BORN SEMICONDUCTOR

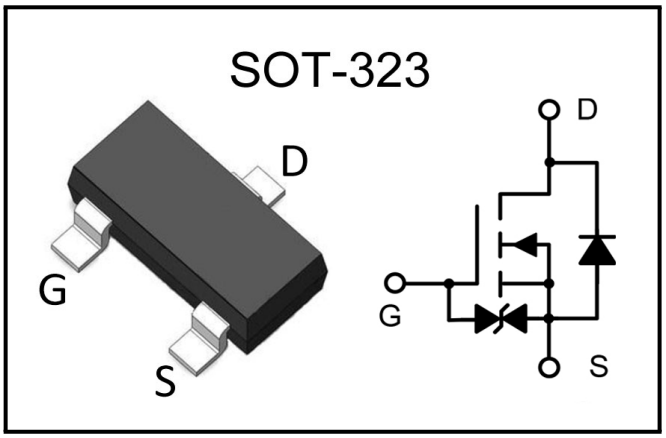
BSS138KW

N-Channel MOSFET

Features

- V_{DS}=50V
- I_D=0.34A
- $R_{DS(ON)}$ @V_{GS}=10V, TYP=1.6Ω
- $R_{DS(ON)}$ @V_{GS}=4.5V, TYP=2.0Ω

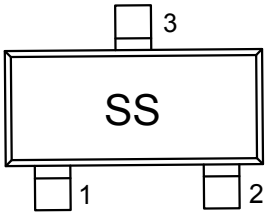
Package



Description

- Advanced trench process technology
- High Density Cell Design For Ultra Low On-Resistance
- SOT-323 for Surface Mount Package.
- HMB ESD Protection 2KV

Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
BSS138KW	SOT-323	SS	3K	Tape and reel

Absolute Maximum Ratings (@T_A=25°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 CurrentV_{GS} =4.5V	T_A = 25°C	0.34	A
		T_A = 70°C	0.27	A
I_{DM}	Pulsed Drain Current (1)	T_A = 25°C	1.5	A
P_D	Power Dissipation	T_A = 25°C	0.35	W
		T_A = 70°C	0.25	W
T_J	junction temperature		150	°C
T_{stg}	storage temperature range		-55 to +150	°C
$R_{\theta JA}$	ThermalResistanceJunction-Ambient		357	°C/W

Revision: 2022-Jan-1-A

BSS138KW

N-Channel MOSFET

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	–	–	1	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=0.3A	–	1.6	2.2	Ω
		V_{GS}=4.5V, I_D=0.2A	–	2.0	3	
Dynamic Electrical Characteristics @T_J = 25°C(unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS} = 30V,	–	23.8	–	pF
C_{oss}	Output Capacitance	V_{GS} = 0V,	–	3.9	–	
C_{rss}	Reverse Transfer Capacitance	f = 1.0MHZ	–	1.5	–	
Q_g	Total Gate Charge	V_{DS}=30V	–	0.93	–	nC
Q_{gs}	Gate-Source Charge	I_D =0.3A,	–	0.18	–	
Q_{gd}	Gate-Drain Charge	V_{GS} = 10V	–	0.31	–	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 30V,	–	6	–	ns
t_r	Turn-On Rise Time	V_{GS} = 10V,	–	3.5	–	
$t_{d(off)}$	Turn-Off Delay Time	R_G = 3.3Ω,	–	20	–	
t_f	Turn-Off Fall Time	I_D = 0.3A	–	5.9	–	
Source Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_S=0.3A,V_{GS}=0V,T_J=25°C	–	–	1.2	V

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

BSS138KW

N-Channel MOSFET

Typical Performance Characteristics(T_J = 25 °C, unless otherwise noted)

