

## Integrated directional coupler for 90 and 180 GHz

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The authors present coplanar integrated directional couplers for 90 and 180 GHz with a 60 GHz (120 GHz) bandwidth and up to 20 dB directivity. A three-dimensional (3-D) field simulator has been used to calculate the complex propagation constants and the impedances of the two modes. For the first time, the comparison of simulated and measured S-parameters up to 230 GHz shows the validity of the design approach and the capability of integrated coplanar couplers.

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