

International
IOR Rectifier

SAFEIR Series
8EWS..S

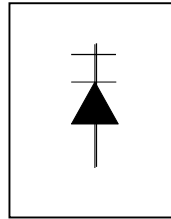
SURFACE MOUNTABLE INPUT RECTIFIER DIODE

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

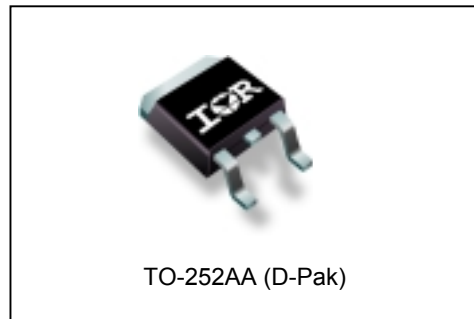
| Applications | Single-phase Bridge | Three-phase Bridge | Units |
|---|---------------------|--------------------|-------|
| NEMA FR-4 or G10 glass fabric-based epoxy with 4oz (140µm) copper | 1.2 | 1.6 | A |
| Aluminum IMS, $R_{thCA} = 15^\circ C/W$ | 2.5 | 2.8 | |
| Aluminum IMS with heatsink, $R_{thCA}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

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

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

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 reappplied |
| I^2t Max. I^2t for fusing | 144 | A ² s | 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 √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 | -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 (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

