

Abstracts

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

F.M. Yamada, A.K. Oki, D.C. Streit, D.K. Umemoto, L.T. Tran, T.R. Block, D.T. Okazaki, M.M. Hoppe and E.A. Rezek. "High-reliability GaAs HBT monolithic microwave amplifier (1997 Vol. I [MWSYM])." 1997 MTT-S International Microwave Symposium Digest 1. (1997 Vol. I [MWSYM]): 141-144.

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 4⁴/spl times/10² hours at a 125/spl deg/C junction temperature. MTF was determined by three-temperature constant-stress accelerated lifetest using $|\Delta S21| > 1.0$ 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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