

MSKSEMI

SEMICONDUCTOR



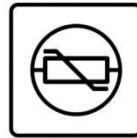
ESD



TVS



TSS



MOV

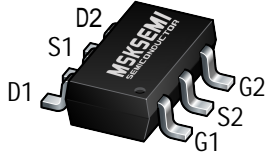


GDT

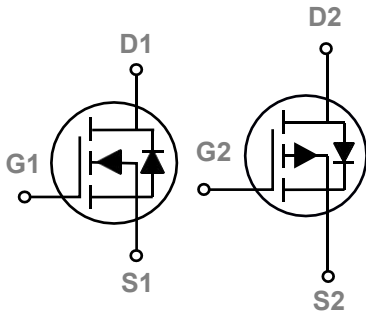


PLED

Product data sheet



SOT-23-6



Features

- Fast switching
- Green Device Available

Applications

- Notebook
- Load Switch
- Networking
- Hand-held Instruments

BVDSS	RDSON	ID
20V	60mΩ	3.0A
-20V	100mΩ	-2.0A

Absolute Maximum Ratings Tc=25°C unless otherwise noted

Symbol	Parameter	Rating		Units
V _{DS}	Drain-Source Voltage	20	-20	V
V _{GS}	Gate-Source Voltage	±12	±12	V
I _D	Drain Current – Continuous (T _C =25°C)	3.0	-2.0	A
	Drain Current – Continuous (T _C =100°C)	2.0	-1.5	A
I _{DM}	Drain Current – Pulsed ¹	12	-8.0	A
P _D	Power Dissipation (T _C =25°C)	1.25	1.25	W
	Power Dissipation – Derate above 25°C	0.01	0.01	W/°C
T _{STG}	Storage Temperature Range	-55 to 150	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to ambient	---	100	°C/W

N-CH Electrical Characteristics (T_J=25 °C, unless otherwise)
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.02	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =20V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =16V, V _{GS} =0V, T _J =125°C	---	---	10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±12V, V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =4.5V, I _D =3A	---	60	80	mΩ
		V _{GS} =2.5V, I _D =2A	---	80	110	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.3	0.7	1.3	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-2	---	mV/°C
gfs	Forward Transconductance	V _{DS} =10V, I _D =2A	---	4.4	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{2, 3}	V _{DS} =10V, V _{GS} =4.5V, I _D =3A	---	5.8	---	nC
Q _{gs}	Gate-Source Charge ^{2, 3}		---	0.6	---	
Q _{gd}	Gate-Drain Charge ^{2, 3}		---	1.5	---	
T _{d(on)}	Turn-On Delay Time ^{2, 3}	V _{DD} =10V, V _{GS} =4.5V, R _G =25Ω I _D =1A	---	2.9	---	ns
T _r	Rise Time ^{2, 3}		---	8.4	---	
T _{d(off)}	Turn-Off Delay Time ^{2, 3}		---	19.2	---	
T _f	Fall Time ^{2, 3}		---	5.6	---	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, F=1MHz	---	515	---	pF
C _{oss}	Output Capacitance		---	50	---	
C _{rss}	Reverse Transfer Capacitance		---	40	---	

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°C	---	---	1.2	V

Note :

