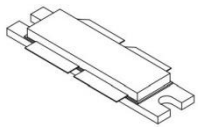
MQ0534R LDMOS TRANSISTOR

Document Number: MQ0534R
Preliminary Datasheet V1.1

340W, 28V High Power RF LDMOS FETs

MQ0534R



Description

The MQ0534R is a 340-watt capable, high performance, unmatched push pull LDMOS FET, for wide-band commercial and industrial applications with frequencies HF to 500MHz.

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.

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

V_{DD} = 28 Volts, I_{DQ} = 250 mA, CW

Freq (MHz)	Pin （dBm）	Psat （W）	Id (A)	Gain (dB)	Eff (%)	2nd (dBc)	3rd (dBc)
20	37.1	206.1	9.65	16.0	76.3	-25	-10.6
60	37	251.2	11.64	17.0	77.1	-36.16	-16.7
100	37.2	263.0	13.34	17.0	70.4	-36.3	-13.7
200	38.2	245.5	15.62	15.7	56.1	-33.35	-9
300	39	245.5	17	14.9	51.6	-32.6	-17.9
400	39	310.5	20.1	15.9	55.2	-40.6	-30.5
500	39.7	263.0	16.36	14.5	57.4	-42	-34.6
520	39.7	269.2	16.4	14.6	58.6	-45	-36

- Typical Performance at 28V (On Innogration 400-500MHz wideband fixture with device soldered):

V_{DD} = 28 Volts, I_{DQ} = 200 mA, CW

Freq (MHz)	Pout (dBm)	Pout (W)	IDS (A)	Pin (dBm)	Gain (dB)	Eff (%)
400	55.41	347.5	19.10	39.40	16.01	64.98
420	55.31	339.6	18.30	39.27	16.04	66.28
440	55.25	335.0	17.50	39.00	16.25	68.36
460	55.11	324.3	16.70	39.20	15.91	69.36
480	54.94	311.9	15.85	39.30	15.64	70.28
500	54.82	303.4	15.60	39.76	15.06	69.46

- Typical Performance at 28V (On Innogration 136-174MHz wideband fixture with device soldered):

V_{DD} = 28 Volts, I_{DQ} = 200 mA, CW

Freq (MHz)	Pout (dBm)	Pout (W)	IDS (A)	Pin (dBm)	Gain (dB)	Eff (%)
136	55.23	333.4	15.90	39.20	16.03	74.89
145	54.91	309.7	16.20	39.30	15.61	68.29
155	55.10	323.6	16.00	39.70	15.40	72.23
165	54.80	302.0	13.76	39.00	15.80	78.38
174	54.78	300.6	12.50	39.40	15.38	85.89

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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)
-

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	+95	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+40	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	RθJC	0.14	°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 ℃ unless otherwise noted)

