Abstracts

300-GHz-Bandwidth Network Analysis Using Time-Domain Electro-Optic Sampling

H. Cheng and J.F. Whitaker. "300-GHz-Bandwidth Network Analysis Using Time-Domain Electro-Optic Sampling." 1993 MTT-S International Microwave Symposium Digest 93.3 (1993 Vol. III [MWSYM]): 1355-1358.

We have demonstrated S-parameter measurements on simple passive circuit elements with 300-GHz bandwidth using an external-electro-optic, time-domain sampling technique. Clean, wideband input pulses were generated and transmitted to the device under test in a novel test fixture which integrated the optoelectronic signal source, the coplanar transmission lines, and the element to be measured on a monolithic low-permittivity substrate. A dramatic increase in the fidelity of short-electrical-pulse transmission, as evidenced by a 75% improvement of 3-dB bandwidth after 2 mm of propagation, was observed on a coplanar stripline supported by a quartz substrate when compared with a circuit fabricated on a GaAs substrate having permittivity approximately three times greater. The availability of this enhanced bandwidth has led to the demonstrated network analysis in the submillimeter-wave range using guided signals.

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