

### Features

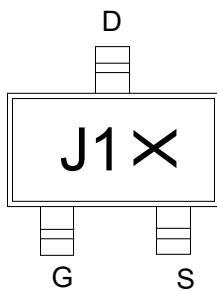
- Low on-resistance
- Fast switching speed
- Easily designed drive circuits
- Easy to parallel Portable equipment

### Application

- Interfacing, Switching

### Product Summary

$V_{DS}$	$R_{DS(ON)}$ TYP	$I_D$
50V	1.5Ω@10V	0.2A
	1.9Ω@4.5V	

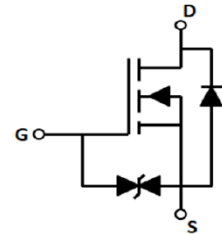


J1 : Device code  
 X : Code

Marking and pin assignment



SOT-23 top view



Schematic diagram



Halogen-Free

### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating	Unit
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### Common Ratings (TC=25°C Unless Otherwise Noted)

$V_{DS}$	Drain-Source Breakdown Voltage	50	V
$V_{GS}$	Gate-Source Voltage	±20	V
$T_J$	Maximum Junction Temperature	150	°C
$T_{STG}$	Storage Temperature Range	-50 to 155	°C
$I_S$	Diode Continuous Forward Current	$T_c=25^\circ\text{C}$ 0.2	A

