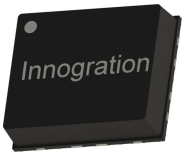
ITEV01151C9A(B) LDMOS TRANSISTOR

Document Number: ITEV01151C9A(B)
Preliminary Datasheet V1.0

150W, 50V High Power RF LDMOS FETs

ITEV01151C9A(B)



Description

The ITEV01151C9A and ITEV01151C9B are both a 150-watt capable, high performance, unmatched LDMOS FET, designed for wide-band commercial and industrial applications with frequencies HF to 150MHz The device offers a more cost effective solution than traditional ceramic device，housed in 12*10mm cost effective plastic open cavity package, and heat dissipated by copper flange directly.

It is featured by single ended configuration for high power and high ruggedness, suitable for Industrial, Scientific and Medical application.

A and B version are mirrored versions mainly for power combination purpose. When combined as 300W single ended solution, it is the thermal enhancement version of ITEV01300C9.

- **Typical performance of mirrored A+B power combination as single ended solution**

  (on Innogration test board with device soldered) Signal: CW , Vgs=3.1V,Vds=50V,Idq=50mA

Freq (MHz)	Pin (dBm)	Pout (dBm)	Pout (W)	Ids (A)	Gain (dB)	Eff (%)	2nd harmonic (dBc)
13.56	32	54.78	301	7.45	22.8	80.70	-20

*Notice: 28-42V data upon request

Features

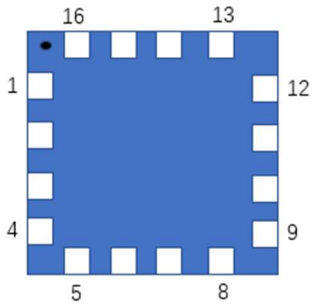
- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Excellent thermal stability, low HCI drift
- Large Positive and Negative Gate/Source Voltage Range for Improved Class C Operation
- Pb-free, RoHS-compliant

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）

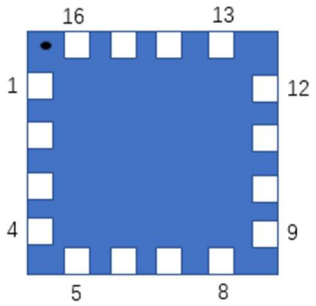
ITEV01151C9A



Pin No.	Symbol	Description
5-8	RF IN/Vgs	RF Input/Gate bias
13-16	RF OUT/Vds	RF Output/Drain bias

10,11	Open	**Must be no open**
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

ITEV01151C9B



Pin No.	Symbol	Description
5-8	RF IN/Vgs	RF Input/Gate bias
13-16	RF OUT/Vds	RF Output/Drain bias
2,3	Open	**Must be no open**
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}	+135	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	$R_{\theta JC}$	0.8	°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	$V_{(BR)DSS}$		135		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} = 50 V, 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} = 50V, I_D = 600 μA)	$V_{GS}(th)$	——	2.65	——	V
Gate Quiescent Voltage (V_{DD} = 50 V, I_D = 180 mA, Measured in Functional Test)	$V_{GS(Q)}$	——	3.4	——	V

