

M2K1025RVP LDMOS TRANSISTOR

Document Number: M2K1025RVP
Preliminary Datasheet V1.0

170W, 28V High Power RF LDMOS FETs

Description

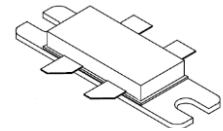
The M2K1025RVP is a 170-watt capable, high performance, unmatched push pull LDMOS FET, for wide-band commercial and industrial applications with frequencies HF to 1GHz.

It can be used for both CW and pulse application or any other modulation signal.

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

In typical multi-octave broadband application like 1-400M,20-1000MHz, it can deliver 100W CW

M2K1025RVP



- Typical Performance at 28V (On Innogration 20MHz-1GHz wideband fixture with device soldered):

M2K1025RVP $V_{DD}=28V$ $V_{gs}=3.37V$ $I_{dq}=300mA$ CW							Harmonic	
F (MHz)	Pin (dBm)	Pout (dBm)	Pout (W)	Ids (A)	Gain (dB)	Eff (%)	2 nd	3 rd
20	38	50.9	123.0	7.2	12.9	61.0	-23	-10.8
50	37.8	51.85	153.1	8.15	14.05	67.1	-20.2	-10.2
100	38	52.58	181.1	9.45	14.58	68.5	-24.9	-11.5
200	37.6	52.6	182.0	10.3	15	63.1	-31.6	-10.2
300	38	52.58	181.1	10.62	14.58	60.9	-27.8	-10
400	37.5	52.2	166.0	10.8	14.7	54.9	-28.7	-14
500	37.8	51.65	146.2	11.37	13.85	45.9	-38.8	-27.6
600	38	51.23	132.7	10	13.23	47.4	-41.8	-43.6
700	38	50.83	121.1	8.76	12.83	49.4	-51.3	-43.5
800	38.6	51.16	130.6	9	12.56	51.8	-62	-45.4
900	39	51.1	128.8	9.33	12.1	49.3	-65.6	-41.7
1000	40	50.74	118.6	9	10.74	47.1	-66.3	-41.2

- Typical Performance at 28V (On Innogration 1MHz-400MHz wideband fixture with device soldered):

M2K1025RVPS $V_{DD}=28V$ $V_{gs}=3.37V$ $I_{dq}=200mA$ CW							Harmonic	
F (MHz)	Pin (dBm)	Psat (dBm)	Psat (W)	I (A)	Gain (dB)	Eff (%)	2 nd	3 th
1	33.04	52.14	163.7	8.72	19.1	67.0	-45	-9.5
5	33	52	158.5	7.84	19	72.2	-28	-10.2
10	32.64	52.04	160.0	7.74	19.4	73.8	-28.2	-10.5
50	33.39	52.19	165.6	8	18.8	73.9	-35.2	-10.4
100	33.66	51.76	150.0	7.64	18.1	70.1	-41.2	-12.1
200	33.36	51.46	140.0	8.08	18.1	61.9	-41.4	-12.8
300	34	50.32	107.6	7.7	16.32	49.9	-32.2	-11.8
400	34	50.33	107.9	7.74	16.33	49.8	-60	-16.3

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Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Excellent thermal stability, low HCI dri
- 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)
- 30-512MHz (ultra shortwave 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)
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Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	+105	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+36	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 $T_c=85^{\circ}\text{C}$, $T_J=200^{\circ}\text{C}$, DC test	$R_{\theta JC}$	0.19	°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 $V_{GS}=0$, $I_{DS}=1.0\text{mA}$	$V_{(BR)DSS}$	105			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 ($V_{DS} = 28\text{V}$, $V_{GS} = 0\text{V}$)	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 ($V_{DS} = 28\text{V}$, $I_D = 800\mu\text{A}$)	$V_{GS(th)}$	—	2.2	—	V
Gate Quiescent Voltage ($V_{DD} = 28\text{V}$, $I_D = 500\text{mA}$, Measured in Functional Test)	$V_{GS(Q)}$	—	3.45	—	V

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20-1000MHz

Reference Circuit of Test Fixture Assembly Diagram (Layout file upon request, 30mil RO4350)

