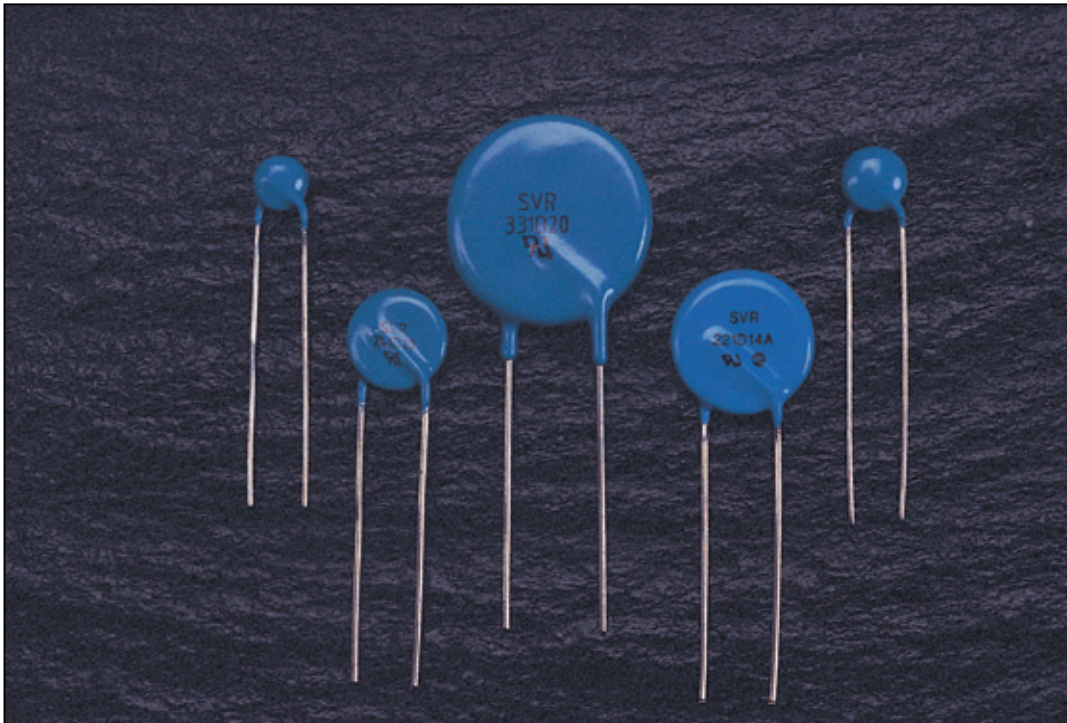


2. SVR varistors for medium & high voltage ratings



● Features

- UL, CSA and VDE safety approvals for standard products.
- Wide voltage range ratings suitable for ac 65V to 1,000V.
(Varistor voltage range : 82 to 1,800V).

● Recommended Applications

- Semiconductor device (TR, Diode, IC, Thyristor or TRIAC etc.) protection.
- Surge protection in consumer electronics.
- Surge protection in communication, measuring or controller electronics.
- Surge protection in electronic home appliances, gas or petroleum appliances.
- Relay or electromagnetic valve surge absorption.

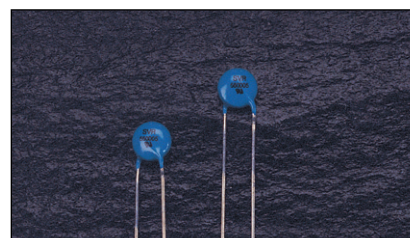
● Related Standards

- UL1414, UL1449, CSA Class 2221 01, CECC 42 000 and CECC 42 200 (VDE).

Electrical characteristics

► D 05-series

Operating temperature range : - 40 ~ 85°C
 Storage temperature range : - 40 ~ 125°C
 Temperature coefficient of varistor voltage : 0 ~ - 0.05%/°C



