

## Description

### JMT N-channel Enhancement Mode Power MOSFET

#### Features

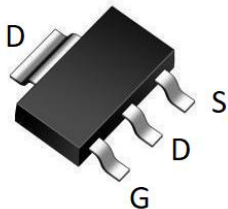
- $V_{DS}=60V$ ,  $I_D=5A$   
 $R_{DS(ON)} < 100m\Omega @ V_{GS} = 10V$   
 $R_{DS(ON)} < 125m\Omega @ V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead free product is acquired

#### Application

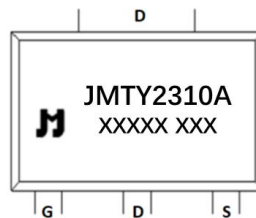
- Load Switch
- PWM Application
- Power management



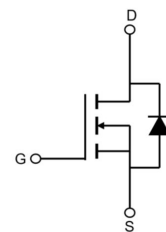
*100% UIS TESTED!*  
*100% ΔVds TESTED!*



SOT-223-3L 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)
JMTY2310A	JMTY2310A	TAPING	SOT-223-3L	13inch	4000	40000

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

Symbol	Parameter	Max.	Units
$V_{DSS}$	Drain-Source Voltage	60	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_A = 25^\circ C$	5
		$T_A = 100^\circ C$	3.3
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>	20	A
EAS	Single Pulsed Avalanche Energy <sup>note2</sup>	4	mJ
$P_D$	Power Dissipation	4	W
$R_{\theta JA}$	Thermal Resistance, Junction to Case	31	$^\circ C/W$
$T_J, T_{STG}$	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 Characteristic</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> = 250μA	60	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =60V, V <sub>GS</sub> = 0V,	-	-	1	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	2.2	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance <small>note2</small>	V <sub>GS</sub> =10V, I <sub>D</sub> =3A	-	75	100	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =2A	-	87	125	
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz	-	350	-	pF
C <sub>oss</sub>	Output Capacitance		-	29	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	23	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = 30V, I <sub>D</sub> = 3A, V <sub>GS</sub> = 10V	-	9	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	1.5	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	2	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> = 30V, I <sub>D</sub> =2A, R <sub>GEN</sub> =3Ω, V <sub>GS</sub> =10V,	-	5	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	7	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	37	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	22	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	5	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	20	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =5A	-	-	1.2	V

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

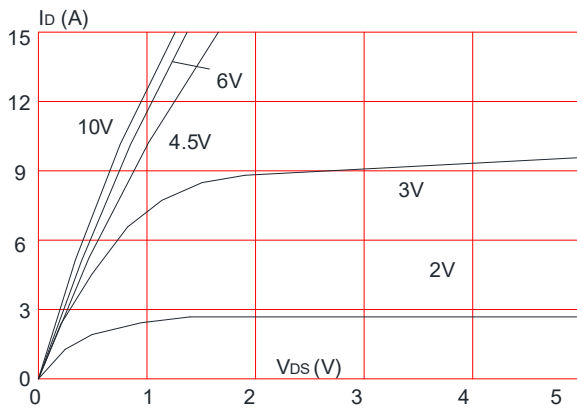
2. EAS condition : T<sub>J</sub>=25°C, V<sub>DD</sub>=30V, V<sub>G</sub>=10V, L=0.5mH, R<sub>g</sub>=25Ω, I<sub>AS</sub>=4A

