

BSS138

N-Channel MOSFET

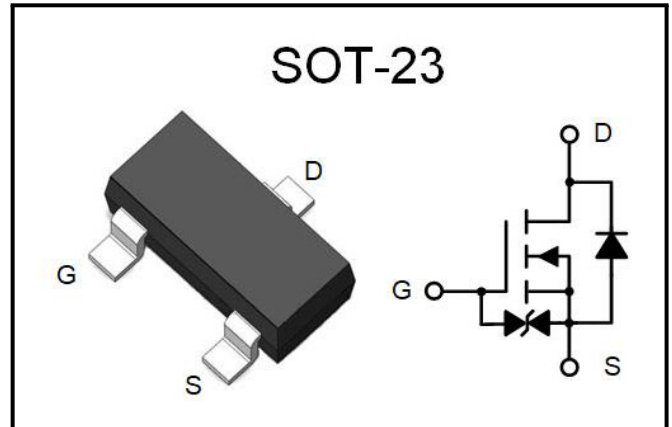
Features

- $V_{DS}=50V$
- $I_D=0.5A$
- $R_{DS(ON)}@V_{GS}=4.5V$, TYP=1.1 Ω
- $R_{DS(ON)}@V_{GS}=3.3V$, TYP=1.5 Ω

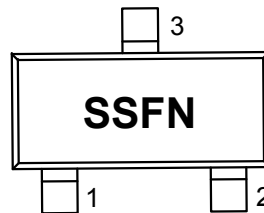
Description

- Advanced trench process technology
- High Density Cell Design For Ultra Low On-Resistance
- SOT-23 for Surface Mount Package.
- HMB ESD Protection 2KV

Package



Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
BSS138	SOT-23	SSFN	3K	Tape and reel

Absolute Maximum Ratings (@ $T_A=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter		Value	Unit
BV_{DS}	Drain-Source Voltage		50	V
V_{GS}	Gate-Source Voltage		± 20	V
I_D	Continuous Drain Current $V_{GS}=4.5V$	$T_A = 25^{\circ}C$	0.5	A
		$T_A = 70^{\circ}C$	0.3	A
I_{DM}	Pulsed Drain Current ⁽¹⁾	$T_A = 25^{\circ}C$	1.6	A
P_D	Power Dissipation	$T_A = 25^{\circ}C$	0.9	W
		$T_A = 70^{\circ}C$	0.8	W
T_J	junction temperature		150	$^{\circ}C$
T_{stg}	storage temperature range		-55 to +150	$^{\circ}C$
$R_{\theta JA}$	ThermalResistanceJunction-Ambient		125	$^{\circ}C/W$



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Electrical Characteristics @T_A=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @T _J = 25°C(unless otherwise stated)						
BV _{DS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250uA	50	—	—	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 50V, V _{GS} = 0V	—	—	0.5	uA
I _{GSS}	Gate Body Leakage	V _{GS} = ±20V, V _{DS} = 0V	—	—	±10	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250uA	0.6	1.0	1.5	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =0.5A	—	1.1	2.5	Ω
		V _{GS} =4.5V, I _D =0.2A	—	1.5	3	
Dynamic Electrical Characteristics @T _J = 25°C(unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} = 30V, V _{GS} = 0V, f = 1.0MHZ	—	23.8	—	pF
C _{oss}	Output Capacitance		—	3.9	—	
C _{rss}	Reverse Transfer Capacitance		—	1.5	—	
Q _g	Total Gate Charge	V _{DS} =30V I _D =0.4A, V _{GS} = 10V	—	0.93	—	nC
Q _{gs}	Gate-Source Charge		—	0.18	—	
Q _{gd}	Gate-Drain Charge		—	0.31	—	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} = 30V, V _{GS} = 10V, R _G = 3.3Ω, I _D = 0.3A	—	6	—	ns
t _r	Turn-On Rise Time		—	3.5	—	
t _{d(off)}	Turn-Off Delay Time		—	20	—	
t _f	Turn-Off Fall Time		—	5.9	—	
Source Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _S =0.5A,V _{GS} =0V,T _J =25°C	—	0.90	1.2	V

Notes:(1)Pulse test pulse width <=300us,duty cycle <= 2%.



