

International  
**IR** Rectifier

**SAFEIR** Series  
40TPS..

## PHASE CONTROL SCR

|                                                                                   |                         |
|-----------------------------------------------------------------------------------|-------------------------|
|  | $V_T < 1.45V @ 40A$     |
|                                                                                   | $I_{TSM} = 500A$        |
|                                                                                   | $V_{RRM} = 800 - 1200V$ |

### Description/ Features

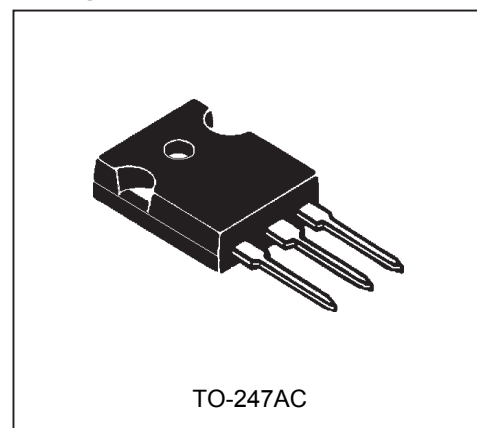
The 40TPS... **SAFEIR** series of silicon controlled rectifiers are specifically designed for medium power switching and phase control applications. The glass passivation technology used has reliable operation up to 125°C junction temperature. Low lgt parts available.

Typical applications are in input rectification (soft start) and these products are designed to be used with International Rectifier input diodes, switches and output rectifiers which are available in identical package outlines.

### Major Ratings and Characteristics

| Characteristics                  | 40TPS..    | Units      |
|----------------------------------|------------|------------|
| $I_{T(AV)}$ Sinusoidal waveform  | 35         | A          |
| $I_{RMS}$                        | 55         | A          |
| $V_{RRM}/V_{DRM}$ Range          | 800 - 1200 | V          |
| $I_{TSM}$                        | 500        | A          |
| $V_T$ @ 40 A, $T_J = 25^\circ C$ | 1.45       | V          |
| dv/dt                            | 1000       | V/ $\mu s$ |
| di/dt                            | 100        | A/ $\mu s$ |
| $T_J$                            | -40 to 125 | $^\circ C$ |

### Package Outline



## Voltage Ratings

| Part Number | $V_{RRM}/V_{DRM}$ , max. repetitive peak and off-state voltage<br>V | $V_{RSM}$ , maximum non repetitive peak reverse voltage<br>V | $I_{RRM}/I_{DRM}$<br>125°C<br>mA |
|-------------|---------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------|
| 40TPS08     | 800                                                                 | 900                                                          | 10                               |
| 40TPS12     | 1200                                                                | 1300                                                         |                                  |

## Absolute Maximum Ratings

| Parameters          |                                                   | 40TPS..            | Units             | Conditions                                               |                                                                                                 |
|---------------------|---------------------------------------------------|--------------------|-------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| I <sub>T(AV)</sub>  | Max. Average On-state Current                     | 35                 | A                 | @ T <sub>C</sub> = 79° C, 180° conduction half sine wave |                                                                                                 |
| I <sub>T(RMS)</sub> | Max. Continuous RMS On-state Current As AC switch | 55                 |                   |                                                          |                                                                                                 |
| I <sub>TSM</sub>    | Max. Peak One Cycle Non-Repetitive Surge Current  | 500                | A                 | 10ms Sine pulse, rated V <sub>RRM</sub> applied          | Initial<br>T <sub>J</sub> = T <sub>J</sub> max.                                                 |
|                     |                                                   | 600                |                   | 10ms Sine pulse, no voltage reapplied                    |                                                                                                 |
| I <sup>2</sup> t    | Max. I <sup>2</sup> t for Fusing                  | 1250               | A <sup>2</sup> s  | 10ms Sine pulse, rated V <sub>RRM</sub> applied          |                                                                                                 |
|                     |                                                   | 1760               |                   | 10ms Sine pulse, no voltage reapplied                    |                                                                                                 |
| I <sup>2</sup> √t   | Max. I <sup>2</sup> √t for Fusing                 | 12500              | A <sup>2</sup> √s | t = 0.1 to 10ms, no voltage reapplied                    |                                                                                                 |
| V <sub>T(TO)1</sub> | Low Level Value of Threshold Voltage              | 1.02               | V                 | T <sub>J</sub> = 125°C                                   |                                                                                                 |
| V <sub>T(TO)2</sub> | High Level Value of Threshold Voltage             | 1.23               |                   |                                                          |                                                                                                 |
| r <sub>t1</sub>     | Low Level Value of On-state Slope Resistance      | 9.74               |                   |                                                          |                                                                                                 |
| r <sub>t2</sub>     | High Level Value of On-state Slope Resistance     | 7.50               | mΩ                |                                                          |                                                                                                 |
| V <sub>TM</sub>     | Max. Peak On-state Voltage                        | 1.85               | V                 | @ 110A, T <sub>J</sub> = 25°C                            |                                                                                                 |
| di/dt               | Max. Rate of Rise of Turned-on Current            | 100                | A/μs              | T <sub>J</sub> = 25°C                                    |                                                                                                 |
| I <sub>H</sub>      | Max. Holding Current                              | 150                | mA                |                                                          |                                                                                                 |
| I <sub>L</sub>      | Max. Latching Current                             | 300                |                   |                                                          |                                                                                                 |
| I <sub>RRM</sub> /  | Max. Reverse and Direct                           | 0.5                | mA                | T <sub>J</sub> = 25°C                                    | V <sub>R</sub> = rated V <sub>RRM</sub> /V <sub>DRM</sub>                                       |
| I <sub>DRM</sub>    | Leakage Current                                   | 10                 |                   | T <sub>J</sub> = 125°C                                   |                                                                                                 |
| dv/dt               | Max. Rate of Rise of Off-state Voltage            | 40TPS08<br>40TPS12 | 500<br>1000       | V/μs                                                     | T <sub>J</sub> = T <sub>J</sub> max., linear to 80% V <sub>DRM</sub> , R <sub>g</sub> -k = open |

