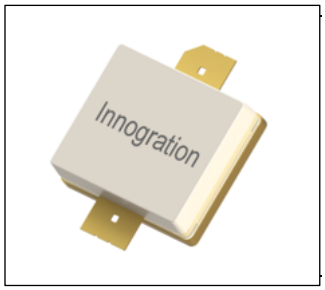
ITIV01500A2C LDMOS TRANSISTOR

Document Number: ITIV01500A2C
Advanced Datasheet V1.0

450W, 50V High Power RF LDMOS FETs



Description

The ITEV01500A2C is a 450-watt capable, high performance, unmatched LDMOS FET, designed for wide-band commercial and industrial applications with frequencies HF to 200MHz, in new generation highly cost effective open cavity package.

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

- Typical performance(on Innogration test board with device soldered)

  Signal: CW , Vgs=3.45V,Vds=50V,Idq=250mA

Freq (MHz)	Pin (dBm)	Pout (dBm)	Pout (W)	Ids (A)	Gain (dB)	Eff (%)	2nd harmonic (dBc)
40.68	32	56.8	470	11.7	24.8	80	-44
108	40	56.8	470	12.3	16.8	76	-24

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

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	+160	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	0.35	°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	$V_{(BR)DSS}$		160		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 = 250 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 450W Pulsed CW Output Power	No Device Degradation

40.68MHz

TYPICAL CHARACTERISTICS

Figure 1: CW Gain and Power Efficiency as a Function of Pout at 40.68MHz

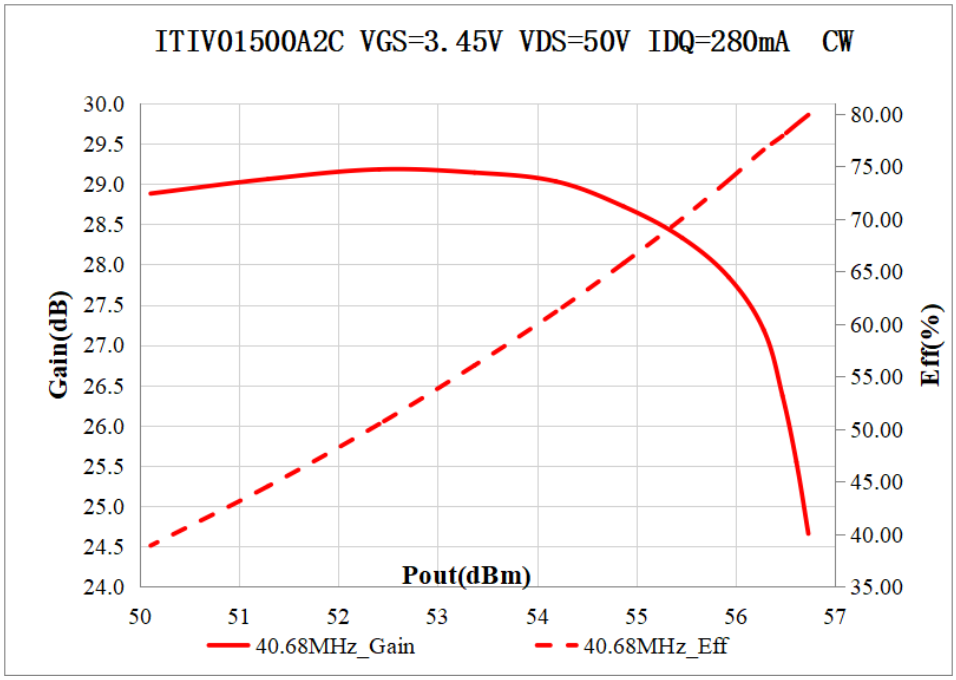
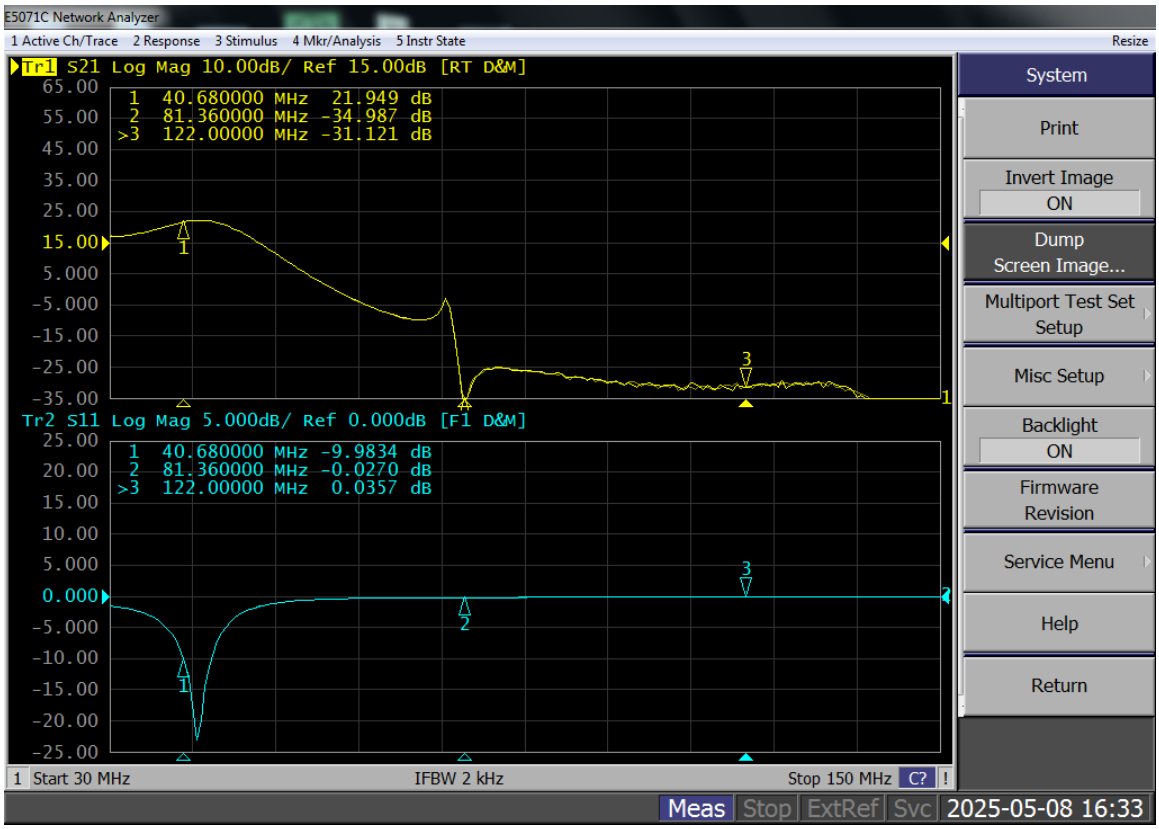


