



## Description

### JMT Dual N-channel Enhancement Mode Power MOSFET

#### Features

- 30V,22A  
 $R_{DS(ON)} < 13m\Omega @ V_{GS} = 10V$   
 $R_{DS(ON)} < 19m\Omega @ V_{GS} = 4.5V$
- Advanced Trench Technology
- Provide Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead Free

#### Application

- Load Switch
- PWM Application
- Power Management



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

Top View

PDFN3x3-8L-D

Bottom View

Marking and pin Assignment

Schematic Diagram

## Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel (pcs)	Per Carton (pcs)
Q3010D	JMTQ3010D	TAPING	PDFN3x3-8L-D	13"	5000	50000

## 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	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ C$	22
		$T_C = 100^\circ C$	14
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>	88	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>note2</sup>	24	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ C$	9.8
$R_{\theta JC}$	Thermal Resistance, Junction to Case	12.8	$^\circ C/W$
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +150	$^\circ C$



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

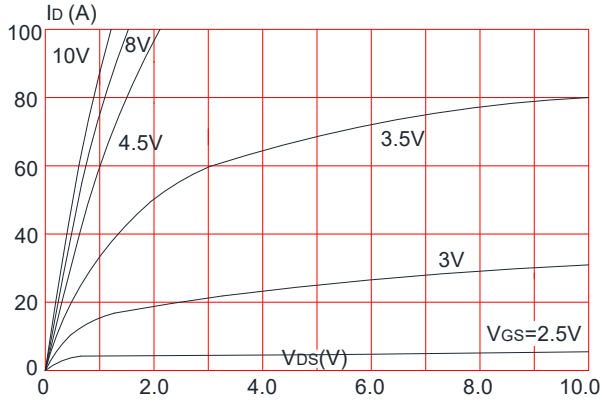
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristics</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V,	-	-	1.0	μA
I <sub>GSS</sub>	Gate 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	1.0	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> =15A	-	10	13	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A	-	14	19	
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1.0MHz	-	1011	-	pF
C <sub>oss</sub>	Output Capacitance		-	142	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	119	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DD</sub> =15V, I <sub>D</sub> =10A, V <sub>GS</sub> =10V	-	19	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	6.3	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	4.5	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =15V, I <sub>D</sub> =20A, R <sub>GEN</sub> =3Ω, V <sub>GS</sub> =10V	-	6	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	5	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	25	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	7	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	22	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	88	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =22A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I <sub>F</sub> =10A, di/dt=100A/μs	-	7	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	6.3	-	nC

- Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature  
 2. EAS condition: Starting T<sub>J</sub>=25°C, V<sub>GS</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=9.8A  
 3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

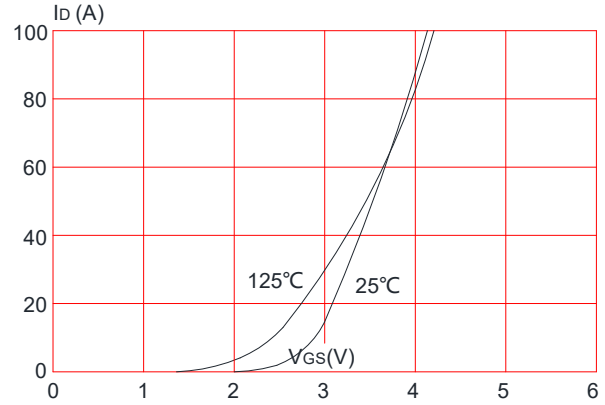


## Typical Performance Characteristics

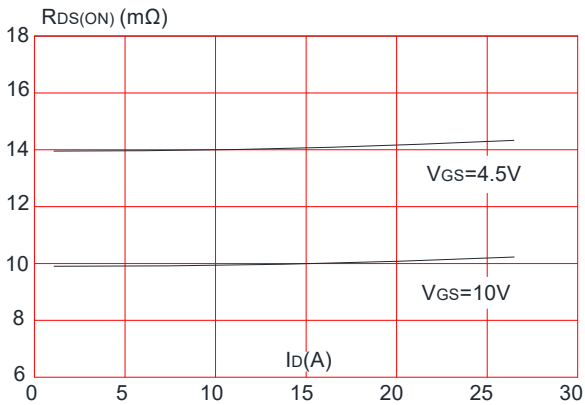
**Figure 1: Output Characteristics**



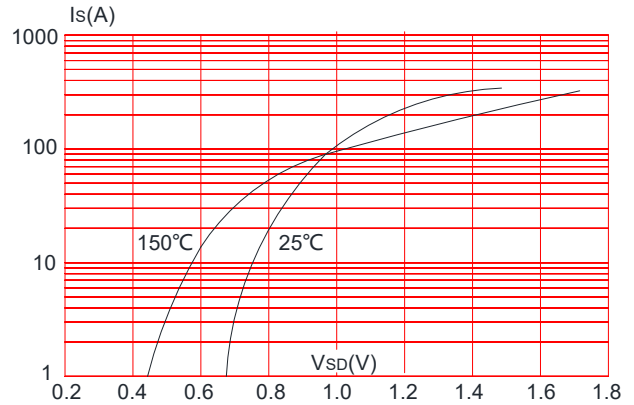
**Figure 2: Typical Transfer Characteristics**



