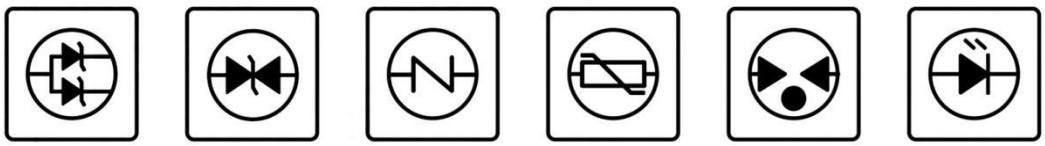
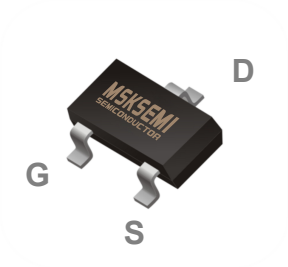
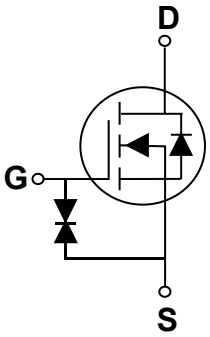
MSKSEMI
SEMICONDUCTOR



Product data sheet



SOT-23



Features

- *55V,0.3A, RDS(ON) =1.2Ω@VGS=10V*
- *Improved dv/dt capability*
- *Fast switching*
- *Green Device Available*
- *G-S ESD Protection Diode Embedded*
- *ESD protected up to 2KV*

BVDSS	RDSON	ID
55V	1.2R	0.3A

Applications

- *Motor Drive*
- *Power Tools*
- *LED Lighting*

Absolute Maximum Ratings T **Tc=25℃ unless otherwise noted**

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	55	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_A=25℃)	0.3	A
	Drain Current – Continuous (T_A=70℃)	0.16	A
I_{DM}	Drain Current – Pulsed[1]	0.8	A
P_D	Power Dissipation (T_A=25℃)	0.35	W
	Power Dissipation – Derate above 25℃	0.003	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	357	℃/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	55	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=55V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=40V , V_{GS}=0V , T_J=125℃	---	---	100	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±20V , V_{DS}=0V	---	---	±10	uA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=0.2A	---	1.2	1.5	Ω
		V_{GS}=4.5V , I_D=0.1A	---	1.5	2.5	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	0.8	1.1	1.5	V
gfs	Forward Transconductance	V_{DS}=10V , I_D=0.2A	---	0.5	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=30V , V_{GS}=10V , I_D=0.2A	---	3.7	---	nC
Q_{gs}	Gate-Source Charge[2,3]		---	0.9	---	
Q_{gd}	Gate-Drain Charge[2,3]		---	0.4	---	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=30V , V_{GS}=10V , R_G=6Ω , I_D=0.2A	---	3	---	ns
T_r	Rise Time[2,3]		---	5	---	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	14	---	
T_f	Fall Time[2,3]		---	9	---	
C_{iss}	Input Capacitance	V_{DS}=30V , V_{GS}=0V , F=1MHz	---	25.5	---	pF
C_{oss}	Output Capacitance		---	17	---	
C_{rss}	Reverse Transfer Capacitance		---	7.8	---	

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	---	---	0.3	A
I_{SM}	Pulsed Source Current		---	---	0.6	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=0.2A , T_J=25℃	---	---	1.4	V
t_{rr}	Reverse Recovery Time	V_R=50V, I_S=0.2A	---	3.4	---	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs, T_J=25℃	---	0.7	---	nC

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.

