Abstracts

Measurement of a filter using a power detector

N. Vasudev and O.M. Collins. "Measurement of a filter using a power detector." 2002 Transactions on Microwave Theory and Techniques 50.9 (Sep. 2002 [T-MTT]): 2083-2089.

This paper presents experimental results on the measurement of the magnitude and phase response of RF and baseband signal paths made with a power detector. The frequency response is obtained by measuring the magnitude and phase of the output of the power detector when the forward path is excited by a pair of tones. This technique provides a means for making vector measurements using a scalar detector. Instruments, like network analyzers, commonly use a mixer and sinusoidal source to downconvert the signal for digitization and measurement. The downconversion in this paper is performed using a power detector and an extra tone in the excitation signal itself, drastically reducing hardware complexity. Important applications of this technique include the characterization of the digital-to-antenna path of a software radio and the equalization of the antialiasing filter in a wide-band arbitrary waveform generator. Three examples of measurement, one at low frequency and two others at radio frequencies, show that the errors in the measured response are comparable to those obtained using conventional network analyzers.

❑ Return to main document.