### Mounted on Large Heat Sink

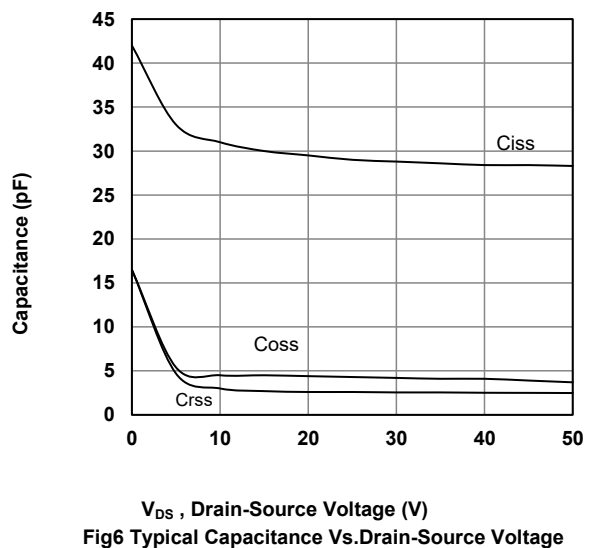
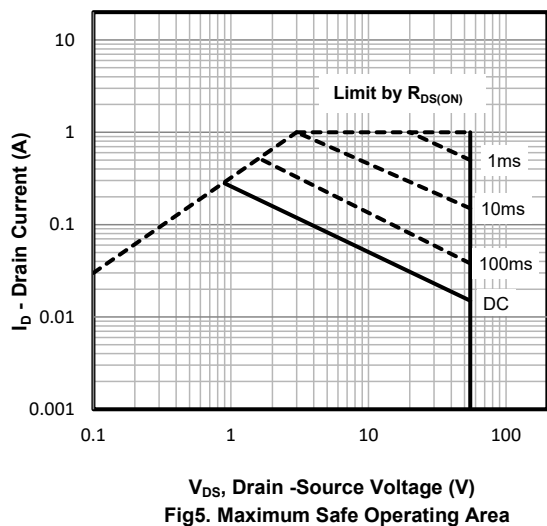
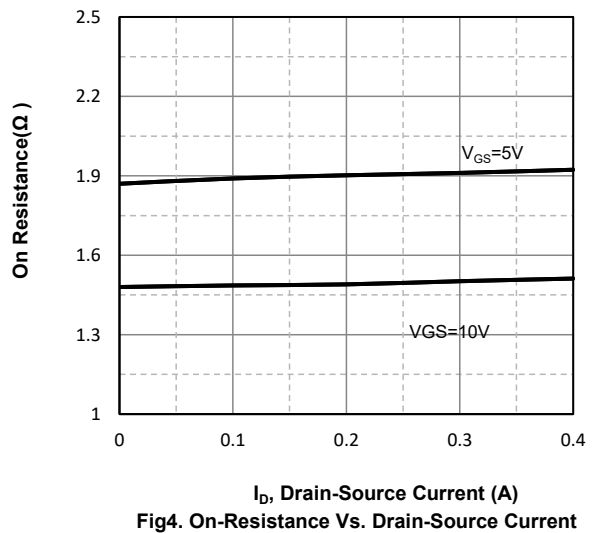
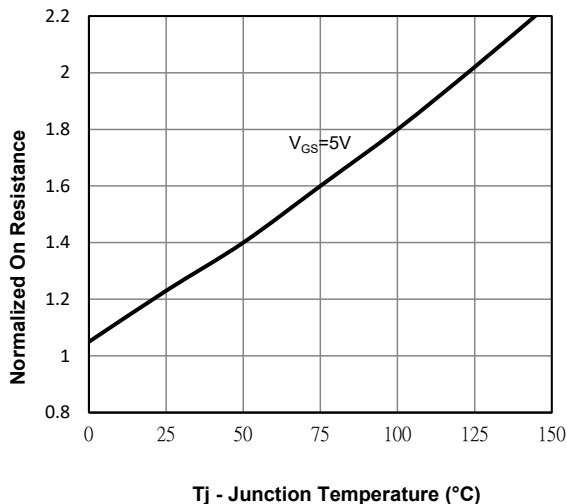
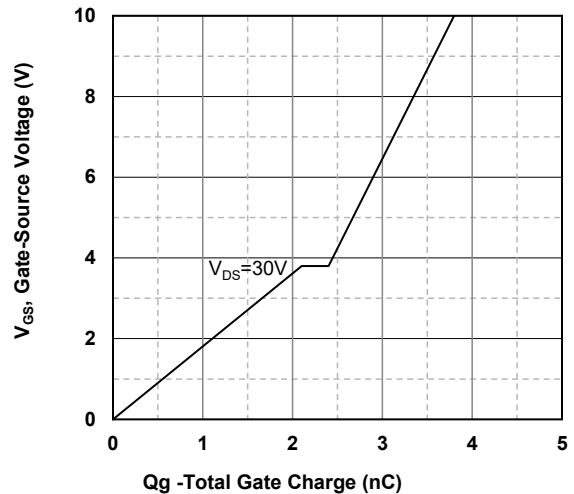
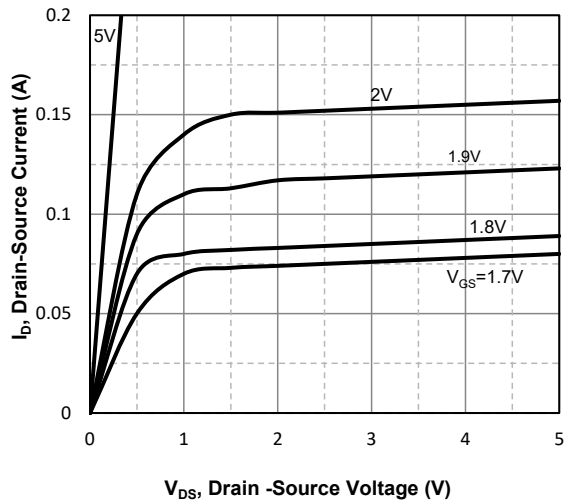
$I_{DM}$	Pulse Drain Current Tested	$T_c=25^\circ\text{C}$ 0.9	A
$I_D$	Continuous Drain Current	$T_c=25^\circ\text{C}$ 0.2	A
$P_D$	Maximum Power Dissipation	$T_c=25^\circ\text{C}$ 0.2	W
ESD	Gate-Source ESD Rating (HBM, Method 3015)	2500	V

