2400-2500MHz, 280W, High Power RF LDMOS FETs

Description

The ITCH25280D4 is a 280-watt, internally matched LDMOS FETs, designed for Multiple use especially RF Energy application including cooking, heating and medical with frequencies from 2400 to 2500 MHz.

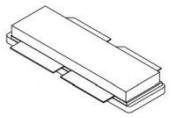
It is qualified up to 32V operation.

•Typical Performance (on Innogration fixture with device soldered):

Idq=20mA Tcase=25 Degree C

Freq(MHz)	Pout (W)	Vdd(V)	Ids(A)	Gp（dB）	Eff(%)
2450	310	32	17	13.5	57

ITCH25280D4



Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Internally Matched for Ease of Use
- Large Positive and Negative Gate/Source Voltage Range for Improved Class C Operation
- Excellent thermal stability, low HCI drift
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	65	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 Tcase= 85°C, Pout=300W CW	RθJC	0.2	°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=100uA)	V_{DSS}	65	——	——	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} = 6 V, V_{DS} = 0 V)	I_{GSS}	——	——	1	μA
Gate Threshold Voltage (V_{DS} = 28V, I_D = 600 uA)	$V_{GS}(th)$	——	1.6	——	V
Gate Quiescent Voltage (V_{DD} = 32 V, I_{DQ} = 20 mA, Measured in Functional Test)	$V_{GS(Q)}$		2.25		V

Functional Tests (In Innogration Test Fixture, 50 ohm system) :V_{DD} = 32 Vdc, I_{DQ} = 20 mA, f = 2450 MHz, CW Signal Measurements., Pin=14W,

Power Gain	Gp	——	13.5	——	dB
Drain Efficiency@Pout	η_D	55	57	59	%
Output Power	P_{-3dB}	290	310	320	W
Input Return Loss	IRL	——	-7	——	dB

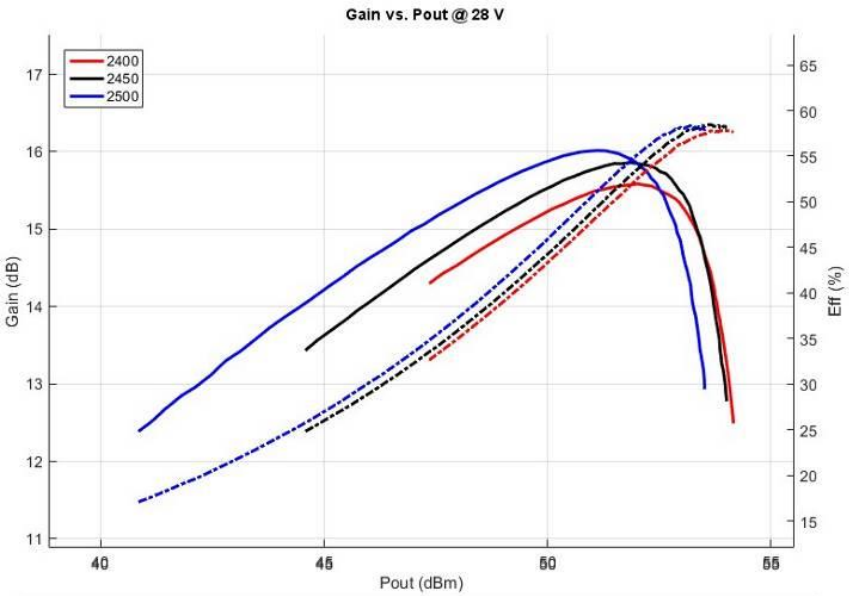
Load Mismatch (In Innogration Test Fixture, 50 ohm system): V_{DD} = 32 Vdc, I_{DQ} = 20 mA, f = 2450MHz

