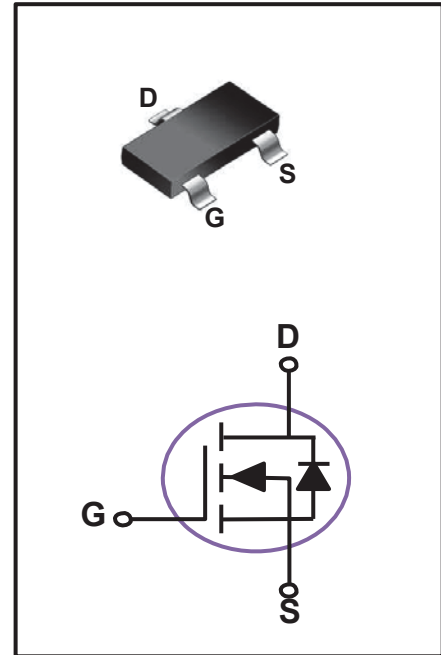


## SOT-23-3 PinConfiguration

BVDSS	RDS(ON)	ID
60V	75mΩ	3.2A



### Features

- 60V,3.2A,  $R_{DS(ON)} = 75m\Omega @ V_{GS} = 10V$
- Improved  $dv/dt$  capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

### Applications

- Motor Drive
- Power Tools
- LED Lighting

## MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current – Continuous ( $T_c=25^\circ C$ )	$I_D$	3.2	A
Drain Current – Continuous ( $T_c=100^\circ C$ )		2	A
Drain Current – Pulsed <sup>1</sup>	$I_{DM}$	12.8	A
Power Dissipation ( $T_c=25^\circ C$ )	$P_D$	1.56	W
Power Dissipation – Derate above 25°C		0.012	W/°C
Storage Temperature Range	$T_{STG}$	-50 to 150	°C
Operating Junction Temperature Range	$T_J$	-50 to 150	°C

### Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to ambient	$R_{\theta JA}$	---	80	°C/W

## MOSFETELECTRICAL CHARACTERISTICS $T_A=25^{\circ}\text{C}$ unless otherwise specified

### Off Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	---	---	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^{\circ}\text{C}, I_D=1\text{mA}$	---	0.05	---	$\text{V}/^{\circ}\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	1	$\mu\text{A}$
		$V_{DS}=48V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	---	---	10	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA

### On Characteristics

Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=6A$	---	60	75	$\text{m}\Omega$
		$V_{GS}=4.5V, I_D=3A$	---	70	90	$\text{m}\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.8	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		---	-5	---	$\text{mV}/^{\circ}\text{C}$
Forward Transconductance	$g_{fs}$	$V_{DS}=10V, I_D=3A$	---	7	---	S

### Dynamic and switching Characteristics

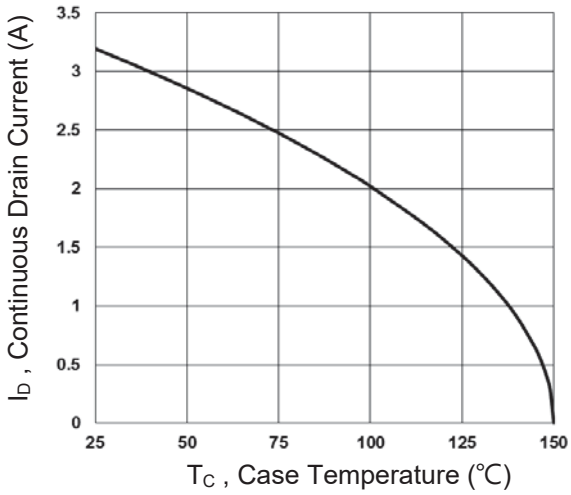
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=48V, V_{GS}=10V, I_D=6A$	---	9.3	14	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		---	2.1	4	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		---	1.8	4	
Turn-On Delay Time <sup>2,3</sup>	$T_{d(on)}$	$V_{DD}=30V, V_{GS}=10V, R_G=3.3\Omega, I_D=1A$	---	2.9	6	ns
Rise Time <sup>2,3</sup>	$T_r$		---	9.5	18	
Turn-Off Delay Time <sup>2,3</sup>	$T_{d(off)}$		---	18.4	35	
Fall Time <sup>2,3</sup>	$T_f$		---	5.3	10	
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V, F=1\text{MHz}$	---	500	725	pF
Output Capacitance	$C_{oss}$		---	45	65	
Reverse Transfer Capacitance	$C_{rss}$		---	16	30	
Gate resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	---	2	4	$\Omega$