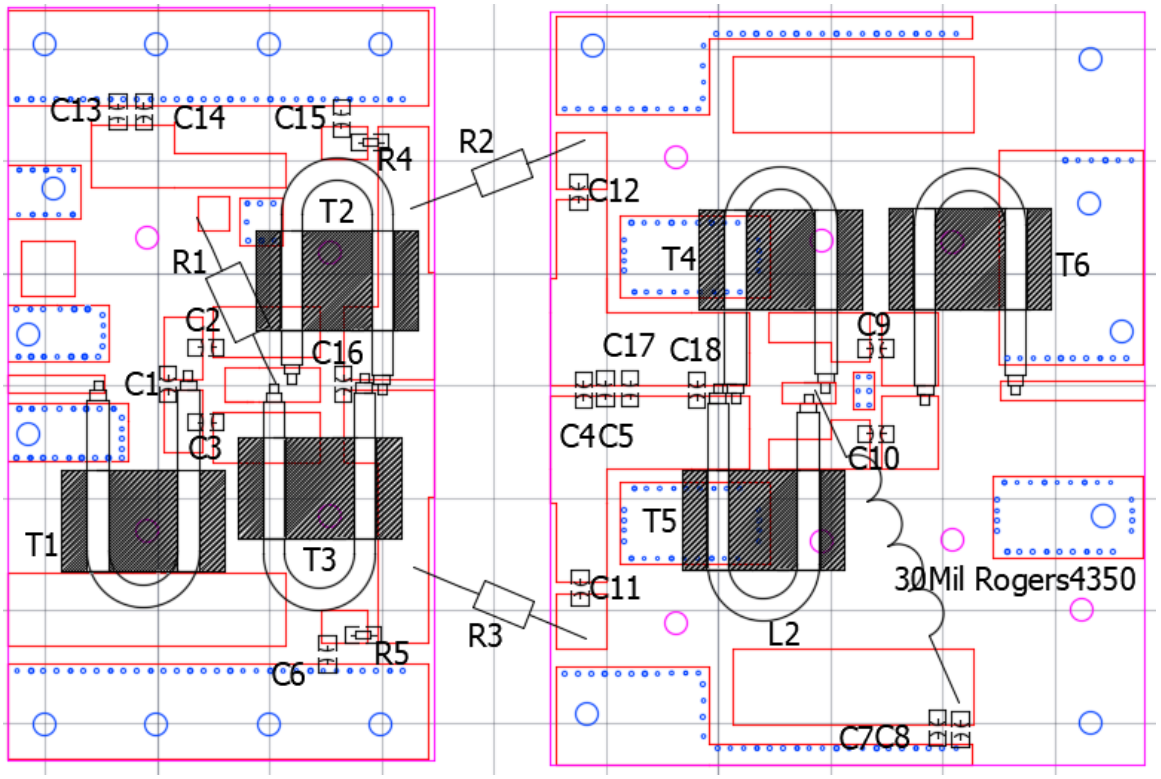
Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics (per half section)					
Drain-Source Voltage V_{GS}=0, I_{DS}=1.0mA	$V_{(BR)DSS}$	95			V
Zero Gate Voltage Drain Leakage Current (V_{DS} = 75V, V_{GS} = 0 V)	I_{DSS}	——	——	1	μA
Zero Gate Voltage Drain Leakage Current (V_{DS} = 28 V, V_{GS} = 0 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} = 28V, I_D = 800 μA)	$V_{GS(th)}$	——	2.2	——	V
Gate Quiescent Voltage (V_{DD} = 28 V, I_D = 800 mA, Measured in Functional Test)	$V_{GS(Q)}$	——	3.1	——	V
Common Source Input Capacitance (V_{GS} = 0V, V_{DS} =28 V, f = 1 MHz)	C_{ISS}		150		pF

Common Source Output Capacitance (V_{GS} = 0V, V_{DS} =28 V, f = 1 MHz)	C_{OSS}		65		pF
Common Source Feedback Capacitance (V_{GS} = 0V, V_{DS} =28 V, f = 1 MHz)	C_{RSS}		3		pF

20-520MHz

Reference Circuit of Test Fixture Assembly Diagram

(Layout file upon request, 30mil RO4350)



