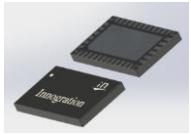
7W,C band 28V Plastic RF LDMOS Transistor

ITEH58007C6



Description

The ITEH58007C6 is a 7-watt, highly rugged, LDMOS transistor, designed for any general applications at frequencies 4.8 to 6GHz, in 10*6mm QFN plastic package, supporting surface mounted on PCB through high density grounding vias.

- Typical 4.9-6.2GHz Class AB RF Performance (On Innogration fixture with device soldered).

V_{DS} = 28V, I_{DQ} = 65mA

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
4900	38.71	7.4	33.9	9.43	39.49	8.9	35.8
5000	38.71	7.4	34.9	10.16	39.51	8.9	36.6
5100	38.51	7.1	34.5	10.98	39.41	8.7	36.8
5200	38.53	7.1	36.3	11.54	39.51	8.9	38.7
5300	38.59	7.2	37.9	11.92	39.61	9.2	40.6
5400	38.37	6.9	37.2	12.15	39.51	8.9	40.5
5500	38.49	7.1	38.9	11.64	39.67	9.3	42.2
5600	38.26	6.7	37.8	11.62	39.53	9.0	41.1
5700	38.1	6.5	36.7	10.59	39.41	8.7	40.2
5800	38.01	6.3	36.0	10.12	39.39	8.7	39.9
5900	37.9	6.2	34.8	10.05	39.35	8.6	38.9
6000	37.8	6.0	33.2	9.12	39.18	8.3	36.7
6100	37.86	6.1	33.5	8.42	39.28	8.5	37.3
6200	37.8	6.0	31.9	8.04	39.12	8.2	35.3

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 5-6GHz
- WIFI High power access point

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	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	$R_{\theta JC}$	4.1	°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	$V_{(BR)DSS}$		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 = 60mA, Measured in Functional Test)	$V_{GS(Q)}$	——	2.7	——	V

Load Mismatch (In Innogration Test Fixture, 50 ohm system): V_{DD} = 28Vdc, I_{DQ} = 60mA, f = 5000 MHz

VSWR 10:1 at 12W 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.