Model No.	Varistor voltage(V) (0.1mA)			Max. continuous voltage(V)		Max. clamping voltage		Power dissipation P _{1am} (W)	Energy (10/1000μs)		Peak current (8/20μs)	
	Min.	V _{NDCI}	Max.	V _{m(ac)}	V _{m(dc)}	V _c (V)	I _p (A)		W _m (J)		I _m (A)	
									S-series	U-series	S-series	U-series
SVR820D05	74	82	90	50	65	145	5	0.1	1.7	3.5	400	800
SVR101D05	90	100	110	60	85	175	5	0.1	2.0	4.0	400	800
SVR121D05	108	120	132	75	100	210	5	0.1	2.5	5.0	400	800
SVR151D05	135	150	165	95	125	260	5	0.1	3.0	6.5	400	800
SVR181D05	162	180	198	115	150	315	5	0.1	3.5	7.5	400	800
SVR201D05	180	200	220	130	170	355	5	0.1	4.0	8.5	400	800
SVR221D05	198	220	242	140	180	380	5	0.1	4.5	9.0	400	800
SVR241D05	216	240	264	150	200	415	5	0.1	5.0	10.5	400	800
SVR271D05	243	270	297	175	225	475	5	0.1	6.0	11.0	400	800
SVR331D05	297	330	363	210	275	580	5	0.1	6.5	13.0	400	800
SVR361D05	324	360	396	230	300	620	5	0.1	7.5	16.0	400	800
SVR391D05	351	390	429	250	320	675	5	0.1	8.0	17.0	400	800
SVR431D05	387	430	473	275	350	745	5	0.1	9.0	20.0	400	800
SVR471D05	423	470	517	300	385	810	5	0.1	10.0	21.0	400	800

► D 07-series

Operating temperature range : - 40 ~ 85°C
 Storage temperature range : - 40 ~ 125°C
 Temperature coefficient of varistor voltage : 0 ~ - 0.05%/°C



Model No.	Varistor voltage(V) (1mA)			Max. continuous voltage(V)		Max. clamping voltage		Power dissipation P _{1am} (W)	Energy (10/1000μs)		Peak current (8/20μs)	
	Min.	V _{NDCI}	Max.	V _{m(ac)}	V _{m(dc)}	V _c (V)	I _p (A)		W _m (J)		I _m (A)	
									S-series	U-series	S-series	U-series
SVR820D07	74	82	90	50	65	135	10	0.25	3.5	7	1,200	1,750
SVR101D07	90	100	110	60	85	165	10	0.25	4.0	8.5	1,200	1,750
SVR121D07	108	120	132	75	100	200	10	0.25	5.0	10.0	1,200	1,750
SVR151D07	135	150	165	95	125	250	10	0.25	6.0	13.0	1,200	1,750
SVR181D07	162	180	198	115	150	300	10	0.25	8.0	16.0	1,200	1,750
SVR201D07	180	200	220	130	170	340	10	0.25	10.0	17.5	1,200	1,750
SVR221D07	198	220	242	140	180	360	10	0.25	10.0	19.0	1,200	1,750
SVR241D07	216	240	264	150	200	395	10	0.25	10.0	21.0	1,200	1,750
SVR271D07	243	270	297	175	225	455	10	0.25	12.0	24.0	1,200	1,750
SVR331D07	297	330	363	210	275	550	10	0.25	14.0	28.0	1,200	1,750
SVR361D07	324	360	396	230	300	595	10	0.25	15.0	32.0	1,200	1,750
SVR391D07	351	390	429	250	320	650	10	0.25	17.0	35.0	1,200	1,750
SVR431D07	387	430	473	275	350	710	10	0.25	20.0	40.0	1,200	1,750
SVR471D07	423	470	517	300	385	775	10	0.25	20.0	42.0	1,200	1,750

► D 10-series

Operating temperature range : - 40 ~ 85°C

Storage temperature range : - 40 ~ 125°C

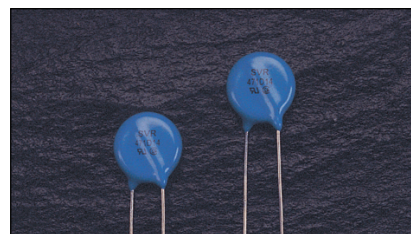
Temperature coefficient of varistor voltage : 0 ~ - 0.05%/°C



