



## BSS123

### 100V N-Channel Enhancement Mode MOSFET – ESD Protected

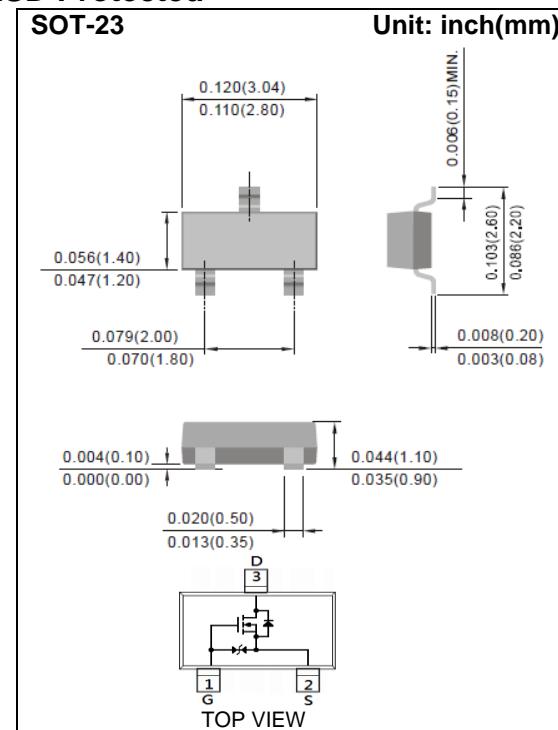
**Voltage** 100 V **Current** 170 mA

#### Features

- RDS(ON) , VGS@10V, ID@170mA<6Ω
- RDS(ON) , VGS@4.5V, ID@130mA<10Ω
- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application, etc
- ESD Protected 2KV HBM
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

#### Mechanical Data

- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026



#### Maximum Ratings and Thermal Characteristics ( $T_A=25^\circ C$ unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNITS
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	170	mA
Pulsed Drain Current <sup>(Note 4)</sup>	$I_{DM}$	680	mA
Power Dissipation	$T_a=25^\circ C$	500	mW
	Derate above $25^\circ C$	4	$mW/^\circ C$
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ C$
Typical Thermal Resistance - Junction to Ambient <sup>(Note 3)</sup>	$R_{\theta JA}$	250	$^\circ C/W$



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### Electrical Characteristics ( $T_A=25^\circ C$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.7	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=170mA$	-	4	6	$\Omega$
		$V_{GS}=4.5V, I_D=130mA$	-	4.5	10	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 10$	$\mu A$
<b>Dynamic</b> <small>(Note 5)</small>						
Total Gate Charge	$Q_g$	$V_{DS}=30V, I_D=170mA,$ $V_{GS}=10V$ <small>(Note 1,2)</small>	-	1.8	-	nC
Gate-Source Charge	$Q_{gs}$		-	0.4	-	
Gate-Drain Charge	$Q_{gd}$		-	0.3	-	
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0MHz$	-	45	-	pF
Output Capacitance	$C_{oss}$		-	14	-	
Reverse Transfer Capacitance	$C_{rss}$		-	7.8	-	
Turn-On Delay Time	$td_{(on)}$	$V_{DD}=30V, I_D=170mA,$ $V_{GS}=10V,$ $R_G=6\Omega$ <small>(Note 1,2)</small>	-	3.4	-	ns
Turn-On Rise Time	$tr$		-	19	-	
Turn-Off Delay Time	$td_{(off)}$		-	8.2	-	
Turn-Off Fall Time	$tf$		-	20	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_s$	---	-	-	170	mA
Diode Forward Voltage	$V_{SD}$	$I_s=170mA, V_{GS}=0V$	-	0.9	1.3	V

NOTES :

1. Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$
2. Essentially independent of operating temperature typical characteristics.
3.  $R_{QJA}$  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 FR-4 with 2oz. square pad of copper.
4. The maximum current rating is package limited.
5. Guaranteed by design, not subject to production testing.



