



BSS123

100V N-Channel Enhancement Mode MOSFET – ESD Protected

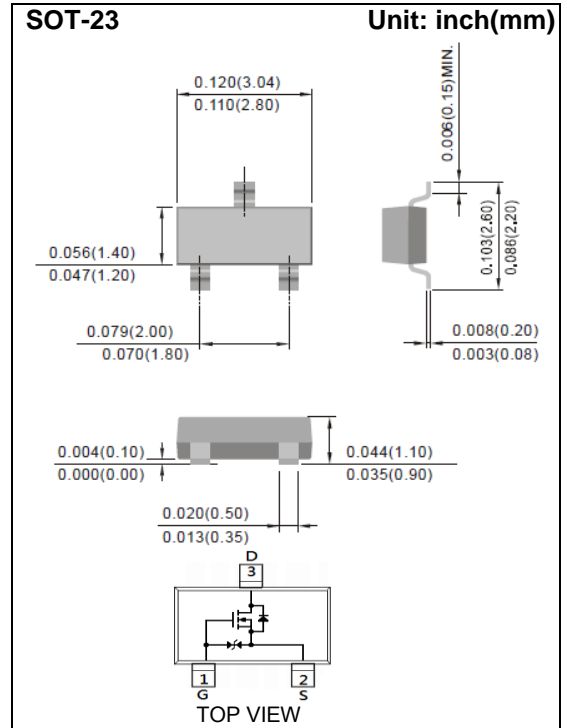
Voltage 100 V **Current** 170 mA

Features

- $R_{DS(ON)}$, $V_{GS}@10V$, $I_D@170mA < 6\Omega$
- $R_{DS(ON)}$, $V_{GS}@4.5V$, $I_D@130mA < 10\Omega$
- 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}	+20	V	
Continuous Drain Current	I_D	170	mA	
Pulsed Drain Current ^(Note 4)	I_{DM}	680	mA	
Power Dissipation	P_D	$T_a=25^\circ C$	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	$R_{\theta JA}$	250	$^\circ C/W$	
- Junction to Ambient ^(Note 3)				



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Electrical Characteristics (T_A=25 °C unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	100	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1	1.7	2.5	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =170mA	-	4	6	Ω
		V _{GS} =4.5V, I _D =130mA	-	4.5	10	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =80V, V _{GS} =0V	-	-	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±10	uA
Dynamic (Note 5)						
Total Gate Charge	Q _g	V _{DS} =30V, I _D =170mA, V _{GS} =10V (Note 1,2)	-	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	t _{d(on)}	V _{DD} =30V, I _D =170mA, V _{GS} =10V, R _G =6Ω (Note 1,2)	-	3.4	-	ns
Turn-On Rise Time	t _r		-	19	-	
Turn-Off Delay Time	t _{d(off)}		-	8.2	-	
Turn-Off Fall Time	t _f		-	20	-	
Drain-Source Diode						
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 ≤ 300us, Duty cycle ≤ 2%
2. Essentially independent of operating temperature typical characteristics.
3. R_{θJA} 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

