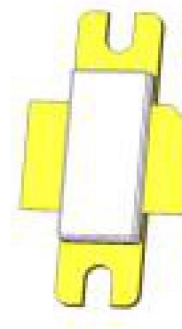


DC-1.6GHz, 800W, 50V, GaN RF Transistor

General Description

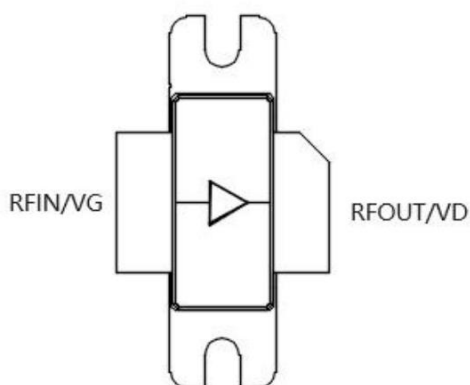
The GNNT1559H is a wideband pre-matched gallium nitride (GaN) high electron mobility transistor (HEMT), The device operates from DC to 1.6GHz with a 50V supply rail. Its typical saturated power is 800W@1.1GHz(Psat).

The Psat gain is 14dB@1.1GHz above, and drain efficiency is 60% above. The device is in an industry standard YJ204 ceramic package.



Typical Application Data

- 0.96-1.225GHz: Psat ≥ 59dBm



Features

- Operating Frequencies: DC-1.6GHz
- Output Power (Psat): 800 W@1.1GHz
- Power Gain: 14dB@1.1GHz
- DE@Psat: 60%@1.1GHz
- Operating Voltage: 50 V
- Support Pulse mode

Recommended Operating Conditions

Parameter	Value
Drain-Source Voltage (V_D)	50 V (Typ)
Quiescent Current (I_{DQ})	200 mA (Typ)
Gate-Source Voltage(V_G)	-2.7V (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}), $T_A = 25^\circ\text{C}$	48 dBm

RF Characteristics, 0.96GHz-1.225GHz EVB

Note:

1. Test condition: $T_A = 25^\circ\text{C}$, $V_D = 50\text{V}$, $IDQ = 200\text{ mA}$, 100us/1ms Pulse

Symbol	Parameter	Min	Typ	Max	Unit
G_{LIN}	Linear Gain	-	16	-	dB
P_{sat}	Output Power	-	800	-	W
DE_{sat}	Drain Efficiency	-	60	-	%
G_{sat}	Gain	-	14	-	dB

Thermal Characteristics

Symbol	Parameter	Min	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance	-		-	°C/W

Test Data, 0.96GHz-1.225GHz

Test Condition: TA = 25 °C, V_D =50 V, I_{DQ} = 200 mA, 100us/1ms Pulse

Freq(GHz)	Psat(dBm)	Psat(W)	Power Gain(dB)	I _D (A)	DE(%)
0.96	59.5	891.3	14.6	28.5	62.5%
1.00	59.6	912.0	14.6	28.5	64.0%
1.05	59.3	851.1	14.3	28.1	60.6%
1.10	59.5	891.3	14.6	28.1	63.4%
1.15	59.7	933.3	14.9	27.8	67.1%
1.20	59.5	891.3	14.8	27.4	65.1%
1.225	59.4	871.0	14.5	25.8	67.5%

Test Condition: TA = 25 °C, V_D =50 V, I_{DQ} = 100 mA, 6ms/40ms Pulse

Freq(GHz)	Psat(dBm)	Psat(W)	Power Gain(dB)	I _D (A)	DE(%)
0.96	56.5	446.7	15.3	19.1	46.8%
1.00	56.5	446.7	15.2	19.1	46.8%
1.05	56.5	446.7	14.8	19.4	46.0%
1.10	56.5	446.7	14.9	19.4	46.0%
1.15	56.5	446.7	15.2	18.7	47.8%
1.20	56.5	446.7	14.7	18.4	48.6%
1.225	56.5	446.7	14.8	17.7	50.5%

