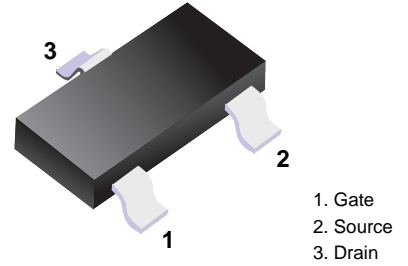


# BSS138

## N-Channel MOSFET



■ Simplified outline(SOT23)

### ■ Features

- $V_{DS} (V) = 50V$
- $I_D = 200 \text{ mA}$  ( $V_{GS} = 10V$ )
- $R_{DS(ON)} < 3.5 \Omega$  ( $V_{GS} = 10V$ )
- Fast Switching Speed
- Low On-Resistance

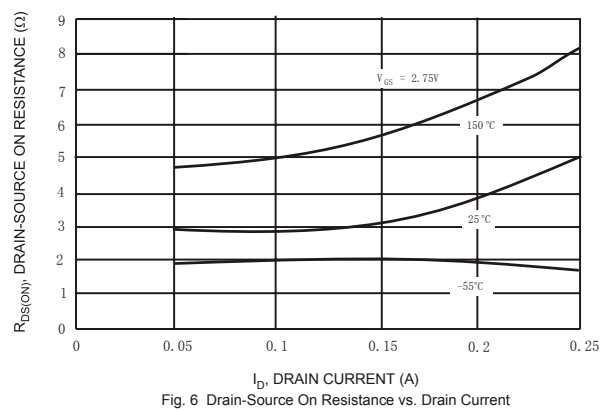
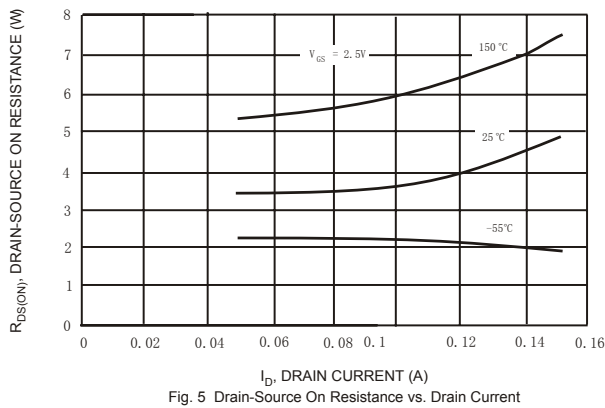
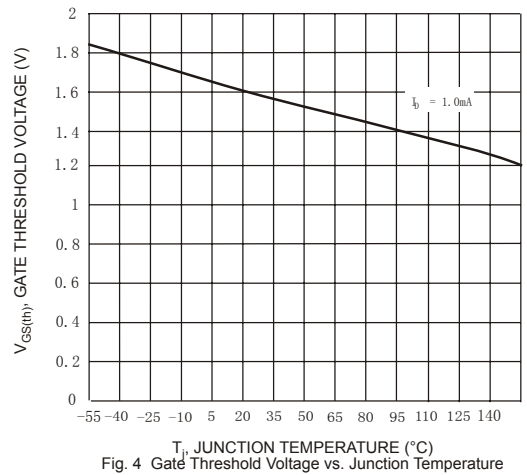
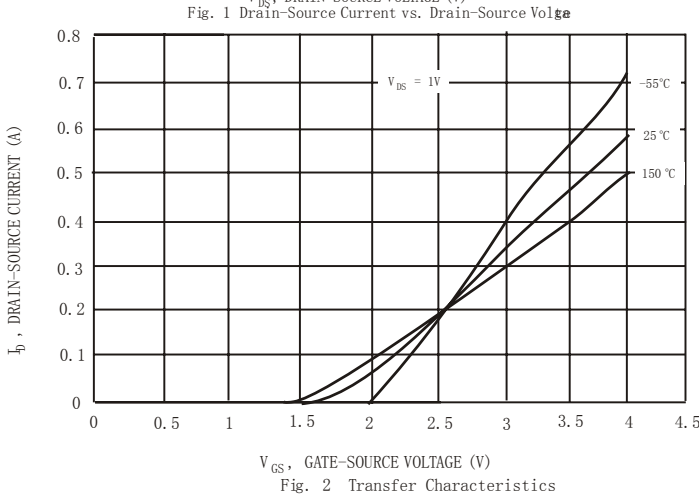
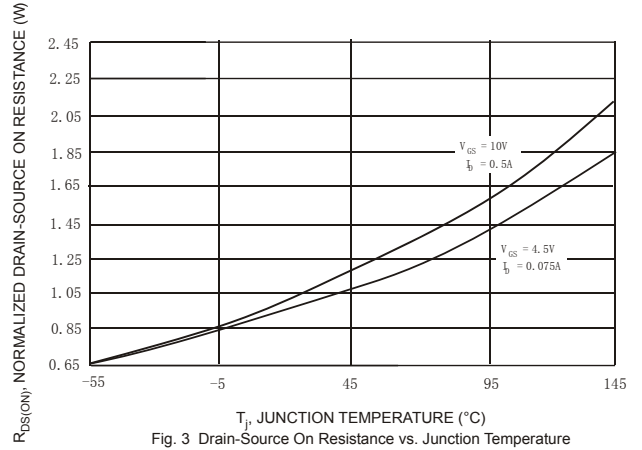
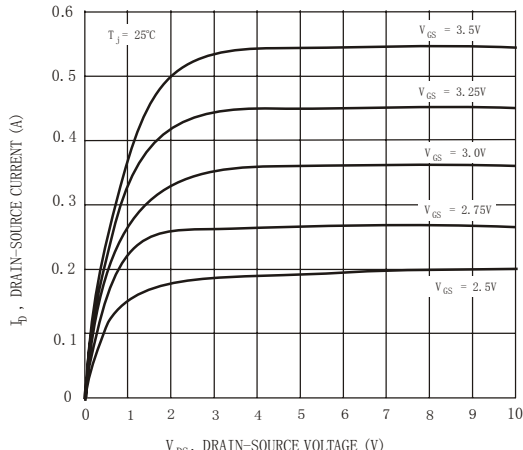
### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	50	V
Drain-Gate Voltage $R_{GS} \leq 20K\Omega$	$V_{DG}$	50	
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current	$I_D$	200	mA
Power Dissipation	$P_D$	300	mW
Thermal Resistance Junction- to-Ambient	$R_{thJA}$	417	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to 150	

