

International  
**IOR** Rectifier

**SAFEIR** Series  
8EWS..S

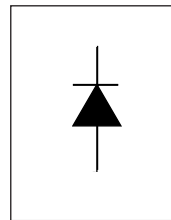
## SURFACE MOUNTABLE INPUT RECTIFIER DIODE

### 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.



$$V_F < 1V @ 5A$$

$$I_{FSM} = 200A$$

$$V_{RRM} 800 \text{ to } 1600V$$

### 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 (140 μm) 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     |
| $V_{RRM}$                       | 800 to 1600 | V     |
| $I_{FSM}$                       | 200         | A     |
| $V_F$ @ 5A, $T_J = 25^\circ C$  | 1.0         | V     |
| $T_J$                           | -40 to 150  | °C    |

### Package Outline



## 8EWS..S *SAFEIR* Series

I2108 rev. F 10/99

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### Voltage Ratings

| Part Number | $V_{RRM}$ , maximum peak reverse voltage<br>V | $V_{RSM}$ , maximum non repetitive peak reverse voltage<br>V | $I_{RRM}$<br>150°C<br>mA |
|-------------|-----------------------------------------------|--------------------------------------------------------------|--------------------------|
| 8EWS08S     | 800                                           | 900                                                          | 0.5                      |
| 8EWS10S     | 1000                                          | 1100                                                         |                          |
| 8EWS12S     | 1200                                          | 1300                                                         |                          |
| 8EWS16S     | 1600                                          | 1700                                                         |                          |

### 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 reappplied                      |
| $I^2t$ Max. $I^2t$ for fusing                              | 144     | $A^2s$        | 10ms Sine pulse, rated $V_{RRM}$ applied                    |
|                                                            | 204     |               | 10ms Sine pulse, no voltage reappplied                      |
| $I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing                | 2040    | $A^2\sqrt{s}$ | $t = 0.1$ to 10ms, no voltage reappplied                    |

### 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                                | -40 to 150            | °C     |                                     |
| $T_{stg}$ Max. Storage Temperature Range                             | -40 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

