

CPC**COOPERATIVE PATENT CLASSIFICATION****H01P****WAVEGUIDES; RESONATORS, LINES, OR OTHER DEVICES OF THE WAVEGUIDE TYPE** (operating at optical frequencies [G02B](#); aerials

[H01Q](#); {modulating electromagnetic waves in transmission line, waveguide, cavity resonator or radiation field of aerial [H03C 7/02](#)}; networks comprising lumped impedance elements [H03H](#))

NOTE

In this subclass, the following expression is used with the meaning indicated :

- "waveguide type" as applied to transmission lines includes only high-frequency coaxial cables or Lecher lines, and as applied to resonators, delay lines, or other devices includes all devices having distributed inductance and capacitance.

H01P 1/00**Auxiliary devices** (coupling devices of the waveguide type [H01P 5/00](#))[H01P 1/005](#)

- . {Diode mounting means}

[H01P 1/02](#)

- . Bends; Corners; Twists

[H01P 1/022](#)

- . . {in waveguides of polygonal cross-section ([H01P 1/065](#) takes precedence)}

[H01P 1/025](#)

- . . . {in the E-plane}

[H01P 1/027](#)

- . . . {in the H-plane}

[H01P 1/04](#)

- . Fixed joints ({pipe joints [F16L](#)}; line connectors [H01R](#); cable fittings [H02G 15/00](#))

[H01P 1/042](#)

- . . {Hollow waveguide joints}

[H01P 1/045](#)

- . . {Coaxial joints}

[H01P 1/047](#)

- . . {Strip line joints}

[H01P 1/06](#)

- . Movable joints, e.g. rotating joints

[H01P 1/061](#)

- . . {the relative movement being a translation along an axis common to at least two rectilinear parts, e.g. expansion joints}

[H01P 1/062](#)

- . . {the relative movement being a rotation}

[H01P 1/063](#)

- . . . {with a limited angle of rotation}

[H01P 1/064](#)

- {the axis of rotation being perpendicular to the transmission path, e.g. hinge joint}

[H01P 1/065](#)

- {the axis of rotation being parallel to the transmission path, e.g. stepped twist}

[H01P 1/066](#)

- . . . {with an unlimited angle of rotation}

[H01P 1/067](#)

- {the energy being transmitted in only one line located on the axis of rotation}

[H01P 1/068](#)

- {the energy being transmitted in at least one ring-shaped transmission line located around the axis of rotation, e.g. "around the mast" rotary joint ([H01P 1/069](#) takes precedence; coaxial line with solid inner conductor [H01P 1/067](#))}

[H01P 1/069](#)

- {the energy being transmitted in at least one ring-shaped transmission line located around an axial transmission line; Concentric coaxial systems}

- H01P 1/08 . Dielectric windows ([coupling devices for transit time tubes H01J 23/36](#))
- H01P 1/10 . for switching or interrupting {(in systems using reflection or reradiation of radio, acoustic or other waves [G01S 7/034](#))}
- H01P 1/11 . . by ferromagnetic devices
- H01P 1/12 . . by mechanical chopper
- H01P 1/122 . . . {[Waveguide switches](#)}
- H01P 1/125 . . . {[Coaxial switches](#)}
- H01P 1/127 . . . {[Strip line switches](#)}
- H01P 1/14 . . by electric discharge devices ([discharge devices H01J 17/64](#))
- H01P 1/15 . . by semiconductor devices
- H01P 1/16 . for mode selection, e.g. mode suppression or mode promotion; for mode conversion ([linking dissimilar lines or devices H01P 5/08](#))
- H01P 1/161 . . sustaining two independent orthogonal modes, e.g. orthomode transducer {(combining or separating polarisations and frequencies [H01P 1/2131](#))}
- H01P 1/162 . . absorbing spurious or unwanted modes of propagation
- H01P 1/163 . . specifically adapted for selection or promotion of the TE₀₁ circular-electric mode
- H01P 1/165 . for rotating the plane of polarisation
- H01P 1/17 . . for producing a continuously rotating polarisation, e.g. circular polarisation
- H01P 1/171 . . . {[using a corrugated or ridged waveguide section](#)}
- H01P 1/172 . . . {[using a dielectric element](#)}
- H01P 1/173 . . . {[using a conductive element](#)}
- H01P 1/174 . . . {[using a magnetic element \(H01P 1/175 takes precedence\)](#)}
- H01P 1/175 . . using Faraday rotators
- H01P 1/18 . Phase-shifters ([H01P 1/165 takes precedence](#); coupling devices with variable coupling factor [H01P 5/04](#))
- H01P 1/181 . . {[using ferroelectric devices](#)}
- H01P 1/182 . . {[Waveguide phase-shifters \(H01P 1/181, H01P 1/185, H01P 1/19 take precedence\)](#)}
- H01P 1/183 . . {[Coaxial phase-shifters \(H01P 1/181, H01P 1/185, H01P 1/19 take precedence\)](#)}
- H01P 1/184 . . {[Strip line phase-shifters \(H01P 1/181, H01P 1/185, H01P 1/19 take precedence\)](#)}
- H01P 1/185 . . using a diode or a gas filled discharge tube
- H01P 1/19 . . using a ferromagnetic device
- H01P 1/195 . . . having a toroidal shape
- H01P 1/20 . Frequency-selective devices, e.g. filters ({[variable impedance transformers, e.g. slug tuners or stub tuners H01P 5/04](#)}; resonators [H01P 7/00](#))
- H01P 1/2002 . . {[Dielectric waveguide filters \(H01P 1/212, H01P 1/213, H01P 1/215, H01P 1/219 take precedence\)](#)}
- H01P 1/2005 . . {[Electromagnetic photonic bandgaps \[EPB\], or photonic bandgaps \[PBG\]](#)}
- H01P 1/2007 . . {[Filtering devices for biasing networks or DC returns](#)}

