

EUROPEAN PATENT OFFICE  
U.S. PATENT AND TRADEMARK OFFICE

CPC NOTICE OF CHANGES 1570

DATE: JANUARY 1, 2024

PROJECT MP12192

**The following classification changes will be effected by this Notice of Changes:**

<u>Action</u>	<u>Subclass</u>	<u>Group(s)</u>
<b>SCHEME:</b>		
Titles Changed:	G02F	1/015
	H01C	7/00
	H01G	SUBCLASS
	H01L	21/04, 21/62
	H01L	27/02, 27/15
	H01L	29/00, 29/92
	H01L	31/06, 31/10, 31/102, 31/107, 31/11, 31/111, 31/147, 31/167
	H01L	33/00
	H03K	3/313
	H10K	10/00, 10/10
	H10N	70/00
Notes New:	H10B	SUBCLASS
	H10N	SUBCLASS
Notes Modified:	H10K	SUBCLASS
<b>DEFINITIONS:</b>		
Definitions Modified:	G09F	9/00
	H01C	SUBCLASS
	H01C	7/00
	H01F	SUBCLASS
	H01G	SUBCLASS
	H01L	SUBCLASS
	H01L	21/04
	H01L	29/00
	H01L	31/068
	H01L	31/12
	H05B	SUBCLASS

**No other subclasses/groups are impacted by this Notice of Changes.**

**This Notice of Changes includes the following [Check the ones included]:**

1. CLASSIFICATION SCHEME CHANGES

- A. New, Modified or Deleted Group(s)

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- B. New, Modified or Deleted Warning(s)
- C. New, Modified or Deleted Note(s)
- D. New, Modified or Deleted Guidance Heading(s)

2. DEFINITIONS

- A. New or Modified Definitions (Full definition template)
- B. Modified or Deleted Definitions (Definitions Quick Fix)

- 3.  REVISION CONCORDANCE LIST (RCL)
- 4.  CHANGES TO THE CPC-TO-IPC CONCORDANCE LIST (CICL)
- 5.  CHANGES TO THE CROSS-REFERENCE LIST (CRL)

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1. CLASSIFICATION SCHEME CHANGES

A. New, Modified or Deleted Group(s)

**SUBCLASS G02F - OPTICAL DEVICES OR ARRANGEMENTS FOR THE CONTROL OF LIGHT BY MODIFICATION OF THE OPTICAL PROPERTIES OF THE MEDIA OF THE ELEMENTS INVOLVED THEREIN; NON-LINEAR OPTICS; FREQUENCY-CHANGING OF LIGHT; OPTICAL LOGIC ELEMENTS; OPTICAL ANALOGUE/DIGITAL CONVERTERS**

<u>Type*</u>	<u>Symbol</u>	<u>Indent Level Number of dots (e.g. 0, 1, 2)</u>	<u>Title</u> <u>“CPC only” text should normally be enclosed in {curly brackets}**</u>	<u>Transferred to#</u>
M	G02F 1/015	2	based on semiconductor elements having potential barriers, e.g. having a PN or PIN junction (G02F 1/03 takes precedence)	

**SUBCLASS H01C - RESISTORS**

<u>Type*</u>	<u>Symbol</u>	<u>Indent Level Number of dots (e.g. 0, 1, 2)</u>	<u>Title</u> <u>“CPC only” text should normally be enclosed in {curly brackets}**</u>	<u>Transferred to#</u>
M	H01C 7/00	0	Non-adjustable resistors formed as one or more layers or coatings; Non-adjustable resistors made from powdered conducting material or powdered semi-conducting material with or without insulating material (consisting of loose powdered or granular material H01C 8/00; resistors having potential barriers, e.g. field-effect resistors, H01L 29/00; semiconductor devices sensitive to electromagnetic or corpuscular radiation, e.g. photoresistors, H01L 31/00; magnetic field controlled resistors H10N 50/10; bulk negative resistance effect devices H10N 80/00)	

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**SUBCLASS H01G - CAPACITORS; CAPACITORS, RECTIFIERS, DETECTORS, SWITCHING DEVICES, LIGHT-SENSITIVE OR TEMPERATURE-SENSITIVE DEVICES OF THE ELECTROLYTIC TYPE (selection of specified materials as dielectric H01B 3/00; capacitors having potential barriers H01L 29/00)**

<u>Type*</u>	<u>Symbol</u>	<u>Indent Level Number of dots (e.g. 0, 1, 2)</u>	<u>Title</u> “CPC only” text should normally be enclosed in {curly brackets}**	<u>Transferred to#</u>
M	H01G	Subclass	CAPACITORS; CAPACITORS, RECTIFIERS, DETECTORS, SWITCHING DEVICES, LIGHT-SENSITIVE OR TEMPERATURE-SENSITIVE DEVICES OF THE ELECTROLYTIC TYPE (selection of specified materials as dielectric H01B 3/00; capacitors having potential barriers H01L 29/00)	

**SUBCLASS H01L - SEMICONDUCTOR DEVICES NOT COVERED BY CLASS H10 (use of semiconductor devices for measuring G01; resistors in general H01C; magnets, inductors or transformers H01F; capacitors in general H01G; electrolytic devices H01G 9/00; batteries or accumulators H01M; waveguides, resonators or lines of the waveguide type H01P; line connectors or current collectors H01R; stimulated-emission devices H01S; electromechanical resonators H03H; loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers H04R; electric light sources in general H05B; printed circuits, hybrid circuits, casings or constructional details of electrical apparatus, manufacture of assemblages of electrical components H05K; use of semiconductor devices in circuits having a particular application, see the subclass for the application)**

<u>Type*</u>	<u>Symbol</u>	<u>Indent Level Number of dots (e.g. 0, 1, 2)</u>	<u>Title</u> “CPC only” text should normally be enclosed in {curly brackets}**	<u>Transferred to#</u>
M	H01L 21/04	2	the devices having potential barriers, e.g. a PN junction, depletion layer or carrier concentration layer	
M	H01L 21/62	2	the devices having no potential barriers	
M	H01L 27/02	1	including semiconductor components specially adapted for rectifying, oscillating, amplifying or switching and having potential barriers; including integrated passive circuit elements having potential barriers	
M	H01L 27/15	1	including semiconductor components having potential barriers, specially adapted for light emission	

