


PHASE CONTROL SCR

| | | |
|---|-------------|--------------|
|  | V_T | < 1.2 V @ 8A |
| | I_{TSM} | = 120A |
| | V_R / V_D | = up to 800V |

Description/Features

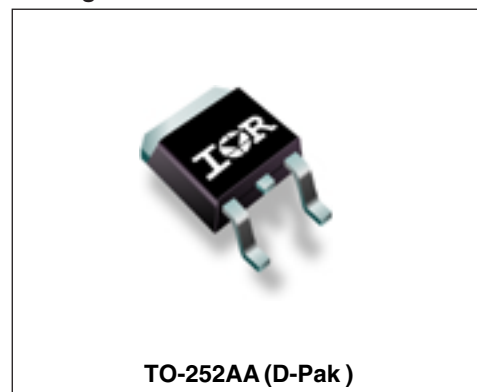
The 8TWS..S **SAFEIR** new series of silicon controlled rectifiers in D-Pak, are specifically designed for low power switching and phase control applications. The glass passivation technology used has reliable operation up to 125°C junction temperature.

Typical applications are in input rectification (soft start), AC switches, Motor Control and Crow-Bar. 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 | 8TWS..S | Units |
|---------------------------------|------------|------------|
| $I_{T(AV)}$ Sinusoidal waveform | 8 | A |
| I_{RMS} | 12 | A |
| V_{RRM} / V_{DRM} | upto 800 | V |
| I_{TSM} | 120 | A |
| V_T @ 8A, $T_J = 25^\circ C$ | 1.2 | V |
| dv/dt | 200 | V/ μs |
| di/dt | 150 | A/ μs |
| T_J | -40 to 125 | $^\circ C$ |

Package Outline



8TWS..S *SAFEIR* Series

Preliminary Data Sheet I2132 rev. C 10/99

International
IOR Rectifier

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 |
|-------------|---|--|------------------------------------|
| 8TWS04S | 400 | 500 | 5 |
| 8TWS06S | 600 | 700 | |
| 8TWS08S | 800 | 900 | |

Absolute Maximum Ratings

| Parameters | 8TWS..S | Units | Conditions |
|--|------------|-----------|---|
| $I_{T(AV)}$ Max. Average On-state Current | 8 | A | @ $T_C = 95^\circ\text{C}$, 180° conduction half sine wave |
| I_{RMS} Max. RMS On-state Current | 12 | | |
| I_{TSM} Max. Peak One Cycle Non-Repetitive Surge Current | 100 120 | | 10ms Sine pulse, rated V_{RRM} applied, $T_J = 125^\circ\text{C}$ 10ms Sine pulse, no voltage reapplied, $T_J = 125^\circ\text{C}$ |
| I^2t Max. I^2t for fusing | 45 70 | A^2s | 10ms Sine pulse, rated V_{RRM} applied, $T_J = 125^\circ\text{C}$ 10ms Sine pulse, no voltage reapplied $T_J = 125^\circ\text{C}$ |
| $I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing | 700 | | $A^2\sqrt{s}$ |
| V_{TM} Max. On-state Voltage Drop | 1.2 | V | @ 8A, $T_J = 25^\circ\text{C}$ |
| r_t On-state slope resistance | 2724 | $m\Omega$ | $T_J = 125^\circ\text{C}$ |
| $V_{T(TO)}$ Threshold Voltage | 1.011 | V | |
| I_{RM} / I_{DM} Max. Reverse and Direct Leakage Current | 0.05 5 | mA | $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ |
| | | | $V_R = \text{rated } V_{RRM} / V_{DRM}$ |
| I_H Max. Holding Current | 85 | mA | Anode Supply = 6V, Resistive load, Initial $I_T = 1A$ |
| I_L Max. Latching Current | 75 | mA | Anode Supply = 6V, Resistive load |
| dv/dt Max. rate of rise of off-state Voltage | 200 | $V/\mu s$ | |
| di/dt Max. rate of rise of turned-on Current | 150 | $A/\mu s$ | |

