

**ECLA****EUROPEAN CLASSIFICATION****H03H****IMPEDANCE NETWORKS, e.g. RESONANT CIRCUITS; RESONATORS**

(measuring, testing G01R; arrangements for producing a reverberation or echo sound [G10K15/08](#); 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)

[N: [Notes](#) [C1109]

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.

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**H03H1/00**

**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 H03H9/00](#))

## H03H1/00A

. [N: of radio frequency interference filters]

## H03H1/02

. of RC networks, e.g. integrated networks

**H03H2/00**

**Networks using elements or techniques not provided for in groups [H03H3/00](#) to [H03H21/00](#)**

## H03H2/00A

. [N: comprising magnetostatic wave network elements]

## H03H2/00B

. [N: comprising optical fibre network elements (optical elements per se [G02B](#), [G02E](#); transmission systems using light waves [H04B10/00](#))]

- H03H2/00T . [N: Coupling circuits between transmission lines or antennas and transmitters, receivers or amplifiers] [N9612]
  - H03H2/00T1 . . [N: Transmitter or amplifier output circuits] [N9612]
  - H03H2/00T2 . . [N: Receiver or amplifier input circuits] [N9612]
- H03H3/00 Apparatus or processes specially adapted for the manufacture of impedance networks, resonating circuits, resonators**
- H03H3/007 . for the manufacture of electromechanical resonators or networks
  - H03H3/007M . . [N: of micro-electro-mechanical resonators or networks (micro-membranes or micro-beams [B81B3/00M2](#); manufacture of micro-structural devices in general [B81C](#))] [N0303]
  - H03H3/007M2 . . . [N: Integration with other electronic structures] [N0303]
  - H03H3/007M4 . . . [N: Arrangements or methods specially adapted for testing micro-electro-mechanical resonators or networks] [N0303]
  - H03H3/007M6 . . . [N: for obtaining desired frequency or temperature coefficients] [N0303]
  - H03H3/007M6B . . . . [N: by tuning of resonance frequency] [N0303]
  - H03H3/007M6B2 . . . . . [N: involving adjustment of the transducing gap] [N0303]
  - H03H3/013 . . for obtaining desired frequency or temperature coefficient ([N: [H03H3/007M6](#)] [H03H3/04](#), [H03H3/10](#) take precedence) [C0303]
  - H03H3/02 . . for the manufacture of piezo-electric or electrostrictive resonators or networks ([H03H3/08](#) takes precedence)
  - H03H3/04 . . . for obtaining desired frequency or temperature coefficient
  - H03H3/06 . . for the manufacture of magnetostrictive resonators or networks
  - H03H3/08 . . for the manufacture of resonators or networks using surface acoustic waves
  - H03H3/10 . . . for obtaining desired frequency or temperature coefficient
- H03H5/00 One-port networks comprising only passive electrical elements as network components**
- H03H5/00B . [N: comprising distributed impedance elements together with lumped impedance elements]
  - H03H5/00C . [N: comprising simultaneously tunable inductance and capacitance] [N9612]
  - H03H5/02 . without voltage- or current-dependent elements
  - H03H5/10 . . comprising at least one element with prescribed temperature coefficient
  - H03H5/12 . with at least one voltage- or current-dependent element
- H03H7/00 Multiple-port networks comprising only passive electrical elements as network components (receiver input circuits [H04B1/18](#); networks simulating a length of communication cable [H04B3/40](#))**
- H03H7/00B . [N: Gyration]
  - H03H7/00C . [N: Capacitive coupling circuits not otherwise provided for]

- H03H7/01 . Frequency selective two-port networks
- H03H7/01A . . [N: Non-linear filters]
- H03H7/01B . . [N: comprising only inductors and capacitors ([H03H7/075](#), [H03H7/09](#), [H03H7/12](#), [H03H7/13](#) take precedence)]
- H03H7/01C . . [N: comprising distributed impedance elements together with lumped impedance elements]
- H03H7/01S . . [N: Electrical filters or coupling circuits] [N9612]
- H03H7/01S1 . . . [N: Coupling circuits between two tubes, not otherwise provided for] [N9612]
- H03H7/01T . . [N: Electrical filters; Controlling thereof] [N9612]
- H03H7/01T1 . . . [N: Bandpass filters ([H03H7/12](#) takes precedence)] [N9612]
- H03H7/01T1A . . . . [N: Intermediate frequency filters] [N9612]
- H03H7/01T1A1 . . . . . [N: without magnetic core] [N9612]
- H03H7/01T1A2 . . . . . [N: with ferromagnetic core] [N9612]
- H03H7/03 . . comprising means for compensation of loss
- H03H7/06 . . including resistors ([H03H7/075](#), [H03H7/09](#), [H03H7/12](#), [H03H7/13](#) take precedence)
- H03H7/065 . . . Parallel T-filters
- H03H7/07 . . . Bridged T-filters
- H03H7/075 . . Ladder networks, e.g. electric wave filters
- H03H7/09 . . Filters comprising mutual inductance
- H03H7/12 . . Bandpass or bandstop filters with adjustable bandwidth and fixed centre frequency ([H03H7/09](#) takes precedence; automatic control of bandwidth in amplifiers [H03G5/16](#))
- H03H7/13 . . using electro-optic elements
- H03H7/17 . . [N: Structural details of sub-circuits of frequency selective networks] [N1204]
- [N: **WARNING**  
not complete, pending reorganisation, see provisionally also [H03H7/01A](#),  
[H03H7/01C](#) to [H03H7/07](#), [H03H7/09](#) to [H03H7/13](#) and [H03H7/42](#)  
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- H03H7/17B . . . [N: Comprising bridging elements, i.e. elements in a series path without own reference to ground and spanning branching nodes of another series path ([H03H7/07](#) takes precedence)] [N1204]
- H03H7/17F . . . [N: Comprising foot-point elements] [N1204]
- H03H7/17F1 . . . . [N: Element to ground being common to different shunt paths, i.e. Y-structure] [N1204]
- H03H7/17F2 . . . . [N: Element between different shunt or branch paths ([H03H7/42M](#) takes precedence)] [N1204]
- H03H7/17R . . . [N: Comprising typical LC combinations, irrespective of presence and location of additional resistors (when resistors are present, also classify in [H03H7/06](#) to [H03H7/07](#))] [N1204]
- H03H7/17R1 . . . . [N: Series LC in series path ([H03H7/17R5](#) takes precedence)] [N1204]
- H03H7/17R2 . . . . [N: Series LC in shunt or branch path ([H03H7/17R6](#) takes precedence)] [N1204]
- H03H7/17R3 . . . . [N: Parallel LC in series path ([H03H7/17R5](#) takes precedence)] [N1204]
- H03H7/17R4 . . . . [N: Parallel LC in shunt or branch path ([H03H7/17R6](#) takes precedence)] [N1204]

- H03H7/17R5 . . . . [N: Combined LC in series path] [N1204]
- H03H7/17R6 . . . . [N: Combined LC in shunt or branch path] [N1204]
  
- H03H7/18 . Networks for phase shifting
- H03H7/18B . . [N: comprising distributed impedance elements together with lumped impedance elements]
- H03H7/19 . . Two-port phase shifters providing a predetermined phase shift, e.g. "all-pass" filters
- H03H7/20 . . Two-port phase shifters providing an adjustable phase shift
- H03H7/21 . . providing two or more phase shifted output signals, e.g. n-phase output
  
