



## Description

### JMG N-channel Enhancement Mode Power MOSFET

#### Features

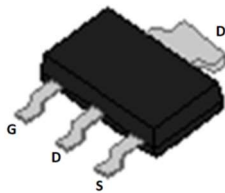
- 100V,7A  
 $R_{DS(ON)} < 140m\Omega @ V_{GS} = 10V$   
 $R_{DS(ON)} < 300m\Omega @ V_{GS} = 4.5V$
- Advanced Split Gate Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead free product is acquired

#### Application

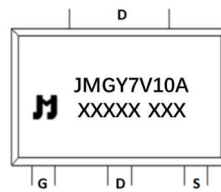
- Load Switch
- PWM Application
- Power management



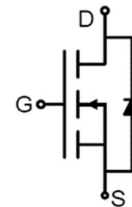
*100% UIS TESTED!*  
*100% ΔVds TESTED!*



SOT-223 top view



Marking and pin Assignment



Schematic Diagram

## Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
JMGY7V10A	JMGY7V10A	TAPING	SOT-223	13inch	4000	40000

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

Symbol	Parameter	Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage	100	V
V <sub>GSS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> = 25°C	7
		T <sub>C</sub> = 100°C	4.5
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	28	A
E <sub>AS</sub>	Single Pulsed Avalanche Energy <sup>note2</sup>	2.25	mJ
P <sub>D</sub>	Power Dissipation	T <sub>C</sub> = 25°C	13.7
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	9.1	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°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	100	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, 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> = ±20V	-	-	±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	1.5	-	2.5	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance <small>note3</small>	V <sub>GS</sub> =10V, I <sub>D</sub> =3.5A	-	110	140	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =2A	-	160	300	
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f = 1MHz	-	206	-	pF
C <sub>oss</sub>	Output Capacitance		-	29	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	1.4	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =25V, I <sub>D</sub> =5A, V <sub>GS</sub> =10V	-	4.3	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	1.5	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	1.1	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =25V, I <sub>D</sub> =5A, R <sub>GEN</sub> =2Ω, V <sub>GS</sub> =10V	-	14.7	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	3.5	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	20.9	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	2.7	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	7	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	28	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> = 0V, I <sub>S</sub> =7A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I <sub>F</sub> =5A, di/dt=100A/μs	-	32	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	39	-	nC

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

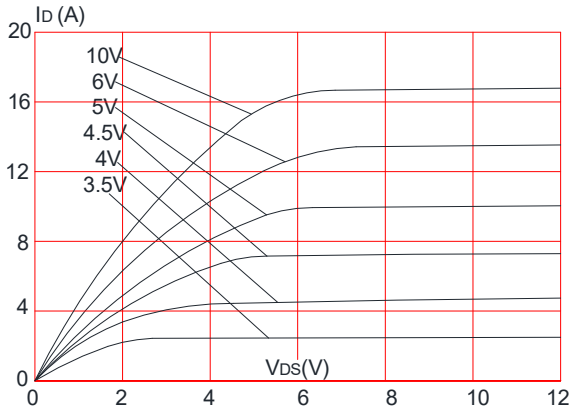
2. EAS condition: T<sub>J</sub>=25°C, VDD=50V, VG=10V, RG=50Ω, L=0.5mH, IAS=3A

