

Abstracts

Design and Operation of Four-Frequency Parametric Up-Converters

J.A. Luksch, E.W. Matthews, Jr. and G.A. VerWys. "Design and Operation of Four-Frequency Parametric Up-Converters." 1961 Transactions on Microwave Theory and Techniques 9.1 (Jan. 1961 [T-MTT]): 44-52.

A theoretical analysis of a four-frequency parametric-diode up-converter is presented, retaining both sum and difference frequencies generated by mixing of pump and signal. Upper and lower sideband up-converters are compared, and it is shown that the gain limitations of the former can be overcome by combination with the latter, without appreciable loss of stability. Three different parametric amplifier configurations utilizing this four-frequency mode of operation have been designed, fabricated, and tested. These designs utilize sum-frequency up-conversion from 400 to 9400 Mc., and have exhibited noise figures below 1.5 db, gain in excess of 12 db, and bandwidths greater than 8 Mc.

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