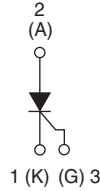




### Phase Control SCR, 10 A



TO-220AB



#### DESCRIPTION/FEATURES

The 10TTS08PbF 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.

Also available in SMD-220 package (series 10TTS08SPbF).

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

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
Capacitive input filter $T_A = 55\text{ °C}$ , $T_J = 125\text{ °C}$ , common heatsink of $1\text{ °C/W}$	13.5	17	A

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{T(AV)}$	Sinusoidal waveform	6.5	A
$I_{T(RMS)}$		10	
$V_{RRM}/V_{DRM}$		800	V
$I_{TSM}$		140	A
$V_T$	6.5 A, $T_J = 25\text{ °C}$	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
10TTS08PbF	800	800	1.0

\* Pb containing terminations are not RoHS compliant, exemptions may apply

# 10TTS08PbF High Voltage Series



Vishay High Power Products 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	$V_{T(TO)}$		0.85	V	
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	
Maximum DC gate current not to trigger	$I_{GD}$		0.1	mA

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	



# 10TTS08PbF High Voltage Series

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
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
	maximum		12 (10)	(lbf · in)
Marking device		Case style TO-220AB	10TTS08	

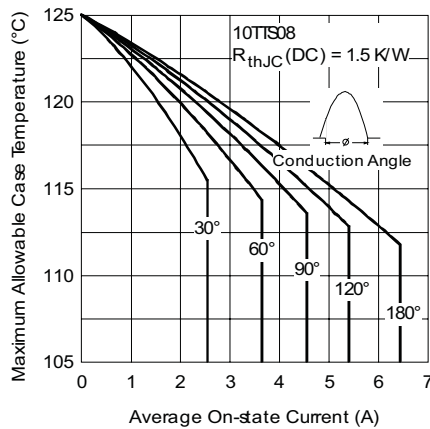


Fig. 1 - Current Rating Characteristics

