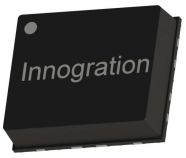
ITGV10160C9 LDMOS TRANSISTOR

Document Number: ITGV10160C9
Preliminary Datasheet V1.1

80W, 28V High Power RF LDMOS FETs

ITGV10160C9



Description

The ITGV10160C9 is a 80-watt capable, high performance, unmatched LDMOS FET, designed for wide-band commercial and industrial applications with frequencies HF to 700MHz, 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 performance(on Innogration test board with device soldered on PCB through high density vias)

V_{DS}= 28V，I_{DQ}=750mA，V_{GS} =3.53V

FREQ (MHZ)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
390	49.12	81.6	55.9	18.22	49.91	98.0	58.6
410	49.18	82.8	59.7	19.36	49.91	97.9	62.4
430	48.52	71.1	62.7	20.5	49.26	84.4	65.8

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

- 30-88MHz (Ground communication)
- 54-88MHz (TV VHF I)
- 88-108MHz (FM)
- 136-174MHz (Commercial ground communication)
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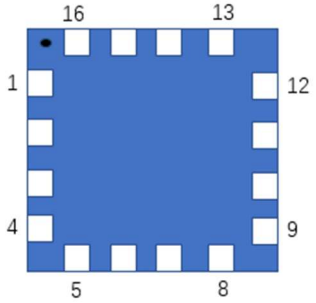
- Laser Exciter
- Synchrotron
- MRI
- Plasma generator
- Weather Radar

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}	+110	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+55	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	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 (T_A = 25 ℃ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics (per half section)					
Drain-Source Voltage V_{GS}=0, I_{DS}=1.0mA	$V_{(BR)DSS}$		110		V
Zero Gate Voltage Drain Leakage Current (V_{DS} = 75V, V_{GS} = 0 V)	I_{DSS}	——	——	1	μA
Zero Gate Voltage Drain Leakage Current (V_{DS} = 28V, V_{GS} = 0 V)	I_{DSS}	——	——	1	μA
Gate--Source Leakage Current (V_{GS} = 10 V, V_{DS} = 0 V)	I_{GSS}	——	——	1	μA
Gate Threshold Voltage (V_{DS} = 28V, I_D = 600 μA)	V_{GS}(th)	——	2.65	——	V
Gate Quiescent Voltage (V_{DD} = 28 V, I_D = 750 mA, Measured in Functional Test)	$V_{GS(Q)}$	——	3.5	——	V

Load Mismatch (In Innogration Test Fixture, 50 ohm system): V_{DD} = 28 Vdc, I_{DQ} = 750 mA, f =700MHz, pulse width:100us, duty cycle:10%

