

International  
**IR** Rectifier

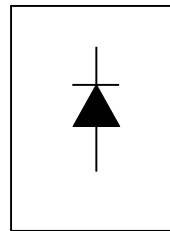
**SAFEIR** Series  
25ETS..S

## INPUT RECTIFIER DIODE

### Description/Features

The 25ETS.. 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.

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  |
| $I_{FSM}$ | = 300A      |
| $V_{RRM}$ | 800 - 1200V |

### Output Current in Typical Applications

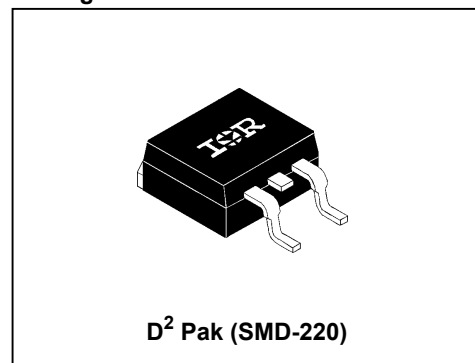
|                                                                                                                       | Single-phase Bridge | Three-phase Bridge | Units |
|-----------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|-------|
| Capacitive input filter $T_A = 55^\circ\text{C}$ , $T_J = 125^\circ\text{C}$ , common heatsink of $1^\circ\text{C/W}$ | 20                  | 23                 | A     |

### Major Ratings and Characteristics

| Characteristics                       | 25ETS..    | Units            |
|---------------------------------------|------------|------------------|
| $I_{F(AV)}$ Sinusoidal waveform       | 25         | A                |
| $V_{RRM}$ Range(*)                    | 800 - 1200 | V                |
| $I_{FSM}$                             | 300        | A                |
| $V_F$ @ 10A, $T_J = 25^\circ\text{C}$ | 1.0        | V                |
| $T_J$                                 | -40 to 150 | $^\circ\text{C}$ |

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

### Package Outline



## 25ETS..S *SAFEIR* Series

Bulletin I2158 05/00

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### Voltage Ratings

| Part Number | $V_{RRM}$ , maximum<br>peak reverse voltage<br>V | $V_{RSM}$ , maximum non repetitive<br>peak reverse voltage<br>V | $I_{RRM}$<br>150°C<br>mA |
|-------------|--------------------------------------------------|-----------------------------------------------------------------|--------------------------|
| 25ETS08S    | 800                                              | 900                                                             | 1                        |
| 25ETS12S    | 1200                                             | 1300                                                            |                          |

Provide terminal coating for voltages above 1200V

### Absolute Maximum Ratings

| Parameters                                                 | 25ETS..S | Units                       | Conditions                                                   |
|------------------------------------------------------------|----------|-----------------------------|--------------------------------------------------------------|
| $I_{F(AV)}$ Max. Average Forward Current                   | 25       | A                           | @ $T_C = 106^\circ\text{C}$ , 180° conduction half sine wave |
| $I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current | 250      | A                           | 10ms Sine pulse, rated $V_{RRM}$ applied                     |
|                                                            | 300      |                             | 10ms Sine pulse, no voltage reapplied                        |
| $I^2t$ Max. $I^2t$ for fusing                              | 316      | $\text{A}^2\text{s}$        | 10ms Sine pulse, rated $V_{RRM}$ applied                     |
|                                                            | 442      |                             | 10ms Sine pulse, no voltage reapplied                        |
| $I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing                | 4420     | $\text{A}^2\sqrt{\text{s}}$ | $t = 0.1$ to 10ms, no voltage reapplied                      |

### Electrical Specifications

| Parameters                            | 25ETS..S | Units | Conditions                      |
|---------------------------------------|----------|-------|---------------------------------|
| $V_{FM}$ Max. Forward Voltage Drop    | 1.14     | V     | @ 25A, $T_J = 25^\circ\text{C}$ |
| $r_t$ Forward slope resistance        | 9.62     | mΩ    | $T_J = 150^\circ\text{C}$       |
| $V_{F(TO)}$ Threshold voltage         | 0.87     | V     |                                 |
| $I_{RM}$ Max. Reverse Leakage Current | 0.1      | mA    | $T_J = 25^\circ\text{C}$        |
|                                       | 1.0      |       | $T_J = 150^\circ\text{C}$       |

