



20W,28V Plastic RF LDMOS Transistor

ITEH27020C6

Description

The ITEH27020C6 is a 20-watt, highly rugged, LDMOS transistor, designed for any general applications at frequencies up to 2.7GHz, in 10*6mm QFN plastic package, supporting surface mounted on PCB through high density grounding vias.

It is part of low power general purpose plastic LDMOS with pin to pin compatibility.

• Typical 2.5-2.7GHz Class AB RF Performance (On Innogrator fixture with device soldered).

VDS=28V, IDQ=155mA

Pulsed CW: 100 us width, 20% duty cycle.

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
2500	44.27	26.7	50.9	17.08	45.12	32.5	53.3
2600	43.81	24.0	53.4	17.56	44.64	29.1	55.2
2700	42.96	19.8	51.7	17.52	43.96	24.9	53.4

WCDMA 1 carrier at different back off: (PAR=10.8db @0.01% probability)

Freq (MHz)	Pout (dBm)	CCDF (dB)	ACPR (dBc)	Gain (dB)	Efficiency (%)
2500	34	9.86	-45.3	17.8	18.7
2600	34	9.52	-43.5	18.4	20.5
2700	34	9.24	-42.1	18.5	22.0
2500	31	10.41	-48.9	17.7	12.5
2600	31	10.33	-49.1	18.3	13.6
2700	31	10.12	-48.9	18.4	14.5
2500	29	10.44	-50.4	17.6	9.4
2600	29	10.51	-51.7	18.2	10.1
2700	29	10.27	-52.4	18.4	10.7

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

- Broadcast and Industrial, Scientific and Medical applications in the frequency range from HF to 2.7GHz
- All 4G/5G cellular application below 2.7GHz

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}	1.1	°C/W

Table 3. ESD Protection Characteristics

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
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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 _{loss}	—	—	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 = 155mA, Measured in Functional Test)	V _{GS(Q)}	—	2.7	—	V

Load Mismatch (In Innegration Test Fixture, 50 ohm system): V_{DD} = 28Vdc, I_{DQ} = 100 mA, f = 2700 MHz

VSWR 10:1 at 20W 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
2500-2700MHz RO4350B 20mils

