

International  
**IOR** Rectifier

**SAFEIR** Series  
8EWS..S

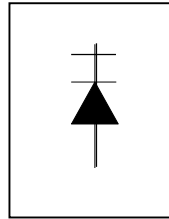
## SURFACE MOUNTABLE INPUT RECTIFIER DIODE

### Description/Features

The 8EWS..S 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.



$$V_F < 1V @ 5A$$

$$I_{FSM} = 200A$$

$$V_{RRM} 800 \text{ to } 1200V$$

### Output Current in Typical Applications

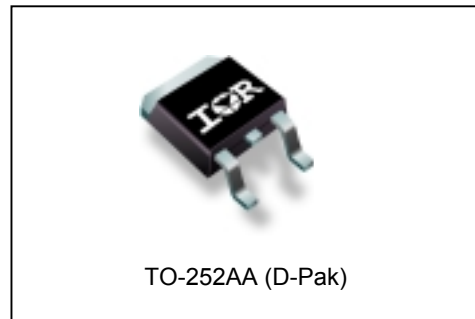
Applications	Single-phase Bridge	Three-phase Bridge	Units
NEMA FR-4 or G10 glass fabric-based epoxy with 4oz (140µm) copper	1.2	1.6	A
Aluminum IMS, $R_{thCA} = 15^\circ C/W$	2.5	2.8	
Aluminum IMS with heatsink, $R_{thCA} = 5^\circ C/W$	5.5	6.5	

$T_A = 55^\circ C$ ,  $T_J = 125^\circ C$ , footprint 300mm<sup>2</sup>

### Major Ratings and Characteristics

Characteristics	8EWS..S	Units
$I_{F(AV)}$ Sinusoidal waveform	8	A
$V_{RRM}$ Range(*)	800 to 1200	V
$I_{FSM}$	200	A
$V_F$ @ 5A, $T_J = 25^\circ C$	1.0	V
$T_J$	-55 to 150	°C

### Package Outline



(\*) for higher voltage up to 1600V contact factory

## 8EWS..S *SAFEIR* Series

Bulletin I2108 rev. G 08/00

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### 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
8EWS08S	800	900	0.5
8EWS10S	1000	1100	
8EWS12S	1200	1300	

### Absolute Maximum Ratings

Parameters	8EWS..S	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	8	A	@ $T_C = 95^\circ\text{C}$ , 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	144	$A^2s$	10ms Sine pulse, rated $V_{RRM}$ applied
	204		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	2040	$A^2\sqrt{s}$	$t = 0.1$ to 10ms, no voltage reapplied

### Electrical Specifications

Parameters	8EWS..S	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop	1.1	V	@ 8A, $T_J = 25^\circ\text{C}$
$r_t$ Forward slope resistance	21.8	mΩ	$T_J = 150^\circ\text{C}$
$V_{F(TO)}$ Threshold voltage	0.81	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	8EWS..S	Units	Conditions
$T_J$ Max. Junction Temperature Range	-55 to 150	°C	
$T_{stg}$ Max. Storage Temperature Range	-55 to 150	°C	
	Soldering Temperature	240	°C for 10 seconds (1.6mm from case)
$R_{thJC}$ Max. Thermal Resistance Junction to Case	3	°C/W	DC operation
$R_{thJA}$ Typ. Thermal Resistance Junction to Ambient (PCB Mount)**	50	°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

