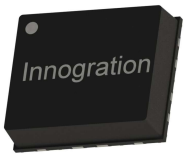
80W,28V Plastic RF LDMOS Transistor

ITEH09080C9



Description

The ITEH09080C9 is a 80-watt, high performance, LDMOS transistor, designed for any general applications at frequencies up to 1GHz, 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
It can be tuned to meet up to 39dBm WCDMA or LTE ACLR without DPD needed purely by back off operation.

- Typical 758-803MHz Class AB RF Performance (On Innogration fixture with device soldered).

VdS= 28V，Idq=600mA，Vgs =2.66V WCDMA-1C-PAR10.8							
Pout=39dBm							
Freq (MHz)	Pout (dBm)	CCDF (dB)	Ppeak (dBm)	Ppeak (W)	ACPR (dBc)	Gain (dB)	Efficiency (%)
758	39.03	9.46	48.49	70.71	-47.82	19.54	18.66
780	39.01	9.73	48.75	74.92	-48.52	19.58	19.6
803	39.01	9.35	48.36	68.57	-47.75	19.15	19.49

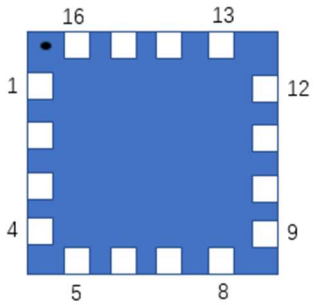
Features

- 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

- P band power amplifier
- All 4G/5G cellular application within 0.7 to 1GHz

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**	$R_{\theta JC}$	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		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 = 800 MHz

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

758-803MHz application board

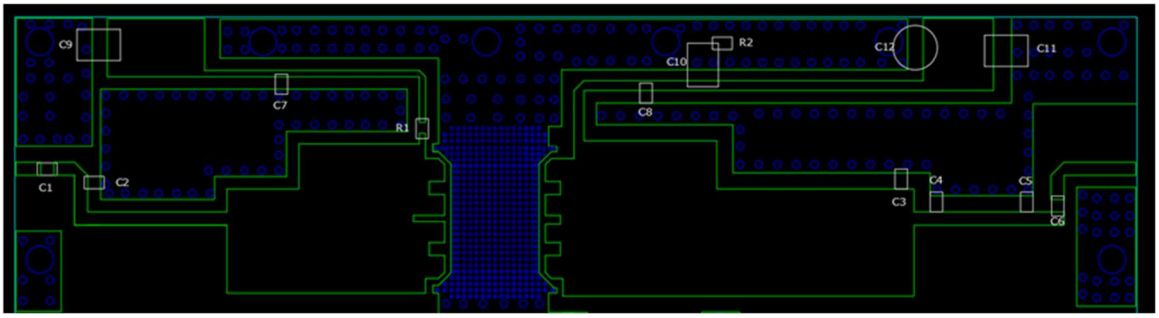


Figure 2. Test Circuit Component Layout, 20mils RO4350B

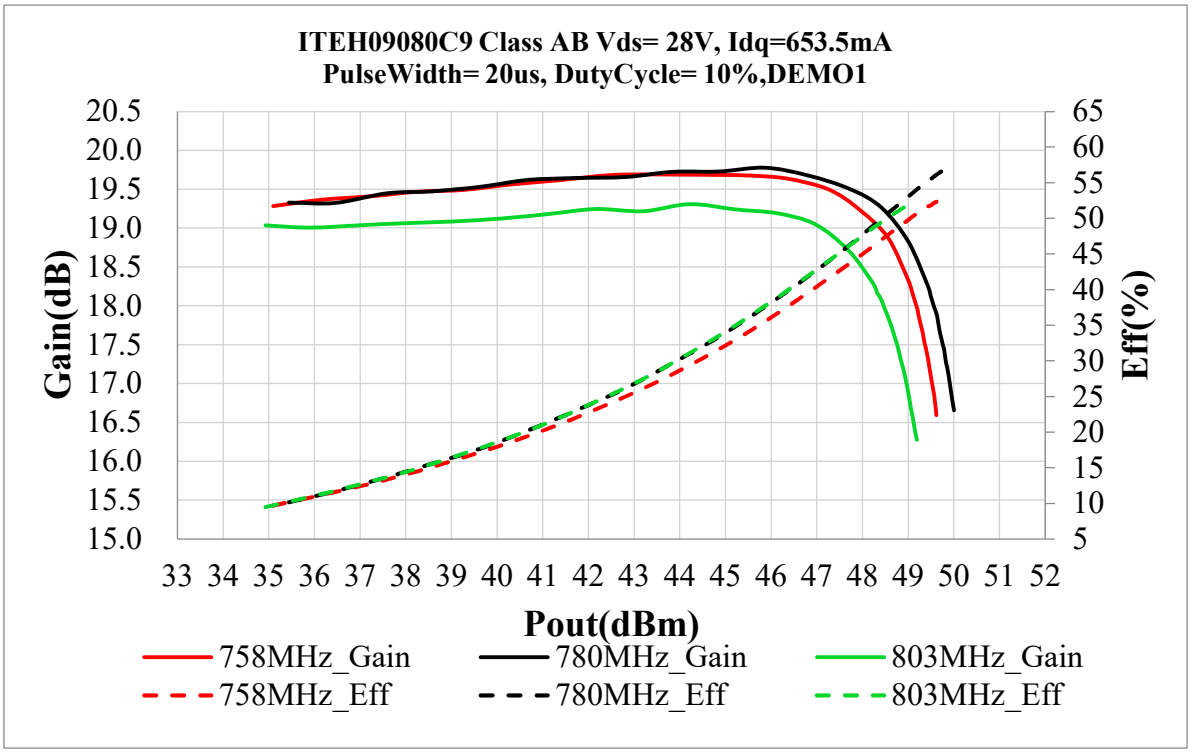
Note:

