

MU0531VX LDMOS TRANSISTOR

Document Number: MU0531VX
Preliminary Datasheet V1.0

325W, 50V High Power RF LDMOS FETs

Description

The MU0531VX is a 325-watt capable, high performance, unmatched LDMOS FET, designed for wide-band commercial and industrial applications with frequencies HF to 0.5 GHz.

It is featured for high power and high ruggedness, suitable for Industrial, Scientific and Medical application, as well as FM radio, VHF TV applications.

MU0531VX



- Typical broadband RF performance(on Innogration **VLMS** test board with device soldered)

Signal: Pulsed CW 100us, 10%, Vgs=3.38v, Vds=50v, Idq=200mA, **No Balun used**

Freq(MHz)	Pin(dBm)	Pout(dBm)	Pout(W)	IDS(A)	Gain(dB)	Eff(%)	2 nd	3 rd
150	42	54.9	309.03	1.47	12.9	48.67	-12.5	-10.6
200	42.04	56.41	437.52	1.55	14.37	64.82	-20.5	-12.3
250	42.06	55.81	381.07	1.39	13.75	64.04	-18.6	-12.0
300	42.07	56.17	414.00	1.72	14.1	54.47	-13.5	-16.8
350	42.09	55.96	394.46	1.87	13.87	47.24	-19.8	-15.3
400	42.1	55.73	374.11	1.6	13.63	53.44	-16.2	-50.0
450	42.22	55.73	374.11	1.63	13.51	52.32	-26.6	-55.0
500	42.23	55.89	388.15	1.74	13.66	50.41	-26.0	-55.0
550	42.24	55.55	358.92	1.44	13.31	57.89	-19.2	-55.0

When used at 28V, it can deliver >120W CW within full band 200-550MHz

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}	-9 to +11	Vdc
Operating Voltage	V _{DO}	+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

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Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case $T_C = 25^\circ\text{C}$, $T_J = 200^\circ\text{C}$, DC test	$R_{\theta JC}$	0.44	$^\circ\text{C/W}$
Transient thermal impedance from junction to case , $T_J = 150^\circ\text{C}$; $t_p = 100\text{ us}$; Duty cycle = 10 %	Z_{th}	0.12	$^\circ\text{C/W}$

Table 3. ESD Protection Characteristics

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
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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_{DSS}	—	—	1	μA
Zero Gate Voltage Drain Leakage Current ($V_{DS} = 50\text{V}$, $V_{GS} = 0\text{V}$)	I_{DSS}	—	—	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 ($V_{DS} = 0.1\text{V}$, $V_{GS} = 10\text{V}$)	$R_{DS(on)}$		165		$\text{m}\Omega$
Common Source Input Capacitance ($V_{GS} = 0\text{V}$, $V_{DS} = 50\text{V}$, $f = 1\text{ MHz}$)	C_{ISS}		295		pF
Common Source Output Capacitance ($V_{GS} = 0\text{V}$, $V_{DS} = 50\text{V}$, $f = 1\text{ MHz}$)	C_{OSS}		75		pF
Common Source Feedback Capacitance ($V_{GS} = 0\text{V}$, $V_{DS} = 50\text{V}$, $f = 1\text{ MHz}$)	C_{RSS}		1.3		pF

Load Mismatch (In Innogration Test Fixture, 50 ohm system): $V_{DD} = 50\text{ Vdc}$, $I_{DQ} = 200\text{ mA}$, $f = 160\text{MHz}$, pulse width:100us, duty cycle:10%

Load 20:1 All phase angles, at 325W Pulsed CW Output Power	No Device Degradation
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150-550MHz

