

International  
**IR** Rectifier

**SAFEIR** Series  
8EWS..SPbF

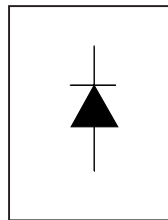
**SURFACE MOUNTABLE  
INPUT RECTIFIER DIODE  
Lead-Free ("PbF" suffix)**

**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, $R_{thCA} = 15^{\circ}C/W$	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 300mm<sup>2</sup>

**Major Ratings and Characteristics**

Characteristics	Values	Units
$I_{F(AV)}$ Sinusoidal waveform	10	A
$V_{RRM}$	800, 1200	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
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
$I^2vt$ Max. $I^2vt$ for fusing	1450	$A^2/s$	$t = 0.1$ 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	$T_J = 25^\circ\text{C}$
	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 (650mm<sup>2</sup>) PCB of FR-4 or G-10 material 4 oz (140 $\mu\text{m}$ ) copper 40 $^\circ\text{C/W}$   
For recommended footprint and soldering techniques refer to application note #AN-994

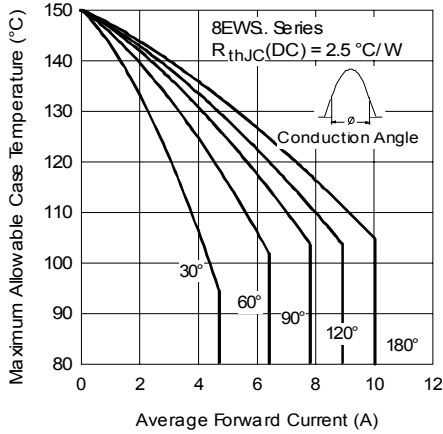


Fig. 1 - Current Rating Characteristics

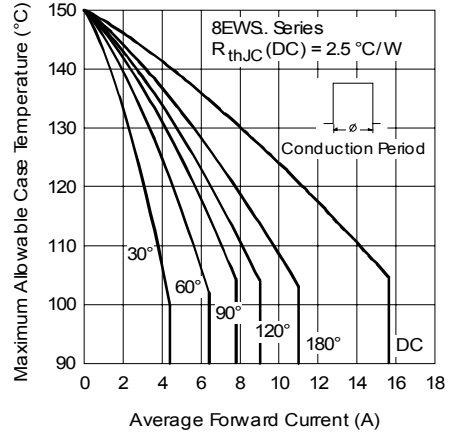


Fig. 2 - Current Rating Characteristics

