carrier}
substrates or labels on containers} 21/673 •• using specially adapted carriers {or holders;	21/67389 {characterised by atmosphere control}
Fixing the workpieces on such carriers or holders	21/67393 {characterised by the presence of atmosphere modifying elements inside or
(holders for supporting a complete device in	attached to the closed carrierl}
operation <u>H01L 23/32</u>)}	21/67396 {characterised by the presence of antistatic
21/67303 {Vertical boat type carrier whereby the substrates are horizontally supported, e.g.	elements}
comprising rod-shaped elements}	21/677 • for conveying, e.g. between different workstations
21/67306 {characterized by a material, a roughness, a	21/67703 {between different workstations}
coating or the like}	21/67706 {Mechanical details, e.g. roller, belt
21/67313 {characterized by the substrate support}	(<u>H01L 21/67709</u> takes precedence)}
21/67313 {Horizontal boat type carrier whereby the substrates are vertically supported, e.g.	21/67709 {using magnetic elements}
comprising rod-shaped elements}	21/67712 {the substrate being handled substantially vertically}
21/67316 {characterized by a material, a roughness, a	21/67715 {Changing the direction of the conveying
coating or the like}	path}

21/67718	• • • • (Changing orientation of the substrate, e.g. from a horizontal position to a vertical	21/6836 {Wafer tapes, e.g. grinding or dicing support tapes (adhesive tapes in general <u>C09J 7/20</u>)}
21/67721	position} {the substrates to be conveyed not	21/6838 { with gripping and holding devices using a vacuum; Bernoulli devices}
21/07/21	being semiconductor wafers or large	
	planar substrates, e.g. chips, lead frames	21/687 using mechanical means, e.g. chucks, clamps or pinches { (using electrostatic chucks
	(H01L 21/6773 takes precedence)	H01L 21/6831)}
21/67724	• • • {by means of a cart or a vehicule}	21/68707 • • • • {the wafers being placed on a robot blade, or
	{using a general scheme of a conveying path	gripped by a gripper for conveyance}
21/0/72/	within a factory}	21/68714 • • • • {the wafers being placed on a susceptor,
21/6773	{Conveying cassettes, containers or carriers}	stage or support}
	{Overhead conveying}	21/68721 {characterised by edge clamping, e.g.
	{Loading to or unloading from a conveyor}	clamping ring}
	{Loading to of unloading from a conveyor} {into and out of processing chamber}	21/68728 {characterised by a plurality of separate
	{Mechanical parts of transfer devices (robots	clamping members, e.g. clamping fingers}
21/07/42	in general in <u>B25J</u>)}	21/68735 {characterised by edge profile or support
21/67745	{characterized by movements or sequence of	profile}
21/07/43	movements of transfer devices}	21/68742 {characterised by a lifting arrangement,
21/67748	• • • {horizontal transfer of a single workpiece}	e.g. lift pins}
	• • • {vertical transfer of a single workpiece}	21/6875 (characterised by a plurality of individual
	{horizontal transfer of a batch of	support members, e.g. support posts or
21/07/34	workpieces}	protrusions}
21/67757	• • • {vertical transfer of a batch of workpieces}	21/68757 {characterised by a coating or a hardness
21/6776	{Continuous loading and unloading	or a material}
21/07/0	into and out of a processing chamber,	21/68764 {characterised by a movable susceptor,
	e.g. transporting belts within processing	stage or support, others than those only
	chambers}	rotating on their own vertical axis, e.g.
21/67763	• • • {the wafers being stored in a carrier, involving	susceptors on a rotating caroussel}
	loading and unloading (H01L 21/6779 takes	21/68771 {characterised by supporting more than
	precedence)}	one semiconductor substrate}
21/67766	{Mechanical parts of transfer devices (robots	21/68778 {characterised by supporting substrates
	in general in <u>B25J</u>)}	others than wafers, e.g. chips}
21/67769	{Storage means}	21/68785 {characterised by the mechanical
21/67772	• • • {involving removal of lid, door, cover}	construction of the susceptor, stage or
21/67775	{Docking arrangements}	support}
21/67778	• • • • {involving loading and unloading of wafers}	21/68792 {characterised by the construction of the
	{Batch transfer of wafers}	shaft}
21/67784	• • • {using air tracks}	21/70 • Manufacture or treatment of devices consisting of a
21/67787	{ with angular orientation of the workpieces}	plurality of solid state components formed in or on a common substrate or of parts thereof; Manufacture
21/6779	• • • • {the workpieces being stored in a carrier,	of integrated circuit devices or of parts thereof
	involving loading and unloading}	({multistep manufacturing processes of assemblies
21/67793	• • • { with orientating and positioning by means of a	consisting of a plurality of individual semiconductor
	vibratory bowl or track}	or other solid state devices <u>H01L 25/00;</u> }
21/67796	• • • { with angular orientation of workpieces	manufacture of assemblies consisting of preformed
	$(\underline{\text{H01L } 21/67787} \text{ and } \underline{\text{H01L } 21/67793} \text{ take})$	electrical components <u>H05K 3/00</u> , <u>H05K 13/00</u>)
	precedence)}	21/702 • • {of thick-or thin-film circuits or parts thereof}
21/68	for positioning, orientation or alignment	21/705 {of thick-film circuits or parts thereof}
21/681	• • • {using optical controlling means}	21/707 { of thin-film circuits or parts thereof}
21/682	• • • {Mask-wafer alignment (in general G03F 7/70,	21/71 Manufacture of specific parts of devices
	<u>G03F 9/70</u>)}	defined in group <u>H01L 21/70</u> ({ <u>H01L 21/0405</u> ,
21/683	• • for supporting or gripping (for conveying	<u>H01L 21/0445</u> }, <u>H01L 21/28</u> , <u>H01L 21/44</u> ,
	H01L 21/677, for positioning, orientation or	<u>H01L 21/48</u> take precedence)
01/2021	alignment H01L 21/68)	21/74 Making of {localized} buried regions, e.g.
21/6831	• • {using electrostatic chucks}	buried collector layers, internal connections
21/6833	{Details of electrostatic chucks}	{substrate contacts}
21/6835	• • • {using temporarily an auxiliary support}	21/743 {Making of internal connections, substrate
	NOTE	contacts }
	{H01L 21/6835, details of the apparatus	21/746 {for AIII-BV integrated circuits}
	are to be further indexed using the indexing	21/76 Making of isolation regions between components
	codes chosen from H01L 2221/68304 and	*
		21/7602 {between components manufactured in an active substrate comprising SiC compounds}

21/7605	• • • • {between components manufactured in an active substrate comprising AIII BV compounds}	21/76237 {introducing impurities in trench side or bottom walls, e.g. for forming channel stoppers or alter isolation behavior}
21/7607	• • • • {between components manufactured in an active substrate comprising $A_{II}B_{VI}$	21/7624 {using semiconductor on insulator [SOI] technology}
21/761	compounds} PN junctions	21/76243 {using silicon implanted buried insulating layers, e.g. oxide layers, i.e.
21/762	Dielectric regions {, e.g. EPIC dielectric isolation, LOCOS; Trench refilling	SIMOX techniques \\ 21/76245 \cdot \
21/76202	techniques, SOI technology, use of channel stoppers}	silicon, i.e. FIPOS techniques} 21/76248 {using lateral overgrowth techniques,
21/76202	{using a local oxidation of silicon, e.g. LOCOS, SWAMI, SILO (H01L 21/76235	i.e. ELO techniques} 21/76251 {using bonding techniques}
	takes precedence; together with vertical isolation, e.g. LOCOS in a SOI substrate, H01L 21/76264)}	21/76254 { with separation/delamination along an ion implanted layer, e.g. Smart-cut, Unibond }
21/76205	• • • • • {in a region being recessed from the surface, e.g. in a recess, groove, tub or	21/76256 { using silicon etch back techniques, e.g. BESOI, ELTRAN}
21/76208	trench region} {using auxiliary pillars in the recessed}	21/76259 { with separation/delamination along a porous layer}
	region, e.g. to form LOCOS over extended areas}	21/76262 {using selective deposition of single crystal silicon, i.e. SEG techniques}
21/7621	{ the recessed region having a shape	21/76264 {SOI together with lateral isolation,
	other than rectangular, e.g. rounded or oblique shape (<u>H01L 21/76208</u> takes precedence)}	e.g. using local oxidation of silicon, or dielectric or polycristalline material
21/76213	{introducing electrical inactive or active	refilled trench or air gap isolation regions, e.g. completely isolated
	impurities in the local oxidation region, e.g. to alter LOCOS oxide growth	semiconductor islands}
	characteristics or for additional isolation	21/76267 {Vertical isolation by silicon implanted buried insulating layers,
21/7/21/	purpose }	e.g. oxide layers, i.e. SIMOX
21/76216	impurities in the local oxidation	techniques} 21/7627 {Vertical isolation by full isolation
	region for the sole purpose of creating channel stoppers}	by porous oxide silicon, i.e. FIPOS techniques}
21/76218	(introducing both types of electrical active impurities in the local oxidation region for the sole	21/76272 {Vertical isolation by lateral overgrowth techniques, i.e. ELO
	purpose of creating channel	techniques} 21/76275 {Vertical isolation by bonding
	stoppers, e.g. for isolation of complementary doped regions}	techniques}
21/76221		21/76278 {Vertical isolation by selective deposition of single crystal silicon,
21/7/224	oxidation steps}	i.e. SEG techniques}
21/76224	{using trench refilling with dielectric materials (trench filling with	21/76281 {Lateral isolation by selective oxidation of silicon}
	polycristalline silicon H01L 21/763;	21/76283 {Lateral isolation by refilling of
	together with vertical isolation, e.g. trench refilling in a SOI substrate	trenches with dielectric material}
	H01L 21/76264)}	21/76286 {Lateral isolation by refilling of trenches with polycristalline material}
21/76227	by full chemical transformation of	21/76289 {Lateral isolation by air gap}
	non-dielectric materials, such as	21/76291 {Lateral isolation by field effect}
	polycristalline silicon, metals}	21/76294 { using selective deposition of single crystal silicon, i.e. SEG techniques}
21/76229	{Concurrent filling of a plurality of trenches having a different trench shape	21/76297 {Dielectric isolation using EPIC
	or dimension, e.g. rectangular and	techniques, i.e. epitaxial passivated
	V-shaped trenches, wide and narrow	integrated circuit} 21/763 Polycrystalline semiconductor regions
21/76232	trenches, shallow and deep trenches} {of trenches having a shape other than	21//63 Polycrystalline semiconductor regions {(H01L 21/76264 takes precedence)}
21/10/23/2	rectangular or V-shape, e.g. rounded	21/764 Air gaps {(<u>H01L 21/76264</u> takes
	corners, oblique or rounded trench walls	precedence)}
21/76235	(H01L 21/76229 takes precedence)} {trench shape altered by a local	21/765 by field effect {(<u>H01L 21/76264</u> takes precedence)}
21/10233	oxidation of silicon process step, e.g.	r/)
	trench corner rounding by LOCOS}	

within a device [comprising conductors and dielectrics] NOTE (Groups (Groups H011_21/7689_H011_21/76898cover muld-step processes for manufacturing interconnections. Information peculiar to a single-step processes should also be classified in the corresponding group, e.g. elening H011_21/202041 etching H011_21/311_H011_21/3213 masking H011_21/327_H011_21/313. H011_21/3144_H011_21/32139 planuaring H011_21/3165. H011_21/321_) 21/76802 [by forming openings in dielectrics] 21/76803 (by forming openings in dielectrics) 21/76804 (by forming penings in dielectrics) 21/76805 (the opening bening a via or contact hole penetrating the underlying conductor) 21/76807 (for daul damascene structures) 21/7681 (involving one or more buried masks) 21/7681 (involving multiple stacked prepathered masks) 21/76813 (involving apartial via etch) 21/76814 (post-teatment or after-treatment, e.g. cleaning or removal of oxides on underlying conductors) 21/76816 (Aspects relating to the layout of the pattern or to the size of vias or renches (layout of the pattern or to the size of vias or renches (layout of the pattern or to the size of vias or renches (layout of the pattern or to the size of vias or renches (layout of the pattern or to the size of vias or renches (layout of the pattern or to the size of vias or renches (layout of the pattern or to the size of vias or renches (layout of the pattern or to the size of vias or renches (layout of the pattern or to the size of vias or renches (layout of the pattern or to the size of vias or renches (layout of the interconnections per se H011_21/3051) 21/76817 (laying printing relating to the layout of the pattern or to the size of vias or renches (layout of the interconnections) pattern or the size of vias or renches (layout of the pattern or to the size of vias or renches (layout of the pattern or to the size of vias or renches (layout of the pattern or the size of vias or renches (layout of the pattern or the size of vias or renches (layout of the pattern or the size of v
Croups Groups H011_21/768 - H011_21/76898cover H011_21/768 - H011_21/76898cover H011_21/768 - H011_21/76898cover H011_21/76819 H012_21/76810 Characterised by the formation and the after-treatment of the dielectrics, e.g. smoothing) H012_21/76804 H011_21/76819 H012_21/76810 Characterised by the formation and the after-treatment of the dielectrics, e.g. smoothing) H012_21/76806 H012_21/76810 H012_21
(Groups H011_21/768 - H011_21/76898cover multi-step processes for manufacturing interconnections. Information peculiar to single-step processes should also be classified in the corresponding group, e.g. cleaning H011_21/20041 - etching H011_21/301. H011_21/3213 - masking H011_21/0021. H011_21/333 - H011_21/311. H011_21/3213 - planarizing H011_21/3105. H011_21/314. H011_21/3219 - planarizing H011_21/3105. H011_21/314. H011_21/3219 - planarizing H011_21/3105. H011_21/3016. H011_21/3105. H011_21/3016. H0
Groups H011_21/768 - H011_21/76898cover multi-step processes for manufacturing interconnections. Information peculiar to single-step processes should also be classified in the corresponding group, e.g. cleaning H011_21/02041 etching H011_21/021_131_H011_21/021_3 h011_21/31_14_H011_21/321_3 planarizing H011_E (2/3)05_H011_21/321_3 h011_21/31_14_H011_21/321_3 planarizing H011_E (2/3)05_H011_21/321_3 h011_21/31_4 h011_21/321_3 h011_21/31_4 h011_21/321_3 h011_21/31_4 h011_21/321_3 h011_21/31_4 h011_21/32_1 h0
HOIL 21/768 + HOIL 21/7689 core multi-steep processes fro manufacturing interconnections. Information peculiar to single-steep processes should also be classified in the corresponding group, e.g cleaning HOIL 21/02044 etching HOIL 21/02044 holl 21/0313 emasking HOIL 21/027 HOIL 21/033 hOIL 21/0314 HOIL 21/3139 planarizing HOIL 21/027 HOIL 21/033 hOIL 21/0314 HOIL 21/3139 planarizing HOIL 21/037 HOIL 21/033 hOIL 21/0321 HOIL 21/0321 HOIL 21/0334 HOIL 21/3319 planarizing HOIL 21/037 HOIL 21/032 HOIL 21/0
multi-step processes for manufacturing interconnections. Information peculiar to single-step processes should also be classified in the corresponding group, e.g. - cleaning HOIL 21/02041 - etching HOIL 21/031, HOIL 21/033, HOIL 21/311, HOIL 21/031, HOIL 21/031, HOIL 21/311, HOIL 21/031, HOIL 21/311, HOIL 21/3213 21/76801 (characterised by the formation and the after-treatment of the dielectrics, e.g. smoothing) treatment of the dielectrics, e.g. smoothing 21/76802 (by forming openings in dielectrics) (the opening being a via or contact hole penetrating the underlying conductor) (the opening being a via or contact hole penetrating the underlying conductor) (throwlving intermediate temporary filling with material) 21/76807 (for dual damascene structures) 21/76841 (Barrier, adhesion or liner layers) 21/76841 (Involving multiple stacked prepatterned masks) 21/76841 (Involving apartial via etch) 21/76841 (Involving multiple stacked prepatterned masks) 21/76849 (the layer being positioned within the main fill metal) 21/76849 (the layer being positioned on top of the patterned masks) 21/76849 (the layer covering a conductive structure (HOIL 21/76849 takes precedence)) 21/76851 (the layer also covering the sidewalls of the patterned to the size of vias or trenches (layout of the interconnections per se HOIL 23/528; CAD of ICs GOF 30/00) (sometiment steps) 21/76852 (the dielectric comprising air gaps) 21/76853 (characterized by particular affertreatment steps) 21/76852 (the dielectric comprising air gaps) 21/76853 (by diffusing alloying elements) 21/76854 (by diffusing alloying elements) 21/76859 (by diffusing alloying elements) 21/76859 (by on implantation) 21/76859 (by on implantation) 21/76850 (by on implantation) 21/76850 (by on im
to single-step processes should also be classified in the corresponding group, e.g.
classified in the corresponding group, e.g.
cleaning H01L 21/3014 etching H01L 21/311, H01L 21/3213 masking H01L 21/31139 hplint 21/31139 planarizing H01L 21/3105 H01L 21/3213) planarizing H01L 21/3105 h01L 21/3213) planarizing H01L 21/32139 planarizing H01L 21/3105 h01L 21/3213) h01L 21/3213] h01L 21/3213) h01L 21/3213] h01L 21/3223] h01L 21/3233] h01L 21/3233
etching B01L 21/311, H01L 21/3213 masking H01L 21/027, H01L 21/303, H01L 21/31144, H01L 21/32139 planarizing H01L 21/3105. H01L 21/32139 planarizing H01L 21/3105. H01L 21/3215 21/76801 (characterised by the formation and the aftertreatment of the dielectrics, e.g. smoothing) treatment of the dielectrics, e.g. smoothing 21/76802 (by forming openings in dielectrics) 21/76804 (by forming tapered via holes) 21/76805 (the opening being a via or contact hole penetrating the underlying conductor) 21/76807 (for dual damascene structures) 21/76841 (Barrier, adhesion or liner layers) 21/76840 (involving intermediate temporary filling with material) 21/76841 (Bottomless liners) 11/76841 (Involving one or more buried masks) 21/76841 (Involving nultiple stacked prepatterned masks) 21/76841 (involving a partial via etch) 21/76841 (post-treatment or after-treatment, e.g. cleaning or removal of oxides on underlying conductors) 21/76849 (the layer being positioned within the main fill metal) 21/76840 (the layer being positioned on top of the pattern or to the size of vias or trenches (layout of the pattern or to the size of vias or trenches (a)out of the pattern or to the size of vias or trenches (a)out of the interconnections per se H01L 23/528; CAD of ICs (3065 30000) 21/76852 (the layer also covering the sidewalls of the conductive structure) 21/76849 (Smoothing of the dielectric (planarisation of insulating materials per se H01L 21/31051) 21/7682 (Modification of the material of dielectric layers, e.g. grading, after-treatment to improve the stability of the layers, to increase their density etc.) 21/76853 (the stability of the layers, to increase their density etc.) 21/76854 (Bombardment with particles, e.g. e.g. (Bombardmen
H01L 21/31144, H01L 21/32139 Planarizing H01L 21/32139 Planarizing H01L 21/3105. H01L 21/321. Conductor insulator semiconductor electrode (gate level interconnections), documents are classified in the relevant electrode (gate level interconnections), documents are classified in the relevant electrode manufacture groups, e.g. H01L 21/28026]. H
• planarizing Holl 21/3105. Holl 21/321.} 21/76801
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21/76823 {transforming an insulating layer into a 21/76862 {Bombardment with particles, e.g.
21/70002 (Boinoardinent with partieres, e.g.
treatment in noble gas plasmas; UV 21/76825 {by exposing the layer to particle irradiation}
radiation, e.g. ion implantation, 21/76864 {Thermal treatment}
irradiation with UV light or electrons 21/76865 {Selective removal of parts of
etc. (plasma treatment <u>H01L 21/76826</u>)} 21/76826 {by contacting the layer with gases, precedence}
li-mid nl-ma-)
21/76828 {characterized by methods of formation other than PVD, CVD or deposition
21/76829 {characterised by the formation of thin from a liquids (PVD H01L 21/2855;
functional dielectric layers, e.g. dielectric CVD <u>H01L 21/28556</u> ; deposition from
etch-stop, barrier, capping or liner layers} 21/76831
21/76831 {in via holes or trenches, e.g. non-conductive sidewall liners} 21/76868 {Forming or treating discontinuous thin films, e.g. repair, enhancement or
21/76832 {Multiple layers} reinforcement of discontinuous thin
films}

21/7687	{Thin films associated with contacts of capacitors}	22/10	• {Measuring as part of the manufacturing process (burn-in G01R 31/2855)}
21/76873	 {Layers specifically deposited to enhance or enable the nucleation of further layers, i.e. seed layers} {for electroplating} {for electroless plating} 	22/12	(for structural parameters, e.g. thickness, line width, refractive index, temperature, warp, bond strength, defects, optical inspection, electrical measurement of structural dimensions, metallurgic measurement of diffusions (electrical).
	• • • • • {for deposition from the gas phase,	22/14	measurement of diffusions <u>H01L 22/14</u>)} • • {for electrical parameters, e.g. resistance, deep-
21/76877	e.g. CVD} {Filling of holes, grooves or trenches, e.g. vias, with conductive material}	22/20	levels, CV, diffusions by electrical means} • {Sequence of activities consisting of a plurality
21/76879	{by selective deposition of conductive material in the vias, e.g. selective C.V.D. on semiconductor material, plating (plating on semiconductors in general H01L 21/288)}	22/22	of measurements, corrections, marking or sorting steps} • {Connection or disconnection of sub-entities or redundant parts of a device in response to a measurement (testing and repair of stores
21/7688	 {by deposition over sacrificial masking layer, e.g. lift-off (lift-off per se H01L 21/0272)} 	22/24	after manufacture including at wafer scale G11C 29/00; fuses per se H01L 23/525)} Optical enhancement of defects or not
21/76882	• • • • • {Reflowing or applying of pressure to better fill the contact hole}		directly visible states, e.g. selective electrolytic deposition, bubbles in liquids, light emission,
21/76883	• • • • {Post-treatment or after-treatment of the conductive material}	22/26	colour change (voltage contrast <u>G01R 31/311</u>)} • • {Acting in response to an ongoing measurement
21/76885	• • • • {By forming conductive members before deposition of protective insulating material, e.g. pillars, studs}		without interruption of processing, e.g. endpoint detection, in-situ thickness measurement (endpoint detection arrangements in CMP
21/76886	• • • • • • • • • • • • • • • • • • •	22/30	apparatus <u>B24B 37/013</u> , in discharge apparatus <u>H01J 37/32</u>)} • {Structural arrangements specially adapted for
21/76888	alloys, reduction of contact resistances} {By rendering at least a portion of the conductor non conductive, e.g.		testing or measuring during manufacture or treatment, or specially adapted for reliability measurements}
21/76889	oxidation} {by forming silicides of refractory metals}	22/32	• • {Additional lead-in metallisation on a device or substrate, e.g. additional pads or pad portions, lines in the scribe line, sacrificed conductors
	{by using superconducting materials}		(arrangements for conducting electric current to or from the solid state body in operation
21/76892 21/76894	{modifying the pattern} {using a laser, e.g. laser cutting, laser	22/34	H01L 23/48)}Circuits for electrically characterising or
21/76895	direct writing, laser repair} {Local interconnects; Local pads, as exemplified by patent document EP0896365}	22/34	monitoring manufacturing processes, e. g. whole test die, wafers filled with test structures, on-board-devices incorporated on each die, process control monitors or pad structures thereof,
	• • • {Formation of self-aligned vias or contact plugs, i.e. involving a lithographically uncritical step}		devices in scribe line (switching, multiplexing, gating devices <u>G01R 19/25</u> ; process control with lithography, e.g. dose control, <u>G03F 7/20</u> ;
21/76898 21/77	 {formed through a semiconductor substrate}. Manufacture or treatment of devices consisting of		structures for alignment control by optical means G03F 7/70633)}
	a plurality of solid state components or integrated circuits formed in, or on, a common substrate (manufacture or treatment of electronic memory devices <u>H10B</u>)	23/00	Details of semiconductor or other solid state devices (H01L 25/00 takes precedence {; structural arrangements for testing or measuring during
21/78	• • • with subsequent division of the substrate into plural individual devices (cutting to change the surface-physical characteristics or shape of semiconductor bodies <u>H01L 21/304</u>)		manufacture or treatment, or for reliability measurements <u>H01L 22/00</u> ; arrangements for connecting or disconnecting semiconductor or solid-state bodies, or methods related thereto <u>H01L 24/00</u> ; finger print sensors <u>G06V 40/12</u> })
21/7806	• • • {involving the separation of the active layers from a substrate}		NOTE
21/7813	• • • • {leaving a reusable substrate, e.g. epitaxial lift off}		This group does not cover: • details of semiconductor bodies or of electrodes
22/00	{Testing or measuring during manufacture or treatment; Reliability measurements, i.e. testing of parts without further processing to modify the parts as such; Structural arrangements therefor}		of devices provided for in subclass <u>H10D</u> , which details are covered by that group; • details peculiar to devices provided for in a single subclass of subclasses <u>H10F</u> , <u>H10H</u> ,

H01L

H01L 23/00			
(continued)	<u>H10K</u> or <u>H10N</u> , which details are covered by those places.	23/26	• • • including materials for absorbing or reacting with moisture or other undesired substances {,
23/02	C		e.g. getters}
23/02	• Containers; Seals (<u>H01L 23/12</u> , <u>H01L 23/34</u> , <u>H01L 23/48</u> , <u>H01L 23/552</u> , { <u>H01L 23/66</u> } take	23/28	• Encapsulations, e.g. encapsulating layers, coatings, {e.g. for protection}(<u>H01L 23/552</u> takes
22/04	precedence; {for memories <u>G11C</u> })		precedence; {insulating layers for contacts or
23/04	 characterised by the shape {of the container or parts, e.g. caps, walls} 		interconnections <u>H01L 23/5329</u> })
23/041	• • { the container being a hollow construction	23/29	• characterised by the material {, e.g. carbon
23/041	having no base used as a mounting for the	23/291	 (interlayer dielectrics <u>H01L 23/5329</u>)} {Oxides or nitrides or carbides, e.g. ceramics,
	semiconductor body}	23/291	glass}
23/043	the container being a hollow construction and	23/293	• • • {Organic, e.g. plastic}
	having a conductive base as a mounting as well as a lead for the semiconductor body	23/295	• • • {containing a filler (<u>H01L 23/296</u> takes precedence)}
23/045	the other leads having an insulating passage	23/296	· · · · {Organo-silicon compounds}
22/047	through the base	23/298	{Semiconductor material, e.g. amorphous
23/047	 the other leads being parallel to the base the other leads being perpendicular to the		silicon}
23/049	base	23/31	• characterised by the arrangement {or shape}
23/051	another lead being formed by a cover plate	23/3107	• • • {the device being completely enclosed}
23/053	parallel to the base plate, e.g. sandwich type the container being a hollow construction and	23/3114	• • • • {the device being a chip scale package, e.g. CSP}
23/033	having an insulating {or insulated} base as a mounting for the semiconductor body	23/3121	• • • {a substrate forming part of the encapsulation}
23/055	the leads having a passage through the base	23/3128	• • • • {the substrate having spherical bumps for external connection}
23/057	{(<u>H01L 23/057</u> takes precedence)} the leads being parallel to the base	23/3135	{Double encapsulation or coating and
23/057	 characterised by the material of the container or 		encapsulation}
23/08	its electrical properties • the material being an electrical insulator, e.g.	23/3142	• • • { Sealing arrangements between parts, e.g. adhesion promotors }
23/08	glass	23/315	• • • { the encapsulation having a cavity }
23/10	characterised by the material or arrangement of seals between parts, e.g. between cap and base of	23/3157	• • • {Partial encapsulation or coating (mask layer used as insulation layer <u>H01L 21/31</u>)}
	the container or between leads and walls of the	23/3164	• • • { the coating being a foil }
	container	23/3171	• • • { the coating being directly applied to the
23/12	. Mountings, e.g. non-detachable insulating substrates		semiconductor body, e.g. passivation layer
23/13	characterised by the shape	23/3178	(H01L 23/3178 takes precedence)} {Coating or filling in grooves made in the
23/14	• characterised by the material or its electrical	23/31/0	semiconductor body}
22/142	properties {(printed circuit boards <u>H05K 1/00</u>)}	23/3185	{the coating covering also the sidewalls of
23/142 23/145	• • {Metallic substrates having insulating layers}• • {Organic substrates, e.g. plastic}		the semiconductor body}
23/147	Semiconductor insulating substrates	23/3192	• • • {Multilayer coating}
23/14/	(semiconductor conductive substrates	23/32	• Holders for supporting the complete device in
	<u>H01L 23/4926</u>)}		operation, i.e. detachable fixtures (<u>H01L 23/40</u> takes precedence)
23/15	• • Ceramic or glass substrates {(<u>H01L 23/142</u> ,	23/34	Arrangements for cooling, heating, ventilating
22/15	<u>H01L 23/145, H01L 23/147</u> take precedence)}	23/31	or temperature compensation {; Temperature
23/16	 Fillings or auxiliary members in containers {or encapsulations}, e.g. centering rings (H01L 23/42, 		sensing arrangements (thermal treatment apparatus
	H01L 23/552 take precedence)		<u>H01L 21/00</u>)}
23/18	Fillings characterised by the material, its physical	23/345	• • {Arrangements for heating (thermal treatment
	or chemical properties, or its arrangement within	22/26	apparatus <u>H01L 21/00</u>)}
	the complete device	23/36	 Selection of materials, or shaping, to facilitate cooling or heating, e.g. heatsinks {(H01L 23/28,
	NOTE		H01L 23/40, H01L 23/42, H01L 23/44,
	Group <u>H01L 23/26</u> takes precedence over groups <u>H01L 23/20</u> - <u>H01L 23/24</u>		<u>H01L 23/46</u> take precedence; heating <u>H01L 23/345</u>)}
23/20	• • • gaseous at the normal operating temperature of	23/367	• • • Cooling facilitated by shape of device {(H01L 23/38, H01L 23/40, H01L 23/42,
	the device		<u>H01L 23/44, H01L 23/46</u> take precedence)}
23/22	liquid at the normal operating temperature of the device	23/3672	• • • • {Foil-like cooling fins or heat sinks (being part of lead-frames <u>H01L 23/49568</u>)}
23/24	solid or gel at the normal operating temperature	23/3675	• • • {characterised by the shape of the housing}
	of the device {(<u>H01L 23/3135</u> takes precedence)}	23/3677	• • • {Wire-like or pin-like cooling fins or heat sinks}

23/373	Cooling facilitated by selection of materials for the device {or materials for thermal expansion adaptation, e.g. carbon}	23/44	• • the complete device being wholly immersed in a fluid other than air {(H01L 23/427 takes precedence)}
23/3731	• • • { Ceramic materials or glass (H01L 23/3732, H01L 23/3733, H01L 23/3735,	23/445	the fluid being a liquefied gas, e.g. in a cryogenic vessel}
	<u>H01L 23/3737</u> , <u>H01L 23/3738</u> take precedence)}	23/46	• • involving the transfer of heat by flowing fluids (H01L 23/42, H01L 23/44 take precedence)
23/3732 23/3733	 {Diamonds} {having a heterogeneous or anisotropic	23/467	• • • by flowing gases, e.g. air {(<u>H01L 23/473</u> takes precedence)}
	structure, e.g. powder or fibres in a matrix, wire mesh, porous structures (<u>H01L 23/3732</u> , <u>H01L 23/3737</u> take precedence)}	23/473	• • • by flowing liquids {(<u>H01L 23/4332</u> , <u>H01L 23/4338</u> take precedence)}
23/3735	{Laminates or multilayers, e.g. direct bond	23/4735	• • • { Jet impingement (<u>H01L 23/4336</u> takes precedence)}
23/3736	copper ceramic substrates} {Metallic materials (<u>H01L 23/3732</u> , <u>H01L 23/3733</u> , <u>H01L 23/3735</u> , <u>H01L 23/3737</u> , <u>H01L 23/3738</u> take precedence)}	23/48	 Arrangements for conducting electric current to or from the solid state body in operation, e.g. leads, terminal arrangements {; Selection of materials therefor}
23/3737	• • • • {Organic materials with or without a		NOTE
22/2729	thermoconductive filler}		{ Arrangements for connecting or disconnecting semiconductor or other solid state bodies,
23/3738 23/38	 {Semiconductor materials} Cooling arrangements using the Peltier effect		or methods related thereto, other than
23/40	Mountings or securing means for detachable		those arrangements or methods covered by
	cooling or heating arrangements { (heating H01L 23/345); fixed by friction, plugs or springs}		the following subgroups, are covered by <u>H01L 24/00</u> .}
23/4006	• • {with bolts or screws}	23/481	• • {Internal lead connections, e.g. via connections,
23/4012	• • • {for stacked arrangements of a plurality of	20, 101	feedthrough structures}
	semiconductor devices (assemblies <u>per se</u> <u>H01L 25/00</u>)}	23/482	 consisting of lead-in layers inseparably applied to the semiconductor body {(electrodes)}
2023/4018	• • • (characterised by the type of device to be	23/4821	• • {Bridge structure with air gap}
2023/4025	heated or cooled} {Base discrete devices, e.g. presspack,	23/4822	{Beam leads}
2023/4023	disc-type transistors}	23/4824	• • • {Pads with extended contours, e.g. grid
2023/4031	Packaged discrete devices, e.g. to-3 housings, diodes}	23/4825	 structure, branch structure, finger structure} • • {for devices consisting of semiconductor layers on insulating or semi-insulating substrates, e.g.
2023/4037	• • • {characterised by thermal path or place of attachment of heatsink}	23/4827	silicon on sapphire devices, i.e. SOS} • • • {Materials}
2023/4043	• • • • {heatsink to have chip}	23/4828	• • • {Iviaterials} • • • • {Conductive organic material or pastes, e.g.
2023/405	• • • {heatsink to package}	23/4020	conductive adhesives, inks}
2023/4056	• • • • {heatsink to additional heatsink}	23/485	consisting of layered constructions comprising
	• • • • {heatsink to or through board or cabinet}		conductive layers and insulating layers,
2023/4068	• • • • {Heatconductors between device and heatsink, e.g. compliant heat-spreaders, heat-conducting bands}		e.g. planar contacts {(H01L 23/4821, H01L 23/4822, H01L 23/4824, H01L 23/4825 take precedence; materials H01L 23/532,
2023/4075	• • • {Mechanical elements}		bond pads <u>H01L 24/02</u> , bump connectors
	{Compliant clamping elements not		<u>H01L 24/10)}</u>
	primarily serving heat-conduction}	23/4855	• • • {Overhang structure}
2023/4087	• • • • • {Mounting accessories, interposers,	23/488	• consisting of soldered {or bonded} constructions
22/4002	clamping or screwing parts}	22/40	{(bump connectors <u>H01L 24/01</u>)}
23/4093	 {Snap-on arrangements, e.g. clips}. Fillings or auxiliary members in containers {or	23/49	• • • wire-like {arrangements or pins or rods (using optical fibres <u>H01L 23/48</u> ; pins attached to
23/42	encapsulations) selected or arranged to facilitate heating or cooling	23/492	insulating substrates <u>H01L 23/49811</u>)} Bases or plates {or solder therefor}
23/427	Cooling by change of state, e.g. use of heat	23/4922	{having a heterogeneous or anisotropic
23, 121	pipes {(by liquefied gas <u>H01L 23/445</u>)}	23/1/22	structure}
23/4275	• • • {by melting or evaporation of solids}	23/4924	{characterised by the materials}
23/433	• • • Auxiliary members {in containers} characterised by their shape, e.g. pistons	23/4926	• • • • { the materials containing semiconductor material }
23/4332	{Bellows}	23/4928	• • • • {the materials containing carbon}
23/4334	• • • {Auxiliary members in encapsulations (<u>H01L 23/49568</u> takes precedence)}	23/495	• • • Lead-frames {or other flat leads (<u>H01L 23/498</u> takes precedence; lead frame interconnections
23/4336	• • • {in combination with jet impingement}		between components <u>H01L 23/52</u>)}
23/4338	• • • {Pistons, e.g. spring-loaded members}	23/49503	{characterised by the die pad}

23/49506 {an insulative substrate being used	23/49827 {Via connections through the substrates,
as a diepad, e.g. ceramic, plastic	e.g. pins going through the substrate, coaxial
$(\underline{H01L\ 23/49531}\ takes\ precedence)$	cables (<u>H01L 23/49822</u> , <u>H01L 23/49833</u> ,
23/4951 {Chip-on-leads or leads-on-chip	H01L 23/4985, H01L 23/49861 take
techniques, i.e. inner lead fingers being	precedence)}
used as die pad}	23/49833 {the chip support structure consisting of a
23/49513 {having bonding material between chip	plurality of insulating substrates}
and die pad}	23/49838 {Geometry or layout}
23/49517 {Additional leads}	23/49844 {for individual devices of subclass H10D}
23/4952 {the additional leads being a bump or a	23/4985 {Flexible insulating substrates
wire}	(<u>H01L 23/49572</u> and <u>H01L 23/49855</u> take
23/49524 {the additional leads being a tape carrier or	precedence)}
flat leads}	23/49855 { for flat-cards, e.g. credit cards (cards per se G06K 19/00) }
23/49527 {the additional leads being a multilayer}	
23/49531 { the additional leads being a wiring board}	23/49861 {Lead-frames fixed on or encapsulated in insulating substrates (H01L 23/4985,
23/49534 {Multi-layer}	H01L 23/49805 take precedence)}
23/49537 {Plurality of lead frames mounted in one	23/49866 {characterised by the materials (materials
device}	of the substrates H01L 23/14, of the lead-
23/49541 {Geometry of the lead-frame}	frames H01L 23/49579)}
23/49544 {Deformation absorbing parts in the	23/49872 {the conductive materials containing
lead frame plane, e.g. meanderline shape	semiconductor material}
(<u>H01L 23/49562</u> takes precedence)}	23/49877 {Carbon, e.g. fullerenes (superconducting
23/49548 {Cross section geometry (<u>H01L 23/49562</u>	fullerenes H10N 60/853)}
takes precedence)} 23/49551 {characterised by bent parts}	23/49883 {the conductive materials containing
	organic materials or pastes, e.g. for thick
23/49555 {the bent parts being the outer leads}	films (for printed circuits H05K 1/092)}
23/49558 {Insulating layers on lead frames, e.g. bridging members}	23/49888 {the conductive materials containing
23/49562 { for individual devices of subclass H10D}	superconducting material}
23/49565 {Side rails of the lead frame, e.g. with	23/49894 {Materials of the insulating layers or
perforations, sprocket holes}	coatings}
23/49568 {specifically adapted to facilitate heat	23/50 . for integrated circuit devices, {e.g. power bus,
dissipation}	number of leads}(<u>H01L 23/482</u> - <u>H01L 23/498</u>
23/49572 {consisting of thin flexible metallic	take precedence)
tape with or without a film carrier	23/52 • Arrangements for conducting electric current within
(H01L 23/49503 - H01L 23/49568 and	the device in operation from one component to
H01L 23/49575 - H01L 23/49579 take	another {, i.e. interconnections, e.g. wires, lead
precedence)}	frames (optical interconnections <u>G02B 6/00</u>)} 23/522 . including external interconnections consisting
23/49575 {Assemblies of semiconductor devices on	
lead frames}	of a multilayer structure of conductive and insulating layers inseparably formed on the
23/49579 {characterised by the materials of the lead	semiconductor body
frames or layers thereon}	23/5221 {Crossover interconnections}
23/49582 {Metallic layers on lead frames}	23/5222 {Capacitive arrangements or effects of, or
23/49586 {Insulating layers on lead frames}	between wiring layers (other capacitive
23/49589 {Capacitor integral with or on the leadframe}	arrangements H01L 23/642)}
23/49593 {Battery in combination with a leadframe}	23/5223 {Capacitor integral with wiring layers}
23/49596 {Oscillators in combination with lead-	23/5225 {Shielding layers formed together with
frames}	wiring layers}
23/498 Leads, {i.e. metallisations or lead-frames} on	23/5226 {Via connections in a multilevel
insulating substrates, {e.g. chip carriers (shape	interconnection structure}
of the substrate <u>H01L 23/13</u>)}	23/5227 {Inductive arrangements or effects of, or
23/49805 {the leads being also applied on the sidewalls	between, wiring layers (other inductive
or the bottom of the substrate, e.g. leadless	arrangements <u>H01L 23/645</u>)}
packages for surface mounting}	23/5228 • • • {Resistive arrangements or effects of, or
23/49811 {Additional leads joined to the metallisation on the insulating substrate, e.g. pins, bumps,	between, wiring layers (other resistive
wires, flat leads (<u>H01L 23/49827</u> takes	arrangements H01L 23/647)}
precedence)}	23/525 with adaptable interconnections
23/49816 {Spherical bumps on the substrate for	23/5252 {comprising anti-fuses, i.e. connections
external connection, e.g. ball grid arrays	having their state changed from non-
[BGA]}	conductive to conductive}
23/49822 {Multilayer substrates (multilayer	23/5254 {the change of state resulting from the use
metallisation on monolayer substrate	of an external beam, e.g. laser beam or ion beam}
<u>H01L 23/498</u>)}	ocani j

23/5256	• • • {comprising fuses, i.e. connections having their state changed from conductive to non-conductive}	23/5384	• • • {Conductive vias through the substrate with or without pins, e.g. buried coaxial conductors (H01L 23/5383, H01L 23/5385
23/5258	• • • • { the change of state resulting from the use of an external beam, e.g. laser beam or ion		take precedence; pins attached to insulating substrates <u>H01L 23/49811</u>)}
22/220	beam}	23/5385	• • • {Assembly of a plurality of insulating
23/528	Layout of the interconnection structure	23/5386	substrates} {Geometry or layout of the interconnection
23/5283 23/5286	 {Cross-sectional geometry} {Arrangements of power or ground buses}	23/3360	structure}
23/5280	 (Arrangements of power of ground buses) characterised by the materials	23/5387	• • • {Flexible insulating substrates (H01L 23/5388
	{Conductive materials}		takes precedence)}
	• • • {based on metals, e.g. alloys, metal silicides (H01L 23/53285 takes	23/5388	• • { for flat cards, e.g. credit cards (cards per se G06K 19/00) }
	precedence)}	23/5389	• • • {the chips being integrally enclosed by the
	• • • • • {the principal metal being aluminium}	23/544	interconnect and support structures}Marks applied to semiconductor devices {or parts},
	{Aluminium alloys}	23/344	e.g. registration marks, {alignment structures, wafer
23/53223	{Additional layers associated with		maps (test patterns for characterising or monitoring
	aluminium layers, e.g. adhesion, barrier, cladding layers}		manufacturing processes <u>H01L 22/00</u>)}
23/53228	• • • • • {the principal metal being copper}		NOTE
	{Copper alloys}		When classifying in group H01L 23/544,
	{Additional layers associated with		details are to be further indexed by using the
	copper layers, e.g. adhesion, barrier,		indexing codes chosen from H01L 2223/544 and
	cladding layers}		subgroups.}
23/53242	• • • • {the principal metal being a noble metal,	23/552	• Protection against radiation, e.g. light {or
23/53247	e.g. gold} {Noble-metal alloys}	23/332	electromagnetic waves}
		23/556	against alpha rays
23/33232	noble-metal layers, e.g. adhesion,	23/562	• {Protection against mechanical damage
	barrier, cladding layers}		(<u>H01L 23/02</u> , <u>H01L 23/28</u> take precedence)}
23/53257	• • • • • { the principal metal being a refractory metal }	23/564	• {Details not otherwise provided for, e.g. protection against moisture (getters <u>H01L 23/26</u>)}
	• • • • • • {Refractory-metal alloys}	23/57	• {Protection from inspection, reverse engineering or
23/53266	{Additional layers associated with	22/572	tampering}
	refractory-metal layers, e.g. adhesion,	23/573	• {using passive means}
23/53271	barrier, cladding layers } {containing semiconductor material, e.g.	23/576 23/58	. {using active circuits}. Structural electrical arrangements for semiconductor
23/332/1	polysilicon}	25/50	devices not otherwise provided for {, e.g. in
23/53276	• • • • {containing carbon, e.g. fullerenes		combination with batteries (H01L 23/49593,
	(superconducting fullerenes		<u>H01L 23/49596</u> take precedence)}
	H10N 60/853)}	23/585	• • {comprising conductive layers or plates or strips
23/5328	{containing conductive organic materials		or rods or rings (<u>H01L 23/60</u> , <u>H01L 23/62</u> ,
00/50005	or pastes, e.g. conductive adhesives, inks}	23/60	 H01L 23/64, H01L 23/66 take precedence)} Protection against electrostatic charges or
23/53285 23/5329	 {containing superconducting materials} {Insulating materials}	23/00	discharges, e.g. Faraday shields
23/5329	{Stacked insulating layers}	23/62	Protection against overvoltage, e.g. fuses, shunts
23/535	including internal interconnections, e.g. cross-	23/64	Impedance arrangements
23/333	under constructions {(internal lead connections	23/642	• • • {Capacitive arrangements (H01L 23/49589,
	<u>H01L 23/481</u>)}		H01L 23/645, H01L 23/647, H01L 23/66
23/538	the interconnection structure between a plurality		take precedence; capacitive effects between
	of semiconductor chips being formed on, or in,		wiring layers on the semiconductor body
	insulating substrates ({H05K takes precedence;	23/645	H01L 23/5222)} {Inductive arrangements (H01L 23/647,
	manufacture or treatment <u>H01L 21/4846</u> }; mountings <u>per se H01L 23/12</u> ; {materials	23/043	H01L 23/66 take precedence)
	H01L 23/49866})	23/647	• • • {Resistive arrangements (H01L 23/66,
23/5381	• • {Crossover interconnections, e.g. bridge		H01L 23/62 take precedence)}
	stepovers}	23/66	High-frequency adaptations
23/5382	• • {Adaptable interconnections, e.g. for		NOTE
00/5000	engineering changes}		{When classifying in group H01L 23/66,
23/5383	• • • {Multilayer substrates (<u>H01L 23/5385</u> takes precedence; multilayer metallisation on		details are to be further indexed by using the
	monolayer substrates <u>H01L 23/538</u>)}		indexing codes chosen from H01L 2223/66
	110110111 01 01001111100 110111 201000)		and subgroups. }

24/00	{Arrangements for connecting or disconnecting semiconductor or solid-state bodies; Methods or apparatus related thereto}	24/10	• • {Bump connectors (bumps on insulating substrates, e.g. chip carriers, <u>H01L 23/49816</u>); Manufacturing methods related thereto}
	NOTES	24/11	• • • {Manufacturing methods (for bumps on
	 1. This group <u>does not cover</u>: details of semiconductor bodies or of electrodes of devices provided for in subclass <u>H10D</u>, 	24/12	 insulating substrates <u>H01L 21/4853</u>)} • {Structure, shape, material or disposition of the bump connectors prior to the connecting process}
	which details are covered by that group; details peculiar to devices provided for in a	24/13	• • • { of an individual bump connector}
	single subclass of subclasses H10F, H10H,	24/14 24/15	 {of a plurality of bump connectors} {Structure, shape, material or disposition of the
	H10K or H10N, which details are covered by those places.		bump connectors after the connecting process}
	 printed circuits, which are covered by groups <u>H05K 1/00</u> - H05K 1/189; 	24/16 24/17	 {of an individual bump connector} {of a plurality of bump connectors}
	 apparatus or manufacturing processes for 	24/18	• • {High density interconnect [HDI] connectors; Manufacturing methods related thereto
	printed circuits, which are covered by groups H05K 3/00 - H05K 3/4685; manufacture or treatment of parts, which are		(interconnection structure between a plurality of semiconductor chips H01L 23/5389)}
	covered by group H01L 21/48 and subgroups except H01L 21/4885 - H01L 21/4896;	24/19	• • • {Manufacturing methods of high density interconnect preforms}
	 assemblies of semiconductor devices, which are covered by groups <u>H01L 21/50</u> - <u>H01L 21/568</u>; 	24/20	• • • {Structure, shape, material or disposition of high density interconnect preforms}
	applying interconnections to be used for carrying current between separate components within a device, which is covered by group	24/23	
	H01L 21/768 and subgroups;containers or seals, which are covered by	24/24	{of an individual high density interconnect connector}
	groups <u>H01L 23/02</u> - <u>H01L 23/10</u> ; • mountings, which are covered by groups	24/25	• • • {of a plurality of high density interconnect connectors}
	 H01L 23/12 - H01L 23/15 and subgroups; arrangements for cooling, heating, ventilating or temperature compensation, 	24/26	• • {Layer connectors, e.g. plate connectors, solder or adhesive layers; Manufacturing methods related thereto}
	which are covered by groups H01L 23/34 - H01L 23/4735;	24/27	{Manufacturing methods}
	 arrangements for conducting electric current, which are covered by groups 	24/28	 {Structure, shape, material or disposition of the layer connectors prior to the connecting process}
	<u>H01L 23/48</u> - <u>H01L 23/50</u> , and by groups <u>H01L 23/52</u> - <u>H01L 23/5389</u> ;	24/29	(of an individual layer connector)
	 structural electrical arrangements, which are 	24/30	• • • {of a plurality of layer connectors}
	 covered by groups <u>H01L 23/58</u> - <u>H01L 23/66</u>; assemblies of semiconductor or other solid 	24/31	• • • {Structure, shape, material or disposition of the layer connectors after the connecting process}
	state devices, which are covered by groups	24/32	• • • { of an individual layer connector }
	<u>H01L 25/00</u> - <u>H01L 25/18</u> .	24/33	 {of a plurality of layer connectors}. {Strap connectors, e.g. copper straps for
	2. In this group the following indexing codes are used: H01L 24/00, H01L 2224/00, H01L 2924/00, and subgroups thereof	24/34	grounding power devices; Manufacturing methods related thereto}
24/01	• {Means for bonding being attached to, or being	24/35	• • • {Manufacturing methods}
	formed on, the surface to be connected, e.g. chip- to-package, die-attach, "first-level" interconnects;	24/36	 • { Structure, shape, material or disposition of the strap connectors prior to the connecting process}
24/02	Manufacturing methods related thereto} • {Bonding areas (on insulating substrates, e.g.	24/37	• • • {of an individual strap connector}
21,702	chip carriers, H01L 23/49816, H01L 23/49838,	24/38 24/39	 {of a plurality of strap connectors} {Structure, shape, material or disposition of the
	<u>H01L 23/5389</u>); Manufacturing methods related thereto}		strap connectors after the connecting process}
24/03	{Manufacturing methods}	24/40 24/41	 {of an individual strap connector} {of a plurality of strap connectors}
24/04	• • • {Structure, shape, material or disposition of the bonding areas prior to the connecting process}	24/42	(Wire connectors; Manufacturing methods related thereto)
24/05	{of an individual bonding area}	24/43	{Manufacturing methods}
24/06 24/07	 {of a plurality of bonding areas} {Structure, shape, material or disposition of the	24/44	• • • (Structure, shape, material or disposition of
	bonding areas after the connecting process}		the wire connectors prior to the connecting process}
24/08 24/09	 {of an individual bonding area} {of a plurality of bonding areas}	24/45	{of an individual wire connector}
∠ + /U7	• • • (or a pruranty or bonding areas)	24/46	• • • {of a plurality of wire connectors}

24/47	• • • {Structure, shape, material or disposition of the wire connectors after the connecting process}	24/85	• • {using a wire connector (wire bonding in general B23K 20/004)}
24/48	• • • {of an individual wire connector}	24/86	using tape automated bonding [TAB]}
24/49	{of a plurality of wire connectors}	24/89	• • {using at least one connector not provided for in
24/50	• • {Tape automated bonding [TAB] connectors,		any of the groups <u>H01L 24/81</u> - <u>H01L 24/86</u> }
	i.e. film carriers; Manufacturing methods related thereto (thin flexible metallic tape with or without a film carrier <u>H01L 23/49572</u> , flexible insulating substrates <u>H01L 23/4985</u> , <u>H01L 23/5387</u>)}	24/90	• {Methods for connecting semiconductor or solid state bodies using means for bonding not being attached to, or not being formed on, the body surface to be connected, e.g. pressure contacts using
24/63	 {Connectors not provided for in any of the groups <u>H01L 24/10</u> - <u>H01L 24/50</u> and subgroups; Manufacturing methods related thereto} 	24/91	springs or clips }{Methods for connecting semiconductor or solid state bodies including different
24/64	• • • {Manufacturing methods}		methods provided for in two or more of groups
24/65	• • • {Structure, shape, material or disposition of the		<u>H01L 24/80</u> - <u>H01L 24/90</u> }
	connectors prior to the connecting process}	24/92	• • {Specific sequence of method steps}
24/66	• • • { of an individual connector}	24/93	• {Batch processes}
24/67	• • • • {of a plurality of connectors}	24/94	• • {at wafer-level, i.e. with connecting carried out
24/68	• • {Structure, shape, material or disposition of the connectors after the connecting process}		on a wafer comprising a plurality of undiced individual devices}
24/69	• • • { of an individual connector}	24/95	• • {at chip-level, i.e. with connecting carried out
24/70	• • • {of a plurality of connectors}		on a plurality of singulated devices, i.e. on diced
24/71	• {Means for bonding not being attached to, or		chips}
	not being formed on, the surface to be connected (holders for supporting the complete device in operation <u>H01L 23/32</u>)}	24/96	• • • { the devices being encapsulated in a common layer, e.g. neo-wafer or pseudo-wafer, said common layer being separable into individual
24/72	 • {Detachable connecting means consisting of mechanical auxiliary parts connecting the device, e.g. pressure contacts using springs or clips} 	24/97	assemblies after connecting }• • {the devices being connected to a common substrate, e.g. interposer, said common
24/73	• {Means for bonding being of different types provided for in two or more of groups H01L 24/10,		substrate being separable into individual assemblies after connecting}
	<u>H01L 24/18, H01L 24/26, H01L 24/34,</u>	24/98	 {Methods for disconnecting semiconductor or solid- state bodies}
	HUIL 24/42, HUIL 24/30, HUIL 24/03,		state occies)
	H01L 24/42, H01L 24/50, H01L 24/63, H01L 24/71}	25/00	,
24/74 24/741	 H01L 24/71 } {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} . {Apparatus for manufacturing means for bonding, 	25/00	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells
	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} . {Apparatus for manufacturing means for bonding, e.g. connectors} {Apparatus for manufacturing bump 	25/00	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00;
24/741 24/742	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} {Apparatus for manufacturing means for bonding, e.g. connectors} {Apparatus for manufacturing bump connectors} 	25/00	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE
24/741 24/742 24/743	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} {Apparatus for manufacturing means for bonding, e.g. connectors} {Apparatus for manufacturing bump connectors} {Apparatus for manufacturing layer connectors} 	25/00	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed
24/741 24/742 24/743 24/744	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} . {Apparatus for manufacturing means for bonding, e.g. connectors} . {Apparatus for manufacturing bump connectors} . {Apparatus for manufacturing layer connectors} . {Apparatus for manufacturing strap connectors} 	25/00	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate.
24/741 24/742 24/743 24/744 24/745	 H01L 24/71 } {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} • {Apparatus for manufacturing means for bonding, e.g. connectors} • • {Apparatus for manufacturing bump connectors} • • {Apparatus for manufacturing layer connectors} • • {Apparatus for manufacturing strap connectors} • • {Apparatus for manufacturing wire connectors} 	25/00	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in
24/741 24/742 24/743 24/744	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} . {Apparatus for manufacturing means for bonding, e.g. connectors} {Apparatus for manufacturing bump connectors} {Apparatus for manufacturing layer connectors} {Apparatus for manufacturing strap connectors} {Apparatus for manufacturing wire connectors} {Apparatus for manufacturing wire connectors} {Apparatus for connecting with bump connectors} 	25/00	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited
24/741 24/742 24/743 24/744 24/745 24/75	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} . {Apparatus for manufacturing means for bonding, e.g. connectors} {Apparatus for manufacturing bump connectors} {Apparatus for manufacturing layer connectors} {Apparatus for manufacturing strap connectors} {Apparatus for manufacturing wire connectors} {Apparatus for manufacturing wire connectors} {Apparatus for connecting with bump connectors or layer connectors} 	25/00	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited to consult the relevant place in class H10 and to
24/741 24/742 24/743 24/744 24/745 24/75 24/76	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} . {Apparatus for manufacturing means for bonding, e.g. connectors} . {Apparatus for manufacturing bump connectors} . {Apparatus for manufacturing layer connectors} . {Apparatus for manufacturing strap connectors} . {Apparatus for manufacturing wire connectors} . {Apparatus for connecting with bump connectors or layer connectors} . {Apparatus for connecting with build-up interconnects} 	25/00	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited
24/741 24/742 24/743 24/744 24/745 24/75	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} {Apparatus for manufacturing means for bonding, e.g. connectors} {Apparatus for manufacturing bump connectors} {Apparatus for manufacturing layer connectors} {Apparatus for manufacturing strap connectors} {Apparatus for manufacturing wire connectors} {Apparatus for connecting with bump connectors or layer connectors} {Apparatus for connecting with build-up interconnects} {Apparatus for connecting with strap connectors} 	25/00 25/03	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited to consult the relevant place in class H10 and to consider the class H10 information as correct, in case of conflict}
24/741 24/742 24/743 24/744 24/745 24/75 24/76	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} . {Apparatus for manufacturing means for bonding, e.g. connectors} . {Apparatus for manufacturing bump connectors} . {Apparatus for manufacturing layer connectors} . {Apparatus for manufacturing strap connectors} . {Apparatus for manufacturing wire connectors} . {Apparatus for connecting with bump connectors or layer connectors} . {Apparatus for connecting with build-up interconnects} 		Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited to consult the relevant place in class H10 and to consider the class H10 information as correct, in case of conflict} . all the devices being of a type provided for in a
24/741 24/742 24/743 24/744 24/745 24/75 24/76 24/77	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} {Apparatus for manufacturing means for bonding, e.g. connectors} {Apparatus for manufacturing bump connectors} {Apparatus for manufacturing layer connectors} {Apparatus for manufacturing strap connectors} {Apparatus for manufacturing wire connectors} {Apparatus for connecting with bump connectors or layer connectors} {Apparatus for connecting with build-up interconnects} {Apparatus for connecting with strap connectors} 		Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited to consult the relevant place in class H10 and to consider the class H10 information as correct, in case of conflict}
24/741 24/742 24/743 24/744 24/745 24/75 24/76 24/77 24/78	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} {Apparatus for manufacturing means for bonding, e.g. connectors} {Apparatus for manufacturing bump connectors} {Apparatus for manufacturing layer connectors} {Apparatus for manufacturing strap connectors} {Apparatus for manufacturing wire connectors} {Apparatus for connecting with bump connectors or layer connectors} {Apparatus for connecting with build-up interconnects} {Apparatus for connecting with strap connectors} {Apparatus for connecting with wire connectors} {Apparatus for connecting with wire connectors} {Apparatus for Tape Automated Bonding [TAB]} {Apparatus for disconnecting} 		Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited to consult the relevant place in class H10 and to consider the class H10 information as correct, in case of conflict} all the devices being of a type provided for in a single subclass of subclasses H10B, H10F, H10H,
24/741 24/742 24/743 24/744 24/745 24/75 24/76 24/77 24/78 24/79	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} . {Apparatus for manufacturing means for bonding, e.g. connectors} . {Apparatus for manufacturing bump connectors} . {Apparatus for manufacturing layer connectors} . {Apparatus for manufacturing strap connectors} . {Apparatus for manufacturing wire connectors} . {Apparatus for connecting with bump connectors or layer connectors} . {Apparatus for connecting with build-up interconnects} . {Apparatus for connecting with strap connectors} . {Apparatus for connecting with wire connectors} . {Apparatus for connecting with wire connectors} . {Apparatus for Tape Automated Bonding [TAB]} . {Apparatus for disconnecting} . {Methods for connecting semiconductor or other 	25/03	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited to consult the relevant place in class H10 and to consider the class H10 information as correct, in case of conflict} all the devices being of a type provided for in a single subclass of subclasses H10B, H10F, H10H, H10K or H10N, e.g. assemblies of rectifier diodes the devices not having separate containers
24/741 24/742 24/743 24/744 24/745 24/75 24/76 24/77 24/78 24/79 24/799 24/80	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} . {Apparatus for manufacturing means for bonding, e.g. connectors} . {Apparatus for manufacturing bump connectors} . {Apparatus for manufacturing layer connectors} . {Apparatus for manufacturing strap connectors} . {Apparatus for manufacturing wire connectors} . {Apparatus for connecting with bump connectors or layer connectors} . {Apparatus for connecting with build-up interconnects} . {Apparatus for connecting with strap connectors} . {Apparatus for connecting with wire connectors} . {Apparatus for Tape Automated Bonding [TAB]} . {Apparatus for connecting semiconductor or other solid state bodies using means for bonding being attached to, or being formed on, the surface to be connected} 	25/03	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited to consult the relevant place in class H10 and to consider the class H10 information as correct, in case of conflict} • all the devices being of a type provided for in a single subclass of subclasses H10B, H10F, H10H, H10K or H10N, e.g. assemblies of rectifier diodes • the devices not having separate containers WARNING Group H01L 25/04 is impacted by reclassification into groups H10N 19/00,
24/741 24/742 24/743 24/744 24/745 24/75 24/76 24/77 24/78 24/79 24/799 24/80	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} . {Apparatus for manufacturing means for bonding, e.g. connectors} . {Apparatus for manufacturing bump connectors} . {Apparatus for manufacturing layer connectors} . {Apparatus for manufacturing strap connectors} . {Apparatus for manufacturing wire connectors} . {Apparatus for connecting with bump connectors or layer connectors} . {Apparatus for connecting with build-up interconnects} . {Apparatus for connecting with strap connectors} . {Apparatus for connecting with wire connectors} . {Apparatus for Tape Automated Bonding [TAB]} . {Apparatus for disconnecting} . {Apparatus for connecting semiconductor or other solid state bodies using means for bonding being attached to, or being formed on, the surface to be connected} . {using a bump connector} 	25/03	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited to consult the relevant place in class H10 and to consider the class H10 information as correct, in case of conflict} • all the devices being of a type provided for in a single subclass of subclasses H10B, H10F, H10H, H10K or H10N, e.g. assemblies of rectifier diodes • the devices not having separate containers WARNING Group H01L 25/04 is impacted by reclassification into groups H10N 19/00, H10N 39/00, H10N 59/00, H10N 69/00,
24/741 24/742 24/743 24/744 24/745 24/75 24/76 24/77 24/78 24/79 24/80 24/80	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} {Apparatus for manufacturing means for bonding, e.g. connectors} {Apparatus for manufacturing bump connectors} {Apparatus for manufacturing layer connectors} {Apparatus for manufacturing strap connectors} {Apparatus for manufacturing wire connectors} {Apparatus for connecting with bump connectors or layer connectors} {Apparatus for connecting with build-up interconnects} {Apparatus for connecting with wire connectors} {Apparatus for connecting with wire connectors} {Apparatus for Tape Automated Bonding [TAB]} {Apparatus for disconnecting} {Methods for connecting semiconductor or other solid state bodies using means for bonding being attached to, or being formed on, the surface to be connected} {using a bump connector} {by forming build-up interconnects at chiplevel, e.g. for high density interconnects [HDI] (interconnection structure between a plurality of semiconductor chips H01L 23/5389)} 	25/03	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited to consult the relevant place in class H10 and to consider the class H10 information as correct, in case of conflict} • all the devices being of a type provided for in a single subclass of subclasses H10B, H10F, H10H, H10K or H10N, e.g. assemblies of rectifier diodes • the devices not having separate containers WARNING Group H01L 25/04 is impacted by reclassification into groups H10N 19/00,
24/741 24/742 24/743 24/744 24/745 24/75 24/76 24/77 24/78 24/79 24/799 24/80	 H01L 24/71} {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies} . {Apparatus for manufacturing means for bonding, e.g. connectors} . {Apparatus for manufacturing bump connectors} . {Apparatus for manufacturing layer connectors} . {Apparatus for manufacturing strap connectors} . {Apparatus for manufacturing wire connectors} . {Apparatus for connecting with bump connectors or layer connectors} . {Apparatus for connecting with build-up interconnects} . {Apparatus for connecting with strap connectors} . {Apparatus for connecting with wire connectors} . {Apparatus for Tape Automated Bonding [TAB]} . {Apparatus for disconnecting} . {Methods for connecting semiconductor or other solid state bodies using means for bonding being attached to, or being formed on, the surface to be connected} . {using a bump connector} . {by forming build-up interconnects at chiplevel, e.g. for high density interconnects [HDI] (interconnection structure between a plurality of 	25/03	Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate H10D 89/00; photovoltaic modules or arrays of photovoltaic cells H10F 19/00) NOTE {Due to the ongoing developments in class H10 and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited to consult the relevant place in class H10 and to consider the class H10 information as correct, in case of conflict} all the devices being of a type provided for in a single subclass of subclasses H10B, H10F, H10H, H10K or H10N, e.g. assemblies of rectifier diodes the devices not having separate containers WARNING Group H01L 25/04 is impacted by reclassification into groups H10N 19/00, H10N 39/00, H10N 59/00, H10N 69/00, H10N 79/00 and H10N 89/00. All groups listed in this Warning should be considered in order to perform a complete

25/041	• • • {the devices being of a type provided for in	25/0657	• • • { Stacked arrangements of devices}
05/040	subclass H10F}		WARNING
25/042	• • • {the devices being arranged next to each other (solar cells H10F 19/00)}		Group H01L 25/0657 is impacted
25/043	{Stacked arrangements of devices}		by reclassification into groups
25/065	the devices being of a type provided for in		H10B 80/00, H10K 39/10, H10K 39/12,
	group <u>H10D 89/00</u>		H10K 39/15, H10K 39/18, H10K 39/601, H10K 39/621, H10K 59/90, H10K 59/95,
	<u>NOTE</u>		H10N 19/00, H10N 39/00, H10N 59/00,
	{Group H01L 25/0652 takes precedence		H10N 69/00, H10N 79/00 and
	over groups <u>H01L 25/0655</u> and		H10N 89/00.
	<u>H01L 25/0657</u> .}		All groups listed in this Warning should be considered in order to perform a
	WARNING		complete search.
	Group H01L 25/065 is impacted by	25/07	the devices being of a type provided for in
	reclassification into groups H10B 80/00,	23/07	group subclass H10D
	H10K 39/10, H10K 39/12, H10K 39/15, H10K 39/18, H10K 39/601, H10K 39/621,		NOTE
	H10K 59/90, H10K 59/95, H10N 19/00,		Group H01L 25/071 takes precedence over
	H10N 39/00, H10N 59/00, H10N 69/00,		groups H01L 25/072 - H01L 25/074.}
	<u>H10N 79/00</u> and <u>H10N 89/00</u> . All groups listed in this Warning should be	25/071	• • • {the devices being arranged next and on each
	considered in order to perform a complete	23/071	other, i.e. mixed assemblies}
	search.	25/072	• • • { the devices being arranged next to each
25/0652	• • • { the devices being arranged next and on each	25/072	other}
	other, i.e. mixed assemblies}	25/073	 {Apertured devices mounted on one or more rods passed through the apertures}
	WARNING	25/074	{Stacked arrangements of non-apertured
	Group H01L 25/0652 is impacted	25/055	devices}
	by reclassification into groups	25/075	• • • the devices being of a type provided for in group <u>H10H 20/00</u>
	H10B 80/00, H10K 39/10, H10K 39/12,	25/0753	• • • • {the devices being arranged next to each
	H10K 39/15, H10K 39/18, H10K 39/601, H10K 39/621, H10K 59/90, H10K 59/95,		other}
	H10N 19/00, H10N 39/00, H10N 59/00,	25/0756	• • • • {Stacked arrangements of devices}
	H10N 69/00, H10N 79/00 and	25/10	• the devices having separate containers
	H10N 89/00.	25/105	• • { the devices being integrated devices of class H10}
	All groups listed in this Warning should be considered in order to perform a		NOTE
	complete search.		
25/0655	• • • { the devices being arranged next to each		{When classifying in group H01L 25/105, details of the assemblies are to be further
	other}		indexed by using the indexing codes chosen
	WARNING		from <u>H01L 2225/1005</u> and subgroups.}
	Group H01L 25/0655 is impacted	25/11	• • • the devices being of a type provided for in
	by reclassification into groups		subclass H10D
	H10B 80/00, H10K 39/10, H10K 39/12, H10K 39/15, H10K 39/18, H10K 39/601,		<u>NOTE</u>
	H10K 39/621, H10K 59/90, H10K 59/95,		{Group H01L 25/112 takes precedence over
	H10N 19/00, H10N 39/00, H10N 59/00,		groups <u>H01L 25/115</u> and <u>H01L 25/117</u> .}
	<u>H10N 69/00, H10N 79/00</u> and H10N 89/00.	25/112	• • • • {Mixed assemblies}
	All groups listed in this Warning should	25/115	• • • • (the devices being arranged next to each
	be considered in order to perform a	25/117	other} {Stacked arrangements of devices}
	complete search.	25/11/	 {Stacked arrangements of devices} the devices being of a type provided for in
			group <u>H10H 20/00</u>

the devices being of types provided for in two or more different subclasses of H10B, H10D, H10F, H10H, H10K or H10N, e.g. forming hybrid circuits

WARNING

Group <u>H01L 25/16</u> is impacted by reclassification into groups <u>H10B 80/00</u>, <u>H10K 39/10</u>, <u>H10K 39/12</u>, <u>H10K 39/15</u>, <u>H10K 39/18</u>, <u>H10K 39/601</u>, <u>H10K 39/621</u>, <u>H10K 59/90</u>, <u>H10K 59/95</u>, <u>H10N 19/00</u>, <u>H10N 39/00</u>, <u>H10N 59/00</u>, <u>H10N 69/00</u>, <u>H10N 79/00</u> and <u>H10N 89/00</u>.

All groups listed in this Warning should be considered in order to perform a complete search.

25/162 • • {the devices being mounted on two or more different substrates}

WARNING

Group H01L 25/162 is impacted by reclassification into groups H10B 80/00, H10K 39/10, H10K 39/12, H10K 39/15, H10K 39/18, H10K 39/601, H10K 39/621, H10K 59/90, H10K 59/95, H10N 19/00, H10N 39/00, H10N 59/00, H10N 69/00, H10N 79/00 and H10N 89/00.

All groups listed in this Warning should be considered in order to perform a complete search.

25/165 . . {Containers}

WARNING

Group <u>H01L 25/165</u> is impacted by reclassification into groups <u>H10B 80/00</u>, <u>H10K 39/10</u>, <u>H10K 39/12</u>, <u>H10K 39/15</u>, <u>H10K 39/18</u>, <u>H10K 39/601</u>, <u>H10K 39/621</u>, <u>H10K 59/90</u>, <u>H10K 59/95</u>, <u>H10N 19/00</u>, <u>H10N 39/00</u>, <u>H10N 59/00</u>, <u>H10N 69/00</u>, <u>H10N 79/00</u> and <u>H10N 89/00</u>.

All groups listed in this Warning should be considered in order to perform a complete search.

