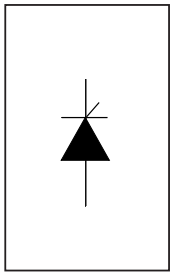
International
IOR Rectifier

SAFEIR Series
25TTS...PbF

PHASE CONTROL SCR
Lead-Free ("PbF" suffix)



V_T < 1.25V @ 16A
I_{TSM} = 300A
V_{RRM} = 800 - 1200V

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.

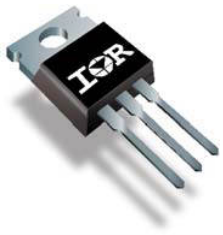
Output Current in Typical Applications

Applications	Single-phase Bridge	Three-phase Bridge	Units
Capacitive input filter T_A = 55°C, T_J = 125°C, common heatsink of 1°C/W	18	22	A

Major Ratings and Characteristics

Characteristics		Values	Units
$I_{T(AV)}$	Sinusoidal waveform	16	A
I_{RMS}		25	A
V_{RRM}/ V_{DRM}		800 - 1200	V
I_{TSM}		300	A
V_T	@ 16 A, T_J = 25°C	1.25	V
dv/dt		500	V/µs
di/dt		150	A/µs
T_J		- 40 to 125	°C

Package Outline



TO-220

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
25TTS08PbF	800	800	10
25TTS12PbF	1200	1200	10

Absolute Maximum Ratings

	Parameters	Values	Units	Conditions
$I_{T(AV)}$	Max. Average On-state Current	16	A	@ T_C = 93° C, 180° conduction half sine wave
I_{RMS}	Max. RMS On-state Current	25		
I_{TSM}	Max. Peak One Cycle Non-Repetitive	300		10ms Sine pulse, rated V_{RRM} applied
	Surge Current	350		10ms Sine pulse, no voltage reapplied
I^2t	Max. I^2t for fusing	450	A^2s	10ms Sine pulse, rated V_{RRM} applied
		630		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$	Max. $I^2\sqrt{t}$ for fusing	6300	$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied
V_{TM}	Max. On-state Voltage Drop	1.25	V	@ 16A, T_J = 25°C
r_t	On-state slope resistance	12.0	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; V_R = rated V_{RRM}/ V_{DRM}
I_H	Holding Current	Typ. -- / Max. 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 Volt.	500	V/µs	
di/dt	Max. Rate of Rise of turned-on Curr.	150	A/µs	

Triggering

Parameters		Values	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 to trigger	60	mA	Anode supply = 6V, resistive load, T_J = - 10°C
		45		Anode supply = 6V, resistive load, T_J = 25°C
		20		Anode supply = 6V, resistive load, T_J = 125°C
V_{GT}	Max. required DC Gate Voltage to trigger	2.5	V	Anode supply = 6V, resistive load, T_J = - 10°C
		2.0		Anode supply = 6V, resistive load, T_J = 25°C
		1.0		Anode supply = 6V, resistive load, T_J = 125°C
V_{GD}	Max. DC Gate Voltage not to trigger	0.25		T_J = 125°C, V_{DRM} = rated value
I_{GD}	Max. DC Gate Current not to trigger	2.0	mA	T_J = 125°C, V_{DRM} = rated value

Switching

Parameters		Values	Units	Conditions
t_{gt}	Typical turn-on time	0.9	µs	T_J = 25°C
t_{rr}	Typical reverse recovery time	4		T_J = 125°C
t_q	Typical turn-off time	110		

Thermal-Mechanical Specifications

Parameters			Values	Units	Conditions
T_J	Max. Junction Temperature Range		-40 to 125	°C	
T_{stg}	Max. Storage Temperature Range		-40 to 125		
R_{thJC}	Max. Thermal Resistance Junction to Case		1.1	°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-220		

