

BSS123W

100V N-Channel Enhancement Mode MOSFET

1. Description

This 100V N-channel MOSFET is based on MDD's unique device design to achieve low $R_{DS(on)}$ and fast switching.

2. Features

- $V_{DS}=100V$, $I_D=170mA$, $R_{DS(on)typ}=3.5\Omega$ @ $V_{GS}=10V$
- Epoxy meets UL-94 V-0 flammability rating and halogen free
- Moisture Sensitivity Level 1
- High temperature soldering guaranteed $260^{\circ}C/10$ seconds at terminals

3. Application

- Direct logic-level interface:TTL/CMOS
- Solid-state relays
- Battery operated systems

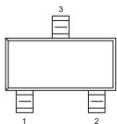
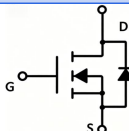
4. Absolute Maximum Ratings($T_A=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	170	mA
Power Dissipation	P_D	200	mW
Thermal Resistance From Junction to Ambient	$R_{\theta JA}$	625	$^{\circ}C/W$
Storage Temperature	T_{stg}	$-55\sim+150$	$^{\circ}C$
Junction Temperature	T_J	$-55\sim+150$	$^{\circ}C$

- Stresses exceeding Maximum Ratings may damage the device.
- Maximum Ratings are stress ratings only.
- Functional operation above the Recommended Operating Conditions is not implied.
- Extended exposure to stresses above the recommended Operating Conditions may affect device reliability

Notes: Device mounted on an FR4 Pinned-Circuit Board(PCB), single-side copper, tin-plated and standard footprint.

