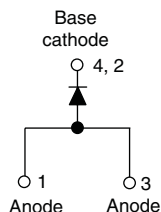




## Phase Control SCR, 8 A



D<sup>2</sup>PAK



### DESCRIPTION/FEATURES

The 12TTS08SPbF 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.



RoHS  
COMPLIANT

Typical applications are in input rectification and crow-bar (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.

This product has been designed and qualified for industrial level and lead (Pb)-free ("PbF" suffix).

### 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	
$V_{RRM}/V_{DRM}$		800	V
$I_{TSM}$		140	A
$V_T$	8 A, $T_J = 25\text{ °C}$	1.2	V
dV/dt		150	V/μs
dI/dt		100	A/μs
$T_J$	Range	- 40 to 125	°C

### VOLTAGE RATINGS

PART NUMBER	$V_{RRM}$ , MAXIMUM PEAK REVERSE VOLTAGE V	$V_{DRM}$ , MAXIMUM PEAK DIRECT VOLTAGE V	$I_{RRM}/I_{DRM}$ AT 125 °C mA
12TTS08SPbF	800	800	1.0

# 12TTS08SPbF High Voltage Series

Vishay High Power Products Phase Control SCR, 8 A



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	$A^2s$
Maximum $I^2t$ for fusing	$I^2t$	10 ms sine pulse, rated $V_{RRM}$ applied, $T_J = 125\text{ }^{\circ}\text{C}$	72	
		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 $I_T = 1$ 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	$\mu s$
Typical reverse recovery time	$t_{rr}$	$T_J = 125\text{ }^{\circ}\text{C}$	3	
Typical turn-off time	$t_q$		100	



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THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range		T <sub>J</sub> , T <sub>Stg</sub>		- 40 to 125	°C
Maximum thermal resistance, junction to case		R <sub>thJC</sub>	DC operation	1.5	°C/W
Maximum thermal resistance, junction to ambient		R <sub>thJA</sub>		62	
Typical thermal resistance, case to heatsink		R <sub>thCS</sub>	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 D <sup>2</sup> PAK (SMD-220)	12TTS08S	

