

SiBar Thyristor Surge Protectors

TVBxxxSA-L Series

Table SB1 - Electrical Characteristics

Part Number	V _{DM} Max. (V)	V _{BO} Max. (V)	I _H Min. (mA)	V _T Max. (V)	C1 (Typ) 50V _{DC} Bias	C2 (Typ) 2V _{DC} Bias	Off-State Current V _{D2} =V _{DM} (μA)
TVB058SA-L	58	77	150	4	43	80	5
TVB170SA-L	170	265	150	4	18	35	5
TVB180SA-L	180	219	150	4	30 (Max)	60 (Max)	5
TVB200SA-L	200	320	150	4	18	35	5
TVB270SA-L	270	365	150	4	15	32	5
TVB300SA-L	300	400	150	4	14	27	5

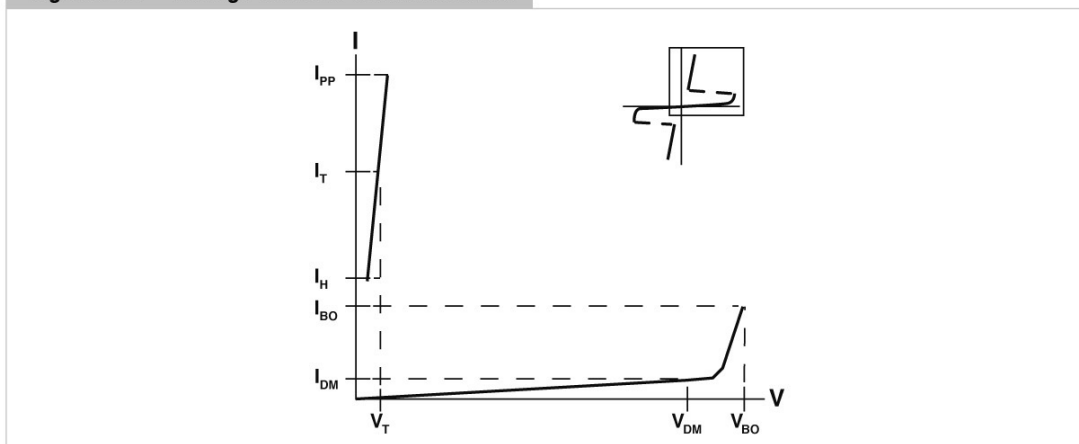
Notes: All electrical characteristics are measured at 25°C.
V_{DM} measured per UL497B pulse requirements: at max. off-state leakage current (IDM) = 5 μA.
V_{BO} measured at 100V/μs.
C1 measured at 1 MHz with a 50 V_{DC} bias.
C2 measured at 1MHz with a 2V_{DC} bias.

Table SB2 – Surge Current Rating

Part Number	TIA-968		Telcordia GR-1089*		IEC61000-4-5	ITU K.20/21/45*			
	Type A	Type B							
	I _{PP} (A) 5 x 320 μs	I _{PP} (A) 10 x 560 μs I _{PP} (A) 10 x 160 μs	I _{PP} (A) 10 x 1000 μs	I _{PP} (A) 2 x 10 μs	I _{PP} (A) 8 x 20 μs	I _{PP} (A) 5 x 310 μs (VOC: 10 x 700μs)	I _{TSM} Min. (A)	di/dt (A/μs)	dV/dt (V/μs)
TVBxxxSA-L	90	70 100	50	150	150	90	22	500	2000

Notes: *Lightning current wave forms for applicable industry specification.
I_{TSM}, peak on-state surge current is measured at 60 Hz, one cycle.
di/dt: critical rate-of-rise of on-state current (pulsed power amplifier V_{max} = 600V; C = 30μF).
dV/dt: critical rate-of-rise of off-state voltage (linear wave form, V₀ = rated V_{BO}, T_i = 25°C

Figure SB1 - Voltage-Current Characteristics



The voltage current (V-I) is useful in depicting the electrical characteristics of the SiBar thyristor surge protectors in relation to each other.

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Figure SB2 - Dimension Figure

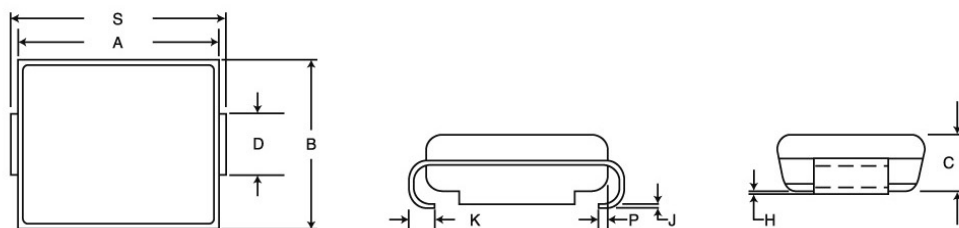


Table SB3 – Dimensions in Millimeters

Dimension	A		B		C		D	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
TVBxxxSA-L	4.06	4.57	3.30	3.94	1.90	2.41	1.95	2.20
	(0.160)	(0.180)	(0.130)	(0.155)	(0.075)	(0.095)	(0.077)	(0.087)