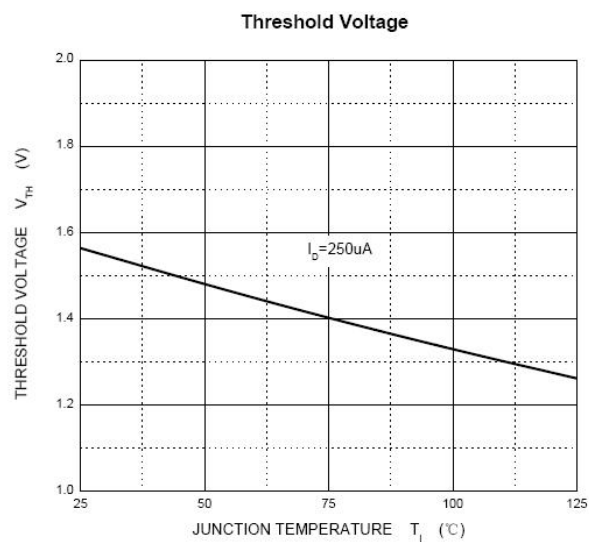
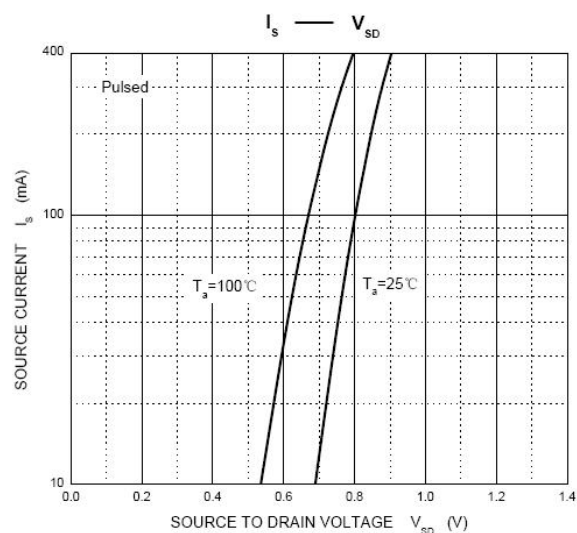
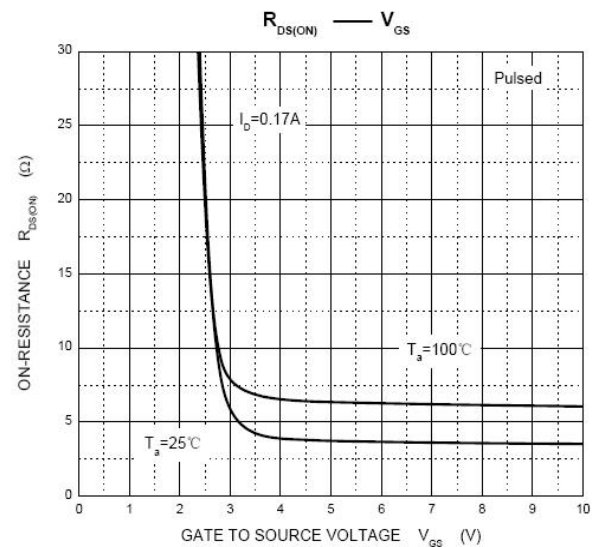
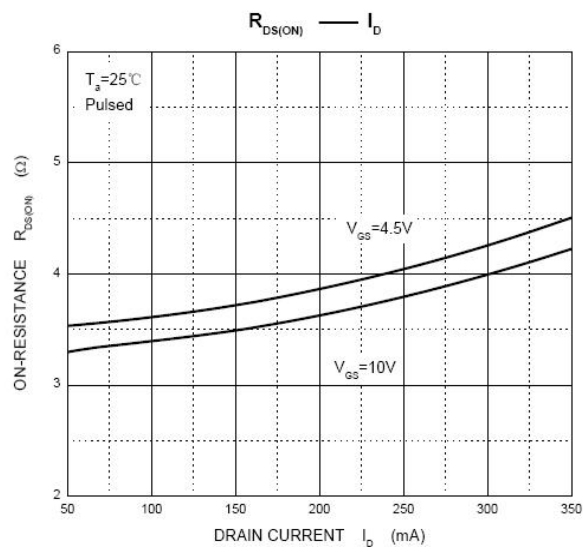
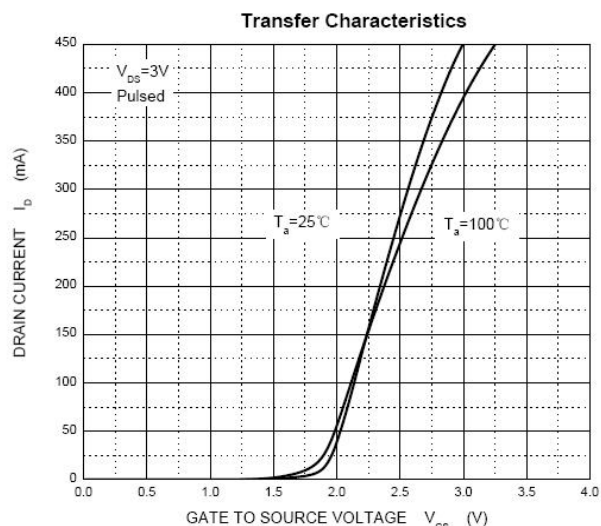
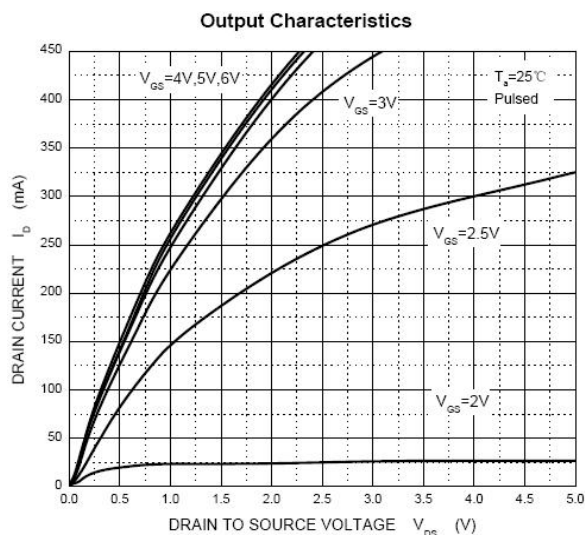
5. Pinning information

