

**GaN 28V, 250W, 3-4GHz RF Power Transistor****Description**

The XTAH35251RC2 is a 250W, both input and output matched GaN HEMT, ideal for multiple applications from 3-4GHz, with excellent RF performance. It can support CW, pulse or any modulated signal.

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

- Typical performance across 3.3-3.6GHz class AB application circuit with device soldered at 28V

V_{ds}=28V, V_{gs}=-2.61V, I_{dq}=100mA;

XTAH35251RC2

| Freq(MHz) | Pin(dBm) | Pout(dBm) | Pout(W) | IDS(A) | Gain(dB) | Eff(%) | 2nd(dBc) | 3rd(dBc) |
|-----------|----------|-----------|---------|--------|----------|--------|----------|----------|
| 3300 | 41 | 54.5 | 281.84 | 16.8 | 13.5 | 59.91 | -29.60 | -53.8 |
| 3400 | 41 | 54.5 | 281.84 | 16.8 | 13.5 | 59.91 | -28.60 | -58.1 |
| 3500 | 41 | 54.36 | 272.90 | 16.3 | 13.36 | 59.79 | -26.80 | -57.6 |
| 3600 | 41 | 54.55 | 263.03 | 15.7 | 13.2 | 59.83 | -28.60 | -55.2 |

Applications

- S band power amplifier
- ISM
- UAV Jammer

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} | 65.4 | 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°C, at T _J =200°C | R _{θJC} | 0.55 | °C /W |

Table 3. Electrical Characteristics (TA = 25°C unless otherwise noted)**DC Characteristics (measured on wafer prior to packaging)**

| Characteristic | Conditions | Symbol | Min | Typ | Max | Unit |
|----------------|------------|--------|-----|-----|-----|------|
|----------------|------------|--------|-----|-----|-----|------|



| | | | | | | |
|--------------------------------|---|---------------------|----|------|----|---|
| Drain-Source Breakdown Voltage | VGS=-8V; IDS=65.4mA | V _{DSS} | | 150 | | V |
| Gate Threshold Voltage | VDS =10V, ID = 65.4mA | V _{GS(th)} | -4 | | -2 | V |
| Gate Quiescent Voltage | VDS =50V, IDS=500mA, Measured in Functional Test | V _{GS(Q)} | | -2.5 | | V |

Ruggedness Characteristics

| Characteristic | Conditions | Symbol | Min | Typ | Max | Unit |
|--------------------------|--|--------|-----|------|-----|------|
| Load mismatch capability | 3.4GHz, Pout=250W Pulsed CW All phase, No device damages | VSWR | | 10:1 | | |

Figure 3: Network analyzer output, S11 and S21 (VDS=28V VGS=-2.5V IDQ=500mA)

