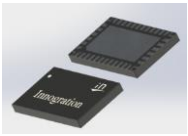
50W,50V Plastic RF LDMOS Transistor

ITGV10050C6



Description

The ITGV10050C6 is a 50V 50-watt, highly rugged, LDMOS transistor, designed for any general applications at frequencies up to 1GHz, in 10*6mm QFN plastic package, supporting surface mounted on PCB through high density grounding vias.

When used at 28V, it can be 25W with more ruggedness margin

- Typical Class AB RF Performance (On Innogration fixture with device soldered).

Vds=**50**V Idq=160mA

Freq (MHz)	Pulse CW Signal			P_{avg}=35dBm WCDMA Signal		
	Gain P1dB (dB)	P3dB (W)	Eff@P3dB (%)	Gp (dB)	Eff(%)	$ACPR_{5M}$ (dBc)
758	16.86	63.63	63.42	17.70	15.98	-46.16
803	16.93	61.25	64.99	18.04	16.49	-47.08
821	16.72	58.94	64.77	18.02	16.73	-46.99

- Typical broadband Class AB RF Performance (On Innogration fixture with device soldered).

Vds=28V Idq=100mA, CW

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
500	43.97	24.9	72.3	18.87	44.81	30.3	77.8
600	43.37	21.7	67.6	18.28	44.32	27.0	72.1
700	43.97	25.0	61.6	17.98	44.8	30.2	65.4
800	43.79	23.9	58.8	18.64	44.75	29.9	62.5
900	43.08	20.3	57.4	18.65	44.31	27.0	62.2
1000	42.28	16.9	57.4	17.51	43.38	21.8	60.1

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

- P band power amplifier
- All 4G/5G cellular application within 0.5 to 1GHz

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	+110	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+55	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	$R_{\theta JC}$	1.2	°C/W

Table 3. ESD Protection Characteristics

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

Table 4. Electrical Characteristics (TA = 25 ℃ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics					
Drain-Source Voltage V_{GS}=0, I_{DS}=100uA	$V_{(BR)DSS}$		110		V
Zero Gate Voltage Drain Leakage Current (V_{DS} = 90V, V_{GS} = 0 V)	I_{DSS}	——	——	1	μA
Gate--Source Leakage Current (V_{GS} = 11 V, V_{DS} = 0 V)	I_{GSS}	——	——	1	μA
Gate Threshold Voltage (V_{DS} = 50V, I_D = 600 μA)	$V_{GS(th)}$	——	2	——	V
Gate Quiescent Voltage (V_{DD} = 50V, I_D = 160mA, Measured in Functional Test)	$V_{GS(Q)}$	——	3.36	——	V

Load Mismatch (In Innogration Test Fixture, 50 ohm system): V_{DD} = 50Vdc, I_{DQ} = 160mA, f = 1000 MHz

VSWR 10:1 at 50W pulse CW Output Power	No Device Degradation

Figure 1:Pin Definition(Top View)

Pin No.	Symbol	Description
8,9,10,11,	Vgs/RF In	Vgs and RF input
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.

