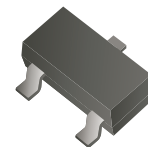


## BSS138-HF

**N-Channel  
RoHS Device  
Halogen Free**



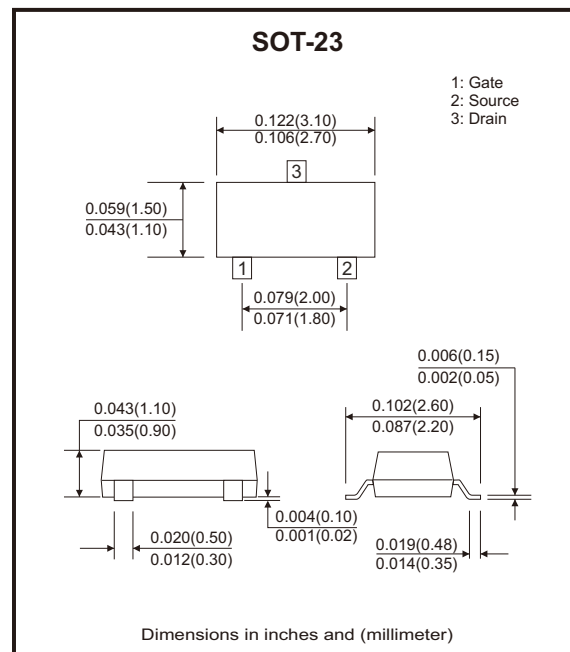
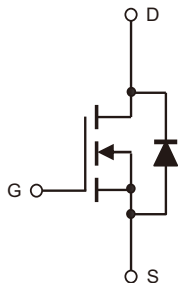
### Features

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

### Mechanical data

- Case: SOT-23, molded plastic.
- Mounting position: Any.

### Circuit Diagram



### Maximum Ratings (at Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Units
Drain-source voltage	V <sub>DSS</sub>	50	V
Drain-gate voltage R <sub>GS</sub> ≤ 20KΩ	V <sub>DGR</sub>	50	V
Gate-source voltage	V <sub>GSS</sub>	±20	V
Drain current-continuous	I <sub>D</sub>	200	mA
Power dissipation	P <sub>D</sub>	300	mW
Thermal resistance, junction to ambient	R <sub>θJA</sub>	417	°C/W
Junction and storage temperature	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (at Ta=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Gate leakage current	$V_{GS} = \pm 20V, V_{DS} = 0V$	$I_{GSS}$			$\pm 1$	$\mu A$
Drain-source breakdown voltage	$V_{GS} = 0V, I_D = 250\mu A$	$V_{(BR)DSS}$	50	75		V
Gate threshold voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(th)}$	0.5	1.2	1.6	V
Zero gate voltage drain current	$V_{DS} = 50V, V_{GS} = 0V$	$I_{DSS}$			0.5	$\mu A$
Drain-source on-state resistance	$I_D = 0.22A, V_{GS} = 10V$	$R_{DS(on)}$		1.4	3.5	$\Omega$
Forward transfer admittance	$V_{DS} = 10V, I_D = 0.2A, f = 1MHz$	$g_{FS}$	100			mS
Input capacitance	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$	$C_{iss}$			50	pF
Output capacitance		$C_{oss}$			25	
Reverse transfer capacitance		$C_{rss}$			8	
Turn-on delay time	$V_{DD} = 30V, I_D = 0.2A, R_{GEN} = 50\Omega$	$t_{D(on)}$			20	ns
Turn-off delay time		$t_{D(off)}$			20	