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

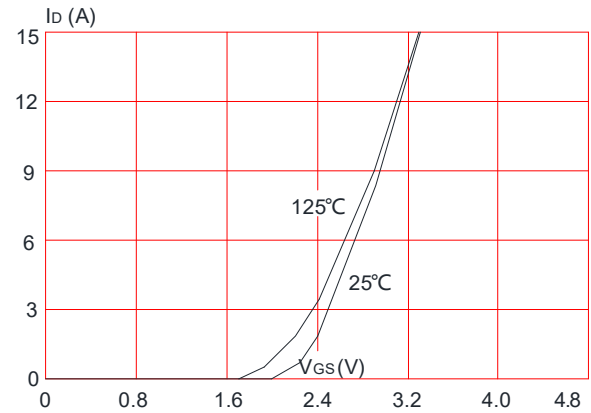


## Typical Performance Characteristics

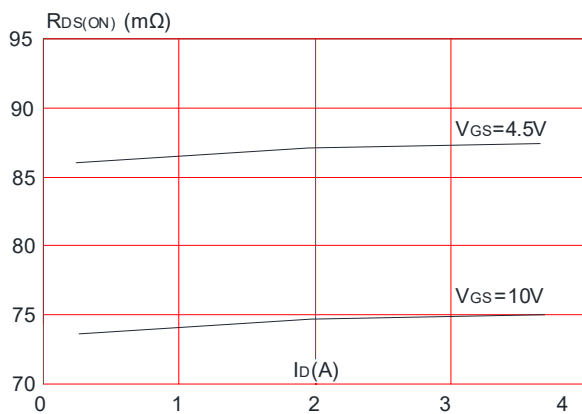
**Figure 1: Output Characteristics**



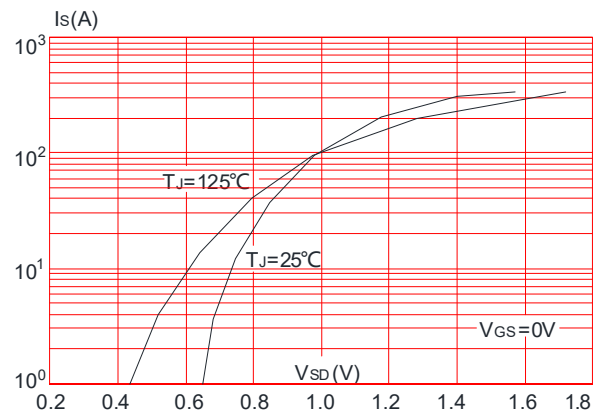
**Figure 2: Typical Transfer Characteristics**



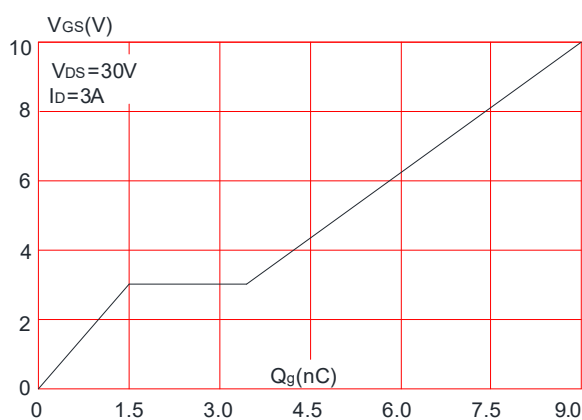
**Figure 3: On-resistance vs. Drain Current**



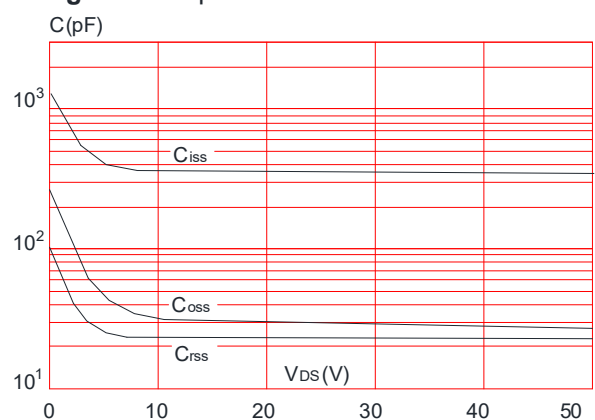
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

