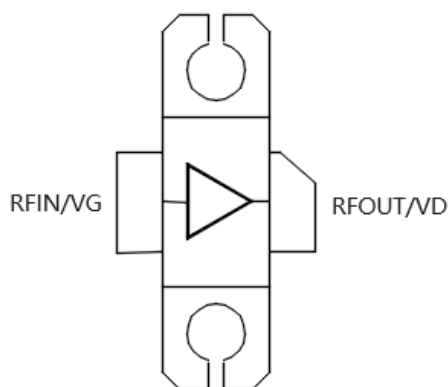
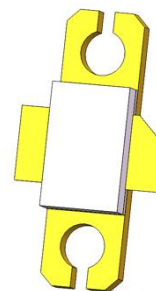


4.8-6.0GHz, 80W, 28V, GaN RF Transistor

General Description

The GNNT6149H is a wideband pre-matched gallium nitride (GaN) high electron mobility transistor (HEMT), The device operates from 4.8 to 6.0GHz with a 28V supply rail. Its typical saturated power is 80W@6.0GHz (P_{sat}). The P_{sat} gain is 10dB@6.0GHz above, and drain efficiency is 55% above. The device is in an industry standard YJ201 ceramic package.



Features

- Operating Frequencies: 4.8-6.0GHz
- Output Power (P_{sat}): 80W@6.0GHz
- Power Gain: 10dB@6.0GHz
- $DE@P_{sat}$: 55%@6.0GHz
- Operating Voltage: 28 V
- Support CW & Pulse mode

Typical Application Data

- (24V) 4.9GHz-6.0GHz: $P_{sat} \geq 46.1\text{dBm}$
- (28V) 4.9GHz-5.65GHz: $P_{sat} \geq 47.2\text{dBm}$
- (28V) 5.1GHz-5.3GHz: $P_{sat} \geq 49.25\text{dBm}$
- (28V) 5.7GHz-5.9GHz: $P_{sat} \geq 48.65\text{dBm}$

Recommended Operating Conditions

Parameter	Value
Drain-Source Voltage (V_D)	28 V (Typ)
Quiescent Current (I_{DQ})	150 mA (Typ)
Gate-Source Voltage(V_G)	-2.3 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 (V_{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}), $T_A = 25^\circ\text{C}$	41 dBm

RF Characteristics, 4.9GHz-6.0GHz EVB

Note:

1. Test condition: $T_A = 25^\circ\text{C}$, $V_D = 24\text{V}$, $I_{DQ} = 150\text{ mA}$, CW

Symbol	Parameter	Min	Typ	Max	Unit
G_{LIN}	Linear Gain	-	11	-	dB
P_{sat}	Output Power	40	45	50	W
DE_{sat}	Drain Efficiency	46	50	-	%
G_{sat}	Gain	-	8	9.2	dB

Thermal Characteristics

Symbol	Parameter	Min	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance	-	1.0	-	°C/W

Test Data, 4.9GHz-6.0GHz EVB

Test Condition: TA = 25 °C, V_D =24 V, I_{DQ} = 150 mA, CW (When V_D =28V, Psat+1.3dB)

Freq(GHz)	Psat(dBm)	Psat(W)	Power Gain(dB)	I _D (A)	DE(%)
4.9	46.10	40.74	7.80	3.65	46.50
5.0	46.10	40.74	7.80	3.66	46.38
5.1	46.13	41.02	7.80	3.66	46.70
5.2	46.70	46.77	8.20	4.00	48.72
5.3	46.90	48.98	8.40	4.00	51.02
5.4	47.00	50.12	8.20	4.10	50.93
5.5	47.00	50.12	8.70	4.10	50.93
5.6	47.00	50.12	8.30	4.00	52.21
5.7	46.90	48.98	8.80	3.88	52.60
5.8	46.80	47.86	9.30	3.88	51.40
5.9	46.80	47.86	9.20	3.80	52.48
6.0	46.10	40.74	8.80	3.36	50.52

Test Data, 4.9GHz-5.65 GHz EVB

Test Condiktion: TA = 25 °C, V_D =28 V, I_{DQ} = 200 mA, CW

Freq(GHz)	Psat(dBm)	Psat(W)	Power Gain(dB)	I _D (A)	DE(%)
4.9	47.55	56.9	9.4	4.00	50.8
5.0	47.80	60.3	10.0	4.12	52.2
5.1	48.15	65.3	9.9	4.38	53.3
5.2	48.55	71.6	9.9	4.53	56.5
5.3	48.30	67.6	10.1	4.29	56.3
5.4	48.45	70.0	10.2	4.45	56.2
5.5	48.45	70.0	9.9	4.32	57.9
5.6	47.55	56.9	9.7	3.68	55.2
5.65	47.20	52.5	9.6	3.53	53.1

Test Data, 5.1GHz-5.3GHz EVB

Test Condition: TA = 25 °C, V_D =28 V, I_{DQ} = 200mA, CW

Freq(GHz)	Psat(dBm)	Psat(W)	Power Gain(dB)	I _D (A)	DE(%)
5.1	49.25	84.1	10.3	5.64	53.3
5.2	49.55	90.2	10.6	5.34	60.3
5.3	49.35	86.1	10.3	5.38	57.2

