



GaN HEMT 28V, 50W, General purpose RF Power Transistor

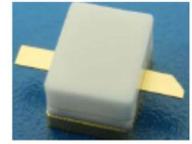
Description

The GTAH15050J2 is a 50W GaN HEMT, designed for multiple applications, up to 1.5GHz. It can be used in CW, Pulse and any other modulation modes.

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

- Typical Class AB RF Performance with device soldered on heatsink in different bands
Vds = 28V, Idq = 10mA, Vgs=-2.68V

GTAH15050J2



Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
1500	47.59	57.39	70.57	19.12	48.4	69	77
1080-1340	46.1	41	63	20	48.1	65	74
850-1080	46.5	45	67	21.5	47.84	60	75
650-850	46.7	47	70	21	47.64	58	75

Applications

- P band power amplifier
- L band power amplifier
- ISM/RF Energy power amplifier at 1.3GHz,915MHz,433MHz etc

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
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

Rating	Symbol	Value	Unit
Drain--Source Voltage	V _{DSS}	+150	Vdc
Gate--Source Voltage	V _{GS}	-8 to +0.5	Vdc
Operating Voltage	V _{DD}	36	Vdc
Maximum gate current	I _{gs}	13.6	mA
Storage Temperature Range	T _{stg}	-65 to +150	°C
Case Operating Temperature	T _C	+150	°C
Operating Junction Temperature	T _J	+225	°C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case by FEA T _C = 85°C, at P _{diss} =20W	R _{θJC}	3.1	°C /W

Table 3. Electrical Characteristics (TA = 25°C unless otherwise noted)

DC Characteristics (main path, measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VGS=-8V; IDS=13.6mA	V _{DSS}		200		V
Gate Threshold Voltage	VDS =10V, ID = 13.6mA	V _{GS(th)}	-4		-2	V

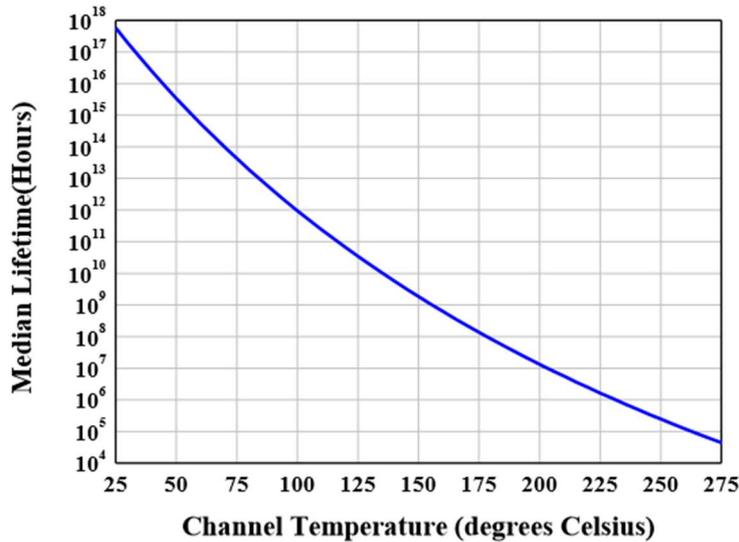


Gate Quiescent Voltage	VDS =28V, IDS=10mA, Measured in Functional Test	V _{GS(Q)}		-2.64		V
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Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1.5GHz, Pout=50W Pulsed CW All phase, No device damages	VSWR		10:1		

