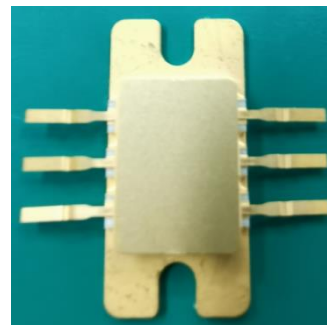


2000-6000MHz, 30W, 28V, GaN RF Transistor

General Description

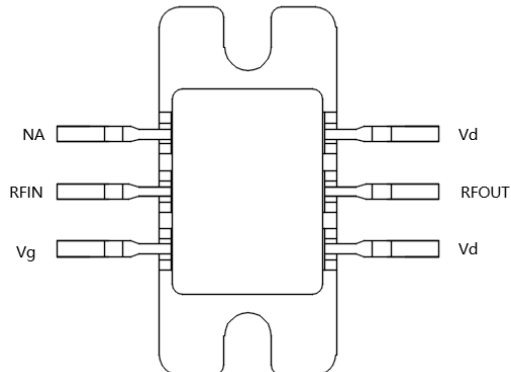
The GNNT2060-45M is a wideband matched gallium nitride (GaN) high electron mobility transistor (HEMT), The device integrated 2-stage power amplifier module with 30W saturated output power and 2.0-6.0GHz operating frequency range. It is 50 Ω input and output and requires minimal external components. The device is in an industry standard mental-ceramic 8.7mm*18mm*2.3mm package.



Applications

- Electronic warfare
- Broad-band application

Block Diagram



Features

- Operating Frequencies: 2000MHz~6000MHz
- Output Power(Psat): 45dBm
- Power Gain: 19dB
- PAE: 40%
- Operating Voltage: 28V
- Support CW & Pulse Mode
- Package: 8.7mm*18mm*2.3mm mental-ceramic

Recommended Operating Conditions

Note:

Parameter	Value
Drain-Source Voltage (V_D)	28 V (Typ)
Quiescent Current (I_{DQ})	1500 mA(Typ)
Gate-Source Voltage(V_G)	-2.30 V(Typ)

- 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 Rating

Note:

1. Operating outside the rated range may cause irreversible damage to the device

Parameter	Range Value
Drain-Source Breakdown Voltage (BV_{DS})	120V
Drain-Source Voltage Range, (V_D)	20~32V
Gate-Source Voltage Range, (V_G)	-10~+1V
Operating Temperature Range	-40~125°C
Storage Temperature Range	-65~150°C
Maximum Input Power, CW (P_{in}), $T_A = 25^\circ\text{C}$	30 dBm

RF Characteristics

Symbol	Parameter	2000MHz	4000MHz	6000MHz	Unit
P_{sat}	Saturated Output Power	46	46	45	dBm
G_p	Power Gain	19	19.5	19	dB
Eff	Drain Efficiency	50	40	35	%