Figure 1 :Typical Output Characteristics

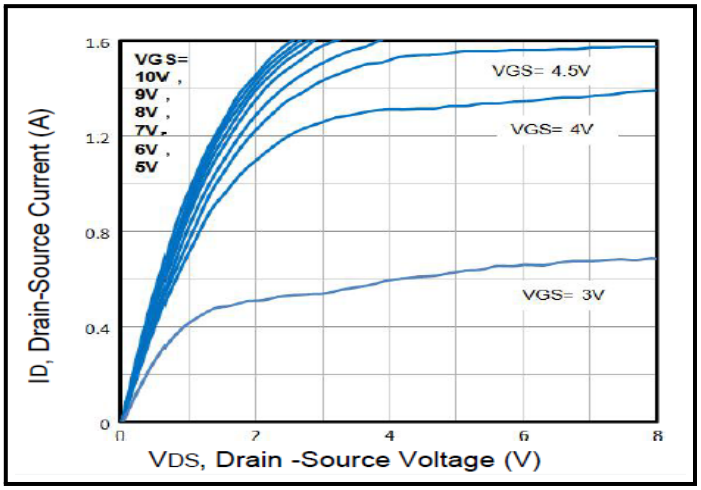


Figure 2 :Normalized Threshold Voltage Vs. Tempera-

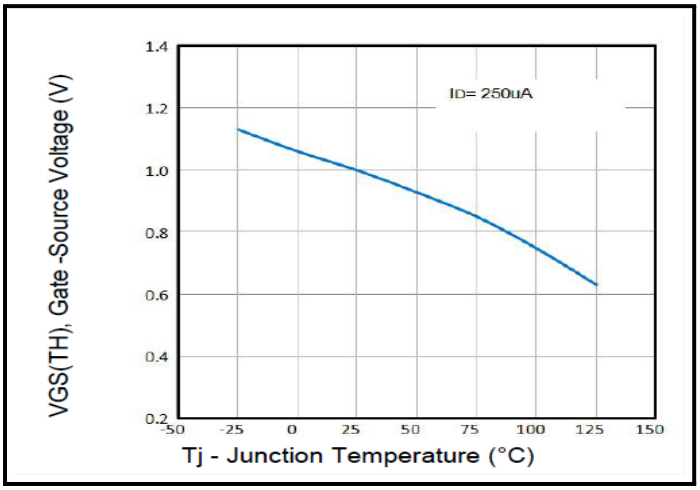


Figure 3 :Typical Transfer Characteristics

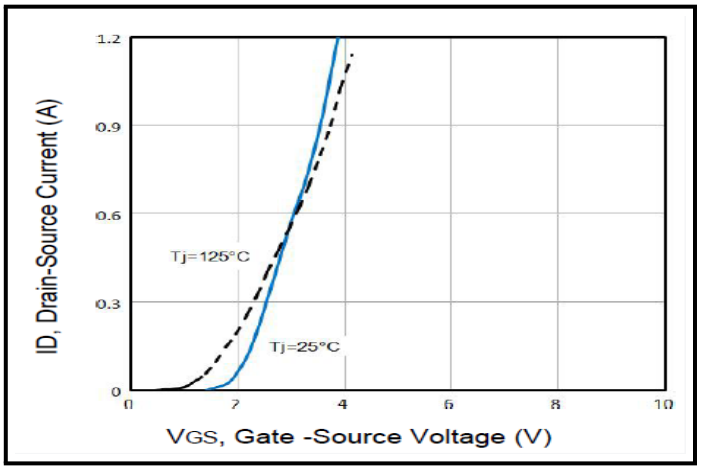


Figure 4 :Maximum Safe Operating Area

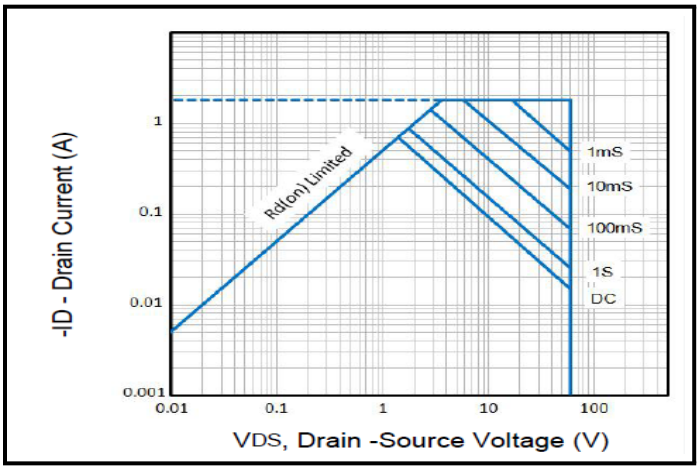


Figure 5 :Typical Capacitance Vs. Drain-Source Volt-

age

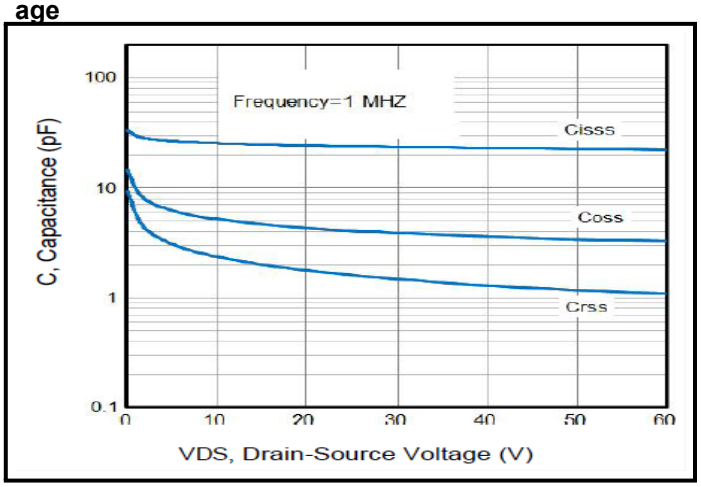