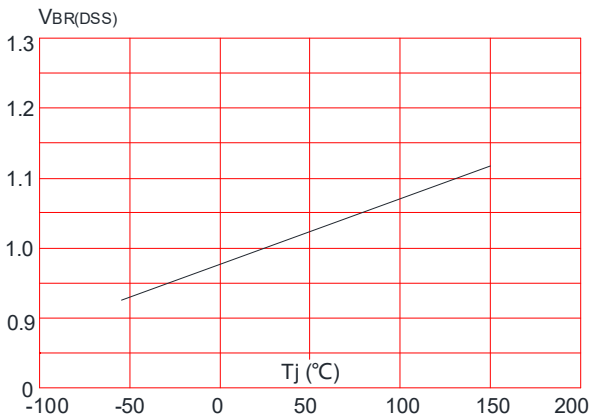


**Figure 6: Capacitance Characteristics**

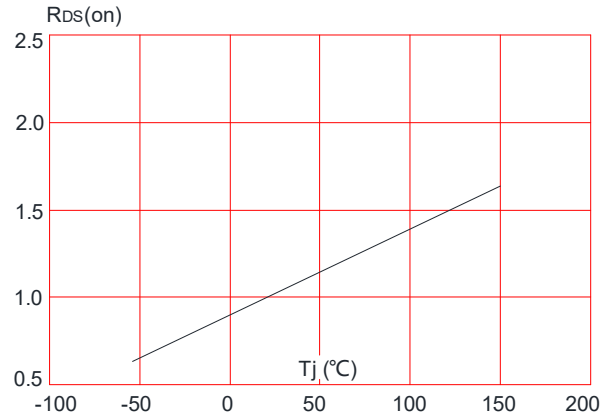




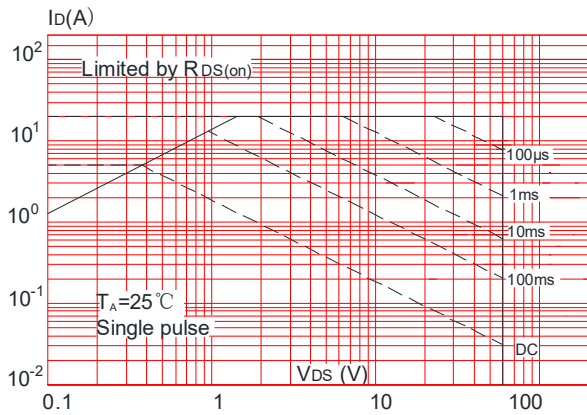
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



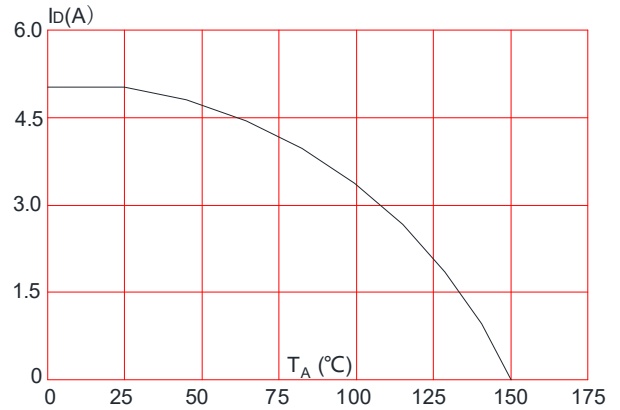
**Figure 8:** Normalized on Resistance vs. Junction Temperature



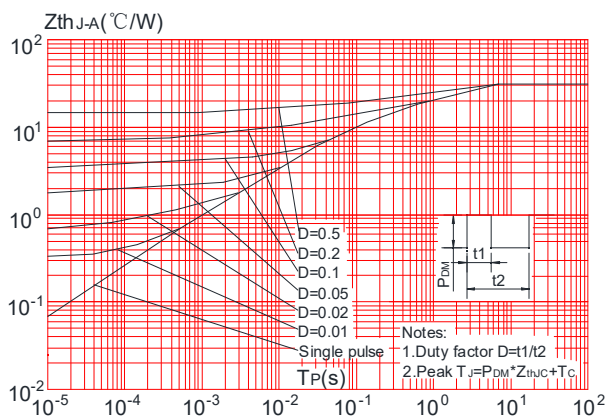
**Figure 9:** Maximum Safe Operating Area



