

### General Features

- High Power and Current Handling Capability
- Lead Free Product is Acquired
- Surface Mount Package

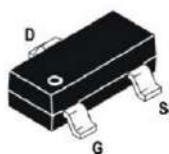
### Application

- Battery Protection
- Load Switch
- Power Management

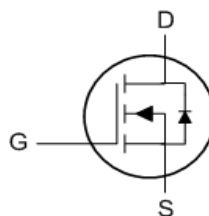
### Product Summary



$V_{DS}$	60	V
$R_{DS(on),TYP} @ V_{GS}=10V$	100	mΩ
$I_D$	3	A



SOT23



N-Channel

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

Symbol	Parameter	Max.	Units
$V_{DSS}$	Drain-Source Voltage	60	V
$V_{GSS}$	Gate-Source Voltage	±20	V
$I_D$	Continuous Drain Current	$T_C = 25^{\circ}C$	3
		$T_C = 100^{\circ}C$	2
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>	10	A
$P_D$	Power Dissipation	0.35	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	$^{\circ}C/W$
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +150	$^{\circ}C$

**Electrical Characteristics** ( $T_c=25^{\circ}\text{C}$  unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=48V, V_{GS}=0V,$	-	-	1	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	-	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note2</small>	$V_{GS}=10V, I_D=2A$	-	-	100	m $\Omega$
		$V_{GS}=4.5V, I_D=1A$	-	-	110	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=30V, V_{GS}=0V,$ $f=1.0MHz$	-	250	-	pF
$C_{oss}$	Output Capacitance		-	26	-	pF
$C_{riss}$	Reverse Transfer Capacitance		-	20	-	pF
$Q_g$	Total Gate Charge	$V_{DS}=30V, I_D=3A,$ $V_{GS}=4.5V$	-	7	-	nC
$Q_{gs}$	Gate-Source Charge		-	1.2	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	1.5	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=30V, I_D=1.5A,$ $R_{GEN}=1\Omega, V_{GS}=10V,$	-	6.5	-	ns
$t_r$	Turn-on Rise Time		-	15.2	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	15.2	-	ns
$t_f$	Turn-off Fall Time		-	10.3	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	3	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	10	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=1A$	-	-	1.2	V

