

International
IOR Rectifier

SAFEIR Series
30TPS..

PHASE CONTROL SCR



$$\begin{aligned} V_T &< 1.3V @ 20A \\ I_{TSM} &= 300A \\ V_{RRM} &800 \text{ to } 1600V \end{aligned}$$

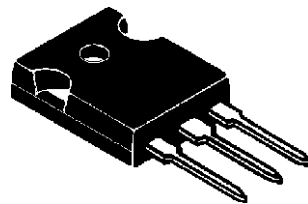
The 30TPS.. **SAFEIR** series of silicon controlled rectifiers are specifically designed for medium power switching and phase control applications. The glass passivation technology used has reliable operation up to 125°C junction temperature.

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 | 30TPS.. | Units |
|--|------------|------------------|
| $I_{T(AV)}$ Sinusoidal waveform | 20 | A |
| I_{RMS} | 30 | A |
| V_{RRM}/V_{DRM} | up to 1600 | V |
| I_{TSM} | 300 | A |
| V_T @ 20 A, $T_J = 25^\circ\text{C}$ | 1.3 | V |
| dv/dt | 500 | V/ μs |
| di/dt | 150 | A/ μs |
| T_J | -40 to 125 | $^\circ\text{C}$ |

Package Outline



Describing/Features

Voltage Ratings

| Part Number | V_{RRM}/V_{DRM} , max. repetitive peak and off-state voltage V | V_{RSM} , maximum non repetitive peak reverse voltage V | I_{RRM}/I_{DRM} 125°C mA |
|-------------|---|--|----------------------------------|
| 30TPS08 | 800 | 900 | 10 |
| 30TPS12 | 1200 | 1300 | |
| 30TPS16 | 1600 | 1700 | |

Absolute Maximum Ratings

| Parameters | | 30TPS.. | Units | Conditions | |
|----------------------------------|--|---------|-------------------|---|--|
| I _{T(AV)} | Max. Average On-state Current | 20 | A | @ T _C = 95° C, 180° conduction half sine wave | |
| I _{RMS} | Max. RMS On-state Current | 30 | | | |
| I _{TSM} | Max. Peak One Cycle Non-Repetitive | 250 | | 10ms Sine pulse, rated V _{RRM} applied | |
| | Surge Current | 300 | | 10ms Sine pulse, no voltage reapplied | |
| I ² t | Max. I ² t for Fusing | 310 | A ² s | 10ms Sine pulse, rated V _{RRM} applied | |
| | | 442 | | 10ms Sine pulse, no voltage reapplied | |
| I ² √t | Max. I ² √t for Fusing | 4420 | A ² √s | t = 0.1 to 10ms, no voltage reapplied | |
| V _{TM} | Max. On-state Voltage Drop | 1.3 | V | @ 20A, T _J = 25°C | |
| r _t | On-state Slope Resistance | 12 | mΩ | T _J = 125°C | |
| V _{T(TO)} | Threshold Voltage | 1.0 | V | | |
| I _{RM} /I _{DM} | Max.Reverse and Direct | 0.5 | mA | T _J = 25 °C | V _R = rated V _{RRM} / V _{DRM} |
| | Leakage Current | 10 | | T _J = 125 °C | |
| I _H | Max. Holding Current | 100 | mA | Anode Supply = 6V, Resistive load, Initial I _T =1A | |
| I _L | Max. Latching Current | 200 | mA | Anode Supply = 6V, Resistive load | |
| dv/dt | Max. Rate of Rise of off-state Voltage | 500 | V/μs | | |
| di/dt | Max. Rate of Rise of turned-on Current | 150 | A/μs | | |