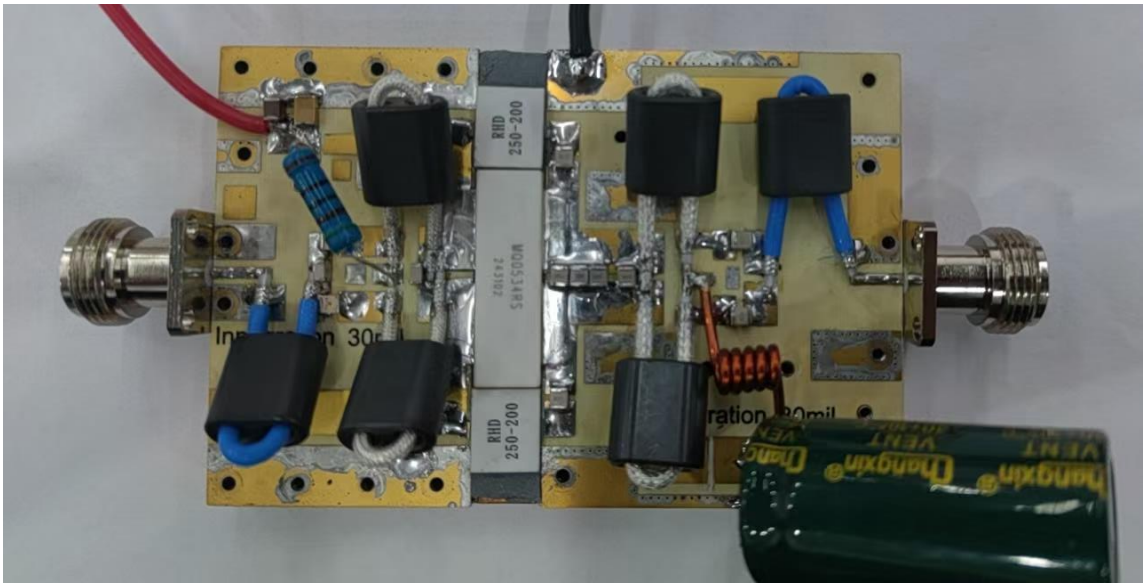
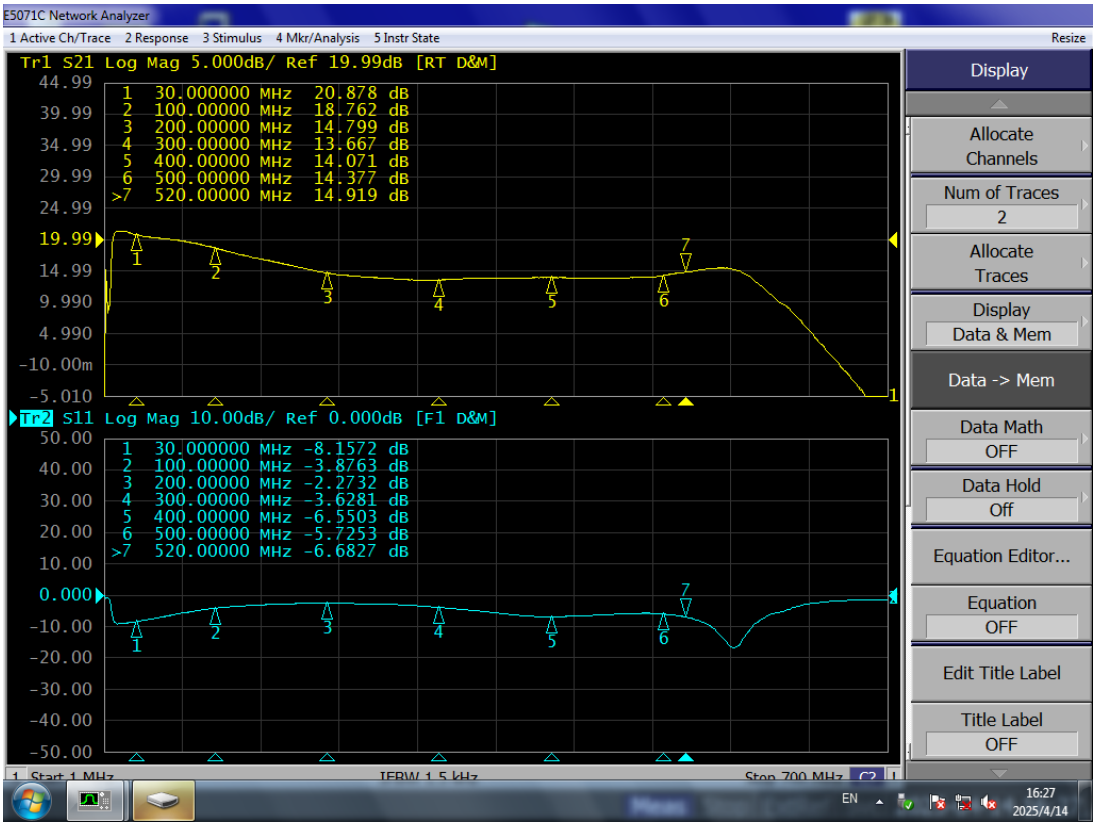


