

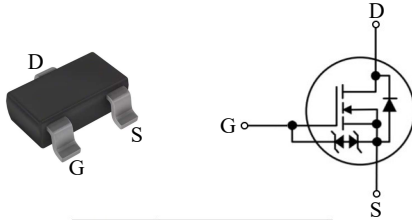


BSS138KWTH

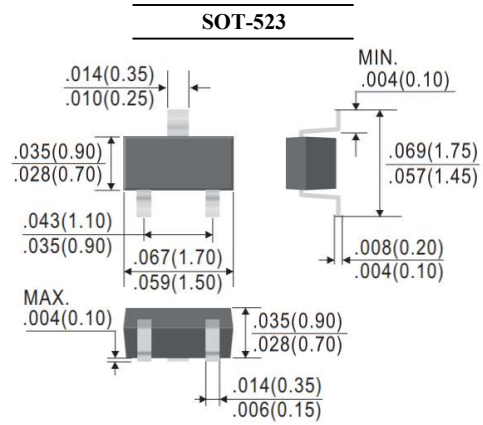
N-Channel Enhancement Mode Field Effect Transistor

FEATURES

- For low voltage, low current switching applications
- ESD protected $\geq 2\text{kV}$
- Suffix "H" indicates Halogen-free parts, ex. BSS138KWTH



Pin	Description
G	Gate
S	Source
D	Drain



Dimensions in inch and (millimeter)

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	50	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	I_D	350	mA
Pulsed Drain Current	I_{DM}	1.2	A
Power Dissipation	P_D	223	mW
Thermal Resistance Junction to Ambient (Note 1)	$R_{\theta JA}$	560	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	- 55 to + 150	$^\circ\text{C}$

Note :

1. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. mounted on a 1 inch square pad of copper.



BSS138KWTB

N-Channel Enhancement Mode Field Effect Transistor

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}	50	-	-	V
Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	$V_{GS(th)}$	0.8	-	1.5	V
Zero Gate Voltage Drain Current	$V_{DS} = 40\text{V}$	I_{DSS}	-	-	1	μA
Gate-Body Leakage Current	$V_{GS} = \pm 20\text{V}$	I_{GSS}	-	-	± 10	μA
Drain-Source On-State Resistance	$V_{GS} = 10\text{V}, I_D = 500\text{mA}$	$R_{DS(on)}$	-	-	1.6	Ω
	$V_{GS} = 4.5\text{V}, I_D = 200\text{mA}$		-	-	2.5	
	$V_{GS} = 2.5\text{V}, I_D = 100\text{mA}$		-	-	4.5	
\						
Input Capacitance	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	C_{iss}	-	35.0	-	pF
Output Capacitance		C_{oss}	-	10.0	-	
Reverse Transfer Capacitance		C_{rss}	-	8.5	-	
Total Gate Charge	$V_{DS} = 25\text{V}, I_D = 250\text{mA}, V_{GS} = 4.5\text{V}$	Q_g	-	0.63	-	
Gate Source Charge		Q_{gs}	-	0.20	-	
Gate Drain Charge		Q_{gd}	-	0.23	-	
Turn-On Delay Time	$V_{DD} = 25\text{V}, V_{GS} = 10\text{V}, I_D = 500\text{mA}, R_G = 6\Omega$	$t_{d(on)}$	-	2.2	-	nS
Turn-On Rise Time		t_r	-	19.2	-	
Turn-Off Delay Time		$t_{d(off)}$	-	6.2	-	
Turn-Off Fall Time		t_f	-	23.0	-	
Drain-Source Body Diode						
Drain-Source Diode Forward Voltage	$I_S = 500\text{mA}$	V_{SD}	-	-	1.5	V