Figure 2: Network analyzer output S11/S21



Reference Circuit of Test Fixture Assembly Diagram

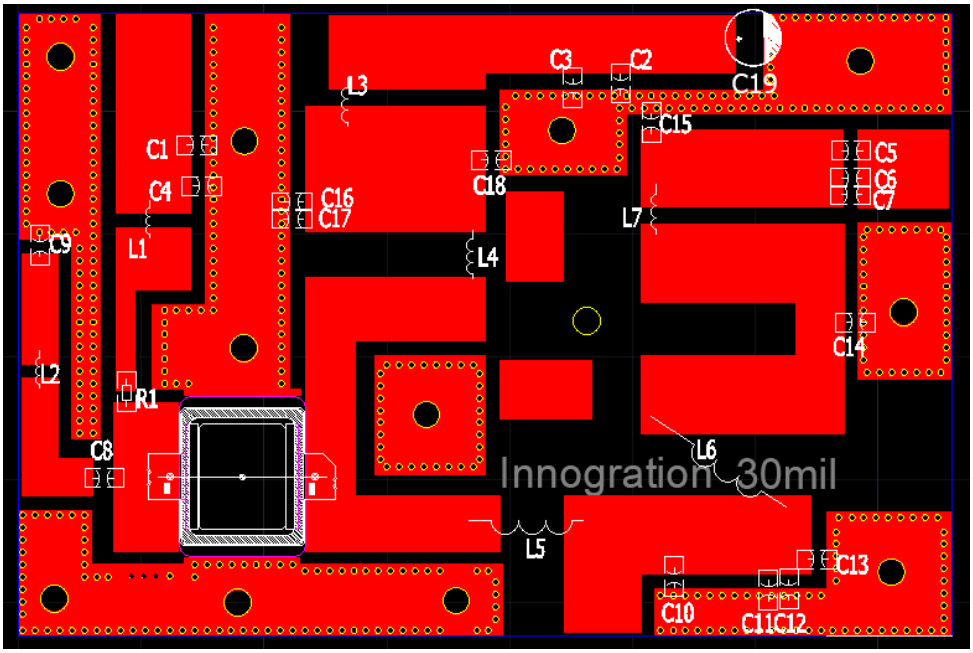


Table 5. Test Circuit Component Designations and Values

Component	Description	Suggestion
C1,C2	10uF/200V-1210	Ceramic multilayer capacitor
C3~C8	10nF/200V-1210	Ceramic multilayer capacitor
C9	270pF	
C10	200pF	
C11	68pF	
C12	47pF	
C13	240pF	
C14	150F	
C15	36pF	
C16	56pF	
C17	1.5pF	
C18	22pF	
C19	470uF/63V	Eectrolytic Capacitor
R1	300Ω/1206	Chip Resistor
L1，L2	47nH	
L3	1.5mm wire，5mm innerdiameter，7turns	DIY
L4	1.5mm wire，5mm innerdiameter，6turns	DIY
L5	1.5mm wire，3mm innerdiameter，2turns	DIY
L6	1.5mm wire，5mm innerdiameter，5turns	DIY
L7	1.5mm wire，5mm innerdiameter，3turns	DIY

