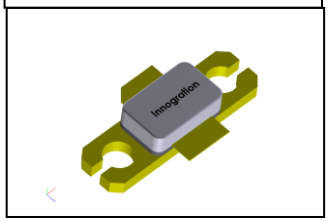
M2U0508RV LDMOS TRANSISTOR

Document Number: M2U0508RV
Preliminary Datasheet V1.1

700MHz, 80W, 50V High Power RF LDMOS FETs

M2U0508RV



Description

The M2U0508RV is a 80-watt P1dB, highly rugged, input matched LDMOS FET, designed for wide-band commercial and industrial applications at frequencies HF to 700MHz.

It is the ruggedness and stability enhancement of M2U1508V at lower band

It can support pulsed, CW or any modulated signal in form of linear or saturated operations.

•Typical Performance (On Innogration narrow band fixtures with device soldered):

V_{ds}= 50V, V_{gs}=3.55V,I_{dq}=200mA						
Freq(MHz)	**Test signal**	**Pin(dBm)**	**Power Gain(dB)**	**Pout(dBm)**	**Pout(W)**	**Eff(%)**
108	**CW**	**23.5**	**26**	**49.5**	**90**	**71**

•Typical Performance of 2pcs in form of push pull (On Innogration broadband band fixtures with device soldered):

V_{ds}= 50V, V_{gs}=3.3V,I_{dq}=200mA						
Freq(MHz)	**Test signal**	**Pin(dBm)**	**Power Gain(dB)**	**Pout(dBm)**	**Pout(W)**	**Eff(%)**
80-1000	**Pulsed CW**	**39.5-40.5**	**12-13**	**52.1-53**	**160-200**	**40**

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

- 2-30MHz (HF or Short wave communication)
- 30-88MHz (Ground communication)
- 54-88MHz (TV VHF I)
- 88-108MHz (FM)
- 118 -140MHz (Avionics)
- 136-174MHz (Commercial ground communication)
- 160-230MHz (TV VHF III)
- 30-512MHz (Jammer, Ground/Air communication)
- 470-860MHz (TV UHF)
- 100kHz - 1000MHz (ISM, instrumentation)

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	125	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	$R_{\theta JC}$	1.5	°C/W

Table 3. ESD Protection Characteristics

Test Methodology	Class

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

Table 4. Electrical Characteristics (TA = 25 ℃ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics					
Drain-Source Voltage V_{GS}=0, I_{DS}=1.0mA	$V_{(BR)DSS}$		125		V
Zero Gate Voltage Drain Leakage Current (V_{DS} = 50V, 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)	$V_{GS(th)}$	——	2.73	——	V
Gate Quiescent Voltage (V_{DD} = 50 V, I_D = 350-mA, Measured in Functional Test)	$V_{GS(Q)}$	——	3.55	——	V
Common Source Input Capacitance (V_{GS} = 0V, V_{DS} =50 V, f = 1 MHz)	C_{ISS}		57		pF
Common Source Output Capacitance (V_{GS} = 0V, V_{DS} =50 V, f = 1 MHz)	C_{OSS}		24		pF
Common Source Feedback Capacitance (V_{GS} = 0V, V_{DS} =50 V, f = 1 MHz)	C_{RSS}		0.75		pF

