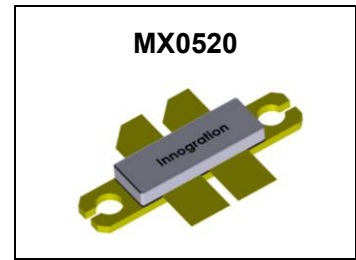


200W, 28V High Power RF LDMOS FETs

Description

The MK0520 is a 200-watt, highly rugged, unmatched LDMOS FET, designed for wide-band commercial and industrial applications with frequencies HF to 1 GHz.



- Typical FM band Performance (On Innogrator fixture with device soldered):

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

Frequency	Pin (dBm)	Pout (W)	Gp (dB)	Eff(%)
88MHz	36.50	241.5	17.33	77.44
108MHz	36.50	260.6	17.66	78.02

- Typical broadband Performance (On Innogrator fixture with device soldered):

$V_{DD} = 28$ Volts, $I_{DQ} = 850$ mA, CW.

Frequency	Gp (dB)	P_{-1dB} (W)	$\eta_D@P_{-1}$ (%)
10 MHz	19.8	80	45.1
20 MHz	20.2	114	55.6
30 MHz	20.0	127	58.8
60 MHz	20.5	157	65.1
100 MHz	20.2	141	50.4
200 MHz	20.3	185	58.1
300 MHz	20.3	186	55.4
400 MHz	19.7	180	58.9
500 MHz	18.6	135	51.5
600 MHz	17.2	90	55.3

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}	+95	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+40	Vdc

MX0520 LDMOS TRANSISTOR

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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°C, T _j =200°C, DC test	R _{θJC}	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 °C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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DC Characteristics (per half section)

Drain-Source Voltage V _{GS} =0, I _{DS} =1.0mA	V _{(BR)DSS}	95	98		V
Zero Gate Voltage Drain Leakage Current (V _{DS} = 75V, V _{GS} = 0 V)	I _{loss}	—	—	1	μA
Zero Gate Voltage Drain Leakage Current (V _{DS} = 28 V, V _{GS} = 0 V)	I _{loss}	—	—	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)}	—	2.19	—	V
Gate Quiescent Voltage (V _{DD} = 28 V, I _D = 500 mA, Measured in Functional Test)	V _{GS(Q)}	—	2.9	—	V
Common Source Input Capacitance (V _{GS} = 0V, V _{DS} =28 V, f = 1 MHz)	C _{ISS}		106		pF
Common Source Output Capacitance (V _{GS} = 0V, V _{DS} =28 V, f = 1 MHz)	C _{OSS}		40		pF
Common Source Feedback Capacitance (V _{GS} = 0V, V _{DS} =28 V, f = 1 MHz)	C _{RSS}		1.6		pF

Functional Tests (In Demo Test Fixture, 50 ohm system) V_{DD} = 28 Vdc, I_{DQ} = 1000 mA, f = 1000 MHz, CW Signal Measurements.

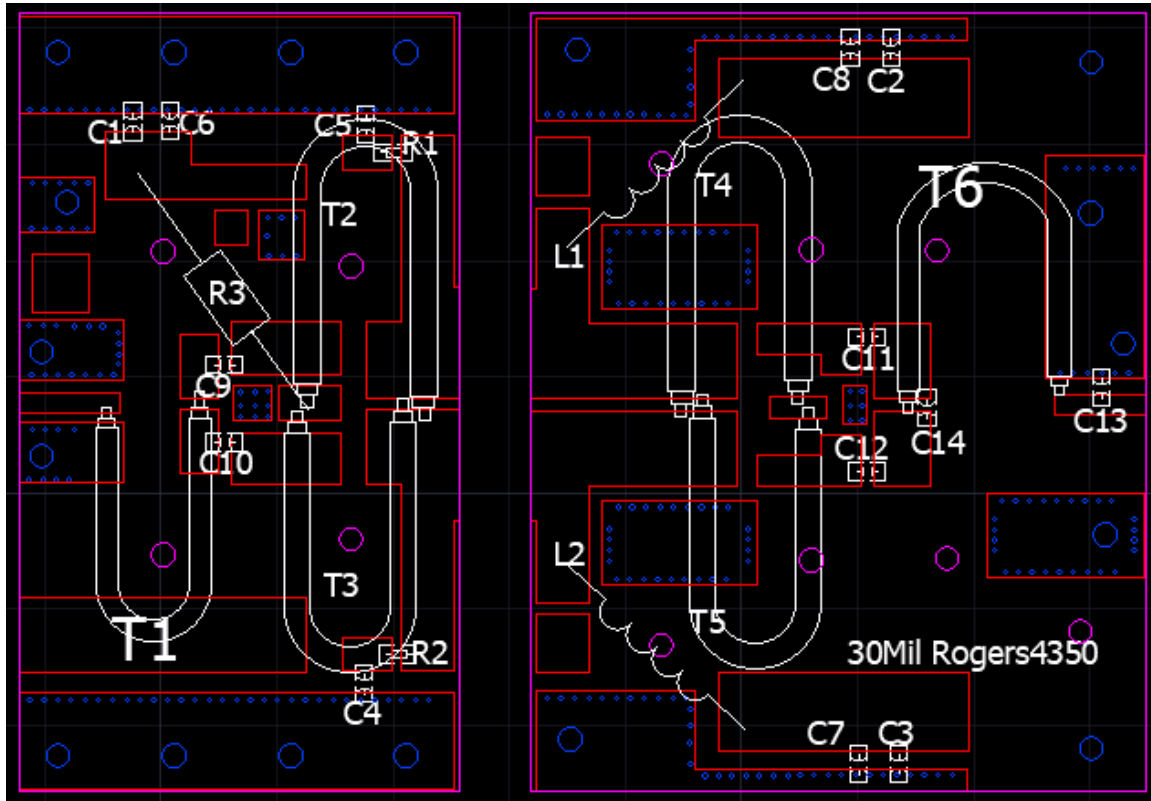
Power Gain	G _p	—	17	—	dB
Drain Efficiency@P1dB	η _D	—	60	—	%
1 dB Compression Point	P _{-1dB}	—	200	—	W
Input Return Loss	IRL	—	-7	—	dB

