# Abstracts

## High reliability non-hermetic 0.15 /spl mu/m GaAs pseudomorphic HEMT MMIC amplifiers

*D.L. Leung, Y.C. Chou, C.S. Wu, R. Kono, J. Scarpulla, R. Lai, M. Hoppe and D.C. Streit. "High reliability non-hermetic 0.15 /spl mu/m GaAs pseudomorphic HEMT MMIC amplifiers." 1999 Radio Frequency Integrated Circuits (RFIC) Symposium 99. (1999 [RFIC]): 153-156.*

High reliability performance of a Ka-band low-noise MMIC amplifier fabricated using a 0.15 /spl mu/m production AlGaAs-InGaAs-GaAs HEMT process technology is reported. Operating at an accelerated DC bias condition of Vds=5.2 V and Ids=250 mA/mm, two-stage balanced amplifiers were lifetested at three-temperatures (T/sub ambient/=235/spl deg/C, T/sub ambient/=250/spl deg/C, and T/sub ambient/=265/spl deg/C) in air ambient. Failure time for each temperature was determined using /spl Delta/S21=-1.0 dB measured at room temperature as the failure criteria. The activation energy (Ea) is 1.6 eV, achieving a projected median-time-to-failure (MTF) of 7/spl times/10/sup 9/ hours at a 125/spl deg/C junction temperature. This is the first report of 0.15 /spl mu/m HEMT reliability based on S21 failure criteria of MMIC amplifiers under DC stress at high junction temperature in air ambient. This result demonstrates a robust HEMT technology immune to the stress effects of high electric field under high temperature operation suitable for non-hermetic commercial Ka-band applications.

❑ Return to main document.