$V_R = \text{rated } V_{RRM}$

### Thermal-Mechanical Specifications

| Parameters        |                                             | 25ETS..S                    | Units   | Conditions                           |
|-------------------|---------------------------------------------|-----------------------------|---------|--------------------------------------|
| T <sub>J</sub>    | Max. Junction Temperature Range             | -40 to 150                  | °C      |                                      |
| T <sub>stg</sub>  | Max. Storage Temperature Range              | -40 to 150                  | °C      |                                      |
| R <sub>thJC</sub> | Max. ThermalResistanceJunction to Case      | 0.9                         | °C/W    | DCoperation                          |
| R <sub>thJA</sub> | Max. Thermal Resistance Junction to Ambient | 62                          | °C/W    |                                      |
| R <sub>thCS</sub> | Typ. Thermal Resistance Case to Heatsink    | 0.5                         | °C/W    | Mounting surface, smooth and greased |
| wt                | Approximate Weight                          | 2 (0.07)                    | g (oz.) |                                      |
| T                 | Mounting Torque                             | Min.                        | 6 (5)   | Kg-cm (lbf-in)                       |
|                   |                                             | Max.                        | 12 (10) |                                      |
| Case Style        |                                             | D <sup>2</sup> Pak(SMD-220) |         |                                      |

