

International  
**IOR** Rectifier

**SAFEIR** Series  
8EWS..SPbF

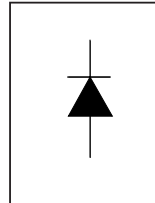
**SURFACE MOUNTABLE  
INPUT RECTIFIER DIODE  
Lead-Free ("PbF" suffix)**

**Description/ Features**

The 8EWS..SPbF 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.



$$V_F < 1V @ 10A$$

$$I_{FSM} = 200A$$

$$V_{RRM} = 800V, 1200V$$

**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 <sub>thCA</sub> = 15°C/W	2.5	2.8	
Aluminum IMS with heatsink, R <sub>thCA</sub> = 5°C/W	5.5	6.5	

T<sub>A</sub> = 55°C, T<sub>J</sub> = 125°C, footprint 300mm<sup>2</sup>

**Major Ratings and Characteristics**

Characteristics	Values	Units
I <sub>F(AV)</sub> Sinusoidal waveform	10	A
V <sub>RRM</sub>	800, 1200	V
I <sub>FSM</sub>	200	A
V <sub>F</sub> @ 10A, T <sub>J</sub> = 25°C	1.10	V
T <sub>J</sub>	-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
8EWS08SPbF	800	900	0.5
8EWS12SPbF	1200	1300	

## 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	$m\Omega$	$T_J = 150^\circ\text{C}$	
$V_{F(TO)}$ Threshold voltage	0.82	V		
$I_{RM}$ Max. Reverse Leakage Current	0.05	mA	$T_J = 25^\circ\text{C}$	$V_R = \text{rated } V_{RRM}$
	0.50		$T_J = 150^\circ\text{C}$	

## 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 (650mm<sup>2</sup>) 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

