Abstracts

Low-loss CPW on low-resistivity Si substrates with a micromachined polyimide interface layer for RFIC interconnects

G.E. Ponchak, A. Margomenos and L.P.B. Katehi. "Low-loss CPW on low-resistivity Si substrates with a micromachined polyimide interface layer for RFIC interconnects." 2001 Transactions on Microwave Theory and Techniques 49.5 (May 2001 [T-MTT]): 866-870.

The measured and calculated propagation constant of coplanar waveguide (CPW) on low-resistivity silicon (1 /spl Omega//spl middot/cm) with a micromachined polyimide interface layer is presented in this paper. With this new structure, the attenuation (decibels per centimeter) of narrow CPW lines on low-resistivity silicon is comparable to the attenuation of narrow CPW lines on high-resistivity silicon. To achieve these results, a 20-/spl mu/m-thick polyimide interface layer is used between the CPW and the Si substrate with the polyimide etched from the CPW slots. Only a single thin-film metal layer is used in this paper, but the technology supports multiple thick metal layers that will further lower the attenuation. These new micromachined CPW lines have a measured effective permittivity of 1.3. Design rules are presented from measured characteristics and finite-element method analysis to estimate the required polyimide thickness for a given CPW geometry.

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