Model No.	Varistor voltage(V) (1mA)			Max. continuous voltage(V)		Max. clamping voltage		Power dissipation P _{lam} (W)	Energy (10/1000μs)		Peak current (8/20μs)	
	Min.	V _{MDC}	Max.	V _{m(ac)}	V _{m(dc)}	V _c (V)	I _p (A)		W _m (J)		I _m (A)	
									S-series	U-series	S-series	U-series
SVR820D10	74	82	90	50	65	135	25	0.4	8	14	2,500	3,500
SVR101D10	90	100	110	60	85	165	25	0.4	10	17	2,500	3,500
SVR121D10	108	120	132	75	100	200	25	0.4	12	20	2,500	3,500
SVR151D10	135	150	165	95	125	250	25	0.4	16	25	2,500	3,500
SVR181D10	162	180	198	115	150	300	25	0.4	18	30	2,500	3,500
SVR201D10	180	200	220	130	170	340	25	0.4	20	35	2,500	3,500
SVR221D10	198	220	242	140	180	360	25	0.4	23	39	2,500	3,500
SVR241D10	216	240	264	150	200	395	25	0.4	25	42	2,500	3,500
SVR271D10	243	270	297	175	225	455	25	0.4	30	49	2,500	3,500
SVR331D10	297	330	363	210	275	550	25	0.4	30	58	2,500	3,500
SVR361D10	324	360	396	230	300	595	25	0.4	35	65	2,500	3,500
SVR391D10	351	390	429	250	320	650	25	0.4	40	70	2,500	3,500
SVR431D10	387	430	473	275	350	710	25	0.4	45	80	2,500	3,500
SVR471D10	423	470	517	300	385	775	25	0.4	45	85	2,500	3,500
SVR561D10	504	560	616	350	455	925	25	0.4	45	92	2,500	3,500
SVR621D10	558	620	682	385	505	1,025	25	0.4	45	92	2,500	3,500
SVR681D10	612	680	748	420	560	1,120	25	0.4	45	92	2,500	3,500
SVR751D10	675	750	825	460	615	1,240	25	0.4	50	100	2,500	3,500
SVR781D10	702	780	858	485	640	1,290	25	0.4	50	104	2,500	3,500
SVR821D10	738	820	902	510	670	1,355	25	0.4	55	110	2,500	3,500
SVR911D10	819	910	1,001	550	745	1,500	25	0.4	60	130	2,500	3,500
SVR102D10	900	1,000	1,100	625	825	1,650	25	0.4	65	140	2,500	3,500
SVR112D10	990	1,000	1,210	680	895	1,815	25	0.4	70	155	2,500	3,500

► D 14-series

Operating temperature range : - 40 ~ 85°C
 Storage temperature range : - 40 ~ 125°C
 Temperature coefficient of varistor voltage : 0 ~ - 0.05%/°C



Model No.	Varistor voltage(V) (1mA)			Max. continuous voltage(V)		Max. clamping voltage		Power dissipation P _{1am} (W)	Energy (10/1000μs)		Peak current (8/20μs)	
	Min.	V _{NDCI}	Max.	V _{m(ac)}	V _{m(dc)}	V _c (V)	I _p (A)		W _{tm} (J)		I _{tm} (A)	
									S-series	U-series	S-series	U-series
SVR820D14	74	82	90	50	65	135	50	0.6	14	28	4,500	6,000
SVR101D14	90	100	110	60	85	165	50	0.6	18	35	4,500	6,000
SVR121D14	108	120	132	75	100	200	50	0.6	20	42	4,500	6,000
SVR151D14	135	150	165	95	125	250	50	0.6	25	53	4,500	6,000
SVR181D14	162	180	198	115	150	300	50	0.6	30	62	4,500	6,000
SVR201D14	180	200	220	130	170	340	50	0.6	35	70	4,500	6,000
SVR221D14	198	220	242	140	180	360	50	0.6	40	78	4,500	6,000
SVR241D14	216	240	264	150	200	395	50	0.6	40	84	4,500	6,000
SVR271D14	243	270	297	175	225	455	50	0.6	50	99	4,500	6,000
SVR331D14	297	330	363	210	275	550	50	0.6	60	115	4,500	6,000
SVR361D14	324	360	396	230	300	595	50	0.6	65	130	4,500	6,000
SVR391D14	351	390	429	250	320	650	50	0.6	70	140	4,500	6,000
SVR431D14	387	430	473	275	350	710	50	0.6	75	155	4,500	6,000
SVR471D14	423	470	517	300	385	775	50	0.6	80	175	4,500	6,000
SVR561D14	504	560	616	350	455	925	50	0.6	80	190	4,500	6,000
SVR621D14	558	620	682	385	505	1,025	50	0.6	85	190	4,500	6,000
SVR681D14	612	680	748	420	560	1,120	50	0.6	90	190	4,500	6,000
SVR751D14	675	750	825	460	615	1,240	50	0.6	100	210	4,500	6,000
SVR781D14	702	780	858	485	640	1,290	50	0.6	105	220	4,500	6,000
SVR821D14	738	820	902	510	670	1,355	50	0.6	110	235	4,500	6,000
SVR911D14	819	910	1,001	550	745	1,500	50	0.6	120	255	4,500	6,000
SVR102D14	900	1,000	1,100	625	825	1,650	50	0.6	130	280	4,500	6,000
SVR112D14	990	1,000	1,210	680	895	1,815	50	0.6	140	310	4,500	6,000
SVR182D14	1,620	1,800	1,980	1,000	1,465	2,970	50	0.6	240		4,500	