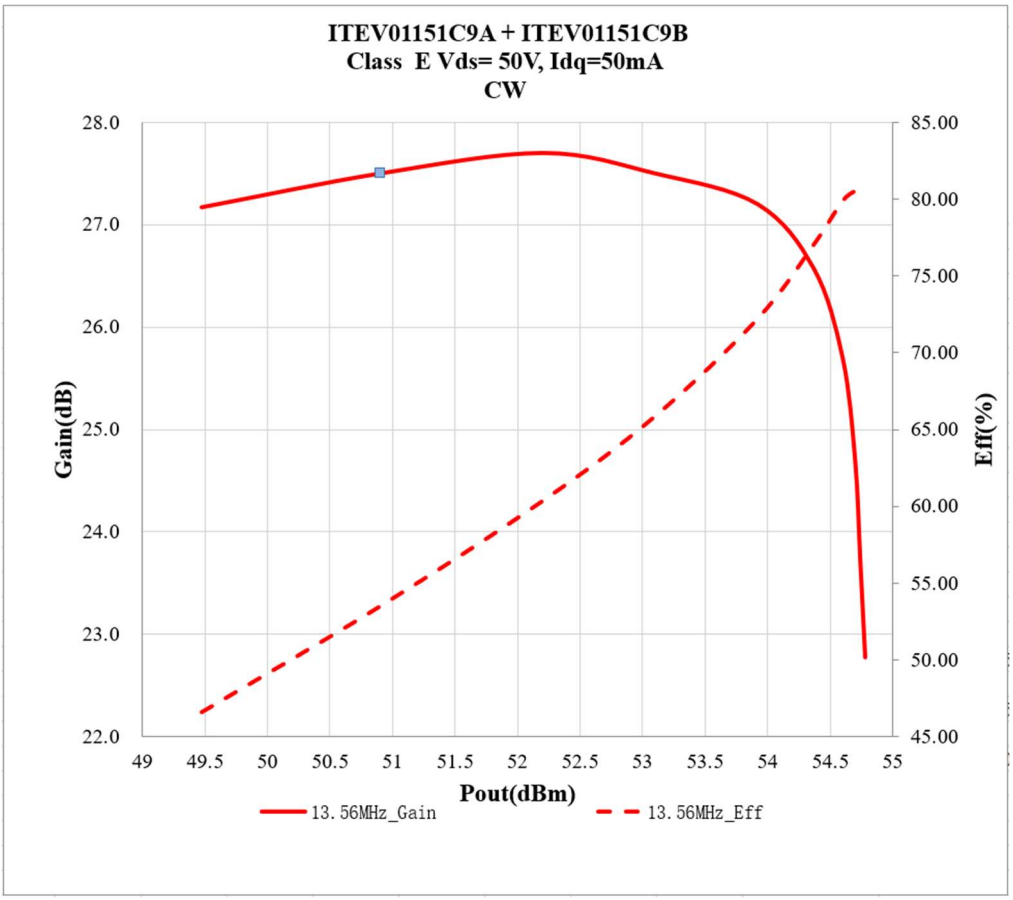
Load Mismatch (In Innogration Test Fixture, 50 ohm system): V_{DD} = 50 Vdc, I_{DQ} = 100 mA, f =100MHz, pulse width:100us, duty cycle:10%

Load 65:1 All phase angles, at 150W Pulsed CW Output Power	No Device Degradation

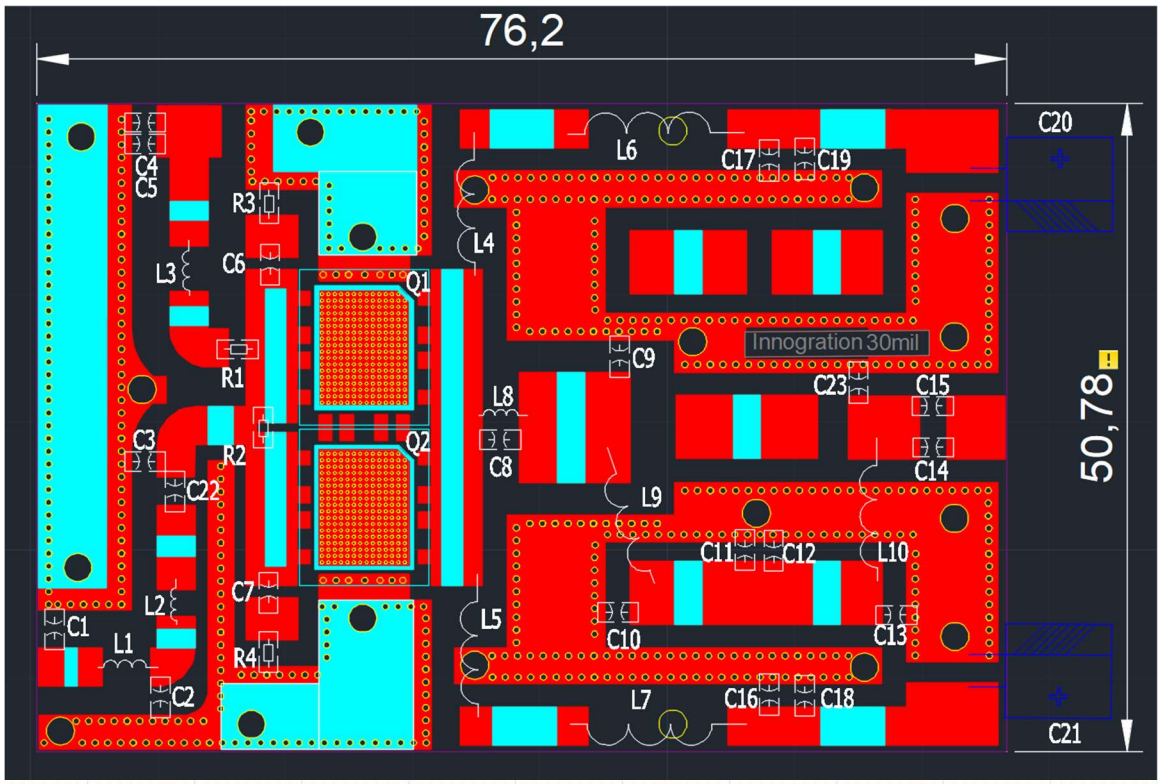
ITEV01151C9A+ITEV01151C9B combined as single ended

