



# 1W,4-6GHz 28V Plastic RF LDMOS Transistor

**ITEH58001C6**

## Description

The ITEH58001C6 is a 7-watt, highly rugged, LDMOS transistor, designed for any general applications at frequencies 4 to 6GHz, in 10\*6mm QFN plastic package, supporting surface mounted on PCB through high density grounding vias.

- Typical 5.7-5.9GHz Class AB RF Performance (On Innogrator fixture with device soldered).



Freq (GHz)	Pulse CW Signal <sup>(1)</sup>			P <sub>avg</sub> =20dBm WCDMA Signal <sup>(2)</sup>		
	Gain P1 (dB)	P3dB (W)	Eff (%)	Gp (dB)	η <sub>D</sub> (%)	ACPR <sub>5M</sub> (dBc)
5.7	9.4	1.8	41	12.2	11.4	-42.3
5.8	9	1.8	42	11.7	11.3	-43.9
5.9	8.6	1.9	41	11.3	11.1	-45.0

(1) Idq=5mA; (2) Idq=15mA

## 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 4-6GHz
- WIFI High power access point

**Table 1. Maximum Ratings**

Rating	Symbol	Value	Unit
Drain--Source Voltage	V <sub>DSS</sub>	+65	Vdc
Gate--Source Voltage	V <sub>GS</sub>	-10 to +10	Vdc
Operating Voltage	V <sub>DD</sub>	+28	Vdc
Storage Temperature Range	T <sub>stg</sub>	-65 to +150	°C
Case Operating Temperature	T <sub>C</sub>	+150	°C
Operating Junction Temperature	T <sub>J</sub>	+225	°C

**Table 2. Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T <sub>C</sub> = 85°C, DC test	R <sub>θJC</sub>	20	°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
<b>DC Characteristics</b>					
Drain-Source Voltage V <sub>GS</sub> =0, I <sub>DS</sub> =100uA	V <sub>(BR)DSS</sub>		65		V
Zero Gate Voltage Drain Leakage Current (V <sub>DS</sub> = 28V, V <sub>GS</sub> = 0 V)	I <sub>DSS</sub>	—	—	1	μA
Gate--Source Leakage Current (V <sub>GS</sub> = 11 V, V <sub>DS</sub> = 0 V)	I <sub>GSS</sub>	—	—	1	μA
Gate Threshold Voltage (V <sub>DS</sub> = 28V, I <sub>D</sub> = 600 μA)	V <sub>GS(th)</sub>	—	2	—	V
Gate Quiescent Voltage (V <sub>DD</sub> = 28V, I <sub>D</sub> = 15mA, Measured in Functional Test)	V <sub>GS(Q)</sub>	—	2.7	—	V

**Load Mismatch (In Innegration Test Fixture, 50 ohm system):** V<sub>DD</sub> = 28Vdc, I<sub>DQ</sub> = 15mA, f = 5900 MHz

VSWR 10:1 at 1W 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**  
**5700-5900MHz RO4350B 20mils**