758-821MHz 50V application board

Reference Circuit of Test Fixture Assembly Diagram
20mils RO4350B

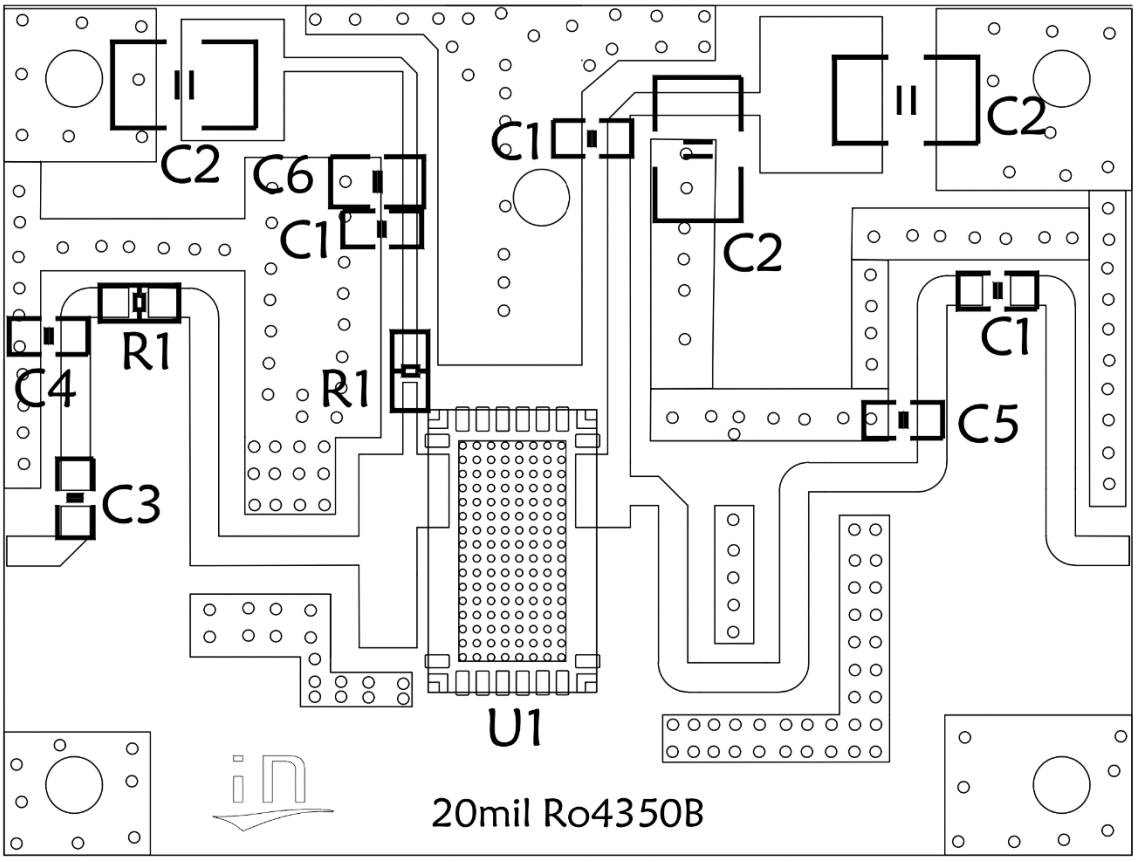


Figure 2. Test Circuit Component Layout

Table 5. Test Circuit Component Designations and Values

Reference	Footprint	Value	Quantity
C1	0805	68pF/250V	3
C2	1210	10uF/100V	3
C3	0805	3.0pF/250V	1
C4	0805	3.9pF/250V	1
C5	0805	3.6pF/250V	1
C6	0805	10uF/16V	1
R1	0603	10R	2
U1	C6	ITGV10050C6	1

TYPICAL CHARACTERISTICS

Figure 5. Power Gain and Drain Efficiency as function of Power Output at Idq=160mA

