Abstracts

A Low-Distortion K-Band GaAs Power FET

T.S. Tan, K. Kotzebue, D.M. Braun, J. Centanni and D. McQuate. "A Low-Distortion K-Band GaAs Power FET." 1988 Transactions on Microwave Theory and Techniques 36.6 (Jun. 1988 [T-MTT]): 1023-1032.

A K-band Iow-distortion GaAs power MESFET has been developed by incorporating a pulse-type channel doping profile using molecular beam epitaxial technology and a novel 0.3 µm T-shaped gate. The low-distortion FET's offer about 10 to 15 dBc improvement in second-harmonic distortion compared to devices fabricated on a uniformly doped active layer. Significantly larger power load-pull contours are obtained with the low-distortion devices, indicating the improved linearity of these devices. In an 8-20 GHz single-stage broad-band amplifier up to 10 dBc improvement in harmonic performance has been achieved using the low-distortion device. This low-distortion device exhibits very linear transconductance (G/sub m/) as a function of the gate bias (V/sub g/). A typical 750 µm gate width device is capable of 26 dBm of output power with 6 dB of gain, and power-added efficiency in excess of 35 percent when measured at 18 GHz. At 25 GHz the device is capable of 24 dBm of output power with 5 dB associated gain.

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