


International  
**IR** Rectifier

**SAFEIR** Series  
 8TWS..S

## PHASE CONTROL SCR

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

### Description/Features

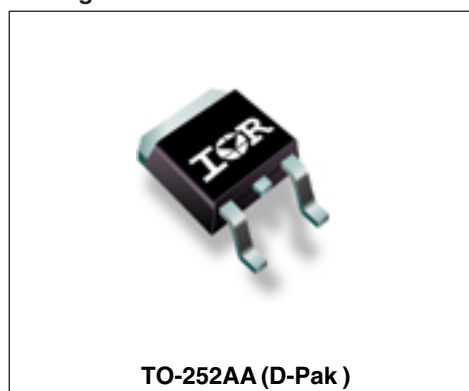
The 8TWS..S **SAFEIR** new series of silicon controlled rectifiers in D-Pak, are specifically designed for low power switching and phase control applications. The glass passivation technology used has reliable operation up to 125°C junction temperature.

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, $T_J = 25^\circ\text{C}$	1.2	V
dv/dt	200	V/ $\mu\text{s}$
di/dt	150	A/ $\mu\text{s}$
$T_J$	-40 to 125	$^\circ\text{C}$

### Package Outline



## 8TWS..S **SAFEIR** Series

Preliminary Data Sheet I2132 rev. C 10/99

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### 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		10ms Sine pulse, rated $V_{RRM}$ applied, $T_J = 125^\circ\text{C}$
	120		10ms Sine pulse, no voltage reapplied, $T_J = 125^\circ\text{C}$
$I^2t$ Max. $I^2t$ for fusing	45	$\text{A}^2\text{s}$	10ms Sine pulse, rated $V_{RRM}$ applied, $T_J = 125^\circ\text{C}$
	70		10ms Sine pulse, no voltage reapplied $T_J = 125^\circ\text{C}$
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	700	$\text{A}^2\sqrt{\text{s}}$	$t=0.1$ to 10ms, no voltage reapplied
$V_{TM}$ Max. On-state Voltage Drop	1.2	V	@ 8A, $T_J = 25^\circ\text{C}$
$r_t$ On-state slope resistance	2724	$\text{m}\Omega$	$T_J = 125^\circ\text{C}$
$V_{T(TO)}$ Threshold Voltage	1.011	V	
$I_{RM} / I_{DM}$ Max. Reverse and Direct Leakage Current	0.05	mA	$T_J = 25^\circ\text{C}$
	5		$T_J = 125^\circ\text{C}$
			$V_R = \text{rated } V_{RRM} / V_{DRM}$
$I_H$ Max. Holding Current	85	mA	Anode Supply = 6V, Resistive load, Initial $I_T=1\text{A}$
$I_L$ Max. Latching Current	75	mA	Anode Supply = 6V, Resistive load
$dv/dt$ Max. rate of rise of off-state Voltage	200	$\text{V}/\mu\text{s}$	
$di/dt$ Max. rate of rise of turned-on Current	150	$\text{A}/\mu\text{s}$	

### 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	$\mu\text{s}$	$T_J = 25^\circ\text{C}$
$t_{tr}$ 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	°C	
$T_{stg}$ Max. Storage Temperature Range	-40 to 125		
Soldering Temperature	240	°C	for 10 seconds (1.6mm from case)
$R_{thJC}$ Max. Thermal Resistance Junction to Case	2.0	°C/W	DC operation
$R_{thJA}$ Max. Thermal Resistance Junction to Ambient (PCB Mount)**	65	°C/W	
wt Approximate Weight	1(0.03)	g(oz.)	
T Case Style	TO-252AA(D-PAK)		

\*\*When mounted on 1" square (650mm<sup>2</sup>) PCB of FR-4 or G-10 material 4oz (140 $\mu\text{m}$ ) copper 40°C/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  
 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)

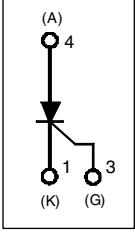
**4** - Type of Silicon:  
S = Standard Thyristors

