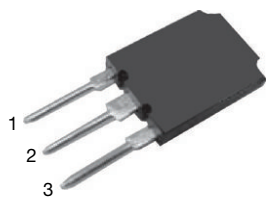
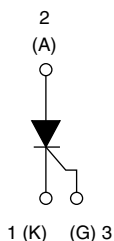




Thyristor High Voltage, Phase Control SCR, 70 A



Super TO-247



FEATURES

- High surge capability
- High voltage input rectification
- Designed and qualified according to JEDEC®-JESD47
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

APPLICATIONS

- AC switches
- High voltage input rectification (soft start)
- High current crow-bar
- Other phase-control circuits
- Designed to be used with Vishay input diodes, switches, and output rectifiers which are available in identical package outlines

DESCRIPTION

The VS-70TPS..PbF high voltage series of silicon controlled rectifiers are specifically designed for high and medium power switching, and phase control applications.

PRODUCT SUMMARY

Package	Super TO-247
Diode variation	Single SCR
$I_{T(AV)}$	70 A
V_{DRM}/V_{RRM}	1200 V, 1600 V
V_{TM}	1.25 V
I_{GT}	100 mA
T_J	-40 °C to 125 °C

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}		1100	A
V_T	100 A, $T_J = 25\text{ °C}$	1.4	V
dV/dt		500	V/ μ s
dI/dt		150	A/ μ 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
VS-70TPS12PbF	1200	1300	15
VS-70TPS16PbF	1600	1700	



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	930	
		10 ms sine pulse, no voltage reapplied		1100	
Maximum I ² t for fusing	I ² t	10 ms sine pulse, rated V _{RRM} applied		4325	
		10 ms sine pulse, no voltage reapplied		6115	
Maximum I ² √t for fusing	I ² √t	t = 0.1 ms to 10 ms, no voltage reapplied		61 150	A ² √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	
Maximum rate of rise of turned-on current	dI/dt	T _J = 25 °C		150	A/μs
Maximum holding current	I _H	Anode supply = 6 V, resistive load, initial I _T = 1 A, T _J = 25 °C		200	mA
Maximum latching current	I _L	Anode supply = 6 V, resistive load, T _J = 25 °C		400	
Maximum reverse and direct leakage current	I _{RRM} /I _{DRM}	T _J = 25 °C	V _R = Rated V _{RRM} /V _{DRM} (T _J = T _J max., linear to 80 % V _{DRM} = R _g -k = Open)	1.0	
		T _J = 125 °C		15	
Maximum rate of rise of off-state voltage	dV/dt	T _J = 125 °C		500	

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	1.8	
		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	Anode supply = 6 V resistive load	150	mA
		T _J = 25 °C		100	
		T _J = 125 °C		80	
Maximum DC gate voltage not to trigger	V _{GD}	T _J = 125 °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 TO-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°	
VS-70TPS..PbF	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

