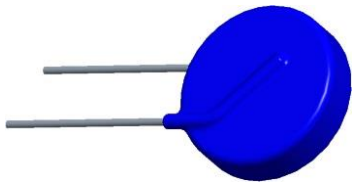
Features

- Wide operating voltage (V_{1mA}) range from 18V to 1800V
- Fast responding to transient over-voltage
- Large absorbing transient energy capability
- Low clamping ratio and no follow-on current
- Moisture sensitivity level: Level 1
- Operating Temperature:-40℃~+105℃
- Storage Temperature:-40℃~+125℃

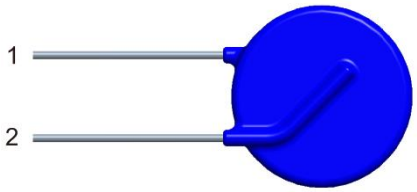
Exterior



Application information

- Transistor, diode, IC, thyristor or triac semiconductor protection
- Surge protection in consumer electronics
- Surge protection in industrial electronics
- Surge protection in electronic home appliances, gas and petroleum appliances
- Relay and electromagnetic valve surge absorption

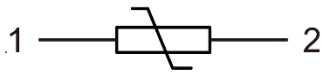
Package (Top View)



Agency Approvals

Icon	Description
RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003
Pb	Mean lead free
Safety certification	UL、TUV、CQC

Schematic Symbol



Electrical Characteristics

Part Number		Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current		Maximum Energy (10/1000μs)		Rated Power	Typical Capacitance (Reference)
Standard	High Surge	V_{AC} (V)	V_{DC} (V)	V_{1mA} (V)	IP (A)	VC (V)	I (A) Standard	I (A) High Surge	(J) Standard	(J) High Surge	(W)	@1KHz (pf)
14D180KXX	14D180KXXH	11	12	18(15~21.6)	10	36	1000	2000	4.0	7.0	0.1	11100
14D220KXX	14D220KXXH	14	18	22(19.5~26)	10	43	1000	2000	5.0	8.0	0.1	9100
14D270KXX	14D270KXXH	17	22	27(24~31)	10	53	1000	2000	6.0	10.0	0.1	7400
14D330KXX	14D330KXXH	20	26	33(29.5~36.5)	10	65	1000	2000	7.5	12.0	0.1	6100
14D390KXX	14D390KXXH	25	31	39(35~43)	10	77	1000	2000	8.6	13.0	0.1	5100
14D470KXX	14D470KXXH	30	38	47(42~52)	10	93	1000	2000	10.0	17.0	0.1	4300
14D560KXX	14D560KXXH	35	45	56(50~62)	10	110	1000	2000	11.0	20.0	0.1	3600
14D680KXX	14D680KXXH	40	56	68(61~75)	10	135	4500	6000	14.0	24.0	0.1	2900
14D820KXX	14D820KXXH	50	65	82(74~90)	50	145	4500	6000	22.0	27.0	0.6	2400

