700MHz-3600MHz, 20W, 28V RF Power LDMOS FETs

Description

The ITCH36015E2 is a 20-watt, internally matched LDMOS FET, designed for cellular base station and ISM applications with frequencies from 700MHz to 3600 MHz

ITCH36015E2

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

V_{DD} = 28 Volts, I_{DQ} = 120 mA，Pulse Width =20us, Duty Cycle =10%.

Frequency (MHz)	G_{MAX} (dB)	P_1dB (dBm)	P_3dB (dBm)	η_D (%)	P_{avg}=33dBm WCDMA Signal(1)		
					Gp (dB)	η_D (%)	ACPR_5M (dBc)
869	22.9	43.7	44.2	64.1	22.6	21.6	-37.1
881.5	22.9	43.4	44.0	65.7	22.5	22.2	-38.8
894	22.4	43.2	43.7	67.2	22.2	22.9	-39.4

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

V_{DD} = 28 Volts, I_{DQ} = 100 mA，Pulse Width =20us, Duty Cycle =10%.

Frequency (MHz)	G_{MAX} (dB)	P_1dB (dBm)	P_3dB (dBm)	η_D (%)	P_{avg}=33dBm WCDMA Signal(1)		
					Gp (dB)	η_D (%)	ACPR_5M (dBc)
2500	15.4	44.3	44.9	57.7	14.7	19.9	-36.4
2600	16.4	43.8	44.4	59.7	15.9	21.7	-37.2
2700	15.6	42.9	43.6	57.8	15.0	23.4	-37.2

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

V_{DD} = 28 Volts, I_{DQ} = 140 mA，Pulse Width =20us, Duty Cycle =10%.

Frequency (MHz)	G_{MAX} (dB)	P_1dB (dBm)	P_3dB (dBm)	η_D (%)	P_{avg}=32.5dBm WCDMA Signal(1)		
					Gp (dB)	η_D (%)	ACPR_5M (dBc)
3400	15.8	42.8	44.0	44.0	15.5	14.8	-38.3
3500	16.7	42.6	43.9	48.2	16.6	16.2	-40.3
3600	16.3	41.8	43.3	44.4	16.1	16.2	-41.8

Note(1) WCDMA signal: 3GPP test model 1; 1 to 64 DPCH; Channel Bandwidth=3.84MHz,PAR =10.5 dB at 0.01 % probability on CCDF.

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}	+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 T_C= 85°C, T_J=200°C, DC test	RθJC	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)

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V; I_{DS}=100uA	V_{DSS}	65			V
Zero Gate Voltage Drain Leakage Current	V_{DS} = 28 V, V_{GS} = 0 V	I_{DSS}			1	μA
Gate--Source Leakage Current	V_{GS} = 9 V, V_{DS} = 0 V	I_{GSS}			1	μA
Gate Threshold Voltage	V_{DS} = 28V, I_D = 300 μA	V_{GS}(th)		1.75		V
Gate Quiescent Voltage	V_{DS} = 28 V, I_{DS} = 150 mA, Measured in Functional Test	$V_{GS(Q)}$		2.7		V

Pulse CW Signal performance (In Innogration Test Fixture, 50 ohm system): V_{DD} = 28 Vdc, I_{DQ} =140 mA, f = 3600 MHz, Pulse CW, Pulse Width =20us, Duty Cycle =10%.

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain	Gp		16.3		dB
Drain Efficiency@P3dB	η_D		44.4		%
3dB Compression Point	P_{-3dB}		43.3		dBm
Input Return Loss	IRL		-7		dB

Load Mismatch (In Innogration Test Fixture, 50 ohm system): V_{DD} = 28 Vdc, I_{DQ} = 140 mA, f = 3600 MHz

VSWR 10:1 at 20W Pulsed CW Output Power	No Device Degradation

TYPICAL CHARACTERISTICS

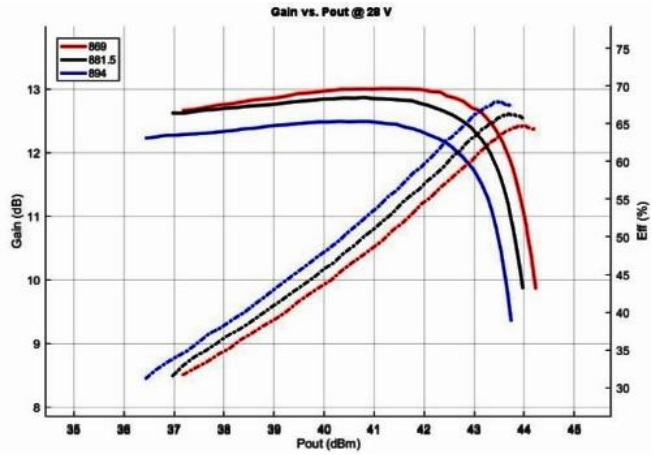


Figure 1. Power gain and drain efficiency as function of Pulse output power（869-894MHz）

Figure 2. Power gain and drain efficiency as function of Pulse output power（2500-2700MHz）

