Abstracts

High-Frequency Doubler Operation of GaAs Field-Effect Transistors

C. Rauscher. "High-Frequency Doubler Operation of GaAs Field-Effect Transistors." 1983 Transactions on Microwave Theory and Techniques 31.6 (Jun. 1983 [T-MTT]): 462-473.

A comprehensive study of single-gate GaAs FET frequency doublers is presented. Special emphasis is placed on exploring high-frequency limitations, while yielding explanations for previously observed lower frequency phenomena as well. Extensive Iarge-signal simulations demonstrate the underlying relationships between circuit performance characteristics and principal design parameter. Verifying experiments include straight frequency doubler and a self-oscillating doubler, both with output signal frequencies in Ku-band. The self-oscillating doubler appears especially attractive, yielding an overall dc-to-RF efficiency of 10 percent. The type of transistor employed in the numerical and experimental examples possesses a gate length of 0.5 µm and a gate width of 250 µm.

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