Part Number		Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current		Maximum Energy (10/1000μs)		Rated Power	Typical Capacitance (Reference)
Standard	High Surge	V_{AC} (V)	V_{DC} (V)	V_{1mA} (V)	IP (A)	VC (V)	I (A) Standard	I (A) High Surge	(J) Standard	(J) High Surge	(W)	@1KHz (pf)
14D101KXX	14D101KXXH	60	85	100(90~110)	50	165	4500	6000	28.0	33.0	0.6	2000
14D121KXX	14D121KXXH	75	100	120(108~132)	50	200	4500	6000	32.0	40.0	0.6	1700
14D151KXX	14D151KXXH	95	125	150(135~165)	50	250	4500	6000	40.0	53.0	0.6	1300
14D181KXX	14D181KXXH	115	150	180(162~198)	50	300	4500	6000	50.0	60.0	0.6	1100
14D201KXX	14D201KXXH	130	170	200(180~220)	50	340	4500	6000	57.0	70.0	0.6	1000
14D221KXX	14D221KXXH	140	180	220(198~242)	50	360	4500	6000	60.0	78.0	0.6	900
14D241KXX	14D241KXXH	150	200	240(216~264)	50	395	4500	6000	63.0	84.0	0.6	830
14D271KXX	14D271KXXH	175	225	270(243~297)	50	455	4500	6000	70.0	99.0	0.6	740
14D301KXX	14D301KXXH	190	250	300(270~330)	50	500	4500	6000	77.0	108	0.6	670
14D331KXX	14D331KXXH	210	275	330(297~363)	50	550	4500	6000	85.0	115	0.6	610
14D361KXX	14D361KXXH	230	300	360(324~396)	50	595	4500	6000	93.0	130	0.6	560
14D391KXX	14D391KXXH	250	320	390(351~429)	50	650	4500	6000	100	140	0.6	510
14D431KXX	14D431KXXH	275	350	430(387~473)	50	710	4500	6000	115	155	0.6	460
14D471KXX	14D471KXXH	300	385	470(423~517)	50	775	4500	6000	118	175	0.6	430
14D511KXX	14D511KXXH	320	415	510(459~561)	50	845	4500	6000	121	180	0.6	390
14D561KXX	14D561KXXH	350	460	560(504~616)	50	925	4500	6000	125	185	0.6	360
14D621KXX	14D621KXXH	385	505	620(558~682)	50	1025	4500	6000	128	190	0.6	320
14D681KXX	14D681KXXH	420	560	680(612~748)	50	1120	4500	6000	130	200	0.6	290
14D751KXX	14D751KXXH	460	615	750(675~825)	50	1240	4500	6000	143	210	0.6	270
14D781KXX	14D781KXXH	485	640	780(702~858)	50	1290	4500	6000	148	220	0.6	260
14D821KXX	14D821KXXH	510	670	820(738~902)	50	1355	4500	6000	157	235	0.6	240
14D911KXX	14D911KXXH	550	745	910(819~1001)	50	1500	4500	6000	175	255	0.6	220
14D102KXX	14D102KXXH	625	825	1000(900~1100)	50	1650	4500	6000	190	280	0.6	200
14D112KXX	14D112KXXH	680	895	1100(990~1210)	50	1815	4500	6000	213	310	0.6	180
14D122KXX	14D122KXXH	750	990	1200(1080~1320)	50	1980	4500	6000	232	324	0.6	160
14D142KXX	14D142KXXH	880	1140	1400(1260~1540)	50	2310	4500	6000	238	327	0.6	150
14D162KXX	14D162KXXH	1000	1280	1600(1440~1760)	50	2640	4500	6000	243	331	0.6	140
14D182KXX	14D182KXXH	1100	1465	1800(1620~1980)	50	2970	4500	5000	250	335	0.6	130

Notes: 1.The tolerance of varistor voltage between 18V and 27V is more than 10%;

2. Leakage Current (@83% of V1mA)：IR≤50μA (180K~680K) ; IR≤25μA (820K~182K).

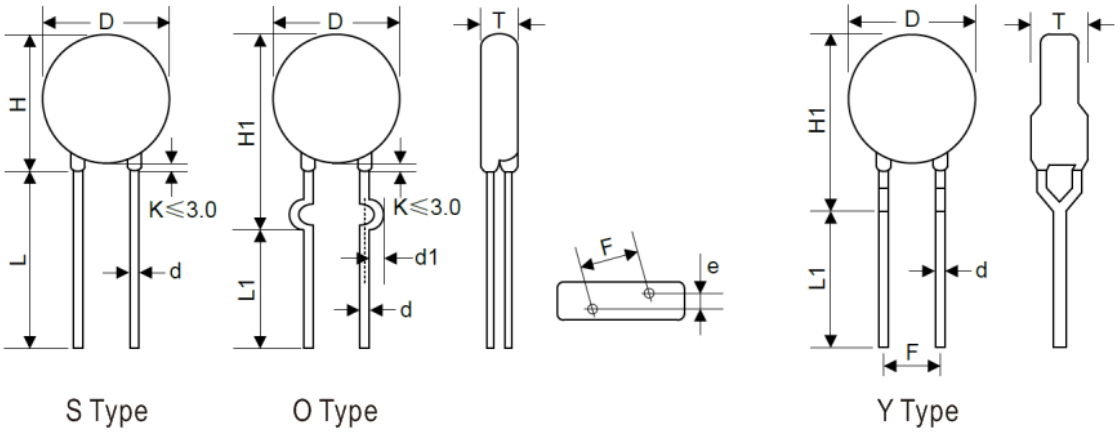
3. The foot shape can be customized according to customer needs.

Part Numbering System

B	M	O	V	1	4	D	4	7	1	K	S	C	H	0	1
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Bencent MOV	Element Diameter		Type	Varistor Voltage		Tolerance		Lead Shape		Packing		Internal control code
	07	Φ7mm	D: Disk	180	18V	K	±10%	S	Straight leads	C	Bulk	01~ZZ
	10	Φ10mm		101	100V	M	±20%	Y	Y Kinked leads	T	Tape & Box	No suffix: Standard type
	14	Φ14mm		102	1000V			O	Outside crimped leads	R	Tape & Reel	
	20	Φ20mm										

Dimensions



S Type O Type Y Type

Notes:The foot shape can be customized according to customer needs.

