

MSKSEMI

SEMICONDUCTOR



ESD



TVS



TSS



MOV

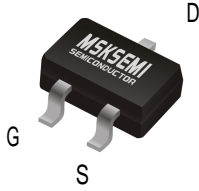


GDT

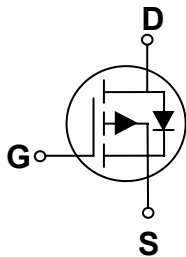


PLED

Product data sheet



SOT-23-3L



Features

- 30V, 3.0A, $R_{DS(ON)} = 75m\Omega @ V_{GS} = -10V$
- Fast switching
- Green Device Available
- Suit for -4 5V Gate Drive Applications

Applications

- Notebook
- Load Switch
- Battery Protection
- Hand-held Instruments

BVDSS	RDSON	ID
-30V	75mΩ	-3.0A

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	±20	V
I_D	Drain Current – Continuous ($T_A=25^\circ C$)	-3.0	A
	Drain Current – Continuous ($T_A=70^\circ C$)	-2.0	A
I_{DM}	Drain Current – Pulsed ¹	-12.0	A
P_D	Power Dissipation ($T_A=25^\circ C$)	1.56	W
	Power Dissipation – Derate above 25°C	0.012	W/°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	80	°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, $I_D=-1mA$	---	-0.02	---	V/°C
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-27V, V_{GS}=0V, T_J=25^\circ C$	---	---	-1	μA
		$V_{DS}=-24V, V_{GS}=0V, T_J=125^\circ C$	---	---	-10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-3A$	---	75	115	$m\Omega$
		$V_{GS}=-4.5V, I_D=-2A$	---	110	145	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.0	-1.6	-2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-2.8	---	mV/°C
g_{fs}	Forward Transconductance	$V_{DS}=-10V, I_D=-1A$	---	3	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2,3}	$V_{DS}=-24V, V_{GS}=-4.5V, I_D=-2A$	---	2.5	---	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	0.1	---	
Q_{gd}	Gate-Drain Charge ^{2,3}		---	1.8	---	
$T_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=-15V, V_{GS}=-10V, R_G=6\Omega$ $I_D=-1A$	---	6.1	---	ns
T_r	Rise Time ^{2,3}		---	8.7	---	
$T_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	33.2	---	
T_f	Fall Time ^{2,3}		---	3.7	---	
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, F=1MHz$	---	226	---	pF
C_{oss}	Output Capacitance		---	39	---	
C_{rss}	Reverse Transfer Capacitance		---	29	---	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	-3.0	A
I_{SM}	Pulsed Source Current		---	---	-6.0	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	---	---	-1.2	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.