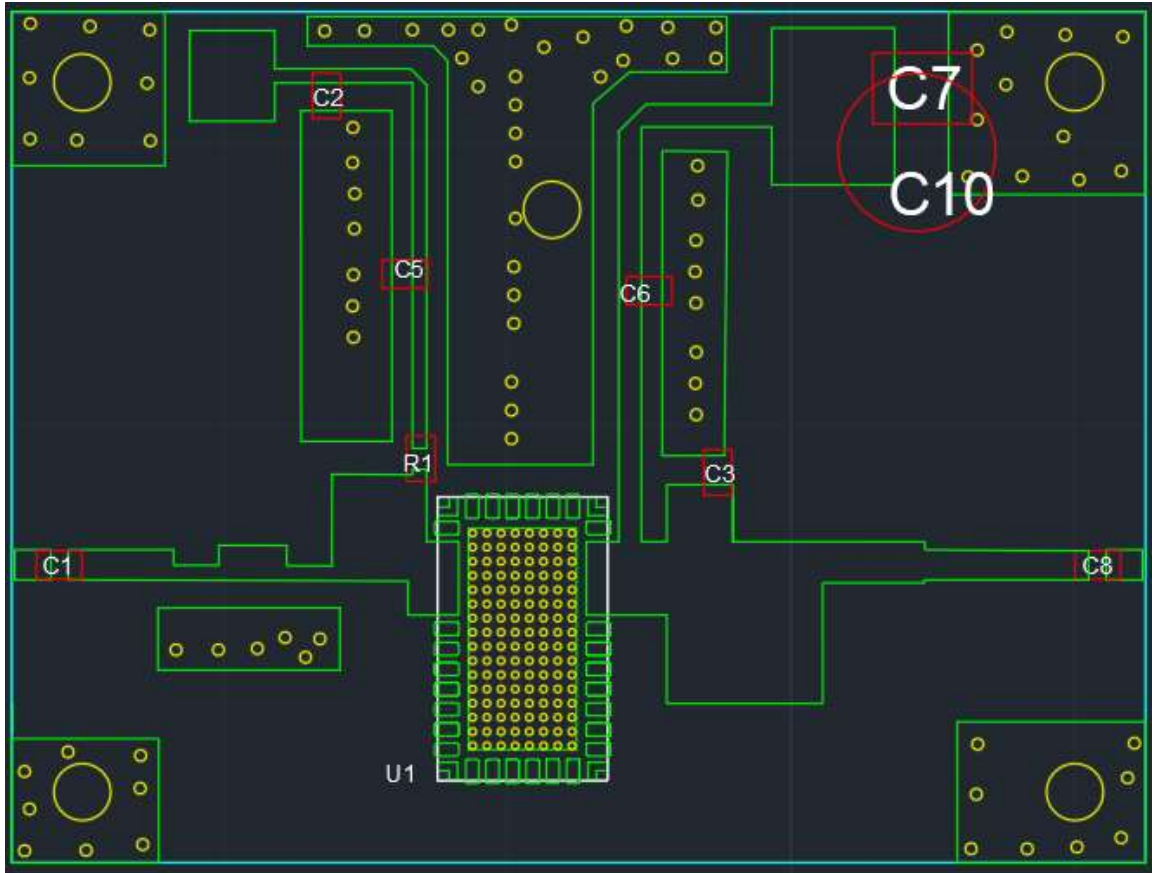


Figure 2. Test Circuit Component Layout

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	
C3	0.1pF	



TYPICAL CHARACTERISTICS

Figure 3. Power Gain and Drain Efficiency as function of Power Out at different bias conditions(Left: Idq=5mA; Right: Idq=15mA)