- H03H7/24 . Frequency- independent attenuators
- H03H7/25 . . comprising an element controlled by an electric or magnetic variable ([H03H7/27](#) takes precedence)
- H03H7/25B . . . [N: the element being a thermistor]
- H03H7/25D . . . [N: the element being a diode]
- H03H7/25D1 . . . . [N: the element being a PIN diode]
- H03H7/25D2 . . . . [N: the element being a VARACTOR diode]
- H03H7/25M . . . [N: using a galvano-magnetic device]
- H03H7/27 . . comprising a photo-electric element
  
- H03H7/30 . Time-delay networks [N: (analogue shift registers [G11C27/04](#))]
- H03H7/32 . . with lumped inductance and capacitance
- H03H7/32A . . . [N: Adjustable networks]
- H03H7/34 . . with lumped and distributed reactance
- H03H7/34A . . . [N: Adjustable networks]
  
- H03H7/38 . Impedance-matching networks
- H03H7/38B . . [N: comprising distributed impedance elements together with lumped impedance elements]
- H03H7/40 . . Automatic matching of load impedance to source impedance
  
- H03H7/42 . Balance/unbalance networks
- H03H7/42B . . [N: comprising distributed impedance elements together with lumped impedance elements]
- H03H7/42M . . [N: Balance-balance networks] [N1204]
  
- [N: **WARNING**  
not complete, pending reorganisation, see provisionally also [H03H1/00](#) to [H03H1/00A](#), [H03H7/01A](#), [H03H7/01C](#) to [H03H7/07](#), [H03H7/09](#) to [H03H7/13](#), [H03H7/42](#) and [H03H7/42B](#)  
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- H03H7/42M1 . . . [N: Common-mode filters ([H02J3/01](#) and [H02M1/12F](#) takes precedence)] [N1204]
  
- [N: **WARNING**  
not complete, pending reorganisation, see provisionally also [H03H1/00](#) to [H03H1/00A](#), [H03H7/01A](#), [H03H7/01C](#) to [H03H7/07](#), [H03H7/09](#) to [H03H7/13](#) and [H03H7/42](#)  
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- H03H7/46 . 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 H04J1/00](#))
- H03H7/46C . . [N: particularly adapted for use in common antenna systems]
- H03H7/46D . . [N: Duplexers] [N0508]
- H03H7/46D1 . . . [N: having variable circuit topology, e.g. including switches] [N0508]
- H03H7/46R . . [N: particularly adapted as input circuit for receivers]
- H03H7/46T . . [N: particularly adapted as coupling circuit between transmitters and antennas]
  
- H03H7/48 . 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 H03H7/21](#))
- H03H7/48C . . [N: particularly adapted for use in common antenna systems]
- H03H7/48R . . [N: particularly adapted as input circuit for receivers]
- H03H7/48T . . [N: particularly adapted as coupling circuit between transmitters and antennas]
  
- H03H7/52 . One-way transmission networks, i.e. unilines
  
- H03H7/54 . Modifications of networks to reduce influence of variations of temperature
  
- H03H9/00** **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 H01L41/00](#); [electromechanical transducers H04R](#))
  
- H03H9/00I . [N: Impedance-matching networks ([H03H9/145 takes precedence](#))] [N0312] [C1112]
- H03H9/00I1 . . [N: using surface acoustic wave devices] [N0407]
- H03H9/00I2 . . [N: using bulk acoustic wave devices] [N0407]
  
- H03H9/00U . [N: Balance-unbalance or balance-balance networks] [N0312] [C0611]
- H03H9/00U1 . . [N: using surface acoustic wave devices] [N0407]
- H03H9/00U1A . . . [N: having one acoustic track only] [N0508]
- H03H9/00U1A1 . . . . [N: the balanced terminals being on the same side of the track] [N0508]
- H03H9/00U1A2 . . . . [N: the balanced terminals being on opposite sides of the track] [N0508]
- H03H9/00U1B . . . [N: having two acoustic tracks ([H03H9/00U1C](#), [H03H9/00U1D take precedence](#))] [N0508]
- H03H9/00U1B1 . . . . [N: being electrically cascaded] [N0508]
- H03H9/00U1B1A . . . . . [N: the balanced terminals being on the same side of the tracks] [N0508]
- H03H9/00U1B1B . . . . . [N: the balanced terminals being on opposite sides of the tracks] [N0508]
- H03H9/00U1B2 . . . . [N: being electrically parallel] [N0508]
- H03H9/00U1B2A . . . . . [N: the balanced terminals being on the same side of the tracks] [N0508]
- H03H9/00U1B2B . . . . . [N: the balanced terminals being on opposite sides of the tracks] [N0508]
- H03H9/00U1C . . . [N: having three acoustic tracks ([H03H9/00U1D takes precedence](#))] [N0508]
- H03H9/00U1D . . . [N: having four acoustic tracks] [N0508]
- H03H9/00U1D1 . . . . [N: Lattice filters] [N1112]
- H03H9/00U2 . . [N: using bulk acoustic wave devices] [N0407]

H03H9/02	. Details
H03H9/02B	. . [N: of bulk acoustic wave devices] [N0508]
H03H9/02B2	. . . [N: Characteristics of piezoelectric layers, e.g. cutting angles] [N0508] [C0605]
H03H9/02B2A	. . . . [N: consisting of quartz] [N0605]
H03H9/02B2C	. . . . [N: consisting of ceramic] [N0605]
H03H9/02B2G	. . . . [N: consisting of a material from the crystal group 32, e.g. langasite, langatate, langanite] [N0605]
H03H9/02B4	. . . [N: Treatment of substrates] [N0508]
H03H9/02B4A	. . . . [N: of the surface including the back surface] [N0508]
H03H9/02B6	. . . [N: Details relating to the vibration mode] [N1204]
H03H9/02B6H	. . . . [N: the vibration mode being harmonic] [N1204]
H03H9/02B6O	. . . . [N: the vibration mode being overmoded] [N1204]
H03H9/02B8	. . . [N: Means for compensation or elimination of undesirable effects] [N0508]
H03H9/02B8A	. . . . [N: of adherence] [N1204]
H03H9/02B8B	. . . . [N: of temperature influence (cutting angles <a href="#">H03H9/02B2</a> )] [N0508] [C0605]
H03H9/02B8C	. . . . [N: of reflections] [N0508]
H03H9/02B8D	. . . . [N: of lateral leakage between adjacent resonators] [N1204]
H03H9/02B8F	. . . . [N: of parasitic elements] [N1204]
H03H9/02B8J	. . . . [N: of stress] [N0605]
H03H9/02B8M	. . . . [N: of electric discharge due to pyroelectricity] [N0605]
H03H9/02B8N	. . . . [N: of ageing changes of characteristics, e.g. electro-acousto-migration] [N0508]
H03H9/02B10	. . . [N: Dimensional parameters, e.g. ratio between two dimension parameters, length, width or thickness] [N1204]
H03H9/02F	. . [N: of interface-acoustic, boundary, pseudo-acoustic or Stonely wave devices] [N0508] [C1207]
H03H9/02G	. . [N: Guided bulk acoustic wave devices or Lamb wave devices having interdigital transducers situated in parallel planes on either side of a piezoelectric layer] [N1112]
H03H9/02K	. . [N: of surface skimming bulk wave devices]
H03H9/02M	. . [N: of micro-electro-mechanical resonators] [N0303]
H03H9/02M2	. . . [N: Driving or detection means] [N0303]
H03H9/02M2B	. . . . [N: Comb electrodes] [N0303]
H03H9/02M4	. . . [N: Suspension means] [N0303]
H03H9/02M4B	. . . . [N: Folded-flexure] [N0303]
H03H9/02M4B2	. . . . . [N: Symmetric folded-flexure] [N0303]
H03H9/02M6	. . . [N: Post-fabrication trimming of parameters, e.g. resonance frequency, Q factor] [N0303]
H03H9/02M6B	. . . . [N: by annealing] [N0303]
H03H9/02M6D	. . . . [N: by application of a DC-bias voltage ( <a href="#">H03H9/02M6F</a> takes precedence)] [N0303]
H03H9/02M6F	. . . . [N: involving adjustment of the transducing gap] [N0303]
H03H9/02M6F2	. . . . . [N: by electrostatically pulling the beam] [N0303]
H03H9/02M8	. . . [N: Means for compensation or elimination of undesired effects] [N0303]

