


## PHASE CONTROL SCR

### Description/Features

The 25TTS.. **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.

	$V_T$	< 1.25V @ 16A
	$I_{TSM}$	= 300A
	$V_{RRM}$	800 to 1600V

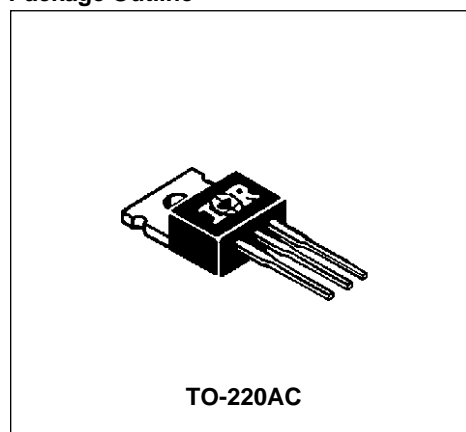
### Output Current in Typical Applications

Applications	Single-phase Bridge	Three-phase Bridge	Units
Capacitive input filter $T_A = 55^\circ\text{C}$ , $T_J = 125^\circ\text{C}$ , common heatsink of $1^\circ\text{C/W}$	18	22	A

### Major Ratings and Characteristics

Characteristics	25TTS..	Units
$I_{T(AV)}$ Sinusoidal waveform	16	A
$I_{RMS}$	25	A
$V_{RRM}/V_{DRM}$	upto 1600	V
$I_{TSM}$	300	A
$V_T$ @ 16A, $T_J = 25^\circ\text{C}$	1.25	V
dv/dt	500	V/ $\mu\text{s}$
di/dt	150	A/ $\mu\text{s}$
$T_J$	-40 to 125	$^\circ\text{C}$

### Package Outline



Also available in SMD-220 package (series 25TTS..S)

## Voltage Ratings

Part Number	$V_{RRM}$ , maximum peak reverse voltage V	$V_{DRM}$ , maximum peak direct voltage V	$I_{RRM}/I_{DRM}$ 125°C mA
25TTS08	800	800	10
25TTS12	1200	1200	
25TTS16	1600	1600	

## Absolute Maximum Ratings

Parameters	25TTS..	Units	Conditions
$I_{T(AV)}$ Max. Average On-state Current	16	A	@ $T_C = 93^\circ\text{C}$ , 180° conduction half sine wave
$I_{RMS}$ Max. RMS On-state Current	25		
$I_{TSM}$ Max. Peak One Cycle Non-Repetitive Surge Current	300 350		10ms Sine pulse, rated $V_{RRM}$ applied 10ms Sine pulse, no voltage reapplied
$I^2t$ Max. $I^2t$ for fusing	450 630	$A^2s$	10ms Sine pulse, rated $V_{RRM}$ applied 10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	6300		$A^2\sqrt{s}$
$V_{TM}$ Max. On-state Voltage Drop	1.25	V	@ 16A, $T_J = 25^\circ\text{C}$
$r_t$ On-state slope resistance	12.0	mΩ	$T_J = 125^\circ\text{C}$
$V_{T(TO)}$ Threshold Voltage	1.0	V	
$I_{RM}/I_{DM}$ Max. Reverse and Direct Leakage Current	0.5 10	mA	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$
			$V_R = \text{rated } V_{RRM} / V_{DRM}$
$I_H$ Holding Current	Typ. Max. -- 100 100 150	mA	Anode Supply = 6V, Resistive load, Initial $I_T = 1A$ 25TTS08, 25TTS12 25TTS16
$I_L$ Max. Latching Current	200		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	25TTS..	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		$T_J = 125^\circ\text{C}$ , $V_{DRM}$ = rated value
$I_{GD}$ Max. DC Gate Current not to trigger	2.0	mA	$T_J = 125^\circ\text{C}$ , $V_{DRM}$ = rated value

### Switching

Parameters	25TTS..	Units	Conditions
$t_{gt}$ Typical turn-on time	0.9	$\mu\text{s}$	$T_J = 25^\circ\text{C}$
$t_{rr}$ Typical reverse recovery time	4		$T_J = 125^\circ\text{C}$
$t_q$ Typical turn-off time	110		

### Thermal-Mechanical Specifications

Parameters	25TTS..	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	1.1	$^\circ\text{C/W}$	DC operation
$R_{thJA}$ Max. Thermal Resistance Junction to Ambient	62		
$R_{thCS}$ Typ. Thermal Resistance Case to Heatsink	0.5		Mounting surface, smooth and greased
wt Approximate Weight	2 (0.07)	g (oz.)	
T Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)
	Max.	12 (10)	
Case Style	TO-220AC		

