



Gallium Nitride 28V,300W,1-2GHz RF Power Transistor

Description

The GTAH17300RC2 is a 300W, both input and output matched GaN HEMT, ideal for multiple applications from 1-2GHz. It can support CW, pulse or any modulated signal.

In typical 1.3-1.9G application, it can deliver >300W CW at 28V and >350W at 32V

There is no guarantee of performance when this part is used outside of stated frequencies.

- Typical performance across 1.3-1.9GHz class AB application circuit with device soldered

$V_{DS}=28V$ $I_{DQ}=100mA$ ($V_{GS}=-2.75V$)

| Freq (MHz) | P1dB (dBm) | P1dB (W) | P1dB Eff(%) | P1dB Gain(dB) | P3dB (dBm) | P3dB (W) | P3dB Eff(%) |
|---------------|---------------|-------------|----------------|------------------|---------------|-------------|----------------|
| 1200 | 54.72 | 296.7 | 51.5 | 14.0 | 55.47 | 352.0 | 53.7 |
| 1300 | 54.57 | 286.8 | 52.1 | 14.5 | 55.28 | 337.3 | 54.1 |
| 1400 | 54.12 | 258.1 | 51.2 | 14.9 | 55.08 | 321.8 | 54.9 |
| 1500 | 53.73 | 235.9 | 49.1 | 15.2 | 55.09 | 323.0 | 55.3 |
| 1600 | 53.71 | 234.9 | 46.2 | 14.0 | 55.14 | 326.4 | 53.7 |
| 1700 | 53.47 | 222.6 | 42.8 | 12.9 | 55.13 | 325.9 | 50.8 |
| 1800 | 53.28 | 212.9 | 41.2 | 13.5 | 55.31 | 339.3 | 50.5 |
| 1900 | 53.31 | 214.3 | 43.1 | 13.8 | 55.20 | 330.9 | 52.1 |

GTAH17300RC2



Applications

- L band power amplifier
- GPS, Beidou jammer
- 1.5GHz LTE amplifier

Important Note: Proper Biasing Sequence for GaN HEMT Transistors

Turning the device ON

1. Set VGS to the pinch--off (VP) voltage, typically -5 V
2. Turn on VDS to nominal supply voltage
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

Turning the device OFF

1. Turn RF power off
2. Reduce VGS down to VP, typically -5 V
3. Reduce VDS down to 0 V
4. Turn off VGS

Table 1. Maximum Ratings

| Rating | Symbol | Value | Unit |
|--------------------------------|-----------|-------------|------|
| Drain--Source Voltage | V_{DSS} | +150 | Vdc |
| Gate--Source Voltage | V_{GS} | -10 to +2 | Vdc |
| Operating Voltage | V_{DD} | 32 | Vdc |
| Maximum gate current | I_{gs} | 90 | mA |
| Storage Temperature Range | T_{stg} | -65 to +150 | °C |
| Case Operating Temperature | T_C | +150 | °C |
| Operating Junction Temperature | T_J | +225 | °C |

Table 2. Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|----------------|--------|-------|------|
|----------------|--------|-------|------|



| | | | |
|--|-----------------|------|----------------------|
| Thermal Resistance, Junction to Case by FEA $T_C = 25^{\circ}\text{C}$, at $T_J = 200^{\circ}\text{C}$ | $R_{\theta JC}$ | 0.45 | $^{\circ}\text{C/W}$ |
|--|-----------------|------|----------------------|

Table 3. Electrical Characteristics ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

DC Characteristics (measured on wafer prior to packaging)

| Characteristic | Conditions | Symbol | Min | Typ | Max | Unit |
|--------------------------------|--|--------------|-----|------|-----|------|
| Drain-Source Breakdown Voltage | $V_{GS} = -8\text{V}$; $I_{DS} = 90\text{mA}$ | V_{DSS} | | 150 | | V |
| Gate Threshold Voltage | $V_{DS} = 10\text{V}$, $I_D = 90\text{mA}$ | $V_{GS(th)}$ | -4 | | -2 | V |
| Gate Quiescent Voltage | $V_{DS} = 50\text{V}$, $I_{DS} = 900\text{mA}$, Measured in Functional Test | $V_{GS(Q)}$ | | -3.2 | | V |

Ruggedness Characteristics

| Characteristic | Conditions | Symbol | Min | Typ | Max | Unit |
|--------------------------|---|--------|-----|------|-----|------|
| Load mismatch capability | 1.2 GHz, $P_{out} = 300\text{W}$ Pulsed CW All phase, No device damages | VSWR | | 10:1 | | |

1.3-1.9G

Figure 3: Network analyzer output, S11 and S21 ($V_{DS} = 28\text{V}$ $V_{GS} = -2.64\text{V}$ $I_{DQ} = 600\text{mA}$)