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<u>Type*</u>	<u>Symbol</u>	<u>Indent Level Number of dots (e.g. 0, 1, 2)</u>	<u>Title</u> <b>“CPC only” text should normally be enclosed in {curly brackets}**</b>	<u>Transferred to#</u>
M	H01L 29/00	0	Semiconductor devices specially adapted for rectifying, amplifying, oscillating or switching and having potential barriers; Capacitors or resistors having potential barriers, e.g. a PN-junction depletion layer or carrier concentration layer; Details of semiconductor bodies or of electrodes thereof {; Multistep manufacturing processes therefor} (H01L 31/00-H01L 33/00, H10K 10/00, H10N take precedence; details other than of semiconductor bodies or of electrodes thereof H01L 23/00; devices consisting of a plurality of solid state components formed in or on a common substrate H01L 27/00)	
M	H01L 29/92	3	Capacitors having potential barriers	
M	H01L 31/06	2	characterised by potential barriers	
M	H01L 31/10	2	characterised by potential barriers, e.g. phototransistors	
M	H01L 31/102	4	characterised by only one potential barrier	
M	H01L 31/107	5	the potential barrier working in a avalanche mode, e.g. a avalanche photodiodes	
M	H01L 31/11	4	characterised by two potential barriers, e.g. bipolar phototransistors	
M	H01L 31/111	4	characterised by at least three potential barriers, e.g. photothyristors	
M	H01L 31/147	3	the light sources and the devices sensitive to radiation all being semiconductor devices characterised by potential barriers	
M	H01L 31/167	3	the light sources and the devices sensitive to radiation all being semiconductor devices characterised by potential barriers	
M	H01L 33/00	0	Semiconductor devices having potential barriers specially adapted for light emission; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof; Details thereof (H10K 50/00 takes precedence; devices consisting of a plurality of semiconductor components formed in or on a common substrate and including semiconductor components having potential barriers, specially adapted for light emission H01L 27/15; semiconductor lasers H01S 5/00)	

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**SUBCLASS H03K - PULSE TECHNIQUE (measuring pulse characteristics G01R; modulating sinusoidal oscillations with pulses H03C; transmission of digital information H04L; discriminator circuits detecting phase difference between two signals by counting or integrating cycles of oscillation H03D 3/04; automatic control, starting, synchronisation or stabilisation of generators of electronic oscillations or pulses where the type of generator is irrelevant or unspecified H03L; coding, decoding or code conversion, in general H03M)**

<u>Type*</u>	<u>Symbol</u>	<u>Indent Level Number of dots (e.g. 0, 1, 2)</u>	<u>Title</u> <u>“CPC only” text should normally be enclosed in {curly brackets}**</u>	<u>Transferred to#</u>
M	H03K 3/313	2	by the use, as active elements, of semiconductor devices with two electrodes, one or two potential barriers, and exhibiting a negative resistance characteristic	

**SUBCLASS H10K - ORGANIC ELECTRIC SOLID-STATE DEVICES**

<u>Type*</u>	<u>Symbol</u>	<u>Indent Level Number of dots (e.g. 0, 1, 2)</u>	<u>Title</u> <u>“CPC only” text should normally be enclosed in {curly brackets}**</u>	<u>Transferred to#</u>
M	H10K 10/00	0	Organic devices specially adapted for rectifying, amplifying, oscillating or switching; Organic capacitors or resistors having potential barriers (integrated devices or assemblies of multiple devices H10K 19/00)	
M	H10K 10/10	1	Organic capacitors or resistors having potential barriers	

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**SUBCLASS H10N - ELECTRIC SOLID-STATE DEVICES NOT OTHERWISE PROVIDED FOR**

<u>Type*</u>	<u>Symbol</u>	<u>Indent Level Number of dots (e.g. 0, 1, 2)</u>	<u>Title</u> <u>“CPC only” text should normally be enclosed in {curly brackets}**</u>	<u>Transferred to#</u>
M	H10N 70/00	0	Solid-state devices having no potential barriers, and specially adapted for rectifying, amplifying, oscillating or switching (integrated devices or assemblies of multiple devices H10N 79/00)	

\*N = new entries where reclassification into entries is involved; C = entries with modified file scope where reclassification of documents from the entries is involved; Q = new entries which are firstly populated with documents via administrative transfers from deleted (D) entries. Afterwards, the transferred documents into the Q entry will either stay or be moved to more appropriate entries, as determined by intellectual reclassification; T = existing entries with enlarged file scope, which receive documents from C or D entries, e.g. when a limiting reference is removed from the entry title; M = entries with no change to the file scope (no reclassification); D = deleted entries; F = frozen entries will be deleted once reclassification of documents from the entries is completed; U = entries that are unchanged.

NOTES:

