Abstracts

Measured Temperature-Dependence of Attenuation Constant and Phase Velocity of a Superconducting PbAu/SiO/Pb Microstripline at 10 GHz and 30 GHz (Short Papers)

R. Popel. "Measured Temperature-Dependence of Attenuation Constant and Phase Velocity of a Superconducting PbAu/SiO/Pb Microstripline at 10 GHz and 30 GHz (Short Papers)." 1983 Transactions on Microwave Theory and Techniques 31.7 (Jul. 1983 [T-MTT]): 600-604.

Measured results for the temperature dependence of the attenuation constant and phase velocity of a superconducting microstripline at 10 GHz and 30 GHz are presented here for the first time. At 9.1 GHz the attenuation constant of a PbAu/SiO/Pb microstripline with a dielectric height of 880 nm decreases from 1.6 dB/m to 0.04 dB/m going from 4.2 K to 2.0 K, while at 27.3 GHz a decrease from 2.6 dB/m to 0.09 dB/m going from 3.0 K to 1.7 K was measured. The calculated and measured temperature dependence of the phase velocity are in good agreement. The measured values for the attenuation constant together with the estimate of conductor losses from the Mattis-Bardeen theory, taking radiation losses and surface roughness into account, lead to an ripper limit estimate for the loss factors of SiO.

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