Abstracts

Modal-S-Matrix Design of Optimum Stepped Ridged and Finned Waveguide Transformers

J. Bornemann and F. Arndt. "Modal-S-Matrix Design of Optimum Stepped Ridged and Finned Waveguide Transformers." 1987 Transactions on Microwave Theory and Techniques 35.6 (Jun. 1987 [T-MTT]): 561-567.

Optimum stepped transformers from rectangular waveguide to ridged and all-metal finned waveguides are designed with the method of field expansion into eigenmodes, which includes higher order mode interaction between the step discontinuities. Computer-optimized design data are given for a Ku-band ridged waveguide prototype with a ridge width of 1 mm, as well as for Ku-band and E-band finned waveguide transformers with commercially available metal fin thicknesses of 0.19 mm and 0.1 mm, respectively, suitable for metal-etching manufacturing technique. The optimum designs achieve a minimum return loss of about 36 dB, or 34 dB for the whole Ku- or E-band, respectively. The theory is verified by comparison with measured results.

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