



7W,4.4-5GHz 28V Plastic RF LDMOS Transistor

ITEH50007C6

Description

The ITEH50007C6 is a 7-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} =27.5dBm WCDMA Signal ⁽²⁾		
	GainP1 (dB)	P3 (W)	Eff (%)	Gp (dB)	η _D (%)	ACPR _{5M} (dBc)
4.8	12.96	9.38	45	13.37	12.45	-42
4.9	12.88	9.51	46	13.46	12.91	-42
5.0	13.12	9.00	44	13.63	12.89	-43

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}	4	°C/W

Table 3. ESD Protection Characteristics

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



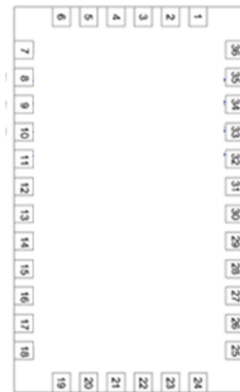
Table 4. Electrical Characteristics (TA = 25 °C unless otherwise noted)

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 = 60mA, Measured in Functional Test)	V _{GS(Q)}	—	2.7	—	V

Load Mismatch (In Innogrations 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
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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**

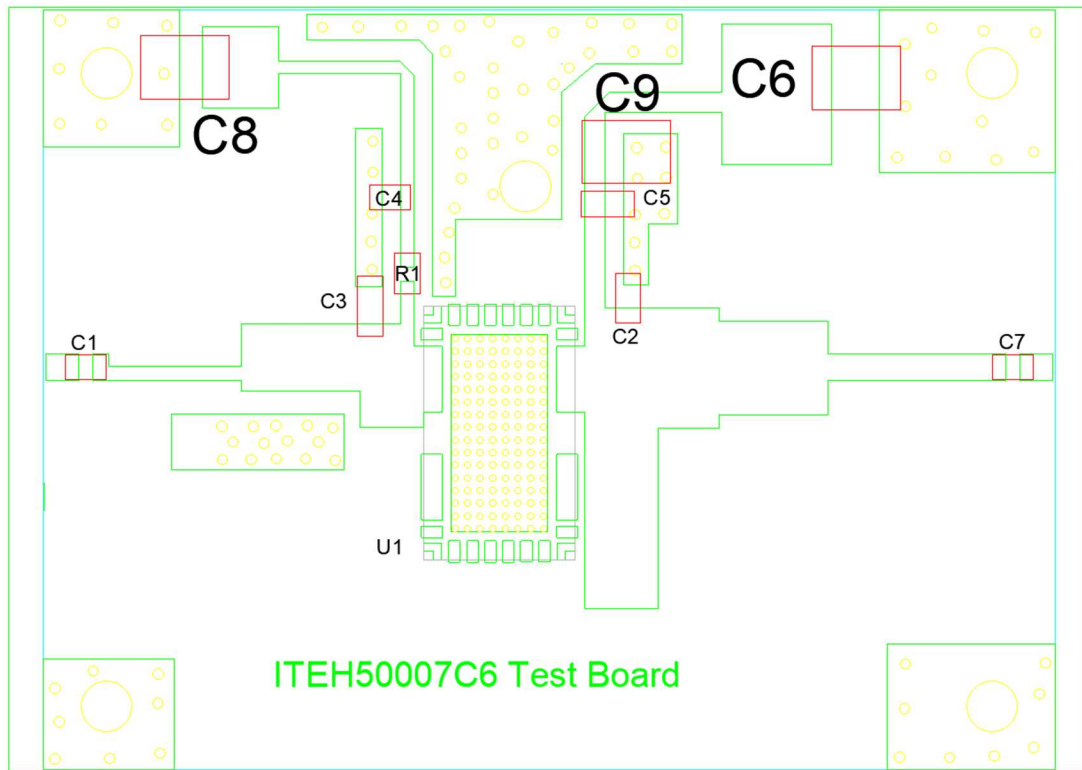


Figure 2. Test Circuit Component Layout

Table 5. Test Circuit Component Designations and Values

Part	Quantity	Description	Part Number	Manufacture
C1,C4,C5,C7	4	3.9pF High Q Capacitor	251SHS3R9BSE	TEMEX
C2,C3	2	0.2pF High Q Capacitor	251SHS0R2BSE	TEMEX
C9,C6,C8	3	10uF MLCC	GRM32EC72A106M E05	Murata
R1	1	10 Ω Power Resistor	ESR03EZPF100	ROHM
U1	1	7W LD MOS Transistor	ITEH50007C6	Innogrations

TYPICAL CHARACTERISTICS

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

(Left: Idq=5mA; Right: Idq=60mA)

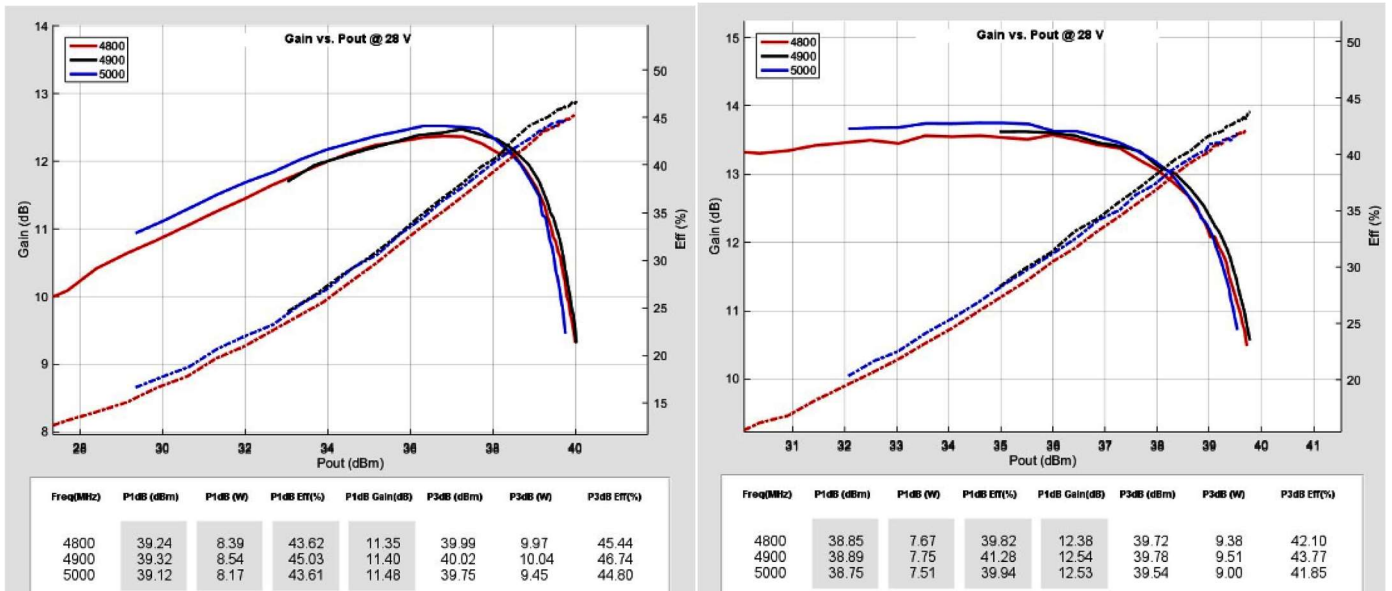


Figure 4. Network analyzer output S11/S21

