

**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 TE 01 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 ( <a href="#">cascaded coaxial cavities H01P 1/205</a> )   |
| 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 ( <a href="#">H01P 1/203 takes precedence</a> )  |
| 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 ( <a href="#">H01P 1/212</a> , <a href="#">H01P 1/213</a> , <a href="#">H01P 1/215</a> , <a href="#">H01P 1/219 take precedence</a> ) |
| H01P 1/208   | ...   | Cascaded cavities; Cascaded resonators inside a hollow waveguide structure ( <a href="#">H01P 1/205 takes precedence</a> )                                     |
| H01P 1/2082  | ....  | {with multimode resonators ( <a href="#">H01P 1/2086 takes precedence</a> )}   |
| 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 ( <a href="#">H01P 1/215 takes precedence</a> )  |
| H01P 1/213   | ..    | combining or separating two or more different frequencies ( <a href="#">H01P 1/215 takes precedence</a> )  |
| H01P 1/2131  | ...   | {with combining or separating polarisations}   |
| H01P 1/2133  | ...   | {using coaxial filters ( <a href="#">H01P 1/2131</a> , <a href="#">H01P 1/2136 take precedence</a> )}  |
| H01P 1/2135  | ...   | {using strip line filters ( <a href="#">H01P 1/2131 takes precedence</a> )}  |
| H01P 1/2136  | ...   | {using comb or interdigital filters; using cascaded coaxial cavities ( <a href="#">H01P 1/2131</a> , <a href="#">H01P 1/2135 take precedence</a> )}            |
| H01P 1/2138  | ...   | {using hollow waveguide filters ( <a href="#">H01P 1/2131 takes precedence</a> )}  |
| 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**

## H01P 3/06

(continued)

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<sub>01</sub> 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 ( <a href="#">H01P 5/04</a> 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}  |
| <b>H01P 7/00</b> | <b>Resonators of the waveguide type</b> ({variable impedance transformers <a href="#">H01P 5/04</a> }; structurally associated with transit-time tubes and interacting with the discharge therein <a href="#">H01J 23/18</a> ; { generators of electronic oscillations using resonators of this type <a href="#">H03B 5/18</a> , <a href="#">H03B 7/14</a> , <a href="#">H03B 9/14</a> ; electronic amplifiers using resonators of this type <a href="#">H03F 3/54</a> }; microwave heating devices <a href="#">H05B 6/64</a> ) |
| 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 ( <a href="#">H01P 7/088</a> takes precedence)}   |
| H01P 7/084       | .. {Triplate line resonators ( <a href="#">H01P 7/088</a> takes precedence)}  |
| H01P 7/086       | .. {Coplanar waveguide resonators ( <a href="#">H01P 7/088</a> 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}