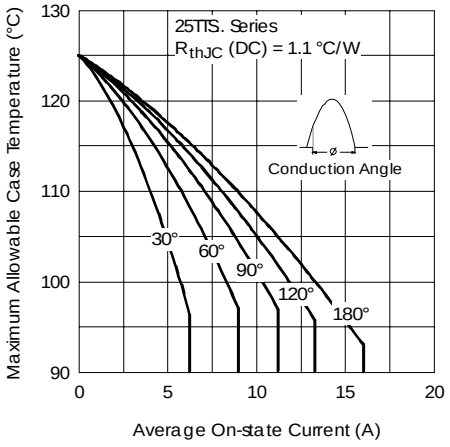


Fig. 1 - Current Rating Characteristics

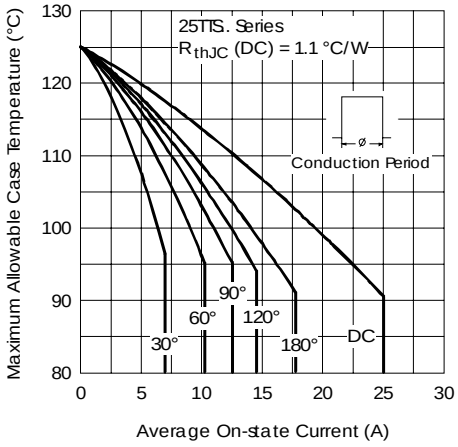


Fig. 2 - Current Rating Characteristics

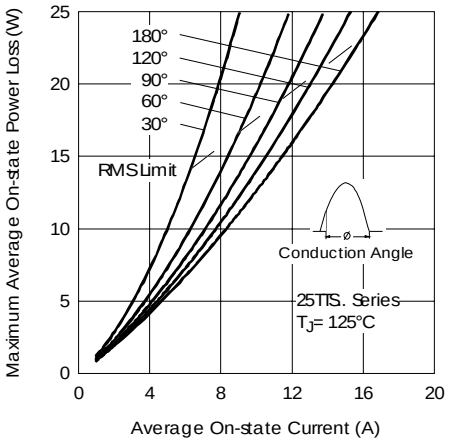


Fig. 3 - On-state Power Loss Characteristics

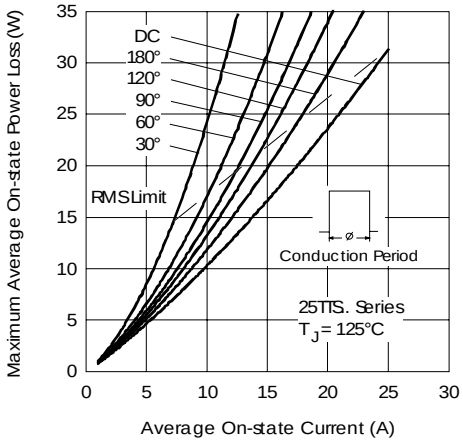


Fig. 4 - On-state Power Loss Characteristics

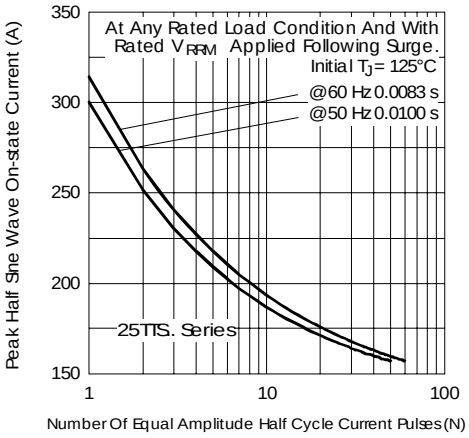