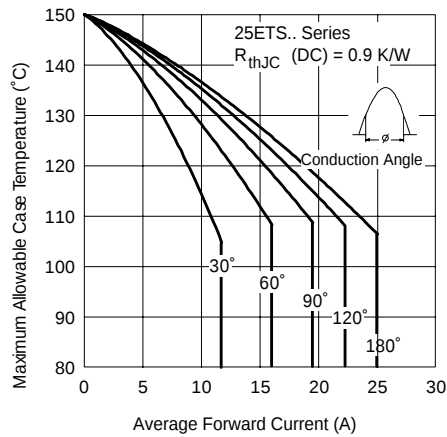


Fig. 1 - Current Rating Characteristics

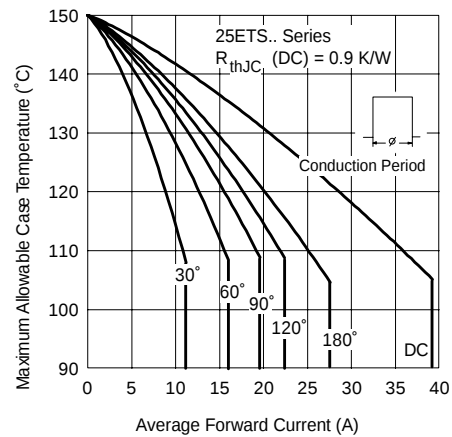


Fig. 2 - Current Rating Characteristics

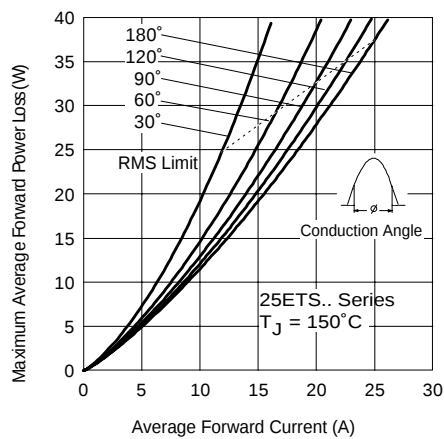


Fig. 3 - Forward Power Loss Characteristics

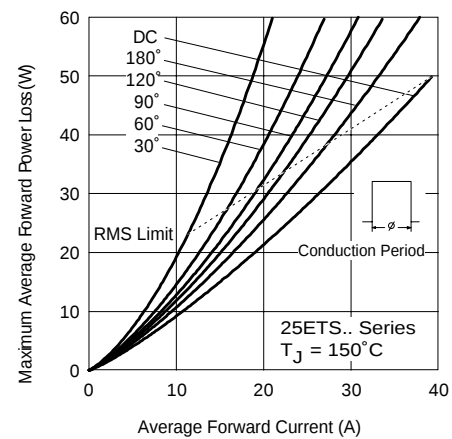


Fig. 4 - Forward Power Loss Characteristics

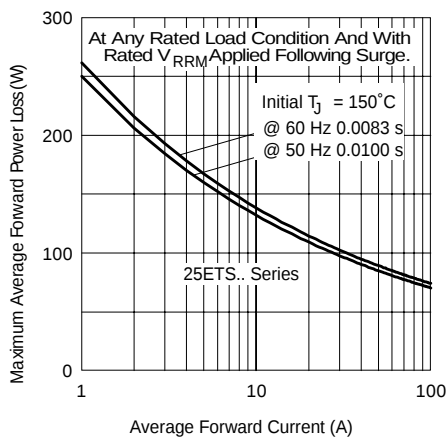


Fig. 5 - Maximum Non-Repetitive Surge Current

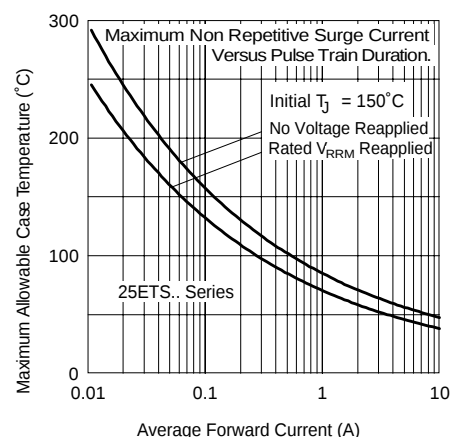


Fig. 6 - Maximum Non-Repetitive Surge Current

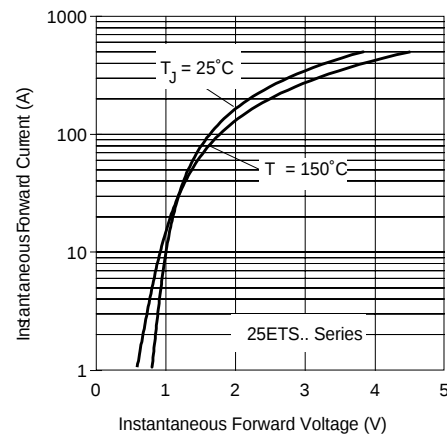


Fig. 7 - Forward Voltage Drop Characteristics

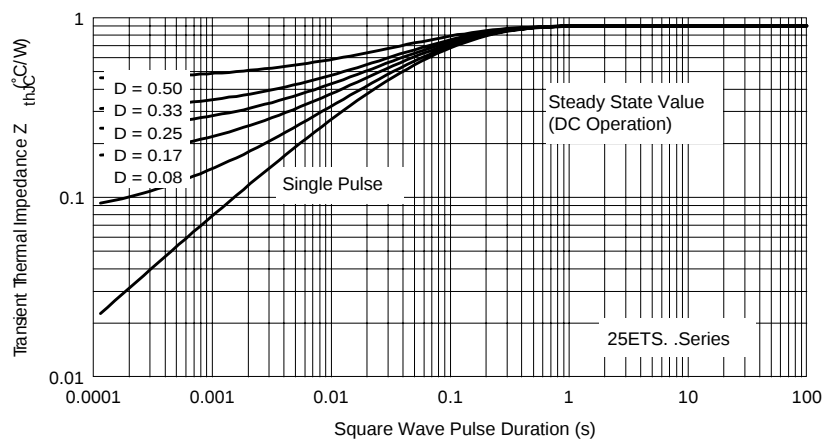


Fig.8- Thermal Impedance  $Z_{thJC}$  Characteristics

## Ordering Information Table

## Device Code

|    |   |   |   |    |   |     |
|----|---|---|---|----|---|-----|
| 25 | E | T | S | 12 | S | TRL |
| 1  | 2 | 3 | 4 | 5  | 6 | 7   |

