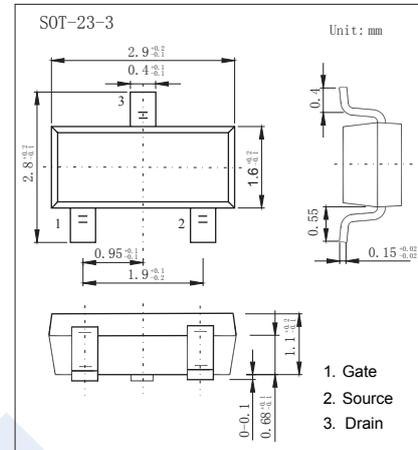


## N-Channel MOSFET

### BSS138E (KSS138E)

#### ■ Features

- $V_{DS} (V) = 50V$
- $I_D = 300 \text{ mA}$  ( $V_{GS} = 10V$ )
- $R_{DS(ON)} < 2.5 \Omega$  ( $V_{GS} = 10V$ )
- $R_{DS(ON)} < 3.5 \Omega$  ( $V_{GS} = 2.5V$ )
- Low On-Resistance
- ESD Rating: 1.5KV HBM



#### ■ 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	$I_D$	300	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	$I_{GSS}$	$V_{DS} = 0V$ , $V_{GS} = \pm 20V$			$\pm 10$	$\mu\text{A}$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 250 \mu\text{A}$	0.7		1.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 500\text{mA}$			2.5	$\Omega$
		$V_{GS} = 2.5V$ , $I_D = 500\text{mA}$			3.5	
Forward Transconductance	$g_{FS}$	$V_{DS} = 25V$ , $I_D = 0.3A$ , $f = 1\text{KHz}$	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	$t_{d(on)}$	$V_{DS} = 30V$ , $I_D = 0.3A$ , $R_G = 50 \Omega$			20	ns
Turn-Off DelayTime	$t_{d(off)}$				20	

#### ■ Marking

Marking	K38
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# N-Channel MOSFET

