

International
IOR Rectifier

SAFEIR Series 8EWS16SPbF

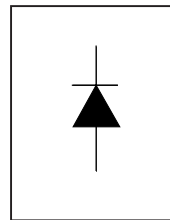
SURFACE MOUNTABLE INPUT RECTIFIER DIODE Lead-Free ("PbF" suffix)

Description/ Features

The 8EWS16SPbF rectifier **SAFEIR** series has been optimized for very low forward voltage drop, with moderate leakage. The glass passivation technology used has reliable operation up to 150° C junction temperature.

The **High Reverse Voltage** range available allows design of input stage primary rectification with **Outstanding Voltage Surge** capability.

Typical applications are in input rectification and these products are designed to be used with International Rectifier Switches and Output Rectifiers which are available in identical package outlines.



$$\begin{aligned} V_F &< 1V @ 10A \\ I_{FSM} &= 200A \\ V_{RRM} &= 1600V \end{aligned}$$

Output Current in Typical Applications

Applications	Single-phase Bridge	Three-phase Bridge	Units
NEMA FR-4 or G10 glass fabric-based epoxy with 4 oz (140μm) copper	1.2	1.6	A
Aluminum IMS, $R_{thCA} = 15^{\circ}C/W$	2.5	2.8	
Aluminum IMS with heatsink, $R_{thCA} = 5^{\circ}C/W$	5.5	6.5	

$T_A = 55^{\circ}C$, $T_J = 125^{\circ}C$, footprint 300mm²

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Sinusoidal waveform	10	A
V_{RRM}	1600	V
I_{FSM}	200	A
V_F @ 10A, $T_J = 25^{\circ}C$	1.10	V
T_J	-40 to 150	°C

Package Outline



Voltage Ratings

Part Number	V_{RRM} , maximum peak reverse voltage V	V_{RSM} , maximum non repetitive peak reverse voltage V	I_{RRM} 150°C mA
8EWS16SPbF	1600	1700	0.5

Absolute Maximum Ratings

Parameters	Values	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	10	A	@ $T_C = 105^\circ\text{C}$, 180° conduction half sine wave
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current	170	A	10ms Sine pulse, rated V_{RRM} applied
	200		10ms Sine pulse, no voltage reapplied
I^2t Max. I^2t for fusing	130	A^2s	10ms Sine pulse, rated V_{RRM} applied
	145		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	1450	$A^2\sqrt{s}$	$t = 0.1$ to 10ms, no voltage reapplied

Electrical Specifications

Parameters	Values	Units	Conditions
V_{FM} Max. Forward Voltage Drop	1.1	V	@ 10A, $T_J = 25^\circ\text{C}$
r_t Forward slope resistance	20	mΩ	$T_J = 150^\circ\text{C}$
$V_{F(TO)}$ Threshold voltage	0.82	V	
I_{RM} Max. Reverse Leakage Current	0.05	mA	$T_J = 25^\circ\text{C}$
	0.50		$T_J = 150^\circ\text{C}$

$V_R = \text{rated } V_{RRM}$

Thermal-Mechanical Specifications

Parameters	Values	Units	Conditions
T_J Max. Junction Temperature Range	-40 to 150	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-40 to 150	$^\circ\text{C}$	
	Soldering Temperature	240	$^\circ\text{C}$
R_{thJC} Max. Thermal Resistance Junction to Case	2.5	$^\circ\text{C/W}$	DC operation
R_{thJA} Typ. Thermal Resistance Junction to Ambient (PCB Mount)**	62	$^\circ\text{C/W}$	
wt Approximate Weight	1(0.03)	g(oz.)	
T Case Style	TO-252AA (D-PAK)		

**When mounted on 1" square (650mm²) PCB of FR-4 or G-10 material 4 oz (140μm) copper 40°C/W
For recommended footprint and soldering techniques refer to application note #AN-994