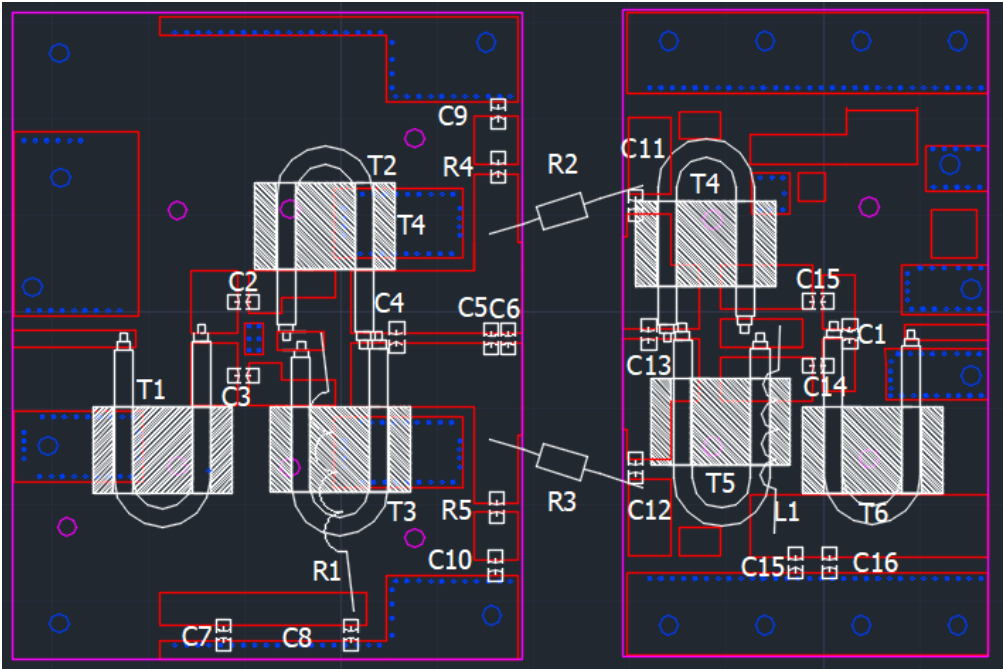


Table 5. Test Circuit Component Designations and Values

Component	Description	Suggestion
C7,C9,C10,C16	10uF 1210	/
C2,C3	2*200pF MQ300805	
C4	6.2pF MQ301111	
C8,C11,C12,C15	10nF 1210	
C5	5.6pF MQ301111	
C6	12pF MQ301111	
C13	15pF MQ301111	
C14,C15	2*470pF MQ301111	
L1	1.5mm wire, 9Turns , 5mm inner diameter,	/
R4,R5	10Ω 2512	/
R3,R2	180 Ω/3W	/
R1	300 Ω/2W	/
T1	50 ohm, 55mm, BN-61-1502	RFSFBU-086-50
T2,T3	16.7 ohm, 50mm, BN-61-1502	SFF-16.7-1.5
T4,T5	16.7 ohm, 50mm, BN-61-202	SFF-12.5-1.5
T6	50ohm , 50mm, ,BN-61-202	RFSFBU-086-50

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1-400MHz

Reference Circuit of Test Fixture Assembly Diagram
(Layout file upon request, 30mil RO4350)

