2300MHz-2500MHz, 50W, 28V RF Power LDMOS FETs

Description

The ITCH25050A2 is a 50-watt , internally matched LDMOS FET, designed for cellular base station and ISM applications with frequencies from 2300MHz to 2500 MHz。

ITCH25050A2

ITCH25050A2E

- Typical Performance of 2400-2500MHz (On Innogration fixture with device soldered):

V_{DD} = 28 Volts, I_{DQ} = 100 mA , Pulse Width =10us, Duty Cycle =12%.

Freq(MHz)	P1(dBm)	Gain@P1(dB)	P3(dBm)	Eff(%)@P3
2400	48.1	16.7	48.8	59.6
2450	47.9	17.1	48.6	61.3
2500	47.4	17.3	48.1	60.8

- Typical Performance of 2400-2500MHz (On Innogration fixture with device soldered):

V_{DD} = 32 Volts, I_{DQ} = 100 mA , CW.

Freq(MHz)	P1(dBm)	Gain@P1(dB)	P3(dBm)	Eff(%)@P3
2400	48.7	16.8	49.3	57.2
2450	48.5	17.1	49.1	58.3
2500	48.2	17.5	48.8	59.4

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}	+69	Vdc
Gate--Source Voltage	V_{GS}	-7 to +10	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	$R_{\theta JC}$	0.9	°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}=1mA	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	$V_{GS(th)}$	1.5	2.0	2.5	V
Gate Quiescent Voltage	V_{DS} = 28 V, I_{DS} = 100 mA, Measured in Functional Test	$V_{GS(Q)}$	2.2	2.7	3.2	V

CW performance (In Innogration Test Fixture, 50 ohm system): V_{DD} = 32 Vdc, I_{DQ} = 100 mA, f = 2400-2500 MHz, CW.

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain @ P1dB	G_p	15.5	17		dB
Drain Efficiency @ P3dB	η_D	52	58		%
3dB Compression Point	P_{-3dB}	48	49.5		dBm
Input Return Loss	IRL		-7		dB

Reference Circuit

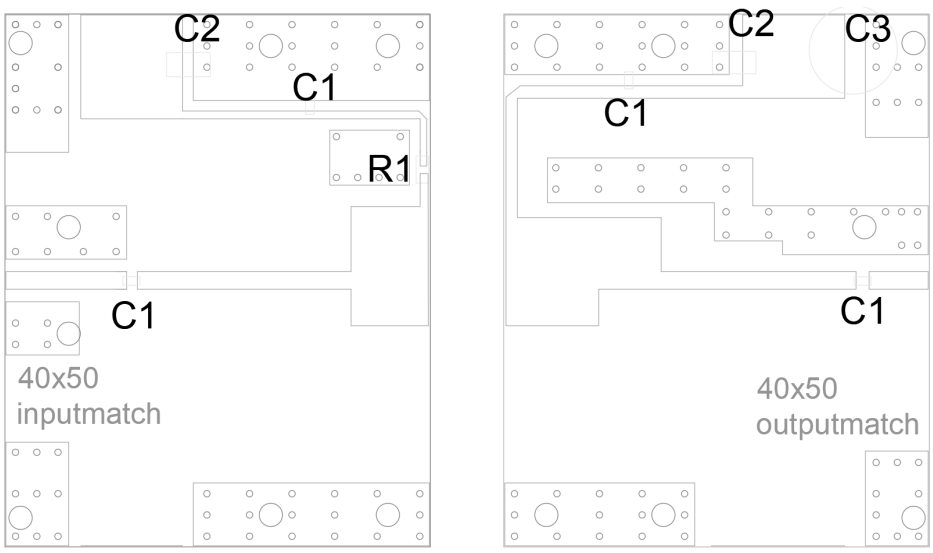


Figure 1. Test Circuit Component Layout (2400MHz~2500MHz)

Table 5. Test Circuit Component Designations and Values

Component	Description
C1	15pF, high Q capacitance
C2	10uF/63V
R1	10 Ω
C3	470uF/63V
PCB	0.762mm [0.030"] thick, εr=3.48, Rogers RO4350B, 1 oz. copper

