



RF LDMOS 12.5V 20W Transistor, 1.5-2.5GHz

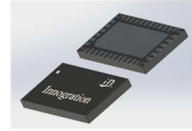
Description

The ITCN25020C6 is a 20W RF LDMOS, designed for multiple applications, within 1.5 to 2.5GHz. The transistor is available in a cost effective 10*6mm, surface mount, QFN package with 100% DC production test to ensure the quality and consistency.

It can be used in CW, Pulse and multiple modulation mode.

There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.

ITCN25020C6



QFN 10*6mm

•Typical RF Performance On Innogrator fixture

$V_{DD} = 12.5\text{ V}$, $I_{DQ} = 300\text{ mA}$, Pulse CW, Pulse Width=20 us, Duty cycle=10%.

Application 1: 2.4-2.5GHz Class AB

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
2400	42.73	18.7	48.1	16.55	43.74	23.7	51.4
2450	42.52	17.9	48.2	16.37	43.63	23.1	52.2
2500	41.72	14.9	46.3	16.59	43.17	20.8	51.5

Application 2: 2.2-2.3GHz Class AB

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
2200	43.06	20.3	49.0	14.74	43.94	24.8	52.4
2250	42.8	19.1	49.9	15.1	43.63	23.1	52.4
2300	42.33	17.1	49.1	15.14	43.33	21.5	52.1

Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Excellent thermal stability, low HCI drift
- Large Positive and Negative Gate/Source Voltage Range for Improved Class C Operation
- Pb-free, RoHS-compliant

Suitable Applications

- GNSS Amplifier
- L or S band radio link
- 2450MHz ISM , WIFI AP

Figure 1: Pin Definition(Top View)





Pin No.	Symbol	Description
8,9,10,11,14,15,16,17	Vgs/RF In	Vgs and RF input
26,27,28,29,32,33,34,35	Vds/RF out	Vds and RF output
2,5,7,12,13,18,20,23,25,30,31,36	GND	DC/RF Ground
Others	NC	No connection
Package Base	GND	DC/RF Ground.

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	+40	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+13.6	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 $T_c = 85^\circ\text{C}$, $T_J = 200^\circ\text{C}$, DC test	$R_{\theta JC}$	1	°C/W

Table 3. ESD Protection Characteristics

Test Methodology	Class
Human Body Model (per JESD22--A114)	Class 2

Table 4. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics					
Drain-Source Voltage $V_{GS} = 0$, $I_{DS} = 100\mu\text{A}$	$V_{(BR)DSS}$		43		V
Zero Gate Voltage Drain Leakage Current ($V_{DS} = 12.5\text{V}$, $V_{GS} = 0\text{V}$)	I_{DSS}	—	—	1	μA
Gate--Source Leakage Current ($V_{GS} = 9\text{V}$, $V_{DS} = 0\text{V}$)	I_{GSS}	—	—	1	μA
Gate Threshold Voltage ($V_{DS} = 12.5\text{V}$, $I_D = 600\mu\text{A}$)	$V_{GS(th)}$	—	2	—	V
Gate Quiescent Voltage ($V_{DD} = 12.5\text{V}$, $I_D = 390\text{mA}$, Measured in Functional Test)	$V_{GS(Q)}$	—	2.6	—	V

Load Mismatch (In Innogrations Test Fixture, 50 ohm system): $V_{DD} = 12.5\text{Vdc}$, $I_{DQ} = 390\text{mA}$, $f = 2300\text{MHz}$

