



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)

$V_{DD}=28V$ $I_{DQ}=50mA$, Pulse CW, Pulse width=20uS, Duty cycle=10%.

Freq (MHz)	Gp (dB)	P _{1dB} (W)	P _{SAT} (W)	Efficiency (%)
5720	14.2	35.5	43	60.5
5800	14.5	31	40	60.4
5850	14.5	27	36.5	59.2

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

$V_{DD}=28V$ $I_{DQ}=330mA$, Pulse CW, Pulse width=20uS, Duty cycle=10%.

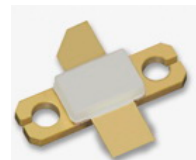
Freq(GHz)	Gp (dB)	P _{1dB} (dBm)	P _{SAT} (dBm)	P _{SAT} (W)	EFF(%)@P3
5150	13.8	44.6	45.7	37	47.1
5250	14.2	44.7	45.8	38	49.3
5350	14	44.6	45.9	39	48.8
5450	13.5	44.7	46.0	40	48.1
5550	13	44.9	46.1	41	48.6
5650	13	44.9	46.2	41	50.5
5750	13.5	44.7	46.1	41	53.7
5850	14	44.4	45.7	37	54.2

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

$V_{DD}=28V$ $I_{DQ}=330mA$, Test signal: WCDMA, 3GPP test model 1; 1 to 64 DPCH; Channel Bandwidth=3.84MHz, PAR =10.5 dB at 0.01 % probability on CCDF.

Freq(MHz)	P _{L(AV)} (dBm)	ACPR(dBc)	Gp (dB)	EFF(%)
5150	36	-40.5/-40.8	13.2	19
5250	36	-40.4/-40.5	13.5	20
5350	36	-39.7/-40.0	13.5	20
5450	36	-39.7/-40.0	12.9	19
5550	36	-39.7/-40.0	12.7	19
5650	36	-39.8/-40.0	12.7	20
5750	36	-39.7/-40.0	13.2	21
5850	36	-40.0/-40.3	13.7	22

GTAH58030GX





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

$V_{DD}=28V$ $I_{DQ}=50mA$, CW, Average Power Output: 30W.

Frequency(MHz)	P_L (W)	Efficiency (%)	Gp (dB)
5720	30	54.8	13.1
5800	30	55.9	12.7
5850	30	56.5	12.3

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 (V_P) voltage, typically $-5V$
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 V_P , typically $-5V$
3. Reduce VDS down to 0V
4. Turn off VGS

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	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	$^\circ C$
Operating Junction Temperature(See note 1)	T_J	+200	$^\circ C$
Total Device Power Dissipation (Dered at above $25^\circ C$, see note 2)	P_{diss}	56	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	$R_{\theta JC}$	3.21	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	$V_{GS} = -8V$; $I_{DS} = 8mA$	V_{DSS}	150			V
Gate Threshold Voltage	$V_{DS} = 28V$, $I_D = 8mA$	$V_{GS(th)}$		-2.7		V
Gate Quiescent Voltage	$V_{DS} = 28V$, $I_{DS} = 330mA$, Measured in Functional Test	$V_{GS(Q)}$		-2.33		V



Functional Tests (In 5.1-5.9GHz wideband Production Test Fixture, 50 ohm system) : $V_{DD} = 28 \text{ Vdc}$, $I_{DQ} = 330 \text{ mA}$, $f = 5800 \text{ MHz}$,
WCDMA signal, $P_{out}=4\text{W}$

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain	Gp		13		dB
Drain Efficiency @ P_{out}	Eff		21		%
Saturated Power by CCDF test	P_{SAT}	30	40		W
Input Return Loss	IRL		-7		dB
Mismatch stress at all phases (Device no damage)	VSWR		10:1		Ψ

Package Outline

Flanged ceramic package; 2 leads

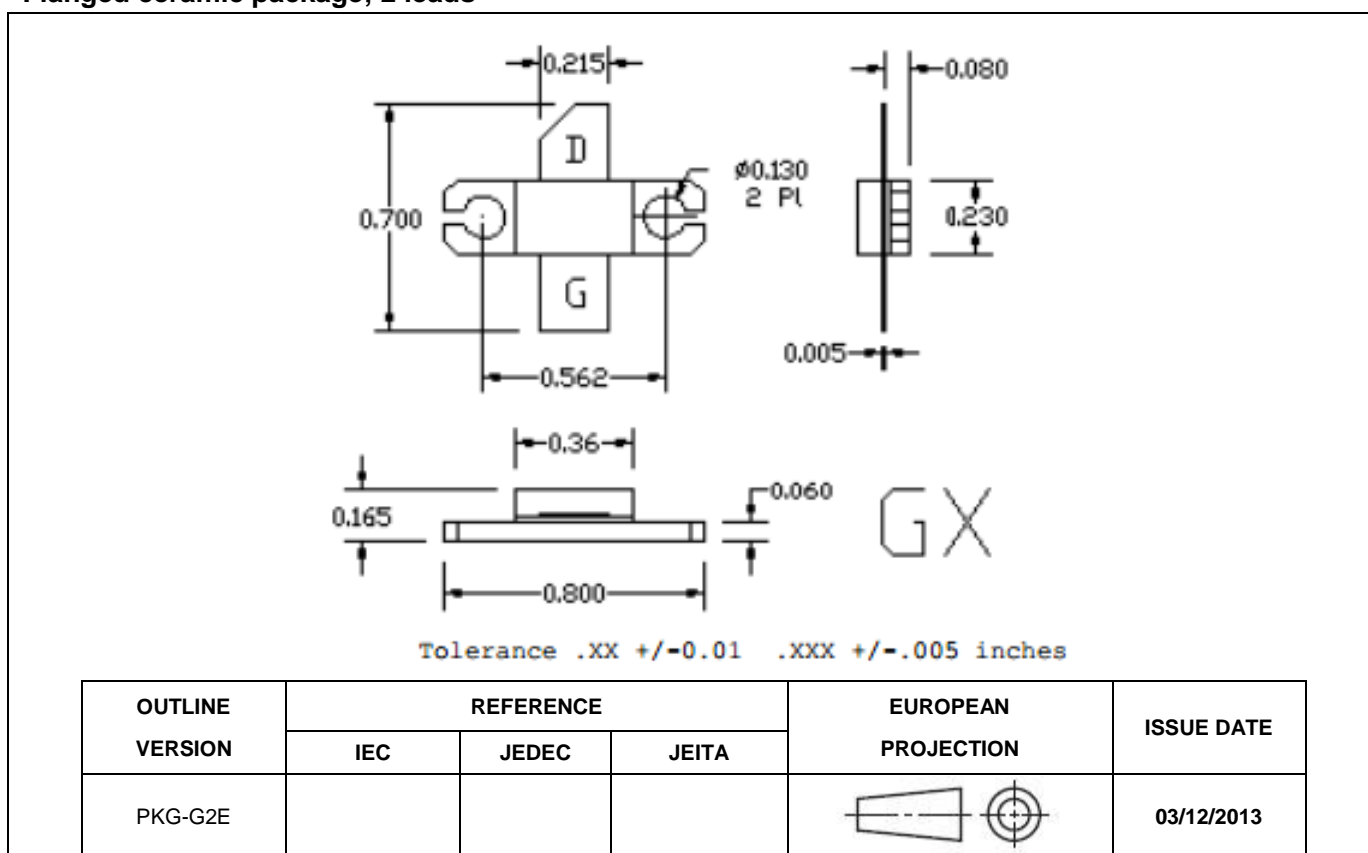


Figure 1. Package Outline PKG-G2E



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

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