

**CPC****COOPERATIVE PATENT CLASSIFICATION****H03H**

**IMPEDANCE NETWORKS, e.g. RESONANT CIRCUITS; RESONATORS**( measuring, testing [G01R](#); arrangements for producing a reverberation or echo sound [G10K 15/08](#) ; impedance networks or resonators consisting of distributed impedances, e.g. of the waveguide type, [H01P](#); control of amplification, e.g. bandwidth control of amplifiers, [H03G](#); tuning resonant circuits, e.g. tuning coupled resonant circuits, [H03J](#); networks for modifying the frequency characteristics of communication systems [H04B](#) )

**NOTE**

This subclass covers :

networks comprising lumped impedance elements;

networks comprising distributed impedance elements together with lumped impedance elements;

networks comprising electromechanical or electro-acoustic elements;

networks simulating reactances and comprising discharge tubes or semiconductor devices;

constructions of electromechanical resonators.

In this subclass, the following expression is used with the meaning indicated:  
"passive elements" means resistors, capacitors, inductors, mutual inductors or diodes.

Attention is drawn to the Notes following the titles of class [B81](#) and subclass [B81B](#) relating to "micro-structural devices" and "micro-structural systems".

In this subclass, main groups with a higher number take precedence.

**H03H 1/00**

**Constructional details of impedance networks whose electrical mode of operation is not specified or applicable to more than one type of network**( [constructional details of electromechanical transducers H03H 9/00](#) )

**H03H 1/0007**

. {of radio frequency interference filters}

**H03H 2001/0014**

. {Capacitor filters, i.e. capacitors whose parasitic inductance is of relevance to consider it as filter}

**H03H 2001/0021**

. {Constructional details}

**H03H 2001/0028**

.. {RFI filters with housing divided in two bodies}

**H03H 2001/0035**

.. {Wound magnetic core}

**H03H 2001/0042**

.. {Wound, ring or feed-through type capacitor}

**H03H 2001/005**

.. {Wound, ring or feed-through type inductor}

**H03H 2001/0057**

.. {comprising magnetic material}

**H03H 2001/0064**

.. {comprising semiconductor material}

**H03H 2001/0071**

.. {comprising zig-zag inductor}

- H03H 2001/0078 . . {comprising spiral inductor on a substrate}
- H03H 2001/0085 . . {Multilayer, e.g. LTCC, HTCC, green sheets(inside PCB filters [H05K](#))}
- H03H 2001/0092 . {Inductor filters, i.e. inductors whose parasitic capacitance is of relevance to consider it as filter}
- H03H 1/02 . of RC networks, e.g. integrated networks
- H03H 2/00** **Networks using elements or techniques not provided for in groups [H03H 3/00](#) to [H03H 21/00](#)**
- H03H 2/001 . {comprising magnetostatic wave network elements}
- H03H 2/003 . {comprising optical fibre network elements( optical elements per se [G02B](#) , [G02F](#) ; transmission systems using light waves [H04B 10/00](#) )}
- H03H 2/005 . {Coupling circuits between transmission lines or antennas and transmitters, receivers or amplifiers}
- H03H 2/006 . . {Transmitter or amplifier output circuits}
- H03H 2/008 . . {Receiver or amplifier input circuits}
- H03H 3/00** **Apparatus or processes specially adapted for the manufacture of impedance networks, resonating circuits, resonators**
- H03H 3/007 . for the manufacture of electromechanical resonators or networks
- H03H 2003/0071 . . {of bulk acoustic wave and surface acoustic wave elements in the same process}
- H03H 3/0072 . . {of micro-electro-mechanical resonators or networks( micro-membranes or micro-beams [B81B 2203/01](#) ; manufacture of micro-structural devices in general [B81C](#) )}
- H03H 3/0073 . . . {Integration with other electronic structures}
- H03H 3/0075 . . . {Arrangements or methods specially adapted for testing micro-electro-mechanical resonators or networks}
- H03H 3/0076 . . . {for obtaining desired frequency or temperature coefficients}
- H03H 3/0077 . . . . {by tuning of resonance frequency}
- H03H 3/0078 . . . . . {involving adjustment of the transducing gap}
- H03H 3/013 . . for obtaining desired frequency or temperature coefficient({ [H03H 3/0076](#) } [H03H 3/04](#) , [H03H 3/10](#) take precedence )
- H03H 3/02 . . for the manufacture of piezo-electric or electrostrictive resonators or networks( [H03H 3/08](#) takes precedence )
- H03H 2003/021 . . . {the resonators or networks being of the air-gap type}
- H03H 2003/022 . . . {the resonators or networks being of the cantilever type}
- H03H 2003/023 . . . {the resonators or networks being of the membrane type}
- H03H 2003/025 . . . {the resonators or networks comprising an acoustic mirror}
- H03H 2003/026 . . . {the resonators or networks being of the tuning fork type}
- H03H 2003/027 . . . {the resonators or networks being of the micro-electro-mechanical [MEMS] type}
- H03H 2003/028 . . . {for obtaining desired values of other parameters}
- H03H 3/04 . . . for obtaining desired frequency or temperature coefficient
- H03H 2003/0407 . . . . {Temperature coefficient}
- H03H 2003/0414 . . . . {Resonance frequency}
- H03H 2003/0421 . . . . . {Modification of the thickness of an element}

H03H 2003/0428	.....	{of an electrode}
H03H 2003/0435	.....	{of a piezoelectric layer}
H03H 2003/0442	.....	{of a non-piezoelectric layer}
H03H 2003/045	.....	{Modification of the area of an element}
H03H 2003/0457	.....	{of an electrode}
H03H 2003/0464	.....	{operating on an additional circuit element, e.g. a passive circuit element connected to the resonator}
H03H 2003/0471	.....	{of a plurality of resonators at different frequencies}
H03H 2003/0478	.....	{in a process for mass production}
H03H 2003/0485	.....	{during the manufacture of a cantilever}
H03H 2003/0492	.....	{during the manufacture of a tuning-fork}
H03H 3/06	..	for the manufacture of magnetostrictive resonators or networks
H03H 3/08	..	for the manufacture of resonators or networks using surface acoustic waves
H03H 3/10	...	for obtaining desired frequency or temperature coefficient

### **H03H 5/00**      **One-port networks comprising only passive electrical elements as network components**

H03H 5/003	.	{comprising distributed impedance elements together with lumped impedance elements}
H03H 5/006	.	{comprising simultaneously tunable inductance and capacitance}
H03H 5/02	.	without voltage- or current-dependent elements
H03H 5/10	..	comprising at least one element with prescribed temperature coefficient
H03H 5/12	.	with at least one voltage- or current-dependent element

### **H03H 7/00**      **Multiple-port networks comprising only passive electrical elements as network components** ( receiver input circuits [H04B 1/18](#) ; networks simulating a length of communication cable [H04B 3/40](#) )

H03H 7/002	.	{Gyrators}
H03H 7/004	.	{Capacitive coupling circuits not otherwise provided for}
H03H 2007/006	.	{MEMS}
H03H 2007/008	..	{the MEMS being trimmable}
H03H 7/01	.	Frequency selective two-port networks
H03H 7/0107	..	{Non-linear filters}
H03H 7/0115	..	{comprising only inductors and capacitors( <a href="#">H03H 7/075</a> , <a href="#">H03H 7/09</a> , <a href="#">H03H 7/12</a> , <a href="#">H03H 7/13</a> take precedence )}
H03H 7/0123	..	{comprising distributed impedance elements together with lumped impedance elements}
H03H 2007/013	..	{Notch or bandstop filters}
H03H 7/0138	..	{Electrical filters or coupling circuits}
H03H 7/0146	...	{Coupling circuits between two tubes, not otherwise provided for}
H03H 7/0153	..	{Electrical filters; Controlling thereof}
H03H 7/0161	...	{Bandpass filters( <a href="#">H03H 7/12</a> takes precedence )}
H03H 7/0169	....	{Intermediate frequency filters}