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



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



## Test Circuit



Figure1:Gate Charge Test Circuit & Waveform

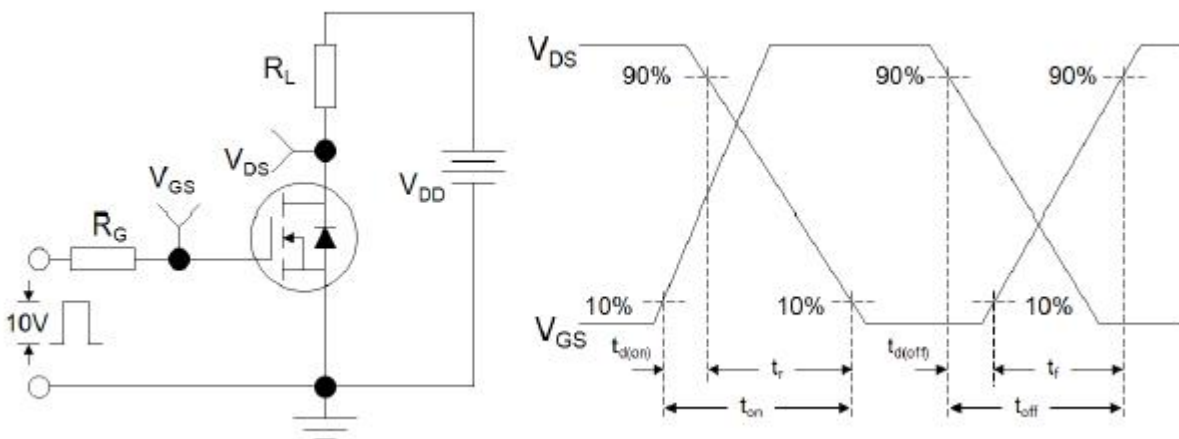


Figure 2: Resistive Switching Test Circuit & Waveforms

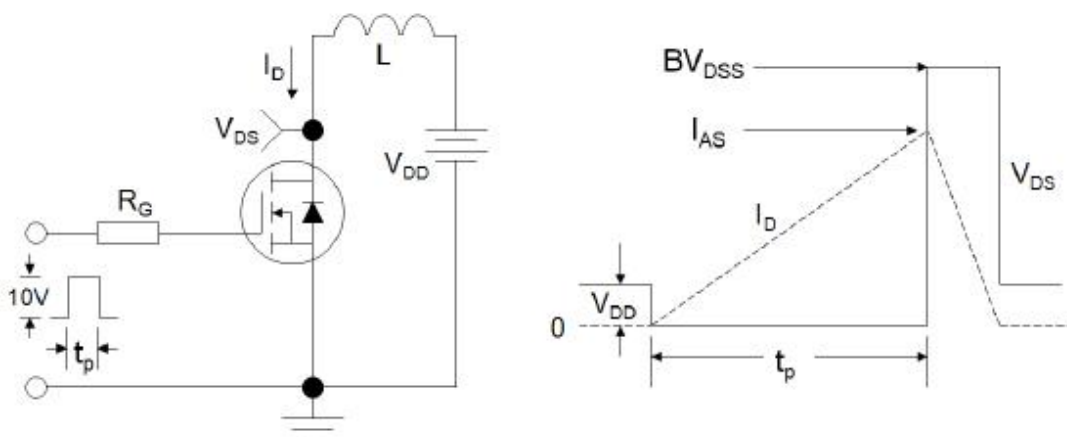
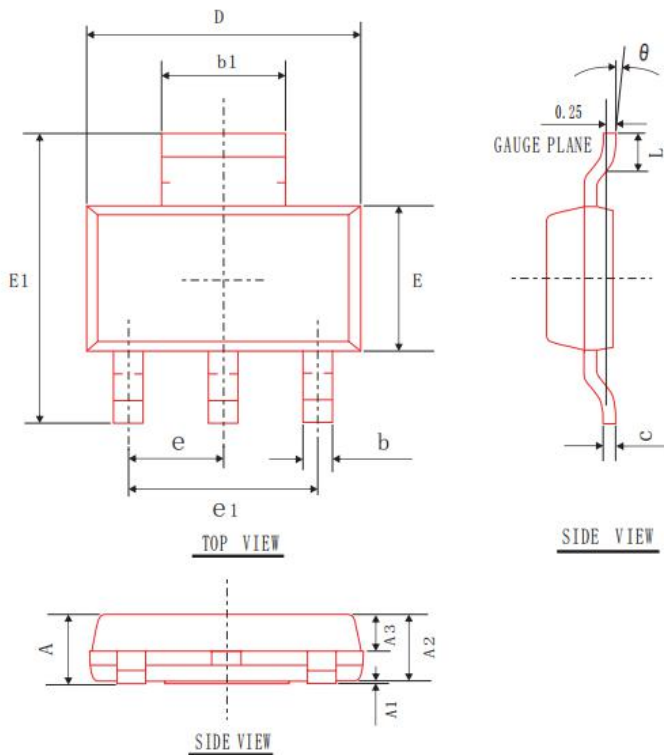


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



## Package Mechanical Data-SOT-223-3L



COMMON DIMENSIONS  
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	---	---	1.80
A1	0.00	0.05	0.10
A2	1.50	1.60	1.70
A3	0.85	0.90	0.95
b	0.66	0.70	0.80
b1	2.96	3.00	3.10
c	0.25	0.30	0.35
D	6.30	6.50	6.70
E	3.30	3.50	3.70
E1	6.80	7.00	7.20
e1	4.40	4.60	4.80
L	0.90	---	1.15
$\theta$	0°	5°	10°
e	2.3 BSC		

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