

# 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

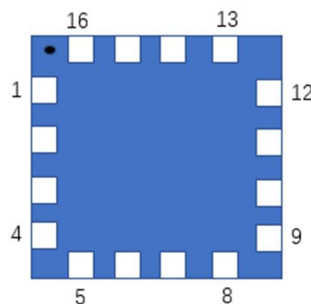
### Features

- 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)
- 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

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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	$T_{stg}$	-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 $T_c=85^\circ\text{C}$ , $T_J=200^\circ\text{C}$ , DC test	$R_{\theta JC}$	0.9	°C/W

**Table 3. ESD Protection Characteristics**

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

**Table 4. Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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

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

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

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

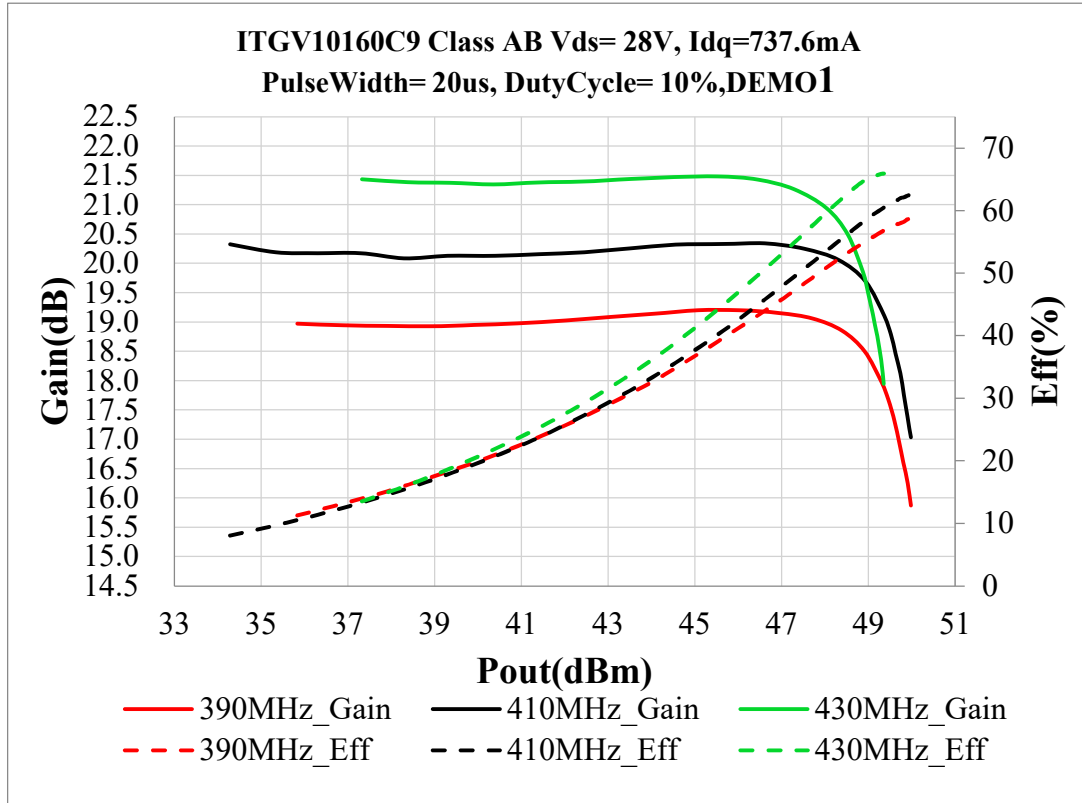
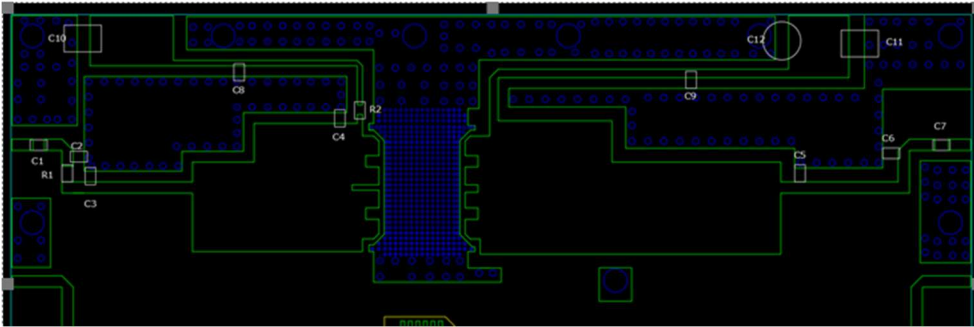


