Abstracts

Time-domain optical sampling of switched-mode microwave amplifiers and multipliers

M.D. Weiss, M.H. Crites, E.W. Bryerton, J.F. Whitaker and Z. Popovic. "Time-domain optical sampling of switched-mode microwave amplifiers and multipliers." 1999 Transactions on Microwave Theory and Techniques 47.12 (Dec. 1999 [T-MTT] (Special Issue on 1999 International Microwave Symposium)): 2599-2604.

Time-domain measurements of the output waveforms of two 8-GHz high-efficiency power amplifiers, a 1-GHz frequency doubler, and a 5-GHz frequency doubler are presented in this paper. A new photoconductive probe has enabled nonintrusive time-domain voltage measurements, which confirm switched-mode class-E and class-F amplifier operation. In order to analyze nonlinear amplifiers designed to deliver a sinusoidal wave to the load, voltages at characteristic points inside the circuit need to be known. In multipliers, waveform measurements track harmonic leakage, expediting the design cycle. The high-impedance probe used here is an optoelectronic sampler, which can sense the charge on an exposed interconnect or the field associated with a buried interconnect. These electric-field data are then converted into voltage.

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