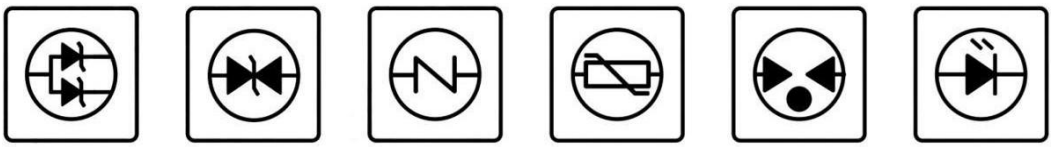
MSKSEMI 美森科
SEMICONDUCTOR



BSS138PS

Product specification

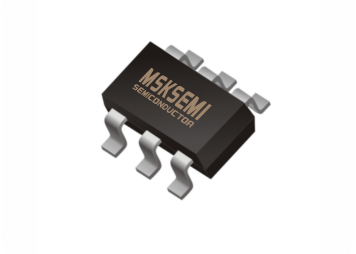
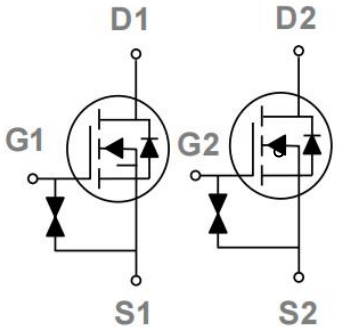
General Features

- 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

Application

- Motor Drive
- Power Tools
- LED Lighting

Reference News

PACKAGE OUTLINE	Pin Configuration	Marking
 SOT-363		K38*** ***83K

Absolute Maximum Ratings (TA=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℃)	0.2	A
I_{DM}	Drain Current – Pulsed[1]	0.9	A
P_D	Power Dissipation (T_A=25℃)	0.28	W
	Power Dissipation – Derate above 25℃	0.002	W/ ℃
T_{STG}	Storage Temperature Range	-50 to 150	℃
T_J	Operating Junction Temperature Range	-50 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	450	℃/ W

Electrical Characteristics (TJ=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
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.04	---	V/ ℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=55V , V_{GS}=0V , T_J=25℃	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±20V , V_{DS}=0V	---	---	±10	uA

On Characteristics

RDS(ON)	Static Drain-Source On-Resistance	VGS=10V , ID=0.3A	---	1.2	1.5	Ω
		VGS=4.5V , ID=0.2A	---	1.3	2.2	Ω
VGS(th)	Gate Threshold Voltage	VGS=VDS , ID =250uA	0.8	1.1	1.6	V
△VGS(th)	VGS(th) Temperature Coefficient		---	-4	---	mV/ C
gfs	Forward Transconductance	VDS=10V , ID=0.1A	---	0.24	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=55V , V_{GS}=10V , I_D=0.2A	---	1.1	---	nC
Q_{gs}	Gate-Source Charge[2,3]		---	0.1	---	
Q_{gd}	Gate-Drain Charge[2,3]		---	0.23	---	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=55V , 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}=10V , V_{GS}=0V , F=1MHz	---	30.6	---	pF
C_{oss}	Output Capacitance		---	5.5	---	
C_{rss}	Reverse Transfer Capacitance		---	4	---	

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=1A , T_J=25C	---	---	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.

