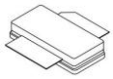
2500MHz-2700MHz, 100W, 28V High Power RF LDMOS FETs

Description

The ITCH27100B2 is a 100-watt, internally matched LDMOS FET, designed for multicarrier WCDMA/PCS/DCS/LTE base station and ISM applications with frequencies from 2500 to 2700 MHz. It Can be used in Class AB/B and Class C for all typical cellular base station modulation formats.

ITCH27100B2



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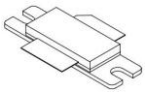


- Typical Performance (On Innogration fixture with device soldered):

VDD = 28 Volts, I_{DQ} = 800 mA, Pulse CW, Pulse Width=100 us, Duty cycle=10% .

Frequency	Gp (dB)	P_{-1dB} (dBm)	η_D@P_{-1} (%)	P_{-3dB} (dBm)	η_D@P_{-3} (%)
2500 MHz	16.1	51.1	52.8	51.8	51.8
2600 MHz	16.8	50.7	52.8	51.8	51.5
2700 MHz	16.9	50.4	51.8	51.4	51.9

- Typical Single-Carrier W-CDMA Performance (On Test Fixture with device soldered):

V_{DD}=28Volts, I_{DQ} = 800 mA, P_{out}= 44.8dBm Avg., IQ Magnitude Clipping, Channel Bandwidth = 3.84 MHz, Input Signal PAR = 10.5 dB @ 0.01% Probability on CCDF.

Frequency	P_{OUT}（dBm）	Gp (dB)	η_D (%)	$ACPR_{5M}$ (dBc)
2620 MHz	44.8	16.5	30.6	-32.6
2655 MHz	44.8	16.5	30.9	-32.4
2690 MHz	44.8	16.6	31.5	-32.2

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 Gate/Source Voltage Range for Improved Class C Operation
- 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	Tstg	-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	$R_{\theta JC}$	0.45	°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
DC Characteristics					
Drain-Source Breakdown Voltage (V_{GS}=0V; I_D=1mA)	V_{DSS}	65	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 = 600 uA)	$V_{GS}(th)$		1.8		V
Gate Quiescent Voltage (V_{DD} = 28 V, I_{DQ} = 800 mA, Measured in Functional Test)	$V_{GS(Q)}$	2.2	2.7	3.2	V

Functional Tests (On Innogration demo, 50 ohm system) :V_{DD} = 28 Vdc, I_{DQ} = 800 mA, f = 2700 MHz, Pulse CW, Pulse Width=100 us, Duty cycle=10% .

Power Gain（Maximum Gain）	Gp		16.9		dB
1 dB Compression Point	P_{-1dB}		50.4		dBm
3dB Compression Point	P_{-3dB}		51.4		dBm
Drain Efficiency@P3dB	η_D		51.9		%
Input Return Loss	IRL		-7		dB

Load Mismatch (On Innogration Test Fixture, 50 ohm system): V_{DD} = 28 Vdc, I_{DQ} = 800 mA, f = 2700 MHz

