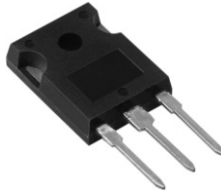
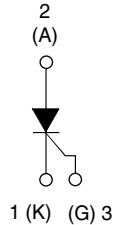


## Phase Control SCR, 35 A



TO-247AC



### DESCRIPTION/FEATURES

The 40TPS...A 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. Low Igt parts available.

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 40 A	< 1.45 V
$I_{TSM}$	500 A
$V_{RRM}$	800/1200 V

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{T(AV)}$	Sinusoidal waveform	35	A
$I_{RMS}$		55	
$V_{RRM}/V_{DRM}$		800/1200	V
$I_{TSM}$		500	A
$V_T$	40 A, $T_J = 25\text{ °C}$	1.45	V
dV/dt		1000	V/ $\mu$ s
dI/dt		100	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
40TPS08A	800	900	10
40TPS12A	1200	1300	
40TPS08	800	900	
40TPS12	1200	1300	

# 40TPS...A/40TPS... High Voltage Series

Vishay High Power Products Phase Control SCR, 35 A



ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average on-state current	$I_{T(AV)}$	$T_C = 79\text{ }^\circ\text{C}$ , 180° conduction half sine wave		35	A
Maximum continuous RMS on-state current as AC switch	$I_{T(RMS)}$			55	
Maximum peak, one-cycle non-repetitive surge current	$I_{TSM}$	10 ms sine pulse, rated $V_{RRM}$ applied	Initial $T_J = T_{J\text{ maximum}}$	500	$A^2s$
		10 ms sine pulse, no voltage reapplied		600	
Maximum $I^2t$ for fusing	$I^2t$	10 ms sine pulse, rated $V_{RRM}$ applied		1250	
		10 ms sine pulse, no voltage reapplied		1760	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1$ to 10 ms, no voltage reapplied		12 500	$A^2\sqrt{s}$
Low level value of threshold voltage	$V_{T(TO)1}$	$T_J = 125\text{ }^\circ\text{C}$		1.02	V
High level value of threshold voltage	$V_{T(TO)2}$			1.23	
Low level value of on-state slope resistance	$r_{t1}$			9.74	$m\Omega$
High level value of on-state slope resistance	$r_{t2}$			7.50	
Maximum peak on-state voltage	$V_{TM}$	110 A, $T_J = 25\text{ }^\circ\text{C}$		1.85	V
Maximum rate of rise of turned-on current	$di/dt$	$T_J = 25\text{ }^\circ\text{C}$		100	$A/\mu s$
Maximum holding current	$I_H$			150	mA
Maximum latching current	$I_L$			300	
Maximum reverse and direct leakage current	$I_{RRM}/I_{DRM}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_{RRM}/V_{DRM}$	0.5	
		$T_J = 125\text{ }^\circ\text{C}$		10	
Maximum rate of rise of off-state voltage 40TPS08	$dV/dt$	$T_J = T_J\text{ maximum}$ , linear to 80 % $V_{DRM}$ , $R_g-k = \text{Open}$		500	$V/\mu s$
Maximum rate of rise of off-state voltage 40TPS12				1000	$V/\mu s$

TRIGGERING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum peak gate power	$P_{GM}$			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	V
		$T_J = 25\text{ }^\circ\text{C}$		2.5	
		$T_J = 125\text{ }^\circ\text{C}$		1.7	
Maximum required DC gate current to trigger	$I_{GT}$	$T_J = -40\text{ }^\circ\text{C}$		270	mA
		$T_J = 25\text{ }^\circ\text{C}$		150	
		$T_J = 125\text{ }^\circ\text{C}$		80	
		$T_J = 25\text{ }^\circ\text{C}$ , for 40TPS08A and 40TPS12A		40	
Maximum DC gate voltage not to trigger	$V_{GD}$	$T_J = 125\text{ }^\circ\text{C}$ , $V_{DRM} = \text{Rated value}$		0.25	V
Maximum DC gate current not to trigger	$I_{GD}$			6	mA



# 40TPS...A/40TPS... High Voltage Series

Phase Control SCR, 35 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	0.6	°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	40TPS08A	
			40TPS12A	
			40TPS08	
			40TPS12	

