

# MSKSEMI

SEMICONDUCTOR



ESD



TVS



TSS



MOV

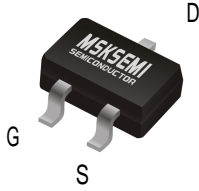


GDT

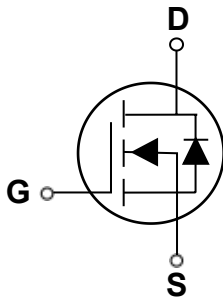


PLED

Product data sheet



SOT-23-3L



**Features**

- 30V, 3.8A ,  $R_{DS(ON)}=45m\Omega@V_{GS}=10V$
- Improved  $dv/dt$  capability
- Fast switching
- Green Device Available

**Applications**

- MB / VGA / Vcore
- Load Switch
- Hand-Held Instrument

BVDSS	RDSON	ID
30V	45mΩ	3.8A

**Absolute Maximum Ratings**  $T_c=25^\circ C$  unless otherwise noted

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D$	Drain Current – Continuous ( $T_A=25^\circ C$ )	3.8	A
	Drain Current – Continuous ( $T_A=70^\circ C$ )	3.0	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	15	A
$P_D$	Power Dissipation ( $T_A=25^\circ C$ )	278	mW
	Power Dissipation – Derate above 25C	2.22	mW/ C
$T_{STG}$	Storage Temperature Range	-50 to 150	C
$T_J$	Operating Junction Temperature Range	-50 to 150	C

**Thermal Characteristics**

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	450	C/ W

**Off Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	$BV_{DSS}$ Temperature Coefficient	Reference to 25°C, $I_D=1mA$	---	0.018	---	V/°C
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=30V, V_{GS}=0V, T_J=25°C$	---	---	1	$\mu A$
		$V_{DS}=24V, V_{GS}=0V, T_J=125°C$	---	---	10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	$\pm 100$	nA

**On Characteristics**

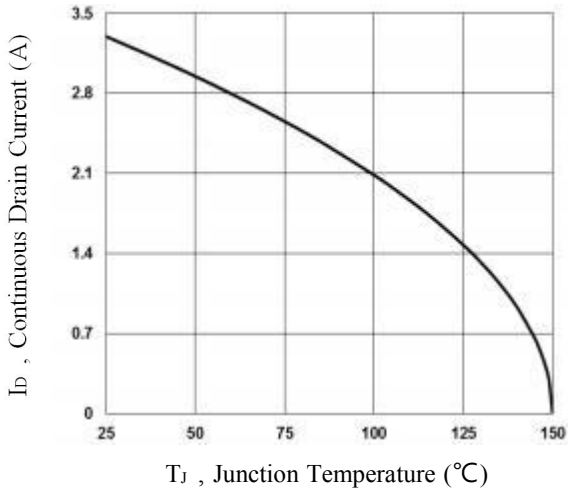
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=3A$	---	45	60	m $\Omega$
		$V_{GS}=4.5V, I_D=2A$	---	50	70	m $\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.5	1.0	2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-3.2	---	mV/°C
$g_{fs}$	Forward Transconductance	$V_{DS}=10V, I_D=2A$	---	2.3	---	S

**Dynamic and switching Characteristics**

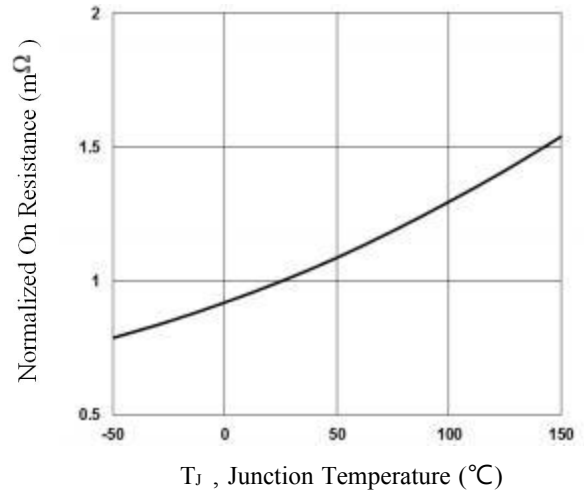
$Q_g$	Total Gate Charge <sup>2, 3</sup>	$V_{DS}=24V, V_{GS}=10V, I_D=1A$	---	3.1	---	nC
$Q_{gs}$	Gate-Source Charge <sup>2, 3</sup>		---	0.1	---	
$Q_{gd}$	Gate-Drain Charge <sup>2, 3</sup>		---	1.7	---	
$T_{d(on)}$	Turn-On Delay Time <sup>2, 3</sup>	$V_{DD}=24V, V_{GS}=10V, R_G=3.3\Omega, I_D=1A$	---	2.2	---	ns
$T_r$	Rise Time <sup>2, 3</sup>		---	6.9	---	
$T_{d(off)}$	Turn-Off Delay Time <sup>2, 3</sup>		---	15.2	---	
$T_f$	Fall Time <sup>2, 3</sup>		---	4.5	---	
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, F=1MHz$	---	245	---	pF
$C_{oss}$	Output Capacitance		---	40	---	
$C_{rss}$	Reverse Transfer Capacitance		---	78	---	
$Z_{ISM}$	Pulsed Source Current		---	---	7.6	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25°C$	---	---	1.3	V