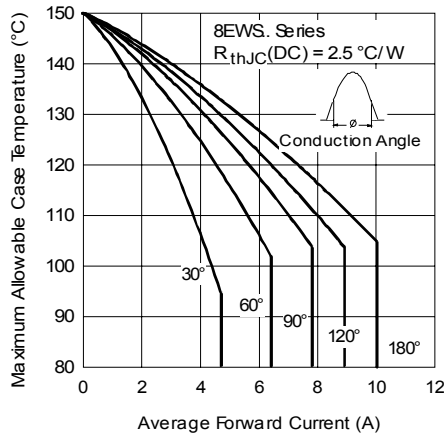


Fig. 1 - Current Rating Characteristics

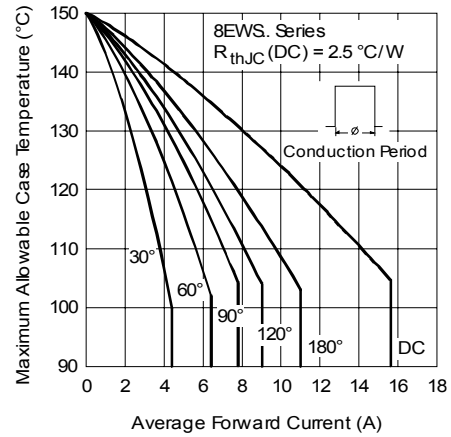


Fig. 2 - Current Rating Characteristics

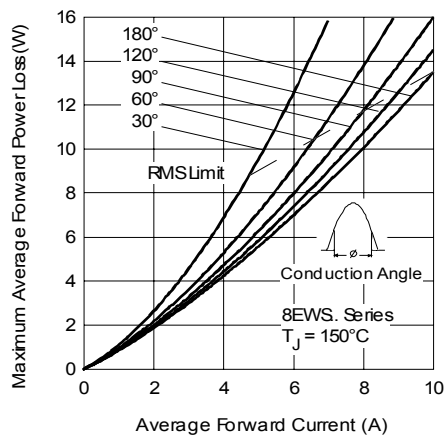


Fig. 3 - Forward Power Loss Characteristics

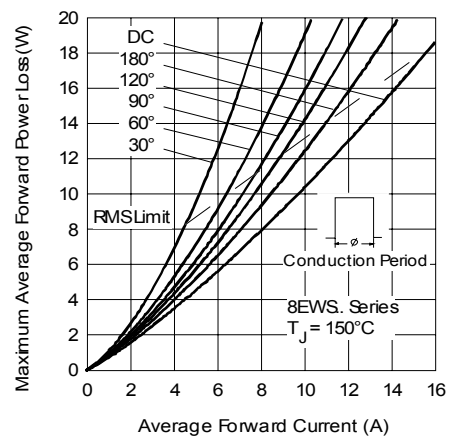


Fig. 4 - Forward Power Loss Characteristics