H03H 7/0176	.....	{witout magnetic core}
H03H 7/0184	.....	{with ferromagnetic core}
H03H 2007/0192	..	{Complex filters}
H03H 7/03	..	comprising means for compensation of loss
H03H 7/06	..	including resistors( <a href="#">H03H 7/075</a> , <a href="#">H03H 7/09</a> , <a href="#">H03H 7/12</a> , <a href="#">H03H 7/13</a> take precedence )
H03H 7/065	...	Parallel T-filters
H03H 7/07	...	Bridged T-filters
H03H 7/075	..	Ladder networks, e.g. electric wave filters
H03H 7/09	..	Filters comprising mutual inductance
H03H 7/12	..	Bandpass or bandstop filters with adjustable bandwidth and fixed centre frequency( <a href="#">H03H 7/09</a> takes precedence; automatic control of bandwidth in amplifiers <a href="#">H03G 5/16</a> )
H03H 7/13	..	using electro-optic elements
H03H 7/17	..	{Structural details of sub-circuits of frequency selective networks}

**WARNING**

not complete, pending reorganisation, see provisionally also [H03H 7/0107](#),  
[H03H 7/0123](#) to [H03H 7/07](#) , [H03H 7/09](#) to [H03H 7/13](#) and [H03H 7/42](#)

H03H 7/1708	...	{Comprising bridging elements, i.e. elements in a series path without own reference to ground and spanning branching nodes of another series path( <a href="#">H03H 7/07</a> takes precedence )}
H03H 7/1716	...	{Comprising foot-point elements}
H03H 7/1725	....	{Element to ground being common to different shunt paths, i.e. Y-structure}
H03H 7/1733	....	{Element between different shunt or branch paths( <a href="#">H03H 7/425</a> takes precedence )}
H03H 7/1741	...	{Comprising typical LC combinations, irrespective of presence and location of additional resistors( when resistors are present, also classify in <a href="#">H03H 7/06</a> to <a href="#">H03H 7/07</a> )}
H03H 7/175	....	{Series LC in series path( <a href="#">H03H 7/1783</a> takes precedence )}
H03H 7/1758	....	{Series LC in shunt or branch path( <a href="#">H03H 7/1791</a> takes precedence )}
H03H 7/1766	....	{Parallel LC in series path( <a href="#">H03H 7/1783</a> takes precedence )}
H03H 7/1775	....	{Parallel LC in shunt or branch path( <a href="#">H03H 7/1791</a> takes precedence )}
H03H 7/1783	....	{Combined LC in series path}
H03H 7/1791	....	{Combined LC in shunt or branch path}
H03H 7/18	.	Networks for phase shifting
H03H 7/185	..	{comprising distributed impedance elements together with lumped impedance elements}
H03H 7/19	..	Two-port phase shifters providing a predetermined phase shift, e.g. "all-pass" filters
H03H 7/20	..	Two-port phase shifters providing an adjustable phase shift
H03H 7/21	..	providing two or more phase shifted output signals, e.g. n-phase output
H03H 7/24	.	Frequency- independent attenuators

- H03H 7/25 . . . comprising an element controlled by an electric or magnetic variable( [H03H 7/27](#) takes precedence )
- H03H 7/251 . . . {the element being a thermistor}
- H03H 7/253 . . . {the element being a diode}
- H03H 7/255 . . . . {the element being a PIN diode}
- H03H 7/256 . . . . {the element being a VARACTOR diode}
- H03H 7/258 . . . {using a galvano-magnetic device}
- H03H 7/27 . . . comprising a photo-electric element
- H03H 7/30 . . Time-delay networks{( [analogue shift registers G11C 27/04](#) )}
- H03H 7/32 . . . with lumped inductance and capacitance
- H03H 7/325 . . . {Adjustable networks}
- H03H 7/34 . . . with lumped and distributed reactance
- H03H 7/345 . . . {Adjustable networks}
- H03H 7/38 . . . Impedance-matching networks
- H03H 7/383 . . . {comprising distributed impedance elements together with lumped impedance elements}
- H03H 2007/386 . . . {Multiple band impedance matching}
- H03H 7/40 . . . Automatic matching of load impedance to source impedance
- H03H 7/42 . . . Balance/unbalance networks
- H03H 7/422 . . . {comprising distributed impedance elements together with lumped impedance elements}
- H03H 7/425 . . . {Balance-balance networks}

**WARNING**

not complete, pending reorganisation, see provisionally also [H03H 1/00](#) to [H03H 1/0007](#), [H03H 7/0107](#), [H03H 7/0123](#) to [H03H 7/07](#) , [H03H 7/09](#) to [H03H 7/13](#) , [H03H 7/42](#) and [H03H 7/422](#)

- H03H 7/427 . . . {Common-mode filters( [H02J 3/01](#) and [H02M 1/126](#) takes precedence )}

**WARNING**

not complete, pending reorganisation, see provisionally also [H03H 1/00](#) to [H03H 1/0007](#), [H03H 7/0107](#), [H03H 7/0123](#) to [H03H 7/07](#) , [H03H 7/09](#) to [H03H 7/13](#) and [H03H 7/42](#)

- H03H 7/46 . . . Networks for connecting several sources or loads, working on different frequencies or frequency bands, to a common load or source( for use in multiplex transmission systems [H04J 1/00](#) )
- H03H 7/461 . . . {particularly adapted for use in common antenna systems}
- H03H 7/463 . . . {Duplexers}
- H03H 7/465 . . . {having variable circuit topology, e.g. including switches}
- H03H 7/466 . . . {particularly adapted as input circuit for receivers}
- H03H 7/468 . . . {particularly adapted as coupling circuit between transmitters and antennas}

- H03H 7/48 . Networks for connecting several sources or loads, working on the same frequency or frequency band, to a common load or source( [phase shifters providing two or more output signals H03H 7/21](#) )
- H03H 7/482 .. {particularly adapted for use in common antenna systems}
- H03H 7/485 .. {particularly adapted as input circuit for receivers}
- H03H 7/487 .. {particularly adapted as coupling circuit between transmitters and antennas}
- H03H 7/52 . One-way transmission networks, i.e. unilines
- H03H 7/54 . Modifications of networks to reduce influence of variations of temperature

**H03H 9/00****Networks comprising electromechanical or electro-acoustic devices;**

**Electromechanical resonators**( [making single crystals C30B](#); selection of materials thereof [H01L](#); piezo-electric, electrostrictive or magnetostrictive devices per se [H01L 41/00](#) ; electromechanical transducers [H04R](#) )

- H03H 9/0004 . {Impedance-matching networks( [H03H 9/145](#) takes precedence )}
- H03H 9/0009 .. {using surface acoustic wave devices}
- H03H 9/0014 .. {using bulk acoustic wave devices}
- H03H 2009/0019 . {Surface acoustic wave multichip}
- H03H 9/0023 . {Balance-unbalance or balance-balance networks}
- H03H 9/0028 .. {using surface acoustic wave devices}
- H03H 9/0033 ... {having one acoustic track only}
- H03H 9/0038 .... {the balanced terminals being on the same side of the track}
- H03H 9/0042 .... {the balanced terminals being on opposite sides of the track}
- H03H 9/0047 ... {having two acoustic tracks( [H03H 9/008](#) , [H03H 9/0085](#) take precedence )}
- H03H 9/0052 .... {being electrically cascaded}
- H03H 9/0057 ..... {the balanced terminals being on the same side of the tracks}
- H03H 9/0061 ..... {the balanced terminals being on opposite sides of the tracks}
- H03H 9/0066 .... {being electrically parallel}
- H03H 9/0071 ..... {the balanced terminals being on the same side of the tracks}
- H03H 9/0076 ..... {the balanced terminals being on opposite sides of the tracks}
- H03H 9/008 ... {having three acoustic tracks( [H03H 9/0085](#) takes precedence )}
- H03H 9/0085 ... {having four acoustic tracks}
- H03H 9/009 .... {Lattice filters}
- H03H 9/0095 .. {using bulk acoustic wave devices}
- H03H 9/02 . Details
- H03H 9/02007 .. {of bulk acoustic wave devices}
- H03H 9/02015 ... {Characteristics of piezoelectric layers, e.g. cutting angles}
- H03H 9/02023 .... {consisting of quartz}
- H03H 9/02031 .... {consisting of ceramic}
- H03H 9/02039 .... {consisting of a material from the crystal group 32, e.g. langasite, langatate, langanite}
- H03H 9/02047 ... {Treatment of substrates}
- H03H 9/02055 .... {of the surface including the back surface}

