Abstracts

Silicon as a Microwave Substrate

A.C. Reyes, S.M. El-Ghazaly, S. Dorn, M. Dydyk and D.K. Schroder. "Silicon as a Microwave Substrate." 1994 MTT-S International Microwave Symposium Digest 94.3 (1994 Vol. III [MWSYM]): 1759-1762.

Silicon has many advantages as a microwave substrate material including low cost and a mature technology. The lower resistivity of Si (/spl ap/10 k Omega-cm) compared to GaAs (/spl ap/10 M Omega-cm) is perceived as a major disadvantage. In this paper, we present measured and simulated results demonstrating that the losses of a coplanar transmission line (CPW) realized on silicon substrates are comparable to the losses of a CPW realized on a GaAs substrate with insulators. The loss mechanisms of Si and GaAs substrates used for microwave applications are analyzed using both microwave and semiconductor physics theory. A high resistivity Si substrate can be used both as a microwave substrate and an active element carrier permitting futher integration at low cost.

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