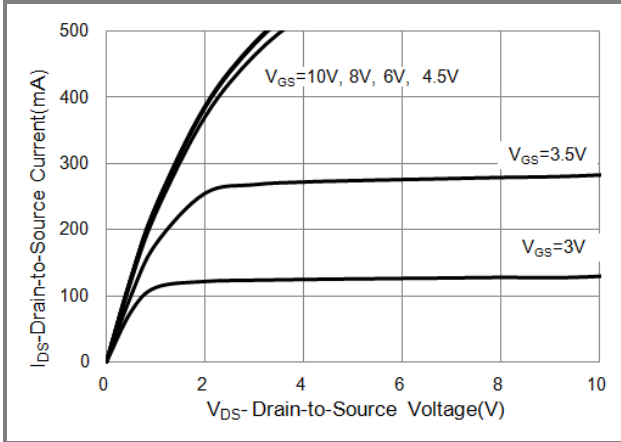


Fig.1 On-Region Characteristics

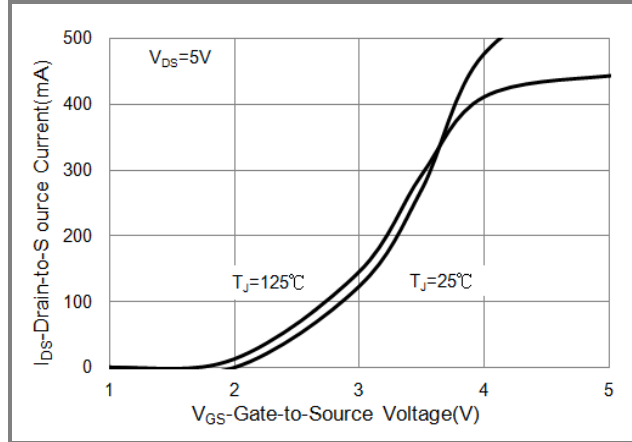


Fig.2 Transfer Characteristics

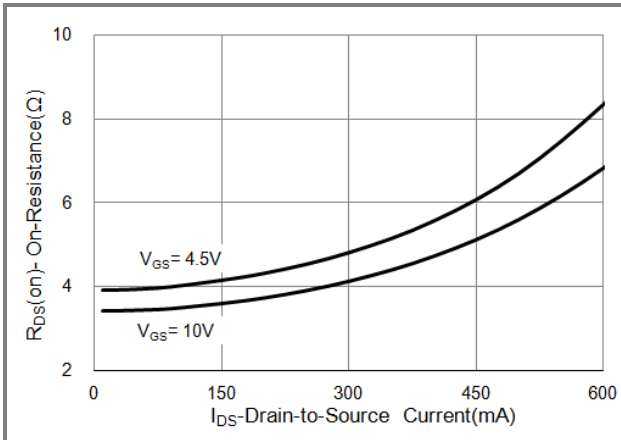


Fig.3 On-Resistance vs. Drain Current

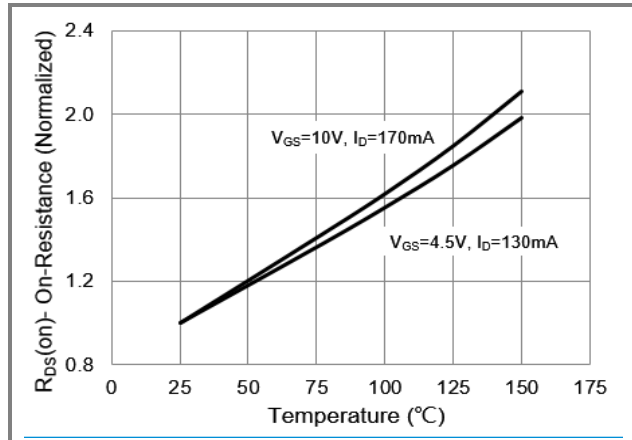


Fig.4 On-Resistance vs. Junction temperature

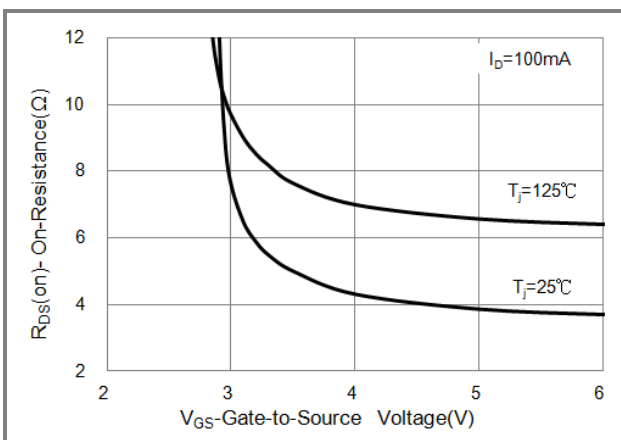


Fig.5 On-Resistance Variation with VGS.

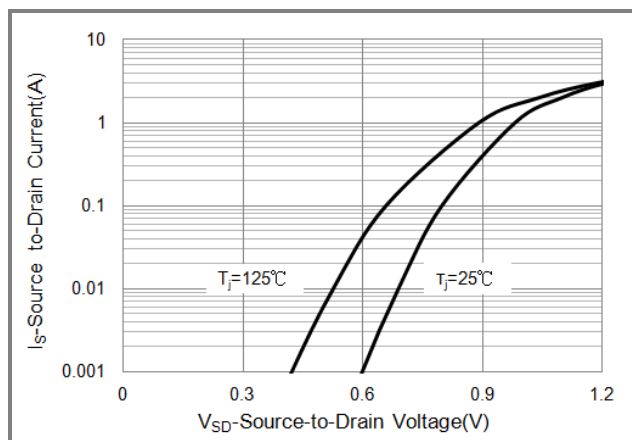


Fig.6 Body Diode Characteristics



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TYPICAL CHARACTERISTIC CURVES

