Phase Control SCR, 70 A

Super-247

DESCRIPTION/FEATURES

Available
RoHS* COMPLIANT

The 70TPS..PbF 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 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 °C	1.4	V
dV/dt		500	V/µs
dI/dt		150	A/µs
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
70TPS12PbF	1200	1300	15
70TPS16PbF	1600	1700	

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

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average on-state current	$I_{T(AV)}$	T_C = 82 °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	
		10 ms sine pulse, no voltage reapplied		1400	
Maximum I^2t for fusing	I^2t	10 ms sine pulse, rated V_{RRM} applied		7200	A^2s
		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	$A^2\sqrt{s}$
Low level value of threshold voltage	$V_{T(TO)1}$	T_J = 125 °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_{t1}			4.138	mΩ
High level value of on-state slope resistance	r_{t2}			3.43	
Maximum peak on-state voltage	V_{TM}	100 A, T_J = 25 °C		1.4	V
Maximum rate of rise of turned-on current	dI/dt	T_J = 25 °C		150	A/µs
Maximum holding current	I_H	T_J = 25 °C		200	mA
Maximum latching current	I_L			400	
Maximum reverse and direct leakage current	I_{RRM}/I_{DRM}	T_J = 25 °C	V_R = Rated V_{RRM}/V_{DRM}	1.0	
		T_J = 125 °C		15	
Maximum rate of rise of off-state voltage	dV/dt	T_J = 125 °C		500	V/µs

TRIGGERING

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum peak gate power	P_{GM}	T = 30 µs		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 °C	Anode supply = 6 V resistive load	4.0	
		T_J = 25 °C		1.5	
		T_J = 125 °C		1.1	
Maximum required DC gate current to trigger	I_{GT}	T_J = - 40 °C		270	mA
		T_J = 25 °C		100	
		T_J = 125 °C		80	
Maximum DC gate voltage not to trigger	V_{GD}	T_J = 120 °C, V_{DRM} = Rated value		0.25	V
Maximum DC gate current not to trigger	I_{GD}			6	mA

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	

$\Delta R_{thJ\text{-}hs}$ 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 $R_{thJ\text{-}hs}$ when devices operate at different conduction angles than DC

