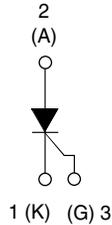


Phase Control SCR, 35 A



TO-247AC



DESCRIPTION/FEATURES

The 40TPS16 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 I_{gt} 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}	1600 V

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	VALUES	UNITS
I _{T(AV)}	Sinusoidal waveform	35	A
I _{RMS}		55	
V _{RRM} /V _{DRM}	Range (1)	1600	V
I _{TSM}		500	A
V _T	40 A, T _J = 25 °C	1.45	V
dV/dt		1000	V/μs
dI/dt		100	A/μs
T _J		- 40 to 125	°C

Note

(1) Contact factory

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
40TPS16	1600	1700	10

40TPS16 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 $T_J = T_J$ maximum	500	A ² s
		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	
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	$r_{\theta 1}$			9.74	mΩ
High level value of on-state slope resistance	$r_{\theta 2}$			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/μs
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	dV/dt	$T_J = T_J$ maximum, linear to 80 % V_{DRM} , $R_g-k = \text{Open}$		1000	V/μs

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	
		$T_J = 25\text{ }^\circ\text{C}$		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	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



40TPS16 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	40TPS16	

40TPS16 High Voltage Series

Vishay High Power Products Phase Control SCR, 35 A

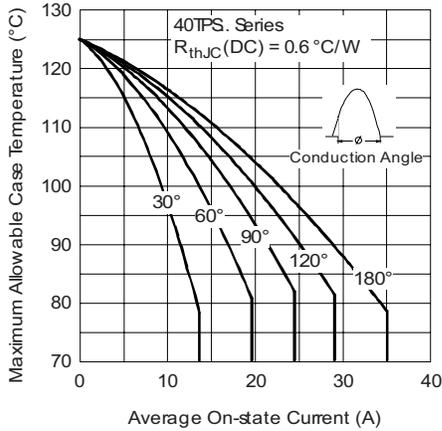


Fig. 1 - Current Rating Characteristics

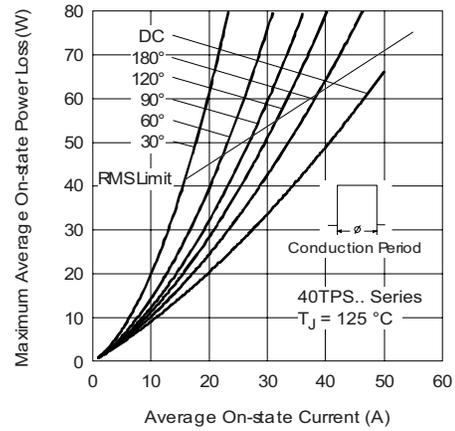


Fig. 4 - On-State Power Loss Characteristics

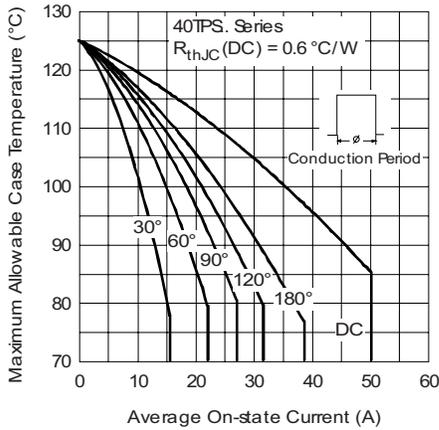


Fig. 2 - Current Rating Characteristics

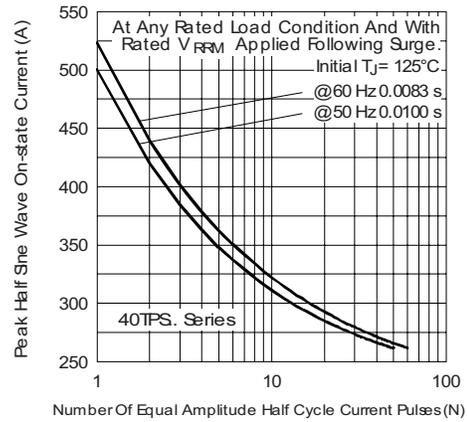


Fig. 5 - Maximum Non-Repetitive Surge Current

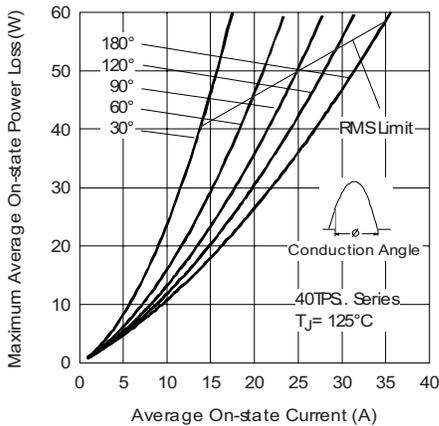


Fig. 3 - On-State Power Loss Characteristics

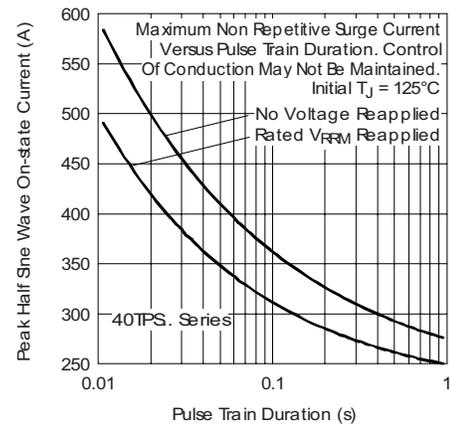


Fig. 6 - Maximum Non-Repetitive Surge Current



40TPS16 High Voltage Series

Phase Control SCR, 35 A Vishay High Power Products

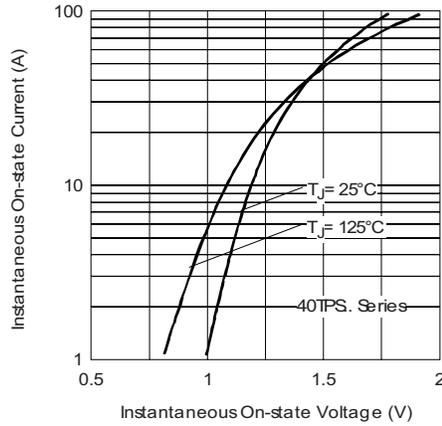


Fig. 7 - On-State Voltage Drop Characteristics

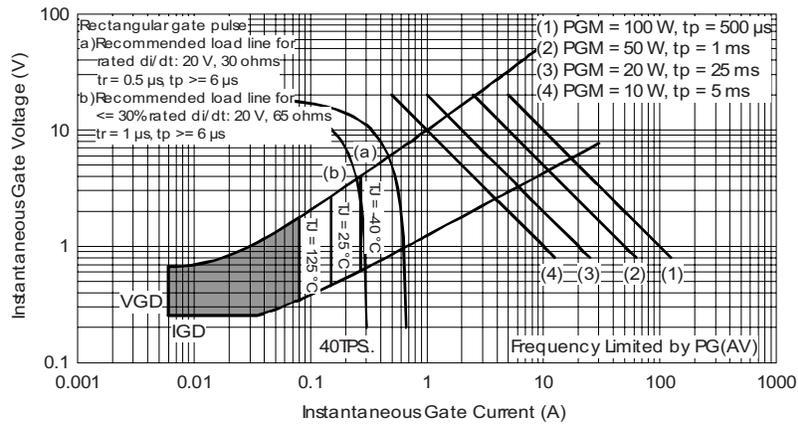


Fig. 8 - Gate Characteristics

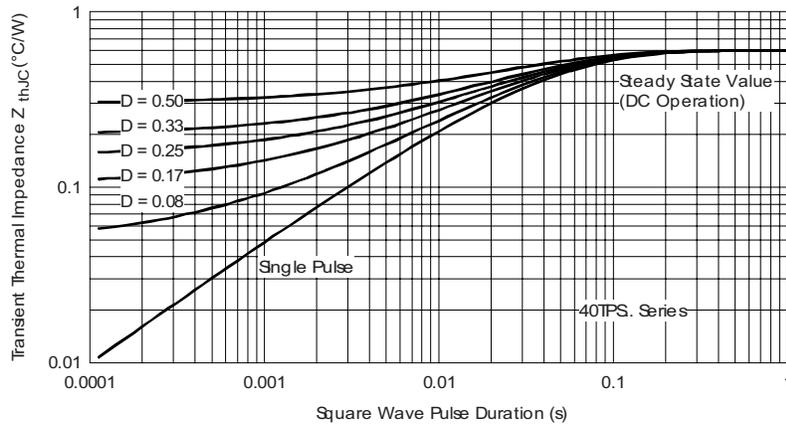


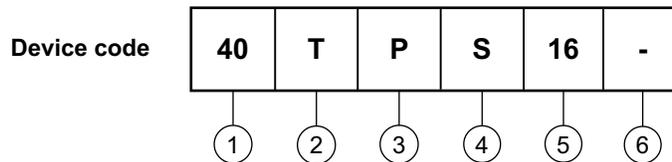
Fig. 9 - Thermal Impedance Z_{thJC} Characteristics

40TPS16 High Voltage Series

Vishay High Power Products Phase Control SCR, 35 A



ORDERING INFORMATION TABLE



- 1** - Current rating (40 = 40 A)
- 2** - Circuit configuration:
T = Thyristor
- 3** - Package:
P = TO-247
- 4** - Type of silicon:
S = Standard recovery rectifier
- 5** - Voltage code x 100 = V_{RRM} (16 = 1600 V - contact factory)
- 6** -
 - None = Standard production
 - PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95024
Part marking information	http://www.vishay.com/doc?95226



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