BSS138KWTH

N-Channel Enhancement Mode Field Effect Transistor

RATINGS AND CHARACTERISTIC CURVES

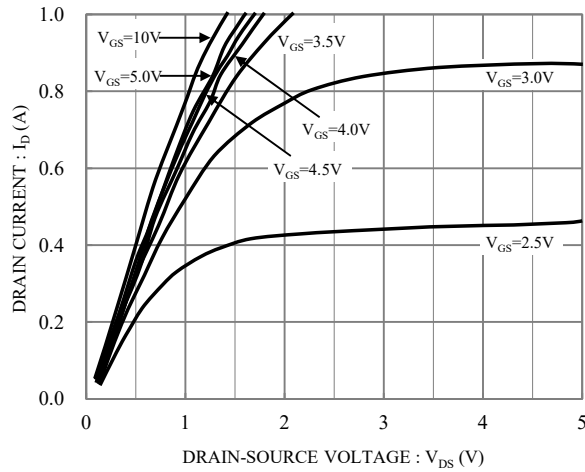


Fig.1 Typical output characteristics

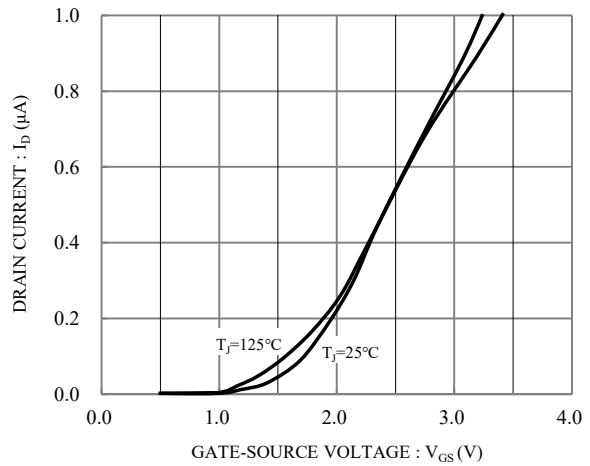


Fig.2 Typical transfer characteristics

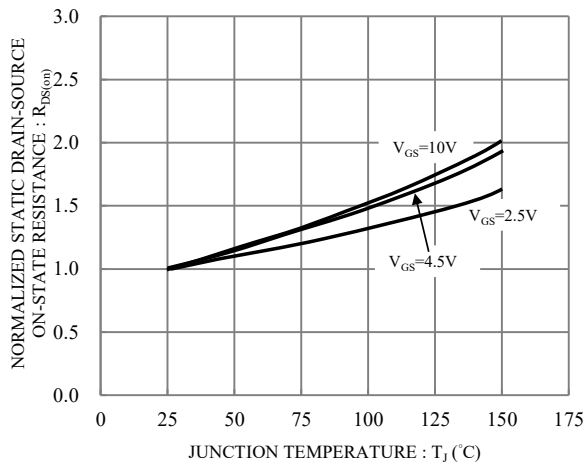


Fig.3 Drain-Source On-State Resistance vs. Junction Temperature

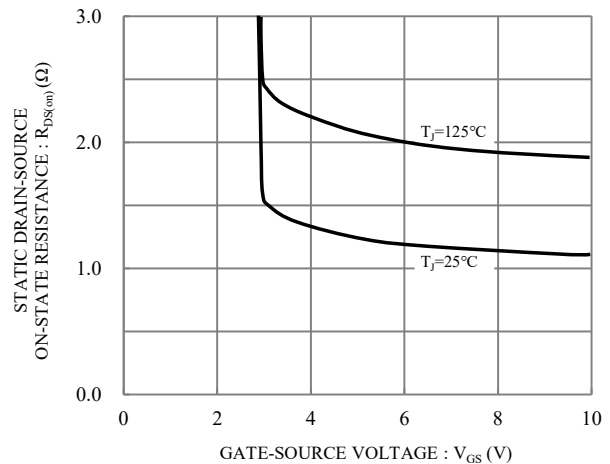


Fig.4 Static drain-source on-state resistance vs. gate-source voltage

