SiBar Thyristor Surge Protectors
TVBxxxNSA-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 VD2=VDM (µA)
TVB058NSA-L	58	77	150	4	44	84	5
TVB065NSA-L	65	88	150	4	41	79	5
TVB075NSA-L	75	98	150	4	34	65	5
TVB090NSA-L	90	130	150	4	31	58	5
TVB120NSA-L	120	160	150	4	24	46	5
TVB140NSA-L	140	180	150	4	23	44	5
TVB170NSA-L	170	220	150	4	20	39	5
TVB180NSA-L	180	240	150	4	19	37	5
TVB190NSA-L	190	260	150	4	19	36	5
TVB220NSA-L	220	300	150	4	17	33	5
TVB275NSA-L	275	350	150	4	15	31	5
TVB320NSA-L	320	400	150	4	14	27	5

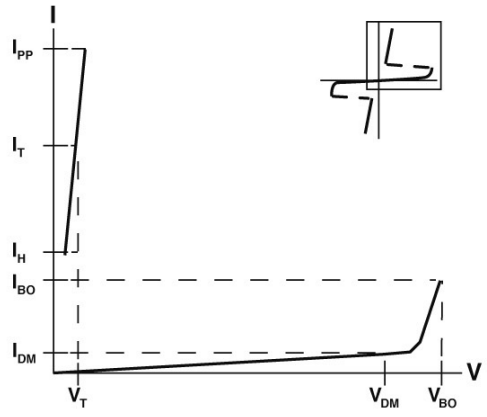
Notes: All electrical characteristics are measured at 25°C.
V_{DM} measured per UL497B pulse requirements: at max. off-state leakage current (IDM) = 5 µA.
V_{BO} measured at 100V/µs.
C1 measured at 1 MHz with a 50 V_{DC} bias.
C2 measured at 1MHz with a 2V_{DC} bias.

Table SB2 – Surge Current Rating

	TIA-968			Telcordia GR-1089*		IEC61000-4-5	ITU K.20/21/45*			
	Type A	Type B								
Part Number	I_{pp}(A) 5 x 320 µs	I_{pp}(A) 10 x 560 µs	$_{pp}$ (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)
TVBxxxNSA-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 Vmax = 600V; C = 30µF).
dV/dt: critical rate-of-rise of off-stage voltage (linear wave form, V_n = rated V_{BO}, Tj = 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.

Figure SB2 - Dimension Figure

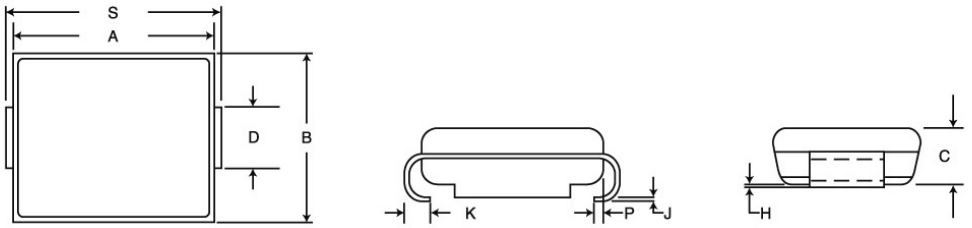


Table SB3 – Dimensions in Millimeters

	A		B		C		D	
Dimension	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**
TVBxxxNSA-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)

	H		J		K		P	S	
Dimension	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	**Ref**	**Min**	**Max.**
TVBxxxNSA-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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Figure SB7 - Recommended Pad Layout

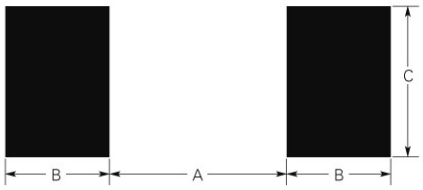

Table SB6 – Packaging and Marking Information

Part Description	Tape and Reel Quantity	Standard Package	Part Marking	Recommended Pad Layout (millimeters/inchs) Dimension A (Nom.)	Dimension B (Nom.)	Dimension C (Nom.)	Agency Recognition*
TVB058NSA-L	2,500	10,000	58NA	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB065NSA-L	2,500	10,000	65NA	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB075NSA-L	2,500	10,000	75NA	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB090NSA-L	2,500	10,000	90NA	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB120NSA-L	2,500	10,000	12NA	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB140NSA-L	2,500	10,000	14NA	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB170NSA-L	2,500	10,000	17NA	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB180NSA-L	2,500	10,000	18NA	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB190NSA-L	2,500	10,000	19NA	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB220NSA-L	2,500	10,000	22NA	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB275NSA-L	2,500	10,000	27NA	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL
TVB320NSA-L	2,500	10,000	32NA	2.261 (0.089)	2.159 (0.085)	2.743 (0.108)	UL

* UL497B, File # E179610