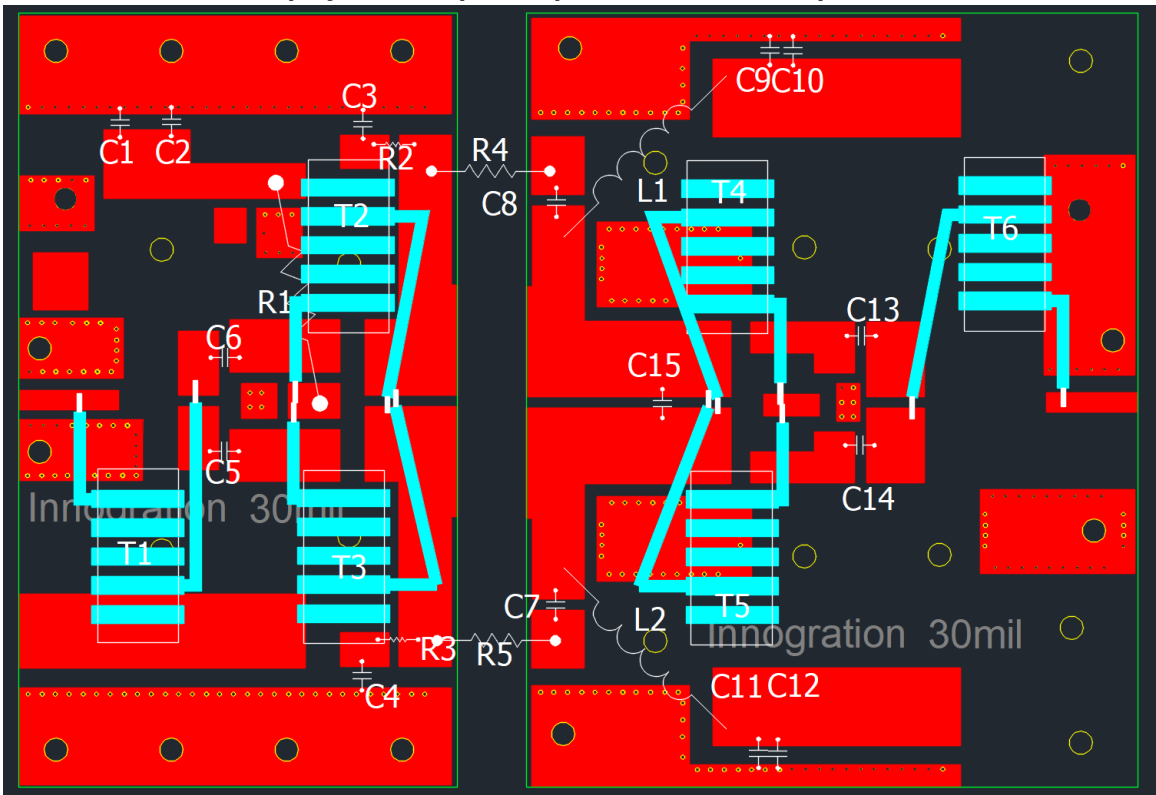


Table 6. Test Circuit Component Designations and Values

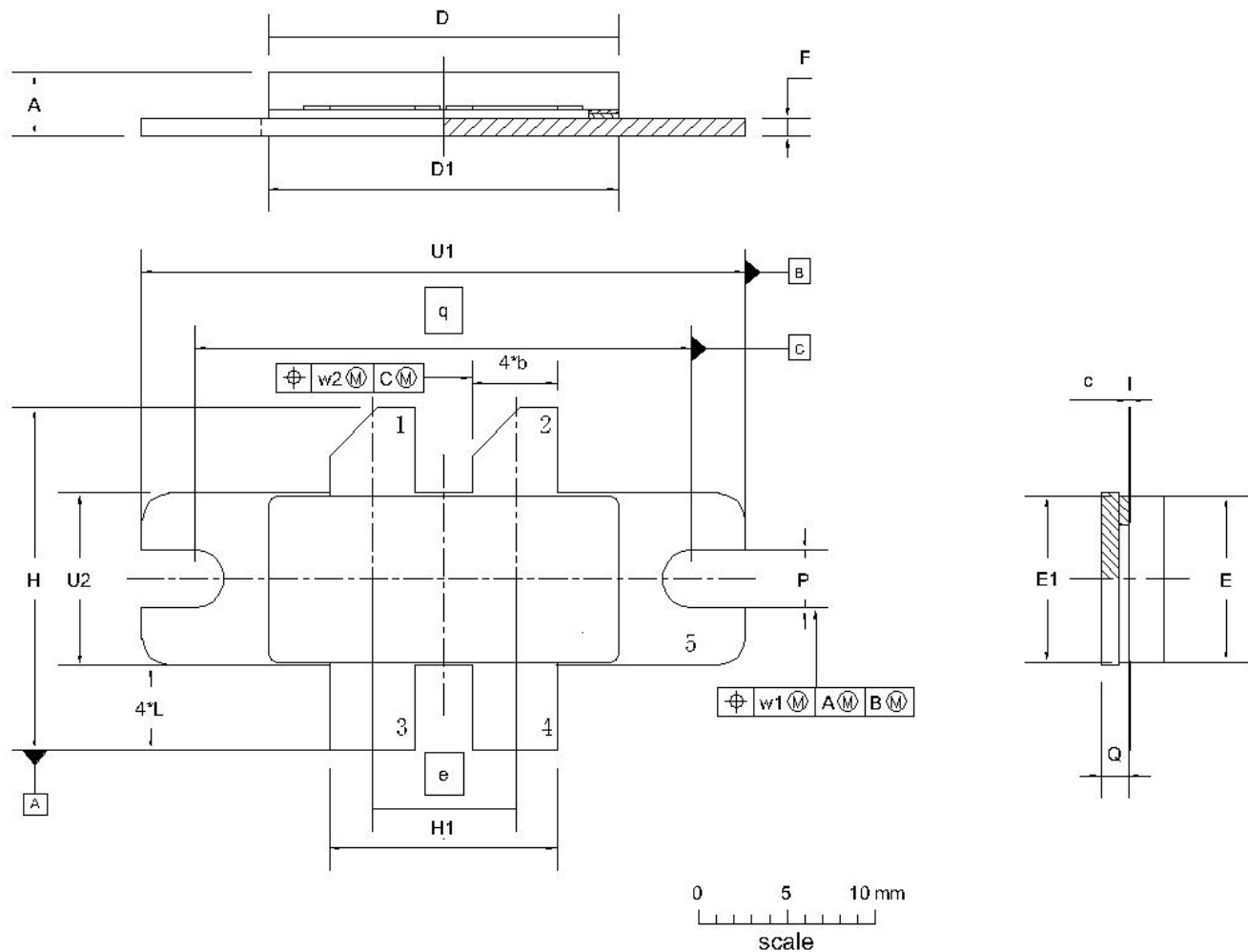
Component	Description	Suggestion
C1,C3,C4,10,C12	10uF/1210	Ceramic Multilayer Capacitor
C2,C5,C6,C9, C11,C13,C14	2.2uF/1812	Ceramic Multilayer Capacitor
C15	15pF/ MQ301111	
C7, C8	1000pF/ .MQ301111	
T1	50ohm 800mm	SFRFBU-086-50 NXO-200
T2,T3	25ohm 460mm	SFF-25-1.5 NXO-200
T4,T5	25ohm 550mm	SFF-25-1.5 NXO-200
T6	50ohm 800mm	SFRFBU-086-50 NXO-200
L1,L2	φ 1mm 19turns T-68-2	DIY
R1	300 Ω /0.25W	Pulg-in Resistor
R2,R3	50 Ω /1206	Chip Resistor
R4,R5	240 Ω /0.5W	TYT RFT-200

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Package Outline

Flanged ceramic package; 2 mounting holes; 4 leads



UNIT	A	b	c	D	D ₁	e	E	E ₁	F	H	H ₁	L	p	Q	q	U ₁	U ₂	W ₁	W ₂
mm	4.72	3.94	0.15	20.02	19.96	8.89	9.50	9.53	1.14	19.94	12.83	5.33	3.38	1.70	27.94	34.16	9.91	0.25	0.51
	3.43	3.68	0.08	19.61	19.66		9.30	9.25	0.89	18.92	12.57	4.32	3.12	1.45		33.91	9.65		
inches	0.186	0.155	0.006	0.788	0.786	0.35	0.374	0.375	0.045	0.785	0.505	0.210	0.133	0.067	1.100	1.345	0.390	0.01	0.02
	0.135	0.145	0.003	0.772	0.774		0.366	0.364	0.035	0.745	0.495	0.170	0.123	0.057		1.335	0.380		

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-B4E					03/12/2013

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2025/3/11	Rev 1.0	Preliminary Datasheet

Application data based on SYX-25-08/11

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