

MSKSEMI

SEMICONDUCTOR



ESD



TVS



TSS



MOV

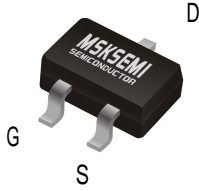


GDT

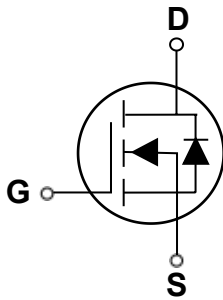


PLED

Product data sheet



SOT-23-3L



Features

- 55V, 2A, $R_{DS(ON)} = 120m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

- Motor Drive
- Power Tools
- LED Lighting

BVDSS	RDSON	ID
55V	120mΩ	2A

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	55	V
V_{GS}	Gate-Source Voltage	± 16	V
I_D	Drain Current – Continuous ($T_c=25^\circ C$)	2.0	A
	Drain Current – Continuous ($T_c=100^\circ C$)	1.7	A
I_{DM}	Drain Current – Pulsed ¹	12.8	A
P_D	Power Dissipation ($T_c=25^\circ C$)	1.56	W
	Power Dissipation – Derate above $25^\circ C$	0.012	W/ $^\circ C$
T_{STG}	Storage Temperature Range	-50 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-50 to 150	$^\circ C$

Thermal Characteristics

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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	55	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C, $I_D=1mA$	---	0.05	---	V/°C
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=55V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	μA
		$V_{DS}=48V, V_{GS}=0V, T_J=125^\circ C$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 16V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=2A$	---	120	150	m Ω
		$V_{GS}=4.5V, I_D=1.5A$	---	150	180	m Ω
$V_{GS(th)}$	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		---	-5	---	mV/°C
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=2A$	---	7	---	S

Dynamic and switching Characteristics

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

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	---	---	2.0	A
I_{SM}	Pulsed Source Current		---	---	4.0	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1.2	V
t_{rr}	Reverse Recovery Time ²	$V_{GS}=30V, I_S=1A, dI/dt=100A/\mu s$ $T_J=25^\circ C$	---	23.2	---	ns
Q_{rr}	Reverse Recovery Charge ²		---	14.3	---	nC

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.

