



Gallium Nitride 28V 25W, RF Power Transistor

Description

The GTAH58025GX is a 25W internally matched, GaN HEMT, designed for multiple applications, especially sub-6GHz LTE/LTE-A/LTE-U, as well as either CW or pulsed applications.

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

- Typical **pulsed CW** performance (on wide band fixture with device soldered)

$V_{DD}=28V$ $I_{DQ}=150mA$, Pulse width=20uS, Duty cycle=10%.

Freq(MHz)	P1dB(dBm)	P3dB(dBm)	P3dB(W)	Eff(%)@P3dB	Gp(dB) @P1dB
5150	44.26	45.22	33.29	49.65	10.36
5250	43.85	45.08	32.22	48.12	10.81
5350	43.95	45.12	32.50	48.13	10.92
5450	44.47	45.30	33.89	50.97	10.66
5550	43.66	45.24	33.40	53.53	11.17
5650	43.18	44.87	30.69	54.28	11.19
5750	43.36	44.82	30.37	55.95	10.85
5850	42.99	44.51	28.25	55.15	10.81
5950	42.49	44.13	25.88	53.86	10.82

- Typical **CW** performance (on wide band fixture with device soldered)

$V_{DD}=28V$ $I_{DQ}=150mA$, Psat defined @ $I_{gs}=1mA$

Freq(MHz)	Pin(dBm)	Psat(dBm)	Psat(W)	Ids(A)	Eff(%)	Gp(dB) @Psat
5150	36.60	44.60	28.84	2.33	44.21	8
5250	36.26	44.49	28.12	2.32	43.29	8.23
5350	36.20	44.56	28.58	2.34	43.62	8.36
5450	36.38	44.78	30.06	2.33	46.08	8.4
5550	36.46	44.79	30.13	2.24	48.04	8.33
5650	36.70	44.62	28.97	2.11	49.04	7.92
5750	36.70	44.57	28.64	2.01	50.89	7.87
5850	36.70	44.36	27.29	1.93	50.50	7.66
5950	36.83	44.12	25.82	1.86	49.58	7.29

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

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. Apply RF input power to desired level

4. Turn off VGS

Table 1. Maximum Ratings

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 @ $T_C = 25^\circ C$	I_{gmax}	6	mA
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ C$
Case Operating Temperature	T_C	+150	$^\circ C$
Operating Junction Temperature(See note 1)	T_J	+200	$^\circ C$
Total Device Power Dissipation (Derated above $25^\circ C$, see note 2)	P_{diss}	43	W

Note: 1. Continuous operation at maximum junction temperature will affect MTTF
2. Bias Conditions should also satisfy the following expression: $P_{diss} < (T_J - T_C) / R_{JC}$ and $T_C = T_{case}$

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case $T_C = 85^\circ C, T_J = 200^\circ C, RF CW$ operation	$R_{\theta JC}$	4.6	C/W

Table 3. Electrical Characteristics ($T_C = 25^\circ C$ unless otherwise noted)

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8V; I_{DS} = 6mA$	V_{DSS}	150			V
Gate Threshold Voltage	$V_{DS} = 28V, I_D = 6mA$	$V_{GS(th)}$		-2.7		V
Gate Quiescent Voltage	$V_{DS} = 28V, I_{DS} = 150mA,$ Measured in Functional Test	$V_{GS(Q)}$		-2.33		V

Functional Tests (In 5.15-5.95GHz wideband Production Test Fixture, 50 ohm system) : $V_{DD} = 28 Vdc, I_{DQ} = 150 mA, f = 5800 MHz,$
WCDMA signal, $P_{out} = 4W$

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain	G_p		12		dB
Drain Efficiency @ P_{out}	Eff		25		%
Saturated Power by CCDF test	P_{SAT}		25		W
Input Return Loss	IRL		-7		dB
Mismatch stress at all phases (Device no damage)	VSWR		10:1		Ψ



