

MQ0530 LDMOS TRANSISTOR

Document Number: MQ0530
Preliminary Datasheet V1.0

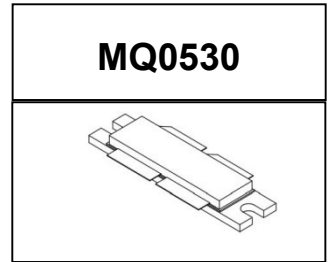
300W, 28V High Power RF LDMOS FETs

Description

The MQ0530 is a 300-watt capable, high performance, unmatched push pull LDMOS FET, for wide-band commercial and industrial applications with frequencies HF to 700MHz.

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 and 32V (On Innogration 30-512MHz wideband fixture with device soldered):

$V_{DD} = 28$ Volts, $I_{DQ} = 120$ mA, CW

Fre(MHZ)	Pin(dBm)	Psat(dBm)	Psat(W)	IDS(A)	Gain(dB)	Eff(%)
30	38.46	53.14	206.1	9.63	14.68	76.42
60	37.12	53.49	223.4	9.9	16.37	80.58
100	38.65	53.73	236.0	11.05	15.08	76.29
150	38.23	54	251.2	13.02	15.77	68.90
200	38.22	53.74	236.6	12.77	15.52	66.17
250	37.22	53.9	245.5	13.14	16.68	66.72
300	37.19	53.56	227.0	11.72	16.37	69.17
350	37.49	53.24	210.9	11.4	15.75	66.06
400	37.46	53.41	219.3	12.94	15.95	60.52
450	38.23	54.04	253.5	14.83	15.81	61.05
512	37.89	53.17	207.5	12.04	15.28	61.55

$V_{DD} = 32$ Volts, $I_{DQ} = 120$ mA, CW

Fre(MHZ)	Pin(dBm)	Psat(dBm)	Psat(W)	IDS(A)	Gain(dB)	Eff(%)
30	38.46	54.13	258.8	10.9	15.67	74.20
60	37.12	54.52	283.1	11.09	17.4	79.78
100	38.65	54.77	299.9	12.33	16.12	76.01
150	38.23	54.9	309.0	14.4	16.67	67.06
200	38.22	54.71	295.8	14.1	16.49	65.56
250	37.22	54.87	306.9	14.49	17.65	66.19
300	37.19	54.53	283.8	12.88	17.34	68.85
350	37.49	54.1	257.0	12.31	16.61	65.25
400	37.46	54.25	266.1	13.92	16.79	59.73
450	38.23	54.77	299.9	15.9	16.54	58.95
512	37.89	54.14	259.4	13.56	16.25	59.78

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

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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}	+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	$R_{\theta JC}$	0.15	°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
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}		140		pF
Common Source Output Capacitance ($V_{GS} = 0\text{V}$, $V_{DS} = 28\text{V}$, $f = 1\text{MHz}$)	C_{OSS}		60		pF
Common Source Feedback Capacitance ($V_{GS} = 0\text{V}$, $V_{DS} = 28\text{V}$, $f = 1\text{MHz}$)	C_{RSS}		2.2		pF