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

 2. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$

### Typical Performance Characteristics

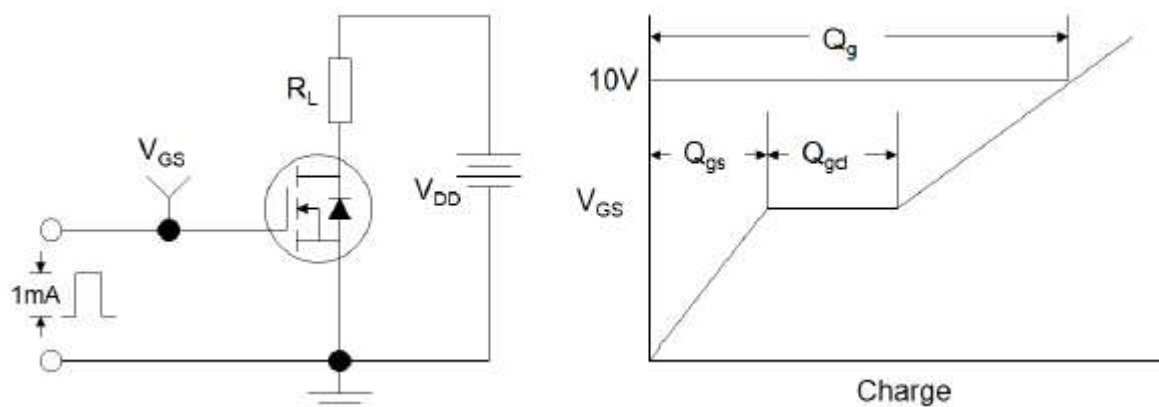


Figure 1: Gate Charge Test Circuit & Waveform

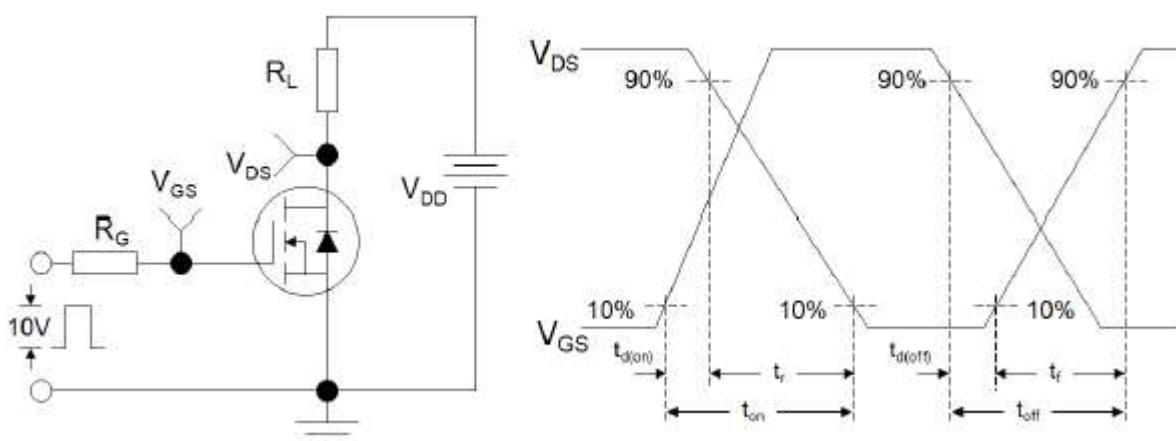


Figure 2: Resistive Switching Test Circuit & Waveforms

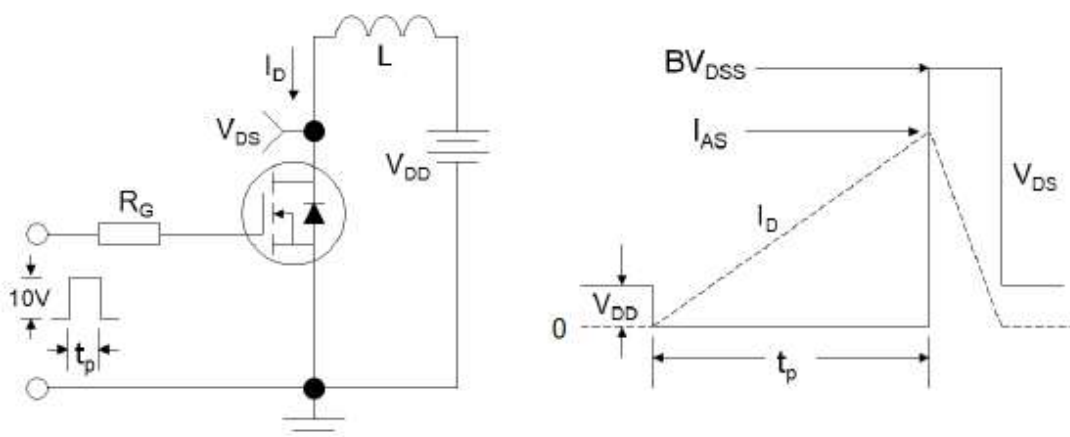


Figure 3: Unclamped Inductive Switching Test Circuit & Waveforms

Typical Electrical and Thermal Characteristics (Curves)