Pin	Symbol	Description	Simplified outline	Equivalent Circuit	Marking	Package
1	G	Gate			B123	SOT-323
2	S	Source				
3	D	Drain				

6. $T_A=25^{\circ}\text{C}$ unless otherwise specified

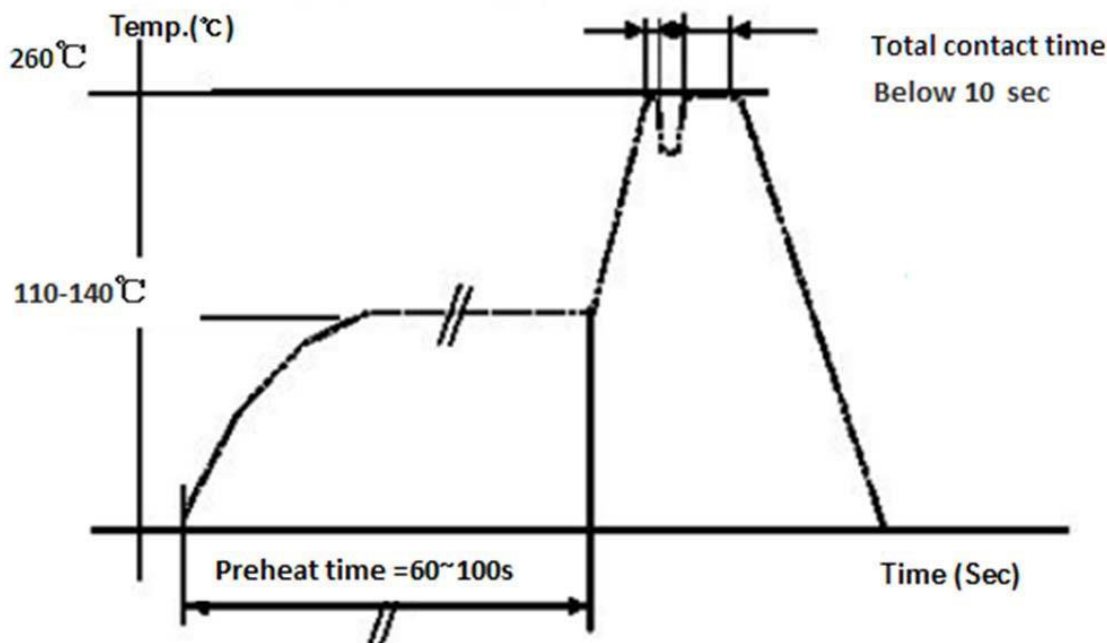
Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{DS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	—	—	V
$V_{TH(GS)}$	Gate-Threshold Voltage*	$V_{DS}=V_{GS}, I_D=1mA$	0.8	1.4	2.0	V
I_{GSS}	Gate-body Leakage	$V_{DS}=0V, V_{GS}=\pm 20V$	—	—	± 50	nA
I_{DSS}	Zero Gate Voltage Drain current	$V_{DS}=100V, V_{GS}=0V$	—	—	1	μA
$R_{DS(ON)}$	Drain-Source On-Resistance*	$V_{GS}=10V, I_D=170mA$	—	3.5	6	Ω
		$V_{GS}=4.5V, I_D=170mA$	—	3.8	10	Ω
V_{SD}	Diode Forward voltage	$V_{GS}=0V, I_S=340mA$	—	—	1.3	V
I_S	Maximum Body-Diode Continuous Current		—	—	170	mA
Q_{gs}	Gate-Source Charge	$V_{GS}=10V$ $V_{DS}=10V$ $I_D=0.22A$	—	1.4	2	nC
Q_{gd}	Output Capacitance		—	0.15	0.25	nC
Q_g	Reverse Transfer Capacitance		—	0.2	0.4	nC
C_{iss}	Input capacitance	$V_{GS}=0V$ $V_{DS}=25V$ $f=1MHz$	—	29	60	pF
C_{oss}	Output capacitance		—	10	15	pF
C_{rss}	Reverse transfer capacitance		—	2	6	pF
$t_{d(on)}$	Turn on Delay Time	$V_{GS}=10V$ $V_{DD}=30V$ $I_D=280mA$ $R_{GEN}=50\Omega$	—	—	8	nS
t_r	Turn on Rise Time		—	—	8	nS
$t_{d(off)}$	Turn Off Delay Time		—	—	13	nS
t_f	Turn Off Fall Time		—	—	16	nS