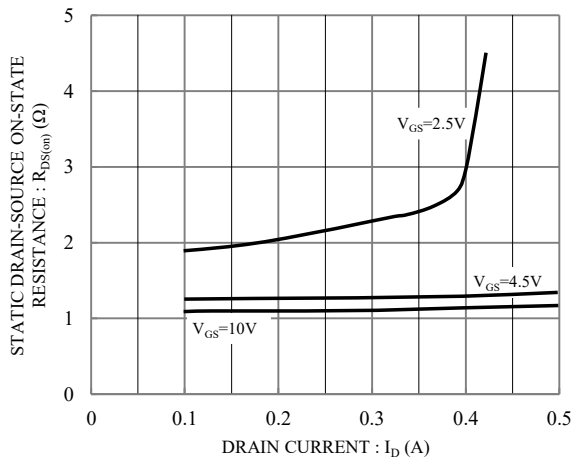


Fig.5 Static drain-source on-state resistance vs. Drain current

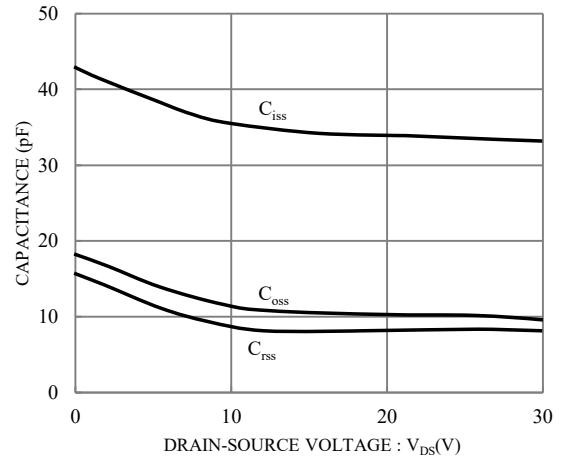


Fig.6 Capacitance vs. Drain-to-Source Voltage



BSS138KWT

N-Channel Enhancement Mode Field Effect Transistor

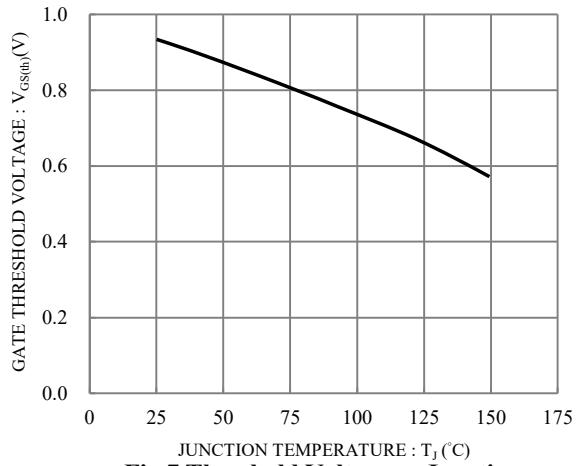


Fig.7 Threshold Voltage vs Junction Temperature

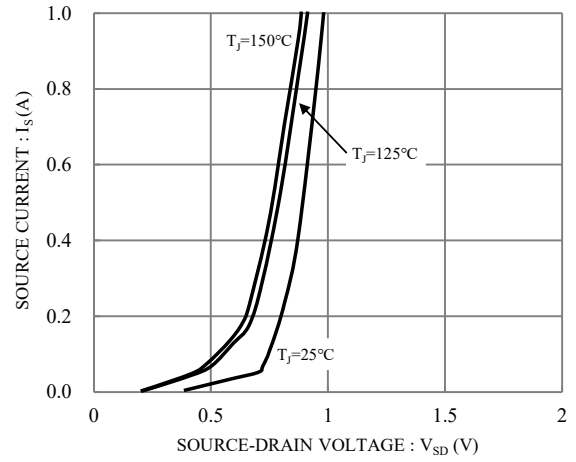


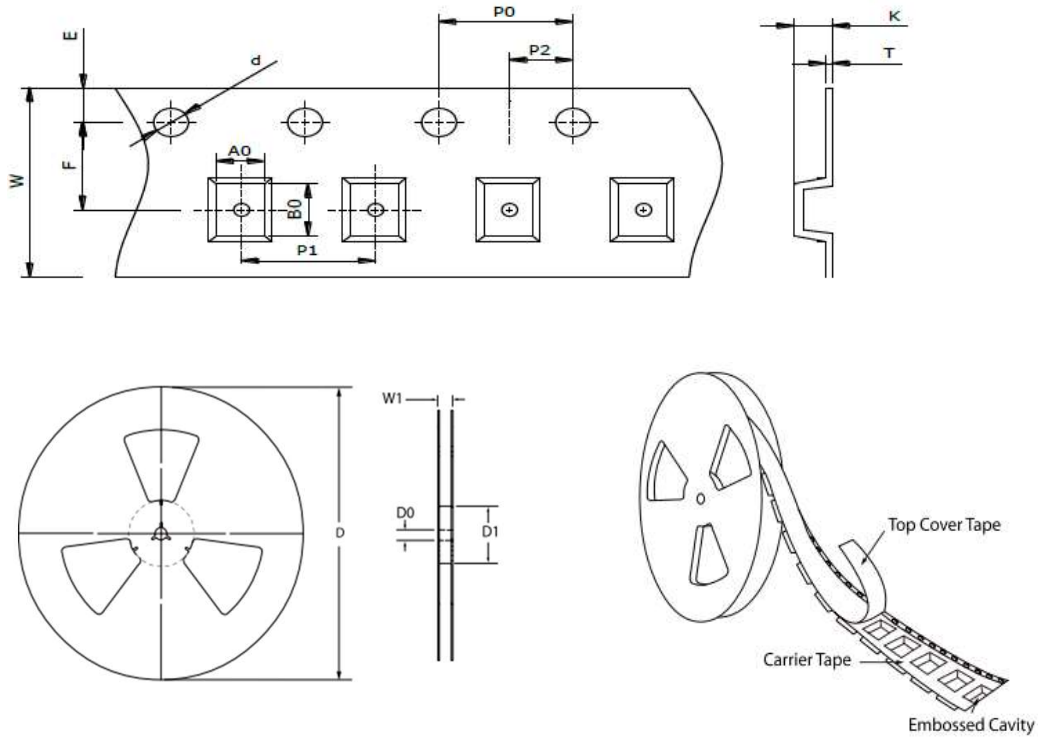
Fig.8 Diode Forward Voltage vs. Current



BSS138KWTH