H03H 9/02062	...	{Details relating to the vibration mode}
H03H 9/0207	....	{the vibration mode being harmonic}
H03H 9/02078	....	{the vibration mode being overmoded}
H03H 9/02086	...	{Means for compensation or elimination of undesirable effects}
H03H 9/02094	....	{of adherence}
H03H 9/02102	....	{of temperature influence( cutting angles <a href="#">H03H 9/02015</a> )}
H03H 9/0211	....	{of reflections}
H03H 9/02118	....	{of lateral leakage between adjacent resonators}
H03H 9/02125	....	{of parasitic elements}
H03H 9/02133	....	{of stress}
H03H 9/02141	....	{of electric discharge due to pyroelectricity}
H03H 9/02149	....	{of ageing changes of characteristics, e.g. electro-acousto-migration}
H03H 9/02157	...	{Dimensional parameters, e.g. ratio between two dimension parameters, length, width or thickness}
H03H 2009/02165	..	{Tuning}
H03H 2009/02173	...	{of film bulk acoustic resonators [FBAR]}
H03H 2009/02181	....	{by application of heat from a heat source}
H03H 2009/02188	....	{Electrically tuning}
H03H 2009/02196	.....	{operating on the FBAR element, e.g. by direct application of a tuning DC voltage}
H03H 2009/02204	.....	{operating on an additional circuit element, e.g. applying a tuning DC voltage to a passive circuit element connected to the resonator}
H03H 2009/02212	....	{Magnetically tuning}
H03H 9/0222	..	{of interface-acoustic, boundary, pseudo-acoustic or Stonely wave devices}
H03H 9/02228	..	{Guided bulk acoustic wave devices or Lamb wave devices having interdigital transducers situated in parallel planes on either side of a piezoelectric layer}
H03H 9/02236	..	{of surface skimming bulk wave devices}
H03H 9/02244	..	{of micro-electro-mechanical resonators}
H03H 2009/02251	...	{Design}
H03H 9/02259	...	{Driving or detection means}
H03H 2009/02267	....	{having dimensions of atomic scale, e.g. involving electron transfer across vibration gap}
H03H 9/02275	....	{Comb electrodes}
H03H 2009/02283	...	{Vibrating means}
H03H 2009/02291	....	{Beams}
H03H 2009/02299	.....	{Comb-like, i.e. the beam comprising a plurality of fingers or protrusions along its length}
H03H 2009/02307	.....	{Dog-bone-like structure, i.e. the elongated part of the "bone" is doubly clamped}
H03H 2009/02314	.....	{forming part of a transistor structure}
H03H 2009/02322	.....	{Material}
H03H 2009/0233	....	{comprising perforations}



H03H 9/02338	...	{Suspension means}
H03H 2009/02346	....	{Anchors for ring resonators}
H03H 2009/02354	.....	{applied along the periphery, e.g. at nodal points of the ring}
H03H 9/02362	....	{Folded-flexure}
H03H 2009/0237	.....	{applied at the center}
H03H 9/02377	.....	{Symmetric folded-flexure}
H03H 2009/02385	....	{Anchors for square resonators, i.e. resonators comprising a square vibrating membrane}
H03H 9/02393	...	{Post-fabrication trimming of parameters, e.g. resonance frequency, Q factor}
H03H 9/02401	....	{by annealing}
H03H 9/02409	....	{by application of a DC-bias voltage( <a href="#">H03H 9/02417</a> takes precedence )}
H03H 9/02417	....	{involving adjustment of the transducing gap}
H03H 9/02425	.....	{by electrostatically pulling the beam}
H03H 9/02433	...	{Means for compensation or elimination of undesired effects}
H03H 2009/0244	....	{Anchor loss}
H03H 9/02448	....	{of temperature influence}
H03H 2009/02456	....	{Parasitic elements or effects, e.g. parasitic capacitive coupling between input and output}
H03H 2009/02464	....	{Pull-in}
H03H 2009/02472	....	{Stiction}
H03H 2009/0248	....	{Strain}
H03H 2009/02488	...	{Vibration modes}
H03H 2009/02496	....	{Horizontal, i.e. parallel to the substrate plane}
H03H 2009/02503	.....	{Breath-like, e.g. Lam? mode, wine-glass mode}
H03H 2009/02511	....	{Vertical, i.e. perpendicular to the substrate plane}
H03H 2009/02519	....	{Torsional}
H03H 2009/02527	....	{Combined}
H03H 9/02535	..	{of surface acoustic wave devices}
H03H 9/02543	...	{Characteristics of substrate, e.g. cutting angles}
H03H 9/02551	....	{of quartz substrates}
H03H 9/02559	....	{of lithium niobate or lithium-tantalate substrates}
H03H 9/02566	....	{of semiconductor substrates}
H03H 9/02574	....	{of combined substrates, multilayered substrates, piezo-electrical layers on not-piezo- electrical substrate}
H03H 9/02582	....	{of diamond substrates}
H03H 9/0259	....	{of langasite substrates}
H03H 9/02598	....	{of langatate substrates}
H03H 9/02606	....	{of langanite substrates}
H03H 9/02614	...	{Treatment of substrates, e.g. curved, spherical, cylindrical substrates ensuring closed round-about circuits for the acoustical waves}
H03H 9/02622	....	{of the surface, including back surface}



H03H 9/02629	....	{of the edges}
H03H 9/02637	...	{Details concerning reflective or coupling arrays}
H03H 9/02645	....	{Waffle-iron or dot arrays}
H03H 9/02653	....	{Grooves or arrays buried in the substrate}
H03H 9/02661	.....	{being located inside the interdigital transducers}
H03H 9/02669	....	{Edge reflection structures, i.e. resonating structures without metallic reflectors, e.g. Bleustein-Gulyaev-Shimizu (BGS), shear horizontal (SH), shear transverse (ST), Love waves devices}
H03H 9/02677	.....	{having specially shaped edges, e.g. stepped, U-shaped edges}
H03H 9/02685	....	{Grating lines having particular arrangements}
H03H 9/02692	.....	{Arched grating lines}
H03H 9/027	.....	{U-shaped grating lines}
H03H 9/02708	.....	{Shifted grating lines}
H03H 9/02716	.....	{Tilted, fan shaped or slanted grating lines}
H03H 9/02724	.....	{Comb like grating lines}
H03H 9/02732	.....	{Bilateral comb like grating lines}
H03H 9/0274	.....	{Intra-transducers grating lines}
H03H 9/02748	.....	{Dog-legged reflectors}
H03H 9/02755	.....	{Meandering floating or grounded grating lines}
H03H 9/02763	.....	{Left and right side electrically coupled reflectors}
H03H 9/02771	.....	{Reflector banks}
H03H 9/02779	....	{Continuous surface reflective arrays}
H03H 9/02787	.....	{having wave guide like arrangements}
H03H 9/02795	....	{Multi-strip couplers as track changers}
H03H 9/02803	....	{Weighted reflective structures}
H03H 9/02811	.....	{Chirped reflective or coupling arrays}
H03H 9/02818	...	{Means for compensation or elimination of undesirable effects}
H03H 9/02826	....	{of adherence}
H03H 9/02834	....	{of temperature influence( cut angles <a href="#">H03H 9/02543</a> )}
H03H 9/02842	....	{of reflections( <a href="#">H03H 9/6406</a> takes precedence )}
H03H 9/0285	.....	{of triple transit echo}
H03H 9/02858	....	{of wave front distortion}
H03H 9/02866	....	{of bulk wave excitation and reflections}
H03H 9/02874	....	{of direct coupling between input and output transducers}
H03H 9/02881	....	{of diffraction of wave beam}
H03H 9/02889	....	{of influence of mass loading}
H03H 9/02897	....	{of strain or mechanical damage, e.g. strain due to bending influence}
H03H 9/02905	....	{Measures for separating propagation paths on substrate}
H03H 9/02913	....	{Measures for shielding against electromagnetic fields( shielding of electrical components in general <a href="#">H05K 9/00</a> )}
H03H 9/02921	....	{Measures for preventing electric discharge due to pyroelectricity}

