

# MX1512VP LDMOS TRANSISTOR

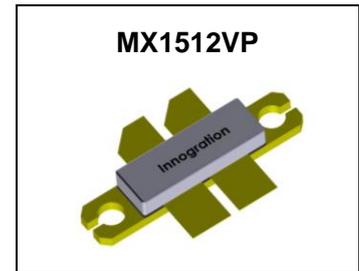
Document Number: MX1512VP  
Preliminary Datasheet V1.1

## 120W, 50V High Power RF LDMOS FETs

### Description

The MX1512VP is a 120-watt, highly rugged, thermally enhanced, unmatched LDMOS FET, designed for wide-band commercial and industrial applications with frequencies HF to 1.5 GHz.

It is featured for high power and high ruggedness, suitable for Industrial, Scientific and Medical application, as well as FM radio, VHF TV and Aerospace applications.



• Typical Performance (On Innogrator narrow band fixture with device soldered):

$V_{DD} = 50$  Volts,  $I_{DQ} = 100$  mA, CW.

Frequency	Gp (dB)	P <sub>out</sub> (W)	$\eta_D @ P_{out}$ (%)
915 MHz	23	120	60

### 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)
- 1200-1400MHz(L band)
- 136-174MHz (Commercial ground communication)
- 160-230MHz (TV VHF III)
- 30-512MHz (Jammer, Ground/Air communication)
- 470-860MHz (TV UHF)
- 100kHz - 1000MHz (ISM, instrumentation)
- 960-1215MHz(Avionics)

**Table 1. Maximum Ratings**

Rating	Symbol	Value	Unit
Drain--Source Voltage	$V_{DSS}$	+125	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 $T_c = 85^\circ\text{C}$ , $P_{out} = 120\text{W}$ CW,	$R_{\theta JC}$	0.7	°C/W

**Table 3. ESD Protection Characteristics**

Test Methodology	Class

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Human Body Model (per JESD22--A114)	Class 2
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**Table 4. Electrical Characteristics** (TA = 25 °C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>DC Characteristics</b>					
Drain-Source Voltage V <sub>GS</sub> =0, I <sub>DS</sub> =1.0Ma	V <sub>(BR)DSS</sub>		122		V
Zero Gate Voltage Drain Leakage Current (V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0 V)	I <sub>loss</sub>	---	---	1	μA
Gate—Source Leakage Current (V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0 V)	I <sub>gss</sub>	---	---	1	μA
Gate Threshold Voltage (V <sub>DS</sub> = 50V, I <sub>D</sub> = 600 μA)	V <sub>GS(th)</sub>	---	2.65	---	V
Gate Quiescent Voltage (V <sub>DD</sub> = 50 V, I <sub>D</sub> = 400 mA, Measured in Functional Test)	V <sub>GS(Q)</sub>	---	3.57	---	V
Drain source on state resistance (V <sub>DS</sub> = 0.1V, V <sub>GS</sub> = 10 V) Each section side of device measured	R <sub>ds(on)</sub>		448		mΩ
Common Source Input Capacitance (V <sub>GS</sub> = 0V, V <sub>DS</sub> =50 V, f = 1 MHz) Each section side of device measured	C <sub>ISS</sub>		55.5		pF
Common Source Output Capacitance (V <sub>GS</sub> = 0V, V <sub>DS</sub> =50 V, f = 1 MHz) Each section side of device measured	C <sub>OSS</sub>		22.6		pF
Common Source Feedback Capacitance (V <sub>GS</sub> = 0V, V <sub>DS</sub> =50 V, f = 1 MHz) Each section side of device measured	C <sub>RSS</sub>		0.57		pF

**Functional Tests** (In Demo Test Fixture, 50 ohm system) V<sub>DD</sub> = 50 Vdc, I<sub>DQ</sub> = 100mA, f = 915 MHz, CW Signal Measurements, Pin=22.5dBm

Power Gain@Pout	G <sub>p</sub>	---	23	---	dB
Output Power	P <sub>out</sub>		120		W
Drain Efficiency@Pout	η <sub>D</sub>	---	60	---	%
Input Return Loss	IRL	---	-7	---	dB
Ruggedness at all phase angle	VSWR		10:1		



## Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2017/9/15	Rev 1.0	Preliminary Datasheet Creation
2021/5/21	Rev 1.1	Package outline update

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