

MV0545VX LDMOS TRANSISTOR

Document Number: MV0545VX
Preliminary Datasheet V1.0

400W, HF-150MHz 50V High Power RF LDMOS

Description

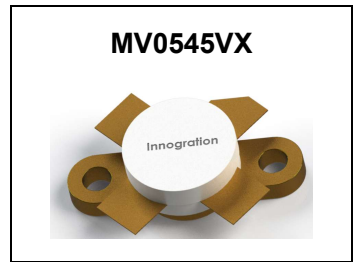
The MV0545VX is a 400W single ended 50V LDMOS, unmatched for any applications within HF-150MHz

It supports CW, and pulsed and any modulated signal at either saturated or linear application.

It can be the drop-in replacement of its equivalent 400W single ended VDMOS like SD2943 etc with improved RF performance like higher efficiency

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

Signal: CW , Vgs=3.2v, Vds=50v, Idq=200mA



Freq(MHz)	Pin(dBm)	Pout(dBm)	Pout(W)	Ids(A)	Gain(dB)	Eff(%)	2 nd Harmonic(dB)	3 rd Harmonic(dB)
30	31.3	56.3	430	11.4	25	75	-29	-25

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}	+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°C, T _j =200°C, DC test	R _{θJC}	0.27	°C/W

Table 3. ESD Protection Characteristics

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

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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					
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 ($V_{DD} = 50\text{V}, I_D = 200\text{ mA}$, Measured in Functional Test)	$V_{GS(Q)}$	—	3.2	—	V
Drain source on state resistance ($V_{DS}=0.1\text{V}, V_{GS}=10\text{V}$)	$R_{ds(on)}$		95		$\text{m}\Omega$
Common Source Input Capacitance ($V_{GS} = 0\text{V}, V_{DS} = 50\text{V}, f = 1\text{ MHz}$)	C_{ISS}		340		pF
Common Source Output Capacitance ($V_{GS} = 0\text{V}, V_{DS} = 50\text{V}, f = 1\text{ MHz}$)	C_{OSS}		90		pF
Common Source Feedback Capacitance ($V_{GS} = 0\text{V}, V_{DS} = 50\text{V}, f = 1\text{ MHz}$)	C_{RSS}		2.2		pF

Load Mismatch (In Innogration Test Fixture, 50 ohm system): $V_{DD} = 50\text{ Vdc}$, $I_{DQ} = 200\text{ mA}$, $f = 108\text{MHz}$, pulse width:100us, duty cycle:10%

Load 20:1 All phase angles, at 350W 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 30MHz

