

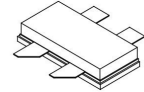


## 2500-2700MHz, 110W, 28V High Power RF LDMOS FETs

### Description

The ITCH27110B4 is a 110-watt, internally matched LDMOS FET, designed for multicarrier WCDMA/PCS/DCS/LTE base station and ISM applications with frequencies from 2500 to 2700MHz. It can be used as Doherty paired device for all typical cellular base station modulation formats.

ITCH27110B4



- Typical Performance of Doherty Demo (On Innegration fixture with device soldered):

Freq (MHz)	Pout (dBm)	CCDF (dB)	Ppeak (dBm)	Ppeak (W)	ACPR (dBc)	Gain (dB)	Eff (%)
2500	42	8.21	50.22	105.1	-29.6	12.5	40.8
2600	42	8.37	50.39	109.3	-32.3	13.3	41.5
2700	42	8.54	50.54	113.4	-37.8	13.5	40.8

### Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Internally Matched for Ease of Use
- Excellent thermal stability, low HCl 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	$T_{stg}$	-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 $T_c=85^\circ\text{C}, P_{out}=16\text{W}$	$R_{\theta JC}$	0.6	°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 (Main path Section)

Drain-Source Breakdown Voltage ( $V_{GS}=0\text{V}; I_D=1\text{mA}$ )	$V_{DSS}$	65	70		V
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 28\text{V}, V_{GS} = 0\text{V}$ )	$I_{DSS}$			10	μA



Gate--Source Leakage Current ( $V_{GS} = 10\text{ V}$ , $V_{DS} = 0\text{ V}$ )	$I_{GSS}$			1	$\mu\text{A}$
Gate Threshold Voltage ( $V_{DS} = 28\text{ V}$ , $I_D = 600\text{ uA}$ )	$V_{GS(th)}$		1.8		V
Gate Quiescent Voltage ( $V_{DD} = 28\text{ V}$ , $I_{DQ} = 250\text{ mA}$ , Measured in Functional Test)	$V_{GS(Q)}$	2.2	2.6	3.2	V

**Functional Tests (On Innegration doherty demo, 50 ohm system) :**  $V_{DD} = 28\text{ Vdc}$ ,  $I_{DQMAIN} = 250\text{ mA}$ ,  $V_{GPEAK} = 1.5\text{ V}$ ,  $f = 2700\text{ MHz}$ , Pulse CW, Pulse Width=20 us, Duty cycle=10%.

Power Gain @ P1dB	$G_p$		10		dB
3dB Compression Point	$P_{-3dB}$		50.5		dBm
Drain Efficiency@P3dB	$\eta_D$	55	60		%
Input Return Loss	IRL		-7		dB

**Load Mismatch (On Innegration Test Fixture, 50 ohm system):**  $V_{DD} = 28\text{ Vdc}$ ,  $I_{DQ} = 250\text{ mA}$ ,  $f = 2700\text{ MHz}$

VSWR 10:1 at 16W WCDMA 1 Carrier Output Power	No Device Degradation
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**Reference Circuit of Test Fixture Assembly Diagram**