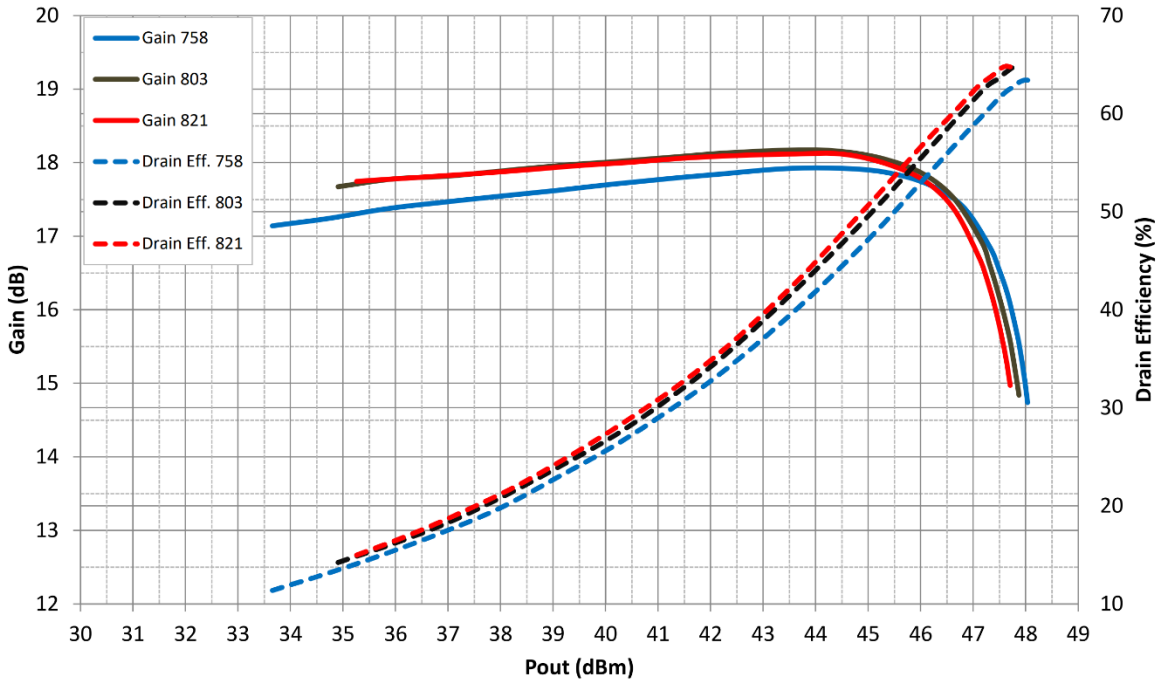
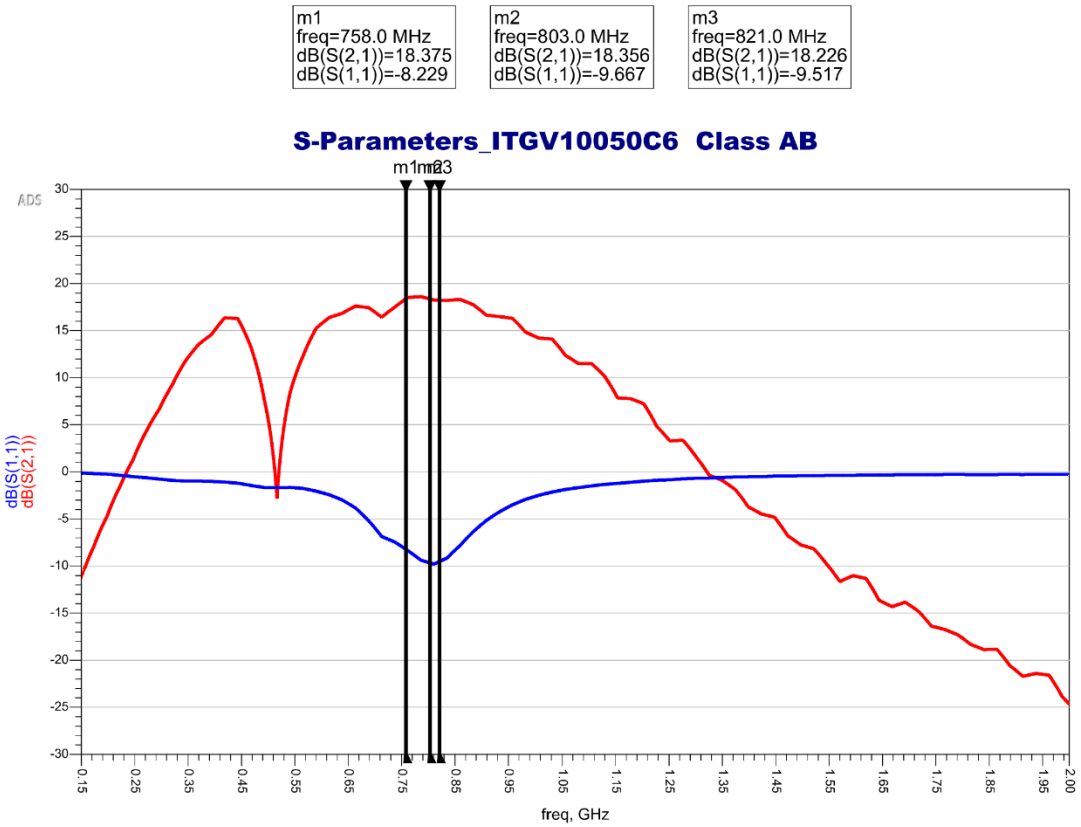