- \*\*No {curly brackets} are used for titles in CPC only subclasses, e.g. C12Y, A23Y; 2000 series symbol titles of groups found at the end of schemes (orthogonal codes); or the Y section titles. The {curly brackets} are used for 2000 series symbol titles found interspersed throughout the main trunk schemes (breakdown codes).
- U groups: it is obligatory to display the required “anchor” symbol (U group), i.e. the entry immediately preceding a new group or an array of new groups to be created (in case new groups are not clearly subgroups of C-type groups). Always include the symbol, indent level and title of the U group in the table above.
- All entry types should be included in the scheme changes table above for better understanding of the overall scheme change picture. Symbol, indent level, and title are required for all types.
- “Transferred to” column must be completed for all C, D, F, and Q type entries. F groups will be deleted once reclassification is completed.
- When multiple symbols are included in the “Transferred to” column, avoid using ranges of symbols in order to be as precise as possible.
- For administrative transfer of documents, the following text should be used: “< administrative transfer to XX>”, “<administrative transfer to XX and YY simultaneously>”, or “<administrative transfer to XX, YY, ...and ZZ simultaneously>” when administrative transfer of the same documents is to more than one place.
- Administrative transfer to main trunk groups is assumed to be the source allocation type, unless otherwise indicated.
- Administrative transfer to 2000/Y series groups is assumed to be “additional information”.
- If needed, instructions for allocation type should be indicated within the angle brackets using the abbreviations “ADD” or “INV”: <administrative transfer to XX ADD>, <administrative transfer to XX INV>, or < administrative transfer to XX ADD, YY INV, ... and ZZ ADD simultaneously>.
- In certain situations, the “D” entries of 2000-series or Y-series groups may not require a destination (“Transferred to”) symbol, however it is required to specify “<no transfer>” in the “Transferred to” column for such cases.
- For finalisation projects, the deleted “F” symbols should have <no transfer> in the “Transferred to” column.
- For more details about the types of scheme change, see CPC Guide.

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C. New, Modified or Deleted Note(s)

**SUBCLASS H10B - ELECTRONIC MEMORY DEVICES**

<u>Type*</u>	<u>Location</u>	<u>Old Note</u>	<u>New/Modified Note</u>
N	H10B		In this subclass, the periodic system used is the I to VIII group system indicated in the Periodic Table under Note (3) of section C.

**SUBCLASS H10K - ELECTRONIC MEMORY DEVICES**

<u>Type*</u>	<u>Location</u>	<u>Old Note</u>	<u>New/Modified Note</u>
M	H10K	<p>1. This subclass <u>covers</u>:</p> <ul style="list-style-type: none"> <li>• individual organic electric solid-state devices, i.e. electric solid-state devices comprising organic material in the active part;</li> <li>• integrated devices, or assemblies of multiple devices, comprising such elements.</li> </ul> <p>2. This subclass <u>does not cover</u>:</p> <ul style="list-style-type: none"> <li>• organic electronic memory devices, which are covered by subclass H10B;</li> <li>• organic thermoelectric, piezoelectric, electrostrictive or magnetostrictive devices, which are covered by subclass H10N;</li> <li>• organic resistors without a potential-jump barrier or surface barrier and not specially adapted for integrated devices, which are covered by subclass H01C;</li> <li>• organic capacitors without a potential-jump barrier or surface barrier and not specially adapted for integrated devices, which are covered by subclass H01G.</li> </ul>	<p>1. This subclass <u>covers</u>:</p> <ul style="list-style-type: none"> <li>• individual organic electric solid-state devices, i.e. electric solid-state devices comprising organic material in the active part;</li> <li>• integrated devices, or assemblies of multiple devices, comprising such elements.</li> </ul> <p>2. This subclass <u>does not cover</u>:</p> <ul style="list-style-type: none"> <li>• organic electronic memory devices, which are covered by subclass H10B;</li> <li>• organic thermoelectric devices, organic thermomagnetic devices, organic piezoelectric devices, organic electrostrictive devices, organic magnetostrictive devices, organic galvanomagnetic devices, organic Hall-effect devices, organic superconducting devices or organic solid-state devices having no potential barriers, and specially adapted for rectifying, amplifying, oscillating or switching, which are covered by subclass H10N;</li> <li>• organic resistors having no potential barriers and not specially adapted for integrated devices, which are covered by subclass H01C;</li> </ul>

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<u>Type*</u>	<u>Location</u>	<u>Old Note</u>	<u>New/Modified Note</u>
		3. In this subclass, it is desirable to add the indexing codes of groups H10K 2101/00 - H10K 2102/00.	<ul style="list-style-type: none"> <li>• organic capacitors having no potential barriers and not specially adapted for integrated devices, which are covered by subclass H01G.</li> </ul> <p>3. In this subclass, the periodic system used is the I to VIII group system indicated in the Periodic Table under Note (3) of section C.</p> <p>4. In this subclass, it is desirable to add the indexing codes of groups {H10K 2101/00-H10K 2102/00}.</p>

**SUBCLASS H10N - ELECTRIC SOLID-STATE DEVICES NOT OTHERWISE PROVIDED FOR**

<u>Type*</u>	<u>Location</u>	<u>Old Note</u>	<u>New/Modified Note</u>
N	H10N		In this subclass, the periodic system used is the I to VIII group system indicated in the Periodic Table under Note (3) of section C.

\*N = new note, M = modified note, D = deleted note

NOTE: The "Location" column only requires the symbol PRIOR to the location of the note. No further directions such as "before" or "after" are required.

## 2. A. DEFINITIONS (modified)

### G09F9/00

#### Definition statement

Replace: The existing Definition statement with the updated one below.

Indicating arrangements, e.g. advertisement displays, for variable information, in which the information is built-up on a support by selection or combination of individual elements. All sorts of electro-mechanical display systems where the image pixels are formed using LEDs, LCDs, optical fibre etc.

#### References

#### Limiting references

Replace: The Limiting references table with the updated one below.

Indicating arrangements for variable information in which the complete information is permanently attached to a movable support which brings it to the display position	G09F11/00
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#### Informative references

Replace: The existing Informative references table with the updated table below.