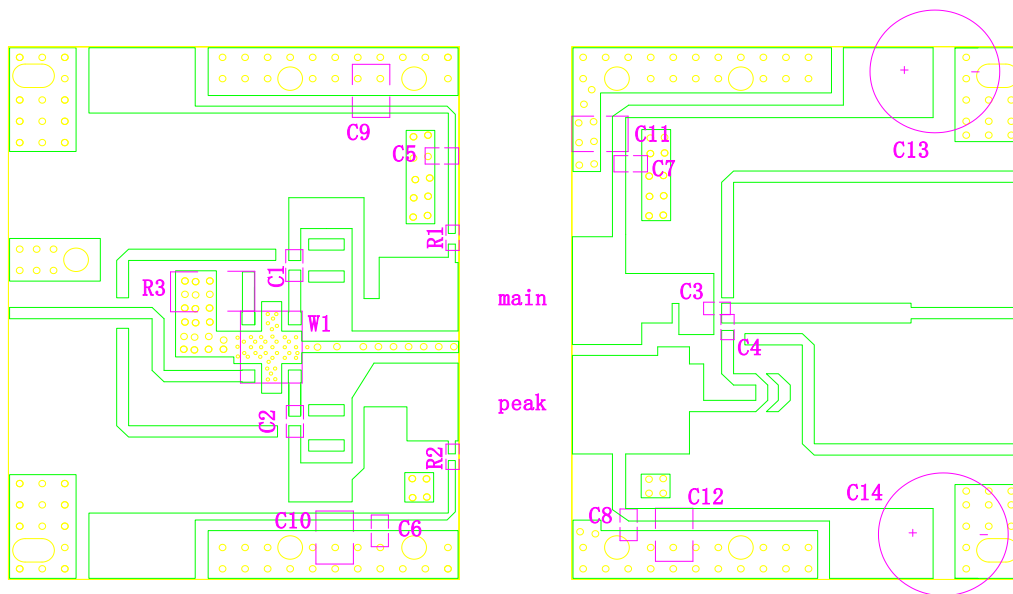


Figure 1. ITCH27110B4 Doherty Test Circuit Component Layout

Table 5. Test Circuit Component Designations and Values

Designator	Footprint	Comment	Quantity
C1, C2, C4, C5, C6, C7, C8	0603	12 pF	7
C3	0603	2.4 pF	1
C9, C10, C11, C12	1210	10uF/100V	4
C13, C14		220uF/63V	2
R1,R2	0603	10Ω	2
R3	2512	51Ω	1
W1		DC2500P02 (YANTEL 2dB)	1