Load 10:1 All phase angles, at 80W Pulsed CW Output Power	No Device Degradation

TYPICAL CHARACTERISTICS

Figure 1: CW Gain and Power Efficiency as a Function of Pout at 390-430MHz

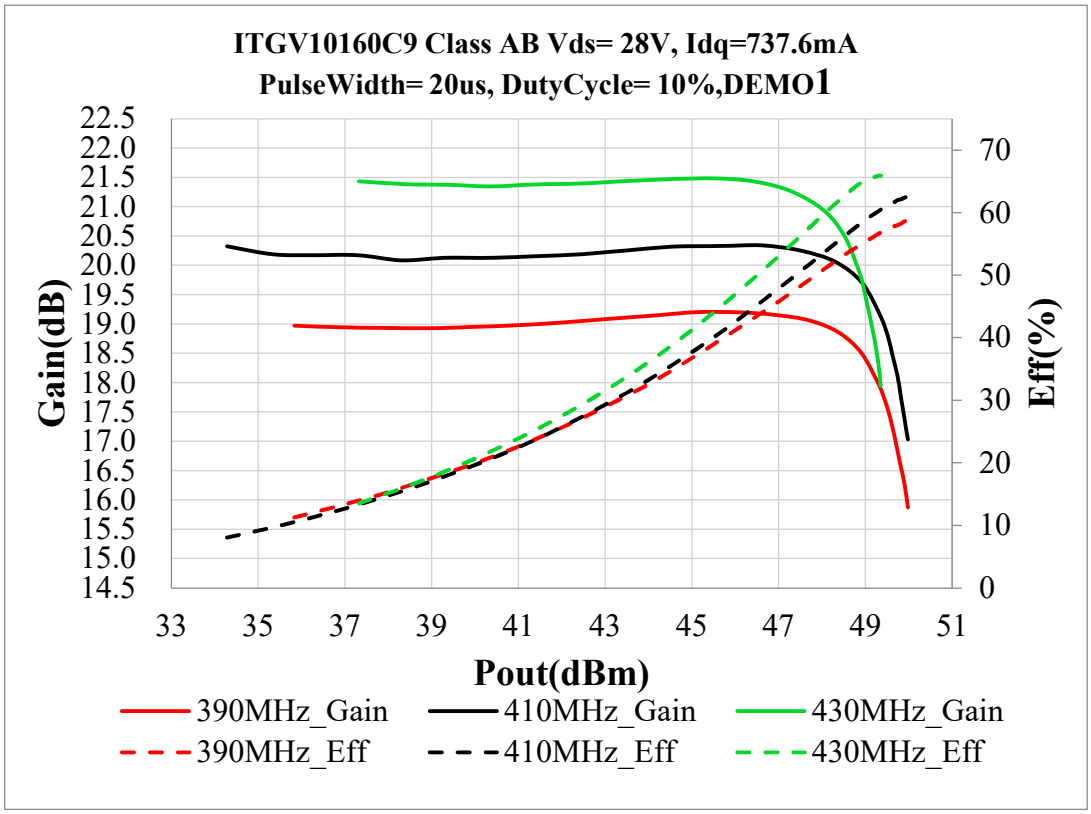


Figure 2: Network analyzer output S11/221

Reference Circuit of Test Fixture Assembly Diagram

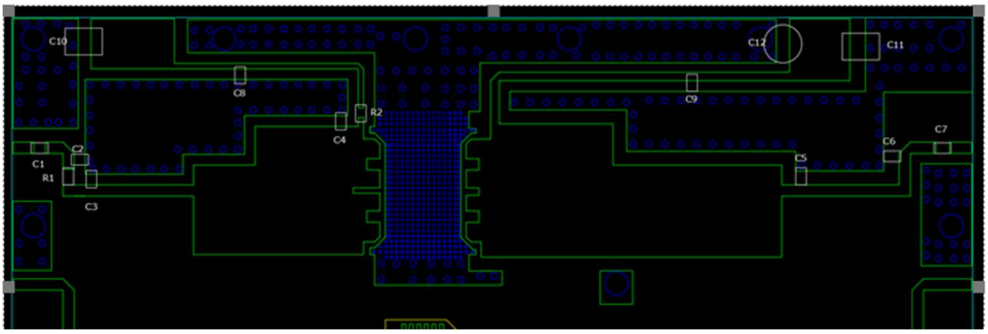
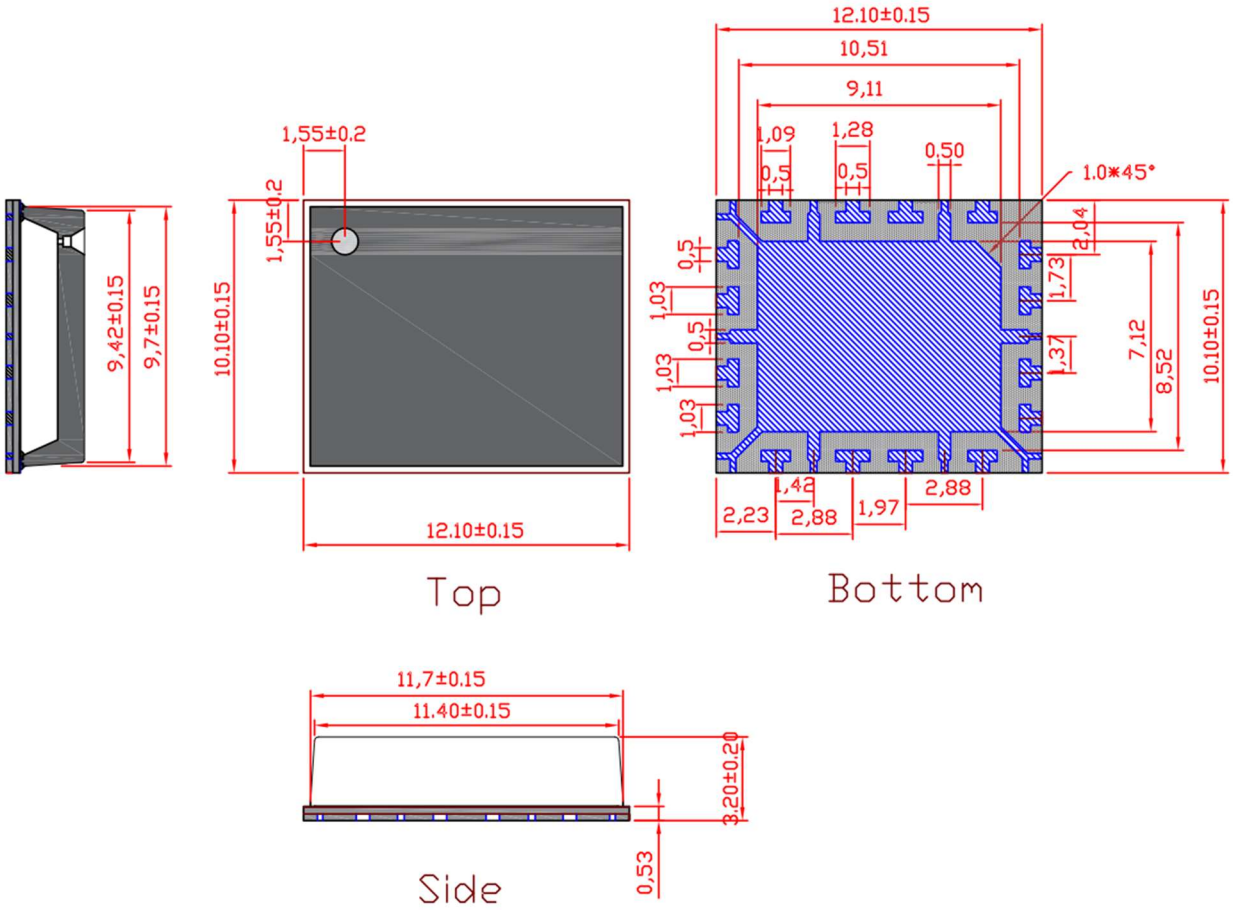


Table 5. Test Circuit Component Designations and Values

Component	Value	Quantity
U1	ITGV10160C9	1
C1 、C7、C8、C9	100pF	4
C2	15pF	1
C3、C4	24pF	2
C5	10pF	1
C6	18pF	1
C10、C11	10uF/63V	2
R1、R2	10Ω	2
C12	470uF/63V	1

Package Dimensions （Unit:mm）



Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2023/6/13	Rev 1.0	Preliminary Datasheet Creation
2023/8/17	Rev 1.1	Modification of package drawing on last page

Application data based on ZYX-23-06

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