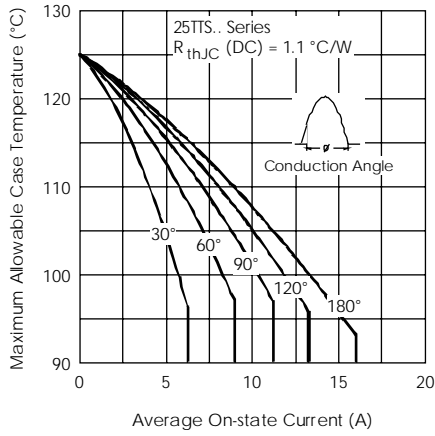


Fig. 1 - Current Rating Characteristics

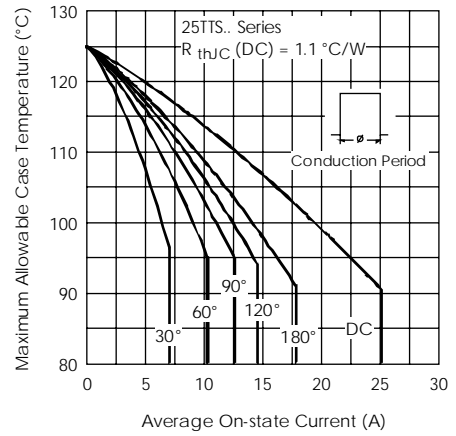


Fig. 2 - Current Rating Characteristics

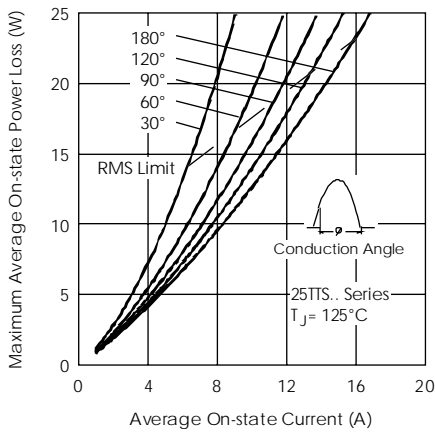


Fig. 3 - On-state Power Loss Characteristics

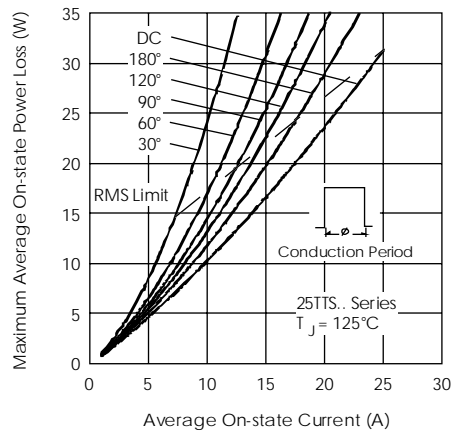


Fig. 4 - On-state Power Loss Characteristics

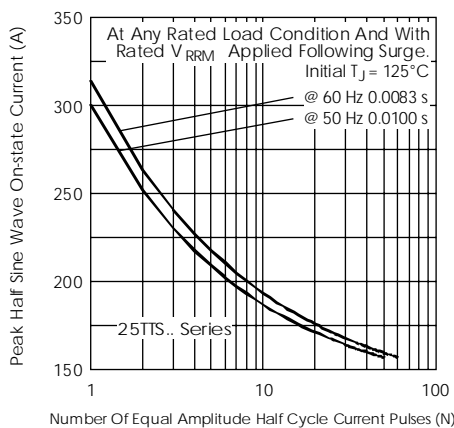


