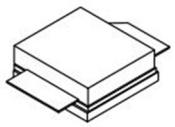
MG2503S LDMOS TRANSISTOR

Document Number: MG2503S
Product Datasheet V1.0

40W, 2-3GHz 28V RF LDMOS FETs

MG2503S



Description

The MG2503S is a 40-watt, internally matched, single ended LDMOS FETs, designed for multiple applications within full band 2.0-3.0GHz.

It can be used in Class AB/B and Class C for all typical modulation formats, for CW and pulsed, linear or saturated applications.

- Typical Performance (On Innogration **2-3GHz** fixture with device soldered):

VDS=28V Idq=100mA Vgs=2.45V CW						
F(MHz)	Pin（dBm）	Psat（dBm）	Psat（W）	I(A)	Gain（dB）	Eff(%)
2000	34.4	45.53	36	2.08	11.1	61.3
2200	31.8	45.54	36	2.47	13.7	51.8
2400	33	46.30	43	3.60	13.3	42.3
2600	32.3	46.90	49	3.65	14.6	47.9
2800	34.8	47.10	51	3.50	12.3	52.3
3000	34.7	45.30	34	3.00	10.6	40.3

- Typical Performance (On Innogration **2-2.5GHz** fixture with device soldered):

VDS=28V Idq=50mA Vgs=2.4V CW						
F(MHz)	Pin（dBm）	Pout（dBm）	Pout（W）	I(A)	Gain（dB）	Eff(%)
2000	31	46.00	40	2.27	15.0	62.6
2100	32.6	46.10	41	2.35	13.5	61.9
2200	31.7	46.00	40	2.49	14.3	57.1
2300	31.6	46.00	40	2.54	14.4	56.0
2400	33	46.00	40	2.55	13.0	55.8
2500	33.3	46.00	40	2.48	12.7	57.3

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

- S band amplifier
- ISM applications
- Cellular amplifier

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	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, DC test	$R_{\theta JC}$	1.3	°C/W

Table 3. ESD Protection Characteristics

Test Methodology	Class
Human Body Model (per JESD22--A114)	Class 2

Table 4. Electrical Characteristics (TA = 25 ℃ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics					
Zero Gate Voltage Drain Leakage Current (V_{DS} = 65V, V_{GS} = 0 V)	I_{DSS}			100	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 = 450 μA)	$V_{GS(th)}$		2.0		V
Gate Quiescent Voltage (V_{DD} = 28 V, I_D = 50mA, Measured in Functional Test)	$V_{GS(Q)}$		2.4		V

Functional Tests (On Demo Test Fixture, 50 ohm system) V_{DD} = 28 Vdc, I_{DQ} = 50 mA, f = 2000 -2500MHz, Pulse CW Signal .

Power Gain	G_p	12	13		dB
Drain Efficiency@P3dB	η_D		55		%
3 dB Compression Point	P_{-3dB}	40			W

Load Mismatch (In Innogration Test Fixture, 50 ohm system): V_{DD} = 28 Vdc, I_{DQ} = 50 mA, f = 2500 MHz

