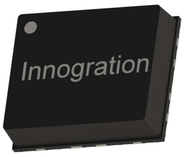
80W,28V Plastic RF LDMOS Transistor

ITEH27080C9



Description

The ITEH27080C9 is an 80-watt, high performance, LDMOS transistor, designed for any general applications at frequencies from 2.5 to 2.7GHz, in 12*10mm QFN plastic package, It can be soldered on PCB through high density grounding vias for pulse or back off linear application or soldered directly on heatsink.for CW application

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

V_{DS}= 28V, Vgs=2.65V(Idq=500mA),				
P_{out}=39.0dBm, WCDMA 1 Carrier				
Freq (MHz)	**P3dB(W)**	**ACPR (dBc)**	**Gain(dB)**	**EFF (%)**
2500	85.9	-42.91	15.8	16.1
2600	86.8	-40.30	15.9	16.4
2700	82.3	-41.75	15.8	17.2

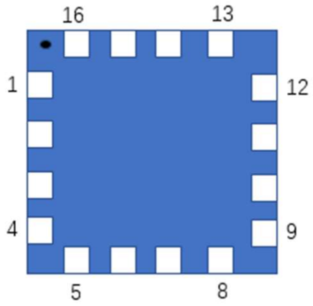
Features

- 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

- S band power amplifier
- All 4G/5G cellular application within 2.5 to 2.7GHz

Pin Configuration and Description （Top view）



Pin No.	Symbol	Description
5-8	RF IN/Vgs	RF Input/Gate bias
13-16	RF OUT/Vds	RF Output/Drain bias
Others	NC	Can be left as either no use or grounding
Package Base	GND	DC/RF Ground. Proposed to be soldered to heatsink plane directly for the best CW thermal and RF performance. Soldered through vias or copper coin allowed for pulsed CW applications, but will result in excessive junction temperatures and different RF performance

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, DC test, **device soldered on heatsink directly**	RθJC	0.9	°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	70	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 = 600mA, Measured in Functional Test)	$V_{GS(Q)}$	——	2.6	——	V

Load Mismatch (In Innogration Test Fixture, 50 ohm system): V_{DD} = 28Vdc, I_{DQ} = 600 mA, f = 2700 MHz

VSWR 10:1 at 80W pulse CW Output Power	No Device Degradation

2500-2700MHz application board

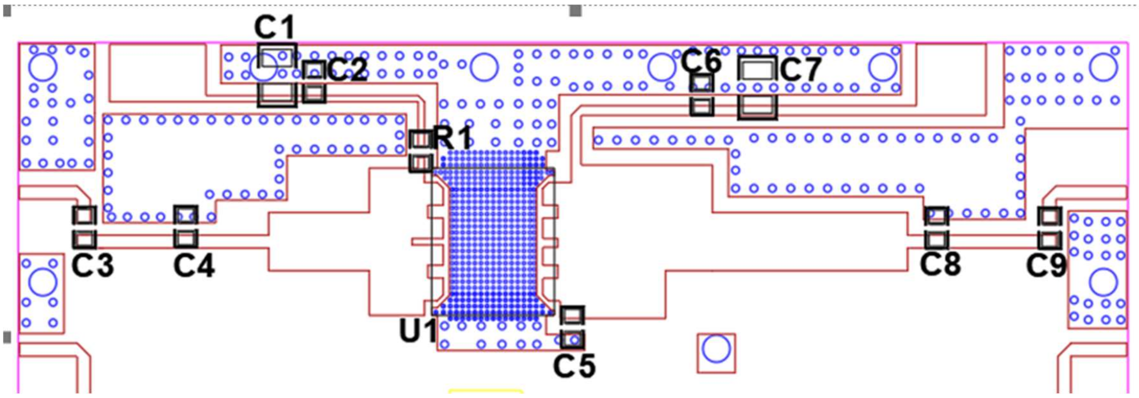


Figure 2. Test Circuit Component Layout, 20mils RO4350B

Table 5. Test Circuit Component Designations and Values

Component	Value	Description
PCB	Thickness,20mil	Rogers 4350
U1	ITEH27080C9	PA
C1、C7	10uF	TDK1206
C2、C3、C6、C9	10pF	ATC600S
C4	1.1pF	ATC600S
C5	1.6pF	ATC600S
C8	1.2pF	ATC600S
R1	10Ω	TDK0805

