Abstracts

Computer-Aided Design of Slit-Coupled H-Plane T-Junction Diplexers with E-Plane Metal-Insert Filters

J. Dittloff and F. Arndt. "Computer-Aided Design of Slit-Coupled H-Plane T-Junction Diplexers with E-Plane Metal-Insert Filters." 1988 Transactions on Microwave Theory and Techniques 36.12 (Dec. 1988 [T-MTT] (1988 Symposium Issue)): 1833-1840.

A rigorous field theory design of a class of rectangular waveguide slit-coupled H-plane T-junction diplexers is described utilizing E-plane metal-insert filters. The filter elements allow low-cost manufacturing by accurate and inexpensive metal-etching techniques. The design method is based on field expansion in suitably normalized eigenmodes which yield the modal scattering matrix of three appropriate key building block structures to be combined, the E-plane metal-insert section, the H-plane iris discontinuity, and the H-plane T. The theory includes the finite thickness of the diaphragms as well as the higher order mode interaction of all discontinuities within the complete diplexer structure. Computer-optimized design data are given for diplexer examples in Ku-band (12-18 GHz) and E-band (60-90 GHz), designed for more than 23 dB common port return losses. The theory is verified by measured results for a five-resonator Ku-band diplexer.

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