

# MU1504 LDMOS TRANSISTOR

Document Number: MU1504  
Product Datasheet V3.0

## 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.

- Typical Performance (On Innogration fixture with device soldered):

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

| Frequency | Gp (dB) | $P_{-1dB}$ (W) | $\eta_D@P_{-1}$ (%) |
|-----------|---------|----------------|---------------------|
| 1000 MHz  | 20      | 40             | 60                  |

- Typical Performance (On Innogration fixture with device soldered):

$V_{DD} = 24$  Volts,  $I_{DQ} = 50$  mA, CW.

| Frequency | Gp (dB) | $P_{-1dB}$ (W) | $\eta_D@P_{-1}$ (%) |
|-----------|---------|----------------|---------------------|
| 1300 MHz  | 15      | 26             | 56                  |

### MU1504



### 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          | $V_{DS}$  | +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<br>$T_C = 85^\circ\text{C}$ , $T_J = 200^\circ\text{C}$ , DC test | $R_{\theta JC}$ | 1.4   | °C/W |

Table 3. ESD Protection Characteristics

| Test Methodology | Class |
|------------------|-------|
|------------------|-------|

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|                                     |         |
|-------------------------------------|---------|
| Human Body Model (per JESD22--A114) | Class 2 |
|-------------------------------------|---------|

**Table 4. Electrical Characteristics** (TA = 25 °C unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

**DC Characteristics**

|  |                      |    |      |   |    |
|--|----------------------|----|------|---|----|
| Drain-Source Voltage<br>V <sub>GS</sub> =0, I <sub>DS</sub> =1.0mA                                       | V <sub>(BR)DSS</sub> | 95 | —    |   | V  |
| Zero Gate Voltage Drain Leakage Current<br>(V <sub>DS</sub> = 75V, V <sub>GS</sub> = 0 V)                | I <sub>DSS</sub>     | —  | —    | 1 | μA |
| Zero Gate Voltage Drain Leakage Current<br>(V <sub>DS</sub> = 28 V, V <sub>GS</sub> = 0 V)               | I <sub>DSS</sub>     | —  | —    | 1 | μA |
| Gate--Source Leakage Current<br>(V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0 V)                          | I <sub>GSS</sub>     | —  | —    | 1 | μA |
| Gate Threshold Voltage<br>(V <sub>DS</sub> = 28V, I <sub>D</sub> = 150 μA)                               | V <sub>GS(th)</sub>  | —  | 2.11 | — | V  |
| Gate Quiescent Voltage<br>(V <sub>DD</sub> = 28 V, I <sub>D</sub> = 200 mA, Measured in Functional Test) | V <sub>GS(Q)</sub>   | —  | 3.1  | — | V  |

**Functional Tests** (In Demo Test Fixture, 50 ohm system) V<sub>DD</sub> = 28 Vdc, I<sub>DQ</sub> = 200mA, f = 1000 MHz, CW Signal Measurements.

|                        |                   |    |    |   |    |
|------------------------|-------------------|----|----|---|----|
| Power Gain             | G <sub>p</sub>    | —  | 20 | — | dB |
| Drain Efficiency@P1dB  | η <sub>D</sub>    | —  | 60 | — | %  |
| 1 dB Compression Point | P <sub>-1dB</sub> | 35 | 40 | — | W  |
| Input Return Loss      | IRL               | —  | -7 | — | dB |

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## Package Outline

Flanged ceramic package; 2 leads

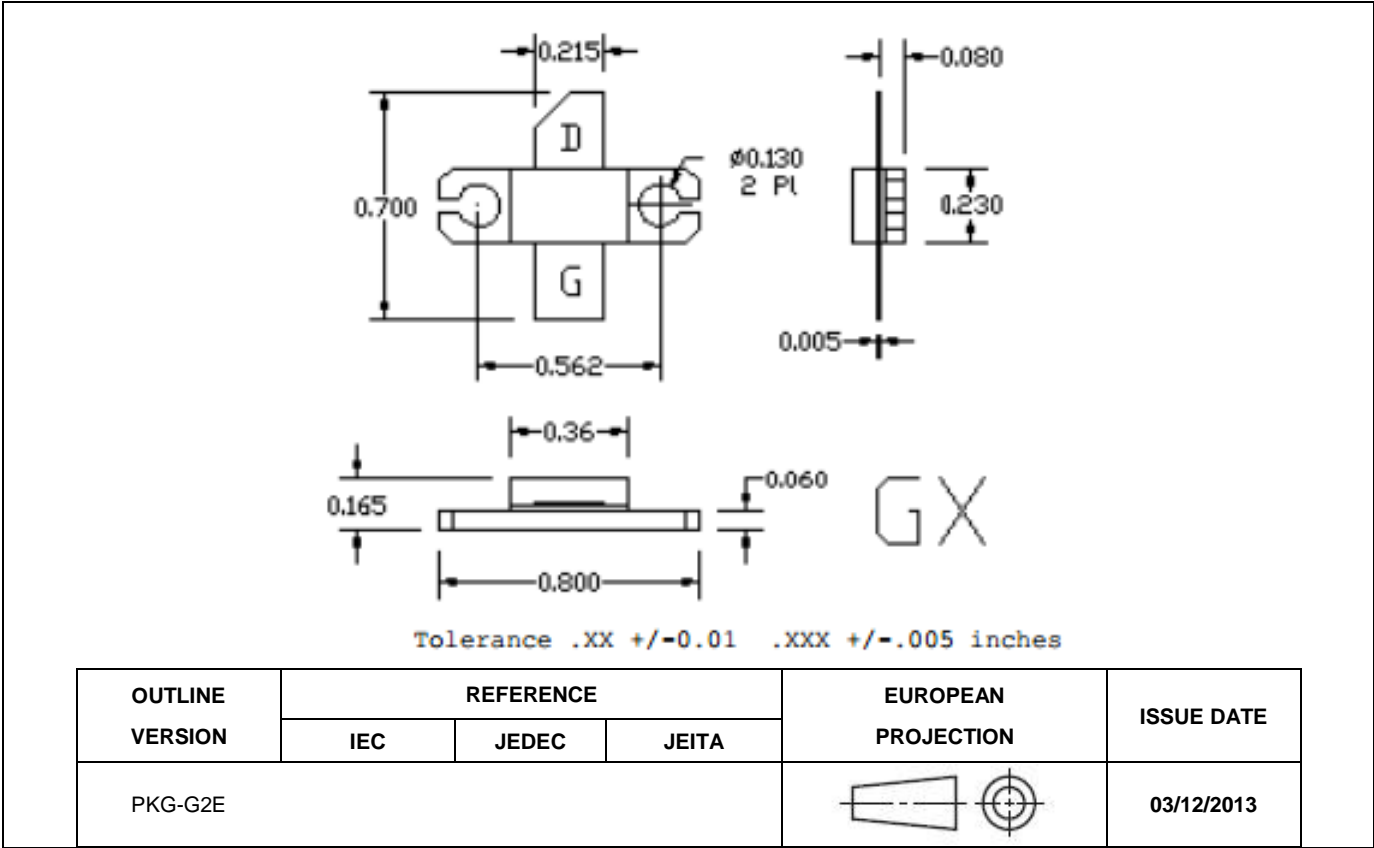


Figure 1. Package Outline PKG-G2E

## 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                                |

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