## Triggering

| Parameters         |                                          | 40TPS.. | Units | Conditions                                             |                                     |
|--------------------|------------------------------------------|---------|-------|--------------------------------------------------------|-------------------------------------|
| P <sub>GM</sub>    | Max. peak Gate Power                     | 10      | W     |                                                        |                                     |
| P <sub>G(AV)</sub> | Max. average Gate Power                  | 2.5     |       |                                                        |                                     |
| I <sub>GM</sub>    | Max. peak Gate Current                   | 2.5     | A     |                                                        |                                     |
| - V <sub>GM</sub>  | Max. peak negative Gate Voltage          | 10      | V     |                                                        |                                     |
| V <sub>GT</sub>    | Max. required DC Gate Voltage to trigger | 4.0     |       | T <sub>J</sub> = - 40°C                                | Anode supply = 6V<br>resistive load |
|                    |                                          | 2.5     |       | T <sub>J</sub> = 25°C                                  |                                     |
|                    |                                          | 1.7     |       | T <sub>J</sub> = 125°C                                 |                                     |
| I <sub>GT</sub>    | Max. required DC Gate Current to trigger | 270     | mA    | T <sub>J</sub> = - 40°C                                |                                     |
|                    |                                          | 150     |       | T <sub>J</sub> = 25°C                                  |                                     |
|                    |                                          | 80      |       | T <sub>J</sub> = 125°C                                 |                                     |
|                    |                                          | 40      |       | T <sub>J</sub> = 25°C, for 40TPS08A and 40TPS12A       |                                     |
| V <sub>GD</sub>    | Max. DC Gate Voltage not to trigger      | 0.25    | V     | T <sub>J</sub> = 125°C, V <sub>DRM</sub> = rated value |                                     |
| I <sub>GD</sub>    | Max. DC Gate Current not to trigger      | 6       | mA    |                                                        |                                     |

## Thermal-Mechanical Specifications

| Parameters        |                                             |      | 40TPS..     | Units             | Conditions                           |
|-------------------|---------------------------------------------|------|-------------|-------------------|--------------------------------------|
| T <sub>J</sub>    | Max. Junction Temperature Range             |      | - 40 to 125 | °C                |                                      |
| T <sub>stg</sub>  | Max. Storage Temperature Range              |      | - 40 to 125 |                   |                                      |
| R <sub>thJC</sub> | Max. Thermal Resistance Junction to Case    |      | 0.6         | °C/W              | DC operation                         |
| R <sub>thJA</sub> | Max. Thermal Resistance Junction to Ambient |      | 40          |                   |                                      |
| R <sub>thCS</sub> | Max. Thermal Resistance Case to Heatsink    |      | 0.2         |                   | 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 (10)     |                   |                                      |
| Case Style        |                                             |      | TO-247AC    |                   |                                      |