# 40TPS...A/40TPS... High Voltage Series

Vishay High Power Products Phase Control SCR, 35 A

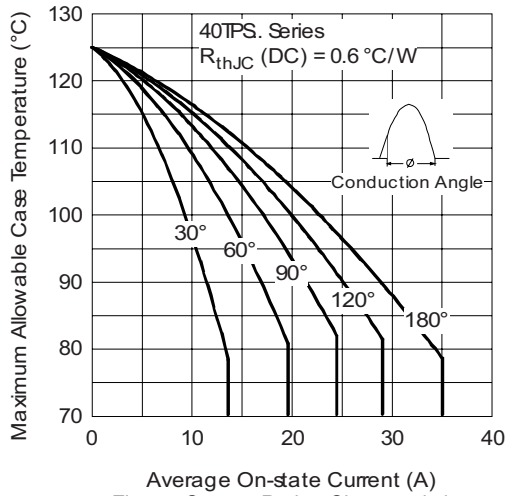


Fig. 1 - Current Rating Characteristics

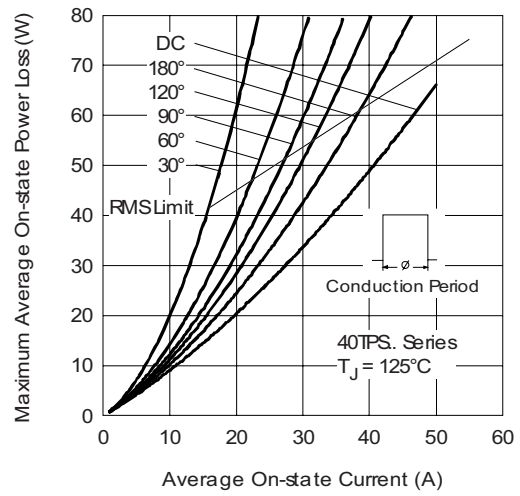


Fig. 4 - On-State Power Loss Characteristics

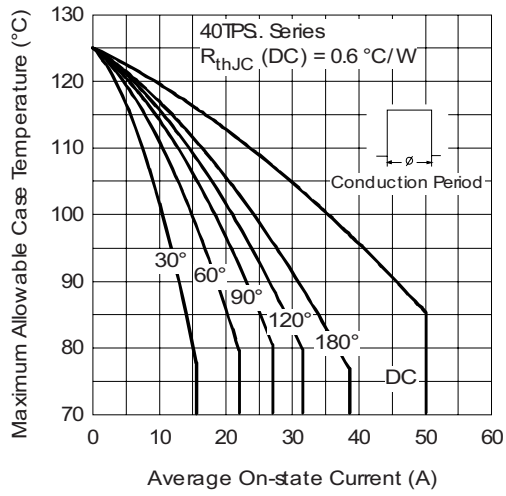


Fig. 2 - Current Rating Characteristics

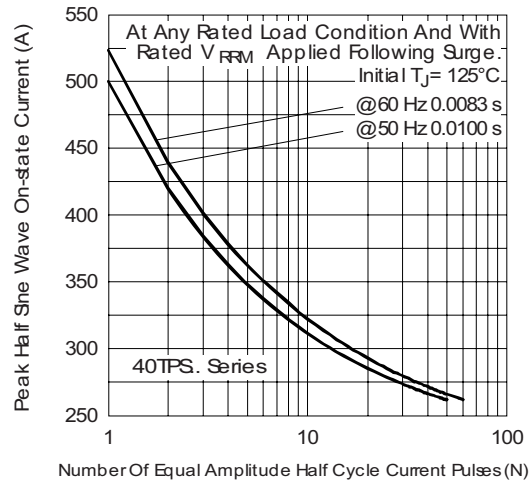


Fig. 5 - Maximum Non-Repetitive Surge Current

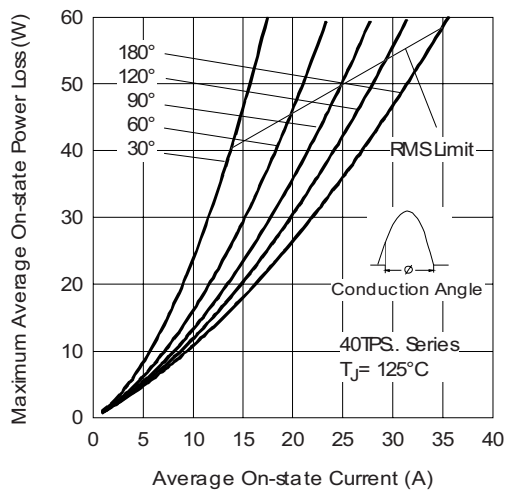


Fig. 3 - On-State Power Loss Characteristics

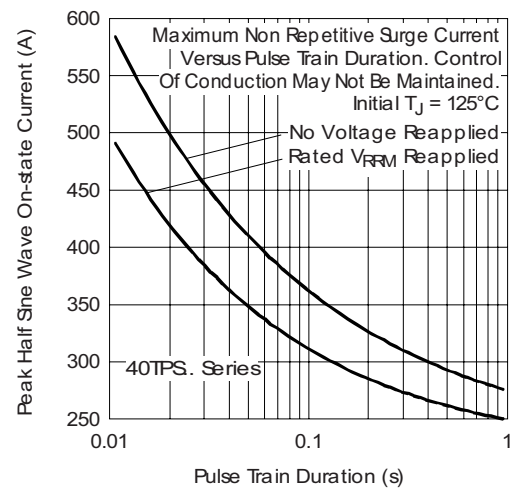


Fig. 6 - Maximum Non-Repetitive Surge Current



# 40TPS...A/40TPS... High Voltage Series

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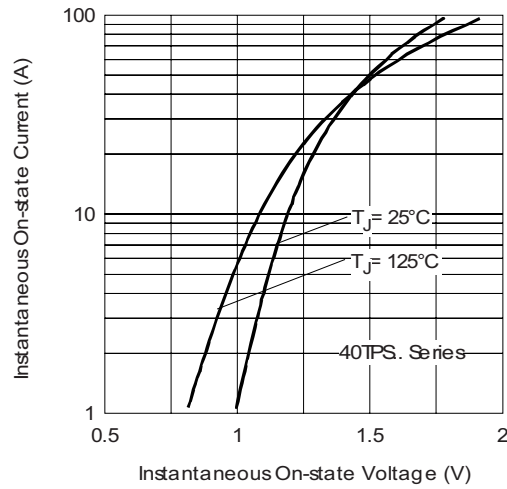