## Note :

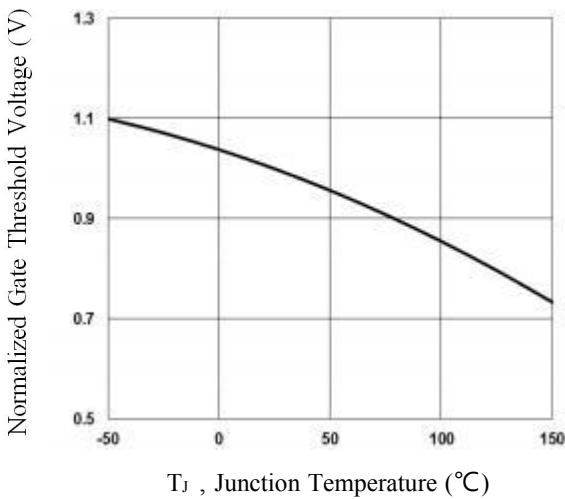
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.



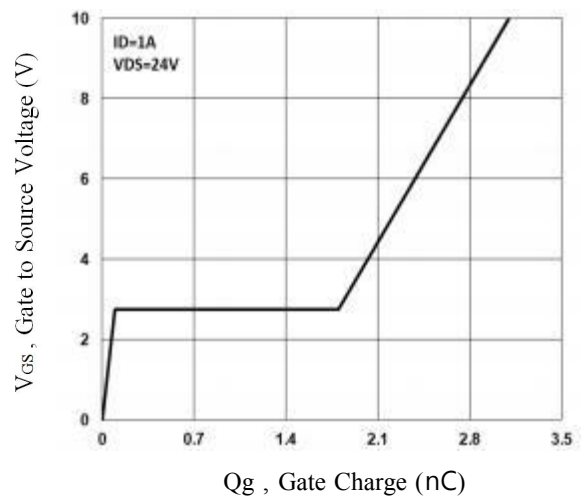
**Fig.1 Continuous Drain Current vs.  $T_J$**



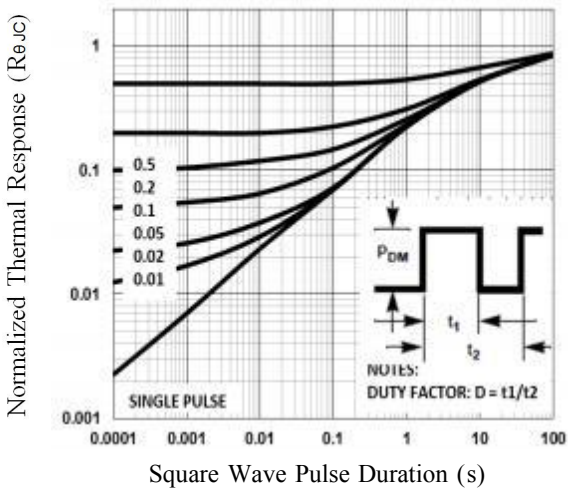
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$**



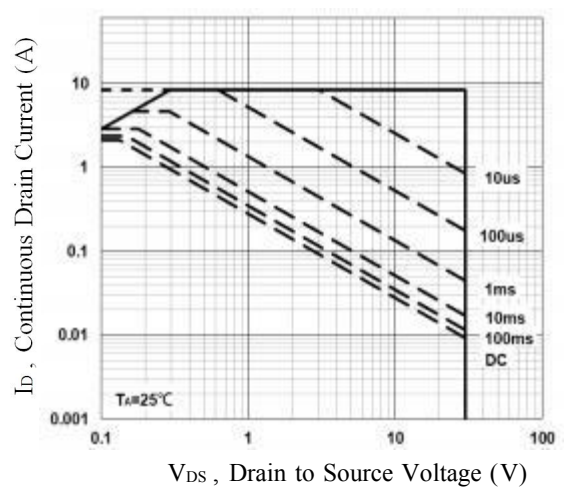
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