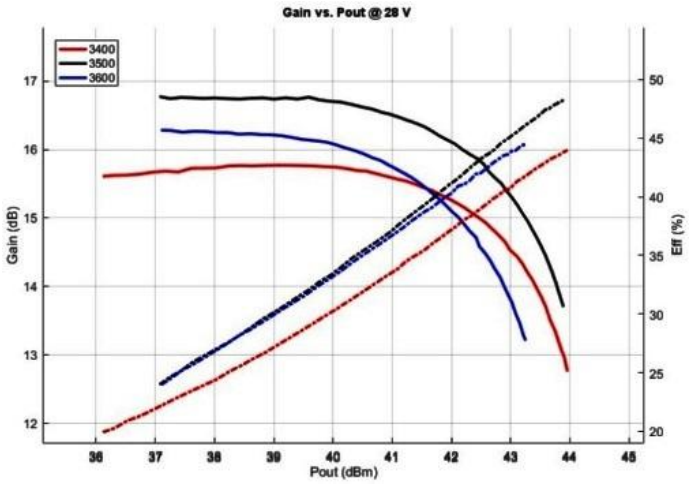
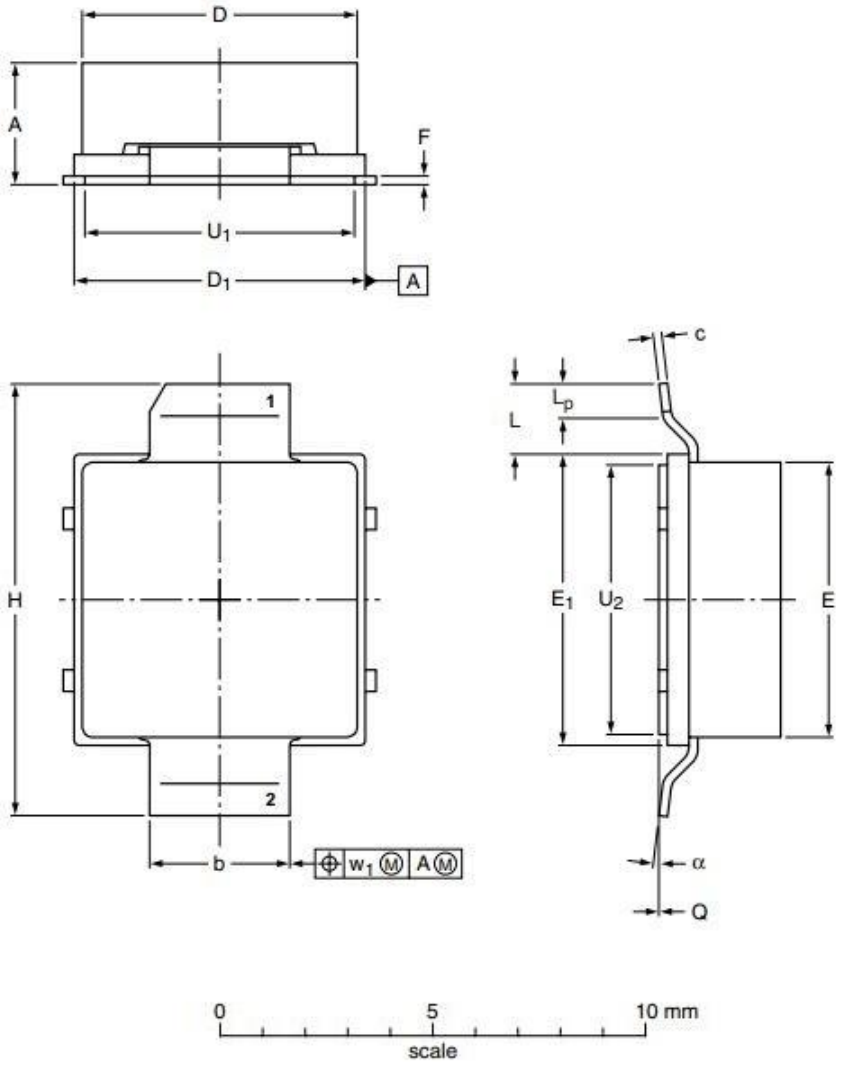


Figure 3. Power gain and drain efficiency as function of Pulse output power（3400-3600MHz）

Package Outline

Earless Flanged ceramic package; 2 leads



UNIT	A	b	c	D	D_1	E	E_1	F	H	L	L_P	Q	U_1	U_2	w_1	α
mm	3.38 2.77	3.38 3.23	0.23 0.18	6.55 6.40	6.93 6.78	6.55 6.40	6.93 6.78	0.23 0.18	10.29 10.03	1.65	1.02 0.51	+0.05 −0.05	6.43 6.27	6.43 6.27	0.51	7° 0°
inches	0.133 0.109	0.133 0.127	0.009 0.007	0.258 0.252	0.273 0.267	0.258 0.252	0.273 0.267	0.009 0.007	0.405 0.395	0.065	0.040 0.020	+0.002 −0.002	0.253 0.247	0.253 0.247	0.02	7° 0°

OUTLINE VERSION	REFERENCE				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
PKG-E-A						10/22/2013

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2017/01/22	**Rev 1.0**	**Preliminary Datasheet**
2017/08/31	**Rev 1.1**	**Preliminary Datasheet**
		Add test data and graph

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