Abstracts

Enhanced on-wafer time-domain waveform measurement through removal of interconnect dispersion and measurement instrument jitter

J.B. Scott, J. Verspecht, B. Behnia, M. Vanden Bossche, A. Cognata, F. Verbeyst, M.L. Thorn and D.R. Scherrer. "Enhanced on-wafer time-domain waveform measurement through removal of interconnect dispersion and measurement instrument jitter." 2002 Transactions on Microwave Theory and Techniques 50.12 (Dec. 2002 [T-MTT] (Special Issue on 2002 International Microwave Symposium)): 3022-3028.

We have measured the output waveshape and rise time of two high-speed digital circuits on a wafer using a 50-GHz prototype of a new instrument. The instrument uses vector error correction to de-embed the component under test like a network analyzer, but reads out in the time domain after the fashion of an equivalent-time oscilloscope. With the calibration plane of the instrument set at the tips of the wafer probes, errors arising from dispersion in the connection hardware are removed. We show that the random jitter in the measurement system is removed without the convolution penalty usually incurred by averaging so that anomalies such as pattern-dependent jitter are exposed. The system rise time is 7 ps, compared to a system rise time of 12-13 ps for a conventional equivalent-time oscilloscope of the same bandwidth in the presence of wafer probes, bias networks, and cables.

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