### ■ Electrical Characteristics $T_a = 25^\circ\text{C}$

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{DSS}$	$I_D=250 \mu\text{A}, V_{GS}=0V$	50			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=50V, V_{GS}=0V$			0.5	$\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250 \mu\text{A}$	0.5		1.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=220\text{mA}$			3.5	$\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=25V, I_D=0.2A, f=1\text{KHz}$	100			mS
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=10V, f=1\text{MHz}$			50	pF
Output Capacitance	$C_{oss}$				25	
Reverse Transfer Capacitance	$C_{rss}$				8	
Turn-On DelayTime	$t_{d(on)}$	$V_{DS}=30V, I_D=0.2A, R_G=50 \Omega$			20	ns
Turn-Off DelayTime	$t_{d(off)}$				20	

■ Typical Characteristics



■ Typical Characteristics

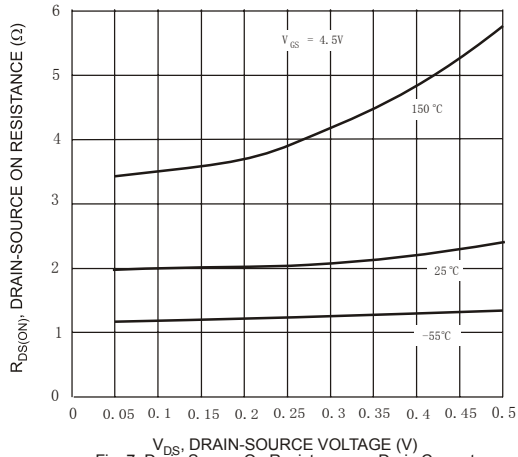


Fig. 7 Drain-Source On Resistance vs. Drain Current

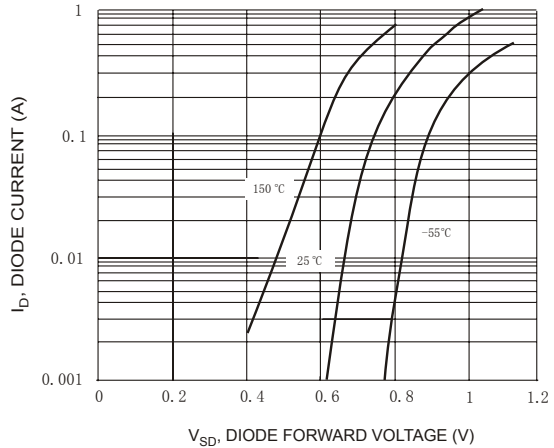


Fig. 9 Body Diode Current vs. Body Diode Voltage

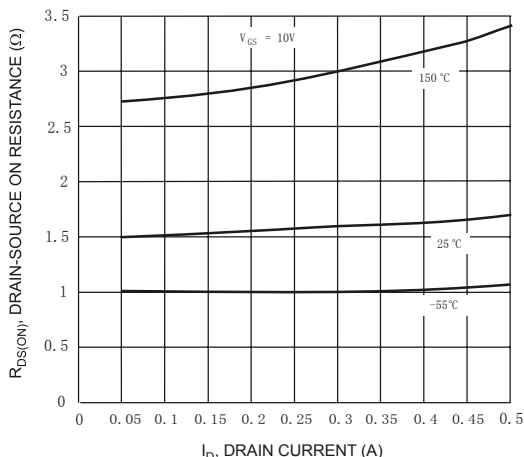


Fig. 8 Drain-Source On Resistance vs. Drain Current

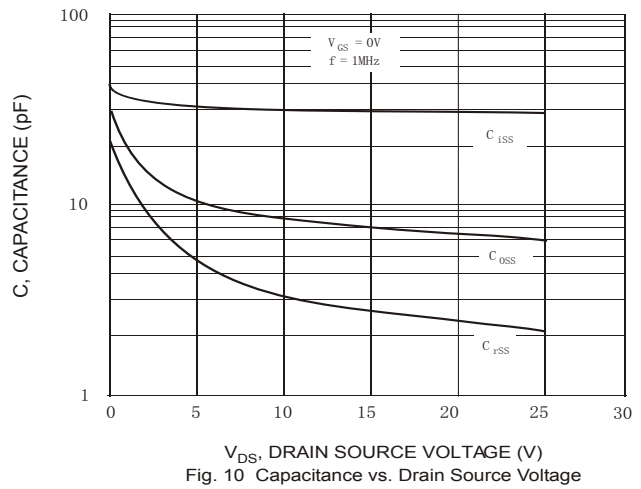
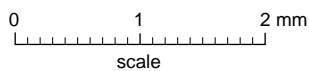
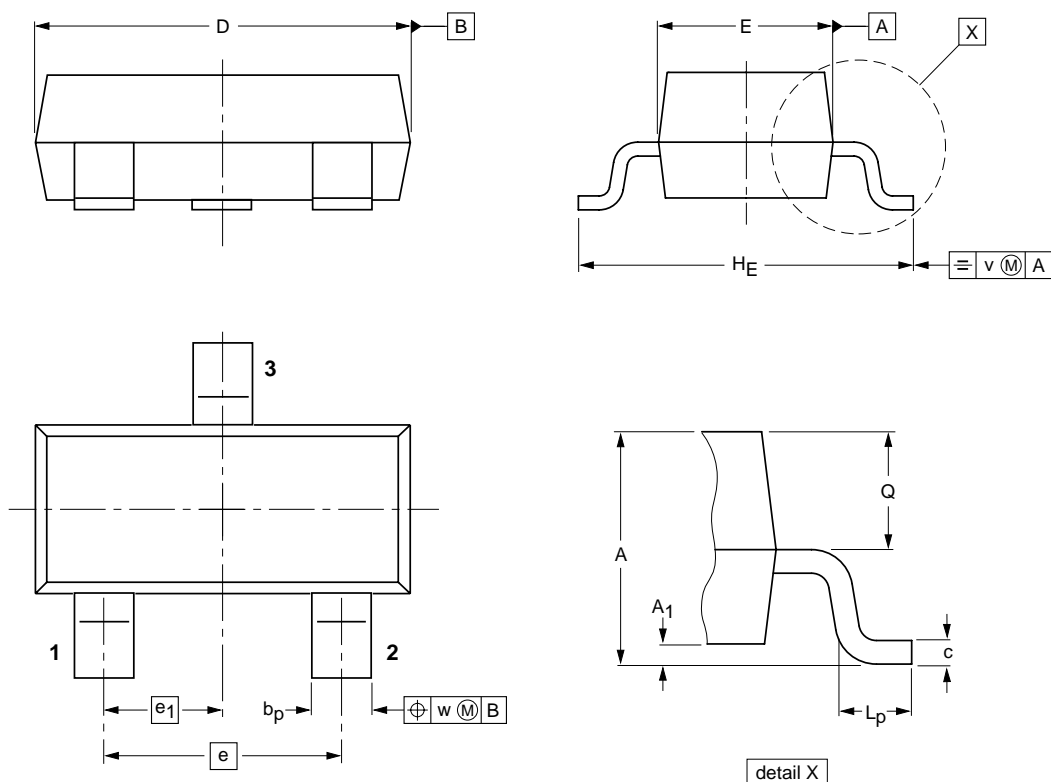


Fig. 10 Capacitance vs. Drain Source Voltage

■ SOT-23



**DIMENSIONS (mm are the original dimensions)**

UNIT	A	A <sub>1</sub> max.	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1