## Rating and Characteristic Curves (BSS138-HF)

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

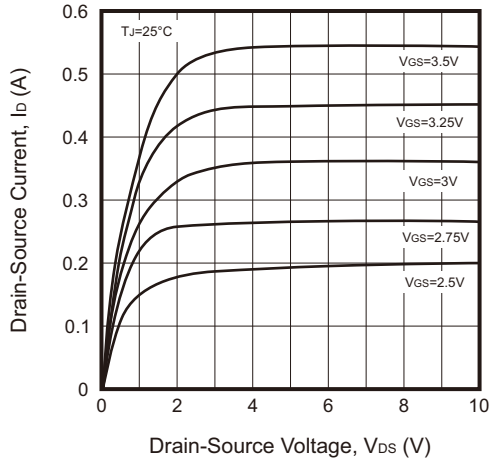


Fig.2 - Transfer Characteristics

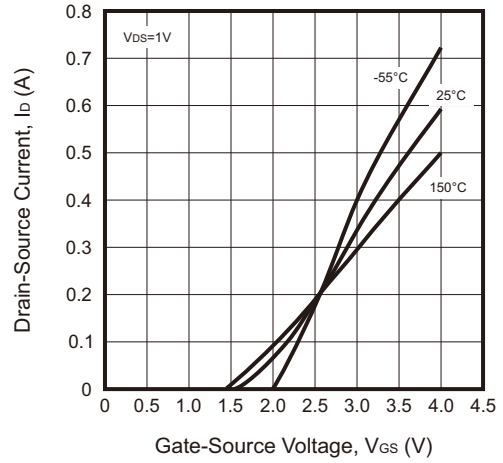


Fig.3 - Body Diode Current vs. Body Diode Voltage

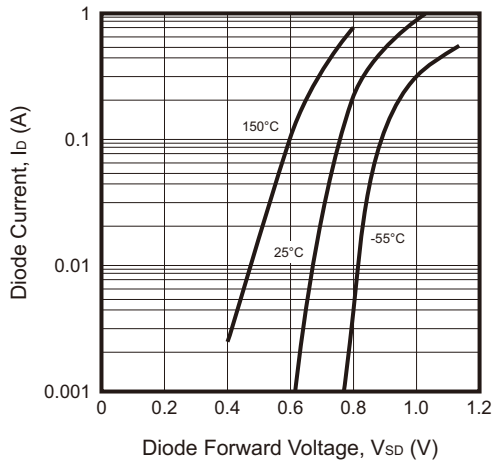
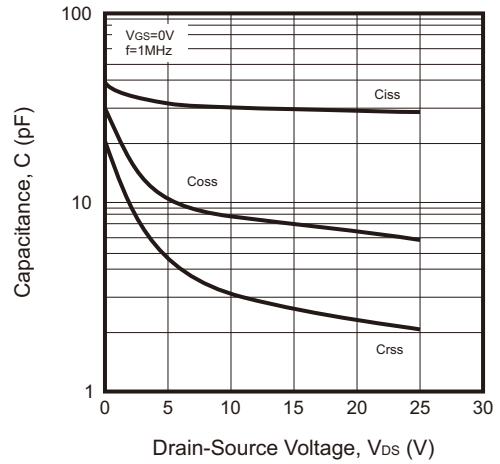
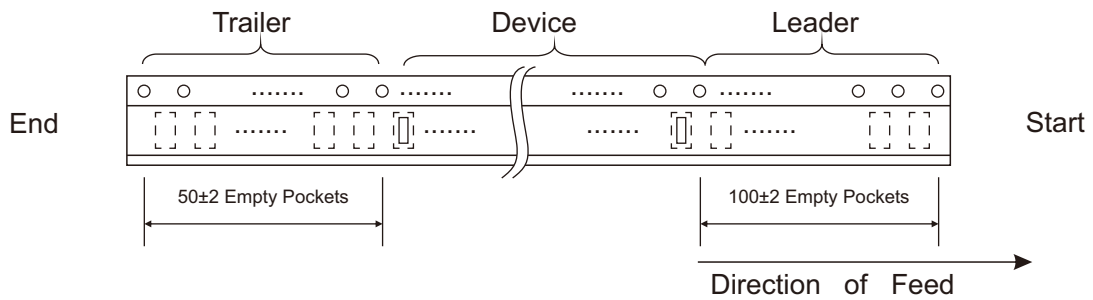
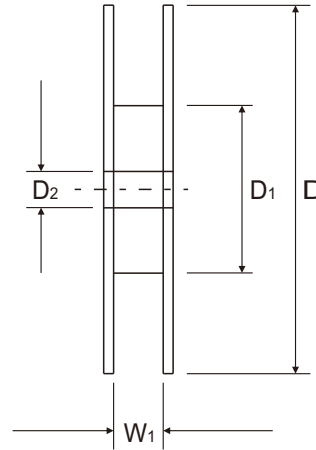
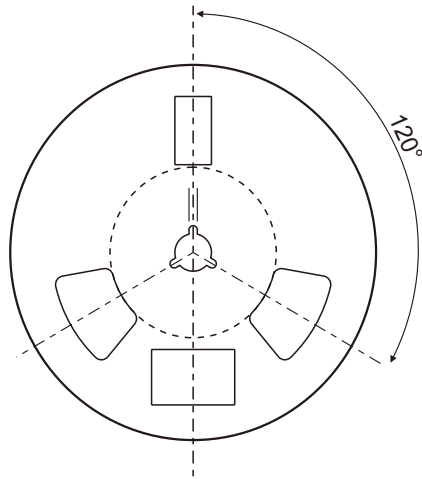
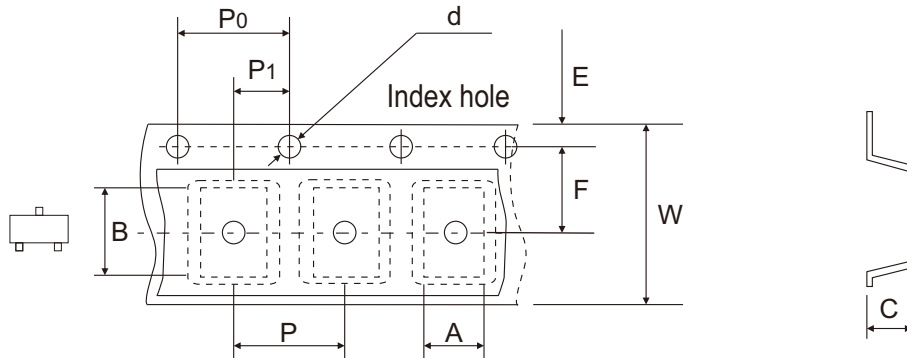


