

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

1. 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.
2. In this subclass, the following expression is used with the meaning indicated:
 "passive elements" means resistors, capacitors, inductors, mutual inductors or diodes.
3. Attention is drawn to the Notes following the titles of class [B81](#) and subclass [B81B](#) relating to "micro-structural devices" and "micro-structural systems".
4. 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}

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| 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**

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| 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](#))**

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| 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 (H03H 7/075 , H03H 7/09 , H03H 7/12 , H03H 7/13 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 (H03H 7/12 takes precedence)} |
| H03H 7/0169 | | {Intermediate frequency filters} |
| H03H 7/0176 | | {without magnetic core} |
| H03H 7/0184 | | {with ferromagnetic core} |

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| H03H 2007/0192 | .. | {Complex filters} |
| H03H 7/03 | .. | comprising means for compensation of loss |
| H03H 7/06 | .. | including resistors (H03H 7/075 , H03H 7/09 , H03H 7/12 , H03H 7/13 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 (H03H 7/09 takes precedence; automatic control of bandwidth in amplifiers H03G 5/16) |
| 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](#)

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| 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 (H03H 7/07 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 (H03H 7/425 takes precedence)} |
| H03H 7/1741 | ... | {Comprising typical LC combinations, irrespective of presence and location of additional resistors (when resistors are present, also classify in H03H 7/06 to H03H 7/07)} |
| H03H 7/175 | .... | {Series LC in series path (H03H 7/1783 takes precedence)} |
| H03H 7/1758 | .... | {Series LC in shunt or branch path (H03H 7/1791 takes precedence)} |
| H03H 7/1766 | .... | {Parallel LC in series path (H03H 7/1783 takes precedence)} |
| H03H 7/1775 | .... | {Parallel LC in shunt or branch path (H03H 7/1791 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}

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| 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} |

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| H03H 9/02086 | ... | {Means for compensation or elimination of undesirable effects} |
| H03H 9/02094 | .... | {of adherence} |
| H03H 9/02102 | .... | {of temperature influence (cutting angles H03H 9/02015)} |
| 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} |

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| 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 (H03H 9/02417 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. Lamé 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} |

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| 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 H03H 9/02543)} |
| H03H 9/02842 | .... | {of reflections (H03H 9/6406 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 H05K 9/00)} |
| 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} |

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| 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 (mounting in enclosures H03H 9/12)} |
| 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 (H03H 9/1021 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 (H03H 9/0566 takes precedence)} |
| H03H 9/0547 | .... | {consisting of a vertical arrangement (H03H 9/0566 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 {(constructional combinations of enclosure with electromechanical and other electronic elements H03H 9/0538)} |
| 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} |

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| 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 IDT's} |
| 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 (H03H 9/145 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 (H03H 9/145 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 H03H 9/14517)} |
| H03H 9/14547 | | {Fan shaped; Tilted; Shifted; Slanted; Tapered; Arched; Stepped finger transducers} |
| H03H 9/1455 | | {constituted of N parallel or series transducers} |

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|---------------|-------|---|
| H03H 9/14552 | | {comprising split fingers} |
| H03H 9/14555 | | {Chirped transducers (H03H 9/6406 takes precedence)} |
| H03H 9/14558 | ..... | {Slanted, tapered or fan shaped transducers (H03H 9/14561 , H03H 9/14564 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 (H03H 9/25 takes precedence) |
| H03H 2009/155 | .. | {using MEMS techniques} |
| H03H 9/17 | .. | having a single resonator (crystal tuning forks H03H 9/21) |
| 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 (H03H 9/177 , H03H 9/178 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 H03H 9/21) |
| 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} |

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|----------------|-------|---|
| 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 (H03H 9/64 takes precedence) |
| H03H 9/542 | ... | {including passive elements (H03H 9/545 takes precedence)} |

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| 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 (H03H 9/0095 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 {(H03H 9/0095 takes precedence)} |
| H03H 9/605 | ..... | {consisting of a ladder configuration} |
| H03H 9/62 | .. | comprising resonators of magnetostrictive material (H03H 9/64 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 G06K 7/10009 , G01S 13/74)} |
| 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 (H03H 9/645 , H03H 9/6453 take precedence)} |
| H03H 9/645 | | {by grating reflectors overlapping both tracks} |

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| 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 (networks for phase shifting H03H 9/66) |
| 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 (H03H 11/08 takes precedence)} |
| H03H 11/0422 | ... | {using transconductance amplifiers, e.g. gmC filters} |

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| H03H 11/0427 | | {Filters using a single transconductance amplifier; Filters derived from a single transconductor filter, e.g. by element substitution, cascading, parallel connection (H03H 11/0433 to H03H 11/0472 take precedence)} |
| H03H 11/0433 | .... | {Two integrator loop filters (H03H 11/0455 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 (H03H 11/08 takes precedence) |
| H03H 11/11 | ... | {using current conveyors} |
| H03H 11/12 | ... | using amplifiers with feedback ({ H03H 11/0422 }, H03H 11/08 , H03H 11/10 take precedence) |
| H03H 11/1204 | .... | {Distributed RC filters} |
| H03H 11/1208 | .... | {comprising an electromechanical resonator} |
| H03H 11/1213 | .... | {using transistor amplifiers (H03H 11/1204 takes precedence; parallel-T filters H03H 11/1295)} |
| H03H 11/1217 | .... | {using a plurality of operational amplifiers (H03H 11/1204 takes precedence; parallel-T filters H03H 11/1295)} |
| H03H 11/1221 | ..... | {Theory; Synthesis (H03H 11/1226 to H03H 11/1252 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 G06F 17/156)} |
| 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 H03H 17/0461)} |
| H03H 2017/022 | ... | {Rounding error} |
| H03H 2017/0222 | ... | {Phase error} |
| H03H 17/0223 | .. | {Computation saving measures; Accelerating measures (computations per se G06F)} |
| 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 G06F 7/60)} |
| 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 (H03H 17/0223 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 H03H 21/0029)} |
| H03H 17/0257 | .... | {KALMAN filters} |
| H03H 17/0258 | | {ARMA filters} |
| H03H 17/026 | ... | {Averaging filters} |
| H03H 17/0261 | ... | {Non linear filters} |

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| 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 (H03H 17/0671 takes precedence)} |
| H03H 17/0283 | .. | {Filters characterised by the filter structure (H03H 17/0202 , H03H 17/0219 to H03H 17/0248 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} |

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| 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 |
| H03H 19/00 | | Networks using time-varying elements, e.g. N-path filters |
| 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} |
| H03H 21/00 | | Adaptive networks |
| 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} |

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| 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 (H03H 21/0014 to H03H 21/0018 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 (H03H 2021/0072 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

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