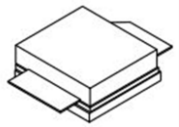
MG3503S LDMOS TRANSISTOR

Document Number: MG3503S
Product Datasheet V1.1

40W, 2.5-3.5GHz 28V RF LDMOS FETs

MG3503S



Description

The MG3503S is a 40-watt, internally matched, single ended LDMOS FETs, designed for multiple applications within full band 2.5-3.5GHz.

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 **2.5-3.5GHz** fixture with device soldered):

Voltage	Signal	Pin(dBm)	Pout(W)	Gain(dB)	Eff(%)
28	Pulse CW	37.5	49.5-54	9.5-9.9	38-52
28	CW	37.5	48-50	9-9.5	36-52
32	Pulse CW	37.5	60-66	10-10.8	36-52
32	CW	37.5	50-60	9.5-10.3	35-50

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	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, 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 = 2500 -3500MHz, Pulse CW Signal .					
Power Gain	Gp	9.5			dB
Drain Efficiency@P3dB	η_D		40		%
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				

2.5-3.5GHz

TYPICAL CHARACTERISTICS

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

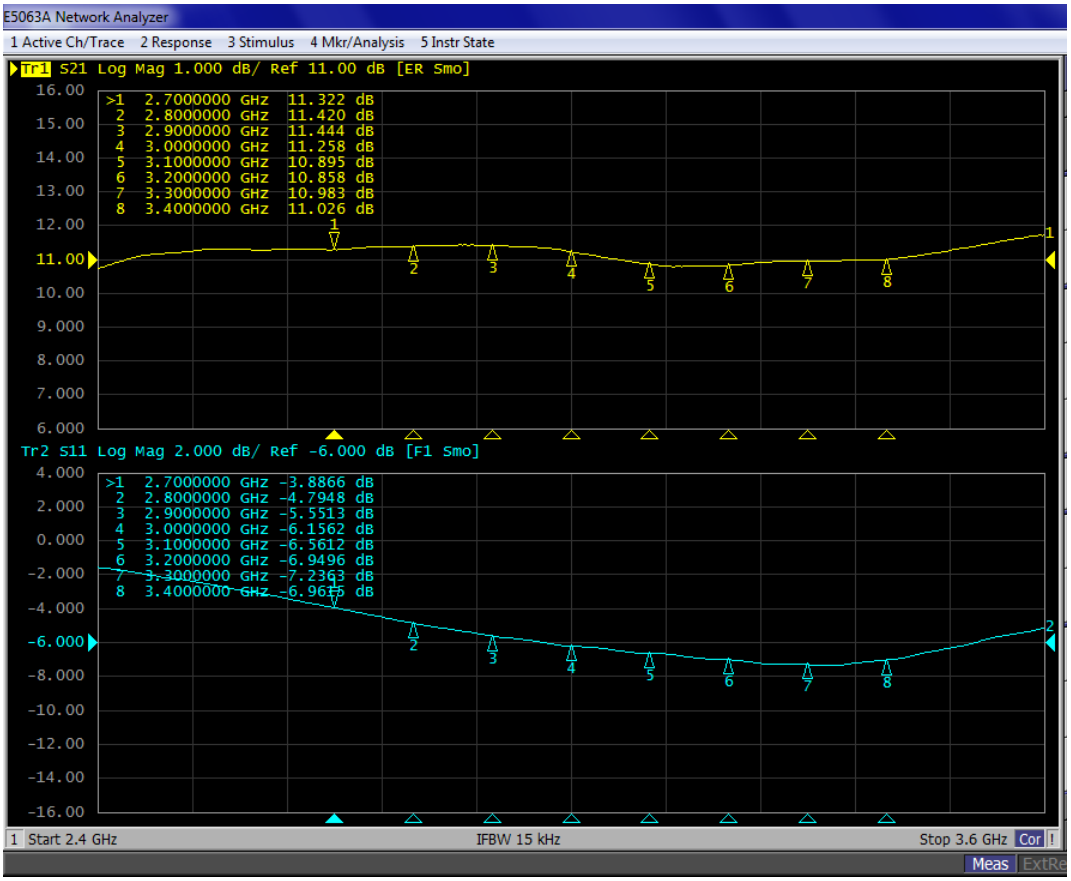


Figure 3. Test Circuit Component Layout

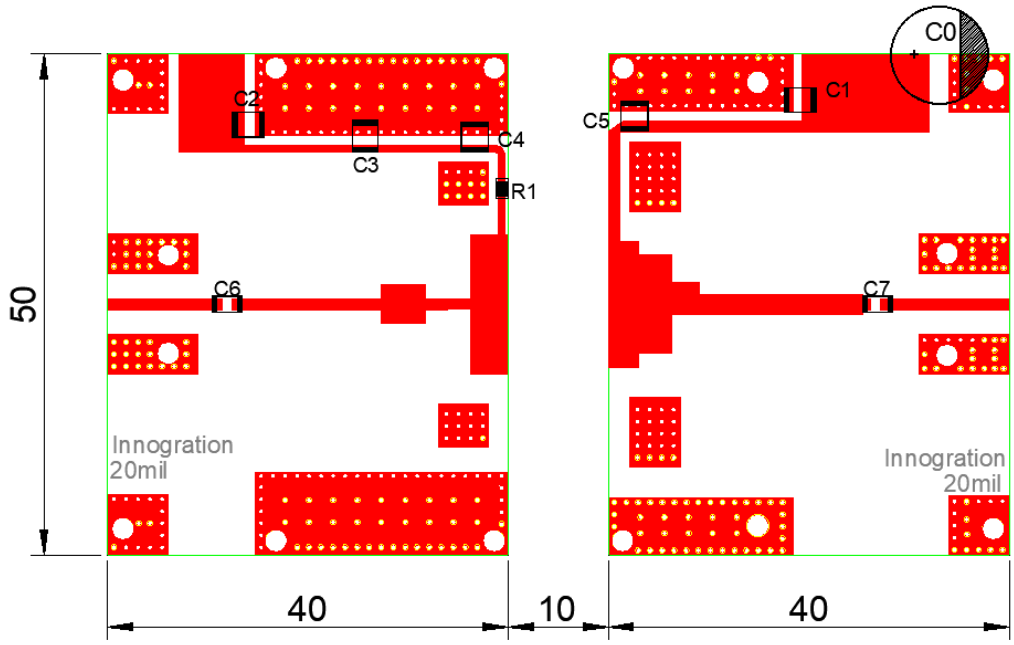
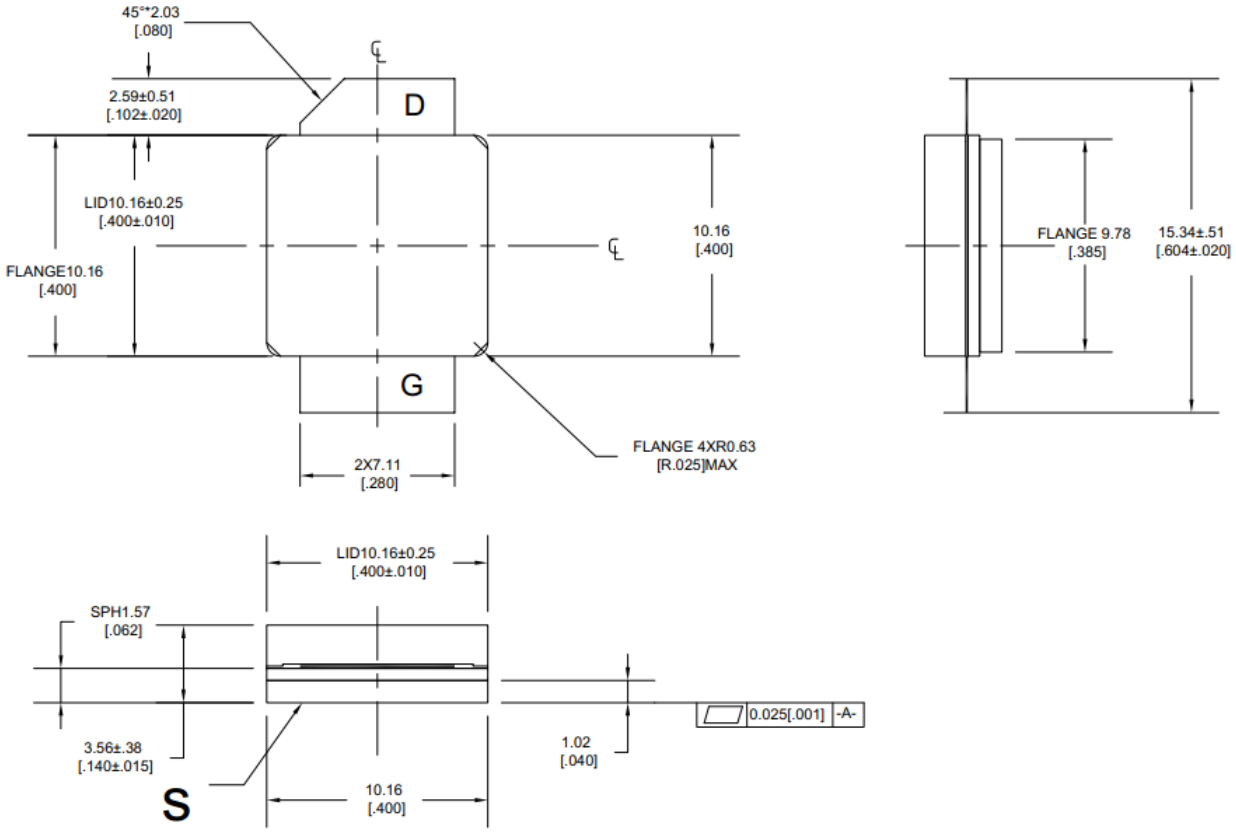


Table 5. Test Circuit Component Designations and Values

Component	Description	Suggestion
C0	1000uF/63V	Electrolytic Capacitor
C1, C2	10uF	1210
C3, C4, C5, C6	10pF	MQ301111
R1	Chip Resistor,10Ω	0805
PCB	Rogers 4350B, thickness 20 mils, 1oz copper	

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
2023/5/24	Rev 1.0	Product Datasheet
2024/11/23	Rev 1.1	Application data update with more info and some typo corrected

Application data based on RXT-23-18

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