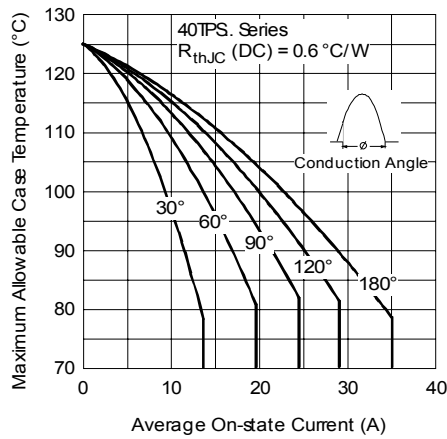


Fig. 1 - Current Rating Characteristics

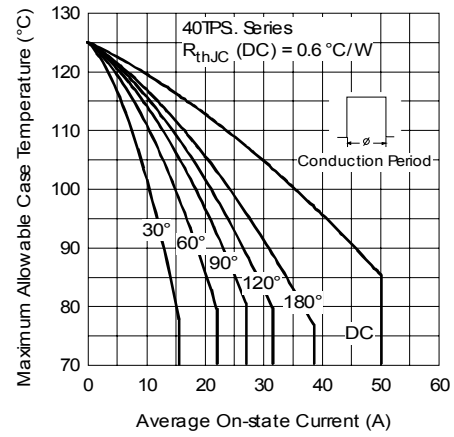


Fig. 2 - Current Rating Characteristics

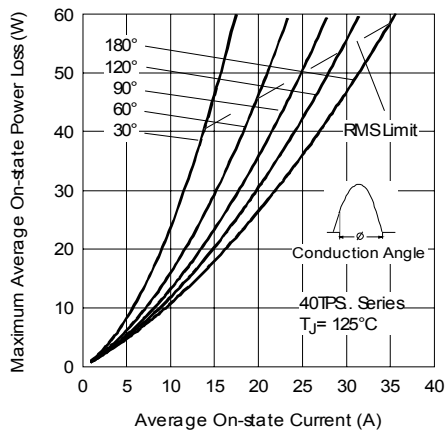


Fig. 3 - On-state Power Loss Characteristics

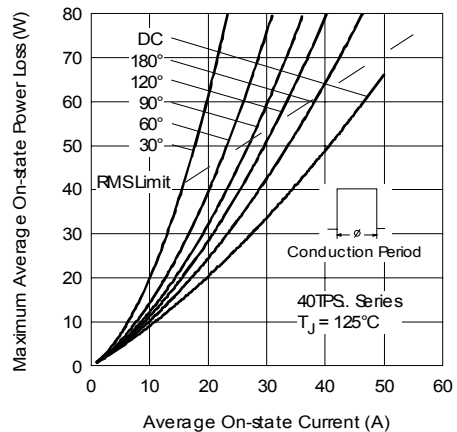


Fig. 4 - On-state Power Loss Characteristics

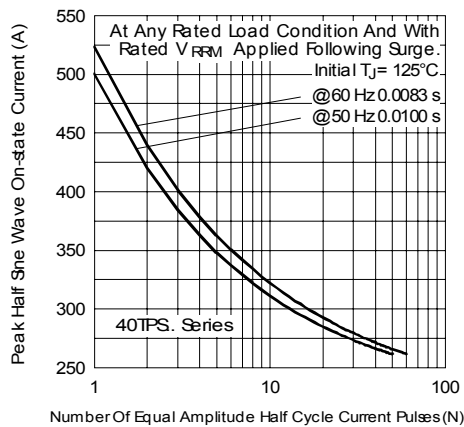


Fig. 5 - Maximum Non-Repetitive Surge Current