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

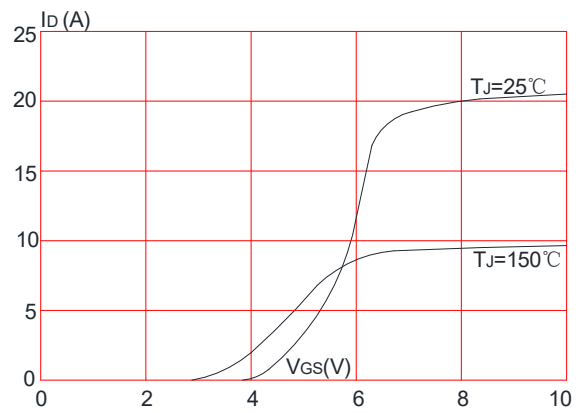


## Typical Performance Characteristics

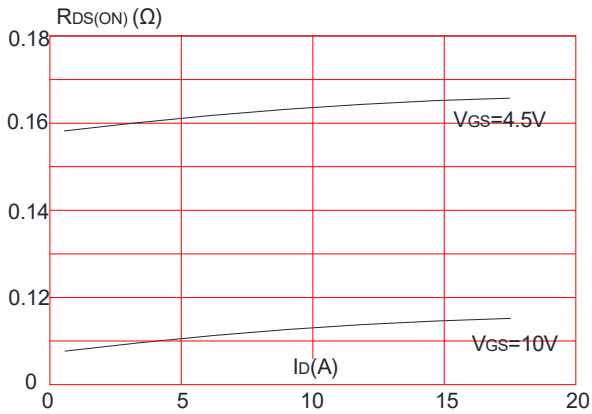
**Figure 1: Output Characteristics**



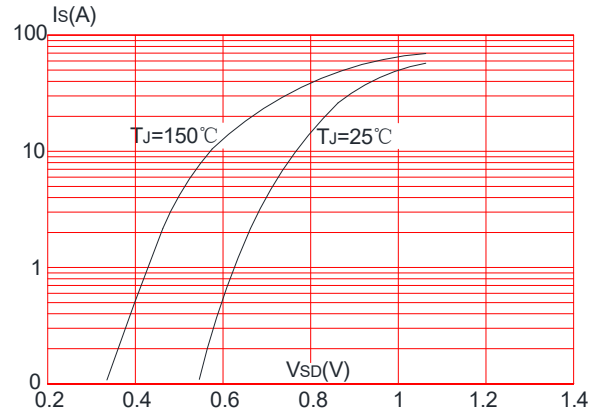
**Figure 2: Typical Transfer Characteristics**



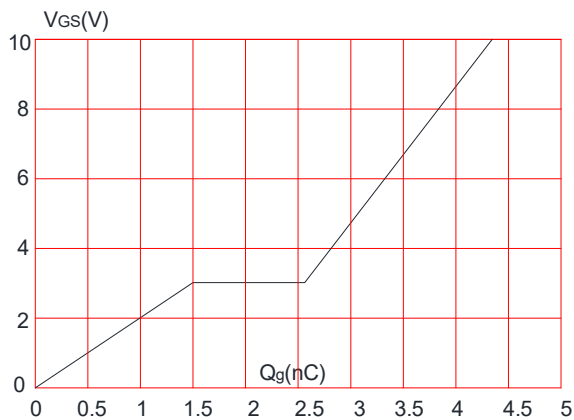
**Figure 3: On-resistance vs. Drain Current**



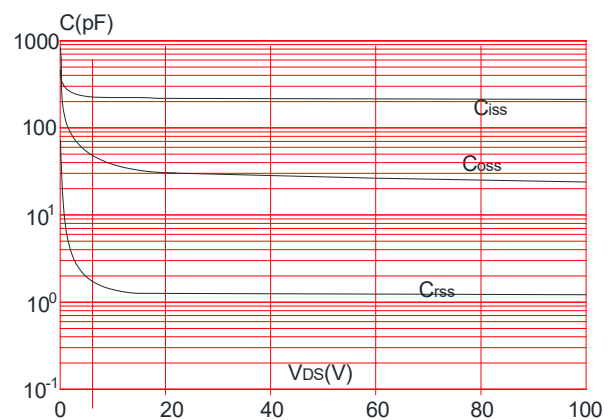
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