► D 20-series

Operating temperature range : - 40 ~ 85°C

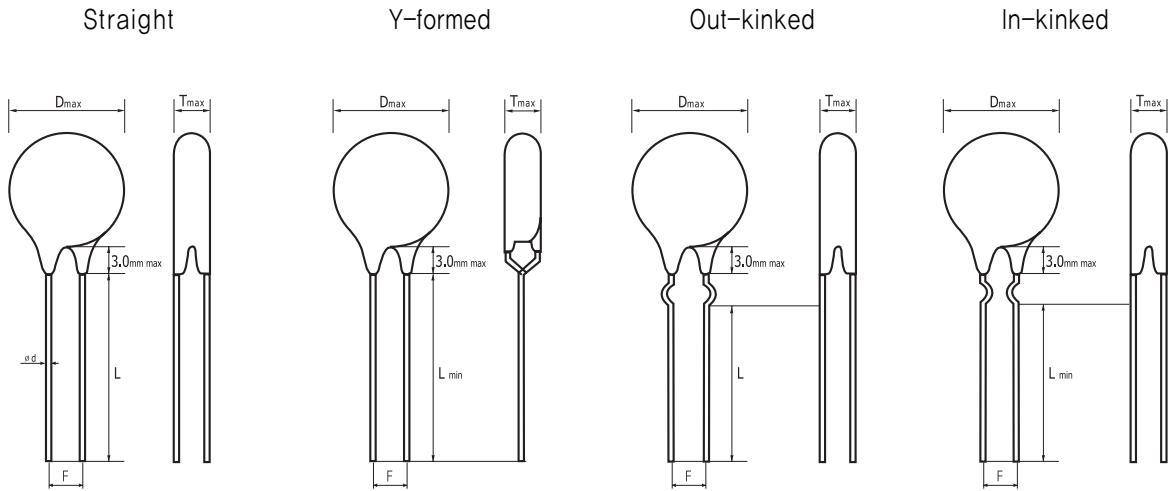
Storage temperature range : - 40 ~ 125°C

Temperature coefficient of varistor voltage : 0 ~ - 0.05%/°C



Model No.	Varistor voltage(V) (1mA)			Max. continuous voltage(V)		Max. clamping voltage		Power dissipation	Energy (10/1000μs)		Peak current (8/20μs)	
	Min.	V _{N(DC)}	Max.	V _{m(ac)}	V _{m(dc)}	V _{c(V)}	I _p (A)	P _{lam} (W)	W _m (J)		I _{tm} (A)	
									S-series	U-series	S-series	U-series
SVR820D20	74	82	90	50	65	135	100	1.0	27	56	6,500	10,000
SVR101D20	90	100	110	60	85	165	100	1.0	30	70	6,500	10,000
SVR121D20	108	120	132	75	100	200	100	1.0	40	85	6,500	10,000
SVR151D20	135	150	165	95	125	250	100	1.0	50	106	6,500	10,000
SVR181D20	162	180	198	115	150	300	100	1.0	60	126	6,500	10,000
SVR201D20	180	200	220	130	170	340	100	1.0	70	140	6,500	10,000
SVR221D20	198	220	242	140	180	360	100	1.0	75	155	6,500	10,000
SVR241D20	216	240	264	150	200	395	100	1.0	80	168	6,500	10,000
SVR271D20	243	270	297	175	225	455	100	1.0	90	190	6,500	10,000
SVR331D20	297	330	363	210	275	550	100	1.0	105	228	6,500	10,000
SVR361D20	324	360	396	230	300	595	100	1.0	120	255	6,500	10,000
SVR391D20	351	390	429	250	320	650	100	1.0	130	275	6,500	10,000
SVR431D20	387	430	473	275	350	710	100	1.0	140	303	6,500	10,000
SVR471D20	423	470	517	300	385	775	100	1.0	150	350	6,500	10,000
SVR561D20	504	560	616	350	455	925	100	1.0	150	382	6,500	10,000
SVR621D20	558	620	682	385	505	1,025	100	1.0	150	382	6,500	10,000
SVR681D20	612	680	748	420	560	1,120	100	1.0	160	382	6,500	10,000
SVR751D20	675	750	825	460	615	1,240	100	1.0	175	420	6,500	10,000
SVR781D20	702	780	858	485	640	1,290	100	1.0	180	435	6,500	10,000
SVR821D20	738	820	902	510	670	1,355	100	1.0	190	460	6,500	10,000
SVR911D20	819	910	1,001	550	745	1,500	100	1.0	215	510	6,500	10,000
SVR102D20	900	1,000	1,100	625	825	1,650	100	1.0	230	565	6,500	10,000
SVR112D20	990	1,000	1,210	680	895	1,815	100	1.0	250	620	6,500	10,000
SVR182D20	1,620	1,800	1,980	1,000	1,465	2,970	100	1.0	400		6,500	