Microstructural devices comprising flexible or deformable elements, e.g. comprising elastic tongues or membranes	B81B3/00
Liquid crystal materials	C09K19/00
Supporting structure for electronic displays	F16M11/00
Light guides	G02B6/00
Optical fibre	G02B6/02
Displays based on interference in an adjustable optical cavity	G02B26/00
Displays based on the rotation of particles under the influence of an external field, e.g. gyricons or twisting ball displays	G02B26/026, G02B26/02
Displays based on reflecting micromechanical devices, e.g. microelectromechanical system (MEMS) mirrors or deformable mirror devices (DMD)	G02B26/08
Head-up displays	G02B27/01

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Other optical systems or other optical apparatus for producing stereoscopic or other three-dimensional effects	G02B30/00,
Technical details of liquid crystal displays (LCD)	G02F1/13
Displays based on electrochromic elements	G02F1/15
Viewers, other than projection viewers, giving motion-picture effects by persistence of vision with interposed lenticular or line screen	G03B25/02
Displays based on electrophoresis	G02F1/167
Abacus	G06C1/00
Details of computer elements, e.g. with folding flat displays	G06F1/1613
Arrangements for transferring data from a digital processing unit to an output display device	G06F3/14
Video walls	G06F3/1446, H01L25/10, H05K5/0021
Slide rules	G06G1/00
Arrangements or circuits for control of indicating devices using static means to present variable information	G09G
3D [Three Dimensional] image rendering	G06T15/00
Plasma display panels	H01J11/00, H01J11/10
Gas discharge panels	H01J17/49
Cathode ray tubes	H01J31/00
Incandescent panels comprising a number of separate incandescent bodies	H01K9/00
Details related to groups of LEDs	H01L25/00
Semiconductor devices having potential barriers, specially adapted for light emission, e.g. LED	H01L27/15, H01L33/00
Mechanical details of telephones, e.g. display to body attachment, foldable	H04M1/02
Pictorial communication, e.g. television	H04N
Electroluminescent light sources	H05B33/00
Display consisting of a printed circuit board carrying a matrix of single LED	H05K3/30
Organic light emitting devices, e.g. OLED displays or PLED displays	H10K59/00, H10K50/00

## H01C

### Definition statement

Insert: The following two bullet points at the end of the bulleted list.

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- Fixed resistors whose effective value is, or is presumed to be, non-variable.
- Details of, or for, resistors.

## References

### Limiting references

Replace: The existing Limiting references table with the updated one below.

Selection of specified materials as dielectric	H01B 3/00
Passive two-terminal components without a potential-jump or surface barrier for integrated circuits	H01L 28/00
Resistors having potential barriers, e.g. field-effect resistors	H01L 29/00
Photoresistors and similar semiconductor devices in which radiation controls flow of current through the device	H01L 31/08
Apparatus or processes for filling or compressing insulating material in heating element tubes	H05B 3/52
Magnetic-field-controlled resistors and similar devices using galvano-magnetic or similar magnetic effects	H10N 50/00, H10N 52/00
Bulk negative resistance effect devices	H10N 80/00

### Informative references

Replace: The reference text for symbols H05K 1/16 and H10N 70/00 with the updated text below.

Printed circuits incorporating printed electric components, e.g. printed resistor, capacitor or inductor	H05K 1/16
Solid state devices for rectifying, amplifying, oscillating or switching having no potential barrier	H10N 70/00

## Glossary of terms

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Replace: The leading capital letters of both the term and explanation with lowercase letters, so that the table reads as follows.

thermistor	type of resistor whose resistance varies significantly with temperature, typically as sharp or sudden change, when a threshold temperature value is reached.
varistor	also referred as Voltage Dependent Resistor is a resistor that conducts significantly increased current when voltage is excessive.
adjustable	mechanically adjustable

## H01C7/00

### References

#### Limiting references

Replace: The Limiting references table with the updated one below.

Resistors consisting of loose powdered or granular material	H01C8/00
Resistors having potential barriers, e.g. field effect resistors	H01L29/00
Semiconductor devices sensitive to electro-magnetic or corpuscular radiation, e.g. photoresistors	H01L31/00
Magnetic field controlled resistors	H10N50/10
Bulk negative resistance effect devices	H10N80/00

#### Informative references

Replace: The Informative references table with the updated table below.

Measuring deformation in a solid state using the change in resistance formed by printed-circuit technique	G01B7/20
Insulating materials	H01B3/00
Passive thin-film or thick-film semiconductor or solid state devices	H01L27/00
Resistors without a potential-jump or surface barrier specially adapted for integrated circuits	H01L28/20
Ohmic resistance heating	H05B3/00

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Printed circuits	H05K
Devices using superconductivity	H10N60/00
Solid state devices for rectifying, amplifying, oscillating or switching having no potential barriers	H10N70/00

## H01F

### Definition statement

Replace: The following two paragraphs in the Definition statement with the updated ones below.

Apparatus or processes for magnetising or demagnetising (H01F 13/00).

Groups H01F 17/00-H01F 38/00 (with the exception of groups H01F 27/42 and H01F 38/32) cover only structural or constructional aspects of transformers, inductive reactors, chokes or the like. These groups do not cover circuit arrangement of such devices, which are covered by the appropriate functional places.

### References

Delete: The Limiting references section and table.

Insert: The following new Application-oriented references section and table.

### Application-oriented references

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Magnets used to separate solid materials from other solid materials or fluids	B03C 1/00
Magnetic work holders	B23Q 3/00, B25B 11/00
Apparatus or processes for degaussing ships	B63G 9/06

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Lifting magnets	B66C 1/00
Magnets or electromagnets in electric meters	G01R
Devices for demagnetising parts of clocks and watches	G04D 9/00
Magnetic record carriers	G11B 5/00
Apparatus or processes specially adapted for manufacturing magnetic record carriers	G11B 5/84
Thin-film magnetic stores	G11C
Apparatus or processes for threading magnetic cores in digital storage elements	G11C 5/12
Magnets or electromagnets in relays	H01H
Magnets or electromagnets in dynamo-electric machines	H02K
Methods or apparatus specially adapted for manufacturing, assembling, maintaining or repairing dynamo-electric machines, e.g. forming windings prior to mounting into the machine	H02K 15/00
Arrangements for controlling transformers, reactors or choke coils for the purpose of obtaining a desired output	H02P 13/00
Magnetic amplifiers	H03F
Impedance networks	H03H
Demagnetising arrangements for color television	H04N 9/29
Acoustic electromechanical transducers having coils or permanent magnets	H04R

**Informative references**

Replace: The reference text for H01L 29/82 with the updated text below.

Insert: The symbol “H01N 52/00” to the row with H10N 50/00 as shown below.

