



12W,4.4-5GHz 28V Plastic RF LDMOS Transistor

ITEH50012C6

Description

The ITEH50012C6 is a 12-watt, highly rugged, LDMOS transistor, designed for any general applications at frequencies 4.4 to 5GHz, in 10*6mm QFN plastic package, supporting surface mounted on PCB through high density grounding vias.

- Typical 4.8-5GHz Class AB RF Performance (On Innegration fixture with device soldered).



Freq (GHz)	Pulse CW Signal ⁽¹⁾			P _{avg} =29.7dBm WCDMA Signal ⁽²⁾		
	GainP1 (dB)	P3 (W)	Eff (%)	Gp (dB)	η _D (%)	ACPR _{5M} (dBc)
4.8	11.49	17.1	43.6	13.3	12.1	-44.2
4.9	11.83	16.3	44.6	13.7	12.7	-44.6
5.0	11.33	14.8	43.0	13.3	13.1	-44.1

(1) Idq=12mA; (2) Idq=120mA

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

- C band power amplifier
- 5G cellular power amplifier within 4.4-5GHz

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}	+28	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 _{θJC}	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 Voltage V _{GS} =0, I _{DS} =100uA	V _{(BR)DSS}		65		V
Zero Gate Voltage Drain Leakage Current (V _{DS} = 28V, 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} = 28V, I _D = 600 μA)	V _{GS(th)}	—	2	—	V
Gate Quiescent Voltage (V _{DD} = 28V, I _D =120mA, Measured in Functional Test)	V _{GS(Q)}	—	2.65	—	V

Load Mismatch (In Innogrations Test Fixture, 50 ohm system): V_{DD} = 28Vdc, I_{DQ} = 120mA, f = 5000 MHz

VSWR 10:1 at 12W pulse CW Output Power	No Device Degradation
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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.

**Reference Circuit of Test Fixture Assembly Diagram
4800-5000MHz RO4350B 20mils**

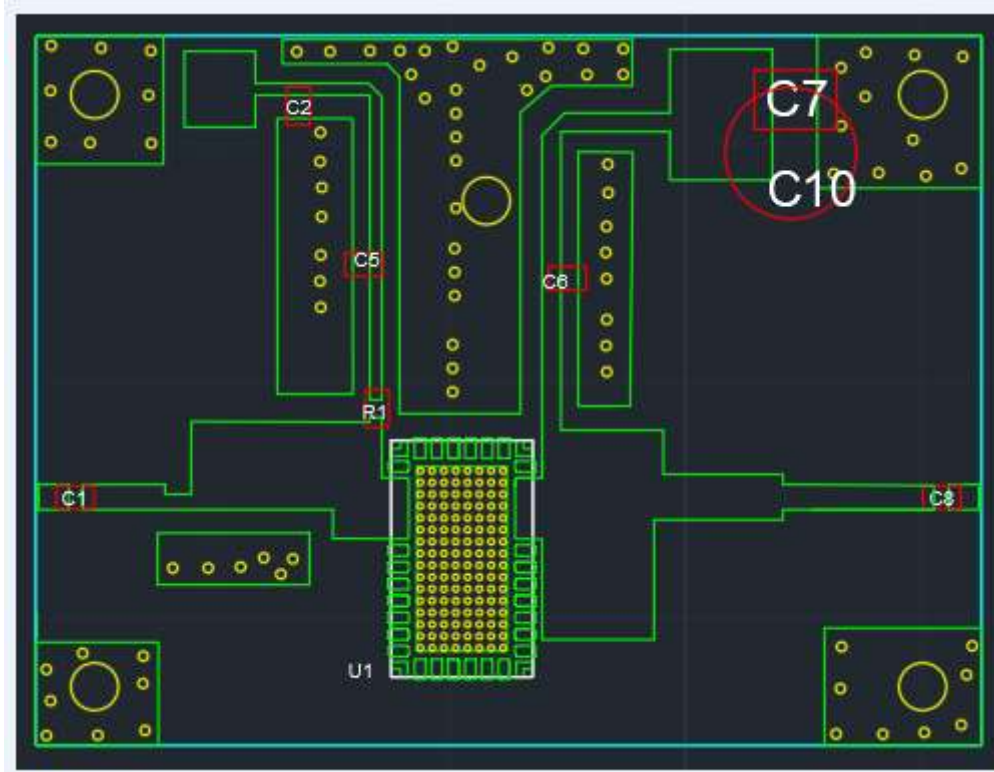


Figure 2. Test Circuit Component Layout

Table 5. Test Circuit Component Designations and Values

BOM		
C2,C7	10uF/63V	1210
C1,C5,C6,C8	3.9pF	0603
R1	10 ohm	0603
C10	470uF	



TYPICAL CHARACTERISTICS

Figure 3. Power Gain and Drain Efficiency as function of Power Out at different bias conditions

