Abstracts

High Temperature Superconducting Slow-Wave Coplanar Transmission Lines with Normal-Metal Crossbars

V.M. Hietala, J.S. Martens, T.A. Plut, C.P. Tigges, T.E. Zipperian, D.S. Ginley and J.K. Truman. "High Temperature Superconducting Slow-Wave Coplanar Transmission Lines with Normal-Metal Crossbars." 1994 Transactions on Microwave Theory and Techniques 42.6 (Jun. 1994 [T-MTT]): 972-975.

A novel superconducting slow-wave transmission line has been prepared by overlaying a superconducting coplanar waveguide with normal metal crossbars. The crossbars increase the energy storage along the transmission line, reducing the line's group velocity allowing for shorter delay lines. Additionally, the cross-sectional dimensions of the line are smaller than typical transmission line structures, allowing for a further reduction of delay line size. Measurements show a group velocity of about 0.12 the speed of light with low dispersion, a 25 Omega characteristic impedance, and moderate transmission loss. Because the group velocity is largely independent of any properties of the super-conductor, these transmission lines exhibit excellent temperature stability and delay reproducibility.

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