

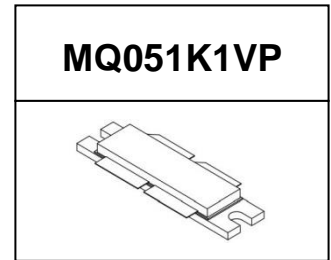
# MQ051K1VP LDMOS TRANSISTOR

Document Number: MQ051K1VP  
Preliminary Datasheet V1.0

## 1100W, 50V High Power RF LDMOS FETs

### Description

The MQ051K1VP is a 1100-watt, unmatched LDMOS FETs, designed for Aerospace and Air Navigation System applications with frequencies from HF to 0.6GHz.



- Typical Performance (In Innogration 325MHz test fixture with device soldered)  
VDD=52V, Vgs=3.1V I<sub>DQ</sub> = 100 mA, Pulse CW, Pulse Width=100 us, Duty cycle=10% .

Pin(dBm)	Pout(W)	Power Gain (dB)	Ids(A)	Eff(%)
37	970	22.8	2.79	69.1
38	1023	22.1	2.93	69.3
39	1071	21.3	3.03	69.9
40	1122	20.5	3.14	70.5

- Typical Performance (In Innogration 325MHz test fixture with devicesoldered):  
VDD=52V, Vgs=3.1V I<sub>DQ</sub> = 100 mA, CW

Pin(dBm)	Pout(W)	Power Gain (dB)	Ids(A)	Eff(%)
38	933	21.7	26.2	68.5
39	1000	21	27.4	70.2
40	1023	20.1	28	70.3

- Capable of Handling >20:1 VSWR at all phase angle, @ 52Vdc, 325 MHz, 1000Watts Pulse CW Output Power

### Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Internally Matched for Ease of Use
- Large Positive and Negative Gate/Source Voltage Range for Improved Class C Operation
- Excellent thermal stability, low HCI drift
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

**Table 1. Maximum Ratings**

Rating	Symbol	Value	Unit
Drain--Source Voltage	V <sub>DSS</sub>	125	Vdc
Gate--Source Voltage	V <sub>GS</sub>	-10 to +10	Vdc
Operating Voltage	V <sub>DD</sub>	+55	Vdc
Storage Temperature Range	T <sub>stg</sub>	-65 to +150	°C
Case Operating Temperature	T <sub>c</sub>	+150	°C
Operating Junction Temperature	T <sub>j</sub>	+225	°C

**Table 2. Thermal Characteristics**

# MQ051K1VP LDMOS TRANSISTOR

Document Number: MQ051K1VP  
Preliminary Datasheet V1.0

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case, Case Temperature 80°C, 1000W Pulse CW, 50 Vdc, I <sub>DQ</sub> = 100 mA	R <sub>θJC</sub>	TBD	°C/W

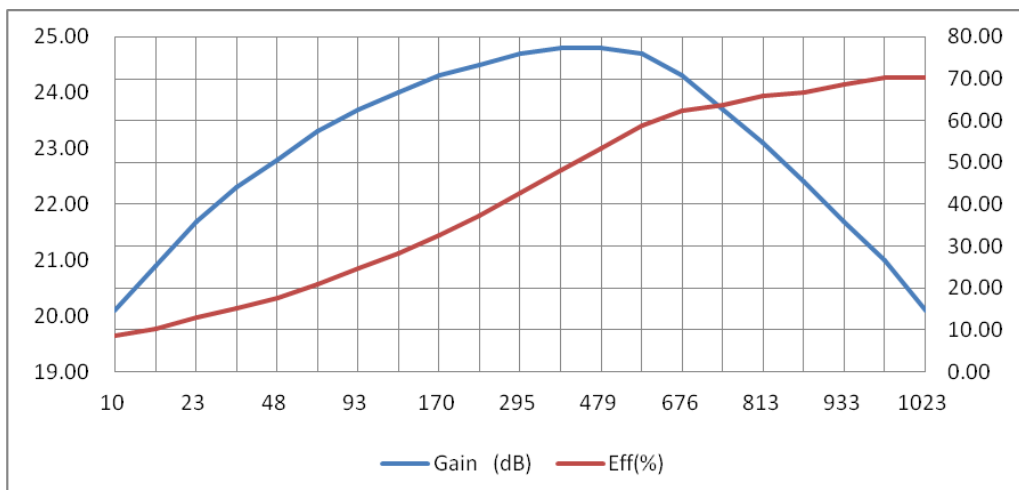
**Table 3. ESD Protection Characteristics**

