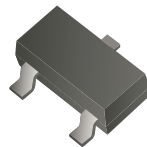


BSS138W-HF

N-Channel
RoHS Device
Halogen Free



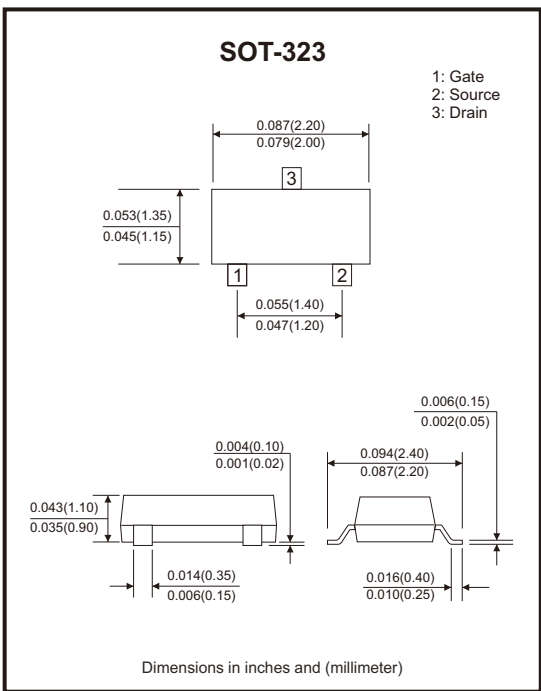
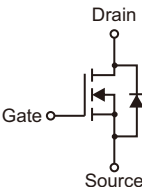
Features

- Low on-resistance.
- Low gate threshold voltage.
- Low input capacitance.
- Fast switching speed.
- Low input/output leakage.

Mechanical data

- Case: SOT-323, molded plastic.
- Mounting position: Any.

Circuit Diagram



Maximum Rating (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	50	V
Drain-gate voltage $R_{GS} \leq 20K\Omega$	V_{DGR}	50	V
Gate-source voltage	V_{GS}	± 20	V
Drain current-continuous	I_D	200	mA
Power dissipation	P_D	200	mW
Thermal resistance, junction-to-ambient	$R_{\theta JA}$	625	$^{\circ}\text{C/W}$
Junction and storage temperature	T_J, T_{STG}	-55 to +150	$^{\circ}\text{C}$

Electrical Characteristics (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Gate leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 1	μA
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	50	75		V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.5	1.2	1.5	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 50V, V_{GS} = 0V$			0.5	μA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 0.5A$		1.0	1.6	Ω
		$V_{GS} = 4.5V, I_D = 0.2A$		1.2	2.5	
		$V_{GS} = 2.5V, I_D = 0.1A,$		1.7	4.5	
Forward transfer admittance	g_{FS}	$V_{DS} = 25V, I_D = 0.2A, f = 1MHz$	100			mS
Input capacitance	C_{iss}	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$			50	pF
Output capacitance	C_{oss}				25	
Reverse transfer capacitance	C_{rss}				8	
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 30V, I_D = 0.2A, R_{GEN} = 50\Omega$			20	ns
Turn-off delay time	$t_{d(off)}$				20	

Typical Rating and Characteristic Curves (BSS138W-HF)

