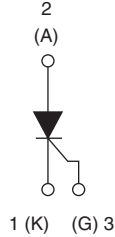


## Phase Control SCR, 70 A



Super-247



### DESCRIPTION/FEATURES

The 70TPS.. High Voltage Series of silicon controlled rectifiers are specifically designed for high and medium power switching and phase control applications.

Typical applications are in input rectification (soft start) or AC-switches or high current crow-bar as well as others phase-control circuits.

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 100 A	< 1.4 V
$I_{TSM}$	1400 A
$V_{RRM}$	1200/1600 V

### MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{T(AV)}$	Sinusoidal waveform	70	A
$I_{RMS}$	Lead current limitation	75	
$V_{RRM}/V_{DRM}$	Range	1200/1600	V
$I_{TSM}$		1400	A
$V_T$	100 A, $T_J = 25\text{ }^\circ\text{C}$	1.4	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 $^\circ\text{C}$ mA
70TPS12	1200	1300	15
70TPS16	1600	1700	

# 70TPS.. High Voltage Series



Vishay High Power Products Phase Control SCR, 70 A

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average on-state current	$I_{T(AV)}$	$T_C = 82\text{ }^\circ\text{C}$ , 180° conduction half sine wave		70	A
Maximum continuous RMS on-state current as AC switch	$I_{T(RMS)}$	Lead current limitation		75	
Maximum peak, one-cycle non-repetitive surge current	$I_{TSM}$	10 ms sine pulse, rated $V_{RRM}$ applied	Initial $T_J = T_J$ maximum	1200	A <sup>2</sup> s
		10 ms sine pulse, no voltage reapplied		1400	
Maximum $I^2t$ for fusing	$I^2t$	10 ms sine pulse, rated $V_{RRM}$ applied		7200	
		10 ms sine pulse, no voltage reapplied		10 200	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ to 10 ms, no voltage reapplied		102 000	A <sup>2</sup> √s
Low level value of threshold voltage	$V_{T(TO)1}$	$T_J = 125\text{ }^\circ\text{C}$		0.916	V
High level value of threshold voltage	$V_{T(TO)2}$			1.21	
Low level value of on-state slope resistance	$r_{\theta 1}$			4.138	mΩ
High level value of on-state slope resistance	$r_{\theta 2}$			3.43	
Maximum peak on-state voltage	$V_{TM}$	100 A, $T_J = 25\text{ }^\circ\text{C}$		1.4	V
Maximum rate of rise of turned-on current	$di/dt$	$T_J = 25\text{ }^\circ\text{C}$		150	A/μs
Maximum holding current	$I_H$	$T_J = 25\text{ }^\circ\text{C}$		200	mA
Maximum latching current	$I_L$			400	
Maximum reverse and direct leakage current	$I_{RRM}/I_{DRM}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_{RRM}/V_{DRM}$	1.0	
		$T_J = 125\text{ }^\circ\text{C}$		15	
Maximum rate of rise of off-state voltage	$dV/dt$	$T_J = 125\text{ }^\circ\text{C}$		500	V/μs

TRIGGERING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum peak gate power	$P_{GM}$	$T = 30\text{ }\mu\text{s}$		10	W
Maximum average gate power	$P_{G(AV)}$			2.5	
Maximum peak gate current	$I_{GM}$			2.5	A
Maximum peak negative gate voltage	$-V_{GM}$			10	V
Maximum required DC gate voltage to trigger	$V_{GT}$	$T_J = -40\text{ }^\circ\text{C}$	Anode supply = 6 V resistive load	4.0	
		$T_J = 25\text{ }^\circ\text{C}$		1.5	
		$T_J = 125\text{ }^\circ\text{C}$		1.1	
Maximum required DC gate current to trigger	$I_{GT}$	$T_J = -40\text{ }^\circ\text{C}$		270	mA
		$T_J = 25\text{ }^\circ\text{C}$		100	
		$T_J = 125\text{ }^\circ\text{C}$		80	
Maximum DC gate voltage not to trigger	$V_{GD}$	$T_J = 120\text{ }^\circ\text{C}$ , $V_{DRM} = \text{Rated value}$		0.25	V
Maximum DC gate current not to trigger	$I_{GD}$			6	mA



# 70TPS.. High Voltage Series

Phase Control SCR, 70 A Vishay High Power Products

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	$T_J$		- 40 to 125	°C
Maximum storage temperature range	$T_{Stg}$		- 40 to 150	
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation	0.27	°C/W
Maximum thermal resistance, junction to ambient	$R_{thJA}$		40	
Typical 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 Super-247	70TPS12	
			70TPS16	

