Description

JMG N-channel Advanced Mode Power MOSFET

Features

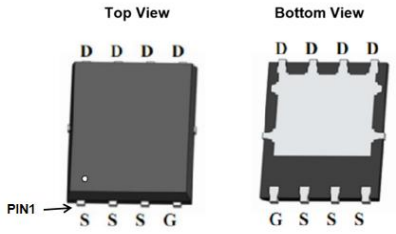
- 60V,160A
  $R_{DS(ON)}$<3mΩ @ V_{GS} = 10V
- Advanced Split Gate Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

Application

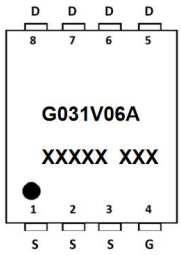
- Load Switch
- PWM Application
- Power management

RoHS

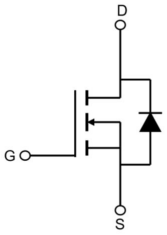
100% UIS TESTED!
100% ΔVds TESTED!



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_C=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		±25	V
I_D	Continuous Drain Current	T_C = 25℃	160	A
		T_C = 100℃	104	A
I_{DM}	Pulsed Drain Current note1		640	A
E_{AS}	Single Pulsed Avalanche Energy note2		196	mJ
P_D	Power Dissipation	T_C = 25℃	125	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics (T_J=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V,	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}= ±25V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	2	3	4	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D=30A	-	2.3	3.0	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	3383	-	pF
C_{oss}	Output Capacitance		-	1940	-	pF
C_{rss}	Reverse Transfer Capacitance		-	14	-	pF
Q_g	Total Gate Charge	V_{DS}=30V, I_D=40A, V_{GS}=10V	-	46	-	nC
Q_{gs}	Gate-Source Charge		-	17	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	10	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=30V, I_D=40A, R_G=2.7Ω, V_{GS}=10V	-	19	-	ns
t_r	Turn-on Rise Time		-	105	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	35	-	ns
t_f	Turn-off Fall Time		-	107	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	160	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	640	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=30A	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	V_{DS}=60V, I_F=40A,dI/dt=300A/μs	-	50	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	115	-	nC

