Abstracts

High-T/sub c/ Superconducting Coupled Coplanar Transmission Lines: A 3D-Transmission Line Matrix Analysis

M. Vanselow, B. Isele, R. Weigel and P. Russer. "High-T/sub c/ Superconducting Coupled Coplanar Transmission Lines: A 3D-Transmission Line Matrix Analysis." 1992 MTT-S International Microwave Symposium Digest 92.2 (1992 Vol. II [MWSYM]): 787-790.

The application of the three dimensional transmission line matrix (3D-TLM) approach to straight high-T/sub c/ super-conducting coupled coplanar waveguide (CCPW) structures, suitable for high-speed interconnects, is presented. We have investigated CCPW's fabricated from laser ablated YBa/sub 2/Cu/sub 3/O/sub 7/ (YBCO) thin-films on lanthanum aluminate (LaAlO/sub 3/) substrates with 0.5 mm thickness. To represent three dimensional space, we use the symmetrical condensed TLM node and a non-uniform discretization scheme. The surface impedance of the high-T/sub c/ superconducting film is described by London theory and modeled as a thin TLM network loaded with resistive and inductive stubs. The losses of the substrate are represented by additional conductance connected in parallel. CCPW line-to-line coupling is evaluated. Preliminary experimental results with fold CCPW's on LaAlO/sub 3/ are discussed. The work arose from a requirement of an accurate analysis of the line-to-line coupling of bent (meander line) long length coplanar waveguides (CPW's) on a 20x20 mm² LaAlO/sub 3/ substrate.

❑ Return to main document.