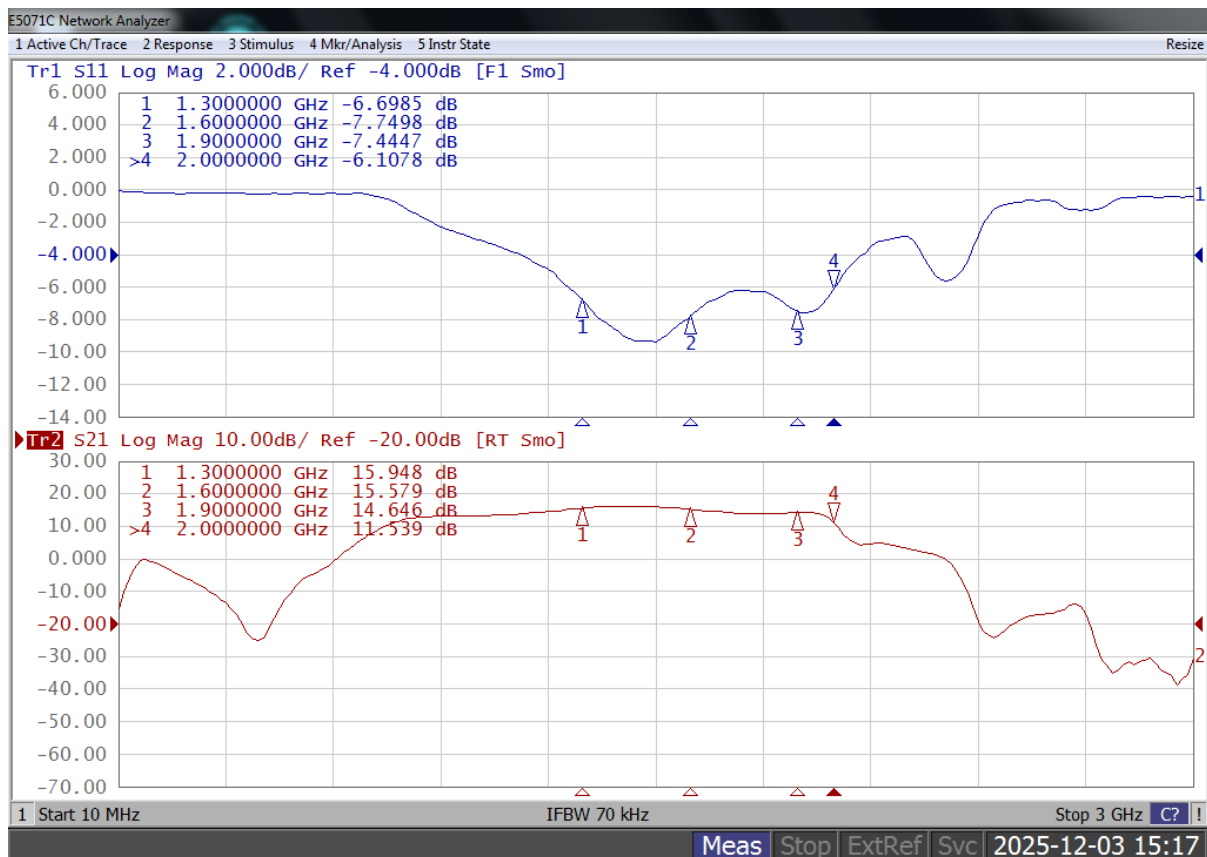


Figure 4: Picture of application board

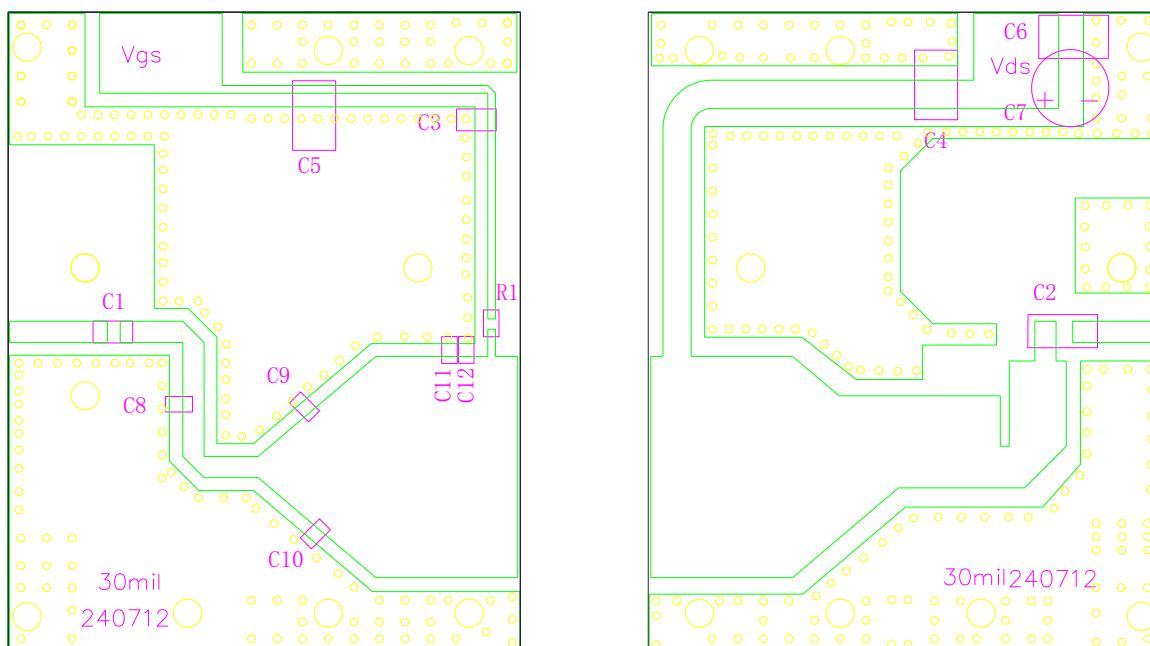


Table 4. Bill of materials of application board (RO4350B 30mil, PCB layout upon request)

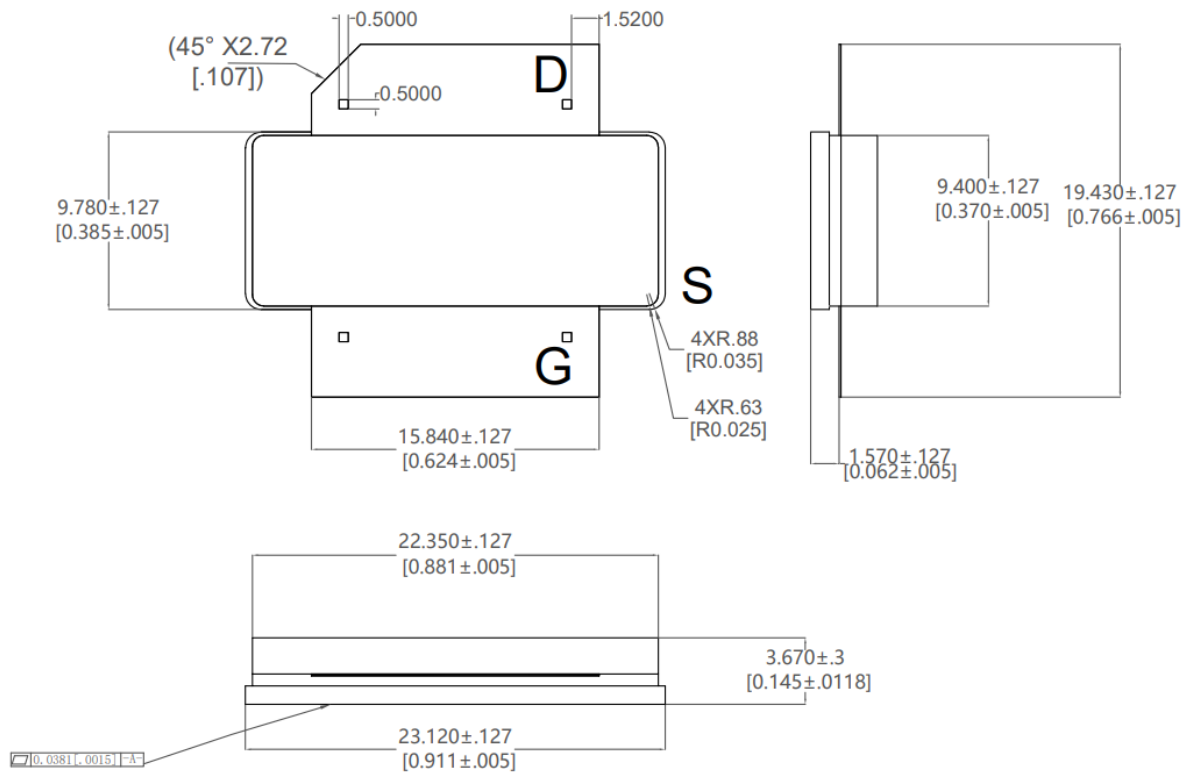
| Designator | Comment | Footprint | Quantity |
|------------|-------------|-----------|----------|
| C1 | 6.8 pF | 0603/0805 | 1 |
| C2, C4, | 30 pF | 1210 | 2 |
| C3 | 30 pF | 0603/0805 | 1 |
| C5, C6 | 10uF/100V | 1210 | 2 |
| C7 | 470uF/63V | | 1 |
| C8 | 1.5 pF | 0603/0805 | 1 |
| C9, C10 | 2.7pF | 0603/0805 | 2 |
| C11, C12 | 2.4 pF | 0603/0805 | 2 |
| R1 | 10 Ω | 0603 | 1 |



Package Outline

Flangeless ceramic package;

INP-688-2-EL (C2)



| OUTLINE VERSION | REFERENCE | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|-----------|-------|-------|------------------------|------------|
| | IEC | JEDEC | JEITA | | |
| PKG-C2 | | | | | 09/27/2018 |



Revision history

Table 4. Document revision history

| Date | Revision | Datasheet Status |
|-----------|----------|---|
| 2025/11/4 | V1.0 | Preliminary Datasheet Creation |
| 2025/12/3 | V2.0 | Modify with internal matching adjustment for better performance |
| | | |

Application data based on: LSM-25-32

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