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

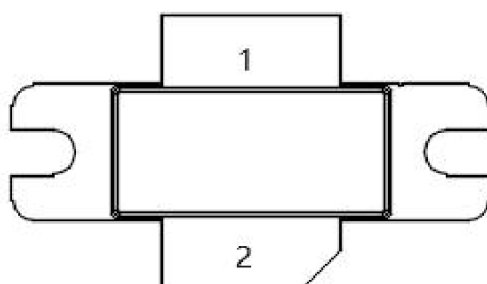
Solderability

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

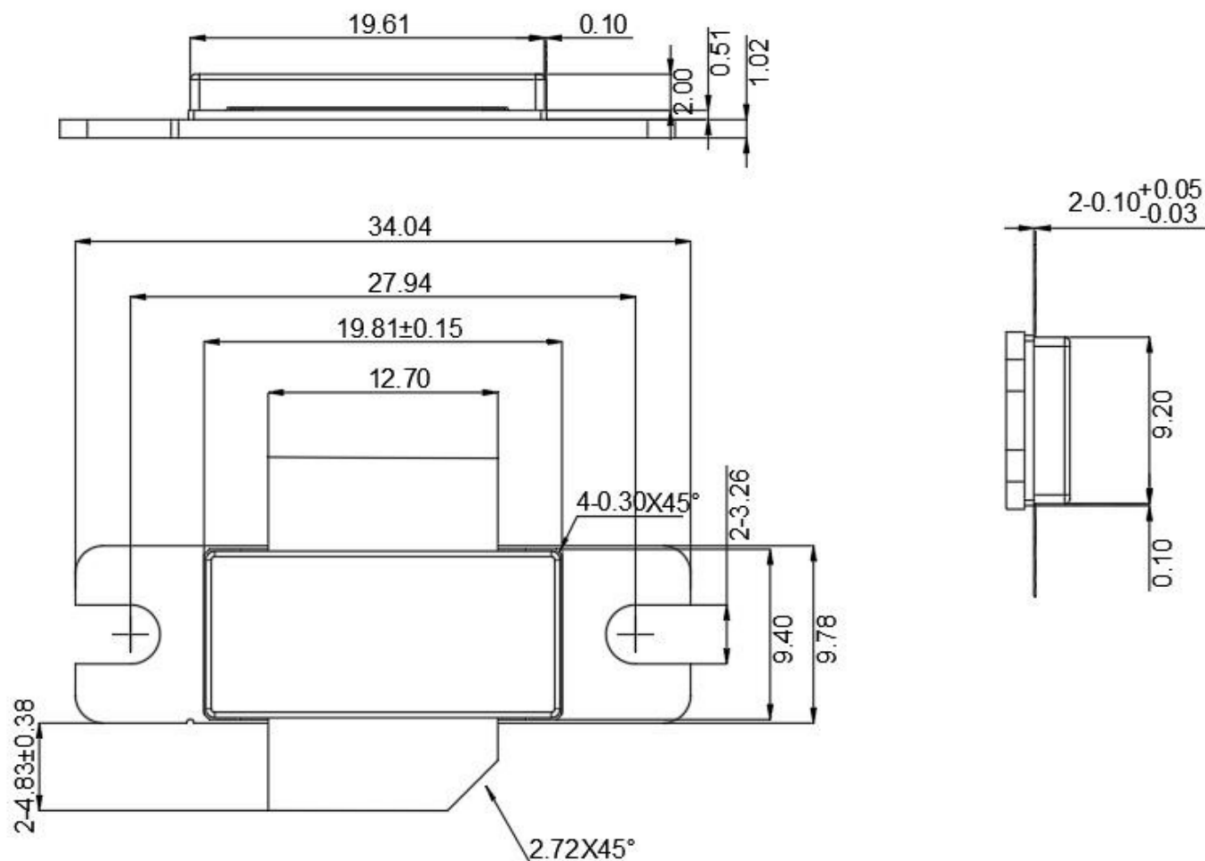
This part is compliant with 2015/863/ and EU 2011/65/EC RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

Pin Configuration



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

Package Dimensions



YJ204

Note:

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

Revision History

Data	Revision	Datasheet Status
2025/2/28	1.0	Preliminary Datasheet
2025/8/6	2.0	Update Test Data (0.96-1.225GHz)