Semiconductor devices having potential barriers controllable by variation of the magnetic field applied to the devices	H01L 29/82
Devices using galvano-magnetic or similar magnetic effects	H10N 50/00, H10N 52/00

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## Special rules of classification

Insert: The following new bullet point at the beginning of the Special rules of classification bulleted list.

- Groups H01F 17/00-H01F 38/00 (with the exception of groups H01F 27/42 and H01F 38/32) cover only structural or constructional aspects of transformers, inductive reactors, chokes or the like. These groups do not cover circuit arrangement of such devices, which are covered by the appropriate functional places.

## Glossary of terms

Replace: The leading capital letter in the term with the corresponding lowercase letter.

compound	homogenous substance comprising at least two elements, having a non-metallic character and a specific (fixed) composition ratio, including also intermetallic compounds.
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## H01G

### References

#### Limiting references

Replace: The entry for “Capacitors...” with the updated reference text and symbols so the table row entry reads as follows.

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Capacitors having potential barriers	H01L 29/00, H10K 10/00
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## Application-oriented references

Replace: The word “utilizing” for the UK spelling “utilising” as shown below.

Impedance networks utilising capacitors, e.g. filters and circuitry thereof	H03H
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## Informative references

Replace: The word “analyzing” with the UK spelling “analysing” as shown below.

Investigating or analysing material by investigating capacitance	G01N 27/22
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## Glossary of terms

Replace: The leading capital letters of each term with the lowercase equivalent.

collector	a conductive component in intimate contact with an electrode material in an electrolytic or electric double layer capacitor
electrolyte	an ionic conducting liquid or solid either comprised in one of the electrodes, typically the cathode, of an electrolytic capacitor or ensuring electric conduction between electrode active parts or electric double layers therein in Electric Double Layer Capacitors

## Synonyms and Keywords

*In patent documents the following abbreviations are often used:*

MLCC	Multilayer Ceramic Capacitor
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Insert: In the Synonyms and Keywords section, add the following new subsection:

*In patent documents, the following words/expressions are often used as synonyms:*

- condenser
- capacitor
- electrochemical capacitor
- double-layer capacitor
- ultracapacitor
- supercapacitor

## H01L

### Definition statement

Replace: The existing Definition statement with the updated one below.

in general

- discrete and integrated semiconductor devices and
- other electric solid state devices (as far as not provided for in another subclass) and
- details thereof.

This includes the following kind of devices:

- integrated circuit devices, e.g. CMOS integrated devices, DRAM, EPROM or CCD;
- semiconductor devices (e.g. field-effect, bipolar) adapted for rectifying, amplifying, oscillating or switching, e.g. diodes, transistors or thyristors;
- semiconductor devices sensitive to radiation, e.g. photo diodes, photo transistors or solar cells;
- incoherent light emitting diodes, e.g. LED;
- solid state devices using organic materials as the active part or using a combination of organic materials with other materials as the active part, e.g. organic LED or polymer LED;
- electric solid state devices using thermoelectric, superconductive, piezo-electric, electrostrictive, magnetostrictive, galvano-magnetic or bulk negative resistance effects, e.g. thermo couples, Peltier elements, Josephson elements or piezo elements;
- photo-resistors, magnetic field dependent resistors or field effect resistors;
- capacitors having potential barriers or resistors having potential barriers;

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- thin-film or thick-film circuits;
- processes and apparatus adapted for the manufacture or treatment of such devices, except where such processes relate to single step processes for which provision exists elsewhere.

## References

### Limiting references

Replace: The entry for “Resistors...” with the updated table row below.

Non-adjustable resistors from semiconductor material	H01C 7/00
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Replace: The reference text and add the new symbol H01S 5/00 to the table row below:

Lasers, stimulated emission devices, e.g. semiconductor laser	H01S, H01S 5/00
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### Glossary of terms

Replace: The leading capital letters of each term and description with the lowercase equivalent.

assembly of a device	the "assembly" of a device is the building up of the device from its component constructional units and includes the provision of fillings in containers.
complete device	a "complete device" is a device in its fully assembled state which may or may not require further treatment, e.g. electro-forming, before it is ready for use but which does not require the addition of further structural units.
component	a "component" is one electric circuit element of a plurality of elements formed in or on a common substrate.
container	a "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.

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device	the term "device" refers to 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".
electrodes	"electrodes" are regions in or on the body of the device (other than the solid-state body itself), which exert an influence on the solid-state body electrically, 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.
encapsulation	an "encapsulation" is an enclosure which consists of one or more layers formed on the body and in intimate contact therewith.
integrated circuit	an "integrated circuit" is a device where all components, e.g. diodes, resistors, are built up on a common substrate and form the device including interconnections between the components.
integration process	processes for the manufacture of at least two different components where the process is especially adapted to their integration, e.g. to take advantage of the integration or to reduce their manufacturing cost. Example: in a CMOS process, the same ion implant dopes the p-MOS gate and the n-MOS source and drain. Consequently, a process for the manufacture of a component per se is not considered as an integration process, even though that component will be part of an integrated circuit.
interconnection	refers to the arrangement of conductive and insulating regions aimed at electrically connecting the respective electrodes of at least two device units, e.g. two transistors.
parts	the term "parts" includes all structural units which are included in a complete "device".
solid state body	the expression "solid state body" refers to the body of material within which, or at the surface of which, the physical effects

	characteristic of the device occur. In thermoelectric devices it includes all materials in the current path.
wafer	a "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 devices or integrated circuits.

## H01L21/04

### References

Delete: The Limiting references section and table.

Insert: The following new rows to the Informative references table.

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Multistep manufacturing processes for semiconductor bodies of said devices	H01L29/02
Multistep manufacturing processes for electrodes of said devices	H01L29/401
Multistep manufacturing processes for said devices	H01L29/66007

## H01L29/00

### Definition statement

Replace: The existing Definition statement with the updated one below.