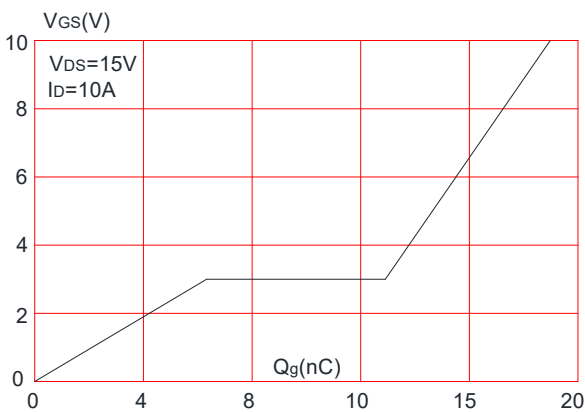
**Figure 3: On-resistance vs. Drain Current**



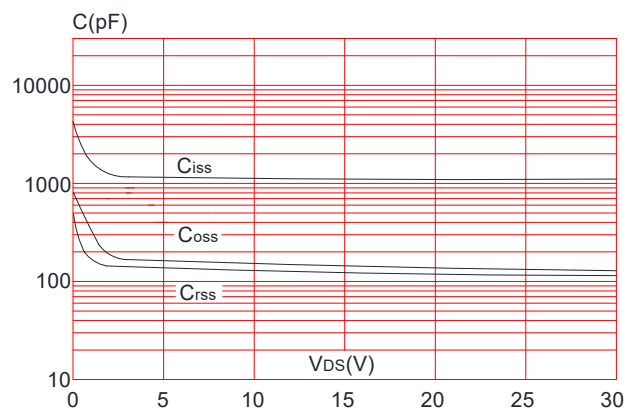
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

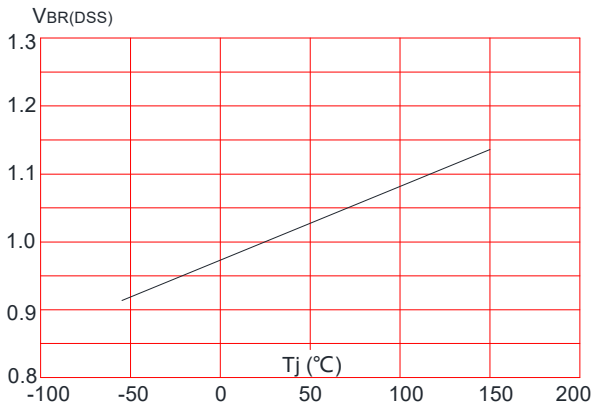


**Figure 6: Capacitance Characteristics**

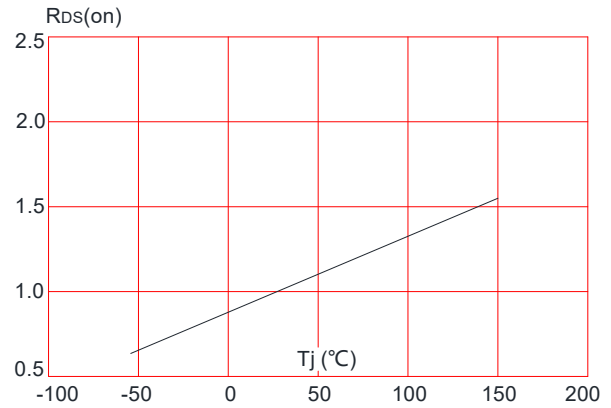




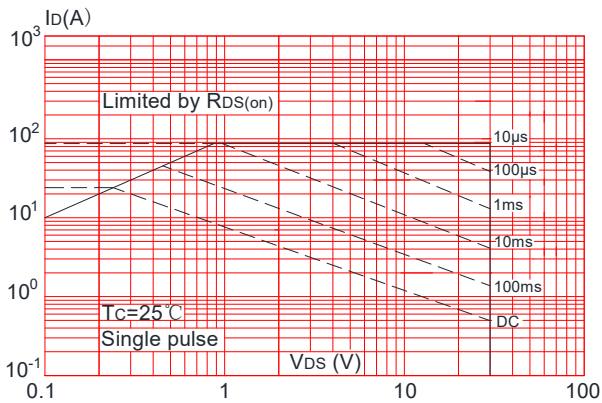
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



