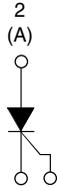


## Phase Control SCR, 20 A



TO-247AC



1 (K) (G) 3

### DESCRIPTION/FEATURES

The 30TPS... 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 20 A	< 1.3 V
$I_{TSM}$	300 A
$V_{RRM}$	800/1200 V

### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{T(AV)}$	Sinusoidal waveform	20	A
$I_{RMS}$		30	
$V_{RRM}/V_{DRM}$		800/1200	V
$I_{TSM}$		300	A
$V_T$	20 A, $T_J = 25\text{ °C}$	1.3	V
dV/dt		500	V/ $\mu$ s
dI/dt		150	A/ $\mu$ s
$T_J$		- 40 to 125	°C

### VOLTAGE RATINGS

PART NUMBER	$V_{RRM}/V_{DRM}$ , MAXIMUM REPETITIVE PEAK AND OFF-STATE VOLTAGE V	$V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$I_{RRM}/I_{DRM}$ AT 125 °C mA
30TPS08	800	900	10
30TPS12	1200	1300	

# 30TPS... High Voltage Series



Vishay High Power Products Phase Control SCR, 20 A

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average on-state current	$I_{T(AV)}$	$T_C = 95\text{ }^\circ\text{C}$ , 180° conduction half sine wave		20	A
Maximum RMS on-state current	$I_{RMS}$			30	
Maximum peak, one-cycle non-repetitive surge current	$I_{TSM}$	10 ms sine pulse, rated $V_{RRM}$ applied		250	
		10 ms sine pulse, no voltage reapplied		300	
Maximum $I^2t$ for fusing	$I^2t$	10 ms sine pulse, rated $V_{RRM}$ applied		310	$A^2s$
		10 ms sine pulse, no voltage reapplied		442	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ to 10 ms, no voltage reapplied		4420	$A^2\sqrt{s}$
Maximum on-state voltage drop	$V_{TM}$	20 A, $T_J = 25\text{ }^\circ\text{C}$		1.3	V
On-state slope resistance	$r_t$	$T_J = 125\text{ }^\circ\text{C}$		12	$m\Omega$
Threshold voltage	$V_{T(TO)}$			1.0	V
Maximum reverse and direct leakage current	$I_{RM}/I_{DM}$	$T_J = 25\text{ }^\circ\text{C}$		0.5	mA
		$T_J = 125\text{ }^\circ\text{C}$		10	
		$V_R = \text{Rated } V_{RRM}/V_{DRM}$			
Maximum holding current	$I_H$	Anode supply = 6 V, resistive load, initial $I_T = 1$ A		100	
Maximum latching current	$I_L$	Anode supply = 6 V, resistive load		200	
Maximum rate of rise of off-state voltage	$dV/dt$			500	$V/\mu s$
Maximum rate of rise of turned-on current	$dI/dt$			150	$A/\mu s$

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, $T_J = -10\text{ }^\circ\text{C}$		60	mA
		Anode supply = 6 V, resistive load, $T_J = 25\text{ }^\circ\text{C}$		45	
		Anode supply = 6 V, resistive load, $T_J = 125\text{ }^\circ\text{C}$		20	
Maximum required DC gate voltage to trigger	$V_{GT}$	Anode supply = 6 V, resistive load, $T_J = -10\text{ }^\circ\text{C}$		2.5	V
		Anode supply = 6 V, resistive load, $T_J = 25\text{ }^\circ\text{C}$		2.0	
		Anode supply = 6 V, resistive load, $T_J = 125\text{ }^\circ\text{C}$		1.0	
Maximum DC gate voltage not to trigger	$V_{GD}$	$T_J = 125\text{ }^\circ\text{C}$ , $V_{DRM} = \text{Rated value}$		0.25	
Maximum DC gate current not to trigger	$I_{GD}$			2.0	mA

SWITCHING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Typical turn-on time	$t_{gt}$	$T_J = 25\text{ }^\circ\text{C}$		0.9	$\mu s$
Typical reverse recovery time	$t_{rr}$	$T_J = 125\text{ }^\circ\text{C}$		4	
Typical turn-off time	$t_q$			110	



# 30TPS... High Voltage Series

Phase Control SCR, 20 A Vishay High Power Products

<b>THERMAL AND MECHANICAL SPECIFICATIONS</b>				
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	0.8	°C/W
Maximum thermal resistance, junction to ambient	$R_{thJA}$		40	
Maximum thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth and greased	0.2	
Approximate weight			6	g
			0.21	oz.
Mounting torque	minimum		6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style TO-247AC (JEDEC)	30TPS08	
			30TPS12	