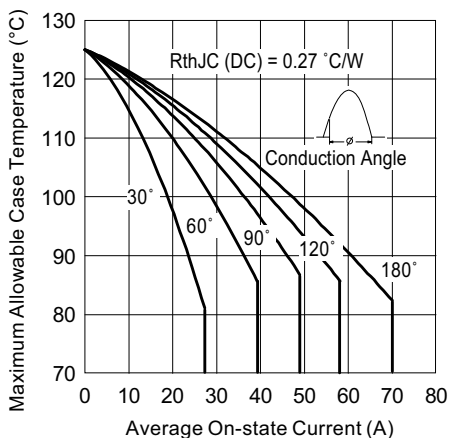


Fig. 1 - Current Rating Characteristics

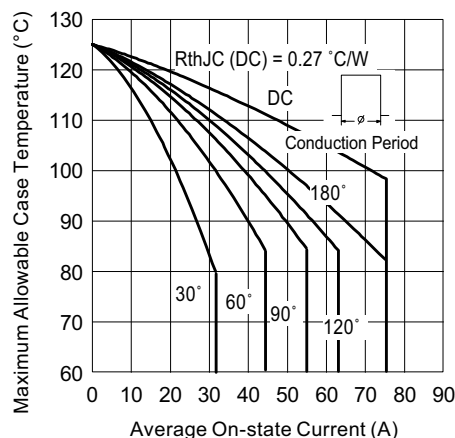


Fig. 2 - Current Rating Characteristics

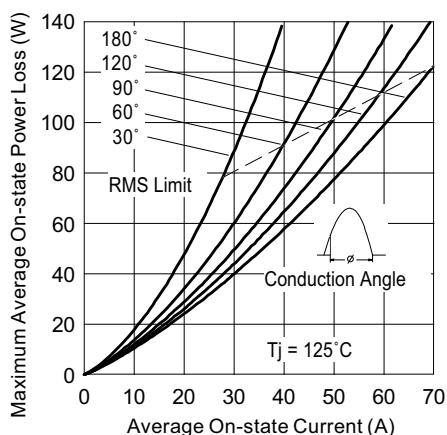


Fig. 3 - On-State Power Loss Characteristics

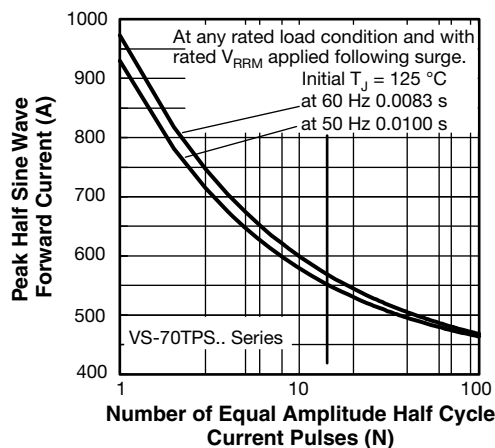


Fig. 5 - Maximum Non-Repetitive Surge Current

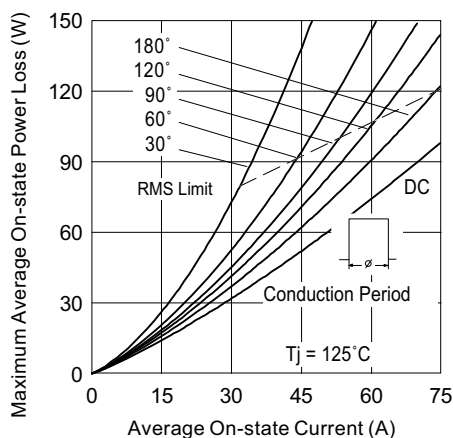


Fig. 4 - On-State Power Loss Characteristics

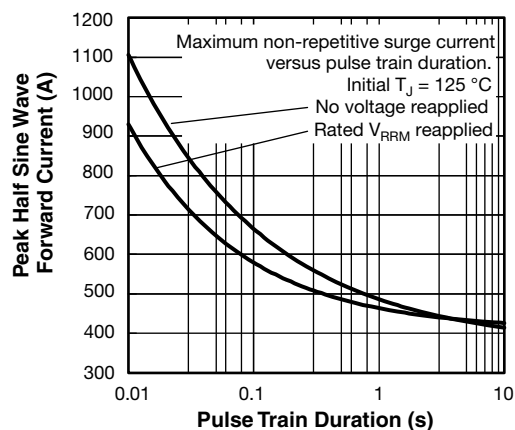


Fig. 6 - Maximum Non-Repetitive Surge Current