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

TYPICAL CHARACTERISTICS

2.4-2.5GHz application

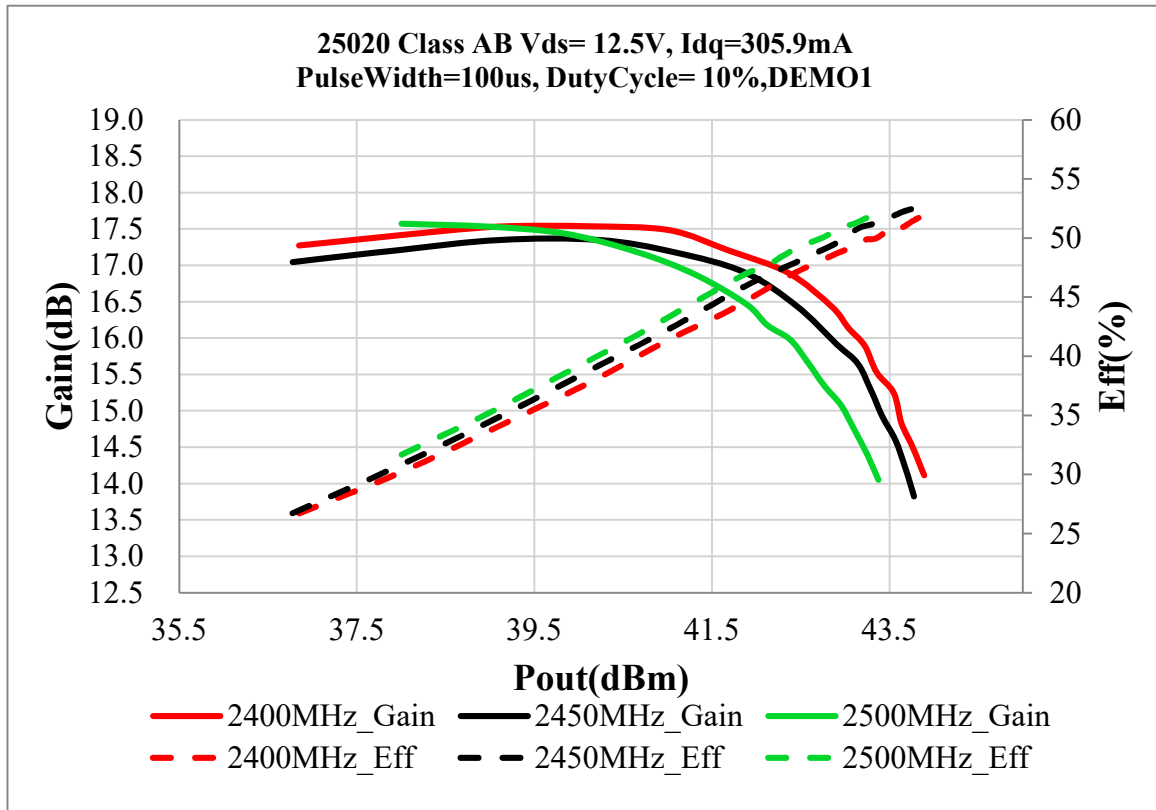
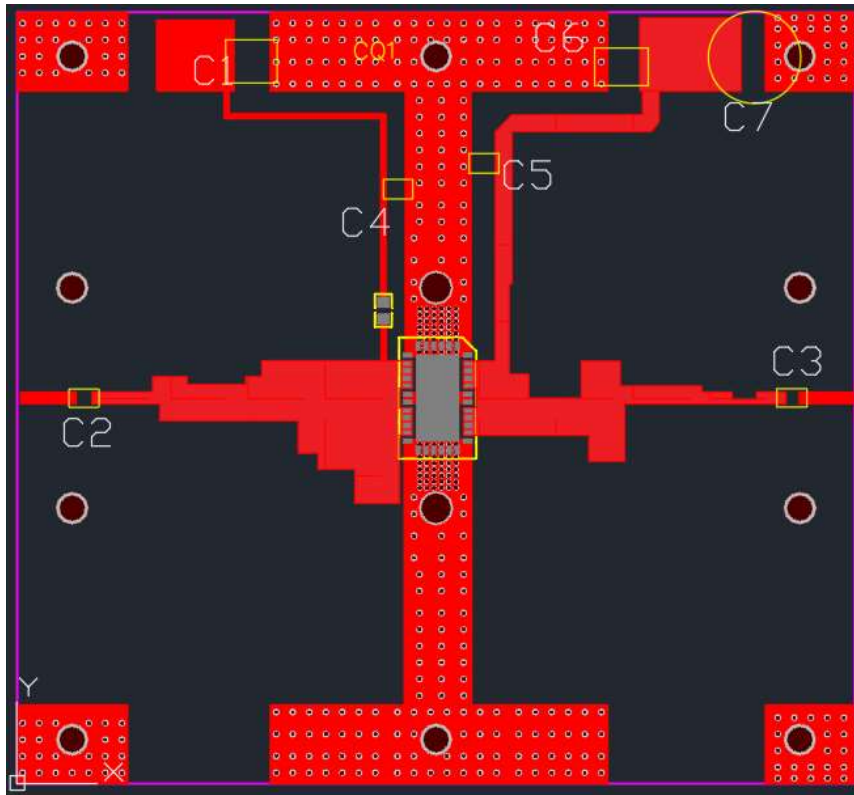