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## TYPICAL CHARACTERISTIC CURVES

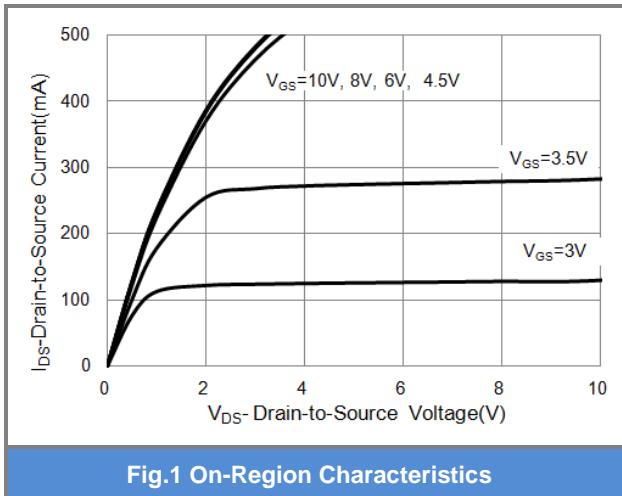


Fig.1 On-Region Characteristics

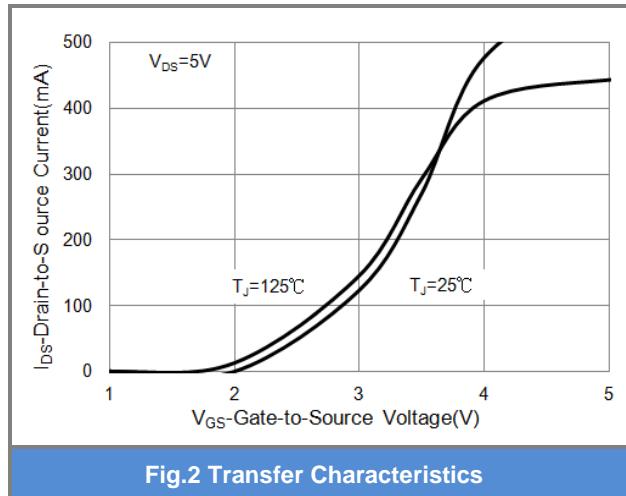


Fig.2 Transfer Characteristics

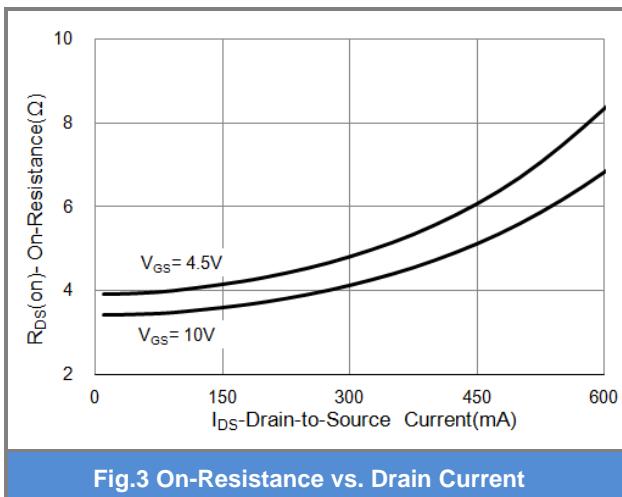


Fig.3 On-Resistance vs. Drain Current