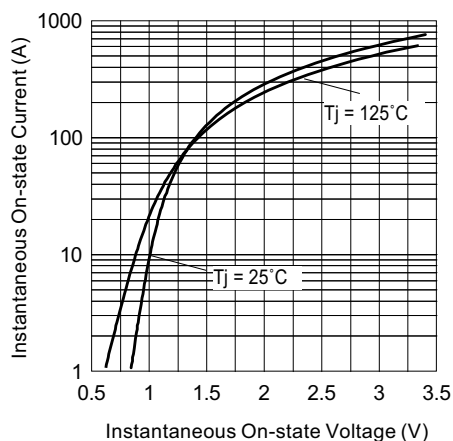
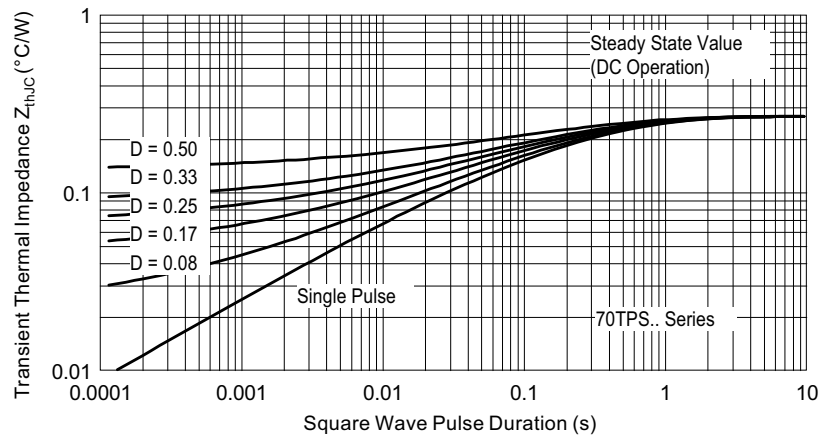
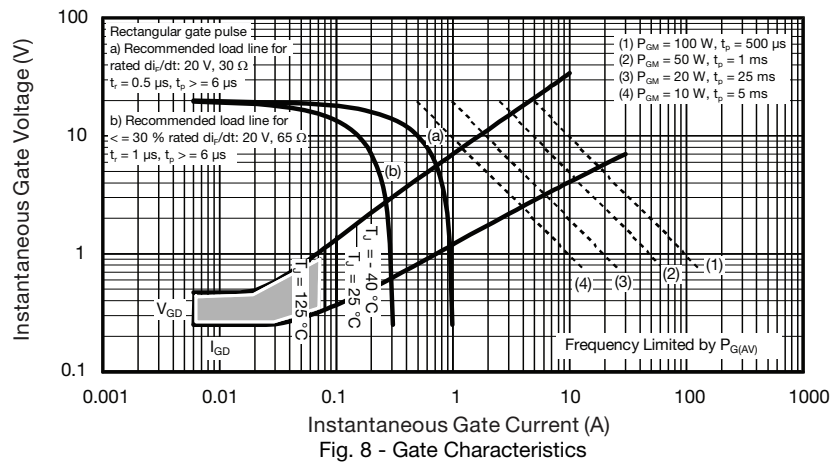


Fig. 7 - On-State Voltage Drop Characteristics





ORDERING INFORMATION TABLE

Device code	VS-	70	T	P	S	16	PbF
	1	2	3	4	5	6	7
1	Vishay Semiconductors product						
2	Current rating (70 = 70 A)						
3	Circuit configuration: T = Thyristor						
4	Package: P = Super TO-247						
5	Type of silicon: S = Standard recovery rectifier						
6	Voltage code x 100 = V_{RRM}						
7	PbF = Lead (Pb)-free						