## BSS138E (KSS138E)

■ Typical Characteristics

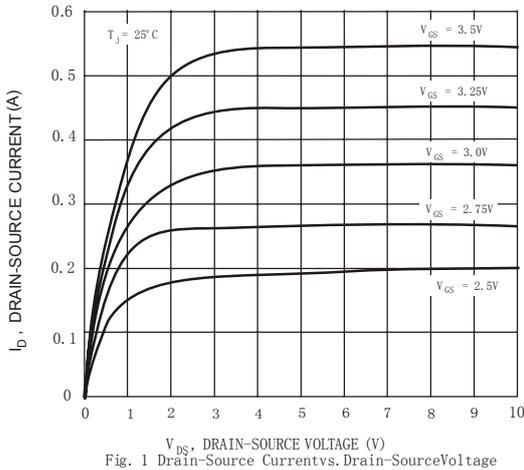


Fig. 1 Drain-Source Current vs. Drain-Source Voltage

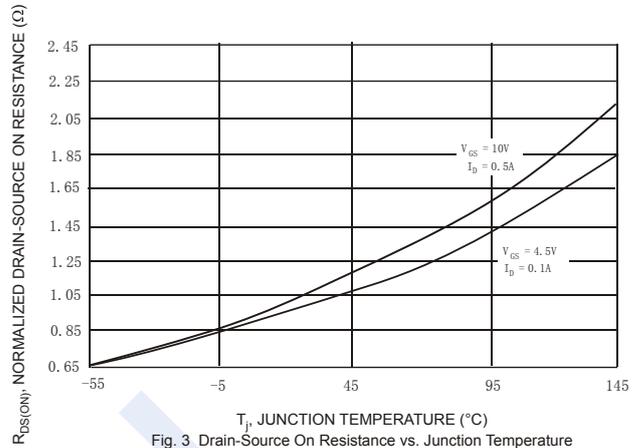


Fig. 3 Drain-Source On Resistance vs. Junction Temperature

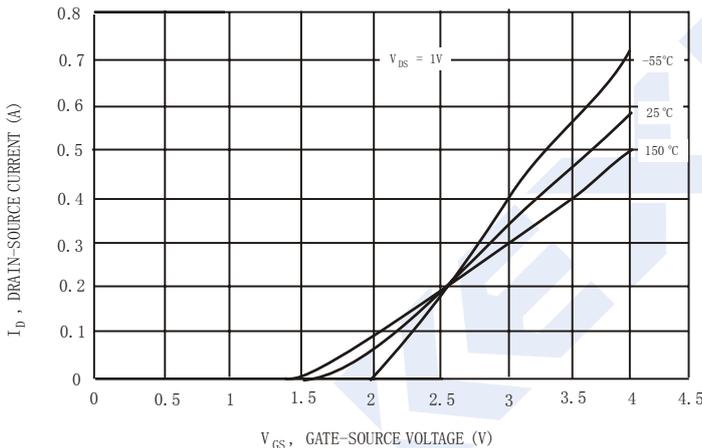


Fig. 2 Transfer Characteristics

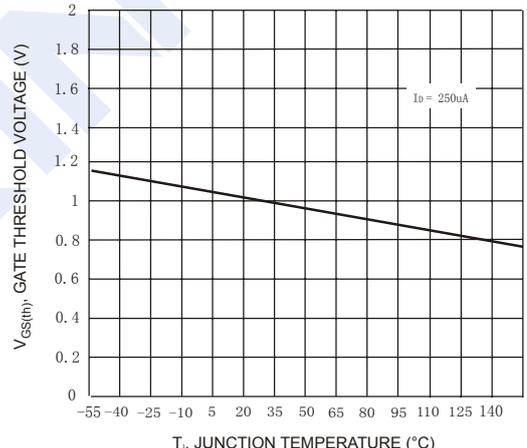


Fig. 4 Gate Threshold Voltage vs. Junction Temperature

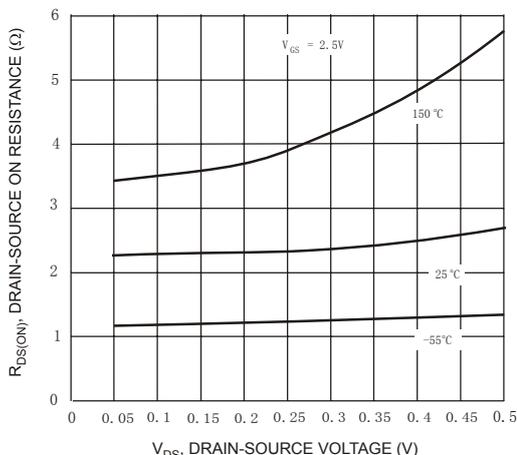


Fig. 5 Drain-Source On Resistance vs. Drain Current

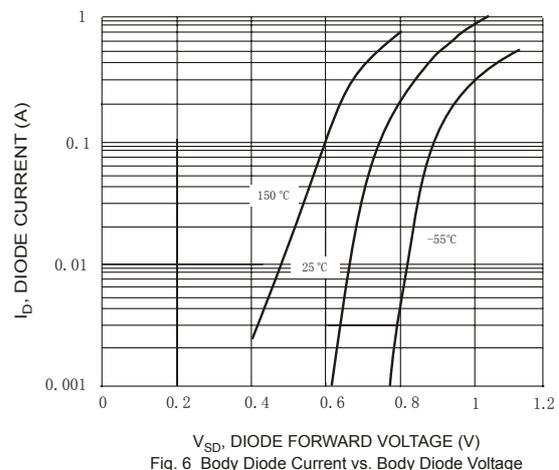


Fig. 6 Body Diode Current vs. Body Diode Voltage

## N-Channel MOSFET BSS138E (KSS138E)

■ Typical Characteristics

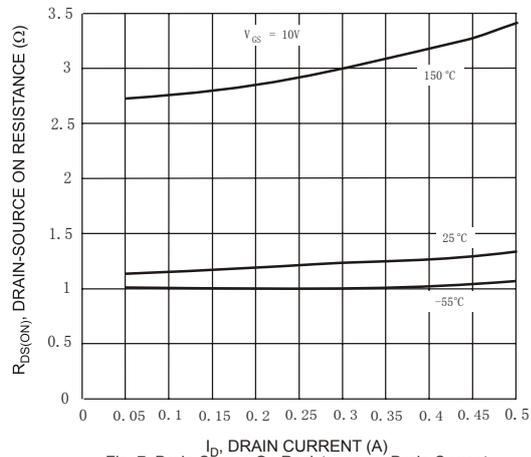


Fig. 7 Drain-Source On Resistance vs. Drain Current

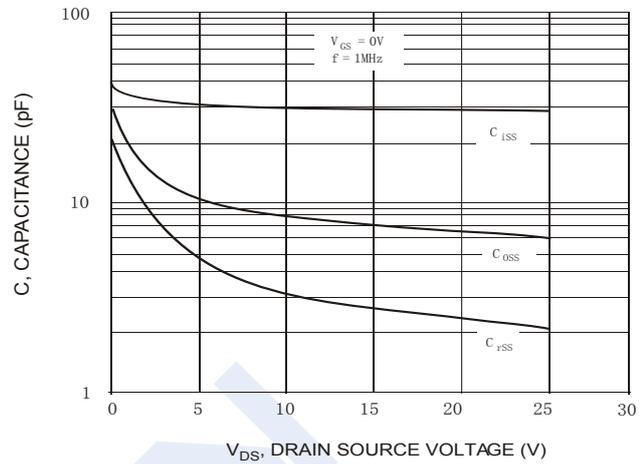


Fig. 8 Capacitance vs. Drain Source Voltage