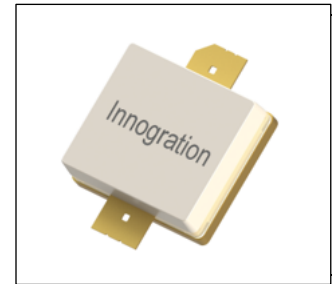


300W, 50V High Power RF LDMOS FETs

Description

The ITEV01150A2C is a 300-watt capable, high performance, unmatched LDMOS FET, designed for wide-band commercial and industrial applications with frequencies HF to 500MHz, 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 Innogrations test board with device soldered)

Signal: CW , $V_{gs}=3.2V, V_{ds}=50V, I_{dq}=100mA$

| Freq (MHz) | Pin (dBm) | Pout (dBm) | Pout (W) | Ids (A) | Gain (dB) | Eff (%) | 2 nd harmonic (dBc) |
|------------|-----------|------------|----------|---------|-----------|---------|--------------------------------|
| 40.68 | 35 | 55 | 316 | 7.9 | 20 | 80 | -20 |

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} | +135 | 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 $T_c=85^\circ C, T_j=200^\circ C, DC$ test | $R_{\theta JC}$ | 0.55 | °C/W |

Table 3. ESD Protection Characteristics

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

ITEV01300A2C LDMOS TRANSISTOR

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|-----------------------|-----|------|-----|---------------|
| DC Characteristics (per half section) | | | | | |
| Drain-Source Voltage $V_{GS}=0, I_{DS}=1.0\text{mA}$ | $V_{(BR)DSS}$ | | 135 | | V |
| Zero Gate Voltage Drain Leakage Current ($V_{DS} = 75\text{V}, V_{GS} = 0\text{V}$) | I_{loss} | — | — | 1 | μA |
| Zero Gate Voltage Drain Leakage Current ($V_{DS} = 50\text{V}, V_{GS} = 0\text{V}$) | I_{loss} | — | — | 1 | μA |
| Gate--Source Leakage Current ($V_{GS} = 10\text{V}, V_{DS} = 0\text{V}$) | I_{GSS} | — | — | 1 | μA |
| Gate Threshold Voltage ($V_{DS} = 50\text{V}, I_D = 600\text{ }\mu\text{A}$) | $V_{GS(th)}$ | — | 2.65 | — | V |
| Gate Quiescent Voltage ($V_{DD} = 50\text{V}, I_D = 100\text{mA}$, Measured in Functional Test) | $V_{GS(Q)}$ | — | 3.2 | — | V |
| Load Mismatch (In Innogration Test Fixture, 50 ohm system): $V_{DD} = 50\text{Vdc}, I_{DQ} = 100\text{mA}, f = 100\text{MHz}$, pulse width:100us, duty cycle:10% | | | | | |
| Load 65:1 All phase angles, at 300W Pulsed CW Output Power | No Device Degradation | | | | |