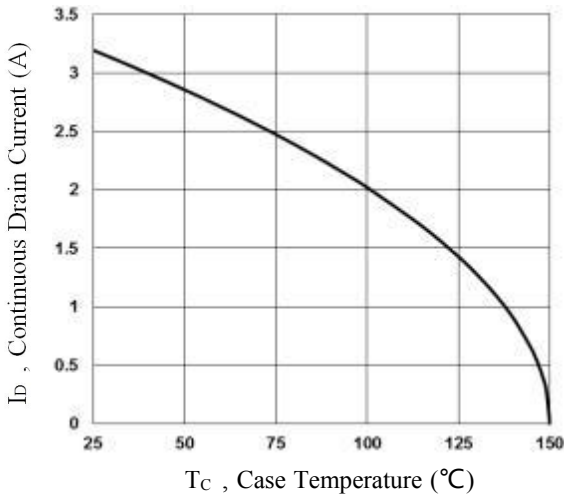


Fig.1 Continuous Drain Current vs. T_C

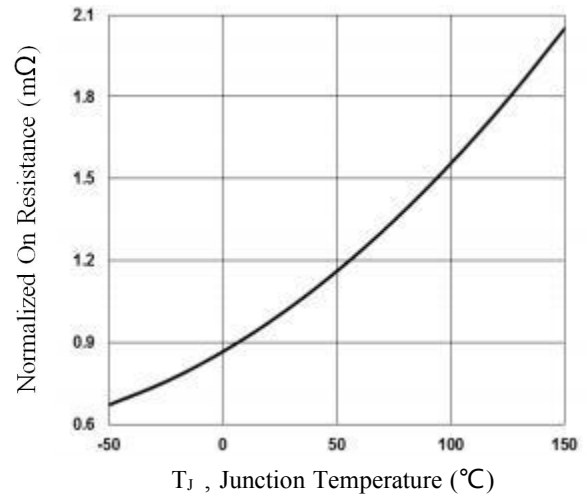


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

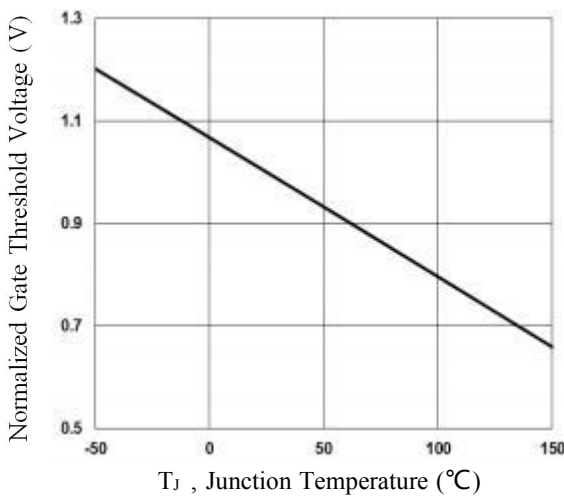


Fig.3 Normalized V_{th} vs. T_J

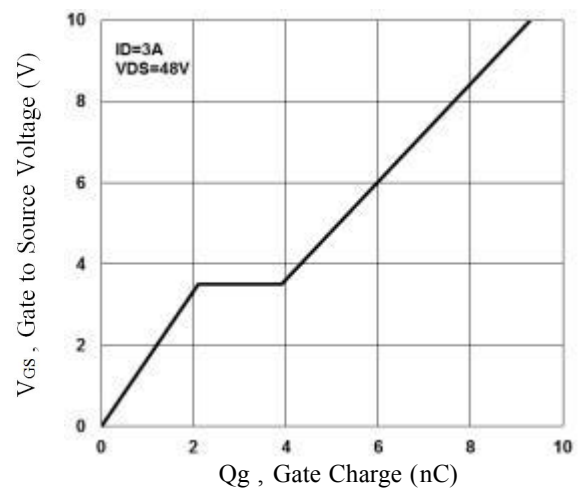


Fig.4 Gate Charge Waveform

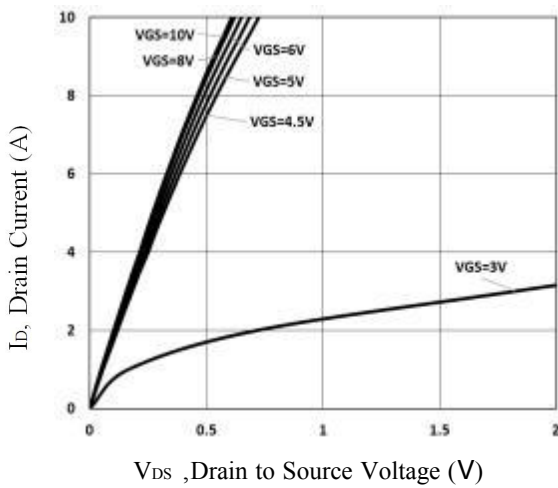


Fig.5 Typical Output Characteristics

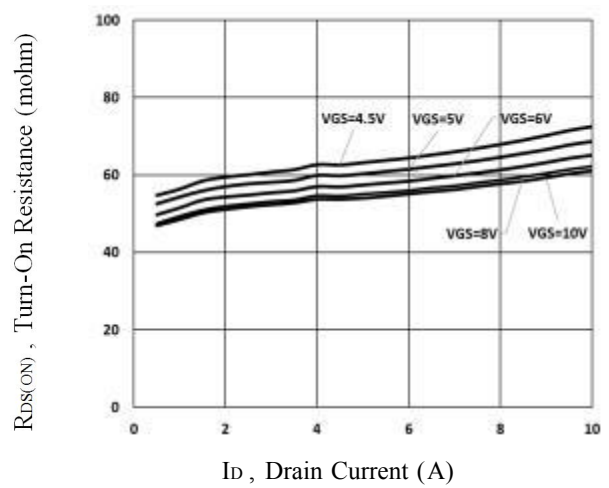


