



Description

JMT N-channel Enhancement Mode Power MOSFET

Features

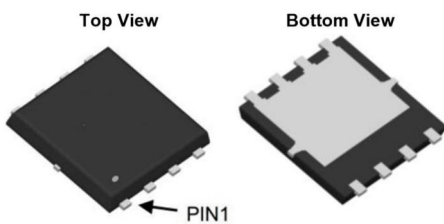
- 30V, 120A
 $R_{DS(ON)} < 2.3m\Omega$ @ $V_{GS} = 10V$
 $R_{DS(ON)} < 4.2m\Omega$ @ $V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

Application

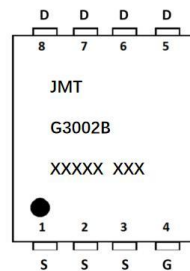
- Load Switch
- PWM Application
- Power Management



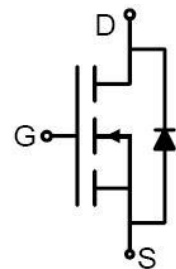
100% UIS TESTED!
100% ΔV_{ds} TESTED!



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)
G3002B	JMTG3002B	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		30	V
V _{GSS}	Gate-Source Voltage		±20	V
I _D	Continuous Drain Current	T _C = 25°C	120	A
		T _C = 100°C	78	A
I _{DM}	Pulsed Drain Current ^{note1}		480	A
E _{AS}	Single Pulsed Avalanche Energy ^{note2}		225	mJ
P _D	Power Dissipation	T _C = 25°C	57	W
R _{θJC}	Thermal Resistance, Junction to Case		2.2	°C/W
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to +150	°C



Electrical Characteristics (T_C=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =30A	-	1.8	2.3	mΩ
		V _{GS} =4.5V, I _D =20A	-	3.2	4.2	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1.0MHz	-	4930	-	pF
C _{Oss}	Output Capacitance		-	682	-	pF
C _{rss}	Reverse Transfer Capacitance		-	566	-	pF
Q _g	Total Gate Charge	V _{DD} =15V, I _D =30A, V _{GS} =10V	-	93	-	nC
Q _{gs}	Gate-Source Charge		-	15	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	23	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =15V,I _D =30A, R _{GEN} =3Ω, V _{GS} =10V	-	17	-	ns
t _r	Turn-on Rise Time		-	137	-	ns
t _{d(off)}	Turn-off Delay Time		-	63	-	ns
t _f	Turn-off Fall Time		-	113	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	120	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	480	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I _F =20A, di/dt=100A/μs	-	26	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	14	-	nC