TYPICAL CHARACTERISTICS

Figure 1: Network analyzer output S11/S21 at 28V Idq=500mA



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

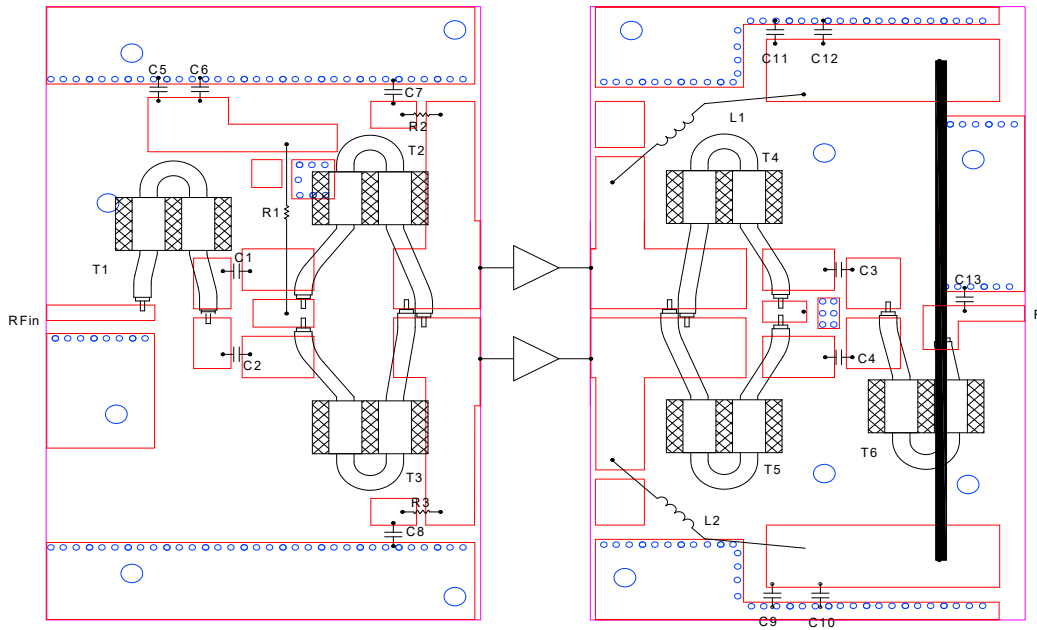


Table 5. Test Circuit Component Designations and Values

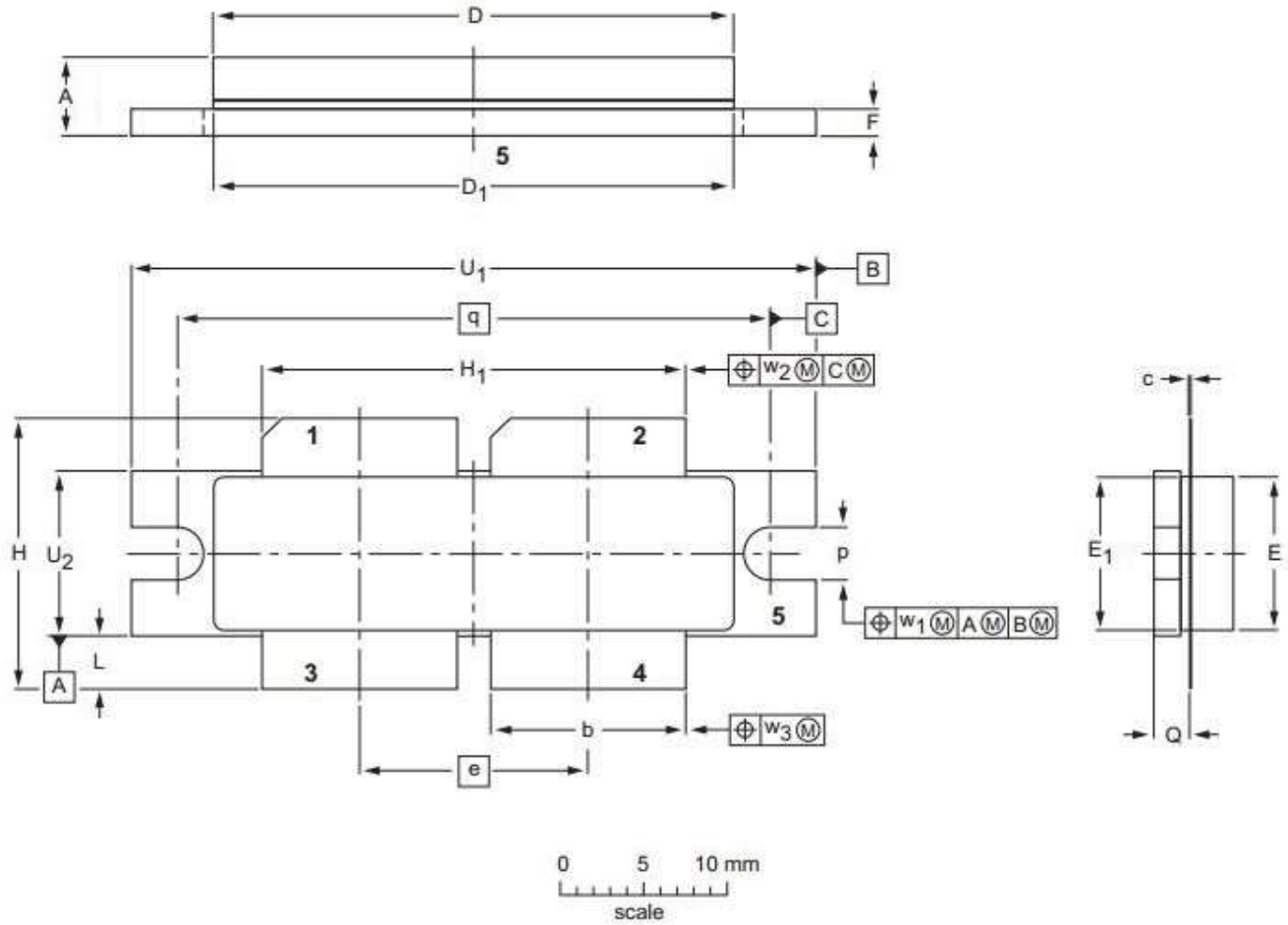
Component	Description	Suggested Manufacturer
C1,C2,C3*2,C4*2, C5,C9,C11,	470pF	DLC70B
C6, C7,C8,C10,C12,	10uF	50V/10UF
C13	1.5pF	DLC70B
R1	470 Ω *2	1/4W
R2,R3	39 Ω *3	1/8W
T1, T6	50ohm,65mm	BN-61-202
T4,T5	12.5ohm,70mm	BN-61-202
T2,T3	17 ohm,70mm	BN-61-202
L1, L2	5 turns,D=5mm	

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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 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

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Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2021/4/29	Rev 1.0	Preliminary Datasheet

Application data based on YHG-21-12

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