



## Description

### JMG N-channel Advanced Mode Power MOSFET

#### Features

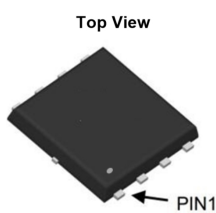
- 120V,90A  
 $R_{DS(ON)} < 7.4m\Omega @ V_{GS} = 10V$
- Advanced Split Gate Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead free product is acquired

#### Application

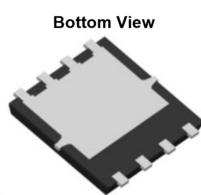
- Load Switch
- PWM Application
- Power management



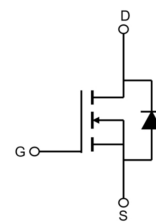
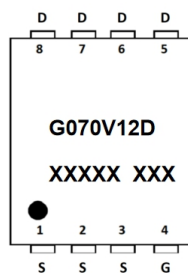
*100% UIS TESTED!*  
*100% ΔVds TESTED!*



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)
G070V12D	JMGG070V12D	TAPING	PDFN5X6-8L	13inch	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
		$T_C = 100^\circ C$	59
$I_{DM}$	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
$R_{\theta JC}$	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)

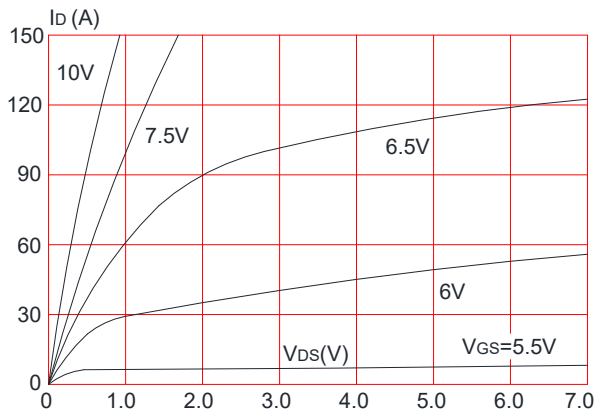
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	120	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =120V, V <sub>GS</sub> =0V,	-	-	1.0	μA
I <sub>GSS</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	7.4	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>DS</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>G</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	T <sub>J</sub> =25°C, 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: 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%

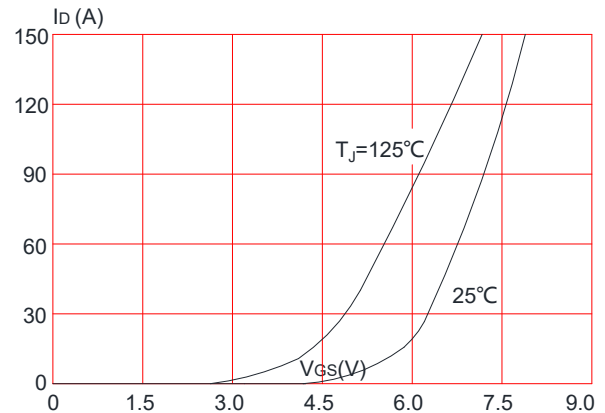


## Typical Performance Characteristics

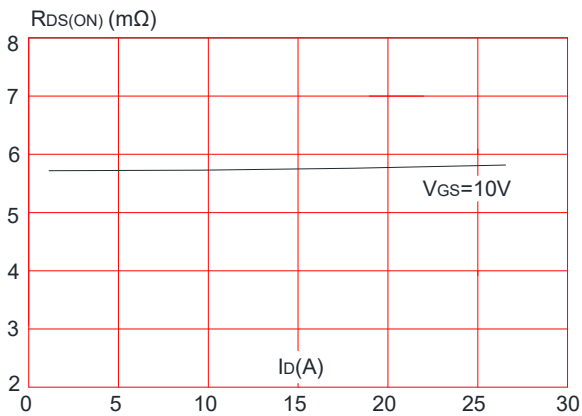
**Figure 1: Output Characteristics**



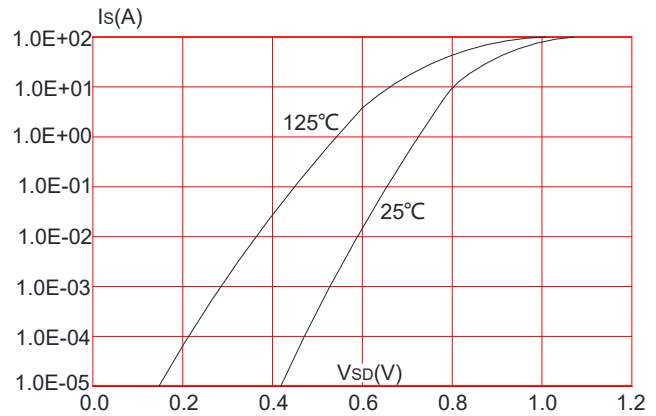
**Figure 2: Typical Transfer Characteristics**