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

2. EAS condition: Starting T_J=25°C, V_{DD}=15V, V_G=10V, L=0.5mH, R_G=25Ω, I_{AS}=30A

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



Typical Performance Characteristics

Figure 1: Output Characteristics

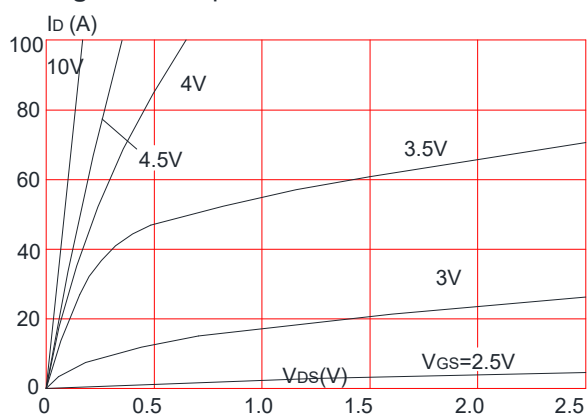


Figure 2: Typical Transfer Characteristics

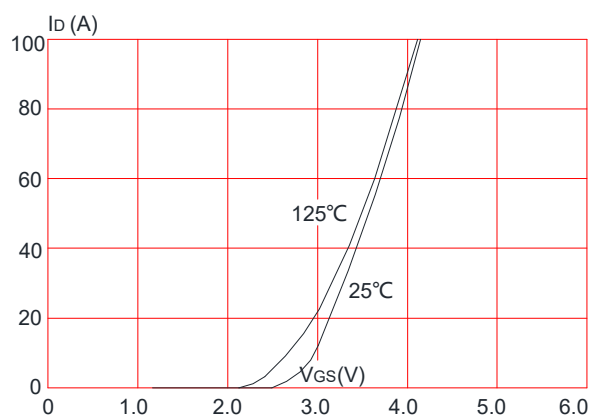


Figure 3: On-resistance vs. Drain Current

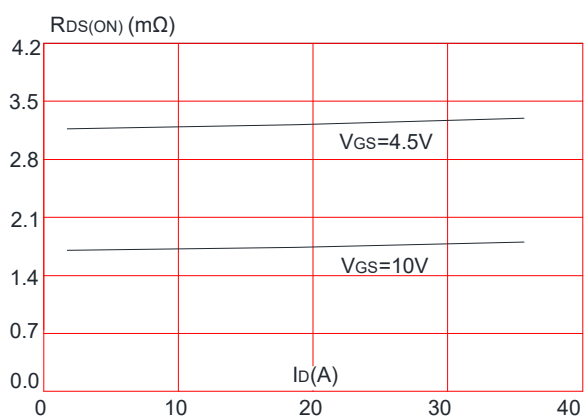


Figure 4: Body Diode Characteristics

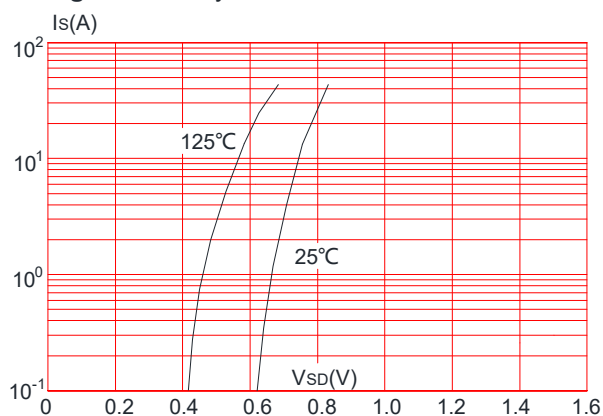


