



Let Performance Drive

QUALIFICATION TEST REPORT

Wafer Process: PHEMT2

Drawing No.: 101116

CMD119P3
CMD132
CMD132P3
CMD157
CMD157P3
CMD158C4
CMD158P3
CMD159
CMD160
CMD161
CMD162
CMD163
CMD163C4
CMD164
CMD165
CMD166
CMD167
CMD167P3

CMD168P3
CMD173
CMD173P4
CMD185P3
CMD186P3
CMD187
CMD187C4
CMD188
CMD189P3
CMD190
CMD191C4
CMD193P3X4
CMD194C3
CMD197
CMD197C4
CMD206
CMD207
CMD222
CMD224

1.0 Introduction

The definition of a qualification family, as defined by EIA/JESD47 Stress Driven Qualification of Integrated Circuits, is all devices that use the same wafer fabrication technology, wafer fabrication process and wafer fabrication site.

This qualification procedure is designed to satisfy the reliability requirements for a GaAs MMIC amplifier using Custom MMIC’s PHEMT2 wafer process. The CMD193 die has been chosen to qualify the PHEMT2 amplifier product line.

1.1 General Description

The CMD193 chip is a GaAs MMIC 8 GHz dual low noise amplifier which produces a gain of 21dB and a noise figure of 1.4dB. There are two completely separate amplifier circuits on each chip. The chip utilizes a GaAs PHEMT process and operates at a positive drain bias of +3.6V.

2.0 Summary of Results

All testing has been completed. The activation energy for the PHEMT2 process is 1.71 eV. Using 85°C as the maximum operating temperature for the device, the equivalent device hours for 92,000 hours at 130°C is calculated to be 28,152,000 hours. Using a Chi-Square confidence level of 90%, the failure rate is calculated to be 8.2×10^{-8} failures per hour or 82 FIT. Using a Chi-Square confidence level of 60%, the failure rate is calculated to be 3.3×10^{-8} failures per hour or 33 FIT.

Test	Qty In	Qty Out	Pass / Fail
Initial Electrical	92	92	Complete
Burn-in, 240 hours	92	92	Complete
Interim Electrical	92	92	Pass
HTOL, 1000 hours	92	92	Complete
Final Electrical	92	92	Pass
Bond Pull	10	10	Pass
Die Shear	10	10	Pass
SEM Inspection	10	10	Pass
Metal and Dielectric Thickness	10	10	Pass