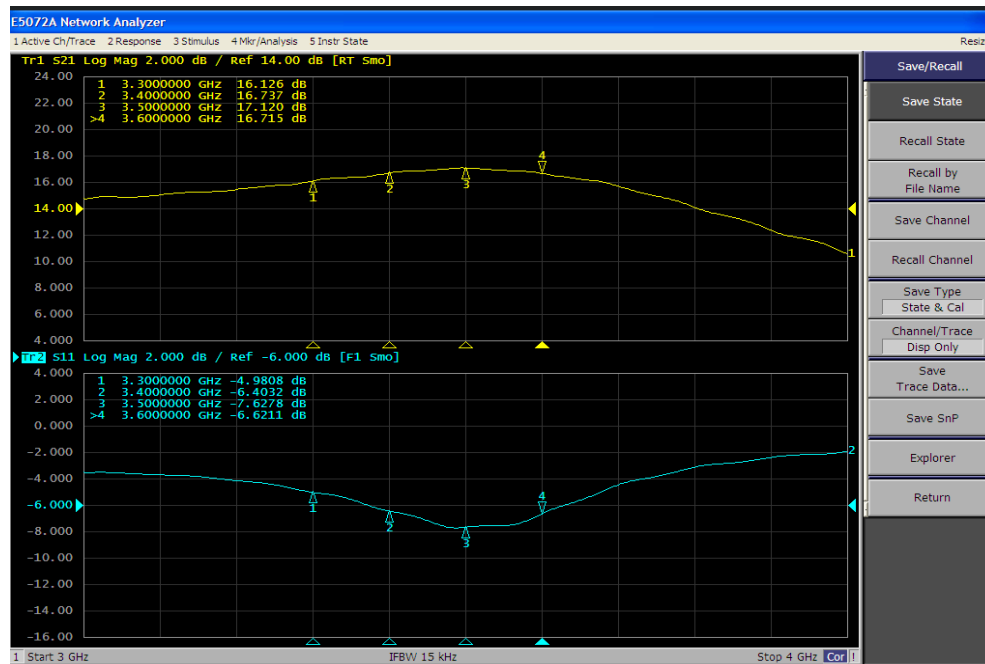


Figure 4: Picture of application board 3.3-3.6GHz class AB

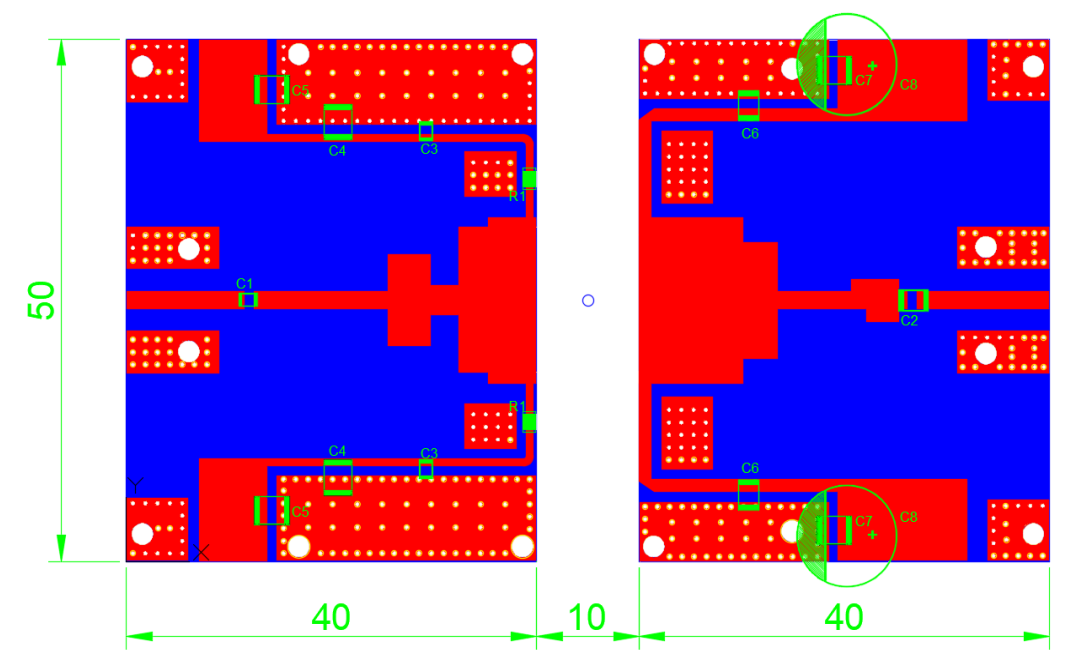




Table 4. Bill of materials of application board (PCB layout upon request)

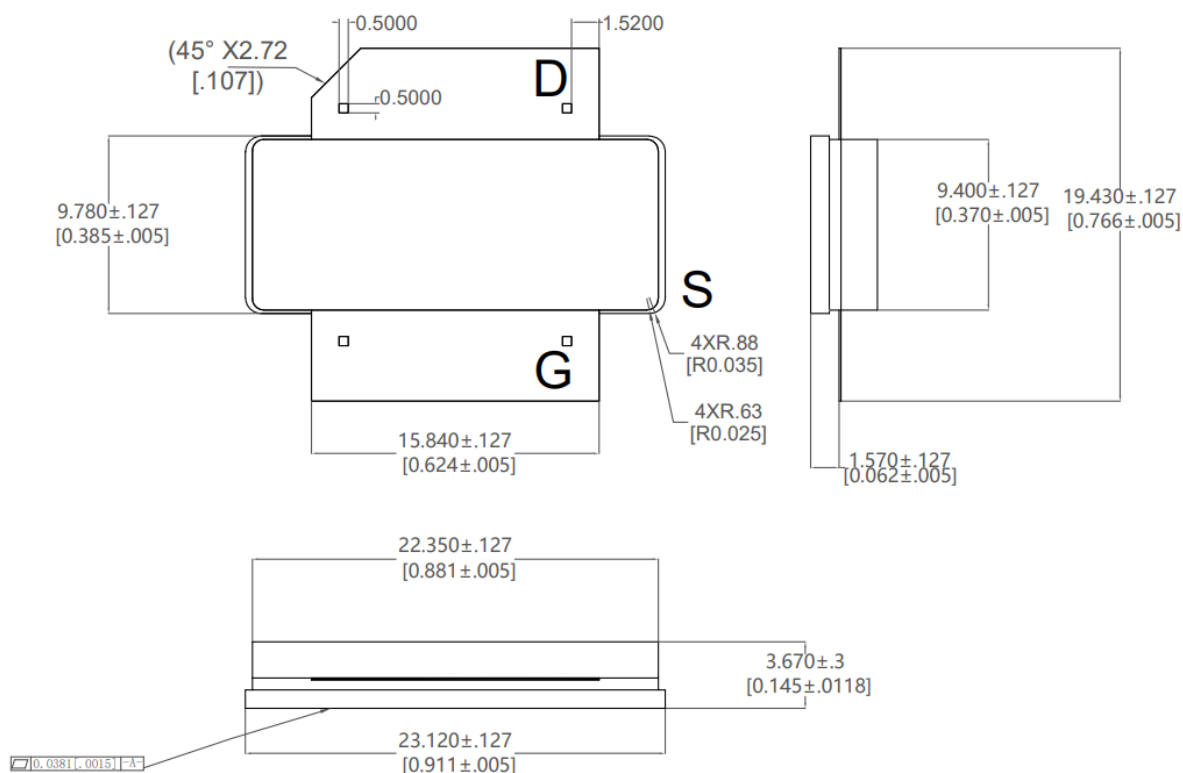
| Component | Description | Suggested Manufacturer |
|-----------|--------------------|------------------------|
| C8 | 470uF/63V | / |
| C4,C5,C7 | 10uF | / |
| C1, C3, | 10pF(MQ300805) | |
| C2, C6, | 10pF(MQ301111) | |
| R1 | Chip Resistor,10Ω | / |
| PCB | 30mil Rogers 4350B | / |



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 |
|-----------|----------|--------------------------------|
| 2025/8/26 | V1.0 | Preliminary Datasheet Creation |
| | | |
| | | |

Application data based on: YHG-25-32

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