Figure 2: Network analyzer output S11/221



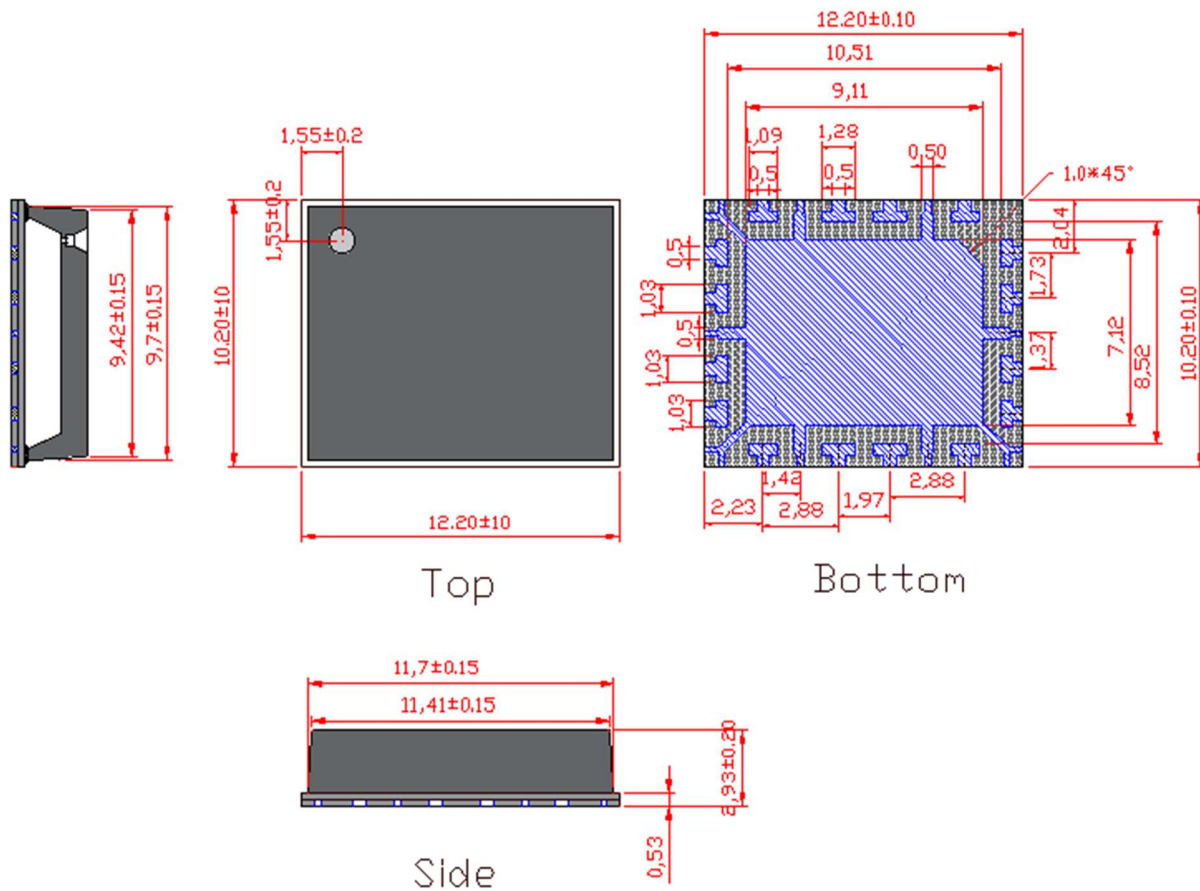
## Reference Circuit of Test Fixture Assembly Diagram



**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	10 $\Omega$	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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