108MHz

TYPICAL CHARACTERISTICS

Figure 3: CW Gain and Power Efficiency as a Function of Pout at 108MHz

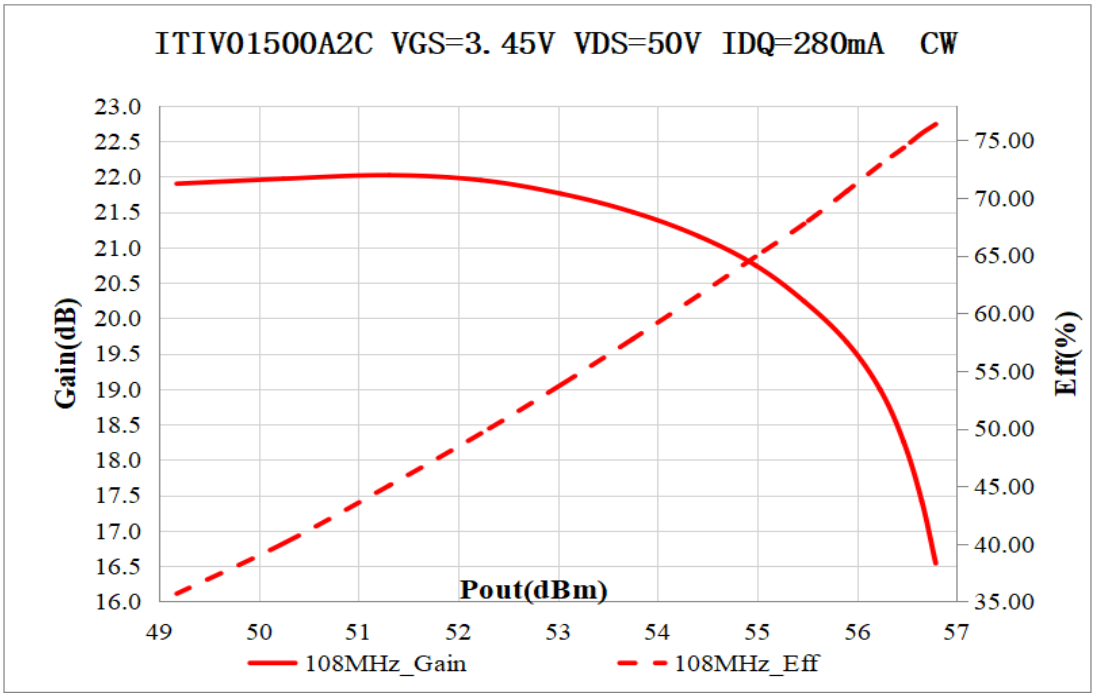
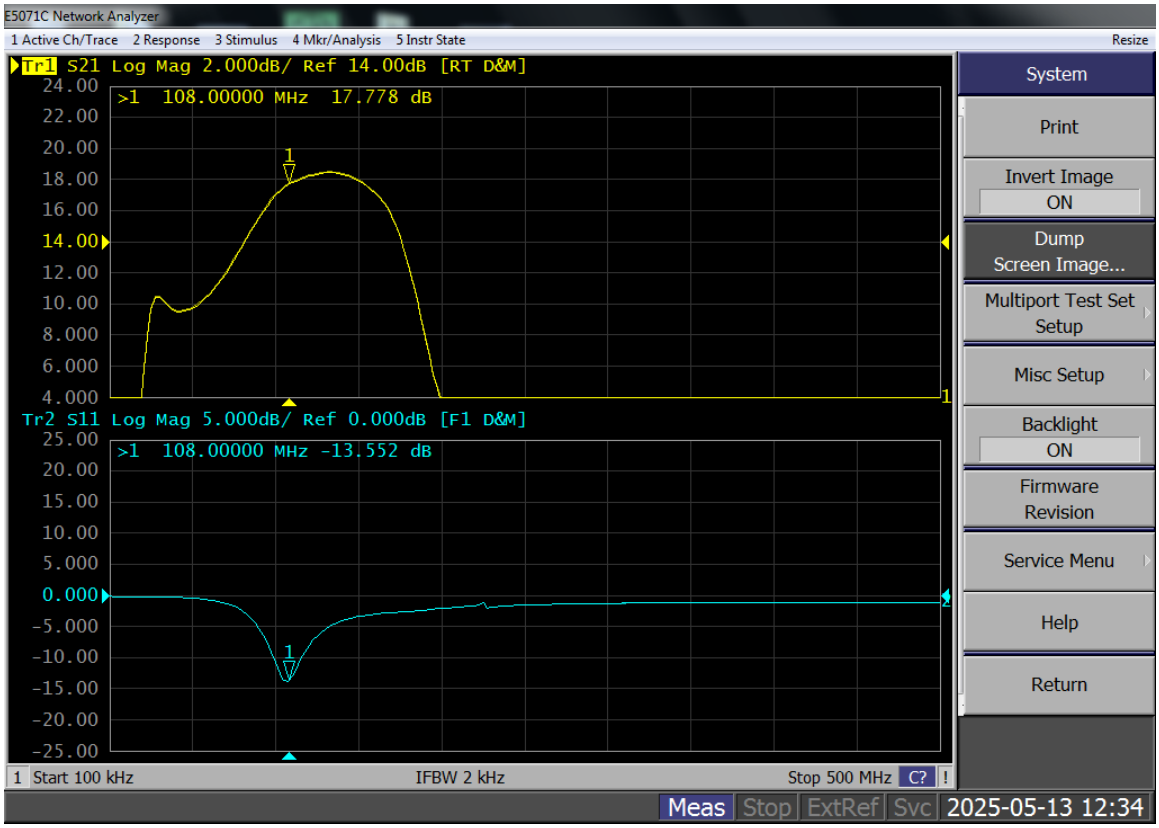


