

International  
**IR** Rectifier

**SAFEIR** Series  
70EPS..

INPUT RECTIFIER DIODE



$I_{F(RMS)} = 135A$   
 $V_F < 1.15V @ 70A$   
 $I_{FSM} = 900A$   
 $V_{RRM} 800 \text{ to } 1200V$

#### Major Ratings and Characteristics

| Characteristics                                    | 70EPS..     | Units      |
|----------------------------------------------------|-------------|------------|
| $I_{F(AV)}$ Sine waveform<br>@ $T_C = 103^\circ C$ | 70          | A          |
| $I_{F(RMS)}$                                       | 135         | A          |
| $V_{RRM}$ range(*)                                 | 800 to 1200 | V          |
| $I_{FSM}$                                          | 900         | A          |
| $V_F$ @ 70A, $T_J = 25^\circ C$                    | 1.12        | V          |
| $T_J$ range                                        | -40 to 150  | $^\circ C$ |

#### Description/ Features

The 70EPS.. 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  $150^\circ C$  junction temperature.

Available in the new **PowIRtab™** package, this new series is suitable for a large range of applications combining excellent die to footprint ratio and sturdiness connectivity for use in high current environments.

#### Case Styles

70EPS..



70EPS..J



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

## 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 |
|-------------|--------------------------------------------------|-----------------------------------------------------------------|--------------------------|
| 70EPS08     | 800                                              | 900                                                             | 5                        |
| 70EPS12     | 1200                                             | 1300                                                            |                          |

## Absolute Maximum Ratings

| Parameters                                               | 70EPS.. | Units                        | Conditions                                                   |
|----------------------------------------------------------|---------|------------------------------|--------------------------------------------------------------|
| $I_{F(AV)}$ Max.AverageForwardCurrent                    | 70      | A                            | @ $T_C = 103^\circ\text{C}$ , 180° conduction half sine wave |
| $I_{F(RMS)}$                                             | 135     | A                            |                                                              |
| $I_{FSM}$ Max.PeakOneCycleNon-Repetitive<br>SurgeCurrent | 800     | A                            | 10ms Sine pulse, rated $V_{RRM}$ applied                     |
|                                                          | 950     |                              | 10ms Sine pulse, no voltage reapplied                        |
| $I^2t$ Max. $I^2t$ for fusing                            | 3200    | $\text{A}^2\text{s}$         | 10ms Sine pulse, rated $V_{RRM}$ applied                     |
|                                                          | 4500    |                              | 10ms Sine pulse, no voltage reapplied                        |
| $I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing              | 32000   | $\text{A}^2/\sqrt{\text{s}}$ | $t = 0.1$ to 10ms, no voltage reapplied                      |

## Electrical Specifications

| Parameters                            | 70EPS.. | Units | Conditions                                             |
|---------------------------------------|---------|-------|--------------------------------------------------------|
| $V_{FM}$ Max. Forward Voltage Drop    | 1.12    | V     | @ 70A, $T_J = 25^\circ\text{C}$                        |
| $r_t$ Forward slope resistance        | 3.075   | mΩ    | $T_J = 150^\circ\text{C}$                              |
| $V_{F(TO)}$ Threshold voltage         | 0.829   | V     |                                                        |
| $I_{RM}$ Max. Reverse Leakage Current | 0.1     | mA    | $T_J = 25^\circ\text{C}$ $V_R = \text{rated } V_{RRM}$ |
|                                       | 5.0     |       | $T_J = 150^\circ\text{C}$                              |

## Thermal-Mechanical Specifications

| Parameters        |                                              | 70EPS..     | 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. Thermal Resistance Junction to Case     | 0.35        | °C/W              | DC operation                         |
| R <sub>thJA</sub> | Max. Thermal Resistance Junction to Ambient  | 40          | °C/W              |                                      |
| R <sub>thCS</sub> | Typical Thermal Resistance, Case to Heatsink | 0.2         | °C/W              | Mounting surface, smooth and greased |
| wt                | Approximate Weight                           | 6(0.21)     | g(oz.)            |                                      |
| T                 | Mounting Torque                              | Min. 6(5)   | Kg-cm<br>(lbf-in) |                                      |
|                   |                                              | Max. 12(12) |                   |                                      |
| Case Style        |                                              | PowIRtab™   |                   |                                      |