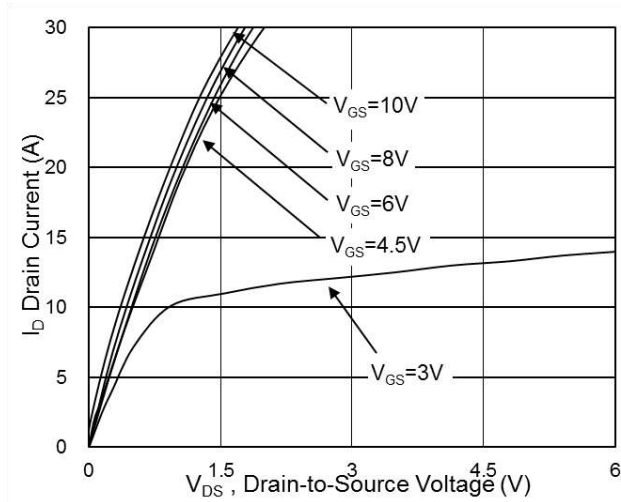


Fig.1 Typical Output Characteristics

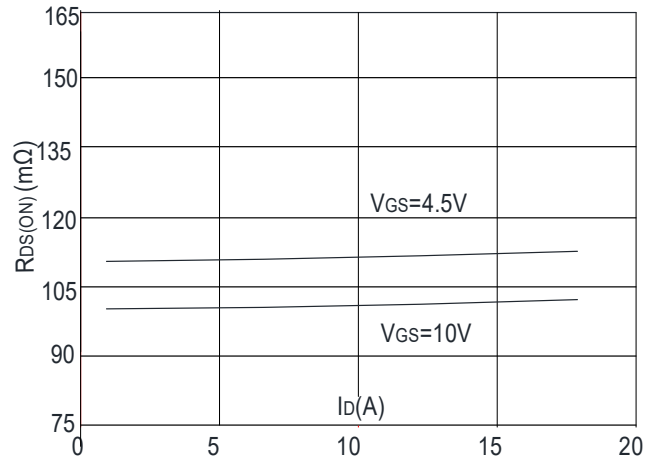


Fig.2 On-Resistance vs Drain Current

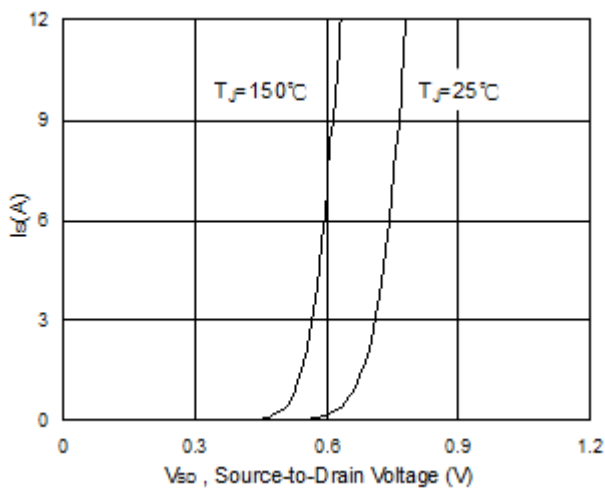


Fig.3 Source Drain Forward Characteristics

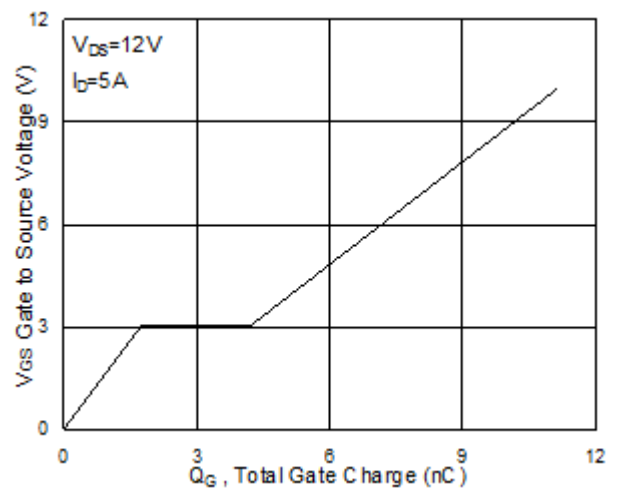


Fig.4 Gate-Charge Characteristics

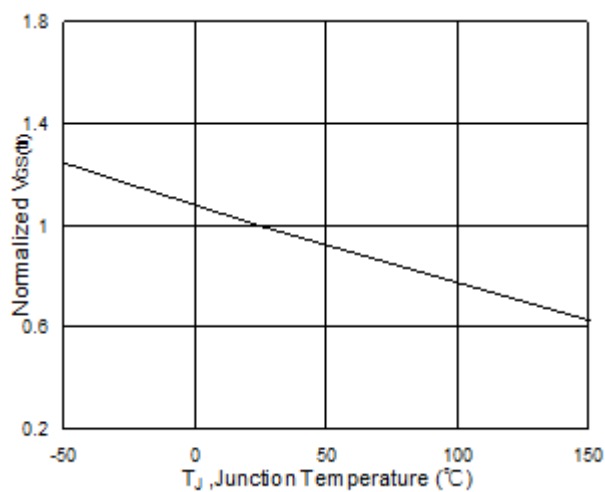


Fig.5 Normalized  $V_{GS(th)}$  vs  $T_J$

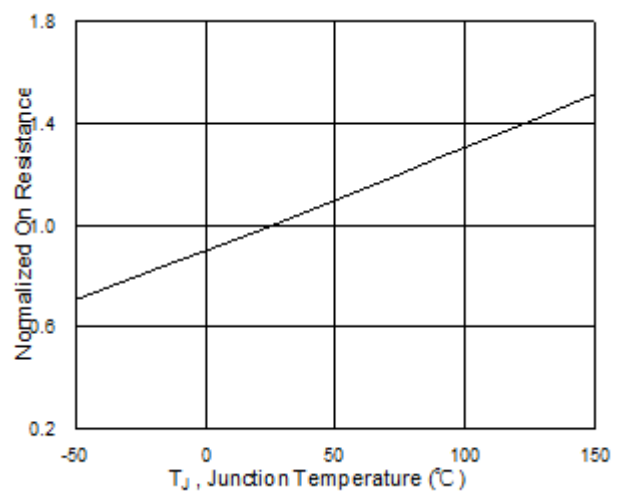


Fig.6 Normalized  $R_{DS(on)}$  vs  $T_J$

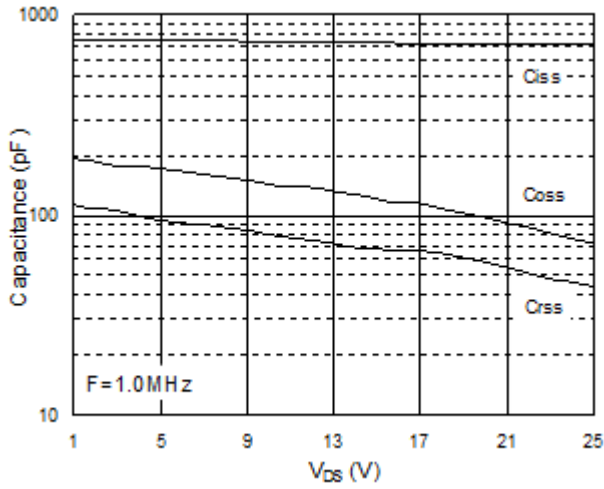


Fig.7 Capacitance

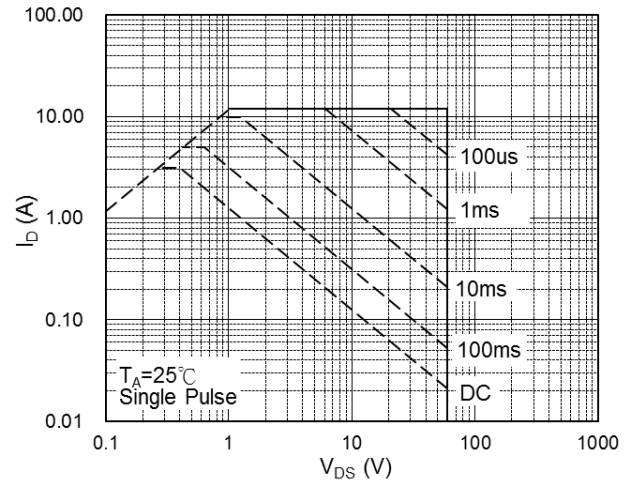


Fig.8 Safe Operating Area