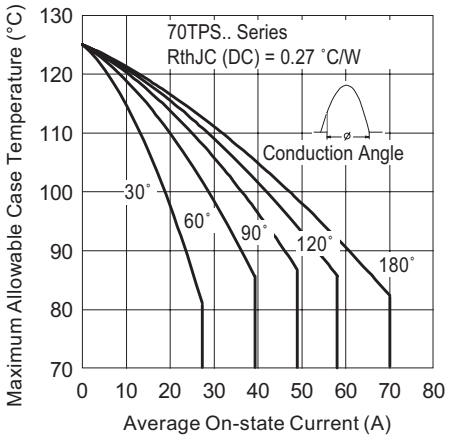


Fig. 1 - Current Rating Characteristics

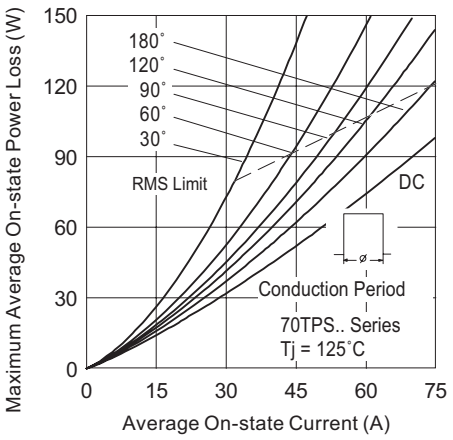


Fig. 4 - On-State Power Loss Characteristics

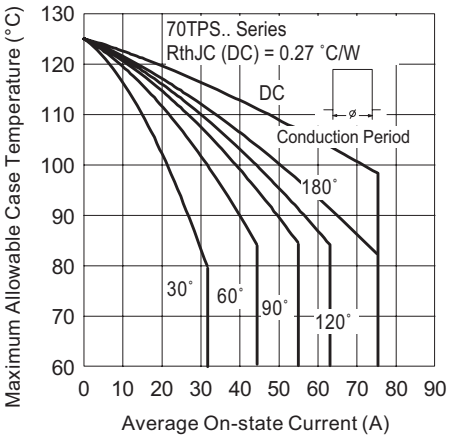


Fig. 2 - Current Rating Characteristics

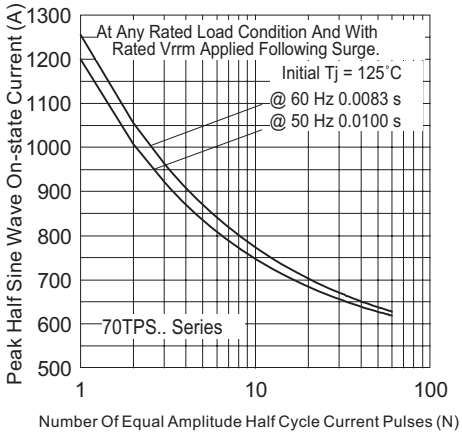


Fig. 5 - Maximum Non-Repetitive Surge Current

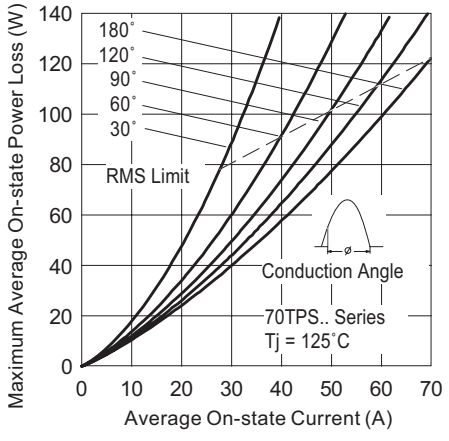


Fig. 3 - On-State Power Loss Characteristics

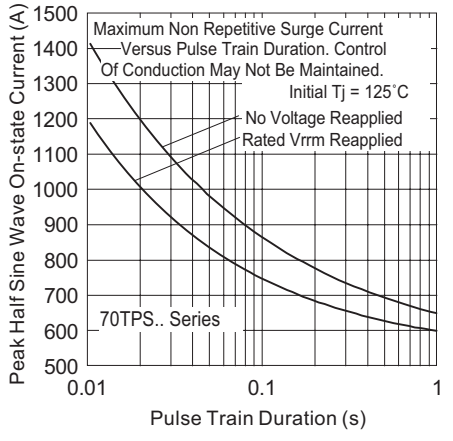


Fig. 6 - Maximum Non-Repetitive Surge Current

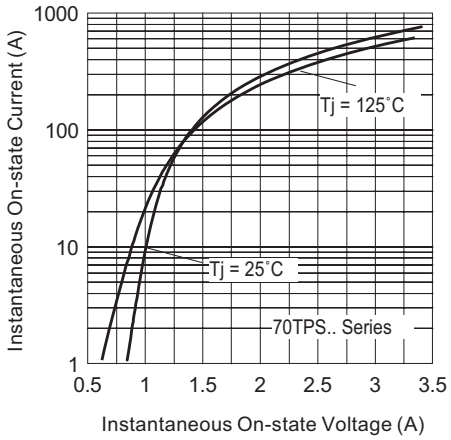


Fig. 7 - On-State Voltage Drop Characteristics

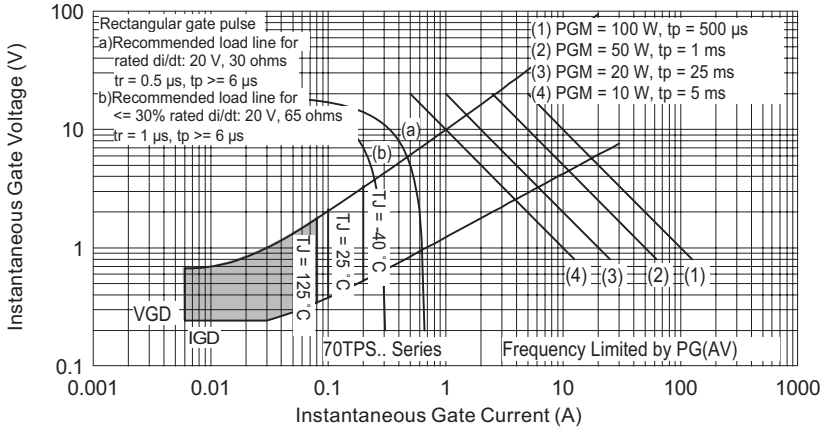


Fig. 8 - Gate Characteristics

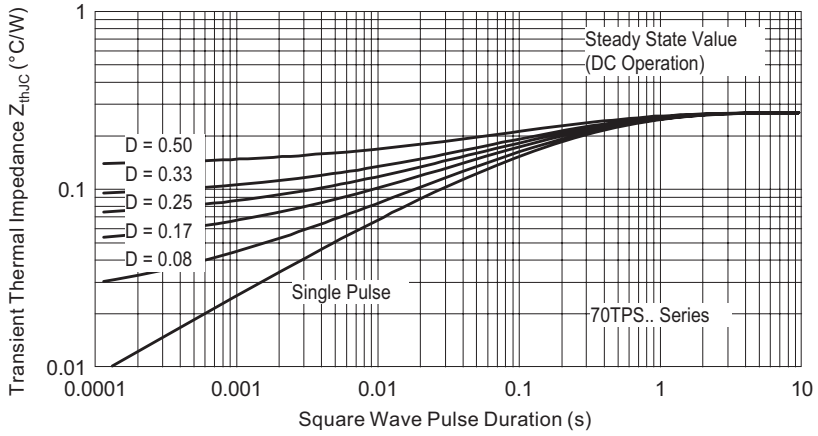
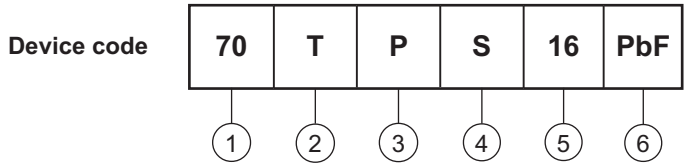


Fig. 9 - Thermal Impedance Z_{thJC} Characteristics

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	http://www.vishay.com/doc?95073
Part marking information	http://www.vishay.com/doc?95070

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