Fig.1 - Drain-Source Current vs. Drain-Source Voltage

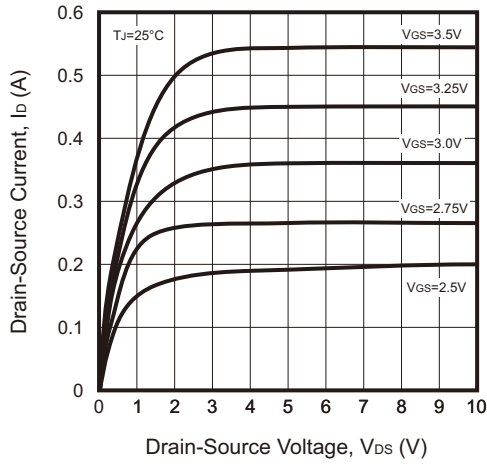


Fig.2 - Transfer Characteristics

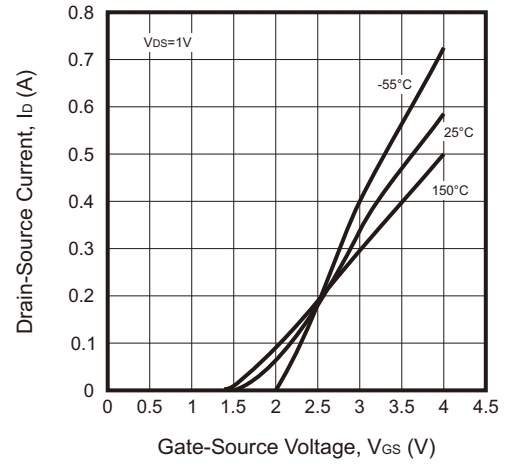


Fig.3 - Body Diode Current vs. Body Diode Voltage

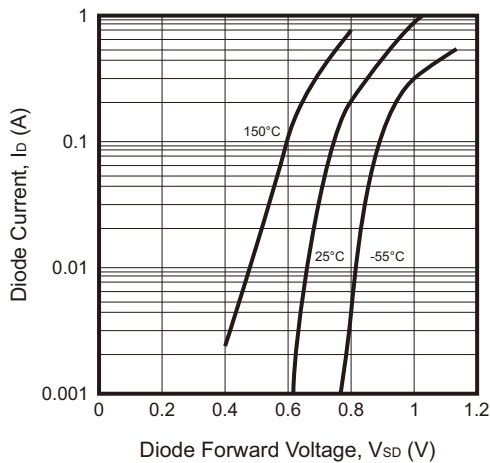


Fig.4 - Capacitance vs. Drain-Source Voltage

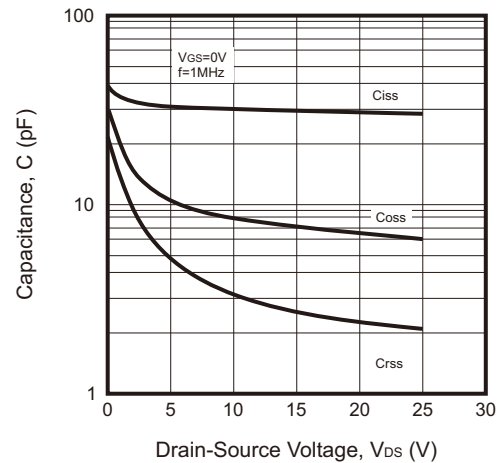


Fig.5 - On-Resistance vs. Drain Current and Gate Voltage

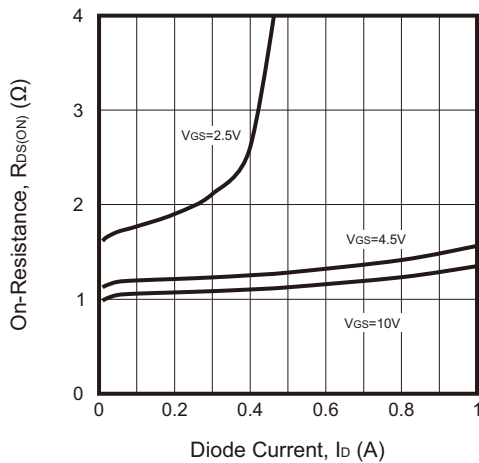
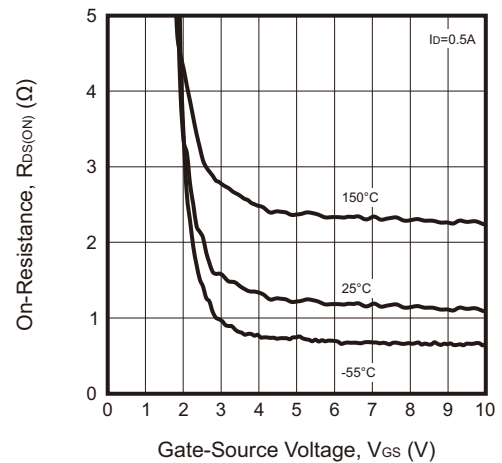
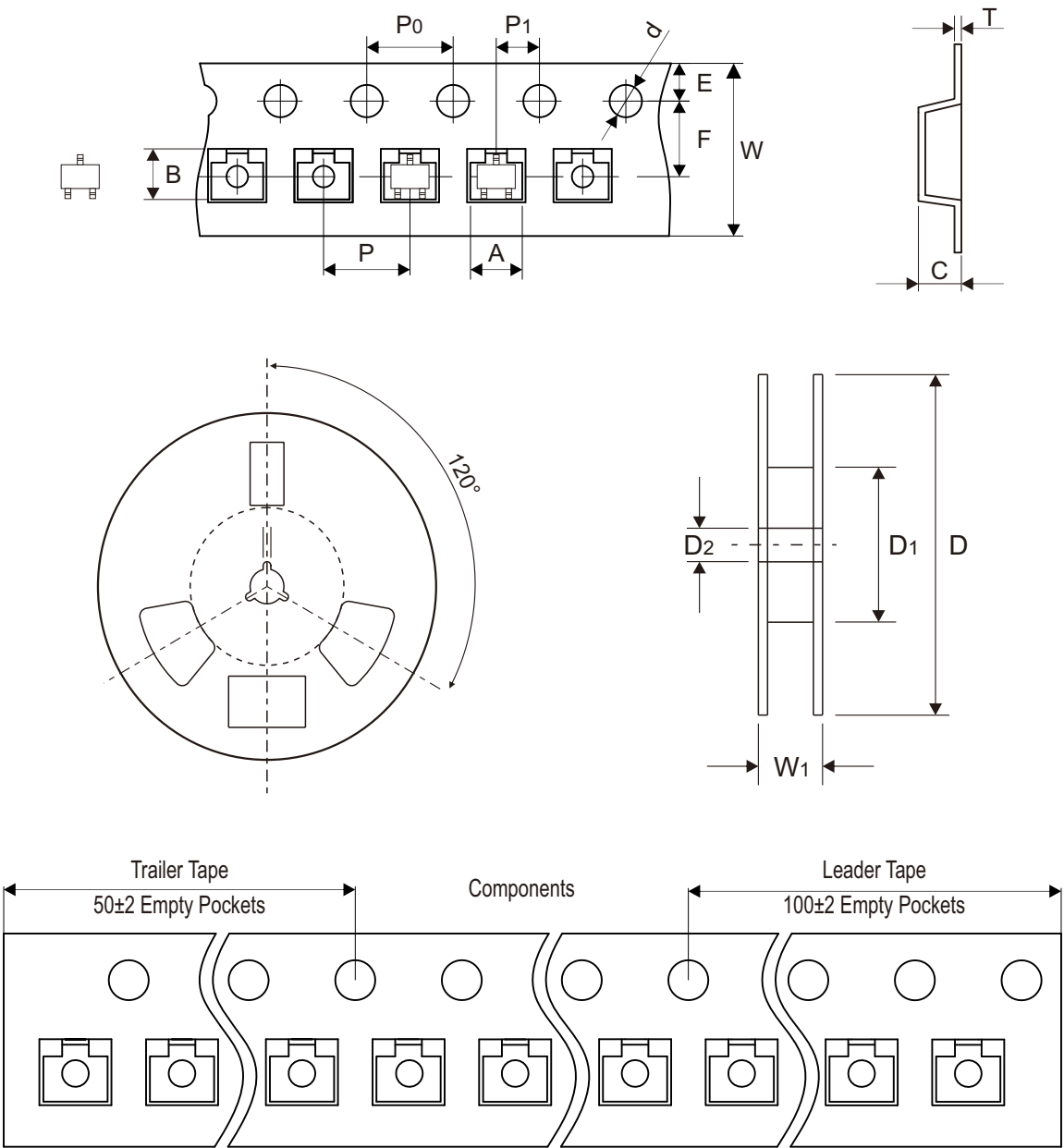


Fig.6 - On-Resistance vs. Gate-Source Voltage



Reel Taping Specification

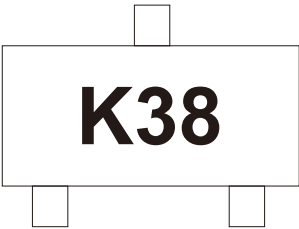