Triggering

| Parameters | 30TPS.. | Units | Conditions |
|---|---------|-------|--|
| P_{GM} Max. Peak Gate Power | 8.0 | W | |
| $P_{G(AV)}$ Max. Average Gate Power | 2.0 | | |
| $+I_{GM}$ Max. Peak Positive Gate Current | 1.5 | A | |
| $-V_{GM}$ Max. Peak Negative Gate Voltage | 10 | V | |
| I_{GT} Max. Required DC Gate Current to Trigger | 60 | mA | Anode supply = 6V, resistive load, $T_J = -10^\circ\text{C}$ |
| | 45 | | Anode supply = 6V, resistive load, $T_J = 25^\circ\text{C}$ |
| | 20 | | Anode supply = 6V, resistive load, $T_J = 125^\circ\text{C}$ |
| V_{GT} Max. Required DC Gate Voltage to Trigger | 2.5 | V | Anode supply = 6V, resistive load, $T_J = -10^\circ\text{C}$ |
| | 2.0 | | Anode supply = 6V, resistive load, $T_J = 25^\circ\text{C}$ |
| | 1.0 | | Anode supply = 6V, resistive load, $T_J = 125^\circ\text{C}$ |
| V_{GD} Max. DC Gate Voltage not to Trigger | 0.25 | | $T_J = 125^\circ\text{C}$, $V_{DRM} = \text{rated value}$ |
| I_{GD} Max. DC Gate Current not to Trigger | 2.0 | mA | $T_J = 125^\circ\text{C}$, $V_{DRM} = \text{rated value}$ |

Switching

| Parameters | 30TPS.. | Units | Conditions |
|--|---------|---------------|---------------------------|
| t_{gt} Typical Turn-on Time | 0.9 | μs | $T_J = 25^\circ\text{C}$ |
| t_{rr} Typical Reverse Recovery Time | 4 | | $T_J = 125^\circ\text{C}$ |
| t_q Typical Turn-off Time | 110 | | |

Thermal-Mechanical Specifications

| Parameters | 30TPS.. | Units | Conditions |
|--|--------------|--------------------|--------------------------------------|
| T_J Max. Junction Temperature Range | - 40 to 125 | $^\circ\text{C}$ | |
| T_{stg} Max. Storage Temperature Range | - 40 to 125 | | |
| R_{thJC} Max. Thermal Resistance Junction to Case | 0.8 | $^\circ\text{C/W}$ | DC operation |
| R_{thJA} Max. Thermal Resistance Junction to Ambient | 40 | | |
| R_{thCS} 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 (lbf-in) | |
| | Max. 12 (10) | | |
| Case Style | TO-247AC | | Jedec (Modified) |

