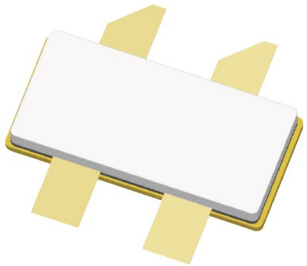
# Thermally Enhanced GaN Amplifier
# 610 W, 48 V, 2620 - 2690 MHz

**GTRB266702FCV1A**
**Rev. V1**

## Features

- GaN on SiC HEMT Technology
- Pulsed CW Performance: 2690 MHz, 48 V, 10 µs Pulse Width, 10% Duty Cycle, Combined Outputs
- Output Power @ P4dB = 610 W
- Efficiency @ P4dB = 65.8%
- Thermally Enhanced Package
- Pb-free and RoHS* Compliant



Package Type: H-37248C-4

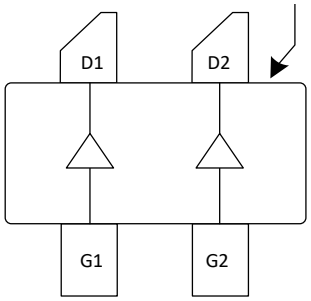
## Applications

- Cellular, 5G Infrastructure

## Description

The GTRB266702FCV1A is a GaN on SiC HEMT amplifier for use in multi-standard cellular power amplifier applications. It features input and output matching, high efficiency, and a thermally-enhanced package with earless flange.

## Functional Schematic




## Typical RF Performance[1]

### Single-carrier WCDMA Specifications

$V_{DD}$ = 48 V, $I_{DQ}$ = 360 mA, $V_{GS(PEAK)}$ = -5.1 V, $P_{OUT}$ = 48.5 dBm avg, $T_C$ = 25°C, Channel Bandwidth = 3.84 MHz, Peak/Average = 10 dB @ 0.01% CCDF

| Frequency (MHz) | Gain (dB) | Efficiency (%) | OPAR (dB) | ACPR (dBc) |
|---|---|---|---|---|
| 2620 | 15.4 | 52.2 | 9.0 | -29.6 |
| 2655 | 15.5 | 51.8 | 9.0 | -29.9 |
| 2690 | 15.7 | 53.3 | 9.1 | -29.5 |

1. Measurements taken with device soldered in Doherty evaluation board for 2620 - 2690 MHz.

## Pin Configuration

| Pin # | Function |
|---|---|
| G1 | Gate Device 1 (main) |
| G2 | Gate Device 2 (peak) |
| D1 | Drain Device 1 (main) |
| D2 | Drain Device 2 (peak |
| S | Source (flange) |

## Ordering Information

| Part Number | Package |
|---|---|
| GTRB266702FCV1A-R0 | 50 piece reel |
| GTRB266702FCV1A-R2 | 250 piece reel |

* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

## RF Electrical Specifications[2]:
## Freq. = 2690 MHz, $V_{DD}$ = 48 V, $I_{DQ}$ = 360 mA, $V_{GS(PEAK)}$ = -5 V, $P_{OUT}$ = 48.5 dBm (70.8 W), $T_C$ = 25°C, Channel Bandwidth = 3.84 MHz, Peak/Average = 10 dB @ 0.01% CCDF

| Parameter | Units | Min. | Typ. | Max. |
|---|---|---|---|---|
| Gain | dB | 13.0 | 14.2 | — |
| Drain Efficiency | % | 45.0 | 49.8 | — |
| Adjacent Channel Power Ratio | dBc | — | -27 | -22 |
| Output PAR @ 0.01% CCDF | dB | 6.9 | 7.5 | — |

2. Performance in MACOM Doherty Production Test Fixture

## DC Electrical Characteristics: $T_A$ = 25°C

| Parameter | Test Conditions | Units | Min. | Typ. | Max. |
|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{GS}$ = -8 V, $I_D$ = 10 mA<br>main, peak | V | 150 | — | — |
| Drain-Source Leakage Current | $V_{GS}$ = -8 V, $V_{DS}$ = 10 V<br>main<br>peak | mA | — | — | 5.7<br>8.0 |
| Gate Threshold Voltage | $V_{DS}$ = 10 V<br>main, $I_D$ = 36 mA<br>peak, $I_D$ = 50 mA | V | -3.8 | -2.5<br>-2.7 | -2.1 |

## Recommended Operating Voltages

| Parameter | Test Conditions | Units | Min. | Typ. | Max. |
|---|---|---|---|---|---|
| Drain Operating Voltage | — | V | 0 | — | 50 |
| Gate Quiescent Voltage | $V_{DS}$ = 48 V, $I_D$ = 360 mA | V | -3.8 | -2.9 | -2.2 |

## Absolute Maximum Ratings[3,4,5]

| Parameter | Absolute Maximum |
|---|---|
| Drain-Source Voltage | 125 V |
| Gate-Source Voltage | -10 V to +2 V |
| Operating Voltage | 55 V |
| Gate Current (main) | 36 mA |
| Gate Current (peak) | 50.4 mA |
| Drain Current (main) | 13.5 A |
| Drain Current (peak) | 18.9 A |
| Junction Temperature | +275°C |
| Storage Temperature | -65°C to +150°C |

3. Exceeding any one or combination of these limits may cause permanent damage to this device.
4. MACOM does not recommend sustained operation near these survivability limits.
5. Product's qualification were performed @ +225°C. Operation @ $T_J$ (+275°C) reduces median time to failure.