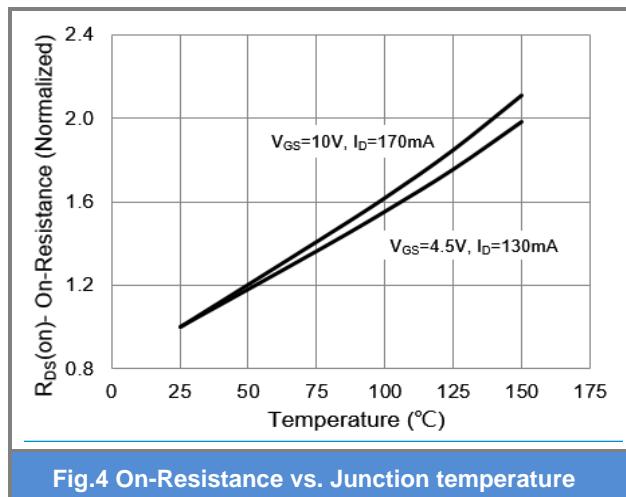


Fig.4 On-Resistance vs. Junction temperature

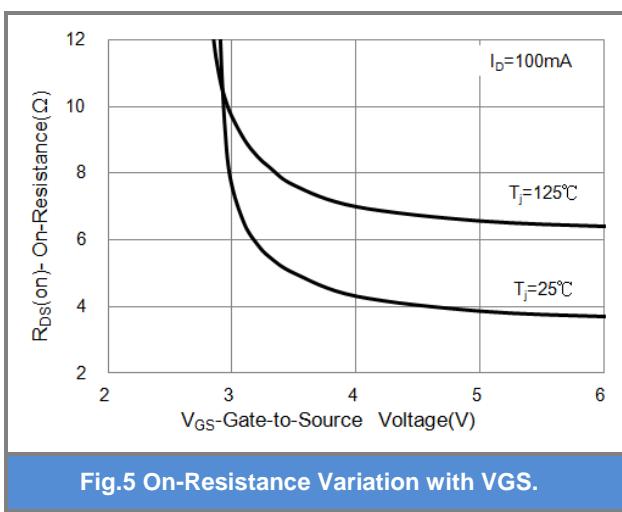


Fig.5 On-Resistance Variation with VGS.

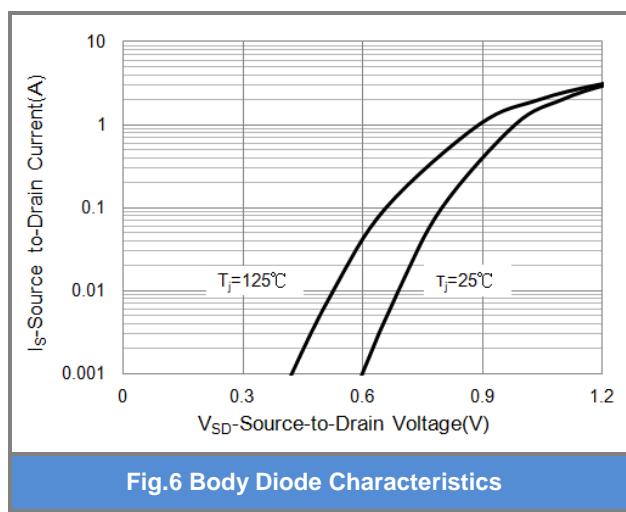


Fig.6 Body Diode Characteristics



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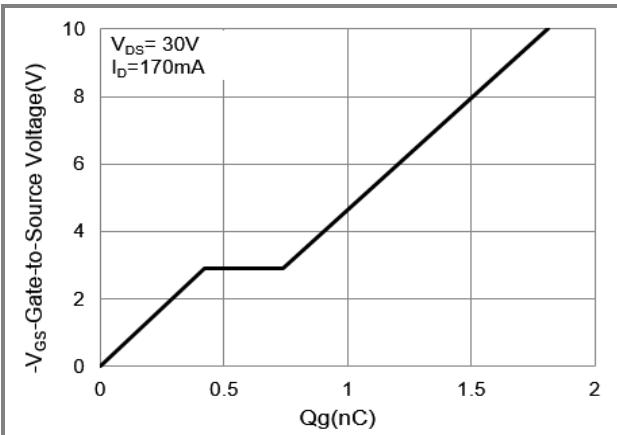