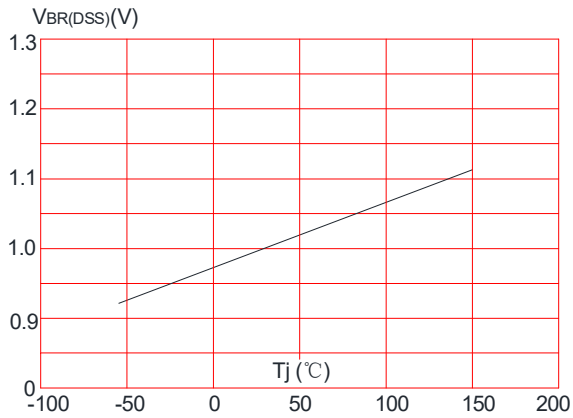


**Figure 6: Capacitance Characteristics**

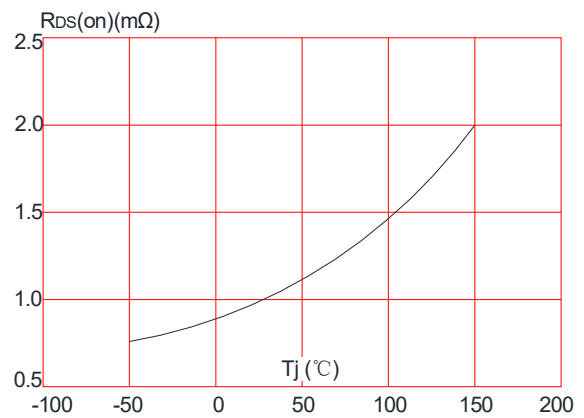




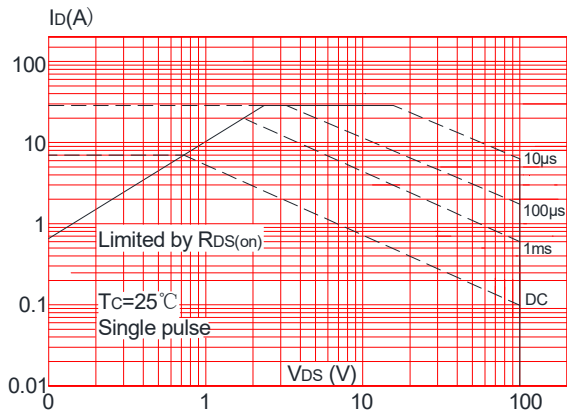
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



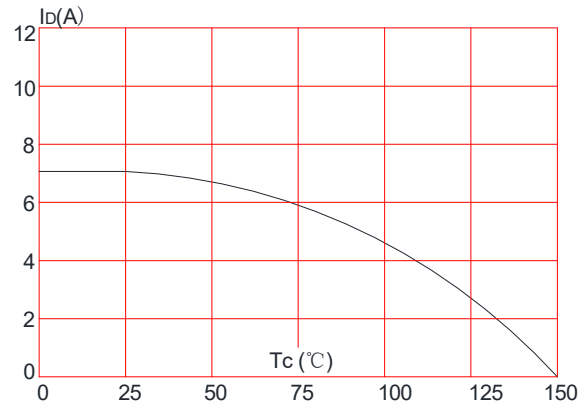
**Figure 8:** Normalized on Resistance vs. Junction Temperature



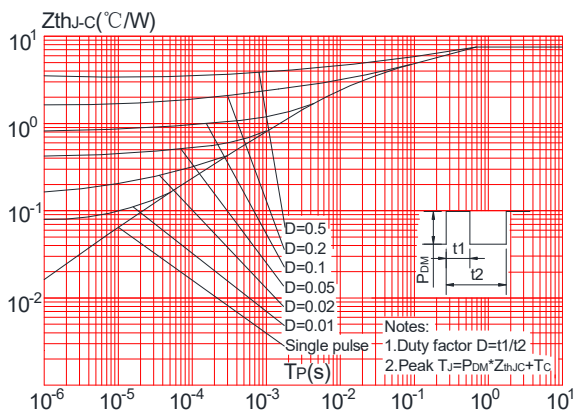
**Figure 9:** Maximum Safe Operating Area