Figure 2: Median Lifetime vs. Channel Temperature



Typical performance at 1.5GHz

Figure 3: Efficiency and power gain as function of Pout

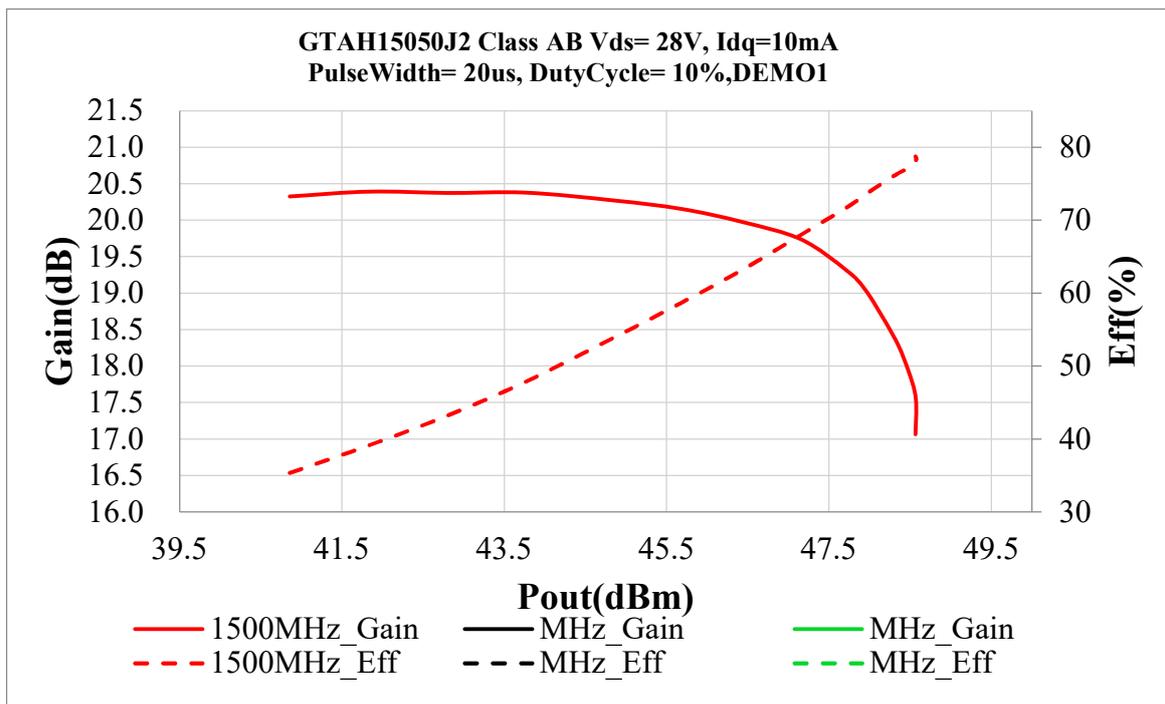


Figure 4: Network analyzer output S11/S21



Figure 5: Picture of application board

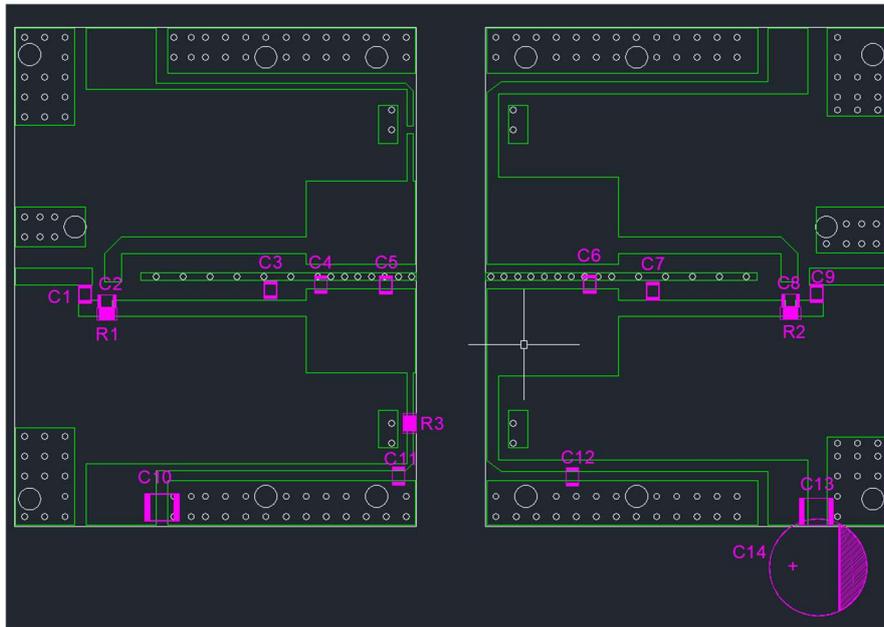


Table 4. Bill of materials of application board (PCB layout upon request, RO4350B 20mils)

Component	Value	Quantity
U1	GTAH15050J2	1
C1、C5、C9	5.6pF	3
C2、C8	20pF	2
C3、C7	2pF	2
C4	3.9pF	1
C6	3pF	1



