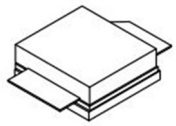
MG1707S LDMOS TRANSISTOR

Document Number: MG1707S
Product Datasheet V2.0

70W, L band 28V High Power RF LDMOS FETs

MG1707S



Description

The MG1707S is a 70-watt, internally matched, single ended LDMOS FETs, designed for multiple applications within 1.1-1.7GHz. 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 fixture with device soldered):

  V_{DD} = 28Volts, I_{DQ} = 150 mA, CW

F(MHz)	Pin（dBm）	Pout（W）	Id(A)	Gain（dB）	Eff(%)
1100	37.1	80.5	5.1	12.0	56.8
1200	37.7	79.4	5.5	11.3	51.6
1300	36.7	81.3	5.8	12.4	50.1
1400	37.7	83.2	6.4	11.5	46.4
1500	37.5	89.1	6.8	12.0	46.8
1600	37.7	89.1	6.7	11.8	47.5
1700	37.4	82.2	6.2	11.8	47.5

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

- L band amplifier
- ISM applications
- GPS, Beidou power 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, T_J=200°C, DC test	RθJC	0.9	°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 = 150 mA, Measured in Functional Test)	$V_{GS(Q)}$		2.67		V
Functional Tests (On Demo Test Fixture, 50 ohm system) V_{DD} = 28 Vdc, I_{DQ} = 150 mA, f = 1100 MHz, Pulse CW Signal Measurements.					
Power Gain	G_p		12		dB
Drain Efficiency@P3dB	η_D		55		%
3 dB Compression Point	P_{-3dB}	70			W
Load Mismatch (In Innogration Test Fixture, 50 ohm system): V_{DD} = 28 Vdc, I_{DQ} = 150 mA, f = 1100 MHz					
VSWR 10:1 at 70W pulse CW Output Power	No Device Degradation				

TYPICAL CHARACTERISTICS

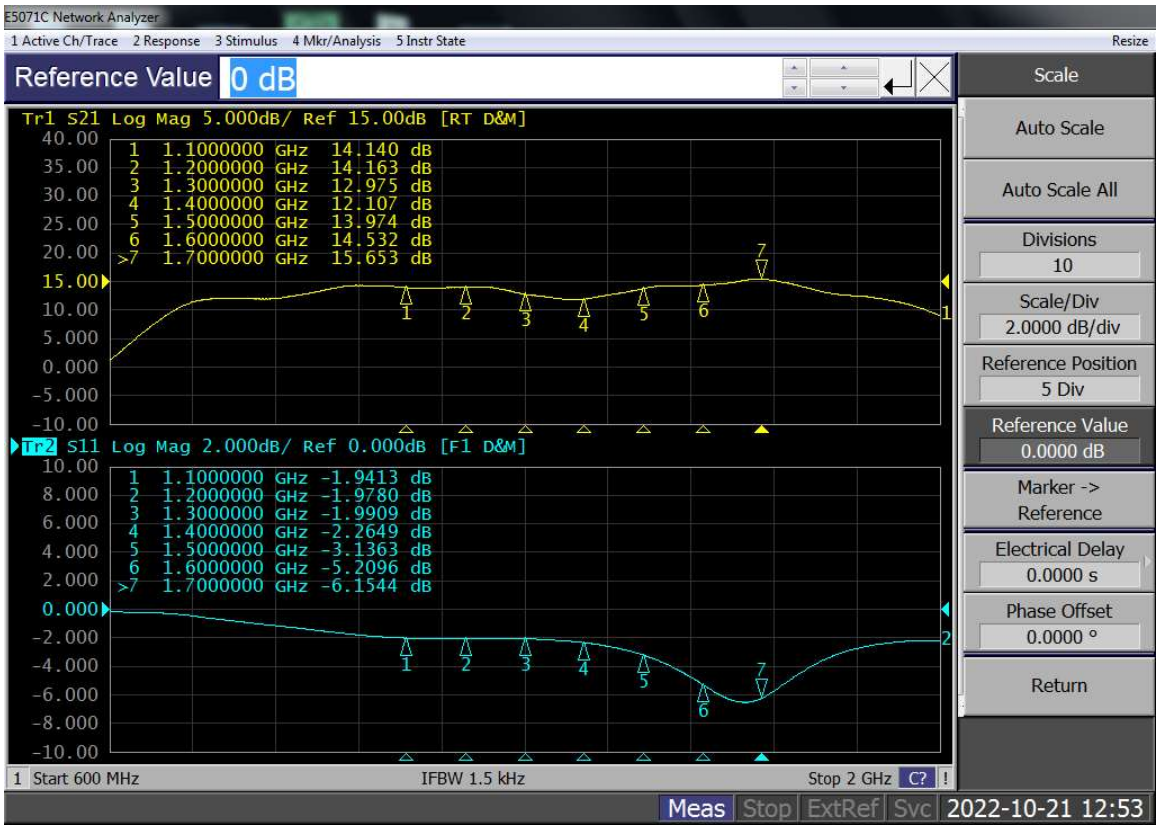
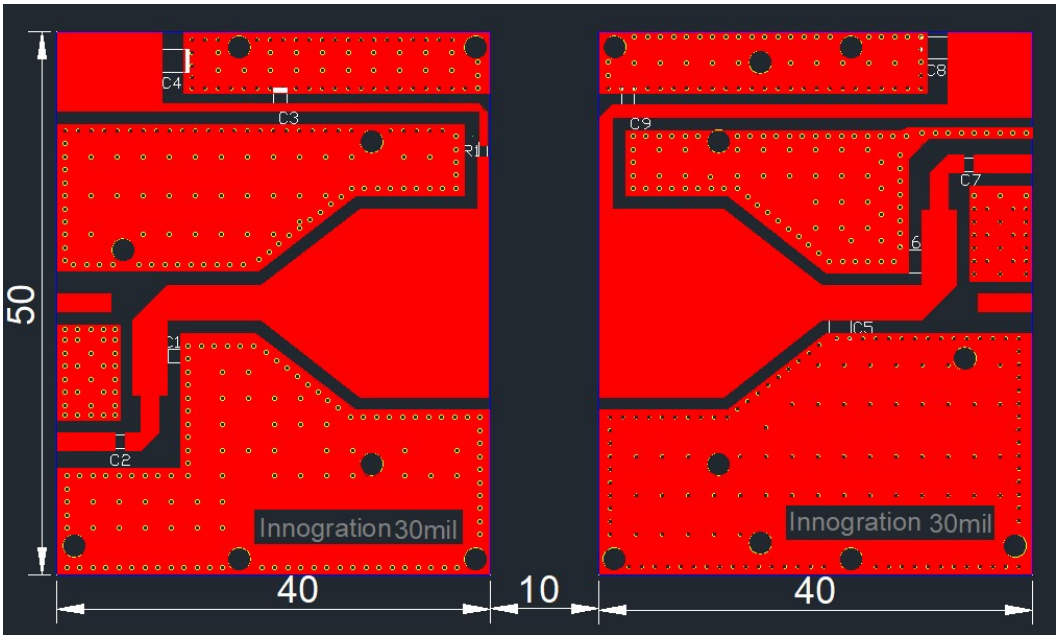


