Abstracts

Fiber-edge electrooptic/magnetooptic probe for spectral-domain analysis of electromagnetic field

S. Wakana, T. Ohara, M. Abe, E. Yamazaki, M. Kishi and M. Tsuchiya. "Fiber-edge electrooptic/magnetooptic probe for spectral-domain analysis of electromagnetic field." 2000 Transactions on Microwave Theory and Techniques 48.12 (Dec. 2000 [T-MTT] (Special Issue on 2000 International Microwave Symposium)): 2611-2616.

We propose a new class of an electromagnetic-held probing scheme for microwave planar circuit diagnosis. The measurement principle is based on the electrooptic/magnetooptic effects of crystals glued at optical fiber facets. We have combined the concept of those fiber-edge probes with a fiber-optic RF spectrum analyzing system containing a continuous-wave semiconductor laser source, a fast photodetector, and an RF spectrum analyzer to realize a highly sensitive measurement equipment of local impedance. Electromagnetic-field intensity on a microstrip transmission line has been measured in the frequency domain, where voltage and current amplitudes have been independently investigated with sensitivities of 16 mV/Hz-1/2 and 0.33 mA/Hz-1/2, respectively. In addition, it has been shown that the former value can be improved to be 0.7 mV/Hz-1/2 or smaller by the resonant cavity enhancement effect.

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