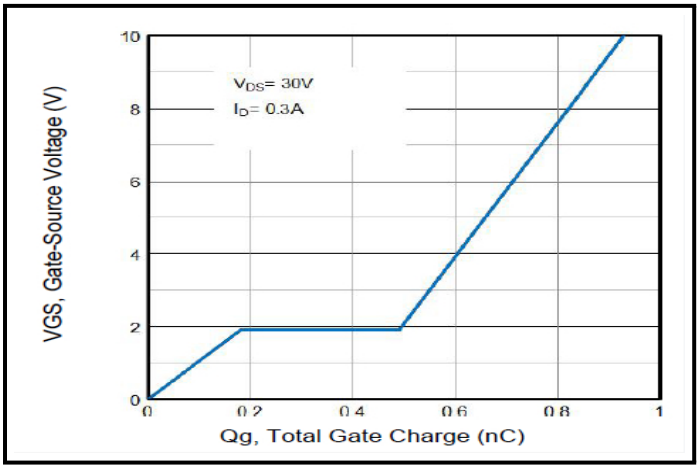


Figure 6 :Typical Gate Charge Vs. Gate-Source Voltage

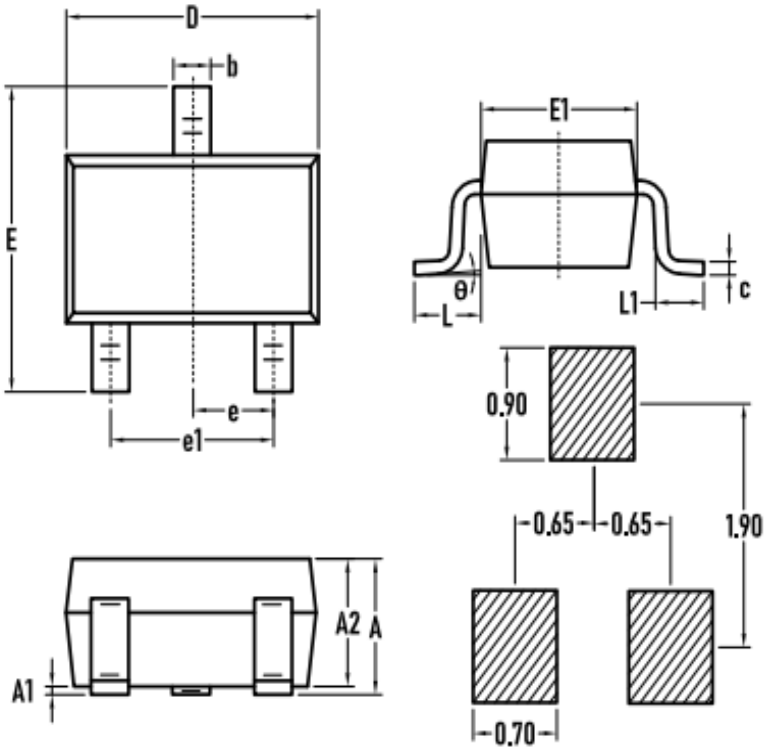


Revision: 2022-Jan-1-A

BSS138KW

N-Channel MOSFET

Outline Drawing – SOT-323



SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.90	1.00	1.10
A1	0.00	0.05	0.10
A2	0.90	0.95	1.00
b	0.20	0.30	0.40
c	0.08	0.12	0.15
D	2.00	2.10	2.20
E	2.15	2.30	2.45
E1	1.15	1.25	1.35
e	0.650Typ.		
e1	1.20	1.30	1.40
L1	0.26	0.36	0.46
L	0.525REF		
θ	0°	4°	8°