Abstracts

Degradation of an X-K/sub u/ Band GaAs/AlGaAs Power HBT MMIC Under RF Stress

A. Gupta, F. Ali, D. Dawson and P. Smith. "Degradation of an X-K/sub u/ Band GaAs/AlGaAs Power HBT MMIC Under RF Stress." 1996 Microwave and Guided Wave Letters 6.1 (Jan. 1996 [MGWL]): 43-45.

This paper summarizes the observed degradation in the performance of a high-efficiency X-K/sub u/ band 1-W HBT power MMIC operating under ~2 dB compression for an extended period. The main finding of this study is that no new degradation mechanisms appeared, even under severe RF stress; the device degraded in the same manner as with dc stress only. The only significant change in device characteristics was increased base leakage current that resulted in a monotonic reduction in current gain after an initial period of stability. Output power of the MMIC remained essentially unchanged even after current gain had dropped to 60% of its initial value. RF properties of the device, both small and large signal, showed little change even after severe deterioration of dc characteristics. The results of this study suggest that HBT reliability can be effectively evaluated for most applications by applying only dc stress to the device.

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