

## Description

### JMT N-channel Enhancement Mode Power MOSFET

#### Features

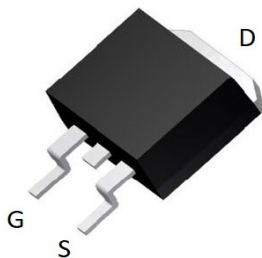
- 30V, 180A  
 $R_{DS(ON)} < 2.6m\Omega @ V_{GS} = 10V$   
 $R_{DS(ON)} < 4.2m\Omega @ V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead Free

#### Applications

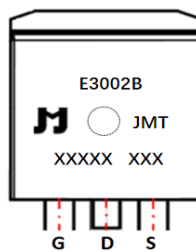
- Load Switch
- PWM Application
- Power Management



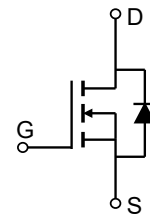
**100% UIS TESTED!**  
**100%  $\Delta V_{ds}$  TESTED!**



TO-263-3L Top View



Marking and Pin Assignment



Schematic Diagram

## Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
JMTE3002B	JMTE3002B	TAPING	TO-263-3L	13"	800	4000

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

Symbol	Parameter	Value	Units
$V_{DS}$	Drain-to-Source Voltage	30	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ C$	180
		$T_C = 100^\circ C$	114
$I_{DM}$	Pulsed Drain Current <sup>(1)</sup>	720	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>(2)</sup>	306	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ C$	96
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient <sup>(3)</sup>	27	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.3	
$T_J, T_{STG}$	Junction & Storage Temperature Range	-55 to 150	$^\circ C$



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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V	30	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V	-	-	1.0	μA
I <sub>GSS</sub>	Gate-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	1.3	1.9	2.5	V
R <sub>DS(ON)</sub>	Static Drain-Source ON-Resistance <sup>(4)</sup>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 30A	-	2.0	2.6	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 20A	-	3.2	4.2	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1MHz	-	5065	-	pF
C <sub>oss</sub>	Output Capacitance		-	574	-	pF
C <sub>riss</sub>	Reverse Transfer Capacitance		-	472	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = 0 to 10V V <sub>DS</sub> = 15V, I <sub>D</sub> = 30A	-	97	-	nC
Q <sub>gs</sub>	Gate Source Charge		-	20	-	nC
Q <sub>gd</sub>	Gate Drain("Miller") Charge		-	23	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 15V I <sub>D</sub> = 30A, R <sub>GEN</sub> = 3Ω	-	16	-	ns
t <sub>r</sub>	Turn-On Rise Time		-	30	-	ns
t <sub>d(off)</sub>	Turn-Off DelayTime		-	54	-	ns
t <sub>f</sub>	Turn-Off Fall Time		-	19	-	ns
<b>Drain-Source Diode Characteristics and Max Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	180	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	720	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> = 30A, di/dt = 100A/us	-	23	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	14	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
  2. E<sub>AS</sub> condition: Starting T<sub>J</sub>=25°C, V<sub>DD</sub>=15V, V<sub>G</sub>=10V, R<sub>G</sub>=25ohm, L=0.5mH, I<sub>AS</sub>=35A
  3. R<sub>θJA</sub> is measured with the device mounted on a 1inch<sup>2</sup> pad of 2oz copper FR4 PCB
  4. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%.

