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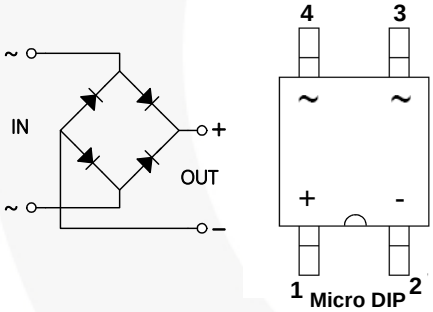
Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

November 2014

MDB10SV
1.2 A, 1000 V, Micro-DIP, Single-Phase Bridge Rectifier

Features

- Optimized V_F: 1.015 V Maximum at 1.2 A
- $I_{F(AV)}$ = 1.2 A
- I_{FSM} = 50 A
- MDB10SS and MDB10S Socket Compatible
- Glass-Passivated Junctions
- Requires Only 35 mm^2 of Board Space
- Low Package Profile: 1.45 mm Typical, 1.60 mm Maximum
- RoHS Compliant
- Halogen Free
- Qualified with IR/convection Solder Reflow (J-STD-020) and Wave Soldering (JESD22-A111)



Description

With the ever-pressing need to improve power supply efficiency and reliability, the MDB10SV sets a new standard in small form-factor, efficient, robust, bridge rectifier performance.

The design offers improved efficiency by achieving a 1.2 A V_F of 1.015 V maximum at 25°C. This lower V_F results in cooler and more efficient power supply operation.

The design enhances reliability with a 50 A I_{FSM} rating to absorb high surge currents, improved I^2t ratings, and supporting a rated breakdown voltage of 1000 V.

Finally, the MDB10SV achieves all this in a small form-factor micro-DIP package, offering a maximum height of 1.6 mm, and requiring only 35 mm^2 of board space.

Ordering Information

Part Number	Top Mark	Package	Packing Method
MDB10SV	MDB10V	Micro DIP	Tape and Reel

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Value	Unit
V_{RRM}	Maximum Repetitive Peak Reverse Voltage	1000	V
V_{RMS}	Maximum RMS Voltage	700	V
V_{DC}	Maximum DC Blocking Voltage	1000	V
$I_{F(AV)}$	Average Rectified Forward Current(1)	1.2	A
I_{FSM}	Peak Forward Surge Current(2)	50	A
I^2t	I^2t Rating for Fusing (t < 8.3 ms)	10.4	A^2S
T_J	Operating Junction Temperature Range	-55 to +150	°C
T_{STG}	Storage Temperature Range	-55 to +150	°C

Notes:

1. 8.3 ms single half-sine wave, R-load, T_A = 25°C.
2. 8.3 ms single half-sine wave, single pulse, T_J = 25°C, compliant with MIL standard.

Thermal Characteristics(3)

Symbol	Parameter	Conditions	Max.	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	Multi-Die Measurement (Maximum Land Pattern: 12 x 12 mm)	55	°C/W
		Multi-Die Measurement (Minimum Land Pattern: 0.95 x 1.65 mm)	115	
ψ_{JL}	Thermal Characterization Parameter, Junction to Lead	Single-Die Measurement (Maximum and Minimum Land Pattern)	18	°C/W

Note:

3. The thermal resistances ($R_{\theta JA}$ & ψ_{JL}) are characterized with the device mounted on the following FR4 printed circuit boards, as shown in Figure 1 and Figure 2. PCB size: 76.2 x 114.3 mm.

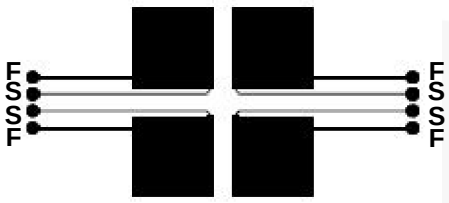


Figure 1. Maximum Pads of 2 oz Copper

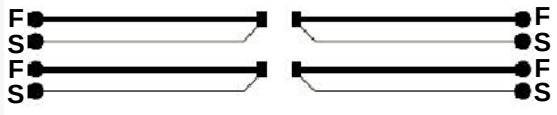


Figure 2. Minimum Pads of 2 oz Copper

Electrical Characteristics

Values are at T_A = 25°C unless otherwise specified.