Fig.7 Gate-Charge Characteristics

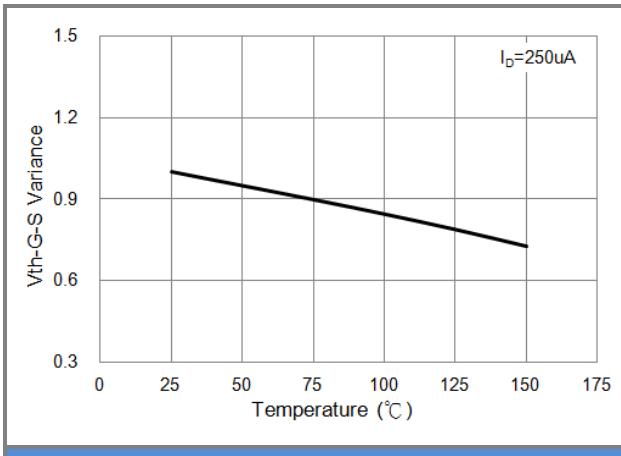


Fig.8 Threshold Voltage Variation with Temperature

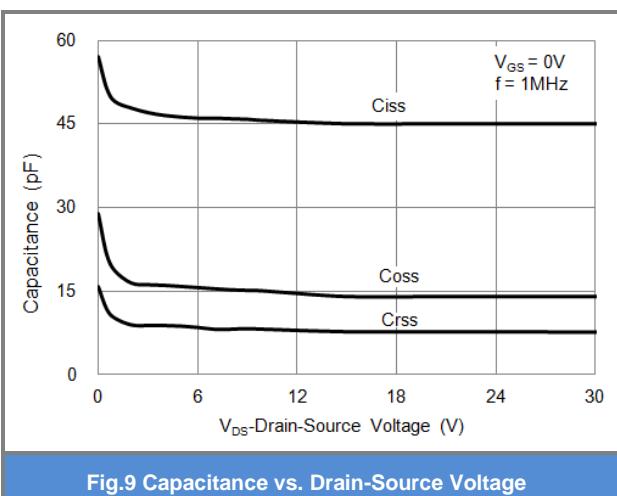


Fig.9 Capacitance vs. Drain-Source Voltage

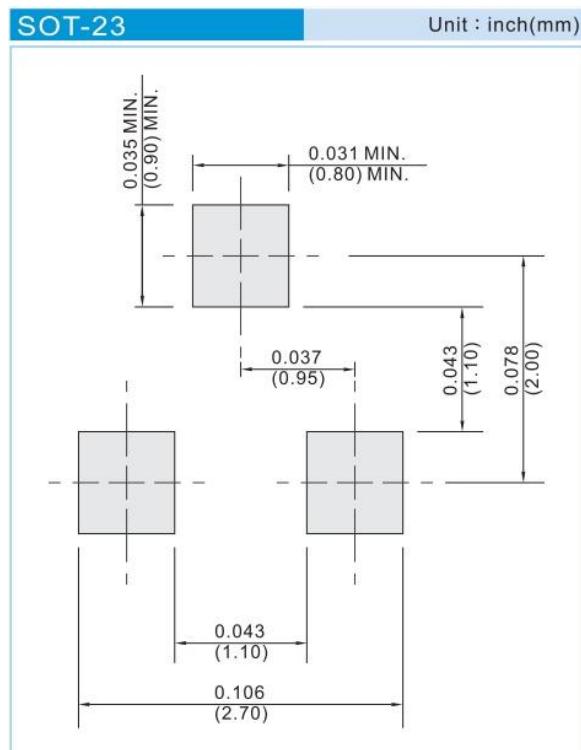


## BSS123

### PART NO PACKING CODE VERSION

PART NO PACKING CODE	Package Type	Packing Type	Marking	Version
BSS123_R1_00001	SOT-23	3K pcs / 7" reel	A76	Halogen free
BSS123_R2_00001	SOT-23	12K pcs / 13" reel	A76	Halogen free

### MOUNTING PAD LAYOUT





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