

# MC1075RVS LDMOS TRANSISTOR

Document Number: MC1075RVS  
Preliminary Datasheet V1.0

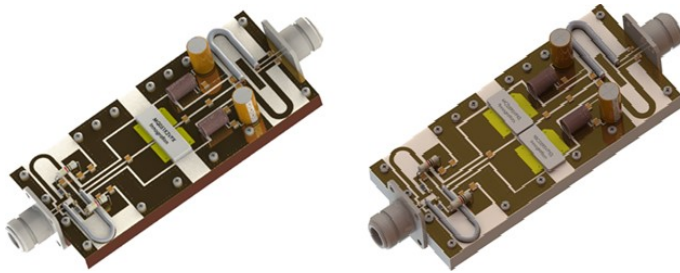
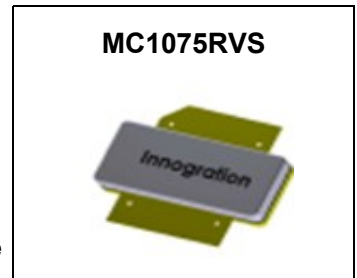
## 700W ,50V High Power RF LDMOS FETs

### Description

The MC1075RVS itself is a 700-watt capable, high performance, unmatched single ended LDMOS FET.

**It is recommended to use paired MC1075RVS to enable 1400W designed for ISM application with frequencies HF to 500MHz. Compared to similar power level but in single dual-path packaged device, it offers better thermal management and easier maintenance.**

Demonstration of paired MC1075RVS(right) Vs single dual-path device(left) at 250MHz



- Typical performance(on 162.5MHz narrow band application board with 2×MC1075RVS devices soldered)

$V_{DS}=50V, I_{DQ}=400mA, CW,$

Freq(MHz)	$P_{out}(W)$	Pin(dBm)	Gain(dB)	$\eta(\%)$
162.5	1400	41	20.5	74

### 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)
- 160-230MHz (TV VHF III)
- 136-174MHz (Commercial ground communication)
- Laser Exciter
- Synchrotron
- MRI
- Plasma generator
- Weather Radar

**Table 1. Maximum Ratings**

Rating	Symbol	Value	Unit
Drain--Source Voltage	$V_{DSS}$	+115	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 $T_c= 85^\circ C, 1400W$ Pulsed CW output,162.5MHz, 2 pcs of MC1075RVS combined, CW	$R_{\theta JC}$	0.1	°C/W

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**Table 3. ESD Protection Characteristics**

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

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

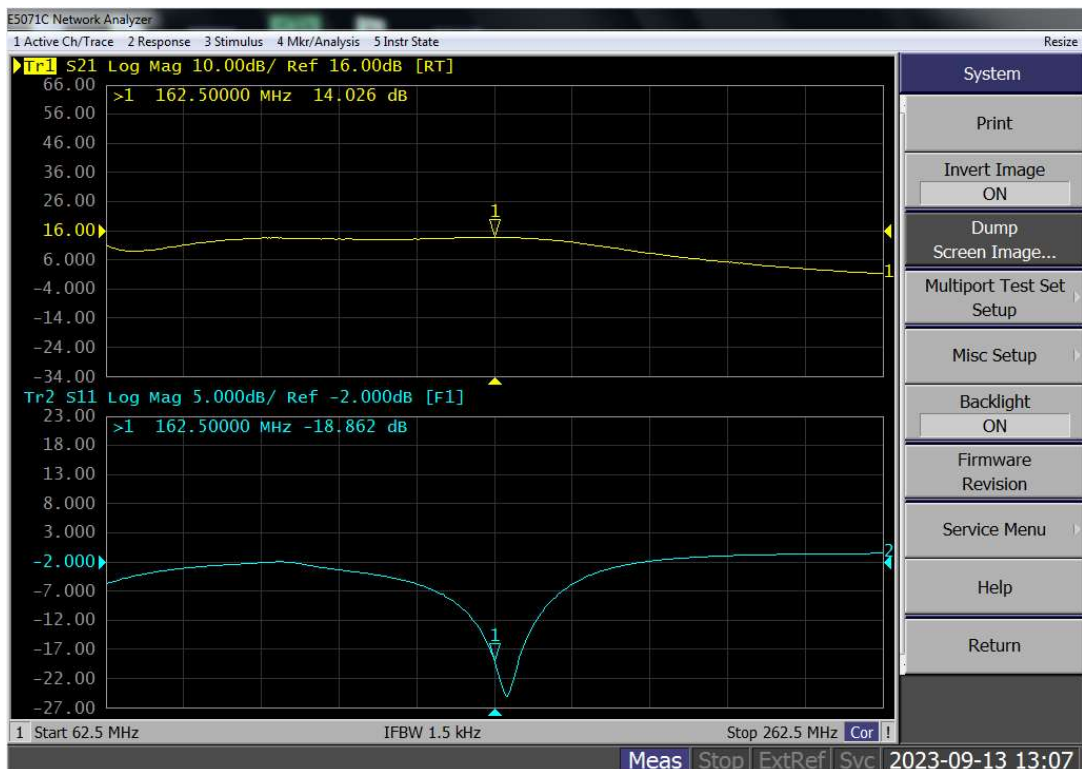
Characteristic	Symbol	Min	Typ	Max	Unit
Drain-Source Voltage $V_{GS}=0, I_{DS}=1.0\text{mA}$	$V_{(BR)DSS}$		115		V
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 75\text{V}, V_{GS} = 0\text{V}$ )	$I_{DSS}$	—	—	1	$\mu\text{A}$
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 50\text{V}, V_{GS} = 0\text{V}$ )	$I_{DSS}$	—	—	1	$\mu\text{A}$
Gate--Source Leakage Current ( $V_{GS} = 10\text{V}, V_{DS} = 0\text{V}$ )	$I_{DSS}$	—	—	1	$\mu\text{A}$
Gate Threshold Voltage ( $V_{DS} = 50\text{V}, I_D = 600\text{ }\mu\text{A}$ )	$V_{GS(th)}$	—	2.0	—	V
Gate Quiescent Voltage ( $V_{DD} = 50\text{V}, I_D = 400\text{mA}$ , Measured in Functional Test)	$V_{GS(Q)}$	—	3.2	—	V