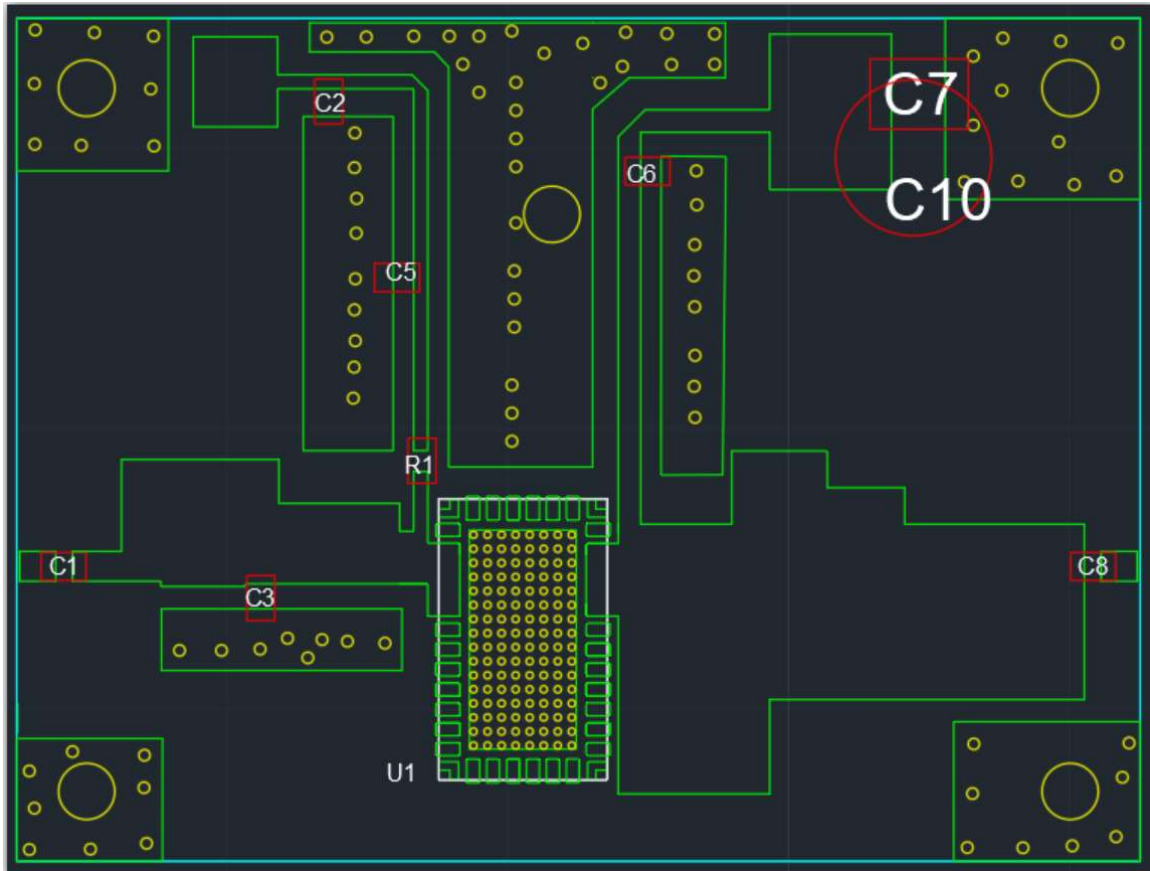


Figure 2. Test Circuit Component Layout

Table 5. Test Circuit Component Designations and Values

BOM		
C2,C7	10uF/63V	1210
C1,C8,C5,C6	12pF	0603
R1	10 ohm	0603
C3	0.5pF	0805
C10	470uF	

TYPICAL CHARACTERISTICS

Figure 3. Power Gain and Drain Efficiency as function of Power Out

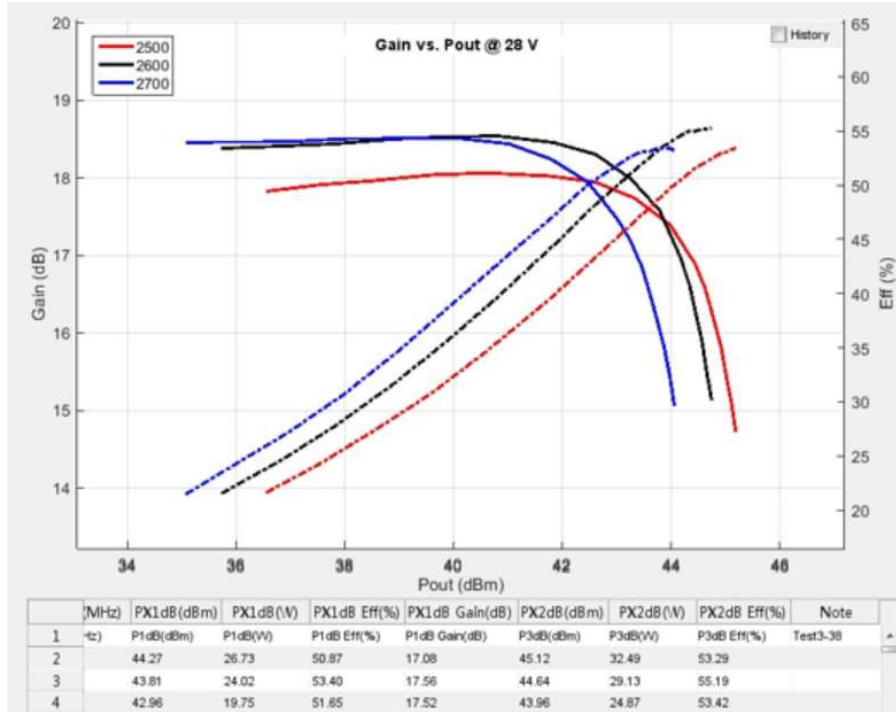
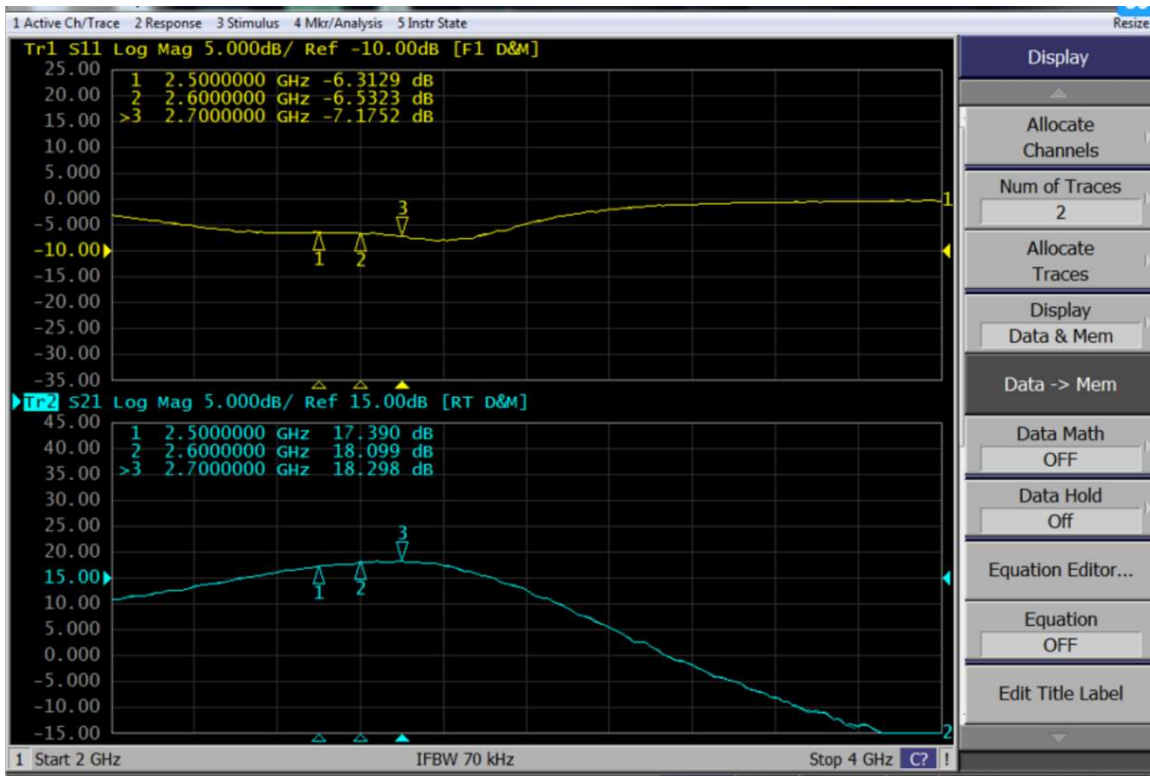