(Left: Idq=12mA; Right: Idq=120mA)

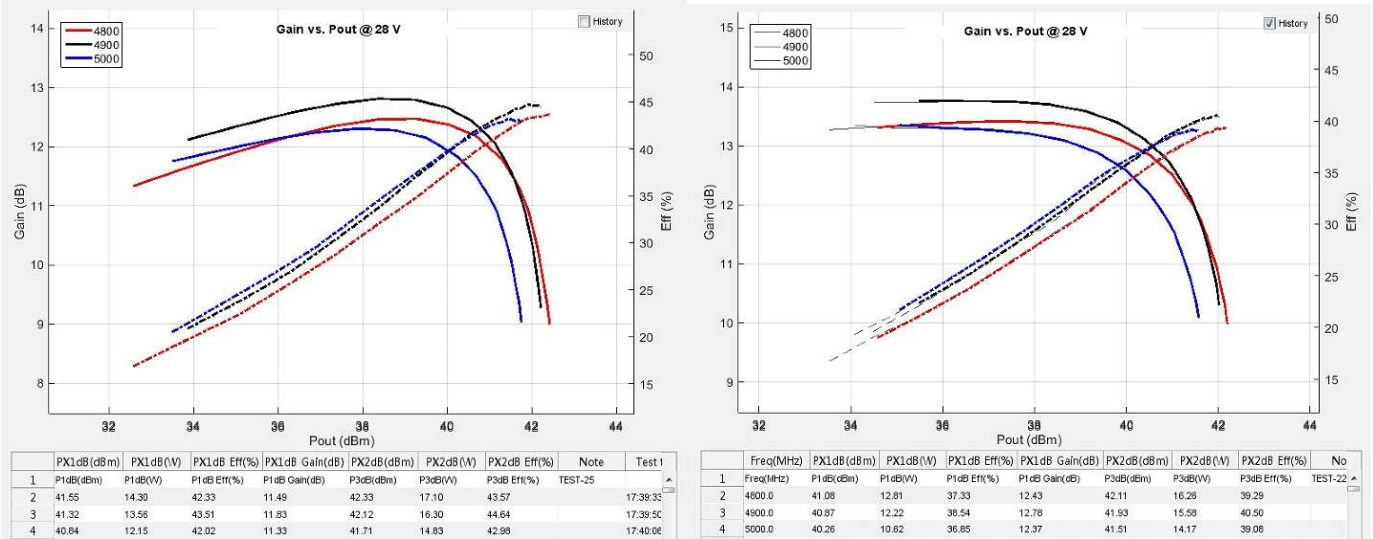
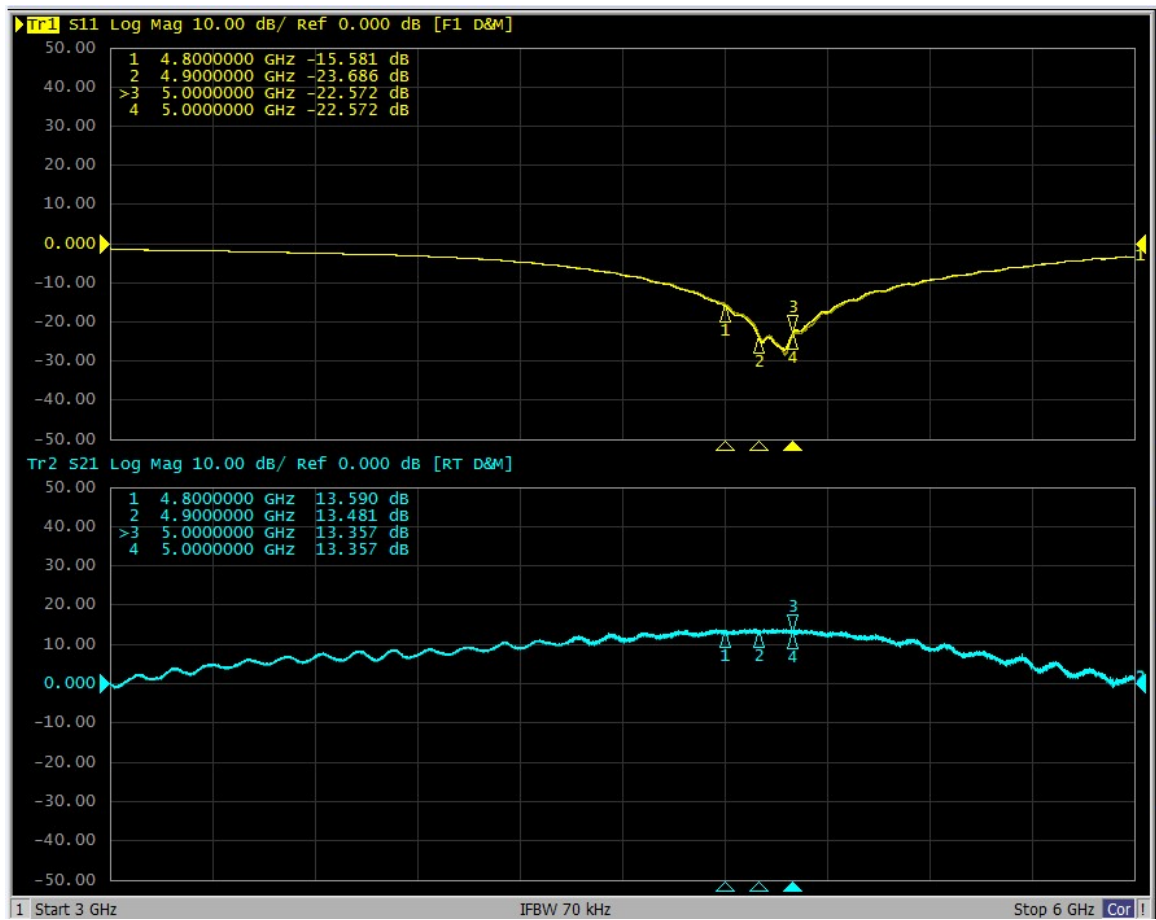


