



## Description

### JMG N-channel Advanced Mode Power MOSFET

#### Features

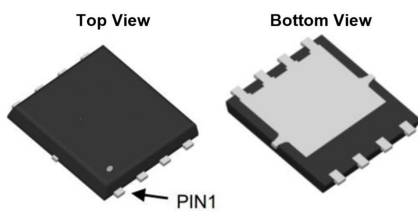
- 120V,90A  
 $R_{DS(ON)} < 7.1m\Omega @ V_{GS} = 10V$
- Advanced Split Gate Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead Free

#### Application

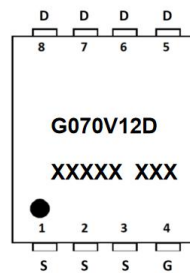
- Load Switch
- PWM Application
- Power Management



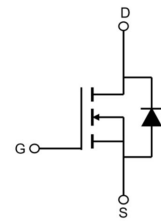
*100% UIS TESTED!*  
*100% ΔVds TESTED!*



PDFN5x6-8L



Marking and pin Assignment



Schematic Diagram

## Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel (pcs)	Per Carton (pcs)
G070V12D	JMGG070V12D	TAPING	PDFN5x6-8L	13"	2500	25000

## Absolute Maximum Ratings ( $T_C=25^\circ C$ unless otherwise specified)

Symbol	Parameter	Max.	Units	
$V_{DSS}$	Drain-Source Voltage	120	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 25$	V	
$I_D$	Continuous Drain Current	$T_C = 25^\circ C$	90	A
		$T_C = 100^\circ C$	59	A
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>	360	A	
$E_{AS}$	Single Pulsed Avalanche Energy <sup>note2</sup>	182	mJ	
$P_D$	Power Dissipation	$T_C = 25^\circ C$	102	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.2	$^\circ C/W$	
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +150	$^\circ C$	



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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristics</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	120	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =120V, V <sub>GS</sub> =0V,	-	-	1.0	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> = ±25V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2	-	4	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance <small>note3</small>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	5.7	7.1	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz	-	3600	-	pF
C <sub>oss</sub>	Output Capacitance		-	2400	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	156	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DD</sub> =60V, I <sub>D</sub> =45A, V <sub>GS</sub> =10V	-	90	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	21	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	24	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =60V, I <sub>D</sub> =45A, R <sub>GEN</sub> =1.6Ω, V <sub>GS</sub> =10V	-	20	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	15	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	40	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	10	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	90	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	360	A
V <sub>SD</sub>	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	I <sub>F</sub> =45A, di/dt=100A/μs	-	70	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	137	-	nC

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

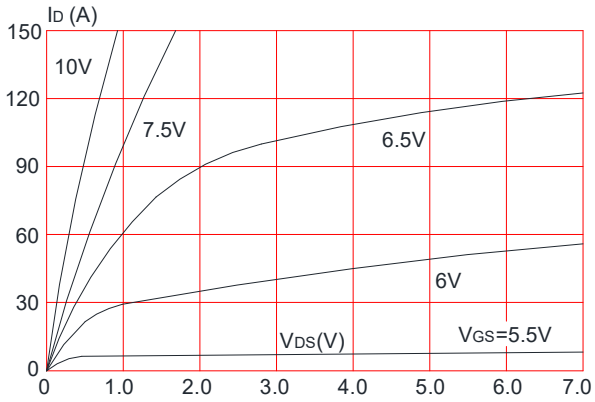
2. EAS condition: Starting T<sub>J</sub>=25°C, V<sub>DD</sub>=60V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=27 A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