Typical Performance Characteristics($T_J = 25^\circ\text{C}$, unless otherwise noted)

Figure 1 :Typical Output Characteristics

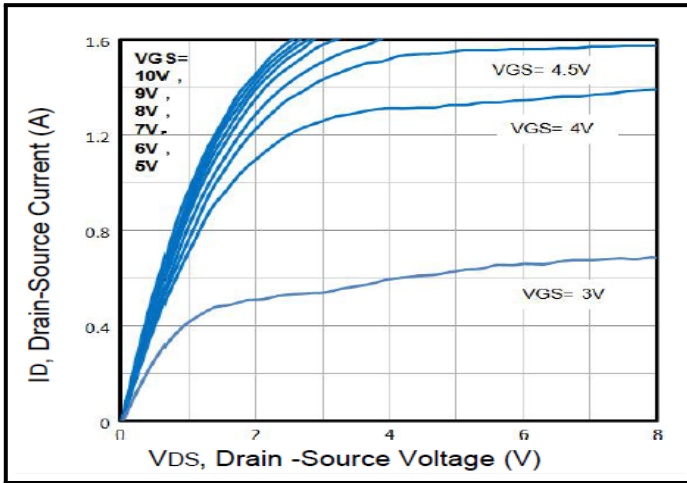


Figure 2 :Normalized Threshold Voltage Vs. Tempera-

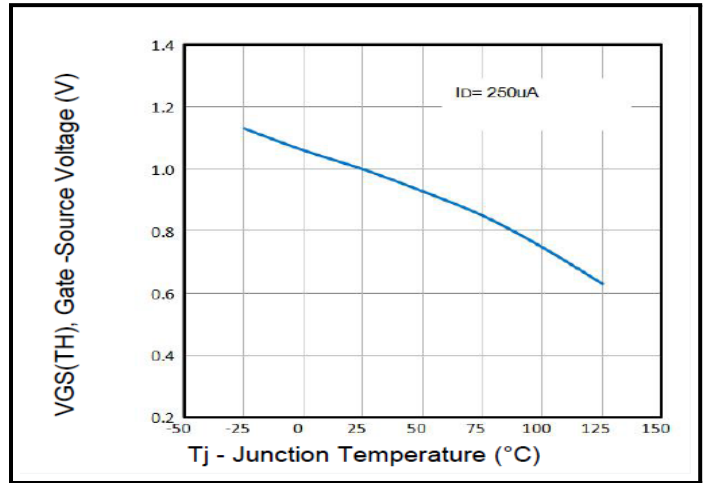


