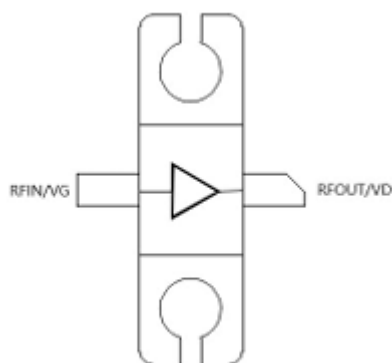


DC-4.0GHz, 25W, 48V, GaN RF Transistor

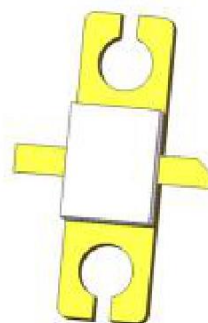
General Description

The GNHT4043H is a wideband pre-matched gallium nitride(GaN) high electron mobility transistor (HEMT) , The device operates from DC to 4.0GHz with a 48V supply rail. Its typical saturated power is 25W@1.0GHz (P_{sat}). The P_{sat} gain is 18dB@1.0GHz above, and drain efficiency is 70% above. The device is in an industry standard YJ203 ceramic package.



Features

- Operating Frequencies: DC-4.0GHz
- Output Power (P_{sat}): 25 W@1.0GHz
- Power Gain: 18dB@1.0GHz
- DE@P_{sat}: 70%@1.0GHz
- Operating Voltage: 48 V
- Support CW & Pulse mode



Typical Application Data

- 0.7GHz-1.225GHz: P_{sat} ≥ 43.8dBm
- 1.25GHz-1.55GHz: P_{sat} ≥ 45.25dBm(pulse)

Recommended Operating Conditions

Parameter	Value
Drain-Source Voltage (V _D)	48 V (Typ)
Quiescent Current (I _{DQ})	100 mA (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 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}), $T_A = 25^\circ \text{C}$	35dBm

RF Characteristics, 0.7GHz-1.225GHz EVB

Note:

1. Test condition: $T_A = 25^\circ \text{C}$, $V_D = 48\text{V}$, $I_{DQ} = 100 \text{mA}$, CW

Symbol	Parameter	Min	Typ	Max	Unit
G_{LIN}	Linear Gain	-	21	-	dB
P_{sat}	Output Power	-	25	-	W
DE_{sat}	Drain Efficiency	-	70	-	%
G_{sat}	Gain	-	18	-	dB

Thermal Characteristics

Symbol	Parameter	Min	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance	-	3.7	-	$^\circ\text{C/W}$

Test Data, 0.7GHz-1.225GHz

Test Condition: TA = 25 °C, VD =48 V, IDQ = 100 mA, CW

Freq(GHz)	Psat(dBm)	Psat(W)	Power Gain(dB)	ID(A)	DE(%)
0.7	43.90	24.55	17.8	0.87	58.78%
0.8	44.30	26.92	18.8	0.82	68.38%
0.9	44.40	27.54	18.8	0.80	71.72%
1.0	44.10	25.70	18.1	0.73	73.36%
1.1	44.10	25.70	18.5	0.74	72.36%
1.2	44.00	25.12	17.6	0.79	66.24%
1.225	44.00	25.12	17.3	0.77	67.96%

Test Data, 1.25GHz-1.55GHz

Test Condition: TA=25°C,VD=50V, IDQ=25mA, 50us/500us pulse

Freq(GHz)	Psat(dBm)	Psat(W)	Power Gain(dB)	ID(A)	DE(%)
1.25	45.80	38.02	18.5	0.108	70.41%
1.35	45.45	35.08	18.6	0.101	69.46%
1.45	45.25	33.50	18.7	0.102	65.68%
1.55	45.60	36.31	17.8	0.113	64.26%