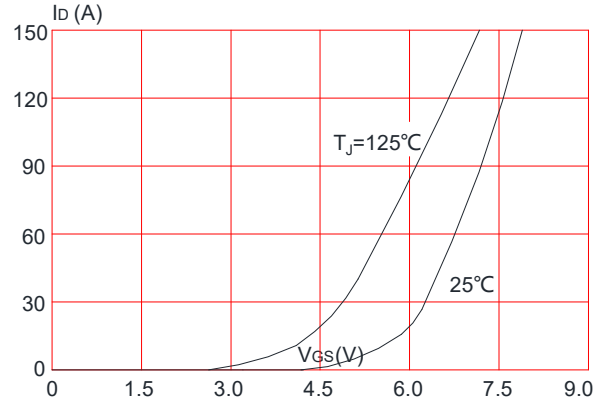


## Typical Performance Characteristics

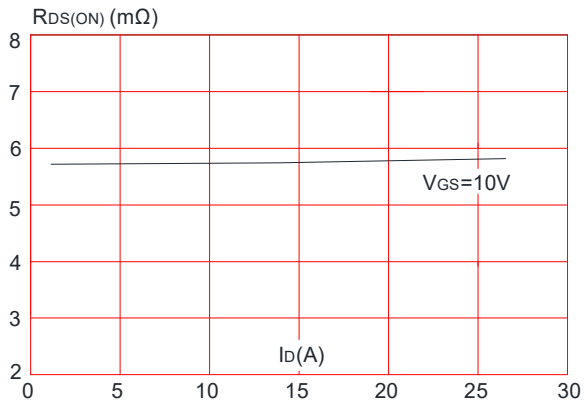
**Figure 1: Output Characteristics**



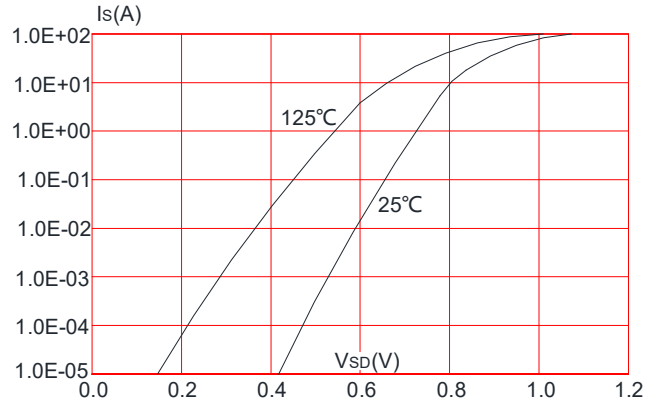
**Figure 2: Typical Transfer Characteristics**



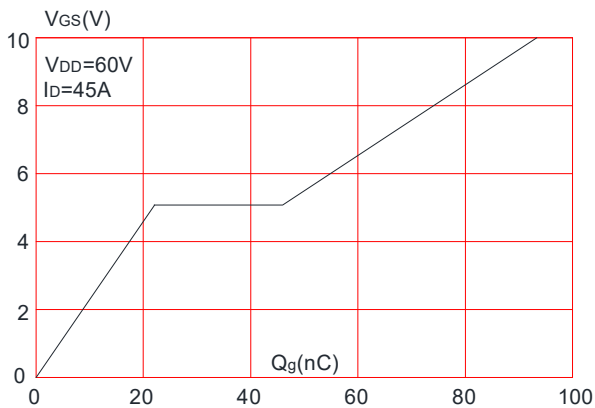
**Figure 3: On-resistance vs. Drain Current**



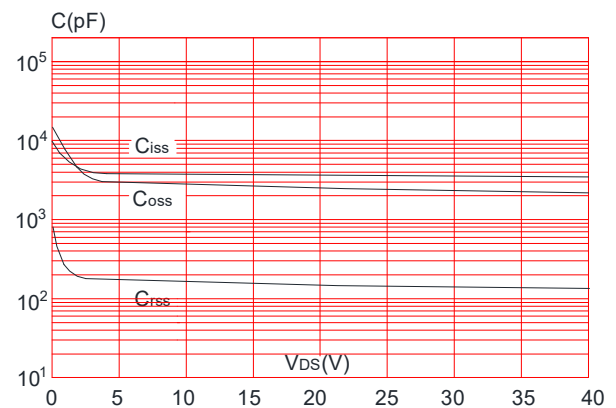
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

