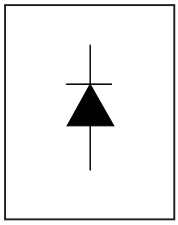
Bulletin I2166 rev. B 09/05

International
IOR Rectifier

# *SAFEIR* Series
# 8EWS..SPbF

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



$V_F$ < 1V @ 10A
$I_{FSM}$ = 200A
$V_{RRM}$ = 800V, 1200V

### 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.

### 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°C/W | 2.5 | 2.8 | |
| Aluminum IMS with heatsink, $R_{thCA}$ = 5°C/W | 5.5 | 6.5 | |

$T_A$ = 55°C, $T_J$ = 125°C, footprint 300mm$^2$

### 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°C | 1.10 | V |
| $T_J$ | - 40 to 150 | °C |

### Package Outline

TO-252AA (D-Pak)

## 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° 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°C | |
| $r_t$ | Forward slope resistance | 20 | mΩ | $T_J$ = 150°C | |
| $V_{F(TO)}$ | Threshold voltage | 0.82 | V | | |
| $I_{RM}$ | Max. Reverse Leakage Current | 0.05 | mA | $T_J$ = 25 °C | $V_R$ = rated $V_{RRM}$ |
| | | 0.50 | | $T_J$ = 150 °C | |

## Thermal-Mechanical Specifications

| | Parameters | Values | 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 | |
| $R_{thJC}$ | Max. Thermal Resistance Junction to Case | 2.5 | °C/W | DC operation |
| $R_{thJA}$ | Typ. Thermal Resistance Junction to Ambient (PCB Mount)** | 62 | °C/W | |
| wt | Approximate Weight | 1(0.03) | g (oz.) | |
| T | Case Style | TO-252AA (D-PAK) | | |