Figure 1: Network Analyzer plots for gain and IRL

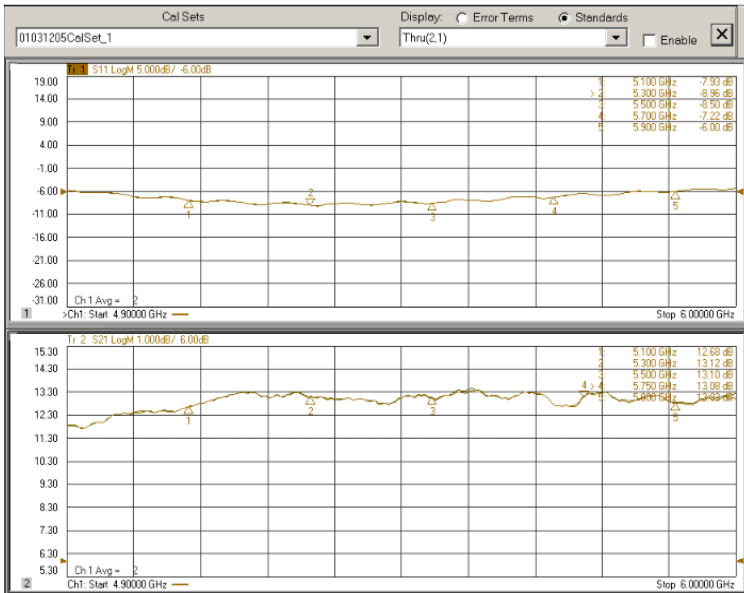
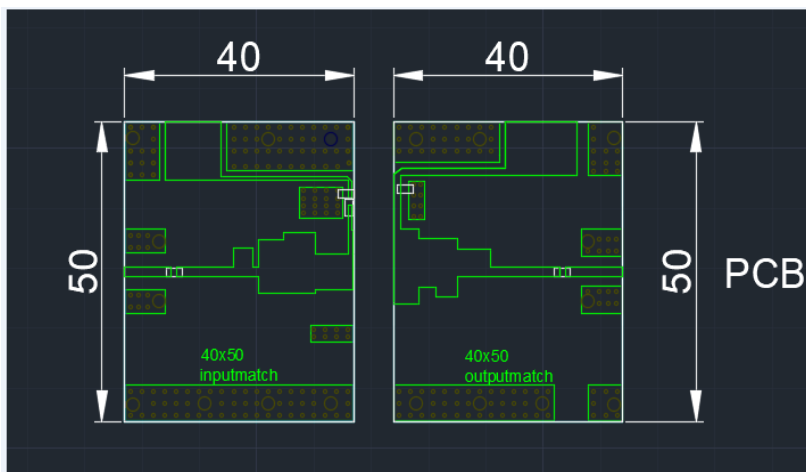
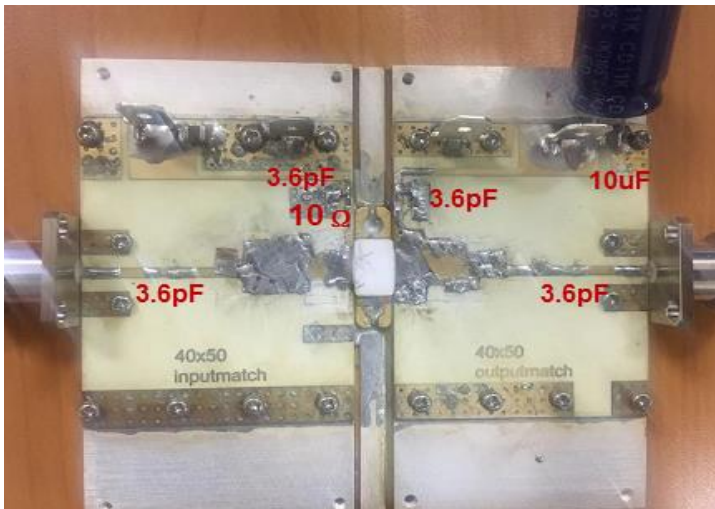


Figure 2: Photo and bill of materials of 5.15-5.95GHz wide band application circuit
PCB:RO4350 30Mil (Layout gerber file upon request)





