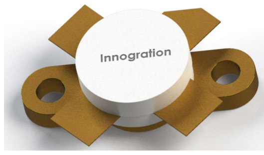
MV0530VX LDMOS TRANSISTOR

Document Number: MV0530VX
Preliminary Datasheet V3.0

300W, HF-0.5GHz 50V High Power RF LDMOS

MV0530VX



Description

The MV0530VX is a 300W single ended 50V LDMOS, unmatched for any applications within HF-0.5GHz

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 300W single ended VDMOS like SD2933/VRF2933 with improved RF performance like higher efficiency

- Typical performance(on Innogration test board with device soldered)
  Signal: CW , Vgs=3.35v,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	33.2	55.6	350	9.5	24	74	-27	-39

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	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	0.5	°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					
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 = 200 mA, Measured in Functional Test)	$V_{GS(Q)}$	——	3.4	——	V
Drain source on state resistance (Vds=0.1V, Vgs=10V)	Rds(on)		180		mΩ
Common Source Input Capacitance (V_{GS} = 0V, V_{DS} =50 V, f = 1 MHz)	C_{ISS}		220		pF
Common Source Output Capacitance (V_{GS} = 0V, V_{DS} =50 V, f = 1 MHz)	C_{OSS}		65		pF
Common Source Feedback Capacitance (V_{GS} = 0V, V_{DS} =50 V, f = 1 MHz)	C_{RSS}		1.5		pF

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

Load 20:1 All phase angles, at 350W Pulsed CW Output Power	No Device Degradation

TYPICAL CHARACTERISTICS

Figure 1: CW Gain and Power Efficiency as a Function of Pout at 30MHz

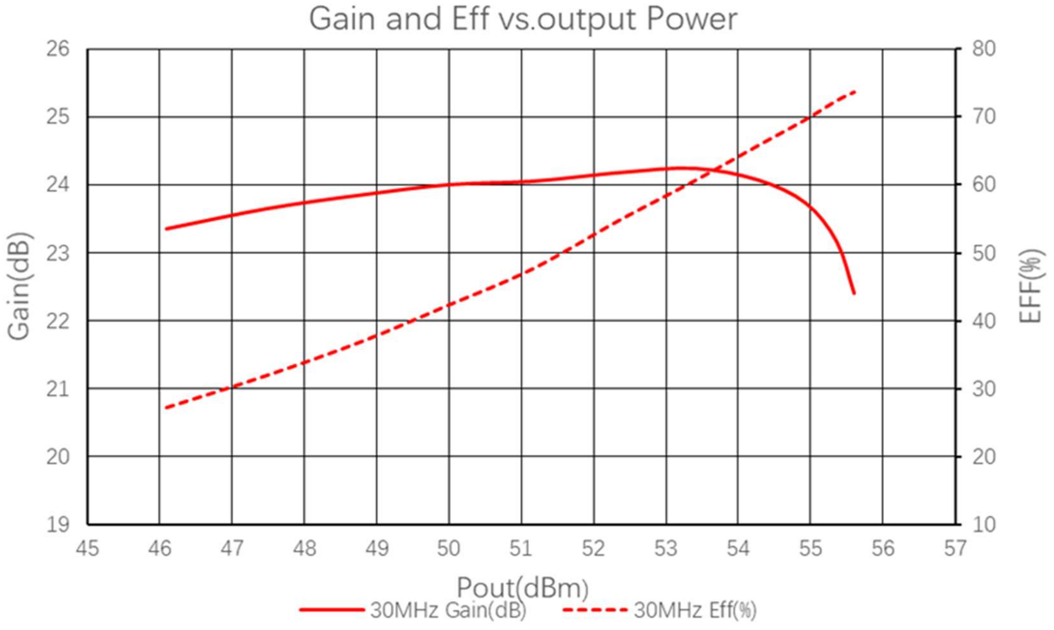
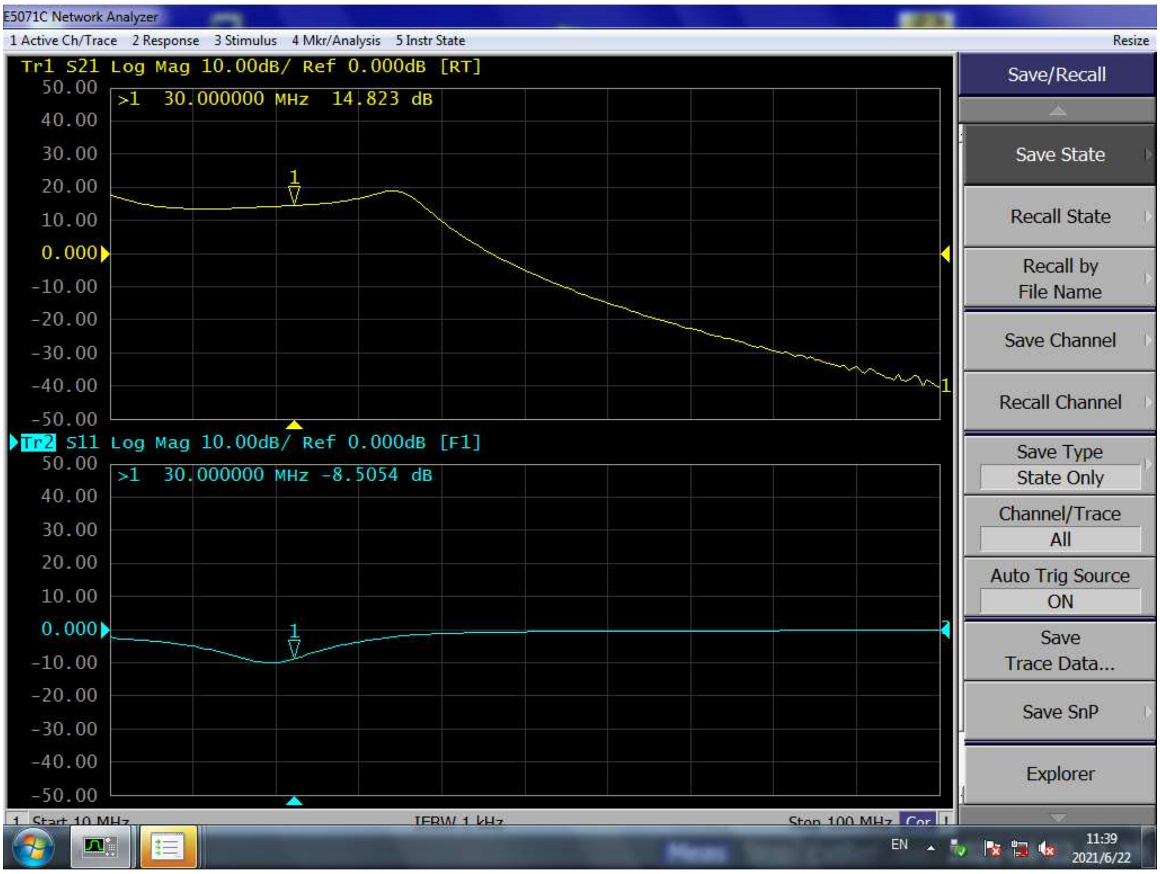


