

## Broadband Monolithic Passive Baluns and Monolithic Double-Balanced Mixer

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This paper presents the design and fabrication of four broadband monolithic passive baluns including CPW Marchand, multilayer MS Marchand, planar-transformer, and broadside-coupled line baluns. Operational frequencies range from 1.5 GHz to 24 GHz. Maximum relative bandwidths in excess of 3:1 are achieved. Simulated performances using full wave electromagnetic (EM) analysis are in good agreement with the measured results. The design of a monolithic double-balanced diode mixer using two planar-transformer baluns are also presented. Without dc bias, the mixer shows a minimum conversion loss of 6 dB with the RF at 5 GHz and a LO drive of 15 dBm at 4 GHz. The measured input IP/sub 3/ of this mixer is better than 15 dBm over the 4 to 5.75 GHz frequency band.

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