### Drain-Source Diode Characteristics and Maximum Ratings

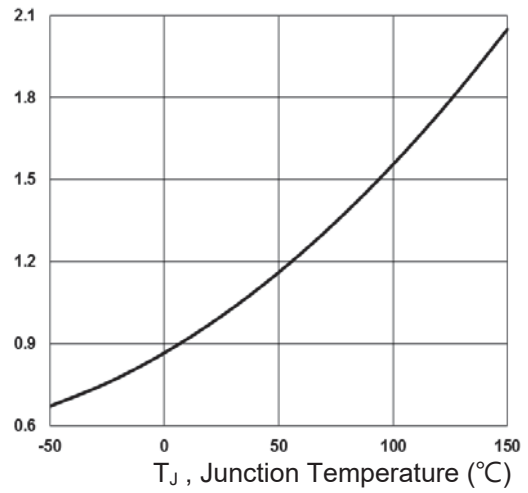
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	$I_S$	$V_G=V_D=0V, \text{Force Current}$	---	---	3.2	A
Pulsed Source Current	$I_{SM}$		---	---	6.4	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	---	---	1	V
Reverse Recovery Time <sup>2</sup>	$t_{rr}$	$V_{GS}=30V, I_S=1A, dI/dt=100A/\mu\text{s}$	---	23.2	---	ns
Reverse Recovery Charge <sup>2</sup>	$Q_{rr}$		$T_J=25^{\circ}\text{C}$	---	14.3	---

Note :

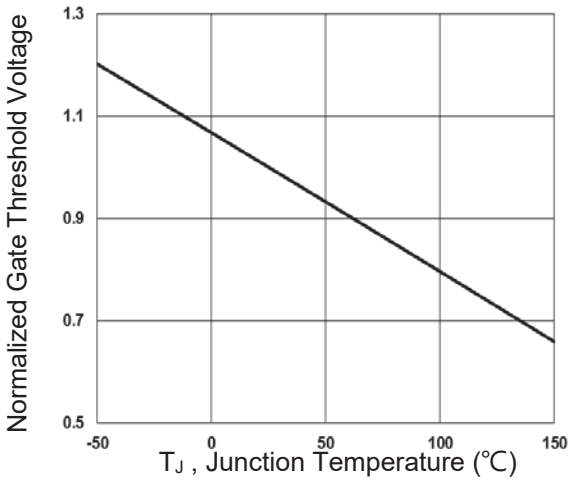
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width  $\leq 300\mu\text{s}$  , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.



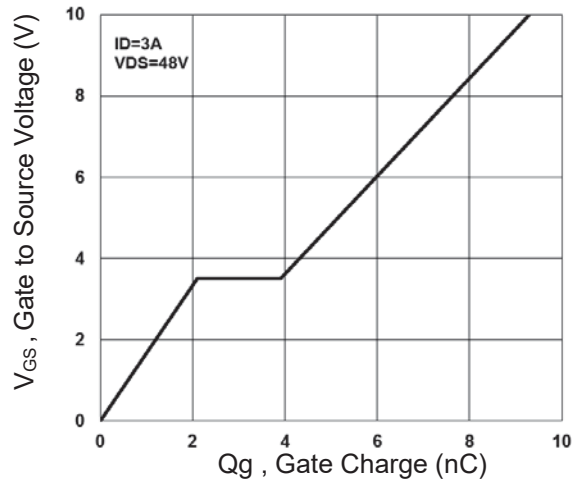
**Fig.1 Continuous Drain Current vs.  $T_c$**



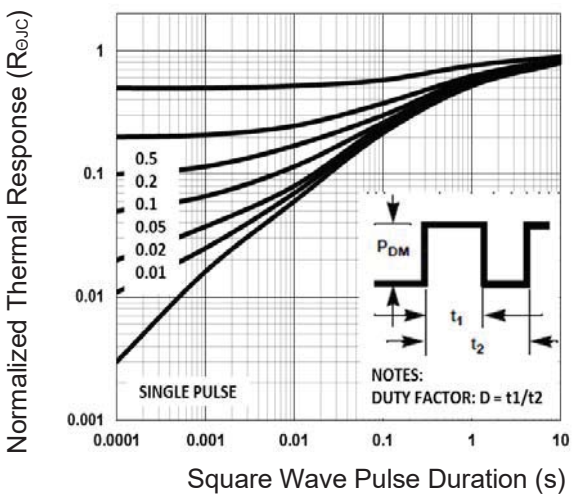
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$**



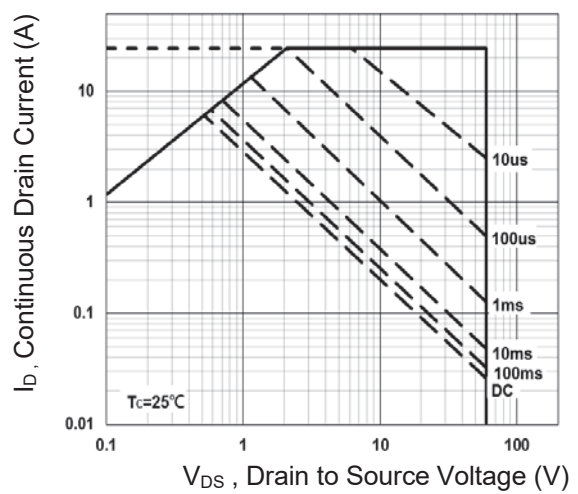
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



