Abstracts

Experimental Analysis of Transmission Line Parameters in High-Speed GaAs Digital Circuit Interconnects

K. Kiziloglu, N. Dagli, G.L. Matthaei and S.I. Long. "Experimental Analysis of Transmission Line Parameters in High-Speed GaAs Digital Circuit Interconnects." 1991 Transactions on Microwave Theory and Techniques 39.8 (Aug. 1991 [T-MTT]): 1361-1367.

Transmission line properties of typical high-speed interconnects are experimentally investigated by fabricating and characterizing coplanar strips on semi-insulating GaAs substrates. The strips have thicknesses of about 2500 Å or 5000 Å and widths of 4, 6, or 8 µm so as to be representative of on-chip interconnects in high-speed GaAs digital circuits. Measurements are carried out up to 18 GHz, and the pertinent line parameters, such as resistance, capacitance per unit length, and characteristic impedance, are extracted using the measured S parameters, The measurement results confirm the quasi-TEM properties of such interconnects. In all cases, the measured distributed capacitance and inductance are insensitive to frequency whereas the resistance is found to increase as much as 38% for the widest and thickest conductors.

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