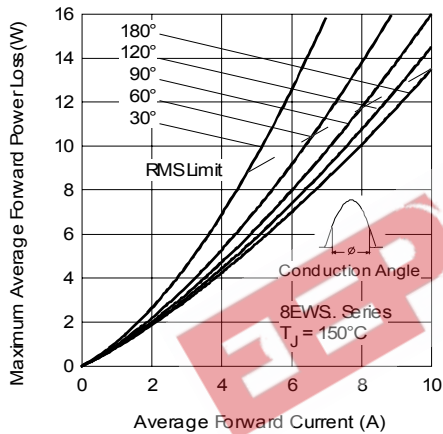


Fig. 3 - Forward Power Loss Characteristics

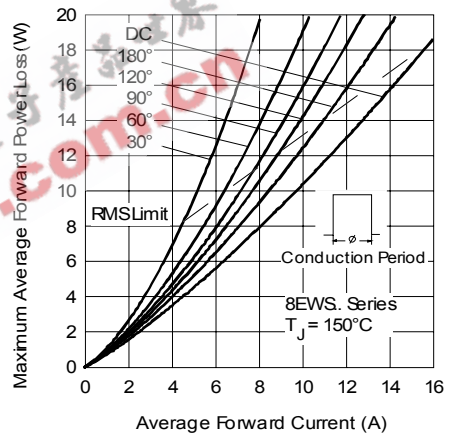


Fig. 4 - Forward Power Loss Characteristics

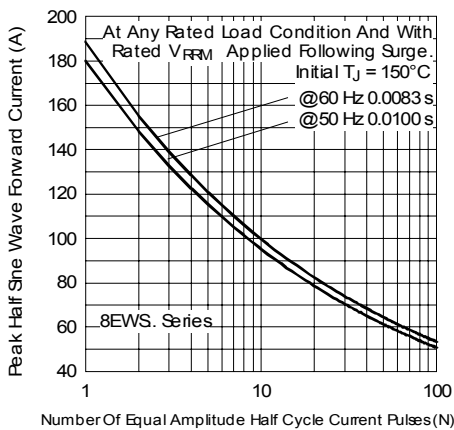


Fig. 5 - Maximum Non-Repetitive Surge Current

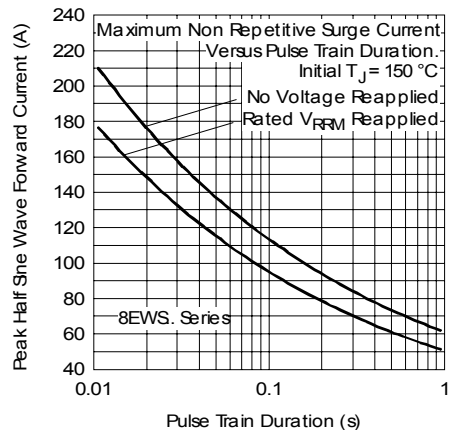


Fig. 6 - Maximum Non-Repetitive Surge Current

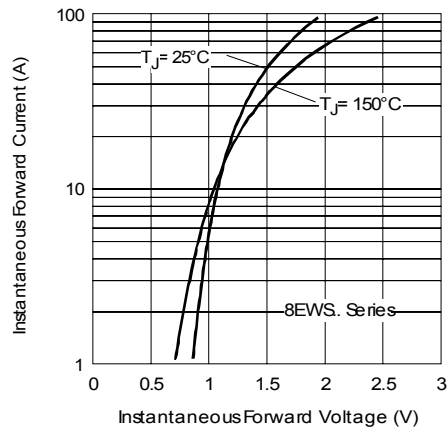


Fig. 8 - Forward Voltage Drop Characteristics

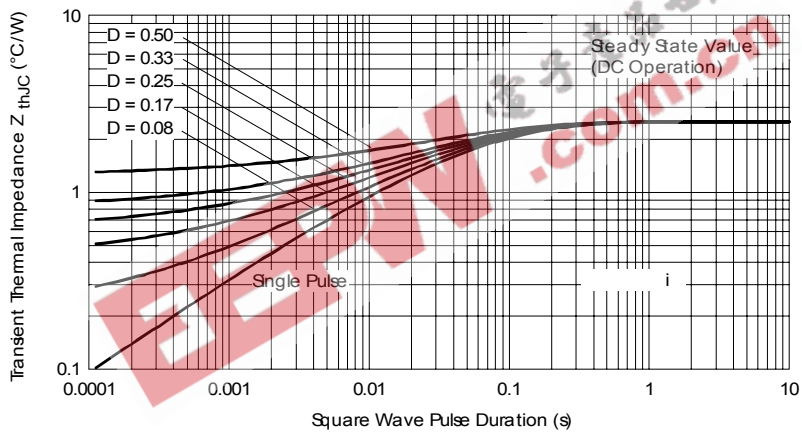
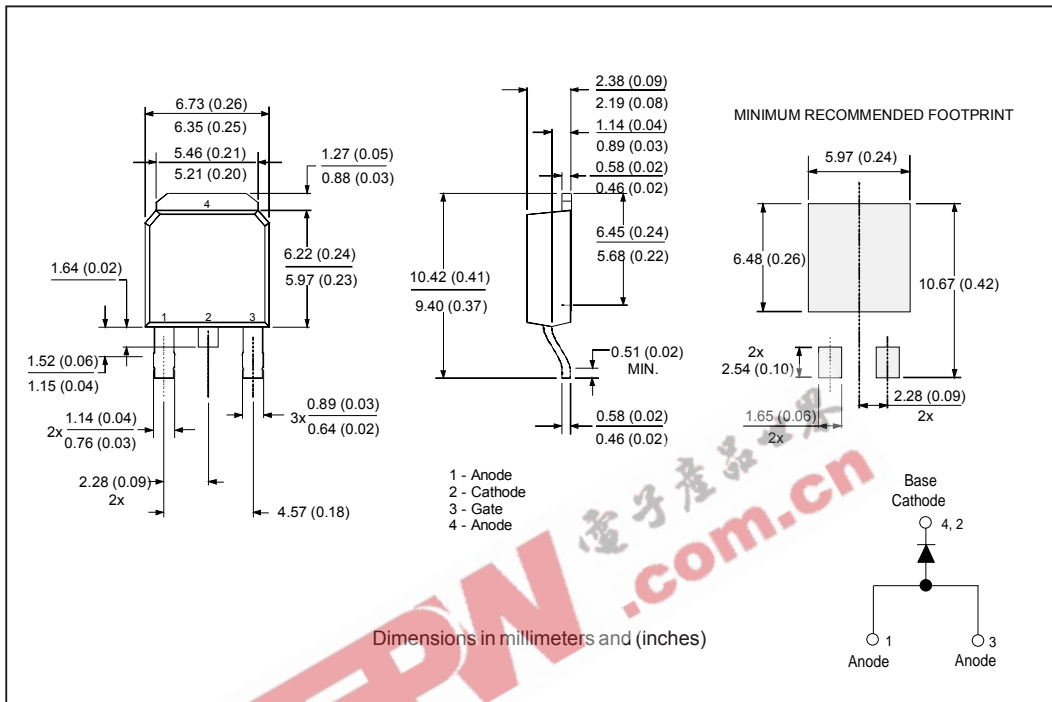
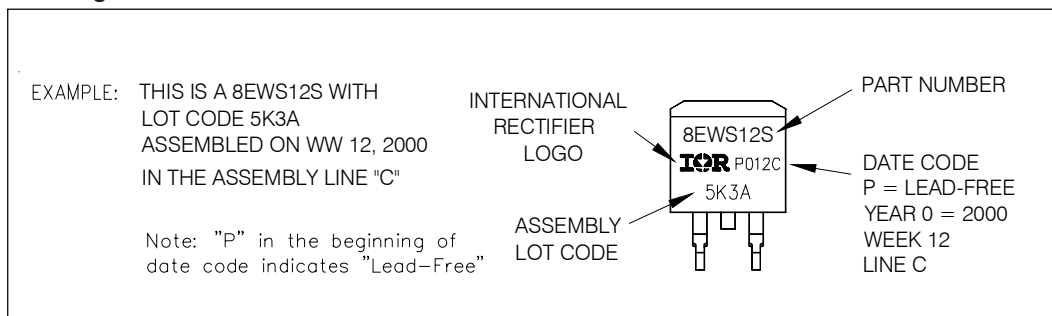


