Abstracts

Ultra-Low DC Power Consumptions in Monolithic L-Band Components

K.R. Cioffi. "Ultra-Low DC Power Consumptions in Monolithic L-Band Components." 1992 Transactions on Microwave Theory and Techniques 40.12 (Dec. 1992 [T-MTT] (1992 Symposium Issue)): 2467-2472.

A set of monolithic L-band components operating at milliwatt and sub-milliwatt dc power consumption have been designed and fabricated. A maximum gain/power quotient of 19.1 dB /mW was recorded for a monolithic amplifier at a frequency of 1.25 GHz with a cascade of 2 MMIC amplifiers yielding a total gain of 15.3 dB on a total power consumption of just 800 µW. This is believed to be the highest gain/power quotient ever reported for a monolithic circuit at L-band. A four pole voltage controlled filter with low power amplifier gain stages showed a loss of 1.6 dB with 15% 3dB bandwidth on a power consumption of 6.75 mW at 1.575 GHz. A subsystem containing the chips was assembled and tested. The ultra-low power consumption were obtained with a standard foundry process using an enhancement mode MESFET with a variety of design techniques. Yields obtained on two 4" GaAs wafers were 96-100%.

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