- Types of inorganic semiconductor components having potential barriers, adapted for rectifying, amplifying, oscillating or switching; Multistep manufacturing processes therefor.
- Types of components for integrated circuits being capacitors or resistors having potential barriers; Multistep manufacturing processes therefor.
- Details of semiconductor bodies of said components; Details of semiconductor bodies not otherwise provided for; Multistep manufacturing processes therefor.

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- Details of electrodes of said components; Details of electrodes of semiconductor components not otherwise provided for; Multistep manufacturing processes therefor.

Further information:

In this main group:

Said potential barriers may be of the PN junction type, the metal-semiconductor junction type, the metal-insulator-semiconductor type, the high-low junction type, the heterojunction type.

Said details of semiconductor bodies and said multistep manufacturing processes therefor are covered by groups H01L29/02 - H01L29/365.

Said details of electrodes are covered by groups H01L29/40 - H01L29/518 except group H01L29/401, and said multistep manufacturing processes therefor are covered by group H01L29/401.

Said types of inorganic semiconductor components are covered by groups H01L29/66 - H01L29/945 except groups H01L29/66007 and subgroups, H01L29/8605, H01L29/92 - H01L29/945, and said multistep manufacturing processes therefor are covered by group H01L29/66007 and subgroups except H01L29/66022 and H01L29/66166 - H01L29/66189.

Said resistors are covered by group H01L29/8605, and said multistep manufacturing processes therefor are covered by groups H01L29/66022, H01L29/6606 and H01L29/66166.

Said capacitors are covered by groups H01L29/92 - H01L29/945, and said multistep manufacturing processes therefor are covered by groups H01L29/66022, H01L29/6606 and H01L29/66174 - H01L29/66189.

## References

### Limiting references

Replace: The Limiting references table with the updated table below.

Details of semiconductor or other solid state devices other than details of semiconductor bodies or of electrodes thereof	H01L23/00
Devices consisting of a plurality of solid state components formed in or on a common substrate	H01L27/00

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Semiconductor devices sensitive to infra-red radiation, light, electromagnetic radiation of shorter wavelength or corpuscular radiation and adapted either for the conversion of the energy of such radiation into electrical energy or for the control of electrical energy by such radiation; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof; Details thereof	H01L31/00
Semiconductor devices having potential barriers specially adapted for light emission; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof; Details thereof	H01L33/00
Organic devices specially adapted for rectifying, amplifying, oscillating or switching; Organic capacitors or resistors having potential barriers	H10K10/00
Electric solid-state devices not otherwise provided for	H10N
Thermo-electric devices comprising a junction of dissimilar materials, i.e. exhibiting Seebeck or Peltier effect with or without other thermo-electric effects or thermomagnetic effects; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof; Details thereof	H10N10/00
Thermoelectric devices without a junction of dissimilar materials; Thermomagnetic devices, e.g. using Nernst-Ettinghausen effect; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof	H10N15/00
Piezoelectric devices; Electrostrictive devices; Magnetostrictive devices; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof; Details thereof	H10N30/00
Devices using galvano-magnetic or similar magnetic effects; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof	H10N50/00
Devices using superconductivity; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof	H10N60/00
Solid state devices adapted for rectifying, amplifying, oscillating or switching having no potential barriers; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof	H10N70/00
Bulk negative resistance effect devices, e.g. Gunn-effect devices; Processes or apparatus peculiar to the manufacture or treatment thereof or of parts thereof	H10N80/00
Details peculiar to solid state devices not provided for in groups H01L27/00 – H01L33/00, H10B10/00 – H10B53/00, H10B69/00, H10K10/00, H10K30/00, H10K50/00, H10K71/00, H10K77/00, H10K85/00 and H10K99/00 and not provided for in any other subclass	H10N99/00

Delete: The References out of a residual place section and table.

**Informative references**

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Replace: The Informative references table with the updated one below.

Processes or apparatuses adapted for the manufacture or treatment of semiconductor or solid state devices or of parts thereof	H01L21/00
Assemblies consisting of a plurality of individual semiconductor or other solid state devices	H01L25/00
Passive two-terminal components without a potential-jump or surface barrier for integrated circuits; Details thereof; Multistep manufacturing processes therefor	H01L28/00
Single-crystal-growth, e.g. of semiconductor material, in general	C30B
Ion-sensitive or chemical field-effect transistors	G01N27/414
Digital stores characterised by the use of particular electric elements; Storage elements therefore	G11C11/00
Resistors in general	H01C
Capacitors in general	H01G
Ceramic barrier-layer capacitors	H01G4/1272
Semiconductor lasers	H01S5/00
Conversion of electric power	H02M
Generation of oscillations	H03B
Amplifiers with semiconductor devices as amplifying elements	H03F3/00, H03F5/00
Electronic switching or gating	H03K17/00
Logic circuits; Inverting circuits	H03K19/00
Printed circuits	H05K1/00, H05K3/00
Solid state devices using organic materials as the active part, or using a combination of organic materials with other materials as the active part; Processes or apparatus specially adapted for the manufacture or treatment of such devices, or of parts thereof	H10K99/00

## Glossary of terms

Replace: The existing Glossary of terms with the updated table below.