Figure 3 :Typical Transfer Characteristics

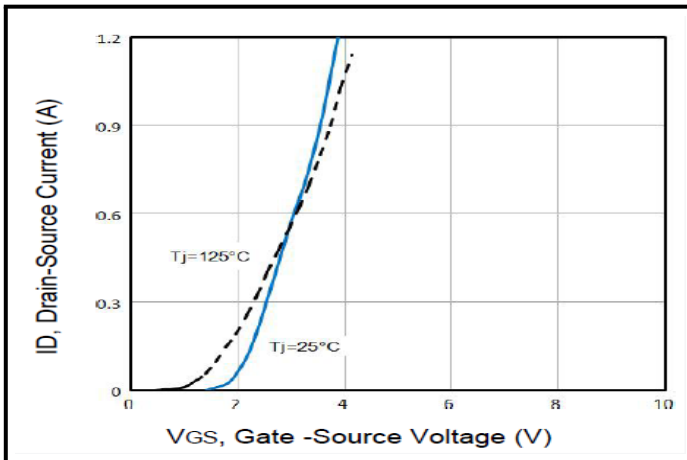


Figure 4 :Maximum Safe Operating Area

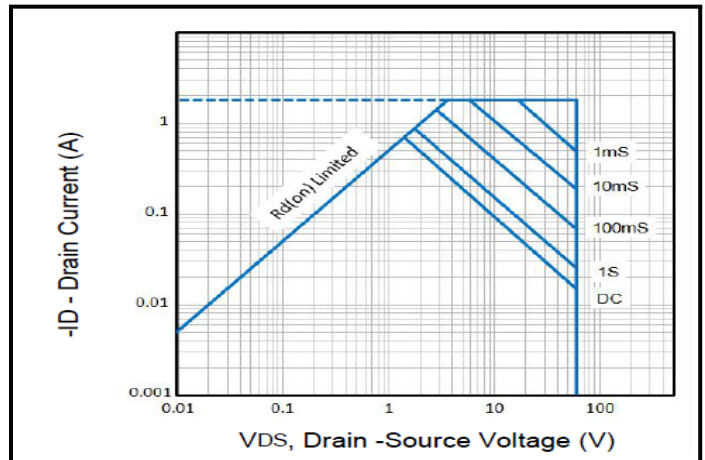


Figure 5 :Typical Capacitance Vs. Drain-Source Volt-

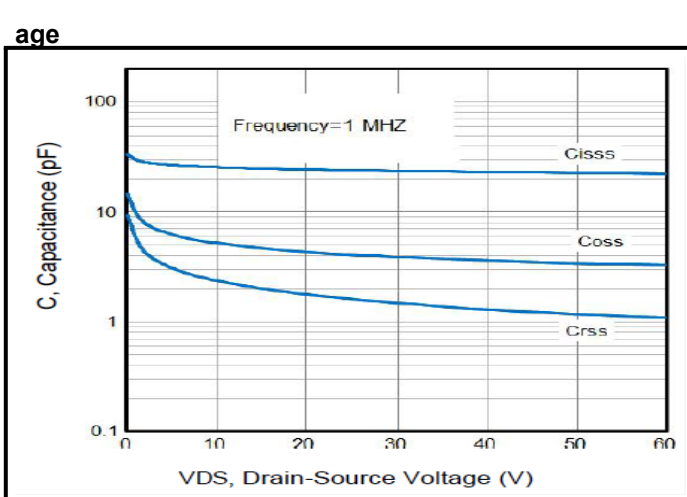
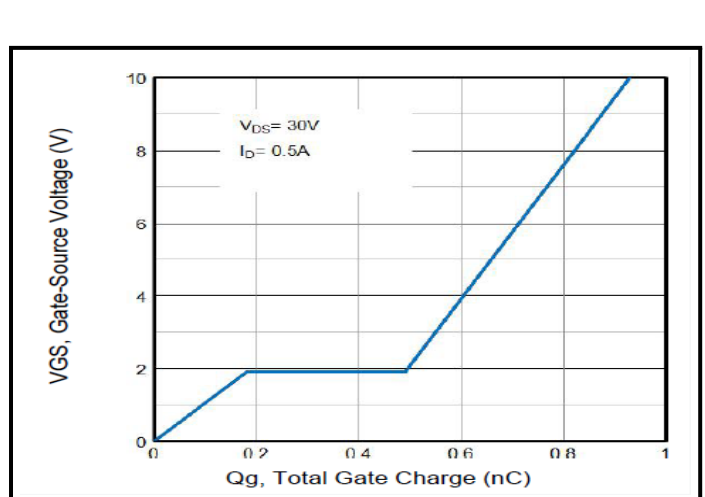