Dimension	H		J		K		P	S	
	Min.	Max.	Min.	Max.	Min.	Max.	Ref	Min	Max.
TVBxxxSA-L	0.051	0.200	0.150	0.31	0.76	1.27	0.51	5.21	5.59
	(0.002)	(0.008)	(0.006)	(0.012)	(0.030)	(0.050)	(0.202)	(0.205)	(0.220)

Notes: *D dimension is measured within dimension P.
TVB series devices use industry standard SMB package type.
All devices are bidirectional and may be oriented in either direction for installation

Table SB4 – Physical Characteristics and Environmental Specifications

Lead material	Matte tin finish (-L devices)
Encapsulating material	Epoxy, meets UL94V-0 requirements
Solderability	per MIL-STD-750, Method 2026
Solder heat withstand	per MIL-STD-750, Method 2031
Solvent resistance	per MIL-STD-750, Method 1022
Mechanical shock	per MIL-STD-750, Method 2016
Vibration	per MIL-STD-750, Method 2056
Storage temperature (°C)	-55 to 150
Operating temperature (°C)	-40 to 125
Junction temperature (°C)	175
Maximum Lead Temperature for Soldering Purpose; for 10s (°C)	260

Table SB5 – Reliability Tests

Test	Conditions	Duration
High temperature, reverse bias	+100°C, 50VDC bias	1000 hours
High humidity, high temperature, reverse bias	85% RH, +85°C, 50VDC bias	1000 hours
High temperature storage life	+150°C	1000 hours
Temperature cycling	-65°C to +150°C, 15 minute dwell	1000 cycles
Autoclave	100% RH, +121°C, 15 PSI	96 hours

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Figures SB3-SB6 - Typical Electrical Characteristics vs. Temperature for SiBar Thyristor Surge Protectors

Figure SB3 - Off-state Voltage vs. Temperature

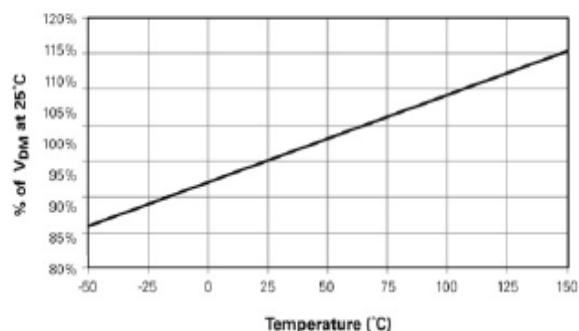


Figure SB4 - Breakover Voltage vs. Temperature

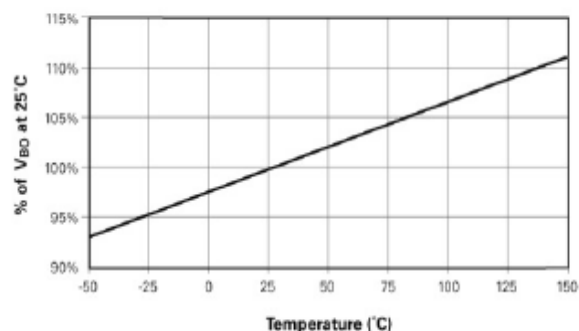


Figure SB5 - Hold Current vs. Temperature

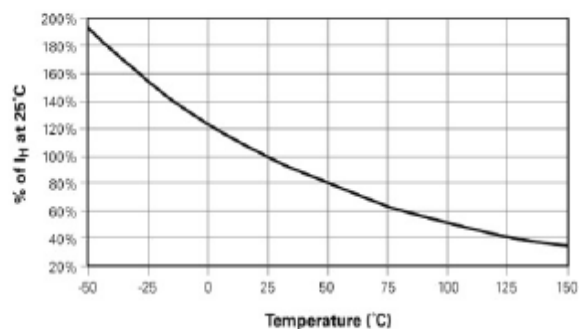
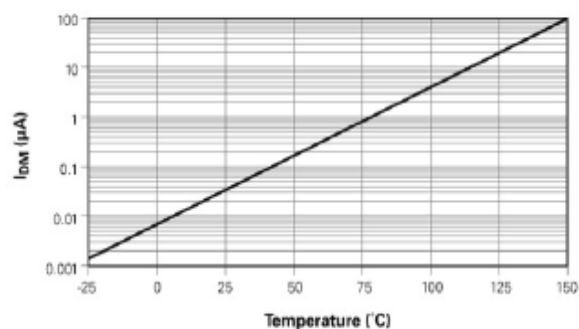


Figure SB6 - Off-state Current vs. Temperature



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Figure SB7 - Recommended Pad Layout

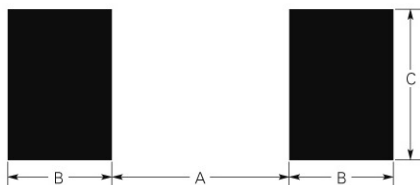


Table SB6 – Packaging and Marking Information

Part Description	Tape and Reel Quantity	Standard Package	Part Marking	Recommended Pad Layout (millimeters/inchs)			Agency Recognition*
				Dimension A (Nom.)	Dimension B (Nom.)	Dimension C (Nom.)	
TVB058SA-L	2,500	10,000	058A	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	--
TVB170SA-L	2,500	10,000	170A	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB180SA-L	2,500	10,000	180A	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB200SA-L	2,500	10,000	200A	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB270SA-L	2,500	10,000	270A	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB300SA-L	2,500	10,000	300A	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
* UL497B, File # E179610							