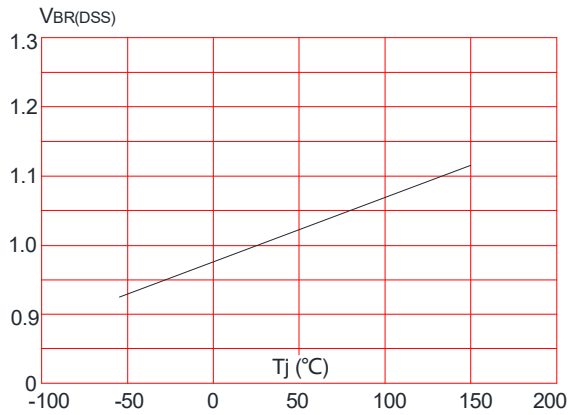


**Figure 6: Capacitance Characteristics**

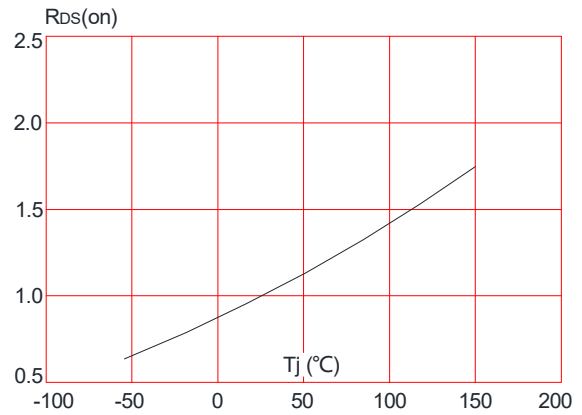




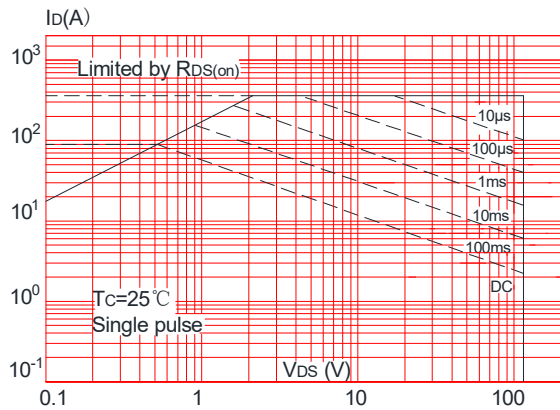
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



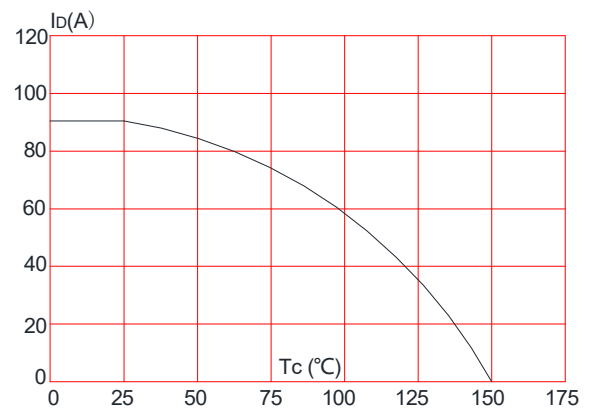
**Figure 8: Normalized on Resistance vs. Junction Temperature**



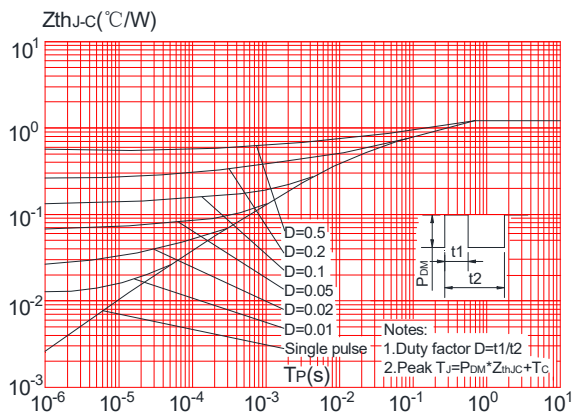
**Figure 9: Maximum Safe Operating Area**