TYPICAL CHARACTERISTICS

Figure 1: CW Gain and Power Efficiency as a Function of Pout at 13.56MHz



Reference Circuit of Test Fixture Assembly Diagram



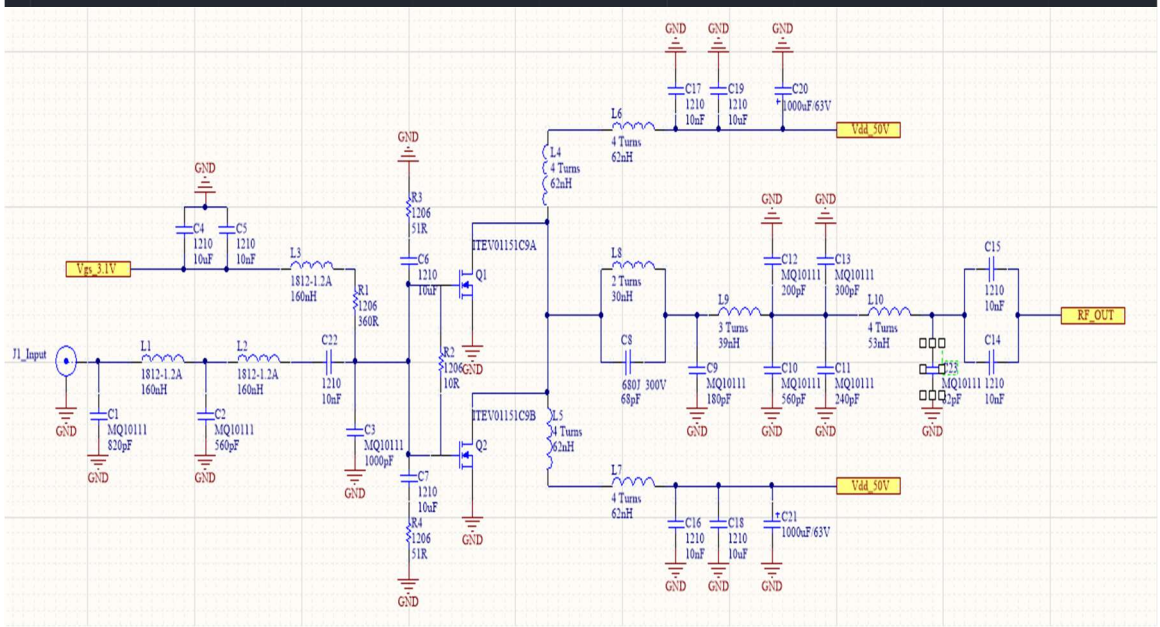
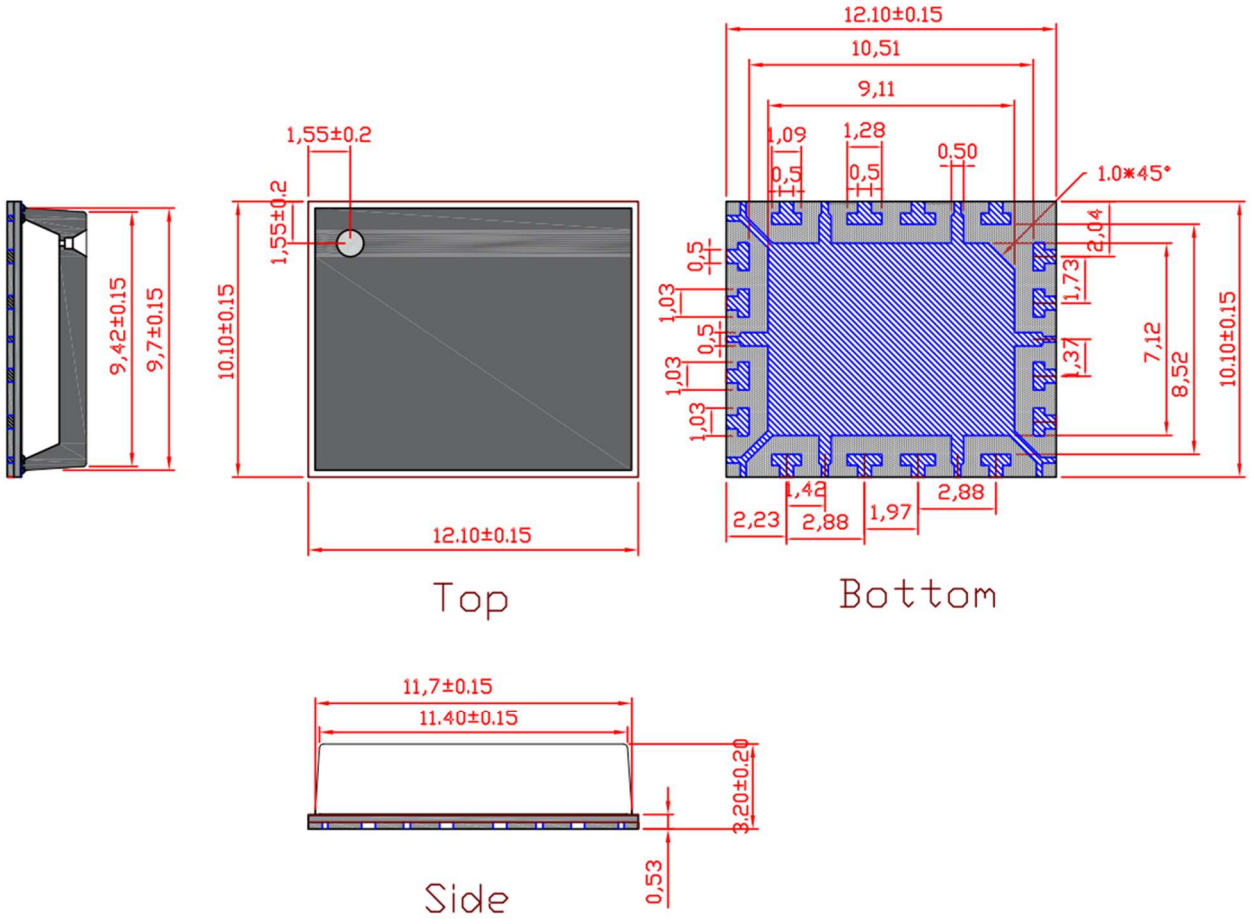


