

Abstracts

Current Distribution in Superconducting Strip Transmission Lines

D.M. Sheen, S.M. Ali, D.E. Oates, R.S. Withers and J.A. Kong. "Current Distribution in Superconducting Strip Transmission Lines." 1991 MTT-S International Microwave Symposium Digest 91.1 (1991 Vol. I [MWSYM]): 161-164.

A method for the calculation of the current distribution, resistance, and inductance for superconducting strip transmission lines is presented. These calculations allow accurate characterization of both high-T_{sub} c/ and low-T_{sub} c/ superconducting strip transmission lines. For a stripline geometry the current distribution, resistance, and inductance are calculated as a function of the penetration depth for various film thicknesses. These calculations are then used to determine the penetration depth for a Y Ba_{sub} 2/ Cu_{sub} 3/O_{sub} 7-X/ superconducting thin film from the measured temperature dependence of the resonant frequency of a stripline resonator. The power dependence of the YBa_{sub} 2/Cu_{sub} 3/O_{sub} 7-X/ surface resistance is shown plotted against the RF magnetic field which is determined from the calculated current distribution.

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