

# MK0525 LDMOS TRANSISTOR

Document Number: MK0525  
Product Datasheet V2.0

## 250W, 28V High Power RF LDMOS FETs

### Description

The MK0525 is a 250-watt, highly rugged, unmatched LDMOS FET, designed for wide-band commercial and industrial applications with frequencies HF to 1 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,  $I_{DQ} = 1200$  mA, CW.

Frequency	Gp (dB)	P <sub>-1dB</sub> (W)	$\eta_D@P_{-1}$ (%)
1000 MHz	17	250	60

#### •Typical Performance (On Innogration fixture with device soldered):

$V_{DD} = 28$  Volts,  $I_{DQ} = 1500$  mA, CW.

Freq(MHz)	Gain ( dB )	P-1(W)	Eff(%)
30	18.9	107	57.5
100	19.3	204	56.5
150	18.6	195	56.6
200	18.5	166	52.5
250	18.9	141	51.5
300	18.8	159	54.5
350	19.1	166	55.6
400	19.1	155	51.7
450	19.4	170	51.0
512	20.6	170	51.7

#### • Typical Performance (In Demo Fixture): $P_{out} = 40$ Watts @ 30 MHz-512 MHz,

$V_{DD} = 28$  Volts,  $I_{DQ} = 1.5$  A, Two tone space 100KHz.

Freq(MHz)	30	100	200	300	400	512
IMD3(dBc)	-38	-37	-33	-37	-39	-36

### 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

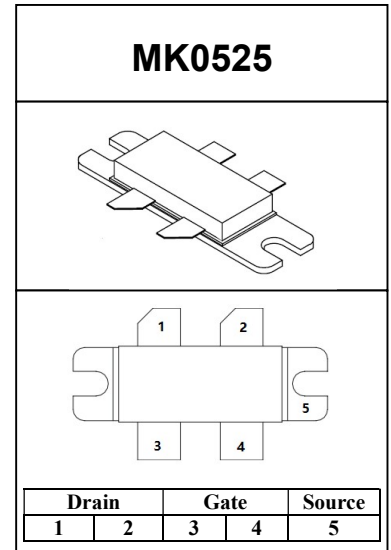


Figure 1. Pin Connection

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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	$R_{\theta JC}$	0.32	°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
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## DC Characteristics (per half section)

Drain-Source Voltage $V_{GS} = 0$ , $I_{DS} = 1.0\text{mA}$	$V_{(BR)DS}$	90			V
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 75\text{V}$ , $V_{GS} = 0\text{V}$ )	$I_{DSS}$	—	—	1	$\mu\text{A}$
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 28\text{V}$ , $V_{GS} = 0\text{V}$ )	$I_{DSS}$	—	—	1	$\mu\text{A}$
Gate--Source Leakage Current ( $V_{GS} = 10\text{V}$ , $V_{DS} = 0\text{V}$ )	$I_{GSS}$	—	—	1	$\mu\text{A}$
Gate Threshold Voltage ( $V_{DS} = 28\text{V}$ , $I_D = 650\mu\text{A}$ )	$V_{GS(th)}$	—	2.15	—	V
Gate Quiescent Voltage ( $V_{DD} = 28\text{V}$ , $I_D = 1.5\text{A}$ , Measured in Functional Test)	$V_{GS(Q)}$	—	3.2	—	V
Common Source Input Capacitance ( $V_{GS} = 0\text{V}$ , $V_{DS} = 28\text{V}$ , $f = 1\text{MHz}$ )	$C_{ISS}$		128		pF
Common Source Output Capacitance ( $V_{GS} = 0\text{V}$ , $V_{DS} = 28\text{V}$ , $f = 1\text{MHz}$ )	$C_{OSS}$		43		pF
Common Source Feedback Capacitance ( $V_{GS} = 0\text{V}$ , $V_{DS} = 28\text{V}$ , $f = 1\text{MHz}$ )	$C_{RSS}$		2.4		pF

**Functional Tests** (In Demo Test Fixture, 50 ohm system)  $V_{DD} = 28\text{Vdc}$ ,  $I_{DQ} = 1200\text{mA}$ ,  $f = 1000\text{MHz}$ , CW Signal Measurements.

