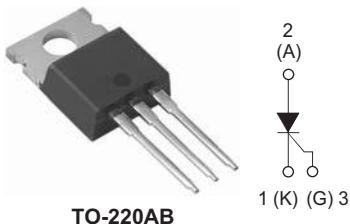


Phase Control SCR, 12.5 A


PRODUCT SUMMARY

V_T at 8 A	1.2 V
I_{TSM}	140 A
V_{RRM}	800 V

DESCRIPTION/FEATURES

The 12TTS08 High Voltage 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 and crowbar (soft start) and these products are designed to be used with Vishay HPP input diodes, switches and output rectifiers which are available in identical package outlines.

Also available in SMD-220 package (series 12TTS..S)

This product has been designed and qualified for industrial level.

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 °C/W	13.5	17	A

MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{T(AV)}$	Sinusoidal waveform	8	A
$I_{T(RMS)}$		12.5	
V_{DRM}/V_{RRM}		800	V
I_{TSM}		140	A
V_T	8 A, $T_J = 25^\circ\text{C}$	1.2	V
dV/dt		150	V/μs
dl/dt		100	A/μs
T_J	Range	- 40 to 125	°C

VOLTAGE RATINGS

PART NUMBER	V_{RRM} , MAXIMUM PEAK VOLTAGE V	V_{DRM} , MAXIMUM PEAK DIRECT VOLTAGE V	I_{RRM}/I_{DRM} AT 125 °C mA
12TTS08	800	800	1.0

12TTS08 High Voltage Series

Vishay High Power Products Phase Control SCR, 12.5 A



ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum average on-state current	$I_{T(AV)}$	$T_C = 108^\circ C$, 180° conduction, half sine wave		8	A	
Maximum RMS on-state current	$I_{T(RMS)}$			12.5		
Maximum peak, one-cycle, non-repetitive surge current	I_{TSM}	$10 \text{ ms sine pulse, rated } V_{RRM} \text{ applied, } T_J = 125^\circ C$		120		
		$10 \text{ ms sine pulse, no voltage reapplied, } T_J = 125^\circ C$		140		
Maximum I^2t for fusing	I^2t	$10 \text{ ms sine pulse, rated } V_{RRM} \text{ applied, } T_J = 125^\circ C$		72	A^2s	
		$10 \text{ ms sine pulse, no voltage reapplied, } T_J = 125^\circ C$		100		
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1 \text{ to } 10 \text{ ms, no voltage reapplied, } T_J = 125^\circ C$		1000	$A^2\sqrt{s}$	
Maximum on-state voltage drop	V_{TM}	$8 \text{ A, } T_J = 25^\circ C$		1.2	V	
On-state slope resistance	r_t	$T_J = 125^\circ C$		16.2	$m\Omega$	
Threshold voltage	$V_{T(TO)}$			0.87	V	
Maximum reverse and direct leakage current	I_{RM}/I_{DM}	$T_J = 25^\circ C$	$V_R = \text{Rated } V_{RRM}/V_{DRM}$	0.05	mA	
		$T_J = 125^\circ C$		1.0		
Typical holding current	I_H	Anode supply = 6 V, resistive load, initial $I_T = 1 \text{ A}$		30		
Maximum latching current	I_L	Anode supply = 6 V, resistive load		50		
Maximum rate of rise of off-state voltage	dV/dt	$T_J = 25^\circ C$		150	$V/\mu s$	
Maximum rate of rise of turned-on current	dl/dt			100	$A/\mu s$	

TRIGGERING

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum peak gate power	P_{GM}			8.0	W
Maximum average gate power	$P_{G(AV)}$			2.0	
Maximum peak positive gate current	$+ I_{GM}$			1.5	A
Maximum peak negative gate voltage	$- V_{GM}$			10	V
Maximum required DC gate current to trigger	I_{GT}	Anode supply = 6 V, resistive load, $T_J = -65^\circ C$		20	mA
		Anode supply = 6 V, resistive load, $T_J = 25^\circ C$		15	
		Anode supply = 6 V, resistive load, $T_J = 125^\circ C$		10	
Maximum required DC gate voltage to trigger	V_{GT}	Anode supply = 6 V, resistive load, $T_J = -65^\circ C$		1.2	V
		Anode supply = 6 V, resistive load, $T_J = 25^\circ C$		1	
		Anode supply = 6 V, resistive load, $T_J = 125^\circ C$		0.7	
Maximum DC gate voltage not to trigger	V_{GD}	$T_J = 125^\circ C$, $V_{DRM} = \text{Rated value}$		0.2	
Maximum DC gate current not to trigger	I_{GD}			0.1	