Fig. 9 - Thermal Impedance  $Z_{thJC}$  Characteristics

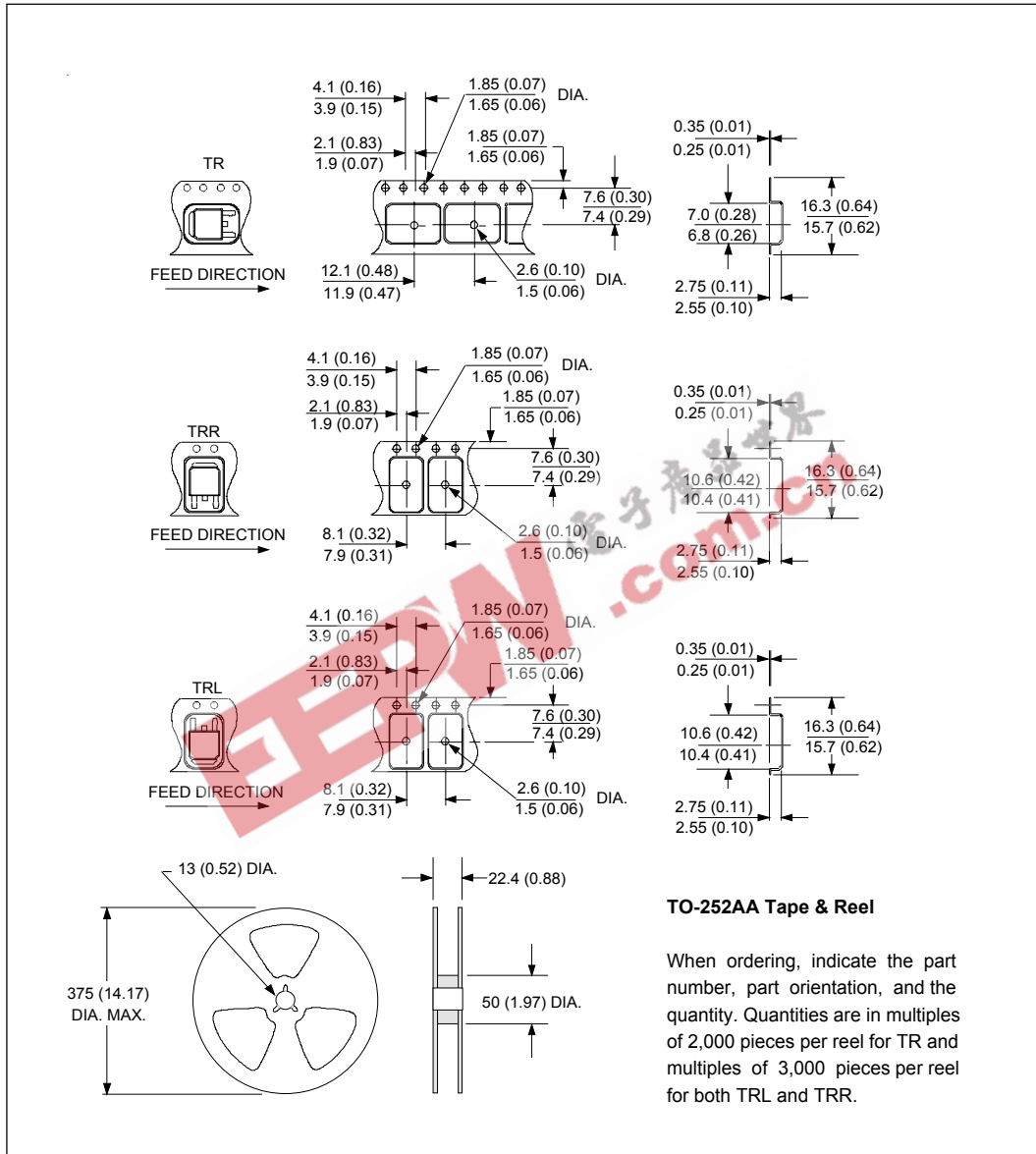
Outline Table



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
<b>1</b>	-	Current Rating (8 = 8A)					
<b>2</b>	-	Circuit Configuration: E = Single Diode					
<b>3</b>	-	Package: W = D-Pak					
<b>4</b>	-	Type of Silicon: S = Standard Recovery Rectifier					
<b>5</b>	-	Voltage Ratings					
<b>6</b>	-	S = Surface Mountable					
<b>7</b>	-	<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>					
<b>8</b>	-	<ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free</li> </ul>					

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.