**When mounted on 1" square (650mm$^2$) 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

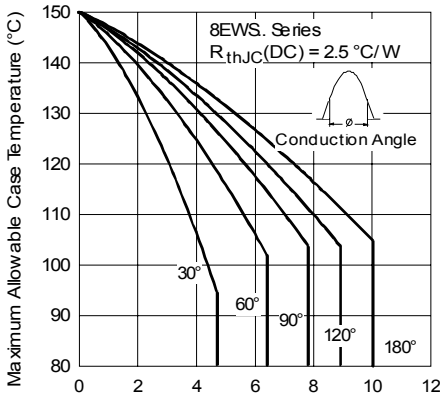



Fig. 1 - Current Rating Characteristics

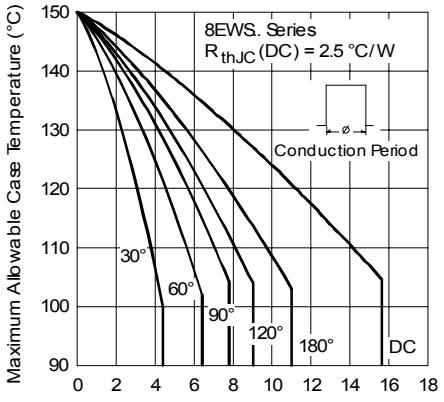



Fig. 2 - Current Rating Characteristics

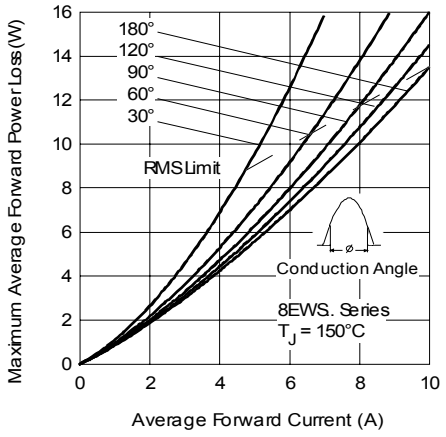



Fig. 3 - Forward Power Loss Characteristics

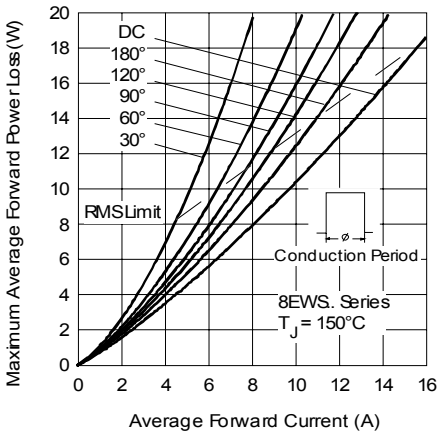



Fig. 4 - Forward Power Loss Characteristics

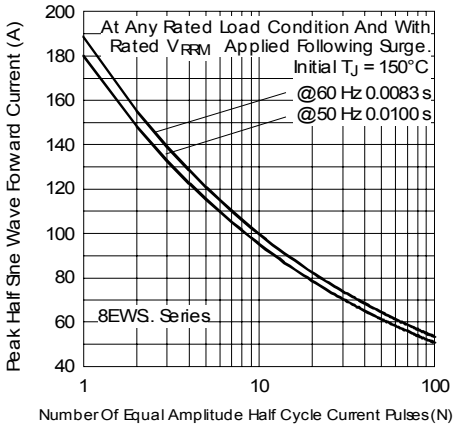



Fig. 5 - Maximum Non-Repetitive Surge Current

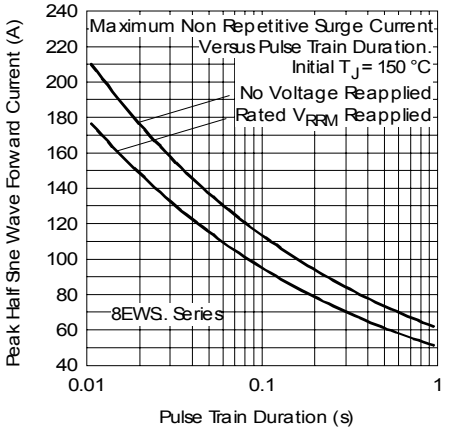



Fig. 6 - Maximum Non-Repetitive Surge Current

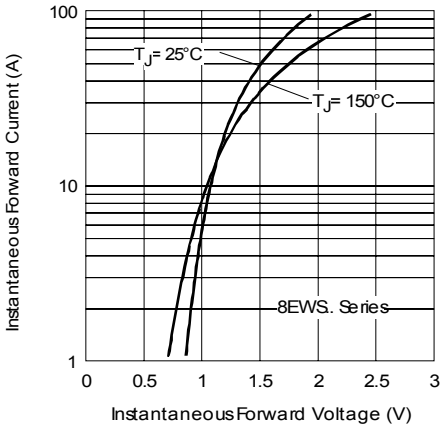



Fig. 8 - Forward Voltage Drop Characteristics

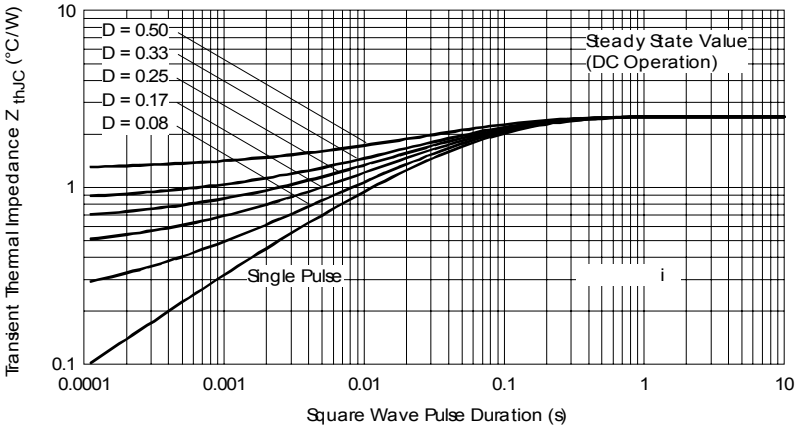
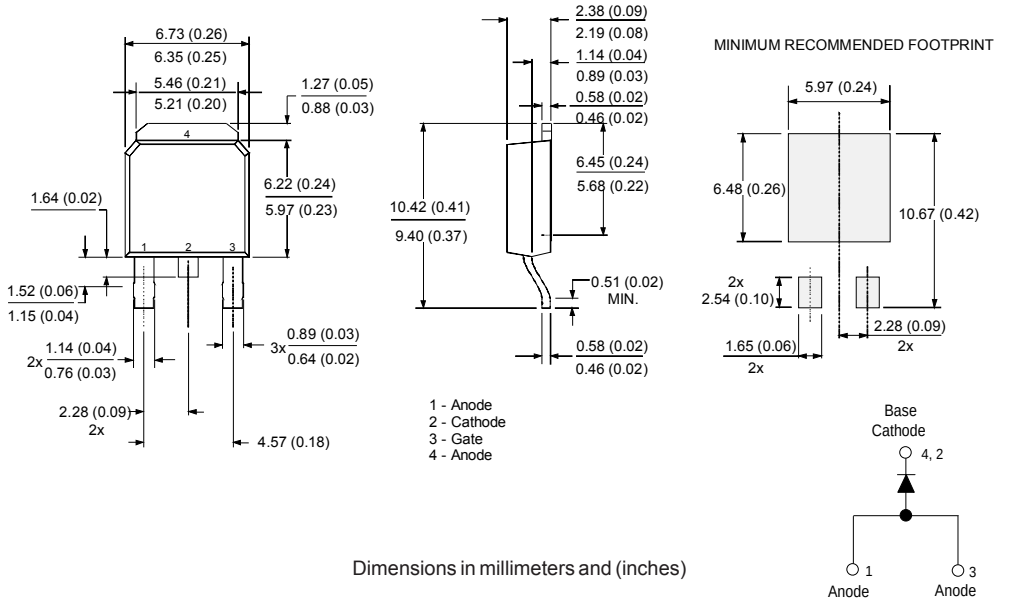
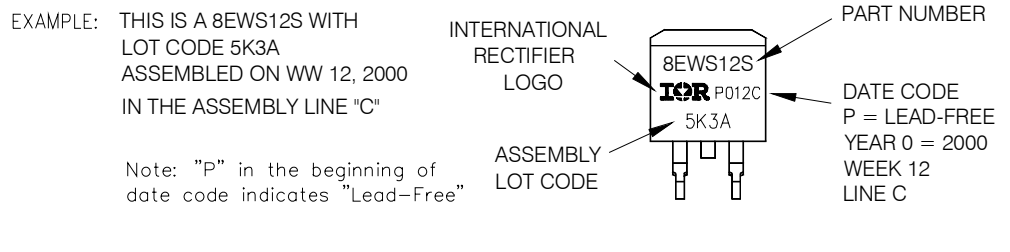



