

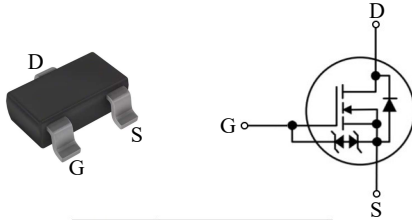


BSS138KWH

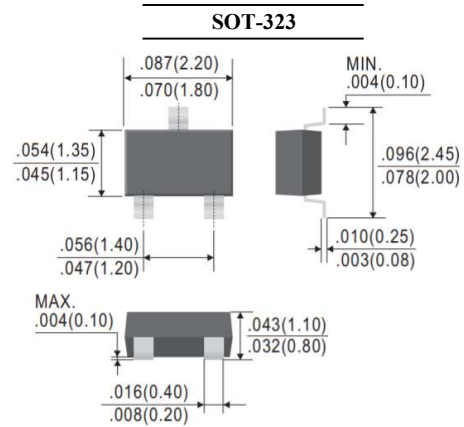
N-Channel Enhancement Mode Field Effect Transistor

FEATURES

- For low voltage, low current switching applications
- ESD Protection >2KV
- Suffix "H" indicates Halogen-free parts, ex. BSS138KWH



Pin	Description
G	Gate
S	Source
D	Drain



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

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	V_{DSS}	60	V	
Gate-Source Voltage	V_{GSS}	± 20	V	
Drain Current (Note 1)	I_D	at $T_A = 25^\circ\text{C}$	320	mA
		at $T_A = 100^\circ\text{C}$	210	
Pulsed Drain Current	I_{DM}	1.2	A	
Total Power Dissipation	P_{tot}	(Note 2)	260	mW
		(Note 1)	310	
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	(Note 2)	480	$^\circ\text{C}/\text{W}$
		(Note 1)	400	
Operating and Storage Temperature Range	T_J, T_{STG}	- 55 to + 150	$^\circ\text{C}$	

Note :

1. Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for drain 1 cm^2 .
1. Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.



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

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Static						
Drain Source Breakdown Voltage	$I_D = 250\mu\text{A}$	V_{DSS}	60	-	-	V
Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	$V_{GS(th)}$	0.48	-	1.6	V
Zero Gate Voltage Drain Current	$V_{DS} = 60\text{V}$	I_{DSS}	-	-	1	μA
Gate-Body Leakage Current	$V_{GS} = \pm 20\text{V}$	I_{GSS}	-	-	± 10	μA
	$V_{GS} = \pm 10\text{V}$		-	-	± 1	
Drain-Source On-State Resistance	$V_{GS} = 10\text{V}, I_D = 320\text{mA}$	$R_{DS(ON)}$	-	-	1.6	Ω
	$V_{GS} = 4.5\text{V}, I_D = 200\text{mA}$		-	-	2.2	
	$V_{GS} = 2.5\text{V}, I_D = 10\text{mA}$		-	-	6.5	
Forward Transconductance	$V_{DS} = 10\text{V}, I_D = 200\text{mA}$	g_{FS}	-	700	-	mS
Dynamic						
Input Capacitance	$V_{GS} = 0\text{V}, V_{DS} = 10\text{V}, f = 1\text{MHz}$	C_{iss}	-	-	56	pF
Output Capacitance	$V_{GS} = 0\text{V}, V_{DS} = 15\text{V}, f = 1\text{MHz}$	C_{oss}	-	7	-	
Reverse Transfer Capacitance		C_{rss}	-	4	-	
Turn-On Delay Time	$V_{DS} = 40\text{V}, V_{GS} = 10\text{V},$ $R_L = 250\Omega, R_G = 6\Omega$	$t_{d(on)}$	-	-	10	nS
Turn-On Rise Time		t_r	-	5	-	
Turn-Off Delay Time		$t_{d(off)}$	-	-	76	
Turn-Off Fall Time		t_f	-	20	-	
Drain-Source Body Diode						
Drain-Source Diode Forward Voltage	$I_S = 300\text{mA}$	V_{SD}	0.47	-	1.20	V



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RATINGS AND CHARACTERISTIC CURVES