Figure 2. Power Gain and Drain Efficiency as Function of Pulse Output Power



Figure 3. Network analyzer output S11/S21 VDS = 12.5Vdc, Idq= 500mA

Reference Circuit of Test Fixture Assembly Diagram
RO4350B 20mils(Layout upon request)



BOM		
C2,C3,C4,C5	12pF	0603
R1	10 ohm	0603
C7	470 uF/63V	
C1,C6	10 uF	

TYPICAL CHARACTERISTICS

2.2-2.3GHz application

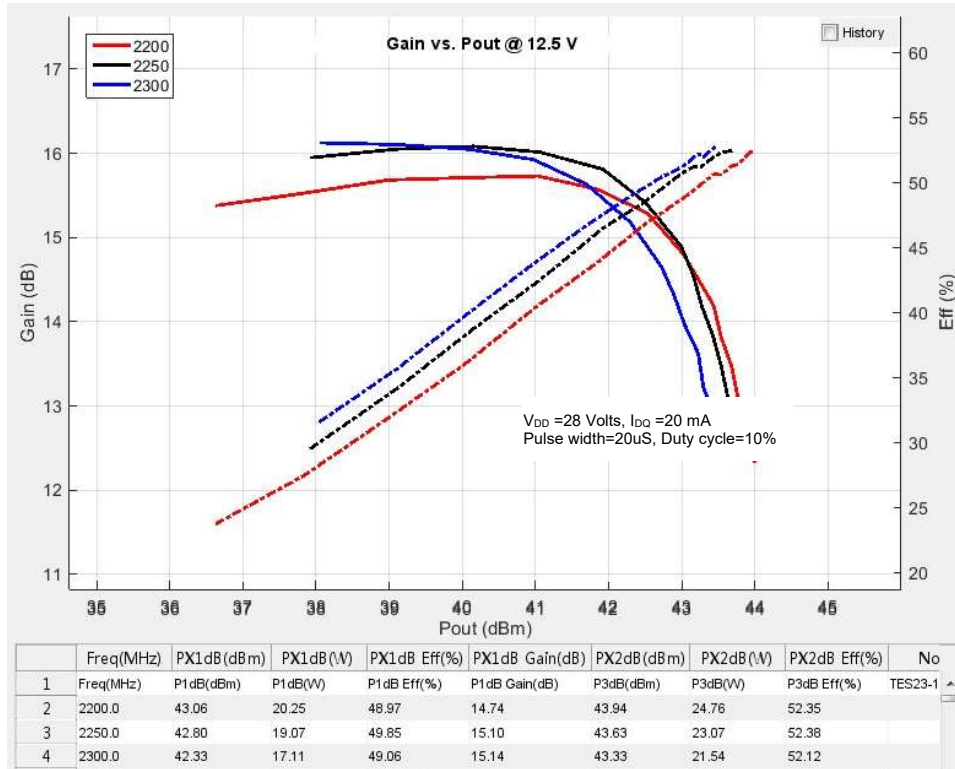


Figure 4. Power Gain and Drain Efficiency as Function of Pulse Output Power

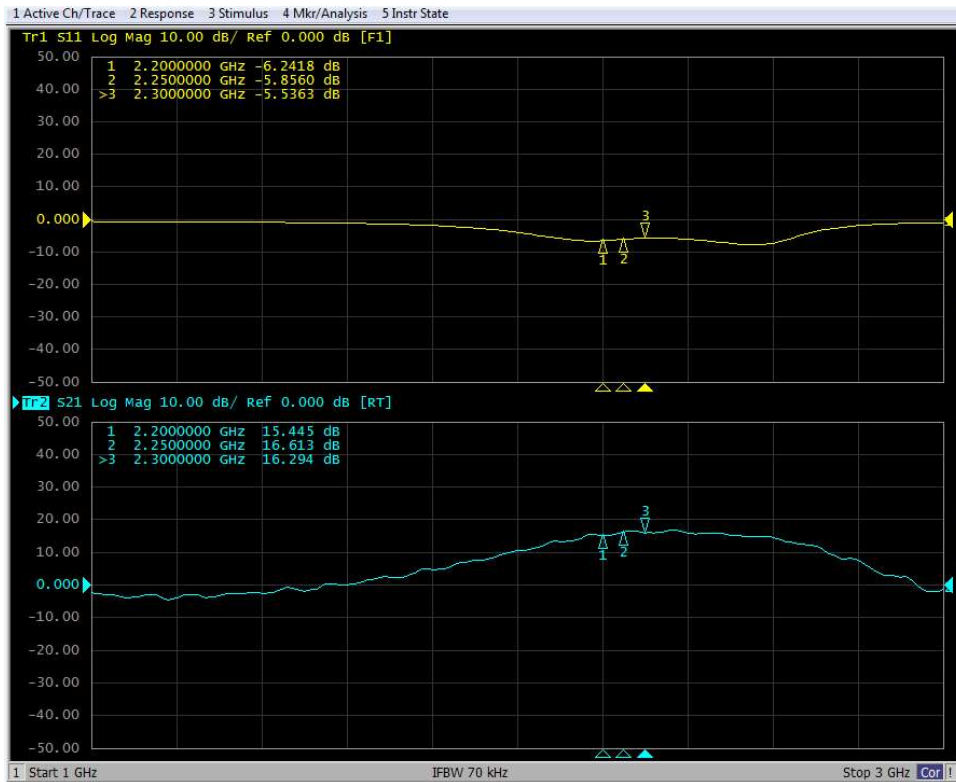
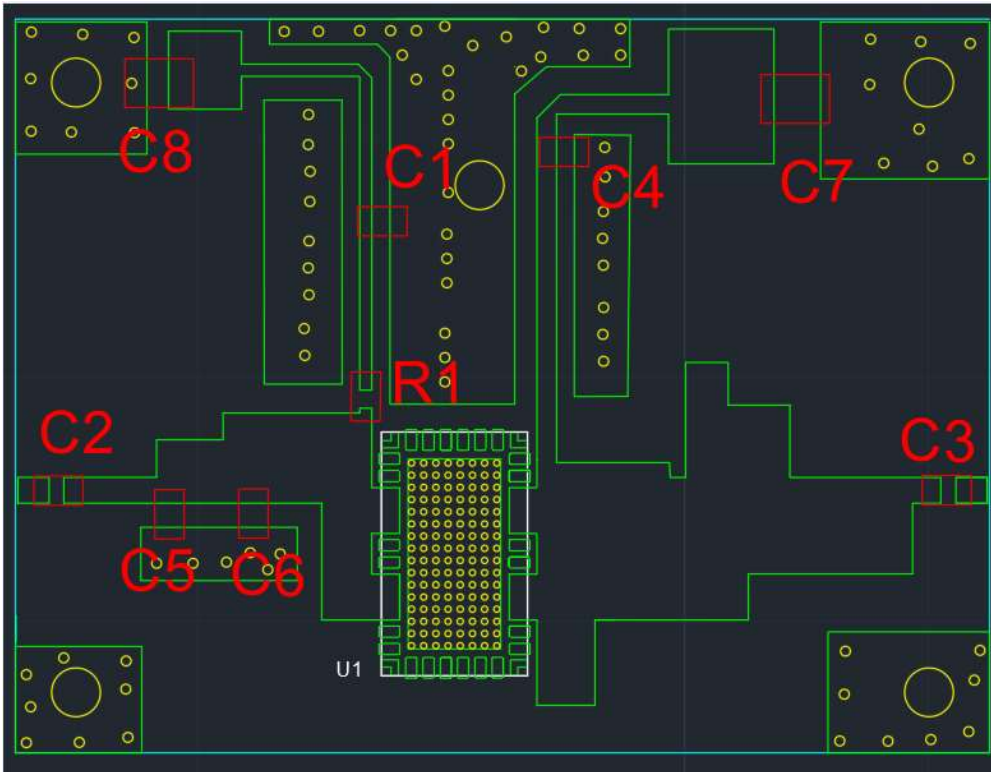


