Abstracts

Bends in Nonradiative Dielectric Waveguides (Dec. 1982 [T-MTT])

T. Yoneyama, M. Yamaguchi and S. Nishida. "Bends in Nonradiative Dielectric Waveguides (Dec. 1982 [T-MTT])." 1982 Transactions on Microwave Theory and Techniques 30.12 (Dec. 1982 [T-MTT] (1982 Symposium Issue)): 2146-2150.

An experimental study was made of bends in the nonradiative dielectric waveguide (NRD-guide) at 50 GHz. The main cause of the bending losses was found to be due to the reflection at the transitions between the straight and curved waveguides rather than due to the radiation. The width of the dielectric strip was experimentally optimized in order to reduce the reflection, and a bend with a curvature radius as small as one guide wavelength could be realized. The experimental results are examined theoretically. The theory implies that the NRD-guide has a favorable tendency to suppress not only the radiation but also the reflection at the curved sections. It is also shown that the field maximum moves outwards or inwards from the mean path of the curved guide according to whether the dielectric strip is wider or narrower than a certain critical width. This critical width can be adopted as a design criterion for a low loss, very sharp NRD-guide bend.

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