Fig. 5 - Maximum Non-Repetitive Surge Current

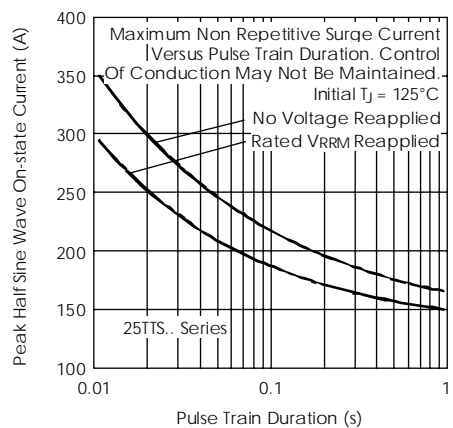


Fig. 6 - Maximum Non-Repetitive Surge Current

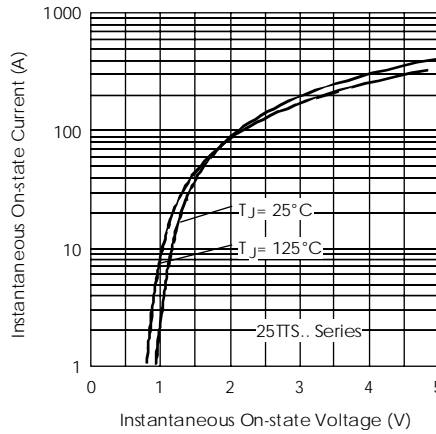


Fig. 7 - On-state Voltage Drop Characteristics

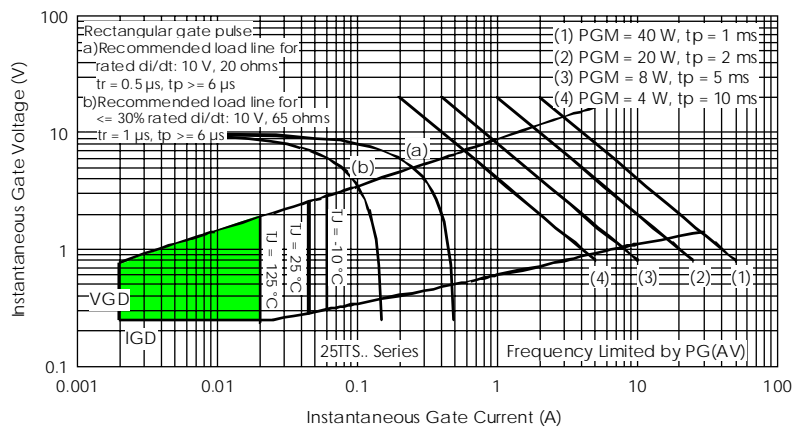


Fig. 8 - Gate Characteristics

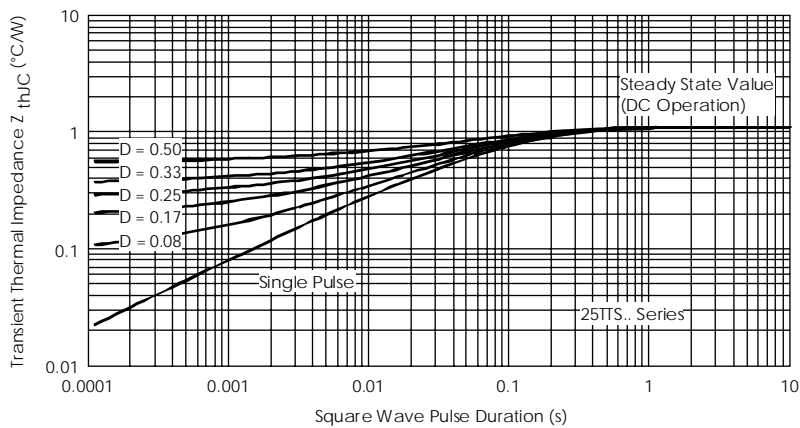
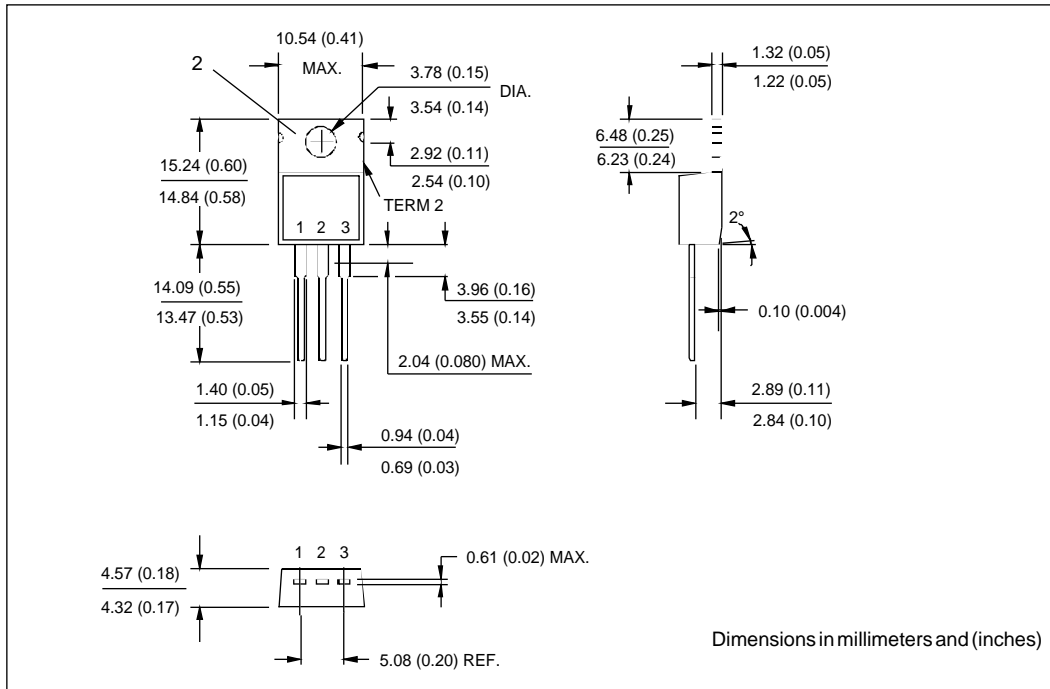
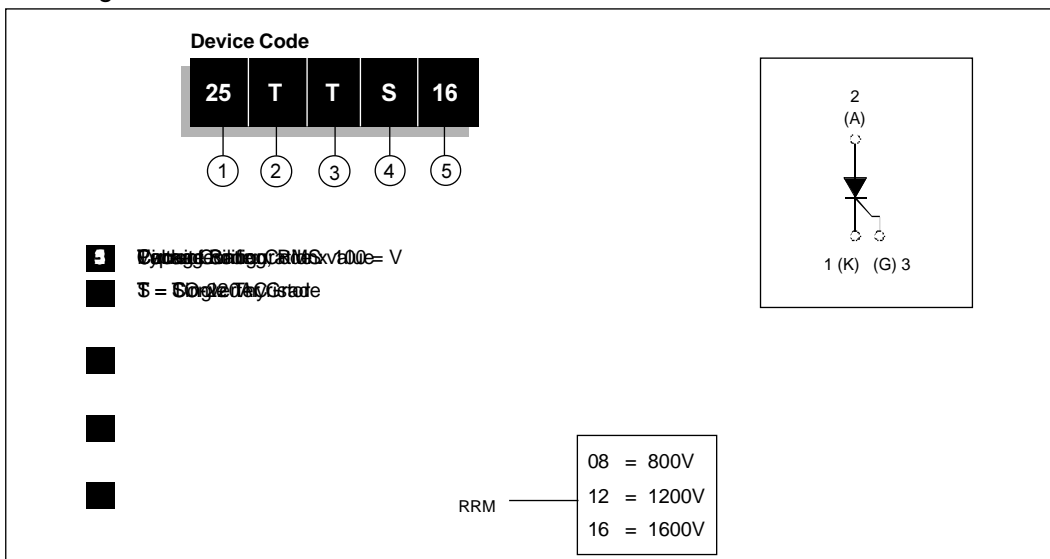


