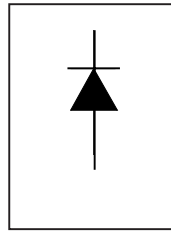


International
IR Rectifier

SAFEIR Series
 40EPS..PbF

INPUT RECTIFIER DIODE
 Lead-Free ("PbF" suffix)



$$V_F < 1V @ 20A$$

$$I_{FSM} = 475A$$

$$V_{RRM} = 800 - 1200V$$

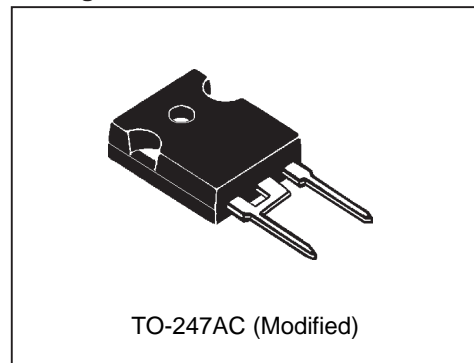
Description/ Features

The 40EPS..PbF 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.

Major Ratings and Characteristics

| Characteristics | Values | Units |
|---------------------------------|------------|-------|
| $I_{F(AV)}$ Sinusoidal waveform | 40 | A |
| V_{RRM} range | 800-1200 | V |
| I_{FSM} | 475 | A |
| V_F @ 20A, $T_J = 25^\circ C$ | 1.0 | V |
| T_J | -40 to 150 | °C |

Package Outline



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 |
|-------------|---|--|--------------------------|
| 40EPS08PbF | 800 | 900 | 1 |
| 40ETF12PbF | 1200 | 1300 | |

Absolute Maximum Ratings

| Parameters | 40EPS.. | Units | Conditions |
|--|---------|---------------|--|
| $I_{F(AV)}$ Max. Average Forward Current | 40 | A | @ $T_C = 105^\circ\text{C}$, 180° conduction half sine wave |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current | 400 | A | 10ms Sine pulse, rated V_{RRM} applied |
| | 475 | | 10ms Sine pulse, no voltage reapplied |
| I^2t Max. I^2t for fusing | 800 | A^2s | 10ms Sine pulse, rated V_{RRM} applied |
| | 1131 | | 10ms Sine pulse, no voltage reapplied |
| $I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing | 11310 | $A^2\sqrt{s}$ | $t = 0.1$ to 10ms, no voltage reapplied |

Electrical Specifications

| Parameters | 40EPS.. | Units | Conditions |
|---------------------------------------|---------|-----------|---------------------------------|
| V_{FM} Max. Forward Voltage Drop | 1.1 | V | @ 40A, $T_J = 25^\circ\text{C}$ |
| r_t Forward slope resistance | 7.16 | $m\Omega$ | $T_J = 150^\circ\text{C}$ |
| $V_{F(TO)}$ Threshold voltage | 0.74 | 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 | 40EPS.. | Units | Conditions |
|---|------------|--------------------|--------------------------------------|
| T_J Max. Junction Temperature Range | -40 to 150 | $^\circ\text{C}$ | |
| T_{stg} Max. Storage Temperature Range | -40 to 150 | $^\circ\text{C}$ | |
| R_{thJC} Max. Thermal Resistance Junction to Case | 0.6 | $^\circ\text{C/W}$ | DC operation |
| R_{thJA} Max. Thermal Resistance Junction to Ambient | 40 | $^\circ\text{C/W}$ | |
| R_{thCS} Typical Thermal Resistance, Case to Heatsink | 0.2 | $^\circ\text{C/W}$ | Mounting surface, smooth and greased |
| wt Approximate Weight | 6 (0.21) | g (oz.) | |
| T Mounting Torque | Min. | 6 (5) | Kg-cm (lbf-in) |
| | Max. | 12 (10) | |
| Case Style | TO-247AC | | JEDEC (Modified) |
| Marking Device | 40EPS12 | | |