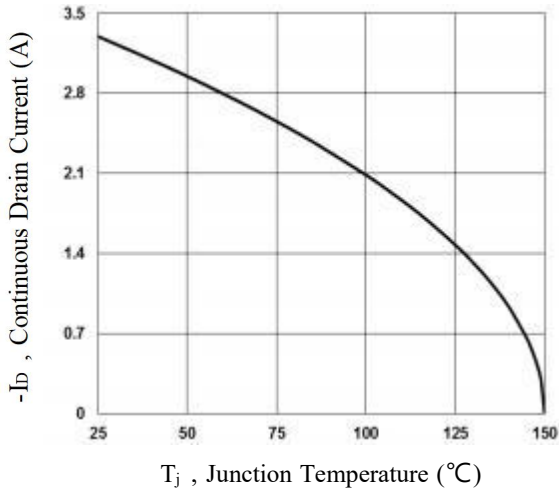


Fig. 1 Continuous Drain Current vs. Tc

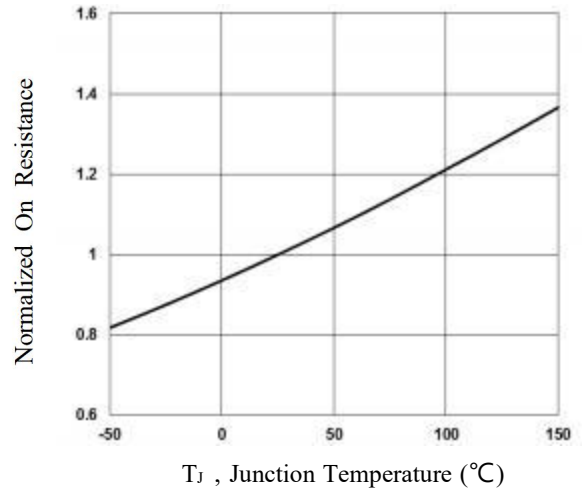


Fig. 2 Normalized RDS(on) vs. Tj

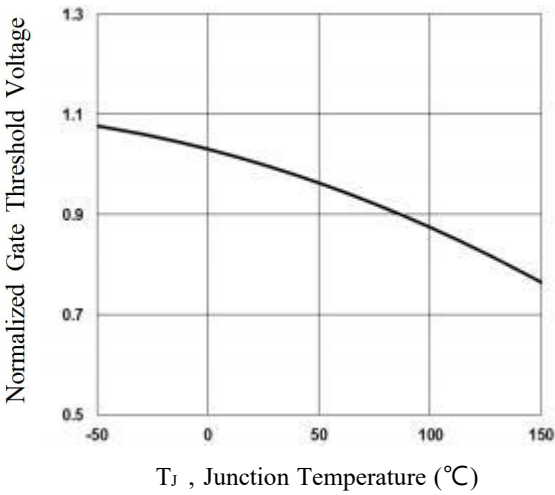


Fig. 3 Normalized V_{th} vs. Tj

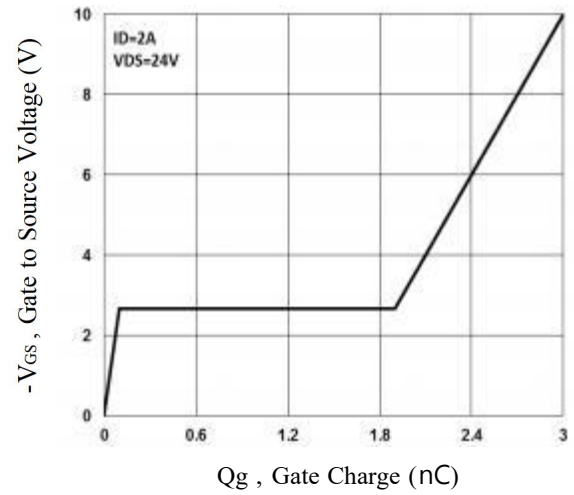


Fig. 4 Gate Charge Waveform

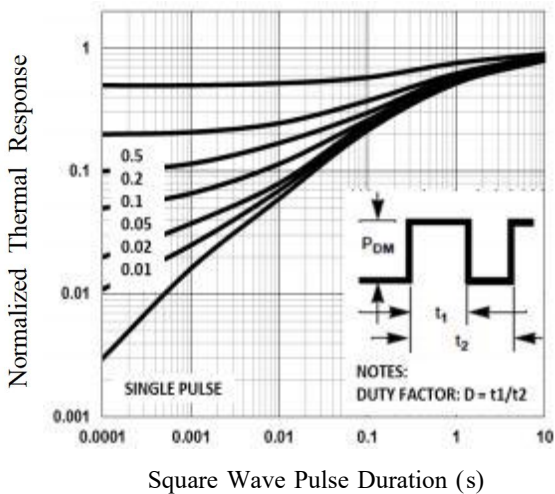


Fig. 5 Normalized Transient Impedance

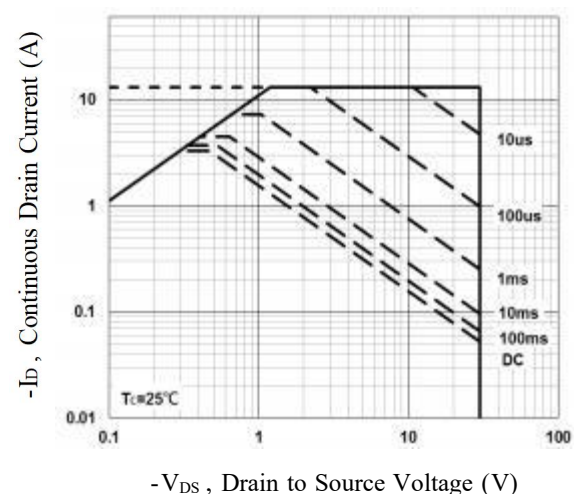