H03H 9/02929	....	{of ageing changes of characteristics, e.g. electro-acousto-migration}
H03H 9/02937	....	{of chemical damage, e.g. corrosion}
H03H 9/02944	....	{of ohmic loss}
H03H 9/02952	....	{of parasitic capacitance}
H03H 9/0296	...	{Surface acoustic wave [SAW] devices having both acoustic and non-acoustic properties}
H03H 9/02968	....	{with optical devices( <a href="#">mounting in enclosures H03H 9/12</a> )}
H03H 9/02976	....	{with semiconductor devices}
H03H 9/02984	...	{Protection measures against damaging}
H03H 9/02992	...	{Details of bus bars, contact pads or other electrical connections for finger electrodes}
H03H 9/05	..	Holders; Supports
H03H 9/0504	...	{for bulk acoustic wave devices}
H03H 9/0509	....	{consisting of adhesive elements}
H03H 9/0514	....	{consisting of mounting pads or bumps}
H03H 9/0519	.....	{for cantilever( <a href="#">H03H 9/1021</a> takes precedence )}
H03H 9/0523	.....	{for flip-chip mounting}
H03H 9/0528	....	{consisting of clips}
H03H 9/0533	....	{consisting of wire}
H03H 9/0538	...	{Constructional combinations of supports or holders with electromechanical or other electronic elements}
H03H 9/0542	....	{consisting of a lateral arrangement( <a href="#">H03H 9/0566</a> takes precedence )}
H03H 9/0547	....	{consisting of a vertical arrangement( <a href="#">H03H 9/0566</a> takes precedence )}
H03H 9/0552	.....	{the device and the other elements being mounted on opposite sides of a common substrate}
H03H 9/0557	.....	{the other elements being buried in the substrate}
H03H 9/0561	.....	{consisting of a multilayered structure}
H03H 9/0566	....	{for duplexers}
H03H 9/0571	.....	{including bulk acoustic wave [BAW] devices}
H03H 9/0576	.....	{including surface acoustic wave [SAW] devices}
H03H 9/058	...	{for surface acoustic wave devices}
H03H 9/0585	....	{consisting of an adhesive layer}
H03H 9/059	....	{consisting of mounting pads or bumps}
H03H 9/0595	...	{the holder support and resonator being formed in one body}
H03H 9/08	...	Holders with means for regulating temperature
H03H 9/09	...	Elastic or damping supports
H03H 9/10	...	Mounting in enclosures{( <a href="#">constructional combinations of enclosure with electromechanical and other electronic elements H03H 9/0538</a> )}
H03H 9/1007	....	{for bulk acoustic wave [BAW] devices}
H03H 9/1014	.....	{the enclosure being defined by a frame built on a substrate and a cap, the frame having no mechanical contact with the BAW device}
H03H 9/1021	.....	{the BAW device being of the cantilever type}

H03H 9/1028	.....	{the BAW device being held between spring terminals}
H03H 9/1035	.....	{the enclosure being defined by two sealing substrates sandwiching the piezoelectric layer of the BAW device}
H03H 9/1042	.....	{the enclosure being defined by a housing formed by a cavity in a resin}
H03H 9/105	.....	{the enclosure being defined by a cover cap mounted on an element forming part of the BAW device}
H03H 9/1057	....	{for micro-electro-mechanical devices}
H03H 9/1064	....	{for surface acoustic wave [SAW] devices}
H03H 9/1071	.....	{the enclosure being defined by a frame built on a substrate and a cap, the frame having no mechanical contact with the SAW device}
H03H 9/1078	.....	{the enclosure being defined by a foil covering the non-active sides of the SAW device}
H03H 9/1085	.....	{the enclosure being defined by a non-uniform sealing mass covering the non-active sides of the BAW device}
H03H 9/1092	.....	{the enclosure being defined by a cover cap mounted on an element forming part of the surface acoustic wave [SAW] device on the side of the IDTs}
H03H 9/12	....	for networks with interaction of optical and acoustic waves
H03H 9/125	..	Driving means, e.g. electrodes, coils
H03H 9/13	...	for networks consisting of piezo-electric or electrostrictive materials( <a href="#">H03H 9/145</a> takes precedence )
H03H 9/131	....	{consisting of a multilayered structure}
H03H 9/132	....	{characterized by a particular shape}
H03H 9/133	....	{for electromechanical delay lines or filters}
H03H 9/135	...	for networks consisting of magnetostrictive materials( <a href="#">H03H 9/145</a> takes precedence )
H03H 9/145	...	for networks using surface acoustic waves
H03H 9/14502	....	{Surface acoustic wave [SAW] transducers for a particular purpose}
H03H 9/14505	.....	{Unidirectional SAW transducers}
H03H 9/14508	.....	{Polyphase SAW} transducers}
H03H 9/14511	.....	{SAW transducers for non-piezoelectric substrates}
H03H 9/14514	.....	{Broad band transducers}
H03H 9/14517	....	{Means for weighting}
H03H 9/1452	.....	{by finger overlap length, apodisation}
H03H 9/14523	.....	{Capacitive tap weighted transducers}
H03H 9/14526	.....	{Finger withdrawal}
H03H 9/14529	.....	{Distributed tap}
H03H 9/14532	.....	{Series weighting; Transverse weighting}
H03H 9/14535	.....	{Position weighting}
H03H 9/14538	....	{Formation}
H03H 9/14541	.....	{Multilayer finger or busbar electrode}
H03H 9/14544	....	{Transducers of particular shape or position( weighting <a href="#">H03H 9/14517</a> )}

H03H 9/14547	.....	{Fan shaped; Tilted; Shifted; Slanted; Tapered; Arched; Stepped finger transducers}
H03H 9/1455	.....	{constituted of N parallel or series transducers}
H03H 9/14552	.....	{comprising split fingers}
H03H 9/14555	.....	{Chirped transducers( <a href="#">H03H 9/6406</a> takes precedence )}
H03H 9/14558	.....	{Slanted, tapered or fan shaped transducers( <a href="#">H03H 9/14561</a> , <a href="#">H03H 9/14564</a> take precedence )}
H03H 9/14561	.....	{Arched, curved or ring shaped transducers}
H03H 9/14564	.....	{Shifted fingers transducers}
H03H 9/14567	.....	{Stepped-fan shaped transducers}
H03H 9/1457	.....	{Transducers having different finger widths}
H03H 9/14573	.....	{Arrow type transducers}
H03H 9/14576	.....	{Transducers whereby only the last fingers have different characteristics with respect to the other fingers, e.g. different shape, thickness or material, split finger}
H03H 9/14579	.....	{the last fingers having a different shape}
H03H 9/14582	.....	{the last fingers having a different pitch}
H03H 9/14585	.....	{the last fingers being split}
H03H 9/14588	.....	{Horizontally-split transducers}
H03H 9/14591	.....	{Vertically-split transducers}
H03H 9/14594	.....	{Plan-rotated or plan-tilted transducers}
H03H 9/14597	....	{Matching SAW transducers to external electrical circuits}
H03H 9/15	.	Constructional features of resonators consisting of piezo-electric or electrostrictive material( <a href="#">H03H 9/25</a> takes precedence )
H03H 2009/155	..	{using MEMS techniques}
H03H 9/17	..	having a single resonator( crystal tuning forks <a href="#">H03H 9/21</a> )
H03H 9/171	...	{implemented with thin-film techniques, i.e. of the film bulk acoustic resonator (FBAR) type}
H03H 9/172	....	{Means for mounting on a substrate, i.e. means constituting the material interface confining the waves to a volume}
H03H 9/173	.....	{Air-gaps}
H03H 9/174	.....	{Membranes}
H03H 9/175	.....	{Acoustic mirrors}
H03H 9/176	...	{consisting of ceramic material( <a href="#">H03H 9/177</a> , <a href="#">H03H 9/178</a> take precedence )}
H03H 9/177	...	{of the energy-trap type}
H03H 9/178	...	{of a laminated structure of multiple piezoelectric layers with inner electrodes}
H03H 9/19	...	consisting of quartz
H03H 9/205	..	having multiple resonators( crystal tuning forks <a href="#">H03H 9/21</a> )
H03H 9/21	..	Crystal tuning forks
H03H 9/215	...	consisting of quartz
H03H 9/22	.	Constructional features of resonators consisting of magnetostrictive material