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



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



## Test Circuit

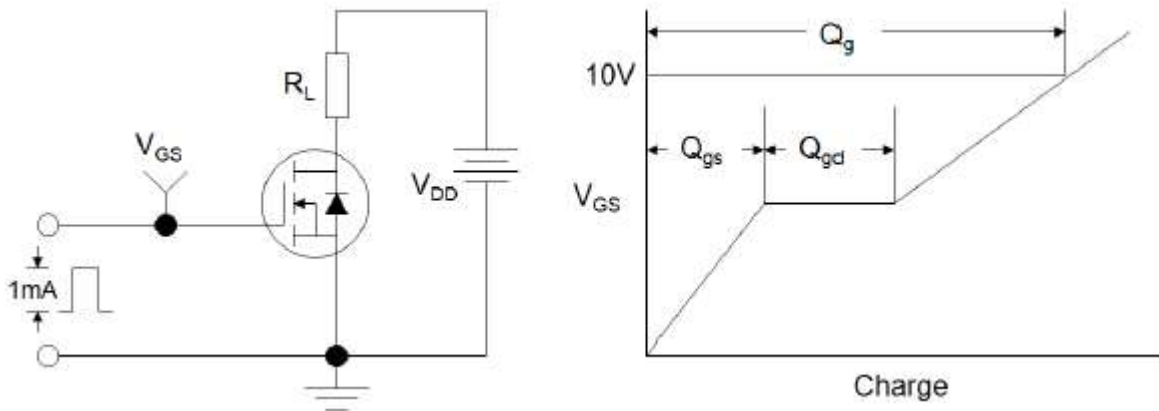


Figure1:Gate Charge Test Circuit & Waveform

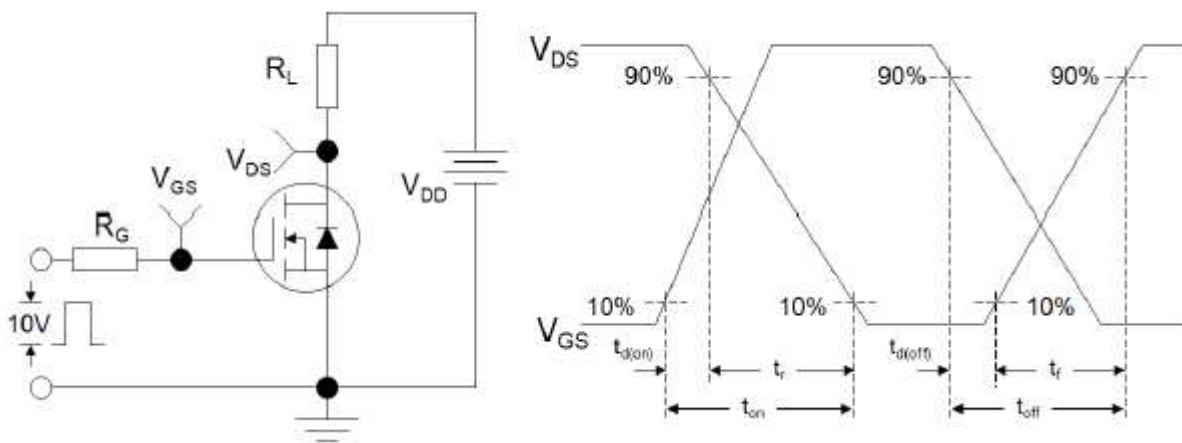


Figure 2: Resistive Switching Test Circuit & Waveforms

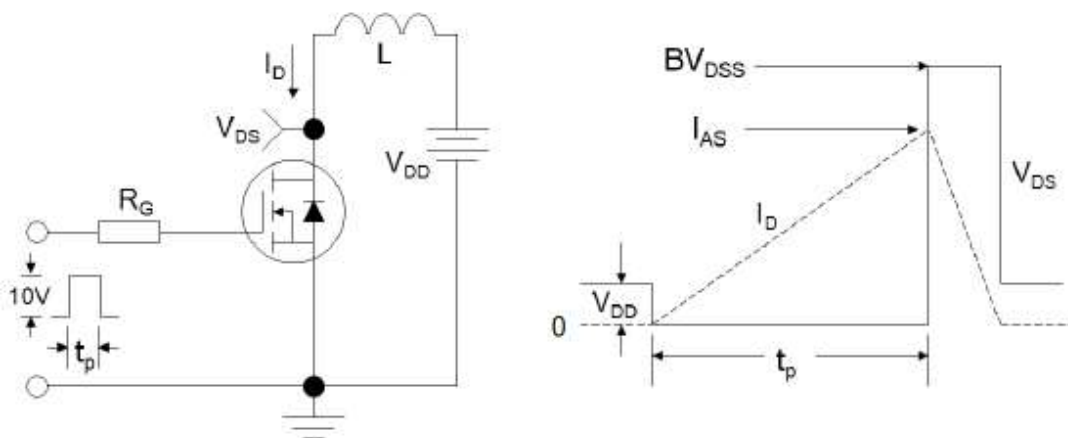
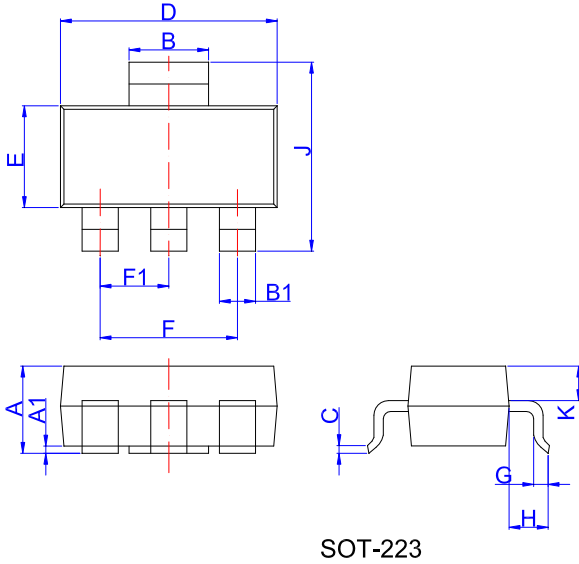


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

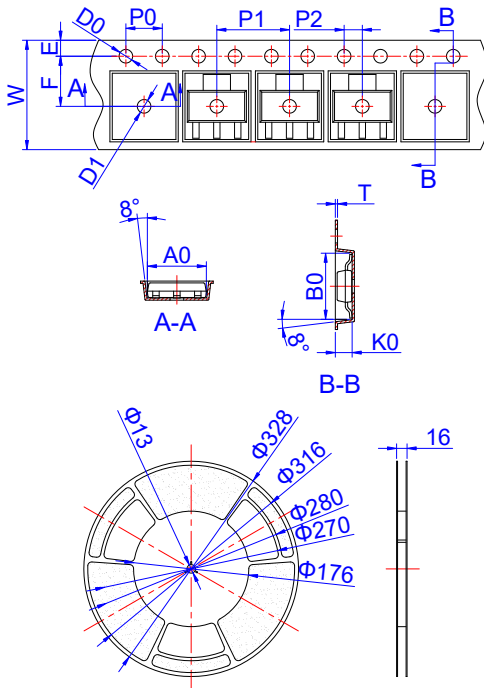


## Package Mechanical Data-SOT-223



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.5	1.6	1.8	0.059	0.063	0.071
A1	0.01	0.06	0.10	0.001	0.002	0.004
B	2.9	3.0	3.1	0.114	0.118	0.122
B1	0.6	0.7	0.8	0.024	0.028	0.031
C	0.22	0.26	0.32	0.009	0.010	0.013
D	6.3	6.5	6.7	0.248	0.256	0.264
E	3.3	3.5	3.7	0.130	0.138	0.146
F		4.6			0.181	
F1		2.3			0.091	
G	0.7	0.9	1.1	0.028	0.035	0.043
H	1.5	1.75	2.0	0.059	0.069	0.079
J	6.7	7.0	7.3	0.264	0.276	0.287
K	0.8	0.9	1.0	0.031	0.035	0.039

## Reel Specification-SOT-223



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	12.00		12.20	0.472		0.483
E	1.65	1.75	1.85	0.065	0.069	0.073
F	5.45	5.50	5.55	0.214	0.217	0.219
D0	1.50		1.60	0.059		0.063
D1	1.55		1.80	0.061		0.071
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.95	2.00	2.05	0.077	0.079	0.081
10P0	39.80	40.00	40.20	1.567	1.575	1.583
A0	6.73	6.83	6.93	0.265	0.269	0.273
B0	7.30	7.40	7.50	0.287	0.291	0.295
K0	1.78	1.88	1.98	0.070	0.074	0.078
T	0.25	0.30	0.35	0.010	0.012	0.014




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