TYPICAL CHARACTERISTICS

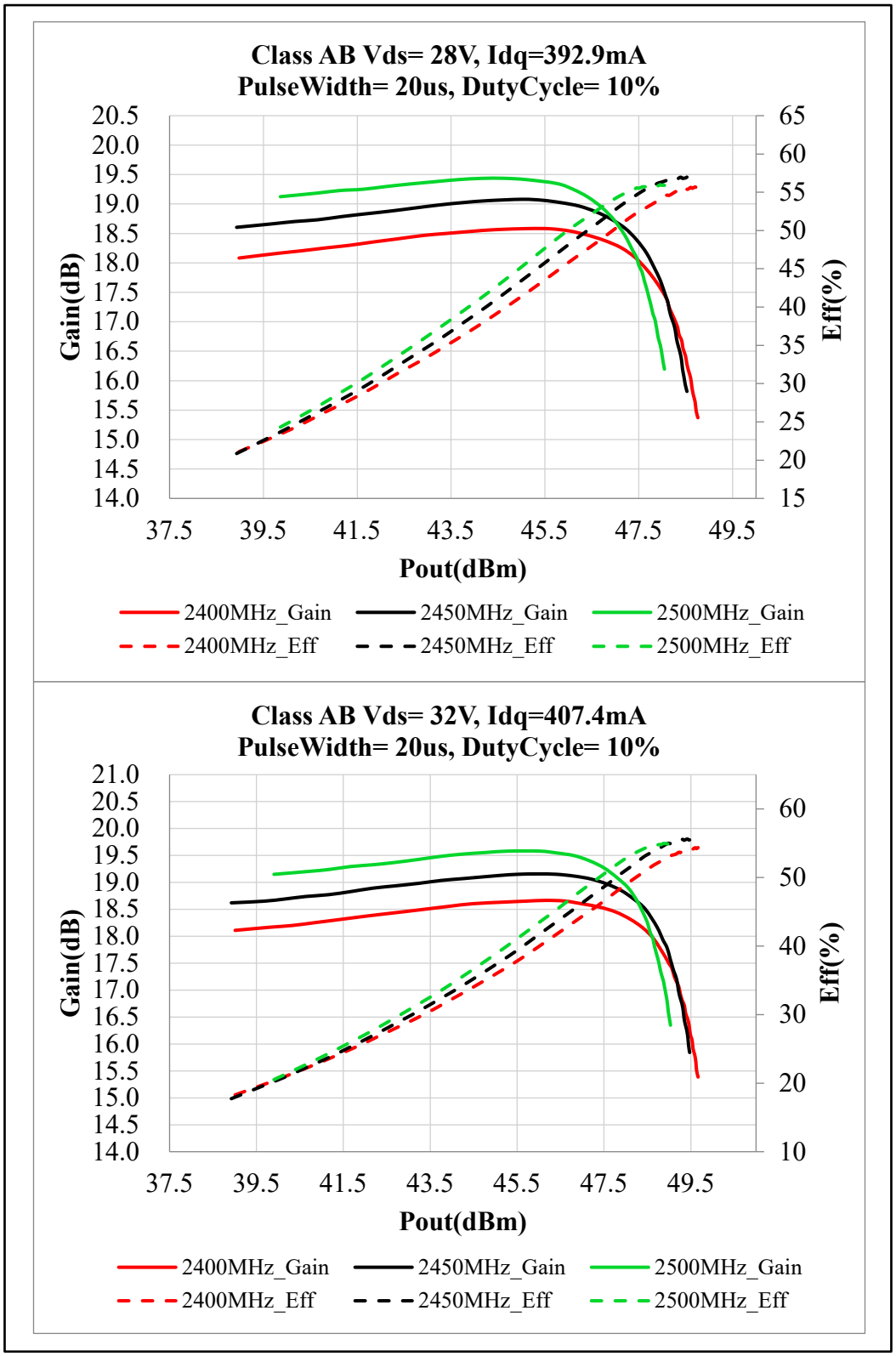
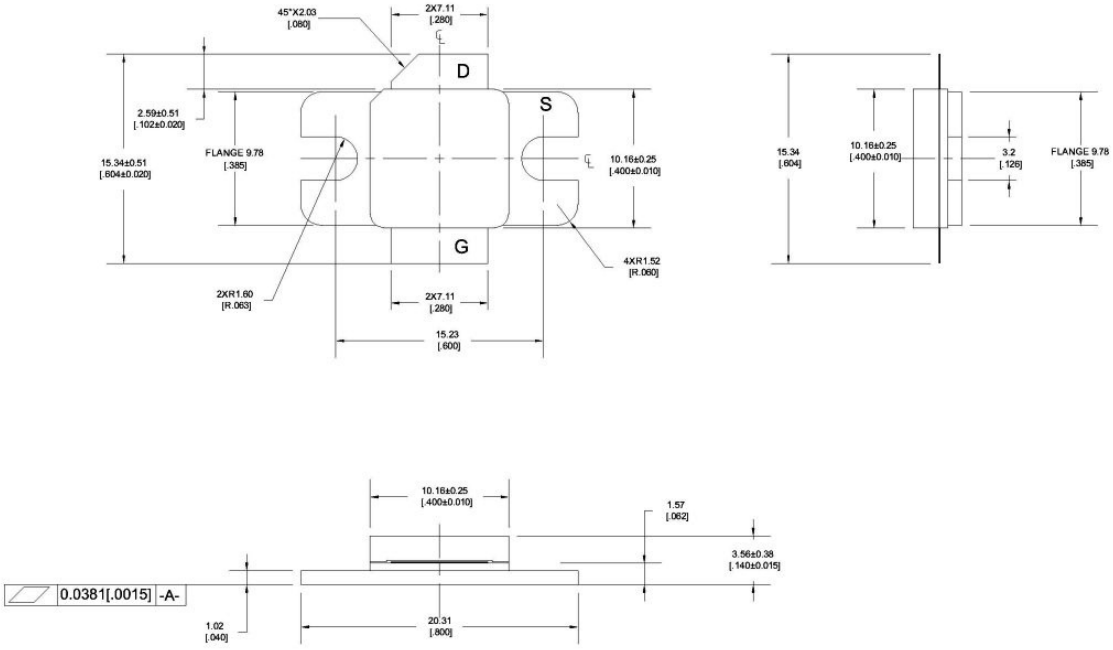


