

373

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Title:Numerical and experimental investigation of a 5-port mitre-bend directional coupler for mode analysis in corrugated waveguides

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Abstract:A directional coupler array with 5 ports integrated into a mitre bend for corrugated waveguide transmission lines at 140 GHz has been manufactured. The design is reviewed, and calculations on the performance for in-situ power measurement and mode discrimination are shown. Emphasis is given on detection of errors in alignment of the transmission system. Experimental tests are performed to benchmark the calculations. The results confirm the predictions and show that such a coupler is a viable tool for power measurement and basic mode analysis in high-power transmission systems. © Springer Science+Business Media, LLC 2012.

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