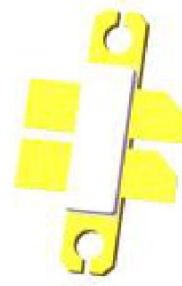


## DC-3.0GHz, 300W, 48V, GaN RF Transistor

### General Description

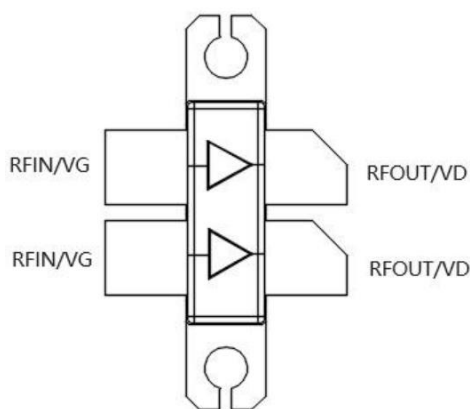
The GNNT3055H is a wideband pre-matched gallium nitride (GaN) high electron mobility transistor (HEMT), The device operates from DC to 3.0GHz with a 48V supply rail. Its typical saturated power is 300W@1.0GHz(Psat).

The Psat gain is 15dB@1.0GHz above, and drain efficiency is 60% above. The device is in an industry standard YJ801 ceramic package.



### Typical Application Data

- 0.7GHz-1.22GHz: Psat ≥ 55.5dBm



### Features

- Operating Frequencies: DC-3.0GHz
- Output Power (Psat): 300W@1.0GHz
- Power Gain: 15dB@1.0GHz
- DE@Psat: 60%@1.0GHz
- Operating Voltage: 48 V
- Support CW & Pulse mode

### Recommended Operating Conditions

| Parameter                      | Value        |
|--------------------------------|--------------|
| Drain-Source Voltage ( $V_D$ ) | 48 V (Typ)   |
| Quiescent Current ( $I_{DQ}$ ) | 400 mA (Typ) |
| Gate-Source Voltage( $V_G$ )   | -2.9 V (Typ) |

Note:

- 1.All the RF spec tested under recommended conditions.
- 2.Bias-up Procedure : Set VG to the pinch-off (VP) voltage, typically -5 V, then turn on VD to nominal supply voltage (28V)
- 3.Bias-down Procedure : Turn off RF signal, then turn off VD and wait 1 second to allow drain capacitor dissipation, turn off VG.

## Absolute Maximum Ratings

Note:

1. Operating outside the rated range may cause irreversible damage to the device.

| Parameter                                                      | Range Value  |
|----------------------------------------------------------------|--------------|
| Drain-Source Breakdown Voltage ( $BV_{DS}$ )                   | 120 V        |
| Drain-Source Voltage Range, ( $V_D$ )                          | 20 to 60 V   |
| Gate-Source Voltage Range, ( $V_G$ )                           | -10 to +1 V  |
| Operating Temperature Range                                    | -40 to 125°C |
| Storage Temperature Range                                      | -65 to 150°C |
| Maximum Input Power, CW ( $P_{in}$ ), $T_A = 25^\circ\text{C}$ | 44 dBm       |

## RF Characteristics, 0.7GHz-1.22GHz EVB

Note:

1. Test condition:  $T_A = 25^\circ\text{C}$ ,  $V_D = 48\text{V}$ ,  $I_{DQ} = 400\text{ mA}$ , CW

| Symbol     | Parameter        | Min | Typ | Max | Unit |
|------------|------------------|-----|-----|-----|------|
| $G_{LIN}$  | Linear Gain      | -   | 18  | -   | dB   |
| $P_{sat}$  | Output Power     | -   | 350 | -   | W    |
| $DE_{sat}$ | Drain Efficiency | -   | 60  | -   | %    |
| $G_{sat}$  | Gain             | -   | 15  | -   | dB   |

## Thermal Characteristics

| Symbol          | Parameter          | Min | Typ | Max | Unit               |
|-----------------|--------------------|-----|-----|-----|--------------------|
| $R_{\theta JC}$ | Thermal Resistance | -   | 0.3 | -   | $^\circ\text{C/W}$ |

## Test Data, 0.7GHz-1.22GHz

Test Condition: TA = 25 °C, V<sub>D</sub> =48 V, I<sub>DQ</sub> = 400 mA, CW

| Freq(GHz) | Psat(dBm) | Psat(W) | Power Gain(dB) | I <sub>D</sub> (A) | DE(%)  |
|-----------|-----------|---------|----------------|--------------------|--------|
| 0.7       | 55.2      | 331.13  | 14.65          | 10.86              | 63.52% |
| 0.8       | 55.4      | 346.74  | 15.38          | 12.70              | 56.88% |
| 0.9       | 55.9      | 389.05  | 16.30          | 14.00              | 57.89% |
| 1.0       | 56.1      | 407.38  | 17.20          | 13.25              | 64.05% |
| 1.1       | 55.75     | 375.84  | 15.77          | 12.90              | 60.70% |
| 1.22      | 55.9      | 389.05  | 16.04          | 13.04              | 62.16% |