25/167 • { comprising optoelectronic devices, e.g. LED, photodiodes }

WARNING

Group <u>H01L 25/167</u> is impacted by reclassification into groups <u>H10B 80/00</u>, <u>H10K 39/10</u>, <u>H10K 39/12</u>, <u>H10K 39/15</u>, <u>H10K 39/18</u>, <u>H10K 39/601</u>, <u>H10K 39/621</u>, <u>H10K 59/90</u>, <u>H10K 59/95</u>, <u>H10N 19/00</u>, <u>H10N 39/00</u>, <u>H10N 59/00</u>, <u>H10N 79/00</u> and <u>H10N 89/00</u>.

All groups listed in this Warning should be considered in order to perform a complete search.

25/18 • the devices being of the types provided for in two or more different main groups of the same subclass of H10B, H10D, H10F, H10H, H10K or H10N

WARNING

Group <u>H01L 25/18</u> is impacted by reclassification into groups <u>H10B 80/00</u>, <u>H10K 19/00</u>, <u>H10K 39/10</u>, <u>H10K 39/12</u>, <u>H10K 39/15</u>, <u>H10K 39/18</u>, <u>H10K 39/601</u>, <u>H10K 39/621</u>, <u>H10K 59/90</u>, <u>H10K 59/95</u>, <u>H10K 65/00</u>, <u>H10N 19/00</u>, <u>H10N 39/00</u>, <u>H10N 79/00</u> and <u>H10N 89/00</u>.

All groups listed in this Warning should be considered in order to perform a complete search.

 (Multistep manufacturing processes of assemblies consisting of devices, the devices being individual devices of subclass H10D or integrated devices of class H10 (H01L 21/50 takes precedence)

2221/00 Processes or apparatus adapted for the manufacture or treatment of semiconductor or solid state devices or of parts thereof covered by H01L 21/00

2221/10 • Applying interconnections to be used for carrying current between separate components within a device

2221/1005 . Formation and after-treatment of dielectrics
2221/101 . . Forming openings in dielectrics
2221/1015 . . . for dual damascene structures

2221/1021 Pre-forming the dual damascene structure in a resist layer

2221/1026 the via being formed by burying a sacrificial pillar in the dielectric and removing the pillar

2221/1031 Dual damascene by forming vias in the via-level dielectric prior to deposition of the trench-level dielectric

2221/1036 Dual damascene with different via-level and trench-level dielectrics

2221/1042 . . . the dielectric comprising air gaps

2221/1047 the air gaps being formed by pores in the dielectric

2221/1052 . . . Formation of thin functional dielectric layers

2221/1057 . . . in via holes or trenches

2221/1063 Sacrificial or temporary thin dielectric films in openings in a dielectric

2221/1068 . Formation and after-treatment of conductors

2221/1073 . . . Barrier, adhesion or liner layers

2221/1078 Multiple stacked thin films not being formed in openings in dielectrics

2221/1084 Layers specifically deposited to enhance or enable the nucleation of further layers, i.e. seed layers

2221/1089 Stacks of seed layers

2221/1094 . . . Conducting structures comprising nanotubes or nanowires

Apparatus for handling semiconductor or electric solid state devices during manufacture or treatment thereof; Apparatus for handling wafers during manufacture or treatment of semiconductor or electric solid state devices or components; Apparatus not specifically provided for elsewhere

2221/683 for supporting or gripping	2223/54486 Located on package parts, e.g. encapsulation,
2221/68304 using temporarily an auxiliary support	leads, package substrate
2221/68309 Auxiliary support including alignment aids	2223/54493 • Peripheral marks on wafers, e.g. orientation flats,
2221/68313 Auxiliary support including a cavity for	notches, lot number
storing a finished device, e.g. IC package,	2223/58 • Structural electrical arrangements for semiconductor
or a partly finished device, e.g. die, during	devices not otherwise provided for
manufacturing or mounting	2223/64 Impedance arrangements
2221/68318 Auxiliary support including means	2223/66 High-frequency adaptations
facilitating the separation of a device or	2223/6605 High-frequency electrical connections
wafer from the auxiliary support	2223/6611 Wire connections
2221/68322 Auxiliary support including means	2223/6616 Vertical connections, e.g. vias
facilitating the selective separation of	2223/6622 Coaxial feed-throughs in active or
some of a plurality of devices from the	passive substrates
auxiliary support	2223/6627 Waveguides, e.g. microstrip line, strip line,
2221/68327 used during dicing or grinding	coplanar line
2221/68331 of passive members, e.g. die mounting	2223/6633 Transition between different waveguide
substrate	types
2221/68336 involving stretching of the auxiliary	2223/6638 Differential pair signal lines
support post dicing	2223/6644 Packaging aspects of high-frequency
2221/6834 used to protect an active side of a device or	amplifiers
wafer	2223/665 Bias feed arrangements
2221/68345 used as a support during the manufacture of self supporting substrates	2223/6655 Matching arrangements, e.g. arrangement
2221/6835 used as a support during build up	of inductive and capacitive components
manufacturing of active devices	2223/6661 for passive devices
2221/68354 used to support diced chips prior to mounting	2223/6666 for decoupling, e.g. bypass capacitors
2221/68359 used as a support during manufacture of	2223/6672 for integrated passive components, e.g.
interconnect decals or build up layers	semiconductor device with passive
2221/68363 used in a transfer process involving transfer	components only
directly from an origin substrate to a target	2223/6677 for antenna, e.g. antenna included within
substrate without use of an intermediate	housing of semiconductor device
handle substrate	2223/6683 for monolithic microwave integrated circuit [MMIC]
2221/68368 used in a transfer process involving at	2223/6688 Mixed frequency adaptations, i.e. for
least two transfer steps, i.e. including an	operation at different frequencies
intermediate handle substrate	2223/6694 Optical signal interface included within high-
2221/68372 used to support a device or wafer when	frequency semiconductor device housing
forming electrical connections thereto	
2221/68377 with parts of the auxiliary support remaining	2224/00 Indexing scheme for arrangements for connecting
in the finished device	or disconnecting semiconductor or solid-state
2221/68381 Details of chemical or physical process used	bodies and methods related thereto as covered by H01L 24/00
for separating the auxiliary support from a device or wafer	2224/01 • Means for bonding being attached to, or being
2221/68386 Separation by peeling	formed on, the surface to be connected, e.g. chip-
2221/6839 using peeling wedge or knife or bar	to-package, die-attach, "first-level" interconnects;
	Manufacturing methods related thereto
2221/68395 using peeling wheel	Manufacturing methods related thereto 2224/02 . Bonding areas; Manufacturing methods related
2223/00 Details relating to semiconductor or other solid	5
2223/00 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00	2224/02 Bonding areas; Manufacturing methods related
2223/00 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 2223/544 . Marks applied to semiconductor devices or parts	2224/02 • Bonding areas; Manufacturing methods related thereto
2223/00 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 2223/544 . Marks applied to semiconductor devices or parts 2223/54406 comprising alphanumeric information	 2224/02 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g.
2223/00 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 2223/544 Marks applied to semiconductor devices or parts comprising alphanumeric information 2223/54413 . comprising digital information, e.g. bar codes,	 2224/02 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers
2223/544 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 2223/544 Marks applied to semiconductor devices or parts comprising alphanumeric information 2223/54413 comprising digital information, e.g. bar codes, data matrix	 2224/02 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers 2224/02122 being formed on the semiconductor or solid-
2223/544 2223/544 Marks applied to semiconductor devices or parts comprising alphanumeric information 2223/54413 comprising digital information, e.g. bar codes, data matrix 2223/5442 comprising non digital, non alphanumeric	 2224/02 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers 2224/02122 being formed on the semiconductor or solid-state body
 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 Marks applied to semiconductor devices or parts comprising alphanumeric information comprising digital information, e.g. bar codes, data matrix comprising non digital, non alphanumeric information, e.g. symbols 	 2224/02 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers 2224/02122 being formed on the semiconductor or solid-state body 2224/02123 inside the bonding area 2224/02125 Reinforcing structures 2224/02126 Collar structures
2223/544 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 2223/544 Marks applied to semiconductor devices or parts comprising alphanumeric information comprising digital information, e.g. bar codes, data matrix 2223/5442 comprising non digital, non alphanumeric information, e.g. symbols 2223/54426 for alignment	 2224/02 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers 2224/02122 being formed on the semiconductor or solid-state body 2224/02123 Reinforcing structures 2224/02126 Collar structures 2224/0213 Alignment aids
2223/544 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 2223/544 Marks applied to semiconductor devices or parts comprising alphanumeric information comprising digital information, e.g. bar codes, data matrix 2223/5442 comprising non digital, non alphanumeric information, e.g. symbols 2223/54426 for alignment containing identification or tracking information	 2224/02 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers 2224/02122 being formed on the semiconductor or solid-state body 2224/02123 inside the bonding area 2224/02125 Reinforcing structures 2224/02126 Collar structures 2224/0213 Alignment aids 2224/02135 Flow barrier
2223/544 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 2223/544 Marks applied to semiconductor devices or parts comprising alphanumeric information 2223/54413 comprising digital information, e.g. bar codes, data matrix comprising non digital, non alphanumeric information, e.g. symbols 2223/54426 for alignment 2223/54433 containing identification or tracking information	 2224/021 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers 2224/02122 being formed on the semiconductor or solid-state body 2224/02123 inside the bonding area 2224/02125 Reinforcing structures 2224/02126 Collar structures 2224/0213 Alignment aids 2224/02135 Flow barrier 2224/0214 Structure of the auxiliary member
2223/544 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 2223/544 Marks applied to semiconductor devices or parts comprising alphanumeric information 2223/54413 comprising digital information, e.g. bar codes, data matrix 2223/5442 comprising non digital, non alphanumeric information, e.g. symbols 2223/54426 for alignment containing identification or tracking information 2223/54444 for electrical read out 2223/54446 where the group H01L 23/00 comprising alphanumeric information alphanumeric information e.g. symbols containing identification or tracking information containing identification er tracking information 2223/54444 containing identification er tracking information	2224/0212 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers 2224/02122 being formed on the semiconductor or solid-state body 2224/02123 inside the bonding area 2224/02125 Reinforcing structures 2224/02126 Collar structures 2224/0213 Alignment aids 2224/02135 Flow barrier 2224/0214 Structure of the auxiliary member 2224/02141 Multilayer auxiliary member
2223/5440 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 2223/544 Marks applied to semiconductor devices or parts comprising alphanumeric information 2223/54413 comprising digital information, e.g. bar codes, data matrix 2223/5442 comprising non digital, non alphanumeric information, e.g. symbols 2223/54426 for alignment 2223/54433 containing identification or tracking information 2223/54444 containing identification or tracking information 2223/54446 containing identification or tracking information containing	2224/0212 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers 2224/02122 being formed on the semiconductor or solid-state body 2224/02123 inside the bonding area 2224/02125 Reinforcing structures 2224/02126 Collar structures 2224/0213 Alignment aids 2224/0213 Flow barrier 2224/0214 Structure of the auxiliary member 2224/02141 Multilayer auxiliary member 2224/02145 Shape of the auxiliary member
2223/5442	2224/0212 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers 2224/02122 being formed on the semiconductor or solid-state body 2224/02123 inside the bonding area 2224/02125 Reinforcing structures 2224/02126 Collar structures 2224/0213 Alignment aids 2224/0213 Flow barrier 2224/0214 Structure of the auxiliary member 2224/02141 Multilayer auxiliary member 2224/02145 Shape of the auxiliary member 2224/0215 Material of the auxiliary member
2223/5440 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 2223/5440 . Marks applied to semiconductor devices or parts 2223/54406 . comprising alphanumeric information 2223/54413 . comprising digital information, e.g. bar codes, data matrix 2223/5442 . comprising non digital, non alphanumeric information, e.g. symbols 2223/54426 . for alignment 2223/54443 . containing identification or tracking information 2223/54446 Wireless electrical read out 2223/54453 . for use prior to dicing 2223/5446 . Located in scribe lines 2223/54466 . Located in a dummy or reference die	2224/0212 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers 2224/02122 being formed on the semiconductor or solid-state body 2224/02123 inside the bonding area 2224/02125 Reinforcing structures 2224/02126 Collar structures 2224/0213 Alignment aids 2224/0213 Flow barrier 2224/0214 Structure of the auxiliary member 2224/02141 Multilayer auxiliary member 2224/02145 Shape of the auxiliary member 2224/0215 Material of the auxiliary member 2224/02163 on the bonding area
2223/5440 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 2223/5440 . Marks applied to semiconductor devices or parts 2223/54406 . comprising alphanumeric information 2223/54413 . comprising digital information, e.g. bar codes, data matrix 2223/5442 . comprising non digital, non alphanumeric information, e.g. symbols 2223/54426 . for alignment 2223/54443 . containing identification or tracking information 2223/54446 Wireless electrical read out 2223/54466 . Located in scribe lines 2223/54473 . for use after dicing	2224/0212 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers 2224/02122 being formed on the semiconductor or solid-state body 2224/02123 inside the bonding area 2224/02125 Reinforcing structures 2224/0213 Collar structures 2224/0213 Alignment aids 2224/0213 Flow barrier 2224/0214 Structure of the auxiliary member 2224/0214 Multilayer auxiliary member 2224/02145 Shape of the auxiliary member 2224/0215 Material of the auxiliary member 2224/02163 Material of the auxiliary member 2224/02163 Reinforcing structures
2223/5440 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 2223/5440 . Marks applied to semiconductor devices or parts 2223/54406 . comprising alphanumeric information 2223/54413 . comprising digital information, e.g. bar codes, data matrix 2223/5442 . comprising non digital, non alphanumeric information, e.g. symbols 2223/54426 . for alignment 2223/54443 . containing identification or tracking information 2223/54446 Wireless electrical read out 2223/54453 . for use prior to dicing 2223/54466 . Located in scribe lines 2223/54473 . for use after dicing 2223/5448 . Located on chip prior to dicing and remaining	2224/0212 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers 2224/02122 being formed on the semiconductor or solid-state body 2224/02123 inside the bonding area 2224/02125 Reinforcing structures 2224/02126 Collar structures 2224/0213 Alignment aids 2224/0213 Flow barrier 2224/0214 Structure of the auxiliary member 2224/0214 Multilayer auxiliary member 2224/02145 Material of the auxiliary member 2224/0215 Material of the auxiliary member 2224/02163 on the bonding area 2224/02165 Reinforcing structures 2224/02166 Collar structures
2223/5440 Details relating to semiconductor or other solid state devices covered by the group H01L 23/00 2223/5440 . Marks applied to semiconductor devices or parts 2223/54406 . comprising alphanumeric information 2223/54413 . comprising digital information, e.g. bar codes, data matrix 2223/5442 . comprising non digital, non alphanumeric information, e.g. symbols 2223/54426 . for alignment 2223/54443 . containing identification or tracking information 2223/54446 Wireless electrical read out 2223/54466 . Located in scribe lines 2223/54473 . for use after dicing	2224/0212 Bonding areas; Manufacturing methods related thereto 2224/0212 Auxiliary members for bonding areas, e.g. spacers 2224/02122 being formed on the semiconductor or solid-state body 2224/02123 inside the bonding area 2224/02125 Reinforcing structures 2224/02126 Collar structures 2224/0213 Alignment aids 2224/0213 Flow barrier 2224/0214 Structure of the auxiliary member 2224/0214 Multilayer auxiliary member 2224/02145 Shape of the auxiliary member 2224/0215 Material of the auxiliary member 2224/02163 on the bonding area 2224/02165 Reinforcing structures

2224/02175 Flow barrier	2224/03011 Involving a permanent auxiliary member, i.e.
2224/0218 Structure of the auxiliary member	a member which is left at least partly in the
2224/02181 Multilayer auxiliary member	finished device, e.g. coating, dummy feature
2224/02185 Shape of the auxiliary member	2224/03013 for holding or confining the bonding area,
2224/0219 Material of the auxiliary member	e.g. solder flow barrier
2224/022 Protective coating, i.e. protective bond-through coating	2224/03015 for aligning the bonding area, e.g. marks, spacers
2224/02205 Structure of the protective coating	2224/03019 for protecting parts during the process
2224/02206 Multilayer protective coating	2224/031 Manufacture and pre-treatment of the
2224/0221 Shape of the protective coating	bonding area preform
	2224/0311 Shaping
2224/02215 Material of the protective coating	2224/0312 Applying permanent coating
2224/02233 not in direct contact with the bonding area	2224/033 by local deposition of the material of the
2224/02235 Reinforcing structures	bonding area
2224/0224 Alignment aids	2224/0331 in liquid form
2224/02245 Flow barrier	2224/03312 Continuous flow, e.g. using a
2224/0225 Structure of the auxiliary member	microsyringe, a pump, a nozzle or
2224/02251 Multilayer auxiliary member	extrusion
2224/02255 Shape of the auxiliary member	
2224/0226 Material of the auxiliary member	2224/03318 by dispensing droplets
2224/023 Redistribution layers [RDL] for bonding areas	2224/0332 Screen printing, i.e. using a stencil
2224/0231 Manufacturing methods of the redistribution	2224/0333 in solid form
layers	2224/03332 using a powder
2224/02311 Additive methods	2224/03334 using a preform
2224/02313 Subtractive methods	2224/034 by blanket deposition of the material of the
	bonding area
2224/02315 Self-assembly processes	2224/0341 in liquid form
2224/02317 by local deposition	2224/03416 Spin coating
2224/02319 by using a preform	2224/03418 Spray coating
2224/02321 Reworking	2224/0342 Curtain coating
2224/0233 Structure of the redistribution layers	2224/03422 by dipping, e.g. in a solder bath
2224/02331 Multilayer structure	2224/03424 Immersion coating, e.g. in a solder bath
2224/02333 being a bump	2224/03426 Chemical solution deposition [CSD], i.e.
2224/02335 Free-standing redistribution layers	using a liquid precursor
2224/0235 Shape of the redistribution layers	
2224/02351 comprising interlocking features	2224/03428 Wave coating
2224/0236 Shape of the insulating layers therebetween	2224/0343 in solid form
2224/0237 Disposition of the redistribution layers	2224/03436 Lamination of a preform, e.g. foil, sheet
2224/02371 connecting the bonding area on a surface	or layer
of the semiconductor or solid-state body	2224/03438 the preform being at least partly pre- patterned
with another surface of the semiconductor	2224/0344 by transfer printing
or solid-state body	2224/03442 using a powder
2224/02372 connecting to a via connection in the	2224/03444 in gaseous form
semiconductor or solid-state body	2224/0345 Physical vapour deposition [PVD], e.g.
2224/02373 Layout of the redistribution layers	evaporation, or sputtering
2224/02375 Top view	2224/03452 Chemical vapour deposition [CVD], e.g.
2224/02377 Fan-in arrangement	laser CVD
2224/02379 Fan-out arrangement	2224/0346 Plating
2224/02381 Side view	2224/03462 Electroplating
2224/0239 Material of the redistribution layers	2224/03464 Electroless plating
2224/024 Material of the insulating layers	2224/03466 Conformal deposition, i.e. blanket
therebetween	deposition of a conformal layer on a
2224/03 Manufacturing methods	patterned surface
2224/03001 Involving a temporary auxiliary member not	2224/0347 using a lift-off mask
forming part of the manufacturing apparatus,	2224/03472 Profile of the lift-off mask
e.g. removable or sacrificial coating, film or	
substrate	2224/03474 Multilayer masks
2224/03002 for supporting the semiconductor or solid-	2224/0348 Permanent masks, i.e. masks left in the finished device, e.g. passivation layers
state body for holding or transferring a preform	2224/035 by chemical or physical modification of a
2224/03003 for holding or transferring a preform	pre-existing or pre-deposited material
2224/03005 for aligning the bonding area, e.g. marks,	2224/03502 Pre-existing or pre-deposited material
spacers	2224/03505 Sintering
2224/03009 for protecting parts during manufacture	2224/0351 Anodisation

2224/03515 Curing and solidification, e.g. of a photosensitive material	2224/03901 with repetition of the same manufacturing step
2224/0352 Self-assembly, e.g. self-agglomeration of	2224/03902 Multiple masking steps
the material in a fluid	2224/03903 using different masks
2224/03522 Auxiliary means therefor, e.g. for self-	2224/03906 with modification of the same mask
assembly activation 2224/03524 with special adaptation of the surface	2224/0391 Forming a passivation layer after forming the bonding area
of the body to be connected or of an auxiliary substrate, e.g. surface shape	2224/03912 the bump being used as a mask for
specially adapted for the self-assembly	patterning the bonding area
process	2224/03914 the bonding area, e.g. under bump
2224/0355 Selective modification	metallisation [UBM], being used as a mask
	for patterning other parts
2224/03552 using a laser or a focussed ion beam [FIB]	2224/03916 a passivation layer being used as a mask for patterning the bonding area
2224/03554 Stereolithography, i.e. solidification of a pattern defined by a laser trace in	2224/0392 specifically adapted to include a probing step
a photosensitive resin	2224/03921 by repairing the bonding area damaged
2224/036 by patterning a pre-deposited material	by the probing step
2224/03602 Mechanical treatment, e.g. polishing,	2224/04 Structure, shape, material or disposition of the
grinding	bonding areas prior to the connecting process
2224/0361 Physical or chemical etching	2224/0401 Bonding areas specifically adapted for bump
2224/03612 by physical means only	connectors, e.g. under bump metallisation
2224/03614 by chemical means only	[UBM]
2224/03616 Chemical mechanical polishing [CMP]	2224/04026 Bonding areas specifically adapted for layer
2224/03618 with selective exposure, development and	connectors
removal of a photosensitive material, e.g.	2224/04034 Bonding areas specifically adapted for strap
of a photosensitive conductive resin	connectors
2224/0362 Photolithography	2224/04042 Bonding areas specifically adapted for wire
2224/03622 using masks	connectors, e.g. wirebond pads
2224/0363 using a laser or a focused ion beam [FIB]	2224/0405 Bonding areas specifically adapted for tape
2224/03632 Ablation by means of a laser or focused	automated bonding [TAB] connectors
ion beam [FIB]	2224/04073 Bonding areas specifically adapted for
2224/037 involving monitoring, e.g. feedback loop	connectors of different types
2224/038 Post-treatment of the bonding area	2224/04105 Bonding areas formed on an encapsulation
2224/0381 Cleaning, e.g. oxide removal step,	of the semiconductor or solid-state body, e.g.
desmearing	bonding areas on chip-scale packages
2224/0382 Applying permanent coating, e.g. in-situ	2224/05 of an individual bonding area
coating	2224/05001 Internal layers
2224/03821 Spray coating	2224/05005 Structure
2224/03822 by dipping, e.g. in a solder bath	2224/05006 Dual damascene structure
2224/03823 Immersion coating, e.g. in a solder bath	2224/05007 comprising a core and a coating
2224/03824 Chemical solution deposition [CSD], i.e.	2224/05008 Bonding area integrally formed
using a liquid precursor	with a redistribution layer on the
2224/03825 Plating, e.g. electroplating, electroless	semiconductor or solid-state body,
plating	e.g.
2224/03826 Physical vapour deposition [PVD], e.g.	2224/05009 Bonding area integrally formed with a via connection of the semiconductor
evaporation, or sputtering	or solid-state body
2224/03827 Chemical vapour deposition [CVD], e.g.	2224/0501 Shape
laser CVD	2224/05011 comprising apertures or cavities
2224/03828 Applying flux	2224/05012 in top view
2224/03829 Applying a precursor material	2224/05013 being rectangular
2224/0383 Reworking, e.g. shaping	2224/05014 being square
2224/03831 involving a chemical process, e.g.	
etching the bonding area	2224/05015 being circular or elliptic
2224/0384 involving a mechanical process, e.g.	2224/05016 in side view
planarising the bonding area	2224/05017 comprising protrusions or indentations
2224/03845 Chemical mechanical polishing [CMP]	2224/05018 being a conformal layer on a
2224/03848 Thermal treatments, e.g. annealing, controlled cooling	patterned surface
2224/03849 Reflowing	2224/05019 being a non conformal layer on a
2224/039 Methods of manufacturing bonding areas	patterned surface
involving a specific sequence of method	2224/0502 Disposition
steps	2224/05022 the internal layer being at least
	partially embedded in the surface

2224/05023 the whole internal layer protruding from the surface	2224/05114 Thallium [TI] as principal constituent
2224/05024 the internal layer being disposed on a redistribution layer on the semiconductor or solid-state body	2224/05116 Lead [Pb] as principal constituent 2224/05117 the principal constituent melting at a temperature of greater than or
2224/05025 the internal layer being disposed on a via connection of the semiconductor	equal to 400°C and less than 950°C 2224/05118 Zinc [Zn] as principal constituent
or solid-state body 2224/05026 the internal layer being disposed in a	2224/0512 Antimony [Sb] as principal constituent
recess of the surface 2224/05027 the internal layer extending out of an opening	2224/05123 Magnesium [Mg] as principal constituent 2224/05124 Aluminium [Al] as principal
2224/05073 Single internal layer	constituent
2224/05075 Plural internal layers	2224/05138 the principal constituent melting
2224/05076 being mutually engaged together, e.g. through inserts	at a temperature of greater than or equal to 950°C and less than 1550°C
2224/05078 being disposed next to each other, e.g. side-to-side arrangements 2224/0508 being stacked	2224/05139 Silver [Ag] as principal constituent
2224/05082 Two-layer arrangements	2224/05144 Gold [Au] as principal
2224/05083 Three-layer arrangements	constituent
2224/05084 Four-layer arrangements	2224/05147 Copper [Cu] as principal
2224/05085 with additional elements, e.g. vias	constituent
arrays, interposed between the stacked layers	2224/05149 Manganese [Mn] as principal constituent 2224/05155 Nickel [Ni] as principal
2224/05086 Structure of the additional element	constituent
2224/05087 being a via with at least a lining layer	2224/05157 Cobalt [Co] as principal constituent
2224/05088 Shape of the additional element	2224/0516 Iron [Fe] as principal constituent
2224/05089 Disposition of the additional element	2224/05163 the principal constituent melting at a temperature of greater than 1550°C
2224/0509 of a single via	2224/05164 Palladium [Pd] as principal
2224/05091 at the center of the internal layers	constituent
2224/05092 at the periphery of the internal layers	2224/05166 Titanium [Ti] as principal constituent
2224/05093 of a plurality of vias	2224/05169 Platinum [Pt] as principal constituent
2224/05094 at the center of the internal layers	2224/0517 Zirconium [Zr] as principal
2224/05095 at the periphery of the	constituent 2224/05171 Chromium [Cr] as principal
internal layers 2224/05096 Uniform arrangement, i.e.	constituent
array	2224/05172 Vanadium [V] as principal constituent
2224/05097 Random arrangement	2224/05173 Rhodium [Rh] as principal
2224/05098 Material of the additional element	constituent
2224/05099 Material	2224/05176 Ruthenium [Ru] as principal
2224/051 with a principal constituent of	constituent 2224/05178 Iridium [Ir] as principal
the material being a metal or a metalloid, e.g. boron [B], silicon	2224/05178 Iridium [Ir] as principal constituent
[Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and	2224/05179 Niobium [Nb] as principal constituent
polonium [Po], and alloys thereof	2224/0518 Molybdenum [Mo] as principal
2224/05101 the principal constituent melting at a temperature of less than 400°C	constituent 2224/05181 Tantalum [Ta] as principal
2224/05105 Gallium [Ga] as principal constituent	constituent 2224/05183 Rhenium [Re] as principal
2224/05109 Indium [In] as principal	constituent Typogton [W] as principal
constituent 2224/05111 Tin [Sn] as principal constituent	2224/05184 Tungsten [W] as principal constituent
2224/05113 Bismuth [Bi] as principal constituent constituent	2224/05186 with a principal constituent of the material being a non metallic, non metalloid inorganic material
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2224/05187 Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/05224 Aluminium [Al] as principal constituent
2224/05188 Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/05238 the principal constituent melting at a temperature of
2224/0519 with a principal constituent of the material being a polymer, e.g.	greater than or equal to 950°C and less than 1550°C
polyester, phenolic based polymer, epoxy	2224/05239 Silver [Ag] as principal constituent
2224/05191 The principal constituent being an elastomer, e.g. silicones, isoprene,	2224/05244 Gold [Au] as principal constituent
neoprene 2224/05193 with a principal constituent	2224/05247 Copper [Cu] as principal constituent
of the material being a solid not provided for in groups	2224/05249 Manganese [Mn] as principal constituent
H01L 2224/051 - H01L 2224/05191, e.g. allotropes of carbon, fullerene,	2224/05255 Nickel [Ni] as principal constituent
graphite, carbon-nanotubes, diamond 22224/05194 with a principal constituent	2224/05257 Cobalt [Co] as principal constituent
of the material being a liquid not provided for in groups H01L 2224/051 - H01L 2224/05191	2224/0526 Iron [Fe] as principal constituent
2224/05195 with a principal constituent of the material being a gas	2224/05263 the principal constituent melting at a temperature of
not provided for in groups H01L 2224/051 - H01L 2224/05191	greater than 1550°C 2224/05264 Palladium [Pd] as principal
2224/05198 with a principal constituent of the material being a combination of two	constituent 2224/05266 Titanium [Ti] as principal
or more materials in the form of a matrix with a filler, i.e. being a hybrid	constituent 2224/05269 Platinum [Pt] as principal
material, e.g. segmented structures, foams	constituent 2224/0527 Zirconium [Zr] as principal constituent
2224/05199 Material of the matrix 2224/052 with a principal constituent of	2224/05271
the material being a metal or a metalloid, e.g. boron [B], silicon	2224/05272 Vanadium [V] as principal constituent
[Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium	2224/05273 Rhodium [Rh] as principal constituent
[Te] and polonium [Po], and alloys thereof	2224/05276 Ruthenium [Ru] as principal constituent
2224/05201 the principal constituent melting at a temperature of less than 400°C	2224/05278 Iridium [Ir] as principal constituent
2224/05205	2224/05279 Niobium [Nb] as principal constituent
2224/05209 Indium [In] as principal constituent	2224/0528 Molybdenum [Mo] as principal constituent
2224/05211 Tin [Sn] as principal constituent	2224/05281 Tantalum [Ta] as principal constituent
2224/05213 Bismuth [Bi] as principal constituent	2224/05283 Rhenium [Re] as principal constituent
2224/05214 Thallium [T1] as principal constituent	2224/05284 Tungsten [W] as principal constituent
2224/05216 Lead [Pb] as principal constituent	2224/05286 with a principal constituent of the material being a non metallic,
2224/05217 the principal constituent melting at a temperature of	non metalloid inorganic material 2224/05287 Ceramics, e.g. crystalline
greater than or equal to 400°C and less than 950°C	carbides, nitrides or oxides 2224/05288 Glasses, e.g. amorphous
2224/05218 Zinc [Zn] as principal constituent	oxides, nitrides or fluorides 2224/0529 with a principal constituent of
2224/0522 Antimony [Sb] as principal constituent	the material being a polymer, e.g. polyester, phenolic based
2224/05223 Magnesium [Mg] as principal constituent	polymer, epoxy

2224/05291 The principal constituent being an elastomer, e.g. silicones,	2224/05349 Manganese [Mn] as principal constituent
isoprene, neoprene	2224/05355 Nickel [Ni] as principal constituent
2224/05293 with a principal constituent of the material being a solid not provided for in groups	2224/05357 Cobalt [Co] as principal constituent
H01L 2224/052 - H01L 2224/05291, e.g. allotropes of carbon,	2224/0536 Iron [Fe] as principal constituent
fullerene, graphite, carbon- nanotubes, diamond	2224/05363 the principal constituent melting at a temperature of
2224/05294 with a principal constituent of the material being a liquid	greater than 1550°C 2224/05364 Palladium [Pd] as
not provided for in groups H01L 2224/052 - H01L 2224/05291	principal constituent 2224/05366 Titanium [Ti] as principal
2224/05295 with a principal constituent of the material being a gas	constituent
not provided for in groups H01L 2224/052 - H01L 2224/05291	2224/05369 Platinum [Pt] as principal constituent
2224/05298 Fillers	2224/0537 Zirconium [Zr] as principal constituent
2224/05299 Base material	2224/05371
2224/053 with a principal constituent of the material being a metal	principal constituent
or a metalloid, e.g. boron [B],	2224/05372 Vanadium [V] as principal constituent
silicon [Si], germanium [Ge], arsenic [As], antimony [Sb],	2224/05373 Rhodium [Rh] as principal constituent
tellurium [Te] and polonium [Po], and alloys thereof	2224/05376 Ruthenium [Ru] as principal constituent
2224/05301 the principal constituent melting at a temperature of	2224/05378 Iridium [Ir] as principal constituent
less than 400°C	2224/05379 Niobium [Nb] as principal constituent
constituent [2224/05309] Indium [In] as principal	2224/0538 Molybdenum [Mo] as
constituent	principal constituent
2224/05311 Tin [Sn] as principal constituent	2224/05381 Tantalum [Ta] as principal constituent
2224/05313 Bismuth [Bi] as principal constituent	2224/05383 Rhenium [Re] as principal constituent
2224/05314 Thallium [Tl] as principal	2224/05384 Tungsten [W] as principal constituent
constituent 2224/05316 Lead [Pb] as principal	2224/05386 with a principal constituent of the material being a non
constituent 2224/05317 the principal constituent	metallic, non metalloid
melting at a temperature	inorganic material 2224/05387 Ceramics, e.g. crystalline
of greater than or equal to 400°C and less than 950°C	carbides, nitrides or oxides
2224/05318 Zinc [Zn] as principal constituent	2224/05388 Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/0532 Antimony [Sb] as	2224/0539 with a principal constituent of
principal constituent 2224/05323 Magnesium [Mg] as	the material being a polymer, e.g. polyester, phenolic based
principal constituent	polymer, epoxy 2224/05391 The principal constituent
2224/05324 Aluminium [Al] as principal constituent	being an elastomer, e.g. silicones, isoprene, neoprene
2224/05338 the principal constituent	2224/05393 with a principal constituent
melting at a temperature of greater than or equal to	of the material being a solid not provided for in groups
950°C and less than 1550°C	H01L 2224/053 - H01L 2224/05391,
2224/05339 Silver [Ag] as principal constituent	e.g. allotropes of carbon, fullerene, graphite, carbon-
2224/05344 Gold [Au] as principal constituent	nanotubes, diamond
2224/05347 Copper [Cu] as principal	2224/05394 with a principal constituent of the material being a liquid
constituent	not provided for in groups H01L 2224/053 - H01L 2224/05391
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of t	h a principal constituent he material being a gas	2224/05463	• • •	• •				melting at a temperature of
<u>H0</u> :	provided for in groups 1L 2224/053 - H01L 2224/05391 h a principal constituent	2224/05464						greater than 1550°C Palladium [Pd] as principal constituent
of t	he material being a heination of two or more	2224/05466		• •				Titanium [Ti] as principal constituent
a m	terials in the form of atrix with a filler, i.e.	2224/05469	• •	• •				
seg	ng a hybrid material, e.g. mented structures, foams ng material	2224/0547						principal constituent
	h a principal constituent	2224/05471	• •	• •		• •		Chromium [Cr] as principal constituent
or a	he material being a metal metalloid, e.g. boron [B],	2224/05472	• •	• •				
arse	con [Si], germanium [Ge], enic [As], antimony [Sb], urium [Te] and polonium	2224/05473						constituent
], and alloys thereof	2224/05476						principal constituent
n	nelting at a temperature of ess than 400°C							Iridium [Ir] as principal constituent
2224/05405								Niobium [Nb] as principal constituent
2224/05409		2224/0548	• •	• •	• •	• •	• •	Molybdenum [Mo] as principal constituent
2224/05411	constituent Tin [Sn] as principal constituent	2224/05481	• •	•				Tantalum [Ta] as principal constituent
2224/05413	Bismuth [Bi] as principal	2224/05483	• •	• •	• •	• •		Rhenium [Re] as principal constituent
2224/05414	constituent Thallium [Tl] as principal constituent	2224/05484	• •	• •				constituent
2224/05416		2224/05486	• •	•		• •		of the material being a non
	he principal constituent							metallic, non metalloid inorganic material
o	nelting at a temperature f greater than or equal to 00°C and less than 950°C							• Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/05418			• •	• •		• •		• Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/0542		2224/0549	• •	•		• •		with a principal constituent of the material being a polymer,
2224/05423	Magnesium [Mg] as principal constituent							e.g. polyester, phenolic based polymer, epoxy
2224/05424		2224/05491	• •	•		• •		• The principal constituent being an elastomer, e.g.
	he principal constituent melting at a temperature	2224/05493						silicones, isoprene, neoprene with a principal constituent of the material being a solid
o	f greater than or equal to 50°C and less than 1550°C							not provided for in groups H01L 2224/054 - H01L 2224/05491,
2224/05439	Silver [Ag] as principal constituent							e.g. allotropes of carbon, fullerene, graphite, carbon-
2224/05444	Gold [Au] as principal constituent	2224/05494						nanotubes, diamond with a principal constituent
2224/05447	Copper [Cu] as principal constituent	2224/03494	• • •	•	• •	• •	• •	of the material being a liquid not provided for in groups
2224/05449	Manganese [Mn] as principal constituent	2224/05405						H01L 2224/054 - H01L 2224/05491 with a principal constituent
2224/05455	Nickel [Ni] as principal constituent	2224/05495	• •	•	• •	• •	• •	of the material being a gas not provided for in groups
2224/05457	Cobalt [Co] as principal constituent							H01L 2224/054 - H01L 2224/05491
2224/0546								

2224/05498 with a principal constituent	2224/05584 Four-layer coating
of the material being a	2224/05599 Material
combination of two or more	2224/056 with a principal constituent of
materials in the form of	the material being a metal or a
a matrix with a filler, i.e.	metalloid, e.g. boron [B], silicon
being a hybrid material, e.g.	[Si], germanium [Ge], arsenic [As],
segmented structures, foams	antimony [Sb], tellurium [Te] and
2224/05499 Shape or distribution of the fillers	polonium [Po], and alloys thereof
2224/0554 External layer	2224/05601 the principal constituent melting at
2224/05541 Structure	a temperature of less than 400°C
2224/05546 Dual damascene structure	2224/05605 Gallium [Ga] as principal
2224/05547 comprising a core and a coating	constituent
2224/05548 Bonding area integrally formed	2224/05609 Indium [In] as principal
with a redistribution layer on the	constituent
semiconductor or solid-state body	2224/05611 Tin [Sn] as principal constituent
2224/0555 Shape	2224/05613 Bismuth [Bi] as principal
2224/05551 comprising apertures or cavities	constituent
2224/05552 in top view	2224/05614 Thallium [TI] as principal
2224/05553 being rectangular	constituent
2224/05554 being square	2224/05616 Lead [Pb] as principal constituent
2224/05555 being circular or elliptic	2224/05617 the principal constituent melting
2224/05556 in side view	at a temperature of greater than or
2224/05557 comprising protrusions or	equal to 400°C and less than 950°C
indentations	2224/05618 Zinc [Zn] as principal constituent
2224/05558 conformal layer on a patterned	2224/0562 Antimony [Sb] as principal
surface	constituent
2224/05559 non conformal layer on a patterned	2224/05623 Magnesium [Mg] as principal
surface	constituent
2224/0556 Disposition	2224/05624 Aluminium [Al] as principal constituent
2224/05561 On the entire surface of the internal	2224/05638 the principal constituent melting
layer	at a temperature of greater than
2224/05562 On the entire exposed surface of the	or equal to 950°C and less than
internal layer	1550°C
2224/05563 Only on parts of the surface of the	2224/05639 Silver [Ag] as principal
internal layer	constituent
2224/05564 Only on the bonding interface of	2224/05644 Gold [Au] as principal
the bonding area 2224/05565 Only outside the bonding interface	constituent
of the bonding area	2224/05647 Copper [Cu] as principal
2224/05566 Both on and outside the bonding	constituent
interface of the bonding area	2224/05649 Manganese [Mn] as principal
2224/05567 the external layer being at least	constituent
partially embedded in the surface	2224/05655 Nickel [Ni] as principal
2224/05568 the whole external layer protruding	constituent
from the surface	2224/05657 Cobalt [Co] as principal
2224/05569 the external layer being disposed	constituent
on a redistribution layer on the	2224/0566 Iron [Fe] as principal constituent
semiconductor or solid-state body	2224/05663 the principal constituent melting
2224/0557 the external layer being disposed on a	at a temperature of greater than 1550°C
via connection of the semiconductor	2224/05664 Palladium [Pd] as principal
or solid-state body	constituent
2224/05571 the external layer being disposed in a	2224/05666 Titanium [Ti] as principal
recess of the surface	constituent
2224/05572 the external layer extending out of	2224/05669 Platinum [Pt] as principal
an opening	constituent
2224/05573 Single external layer	2224/0567 Zirconium [Zr] as principal
2224/05575 Plural external layers	constituent
2224/05576 being mutually engaged together, e.g.	2224/05671 Chromium [Cr] as principal
through inserts	constituent
2224/05578 being disposed next to each other, e.g. side-to-side arrangements	2224/05672 Vanadium [V] as principal
2224/0558 being stacked	constituent
2224/05582 Two-layer coating	2224/05673 Rhodium [Rh] as principal
2224/05583 Three-layer coating	constituent
222 " 55555 Three-rayer coating	

2224/05676 Ruthenium [Ru] as principal constituent	2224/05713 Bismuth [Bi] as principal constituent
2224/05678 Iridium [Ir] as principal constituent	2224/05714 Thallium [T1] as principal constituent
2224/05679 Niobium [Nb] as principal constituent	2224/05716 Lead [Pb] as principal constituent
2224/0568 Molybdenum [Mo] as principal constituent	2224/05717 the principal constituent melting at a temperature of
2224/05681 Tantalum [Ta] as principal constituent	greater than or equal to 400°C and less than 950°C
2224/05683 Rhenium [Re] as principal constituent	2224/05718 Zinc [Zn] as principal constituent
2224/05684 Tungsten [W] as principal constituent	2224/0572 Antimony [Sb] as principal constituent
2224/05686 with a principal constituent of the material being a non metallic, non	2224/05723 Magnesium [Mg] as principal constituent
metalloid inorganic material 2224/05687 Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/05724 Aluminium [Al] as principal constituent
2224/05688 Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/05738 the principal constituent melting at a temperature of greater than or equal to 950°C
2224/0569 with a principal constituent of the material being a polymer, e.g.	and less than 1550°C 2224/05739 Silver [Ag] as principal
polyester, phenolic based polymer,	constituent
epoxy 2224/05691 The principal constituent being an	2224/05744 Gold [Au] as principal constituent
elastomer, e.g. silicones, isoprene, neoprene	2224/05747 Copper [Cu] as principal constituent
2224/05693 with a principal constituent of the material being a solid	2224/05749 Manganese [Mn] as principal constituent
not provided for in groups <u>H01L 2224/056</u> - <u>H01L 2224/05691</u> ,	2224/05755 Nickel [Ni] as principal constituent
e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/05757 Cobalt [Co] as principal constituent
2224/05694 with a principal constituent of the material being a liquid	2224/0576 Iron [Fe] as principal constituent
not provided for in groups H01L 2224/056 - H01L 2224/05691 2224/05695 with a principal constituent	2224/05763 the principal constituent melting at a temperature of
of the material being a gas	greater than 1550°C 2224/05764 Palladium [Pd] as principal
not provided for in groups <u>H01L 2224/056</u> - <u>H01L 2224/05691</u>	constituent 2224/05766 Titanium [Ti] as principal
2224/05698 with a principal constituent of the material being a combination of two	constituent 2224/05769 Platinum [Pt] as principal
or more materials in the form of a matrix with a filler, i.e. being a hybrid	constituent
material, e.g. segmented structures, foams	2224/0577 Zirconium [Zr] as principal constituent
2224/05699 Material of the matrix 2224/057 with a principal constituent of	2224/05771 Chromium [Cr] as principal constituent
the material being a metal or a metalloid, e.g. boron [B], silicon	2224/05772 Vanadium [V] as principal constituent
[Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium	2224/05773 Rhodium [Rh] as principal constituent
[Te] and polonium [Po], and alloys thereof	2224/05776 Ruthenium [Ru] as principal constituent
2224/05701 the principal constituent	2224/05778 Iridium [Ir] as principal constituent
melting at a temperature of less than 400°C	2224/05779 Niobium [Nb] as principal constituent
2224/05705 Gallium [Ga] as principal constituent	2224/0578 Molybdenum [Mo] as principal constituent
2224/05709 Indium [In] as principal constituent	2224/05781 Tantalum [Ta] as principal
2224/05711 Tin [Sn] as principal constituent	constituent

2224/05783 Rhenium [Re] as principal constituent	2224/05823 Magnesium [Mg] as principal constituent
2224/05784 Tungsten [W] as principal constituent	2224/05824 Aluminium [Al] as principal constituent
2224/05786 with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/05838 the principal constituent melting at a temperature of greater than or equal to
2224/05787 Ceramics, e.g. crystalline carbides, nitrides or oxides	950°C and less than 1550°C 2224/05839 Silver [Ag] as principal
2224/05788 Glasses, e.g. amorphous oxides, nitrides or fluorides	constituent 2224/05844 Gold [Au] as principal
2224/0579 with a principal constituent of the material being a polymer,	constituent 2224/05847 Copper [Cu] as principal
e.g. polyester, phenolic based polymer, epoxy	constituent 2224/05849 Manganese [Mn] as
2224/05791 The principal constituent being	principal constituent
an elastomer, e.g. silicones, isoprene, neoprene	2224/05855 Nickel [Ni] as principal constituent
2224/05793 with a principal constituent of the material being a solid	2224/05857 Cobalt [Co] as principal constituent
not provided for in groups H01L 2224/057 - H01L 2224/05791,	2224/0586 Iron [Fe] as principal constituent
e.g. allotropes of carbon,	2224/05863 the principal constituent
fullerene, graphite, carbon- nanotubes, diamond	melting at a temperature of greater than 1550°C
2224/05794 with a principal constituent of the material being a liquid	2224/05864 Palladium [Pd] as principal constituent
not provided for in groups <u>H01L 2224/057</u> - <u>H01L 2224/05791</u>	2224/05866
2224/05795 with a principal constituent	2224/05869 Platinum [Pt] as principal
of the material being a gas not provided for in groups H01L 2224/057 - H01L 2224/05791	constituent 2224/0587 Zirconium [Zr] as
2224/05798 Fillers	principal constituent
2224/05799 Base material	2224/05871
2224/058 with a principal constituent of the material being a metal	principal constituent 2224/05872 Vanadium [V] as principal constituent
or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge],	2224/05873 Rhodium [Rh] as principal
arsenic [As], antimony [Sb], tellurium [Te] and polonium	constituent 2224/05876 Ruthenium [Ru] as
[Po], and alloys thereof	principal constituent
2224/05801 the principal constituent	2224/05878 Iridium [Ir] as principal constituent
melting at a temperature of less than 400°C	2224/05879 Niobium [Nb] as principal constituent
2224/05805 Gallium [Ga] as principal constituent	2224/0588 Molybdenum [Mo] as
2224/05809 Indium [In] as principal constituent	principal constituent 2224/05881 Tantalum [Ta] as principal
2224/05811 Tin [Sn] as principal	constituent 2224/05883 Rhenium [Re] as principal
constituent 2224/05813 Bismuth [Bi] as principal	constituent
constituent	2224/05004
	2224/05884 Tungsten [W] as principal
2224/05814 Thallium [Tl] as principal	2224/05886 Tungsten [W] as principal constituent
	constituent 2224/05886 with a principal constituent of the material being a non metallic, non metalloid
2224/05814 Thallium [TI] as principal constituent 2224/05816 Lead [Pb] as principal constituent 2224/05817 the principal constituent	constituent 2224/05886 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2224/05887 Ceramics, e.g. crystalline
2224/05814 Thallium [TI] as principal constituent 2224/05816 Lead [Pb] as principal constituent 2224/05817 the principal constituent melting at a temperature of greater than or equal to	constituent 2224/05886 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2224/05887 Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/05814 Thallium [TI] as principal constituent 2224/05816 Lead [Pb] as principal constituent 2224/05817	constituent 2224/05886 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2224/05887 Ceramics, e.g. crystalline
2224/05814 Thallium [TI] as principal constituent 2224/05816 Lead [Pb] as principal constituent 2224/05817 the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	constituent 2224/05886 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2224/05887 Ceramics, e.g. crystalline carbides, nitrides or oxides 2224/05888 Glasses, e.g. amorphous

2224/0589 with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/05938 the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/05891 The principal constituent being an elastomer, e.g.	2224/05939 Silver [Ag] as principal constituent
silicones, isoprene, neoprene 2224/05893 with a principal constituent	2224/05944 Gold [Au] as principal constituent
of the material being a solid not provided for in groups	2224/05947 Copper [Cu] as principal constituent
<u>H01L 2224/058</u> - <u>H01L 2224/0589</u> e.g. allotropes of carbon,	2224/05949 Manganese [Mn] as principal constituent
fullerene, graphite, carbon- nanotubes, diamond	2224/05955 Nickel [Ni] as principal constituent
2224/05894 with a principal constituent of the material being a liquid	2224/05957 Cobalt [Co] as principal constituent
not provided for in groups <u>H01L 2224/058</u> - <u>H01L 2224/0589</u>	2224/0596 Iron [Fe] as principal constituent
2224/05895 with a principal constituent of the material being a gas	2224/05963 the principal constituent melting at a temperature of
not provided for in groups H01L 2224/058 - H01L 2224/0589	greater than 1550°C
2224/05898 with a principal constituent of the material being a	2224/05964 Palladium [Pd] as principal constituent
combination of two or more materials in the form of	2224/05966 Titanium [Ti] as principal constituent
a matrix with a filler, i.e.	2224/05969 Platinum [Pt] as principal constituent
being a hybrid material, e.g. segmented structures, foams	2224/0597 Zirconium [Zr] as principal constituent
2224/05899 Coating material 2224/059 with a principal constituent	2224/05971 Chromium [Cr] as principal constituent
of the material being a metal or a metalloid, e.g. boron [B],	2224/05972 Vanadium [V] as principal
silicon [Si], germanium [Ge], arsenic [As], antimony [Sb],	constituent 2224/05973 Rhodium [Rh] as principal
tellurium [Te] and polonium [Po], and alloys thereof	constituent [Ru] as
2224/05901 the principal constituent melting at a temperature of	principal constituent 2224/05978 Iridium [Ir] as principal
less than 400°C	constituent 2224/05979 Niobium [Nb] as principal
2224/05905 Gallium [Ga] as principal constituent	constituent
2224/05909 Indium [In] as principal constituent	2224/0598 Molybdenum [Mo] as principal constituent
2224/05911 Tin [Sn] as principal constituent	2224/05981 Tantalum [Ta] as principal constituent
2224/05913 Bismuth [Bi] as principal constituent	2224/05983 Rhenium [Re] as principal constituent
2224/05914 Thallium [Tl] as principal constituent	2224/05984 Tungsten [W] as principal constituent
2224/05916 Lead [Pb] as principal constituent	2224/05986 with a principal constituent of the material being a non
2224/05917 the principal constituent melting at a temperature	metallic, non metalloid inorganic material
of greater than or equal to	2224/05987 Ceramics, e.g. crystalline carbides, nitrides or oxides
400°C and less than 950°C 2224/05918 Zinc [Zn] as principal	2224/05988 Glasses, e.g. amorphous oxides, nitrides or fluorides
constituent 2224/0592 Antimony [Sb] as	2224/0599 with a principal constituent of
principal constituent 2224/05923 Magnesium [Mg] as	the material being a polymer, e.g. polyester, phenolic based
principal constituent 2224/05924 Aluminium [Al] as	polymer, epoxy 2224/05991 The principal constituent
principal constituent	being an elastomer, e.g. silicones, isoprene, neoprene

not provided for in groups H01L 2224/059 - H01L 2224/05991 2224/06146
2224/05994 with a principal constituent of the material being a liquid not provided for in groups H01L 2224/059 - H01L 2224/05991 2224/05995 with a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups With a principal constituent of the mat
of the material being a liquid not provided for in groups H01L 2224/059 - H01L 2224/05991 2224/05995
2224/05995 with a principal constituent of the material being a gas not provided for in groups With a principal constituent of the material being a gas not provided for in groups Wirnor array, i.e. array having only a reflection symmetry, i.e. bilateral
of the material being a gas not provided for in groups 1011 2024/0500 Hotel 2024/05001 2224/05001 Mirror array, i.e. array having only a reflection symmetry, i.e. bilateral
Symmetry
2224/05998 with a principal constituent of the material being a uniform pitch across the array
combination of two or more 2224/06152 being non uniform, i.e. having a
a matrix with a filler, i.e. being a hybrid meterial a g
segmented structures, foams 2224/06154 covering only portions of the
2224/05999 Shape or distribution of the fillers
2224/06 of a plurality of bonding areas 2224/0601 Structure 2224/0615 Covering only the peripheral area
2224/0603 Structure of the surface to be connected, i.e. peripheral arrangements
e.g. different heights or widths 2224/06156 Covering only the central area of
2224/0605 Shape the surface to be connected, i.e. 2224/06051 Bonding areas having different shapes central arrangements
2224/06051 Bonding areas having different shapes central arrangements 2224/061 Disposition 2224/06157 with specially adapted
2224/06102 the bonding areas being at different redistribution layers [RDL]
heights 2224/06158 being disposed in a single wiring
2224/0612 Layout level, i.e. planar layout
2224/0613 Square or rectangular array 2224/06159 being disposed in different wiring levels, i.e. resurf layout
uniform pitch across the array 2224/0616 Random array, i.e. array with no
2224/06132 being non uniform, i.e. having a symmetry
non uniform pitch across the array 2224/06163 with a staggered arrangement 2224/06133 with a staggered arrangement, e.g. 2224/06164 covering only portions of the
depopulated array surface to be connected
2224/06134 covering only portions of the surface to be connected of the surface to be connected,
2224/06135 Covering only the peripheral area of the surface to be connected, 2224/06166 Covering only the central area of
i.e. peripheral arrangements the surface to be connected, i.e. 2224/06136 Covering only the central area of central arrangements
the surface to be connected, i.e. 2224/06167 with specially adapted central arrangements redistribution layers [RDL]
2224/06137 with specially adapted redistribution layers [RDL] 2224/06168 being disposed in a single wiring level, i.e. planar layout
2224/06138 being disposed in a single wiring level, i.e. planar layout 2224/06169 being disposed in different wiring levels, i.e. resurf layout
2224/06139 being disposed in different wiring levels, i.e. resurf layout layouts
2224/0614 Circular array, i.e. array with radial symmetry 2224/06179 Corner adaptations, i.e. disposition of the bonding areas at the corners of the
2224/06141 being uniform, i.e. having a semiconductor or solid-state body
uniform pitch across the array 2224/0618 being disposed on at least two different sides of the body, e.g. dual array
non uniform pitch across the array 2224/06181 On opposite sides of the body
2224/06143 with a staggered arrangement, e.g. 2224/06182 with specially adapted redistribution layers [RDL]
2224/06144 covering only portions of the surface to be connected 2224/06183 On contiguous sides of the body

2224/06187 with specially adapted redistribution layers [RDL]	2224/08151 the bonding area connecting between a semiconductor or solid-state
2224/06188 being disposed in a single wiring level, i.e. planar layout	body and an item not being a semiconductor or solid-state body,
2224/06189 being disposed in different wiring levels, i.e. resurf layout	e.g. chip-to-substrate, chip-to-passive
2224/065 Material	arranged next to each other, e.g. on
2224/06505 Bonding areas having different materials	a common substrate
2224/0651 Function	2224/08155 the item being non-metallic, e.g.
2224/06515 Bonding areas having different	being an insulating substrate with
functions	or without metallisation
2224/06517 including bonding areas providing primarily mechanical bonding	2224/0816 the bonding area connecting to a pin of the item
2224/06519 including bonding areas providing primarily thermal dissipation	2224/08163 the bonding area connecting to a potential ring of the item
2224/07 Structure, shape, material or disposition of the	2224/08165 the bonding area connecting to
bonding areas after the connecting process	a via metallisation of the item
2224/08 of an individual bonding area	2224/08167 the bonding area connecting
2224/0801 Structure	to a bonding area disposed in
	a recess of the surface of the
2224/0805 Shape	item
2224/08052 in top view	2224/08168 the bonding area connecting to
2224/08053 being non uniform along the bonding area	a bonding area protruding from the surface of the item
2224/08054 being rectangular	2224/08175 the item being metallic
2224/08055 being square	2224/08183 the bonding area connecting to
2224/08056 being circular or elliptic	a potential ring of the item
2224/08057 in side view	2224/08187 the bonding area connecting
2224/08058 being non uniform along the bonding area	to a bonding area disposed in a recess of the surface of the
2224/08059 comprising protrusions or indentations	item 2224/08188 the bonding area connecting to
2224/0807 of bonding interfaces, e.g. interlocking features	a bonding area protruding from the surface of the item
2224/081 Disposition	2224/08195 the item being a discrete passive
2224/08111 the bonding area being disposed in a recess of the surface of the body	component 2224/08197 the bonding area connecting
2224/08112 the bonding area being at least partially embedded in the surface of the body	to a bonding area disposed in a recess of the surface of the
2224/08113 the whole bonding area protruding from	item
the surface of the body	2224/08198 the bonding area connecting to
2224/0812 the bonding area connecting directly to another bonding area, i.e. connectorless	a bonding area protruding from the surface of the item
bonding, e.g. bumpless bonding	2224/08221 the body and the item being stacked
2224/08121 the connected bonding areas being not	2224/08225 the item being non-metallic,
aligned with respect to each other 2224/08123 the bonding area connecting directly	e.g. insulating substrate with or without metallisation
to at least two bonding areas	2224/0823 the bonding area connecting to
2224/08135 the bonding area connecting between different semiconductor or solid-state	a pin of the item 2224/08233 the bonding area connecting to
bodies, i.e. chip-to-chip	a potential ring of the item
2224/08137 the bodies being arranged next to each other, e.g. on a common	2224/08235 the bonding area connecting to a via metallisation of the item
substrate	2224/08237 the bonding area connecting
2224/08145 the bodies being stacked	to a bonding area disposed in
2224/08146 the bonding area connecting to a	a recess of the surface of the
via connection in the body	item
2224/08147 the bonding area connecting to a	2224/08238 the bonding area connecting to
bonding area disposed in a recess of the surface of the body	a bonding area protruding from the surface of the item
2224/08148 the bonding area connecting to a	2224/08245 the item being metallic
bonding area protruding from the	2224/08253 the bonding area connecting to
surface of the body	a potential ring of the item
·	-

2224/08257 the bonding area connecting	2224/09152 being non uniform, i.e. having a
to a bonding area disposed in a recess of the surface of the	non uniform pitch across the array 2224/09153 with a staggered arrangement, e.g.
item 2224/08258 the bonding area connecting to	depopulated array 2224/09154 covering only portions of the
a bonding area protruding from the surface of the item	surface to be connected
2224/08265 the item being a discrete passive	2224/09155 Covering only the peripheral area of the surface to be connected,
component	i.e. peripheral arrangements
2224/08267 the bonding area connecting	2224/09156 Covering only the central area of
to a bonding area disposed in	the surface to be connected, i.e.
a recess of the surface of the item	central arrangements 2224/0916 Random array, i.e. array with no
2224/08268 the bonding area connecting to	symmetry
a bonding area protruding from	2224/09163 with a staggered arrangement
the surface of the item	2224/09164 covering only portions of the
2224/085 Material	surface to be connected
2224/08501 at the bonding interface	2224/09165 Covering only the peripheral area
2224/08502 comprising an eutectic alloy	of the surface to be connected,
2224/08503 comprising an intermetallic	i.e. peripheral arrangements
compound	2224/09177 Combinations of arrays with different
2224/08505 outside the bonding interface	layouts
2224/08506 comprising an eutectic alloy	2224/09179 Corner adaptations, i.e. disposition of the bonding areas at the corners of the
2224/09 of a plurality of bonding areas 2224/0901 Structure	semiconductor or solid-state body
2224/0903 Bonding areas having different sizes,	2224/0918 being disposed on at least two different
e.g. different diameters, heights or	sides of the body, e.g. dual array
widths	2224/09181 On opposite sides of the body
2224/0905 Shape	2224/09183 On contiguous sides of the body
2224/09051 Bonding areas having different shapes	2224/095 Material
2224/09055 of their bonding interfaces	2224/09505 Bonding areas having different materials
2224/091 Disposition	2224/0951 Function
2224/09102 the bonding areas being at different	2224/09515 Bonding areas having different
heights	functions
2224/09103 on the semiconductor or solid-state body	2224/09517 including bonding areas providing primarily mechanical support
2224/09104 outside the semiconductor or solid- state body	2224/09519 including bonding areas providing primarily thermal dissipation
2224/0912 Layout	2224/10 Bump connectors; Manufacturing methods related
2224/0913 Square or rectangular array	thereto
2224/09132 being non uniform, i.e. having a	2224/1012 Auxiliary members for bump connectors, e.g.
non uniform pitch across the array	spacers
2224/09133 with a staggered arrangement, e.g.	2224/10122 being formed on the semiconductor or solid-
depopulated array	state body to be connected
2224/09134 covering only portions of the	2224/10125 Reinforcing structures
surface to be connected	2224/10126 Bump collar
2224/09135 Covering only the peripheral area	2224/10135 Alignment aids
of the surface to be connected,	2224/10145 Flow barriers
i.e. peripheral arrangements 2224/0914 Circular array, i.e. array with radial	2224/10152 being formed on an item to be connected not being a semiconductor or solid-state body
symmetry	2224/10155 Reinforcing structures
2224/09142 being non uniform, i.e. having a	2224/10156 Bump collar
non uniform pitch across the array	2224/10165 Alignment aids
2224/09143 with a staggered arrangement	2224/10175 Flow barriers
2224/09144 covering only portions of the	2224/10 Manufacturing methods
surface to be connected	2224/11001 Involving a temporary auxiliary member not
2224/09145 Covering only the peripheral area of the surface to be connected,	forming part of the manufacturing apparatus, e.g. removable or sacrificial coating, film or
i.e. peripheral arrangements	substrate
2224/0915 Mirror array, i.e. array having only a reflection symmetry, i.e. bilateral	2224/11002 for supporting the semiconductor or solid- state body
symmetry heing uniform, i.e. having a	2224/11003 for holding or transferring the bump
2224/09151 being uniform, i.e. having a uniform pitch across the array	preform

2224/11005 for aligning the bump connector, e.g.	2224/115 by chemical or physical modification of a
marks, spacers	pre-existing or pre-deposited material
2224/11009 for protecting parts during manufacture	2224/11502 Pre-existing or pre-deposited material
2224/11011 Involving a permanent auxiliary member, i.e.	2224/11505 Sintering
a member which is left at least partly in the	2224/1151 Anodisation
finished device, e.g. coating, dummy feature	2224/11515 Curing and solidification, e.g. of a
2224/11013 for holding or confining the bump	photosensitive bump material
connector, e.g. solder flow barrier	2224/1152 Self-assembly, e.g. self-agglomeration of
2224/11015 for aligning the bump connector, e.g.	the bump material in a fluid
marks, spacers	2224/11522 Auxiliary means therefor, e.g. for self-
2224/11019 for protecting parts during the process	assembly activation
2224/111 Manufacture and pre-treatment of the bump connector preform	2224/11524 with special adaptation of the surface
2224/1111 Shaping	or of an auxiliary substrate, e.g. surface shape specially adapted for the self-
2224/1112 Applying permanent coating	assembly process
2224/113 by local deposition of the material of the	2224/11526 involving the material of the bonding
bump connector	area, e.g. bonding pad or under bump
2224/1131 in liquid form	metallisation [UBM]
2224/11312 Continuous flow, e.g. using a	2224/1155 Selective modification
microsyringe, a pump, a nozzle or	2224/11552 using a laser or a focussed ion beam
extrusion	[FIB]
2224/11318 by dispensing droplets	2224/11554 Stereolithography, i.e. solidification
2224/1132 Screen printing, i.e. using a stencil	of a pattern defined by a laser trace in
2224/1133 in solid form	a photosensitive resin
2224/11332 using a powder	2224/116 by patterning a pre-deposited material
2224/11334 using preformed bumps	2224/11602 Mechanical treatment, e.g. polishing,
2224/1134 Stud bumping, i.e. using a wire-bonding	grinding
apparatus	2224/1161 Physical or chemical etching
2224/114 by blanket deposition of the material of the	2224/11612 by physical means only
bump connector	2224/11614 by chemical means only
2224/1141 in liquid form	2224/11616 Chemical mechanical polishing [CMP]
2224/11416 Spin coating	2224/11618 with selective exposure, development
2224/11418 Spray coating	and removal of a photosensitive bump
2224/1142 Curtain coating	material, e.g. of a photosensitive
2224/11422 by dipping, e.g. in a solder bath	conductive resin
2224/11424 Immersion coating, e.g. in a solder bath	2224/1162 using masks
2224/11426 Chemical solution deposition [CSD], i.e.	2224/11622 Photolithography
using a liquid precursor	2224/1163 using a laser or a focused ion beam [FIB]
2224/11428 Wave coating	2224/11632 Ablation by means of a laser or focused
2224/1143 in solid form	ion beam [FIB]
2224/11436 Lamination of a preform, e.g. foil, sheet	2224/117 involving monitoring, e.g. feedback loop
or layer	2224/118 Post-treatment of the bump connector
2224/11438 the preform being at least partly pre-	2224/1181 Cleaning, e.g. oxide removal step,
patterned	desmearing Applying promonent section and in city
2224/1144 by transfer printing	2224/1182 Applying permanent coating, e.g. in-situ coating
2224/11442 using a powder	2224/11821 Spray coating
2224/11444 in gaseous form	2224/11822 by dipping, e.g. in a solder bath
2224/1145 Physical vapour deposition [PVD], e.g.	2224/11823 Immersion coating, e.g. in a solder bath
evaporation, or sputtering	2224/11824 Chemical solution deposition [CSD], i.e.
2224/11452 Chemical vapour deposition [CVD], e.g.	using a liquid precursor
laser CVD	2224/11825 Plating, e.g. electroplating, electroless
2224/1146 Plating	plating
2224/11462 Electroplating	2224/11826 Physical vapour deposition [PVD], e.g.
2224/11464 Electroless plating	evaporation, or sputtering
2224/11466 Conformal deposition, i.e. blanket	2224/11827 Chemical vapour deposition [CVD], e.g.
deposition of a conformal layer on a	laser CVD
patterned surface	2224/1183 Reworking, e.g. shaping
2224/1147 using a lift-off mask	2224/11831 involving a chemical process, e.g.
2224/11472 Profile of the lift-off mask	etching the bump connector
2224/11474 Multilayer masks	2224/1184 involving a mechanical process, e.g.
2224/1148 Permanent masks, i.e. masks left in the	planarising the bump connector
finished device, e.g. passivation layers	2224/11845 Chemical mechanical polishing [CMP]

2224/11848 Thermal treatments, e.g. annealing, controlled cooling	2224/13023 the whole bump connector protruding from the surface
2224/11849 Reflowing	2224/13024 the bump connector being disposed
2224/119 Methods of manufacturing bump connectors	on a redistribution layer on the
involving a specific sequence of method	semiconductor or solid-state body
steps	2224/13025 the bump connector being disposed on
2224/11901 with repetition of the same manufacturing step	a via connection of the semiconductor or solid-state body
2224/11902 Multiple masking steps	2224/13026 relative to the bonding area, e.g. bond
2224/11903 using different masks	pad, of the semiconductor or solid-
2224/11906 with modification of the same mask	state body
2224/1191 Forming a passivation layer after forming the bump connector	2224/13027 the bump connector being offset with respect to the bonding area, e.g. bond pad
2224/11912 the bump being used as a mask for	2224/13028 the bump connector being disposed
patterning other parts [2224/11914] the under bump metallisation [UBM]	on at least two separate bonding
being used as a mask for patterning other	areas, e.g. bond pads
parts	2224/13075 Plural core members
2224/11916 a passivation layer being used as a mask	2224/13076 being mutually engaged together, e.g.
for patterning other parts	through inserts
2224/12 Structure, shape, material or disposition of	2224/13078 being disposed next to each other, e.g.
the bump connectors prior to the connecting	side-to-side arrangements
process	2224/1308 being stacked
2224/12105 Bump connectors formed on an	2224/13082 Two-layer arrangements 2224/13083 Three-layer arrangements
encapsulation of the semiconductor or	•
solid-state body, e.g. bumps on chip-scale packages	2224/13084 Four-layer arrangements 2224/13099 Material
2224/13 of an individual bump connector	2224/131 with a principal constituent of
2224/13001 Core members of the bump connector	the material being a metal or a
2224/13005 Structure	metalloid, e.g. boron [B], silicon
2224/13006 Bump connector larger than the	[Si], germanium [Ge], arsenic [As],
underlying bonding area, e.g. than the under bump metallisation [UBM]	antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/13007 Bump connector smaller than the	2224/13101 the principal constituent melting at
underlying bonding area, e.g. than the	a temperature of less than 400°C
under bump metallisation [UBM]	2224/13105 Gallium [Ga] as principal
2224/13008 Bump connector integrally formed	constituent 2224/12100 Indian Indian Constituent
with a redistribution layer on the semiconductor or solid-state body	2224/13109 Indium [In] as principal constituent
2224/13009 Bump connector integrally formed	2224/13111 Tin [Sn] as principal constituent
with a via connection of the	2224/13113 Bismuth [Bi] as principal
semiconductor or solid-state body	constituent
2224/1301 Shape	2224/13114 Thallium [Tl] as principal
2224/13011 comprising apertures or cavities, e.g.	constituent
hollow bump	2224/13116 Lead [Pb] as principal constituent
2224/13012 in top view	2224/13117 the principal constituent melting
2224/13013 being rectangular or square	at a temperature of greater than or
2224/13014 being circular or elliptic	equal to 400°C and less than 950°C
2224/13015 comprising protrusions or	2224/13118 Zinc [Zn] as principal constituent 2224/1312 Antimony [Sb] as principal
indentations	constituent
2224/13016 in side view 2224/13017 being non uniform along the bump	2224/13123 Magnesium [Mg] as principal
connector	constituent
2224/13018 comprising protrusions or indentations	2224/13124 Aluminium [Al] as principal constituent
2224/13019 at the bonding interface of the	2224/13138 the principal constituent melting
bump connector, i.e. on the	at a temperature of greater than
surface of the bump connector	or equal to 950°C and less than
2224/1302 Disposition	1550°C
2224/13021 the bump connector being disposed in a recess of the surface	2224/13139 Silver [Ag] as principal constituent
2224/13022 the bump connector being at least partially embedded in the surface	2224/13144 Gold [Au] as principal constituent