Power Gain	$G_p$	—	17	—	dB
Drain Efficiency@P1dB	$\eta_D$	—	60	—	%
1 dB Compression Point	$P_{-1dB}$	—	250	—	W
Input Return Loss	IRL	—	-7	—	dB

**Load Mismatch (In Innogration Test Fixture, 50 ohm system):**  $V_{DD} = 28\text{Vdc}$ ,  $I_{DQ} = 1200\text{mA}$ ,  $f = 1000\text{MHz}$

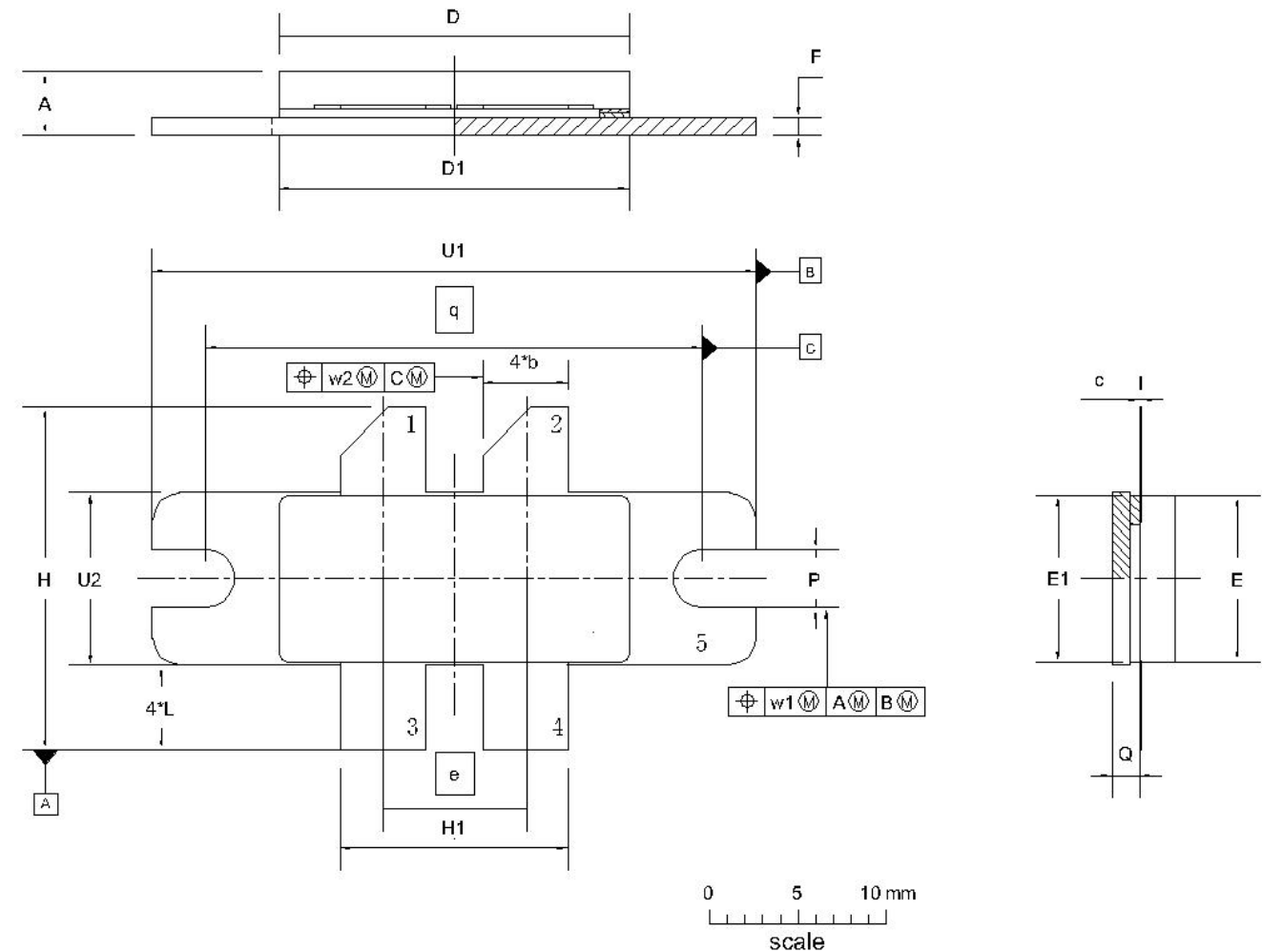
VSWR 20:1 at 250W pulse CW Output Power	No Device Degradation
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## Package Outline

Flanged ceramic package; 2 mounting holes; 4 leads



UNIT	A	b	c	D	D <sub>1</sub>	e	E	E <sub>1</sub>	F	H	H <sub>1</sub>	L	p	Q	q	U <sub>1</sub>	U <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>
mm	4.72	3.94	0.15	20.02	19.96	8.89	9.50	9.53	1.14	19.94	12.83	5.33	3.38	1.70	27.94	34.16	9.91	0.25	0.51
	3.43	3.68	0.08	19.61	19.66		9.30	9.25	0.89	18.92	12.57	4.32	3.12	1.45		33.91	9.65		
inches	0.186	0.155	0.006	0.788	0.786	0.35	0.374	0.375	0.045	0.785	0.505	0.210	0.133	0.067	1.100	1.345	0.390	0.01	0.02
	0.135	0.145	0.003	0.772	0.774		0.366	0.364	0.035	0.745	0.495	0.170	0.123	0.057		1.335	0.380		

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-B4E					03/12/2013

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## Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2016/8/8	Rev 1.0	Preliminary Datasheet
2017/2/22	Rev 2.0	Product Datasheet

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