Abstracts

W-band finite ground coplanar monolithic multipliers

J. Papapolymerou, F. Brauchler, J. East and L.P.B. Katehi. "W-band finite ground coplanar monolithic multipliers." 1999 Transactions on Microwave Theory and Techniques 47.5 (May 1999 [T-MTT]): 614-619.

This paper describes the design, fabrication, and experimental evaluation of W-band planar monolithic varactor frequency multipliers based on finite ground coplanar (FGC) lines. These lines are a low-loss low-dispersion alternative of a planar transmission line to more conventional microstrip of coplanar waveguide lines at millimeter-wave frequencies. The near transverse-electromagnetic nature of propagation of the FGC lines simplifies circuit design and layout. Two-diode W-band varactor multipliers with input Q's of two and three and FGC input and output have been realized. The multiplier with input Q=2 has an output power of 72 mW, an efficiency of 16.3% near 80 GHz, and a -3-dB bandwidth greater than 10 GHz, while the multiplier with Q=3 has an efficiency of 21.5% near 70 GHz and a 6-GHz bandwidth. This paper briefly describes the characteristics of the FGC lines, the design of the multipliers and their radiofrequency performance.

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