**Load Mismatch (In Innogration Test Fixture, 50 ohm system):**  $V_{DD} = 50\text{Vdc}, I_{DQ} = 200\text{mA}, f = 162.5\text{MHz}$ , pulse width:100us, duty cycle:10%, 2 piece of MC1075RVS combined

Open and short, at 1400W Pulsed CW Output Power	No Device Degradation
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## TYPICAL CHARACTERISTICS

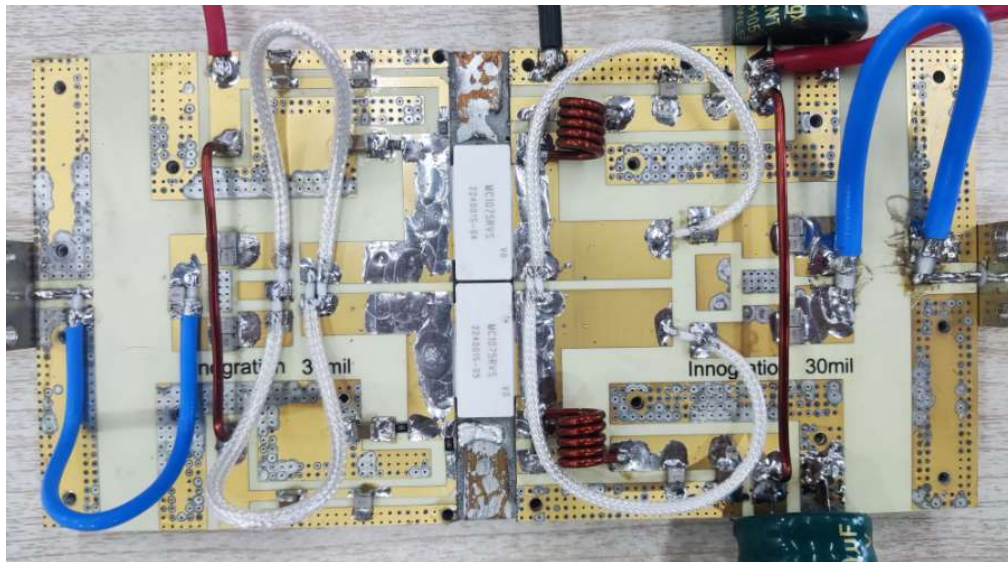
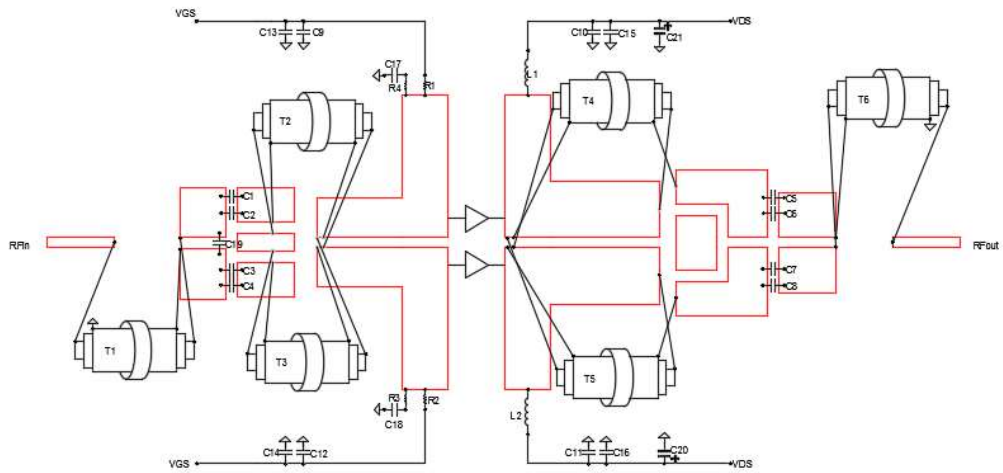
**Figure 1: Network analyzer output S11/S21  $V_{ds}=50\text{V}, I_{dq}=400\text{mA}, P_{in}=0\text{dBm}$**



