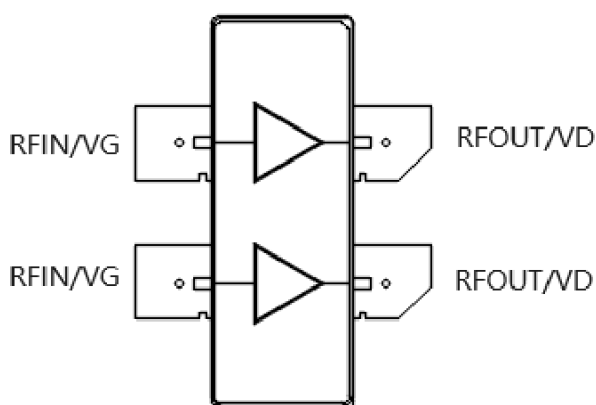
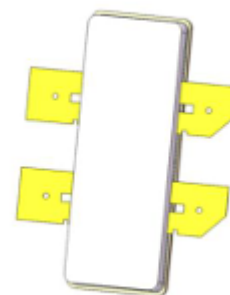


DC-3.0GHz, 125W, 28V, GaN RF Transistor

General Description

The GNNT3151HP is a wideband pre-matched gallium nitride (GaN) high electron mobility transistor (HEMT), The device operates from DC to 3.0GHz with a 28V supply rail. Its typical saturated power is 125W@3.0GHz(P_{sat}).The P_{sat} gain is 11dB@3.0GHz above, drain efficiency is 50% above. The device is in an industry standard YJ802 ceramic package.



Features

- Operating Frequencies: DC-3.0GHz
- Output Power (P_{sat}): 125 W@3.0GHz
- Power Gain: 11dB@3.0GHz
- $DE@P_{sat}$: 50%@3.0GHz
- Operating Voltage: 28 V
- Support CW & Pulse mode

Typical Application Data

- 0.5GHz-2.7GHz: $P_{sat} \geq 49.1\text{dBm}$
- 0.5GHz-2.5GHz: $P_{sat} \geq 50.0\text{dBm}$

Recommended Operating Conditions

Parameter	Value
Drain-Source Voltage (V_D)	28 V (Typ)
Quiescent Current (I_{DQ})	200mA (Typ)
Gate-Source Voltage(V_G)	-2.8V (Typ)

Note:

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

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 32 V
Gate-Source Voltage Range, (V_G)	-10 to +1 V
Operating Temperature Range	-40 to 85°C
Storage Temperature Range	-65 to 150°C
Maximum Input Power, CW (P_{in}), $T_A = 25^\circ \text{C}$	42 dBm

Thermal Characteristics

Symbol	Parameter	Min	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance	-	0.9	-	°C/W

RF Characteristics, 0.5GHz-2.7GHz EVB

Note:

1. Test condition: $T_A = 25^\circ \text{C}$, $V_D = 28\text{V}$, $I_{DQ} = 200 \text{ mA}$, CW

Symbol	Parameter	Min	Typ	Max	Unit
G_{LIN}	Linear Gain	-	14	-	dB
P_{sat}	Output Power	-	125	-	W
DE_{sat}	Drain Efficiency	-	50	-	%
G_{sat}	Gain	-	11	-	dB