- 1** - Current Rating
- 2** - Circuit Configuration: E = Single Diode
- 3** - Package: T = TO-220AC
- 4** - Type of Silicon: S = Standard Recovery Rectifier
- 5** - Voltage code: Code x 100 =  $V_{RRM}$
- 6** - S = TO-220 D<sup>2</sup>Pak (SMD-220) Version
- 7** - Tape and Reel Option

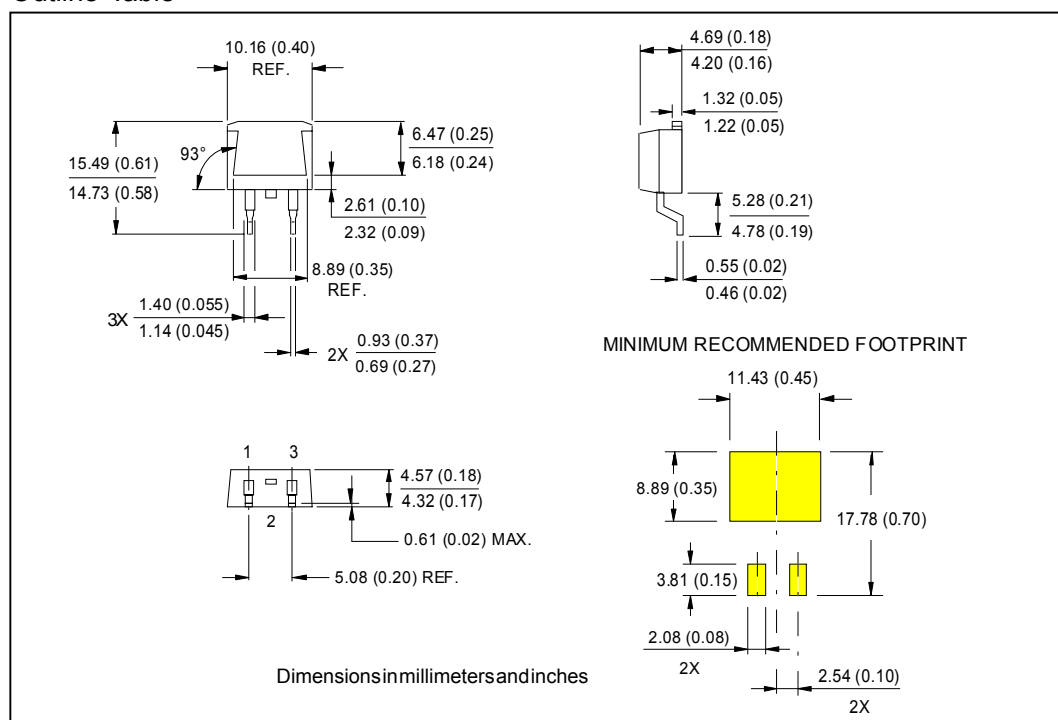
|    |         |
|----|---------|
| 08 | = 800V  |
| 12 | = 1200V |

