



## Gallium Nitride 28V 30W, RF Power Transistor

### Description

The GTAH58030GX is a 30W internally matched, GaN HEMT, designed for multiple applications, especially sub-6GHz LTE/LTE-A/LTE-U from 4500-5900MHz.

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

- Typical performance (on narrow band fixture with device soldered)

$V_{DD}=28V$   $I_{DQ}=100mA$ , Pulse CW, Pulse width=20uS, Duty cycle=10%.

Freq(GHz)	P1(dBm)	P3(dBm)	P3(W)	Eff(%)@P3	Power Gain@ P1(dB)
5700	44.47	45.30	33.9	53.85	13.64
5800	44.36	45.10	32.4	53.83	13.53
5900	43.76	44.82	30.4	54.86	14.22

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

$V_{DD}=28V$   $I_{DQ}=300mA$ , Pulse CW, Pulse width=20uS, Duty cycle=10%.

Freq(GHz)	P1(dBm)	P3(dBm)	P3(W)	Eff(%)@P3
5200	44.71	45.92	39	47.2
5300	44.37	45.76	38	50.2
5400	44.53	45.67	37	50.5
5500	44.54	45.50	35	48.4
5600	43.49	45.23	33	47.3
5700	43.70	45.13	32	46.6
5800	44.04	45.09	32	45.6
5900	43.44	45.00	32	45.5



### 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

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 @ $T_c = 25^\circ C$	$I_{gmax}$	8	mA
Storage Temperature Range	$T_{stg}$	-65 to +150	$^\circ C$



Case Operating Temperature	$T_c$	+150	°C
Operating Junction Temperature(See note 1)	$T_j$	+200	°C
Total Device Power Dissipation (Derated above 25°C, see note 2)	$P_{diss}$	56	W

Note: 1. Continuous operation at maximum junction temperature will affect MTF  
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 $T_c = 85^\circ\text{C}$ , $T_j = 200^\circ\text{C}$ , RF CW operation	$R_{\theta JC}$	3.21	C/W

**Table 3. Electrical Characteristics** ( $T_c = 25^\circ\text{C}$  unless otherwise noted)

**DC Characteristics**

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$ ; $I_{DS} = 8\text{mA}$	$V_{DSS}$	150			V
Gate Threshold Voltage	$V_{DS} = 28\text{V}$ , $I_D = 8\text{mA}$	$V_{GS(th)}$		-2.7		V
Gate Quiescent Voltage	$V_{DS} = 28\text{V}$ , $I_{DS} = 300\text{mA}$ , Measured in Functional Test	$V_{GS(Q)}$		-2.33		V

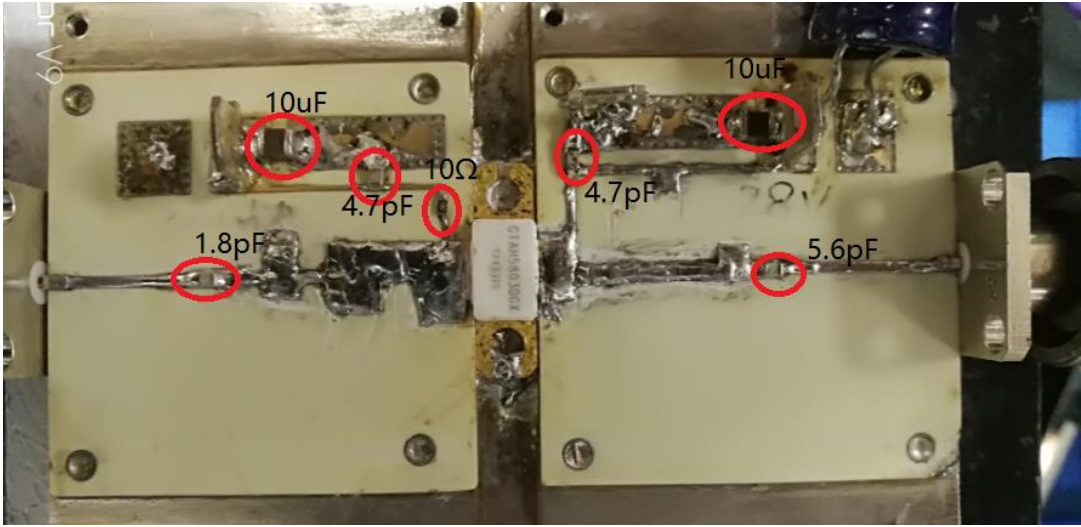
**Functional Tests (In 5.7-5.9GHz wideband Production Test Fixture, 50 ohm system)** :  $V_{DD} = 28\text{Vdc}$ ,  $I_{DQ} = 300\text{mA}$ ,  $f = 5800\text{MHz}$ , WCDMA signal,  $P_{out} = 4\text{W}$