1) Shapes and dimensions (Bulk type)



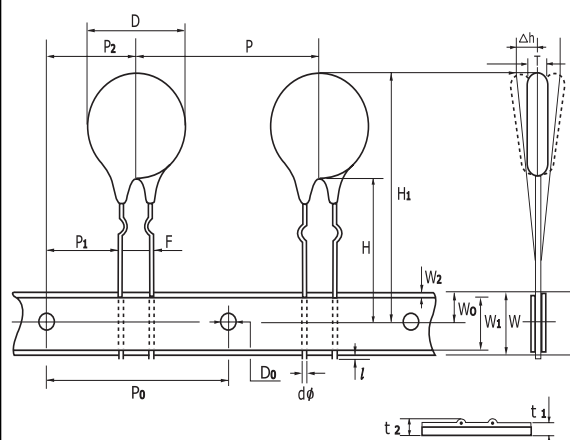
► Dimensions

Part No.	Dmax	Tmax	Lmin	ød	F	Part No.	Dmax	Tmax	Lmin	ød	F
SVR180D05 ~ SVR271D05	7.5	5.0	25	0.6±0.05	5.0±1.0	SVR331D10 ~ SVR112D10	14.0	10.0	25	0.8±0.05	7.5±1.0
SVR331D05 ~ SVR471D05		7.0				SVR180D14 ~ SVR271D14					
SVR180D07 ~ SVR271D07	9.0	5.0	25	0.6±0.05	5.0±1.0	SVR331D14 ~ SVR182D14	18.0	5.0	25	0.8±0.05	7.5±1.0
SVR331D07 ~ SVR471D07		7.0				15.0					
SVR180D10 ~ SVR271D10	14.0	5.0	25	0.8±0.05	7.5±1.0	SVR180D20 ~ SVR271D20	24.0	5.0	25	0.8±0.05	10.0±1.0
SVR331D20 ~ SVR182D20						15.0					

2) TAPE and AMMO specifications.

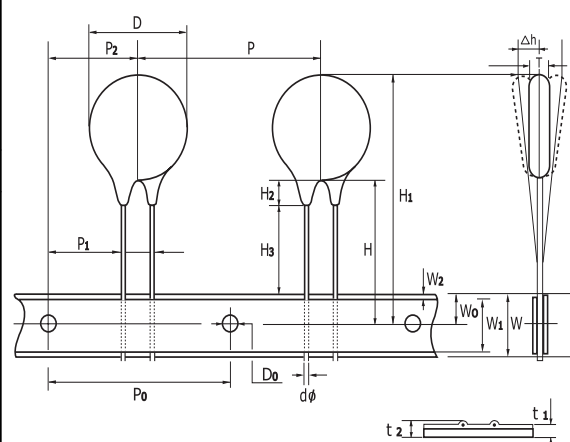
► Kinked leads and taped [Taping dimensions in mm (not to scale)]

