



Gallium Nitride 28V 65W, RF Power Transistor

Description

The XTAH27065GX is a 65W internally matched, GaN HEMT, designed for multiple applications, especially LTE/LTE-A/LTE-U from 1800-2700MHz. In its typical 2.1-2.8G broadband application, it can deliver more than 60W across the full band.

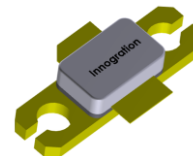
There is no guarantee of performance when this part is used in applications designed outside of these frequencies.

- Typical performance (on 2.1-2.8GHz wideband fixture with device soldered)

V_{ds}=28V, V_{gs}=-2.3V, I_{dq}=50mA, Test signal: CW

| Freq (MHz) | P1dB (dBm) | P1dB (W) | P1dB Eff (%) | P1dB Gain(dB) | P3dB (dBm) | P3dB (W) | P3dB Eff (%) |
|---------------|---------------|-------------|-----------------|------------------|---------------|-------------|-----------------|
| 2100 | 47.39 | 54.8 | 60.9 | 16.06 | 48.34 | 68.2 | 67.3 |
| 2200 | 47.33 | 54.1 | 63.9 | 16.18 | 48.24 | 66.7 | 68.8 |
| 2300 | 47.47 | 55.9 | 65.5 | 16.46 | 48.32 | 67.9 | 70.1 |
| 2400 | 47.44 | 55.5 | 64.7 | 16.55 | 48.28 | 67.4 | 69.1 |
| 2500 | 47.52 | 56.5 | 63.4 | 16.8 | 48.37 | 68.7 | 67.7 |
| 2600 | 47.54 | 56.8 | 62.6 | 17.39 | 48.46 | 70.1 | 67.5 |
| 2700 | 47.11 | 51.4 | 60.7 | 17.98 | 48.33 | 68.1 | 67.2 |
| 2800 | 46.43 | 44.0 | 57.5 | 17.65 | 48.03 | 63.6 | 67.0 |

XTAH27065GX



Applications and Features

- Suitable for wireless communication infrastructure, wideband amplifier, EMC testing, ISM etc.
- High Efficiency and Linear Gain Operations
- Thermally Enhanced Industry Standard Package
- High Reliability Metallization Process
- Excellent thermal Stability and Excellent Ruggedness
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Important Note: Proper Biasing Sequence for GaN HEMT Transistors

Turning the device ON

1. Set V_{GS} to the pinch-off (V_P) voltage, typically -5 V
2. Turn on V_{DS} to nominal supply voltage (28V)
3. Increase V_{GS} until I_{DS} current is attained
4. Apply RF input power to desired level

Turning the device OFF

1. Turn RF power off
2. Reduce V_{GS} down to V_P, typically -5 V
3. Reduce V_{DS} down to 0 V
4. Turn off V_{GS}

Table 1. Maximum Ratings

| Rating | Symbol | Value | Unit |
|--|-------------------|-------------|------|
| Drain--Source Voltage | V _{DSS} | 150 | Vdc |
| Gate--Source Voltage | V _{GS} | -10,+2 | Vdc |
| Operating Voltage | V _{DO} | 40 | Vdc |
| Maximum Forward Gate Current @ T _C = 25°C | I _{gmax} | 13.6 | mA |
| Storage Temperature Range | T _{stg} | -65 to +150 | °C |
| Case Operating Temperature | T _c | +150 | °C |
| Operating Junction Temperature(See note 1) | T _j | +200 | °C |
| Total Device Power Dissipation (Derated above 25°C, see note 2) | P _{diss} | 70 | W |

Note: 1. Continuous operation at maximum junction temperature will affect MTTF

2. Bias Conditions should also satisfy the following expression: P_{diss} < (T_j - T_c) / R_{JC} and T_c = T_{case}



Table 2. Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------|-------|------|
| Thermal Resistance, Junction to Case $T_C = 85^{\circ}\text{C}$, $T_J = 200^{\circ}\text{C}$, RF CW operation | $R_{\theta JC}$ | 2.52 | C/W |

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

DC Characteristics

| Characteristic | Conditions | Symbol | Min | Typ | Max | Unit |
|--------------------------------|--|--------------|-----|------|-----|------|
| Drain-Source Breakdown Voltage | $V_{GS} = -8\text{V}$; $I_{DS} = 13.6\text{mA}$ | V_{DSS} | 150 | | | V |
| Gate Threshold Voltage | $V_{DS} = 28\text{V}$, $I_D = 13.6\text{mA}$ | $V_{GS(th)}$ | | -2.7 | | V |

