

# Bridge Rectifiers, Single-Phase, MicroDIP, 1 A

## MDB8S Series

MDB6S / MDB8S / MDB10S

### Description

With the ever pressing need to improve power supply efficiency and reliability, the MDBxS family is focused on offering a best in class small form factor combined with best in class efficient rectifier performance.

The “S” family offers industry leading balance of efficiency, size, and cost. They offer designers improved efficiency by achieving an industry leading  $V_F$  of 0.935 V Typ. at 1 A 25°C, and a  $V_F$  of 1.165 V Typ. at 5 A 25°C. These lower  $V_F$  values offer roughly a 5% efficiency improvement over measured competitive same form factor devices. This lower  $V_F$  vs. competitive devices results in cooler and more efficient power supply operation.

The design supports a 30 A  $I_{FSM}$  rating to absorb high surge currents and offers rated breakdown voltages up to 1000 V.

Finally, the MDBxS family achieves all this in a small form factor micro-dip package – offering a max height of 1.6 mm, and requiring only 35 mm<sup>2</sup> of board space.

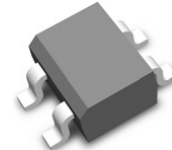
### Features

- Low Package Profile: 1.60 mm (max)
- Small Area Requirements: 35 mm<sup>2</sup>
- Efficient  $V_F$ 
  - ◆ 0.935 V (Typ) at 1 A
  - ◆ 1.165 V (Typ) at 5 A
- $I_F(AV) = 1.0$  A
- $I_{FSM} = 30$  A
- Glass Passivated Junctions
- UL Certification: E352360
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

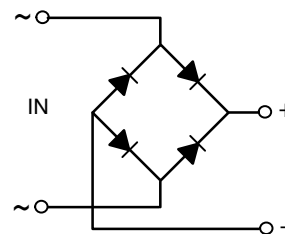


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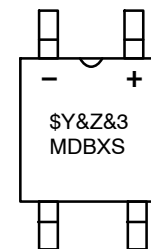
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TSSOP4  
5.0x4.4  
CASE 948BS



### MARKING DIAGRAM



\$Y = ON Semiconductor Logo  
&Z = Assembly Plant Code  
&3 = 3-Digit Data Code (Year & Week)  
MDBXS = Specific Device Code  
X = 6, 8, 10

### ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

# MDB8S Series

## ABSOLUTE MAXIMUM RATINGS

(Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Value			Units
		MDB6S	MDB8S	MDB10S	
$V_{RRM}$	Maximum Repetitive Peak Reverse Voltage	600	800	1000	V
$V_{RMS}$	Maximum RMS Voltage	420	560	700	V
$V_{DC}$	Maximum DC Blocking Voltage	600	800	1000	V
$I_{F(AV)}$	Average Rectified Forward Current (Note 1)	1.0			A
$I_{FSM}$	Peak Forward Surge Current (Note 2)	30			A
$I^2t$	$I^2t$ Rating for fusing ( $t < 8.3$ ms)	3.735			$\text{A}^2\text{S}$
$T_J$	Operating Junction Temperature Range	-55 to +150			$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to +150			$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

- 60 Hz sine wave, R-load,  $T_A = 25^\circ\text{C}$  on FR-4 PCB.
- 60 Hz sine wave, Non-repetitive 1 cycle peak value,  $T_J = 25^\circ\text{C}$ .

## THERMAL CHARACTERISTICS (Note 3)

Symbol	Parameter	Value	Typ.	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	Measurement with Dual Dice	250	$^\circ\text{C}/\text{W}$
		Measurement with Single Die	150	$^\circ\text{C}/\text{W}$
$\Psi_{JL}$	Thermal Characterization Junction to Lead	Pin 2	57	$^\circ\text{C}/\text{W}$
		Pin 1, 3, 4	15	$^\circ\text{C}/\text{W}$

- Device mounted on FR-4 PCB with board size = 76.2 mm x 114.3 mm (JESD51-3 standards).

## ELECTRICAL CHARACTERISTICS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Value	Unit
$V_F$	Maximum Forward Voltage	$I_F = 1$ A, Pulse measurement, Per diode	1.1	V
$I_R$	Maximum Reverse Current	At $V_{RRM}$ , Pulse measurement, Per diode	10	$\mu\text{A}$
$C_J$	Typical Junction Capacitance	$V_R = 4$ V, $f = 1$ MHz	10	pF

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

## ORDERING INFORMATION

Part Number	Marking	Package	Shipping <sup>†</sup>
MDB6S	MDB6S	TSSOP4 5.0x4.4 / Micro-DIP	5000 / Tape & Reel
MDB8S	MDB8S		
MDB10S	MDB10S		

# MDB8S Series

## TYPICAL PERFORMANCE CHARACTERISTICS

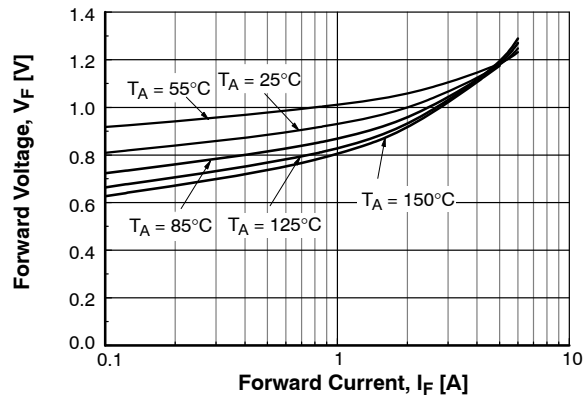


Figure 1. Forward Voltage vs. Forward Current (Per Diode)

