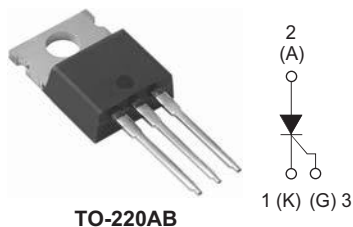


Phase Control SCR, 12.5 A



TO-220AB

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.

PRODUCT SUMMARY

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

OUTPUT CURRENT IN TYPICAL APPLICATIONS

APPLICATIONS	SINGLE-PHASE BRIDGE	THREE-PHASE BRIDGE	UNITS
Capacitive input filter $T_A = 55\text{ °C}$, $T_J = 125\text{ °C}$, 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, $T_J = 25\text{ °C}$	1.2	V
dV/dt		150	V/ μ s
dI/dt		100	A/ μ s
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

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ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average on-state current	$I_{T(AV)}$	$T_C = 108\text{ }^{\circ}\text{C}$, 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 ms sine pulse, rated V_{RRM} applied, $T_J = 125\text{ }^{\circ}\text{C}$	120	
		10 ms sine pulse, no voltage reapplied, $T_J = 125\text{ }^{\circ}\text{C}$	140	
Maximum I^2t for fusing	I^2t	10 ms sine pulse, rated V_{RRM} applied, $T_J = 125\text{ }^{\circ}\text{C}$	72	A^2s
		10 ms sine pulse, no voltage reapplied, $T_J = 125\text{ }^{\circ}\text{C}$	100	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ to 10 ms, no voltage reapplied, $T_J = 125\text{ }^{\circ}\text{C}$	1000	$A^2\sqrt{s}$
Maximum on-state voltage drop	V_{TM}	8 A, $T_J = 25\text{ }^{\circ}\text{C}$	1.2	V
On-state slope resistance	r_t	$T_J = 125\text{ }^{\circ}\text{C}$	16.2	$m\Omega$
Threshold voltage	$V_{T(TO)}$		0.87	V
Maximum reverse and direct leakage current	I_{RM}/I_{DM}	$T_J = 25\text{ }^{\circ}\text{C}$	0.05	mA
		$T_J = 125\text{ }^{\circ}\text{C}$	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	$T_J = 25\text{ }^{\circ}\text{C}$	150	$V/\mu s$
Maximum rate of rise of turned-on current	dI/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, $T_J = -65\text{ }^{\circ}\text{C}$	20	mA
		Anode supply = 6 V, resistive load, $T_J = 25\text{ }^{\circ}\text{C}$	15	
		Anode supply = 6 V, resistive load, $T_J = 125\text{ }^{\circ}\text{C}$	10	
Maximum required DC gate voltage to trigger	V_{GT}	Anode supply = 6 V, resistive load, $T_J = -65\text{ }^{\circ}\text{C}$	1.2	V
		Anode supply = 6 V, resistive load, $T_J = 25\text{ }^{\circ}\text{C}$	1	
		Anode supply = 6 V, resistive load, $T_J = 125\text{ }^{\circ}\text{C}$	0.7	
Maximum DC gate voltage not to trigger	V_{GD}	$T_J = 125\text{ }^{\circ}\text{C}$, $V_{DRM} = \text{Rated value}$	0.2	mA
Maximum DC gate current not to trigger	I_{GD}		0.1	

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



12TTS08 High Voltage Series

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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

