

MQ0580RVP LDMOS TRANSISTOR

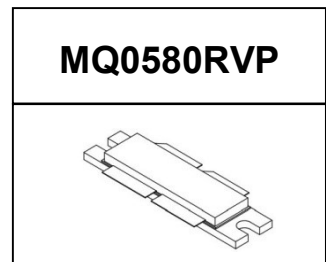
Document Number: MQ0580RVP
Preliminary Datasheet V1.1

800W, 50V High Power RF LDMOS FETs

Description

The MQ0580RVP is a 800W capable, highly rugged, unmatched LDMOS FET, designed for commercial and industrial applications from 200MHz up to 500MHz, supporting both pulse and CW applications.

It is featured for industry leading high power and high ruggedness, suitable for Industrial, Scientific and Medical application, as well as VHF communication, UHF TV and Aerospace applications.



- Application data at **325MHz narrow band** with device soldered

Freq(MHz)	Voltage(V)	Signal type	Pin(dBm)	Pout(W)	Power Gain(dB)	Eff(%)
325	50	CW	42.5	809	16.5	74

- Application data in **370-470MHz wide band** with device soldered

VDS=50V VGS=3.31V IDQ=300Ma Signal mode: Pulse Width=100us,DutyCyce=10%

Freq(MHz)	Pin(dBm)	Pout(dBm)	Pout(W)	IDS(A)	Power Gain(dB)	Eff(%)
370	41.96	59.12	816.6	3.0	17.16	60
390	40.91	58.83	763.8	2.79	17.92	61.35
410	41.81	58.62	727.8	2.68	16.81	61.16
430	42.05	58.61	726.1	2.48	16.56	66.62
450	42.05	58.02	633.9	2.27	15.97	64.35
470	41.99	57.88	613.8	2.4	15.89	58.45

Features

- High breakdown voltage enable high ruggedness
- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Large Positive and Negative Gate/Source Voltage Range for Improved Class C Operation
- Excellent thermal stability, low HCI drift
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V _{DSS}	115	Vdc
Gate--Source Voltage	V _{GS}	-10 to +10	Vdc
Operating Voltage	V _{DD}	+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

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case ,Case Temperature 85°C, 800W CW, 50 Vdc, IDQ = 240 mA	R _{θJC}	0.18	°C/W

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Table 3. ESD Protection Characteristics

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

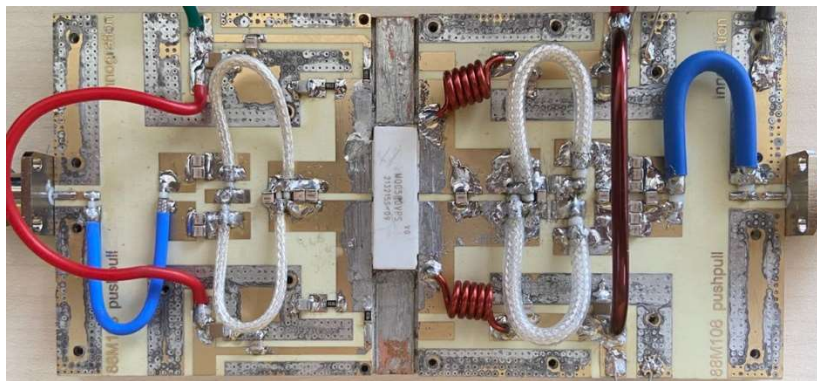
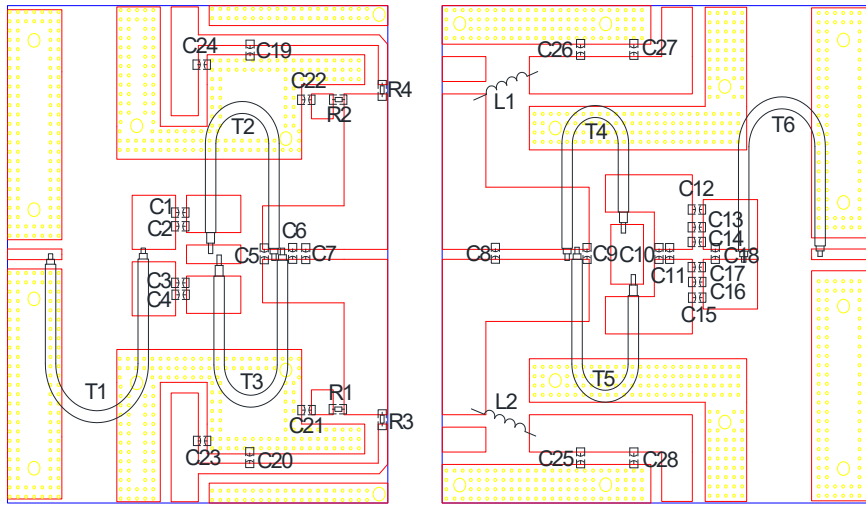
Table 4. Electrical Characteristics (TA = 25 °C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics					
Drain-Source Voltage V _{GS} =0V, I _{DS} =1.0mA	V _{(BR)DSS}		115		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)}	—	2.54	—	V
Gate Quiescent Voltage (V _{DD} = 50 V, I _D = 240 mA, Measured in Functional Test)	V _{GS(Q)}	—	3	—	V
Drain source on state resistance (V _{DS} = 0.1V, V _{GS} = 10 V) Each section side of device measured	R _{ds(on)}		54		mΩ
Common Source Input Capacitance (V _{GS} = 0V, V _{DS} =50 V, f = 1 MHz) Each section side of device measured	C _{ISS}		220		pF
Common Source Output Capacitance (V _{GS} = 0V, V _{DS} =50 V, f = 1 MHz) Each section side of device measured	C _{OSS}		85		pF
Common Source Feedback Capacitance (V _{GS} = 0V, V _{DS} =50 V, f = 1 MHz) Each section side of device measured	C _{RSS}		2.5		pF