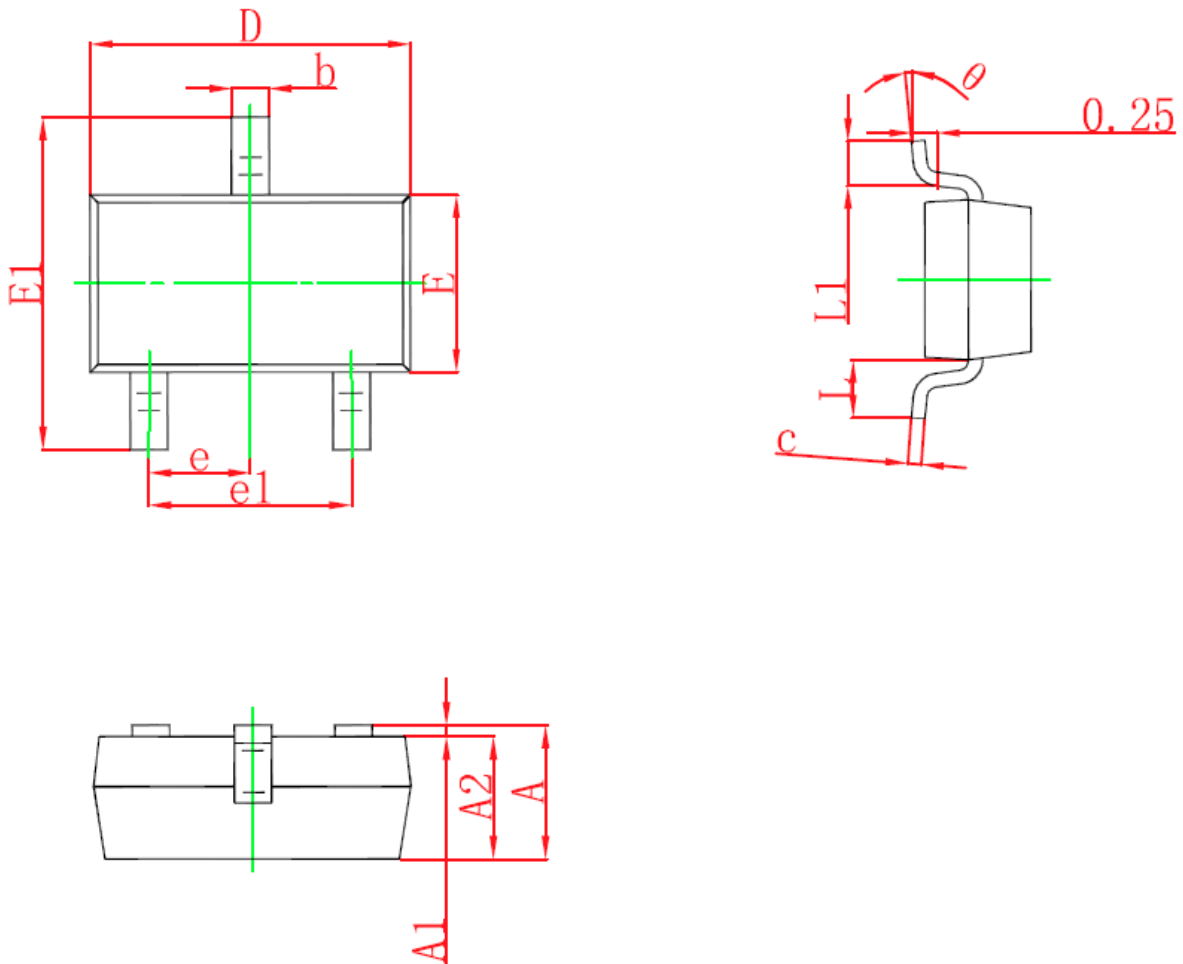
### Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
BSS138K	SOT-23	J1	3,000	45,000	180,000	7" reel

Electrical Characteristics (T <sub>J</sub> =25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T <sub>J</sub> = 25°C (unless otherwise stated)						
BV <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	50	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V	--	--	1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±10	μA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.8	1.1	1.5	V
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =0.3A	--	1.5	5	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.15A	--	1.9	6	Ω
Dynamic Electrical Characteristics @ T <sub>J</sub> = 25°C (unless otherwise stated)						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHz	--	22	--	pF
C <sub>OSS</sub>	Output Capacitance		--	3.5	--	pF
C <sub>RSS</sub>	Reverse Transfer Capacitance		--	2.9	--	pF
Switching Characteristics						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =30V, I <sub>D</sub> =0.2A, V <sub>GS</sub> =4.5V	--	1.4	--	nC
Q <sub>gs</sub>	Gate Source Charge		--	2.1	--	nC
Q <sub>gd</sub>	Gate Drain Charge		--	0.27	--	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =30V, I <sub>D</sub> =0.2A, V <sub>GS</sub> =4.5V, R <sub>G</sub> =10Ω	--	3.6	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	23.2	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	5.5	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	23.3	--	nS
Source- Drain Diode Characteristics						
V <sub>SD</sub>	Forward on voltage	T <sub>J</sub> =25°C, I <sub>S</sub> =0.1A,	--	--	1.2	V

**Typical Operating Characteristics**



**SOT-23 Package information**


Symbol	Dimensions in Millimeters(mm)		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
E1	2.250	2.550	0.088	0.100
E	1.200	1.400	0.047	0.055
e	0.950TYP		0.037TYP	
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°