*In this place, the following terms or expressions are used with the meaning indicated:*

alloy	homogeneous material having chemically combined atoms or ions in variable proportions, e.g. $\text{Al}_x\text{Ga}_{(1-x)}\text{As}$
bidirectional	conducting main current in opposite directions
bandgap, band gap	difference between energy levels of electrons bound to their nuclei (valence electrons) and energy levels allowing electrons to migrate freely (conduction electrons)
bipolar device	device using both charge carrier types in operation, i.e. both electrons and holes

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breakdown	sudden change to a very low dynamic electrical resistance, e.g. in a reverse biased pn-junction
channel stopper	means for limiting parasitic surface channel formation, usually a highly doped surface region in a lightly doped substrate of same conductivity type
charge carrier	electron (having a negative charge) or hole (having a positive charge)
circuit	plurality of electric elements interconnected to perform an electrical or electronic function
conductivity	ability of a material to conduct electric current
component	a single active or passive electric circuit element that may be formed in or on a common substrate
compound	homogeneous material having chemically combined atoms or ions in definite proportions, e.g. gallium arsenide (GaAs), silicon carbide (SiC)
device	electric circuit element
diode	two-terminal semiconductor component with non linear current-voltage characteristic
electrode	region other than the semiconductor body itself, which exerts an influence on the solid state body electrically, whether or not an external electrical connection is made thereto. The term covers capacitive or inductive coupling arrangements and an electrode may include several portions, e.g. metallic and dielectric regions of a capacitive coupling arrangement. 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.
electron	negative charge carrier
field plate	electric field shaping field-effect electrode
guard region	electric field shaping semiconductor region, e.g. to increase the breakdown voltage of an adjacent pn-junction
guard ring	electric field shaping ring-shaped semiconductor region
high-low junction	junction of materials with relatively high and low doping concentration
heterojunction	junction of different materials
hole	positive charge carrier, i.e. missing valence electron, valence band vacancy
homojunction	junction of same material
multiple quantum well	quantum structure composed of a plurality of uncorrelated quantum wells
N-type	negative conductivity type, i.e. with electrons as majority charge carriers
ohmic contact	non-rectifying contact
part	any structural unit included in a complete device

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Pn-junction	junction of materials of opposite conductivity types, i.e. n-type and p-type materials
P-type	positive conductivity type, i.e. with holes as majority charge carriers
quantum well	potential well with one-dimensional confinement whereby quantum effects are achieved
quantum wire	potential well with two-dimensional confinement whereby quantum effects are achieved
quantum box	potential well with three-dimensional confinement whereby quantum effects are achieved
schottky contact	rectifying metal-semiconductor contact
semiconductor body	body of semiconductor material within which, or at the surface of which, the physical effects characteristic of the component occur
silicide	silicon-metal compound
structurally associated with	with a built-in
superlattice	quantum structure with a plurality of correlated quantum wells leading to the formation of mini-bands and mini-bandgaps across the whole structure
unipolar device	device using only one of both charge carrier types, i. e. either electrons or holes

## Synonyms and Keywords

Replace: The following TWO subsections of the Synonyms and Keywords section.

*In patent documents, the following words/expressions are often used as synonyms:*

- atomic layer doping, atomic plane doping, delta doping, planar doping
- chip, die
- depletion region, space charge region
- electrode, contact
- Group IV, group 14: C, Si, Ge, Sn, Pb
- II-VI, group 12/16, e.g. CdTe
- III-V, AIIIBV, AIII-BV, group 13/15, e.g. GaAs
- intrinsic, undoped, not intentionally doped
- impurity, dopant, doping material
- polysilicon, poly-Si, polycrystalline silicon
- charge compensation, coolMOS, multi-RESURF, superjunction
- channel stopper, channel stop, chanstop

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*In patent documents, the following words/expressions are often used with the meaning indicated:*

Breakover	start of regenerative current flow in a thyristor
Chip	piece of semiconductor material, e.g. single crystal semiconductor substrate, having one or more active or passive electric circuit elements
(charge or carrier) confinement	restriction of charge carriers to locations of reduced dimensions, e.g. quantum wells, field-effect induced potential wells
Crystal defect	non-uniformity in crystal lattice
De Broglie wavelength	wavelength of a particle
Depletion region	region from which free charge carriers are expelled
Direct bandgap material	semiconductor material wherein transition from the conduction to the valence band does not require a change in crystal momentum for an electron, e.g. gallium arsenide (GaAs)
Doping concentration	number of dopant atoms per a given volume of semiconductor material, e.g. per cubic centimetre
Doping density	number of dopant atoms per a given surface of semiconductor material, e.g. per square centimetre
Doping profile	point-to-point doping concentration throughout a semiconductor body or region thereof
Epitaxial layer	added layer of semiconductor crystal taking on the same crystalline orientation as a semiconductor crystal substrate
Field oxide	oxide layer overlying a major surface of a device semiconductor body
Floating gate	electrically floating gate electrode, e.g. having no direct electrical connection, usually used for charge storage
Forward bias	voltage applied in a current conducting direction
Indirect bandgap material	semiconductor material wherein transition from the conduction to the valence band requires a change in crystal momentum for an electron, e.g. silicon (Si)
Inversion layer	surface region in a semiconductor material wherein the minority carrier concentration is larger than the majority carrier concentration, e.g. induced by field-effect
Latch-up	regenerative feedback loop thyristor-type conducting state, being parasitic in e.g. non thyristor-type components due to loss of gating capability
Lifetime killer	deep level impurity creating a potential trap for charge carriers in the forbidden band remote from the conduction and valence bands thereby reducing charge carrier lifetime
Majority carrier	more abundant charge carrier
Minority carrier	less abundant charge carrier

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Polycide	polysilicon-silicide stack
Recombination center, deep level center	potential trap for charge carriers in the forbidden band remote from the conduction and valence bands
Reverse bias	voltage applied in a current blocking direction
Shockley diode	two-terminal thyristor
Silicon controlled rectifier (SCR)	three-terminal thyristor
Salicide process	self-aligned silicide process
Wide band gap semiconductor material	semiconductor material with a band gap larger than 1.7 eV, e.g. SiC, GaN, diamond

