Abstracts

Optically CW-Induced Losses in Semiconductor Coplanar Waveguides

W. Platte and B. Sauerer. "Optically CW-Induced Losses in Semiconductor Coplanar Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 139-149.

This paper presents a quasi-static analysis of photoinduced wave attenuation in a continuously illuminated coplanar waveguide transmission line on semiconductor substrate, using a conformal mapping technique. The relevant effects of charge carrier diffusion and surface recombination on photoconductivity and plasma penetration depth have been incorporated into the theory. This finally allows a quantitative estimate of optically induced losses as a function of the various light source and substrate parameters by means of numerically calculated diagrams. In the particular case of small-plasma-depth excitation, an approximate, analytical expression for the light-controlled attenuation constant is presented. Initial experimental results are in relatively good agreement with the theory.

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