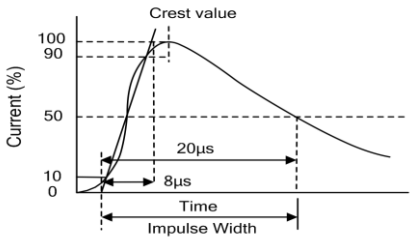
Unit: mm

Table 1	
Symbol	Dimension
H	14.5~20.0
H1	17.0~23.0
L(min)	20
L1(min)	15
D(max)	14.0~18.0
F	7.5±0.8
T	Table 2
e(±0. 8)	Table 2
d(±0. 05)	0.8
d1(±0. 4)	1. 4

Unit: mm

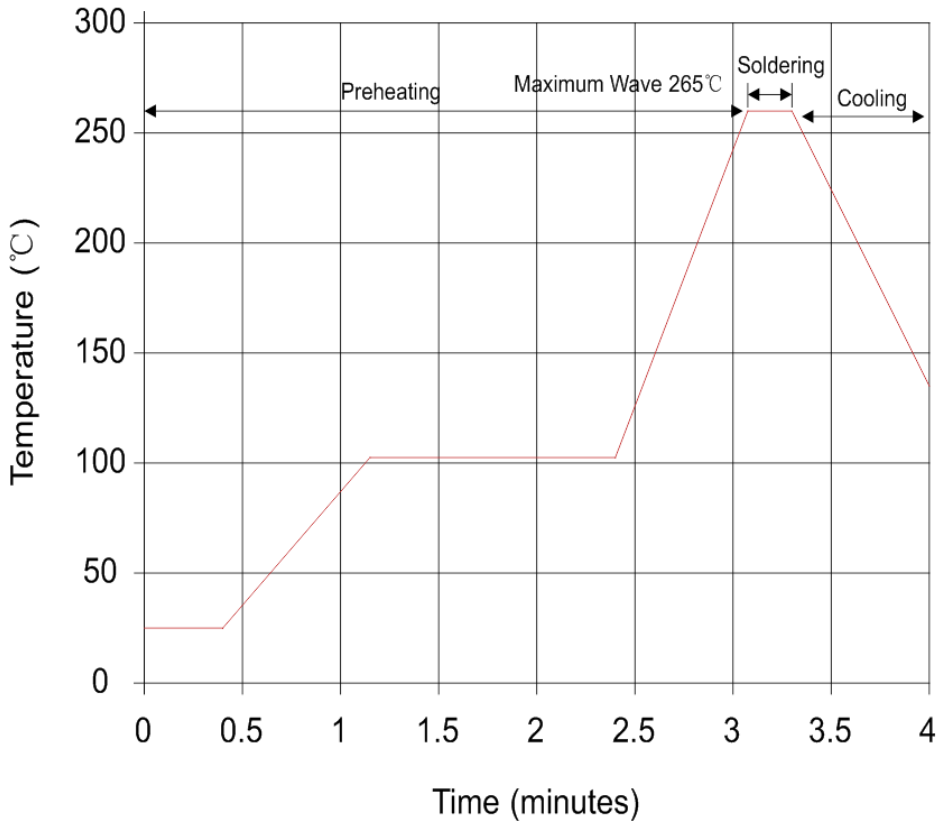
Table 2					
Model	T	e	Model	T	e
180K	2.55~5.30	1.5	361K	3.38~6.70	2.7
220K	2.65~5.44	1.6	391K	3.48~6.88	2.8
270K	2.76~5.64	1.8	431K	3.61~7.13	3.0
330K	2.89~5.83	1.7	471K	3.74~7.37	3.2
390K	2.84~5.61	1.8	511K	3.87~7.62	3.4
470K	2.96~5.83	1.9	561K	4.03~7.92	3.6
560K	3.11~6.08	2.0	621K	4.23~8.29	3.9
680K	3.31~6.37	2.2	681K	4.43~8.66	4.2
820K	2.64~5.31	1.8	751K	4.65~8.73	4.3
101K	2.74~5.48	2.0	781K	4.75~8.79	4.4
121K	2.84~5.68	2.2	821K	4.88~9.01	4.6
151K	2.69~5.47	1.8	911K	5.18~9.05	4.8
181K	2.79~5.66	1.9	102K	5.47~9.50	5.1
201K	2.87~5.82	2.0	112K	5.80~10.0	5.4
221K	2.92~5.84	2.1	122K	6.13~10.5	5.6
241K	2.99~5.97	2.2	142K	6.78~11.5	5.9
271K	3.08~6.15	2.4	162K	7.44~12.5	6.5
301K	3.18~6.33	2.5	182K	8.09~13.5	6.9
331K	3.28~6.52	2.5			