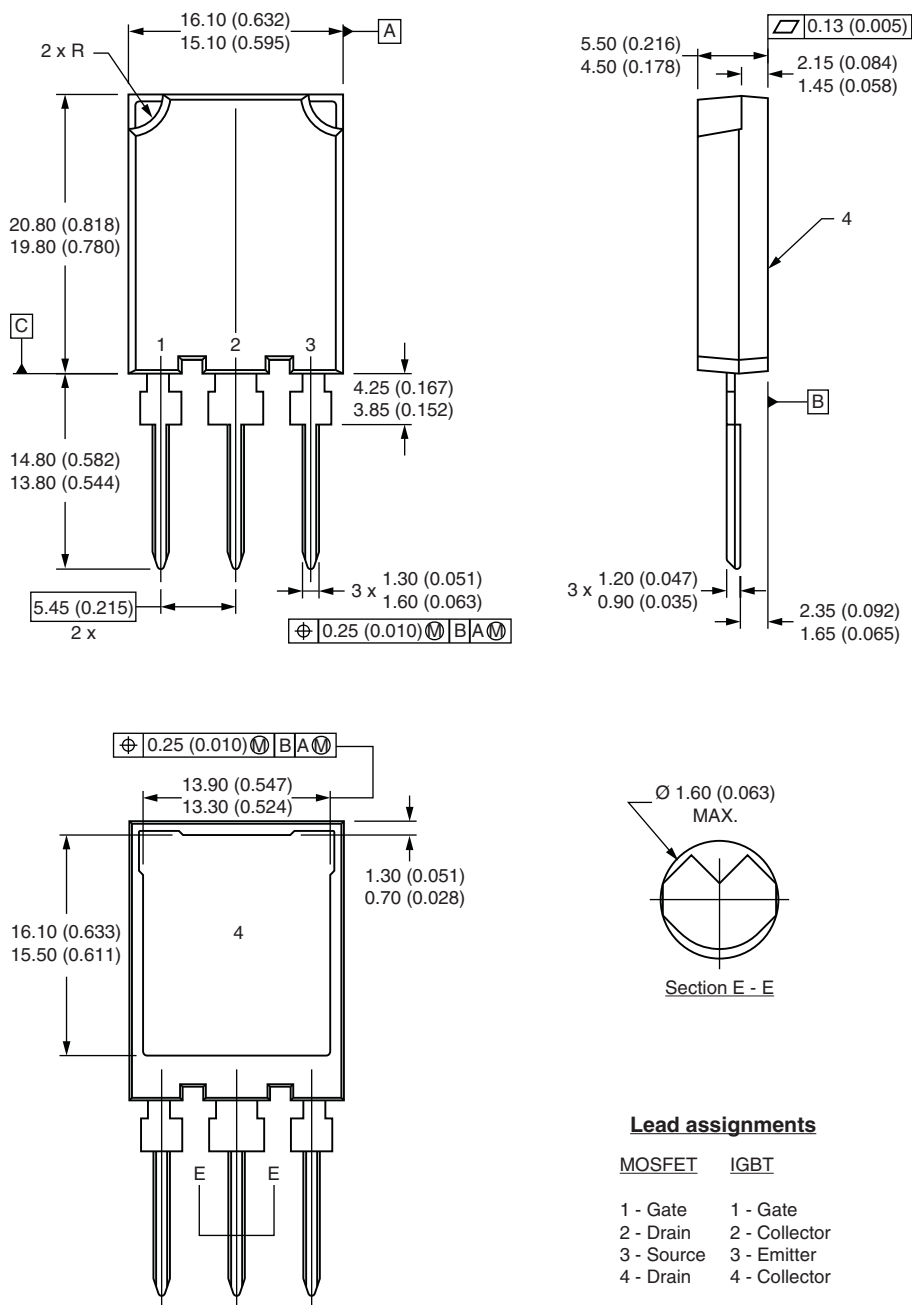
12 = 1200 V 16 = 1600 V

ORDERING INFORMATION (example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-70TPS12PbF	25	500	Antistatic plastic tube
VS-70TPS16PbF	25	500	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95073
Part marking information	www.vishay.com/doc?95070

Super TO-247

DIMENSIONS in millimeters (inches)



Notes

- (1) Dimension and tolerancing per ASME Y14.5M-1994
- (2) Controlling dimension: millimeter
- (3) Outline conforms to JEDEC® outline TO-274AA



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