**Fig.4 Gate Charge Waveform**



**Fig.5 Normalized Transient Impedance**



**Fig.6 Maximum Safe Operation Area**



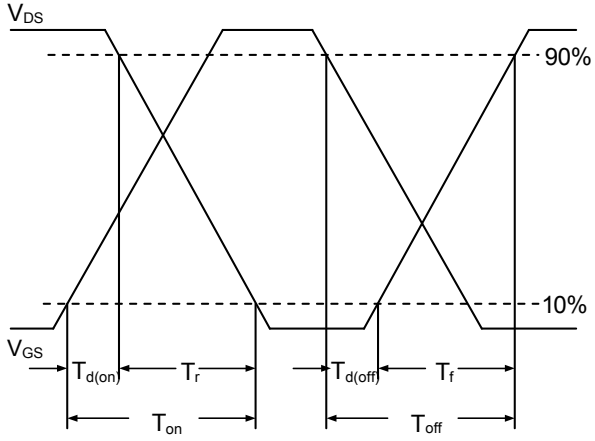


Fig. 7 Switching Time Waveform

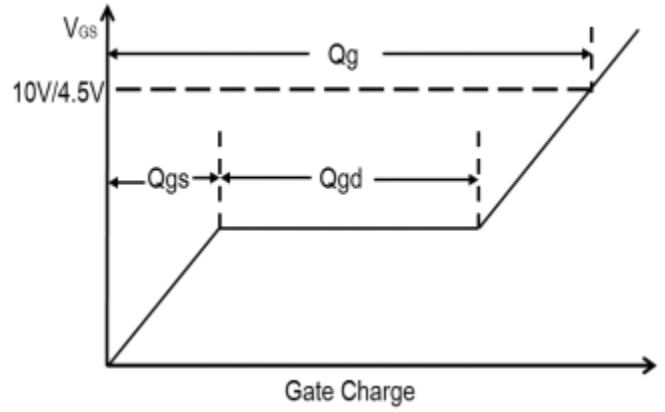
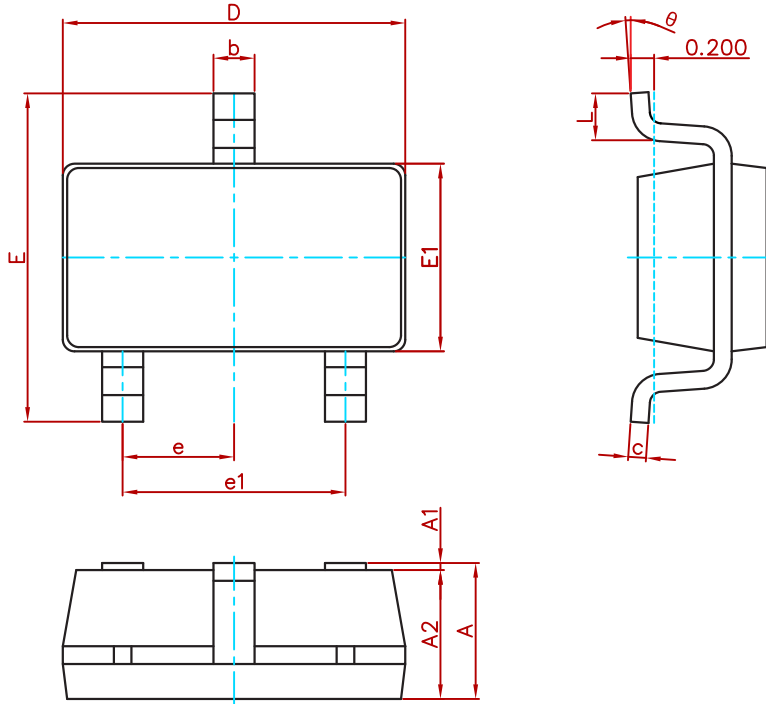


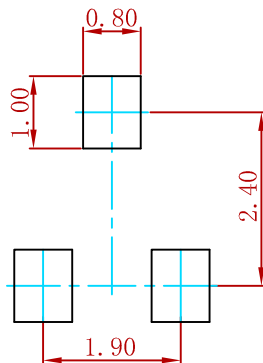
Fig. 8 Gate Charge Waveform

**PACKAGE MECHANICAL DATA**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

**Suggested Pad Layout**



Note:  
 1. Controlling dimension: in millimeters.  
 2. General tolerance: ± 0.05mm.  
 3. The pad layout is for reference purposes only.

**REEL SPECIFICATION**

P/N	PKG	QTY
AO3418	SOT-23-3L	3000

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