H03H9/02M8B	. . . .	[N: of temperature influence] [N0303]
H03H9/02S	. .	[N: of surface acoustic wave devices]
H03H9/02S2	. . .	[N: Characteristics of substrate, e.g. cutting angles]
H03H9/02S2A	. . . .	[N: of quartz substrates]
H03H9/02S2B	. . . .	[N: of lithium niobate or lithium-tantalate substrates]
H03H9/02S2D	. . . .	[N: of semiconductor substrates]
H03H9/02S2E	. . . .	[N: of combined substrates, multilayered substrates, piezo-electrical layers on not-piezo- electrical substrate]
H03H9/02S2F	. . . .	[N: of diamond substrates]
H03H9/02S2G	. . . .	[N: of langasite substrates] [N0202]
H03H9/02S2H	. . . .	[N: of langatate substrates] [N0202]
H03H9/02S2I	. . . .	[N: of langanite substrates] [N0202]
H03H9/02S4	. . .	[N: Treatment of substrates, e.g. curved, spherical, cylindrical substrates ensuring closed round-about circuits for the acoustical waves] [C1112]
H03H9/02S4A	. . . .	[N: of the surface, including back surface] [C0508]
H03H9/02S4B	. . . .	[N: of the edges] [C0508]
H03H9/02S6	. . .	[N: Details concerning reflective or coupling arrays] [C0508]
H03H9/02S6A	. . . .	[N: Waffle-iron or dot arrays]
H03H9/02S6C	. . . .	[N: Grooves or arrays buried in the substrate]
H03H9/02S6C1	. . . . .	[N: being located inside the interdigital transducers] [N1109]
H03H9/02S6F	. . . .	[N: 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] [N0508]
H03H9/02S6F1	. . . . .	[N: having specially shaped edges, e.g. stepped, U-shaped edges] [N0508]
H03H9/02S6R	. . . .	[N: Grating lines having particular arrangements] [N1109]
H03H9/02S6R1	. . . . .	[N: Arched grating lines] [N1109]
H03H9/02S6R1U	. . . . .	[N: U-shaped grating lines] [N1109]
H03H9/02S6R2	. . . . .	[N: Shifted grating lines] [N1109]
H03H9/02S6R3	. . . . .	[N: Tilted, fan shaped or slanted grating lines] [N1109]
H03H9/02S6R4	. . . . .	[N: Comb like grating lines] [N1109]
H03H9/02S6R4B	. . . . .	[N: Bilateral comb like grating lines] [N1109]
H03H9/02S6R5	. . . . .	[N: Intra-transducers grating lines] [N1109]
H03H9/02S6R5D	. . . . .	[N: Dog-legged reflectors] [N1109]
H03H9/02S6R5M	. . . . .	[N: Meandering floating or grounded grating lines] [N1109]
H03H9/02S6R6	. . . . .	[N: Left and right side electrically coupled reflectors] [N1109]
H03H9/02S6R7	. . . . .	[N: Reflector banks] [N1109]
H03H9/02S6S	. . . .	[N: Continuous surface reflective arrays] [N1109]
H03H9/02S6S1	. . . . .	[N: having wave guide like arrangements] [N1109]
H03H9/02S6T	. . . .	[N: Multi-strip couplers as track changers] [N1109]
H03H9/02S6W	. . . .	[N: Weighted reflective structures] [N1109]
H03H9/02S6W1	. . . . .	[N: Chirped reflective or coupling arrays] [N1109]
H03H9/02S8	. . .	[N: Means for compensation or elimination of undesirable effects]
H03H9/02S8A	. . . .	[N: of adherence] [N1204]

H03H9/02S8B	. . . .	[N: of temperature influence ( <a href="#">cut angles H03H9/02S2</a> )]
H03H9/02S8C	. . . .	[N: of reflections ( <a href="#">H03H9/64D</a> takes precedence)] [C1112]
H03H9/02S8C1	. . . . .	[N: of triple transit echo]
H03H9/02S8D	. . . .	[N: of wave front distortion]
H03H9/02S8E	. . . .	[N: of bulk wave excitation and reflections]
H03H9/02S8F	. . . .	[N: of direct coupling between input and output transducers]
H03H9/02S8G	. . . .	[N: of diffraction of wave beam]
H03H9/02S8H	. . . .	[N: of influence of mass loading]
H03H9/02S8J	. . . .	[N: of strain or mechanical damage, e.g. strain due to bending influence] [C1207]
H03H9/02S8K	. . . .	[N: Measures for separating propagation paths on substrate]
H03H9/02S8L	. . . .	[N: Measures for shielding against electromagnetic fields ( <a href="#">shielding of electrical components in general H05K9/00</a> )]
H03H9/02S8M	. . . .	[N: Measures for preventing electric discharge due to pyroelectricity]
H03H9/02S8N	. . . .	[N: of ageing changes of characteristics, e.g. electro-acousto-migration] [C0508]
H03H9/02S8P	. . . .	[N: of chemical damage, e.g. corrosion] [N1204]
H03H9/02S8T	. . . .	[N: of ohmic loss] [N1204]
H03H9/02S8U	. . . .	[N: of parasitic capacitance] [N1204]
H03H9/02S10	. . . .	[N: Surface acoustic wave [SAW] devices having both acoustic and non-acoustic properties] [C1207]
H03H9/02S10B	. . . .	[N: with optical devices ( <a href="#">mounting in enclosures H03H9/12</a> )]
H03H9/02S10C	. . . .	[N: with semiconductor devices]
H03H9/02S12	. . . .	[N: Protection measures against damaging]
H03H9/02S16	. . . .	[N: Details of bus bars, contact pads or other electrical connections for finger electrodes] [N0508]
H03H9/05	. .	Holders; Supports
H03H9/05A	. . . .	[N: for bulk acoustic wave devices] [N1008]
H03H9/05A1	. . . .	[N: consisting of adhesive elements] [N1008]
H03H9/05A2	. . . .	[N: consisting of mounting pads or bumps] [N1008]
H03H9/05A2A	. . . . .	[N: for cantilever ( <a href="#">H03H9/10B1C</a> takes precedence)] [N1008]
H03H9/05A2B	. . . . .	[N: for flip-chip mounting] [N1008]
H03H9/05A3	. . . .	[N: consisting of clips] [N1008]
H03H9/05A4	. . . .	[N: consisting of wire] [N1008]
H03H9/05B	. . . .	[N: Constructional combinations of supports or holders with electromechanical or other electronic elements]
H03H9/05B1	. . . .	[N: consisting of a lateral arrangement ( <a href="#">H03H9/05B3</a> takes precedence)] [N1008]
H03H9/05B2	. . . .	[N: consisting of a vertical arrangement ( <a href="#">H03H9/05B3</a> takes precedence)] [N1008]
H03H9/05B2A	. . . . .	[N: the device and the other elements being mounted on opposite sides of a common substrate] [N1008]
H03H9/05B2B	. . . . .	[N: the other elements being buried in the substrate] [N1008]
H03H9/05B2C	. . . . .	[N: consisting of a multilayered structure] [N1008]
H03H9/05B3	. . . .	[N: for duplexers] [N1008]