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>DC Characteristics</b>					
Drain-Source Voltage V <sub>GS</sub> =0, I <sub>DS</sub> =1.0Ma	V <sub>(BR)DSS</sub>		122		V
Zero Gate Voltage Drain Leakage Current (V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0 V)	I <sub>DSS</sub>	—	—	1	μA
Gate—Source Leakage Current (V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0 V)	I <sub>GSS</sub>	—	—	1	μA
Gate Threshold Voltage (V <sub>DS</sub> = 50V, I <sub>D</sub> = 600 μA)	V <sub>GS(th)</sub>	—	2.53	—	V
Gate Quiescent Voltage (V <sub>DD</sub> = 50 V, I <sub>D</sub> = 400 mA, Measured in Functional Test)	V <sub>GS(Q)</sub>	—	3.1	—	V
Drain source on state resistance (V <sub>DS</sub> = 0.1V, V <sub>GS</sub> = 10 V) Each section side of device measured	R <sub>ds(on)</sub>		94.6		mΩ
Common Source Input Capacitance (V <sub>GS</sub> = 0V, V <sub>DS</sub> =50 V, f = 1 MHz) Each section side of device measured	C <sub>ISS</sub>		327		pF
Common Source Output Capacitance (V <sub>GS</sub> = 0V, V <sub>DS</sub> =50 V, f = 1 MHz) Each section side of device measured	C <sub>OSS</sub>		97.3		pF
Common Source Feedback Capacitance (V <sub>GS</sub> = 0V, V <sub>DS</sub> =50 V, f = 1 MHz) Each section side of device measured	C <sub>RSS</sub>		1.95		pF

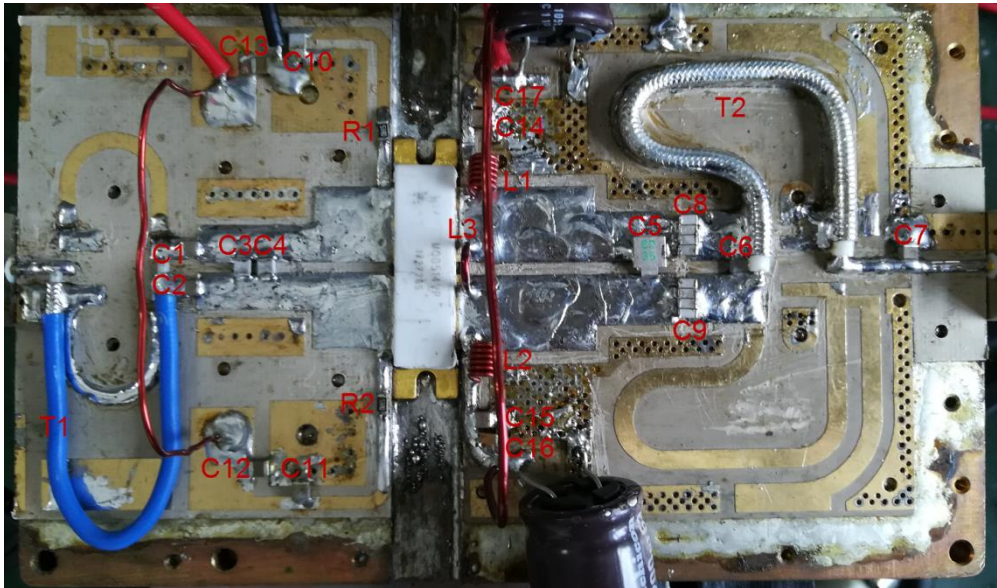
**Figure 1: CW gain and efficiency as a Function of Output Power**