TRL = Left Reel

TRR = Right Orientation Reel

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

## Outline Table

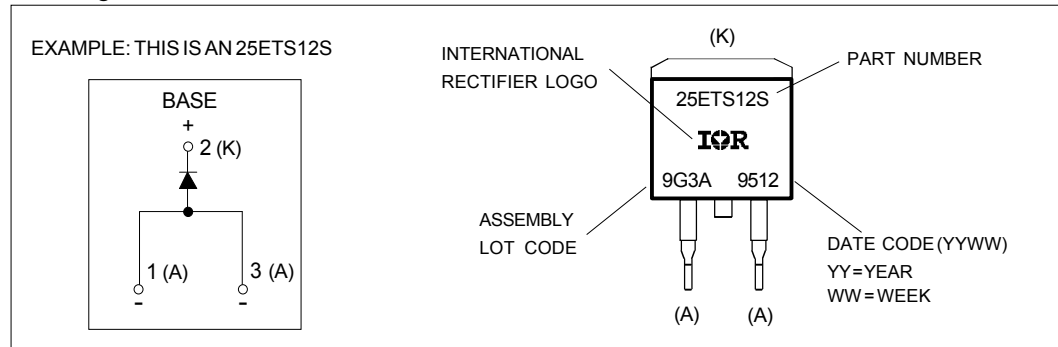


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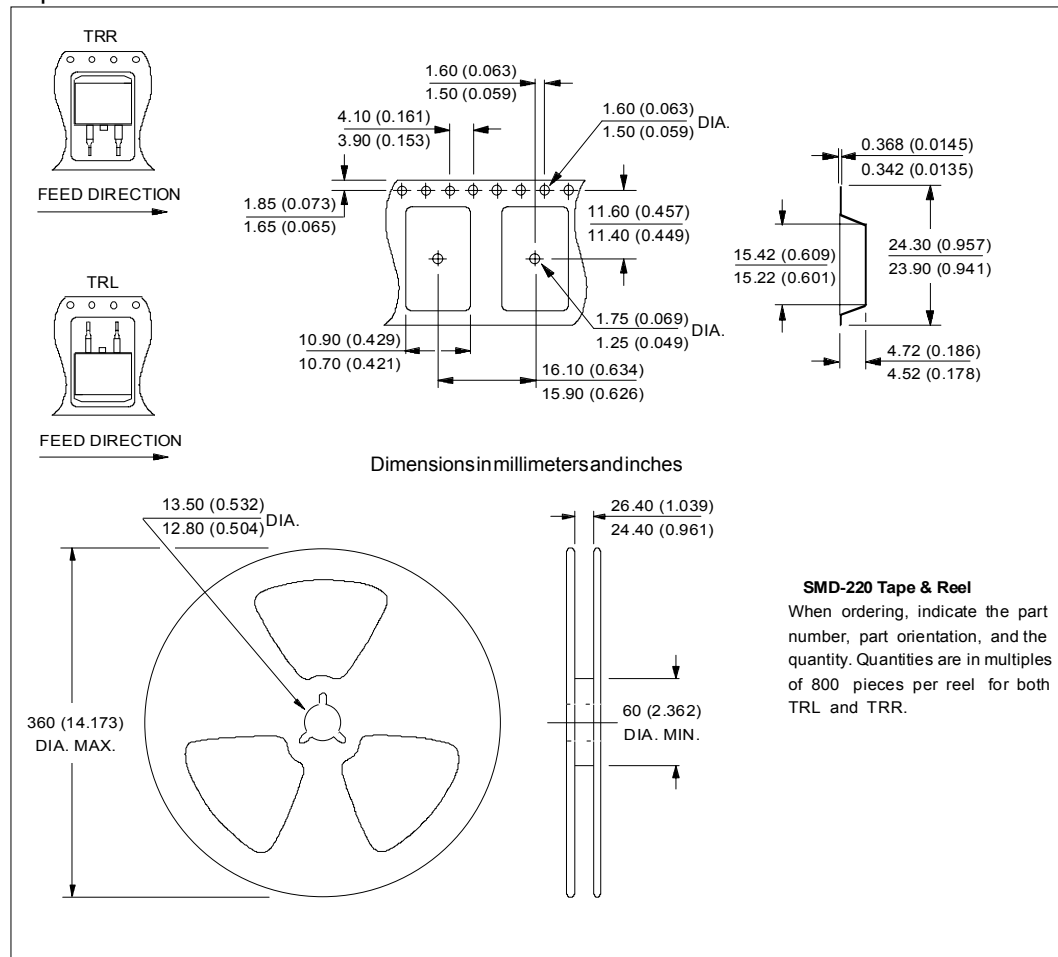
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### Marking Information



### Tape & Reel Information



**WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245 U.S.A. Tel: (310) 322 3331. Fax: (310) 322 3332.  
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**IR GERMANY:** Saalburgstrasse 157, 61350 Bad Homburg. Tel: ++ 49 6172 96590. Fax: ++ 49 6172 965933.  
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**IR FAR EAST:** K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo, Japan 171. Tel: 81 3 3983 0086.  
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