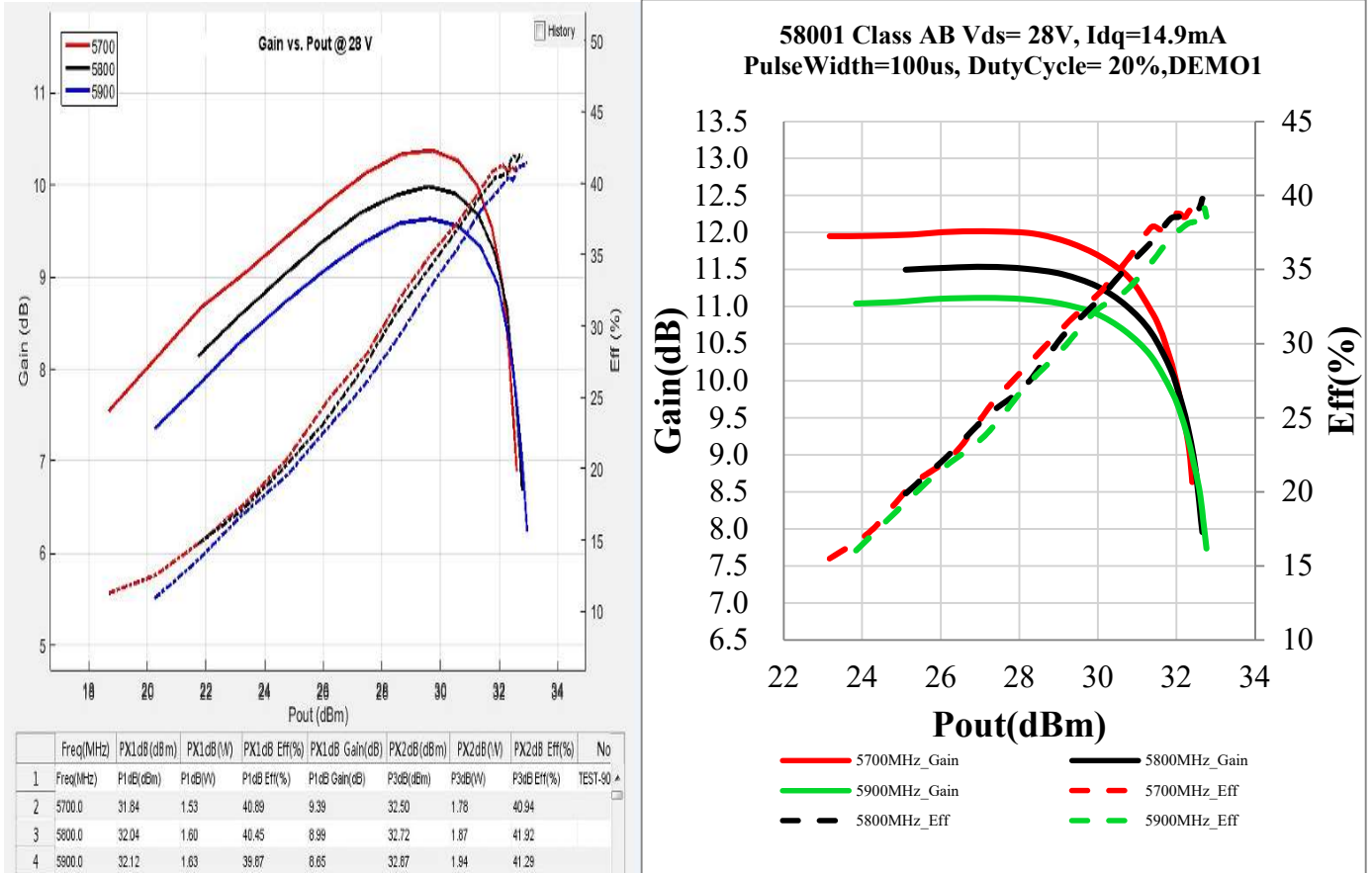
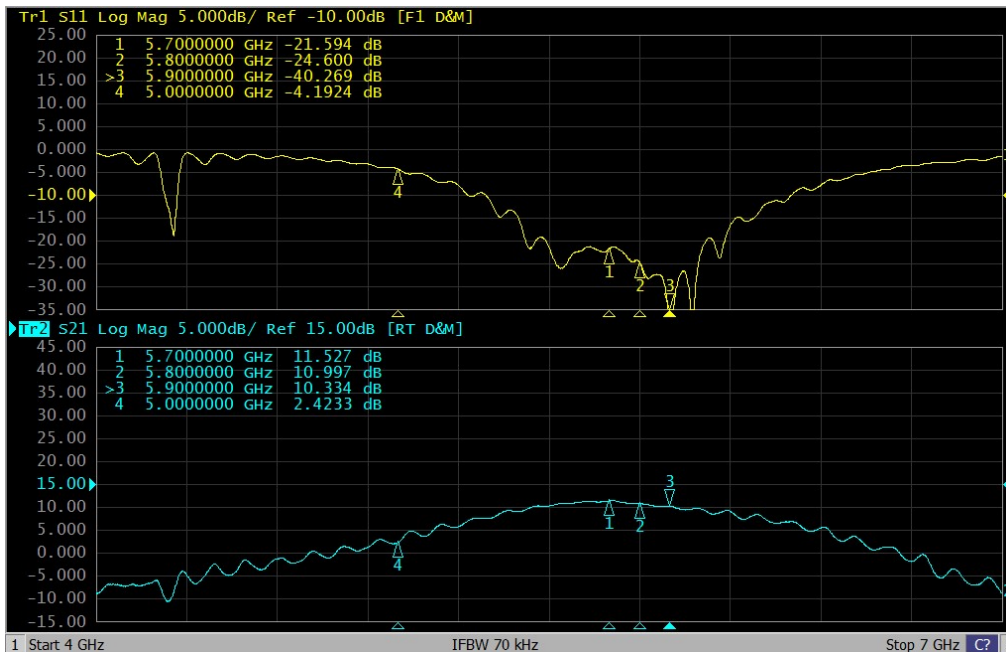