Fig. 6 Maximum Safe Operation Area

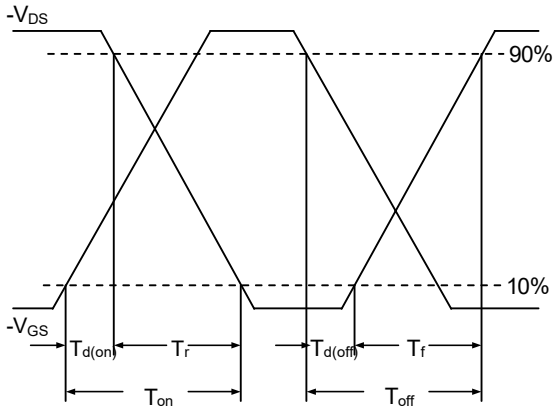


Fig. 7 Switching Time Waveform

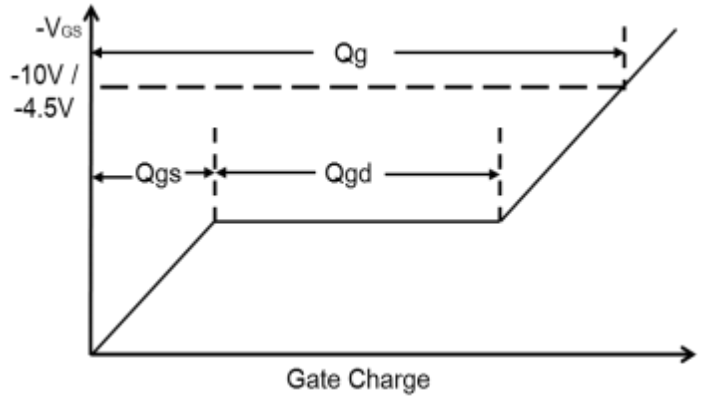
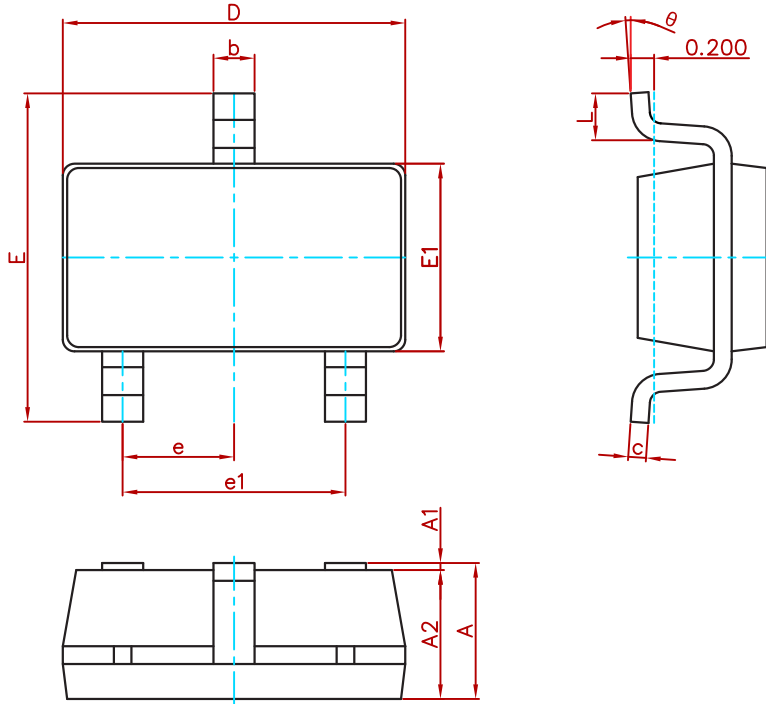


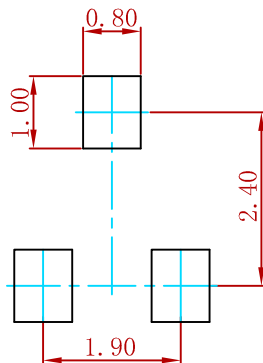
Fig. 8 Gate Charge Waveform

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
AO3409	SOT-23-3L	3000

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