- H01P 1/201 . . Filters for transverse electromagnetic waves
([H01P 1/212](#),[H01P 1/213](#),[H01P 1/215](#),[H01P 1/219](#) take precedence)
- H01P 1/2013 . . . {Coplanar line filters}
- H01P 1/2016 . . . {Slot line filters; Fin line filters}
- H01P 1/202 . . . Coaxial filters ([cascaded coaxial cavities](#) [H01P 1/205](#))
- H01P 1/203 . . . Strip line filters
- H01P 1/20309 {with dielectric resonator}
- H01P 1/20318 {with dielectric resonators as non-metallised opposite openings in the metallised surfaces of a substrate}
- H01P 1/20327 {Electromagnetic interstage coupling}
- H01P 1/20336 {Comb or interdigital filters}
- H01P 1/20345 {Multilayer filters}
- H01P 1/20354 {Non-comb or non-interdigital filters}
- H01P 1/20363 {Linear resonators}
- H01P 1/20372 {Hairpin resonators}
- H01P 1/20381 {Special shape resonators}
- H01P 1/2039 {Galvanic coupling between Input/Output}
- H01P 1/205 . . . Comb or interdigital filters; Cascaded coaxial cavities ([H01P 1/203](#) takes precedence)
- H01P 1/2053 {the coaxial cavity resonators being disposed parall to each other}
- H01P 1/2056 {Comb filters or interdigital filters with metallised resonator holes in a dielectric block}
- H01P 1/207 . . Hollow waveguide filters ([H01P 1/212](#), [H01P 1/213](#), [H01P 1/215](#), [H01P 1/219](#) take precedence)
- H01P 1/208 . . . Cascaded cavities; Cascaded resonators inside a hollow waveguide structure ([H01P 1/205](#) takes precedence)
- H01P 1/2082 {with multimode resonators ([H01P 1/2086](#) takes precedence)}
- H01P 1/2084 {with dielectric resonators}
- H01P 1/2086 {multimode}
- H01P 1/2088 {Integrated in a substrate}
- H01P 1/209 . . . comprising one or more branching arms or cavities wholly outside the main waveguide
- H01P 1/211 . . . Waffle-iron filters; Corrugated structures
- H01P 1/212 . . suppressing or attenuating harmonic frequencies ([H01P 1/215](#) takes precedence)
- H01P 1/213 . . combining or separating two or more different frequencies ([H01P 1/215](#) takes precedence)
- H01P 1/2131 . . . {with combining or separating polarisations}
- H01P 1/2133 . . . {using coaxial filters ([H01P 1/2131](#), [H01P 1/2136](#) take precedence)}
- H01P 1/2135 . . . {using strip line filters ([H01P 1/2131](#) takes precedence)}
- H01P 1/2136 . . . {using comb or interdigital filters; using cascaded coaxial cavities ([H01P 1/2131](#), [H01P 1/2135](#) take precedence)}
- H01P 1/2138 . . . {using hollow waveguide filters ([H01P 1/2131](#) takes precedence)}