TYPICAL CHARACTERISTICS

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

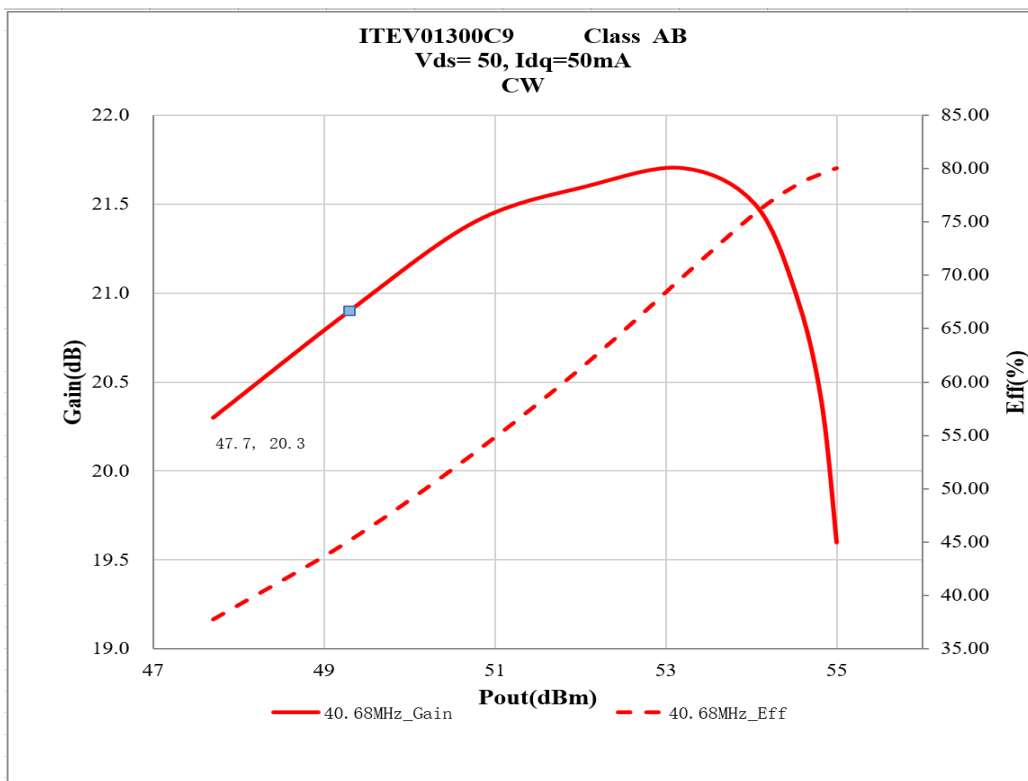
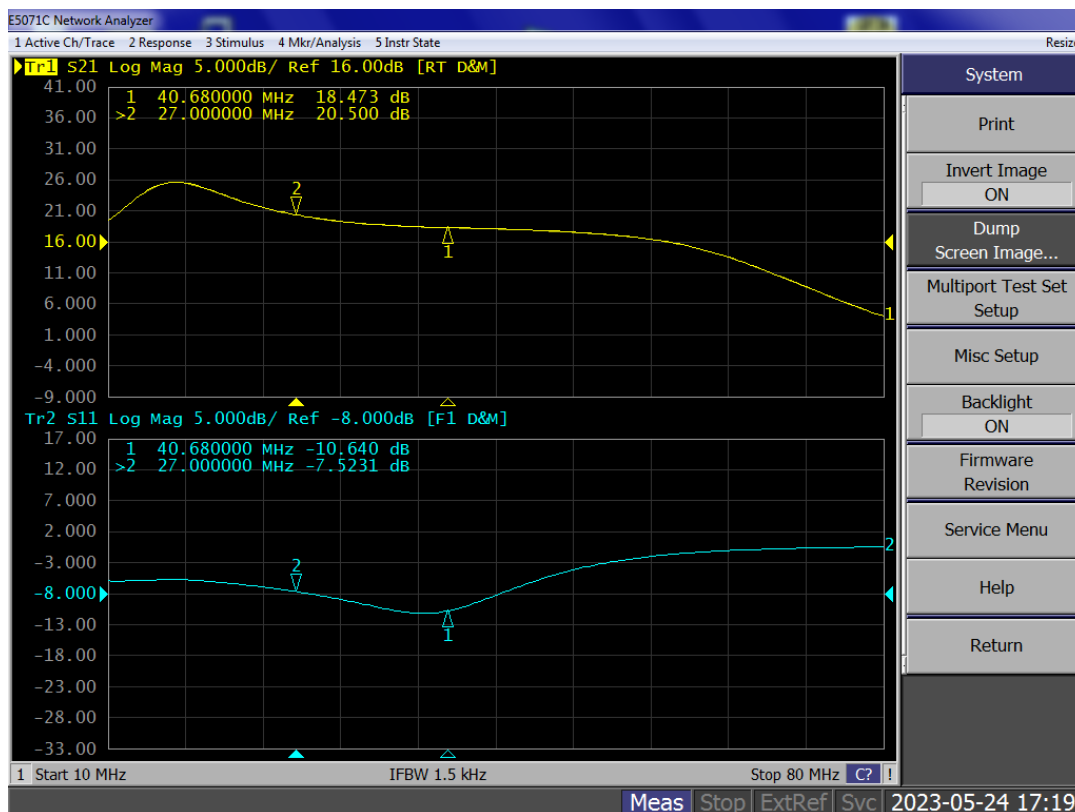