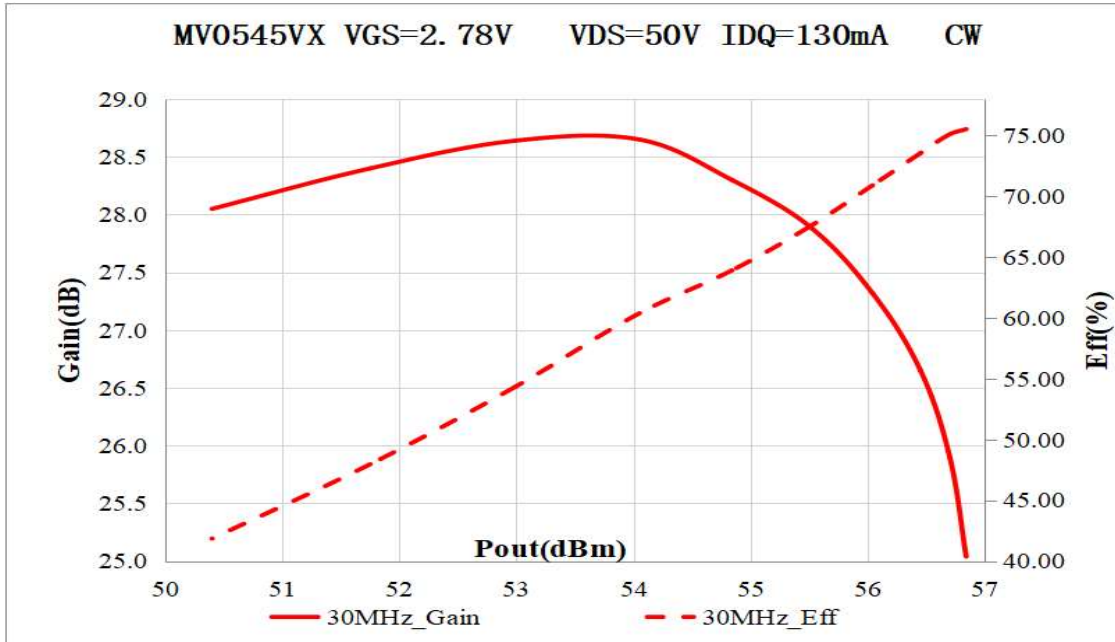
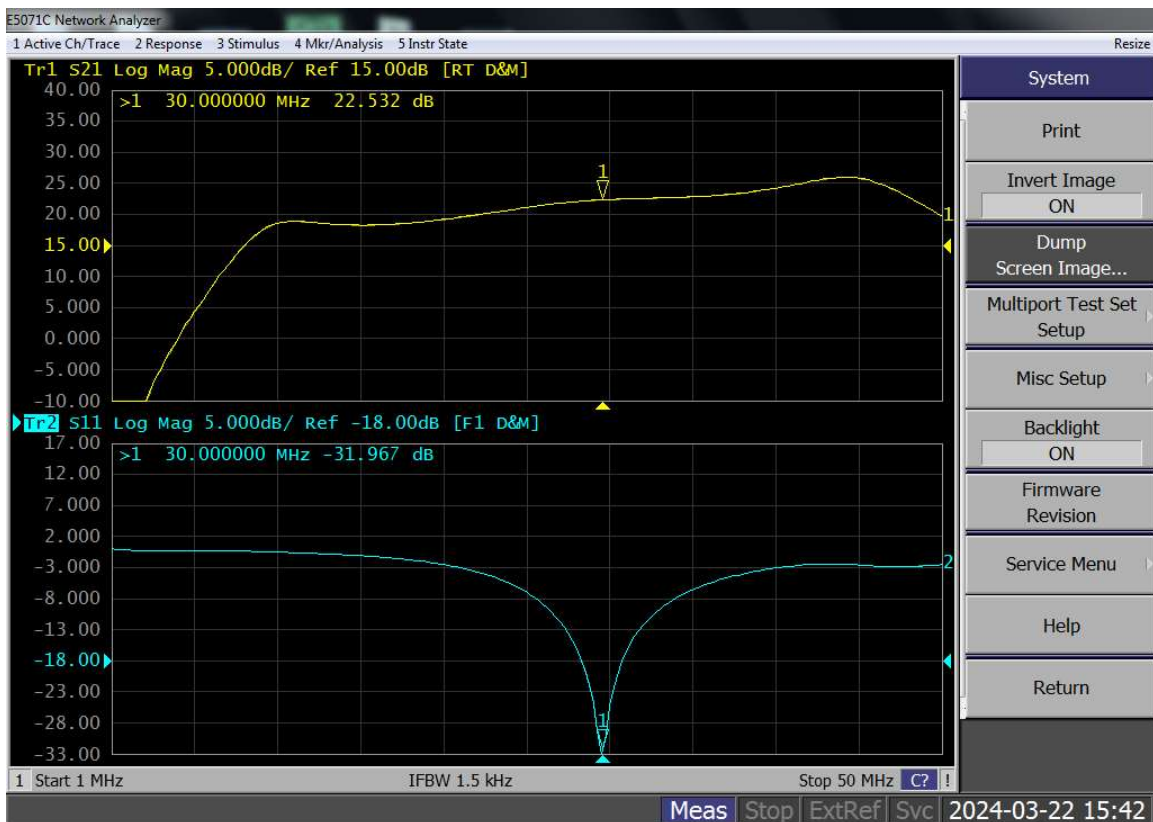


Figure 1: Network analyzer output S11/221



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Reference Circuit of Test Fixture Assembly Diagram (PCB file upon request)