Figure 5: Gate Charge Characteristics

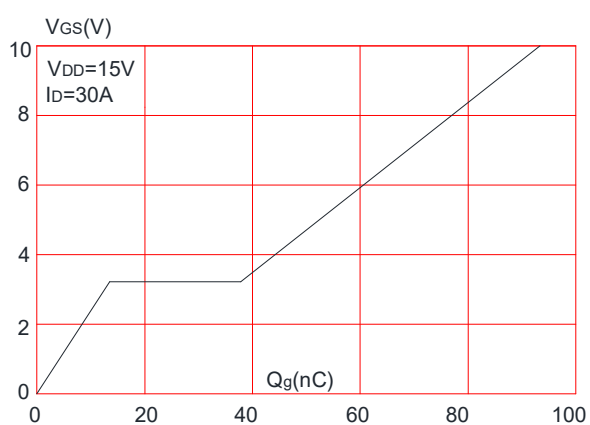


Figure 6: Capacitance Characteristics

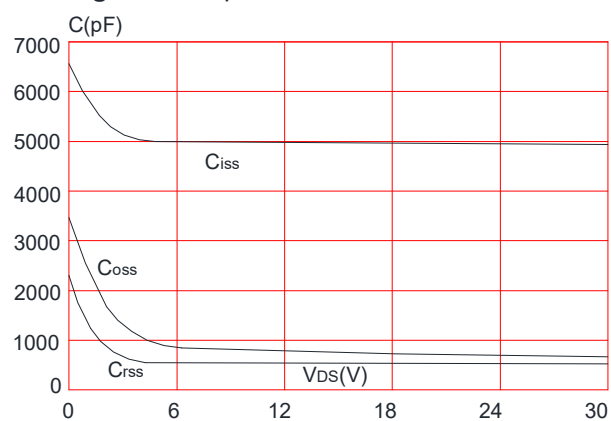


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

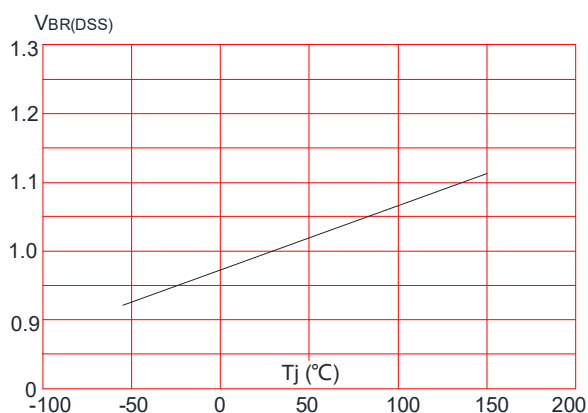


Figure 8: Normalized on Resistance vs. Junction Temperature

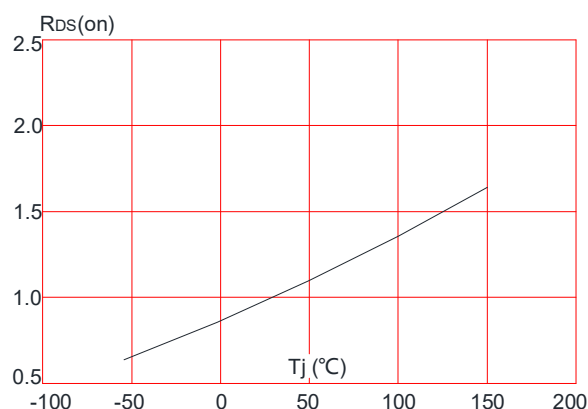


Figure 9: Maximum Safe Operating Area

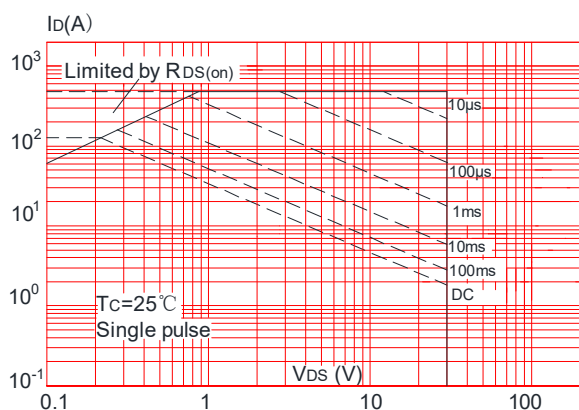


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

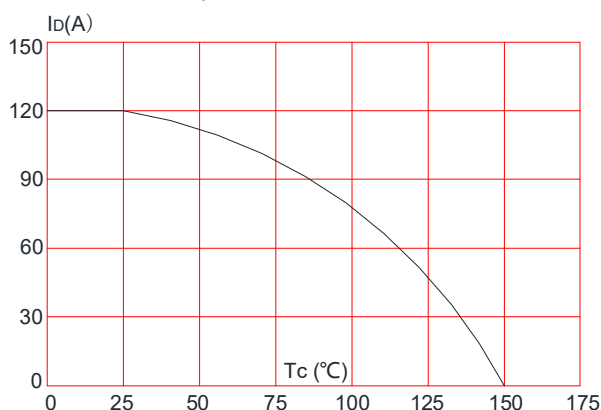
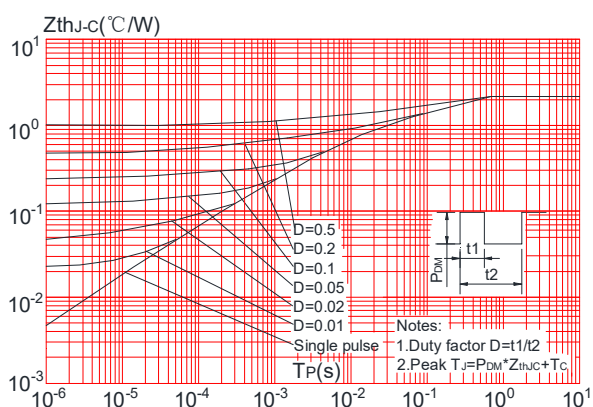