108MHz

TYPICAL CHARACTERISTICS

Figure 2: Network analyzer output S11/S21

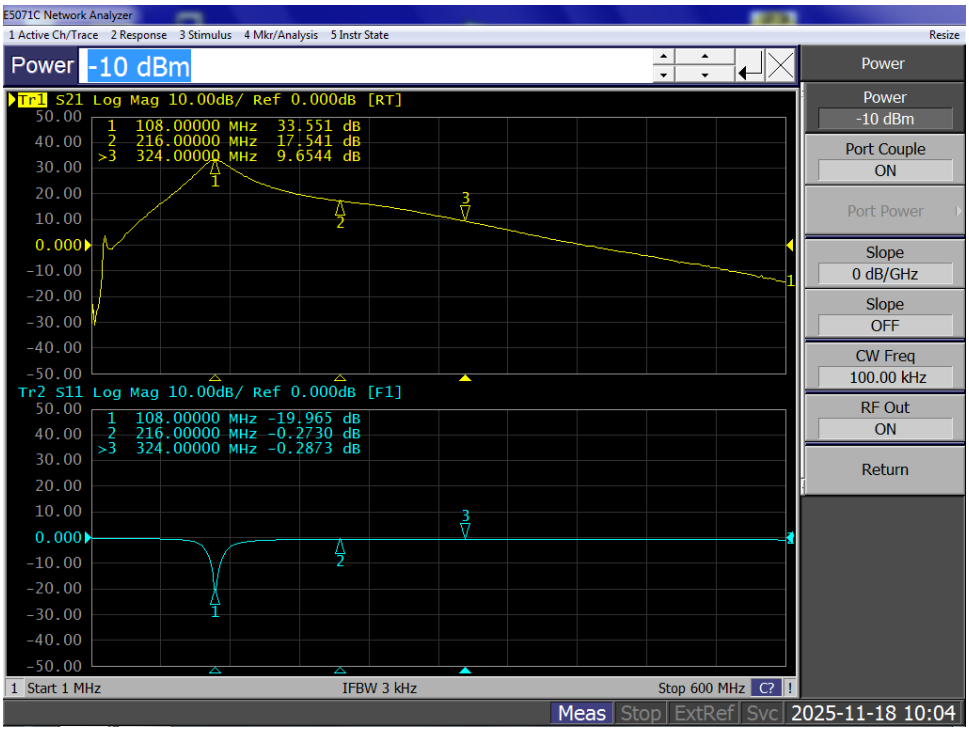
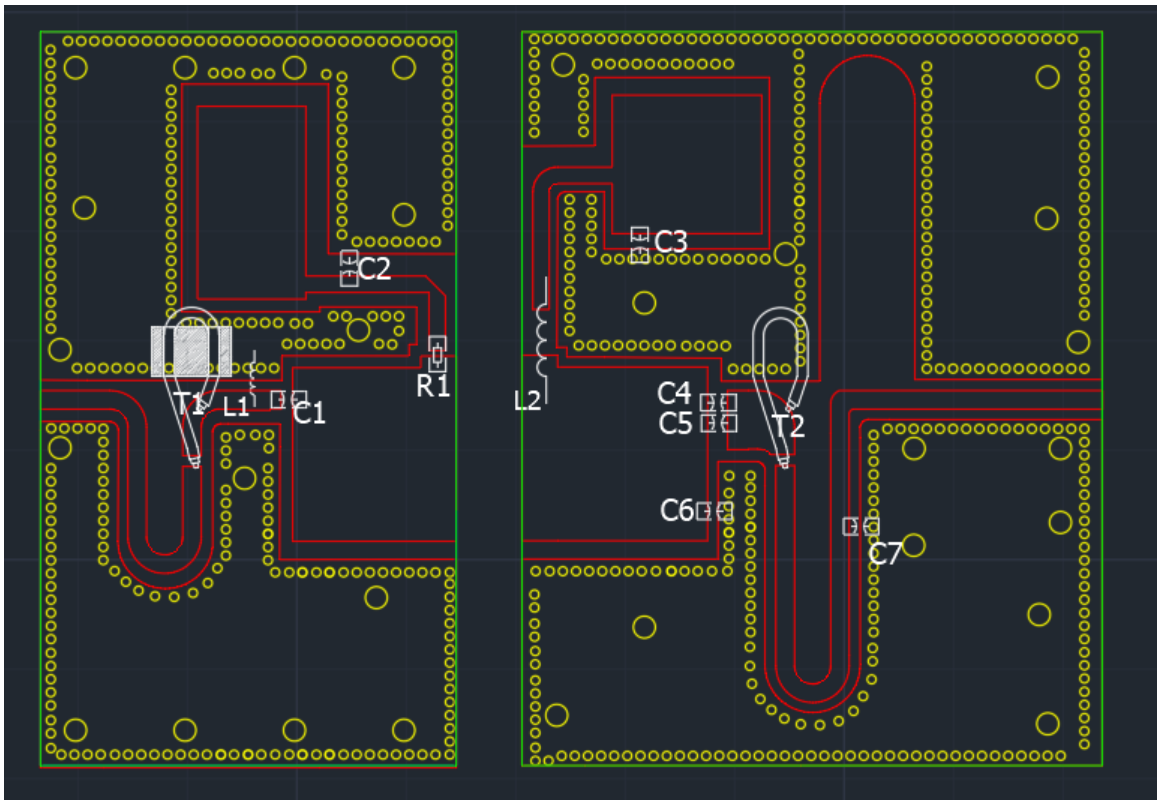