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain	$G_p$		13		dB
Drain Efficiency @ $P_{out}$	Eff		20		%
Saturated Power by CCDF test	$P_{SAT}$		30		W
Input Return Loss	IRL		-7		dB
Mismatch stress at all phases (Device no damage)	VSWR		10:1		$\Psi$



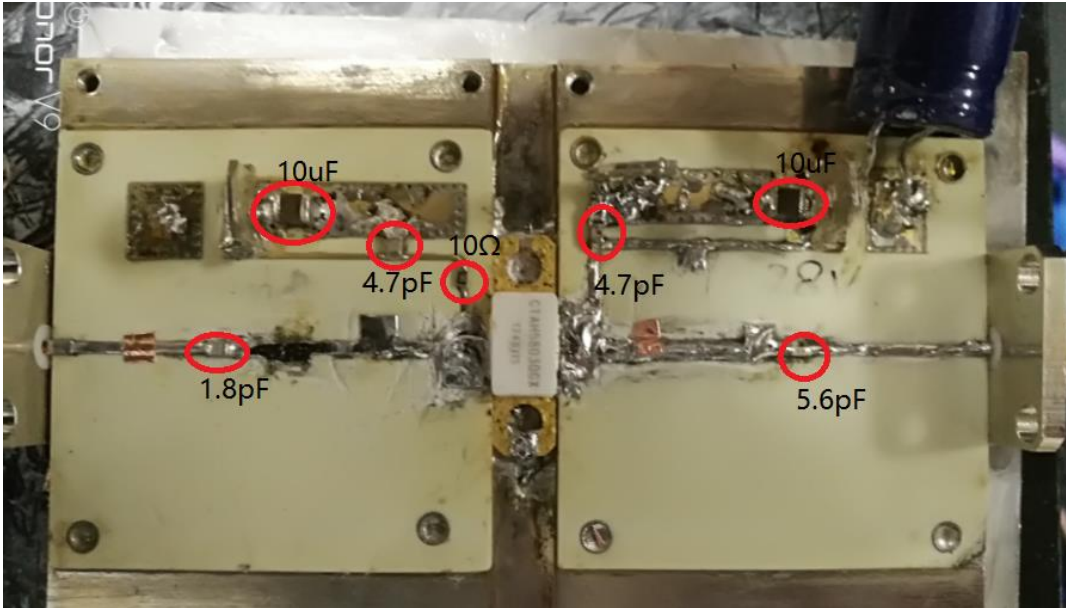
**Figure 1: Photo of narrow band application circuit**

PCB:RO4350 20Mil (Layout gerber file upon request)



**Figure 2: Photo of wideband application circuit**

PCB:RO4350 20Mil (Layout gerber file upon request)