2.1-2.8GHz Typical performance

Figure 2: Power gain, efficiency as function of Pout at 28V

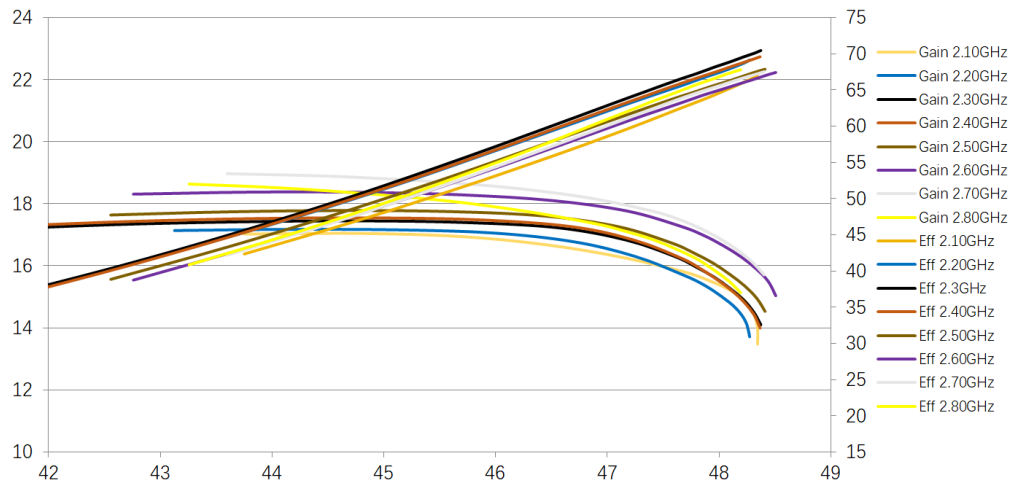


Figure 3: Network analyzer output S11/S21

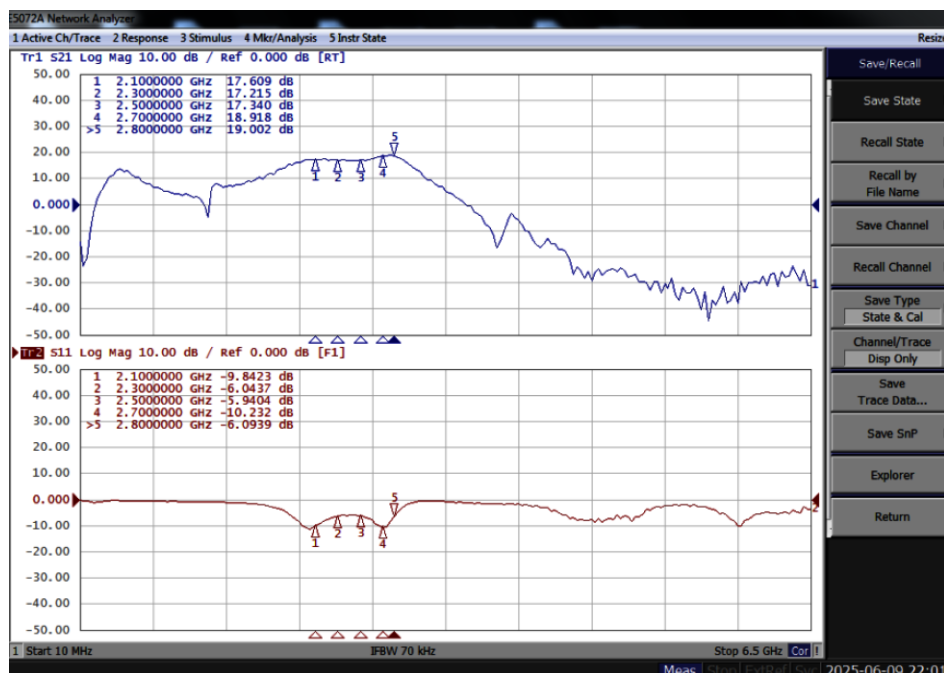
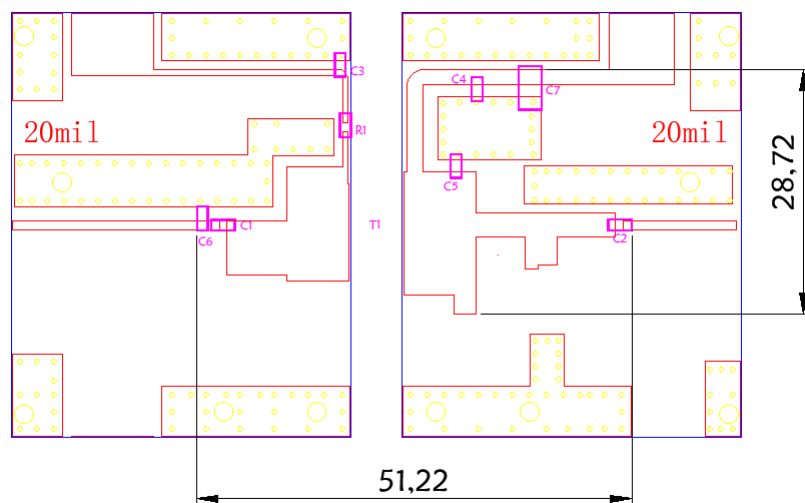


