

Rigorous Analysis of the Rectangular Waveguide Six-Port Cross Junction

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The modal S-matrix of the general rectangular waveguide six-port cross junction key-building block is derived by applying the mode-matching technique. Rapid convergence and accurate results are achieved by the superposition of six standing wave solutions in the common cavity regions which meet the electric wall boundary conditions in the waveguide ports rigorously. The theory is verified by measurements at a six-port cross with standard Ku-band (WR 62) rectangular waveguide ports.

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