



80W, 28V High Power RF LDMOS FETs

Description

The ITCH09080GX is a 80-watt, unmatched LDMOS FETs, designed for Wide-band and Mobile radio applications with frequencies from HF to 1500MHz. It can be used in Class AB/B and Class C for all typical modulation formats.

• Typical Class AB Performance (On Innegration fixture with device soldered):

VDD = 28 Volts, Vgs=3.02V, IDQ = 450 mA, Pulse CW, Pulse Width =20us, Duty Cycle =10%.

Frequency	Gain (dB)	P _{-1dB} (W)	η_D @P ₋₁ (%)	P _{-3dB} (W)	η_D @P ₋₃ (%)
880MHz	20	80	52	120	61



Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Internally Matched for Ease of Use
- Excellent thermal stability, low HCI drift
- Large Positive and Negative for Improved Class C Oper.
- Pb-free, RoHS-compliant

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V _{DSS}	+70	Vdc
Gate--Source Voltage	V _{GS}	-10 to +10	Vdc
Operating Voltage	V _{DD}	+32	Vdc
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 T _C = 85°C, T _J =200°C, DC test	R _{θJC}	0.76	°C/W

Table 3. ESD Protection Characteristics

Test Methodology	Class
Human Body Model (per JESD22--A114)	Class 2

Table 4. Electrical Characteristics (TA = 25 °C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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DC Characteristics

Drain-Source Voltage V _{GS} =0, I _{DS} =1.0mA	V _{(BR)DSS}	70	—		V
Zero Gate Voltage Drain Leakage Current (V _{DS} = 28 V, V _{GS} = 0 V)	I _{DSS}	—	—	10	μA
Gate--Source Leakage Current (V _{GS} = 10 V, V _{DS} = 0 V)	I _{GSS}	—	—	1	μA



Gate Threshold Voltage ($V_{DS} = 28V, I_D = 300 \mu A$)	$V_{GS(th)}$	—	1.6	—	V
Gate Quiescent Voltage ($V_{DD} = 28 V, I_D = 450 mA$, Measured in Functional Test)	$V_{GS(Q)}$	—	3.0	—	V

Functional Tests (In Demo Test Fixture, 50 ohm system) $V_{DD} = 28 Vdc, I_{DQ} = 450mA, f = 880 MHz$, Pulse Width =20us, Duty Cycle =10%..

Power Gain	G_p	—	19	—	dB
Drain Efficiency@P3dB	η_D	—	52	—	%
3 dB Compression Point	P_{-1dB}	—	80	—	W
Input Return Loss	IRL	—	-7	—	dB

Load Mismatch (In Innegration Test Fixture, 50 ohm system): $V_{DD} = 28 Vdc, I_{DQ} = 450 mA, f = 870 MHz$

VSWR 10:1 at 80W pulse CW Output Power	No Device Degradation
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Figure 1: Pulsed CW performance ($V_{DS} = 28$ Volts, $V_{gs}=3.02V, I_{DQ} = 450 mA$, Pulse CW, Pulse Width =20us, Duty Cycle =10%.)

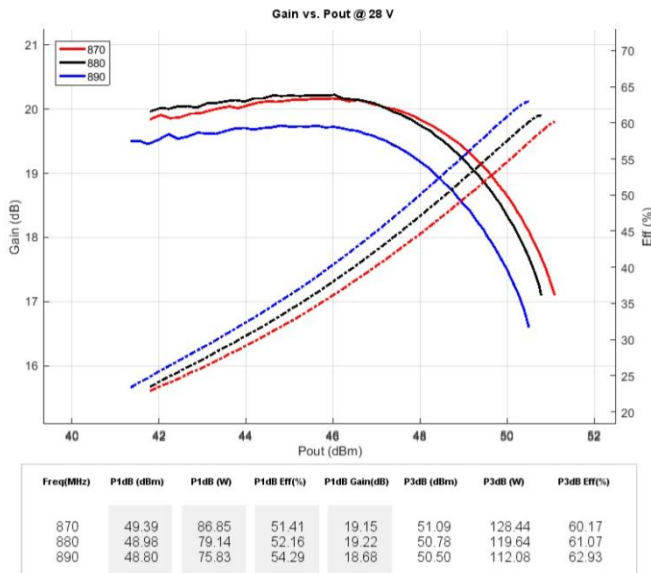


Figure 2: Network Analyzer Results (S11, S21) ($V_{DS}=28V, I_{dq}=800mA$)