## Typical Performance Characteristics

Figure 1: Output Characteristics

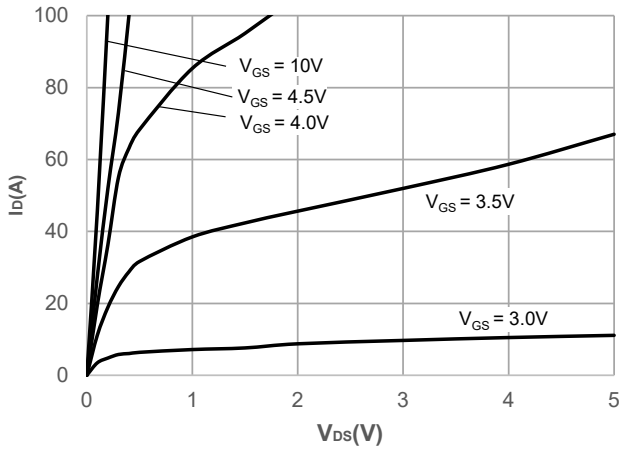


Figure 2: Typical Transfer Characteristics

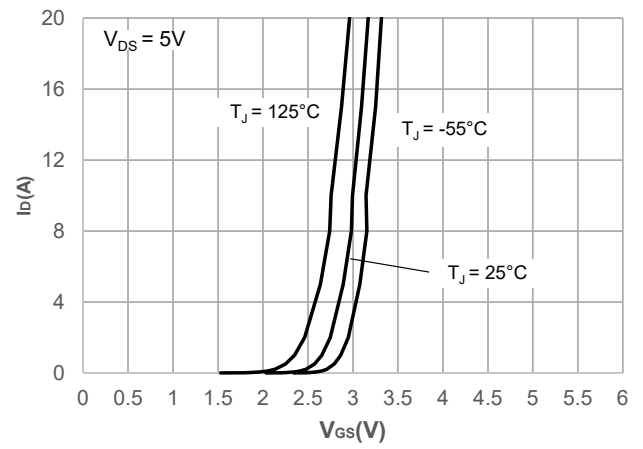


Figure 3: On-resistance vs. Drain Current

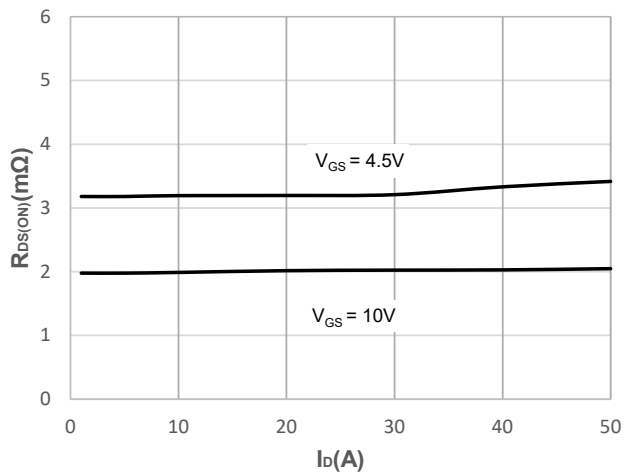


Figure 4: Body Diode Characteristics

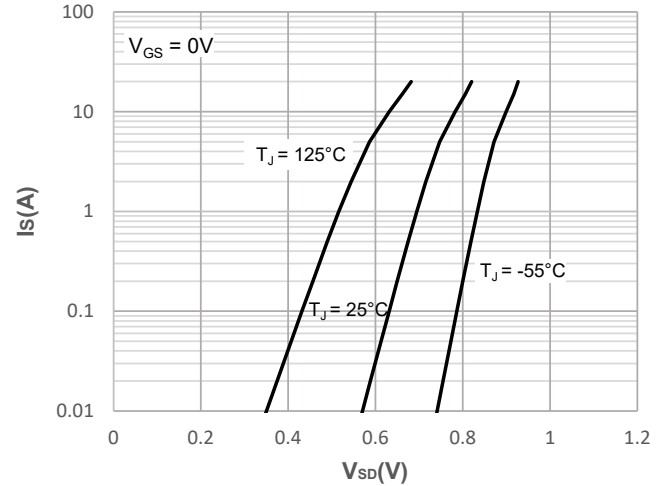


Figure 5: Gate Charge Characteristics

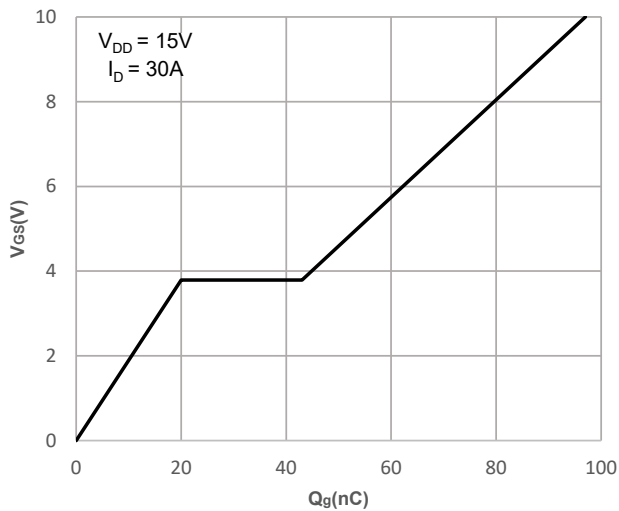
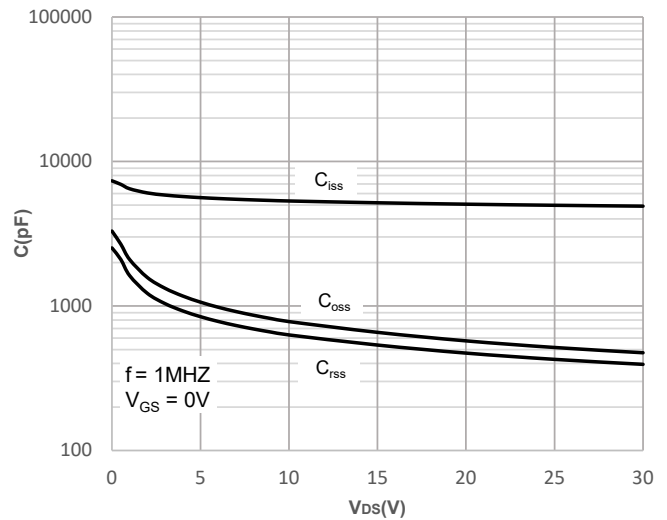