H03H9/05B3B	. . . . .	[N: including bulk acoustic wave [BAW] devices] [N1008] [C1207]
H03H9/05B3S	. . . . .	[N: including surface acoustic wave [SAW] devices] [N1008] [C1207]
H03H9/05C	. . . . .	[N: for surface acoustic wave devices]
H03H9/05C1	. . . . .	[N: consisting of an adhesive layer] [N1008]
H03H9/05C2	. . . . .	[N: consisting of mounting pads or bumps] [N1008]
H03H9/05D	. . . . .	[N: the holder support and resonator being formed in one body]
H03H9/08	. . . . .	Holders with means for regulating temperature
H03H9/09	. . . . .	Elastic or damping supports
H03H9/10	. . . . .	Mounting in enclosures [N: (constructional combinations of enclosure with electromechanical and other electronic elements <a href="#">H03H9/05B</a> )]
H03H9/10B	. . . . .	[N: for bulk acoustic wave [BAW] devices] [N1008] [C1207]
H03H9/10B1	. . . . .	[N: the enclosure being defined by a frame built on a substrate and a cap, the frame having no mechanical contact with the BAW device] [N1008] [C1207]
H03H9/10B1C	. . . . .	[N: the BAW device being of the cantilever type] [N1008] [C1207]
H03H9/10B1T	. . . . .	[N: the BAW device being held between spring terminals] [N1008] [C1207]
H03H9/10B2	. . . . .	[N: the enclosure being defined by two sealing substrates sandwiching the piezoelectric layer of the BAW device] [N1008] [C1207]
H03H9/10B3	. . . . .	[N: the enclosure being defined by a housing formed by a cavity in a resin] [N1008]
H03H9/10B4	. . . . .	[N: the enclosure being defined by a cover cap mounted on an element forming part of the BAW device] [N1008] [C1207]
H03H9/10M	. . . . .	[N: for micro-electro-mechanical devices] [N0303]
H03H9/10S	. . . . .	[N: for surface acoustic wave [SAW] devices] [N0508] [C1207]
H03H9/10S1	. . . . .	[N: the enclosure being defined by a frame built on a substrate and a cap, the frame having no mechanical contact with the SAW device ] [N0508] [C1207]
H03H9/10S2	. . . . .	[N: the enclosure being defined by a foil covering the non-active sides of the SAW device] [N0508] [C1207]
H03H9/10S3	. . . . .	[N: the enclosure being defined by a non-uniform sealing mass covering the non-active sides of the BAW device] [N0508] [C1207]
H03H9/10S4	. . . . .	[N: 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] [N1008] [C1207]
H03H9/12	. . . . .	for networks with interaction of optical and acoustic waves
H03H9/125	. . . . .	Driving means, e.g. electrodes, coils
H03H9/13	. . . . .	for networks consisting of piezo-electric or electrostrictive materials ( <a href="#">H03H9/145</a> takes precedence)
H03H9/13M	. . . . .	[N: consisting of a multilayered structure] [N1204]
H03H9/13S	. . . . .	[N: characterized by a particular shape] [N1204]
H03H9/13T	. . . . .	[N: for electromechanical delay lines or filters] [N9612]
H03H9/135	. . . . .	for networks consisting of magnetostrictive materials ( <a href="#">H03H9/145</a> takes precedence)
H03H9/145	. . . . .	for networks using surface acoustic waves
H03H9/145B	. . . . .	[N: Surface acoustic wave [SAW] transducers for a particular purpose] [C1207]

H03H9/145B1	. . . . .	[N: Unidirectional SAW transducers] [C1207]
H03H9/145B3	. . . . .	[N: Polyphase SAW] transducers] [C1207]
H03H9/145B5	. . . . .	[N: SAW transducers for non-piezoelectric substrates] [C1207]
H03H9/145B6	. . . . .	[N: Broad band transducers]
H03H9/145C	. . . . .	[N: Means for weighting]
H03H9/145C1	. . . . .	[N: by finger overlap length, apodisation]
H03H9/145C2	. . . . .	[N: Capacitive tap weighted transducers]
H03H9/145C3	. . . . .	[N: Finger withdrawal]
H03H9/145C4	. . . . .	[N: Distributed tap]
H03H9/145C4B	. . . . .	[N: Series weighting; Transverse weighting]
H03H9/145C4D	. . . . .	[N: Position weighting]
H03H9/145D	. . . . .	[N: Formation]
H03H9/145D2	. . . . .	[N: Multilayer finger or busbar electrode] [N1112]
H03H9/145E	. . . . .	[N: Transducers of particular shape or position ( <a href="#">weighting H03H9/145C</a> )]
H03H9/145E1	. . . . .	[N: Fan shaped; Tilted; Shifted; Slanted; Tapered; Arched; Stepped finger transducers]
H03H9/145E2	. . . . .	[N: constituted of N parallel or series transducers]
H03H9/145E3	. . . . .	[N: comprising split fingers]
H03H9/145E4	. . . . .	[N: Chirped transducers ( <a href="#">H03H9/64D</a> takes precedence)] [C1112]
H03H9/145E6	. . . . .	[N: Slanted, tapered or fan shaped transducers ( <a href="#">H03H9/145E7</a> , <a href="#">H03H9/145E8</a> take precedence)] [N1109] [C1207]
H03H9/145E7	. . . . .	[N: Arched, curved or ring shaped transducers] [N1109]
H03H9/145E8	. . . . .	[N: Shifted fingers transducers] [N1109]
H03H9/145E8B	. . . . .	[N: Stepped-fan shaped transducers] [N1109]
H03H9/145E9	. . . . .	[N: Transducers having different finger widths] [N1109]
H03H9/145E10	. . . . .	[N: Arrow type transducers] [N1109]
H03H9/145E11	. . . . .	[N: Transducers whereby only the last fingers have different characteristics with respect to the other fingers, e.g. different shape, thickness or material, split finger] [N1109]
H03H9/145E11F	. . . . .	[N: the last fingers having a different shape] [N1109]
H03H9/145E11P	. . . . .	[N: the last fingers having a different pitch] [N1109]
H03H9/145E11S	. . . . .	[N: the last fingers being split] [N1109]
H03H9/145E12	. . . . .	[N: Horizontally-split transducers] [N1109]
H03H9/145E13	. . . . .	[N: Vertically-split transducers] [N1109]
H03H9/145E14	. . . . .	[N: Plan-rotated or plan-tilted transducers] [N1109]
H03H9/145F	. . . . .	[N: Matching SAW transducers to external electrical circuits]
H03H9/15	. . . . .	Constructional features of resonators consisting of piezo-electric or electrostrictive material ( <a href="#">H03H9/25</a> takes precedence)
H03H9/17	. . . . .	having a single resonator ( <a href="#">crystal tuning forks H03H9/21</a> )
H03H9/17A	. . . . .	[N: implemented with thin-film techniques, i.e. of the film bulk acoustic resonator (FBAR) type] [N0508]
H03H9/17A1	. . . . .	[N: Means for mounting on a substrate, i.e. means constituting the material interface confining the waves to a volume] [N0508] [C0605]
H03H9/17A1A	. . . . .	[N: Air-gaps] [N0508]