## Package Outline

Flanged ceramic package; 2 leads

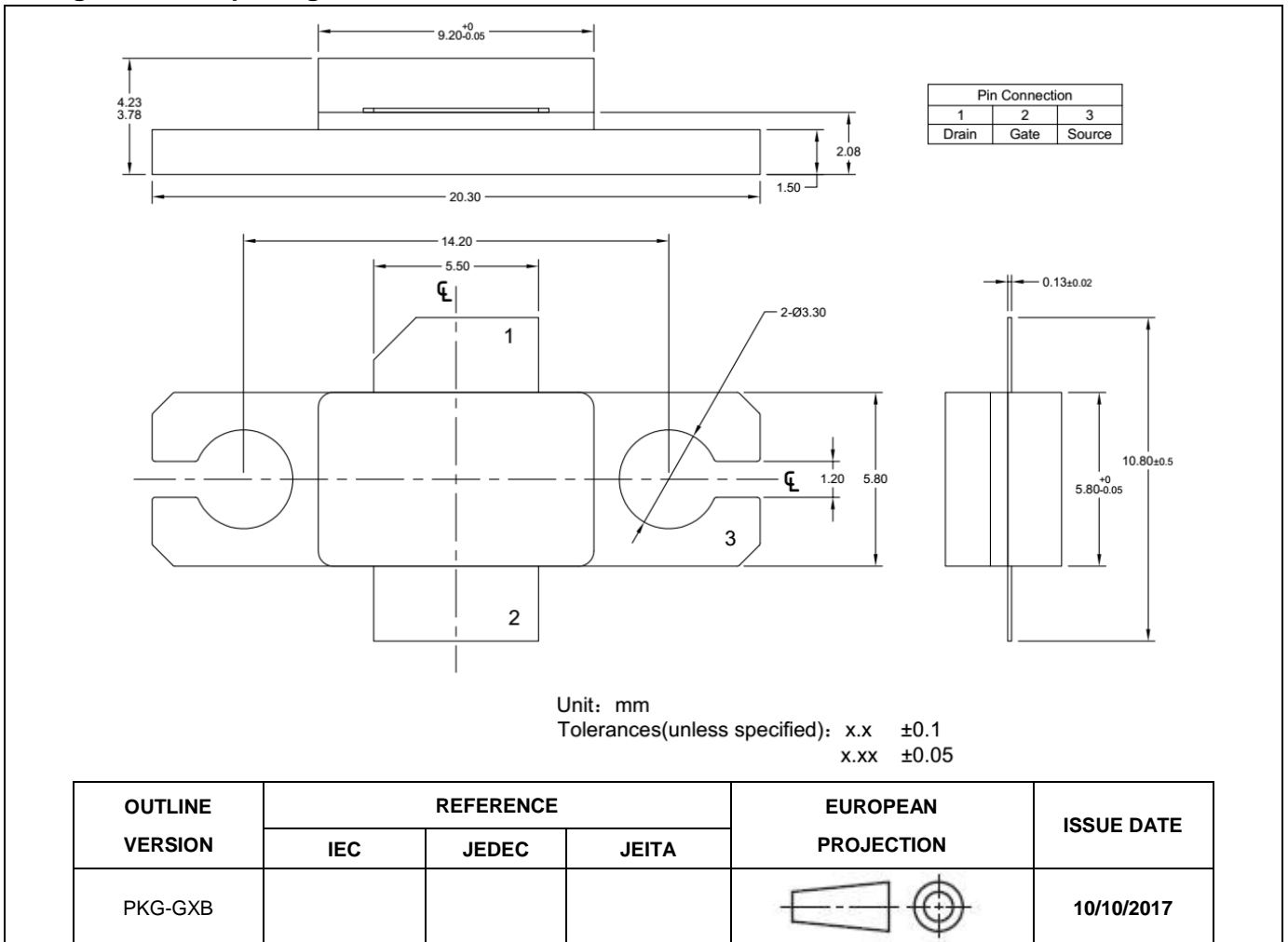


Figure 1. Package Outline PKG-G2E



## Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2017/4/27	V1.0	Preliminary Datasheet Creation
2017/6/01	V1.1	Preliminary Datasheet
2017/11/28	V1.2	Performance updated per new dice configuration

### Notice

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