Symbol	Dimension			
	ø5	ø7	ø10	ø14
D	8.0	9.0	14.0	17.5
T	6.0	6.0	8.5	12.0
dø	0.6±0.05	0.6±0.05	0.8±0.05	0.8±0.05
P	12.7±1.0	12.7±1.0	25.4±1.0	25.4±1.0
P ₀	12.7±0.3	12.7±0.3	12.7±0.3	12.7±0.3
P ₁	3.55±0.7	3.55±0.7	8.55±1.0	8.55±1.0
F	5.0±0.5	5.0±0.5	7.5±0.5	7.5±0.5
H ₁	27.0 max.	28.0 max.	33.0 max.	38.0 max.
D ₀	4.0±0.2			
Δh	0.0±2.0			
W	18.0+1.0, -0.5			
W ₀	9.0±0.5			
W ₁	12.5 min.			
W ₂	3.0 max.			
t ₁	0.7±0.3			
t ₂	1.5 max.			
H	20.0±1.0			
l	1.0 max			



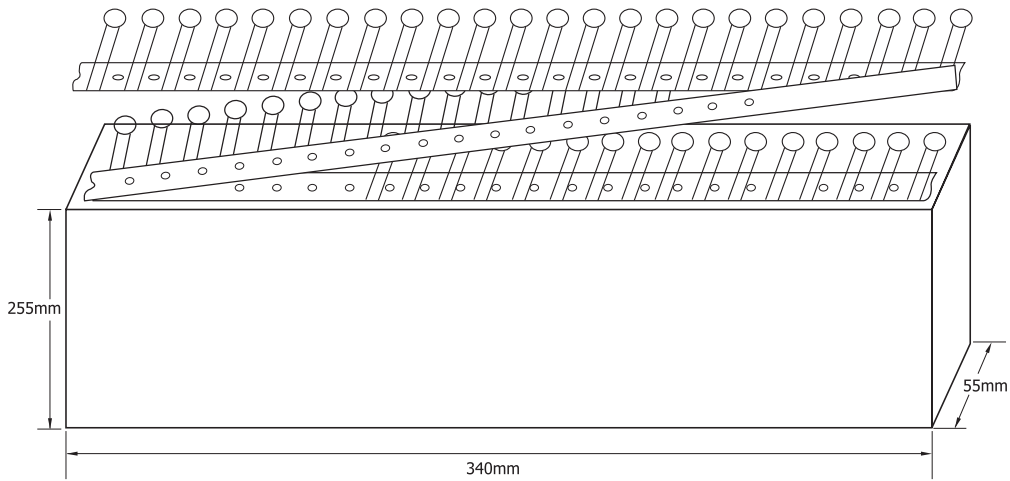
► Straight Leads and Taped [Taping dimensions in mm (not to scale)]

Symbol	Dimension			
	ø5	ø7	ø10	ø14
D	8.0	9.0	14.0	17.5
T	6.0	6.0	8.5	12.0
dø	0.6±0.05	0.6±0.05	0.8±0.05	0.8±0.05
P	12.7±1.0	12.7±1.0	25.4±1.0	25.4±1.0
P ₀	12.7±0.3	12.7±0.3	12.7±0.3	12.7±0.3
P ₁	3.55±0.7	3.55±0.7	8.55±1.0	8.55±1.0
F	5.0±0.5	5.0±0.5	7.5±0.5	7.5±0.5
H ₁	27.0 max.	28.0 max.	33.0 max.	38.0 max.
D ₀	4.0±0.2			
Δh	0.0±2.0			
W	18.0+1.0, -0.5			
W ₀	9.0±0.5			
W ₁	12.5 min.			
W ₂	3.0 max.			
t ₁	0.7±0.3			
t ₂	1.5 max.			
H	18.0±1.0			



► Packing specifications [Taping]

Model No.	Packaging quantity
All model of $\varnothing 05$ and $\varnothing 07$	1,000 pcs./Box
SVR820D10	1,000 pcs./Box
Other model in $\varnothing 10$	500 pcs./Box
$\varnothing 14$ model	500 pcs./Box