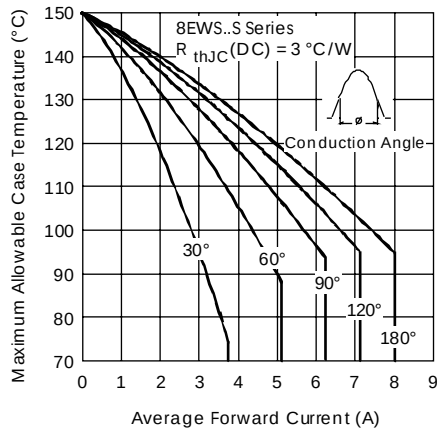


Fig. 1 - Current Rating Characteristics

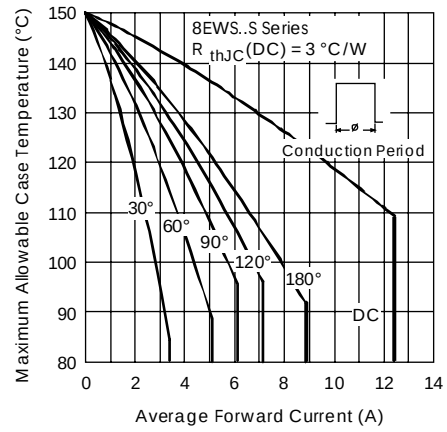


Fig. 2 - Current Rating Characteristics

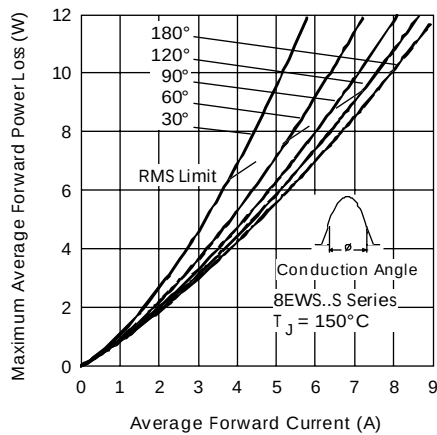


Fig. 3 - Forward Power Loss Characteristics

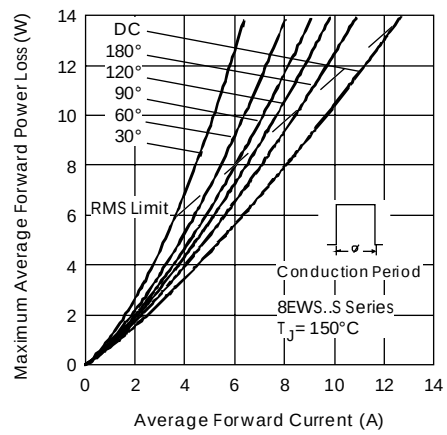


Fig. 4 - Forward Power Loss Characteristics

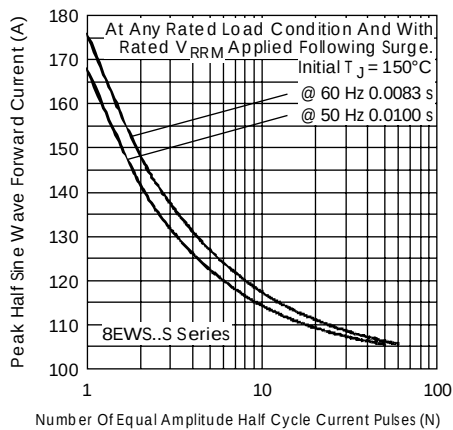


Fig. 5 - Maximum Non-Repetitive Surge Current

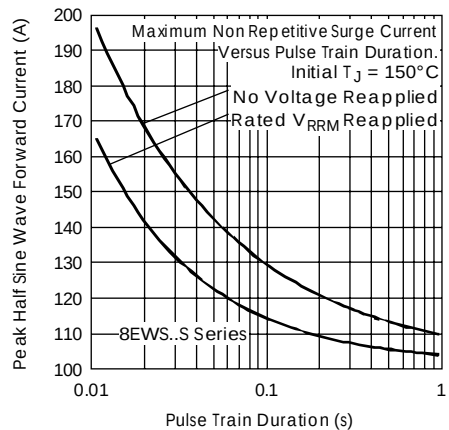


Fig. 6 - Maximum Non-Repetitive Surge Current

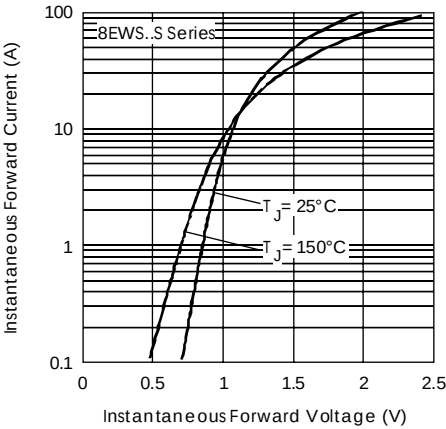


Fig.7-Forward Voltage Drop Characteristics

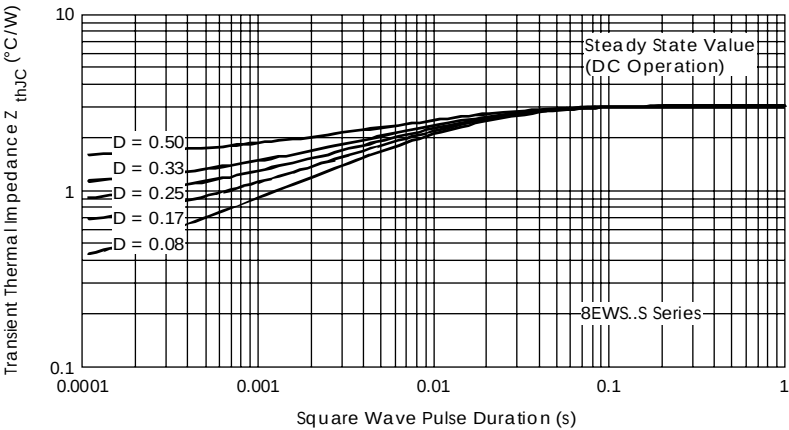


Fig.8-Thermal Impedance  $Z_{thJC}$  Characteristics

## Ordering Information Table

| Device Code |   |   |   |    |   |     |
|-------------|---|---|---|----|---|-----|
| 8           | E | W | S | 16 | S | TRL |
| 1           | 2 | 3 | 4 | 5  | 6 | 7   |

