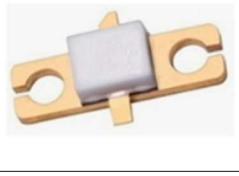
NME8002H GaN TRANSISTOR

Document Number: NME8002H
Preliminary Datasheet V1.0

Gallium Nitride 28V 20W, RF Power Transistor

NME8002H



Description

The NME8002H is a 20W, GaN HEMT, designed for multiple applications with frequencies up to 8GHz.

There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.

- Typical performance (on Innogration broadband band production fixture with device soldered)

NME8002H Vds=28V,Vgs=-2.57V,Idq=20mA, CW						
Freq(MHz)	Pin(dBm)	Pout(dBm)	Pout(W)	Ids(mA)	Gain(dB)	Eff(%)
6700	34.52	43.5	22.39	1.95	8.98	41.00
6800	36.4	43.62	23.01	1.86	7.22	44.19
6900	36.3	43.3	21.2	1.65	7.00	45.85
7000	35.07	43.61	22.96	1.74	8.54	47.13
7100	35.92	43.11	20.46	1.54	7.19	47.46

Applications and Features

- Suitable for wireless communication infrastructure, wideband amplifier, EMC testing, ISM etc.
- High Efficiency and Linear Gain Operations
- Thermally Enhanced Industry Standard Package
- High Reliability Metallization Process
- Excellent thermal Stability and Excellent Ruggedness
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Important Note: Proper Biasing Sequence for GaN HEMT Transistors

Turning the device ON

1. Set VGS to the pinch--off (VP) voltage, typically –5 V
2. Turn on VDS to nominal supply voltage (28V)
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

Turning the device OFF

1. Turn RF power off
2. Reduce VGS down to VP, typically –5 V
3. Reduce VDS down to 0 V
4. Turn off VGS

Table 1. Maximum Ratings (Not simultaneous, TC = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	150	Vdc
Gate--Source Voltage	V_{GS}	-10,+2	Vdc
Operating Voltage	V_{DD}	40	Vdc
Maximum Forward Gate Current	Igmax	5	mA
Storage Temperature Range	Tstg	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature(See note 1)	T_J	+200	°C

1. **Continuous operation at maximum junction temperature will affect MTTF**

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 85°C, T_J=200°C, DC Power Dissipation(See note 1)	$R_{\theta JC}$	4	C/W

1. **$R_{\theta JC\text{-}DC}$ is tested at only DC condition, it is related to the highest thermal resistor value among all test conditions. It might be differently lower in different RF operation conditions like CW signal ,pulsed RF signal etc.**

Table 3. Electrical Characteristics (T_C = 25℃ unless otherwise noted)

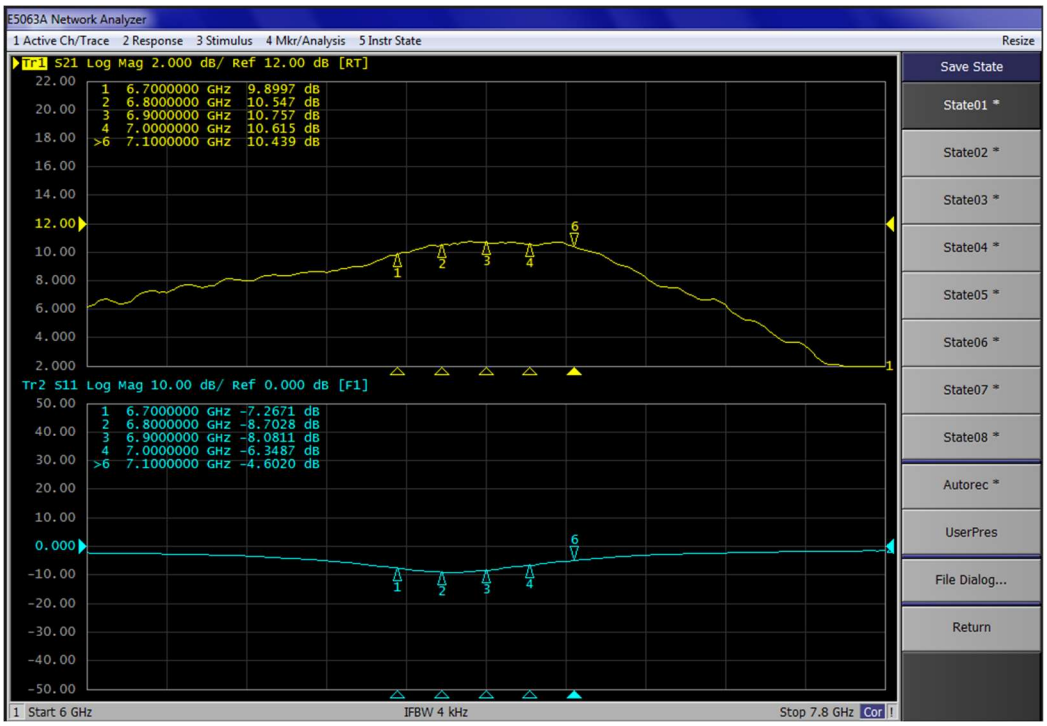
DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=5mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D = 5mA	V_{GS}(th)		-2.7		V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=100mA, Measured in Functional Test	$V_{GS(Q)}$		-2.47		V