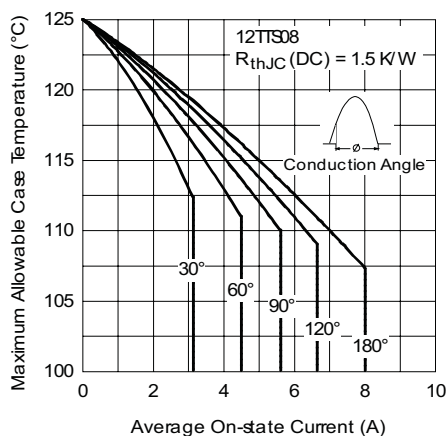


Fig. 1 - Current Ratings Characteristics

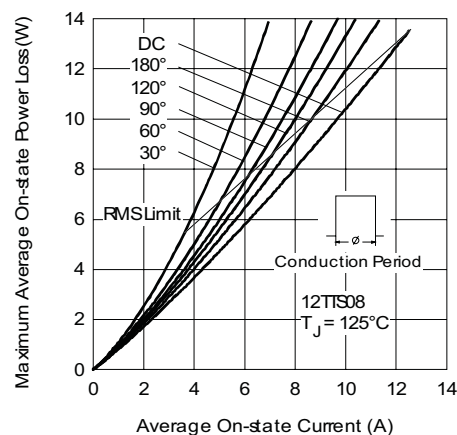


Fig. 4 - On-State Power Loss Characteristics

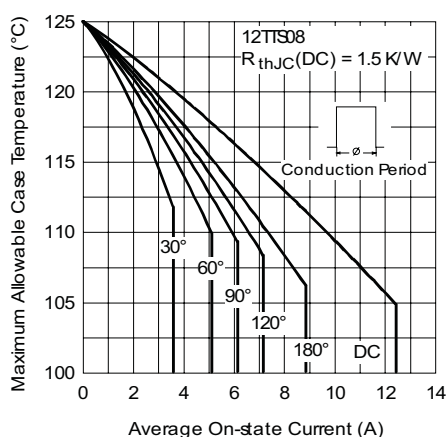


Fig. 2 - Current Ratings Characteristics

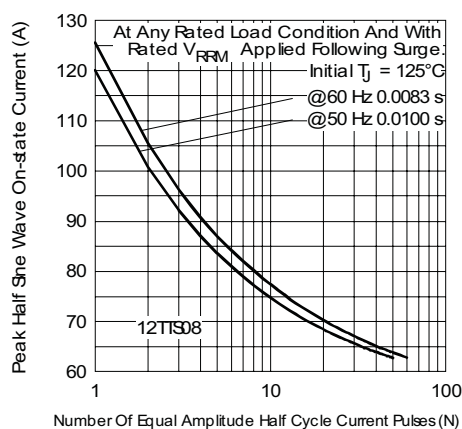


Fig. 5 - Maximum Non-Repetitive Surge Current

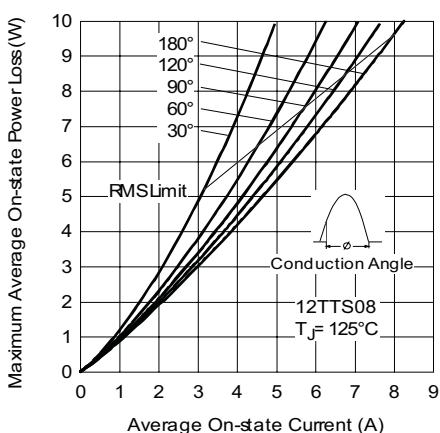


Fig. 3 - On-State Power Loss Characteristics

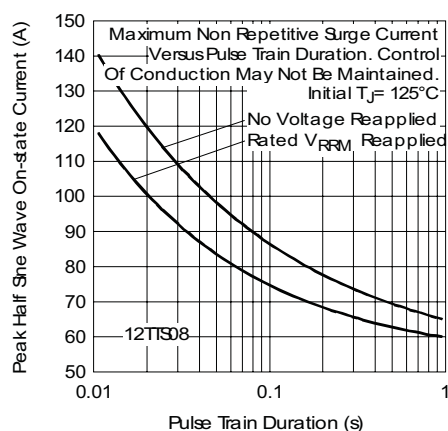


Fig. 6 - Maximum Non-Repetitive Surge Current



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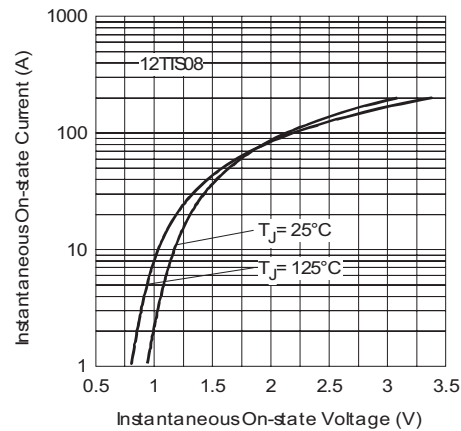


Fig. 7 - On-State Voltage Drop Characteristics

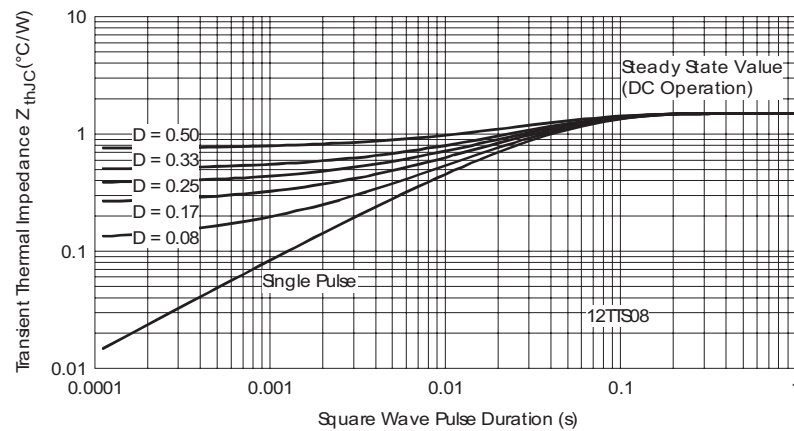


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

12TTS08 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
	1	- 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



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