2224/13147 Copper [Cu] as principal constituent	2224/13195 with a principal constituent of the material being a gas
2224/13149 Manganese [Mn] as principal constituent	not provided for in groups <u>H01L 2224/131</u> - <u>H01L 2224/13191</u>
2224/13155 Nickel [Ni] as principal constituent	2224/13198 with a principal constituent of the material being a combination of two
2224/13157 Cobalt [Co] as principal constituent	or more materials in the form of a matrix with a filler, i.e. being a hybrid
2224/1316 Iron [Fe] as principal constituent 2224/13163 the principal constituent melting	material, e.g. segmented structures, foams
at a temperature of greater than 1550°C	2224/13199 Material of the matrix 2224/132 with a principal constituent of
2224/13164 Palladium [Pd] as principal constituent	the material being a metal or a metalloid, e.g. boron [B], silicon
2224/13166 Titanium [Ti] as principal constituent	[Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium
2224/13169 Platinum [Pt] as principal constituent	[Te] and polonium [Po], and alloys thereof
2224/1317 Zirconium [Zr] as principal constituent	2224/13201 the principal constituent melting at a temperature of less than 400°C
2224/13171 Chromium [Cr] as principal constituent	2224/13205
2224/13172 Vanadium [V] as principal constituent	2224/13209 Indium [In] as principal constituent
2224/13173 Rhodium [Rh] as principal constituent	2224/13211
2224/13176 Ruthenium [Ru] as principal constituent	2224/13213 Bismuth [Bi] as principal constituent
2224/13178 Iridium [Ir] as principal constituent	2224/13214 Thallium [Tl] as principal constituent
2224/13179 Niobium [Nb] as principal constituent	2224/13216 Lead [Pb] as principal constituent
2224/1318 Molybdenum [Mo] as principal constituent	2224/13217 the principal constituent melting at a temperature of
2224/13181 Tantalum [Ta] as principal constituent	greater than or equal to 400°C and less than 950°C
2224/13183 Rhenium [Re] as principal constituent	2224/13218 Zinc [Zn] as principal constituent
2224/13184 Tungsten [W] as principal constituent	2224/1322 Antimony [Sb] as principal constituent
2224/13186 with a principal constituent of the material being a non metallic, non	2224/13223 Magnesium [Mg] as principal constituent
metalloid inorganic material 2224/13187 Ceramics, e.g. crystalline carbides,	2224/13224 Aluminium [Al] as principal constituent
nitrides or oxides 2224/13188 Glasses, e.g. amorphous oxides,	2224/13238 the principal constituent melting at a temperature of
nitrides or fluorides 2224/1319 with a principal constituent of	greater than or equal to 950°C and less than 1550°C
the material being a polymer, e.g. polyester, phenolic based polymer,	2224/13239 Silver [Ag] as principal constituent
epoxy 2224/13191 The principal constituent being an	2224/13244 Gold [Au] as principal constituent
elastomer, e.g. silicones, isoprene, neoprene	2224/13247 Copper [Cu] as principal constituent
2224/13193 with a principal constituent of the material being a solid	2224/13249 Manganese [Mn] as principal constituent
not provided for in groups H01L 2224/131 - H01L 2224/13191,	2224/13255 Nickel [Ni] as principal constituent
e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/13257 Cobalt [Co] as principal constituent
2224/13194 with a principal constituent of the material being a liquid not provided for in groups	2224/1326 Iron [Fe] as principal constituent
H01L 2224/131 - H01L 2224/13191	

2224/13263 the principal constituent melting at a temperature of greater than 1550°C	2224/133 with a principal constituent of the material being a metal or a metalloid, e.g. boron [B],
2224/13264 Palladium [Pd] as principal constituent	silicon [Si], germanium [Ge], arsenic [As], antimony [Sb],
2224/13266 Titanium [Ti] as principal constituent	tellurium [Te] and polonium [Po], and alloys thereof
2224/13269 Platinum [Pt] as principal constituent	2224/13301 the principal constituent melting at a temperature of
2224/1327 Zirconium [Zr] as principal constituent	less than 400°C 2224/13305
2224/13271 Chromium [Cr] as principal constituent	2224/13309 Indium [In] as principal constituent
2224/13272 Vanadium [V] as principal constituent 2224/13273 Rhodium [Rh] as principal	2224/13311 Tin [Sn] as principal constituent
constituent 2224/13276 Ruthenium [Ru] as principal	2224/13313 Bismuth [Bi] as principal constituent
constituent 2224/13278 Iridium [Ir] as principal	2224/13314 Thallium [Tl] as principal constituent
constituent 2224/13279 Niobium [Nb] as principal	2224/13316 Lead [Pb] as principal constituent
constituent 2224/1328 Molybdenum [Mo] as	2224/13317 the principal constituent melting at a temperature of greater than or equal to
principal constituent 2224/13281 Tantalum [Ta] as principal	400°C and less than 950°C 2224/13318 Zinc [Zn] as principal
constituent 2224/13283 Rhenium [Re] as principal constituent	constituent 2224/1332 Antimony [Sb] as
2224/13284 Tungsten [W] as principal constituent	principal constituent 2224/13323 Magnesium [Mg] as
2224/13286 with a principal constituent of the material being a non metallic,	principal constituent 2224/13324 Aluminium [Al] as
non metalloid inorganic material 2224/13287 Ceramics, e.g. crystalline	principal constituent 2224/13338 the principal constituent
carbides, nitrides or oxides 2224/13288 Glasses, e.g. amorphous	melting at a temperature of greater than or equal to 950°C and less than 1550°C
oxides, nitrides or fluorides 2224/1329 with a principal constituent of	2224/13339 Silver [Ag] as principal constituent
the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/13344 Gold [Au] as principal constituent
2224/13291 The principal constituent being an elastomer, e.g. silicones,	2224/13347 Copper [Cu] as principal constituent
isoprene, neoprene 2224/13293 with a principal constituent	2224/13349 Manganese [Mn] as principal constituent
of the material being a solid not provided for in groups	2224/13355 Nickel [Ni] as principal constituent
H01L 2224/132 - H01L 2224/13291, e.g. allotropes of carbon, fullerene, graphite, carbon-	2224/13357 Cobalt [Co] as principal constituent 2224/1336 Iron [Fe] as principal
nanotubes, diamond 2224/13294 with a principal constituent	2224/1336 Iron [Fe] as principal constituent 2224/13363 the principal constituent
of the material being a liquid not provided for in groups H01L 2224/132 - H01L 2224/13291	melting at a temperature of greater than 1550°C 2224/13364 Palladium [Pd] as
2224/13295 with a principal constituent of the material being a gas	principal constituent 2224/13366
not provided for in groups <u>H01L 2224/132</u> - <u>H01L 2224/13291</u>	constituent 2224/13369 Platinum [Pt] as principal
2224/13298 Fillers 2224/13299 Base material	constituent 2224/1337 Zirconium [Zr] as
	principal constituent

2224/13371 Chromium [Cr] as	2224/13401 the principal constituent
principal constituent 2224/13372 Vanadium [V] as principal constituent	
constituent 2224/13373 Rhodium [Rh] as princi	ipal 2224/13405
constituent [Ru] as	2224/13409 Indium [In] as principal constituent
principal constituent 2224/13378 Iridium [Ir] as principal	2224/13411 Tin [Sn] as principal constituent
constituent 2224/13379 Niobium [Nb] as princi	2224/13413 Bismuth [Bi] as principal
constituent 2224/1338 Molybdenum [Mo] as	2224/13414 Thallium [Tl] as principal constituent
principal constituent	2224/13416 Lead [Pb] as principal
2224/13381 Tantalum [Ta] as princi	2224/13417 the principal constituent
2224/13383 Rhenium [Re] as princi constituent	of greater than or equal to
2224/13384 Tungsten [W] as princi constituent	2224/13418 Zinc [Zn] as principal
2224/13386 with a principal constituent of the material being a non	constituent 2224/1342 Antimony [Sb] as
metallic, non metalloid	principal constituent
inorganic material 2224/13387 Ceramics, e.g. crystalline	2224/13423 Magnesium [Mg] as principal constituent
carbides, nitrides or oxide	es 2224/13424 Aluminium [Al] as
2224/13388 Glasses, e.g. amorphous oxides, nitrides or fluorid-	principal constituent es 2224/13438 the principal constituent
2224/1339 with a principal constituent	
the material being a polyme e.g. polyester, phenolic base	950°C and less than 1550°C
polymer, epoxy 2224/13391 The principal constituent	2224/13439 Silver [Ag] as principal constituent
being an elastomer, e.g. silicones, isoprene, neopr	2224/13444 Gold [Au] as principal
2224/13393 with a principal constituent of the material being a solid	2224/13447 Copper [Cu] as principal
not provided for in groups H01L 2224/133 - H01L 222	2224/13449 Manganese [Mn] as
e.g. allotropes of carbon,	4/13391, principal constituent 2224/13455 Nickel [Ni] as principal
fullerene, graphite, carbon- nanotubes, diamond	constituent 2224/13457 Cobalt [Co] as principal
2224/13394 with a principal constituent	constituent
of the material being a liquion not provided for in groups	constituent
H01L 2224/133 - H01L 222 2224/13395 with a principal constituent	2224/13403 the principal constituent
of the material being a gas	melting at a temperature of greater than 1550°C
not provided for in groups <u>H01L 2224/133</u> - <u>H01L 222</u>	2224/13464 Palladium [Pd] as principal constituent
2224/13398 with a principal constituent of the material being a	2224/13466 Titanium [Ti] as principal
combination of two or more	constituent 2224/13469 Platinum [Pt] as principal
materials in the form of a matrix with a filler, i.e.	constituent
being a hybrid material, e.g. segmented structures, foams	
2224/13399 Coating material	2224/13471
2224/134 with a principal constituent of the material being a meta	2224/13472 Vanadium [V] as principal
or a metalloid, e.g. boron [B	constituent
silicon [Si], germanium [Ge arsenic [As], antimony [Sb]	constituent
tellurium [Te] and polonium [Po], and alloys thereof	

2224/13478 Iridium [Ir] as principal	2224/13563 Only on parts of the surface of the
constituent	core, i.e. partial coating
2224/13479 Niobium [Nb] as principal constituent	2224/13564 Only on the bonding interface of the bump connector
2224/1348 Molybdenum [Mo] as principal constituent	2224/13565 Only outside the bonding interface of the bump connector
2224/13481 Tantalum [Ta] as principal constituent	2224/13566 Both on and outside the bonding interface of the bump connector
2224/13483 Rhenium [Re] as principal	2224/1357 Single coating layer
constituent	2224/13575 Plural coating layers
2224/13484 Tungsten [W] as principal constituent	2224/13576 being mutually engaged together, e.g. through inserts
2224/13486 with a principal constituent of the material being a non	2224/13578 being disposed next to each other, e.g. side-to-side arrangements
metallic, non metalloid	2224/1358 being stacked
inorganic material	2224/13582 Two-layer coating
2224/13487 Ceramics, e.g. crystalline	2224/13583 Three-layer coating
carbides, nitrides or oxides	2224/13584 Four-layer coating
2224/13488 Glasses, e.g. amorphous	2224/13599 Material
oxides, nitrides or fluorides	2224/136 with a principal constituent of
2224/1349 with a principal constituent of	the material being a metal or a
the material being a polymer,	metalloid, e.g. boron [B], silicon
e.g. polyester, phenolic based	[Si], germanium [Ge], arsenic [As],
polymer, epoxy	antimony [Sb], tellurium [Te] and
2224/13491 The principal constituent being an elastomer, e.g.	polonium [Po], and alloys thereof
silicones, isoprene, neoprene	2224/13601 the principal constituent melting at
2224/13493 with a principal constituent	a temperature of less than 400°C
of the material being a solid not provided for in groups	2224/13605 Gallium [Ga] as principal constituent
H01L 2224/134 - H01L 2224/13491	2224/13609 Indium [In] as principal
e.g. allotropes of carbon,	Constituent
fullerene, graphite, carbon-	2224/13611 Tin [Sn] as principal constituent
nanotubes, diamond 2224/13494 with a principal constituent	2224/13613 Bismuth [Bi] as principal constituent
of the material being a liquid	2224/13614 Thallium [Tl] as principal
not provided for in groups	constituent 2224/13616 Lead [Pb] as principal constituent
	2224/13617 the principal constituent melting
2224/13495 with a principal constituent	at a temperature of greater than or
of the material being a gas not provided for in groups	equal to 400°C and less than 950°C
H011 2224/134 - H011 2224/13491	2224/13618 Zinc [Zn] as principal constituent
2224/13498 with a principal constituent	2224/1362 Antimony [Sb] as principal
of the material being a	constituent
combination of two or more	2224/13623 Magnesium [Mg] as principal
materials in the form of	constituent
a matrix with a filler, i.e. being a hybrid material, e.g.	2224/13624 Aluminium [Al] as principal constituent
segmented structures, foams	2224/13638 the principal constituent melting
2224/13499 Shape or distribution of the fillers	at a temperature of greater than
2224/1354 Coating	or equal to 950°C and less than
2224/13541 Structure	1550°C
2224/1355 Shape	2224/13639 Silver [Ag] as principal
2224/13551 being non uniform	constituent
2224/13552 comprising protrusions or	2224/13644 Gold [Au] as principal constituent
indentations 2224/13553 at the bonding interface of the	2224/13647 Copper [Cu] as principal
bump connector, i.e. on the	constituent
surface of the bump connector	2224/13649 Manganese [Mn] as principal
2224/1356 Disposition	constituent
2224/13561 On the entire surface of the core, i.e.	2224/13655 Nickel [Ni] as principal
integral coating	constituent
2224/13562 On the entire exposed surface of the core	2224/13657 Cobalt [Co] as principal constituent
COLO	2224/1366 Iron [Fe] as principal constituent

2224/13663	• the principal constituent melting	2224/13699	
2224/13664	at a temperature of greater than 1550°C Palladium [Pd] as principal	2224/137	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon
2224/13666	constituent Titanium [Ti] as principal constituent		[Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and
2224/13669	Platinum [Pt] as principal	2224/13701	alloys thereof
2224/1367	constituent Zirconium [Zr] as principal constituent	2224/15/01	melting at a temperature of less than 400°C
2224/13671	Chromium [Cr] as principal constituent	2224/13705	constituent
2224/13672	Vanadium [V] as principal constituent	2224/13709	Indium [In] as principal constituent
2224/13673	Rhodium [Rh] as principal constituent	2224/13711	Tin [Sn] as principal constituent
2224/13676	Ruthenium [Ru] as principal constituent	2224/13713	Bismuth [Bi] as principal constituent
2224/13678	Iridium [Ir] as principal constituent	2224/13714	Thallium [Tl] as principal constituent
2224/13679	Niobium [Nb] as principal constituent	2224/13716	Lead [Pb] as principal constituent
2224/1368		2224/13717	melting at a temperature of
2224/13681	Tantalum [Ta] as principal constituent		greater than or equal to 400°C and less than 950°C
2224/13683	Rhenium [Re] as principal constituent	2224/13718	constituent
2224/13684	Tungsten [W] as principal constituent	2224/1372	Antimony [Sb] as principal constituent
2224/13686	with a principal constituent of the material being a non metallic, non	2224/13723	principal constituent
2224/13687	metalloid inorganic material Ceramics, e.g. crystalline carbides,		Aluminium [Al] as principal constituent
	nitrides or oxides Glasses, e.g. amorphous oxides,	2224/13738	melting at a temperature of
	nitrides or fluorides with a principal constituent of		greater than or equal to 950°C and less than 1550°C
	the material being a polymer, e.g. polyester, phenolic based polymer,	2224/13739	constituent
2224/13691	epoxy The principal constituent being an	2224/13744	Gold [Au] as principal constituent
	elastomer, e.g. silicones, isoprene, neoprene	2224/13747	Copper [Cu] as principal constituent
2224/13693	with a principal constituent of the material being a solid	2224/13749	principal constituent
	not provided for in groups <u>H01L 2224/136</u> - <u>H01L 2224/13691</u> ,	2224/13755	constituent
	e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/13757	Cobalt [Co] as principal constituent
2224/13694	of the material being a liquid	2224/1376	Iron [Fe] as principal constituent
	not provided for in groups <u>H01L 2224/136</u> - <u>H01L 2224/13691</u>	2224/13763	• the principal constituent melting at a temperature of
2224/13695	with a principal constituent of the material being a gas	2224/13764	greater than 1550°C Palladium [Pd] as principal
	not provided for in groups H01L 2224/136 - H01L 2224/13691	2224/13766	constituent Titanium [Ti] as principal
2224/13698	material being a combination of two	2224/13769	
	or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures,	2224/1377	. , 1
	foams		constituent

2224/13771 Chromium [Cr] as principal constituent	2224/13811 Tin [Sn] as principal constituent
2224/13772 Vanadium [V] as principal constituent	2224/13813 Bismuth [Bi] as principal constituent
2224/13773 Rhodium [Rh] as principal constituent	2224/13814 Thallium [Tl] as principal constituent
2224/13776 Ruthenium [Ru] as principal constituent	2224/13816 Lead [Pb] as principal constituent
2224/13778 Iridium [Ir] as principal constituent	2224/13817 the principal constituent melting at a temperature
2224/13779 Niobium [Nb] as principal constituent	of greater than or equal to 400°C and less than 950°C
2224/1378 Molybdenum [Mo] as principal constituent	2224/13818 Zinc [Zn] as principal constituent
2224/13781 Tantalum [Ta] as principal constituent	2224/1382 Antimony [Sb] as principal constituent
2224/13783 Rhenium [Re] as principal constituent	2224/13823 Magnesium [Mg] as principal constituent
2224/13784 Tungsten [W] as principal constituent	2224/13824 Aluminium [Al] as principal constituent
2224/13786 with a principal constituent of the material being a non metallic,	2224/13838 the principal constituent melting at a temperature
non metalloid inorganic material 2224/13787 Ceramics, e.g. crystalline	of greater than or equal to 950°C and less than 1550°C
carbides, nitrides or oxides 2224/13788 Glasses, e.g. amorphous	2224/13839 Silver [Ag] as principal constituent 2224/13844 Gold [Au] as principal
oxides, nitrides or fluorides 2224/1379 with a principal constituent of the material being a polymer,	2224/13844 Gold [Au] as principal constituent 2224/13847 Copper [Cu] as principal
e.g. polyester, phenolic based polymer, epoxy	constituent 2224/13849 Manganese [Mn] as
2224/13791 The principal constituent being an elastomer, e.g. silicones,	principal constituent 2224/13855 Nickel [Ni] as principal
isoprene, neoprene 2224/13793 with a principal constituent	constituent 2224/13857 Cobalt [Co] as principal
of the material being a solid not provided for in groups	constituent 2224/1386 Iron [Fe] as principal
H01L 2224/137 - H01L 2224/13791, e.g. allotropes of carbon,	constituent 2224/13863 the principal constituent
fullerene, graphite, carbon- nanotubes, diamond	melting at a temperature of greater than 1550°C
2224/13794 with a principal constituent of the material being a liquid	2224/13864 Palladium [Pd] as principal constituent
not provided for in groups <u>H01L 2224/137</u> - <u>H01L 2224/13791</u>	2224/13866 Titanium [Ti] as principal constituent
2224/13795 with a principal constituent of the material being a gas	2224/13869 Platinum [Pt] as principal constituent
not provided for in groups H01L 2224/137 - H01L 2224/13791	2224/1387 Zirconium [Zr] as principal constituent
2224/13798 Fillers 2224/13799 Base material	2224/13871 Chromium [Cr] as principal constituent
2224/138 with a principal constituent of the material being a metal	2224/13872 Vanadium [V] as principal constituent
or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge],	2224/13873 Rhodium [Rh] as principal constituent
arsenic [As], antimony [Sb], tellurium [Te] and polonium	2224/13876 Ruthenium [Ru] as principal constituent
[Po], and alloys thereof 2224/13801 the principal constituent	2224/13878 Iridium [Ir] as principal constituent
melting at a temperature of less than 400°C	2224/13879 Niobium [Nb] as principal constituent
2224/13805 Gallium [Ga] as principal constituent	2224/1388 Molybdenum [Mo] as principal constituent
2224/13809 Indium [In] as principal constituent	p.mo-pai sonoment

2224/13881 Tantalum [Ta] as principal constituent	2224/13916 Lead [Pb] as principal constituent
2224/13883 Rhenium [Re] as principal constituent	2224/13917 the principal constituent melting at a temperature
2224/13884 Tungsten [W] as principal constituent	of greater than or equal to 400°C and less than 950°C
2224/13886 with a principal constituent of the material being a non	2224/13918 Zinc [Zn] as principal constituent
metallic, non metalloid inorganic material	2224/1392 Antimony [Sb] as principal constituent
2224/13887 Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/13923 Magnesium [Mg] as principal constituent
2224/13888 Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/13924 Aluminium [Al] as principal constituent
2224/1389 with a principal constituent of the material being a polymer, e.g. polyester, phenolic based	2224/13938 the principal constituent melting at a temperature of greater than or equal to
polymer, epoxy	950°C and less than 1550°C 2224/13939 Silver [Ag] as principal
2224/13891 The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	constituent 2224/13944 Gold [Au] as principal
2224/13893 with a principal constituent	constituent
of the material being a solid not provided for in groups	2224/13947 Copper [Cu] as principal constituent
e.g. allotropes of carbon,	2224/13949 Manganese [Mn] as principal constituent
fullerene, graphite, carbon- nanotubes, diamond	2224/13955 Nickel [Ni] as principal constituent
2224/13894 with a principal constituent of the material being a liquid	2224/13957 Cobalt [Co] as principal constituent
not provided for in groups <u>H01L 2224/138</u> - <u>H01L 2224/13891</u>	2224/1396 Iron [Fe] as principal constituent
2224/13895 with a principal constituent of the material being a gas not provided for in groups	2224/13963 the principal constituent melting at a temperature of greater than 1550°C
<u>H01L 2224/138 - H01L 2224/13891</u> 2224/13898 with a principal constituent	2224/13964 Palladium [Pd] as principal constituent
of the material being a combination of two or more	2224/13966 Titanium [Ti] as principal constituent
materials in the form of a matrix with a filler, i.e.	2224/13969 Platinum [Pt] as principal constituent
being a hybrid material, e.g. segmented structures, foams	2224/1397 Zirconium [Zr] as
2224/13899 Coating material	principal constituent 2224/13971 Chromium [Cr] as
2224/139 with a principal constituent of the material being a metal	principal constituent
or a metalloid, e.g. boron [B],	2224/13972 Vanadium [V] as principal constituent
silicon [Si], germanium [Ge], arsenic [As], antimony [Sb],	2224/13973 Rhodium [Rh] as principal constituent
tellurium [Te] and polonium [Po], and alloys thereof	2224/13976 Ruthenium [Ru] as
2224/13901 the principal constituent melting at a temperature of	principal constituent 2224/13978 Iridium [Ir] as principal
less than 400°C	constituent 2224/13979 Niobium [Nb] as principal
constituent 2224/13909 Indium [In] as principal	constituent 2224/1398 Molybdenum [Mo] as
constituent 2224/13911 Tin [Sn] as principal	principal constituent 2224/13981 Tantalum [Ta] as principal
constituent 2224/13913 Bismuth [Bi] as principal	constituent 2224/13983 Rhenium [Re] as principal
constituent [2224/13914] Thallium [TI] as principal	constituent 2224/13984 Tungsten [W] as principal
constituent	constituent

2224/13986 with a principal constituent of the material being a non metallic, non metalloid	2224/14136 Covering only the central area of the surface to be connected, i.e. central arrangements
inorganic material 2224/13987 Ceramics, e.g. crystalline	2224/1414 Circular array, i.e. array with radial symmetry
carbides, nitrides or oxides	2224/14141 being uniform, i.e. having a
2224/13988 Glasses, e.g. amorphous	uniform pitch across the array
oxides, nitrides or fluorides 2224/1399 with a principal constituent of	2224/14142 being non uniform, i.e. having a non uniform pitch across the array
the material being a polymer, e.g. polyester, phenolic based	2224/14143 with a staggered arrangement, e.g. depopulated array
polymer, epoxy 2224/13991 The principal constituent	2224/14144 covering only portions of the surface to be connected
being an elastomer, e.g. silicones, isoprene, neoprene	2224/14145 Covering only the peripheral area of the surface to be connected,
2224/13993 with a principal constituent	i.e. peripheral arrangements
of the material being a solid not provided for in groups H01L 2224/139 - H01L 2224/13991	2224/14146 Covering only the central area of the surface to be connected, i.e. central arrangements
e.g. allotropes of carbon,	2224/1415 Mirror array, i.e. array having only
fullerene, graphite, carbon- nanotubes, diamond	a reflection symmetry, i.e. bilateral symmetry
2224/13994 with a principal constituent	2224/14151 being uniform, i.e. having a
of the material being a liquid not provided for in groups	uniform pitch across the array
H01L 2224/139 - H01L 2224/13991 2224/13995 with a principal constituent	non uniform pitch across the array
of the material being a gas	2224/14153 with a staggered arrangement, e.g. depopulated array
not provided for in groups <u>H01L 2224/139</u> - <u>H01L 2224/13991</u>	2224/14154 covering only portions of the
2224/13998 with a principal constituent	2224/14155 Covering only the peripheral area
of the material being a combination of two or more	of the surface to be connected,
materials in the form of	i.e. peripheral arrangements 2224/14156 Covering only the central area of
a matrix with a filler, i.e. being a hybrid material, e.g.	the surface to be connected, i.e. central arrangements
segmented structures, foams	2224/1416 Random layout, i.e. layout with no
2224/13999 Shape or distribution of the fillers 2224/14 of a plurality of bump connectors	symmetry
2224/1401 Structure	2224/14163 with a staggered arrangement
2224/1403 Bump connectors having different sizes,	2224/14164 covering only portions of the surface to be connected
e.g. different diameters, heights or widths	2224/14165 Covering only the peripheral area
2224/1405 Shape	of the surface to be connected,
2224/14051 Bump connectors having different	i.e. peripheral arrangements 2224/14166 Covering only the central area of
shapes 2224/141 Disposition	the surface to be connected, i.e. central arrangements
2224/14104 relative to the bonding areas, e.g. bond pads, of the semiconductor or solid-state	2224/14177 Combinations of arrays with different
body	layouts 2224/14179 Corner adaptations, i.e. disposition of
2224/1411 the bump connectors being bonded to at least one common bonding area	the bump connectors at the corners of the semiconductor or solid-state body
2224/1412 Layout	2224/1418 being disposed on at least two different
2224/1413 Square or rectangular array 2224/14131 being uniform, i.e. having a	sides of the body, e.g. dual array
uniform pitch across the array	2224/14181 On opposite sides of the body 2224/14183 On contiguous sides of the body
2224/14132 being non uniform, i.e. having a	2224/145
non uniform pitch across the array	2224/14505 Bump connectors having different
2224/14133 with a staggered arrangement, e.g. depopulated array	materials 2224/1451 Function
2224/14134 covering only portions of the surface to be connected	2224/14515 Bump connectors having different
surface to be connected 2224/14135 Covering only the peripheral area	functions
of the surface to be connected, i.e. peripheral arrangements	2224/14517 including bump connectors providing primarily mechanical bonding

2224/14519 including bump connectors providing primarily thermal dissipation	2224/16151 the bump connector connecting between a semiconductor or solid-state body and an item not being a semiconductor or
2224/15 • • • Structure, shape, material or disposition of the bump connectors after the connecting process	solid-state body, e.g. chip-to-substrate,
2224/16 of an individual bump connector	chip-to-passive
2224/1601 Structure	2224/16153 the body and the item being arranged
2224/16012 relative to the bonding area, e.g. bond pad	next to each other, e.g. on a common substrate
2224/16013 the bump connector being larger than the bonding area, e.g. bond pad	2224/16155 the item being non-metallic, e.g. being an insulating substrate with or without metallisation
2224/16014 the bump connector being smaller than the bonding area, e.g. bond pad	2224/16157 the bump connector connecting
2224/1605 Shape	to a bond pad of the item
2224/16052 in top view	2224/1616 the bump connector connecting
2224/16054 being rectangular or square	to a pin of the item
2224/16055 being circular or elliptic	2224/16163 the bump connector connecting
2224/16056 comprising protrusions or	to a potential ring of the item
indentations 2224/16057 in side view	2224/16165 the bump connector connecting to a via metallisation of the item
	2224/16167 the bump connector connecting
2224/16058 being non uniform along the bump connector	to a bonding area disposed in a recess of the surface of the item
2224/16059 comprising protrusions or	2224/16168 the bump connector connecting
indentations 2224/1607 of bonding interfaces, e.g. interlocking	to a bonding area protruding from the surface of the item
features	
2224/161 Disposition	2224/16175 the item being metallic
2224/16104 relative to the bonding area, e.g. bond	2224/16183 the bump connector connecting
pad	to a potential ring of the item
2224/16105 the bump connector connecting	2224/16187 the bump connector connecting
bonding areas being not aligned with	to a bonding area disposed in a
respect to each other	recess of the surface of the item
2224/16106 the bump connector connecting one	2224/16188 the bump connector connecting
	to a bonding area protruding
bonding area to at least two respective	from the surface of the item
bonding areas	2224/16195 the item being a discrete passive
2224/16108 the bump connector not being	component
orthogonal to the surface	2224/16197 the bump connector connecting
2224/16111 the bump connector being disposed in a recess of the surface	to a bonding area disposed in a
	recess of the surface of the item
2224/16112 the bump connector being at least	2224/16198 the bump connector connecting
partially embedded in the surface	to a bonding area protruding
2224/16113 the whole bump connector protruding	from the surface of the item
from the surface	2224/16221 the body and the item being stacked
2224/1613 the bump connector connecting within	2224/16225 the item being non-metallic, e.g.
a semiconductor or solid-state body, i.e.	insulating substrate with or without
connecting two bonding areas on the same semiconductor or solid-state body	metallisation
2224/16135 the bump connector connecting between	2224/16227 the bump connector connecting
different semiconductor or solid-state	to a bond pad of the item
bodies, i.e. chip-to-chip	2224/1623 the bump connector connecting
2224/16137 the bodies being arranged next to each	to a pin of the item
other, e.g. on a common substrate	2224/16233 the bump connector connecting
2224/16141 the bodies being arranged on opposite	to a potential ring of the item
sides of a substrate, e.g. mirror	2224/16235 the bump connector connecting
arrangements	to a via metallisation of the item
2224/16145 the bodies being stacked	2224/16237 the bump connector connecting
	to a bonding area disposed in a
2224/16146 the bump connector connecting to a via connection in the	recess of the surface of the item
semiconductor or solid-state body	2224/16238 the bump connector connecting
2224/16147 the bump connector connecting to a	to a bonding area protruding
bonding area disposed in a recess of	from the surface of the item
the surface	2224/1624 the bump connector connecting
2224/16148 the bump connector connecting to	between the body and an
a bonding area protruding from the	opposite side of the item with
surface	respect to the body
	2224/16245 the item being metallic

2224/16253 the bump connector connecting	2224/17143 with a staggered arrangement
to a potential ring of the item	2224/17144 covering only portions of the
2224/16257 the bump connector connecting	surface to be connected
to a bonding area disposed in a	2224/17145 Covering only the peripheral area
recess of the surface of the item	of the surface to be connected,
2224/16258 the bump connector connecting	i.e. peripheral arrangements
to a bonding area protruding	2224/17146 Covering only the central area of
from the surface of the item 2224/1626 the bump connector connecting	the surface to be connected, i.e.
between the body and an	central arrangements 2224/1715 Mirror array, i.e. array having only
opposite side of the item with	a reflection symmetry, i.e. bilateral
respect to the body	symmetry
2224/16265 the item being a discrete passive	2224/17151 being uniform, i.e. having a
component	uniform pitch across the array
2224/16267 the bump connector connecting	2224/17152 being non uniform, i.e. having a
to a bonding area disposed in a recess of the surface of the item	non uniform pitch across the array
2224/16268 the bump connector connecting	2224/17153 with a staggered arrangement, e.g. depopulated array
to a bonding area protruding	2224/17154 covering only portions of the
from the surface of the item	surface to be connected
2224/165 Material	2224/17155 Covering only the peripheral area
2224/16501 at the bonding interface	of the surface to be connected,
2224/16502 comprising an eutectic alloy	i.e. peripheral arrangements
2224/16503 comprising an intermetallic	2224/17156 Covering only the central area of the surface to be connected, i.e.
compound 2224/16505 outside the bonding interface, e.g. in the	central arrangements
bulk of the bump connector	2224/1716 Random layout, i.e. layout with no
2224/16506 comprising an eutectic alloy	symmetry
2224/16507 comprising an intermetallic	2224/17163 with a staggered arrangement
compound	2224/17164 covering only portions of the
2224/17 of a plurality of bump connectors	surface to be connected
2224/1701 Structure	2224/17165 Covering only the peripheral area of the surface to be connected,
2224/1703 Bump connectors having different sizes, e.g. different diameters, heights or	i.e. peripheral arrangements
widths	2224/17166 Covering only the central area of
2224/1705 Shape	the surface to be connected, i.e.
2224/17051 Bump connectors having different	central arrangements
shapes	2224/17177 Combinations of arrays with different
2224/17055 of their bonding interfaces	layouts 2224/17179 Corner adaptations, i.e. disposition of
2224/171 Disposition	the bump connectors at the corners of
2224/17104 relative to the bonding areas, e.g. bond pads	the semiconductor or solid-state body
2224/17106 the bump connectors being bonded to	2224/1718 being disposed on at least two different
at least one common bonding area	sides of the body, e.g. dual array
2224/17107 the bump connectors connecting	2224/17181 On opposite sides of the body
two common bonding areas	2224/17183 On contiguous sides of the body
2224/1712 Layout	2224/175 Material 2224/17505 Bump connectors having different
2224/1713 Square or rectangular array	materials
2224/17132 being non uniform, i.e. having a non uniform pitch across the array	2224/1751 Function
2224/17133 with a staggered arrangement, e.g.	2224/17515 Bump connectors having different
depopulated array	functions
2224/17134 covering only portions of the	2224/17517 including bump connectors providing
surface to be connected	primarily mechanical support
2224/17135 Covering only the peripheral area	2224/17519 including bump connectors providing primarily thermal dissipation
of the surface to be connected, i.e. peripheral arrangements	2224/18 High density interconnect [HDI] connectors;
2224/17136 Covering only the central area of	Manufacturing methods related thereto
the surface to be connected, i.e.	2224/19 Manufacturing methods of high density
central arrangements	interconnect preforms
2224/1714 Circular array, i.e. array with radial	2224/20 Structure, shape, material or disposition of high
symmetry	density interconnect preforms 2224/21 of an individual HDI interconnect
2224/17142 being non uniform, i.e. having a non uniform pitch across the array	2224/21 of an individual HDI interconnect 2224/2101 Structure
non uniform pitch across the array	ELL TILIOI SHUCHIE

2224/2105 Shape	2224/24175 the item being metallic
2224/211 Disposition	2224/24195 the item being a discrete passive
2224/214 Connecting portions	component
2224/215 Material	2224/24221 the body and the item being stacked
2224/22 of a plurality of HDI interconnects	2224/24225 the item being non-metallic, e.g.
2224/2201 Structure	insulating substrate with or without
2224/2205 Shape	metallisation
2224/221 Disposition	2224/24226 the HDI interconnect connecting
2224/224 Connecting portions	to the same level of the item
2224/225 Material	at which the semiconductor or
2224/22505 HDI interconnects having different	solid-state body is mounted, e.g.
materials	the item being planar
2224/23 Structure, shape, material or disposition of the	2224/24227 the HDI interconnect not
high density interconnect connectors after the	connecting to the same level of the item at which the
connecting process	semiconductor or solid-state
2224/24 of an individual high density interconnect	body is mounted, e.g. the
connector	semiconductor or solid-state
2224/2401 Structure	body being mounted in a cavity
2224/24011 Deposited, e.g. MCM-D type	or on a protrusion of the item
2224/2402 Laminated, e.g. MCM-L type	2224/24245 the item being metallic
2224/2405 Shape	2224/24246 the HDI interconnect connecting
2224/24051 Conformal with the semiconductor or	to the same level of the item
solid-state device	at which the semiconductor or
2224/241 Disposition	solid-state body is mounted, e.g.
2224/24101 Connecting bonding areas at the same	the item being planar 2224/24247 the HDI interconnect not
height Connecting banding gross at different	2224/24247 the HDI interconnect not connecting to the same level
2224/24105 Connecting bonding areas at different heights	of the item at which the
2224/2413 Connecting within a semiconductor or	semiconductor or solid-state
solid-state body	body is mounted, e.g. the
2224/24135 Connecting between different	semiconductor or solid-state
semiconductor or solid-state bodies, i.e.	body being mounted in a cavity
chip-to-chip	or on a protrusion of the item
2224/24137 the bodies being arranged next to each	2224/24265 the item being a discrete passive
other, e.g. on a common substrate	component
2224/24141 the bodies being arranged on opposite	2224/244 Connecting portions
sides of a substrate, e.g. mirror	2224/245 Material
arrangements	2224/2499 Auxiliary members for HDI interconnects,
2224/24145 the bodies being stacked	e.g. spacers, alignment aids
2224/24146 the HDI interconnect connecting	2224/24991 being formed on the semiconductor or solid-state body to be connected
to the same level of the lower semiconductor or solid-state body	2224/24992 Flow barrier
at which the upper semiconductor	2224/24996 being formed on an item to be connected
or solid-state body is mounted	not being a semiconductor or solid-state
2224/24147 the HDI interconnect not	body
connecting to the same level	2224/24997 Flow barrier
of the lower semiconductor or	2224/24998 Reinforcing structures, e.g. ramp-like
solid-state body at which the	support
upper semiconductor or solid-	2224/25 of a plurality of high density interconnect
state body is mounted, e.g. the	connectors
upper semiconductor or solid-state body being mounted in a cavity	2224/2501 Structure
or on a protrusion of the lower	2224/2505 Shape
semiconductor or solid-state body	2224/251 Disposition
2224/24151 Connecting between a semiconductor or	2224/25105 Connecting at different heights
solid-state body and an item not being a	2224/2511 the connectors being bonded to at least
semiconductor or solid-state body, e.g.	one common bonding area
	2224/25111
chip-to-substrate, chip-to-passive	2224/25111 the connectors connecting two
2224/24153 the body and the item being arranged	common bonding areas
2224/24153 the body and the item being arranged next to each other, e.g. on a common	common bonding areas 2224/25112 the connectors connecting a common
2224/24153 the body and the item being arranged next to each other, e.g. on a common substrate	common bonding areas 2224/25112 the connectors connecting a common bonding area on the semiconductor or
2224/24153 the body and the item being arranged next to each other, e.g. on a common substrate 2224/24155 the item being non-metallic, e.g.	common bonding areas 2224/25112 the connectors connecting a common
2224/24153 the body and the item being arranged next to each other, e.g. on a common substrate	common bonding areas 2224/25112 the connectors connecting a common bonding area on the semiconductor or solid-state body to different bonding

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postification bonding area custide the body to a common bonding area custide the body to bonding area custide the body to 2224/27312 Layout	2224/25113 the connectors connecting different	2224/2733 in solid form
Donding area nurside the body 2224/274		
2224/25197		
2224/2517		•
2224/25174 - Stacked arrangements 2224/25175 - Parallel arrangements 2224/25177 - Combinations of a pharality of arrangements 2224/2518 - being disposed on at least two different sides of the body, e.g., fund array 2224/2518 - being disposed on at least two different sides of the body, e.g., fund array 2224/2514 - Connecting portions being stacked 2224/2515 - Material 2224/2515 - Material 2224/2516 - Lapyer connectors, g.g. plate connectors, solder or allessive layers, Manufacturing methods related therero 2224/2612 - Austriliny members for layer connectors, e.g., spaces 2224/26120 - Austriliny members for layer connectors, e.g., spaces 2224/26121 - Reinforcing structures 2224/26122 - being formed on the semiconductor or solid-state body to be connected or being a semiconductor or solid-state body being a semiconductor or solid-state body 2224/2615 - Flow barriers 2224/26165 - Alignment aids 2224/27100 - Involving a temporary auxiliny member not forming part of the manufacturing apparatus, e.g., removable or surficient state body 2224/2700 - for supporting the semiconductor or solid-state body 2224/2700 - for supporting the semiconductor or solid-state body 2224/2700 - for supporting the semiconductor or solid-state body 2224/2700 - for supporting the semiconductor or solid-state body 2224/2700 - for supporting the semiconductor or solid-state body 2224/2700 - for supporting the semiconductor or solid-state body 2224/2700 - for supporting the semiconductor or solid-state body 2224/2700 - for supporting the semiconductor or solid-state body 2224/2700 - for supporting the semiconductor or solid-state body 2224/2700 - for supporting the semiconductor or solid-state body 2224/2700 - for supporting the semiconductor or solid-state body 2224/2700 - for supporting the semiconductor or solid-state body 2224/2700 - for supporting the semiconductor or solid-state body 2224/2700 - for supporting the super-connector region marks, spaces 2224/2700 - for photoconstructing parts during manufacture 2224/2700 - for boding or co		•
2224/25178 . Parallel arrangements 2224/25177 . Combinations of a plurality of arrangements 2224/2518 . being disposed on at least two different sides of the body, e.g. dual array 2224/2514 . Connecting portions being stacked 2224/2515 . Meterial 2224/2516 . Meterial 2224/26 . Layer connectors, e.g. plate connectors, solder or adhesive layers. Manufacturing methods related thereto 2224/261 . Layer connectors, e.g. plate connectors, c.g. spaces 2224/2612 . Auxiliary members for layer connectors, c.g. spaces 2224/2612 . Seeing formed on the semiconductor or solid- state body to be connected state body to be connected 2224/26135 . Aligament aids 2224/26135 . Aligament aids 2224/26135 . Plow barriers 2224/26135 . Reinforcing structures 2224/26135 . Reinforcing structures 2224/26135 . Reinforcing structures 2224/26135 . Plow barriers 2224/26136 . Aligament aids 2224/26137 . Plow barriers 2224/27010 . Involving a temporary auxiliary member not forming part of the manufacturing appearus, e.g. removable or sacrifical costing, film or substrate 2224/27001 . Involving a temporary auxiliary member not forming part of the manufacturing appearus e.g. removable or sacrifical costing, film or substrate 2224/27001 . Involving a permanent auxiliary member, i.e. a member which is first a least partly in the perform 2224/27001 . Involving a permanent auxiliary member, i.e. a member which is first a least partly in the perform 2224/27011 . Involving a permanent auxiliary member, i.e. a member which is first a least partly in the finished device, e.g. conting, dummy (cature 2224/27012 . For bigging the layer connector, e.g. marks, spacers 2224/27013 . The fooling or or offining the layer 2224/2714 . Spaping 2224/2715 . Spaping 2224/2716 . Spaping e.g. a model or exercision of the material of the layer connector perform 2224/2711 . Shaping 2224/2731 . in liquid form 2224/2731 in liquid		
2224/2517 Combinations of a plurality of arrangements 2224/2518 being disposed on at least two different sides of the body, e.g. and array 2224/254 Connecting portions being stacked 2224/254 the connecting portions being staged 2224/2743 the connecting portions being staged 2224/2744 the connecting portions being staged 2224/2743 the connectors, e.g. plate connectors, solder or alkersive layers. Manufacturing methods related thereo 2224/2612 havilitary members for layer connector or sold-state body to be connected or being formed on the semiconductor or sold-state body to be connected or being a semiconductor or sold-state body to be connected or being a semiconductor or sold-state body to be connected or being a semiconductor or sold-state body to be connected or being a semiconductor or sold-state body to be connected or being a semiconductor or sold-state body to be connected for being a semiconductor or sold-state body to be connected for being a semiconductor or sold-state body to be connected for being a semiconductor or sold-state body to be connected for being a semiconductor or sold-state body to be connected for being a semiconductor or sold-state body to be connected for being a semiconductor or sold-state body to be connected for being a semiconductor or sold-state body to be connected for being a semiconductor or sold-state body to be connected for being as semiconductor or sold-state body to be connected for being as semiconductor or sold-state body to be connected for being as semiconductor or sold-state body to be connected for being as semiconductor or sold-state body to be connected for being as semiconductor or sold-state body to be connected for being as semiconductor or sold-state body to be connected for being as semiconductor or sold-state body to be connected for being as semiconductor or sold-state body to be connected for being as solder flow barrier for being from the semiconductor or sold-state body to be connected for being as solder flow barrier for the finished device, e.g., solde		
arrangements being disposed on at least two different sides of the body, e.g. dual array 2224/2544 2224/2541 2224/2542 2224/2543		
2224/2518 being disposed on at least two different sides of the body, e.g., challenger of the horizons of the body e.g., challenger of the horizons of the hor		
sides of the body, e.g., dual array 2224/2543 Connecting portions being stacked 2224/2543 the connecting portions being stacked 2224/2543 the connecting portions being stacked 2224/255 Material 2224/26 Layer connectors, e.g. plate connectors, e.g. spaces 2224/26 2224/27 2224/26 2224/27	-	
2224/254		
2224/2541		
2224/2743 in solid form 2224/2745		
2224/2765 . Material 2224/26		-
2224/2612 Auxiliary members for layer connectors, e.g. spaces of layer adhesive layers; Manufacturing methods related thereto. 2224/26122 Auxiliary members for layer connected spaces. 2224/26123 being formed on the semiconductor or solid-state body to be connected state body to be connected being a semiconductor or solid-state body to be connected being a semiconductor or solid-state body being formed on an item to be connected not being a semiconductor or solid-state body being formed on an item to be connected not being a semiconductor or solid-state body being formed on an item to be connected not being a semiconductor or solid-state body being formed on an item to be connected not being a semiconductor or solid-state body being formed on an item to be connected not being a semiconductor or solid-state body substrate semiconductor or solid-state body state body substrate semiconductor or solid-state body substrate semiconductor o		
adhesive layers; Manufacturing methods related thereto patterned thereto patterned thereto patterned thereto patterned thereto patterned		• •
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2224/2612	· · · · · · · · · · · · · · · · · · ·	
spacers 2224/26122	2224/2612 Auxiliary members for layer connectors, e.g.	*
2224/26122 . being formed on the semiconductor or solid-state body to be connected 2224/27612 . Reinforcing structures 2224/276135 . Alignment aids 2224/27615 . Physical vapour deposition [PVD], e.g. evaporation, or sputtering 2224/27615 . Physical vapour deposition [CVD], e.g. laser CVD 2224/27615 . Physical vapour deposition [PVD], e.g. evaporation, or sputtering 2224/27615 . Reinforcing structures 2224/27616 . Reinforcing structures 2224/27616 . Alignment aids 2224/2766 . Alignment aids 2224/2766 . Alignment aids 2224/2766 . Conformal deposition, i.e. blanket deposition of a conformal layer on a patterned surface deposition of a conformal layer on a patterned surface 2224/27001 . Involving a temporary auxiliary member not forming part of the manufacturing apparatus, e.g. removable or sacrificial coating, film or substrate 2224/27002 . for supporting the semiconductor or solid-state body 2224/27003 . for holding or transferring the layer preform 2224/27003 . for holding or transferring the layer preform 2224/27005 . for aligning the layer connector, e.g. marks. spacers 2224/27001 . Involving a permanent auxiliary member, i.e. a member which is left at least partly in the finished device, e.g. coating, dummy feature 2224/27011 . Involving a permanent auxiliary member, i.e. a member which is left at least partly in the finished device, e.g. coating, dummy feature 2224/27012 . For protecting parts during the layer connector, e.g. marks. spacers 2224/27013 . for holding or confining the layer connector preform 2224/27014 . Shaping 2224/2716 . Shaping 2224/2731 . Shaping 2224/2731 . Shaping 2224/2731 . On the material of the layer connector preform 2224/2731 . In liquid form 2224/2731 . In liquid form 2224/2731 . In liquid form 2224/2731 . On timuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion 2224/2731 . Ontinuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion 2224/2730 . Mechanical treatment, e.g. polishing, 2224/2760 . Mechanical treatment, e.g. polishing, 2224/2760 . Mechanic		
state body to be connected 2224/26125 2224/26135 2224/26145 2224/26145 2224/26152 2246/26152 2246/26153 2246/26155 2246/27001 2224/27001 2224/27001 2224/27001 2224/27002 205 206 207 207 208 208 208 208 208 208 208 208 208 208	2224/26122 being formed on the semiconductor or solid-	
2224/26152	state body to be connected	
2224/26155 Alignment aids 2224/26152 being formed on an item to be connected not being a semiconductor or solid-state body 2224/26155 Reinforcing structures 2224/26165 Alignment aids 2224/26165 Alignment aids 2224/27101 Involving a temporary auxiliary member not forming part of the manufacturing apparatus, e.g. removable or sacrificial coating, filin or substrate 2224/27002 for supporting the semiconductor or solid-state body 2224/27003 for holding or transferring the layer preform 2224/27009 for a ligning the layer connector, e.g. marks, spacers 2224/27011 Involving a permanent auxiliary member, i.e. a member which is left at least partly in the finished device, e.g. coating, dummy feature 2224/27013 for holding or confining the layer connector, e.g. marks, spacers 2224/2701 For bolding or confining the layer connector, e.g. marks, spacers 2224/27013 for laigning the layer connector, e.g. marks, spacers 2224/27014 Shaping 2224/2711 Shaping 2224/2712 Applying permanent coating 2224/2711 Shaping 2224/2712 Applying permanent coating 2224/2713 by local deposition of the material of the layer connector preform 2224/2731 in liquid form 2224/2731 Continuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion 2224/2731 by dispensing droplets 2	2224/26125 Reinforcing structures	
2224/26152 . being formed on an item to be connected not being a semiconductor or solid-state body 2224/26155 . Reinforcing structures 2224/26165 . Alignment aids 2224/26175 . Flow barriers 2224/2701	2224/26135 Alignment aids	
being formed on an item to be connected not being a semiconductor or solid-state body 2224/26155	2224/26145 Flow barriers	
being a semiconductor or solid-state body 2224/27615	2224/26152 being formed on an item to be connected not	
2224/26155 . Reinforcing structures 2224/26165 . Alignment aids 2224/27166 . Conformal deposition, i.e. blanket deposition of a conformal layer on a patterned surface 2224/27001 . Involving a temporary auxiliary member not forming part of the manufacturing apparatus, e.g. removable or sacrificial coating, film or substrate 2224/27002 . for supporting the semiconductor or solid- state body 2224/27003 . for holding or transferring the layer preform 2224/27005 . for aligning the layer connector, e.g. marks, spacers 2224/27099 . for protecting parts during manufacture 2224/27011 . Involving a permanent auxiliary member, i.e. a member which is left at least partly in the finished device, e.g. coating, dummy feature 2224/27013 . for holding or confining the layer connector, e.g. solder flow barrier 2224/27015 . for aligning the layer connector, e.g. marks, spacers 2224/27016 . for protecting parts during manufacture 2224/27017 . Manufacture and pre-treatment of the layer connector preform 2224/2711 . Shaping 2224/2712 . Applying permanent coating 2224/2713 . by local deposition of the material of the layer connector 2224/2731 . in liquid form 2224/2731 . by local deposition of the material of the layer connector 2224/2731 . in liquid form 2224/2731 . by local deposition of opens.	being a semiconductor or solid-state body	
2224/26165 - Flow barriers 2224/26175 - Flow barriers 2224/27001 - Involving a temporary auxiliary member not forming part of the manufacturing apparatus, e.g. removable or sacrificial coating, film or substrate 2224/27002 - for supporting the semiconductor or solid-state body 2224/27003 - for holding or transferring the layer preform 2224/27005 - for aligning the layer connector, e.g. marks, spacers 2224/27009 - for protecting parts during manufacture 2224/27011 - Involving a permanent auxiliary member, i.e. a member which is left at least partly in the finished device, e.g. coating, dummy feature 2224/27013 - for holding or confining the layer connector, e.g. solder flow barrier 2224/27015 - for aligning the layer connector, e.g. solder flow barrier 2224/2701 - Manufacture and pre-treatment of the layer connector preform 2224/2711 - Shaping 2224/2712 - Applying permanent coating 2224/273 - by local deposition of the material of the layer connector preform 2224/2731 - in liquid form 2224/2731 - in liquid form 2224/2731 - in liquid form 2224/2731 - Continuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion 2224/2731 - by by local deposition of the material of the layer connector extrusion 2224/2731 - by local deposition of the material of the layer connector extrusion 2224/2731 - Continuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion 2224/2731 - by local deposition of a patterned surface deposition in a patterned surface deposition of a patterned surface deposition in a patterned surface deposition of a patterned surface deposition of a patterned surface deposition in a patterned surface deposition of a patterned surface assistance in a photosensitive resin approach surface and pre-treatment of the layer connector surface and pre-treatment of		
2224/2701		
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forming part of the manufacturing apparatus, e.g. removable or sacrificial coating, film or substrate substrate 2224/27002 . for supporting the semiconductor or solid-state body 2224/27003 . for holding or transferring the layer preform 2224/27005 . for aligning the layer connector, e.g. marks, spacers 2224/27011 . Involving a permanent auxiliary member, i.e. a member which is left at least partly in the finished device, e.g. coating, dummy feature 2224/27013 . for holding or confining the layer connector, e.g. solder flow barrier 2224/27015 . for aligning the layer connector, e.g. marks, spacers 2224/27019 . for protecting parts during the layer connector, e.g. solder flow barrier 2224/2711 . Shaping 2224/2711 . Shaping 2224/2712 . Applying permanent coating 2224/2731 by local deposition of the material of the layer connector preform 2224/2731 . in liquid form 2224/2731 . Continuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion 2224/27318 . by dispensing droplets 2224/2760 . Mechanical treatment, e.g. polishing, appearance, in the finished device, e.g. passivation layers 2224/2744 . Multilayer masks 12224/2745 . by chemical or physical modification of a pre-existing or pre-deposited material 2224/2750 . Sintering 2224/2751 . Anodisation 2224/2751 . Anodisation 2224/2751 . Curing and solidification, e.g. of a photosensitive layer material aphotosensitive layer material in a fluid 2224/2752 . Self-assembly, e.g. self-agglomeration of the layer assembly activation 2224/2752 . with special adaptation of the surface or of an auxiliary substrate, e.g. surface shape specially adapted for the self-assembly process . involving the material of the bonding area, e.g. bonding pad 2224/2755 . Selective modification of a pattern defined by a laser trace in a photosensitive resin a		-
e.g. removable or sacrificial coating, film or substrate 2224/27002 for supporting the semiconductor or solid-state body 2224/27003 for holding or transferring the layer preform 2224/27005 for aligning the layer connector, e.g. marks, spacers 2224/27009 for protecting parts during manufacture 2224/27011 Involving a permanent auxiliary member, i.e. a member which is left at least partly in the finished device, e.g. coating, dummy feature 2224/27013 for holding or confining the layer connector, e.g. solder flow barrier 2224/27015 for aligning the layer connector, e.g. marks, spacers 2224/27019 for protecting parts during the process 2224/2711 Shaping 2224/2711 Shaping 2224/2712 Applying permanent coating 2224/2731 in liquid form 2224/2731 in liquid form 2224/2731 Continuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion 2224/27318 by dispensing droplets 2224/27318 . by dispensing droplets 2224/2731 of or spension draterial coating and solidification of a pre-existing or pre-deposited material pre-deposited material 2224/2750 . Sintering 2224/2751 . Anodisation 2224/2751 . Anodisation 2224/2751 . Curring and solidification, e.g. of a photosensitive layer material of the layer material of the layer material of the layer material in a fluid photosensitive layer material or the layer material or a photosensitive layer material or the layer material or a photosensitive layer material or the layer material or a photosensitive layer material or the layer material or a photosensitive layer material or the layer material or a photosensitive layer material or the layer material or a photosensitive layer m		2224/2747 using a lift-off mask
substrate 2224/27002		2224/27472 Profile of the lift-off mask
2224/27002		2224/27474 Multilayer masks
state body 2224/27003 . for holding or transferring the layer preform 2224/27005 . for aligning the layer connector, e.g. marks, spacers 2224/27009 . for protecting parts during manufacture 2224/27011 . Involving a permanent auxiliary member, i.e. a member which is left at least partly in the finished device, e.g. coating, dummy feature 2224/27013 . for holding or confining the layer connector, e.g. solder flow barrier 2224/27015 . for aligning the layer connector, e.g. marks, spacers 2224/27016 . for protecting parts during the process 2224/27017 . Manufacture and pre-treatment of the layer connector preform 2224/2711 . Shaping 2224/2711 . Shaping 2224/2731 . in liquid form 2224/2731 . in liquid form 2224/2731 . Continuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion 2224/2731 . by dispensing droplets 2224/2731 . dispense draw and pre-deposited material of the pre-existing or pre-deposited material 2224/2750 . Sintering 2224/2751 . Anodisation 2224/2751 . Curing and solidification, e.g. of a photosensitive layer material 2224/2752 . Self-assembly, e.g. self-agglomeration of the layer material in a fluid 2224/2752 . with special adaptation of the surface or of an auxiliary substrate, e.g. surface shape specially adapted for the self-assembly process 2224/2752 . involving the material of the bonding area, e.g. bonding pad 2224/2755 . selective modification 2224/2755 . using a laser or a focussed ion beam [FiB] 2224/2751 . Stereolithography, i.e. solidification of a pattern defined by a laser trace in a photosensitive resin 2224/2731 . by dispensing droplets 2224/2732 . Mechanical treatment, e.g. polishing,		2224/2748 Permanent masks, i.e. masks left in the
2224/27003		finished device, e.g. passivation layers
preform 2224/27005 . for aligning the layer connector, e.g. marks, spacers 2224/27009 . for protecting parts during manufacture 2224/27011 . Involving a permanent auxiliary member, i.e. a member which is left at least partly in the finished device, e.g. coating, dummy feature 2224/27013 . for holding or confining the layer connector, e.g. solder flow barrier 2224/27015 . for aligning the layer connector, e.g. marks, spacers 2224/27019 . for protecting parts during the process 2224/2711 . Manufacture and pre-treatment of the layer connector preform 2224/2712 . Applying permanent coating 2224/2731 . in liquid form 2224/2731 . in liquid form 2224/2731 . Continuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion 2224/2731 . by dispensing droplets 2224/2731 . continuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion 2224/2731 . by dispensing droplets 2224/2731 . continuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion 2224/2731 . by dispensing droplets 2224/2731 . continuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion 2224/2731 . by dispensing droplets 2224/2731 . device material draterial 2224/2732 . device material and flux droid draterial 2224/2732 . device material and fluxidition and photosensitive material 2224/2750 . Auxiliary means therefor, e.g. for self-assembly, e.g. self-agglomeration of the layer material or the layer material or the layer material or	-	
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2224/27318 by dispensing droplets 2224/27602 Mechanical treatment, e.g. polishing,		
2224/2722		
grinding		
	222412132 Screen printing, i.e. using a stench	grinding

2224/27618 - Ivy plysical means only 2224/27616 - Chemical means only 2224/27616 - Chemical means only 2224/27618 - with selective exposure, development and emoval of a photosensitive layer material, e.g. of a photosensitive conductive resin 2224/2762 - using masks 2224/2763 - using masks 2224/2763 - Ivy plysical means of the semiconductor or solid-state body 2224/2763 - Susing a faser or a focused ion beam [HB] 2224/2763 - Abitation by means of a laser or focused ion beam [HB] 2224/2763 - Abitation by means of a laser or a focused ion beam [HB] 2224/2763 - Abitation by means of a laser or a focused ion beam [HB] 2224/2763 - Abitation by means of a laser or a focused ion beam [HB] 2224/2763 - Abitation by means of a laser or a focused ion beam [HB] 2224/2763 - Abitation by means of a laser or a focused ion beam [HB] 2224/2763 - Abitation by means of a laser or a focused ion beam [HB] 2224/2763 - Abitation by means of a laser or focused ion beam [HB] 2224/2764 - Post-treatment of the layer connector 2224/2778 - Post-treatment of the layer connector 2224/2782 - Chemical solution deposition [CSD], i.e. using a flight precusor 2224/2782 - Davis (Chemical solution deposition [CSD], i.e. using a flight precusor 2224/27825 - Plating, e.g. electroplating, electroless plating 2224/27827 - Chemical vapour deposition [CVD], e.g. lesser (CV) 2224/27827 - Chemical vapour deposition [CVD], e.g. lesser (CV) 2224/2783 - lesser (CV) 2224/2784 - lesser (CV) 2224/2785 - lesser (CV) 2224/2786 - lesser (CV) 2224/2786 - lesser (CV) 2224/2787 - lesser (CV) 2224/2788 - lesser (CV) 2224/2788 - lesser (CV) 2224/2789 - lesser (CV) 2224/2	2224/2761 Physical or chemical etching	2224/29007 Layer connector smaller than the
2224/27614 by chemical means only	•	
2224/27816 Chemical mechanical polishing (CMP) with a redistribution layer on the removal of a photosensitive conductive resist c.g. of a photosensitive layer material, e.g. of a photosensitive conductive resist c.g. of a photosensitive		
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2224/29012 in top view		
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2224/27822 by dipping, e.g. in a solder bath 2224/27823	ε	2224/29018 comprising protrusions or
2224/27823		indentations
2224/27824 Chemical solution deposition [CSD], i.e. using a liquid precursor 2224/27825 Plating, e.g. electroplating, electroless plating 2224/27826 Physical vapour deposition [FVD], e.g. evaporation, or sputtering 2224/27827 Chemical vapour deposition [CVD], e.g. laser CVD 2224/2783 Reworking, e.g. shaping 2224/2783 Reworking, e.g. shaping 2224/2784 involving a hemical process, e.g. etching the layer connector enhined process, e.g. planarising the layer connector 2224/2784 involving a nechanical process, e.g. planarising the layer connector 2224/2784 Them I treatments, e.g. annealing, controlled cooling 2224/2784 Them I treatments, e.g. annealing, controlled cooling 2224/2784 Them I treatments, e.g. annealing, controlled cooling 2224/2789 Aeflowing 2224/2790 Methods of manufacturing layer connectors involving a specific sequence of method steep 2224/2790 Awith perition of the same manufacturing step 2224/2790 Awith perition of the same manufacturing step 2224/2790 Awith perition of the same manufacturing the parts of the layer connector of the layer connector being disposed on a via connection of the semiconductor or solid-state body 2224/2790 Awith perition of the same manufacturing step 2224/2790 Awith perition of the same manufacturing step 2224/2790 Awith perition of the same manufacturing the parts of the layer connector of the layer connector being disposed on at least two separate bonding area, e.g. bond pad or at least two separate bonding area, e.g. bond pad or at least two separate bonding area, e.g. bond pad or at least two separate bonding area, e.g. bond pad or at least two separate bonding area, e.g. bond pad or at least two separate bonding area, e.g. bond pad or at least two separate bonding area, e.g. bond pad or at least two separate bonding area, e.g. bond pad or at least two separate bonding area, e.g. bond pad or at least two separate bonding area, e.g. bond pad or at least two separate bonding area, e.g. bond pad or at least two separate bonding area, e.g. bond pad or at		
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2224/2905 Structure, shape, material or disposition of the layer connectors prior to the connecting process 2224/28105 Layer connectors formed on an encapsulation of the semiconductor or solid-state body, e.g. layer connectors on chip-scale packages 2224/290 of an individual layer connector 2224/29001 Core members of the layer connector 2224/29005 Structure 2224/29006 Layer connector larger than the 2224/29090 Layer connector larger than the		surface to be connected
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2224/29001 Core members of the layer connector 2224/29005 Structure 2224/29006 Layer connector larger than the 2224/29099 Material		
2224/29001 Core members of the layer connector 2224/29005 Structure 2224/29006 Layer connector larger than the 2224/29099 Material		
2224/29005 Structure 2224/29006 Layer connector larger than the 2224/29099 Material	•	
2224/29006 Layer connector larger than the	•	
underlying bonding area		
	underlying bonding area	

the material being a metal or a metalloid, e.g. boron [B], silicon	constituent 224/29179 Niobium [Nb] as principal	
[Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and	constituent 224/2918 Molybdenum [Mo] as prin	
	constituent 224/29181 Tantalum [Ta] as principal	l
	constituent 224/29183 Rhenium [Re] as principal	
	constituent 224/29184 Tungsten [W] as principal	
constituent 2224/29111 Tin [Sn] as principal constituent	constituent 224/29186 with a principal constituent of t	he
2224/29113 Bismuth [Bi] as principal constituent	material being a non metallic, r metalloid inorganic material	non
2224/29114 Thallium [TI] as principal constituent	224/29187 Ceramics, e.g. crystalline car nitrides or oxides	bides,
2224/29116 Lead [Pb] as principal constituent 2224/29117 the principal constituent melting	224/29188 Glasses, e.g. amorphous oxic nitrides or fluorides	les,
	224/2919 with a principal constituent of the material being a polymer, e	a.
2224/29118 Zinc [Zn] as principal constituent	polyester, phenolic based polyr	
2224/2912 Antimony [Sb] as principal constituent	epoxy 224/29191 The principal constituent bei	ng an
2224/29123 Magnesium [Mg] as principal constituent	elastomer, e.g. silicones, isop neoprene	
2224/29124 Aluminium [Al] as principal constituent	224/29193 with a principal constituent of the material being a solid	
2224/29138 the principal constituent melting	not provided for in groups H01L 2224/291 - H01L 2224/2	0101
at a temperature of greater than or equal to 950°C and less than 1550°C	e.g. allotropes of carbon, fuller graphite, carbon-nanotubes, dia	ene,
	224/29194 with a principal constituent of the material being a liquid	
2224/29144 Gold [Au] as principal constituent	not provided for in groups <u>H01L 2224/291</u> - <u>H01L 2224/2</u>	9191
	224/29195 with a principal constituent of the material being a gas	
2224/29149 Manganese [Mn] as principal constituent	not provided for in groups <u>H01L 2224/291</u> - <u>H01L 2224/2</u>	
2224/29155 Nickel [Ni] as principal constituent	224/29198 with a principal constituent of t material being a combination o	f two
2224/29157 Cobalt [Co] as principal constituent	or more materials in the form o matrix with a filler, i.e. being a	hybrid
2224/2916 Iron [Fe] as principal constituent	material, e.g. segmented structu foams	ires,
at a temperature of greater than	224/29199 Material of the matrix	
1550°C	224/292 with a principal constituen the material being a metal	
2224/29164 Palladium [Pd] as principal constituent	metalloid, e.g. boron [B], s [Si], germanium [Ge], arse	silicon
2224/29166 Titanium [Ti] as principal constituent	[S1], germanum [Ge], alse [As], antimony [Sb], tellur [Te] and polonium [Po], al	ium
2224/29169 Platinum [Pt] as principal constituent	alloys thereof 224/29201 the principal constituent	
2224/2917 Zirconium [Zr] as principal constituent	melting at a temperature than 400°C	
2224/29171 Chromium [Cr] as principal constituent	224/29205 Gallium [Ga] as princ constituent	ipal
2224/20172 Vanadium [V] as principal	224/29209 Indium [In] as princip constituent	oal
2224/29173 Rhodium [Rh] as principal constituent	224/29211 Tin [Sn] as principal constituent	
2224/29176 Ruthenium [Ru] as principal constituent	224/29213 Bismuth [Bi] as princ constituent	ipal

2224/29214 Thallium [Tl] as principal constituent	2224/29284 Tungsten [W] as principal constituent
2224/29216 Lead [Pb] as principal constituent	2224/29286 with a principal constituent of the material being a non metallic,
2224/29217 the principal constituent	non metalloid inorganic material
melting at a temperature of greater than or equal to 400°C	2224/29287 Ceramics, e.g. crystalline carbides, nitrides or oxides
and less than 950°C	2224/29288 Glasses, e.g. amorphous
2224/29218 Zinc [Zn] as principal constituent	oxides, nitrides or fluorides 2224/2929 with a principal constituent of
2224/2922 Antimony [Sb] as principal	the material being a polymer,
constituent 2224/29223 Magnesium [Mg] as	e.g. polyester, phenolic based polymer, epoxy
principal constituent	2224/29291 The principal constituent being
2224/29224 Aluminium [Al] as principal constituent	an elastomer, e.g. silicones, isoprene, neoprene
2224/29238 the principal constituent	2224/29293 with a principal constituent of the material being a solid
melting at a temperature of greater than or equal to 950°C	not provided for in groups
and less than 1550°C	H01L 2224/292 - H01L 2224/29291, e.g. allotropes of carbon,
2224/29239 Silver [Ag] as principal constituent	fullerene, graphite, carbon-
2224/29244 Gold [Au] as principal	nanotubes, diamond
constituent 2224/29247 Copper [Cu] as principal	2224/29294 with a principal constituent of the material being a liquid
constituent	not provided for in groups H01L 2224/292 - H01L 2224/29291
2224/29249 Manganese [Mn] as principal constituent	2224/29295 with a principal constituent
2224/29255 Nickel [Ni] as principal	of the material being a gas not provided for in groups
constituent 2224/29257 Cobalt [Co] as principal	<u>H01L 2224/292</u> - <u>H01L 2224/29291</u>
constituent	2224/29298 Fillers 2224/29299 Base material
2224/2926 Iron [Fe] as principal constituent	2224/293 with a principal constituent
2224/29263 the principal constituent	of the material being a metal or a metalloid, e.g. boron [B],
melting at a temperature of greater than 1550°C	silicon [Si], germanium [Ge],
2224/29264 Palladium [Pd] as principal	arsenic [As], antimony [Sb], tellurium [Te] and polonium
constituent 2224/29266 Titanium [Ti] as principal	[Po], and alloys thereof
constituent	2224/29301 the principal constituent melting at a temperature of
2224/29269 Platinum [Pt] as principal constituent	less than 400°C
2224/2927 Zirconium [Zr] as principal	2224/29305 Gallium [Ga] as principal constituent
constituent 2224/29271 Chromium [Cr] as principal	2224/29309 Indium [In] as principal
constituent	constituent 2224/29311 Tin [Sn] as principal
2224/29272 Vanadium [V] as principal constituent	constituent
2224/29273 Rhodium [Rh] as principal	2224/29313 Bismuth [Bi] as principal constituent
constituent 2224/29276 Ruthenium [Ru] as principal	2224/29314 Thallium [Tl] as principal
constituent	constituent 2224/29316 Lead [Pb] as principal
2224/29278 Iridium [Ir] as principal constituent	constituent
2224/29279 Niobium [Nb] as principal	2224/29317 the principal constituent melting at a temperature
constituent 2224/2928 Molybdenum [Mo] as	of greater than or equal to
principal constituent	400°C and less than 950°C 2224/29318 Zinc [Zn] as principal
2224/29281 Tantalum [Ta] as principal constituent	constituent
2224/29283 Rhenium [Re] as principal	2224/2932 Antimony [Sb] as principal constituent
constituent	2224/29323 Magnesium [Mg] as
	principal constituent