SWITCHING

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Typical turn-on time	t_{gt}	$T_J = 25^\circ C$		0.8	μs
Typical reverse recovery time	t_{rr}	$T_J = 125^\circ C$		3	
Typical turn-off time	t_q			100	



12TTS08 High Voltage Series

Phase Control SCR, 12.5 A Vishay High Power Products

THERMAL AND MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}		- 40 to 125	°C
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	1.5	°C/W
Maximum thermal resistance, junction to ambient	R_{thJA}		62	
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased	0.5	
Approximate weight			2	g
			0.07	oz.
Mounting torque	minimum		6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style TO-220AB	12TTS08	

12TTS08 High Voltage Series

Vishay High Power Products Phase Control SCR, 12.5 A

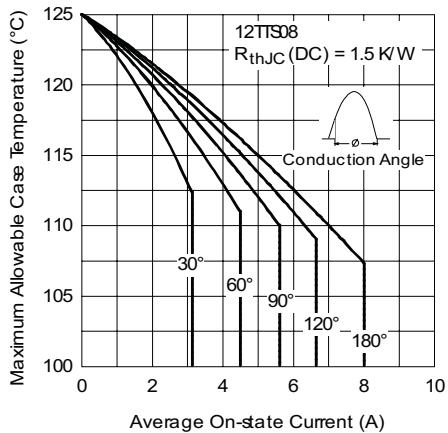


Fig. 1 - Current Ratings Characteristics

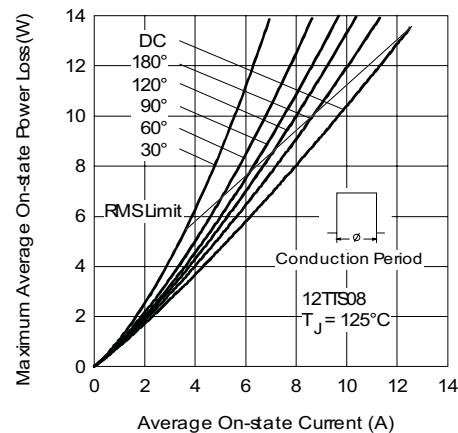


Fig. 4 - On-State Power Loss Characteristics

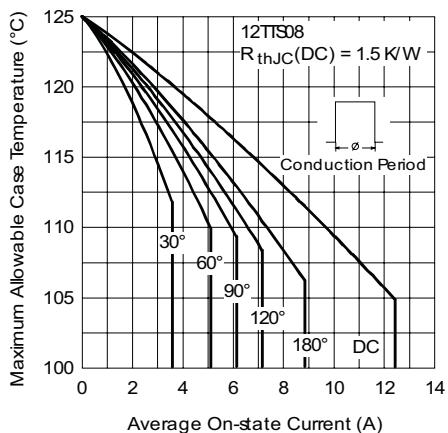


Fig. 2 - Current Ratings Characteristics