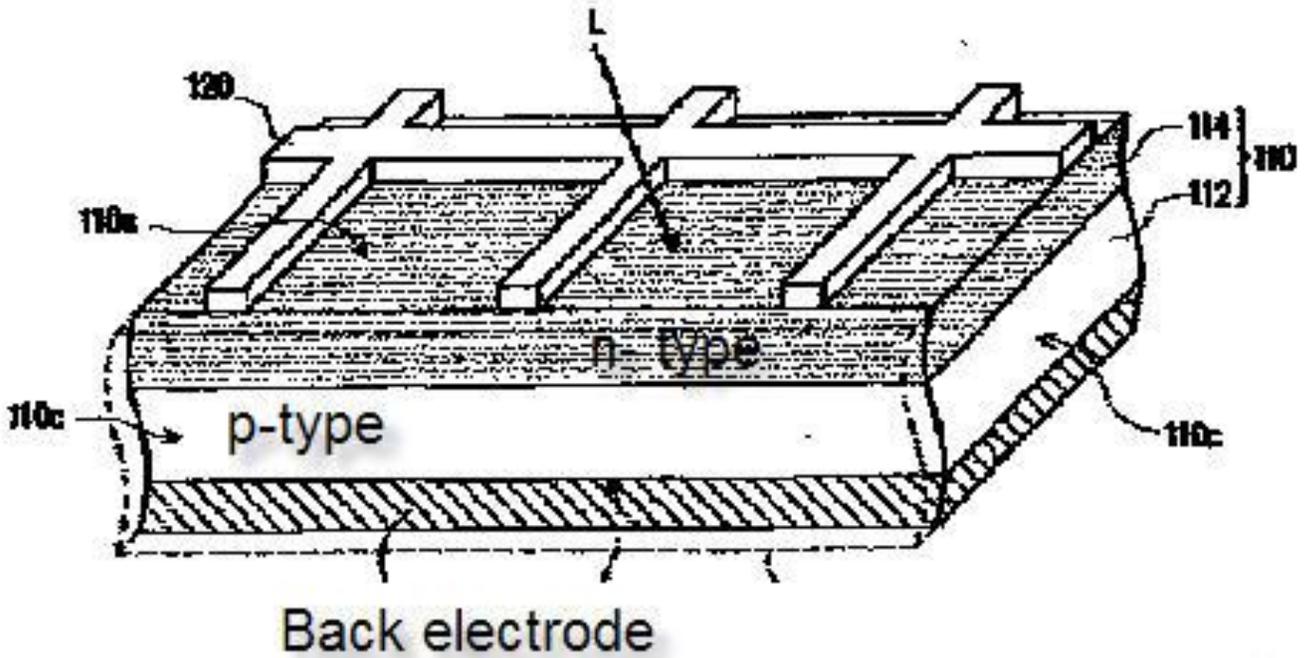
## H01L31/068

### Definition statement

Replace: The Definition statement text with the updated text below. Do not update image.

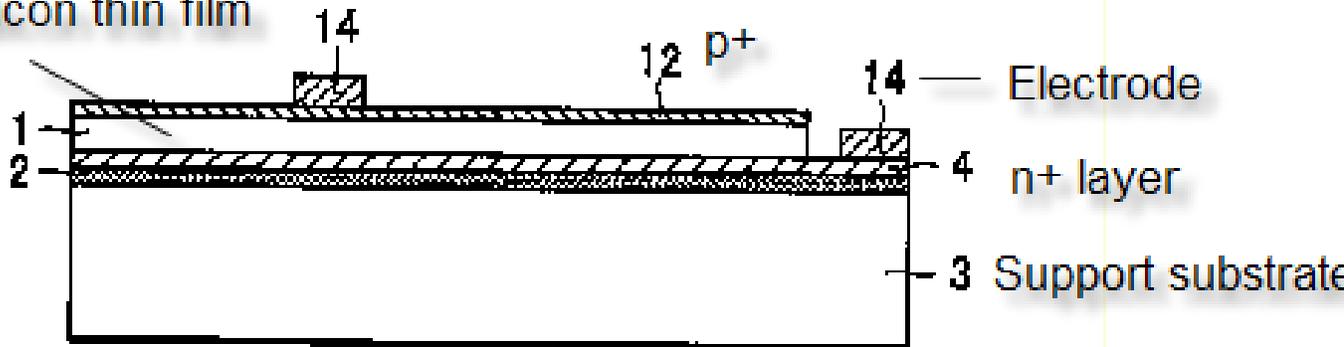
Photovoltaic devices where the potential barrier is a p-n junction involving one single material (same composition and same crystal structure) with different dopants (so called "homojunction"). This group covers mostly silicon homojunction p-n solar cells.

Example of bulk silicon solar cell:



Example of thin film solar cell:

Silicon thin film



## References

Delete: The Limiting references section and table.

Replace: The reference text associated with H01L 31/072 with the updated text below.

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## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Devices having potential barriers being only of the PN heterojunction type, e.g. a-Si / c-Si solar cell	H01L 31/072
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## Special rules of classification

Insert: The following paragraph at the end of the Special rules of classification section.

Amorphous silicon is not considered to be the same material as crystalline silicon, because a-Si and c-Si have a different crystal structure, and a different band gap. An a-Si / c-Si structure is, therefore, considered a heterojunction, which are covered by H01L 31/072.

## H01L31/12

### References

Delete: The Limiting references section and table.

Replace: The Informative references table with the updated table below.

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Assemblies of opto-electronic devices (not integrated on the same substrate, only juxtaposed, and not electrically nor optically coupled)	H01L 25/167
Semiconductor devices having potential barriers, specially adapted for light emission	H01L 33/00
Coupling light guides with opto-electronic elements	G02B 6/42
Amplifiers using electroluminescent element or photocell	H03F 17/00
Electronic switching using opto-electronic devices	H03K 17/968

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Optical interconnects	H04B 10/801
Electroluminescent light sources per se	H05B 33/00
Combination of organic light sensitive components with organic light emitting components, e.g. optocoupler	H10K 65/00

## H05B

### Definition statement

Replace: The word “utilizing” with the UK version “utilising” so the first bullet point reads as follows.

Electric heating

- Heat sources utilising ohmic resistance, electric, magnetic or electromagnetic fields, electric discharge, or combinations thereof;

### References out of a residual place

Replace: The reference text for H01L 27/15, H01L 33/00, so the entry reads as follows.

Electric light sources

Semiconductor devices having potential barriers, specially adapted for light emission, e.g. LEDs	H01L 27/15, H01L 33/00
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