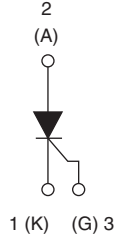


Phase Control SCR, 70 A



Super-247



DESCRIPTION/FEATURES

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



RoHS*
COMPLIANT

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 and lead (Pb)-free ("PbF" suffix).

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/ μs
dI/dt		150	A/ μs
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
70TPS12PbF	1200	1300	15
70TPS16PbF	1600	1700	

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

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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 ² 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 ² √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



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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	

ΔR_{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

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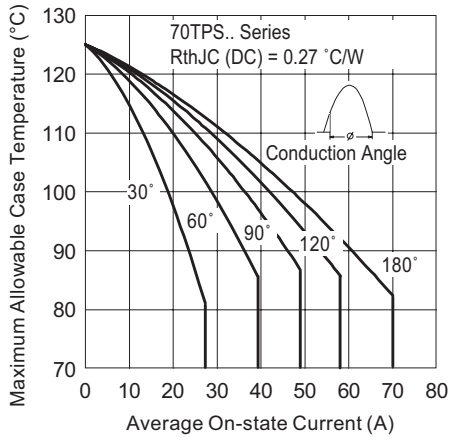


Fig. 1 - Current Rating Characteristics

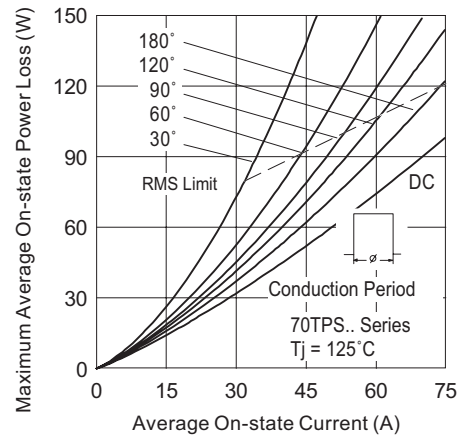


