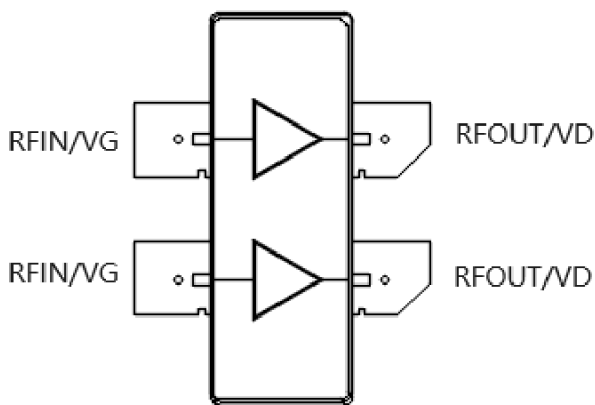
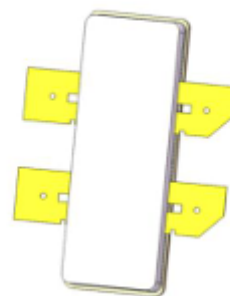


5.7-6.8GHz, 125W, 28V, GaN RF Transistor

General Description

The GNNT6851HP is a wideband pre-matched gallium nitride (GaN) high electron mobility transistor (HEMT), The device operates from 5.7GHz to 6.8GHz with a 28V supply rail. Its typical saturated power is 125W@6.1GHz(P_{sat}).

The P_{sat} gain is 8.9dB@6.1GHz above, drain efficiency is 45% above. The device is in an industry standard YJ802 ceramic package.



Features

- Operating Frequencies: 5.7-6.8GHz
- Output Power (P_{sat}): 125W@6.0GHz
- Power Gain: 8.9dB@6.1GHz
- $DE@P_{sat}$: 45.8%@6.3GHz
- Operating Voltage: 28 V
- Support CW & Pulse mode

Typical Application Data

- 6.1GHz-6.7GHz: $P_{sat} \geq 50.9\text{dBm}$
- 5.7GHz-6.2GHz: $P_{sat} \geq 50.9\text{dBm}$

Recommended Operating Conditions

Parameter	Value
Drain-Source Voltage (V_D)	28 V (Typ)
Quiescent Current (I_{DQ})	150mA (Typ)
Gate-Source Voltage(V_G)	-2.35 V (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 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, 6.1GHz-6.7GHz EVB

Note:

1. Test condition: $T_A = 25^\circ \text{C}$, $V_D = 28\text{V}$, $I_{DQ} = 150 \text{ mA}$, CW

Symbol	Parameter	Min	Typ	Max	Unit
G_{LIN}	Linear Gain	11.5	12	12.5	dB
P_{sat}	Output Power	-	125	-	W
DE_{sat}	Drain Efficiency	-	46	-	%
G_{sat}	Gain	-	9	-	dB

Thermal Characteristics

Symbol	Parameter	Min	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance	-	0.85	-	°C/W

Test Data, 6.1GHz-6.7GHz

Test Condition: $T_A = 25\text{ }^{\circ}\text{C}$, $V_D = 28\text{ V}$, $I_{DQ} = 150\text{ mA}$, CW

Freq(GHz)	Psat(dBm)	Psat(W)	Power Gain(dB)	I_D (A)	DE(%)
6.1	50.9	123.03	8.9	8.40	52.31
6.2	51.0	125.89	9.1	9.00	49.96
6.3	51.0	125.89	9.5	9.80	45.88
6.4	51.5	141.25	9.8	10.20	49.46
6.5	51.2	131.83	9.5	9.44	49.87
6.6	51.0	125.89	9.5	9.35	48.09
6.7	50.9	123.03	9.4	9.14	48.07

Test Data, 5.7GHz-6.2GHz

Test Condition: $T_A = 25\text{ }^{\circ}\text{C}$, $V_D = 28\text{ V}$, $I_{DQ} = 150\text{ mA}$, CW

Freq(GHz)	Psat(dBm)	Psat(W)	Power Gain(dB)	I_D (A)	DE(%)
5.7	51.6	144.54	8.5	9.40	54.92
5.8	51.6	144.54	9.1	9.47	54.51
5.9	51.6	144.54	9.5	10.40	49.64
6.0	51.4	138.04	9.6	9.75	50.56
6.1	51.3	134.90	9.6	8.88	54.25
6.2	50.9	123.03	9.1	8.97	48.98

