Abstracts

Nonradiative Dielectric Waveguide for Millimeter-Wave Integrated Circuits

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A nonradiative dielectric waveguide is proposed in which dielectic strips are sandwiched between two parallel metal plates separated by a distance smaller than half a wavelength. Though the structure is substantially the same as that of the H-guide, it is based on a quite different principle of operation. This dielectric guide is particularly applicable in millimeter-wave integrated circuits, since it is not only small in size, but also allows bends and junctions to be incorporated into the circuits with very little radiation and interference. A design diagram is given. Losses and coupling coefficients of the strips are calculated, as well. Some basic circuit components, such as 90° and 180° bends and T-junctions, made of polystyrene strips, are measured to confirm their usefulness in millimeter-wave integrated circuits.

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