**Fig.4 Gate Charge Waveform**



**Fig.5 Normalized Transient Response**



**Fig.6 Maximum Safe Operation Area**

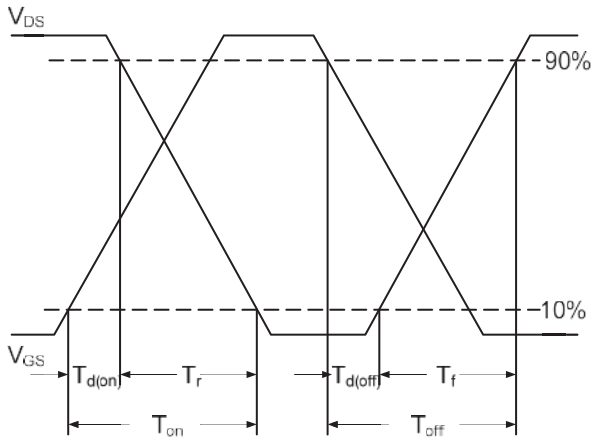


Fig.7 Switching Time Waveform

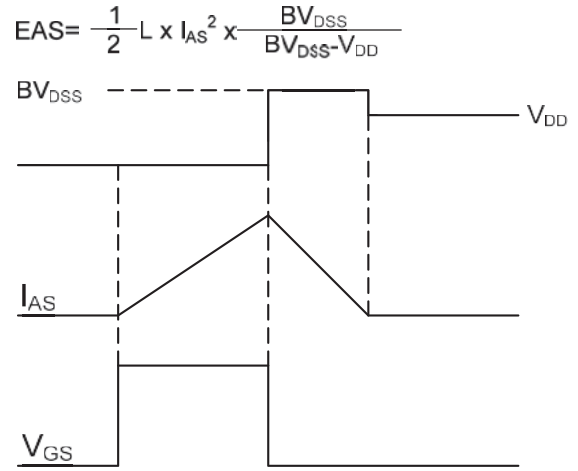
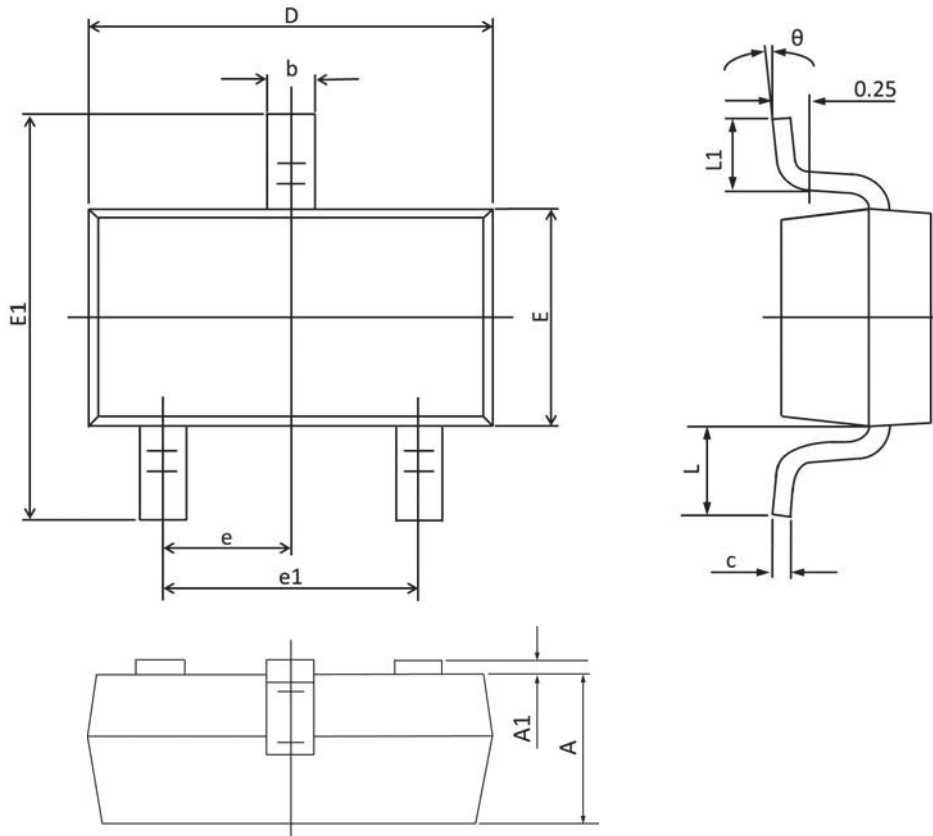


Fig.8 EAS Waveform

## SOT23-3S PACKAGE INFORMATION



Symbol	Dimensions In		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.03	0.039
A1	0.000	0.100	0.00	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
$\theta$	1°	7°	1°	7°