Electrical Ratings

Items	Test Condition/Description	Requirement
Varistor Voltage	The voltage between the two terminals with the specified measuring current 1mA.DC applied is called V_{1mA}.	To meet the Specified value
Maximum Allowable Voltage	The recommended maximum sine wave voltage (RMS) or the Maximum DC voltage can be applied continuously.	
Maximum Clamping Voltage	The maximum voltage between the two terminals with the specification standard impulse current. Applied waveform: 8/20μs 	
Rated Wattage	The maximum average power that can be applied within the specified ambient temperature.	
Energy	The maximum energy within the varistor voltage change of ±10%when one impulse of 10/1000μs or 2ms is applied.	
Withstanding Surge Current	The maximum current within the varistor voltage change of ±10% withthe standard impulse current (8/20μs) applied one time.	
Varistor Voltage Temp. Coefficient	$\left\lvert \frac{V_{1mA@105℃}-V_{1mA@25℃}}{V_{1mA@25℃}} \times \frac{1}{80} \times 100\%(\%/℃) \right\rvert$	≤0.05%/℃
	$\left\lvert \frac{V_{1mA@-40℃}-V_{1mA@25℃}}{V_{1mA@25℃}} \times \frac{1}{65} \times 100\%(\%/℃) \right\rvert$	
Surge Life	The change of Vb shall be measured after the impulse listed below which is applied 10,000 times continuously with the interval of ten seconds at room temperature. 14Φ series: 180K to 680K — 75A (8/20μs); 820K to 182K — 150A (8/20μs)	$\frac{\Delta Vb}{Vb} \leq \pm 10\%$

Soldering Recommendation

Lead-free Wave Soldering Recommendation



	Item	Conditions
Preheating	Room Temp. to 110（100-110）℃	30-50 seconds
	100-110℃	60-70s seconds
	110℃to Soldering Temp.	30-50s seconds
Soldering	Peak Temp.	265℃
	Dipping Time	10 seconds (max)
	Soldering	1 time

Recommendation Reworking Conditions with Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360℃
Soldering Time	3 seconds (max)
Distance from Varistor	2mm (min)

