Abstracts

On the effect of IF power nulls in Schottky diode harmonic mixers

R. Feinaugle, H.-W. Hubers, H.P. Roser and J.L. Hesler. "On the effect of IF power nulls in Schottky diode harmonic mixers." 2002 Transactions on Microwave Theory and Techniques 50.1 (Jan. 2002, Part I [T-MTT] (Mini-Special Issue on 1999 International Microwave and Optoelectronics Conference (IMOC'99))): 134-142.

Experimental results reveal the existence of a null in the IF output power for certain bias voltage levels in single Schottky diode harmonic mixers at terahertz frequencies. This dramatic loss of IF power is due to a drastic increase of conversion loss and is governed by intrinsic diode parameters, as well as external parameters. For a second harmonic mixer, this is due to a competition of two mixing paths; one is the mixing of the RF with the doubled local oscillator (LO) frequency and the other a mixing of the RF with the LO to an LO sideband followed by a second mixing with the LO, both leading to the IF. In this paper, we present a systematic investigation of and some basic relations between these parameters and the depth and voltage levels where the conversion loss increases. Good agreement is obtained between a simple analysis and the experimental data on second and fourth harmonic mixers.

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