Package Outline

Flanged ceramic package; 2 leads

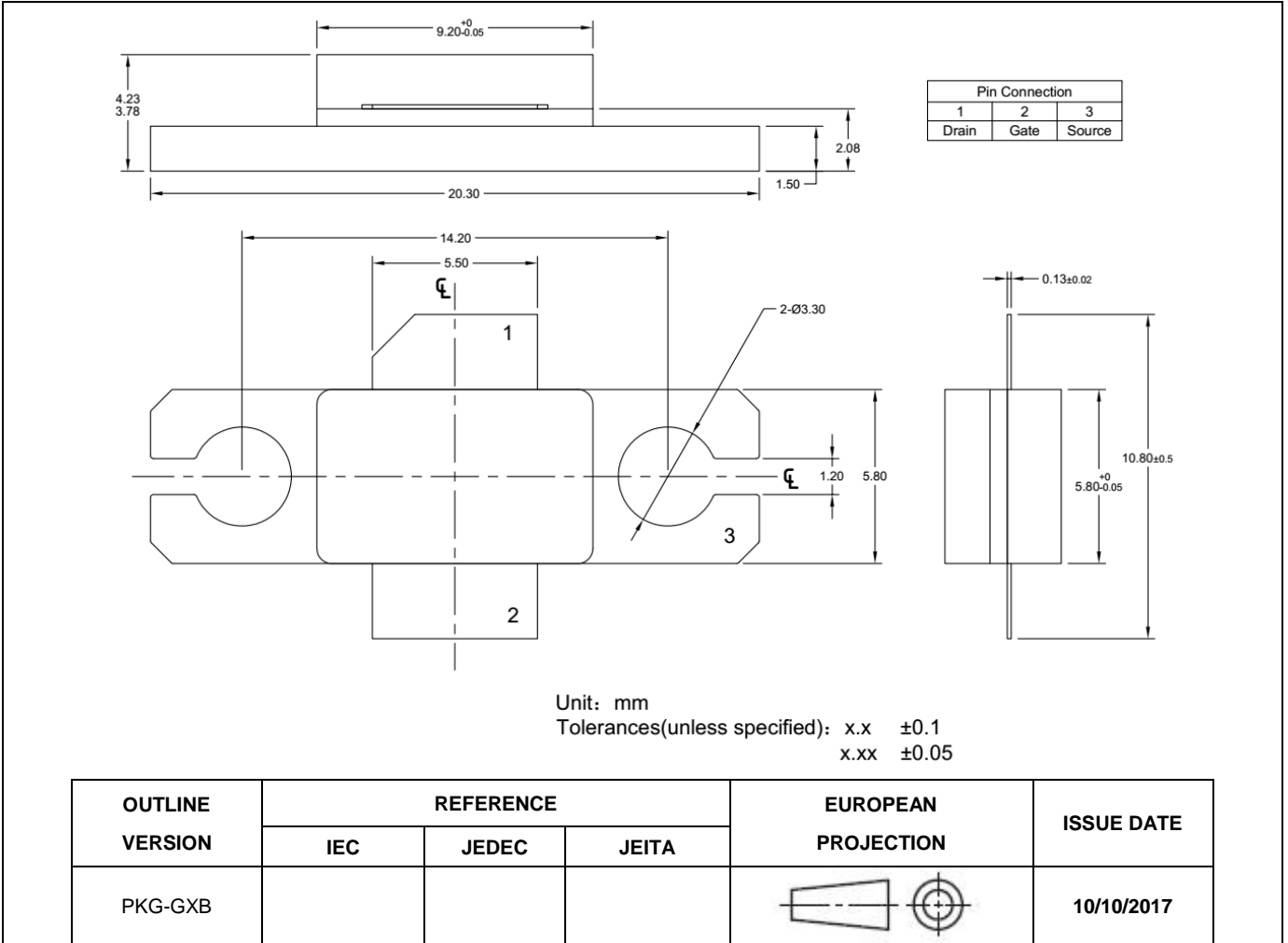


Figure 1. Package Outline PKG-G2E



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2018/11/6	V1.0	Preliminary Datasheet Creation

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