

MU1504 LDMOS TRANSISTOR

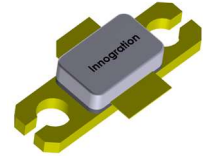
Document Number: MU1504
Product Datasheet V3.1

1500MHz, 40W, 28V High Power RF LDMOS FETs

Description

The MU1504 is a 40-watt, highly rugged, unmatched LDMOS FET, designed for wide-band commercial and industrial applications at frequencies HF to 1.5 GHz. It can be used in Class AB/B and Class C for all typical modulation formats.

MU1504



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

MU1504 Vgs=3.0V Vds=28V Idq=50mA CW								
Freq (MHz)	Psat (dBm)	Psat (W)	IDS (A)	Pin (dBm)	Gain (dB)	Eff(%)	2th (dBc)	3th (dBc)
30	45.03	31.8	1.57	29.83	15.20	72.43	-12.0	-9.4
50	45.52	35.6	1.76	29.24	16.28	72.33	-18.7	-10.7
100	46.12	40.9	2.02	30.19	15.93	72.36	-18.0	-10.8
150	46.92	49.2	2.54	30.44	16.48	69.18	-18.5	-9.4
200	46.91	49.1	2.51	30.72	16.19	69.85	-13.1	-12.4
250	45.81	38.1	2.00	29.10	16.71	68.05	-12.3	-20.4
300	45.41	34.8	1.78	29.24	16.17	69.73	-14.5	-22.2
350	44.75	29.9	1.79	28.66	16.09	59.56	-17.6	-18.1
400	44.25	26.6	1.88	29.50	14.75	50.55	-19.6	-24.1
450	44.24	26.5	1.68	29.53	14.71	56.43	-19.2	-32.0
500	44.20	26.3	1.66	30.23	13.97	56.59	-30.8	-24.0
512	44.12	25.8	1.65	30.62	13.50	55.89	-27.2	-18.0

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)

MU1504 LDMOS TRANSISTOR

Document Number: MU1504
Product Datasheet V3.1

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	+95	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+40	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 $T_c = 85^\circ\text{C}$, $T_j = 200^\circ\text{C}$, DC test	$R_{\theta JC}$	1.4	°C/W

Table 3. ESD Protection Characteristics

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

Table 4. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics					
Drain-Source Voltage $V_{GS} = 0$, $I_{DS} = 1.0\text{mA}$	$V_{(BR)DSS}$	95	---	---	V
Zero Gate Voltage Drain Leakage Current ($V_{DS} = 75\text{V}$, $V_{GS} = 0\text{V}$)	I_{DSS}	---	---	1	μA
Zero Gate Voltage Drain Leakage Current ($V_{DS} = 28\text{V}$, $V_{GS} = 0\text{V}$)	I_{DSS}	---	---	1	μA
Gate--Source Leakage Current ($V_{GS} = 10\text{V}$, $V_{DS} = 0\text{V}$)	I_{GSS}	---	---	1	μA
Gate Threshold Voltage ($V_{DS} = 28\text{V}$, $I_D = 150\mu\text{A}$)	$V_{GS(th)}$	---	2.11	---	V
Gate Quiescent Voltage ($V_{DD} = 28\text{V}$, $I_D = 200\text{mA}$, Measured in Functional Test)	$V_{GS(Q)}$	---	3.1	---	V