TYPICAL CHARACTERISTICS

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

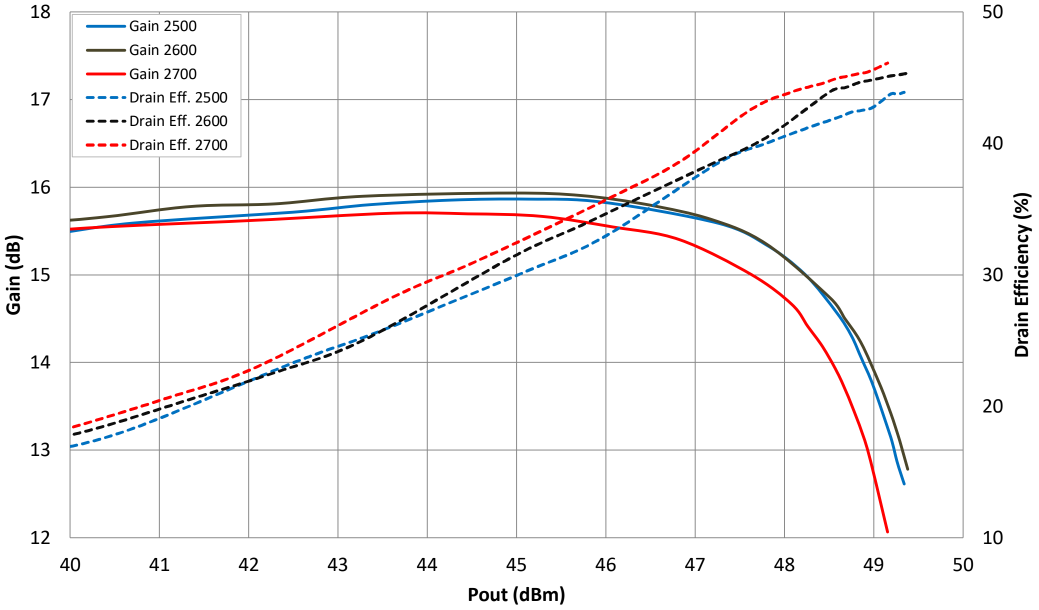
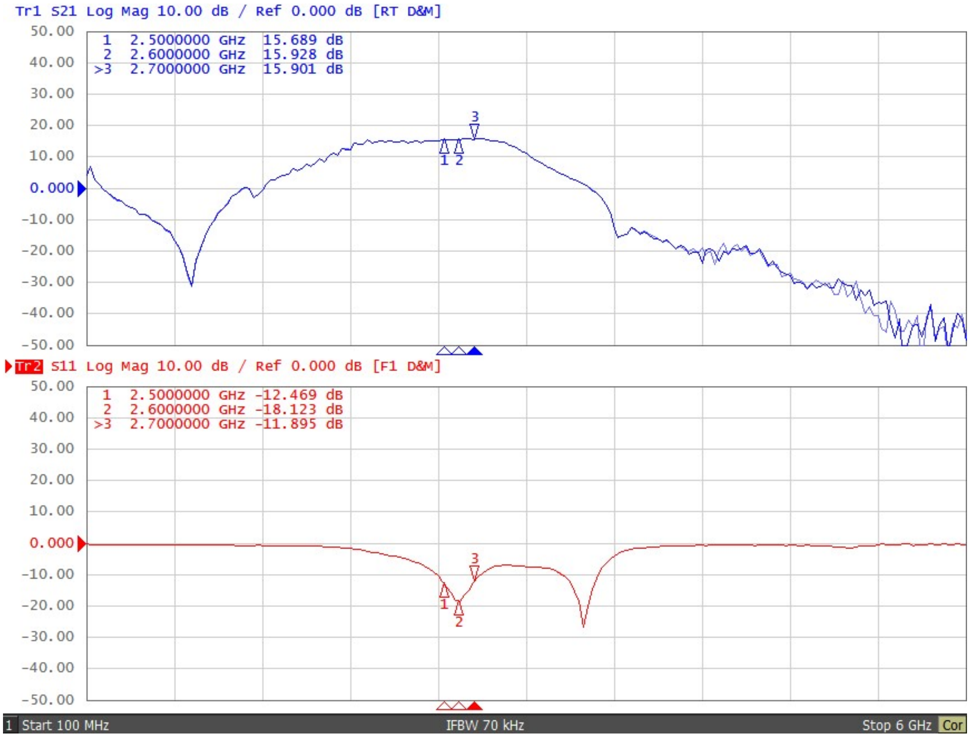