Symbol	Parameter	Conditions		Value		Unit
				Typ.	Max.	
V_F	Maximum Forward Voltage	I_F = 0.3 A, 300 µs Pulse, 1% Duty Cycle, Per Diode		0.850		V
		I_F = 1.0 A, 300 µs Pulse, 1% Duty Cycle, Per Diode		0.930		
		I_F = 1.2 A, 300 µs Pulse, 1% Duty Cycle, Per Diode		0.940	1.015	
I_R	Maximum Reverse Current	At V_{RWM}, Pulse Measurement, Per Diode	T_A = 25°C	0.1	10.0	µA
			T_A = 125°C	95.0		
C_J	Typical Junction Capacitance	V_R = 4 V, f = 1 MHz		14		pF
t_{rr}	Typical Reverse-Recovery Time	I_F = 0.5 A, I_{RM} = 1 A, $I_{R(REC)}$ = 0.25 A		1430		ns

Typical Performance Characteristics

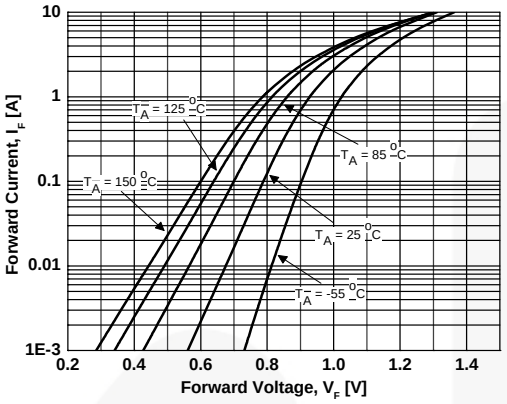


Figure 3. Typical Instantaneous Forward Voltage Per Leg