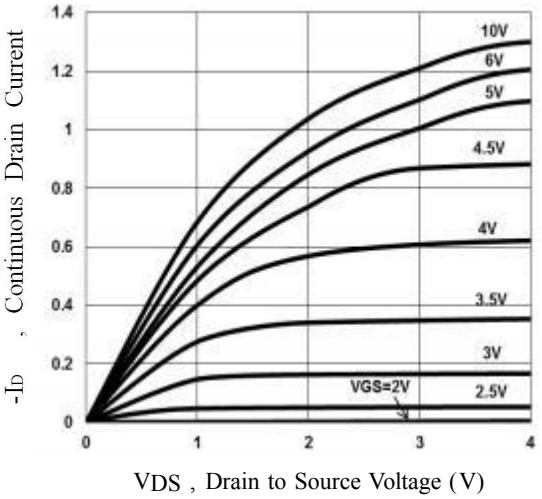


Fig. 1 Output Characteristics

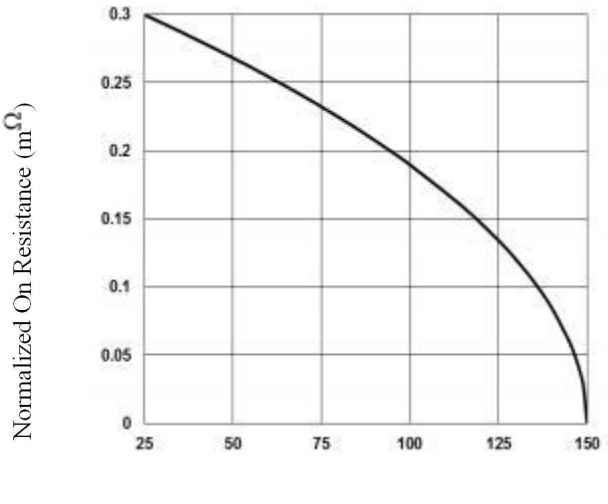


Fig. 2 Continuous Drain Current vs. TJ

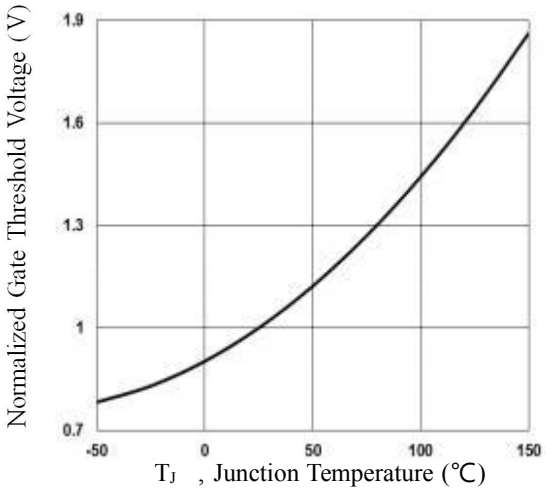


Fig. 3 Normalized RDSON vs. TJ

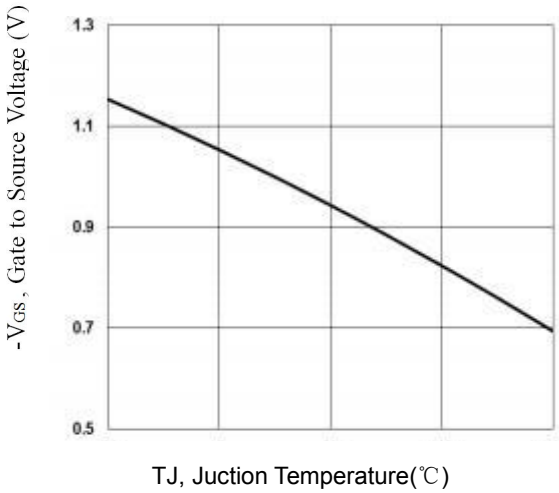


Fig. 4 Normalized Vth vs. TJ

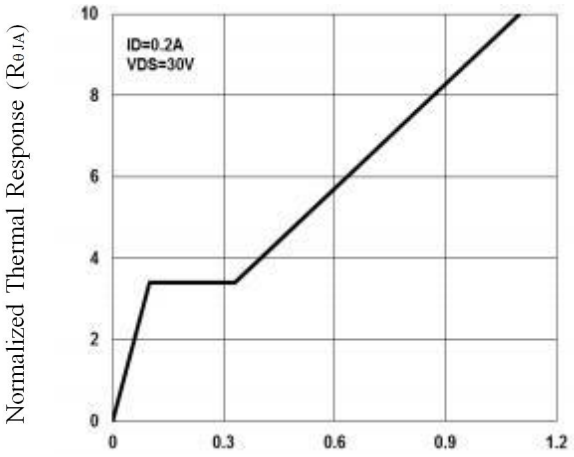


Fig. 5 Gate Charge Waveform

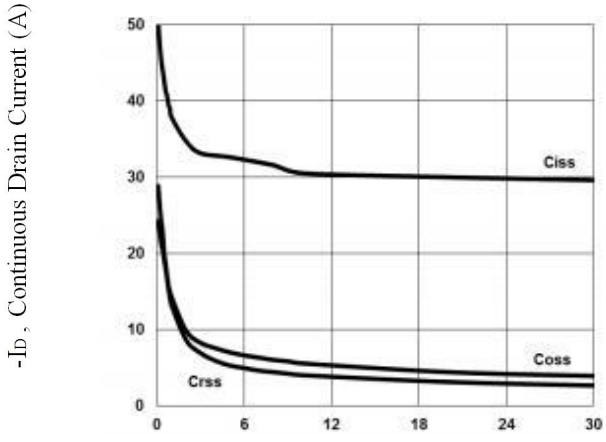


Fig. 6 Capacitance Characteristics

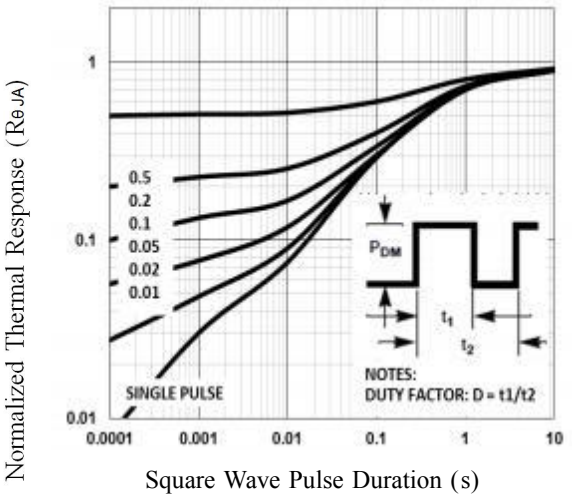


Fig. 7 Normalized Transient Impedance

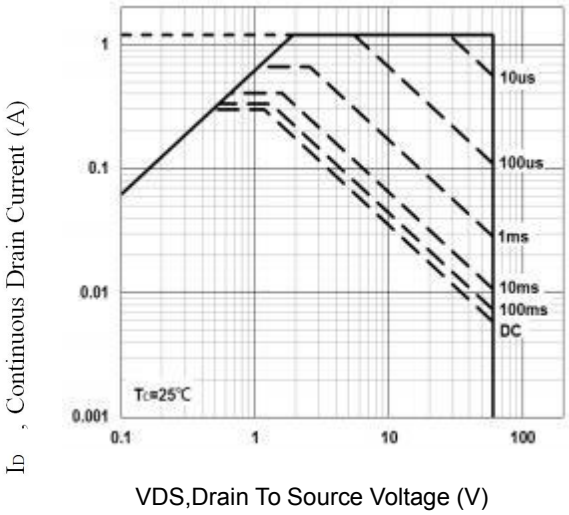


Fig. 8 Maximum Safe Operation Area