Figure 6: Capacitance Characteristics



## Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

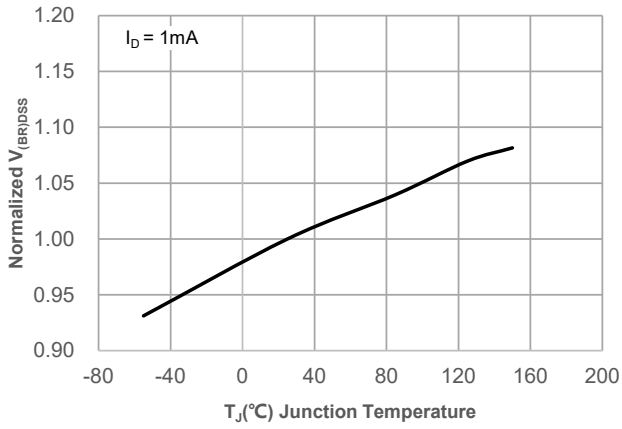


Figure 8: Normalized on Resistance vs. Junction Temperature

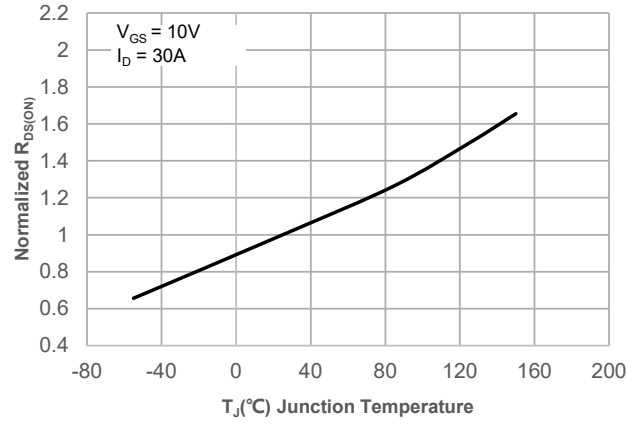


Figure 9: Maximum Safe Operating Area

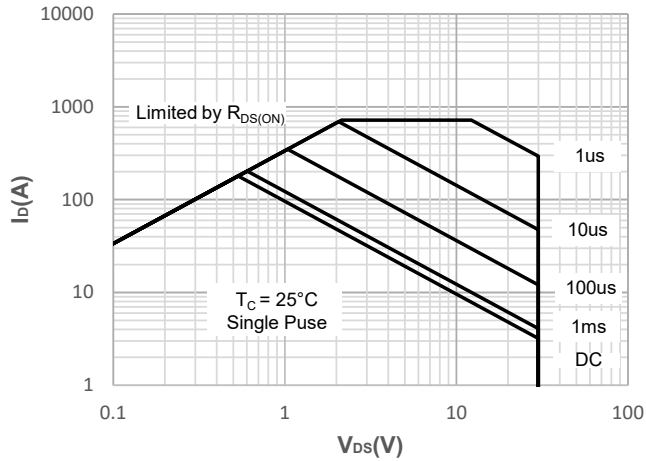