VSWR 10:1 at 130W pulse CW Output Power	No Device Degradation

TYPICAL CHARACTERISTICS

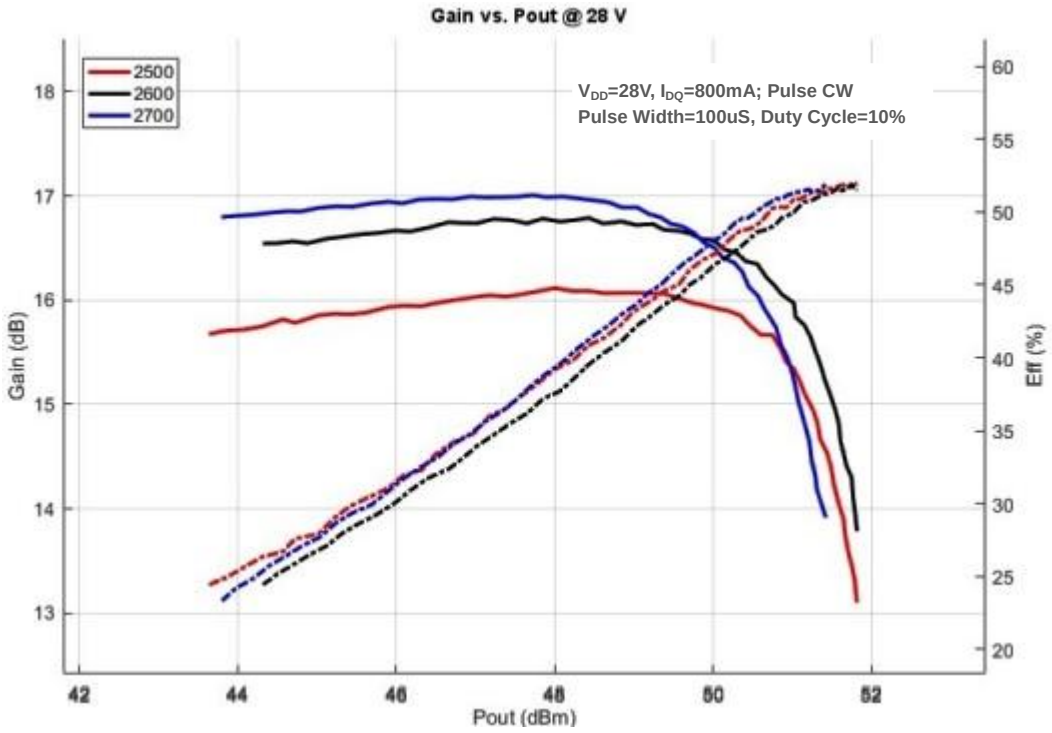


Figure 1. Power gain and