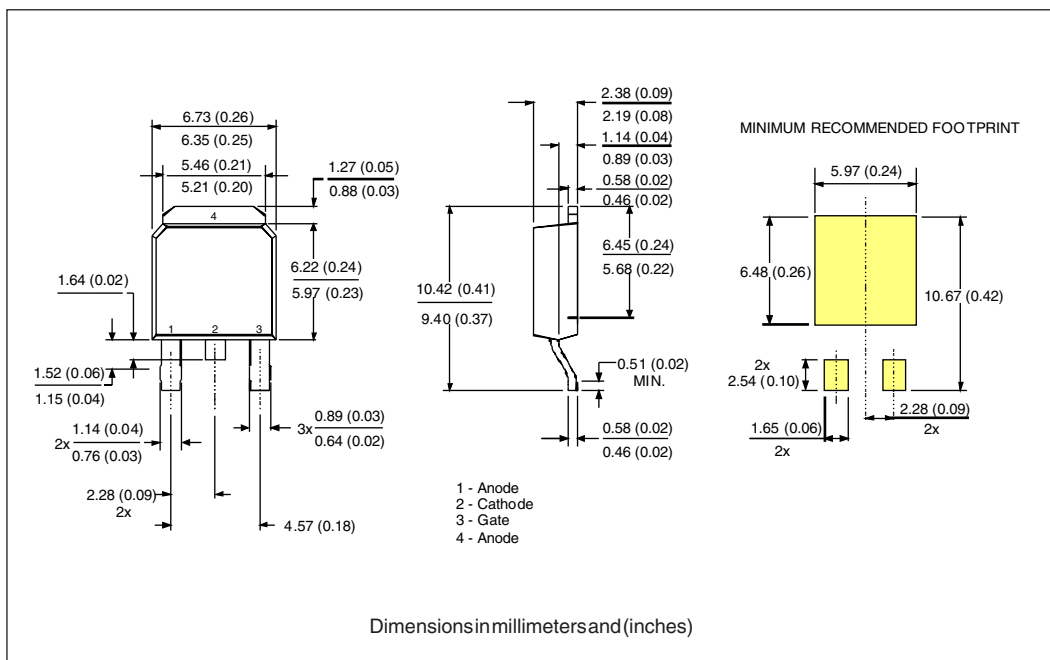
|          |   |                                      |
|----------|---|--------------------------------------|
| <b>1</b> | - | Current Rating                       |
| <b>2</b> | - | Circuit Configuration                |
|          |   | E = Single Diode                     |
| <b>3</b> | - | Package                              |
|          |   | W = D-PAK                            |
| <b>4</b> | - | Type of Silicon                      |
|          |   | S = Standard Recovery Rectifier      |
| <b>5</b> | - | Voltage code: Code x 100 = $V_{RRM}$ |
| <b>6</b> | - | S = Surface Mountable                |
| <b>7</b> | - | Tape and Reel Option                 |
|          |   | TRL = Left Reel                      |
|          |   | TRR = Right Orientation Reel         |

|    |   |       |
|----|---|-------|
| 08 | = | 800V  |
| 10 | = | 1000V |
| 12 | = | 1200V |
| 16 | = | 1600V |

## Outline Table

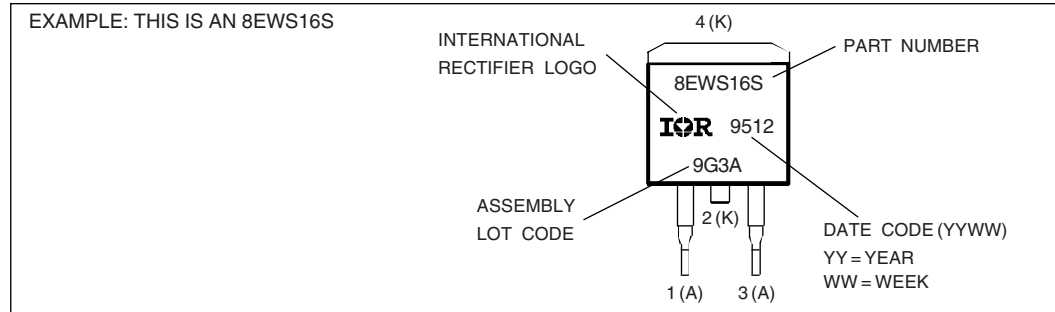


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### Marking Information



### Tape & Reel Information