Triggering

| Parameters | 8TWS..S | 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 | 20 | mA | Anode supply = 6V, resistive load, $T_J = -10^\circ\text{C}$ |
| | 15 | | Anode supply = 6V, resistive load, $T_J = 25^\circ\text{C}$ |
| | 10 | | Anode supply = 6V, resistive load, $T_J = 125^\circ\text{C}$ |
| V_{GT} Max. required DC Gate Voltage to trigger | 1.2 | V | Anode supply = 6V, resistive load, $T_J = -10^\circ\text{C}$ |
| | 1 | | Anode supply = 6V, resistive load, $T_J = 25^\circ\text{C}$ |
| | 0.75 | | Anode supply = 6V, resistive load, $T_J = 125^\circ\text{C}$ |
| V_{GD} Max. DC Gate Voltage not to trigger | 0.20 | | $T_J = 125^\circ\text{C}$, $V_{DRM} = \text{rated value}$ |
| I_{GD} Max. DC Gate Current not to trigger | 0.10 | mA | $T_J = 125^\circ\text{C}$, $V_{DRM} = \text{rated value}$ |

Switching

| Parameters | 8TWS..S | Units | Conditions |
|--|---------|---------------|---------------------------|
| t_{gt} Typical turn-on time | 0.8 | μs | $T_J = 25^\circ\text{C}$ |
| t_{tr} Typical reverse recovery time | 3 | | $T_J = 125^\circ\text{C}$ |
| t_q Typical turn-off time | 100 | | |

Thermal-Mechanical Specifications

| Parameters | 8TWS..S | Units | Conditions |
|--|-----------------|---------------------------|----------------------------------|
| T_J Max. Junction Temperature Range | -40 to 125 | $^\circ\text{C}$ | |
| T_{stg} Max. Storage Temperature Range | -40 to 125 | | |
| Soldering Temperature | 240 | $^\circ\text{C}$ | for 10 seconds (1.6mm from case) |
| R_{thJC} Max. Thermal Resistance Junction to Case | 2.0 | $^\circ\text{C}/\text{W}$ | DC operation |
| R_{thJA} Max. Thermal Resistance Junction to Ambient (PCB Mount)** | 65 | $^\circ\text{C}/\text{W}$ | |
| wt Approximate Weight | 1(0.03) | g(oz.) | |
| T Case Style | TO-252AA(D-PAK) | | |

**When mounted on 1" square (650mm²) PCB of FR-4 or G-10 material 4oz (140 μm) copper 40 $^\circ\text{C}/\text{W}$
 For recommended footprint and soldering techniques refer to application note #AN-994

8TWS..S SAFEIR Series

Preliminary Data Sheet I2132 rev. C 10/99

International
IR Rectifier

Ordering Information Table

| Device Code | | | | | | |
|-------------|----------|----------|----------|-----------|----------|------------|
| 8 | T | W | S | 08 | S | TRL |
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |

1 - Current Rating

2 - Circuit Configuration:
T = Thyristor

3 - Package:
W = TO-252AA (D-Pak)

4 - Type of Silicon:
S = Standard Thyristors

5 - Voltage code: Code x 100 = V_{RRM}

6 - SMD Package

7 - Tape and Reel Option
TRL = Left Reel
TRR = Right Orientation Reel

| |
|-----------|
| 04 = 400V |
| 06 = 600V |
| 08 = 800V |

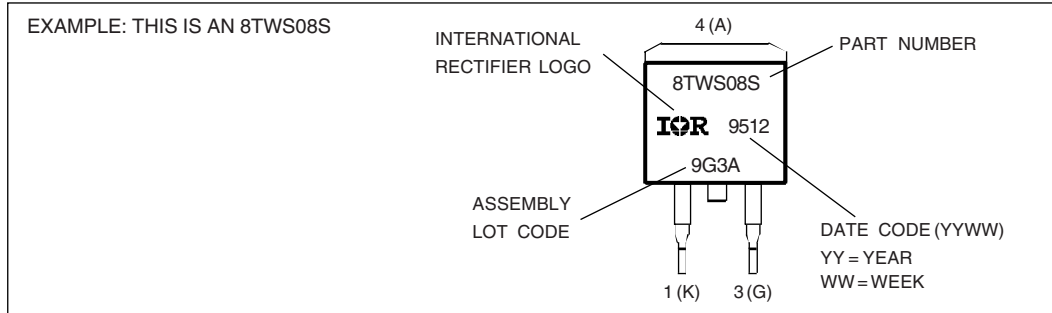
Outline Table

Dimensions in millimeters and (inches)