- H03H 9/24 . Constructional features of resonators of material which is not piezo-electric, electrostrictive, or magnetostrictive
- H03H 9/2405 . . {of micro-electro-mechanical resonators}
- H03H 2009/241 . . . {Bulk-mode MEMS resonators}
- H03H 2009/2415 . . . . {with concave shape [CBAR]}
- H03H 2009/2421 . . . . {with I shape [IBAR]}
- H03H 9/2426 . . . {in combination with other electronic elements}
- H03H 9/2431 . . . {Ring resonators}
- H03H 9/2436 . . . {Disk resonators}
- H03H 2009/2442 . . . {Square resonators}
- H03H 9/2447 . . . {Beam resonators( [H03H 9/2468](#) takes precedence )}
- H03H 9/2452 . . . . {Free-free beam resonators}
- H03H 9/2457 . . . . {Clamped-free beam resonators}
- H03H 9/2463 . . . . {Clamped-clamped beam resonators}
- H03H 9/2468 . . . {Tuning fork resonators}
- H03H 9/2473 . . . . {Double-Ended Tuning Fork (DETF) resonators}
- H03H 9/2478 . . . . {Single-Ended Tuning Fork resonators}
- H03H 9/2484 . . . . . {with two fork tines, e.g. Y-beam cantilever}
- H03H 9/2489 . . . . . {with more than two fork tines}
- H03H 9/2494 . . . . {H-shaped, i.e. two tuning forks with common base}
- H03H 9/25 . Constructional features of resonators using surface acoustic waves{( [devices for manipulating acoustic surface waves in general G10K 11/36](#) )}
- H03H 9/30 . Time-delay networks
- H03H 9/36 . . with non-adjustable delay time( [H03H 9/40](#) , [H03H 9/42](#) take precedence )
- H03H 9/38 . . with adjustable delay time( [H03H 9/40](#) , [H03H 9/42](#) take precedence )
- H03H 9/40 . . Frequency dependent delay lines, e.g. dispersive delay lines( [H03H 9/42](#) takes precedence )
- H03H 9/42 . . using surface acoustic waves{( [devices for manipulating acoustic surface waves in general G10K 11/36](#) )}
- H03H 9/423 . . . {with adjustable delay time}
- H03H 9/426 . . . {Magneto-elastic surface waves}
- H03H 9/44 . . . Frequency dependent delay lines, e.g. dispersive delay lines
- H03H 9/46 . Filters( [multiple-port electromechanical filters H03H 9/70](#) )
- H03H 9/462 . . {Micro-electro-mechanical filters}
- H03H 9/465 . . . {in combination with other electronic elements}
- H03H 9/467 . . . {Post-fabrication trimming of parameters, e.g. center frequency}
- H03H 9/48 . . Coupling means therefor
- H03H 9/485 . . . {for micro-electro-mechanical filters}
- H03H 9/50 . . . Mechanical coupling means
- H03H 9/505 . . . . {for micro-electro-mechanical filters}
- H03H 9/52 . . . Electric coupling means

H03H 9/525	....	{for micro-electro-mechanical filters}
H03H 9/54	..	comprising resonators of piezo-electric or electrostrictive material( <a href="#">H03H 9/64</a> takes precedence )
H03H 9/542	...	{including passive elements( <a href="#">H03H 9/545</a> takes precedence )}
H03H 9/545	...	{including active elements}
H03H 9/547	...	{Notch filters, e.g. notch BAW or thin film resonator filters}
H03H 9/56	...	Monolithic crystal filters
H03H 9/562	....	{comprising a ceramic piezoelectric layer}
H03H 9/564	....	{implemented with thin-film techniques}
H03H 9/566	....	{Electric coupling means therefor( <a href="#">H03H 9/0095</a> takes precedence )}
H03H 9/568	.....	{consisting of a ladder configuration}
H03H 9/58	...	Multiple crystal filters
H03H 9/581	....	{comprising ceramic piezoelectric layers}
H03H 9/582	....	{implemented with thin-film techniques}
H03H 9/583	.....	{comprising a plurality of piezoelectric layers acoustically coupled}
H03H 9/584	.....	{Coupled Resonator Filters (CFR)}
H03H 9/585	.....	{Stacked Crystal Filters (SCF)}
H03H 9/586	.....	{Means for mounting to a substrate, i.e. means constituting the material interface confining the waves to a volume}
H03H 9/587	.....	{Air-gaps}
H03H 9/588	.....	{Membranes}
H03H 9/589	.....	{Acoustic mirrors}
H03H 9/60	....	Electric coupling means therefor{( <a href="#">H03H 9/0095</a> takes precedence )}
H03H 9/605	.....	{consisting of a ladder configuration}
H03H 9/62	..	comprising resonators of magnetostrictive material( <a href="#">H03H 9/64</a> takes precedence )
H03H 9/64	..	using surface acoustic waves
H03H 9/6403	...	{Programmable filters}
H03H 9/6406	...	{Filters characterised by a particular frequency characteristic}
H03H 9/6409	....	{SAW notch filters}
H03H 9/6413	....	{SAW comb filters}
H03H 9/6416	....	{SAW matched filters, e.g. surface acoustic wave compressors, chirped or coded surface acoustic wave filters}
H03H 9/642	.....	{SAW transducers details for remote interrogation systems, e.g. surface acoustic wave transducers details for ID-tags( remote interrogation systems per se <a href="#">G06K 7/10009</a> , <a href="#">G01S 13/74</a> )}
H03H 9/6423	...	{Means for obtaining a particular transfer characteristic}
H03H 9/6426	....	{Combinations of the characteristics of different transducers}
H03H 9/643	....	{the transfer characteristic being determined by reflective or coupling array characteristics}
H03H 9/6433	....	{Coupled resonator filters}
H03H 9/6436	.....	{having one acoustic track only}
H03H 9/644	.....	{having two acoustic tracks}

H03H 9/6443	.....	{being acoustically coupled}
H03H 9/6446	.....	{by floating multistrip couplers( <a href="#">H03H 9/645</a> , <a href="#">H03H 9/6453</a> take precedence )}
H03H 9/645	.....	{by grating reflectors overlapping both tracks}
H03H 9/6453	.....	{by at least an interdigital transducer overlapping both tracks}
H03H 9/6456	.....	{being electrically coupled}
H03H 9/6459	.....	{via one connecting electrode}
H03H 9/6463	.....	{the tracks being electrically cascaded}
H03H 9/6466	.....	{each track containing more than two transducers}
H03H 9/6469	.....	{via two connecting electrodes}
H03H 9/6473	.....	{the electrodes being electrically interconnected}
H03H 9/6476	.....	{the tracks being electrically parallel}
H03H 9/6479	.....	{Capacitively coupled SAW resonator filters}
H03H 9/6483	.....	{Ladder SAW filters}
H03H 9/6486	.....	{having crossing or intersecting acoustic tracks, e.g. intersection in a perpendicular or diagonal orientation}
H03H 9/6489	...	{Compensation of undesirable effects}
H03H 9/6493	....	{Side lobe suppression}
H03H 9/6496	....	{Reducing ripple in transfer characteristic}
H03H 9/66	.	Phase shifters
H03H 9/68	..	using surface acoustic waves
H03H 9/70	.	Multiple-port networks for connecting several sources or loads, working on different frequencies or frequency bands, to a common load or source
H03H 9/703	..	{Networks using bulk acoustic wave devices}
H03H 9/706	...	{Duplexers}
H03H 9/72	..	Networks using surface acoustic waves
H03H 9/725	...	{Duplexers}
H03H 9/74	.	Multiple-port networks for connecting several sources or loads, working on the same frequency or frequency band, to a common load or source( <a href="#">networks for phase shifting H03H 9/66</a> )
H03H 9/76	..	Networks using surface acoustic waves