Fig. 5 - Maximum Non-Repetitive Surge Current

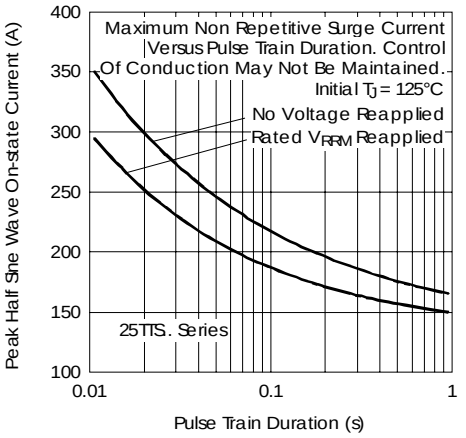


Fig. 6 - Maximum Non-Repetitive Surge Current

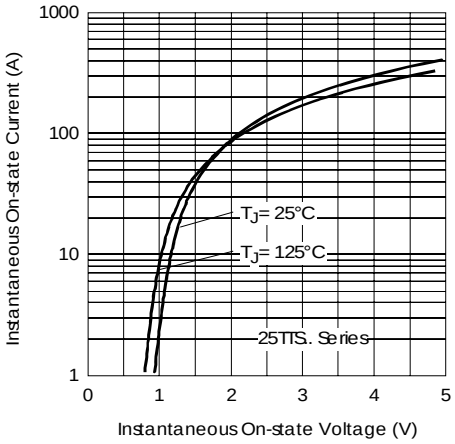


Fig. 7 - On-state Voltage Drop Characteristics

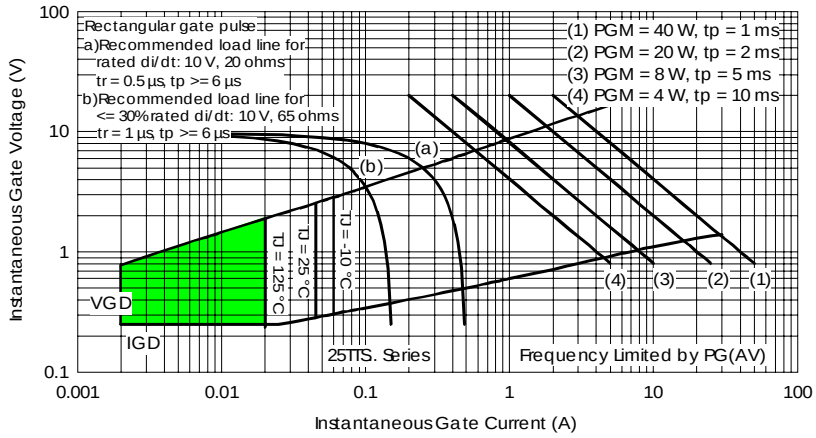


Fig. 8 - Gate Characteristics

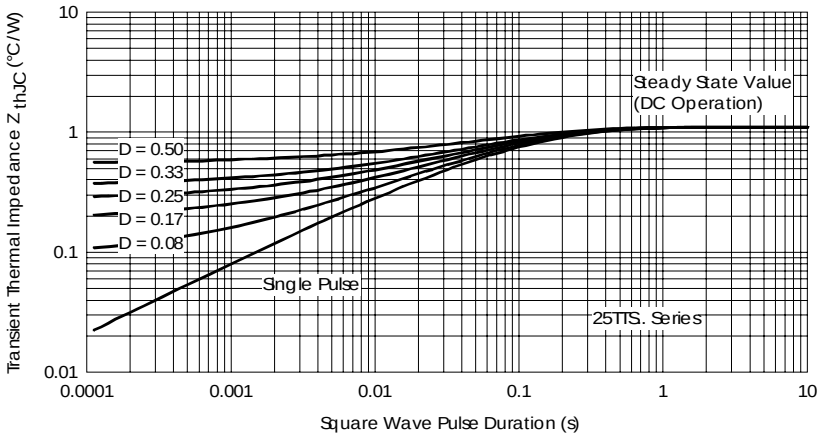
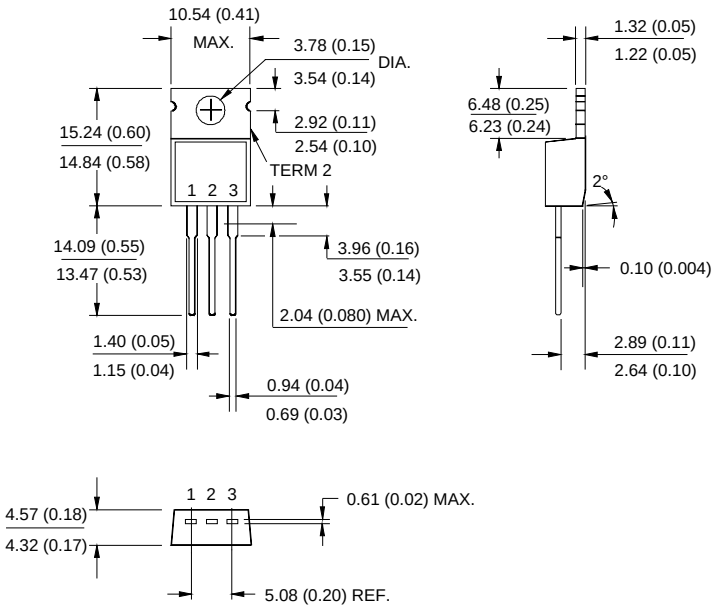