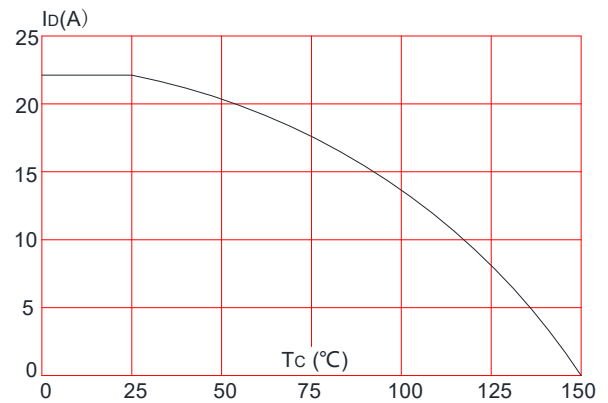
**Figure 8:** Normalized on Resistance vs. Junction Temperature



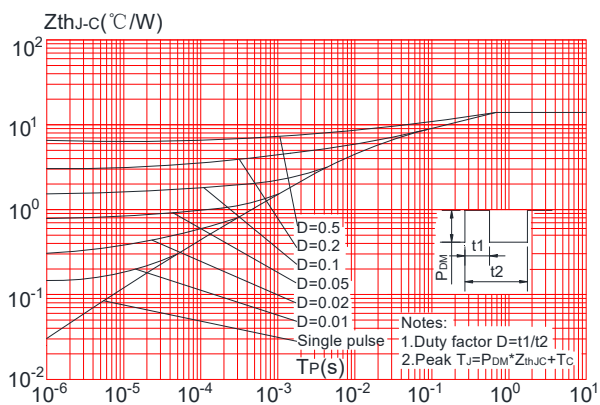
**Figure 9:** Maximum Safe Operating Area