Fig. 7 - On-State Voltage Drop Characteristics

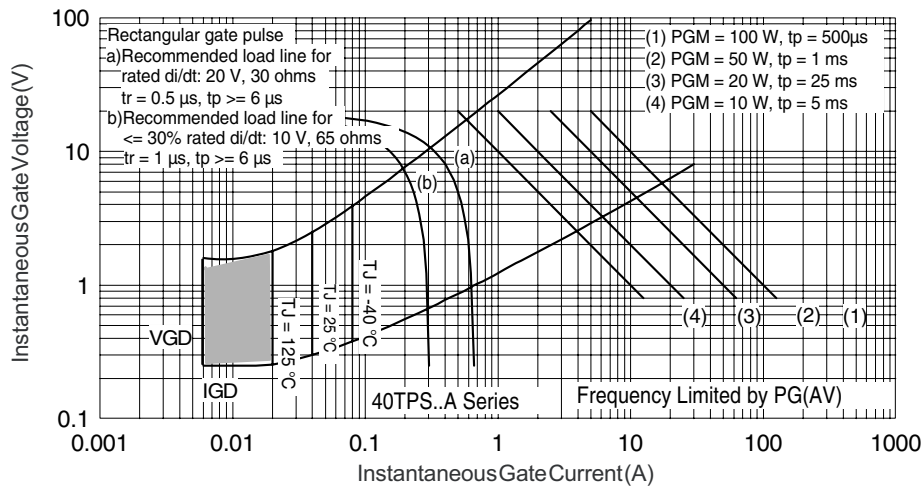


Fig. 8 - Gate Characteristics

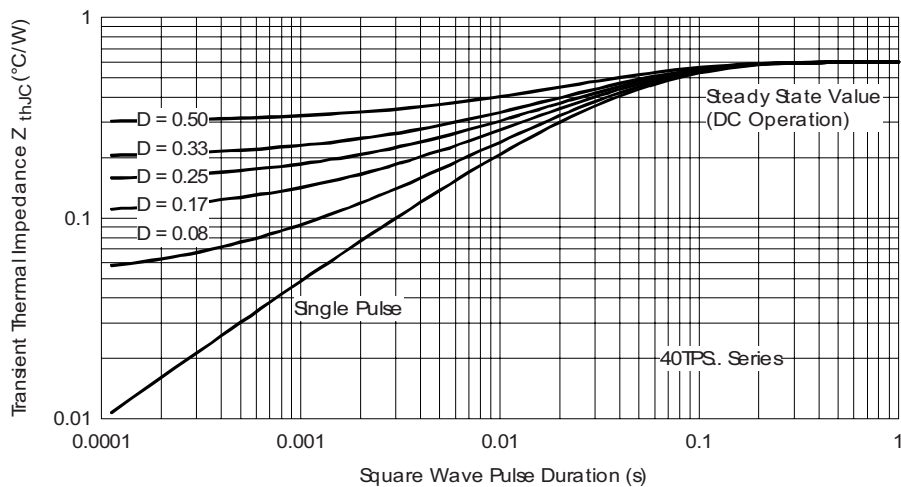


Fig. 9 - Thermal Impedance  $Z_{thjC}$  Characteristics

# 40TPS...A/40TPS... High Voltage Series

Vishay High Power Products Phase Control SCR, 35 A



## ORDERING INFORMATION TABLE

Device code	<b>40</b>	<b>T</b>	<b>P</b>	<b>S</b>	<b>12</b>	<b>A</b>	<b>-</b>
	①	②	③	④	⑤	⑥	⑦
	<b>1</b>	-	Current rating (40 = 40 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 ratings			08 = 800 V 12 = 1200 V	
	<b>6</b>	-	• A = Low Igt selection 40 mA maximum • None = Standard Igt selection				
	<b>7</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>



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