Abstracts

Transmission Response Measurements of Frequency-Translating Devices Using a Vector Network Analyzer

C.J. Clark, A.A. Moulthrop, M.S. Muha and C.P. Silva. "Transmission Response Measurements of Frequency-Translating Devices Using a Vector Network Analyzer." 1996 Transactions on Microwave Theory and Techniques 44.12 (Dec. 1996, Part II [T-MTT] (1996 Symposium Issue)): 2724-2736.

A new method for accurately determining the transmission response of frequency-translating devices (FTD's) is presented. The absolute amptitude and phase of the FTD under test is obtained using a vector network analyzer (VNA) and two test FTD's, where one FTD must have reciprocal frequency response characteristics. The characterization of single-sideband (SSB) FTD's is obtained in a straightforward manner by combining data from three VNA two-port swept measurements. The characterization of double-sideband (DSB) FTD's can be performed in the same manner as for SSB FTD's, or, more accurately, by combining data from six two-port swept baseband measurements. A complete analysis of the characterization method using low-pass equivalent (LPE) signals and systems is presented, along with the development of the appropriate data reduction procedures needed to arrive at the de-embedded LPE FTD transmission responses. The validation and accuracy of the method is demonstrated with results for both SSB and DSB FTD's operating at 20 GHz.

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