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

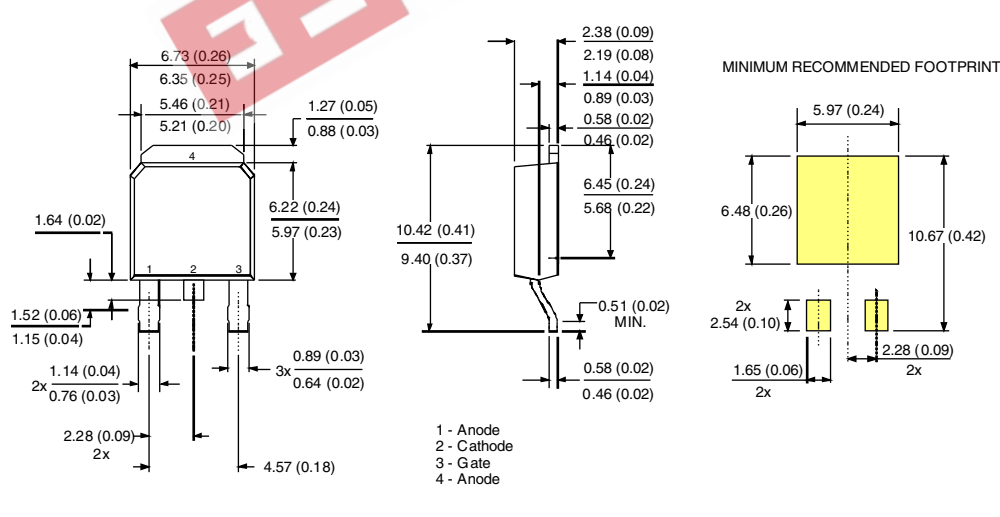
04	= 400V
06	= 600V
08	= 800V

**6** - SMD Package

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



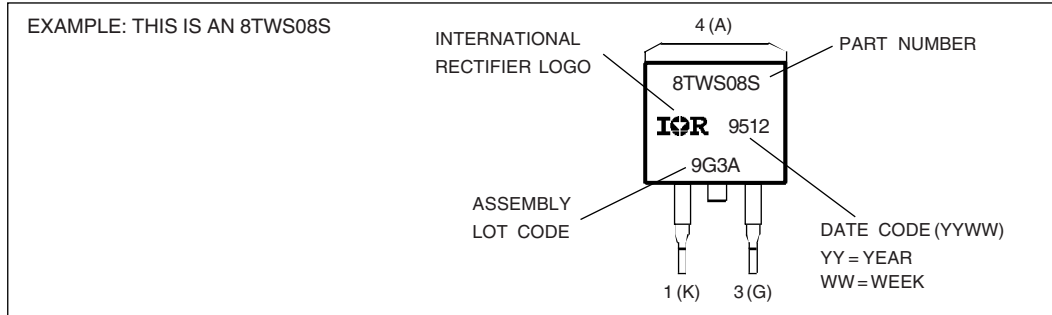
## Outline Table



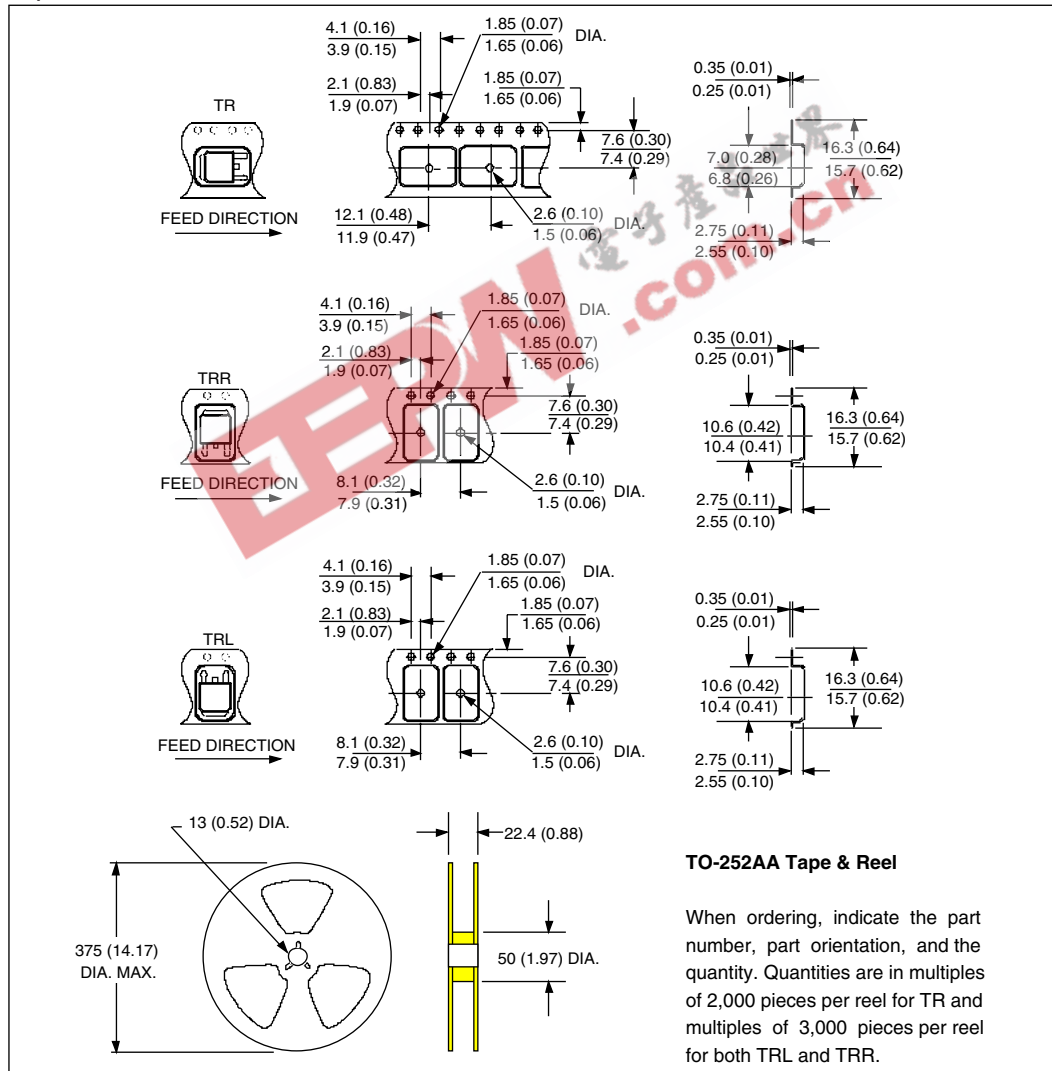
Dimensions in millimeters and (inches)

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

**Marking Information**



**Tape & Reel Information**



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**IR** Rectifier

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Data and specifications subject to change without notice.