

High-reliability GaAs HBT monolithic microwave amplifier (1997 Vol. I [MWSYM])

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High-reliability performance of an X-band high-intercept MMIC amplifier fabricated using a production GaAs/AlGaAs HBT process technology is reported. Operating at 20 kA/cm² quiescent collector current density, the single-stage balanced amplifier with on-chip regulation has a projected median-time-to-failure (MTF) of 4/spl times/10/sup 7/ hours at a 125/spl deg/C junction temperature. MTF was determined by three-temperature constant-stress accelerated lifetest using $|S_{21}| > 1.0$ dB as the failure criterion. Additionally, an activation energy (E_a) of 1.2 eV and log-standard deviation (σ) of 0.7 was measured. This is the first report of HBT reliability based on small-signal microwave characteristics of HBT MMIC amplifiers under lifetest.

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