## **H03H 11/00      Networks using active elements**

### **WARNING**

Group [H03H 11/11](#) does not correspond to former or current IPC groups.  
Concordance CPC : IPC for these groups is as follows: - [H03H 11/11](#) - [H03H 11/04](#)

H03H 11/02	.	Multiple-port networks
H03H 11/025	..	{using current conveyors}
H03H 11/04	..	Frequency selective two-port networks
H03H 11/0405	...	{Non-linear filters}
H03H 2011/0411	....	{Rank order or median filters}



H03H 11/0416	...	{using positive impedance converters( <a href="#">H03H 11/08</a> takes precedence )}
H03H 11/0422	...	{using transconductance amplifiers, e.g. gmC filters}
H03H 11/0427	....	{Filters using a single transconductance amplifier; Filters derived from a single transconductor filter, e.g. by element substitution, cascading, parallel connection( <a href="#">H03H 11/0433</a> to <b>H03H11/C10</b> take precedence )}
H03H 11/0433	....	{Two integrator loop filters( <a href="#">H03H 11/0455</a> takes precedence )}
H03H 11/0438	.....	{Tow-Thomas biquad}
H03H 11/0444	....	{Simulation of ladder networks}
H03H 11/045	.....	{Leapfrog structures}
H03H 11/0455	....	{Multiple integrator loop feedback filters}
H03H 11/0461	....	{Current mode filters}
H03H 11/0466	....	{Filters combining transconductance amplifiers with other active elements, e.g. operational amplifiers, transistors, voltage conveyors}
H03H 11/0472	....	{Current or voltage controlled filters}
H03H 2011/0477	...	{using current feedback operational amplifiers}
H03H 2011/0483	...	{using operational transresistance amplifiers [OTRA]}
H03H 2011/0488	...	{Notch or bandstop filters}
H03H 2011/0494	...	{Complex filters}
H03H 11/06	...	comprising means for compensation of loss
H03H 11/08	...	using gyrators
H03H 11/10	...	using negative impedance converters( <a href="#">H03H 11/08</a> takes precedence )
H03H 11/11	...	{using current conveyors}
H03H 11/12	...	using amplifiers with feedback({ <a href="#">H03H 11/0422</a> } , <a href="#">H03H 11/08</a> , <a href="#">H03H 11/10</a> take precedence )
H03H 11/1204	....	{Distributed RC filters}
H03H 11/1208	....	{comprising an electromechanical resonator}
H03H 11/1213	....	{using transistor amplifiers( <a href="#">H03H 11/1204</a> takes precedence; parallel-T filters <a href="#">H03H 11/1295</a> )}
H03H 11/1217	....	{using a plurality of operational amplifiers( <a href="#">H03H 11/1204</a> takes precedence; parallel-T filters <a href="#">H03H 11/1295</a> )}
H03H 11/1221	.....	{Theory; Synthesis( <a href="#">H03H 11/1226</a> to <a href="#">H03H 11/1252</a> take precedence )}
H03H 11/1226	.....	{Filters using operational amplifier poles}
H03H 11/123	.....	{Modifications to reduce sensitivity}
H03H 11/1234	.....	{Modifications to reduce detrimental influences of amplifier imperfections, e.g. limited gain-bandwidth product, limited input impedance}
H03H 11/1239	.....	{Modifications to reduce influence of variations of temperature}
H03H 11/1243	.....	{Simulation of ladder networks}
H03H 11/1247	.....	{Leapfrog structures}

**WARNING**

Not complete, pending reorganisation, see provisionally also  
[H03H 11/1217](#) to [H03H 11/1252](#)

H03H 11/1252 ..... {Two integrator-loop-filters}  
H03H 11/1256 ..... {Tow-Thomas biquad}

### **WARNING**

Not complete, pending reorganisation, see provisionally also  
[H03H 11/1217](#) to [H03H 11/1252](#)

H03H 11/126 .... {using a single operational amplifier( [H03H 11/1204](#) takes precedence;  
parallel-T filters [H03H 11/1295](#) )}  
H03H 11/1265 ..... {Synthesis( [H03H 11/1269](#) to [H03H 11/1282](#) take precedence )}  
H03H 11/1269 ..... {Filters using the operational amplifier pole}  
H03H 11/1273 ..... {Modifications to reduce sensitivity}  
H03H 11/1278 ..... {Modifications to reduce detrimental influences of amplifier imperfections,  
e.g. limited gain-bandwidth product, limited input impedance}  
H03H 11/1282 ..... {Modifications to reduce influence of variations of temperature}  
H03H 11/1286 ..... {Sallen-Key biquad}

### **WARNING**

Not complete, pending reorganisation, see provisionally also  
[H03H 11/126](#) to [H03H 11/1282](#)

H03H 11/1291 ..... {Current or voltage controlled filters}  
H03H 11/1295 ..... {Parallel-T filters}  
H03H 11/14 ... using electro-optic devices  
H03H 11/16 .. Networks for phase shifting  
H03H 11/18 ... Two-port phase shifters providing a predetermined phase shift, e.g. "all-pass"  
filters  
H03H 11/20 ... Two-port phase shifters providing an adjustable phase shift  
H03H 11/22 ... providing two or more phase shifted output signals, e.g. n-phase output  
H03H 11/24 .. Frequency-independent attenuators  
H03H 11/245 ... {using field-effect transistor}  
H03H 11/26 .. Time-delay networks( analogue shift registers [G11C 27/04](#) )  
H03H 11/265 ... {with adjustable delay}  
H03H 11/28 .. Impedance matching networks  
H03H 11/30 ... Automatic matching of source impedance to load impedance  
H03H 11/32 .. Balance-unbalance networks  
H03H 11/34 .. Networks for connecting several sources or loads working on different frequencies  
or frequency bands, to a common load or source( for use in multiplex transmission  
systems [H04J 1/00](#) )  
H03H 11/342 ... {particularly adapted for use in common antenna systems}  
H03H 11/344 ... {Duplexers}  
H03H 11/346 ... {particularly adapted as input circuit for receivers}  
H03H 11/348 ... {particularly adapted as coupling circuit between transmitters and antenna}

- H03H 11/36      ..      Networks for connecting several sources or loads, working on the same frequency band, to a common load or source( [phase shifters providing two or more output signals H03H 11/22](#) )
- H03H 11/362      ...      {particularly adapted for use in common antenna systems}
- H03H 11/365      ...      {particularly adapted as input circuit for receivers}
- H03H 11/367      ...      {particularly adapted as coupling circuit between transmitters and antenna}
- H03H 11/38      ..      One-way transmission networks, i.e. unilines
- H03H 11/40      ..      Impedance converters
- H03H 11/405      ...      {Positive impedance converters( [H03H 11/42](#) takes precedence; used in frequency selective networks [H03H 11/0416](#) )}
- H03H 11/42      ...      Gyrators( [used in frequency selective networks H03H 11/08](#) )
- H03H 11/44      ...      Negative impedance converters( [H03H 11/42](#) takes precedence; used in frequency selective networks [H03H 11/10](#) )
- H03H 11/46      .      One-port networks
- H03H 11/48      ..      simulating reactances
- H03H 11/481      ...      {Simulating capacitances}

**WARNING**

Not complete, pending reorganisation, see provisionally also [H03H 11/48](#) to [H03H 11/52](#)

- H03H 11/483      ...      {Simulating capacitance multipliers}

**WARNING**

Not complete, pending reorganisation, see provisionally also [H03H 11/48](#) to [H03H 11/52](#)