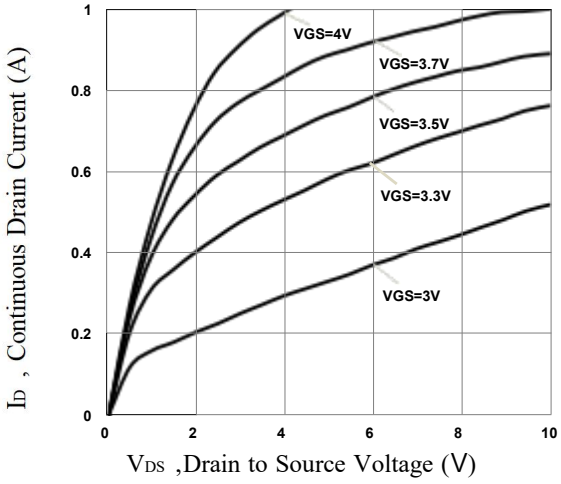


Fig. 1 Typical Output Characteristics

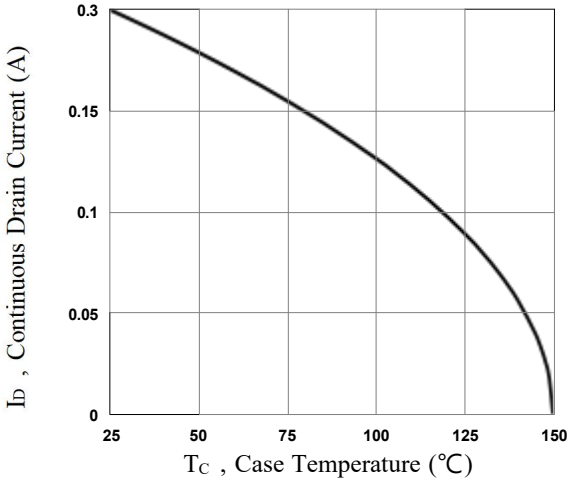


Fig. 2 Continuous Drain Current vs. TC

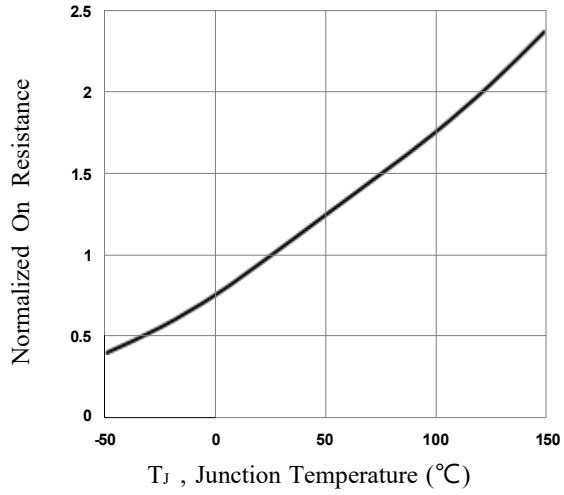


Fig. 3 Normalized RDSON vs. TJ

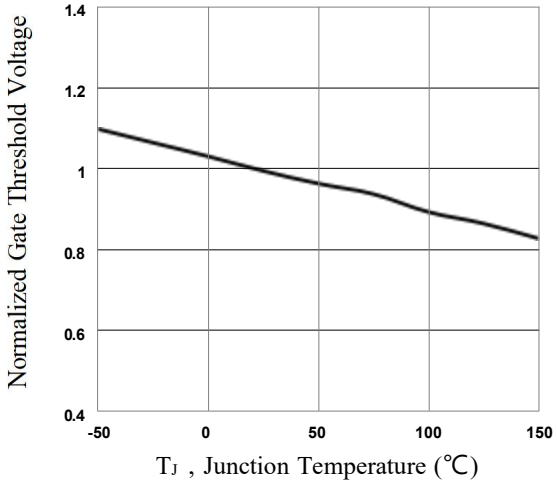


Fig. 4 Normalized Vth vs. TJ

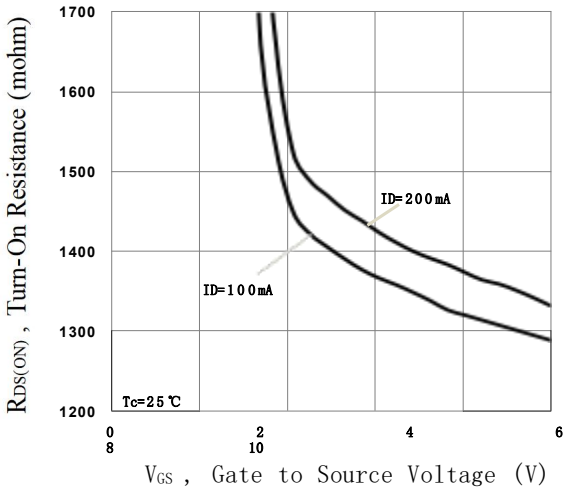


Fig. 5 Turn-On Resistance vs. VGS

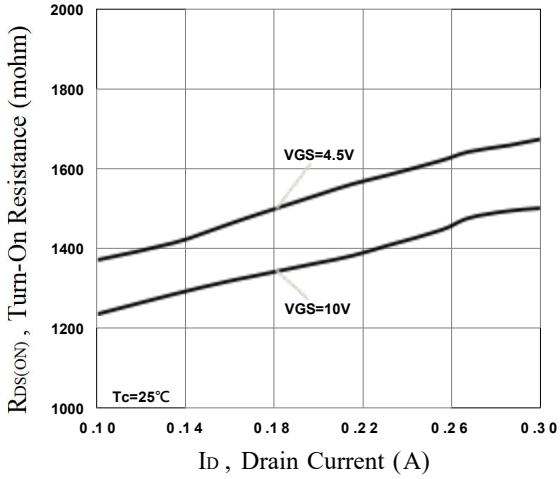


Fig. 6 Turn-On Resistance vs. ID

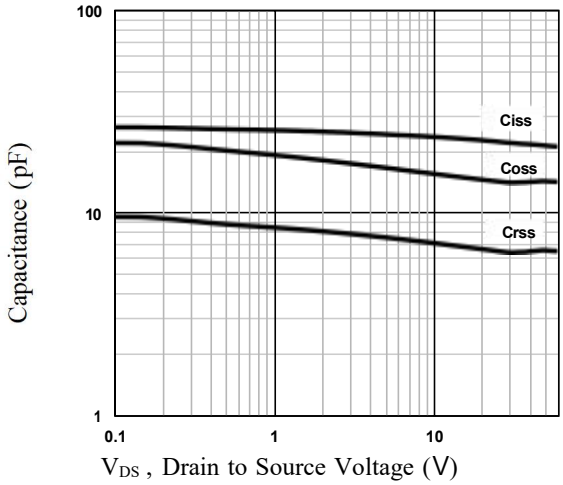