2224/29324	Aluminium [Al] as	2224/29391		The principal constituent
	principal constituent	222 1/2/3/1		being an elastomer, e.g.
2224/29338	1 1	2224/20202		silicones, isoprene, neoprene
	melting at a temperature of greater than or equal to	2224/29393		with a principal constituent of the material being a solid
	950°C and less than 1550°C			not provided for in groups
2224/29339	- 0- 1			H01L 2224/293 - H01L 2224/29391,
2224/29344	constituent • Gold [Au] as principal			e.g. allotropes of carbon, fullerene, graphite, carbon-
2224/2/344	constituent			nanotubes, diamond
2224/29347	** *	2224/29394		with a principal constituent
2224/29349	constituent Manganese [Mn] as			of the material being a liquid not provided for in groups
2224/29349	principal constituent			H01L 2224/293 - H01L 2224/29391
2224/29355	Nickel [Ni] as principal	2224/29395		with a principal constituent
2224/20257	constituent			of the material being a gas not provided for in groups
2224/29357	Cobalt [Co] as principal constituent			H01L 2224/293 - H01L 2224/29391
2224/2936		2224/29398		with a principal constituent
	constituent			of the material being a combination of two or more
2224/29363	• the principal constituent melting at a temperature of			materials in the form of
	greater than 1550°C			a matrix with a filler, i.e.
2224/29364				being a hybrid material, e.g. segmented structures, foams
2224/29366	principal constituent . Titanium [Ti] as principal	2224/29399	C	oating material
2224/29300	constituent	2224/294		with a principal constituent
2224/29369	. , , ,			of the material being a metal or a metalloid, e.g. boron [B],
2224/2937	constituent Zirconium [Zr] as			silicon [Si], germanium [Ge],
2224/2937	principal constituent			arsenic [As], antimony [Sb], tellurium [Te] and polonium
2224/29371	Chromium [Cr] as			[Po], and alloys thereof
2224/20272	principal constituent	2224/29401		• the principal constituent
2224/29372	Vanadium [V] as principal constituent			melting at a temperature of less than 400°C
2224/29373	2 3 1 1	2224/29405		
2224/2027/	constituent			constituent
2224/29376	Ruthenium [Ru] as principal constituent	2224/29409	• • • • • • • • • •	Indium [In] as principal constituent
2224/29378	Iridium [Ir] as principal	2224/29411		
2224/20270	constituent			constituent
2224/29379	Niobium [Nb] as principal constituent	2224/29413		Bismuth [Bi] as principal constituent
2224/2938		2224/29414		
2224/20291	principal constituent			constituent
2224/29381	Tantalum [Ta] as principal constituent	2224/29416	• • • • • • • • • •	Lead [Pb] as principal constituent
2224/29383		2224/29417		the principal constituent
2224/29384	constituent Tungsten [W] as principal			melting at a temperature
2224/27304	constituent			of greater than or equal to 400°C and less than 950°C
	with a principal constituent	2224/29418		
	of the material being a non metallic, non metalloid			constituent
	inorganic material	2224/2942		Antimony [Sb] as principal constituent
2224/29387	. Ceramics, e.g. crystalline	2224/29423		
2224/29388	carbides, nitrides or oxides Glasses, e.g. amorphous			principal constituent
LLL4/L/300 • • • • • • • • • •	oxides, nitrides or fluorides	2224/29424		Aluminium [Al] as principal constituent
	with a principal constituent of	2224/29438		 the principal constituent
	the material being a polymer, e.g. polyester, phenolic based			melting at a temperature
	polymer, epoxy			of greater than or equal to 950°C and less than 1550°C

2224/29439 Silver [Ag] as principal constituent	2224/29493 with a principal constituent of the material being a solid
2224/29444 Gold [Au] as principal constituent	not provided for in groups H01L 2224/294 - H01L 2224/29491,
2224/29447 Copper [Cu] as principal constituent	e.g. allotropes of carbon, fullerene, graphite, carbon-
2224/29449 Manganese [Mn] as principal constituent	nanotubes, diamond 2224/29494 with a principal constituent
2224/29455 Nickel [Ni] as principal constituent	of the material being a liquid not provided for in groups H01L 2224/294 - H01L 2224/29491
2224/29457 Cobalt [Co] as principal constituent	2224/29495 with a principal constituent
2224/2946 Iron [Fe] as principal constituent	of the material being a gas not provided for in groups H01L 2224/294 - H01L 2224/29491
2224/29463 the principal constituent melting at a temperature of greater than 1550°C	2224/29498 with a principal constituent of the material being a
2224/29464 Palladium [Pd] as principal constituent	combination of two or more materials in the form of
2224/29466	a matrix with a filler, i.e. being a hybrid material, e.g.
2224/29469 Platinum [Pt] as principal	segmented structures, foams 2224/29499 Shape or distribution of the fillers
constituent	2224/2954 Coating
2224/2947 Zirconium [Zr] as principal constituent	2224/29541 Structure
2224/29471 Chromium [Cr] as	2224/2955 Shape
principal constituent	2224/29551 being non uniform 2224/29552 comprising protrusions or
2224/29472 Vanadium [V] as principal constituent	indentations
2224/29473 Rhodium [Rh] as principal	2224/29553 at the bonding interface of the layer connector, i.e. on the
constituent	surface of the layer connector
2224/29476 Ruthenium [Ru] as principal constituent	2224/2956 Disposition
2224/29478 Iridium [Ir] as principal constituent	2224/29561 On the entire surface of the core, i.e. integral coating
2224/29479 Niobium [Nb] as principal constituent	2224/29562 On the entire exposed surface of the core
2224/2948 Molybdenum [Mo] as principal constituent	2224/29563 Only on parts of the surface of the core, i.e. partial coating
2224/29481	2224/29564 Only on the bonding interface of the layer connector
2224/29483 Rhenium [Re] as principal constituent	2224/29565 Only outside the bonding interface of the layer connector
2224/29484 Tungsten [W] as principal constituent	2224/29566 Both on and outside the bonding interface of the layer connector
2224/29486 with a principal constituent	2224/2957 Single coating layer
of the material being a non	2224/29575 Plural coating layers
metallic, non metalloid inorganic material	2224/29576 being mutually engaged together, e.g. through inserts
2224/29487 Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/29578 being disposed next to each other, e.g. side-to-side arrangements
2224/29488 Glasses, e.g. amorphous	2224/2958 being stacked
oxides, nitrides or fluorides	2224/29582 Two-layer coating
2224/2949 with a principal constituent of	2224/29583 Three-layer coating
the material being a polymer, e.g. polyester, phenolic based	2224/29584 Four-layer coating 2224/29599 Material
polymer, epoxy	2224/296 with a principal constituent of
2224/29491 The principal constituent being an elastomer, e.g.	the material being a metal or a metalloid, e.g. boron [B], silicon
silicones, isoprene, neoprene	[Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and
	polonium [Po], and alloys thereof
	2224/29601 the principal constituent melting at a temperature of less than 400°C

2224/29605 Gallium [Ga] as principal constituent	2224/29683 Rhenium [Re] as principal constituent
2224/29609 Indium [In] as principal constituent	2224/29684 Tungsten [W] as principal constituent
2224/29611 Tin [Sn] as principal constituent 2224/29613 Bismuth [Bi] as principal constituent	2224/29686 with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/29614 Thallium [Tl] as principal constituent	2224/29687 Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/29616 Lead [Pb] as principal constituent 2224/29617 the principal constituent melting	2224/29688 Glasses, e.g. amorphous oxides, nitrides or fluorides
at a temperature of greater than or equal to 400°C and less than 950°C 2224/29618 Zinc [Zn] as principal constituent	2224/2969 with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer,
2224/2962 Antimony [Sb] as principal constituent	epoxy 2224/29691 The principal constituent being an
2224/29623 Magnesium [Mg] as principal constituent	elastomer, e.g. silicones, isoprene, neoprene
2224/29624 Aluminium [Al] as principal constituent	2224/29693 with a principal constituent of the material being a solid
2224/29638 the principal constituent melting at a temperature of greater than	not provided for in groups H01L 2224/296 - H01L 2224/29691, e.g. allotropes of carbon, fullerene,
or equal to 950°C and less than 1550°C	graphite, carbon-nanotubes, diamond
2224/29639 Silver [Ag] as principal constituent	2224/29694 with a principal constituent of the material being a liquid not provided for in groups
2224/29644 Gold [Au] as principal constituent	<u>H01L 2224/296</u> - <u>H01L 2224/29691</u>
2224/29647 Copper [Cu] as principal constituent	2224/29695 with a principal constituent of the material being a gas
2224/29649 Manganese [Mn] as principal constituent	not provided for in groups H01L 2224/296 - H01L 2224/29691
2224/29655 Nickel [Ni] as principal constituent	2224/29698 with a principal constituent of the material being a combination of two or more materials in the form of a
2224/29657 Cobalt [Co] as principal constituent	matrix with a filler, i.e. being a hybrid material, e.g. segmented structures,
2224/2966 Iron [Fe] as principal constituent	foams
2224/29663 the principal constituent melting at a temperature of greater than	2224/29699 Material of the matrix
1550°C	2224/297 with a principal constituent of the material being a metal or a
2224/29664 Palladium [Pd] as principal constituent	metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic
2224/29666 Titanium [Ti] as principal constituent	[As], antimony [Sb], tellurium [Te] and polonium [Po], and
2224/29669 Platinum [Pt] as principal constituent	alloys thereof
2224/2967 Zirconium [Zr] as principal constituent	2224/29701 the principal constituent melting at a temperature of less than 400°C
2224/29671 Chromium [Cr] as principal constituent	2224/29705 Gallium [Ga] as principal constituent
2224/29672 Vanadium [V] as principal constituent	2224/29709 Indium [In] as principal constituent
2224/29673 Rhodium [Rh] as principal constituent	2224/29711 Tin [Sn] as principal constituent
2224/29676 Ruthenium [Ru] as principal constituent	2224/29713 Bismuth [Bi] as principal constituent
2224/29678 Iridium [Ir] as principal constituent	2224/29714 Thallium [Tl] as principal constituent
2224/29679 Niobium [Nb] as principal constituent	2224/29716 Lead [Pb] as principal constituent
2224/2968 Molybdenum [Mo] as principal constituent	2224/29717 the principal constituent melting at a temperature of
2224/29681 Tantalum [Ta] as principal constituent	greater than or equal to 400°C and less than 950°C

2224/29718 Zinc [Zn] as principal constituent	2224/2979 with a principal constituent of the material being a polymer,
2224/2972 Antimony [Sb] as principal constituent	e.g. polyester, phenolic based polymer, epoxy
2224/29723 Magnesium [Mg] as principal constituent	2224/29791 The principal constituent being an elastomer, e.g. silicones,
2224/29724 Aluminium [Al] as principal constituent	isoprene, neoprene 2224/29793 with a principal constituent
2224/29738 the principal constituent melting at a temperature of	of the material being a solid not provided for in groups
greater than or equal to 950°C and less than 1550°C	<u>H01L 2224/297 - H01L 2224/29791</u> e.g. allotropes of carbon,
2224/29739 Silver [Ag] as principal constituent	fullerene, graphite, carbon- nanotubes, diamond
2224/29744 Gold [Au] as principal constituent	2224/29794 with a principal constituent of the material being a liquid
2224/29747 Copper [Cu] as principal constituent	not provided for in groups <u>H01L 2224/297</u> - <u>H01L 2224/29791</u>
2224/29749 Manganese [Mn] as	2224/29795 with a principal constituent of the material being a gas
principal constituent 2224/29755 Nickel [Ni] as principal constituent	not provided for in groups <u>H01L 2224/297</u> - <u>H01L 2224/29791</u>
2224/29757 Cobalt [Co] as principal	2224/29798 Fillers
constituent	2224/29799 Base material 2224/298 with a principal constituent
2224/2976 Iron [Fe] as principal constituent	of the material being a metal
2224/29763 the principal constituent melting at a temperature of	or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb],
greater than 1550°C 2224/29764 Palladium [Pd] as principal	tellurium [Te] and polonium
constituent	[Po], and alloys thereof
2224/29766 Titanium [Ti] as principal constituent	melting at a temperature of less than 400°C
2224/29769 Platinum [Pt] as principal constituent	2224/29805 Gallium [Ga] as principal constituent
2224/2977 Zirconium [Zr] as principal constituent	2224/29809 Indium [In] as principal constituent
2224/29771 Chromium [Cr] as principal constituent	2224/29811 Tin [Sn] as principal
2224/29772 Vanadium [V] as principal constituent	constituent 2224/29813 Bismuth [Bi] as principal constituent
2224/29773 Rhodium [Rh] as principal constituent	2224/29814 Thallium [Tl] as principal
2224/29776 Ruthenium [Ru] as principal	constituent 2224/29816 Lead [Pb] as principal
constituent 2224/29778 Iridium [Ir] as principal	constituent 2224/29817 the principal constituent
constituent	melting at a temperature
2224/29779 Niobium [Nb] as principal constituent	of greater than or equal to 400°C and less than 950°C
2224/2978 Molybdenum [Mo] as principal constituent	2224/29818 Zinc [Zn] as principal constituent
2224/29781 Tantalum [Ta] as principal constituent	2224/2982 Antimony [Sb] as
2224/29783 Rhenium [Re] as principal constituent	principal constituent 2224/29823 Magnesium [Mg] as
2224/29784 Tungsten [W] as principal constituent	principal constituent 2224/29824 Aluminium [Al] as
2224/29786 with a principal constituent of the material being a non metallic,	principal constituent 2224/29838 the principal constituent
non metalloid inorganic material 2224/29787 Ceramics, e.g. crystalline	melting at a temperature of greater than or equal to 950°C and less than 1550°C
carbides, nitrides or oxides 2224/29788 Glasses, e.g. amorphous	2224/29839 Silver [Ag] as principal constituent
oxides, nitrides or fluorides	constituent

2224/29844 Gold [Au] as principal constituent	2224/29893	with a principal constituent of the material being a solid
2224/29847 Copper [Cu] as principal constituent		not provided for in groups H01L 2224/298 - H01L 2224/29891,
2224/29849 Manganese [Mn] as principal constituent		e.g. allotropes of carbon, fullerene, graphite, carbon-
2224/29855 Nickel [Ni] as principal constituent	2224/29894	nanotubes, diamond with a principal constituent
2224/29857 Cobalt [Co] as principal constituent	222 11 27 69 1	of the material being a liquid not provided for in groups H01L 2224/298 - H01L 2224/29891
2224/2986 Iron [Fe] as principal constituent	2224/29895	with a principal constituent
2224/29863 the principal constituent melting at a temperature of greater than 1550°C		of the material being a gas not provided for in groups H01L 2224/298 - H01L 2224/29891
2224/29864 Palladium [Pd] as principal constituent	2224/29898	with a principal constituent of the material being a
2224/29866 Titanium [Ti] as principal constituent		combination of two or more materials in the form of
2224/29869 Platinum [Pt] as principal constituent		a matrix with a filler, i.e. being a hybrid material, e.g.
2224/2987 Zirconium [Zr] as	2224/29899	segmented structures, foams Coating material
principal constituent 2224/29871 Chromium [Cr] as		with a principal constituent
principal constituent		of the material being a metal or a metalloid, e.g. boron [B],
2224/29872 Vanadium [V] as principal constituent		silicon [Si], germanium [Ge],
2224/29873 Rhodium [Rh] as principal constituent		arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/29876 Ruthenium [Ru] as principal constituent	2224/29901	the principal constituent
2224/29878 Iridium [Ir] as principal		melting at a temperature of less than 400°C
constituent 2224/29879 Niobium [Nb] as principal	2224/29905	Gallium [Ga] as principal constituent
constituent 2224/2988 Molybdenum [Mo] as	2224/29909	•
principal constituent	2224/29911	constituent . Tin [Sn] as principal
2224/29881 Tantalum [Ta] as principal constituent	2224/20012	constituent
2224/29883 Rhenium [Re] as principal	2224/29913	constituent
constituent 2224/29884 Tungsten [W] as principal	2224/29914	Thallium [Tl] as principal constituent
constituent 2224/29886 with a principal constituent	2224/29916	Lead [Pb] as principal constituent
of the material being a non	2224/29917	
metallic, non metalloid inorganic material		melting at a temperature of greater than or equal to
2224/29887 Ceramics, e.g. crystalline		400°C and less than 950°C
carbides, nitrides or oxides 2224/29888 Glasses, e.g. amorphous	2224/29918	Zinc [Zn] as principal constituent
oxides, nitrides or fluorides 2224/2989 with a principal constituent of	2224/2992	Antimony [Sb] as principal constituent
the material being a polymer,	2224/29923	Magnesium [Mg] as
e.g. polyester, phenolic based polymer, epoxy	2224/29924	principal constituent • Aluminium [Al] as
2224/29891 The principal constituent	2227(2))27	principal constituent
being an elastomer, e.g. silicones, isoprene, neoprene	2224/29938	the principal constituent melting at a temperature
		of greater than or equal to
	2224/29939	950°C and less than 1550°C . Silver [Ag] as principal
		constituent
	2224/29944	Gold [Au] as principal constituent

2224/29947	Copper [Cu] as principal constituent	2224/29994	with a principal constituent of the material being a liquid
2224/29949			not provided for in groups H01L 2224/299 - H01L 2224/29991
2224/29955		2224/29995	
2224/29957			not provided for in groups H01L 2224/299 - H01L 2224/29991
2224/2996	Iron [Fe] as principal constituent	2224/29998	of the material being a
2224/29963	• the principal constituent melting at a temperature of greater than 1550°C		combination of two or more materials in the form of a matrix with a filler, i.e.
2224/29964			being a hybrid material, e.g. segmented structures, foams
2224/29966	Titanium [Ti] as principal	2224/29999	Shape or distribution of the fillers lity of layer connectors
2224/20060	constituent	2224/3001 Structu	· ·
2224/29969	constituent	2224/3003 Laye	r connectors having different sizes,
2224/2997	Zirconium [Zr] as principal constituent	e.g. o 2224/3005 Shape	lifferent heights or widths
2224/29971		2224/30051 Laye	r connectors having different
2224/299/1	principal constituent	shap	es
2224/29972	Vanadium [V] as principal	2224/301 Dispos	
	constituent		ve to the bonding areas, e.g. bond
2224/29973	• Rhodium [Rh] as principal constituent	body	
2224/29976	principal constituent	at	e layer connectors being bonded to least one common bonding area
2224/29978	Iridium [Ir] as principal constituent	2224/3012 Layo 2224/3013 Sq	
2224/20070		2224/30131	·
2224/29979	Niobium [Nb] as principal constituent		uniform pitch across the array
2224/2998	Molybdenum [Mo] as principal constituent		being non uniform, i.e. having a non uniform pitch across the array
2224/29981		2224/30133	with a staggered arrangement, e.g. depopulated array
2224/29983		2224/30134	covering only portions of the surface to be connected
2224/29984	Tungsten [W] as principal constituent		 Covering only the peripheral area of the surface to be connected,
	with a principal constituent	2224/20124	i.e. peripheral arrangements
	of the material being a non metallic, non metalloid inorganic material	2224/30130	Covering only the central area of the surface to be connected, i.e. central arrangements
2224/29987	_	2224/3014 Ci	rcular array, i.e. array with radial
2224123301	carbides, nitrides or oxides		mmetry
2224/29988			being uniform, i.e. having a uniform pitch across the array
	with a principal constituent of the material being a polymer,		being non uniform, i.e. having a non uniform pitch across the array
	e.g. polyester, phenolic based polymer, epoxy	2224/30143	covering only portions of the surface to be connected
2224/29991	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/30145	• Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
		2224/30146	Covering only the central area of the surface to be connected, i.e. central arrangements
	H01L 2224/299 - H01L 2224/29991	2224/3015 M	irror array, i.e. array having only
	e.g. allotropes of carbon,		eflection symmetry, i.e. bilateral
	fullerene, graphite, carbon-	•	mmetry
	nanotubes, diamond		being uniform, i.e. having a uniform pitch across the array

2224/30152 being non uniform, i.e. having a non uniform pitch across the array	2224/32059 comprising protrusions or indentations
2224/30153 with a staggered arrangement, e.g. depopulated array	2224/3207 of bonding interfaces, e.g. interlocking features
2224/30154 covering only portions of the	2224/321 Disposition
surface to be connected 2224/30155 Covering only the peripheral area	2224/32104 relative to the bonding area, e.g. bond pad
of the surface to be connected, i.e. peripheral arrangements	2224/32105 the layer connector connecting bonding areas being not aligned with
2224/30156 Covering only the central area of the surface to be connected, i.e. central arrangements	respect to each other 2224/32106 the layer connector connecting one bonding area to at least two respective
2224/3016 Random layout, i.e. layout with no	bonding areas
symmetry 2224/30163 with a staggered arrangement	2224/32111 the layer connector being disposed in a recess of the surface
2224/30164 covering only portions of the surface to be connected	2224/32112 the layer connector being at least partially embedded in the surface
2224/30165 Covering only the peripheral area	2224/32113 the whole layer connector protruding
of the surface to be connected,	from the surface
i.e. peripheral arrangements 2224/30166 Covering only the central area of	2224/3213 the layer connector connecting within a semiconductor or solid-state body, i.e.
the surface to be connected, i.e. central arrangements	connecting two bonding areas on the same semiconductor or solid-state body
2224/30177 Combinations of arrays with different	2224/32135 the layer connector connecting between
layouts 2224/30179 Corner adaptations, i.e. disposition of	different semiconductor or solid-state bodies, i.e. chip-to-chip
the layer connectors at the corners of	2224/32137 the bodies being arranged next to each
the semiconductor or solid-state body 2224/3018 being disposed on at least two different	other, e.g. on a common substrate 2224/32141 the bodies being arranged on opposite
sides of the body, e.g. dual array	sides of a substrate, e.g. mirror
2224/30181 On opposite sides of the body	arrangements
2224/30183 On contiguous sides of the body	2224/32145 the bodies being stacked
2224/305 Material	2224/32146 the layer connector connecting
2224/30505 Layer connectors having different materials	to a via connection in the semiconductor or solid-state body
2224/3051 Function	2224/32147 the layer connector connecting to a
2224/30515 Layer connectors having different functions	bonding area disposed in a recess of the surface
2224/30517 including layer connectors providing primarily mechanical bonding	2224/32148 the layer connector connecting to a bonding area protruding from the surface
2224/30519 including layer connectors providing primarily thermal dissipation	2224/32151 the layer connector connecting between
2224/31 Structure, shape, material or disposition of the	a semiconductor or solid-state body and an item not being a semiconductor or
layer connectors after the connecting process	solid-state body, e.g. chip-to-substrate,
2224/32 of an individual layer connector	chip-to-passive
2224/3201 Structure	2224/32153 the body and the item being arranged
2224/32012 relative to the bonding area, e.g. bond pad	next to each other, e.g. on a common substrate
2224/32013 the layer connector being larger than the bonding area, e.g. bond pad	2224/32155 the item being non-metallic, e.g. being an insulating substrate with
2224/32014 the layer connector being smaller than the bonding area, e.g. bond pad	or without metallisation 2224/32157 the layer connector connecting to
2224/3205 Shape	a bond pad of the item
2224/32052 in top view	2224/3216 the layer connector connecting to
2224/32053 being non uniform along the layer connector	a pin of the item 2224/32163 the layer connector connecting to
2224/32054 being rectangular or square	a potential ring of the item
2224/32055 being circular or elliptic	2224/32165 the layer connector connecting to
2224/32056 comprising protrusions or	a via metallisation of the item
indentations	2224/32167 the layer connector connecting
2224/32057 in side view	to a bonding area disposed in a
2224/32058 being non uniform along the layer connector	recess of the surface of the item

2224/32168 the layer connector connecting to	2224/32501 at the bonding interface
a bonding area protruding from	2224/32502 comprising an eutectic alloy
the surface of the item	2224/32503 comprising an intermetallic
2224/32175 the item being metallic	compound
2224/32183 the layer connector connecting to	2224/32505 outside the bonding interface, e.g. in the
a potential ring of the item	bulk of the layer connector
2224/32187 the layer connector connecting	2224/32506 comprising an eutectic alloy
to a bonding area disposed in a	2224/32507 comprising an intermetallic
recess of the surface of the item	compound
2224/32188 the layer connector connecting to	2224/33 of a plurality of layer connectors
a bonding area protruding from	2224/3301 Structure
the surface of the item	2224/3303 Layer connectors having different sizes,
2224/32195 the item being a discrete passive	e.g. different heights or widths
component	2224/3305 Shape
2224/32197 the layer connector connecting to a bonding area disposed in a	2224/33051 Layer connectors having different
recess of the surface of the item	shapes
2224/32198 the layer connector connecting to	2224/33055 of their bonding interfaces
a bonding area protruding from	2224/331 Disposition
the surface of the item	2224/33104 relative to the bonding areas, e.g. bond
2224/32221 the body and the item being stacked	pads
2224/32225 the item being non-metallic, e.g.	2224/33106 the layer connectors being bonded to
insulating substrate with or without	at least one common bonding area
metallisation	2224/33107 the layer connectors connecting two
2224/32227 the layer connector connecting to	common bonding areas
a bond pad of the item	2224/3312 Layout
2224/3223 the layer connector connecting to	2224/3313 Square or rectangular array
a pin of the item	2224/33132 being non uniform, i.e. having a
2224/32233 the layer connector connecting to	non uniform pitch across the array
a potential ring of the item	2224/33133 with a staggered arrangement, e.g. depopulated array
2224/32235 the layer connector connecting to	
a via metallisation of the item	2224/33134 covering only portions of the surface to be connected
2224/32237 the layer connector connecting	2224/33135 Covering only the peripheral area
to a bonding area disposed in a	of the surface to be connected,
recess of the surface of the item	i.e. peripheral arrangements
2224/32238 the layer connector connecting to	2224/3314 Circular array, i.e. array with radial
a bonding area protruding from the surface of the item	symmetry
2224/3224 the layer connector connecting	2224/33142 being non uniform, i.e. having a
between the body and an	non uniform pitch across the array
opposite side of the item with	2224/33143 with a staggered arrangement
respect to the body	2224/33144 covering only portions of the
2224/32245 the item being metallic	surface to be connected
2224/32253 the layer connector connecting to	2224/33145 Covering only the peripheral area
a potential ring of the item	of the surface to be connected,
2224/32257 the layer connector connecting	i.e. peripheral arrangements
to a bonding area disposed in a	2224/3315 Mirror array, i.e. array having only
recess of the surface of the item	a reflection symmetry, i.e. bilateral
2224/32258 the layer connector connecting to	symmetry
a bonding area protruding from	2224/33151 being uniform, i.e. having a
the surface of the item	uniform pitch across the array
2224/3226 the layer connector connecting	2224/33152 being non uniform, i.e. having a non uniform pitch across the array
between the body and an	2224/33153 with a staggered arrangement, e.g.
opposite side of the item with	depopulated array
respect to the body	2224/33154 covering only portions of the
2224/32265 the item being a discrete passive component	surface to be connected
2224/32267 the layer connector connecting	2224/33155 Covering only the peripheral area
to a bonding area disposed in a	of the surface to be connected,
recess of the surface of the item	i.e. peripheral arrangements
2224/32268 the layer connector connecting to	2224/33156 Covering only the central area of
a bonding area protruding from	the surface to be connected, i.e.
the surface of the item	central arrangements
2224/325 Material	2224/3316 Random layout, i.e. layout with no
	symmetry

2224/33163 with a staggered arrangement	2224/35847 with a mechanical process, e.g. with
2224/33164 covering only portions of the surface to be connected	flattening of the connector 2224/35848 Thermal treatments, e.g. annealing,
2224/33165 Covering only the peripheral area	controlled cooling
of the surface to be connected,	2224/35985 Methods of manufacturing strap connectors
i.e. peripheral arrangements [2224/33177] Combinations of arrays with different	involving a specific sequence of method steps
layouts	2224/35986 with repetition of the same manufacturing
2224/33179 Corner adaptations, i.e. disposition of the layer connectors at the corners of	step 2224/36 Structure, shape, material or disposition of the
the semiconductor or solid-state body	strap connectors prior to the connecting process
2224/3318 being disposed on at least two different sides of the body, e.g. dual array	2224/37 of an individual strap connector 2224/37001 Core members of the connector
2224/33181 On opposite sides of the body	2224/37005 Structure
2224/33183 On contiguous sides of the body	2224/3701 Shape
2224/335 Material 2224/33505 Layer connectors having different	2224/37011 comprising apertures or cavities 2224/37012 Cross-sectional shape
materials	2224/37013 being non uniform along the
2224/3351 Function 2224/33515 Layer connectors having different	connector
functions	2224/3702 Disposition 2224/37025 Plural core members
2224/33517 including layer connectors providing	2224/37026 being mutually engaged together, e.g.
primarily mechanical support 2224/33519 including layer connectors providing	through inserts
primarily thermal dissipation	2224/37028 Side-to-side arrangements 2224/3703 Stacked arrangements
2224/34 Strap connectors, e.g. copper straps for grounding	2224/37032 Two-layer arrangements
power devices; Manufacturing methods related thereto	2224/37033 Three-layer arrangements
2224/35 Manufacturing methods	2224/37034 Four-layer arrangements 2224/37099 Material
2224/35001 Involving a temporary auxiliary member not	2224/371 with a principal constituent of
forming part of the manufacturing apparatus, e.g. removable or sacrificial coating, film or	the material being a metal or a
substrate	metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As],
2224/351 Pre-treatment of the preform connector	antimony [Sb], tellurium [Te] and
2224/3512 Applying permanent coating, e.g. in-situ coating	polonium [Po], and alloys thereof
2224/35125 Plating, e.g. electroplating, electroless	2224/37101 the principal constituent melting at a temperature of less than 400°C
plating	2224/37105 Gallium [Ga] as principal
2224/352 Mechanical processes 2224/3521 Pulling	constituent
2224/355 Modification of a pre-existing material	2224/37109 Indium [In] as principal constituent
2224/3551 Sintering	2224/37111 Tin [Sn] as principal constituent
2224/3552 Anodisation	2224/37113 Bismuth [Bi] as principal
2224/357 Involving monitoring, e.g. feedback loop 2224/358 Post-treatment of the connector	constituent
2224/3581 Cleaning, e.g. oxide removal step,	2224/37114 Thallium [Tl] as principal constituent
desmearing	2224/37116 Lead [Pb] as principal constituent
2224/3582 Applying permanent coating, e.g. in-situ coating	2224/37117 the principal constituent melting
2224/35821 Spray coating	at a temperature of greater than or equal to 400°C and less than 950°C
2224/35822 Dip coating	2224/37118 Zinc [Zn] as principal constituent
2224/35823 Immersion coating, e.g. solder bath	2224/3712 Antimony [Sb] as principal
2224/35824 Chemical solution deposition [CSD], i.e. using a liquid precursor	constituent 2224/37123 Magnesium [Mg] as principal
2224/35825 Plating, e.g. electroplating, electroless	constituent
plating 2224/35826 Physical vapour deposition [PVD], e.g.	2224/37124 Aluminium [Al] as principal constituent
evaporation, sputtering	2224/37138 the principal constituent melting
2224/35827 Chemical vapour deposition [CVD], e.g.	at a temperature of greater than or equal to 950°C and less than
laser CVD 2224/3583 Reworking	1550°C
2224/35831 with a chemical process, e.g. with	2224/37139 Silver [Ag] as principal
etching of the connector	constituent

2224/37144 Gold [Au] as principal constituent	2224/37194 with a principal constituent of the material being a liquid
2224/37147 Copper [Cu] as principal constituent	not provided for in groups <u>H01L 2224/371</u> - <u>H01L 2224/37191</u>
2224/37149 Manganese [Mn] as principal constituent	2224/37195 with a principal constituent of the material being a gas
2224/37155 Nickel [Ni] as principal constituent	not provided for in groups <u>H01L 2224/371</u> - <u>H01L 2224/37191</u>
2224/37157 Cobalt [Co] as principal constituent	2224/37198 with a principal constituent of the material being a combination of two
2224/3716 Iron [Fe] as principal constituent	or more materials in the form of a
2224/37163 the principal constituent melting	matrix with a filler, i.e. being a hybrid material, e.g. segmented structures,
at a temperature of greater than 1550°C	foams
2224/37164 Palladium [Pd] as principal	2224/37199 Material of the matrix
constituent	2224/372 with a principal constituent of
2224/37166 Titanium [Ti] as principal constituent	the material being a metal or a metalloid, e.g. boron [B], silicon
2224/37169 Platinum [Pt] as principal constituent	[Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium
2224/3717 Zirconium [Zr] as principal	[Te] and polonium [Po], and alloys thereof
constituent	2224/37201 the principal constituent
2224/37171	melting at a temperature of less than 400°C
2224/37172 Vanadium [V] as principal constituent	2224/37205 Gallium [Ga] as principal constituent
2224/37173 Rhodium [Rh] as principal constituent	2224/37209 Indium [In] as principal constituent
2224/37176 Ruthenium [Ru] as principal constituent	2224/37211 Tin [Sn] as principal constituent
2224/37178 Iridium [Ir] as principal constituent	2224/37213 Bismuth [Bi] as principal constituent
2224/37179 Niobium [Nb] as principal constituent	2224/37214 Thallium [Tl] as principal constituent
2224/3718 Molybdenum [Mo] as principal constituent	2224/37216 Lead [Pb] as principal constituent
2224/37181 Tantalum [Ta] as principal constituent	2224/37217 the principal constituent melting at a temperature of
2224/37183 Rhenium [Re] as principal constituent	greater than or equal to 400°C and less than 950°C
2224/37184 Tungsten [W] as principal constituent	2224/37218 Zinc [Zn] as principal constituent
2224/37186 with a principal constituent of the material being a non metallic, non	2224/3722 Antimony [Sb] as principal constituent
metalloid inorganic material	2224/37223 Magnesium [Mg] as
2224/37187 Ceramics, e.g. crystalline carbides, nitrides or oxides	principal constituent
2224/37188 Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/37224 Aluminium [Al] as principal constituent
2224/3719 with a principal constituent of	2224/37238 the principal constituent melting at a temperature of
the material being a polymer, e.g. polyester, phenolic based polymer,	greater than or equal to 950°C and less than 1550°C
epoxy	2224/37239 Silver [Ag] as principal
2224/37191 The principal constituent being an	constituent
elastomer, e.g. silicones, isoprene, neoprene	2224/37244 Gold [Au] as principal
2224/37193 with a principal constituent	constituent 2224/37247 Copper [Cu] as principal
of the material being a solid	constituent
not provided for in groups H01L 2224/371 - H01L 2224/37191,	2224/37249 Manganese [Mn] as
e.g. allotropes of carbon, fullerene,	principal constituent 2224/37255 Nickel [Ni] as principal
graphite, carbon-nanotubes, diamond	constituent
	2224/37257 Cobalt [Co] as principal
	constituent

2224/3726 Iron [Fe] as principal constituent	2224/373 with a principal constituent of the material being a metal
2224/37263 the principal constituent melting at a temperature of greater than 1550°C	or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb],
2224/37264 Palladium [Pd] as principal constituent	tellurium [Te] and polonium [Po], and alloys thereof
2224/37266 Titanium [Ti] as principal constituent	2224/37301 the principal constituent melting at a temperature of
2224/37269 Platinum [Pt] as principal constituent	less than 400°C 2224/37305 Gallium [Ga] as principal
2224/3727 Zirconium [Zr] as principal constituent	constituent 2224/37309 Indium [In] as principal constituent
2224/37271 Chromium [Cr] as principal constituent	2224/37311
2224/37272 Vanadium [V] as principal constituent	2224/37313 Bismuth [Bi] as principal constituent
2224/37273 Rhodium [Rh] as principal constituent	2224/37314 Thallium [Tl] as principal constituent
2224/37276 Ruthenium [Ru] as principal constituent 2224/37278 Iridium [Ir] as principal	2224/37316 Lead [Pb] as principal constituent
constituent 2224/37279 Niobium [Nb] as principal	2224/37317 the principal constituent melting at a temperature
constituent 2224/3728 Molybdenum [Mo] as	of greater than or equal to 400°C and less than 950°C
principal constituent 2224/37281 Tantalum [Ta] as principal	2224/37318 Zinc [Zn] as principal constituent
constituent 2224/37283 Rhenium [Re] as principal	2224/3732 Antimony [Sb] as principal constituent
constituent 2224/37284 Tungsten [W] as principal	2224/37323 Magnesium [Mg] as principal constituent
constituent 2224/37286 with a principal constituent of	2224/37324 Aluminium [Al] as principal constituent 2224/37338 the principal constituent
the material being a non metallic, non metalloid inorganic material	melting at a temperature of greater than or equal to
2224/37287 Ceramics, e.g. crystalline carbides, nitrides or oxides	950°C and less than 1550°C 2224/37339 Silver [Ag] as principal
2224/37288 Glasses, e.g. amorphous oxides, nitrides or fluorides	constituent 2224/37344 Gold [Au] as principal
2224/3729 with a principal constituent of the material being a polymer,	constituent 2224/37347 Copper [Cu] as principal
e.g. polyester, phenolic based polymer, epoxy	constituent 2224/37349 Manganese [Mn] as
2224/37291 The principal constituent being an elastomer, e.g. silicones,	principal constituent 2224/37355 Nickel [Ni] as principal
isoprene, neoprene 2224/37293 with a principal constituent	constituent
of the material being a solid not provided for in groups H01L 2224/372 - H01L 2224/37291,	2224/37357 Cobalt [Co] as principal constituent 2224/3736 Iron [Fe] as principal
e.g. allotropes of carbon,	constituent
fullerene, graphite, carbon- nanotubes, diamond 2224/37294 with a principal constituent	2224/37363 the principal constituent melting at a temperature of greater than 1550°C
2224/37294 with a principal constituent of the material being a liquid not provided for in groups	2224/37364 Palladium [Pd] as principal constituent
<u>H01L 2224/372</u> - <u>H01L 2224/37291</u> 2224/37295 with a principal constituent	2224/37366
of the material being a gas not provided for in groups	2224/37369 Platinum [Pt] as principal constituent
<u>H01L 2224/372</u> - <u>H01L 2224/37291</u> 2224/37298 Fillers	2224/3737 Zirconium [Zr] as principal constituent
2224/37299 Base material	principal constituent

2224/37371	2224/37401 the principal constituent melting at a temperature of
2224/37372 Vanadium [V] as principal constituent	less than 400°C 2224/37405 Gallium [Ga] as principal
2224/37373 Rhodium [Rh] as principal	constituent
constituent 2224/37376 Ruthenium [Ru] as	2224/37409 Indium [In] as principal constituent
principal constituent 2224/37378 Iridium [Ir] as principal	2224/37411 Tin [Sn] as principal constituent
constituent 2224/37379 Niobium [Nb] as principal	2224/37413 Bismuth [Bi] as principal constituent
constituent	2224/37414 Thallium [Tl] as principal constituent
principal constituent	2224/37416 Lead [Pb] as principal
2224/37381 Tantalum [Ta] as principal constituent	constituent 2224/37417 the principal constituent
2224/37383 Rhenium [Re] as principal constituent	melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/37384 Tungsten [W] as principal constituent	2224/37418 Zinc [Zn] as principal
2224/37386 with a principal constituent of the material being a non	2224/3742 Antimony [Sb] as
metallic, non metalloid inorganic material	principal constituent 2224/37423 Magnesium [Mg] as
2224/37387 Ceramics, e.g. crystalline	principal constituent
carbides, nitrides or oxides	2224/37424 Aluminium [Al] as principal constituent
oxides, nitrides or fluorides 2224/3739 with a principal constituent of	2224/37438 the principal constituent melting at a temperature
the material being a polymer, e.g. polyester, phenolic based	of greater than or equal to 950°C and less than 1550°C
polymer, epoxy	2224/37439 Silver [Ag] as principal
2224/37391 The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	constituent 2224/37444 Gold [Au] as principal constituent
2224/37393 with a principal constituent of the material being a solid	2224/37447 Copper [Cu] as principal constituent
not provided for in groups H01L 2224/373 - H01L 2224/3739	2224/37449 Manganese [Mn] as
e.g. allotropes of carbon,	principal constituent 2224/37455 Nickel [Ni] as principal
fullerene, graphite, carbon- nanotubes, diamond	constituent 2224/37457 Cobalt [Co] as principal
2224/37394 with a principal constituent of the material being a liquid	constituent 2224/3746 Iron [Fe] as principal
not provided for in groups H01L 2224/373 - H01L 2224/3739	constituent
2224/37395 with a principal constituent	melting at a temperature of
of the material being a gas not provided for in groups	greater than 1550°C 2224/37464 Palladium [Pd] as
H01L 2224/373 - H01L 2224/3739 2224/37398 with a principal constituent	principal constituent 2224/37466 Titanium [Ti] as principal
of the material being a combination of two or more	constituent
materials in the form of a matrix with a filler, i.e.	2224/37469 Platinum [Pt] as principal constituent
being a hybrid material, e.g.	2224/3747 Zirconium [Zr] as principal constituent
segmented structures, foams 2224/37399 Coating material	2224/37471 Chromium [Cr] as principal constituent
2224/374 with a principal constituent of the material being a metal	2224/37472 Vanadium [V] as principal
or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge],	constituent 2224/37473 Rhodium [Rh] as principal
arsenic [As], antimony [Sb], tellurium [Te] and polonium	constituent [2224/37476] Ruthenium [Ru] as
[Po], and alloys thereof	principal constituent

2224/37478 Iridium [Ir] as principal constituent	2224/37599 Material 2224/376 with a principal constituent of
2224/37479 Niobium [Nb] as principal	the material being a metal or a
constituent 2224/3748 Molybdenum [Mo] as	metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As],
principal constituent 2224/37481 Tantalum [Ta] as principal	antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
constituent 2224/37483 Rhenium [Re] as principal	2224/37601 the principal constituent melting at a temperature of less than 400°C
constituent 2224/37484 Tungsten [W] as principal	2224/37605 Gallium [Ga] as principal constituent
constituent 2224/37486 with a principal constituent	2224/37609 Indium [In] as principal constituent
of the material being a non metallic, non metalloid	2224/37611 Tin [Sn] as principal constituent 2224/37613 Bismuth [Bi] as principal
inorganic material	constituent
2224/37487 Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/37614 Thallium [Tl] as principal constituent
2224/37488 Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/37616 Lead [Pb] as principal constituent 2224/37617 the principal constituent melting
2224/3749 with a principal constituent of the material being a polymer,	at a temperature of greater than or equal to 400°C and less than 950°C
e.g. polyester, phenolic based	2224/37618 Zinc [Zn] as principal constituent
polymer, epoxy 2224/37491 The principal constituent	2224/3762 Antimony [Sb] as principal constituent
being an elastomer, e.g.	2224/37623 Magnesium [Mg] as principal
silicones, isoprene, neoprene 2224/37493 with a principal constituent	constituent 2224/37624 Aluminium [Al] as principal
of the material being a solid not provided for in groups	constituent 2224/37638 the principal constituent melting
H01L 2224/374 - H01L 2224/3749 e.g. allotropes of carbon, fullerene, graphite, carbon-	at a temperature of greater than or equal to 950°C and less than 1550°C
nanotubes, diamond 2224/37494 with a principal constituent	2224/37639 Silver [Ag] as principal
of the material being a liquid not provided for in groups	constituent 2224/37644 Gold [Au] as principal
<u>H01L 2224/374</u> - <u>H01L 2224/3749</u>	constituent 2224/37647 Copper [Cu] as principal
2224/37495 with a principal constituent of the material being a gas	constituent
not provided for in groups	2224/37649 Manganese [Mn] as principal constituent
H01L 2224/3749 - H01L 2224/3749 2224/37498 with a principal constituent	2224/37655 Nickel [Ni] as principal constituent
of the material being a combination of two or more	2224/37657 Cobalt [Co] as principal
materials in the form of	constituent
a matrix with a filler, i.e.	2224/3766 Iron [Fe] as principal constituent 2224/37663 the principal constituent melting
being a hybrid material, e.g. segmented structures, foams	at a temperature of greater than
2224/37499 Shape or distribution of the fillers	1550°C
2224/3754 Coating	constituent
2224/37541 Structure	2224/37666 Titanium [Ti] as principal
2224/3755 Shape 2224/3756 Disposition, e.g. coating on a part of the	constituent
core	2224/37669 Platinum [Pt] as principal constituent
2224/37565 Single coating layer	2224/3767 Zirconium [Zr] as principal
2224/3757 Plural coating layers	constituent
2224/37572 Two-layer stack coating 2224/37573 Three-layer stack coating	2224/37671 Chromium [Cr] as principal
2224/37574 Four-layer stack coating	constituent
2224/37576 being mutually engaged together, e.g.	2224/37672 Vanadium [V] as principal constituent
through inserts 2224/37578 being disposed next to each other, e.g.	2224/37673 Rhodium [Rh] as principal constituent
side-to-side arrangements	

2224/37676 Ruthenium [Ru] as principal constituent	2224/37713 Bismuth [Bi] as principal constituent
2224/37678 Iridium [Ir] as principal constituent	2224/37714 Thallium [Tl] as principal constituent
2224/37679 Niobium [Nb] as principal constituent	2224/37716 Lead [Pb] as principal constituent
2224/3768 Molybdenum [Mo] as principal constituent	2224/37717 the principal constituent melting at a temperature of
2224/37681 Tantalum [Ta] as principal constituent	greater than or equal to 400°C and less than 950°C
2224/37683 Rhenium [Re] as principal constituent	2224/37718 Zinc [Zn] as principal constituent
2224/37684 Tungsten [W] as principal constituent	2224/3772 Antimony [Sb] as principal constituent
2224/37686 with a principal constituent of the material being a non metallic, non	2224/37723 Magnesium [Mg] as principal constituent
metalloid inorganic material 2224/37687 Ceramics, e.g. crystalline carbides,	2224/37724 Aluminium [Al] as principal constituent
nitrides or oxides 2224/37688 Glasses, e.g. amorphous oxides,	2224/37738 the principal constituent melting at a temperature of
nitrides or fluorides 2224/3769 with a principal constituent of	greater than or equal to 950°C and less than 1550°C
the material being a polymer, e.g. polyester, phenolic based polymer,	2224/37739 Silver [Ag] as principal constituent
epoxy 2224/37691 The principal constituent being an	2224/37744 Gold [Au] as principal constituent
elastomer, e.g. silicones, isoprene, neoprene	2224/37747 Copper [Cu] as principal constituent
2224/37693 with a principal constituent of the material being a solid	2224/37749 Manganese [Mn] as principal constituent
not provided for in groups <u>H01L 2224/376</u> - <u>H01L 2224/37691</u> ,	2224/37755 Nickel [Ni] as principal constituent
e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/37757 Cobalt [Co] as principal constituent
2224/37694 with a principal constituent of the material being a liquid	2224/3776 Iron [Fe] as principal constituent
not provided for in groups H01L 2224/376 - H01L 2224/37691	2224/37763 the principal constituent melting at a temperature of
2224/37695 with a principal constituent of the material being a gas	greater than 1550°C 2224/37764 Palladium [Pd] as principal
not provided for in groups <u>H01L 2224/376</u> - <u>H01L 2224/37691</u>	constituent 2224/37766 Titanium [Ti] as principal
2224/37698 with a principal constituent of the material being a combination of two	constituent 2224/37769 Platinum [Pt] as principal
or more materials in the form of a matrix with a filler, i.e. being a hybrid	constituent
material, e.g. segmented structures, foams	2224/3777 Zirconium [Zr] as principal constituent
2224/37699 Material of the matrix 2224/377 with a principal constituent of	2224/37771 Chromium [Cr] as principal constituent
the material being a metal or a metalloid, e.g. boron [B], silicon	2224/37772 Vanadium [V] as principal constituent
[Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium	2224/37773 Rhodium [Rh] as principal constituent
[Te] and polonium [Po], and alloys thereof	2224/37776 Ruthenium [Ru] as principal constituent
2224/37701 the principal constituent melting at a temperature of less	2224/37778 Iridium [Ir] as principal constituent
than 400°C	2224/37779 Niobium [Nb] as principal constituent
2224/37705	2224/3778 Molybdenum [Mo] as principal constituent
2224/37709 Indium [In] as principal constituent	2224/37781 Tantalum [Ta] as principal constituent
2224/37711 Tin [Sn] as principal constituent	Constituent

2224/37783 Rhenium [Re] as principal constituent	2224/37823 Magnesium [Mg] as principal constituent
2224/37784 Tungsten [W] as principal constituent	2224/37824 Aluminium [Al] as principal constituent
2224/37786 with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/37838 the principal constituent melting at a temperature of greater than or equal to
2224/37787 Ceramics, e.g. crystalline carbides, nitrides or oxides	950°C and less than 1550°C 2224/37839 Silver [Ag] as principal
2224/37788 Glasses, e.g. amorphous oxides, nitrides or fluorides	constituent 2224/37844 Gold [Au] as principal
2224/3779 with a principal constituent of	constituent
the material being a polymer, e.g. polyester, phenolic based	2224/37847 Copper [Cu] as principal constituent
polymer, epoxy 2224/37791 The principal constituent being	2224/37849 Manganese [Mn] as principal constituent
an elastomer, e.g. silicones, isoprene, neoprene	2224/37855 Nickel [Ni] as principal constituent
2224/37793 with a principal constituent of the material being a solid	2224/37857 Cobalt [Co] as principal constituent
not provided for in groups H01L 2224/377 - H01L 2224/37791,	2224/3786 Iron [Fe] as principal constituent
e.g. allotropes of carbon,	2224/37863 the principal constituent
fullerene, graphite, carbon- nanotubes, diamond	melting at a temperature of greater than 1550°C
2224/37794 with a principal constituent of the material being a liquid	2224/37864 Palladium [Pd] as principal constituent
not provided for in groups <u>H01L 2224/377</u> - <u>H01L 2224/37791</u>	2224/37866 Titanium [Ti] as principal constituent
2224/37795 with a principal constituent of the material being a gas	2224/37869 Platinum [Pt] as principal constituent
not provided for in groups <u>H01L 2224/377</u> - <u>H01L 2224/37791</u>	2224/3787 Zirconium [Zr] as principal constituent
2224/37798 Fillers	2224/37871 Chromium [Cr] as
2224/37799 Base material 2224/378 with a principal constituent	principal constituent
of the material being a metal	2224/37872 Vanadium [V] as principal constituent
or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge],	2224/37873 Rhodium [Rh] as principal constituent
arsenic [As], antimony [Sb], tellurium [Te] and polonium	2224/37876 Ruthenium [Ru] as
[Po], and alloys thereof	principal constituent 2224/37878 Iridium [Ir] as principal
2224/37801 the principal constituent melting at a temperature of	constituent
less than 400°C 2224/37805 Gallium [Ga] as principal	2224/37879 Niobium [Nb] as principal constituent
constituent	2224/3788 Molybdenum [Mo] as principal constituent
2224/37809 Indium [In] as principal constituent	2224/37881 Tantalum [Ta] as principal
2224/37811 Tin [Sn] as principal constituent	constituent 2224/37883 Rhenium [Re] as principal
2224/37813 Bismuth [Bi] as principal constituent	constituent 2224/37884 Tungsten [W] as principal
2224/37814 Thallium [T1] as principal	constituent 2224/37886 with a principal constituent
constituent 2224/37816 Lead [Pb] as principal constituent	of the material being a non metallic, non metalloid
2224/37817 the principal constituent	inorganic material 2224/37887 Ceramics, e.g. crystalline
melting at a temperature of greater than or equal to	carbides, nitrides or oxides
400°C and less than 950°C	2224/37888 Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/37818 Zinc [Zn] as principal constituent	•
2224/3782 Antimony [Sb] as	
principal constituent	

2224/3789 with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/37938 the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/37891 The principal constituent being an elastomer, e.g.	2224/37939 Silver [Ag] as principal constituent
silicones, isoprene, neoprene	2224/37944 Gold [Au] as principal constituent
of the material being a solid not provided for in groups H01L 2224/378 - H01L 2224/3789	2224/37947 Copper [Cu] as principal constituent
e.g. allotropes of carbon, fullerene, graphite, carbon-	1 2224/37949
nanotubes, diamond 2224/37894 with a principal constituent	constituent 2224/37957 Cobalt [Co] as principal
of the material being a liquid not provided for in groups	constituent
H01L 2224/3789 - H01L 2224/3789 2224/37895 with a principal constituent	- constituent
of the material being a gas not provided for in groups H01L 2224/378 - H01L 2224/3789	2224/37963 the principal constituent melting at a temperature of greater than 1550°C
2224/37898 with a principal constituent	2224/37964 Palladium [Pd] as principal constituent
of the material being a combination of two or more materials in the form of	2224/37966 Titanium [Ti] as principal constituent
a matrix with a filler, i.e.	2224/37969 Platinum [Pt] as principal constituent
being a hybrid material, e.g. segmented structures, foams	2224/3797 Zirconium [Zr] as principal constituent
2224/37899 Coating material 2224/379 with a principal constituent	2224/37971
of the material being a metal	principal constituent 2224/37972 Vanadium [V] as principal
or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge],	constituent
arsenic [As], antimony [Sb], tellurium [Te] and polonium	2224/37973 Rhodium [Rh] as principal constituent
[Po], and alloys thereof	2224/37976 Ruthenium [Ru] as principal constituent
2224/37901 the principal constituent melting at a temperature of less than 400°C	2224/37978 Iridium [Ir] as principal constituent
2224/37905 Gallium [Ga] as principal constituent	2224/37979 Niobium [Nb] as principal constituent
2224/37909 Indium [In] as principal constituent	2224/3798 Molybdenum [Mo] as principal constituent
2224/37911 Tin [Sn] as principal constituent	2224/37981 Tantalum [Ta] as principal constituent
2224/37913 Bismuth [Bi] as principal constituent	2224/37983 Rhenium [Re] as principal constituent
2224/37914 Thallium [Tl] as principal constituent	2224/37984 Tungsten [W] as principal constituent
2224/37916 Lead [Pb] as principal constituent	2224/37986 with a principal constituent of the material being a non
2224/37917 the principal constituent melting at a temperature	metallic, non metalloid inorganic material
of greater than or equal to 400°C and less than 950°C	2224/37987 Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/37918 Zinc [Zn] as principal constituent	2224/37988 Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/3792 Antimony [Sb] as principal constituent	2224/3799 with a principal constituent of the material being a polymer,
2224/37923 Magnesium [Mg] as	e.g. polyester, phenolic based polymer, epoxy
principal constituent 2224/37924 Aluminium [Al] as principal constituent	2224/37991 The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
	sincones, isopiene, neopiene

2224/37993 with a principal constituent	2224/40145 the bodies being stacked
of the material being a solid not provided for in groups	2224/40147 with an intermediate bond, e.g. continuous strap daisy chain
H01L 2224/379 - H01L 2224/3799 e.g. allotropes of carbon,	2224/40151 Connecting between a semiconductor or solid-state body and an item not being a
fullerene, graphite, carbon-	semiconductor or solid-state body, e.g.
nanotubes, diamond	chip-to-substrate, chip-to-passive
2224/37994 with a principal constituent of the material being a liquid	2224/40153 the body and the item being arranged next to each other, e.g. on a common
not provided for in groups	substrate
2224/37995 with a principal constituent	1 2224/40155 the item being non-metallic, e.g. insulating substrate with or without
of the material being a gas	metallisation
not provided for in groups <u>H01L 2224/379</u> - <u>H01L 2224/3799</u>	2224/40157 Connecting the strap to a bond pad of the item
2224/37998 with a principal constituent	2224/40158 the bond pad being disposed
of the material being a combination of two or more	in a recess of the surface of the item
materials in the form of	2224/40159 the bond pad protruding from
a matrix with a filler, i.e. being a hybrid material, e.g.	the surface of the item
segmented structures, foams	2224/4016 Connecting the strap to a pin of the item
2224/37999 Shape or distribution of the fillers 2224/38 of a plurality of strap connectors	2224/40163 Connecting the strap to a
2224/39 Structure, shape, material or disposition of the	potential ring of the item 2224/40165 Connecting the strap to a via
strap connectors after the connecting process	metallisation of the item
2224/40 of an individual strap connector 2224/4001 Structure	2224/40175 the item being metallic
2224/4005 Shape	2224/40177 Connecting the strap to a bond pad of the item
2224/4007 of bonding interfaces, e.g. interlocking features	2224/40178 the bond pad being disposed
2224/4009 Loop shape	in a recess of the surface of the item
2224/40091 Arched	2224/40179 the bond pad protruding from
2224/40095 Kinked 2224/401 Disposition	the surface of the item
2224/40101 Connecting bonding areas at the same	2224/40183 Connecting the strap to a potential ring of the item
height, e.g. horizontal bond	2224/40195 the item being a discrete passive
2224/40105 Connecting bonding areas at different heights	component 2224/40221 the body and the item being stacked
2224/40106 the connector being orthogonal to a	2224/40225 the item being non-metallic, e.g.
side surface of the semiconductor or solid-state body, e.g. parallel layout	insulating substrate with or without metallisation
2224/40108 the connector not being orthogonal to	2224/40227 Connecting the strap to a bond
a side surface of the semiconductor or solid-state body, e.g. fanned-out	pad of the item
connectors, radial layout	2224/40228 the bond pad being disposed in a recess of the surface of the
2224/40111 the strap connector extending above another semiconductor or solid-state	item
body	2224/40229 the bond pad protruding from the surface of the item
2224/4013 Connecting within a semiconductor or	2224/4023 Connecting the strap to a pin of
solid-state body, i.e. fly strap, bridge strap	the item 2224/40233 Connecting the strap to a
2224/40132 with an intermediate bond, e.g.	potential ring of the item
continuous strap daisy chain 2224/40135 Connecting between different	2224/40235 Connecting the strap to a via metallisation of the item
semiconductor or solid-state bodies, i.e.	2224/40237 Connecting the strap to a die pad
chip-to-chip 2224/40137 the bodies being arranged next to each	of the item 2224/4024 Connecting between the body
other, e.g. on a common substrate	and an opposite side of the item
2224/40139 with an intermediate bond, e.g. continuous strap daisy chain	with respect to the body
2224/40141 the bodies being arranged on opposite	2224/40245 the item being metallic 2224/40247 Connecting the strap to a bond
sides of a substrate, e.g. mirror arrangements	pad of the item
arrangements	

2224/40248 the bond pad being disposed	2224/41052 Different loop heights
in a recess of the surface of the	2224/411 Disposition
item	2224/41105 Connecting at different heights
2224/40249 the bond pad protruding from	2224/41107 on the semiconductor or solid-state
the surface of the item	body being
2224/40253 Connecting the strap to a potential ring of the item	2224/41109 outside the semiconductor or solid- state body
2224/40257 Connecting the strap to a die pad	2224/4111 the connectors being bonded to at least
of the item	one common bonding area, e.g. daisy
2224/4026 Connecting between the body	chain
and an opposite side of the item with respect to the body	2224/41111 the connectors connecting two common bonding areas
2224/40265 the item being a discrete passive	2224/41112 the connectors connecting a common
component	bonding area on the semiconductor or
2224/404 Connecting portions	solid-state body to different bonding
2224/4046 with multiple bonds on the same	areas outside the body, e.g. diverging
bonding area	straps
2224/40475 connected to auxiliary connecting means	2224/41113 the connectors connecting different
on the bonding areas	bonding areas on the semiconductor
2224/40477 being a pre-ball (i.e. a ball formed by	or solid-state body to a common
capillary bonding)	bonding area outside the body, e.g.
2224/40479 on the semiconductor or solid-state	converging straps
body	2224/4112 Layout
2224/4048 outside the semiconductor or solid-	2224/4117 Crossed straps
state body	2224/41171 Fan-out arrangements
2224/40484 being a plurality of pre-balls	2224/41173 Radial fan-out arrangements
disposed side-to-side	2224/41174 Stacked arrangements
2224/40486 on the semiconductor or solid-	2224/41175 Parallel arrangements
state body 2224/40487 outside the semiconductor or	2224/41176 Strap connectors having the same
solid-state body	loop shape and height
2224/40491 being an additional member attached	2224/41177 Combinations of different
to the bonding area through an	arrangements
adhesive or solder, e.g. buffer pad	2224/41179 Corner adaptations, i.e. disposition of the strap connectors at the corners of
2224/40496 not being interposed between the	the semiconductor or solid-state body
connector and the bonding area	2224/4118 being disposed on at least two different
2224/40499 Material of the auxiliary connecting	sides of the body, e.g. dual array
means	2224/414 Connecting portions
2224/405 Material	2224/4141 the connecting portions being stacked
2224/40505 at the bonding interface	2224/41421 on the semiconductor or solid-state
2224/40506 comprising an eutectic alloy	body
2224/40507 comprising an intermetallic compound	2224/41422 outside the semiconductor or solid-
2224/4051 Morphology of the connecting	state body
portion, e.g. grain size distribution	2224/4143 the connecting portions being staggered 2224/415 Material
2224/4052 Bonding interface between the	
connecting portion and the bonding	2224/41505 Connectors having different materials 2224/42 Wire connectors; Manufacturing methods related
area	thereto
2224/4099 Auxiliary members for strap connectors,	2224/43 Manufacturing methods
e.g. flow-barriers, spacers	2224/43001 Involving a temporary auxiliary member not
2224/40991 being formed on the semiconductor or	forming part of the manufacturing apparatus,
solid-state body to be connected	e.g. removable or sacrificial coating, film or
2224/40992 Reinforcing structures	substrate
2224/40993 Alignment aids	2224/431 Pre-treatment of the preform connector
2224/40996 being formed on an item to be connected	2224/4312 Applying permanent coating, e.g. in-situ
not being a semiconductor or solid-state body	coating 2224/43125 Plating, e.g. electroplating, electroless
2224/40997 Reinforcing structures	plating
2224/40998 Alignment aids	2224/432 Mechanical processes
2224/41 of a plurality of strap connectors	2224/4321 Pulling
2224/4101 Structure	2224/435 Modification of a pre-existing material
2224/4103 Connectors having different sizes	2224/4351 Sintering
2224/4105 Shape	2224/4352 Anodisation
2224/41051 Connectors having different shapes	LELTITOJE • • • • AHOUISAUOII
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2224/437 Involving monitoring, e.g. feedback loop	2224/45109 Indium (In) as principal
2224/438 Post-treatment of the connector	constituent
2224/4381 Cleaning, e.g. oxide removal step,	2224/45111 Tin (Sn) as principal constituent
desmearing	2224/45113 Bismuth (Bi) as principal
2224/4382 Applying permanent coating, e.g. in-situ	constituent
coating	2224/45114 Thallium (Tl) as principal
2224/43821 Spray coating	constituent
2224/43822 Dip coating	2224/45116 Lead (Pb) as principal constituent
2224/43823 Immersion coating, e.g. solder bath	2224/45117 the principal constituent melting
2224/43824 Chemical solution deposition [CSD], i.e.	at a temperature of greater than or
using a liquid precursor	equal to 400°C and less than 950°C
2224/43825 Plating, e.g. electroplating, electroless	2224/45118 Zinc (Zn) as principal constituent
plating	2224/4512 Antimony (Sb) as principal
	constituent
2224/43826 Physical vapour deposition [PVD], e.g.	2224/45123 Magnesium (Mg) as principal
evaporation, sputtering	constituent
2224/43827 Chemical vapour deposition [CVD], e.g.	
laser CVD	2224/45124 Aluminium (Al) as principal constituent
2224/4383 Reworking	
2224/43831 with a chemical process, e.g. with	2224/45138 the principal constituent melting
etching of the connector	at a temperature of greater than
2224/43847 with a mechanical process, e.g. with	or equal to 950°C and less than
flattening of the connector	1550°C
2224/43848 Thermal treatments, e.g. annealing,	2224/45139 Silver (Ag) as principal
controlled cooling	constituent
2224/43985 Methods of manufacturing wire connectors	2224/45144 Gold (Au) as principal
involving a specific sequence of method	constituent
steps	2224/45147 Copper (Cu) as principal
2224/43986 with repetition of the same manufacturing	constituent
step	2224/45149 Manganese (Mn) as principal
2224/44 Structure, shape, material or disposition of the	constituent
wire connectors prior to the connecting process	2224/45155 Nickel (Ni) as principal
2224/45 of an individual wire connector	constituent
2224/45001 Core members of the connector	2224/45157 Cobalt (Co) as principal
2224/45005 Structure	constituent
	2224/4516 Iron (Fe) as principal constituent
2224/4501 Shape	2224/45163 the principal constituent melting
2224/45012 Cross-sectional shape	at a temperature of greater than
2224/45013 being non uniform along the	1550°C
connector	2224/45164 Palladium (Pd) as principal
2224/45014 Ribbon connectors, e.g. rectangular	constituent
cross-section	2224/45166 Titanium (Ti) as principal
2224/45015 being circular	constituent
2224/45016 being elliptic	2224/45169 Platinum (Pt) as principal
2224/4502 Disposition	constituent
2224/45025 Plural core members	
2224/45026 being mutually engaged together, e.g.	2224/4517 Zirconium (Zr) as principal constituent
through inserts	
2224/45028 Side-to-side arrangements	2224/45171 Chromium (Cr) as principal
2224/4503 Stacked arrangements	constituent
2224/45032 Two-layer arrangements	2224/45172 Vanadium (V) as principal
2224/45033 Three-layer arrangements	constituent
	2224/45173 Rhodium (Rh) as principal
2224/45034 Four-layer arrangements	constituent
2224/45099 Material	2224/45176 Ruthenium (Ru) as principal
2224/451 with a principal constituent of	constituent
the material being a metal or a	2224/45178 Iridium (Ir) as principal
metalloid, e.g. boron (B), silicon	constituent
(Si), germanium (Ge), arsenic (As),	2224/45179 Niobium (Nb) as principal
antimony (Sb), tellurium (Te) and	constituent
polonium (Po), and alloys thereof	2224/4518 Molybdenum (Mo) as principal
2224/45101 the principal constituent melting at	constituent
a temperature of less than 400°C	2224/45181 Tantalum (Ta) as principal
2224/45105 Gallium (Ga) as principal	constituent
constituent	2224/45192 Phanium (Da) as minainal
	2224/45183 Rhenium (Re) as principal
	constituent

2224/45184 Tungsten (W) as principal constituent	2224/4522 Antimony (Sb) as principal constituent
2224/45186 with a principal constituent of the material being a non metallic, non	2224/45223 Magnesium (Mg) as principal constituent
metalloid inorganic material 2224/45187 Ceramics, e.g. crystalline carbides,	2224/45224 Aluminium (Al) as principal constituent
nitrides or oxides 2224/45188 Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/45238 the principal constituent melting at a temperature of greater than or equal to 950°C
2224/4519 with a principal constituent of	and less than 1550°C
the material being a polymer, e.g. polyester, phenolic based polymer,	2224/45239 Silver (Ag) as principal constituent
epoxy 2224/45191 The principal constituent being an	2224/45244 Gold (Au) as principal constituent
elastomer, e.g. silicones, isoprene, neoprene	2224/45247 Copper (Cu) as principal constituent
2224/45193 with a principal constituent of the material being a solid	2224/45249 Manganese (Mn) as principal constituent
not provided for in groups H01L 2224/451 - H01L 2224/45191,	2224/45255 Nickel (Ni) as principal constituent
e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/45257 Cobalt (Co) as principal constituent
2224/45194 with a principal constituent of the material being a liquid	2224/4526 Iron (Fe) as principal constituent
not provided for in groups H01L 2224/451 - H01L 2224/45191	2224/45263 the principal constituent
2224/45195 with a principal constituent	melting at a temperature of greater than 1550°C
of the material being a gas not provided for in groups	2224/45264 Palladium (Pd) as principal constituent
H01L 2224/451 - H01L 2224/45191 2224/45198 with a principal constituent of the	2224/45266 Titanium (Ti) as principal constituent
material being a combination of two or more materials in the form of a	2224/45269 Platinum (Pt) as principal constituent
matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/4527 Zirconium (Zr) as principal constituent
2224/45199 Material of the matrix	2224/45271
2224/452 with a principal constituent of the material being a metal or a	2224/45272 Vanadium (V) as principal constituent
metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic	2224/45273 Rhodium (Rh) as principal
(As), antimony (Sb), tellurium (Te) and polonium (Po), and	constituent 2224/45276 Ruthenium (Ru) as principal constituent
alloys thereof 2224/45201 the principal constituent	2224/45278 Iridium (Ir) as principal
melting at a temperature of less than 400°C	constituent 2224/45279 Niobium (Nb) as principal
2224/45205 Gallium (Ga) as principal	constituent 2224/4528 Molybdenum (Mo) as
constituent 2224/45209 Indium (In) as principal	principal constituent
constituent 2224/45211 Tin (Sn) as principal	2224/45281 Tantalum (Ta) as principal constituent
constituent	2224/45283 Rhenium (Re) as principal constituent
2224/45213 Bismuth (Bi) as principal constituent	2224/45284 Tungsten (W) as principal
2224/45214 Thallium (Tl) as principal constituent	constituent 2224/45286 with a principal constituent of
2224/45216 Lead (Pb) as principal constituent	the material being a non metallic, non metalloid inorganic material
2224/45217 the principal constituent melting at a temperature of	2224/45287 Ceramics, e.g. crystalline carbides, nitrides or oxides
greater than or equal to 400°C and less than 950°C	2224/45288 Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/45218 Zinc (Zn) as principal constituent	

2224/4529 with a principal constituent of	2224/45344 Gold (Au) as principal
the material being a polymer, e.g. polyester, phenolic based	constituent 2224/45347 Copper (Cu) as principal
polymer, epoxy 2224/45291 The principal constituent being	constituent
an elastomer, e.g. silicones,	2224/45349 Manganese (Mn) as principal constituent
isoprene, neoprene 2224/45293 with a principal constituent	2224/45355 Nickel (Ni) as principal constituent
of the material being a solid	2224/45357 Cobalt (Co) as principal
not provided for in groups <u>H01L 2224/452</u> - <u>H01L 2224/45291</u> ,	constituent 2224/4536 Iron (Fe) as principal
e.g. allotropes of carbon, fullerene, graphite, carbon-	constituent
nanotubes, diamond	2224/45363 the principal constituent melting at a temperature of
2224/45294 with a principal constituent of the material being a liquid	greater than 1550°C 2224/45364 Palladium (Pd) as
not provided for in groups H01L 2224/452 - H01L 2224/45291	principal constituent
2224/45295 with a principal constituent	2224/45366 Titanium (Ti) as principal constituent
of the material being a gas not provided for in groups	2224/45369 Platinum (Pt) as principal
<u>H01L 2224/452</u> - <u>H01L 2224/45291</u> 2224/45298 Fillers	constituent 2224/4537 Zirconium (Zr) as
2224/45299 Base material	principal constituent 2224/45371 Chromium (Cr) as
2224/453 with a principal constituent of the material being a metal	principal constituent
or a metalloid, e.g. boron (B),	2224/45372 Vanadium (V) as principal constituent
silicon (Si), germanium (Ge), arsenic (As), antimony (Sb),	2224/45373 Rhodium (Rh) as principal
tellurium (Te) and polonium (Po), and alloys thereof	constituent 2224/45376 Ruthenium (Ru) as
2224/45301 the principal constituent	principal constituent 2224/45378 Iridium (Ir) as principal
melting at a temperature of less than 400°C	constituent
2224/45305	2224/45379 Niobium (Nb) as principal constituent
2224/45309 Indium (In) as principal	2224/4538 Molybdenum (Mo) as principal constituent
constituent 2224/45311 Tin (Sn) as principal	2224/45381 Tantalum (Ta) as principal
constituent	constituent 2224/45383 Rhenium (Re) as principal
2224/45313 Bismuth (Bi) as principal constituent	constituent
2224/45314 Thallium (Tl) as principal constituent	2224/45384 Tungsten (W) as principal constituent
2224/45316 Lead (Pb) as principal	2224/45386 with a principal constituent of the material being a non
constituent 2224/45317 the principal constituent	metallic, non metalloid
melting at a temperature of greater than or equal to	inorganic material 2224/45387 Ceramics, e.g. crystalline
400°C and less than 950°C	carbides, nitrides or oxides
2224/45318 Zinc (Zn) as principal constituent	oxides, nitrides or fluorides
2224/4532 Antimony (Sb) as	2224/4539 with a principal constituent of the material being a polymer,
principal constituent 2224/45323 Magnesium (Mg) as	e.g. polyester, phenolic based polymer, epoxy
principal constituent 2224/45324 Aluminium (Al) as	2224/45391 The principal constituent
principal constituent	being an elastomer, e.g. silicones, isoprene, neoprene
2224/45338 the principal constituent melting at a temperature	,,
of greater than or equal to 950°C and less than 1550°C	
2224/45339 Silver (Ag) as principal	
constituent	