drain efficiency as function of

Pulse output power（2500MHz-2700MHz）

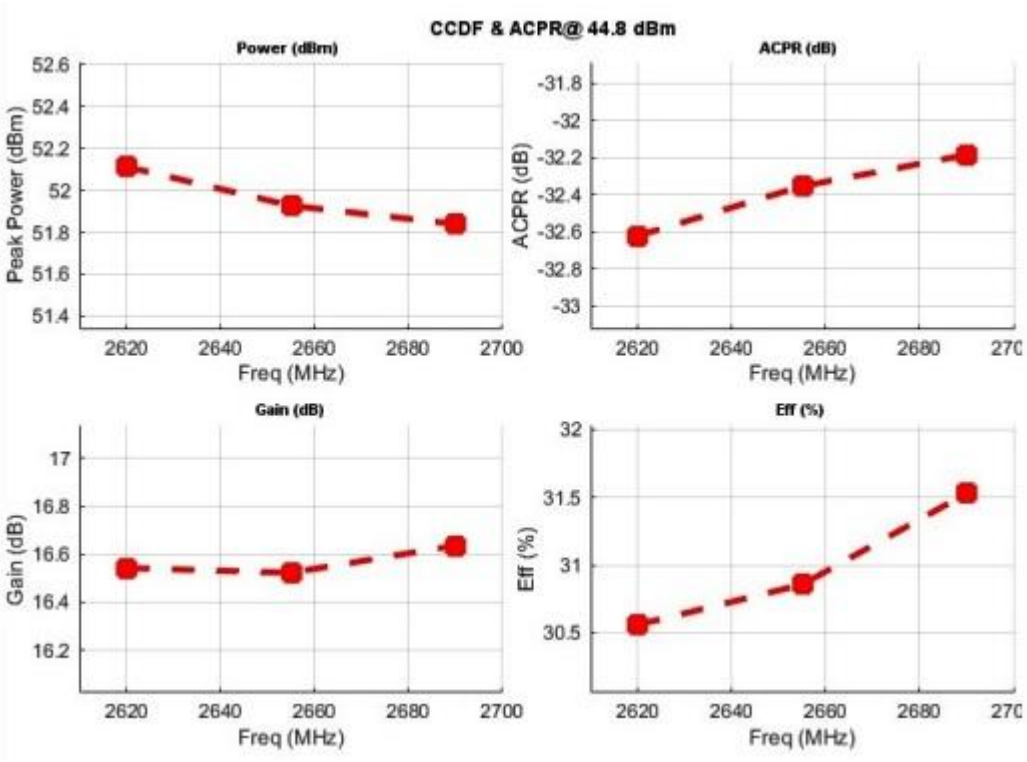
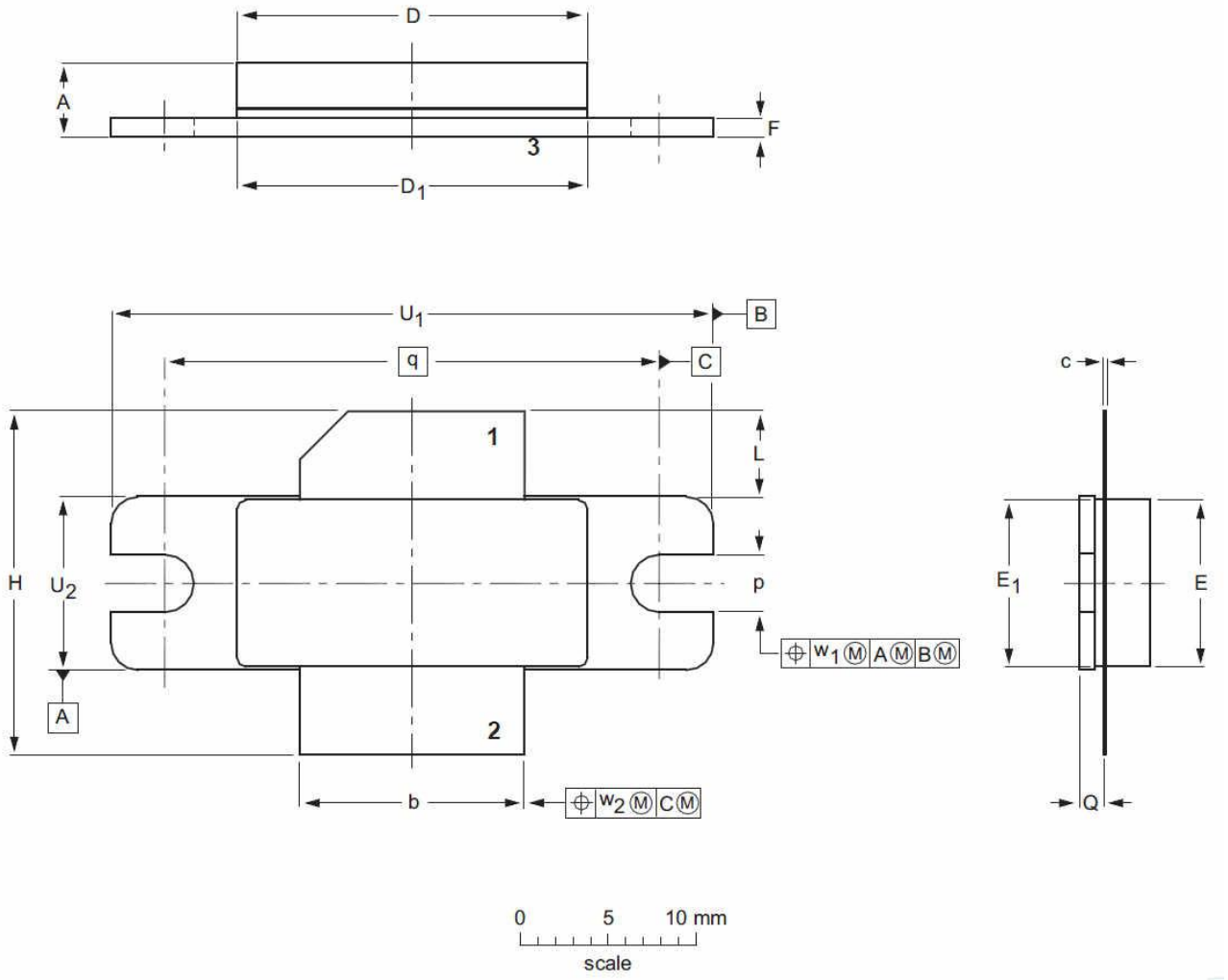