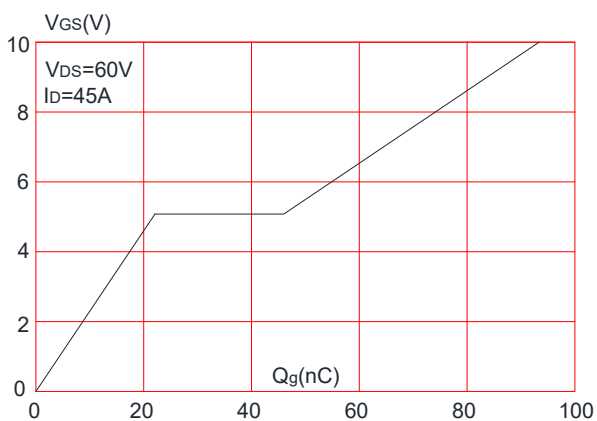
**Figure 3: On-resistance vs. Drain Current**



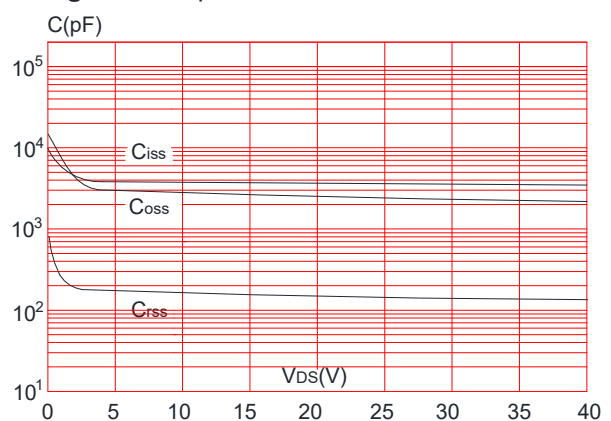
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

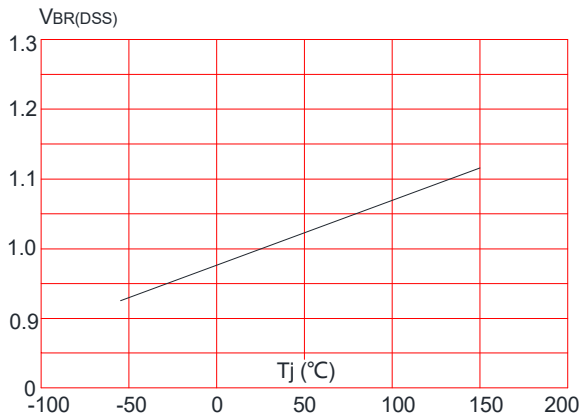


**Figure 6: Capacitance Characteristics**

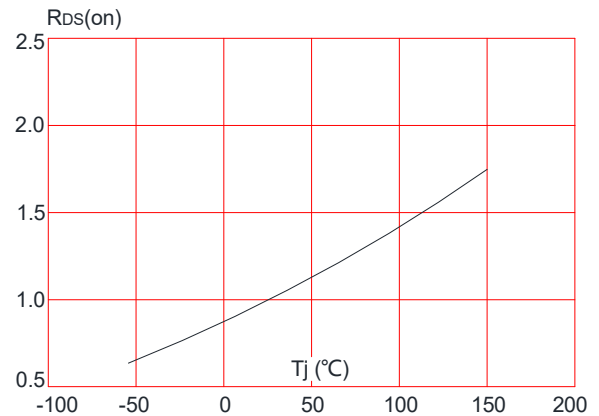




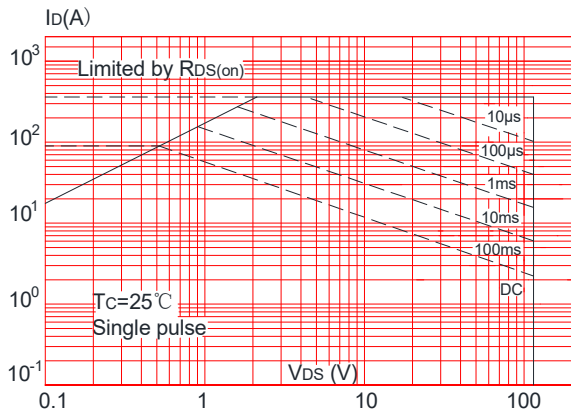
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