VSWR 5:1 at 40W pulse CW Output Power	No Device Degradation

2-2.5GHz

TYPICAL CHARACTERISTICS

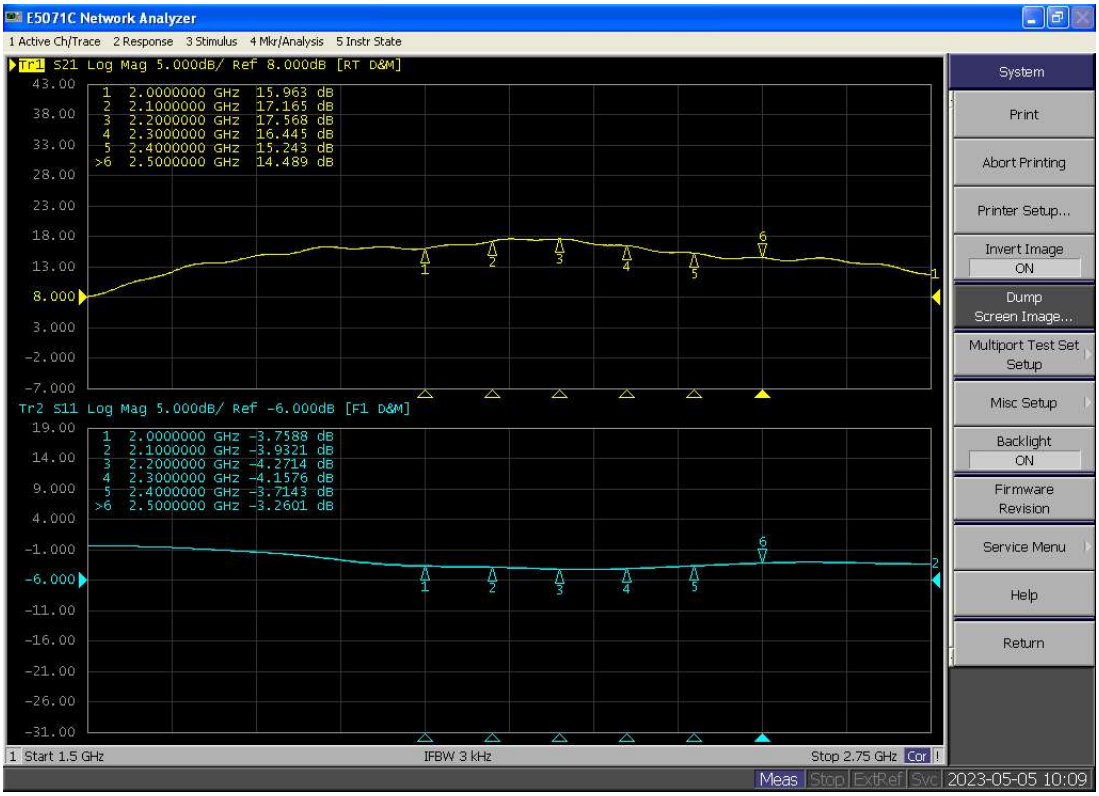


Figure 2. Network analyzer output S11/S21 (VDS=28V IDQ=200mA VGS=2.95V)