Reference Circuit of Test Fixture Assembly Diagram

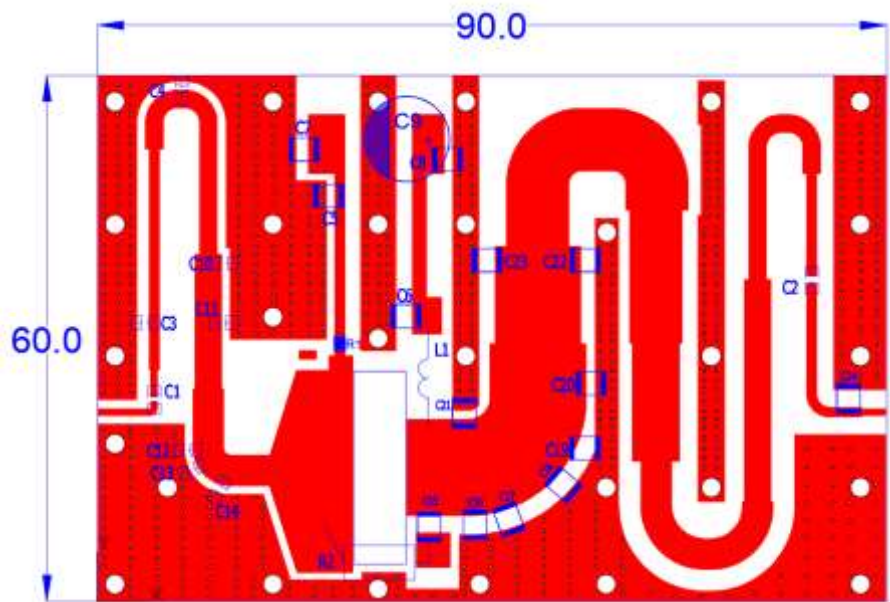


Table 5. Test Circuit Component Designations and Values

Component	Description	Suggested Manufacturer
C1	100pF/MQ300805	
C2	200pF/ MQ301111	
C9	470uF	
C7,C8	10uF	
C5, C6	10nF	
C16	1000pF/ MQ301111	
C3	3pF/ MQ300805	
C4	2pF/ MQ300805	
C10	5.6pF/ MQ300805	
C11, C12	12pF/ MQ300805	
C13, C14	10pF/ MQ300805	
C16, C21	15pF/ MQ301111	
C17	6.8pF/ MQ301111	
C18, C20	8.2pF/ MQ301111	
C19,C22	12pF/ MQ301111	
C23	10pF/ MQ301111	
C24	1pF/ MQ301111	
L1	1.5mm,Half turns, diameter :8mm	DIY air core inductance
R2	330,ohm	---
R1	10,ohm/1206	Chip Resistor
PCB	F4BTMS1000 ,r=10.2 ,30 mil	

Package Outline

Flanged ceramic package; 2 leads

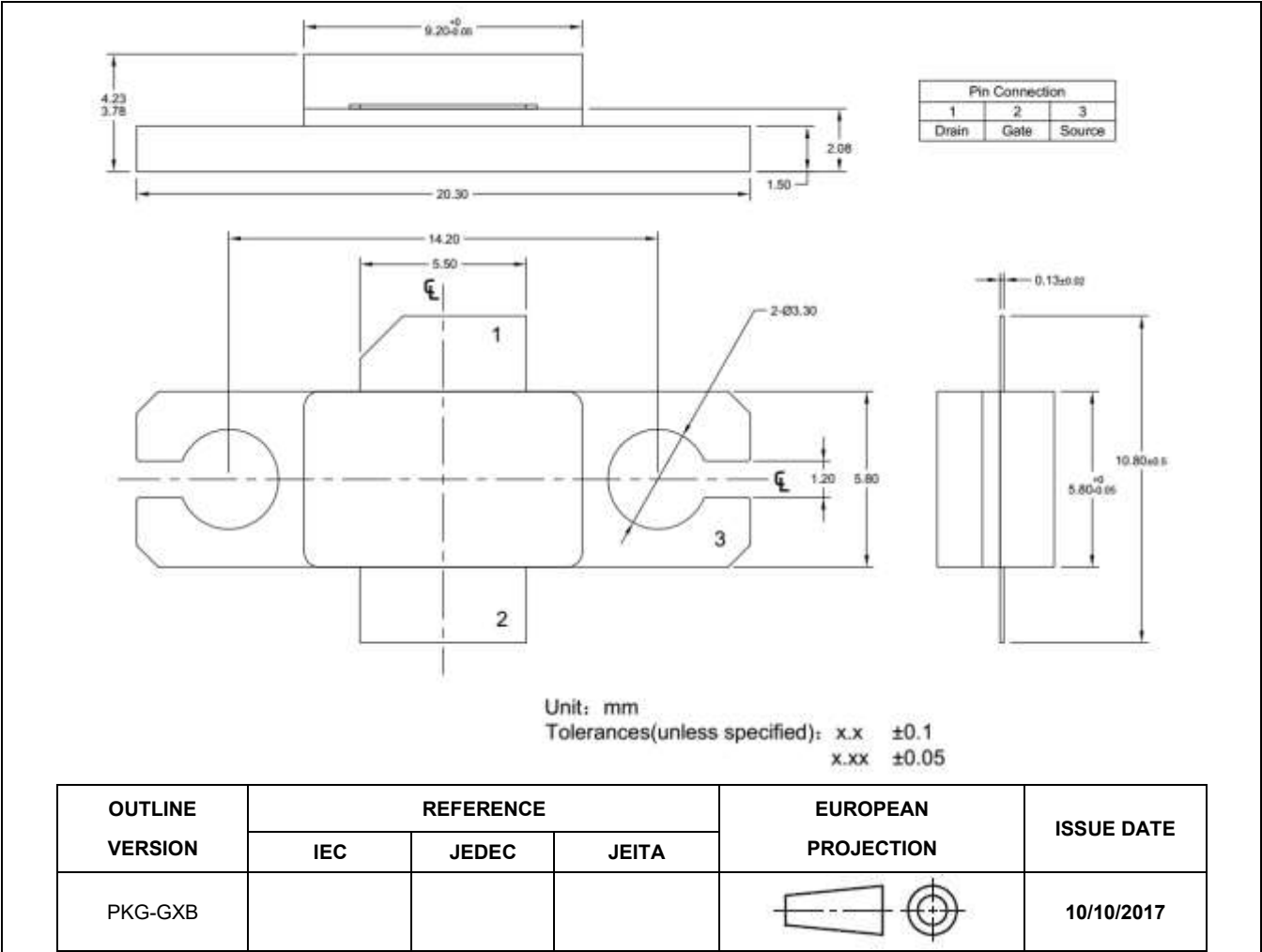


Figure 1. Package Outline PKG-G2E

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2026/9/9	Rev 1.0	Preliminary Datasheet Creation

Application data based on YHG-26-33

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