Test Data, 500MHz-2700MHz

Test Condition: TA = 25 °C, VD = 28 V, IDQ = 200 mA, CW

Freq(MHz)	Psat(dBm)	Psat(W)	Power Gain(dB)	ID(A)	DE(%)
500	51.4	138.0	12.4	9.80	50.31%
600	51.2	131.8	13.5	7.70	61.14%
700	51.0	125.9	13.1	6.40	70.25%
800	50.9	123.0	13.0	6.00	73.23%
900	50.9	123.0	13.3	6.30	69.74%
1000	50.9	123.0	13.0	6.55	67.08%
1100	50.2	104.7	11.6	5.50	68.00%
1200	49.9	97.7	11.3	5.30	65.85%
1300	49.9	97.7	10.0	5.45	64.04%
1400	49.7	93.3	10.2	5.77	57.77%
1500	50.2	104.7	9.8	6.40	58.43%
1600	49.9	97.7	9.8	5.90	59.15%
1700	49.7	93.3	10.2	5.50	60.60%
1800	49.1	81.3	10.5	5.30	54.77%
1900	50.0	100.0	9.6	7.20	49.60%
2000	50.7	117.5	10.4	8.05	52.13%
2100	50.5	112.2	9.7	7.74	51.77%
2200	50.3	107.2	10.3	7.70	49.70%
2300	50.4	109.6	10.2	7.65	51.19%
2400	49.8	95.5	10.4	7.47	45.66%
2500	50.3	107.2	10.4	8.05	47.54%
2600	50.1	102.3	10.1	7.45	49.06%
2700	49.5	89.1	10.0	6.70	47.51%

RF Characteristics, 0.5GHz-2.5GHz EVB

Note:

1. Test condition: TA = 25 °C, VD = 28V, IDQ = 200 mA, CW

Symbol	Parameter	Min	Typ	Max	Unit
G_{LIN}	Linear Gain	13	-	-	dB
P_{sat}	Output Power	100	-	-	W
DE_{sat}	Drain Efficiency	50	-	-	%
G_{sat}	Gain	10	-	-	dB

500MHz-2500MHzEVB 测试数据

Freq(MHz)	Psat(dBm)	Psat(W)	Power Gain(dB)	I_D (A)	DE(%)
500	50.3	107.2	10.7	6.10	62.7%
600	50.2	104.7	11.5	5.70	65.6%
700	50.8	120.2	13.8	6.80	63.1%
800	51.0	125.9	13.3	7.00	64.2%
900	50.7	117.5	12.7	6.15	68.2%
1000	50.4	109.6	10.7	5.90	66.4%
1100	50.0	100.0	10.0	5.55	64.4%
1200	50.3	107.2	10.7	6.15	62.2%
1300	50.1	102.3	10.7	6.00	60.9%
1400	50.4	109.6	11.9	6.40	61.2%
1500	50.2	104.7	10.8	5.75	65.0%
1600	50.5	112.2	11.4	6.75	59.4%
1700	50.1	102.3	11.3	6.30	58.0%
1800	50.4	109.6	10.4	6.45	60.7%
1900	50.3	107.2	10.8	6.20	61.7%
2000	51.1	128.8	11.3	7.60	60.5%
2100	50.9	123.0	10.4	7.70	57.1%
2200	50.5	112.2	10.9	7.20	55.7%
2300	50.4	109.6	10.5	7.45	52.6%
2400	50.7	117.5	12.0	7.60	55.2%
2500	50.4	109.6	10.6	7.30	53.6%

ESD Protection Characteristics

Test Methodology	Class	Standard
Human Body Model	$\pm 225V$	JEDEC Standard JS-001-2017
Charge Device Model	$\pm 1000V$	JEDEC Standard JS-002-2018

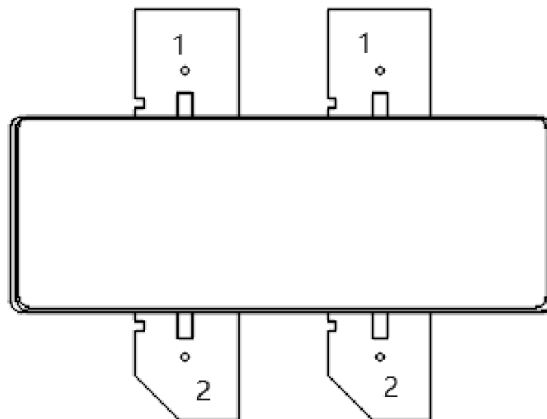
Solderability

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.