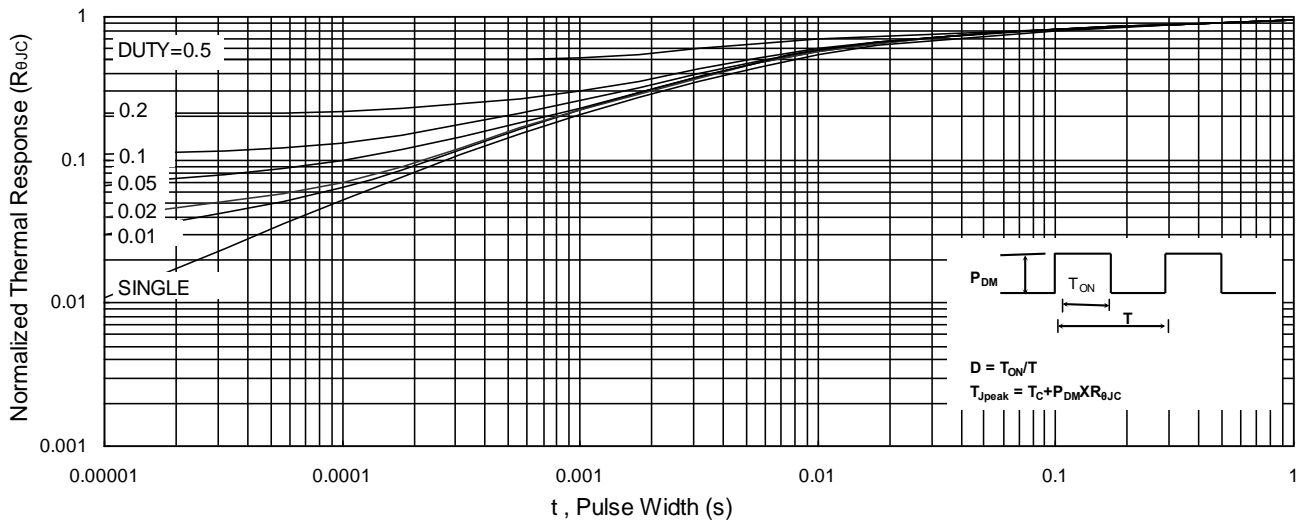


Fig.9 Normalized Maximum Transient Thermal Impedance

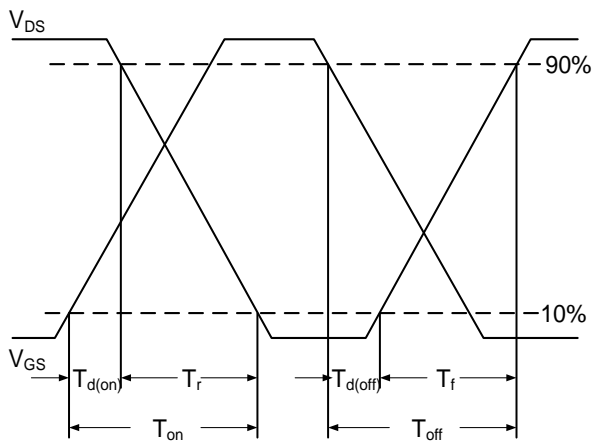
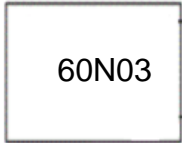


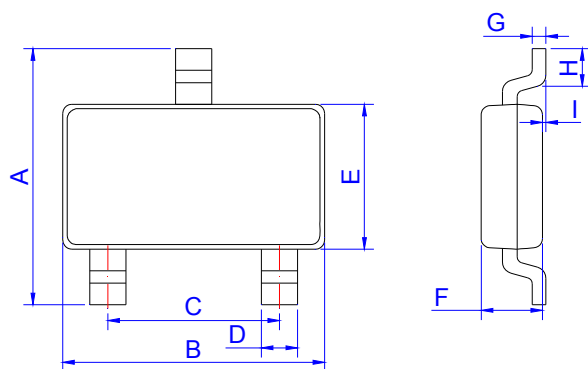
Fig.10 Switching Time Waveform

## Ordering and Marking Information

Ordering Device No	Marking	Package	Packing	Quantity
JME60N03ZA-R	60N03	SOT23	Tape&Reel	3000/Reel

PACKAGE	MARKING
SOT23	

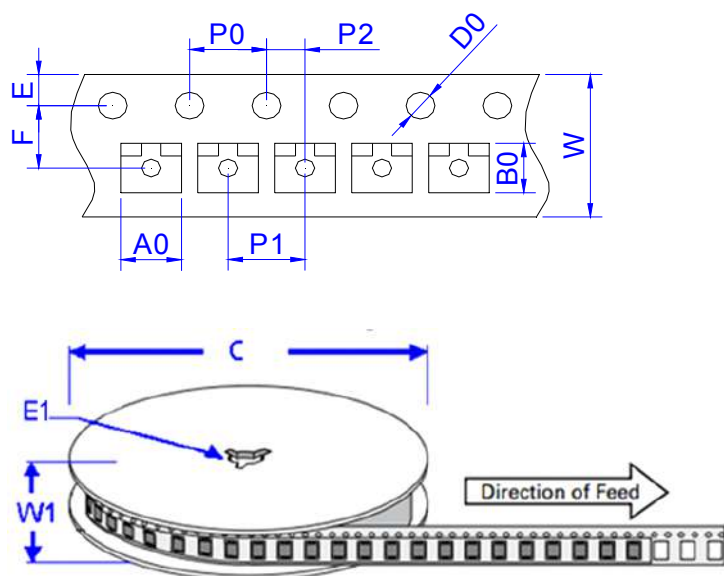
### Package Mechanical Data



SOT-23

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.30	2.40	2.50	0.091	0.095	0.098
B	2.80	2.90	3.00	0.110	0.114	0.118
C	1.90 REF			0.075 REF		
D	0.35	0.40	0.45	0.014	0.016	0.018
E	1.20	1.30	1.40	0.047	0.051	0.055
F	0.90	1.00	1.10	0.035	0.039	0.043
G		0.10	0.15		0.004	0.006
H	0.20			0.008		
I	0		0.10	0		0.004

### Package Information-SOT23



Ref.	Dimensions	
	Millimeters	Inches
A0	3.15 ± 0.3	0.124 ± 0.012
B0	2.77 ± 0.3	0.109 ± 0.012
C	178	7.0
D0	1.50±0.1	0.059 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3±0.3	0.524± 0.012
F	3.5 ± 0.2	0.138 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	4.00 ± 0.2	0.157 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	8.00 ± 0.2	0.315 ± 0.008
W1	11.5±1.0	0.453 ± 0.039

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