- H03H 11/485      ...      {Simulating inductances using operational amplifiers}

**WARNING**

Not complete, pending reorganisation, see provisionally also [H03H 11/48](#) to [H03H 11/52](#)

- H03H 11/486      ...      {Simulating inductances using transconductance amplifiers}

**WARNING**

Not complete, pending reorganisation, see provisionally also [H03H 11/48](#) to [H03H 11/52](#)

- H03H 11/488      ...      {Simulating inductances using current conveyors}

**WARNING**

Not complete, pending reorganisation, see provisionally also [H03H 11/48](#) to [H03H 11/52](#)

- H03H 11/50 . . . using gyrators
- H03H 11/52 . . . simulating negative resistances
- H03H 11/525 . . . {Simulating frequency dependent negative resistance [FDNR]}

#### **WARNING**

Not complete, pending reorganisation, see provisionally also [H03H 11/52](#)

- H03H 11/53 . . . {simulating resistances; simulating resistance multipliers}

#### **WARNING**

Not complete, pending reorganisation, see provisionally also [H03H 11/48](#) to [H03H 11/52](#)

- H03H 11/54 . . . Modifications of networks to reduce influence of variations of temperature

### **H03H 15/00**

#### **Transversal filters**( electromechanical filters [H03H 9/46](#) , [H03H 9/70](#) )

- H03H 2015/002 . . . {Computation saving measures}
- H03H 2015/005 . . . {comprising capacitors implemented with MEMS technology}
- H03H 2015/007 . . . {Programmable filters}
- H03H 15/02 . . . using analogue shift registers
- H03H 15/023 . . . {with parallel-input configuration}
- H03H 2015/026 . . . {Matched filters in charge domain}

### **H03H 17/00**

#### **Networks using digital techniques**

- H03H 17/0009 . . . {Time-delay networks}
- H03H 17/0018 . . . {Realizing a fractional delay}
- H03H 17/0027 . . . {by means of a non-recursive filter}
- H03H 17/0036 . . . {by means of a recursive filter}
- H03H 17/0045 . . . {Impedance matching networks}
- H03H 17/0054 . . . {Attenuators}
- H03H 17/0063 . . . {R, L, C, simulating networks}
- H03H 2017/0072 . . . {Theoretical filter design}
- H03H 2017/0081 . . . {of FIR filters}
- H03H 2017/009 . . . {of IIR filters}
- H03H 17/02 . . . Frequency selective networks{( digital computers for complex mathematical operations [G06F 17/10](#) )}
- H03H 17/0201 . . . {Wave digital filters}
- H03H 17/0202 . . . {Two or more dimensional filters; Filters for complex signals( multidimensional convolutions [G06F 17/153](#) )}
- H03H 2017/0204 . . . {Comb filters}
- H03H 2017/0205 . . . {Kalman filters}
- H03H 2017/0207 . . . {Median filters}
- H03H 2017/0208 . . . {using neural networks}

H03H 2017/021	...	{Wave digital filters}
H03H 17/0211	..	{using specific transformation algorithms, e.g. WALSH functions, Fermat transforms, Mersenne transforms, polynomial transforms, Hilbert transforms( correlation computation <a href="#">G06F 17/156</a> )}
H03H 17/0213	...	{Frequency domain filters using Fourier transforms}
H03H 2017/0214	....	{with input-sampling frequency and output-delivery frequency which differ, e.g. interpolation, extrapolation; anti-aliasing}
H03H 17/0216	...	{Quefrency domain filters}
H03H 17/0217	...	{Number theoretic transforms}
H03H 17/0219	..	{Compensation of undesirable effects, e.g. quantisation noise, overflow( stability problems <a href="#">H03H 17/0461</a> )}
H03H 2017/022	...	{Rounding error}
H03H 2017/0222	...	{Phase error}
H03H 17/0223	..	{Computation saving measures; Accelerating measures( computations per se <a href="#">G06F</a> )}
H03H 17/0225	...	{Measures concerning the multipliers}
H03H 17/0226	....	{comprising look-up tables}
H03H 17/0227	...	{Measures concerning the coefficients}
H03H 17/0229	....	{reducing the number of taps}
H03H 17/023	....	{reducing the wordlength, the possible values of coefficients}
H03H 2017/0232	.....	{Canonical signed digit [CSD] or power of 2 coefficients}
H03H 17/0233	...	{Measures concerning the signal representation}
H03H 17/0235	....	{reducing the wordlength of signals}
H03H 17/0236	....	{using codes}
H03H 17/0238	...	{Measures concerning the arithmetic used( performing computations <a href="#">G06F 7/60</a> )}
H03H 17/0239	....	{Signed digit arithmetic}
H03H 17/0241	....	{Distributed arithmetic}
H03H 17/0242	....	{Residue number arithmetic}
H03H 2017/0244	...	{Measures to reduce settling time}
H03H 2017/0245	...	{Measures to reduce power consumption( <a href="#">H03H 17/0223</a> takes preference )}
H03H 2017/0247	...	{Parallel structures using a slower clock}
H03H 17/0248	..	{Filters characterised by a particular frequency response or filtering method}
H03H 17/025	...	{Notch filters}
H03H 17/0251	...	{Comb filters}
H03H 17/0252	...	{Elliptic filters}
H03H 17/0254	...	{Matched filters}
H03H 17/0255	...	{Filters based on statistics( adaptive filters <a href="#">H03H 21/0029</a> )}
H03H 17/0257	....	{KALMAN filters}
H03H 17/0258	....	{ARMA filters}
H03H 17/026	...	{Averaging filters}
H03H 17/0261	...	{Non linear filters}

H03H 17/0263	....	{Rank order filters}
H03H 17/0264	...	{Filter sets with mutual related characteristics}
H03H 17/0266	....	{Filter banks}
H03H 17/0267	.....	{comprising non-recursive filters}
H03H 17/0269	.....	{comprising recursive filters}
H03H 17/027	....	{Complementary filters; Phase complementary filters}
H03H 17/0272	....	{Quadrature mirror filters}
H03H 17/0273	....	{Polyphase filters}
H03H 17/0275	.....	{comprising non-recursive filters}
H03H 17/0276	.....	{having two phases}
H03H 17/0277	.....	{comprising recursive filters}
H03H 17/0279	.....	{having two phases}
H03H 17/028	...	{Polynomial filters}
H03H 17/0282	...	{Sinc or gaussian filters( <a href="#">H03H 17/0671</a> takes precedence )}
H03H 17/0283	..	{Filters characterised by the filter structure( <a href="#">H03H 17/0202</a> , <a href="#">H03H 17/0219</a> to <a href="#">H03H 17/0248</a> take precedence )}
H03H 17/0285	...	{Ladder or lattice filters}
H03H 17/0286	...	{Combinations of filter structures}
H03H 17/0288	....	{Recursive, non-recursive, ladder, lattice structures}
H03H 17/0289	....	{Digital and active filter structures}
H03H 17/0291	....	{Digital and sampled data filters}
H03H 17/0292	...	{Time multiplexed filters; Time sharing filters}
H03H 17/0294	..	{Variable filters; Programmable filters}
H03H 2017/0295	...	{Changing between two filter characteristics}
H03H 2017/0297	...	{Coefficients derived from input parameters}
H03H 2017/0298	..	{DSP implementation}
H03H 17/04	..	Recursive filters
H03H 17/0405	...	{comprising a ROM addressed by the input and output data signals}
H03H 17/0411	...	{using DELTA modulation}
H03H 17/0416	...	{with input-sampling frequency and output-delivery frequency which differ, e.g. extrapolation; Anti-aliasing}
H03H 17/0422	....	{the input and output signals being derived from two separate clocks, i.e. asynchronous sample rate conversion}
H03H 17/0427	....	{characterized by the ratio between the input-sampling and output-delivery frequencies}
H03H 17/0433	.....	{the ratio being arbitrary or irrational}
H03H 17/0438	.....	{the ratio being integer}
H03H 17/0444	.....	{where the output-delivery frequency is higher than the input sampling frequency, i.e. interpolation}
H03H 17/045	.....	{where the output-delivery frequency is lower than the input sampling frequency, i.e. decimation}
H03H 17/0455	.....	{the ratio being rational}