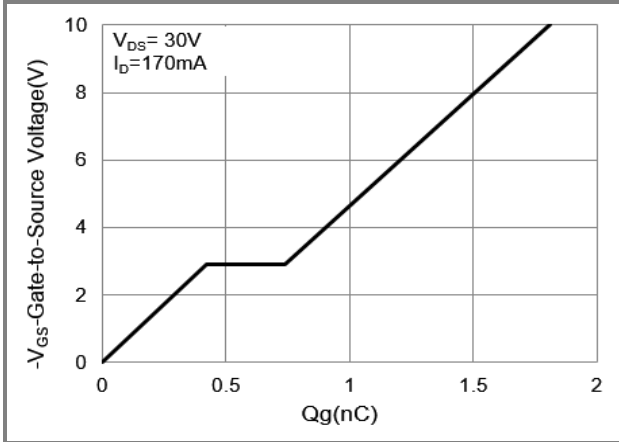


Fig.7 Gate-Charge Characteristics

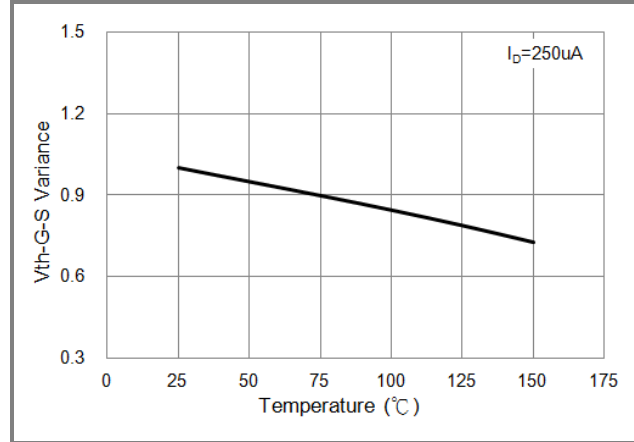


Fig.8 Threshold Voltage Variation with Temperature

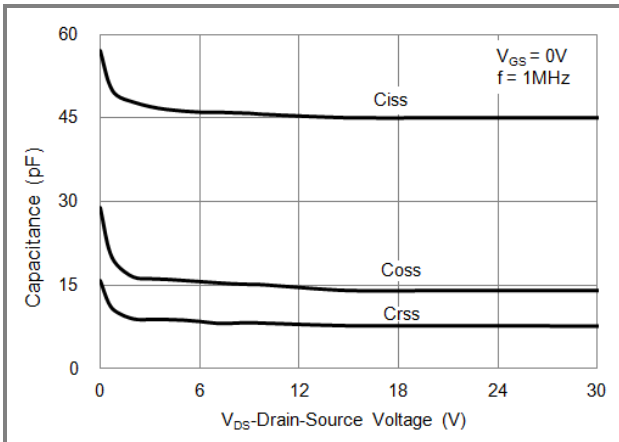


Fig.9 Capacitance vs. Drain-Source Voltage

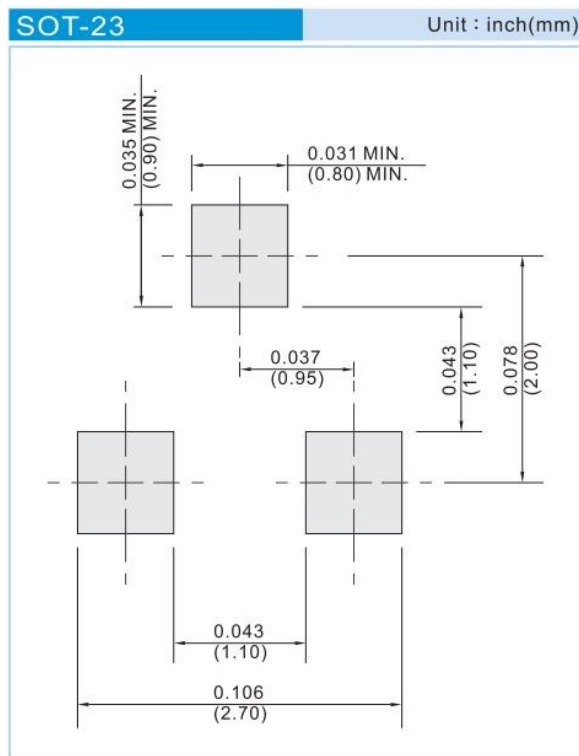


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PART NO PACKING CODE VERSION

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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