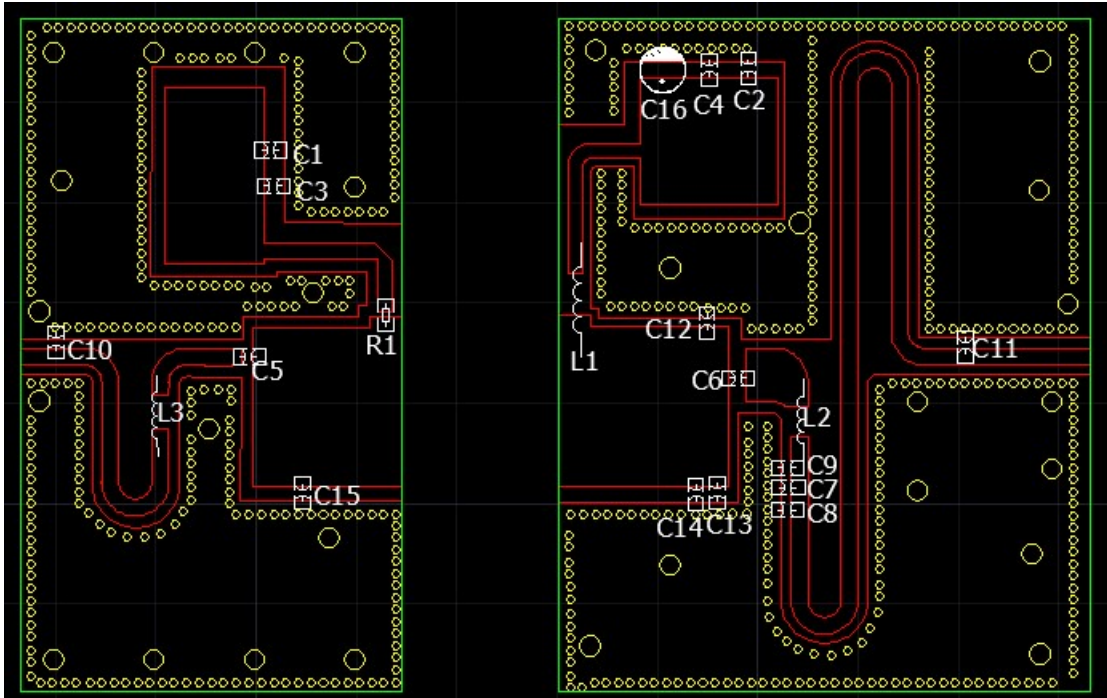
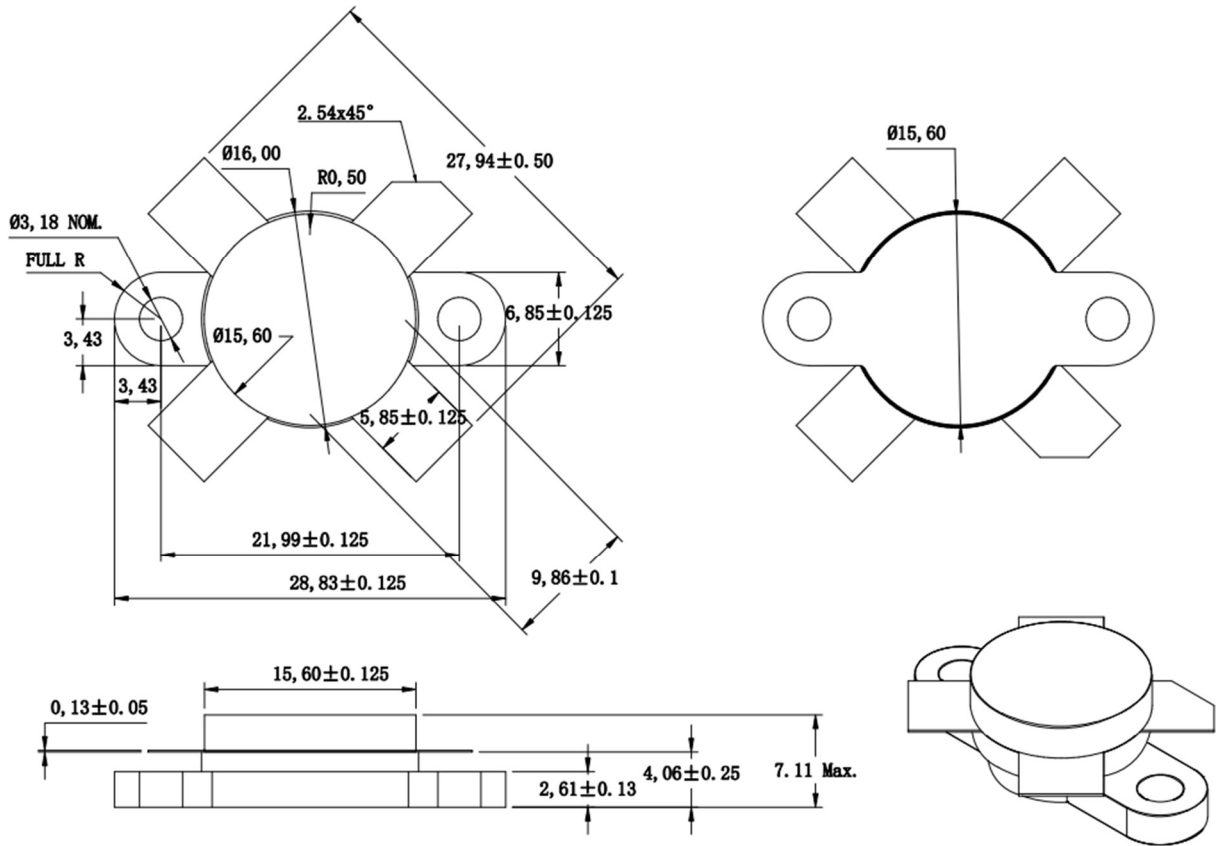


Table 1. Test Circuit Component Designations and Values (30MHz)

Component	Description	Suggested Manufacturer
C1,C2	10uF	10uF/100V
C3~C6	10nF	10nF/100V
C7	47pF	MQ101111
C8,C9,C14	100pF	MQ101111
C10	300pF	MQ101111
C11,C13	150pF	MQ101111
C12	56pF	MQ101111
C15	200pF	MQ101111
C16	4700uF/63V	Electrolytic Capacitor
R1	10 Ω	Chip Resistor
L1	d=1.5mm, D=5mm, 19 Turns	
L2	d=1.5mm, D=5mm, 5 Turns	
L3	d=1.5mm, D=5mm, 7 Turns	
PCB	30Mil Rogers4350	

Package Outline

Flanged ceramic package; 2 mounting holes; 2 leads (1—Gate, 2—Drain, 3—Source)



Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2023/12/4	Rev 1.0	Advanced datasheet generation
2024/3/25	Rev 1.0	Preliminary datasheet generation

Application data based on TC-24-16

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