Abstracts

Analysis and design of circular ridged waveguide components

J. Bornemann, S. Amari, J. Uher and R. Vahldieck. "Analysis and design of circular ridged waveguide components." 1999 Transactions on Microwave Theory and Techniques 47.3 (Mar. 1999 [T-MTT]): 330-335.

A fast and efficient radial mode-matching technique (RMMT) is applied to the analysis and design of components in circular ridge waveguide technology. Five different structures are investigated with respect to their performance as filters and polarizers. For fast computation, pie-shaped metal ridges and septa are assumed to better fit the cylindrical coordinate system. In practice, the pie-shaped structures are approximated by rectangular cross-section metal inserts. The validity of this approximation is investigated by comparing with measurements and finite-element analysis. It is found that for thin etchable inserts, the measured filter response is in excellent agreement with the theoretical prediction and that for polarizers, the axial ratio response is not particularly sensitive to the ridge shape. Differences between computed and measured results occur only at return loss and isolation levels beyond 25 dB. A central processing unit time comparison with HFSS (4.0) results in a 10-min versus 3-h advantage in favor of the RMMT.

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