- H03H9/17A1B . . . . . [N: Membranes] [N0508]
- H03H9/17A1C . . . . . [N: Acoustic mirrors] [N0508]
- H03H9/17C . . . [N: consisting of ceramic material (H03H9/17D, H03H9/17E take precedence)] [C0605]
- H03H9/17D . . . [N: of the energy-trap type] [N0508]
- H03H9/17E . . . [N: of a laminated structure of multiple piezoelectric layers with inner electrodes] [N0605]
- H03H9/19 . . . consisting of quartz
- H03H9/205 . . having multiple resonators (crystal tuning forks [H03H9/21](#))
- H03H9/21 . . Crystal tuning forks
- H03H9/215 . . . consisting of quartz
- H03H9/22 . Constructional features of resonators consisting of magnetostrictive material
- H03H9/24 . Constructional features of resonators of material which is not piezo-electric, electrostrictive, or magnetostrictive
- H03H9/24M . . [N: of micro-electro-mechanical resonators] [N0303]
- H03H9/24M2 . . . [N: in combination with other electronic elements] [N0303]
- H03H9/24M4 . . . [N: Ring resonators] [N0502]
- H03H9/24M6 . . . [N: Disk resonators] [N0502]
- H03H9/24M8 . . . [N: Beam resonators ([H03H9/24M10](#) takes precedence)] [N0502]
- H03H9/24M8B . . . . [N: Free-free beam resonators] [N0502]
- H03H9/24M8D . . . . [N: Clamped-free beam resonators] [N0502]
- H03H9/24M8F . . . . [N: Clamped-clamped beam resonators] [N0502]
- H03H9/24M10 . . . [N: Tuning fork resonators] [N0502]
- H03H9/24M10B . . . . [N: Double-Ended Tuning Fork (DETF) resonators] [N0502]
- H03H9/24M10D . . . . [N: Single-Ended Tuning Fork resonators] [N0502]
- H03H9/24M10D2 . . . . . [N: with two fork tines, e.g. Y-beam cantilever] [N0502]
- H03H9/24M10D4 . . . . . [N: with more than two fork tines] [N0502]
- H03H9/24M10F . . . . . [N: H-shaped, i.e. two tuning forks with common base] [N0502]
- H03H9/25 . Constructional features of resonators using surface acoustic waves [N: (devices for manipulating acoustic surface waves in general [G10K11/36](#))]
- H03H9/30 . Time-delay networks
- H03H9/36 . . with non-adjustable delay time ([H03H9/40](#), [H03H9/42](#) take precedence)
- H03H9/38 . . with adjustable delay time ([H03H9/40](#), [H03H9/42](#) take precedence)
- H03H9/40 . . Frequency dependent delay lines, e.g. dispersive delay lines ([H03H9/42](#) takes precedence)
- H03H9/42 . . using surface acoustic waves [N: (devices for manipulating acoustic surface waves in general [G10K11/36](#))]
- H03H9/42A . . . [N: with adjustable delay time]
- H03H9/42B . . . [N: Magneto-elastic surface waves]
- H03H9/44 . . . Frequency dependent delay lines, e.g. dispersive delay lines
- H03H9/46 . Filters (multiple-port electromechanical filters [H03H9/70](#))

H03H9/46M	. .	[N: Micro-electro-mechanical filters] [N0303]
H03H9/46M2	. . .	[N: in combination with other electronic elements] [N0303]
H03H9/46M4	. . .	[N: Post-fabrication trimming of parameters, e.g. center frequency] [N0303]
H03H9/48	. .	Coupling means therefor
H03H9/48M	. . .	[N: for micro-electro-mechanical filters] [N0303]
H03H9/50	. . .	Mechanical coupling means
H03H9/50M	. . . .	[N: for micro-electro-mechanical filters] [N0303]
H03H9/52	. . .	Electric coupling means
H03H9/52M	. . . .	[N: for micro-electro-mechanical filters] [N0303]
H03H9/54	. .	comprising resonators of piezo-electric or electrostrictive material ( <a href="#">H03H9/64</a> takes precedence)
H03H9/54A	. . .	[N: including passive elements (H03H9/54B takes precedence)] [C0611]
H03H9/54B	. . .	[N: including active elements] [N0611]
H03H9/54N	. . .	[N: Notch filters, e.g. notch BAW or thin film resonator filters ] [N1112] [C1207]
H03H9/56	. . .	Monolithic crystal filters
H03H9/56C	. . . .	[N: comprising a ceramic piezoelectric layer] [N0611]
H03H9/56F	. . . .	[N: implemented with thin-film techniques] [N0611]
H03H9/56P	. . . .	[N: Electric coupling means therefor (H03H9/00U2 takes precedence)] [N0611]
H03H9/56P1	. . . . .	[N: consisting of a ladder configuration] [N0611]
H03H9/58	. . .	Multiple crystal filters
H03H9/58C	. . . .	[N: comprising ceramic piezoelectric layers] [N0611]
H03H9/58F	. . . .	[N: implemented with thin-film techniques] [N0508]
H03H9/58F2	. . . . .	[N: comprising a plurality of piezoelectric layers acoustically coupled] [N0508]
H03H9/58F2C	. . . . .	[N: Coupled Resonator Filters (CFR)] [N0508]
H03H9/58F2S	. . . . .	[N: Stacked Crystal Filters (SCF)] [N0508]
H03H9/58F4	. . . . .	[N: Means for mounting to a substrate, i.e. means constituting the material interface confining the waves to a volume] [N0508]
H03H9/58F4A	. . . . .	[N: Air-gaps] [N0508]
H03H9/58F4B	. . . . .	[N: Membranes] [N0508]
H03H9/58F4C	. . . . .	[N: Acoustic mirrors] [N0508]
H03H9/60	. . . .	Electric coupling means therefor [N: (H03H9/00U2 takes precedence)] [C0611]
H03H9/60L	. . . . .	[N: consisting of a ladder configuration] [N0611]
H03H9/62	. .	comprising resonators of magnetostrictive material ( <a href="#">H03H9/64</a> takes precedence)
H03H9/64	. .	using surface acoustic waves
H03H9/64C	. . .	[N: Programmable filters]
H03H9/64D	. . .	[N: Filters characterised by a particular frequency characteristic]
H03H9/64D1	. . . .	[N: SAW notch filters]
H03H9/64D2	. . . .	[N: SAW comb filters]
H03H9/64D3	. . . .	[N: SAW matched filters, e.g. surface acoustic wave compressors, chirped or coded surface acoustic wave filters] [N1112] [C1207]
H03H9/64D3T	. . . . .	[N: SAW transducers details for remote interrogation systems, e.g.