- H01P 1/215
 - . . using ferromagnetic material
- H01P 1/217
 - . . . the ferromagnetic material acting as a tuning element in resonators
- H01P 1/218
 - . . . the ferromagnetic material acting as a frequency selective coupling element, e.g. YIG-filters
- H01P 1/219
 - . . Evanescent mode filters
- H01P 1/22
 - Attenuating devices ([dissipative terminating devices H01P 1/26](#))
- H01P 1/222
 - . . {[Waveguide attenuators \(H01P 1/23 takes precedence\)](#)}
- H01P 1/225
 - . . {[Coaxial attenuators \(H01P 1/23 takes precedence\)](#)}
- H01P 1/227
 - . . {[Strip line attenuators \(H01P 1/23 takes precedence\)](#)}
- H01P 1/23
 - . . using ferromagnetic material
- H01P 1/24
 - Terminating devices
- H01P 1/26
 - . . Dissipative terminations
- H01P 1/262
 - . . . {[the dissipative medium being a liquid or being cooled by a liquid](#)}
- H01P 1/264
 - . . . {[Waveguide terminations \(H01P 1/262 takes precedence\)](#)}
- H01P 1/266
 - . . . {[Coaxial terminations \(H01P 1/262 takes precedence\)](#)}
- H01P 1/268
 - . . . {[Strip line terminations \(H01P 1/262 takes precedence\)](#)}
- H01P 1/28
 - . . Short-circuiting plungers ([coupling devices with variable coupling factor H01P 5/04](#))
- H01P 1/30
 - for compensation of, or protection against, temperature or moisture effects; {[for improving power handling capability \(H01P 1/04, H01P 1/08 take precedence\)](#)}
- H01P 1/32
 - Non-reciprocal transmission devices ([H01P 1/02 to H01P 1/30 take precedence](#))
- H01P 1/36
 - . . Isolators
- H01P 1/362
 - . . . {[Edge-guided mode devices](#)}
- H01P 1/365
 - . . . Resonance absorption isolators
- H01P 1/37
 - . . . Field displacement isolators
- H01P 1/375
 - . . . using Faraday rotators
- H01P 1/38
 - . . Circulators
- H01P 1/383
 - . . . Junction circulators, e.g. Y-circulators
- H01P 1/387
 - Strip line circulators
- H01P 1/39
 - Hollow waveguide circulators
- H01P 1/393
 - . . . using Faraday rotators
- H01P 1/397
 - . . . using non- reciprocal phase shifters ([H01P 1/393 takes precedence](#))
- H01P 3/00**
 - Waveguides; Transmission lines of the waveguide type**
- H01P 3/003
 - {[Coplanar lines](#)}
- H01P 3/006
 - . . {[Conductor backed coplanar waveguides](#)}
- H01P 3/02
 - with two longitudinal conductors
- H01P 3/023
 - . . {[Fin lines; Slot lines](#)}
- H01P 3/026
 - . . {[Coplanar striplines \[CPS\]](#)}
- H01P 3/04
 - . . Lines formed as Lecher wire pairs

- H01P 3/06
- • Coaxial lines (not suitable for handling frequencies considerably beyond the audio range, {coaxial cables in general} [H01B 11/18](#))
- NOTE**
- This subgroup is only used for documents disclosing typical HF-features of coaxial cables, e.g. propagation of non-TEM-modes, multimoding, oversized coaxial cables, particular cross-section adapted for HF-propagation
- H01P 3/08
- • Microstrips; Strip lines
- H01P 3/081
- • • {Micro-striplines}
- H01P 3/082
- • • • {Multilayer dielectric}
- H01P 3/084
- • • • {Suspended micro-striplines}
- H01P 3/085
- • • {Triplate lines}
- H01P 3/087
- • • • {Suspended triplate lines}
- H01P 3/088
- • • {Stacked transmission lines}
- H01P 3/10
- Wire waveguides, i.e. with a single solid longitudinal conductor
- H01P 3/12
- Hollow waveguides ([H01P 3/20 takes precedence](#))
- H01P 3/121
- • {integrated in a substrate}
- H01P 3/122
- • {Dielectric loaded (not air)}
- H01P 3/123
- • with a complex or stepped cross-section, e.g. ridged or grooved waveguides ([H01P 3/14 takes precedence](#))
- H01P 3/127
- • with a circular, elliptic, or parabolic cross-section
- H01P 3/13
- • specially adapted for transmission of the TE_{01} circular-electric mode {(selection, promotion [H01P 1/163](#))}
- H01P 3/14
- • flexible
- H01P 3/16
- Dielectric waveguides, i.e. without a longitudinal conductor
- H01P 3/165
- • {Non-radiating dielectric waveguides}
- H01P 3/18
- built-up from several layers to increase operating surface, i.e. alternately conductive and dielectric layers
- H01P 3/20
- Quasi-optical arrangements for guiding a wave, e.g. focusing by dielectric lenses ([quasi-optical devices in general H01Q 15/00](#))
- H01P 5/00**
- Coupling devices of the waveguide type** (non-reciprocal devices [H01P 1/32](#); for introducing or removing wave energy to or from the discharge in transit-time tubes [H01J 23/36](#))
- H01P 5/02
- with invariable factor of coupling ([H01P 5/12 takes precedence](#) {choke joints [H01P 1/04](#), [H01P 1/06](#)})
- H01P 5/022
- • {Transitions between lines of the same kind and shape, but with different dimensions}
- H01P 5/024
- • • {between hollow waveguides}
- H01P 5/026
- • • {between coaxial lines}
- H01P 5/028
- • • {between strip lines}
- H01P 5/04
- with variable factor of coupling