Figure 6 :Typical Gate Charge Vs. Gate-Source Voltage



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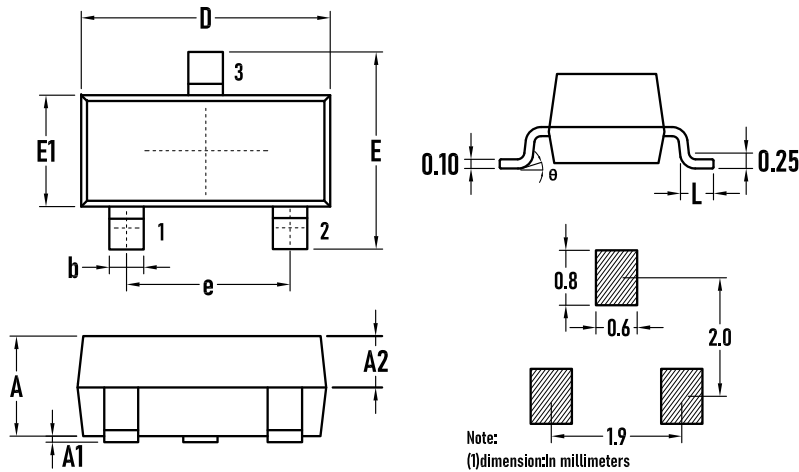
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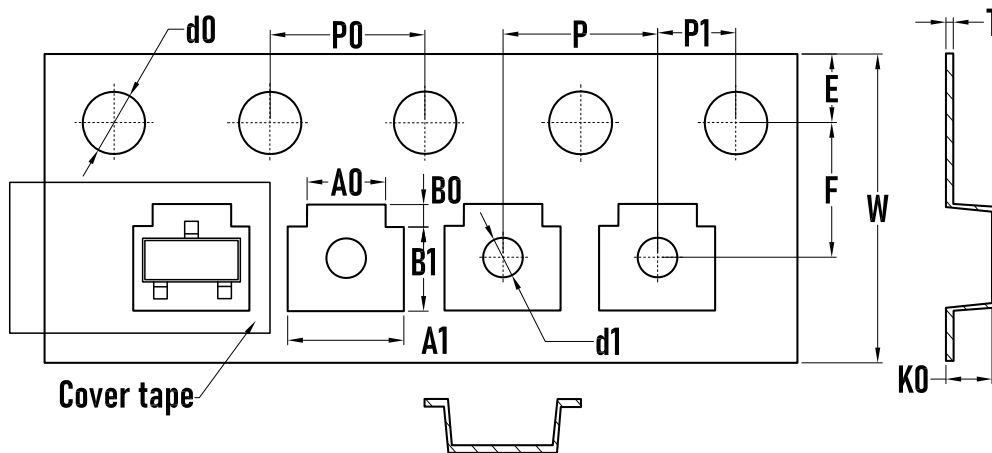
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Outline Drawing – SOT-23



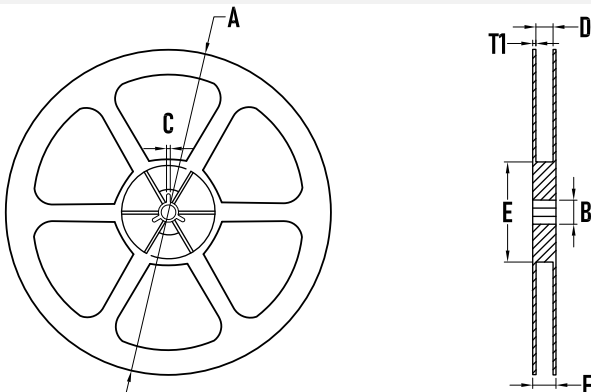
SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.90	1.00	1.10
A1	0.01	—	0.10
A2	0.50	0.60	0.70
D	2.80	2.90	3.00
b	0.25	0.35	0.45
E	2.10	2.30	2.50
E1	1.20	1.30	1.40
e	1.80	1.90	2.00
L	0.25	0.35	0.45
θ	0	—	8°

Packaging Tape - SOT-23



SYMBOL	MILLIMETER
A0	2.10±0.10
A1	3.10±0.10
B0	0.65±0.10
B1	2.75±0.10
d0	1.55±0.10
d1	1.00±0.05
E	1.75±0.10
F	3.50±0.10
K0	1.10±0.10
P	4.00±0.10
P0	4.00±0.10
P1	2.00±0.10
W	8.00±0.30
T	0.20 ±0.05

Packaging Reel



SYMBOL	MILLIMETER
A	177.8±0.2
B	3.1
C	13.50
D	9.6±0.3
E	75±0.2
F	12.3±0.3
T1	1.0±0.2
Quantity	3000PCS

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