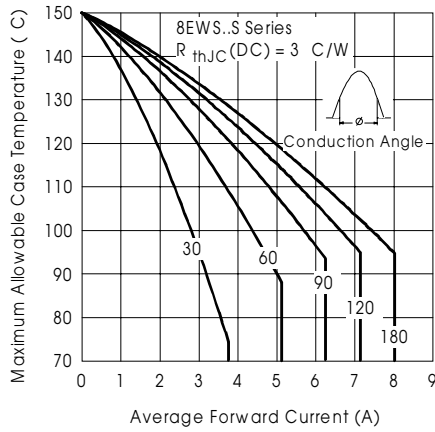


Fig. 1 - Current Rating Characteristics

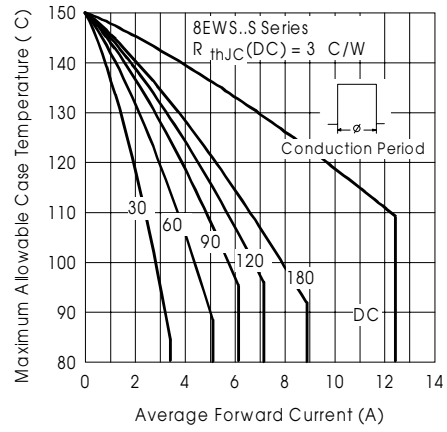


Fig. 2 - Current Rating Characteristics

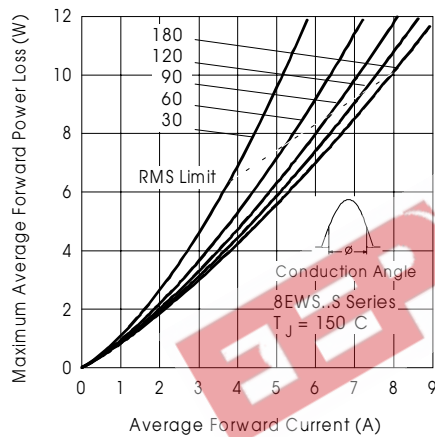


Fig. 3 - Forward Power Loss Characteristics

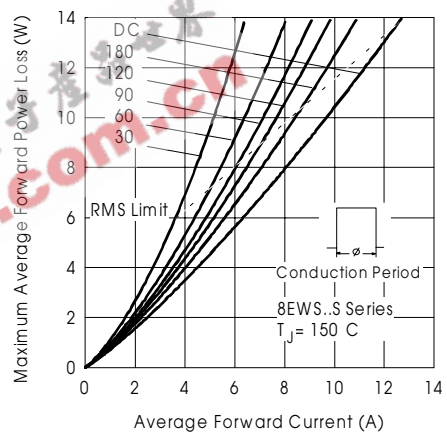


Fig. 4 - Forward Power Loss Characteristics

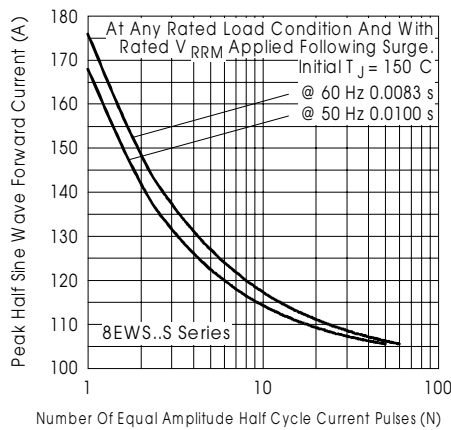


Fig. 5 - Maximum Non-Repetitive Surge Current

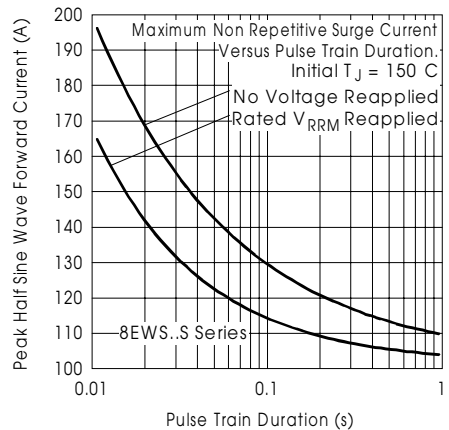


Fig. 6 - Maximum Non-Repetitive Surge Current

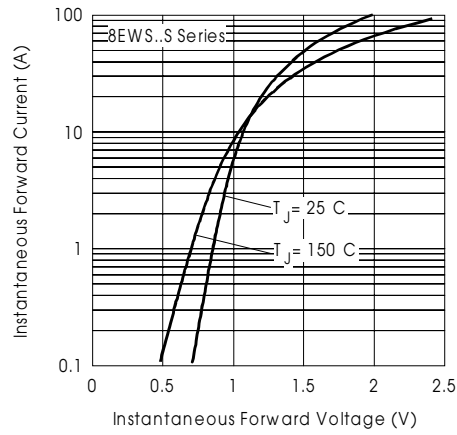


Fig.7-Forward Voltage Drop Characteristics

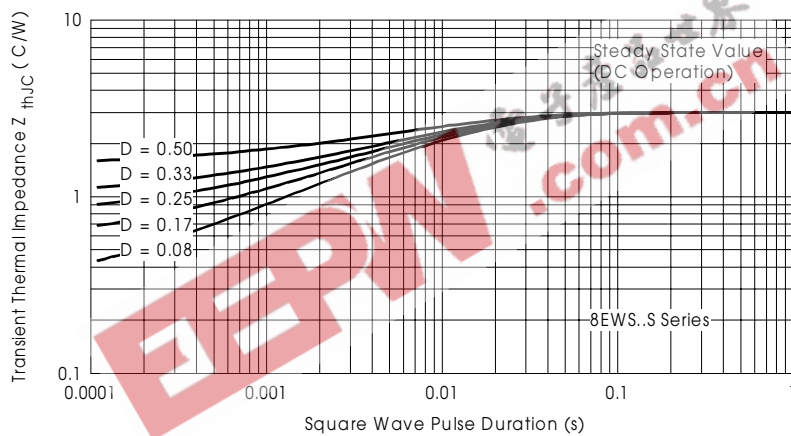


Fig.8- Thermal Impedance Z_{thJC} Characteristics

Ordering Information Table

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

| | | | | | | | |
|---|---|----|--------|----|---------|----|---------|
| <p>1 - Current Rating</p> <p>2 - Circuit Configuration E = Single Diode</p> <p>3 - Package W = D-PAK</p> <p>4 - Type of Silicon S = Standard Recovery Rectifier</p> <p>5 - Voltage code: Code x 100 = V_{RRM}</p> <p>6 - S = Surface Mountable</p> <p>7 - Tape and Reel Option TRL = Left Reel TRR = Right Orientation Reel</p> | <table border="1"> <tr><td>08</td><td>= 800V</td></tr> <tr><td>10</td><td>= 1000V</td></tr> <tr><td>12</td><td>= 1200V</td></tr> </table> | 08 | = 800V | 10 | = 1000V | 12 | = 1200V |
| 08 | = 800V | | | | | | |
| 10 | = 1000V | | | | | | |
| 12 | = 1200V | | | | | | |

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

Outline Table

Dimensions in millimeters and (inches)