## Thermal Characteristics

| Parameter | Test Conditions | Units | Min. | Typ. | Max. |
|---|---|---|---|---|---|
| Thermal Resistance ($R_{\theta JC}$)<br>main<br>peak | $T_C$ = +85°C, 48 V,<br>134 W DC<br>140 W DC | °C/W | — | <br>1.05<br>1.00 | — |

## Bias Sequencing

### Bias ON

1. Ensure RF is turned off
2. Apply pinch-off voltage of -5 V to the gate
3. Apply nominal drain voltage
4. Bias gate to desired quiescent drain current
5. Apply RF

### Bias OFF

1. Turn RF off
2. Apply pinch-off voltage to the gate
3. Turn-off drain voltage
4. Turn-off gate voltage

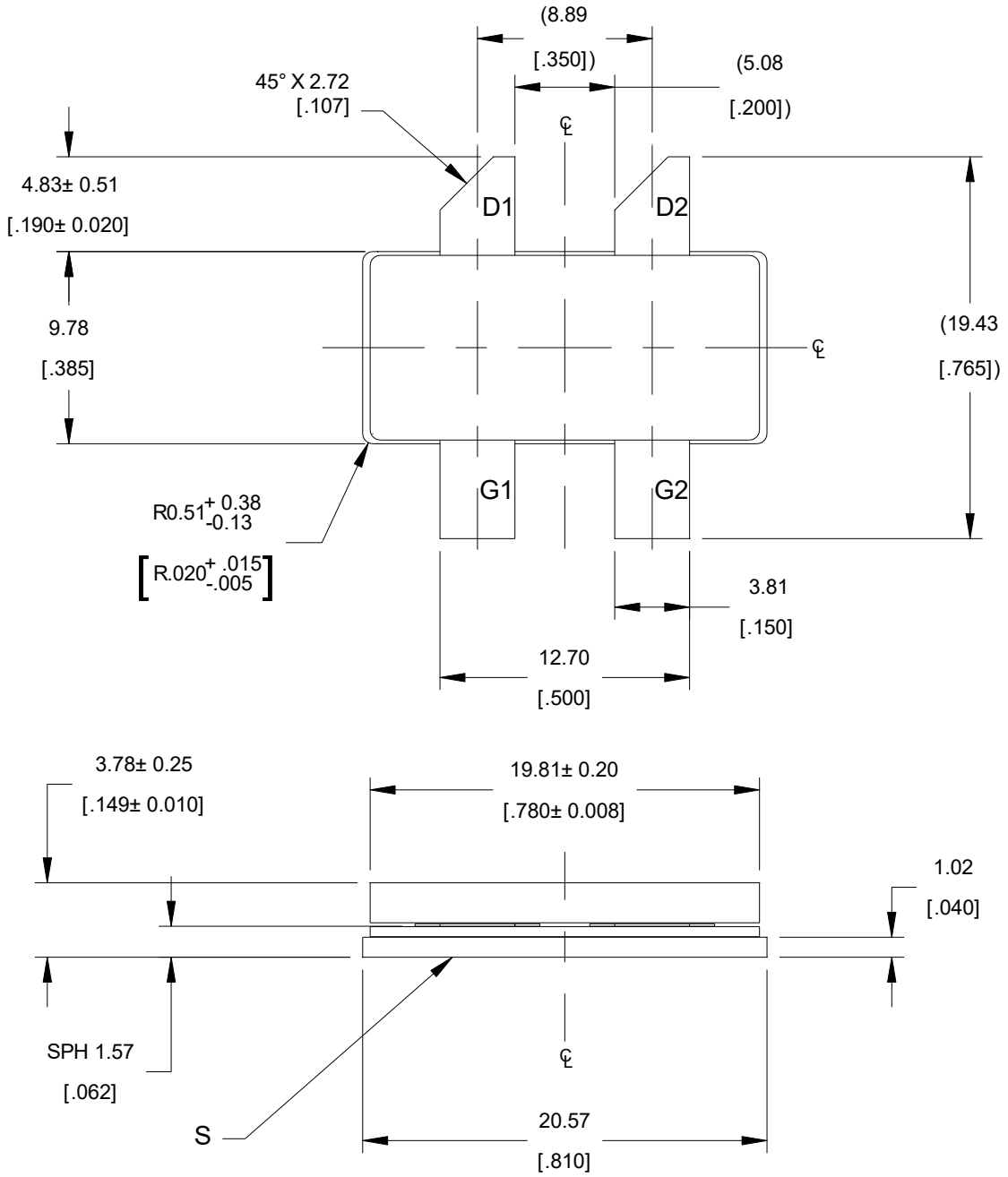
## Handling Procedures

Please observe the following precautions to avoid damage:

## Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

## Lead-Free Outline Drawing H-37248C-4




Interpret dimensions and tolerances per ASME Y14.5M-1994
Primary dimensions are mm; alternate dimensions are inches
All tolerances ± 0.127 [0.005]
Lead thickness: 0.13 ± 0.05 mm [0.005 ± 0.002 inch]
Gold plating thickness: 1.14 ± 0.38 micron [45 ± 15 microinch]