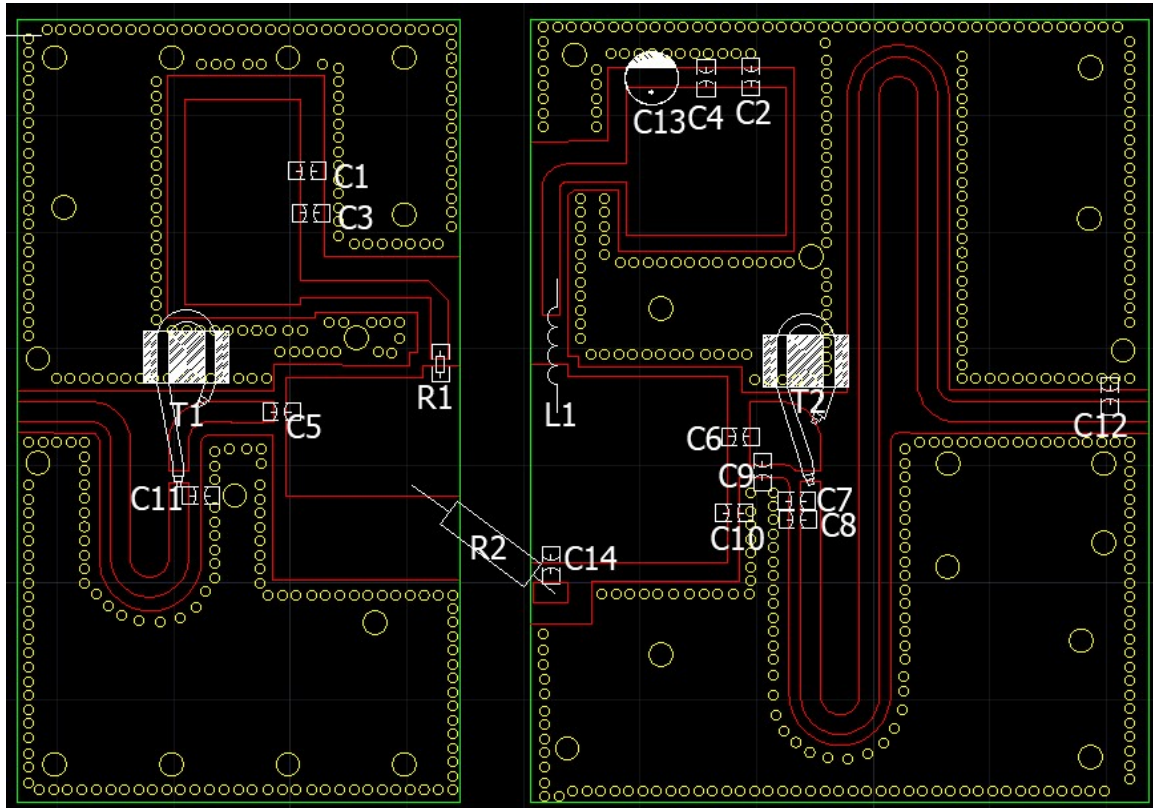
Functional Tests (In Demo Test Fixture, 50 ohm system) $V_{DD} = 28\text{Vdc}$, $I_{DQ} = 200\text{mA}$, $f = 1000\text{MHz}$, CW Signal Measurements.

Power Gain	G_p	---	20	---	dB
Drain Efficiency@P1dB	η_D	---	60	---	%
1 dB Compression Point	P_{-1dB}	35	40	---	W
Input Return Loss	IRL	---	-7	---	dB

MU1504 LDMOS TRANSISTOR

Document Number: MU1504
Product Datasheet V3.1

Figure 2. Test Circuit Component Layout of 30-512MHz



Component	Description	Suggested Manufacturer
C1,C2,C14	10uF	10uF/100V
C3,C4	10nF	10nF/100V
C5,C6	470pF	MQ101111
C7	2pF	MQ101111
C8	1pF	MQ101111
C9	4.3pF	MQ101111
C10	1.5pF	MQ101111
C11	3pF	MQ101111
C12	2.7pF	MQ101111
C13	470uF/63V	Electrolytic Capacitor
R1	100 Ω	Chip Resistor
R2	330 Ω	
L1	d=1.5mm, D=3.1mm, 8 turns	
T1	25ohm, 60mm	SFF-25-1.5, BN-61-1502
T2	50ohm, 60mm	RFSFBU-086-50;BN-61-1502
PCB	30Mil	Rogers4350