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Reference Circuit of Test Fixture (325MHz) (Layout file upon request) PCB: Roger 4350B, 30mils

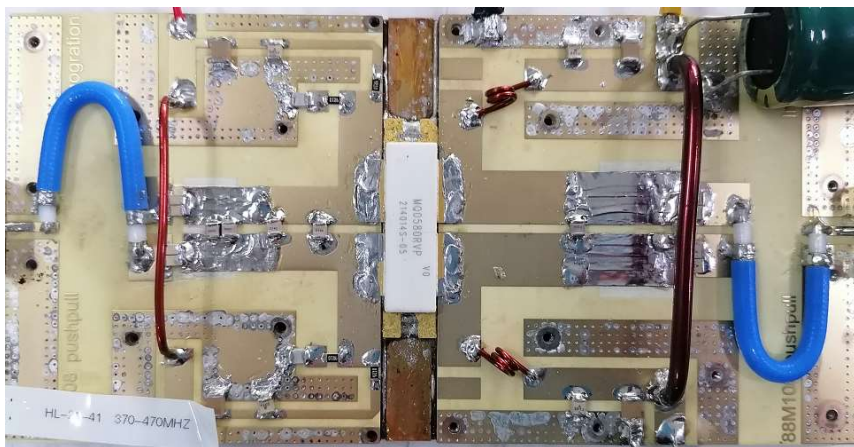
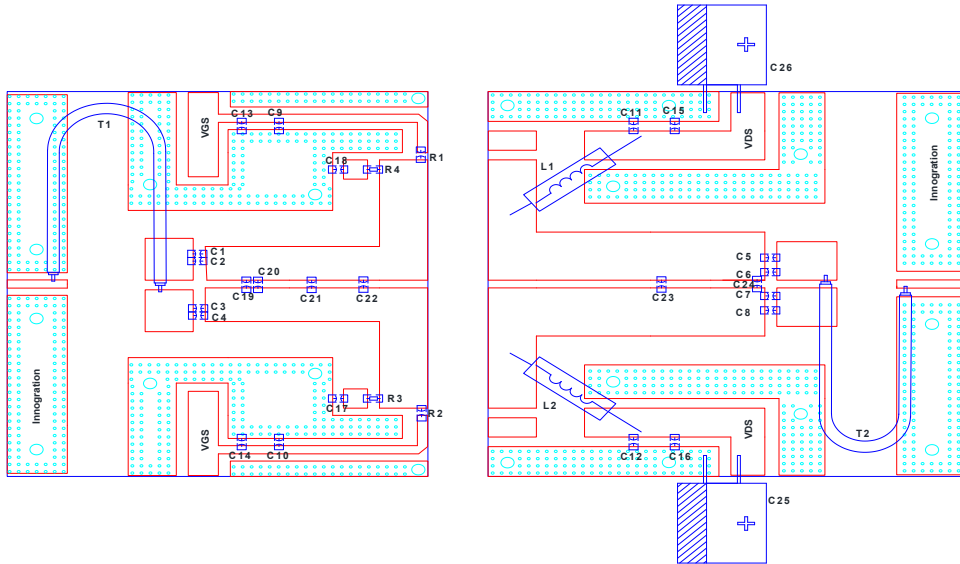


Component	Description	Suggested part type
C1,C2,C3,C4,C12,C13,C14,C15,C16,C17,C19,C20,C25,C26	150pF	DLC75B
C5,C6	30pF	DLC75B
C7	39pF	DLC75B
C8,C9	6.8Pf	DLC75B
C10,C18	2Pf	DLC75B
C11	0.5pF	DLC75B
C21,C22	1000pF	DLC75B
C23,C24	10nF	1812
C27,C28	10uF	10uF/50V
R1,R2,R3,R4	Chip Resistor,15ohm	1206
T1	50ohm, Line length=70mm	SF-086-50
T2,T3	12.5ohm, Line length=70mm	SFF-12.5-1.5
T4,T5	12.5ohm,Line length=70mm	SFF-12.5-3
T6	50ohm, Line length=70mm	RG-402-3
L1,L2	5turns, Inside diameter 5mm	