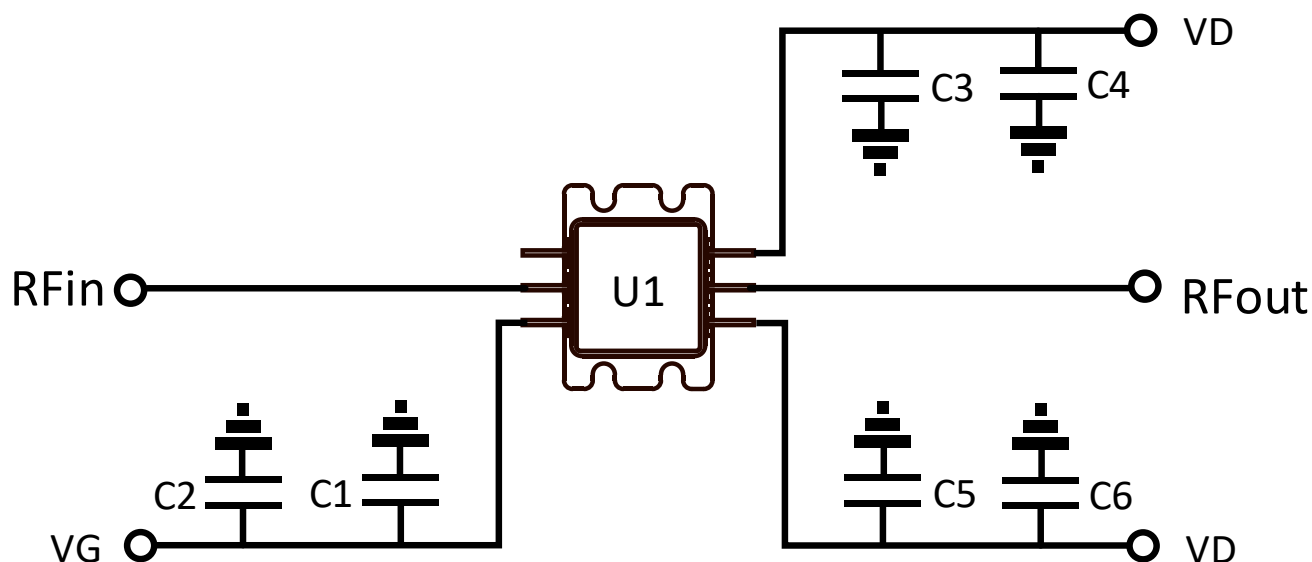
Test condition: $T_A = 25^\circ\text{C}$, $V_D = 28\text{V}$, $I_{DQ} = 1500\text{mA}$, CW

Thermal Characteristics

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

Test condition: $T_A = 25^\circ\text{C}$, $V_D = 28\text{V}$, $I_{DQ} = 1500\text{mA}$, CW

Evaluation Board



BOM List of EVB

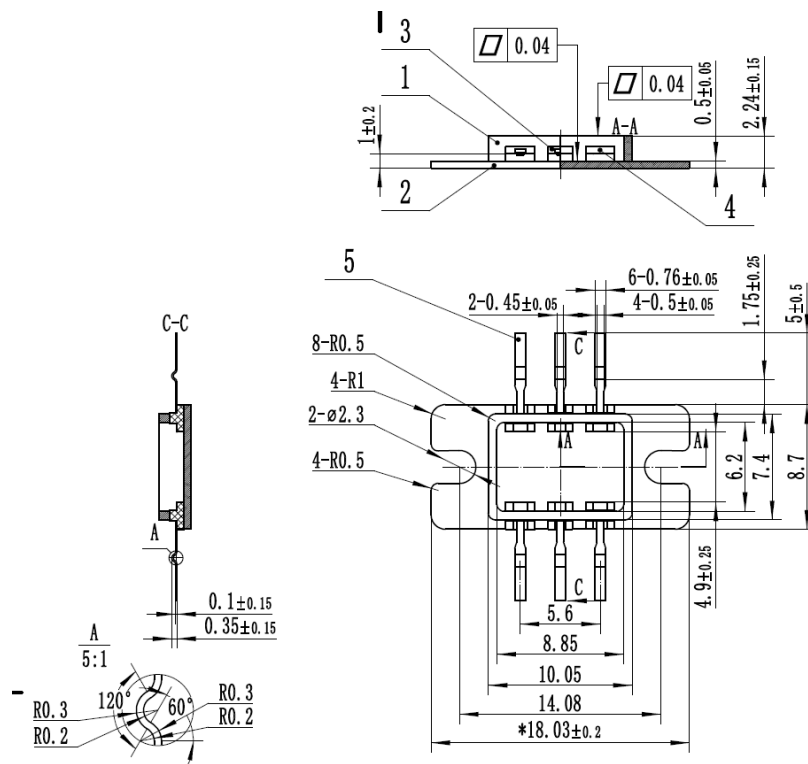
Ref Des	Value	Qty	Manufacturer	Part#
C1, C3, C5	10 nF	3		Wisthand voltage 50V+
C2, C4, C6	10 uF	3		Wisthand voltage 50V+
U1	/	1	Gaxtrem	GNNT2060-45M