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

2. EAS condition: T_J=25℃, V_{DD}=30V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=28A

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

Typical Performance Characteristics

Figure1: Output Characteristics

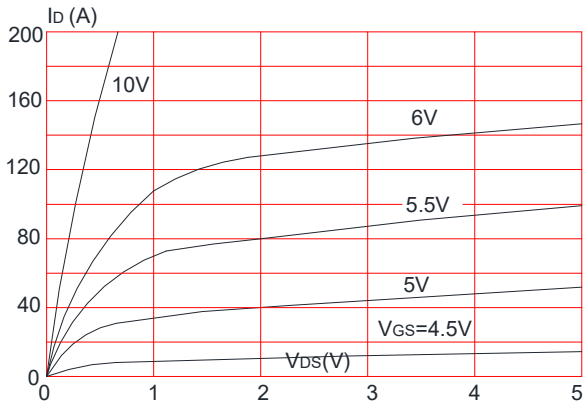


Figure 2: Typical Transfer Characteristics

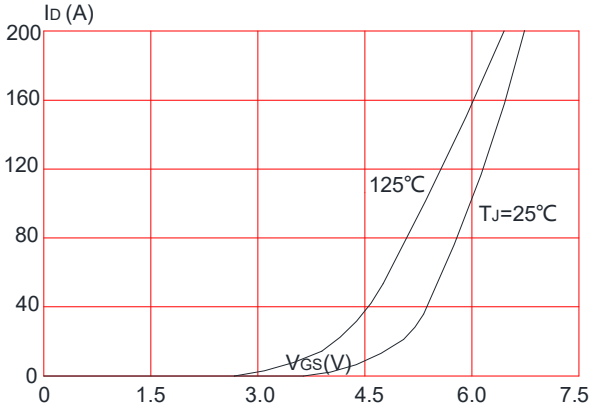


Figure 3: On-resistance vs. Drain Current

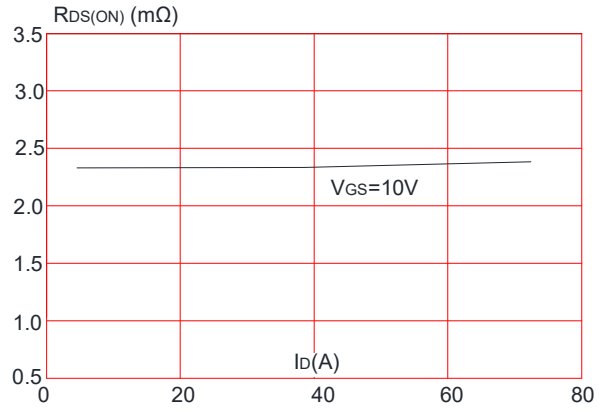


Figure 4: Body Diode Characteristics

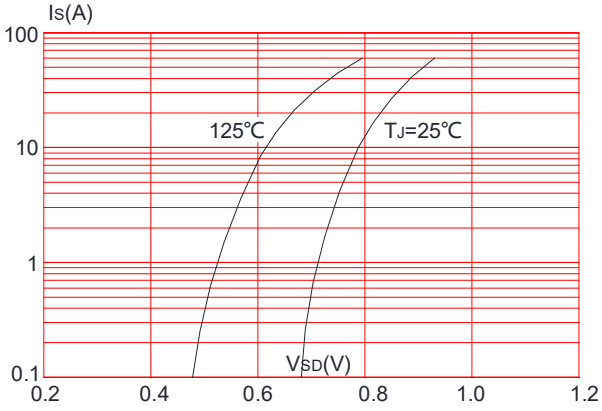