Fig. 9 - Thermal Impedance  $Z_{thJC}$  Characteristics

Outline Table



Ordering Information Table



International  
**IOR** Rectifier

**WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245 U.S.A. Tel: (310) 322 3331. Fax: (310) 322 3332.  
**EUROPEAN HEADQUARTERS:** Hurst Green, Oxted, Surrey RH8 9BB, U.K. Tel: ++ 44 1883 732020. Fax: ++ 44 1883 733408.  
**IR CANADA:** 15 Lincoln Court, Brampton, Markham, Ontario L6T3Z2. Tel: (905) 453 2200. Fax: (905) 475 8801.  
**IR GERMANY:** Saalburgstrasse 157, 61350 Bad Homburg. Tel: ++ 49 6172 96590. Fax: ++ 49 6172 965933.  
**IR ITALY:** Via Liguria 49, 10071 Borgaro, Torino. Tel: ++ 39 11 4510111. Fax: ++ 39 11 4510220.  
**IR FAR EAST:** K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo, Japan 171. Tel: 81 3 3983 0086.  
**IR SOUTHEAST ASIA:** 1 Kim Seng Promenade, Great World City West Tower, 13-11, Singapore 237994. Tel: ++ 65 838 4630.  
**IR TAIWAN:** 16 Fl. Suite D.207, Sec. 2, Tun Haw South Road, Taipei, 10673, Taiwan. Tel: 886 2 2377 9936.

*Fax-On-Demand: +44 1883 733420*

*Data and specifications subject to change without notice.*



## Notice

The products described herein were acquired by Vishay Intertechnology, Inc., as part of its acquisition of International Rectifier's Power Control Systems (PCS) business, which closed in April 2007. Specifications of the products displayed herein are pending review by Vishay and are subject to the terms and conditions shown below.

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.

International Rectifier®, IR®, the IR logo, HEXFET®, HEXSense®, HEXDIP®, DOL®, INTERO®, and POWIRTRAIN® are registered trademarks of International Rectifier Corporation in the U.S. and other countries. All other product names noted herein may be trademarks of their respective owners.