$\Delta R_{thJ-hs}$ CONDUCTION PER JUNCTION											
DEVICE	SINE HALF WAVE CONDUCTION					RECTANGULAR WAVE CONDUCTION					UNITS
	180°	120°	90°	60°	30°	180°	120°	90°	60°	30°	
70TPS	0.078	0.092	0.117	0.172	0.302	0.053	0.092	0.125	0.180	0.306	°C/W

**Note**

- The table above shows the increment of thermal resistance  $R_{thJ-hs}$  when devices operate at different conduction angles than DC

# 70TPS.. High Voltage Series



Vishay High Power Products Phase Control SCR, 70 A

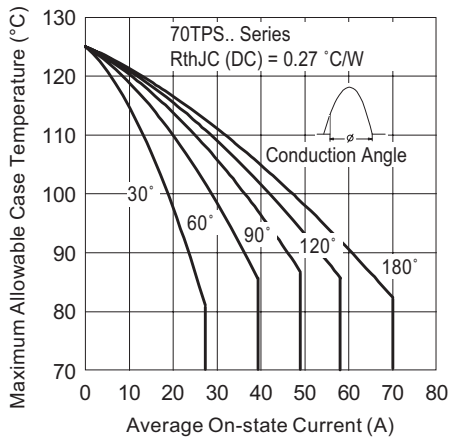


Fig. 1 - Current Rating Characteristics

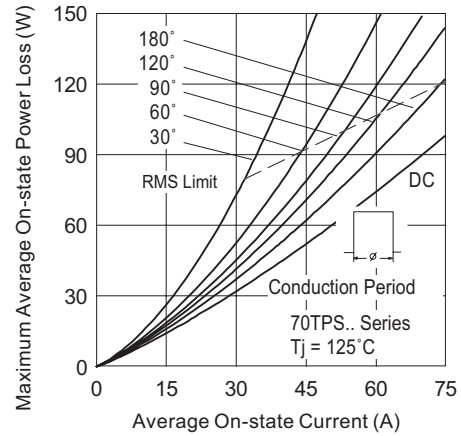


Fig. 4 - On-State Power Loss Characteristics

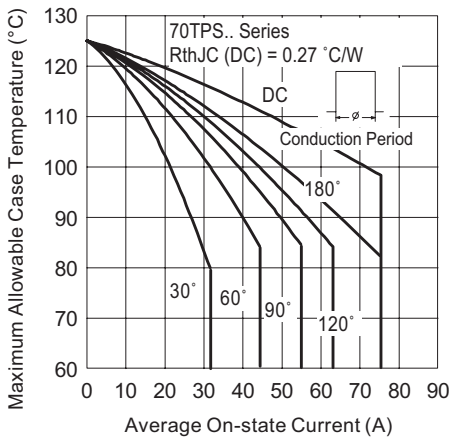


Fig. 2 - Current Rating Characteristics

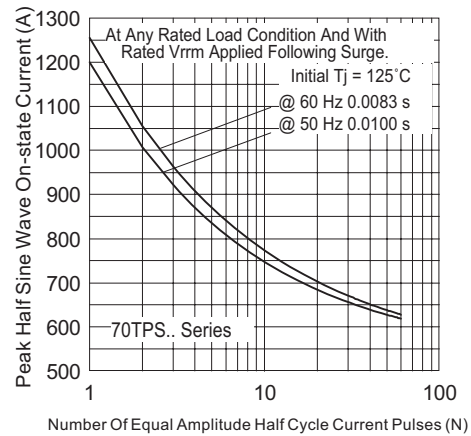


Fig. 5 - Maximum Non-Repetitive Surge Current

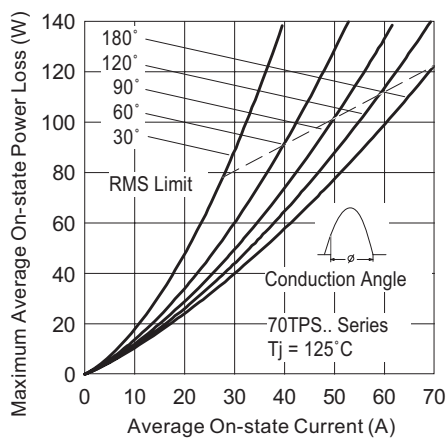


Fig. 3 - On-State Power Loss Characteristics

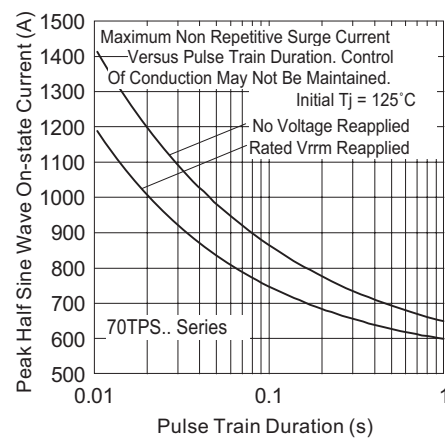


Fig. 6 - Maximum Non-Repetitive Surge Current