# 30TPS... High Voltage Series



Vishay High Power Products Phase Control SCR, 20 A

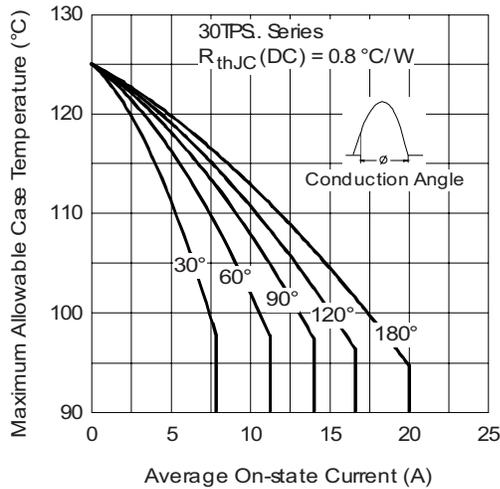


Fig. 1 - Current Rating Characteristics

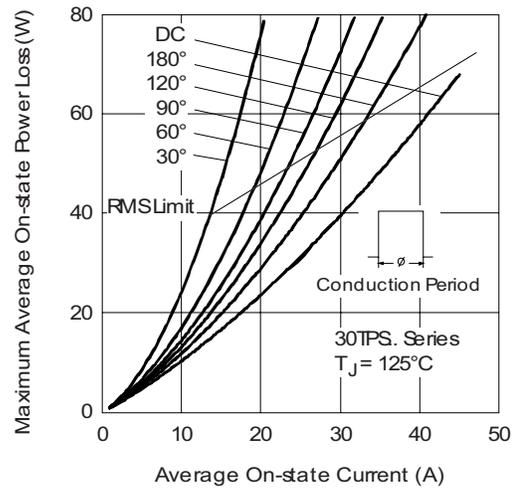


Fig. 4 - On-State Power Loss Characteristics

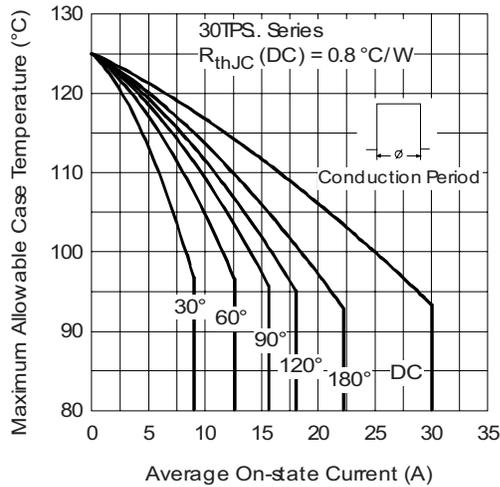


Fig. 2 - Current Rating Characteristics

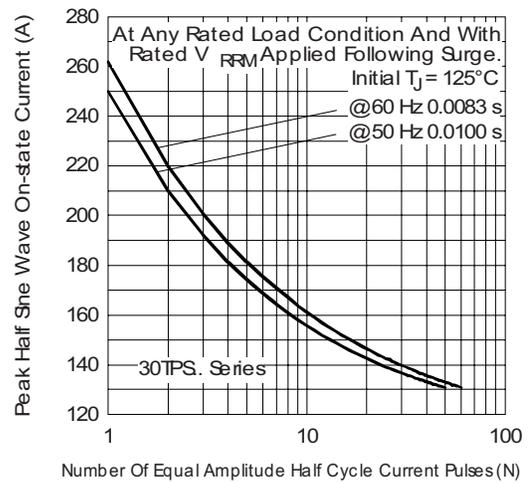


Fig. 5 - Maximum Non-Repetitive Surge Current

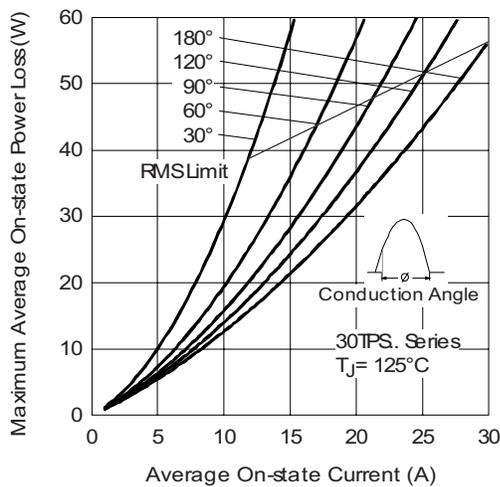


Fig. 3 - On-State Power Loss Characteristics

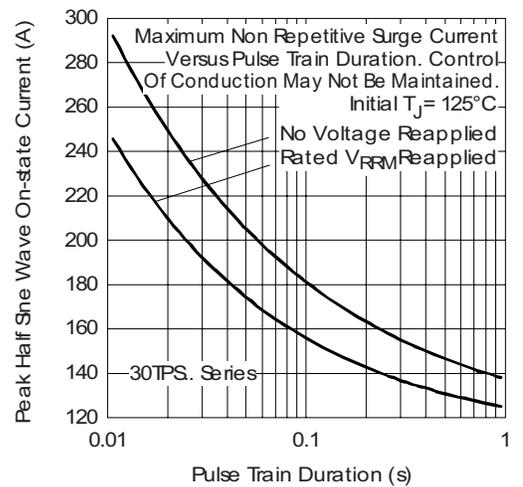


Fig. 6 - Maximum Non-Repetitive Surge Current



# 30TPS... High Voltage Series

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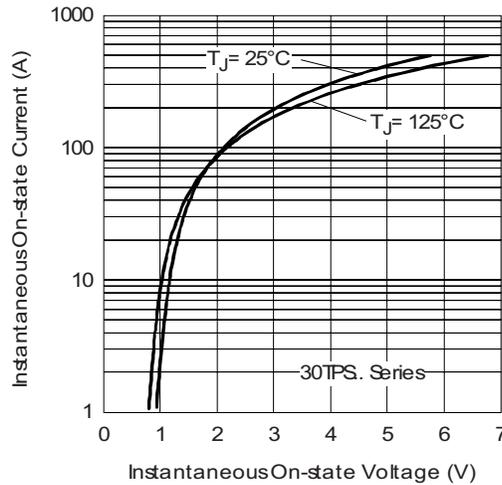


Fig. 7 - On-State Voltage Drop Characteristics

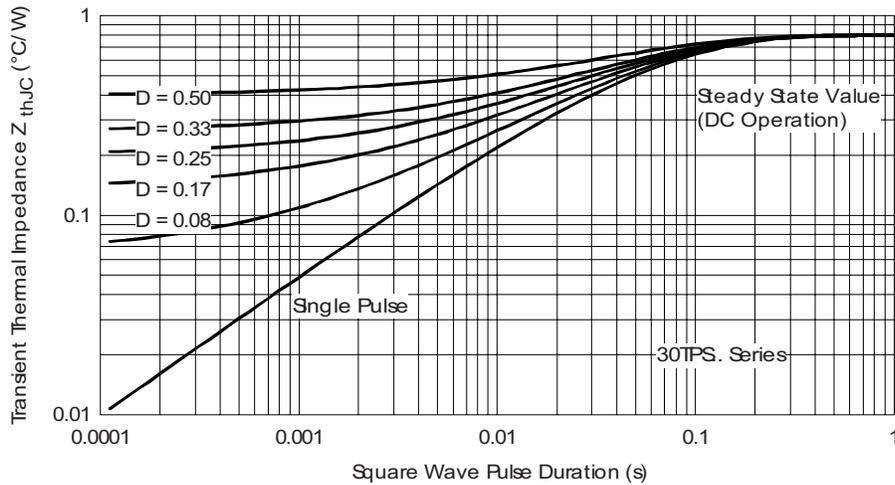


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