2224/45202		0004/45447		
2224/45393	with a principal constituent of the material being a solid	2224/45447 .	• • • •	 Copper (Cu) as principal constituent
	not provided for in groups H01L 2224/453 - H01L 2224/4539	2224/45449 .		 E ,
	e.g. allotropes of carbon,	2224/45455 •		 principal constituent Nickel (Ni) as principal
	fullerene, graphite, carbon-	222 1/ 13 133		 constituent
2224/45204	nanotubes, diamond	2224/45457		 ·
2224/45394	with a principal constituent of the material being a liquid	2224/4546		 constituent . Iron (Fe) as principal
	not provided for in groups		• • • •	 constituent
2224/45205	<u>H01L 2224/453</u> - <u>H01L 2224/4539</u>	2224/45463 .		
2224/45395	with a principal constituent of the material being a gas			melting at a temperature of greater than 1550°C
	not provided for in groups	2224/45464		 • Palladium (Pd) as
2224/45200	H01L 2224/453 - H01L 2224/4539	1		 principal constituent
2224/45398	with a principal constituent of the material being a	2224/45466 .		 · / 1 1
	combination of two or more	2224/45469		constituent Platinum (Pt) as principal
	materials in the form of	2224/43407	• • • •	 constituent
	a matrix with a filler, i.e. being a hybrid material, e.g.	2224/4547		 , , , , ,
	segmented structures, foams	2224/45451		principal constituent
	Coating material	2224/45471 .	• • • •	 Chromium (Cr) as principal constituent
2224/454	with a principal constituent of the material being a metal	2224/45472		
	or a metalloid, e.g. boron (B),			constituent
	silicon (Si), germanium (Ge),	2224/45473 .	• • • •	 Rhodium (Rh) as principal constituent
	arsenic (As), antimony (Sb), tellurium (Te) and polonium	2224/45476 .		
	(Po), and alloys thereof			principal constituent
2224/45401	. the principal constituent	2224/45478 .		 Iridium (Ir) as principal constituent
	melting at a temperature of less than 400°C	2224/45479		
2224/45405				 constituent
	constituent	2224/4548 .		 Molybdenum (Mo) as
2224/45409	. Indium (In) as principal constituent	2224/45481		 principal constituent . Tantalum (Ta) as principal
2224/45411		222 1/ 13 101		 constituent
	constituent	2224/45483 .		 \
2224/45413		2224/45484		constituent Tungsten (W) as principal
2224/45414	constituent Thallium (Tl) as principal	2224/43464 •	• • • •	 constituent
2227/33717	constituent	2224/45486 .		 with a principal constituent
2224/45416				of the material being a non metallic, non metalloid
2224/45417	constituent the principal constituent			inorganic material
2224/4541/	melting at a temperature	2224/45487 .		 . Ceramics, e.g. crystalline
	of greater than or equal to	2224/45499		carbides, nitrides or oxides Glasses, e.g. amorphous
2224/45418	400°C and less than 950°C	2224/43466 •	• • • •	 oxides, nitrides or fluorides
2224/45410	constituent	2224/4549		 with a principal constituent of
2224/4542				the material being a polymer,
2224/45422	principal constituent			e.g. polyester, phenolic based polymer, epoxy
2224/45423	Magnesium (Mg) as principal constituent	2224/45491 .		 . The principal constituent
2224/45424	Aluminium (Al) as			being an elastomer, e.g.
2224/45429	principal constituent	2224/45493		 silicones, isoprene, neoprene with a principal constituent
2224/45438	the principal constituent melting at a temperature			 of the material being a solid
	of greater than or equal to			not provided for in groups
2224/45420	950°C and less than 1550°C			H01L 2224/454 - H01L 2224/45491, e.g. allotropes of carbon,
2224/45439	Silver (Ag) as principal constituent			fullerene, graphite, carbon-
2224/45444				nanotubes, diamond
	constituent			

2224/45494 with a principal constituent of the material being a liquid	2224/45639 Silver (Ag) as principal constituent
not provided for in groups <u>H01L 2224/454</u> - <u>H01L 2224/4549</u>	2224/45644 Gold (Au) as principal constituent
2224/45495 with a principal constituent of the material being a gas	2224/45647 Copper (Cu) as principal constituent
not provided for in groups <u>H01L 2224/454</u> - <u>H01L 2224/4549</u>	2224/45649 Manganese (Mn) as principal constituent
2224/45498 with a principal constituent of the material being a	2224/45655 Nickel (Ni) as principal constituent
combination of two or more materials in the form of	2224/45657 Cobalt (Co) as principal constituent
a matrix with a filler, i.e. being a hybrid material, e.g.	2224/4566 Iron (Fe) as principal constituent 2224/45663 the principal constituent melting
segmented structures, foams	at a temperature of greater than
2224/45499 Shape or distribution of the fillers 2224/4554 Coating	1550°C
2224/45541 Structure	2224/45664 Palladium (Pd) as principal constituent
2224/4555 Shape	2224/45666 Titanium (Ti) as principal
2224/4556 Disposition, e.g. coating on a part of the	constituent
core	2224/45669 Platinum (Pt) as principal
2224/45565 Single coating layer 2224/4557 Plural coating layers	constituent
2224/45572 Two-layer stack coating	2224/4567 Zirconium (Zr) as principal constituent
2224/45573 Three-layer stack coating	2224/45671 Chromium (Cr) as principal
2224/45574 Four-layer stack coating	constituent
2224/45576 being mutually engaged together, e.g. through inserts	2224/45672 Vanadium (V) as principal constituent
2224/45578 being disposed next to each other, e.g. side-to-side arrangements	2224/45673 Rhodium (Rh) as principal constituent
2224/45599 Material	2224/45676 Ruthenium (Ru) as principal
2224/456 with a principal constituent of	constituent
the material being a metal or a metalloid, e.g. boron (B), silicon	2224/45678 Iridium (Ir) as principal constituent
(Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and	2224/45679 Niobium (Nb) as principal constituent
polonium (Po), and alloys thereof	2224/4568 Molybdenum (Mo) as principal
2224/45601 the principal constituent melting at	constituent
a temperature of less than 400°C	2224/45681 Tantalum (Ta) as principal
2224/45605 Gallium (Ga) as principal constituent	constituent 2224/45683 Rhenium (Re) as principal
2224/45609 Indium (In) as principal	constituent
constituent	2224/45684 Tungsten (W) as principal
2224/45611 Tin (Sn) as principal constituent 2224/45613 Bismuth (Bi) as principal	constituent 2224/45686 with a principal constituent of the
constituent	material being a non metallic, non
2224/45614 Thallium (TI) as principal constituent	metalloid inorganic material 2224/45687 Ceramics, e.g. crystalline carbides,
2224/45616 Lead (Pb) as principal constituent	nitrides or oxides
2224/45617 the principal constituent melting at a temperature of greater than or	2224/45688 Glasses, e.g. amorphous oxides, nitrides or fluorides
equal to 400°C and less than 950°C	2224/4569 with a principal constituent of
2224/45618 Zinc (Zn) as principal constituent	the material being a polymer, e.g.
2224/4562 Antimony (Sb) as principal constituent	polyester, phenolic based polymer, epoxy
2224/45623 Magnesium (Mg) as principal constituent	2224/45691 The principal constituent being an elastomer, e.g. silicones, isoprene,
2224/45624 Aluminium (Al) as principal	neoprene 2224/45693 with a principal constituent
constituent 2224/45638 the principal constituent melting	of the material being a solid
at a temperature of greater than	not provided for in groups
or equal to 950°C and less than	H01L 2224/456 - H01L 2224/45691,
1550°C	e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
	• • • • • • • • • • • • • • • • • • • •

2224/45694 with a principal constituent of the material being a liquid	2224/4576 Iron (Fe) as principal constituent
not provided for in groups <u>H01L 2224/456</u> - <u>H01L 2224/45691</u>	2224/45763 the principal constituent melting at a temperature of
2224/45695 with a principal constituent of the material being a gas not provided for in groups	greater than 1550°C 2224/45764 Palladium (Pd) as principal constituent
H01L 2224/456 - H01L 2224/45691 2224/45698 with a principal constituent of the	2224/45766 Titanium (Ti) as principal constituent
material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid	2224/45769 Platinum (Pt) as principal constituent
material, e.g. segmented structures, foams	2224/4577 Zirconium (Zr) as principal constituent 2224/45771 Chromium (Cr) as principal
2224/45699 Material of the matrix	constituent
2224/457 with a principal constituent of the material being a metal or a	2224/45772 Vanadium (V) as principal constituent
metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium	2224/45773 Rhodium (Rh) as principal constituent
(Te) and polonium (Po), and alloys thereof	2224/45776 Ruthenium (Ru) as principal constituent 2224/45778 Iridium (Ir) as principal
2224/45701 the principal constituent	constituent
melting at a temperature of less than 400°C 2224/45705 Gallium (Ga) as principal	2224/45779 Niobium (Nb) as principal constituent
constituent 2224/45709 Indium (In) as principal	2224/4578 Molybdenum (Mo) as principal constituent
constituent 2224/45711 Tin (Sn) as principal	2224/45781 Tantalum (Ta) as principal constituent
constituent 2224/45713 Bismuth (Bi) as principal	2224/45783 Rhenium (Re) as principal constituent
constituent 2224/45714 Thallium (Tl) as principal	2224/45784 Tungsten (W) as principal constituent 2224/45786 with a principal constituent of
constituent 2224/45716 Lead (Pb) as principal	the material being a non metallic, non metalloid inorganic material
constituent 2224/45717 the principal constituent	2224/45787 Ceramics, e.g. crystalline carbides, nitrides or oxides
melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/45788 Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/45718 Zinc (Zn) as principal constituent	2224/4579 with a principal constituent of the material being a polymer,
2224/4572 Antimony (Sb) as principal constituent	e.g. polyester, phenolic based polymer, epoxy
2224/45723 Magnesium (Mg) as principal constituent	2224/45791 The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/45724 Aluminium (Al) as principal constituent	2224/45793 with a principal constituent of the material being a solid
2224/45738 the principal constituent melting at a temperature of greater than or equal to 950°C	not provided for in groups <u>H01L 2224/457</u> - <u>H01L 2224/45791</u> ,
and less than 1550°C	e.g. allotropes of carbon,
2224/45739 Silver (Ag) as principal constituent	fullerene, graphite, carbon- nanotubes, diamond 2224/45794 with a principal constituent
2224/45744 Gold (Au) as principal constituent	of the material being a liquid not provided for in groups
2224/45747 Copper (Cu) as principal constituent	<u>H01L 2224/457</u> - <u>H01L 2224/45791</u> 2224/45795 with a principal constituent
2224/45749 Manganese (Mn) as principal constituent	of the material being a gas not provided for in groups
2224/45755 Nickel (Ni) as principal constituent	<u>H01L 2224/457</u> - <u>H01L 2224/45791</u> 2224/45798 Fillers
2224/45757 Cobalt (Co) as principal constituent	2224/45799 Base material

2224/458	with a principal constituent of the material being a metal	2224/45871	Chromium (Cr) as principal constituent
	or a metalloid, e.g. boron (B),	2224/45872	• • Vanadium (V) as principal
	silicon (Si), germanium (Ge), arsenic (As), antimony (Sb),	2224/45873	· / 1 1
	tellurium (Te) and polonium (Po), and alloys thereof	2224/45876	constituent Ruthenium (Ru) as
2224/45801	• the principal constituent melting at a temperature of		principal constituent
2224/45905	less than 400°C	2224/45878	constituent
2224/45805	constituent	2224/45879	Niobium (Nb) as principal constituent
2224/45809	Indium (In) as principal constituent	2224/4588	• • • Molybdenum (Mo) as principal constituent
2224/45811	Tin (Sn) as principal constituent	2224/45881	
2224/45813	Bismuth (Bi) as principal constituent	2224/45883	Rhenium (Re) as principal
2224/45814		2224/45884	
2224/45816	Lead (Pb) as principal	2224/45886	constituent with a principal constituent
2224/45817	constituent . the principal constituent		of the material being a non metallic, non metalloid
	melting at a temperature of greater than or equal to		inorganic material
	400°C and less than 950°C	2224/45887	• Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/45818	constituent	2224/45888	• Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/4582	Antimony (Sb) as principal constituent	2224/4589	• with a principal constituent of the material being a polymer,
2224/45823	Magnesium (Mg) as principal constituent		e.g. polyester, phenolic based polymer, epoxy
2224/45824		2224/45891	The principal constituent
2224/45838	. the principal constituent		being an elastomer, e.g. silicones, isoprene, neoprene
	melting at a temperature of greater than or equal to	2224/45893	 with a principal constituent of the material being a solid
2224/45839	950°C and less than 1550°C Silver (Ag) as principal		not provided for in groups H01L 2224/458 - H01L 2224/45891,
	constituent		e.g. allotropes of carbon,
2224/45844	constituent		fullerene, graphite, carbon- nanotubes, diamond
2224/45847	Copper (Cu) as principal constituent	2224/45894	with a principal constituent of the material being a liquid
2224/45849	Manganese (Mn) as principal constituent		not provided for in groups H01L 2224/458 - H01L 2224/45891
2224/45855	Nickel (Ni) as principal	2224/45895	• with a principal constituent
2224/45857	constituent Cobalt (Co) as principal		of the material being a gas not provided for in groups
2224/4586	constituent . Iron (Fe) as principal	2224/45898	<u>H01L 2224/458</u> - <u>H01L 2224/45891</u> • with a principal constituent
2224/45863	constituent		of the material being a combination of two or more
2224/43003	melting at a temperature of		materials in the form of a matrix with a filler, i.e.
2224/45864			being a hybrid material, e.g. segmented structures, foams
2224/45866	principal constituent . Titanium (Ti) as principal	2224/45899	Coating material
	constituent	2224/459	• with a principal constituent of the material being a metal
2224/45869	constituent		or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge),
2224/4587	Zirconium (Zr) as principal constituent		arsenic (As), antimony (Sb),
			tellurium (Te) and polonium (Po), and alloys thereof

melting at a temperature of	2224/45979 Niobium (Nb) as principal
less than 400°C	constituent
constituent 2224/45909 Indium (In) as principal	2224/4598 Molybdenum (Mo) as principal constituent
constituent	2224/45981 Tantalum (Ta) as principal
2224/45911 Tin (Sn) as principal constituent	constituent 2224/45983 Rhenium (Re) as principal
2224/45913 Bismuth (Bi) as principal constituent	constituent 2224/45984 Tungsten (W) as principal
2224/45914 Thallium (Tl) as principal constituent	constituent 2224/45986 with a principal constituent
2224/45916 Lead (Pb) as principal constituent	of the material being a non metallic, non metalloid
2224/45917 the principal constituent	inorganic material
melting at a temperature of greater than or equal to	2224/45987 Ceramics, e.g. crystalline carbides, nitrides or oxides
400°C and less than 950°C 2224/45918 Zinc (Zn) as principal	2224/45988 Glasses, e.g. amorphous oxides, nitrides or fluorides
constituent	2224/4599 with a principal constituent of
2224/4592 Antimony (Sb) as principal constituent	the material being a polymer, e.g. polyester, phenolic based
2224/45923 Magnesium (Mg) as	polymer, epoxy
principal constituent 2224/45924 Aluminium (Al) as	2224/45991 The principal constituent being an elastomer, e.g.
principal constituent	silicones, isoprene, neoprene
2224/45938 the principal constituent melting at a temperature of greater than or equal to	2224/45993 with a principal constituent of the material being a solid not provided for in groups
950°C and less than 1550°C	<u>H01L 2224/459</u> - <u>H01L 2224/45991</u> ,
2224/45939 Silver (Ag) as principal constituent	e.g. allotropes of carbon, fullerene, graphite, carbon-
2224/45944 Gold (Au) as principal constituent	nanotubes, diamond 2224/45994 with a principal constituent
2224/45947 Copper (Cu) as principal constituent	of the material being a liquid not provided for in groups
2224/45949 Manganese (Mn) as principal constituent	H01L 2224/459 - H01L 2224/45991 2224/45995 with a principal constituent
2224/45955 Nickel (Ni) as principal constituent	of the material being a gas not provided for in groups
2224/45957 Cobalt (Co) as principal	H01L 2224/459 - H01L 2224/45991 2224/45998 with a principal constituent
constituent 2224/4596 Iron (Fe) as principal	of the material being a combination of two or more
constituent	materials in the form of
2224/45963 the principal constituent melting at a temperature of	a matrix with a filler, i.e. being a hybrid material, e.g.
greater than 1550°C 2224/45964 Palladium (Pd) as	segmented structures, foams
principal constituent	2224/45999 Shape or distribution of the fillers
2224/45966 Titanium (Ti) as principal	2224/46 of a plurality of wire connectors 2224/47 Structure, shape, material or disposition of the
constituent 2224/45969 Platinum (Pt) as principal	wire connectors after the connecting process
constituent	2224/48 of an individual wire connector 2224/4801 Structure
2224/4597 Zirconium (Zr) as principal constituent	2224/4801 Structure 2224/48011 Length
2224/45971 Chromium (Cr) as	2224/4805 Shape
principal constituent	2224/4807 of bonding interfaces, e.g. interlocking features
2224/45972 Vanadium (V) as principal constituent	2224/4809 Loop shape
2224/45973 Rhodium (Rh) as principal	2224/48091 Arched
constituent	2224/48092 Helix
2224/45976 Ruthenium (Ru) as principal constituent	2224/48095 Kinked

22448107 the kinked part being in proximity to be bonding area outside the semiconductor or solid-state body 22448158 the bond part of the item being account of the item ac	2224/48096 the kinked part being in proximity to the bonding area on the semiconductor or solid-state body	2224/48155 the item being non-metallic, e.g. insulating substrate with or without metallisation
Disposition Disposition Disposition Disposition Connecting bonding areas at the same height, e.g. horizontal bond Disposition Di	2224/48097 the kinked part being in proximity to the bonding area outside the	2224/48157 connecting the wire to a bond pad of the item
2224/48105 Connecting bonding areas at the same beight, e.g., bortzumtal blond beights Connecting bonding areas at different beights Connecting bonding areas at different beights Connecting bonding areas at different self-gas at surface of the surface		
Legistrice, Lorizontal bond 2224/48159 the bond pad protruding from the surface of the item being and different solid-state body, e.g. continuous wire daisy chain cherry or solid-state body, e.g. continuous wire daisy chain bonding area of the surface of		
Connecting bonding areas at different heights as wife as of the semiconductor or soll-d-state body, e.g. parallel layout or soll-d-state body, e.g. parallel layout or soll-d-state body, e.g. parallel layout connectors, radial layout connecting the write to a bond para do fits bettern the bonding area outside the semiconductor or solid-state body, e.g. drag continuous wire daisy chain connecting to a bonding area of sposed in a recess of the surface of the item connecting the write to a point of the body and the item being areasy continuous wire daisy chain connecting to a bonding area of possed in a recess of the surface of the item connecting the write to a point of the item connecting the surface of the item connecting th		
side surface of the semiconductor or solid-state body, e.g. framell layout to a potential ring of the item connector on being orthogonal to a side surface of the semiconductor or solid-state body, e.g. famed-out cornecting the semiconductor or solid-state body, e.g. famed-out cornecting to a bonding area of the semiconductor or solid-state body body with respect to the bonding area outside the semiconductor or solid-state body body with respect to the bonding area outside the semiconductor or solid-state body body another semiconductor or solid-state body body with the wire connector semiconductor or solid-state body i.e. fly wire, bridge wire with an intermediate bond, e.g. continuous wire daisy chain continuous wire daisy chain bonding area approach another, e.g. on a common substrate body the body and an another semiconductor or solid-state body. e.g. continuous wire daisy chain continuous wire daisy chain the surface bonding area protruding from the surface another semiconductor or solid-state body. e.g. continuous wire daisy chain continuous wire daisy chain another semiconductor or solid-state body. e.g. continuous wire daisy chain continuous wire daisy chain another semiconductor or solid-state body. e.g. continuous wire daisy chain continuous wire daisy chain another semiconductor or solid-state body. e.g. continuous wire daisy chain continuous wire daisy chain another semiconductor or solid-state body. e.g. continuous wire daisy chain another semiconductor or solid-state body. e.g. continuous wire daisy chain another semiconductor or solid-state body. e.g. continuous wire daisy chain another semiconductor or solid-state body. e.g. continuous wire daisy chain another semiconductor or solid-state body and the item being stacked another semiconductor or solid-state body and the item being stacked another semiconductor or solid-state body. e.g. continuous wire daisy c	2224/48105 Connecting bonding areas at different	the surface of the item
side surface of the semiconductor or solid-state body, e.g., famed out connecting the wire to a via metallisation of the item or solid-state body, e.g., famed out connecting the wire to a via metallisation of the item or solid-state body, e.g., famed out connecting the wire to a via metallisation of the item or solid-state body to a bonding area of the semiconductor or solid-state body located at the far end of the body with respect to the bonding area outside the semiconductor or solid-state body to located at the far end of the body with respect to the bonding area outside the semiconductor or solid-state body to connecting the wire to a bonding area outside the semiconductor or solid-state body and the item semiconductor or solid-state body and the item being a discrete passive component or solid-state body seminor of the item being a discrete passive component or solid-state body seminor of the item being a discrete passive component or solid-state body seminor of the item being a discrete passive component or solid-state body seminor of the item being a discrete passive component or solid-state body seminor or solid-state body and the item being adiscrete passive component or solid-state body seminor or solid-state body and seminor or solid-state body seminor or solid-state body, e.g., chip to substrate, e.g. mirror arrangements seminor or solid-state body, e.g., chip to substrate, e.g. mirror arrangements or solid-state body, e.g., chip to substrate, e.g. mirror solid-state body, e.g., chip to substrate, e.g. mirror solid-state body, e.g., chip to substrate, e.g. mirror solid-state body, e.g.,	e e e e e e e e e e e e e e e e e e e	
2224/48108	side surface of the semiconductor or	2224/48163 connecting the wire to a potential
connecting that all ayout 2224/4811 Connecting to a bonding area of the semiconductor or solid-state body located at the far end of the body with respect to the bonding area outside the semiconductor or solid-state body semiconductor or solid-state body semiconductor or solid-state body and the removement of the item 2224/48113 the wire connector extending above another semiconductor or solid-state body with a semiconductor or solid-state body with a semiconductor or solid-state body wire wire connecting the wire to a potential ring of the item being a discrete passive component wire connecting the wire to a potential ring of the item being a discrete passive component wire continuous wire daisy chain characteristics and the surface of the item being a discrete passive component wire common substrate semiconductor or solid-state body. e.g. chip-to-chip capable semiconductor or solid-state body i.e. chip-to-chip capable semiconductor or solid-state bodies, i.e. chip-to-chip capable semiconductor or solid-state bodies, i.e. chip-to-chip capable semiconductor or solid-state bodies, i.e. chip-to-chip capable semiconductor or solid-state bodies i.e. chip-to-chip capable semiconductor or solid-state body and semiconductor or solid-state body and semiconductor or solid-state body and an intermotiate semiconductor or solid-state body and an item not being a semiconductor or solid-state body, and an item not being a semiconductor or solid-state body, and an item not being a semiconductor or solid-state body, and an item not being a semiconductor or solid-state body, and an item not being a semi	2224/48108 the connector not being orthogonal to	2224/48165 connecting the wire to a via
Connecting to a bonding area of the semiconductor or solid-state body located at the far end of the body with respect to the bonding area outside the semiconductor or solid-state body in the semiconductor or solid-state body another semiconductor or solid-state body another semiconductor or solid-state body another semiconductor or solid-state body and the imen being a semiconductor or solid-state body wire solid-state body and in term on being a semiconductor or solid-state body and in term on being a semiconductor or solid-state body and in term on being a semiconductor or solid-state body and in term on being a semiconductor or solid-state body and in term on being a semiconductor or solid-state body and in term on being a semiconductor or solid-state body and in term on being a semiconductor or solid-state body and in term on being a semiconductor or solid-state body and in term on being a semiconductor or		
2224/4811 Connecting to a bonding area of the semiconductor or solid-state body located at the far end of the body with respect to the bonding area outside the semiconductor or solid-state body and the item being a discrete passive component of the item being add of the item being add of the item and the item being disposed in a recess of the surface of the item of the item being disposed in a recess of the surface of the item of the surface of the item of the		
semiconductor or solid-state body located at the far end of the body with respect to the bonding area outside the semiconductor or solid-state body 2224/48111	·	
respect to the bonding area outside the semiconductor or solid-state body and the item connector extending above another semiconductor or solid-state body of solid-state body i.e. fly wire, bridge wire solid-state body, i.e. fly wire, bridge wire continuous wire daisy chain semiconductor or solid-state body i.e. fly wire, bridge wire wire to a both of the item being and siscrete passive component solid-state body i.e. fly wire, bridge wire continuous wire daisy chain centre of the item being and siscrete passive component solid-state body i.e. chip-to-chip continuous wire daisy chain semiconductor or solid-state bodies, i.e. chip-to-chip continuous wire daisy chain centre of the surface of the item being and siscrete passive component solid-state bodies, i.e. chip-to-chip continuous wire daisy chain centre of the surface of the item being and siscrete passive component component solid-state bodies, i.e. chip-to-chip continuous wire daisy chain centre of the surface of the item being and siscrete passive component component solid-state bodies, i.e. chip-to-chip continuous wire daisy chain centre of the surface of the item being and siscrete passive component	semiconductor or solid-state body	2224/48178 the bond pad being disposed in a
semiconductor or solid-state body another semiconductor or solid-state body body 2224/48131 Connecting within a semiconductor or solid-state body, i.e. fly wire, bridge wire wire 2224/48132 with an intermediate bond, e.g. continuous wire daisy chain emitted between different semiconductor or solid-state bodies, i.e. fly wire, bridge wire 2224/48135 Connecting between different semiconductor or solid-state bodies, i.e. chip-to-chip 2224/48137 the bodies being arranged next to each other, e.g. on a common substrate 2224/48138 the wire connector connecting to a bonding area protruding from the surface 2224/48141 the bodies being arranged on opposite sides of a substrate, e.g. mirror arrangements 2224/48147 with an intermediate bond, e.g. continuous wire daisy chain bonding area protruding from the surface 2224/48148 the wire connector connecting to a bonding area protruding from the surface 2224/48147 with an intermediate bond, e.g. continuous wire daisy chain bonding area protruding from the surface 2224/48148 the wire connector connecting to a bonding area protruding from the surface and sides of a substrate, e.g. mirror arrangements 2224/48147 with an intermediate bond, e.g. continuous wire daisy chain bonding area protruding from the surface 2224/48148 the wire connector connecting to a bonding area disposed in a recess of the surface 2224/48148 the wire connector connecting to a bonding area area disposed in a recess of the surface 2224/48148 the wire connector connecting to a bonding area protruding from the surface 2224/48148 the wire connector connecting to a bonding area protruding from the surface 2224/48149 the bodies being stacked 2224/48149 the wire to onnecting to a bonding area area disposed in a recess of the surface 2224/48149 the wire connector connecting to a bonding area protruding from the surface 2224/48151 Connecting between a semiconductor or solid-state body and an item not being a semiconductor or solid-state body, e.g. chip-to-substrate, e.g. on a common substrate 2224/48251 connecting		
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semiconductor or solid-state body, e.g. chip-to-substrate, chip-to-passive 2224/48153 the body and the item being arranged next to each other, e.g. on a common substrate 2224/48257		the surface of the item
chip-to-substrate, chip-to-passive 2224/48153 the body and the item being arranged next to each other, e.g. on a common substrate 2224/4826		
2224/48153 the body and the item being arranged next to each other, e.g. on a common substrate 2224/48257 connecting the wire to a die pad of the item 2224/4826 Connecting the wire to a die pad of the item 2224/4826		
substrate 2224/4826	2224/48153 the body and the item being arranged	-
and an opposite side of the item	_	
	substrate	and an opposite side of the item

2224/48265 the item being a discrete passive component	2224/4849 outside the semiconductor or solid-state body
2224/484 Connecting portions	2224/48491 being an additional member
2224/4845 Details of ball bonds	attached to the bonding area
2224/48451 Shape	through an adhesive or solder, e.g.
2224/48453 of the interface with the bonding	buffer pad
area	2224/48496 not being interposed between the wire
2224/48455 Details of wedge bonds	connector and the bonding area
2224/48456 Shape	2224/48499 Material of the auxiliary connecting
•	means
2224/48458 of the interface with the bonding	2224/485 Material
area	2224/48505 at the bonding interface
2224/4846 with multiple bonds on the same	
bonding area	2224/48506 comprising an eutectic alloy
2224/48463 the connecting portion on the bonding	2224/48507 comprising an intermetallic
area of the semiconductor or solid-state	compound
body being a ball bond	2224/4851 Morphology of the connecting
2224/48464 the other connecting portion not on	portion, e.g. grain size distribution
the bonding area also being a ball	2224/48511 Heat affected zone [HAZ]
bond, i.e. ball-to-ball	2224/4852 Bonding interface between the
2224/48465 the other connecting portion not on	connecting portion and the bonding
the bonding area being a wedge bond,	area
i.e. ball-to-wedge, regular stitch	2224/48599 Principal constituent of the
2224/4847 the connecting portion on the bonding	connecting portion of the wire
area of the semiconductor or solid-state	connector being Gold (Au)
body being a wedge bond	2224/486 with a principal constituent of the
	bonding area being a metal or a
2224/48471 the other connecting portion not on	metalloid, e.g. boron (B), silicon
the bonding area being a ball bond,	
i.e. wedge-to-ball, reverse stitch	(Si), germanium (Ge), arsenic (As),
2224/48472 the other connecting portion not on	antimony (Sb), tellurium (Te) and
the bonding area also being a wedge	polonium (Po), and alloys thereof
bond, i.e. wedge-to-wedge	2224/48601 the principal constituent melting
2224/48475 connected to auxiliary connecting means	at a temperature of less than
on the bonding areas, e.g. pre-ball,	400°C
wedge-on-ball, ball-on-ball	2224/48605 Gallium (Ga) as principal
2224/48476 between the wire connector and the	constituent
bonding area	2224/48609 Indium (In) as principal
2224/48477 being a pre-ball (i.e. a ball formed	constituent
by capillary bonding)	2224/48611 Tin (Sn) as principal
2224/48478 the connecting portion being a	constituent
wedge bond, i.e. wedge on pre-	2224/48613 Bismuth (Bi) as principal
ball	constituent
	2224/48614 Thallium (Tl) as principal
2224/48479 on the semiconductor or solid-	constituent
state body	
2224/4848 outside the semiconductor or	2224/48616 Lead (Pb) as principal
solid-state body	constituent
2224/48481 the connecting portion being a	2224/48617 the principal constituent melting
ball bond, i.e. ball on pre-ball	at a temperature of greater than
2224/48482 on the semiconductor or solid-	or equal to 400°C and less than
state body	950 °C
2224/48483 outside the semiconductor or	2224/48618 Zinc (Zn) as principal
solid-state body	constituent
2224/48484 being a plurality of pre-balls	2224/4862 Antimony (Sb) as principal
disposed side-to-side	constituent
2224/48485 the connecting portion being a	2224/48623 Magnesium (Mg) as principal
wedge bond, i.e. wedge on pre-	constituent
	2224/48624 Aluminium (Al) as principal
ball	constituent
2224/48486 on the semiconductor or	
solid-state body	2224/48638 the principal constituent melting
2224/48487 outside the semiconductor or	at a temperature of greater than
solid-state body	or equal to 950°C and less than
2224/48488 the connecting portion being a	1550°C
ball bond, i.e. ball on pre-ball	2224/48639 Silver (Ag) as principal
2224/48489 on the semiconductor or	constituent
solid-state body	
·	

2224/48644	Gold (Au) as principal constituent	2224/48694	of the bonding area being a
2224/48647	Copper (Cu) as principal constituent		liquid not provided for in groups H01L 2224/486 - H01L 2224/4869
2224/48649	Manganese (Mn) as principal constituent	2224/48698	 with a principal constituent of the bonding area being a combination
2224/48655	Nickel (Ni) as principal constituent		of two or more material regions, i.e. being a hybrid material, e.g.
2224/48657			segmented structures, island patterns
2224/4866			Principal constituent of the connecting portion of the wire
2224/48663	. the principal constituent melting		connector being Aluminium (Al)
	at a temperature of greater than 1550°C	2224/487	bonding area being a metal or a
2224/48664	• Palladium (Pd) as principal constituent		metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As),
2224/48666	Titanium (Ti) as principal constituent		antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof
2224/48669		2224/48701	• • the principal constituent melting at a temperature of less than
2224/4867		2224/48705	400°C Gallium (Ga) as principal
2224/48671	constituent • Chromium (Cr) as principal	2224/40/03	constituent
2224/400/1	constituent	2224/48709	Indium (In) as principal constituent
2224/48672	Vanadium (V) as principal constituent	2224/48711	Tin (Sn) as principal
2224/48673	Rhodium (Rh) as principal constituent	2224/48713	constituent Bismuth (Bi) as principal
2224/48678		2224/48714	constituent Thallium (Tl) as principal
2224/48679	Niobium (Nb) as principal	2224/48716	constituent Lead (Pb) as principal
2224/4868	constituentMolybdenum (Mo) as principal		constituent
	constituent	2224/48717	• the principal constituent melting at a temperature of greater than
2224/48681	constituent		or equal to 400°C and less than 950 °C
2224/48683	Rhenium (Re) as principal constituent	2224/48718	Zinc (Zn) as principal
2224/48684	Tungsten (W) as principal constituent	2224/4872	
2224/48686	with a principal constituent of the bonding area being a non metallic,	2224/48723	constituent Magnesium (Mg) as principal
	non metalloid inorganic material	2224/48724	constituent Aluminium (Al) as principal
2224/48687	 Ceramics, e.g. crystalline carbides, nitrides or oxides 	2224/40/24	constituent
2224/48688	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/48738	• the principal constituent melting at a temperature of greater than
2224/4869	with a principal constituent of the		or equal to 950°C and less than 1550°C
	bonding area being a polymer, e.g. polyester, phenolic based polymer,	2224/48739	
2224/48691	1 1	2224/48744	Gold (Au) as principal constituent
	an elastomer, e.g. silicones, isoprene, neoprene	2224/48747	
2224/48693	with a principal constituent of the bonding area being a	2224/48749	
	solid not provided for in groups <u>H01L 2224/486</u> - <u>H01L 2224/4869</u> ,	2224/48755	
	e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes,	2224/48757	Cobalt (Co) as principal
	diamond	2224/4876	constituent Iron (Fe) as principal
			constituent

2224/48763 the principal constituent melting at a temperature of greater than 1550°C	2224/488 with a principal constituent of the bonding area being a metal or a metalloid, e.g. boron (B), silicon
2224/48764 Palladium (Pd) as principal constituent	(Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and
2224/48766 Titanium (Ti) as principal constituent	polonium (Po), and alloys thereof 2224/48801 the principal constituent melting at a temperature of less than
2224/48769 Platinum (Pt) as principal constituent	400°C
2224/4877 Zirconium (Zr) as principal constituent	2224/48805 Gallium (Ga) as principal constituent
2224/48771 Chromium (Cr) as principal constituent	2224/48809 Indium (In) as principal constituent
2224/48772 Vanadium (V) as principal constituent	2224/48811 Tin (Sn) as principal constituent
2224/48773 Rhodium (Rh) as principal constituent	2224/48813 Bismuth (Bi) as principal constituent
2224/48778 Iridium (Ir) as principal constituent	2224/48814 Thallium (Tl) as principal constituent
2224/48779 Niobium (Nb) as principal constituent	2224/48816 Lead (Pb) as principal constituent
2224/4878 Molybdenum (Mo) as principal constituent	2224/48817 the principal constituent melting at a temperature of greater than
2224/48781 Tantalum (Ta) as principal constituent	or equal to 400°C and less than 950 °C
2224/48783 Rhenium (Re) as principal constituent	2224/48818 Zinc (Zn) as principal constituent
2224/48784 Tungsten (W) as principal constituent	2224/4882 Antimony (Sb) as principal constituent
2224/48786 with a principal constituent of the bonding area being a non metallic,	2224/48823 Magnesium (Mg) as principal constituent
non metalloid inorganic material 2224/48787 Ceramics, e.g. crystalline	2224/48824 Aluminium (Al) as principal constituent
carbides, nitrides or oxides	2224/48838 the principal constituent melting at a temperature of greater than
2224/48788 Glasses, e.g. amorphous oxides, nitrides or fluorides	or equal to 950°C and less than 1550°C
2224/4879 with a principal constituent of the bonding area being a polymer, e.g.	2224/48839 Silver (Ag) as principal constituent
polyester, phenolic based polymer, epoxy	2224/48844 Gold (Au) as principal
2224/48791 The principal constituent being an elastomer, e.g. silicones,	constituent 2224/48847 Copper (Cu) as principal
isoprene, neoprene 2224/48793 with a principal constituent	constituent 2224/48849 Manganese (Mn) as principal
of the bonding area being a solid not provided for in groups	constituent 2224/48855 Nickel (Ni) as principal
<u>H01L 2224/487</u> - <u>H01L 2224/4879</u> ,	constituent
e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes,	2224/48857 Cobalt (Co) as principal constituent
diamond 2224/48794 with a principal constituent	2224/4886 Iron (Fe) as principal constituent
of the bonding area being a liquid not provided for in groups	2224/48863 the principal constituent melting at a temperature of greater than
<u>H01L 2224/487</u> - <u>H01L 2224/4879</u>	1550°C
2224/48798 with a principal constituent of the bonding area being a combination	2224/48864 Palladium (Pd) as principal constituent
of two or more material regions, i.e. being a hybrid material, e.g.	2224/48866 Titanium (Ti) as principal constituent
segmented structures, island patterns	2224/48869 Platinum (Pt) as principal constituent
2224/48799 Principal constituent of the connecting portion of the wire	2224/4887 Zirconium (Zr) as principal constituent
connector being Copper (Cu)	2224/48871 Chromium (Cr) as principal constituent

2224/48872 Vanadium (V) as principal	2224/49051 Connectors having different shapes
constituent	2224/49052 Different loop heights
2224/48873 Rhodium (Rh) as principal	2224/4909 Loop shape arrangement
constituent	2224/49095 parallel in plane
2224/48878 Iridium (Ir) as principal	2224/49096 horizontal
constituent	2224/49097 vertical
2224/48879 Niobium (Nb) as principal	2224/491 Disposition
constituent	2224/49105 Connecting at different heights
2224/4888 Molybdenum (Mo) as principal	2224/49107 on the semiconductor or solid-state
constituent	body
2224/48881 Tantalum (Ta) as principal	2224/49109 outside the semiconductor or solid-
constituent	state body
2224/48883 Rhenium (Re) as principal	•
constituent	2224/4911 the connectors being bonded to at least one common bonding area, e.g. daisy
2224/48884 Tungsten (W) as principal	chain
constituent	2224/49111 the connectors connecting two
2224/48886 with a principal constituent of the	common bonding areas, e.g. Litz or
bonding area being a non metallic,	braid wires
non metalloid inorganic material	2224/49112 the connectors connecting a common
2224/48887 Ceramics, e.g. crystalline	bonding area on the semiconductor or
carbides, nitrides or oxides	solid-state body to different bonding
2224/48888 Glasses, e.g. amorphous oxides,	areas outside the body, e.g. diverging
nitrides or fluorides	wires
2224/4889 with a principal constituent of the	2224/49113 the connectors connecting different
bonding area being a polymer, e.g.	bonding areas on the semiconductor
polyester, phenolic based polymer,	or solid-state body to a common
epoxy	bonding area outside the body, e.g.
2224/48891 The principal constituent being	converging wires
an elastomer, e.g. silicones,	2224/4912 Layout
isoprene, neoprene	2224/4917 Crossed wires
2224/48893 with a principal constituent	2224/49171 Fan-out arrangements
of the bonding area being a	2224/49173 Radial fan-out arrangements
solid not provided for in groups	2224/49174 Stacked arrangements
H01L 2224/488 - H01L 2224/4889, e.g. allotropes of carbon, fullerene,	2224/49175 Parallel arrangements
graphite, carbon-nanotubes,	2224/49176 Wire connectors having the same
diamond	loop shape and height
2224/48894 with a principal constituent	2224/49177 Combinations of different
of the bonding area being a	arrangements
liquid not provided for in groups	2224/49179 Corner adaptations, i.e. disposition
H01L 2224/488 - H01L 2224/4889	of the wire connectors at the
2224/48898 with a principal constituent of the	corners of the semiconductor or
bonding area being a combination	solid-state body
of two or more material regions,	2224/4918 being disposed on at least two different
i.e. being a hybrid material, e.g.	sides of the body, e.g. dual array
segmented structures, island	2224/494 Connecting portions
patterns	2224/4941 the connecting portions being stacked
2224/4899 Auxiliary members for wire connectors,	2224/4942 Ball bonds
e.g. flow-barriers, reinforcing structures,	2224/49421 on the semiconductor or solid-state
spacers, alignment aids	body
2224/48991 being formed on the semiconductor or	2224/49422 outside the semiconductor or solid-
solid-state body to be connected	state body
2224/48992 Reinforcing structures	2224/49425 Wedge bonds
2224/48993 Alignment aids	2224/49426 on the semiconductor or solid-state
2224/48996 being formed on an item to be connected	body 2224/40427 outside the comiconductor or solid
not being a semiconductor or solid-state body	2224/49427 outside the semiconductor or solid- state body
	•
2224/48997 Reinforcing structures	2224/49429 Wedge and ball bonds
2224/48998 Alignment aids	2224/4943 the connecting portions being staggered
2224/49 of a plurality of wire connectors	2224/49431 on the semiconductor or solid-state
2224/4901 Structure	body 2224/49433 outside the semiconductor or solid
2224/4903 Connectors having different sizes, e.g. different diameters	2224/49433 outside the semiconductor or solid- state body
	state body
2224/4905 Shape	

2224/4945 Wire connectors having connecting	2224/73263 Layer and strap connectors
portions of different types on the	2224/73265 Layer and wire connectors
semiconductor or solid-state body, e.g. regular and reverse stitches	2224/73267 Layer and HDI connectors
2224/495 Material	2224/73269 Layer and TAB connectors
2224/49505 Connectors having different materials	2224/73271 Strap and wire connectors
2224/49303 Collinectors having different materials 2224/50 Tape automated bonding [TAB] connectors, i.e.	2224/73273 Strap and HDI connectors
film carriers; Manufacturing methods related	2224/73275 Strap and TAB connectors
thereto	2224/73277 Wire and HDI connectors
2224/63 • Connectors not provided for in any of the groups	2224/73279 Wire and TAB connectors
H01L 2224/10 - H01L 2224/50 and subgroups;	2224/73281 HDI and TAB connectors
Manufacturing methods related thereto	2224/74 • Apparatus for manufacturing arrangements for
2224/64 Manufacturing methods	connecting or disconnecting semiconductor or solid- state bodies and for methods related thereto
2224/65 Structure, shape, material or disposition of the	2224/741 • • Apparatus for manufacturing means for bonding,
connectors prior to the connecting process	e.g. connectors
2224/66 • • • of an individual connector	2224/742 Apparatus for manufacturing bump connectors
2224/67 of a plurality of connectors	2224/743 Apparatus for manufacturing layer connectors
2224/68 Structure, shape, material or disposition of the	2224/744 Apparatus for manufacturing strap connectors
connectors after the connecting process	2224/745 Apparatus for manufacturing wire connectors
2224/69 of an individual connector	2224/749 Tools for reworking, e.g. for shaping
2224/70 of a plurality of connectors	2224/75 . Apparatus for connecting with bump connectors
• Means for bonding not being attached to, or not	or layer connectors
being formed on, the surface to be connected	2224/75001 Calibration means
. Detachable connecting means consisting of	2224/7501 Means for cleaning, e.g. brushes, for hydro
mechanical auxiliary parts connecting the device,	blasting, for ultrasonic cleaning, for dry
e.g. pressure contacts using springs or clips	ice blasting, using gas-flow, by etching, by
2224/73 • Means for bonding being of different types provided for in two or more of groups H01L 2224/10,	applying flux or plasma
H01L 2224/18, H01L 2224/26, H01L 2224/34,	2224/751 Means for controlling the bonding
H01L 2224/42, H01L 2224/50, H01L 2224/63,	environment, e.g. valves, vacuum pumps
H01L 2224/71	2224/75101 Chamber
2224/731 . Location prior to the connecting process	2224/75102 Vacuum chamber
2224/73101 on the same surface	2224/7511 High pressure chamber
2224/73103 Bump and layer connectors	2224/7515 Means for applying permanent coating, e.g. in-
2224/73104 the bump connector being embedded into	situ coating
the layer connector	2224/75151 Means for direct writing
2224/73151 on different surfaces	2224/75152 Syringe
2224/73153 Bump and layer connectors	2224/75153 integrated into the bonding head
2224/732 . Location after the connecting process	2224/75155 Jetting means, e.g. ink jet
2224/73201 on the same surface	2224/75158 including a laser
2224/73203 Bump and layer connectors	2224/75161 Means for screen printing, e.g. roller,
2224/73204 the bump connector being embedded into	squeegee, screen stencil 2224/7517 Means for applying a preform, e.g. laminator
the layer connector	2224/7517 including a vacuum-bag
2224/73205 Bump and strap connectors	2224/7518 Means for blanket deposition
2224/73207 Bump and wire connectors	2224/75181 for spin coating, i.e. spin coater
2224/73209 Bump and HDI connectors	2224/75182 for curtain coating
2224/73211 Bump and TAB connectors	2224/75183 for immersion coating, i.e. bath
2224/73213 Layer and strap connectors	2224/75184 for spray coating, i.e. nozzle
2224/73215 Layer and wire connectors	2224/75185 Means for physical vapour deposition
2224/73217 Layer and HDI connectors	[PVD], e.g. evaporation, sputtering
2224/73219 Layer and TAB connectors	2224/75186 Means for sputtering, e.g. target
2224/73221 Strap and wire connectors	2224/75187 Means for evaporation
2224/73223 Strap and HDI connectors	2224/75188 Means for chemical vapour deposition
2224/73225 Strap and TAB connectors	[CVD], e.g. for laser CVD
2224/73227 Wire and HDI connectors	2224/75189 Means for plating, e.g. for electroplating,
2224/73229 Wire and TAB connectors	electroless plating
2224/73231 HDI and TAB connectors	2224/752 Protection means against electrical discharge
2224/73251 on different surfaces	2224/7525 Means for applying energy, e.g. heating means
2224/73253 Bump and layer connectors	2224/75251 in the lower part of the bonding apparatus,
2224/73255 Bump and strap connectors	e.g. in the apparatus chuck
2224/73257 Bump and wire connectors	2224/75252 in the upper part of the bonding apparatus,
2224/73259 Bump and HDI connectors	e.g. in the bonding head
2224/73261 Bump and TAB connectors	2224/75253 adapted for localised heating

2224/7526 Polychromatic heating lamp	2224/75501 in the lower part of the handing apparatus
2224/75261 Laser	2224/75501 in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/75262 in the lower part of the bonding apparatus,	2224/75502 in the upper part of the bonding apparatus,
e.g. in the apparatus chuck	e.g. in the bonding head
2224/75263 in the upper part of the bonding apparatus,	2224/7555 • • • Mechanical means, e.g. for planarising,
e.g. in the bonding head	pressing, stamping
5	2224/756 Means for supplying the connector to be
2224/75264 by induction heating, i.e. coils	connected in the bonding apparatus
2224/75265 in the lower part of the bonding apparatus,	2224/75601 Storing means
e.g. in the apparatus chuck	2224/75611 Feeding means
2224/75266 in the upper part of the bonding apparatus, e.g. in the bonding head	2224/75621 Holding means
	-
2224/75267 Flame torch, e.g. hydrogen torch	2224/7565 Means for transporting the components to be connected
2224/75268 Discharge electrode	2224/75651 Belt conveyor
2224/75269 Shape of the discharge electrode	-
2224/7527 Material of the discharge electrode	2224/75652 Chain conveyor
2224/75271 Circuitry of the discharge electrode	2224/75653 Vibrating conveyor
2224/75272 Oven	2224/75654 Pneumatic conveyor
2224/7528 Resistance welding electrodes, i.e. for ohmic	2224/75655 in a fluid
heating	2224/757 Means for aligning
2224/75281 in the lower part of the bonding apparatus,	2224/75701 in the lower part of the bonding apparatus,
e.g. in the apparatus chuck	e.g. in the apparatus chuck
2224/75282 in the upper part of the bonding apparatus,	2224/75702 in the upper part of the bonding apparatus,
e.g. in the bonding head	e.g. in the bonding head
2224/75283 by infrared heating, e.g. infrared heating	2224/75703 Mechanical holding means
lamp	2224/75704 in the lower part of the bonding apparatus,
2224/753 by means of pressure	e.g. in the apparatus chuck
2224/75301 Bonding head	2224/75705 in the upper part of the bonding apparatus,
2224/75302 Shape	e.g. in the bonding head
2224/75303 of the pressing surface	2224/75723 Electrostatic holding means
2224/75304 being curved	2224/75724 in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/75305 comprising protrusions	2224/75725 in the upper part of the bonding apparatus,
2224/7531 of other parts	e.g. in the bonding head
2224/75312 Material	2224/75733 Magnetic holding means
2224/75313 Removable bonding head	2224/75734 in the lower part of the bonding apparatus,
2224/75314 Auxiliary members on the pressing	e.g. in the apparatus chuck
surface	2224/75735 in the upper part of the bonding apparatus,
2224/75315 Elastomer inlay	e.g. in the bonding head
2224/75316 with retaining mechanisms	2224/75743 Suction holding means
2224/75317 Removable auxiliary member	2224/75744 in the lower part of the bonding apparatus,
2224/75318 Shape of the auxiliary member	e.g. in the apparatus chuck
2224/7532 Material of the auxiliary member	2224/75745 in the upper part of the bonding apparatus,
2224/75343 by ultrasonic vibrations	e.g. in the bonding head
2224/75344 Eccentric cams	2224/75753 Means for optical alignment, e.g. sensors
2224/75345 in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/75754 Guiding structures
2224/75346 in the upper part of the bonding	2224/75755 in the lower part of the bonding apparatus,
apparatus, e.g. in the bonding head	e.g. in the apparatus chuck
2224/75347 Piezoelectric transducers	2224/75756 in the upper part of the bonding apparatus,
2224/75348 in the lower part of the bonding	e.g. in the bonding head
apparatus, e.g. in the apparatus chuck	2224/758 Means for moving parts
2224/75349 in the upper part of the bonding	2224/75801 Lower part of the bonding apparatus, e.g. XY
apparatus, e.g. in the bonding head	table
2224/7535 Stable and mobile yokes	2224/75802 Rotational mechanism
2224/75351 in the lower part of the bonding	2224/75803 Pivoting mechanism
apparatus, e.g. in the apparatus chuck	2224/75804 Translational mechanism
2224/75352 in the upper part of the bonding	2224/75821 Upper part of the bonding apparatus, i.e.
apparatus, e.g. in the bonding head	bonding head
2224/75353 Ultrasonic horns	2224/75822 Rotational mechanism
2224/75354 in the lower part of the bonding	2224/75823 Pivoting mechanism
apparatus, e.g. in the apparatus chuck	2224/75824 Translational mechanism
2224/75355 Design, e.g. of the wave guide	2224/75841 of the bonding head
2224/755 Cooling means	2224/75842 Rotational mechanism
	2224/75843 Pivoting mechanism

2224/759 Means for monitoring the connection process	2224/76265 in the lower part of the bonding apparatus,
2224/75901 using a computer, e.g. fully- or semi-	e.g. in the apparatus chuck
automatic bonding	2224/76266 in the upper part of the bonding apparatus
2224/7592 Load or pressure adjusting means, e.g.	2224/76267 Flame torch, e.g. hydrogen torch
sensors 2224/75925 Vibration adjusting means, e.g. sensors	2224/76268 Discharge electrode
2224/7595 Means for forming additional members	2224/76269 Shape of the discharge electrode
2224/7598 specially adapted for batch processes	2224/7627 Material of the discharge electrode
2224/75981 Apparatus chuck	2224/76271 Circuitry of the discharge electrode 2224/76272 Oven
2224/75982 Shape	
2224/75983 of the mounting surface	2224/7628 Resistance welding electrodes, i.e. for ohmic heating
2224/75984 of other portions	2224/76281 in the lower part of the bonding apparatus,
2224/75985 Material	e.g. in the apparatus chuck
2224/75986 Auxiliary members on the pressing surface	2224/76282 in the upper part of the bonding apparatus
2224/75987 Shape of the auxiliary member	2224/76283 by infrared heating, e.g. infrared heating
2224/75988 Material of the auxiliary member	lamp
2224/76 . Apparatus for connecting with build-up	2224/763 by means of pressure
interconnects	2224/76301 Pressing head
2224/76001 Calibration means	2224/76302 Shape
2224/7601 • • • Means for cleaning, e.g. brushes, for hydro	2224/76303 of the pressing surface
blasting, for ultrasonic cleaning, for dry	2224/76304 being curved
ice blasting, using gas-flow, by etching, by	2224/76305 comprising protrusions
applying flux or plasma	2224/7631 of other parts
2224/761 Means for controlling the bonding	2224/76312 Material
environment, e.g. valves, vacuum pumps	2224/76313 Removable pressing head
2224/76101 Chamber	2224/76314 Auxiliary members on the pressing
2224/76102 Vacuum chamber	surface
2224/7611 High pressure chamber	2224/76315 Elastomer inlay
2224/7615 Means for depositing	2224/76316 with retaining mechanisms
2224/76151 Means for direct writing	2224/76317 Removable auxiliary member
2224/76152 Syringe	2224/76318 Shape of the auxiliary member
2224/76155 Jetting means, e.g. ink jet	2224/7632 Material of the auxiliary member
2224/76158 including a laser	2224/76343 by ultrasonic vibrations
2224/76161 Means for screen printing, e.g. roller,	2224/76344 Eccentric cams
squeegee, screen stencil	2224/76345 in the lower part of the bonding
2224/7617 Means for applying a preform, e.g. laminator	apparatus, e.g. in the apparatus chuck
2224/76171 including a vacuum-bag	2224/76346 in the upper part of the bonding
2224/7618 Means for blanket deposition	apparatus
2224/76181 for spin coating, i.e. spin coater	2224/76347 Piezoelectric transducers
2224/76182 for curtain coating	2224/76348 in the lower part of the bonding
2224/76183 for immersion coating, i.e. bath	apparatus, e.g. in the apparatus chuck
2224/76184 for spray coating, i.e. nozzle	2224/76349 in the upper part of the bonding
2224/76185 Means for physical vapour deposition	apparatus
[PVD]	2224/7635 Stable and mobile yokes
2224/76186 Means for sputtering, e.g. target	2224/76351 in the lower part of the bonding
2224/76187 Means for evaporation	apparatus, e.g. in the apparatus chuck
2224/76188 Means for chemical vapour deposition [CVD], e.g. for laser CVD	2224/76352 in the upper part of the bonding apparatus
	2224/76353 Ultrasonic horns
2224/76189 Means for plating, e.g. for electroplating, electroless plating	2224/76354 in the lower part of the bonding
2224/762 Protection means against electrical discharge	apparatus, e.g. in the apparatus chuck
2224/7625 Means for applying energy, e.g. heating means	2224/76355 Design, e.g. of the wave guide
2224/76251 in the lower part of the bonding apparatus,	2224/765 Cooling means
e.g. in the apparatus chuck	2224/76501 in the lower part of the bonding apparatus,
2224/76252 in the upper part of the bonding apparatus	e.g. in the apparatus chuck
2224/76253 adapted for localised heating	2224/76502 in the upper part of the bonding apparatus
2224/7626 Polychromatic heating lamp	2224/7655 Mechanical means, e.g. for planarising,
2224/76261 Laser	pressing, stamping
2224/76262 in the lower part of the bonding apparatus,	2224/76552 for drilling
e.g. in the apparatus chuck	2224/76554 for abrasive blasting, e.g. sand blasting, wet
2224/76263 in the upper part of the bonding apparatus	blasting, hydro-blasting, dry ice blasting
2224/76264 by induction heating, i.e. coils	2224/766 Means for supplying the material of the
, , ,	interconnect

2224/76601 Storing moons	2224/76096 Assisting marshage on the pressing sturfees
2224/76601 Storing means	2224/76986 Auxiliary members on the pressing surface
2224/76611 Feeding means	2224/76987 Shape of the auxiliary member
2224/76621 Holding means	2224/76988 Material of the auxiliary member
2224/7665 Means for transporting the components to be connected	2224/77 Apparatus for connecting with strap connectors
	2224/77001 Calibration means
2224/76651 Belt conveyor	2224/7701 Means for cleaning, e.g. brushes, for hydro
2224/76652 Chain conveyor	blasting, for ultrasonic cleaning, for dry
2224/76653 Vibrating conveyor	ice blasting, using gas-flow, by etching, by
2224/76654 Pneumatic conveyor	applying flux or plasma
2224/76655 in a fluid	2224/771 Means for controlling the bonding
2224/767 Means for aligning	environment, e.g. valves, vacuum pumps
2224/76701 • • • in the lower part of the bonding apparatus,	2224/77101 Chamber
e.g. in the apparatus chuck	2224/77102 Vacuum chamber
2224/76702 in the upper part of the bonding apparatus	2224/7711 High pressure chamber
2224/76703 Mechanical holding means	2224/7715 Means for applying permanent coating, e.g. in-
2224/76704 in the lower part of the bonding apparatus,	situ coating
e.g. in the apparatus chuck	2224/77151 Means for direct writing
2224/76705 in the upper part of the bonding apparatus	2224/77152 Syringe
2224/76723 Electrostatic holding means	2224/77153 integrated into the capillary or wedge
2224/76724 in the lower part of the bonding apparatus,	2224/77155 Jetting means, e.g. ink jet
e.g. in the apparatus chuck	2224/77158 including a laser
2224/76725 in the upper part of the bonding apparatus	2224/77161 Means for screen printing, e.g. roller,
2224/76733 Magnetic holding means	squeegee, screen stencil
2224/76734 in the lower part of the bonding apparatus,	2224/7717 Means for applying a preform, e.g. laminator
e.g. in the apparatus chuck	2224/77171 including a vacuum-bag
2224/76735 in the upper part of the bonding apparatus	2224/7718 Means for blanket deposition
2224/76743 Suction holding means	2224/77181 for spin coating, i.e. spin coater
2224/76744 in the lower part of the bonding apparatus,	2224/77182 for curtain coating
e.g. in the apparatus chuck	2224/77183 for immersion coating, i.e. bath
2224/76745 in the upper part of the bonding apparatus	2224/77184 for spray coating, i.e. nozzle
	2224/77185 Means for physical vapour deposition
2224/76753 Means for optical alignment, e.g. sensors	[PVD], e.g. evaporation, sputtering
2224/76754 Guiding structures	
2224/76755 in the lower part of the bonding apparatus,	2224/77186 Means for sputtering, e.g. target
e.g. in the apparatus chuck	2224/77187 Means for evaporation
2224/76756 in the upper part of the bonding apparatus	2224/77188 Means for chemical vapour deposition
2224/768 Means for moving parts	[CVD], e.g. for laser CVD
2224/76801 Lower part of the bonding apparatus, e.g. XY	2224/77189 Means for plating, e.g. for electroplating,
table	electroless plating
2224/76802 Rotational mechanism	2224/772 Protection means against electrical discharge
2224/76803 Pivoting mechanism	2224/7725 Means for applying energy, e.g. heating means
2224/76804 Translational mechanism	2224/77251 in the lower part of the bonding apparatus,
2224/76821 Upper part of the bonding apparatus, i.e.	e.g. in the apparatus chuck
bonding head	2224/77252 in the upper part of the bonding apparatus,
2224/76822 Rotational mechanism	e.g. in the wedge
2224/76823 Pivoting mechanism	2224/77253 adapted for localised heating
2224/76824 Translational mechanism	2224/7726 Polychromatic heating lamp
2224/76841 • • • of the bonding head	2224/77261 Laser
2224/76842 Rotational mechanism	2224/77262 in the lower part of the bonding apparatus,
2224/76843 Pivoting mechanism	e.g. in the apparatus chuck
2224/769 Means for monitoring the connection process	2224/77263 in the upper part of the bonding apparatus,
2224/76901 using a computer, e.g. fully- or semi-	e.g. in the wedge
automatic bonding	2224/77264 by induction heating, i.e. coils
2224/7692 Load or pressure adjusting means, e.g.	2224/77265 in the lower part of the bonding apparatus,
sensors	e.g. in the apparatus chuck
2224/76925 Vibration adjusting means, e.g. sensors	2224/77266 in the upper part of the bonding apparatus,
2224/7695 Means for forming additional members	e.g. in the wedge
2224/7698 specially adapted for batch processes	2224/77267 Flame torch, e.g. hydrogen torch
2224/76981 Apparatus chuck	2224/77268 Discharge electrode
2224/76982 Shape	2224/77269 Shape of the discharge electrode
2224/76983 of the mounting surface	2224/7727 Material of the discharge electrode
2224/76984 of other portions	2224/77271 Circuitry of the discharge electrode
2224/76985 Material	2224/77272 Oven
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2224/7728 Resistance welding electrodes, i.e. for ohmic	2224/77655 in a fluid
heating	2224/777 Means for aligning
2224/77281 in the lower part of the bonding apparatus,	2224/77701 in the lower part of the bonding apparatus,
e.g. in the apparatus chuck	e.g. in the apparatus chuck
2224/77282 in the upper part of the bonding apparatus,	2224/77702 in the upper part of the bonding apparatus,
e.g. in the wedge	e.g. in the wedge
2224/77283 by infrared heating, e.g. infrared heating	2224/77703 Mechanical holding means
lamp	2224/77704 in the lower part of the bonding apparatus,
2224/773 by means of pressure	e.g. in the apparatus chuck
2224/77313 Wedge	2224/77705 in the upper part of the bonding apparatus,
2224/77314 Shape	e.g. in the wedge
2224/77315 of the pressing surface, e.g. tip or	2224/77723 Electrostatic holding means
head	2224/77724 in the lower part of the bonding apparatus,
2224/77316 comprising protrusions	e.g. in the apparatus chuck
2224/77317 of other portions	2224/77725 in the upper part of the bonding apparatus,
2224/77318 inside the capillary	e.g. in the wedge
2224/77319 outside the capillary	2224/77733 Magnetic holding means
	2224/7734 in the lower part of the bonding apparatus,
2224/7732 Removable wedge	e.g. in the apparatus chuck
2224/77321 Material	5 11
2224/77325 Auxiliary members on the pressing	2224/77735 in the upper part of the bonding apparatus,
surface	e.g. in the wedge
2224/77326 Removable auxiliary member	2224/77743 Suction holding means
2224/77327 Shape of the auxiliary member	2224/77744 in the lower part of the bonding apparatus,
2224/77328 Material of the auxiliary member	e.g. in the apparatus chuck
2224/77343 by ultrasonic vibrations	2224/77745 in the upper part of the bonding apparatus,
2224/77344 Eccentric cams	e.g. in the wedge
2224/77345 in the lower part of the bonding	2224/77753 Means for optical alignment, e.g. sensors
apparatus, e.g. in the apparatus chuck	2224/77754 Guiding structures
2224/77346 in the upper part of the bonding	2224/77755 in the lower part of the bonding apparatus,
apparatus, e.g. in the wedge	e.g. in the apparatus chuck
2224/77347 Piezoelectric transducers	2224/77756 in the upper part of the bonding apparatus,
2224/77348 in the lower part of the bonding	e.g. in the wedge
apparatus, e.g. in the apparatus chuck	2224/778 Means for moving parts
	2224/77801 Lower part of the bonding apparatus, e.g. XY
2224/77349 in the upper part of the bonding	table
apparatus, e.g. in the wedge	
	7774/7807 Rotational mechanism
2224/7735 Stable and mobile yokes	2224/77802 Rotational mechanism
2224/77351 in the lower part of the bonding	2224/77803 Pivoting mechanism
2224/77351 in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/77803 Pivoting mechanism 2224/77804 Translational mechanism
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2224/77351 in the lower part of the bonding apparatus, e.g. in the apparatus chuck 2224/77352 in the upper part of the bonding apparatus, e.g. in the wedge 2224/77353 Ultrasonic horns 2224/77354 In the lower part of the bonding apparatus, e.g. in the mounting chuck 2224/77355 Design, e.g. of the wave guide 2224/775 Cooling means 2224/77501 in the lower part of the bonding apparatus, e.g. in the apparatus chuck 2224/77502 in the upper part of the bonding apparatus, e.g. in the wedge 2224/7755 . Mechanical means, e.g. for severing, pressing, stamping 2224/776 . Means for supplying the connector to be connected in the bonding apparatus 2224/77611 Storing means 2224/77631 Means for wire tension adjustments 2224/77655 Means for transporting the components to be connected 2224/77651 Belt conveyor 2224/77652 Chain conveyor	2224/77803 Pivoting mechanism 2224/77804 Translational mechanism 2224/77821 Upper part of the bonding apparatus, i.e. bonding head, e.g. capillary or wedge 2224/77822 Rotational mechanism 2224/77823 Pivoting mechanism 2224/77844 Of the pressing portion, e.g. tip or head 2224/77845 Pivoting mechanism 2224/77846 Rotational mechanism 2224/77847 Pivoting mechanism 2224/77848 Pivoting mechanism 2224/7790 Weans for monitoring the connection process 2224/7790 using a computer, e.g. fully- or semiautomatic bonding 2224/7792 Load or pressure adjusting means, e.g. sensors 2224/7795 Vibration adjusting means, e.g. sensors 2224/7798 specially adapted for batch processes 2224/77981 Apparatus chuck 2224/77982 Shape 2224/77984 of the mounting surface 2224/77985 Material 2224/77986 Auxiliary members on the pressing surface 2224/77987 Shape of the auxiliary member
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2224/78001 Calibration means	2224/78316 comprising protrusions
2224/7801 Means for cleaning, e.g. brushes, for hydro	2224/78317 of other portions
blasting, for ultrasonic cleaning, for dry	2224/78318 inside the capillary
ice blasting, using gas-flow, by etching, by	2224/78319 outside the capillary
applying flux or plasma	2224/7832 Removable wedge
2224/781 Means for controlling the bonding	2224/78321 Material
environment, e.g. valves, vacuum pumps	2224/78325 Auxiliary members on the pressing
2224/78101 Chamber	surface
2224/78102 Vacuum chamber	2224/78326 Removable auxiliary member
2224/7811 High pressure chamber	2224/78327 Shape of the auxiliary member
2224/7815 Means for applying permanent coating, e.g. in-	2224/78328 Material of the auxiliary member
situ coating	2224/78343 by ultrasonic vibrations
2224/782 Protection means against electrical discharge	2224/78344 Eccentric cams
2224/7825 Means for applying energy, e.g. heating means	2224/78345 in the lower part of the bonding
2224/78251 in the lower part of the bonding apparatus, e.g. in the apparatus chuck	apparatus, e.g. in the apparatus chuck
2224/78252 in the upper part of the bonding apparatus,	2224/78346 in the upper part of the bonding
e.g. in the capillary or wedge	apparatus, e.g. in the capillary or
2224/78253 adapted for localised heating	wedge
2224/7826 Polychromatic heating lamp	2224/78347 Piezoelectric transducers
2224/78261 Laser	2224/78348 in the lower part of the bonding
2224/78262 in the lower part of the bonding apparatus,	apparatus, e.g. in the apparatus chuck
e.g. in the apparatus chuck	2224/78349 in the upper part of the bonding
2224/78263 in the upper part of the bonding apparatus,	apparatus, e.g. in the capillary or wedge
e.g. in the capillary or wedge	2224/7835 Stable and mobile yokes
2224/78264 by induction heating, i.e. coils	2224/78351 in the lower part of the bonding
2224/78265 in the lower part of the bonding apparatus,	apparatus, e.g. in the apparatus chuck
e.g. in the apparatus chuck	2224/78352 in the upper part of the bonding
2224/78266 in the upper part of the bonding apparatus,	apparatus, e.g. in the capillary or
e.g. in the capillary or wedge	wedge
2224/78267 Flame torch, e.g. hydrogen torch	2224/78353 Ultrasonic horns
2224/78268 Discharge electrode	2224/78354 in the lower part of the bonding
2224/78269 Shape of the discharge electrode	apparatus, e.g. in the mounting chuck
2224/7827 Material of the discharge electrode	2224/78355 Design, e.g. of the wave guide
2224/78271 Circuitry of the discharge electrode	2224/785 Cooling means
2224/78272 Oven	2224/78501 in the lower part of the bonding apparatus,
2224/7828 Resistance welding electrodes, i.e. for ohmic	e.g. in the apparatus chuck
heating	2224/78502 in the upper part of the bonding apparatus,
2224/78281 in the lower part of the bonding apparatus,	e.g. in the capillary or wedge
e.g. in the apparatus chuck	2224/7855 Mechanical means, e.g. for severing, pressing,
2224/78282 in the upper part of the bonding apparatus,	stamping
e.g. in the capillary or wedge	2224/786 Means for supplying the connector to be
2224/78283 by infrared heating, e.g. infrared heating	connected in the bonding apparatus
lamp	2224/78601 Storing means
2224/783 by means of pressure	2224/78611 Feeding means
2224/78301 Capillary	2224/78621 Holding means, e.g. wire clampers
2224/78302 Shape	2224/78631 Means for wire tension adjustments
2224/78303 of the pressing surface, e.g. tip or	2224/7865 Means for transporting the components to be connected
head	
2224/78304 comprising protrusions	2224/78651 Belt conveyor
2224/78305 of other portions	2224/78652 Chain conveyor
2224/78306 inside the capillary	2224/78653 Vibrating conveyor
2224/78307 outside the capillary	2224/78654 Pneumatic conveyor
2224/78308 Removable capillary	2224/78655 in a fluid
2224/78309 Material	2224/787 Means for aligning
2224/7831 Auxiliary members on the pressing	2224/78701 in the lower part of the bonding apparatus,
surface 2224/78311 Permayahla auxiliary member	e.g. in the apparatus chuck 2224/78702 in the upper part of the bonding apparatus,
2224/78311 Removable auxiliary member	e.g. in the capillary or wedge
2224/78312 Shape of the auxiliary member	2224/78703 Mechanical holding means
2224/78313 Wedge 2224/78314 Shape	2224/78704 in the lower part of the bonding apparatus,
2224/78315 of the pressing surface, e.g. tip or	e.g. in the apparatus chuck

head

2224/78705 in the upper part of the bonding apparatus,	2224/7911 High pressure chamber
e.g. in the capillary or wedge	2224/7915 Means for applying permanent coating
2224/78723 Electrostatic holding means	2224/79151 Means for direct writing
2224/78724 in the lower part of the bonding apparatus,	2224/79152 Syringe
e.g. in the apparatus chuck	2224/79153 integrated into the pressing head
2224/78725 in the upper part of the bonding apparatus,	2224/79155 Jetting means, e.g. ink jet
e.g. in the capillary or wedge	2224/79158 including a laser
2224/78733 Magnetic holding means	2224/79161 Means for screen printing, e.g. roller,
2224/78734 in the lower part of the bonding apparatus,	squeegee, screen stencil
e.g. in the apparatus chuck	2224/7917 Means for applying a preform, e.g. laminator
2224/78735 in the upper part of the bonding apparatus,	2224/79171 including a vacuum-bag
e.g. in the capillary or wedge	2224/7918 Means for blanket deposition
2224/78743 Suction holding means	2224/79181 for spin coating, i.e. spin coater
2224/78744 in the lower part of the bonding apparatus,	2224/79182 for curtain coating
e.g. in the apparatus chuck	2224/79183 for immersion coating, i.e. bath
2224/78745 in the upper part of the bonding apparatus,	2224/79184 for spray coating, i.e. nozzle
e.g. in the capillary or wedge	2224/79185 Means for physical vapour deposition
2224/78753 Means for optical alignment, e.g. sensors	[PVD], e.g. evaporation, sputtering
2224/78754 Guiding structures	2224/79186 Means for sputtering, e.g. target
2224/78755 in the lower part of the bonding apparatus,	2224/79187 Means for evaporation
e.g. in the apparatus chuck	2224/79188 Means for chemical vapour deposition
2224/78756 in the upper part of the bonding apparatus,	[CVD], e.g. for laser CVD
e.g. in the capillary or wedge	2224/79189 Means for plating, e.g. for electroplating,
2224/788 Means for moving parts	electroless plating
2224/78801 Lower part of the bonding apparatus, e.g. XY table	2224/792 Protection means against electrical discharge
2224/78802 Rotational mechanism	2224/7925 Means for applying energy, e.g. heating means
2224/78803 Pivoting mechanism	2224/79251 in the lower part of the bonding apparatus,
2224/78804 Translational mechanism	e.g. in the apparatus chuck
2224/78821 Upper part of the bonding apparatus, i.e.	2224/79252 in the upper part of the bonding apparatus,
bonding head, e.g. capillary or wedge	e.g. in the pressing head
2224/78822 Rotational mechanism	2224/79253 adapted for localised heating
2224/78823 Pivoting mechanism	2224/7926 Polychromatic heating lamp
2224/78824 Translational mechanism	2224/79261 Laser
2224/78841 of the pressing portion, e.g. tip or head	2224/79262 in the lower part of the bonding apparatus,
2224/78842 Rotational mechanism	e.g. in the apparatus chuck
2224/78843 Pivoting mechanism	2224/79263 in the upper part of the bonding apparatus,
2224/789 Means for monitoring the connection process	e.g. in the pressing head
2224/78901 using a computer, e.g. fully- or semi-	2224/79264 by induction heating, i.e. coils 2224/79265 in the lower part of the bonding apparatus,
automatic bonding	e.g. in the apparatus chuck
2224/7892 Load or pressure adjusting means, e.g.	2224/79266 in the upper part of the bonding apparatus,
sensors	e.g. in the pressing head
2224/78925 Vibration adjusting means, e.g. sensors	2224/79267 Flame torch, e.g. hydrogen torch
2224/7895 Means for forming additional members	2224/79268 Discharge electrode
2224/7898 specially adapted for batch processes	2224/79269 Shape of the discharge electrode
2224/78981 Apparatus chuck	2224/7927 Material of the discharge electrode
2224/78982 Shape	2224/79271 Circuitry of the discharge electrode
2224/78983 of the mounting surface	2224/79272 Oven
2224/78984 of other portions	2224/7928 Resistance welding electrodes, i.e. for ohmic
2224/78985 Material	heating
2224/78986 Auxiliary members on the pressing surface	2224/79281 in the lower part of the bonding apparatus,
2224/78987 Shape of the auxiliary member	e.g. in the apparatus chuck
2224/78988 Material of the auxiliary member	2224/79282 in the upper part of the bonding apparatus,
2224/79 Apparatus for Tape Automated Bonding [TAB]	e.g. in the pressing head
2224/79001 Calibration means	2224/79283 by infrared heating, e.g. infrared heating
2224/7901 Means for cleaning, e.g. brushes, for hydro	lamp
blasting, for ultrasonic cleaning, for dry	2224/793 by means of pressure
ice blasting, using gas-flow, by etching, by	2224/79301 Pressing head
applying flux or plasma	2224/79302 Shape
2224/791 Means for controlling the bonding	2224/79303 of the pressing surface
environment, e.g. valves, vacuum pumps	2224/79304 being curved
2224/79101 Chamber	2224/79305 comprising protrusions
2224/79102 Vacuum chamber	