Fig.6 Turn-On Resistance vs. I_D

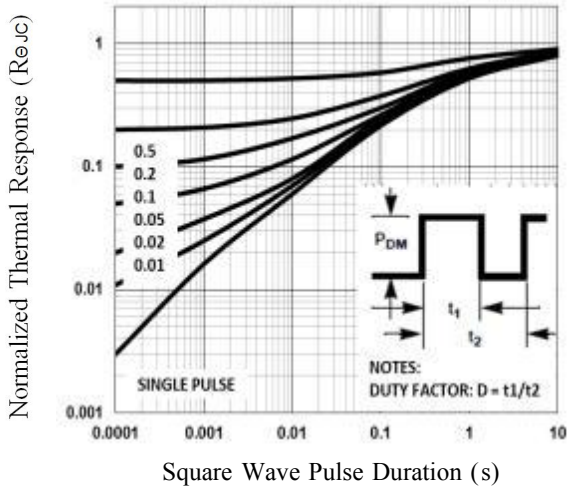


Fig.7 Normalized Transient Response

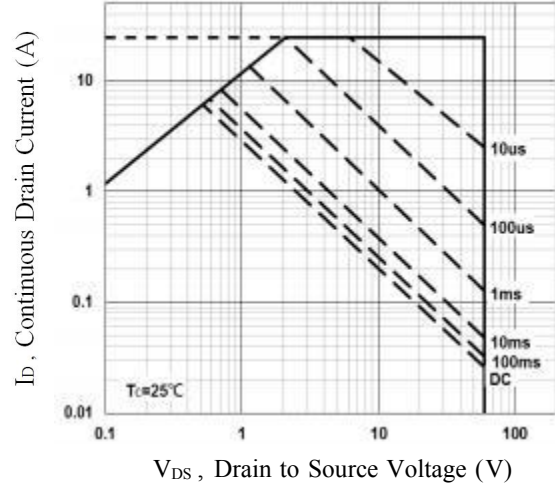


Fig.8 Maximum Safe Operation Area

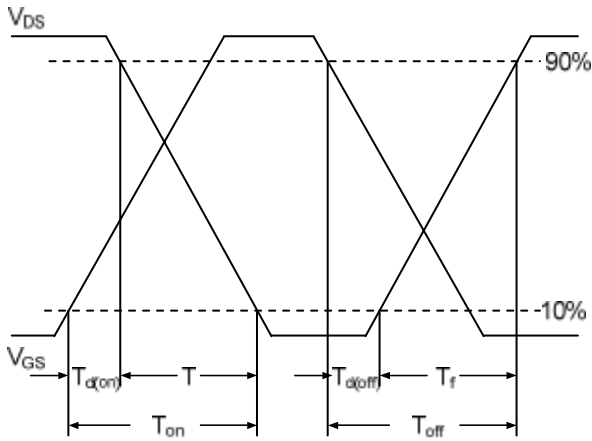
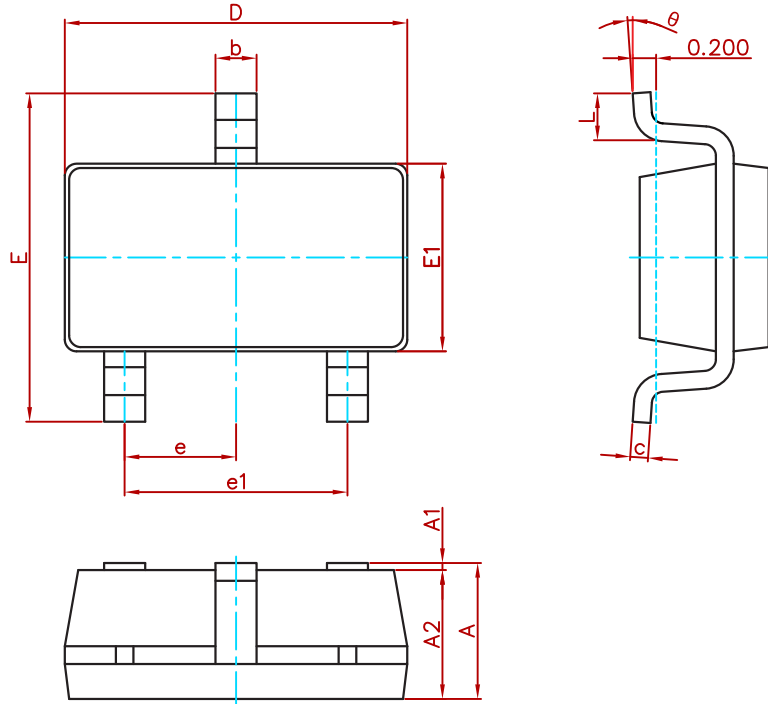


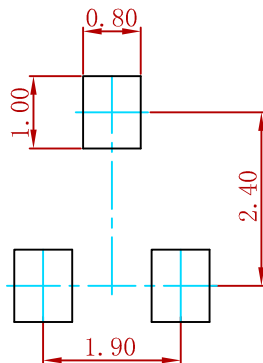
Fig.9 Switching Time Waveform

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
AO3422	SOT-23-3L	3000

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