Mechanical Characteristics

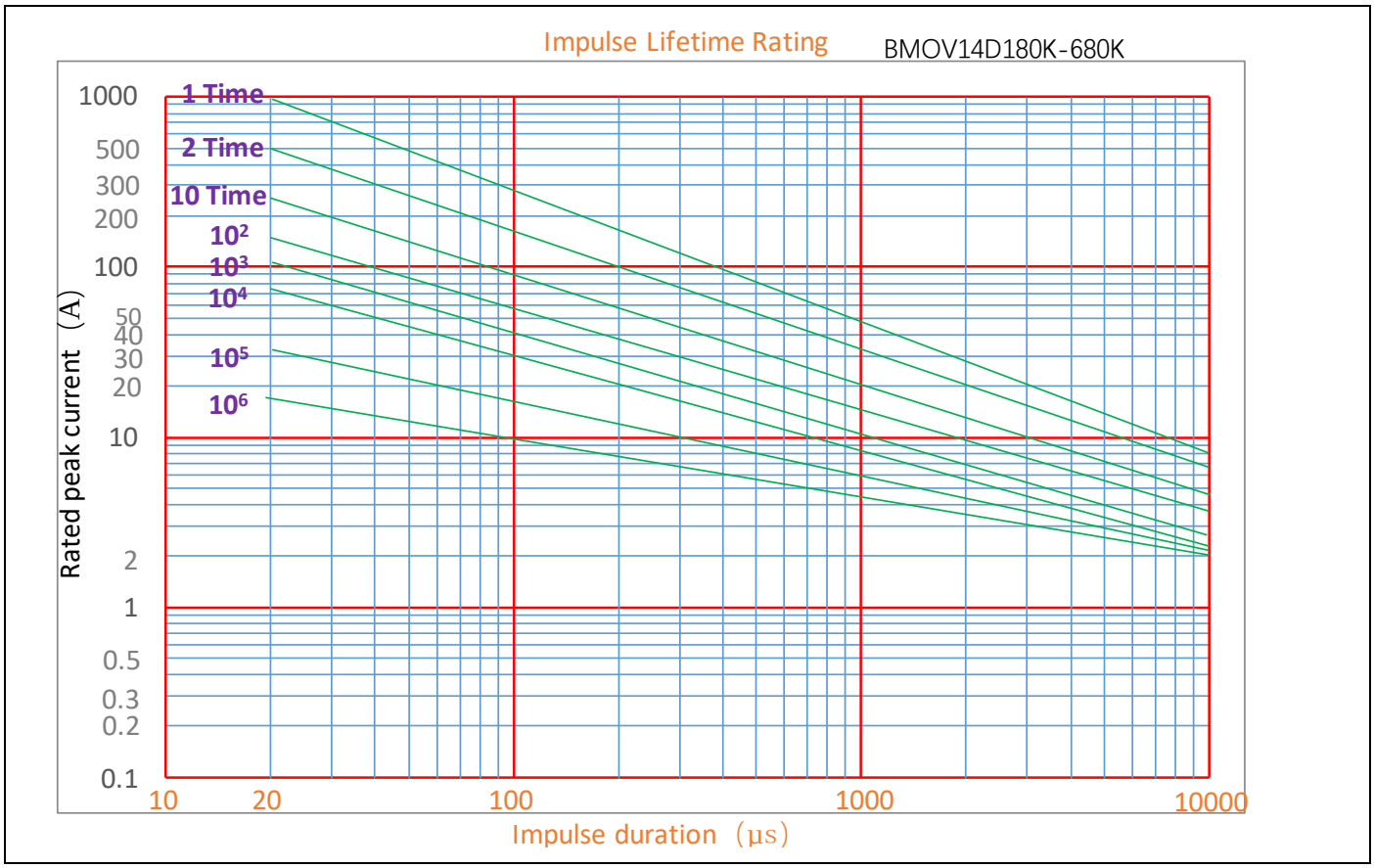
<table>
<tr><th>Items</th><th>Test conditions / Methods</th><th>Specifications</th></tr>
<tr><td>Tensile Strength of Terminals</td><td>Gradually applying the force specified and keeping the unit fixed for 10±1 sec
<table>
<tr><th>Terminal diameter (mm)</th><th>Force (kg)</th></tr>
<tr><td>0.5＜d≤0.8</td><td>1.0</td></tr>
<tr><td>0.8＜d≤1.25</td><td>2.0</td></tr>
<tr><td>1.25＜d</td><td>4.0</td></tr>
</table></td><td>No visible damage
|△V1mA/V1mA |≤5%</td></tr>
<tr><td>Bending Strength of Terminals</td><td>Hold specimen and apply the force specified below to each lead.
Bend the specimen to 90°, then return to the original position.
Repeat the procedure in the opposite direction.
<table>
<tr><th>Terminal diameter (mm)</th><th>Force (kg)</th></tr>
<tr><td>0.5＜d≤0.8</td><td>0.5</td></tr>
<tr><td>0.8＜d≤1.25</td><td>1.0</td></tr>
<tr><td>1.25＜d</td><td>2.0</td></tr>
</table></td><td>No visible damage
|△V1mA/V1mA |≤5%</td></tr>
<tr><td>Vibration</td><td>Frequency range: 10~55 Hz
Amplitude: 0.75mm or 98m/s^2
Direction: 3 mutually perpendicular directions, 2hrs each.</td><td>No visible damage
|△V1mA/V1mA |≤5%</td></tr>
<tr><td>Solder ability</td><td>Solder Temp: 245±5˚C
Dipping Time: 2±0.5 sec</td><td>Atleast 95% of terminal electrode is covered by new solder</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>Solder Temp: 260±5˚C
Dipping Time: 10±1 sec</td><td>No visible damage
|△V1mA/V1mA |≤10%</td></tr>
</table>