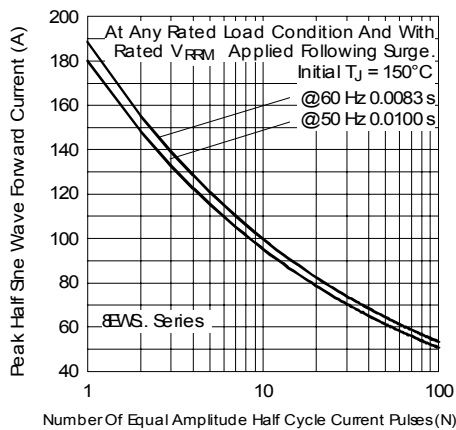


Fig. 5 - Maximum Non-Repetitive Surge Current

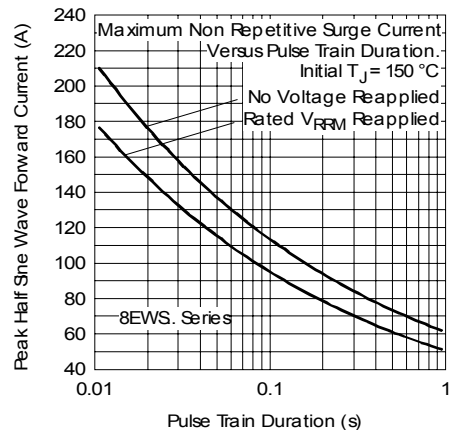


Fig. 6 - Maximum Non-Repetitive Surge Current

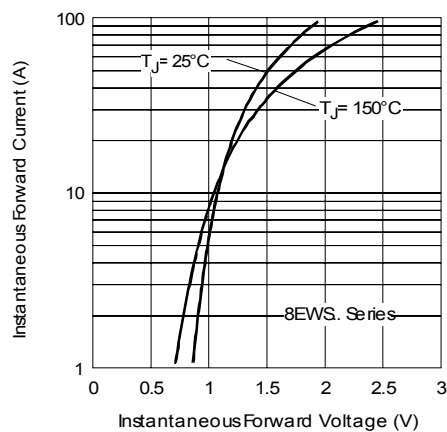
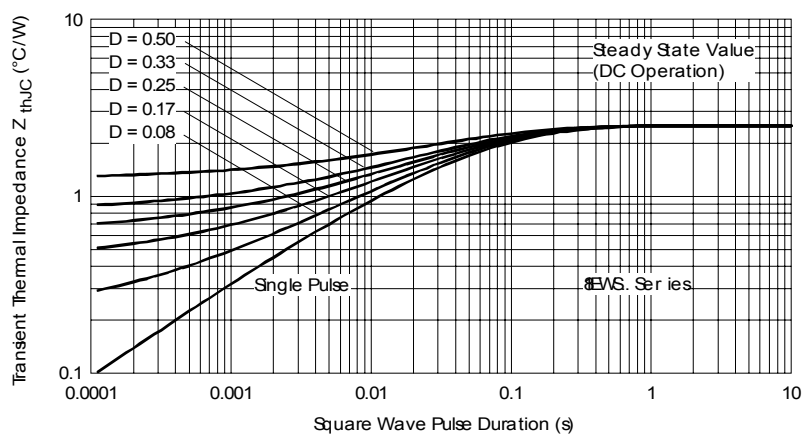
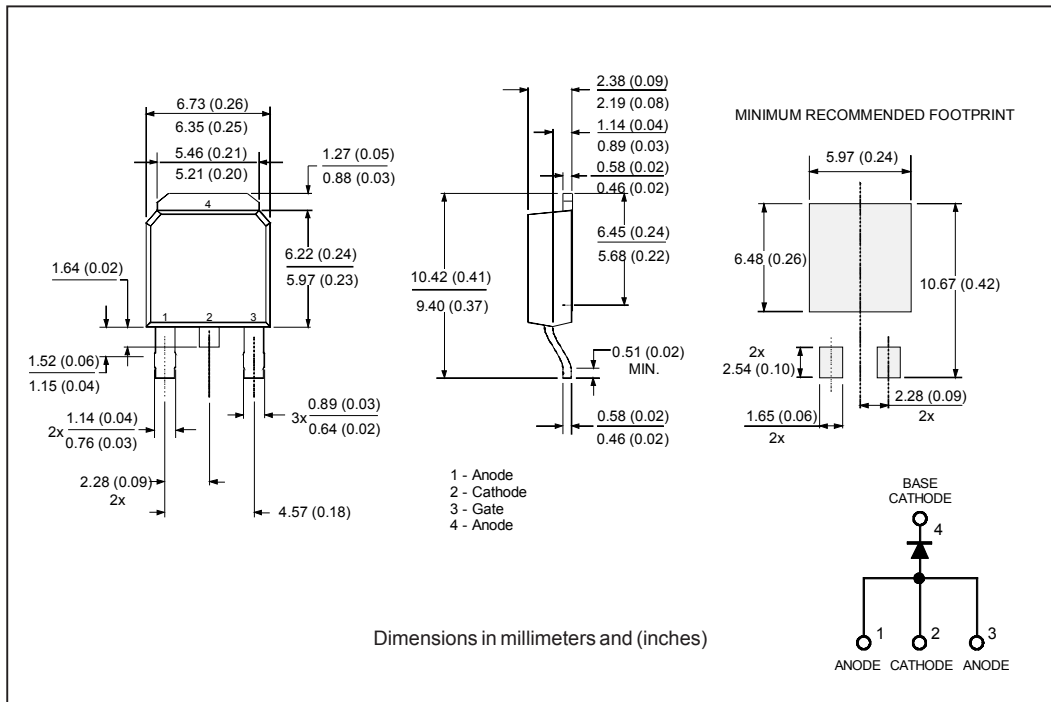