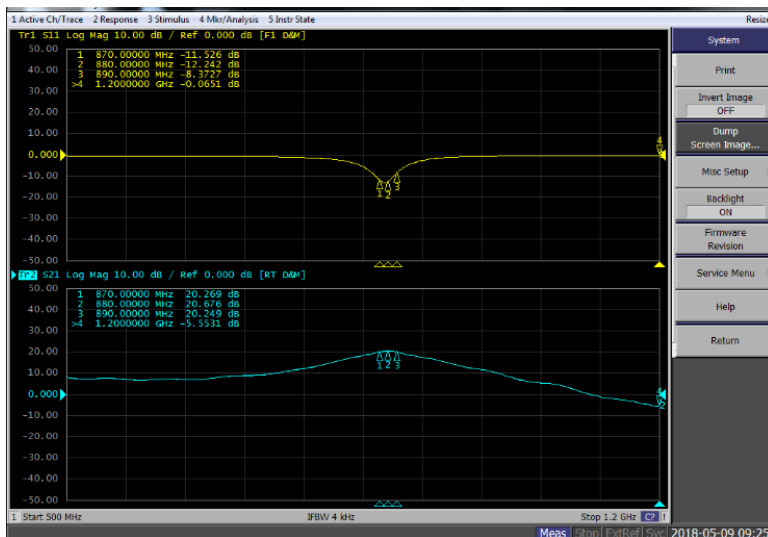




Figure 3: IM3 & IM5 as function of Idq (VDS=28V, f=880MHz, Two-Tone, Carrier Spacing=500kHz)

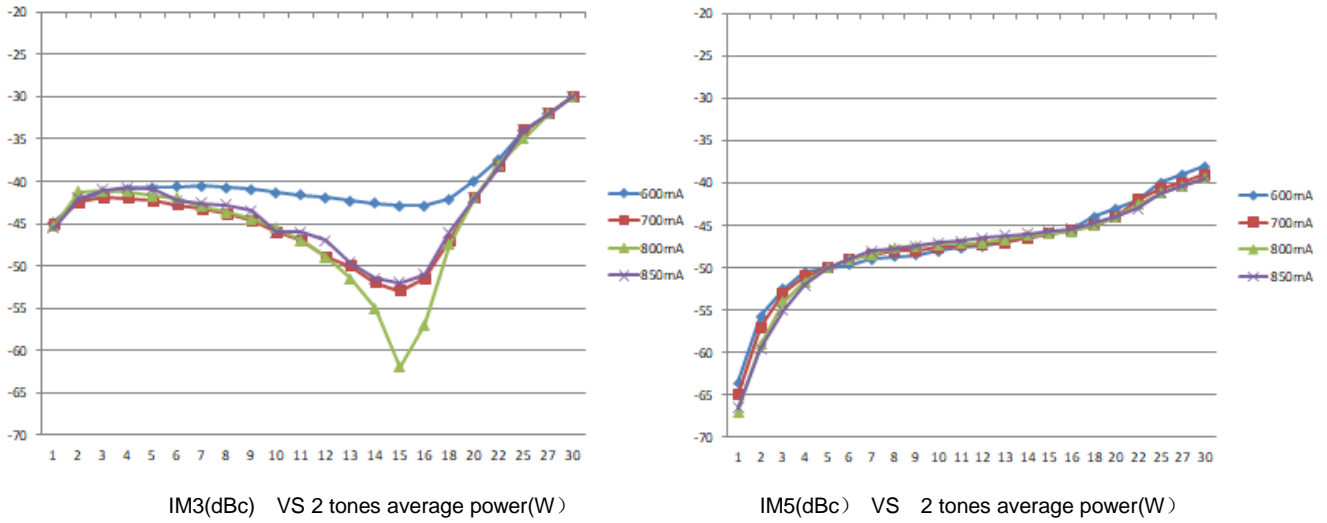


Figure 4: WCDMA ACPR performance (VDS=28V, Idq=800mA, Single Carrier W-CDMA, PAR=10.8Db@0.01% Probability on CCDF.)