VSWR 10:1 at 350W pulse CW Output Power	No Device Degradation

Figure 1

Signal: Pulse width 20us, duty cycle 10% ,

Vgs= 2.26V,Vdd= 28V,Idq=20mA

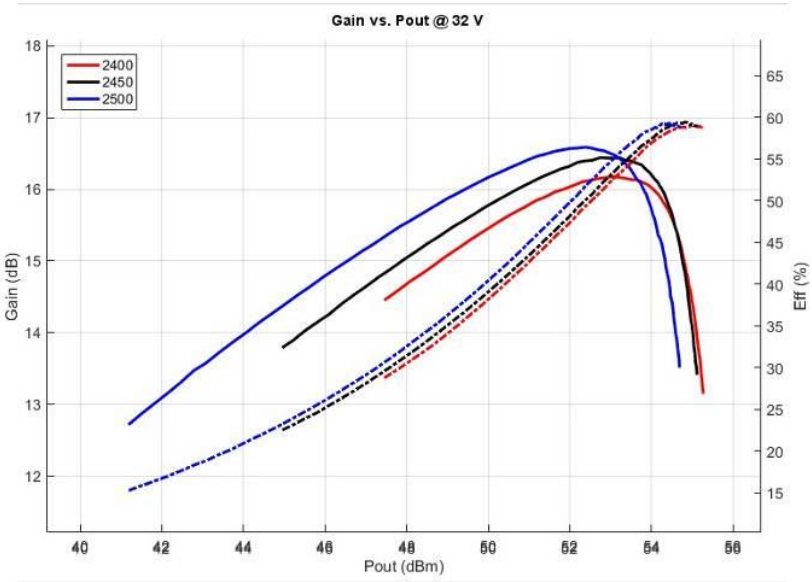


Freq(MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
2400	53.59	228.45	57.58	14.54	54.16	260.60	57.63
2450	53.46	221.77	58.37	14.80	54.01	251.70	58.13
2500	52.90	195.00	57.88	14.95	53.51	224.62	57.67

Figure 2

Signal: Pulse width20us, duty cycle 10%

Vgs= 2.25V,Vds= 32V,Idq=20mA



Freq(MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
2400	54.74	297.79	58.82	15.17	55.27	336.76	58.72
2450	54.63	290.40	59.31	15.39	55.12	325.06	58.90
2500	54.09	256.35	58.77	15.57	54.69	294.32	58.67

Figure3:

Network Analyzer S11 and S22 (Vds=32V, Idq=1.5A)

Figure 4: Fixture circuit photo

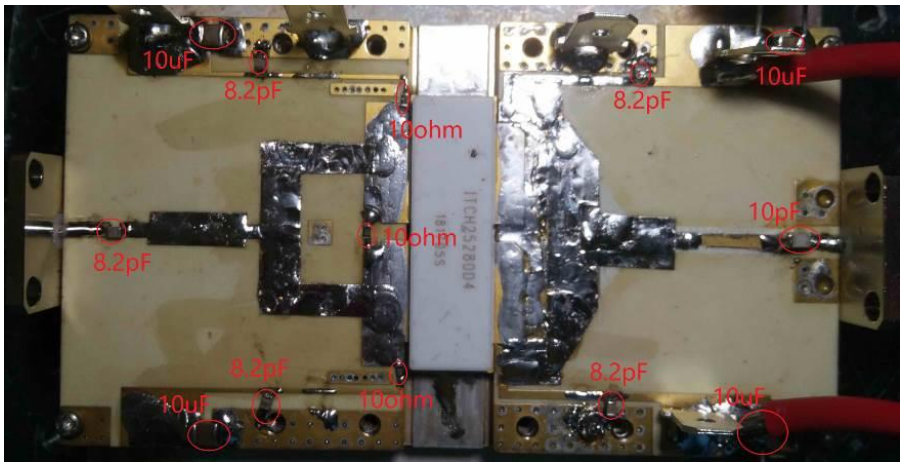
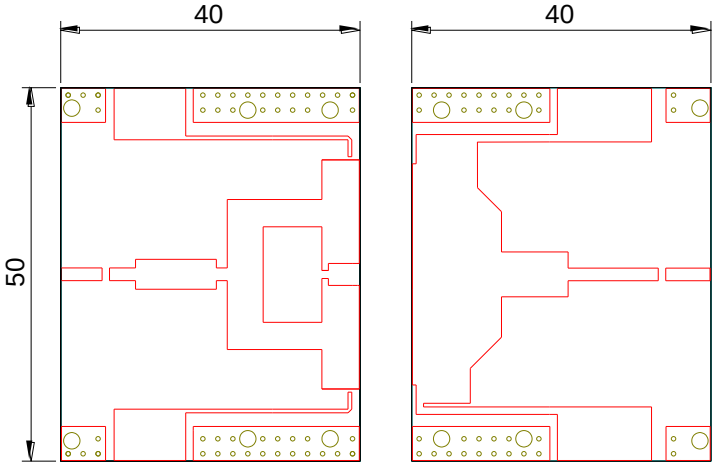