2224/7931 of other parts	2224/79733 Magnetic holding means
2224/79312 Material	2224/79734 in the lower part of the bonding apparatus,
2224/79313 Removable pressing head	e.g. in the apparatus chuck
2224/79314 Auxiliary members on the pressing	2224/79735 in the upper part of the bonding apparatus,
surface	e.g. in the pressing head
2224/79315 Elastomer inlay	2224/79743 Suction holding means
2224/79316 with retaining mechanisms	2224/79744 in the lower part of the bonding apparatus,
2224/79317 Removable auxiliary member	e.g. in the apparatus chuck
2224/79318 Shape of the auxiliary member	2224/79745 in the upper part of the bonding apparatus, e.g. in the pressing head
2224/7932 Material of the auxiliary member	2224/79753 Means for optical alignment, e.g. sensors
2224/79343 by ultrasonic vibrations	2224/79754 Guiding structures
2224/79344 Eccentric cams 2224/79345 in the lower part of the bonding	2224/79755 in the lower part of the bonding apparatus,
apparatus, e.g. in the apparatus chuck	e.g. in the apparatus chuck
2224/79346 in the upper part of the bonding	2224/79756 in the upper part of the bonding apparatus,
apparatus, e.g. in the pressing head	e.g. in the pressing head
2224/79347 Piezoelectric transducers	2224/798 Means for moving parts
2224/79348 in the lower part of the bonding	2224/79801 Lower part of the bonding apparatus, e.g. XY
apparatus, e.g. in the apparatus chuck	table
2224/79349 in the upper part of the bonding	2224/79802 Rotational mechanism
apparatus, e.g. in the pressing head	2224/79803 Pivoting mechanism 2224/79804 Translational mechanism
2224/7935 Stable and mobile yokes 2224/79351 in the lower part of the bonding	2224/79821 Upper part of the bonding apparatus, i.e.
apparatus, e.g. in the apparatus chuck	pressing head
2224/79352 in the upper part of the bonding	2224/79822 Rotational mechanism
apparatus, e.g. in the pressing head	2224/79823 Pivoting mechanism
2224/79353 Ultrasonic horns	2224/79824 Translational mechanism
2224/79354 in the lower part of the bonding	2224/79841 of the pressing head
apparatus, e.g. in the apparatus chuck	2224/79842 Rotational mechanism
2224/79355 Design, e.g. of the wave guide	2224/79843 Pivoting mechanism
2224/795 Cooling means	2224/799 Means for monitoring the connection process
2224/79501 in the lower part of the bonding apparatus,	2224/79901 using a computer, e.g. fully- or semi-
e.g. in the apparatus chuck 2224/79502 in the upper part of the bonding apparatus,	automatic bonding 2224/7992 Load or pressure adjusting means, e.g.
e.g. in the pressing head	sensors
2224/7955 Mechanical means, e.g. for pressing, stamping	2224/79925 Vibration adjusting means, e.g. sensors
2224/796 Means for supplying the connector to be	2224/7995 Means for forming additional members
connected in the bonding apparatus	2224/7998 specially adapted for batch processes
2224/79601 Storing means	2224/79981 Apparatus chuck
2224/79611 Feeding means	2224/79982 Shape
2224/79621 Holding means	2224/79983 of the mounting surface
2224/7965 Means for transporting the components to be	2224/79984 of other portions
connected 2224/79651 Belt conveyor	2224/79985 Material
2224/79652 Chain conveyor	2224/79986 Auxiliary members on the pressing surface
2224/79653 Vibrating conveyor	2224/79987 Shape of the auxiliary member 2224/79988 Material of the auxiliary member
2224/79654 Pneumatic conveyor	2224/7999 for disconnecting
2224/79655 in a fluid	2224/80 • Methods for connecting semiconductor or other
2224/797 Means for aligning	solid state bodies using means for bonding being
2224/79701 in the lower part of the bonding apparatus,	attached to, or being formed on, the surface to be
e.g. in the apparatus chuck	connected
2224/79702 in the upper part of the bonding apparatus,	2224/80001 by connecting a bonding area directly to another
e.g. in the pressing head	bonding area, i.e. connectorless bonding, e.g.
2224/79703 Mechanical holding means 2224/79704 in the lower part of the bonding apparatus,	bumpless bonding 2224/80003 involving a temporary auxiliary member not
e.g. in the apparatus chuck	forming part of the bonding apparatus
2224/79705 in the upper part of the bonding apparatus,	2224/80004 being a removable or sacrificial coating
e.g. in the pressing head	2224/80006 being a temporary or sacrificial substrate
2224/79723 Electrostatic holding means	2224/80007 involving a permanent auxiliary member
2224/79724 in the lower part of the bonding apparatus,	being left in the finished device, e.g. aids for
e.g. in the apparatus chuck	protecting the bonding area during or after the
2224/79725 in the upper part of the bonding apparatus,	bonding process 2224/80009 Pre-treatment of the bonding area
e.g. in the pressing head	• • • 11e-deadness of the boliding area

2224/8001 Cleaning the bonding area, e.g. oxide	2224/80132 using marks formed outside the
removal step, desmearing	semiconductor or solid-state body, i.e.
2224/80011 Chemical cleaning, e.g. etching, flux	"off-chip"
2224/80012 Mechanical cleaning, e.g. abrasion	2224/80136 involving guiding structures, e.g. spacers or
using hydro blasting, brushes, ultrasonic	supporting members
cleaning, dry ice blasting, gas-flow	2224/80138 the guiding structures being at least
2224/80013 Plasma cleaning	partially left in the finished device
2224/80014 Thermal cleaning, e.g. decomposition,	2224/80139 Guiding structures on the body
sublimation 2224/80019 Combinations of two or more	2224/8014 Guiding structures outside the body
cleaning methods provided for in	2224/80141 Guiding structures both on and outside the body
at least two different groups from	2224/80143 Passive alignment, i.e. self alignment, e.g.
H01L 2224/8001 - H01L 2224/80014	using surface energy, chemical reactions,
2224/8002 Applying permanent coating to the bonding	thermal equilibrium
area in the bonding apparatus, e.g. in-situ	2224/80148 involving movement of a part of the bonding
coating	apparatus
2224/80024 Applying flux to the bonding area in the	2224/80149 being the lower part of the bonding
bonding apparatus	apparatus, i.e. holding means for the
2224/8003 Reshaping the bonding area in the bonding	bodies to be connected, e.g. XY table
apparatus, e.g. flattening the bonding area	2224/8015 Rotational movements
2224/80031 by chemical means, e.g. etching,	2224/8016 Translational movements
anodisation	2224/80169 being the upper part of the bonding
2224/80035 by heating means 2224/80037 using a polychromatic heating lamp	apparatus, i.e. bonding head
2224/80039 using a polychromatic heating ramp	2224/8017 Rotational movements
2224/80041 Induction heating, i.e. eddy currents	2224/8018 Translational movements
2224/80047 by mechanical means, e.g. severing,	2224/8019 Arrangement of the bonding areas prior to mounting
pressing, stamping	2224/80194 Lateral distribution of the bonding areas
2224/80048 Thermal treatments, e.g. annealing,	2224/802 Applying energy for connecting
controlled pre-heating or pre-cooling	2224/80201 Compression bonding
2224/80051 Forming additional members	2224/80203 Thermocompression bonding, e.g.
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment	diffusion bonding, pressure joining, thermocompression welding or solid-state
2224/80052 Detaching bonding areas, e.g. after testing	diffusion bonding, pressure joining,
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment	diffusion bonding, pressure joining, thermocompression welding or solid-state
 2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being inert	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being inert 2224/80085 being a liquid, e.g. for fluidic self-assembly	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being inert	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being inert 2224/80085 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/80091 Under pressure	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being inert 2224/80085 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/80091 Under pressure 2224/80092 Atmospheric pressure	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being inert 2224/80085 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/80091 Under pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being inert 2224/80085 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/80091 Under pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80095 Temperature settings	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being inert 2224/80085 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/80091 Under pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80096 Temperature settings 2224/80096 Transient conditions	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/80091 Atmospheric pressure 2224/80092 Atmospheric pressure 2224/80095 Transient conditions, e.g. gas-flow 2224/80096 Transient conditions 2224/80097 Heating	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being inert 2224/80085 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/80091 Atmospheric pressure 2224/80092	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being inert 2224/80085 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/80091 Atmospheric pressure 2224/80092	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents 2224/80224 using a laser
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being a liquid, e.g. for fluidic self-assembly 2224/80085 being a liquid, e.g. for fluidic self-assembly 2224/80091 Vacuum 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80095 Temperature settings 2224/80096 Transient conditions 2224/80097 Heating 2224/80099 Cooling 2224/80099 Ambient temperature 2224/8011 . involving protection against electrical	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents 2224/80224 using a laser 2224/8023 Polychromatic or infrared lamp heating
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being inert 2224/80085 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/80091 Under pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80095 Temperature settings 2224/80096 Transient conditions 2224/80097 Heating 2224/80099 Cooling 2224/80099 Ambient temperature 2224/8011 involving protection against electrical discharge, e.g. removing electrostatic charge	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents 2224/8023 Polychromatic or infrared lamp heating 2224/8023 using an autocatalytic reaction, e.g.
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being inert 2224/80085 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/80091 Under pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80096 Temperature settings 2224/80097 Heating 2224/80098 Cooling 2224/80099 Ambient temperature 2224/8011 involving protection against electrical discharge, e.g. removing electrostatic charge 2224/8012 Aligning	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents 2224/8023 Polychromatic or infrared lamp heating 2224/80232 using an autocatalytic reaction, e.g. exothermic brazing
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/8009 Under pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80095 Temperature settings 2224/80096 Transient conditions 2224/80097 Heating 2224/80098 Cooling 2224/80099 Ambient temperature 2224/8011 involving protection against electrical discharge, e.g. removing electrostatic charge 2224/8012 Active alignment, i.e. by apparatus steering,	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents 2224/8023 Polychromatic or infrared lamp heating 2224/8023 using an autocatalytic reaction, e.g.
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/8009 Under pressure 2224/80091 Atmospheric pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80096 Temperature settings 2224/80097 Heating 2224/80098 Cooling 2224/80099 Ambient temperature 2224/8011 involving protection against electrical discharge, e.g. removing electrostatic charge 2224/8012 Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents 2224/80224 using a laser 2224/80232 Polychromatic or infrared lamp heating 2224/80232 using an autocatalytic reaction, e.g. exothermic brazing
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/8009 Under pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80095 Temperature settings 2224/80096 Transient conditions 2224/80097 Heating 2224/80098 Cooling 2224/80099 Ambient temperature 2224/8011 involving protection against electrical discharge, e.g. removing electrostatic charge 2224/8012 Active alignment, i.e. by apparatus steering,	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents 2224/80224 using a laser 2224/80232 Polychromatic or infrared lamp heating 2224/80232 using an autocatalytic reaction, e.g. exothermic brazing 2224/80234 using means for applying energy being within the device, e.g. integrated heater
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/8009 Under pressure 2224/80091 Atmospheric pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80096 Temperature settings 2224/80097 Heating 2224/80099 Heating 2224/80099 Ambient temperature 2224/8011 involving protection against electrical discharge, e.g. removing electrostatic charge 2224/8012 Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors 2224/80122 by detecting inherent features of, or	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents 2224/80234 using a laser 2224/80235 Polychromatic or infrared lamp heating 2224/80236 using an autocatalytic reaction, e.g. exothermic brazing 2224/80236 using means for applying energy being within the device, e.g. integrated heater 2224/80237 using an electron beam 2224/80238 using an electron beam
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/8009 Atmospheric pressure 2224/80091 Transient conditions, e.g. gas-flow 2224/80093 Transient conditions 2224/80096 Temperature settings 2224/80097 Heating 2224/80098 Cooling 2224/80099 Ambient temperature 2224/8011 involving protection against electrical discharge, e.g. removing electrostatic charge 2224/8012 Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors 2224/80122 by detecting inherent features of, or outside, the semiconductor or solid-state	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 . applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 . with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents 2224/80234 using a laser 2224/80235 Polychromatic or infrared lamp heating 2224/80236 using means for applying energy being within the device, e.g. integrated heater 2224/80237 using an electron beam 2224/80238 using electric resistance welding, i.e. ohmic heating
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/8009 Vacuum 2224/80091 Under pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80096 Temperature settings 2224/80097 Heating 2224/80098 Cooling 2224/80099 Ambient temperature 2224/8011 involving protection against electrical discharge, e.g. removing electrostatic charge 2224/8012 Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors 2224/80122 by detecting inherent features of, or outside, the semiconductor or solid-state body	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents 2224/80234 using a laser 2224/80235 Polychromatic or infrared lamp heating 2224/80236 using an autocatalytic reaction, e.g. exothermic brazing 2224/80237 using means for applying energy being within the device, e.g. integrated heater 2224/80237 using an electron beam 2224/80238 using electric resistance welding, i.e. ohmic heating 2224/80334 Bonding interfaces of the bonding area
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being a liquid, e.g. for fluidic self-assembly 2224/80085 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/80091 Under pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80095 Temperature settings 2224/80096 Transient conditions 2224/80097 Heating 2224/80098 Cooling 2224/80109 Ambient temperature 2224/8011 involving protection against electrical discharge, e.g. removing electrostatic charge 2224/8012 Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors 2224/80123 by detecting inherent features of, or outside, the semiconductor or solid-state body 2224/80125 Shape or position of the body 2224/80125 Bonding areas on the body 2224/80127 Bonding areas outside the body	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents 2224/80234 using a laser 2224/80235 Polychromatic or infrared lamp heating 2224/80236 using an autocatalytic reaction, e.g. exothermic brazing 2224/80236 using means for applying energy being within the device, e.g. integrated heater 2224/80237 using an electron beam 2224/80238 using electric resistance welding, i.e. ohmic heating 2224/8034 Bonding interfaces of the bonding area 2224/80345 Shape, e.g. interlocking features
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being a liquid, e.g. for fluidic self-assembly 2224/80085 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/80091 Under pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80095 Temperature settings 2224/80096 Transient conditions 2224/80097 Heating 2224/80098 Cooling 2224/80099 Ambient temperature 2224/8010 involving protection against electrical discharge, e.g. removing electrostatic charge 2224/8012 Aligning 2224/8012 Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors 2224/80123 by detecting inherent features of, or outside, the semiconductor or solid-state body 2224/80125 Bonding areas on the body 2224/80127 Bonding areas outside the body 2224/80129 Shape or position of the other item	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents 2224/80224 using a laser 2224/80234 Polychromatic or infrared lamp heating 2224/80235 using an autocatalytic reaction, e.g. exothermic brazing 2224/80236 using means for applying energy being within the device, e.g. integrated heater 2224/80237 using an electron beam 2224/80238 using an electron beam 2224/8034 Bonding interfaces of the bonding area 2224/80345 Shape, e.g. interlocking features 2224/80355 having an external coating, e.g. protective
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being a liquid, e.g. for fluidic self-assembly 2224/80095 being a liquid, e.g. for fluidic self-assembly 2224/80091 Under pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80096 Transient conditions 2224/80097 Heating 2224/80098 Cooling 2224/80099 Ambient temperature 2224/8011 involving protection against electrical discharge, e.g. removing electrostatic charge 2224/8012 Aligning 2224/80121 Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors 2224/80122 by detecting inherent features of, or outside, the semiconductor or solid-state body 2224/80123 Shape or position of the body 2224/80127 Bonding areas on the body 2224/80129 Bonding areas outside the body 2224/80129 Shape or position of the other item 2224/8013 Shape or position of the other item	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80211 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80224 with a graded temperature profile 2224/8022 with a graded temperature profile 2224/8022 Induction heating, i.e. eddy currents 2224/80224 using a laser 2224/80230 Polychromatic or infrared lamp heating 2224/80231 using an autocatalytic reaction, e.g. exothermic brazing 2224/80232 using an autocatalytic reaction, e.g. exothermic brazing 2224/80234 using means for applying energy being within the device, e.g. integrated heater 2224/80237 using an electron beam 2224/80238 using an electron beam 2224/80239 using an electron beam 2224/80230 Bonding interfaces of the bonding area 2224/8034 Bonding interfaces of the bonding area 2224/80345 Shape, e.g. interlocking features 2224/80355 having an external coating, e.g. protective bond-through coating
2224/80052 Detaching bonding areas, e.g. after testing 2224/80053 Bonding environment 2224/80054 Composition of the atmosphere 2224/80055 being oxidating 2224/80065 being reducing 2224/80075 being a liquid, e.g. for fluidic self-assembly 2224/80085 being a liquid, e.g. for fluidic self-assembly 2224/8009 Vacuum 2224/80091 Under pressure 2224/80092 Atmospheric pressure 2224/80093 Transient conditions, e.g. gas-flow 2224/80095 Temperature settings 2224/80096 Transient conditions 2224/80097 Heating 2224/80098 Cooling 2224/80099 Ambient temperature 2224/8010 involving protection against electrical discharge, e.g. removing electrostatic charge 2224/8012 Aligning 2224/8012 Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors 2224/80123 by detecting inherent features of, or outside, the semiconductor or solid-state body 2224/80125 Bonding areas on the body 2224/80127 Bonding areas outside the body 2224/80129 Shape or position of the other item	diffusion bonding, pressure joining, thermocompression welding or solid-state welding 2224/80204 with a graded temperature profile 2224/80205 Ultrasonic bonding 2224/80206 Direction of oscillation 2224/80207 Thermosonic bonding 2224/80209 applying unidirectional static pressure 2224/80211 applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid 2224/80213 using a reflow oven 2224/80215 with a graded temperature profile 2224/8022 with energy being in the form of electromagnetic radiation 2224/80222 Induction heating, i.e. eddy currents 2224/80224 using a laser 2224/80234 Polychromatic or infrared lamp heating 2224/80235 using an autocatalytic reaction, e.g. exothermic brazing 2224/80236 using means for applying energy being within the device, e.g. integrated heater 2224/80237 using an electron beam 2224/80238 using an electron beam 2224/8034 Bonding interfaces of the bonding area 2224/80345 Shape, e.g. interlocking features 2224/80355 having an external coating, e.g. protective

2224/8036 Bonding interfaces of the semiconductor or solid state body	2224/8048 Molybdenum [Mo] as principal constituent
2224/80365 Shape, e.g. interlocking features	2224/80481 Tantalum [Ta] as principal constituent
2224/80375 having an external coating, e.g. protective	2224/80483 Rhenium [Re] as principal constituent
bond-through coating	2224/80484 Tungsten [W] as principal constituent
2224/80379 Material	2224/80486 with a principal constituent of the material
2224/8038 Bonding interfaces outside the semiconductor or solid-state body	being a non metallic, non metalloid inorganic material
2224/80385 Shape, e.g. interlocking features	2224/80487 Ceramics, e.g. crystalline carbides,
2224/80395 having an external coating, e.g. protective	nitrides or oxides
bond-through coating 2224/80399 Material	2224/80488 Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/804 with a principal constituent of the material	2224/8049 with a principal constituent of the material
being a metal or a metalloid, e.g. boron	being a polymer, e.g. polyester, phenolic
[B], silicon [Si], germanium [Ge], arsenic	based polymer, epoxy
[As], antimony [Sb], tellurium [Te] and	2224/80491 The principal constituent being an
polonium [Po], and alloys thereof	elastomer, e.g. silicones, isoprene,
2224/80401 the principal constituent melting at a	neoprene
temperature of less than 400°C	2224/80493 with a principal constituent of the material
2224/80405 Gallium [Ga] as principal constituent	being a solid not provided for in groups
2224/80409 Indium [In] as principal constituent	H01L 2224/804 - H01L 2224/80491, e.g.
2224/80411 Tin [Sn] as principal constituent	allotropes of carbon, fullerene, graphite,
2224/80413 Bismuth [Bi] as principal constituent	carbon-nanotubes, diamond
2224/80414 Thallium [Tl] as principal constituent	2224/80494 with a principal constituent of the material
2224/80416 Lead [Pb] as principal constituent	being a liquid not provided for in groups H01L 2224/804 - H01L 2224/80491
2224/80417 the principal constituent melting at a	2224/80495 with a principal constituent of the material
temperature of greater than or equal to	being a gas not provided for in groups
400°C and less than 950°C	H01L 2224/804 - H01L 2224/80491
2224/80418 Zinc [Zn] as principal constituent	2224/80498 with a principal constituent of the material
2224/8042 Antimony [Sb] as principal	being a combination of two or more
constituent	materials in the form of a matrix with a
2224/80423 Magnesium [Mg] as principal	filler, i.e. being a hybrid material, e.g.
constituent	segmented structures, foams
2224/80424 Aluminium [Al] as principal	2224/80499 Material of the matrix
constituent	2224/805 with a principal constituent of
2224/80438 the principal constituent melting at a	the material being a metal or a
temperature of greater than or equal to 950°C and less than 1550°C	metalloid, e.g. boron [B], silicon
	[Si], germanium [Ge], arsenic [As],
2224/80439 Silver [Ag] as principal constituent 2224/80444 Gold [Au] as principal constituent	antimony [Sb], tellurium [Te] and
2224/80447 Copper [Cu] as principal constituent	polonium [Po], and alloys thereof
2224/80449 Manganese [Mn] as principal	2224/80501 the principal constituent melting at
constituent	a temperature of less than 400°C
2224/80455 Nickel [Ni] as principal constituent	2224/80505 Gallium [Ga] as principal constituent
2224/80457 Cobalt [Co] as principal constituent	2224/80509 Indium [In] as principal
2224/8046 Iron [Fe] as principal constituent	constituent
2224/80463 the principal constituent melting at a	2224/80511 Tin [Sn] as principal constituent
temperature of greater than 1550°C	2224/80513 Bismuth [Bi] as principal
2224/80464 Palladium [Pd] as principal	constituent
constituent	2224/80514 Thallium [Tl] as principal
2224/80466 Titanium [Ti] as principal constituent	constituent
2224/80466 Titanium [Ti] as principal constituent 2224/80469 Platinum [Pt] as principal constituent	constituent 2224/80516 Lead [Pb] as principal constituent
2224/80466 Titanium [Ti] as principal constituent	constituent 2224/80516 Lead [Pb] as principal constituent 2224/80517 the principal constituent melting
2224/80466 Titanium [Ti] as principal constituent 2224/80469 Platinum [Pt] as principal constituent 2224/8047 Zirconium [Zr] as principal constituent	constituent 2224/80516 Lead [Pb] as principal constituent
2224/80466 Titanium [Ti] as principal constituent 2224/80469 Platinum [Pt] as principal constituent 2224/8047 Zirconium [Zr] as principal constituent	constituent 2224/80516 Lead [Pb] as principal constituent 2224/80517 the principal constituent melting at a temperature of greater than or
2224/80466 Titanium [Ti] as principal constituent 2224/80469 Platinum [Pt] as principal constituent 2224/8047 Zirconium [Zr] as principal constituent 2224/80471 Chromium [Cr] as principal	constituent 2224/80516 Lead [Pb] as principal constituent 2224/80517 the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/80466 Titanium [Ti] as principal constituent 2224/80469 Platinum [Pt] as principal constituent 2224/8047 Zirconium [Zr] as principal constituent 2224/80471 Chromium [Cr] as principal constituent	constituent 2224/80516 Lead [Pb] as principal constituent 2224/80517 the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C 2224/80518 Zinc [Zn] as principal constituent
2224/80466 Titanium [Ti] as principal constituent 2224/80469 Platinum [Pt] as principal constituent 2224/8047 Zirconium [Zr] as principal constituent 2224/80471 Chromium [Cr] as principal constituent 2224/80472 Vanadium [V] as principal constituent	constituent 2224/80516 Lead [Pb] as principal constituent 2224/80517 the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C 2224/80518 Zinc [Zn] as principal constituent 2224/8052 Antimony [Sb] as principal
2224/80466 Titanium [Ti] as principal constituent2224/80469 Platinum [Pt] as principal constituent2224/8047 Zirconium [Zr] as principal constituent2224/80471 Chromium [Cr] as principal constituent2224/80472 Vanadium [V] as principal constituent2224/80473 Rhodium [Rh] as principal constituent	constituent 2224/80516 Lead [Pb] as principal constituent 2224/80517 the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C 2224/80518 Zinc [Zn] as principal constituent 2224/8052 Antimony [Sb] as principal constituent 2224/80523 Magnesium [Mg] as principal constituent
2224/80466 Titanium [Ti] as principal constituent2224/80469 Platinum [Pt] as principal constituent2224/8047 Zirconium [Zr] as principal constituent2224/80471	constituent 2224/80516 Lead [Pb] as principal constituent 2224/80517 the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C 2224/80518 Zinc [Zn] as principal constituent 2224/8052 Antimony [Sb] as principal constituent 2224/80523 Magnesium [Mg] as principal constituent 2224/80524 Aluminium [Al] as principal
2224/80466 Titanium [Ti] as principal constituent 2224/80469 Platinum [Pt] as principal constituent 2224/8047 Zirconium [Zr] as principal constituent 2224/80471 Chromium [Cr] as principal constituent 2224/80472 Vanadium [V] as principal constituent 2224/80473 Rhodium [Rh] as principal constituent 2224/80476 Ruthenium [Ru] as principal constituent	constituent 2224/80516 Lead [Pb] as principal constituent 2224/80517 the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C 2224/80518 Zinc [Zn] as principal constituent 2224/8052 Antimony [Sb] as principal constituent 2224/80523 Magnesium [Mg] as principal constituent

2224/80538 the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/80593 with a principal constituent of the material being a solid not provided for in groups H01L 2224/805 - H01L 2224/80591,
2224/80539 Silver [Ag] as principal constituent	e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/80544 Gold [Au] as principal constituent	2224/80594 with a principal constituent of the material being a liquid
2224/80547 Copper [Cu] as principal constituent	not provided for in groups <u>H01L 2224/805</u> - <u>H01L 2224/80591</u>
2224/80549 Manganese [Mn] as principal constituent	2224/80595 with a principal constituent of the material being a gas
2224/80555 Nickel [Ni] as principal constituent	not provided for in groups <u>H01L 2224/805</u> - <u>H01L 2224/80591</u>
2224/80557 Cobalt [Co] as principal constituent	2224/80598 Fillers 2224/80599 Base material
2224/8056 Iron [Fe] as principal constituent 2224/80563 the principal constituent melting at a temperature of greater than 1550°C	2224/806 with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As],
2224/80564 Palladium [Pd] as principal constituent	antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/80566 Titanium [Ti] as principal constituent	2224/80601 the principal constituent melting at a temperature of less than 400°C
2224/80569 Platinum [Pt] as principal constituent	2224/80605 Gallium [Ga] as principal
2224/8057 Zirconium [Zr] as principal constituent	constituent 2224/80609 Indium [In] as principal
2224/80571 Chromium [Cr] as principal constituent	constituent 2224/80611 Tin [Sn] as principal
2224/80572 Vanadium [V] as principal constituent	constituent 2224/80613 Bismuth [Bi] as principal
2224/80573 Rhodium [Rh] as principal constituent	constituent 2224/80614 Thallium [Tl] as principal
2224/80576 Ruthenium [Ru] as principal constituent	constituent 2224/80616 Lead [Pb] as principal
2224/80578 Iridium [Ir] as principal constituent	constituent 2224/80617 the principal constituent melting
2224/80579 Niobium [Nb] as principal constituent	at a temperature of greater than or equal to 400°C and less than 950°C
2224/8058 Molybdenum [Mo] as principal constituent	2224/80618 Zinc [Zn] as principal constituent
2224/80581 Tantalum [Ta] as principal constituent	2224/8062 Antimony [Sb] as principal constituent
2224/80583 Rhenium [Re] as principal constituent	2224/80623 Magnesium [Mg] as principal constituent
2224/80584 Tungsten [W] as principal constituent	2224/80624 Aluminium [Al] as principal constituent
2224/80586 with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/80638 the principal constituent melting at a temperature of greater than or equal to 950°C and less than
2224/80587 Ceramics, e.g. crystalline carbides, nitrides or oxides	1550°C
2224/80588 Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/80639 Silver [Ag] as principal constituent
2224/8059 with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer,	2224/80644 Gold [Au] as principal constituent 2224/80647 Copper [Cu] as principal
epoxy	constituent 2224/80649 Manganese [Mn] as principal
2224/80591 The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	constituent 2224/80655 Nickel [Ni] as principal
псоргене	constituent 2224/80657 Cobalt [Co] as principal
	constituent

2224/8066	constituent the principal constituent melting at a temperature of greater than 1550°C	2224/80698 with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented
2224/80664	Palladium [Pd] as principal constituent Titanium [Ti] as principal	structures, foams 2224/80699 Coating material 2224/807 with a principal constituent of
2224/80669	constituent	the material being a metal or a metalloid, e.g. boron [B], silicon
2224/8067	constituent Zirconium [Zr] as principal constituent	[Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/80671		2224/80701 the principal constituent melting at a temperature of less than
2224/80672	constituent	400°C 2224/80705 Gallium [Ga] as principal constituent
2224/80673	constituent	2224/80709 Indium [In] as principal constituent
	Ruthenium [Ru] as principal constituent	2224/80711 Tin [Sn] as principal constituent
2224/80678	constituent	2224/80713 Bismuth [Bi] as principal constituent
2224/80679	constituent	2224/80714 Thallium [Tl] as principal constituent
2224/80681	constituent	2224/80716 Lead [Pb] as principal constituent
2224/80683	constituent	2224/80717 the principal constituent melting at a temperature of greater than
2224/80684		or equal to 400°C and less than 950°C 2224/80718 Zinc [Zn] as principal
2224/80686	constituent with a principal constituent of the	constituent 2224/8072 Antimony [Sb] as principal
2224/90497	material being a non metallic, non metalloid inorganic material	constituent 2224/80723 Magnesium [Mg] as principal
2224/80687	carbides, nitrides or oxides Glasses, e.g. amorphous oxides,	constituent 2224/80724 Aluminium [Al] as principal
2224/8069	nitrides or fluorides with a principal constituent of	constituent 2224/80738 the principal constituent melting
	the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	at a temperature of greater than or equal to 950°C and less than 1550°C
2224/80691	The principal constituent being an elastomer, e.g. silicones,	2224/80739 Silver [Ag] as principal constituent
2224/80693	* *	2224/80744 Gold [Au] as principal constituent
	of the material being a solid not provided for in groups	2224/80747 Copper [Cu] as principal constituent
	H01L 2224/806 - H01L 2224/80691, e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes,	2224/80749 Manganese [Mn] as principal constituent 2224/80755 Nickel [Ni] as principal
2224/80694	diamond with a principal constituent	constituent 2224/80757 Cobalt [Co] as principal
	of the material being a liquid not provided for in groups	constituent 2224/8076 Iron [Fe] as principal
2224/80695	H01L 2224/806 - H01L 2224/80691 with a principal constituent	constituent 2224/80763 the principal constituent melting
	of the material being a gas not provided for in groups H01L 2224/806 - H01L 2224/80691	at a temperature of greater than 1550°C
	1101L 2224/000 - 1101L 2224/00091	2224/80764 Palladium [Pd] as principal constituent 2224/80766 Titanium [Ti] as principal
		constituent

2224/80769 Platinum [Pt] as principal constituent	2224/8081 involving forming an intermetallic compound at the bonding interface
2224/8077 Zirconium [Zr] as principal	2224/80815 Reflow soldering
constituent	2224/8082 Diffusion bonding
2224/80771 Chromium [Cr] as principal	2224/80825 Solid-liquid interdiffusion
constituent	2224/8083 Solid-solid interdiffusion
2224/80772 Vanadium [V] as principal	2224/8084 Sintering
constituent 2224/80773 Rhodium [Rh] as principal constituent	2224/8085 using a polymer adhesive, e.g. an adhesive based on silicone, epoxy, polyimide,
2224/80776 Ruthenium [Ru] as principal	polyester 2224/80855 Hardening the adhesive by curing, i.e.
constituent 2224/80778 Iridium [Ir] as principal	thermosetting 2224/80856 Pre-cured adhesive, i.e. B-stage
constituent	adhesive
2224/80779 Niobium [Nb] as principal constituent	2224/80859 Localised curing of parts of the bonding area
2224/8078 Molybdenum [Mo] as principal	2224/80862 Heat curing
constituent	2224/80865 Microwave curing
2224/80781 Tantalum [Ta] as principal	2224/80868 Infrared [IR] curing
constituent	2224/80871 Visible light curing
2224/80783 Rhenium [Re] as principal	2224/80874 Ultraviolet [UV] curing
constituent	2224/80877 Moisture curing, i.e. curing by exposing
2224/80784 Tungsten [W] as principal constituent	to humidity, e.g. for silicones and polyurethanes
2224/80786 with a principal constituent of the material being a non metallic, non	2224/8088 Hardening the adhesive by cooling, e.g. for thermoplastics or hot-melt adhesives
metalloid inorganic material	2224/80885 Combinations of two or more
2224/80787 Ceramics, e.g. crystalline carbides, nitrides or oxides	hardening methods provided for in
2224/80788 Glasses, e.g. amorphous oxides,	at least two different groups from H01L 2224/80855 - H01L 2224/8088, e.g.
nitrides or fluorides	for hybrid thermoplastic-thermosetting
2224/8079 with a principal constituent of	adhesives
the material being a polymer, e.g. polyester, phenolic based polymer,	2224/8089 using an inorganic non metallic glass type adhesive, e.g. solder glass
epoxy 2224/80791 The principal constituent being	2224/80893 Anodic bonding, i.e. bonding by applying a
an elastomer, e.g. silicones, isoprene, neoprene	voltage across the interface in order to induce ions migration leading to an irreversible
2224/80793 with a principal constituent	chemical bond
of the material being a solid	2224/80894 Direct bonding, i.e. joining surfaces
not provided for in groups	by means of intermolecular attracting interactions at their interfaces, e.g. covalent
<u>H01L 2224/807</u> - <u>H01L 2224/80791</u> ,	bonds, van der Waals forces
e.g. allotropes of carbon, fullerene,	2224/80895 between electrically conductive surfaces,
graphite, carbon-nanotubes, diamond	e.g. copper-copper direct bonding, surface activated bonding
2224/80794 with a principal constituent	
of the material being a liquid	2224/80896 between electrically insulating surfaces, e.g. oxide or nitride layers
not provided for in groups	2224/80897 Mechanical interlocking, e.g. anchoring,
<u>H01L 2224/807 - H01L 2224/80791</u>	hook and loop-type fastening or the like
2224/80795 with a principal constituent	2224/80898 Press-fitting, i.e. pushing the parts
of the material being a gas	together and fastening by friction, e.g. by
not provided for in groups	compression of one part against the other
<u>H01L 2224/807 - H01L 2224/80791</u>	2224/80899 using resilient parts in the bonding area
2224/80798 with a principal constituent of the	2224/809 with the bonding area not providing any
material being a combination of	mechanical bonding
two or more materials in the form of a matrix with a filler, i.e. being	2224/80901 Pressing a bonding area against another
a hybrid material, e.g. segmented	bonding area by means of a further bonding
structures, foams	area or connector
2224/80799 Shape or distribution of the fillers	2224/80902 by means of a further bonding area
2224/808 Bonding techniques	2224/80903 by means of a bump or layer connector
2224/80801 Soldering or alloying	2224/80904 by means of an encapsulation layer or foil
2224/80805 involving forming a eutectic alloy at the	2224/80905 Combinations of bonding methods provided
bonding interface	for in at least two different groups from H01L 2224/808 - H01L 2224/80904

2224/80906 Specific sequence of method steps	2224/8102 Applying permanent coating to the bump
2224/80907 Intermediate bonding, i.e. intermediate	connector in the bonding apparatus, e.g. in-
bonding step for temporarily bonding the semiconductor or solid-state body, followed	situ coating 2224/81022 Cleaning the bonding area, e.g. oxide
by at least a further bonding step	removal step, desmearing
2224/80908 involving monitoring, e.g. feedback loop	2224/81024 Applying flux to the bonding area
2224/80909 Post-treatment of the bonding area	2224/81026 Applying a precursor material to the bonding
2224/8091 Cleaning, e.g. oxide removal step,	area
desmearing	2224/8103 Reshaping the bump connector in the
2224/80911 Chemical cleaning, e.g. etching, flux	bonding apparatus, e.g. flattening the bump
2224/80912 Mechanical cleaning, e.g. abrasion	connector
using hydro blasting, brushes, ultrasonic	2224/81031 by chemical means, e.g. etching,
cleaning, dry ice blasting, gas-flow	anodisation
2224/80913 Plasma cleaning	2224/81035 by heating means
2224/80914 Thermal cleaning, e.g. using laser ablation	2224/81037 using a polychromatic heating lamp
or by electrostatic corona discharge	2224/81039 using a laser
2224/80919 Combinations of two or more	2224/81041 Induction heating, i.e. eddy currents
cleaning methods provided for in	2224/81047 by mechanical means, e.g. severing,
at least two different groups from	pressing, stamping
<u>H01L 2224/8091</u> - <u>H01L 2224/80914</u>	2224/81048 Thermal treatments, e.g. annealing,
2224/8092 Applying permanent coating, e.g. protective	controlled pre-heating or pre-cooling
coating	2224/81051 Forming additional members
2224/8093 Reshaping	2224/81052 Detaching bump connectors, e.g. after testing
2224/80931 by chemical means, e.g. etching	2224/81053 Bonding environment
2224/80935 by heating means, e.g. reflowing	2224/81054 Composition of the atmosphere
2224/80937 using a polychromatic heating lamp	2224/81055 being oxidating
2224/80939 using a laser	2224/81065 being reducing
2224/80941 Induction heating, i.e. eddy currents 2224/80943 using a flame torch, e.g. hydrogen torch	2224/81075 being inert
2224/80945 using a frame torch, e.g. hydrogen torch	2224/81085 being a liquid, e.g. for fluidic self-assembly
flame off [EFO]	2224/8109 Vacuum
2224/80947 by mechanical means, e.g. pull-and-cut,	2224/81091 Under pressure
pressing, stamping	2224/81092 Atmospheric pressure
2224/80948 Thermal treatments, e.g. annealing,	2224/81093 Transient conditions, e.g. gas-flow
controlled cooling	2224/81095 Temperature settings
2224/80951 Forming additional members, e.g. for	2224/81096 Transient conditions
reinforcing	2224/81097 Heating
2224/80986 Specific sequence of steps, e.g. repetition of	2224/81098 Cooling
manufacturing steps, time sequence	2224/81099 Ambient temperature 2224/811 the bump connector being supplied to the parts
2224/81 using a bump connector	to be connected in the bonding apparatus
2224/81001 involving a temporary auxiliary member not	2224/81101 as prepeg comprising a bump connector, e.g.
forming part of the bonding apparatus	provided in an insulating plate member
2224/81002 being a removable or sacrificial coating	2224/8111 involving protection against electrical
2224/81005 being a temporary or sacrificial substrate	discharge, e.g. removing electrostatic charge
2224/81007 involving a permanent auxiliary member being	2224/8112 Aligning
left in the finished device, e.g. aids for holding	2224/81121 Active alignment, i.e. by apparatus steering,
or protecting the bump connector during or after the bonding process	e.g. optical alignment using marks or sensors
2224/81009 Pre-treatment of the bump connector or the	2224/81122 by detecting inherent features of, or
bonding area	outside, the semiconductor or solid-state
2224/8101 Cleaning the bump connector, e.g. oxide	body
removal step, desmearing	2224/81123 Shape or position of the body
2224/81011 Chemical cleaning, e.g. etching, flux	2224/81125 Bonding areas on the body
2224/81012 Mechanical cleaning, e.g. abrasion	2224/81127 Bonding areas outside the body
using hydro blasting, brushes, ultrasonic	2224/81129 Shape or position of the other item
cleaning, dry ice blasting, gas-flow	2224/8113 using marks formed on the semiconductor
2224/81013 Plasma cleaning	or solid-state body
2224/81014 Thermal cleaning, e.g. decomposition,	2224/81132 using marks formed outside the
sublimation	semiconductor or solid-state body, i.e. "off-chip"
2224/81019 Combinations of two or more	2224/81136 involving guiding structures, e.g. spacers or
cleaning methods provided for in	supporting members
at least two different groups from H01L 2224/8101 - H01L 2224/81014	2224/81138 the guiding structures being at least
1101L 2224/0101 - 1101L 2224/01014	partially left in the finished device

0004/01100	2004/01255
2224/81139 Guiding structures on the body	2224/81355 having an external coating, e.g. protective bond-through coating
2224/8114 Guiding structures outside the body	
2224/81141 Guiding structures both on and outside the body	2224/81359 Material 2224/8136 Bonding interfaces of the semiconductor or
2224/81143 Passive alignment, i.e. self alignment, e.g.	solid state body
using surface energy, chemical reactions,	2224/81365 Shape, e.g. interlocking features
thermal equilibrium	2224/81375 having an external coating, e.g. protective
2224/81148 involving movement of a part of the bonding	bond-through coating
apparatus	2224/81379 Material
2224/81149 being the lower part of the bonding	2224/8138 Bonding interfaces outside the semiconductor
apparatus, i.e. holding means for the	or solid-state body
bodies to be connected, e.g. XY table	2224/81385 Shape, e.g. interlocking features
2224/8115 Rotational movements	2224/81395 having an external coating, e.g. protective
2224/8116 Translational movements	bond-through coating
2224/81169 being the upper part of the bonding	2224/81399 Material
apparatus, i.e. bonding head	2224/814 with a principal constituent of the material
2224/8117 Rotational movements	being a metal or a metalloid, e.g. boron
2224/8118 Translational movements	[B], silicon [Si], germanium [Ge], arsenic
2224/8119 Arrangement of the bump connectors prior to	[As], antimony [Sb], tellurium [Te] and
mounting	polonium [Po], and alloys thereof
2224/81191 wherein the bump connectors are disposed	2224/81401 the principal constituent melting at a
only on the semiconductor or solid-state	temperature of less than 400°C
body	2224/81405 Gallium [Ga] as principal constituent
2224/81192 wherein the bump connectors are disposed	2224/81409 Indium [In] as principal constituent
only on another item or body to be connected to the semiconductor or solid-state body	2224/81411 Tin [Sn] as principal constituent
2224/81193 wherein the bump connectors are disposed	2224/81413 Bismuth [Bi] as principal constituent
on both the semiconductor or solid-state	2224/81414 Thallium [T1] as principal constituent
body and another item or body to be	2224/81416 Lead [Pb] as principal constituent
connected to the semiconductor or solid-state	2224/81417 the principal constituent melting at a
body	temperature of greater than or equal to 400°C and less than 950°C
2224/81194 Lateral distribution of the bump connectors	2224/81418 Zinc [Zn] as principal constituent
2224/812 Applying energy for connecting	2224/8142 Antimony [Sb] as principal
2224/81201 Compression bonding	constituent
2224/81203 Thermocompression bonding, e.g.	2224/81423 Magnesium [Mg] as principal
diffusion bonding, pressure joining,	constituent
thermocompression welding or solid-state	2224/81424 Aluminium [Al] as principal
welding	constituent
2224/81204 with a graded temperature profile	2224/81438 the principal constituent melting at a
2224/81205 Ultrasonic bonding	temperature of greater than or equal to
2224/81206 Direction of oscillation	950°C and less than 1550°C
2224/81207 Thermosonic bonding	2224/81439 Silver [Ag] as principal constituent
2224/81208 applying unidirectional static pressure	2224/81444 Gold [Au] as principal constituent
2224/81209 applying isostatic pressure, e.g. degassing	2224/81447 Copper [Cu] as principal constituent
using vacuum or a pressurised liquid	2224/81449 Manganese [Mn] as principal
2224/8121 using a reflow oven	constituent
2224/81211 with a graded temperature profile	2224/81455 Nickel [Ni] as principal constituent
2224/8122 with energy being in the form of electromagnetic radiation	2224/81457 Cobalt [Co] as principal constituent
2224/81222 Induction heating, i.e. eddy currents	2224/8146 Iron [Fe] as principal constituent
2224/81224 using a laser	2224/81463 the principal constituent melting at a
2224/8123 Polychromatic or infrared lamp heating	temperature of greater than 1550°C
2224/81232 Polychromatic of infrared famp feating	2224/81464 Palladium [Pd] as principal
exothermic brazing	constituent 2224/81466 Titanium [Til as principal constituent
2224/81234 using means for applying energy being	2224/81466 Titanium [Ti] as principal constituent
within the device, e.g. integrated heater	2224/81469 Platinum [Pt] as principal constituent
2224/81236 using electro-static corona discharge	2224/8147 Zirconium [Zr] as principal constituent
2224/81237 using an electron beam	2224/81471 Chromium [Cr] as principal
2224/81238 using electric resistance welding, i.e. ohmic	constituent
heating	2224/81472 Vanadium [V] as principal constituent
2224/8134 Bonding interfaces of the bump connector	2224/81473 Rhodium [Rh] as principal constituent
2224/81345 Shape, e.g. interlocking features	2224/81476 Ruthenium [Ru] as principal
1	constituent

2224/81478 Iridium [Ir] as principal constituent 2224/81479 Niobium [Nb] as principal constituent	2224/81524 Aluminium [Al] as principal constituent
2224/8148 Molybdenum [Mo] as principal constituent	2224/81538 the principal constituent melting at a temperature of greater than
2224/81481 Tantalum [Ta] as principal constituent	or equal to 950°C and less than 1550°C
2224/81483 Rhenium [Re] as principal constituent 2224/81484 Tungsten [W] as principal constituent	2224/81539 Silver [Ag] as principal constituent
2224/81486 with a principal constituent of the material being a non metallic, non metalloid	2224/81544 Gold [Au] as principal constituent
inorganic material 2224/81487 Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/81547 Copper [Cu] as principal constituent
2224/81488 Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/81549 Manganese [Mn] as principal constituent
2224/8149 with a principal constituent of the material being a polymer, e.g. polyester, phenolic	2224/81555 Nickel [Ni] as principal constituent
based polymer, epoxy 2224/81491 The principal constituent being an	2224/81557 Cobalt [Co] as principal constituent
elastomer, e.g. silicones, isoprene, neoprene	2224/8156 Iron [Fe] as principal constituent 2224/81563 the principal constituent melting
2224/81493 with a principal constituent of the material	at a temperature of greater than 1550°C
being a solid not provided for in groups <u>H01L 2224/814</u> - <u>H01L 2224/81491</u> , e.g.	2224/81564 Palladium [Pd] as principal
allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	constituent [2224/81566] Titanium [Ti] as principal
2224/81494 with a principal constituent of the material being a liquid not provided for in groups	constituent 2224/81569 Platinum [Pt] as principal
<u>H01L 2224/814</u> - <u>H01L 2224/81491</u>	constituent
2224/81495 with a principal constituent of the material being a gas not provided for in groups	2224/8157 Zirconium [Zr] as principal constituent
<u>H01L 2224/814 - H01L 2224/81491</u> 2224/81498 with a principal constituent of the material	2224/81571 Chromium [Cr] as principal constituent
being a combination of two or more materials in the form of a matrix with a	2224/81572 Vanadium [V] as principal constituent
filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/81573 Rhodium [Rh] as principal constituent
2224/81499 Material of the matrix	2224/81576 Ruthenium [Ru] as principal
2224/815 with a principal constituent of the material being a metal or a	constituent 2224/81578 Iridium [Ir] as principal
metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As],	constituent
antimony [Sb], tellurium [Te] and	2224/81579 Niobium [Nb] as principal constituent
polonium [Po], and alloys thereof 2224/81501 the principal constituent melting at	2224/8158 Molybdenum [Mo] as principal constituent
a temperature of less than 400°C 2224/81505 Gallium [Ga] as principal	2224/81581 Tantalum [Ta] as principal constituent
constituent 2224/81509 Indium [In] as principal	2224/81583 Rhenium [Re] as principal constituent
constituent	2224/81584 Tungsten [W] as principal
2224/81511 Tin [Sn] as principal constituent 2224/81513 Bismuth [Bi] as principal	constituent [2224/81586] with a principal constituent of the
constituent 2224/81514 Thallium [Tl] as principal	material being a non metallic, non metalloid inorganic material
constituent 2224/81516 Lead [Pb] as principal constituent	2224/81587 Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/81517 the principal constituent melting at a temperature of greater than or	2224/81588 Glasses, e.g. amorphous oxides, nitrides or fluorides
equal to 400°C and less than 950°C	2224/8159 with a principal constituent of
2224/81518 Zinc [Zn] as principal constituent 2224/8152 Antimony [Sb] as principal constituent	the material being a polymer, e.g. polyester, phenolic based polymer,
2224/81523 Magnesium [Mg] as principal constituent	epoxy 2224/81591 The principal constituent being an elastomer, e.g. silicones, isoprene,
	neoprene

2224/81593 with a principal constituent of the material being a solid	2224/8166 Iron [Fe] as principal constituent
not provided for in groups H01L 2224/815 - H01L 2224/81591, e.g. allotropes of carbon, fullerene,	2224/81663 the principal constituent melting at a temperature of greater than 1550°C
graphite, carbon-nanotubes, diamond	2224/81664 Palladium [Pd] as principal
2224/81594 with a principal constituent of the material being a liquid not provided for in groups	constituent 2224/81666 Titanium [Ti] as principal constituent
<u>H01L 2224/815</u> - <u>H01L 2224/81591</u>	2224/81669 Platinum [Pt] as principal
2224/81595 with a principal constituent of the material being a gas	constituent 2224/8167 Zirconium [Zr] as principal
not provided for in groups <u>H01L 2224/815</u> - <u>H01L 2224/81591</u>	constituent 2224/81671 Chromium [Cr] as principal
2224/81598 Fillers	constituent
2224/81599 Base material	2224/81672 Vanadium [V] as principal
2224/816 with a principal constituent of the material being a metal or a	constituent 2224/81673 Rhodium [Rh] as principal
metalloid, e.g. boron [B], silicon	constituent
[Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and	2224/81676 Ruthenium [Ru] as principal constituent
polonium [Po], and alloys thereof 2224/81601 the principal constituent melting	2224/81678 Iridium [Ir] as principal
at a temperature of less than 400°C	constituent 2224/81679 Niobium [Nb] as principal
2224/81605 Gallium [Ga] as principal constituent	constituent 2224/8168 Molybdenum [Mo] as principal
2224/81609 Indium [In] as principal constituent	constituent 2224/81681 Tantalum [Ta] as principal
2224/81611 Tin [Sn] as principal constituent	constituent 2224/81683 Rhenium [Re] as principal
2224/81613 Bismuth [Bi] as principal constituent	constituent 2224/81684 Tungsten [W] as principal
2224/81614 Thallium [TI] as principal constituent	constituent 2224/81686 with a principal constituent of the
2224/81616 Lead [Pb] as principal constituent	material being a non metallic, non metalloid inorganic material
2224/81617 the principal constituent melting	2224/81687 Ceramics, e.g. crystalline carbides, nitrides or oxides
at a temperature of greater than or equal to 400°C and less than	2224/81688 Glasses, e.g. amorphous oxides, nitrides or fluorides
950°C	2224/8169 with a principal constituent of
2224/81618 Zinc [Zn] as principal constituent	the material being a polymer, e.g. polyester, phenolic based polymer,
2224/8162 Antimony [Sb] as principal constituent	epoxy
2224/81623 Magnesium [Mg] as principal	2224/81691 The principal constituent being an elastomer, e.g. silicones,
constituent	isoprene, neoprene
2224/81624 Aluminium [Al] as principal constituent	2224/81693 with a principal constituent of the material being a solid
2224/81638 the principal constituent melting	not provided for in groups
at a temperature of greater than or equal to 950°C and less than 1550°C	<u>H01L 2224/816</u> - <u>H01L 2224/81691</u> , e.g. allotropes of carbon, fullerene,
2224/81639 Silver [Ag] as principal constituent	graphite, carbon-nanotubes, diamond
2224/81644 Gold [Au] as principal constituent	2224/81694 with a principal constituent of the material being a liquid
2224/81647 Copper [Cu] as principal	not provided for in groups <u>H01L 2224/816</u> - <u>H01L 2224/81691</u>
constituent 2224/81649 Manganese [Mn] as principal	2224/81695 with a principal constituent of the material being a gas
constituent 2224/81655 Nickel [Ni] as principal	not provided for in groups <u>H01L 2224/816</u> - <u>H01L 2224/81691</u>
constituent Cobalt [Col as principal	
2224/81657 Cobalt [Co] as principal constituent	

2224/81698 with a principal constituent of the	2224/81769 Platinum [Pt] as principal
material being a combination of two or more materials in the form of a matrix with a filler, i.e. being	constituent 2224/8177 Zirconium [Zr] as principal
a hybrid material, e.g. segmented structures, foams	constituent 2224/81771 Chromium [Cr] as principal constituent
2224/81699 Coating material 2224/817 with a principal constituent of	2224/81772 Vanadium [V] as principal
the material being a metal or a	constituent 2224/81773 Rhodium [Rh] as principal
metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As],	constituent 2224/81776 Ruthenium [Ru] as principal
antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	constituent 2224/81778 Iridium [Ir] as principal
2224/81701 the principal constituent melting at a temperature of less than	constituent 2224/81779 Niobium [Nb] as principal
400°C	constituent
2224/81705 Gallium [Ga] as principal constituent	2224/8178 Molybdenum [Mo] as principal constituent
2224/81709 Indium [In] as principal constituent	2224/81781 Tantalum [Ta] as principal constituent
2224/81711 Tin [Sn] as principal constituent	2224/81783 Rhenium [Re] as principal constituent
2224/81713 Bismuth [Bi] as principal constituent	2224/81784 Tungsten [W] as principal constituent
2224/81714 Thallium [TI] as principal constituent	2224/81786 with a principal constituent of the
2224/81716 Lead [Pb] as principal constituent	material being a non metallic, non metalloid inorganic material
2224/81717 the principal constituent melting	2224/81787 Ceramics, e.g. crystalline carbides, nitrides or oxides
at a temperature of greater than or equal to 400°C and less than	2224/81788 Glasses, e.g. amorphous oxides, nitrides or fluorides
950°C 2224/81718 Zinc [Zn] as principal	2224/8179 with a principal constituent of
constituent 2224/8172 Antimony [Sb] as principal	the material being a polymer, e.g. polyester, phenolic based polymer,
constituent	epoxy 2224/81791 The principal constituent being
2224/81723 Magnesium [Mg] as principal constituent	an elastomer, e.g. silicones, isoprene, neoprene
2224/81724 Aluminium [Al] as principal constituent	2224/81793 with a principal constituent of the material being a solid
2224/81738 the principal constituent melting at a temperature of greater than	not provided for in groups H01L 2224/817 - H01L 2224/81791,
or equal to 950°C and less than 1550°C	e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes,
2224/81739 Silver [Ag] as principal	diamond
constituent 2224/81744 Gold [Au] as principal	2224/81794 with a principal constituent of the material being a liquid
constituent 2224/81747 Copper [Cu] as principal	not provided for in groups H01L 2224/817 - H01L 2224/81791
constituent	2224/81795 with a principal constituent
2224/81749 Manganese [Mn] as principal constituent	of the material being a gas not provided for in groups
2224/81755 Nickel [Ni] as principal constituent	<u>H01L 2224/817</u> - <u>H01L 2224/81791</u> 2224/81798 with a principal constituent of the
2224/81757 Cobalt [Co] as principal constituent	material being a combination of two or more materials in the form
2224/8176 Iron [Fe] as principal constituent	of a matrix with a filler, i.e. being a hybrid material, e.g. segmented
2224/81763 the principal constituent melting	structures, foams 2224/81799 Shape or distribution of the fillers
at a temperature of greater than $1550^{\circ}\mathrm{C}$	2224/818 Bonding techniques
2224/81764 Palladium [Pd] as principal	2224/81801 Soldering or alloying
constituent 2224/81766 Titanium [Ti] as principal	2224/81805 involving forming a eutectic alloy at the bonding interface
constituent	•

2224/8181 involving forming an intermetallic	2224/81906 Specific sequence of method steps
compound at the bonding interface	2224/81907 Intermediate bonding, i.e. intermediate
2224/81815 Reflow soldering	bonding step for temporarily bonding the
2224/8182 Diffusion bonding	semiconductor or solid-state body, followed
2224/81825 Solid-liquid interdiffusion	by at least a further bonding step
2224/8183 Solid-solid interdiffusion	2224/81908 involving monitoring, e.g. feedback loop
2224/8184 Sintering	2224/81909 Post-treatment of the bump connector or
2224/8185 using a polymer adhesive, e.g. an adhesive	bonding area
based on silicone, epoxy, polyimide, polyester	2224/8191 Cleaning, e.g. oxide removal step, desmearing
2224/81855 Hardening the adhesive by curing, i.e.	2224/81911 Chemical cleaning, e.g. etching, flux
thermosetting	2224/81912 Mechanical cleaning, e.g. abrasion
2224/81856 Pre-cured adhesive, i.e. B-stage	using hydro blasting, brushes, ultrasonic
adhesive	cleaning, dry ice blasting, gas-flow
2224/81859 Localised curing of parts of the bump	2224/81913 Plasma cleaning
connector	2224/81914 Thermal cleaning, e.g. using laser ablation
2224/81862 Heat curing	or by electrostatic corona discharge
2224/81865 Microwave curing	2224/81919 Combinations of two or more
2224/81868 Infrared [IR] curing	cleaning methods provided for in
2224/81871 Visible light curing	at least two different groups from
	H01L 2224/8191 - H01L 2224/81914
2224/81874 Ultraviolet [UV] curing	2224/8192 Applying permanent coating, e.g. protective
2224/81877 Moisture curing, i.e. curing by exposing to humidity, e.g. for silicones and	coating
polyurethanes	2224/8193 Reshaping
2224/8188 Hardening the adhesive by cooling, e.g. for	2224/81931 by chemical means, e.g. etching
thermoplastics or hot-melt adhesives	2224/81935 by heating means, e.g. reflowing
2224/81885 Combinations of two or more	2224/81937 using a polychromatic heating lamp
hardening methods provided for in	2224/81939 using a laser
at least two different groups from	2224/81941 Induction heating, i.e. eddy currents
H01L 2224/81855 - H01L 2224/8188, e.g.	2224/81943 using a flame torch, e.g. hydrogen torch
for hybrid thermoplastic-thermosetting	2224/81945 using a corona discharge, e.g. electronic
adhesives	flame off [EFO]
2224/8189 using an inorganic non metallic glass type	2224/81947 by mechanical means, e.g. "pull-and-cut",
adhesive, e.g. solder glass	pressing, stamping
2224/81893 Anodic bonding, i.e. bonding by applying a voltage across the interface in order to induce	2224/81948 Thermal treatments, e.g. annealing,
ions migration leading to an irreversible	controlled cooling
chemical bond	2224/81951 Forming additional members, e.g. for reinforcing
2224/81894 Direct bonding, i.e. joining surfaces	2224/81986 Specific sequence of steps, e.g. repetition of
by means of intermolecular attracting	manufacturing steps, time sequence
interactions at their interfaces, e.g. covalent	2224/82 • by forming build-up interconnects at chip-level,
bonds, van der Waals forces	e.g. for high density interconnects [HDI]
2224/81895 between electrically conductive surfaces,	2224/82001 involving a temporary auxiliary member not
e.g. copper-copper direct bonding, surface	forming part of the bonding apparatus
activated bonding	2224/82002 being a removable or sacrificial coating
2224/81896 between electrically insulating surfaces,	2224/82005 being a temporary or sacrificial substrate
e.g. oxide or nitride layers	2224/82007 involving a permanent auxiliary member being
2224/81897 Mechanical interlocking, e.g. anchoring,	left in the finished device, e.g. aids for holding
hook and loop-type fastening or the like	or protecting a build-up interconnect during or
2224/81898 Press-fitting, i.e. pushing the parts	after the bonding process
together and fastening by friction, e.g. by	2224/82009 Pre-treatment of the connector or the bonding
compression of one part against the other	area
2224/81899 using resilient parts in the bump	2224/8201 Cleaning, e.g. oxide removal step,
connector or in the bonding area	desmearing
2224/819 with the bump connector not providing any	2224/8203 Reshaping, e.g. forming vias
mechanical bonding	2224/82031 by chemical means, e.g. etching,
2224/81901 Pressing the bump connector against the	anodisation
bonding areas by means of another connector	2224/82035 by heating means
2224/81902 by means of another bump connector	2224/82039 using a laser
2224/81903 by means of a layer connector	2224/82045 using a corona discharge, e.g. electronic
2224/81904 by means of an encapsulation layer or foil	flame off [EFO]
2224/81905 Combinations of bonding methods provided	2224/82047 by mechanical means, e.g. severing,
for in at least two different groups from	pressing, stamping
<u>H01L 2224/818</u> - <u>H01L 2224/81904</u>	

2224/82048 Thermal treatments, e.g. annealing,	2224/82207 Thermosonic bonding
controlled pre-heating or pre-cooling	2224/8221 with energy being in the form of
2224/82051 Forming additional members	electromagnetic radiation
2224/82053 Bonding environment	2224/82212 Induction heating, i.e. eddy currents
2224/82054 Composition of the atmosphere	2224/82214 using a laser
2224/82085 being a liquid, e.g. for fluidic self-assembly	2224/8223 Polychromatic or infrared lamp heating
2224/8209 Vacuum	2224/82232 using an autocatalytic reaction, e.g.
2224/82091 Under pressure	exothermic brazing
2224/82095 Temperature settings	2224/82234 using means for applying energy being
2224/82096 Transient conditions	within the device, e.g. integrated heater
2224/82097 Heating	2224/82236 using electro-static corona discharge
2224/82098 Cooling	2224/82237 using electron beam
2224/82099 Ambient temperature	2224/82238 using electric resistance welding, i.e. ohmic
2224/821 Forming a build-up interconnect	heating
2224/82101 by additive methods, e.g. direct writing	2224/8234 Bonding interfaces of the connector
2224/82102 using jetting, e.g. ink jet	2224/82345 Shape, e.g. interlocking features
2224/82103 using laser direct writing	2224/82355 having an external coating, e.g. protective
2224/82104 using screen printing	bond-through coating
2224/82105 by using a preform	2224/82359 Material
2224/82106 by subtractive methods	2224/8236 Bonding interfaces of the semiconductor or
2224/82108 by self-assembly processes	solid state body
2224/8211 involving protection against electrical	2224/82365 Shape, e.g. interlocking features
discharge, e.g. removing electrostatic charge	2224/82375 having an external coating, e.g. protective bond-through coating
2224/8212 Aligning	2224/82379 Material
2224/82121 Active alignment, i.e. by apparatus steering,	2224/8238 Bonding interfaces outside the semiconductor
e.g. optical alignment using marks or sensors	or solid-state body
2224/82122 by detecting inherent features of, or	2224/82385 Shape, e.g. interlocking features
outside, the semiconductor or solid-state	2224/82395 having an external coating, e.g. protective
body	bond-through coating
2224/8213 using marks formed on the semiconductor or solid-state body	2224/82399 Material
2224/82132 using marks formed outside the	2224/828 Bonding techniques
semiconductor or solid-state body, i.e.	2224/82801 Soldering or alloying
"off-chip"	2224/82805 involving forming a eutectic alloy at the
2224/82136 involving guiding structures, e.g. spacers or	bonding interface
supporting members	2224/8281 involving forming an intermetallic
2224/82138 the guiding structures being at least	compound at the bonding interface
partially left in the finished device	2224/82815 Reflow soldering
2224/82143 Passive alignment, i.e. self alignment, e.g.	2224/8282 Diffusion bonding
using surface energy, chemical reactions,	2224/82825 Solid-liquid interdiffusion
thermal equilibrium	2224/8283 Solid-solid interdiffusion
2224/82148 involving movement of a part of the bonding	2224/8284 Sintering
apparatus	2224/8285 using a polymer adhesive, e.g. an adhesive
2224/82149 being the lower part of the bonding apparatus, i.e. holding means for the	based on silicone, epoxy, polyimide,
bodies to be connected, e.g. XY table	polyester
2224/8215 Rotational movements	2224/82855 Hardening the adhesive by curing, i.e. thermosetting
2224/8216 Translational movements	2224/82856 Pre-cured adhesive, i.e. B-stage
2224/82169 being the upper part of the bonding	adhesive
apparatus, e.g. nozzle	2224/82859 Localised curing of parts of the
2224/8217 Rotational movement	connector
2224/8218 Translational movements	2224/82862 Heat curing
2224/82181 connecting first on the semiconductor	2224/82865 Microwave curing
or solid-state body, i.e. on-chip,	2224/82868 Infrared [IR] curing
2224/82186 connecting first outside the	2224/82871 Visible light curing
semiconductor or solid-state body, i.e.	2224/82874 Ultraviolet [UV] curing
off-chip	2224/82877 Moisture curing, i.e. curing by exposing
2224/82191 connecting first both on and outside	to humidity, e.g. for silicones and
the semiconductor or solid-state body	polyurethanes
2224/822 Applying energy for connecting	2224/8288 Hardening the adhesive by cooling, e.g. for
2224/82201 Compression bonding	thermoplastics or hot-melt adhesives
2224/82203 Thermocompression bonding	
2224/82205 Ultrasonic bonding	

