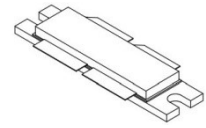


MQ0523R LDMOS TRANSISTOR

Document Number: MQ0523R
Preliminary Datasheet V1.0

230W, 28V High Power RF LDMOS FETs

MQ0523R



Description

The MQ0523R is a 230-watt capable, high performance, unmatched push pull LDMOS FET, for wide-band commercial and industrial applications with frequencies HF to 1000MHz.

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.

It is the performance enhancement of MK0520/MK0525 with similar power capability, with higher efficiency and lower Rth

- Typical Performance at 28V (On Innogration 30-512MHz wideband fixture with device soldered):

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
30	50.76	119.2	57.8	22.3	52	158.6	67.5
60	51.8	151.4	67.3	22.23	52.75	188.3	74.6
100	52.12	162.9	64.8	21.49	52.99	199.2	70.6
150	52.48	176.8	60.1	20.27	53.44	220.6	65.6
200	52.44	175.2	59.6	19.75	53.32	214.7	64.1
250	52.44	175.4	60.8	19.53	53.25	211.6	64.3
300	52.4	173.8	59.4	19.07	53.29	213.2	63.0
350	52.43	175.1	59.0	18.65	53.44	220.6	63.1
400	52.37	172.5	59.3	18.17	53.38	217.8	63.2
450	52.2	166.1	58.8	17.45	53.25	211.3	63.0
500	51.18	131.1	57.3	16.72	52.39	173.5	62.4
512	50.81	120.4	56.5	16.53	52.02	159.4	61.3

32V data upon request

Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Excellent thermal stability, low HCl 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)
-

Table 1. Maximum Ratings

MQ0523R LDMOS TRANSISTOR

Document Number: MQ0523R
Preliminary Datasheet V1.0

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	+95	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+40	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	$R_{\theta JC}$	0.2	°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 $V_{GS} = 0$, $I_{DS} = 1.0\text{mA}$	$V_{(BR)DSS}$	95			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 ($V_{DD} = 28\text{V}$, $I_D = 800\text{mA}$, Measured in Functional Test)	$V_{GS(Q)}$	—	3.1	—	V
Common Source Input Capacitance ($V_{GS} = 0\text{V}$, $V_{DS} = 28\text{V}$, $f = 1\text{MHz}$)	C_{ISS}		110		pF
Common Source Output Capacitance ($V_{GS} = 0\text{V}$, $V_{DS} = 28\text{V}$, $f = 1\text{MHz}$)	C_{OSS}		45		pF
Common Source Feedback Capacitance ($V_{GS} = 0\text{V}$, $V_{DS} = 28\text{V}$, $f = 1\text{MHz}$)	C_{RSS}		2		pF