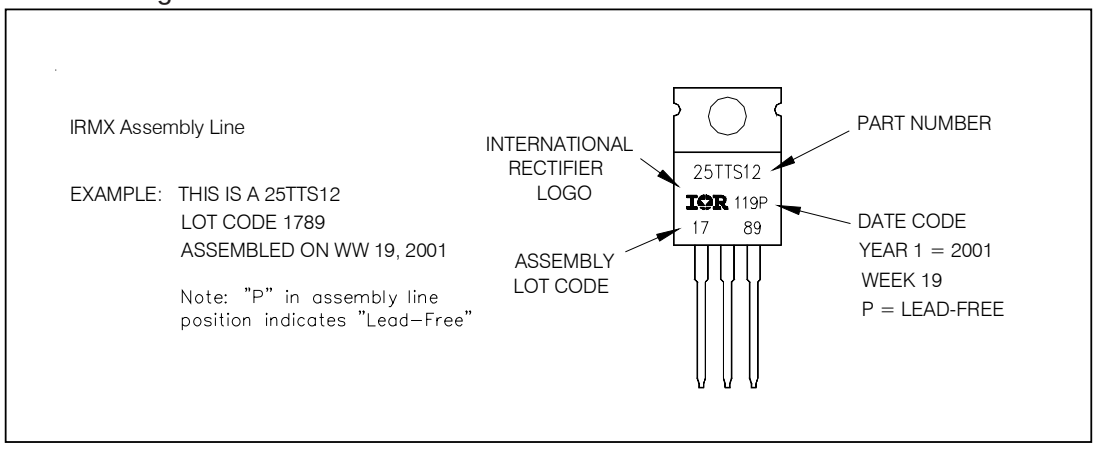
Fig. 9 - Thermal Impedance Z_{thJC} Characteristics

Outline Table



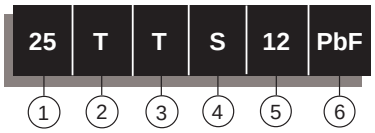
Conform to JEDEC outline TO-220AB
Dimensions in millimeters and (inches)

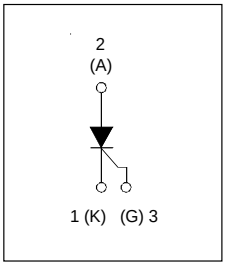
Part Marking Information



Ordering Information Table

Device Code





1	-	Current Rating (25 = 25A)
2	-	Circuit Configuration T = Single Thyristor
3	-	Package T = TO-220AC
4	-	Type of Silicon S = Standard Recovery Rectifier
5	-	Voltage Rating — 08 = 800V, 12 = 1200V
6	-	• PbF = Lead-Free

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level and Lead-Free.
Qualification Standards can be found on IR's Web site.

International
IOR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
01/07

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.