Figure 2. Network analyzer output S11/S21 (VDS=28V IDQ=150mA VGS=2.67V)

Figure 3. Test Circuit Component Layout



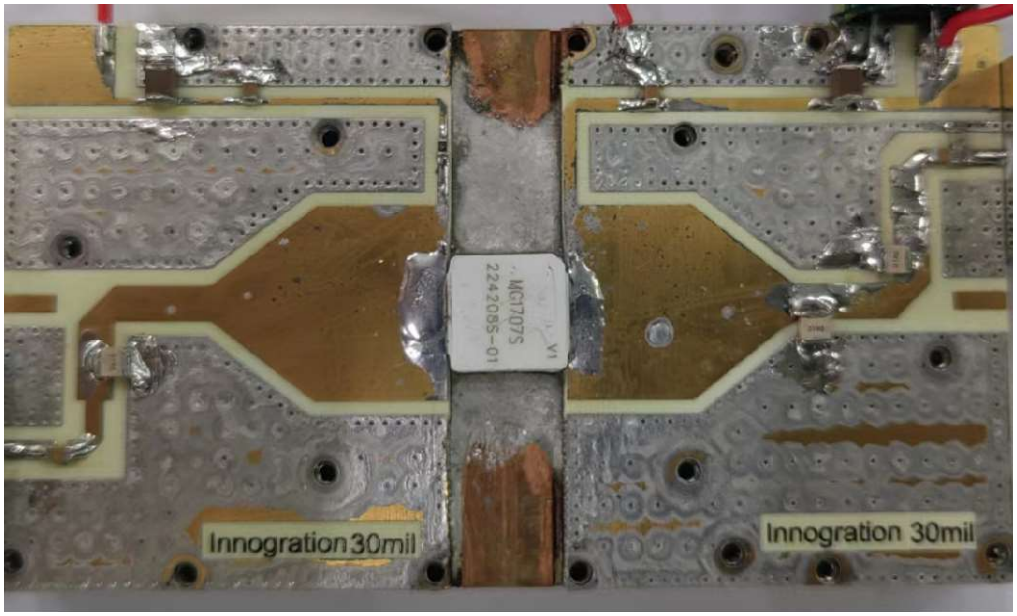
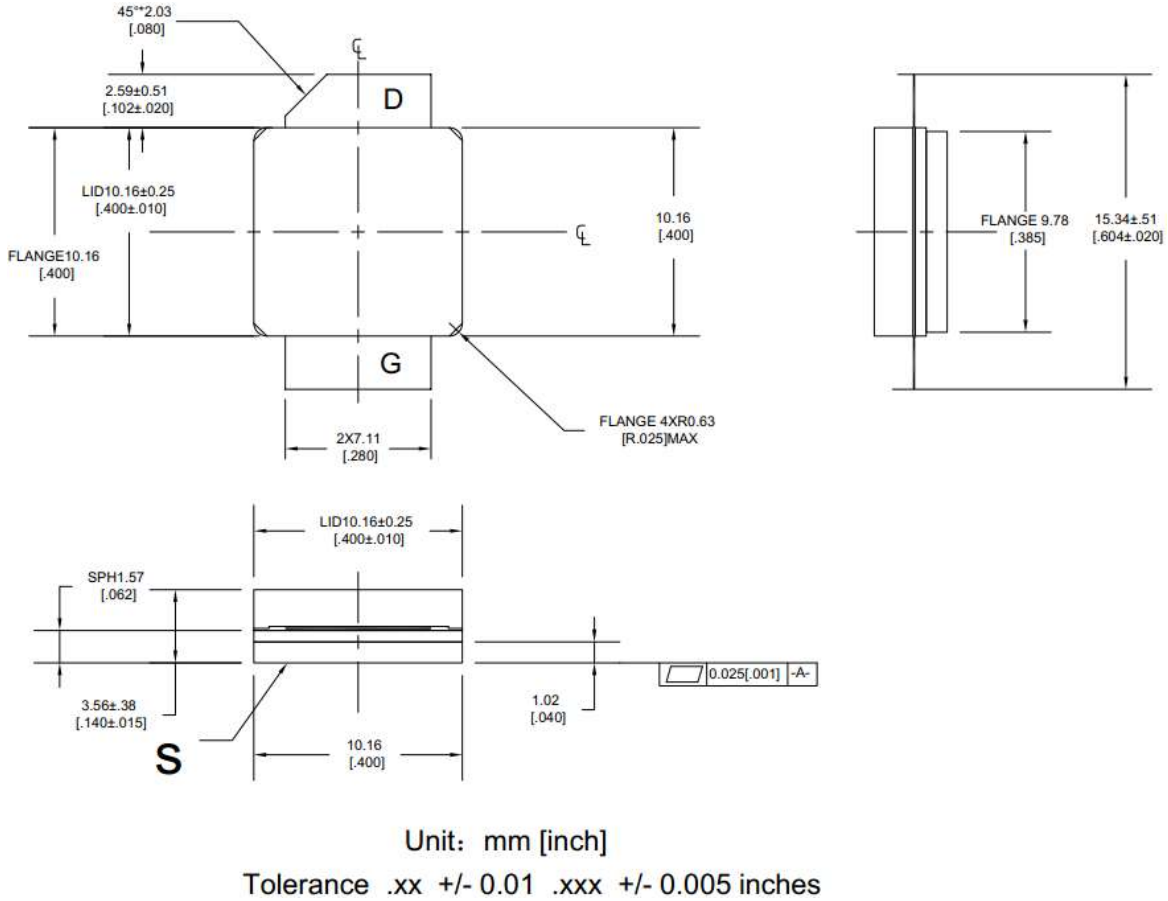


Table 4. Test Circuit Component Designations and Values

Component	Description	Suggested Manufacturer
C2、C3、C7、C9	56pF ATC 100A	
C1	1.8pF ATC 100B	
C6、C5	1pF ATC 100B	
C4、C8	10UF 1210	
R1	8.2Ω 0603	
PCB	30mil 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
2022/8/26	Rev 1.0	Product Datasheet
2022/10/21	Rev 2.0	Update according to V1 new design

Application data based on SYX-22-20

Disclaimers

Specifications are subject to change without notice. Innogration believes the information contained within this data sheet to be accurate and reliable. However, no responsibility is assumed by Innogration for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Innogration . Innogration makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose."Typical" parameters are the average values expected by Innogration in large quantities and are provided for information purposes only. These values can and do vary in different applications and actual performance can vary over time. All operating parameters should be validated by customer's technical experts for each application. Innogration products are not designed, intended or authorized for use as components in applications intended for surgical implant into the body or to support or sustain life, in applications in which the failure of the Innogration product could result in personal injury or death or in applications for planning, construction, maintenance or direct operation of a nuclear facility. For any concerns or questions related to terms or conditions, pls check with Innogration and authorized distributors