Abstracts

Rigorous Design of Sidewall Aperture Couplers

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The rigorous field theory CAD of rectangular waveguide sidewall aperture couplers is introduced which are coupled by rectangular apertures of different size. Based on the rectangular waveguide T-junction and the double-step discontinuity key-building block modal S-matrices which are calculated by the mode-matching method, the design takes rigorously into account both the finite wall thickness and the higher order mode interaction between all discontinuities. Design examples for rectangular aperture 10dB-, 8.34dB-, and 3dB-couplers in the waveguide Ku-band (12 - 18 GHz) demonstrate the efficiency of the design method. The theory is verified by excellent agreement with measurements.

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