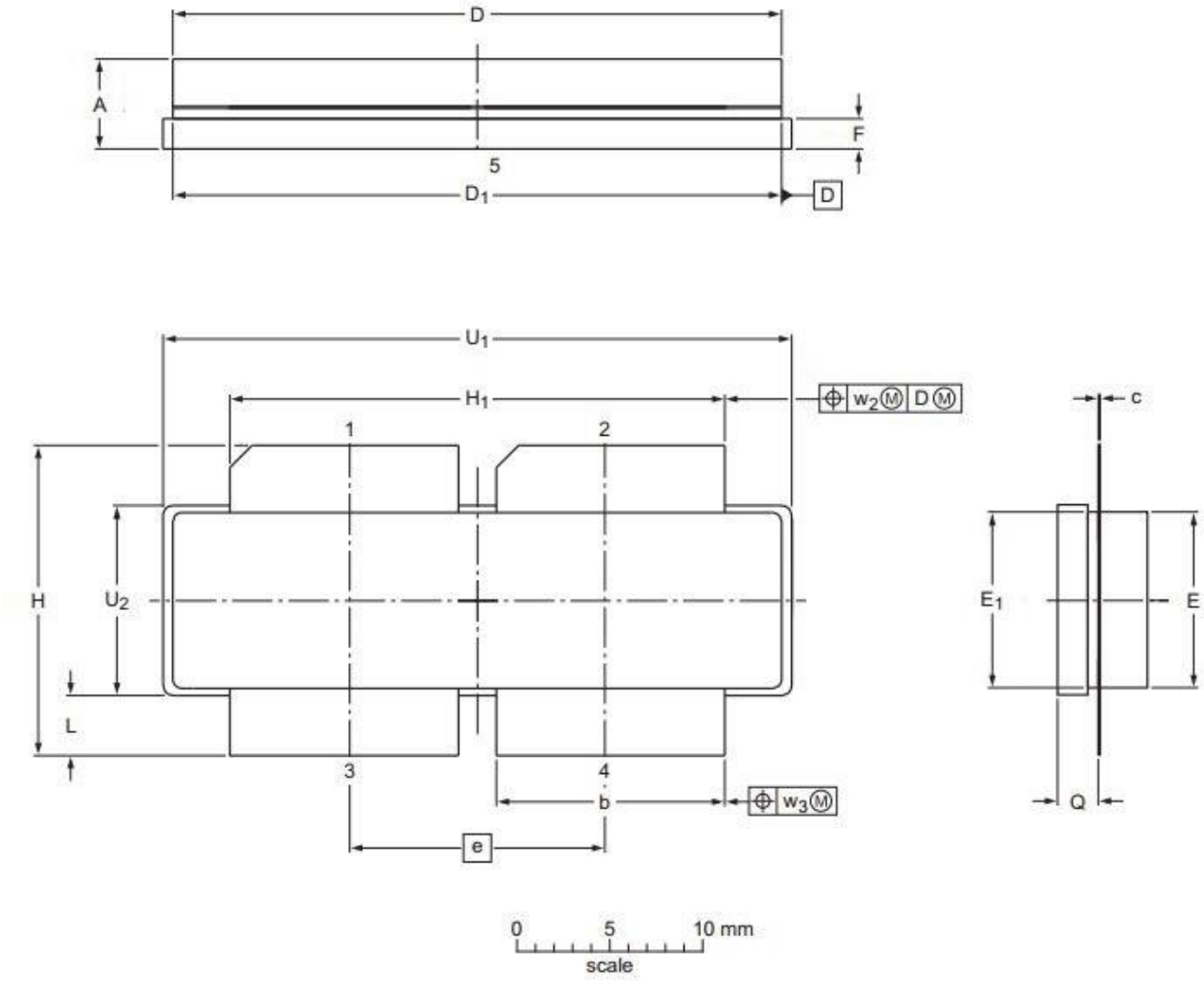
Figure 5: PCB Layout info (Drawing file upon request)

Rogers 4350 , Thickness:30 mil



Package Outline

Earless flanged ceramic package; 4 leads（1、2—DRAIN、3、4—GATE、5—SOURCE）



UNIT	A	b	c	D	D_1	e	E	E_1	F	H	H_1	L	Q	U_1	U_2	W_2	W_2
mm	4.7 4.2	11.81 11.56	0.18 0.10	31.55 30.94	31.52 30.96	13.72	9.50 9.30	9.53 9.27	1.75 1.50	17.12 16.10	25.53 25.27	3.48 2.97	2.26 2.01	32.39 32.13	10.29 10.03	0.25	0.25
inches	0.185 0.165	0.465 0.455	0.007 0.004	1.242 1.218	1.241 1.219	0.540	0.374 0.366	0.375 0.365	0.069 0.059	0.674 0.634	1.005 0.995	0.137 0.117	0.089 0.079	1.275 1.265	0.405 0.395	0.01	0.01

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-D4					03/12/2013

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2018/5/16	**V1**	**Preliminary Datasheet Creation**

Disclaimers

Specifications are subject to change without notice. Innogration believes the information contained within this data sheet to be accurate and reliable. However, no responsibility is assumed by Innogration for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Innogration . Innogration makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose."Typical" parameters are the average values expected by Innogration in large quantities and are provided for information purposes only. These values can and do vary in different applications and actual performance can vary over time. All operating parameters should be validated by customer's technical experts for each application. Innogration products are not designed, intended or authorized for use as components in applications intended for surgical implant into the body or to support or sustain life, in applications in which the failure of the Innogration product could result in personal injury or death or in applications for planning, construction, maintenance or direct operation of a nuclear facility. For any concerns or questions related to terms or conditions, pls check with Innogration and authorized distributors