7. Electrical Characteristics Diagrams

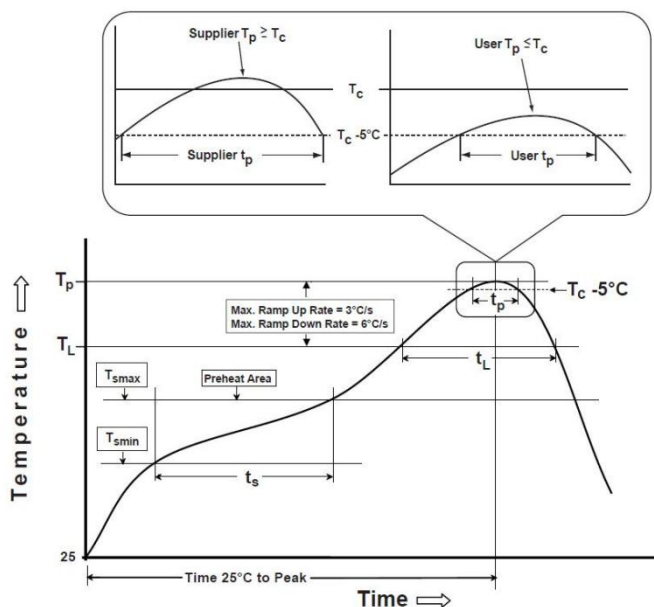


8. Recommended Soldering Profile for Rectifier Diodes

a)Wave Soldering Profile



b)Reflow Soldering Profile(PbFreeApplication),refer to IPC/JEDEC J-STD-020



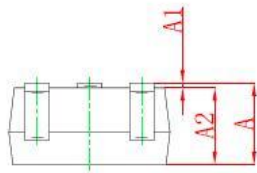
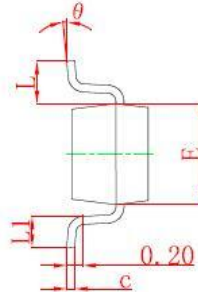
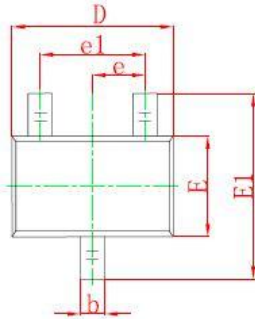
Preheat/Soak Temperature Min (T _{sm} in) Temperature Max (T _{sm} max) Time (ts) from (T _{sm} in to T _{sm} max)	50 °C 200 °C 60-120 seconds
Melting Point of Solder (Sn Ag Cu)	217°C
Ramp-up Rate to 217°C (Melting Point of Solder)	3°C/sec
Time at Temp. >217°C (Melting Point of Solder)	60~150 Sec
Peak Temperature	255±5°C
Time within 5°C below Peak Temp.	20~40 Sec
Cooling Rate	6°C/sec (max)
Time from 25°C to Peak Temp.	8min (max)

c)Manual Soldering

When using an electric soldering iron for manual soldering, it is recommended that the temperature does not exceed 300°C and the soldering time is less than 10 seconds.

9. Outline Drawing

SOT-323 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
theta	0°	8°	0°	8°

10. Important Notice and Disclaimer

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