Figure 3. Test Circuit Component Layout

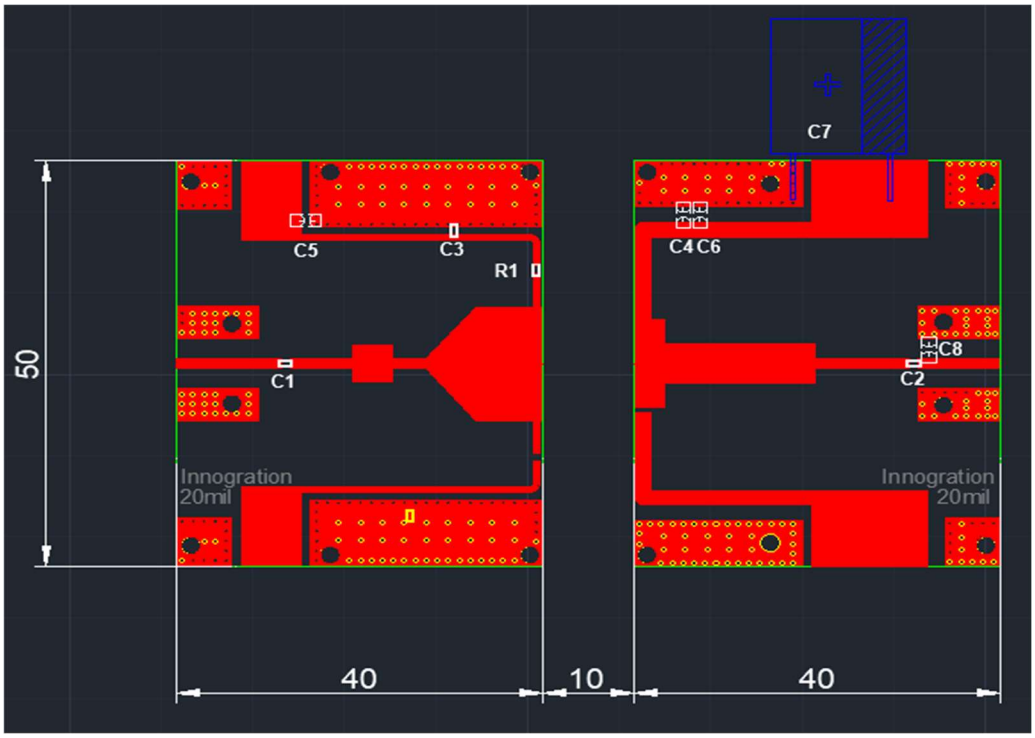


Table 5. Test Circuit Component Designations and Values

Part	description	Model
R1	7.50Ω	Chip Resistor
C1,C2,C3	20pF 600F	
C5,C6	10UF 1210	
C4	20pF MQ10111	
C7	470UF/63V	
C8	0.3 pF MQ10111	
PCB	20mil Rogers4350B	

2-3GHz

TYPICAL CHARACTERISTICS

Figure 3. Network analyzer output S11/S21 (VDS=28V IDQ=200mA VGS=2.95V)