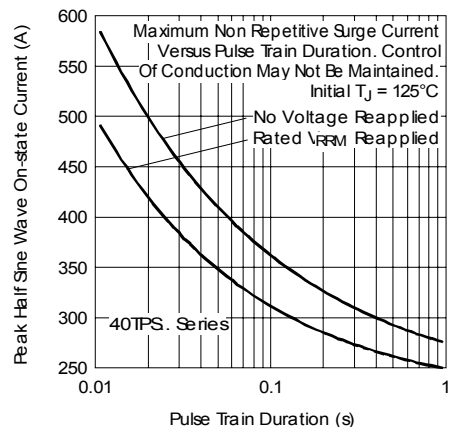


Fig. 6 - Maximum Non-Repetitive Surge Current

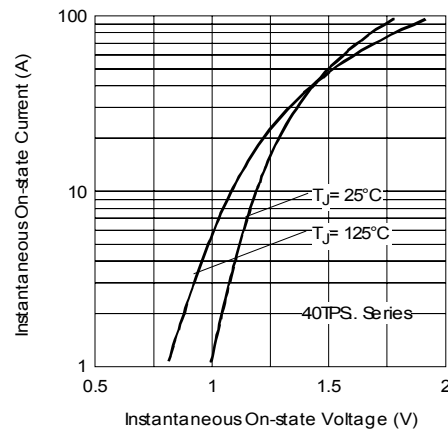


Fig. 7 - On-state Voltage Drop Characteristics

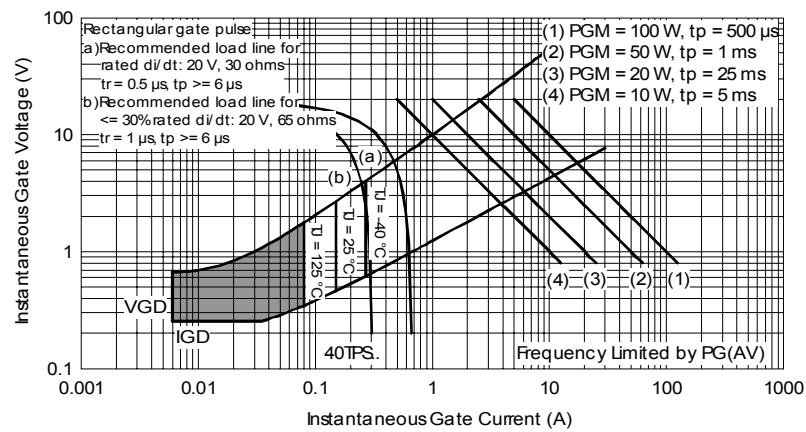


Fig. 8 - Gate Characteristics

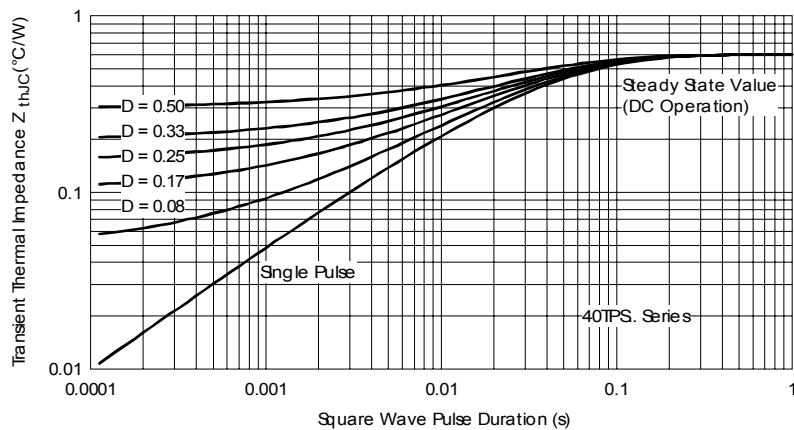


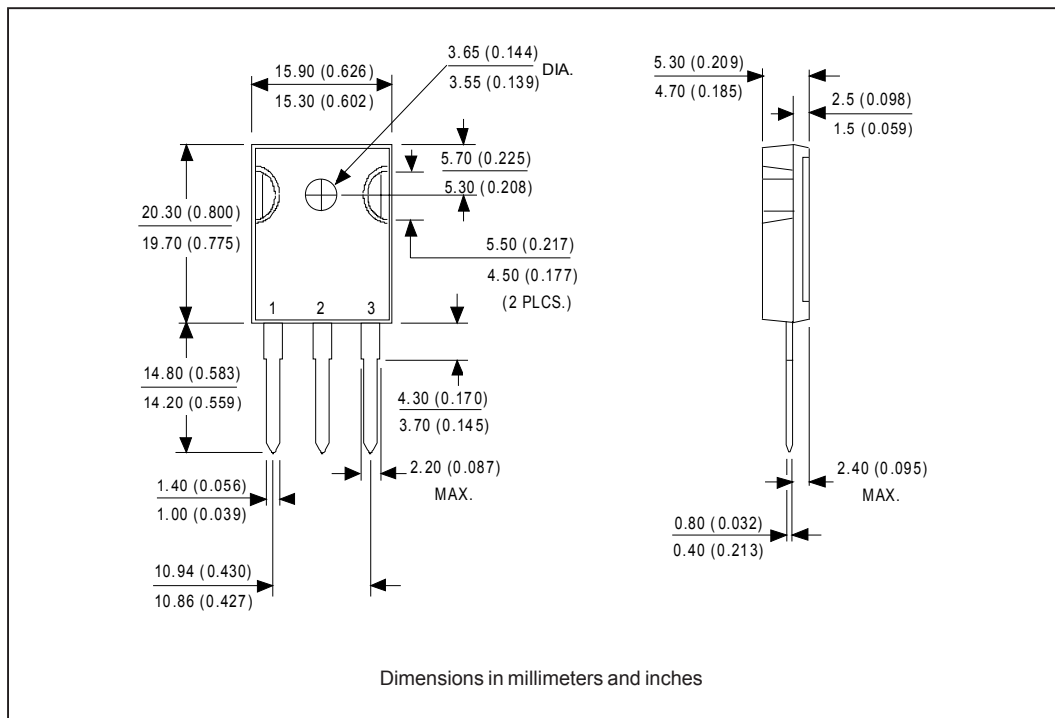
Fig. 9 - Thermal Impedance  $Z_{thJC}$  Characteristics