Figure 5: Gate Charge Characteristics

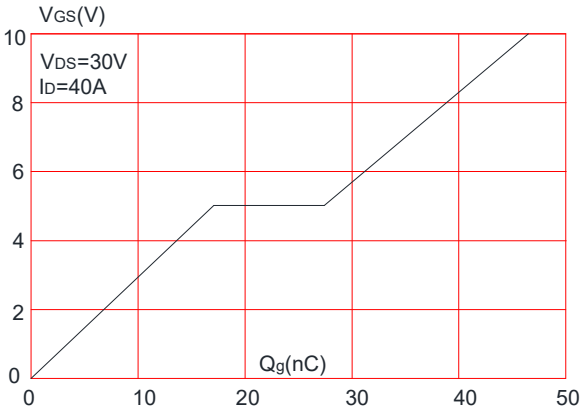


Figure 6: Capacitance Characteristics

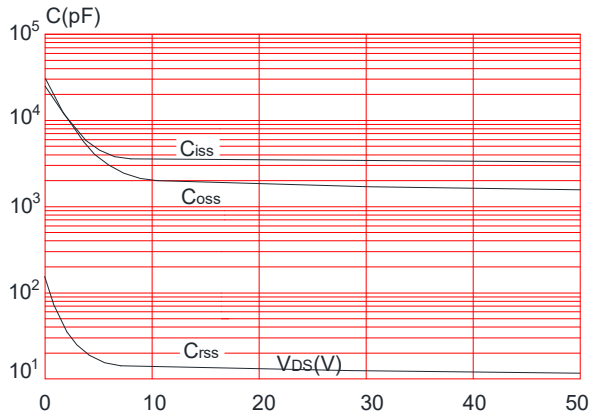


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

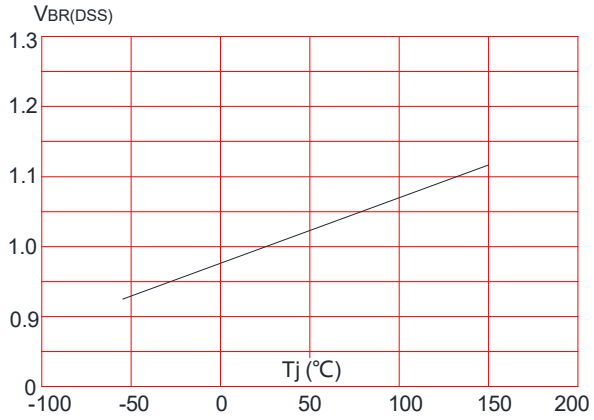


Figure 8: Normalized on Resistance vs. Junction Temperature

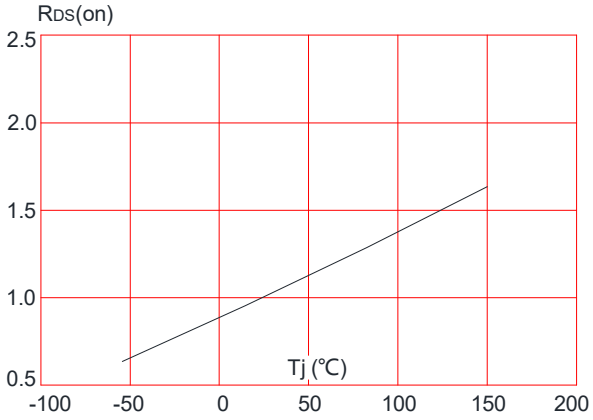


Figure 9: Maximum Safe Operating Area

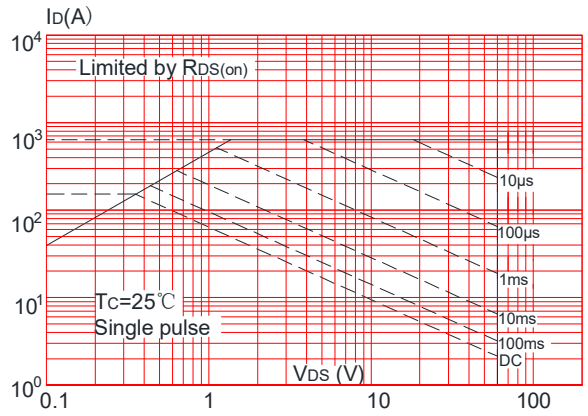


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

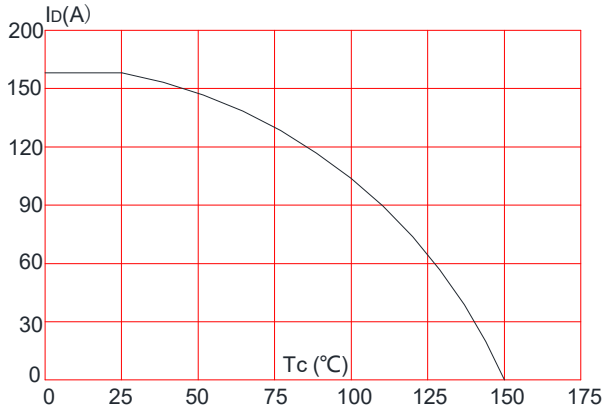
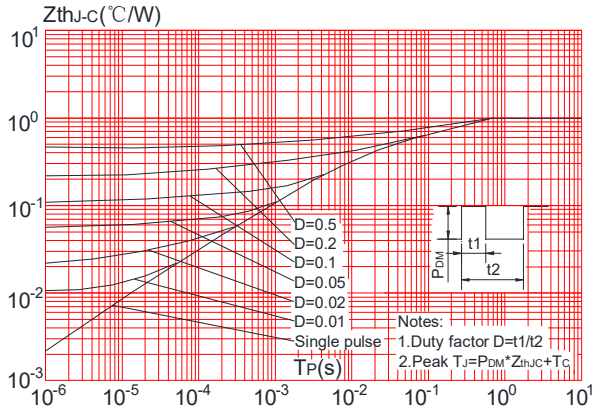