Load Mismatch (In Innogration Test Fixture, 50 ohm system): V_{DD} = 28 Vdc, I_{DQ} = 1000 mA, f = 1000 MHz

VSWR 20:1 at 200W pulse CW Output Power	No Device Degradation
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88-108MHz

Reference Circuit of Test Fixture Assembly Diagram



Component	Description	Suggestion
C1~C5	10uF/200V-1210	Ceramic multilayer capacitor
C6~C8	10nF/200V-1210	Ceramic multilayer capacitor
C9, C10	150pF	
C11,C12	1000pF	
C13	9.1pF	
C14	10pF	
T1, T6	50 ohm-150mm	RFSFBU-086-50
T2~T5	16.7 ohm-150mm	SFF-16.7-1.5
R3	10 Ω	color ring resistor
R1,R2	10 Ω -2512	Chip Resistor
L1,L2	1.5mm wire , 5mm inner diameter, 6Turns	DIY

TYPICAL CHARACTERISTICS

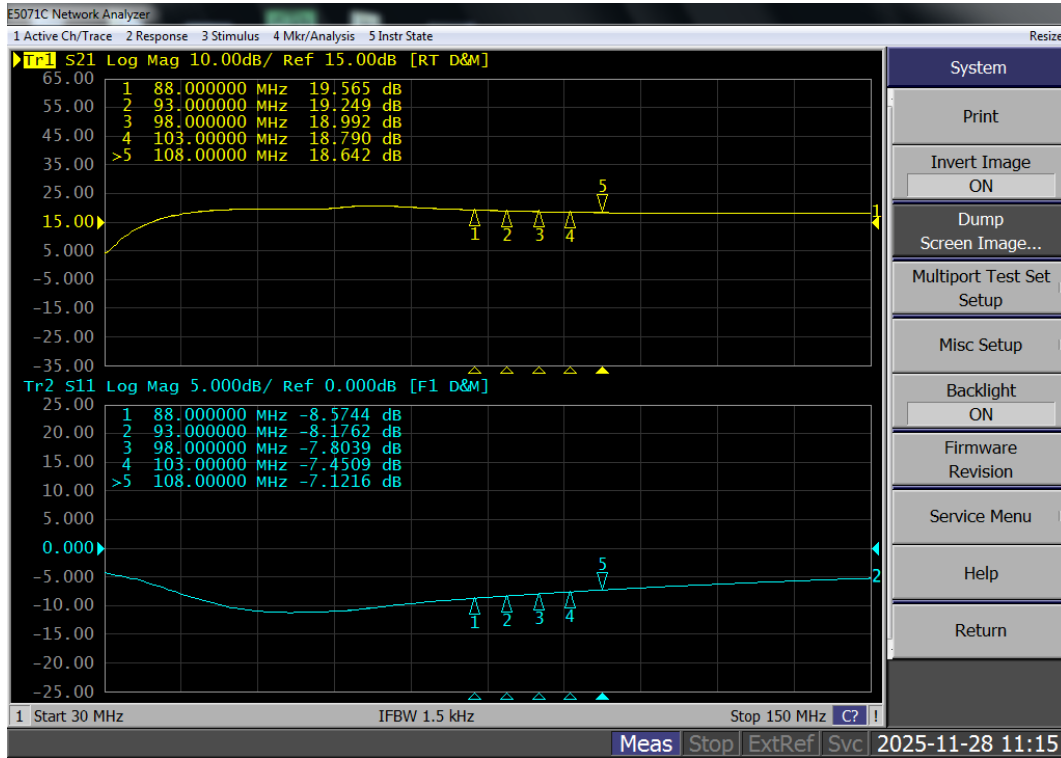
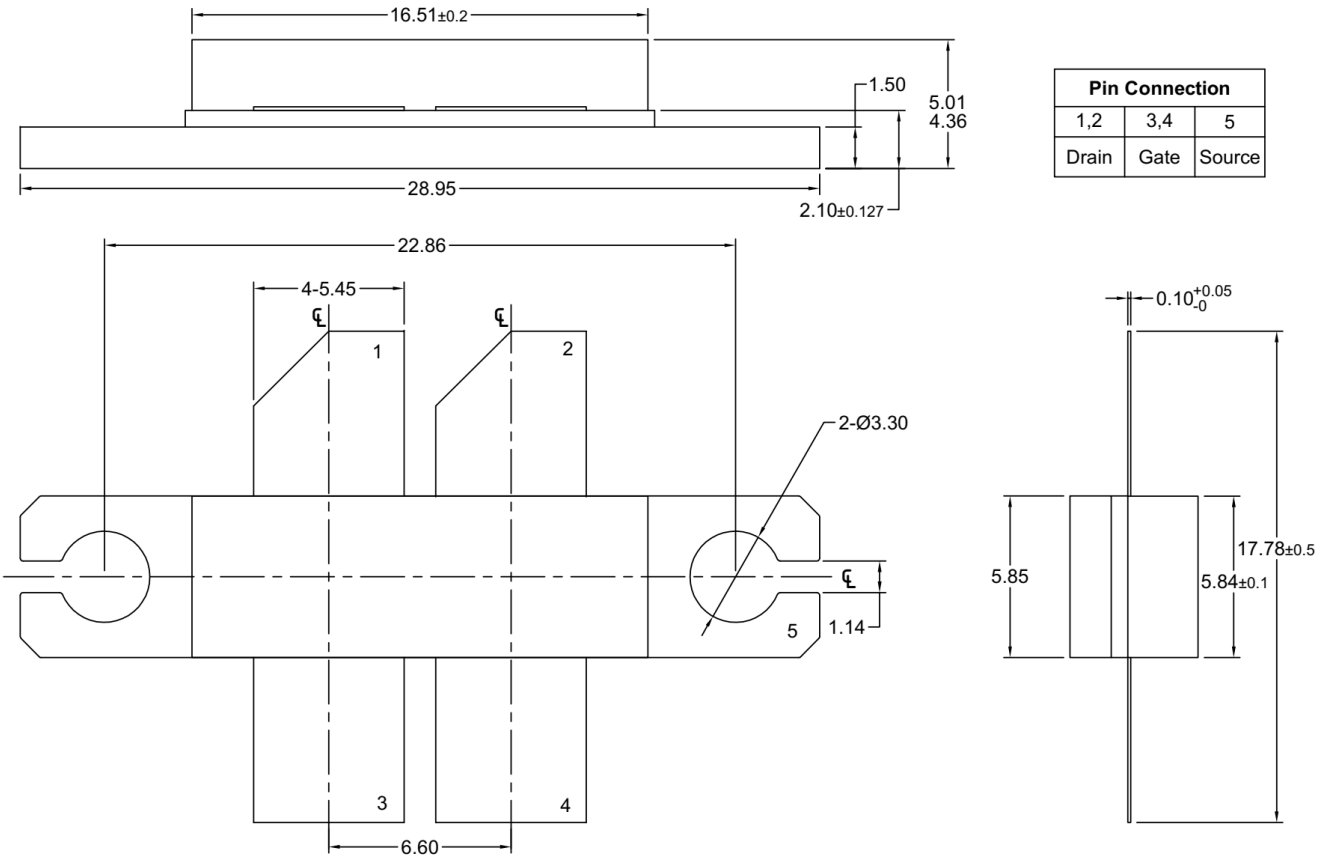


Figure 2: Network analyzer output S11/S21

Package Outline

Flanged ceramic package; 2 mounting holes; 4 leads



Unit: mm
Tolerances(unless specified): x.x ±0.15
x.xx ±0.127

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-LBB					11/15/2019

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2017/10/13	Rev 1.0	Product Datasheet Creation
2021/5/21	Rev 1.1	Package outline update
2025/11/28	Rev 1.2	Use 88-108MHz application data on 1 st page

Application data based on TC-25-43

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