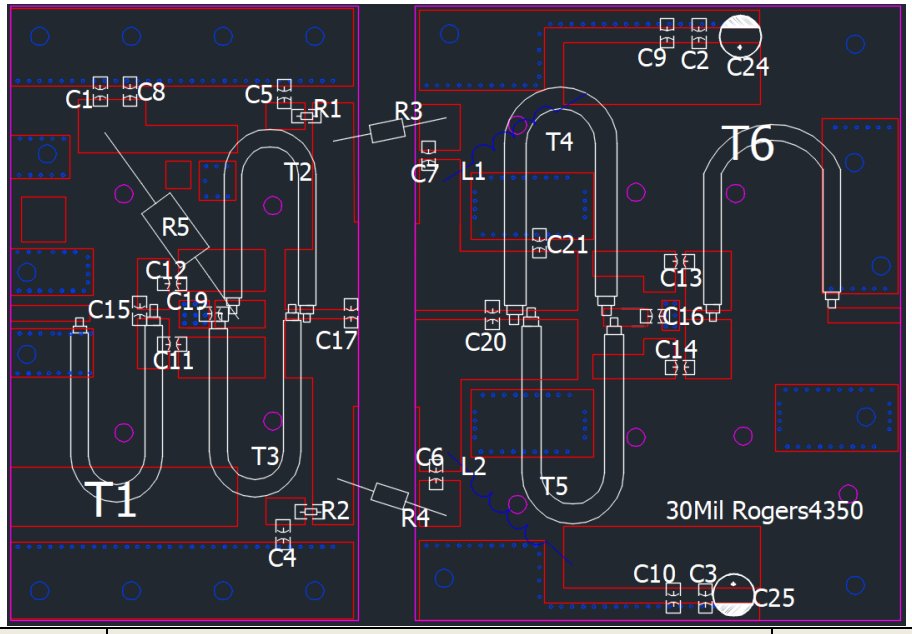
Figure 3. Test Circuit Component Layout (PCB Roger 4350B 30Mil, PCB file upon request)



Component	Description	Suggestion
C1	220pF/MQ301111	
C2,C3	10uF/1210	/
C4,C5	560pF/MQ101111	/
C6	39PF/MQ101111	
C7	2.2pF/MQ101111	
R1	360 Ω	1206
T1	25 Ohm,50mm	SFF-25-1.5/BN-61-202
T2	50 Ohm,100mm	RFSFBU-86-50
L1	0.8mm wire,4turns, ϕ=3mm	DIY
L2	0.8mm wire,9turns, ϕ=3mm	DIY
D2	25 Ohm,25mm/FB-61-2501	SFF-25-1.5
T1	25 Ohm,31mm	SFF-25-1.5
T2	25 Ohm,24mm	SFF-25-1.5
L1	0.8mm wire,13turns, ϕ=3mm	DIY