H03H 17/0461	...	{Quantisation; Rounding; Truncation; Overflow oscillations or limit cycles eliminating measures}
H03H 2017/0466	....	{Reduction of limit cycle oscillation}
H03H 2017/0472	...	{based on allpass structures}
H03H 2017/0477	...	{Direct form I}
H03H 2017/0483	....	{Transposed}
H03H 2017/0488	...	{Direct form II}
H03H 2017/0494	....	{Transposed}
H03H 17/06	..	Non-recursive filters
H03H 17/0607	...	{comprising a ROM addressed by the input data signals}
H03H 17/0614	...	{using Delta-modulation}
H03H 17/0621	...	{with input-sampling frequency and output-delivery frequency which differ, e.g. extrapolation; Anti-aliasing}
H03H 17/0628	....	{the input and output signals being derived from two separate clocks, i.e. asynchronous sample rate conversion}
H03H 17/0635	....	{characterized by the ratio between the input-sampling and output-delivery frequencies}
H03H 17/0642	.....	{the ratio being arbitrary or irrational}
H03H 17/065	.....	{the ratio being integer}
H03H 17/0657	.....	{where the output-delivery frequency is higher than the input sampling frequency, i.e. interpolation}
H03H 17/0664	.....	{where the output-delivery frequency is lower than the input sampling frequency, i.e. decimation}
H03H 17/0671	.....	{Cascaded integrator-comb [CIC]filters}
H03H 2017/0678	.....	{with parallel structure, i.e. parallel CIC [PCIC]}
H03H 17/0685	.....	{the ratio being rational}
H03H 2017/0692	...	{Transposed}
H03H 17/08	.	Networks for phase shifting
<b>H03H 19/00</b>		<b>Networks using time-varying elements, e.g. N-path filters</b>
H03H 19/002	.	{N-path filters}
H03H 19/004	.	{Switched capacitor networks}
H03H 19/006	..	{simulating one-port networks}
H03H 19/008	.	{with variable switch closing time}
<b>H03H 21/00</b>		<b>Adaptive networks</b>
H03H 21/0001	.	{Analogue adaptive filters}
H03H 21/0003	..	{comprising CCD devices}
H03H 21/0005	..	{comprising SAW devices}
H03H 21/0007	..	{comprising switched capacitor [SC]devices}
H03H 2021/0009	..	{Details}
H03H 2021/001	...	{Analog multipliers}



H03H 21/0012	. {Digital adaptive filters}
H03H 21/0014	.. {Lattice filters}
H03H 21/0016	.. {Non linear filters}
H03H 21/0018	.. {Matched filters}
H03H 21/002	.. {Filters with a particular frequency response( <a href="#">H03H 21/0014</a> to <a href="#">H03H 21/0018</a> take precedence )}
H03H 21/0021	... {Notch filters}
H03H 21/0023	... {Comb filters}
H03H 21/0025	.. {Particular filtering methods}
H03H 21/0027	... {filtering in the frequency domain}
H03H 21/0029	... {based on statistics}
H03H 21/003	.... {KALMAN filters}
H03H 21/0032	.... {ARMA filters}
H03H 2021/0034	... {Blind source separation}
H03H 2021/0036	.... {of convolutive mixtures}
H03H 2021/0038	.... {of instantaneous mixtures}
H03H 2021/004	.... {using state space representation}
H03H 2021/0041	... {Subband decomposition}
H03H 21/0043	.. {Adaptive algorithms}
H03H 2021/0045	... {Equation error}
H03H 2021/0047	.... {Combined output and equation error}
H03H 2021/0049	... {Recursive least squares algorithm}
H03H 2021/005	.... {with forgetting factor}
H03H 2021/0052	.... {combined with stochastic gradient algorithm}
H03H 2021/0054	..... {Affine projection}
H03H 2021/0056	... {Non-recursive least squares algorithm [LMS]}
H03H 2021/0058	.... {Block LMS, i.e. in frequency domain}
H03H 2021/0059	.... {Delayed LMS}
H03H 2021/0061	.... {Normalized LMS [NLMS]}
H03H 2021/0063	..... {Proportionate NLMS}
H03H 2021/0065	.... {Sign-sign LMS}
H03H 21/0067	.. {Means or methods for compensation of undesirable effects}
H03H 2021/0069	... {Finite wordlength}
H03H 2021/007	.. {Computation saving measures; Accelerating measures}
H03H 2021/0072	... {Measures relating to the coefficients}
H03H 2021/0074	.... {Reduction of the update frequency}
H03H 2021/0076	... {Measures relating to the convergence time( <a href="#">H03H 2021/0072</a> takes preference )}
H03H 2021/0078	.... {varying the step size}
H03H 2021/0079	... {using look-up tables}

H03H 2021/0081	..	{Details}
H03H 2021/0083	...	{Shadow filter, i.e. one of two filters which are simultaneously adapted, wherein the results of adapting the shadow filter are used for adapting the other filter}
H03H 2021/0085	..	{Applications}
H03H 2021/0087	...	{Prediction}
H03H 2021/0089	...	{System identification, i.e. modeling}
H03H 2021/009	....	{with recursive filters}
H03H 2021/0092	...	{Equalization, i.e. inverse modeling}
H03H 2021/0094	...	{Interference Cancelling}
H03H 2021/0096	..	{with input-sampling frequency and output-delivery frequency which differ, e.g. extrapolation; anti-aliasing}
H03H 2021/0098	.	{Adaptive filters comprising analog and digital structures}

**H03H 2210/00****Indexing scheme relating to details of tunable filters**

H03H 2210/01	.	Tuned parameter of filter characteristics
H03H 2210/012	..	Centre frequency; Cut-off frequency
H03H 2210/015	..	Quality factor or bandwidth
H03H 2210/017	..	Amplitude, gain or attenuation
H03H 2210/02	.	Variable filter component
H03H 2210/021	..	Amplifier, e.g. transconductance amplifier
H03H 2210/023	...	Tuning of transconductance via tail current source
H03H 2210/025	..	Capacitor
H03H 2210/026	..	Inductor
H03H 2210/028	..	Resistor
H03H 2210/03	.	Type of tuning
H03H 2210/033	..	Continuous
H03H 2210/036	..	Stepwise
H03H 2210/04	.	Filter calibration method
H03H 2210/043	..	by measuring time constant
H03H 2210/046	..	Master -slave

**H03H 2218/00****Indexing scheme relating to details of digital filters**

H03H 2218/02	.	Coefficients
H03H 2218/025	..	updated selectively, e.g. by, in the presence of noise, temporally cancelling the update and outputting a predetermined value
H03H 2218/04	.	In-phase and quadrature [I/Q] signals
H03H 2218/06	.	Multiple-input, multiple-output [MIMO]; Multiple-input, single-output [MISO]
H03H 2218/08	.	Resource sharing
H03H 2218/085	..	Multipliers
H03H 2218/10	.	Multiplier and or accumulator units
H03H 2218/12	.	Signal conditioning
H03H 2218/14	.	Non-uniform sampling

<b>H03H 2220/00</b>	<b>Indexing scheme relating to structures of digital filters</b>
H03H 2220/02	. Modular, e.g. cells connected in cascade
H03H 2220/04	. Pipelined
H03H 2220/06	. Systolic
H03H 2220/08	. Variable filter length
<b>H03H 2222/00</b>	<b>Indexing scheme relating to digital filtering methods</b>
H03H 2222/02	. using fuzzy logic
H03H 2222/04	. using neural networks
H03H 2222/06	. using wavelets
<b>H03H 2240/00</b>	<b>Indexing scheme relating to filter banks</b>
<b>H03H 2250/00</b>	<b>Indexing scheme relating to dual- or multi-band filters</b>
<b>H03H 2260/00</b>	<b>Theory relating to impedance networks</b>