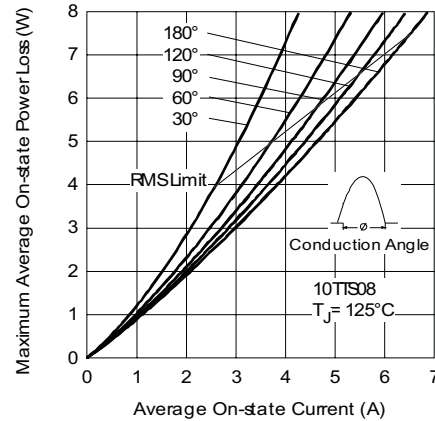


Fig. 3 - On-State Power Loss Characteristics

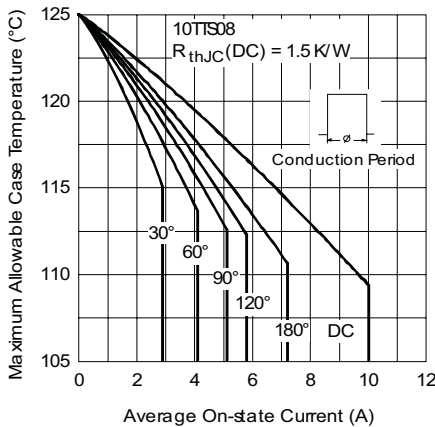


Fig. 2 - Current Rating Characteristic

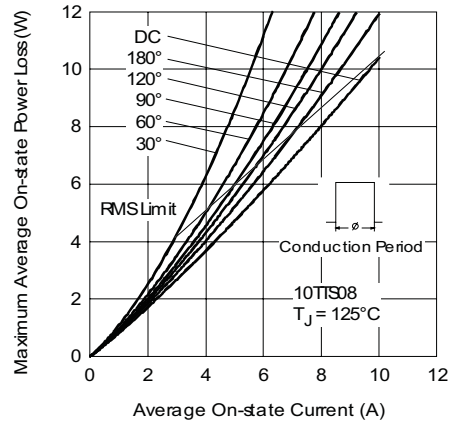


Fig. 4 - On-State Power Loss Characteristics

# 10TTS08PbF High Voltage Series

Vishay High Power Products Phase Control SCR, 10 A

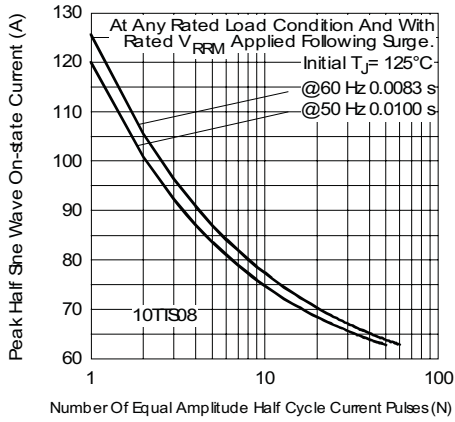


Fig. 5 - Maximum Non-Repetitive Surge Current

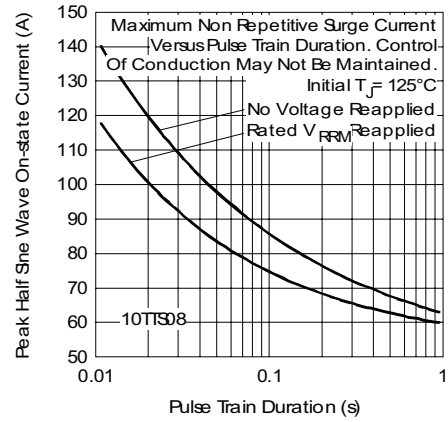


Fig. 6 - Maximum Non-Repetitive Surge Current

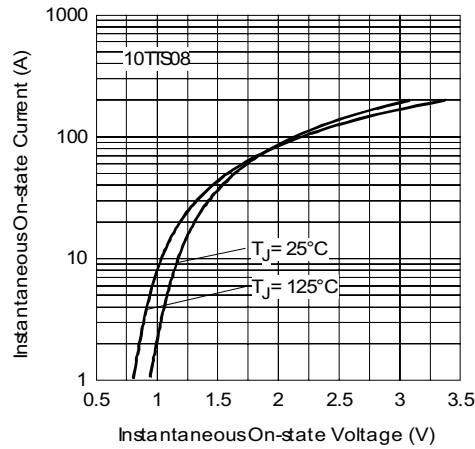


Fig. 7 - On-State Voltage Drop Characteristics

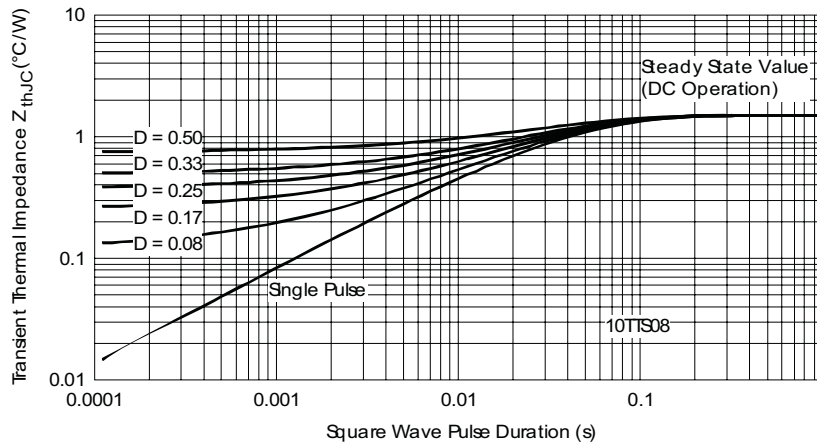


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics



# 10TTS08PbF High Voltage Series

Phase Control SCR, 10 A Vishay High Power Products

## ORDERING INFORMATION TABLE

Device code	10	T	T	S	08	PbF
	①	②	③	④	⑤	⑥
<b>1</b>	-	Current rating				
<b>2</b>	-	Circuit configuration: T = Single thyristor				
<b>3</b>	-	Package: T = TO-220AB				
<b>4</b>	-	Type of silicon: S = Converter grade				
<b>5</b>	-	Voltage code x 100 = $V_{RRM}$				
<b>6</b>	-	• None = Standard production • PbF = Lead (Pb)-free				

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95222">http://www.vishay.com/doc?95222</a>
Part marking information	<a href="http://www.vishay.com/doc?95225">http://www.vishay.com/doc?95225</a>



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