TYPICAL CHARACTERISTICS

Figure 1: Network analyzer output S11/S21 at 28V Idq=450mA



MQ0523R LDMOS TRANSISTOR

Document Number: MQ0523R
Preliminary Datasheet V1.0

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

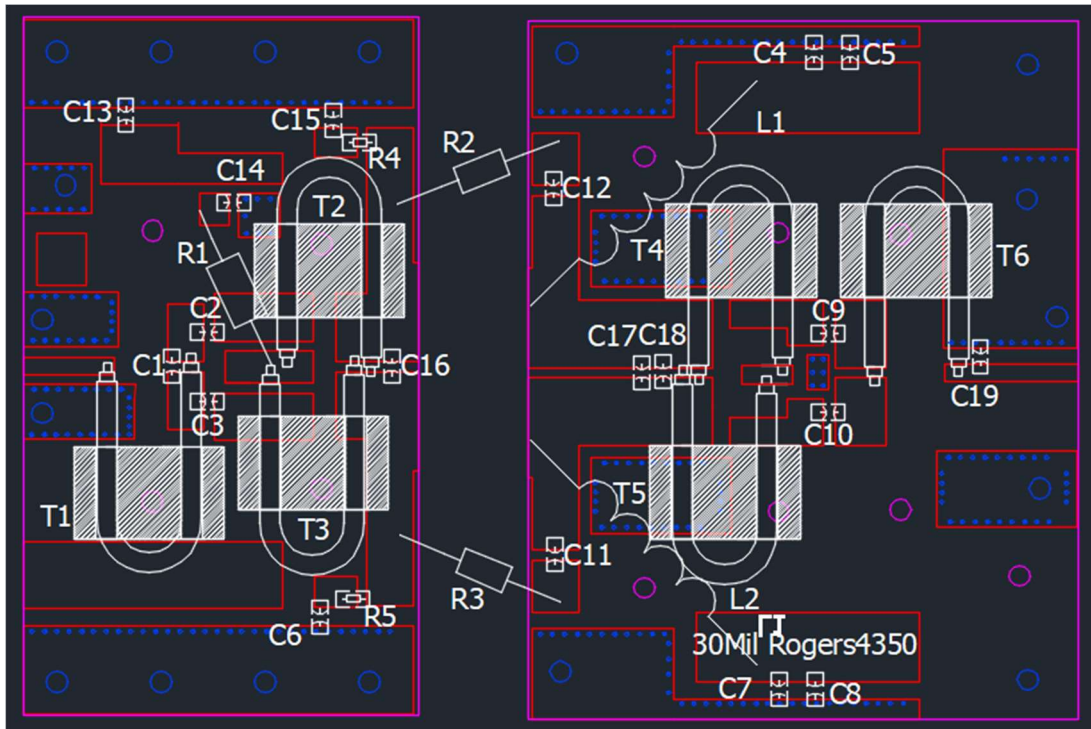


Table 5. Test Circuit Component Designations and Values

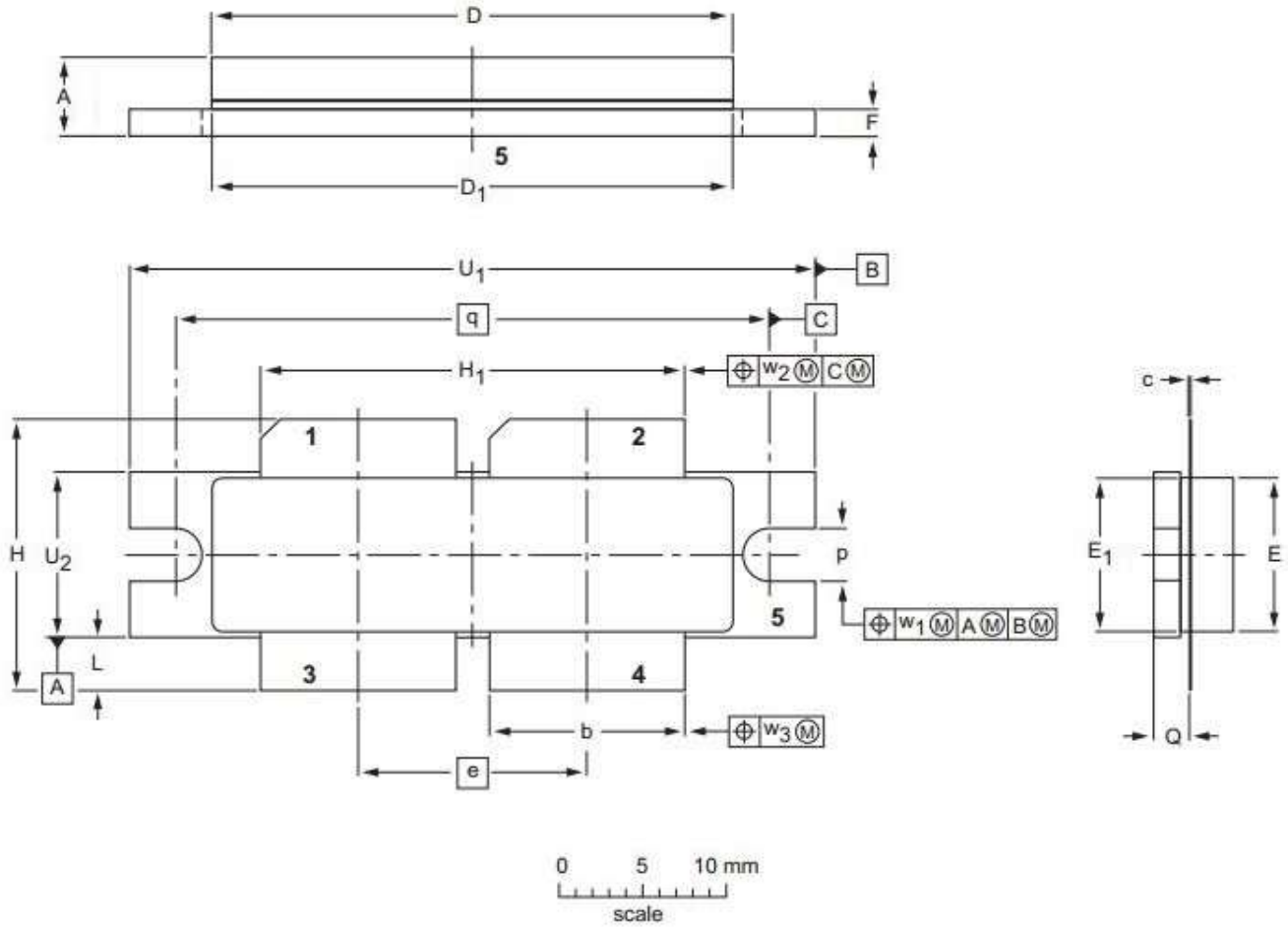
Component	Description	Suggestion
C1	2.7pF MQ301111	
C2,C3	560pF MQ301111	
C4,C7,C9,C10,C11,C12,C14	10nF 1210	
C5,C6,C8,C13,C15	10UF 1210	
C16,C17	9.1pF MQ101111	
C18	5.6pF MQ101111	
C19	1.5pF MQ101111	
R1	330Ω/1W	
R2,R3	510Ω/2W	
R4,R5	17Ω 1206	
T1,T6	SFF-50-1.5 BN-61-202 650mm	
T2,T3	SFF-16.7-1.5 BN-61-202 610mm 4:1	
T4,T5	SFF-12.5-1.5 BN-61-202 610mm 4:1	
PCB	30mil Rogers4350B	

MQ0523R LDMOS TRANSISTOR

Document Number: MQ0523R
Preliminary Datasheet V1.0

Package Outline

Flanged ceramic package; 2 mounting holes; 4 leads (1, 2—DRAIN, 3, 4—GATE, 5—SOURCE)



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	W ₂
mm	4.7	11.81	0.18	31.55	31.52	13.72	9.50	9.53	1.75	17.12	25.53	3.48	3.30	2.26	35.56	41.28	10.29	0.25	0.51	0.25
	4.2	11.56	0.10	30.94	30.96		9.30	9.27	1.50	16.10	25.27	2.97	3.05	2.01		41.02	10.03			
inches	0.185	0.465	0.007	1.242	1.241	0.540	0.374	0.375	0.069	0.674	1.005	0.137	0.130	0.089	1.400	1.625	0.405	0.01	0.02	0.01
	0.165	0.455	0.004	1.218	1.219		0.366	0.365	0.059	0.634	0.995	0.117	0.120	0.079		1.615	0.395			

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-D4E					03/12/2013

MQ0523R LDMOS TRANSISTOR

Document Number: MQ0523R
Preliminary Datasheet V1.0

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2023/9/8	Rev 1.0	Preliminary Datasheet

Application data based on SYX-23-44

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