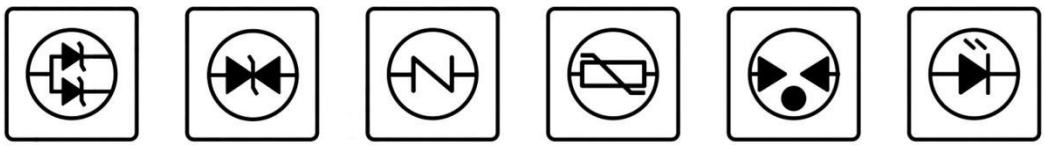
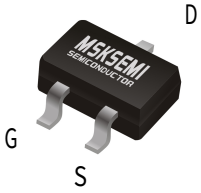
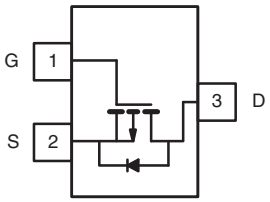
MSKSEMI
SEMICONDUCTOR



Product data sheet



SOT-23



Features

- *-20V,-5.5A, RDS(ON) =25mΩ@VGS = -4.5V*
- *Improved dv/dt capability*
- *Fast switching*
- *Green Device Available*

Applications

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

BVDSS	RDSON	ID
-12V	25mΩ	-5.5A

Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-12	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current – Continuous (T_C=25˚C)	-5.5	A
	Drain Current – Continuous (T_C=100˚C)	-3.5	A
I_{DM}	Drain Current – Pulsed[1]	-21.2	A
P_D	Power Dissipation (T_C=25˚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

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-12	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.02	---	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-20V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-16V , V_{GS}=0V , T_J=125℃	---	---	-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=-4A	---	25	35	mΩ
		V_{GS}=-2.5V , I_D=-3A	---	35	50	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-0.3	-0.6	-1	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	2	---	mV/℃
gfs	Forward Transconductance	V_{DS}=-12V , I_S=-3A	---	8.4	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=-10V , V_{GS}=-4.5V , I_D=-4A	---	16.1	---	nC
Q_{gs}	Gate-Source Charge[2,3]		---	1.8	---	
Q_{gd}	Gate-Drain Charge[2,3]		---	3.8	---	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=-10V , V_{GS}=-4.5V , R_G=25Ω I_D=-1A	---	8.2	---	nS
T_r	Rise Time[2,3]		---	30	---	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	71.1	---	
T_f	Fall Time[2,3]		---	19.8	---	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , F=1MHz	---	1440	---	pF
C_{oss}	Output Capacitance		---	155	---	
C_{rss}	Reverse Transfer Capacitance		---	115	---	

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	---	---	-5.5	A
I_{SM}	Pulsed Source Current		---	---	-21.2	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-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.

