Abstracts

A Monolithic Ka-Band HEMT Low-Noise Amplifier (Dec. 1988 [T-MTT])

C. Yuen, C.K. Nishimoto, M.W. Glenn, Y.-C. Pao, R.A. LaRue, R. Norton, M. Day, I. Zubeck, S.G. Bandy and G.A. Zdasiuk. "A Monolithic Ka-Band HEMT Low-Noise Amplifier (Dec. 1988 [T-MTT])." 1988 Transactions on Microwave Theory and Techniques 36.12 (Dec. 1988 [T-MTT] (1988 Symposium Issue)): 1930-1937.

A monolithic, single-stage HEMT low-noise amplifier has been, developed for the 20-40 GHz band. This amplifier includes a single 0.25-µm-gate-length HEMT active device with on-chip matching and biasing circuits. A gain of approximately 6 dB from 20 to 38 GHz and a noise figure of approximately 5 dB from 26.5 to 40 GHz were measured. Replacing the triangular gate profile by a mushroom gate profile in the amplifier increased the measured gain to 8 dB from 20 to 37 GHz and reduced the measured noise figure to 4 dB from 26 to 40 GHz. These are the best reported results for a MMIC amplifier over this bandwidth. The chip size is 2.2 mm x 1.1 mm. The same amplifier was fabricated on pseudomorphic HEMT material with a triangular gate profile and has achieved 7.5 dB gain across the 20-35 GHz bandwidth and a 6.0 dB noise figure from 26.5 to 40 GHz. The measured 1 dB compression powers at 30 GHz for the conventional and pseudomorphic HEMT amplifiers are 10 dBm and 11.5 dBm, respectively, when biased for maximum power.

❑ Return to main document.