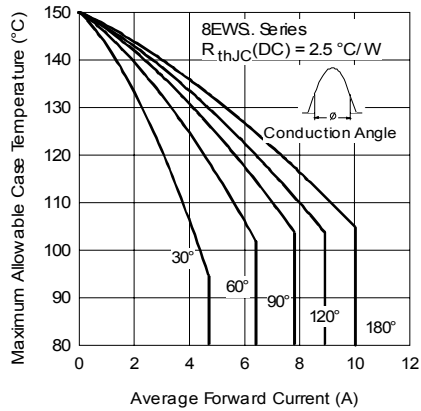


Fig. 1 - Current Rating Characteristics

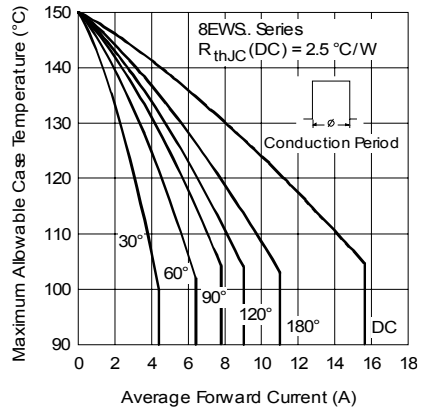


Fig. 2 - Current Rating Characteristics

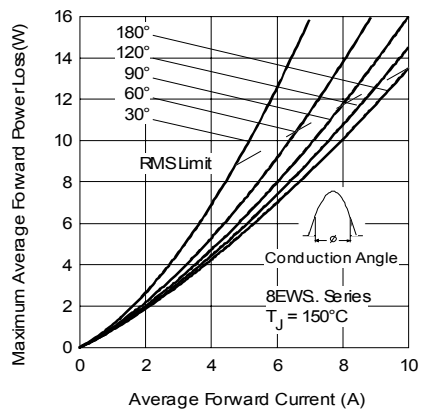


Fig. 3 - Forward Power Loss Characteristics

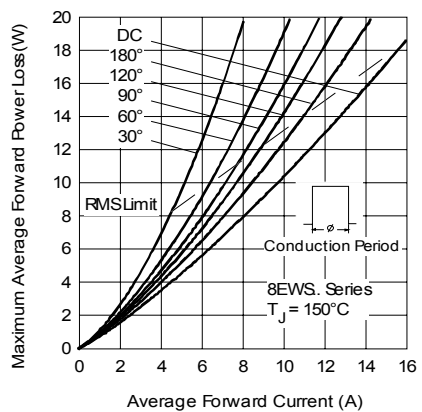


Fig. 4 - Forward Power Loss Characteristics

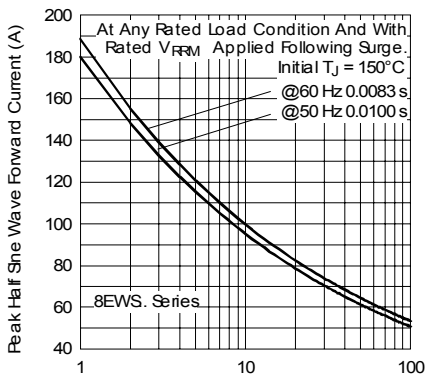


Fig. 5 - Maximum Non-Repetitive Surge Current

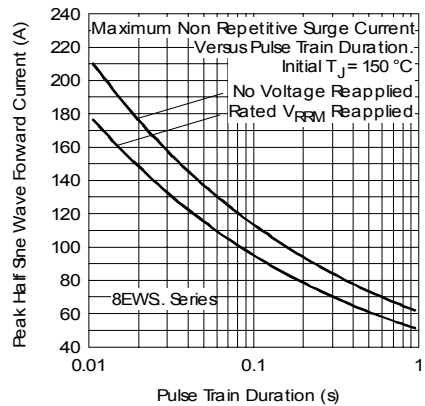


Fig. 6 - Maximum Non-Repetitive Surge Current

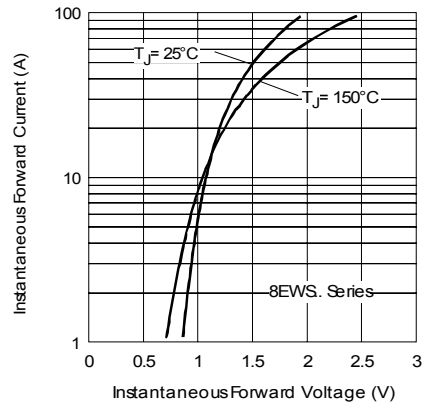


Fig. 8 - Forward Voltage Drop Characteristics

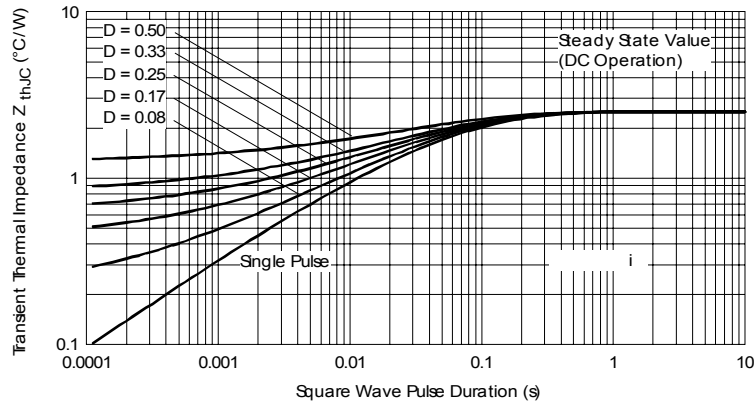
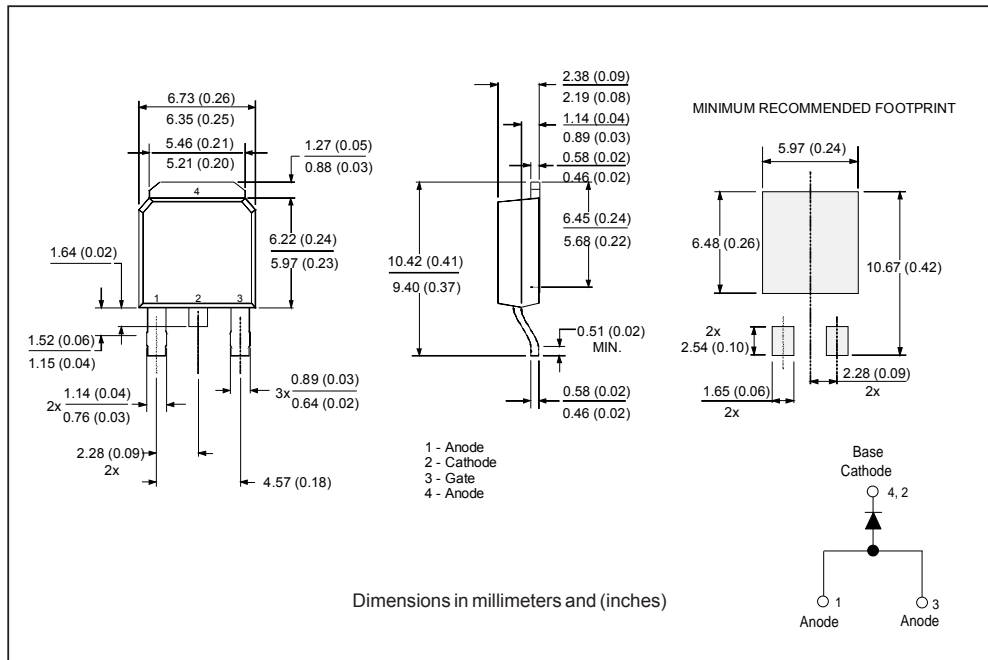
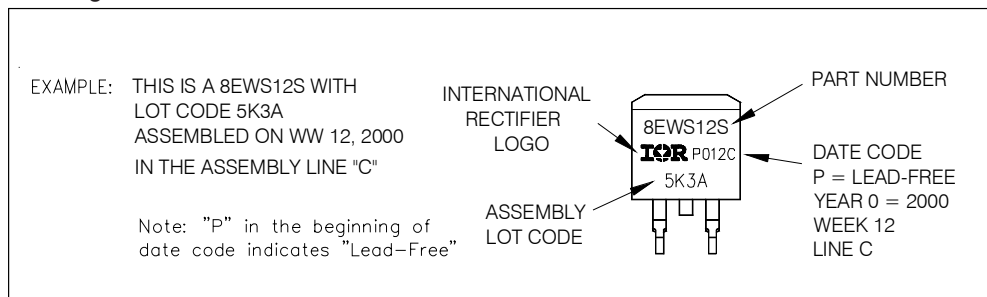