Table 5. Test Circuit Component Designations and Values

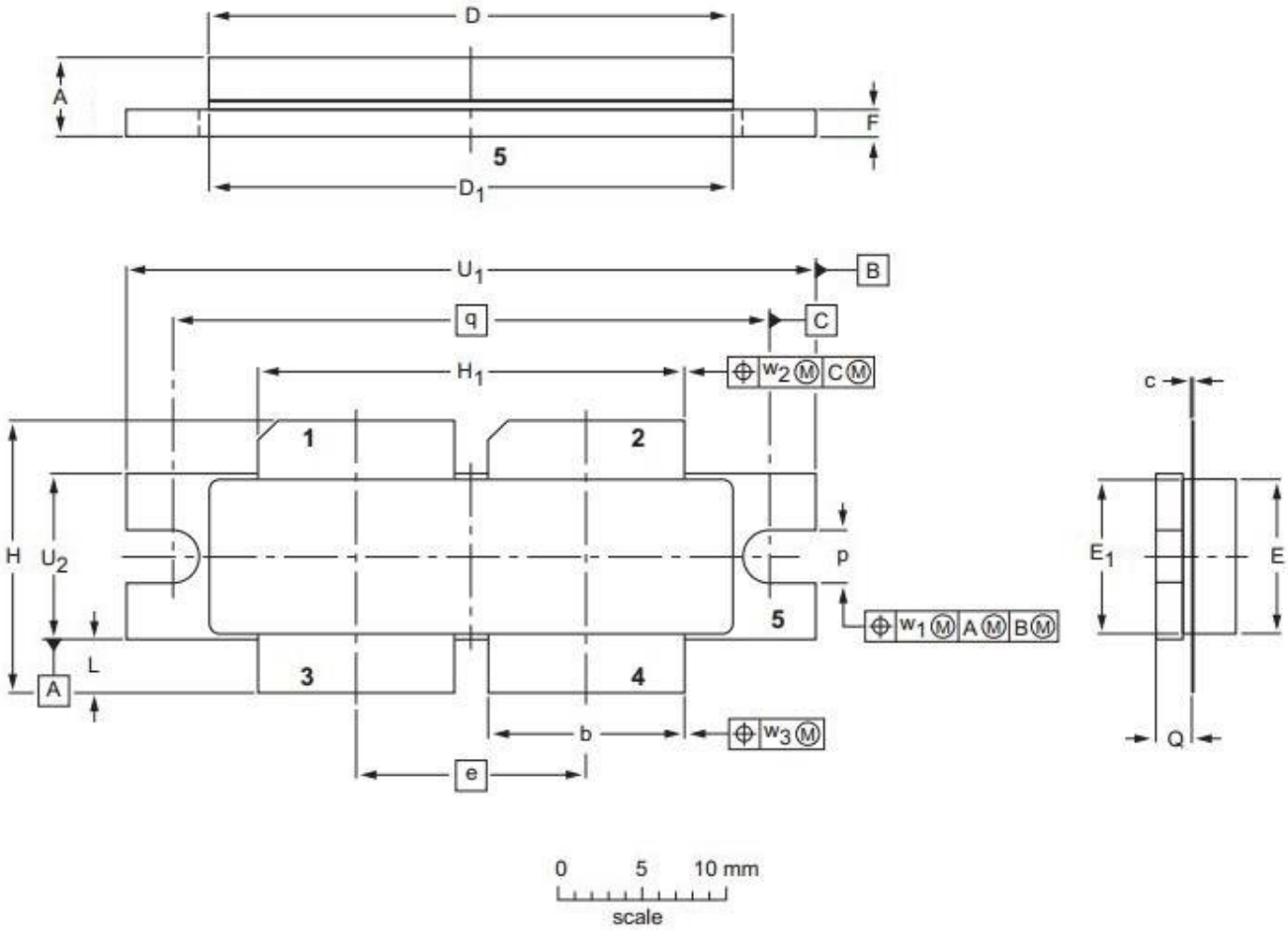
Component	Description	Suggestion
C1	6.2pF MQ301111	
C2,C3	470pF MQ301111	
C7,C14	10nF 1210	//
C6,C8,C13,C15	10UF 1210	//
C9-C12	820pF MQ101111	
C4	12pF MQ301111	
C5,C17	10pF MQ301111	
C16	47pF MQ301111	
C18	6.8pF MQ301111	
R1	330Ω/0.25W	Color ring Resistance
R2,R3	250Ω/200W	RFTYT Technology Co.LTD
R4,R5	25.5 Ω 1206	Chip Resistor
T1	SFF-50-1.5 BN-61-202 620mm	//
T2,T3	SFF-16.7-1.5 BN-61-202 620mm 4:1	//
T4,T5	SFF-12.5-1.5 BN-61-202 620mm 4:1	//
T6	SFF-25-1.5 BN-61-202 620mm	//
L1	1.5mm wire ， 5mm inner diameter, 5Turns	DIY
PCB	30mil Rogers4350B	

Network analyzer output S11/S21, Vds=28V, Idq=650mA



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

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

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2024/5/24	Rev 1.0	Preliminary Datasheet
2025/4/15	Rev 1.1	Update the datasheet with improved performance of 20-520MHz

Application data based on SYX-23-45/TC-24-31/32/SYX-25-16

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