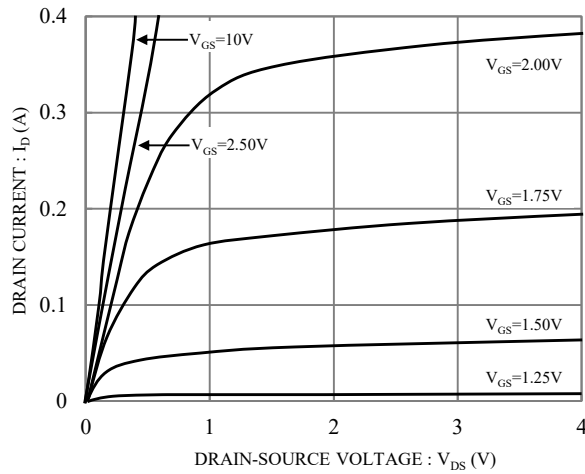


Fig.1 Typical output characteristics

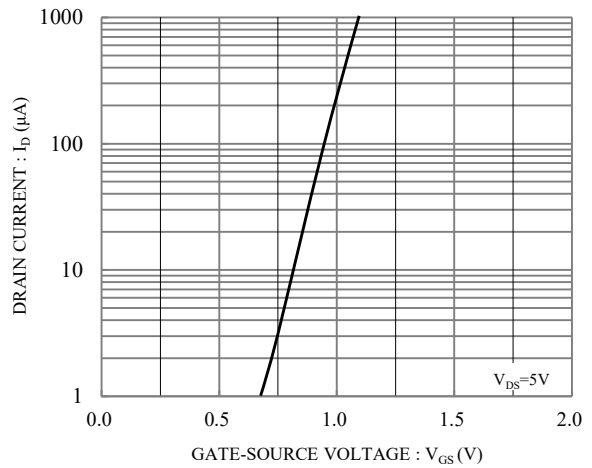


Fig.2 Typical transfer characteristics

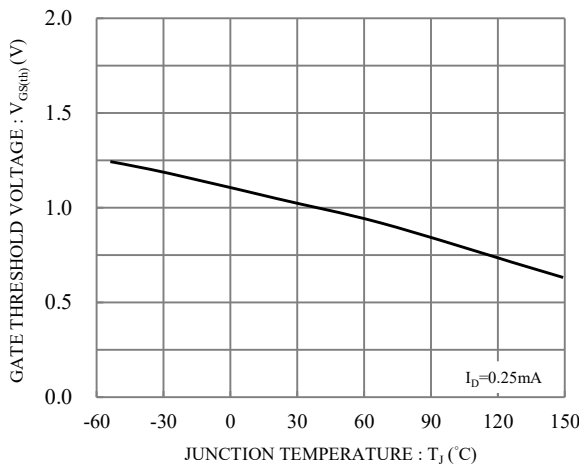


Fig.3 Gate threshold voltage vs. Junction temperature

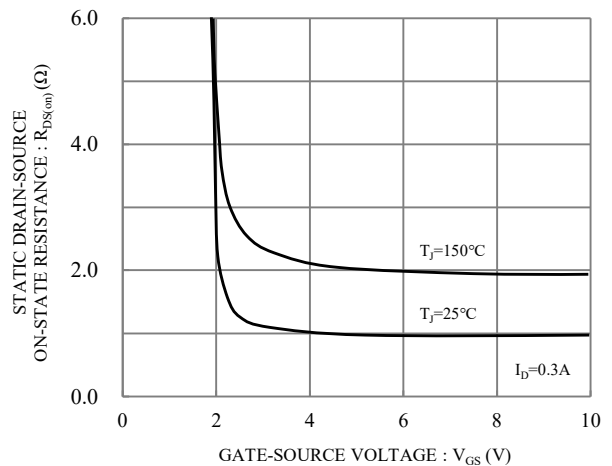


Fig.4 Static drain-source on-state resistance vs. gate-source voltage

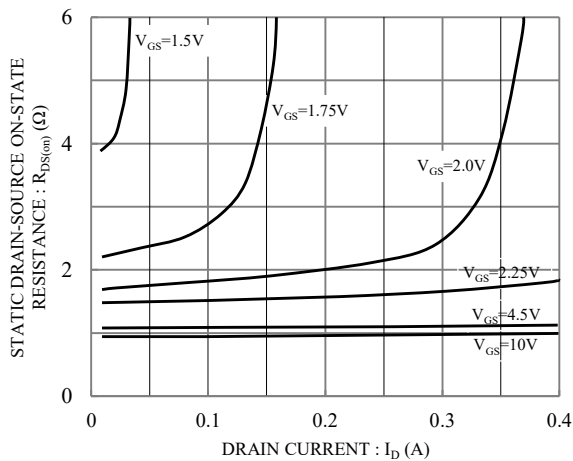


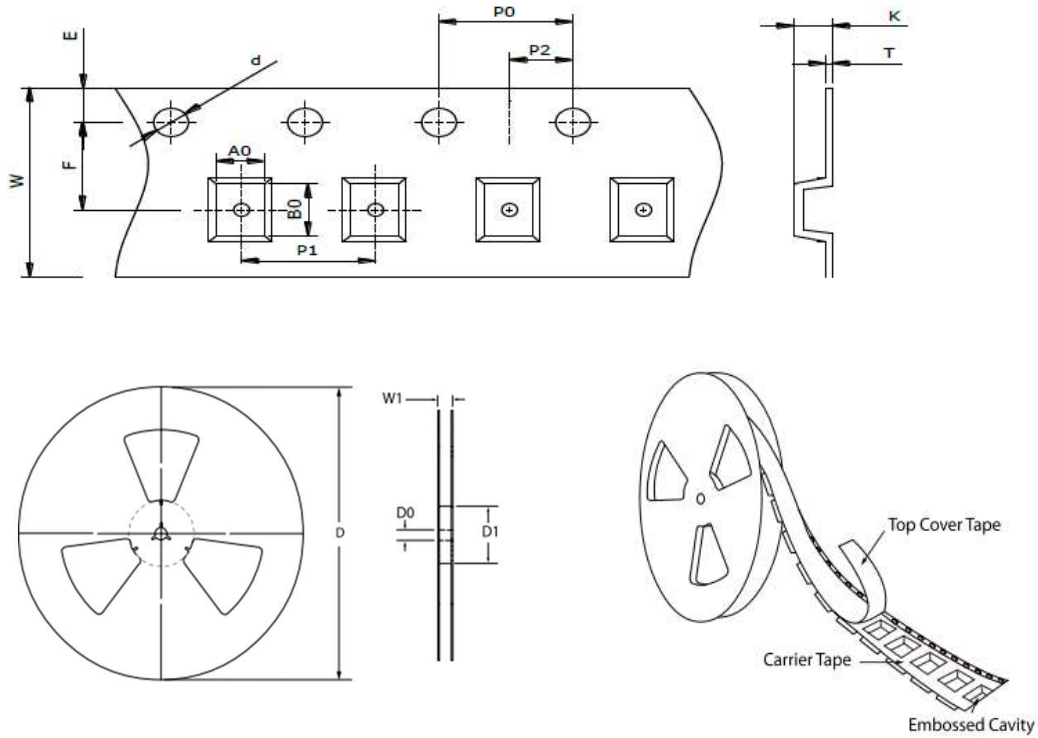
Fig.5 Static drain-source on-state resistance vs. drain current



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TAPE & REEL SPECIFICATION



Item	Symbol	SOT-323
Carrier width	A ₀	2.30 ± 0.10
Carrier length	B ₀	2.30 ± 0.10
Carrier depth	K	1.30 ± 0.10