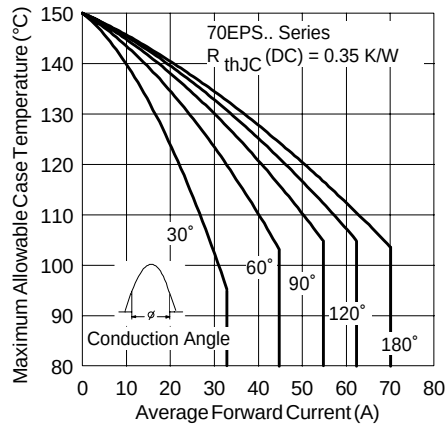


Fig. 1- Current Rating Characteristics

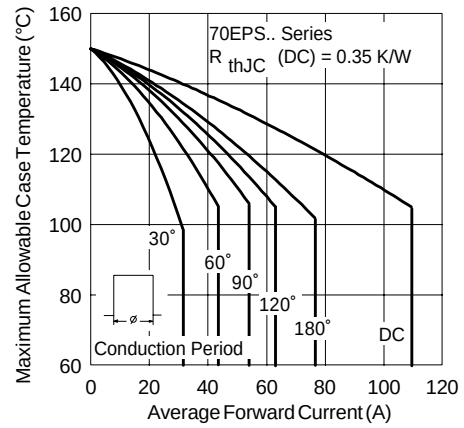


Fig. 2- Current Rating Characteristics

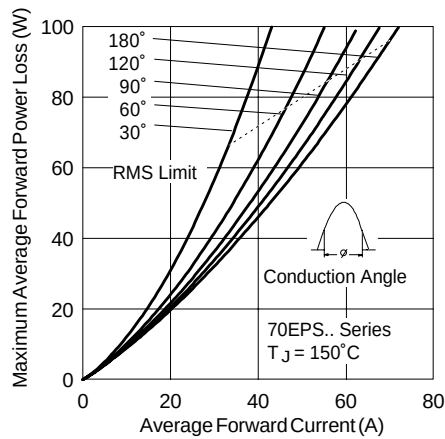


Fig. 3- Forward Power Loss Characteristics

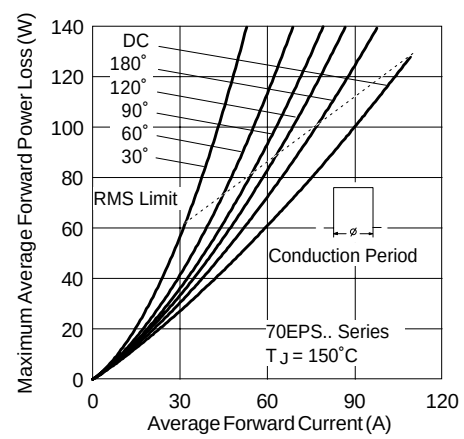


Fig. 4- Forward Power Loss Characteristics

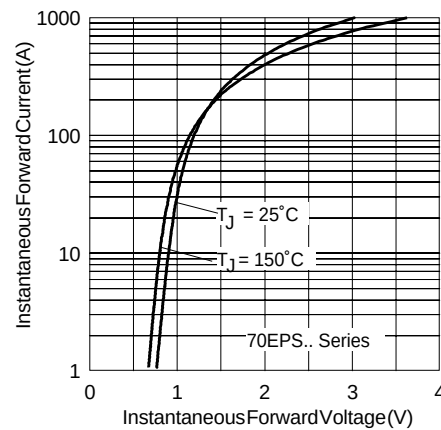


Fig. 5- Forward Voltage Drop Characteristics

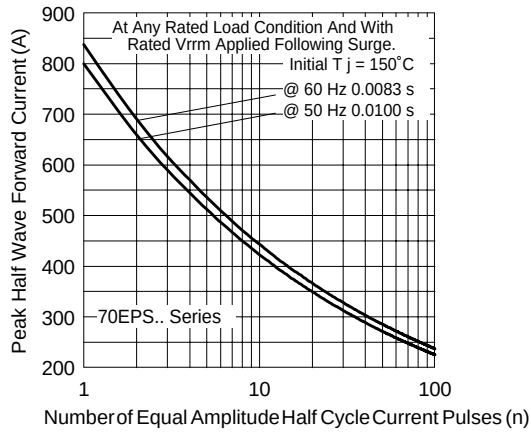


