Abstracts

Uniplanar Power Dividers Using Coupled CPW and Asymmetrical CPS for MIC's and MMIC's

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Uniplanar coplanar waveguide (CPW), coplanar strip (CPS), and slotline on dielectric substrates have many applications in microwave integrated circuit (MIC) and monolithic microwave/millimeter wave integrated circuit (MMIC) designs. New power dividers using one-section and two-section coupled CPW have been developed. These circuits provide substantially improved performance over a wider bandwidth than conventional microstrip power dividers. Measured results show that the one-section CPW power divider has greater than 20-dB isolation, less than 0.3-dB insertion loss, a 0.2-dB power dividing imbalance, and a 2° phase imbalance over a bandwidth of more than 30% centered at 3 GHz. The two-section CPW power divider has greater than 24-dB isolation, less than 0.5-dB insertion loss, a O.1dB power dividing imbalance, and a 1.6° phase imbalance over a bandwidth of more than 66% centered at 3 GHz. Experimental results agree well with calculated ones. In-phase and 180° out-of-phase power dividers constructed by the circuit configuration method are described in this paper. The even-odd mode excited method is used to analyze the power dividers. Also two other power dividers using asymmetrical coplanar strip (ACPS) have been developed with good performance. A 180° out-of-phase power divider is demonstrated with an amplitude imbalance of 0.4 dB and a phase difference of 180° ± 1° over a wide bandwidth.

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