Reliability

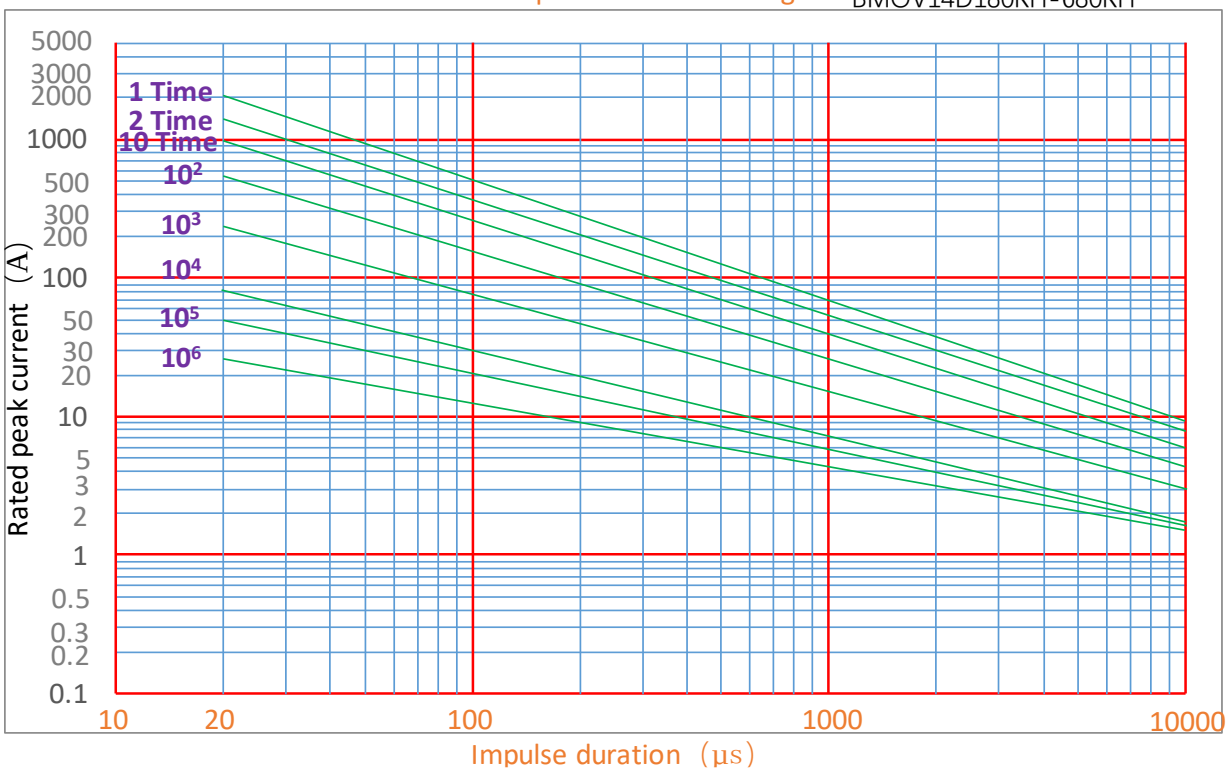
<table>
<tr><th>Items</th><th>Test conditions / Methods</th><th>Specifications</th></tr>
<tr><td>High Temperature Storage</td><td>Ambient Temp: 125±2˚C
Duration: 1000hrs</td><td>|△V1mA/V1mA |≤5%</td></tr>
<tr><td>Low Temperature Storage</td><td>Ambient Temp: -40±2˚C
Duration: 1000hrs</td><td>|△V1mA/V1mA |≤5%</td></tr>
<tr><td>Humidity</td><td>Ambient Temp: 40±2˚C, 90~95% R.H.
Duration: 1000hrs</td><td>|△V1mA/V1mA |≤5%</td></tr>
<tr><td>Temperature Cycle</td><td>The conditions shown below shall be repeated 5 cycles
<table>
<tr><th>Step</th><th>Temperature (˚C)</th><th>Period (minutes)</th></tr>
<tr><td>1</td><td>-40±3</td><td>30±3</td></tr>
<tr><td>2</td><td>Room temperature</td><td>15±3</td></tr>
<tr><td>3</td><td>125±3</td><td>30±3</td></tr>
<tr><td>4</td><td>Room temperature</td><td>15±3</td></tr>
</table></td><td>No visible damage
|△V1mA/V1mA |≤5%</td></tr>
</table>

Items	Test conditions / Methods	Specifications
High Temperature Load	Ambient Temp: 105±2˚C Duration: 1000hrs Load: Max. Allowable Voltage In AC eara.	|△V1mA/V1mA |≤10%
Damp Heat Load	Ambient Temp: 40±2˚C, 90~95% R.H. Duration: 1000hrs Load: Max. Allowable Voltage	No visible damage |△V1mA/V1mA |≤10%
Voltage Proof	Metal balls method, 2500Vac 1 min.	No visible damage