Figure 4: Picture of application board



| Part | Quantity | Description | Part Number | Manufacture |
|-------------|----------|----------------------------|-------------------|--------------|
| C1,C2,C3,C4 | 4 | 10pF High Q Capacitor | 251SHS100BSE | TEMEX |
| C5 | 1 | 1.1pF High Q Capacitor | 251SHS1R1BSE | TEMEX |
| C6 | 1 | 0.4pF High Q Capacitor | 251SHS0R4BSE | TEMEX |
| C7 | 1 | 10uF MLCC | GRM32EC72A106ME05 | Murata |
| R1 | 1 | 10 Ω Power Resistor | ESR03EZPF100 | ROHM |
| T1 | 1 | 65W GaN Transistor | XTAH27065GX | Innogrations |



Package Outline

Flanged ceramic package; 2 leads

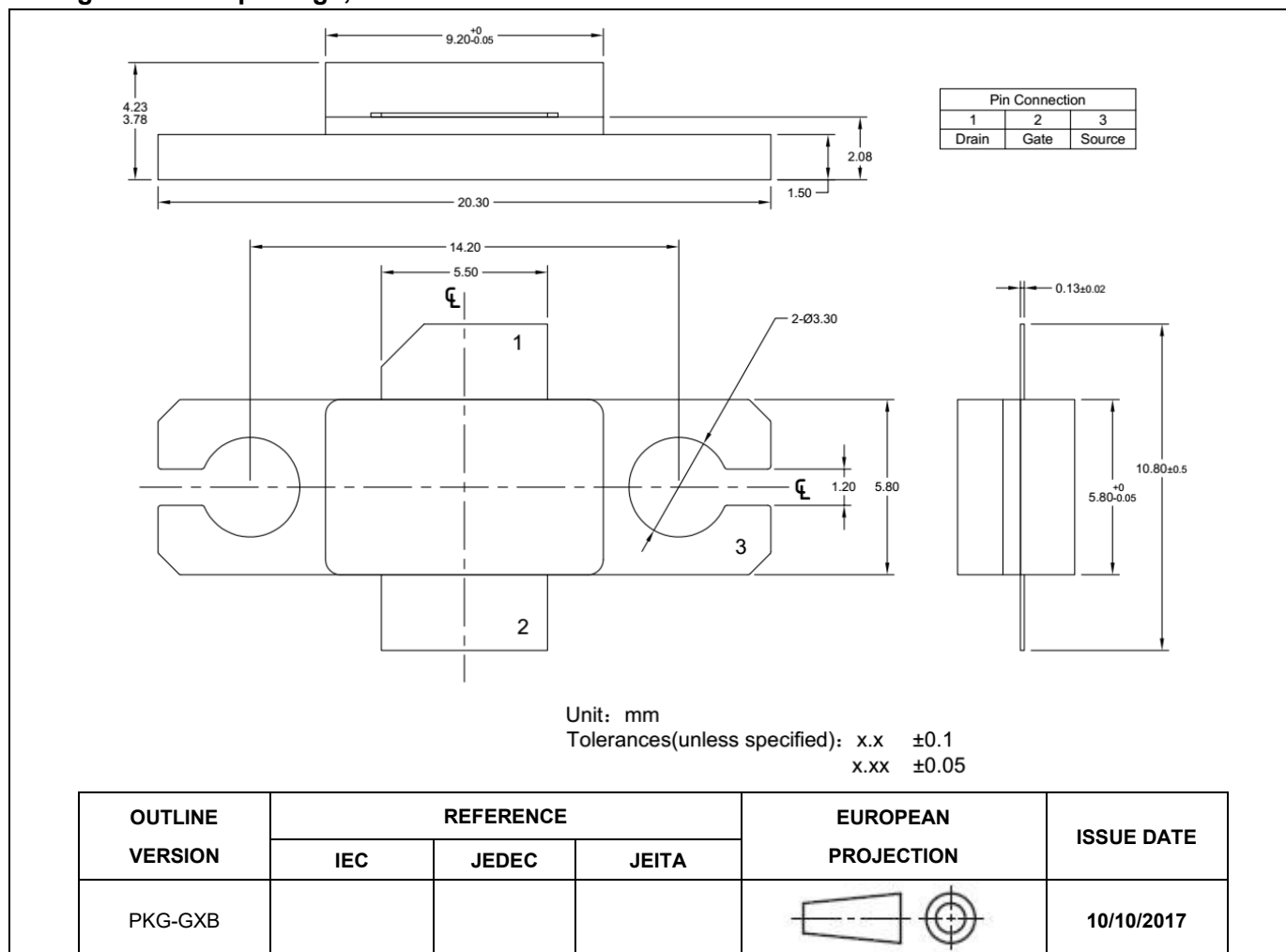


Figure 1. Package Outline PKG-G2E



Revision history

Table 4. Document revision history

| Date | Revision | Datasheet Status |
|-----------|----------|--------------------------------|
| 2025/6/10 | V1.0 | Preliminary Datasheet Creation |

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