Fig. 9 - Thermal Impedance  $Z_{thJC}$  Characteristics

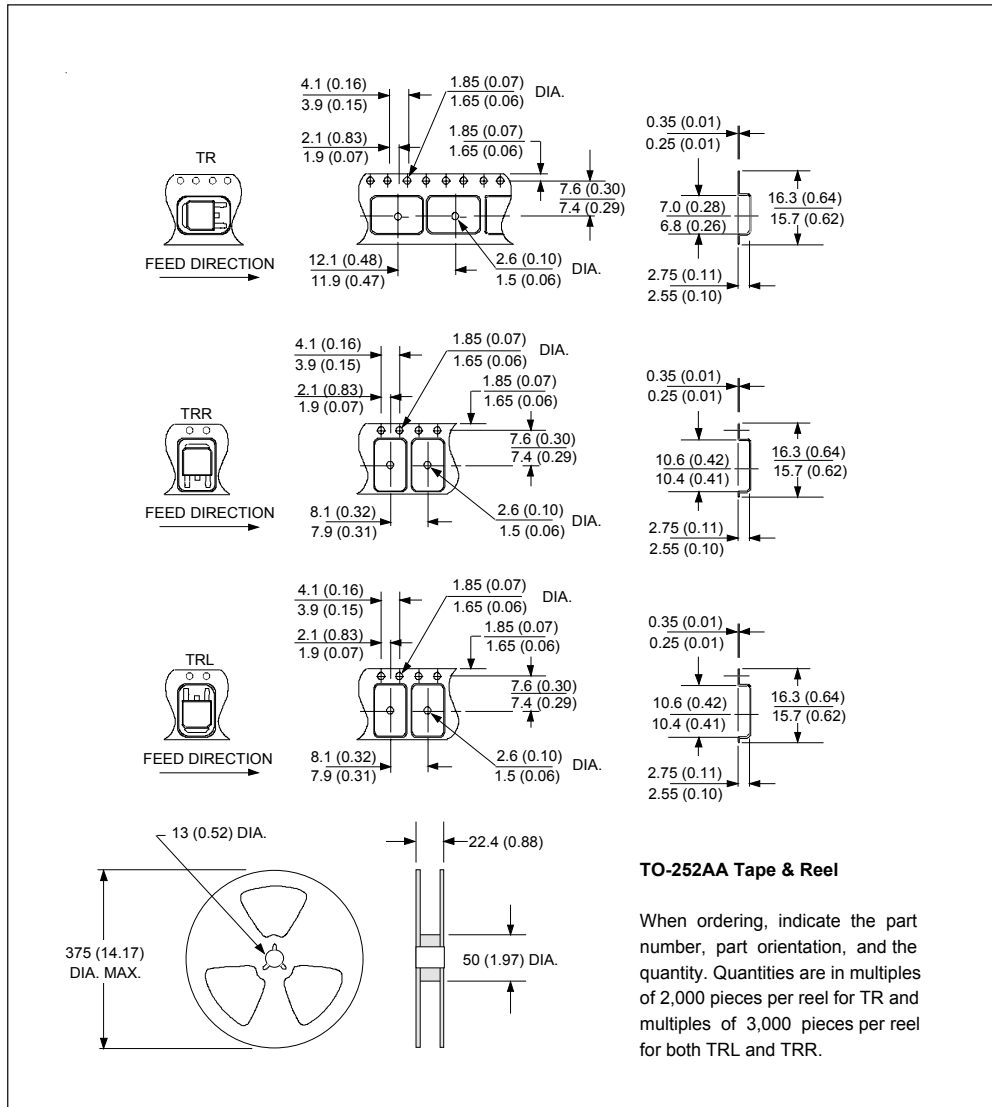
Outline Table



Marking Information



Tape & Reel Information



Ordering Information Table

Device Code							
8	E	W	S	12	S	TR	PbF
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

<p><b>1</b> - Current Rating (8 = 8A)</p> <p><b>2</b> - Circuit Configuration: E = Single Diode</p> <p><b>3</b> - Package: W = D-Pak</p> <p><b>4</b> - Type of Silicon: S = Standard Recovery Rectifier</p> <p><b>5</b> - Voltage Ratings</p> <p><b>6</b> - S = Surface Mountable</p> <p><b>7</b> -</p> <ul style="list-style-type: none"> <li>• TR = Tape &amp; Reel</li> <li>• TRR = Tape &amp; Reel (Right Oriented)</li> <li>• TRL = Tape &amp; Reel (Left Oriented)</li> </ul> <p><b>8</b> -</p> <ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free</li> </ul>	<p>—————</p>	<p>08 = 800V 12 = 1200V</p>
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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.



## Notice

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