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## **BSS138BKW**

**Product specification**

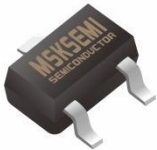
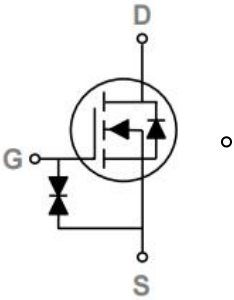
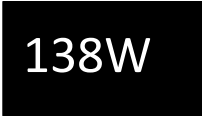
**General Features**

- 55V,300mA, RDS(ON) =1.2Ω@VGS = 10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

**Application**

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

**Reference News**

PACKAGE OUTLINE	Pin Configuration	Marking
		
<p>SOT-323</p>		

**Absolute Maximum Ratings Tc=25°C unless otherwise noted**

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	55	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Drain Current – Continuous (T <sub>A</sub> =25°C)	300	mA
	Drain Current – Continuous (T <sub>A</sub> =70°C)	240	mA
I <sub>DM</sub>	Drain Current – Pulsed <sup>1</sup>	1.2	A
P <sub>D</sub>	Power Dissipation (T <sub>A</sub> =25°C)	313	mW
	Power Dissipation – Derate above 25°C	2.5	mW/°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

**Thermal Characteristics**

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction to ambient	---	450	°C/W

**Electrical Characteristics (T<sub>J</sub>=25°C , unless otherwise noted)**
**Off Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =250μA	55	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C , I <sub>D</sub> =1mA	---	0.05	---	V/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =48V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C	---	---	1	μA
		V <sub>DS</sub> =55V , V <sub>GS</sub> =0V , T <sub>J</sub> =85°C	---	---	400	A
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V	---	---	±6	μA

**On Characteristics**

R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V , I <sub>D</sub> =0.3A	---	1.2	1.5	Ω
		V <sub>GS</sub> =4.5V , I <sub>D</sub> =0.2A	---	1.5	2.3	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	0.8	1.1	1.6	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	3	---	mV/°C

**On Characteristics**

R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V , I <sub>D</sub> =0.3A	---	1.2	1.5	Ω
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ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	3	---	mV/°C

**Dynamic and switching Characteristics**

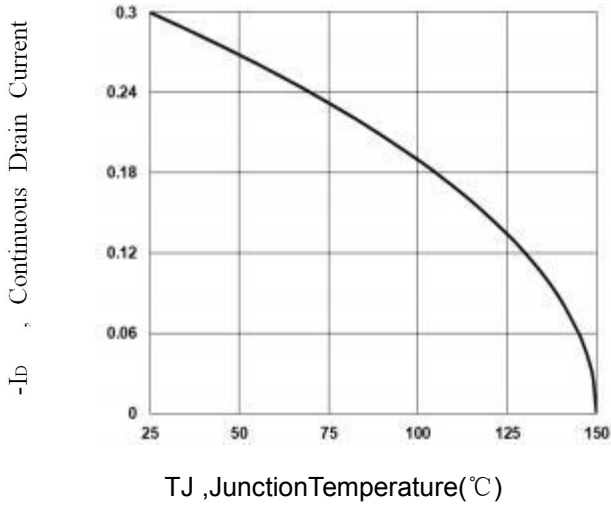
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =30V , V <sub>GS</sub> =0V , F=1MHz	---	23	---	pF
C <sub>oss</sub>	Output Capacitance		---	16	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	10	---	

**Drain-Source Diode Characteristics and Maximum Ratings**

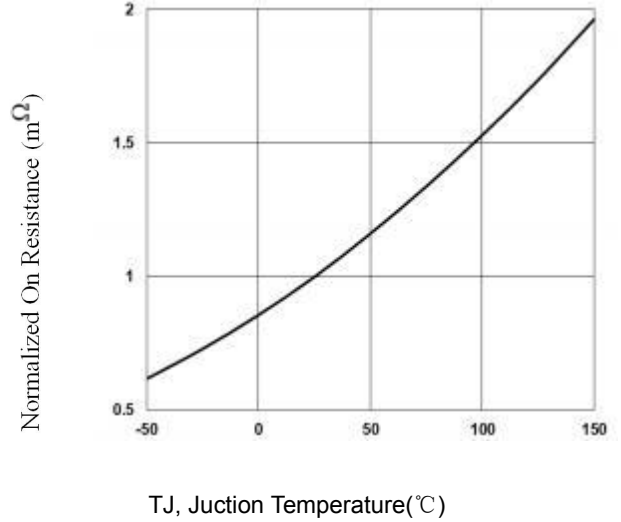
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	300	mA
I <sub>SM</sub>	Pulsed Source Current		---	---	600	mA
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V , I <sub>S</sub> =0.3A , T <sub>J</sub> =25°C	---	---	1.4	V

Note :

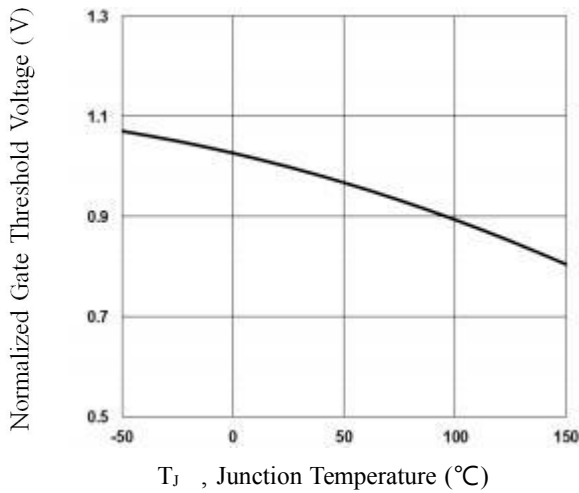
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2% .
3. Essentially independent of operating temperature.



