Abstracts

Absolute potential measurements inside microwave digital IC's using a micromachined photoconductive sampling probe

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A measurement system for internal node testing of integrated circuits using a micromachined photoconductive sampling probe is described and characterized. Special emphasis is placed upon the system performance, demonstrating how absolute voltage measurements are achieved in a DC-to-MM-wave bandwidth. The feasibility of the setup is illustrated using an InP heterojunction bipolar transistor frequency divider. Detailed waveforms at different circuit nodes and the corresponding propagation delays from within this circuit at operating frequencies up to 10 GHz are presented. The results demonstrate for the first time the use of photoconductive probes for calibration-free, absolute-voltage, DC-coupled potential measurements in high-frequency and high-speed integrated circuits.

❑ Return to main document.