N-Channel Enhancement Mode Field Effect Transistor

TAPE & REEL SPECIFICATION



Item	Symbol	SOT-523
Carrier width	A ₀	1.95 ± 0.10
Carrier length	B ₀	1.90 ± 0.10
Carrier depth	K	1.20 ± 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-523	7"	4,000

MARKING CODE

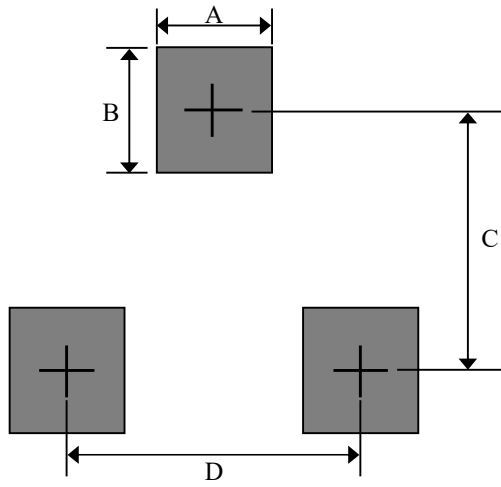
Part Number	Marking Code
BSS138KWTH	MR



BSS138KWTH

N-Channel Enhancement Mode Field Effect Transistor

SUGGESTED SOLDER PAD LAYOUT



Unit : mm

PACKAGE	A	B	C	D
SOT-523	0.70	0.70	1.30	1.00