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

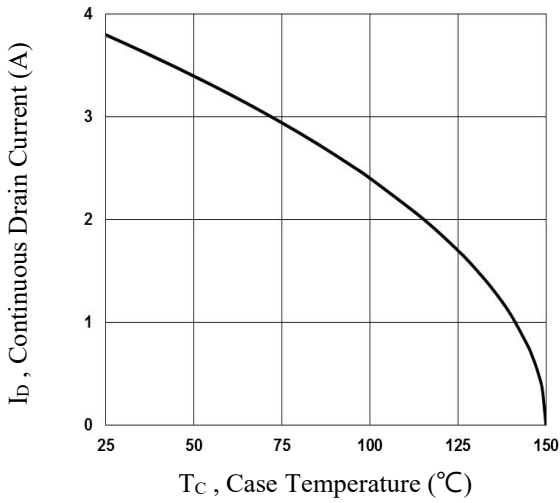


Fig.1 Continuous Drain Current vs. T_C

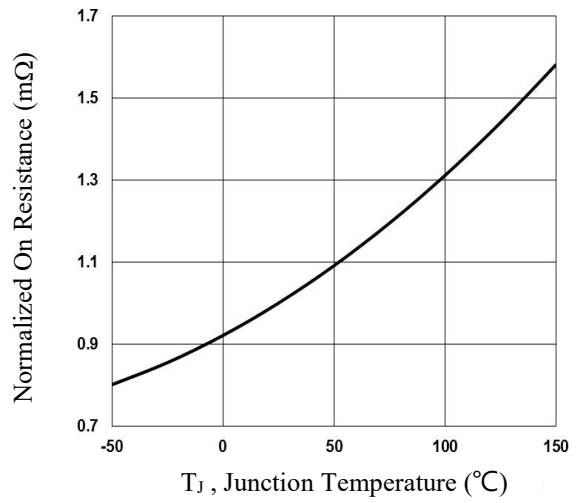


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

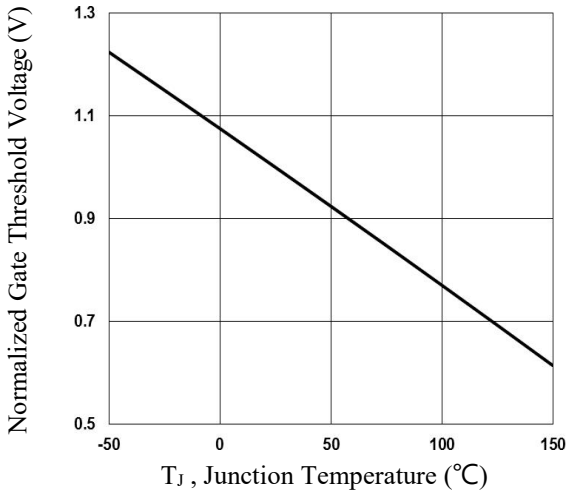


Fig.3 Normalized V_{th} vs. T_J

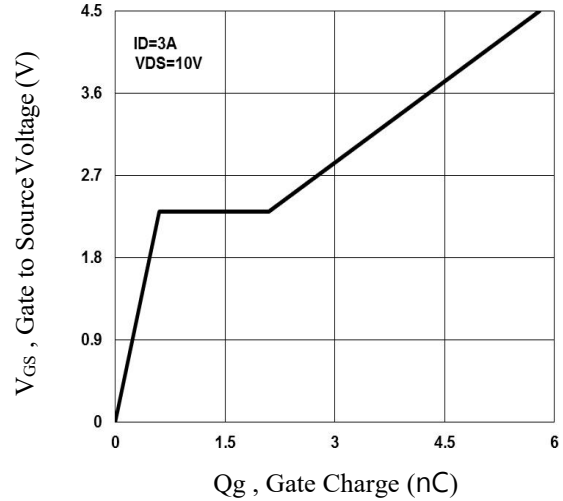


Fig.4 Gate Charge Waveform

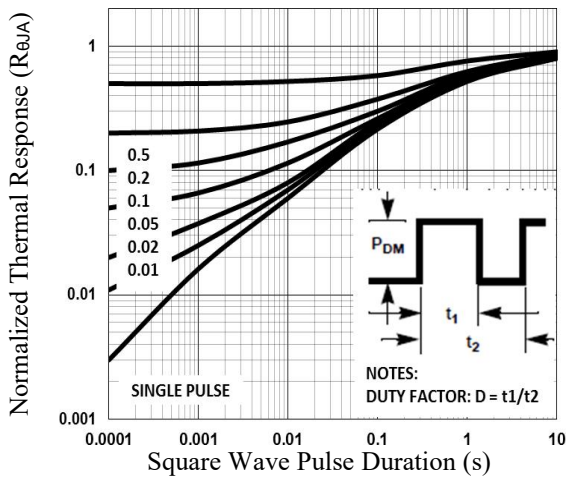


Fig.5 Normalized Transient Impedance

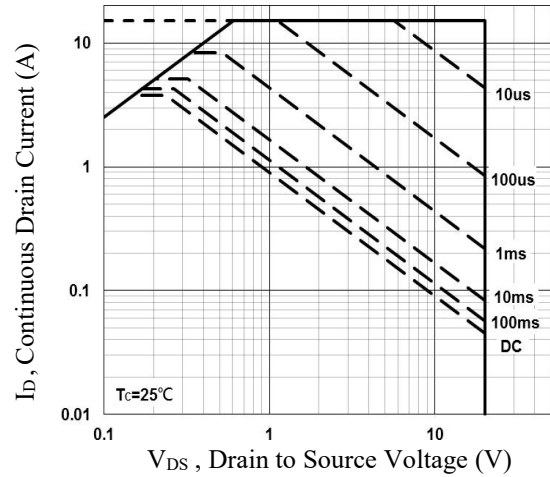


Fig.6 Maximum Safe Operation Area

P-CH Electrical Characteristics (T_J=25 °C, unless otherwise)
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-20	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA	---	-0.01	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-20V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-16V, V _{GS} =0V, T _J =125°C	---	---	-10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±12V, V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-3A	---	100	130	mΩ
		V _{GS} =-2.5V, I _D =-2A	---	130	160	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-0.3	-0.7	-1.3	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	3	---	mV/°C
gfs	Forward Transconductance	V _{DS} =-10V, I _D =-1A	---	2.2	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{2, 3}	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-2A	---	4.8	---	nC
Q _{gs}	Gate-Source Charge ^{2, 3}		---	0.5	---	
Q _{gd}	Gate-Drain Charge ^{2, 3}		---	1.9	---	
T _{d(on)}	Turn-On Delay Time ^{2, 3}	V _{DD} =-10V, V _{GS} =-4.5V, R _G =25Ω I _D =-1A	---	3.5	---	ns
T _r	Rise Time ^{2, 3}		---	12.6	---	
T _{d(off)}	Turn-Off Delay Time ^{2, 3}		---	32.6	---	
T _f	Fall Time ^{2, 3}		---	8.4	---	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, F=1MHz	---	350	---	pF
C _{oss}	Output Capacitance		---	65	---	
C _{rss}	Reverse Transfer Capacitance		---	50	---	

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°C	---	---	-1.2	V

ve Rating : Pulsed width limited by maximum junction temperature.

5. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
6. Essentially independent of operating temperature.