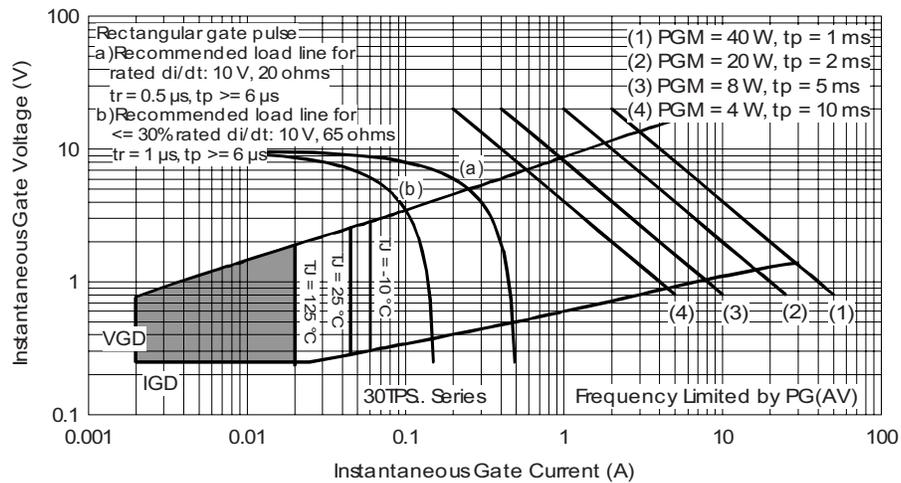


Fig. 9 - Gate Characteristics

# 30TPS... High Voltage Series

Vishay High Power Products Phase Control SCR, 20 A



## ORDERING INFORMATION TABLE

Device code	30	T	P	S	12	-
	①	②	③	④	⑤	⑥
<b>1</b>	-	Current rating (30 = 30 A)				
<b>2</b>	-	Circuit configuration: T = Thyristor				
<b>3</b>	-	Package: P = TO-247				
<b>4</b>	-	Type of silicon: S = Standard recovery rectifier				
<b>5</b>	-	Voltage code x 100 = $V_{RRM}$				
<b>6</b>	-	<ul style="list-style-type: none"><li>• None = Standard production</li><li>• PbF = Lead (Pb)-free</li></ul>				

08 = 800 V  
12 = 1200 V

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95223">http://www.vishay.com/doc?95223</a>
Part marking information	<a href="http://www.vishay.com/doc?95226">http://www.vishay.com/doc?95226</a>



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