Fig. 5 - Maximum Non-Repetitive Surge Current

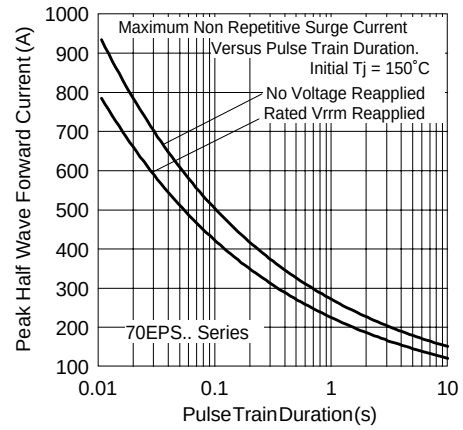


Fig. 6 - Maximum Non-Repetitive Surge Current

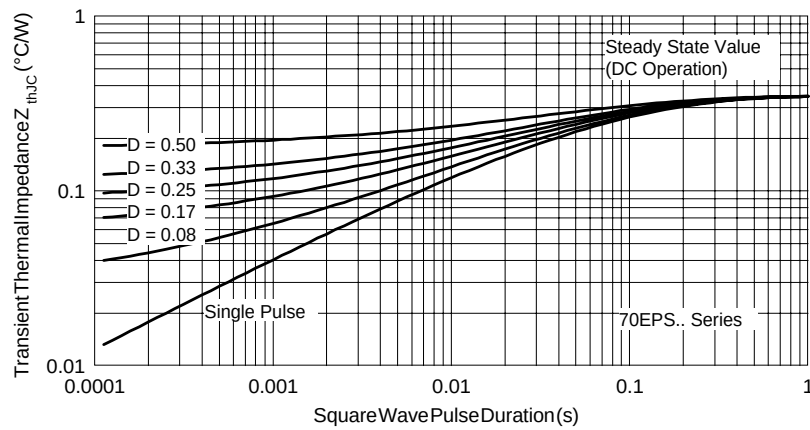
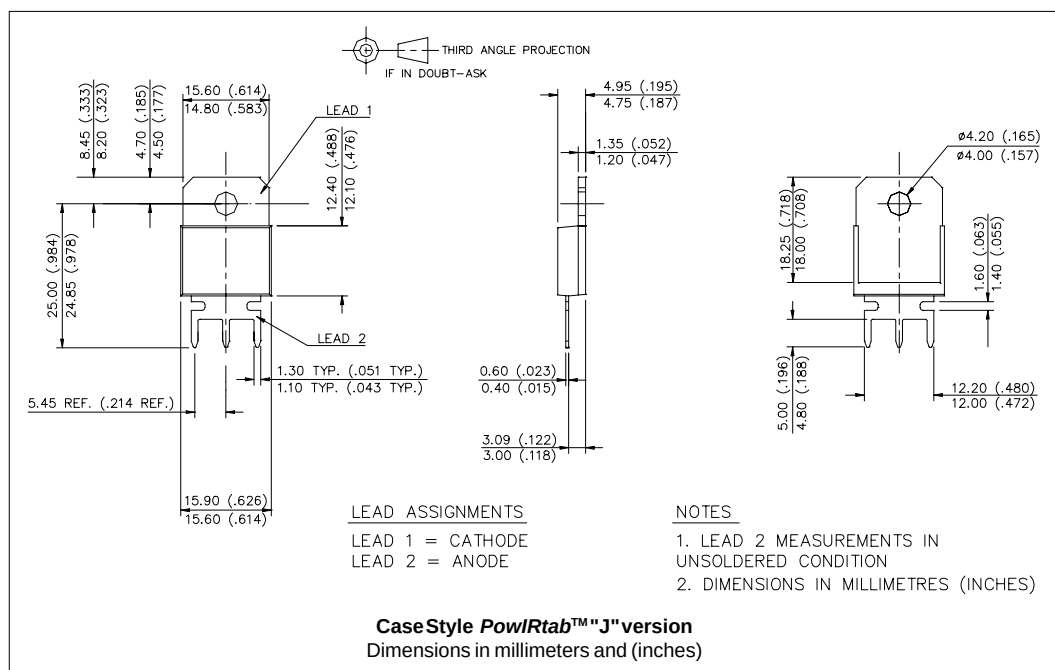
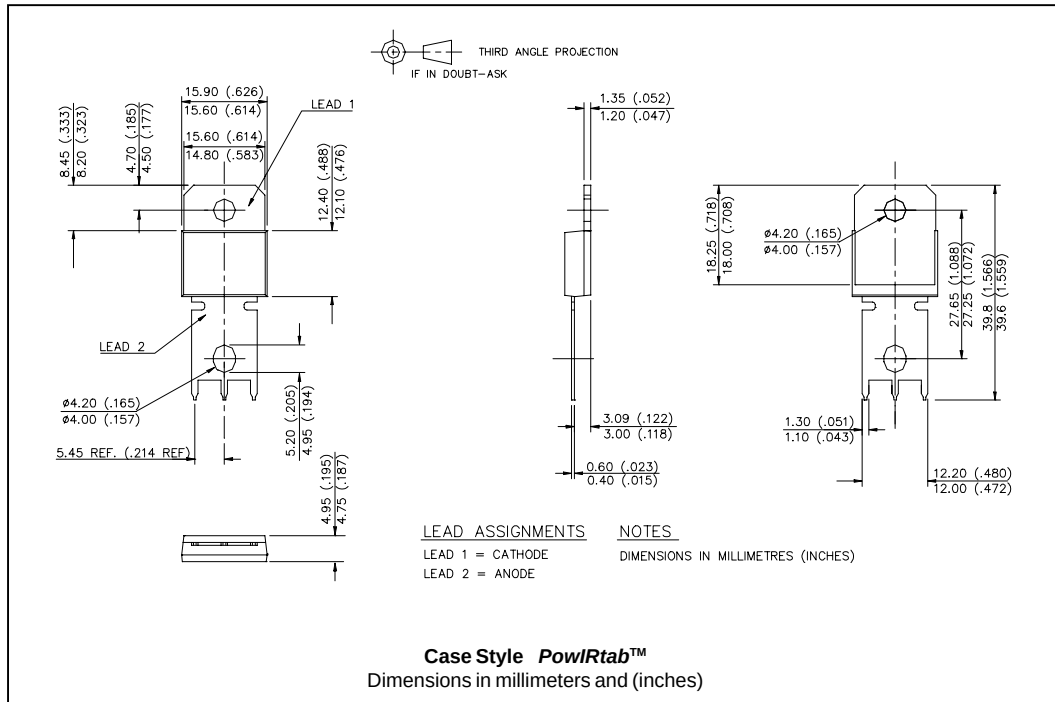


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

## Outline Table



## Ordering Information Table

## Device Code

- 1** - Current Rating
- 2** - Circuit Configuration:  
E = Single Diode
- 3** - Package:  
P = *PowIRtab*<sup>TM</sup>
- 4** - Type of Silicon:  
S = Standard Recovery Rectifier
- 5** - Voltage code: Code x 100 = V<sub>RRM</sub>

08 = 800V  
12 = 1200V

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

Data and specifications subject to change without notice.  
This product has been designed and qualified for Industrial Level.  
Qualification Standards can be found on IR's Web site.

International  
**IR** Rectifier

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