MU1504 LDMOS TRANSISTOR

Document Number: MU1504
Product Datasheet V3.1

Package Outline

Flanged ceramic package; 2 leads

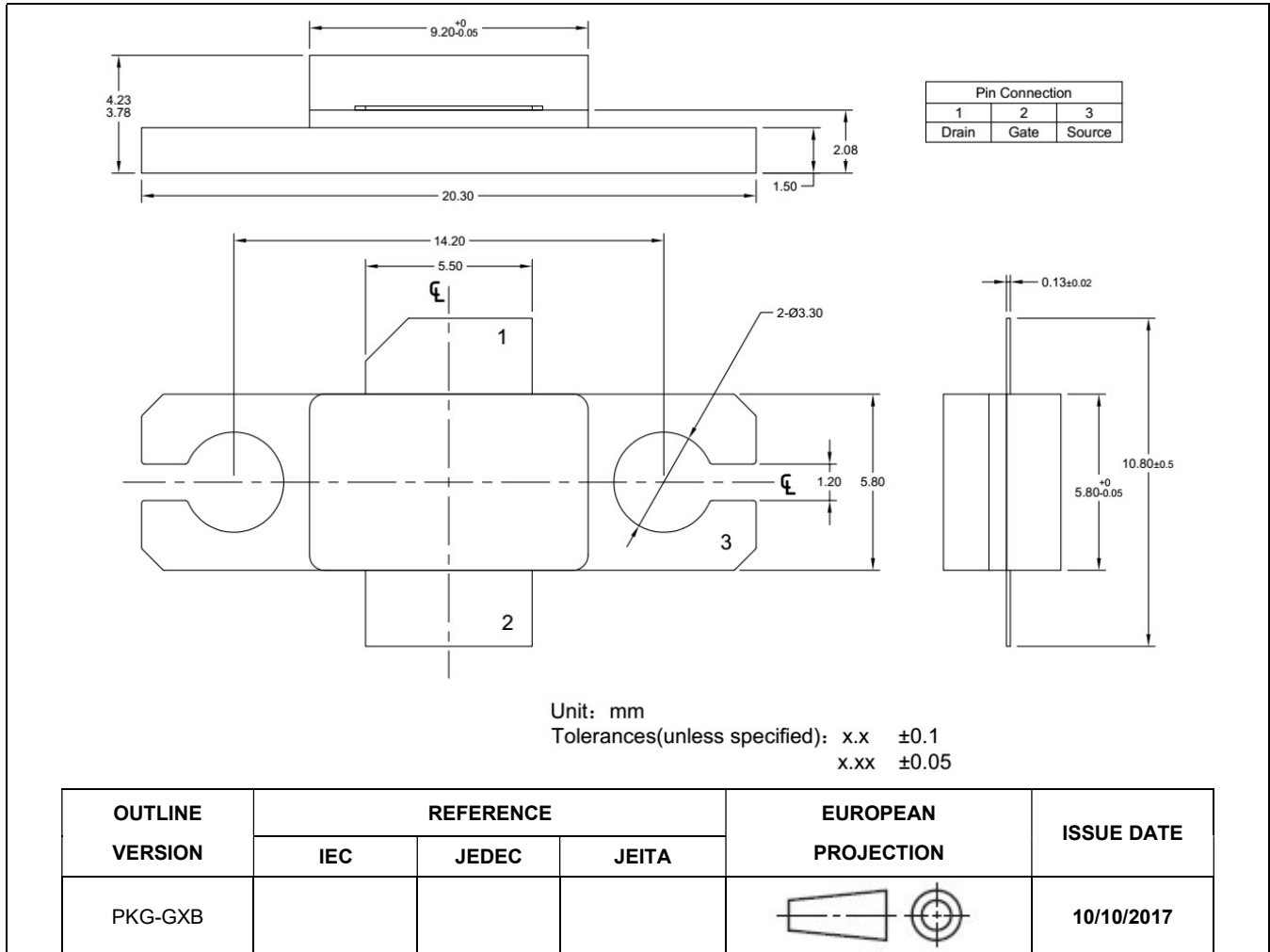


Figure 1. Package Outline PKG-G2E

MU1504 LDMOS TRANSISTOR

Document Number: MU1504
Product Datasheet V3.1

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2016/4/13	V1.0	Preliminary Datasheet Creation
2016/6/16	V2.0	Preliminary Datasheet, Update Datasheet Template
2017/2/22	V3.0	Product Datasheet
2024/3/28	V3.1	Change the application carrier to 30-512MHz

Application data based on TC-24-18

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

Copyright © by Innogration (Suzhou) Co.,Ltd.