Figure 2. Single−Carrier WCDMA CCDF and

$ACPR_{5MHz}$ @ 30W as function frequency

Package Outline

Flanged ceramic package; 2 mounting holes; 2 leads（1—DRAIN、2—GATE、3—SOURCE）



UNIT	A	b	c	D	D_1	E	E_1	F	H	L	p	Q	q	U_1	U_2	W_1	W_2
mm	4.72 3.43	12.83 12.57	0.15 0.08	20.02 19.61	19.96 19.66	9.50 9.30	9.53 9.25	1.14 0.89	19.94 18.92	5.33 4.32	3.38 3.12	1.70 1.45	27.94	34.16 33.91	9.91 9.65	0.25	0.51
inches	0.186 0.135	0.505 0.495	0.006 0.003	0.788 0.772	0.786 0.774	0.374 0.366	0.375 0.364	0.045 0.035	0.785 0.745	0.210 0.170	0.133 0.123	0.067 0.057	1.100	1.345 1.335	0.390 0.380	0.01	0.02

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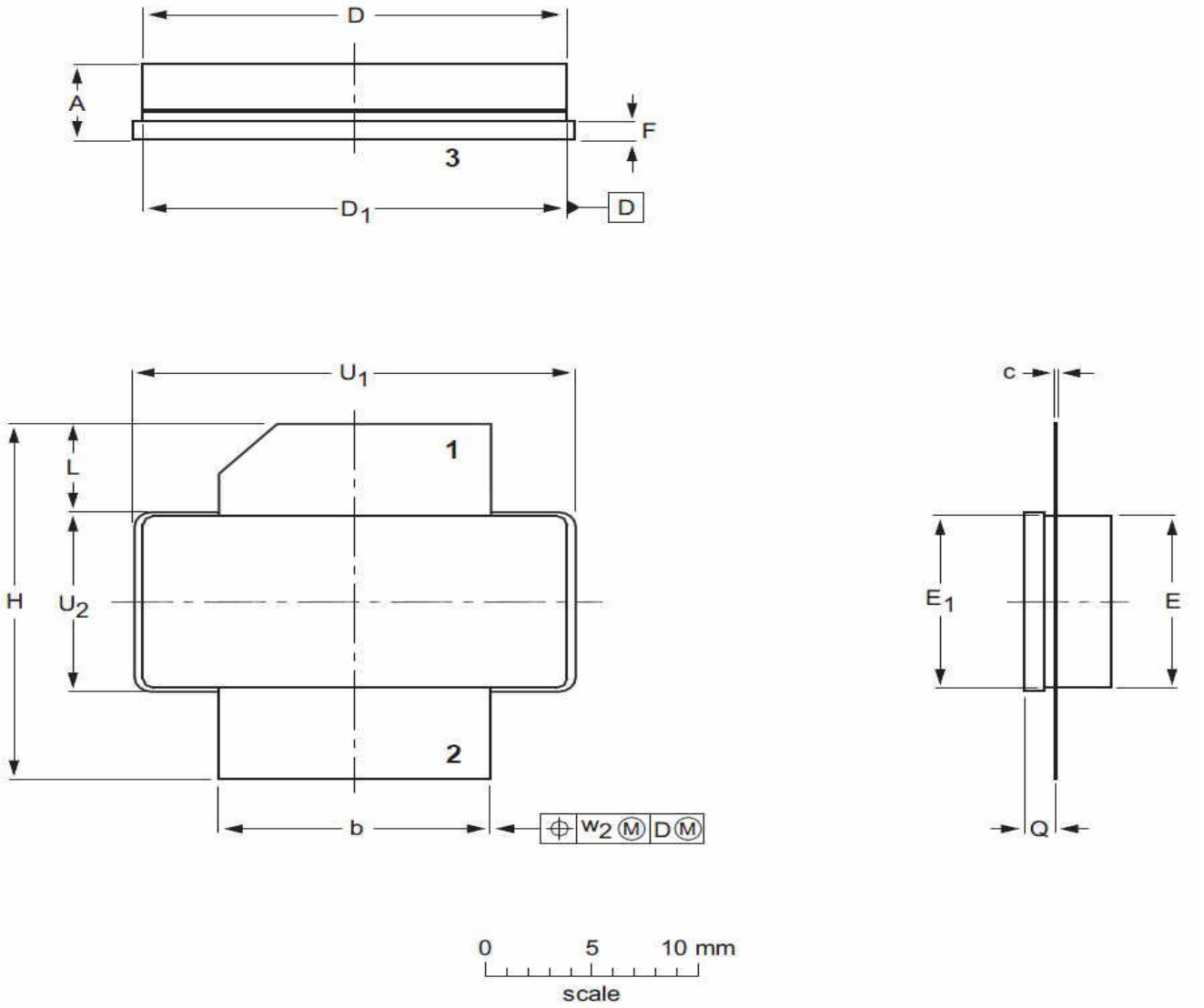
	IEC	JEDEC	JEITA		
PKG-B2E					03/12/2013

Earless flanged ceramic package; 2 leads（1—DRAIN、2—GATE、3—SOURCE）



UNIT	A	b	c	D	D_1	E	E_1	F	H	L	Q	U_1	U_2	W_2
mm	4.72 3.43	12.83 12.57	0.15 0.08	20.02 19.61	19.96 19.66	9.50 9.30	9.53 9.25	1.14 0.89	19.94 18.92	5.33 4.32	1.70 1.45	20.70 20.45	9.91 9.65	0.25
inches	0.186 0.135	0.505 0.495	0.006 0.003	0.788 0.772	0.786 0.774	0.374 0.366	0.375 0.364	0.045 0.035	0.785 0.745	0.210 0.170	0.067 0.057	0.815 0.805	0.390 0.380	0.010

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-B2					03/12/2013

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2017/09/08	**Rev 1.0**	**Preliminary Datasheet**

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