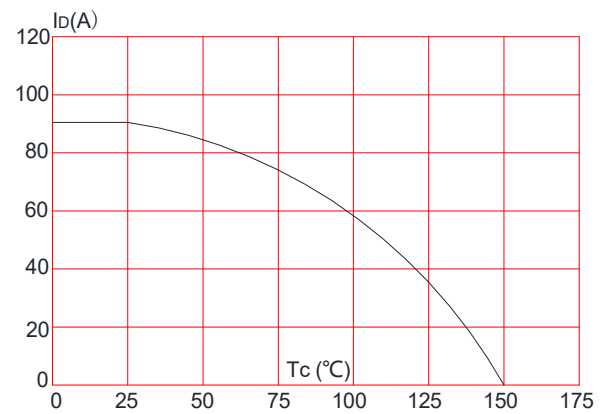
**Figure 8:** Normalized on Resistance vs. Junction Temperature



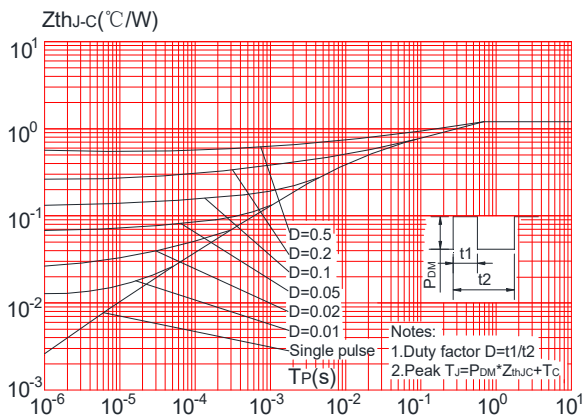
**Figure 9:** Maximum Safe Operating Area