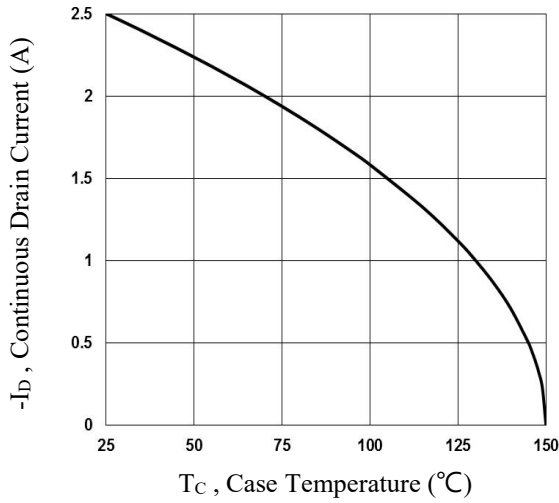


Fig.7 Continuous Drain Current vs. T_c

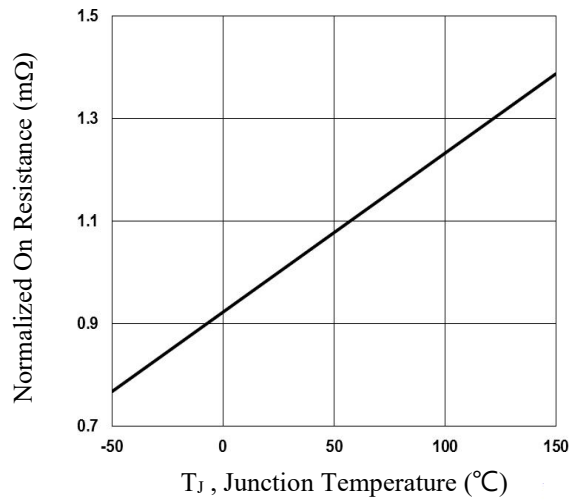


Fig.8 Normalized $R_{DS(on)}$ vs. T_j

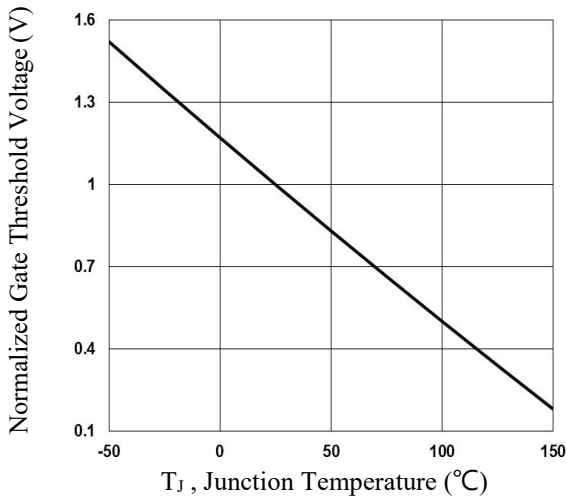


Fig.9 Normalized V_{th} vs. T_j

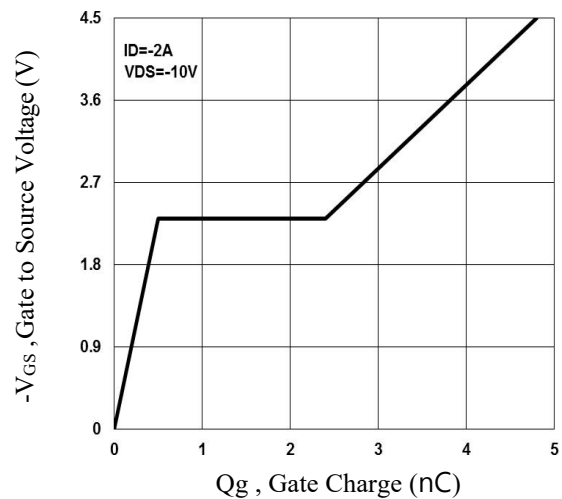


Fig.10 Gate Charge Waveform

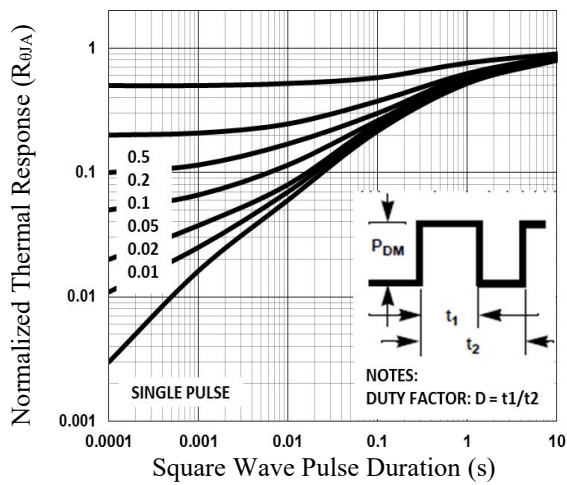


Fig.11 Normalized Transient Impedance