Figure 3. Test Circuit Component Layout

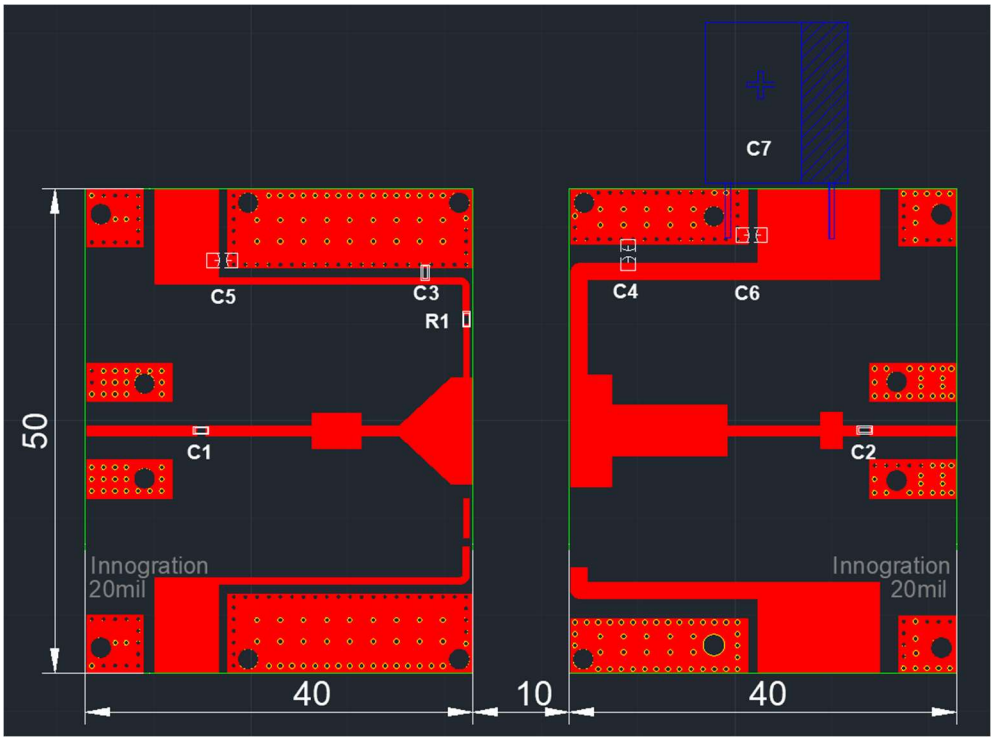
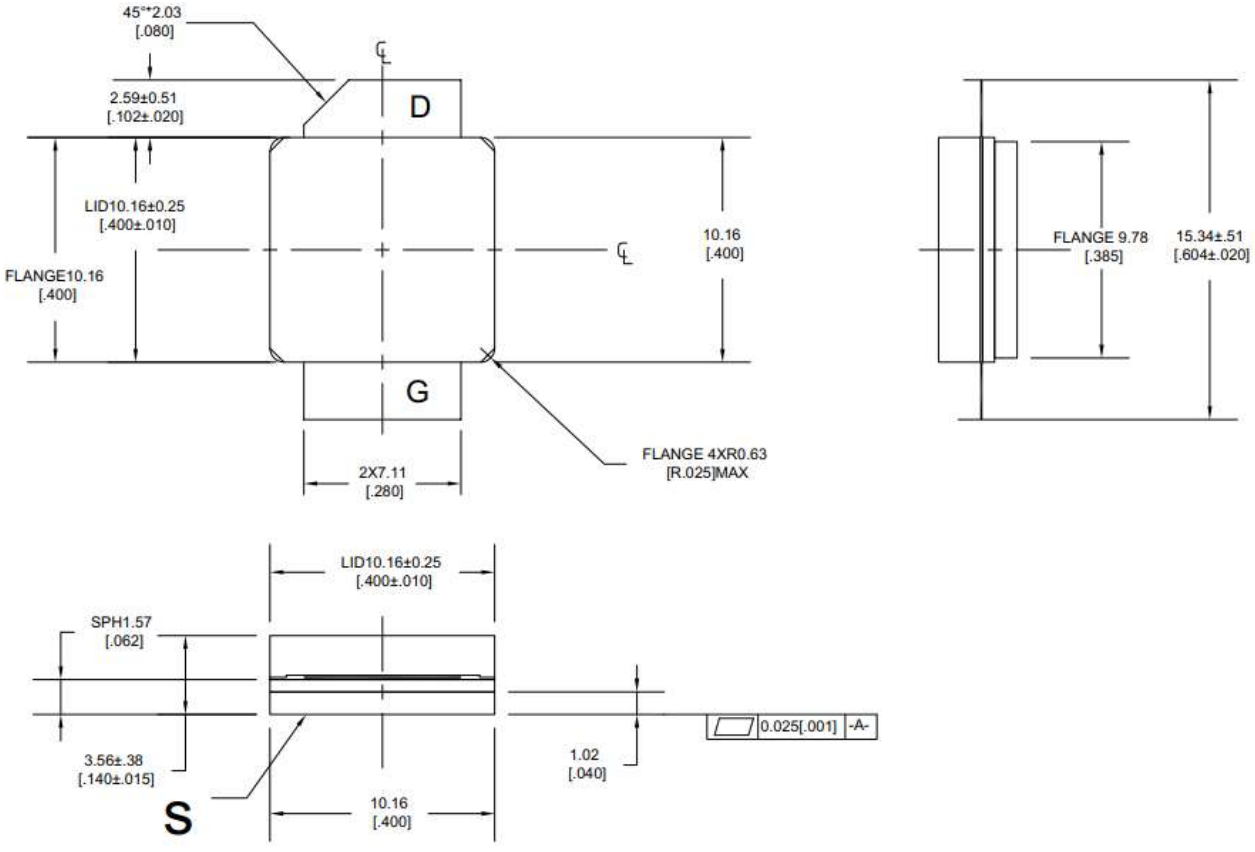


Table 6. Test Circuit Component Designations and Values

Part	description	Model
R1	7.50Ω	Chip Resistor
C1, C3	15pF 600F	
C5,C6	10uF 1210	
C2,C4	10pF 600F	
C7	470UF/63V	
PCB	20mil Rogers4350B	

Package Outline

Earless flanged ceramic package; 2 leads



Unit：mm [inch]

Tolerance .xx +/- 0.01 .xxx +/- 0.005 inches

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2023/5/5	**Rev 1.0**	**Product Datasheet**

Application data based on SYX-23-17/18

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