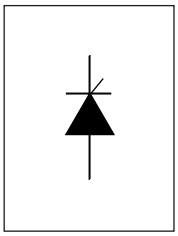
Preliminary Data Sheet I2132 rev. C 10/99

International
IOR Rectifier

*SAFE**IR*** 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 *SAFE**IR*** 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}	up to 800	V
I_{TSM}	120	A
V_T @ 8A, T_J = 25°C	1.2	V
dv/dt	200	V/µs
di/dt	150	A/µs
T_J	-40 to 125	°C

Package Outline

TO-252AA (D-Pak)

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° C, 180° conduction half sine wave	
I_{RMS}	Max. RMS On-state Current	12			
I_{TSM}	Max. Peak One Cycle	100		10ms Sine pulse, rated V_{RRM} applied, T_J = 125°C	
	Non-Repetitive Surge Current	120		10ms Sine pulse, no voltage reapplied, T_J = 125°C	
I^2t	Max. I^2t for fusing	45	A^2s	10ms Sine pulse, rated V_{RRM} applied, T_J = 125°C	
		70		10ms Sine pulse, no voltage reapplied T_J = 125°C	
$I^2\sqrt{t}$	Max. $I^2\sqrt{t}$ for fusing	700	$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied	
V_{TM}	Max. On-state Voltage Drop	1.2	V	@ 8A, T_J = 25°C	
r_t	On-state slope resistance	2724	mΩ	T_J = 125°C	
$V_{T(TO)}$	Threshold Voltage	1.011	V		
I_{RM} / I_{DM}	Max. Reverse and Direct	0.05	mA	T_J = 25 °C	V_R = rated V_{RRM} / V_{DRM}
	Leakage Current	5		T_J = 125 °C	
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/µs		
di/dt	Max. rate of rise of turned-on Current	150	A/µs		

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. paek positive Gate Current	1.5	A	
$- V_{GM}$	Max. paek negative Gate Voltage	10	V	
I_{GT}	Max. required DC Gate Current	20	mA	Anode supply = 6V, resistive load, T_J = - 10°C
	to trigger	15		Anode supply = 6V, resistive load, T_J = 25°C
		10		Anode supply = 6V, resistive load, T_J = 125°C
V_{GT}	Max. required DC Gate Voltage	1.2	V	Anode supply = 6V, resistive load, T_J = - 10°C
	to trigger	1		Anode supply = 6V, resistive load, T_J = 25°C
		0.75		Anode supply = 6V, resistive load, T_J = 125°C
V_{GD}	Max. DC Gate Voltage not to trigger	0.20		T_J = 125°C, V_{DRM} = rated value
I_{GD}	Max. DC Gate Current not to trigger	0.10	mA	T_J = 125°C, V_{DRM} = rated value

Switching

	Parameters	8TWS..S	Units	Conditions
t_{gt}	Typical turn-on time	0.8	µs	T_J = 25°C
t_{rr}	Typical reverse recovery time	3		T_J = 125°C
t_q	Typical turn-off time	100		

Thermal-Mechanical Specifications

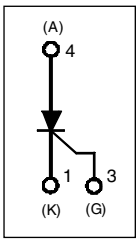
	Parameters	8TWS..S	Units	Conditions
T_J	Max. Junction Temperature Range	- 40 to 125	°C	
T_{stg}	Max. Storage Temperature Range	- 40 to 125		
	Soldering Temperature	240	°C	for 10 seconds (1.6mm from case)
R_{thJC}	Max. Thermal Resistance Junction	2.0	°C/W	DC operation
	to Case			
R_{thJA}	Max. Thermal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

**When mounted on 1" square (650mm^2) PCB of FR-4 or G-10 material 4 oz (140µm) copper 40°C/W
For recommended footprint and soldering techniques refer to application note #AN-994