Figure 10: Maximum Continuous Driand Current vs. Case Temperature

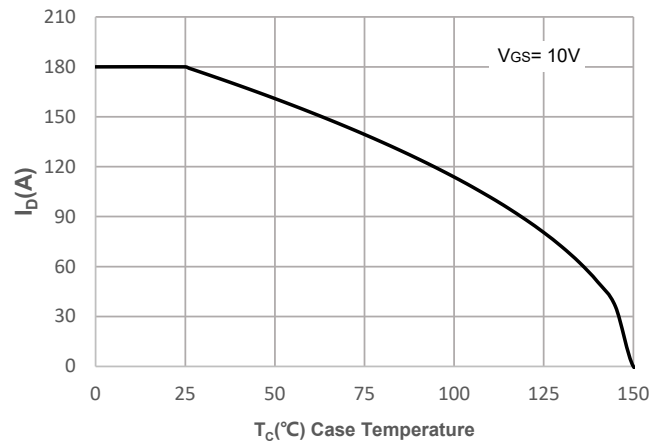


Figure 11: Normalized Maximum Transient Thermal Impedance

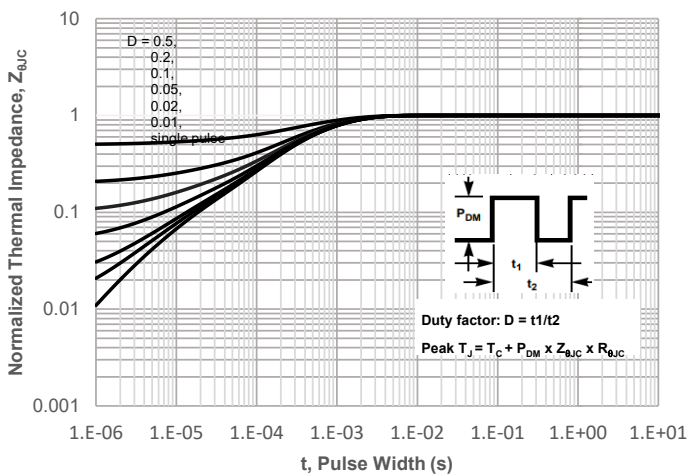
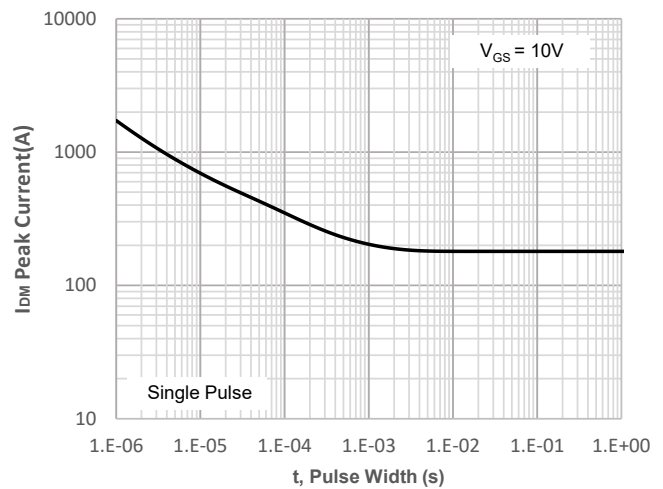


Figure 12: Peak Current Capacity



## Test Circuit

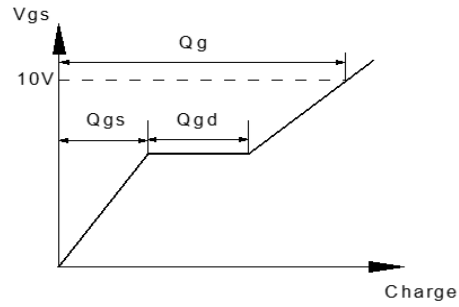
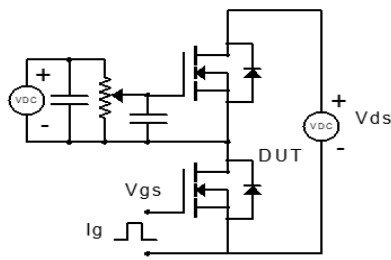