ESD Protection Characteristics

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

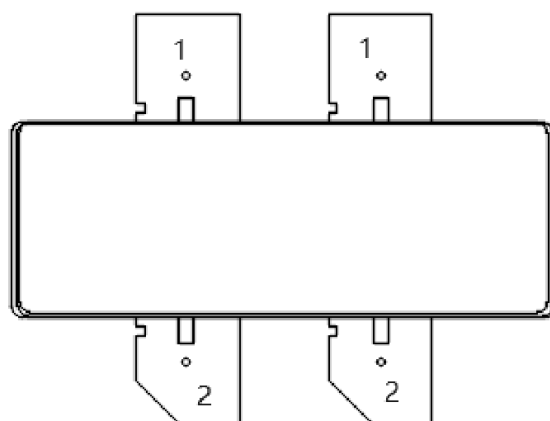
Solderability

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

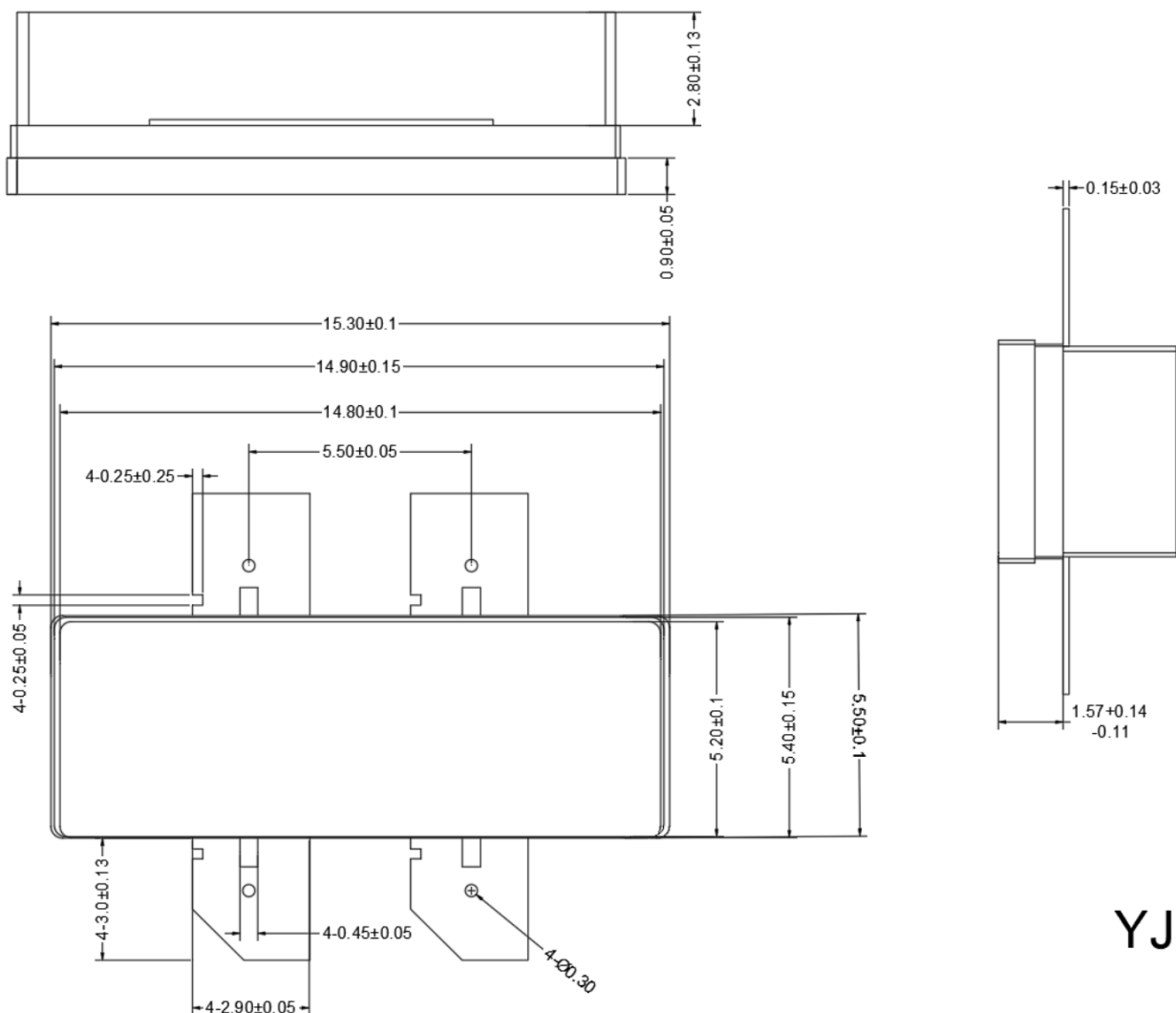
This part is compliant with 2015/863/ and EU 2011/65/EC RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

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



Note:

1. All dimensions are in millimeters.
2. All dimension tolerances are ± 0.10 or ± 0.20 mm.

Revision History

Data	Revision	Datasheet Status
2025/06/18	1.0	Preliminary Datasheet
2025/07/08	2.0	Update test data