## ESD Protection Characteristics

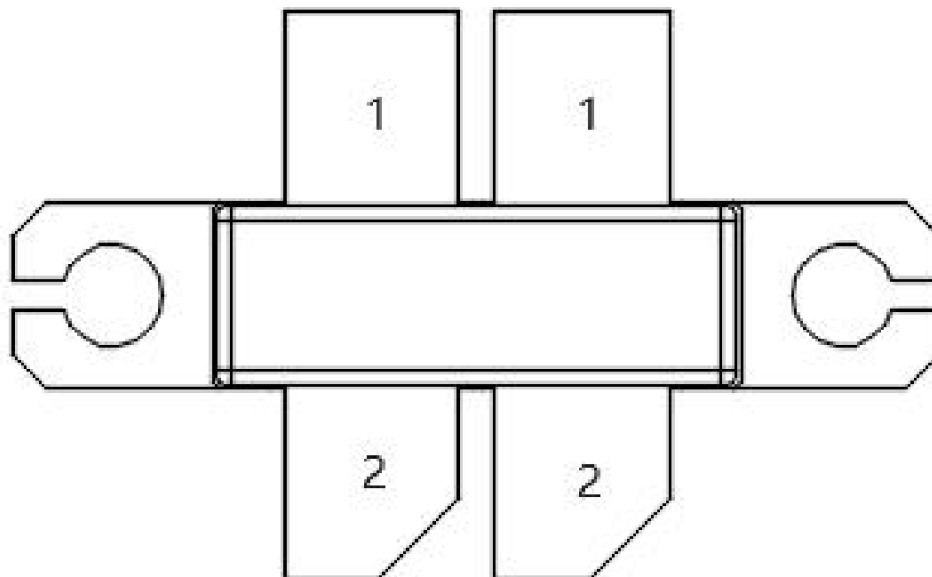
| Test Methodology    | Class  | Standard                   |
|---------------------|--------|----------------------------|
| Human Body Model    | ±225V  | JEDEC Standard JS-001-2017 |
| Charge Device Model | ±1000V | JEDEC Standard JS-002-2018 |

## Solderability

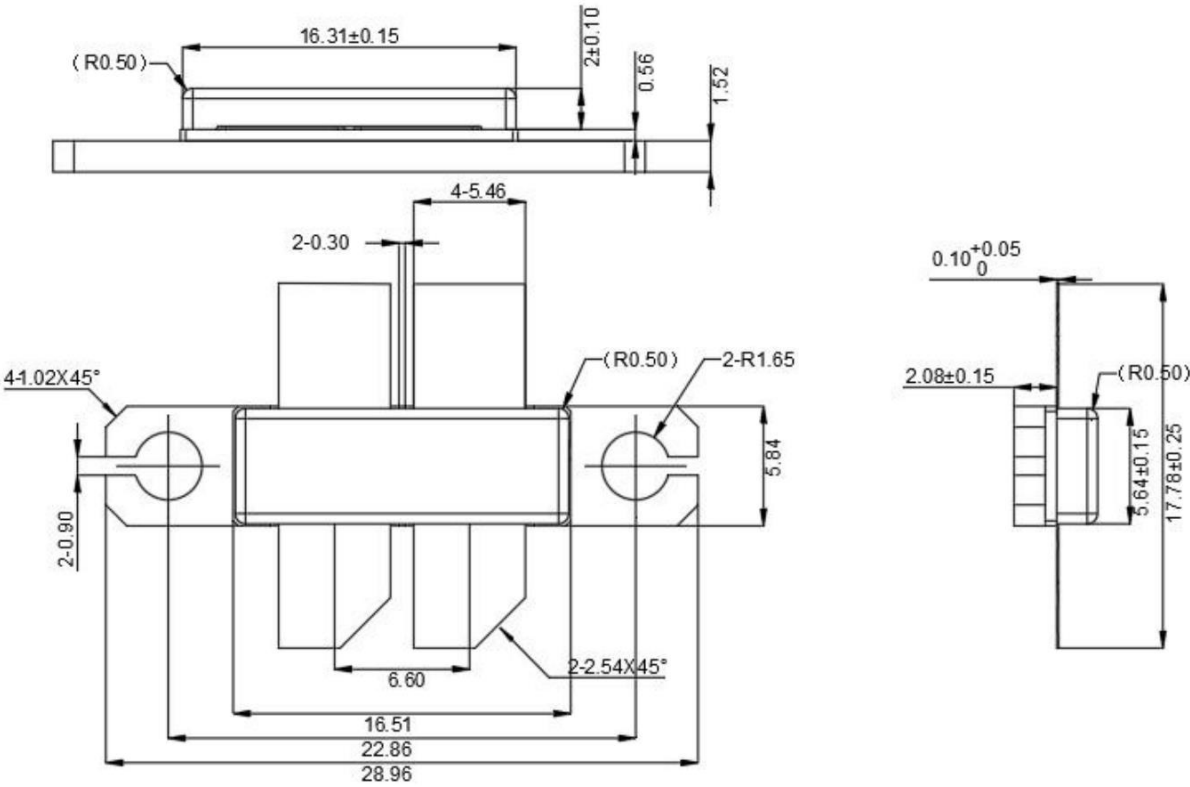
This package is lead-free/RoHS-compliant. The plating material on the leads is NiAu. It is compatible with both lead-free (maximum 260 °C reflow temperature) and tin-lead (maximum 245°C reflow temperature) soldering processes.

## RoHs Compliance

This part is compliant with 2015/863/ and EU 2011/65/EC RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).



| PIN | Symbol         | Description                                                                                  |
|-----|----------------|----------------------------------------------------------------------------------------------|
| 1   | $V_G$ / RF IN  | Gate voltage / RF Input to be matched to 50 ohms;                                            |
| 2   | $V_D$ / RF OUT | Drain voltage / RF Output to be matched to 50 ohms                                           |
| --  | Source         | Source connected to ground, It needs to be welded onto the substrate under the window of PCB |



YJ801

Note:

- 1. All dimensions are in millimeters.
- 2. All dimension tolerances are +/- 0.10 or +/- 0.20 mm.

Revision History

| Data      | Revision | Datasheet Status      |
|-----------|----------|-----------------------|
| 2024/6/11 | 1.0      | Preliminary Datasheet |
| 2024/7/2  | 1.1      | Update Test Data      |