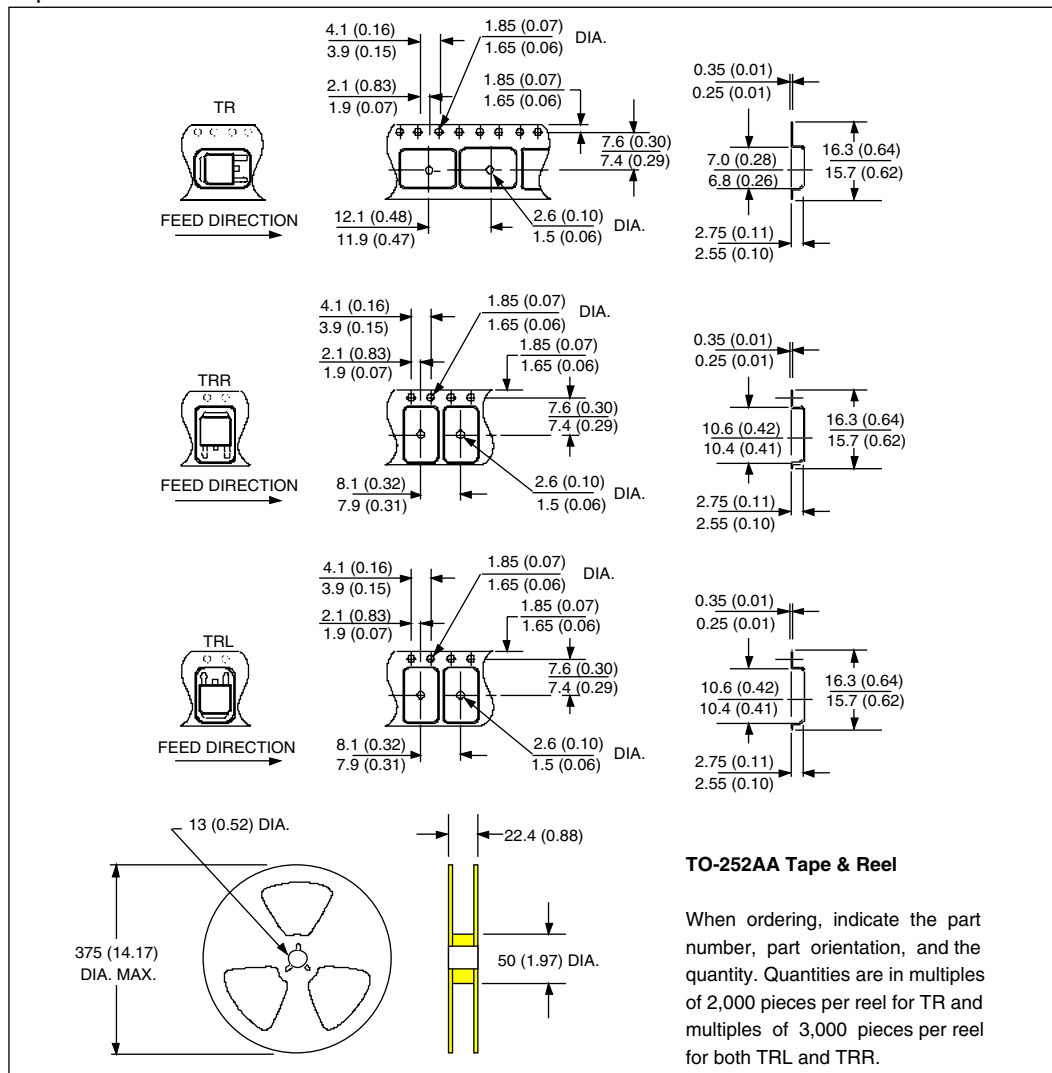
1 - Anode
2 - Cathode
3 - Gate
4 - Anode

MINIMUM RECOMMENDED FOOTPRINT

Marking Information



Tape & Reel Information



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