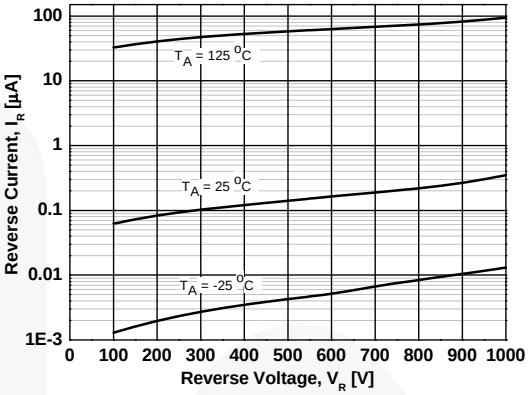


Figure 4. Typical Reverse-Voltage Current Characteristics

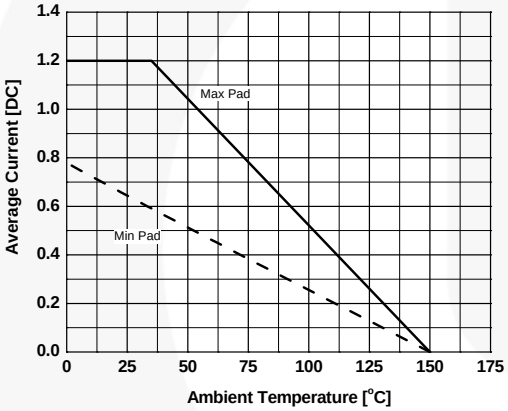


Figure 5. Forward Current Derating Curve

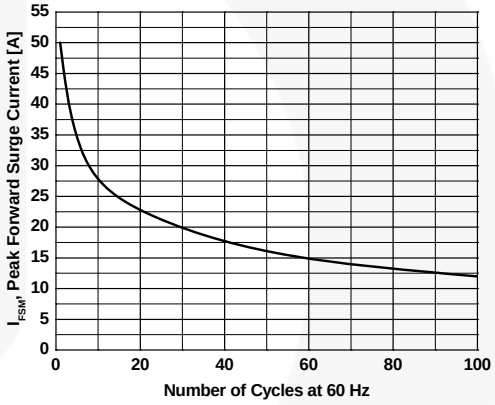


Figure 6. Surge Current Derating Curve

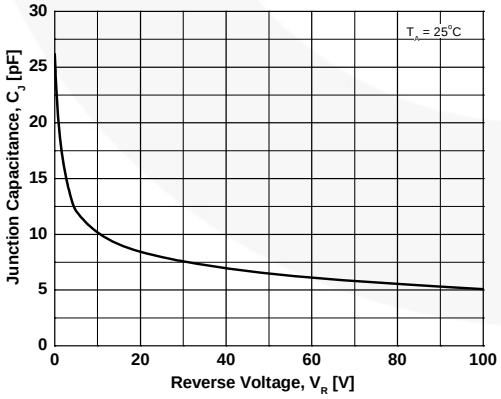
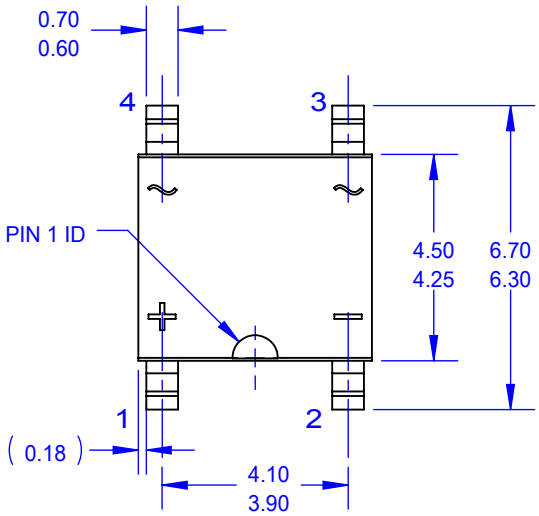
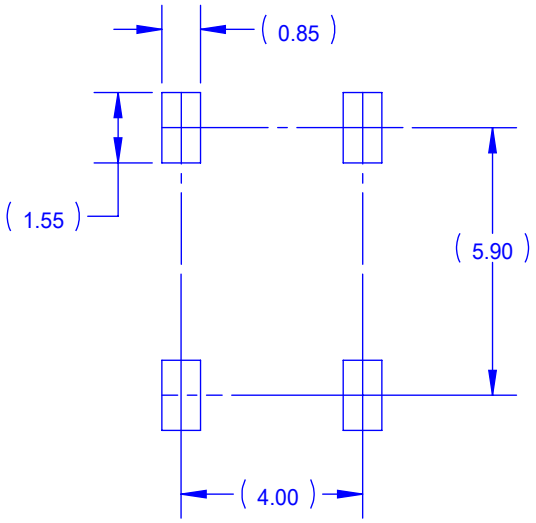


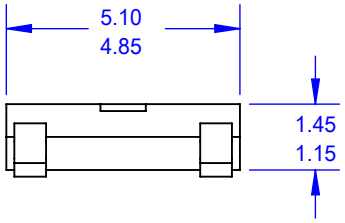
Figure 7. Typical Junction Capacitance



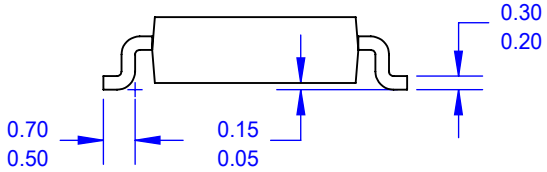
TOP VIEW



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.
G. DRAWING FILE NAME: MKT-TDI04BREV1.

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