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



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



## Test Circuit

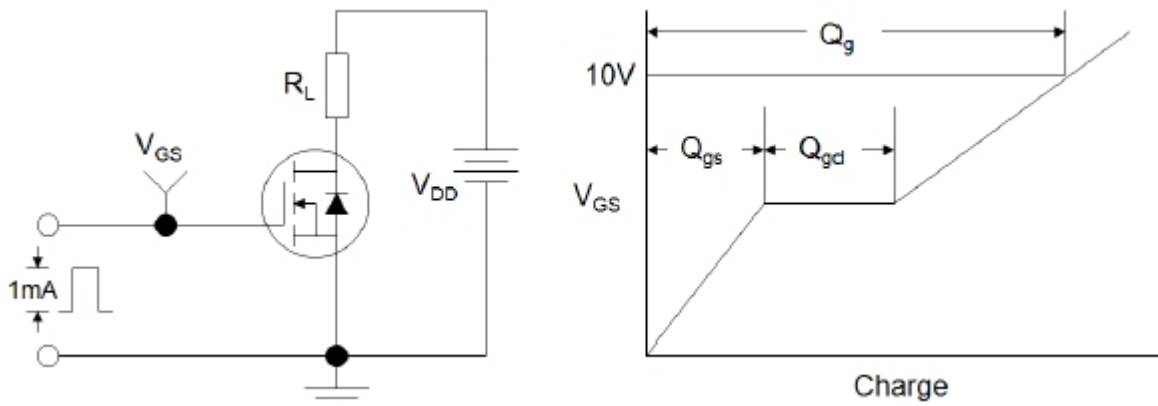


Figure1:Gate Charge Test Circuit & Waveform

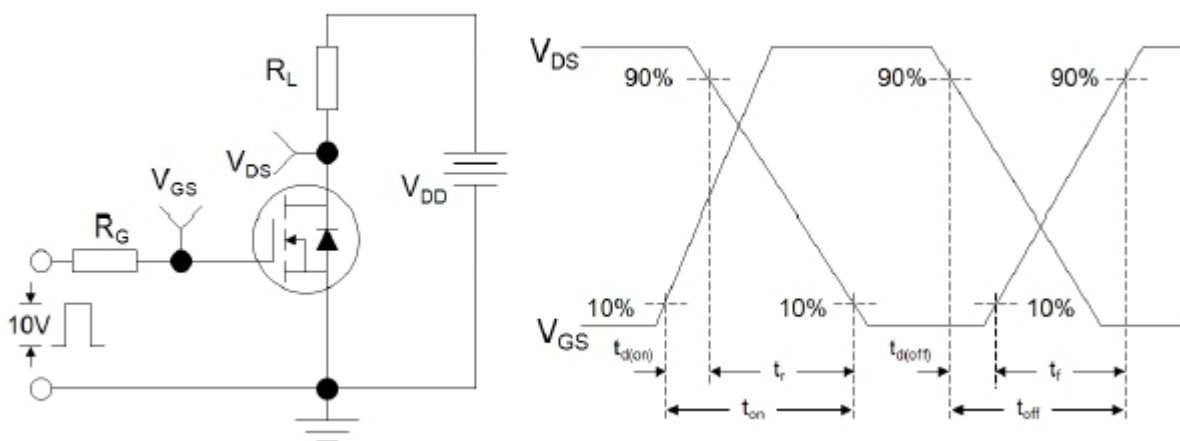


Figure 2: Resistive Switching Test Circuit & Waveforms

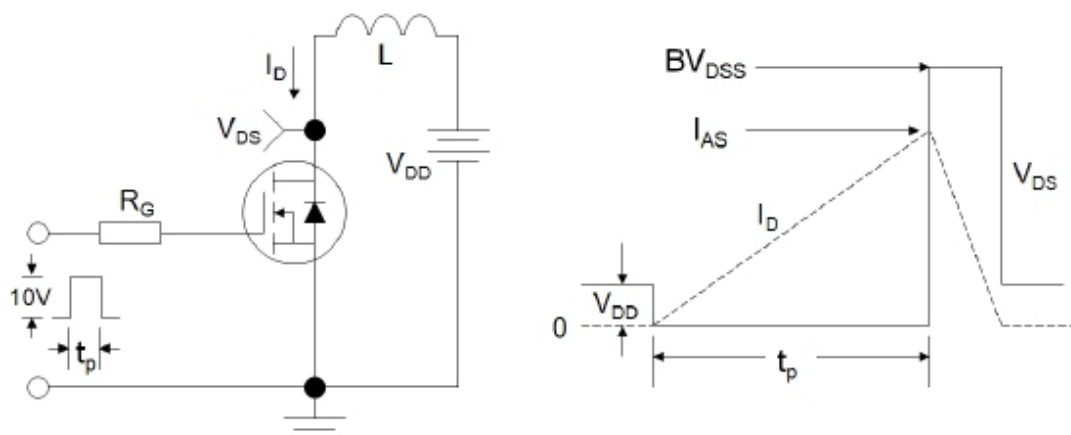
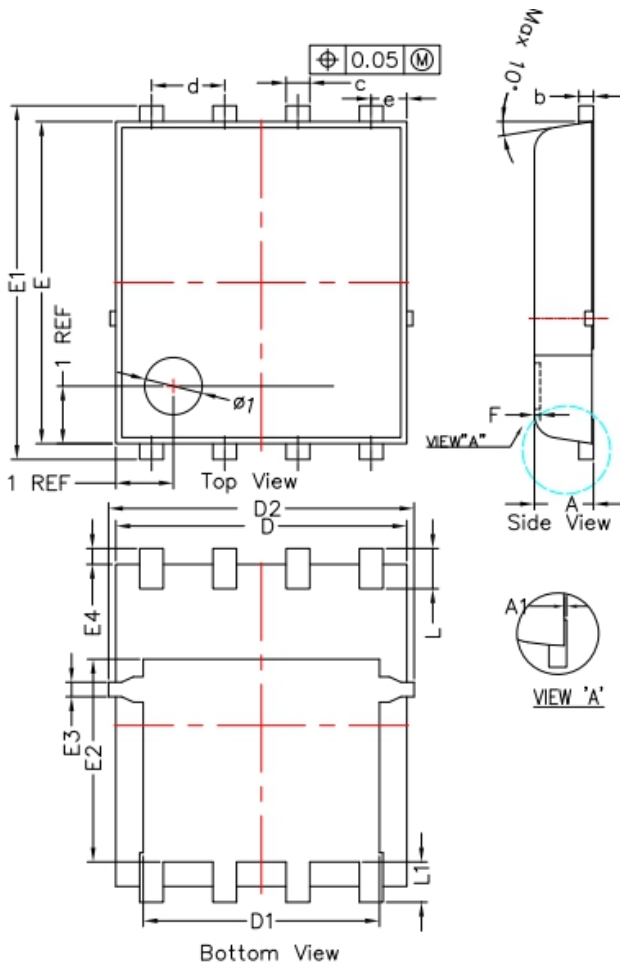


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



## 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	5.200	5.300	5.400	0.205	0.209	0.213
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	0.600	0.700	0.800	0.02	0.03	0.03
L1	0.600	0.700	0.800	0.02	0.03	0.03

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