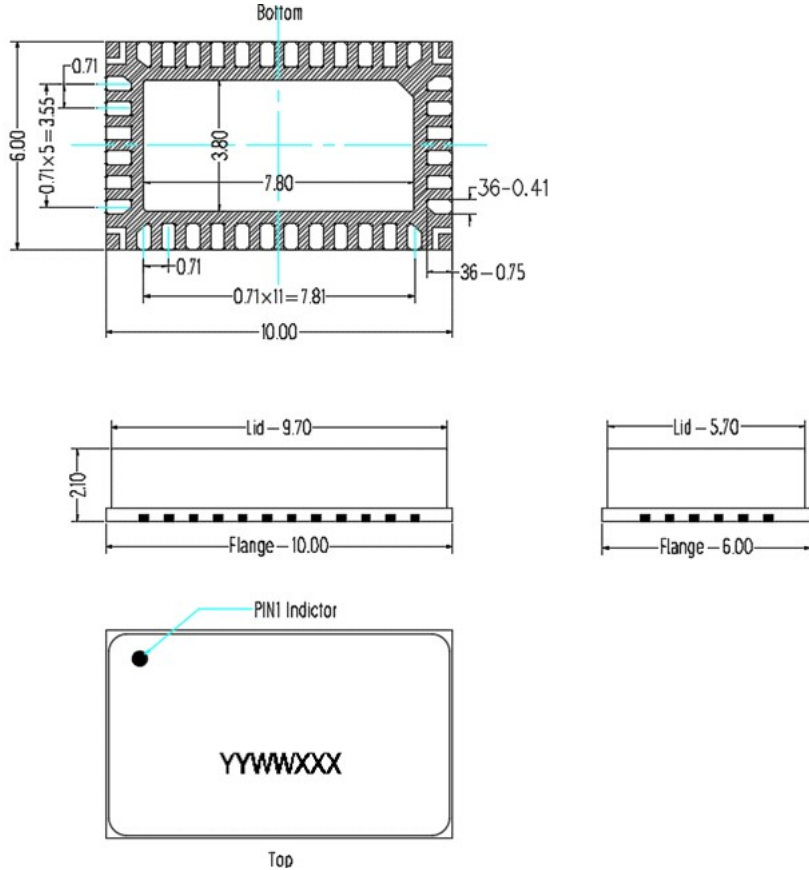
Figure 4. Network analyzer output S11/S21





### Package Dimensions

#### 10\*6 Plastic Package



Notes:

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

### Revision history

Table 7. Document revision history

Date	Revision	Datasheet Status
2022/8/17	Rev 1.0	Preliminary Datasheet
2022/12/9	Rev 1.1	Update on Pin Definition

#### Application data based on ZXY-22-34

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