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



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



## Test Circuit



Figure1:Gate Charge Test Circuit & Waveform

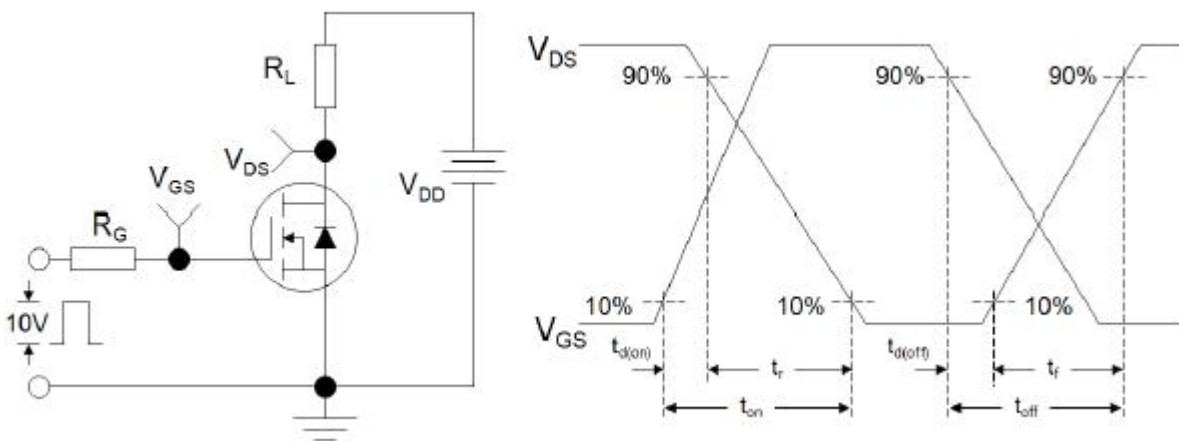


Figure 2: Resistive Switching Test Circuit & Waveforms

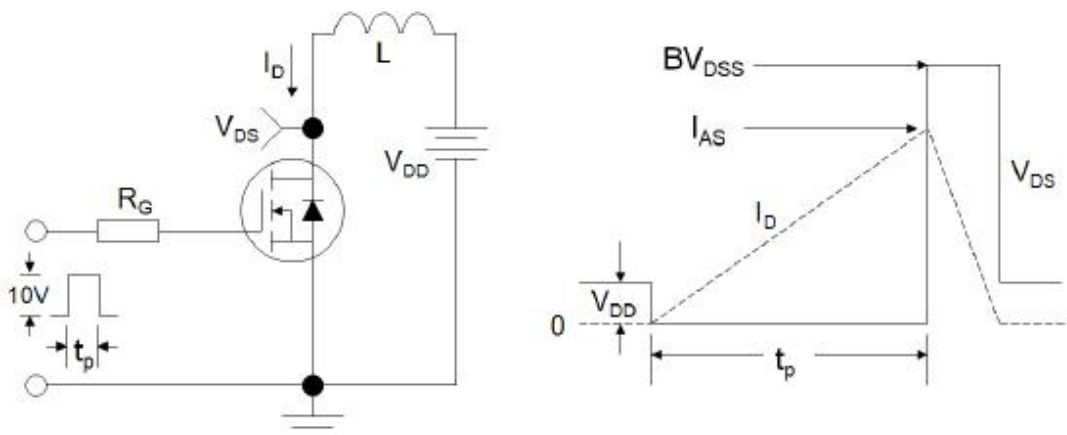
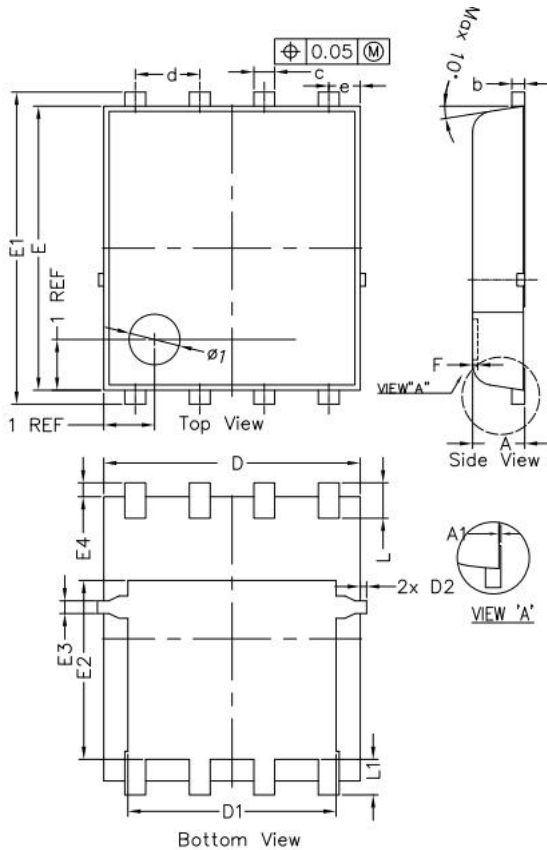


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



## Package Mechanical Data-PDFN5x6-8L



SYMBOLS	DIMENSION IN MM			DIMENSION IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
* A	0.900	1.000	1.100	0.035	0.039	0.043
A1	0.000	---	0.050	0.000	----	0.002
b	0.246	0.254	0.312	0.010	0.010	0.012
* c	0.310	0.410	0.510	0.012	0.016	0.020
d	1.27 BSC			0.050 BSC		
* D	4.950	5.050	5.150	0.195	0.199	0.203
D1	4.000	4.100	4.200	0.157	0.161	0.165
* D2	---	---	0.125	---	---	0.005
e	0.62 BSC			0.024 BSC		
* E	5.500	5.600	5.700	0.217	0.220	0.224
* E1	6.050	6.150	6.250	0.238	0.242	0.246
E2	3.425	3.525	3.625	0.135	0.139	0.143
E3	0.150	0.250	0.350	0.006	0.010	0.014
* E4	0.175	0.275	0.375	0.007	0.011	0.015
F	-	-	0.100	-	-	0.004
* L	0.500	0.600	0.700	0.02	0.02	0.03
L1	0.600	0.700	0.800	0.02	0.03	0.03

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