Figure 4. Network analyzer output S11/S21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Tr1 S21 Log Mag 10.00 dB / Ref 0.000 dB [RT D&M]
 1  2.5000000 GHz  15.689 dB
 2  2.6000000 GHz  15.928 dB
>3  2.7000000 GHz  15.901 dB

Tr2 S11 Log Mag 10.00 dB / Ref 0.000 dB [F1 D&M]
 1  2.5000000 GHz -12.469 dB
 2  2.6000000 GHz -18.123 dB
>3  2.7000000 GHz -11.895 dB

1 Start 100 MHz          IFBW 70 kHz          Stop 6 GHz Cor
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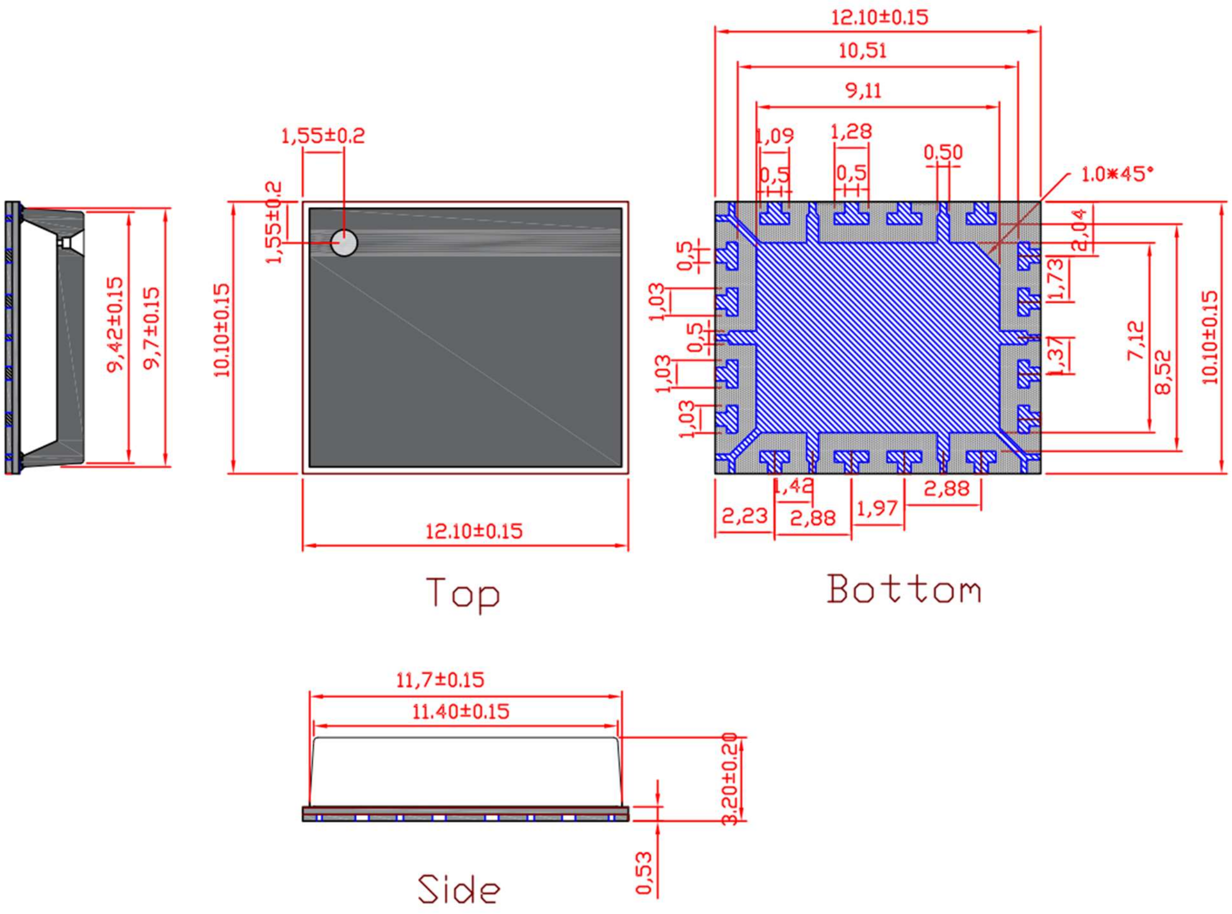
Package Dimensions



Revision history

Table 7. Document revision history

Date	Revision	Datasheet Status
2023/12/11	Rev 1.0	Preliminary Datasheet

Application data based on HJ-23-24

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