Figure 5. Network analyzer output S11/S21 VDS = 12.5Vdc, Idq= 500mA

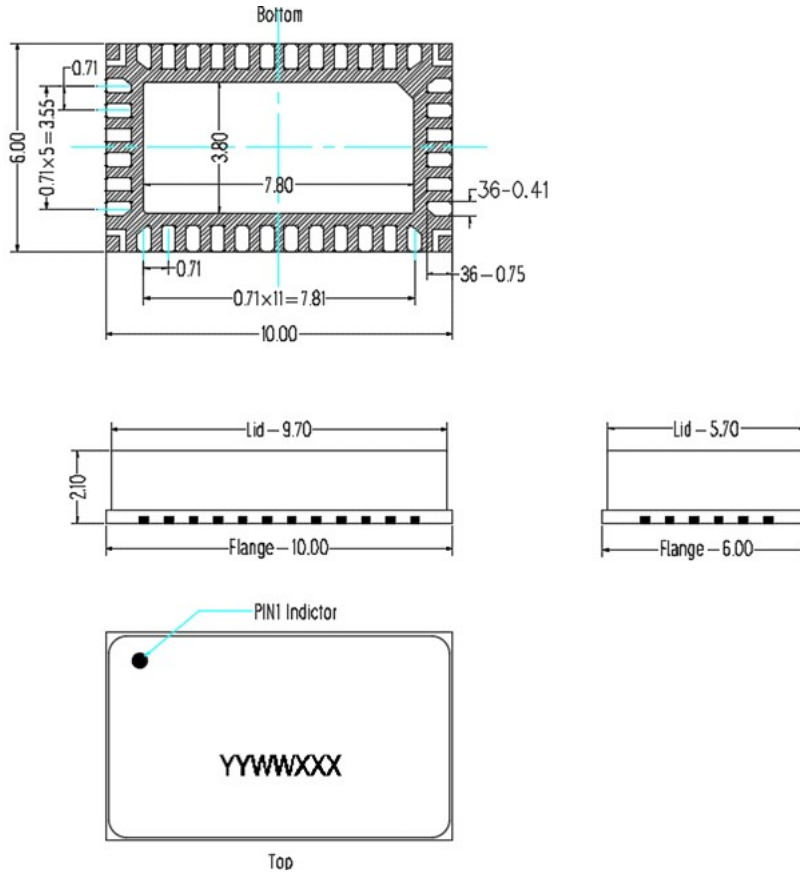
Reference Circuit of Test Fixture Assembly Diagram
RO4350B 20mils(Layout upon request)



BOM		
C5	0.5pF	1210
C1,C2,C3,C4	12pF	0603
R1	10 ohm	0603
C7 C8	10uF/63V	
C6	2pF	
C9	470 uF/63V	

Package Dimensions

10*6 Plastic Package



Notes:

1. All dimensions are in mm;
2. The tolerances unless specified are ± 0.2 mm.

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2022/9/29	V1.0	Datasheet Creation
2022/12/9	V1.1	Update on Pin Definition
2023/1/5	V1.2	Modify the device outline drawing on 2.4-2.5GHz application board

Application data based on ZXY-22-36/37

Notice

Specifications are subject to change without notice. Innogrations believes the information within the data sheet to be reliable. Innogrations makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose.

“Typical” parameter is the average values expected by Innogrations in quantities and are provided for information purposes only. It can and do vary in different applications and related performance can vary over time. All parameters should be validated by customer’s technical experts for each application.

Innogrations 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 Innogrations 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, please check with Innogrations and authorized distributors

Copyright © by Innogrations (Suzhou) Co.,Ltd.