Reference Circuit of Test Fixture Assembly Diagram
4900-6200MHz RO4350B 20mils

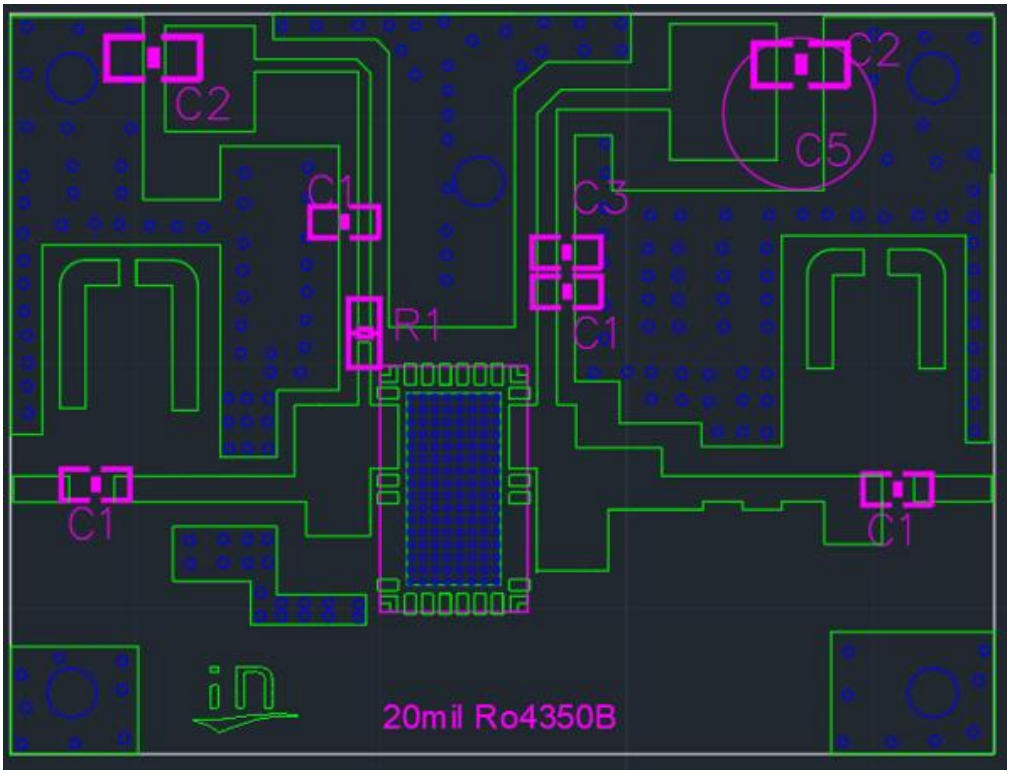


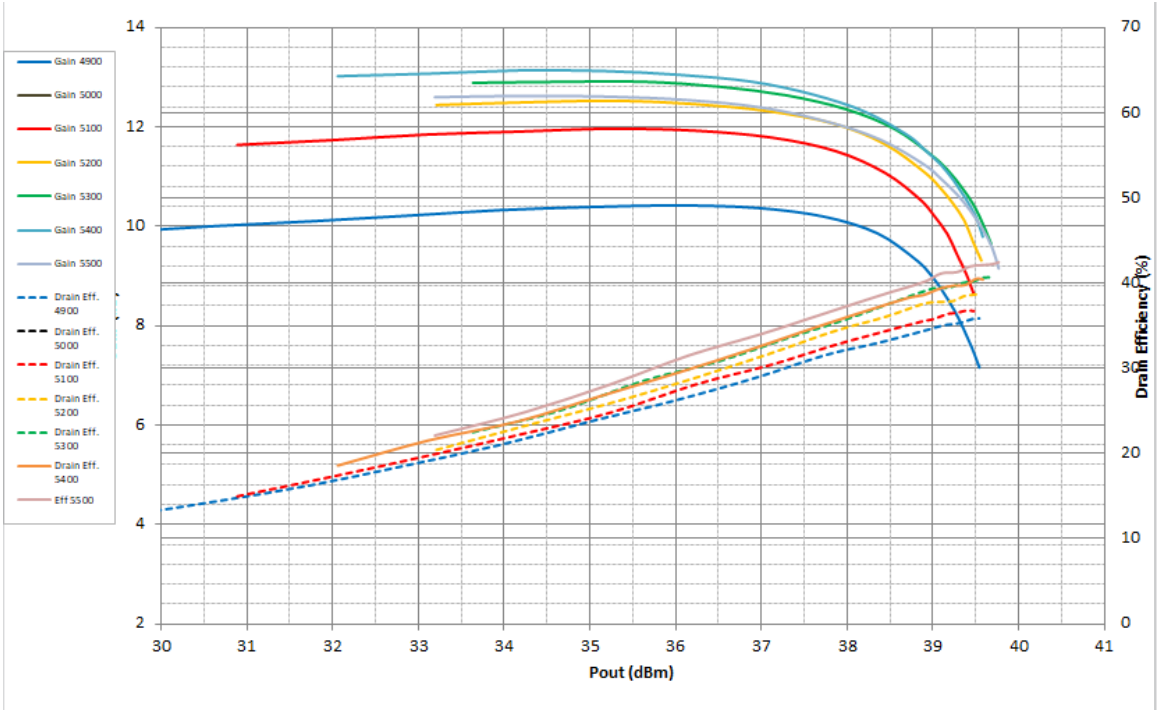
Figure 2. Test Circuit Component Layout

Table 5. Test Circuit Component Designations and Values

Component	Value	Quantity
C1	3.9pF	4
C2	10uF	2
R1	10 ohm	1
C5	470uF	1
C3	1uF	1

TYPICAL CHARACTERISTICS