Fig.4 - Capacitance vs. Drain-Source Voltage



Reel Taping Specification

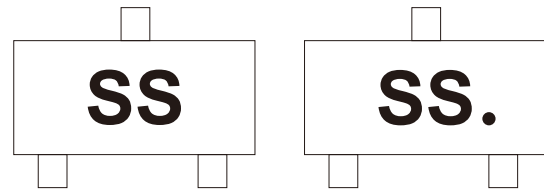


SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	1.50 ± 0.10	178.00 ± 1.00	54.00 ± 0.50	13.00 ± 0.50
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	0.059 ± 0.004	7.008 ± 0.039	2.126 ± 0.020	0.512 ± 0.020

SOT-23	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	8.00 + 0.30 - 0.10	9.50 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.315 + 0.012 - 0.004	0.374 ± 0.039

## Marking Code

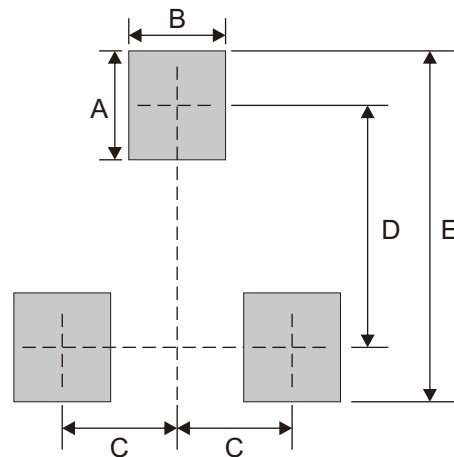
Part Number	Marking Code
BSS138-HF	SS



Solid dot = Control code

## Suggested P.C.B. PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.90	0.035
B	0.80	0.031
C	0.95	0.037
D	2.00	0.079
E	2.90	0.114



## Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-23	3,000	7