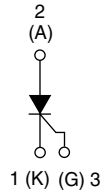


## Surface Mountable Phase Control SCR, 10 A



D<sup>2</sup>PAK



### DESCRIPTION/FEATURES

The 10TTS08S 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 (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.

### PRODUCT SUMMARY

$V_T$ at 6.5 A	< 1.15 V
$I_{TSM}$	140 A
$V_{RRM}$	800 V

### OUTPUT CURRENT IN TYPICAL APPLICATIONS

APPLICATIONS	SINGLE-PHASE BRIDGE	THREE-PHASE BRIDGE	UNITS
NEMA FR-4 or G-10 glass fabric-based epoxy with 4 oz. (140 $\mu$ m) copper	2.5	3.5	A
Aluminum IMS, $R_{thCA} = 15$ °C/W	6.3	9.5	
Aluminum IMS with heatsink, $R_{thCA} = 5$ °C/W	14.0	18.5	

#### Note

- $T_A = 55$  °C,  $T_J = 125$  °C, footprint 300 mm<sup>2</sup>

### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{T(AV)}$	Sinusoidal waveform	6.5	A
$I_{RMS}$		10	
$V_{RRM}/V_{DRM}$		800	V
$I_{TSM}$		140	A
$V_T$	6.5 A, $T_J = 25$ °C	1.15	V
dV/dt		150	V/ $\mu$ s
dI/dt		100	A/ $\mu$ s
$T_J$	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
10TTS08S	800	800	1.0

# 10TTS08S High Voltage Series



Vishay High Power Products

Surface Mountable  
Phase Control SCR, 10 A

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Maximum average on-state current	$I_{T(AV)}$	$T_C = 112\text{ }^\circ\text{C}$ , 180° conduction half sine wave	6.5	A	
Maximum RMS on-state current	$I_{T(RMS)}$		10		
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	$V_{TM}$	6.5 A, $T_J = 25\text{ }^\circ\text{C}$	1.15	V	
On-state slope resistance	$r_t$	$T_J = 125\text{ }^\circ\text{C}$	17.3	$m\Omega$	
Threshold voltage	$V_{T(TO)}$				
Maximum reverse and direct leakage current	$I_{RM}/I_{DM}$	$V_R = \text{Rated } V_{RRM}/V_{DRM}$	$T_J = 25\text{ }^\circ\text{C}$	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	



# 10TTS08S High Voltage Series

Surface Mountable  
Phase Control SCR, 10 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
Soldering temperature	$T_S$	For 10 s (1.6 mm from case)	240	
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation	1.5	°C/W
Typical thermal resistance, junction to ambient (PCB mount)	$R_{thJA}^{(1)}$		40	
Approximate weight			2	g
			0.07	oz.
Marking device		Case style D <sup>2</sup> PAK (SMD-220)	10TTS08S	

**Note**

<sup>(1)</sup> When mounted on 1" square (650 mm<sup>2</sup>) PCB of FR-4 or G-10 material 4 oz. (140 μm) copper 40 °C/W  
For recommended footprint and soldering techniques refer to application note #AN-994