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

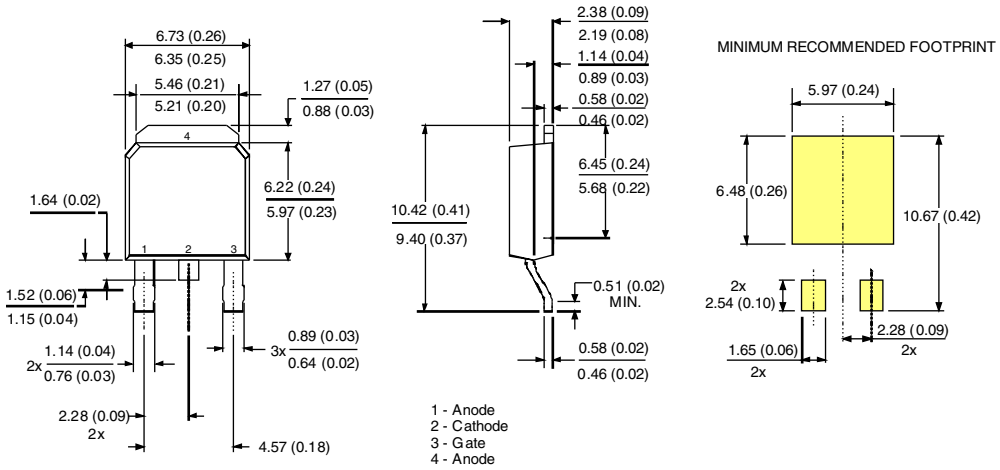
5 - Voltage code: Code x 100 = V_{RRM}

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

6 - SMD Package

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

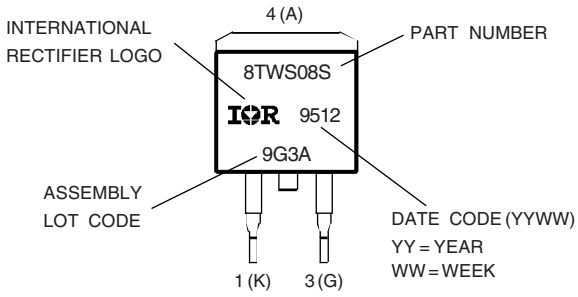
Outline Table



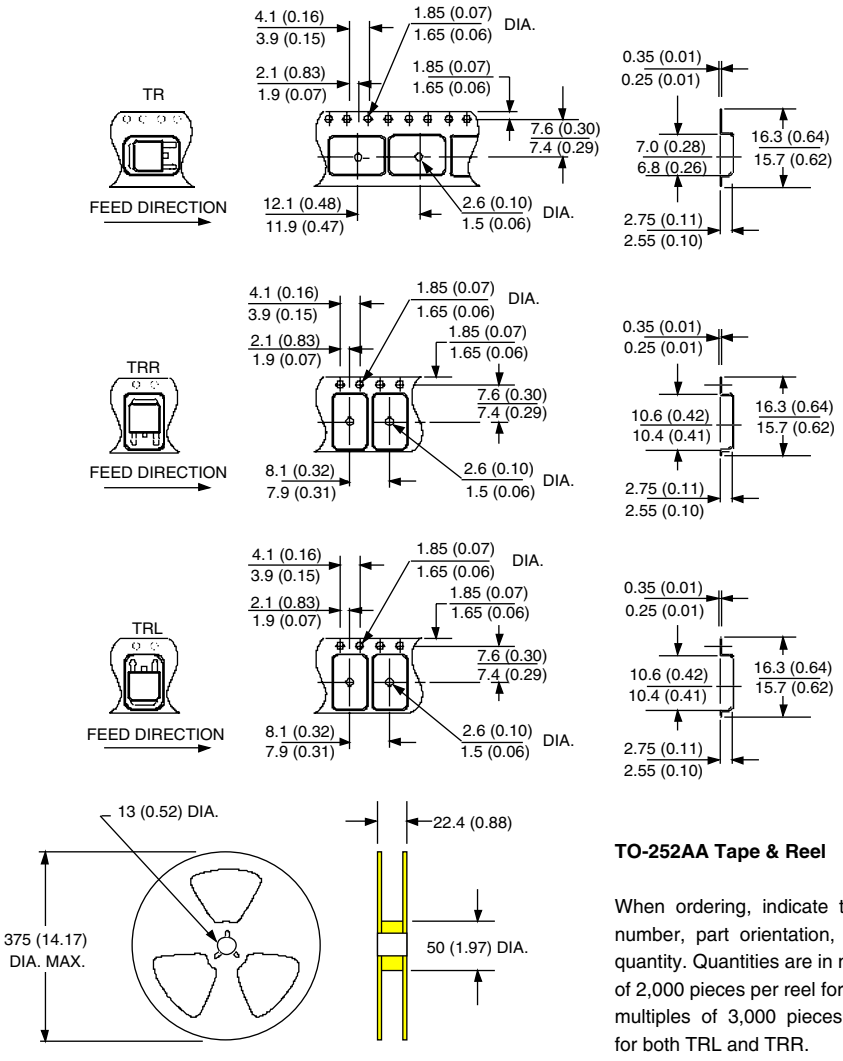
Dimensions in millimeters and (inches)

Marking Information

EXAMPLE: THIS IS AN 8TWS08S



Tape & Reel Information



TO-252AA Tape & Reel

When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 2,000 pieces per reel for TR and multiples of 3,000 pieces per reel for both TRL and TRR.

International
IOR Rectifier

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