Sprocket hole	d	1.50 ± 0.10
Reel outside diameter	D	178.00 ± 2.00
Feed hole width	D ₀	13.00 ± 0.50
Reel inner diameter	D ₁	MIN. 50.00
Sprocket hole position	E	1.75 ± 0.10
Punch hole position	F	3.50 ± 0.10
Sprocket hole pitch	P ₀	4.00 ± 0.10
Punch hole pitch	P ₁	4.00 ± 0.10
Embossment center	P ₂	2.00 ± 0.10
Overall tape thickness	T	0.20 ± 0.05
Tape width	W	8.00 ± 0.20
Reel width	W1	MAX. 14.50

ORDER INFORMATION

Package	Reel Size	Quantity
SOT-323	7"	3,000

MARKING CODE

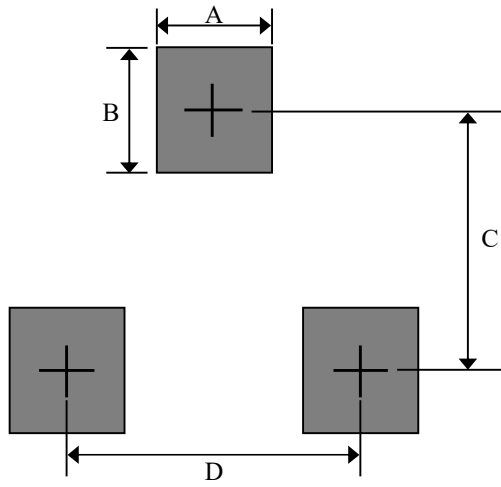
Part Number	Marking Code
BSS138KWH	VD



BSS138KWH

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SUGGESTED SOLDER PAD LAYOUT



Unit : mm

PACKAGE	A	B	C	D
SOT-323	0.80	0.80	1.60	1.30