Fig. 7 Capacitance Characteristics

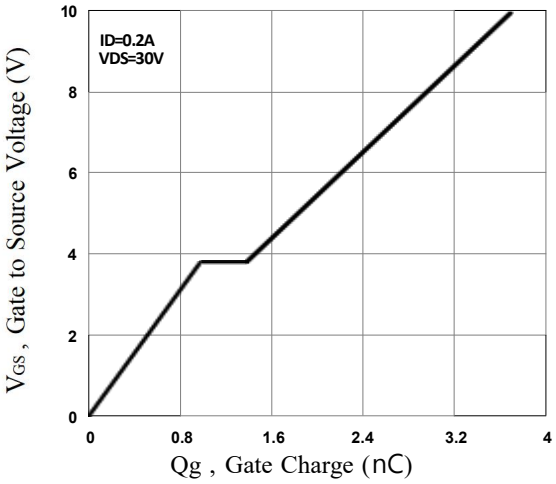


Fig. 8 Gate Charge Characteristics

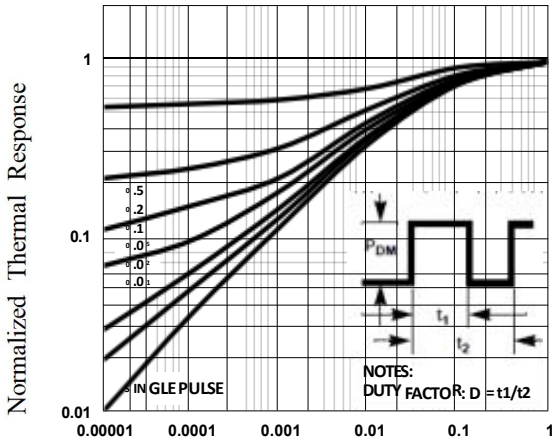


Fig. 9 Normalized Transient

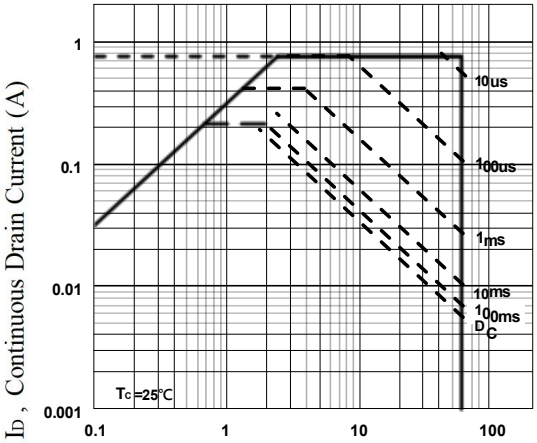
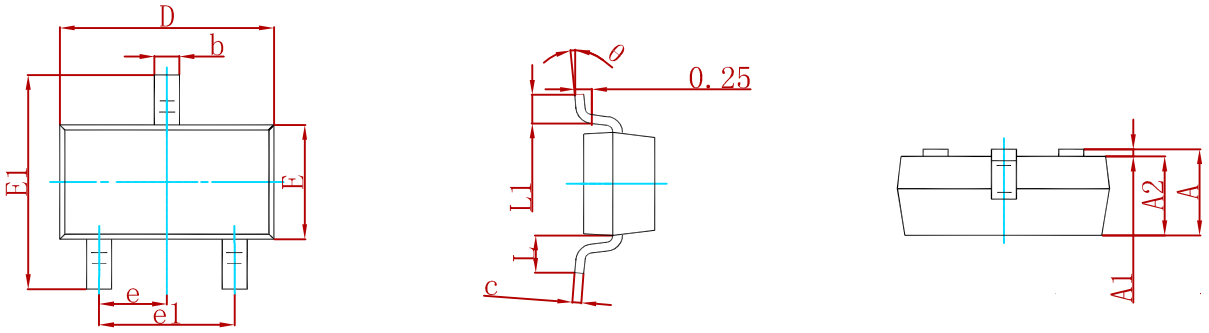


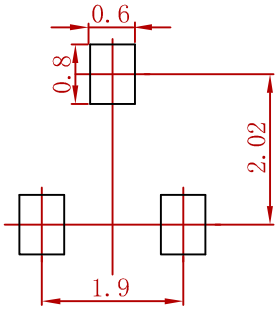
Fig. 10 Maximum Safe Operation Area

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
BSS138K	SOT-23	3000

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