Figure 2. Power Gain and Drain Efficiency as Function of Pulse Output Power

Package Outline

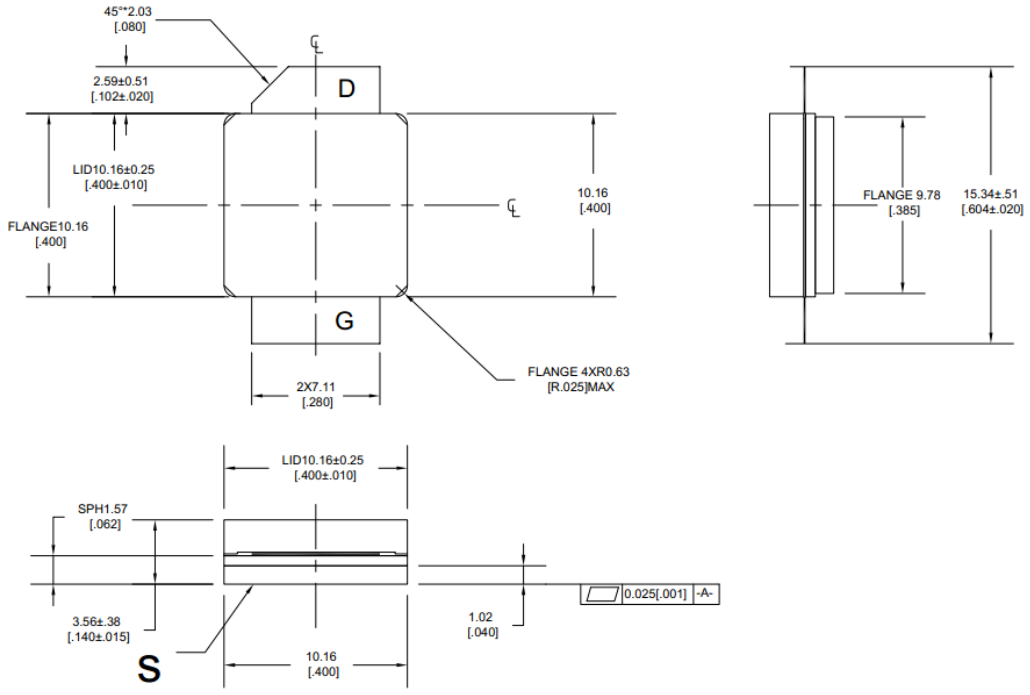
Eared Flanged ceramic package; 2 leads (A2E)



Unit：mm [inch]

Tolerance .xx +/- 0.01 .xxx +/- 0.005 inches

Earless Flanged ceramic package; 2 leads (A2)



Unit：mm [inch]

Tolerance .xx +/- 0.01 .xxx +/- 0.005 inches

Revision history

Table 6. Document revision history

Date	Revision	Datasheet Status
2021/6/16	Rev 1.0	Preliminary Datasheet
2023/2/23	Rev 2.0	Update test data
2023/12/21	Rev 2.1	Update parameters

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