Figure 2: Network analyzer output S11/S21



Reference Circuit of Test Fixture Assembly Diagram

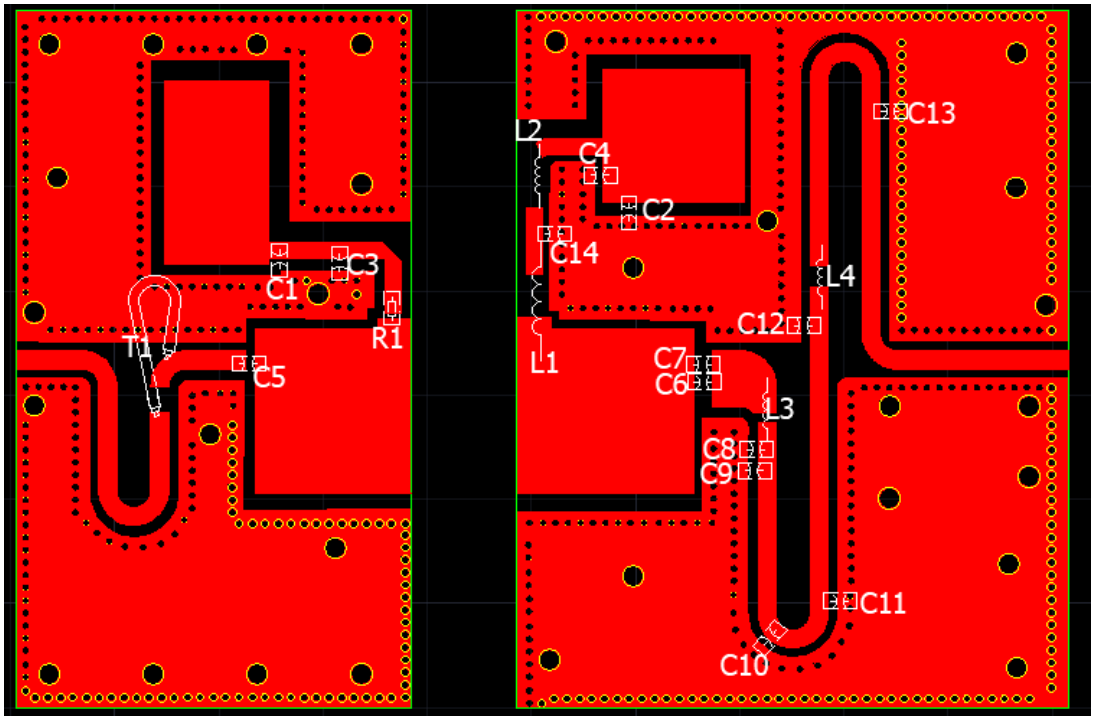
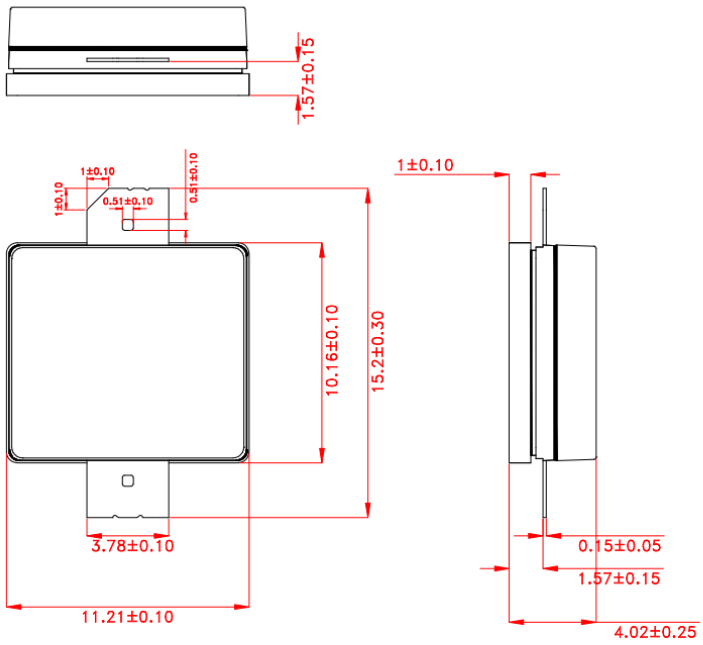
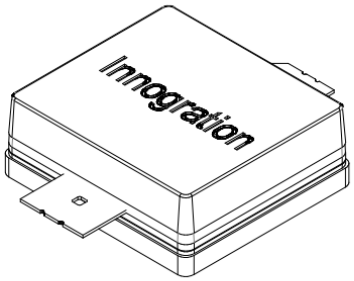


Table 6. Test Circuit Component Designations and Values

Component	Description	Suggestion
C1,C2	10uF/200V-1210	Ceramic multilayer capacitor
C3	910pF	
C4	10nF/200V-1210	Ceramic multilayer capacitor
C5	330pF	
C6,C7	1000pF	
C8	15pF	
C9	47pF	
C10	82pF	
C11	10F	
C12	24pF	
C13	22pF	
C14	18pF	
R1	300Ω/1206	Chip Resistor
L1	1.5mm wire，5mm innerdiameter，6turns	DIY
L2	1.5mm wire，5mm innerdiameter，3turns	DIY
L3	1.5mm wire，5mm innerdiameter，1turns	DIY
L4	1.5mm wire，5mm innerdiameter，2turns	DIY
T1	12.5ohm-45mm	SFF-12.5-1.5

Package Dimensions （Unit:mm）





Unit:mm

Tolerance ±0.10mm,Except as Noted.

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2025/5/14	Rev 1.0	Advanced Datasheet Creation

Application data based on TC-25-21/22

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