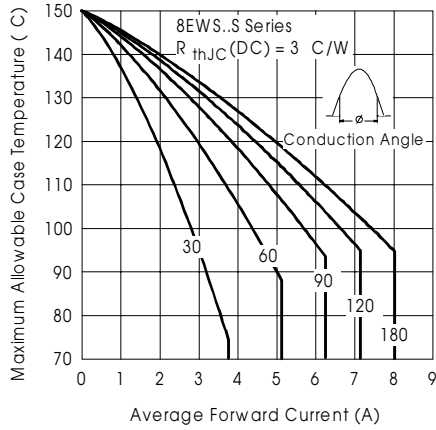


Fig. 1 - Current Rating Characteristics

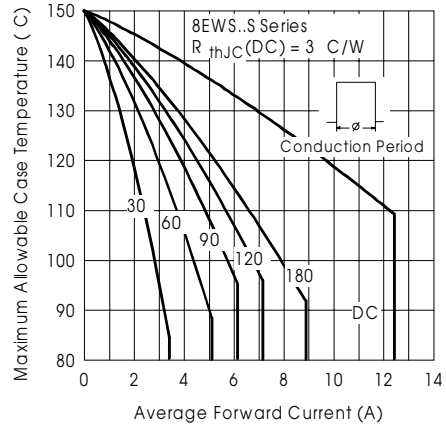


Fig. 2 - Current Rating Characteristics

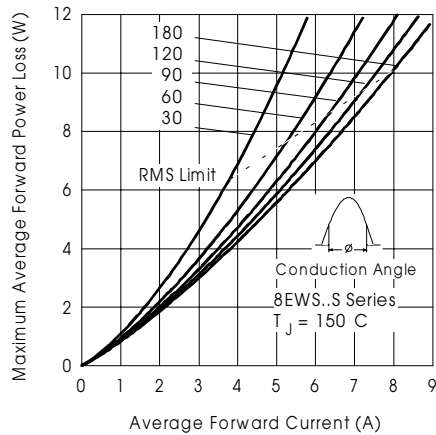


Fig. 3 - Forward Power Loss Characteristics

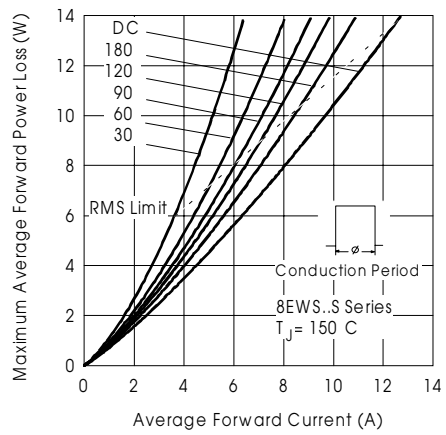


Fig. 4 - Forward Power Loss Characteristics

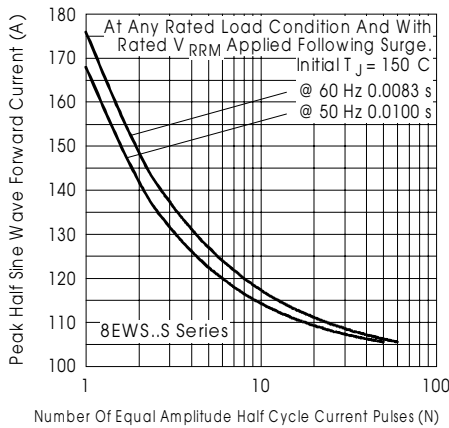


Fig. 5 - Maximum Non-Repetitive Surge Current

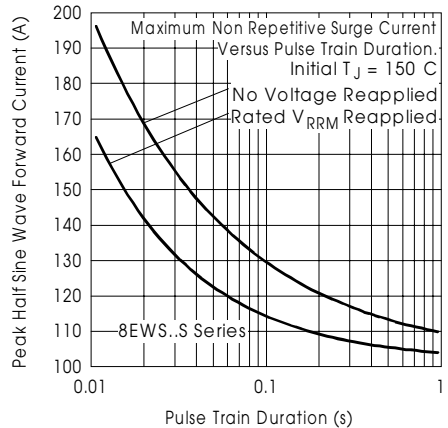


Fig. 6 - Maximum Non-Repetitive Surge Current

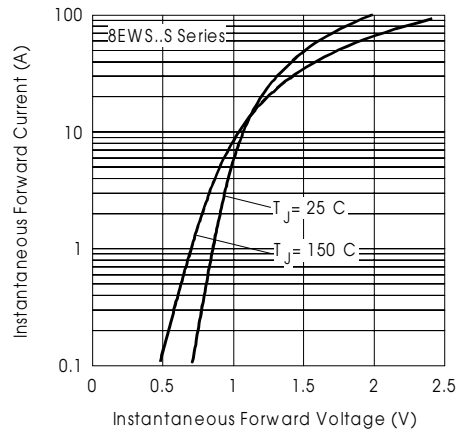


Fig.7-Forward Voltage Drop Characteristics

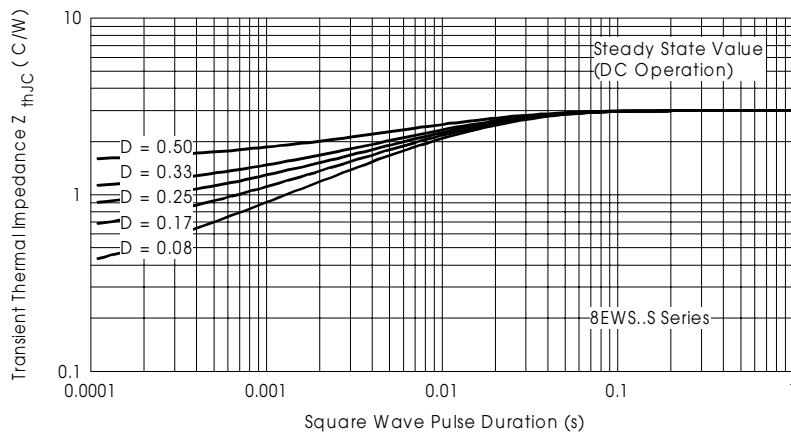


Fig.8-Thermal Impedance  $Z_{thJC}$  Characteristics

Ordering Information Table

Device Code						
8	E	W	S	12	S	TRL
①	②	③	④	⑤	⑥	⑦

<p><b>1</b> - Current Rating</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 code: Code x 100 = <math>V_{RRM}</math></p> <p><b>6</b> - S = Surface Mountable</p> <p><b>7</b> - Tape and Reel Option TRL = Left Reel TRR = Right