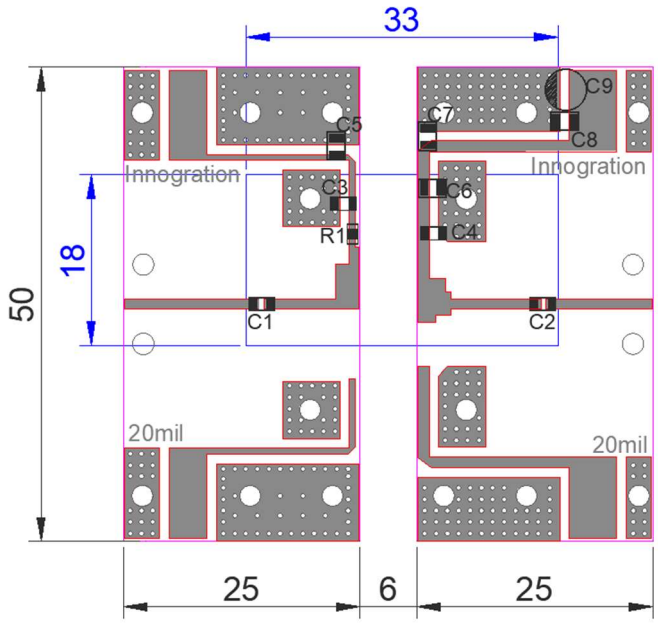
Typical performance

6.7-7.1GHz

Figure 3: Network analyzer output, S11 and S21（ VDS=28V VGS=-2.45V IDQ=100mA）



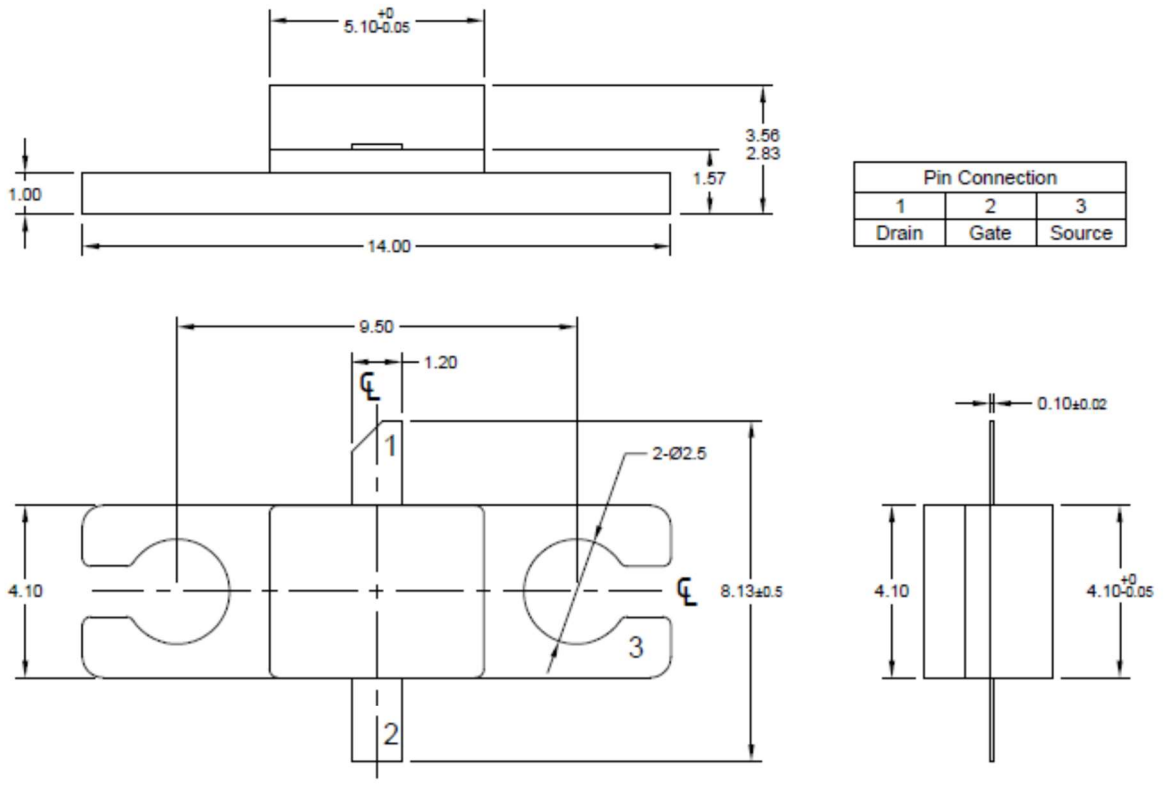
Reference Circuit of Test Fixture Assembly Diagram



Component	Description	Suggestion
C1、C2	1.8pF	ATC600F
C3、C4	2.4pF	ATC600F
C5、C6、C7	10uF/50V	1210
C8	470uF/63V	
R1	10Ω	1206
PCB	20Mil Rogers 4350B	

Package Outline

Flanged ceramic package; 2 leads



Pin Connection		
1	2	3
Drain	Gate	Source

Unit: mm
Tolerances(unless specified): x.x ±0.25
x.xx ±0.13

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-MME					10/10/2016

Figure 1. Package Outline PKG-MME

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2023/3/20	**V1.0**	**Preliminary Datasheet**

Application data based on YHG-23-07

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