# MQ051K1VP LDMOS TRANSISTOR

Document Number: MQ051K1VP  
Preliminary Datasheet V1.0

Figure 2: 325MHz test fixture picture



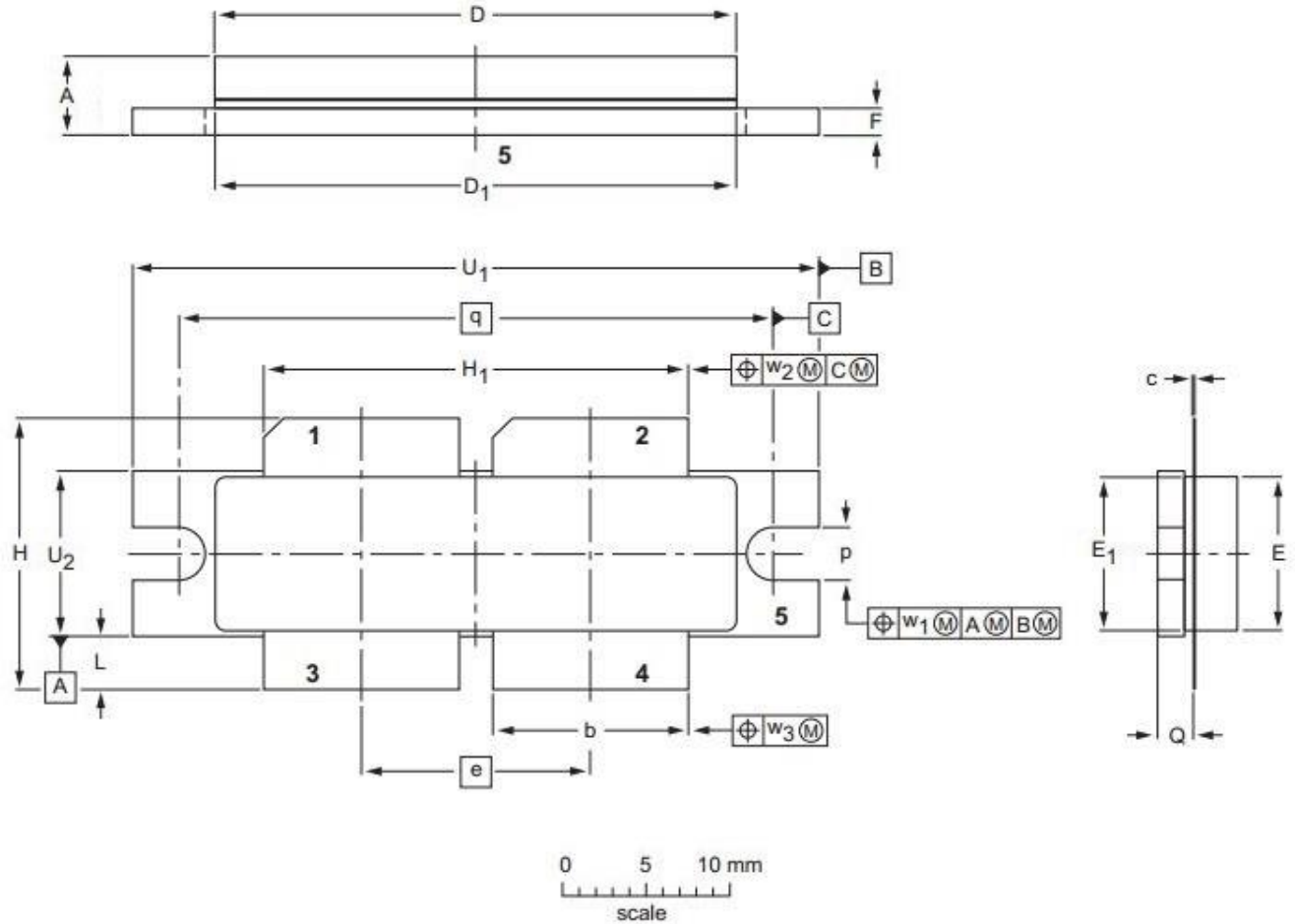
BOM		
C1,C2,C10,C11,C14,C15	300PF	ATC800B
C3	39PF	ATC800B
C4	33PF	ATC800B
C5	36PF	CDE
C6	2.7PF	ATC800B
C7	2.2PF	ATC800B
C8,C9	68PF x4	ATC800B
C12,C13,C16,C17	1UF	
R1,R2	25 $\Omega$	
L1, L2	6turns	Diameter=3.5mm
L3	1turns	Diameter=7.5mm
T1	25 $\Omega$ 100mm	
T2	25 $\Omega$ 112mm	

# MQ051K1VP LDMOS TRANSISTOR

Document Number: MQ051K1VP  
Preliminary Datasheet V1.0

## Package Outline

Flanged ceramic package; 2 mounting holes; 4 leads (1、2—DRAIN、3、4—GATE、5—SOURCE)



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>	W <sub>3</sub>
mm	4.7	11.81	0.18	31.55	31.52	13.72	9.50	9.53	1.75	17.12	25.53	3.48	3.30	2.26	35.56	41.28	10.29	0.25	0.51	0.25
	4.2	11.56	0.10	30.94	30.96		9.30	9.27	1.50	16.10	25.27	2.97	3.05	2.01		41.02	10.03			
inches	0.185	0.465	0.007	1.242	1.241	0.540	0.374	0.375	0.069	0.674	1.005	0.137	0.130	0.089	1.400	1.625	0.405	0.01	0.02	0.01
	0.165	0.455	0.004	1.218	1.219		0.366	0.365	0.059	0.634	0.995	0.117	0.120	0.079		1.615	0.395			

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-D4E					03/12/2013

# MQ051K1VP LDMOS TRANSISTOR

Document Number: MQ051K1VP  
Preliminary Datasheet V1.0

## Revision history

Table 6. Document revision history

Date	Revision	Datasheet Status
2017/07/31	Rev 1.0	Preliminary Datasheet

## 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.