Abstracts

Optimal Field Theory Design of Stepped E-Plane Finned Waveguide Transformers of Different Inner Cross-Sections

This paper presents a new design of broadband double-stepped ridged and all-metal finned waveguide transformers which combines the advantage of constant ridge thickness with that of the optimum matching potential of different waveguide inner cross-section dimensions. Based on the modal scattering matrix method, the rigorous design takes into account the influences of both, the finite ridge or fin thicknesses and the higher-order mode interaction at all discontinuities. Computer optimized design data are given for compact transformers for WR112 and WR42 input waveguides achieving a return loss of more than 33dB for the whole waveguide bands. The theory is verified by measurements.

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