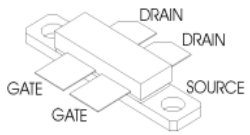
MX1520C LDMOS TRANSISTOR

Document Number: MX1520C
Product Datasheet V1.0

200W, 28V High Power RF LDMOS FETs

MX1520C



Description

The MX1520C is a 200-watt high performance, unmatched LDMOS FET, designed for wide-band commercial and industrial applications with frequencies HF to 1.5 GHz.

- **Typical performance(on 108-512MHz wideband board with device soldered)**

  Signal：Two-tone space 1.6MHz , Vgs=2.75V,Vds=28V, Idq=900mA

Freq(MHz)	Pin(dBm)	Pav(W)	Ids(A)	Gain(dB)	Eff(%)	IMD3
48	23	40	4.56	23	31	-30
58	22.2	40	4.3	23.8	33	-32
68	22	40	4.06	24	35	-32
88	21.6	40	3.75	24.4	38	-32
108	21.4	40	3.57	24.6	40	-33
150	21.8	40	3.51	24.2	41	-32
200	21.5	40	3.52	24.5	40	-37
225	22.4	40	3.56	23.6	40	-38
250	23.1	40	3.6	22.9	39	-39
300	23	40	3.65	23	39	-40
350	22.2	40	3.63	23.8	39	-37
400	22.6	40	3.56	23.4	40	-33
450	23.1	40	3.64	22.9	39	-34
512	22.7	40	3.81	23.3	37	-32

Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Excellent thermal stability, low HCI drift
- 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)
- 30-88MHz (Ground 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)
- 100kHz - 1000MHz (ISM, instrumentation)

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	+65	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+32	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	0.35	°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	$V_{(BR)DSS}$	65			V
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 = 600 μA)	V_{GS}(th)	——	1.98	——	V
Gate Quiescent Voltage (V_{DD} = 28 V, I_D = 220 mA, Measured in Functional Test)	$V_{GS(Q)}$	——	2.53	——	V
Drain source on state resistance (V_{DS} = 0.1V, V_{GS} = 10 V)	Rds(on)		100		mΩ
Common Source Input Capacitance (V_{GS} = 0V, V_{DS} =28 V, f = 1 MHz)	C_{ISS}		92		pF
Common Source Output Capacitance (V_{GS} = 0V, V_{DS} =28 V, f = 1 MHz)	C_{OSS}		39		pF
Common Source Feedback Capacitance (V_{GS} = 0V, V_{DS} =28 V, f = 1 MHz)	C_{RSS}		1.58		pF

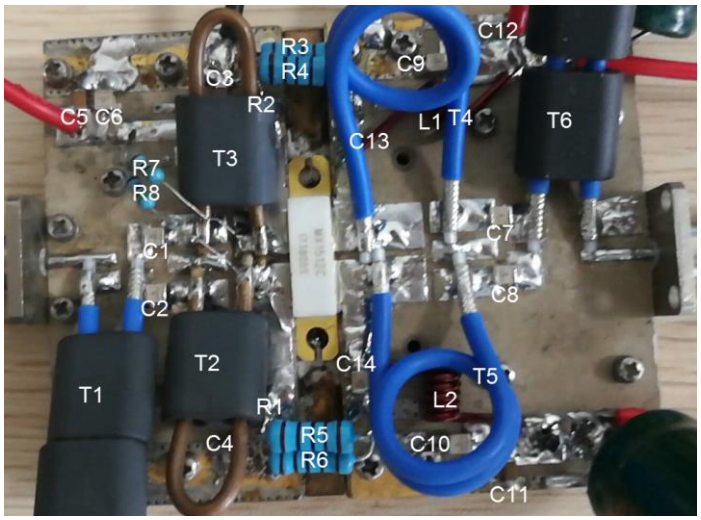
Functional Tests (In Demo Test Fixture, 50 ohm system) V_{DD} = 28 Vdc, I_{DQ} = 220 mA, f = 1300 MHz, CW Signal Measurements.

Power Gain	G_p	——	18	——	dB
Drain Efficiency@P1dB	η_D	——	65	——	%
1 dB Compression Point	P_{-1dB}	——	200	——	W
Input Return Loss	IRL	——	-7	——	dB

Load Mismatch (In Innogration Test Fixture, 50 ohm system): V_{DD} = 28 Vdc, I_{DQ} = 220 mA, f = 1300 MHz

VSWR 10:1 at 200W CW Output Power	No Device Degradation

Figure 1: 108-512MHz wideband application circuit picture

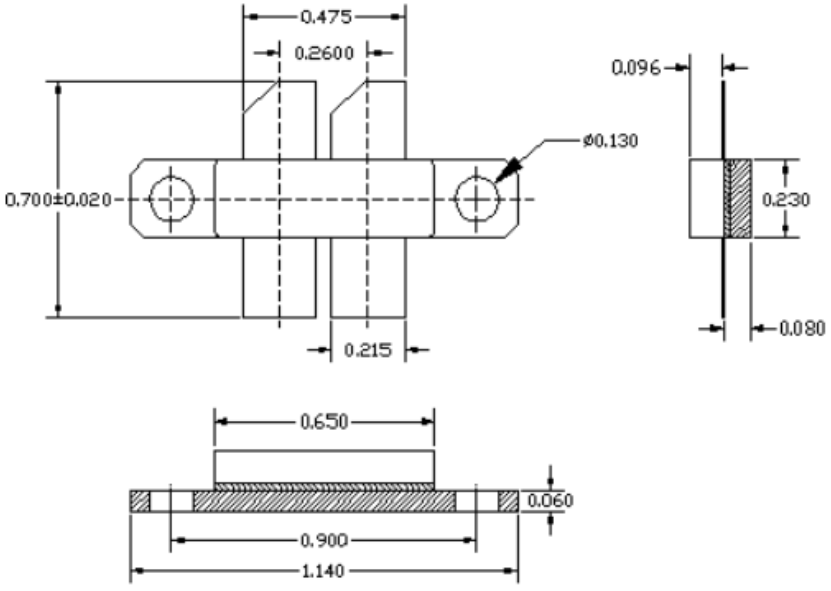


Bill of Materials

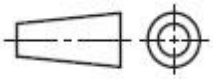
C1,C2,C6, C7,C8,C9, C10,C13, C14	1000PF	ATC100B
C3,C4,C5, C11,C12	1UF	1UF/50V
R1,R2	10Ω	1206
R3,R4,R5, R6	1000Ω	
R7,R8	51Ω	
T1,T6	50Ω,90mm	No.61
T2,T3	12Ω,70mm	No.61
T4,T5	25Ω,120mm	
L1,L2	5 Turns	D=3mm

Package Outline

Flanged ceramic package; 2 mounting holes; 4 leads



Tolerance .XX +/-0.01 .XXX +/-.005 inches

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

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2017/10/13	Rev 1.0	Product Datasheet Creation

Disclaimers