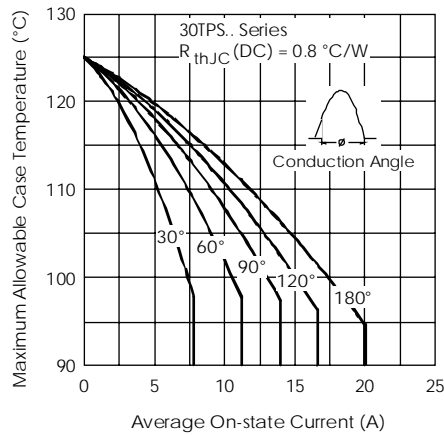


Fig. 1 - Current Rating Characteristics

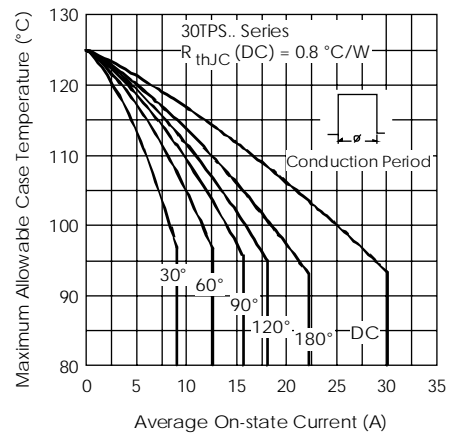


Fig. 2 - Current Rating Characteristics

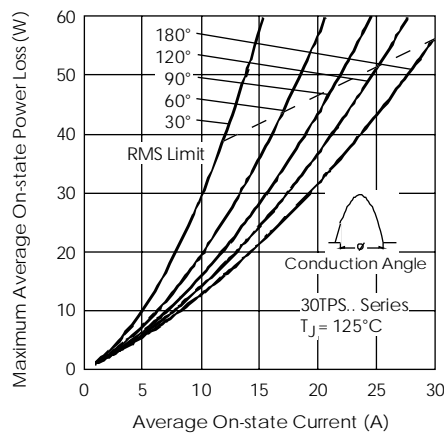


Fig. 3 - On-state Power Loss Characteristics

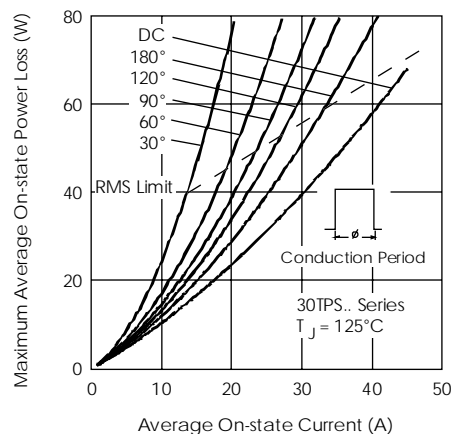


Fig. 4 - On-state Power Loss Characteristics

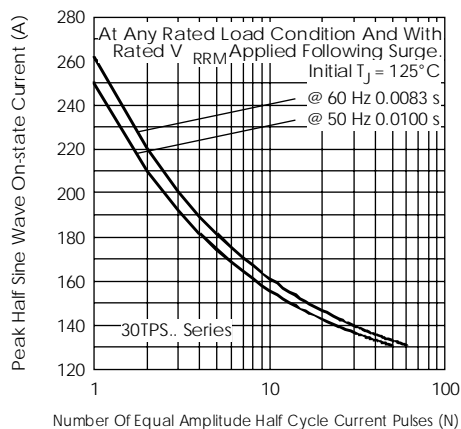


Fig. 5 - Maximum Non-Repetitive Surge Current

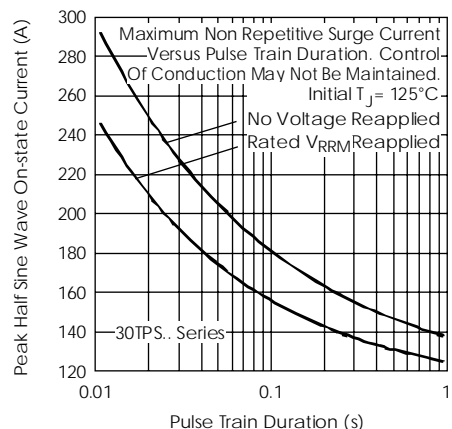


Fig. 6 - Maximum Non-Repetitive Surge Current

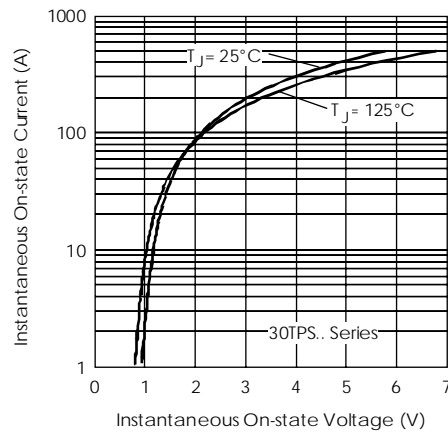


Fig. 7 - On-state Voltage Drop Characteristics

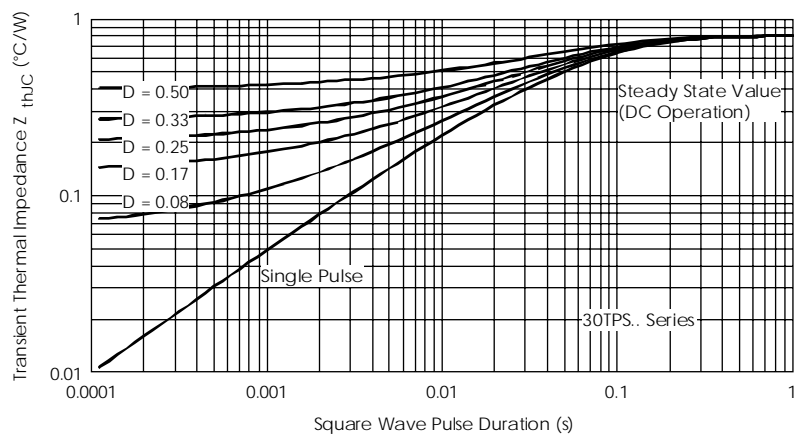