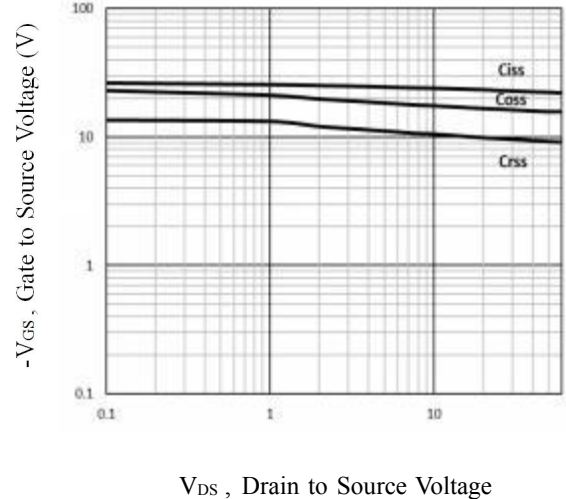
**Fig.1 Continuous Drain Current vs.  $T_C$**



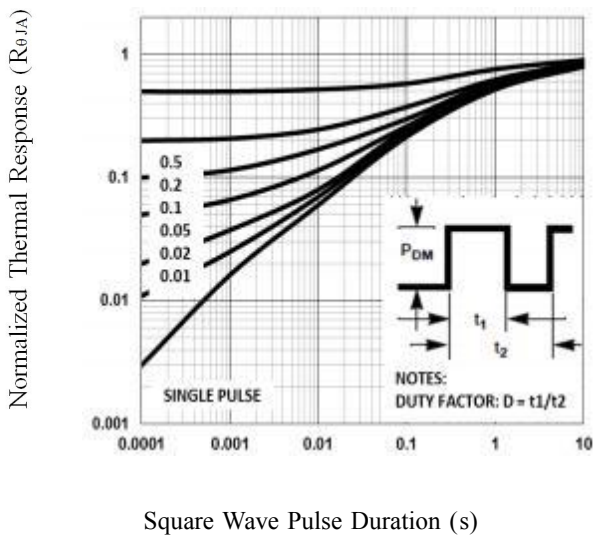
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$**



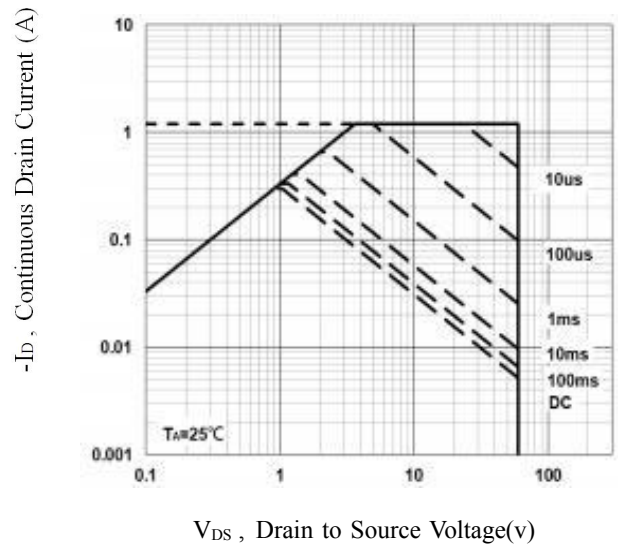
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



**Fig.4 Capacitance Characteristics**



**Fig.5 Normalized Transient Response**

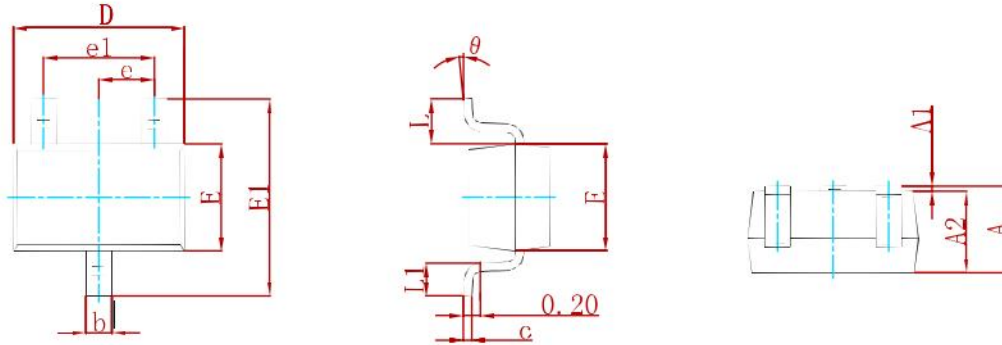


**Fig.6 Maximum Safe Operation Area**



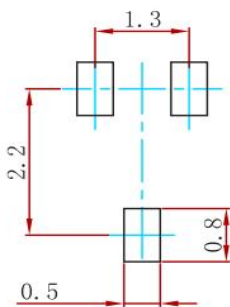


**PACKAGE MECHANICAL DATA**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018

**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
BSS138PW	SOT-323	3000



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