Abstracts

Transmission Characteristics of Finite-Width Conductor-Backed Coplanar Waveguide

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This paper presents theoretical and experimental results for a finite-width conductor-backed coplanar waveguide (FW-CBCPW). The guiding characteristics of FW-CBCPW are investigated first by the rigorous method of mode matching. An FW-CBCPW through line is then placed within a test fixture commonly used in laboratories, and the scattering parameters of the through line are obtained theoretically by approximating the FW-CBCPW as a simple system of coupled transmission lines. Experimental results are shown to agree very well with the theoretical ones. In particular, the anomalous behavior observed in the transmission characteristic of the through line is related to the resonant phenomenon of the terminated side planes which are short-circuited at both input and output ends due to the test fixture. Finally, a technique of mode suppression in the side-plane regions is suggested for the improvement of signal transmission over a broad band of frequency spectrum. The effects of extra higher order modes on the transmission characteristics at high frequencies are also discussed.

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