Fig. 9 - Thermal Impedance $Z_{thJC}$ Characteristics

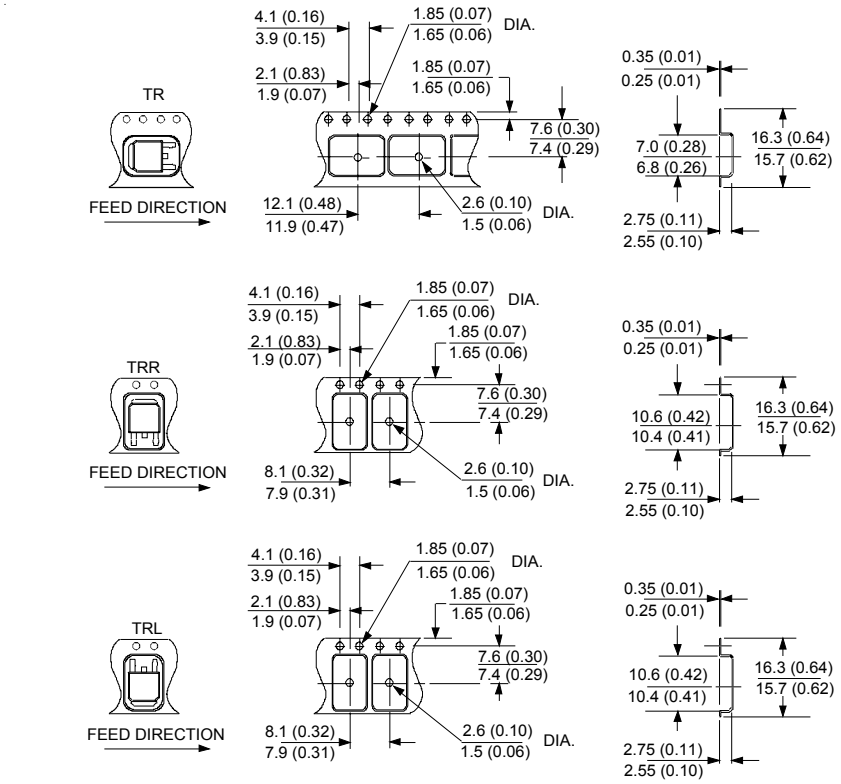
## Outline Table

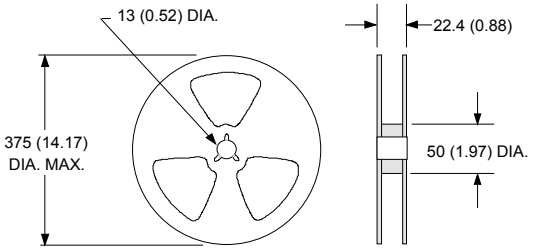



## Marking Information



## Tape & Reel Information




**TO-252AA Tape & Reel**

When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 2,000 pieces per reel for TR and multiples of 3,000 pieces per reel for both TRL and TRR.

## Ordering Information Table

**Device Code**

| 8 | E | W | S | 12 | S | TR | PbF |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**1** - Current Rating (8 = 8A)

**2** - Circuit Configuration:
E = Single Diode

**3** - Package:
W = D-Pak

**4** - Type of Silicon:
S = Standard Recovery Rectifier

**5** - Voltage Ratings
- 08 = 800V
- 12 = 1200V

**6** - S = Surface Mountable

**7** -
- TR = Tape & Reel
- TRR = Tape & Reel (Right Oriented)
- TRL = Tape & Reel (Left Oriented)

**8** -
- none = Standard Production
- PbF = Lead-Free

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.

International
IOR Rectifier

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