2224/82885 Combinations of two or more	2224/83019 Combinations of two or more
hardening methods provided for in at least two different groups from H01L 2224/82855 - H01L 2224/8288, e.g.	cleaning methods provided for in at least two different groups from H01L 2224/8301 - H01L 2224/83014
for hybrid thermoplastic-thermosetting	2224/8302 Applying permanent coating to the layer
adhesives	connector in the bonding apparatus, e.g. in-
2224/8289 using an inorganic non metallic glass type	situ coating
adhesive, e.g. solder glass 2224/82893 Anodic bonding, i.e. bonding by applying a	2224/83022 Cleaning the bonding area, e.g. oxide removal step, desmearing
voltage across the interface in order to induce	2224/83024 Applying flux to the bonding area
ions migration leading to an irreversible	2224/83026 Applying a precursor material to the bonding
chemical bond	area
2224/82895 Direct bonding, i.e. joining surfaces by means of intermolecular attracting	2224/8303 Reshaping the layer connector in the bonding
interactions at their interfaces, e.g. covalent	apparatus, e.g. flattening the layer connector
bonds, van der Waals forces	2224/83031 by chemical means, e.g. etching, anodisation
2224/82896 between electrically conductive surfaces,	2224/83035 by heating means
e.g. copper-copper direct bonding, surface	2224/83037 using a polychromatic heating lamp
activated bonding 2224/82897 between electrically insulating surfaces,	2224/83039 using a laser
e.g. oxide or nitride layers	2224/83041 Induction heating, i.e. eddy currents
2224/82899 Combinations of bonding methods provided	2224/83047 by mechanical means, e.g. severing,
for in at least two different groups from	pressing, stamping Thermal treatments on a pressling
<u>H01L 2224/828</u> - <u>H01L 2224/82897</u>	2224/83048 Thermal treatments, e.g. annealing, controlled pre-heating or pre-cooling
2224/829 involving monitoring, e.g. feedback loop	2224/83051 Forming additional members, e.g. dam
2224/82909 Post-treatment of the connector or the bonding	structures
area 2224/8291 Cleaning, e.g. oxide removal step,	2224/83052 Detaching layer connectors, e.g. after testing
desmearing	2224/83053 Bonding environment
2224/8293 Reshaping	2224/83054 Composition of the atmosphere
2224/82931 by chemical means, e.g. etching,	2224/83055 being oxidating
anodisation	2224/83065 being reducing
2224/82935 by heating means	2224/83075 being inert 2224/83085 being a liquid, e.g. for fluidic self-assembly
2224/82939 using a laser	2224/8309 Vacuum
2224/82945 using a corona discharge, e.g. electronic flame off [EFO]	2224/83091 Under pressure
2224/82947 by mechanical means, e.g. severing,	2224/83092 Atmospheric pressure
pressing, stamping	2224/83093 Transient conditions, e.g. gas-flow
2224/82948 Thermal treatments, e.g. annealing,	2224/83095 Temperature settings
controlled pre-heating or pre-cooling	2224/83096 Transient conditions
2224/82951 Forming additional members	2224/83097 Heating 2224/83098 Cooling
2224/82986 Specific sequence of steps, e.g. repetition of manufacturing steps, time sequence	2224/83099 Ambient temperature
2224/83 using a layer connector	2224/831 the layer connector being supplied to the parts
2224/83001 involving a temporary auxiliary member not	to be connected in the bonding apparatus
forming part of the bonding apparatus	2224/83101 as prepeg comprising a layer connector, e.g.
2224/83002 being a removable or sacrificial coating	provided in an insulating plate member
2224/83005 being a temporary or sacrificial substrate	2224/83102 using surface energy, e.g. capillary forces
2224/83007 involving a permanent auxiliary member being left in the finished device, e.g. aids for holding	2224/83104 by applying pressure, e.g. by injection 2224/8311 involving protection against electrical
or protecting the layer connector during or after	discharge, e.g. removing electrostatic charge
the bonding process	2224/8312 Aligning
2224/83009 Pre-treatment of the layer connector or the	2224/83121 Active alignment, i.e. by apparatus steering,
bonding area	e.g. optical alignment using marks or sensors
2224/8301 Cleaning the layer connector, e.g. oxide removal step, desmearing	2224/83122 by detecting inherent features of, or
2224/83011 Chemical cleaning, e.g. etching, flux	outside, the semiconductor or solid-state body
2224/83012 Mechanical cleaning, e.g. abrasion	2224/83123 Shape or position of the body
using hydro blasting, brushes, ultrasonic	2224/83125 Bonding areas on the body
cleaning, dry ice blasting, gas-flow	2224/83127 Bonding areas outside the body
2224/83013 Plasma cleaning Thermal cleaning and decomposition	2224/83129 Shape or position of the other item
2224/83014 Thermal cleaning, e.g. decomposition, sublimation	2224/8313 using marks formed on the semiconductor
Suominauon	or solid-state body

2224/83132 using marks formed outside the semiconductor or solid-state body, i.e.	2224/83237 using an electron beam 2224/83238 using electric resistance welding, i.e. ohmic
"off-chip" 2224/83136 involving guiding structures, e.g. spacers or	heating 2224/8334 Bonding interfaces of the layer connector
supporting members	2224/83345 Shape, e.g. interlocking features
2224/83138 the guiding structures being at least partially left in the finished device	2224/83355 having an external coating, e.g. protective bond-through coating
2224/83139 Guiding structures on the body	2224/83359 Material
2224/8314 Guiding structures outside the body	2224/8336 Bonding interfaces of the semiconductor or
2224/83141 Guiding structures both on and outside	solid state body
the body	2224/83365 Shape, e.g. interlocking features
2224/83143 Passive alignment, i.e. self alignment, e.g. using surface energy, chemical reactions,	2224/83375 having an external coating, e.g. protective bond-through coating
thermal equilibrium	2224/83379 Material
2224/83148 involving movement of a part of the bonding	2224/8338 Bonding interfaces outside the semiconductor
apparatus	or solid-state body
2224/83149 being the lower part of the bonding	2224/83385 Shape, e.g. interlocking features
apparatus, i.e. holding means for the	2224/83395 having an external coating, e.g. protective
bodies to be connected, e.g. XY table	bond-through coating
2224/8315 Rotational movements	2224/83399 Material
2224/8316 Translational movements	2224/834 with a principal constituent of the material
2224/83169 being the upper part of the bonding	being a metal or a metalloid, e.g. boron
apparatus, i.e. bonding head	[B], silicon [Si], germanium [Ge], arsenic
2224/8317 Rotational movements	[As], antimony [Sb], tellurium [Te] and
2224/8318 Translational movements	polonium [Po], and alloys thereof
2224/8319 Arrangement of the layer connectors prior to	2224/83401 the principal constituent melting at a
mounting	temperature of less than 400°C
2224/83191 wherein the layer connectors are disposed	2224/83405 Gallium [Ga] as principal constituent
only on the semiconductor or solid-state	2224/83409 Indium [In] as principal constituent
body	2224/83411 Tin [Sn] as principal constituent
2224/83192 wherein the layer connectors are disposed	2224/83413 Bismuth [Bi] as principal constituent
only on another item or body to be connected	2224/83414 Thallium [TI] as principal constituent
to the semiconductor or solid-state body	2224/83416 Lead [Pb] as principal constituent
2224/83193 wherein the layer connectors are disposed on	2224/83417 the principal constituent melting at a
both the semiconductor or solid-state body	temperature of greater than or equal to
and another item or body to be connected to	400°C and less than 950°C
the semiconductor or solid-state body	2224/83418 Zinc [Zn] as principal constituent
2224/83194 Lateral distribution of the layer connectors	2224/8342 Antimony [Sb] as principal
2224/832 Applying energy for connecting	constituent
2224/83201 Compression bonding	2224/83423 Magnesium [Mg] as principal
2224/83203 Thermocompression bonding, e.g.	constituent
diffusion bonding, pressure joining, thermocompression welding or solid-state	2224/83424 Aluminium [Al] as principal
welding	constituent
2224/83204 with a graded temperature profile	2224/83438 the principal constituent melting at a
2224/83205 Ultrasonic bonding	temperature of greater than or equal to
2224/83206 Direction of oscillation	950°C and less than 1550°C
2224/83207 Thermosonic bonding	2224/83439 Silver [Ag] as principal constituent
2224/83208 applying unidirectional static pressure	2224/83444 Gold [Au] as principal constituent
2224/83209 applying undirectional static pressure	2224/83447 Copper [Cu] as principal constituent
using vacuum or a pressurised liquid	2224/83449 Manganese [Mn] as principal
2224/8321 using a reflow oven	constituent
2224/83211 with a graded temperature profile	2224/83455 Nickel [Ni] as principal constituent
2224/8322 with a graded temperature profile	2224/83457 Cobalt [Co] as principal constituent
electromagnetic radiation	2224/8346 Iron [Fe] as principal constituent
2224/83222 Induction heating, i.e. eddy currents	2224/83463 the principal constituent melting at a
2224/83224 using a laser	temperature of greater than 1550°C
2224/8323 Polychromatic or infrared lamp heating	2224/83464 Palladium [Pd] as principal
2224/83232 Polychromatic or infrared lamp heating 2224/83232 using an autocatalytic reaction, e.g.	constituent
exothermic brazing	2224/83466 Titanium [Ti] as principal constituent
2224/83234 using means for applying energy being	2224/83469 Platinum [Pt] as principal constituent
within the device, e.g. integrated heater	2224/8347 Zirconium [Zr] as principal
2224/83236 using electro-static corona discharge	constituent
2227/05250 using electro-static colonia discharge	

2224/83471 Chromium [Cr] as principal constituent	2224/83518 Zinc [Zn] as principal constituent 2224/8352 Antimony [Sb] as principal
2224/83473	constituent 2224/83523 Magnesium [Mg] as principal constituent
constituent 2224/83478 Iridium [Ir] as principal constituent	2224/83524 Aluminium [Al] as principal constituent
2224/83479 Niobium [Nb] as principal constituent 2224/8348 Molybdenum [Mo] as principal constituent	2224/83538 the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/83481 Tantalum [Ta] as principal constituent 2224/83483 Rhenium [Re] as principal constituent	2224/83539 Silver [Ag] as principal constituent
2224/83484 Tungsten [W] as principal constituent 2224/83486 with a principal constituent of the material being a non metallic, non metalloid	2224/83544 Gold [Au] as principal constituent
inorganic material	2224/83547 Copper [Cu] as principal constituent
2224/83487 Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/83549 Manganese [Mn] as principal constituent
2224/83488 Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/83555 Nickel [Ni] as principal constituent
2224/8349 with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/83557 Cobalt [Co] as principal constituent
2224/83491 The principal constituent being an	2224/8356 Iron [Fe] as principal constituent
elastomer, e.g. silicones, isoprene,	2224/83563 the principal constituent melting at a temperature of greater than
neoprene 2224/83493 with a principal constituent of the material	1550°C
being a solid not provided for in groups H01L 2224/834 - H01L 2224/83491, e.g.	2224/83564 Palladium [Pd] as principal constituent
allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/83566 Titanium [Ti] as principal constituent
2224/83494 with a principal constituent of the material being a liquid not provided for in groups	2224/83569 Platinum [Pt] as principal constituent
<u>H01L 2224/834 - H01L 2224/83491</u>	2224/8357 Zirconium [Zr] as principal
2224/83495 with a principal constituent of the material being a gas not provided for in groups H01L 2224/834 - H01L 2224/83491	constituent 2224/83571 Chromium [Cr] as principal constituent
2224/83498 with a principal constituent of the material being a combination of two or more	2224/83572 Vanadium [V] as principal constituent
materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g.	2224/83573 Rhodium [Rh] as principal constituent
segmented structures, foams	2224/83576 Ruthenium [Ru] as principal
2224/83499 Material of the matrix 2224/835 with a principal constituent of	constituent 2224/83578 Iridium [Ir] as principal
the material being a metal or a metalloid, e.g. boron [B], silicon	constituent
[Si], germanium [Ge], arsenic [As],	2224/83579 Niobium [Nb] as principal constituent
antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/8358 Molybdenum [Mo] as principal constituent
2224/83501 the principal constituent melting at a temperature of less than 400°C	2224/83581 Tantalum [Ta] as principal constituent
2224/83505 Gallium [Ga] as principal constituent	2224/83583 Rhenium [Re] as principal
2224/83509 Indium [In] as principal constituent	constituent 2224/83584 Tungsten [W] as principal constituent
2224/83511 Tin [Sn] as principal constituent	2224/83586 with a principal constituent of the
2224/83513 Bismuth [Bi] as principal constituent	material being a non metallic, non metalloid inorganic material
2224/83514 Thallium [Tl] as principal constituent	2224/83587 Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/83516 Lead [Pb] as principal constituent	2224/83588 Glasses, e.g. amorphous oxides,
2224/83517 the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	nitrides or fluorides

2224/8359 with a principal constituent of the material being a polymer, e.g.	2224/83647 Copper [Cu] as principal constituent
polyester, phenolic based polymer, epoxy	2224/83649 Manganese [Mn] as principal constituent
2224/83591 The principal constituent being an elastomer, e.g. silicones, isoprene,	2224/83655 Nickel [Ni] as principal constituent
neoprene 2224/83593 with a principal constituent	2224/83657 Cobalt [Co] as principal constituent
of the material being a solid not provided for in groups	2224/8366 Iron [Fe] as principal constituent
<u>H01L 2224/835</u> - <u>H01L 2224/83591</u> , e.g. allotropes of carbon, fullerene,	2224/83663 the principal constituent melting at a temperature of greater than
graphite, carbon-nanotubes, diamond	1550°C
2224/83594 with a principal constituent of the material being a liquid not provided for in groups	2224/83664 Palladium [Pd] as principal constituent
H01L 2224/835 - H01L 2224/83591	2224/83666 Titanium [Ti] as principal constituent
2224/83595 with a principal constituent of the material being a gas not provided for in groups	2224/83669 Platinum [Pt] as principal constituent
H01L 2224/835 - H01L 2224/83591	2224/8367 Zirconium [Zr] as principal constituent
2224/83598 Fillers 2224/83599 Base material	2224/83671 Chromium [Cr] as principal
2224/836 with a principal constituent of the material being a metal or a	constituent 2224/83672 Vanadium [V] as principal
metalloid, e.g. boron [B], silicon	constituent 2224/83673 Rhodium [Rh] as principal
[Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and	constituent 2224/83676 Ruthenium [Ru] as principal
polonium [Po], and alloys thereof 2224/83601 the principal constituent melting	constituent
at a temperature of less than 400°C	2224/83678 Iridium [Ir] as principal constituent
2224/83605 Gallium [Ga] as principal constituent	2224/83679 Niobium [Nb] as principal constituent
2224/83609 Indium [In] as principal constituent	2224/8368 Molybdenum [Mo] as principal constituent
2224/83611 Tin [Sn] as principal constituent	2224/83681 Tantalum [Ta] as principal constituent
2224/83613 Bismuth [Bi] as principal	2224/83683 Rhenium [Re] as principal constituent
constituent 2224/83614 Thallium [Tl] as principal constituent	2224/83684 Tungsten [W] as principal constituent
2224/83616 Lead [Pb] as principal	2224/83686 with a principal constituent of the material being a non metallic, non
constituent 2224/83617 the principal constituent melting	metalloid inorganic material
at a temperature of greater than or equal to 400°C and less than	2224/83687 Ceramics, e.g. crystalline carbides, nitrides or oxides
950°C	2224/83688 Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/83618 Zinc [Zn] as principal constituent	2224/8369 with a principal constituent of
2224/8362 Antimony [Sb] as principal constituent	the material being a polymer, e.g. polyester, phenolic based polymer,
2224/83623 Magnesium [Mg] as principal constituent	epoxy 2224/83691 The principal constituent being
2224/83624 Aluminium [A1] as principal constituent	an elastomer, e.g. silicones, isoprene, neoprene
2224/83638 the principal constituent melting at a temperature of greater than or equal to 950°C and less than	2224/83693 with a principal constituent of the material being a solid not provided for in groups
1550°C 2224/83639 Silver [Ag] as principal	H01L 2224/836 - H01L 2224/83691, e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes,
constituent 2224/83644 Gold [Au] as principal	graphite, carbon-nanotubes, diamond
constituent	

2224/83694 with a principal constituent of the material being a liquid	2224/8376 Iron [Fe] as principal constituent
not provided for in groups <u>H01L 2224/836</u> - <u>H01L 2224/83691</u>	2224/83763 the principal constituent melting at a temperature of greater than
2224/83695 with a principal constituent of the material being a gas	1550°C 2224/83764 Palladium [Pd] as principal
not provided for in groups H01L 2224/836 - H01L 2224/83691	constituent 2224/83766 Titanium [Ti] as principal
2224/83698 with a principal constituent of the material being a combination of	constituent
two or more materials in the form of a matrix with a filler, i.e. being	2224/83769 Platinum [Pt] as principal constituent
a hybrid material, e.g. segmented	2224/8377 Zirconium [Zr] as principal constituent
structures, foams 2224/83699 Coating material	2224/83771 Chromium [Cr] as principal constituent
2224/837 with a principal constituent of the material being a metal or a	2224/83772 Vanadium [V] as principal constituent
metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As],	2224/83773 Rhodium [Rh] as principal
antimony [Sb], tellurium [Te] and	constituent 2224/83776 Ruthenium [Ru] as principal
polonium [Po], and alloys thereof 2224/83701 the principal constituent melting	constituent 2224/83778 Iridium [Ir] as principal
at a temperature of less than $400^{\circ}\mathrm{C}$	constituent
2224/83705 Gallium [Ga] as principal constituent	2224/83779 Niobium [Nb] as principal constituent
2224/83709 Indium [In] as principal	2224/8378 Molybdenum [Mo] as principal constituent
constituent 2224/83711 Tin [Sn] as principal	2224/83781 Tantalum [Ta] as principal constituent
constituent 2224/83713 Bismuth [Bi] as principal	2224/83783 Rhenium [Re] as principal
constituent 2224/83714 Thallium [TI] as principal	constituent 2224/83784 Tungsten [W] as principal
constituent	constituent 2224/83786 with a principal constituent of the
2224/83716 Lead [Pb] as principal constituent	material being a non metallic, non metalloid inorganic material
2224/83717 the principal constituent melting at a temperature of greater than	2224/83787 Ceramics, e.g. crystalline
or equal to 400°C and less than 950°C	carbides, nitrides or oxides 2224/83788 Glasses, e.g. amorphous oxides,
2224/83718 Zinc [Zn] as principal constituent	nitrides or fluorides 2224/8379 with a principal constituent of
2224/8372 Antimony [Sb] as principal	the material being a polymer, e.g. polyester, phenolic based polymer,
constituent 2224/83723 Magnesium [Mg] as principal	epoxy 2224/83791 The principal constituent being
constituent 2224/83724 Aluminium [Al] as principal	an elastomer, e.g. silicones, isoprene, neoprene
constituent 2224/83738 the principal constituent melting	2224/83793 with a principal constituent
at a temperature of greater than	of the material being a solid not provided for in groups
or equal to 950°C and less than 1550°C	H01L 2224/837 - H01L 2224/83791, e.g. allotropes of carbon, fullerene,
2224/83739 Silver [Ag] as principal constituent	graphite, carbon-nanotubes, diamond
2224/83744 Gold [Au] as principal constituent	2224/83794 with a principal constituent
2224/83747 Copper [Cu] as principal constituent	of the material being a liquid not provided for in groups
2224/83749 Manganese [Mn] as principal	<u>H01L 2224/837</u> - <u>H01L 2224/83791</u> 22224/83795 with a principal constituent
constituent 2224/83755 Nickel [Ni] as principal	of the material being a gas not provided for in groups
constituent 2224/83757 Cobalt [Co] as principal	H01L 2224/837 - H01L 2224/83791
constituent	

2224/83798 with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented	2224/83894 Direct bonding, i.e. joining surfaces by means of intermolecular attracting interactions at their interfaces, e.g. covalent bonds, van der Waals forces
structures, foams	2224/83895 between electrically conductive surfaces, e.g. copper-copper direct bonding, surface
2224/83799 Shape or distribution of the fillers	activated bonding
2224/838 Bonding techniques	2224/83896 between electrically insulating surfaces,
2224/83801 Soldering or alloying	e.g. oxide or nitride layers
2224/83805 involving forming a eutectic alloy at the bonding interface	2224/83897 Mechanical interlocking, e.g. anchoring, hook and loop-type fastening or the like
2224/8381 involving forming an intermetallic compound at the bonding interface	2224/83898 Press-fitting, i.e. pushing the parts together and fastening by friction, e.g. by
2224/83815 Reflow soldering	compression of one part against the other
2224/8382 Diffusion bonding	2224/83899 using resilient parts in the layer
2224/83825 Solid-liquid interdiffusion	connector or in the bonding area
2224/8383 Solid-solid interdiffusion	2224/839 with the layer connector not providing any mechanical bonding
2224/8384 Sintering	
2224/8385 using a polymer adhesive, e.g. an adhesive based on silicone, epoxy, polyimide,	2224/83901 Pressing the layer connector against the bonding areas by means of another connector
polyester	2224/83902 by means of another layer connector
2224/83851 being an anisotropic conductive adhesive	2224/83903 by means of a bump connector
2224/83855 Hardening the adhesive by curing, i.e.	2224/83904 by means of an encapsulation layer or foil
thermosetting	2224/83905 Combinations of bonding methods provided
2224/83856 Pre-cured adhesive, i.e. B-stage adhesive	for in at least two different groups from H01L 2224/838 - H01L 2224/83904
2224/83859 Localised curing of parts of the layer	2224/83906 Specific sequence of method steps
connector	2224/83907 Intermediate bonding, i.e. intermediate
2224/83862 Heat curing	bonding step for temporarily bonding the
2224/83865 Microwave curing	semiconductor or solid-state body, followed
2224/83868 Infrared [IR] curing	by at least a further bonding step
2224/83871 Visible light curing	2224/83908 involving monitoring, e.g. feedback loop
2224/83874 Ultraviolet [UV] curing	2224/83909 Post-treatment of the layer connector or
2224/83877 Moisture curing, i.e. curing by exposing to humidity, e.g. for silicones and	bonding area 2224/8391 Cleaning, e.g. oxide removal step, desmearing
polyurethanes	2224/83911 Chemical cleaning, e.g. etching, flux
2224/8388 Hardening the adhesive by cooling, e.g. for	2224/83912 Mechanical cleaning, e.g. abrasion
thermoplastics or hot-melt adhesives	using hydro blasting, brushes, ultrasonic
2224/83885 Combinations of two or more	cleaning, dry ice blasting, gas-flow
hardening methods provided for in	2224/83913 Plasma cleaning
at least two different groups from H01L 2224/83855 - H01L 2224/8388, e.g.	2224/83914 Thermal cleaning, e.g. using laser ablation
for hybrid thermoplastic-thermosetting	or by electrostatic corona discharge
adhesives	2224/83919 Combinations of two or more
2224/83886 Involving a self-assembly process, e.g. self-	cleaning methods provided for in
agglomeration of a material dispersed in a	at least two different groups from
fluid	<u>H01L 2224/8391</u> - <u>H01L 2224/83914</u>
2224/83887 Auxiliary means therefor, e.g. for self-assembly activation	2224/8392 Applying permanent coating, e.g. protective coating
2224/83888 with special adaptation of the surface of	2224/8393 Reshaping
the body to be connected, e.g. surface	2224/83931 by chemical means, e.g. etching
shape specially adapted for the self-	2224/83935 by heating means, e.g. reflowing
assembly process	2224/83937 using a polychromatic heating lamp
2224/83889 involving the material of the bonding area,	2224/83939 using a laser
e.g. bonding pad	2224/83941 Induction heating, i.e. eddy currents
2224/8389 using an inorganic non metallic glass type	2224/83943 using a flame torch, e.g. hydrogen torch
adhesive, e.g. solder glass 2224/83893 Anodic bonding, i.e. bonding by applying a	2224/83945 using a corona discharge, e.g. electronic flame off [EFO]
voltage across the interface in order to induce	2224/83947 by mechanical means, e.g. "pull-and-cut",
ions migration leading to an irreversible	pressing, stamping
chemical bond	2224/83948 Thermal treatments, e.g. annealing,
	controlled cooling
	2224/83951 Forming additional members, e.g. for reinforcing, fillet sealant
	remoreing, inter scarain

2224/83986 Specific sequence of steps, e.g. repetition of manufacturing steps, time sequence	2224/84121 Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors
2224/84 using a strap connector	2224/84122 by detecting inherent features of, or
2224/84001 involving a temporary auxiliary member not forming part of the bonding apparatus	outside, the semiconductor or solid-state body
2224/84002 being a removable or sacrificial coating	2224/84123 Shape or position of the body
2224/84005 being a temporary substrate	2224/84125 Bonding areas on the body
2224/84007 involving a permanent auxiliary member being	2224/84127 Bonding areas outside the body
left in the finished device, e.g. aids for holding	2224/84129 Shape or position of the other item
or protecting the strap connector during or after the bonding process	2224/8413 using marks formed on the semiconductor or solid-state body
2224/84009 Pre-treatment of the connector and/or the bonding area	2224/84132 using marks formed outside the semiconductor or solid-state body, i.e.
2224/8401 Cleaning, e.g. oxide removal step,	"off-chip"
desmearing	2224/84136 involving guiding structures, e.g. spacers or
2224/84011 Chemical cleaning, e.g. etching, flux	supporting members
2224/84012 Mechanical cleaning, e.g. abrasion using hydro blasting, brushes, ultrasonic	2224/84138 the guiding structures being at least partially left in the finished device
cleaning, dry ice blasting, gas-flow	2224/84143 Passive alignment, i.e. self alignment, e.g.
2224/84013 Plasma cleaning	using surface energy, chemical reactions,
2224/84014 Thermal cleaning, e.g. decomposition,	thermal equilibrium
sublimation 2224/84019 Combinations of two or more	2224/84148 involving movement of a part of the bonding apparatus
cleaning methods provided for in	2224/84149 being the lower part of the bonding
at least two different groups from	apparatus, i.e. holding means for the
H01L 2224/8401 - H01L 2224/84014	bodies to be connected, e.g. XY table
2224/8402 Applying permanent coating, e.g. in-situ	2224/8415 Rotational movements
coating	2224/8416 Translational movements
2224/8403 Reshaping	2224/84169 being the upper part of the bonding
2224/84031 by chemical means, e.g. etching, anodisation	apparatus, i.e. bonding head, 2224/8417 Rotational movements
2224/84035 by heating means, e.g. "free-air-ball"	2224/8418 Translational movements
2224/84037 using a polychromatic heating lamp	2224/84181 connecting first on the semiconductor
2224/84039 using a laser	or solid-state body, i.e. on-chip,
2224/84041 Induction heating, i.e. eddy currents	regular stitch
2224/84043 using a flame torch, e.g. hydrogen torch	2224/84186 connecting first outside the
2224/84045 using a corona discharge, e.g. electronic flame off [EFO]	semiconductor or solid-state body, i.e. off-chip, reverse stitch
2224/84047 by mechanical means, e.g. severing,	2224/84191 connecting first both on and outside
pressing, stamping	the semiconductor or solid-state body,
2224/84048 Thermal treatments, e.g. annealing,	i.e. regular and reverse stitches
controlled pre-heating or pre-cooling	2224/84196 involving intermediate connecting
2224/84051 Forming additional members	steps before cutting the strap
2224/84053 Bonding environment	connector
2224/84054 Composition of the atmosphere	2224/842 Applying energy for connecting
2224/84055 being oxidating	2224/84201 Compression bonding
2224/84065 being reducing	2224/84203 Thermocompression bonding
2224/84075 being inert	2224/84205 Ultrasonic bonding
2224/84085 being a liquid (e.g. for fluidic self-assembly)	2224/84206 Direction of oscillation
2224/8409 Vacuum	2224/84207 Thermosonic bonding
2224/84091 Under pressure	2224/8421 with energy being in the form of electromagnetic radiation
2224/84092 Atmospheric pressure	2224/84212 Induction heating, i.e. eddy currents
2224/84093 Transient conditions, e.g. gas-flow	
2224/84095 Temperature settings	2224/84214 using a laser 2224/8423 Polychromatic or infrared lamp heating
2224/84096 Transient conditions	2224/8423 Polychromatic or infrared lamp heating 2224/84232 using an autocatalytic reaction, e.g.
2224/84097 Heating	exothermic brazing
2224/84098 Cooling	2224/84234 using means for applying energy being
2224/84099 Ambient temperature	within the device, e.g. integrated heater
2224/841 the connector being supplied to the parts to be	2224/84236 using electro-static corona discharge
connected in the bonding apparatus	2224/84237 using an electron beam
2224/8411 involving protection against electrical	2224/84238 using electric resistance welding, i.e. ohmic
discharge, e.g. removing electrostatic charge	heating
2224/8412 Aligning	

2224/0424 P. I	0004/04476 P. d. ' [D. l. ' ' 1
2224/8434 Bonding interfaces of the connector	2224/84476 Ruthenium [Ru] as principal constituent
2224/84345 Shape, e.g. interlocking features	
2224/84355 having an external coating, e.g. protective	2224/84478 Iridium [Ir] as principal constituent
bond-through coating	2224/84479 Niobium [Nb] as principal constituent
2224/84359 Material	2224/8448 Molybdenum [Mo] as principal
2224/8436 Bonding interfaces of the semiconductor or	constituent
solid state body	2224/84481 Tantalum [Ta] as principal constituent
2224/84365 Shape, e.g. interlocking features	2224/84483 Rhenium [Re] as principal constituent
2224/84375 having an external coating, e.g. protective	2224/84484 Tungsten [W] as principal constituent
bond-through coating	2224/84486 with a principal constituent of the material
2224/84379 Material	being a non metallic, non metalloid
2224/8438 Bonding interfaces outside the semiconductor	inorganic material
or solid-state body	2224/84487 Ceramics, e.g. crystalline carbides,
2224/84385 Shape, e.g. interlocking features	nitrides or oxides
2224/84395 having an external coating, e.g. protective	2224/84488 Glasses, e.g. amorphous oxides, nitrides
bond-through coating	or fluorides
2224/84399 Material	2224/8449 with a principal constituent of the material
2224/844 with a principal constituent of the material	being a polymer, e.g. polyester, phenolic based polymer, epoxy
being a metal or a metalloid, e.g. boron	2224/84491 The principal constituent being an
[B], silicon [Si], germanium [Ge], arsenic	elastomer, e.g. silicones, isoprene,
[As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	neoprene
2224/84401 the principal constituent melting at a	2224/84493 with a principal constituent of the material
temperature of less than 400°C	being a solid not provided for in groups
2224/84405 Gallium [Ga] as principal constituent	H01L 2224/844 - H01L 2224/84491, e.g.
2224/84409 Indium [In] as principal constituent	allotropes of carbon, fullerene, graphite,
2224/84411 Tin [Sn] as principal constituent	carbon-nanotubes, diamond
2224/84413 Bismuth [Bi] as principal constituent	2224/84494 with a principal constituent of the material
2224/84414 Thallium [TI] as principal constituent	being a liquid not provided for in groups
2224/84416 Lead [Pb] as principal constituent	<u>H01L 2224/844</u> - <u>H01L 2224/84491</u>
	2224/84495 with a principal constituent of the material
2224/84417 the principal constituent melting at a temperature of greater than or equal to	being a gas not provided for in groups
400°C and less than 950°C	<u>H01L 2224/844</u> - <u>H01L 2224/84491</u>
2224/84418 Zinc [Zn] as principal constituent	2224/84498 with a principal constituent of the material
2224/8442 Antimony [Sb] as principal	being a combination of two or more
constituent	materials in the form of a matrix with a
2224/84423 Magnesium [Mg] as principal	filler, i.e. being a hybrid material, e.g.
constituent	segmented structures, foams
2224/84424 Aluminium [Al] as principal	2224/84499 Material of the matrix
constituent	2224/845 with a principal constituent of
2224/84438 the principal constituent melting at a	the material being a metal or a metalloid, e.g. boron [B], silicon
temperature of greater than or equal to	[Si], germanium [Ge], arsenic [As],
950°C and less than 1550°C	antimony [Sb], tellurium [Te] and
2224/84439 Silver [Ag] as principal constituent	polonium [Po], and alloys thereof
2224/84444 Gold [Au] as principal constituent	2224/84501 the principal constituent melting at
2224/84447 Copper [Cu] as principal constituent	a temperature of less than 400°C
2224/84449 Manganese [Mn] as principal	2224/84505 Gallium [Ga] as principal
constituent	constituent
2224/84455 Nickel [Ni] as principal constituent	2224/84509 Indium [In] as principal
2224/84457 Cobalt [Co] as principal constituent	constituent
2224/8446 Iron [Fe] as principal constituent	2224/84511 Tin [Sn] as principal constituent
2224/84463 the principal constituent melting at a	2224/84513 Bismuth [Bi] as principal
temperature of greater than 1550°C	constituent
2224/84464 Palladium [Pd] as principal	2224/84514 Thallium [Tl] as principal
constituent	constituent
2224/84466 Titanium [Ti] as principal constituent	2224/84516 Lead [Pb] as principal constituent
2224/84469 Platinum [Pt] as principal constituent	2224/84517 the principal constituent melting
2224/8447 Zirconium [Zr] as principal	at a temperature of greater than or
constituent	equal to 400°C and less than 950°C
2224/84471 Chromium [Cr] as principal	2224/84518 Zinc [Zn] as principal constituent
constituent	2224/8452 Antimony [Sb] as principal
2224/84472 Vanadium [V] as principal constituent	constituent
2224/84473 Rhodium [Rh] as principal constituent	

2224/84523	Magnesium [Mg] as principal constituent	2224/84591	The principal constituent being an elastomer, e.g. silicones, isoprene,
2224/84524	Aluminium [Al] as principal constituent	2224/84593 v	neoprene vith a principal constituent
2224/84538	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	c n <u>I</u>	of the material being a solid not provided for in groups HOIL 2224/845 - HOIL 2224/84591, a.g. allotropes of carbon, fullerene,
2224/84539	Silver [Ag] as principal constituent	2224/84594 v	raphite, carbon-nanotubes, diamond with a principal constituent
2224/84544	Gold [Au] as principal constituent	n	of the material being a liquid not provided for in groups
2224/84547	Copper [Cu] as principal constituent	2224/84595 v	H01L 2224/845 - H01L 2224/84591 with a principal constituent
2224/84549	Manganese [Mn] as principal constituent	n	of the material being a gas not provided for in groups
2224/84555	constituent	2224/84598 Fill	
2224/84557	constituent	2224/84599 E	with a principal constituent of
	• Iron [Fe] as principal constituent • the principal constituent melting at a temperature of greater than 1550°C		the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and
2224/84564	 Palladium [Pd] as principal constituent 	2224/84601	polonium [Po], and alloys thereofthe principal constituent melting at a temperature of less than
2224/84566	Titanium [Ti] as principal constituent	2224/84605	400°C
2224/84569	• Platinum [Pt] as principal constituent	2224/84605	constituent
2224/8457	Zirconium [Zr] as principal constituent	2224/84609	constituent
2224/84571	Chromium [Cr] as principal constituent	2224/84611	constituent
2224/84572	Vanadium [V] as principal constituent	2224/84613	constituent
2224/84573	Rhodium [Rh] as principal constituent	2224/84614	constituent
2224/84576	Ruthenium [Ru] as principal constituent	2224/84616	 Lead [Pb] as principal constituent the principal constituent melting
2224/84578	constituent	2224/04017	at a temperature of greater than or equal to 400°C and less than 950°C
2224/8458	constituent Molybdenum [Mo] as principal	2224/84618	
2224/84581		2224/8462	Antimony [Sb] as principal constituent
2224/84583	1 1	2224/84623	Magnesium [Mg] as principal constituent
2224/84584	2 1 1	2224/84624	Aluminium [Al] as principal constituent
1	constituent with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/84638	at a temperature of greater than or equal to 950°C and less than
	• Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/84639	1550°C Silver [Ag] as principal constituent
2224/84588	 Glasses, e.g. amorphous oxides, nitrides or fluorides 	2224/84644	
t	with a principal constituent of the material being a polymer, e.g.	2224/84647	
-	polyester, phenolic based polymer, epoxy	2224/84649	Manganese [Mn] as principal constituent

2224/84657 Cobalt [Co] as principal not provided for in gro	gas
2224/84657 Cobalt [Co] as principal constituent H01L 2224/846 - H011	
2224/8466 Iron [Fe] as principal constituent 2224/84698 with a principal constituent material being a combi	
2224/84663 the principal constituent melting at a temperature of greater than 1550°C two or more materials of a matrix with a filler a hybrid material, e.g. two or more materials.	r, i.e. being
2224/84664 Palladium [Pd] as principal constituent 2224/84699 Coating material	
2224/84666 Titanium [Ti] as principal constituent 2224/847 with a principal constituent the material being a mo	etal or a
2224/84669 Platinum [Pt] as principal metalloid, e.g. boron [l constituent [Si], germanium [Ge],	arsenic [As],
2224/8467 Zirconium [Zr] as principal constituent antimony [Sb], telluriu polonium [Po], and alle	oys thereof
2224/84671	
2224/846/2 Vanadium [V] as principal constituent 2224/84705 Gallium [Ga] as p	rincipal
2224/84673 Rhodium [Rh] as principal constituent 2224/84709 Indium [In] as principal constituent	ncipal
2224/84676 Ruthenium [Ru] as principal constituent 2224/84711 Tin [Sn] as principal constituent	pal
2224/846/8	rincipal
2224/84679 Niobium [Nb] as principal constituent 2224/84714 Thallium [Tl] as principal constituent	orincipal
2224/8468 Molybdenum [Mo] as principal constituent 2224/84716 Lead [Pb] as principal constituent	cipal
2224/84681	
2224/84683 Rhenium [Re] as principal or equal to 400°C an constituent 950°C	
2224/84684 Tungsten [W] as principal constituent 2224/84718 Zinc [Zn] as principal constituent	ipal
2224/84686 with a principal constituent of the material being a non metallic, non constituent	principal
metalloid inorganic material 2224/84687 Ceramics, e.g. crystalline 2224/84723 Magnesium [Mg]	as principal
carbides, nitrides or oxides 2224/84688	s principal
nitrides or fluorides 2224/8469 the principal constituent of	
the material being a polymer, e.g. or equal to 950°C an polyester, phenolic based polymer,	
epoxy 2224/84691 The principal constituent being constituent 2224/84739 Silver [Ag] as principal constituent	ncipal
an elastomer, e.g. silicones, isoprene, neoprene 2224/84744	cipal
2224/84693 with a principal constituent of the material being a solid not provided for in groups 2224/84747	incipal
H01L 2224/846 - H01L 2224/84691, e.g. allotropes of carbon, fullerene,	as principal
graphite, carbon-nanotubes, diamond 2224/84755 Nickel [Ni] as prince constituent	ncipal
2224/84694 with a principal constituent of the material being a liquid 2224/84757 Cobalt [Co] as pri constituent	ncipal
not provided for in groups H01L 2224/846 - H01L 2224/84691 2224/8476 Iron [Fe] as princi	pal
2224/84763 the principal constitution at a temperature of g	

2224/84764 Palladium [Pd] as principal	2224/84801 Soldering or alloying
constituent 2224/84766 Titanium [Ti] as principal	2224/84805 involving forming a eutectic alloy at the bonding interface
constituent	2224/8481 involving forming an intermetallic
2224/84769 Platinum [Pt] as principal	compound at the bonding interface
constituent	2224/84815 Reflow soldering
2224/8477 Zirconium [Zr] as principal	2224/8482 Diffusion bonding
constituent	2224/84825 Solid-liquid interdiffusion
2224/84771 Chromium [Cr] as principal	2224/8483 Solid-solid interdiffusion
constituent	2224/8484 Sintering
2224/84772 Vanadium [V] as principal	2224/8485 using a polymer adhesive, e.g. an adhesive
constituent	based on silicone, epoxy, polyimide,
2224/84773 Rhodium [Rh] as principal	polyester
constituent Duth private ID-1 or private I	2224/84855 Hardening the adhesive by curing, i.e.
2224/84776 Ruthenium [Ru] as principal constituent	thermosetting
2224/84778 Iridium [Ir] as principal	2224/84856 Pre-cured adhesive, i.e. B-stage
constituent	adhesive
2224/84779 Niobium [Nb] as principal	2224/84859 Localised curing of parts of the connector
constituent	
2224/8478 Molybdenum [Mo] as principal	2224/84862 Heat curing 2224/84865 Microwave curing
constituent	2224/84868 Infrared [IR] curing
2224/84781 Tantalum [Ta] as principal	2224/84871 Visible light curing
constituent	2224/84874 Ultraviolet [UV] curing
2224/84783 Rhenium [Re] as principal	2224/84877 Moisture curing, i.e. curing by exposing
constituent	to humidity, e.g. for silicones and
2224/84784 Tungsten [W] as principal	polyurethanes
constituent	2224/8488 Hardening the adhesive by cooling, e.g. for
2224/84786 with a principal constituent of the	thermoplastics or hot-melt adhesives
material being a non metallic, non metalloid inorganic material	2224/84885 Combinations of two or more
2224/84787 Ceramics, e.g. crystalline	hardening methods provided for in
carbides, nitrides or oxides	at least two different groups from
2224/84788 Glasses, e.g. amorphous oxides,	<u>H01L 2224/84855</u> - <u>H01L 2224/8488</u> , e.g.
nitrides or fluorides	for hybrid thermoplastic-thermosetting adhesives
2224/8479 with a principal constituent of	2224/8489 using an inorganic non metallic glass type
the material being a polymer, e.g.	adhesive, e.g. solder glass
polyester, phenolic based polymer,	2224/84893 • • • Anodic bonding, i.e. bonding by applying a
epoxy	voltage across the interface in order to induce
2224/84791 The principal constituent being	ions migration leading to an irreversible
an elastomer, e.g. silicones,	chemical bond
isoprene, neoprene	2224/84895 Direct bonding, i.e. joining surfaces
2224/84793 with a principal constituent of the material being a solid	by means of intermolecular attracting
not provided for in groups	interactions at their interfaces, e.g. covalent
H01L 2224/847 - H01L 2224/84791,	bonds, van der Waals forces
e.g. allotropes of carbon, fullerene,	2224/84897 between electrically conductive surfaces, e.g. copper-copper direct bonding, surface
graphite, carbon-nanotubes,	activated bonding
diamond	2224/84898 between electrically insulating surfaces,
2224/84794 with a principal constituent	e.g. oxide or nitride layersg
of the material being a liquid	2224/84899 Combinations of bonding methods provided
not provided for in groups	for in at least two different groups from
H01L 2224/847 - H01L 2224/84791 2224/84795 with a principal constituent	<u>H01L 2224/848</u> - <u>H01L 2224/84898</u>
of the material being a gas	2224/849 involving monitoring, e.g. feedback loop
not provided for in groups	2224/84909 Post-treatment of the connector or bonding area
<u>H01L 2224/847</u> - <u>H01L 2224/84791</u>	2224/8491 Cleaning, e.g. oxide removal step,
2224/84798 with a principal constituent of the	desmearing
material being a combination of	2224/84911 Chemical cleaning, e.g. etching, flux
two or more materials in the form	2224/84912 Mechanical cleaning, e.g. abrasion using hydro blasting, brushes, ultrasonic
of a matrix with a filler, i.e. being	cleaning, dry ice blasting, gas-flow
a hybrid material, e.g. segmented structures, foams	2224/84913 Plasma cleaning
2224/84799 Shape or distribution of the fillers	2224/84914 Thermal cleaning, e.g. using laser ablation
2224/848 Bonding techniques	or by electrostatic corona discharge
222 ", 540 Boliding techniques	, ,

2224/84919 Combinations of two or more cleaning methods provided for in at least two different groups from	2224/85045 using a corona discharge, e.g. electronic flame off [EFO]
<u>H01L 2224/8491</u> - <u>H01L 2224/84914</u>	2224/85047 by mechanical means, e.g. severing, pressing, stamping
2224/8492 Applying permanent coating, e.g. protective coating	2224/85048 Thermal treatments, e.g. annealing, controlled pre-heating or pre-cooling
2224/8493 Reshaping, e.g. for severing the strap, modifying the loop shape	2224/85051 Forming additional members, e.g. for "wedge-on-ball", "ball-on-wedge", "ball-on-
2224/84931 by chemical means, e.g. etching	ball" connections
2224/84935 by heating means, e.g. reflowing	2224/85053 Bonding environment
2224/84937 using a polychromatic heating lamp	2224/85054 Composition of the atmosphere
2224/84939 using a laser	2224/85055 being oxidating
2224/84941 Induction heating, i.e. eddy currents	2224/85065 being reducing
2224/84943 using a flame torch, e.g. hydrogen torch	2224/85075 being inert
2224/84945 using a corona discharge, e.g. electronic flame off [EFO]	2224/85085 being a liquid, e.g. for fluidic self-assembly
	2224/8509 Vacuum
2224/84947 by mechanical means, e.g. pressing,	2224/85091 Under pressure
stamping	2224/85092 Atmospheric pressure
2224/84948 Thermal treatments, e.g. annealing,	2224/85093 Transient conditions, e.g. gas-flow
controlled cooling	2224/85095 Temperature settings
2224/84951 Forming additional members, e.g. for	2224/85096 Transient conditions
reinforcing	2224/85097 Heating
2224/84986 Specific sequence of steps, e.g. repetition of	2224/85098 Cooling
manufacturing steps, time sequence	2224/85099 Ambient temperature
2224/85 using a wire connector	2224/851 the connector being supplied to the parts to be
2224/85001 involving a temporary auxiliary member	connected in the bonding apparatus
not forming part of the bonding apparatus, e.g. removable or sacrificial coating, film or	2224/8511 involving protection against electrical discharge, e.g. removing electrostatic charge
substrate	2224/8512 Aligning
2224/85002 being a removable or sacrificial coating	2224/85121 Active alignment, i.e. by apparatus steering,
2224/85005 being a temporary or sacrificial substrate	e.g. optical alignment using marks or sensors
2224/85007 involving a permanent auxiliary member being left in the finished device, e.g. aids for holding or protecting the wire connector during or after	2224/85122 by detecting inherent features of, or outside, the semiconductor or solid-state
the bonding process	body
2224/85009 Pre-treatment of the connector or the bonding	2224/85123 Shape or position of the body
area	2224/85125 Bonding areas on the body
2224/8501 Cleaning, e.g. oxide removal step,	2224/85127 Bonding areas outside the body
desmearing	2224/85129 Shape or position of the other item
2224/85011 Chemical cleaning, e.g. etching, flux	2224/8513 using marks formed on the semiconductor
2224/85012 Mechanical cleaning, e.g. abrasion	or solid-state body 2224/85132 using marks formed outside the
using hydro blasting, brushes, ultrasonic	semiconductor or solid-state body, i.e.
cleaning, dry ice blasting, gas-flow	"off-chip"
2224/85013 Plasma cleaning	2224/85136 involving guiding structures, e.g. spacers or
2224/85014 Thermal cleaning, e.g. decomposition,	supporting members
sublimation	2224/85138 the guiding structures being at least
2224/85016 using a laser	partially left in the finished device
2224/85017 Electron beam cleaning	2224/85143 Passive alignment, i.e. self alignment, e.g.
2224/85019 Combinations of two or more	using surface energy, chemical reactions,
cleaning methods provided for in	thermal equilibrium
at least two different groups from	2224/85148 involving movement of a part of the bonding
<u>H01L 2224/8501</u> - <u>H01L 2224/85014</u>	apparatus
2224/8502 Applying permanent coating, e.g. in-situ	2224/85149 being the lower part of the bonding
coating	apparatus, i.e. holding means for the
2224/8503 Reshaping, e.g. forming the ball or the	bodies to be connected, e.g. XY table
wedge of the wire connector	2224/8515 Rotational movements
2224/85031 by chemical means, e.g. etching,	2224/8516 Translational movements
anodisation	2224/85169 being the upper part of the bonding
2224/85035 by heating means, e.g. "free-air-ball"	apparatus, i.e. bonding head, e.g. capillary
2224/85037 using a polychromatic heating lamp	or wedge
2224/85039 using a laser	2224/8517 Rotational movements
2224/85041 Induction heating, i.e. eddy currents	2224/8518 Translational movements
2224/85043 using a flame torch, e.g. hydrogen torch	Translational movements

2224/85181 connecting first on the semiconductor or solid-state body, i.e. on-chip, regular stitch	2224/85417 the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/85186 connecting first outside the	2224/85418 Zinc (Zn) as principal constituent
semiconductor or solid-state body, i.e.	
off-chip, reverse stitch	2224/8542 Antimony (Sb) as principal constituent
2224/85191 connecting first both on and outside the semiconductor or solid-state body,	2224/85423 Magnesium (Mg) as principal constituent
i.e. regular and reverse stitches 2224/85196 involving intermediate connecting	2224/85424 Aluminium (Al) as principal constituent
steps before cutting the wire	
connector	2224/85438 the principal constituent melting at a temperature of greater than or equal to
2224/852 Applying energy for connecting	950°C and less than 1550°C
2224/85201 Compression bonding	2224/85439 Silver (Ag) as principal constituent
2224/85203 Thermocompression bonding	2224/85444 Gold (Au) as principal constituent
2224/85205 Ultrasonic bonding	2224/85447 Copper (Cu) as principal constituent
2224/85206 Direction of oscillation	2224/85449 Manganese (Mn) as principal
2224/85207 Thermosonic bonding	constituent
2224/8521 with energy being in the form of	2224/85455 Nickel (Ni) as principal constituent
electromagnetic radiation	2224/85457 Cobalt (Co) as principal constituent
2224/85212 Induction heating, i.e. eddy currents	2224/8546 Iron (Fe) as principal constituent
2224/85214 using a laser	2224/85463 the principal constituent melting at a
2224/8523 Polychromatic or infrared lamp heating	temperature of greater than 1550°C
2224/85232 using an autocatalytic reaction, e.g. exothermic brazing	2224/85464 Palladium (Pd) as principal constituent
2224/85234 using means for applying energy being	2224/85466 Titanium (Ti) as principal constituent
within the device, e.g. integrated heater	2224/85469 Platinum (Pt) as principal constituent
2224/85236 using electro-static corona discharge	2224/8547 Zirconium (Zr) as principal
2224/85237 using electron beam	constituent
2224/85238 using electric resistance welding, i.e. ohmic heating	2224/85471 Chromium (Cr) as principal constituent
2224/8534 Bonding interfaces of the connector	2224/85472 Vanadium (V) as principal constituent
2224/85345 Shape, e.g. interlocking features	2224/85473 Rhodium (Rh) as principal constituent
2224/85355 having an external coating, e.g. protective bond-through coating	2224/85476 Ruthenium (Ru) as principal constituent
2224/85359 Material	2224/85478 Iridium (Ir) as principal constituent
2224/8536 Bonding interfaces of the semiconductor or	2224/85479 Niobium (Nb) as principal constituent
solid state body	2224/8548 Molybdenum (Mo) as principal
2224/85365 Shape, e.g. interlocking features	constituent
2224/85375 having an external coating, e.g. protective	2224/85481 Tantalum (Ta) as principal constituent
bond-through coating	2224/85483 Rhenium (Re) as principal constituent
2224/85379 Material	2224/85484 Tungsten (W) as principal constituent
2224/8538 Bonding interfaces outside the semiconductor	2224/85486 with a principal constituent of the material
or solid-state body 2224/85385 Shape, e.g. interlocking features	being a non metallic, non metalloid inorganic material
2224/85395 having an external coating, e.g. protective	2224/85487 Ceramics, e.g. crystalline carbides,
bond-through coating	nitrides or oxides
2224/85399 Material	2224/85488 Glasses, e.g. amorphous oxides, nitrides
2224/854 with a principal constituent of the material	or fluorides
being a metal or a metalloid, e.g. boron	2224/8549 with a principal constituent of the material
(B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and	being a polymer, e.g. polyester, phenolic based polymer, epoxy
polonium (Po), and alloys thereof	2224/85491 The principal constituent being an
2224/85401 the principal constituent melting at a temperature of less than 400°C	elastomer, e.g. silicones, isoprene, neoprene
2224/85405 Gallium (Ga) as principal constituent	2224/85493 with a principal constituent of the material
2224/85409 Indium (In) as principal constituent	being a solid not provided for in groups
2224/85411 Tin (Sn) as principal constituent	H01L 2224/854 - H01L 2224/85491, e.g.
2224/85413 Bismuth (Bi) as principal constituent	allotropes of carbon, fullerene, graphite,
2224/85414 Thallium (Tl) as principal constituent	carbon-nanotubes, diamond
2224/85416 Lead (Pb) as principal constituent	2224/85494 with a principal constituent of the material
	being a liquid not provided for in groups H01L 2224/854 - H01L 2224/85491

2224/85495 with a principal constituent of the material being a gas not provided for in groups	2224/8557 Zirconium (Zr) as principal constituent
H01L 2224/8549 - H01L 2224/85491 2224/85498 with a principal constituent of the material	2224/85571 Chromium (Cr) as principal constituent
being a combination of two or more materials in the form of a matrix with a	2224/85572 Vanadium (V) as principal constituent
filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/85573 Rhodium (Rh) as principal constituent
2224/85499 Material of the matrix	2224/85576 Ruthenium (Ru) as principal
2224/855 with a principal constituent of the material being a metal or a	constituent 2224/85578 Iridium (Ir) as principal
metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As),	constituent
antimony (Sb), tellurium (Te) and	2224/85579 Niobium (Nb) as principal constituent
polonium (Po), and alloys thereof 2224/85501 the principal constituent melting at	2224/8558 Molybdenum (Mo) as principal constituent
a temperature of less than 400°C	2224/85581 Tantalum (Ta) as principal
2224/85505 Gallium (Ga) as principal constituent	constituent
2224/85509 Indium (In) as principal	2224/85583 Rhenium (Re) as principal constituent
constituent Tir (Sp) as principal constituent	2224/85584 Tungsten (W) as principal
2224/85511 Tin (Sn) as principal constituent 2224/85513 Bismuth (Bi) as principal	constituent 2224/85586 with a principal constituent of the
constituent 2224/85514 Thallium (Tl) as principal	material being a non metallic, non metalloid inorganic material
constituent 2224/85516 Lead (Pb) as principal constituent	2224/85587 Ceramics, e.g. crystalline carbides,
2224/85517 the principal constituent melting	nitrides or oxides 2224/85588 Glasses, e.g. amorphous oxides,
at a temperature of greater than or equal to 400°C and less than 950°C	nitrides or fluorides
2224/85518 Zinc (Zn) as principal constituent	2224/8559 with a principal constituent of the material being a polymer, e.g.
2224/8552 Antimony (Sb) as principal constituent	polyester, phenolic based polymer, epoxy
2224/85523 Magnesium (Mg) as principal constituent	2224/85591 The principal constituent being an elastomer, e.g. silicones, isoprene,
2224/85524 Aluminium (Al) as principal constituent	neoprene
2224/85538 the principal constituent melting	2224/85593 with a principal constituent of the material being a solid
at a temperature of greater than	not provided for in groups
or equal to 950°C and less than 1550°C	H01L 2224/855 - H01L 2224/85591, e.g. allotropes of carbon, fullerene,
2224/85539 Silver (Ag) as principal	graphite, carbon-nanotubes, diamond
constituent	2224/85594 with a principal constituent
2224/85544 Gold (Au) as principal constituent	of the material being a liquid not provided for in groups
2224/85547 Copper (Cu) as principal	<u>H01L 2224/855</u> - <u>H01L 2224/85591</u>
constituent 2224/85549 Manganese (Mn) as principal	2224/85595 with a principal constituent of the material being a gas
2224/85549 Manganese (Mn) as principal constituent	not provided for in groups
2224/85555 Nickel (Ni) as principal	<u>H01L 2224/855</u> - <u>H01L 2224/85591</u> 2224/85598 Fillers
constituent 2224/85557 Cobalt (Co) as principal	2224/85599 Base material
constituent	2224/856 with a principal constituent of
2224/8556 Iron (Fe) as principal constituent	the material being a metal or a metalloid, e.g. boron (B), silicon
2224/85563 the principal constituent melting at a temperature of greater than	(Si), germanium (Ge), arsenic (As),
1550°C	antimony (Sb), tellurium (Te) and
2224/85564 Palladium (Pd) as principal	polonium (Po), and alloys thereof 2224/85601 the principal constituent melting
constituent 2224/85566 Titanium (Ti) as principal constituent	at a temperature of less than 400°C
2224/85569 Platinum (Pt) as principal	2224/85605 Gallium (Ga) as principal
constituent	constituent 2224/85609 Indium (In) as principal
	constituent

2224/85611 Tin (Sn) as princi constituent	pal 2224/85681 Tantalum (Ta) as principal constituent
2224/85613 Bismuth (Bi) as p constituent	
2224/85614 Thallium (Tl) as p constituent	principal 2224/85684 Tungsten (W) as principal constituent
2224/85616 Lead (Pb) as prine constituent	material being a non metallic, non
2224/85617 the principal constit at a temperature of a or equal to 400°C are	greater than 2224/85687 Ceramics, e.g. crystalline
950°C 2224/85618 Zinc (Zn) as princ	2224/85688 Glasses, e.g. amorphous oxides,
constituent 2224/8562 Antimony (Sb) as	2224/8569 with a principal constituent of
2224/85623	polyester, phenolic based polymer,
constituent 2224/85624 Aluminium (Al) a	2224/85691 The principal constituent being
constituent 2224/85638 the principal constit	isoprene, neoprene
at a temperature of gor equal to 950°C at 1550°C	greater than of the material being a solid
2224/85639 Silver (Ag) as pri constituent	graphite, carbon-nanotubes,
2224/85644 Gold (Au) as prin constituent	2224/85694 with a principal constituent
2224/85647 Copper (Cu) as proconstituent	not provided for in groups
2224/85649 Manganese (Mn) constituent	2224/85695 with a principal constituent
2224/85655 Nickel (Ni) as pri constituent	not provided for in groups
2224/85657 Cobalt (Co) as priconstituent	2224/85698 with a principal constituent of the
2224/8566 Iron (Fe) as princ constituent	two or more materials in the form of a matrix with a filler, i.e. being
2224/85663 the principal constit at a temperature of § 1550°C	uent melting a hybrid material, e.g. segmented structures, foams
2224/85664 Palladium (Pd) as	s principal 2224/85699 Coating material 2224/857 with a principal constituent of
constituent 2224/85666 Titanium (Ti) as p	the material being a metal or a
constituent 2224/85669 Platinum (Pt) as p	(Si), germanium (Ge), arsenic (As).
constituent 2224/8567 Zirconium (Zr) as	polonium (Po), and alloys thereof
constituent 2224/85671 Chromium (Cr) a.	at a temperature of less than
constituent	2224/85705 Gallium (Ga) as principal
2224/85672 Vanadium (V) as constituent	2224/85709 Indium (In) as principal
2224/85673 Rhodium (Rh) as constituent	principal constituent 2224/85711 Tin (Sn) as principal
2224/85676 Ruthenium (Ru) a constituent	as principal constituent
2224/85678 Iridium (Ir) as pri constituent	Constituent
2224/85679 Niobium (Nb) as constituent	Constituent
2224/8568 Molybdenum (Moconstituent	o) as principal constituent

2224/85717 the principal constituent melting at a temperature of greater than	2224/85787 Ceramics, e.g. crystalline carbides, nitrides or oxides
or equal to 400°C and less than 950°C	2224/85788 Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/85718 Zinc (Zn) as principal constituent	2224/8579 with a principal constituent of the material being a polymer, e.g.
2224/8572 Antimony (Sb) as principal constituent	polyester, phenolic based polymer, epoxy
2224/85723 Magnesium (Mg) as principal constituent	2224/85791 The principal constituent being an elastomer, e.g. silicones,
2224/85724 Aluminium (Al) as principal constituent	isoprene, neoprene 2224/85793 with a principal constituent
2224/85738 the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	of the material being a solid not provided for in groups H01L 2224/857 - H01L 2224/85791, e.g. allotropes of carbon, fullerene,
2224/85739 Silver (Ag) as principal constituent	graphite, carbon-nanotubes, diamond
2224/85744 Gold (Au) as principal constituent	2224/85794 with a principal constituent of the material being a liquid
2224/85747 Copper (Cu) as principal constituent	not provided for in groups H01L 2224/857 - H01L 2224/85791
2224/85749 Manganese (Mn) as principal constituent	2224/85795 with a principal constituent of the material being a gas not provided for in groups
2224/85755 Nickel (Ni) as principal constituent	<u>H01L 2224/857</u> - <u>H01L 2224/85791</u>
2224/85757 Cobalt (Co) as principal constituent	2224/85798 with a principal constituent of the material being a combination of
2224/8576 Iron (Fe) as principal constituent	two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented
2224/85763 the principal constituent melting at a temperature of greater than	structures, foams 2224/85799 Shape or distribution of the fillers
1550°C	2224/858 Bonding techniques
2224/85764 Palladium (Pd) as principal	2224/85801 Soldering or alloying
constituent 2224/85766	2224/85805 involving forming a eutectic alloy at the bonding interface
constituent 2224/85769 Platinum (Pt) as principal	2224/8581 involving forming an intermetallic compound at the bonding interface
constituent 2224/8577 Zirconium (Zr) as principal	2224/85815 Reflow soldering
constituent	2224/8582 Diffusion bonding
2224/85771 Chromium (Cr) as principal	2224/85825 Solid-liquid interdiffusion
constituent	2224/8583 Solid-solid interdiffusion, e.g. "direct
2224/85772 Vanadium (V) as principal	bonding" 2224/8584 Sintering
constituent 2224/85773 Rhodium (Rh) as principal	2224/8585 using a polymer adhesive, e.g. an adhesive
constituent	based on silicone, epoxy, polyimide,
2224/85776 Ruthenium (Ru) as principal	polyester
constituent 2224/85778 Iridium (Ir) as principal	2224/85855 Hardening the adhesive by curing, i.e. thermosetting
constituent 2224/85779 Niobium (Nb) as principal	2224/85856 Pre-cured adhesive, i.e. B-stage adhesive
constituent 2224/8578 Molybdenum (Mo) as principal	2224/85859 Localised curing of parts of the connector
constituent	2224/85862 Heat curing
2224/85781 Tantalum (Ta) as principal	2224/85865 Microwave curing
constituent	2224/85868 Infrared [IR] curing
2224/85783 Rhenium (Re) as principal	2224/85871 Visible light curing
constituent Typesten (W) as principal	2224/85874 Ultraviolet [UV] curing
2224/85784 Tungsten (W) as principal constituent	2224/85877 Moisture curing, i.e. curing by exposing to humidity, e.g. for silicones and
2224/85786 with a principal constituent of the	polyurethanes Hardening the adhesive by cooling a g for
material being a non metallic, non metalloid inorganic material	2224/8588 Hardening the adhesive by cooling, e.g. for thermoplastics or hot-melt adhesives

2224/05005	2004/07001
2224/85885 Combinations of two or more hardening methods provided for in	2224/86001 involving a temporary auxiliary member not forming part of the bonding apparatus
at least two different groups from	2224/86002 being a removable or sacrificial coating
H01L 2224/85855 - H01L 2224/8588, e.g.	2224/86005 being a temporary or sacrificial substrate
for hybrid thermoplastic-thermosetting	2224/86007 involving a permanent auxiliary member being
adhesives	left in the finished device, e.g. aids for holding
2224/8589 using an inorganic non metallic glass type	or protecting the TAB connector during or after
adhesive, e.g. solder glass	the bonding process
2224/85893 Anodic bonding, i.e. bonding by applying a	2224/86009 Pre-treatment of the connector or the bonding
voltage across the interface in order to induce	area
ions migration leading to an irreversible chemical bond	2224/8601 Cleaning, e.g. oxide removal step,
2224/85895 Direct bonding, i.e. joining surfaces	desmearing
by means of intermolecular attracting	2224/8603 Reshaping
interactions at their interfaces, e.g. covalent	2224/86031 by chemical means, e.g. etching, anodisation
bonds, van der Waals forces	2224/86035 by heating
2224/85897 between electrically conductive surfaces,	2224/86039 using a laser
e.g. copper-copper direct bonding, surface	2224/86045 using a corona discharge, e.g. electronic
activated bonding	flame off [EFO]
2224/85898 between electrically insulating surfaces,	2224/86047 by mechanical means, e.g. severing,
e.g. oxide or nitride layers 2224/85899 Combinations of bonding methods provided	pressing, stamping
for in at least two different groups from	2224/86048 Thermal treatment, e.g. annealing, controlled
H01L 2224/858 - H01L 2224/85898	pre-heating or pre-cooling
2224/859 involving monitoring, e.g. feedback loop	2224/86051 Forming additional members
2224/85909 Post-treatment of the connector or wire	2224/86053 Bonding environment
bonding area	2224/86054 Composition of the atmosphere
2224/8591 Cleaning, e.g. oxide removal step,	2224/86085 being a liquid, e.g. fluidic self-assembly
desmearing	2224/8609 Vacuum
2224/85911 Chemical cleaning, e.g. etching, flux	2224/86091 Under pressure
2224/85912 Mechanical cleaning, e.g. abrasion	2224/86095 Temperature settings
using hydro blasting, brushes, ultrasonic	2224/86096 Transient conditions
cleaning, dry ice blasting, gas-flow	2224/86097 Heating
2224/85913 Plasma cleaning	2224/86098 Cooling 2224/86099 Ambient temperature
2224/85914 Thermal cleaning, e.g. using laser ablation or by electrostatic corona discharge	2224/861 the connector being supplied to the parts to be
2224/85916 using a laser	connected in the bonding apparatus
2224/85917 Electron beam cleaning	2224/8611 involving protection against electrical
2224/85919 Combinations of two or more	discharge, e.g. removing electrostatic charge
cleaning methods provided for in	2224/8612 Aligning
at least two different groups from	2224/86121 Active alignment, i.e. by apparatus steering,
<u>H01L 2224/8591</u> - <u>H01L 2224/85914</u>	e.g. optical alignment using marks or sensors
2224/8592 Applying permanent coating, e.g. protective	2224/86122 by detecting inherent features of, or
coating	outside, the semiconductor or solid-state
2224/8593 Reshaping, e.g. for severing the wire, modifying the wedge or ball or the loop	body 2224/8613 using marks formed on the semiconductor
shape	or solid-state body
2224/85931 by chemical means, e.g. etching	2224/86132 using marks formed outside the
2224/85935 by heating means, e.g. reflowing	semiconductor or solid-state body, i.e.
2224/85937 using a polychromatic heating lamp	"off-chip"
2224/85939 using a laser	2224/86136 involving guiding structures, e.g. spacers or
2224/85941 Induction heating, i.e. eddy currents	supporting members
2224/85943 using a flame torch, e.g. hydrogen torch	2224/86138 the guiding structures being at least
2224/85945 using a corona discharge, e.g. electronic	partially left in the finished device
flame off [EFO]	2224/86143 Passive alignment, i.e. self alignment, e.g. using surface energy, chemical reactions,
2224/85947 by mechanical means, e.g. "pull-and-cut",	thermal equilibrium
pressing, stamping Thermal treatments are appealing	2224/86148 involving movement of a part of the bonding
2224/85948 Thermal treatments, e.g. annealing, controlled cooling	apparatus
2224/85951 Forming additional members, e.g. for	2224/86149 being the lower part of the bonding
reinforcing	apparatus, i.e. holding means for the
2224/85986 Specific sequence of steps, e.g. repetition of	bodies to be connected, e.g. XY table
manufacturing steps, time sequence	2224/8615 Rotational movements
2224/86 using tape automated bonding [TAB]	2224/8616 Translational movements

2224/86169 being the upper part of the bonding apparatus, e.g. nozzle	2224/86856 Pre-cured adhesive, i.e. B-stage adhesive
2224/8617 Rotational movement	2224/86859 Localised curing of parts of the
2224/8618 Translational movements	connector
	2224/86862 Heat curing
2224/86181 connecting first on the semiconductor or solid-state body, i.e. on-chip,	
•	2224/86865 Microwave curing
2224/86186 connecting first outside the	2224/86868 Infrared [IR] curing
semiconductor or solid-state body, i.e. off-chip	2224/86871 Visible light curing
•	2224/86874 Ultraviolet [UV] curing
2224/86191 connecting first both on and outside the semiconductor or solid-state body	2224/86877 Moisture curing, i.e. curing by exposing
· · · · · · · · · · · · · · · · · · ·	to humidity, e.g. for silicones and
2224/862 Applying energy for connecting	polyurethanes
2224/86201 Compression bonding	2224/8688 Hardening the adhesive by cooling, e.g. for
2224/86203 Thermo-compression bonding	thermoplastics or hot-melt adhesives
2224/86205 Ultrasonic bonding	2224/86885 Combinations of two or more hardening
2224/86207 Thermosonic bonding	methods provided for in at least
2224/8621 with energy being in the form of	two different groups selected from H01L 2224/86855 - H01L 2224/8688,
electromagnetic radiation	e.g. hybrid thermoplastic-thermosetting
2224/86212 Induction heating, i.e. eddy currents	adhesives
2224/86214 using a laser	2224/8689 using an inorganic non metallic glass type
2224/8623 Polychromatic or infrared lamp heating	adhesive, e.g. solder glass
2224/86232 using an autocatalytic reaction, e.g.	2224/86893 Anodic bonding, i.e. bonding by applying a
exothermic brazing	voltage across the interface in order to induce
2224/86234 using means for applying energy being	ions migration leading to an irreversible
within the device, e.g. integrated heater	chemical bond
2224/86236 using electro-static corona discharge	2224/86895 Direct bonding, i.e. joining surfaces
2224/86237 using electron beam	by means of intermolecular attracting
2224/86238 using electric resistance welding, i.e.	interactions at their interfaces, e.g. covalent
ohmic heating	bonds, van der Waals forces
2224/8634 Bonding interfaces of the connector	2224/86896 between electrically conductive surfaces,
2224/86345 Shape, e.g. interlocking features	e.g. copper-copper direct bonding, surface
2224/86355 having an external coating, e.g. protective	activated bonding
bond-through coating	2224/86897 between electrically insulating surfaces,
2224/86359 Material	e.g. oxide or nitride layers
2224/8636 Bonding interfaces of the semiconductor or	2224/86899 Combinations of bonding methods provided
solid state body	for in at least two different groups from
2224/86365 Shape, e.g. interlocking features	<u>H01L 2224/868</u> - <u>H01L 2224/86897</u>
2224/86375 having an external coating, e.g. protective bond-through coating	2224/869 involving monitoring, e.g. feedback loop
	2224/86909 Post-treatment of the connector or the bonding
2224/86379 Material 2224/8638 Bonding interfaces outside the semiconductor	area
or solid-state body	2224/8691 Cleaning, e.g. oxide removal step,
2224/86385 Shape, e.g. interlocking features	desmearing
2224/86395 having an external coating, e.g. protective	2224/8693 Reshaping 2224/86931 by chemical means, e.g. etching,
bond-through coating	anodisation
2224/86399 Material	2224/86935 by heating means
2224/868 Bonding techniques	2224/86939 using a laser
2224/86801 Soldering or alloying	·
2224/86805 involving forming a eutectic alloy at the	2224/86945 using a corona discharge, e.g. electronic flame off [EFO]
bonding interface	2224/86947 by mechanical means, e.g. severing,
2224/8681 involving forming an intermetallic	pressing, stamping
compound at the bonding interface	2224/86948 Thermal treatments, e.g. annealing,
2224/86815 Reflow soldering	controlled pre-heating or pre-cooling
2224/8682 Diffusion bonding	2224/86951 Forming additional members
2224/86825 Solid-liquid interdiffusion	2224/86986 Specific sequence of steps, e.g. repetition of
2224/8683 Solid-solid interdiffusion	manufacturing steps, time sequence
2224/8684 Sintering	2224/89 • using at least one connector not provided for in
2224/8685 using a polymer adhesive, e.g. an adhesive	any of the groups <u>H01L 2224/81</u> - <u>H01L 2224/86</u>
based on silicone, epoxy, polyimide,	2224/90 • Methods for connecting semiconductor or solid state
polyester	bodies using means for bonding not being attached
2224/86855 Hardening the adhesive by curing, i.e.	to, or not being formed on, the body surface to be
thermosetting	connected, e.g. pressure contacts using springs or
Č	clips