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## Reference Circuit of Test Fixture (162.5MHz Pulsed CW Power Amplifier)



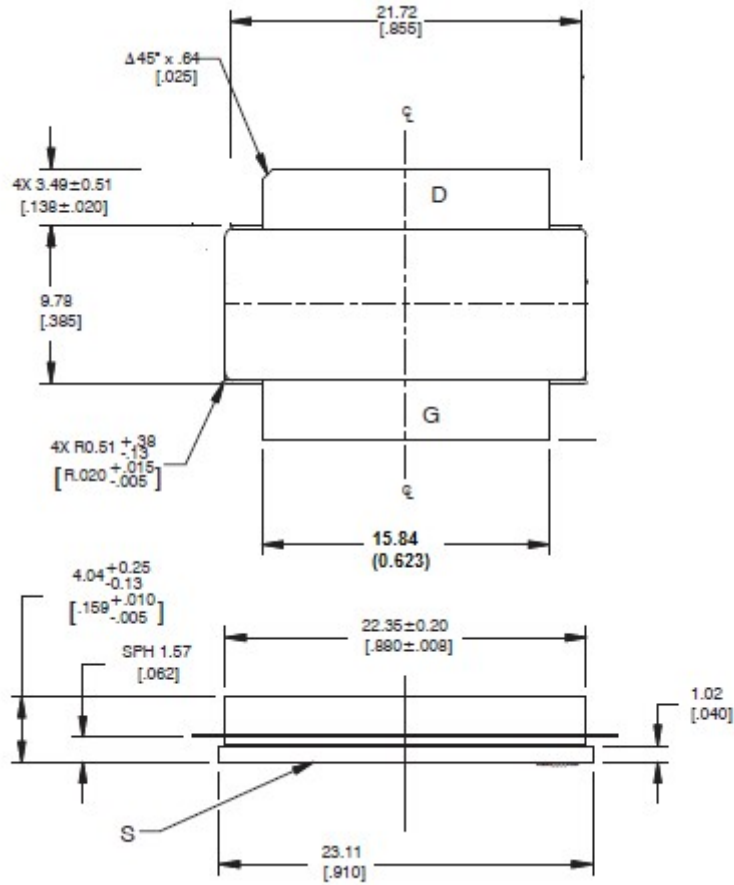
Component	Description	Suggestion
C1~C12	470pF	MQ301111
C14~C18	10uF	10uF/100V
C19	47pF	MQ301111
C20,C21	4700uF/63V	
R1~R4	18 Ω	1206
L1,L2	5 Turns, d=5mm D=1.5mm	4700uF/63V
T1	50ohm 10mm	SF-086-50
T2,T3	12.5ohm 10mm	SFF-12.5-1.5
T4,T5	16.7ohm 10mm	SFF-16.7-1.5
T6	35ohm	SFF-25-3
T4,T5	12.5ohm 10mm	SFF-12.5-3
T6	16.7ohm	SFF-16.7-1.5

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## Package Outline

Flangeless ceramic package;



OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-C2					09/27/2018

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## Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2023/9/13	Rev 1.0	Preliminary datasheet

Application data based on HL-23-42

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