Orientation Reel</p>	<table border="1"> <tr><td>08 = 800V</td></tr> <tr><td>10 = 1000V</td></tr> <tr><td>12 = 1200V</td></tr> </table>	08 = 800V	10 = 1000V	12 = 1200V
08 = 800V				
10 = 1000V				
12 = 1200V				

BASE CATHODE

4

1 2 3

ANODE CATHODE ANODE

(\*) for higher voltage up to 1600V contact factory

Outline Table

6.73 (0.26)  
6.35 (0.25)  
5.46 (0.21)  
5.21 (0.20)  
1.27 (0.05)  
0.88 (0.03)  
1.64 (0.02)  
6.22 (0.24)  
5.97 (0.23)  
1.52 (0.06)  
1.15 (0.04)  
1.14 (0.04)  
0.76 (0.03)  
2x  
2.28 (0.09)  
2x  
0.89 (0.03)  
0.64 (0.02)  
3x  
4.57 (0.18)

2.38 (0.09)  
2.19 (0.08)  
1.14 (0.04)  
0.89 (0.03)  
0.58 (0.02)  
0.46 (0.02)  
6.45 (0.24)  
5.68 (0.22)  
10.42 (0.41)  
9.40 (0.37)  
0.51 (0.02)  
MIN.  
0.58 (0.02)  
0.46 (0.02)

1 - Anode  
2 - Cathode  
3 - Gate  
4 - Anode

MINIMUM RECOMMENDED FOOTPRINT

5.97 (0.24)  
6.48 (0.26)  
10.67 (0.42)  
2x  
2.54 (0.10)  
1.65 (0.06)  
2x  
2.28 (0.09)  
2x

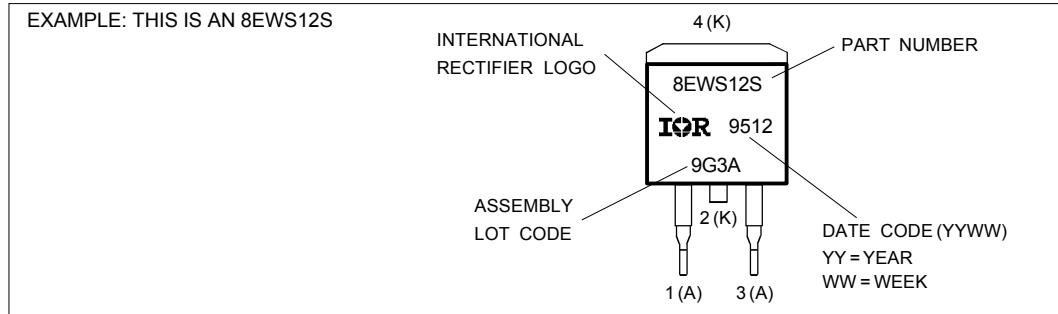
Dimensions in millimeters and (inches)