- surface acoustic wave transducers details for ID-tags ([remote interrogation systems per se G06K7/10A, G01S13/74](#)) [N1112] [C1207]
- H03H9/64E . . . [N: Means for obtaining a particular transfer characteristic]
- H03H9/64E1 . . . . [N: Combinations of the characteristics of different transducers]
- H03H9/64E2 . . . . [N: the transfer characteristic being determined by reflective or coupling array characteristics]
- H03H9/64E3 . . . . [N: Coupled resonator filters]
- H03H9/64E3A . . . . . [N: having one acoustic track only] [N0508]
- H03H9/64E3B . . . . . [N: having two acoustic tracks] [N0508]
- H03H9/64E3B1 . . . . . [N: being acoustically coupled] [N0508]
- H03H9/64E3B1A . . . . . {7 dots} [N: by floating multistrip couplers ([H03H9/64E3B1B, H03H9/64E3B1C](#) take precedence)] [N0508]
- H03H9/64E3B1B . . . . . {7 dots} [N: by grating reflectors overlapping both tracks] [N0508]
- H03H9/64E3B1C . . . . . {7 dots} [N: by at least an interdigital transducer overlapping both tracks] [N0508]
- H03H9/64E3B2 . . . . . [N: being electrically coupled] [N0508]
- H03H9/64E3B2A . . . . . {7 dots} [N: via one connecting electrode] [N0508]
- H03H9/64E3B2A1 . . . . . {8 dots} [N: the tracks being electrically cascaded] [N0508]
- H03H9/64E3B2A1A . . . . . {9 dots} [N: each track containing more than two transducers] [N0508]
- H03H9/64E3B2B . . . . . {7 dots} [N: via two connecting electrodes] [N0508]
- H03H9/64E3B2B1 . . . . . {8 dots} [N: the electrodes being electrically interconnected] [N0508]
- H03H9/64E3B2B2 . . . . . {8 dots} [N: the tracks being electrically parallel] [N0508]
- H03H9/64E3C . . . . . [N: Capacitively coupled SAW resonator filters] [N1112] [C1207]
- H03H9/64E3L . . . . . [N: Ladder SAW filters] [N1112] [C1207]
- H03H9/64E3R . . . . . [N: having crossing or intersecting acoustic tracks, e.g. intersection in a perpendicular or diagonal orientation] [N1112]
- H03H9/64F . . . . [N: Compensation of undesirable effects]
- H03H9/64F1 . . . . [N: Side lobe suppression]
- H03H9/64F2 . . . . [N: Reducing ripple in transfer characteristic]
- H03H9/66 . . . Phase shifters
- H03H9/68 . . . using surface acoustic waves
- H03H9/70 . . . Multiple-port networks for connecting several sources or loads, working on different frequencies or frequency bands, to a common load or source
- H03H9/70B . . . [N: Networks using bulk acoustic wave devices] [N0508]
- H03H9/70B1 . . . . [N: Duplexers] [N0508]
- H03H9/72 . . . Networks using surface acoustic waves
- H03H9/72D . . . . [N: Duplexers] [N0508]
- H03H9/74 . . . 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 H03H9/66](#))
- H03H9/76 . . . Networks using surface acoustic waves

**H03H11/00****Networks using active elements****[N: WARNING**

[N1207]Group [H03H11/11](#) does not correspond to former or current IPC groups.  
Concordance ECLA : IPC for these groups is as follows: - [H03H11/11](#) - [H03H11/04](#)  
]

- H03H11/02 . Multiple-port networks
- H03H11/02C . . [N: using current conveyors] [N1204]
- H03H11/04 . . Frequency selective two-port networks
- H03H11/04A . . . [N: Non-linear filters]
- H03H11/04B . . . [N: using positive impedance converters ([H03H11/08](#) takes precedence)]
- H03H11/04C . . . [N: using transconductance amplifiers, e.g. gmC filters] [C1207]
- H03H11/04C1 . . . . [N: Filters using a single transconductance amplifier; Filters derived from a single transconductor filter, e.g. by element substitution, cascading, parallel connection ([H03H11/04C2](#) to [H03H11/C10](#) take precedence)] [N1204]
- H03H11/04C2 . . . . [N: Two integrator loop filters ([H03H11/04C4](#) takes precedence)] [N1204]
- H03H11/04C2T . . . . . [N: Tow-Thomas biquad] [N1204]
- H03H11/04C3 . . . . [N: Simulation of ladder networks] [N1204]
- H03H11/04C3L . . . . . [N: Leapfrog structures] [N1204]
- H03H11/04C4 . . . . [N: Multiple integrator loop feedback filters] [N1204]
- H03H11/04C5 . . . . [N: Current mode filters] [N1204]
- H03H11/04C6 . . . . [N: Filters combining transconductance amplifiers with other active elements, e.g. operational amplifiers, transistors, voltage conveyors] [N1204]
- H03H11/04C10 . . . . [N: Current or voltage controlled filters] [N1204]
- H03H11/06 . . . comprising means for compensation of loss
- H03H11/08 . . . using gyrators
- H03H11/10 . . . using negative impedance converters ([H03H11/08](#) takes precedence)
- H03H11/11 . . . [N: using current conveyors] [N1204]
- H03H11/12 . . . using amplifiers with feedback ([N: [H03H11/04C](#)], [H03H11/08](#), [H03H11/10](#) take precedence)
- H03H11/12A . . . . [N: Distributed RC filters]
- H03H11/12B . . . . [N: comprising an electromechanical resonator]
- H03H11/12C . . . . [N: using transistor amplifiers ([H03H11/12A](#) takes precedence; parallel-T filters [H03H11/12G](#))]
- H03H11/12D . . . . [N: using a plurality of operational amplifiers ([H03H11/12A](#) takes precedence; parallel-T filters [H03H11/12G](#))]
- H03H11/12D1 . . . . . [N: Theory; Synthesis ([H03H11/12D2](#) to [H03H11/12D7](#) take precedence)]
- H03H11/12D2 . . . . . [N: Filters using operational amplifier poles]
- H03H11/12D3 . . . . . [N: Modifications to reduce sensitivity]
- H03H11/12D4 . . . . . [N: Modifications to reduce detrimental influences of amplifier imperfections, e.g. limited gain-bandwidth product, limited input impedance]
- H03H11/12D5 . . . . . [N: Modifications to reduce influence of variations of temperature]
- H03H11/12D6 . . . . . [N: Simulation of ladder networks]