3) Performance characteristics

Characteristics		Test method/Discription	Specifications																																												
Standard test condition		Unless otherwise specified, electrical characteristics shall be measured at following conditions (Temp. : 15 to 35°C, Humidity : 45 to 75% RH, Atmospheric pressure : 860 to 1060hPa)	—																																												
Electrical	Varistor voltage	The voltage between two terminals with the specified measuring current $I_{N(DC)}$ applied is called V_C or $V_{N(DC)}$. The measurement shall be made as fast as possible to avoid heat affection.	To meet the specified value.																																												
	Max. continuous voltage	The maximum rms voltage or the maximum dc voltage that can be applied continuously.																																													
	Max. clamping voltage	The maximum voltage between two terminals with the specified standard impulse current (8/20 μ s). <div style="text-align: center;"> <p>Standards impulse current waveform.</p> </div>																																													
	Rated power	The maximum power that can be applied within the specified ambient temperature.																																													
	Energy	The maximum energy within the varistor voltage change of $\pm 10\%$ when a single impulse current of 10/1000 μ s is applied.																																													
	Max. peak current	The maximum current within the varistor voltage change of $\pm 10\%$ with the standard impulse current (8/20 μ s) applied.																																													
	Temperature coefficient of varistor voltage	$\frac{V_{N(DC)} \text{ at } 85^\circ\text{C} - V_{N(DC)} \text{ at } 25^\circ\text{C}}{V_{N(DC)} \text{ at } 25^\circ\text{C}} \times \frac{1}{60} \times 100(\%/^\circ\text{C})$	0 to - 0.05 %/°C max.																																												
	Impulse life	The change of $V_{N(DC)}$ shall be measured after the impulse listed below is applied 10,000 to 100,000 times continuously with the interval of ten seconds at room temperature. <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Part No.</th> <th>Impulse life(1)</th> <th>Impulse life(2)</th> </tr> <tr> <th>$\times 10^4$ times</th> <th>$\times 10^5$ times</th> </tr> <tr> <th colspan="3">Impulse current (8/20μs)</th> </tr> </thead> <tbody> <tr><td>SVR180D05~SVR680D05</td><td>8 A</td><td>5 A</td></tr> <tr><td>SVR180D07~SVR680D07</td><td>25 A</td><td>15 A</td></tr> <tr><td>SVR180D10~SVR680D10</td><td>50 A</td><td>35 A</td></tr> <tr><td>SVR180D14~SVR680D14</td><td>90 A</td><td>30 A</td></tr> <tr><td>SVR180D20~SVR680D20</td><td>130 A</td><td>65 A</td></tr> <tr><td>SVR820D05~SVR471D05</td><td>40 A</td><td>25 A</td></tr> <tr><td>SVR820D07~SVR471D07</td><td>100 A</td><td>60 A</td></tr> <tr><td>SVR820D10~SVR112D10</td><td>150 A</td><td>85 A</td></tr> <tr><td>SVR820D14~SVR112D14</td><td>200 A</td><td>110 A</td></tr> <tr><td>SVR182D14</td><td>150 A</td><td>90 A</td></tr> <tr><td>SVR820D20~SVR112D20</td><td>250 A</td><td>120 A</td></tr> <tr><td>SVR182D20</td><td>200 A</td><td>100 A</td></tr> </tbody> </table>	Part No.	Impulse life(1)	Impulse life(2)	$\times 10^4$ times	$\times 10^5$ times	Impulse current (8/20 μ s)			SVR180D05~SVR680D05	8 A	5 A	SVR180D07~SVR680D07	25 A	15 A	SVR180D10~SVR680D10	50 A	35 A	SVR180D14~SVR680D14	90 A	30 A	SVR180D20~SVR680D20	130 A	65 A	SVR820D05~SVR471D05	40 A	25 A	SVR820D07~SVR471D07	100 A	60 A	SVR820D10~SVR112D10	150 A	85 A	SVR820D14~SVR112D14	200 A	110 A	SVR182D14	150 A	90 A	SVR820D20~SVR112D20	250 A	120 A	SVR182D20	200 A	100 A	$\Delta V_{N(DC)} / V_{N(DC)} \leq \pm 10\%$
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Withstanding voltage (Body insulation)	The specified voltage shall be applied between both terminals of the specimen connected together and metal foil closely wrapped round its body for 1 minute. $V_{0,1mA}, V_{1mA} \leq 330V : 1000 \text{ Vrms}$ $V_{0,1mA}, V_{1mA} > 330V : 1500 \text{ Vrms}$	No breakdown.																																													