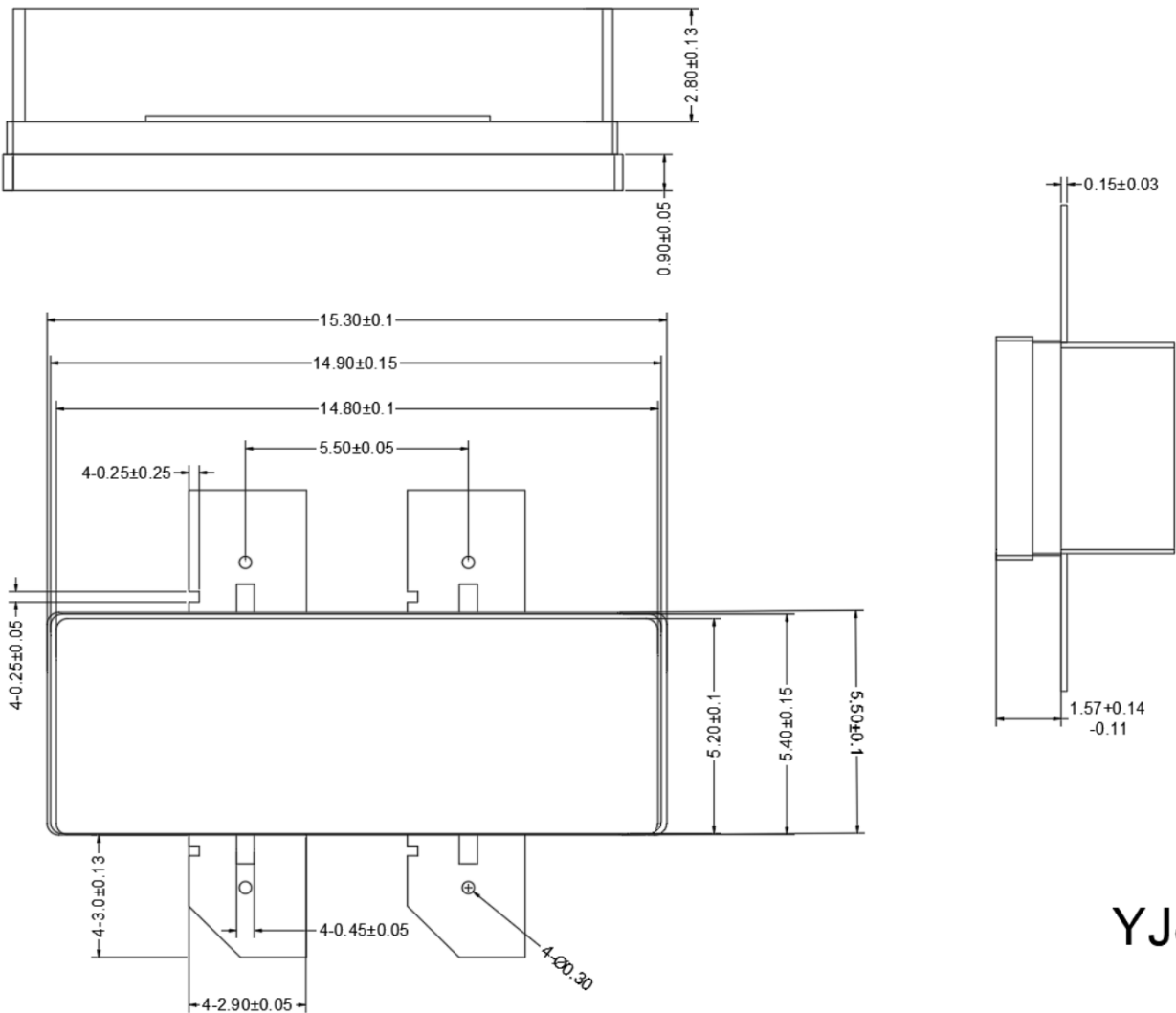
RoHs Compliance

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



YJ802

Note:

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

Revision History

Data	Revision	Datasheet Status
2024/3/20	1.0	Preliminary Datasheet
2024/6/11	1.1	Uniform format
2024/10/23	1.2	Rectify errors
2024/10/28	1.3	Rectify errors
2025/8/25	1.4	Add test data(0.5GHz-2.5GHz)