H03H11/12D6A	. . . . .	[N: Leapfrog structures] [N1204]
		[N: <b>WARNING</b> Not complete, pending reorganisation, see provisionally also <a href="#">H03H11/12D</a> to <a href="#">H03H11/12D7</a> ]
H03H11/12D7	. . . . .	[N: Two integrator-loop-filters]
H03H11/12D7A	. . . . .	[N: Tow-Thomas biquad] [N1204]
		[N: <b>WARNING</b> Not complete, pending reorganisation, see provisionally also <a href="#">H03H11/12D</a> to <a href="#">H03H11/12D7</a> ]
H03H11/12E	. . . . .	[N: using a single operational amplifier ( <a href="#">H03H11/12A</a> takes precedence; parallel-T filters <a href="#">H03H11/12G</a> )]
H03H11/12E1	. . . . .	[N: Synthesis ( <a href="#">H03H11/12E2</a> to <a href="#">H03H11/12E5</a> take precedence)]
H03H11/12E2	. . . . .	[N: Filters using the operational amplifier pole]
H03H11/12E3	. . . . .	[N: Modifications to reduce sensitivity]
H03H11/12E4	. . . . .	[N: Modifications to reduce detrimental influences of amplifier imperfections, e.g. limited gain-bandwidth product, limited input impedance]
H03H11/12E5	. . . . .	[N: Modifications to reduce influence of variations of temperature]
H03H11/12E6	. . . . .	[N: Sallen-Key biquad] [N1204]
		[N: <b>WARNING</b> Not complete, pending reorganisation, see provisionally also <a href="#">H03H11/12E</a> to <a href="#">H03H11/12E5</a> ]
H03H11/12F	. . . . .	[N: Current or voltage controlled filters]
H03H11/12G	. . . . .	[N: Parallel-T filters]
H03H11/14	. . . . .	using electro-optic devices
H03H11/16	. . . . .	Networks for phase shifting
H03H11/18	. . . . .	Two-port phase shifters providing a predetermined phase shift, e.g. "all-pass" filters
H03H11/20	. . . . .	Two-port phase shifters providing an adjustable phase shift
H03H11/22	. . . . .	providing two or more phase shifted output signals, e.g. n-phase output
H03H11/24	. . . . .	Frequency-independent attenuators
H03H11/24A	. . . . .	[N: using field-effect transistor]
H03H11/26	. . . . .	Time-delay networks ( <a href="#">analogue shift registers G11C27/04</a> )
H03H11/26A	. . . . .	[N: with adjustable delay]
H03H11/28	. . . . .	Impedance matching networks
H03H11/30	. . . . .	Automatic matching of source impedance to load impedance
H03H11/32	. . . . .	Balance-unbalance networks
H03H11/34	. . . . .	Networks for connecting several sources or loads working on different frequencies or frequency bands, to a common load or source ( <a href="#">for use in multiplex transmission systems H04J1/00</a> )
H03H11/34C	. . . . .	[N: particularly adapted for use in common antenna systems]
H03H11/34D	. . . . .	[N: Duplexers] [N0508]

- H03H11/34R . . . [N: particularly adapted as input circuit for receivers]
- H03H11/34T . . . [N: particularly adapted as coupling circuit between transmitters and antenna]
- H03H11/36 . . 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 H03H11/22](#))
- H03H11/36C . . . [N: particularly adapted for use in common antenna systems]
- H03H11/36R . . . [N: particularly adapted as input circuit for receivers]
- H03H11/36T . . . [N: particularly adapted as coupling circuit between transmitters and antenna]
- H03H11/38 . . One-way transmission networks, i.e. unilines
- H03H11/40 . . Impedance converters
- H03H11/40A . . . [N: Positive impedance converters ([H03H11/42 takes precedence; used in frequency selective networks H03H11/04B](#))]
- H03H11/42 . . . Gyrators ([used in frequency selective networks H03H11/08](#))
- H03H11/44 . . . Negative impedance converters ([H03H11/42 takes precedence; used in frequency selective networks H03H11/10](#))
  
- H03H11/46 . One-port networks
- H03H11/48 . . simulating reactances
- H03H11/48A . . . [N: Simulating capacitances] [N1204]  
  - [N: **WARNING**
  - Not complete, pending reorganisation, see provisionally also [H03H11/48](#) to [H03H11/52](#)
  - ]
- H03H11/48B . . . [N: Simulating capacitance multipliers] [N1204]  
  - [N: **WARNING**
  - Not complete, pending reorganisation, see provisionally also [H03H11/48](#) to [H03H11/52](#)
  - ]
- H03H11/48C . . . [N: Simulating inductances using operational amplifiers] [N1204]  
  - [N: **WARNING**
  - Not complete, pending reorganisation, see provisionally also [H03H11/48](#) to [H03H11/52](#)
  - ]
- H03H11/48D . . . [N: Simulating inductances using transconductance amplifiers] [N1204]  
  - [N: **WARNING**
  - Not complete, pending reorganisation, see provisionally also [H03H11/48](#) to [H03H11/52](#)
  - ]
- H03H11/48E . . . [N: Simulating inductances using current conveyors] [N1204]  
  - [N: **WARNING**
  - Not complete, pending reorganisation, see provisionally also [H03H11/48](#) to [H03H11/52](#)
  - ]
- H03H11/50 . . . using gyrators
- H03H11/52 . . simulating negative resistances
- H03H11/52A . . . [N: Simulating frequency dependent negative resistance [FDNR]] [N1204]

- [N: **WARNING**  
Not complete, pending reorganisation, see provisionally also [H03H11/52](#)  
]
- H03H11/53 . . [N: simulating resistances; simulating resistance multipliers] [N1204]
- [N: **WARNING**  
Not complete, pending reorganisation, see provisionally also [H03H11/48](#) to  
[H03H11/52](#)  
]
- H03H11/54 . Modifications of networks to reduce influence of variations of temperature
- H03H15/00** **Transversal filters** (electromechanical filters [H03H9/46](#), [H03H9/70](#))
- H03H15/02 . using analogue shift registers
- H03H15/02A . . [N: with parallel-input configuration]
- H03H17/00** **Networks using digital techniques**
- H03H17/00A . [N: Time-delay networks]
- H03H17/00A2 . . [N: Realizing a fractional delay] [N1109]
- H03H17/00A2F . . . [N: by means of a non-recursive filter] [N1109]
- H03H17/00A2H . . . [N: by means of a recursive filter] [N1109]
- H03H17/00B . [N: Impedance matching networks]
- H03H17/00C . [N: Attenuators]
- H03H17/00D . [N: R, L, C, simulating networks]
- H03H17/02 . Frequency selective networks [N: (digital computers for complex mathematical operations [G06F17/10](#))]
- H03H17/02A . . [N: Wave digital filters]
- H03H17/02B . . [N: Two or more dimensional filters; Filters for complex signals (multidimensional convolutions [G06F17/15M](#))]
- H03H17/02C . . [N: using specific transformation algorithms, e.g. WALSH functions, Fermat transforms, Mersenne transforms, polynomial transforms, Hilbert transforms (correlation computation [G06F17/15P](#))]
- H03H17/02C1 . . . [N: Frequency domain filters using Fourier transforms]
- H03H17/02C2 . . . [N: Quefrequency domain filters]
- H03H17/02C3 . . . [N: Number theoretic transforms]
- H03H17/02D . . [N: Compensation of undesirable effects, e.g. quantisation noise, overflow (stability problems [H03H17/04D](#))]
- H03H17/02E . . [N: Computation saving measures; Accelerating measures (computations per se [G06F](#))]
- H03H17/02E1 . . . [N: Measures concerning the multipliers]
- H03H17/02E1A . . . . [N: comprising look-up tables]