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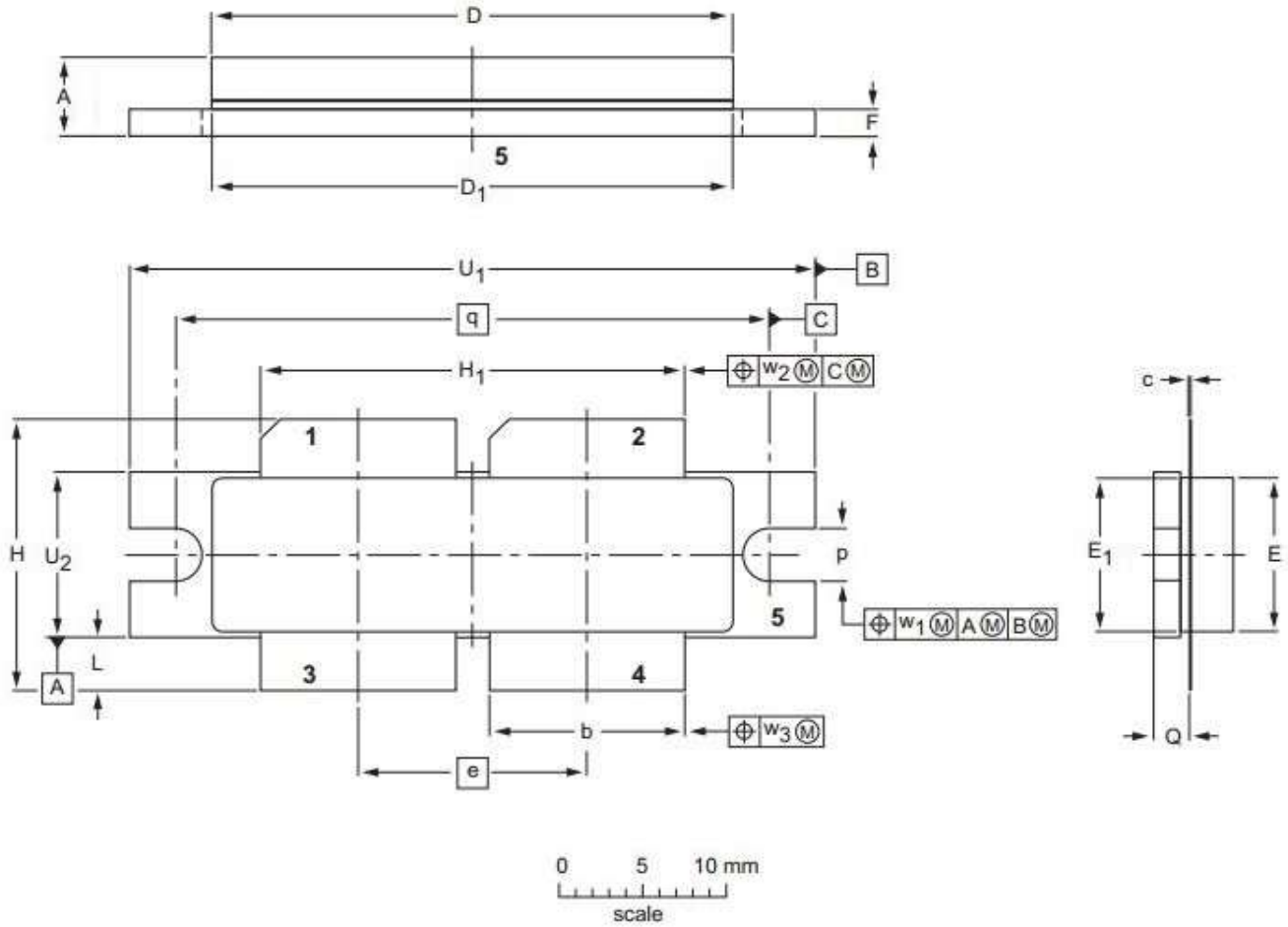
Part	description	Model
C1~C12	200pF	DLC70B
C13~C16	10nF	Ceramic multilayer capacitor
C17,C18	1000pF	DLC70B
C19,C20	5.6pF	DLC70B
C21,C22	18pF	DLC70B
C23,C24	10pF	DLC70B
C25,C26	4700uF/63V	Electrolytic Capacitor
R1,R2,R3,R4	9.1 Ω	Chip Resistor
T1,T2	25ohm/50mm	
L1, L2	2turns,绕径 5mm 线径 1mm	DIY air core inductance
PCB	0.762mm [0.030"] thick, εr=3.50, Rogers 4350B, 1 oz. copper	

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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 ₃
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

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Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2021/9/10	Rev 1.0	Preliminary Datasheet
2021/10/25	Rev 1.1	MQ0580VP upgraded to MQ0580RVP

Application data based on ZL-21-21, HL-21-41

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