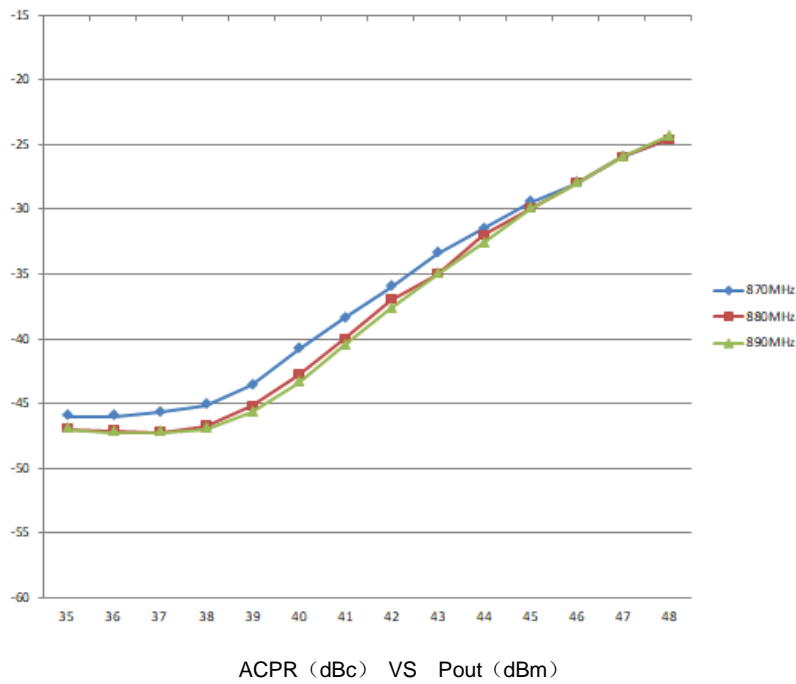


Figure 5: Photo of 880MHz application circuit

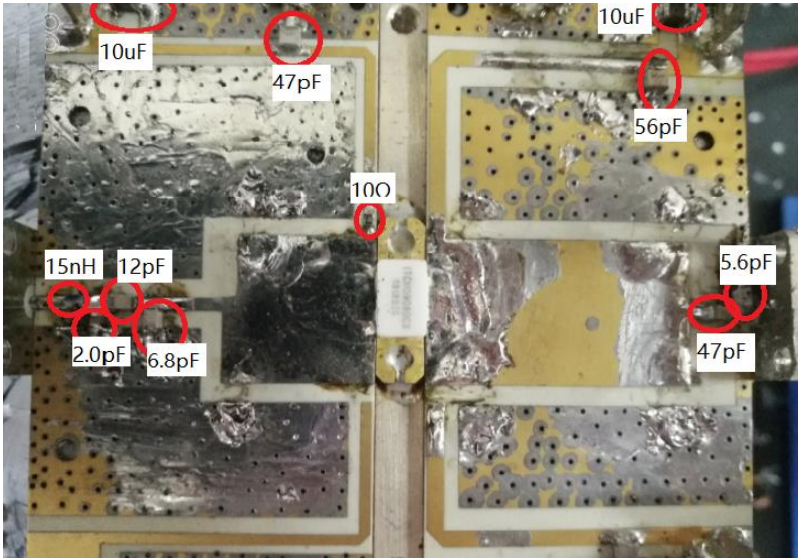
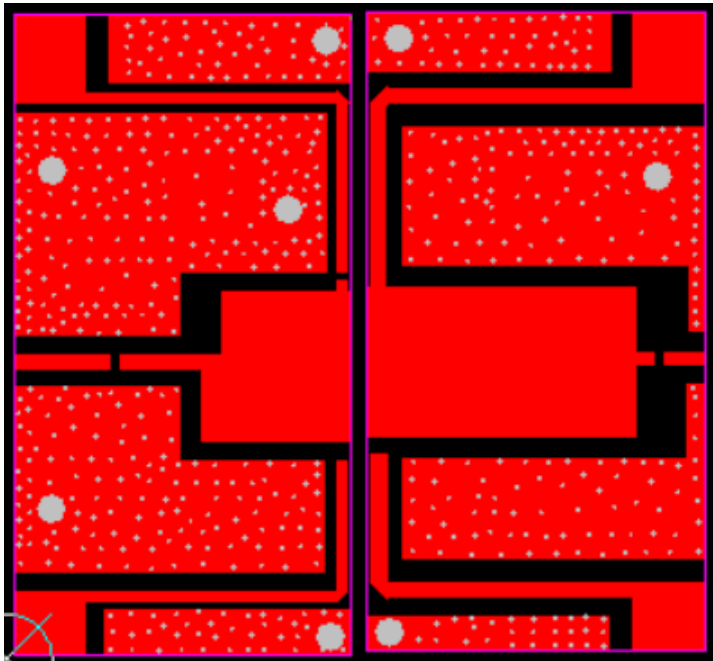