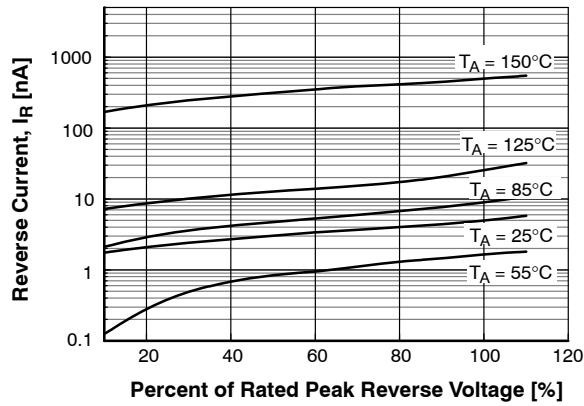


Figure 2. Typical Reverse Current Characteristic (Per Diode)

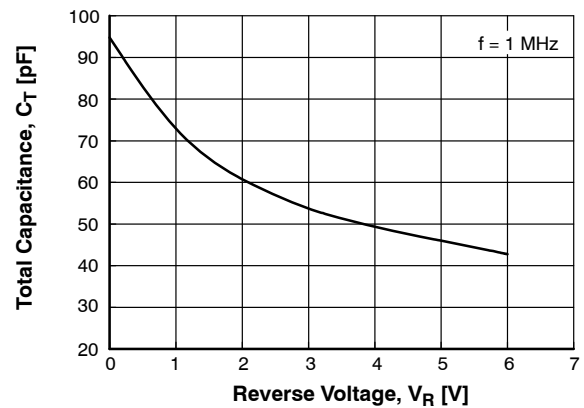


Figure 3. Total Capacitance

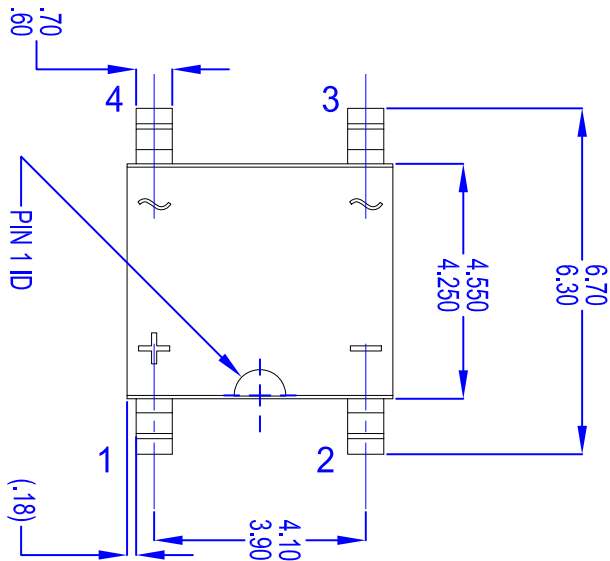
**MECHANICAL CASE OUTLINE**  
**PACKAGE DIMENSIONS**

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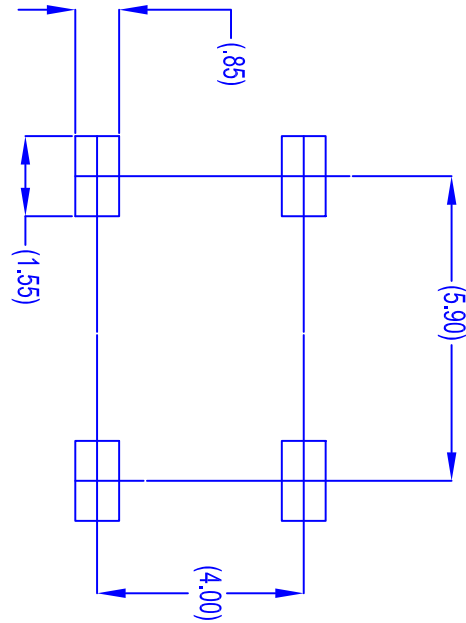


TSSOP4 5.0x4.4 / Micro-DIP  
CASE 948BS  
ISSUE O

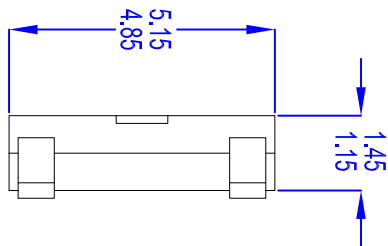
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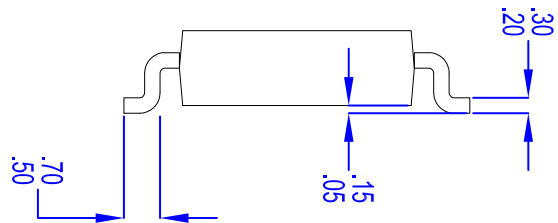
TOP VIEW



LAND PATTERN RECOMMENDATION



SIDE VIEW



END VIEW

NOTES:

- A. THIS PACKAGE DOES NOT CONFORM TO ANY REFERENCE STANDARD.
- B. ALL DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS.

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<b>DESCRIPTION:</b>	<b>TSSOP4 5.0x4.4 / Micro-DIP</b>	<b>PAGE 1 OF 1</b>

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