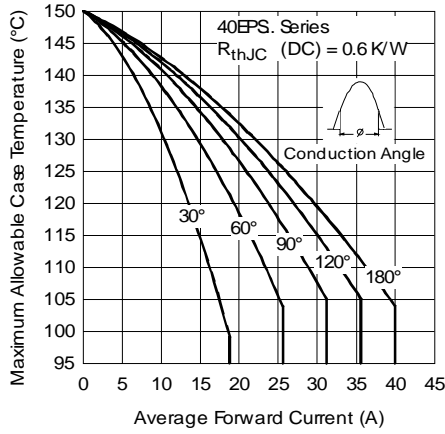


Fig. 1 - Current Rating Characteristics

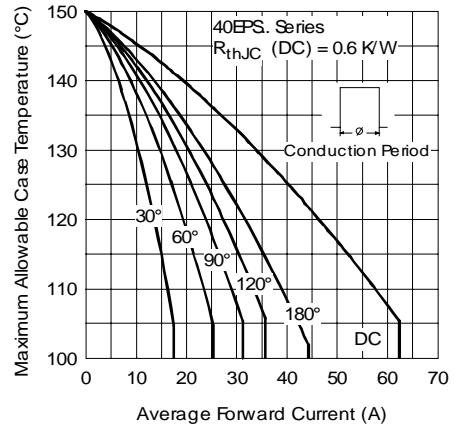


Fig. 2 - Current Rating Characteristics

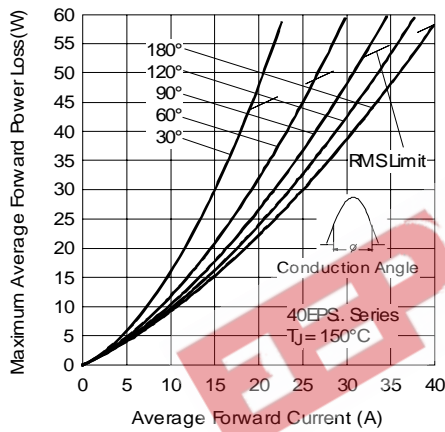


Fig. 3 - Forward Power Loss Characteristics

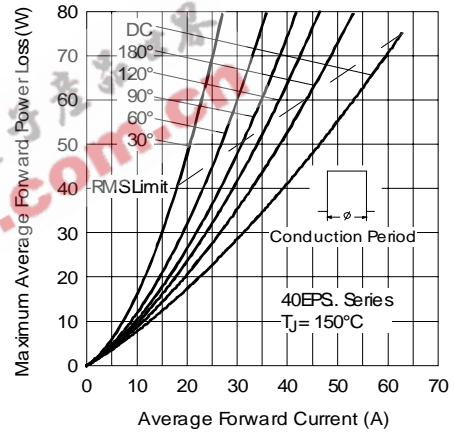


Fig. 4 - Forward Power Loss Characteristics

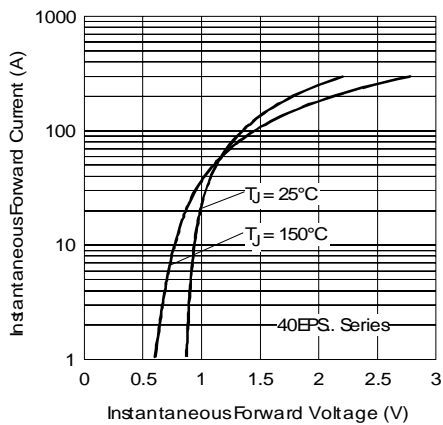


Fig. 5 - Forward Voltage Drop Characteristics

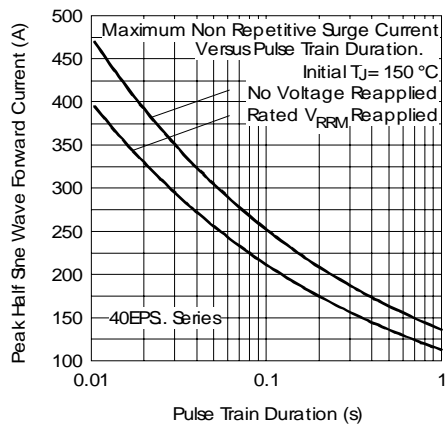


Fig. 6 - Maximum Non-Repetitive Surge Current

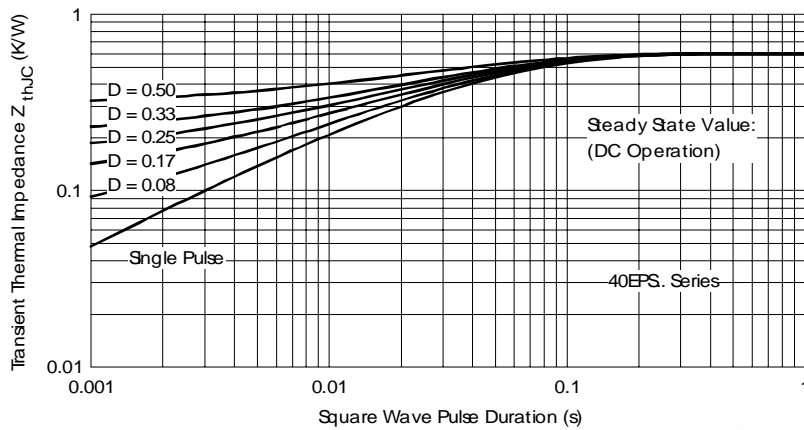
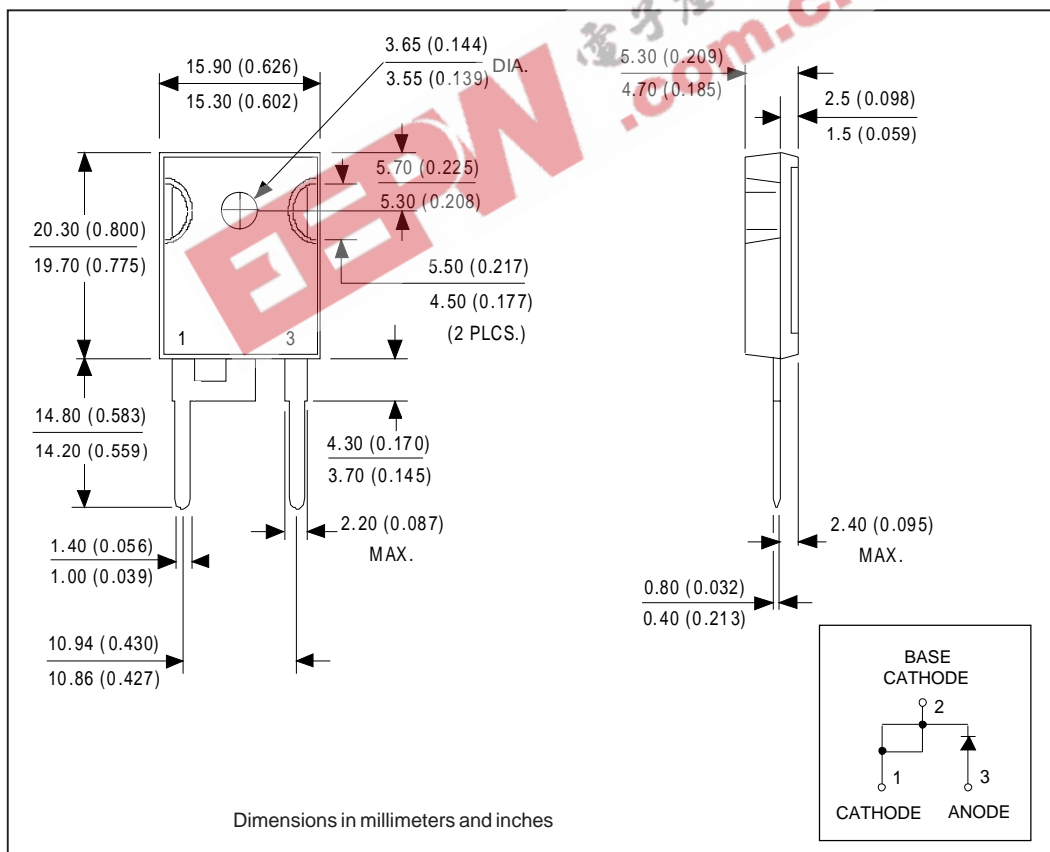


Fig. 7 - Thermal Impedance Z_{thJC} Characteristics

Outline Table



Marking Information

EXAMPLE: THIS IS A 40EPS12 WITH ASSEMBLY LOT CODE 5657 ASSEMBLED ON WW 35, 2000 IN ASSEMBLY LINE "H"

INTERNATIONAL RECTIFIER LOGO

ASSEMBLY LOT CODE

PART NUMBER

DATE CODE
P = LEAD-FREE
YEAR 0 = 2000
WEEK 35
LINE H

Ordering Information Table

| Device Code | | | | | |
|-------------|---|---------------------------------|------------|----|-----|
| 40 | E | P | S | 12 | PbF |
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | - | Current Rating (40 = 40A) | | | |
| 2 | - | Circuit Configuration: | | | |
| | | E = Single Diode | | | |
| 3 | - | Package: | | | |
| | | P = TO-247AC (Modified) | | | |
| 4 | - | Type of Silicon: | | | |
| | | S = Standard Recovery Rectifier | | | |
| 5 | - | Voltage Ratings | 12 = 1200V | | |
| | | | 08 = 800V | | |
| 6 | - | • 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.