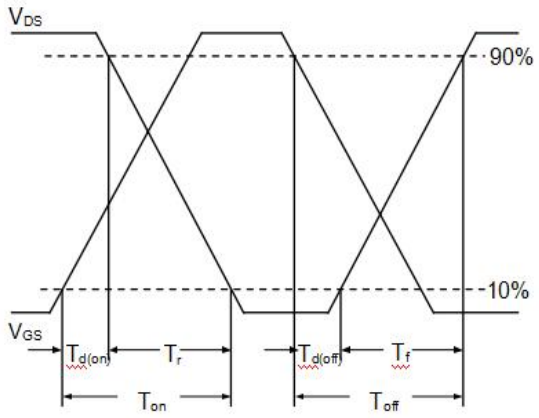
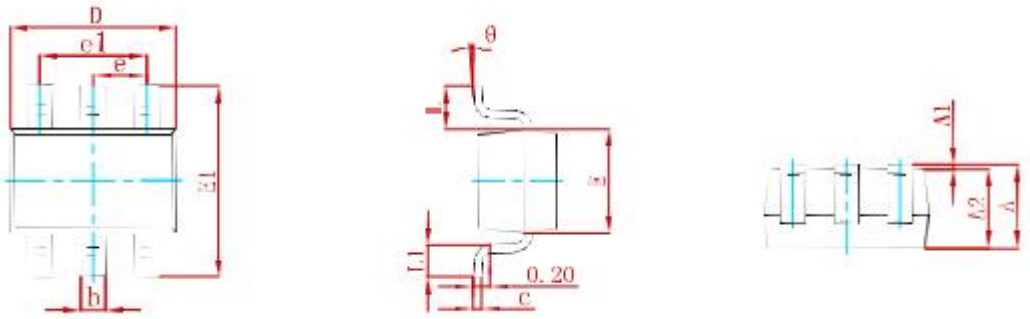


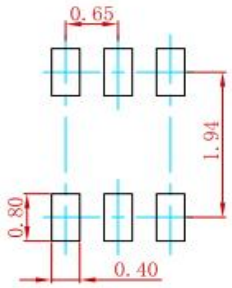
Fig. 9 Switching Time Waveform

PACKAGE MECHANICAL DATA



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	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	0.150	0.350	0.006	0.014
c	0.100	0.150	0.004	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.400	0.085	0.094
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
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
BSS138PS	SOT-363	3000

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