Figure 2: Network analyzer output S11/S21



Reference Circuit of Test Fixture Assembly Diagram

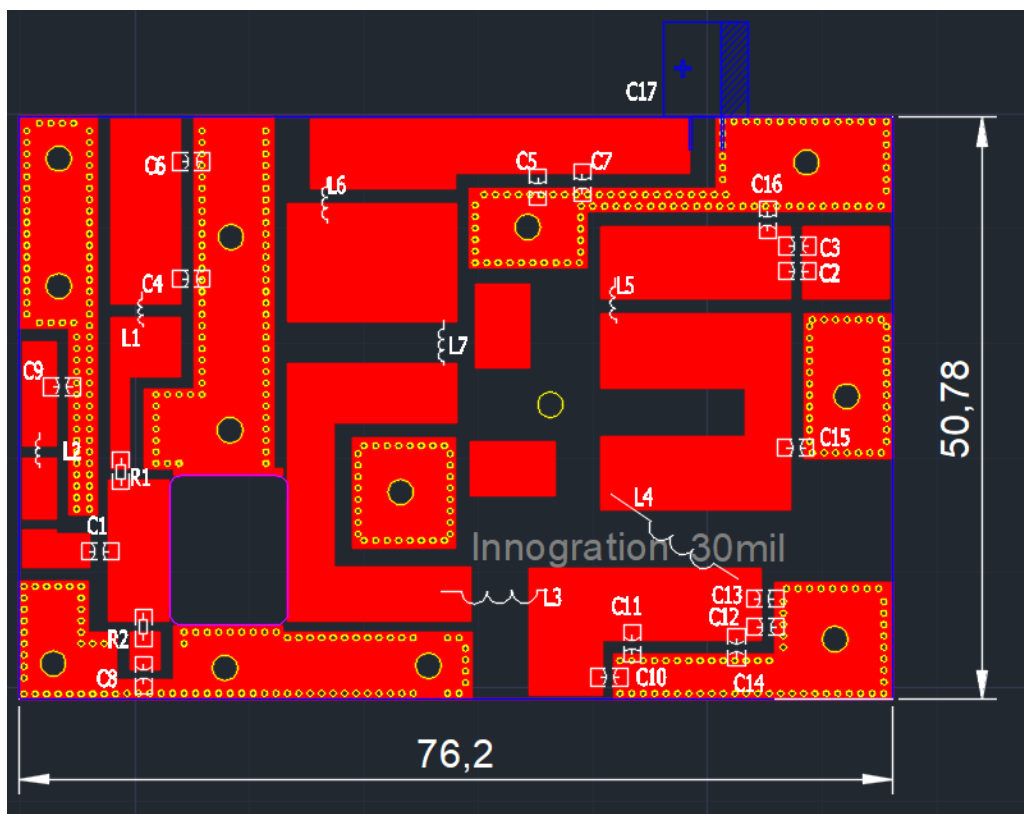
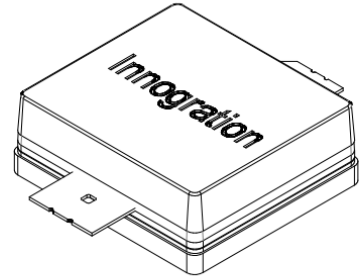
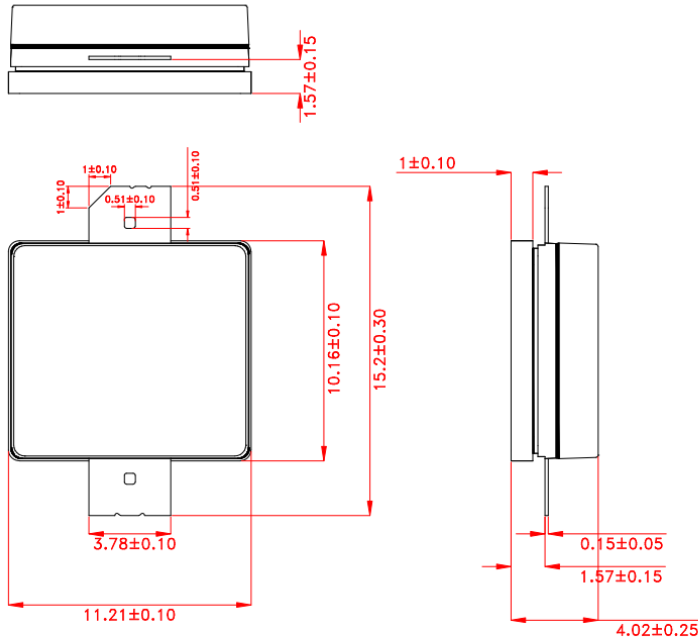


Table 5. Test Circuit Component Designations and Values

| Component | Description | Suggestion |
|-----------------|---------------------|------------------------------|
| C1,C2,C3, | 10uF 100V | Ceramic multilayer capacitor |
| C4,C5,C6,C7,C16 | 10nF 100V | Ceramic multilayer capacitor |
| C14 | 470uF,63V | Electrolytic Capacitor |
| C15 | 200pF | MQ101111 |
| C8 | 100pF | MQ101111 |
| C9,C11 | 33pF | MQ101111 |
| C10 | 22pF | MQ101111 |
| C12 | 150pF | MQ101111 |
| C13 | 56pF | MQ101111 |
| C15 | 39pF | MQ101111 |
| L1 | 47nH | |
| L6 | 150nH | |
| R1 | 300 Ω , 1206 | Chip Resistor |
| R2 | 5 Ω | Chip Resistor |
| L2,L7 | 1.5mm, 6 turns, φ 5 | |
| L3 | 1.5mm, 2 turns, φ 5 | |
| L4 | 1.5mm, 4 turns, φ 5 | |
| PCB | 30Mil Rogers4350 | |

Package Dimensions (Unit:mm)



Unit:mm

Tolerance ± 0.10 mm, Except as Noted.

Revision history

Table 5. Document revision history

| Date | Revision | Datasheet Status |
|-----------|----------|---|
| 2024/8/27 | Rev 1.0 | Preliminary Datasheet Creation from C9 version to A2C |
| | | |
| | | |

Application data based on SYX-24-28

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