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

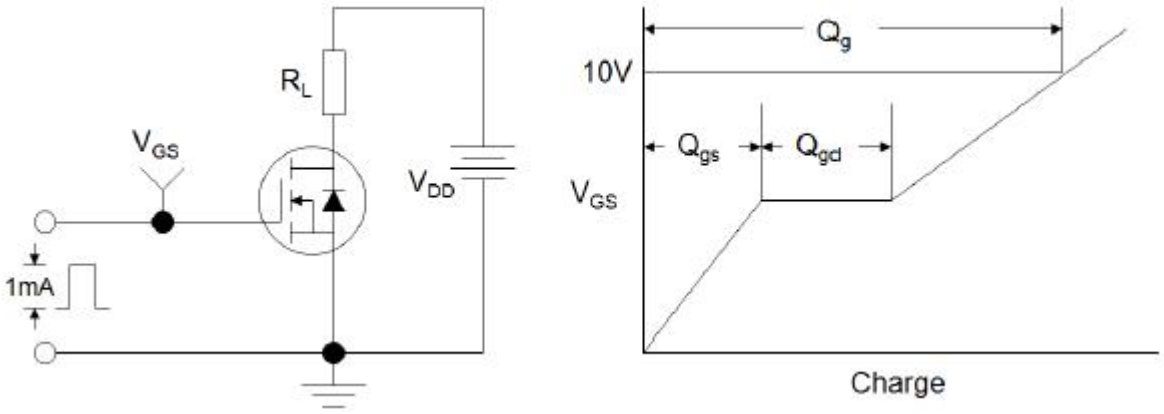


Figure1:Gate Charge Test Circuit & Waveform

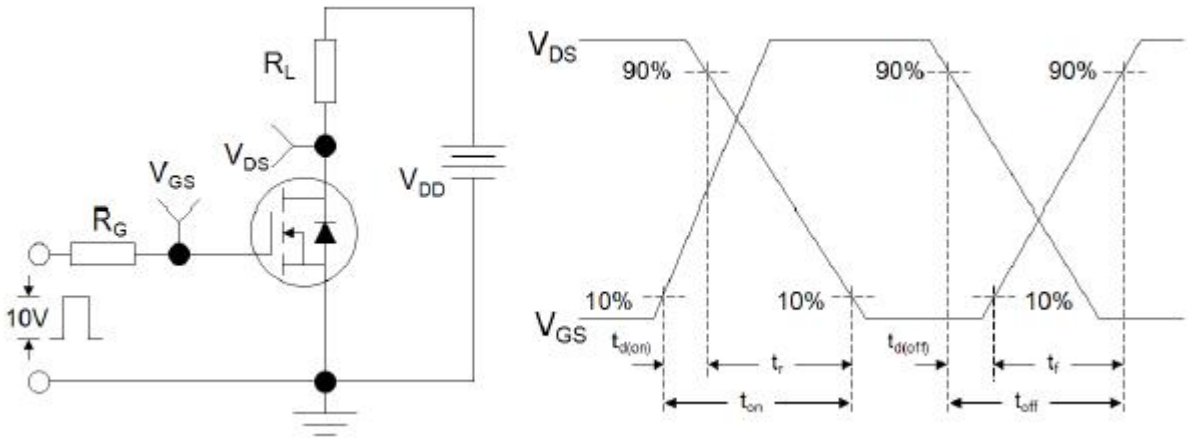


Figure 2: Resistive Switching Test Circuit & Waveforms

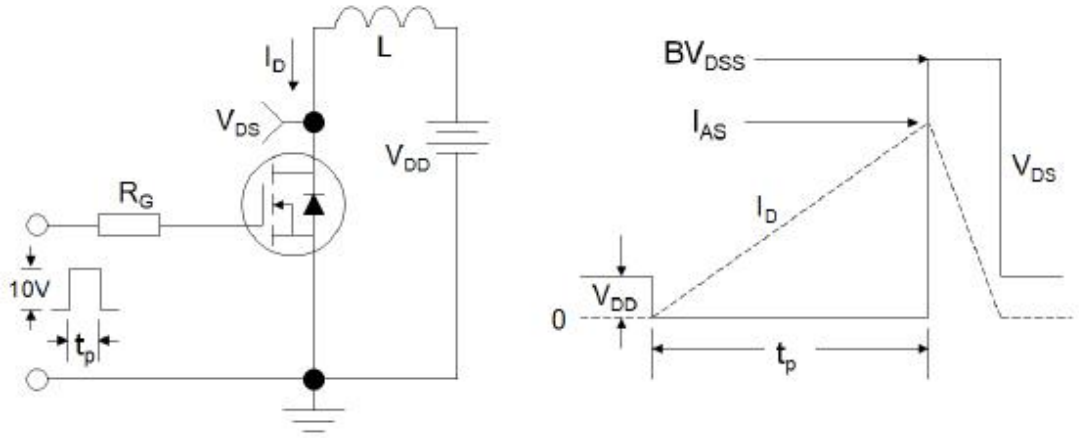
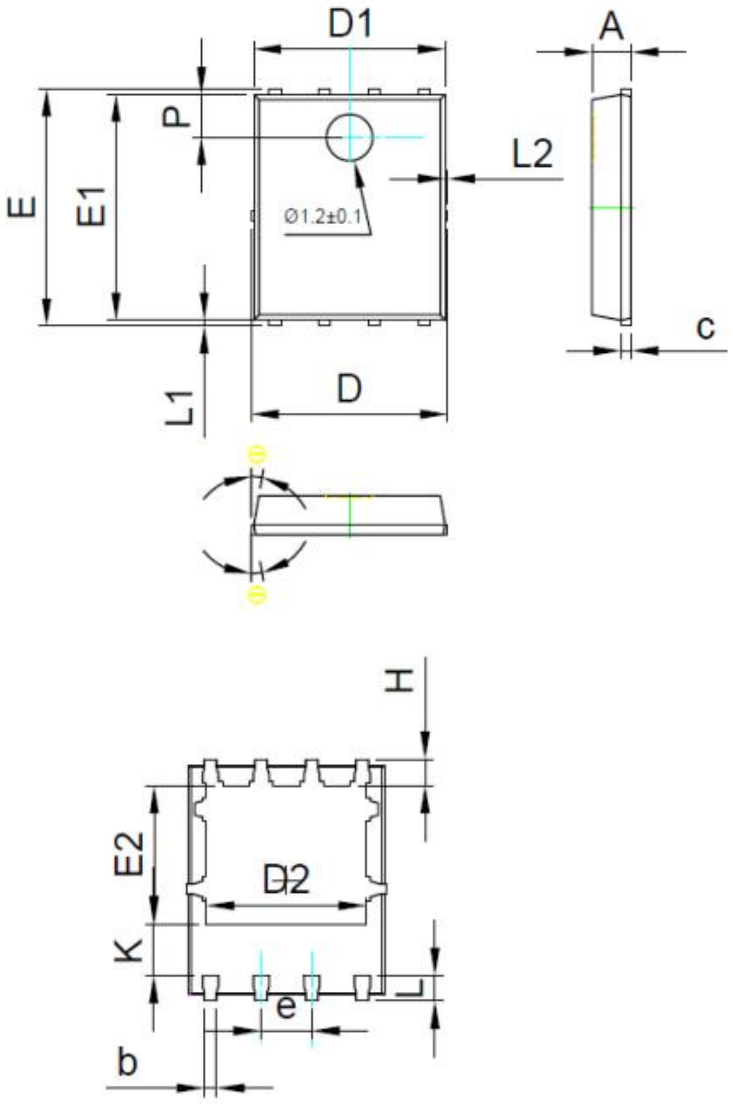


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

Package Mechanical Data- PDFN5x6-8L



SYMBOL	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.35	0.40	0.45
c	0.21	0.25	0.34
D	–	–	5.10
D1	4.85	4.90	4.95
D2	3.96	4.01	4.06
e	1.27 BSC		
E	5.95	6.00	6.05
E1	5.70	5.75	5.80
E2	3.425	3.475	3.525
H	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°
P	1.05	1.10	1.15