Abstracts

Pulse-coupling measurement of coupled microstrip lines using a micromachined picosecond optical near-field probe

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By measuring the transverse electric-field distributions using a newly developed micromachined optical near-field mapping probe, pulse-coupling phenomena on coupled microstrip lines are reported for the first time. The measured field distribution of the propagating coupled pulse provides useful information to aid understanding of the coupling phenomena; this cannot be obtained by conventional external-port access test instruments. The measurement is performed based on the picosecond photoconductivity of low-temperature-grown GaAs (LT-GaAs). A system for the measurement of the internal electric field distribution using the optical near-field probe is described and characterized. It is capable of measuring independent orthogonal components of free-space electric fields with less than 2-ps temporal resolution and with minimal loading effects. The loading effects of the probe are minimized by adopting a micromachining technique for the use of a 1-/spl mu/m-thick LT-GaAs epilayer as a substrate, and by using silver-paint-coated optical fibers for electrical connections.

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