2224/91 • Methods for connecting semiconductor or solid state bodies including different	2224/92166 the second connecting process involving a strap connector
methods provided for in two or more of groups <u>H01L 2224/80</u> - <u>H01L 2224/90</u>	2224/92168 the second connecting process involving a TAB connector
2224/92 • • Specific sequence of method steps	2224/92172 the first connecting process involving a
2224/9201 Forming connectors during the connecting process, e.g. in-situ formation of bumps	TAB connector 2224/92173 the second connecting process involving
2224/9202 Forming additional connectors after the	a bump connector
connecting process 2224/9205 Intermediate bonding steps, i.e. partial	2224/92174 the second connecting process involving a build-up interconnect
connection of the semiconductor or solid-state body during the connecting process	2224/92175 the second connecting process involving a layer connector
2224/921 Connecting a surface with connectors of different types	2224/92176 the second connecting process involving a strap connector
2224/9211 Parallel connecting processes	2224/92177 the second connecting process involving
2224/9212 Sequential connecting processes	a wire connector
2224/92122 the first connecting process involving a	2224/922 Connecting different surfaces of the
bump connector 2224/92124 the second connecting process involving	semiconductor or solid-state body with connectors of different types
a build-up interconnect	2224/9221 Parallel connecting processes
2224/92125 the second connecting process involving	2224/9222 Sequential connecting processes
a layer connector	2224/92222 the first connecting process involving a
2224/92127 the second connecting process involving a wire connector	bump connector
2224/92132 the first connecting process involving a	2224/92224 the second connecting process involving a build-up interconnect
build-up interconnect 2224/92133 the second connecting process involving	2224/92225 the second connecting process involving a layer connector
a bump connector 2224/92135 the second connecting process involving	2224/92226 the second connecting process involving
a layer connector	a strap connector 2224/92227 the second connecting process involving
2224/92136 the second connecting process involving a strap connector	a wire connector 2224/92228 the second connecting process involving
2224/92137 the second connecting process involving a wire connector	a TAB connector
2224/92138 the second connecting process involving	2224/92242 the first connecting process involving a layer connector
a TAB connector 2224/92142 the first connecting process involving a	2224/92244 the second connecting process involving a build-up interconnect
layer connector	2224/92246 the second connecting process involving
2224/92143 the second connecting process involving a bump connector	a strap connector 2224/92247 the second connecting process involving
2224/92144 the second connecting process involving a build-up interconnect	a wire connector 2224/92248 the second connecting process involving
2224/92147 the second connecting process involving	a TAB connector
a wire connector 2224/92148 the second connecting process involving	2224/92252 the first connecting process involving a strap connector
a TAB connector	2224/92253 the second connecting process involving
2224/92152 the first connecting process involving a	a bump connector
strap connector 2224/92153 the second connecting process involving	2224/92255 the second connecting process involving a layer connector
a bump connector	Batch processes
2224/92155 the second connecting process involving a layer connector	2224/94 • at wafer-level, i.e. with connecting carried out on a wafer comprising a plurality of undiced
2224/92157 the second connecting process involving a wire connector	individual devices 2224/95 • at chip-level, i.e. with connecting carried out on a
2224/92158 the second connecting process involving	plurality of singulated devices, i.e. on diced chips
a TAB connector 2224/92162 the first connecting process involving a	2224/95001 involving a temporary auxiliary member not forming part of the bonding apparatus,
wire connector 2224/92163 the second connecting process involving	e.g. removable or sacrificial coating, film or substrate
a bump connector	2224/95053 Bonding environment
2224/92164 the second connecting process involving	2224/95085 being a liquid, e.g. for fluidic self-assembly
a build-up interconnect	2224/95091 Under pressure
2224/92165 the second connecting process involving a layer connector	2224/95092 Atmospheric pressure, e.g. dry self-assembly

2224/95093 Transient conditions, e.g. assisted by a gas flow or a liquid flow	2225/06524 Electrical connections formed on device or on substrate, e.g. a deposited or grown
2224/951 Supplying the plurality of semiconductor or	layer
solid-state bodies	2225/06527 Special adaptation of electrical
2224/95101 in a liquid medium	connections, e.g. rewiring, engineering
2224/95102 being a colloidal droplet	changes, pressure contacts, layout
2224/9511 using a rack or rail	2225/06531 Non-galvanic coupling, e.g. capacitive
2224/95115 using a roll-to-roll transfer technique	coupling
2224/9512 • • • Aligning the plurality of semiconductor or	2225/06534 Optical coupling
solid-state bodies	2225/06537 Electromagnetic shielding
2224/95121 Active alignment, i.e. by apparatus steering	2225/06541 Conductive via connections through the
2224/95122 by applying vibration	device, e.g. vertical interconnects, through
2224/95123 by applying a pressurised fluid flow, e.g.	silicon via [TSV]
liquid or gas flow	2225/06544 Design considerations for via
2224/95133 by applying an electromagnetic field	connections, e.g. geometry or layout
2224/95134 Electrowetting, i.e. by changing the	2225/06548 Conductive via connections through the
surface energy of a droplet	substrate, container, or encapsulation
2224/95136 involving guiding structures, e.g. shape	2225/06551 Conductive connections on the side of the
matching, spacers or supporting members	device
2224/95143 Passive alignment, i.e. self alignment, e.g.	2225/06555 Geometry of the stack, e.g. form of the
using surface energy, chemical reactions,	devices, geometry to facilitate stacking
thermal equilibrium	2225/06558 the devices having passive surfaces
2224/95144 Magnetic alignment, i.e. using permanent	facing each other, i.e. in a back-to-back
magnetic parts in the semiconductor or	arrangement
solid-state body	2225/06562 at least one device in the stack being
2224/95145 Electrostatic alignment, i.e. polarity	rotated or offset
alignment with Coulomb charges	2225/06565 the devices having the same size and
2224/95146 by surface tension	there being no auxiliary carrier between
2224/95147 by molecular lock-key, e.g. by DNA	the devices
2224/95148 involving movement of a part of the bonding	2225/06568 the devices decreasing in size, e.g.
apparatus	pyramidical stack
2224/96 the devices being encapsulated in a common	2225/06572 Auxiliary carrier between devices, the
layer, e.g. neo-wafer or pseudo-wafer, said	carrier having an electrical connection
common layer being separable into individual	structure
assemblies after connecting	2225/06575 Auxiliary carrier between devices, the
2224/97 the devices being connected to a common	carrier having no electrical connection
substrate, e.g. interposer, said common	structure
substrate being separable into individual	2225/06579 TAB carriers; beam leads
assemblies after connecting	2225/06582 Housing for the assembly, e.g. chip scale
2224/98 • Methods for disconnecting semiconductor or solid-	package [CSP]
state bodies	2225/06586 Housing with external bump or bump-
	like connectors
2225/00 Details relating to assemblies covered by the group	2225/06589 Thermal management, e.g. cooling
H01L 25/00 but not provided for in its subgroups	2225/06593 Mounting aids permanently on device;
• All the devices being of a type provided for in the	arrangements for alignment
same main group of the same subclass of class <u>H10</u> ,	2225/06596 Structural arrangements for testing
e.g. assemblies of rectifier diodes	the devices having separate containers
2225/04 the devices not having separate containers	2225/1005 the devices being integrated devices of class
2225/065 All the devices being of a type provided for in	<u>H10</u>
the same main group of the same subclass of	2225/1011 the containers being in a stacked
class <u>H10</u>	arrangement
2225/06503 Stacked arrangements of devices	2225/1017 the lowermost container comprising a
2225/06506 Wire or wire-like electrical connections	device support
between devices	2225/1023 the support being an insulating substrate
2225/0651 Wire or wire-like electrical connections	2225/1029 the support being a lead frame
from device to substrate	2225/1035 the device being entirely enclosed by the
2225/06513 Bump or bump-like direct electrical	support, e.g. high-density interconnect
connections between devices, e.g. flip-chip	[HDI]
connection, solder bumps	2225/1041 Special adaptations for top connections of
2225/06517 Bump or bump-like direct electrical	the lowermost container, e.g. redistribution
connections from device to substrate	layer, integral interposer
2225/0652 Bump or bump-like direct electrical	2225/1047 Details of electrical connections between
connections from substrate to substrate	containers
	2225/1052 Wire or wire-like electrical connections

2225/1058	Bump or bump-like electrical	2924/01024 Chromium [Cr]
	connections, e.g. balls, pillars, posts	2924/01025 Manganese [Mn]
2225/1064	Electrical connections provided on	2924/01026 Iron [Fe]
	a side surface of one or more of the	2924/01027 Cobalt [Co]
	containers	2924/01028 Nickel [Ni]
2225/107	Indirect electrical connections, e.g. via	2924/01029 Copper [Cu]
	an interposer, a flexible substrate, using	2924/0103 • • Zinc [Zn]
	TAB	2924/01031 Gallium [Ga]
2225/1076	Shape of the containers	2924/01032 Germanium [Ge]
2225/1082	for improving alignment between	2924/01033 . Arsenic [As]
	containers, e.g. interlocking features	2924/01034 Selenium [Se]
2225/1088	Arrangements to limit the height of the	
	assembly	2924/01035 Bromine [Br]
2225/1094	Thermal management, e.g. cooling	2924/01036 Krypton [Kr]
2024/00		2924/01037 Rubidium [Rb]
2924/00	Indexing scheme for arrangements or methods	2924/01038 Strontium [Sr]
	for connecting or disconnecting semiconductor or	2924/01039 Yttrium [Y]
2024/0001	solid-state bodies as covered by H01L 24/00	2924/0104 Zirconium [Zr]
2924/0001	Technical content checked by a classifier	2924/01041 Niobium [Nb]
	<u>NOTE</u>	2924/01042 Molybdenum [Mo]
	Codes H01L 2924/0001 - H01L 2924/0002 are	2924/01043 Technetium [Tc]
	used to describe the status of reclassification;	2924/01044 Ruthenium [Ru]
	they do not relate to technical features as such	2924/01045 Rhodium [Rh]
	they do not relate to technical features as such	2924/01046 • • Palladium [Pd]
2924/00011	Not relevant to the scope of the group, the symbol	2924/01047 • Silver [Ag]
	of which is combined with the symbol of this	2924/01048 • Cadmium [Cd]
	group	2924/01049 Indium [In]
2924/00012	Relevant to the scope of the group, the symbol of	2924/0105 . Tin [Sn]
	which is combined with the symbol of this group	2924/01051 . Antimony [Sb]
2924/00013	Fully indexed content	-
	the subject-matter covered by the group, the	2924/01052 Tellurium [Te]
	symbol of which is combined with the symbol	2924/01053 Iodine [I]
	of this group, being disclosed without further	2924/01054 Xenon [Xe]
	technical details	2924/01055 Cesium [Cs]
2924/00015	the subject-matter covered by the group, the	2924/01056 Barium [Ba]
	symbol of which is combined with the symbol of	2924/01057 Lanthanum [La]
	this group, being disclosed as prior art	2924/01058 Cerium [Ce]
2924/0002		2924/01059 Praseodymium [Pr]
	H01L 24/00 and H01L 2224/00	2924/0106 Neodymium [Nd]
2924/01	Chemical elements	2924/01061 Promethium [Pm]
	Hydrogen [H]	2924/01062 Samarium [Sm]
	Helium [He]	2924/01063 Europium [Eu]
	Lithium [Li]	2924/01064 Gadolinium [Gd]
	Beryllium [Be]	2924/01065 Terbium [Tb]
	. Boron [B]	2924/01066 • Dysprosium [Dy]
	. Carbon [C]	2924/01067 • Holmium [Ho]
	. Nitrogen [N]	2924/01068 . Erbium [Er]
	-	2924/01069 Thulium [Tm]
	Oxygen [O]	2924/0107 . Ytterbium [Yb]
	Fluorine [F]	
	Neon [Ne]	2924/01071 Lutetium [Lu]
	Sodium [Na]	2924/01072 Hafnium [Hf]
	Magnesium [Mg]	2924/01073 Tantalum [Ta]
	Aluminum [Al]	2924/01074 Tungsten [W]
2924/01014	Silicon [Si]	2924/01075 Rhenium [Re]
	Phosphorus [P]	2924/01076 Osmium [Os]
2924/01016	Sulfur [S]	2924/01077 • • Iridium [Ir]
2924/01017	Chlorine [Cl]	2924/01078 • • Platinum [Pt]
2924/01018	Argon [Ar]	2924/01079 Gold [Au]
	Potassium [K]	2924/0108 Mercury [Hg]
	. Calcium [Ca]	2924/01081 Thallium [Tl]
	Scandium [Sc]	2924/01082 Lead [Pb]
	. Titanium [Ti]	2924/01083 • • Bismuth [Bi]
	Vanadium [V]	2924/01084 • • Polonium [Po]
2727/01023	/	

2924/01085 Astatine [At]	2924/0421 1st Group
2924/01086 Radon [Rn]	2924/0422 2nd Group
2924/01087 Francium [Fr]	2924/0423 3rd Group
2924/01088 Radium [Ra]	2924/0424 4th Group
2924/01089 Actinium [Ac]	2924/0425 5th Group
2924/0109 Thorium [Th]	2924/0426 6th Group
2924/01091 Protactinium [Pa]	2924/0427 7th Group
2924/01092 Uranium [U]	2924/0428 8th Group
2924/01093 Neptunium [Np]	2924/0429 9th Group
2924/01094 Plutonium [Pu]	2924/044 10th Group
• Groups of the periodic table	2924/0441 11th Group
2924/01101 Alkali metals	2924/0442 12th Group
2924/01102 Alkali earth metals	2924/0443 • • 13th Group
2924/01103 Transition metals	2924/0444 14th Group
2924/01104 Refractory metals	2924/0445 Lanthanides
2924/01105 Rare earth metals	2924/0446 Actinides
2924/01106 Lanthanides, i.e. Ce, Pr, Nd, Pm, Sm, Eu, Gd,	2924/0449 being a combination of two or more
Tb, Dy, Ho, Er, Tm, Yb, Lu	materials provided in the groups
2924/01107 Actinides, i.e. Th, Pa, U, Np, Pu, Am, Cm, Bk,	H01L 2924/0421 - H01L 2924/0446
Cf, Es, Fm, Md, No, Lr	2924/04491 having a monocrystalline microstructure
2924/01108 Noble metals	2924/04492 having a polycrystalline microstructure
2924/01109 Metalloids or Semi-metals	2924/04494 having an amorphous microstructure, i.e. glass
2924/0111 Chalcogens	2924/045 • Carbides composed of metals from groups of the
2924/01111 Halogens	periodic table
2924/01112 Noble gases	2924/0451 1st Group
2924/012 • Semiconductor purity grades	2924/0452 2nd Group
2924/01201 1N purity grades, i.e. 90%	2924/0453 3rd Group
2924/01202 2N purity grades, i.e. 99%	2924/0454 4th Group
2924/01203 3N purity grades, i.e. 99.9%	2924/04541 TiC
2924/01204 • • 4N purity grades, i.e. 99.99%	2924/0455 5th Group
2924/01205 • • 5N purity grades, i.e. 99.999%	2924/0456 6th Group
2924/01206 • 6N purity grades, i.e. 99.9999%	2924/04563 WC
2924/01207 • 7N purity grades, i.e. 99.99999%	2924/0457 7th Group
2924/01208 • 8N purity grades, i.e. 99.999999%	2924/0458 8th Group
2924/013 • Alloys	2924/0459 9th Group
2924/0132 Binary Alloys	2924/046 10th Group
2924/01321 • • • Isomorphous Alloys	2924/0461 11th Group
2924/01322 Eutectic Alloys, i.e. obtained by a liquid	2924/0462 12th Group
transforming into two solid phases	2924/0463 13th Group
2924/01323 Hypoeutectic alloys i.e. with compositions	2924/0464 14th Group
lying to the left of the eutectic point	2924/04642 SiC
2924/01324 Hypereutectic alloys i.e. with compositions	2924/0465 Lanthanides
lying to the right of the eutectic point	2924/0466 Actinides
2924/01325 Peritectic Alloys, i.e. obtained by a liquid and	2924/0469 being a combination of two or more
a solid transforming into a new and different	materials provided in the groups
solid phase	<u>H01L 2924/0451</u> - <u>H01L 2924/0466</u>
2924/01326 Monotectics, i.e. obtained by a liquid	2924/04691 having a monocrystalline microstructure
transforming into a solid and a new and	2924/04692 having a polycrystalline microstructure
different liquid phase	2924/04694 • having an amorphous microstructure, i.e. glass
2924/01327 Intermediate phases, i.e. intermetallics	• Silicides composed of metals from groups of the
compounds	periodic table
2924/0133 • Ternary Alloys	2924/0471 1st Group
2924/0134 • • Quaternary Alloys	2924/0472 2nd Group
2924/0135 Quinary Alloys	2924/0473 3rd Group
2924/014 Solder alloys	2924/0474 4th Group
2924/01402 • Invar, i.e. single-phase alloy of around 36%	2924/0475 5th Group
nickel and 64% iron	2924/0476 6th Group
2924/01403 • Kovar, i.e. FeNiCo alloys	2924/0477 7th Group
2924/01404 • Alloy 42, i.e. FeNi42	2924/0478 8th Group
2924/01405 • Inovco, i.e. Fe-33Ni-4.5Co	2924/0479 9th Group
• Borides composed of metals from groups of the	2924/048 10th Group
periodic table	2924/0481 11th Group

2924/0482 12th Group	2924/05294 • having an amorphous microstructure, i.e. glass
2924/0483 13th Group	2924/053 • Oxides composed of metals from groups of the
2924/0484 14th Group	periodic table
2924/0485 . Lanthanides	2924/0531 1st Group 2924/0532 2nd Group
2924/0486 • Actinides	
2924/0489 being a combination of two or more	2924/0533 • • 3rd Group
materials provided in the groups H01L 2924/0471 - H01L 2924/0486	2924/0534 4th Group
	2924/05341 TiO ₂
2924/04891 having a monocrystalline microstructure 2924/04892 having a polycrystalline microstructure	2924/05342 ZrO ₂
2924/04894 • having an amorphous microstructure, i.e. glass	2924/0535 • • 5th Group
2924/049 • Nitrides composed of metals from groups of the	2924/0536 6th Group
periodic table	2924/0537 7th Group 2924/0538 8th Group
2924/0491 1st Group	2924/0538 8th Group 2924/05381 FeOx
2924/0492 • 2nd Group	2924/0539 • • • • • FeOx 2924/0539 • • • 9th Group
2924/0493 3rd Group	2924/054 • • 10th Group
2924/0494 4th Group	2924/0541 • 10th Group
2924/04941 TiN	2924/0542 • 12th Group
2924/0495 5th Group	2924/0543 • 12th Group
2924/04953 TaN	2924/05432 Al ₂ O ₃
2924/0496 6th Group	2924/0544 • 14th Group
2924/0497 7th Group	2924/05442 SiO ₂
2924/0498 8th Group	2924/0545 Lanthanides
2924/0499 9th Group	2924/0546 • Actinides
2924/05 10th Group	2924/0549 Actinities 2924/0549 being a combination of two or more
2924/0501 11th Group	materials provided in the groups
2924/0502 12th Group	H01L 2924/0531 - H01L 2924/0546
2924/0503 13th Group	2924/05491 • having a monocrystalline microstructure
2924/05032 AIN	2924/05492 having a polycrystalline microstructure
2924/0504 14th Group	2924/05494 • having an amorphous microstructure, i.e. glass
2924/05042 Si ₃ N ₄	2924/055 • Chalcogenides other than oxygen i.e. sulfides,
4724/U-U44 • • • 0131N	
2924/0505 Lanthanides	selenides and tellurides composed of metals from groups of the periodic table
2924/0505 Lanthanides 2924/0506 Actinides	selenides and tellurides composed of metals from
 2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more 	selenides and tellurides composed of metals from groups of the periodic table
2924/0505 Lanthanides 2924/0506 Actinides	selenides and tellurides composed of metals from groups of the periodic table 2924/0551 • 1st Group
 2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups 	selenides and tellurides composed of metals from groups of the periodic table 2924/0551 • 1st Group 2924/0552 • 2nd Group
 2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
 2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
 2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
 2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
 2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
 2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 . Phosphides composed of metals from groups of the periodic table 2924/0511 . 1st Group 2924/0512 . 2nd Group 	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
 2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 . Phosphides composed of metals from groups of the periodic table 2924/0511 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 . Phosphides composed of metals from groups of the periodic table 2924/0511 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 . Phosphides composed of metals from groups of the periodic table 2924/0511 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 . Phosphides composed of metals from groups of the periodic table 2924/0511 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group 2924/0515 . 5th Group	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 . Phosphides composed of metals from groups of the periodic table 2924/0511 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group 2924/0515 . 5th Group 2924/0517 . 7th Group 2924/0518 . 8th Group	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 . Phosphides composed of metals from groups of the periodic table 2924/0511 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group 2924/0515 . 5th Group 2924/0516 . 6th Group 2924/0517 . 7th Group	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 . Phosphides composed of metals from groups of the periodic table 2924/0511 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group 2924/0515 . 5th Group 2924/0517 . 7th Group 2924/0518 . 8th Group	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 . Phosphides composed of metals from groups of the periodic table 2924/051 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group 2924/0515 . 5th Group 2924/0516 . 6th Group 2924/0517 . 7th Group 2924/0519 . 9th Group 2924/052 . 10th Group 2924/0521 . 11th Group	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 . Phosphides composed of metals from groups of the periodic table 2924/051 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group 2924/0515 . 5th Group 2924/0516 . 6th Group 2924/0517 . 7th Group 2924/0518 . 8th Group 2924/0521 . 10th Group 2924/0521 . 11th Group 2924/0522 . 12th Group	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 . Phosphides composed of metals from groups of the periodic table 2924/051 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group 2924/0515 . 5th Group 2924/0516 . 6th Group 2924/0517 . 7th Group 2924/0519 . 9th Group 2924/052 . 10th Group 2924/0521 . 11th Group	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 . Phosphides composed of metals from groups of the periodic table 2924/051 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group 2924/0515 . 5th Group 2924/0516 . 6th Group 2924/0517 . 7th Group 2924/0518 . 8th Group 2924/0521 . 10th Group 2924/0521 . 11th Group 2924/0522 . 12th Group	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 .	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/0510 . Phosphides composed of metals from groups of the periodic table 2924/0511 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group 2924/0515 . 5th Group 2924/0516 . 6th Group 2924/0517 . 7th Group 2924/0518 . 8th Group 2924/0521 . 10th Group 2924/0522 . 12th Group 2924/0523 . 13th Group 2924/0524 . 14th Group 2924/0525 . Lanthanides 2924/0526 . Actinides	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/0511 . Phosphides composed of metals from groups of the periodic table 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group 2924/0515 . 5th Group 2924/0516 . 6th Group 2924/0517 . 7th Group 2924/0518 . 8th Group 2924/0521 . 10th Group 2924/0522 . 12th Group 2924/0523 . 13th Group 2924/0524 . 14th Group 2924/0525 . Lanthanides 2924/0529 . being a combination of two or more	selenides and tellurides composed of metals from groups of the periodic table 2924/0551
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 Phosphides composed of metals from groups of the periodic table 2924/0511 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group 2924/0516 . 6th Group 2924/0517 . 7th Group 2924/0518 . 8th Group 2924/0520 . 10th Group 2924/0521 . 11th Group 2924/0522 . 12th Group 2924/0523 . 13th Group 2924/0524 . 14th Group 2924/0525 . Lanthanides 2924/0529 . being a combination of two or more materials provided in the groups	selenides and tellurides composed of metals from groups of the periodic table 2924/0551 . 1st Group 2924/0552 . 2nd Group 2924/0553 . 3rd Group 2924/0554 . 4th Group 2924/0555 . 5th Group 2924/0556 . 6th Group 2924/0557 . 7th Group 2924/0558 . 8th Group 2924/0559 . 9th Group 2924/056 . 10th Group 2924/056 . 10th Group 2924/056 . 11th Group 2924/056 . 13th Group 2924/056 . 13th Group 2924/0563 . 13th Group 2924/0564 . 14th Group 2924/0565 . Lanthanides 2924/0565 . Lanthanides 2924/0569 . being a combination of two or more materials provided in the groups H01L 2924/0551 - H01L 2924/0566 2924/05691 . having a polycrystalline microstructure 2924/05694 . having an amorphous microstructure 2924/05695 . having an amorphous microstructure 2924/05691 . having an amorphous microstructure 2924/05691 . having an amorphous microstructure 2924/0571 . 1st Group 2924/0572 . 2nd Group
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05092 . having a polycrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 . Phosphides composed of metals from groups of the periodic table 2924/0511 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group 2924/0515 . 5th Group 2924/0516 . 6th Group 2924/0517 . 7th Group 2924/0518 . 8th Group 2924/0521 . 10th Group 2924/0522 . 10th Group 2924/0523 . 13th Group 2924/0524 . 14th Group 2924/0525 . Lanthanides 2924/0526 . Actinides 2924/0529 . being a combination of two or more materials provided in the groups H01L 2924/0511 - H01L 2924/0526	selenides and tellurides composed of metals from groups of the periodic table 2924/0551 . 1st Group 2924/0552 . 2nd Group 2924/0553 . 3rd Group 2924/0554 . 4th Group 2924/0555 . 5th Group 2924/0556 . 6th Group 2924/0557 . 7th Group 2924/0558 . 8th Group 2924/0559 . 9th Group 2924/056 . 10th Group 2924/056 . 11th Group 2924/056 . 12th Group 2924/056 . 13th Group 2924/0564 . 14th Group 2924/0565 . Lanthanides 2924/0565 . Lanthanides 2924/0569 . being a combination of two or more materials provided in the groups HOIL 2924/0565 . having a monocrystalline microstructure 2924/05691 . having a monocrystalline microstructure 2924/05692 . having a polycrystalline microstructure 2924/0570 . having an amorphous microstructure 2924/0571 . having an amorphous microstructure, i.e. glass 2924/0571 . 1st Group 2924/0572 . 2nd Group 2924/0573 . 3rd Group
2924/0505 . Lanthanides 2924/0506 . Actinides 2924/0509 . being a combination of two or more materials provided in the groups H01L 2924/0491 - H01L 2924/0506 2924/05091 . having a monocrystalline microstructure 2924/05094 . having an amorphous microstructure, i.e. glass 2924/051 Phosphides composed of metals from groups of the periodic table 2924/0511 . 1st Group 2924/0512 . 2nd Group 2924/0513 . 3rd Group 2924/0514 . 4th Group 2924/0516 . 6th Group 2924/0517 . 7th Group 2924/0518 . 8th Group 2924/0520 . 10th Group 2924/0521 . 11th Group 2924/0522 . 12th Group 2924/0523 . 13th Group 2924/0524 . 14th Group 2924/0525 . Lanthanides 2924/0529 . being a combination of two or more materials provided in the groups	selenides and tellurides composed of metals from groups of the periodic table 2924/0551 . 1st Group 2924/0552 . 2nd Group 2924/0553 . 3rd Group 2924/0554 . 4th Group 2924/0555 . 5th Group 2924/0556 . 6th Group 2924/0557 . 7th Group 2924/0558 . 8th Group 2924/0559 . 9th Group 2924/056 . 10th Group 2924/056 . 10th Group 2924/056 . 11th Group 2924/056 . 13th Group 2924/056 . 13th Group 2924/0563 . 13th Group 2924/0564 . 14th Group 2924/0565 . Lanthanides 2924/0565 . Lanthanides 2924/0569 . being a combination of two or more materials provided in the groups H01L 2924/0551 - H01L 2924/0566 2924/05691 . having a polycrystalline microstructure 2924/05694 . having an amorphous microstructure 2924/05695 . having an amorphous microstructure 2924/05691 . having an amorphous microstructure 2924/05691 . having an amorphous microstructure 2924/0571 . 1st Group 2924/0572 . 2nd Group

2924/0576 6th Group	2924/096 Cermets, i.e. composite material composed of
2924/0577 7th Group	ceramic and metallic materials
2924/0578 8th Group	2924/097 Glass-ceramics, e.g. devitrified glass
2924/0579 • • 9th Group	2924/09701 Low temperature co-fired ceramic [LTCC]
2924/058 10th Group	2924/10 • Details of semiconductor or other solid state devices to be connected
2924/0581 11th Group	
2924/0582 12th Group	2924/1011 Structure
2924/0583 13th Group	2924/1015 Shape
2924/0584 14th Group	2924/10155 being other than a cuboid
2924/0585 Lanthanides	2924/10156 at the periphery
2924/0586 Actinides	2924/10157 at the active surface
2924/0589 being a combination of two or more	2924/10158 at the passive surface
materials provided in the groups	2924/1016 being a cuboid
<u>H01L 2924/0571</u> - <u>H01L 2924/0586</u>	2924/10161 with a rectangular active surface
2924/05891 having a monocrystalline microstructure	2924/10162 with a square active surface
2924/05892 having a polycrystalline microstructure	2924/1017 being a sphere
 2924/05894 having an amorphous microstructure, i.e. glass 2924/059 . Being combinations of any of the materials from 	2924/102 . Material of the semiconductor or solid state bodies
the groups H01L 2924/042 - H01L 2924/0584, e.g.	2924/1025 Semiconducting materials
oxynitrides	2924/10251 Elemental semiconductors, i.e. Group IV
2924/05991 • having a monocrystalline microstructure	2924/10252 Germanium [Ge]
2924/05992 • having a polycrystalline microstructure	2924/10253 Silicon [Si]
2924/05994 • having an amorphous microstructure, i.e. glass	2924/10254 Diamond [C]
2924/06 • Polymers	2924/1026 Compound semiconductors
2924/061 • Polyolefin polymer	2924/1027 IV
2924/0615 . Styrenic polymer	2924/1027 Silicon-germanium [SiGe]
2924/062 . Halogenated polymer	2924/10272 Silicon Carbide [SiC]
2924/0625 . Polyvinyl alchohol	2924/1032 III-V
2924/063 . Polyvinyl acetate	2924/1032 Aluminium antimonide [AlSb]
2924/0635 . Acrylic polymer	2924/10322 Aluminium arsenide [AlAs]
2924/064 . Graft polymer	2924/10323 Aluminium arsenide [AIAS]
2924/0645 . Block copolymer	2924/10324 Aluminium intide [AIN]
2924/065 . ABS	2924/10325 Boron nitride [BN], e.g. cubic,
2924/0655 . Polyacetal	hexagonal, nanotube
2924/066 . Phenolic resin	2924/10326 Boron phosphide [BP]
2924/0665 . Epoxy resin	2924/10327 Boron arsenide [BAs, $B_{12}As_2$]
2924/067 . Polyphenylene	2924/10328 Gallium antimonide [GaSb]
2924/0675 . Polyester	2924/10329 Gallium arsenide [GaAs]
2924/068 • Polycarbonate	2924/1033 Gallium nitride [GaN]
2924/0685 Polyether	2924/10331 Gallium phosphide [GaP]
2924/069 • Polyurethane	2924/10332 Indium antimonide [InSb]
2924/0695 . Polyamide	2924/10333 Indium arsenide [InAs]
2924/07 . Polyamine or polyimide	2924/10334 Indium nitride [InN]
2924/07001 Polyamine	2924/10335 Indium phosphide [InP]
2924/07025 Polyimide	2924/10336 Aluminium gallium arsenide [AlGaAs]
2924/0705 Sulfur containing polymer	2924/10337 Indium gallium arsenide [InGaAs]
2924/0715 . Polysiloxane	2924/10338 Indium gallium phosphide [InGaP]
2924/078 • Adhesive characteristics other than chemical	2924/10339 Aluminium indium arsenide [AlInAs]
2924/07802 not being an ohmic electrical conductor	2924/1034 Aluminium indium antimonide [AlInSb]
2924/0781 being an ohmic electrical conductor	2924/10341 Gallium arsenide nitride [GaAsN]
2924/07811 Extrinsic, i.e. with electrical conductive	2924/10342 Gallium arsenide phosphide [GaAsP]
fillers	2924/10343 Gallium arsenide antimonide [GaAsSb]
2924/07812 Intrinsic, e.g. polyaniline [PANI]	2924/10344 Aluminium gallium nitride [AlGaN]
2924/0782 being pressure sensitive	2924/10345 Aluminium gallium phosphide [AlGaP]
2924/095 • with a principal constituent of the material being a	2924/10346 Indium gallium nitride [InGaN]
combination of two or more materials provided in	2924/10347 Indium arsenide antimonide [InAsSb]
the groups <u>H01L 2924/013</u> - <u>H01L 2924/0715</u>	2924/10348 Indium gallium antimonide [InGaSb]
2924/0951 Glass epoxy laminates	2924/10349 Aluminium gallium indium phosphide
2924/09511 FR-4	[AlGaInP]
2924/09512 FR-5	2924/1035 Aluminium gallium arsenide phosphide
2924/09522 G10	[AlGaInP]
2924/09523 G11	

2924/10351 Indium gallium arsenide phosphide	2924/10676 Bismuth trioxide $[Bi2O3]$
[InGaAsP]	2924/10677 Tin dioxide [SnO ₂]
2924/10352 Indium gallium arsenide antimonide	2924/10678 Barium titanate [BaTiO ₃]
[InGaAsSb]	2924/10679 Strontium titanate [SrTiO $_3$]
2924/10353 Indium arsenide antimonide phosphide	2924/1068 Lithium niobate [LiNbO ₃]
[InAsSbP]	2924/10681 Lanthanum copper oxide [La ₂ CuO ₄]
2924/10354 Aluminium indium arsenide phosphide	2924/1072 Layered
[AlInAsP]	2924/10721 Lead(II)iodide [PbI ₂]
2924/10355 Aluminium gallium arsenide nitride	2924/10722 Molybdenum disulfide [MoS_2]
[AlGaAsN]	2924/10723 Gallium selenide [GaSe]
2924/10356 Indium gallium arsenide nitride	2924/10724 Tin sulfide [SnS]
[InGaAsN]	2924/10725 Bismuth sulfide [Bi ₂ S ₃]
2924/10357 Indium aluminium arsenide nitride	2924/1077 Magnetic diluted [DMS]
[InAlAsN]	2924/10771 Gallium manganese arsenide [GaMnAs]
2924/10358 Gallium arsenide antimonide nitride	2924/10772 Indium manganese arsenide [InMnAs]
[GaAsSbN]	2924/10773 Cadmium manganese telluride
2924/10359 Gallium indium nitride arsenide	[CdMnTe]
antimonide [GaInNAsSb]	2924/10774 Lead manganese telluride [PbMnTe]
2924/1036 Gallium indium arsenide antimonide	2924/10775 Lead manganese tenunde [rown1e]
phosphide [GaInAsSbP]	
2924/1037 II-VI	$[La_{0.7}Ca_{0.3}MnO_3]$
2924/10371 Cadmium selenide [CdSe]	2924/10776 Iron(II)oxide [FeO]
2924/10372 Cadmium sulfide [CdS]	2924/10777 Nickel(II)oxide [NiO]
2924/10373 Cadmium telluride [CdTe]	2924/10778 Europium(II)oxide [EuO]
2924/10375 Zinc selenide [ZnSe]	2924/10779 Europium(II)sulfide [EuS]
2924/10376 Zinc sulfide [ZnS]	2924/1078 Chromium(III)bromide [CrBr ₃]
2924/10377 Zinc telluride [ZnTe]	2924/1082 Other
2924/10378 Cadmium zinc telluride, i.e. CZT	2924/10821 Copper indium gallium selenide, CIGS
[CdZnTe]	[Cu[In,Ga]Se ₂]
2924/10379 Mercury cadmium telluride [HgZnTe]	2924/10822 Copper zinc tin sulfide, CZTS
2924/1038 Mercury zinc telluride [HgZnSe]	$[Cu_2ZnSnS_4]$
2924/10381 Mercury zinc selenide [HgZnSe]	2924/10823 Copper indium selenide, CIS [CuInSe ₂]
2924/1042 I-VII	2924/10824 Silver gallium sulfide [AgGaS $_2$]
2924/10421 Cuprous chloride [CuCl]	2924/10825 Zinc silicon phosphide [ZnSiP ₂]
2924/1047 I-VI	2924/10826 Arsenic selenide $[As_2S_3]$
2924/10471 Copper sulfide [CuS]	2924/10827 Platinum silicide [PtSi]
2924/1052 IV-VI	2924/10828 Bismuth(III)iodide [BiI ₃]
2924/10521 Lead selenide [PbSe]	2924/10829 Mercury(II)iodide [HgI ₂]
	2924/1083 Thallium(I)bromide [TlBr]
2924/10522 Lead(II)sulfide [PbS]	2924/10831 Selenium [Se]
2924/10523 Lead telluride [PbTe]	2924/10832 Silver sulfide [Ag ₂ S]
2924/10524 Tin sulfide [SnS, SnS ₂]	2924/10833 Iron disulfide [FeS ₂]
2924/10525 Tin telluride [SnTe]	2924/11 • • Device type
2924/10526 Lead tin telluride [PbSnTe]	2924/12 Passive devices, e.g. 2 terminal devices
2924/10527 Thallium tin telluride [Tl_2SnTe_5]	2924/1203 Rectifying Diode
2924/10528 Thallium germanium telluride	2924/12031 PIN diode
[Tl ₂ GeTe ₅]	2924/12032 Schottky diode
2924/1057 V-VI	2924/12033 Gunn diode
2924/10571 Bismuth telluride [Bi ₂ Te ₃]	2924/12034 Varactor
2924/1062 II-V	2924/12035 Zener diode
2924/10621 Cadmium phosphide [Cd ₃ P ₂]	2924/12036 PN diode
2924/10622 Cadmium arsenide [Cd ₃ As ₂]	2924/12036 PN diode 2924/12037 Cat's whisker diode
2924/10623 Cadmium antimonide [Cd_3Sb_2]	
2924/10624 Zinc phosphide [Zn ₃ P ₂]	2924/12038 Point contact
2924/10625 Zinc arsenide [Zn ₃ As ₂]	2924/1204 Optical Diode
$2924/10626$ Zinc antimonide [Zn_3Sb_2]	2924/12041 LED
2924/1067 Oxide	2924/12042 LASER
2924/10671 Titanium dioxide, anatase, rutile,	2924/12043 Photo diode
brookite [TiO ₂]	2924/12044 OLED
2924/10672 Copper(I)oxide [Cu ₂ O]	2924/1205 Capacitor
2924/10673 Copper(II)oxide [CuO]	2924/1206 Inductor
2924/10674 Uranium dioxide [UO ₂]	2924/1207 Resistor
2924/10675 Uranium trioxide [UO ₃]	2924/13 Discrete devices, e.g. 3 terminal devices
	2924/1301 Thyristor

2024/12011 A 1 C 4 TH 1 4 [A CT]	2024/12077
2924/13011 Anode Gate Thyristor [AGT]	2924/13067 FinFET, source/drain region shapes fins on the silicon surface
2924/13013 Bidirectional Control Thyristor [BCT]	2924/13068 Fast-reverse epitaxial diode field-effect
2924/13014 Breakover Diode [BOD]	transistor [FREDFET]
2924/13015 DIAC - Bidirectional trigger device	2924/13069 Thin film transistor [TFT]
2924/13016 Dynistor - Unidirectional switching device	2924/1307 Organic Field-Effect Transistor [OFET]
2924/13017 Shockley diode - Unidirectional trigger and switching device	2924/13071 Ballistic transistor
2924/13018 SIDAC - Bidirectional switching device	2924/13072 Sensor FET
2924/13019 Trisil, SIDACtor - Bidirectional protection	2924/13073 ion-sensitive field-effect transistor
devices	[ISFET]
2924/1302 GTO - Gate Turn-Off thyristor	2924/13074 Electrolyte-oxide-semiconductor
2924/13021	field effect transistor [EOSFET], e.g.
Turn-Off thyristor	Neurochip
2924/13022 MA-GTO - Modified Anode Gate Turn-	2924/13075 Deoxyribonucleic acid field-effect
Off thyristor	transistor [DNAFET]
2924/13023 IGCT - Integrated Gate Commutated	2924/13076 DEPFET
Thyristor	2924/13078 Unijunction transistors
2924/13024 LASCR - Light Activated SCR, or LTT -	2924/13079 Single-electron transistors [SET]
Light triggered thyristor	2924/1308 Nanofluidic transistor
2924/13025 Light Activated Semiconducting Switch	2924/13081 Multigate devices
[LASS]	2924/13082 Tetrode transistor
2924/13026 MCT - MOSFET Controlled Thyristor - It	2924/13083 Pentode transistor
contains two additional FET structures for	2924/13084 Trigate transistor
on/off control	2924/13085 Dual gate FETs
2924/13027 BRT - Base Resistance Controlled	2924/13086 Junctionless Nanowire Transistor [JNT]
Thyristor	2924/13087 Vertical-Slit Field-Effect Transistor
2924/13028 RCT - Reverse Conducting Thyristor	[VeSFET]
2924/13029 PUT or PUJT - Programmable Unijunction	2924/13088 Graphene Nanoribbon Field-Effect
Transistor - A thyristor with gate on n-type	Transistor [GNRFET]
layer near to the anode used as a functional	2924/13089 Nanoparticle Organic Memory Field-
replacement for unijunction transistor	Effect Transistor [NOMFET]
2924/1303 SCS - Silicon Controlled Switch or	2924/1309 Modulation-Doped Field Effect
Thyristor Tetrode - A thyristor with both	Transistor [MODFET]
cathode and anode gates	2924/13091 Metal-Oxide-Semiconductor Field-
2924/13032 SITh - Static Induction Thyristor, or FCTh - Field Controlled Thyristor - containing	Effect Transistor [MOSFET]
a gate structure that can shut down anode	2924/13092 Dual Gate Metal-Oxide-
current flow	Semiconductor Field-Effect
2924/13033 TRIAC - Triode for Alternating Current	Transistor [DGMOSFET]
- A bidirectional switching device	2924/14 Integrated circuits
containing two thyristor structures with	2924/141 Analog devices
common gate contact	2924/142 HF devices
2924/13034 Silicon Controlled Rectifier [SCR]	2924/1421 RF devices
2924/13035 Asymmetrical SCR [ASCR]	2924/14211 Voltage-controlled oscillator [VCO]
2924/1304 Transistor	2924/14215 Low-noise amplifier [LNA]
2924/1305 Bipolar Junction Transistor [BJT]	2924/1422 Mixer
2924/13051 Heterojunction bipolar transistor [HBT]	2924/14221 Electronic mixer
2924/13052 Schottky transistor	2924/14222 Frequency mixer
2924/13053 Avalanche transistor	2924/1423 Monolithic Microwave Integrated Circuit
2924/13054 Darlington transistor	[MMIC]
2924/13055 Insulated gate bipolar transistor [IGBT]	2924/1424 Operational amplifier
2924/13056 Photo transistor	2924/1425 Converter
2924/1306 Field-effect transistor [FET]	2924/14251 Frequency converter
2924/13061 Carbon nanotube field-effect transistor	2924/14252 Voltage converter
[CNFET]	2924/14253 Digital-to-analog converter [DAC]
2924/13062 Junction field-effect transistor [JFET]	2924/1426 Driver
2924/13063 Metal-Semiconductor Field-Effect	2924/1427 Voltage regulator [VR]
Transistor [MESFET]	2924/143 Digital devices
2924/13064 High Electron Mobility Transistor	2924/1431 Logic devices
[HEMT, HFET [heterostructure FET],	2924/1432 Central processing unit [CPU]
MODFET]	2924/1433 Application-specific integrated circuit
2924/13066 Inverted-T field effect transistor	[ASIC]
[ITFET]	2924/14335 Digital signal processor [DSP]
	2924/1434 Memory

2024/1425 D. I. [D.A.M]	2024/152
2924/1435 Random access memory [RAM]	2924/153 Connection portion
2924/1436 Dynamic random-access memory [DRAM]	2924/1531 the connection portion being formed only on the surface of the substrate opposite to the
2924/14361 Synchronous dynamic random	die mounting surface
access memory [SDRAM]	2924/15311 being a ball array, e.g. BGA
2924/14362 RAS Only Refresh [ROR]	2924/15312 being a pin array, e.g. PGA
2924/14363 CAS before RAS refresh [CBR]	2924/15313 being a land array, e.g. LGA
2924/14364 Multibank DRAM [MDRAM]	2924/1532 the connection portion being formed on the
2924/14365 Video DRAM [VRAM]	die mounting surface of the substrate
2924/14366 Window DRAM [WRAM]	2924/15321 being a ball array, e.g. BGA 2924/15322 being a pin array, e.g. PGA
2924/14367 Fast page mode DRAM [FPM DRAM]	2924/15322 being a land array, e.g. FGA
2924/14368 Extended data out DRAM [EDO	2924/1533 the connection portion being formed
DRAM]	both on the die mounting surface of the
2924/14369 Burst EDO DRAM [BEDO	substrate and outside the die mounting
DRAM]	surface of the substrate
2924/1437 Static random-access memory	2924/15331 being a ball array, e.g. BGA
[SRAM]	2924/15332 being a pin array, e.g. PGA
2924/1438 Flash memory	2924/15333 being a land array, e.g. LGA
2924/1441 Ferroelectric RAM [FeRAM or	2924/156 Material
FRAM]	2924/157 with a principal constituent of the material
2924/1442 Synchronous graphics RAM	being a metal or a metalloid, e.g. boron [B],
[SGRAM]	silicon [Si], germanium [Ge], arsenic [As],
2924/1443 Non-volatile random-access memory	antimony [Sb], tellurium [Te] and polonium
[NVRAM]	[Po], and alloys thereof
2924/1444 PBRAM	2924/15701 the principal constituent melting at a temperature of less than 400 C
2924/145 Read-only memory [ROM]	2924/15717 the principal constituent melting at a
2924/1451 EPROM	temperature of greater than or equal to 400
2924/14511 EEPROM	C and less than 950 C
2924/1453 PROM	2924/15724 Aluminium [Al] as principal constituent
2924/146 Mixed devices 2924/1461 MEMS	2924/15738 the principal constituent melting at a
2924/1401 MEMS 2924/15 . Details of package parts other than the	temperature of greater than or equal to 950
semiconductor or other solid state devices to be	C and less than 1550 C
***************************************	2924/15747 Copper [Cu] as principal constituent
connected	
	2924/1576 Iron [Fe] as principal constituent
connected 2924/151 . Die mounting substrate 2924/1511 Structure	2924/1576 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a
2924/151 Die mounting substrate 2924/1511 Structure	2924/1576 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C
2924/151 Die mounting substrate	2924/1576 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C 2924/15786 with a principal constituent of the material
 2924/151 Die mounting substrate 2924/1511 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, 	 2924/1576 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C 2924/15786 with a principal constituent of the material being a non metallic, non metalloid inorganic
 2924/151 Die mounting substrate 2924/1511 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 	 2924/1576 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C 2924/15786 with a principal constituent of the material being a non metallic, non metalloid inorganic material
 2924/151 Die mounting substrate 2924/1511 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a 	 2924/1576 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C 2924/15786 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2924/15787 Ceramics, e.g. crystalline carbides, nitrides
 2924/151 Die mounting substrate 2924/1511 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 	 2924/1576 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C 2924/15786 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2924/15787 Ceramics, e.g. crystalline carbides, nitrides or oxides
 2924/1511 Die mounting substrate 2924/1515 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a 	 2924/15763 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C 2924/15786 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2924/15787 Ceramics, e.g. crystalline carbides, nitrides or oxides 2924/15788 Glasses, e.g. amorphous oxides, nitrides or fluorides
 2924/1511 Die mounting substrate 2924/1515 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 	 2924/1576 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C 2924/15786 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2924/15787 Ceramics, e.g. crystalline carbides, nitrides or oxides 2924/15788 Glasses, e.g. amorphous oxides, nitrides or fluorides 2924/1579 with a principal constituent of the material
 2924/1511 Die mounting substrate 2924/1511 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 	 2924/1576
 2924/1511 Die mounting substrate 2924/1515 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 2924/15157 Top view 	 2924/1576
 2924/1511 Die mounting substrate 2924/1511 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 	 2924/1576
 2924/1511 Die mounting substrate 2924/1515 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 2924/15157 Top view 2924/15158 the die mounting substrate being other than a 	 2924/1576
 2924/1511 Die mounting substrate 2924/1515 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 2924/15157 Top view 2924/15158 the die mounting substrate being other than a cuboid 	 2924/1576
 2924/1511 Die mounting substrate 2924/1515 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 2924/15158 the die mounting substrate being other than a cuboid 2924/15159 Side view 2924/15162 Side view 2924/15165	 2924/1576
 2924/1511 Die mounting substrate 2924/1515 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 2924/15157 Top view 2924/15159 Side view 2924/15162 Side view 2924/15165	 2924/1576
 2924/1511 Die mounting substrate 2924/1515 Shape 2924/1515 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 2924/15157 Top view 2924/15159 Side view 2924/15162 Side view 2924/15165 Side view 2924/15162 Top view 2924/15170 Top view 2924/15171 Multilayer substrate 2924/15172 Fan-out arrangement of the internal vias 	 2924/1576
2924/1511 Die mounting substrate 2924/1511 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 2924/15157 Top view 2924/15158 the die mounting substrate being other than a cuboid 2924/15160 Side view 2924/15161 Side view 2924/15162 Top view 2924/15163 Monolayer substrate 2924/1517 Multilayer substrate 2924/1517 Fan-out arrangement of the internal vias 2924/15173 in a single layer of the multilayer substrate	 2924/15763 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C 2924/15786 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2924/15787 Ceramics, e.g. crystalline carbides, nitrides or oxides 2924/15788 Glasses, e.g. amorphous oxides, nitrides or fluorides 2924/1579 with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy 2924/15791 The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene 2924/15793 with a principal constituent of the material being a solid not provided for in groups HOLL 2924/157 - HOLL 2924/15791, e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2924/1511 Die mounting substrate 2924/1515 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 2924/15157 Top view 2924/15158 the die mounting substrate being other than a cuboid 2924/15160 Side view 2924/15161 Side view 2924/15162 Top view 2924/15163 Monolayer substrate 2924/1517 Multilayer substrate 2924/1517 Fan-out arrangement of the internal vias 2924/15173 in a single layer of the multilayer	 2924/1576
2924/1511 Die mounting substrate 2924/1511 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 2924/15157 Top view 2924/15158 the die mounting substrate being other than a cuboid 2924/15160 Side view 2924/15161 Side view 2924/15162 Top view 2924/15163 Monolayer substrate 2924/15174 Fan-out arrangement of the internal vias 2924/15173 in a single layer of the multilayer substrate 2924/15174 in different layers of the multilayer substrate	 2924/1576
2924/1511 Die mounting substrate 2924/1511 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 2924/15157 Top view 2924/15158 the die mounting substrate being other than a cuboid 2924/15160 Side view 2924/15161 Side view 2924/15162 Top view 2924/15163 Monolayer substrate 2924/15171 Multilayer substrate 2924/15172 Fan-out arrangement of the internal vias 2924/15173 in a single layer of the multilayer substrate 2924/15174 in different layers of the multilayer substrate	 2924/15763 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C 2924/15786 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2924/15787 Ceramics, e.g. crystalline carbides, nitrides or oxides 2924/15788 Glasses, e.g. amorphous oxides, nitrides or fluorides 2924/1579 with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy 2924/15791 The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene 2924/15793 with a principal constituent of the material being a solid not provided for in groups HOIL 2924/157 - HOIL 2924/15791, e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond 2924/15798 with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler,
2924/1511 Die mounting substrate 2924/1511 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 2924/15157 Top view 2924/15158 the die mounting substrate being other than a cuboid 2924/15160 Side view 2924/15161 Side view 2924/15162 Top view 2924/15163 Monolayer substrate 2924/1517 Multilayer substrate 2924/1517 in a single layer of the multilayer substrate 2924/15174 in different layers of the multilayer substrate 2924/15182 Fan-in arrangement of the internal vias 2924/15183 in a single layer of the multilayer substrate	2924/15763 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C 2924/15786 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2924/15787 Ceramics, e.g. crystalline carbides, nitrides or oxides 2924/15788 Glasses, e.g. amorphous oxides, nitrides or fluorides 2924/1579 with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy 2924/15791 The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene 2924/15793 with a principal constituent of the material being a solid not provided for in groups H01L 2924/157 - H01L 2924/15791, e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond 2924/15798 with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented
 2924/1511 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 2924/15158 the die mounting substrate being other than a cuboid 2924/15159 Side view 2924/15162 Top view 2924/15165 Monolayer substrate 2924/1517 Multilayer substrate 2924/1517 fan-out arrangement of the internal vias 2924/1517 in a single layer of the multilayer substrate 2924/15182 Fan-in arrangement of the internal vias 2924/15183 in a single layer of the multilayer substrate 2924/15184 in a single layer of the multilayer substrate 	 2924/1576 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C 2924/15786 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2924/15787 Ceramics, e.g. crystalline carbides, nitrides or oxides 2924/15788 Glasses, e.g. amorphous oxides, nitrides or fluorides 2924/1579 with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy 2924/15791 The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene 2924/15793 with a principal constituent of the material being a solid not provided for in groups H01L 2924/157 - H01L 2924/15791, e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond 2924/15798 with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2924/1515 Structure 2924/1515 Shape 2924/1515	 2924/1576 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C 2924/15786 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2924/15787 Ceramics, e.g. crystalline carbides, nitrides or oxides 2924/15788 Glasses, e.g. amorphous oxides, nitrides or fluorides 2924/1579 with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy 2924/15791 The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene 2924/15793 with a principal constituent of the material being a solid not provided for in groups H01L 2924/157 - H01L 2924/15791, e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond 2924/15798 with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams 2924/161 Cap
 2924/1511 Structure 2924/1515 Shape 2924/15151 the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections 2924/15153 the die mounting substrate comprising a recess for hosting the device 2924/15155 the shape of the recess being other than a cuboid 2924/15156 Side view 2924/15158 the die mounting substrate being other than a cuboid 2924/15159 Side view 2924/15162 Top view 2924/15165 Monolayer substrate 2924/1517 Multilayer substrate 2924/1517 fan-out arrangement of the internal vias 2924/1517 in a single layer of the multilayer substrate 2924/15182 Fan-in arrangement of the internal vias 2924/15183 in a single layer of the multilayer substrate 2924/15184 in a single layer of the multilayer substrate 	 2924/1576 Iron [Fe] as principal constituent 2924/15763 the principal constituent melting at a temperature of greater than 1550 C 2924/15786 with a principal constituent of the material being a non metallic, non metalloid inorganic material 2924/15787 Ceramics, e.g. crystalline carbides, nitrides or oxides 2924/15788 Glasses, e.g. amorphous oxides, nitrides or fluorides 2924/1579 with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy 2924/15791 The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene 2924/15793 with a principal constituent of the material being a solid not provided for in groups H01L 2924/157 - H01L 2924/15791, e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond 2924/15798 with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams

2924/16151 Cap comprising an aperture, e.g. for pressure control, encapsulation	2924/16586 with a principal constituent of the material being a non metallic, non metalloid
2924/16152 Cap comprising a cavity for hosting the device, e.g. U-shaped cap	inorganic material 2924/16587 Ceramics, e.g. crystalline carbides,
2924/16153 Cap enclosing a plurality of side-by-side cavities [e.g. E-shaped cap]	nitrides or oxides 2924/16588 Glasses, e.g. amorphous oxides, nitrides
2924/1616 Cavity shape	or fluorides
2924/1617 Cavity coating	2924/1659 with a principal constituent of the material
2924/16171 Material	being a polymer, e.g. polyester, phenolic
2924/16172 with a principal constituent of	based polymer, epoxy
the material being a metal or a	2924/16593 with a principal constituent of the material
metalloid, e.g. boron [B], silicon	being a solid not provided for in groups H01L 2924/157 - H01L 2924/15791, e.g.
[Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and	allotropes of carbon, fullerene, graphite,
polonium [Po], and alloys thereof	carbon-nanotubes, diamond
2924/16173 with a principal constituent of the	2924/16598 with a principal constituent of the material
material being a non metallic, non	being a combination of two or more
metalloid inorganic material	materials in the form of a matrix with a
2924/16174 Ceramics, e.g. crystalline carbides,	filler, i.e. being a hybrid material, e.g. segmented structures, foams
nitrides or oxides	2924/166 Material
2924/16175 Glasses, e.g. amorphous oxides, nitrides or fluorides	2924/167 with a principal constituent of the material
2924/16176 with a principal constituent of	being a metal or a metalloid, e.g. boron [B],
the material being a polymer, e.g.	silicon [Si], germanium [Ge], arsenic [As],
polyester, phenolic based polymer,	antimony [Sb], tellurium [Te] and polonium
epoxy	[Po], and alloys thereof
2924/16177 The principal constituent being an	2924/16701 the principal constituent melting at a temperature of less than 400 C
elastomer, e.g. silicones, isoprene, neoprene	2924/16717 the principal constituent melting at a
2924/16178 with a principal constituent	temperature of greater than or equal to 400
of the material being a solid	C and less than 950 C
not provided for in groups	2924/16724 Aluminium [Al] as principal constituent
<u>H01L 2924/157</u> - <u>H01L 2924/15791</u> ,	2924/16738 the principal constituent melting at a
e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	temperature of greater than or equal to 950 C and less than 1550 C
2924/16179 with a principal constituent of the	2924/16747 Copper [Cu] as principal constituent
material being a combination of two	2924/1676 Iron [Fe] as principal constituent
or more materials in the form of a	2924/16763 the principal constituent melting at a
matrix with a filler, i.e. being a hybrid	temperature of greater than 1550 C
material, e.g. segmented structures, foams	2924/16786 with a principal constituent of the material
2924/1619 Cavity coating shape	being a non metallic, non metalloid inorganic material
2924/16195 Flat cap [not enclosing an internal cavity]	2924/16787 Ceramics, e.g. crystalline carbides, nitrides
2924/16196 Cap forming a cavity, e.g. being a curved	or oxides
metal foil	2924/16788 Glasses, e.g. amorphous oxides, nitrides or
2924/162 Disposition	fluorides
2924/16235 Connecting to a semiconductor or solid-state	2924/1679 with a principal constituent of the material
bodies, i.e. cap-to-chip 2924/16251 Connecting to an item not being a	being a polymer, e.g. polyester, phenolic based polymer, epoxy
semiconductor or solid-state body, e.g. cap-	2924/16791 The principal constituent being an
to-substrate	elastomer, e.g. silicones, isoprene,
2924/1626 Cap-in-cap assemblies	neoprene
2924/1627 stacked type assemblies, e.g. stacked multi-	2924/16793 with a principal constituent of the material
cavities	being a solid not provided for in groups H01L 2924/167 - H01L 2924/16791, e.g.
2924/163 Connection portion, e.g. seal 2924/1631 Structure	allotropes of carbon, fullerene, graphite,
2924/16315 Shape	carbon-nanotubes, diamond
2924/1632 Disposition	2924/16798 with a principal constituent of the material
2924/164 Material	being a combination of two or more
2924/165 with a principal constituent of the material	materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented
being a metal or a metalloid, e.g. boron	structures, foams
[B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and	2924/171 Frame
polonium [Po], and alloys thereof	2924/1711 Structure
r [. 0], and anoyo alloco.	2924/1715 Shape

0004/17151	2024/10011
2924/17151 Frame comprising an aperture, e.g. for	2924/19011 including integrated passive components
pressure control, encapsulation	2924/19015 including thin film passive components
2924/172 Disposition	2924/1902 including thick film passive components
2924/173 Connection portion, e.g. seal	2924/1903 including wave guides
2924/176 Material	2924/19031 being a strip line type
2924/177 with a principal constituent of the material being a metal or a metalloid, e.g. boron [B],	2924/19032 being a microstrip line type
silicon [Si], germanium [Ge], arsenic [As],	2924/19033 being a coplanar line type
antimony [Sb], tellurium [Te] and polonium	2924/19038 being a hybrid line type
[Po], and alloys thereof	2924/19039 impedance transition between different
2924/17701 the principal constituent melting at a	types of wave guides
temperature of less than 400 C	2924/1904 Component type
2924/17717 the principal constituent melting at a	2924/19041 being a capacitor
temperature of greater than or equal to 400	2924/19042 being an inductor
C and less than 950 C	2924/19043 being a resistor
2924/17724 Aluminium [Al] as principal constituent	2924/1905 Shape
2924/17738 the principal constituent melting at a	2924/19051 Impedance matching structure [e.g. balun]
temperature of greater than or equal to 950	2924/191 Disposition
C and less than 1550 C	2924/19101 of discrete passive components
2924/17747 Copper [Cu] as principal constituent	2924/19102 in a stacked assembly with the
2924/1776 Iron [Fe] as principal constituent	semiconductor or solid state device
2924/17763 the principal constituent melting at a	2924/19103 interposed between the semiconductor or
temperature of greater than 1550 C	solid-state device and the die mounting
2924/17786 with a principal constituent of the material	substrate, i.e. chip-on-passive
being a non metallic, non metalloid inorganic	2924/19104 on the semiconductor or solid-state device,
material	i.e. passive-on-chip
2924/17787 Ceramics, e.g. crystalline carbides, nitrides	2924/19105 in a side-by-side arrangement on a common
or oxides	die mounting substrate
2924/17788 Glasses, e.g. amorphous oxides, nitrides or	2924/19106 in a mirrored arrangement on two different
fluorides	side of a common die mounting substrate
2924/1779 with a principal constituent of the material	2924/19107 off-chip wires
being a polymer, e.g. polyester, phenolic	2924/20 • Parameters
based polymer, epoxy	2924/201 Temperature ranges
2924/17791 The principal constituent being an	2924/20101 Temperature range T<0 C, T<273.15 K
elastomer, e.g. silicones, isoprene,	2924/20102 Temperature range 0 C= <t<60 273.15="" c,="" k<="" td=""></t<60>
neoprene	= <t<333.15k< td=""></t<333.15k<>
2924/17793 with a principal constituent of the material	2924/20103 Temperature range 60 C= <t<100 333.15="" c,="" k<="" td=""></t<100>
being a solid not provided for in groups	=< T< 373.15K
<u>H01L 2924/177</u> - <u>H01L 2924/17791</u> , e.g.	2924/20104 Temperature range 100 C= <t<150 373.15="" c,="" k<="" td=""></t<150>
allotropes of carbon, fullerene, graphite,	=< T < 423.15K
carbon-nanotubes, diamond	2924/20105 Temperature range 150 C= <t<200 423.15="" c,="" k<="" td=""></t<200>
2924/17798 with a principal constituent of the material being a combination of two or more	=< T < 473.15K
materials in the form of a matrix with a filler,	2924/20106 Temperature range 200 C= <t<250 473.15="" 523.15="" <="" c,="" k="<T" k<="" td=""></t<250>
i.e. being a hybrid material, e.g. segmented	
structures, foams	2924/20107 Temperature range 250 C= <t<300 523.15k="<T<" 573.15k<="" c,="" td=""></t<300>
2924/181 . Encapsulation	
2924/1811 Structure	2924/20108 Temperature range 300 C= <t<350 573.15k="<T<623.15K</td" c,=""></t<350>
2924/1815 Shape	2924/20109 Temperature range 350 C= <t<400 623.15k<="" c,="" td=""></t<400>
2924/1816 Exposing the passive side of the	= <t<673.15k< td=""></t<673.15k<>
semiconductor or solid-state body	2924/2011 Temperature range 400 C= <t<450 673.15k<="" c,="" td=""></t<450>
2924/18161 of a flip chip	= <t<723.15k< td=""></t<723.15k<>
2924/18162 of a chip with build-up interconnect	2924/20111 Temperature range 450 C= <t<500 723.15k<="" c,="" td=""></t<500>
2924/18165 of a wire bonded chip	= <t<773.15k< td=""></t<773.15k<>
2924/182 Disposition	2924/202 . Electromagnetic wavelength ranges [W]
2924/183 Connection portion, e.g. seal	2924/20201 Gamma radiation, i.e. wavelength less than
2924/18301 being an anchoring portion, i.e. mechanical	0.01 nm
interlocking between the encapsulation resin	2924/20202 X-ray radiation, i.e. wavelength 0.01 to 10 nm
and another package part	2924/2021 Ultraviolet radiation
2924/186 Material	2924/2021 Utv-C 100= <w<280 nm<="" td=""></w<280>
2924/19 • Details of hybrid assemblies other than the	2924/20212 UV-B 280= <w<315 nm<="" td=""></w<315>
semiconductor or other solid state devices to be	2924/20212 UV-B 280=< W<513 IIII 2924/20213 UV-A 315=< W<400 nm
connected	
2924/1901 • Structure	2924/2024 Visible spectrum wavelength 390= <w<700 400-790="" i.e.="" nm,="" td="" thz<=""></w<700>
	IIII, 1.0. 400-770 1112

2024/2026 I C I I' ' 700 W 2000	2024/2075
2924/2026 Infrared radiation 700= <w<3000 nm<="" td=""><td>2924/2075 larger or equal to 1 micron less than 10 microns</td></w<3000>	2924/2075 larger or equal to 1 micron less than 10 microns
2924/20261 IR-A 700= <w<1400 215="" i.e.="" nm,="" td="" thz-430="" thz<=""><td>2924/20751 larger or equal to 10 microns less than 20 microns</td></w<1400>	2924/20751 larger or equal to 10 microns less than 20 microns
2924/20262 IR-B 1400= <w<3000 100thz-215="" i.e.="" nm,="" td="" thz<=""><td>2924/20752 larger or equal to 20 microns less than 30 microns</td></w<3000>	2924/20752 larger or equal to 20 microns less than 30 microns
2924/20263 IR-C 3000 nm = <w<1 300="" ghz-100thz<="" i.e.="" mm,="" td=""><td>2924/20753 larger or equal to 30 microns less than 40 microns</td></w<1>	2924/20753 larger or equal to 30 microns less than 40 microns
2924/2027 Radio 1 mm - km 300 GHz - 3 Hz	2924/20754 larger or equal to 40 microns less than 50 microns
2924/20271 Microwave radiation 1 mm - 1 meter, ie 300 GHz - 300 MHz	2924/20755 larger or equal to 50 microns less than 60
2924/203 • Ultrasonic frequency ranges, i.e. KHz	microns
2924/20301 Ultrasonic frequency [f] f<25 kHz	2924/20756 larger or equal to 60 microns less than 70
2924/20302 Ultrasonic frequency [f] 25 Khz= <f< 50="" khz<="" td=""><td>microns</td></f<>	microns
2924/20303 Ultrasonic frequency [f] 50 Khz= <f< 75="" khz<="" td=""><td>2924/20757 larger or equal to 70 microns less than 80</td></f<>	2924/20757 larger or equal to 70 microns less than 80
2924/20304 Ultrasonic frequency [f] 75 Khz= <f< 100="" khz<="" td=""><td>microns</td></f<>	microns
2924/20305 Ultrasonic frequency [f] 100 Khz= <f< 125<="" td=""><td>2924/20758 larger or equal to 80 microns less than 90</td></f<>	2924/20758 larger or equal to 80 microns less than 90
KHz	microns
2924/20306 Ultrasonic frequency [f] 125 Khz= <f< 150="" khz<="" td=""><td>2924/20759 larger or equal to 90 microns less than 100 microns</td></f<>	2924/20759 larger or equal to 90 microns less than 100 microns
2924/20307 Ultrasonic frequency [f] 150 Khz= <f< 175<="" td=""><td>2924/2076 equal to or larger than 100 microns</td></f<>	2924/2076 equal to or larger than 100 microns
KHz	2924/30 • Technical effects
2924/20308 Ultrasonic frequency [f] 175 Khz= <f< 200<="" td=""><td>2924/301 • Electrical effects</td></f<>	2924/301 • Electrical effects
KHz	2924/30101 Resistance
2924/20309 Ultrasonic frequency [f] f>=200 KHz	2924/30105 Capacitance
2924/206 . Length ranges	2924/30107 Inductance
2924/2064 larger or equal to 1 micron less than 100	2924/3011 Impedance
microns	2924/30111 matching
2924/20641 larger or equal to 100 microns less than 200	2924/302 Electrostatic
microns	2924/30201 Charge
2924/20642 larger or equal to 200 microns less than 300	2924/30205 Discharge
microns	2924/3025 Electromagnetic shielding
2924/20643 larger or equal to 300 microns less than 400	2924/35 . Mechanical effects
microns	2924/351 Thermal stress
2924/20644 larger or equal to 400 microns less than 500	2924/3511 Warping
microns	2924/3512 Cracking
2924/20645 larger or equal to 500 microns less than 600	2924/35121 Peeling or delaminating
microns	2924/36 Material effects
2924/20646 larger or equal to 600 microns less than 700	2924/364 Polymers
microns	2924/3641 Outgassing
2924/20647 larger or equal to 700 microns less than 800	2924/365 Metallurgical effects
microns	2924/3651 Formation of intermetallics
2924/20648 larger or equal to 800 microns less than 900	2924/36511 Purple plague
microns	2924/3656 Formation of Kirkendall voids
2924/20649 larger or equal to 900 microns less than 1000	2924/37 • Effects of the manufacturing process
microns	2924/37001 Yield
2924/2065 larger or equal to 1000 microns less than 1500 microns	2924/37002 Shelf life
	2924/3701 increased through put
2924/20651 larger or equal to 1500 microns less than 2000 microns	2924/38 • Effects and problems related to the device
2924/20652 larger or equal to 2000 microns less than 2500	integration
microns	2924/381 Pitch distance
2924/20653 larger or equal to 2500 microns less than 3000	2924/384 Bump effects
microns	2924/3841 Solder bridging
2924/20654 larger or equal to 3000 microns less than 4000	2924/386 Wire effects
microns	2924/3861 Sag
2924/20655 larger or equal to 4000 microns less than 5000	2924/3862 Sweep
microns	2924/40 Details of apparatuses used for either manufacturing
2924/20656 larger or equal to 5000 microns less than 6000 microns	connectors or connecting the semiconductor or solid-state body
2924/20657 larger or equal to 6000 microns less than 7000	2924/401 . LASER
microns	2924/40101 Mode
2924/20658 larger or equal to 7000 microns less than 8000	2924/40102 being pulsed
microns	2924/40103 being continous
2924/207 . Diameter ranges	

2924/207 . Diameter ranges

2924/40105	
2924/4015	· · · Shape
2924/402	Type
2924/40201	being a chemical
2924/40202	Deuterium Flouride [DF] LASER
2924/40203	Hydrogen Flouride [HF] LASER
2924/40207	Dye laser
2924/4025	being a gas
2924/40251	argon-ion LASER
2924/40252	CO ₂ LASER
2924/40253	HeAg LASER
2924/40254	HeNe LASER
2924/40255	NeCu LASER
2924/403	being an Excimer
2924/40301	ArF LASER
2924/40302	F2 LASER
2924/40303	KrCl LASER
2924/40304	KrF LASER
2924/40305	XeCl LASER
2924/40306	XeF LASER
2924/4035	being a fiber hosted LASER
2924/404	being a solid state
2924/40401	Free electron LASER
2924/40402	Photonic crystal LASER
2924/40403	Fiber solid state LASER
2924/40404	Yttrium Aluminium Garnet Nd:YAG
	LASER
2924/40405	Yttrium Lithium Flouride Nd:YLF
	LASER
2924/40406	Ruby LASER
2924/40407	Yb:YAG LASER
2924/405	Wavelength
2924/40501	UV spectrum
2924/40502	Visible spectrum
2924/40503	IR spectrum