# 8EWS..S SAFEIR Series

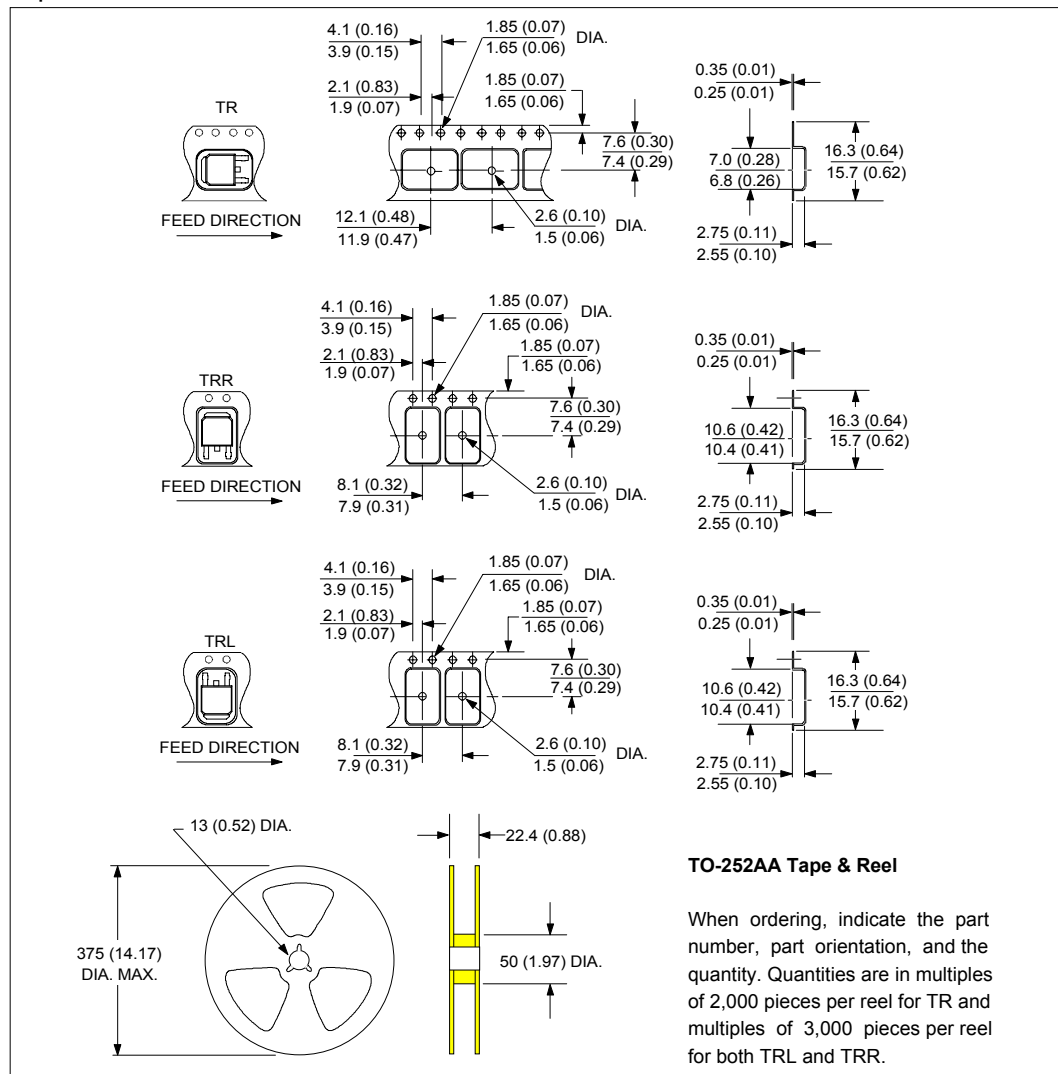
Bulletin I2108 rev. G 08/00

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## Marking Information



## Tape & Reel Information



**WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245 U.S.A. Tel: (310) 322 3331. Fax: (310) 322 3332.  
**EUROPEAN HEADQUARTERS:** Hurst Green, Oxted, Surrey RH8 9BB, U.K. Tel: ++ 44 1883 732020. Fax: ++ 44 1883 733408.  
**IR CANADA:** 15 Lincoln Court, Brampton, Markham, Ontario L6T3Z2. Tel: (905) 453 2200. Fax: (905) 475 8801.  
**IR GERMANY:** Saalburgstrasse 157, 61350 Bad Homburg. Tel: ++ 49 6172 96590. Fax: ++ 49 6172 965933.  
**IR ITALY:** Via Liguria 49, 10071 Borgaro, Torino. Tel: ++ 39 11 4510111. Fax: ++ 39 11 4510220.  
**IR FAR EAST:** K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo, Japan 171. Tel: 81 3 3983 0086.  
**IR SOUTHEAST ASIA:** 1 Kim Seng Promenade, Great World City West Tower, 13-11, Singapore 237994. Tel: ++ 65 838 4630.  
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