C10、C13	10uF	2
C11、C12	20pF	2
C14	470uF/63V	1
R1、R2	50 Ω	2
R3	10 Ω	1

Package Outline

Earless ceramic package; 2 leads

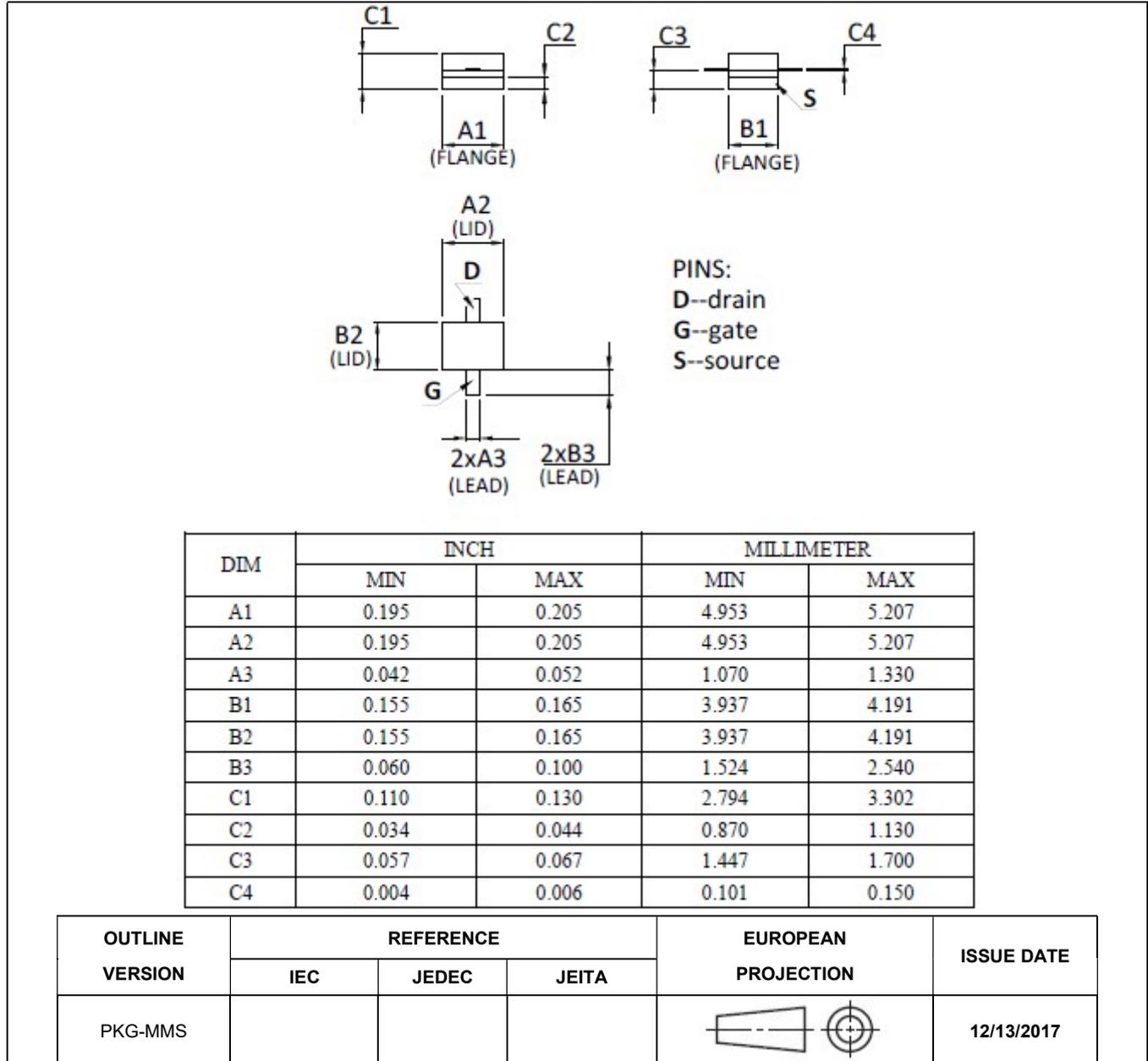


Figure 1. Package Outline PKG-MMS



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2024/4/7	V1.0	Preliminary Datasheet Creation

Application data based on: CWZ-24-02/03-04-05

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