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



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



## Test Circuit

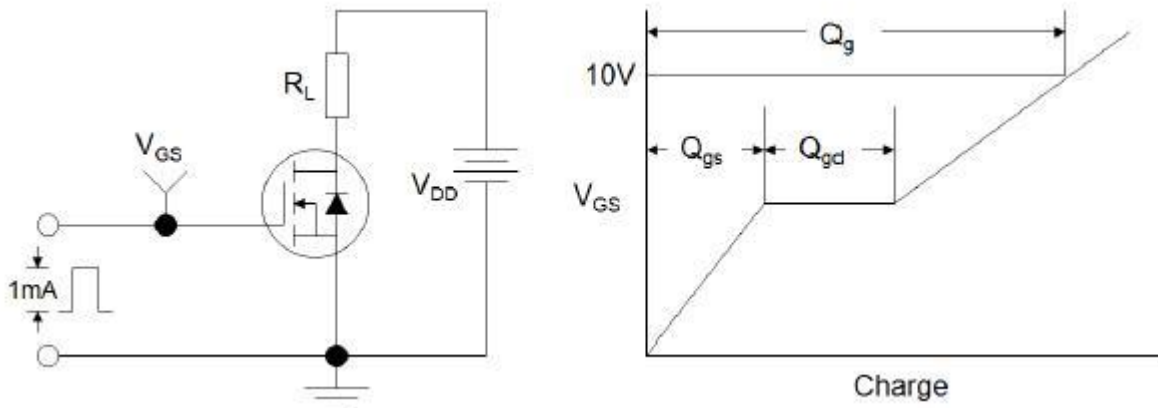


Figure1:Gate Charge Test Circuit & Waveform

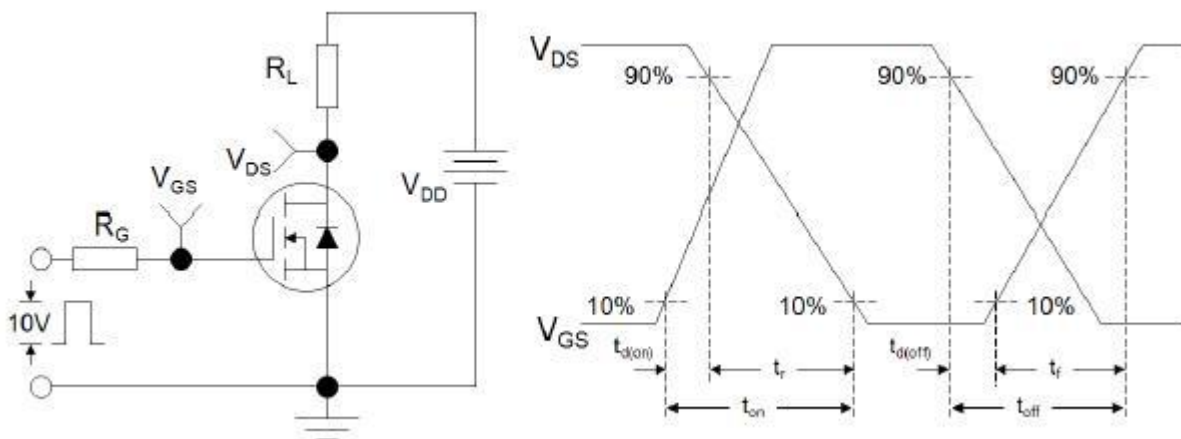


Figure 2: Resistive Switching Test Circuit & Waveforms

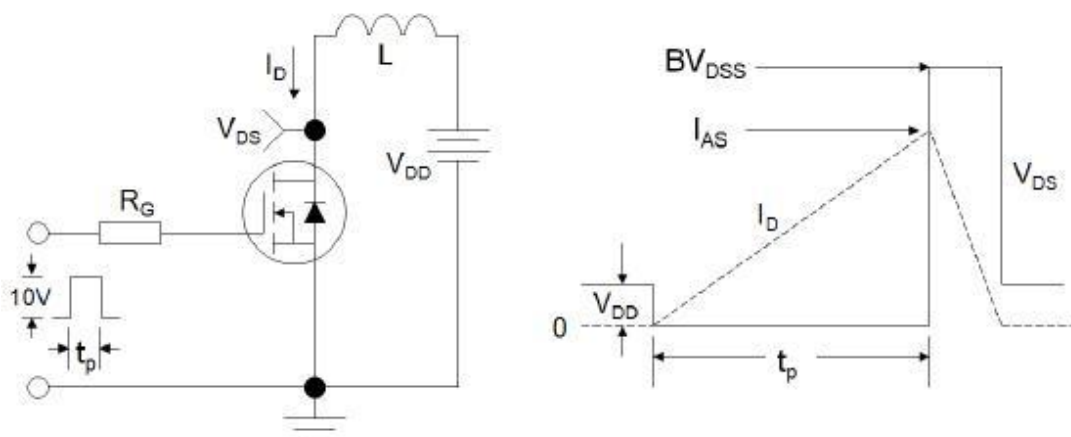
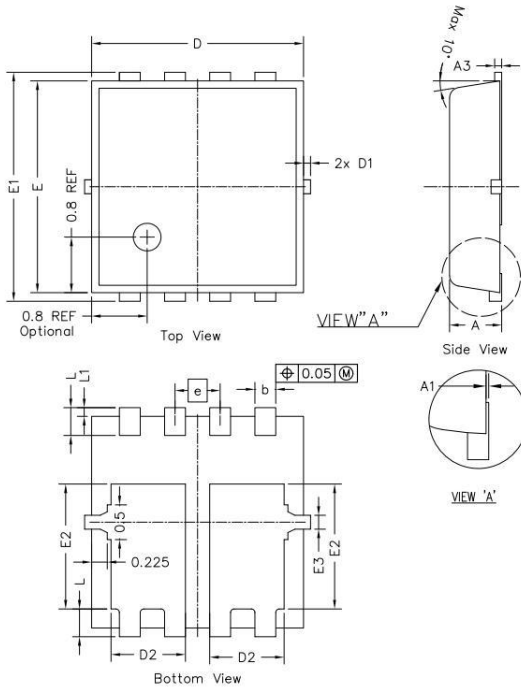


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



## Package Mechanical Data-PDFN3x3-8L-D



SYMBOLS	DIMENSION IN MM			DIMENSION IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.700	0.750	0.800	0.028	0.030	0.031
A1	---	---	0.050	----	----	0.002
A3	0.144	0.152	0.202	0.006	0.006	0.008
b	0.250	0.300	0.350	0.010	0.012	0.014
e	0.65 BSC			0.026 BSC		
D	2.950	3.050	3.150	0.116	0.120	0.124
E	2.950	3.050	3.150	0.116	0.120	0.124
D1	---	---	0.125	----	----	0.005
E1	3.200	3.300	3.400	0.126	0.130	0.134
D2	0.970	1.070	1.170	0.038	0.042	0.046
E2	1.700	1.800	1.900	0.067	0.071	0.075
E3	0.150	0.200	0.250	0.006	0.008	0.010
L	0.300	0.400	0.500	0.012	0.016	0.020
L1	0.075	0.125	0.175	0.003	0.005	0.007

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