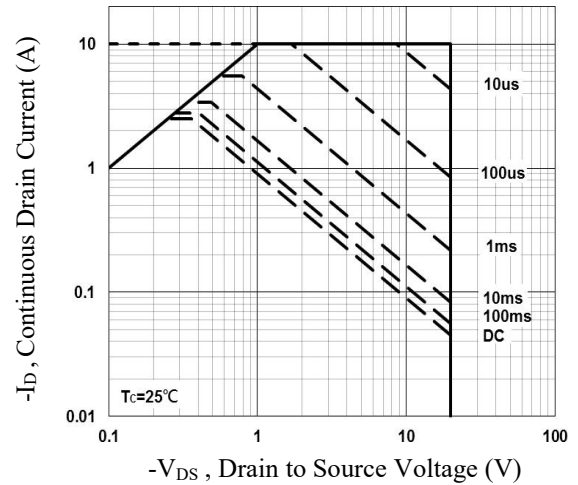
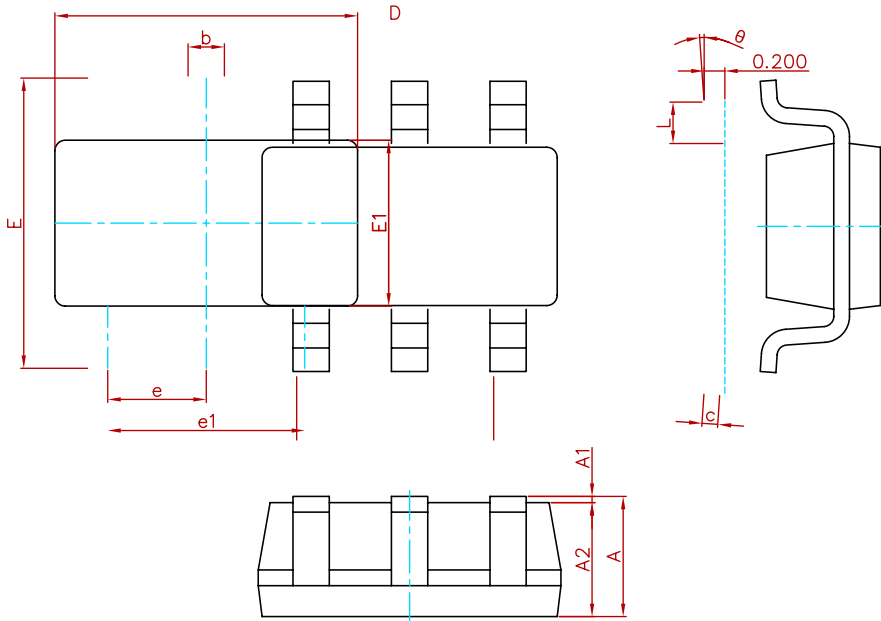


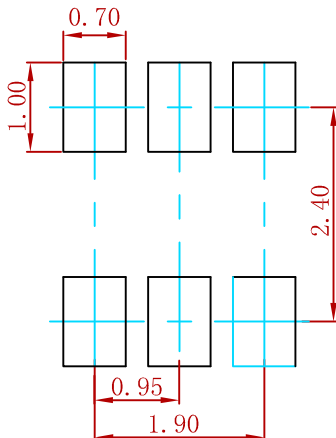
Fig.12 Maximum Safe Operation Area

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: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.

REEL SPECIFICATION

P/N	PKG	QTY
FDC6327C-MS	SOT-23-6	3000

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