Abstracts

Probe-tone S-parameter measurements

J. Martens and P. Kapetanic. "Probe-tone S-parameter measurements." 2002 Transactions on Microwave Theory and Techniques 50.9 (Sep. 2002 [T-MTT]): 2076-2082.

The measurement of device behavior under complex actual operating conditions is an increasingly important measurement problem. In particular, it can be difficult to accurately measure gain and some reflection coefficients of a power amplifier operating under a realistic modulated signal drive. A small-signal measurement alone of a power amplifier is generally incorrect since the device-under-test will not be biased correctly. A fully modulated measurement, however, may require very dedicated equipment, long measurement times for adequate stability, and special calibration techniques. The methodology discussed here, i.e., the use of S-parameter probe signals in addition to power signals, will allow self-consistent S-parameter measurement under these conditions with full (traceable) vector calibrations and reduced uncertainties. In some sense, the small probe signal is used to quantify nonlinearities introduced by the modulated signal. In addition, the measurement has the flexibility to perform frequency-domain profiling to elucidate the behavior that may be experienced by interfering signals.

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