Abstracts

Rigorous Analysis and Design of a High-Performance 94 GHz MMIC Doubler

S.-W. Chen, T.C. Ho, K. Pande and P.D. Rice. "Rigorous Analysis and Design of a High-Performance 94 GHz MMIC Doubler." 1993 Transactions on Microwave Theory and Techniques 41.11 (Dec. 1993 [T-MTT] (1993 Symposium Issue)): 2317-2322.

A 94 GHz monolithic microwave integrated circuit (MMIC) frequency doubler with 25 percent efficiency and 65 mW output power has been developed rising Schottky-barrier varactor diode. Variations in the diode's performance as a doubler with its geometry and doping profile were analyzed for optimum efficiency and output power. Optimum doubler performance was obtained as a consequence of use of the optimized diode parameters resulting from this analysis. A simple but highly effective circuit topology was employed to transform the 50 Omega terminations to optimum source an load impedances, and also to provide isolation between the fundamental and second harmonic signals at input and output ports. Measured results of the diode parameters as well as doubler response showed excellent agreement with the analysis. The doubler exhibits better performance than those reported in the literature at similar frequencies using an MMIC approach.

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