Table 5. Test Circuit Component Designations and Values

Component	Description	Suggested Manufacturer
C4,C6,C7,C18,C19	10uF 100V	Ceramic multilayer capacitor
C5,C14,C15,C16,C17,C22	10nF 100V	Ceramic multilayer capacitor
C20,C21	1000uF,63V	Electrolytic Capacitor
C1	820pF	MQ101111
C2,C10	560pF	MQ101111

C3	1000pF	MQ101111
C12,C13	270pF	MQ101111
C8	68Pf(680J/300V)	Huamao
C9	180pF	MQ101111
C11	240pF	MQ101111
C12	200pF	MQ101111

Package Dimensions （Unit:mm）



Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2024/2/23	Rev 1.0	Preliminary Datasheet Creation

Application data based on SYX-24-03

Disclaimers

Specifications are subject to change without notice. Innogration believes the information contained within this data sheet to be accurate and reliable. However, no responsibility is assumed by Innogration for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Innogration . Innogration makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose."Typical" parameters are the average values expected by Innogration in large quantities and are provided for information purposes only. These values can and do vary in different applications and actual performance can vary over time. All operating parameters should be validated by customer's technical experts for each application. Innogration products are not designed, intended or authorized for use as components in applications intended for surgical implant into the body or to support or sustain life, in applications in which the failure of the Innogration product could result in personal injury or death or in applications for planning, construction, maintenance or direct operation of a nuclear facility. For any concerns or questions related to terms or conditions, pls check with Innogration and authorized distributors

Copyright © by Innogration (Suzhou) Co.,Ltd.