### **Description**

### JMG N-channel Advanced Mode Power MOSFET

#### **Features**

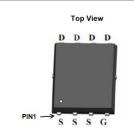
- 60V,160A
  - $R_{DS(ON)}$ <3m $\Omega$  @  $V_{GS}$  = 10V
- Advanced Split Gate Trench Technology
- $\bullet \;\;$  Excellent  $R_{\text{DS}(\text{ON})} and \; Low \; Gate \; Charge$
- Lead free product is acquired

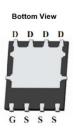
### **Application**

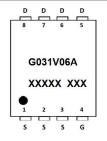
- Load Switch
- PWM Application
- Power management

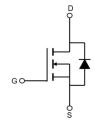
100% UIS TESTED! 100% ΔVds TESTED!











PDFN5x6-8L

Marking and pin Assignment

**Schematic Diagram** 

### **Package Marking and Ordering Information**

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
G031V06A	JMGG031V06A	TAPING	PDFN5x6-8L	13inch	2500	25000

### **Absolute Maximum Ratings** (T<sub>C</sub>=25 ℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage		60	V
V <sub>GSS</sub>	Gate-Source Voltage		±25	V
	Continuous Drain Current	T <sub>C</sub> = 25 °C	160	Α
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> = 100 °C	104	Α
I <sub>DM</sub>	Pulsed Drain Current note1		640	Α
Eas	Single Pulsed Avalanche Energy <sup>n</sup>	ote2	196	mJ
P <sub>D</sub>	Power Dissipation	T <sub>C</sub> = 25 ℃	125	W
R <sub>θJC</sub>	Thermal Resistance, Junction	n to Case	1	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temporal	erature Range	-55 to +150	$^{\circ}$

## **Electrical Characteristics** (T<sub>J</sub>=25°C unless otherwise specified)

Symbol	Parameter	<b>Test Condition</b>	Min.	Тур.	Max.	Units
Off Charac	cteristic		'		1	
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	60	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V,	-	-	1.0	μΑ
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> = ±25V	-	-	±100	nA
On Charac	cteristics					
V <sub>GS(th)</sub>	Gate Threshold Voltage V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250µA		2	3	4	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	-	2.3	3.0	mΩ
Dynamic (	Characteristics		'		1	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz	-	3383	-	pF
Coss	Output Capacitance		-	1940	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	14	-	pF
Qg	Total Gate Charge	V <sub>DS</sub> =30V, I <sub>D</sub> =40A,	-	46	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	17	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge	VGS=10V	_	10	-	nC
Switching	Characteristics					
t <sub>d(on)</sub>	Turn-on Delay Time		-	19	-	ns
tr	Turn-on Rise Time	$V_{DD}$ =30 $V$ , $I_D$ =40 $A$ ,	-	105	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G$ =2.7 $\Omega$ , $V_{GS}$ =10 $V$	-	35	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	107	-	ns
Drain-Sou	rce Diode Characteristics and Maximu	ım Ratings				
Is	Maximum Continuous Drain to Source Diode Forward Current			-	160	Α
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current			-	640	Α
$V_{\text{SD}}$	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =30A	-	-	1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	Body Diode Reverse Recovery Time		50	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	V <sub>DS</sub> =60V, I <sub>F</sub> =40A,dI/dt=300A/μs	-	115	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

<sup>2.</sup> EAS condition: TJ=25  $^{\circ}\text{C}$  , VDD=30V, VG=10V, RG=25 $\Omega$ , L=0.5mH, IAS=28A

<sup>3.</sup> Pulse Test: Pulse Width≤300µs, Duty Cycle≤0.5%

## **Typical Performance Characteristics**

Figure1: Output Characteristics

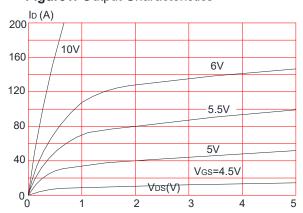


Figure 3:On-resistance vs. Drain Current

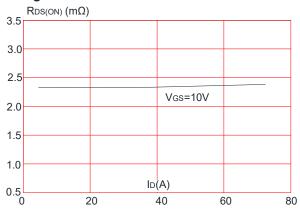


Figure 5: Gate Charge Characteristics

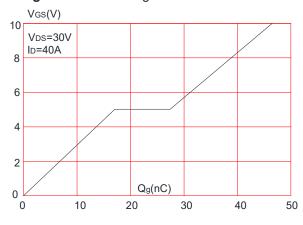


Figure 2: Typical Transfer Characteristics

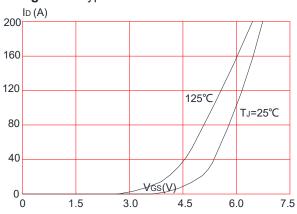


Figure 4: Body Diode Characteristics

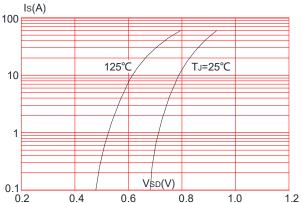
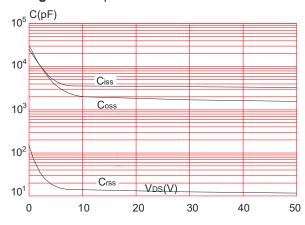


