Abstracts

Novel 18/36 GHz (M)MIC GaAs FET Frequency Doublers in CPW-Techniques Under the Consideration of the Effects of Coplanar Discontinuities

M. Abdo-Tuko, M. Naghed and I. Wolff. "Novel 18/36 GHz (M)MIC GaAs FET Frequency Doublers in CPW-Techniques Under the Consideration of the Effects of Coplanar Discontinuities." 1993 Transactions on Microwave Theory and Techniques 41.7 (Aug. 1993 [T-MTT]): 1307-1315.

The design and performance of single-device and balanced versions of (M)MIC GaAs FET frequency doublers from 18 GHz to 36 GHz, fabricated in purely coplanar waveguide techniques, are presented. Coplanar discontinuities which are usually neglected are taken into consideration in the analysis and design. Spiral inductors and their associated parasitic capacitance are used for impedance matching and phase shifting purposes. The simulation technique used to characterize the spiral inductors is described in detail. Measurement and simulation results show good agreement. The investigated hybrid doublers have a minimum conversion loss of 7 dB while a maximum conversion gain of 6B is predicted for the monolithic version of the doublers. They are fabricated on ceramic and gallium arsenide substrates and are simple, cost effective, and applicable in low and medium power transmitter/receiver systems.

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