Abstracts

Broadband Monolithic Passive Baluns and Monolithic Double-Balanced Mixer (Dec. 1991 [T-MTT])

T.-H. Chen, K.W. Chang, S.B. Bui, H. Wang, G.S. Dow, L.C.T. Liu, T.S. Lin and W.S. Titus. "Broadband Monolithic Passive Baluns and Monolithic Double-Balanced Mixer (Dec. 1991 [T-MTT])." 1991 Transactions on Microwave Theory and Techniques 39.12 (Dec. 1991 [T-MTT] (1991 Symposium Issue)): 1980-1986.

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. Also, two accurate equivalent circuit models constructed from either EM simulated or measured s-parameters are developed for the MS Marchand and transformer baluns making the optimization of baluns and circuit design using the bahms much more efficient. Additionally, the design of a monolithic double-balanced diode mixer using two planar-transformer baluns is 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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