Abstracts

Slow-Wave Propagation Along Variable Schottky-Contact Microstrip Line

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Schottky-contact microstrip lines (SCML) are a special type of transmission line on the semiconducting substrate: the metallic-strip conductor is specially selected to form a rectifying metal-semiconductor transition while the ground plane exhibits an ohmic metallization. Thus the cross section of SCML is similar to that of a Schottky-barrier diode. The resulting voltage-dependent capacitance per unit length causes the nonlinear behavior of such lines. In this paper a detailed analysis of the, slow-wave propagation on SCML is presented, including the effect of metallic losses. Formulas for the propagation constant and characteristic impedance are derived and an equivalent circuit is presented. Conditions for slow-mode behavior are given, particularly taking into account the influence of imperfect conductors and defining the range of many interesting applications. Experimental results performed on Si-SCML are compared with theory.

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