Abstracts

Effect of Upper Sideband Impedance on a Lower Sideband Up-Converter

W.A. Davis and P.J. Khan. "Effect of Upper Sideband Impedance on a Lower Sideband Up-Converter." 1973 Transactions on Microwave Theory and Techniques 21.6 (Jun. 1973 [T-MTT]): 386-392.

An analysis is given of a lower sideband up-converter which includes a finite circuit reactance X/sub 33/ at the upper sideband frequency, in addition to the circuit impedances at the input signal and output lower sideband frequencies. The expressions developed for the gain, gain sensitivity to pump power variation, and noise figure show the extent to which gain and gain sensitivity decrease, and noise figure increases when X/sub 33/ is finite, as compared to the case when X/sub 33/ is infinite. For a simple circuit configuration the gain-bandwidth product changes markedly when X/sub 33/ is small at the center frequency. In addition, when second-harmonic pump power is allowed to flow through the varactor diode, the performance of the lower sideband up-converter can be improved.

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