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

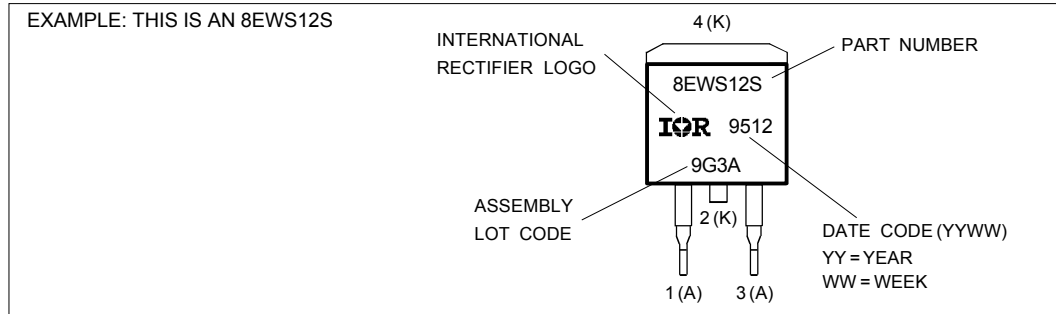
MINIMUM RECOMMENDED FOOTPRINT

8EWS..S SAFEIR Series

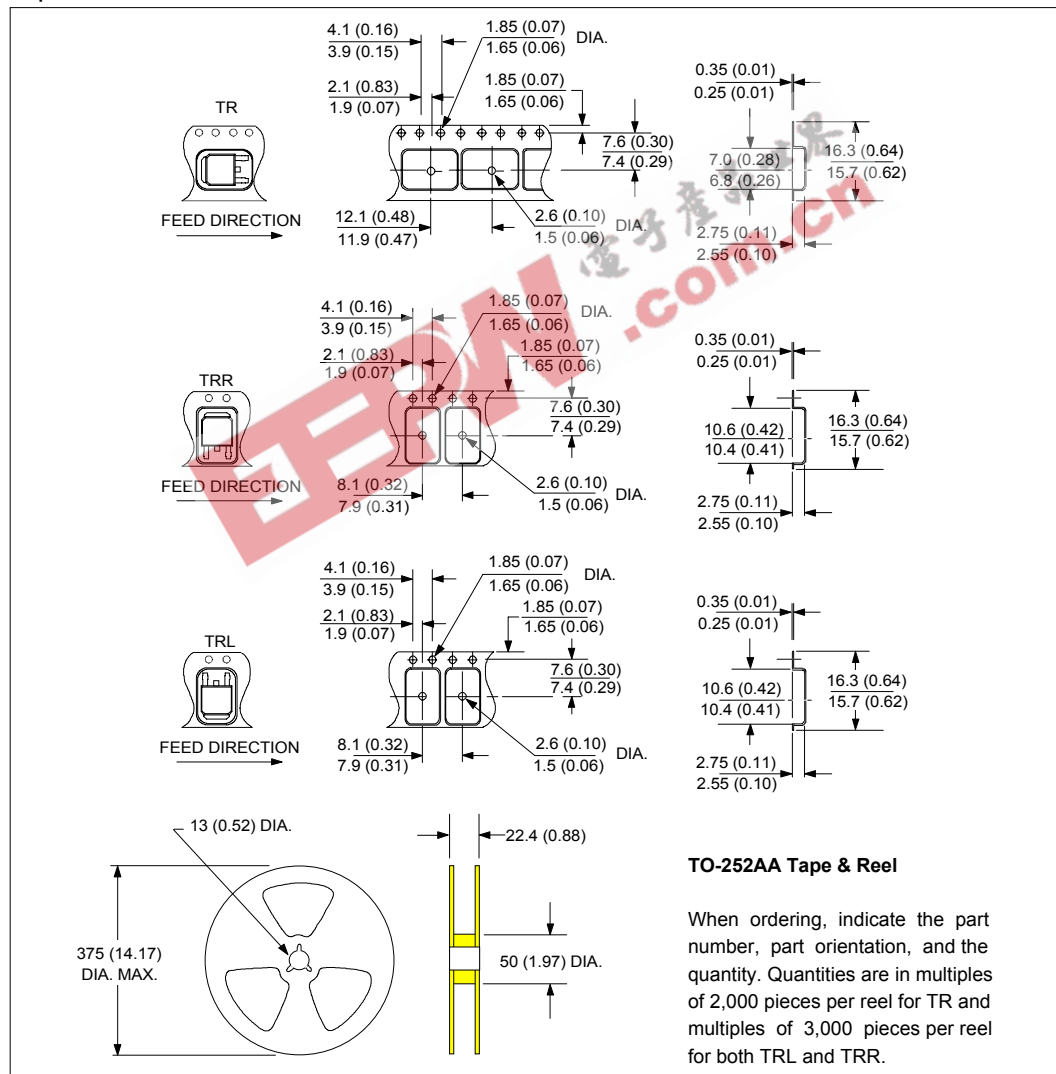
Bulletin I2108 rev. G 08/00

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Marking Information



Tape & Reel Information



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Data and specifications subject to change without notice.