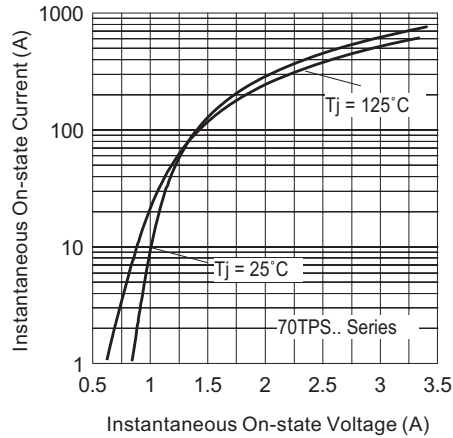


Fig. 7 - On-State Voltage Drop Characteristics

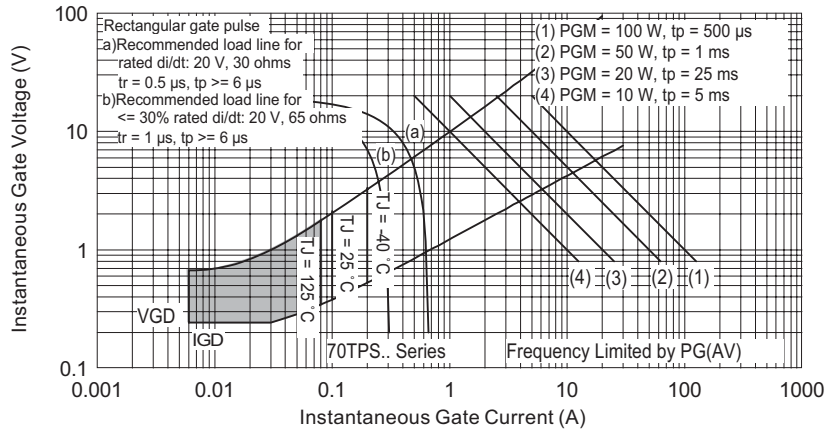


Fig. 8 - Gate Characteristics

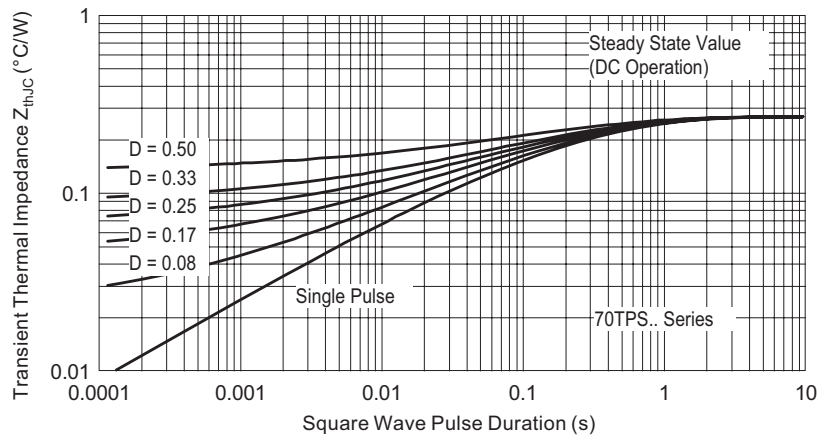


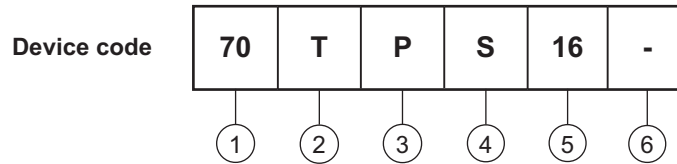
Fig. 9 - Thermal Impedance  $Z_{thJC}$  Characteristics

# 70TPS.. High Voltage Series



Vishay High Power Products Phase Control SCR, 70 A

## ORDERING INFORMATION TABLE



- 1** - Current rating (70 = 70 A)
- 2** - Circuit configuration:  
T = Thyristor
- 3** - Package:  
P = Super-247
- 4** - Type of silicon:  
S = Standard recovery rectifier
- 5** - Voltage code x 100 =  $V_{RRM}$  12 = 1200 V  
16 = 1600 V
- 6** -
  - None = Standard production
  - PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95073">http://www.vishay.com/doc?95073</a>
Part marking information	<a href="http://www.vishay.com/doc?95070">http://www.vishay.com/doc?95070</a>



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