- H01P 5/08
 - for linking dissimilar lines or devices ([H01P 1/16](#), [H01P 5/04](#) take precedence; linking lines of the same kind but with different dimensions [H01P 5/02](#))
- H01P 5/082
 - • {Transitions between hollow waveguides of different shape, e.g. between a rectangular and a circular waveguide}
- H01P 5/085
 - • {Coaxial-line/strip-line transitions}
- H01P 5/087
 - • {Transitions to a dielectric waveguide}
- H01P 5/10
 - • for coupling balanced with unbalanced lines or devices
- H01P 5/1007
 - • • {Microstrip transitions to Slotline or finline}
- H01P 5/1015
 - • • {Coplanar line transitions to Slotline or finline}
- H01P 5/1022
 - • • {Transitions to dielectric waveguide}
- H01P 5/103
 - • • Hollow-waveguide/coaxial-line transitions
- H01P 5/107
 - • • Hollow-waveguide/strip-line transitions
- H01P 5/12
 - Coupling devices having more than two ports ([H01P 5/04](#) takes precedence)
- H01P 5/16
 - • Conjugate devices, i.e. devices having at least one port decoupled from one other port
- H01P 5/18
 - • • consisting of two coupled guides, e.g. directional couplers
- H01P 5/181
 - • • • {the guides being hollow waveguides}
- H01P 5/182
 - • • • • {the waveguides being arranged in parallel}
- H01P 5/183
 - • • • • {at least one of the guides being a coaxial line}
- H01P 5/184
 - • • • • {the guides being strip lines or microstrips}
- H01P 5/185
 - • • • • {Edge coupled lines}
- H01P 5/186
 - • • • • • {Lange couplers}
- H01P 5/187
 - • • • • {Broadside coupled lines}
- H01P 5/188
 - • • • • {the guides being dielectric waveguides}
- H01P 5/19
 - • • of the junction type
- H01P 5/20
 - • • • Magic-T junctions
- H01P 5/22
 - • • • Hybrid ring junctions
- H01P 5/222
 - • • • • {180° rat race hybrid rings}
- H01P 5/225
 - • • • • {180° reversed phase hybrid rings}
- H01P 5/227
 - • • • • {90° branch line couplers}
- H01P 7/00**

Resonators of the waveguide type ({variable impedance transformers [H01P 5/04](#)}; structurally associated with transit-time tubes and interacting with the discharge therein [H01J 23/18](#); {generators of electronic oscillations using resonators of this type [H03B 5/18](#), [H03B 7/14](#), [H03B 9/14](#); electronic amplifiers using resonators of this type [H03F 3/54](#)}; microwave heating devices [H05B 6/64](#))
- H01P 7/005
 - {Helical resonators; Spiral resonators}
- H01P 7/02
 - Lecher resonators
- H01P 7/04
 - Coaxial resonators
- H01P 7/06
 - Cavity resonators
- H01P 7/065
 - • {integrated in a substrate}
- H01P 7/08
 - Strip line resonators

- H01P 7/082 . . {Microstripline resonators ([H01P 7/088](#) takes precedence)}
- H01P 7/084 . . {Triplate line resonators ([H01P 7/088](#) takes precedence)}
- H01P 7/086 . . {Coplanar waveguide resonators ([H01P 7/088](#) takes precedence)}
- H01P 7/088 . . {Tunable resonators}
- H01P 7/10 . Dielectric resonators
- H01P 7/105 . . {Multimode resonators}

H01P 9/00

Delay lines of the waveguide type (structurally associated with transit-time tubes and interacting with the discharge therein [H01J 23/24](#))

- H01P 9/003 . {Delay equalizers}
- H01P 9/006 . {Meander lines}
- H01P 9/02 . Helical lines
- H01P 9/04 . Interdigital lines

H01P 11/00

Apparatus or processes specially adapted for manufacturing waveguides or resonators, lines, or other devices of the waveguide type (manufacture of coaxial cables [H01B 13/00](#))

- H01P 11/001 . {Manufacturing waveguides or transmission lines of the waveguide type}
- H01P 11/002 . . {Manufacturing hollow waveguides}
- H01P 11/003 . . {Manufacturing lines with conductors on a substrate, e.g. strip lines, slot lines}
- H01P 11/005 . . {Manufacturing coaxial lines}
- H01P 11/006 . . {Manufacturing dielectric waveguides}
- H01P 11/007 . {Manufacturing frequency-selective devices ([resonators H01P 11/008](#))}
- H01P 11/008 . {Manufacturing resonators}