ESD Protection Characteristics

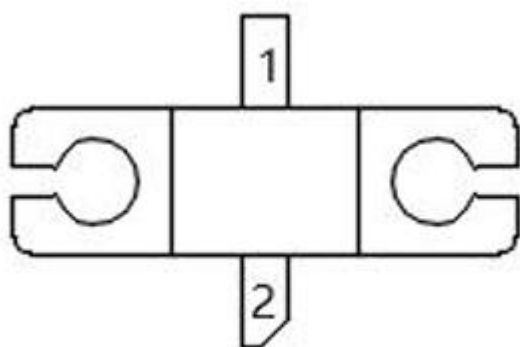
Test Methodology	Class	Standard
Human Body Model	±225V	JEDEC Standard JS-001-2017
Charge Device Model	±1000V	JEDEC Standard JS-002-2018

Solderability

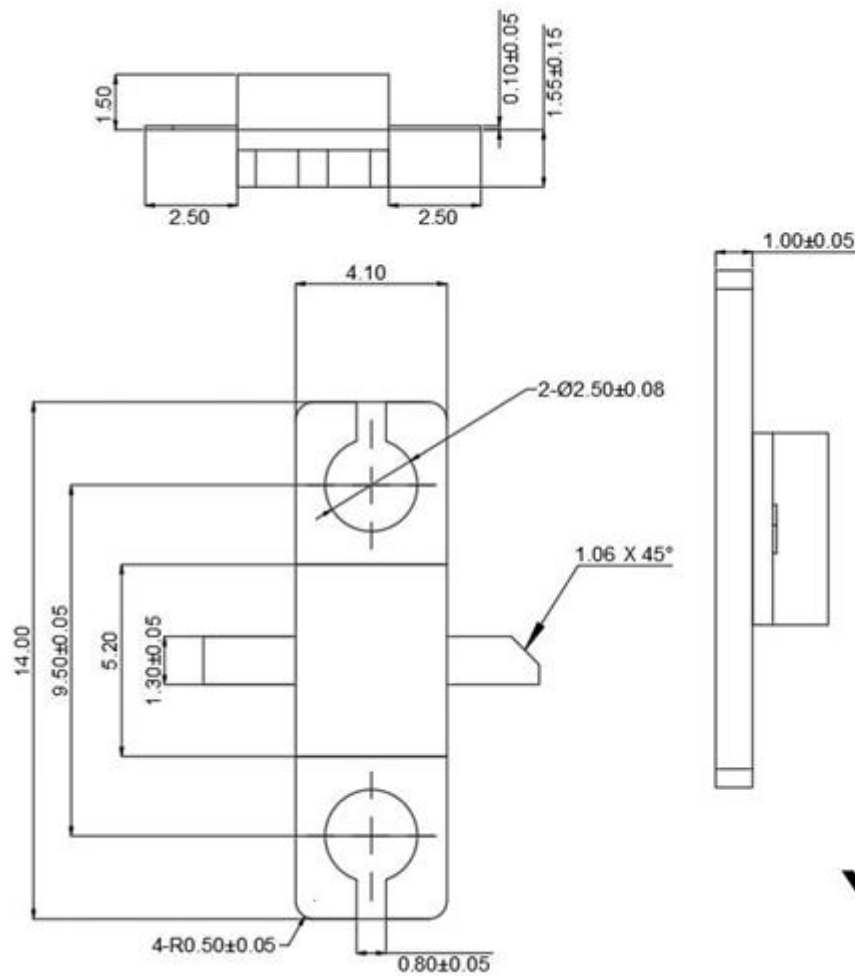
This package is lead-free/RoHS-compliant. The plating material on the leads is NiAu. It is compatible with both lead-free (maximum 260 °C reflow temperature) and tin-lead (maximum 245°C reflow temperature) soldering processes.

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	Gate voltage / RF Input
2	V_D	Drain voltage / RF Output
--	Source	Source connected to ground, It needs to be welded onto the substrate under the window of PCB



YJ203

Note:

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

Revision History

Data	Revision	Datasheet Status
2024/7/3	1.0	Preliminary Datasheet
2024/9/30	1.1	Update Test data