Figure 1: Gate Charge Test Circuit & Waveform

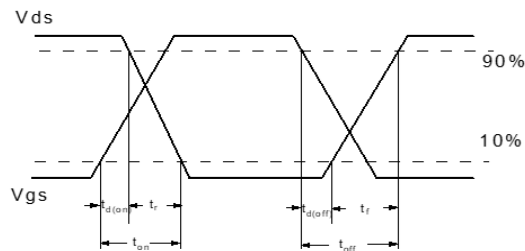
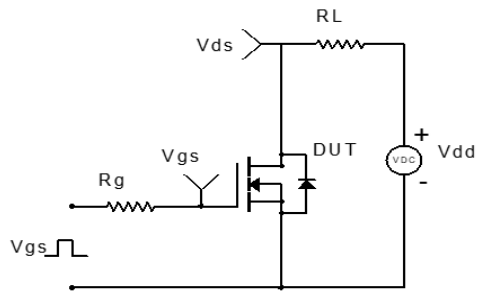


Figure 2: Resistive Switching Test Circuit & Waveform

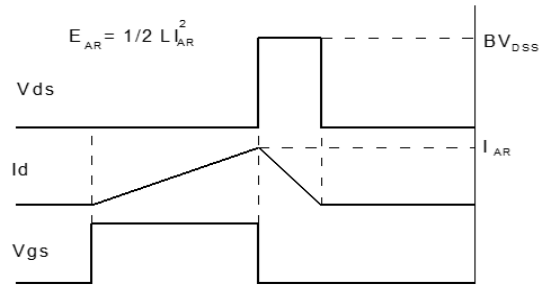
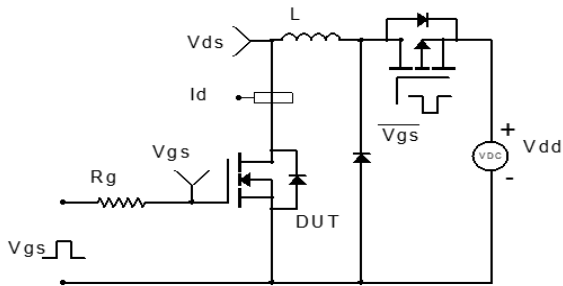


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

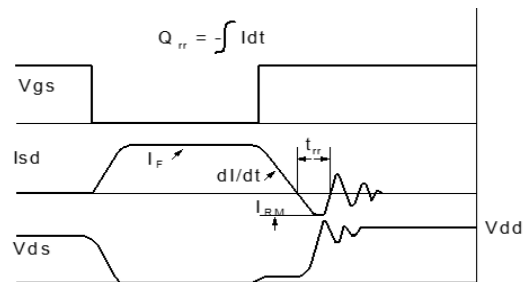
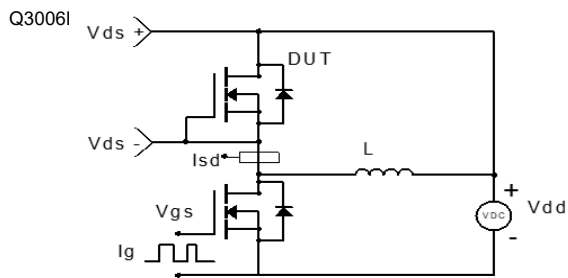
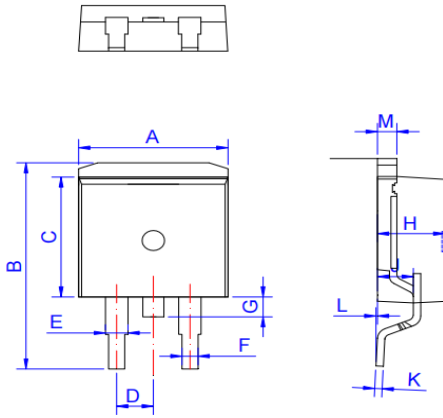



Figure 4: Diode Recovery Test Circuit & Waveform

## Package Mechanical Data(TO-263-3L)



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.90		10.20	0.390		0.402
B	14.70		15.80	0.579		0.622
C	9.4		9.6	0.37		0.378
D		2.54			0.100	
E	1.20		1.40	0.047		0.055
F	0.75		0.85	0.029		0.033
G			1.75			0.069
H	4.40		4.70	0.173		0.185
J	2.30		2.70	0.091		0.106
K	0.38		0.55	0.015		0.022
L	0	0.10	0.25	0	0.004	0.010
M	1.25		1.35	0.049		0.053

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