Table 5. Test Circuit Component Designations and Values

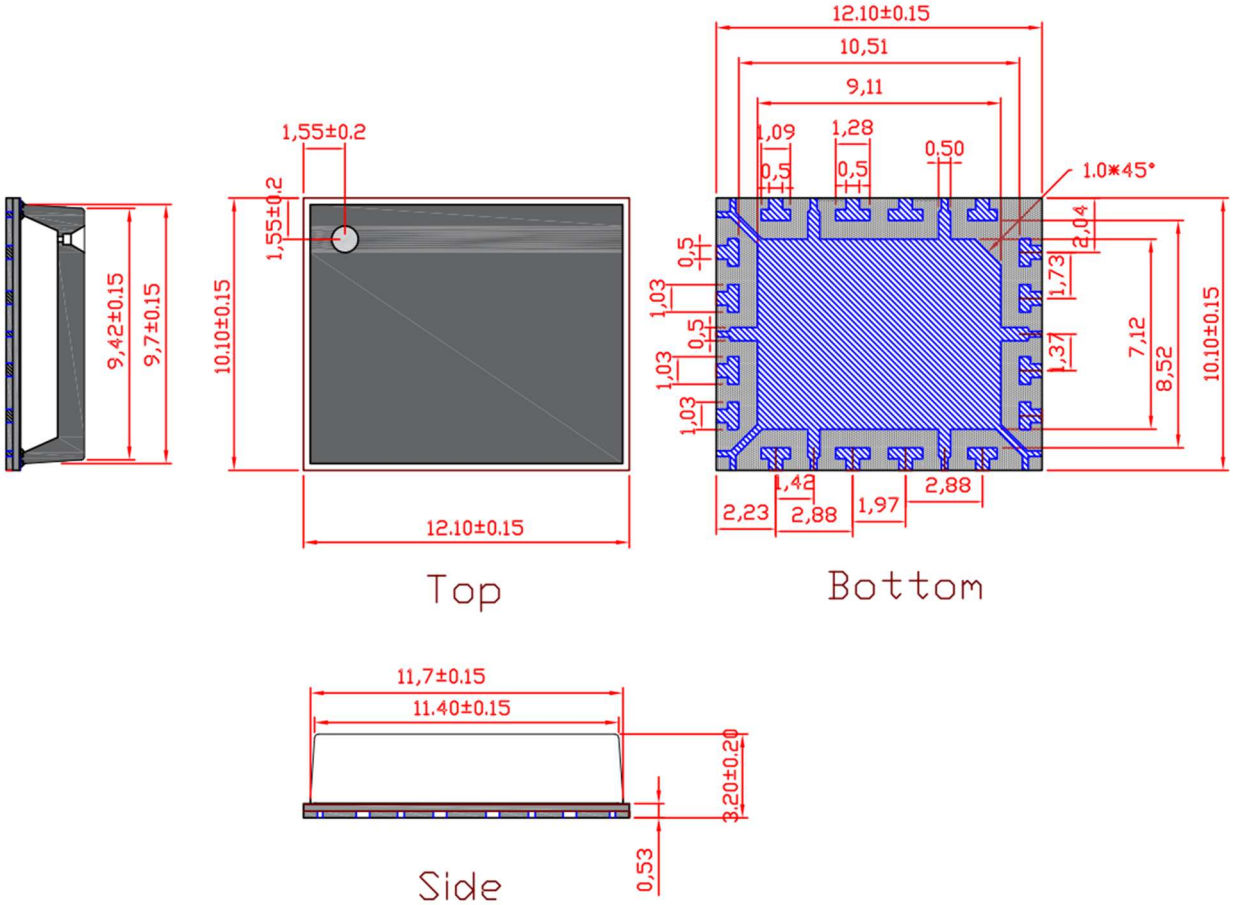
Component	Value	Quantity
U1	ITEH09080C9	1
C1	6.8pF	1
C2、C3	8.2pF	2
C4	2pF	1
C5	3pF	1
C6、C7、C8	100pF	3
C9、C10、C11	10uF/63V	3
R1、R2	10Ω	2
C12	470uF/63V	1

TYPICAL CHARACTERISTICS

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



Package Dimensions



Revision history

Table 7. Document revision history

Date	Revision	Datasheet Status
2023/6/2	Rev 1.0	Preliminary Datasheet
2023/8/17	Rev 1.1	Modification of package drawing on last page

Application data based on ZYX-23-06

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