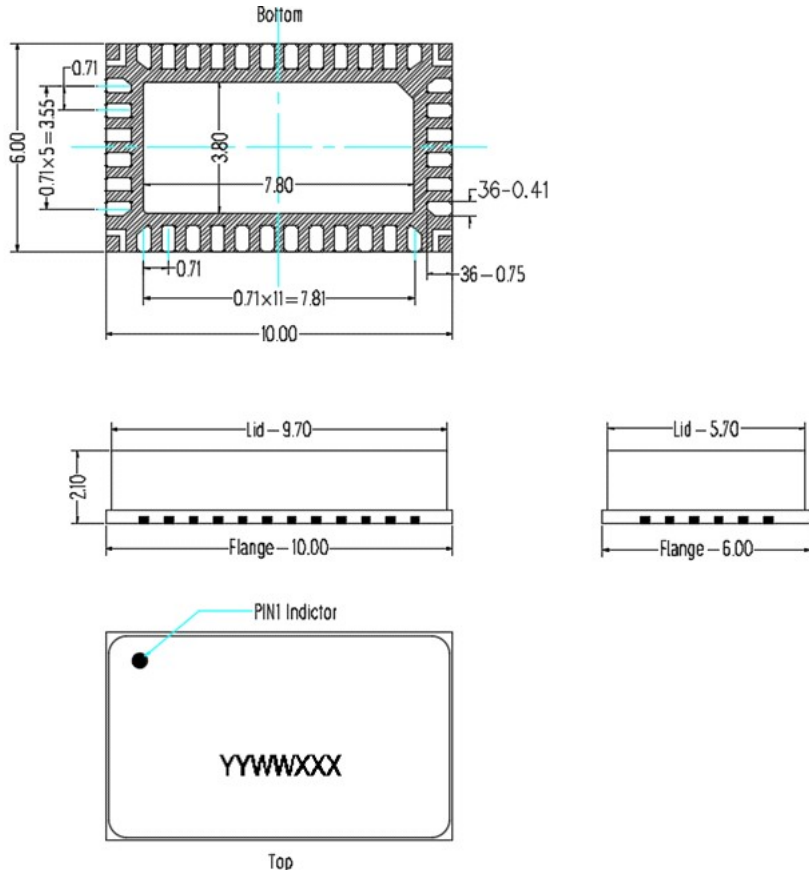
Figure 4. Network analyzer output S11/S21





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
2022/2/19	Rev 1.0	Preliminary Datasheet
2022/2/28	Rev 1.1	High linearity tuning result updated
2022/12/9	Rev 1.2	Update on Pin Definition

Application data based on ZXY-22-04

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