Abstracts

A General Analysis of Propagation Along Multiple-Layer Superconducting Stripline and Microstrip Transmission Lines

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A rigorous spectral-domain formulation for a superconducting stripline or microstrip transmission line with a multiple-layer dielectric substrate is presented. The formulation models the strip conductor as a surface current with an equivalent surface impedance, where the surface impedance is approximated in closed form when the strip is either much thinner or much thicker than a penetration depth. In either case the surface impedance is related to the complex conductivity of the material, which is calculated from a two-fluid model. Results are presented to show the slow-wave propagation and attenuation along both microstrip and stripline packages in a realistic multiple-layer configuration, which accounts for the field penetration into the superconducting ground planes.

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