80-1000MHz 2 pcs Balun configuration

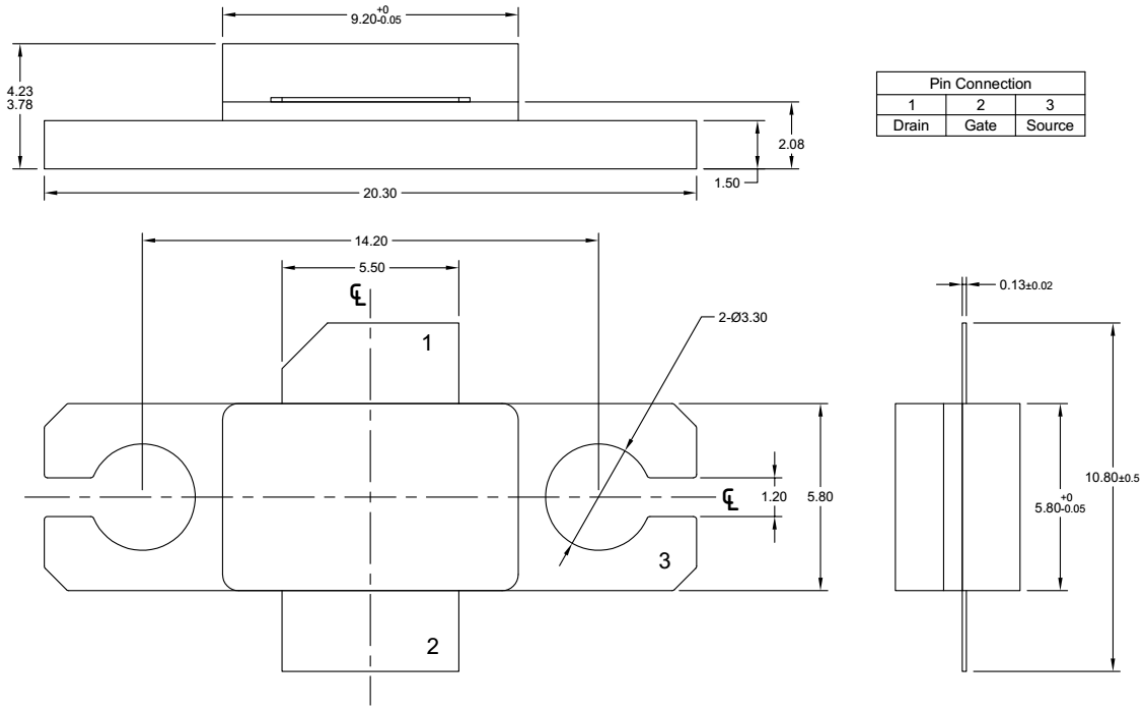
TYPICAL CHARACTERISTICS



Component	Description	Suggestion
C1~C3,	10uF 1210	/
C4~C7,C9,C10	1000pF MQ301111	
C11,C12	120pF*2 MQ300805	
C8,C13,C14	10nF 1210	
C15	1.3pF MQ300805	
C16,C19	560pF MQ301111	
C17	6.8pF MQ301111	
C20	5.6pF MQ301111	
C24,C25	470Uf/63V	
L1,L2	1.5mm wire, 5Turns , 5mm inner diameter,	
R1,R2	18Ω 1206	
R3,R4	300Ω/2W	
R5	300Ω/0.25W	
T1	50 ohm，60mm, NX0-60	RFSFBU-086-50
T2,T3	16.7 ohm，450mm	SFF-16.7-1.5
T4,T5	25 ohm，60mm, NX0-60	SFF-25-1.5
T6	50ohm ，55mm, NXO-60	RFSFBU-086-50

Package Outline

Flanged ceramic package; 2 leads



OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-GXB					10/10/2017

Figure 1. Package Outline PKG-G2E

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2025/11/22	V1.0	Preliminary Datasheet Creation
2026/5/7	V1.1	Add 80-1000M 2 pcs balun application data, to be rugged backup of MX1512VP

Application data based on SYX-25-53/26-24

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