Abstracts

Quasi-TEM Analysis of "Slow-Wave" Mode Propagation on Coplanar Microstructure MIS Transmission Lines

Y.R. Kwon, V.M. Hietala and K.S. Champlin. "Quasi-TEM Analysis of "Slow-Wave" Mode Propagation on Coplanar Microstructure MIS Transmission Lines." 1987 Transactions on Microwave Theory and Techniques 35.6 (Jun. 1987 [T-MTT]): 545-551.

We present a simple quasi-TEM analysis of "slow-wave" mode propagation on micron-size coplanar MIS transmission lines on heavily doped semiconductors and compare theoretical results with measurements on four such structures at frequencies from 1.0 to 12.4 GHz. Excellent agreement is found, which shows that the "slow-wave" mode propagating on these transmission lines is, in fact, a quasi-TEM mode. Relatively low-loss propagation along with significant wavelength reduction is observed. Conduction losses of the metal, which have been tacitly ignored in previously published "full-wave" treatments of "slow-wave" mode propagation, are included in the theory and are shown to dominate the attenuation at frequencies below 25 GHz and to still be significant at frequencies up to at least 100 GHz.

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