EVB Test Result, 2.0GHz-6.0GHz

Test condition: TA = 25 °C, VD = 28V, IDQ = 1500mA, CW

Freq(MHz)	Psat(dBm)	Psat(W)	Power Gain(dB)	I _D (A)	DE(%)
2.0	46.20	41.69	20.15	2.93	50.81%
2.2	46.60	45.71	19.90	3.11	52.49%
2.4	45.80	38.02	20.60	2.81	48.32%
2.6	45.60	36.31	21.60	3.00	43.22%
2.8	46.15	41.21	20.45	3.43	42.91%
3.0	45.80	38.02	19.85	3.37	40.29%
3.2	45.20	33.11	18.80	3.41	34.68%
3.4	46.00	39.81	18.50	3.75	37.91%
3.6	46.00	39.81	18.90	3.76	37.81%
3.8	46.00	39.81	19.80	3.49	40.74%
4.0	46.05	40.27	19.85	3.44	41.81%
4.2	45.60	36.31	19.65	3.27	39.65%
4.4	45.55	35.89	19.35	3.17	40.44%
4.6	45.30	33.88	18.20	3.38	35.80%
4.8	45.10	32.36	18.20	3.26	35.45%
5.0	45.20	33.11	18.10	3.45	34.28%
5.2	45.00	31.62	18.70	3.28	34.43%
5.4	45.05	31.99	18.85	3.41	33.50%
5.6	44.90	30.90	19.00	3.37	32.75%
5.8	45.30	33.88	19.85	3.30	36.67%
6.0	45.15	32.73	20.10	3.32	35.21%

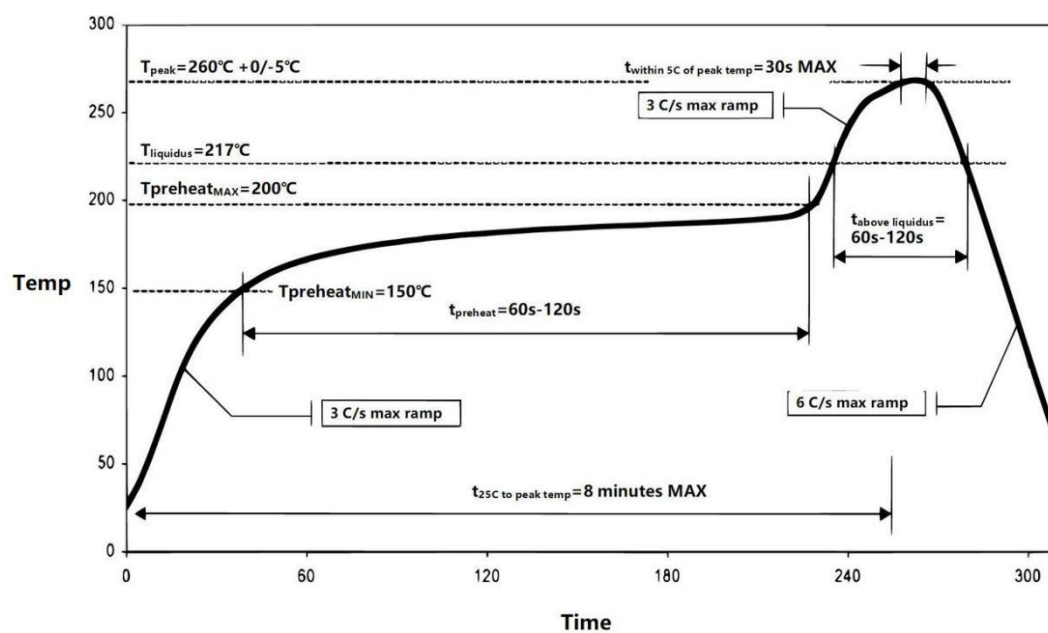
Mechanical Information



Note:

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

Recommended Solder Temperature Profile



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).

Revision History

Data	Revision	Datasheet Status
2024/08/14	1.0	Preliminary Datasheet
2024/10/30	1.1	Update Test Data