Figure 3. Power Gain and Drain Efficiency as function of Power Out at Idq=6mA



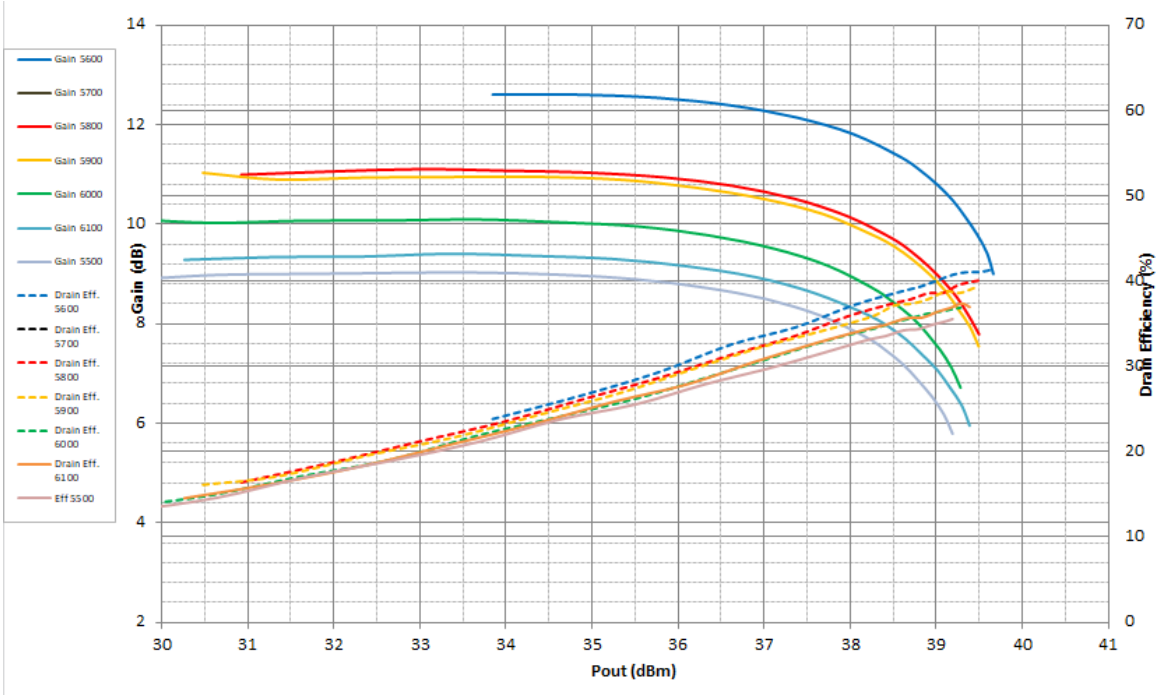
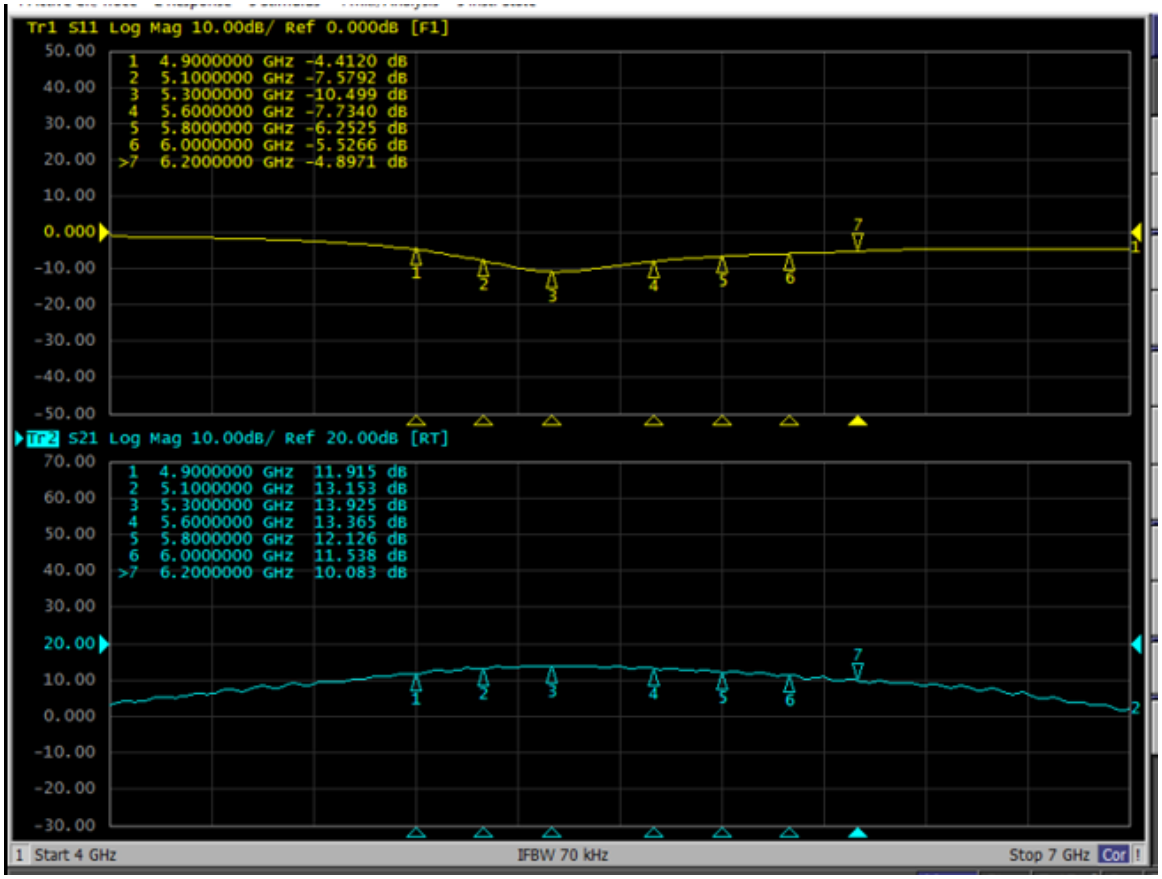
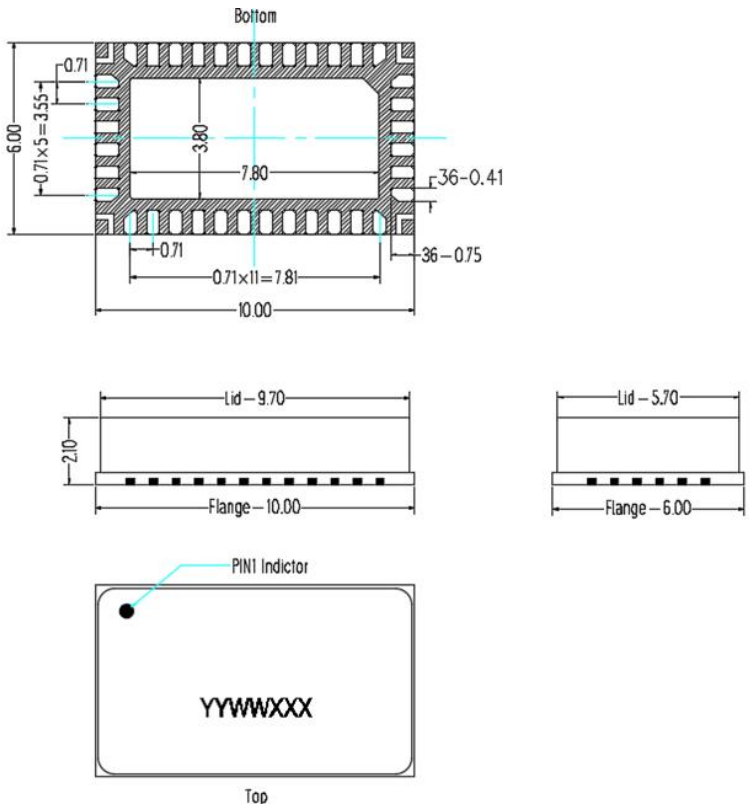


Figure 4.Network analyzer output S11/S21



Package Dimensions

10*6 Plastic Package



Notes:

1. All dimensions are in mm; and the tolerances unless specified are ±0.2mm.

Revision history

Table 7. Document revision history

Date	Revision	Datasheet Status
2022/8/15	**Rev 1.0**	**Preliminary Datasheet**
2022/12/9	**Rev 1.1**	Update on Pin Definition
2024/12/5	**Rev 1.2**	Use 5.1-5.9G as carrier application
2025/7/18	**Rev 1.3**	Change the carrier application to 4.9-6.2G

Application data based on ZXY-22-32/25-10

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