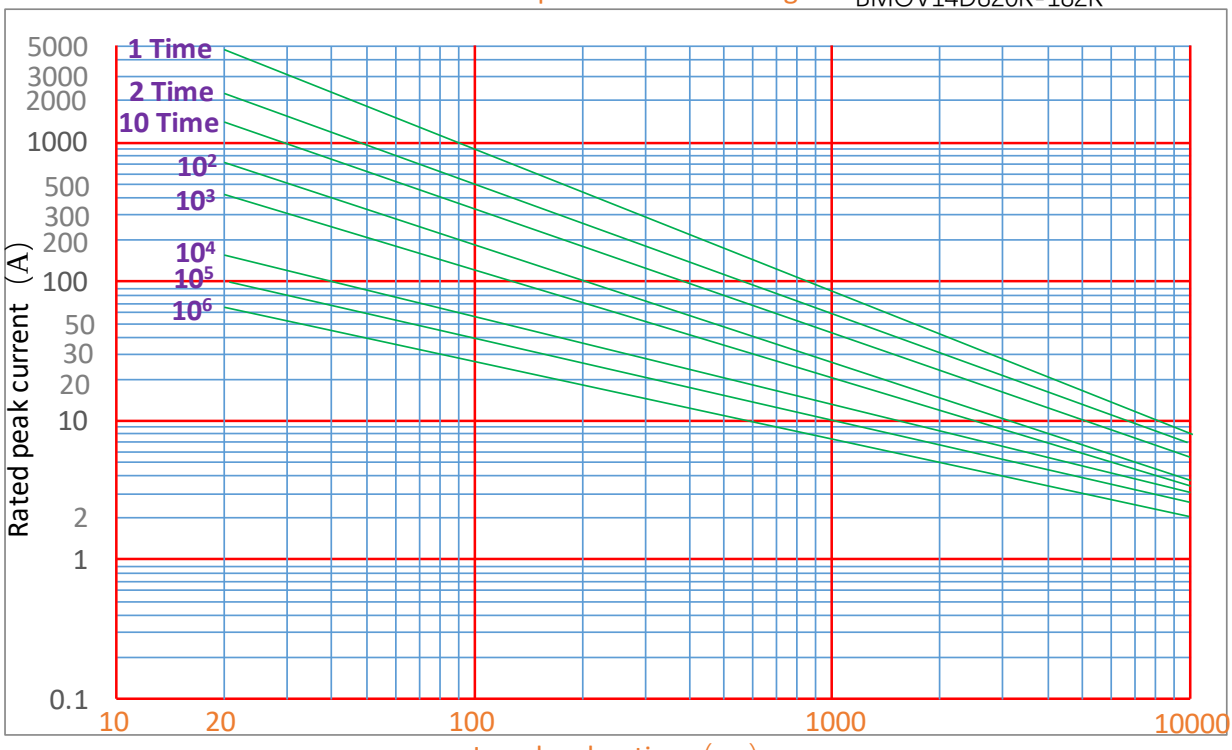
Maximum Surge Current Derating Curve

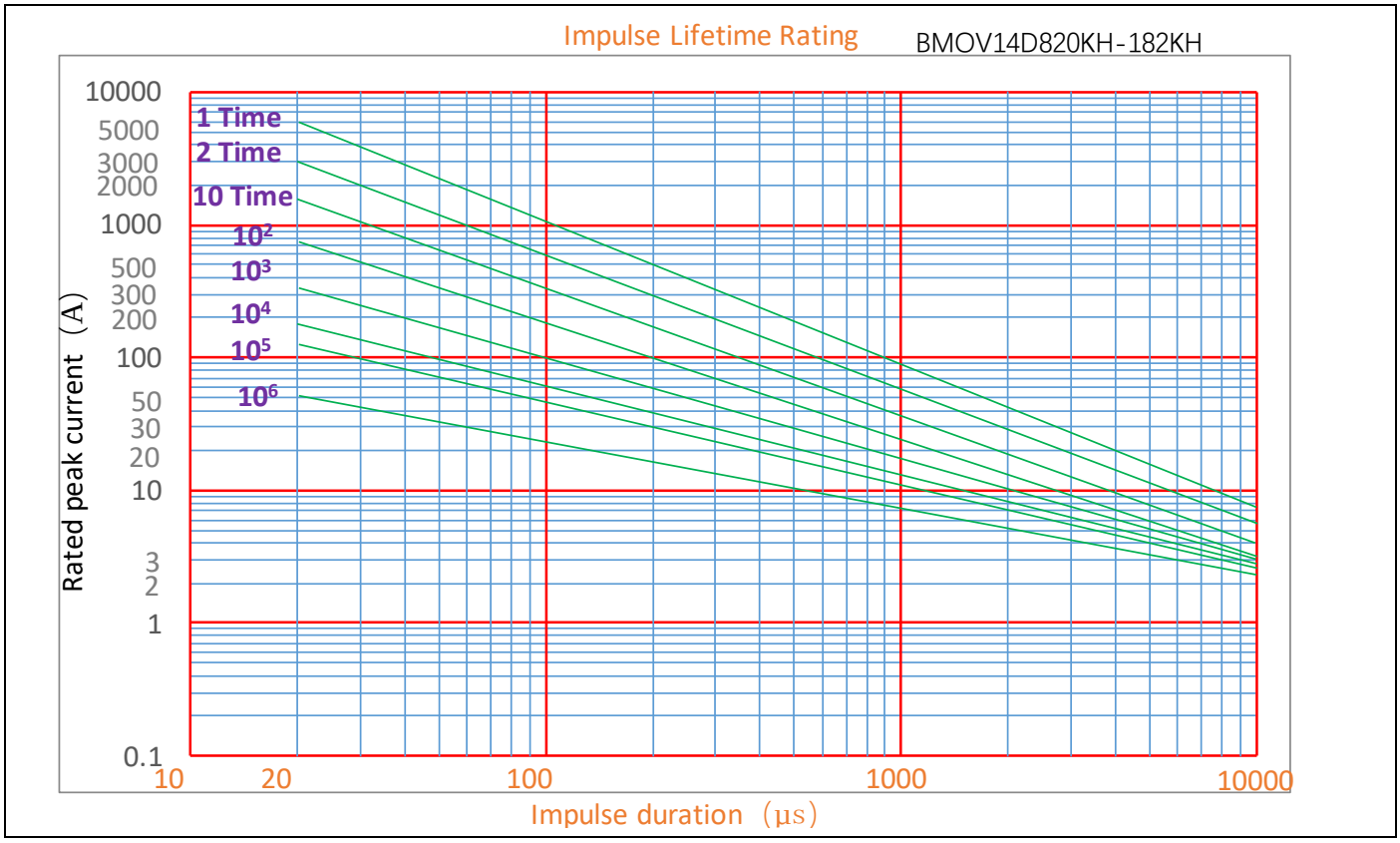


Impulse Lifetime Rating BMOV14D180KH-680KH

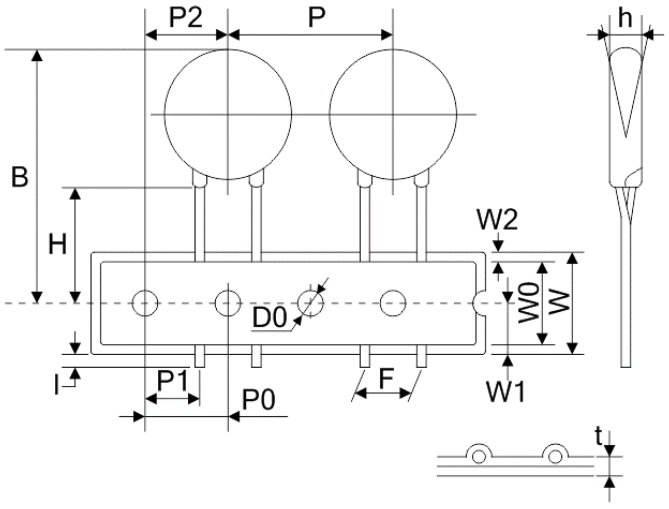


Impulse Lifetime Rating BMOV14D820K-182K



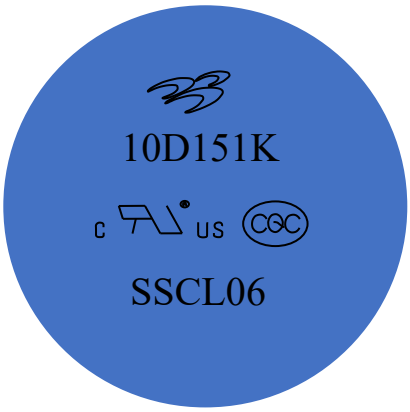


Taping Dimensions



Symbol	Dimension (mm)
P	25.4±1.0
P0	12.7±1.0
P1	8.95±0.7
P2	12.7±1.3
F	7.5±0.8
h	0±4
w	18.0±1.0
W0	12.0±1.0
W1	9.0±0.5
W2	3.0max
H	20.0±2.0
I	1.0max
D0	4.0±0.2
t	0.6±0.3
B	40max

Marking Code



: Bencent

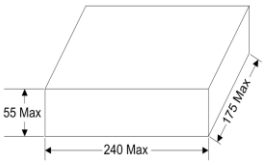