Fig. 4 - On-State Power Loss Characteristics

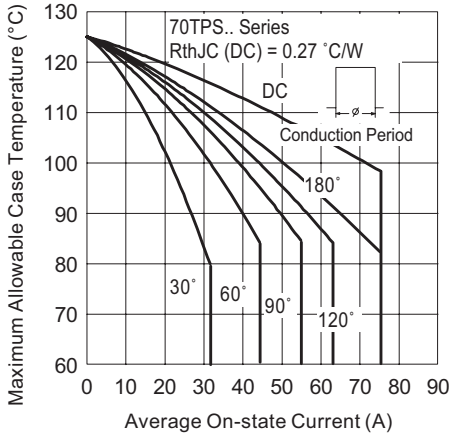


Fig. 2 - Current Rating Characteristics

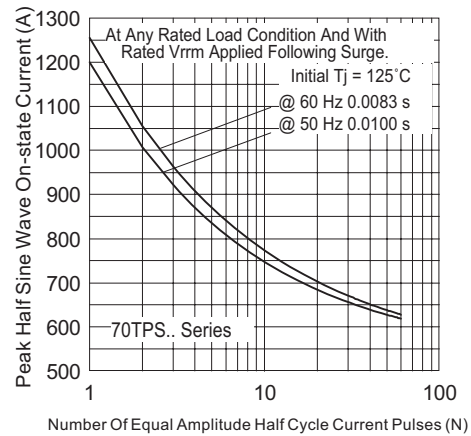


Fig. 5 - Maximum Non-Repetitive Surge Current

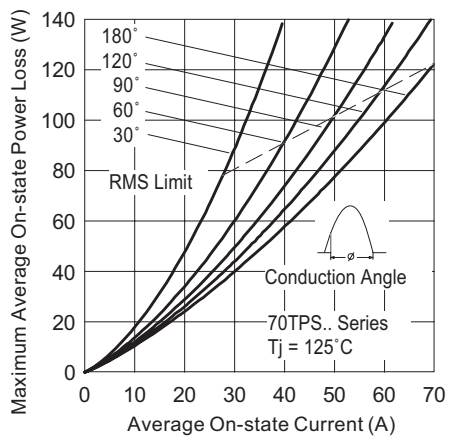


Fig. 3 - On-State Power Loss Characteristics

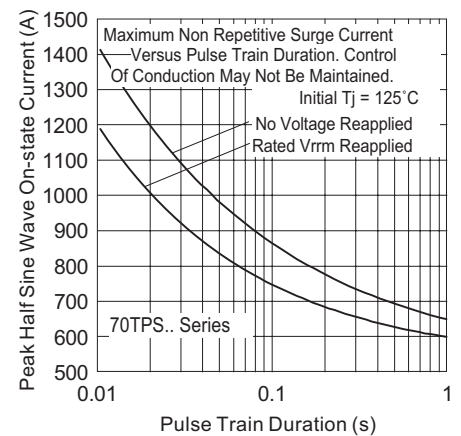


Fig. 6 - Maximum Non-Repetitive Surge Current



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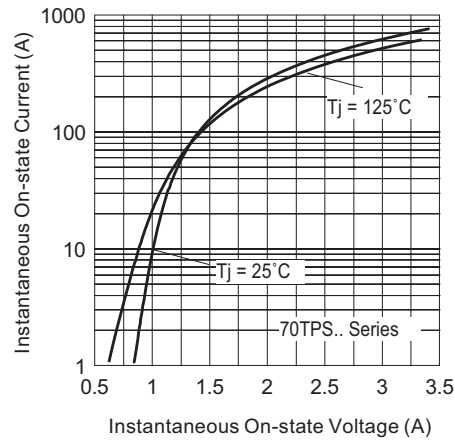


Fig. 7 - On-State Voltage Drop Characteristics

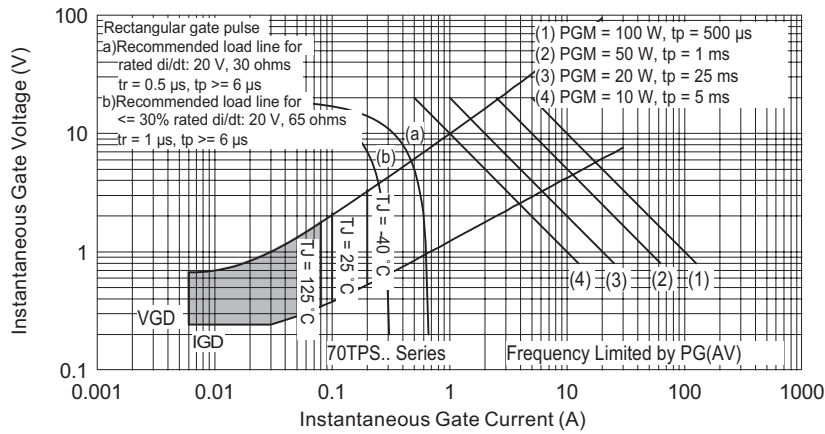


Fig. 8 - Gate Characteristics

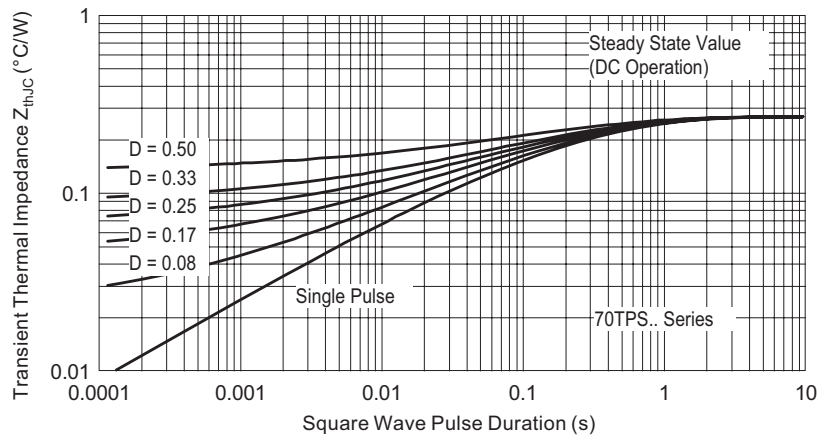


Fig. 9 - Thermal Impedance Z_{thJC} Characteristics

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ORDERING INFORMATION TABLE

Device code	70	T	P	S	16	PbF
	①	②	③	④	⑤	⑥
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	http://www.vishay.com/doc?95073
Part marking information	http://www.vishay.com/doc?95070



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