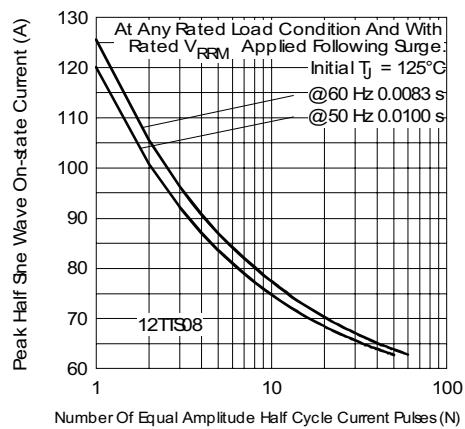


Fig. 5 - Maximum Non-Repetitive Surge Current

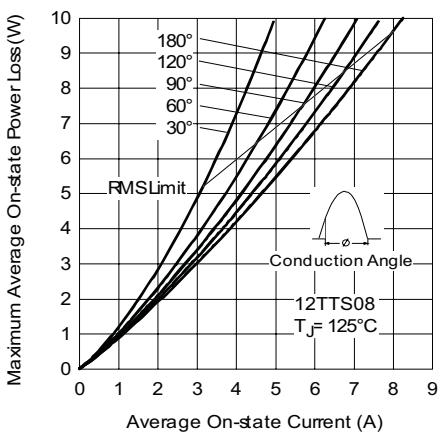


Fig. 3 - On-State Power Loss Characteristics

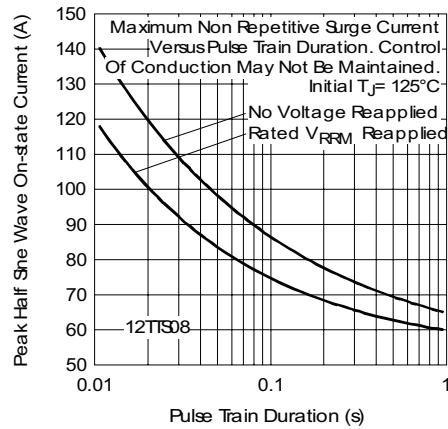


Fig. 6 - Maximum Non-Repetitive Surge Current

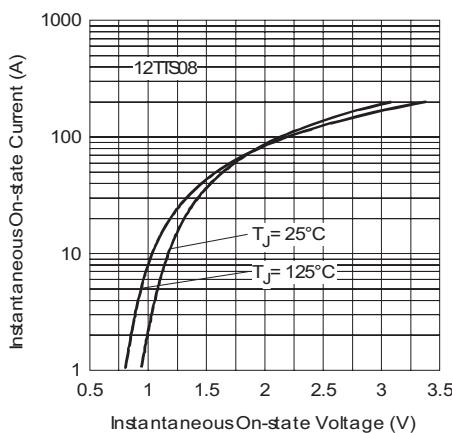


Fig. 7 - On-State Voltage Drop Characteristics

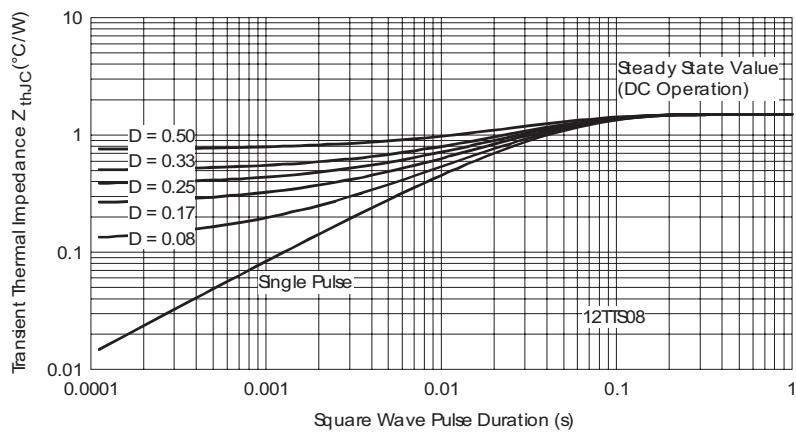


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

12TT808 High Voltage Series

Vishay High Power Products Phase Control SCR, 12.5 A



ORDERING INFORMATION TABLE

Device code	12	T	T	S	08	-
	1	2	3	4	5	6

- Current ratings (12 = 12.5 A)
- 2 - Circuit configuration:
T = Single thyristor
- 3 - Package:
T = TO-220
- 4 - Type of silicon:
S = Standard recovery rectifier
- 5 - Voltage rating (08 = 800 V)
- 6 - • None = Standard production
• PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95222
Part marking information	http://www.vishay.com/doc?95225

Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.