H03H17/02E2	. . .	[N: Measures concerning the coefficients]
H03H17/02E2A	. . . .	[N: reducing the number of taps]
H03H17/02E2B	. . . .	[N: reducing the wordlength, the possible values of coefficients]
H03H17/02E3	. . .	[N: Measures concerning the signal representation]
H03H17/02E3A	. . . .	[N: reducing the wordlength of signals]
H03H17/02E3B	. . . .	[N: using codes]
H03H17/02E4	. . .	[N: Measures concerning the arithmetic used ( <b>performing computations G06F7/60</b> )]
H03H17/02E4A	. . . .	[N: Signed digit arithmetic]
H03H17/02E4B	. . . .	[N: Distributed arithmetic]
H03H17/02E4C	. . . .	[N: Residue number arithmetic]
H03H17/02F	. .	[N: Filters characterised by a particular frequency response or filtering method]
H03H17/02F1	. . .	[N: Notch filters]
H03H17/02F2	. . .	[N: Comb filters]
H03H17/02F3	. . .	[N: Elliptic filters]
H03H17/02F4	. . .	[N: Matched filters]
H03H17/02F5	. . .	[N: Filters based on statistics ( <b>adaptive filters H03H21/00B5B</b> )]
H03H17/02F5A	. . . .	[N: KALMAN filters]
H03H17/02F5B	. . . .	[N: ARMA filters]
H03H17/02F6	. . .	[N: Averaging filters]
H03H17/02F7	. . .	[N: Non linear filters]
H03H17/02F7A	. . . .	[N: Rank order filters]
H03H17/02F8	. . .	[N: Filter sets with mutual related characteristics]
H03H17/02F8A	. . . .	[N: Filter banks]
H03H17/02F8A2	. . . . .	[N: comprising non-recursive filters] [N1109]
H03H17/02F8A4	. . . . .	[N: comprising recursive filters] [N1109]
H03H17/02F8B	. . . .	[N: Complementary filters; Phase complementary filters]
H03H17/02F8C	. . . .	[N: Quadrature mirror filters]
H03H17/02F8D	. . . .	[N: Polyphase filters]
H03H17/02F8D2	. . . . .	[N: comprising non-recursive filters] [N1109]
H03H17/02F8D2B	. . . . .	[N: having two phases] [N1109]
H03H17/02F8D4	. . . . .	[N: comprising recursive filters] [N1109]
H03H17/02F8D4B	. . . . .	[N: having two phases] [N1109]
H03H17/02F9	. . .	[N: Polynomial filters] [N1109]
H03H17/02F10	. . .	[N: Sinc or gaussian filters ( <b>H03H17/06C4K takes precedence</b> )] [N1109]
H03H17/02G	. .	[N: Filters characterised by the filter structure ( <b>H03H17/02B, H03H17/02D to H03H17/02F take precedence</b> )]
H03H17/02G1	. . .	[N: Ladder or lattice filters]
H03H17/02G2	. . .	[N: Combinations of filter structures]
H03H17/02G2A	. . . .	[N: Recursive, non-recursive, ladder, lattice structures]
H03H17/02G2B	. . . .	[N: Digital and active filter structures]
H03H17/02G2C	. . . .	[N: Digital and sampled data filters]
H03H17/02G3	. . .	[N: Time multiplexed filters; Time sharing filters]

- H03H17/02H . . [N: Variable filters; Programmable filters]
- H03H17/04 . . Recursive filters
- H03H17/04A . . . [N: comprising a ROM addressed by the input and output data signals]
- H03H17/04B . . . [N: using DELTA modulation]
- H03H17/04C . . . [N: with input-sampling frequency and output-delivery frequency which differ, e.g. extrapolation; Anti-aliasing] [C1109]
- H03H17/04C2 . . . . [N: the input and output signals being derived from two separate clocks, i.e. asynchronous sample rate conversion] [N1109]
- H03H17/04C4 . . . . [N: characterized by the ratio between the input-sampling and output-delivery frequencies] [N1109]
- H03H17/04C4A . . . . . [N: the ratio being arbitrary or irrational] [N1109]
- H03H17/04C4H . . . . . [N: the ratio being integer] [N1109]
- H03H17/04C4H1 . . . . . [N: where the output-delivery frequency is higher than the input sampling frequency, i.e. interpolation] [N1109]
- H03H17/04C4H2 . . . . . [N: where the output-delivery frequency is lower than the input sampling frequency, i.e. decimation] [N1109]
- H03H17/04C4R . . . . . [N: the ratio being rational] [N1109]
- H03H17/04D . . . [N: Quantisation; Rounding; Truncation; Overflow oscillations or limit cycles eliminating measures]
- H03H17/06 . . Non-recursive filters
- H03H17/06A . . . [N: comprising a ROM addressed by the input data signals]
- H03H17/06B . . . [N: using Delta-modulation]
- H03H17/06C . . . [N: with input-sampling frequency and output-delivery frequency which differ, e.g. extrapolation; Anti-aliasing] [C1109]
- H03H17/06C2 . . . . [N: the input and output signals being derived from two separate clocks, i.e. asynchronous sample rate conversion] [N1109]
- H03H17/06C4 . . . . [N: characterized by the ratio between the input-sampling and output-delivery frequencies] [N1109]
- H03H17/06C4A . . . . . [N: the ratio being arbitrary or irrational] [N1109]
- H03H17/06C4H . . . . . [N: the ratio being integer] [N1109]
- H03H17/06C4H1 . . . . . [N: where the output-delivery frequency is higher than the input sampling frequency, i.e. interpolation] [N1109]
- H03H17/06C4H2 . . . . . [N: where the output-delivery frequency is lower than the input sampling frequency, i.e. decimation] [N1109]
- H03H17/06C4K . . . . . [N: Cascaded integrator-comb [CIC] filters] [N1109]
- H03H17/06C4R . . . . . [N: the ratio being rational] [N1109]
- H03H17/08 . Networks for phase shifting

### **H03H19/00 Networks using time-varying elements, e.g. N-path filters**

- H03H19/00A . [N: N-path filters]
- H03H19/00B . [N: Switched capacitor networks]
- H03H19/00B1 . . [N: simulating one-port networks]
- H03H19/00D . [N: with variable switch closing time]

**H03H21/00****Adaptive networks**

- H03H21/00A . [N: Analogue adaptive filters]
- H03H21/00A1 . . [N: comprising CCD devices]
- H03H21/00A2 . . [N: comprising SAW devices]
- H03H21/00A3 . . [N: comprising switched capacitor [SC] devices] [C1207]
  
- H03H21/00B . [N: Digital adaptive filters]
- H03H21/00B1 . . [N: Lattice filters]
- H03H21/00B2 . . [N: Non linear filters]
- H03H21/00B3 . . [N: Matched filters]
- H03H21/00B4 . . [N: Filters with a particular frequency response ([H03H21/00B1](#) to [H03H21/00B3](#) take precedence)]
- H03H21/00B4A . . . [N: Notch filters]
- H03H21/00B4B . . . [N: Comb filters]
- H03H21/00B5 . . [N: Particular filtering methods]
- H03H21/00B5A . . . [N: filtering in the frequency domain]
- H03H21/00B5B . . . [N: based on statistics]
- H03H21/00B5B1 . . . . [N: KALMAN filters]
- H03H21/00B5B2 . . . . [N: ARMA filters]
- H03H21/00B6 . . [N: Adaptive algorithms]
- H03H21/00B7 . . [N: Means or methods for compensation of undesirable effects]