Figure 6 PCB:RO4350 30Mil (Layout gerber file upon request):





Package Outline

Flanged ceramic package; 2 leads

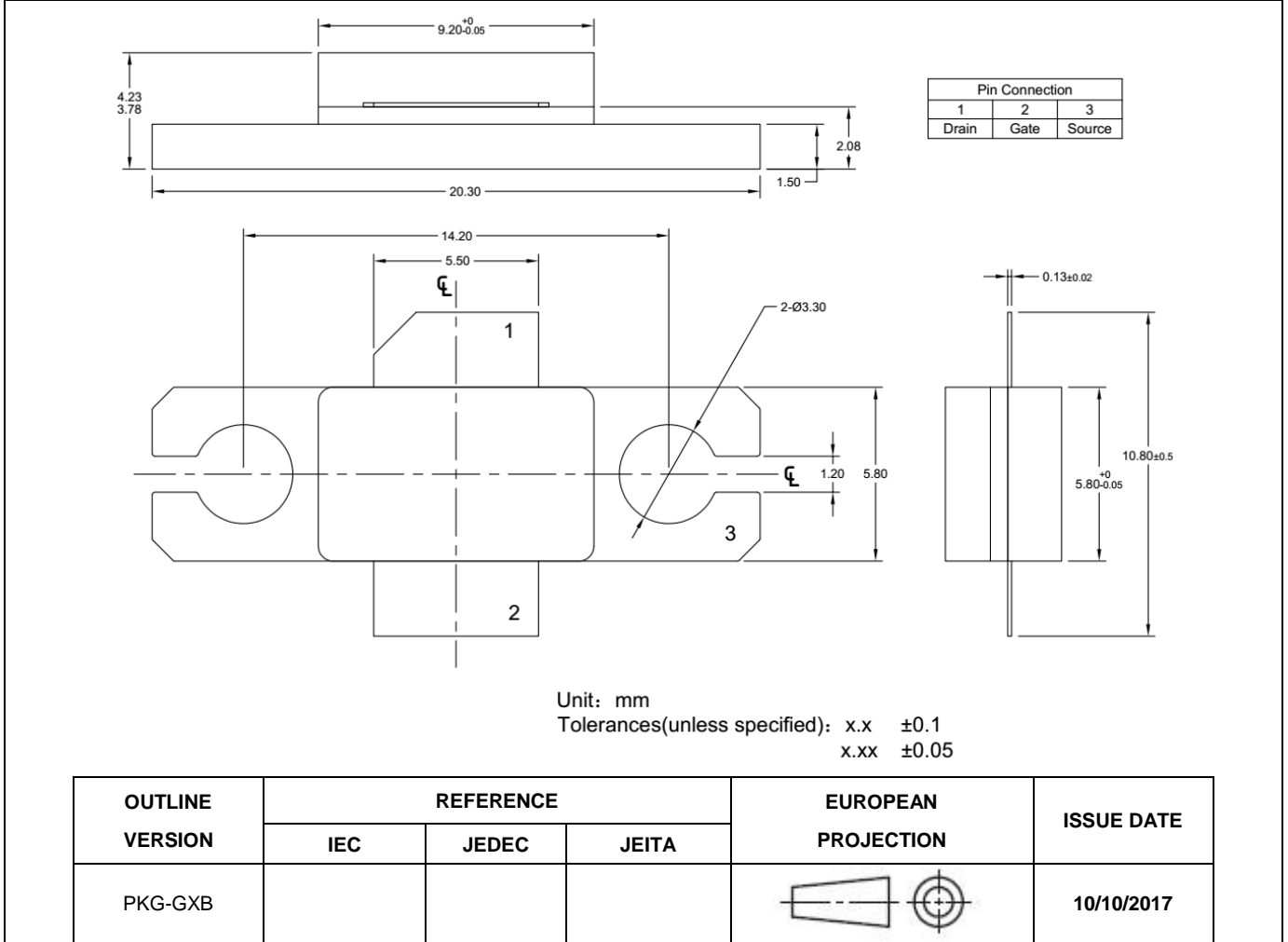


Figure 1. Package Outline PKG-G2E



Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2018/5/10	Rev 1.0	Product Datasheet

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