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

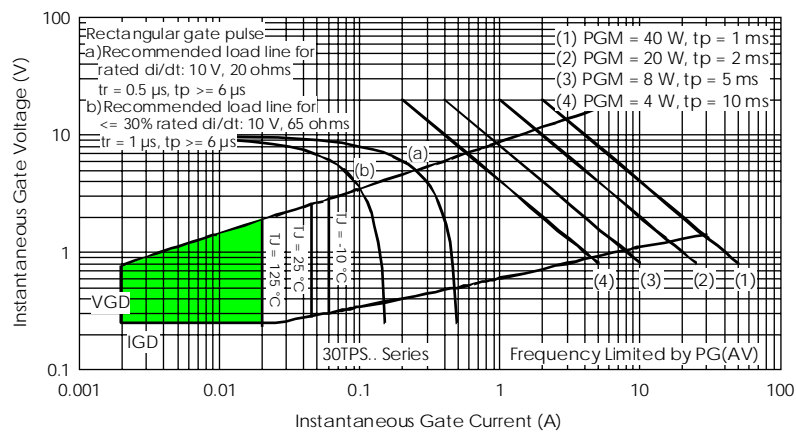


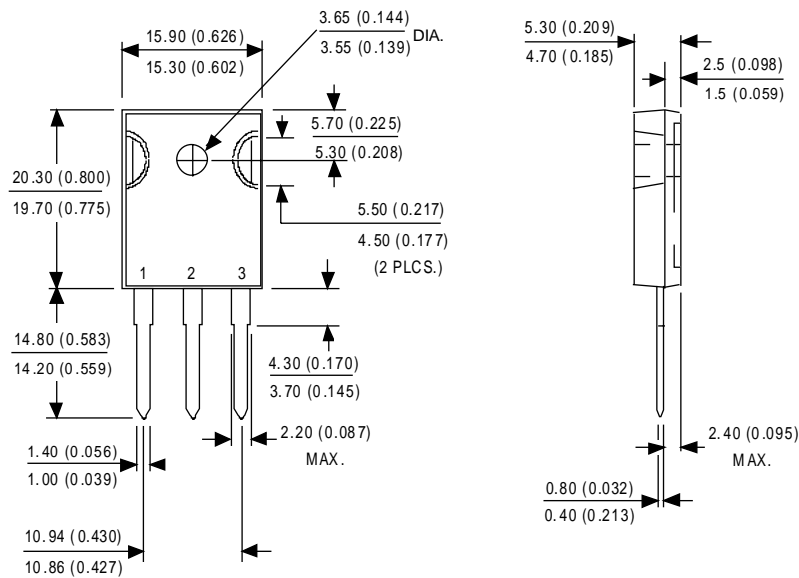
Fig. 9 - Gate Characteristics

30TPS.. *SAFEIR* Series

Bulletin I2136 04/97

International
IR Rectifier

Outline Table



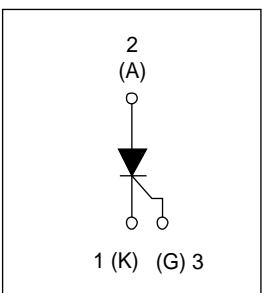
Dimensions in millimeters and inches

Ordering Information Table

Device Code

| | | | | |
|----|---|---|---|----|
| 30 | T | P | S | 16 |
| ① | ② | ③ | ④ | ⑤ |

- 30 = 30 Amps
- T = Toroidal Recovery Rectifier
- P = Power
- S = Safety
- 16 = 1600V



| | |
|-----|------------|
| RRM | 08 = 800V |
| | 12 = 1200V |
| | 16 = 1600V |



Notice

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