## 40TPS.. *SAFEIR* Series

Bulletin I2107 rev. G 09/03

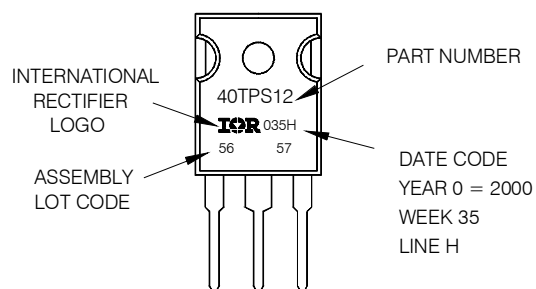
International  
**IR** Rectifier

### Outline Table

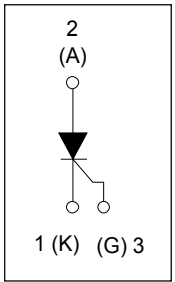


### Marking Information

EXAMPLE: THIS IS A 40TPS12  
WITH ASSEMBLY  
LOT CODE 5657  
ASSEMBLED ON WW 35, 2000  
IN THE ASSEMBLY LINE "H"



## Ordering Information Table

| Device Code |                                                                                                                                                                                                                                                                                                                                                                                             |   |   |    |                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|-------------------------------------------------------------------------------------|
| 40          | T                                                                                                                                                                                                                                                                                                                                                                                           | P | S | 12 |                                                                                     |
| 1           | 2                                                                                                                                                                                                                                                                                                                                                                                           | 3 | 4 | 5  | 6                                                                                   |
| 1           | <ul style="list-style-type: none"> <li>- Current Rating</li> <li>- Circuit Configuration:<br/>T = Thyristor</li> <li>- Package:<br/>P = TO-247</li> <li>- Type of Silicon:<br/>S = Standard Recovery Rectifier</li> <li>- Voltage code: Code x 100 = <math>V_{RRM}</math></li> <li>- None = Standard lgt selection<br/>A = Low lgt selection 40mA max. for 40TPS08A and 40TPS12A</li> </ul> |   |   |    |                                                                                     |
|             |                                                                                                                                                                                                                                                                                                                                                                                             |   |   |    |  |
|             |                                                                                                                                                                                                                                                                                                                                                                                             |   |   |    | <div>08 = 800V</div> <div>12 = 1200V</div>                                          |

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

**IR WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105  
TAC Fax: (310) 252-7309  
Visit us at [www.irf.com](http://www.irf.com) for sales contact information. 09/03

# AMEYA360

## Components Supply Platform

Authorized Distribution Brand :



Website :

Welcome to visit [www.ameya360.com](http://www.ameya360.com)

Contact Us :

➤ Address :

401 Building No.5, JiuGe Business Center, Lane 2301, Yishan Rd  
Minhang District, Shanghai , China

➤ Sales :

Direct +86 (21) 6401-6692

Email [amall@ameya360.com](mailto:amall@ameya360.com)

QQ 800077892

Skype ameyasales1 ameyasales2

➤ Customer Service :

Email [service@ameya360.com](mailto:service@ameya360.com)

➤ Partnership :

Tel +86 (21) 64016692-8333

Email [mkt@ameya360.com](mailto:mkt@ameya360.com)