Figure 1: Network analyzer output S11/221



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

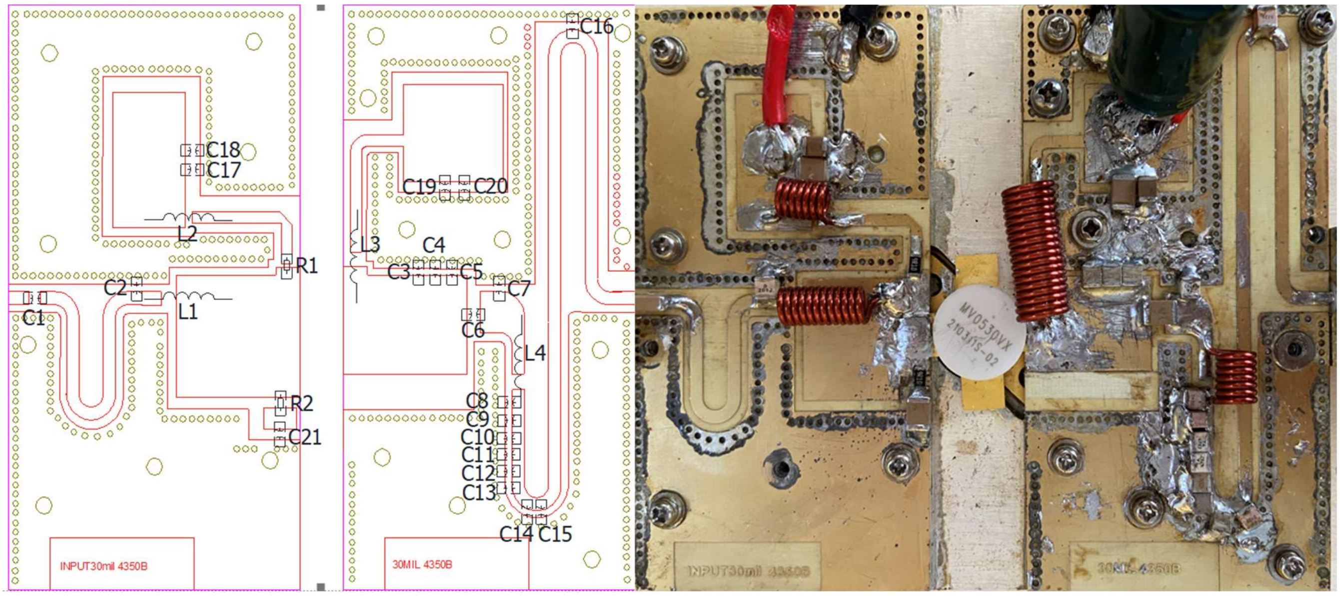
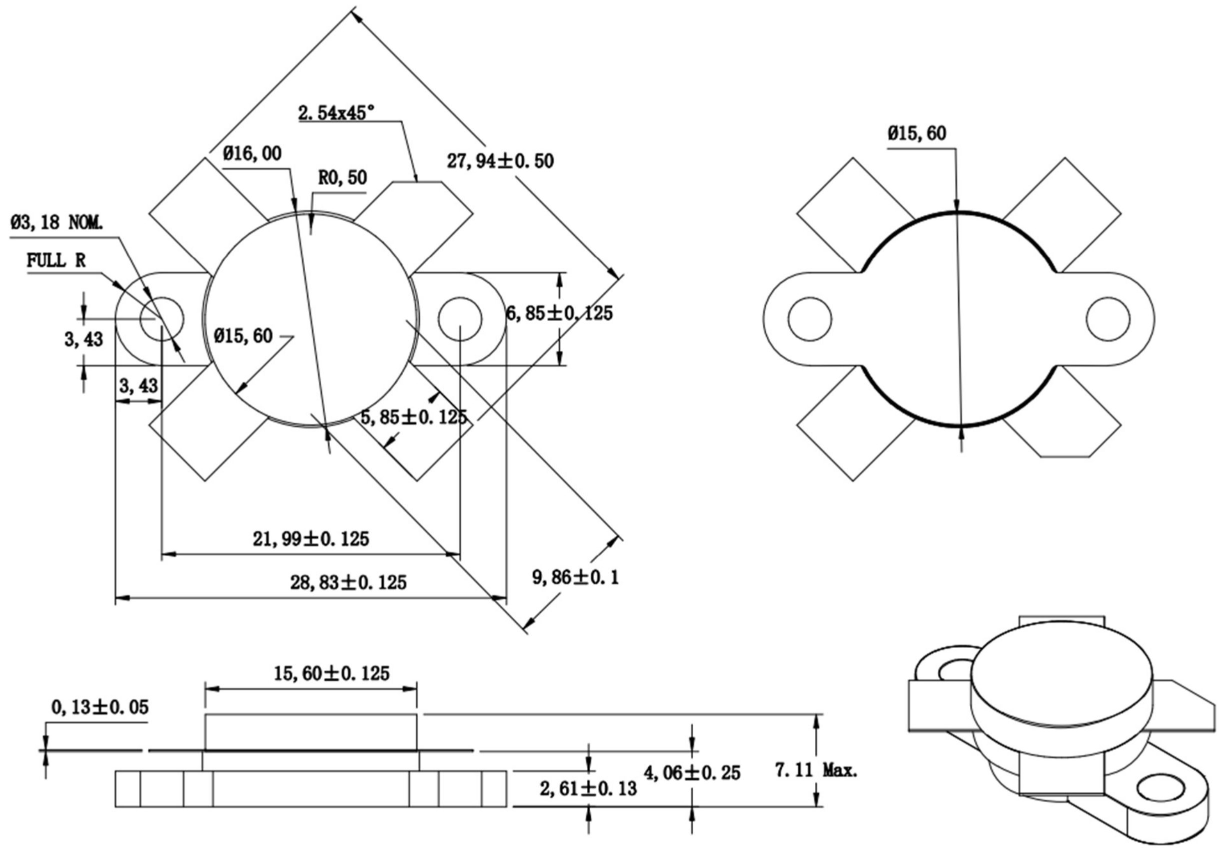


Table 1. Test Circuit Component Designations and Values (30MHz)

Component	Description	Suggestion
C1,C6,C17,C19,C21	10nF	CC1812KKX7RDBB103
C2	200pF	ATC800B
C3,C4,C14	68pF	ATC800B
C5,C12	100pF	ATC800B
C7,C10,C11,C13	47pF	DLC70B
C8	24pF	DLC70B
C9,C16	22pF	DLC70B
C15	12pF	DLC70B
C18,C20	10uF	10uF/50V
R1,R2	Chip Resistor,10ohm	1206
L1	12 turns, Inside diameter 3mm	
L2	7 turns, Inside diameter 3mm	
T2,T3	18 turns, Inside diameter 5mm	
T4,T5	7 turns, Inside diameter 3mm	

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
2021/6/22	Rev 1.0	Preliminary datasheet
2022/5/24	Rev 1.1	Modification of V4E package picture and drawing
2023/11/21	Rev 2.0	Modify drawing of extended leads length
2023/12/4	Rev 3.0	Finalized by changing to V4E1 package

Application data based on ZL-21-15

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