SOT-323	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	2.25 ± 0.10	2.55 ± 0.10	1.19 ± 0.10	1.50 ± 0.10	178.00 ± 1.00	54.00 ± 0.50	13.00 ± 0.50
	(inch)	0.089 ± 0.004	0.100 ± 0.004	0.047 ± 0.004	0.059 ± 0.004	7.008 ± 0.039	2.126 ± 0.020	0.512 ± 0.020

SOT-323	SYMBOL	E	F	P	P0	P1	T	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.22 ± 0.02	8.00 + 0.30 - 0.10	12.50 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.004	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.009 ± 0.001	0.315 + 0.012 - 0.004	0.492 ± 0.039

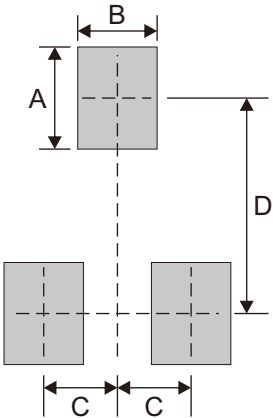
Marking Code

Part Number	Marking Code
BSS138W-HF	K38



Suggested P.C.B. PAD Layout

SIZE	SOT-323	
	(mm)	(inch)
A	0.90	0.035
B	0.70	0.028
C	0.65	0.026
D	1.90	0.075



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-323	3,000	7