# 12TTS08SPbF High Voltage Series

Vishay High Power Products Phase Control SCR, 8 A

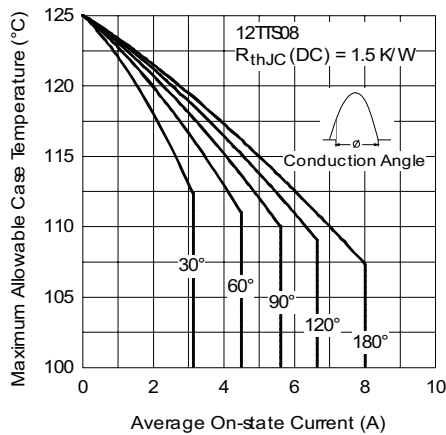


Fig. 1 - Current Rating Characteristics

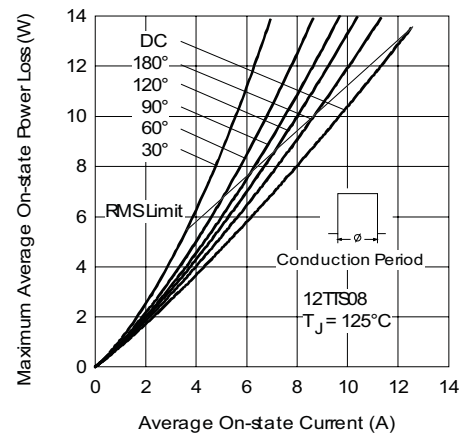


Fig. 4 - On-State Power Loss Characteristics

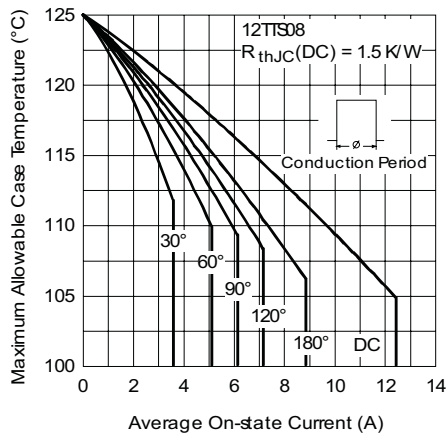


Fig. 2 - Current Rating Characteristics

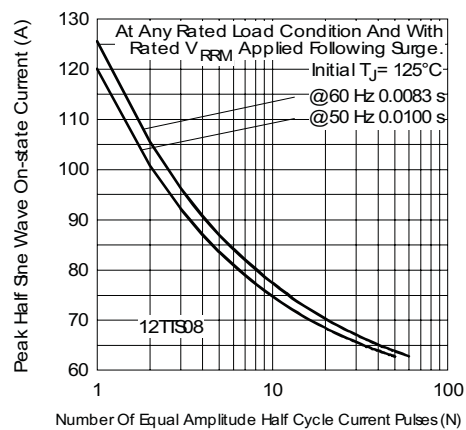


Fig. 5 - Maximum Non-Repetitive Surge Current

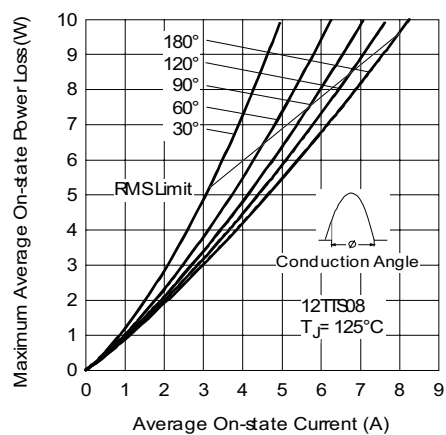


Fig. 3 - On-State Power Loss Characteristics

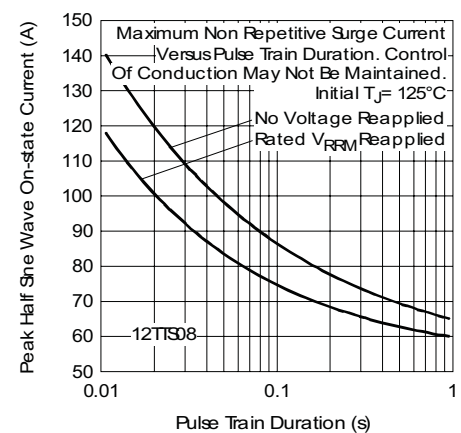


Fig. 6 - Maximum Non-Repetitive Surge Current



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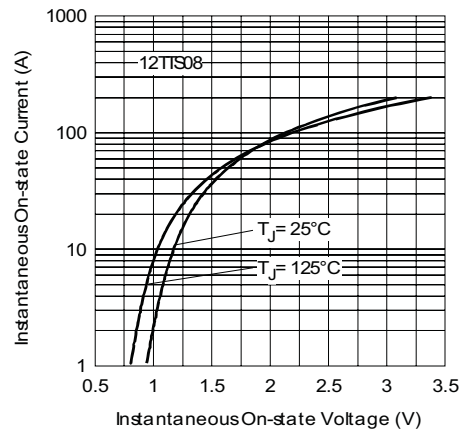


Fig. 7 - On-State Voltage Drop Characteristics

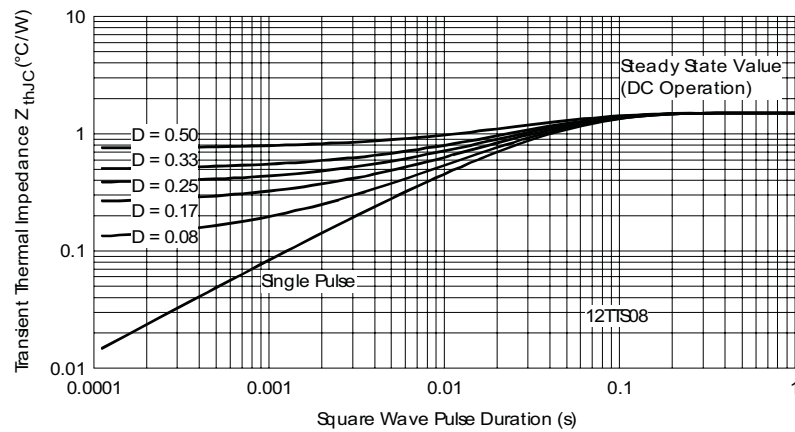


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

# 12TTS08SPbF High Voltage Series

Vishay High Power Products Phase Control SCR, 8 A



## ORDERING INFORMATION TABLE

Device code	12	T	T	S	08	S	TRL	PbF
	1	2	3	4	5	6	7	8

- 1** - Current rating (12.5 A)
- 2** - Circuit configuration:  
T = Single thyristor
- 3** - Package:  
T = TO-220AC
- 4** - Type of silicon:  
S = Standard recovery rectifier
- 5** - Voltage rating (08 = 800 V)
- 6** - S = TO-220 D<sup>2</sup>PAK (SMD-220) version
- 7** -
  - None = Tube
  - TRL = Tape and reel (left oriented)
  - TRR = Tape and reel (right oriented)
- 8** -
  - None = Standard production
  - PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95046">http://www.vishay.com/doc?95046</a>
Part marking information	<a href="http://www.vishay.com/doc?95054">http://www.vishay.com/doc?95054</a>
Packaging information	<a href="http://www.vishay.com/doc?95032">http://www.vishay.com/doc?95032</a>



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