### TYPICAL CHARACTERISTICS

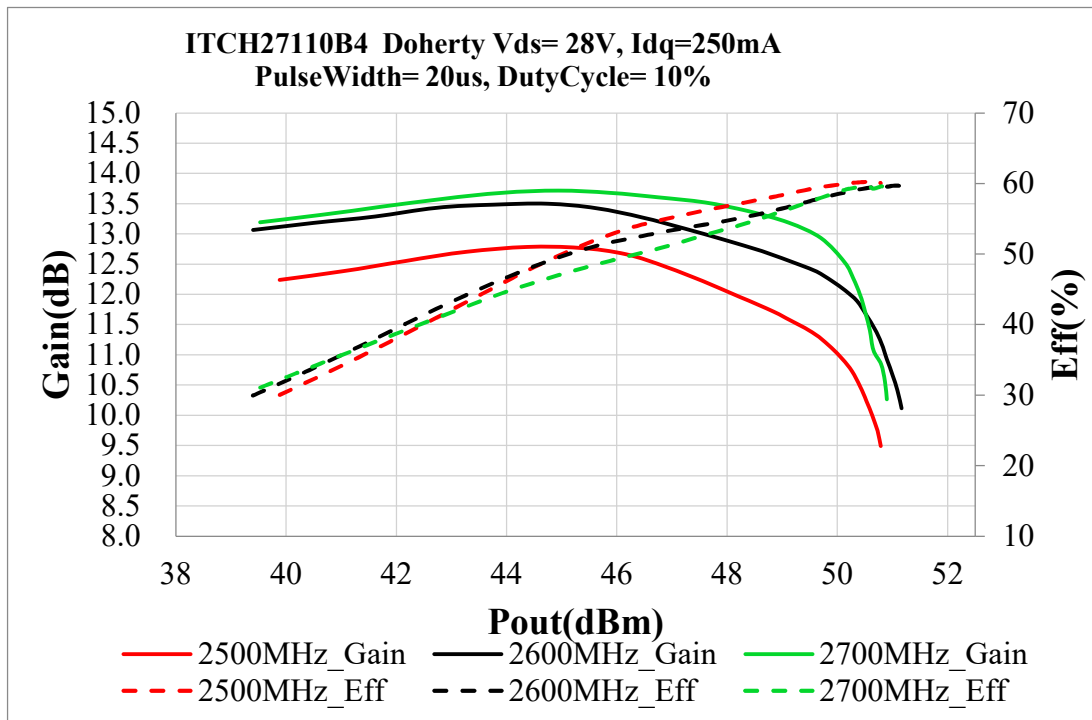


Figure 2. Power gain and drain efficiency as function of pulsed CW Pout

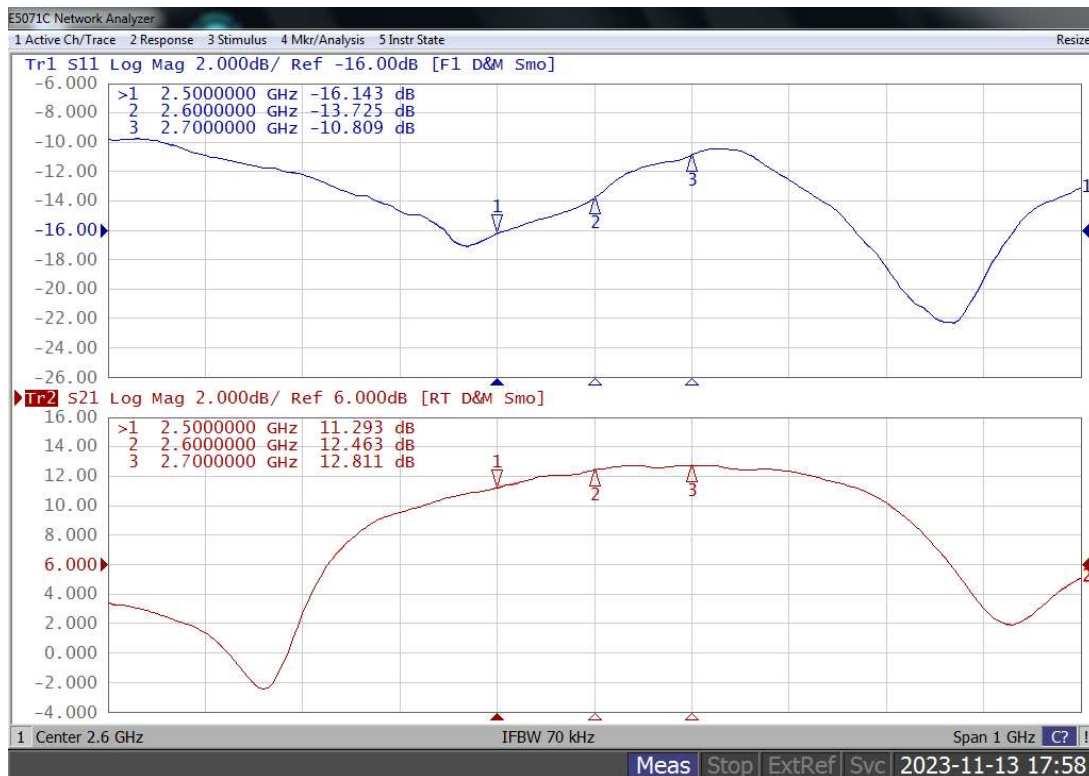
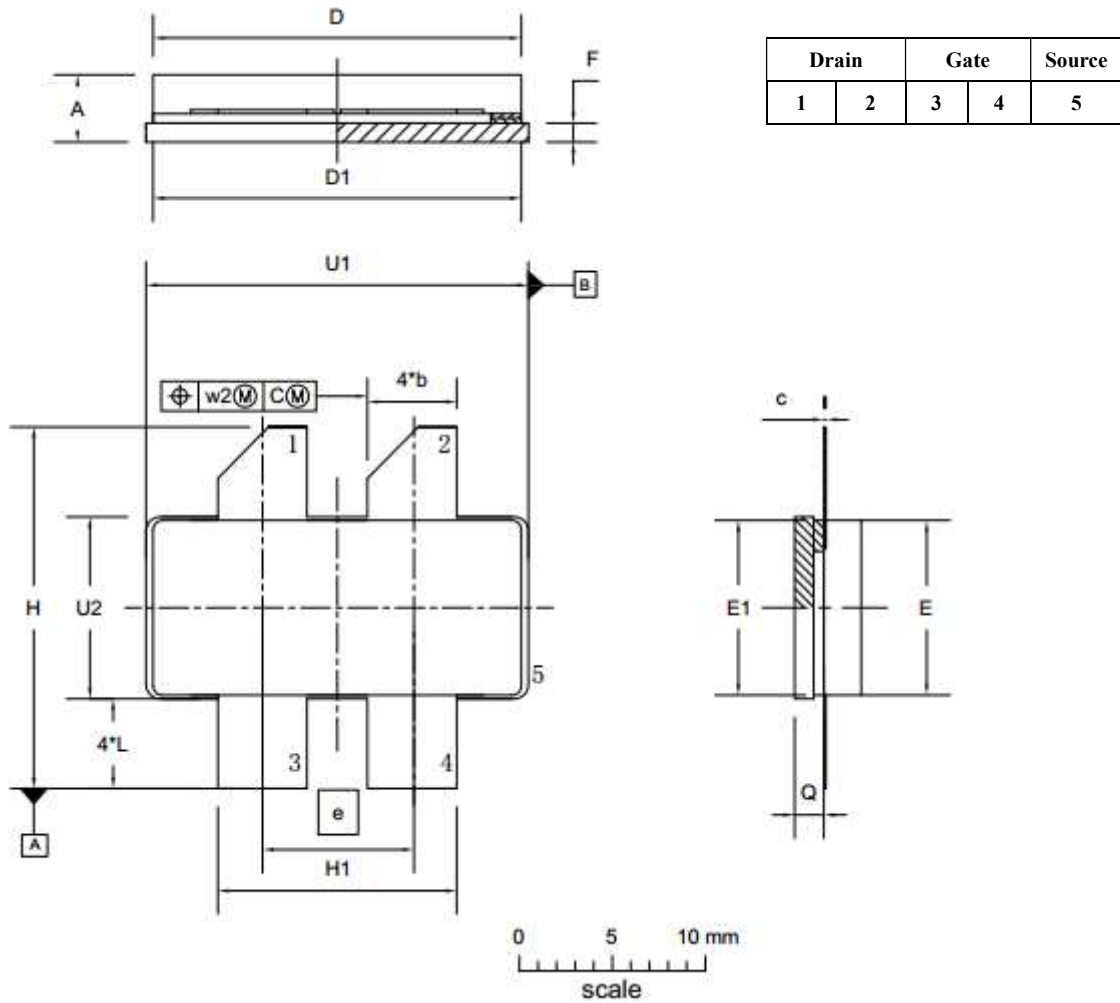


Figure 3. Broadband Frequency Response



Earless Flanged Ceramic Package; 4 leads



UNIT	A	b	c	D	D <sub>1</sub>	e	E	E <sub>1</sub>	F	H	H <sub>1</sub>	L	Q	U <sub>1</sub>	U <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>
mm	4.72	4.67	0.15	20.02	19.96	7.90	9.50	9.53	1.14	19.94	12.98	5.33	1.70	20.70	9.91	0.25	0.51
	3.43	4.93	0.08	19.61	19.66		9.30	9.25	0.89	18.92	12.73	4.32	1.45	20.45	9.65		
inches	0.186	0.194	0.006	0.788	0.786	0.311	0.374	0.375	0.045	0.785	0.511	0.210	0.067	0.815	0.390	0.01	0.02
	0.135	0.184	0.003	0.772	0.774		0.366	0.364	0.035	0.745	0.501	0.170	0.057	0.805	0.380		

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-B4					03/12/2013



## Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2023/11/14	Rev 1.0	Product Datasheet

Application data based on LSM-23-36

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