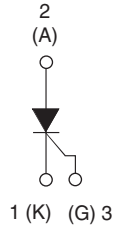


## Phase Control SCR, 20 A



TO-247AC



### DESCRIPTION/FEATURES

The 30TPS16PbF 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 (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 20 A	< 1.3 V
$I_{TSM}$	300 A
$V_{RRM}$	1600 V

### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{T(AV)}$	Sinusoidal waveform	20	A
$I_{RMS}$		30	
$V_{RRM}/V_{DRM}$		1600	V
$I_{TSM}$		300	A
$V_T$	20 A, $T_J = 25\text{ }^\circ\text{C}$	1.3	V
dV/dt		500	V/ $\mu\text{s}$
dI/dt		150	A/ $\mu\text{s}$
$T_J$		- 40 to 125	$^\circ\text{C}$

### 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
30TPS16PbF	1600	1700	10

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

# 30TPS16PbF 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 <sup>2</sup> s
		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 <sup>2</sup> √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	mΩ
Threshold voltage	$V_{T(TO)}$			1.0	V
Maximum reverse and direct leakage current	$I_{RM}/I_{DM}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_{RRM}/V_{DRM}$	0.5	mA
		$T_J = 125\text{ }^\circ\text{C}$		10	
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/μs
Maximum rate of rise of turned-on current	$dI/dt$			150	A/μs

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	mA
Maximum DC gate current not to trigger	$I_{GD}$			2.0	

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



# 30TPS16PbF 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
	maximum		12 (10)	(lbf · in)
Marking device		Case style TO-247AC (JEDEC)	30TPS16	