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

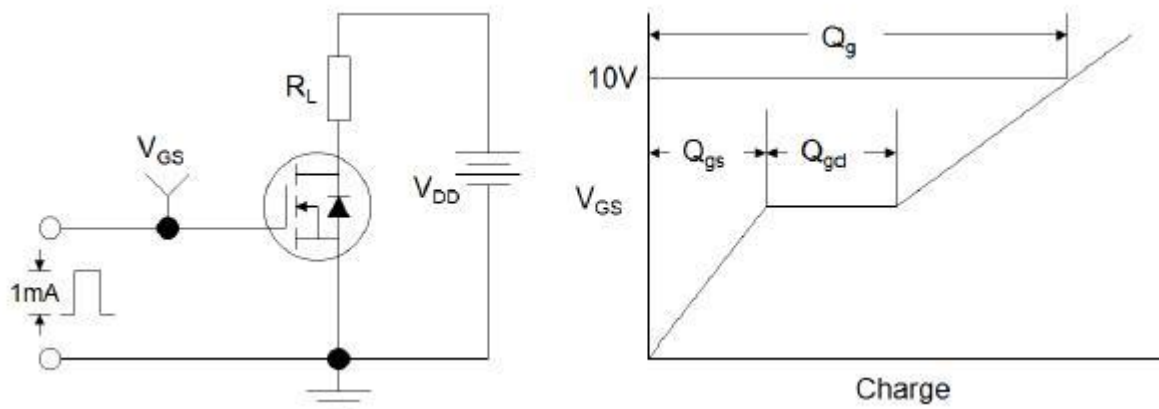


Figure1:Gate Charge Test Circuit & Waveform

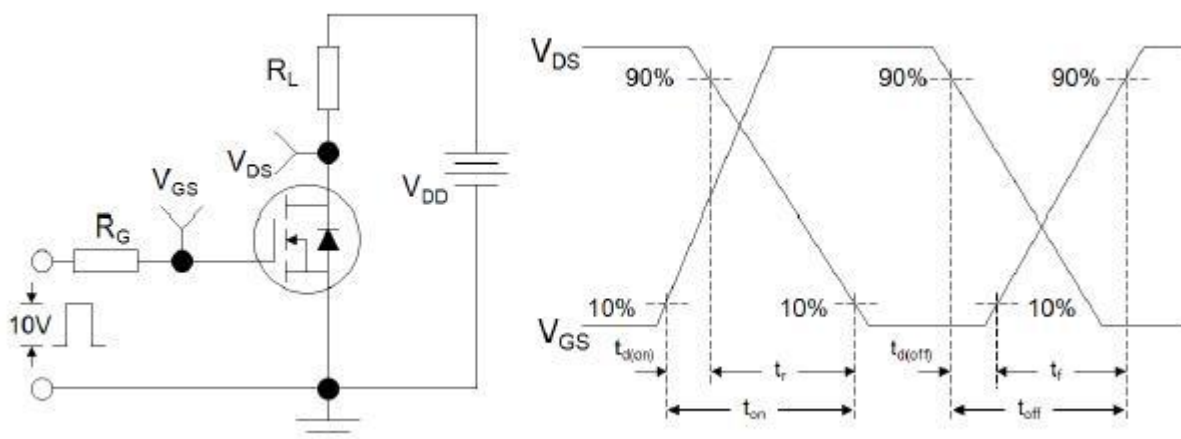


Figure 2: Resistive Switching Test Circuit & Waveforms

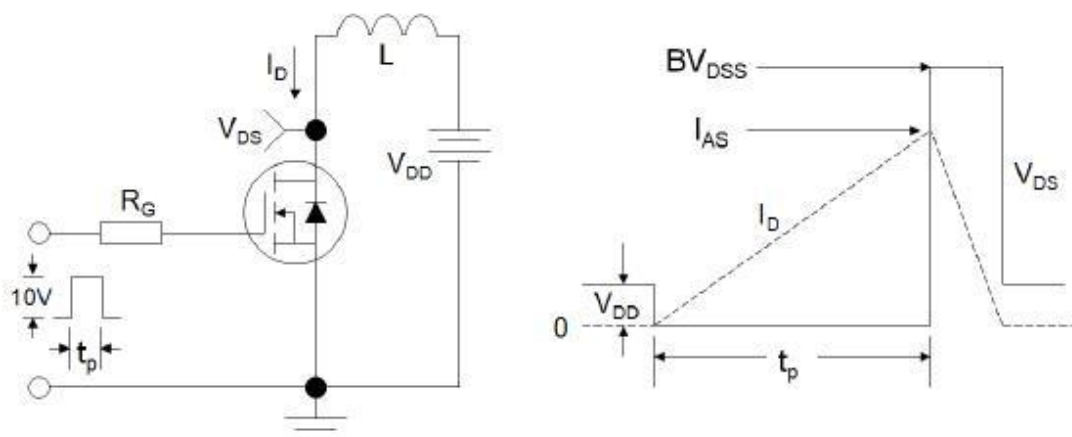
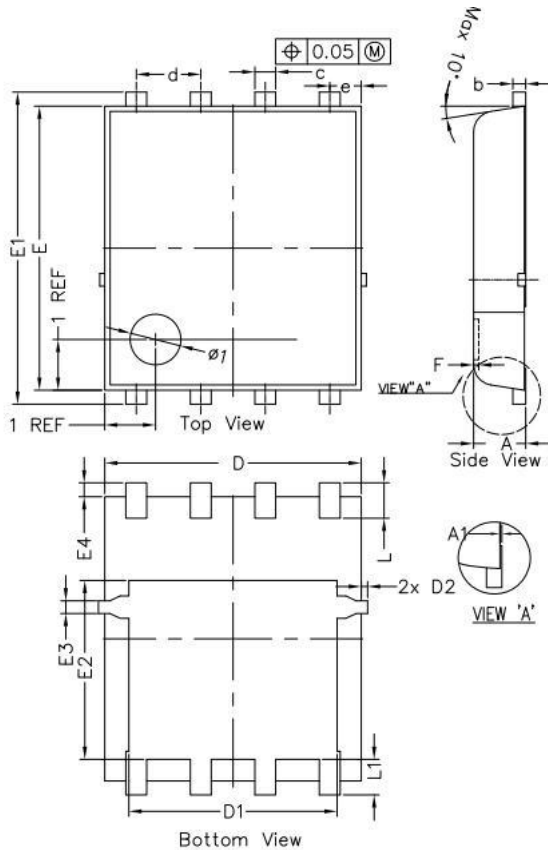


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



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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