Figure 6: Capacitance Characteristics



**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature

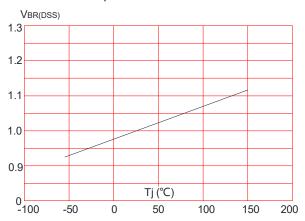
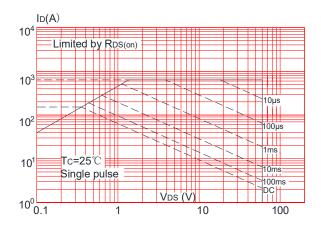
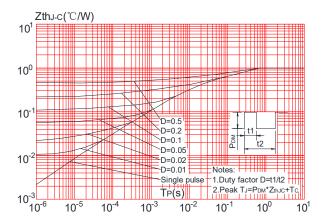


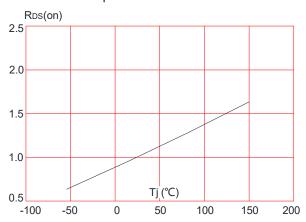
Figure 9: Maximum Safe Operating Area



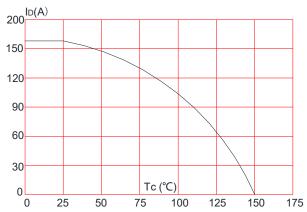
**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case



**Figure 8:** Normalized on Resistance vs. Junction Temperature



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature





### **Test Circuit**

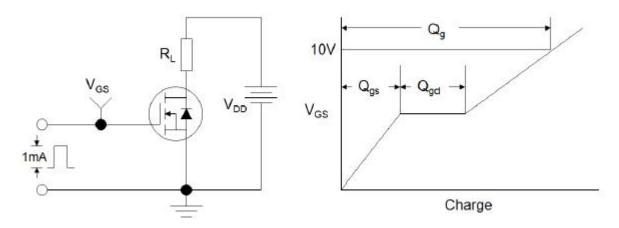


Figure1:Gate Charge Test Circuit & Waveform

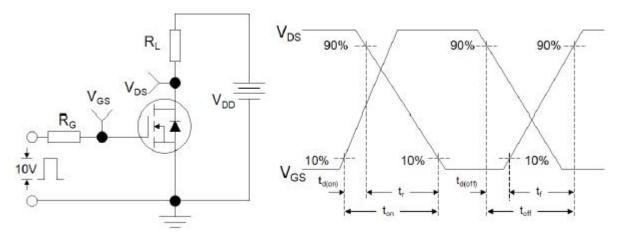


Figure 2: Resistive Switching Test Circuit & Waveforms

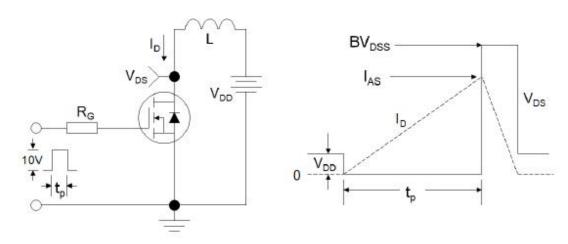
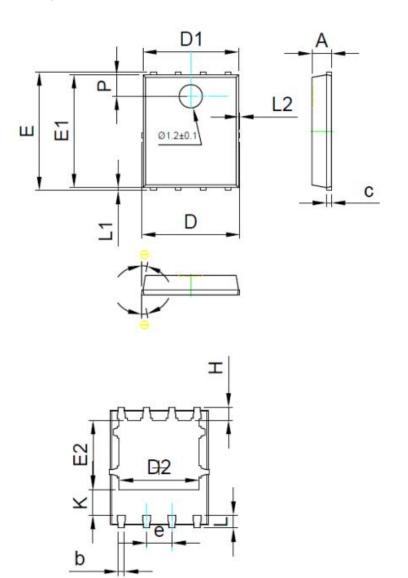


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



### Package Mechanical Data-PDFN5x6-8L



SYMBOL	MIN	NOM	MAX	
A	0.90	1.00	1.10	
b	0.35	0.40	0.45	
С	0.21	0.25	0.34	
D		-	5.10	
D1	4.85	4.90	4.95	
D2	3.96	4.01	4.06	
е	1.27 BSC			
E	5.95	6.00	6.05	
E1	5.70	5.75	5.80	
E2	3.425	3.475	3.525	
Н	0.60	0.65	0.70	
K	1.29	-	-	
L	0.60	0.65	0.70	
L1	0.05	0.15	0.25	
L2	. =	-	0.12	
Θ	8°	10*	12*	
Р	1.05	1.10	1.15	

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