# 10TTS08S High Voltage Series



Vishay High Power Products

Surface Mountable  
Phase Control SCR, 10 A

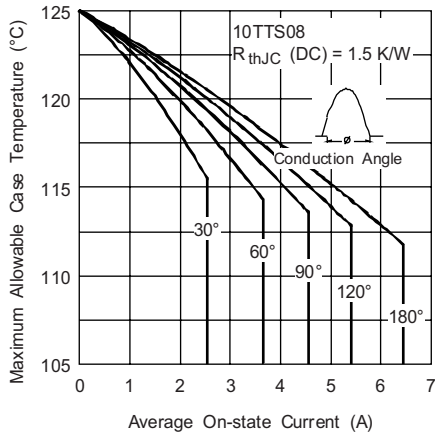


Fig. 1 - Current Rating Characteristics

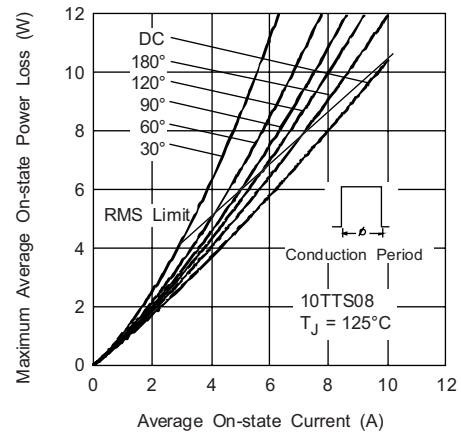


Fig. 4 - On-State Power Loss Characteristics

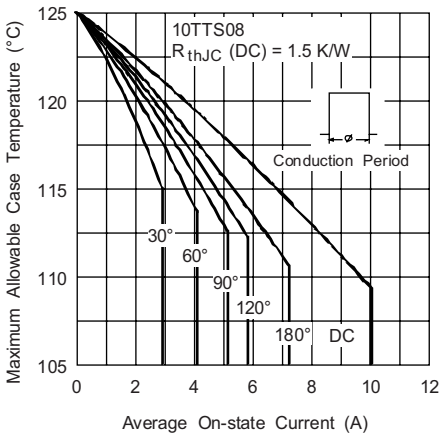


Fig. 2 - Current Rating Characteristics

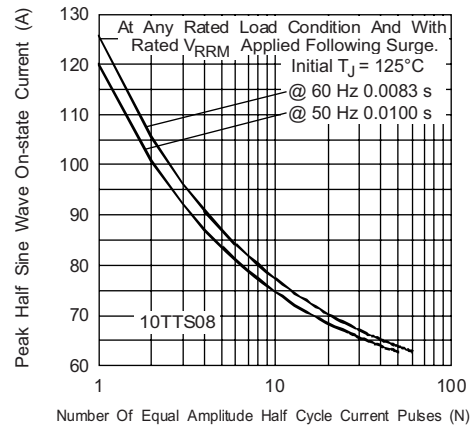


Fig. 5 - Maximum Non-Repetitive Surge Current

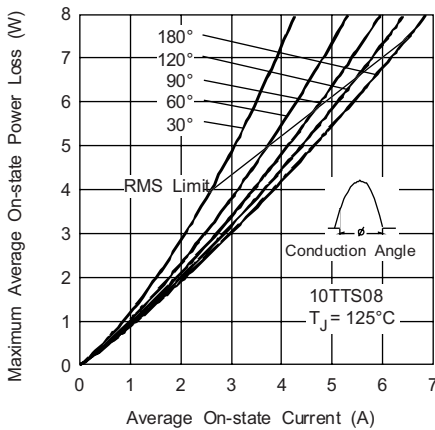


Fig. 3 - On-State Power Loss Characteristics

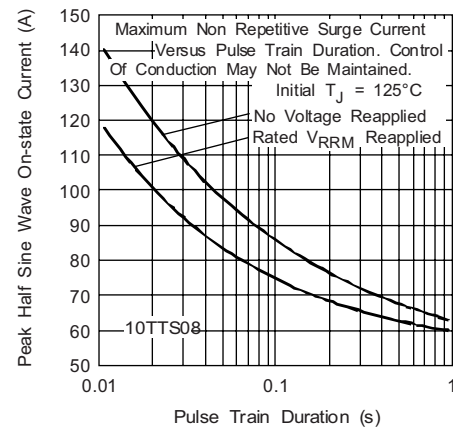


Fig. 6 - Maximum Non-Repetitive Surge Current



# 10TTS08S High Voltage Series

Surface Mountable  
Phase Control SCR, 10 A

Vishay High Power Products

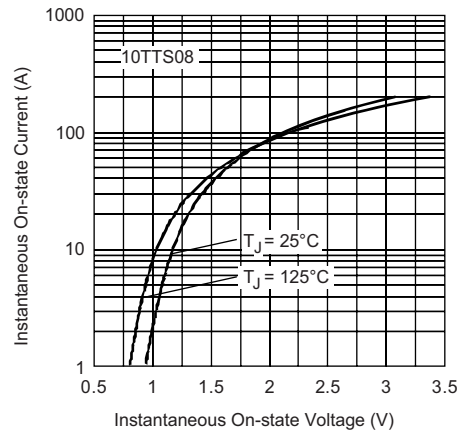


Fig. 7 - On-State Voltage Drop Characteristics

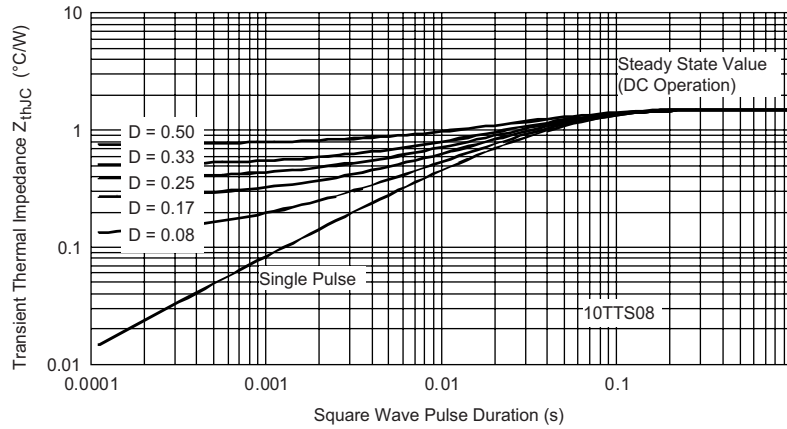


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

# 10TTS08S High Voltage Series

Vishay High Power Products

Surface Mountable  
Phase Control SCR, 10 A



## ORDERING INFORMATION TABLE

Device code	10	T	T	S	08	S	TRL	-
	①	②	③	④	⑤	⑥	⑦	⑧

- 1** - Current rating, RMS value
- 2** - Circuit configuration:  
T = Single thyristor
- 3** - Package:  
T = TO-220AC
- 4** - Type of silicon:  
S = Converter grade
- 5** - Voltage code x 100 =  $V_{RRM}$
- 6** - S = TO-220 D<sup>2</sup>PAK (SMD-220) version
- 7** - Tape and reel option:
  - TRL = Left reel
  - TRR = Right orientation reel
- 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>



## 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.