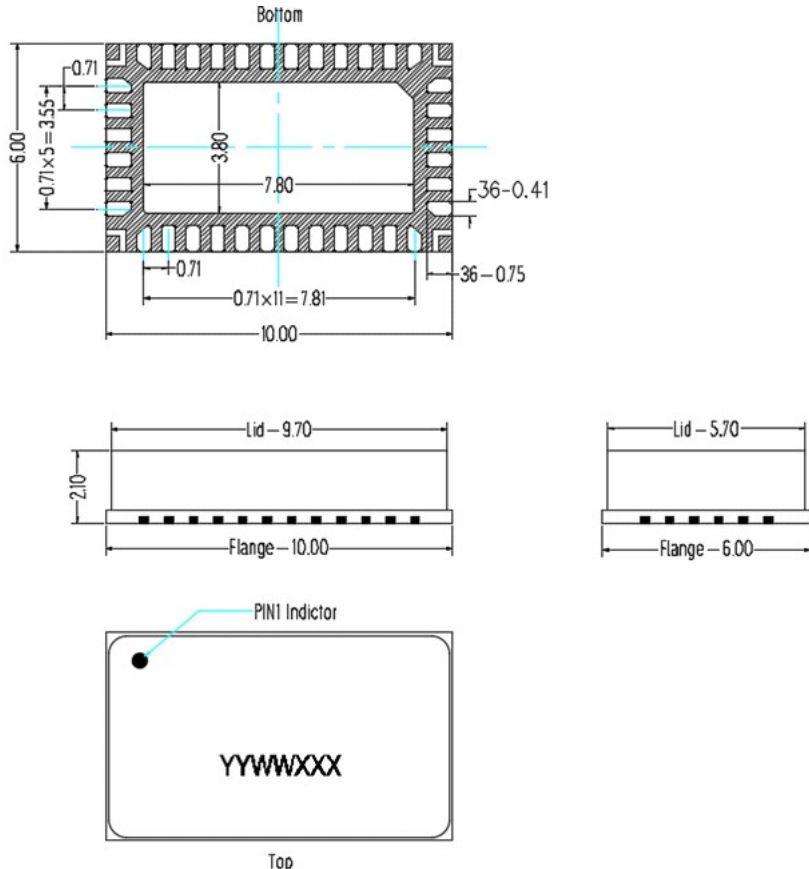
Figure 4. Network analyzer output S11/S21





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 7. Document revision history

Date	Revision	Datasheet Status
2022/7/14	Rev 1.0	Preliminary Datasheet
2022/12/9	Rev 1.1	Update on Pin Definition

Application data based on ZXY-22-33

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