Test Data, 5.7GHz-5.9GHz EVB

Test Condition: TA = 25 °C, V_D =28 V, I_{DQ} = 200mA, CW

Freq(GHz)	Psat(dBm)	Psat(W)	Power Gain(dB)	I _D (A)	DE(%)
5.7	49.00	79.4	9.7	5.90	48.1
5.8	49.18	82.8	9.5	5.41	54.7
5.9	48.65	73.3	9.4	4.70	55.7

ESD Protection Characteristics

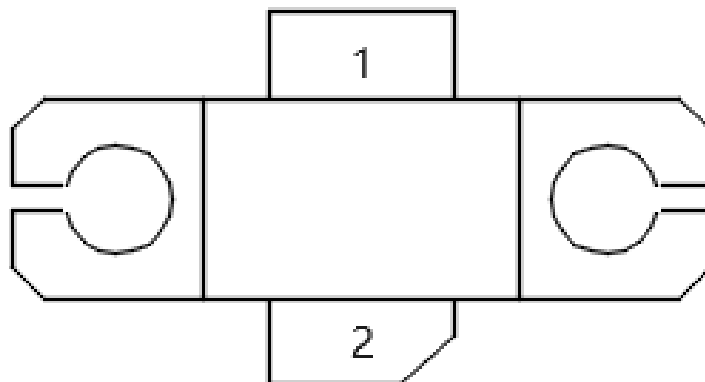
Test Methodology	Class	Standard
Human Body Model	±225V	JEDEC Standard JS-001-2017
Charge Device Model	±1000V	JEDEC Standard JS-002-2018

Solderability

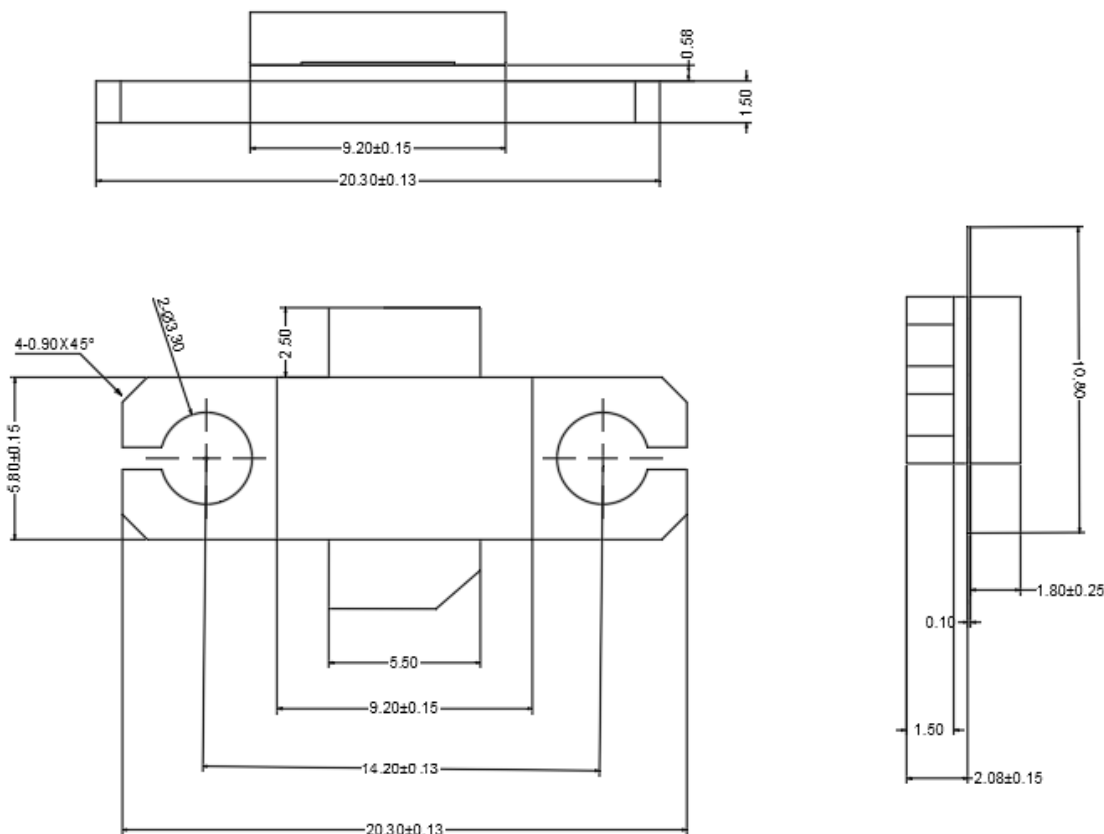
This package is lead-free/RoHS-compliant. The plating material on the leads is NiAu. It is compatible with both lead-free (maximum 260 °C reflow temperature) and tin-lead (maximum 245°C reflow temperature) soldering processes.

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



YJ201

Note:

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

Revision History

Data	Revision	Datasheet Status
2024/8/1	1.0	Preliminary Datasheet
2024/8/8	1.1	Update Test Data
2024/9/30	1.2	Rectify Errors
2025/5/21	1.3	Update Test Data