► Performance characteristics

Mechanical	Robustness of terminals (tensile)	After gradually applying the force specified below and keeping the unit fixed for 10 seconds, the terminal shall be visually examined for any damage. Terminal diameter $\phi 0.6$: 9.8N (1.0kgf) $\phi 0.8$: 9.8N (1.0kgf)	No remarkable mechanical damage.															
	Robustness of terminals (bending)	The unit shall be secured with its terminal kept vertical and the force specified below shall be applied in the axial direction. The terminal shall gradually be bent by 90° in one direction then 90° in the opposite direction, and again back to the original position. The damage of the terminal shall be visually examined. Terminal diameter $\phi 0.6$: 4.9N (0.5kgf) $\phi 0.8$: 4.9N (0.5kgf)																
	Vibration	After repeatedly applying a single harmonic vibration(amplitude: 0.75mm, double amplitude: 1.5mm) with 1 minute vibration frequency cycles (10Hz to 55Hz to 10Hz) to each of three perpendicular directions for 2 hours. Thereafter, the unit shall be visually examined.																
	Solderability	After dipping the terminals to a depth of approximately 3mm from the body in a soldering bath of 235±5°C for 2.0±0.5 seconds, the terminal shall be visually examined.		Approximately 95% of the terminals shall be covered uniformly with new solder.														
	Resistance to soldering heat	After each lead shall be dipped into a solder bath having a temperature of 260±5°C to a point of 2.0 to 2.5mm from the body of the unit, using shielding board (t=1.5mm), be held there for 10±1 seconds ($\phi 05$ series : 5±1 seconds) and then be stored at room temperature and normal humidity for 1 to 2 hours. The change of $V_{N(DC)}$ and mechanical damages shall be examined.		$\Delta V_{N(DC)} / V_{N(DC)} \leq \pm 5\%$ No remarkable damage.														
Environmental	Temperature cycle	The temperature cycles shown below shall be repeated five times and then stored at room temperature and normal humidity for one to two hours. The change of $V_{N(DC)}$ and mechanical damage shall be examined. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Step</th> <th>Temperature(°C)</th> <th>Period(minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40 $\pm \frac{3}{3}$</td> <td>30 $\pm \frac{3}{3}$</td> </tr> <tr> <td>2</td> <td>Room temp.</td> <td>15 $\pm \frac{3}{3}$</td> </tr> <tr> <td>3</td> <td>125 $\pm \frac{2}{2}$</td> <td>30 $\pm \frac{3}{3}$</td> </tr> <tr> <td>4</td> <td>Room temp.</td> <td>15 $\pm \frac{3}{3}$</td> </tr> </tbody> </table>	Step	Temperature(°C)	Period(minutes)	1	-40 $\pm \frac{3}{3}$	30 $\pm \frac{3}{3}$	2	Room temp.	15 $\pm \frac{3}{3}$	3	125 $\pm \frac{2}{2}$	30 $\pm \frac{3}{3}$	4	Room temp.	15 $\pm \frac{3}{3}$	No remarkable damage. $\Delta V_{N(DC)} / V_{N(DC)} \leq \pm 10\%$
	Step	Temperature(°C)	Period(minutes)															
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High temperature storage/Dry heat	The specimen shall be subjected to 125±2°C for 1,000 hours in a thermostatic bath without load and then stored at room temperature and normal humidity for one to two hours. Thereafter, the change of $V_{N(DC)}$ shall be measured.	$\Delta V_{N(DC)} / V_{N(DC)} \leq \pm 5\%$																
Low temperature storage/Cold	The specimen shall be subjected to -40±2°C, 90~95% RH without load for 1,000 hours and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of $V_{N(DC)}$ shall be measured.																	
High temperature load/Dry heat load	After being continuously applied the maximum continuous voltage at 85±5°C for 1,000 hours, the specimen shall be stored at room temperature and normal humidity for one to two hours. Thereafter, the change of $V_{N(DC)}$ shall be measured.	$\Delta V_{N(DC)} / V_{N(DC)} \leq \pm 10\%$																
Damp heat load/Humidity load	The specimen shall be subjected to 40±2°C, 90~95% RH and the max. continuous voltage for 1,000 hours and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of $V_{N(DC)}$ shall be measured.																	
Humidity (Steady state)	The specimen shall be subjected to 40±2°C, 90~95% RH without load for 1,000 hours and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of $V_{N(DC)}$ shall be measured.	$\Delta V_{N(DC)} / V_{N(DC)} \leq \pm 5\%$																