# 30TPS16PbF High Voltage Series

Vishay High Power Products Phase Control SCR, 20 A

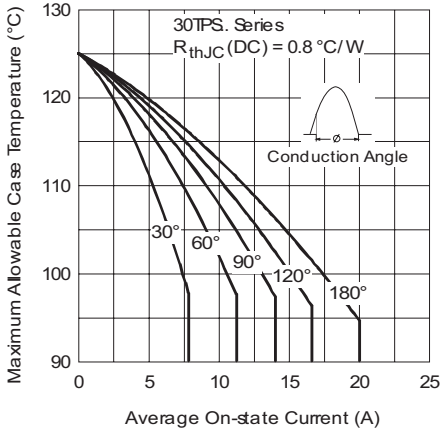


Fig. 1 - Current Rating Characteristics

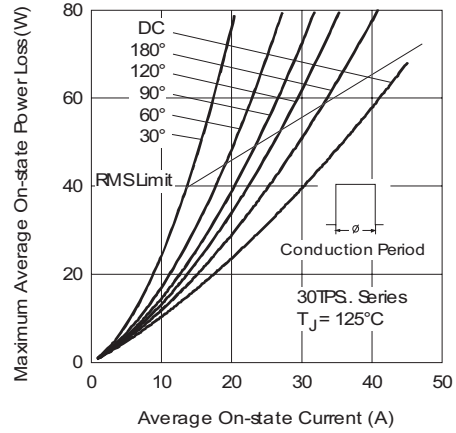


Fig. 4 - On-State Power Loss Characteristics

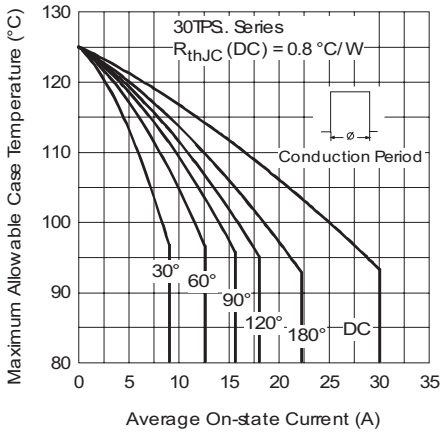


Fig. 2 - Current Rating Characteristics

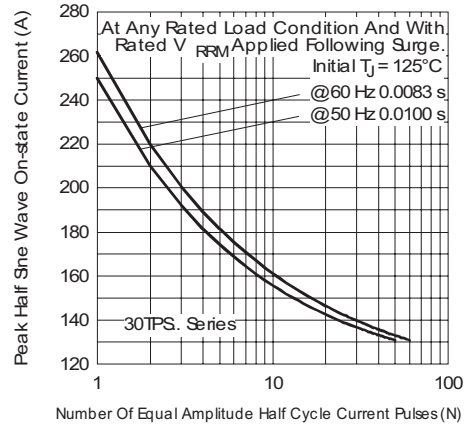


Fig. 5 - Maximum Non-Repetitive Surge Current

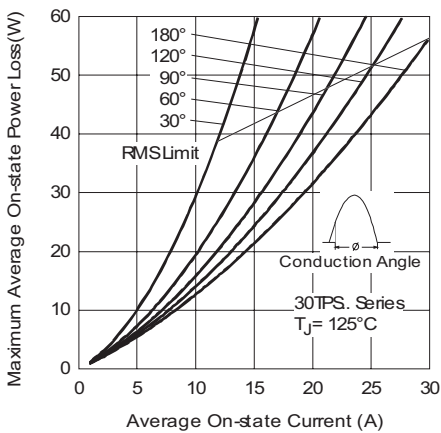


Fig. 3 - On-State Power Loss Characteristics

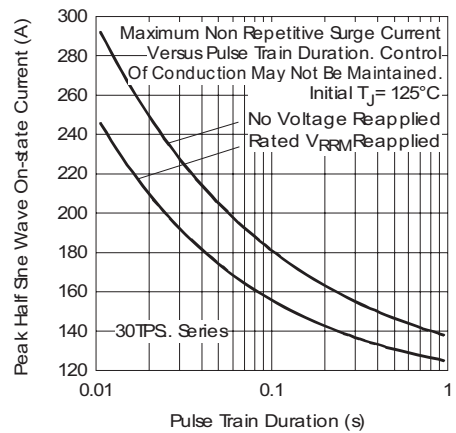


Fig. 6 - Maximum Non-Repetitive Surge Current



# 30TPS16PbF High Voltage Series

Phase Control SCR, 20 A Vishay High Power Products

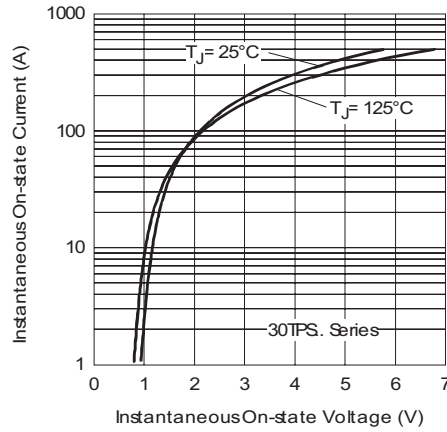


Fig. 7 - On-State Voltage Drop Characteristics

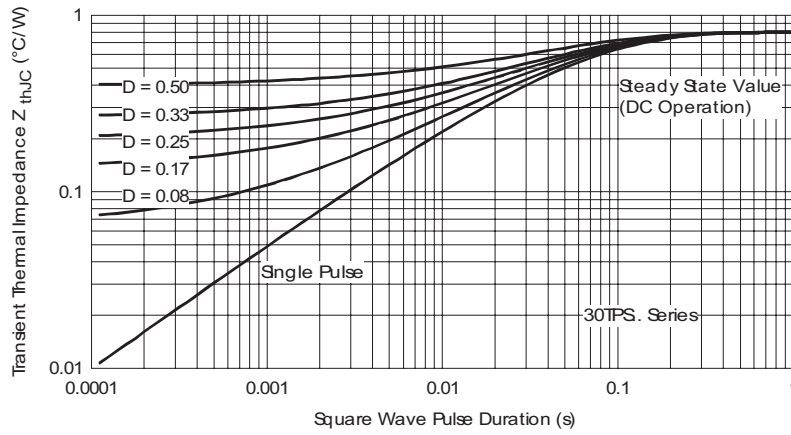


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

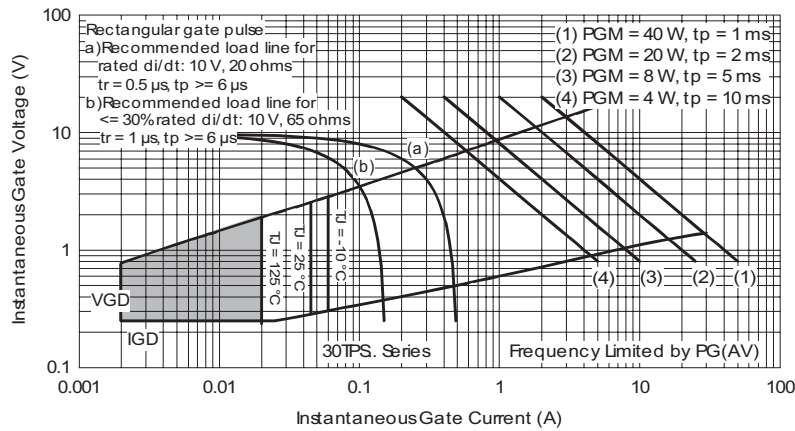


Fig. 9 - Gate Characteristics

# 30TPS16PbF High Voltage Series

Vishay High Power Products Phase Control SCR, 20 A



## ORDERING INFORMATION TABLE

Device code	30	T	P	S	16	PbF
	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 rating (16 = 1600 V)			
	<b>6</b>	-	• None = Standard production • PbF = Lead (Pb)-free			

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>



## 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.