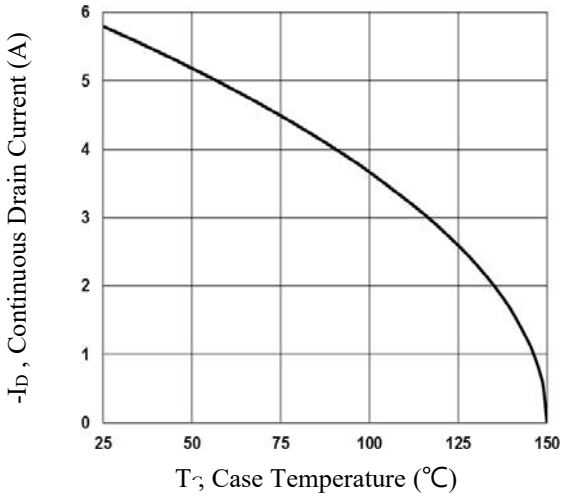


Fig.1 Continuous Drain Current vs. T_C

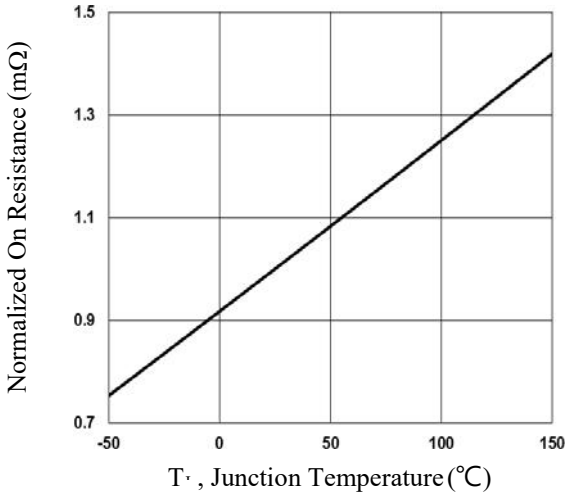


Fig.2 Normalized RDSON vs. T_J

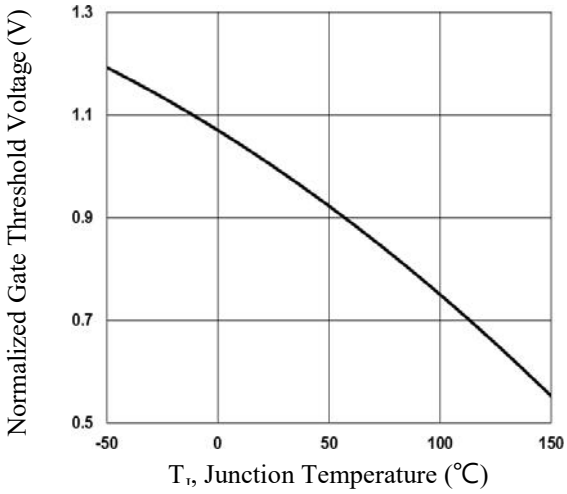


Fig.3 Normalized V_{th} vs. T_J

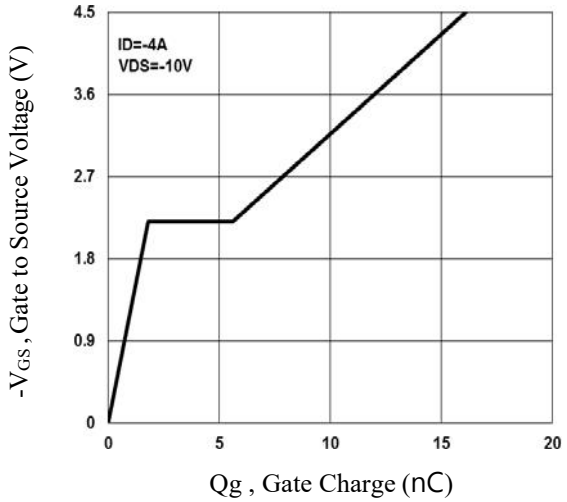


Fig.4 Gate Charge Waveform

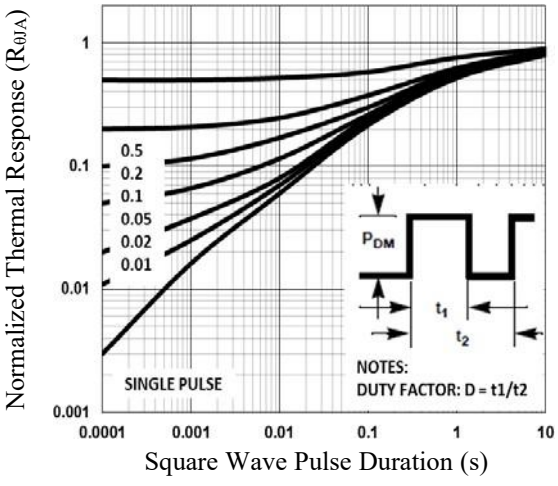


Fig.5 Normalized Transient Impedance

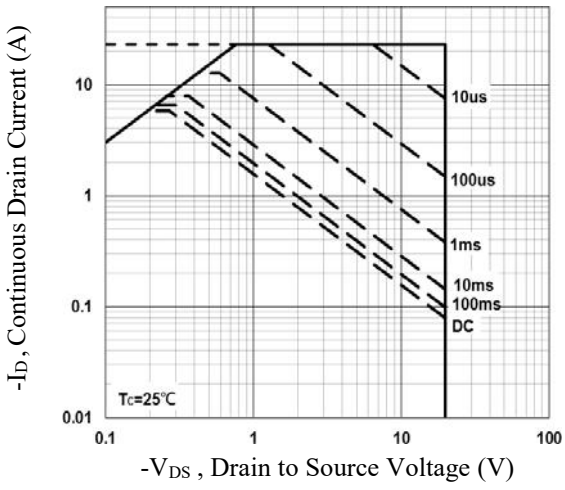
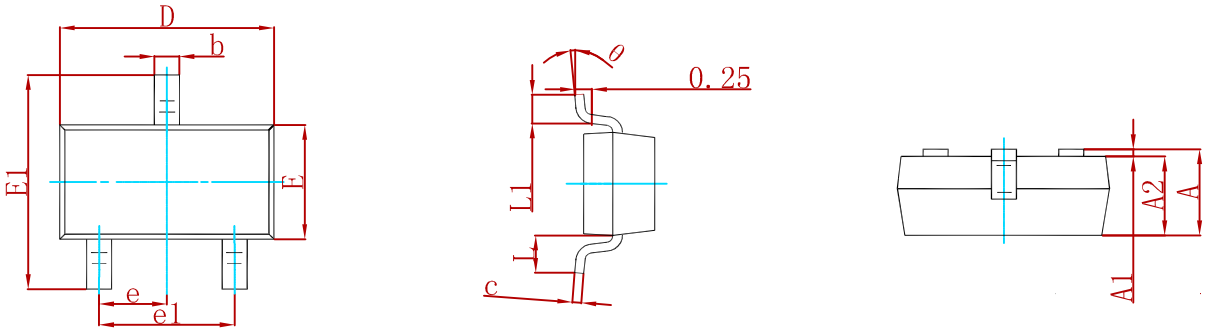


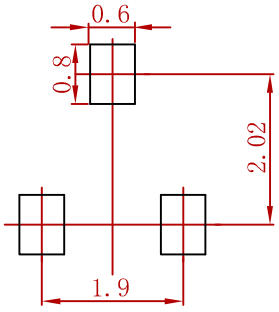
Fig.6 Maximum Safe Operation Area

PACKAGE MECHANICAL DATA



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
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	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
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
SI2333DDS-T1-GE3-MS	SOT-23	3000

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