Abstracts

A New Impedance-Matched Wide-Band Balun and Magic Tee

G.J. Laughlin. "A New Impedance-Matched Wide-Band Balun and Magic Tee." 1976 Transactions on Microwave Theory and Techniques 24.3 (Mar. 1976 [T-MTT]): 135-141.

A new wide-band microwave balun particularly attractive for microstrip circuitry is described in which the normally balanced line is in the form of a pair of equal-amplitude and antiphase unbalanced lines. This novel method of input-output coupling allows a coplanar arrangement of input and output microstrip lines. Often the balanced and unbalanced line impedances in a balun are unequal, necessitating an impedance-matching network. A first-order reflection coefficient theory that mutually considers the impedance effects of the balun cavity, a compensating stub, and a quarter-wave transformer is used to design wide-band impedance-matched baluns. Curves of VSWR versus bandwidth are presented for several balanced-to-unbalanced line-impedance ratios. Experimental results are given for an octave-band impedance-matched balun with a balanced-to-unbalanced impedance ratio of 2:1. The new wide-band balun is adaptable to a microstrip magic tee. A proposed magic tee that relies on circuit symmetry for operation has multioctave bandwidth potential.

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