Figure 6.Network analyzer output S11/S21



500-1000MHz 28V application board

Reference Circuit of Test Fixture Assembly Diagram
20mils RO4350B

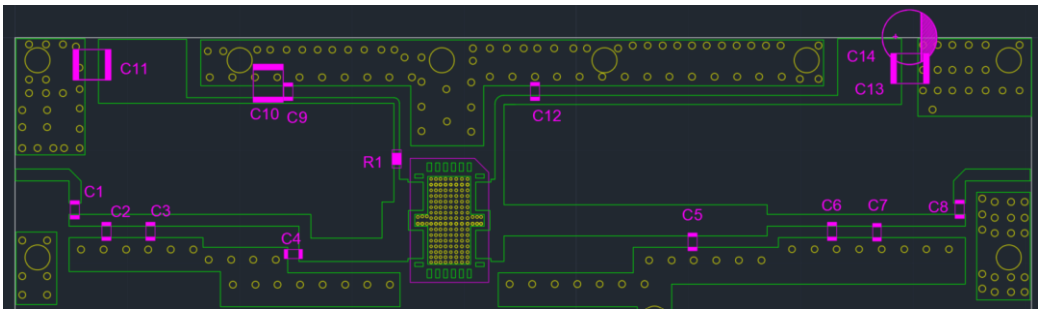


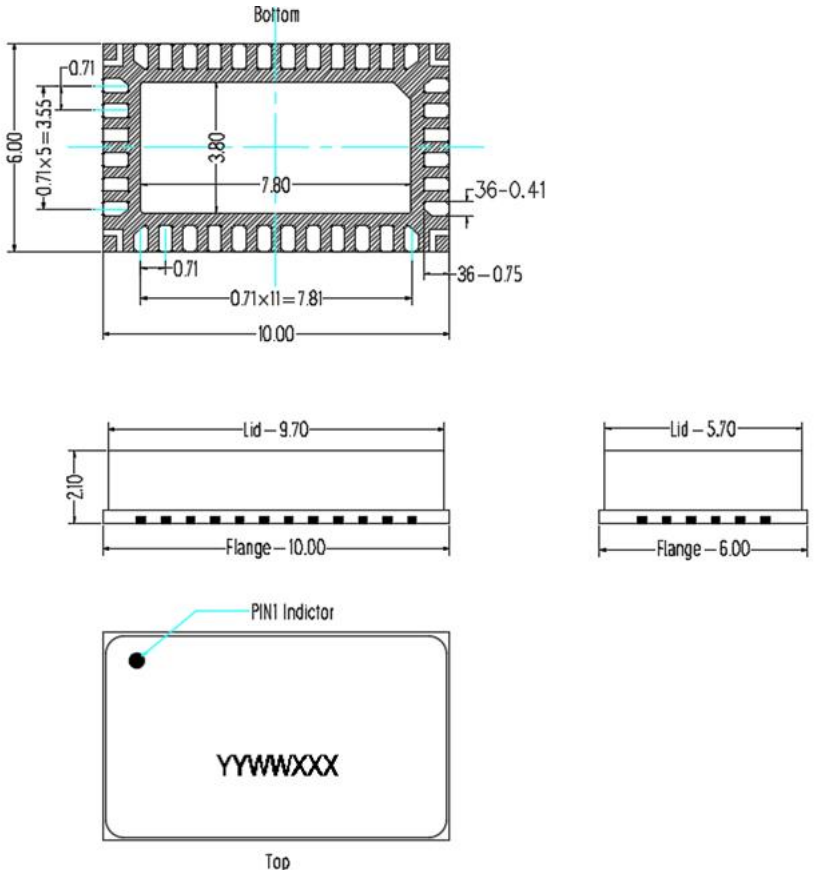
Figure 7. Test Circuit Component Layout

Table 6. Test Circuit Component Designations and Values

Reference	Footprint	Value	Quantity
C1	0603	47 pF	1
C2	0603	0.9 pF	1
C3,C5	0603	2.4 pF	2
C4	0603	6.8 pF	1
C6,C7	0603	1.2 pF	2
C8,C9,C12	0603	68 pF	3
C10,C11,C13	1210	10 uF/63V	3
C14	/	470 uF	1
R1	0603	10 ohm	1
U1	C6	ITGV10050C6	1

Package Dimensions

10*6 Plastic Package



Notes:

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

Revision history

Table 7. Document revision history

Date	Revision	Datasheet Status
2022/1/6	**Rev 1.0**	**Preliminary Datasheet**
2026/4/14	**Rev 1.1**	Add 28V broadband data

Application data based on ZBB-23-01/CWZ-26-07

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