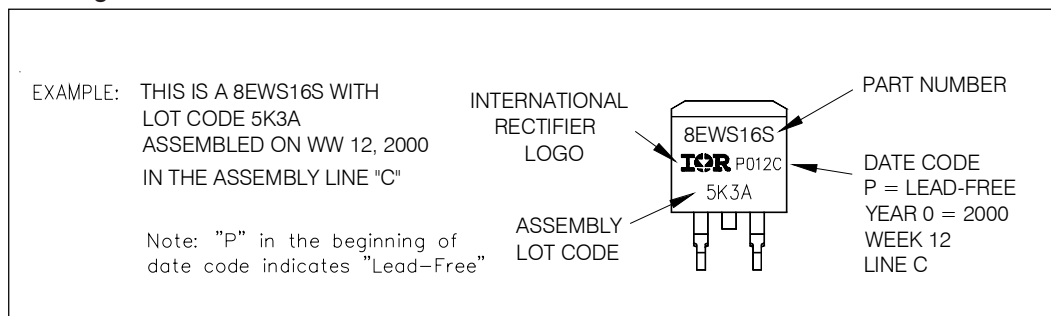
Fig. 8 - Forward Voltage Drop Characteristics

Fig. 9 - Thermal Impedance Z_{thJC} Characteristics

Outline Table



Marking Information



Technical drawings of TO-252AA Tape & Reel components. The drawings include side views for TR, TRR, and TRL orientations, showing dimensions for feed direction, mounting holes, and overall size. A top view shows the circular component with three mounting tabs. A side view shows the component's profile with dimensions for height and diameter.

TR Orientation:

- Feed Direction: Indicated by an arrow pointing right.
- Dimensions: 4.1 (0.16), 3.9 (0.15), 2.1 (0.83), 1.9 (0.07), 1.85 (0.07), 1.65 (0.06), 7.6 (0.30), 7.4 (0.29), 12.1 (0.48), 11.9 (0.47), 2.6 (0.10), 1.5 (0.06), 2.75 (0.11), 2.55 (0.10).

TRR Orientation:

- Feed Direction: Indicated by an arrow pointing right.
- Dimensions: 4.1 (0.16), 3.9 (0.15), 2.1 (0.83), 1.9 (0.07), 1.85 (0.07), 1.65 (0.06), 7.6 (0.30), 7.4 (0.29), 8.1 (0.32), 7.9 (0.31), 2.6 (0.10), 1.5 (0.06), 2.75 (0.11), 2.55 (0.10).

TRL Orientation:

- Feed Direction: Indicated by an arrow pointing right.
- Dimensions: 4.1 (0.16), 3.9 (0.15), 2.1 (0.83), 1.9 (0.07), 1.85 (0.07), 1.65 (0.06), 7.6 (0.30), 7.4 (0.29), 8.1 (0.32), 7.9 (0.31), 2.6 (0.10), 1.5 (0.06), 2.75 (0.11), 2.55 (0.10).

Top View:

- Dimensions: 13 (0.52) DIA., 375 (14.17) DIA. MAX.

Side View:

- Dimensions: 22.4 (0.88), 50 (1.97) DIA.

TO-252AA Tape & Reel

When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 2,000 pieces per reel for TR and multiples of 3,000 pieces per reel for both TRL and TRR.

Ordering Information Table

Device Code							
8	E	W	S	16	S	TR	PbF
1	2	3	4	5	6	7	8
1	-	Current Rating (8 = 8A)					
2	-	Circuit Configuration:					
		E = Single Diode					
3	-	Package:					
		W = D-Pak					
4	-	Type of Silicon:					
		S = Standard Recovery Rectifier					
5	-	Voltage Rating (16 = 1600V)					
6	-	S = Surface Mountable					
7	-	• TR = Tape & Reel • TRR = Tape & Reel (Right Oriented) • TRL = Tape & Reel (Left Oriented)					
8	-	• none = Standard Production • PbF = Lead-Free					

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level and Lead-Free.
Qualification Standards can be found on IR's Web site.

International
IR Rectifier

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Visit us at www.irf.com for sales contact information. 07/05