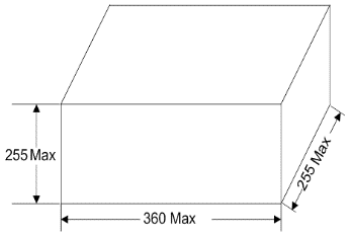
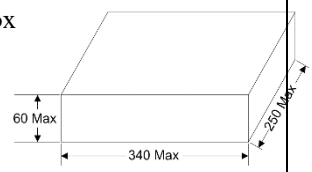
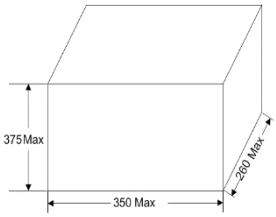
14: Disk 14mm; D:Rotundity; XXXK: Varistor Voltage
X:High surge code, no 'X' is standard

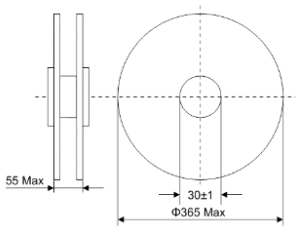
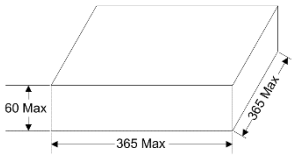
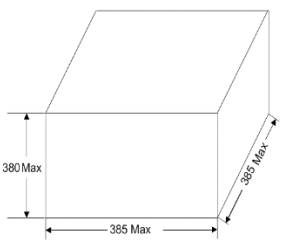
: UL\CQC Mark

XX: Control code; X: Year ; X: Month
XX: Date

Quantity

Packaging Dimensions (Unit: mm)

Inner box size	Outer box size	Quantity
Bulk 		400pcs/bag 2bags/box (180K~331K)
		300pcs/bag 2bags/box (361K~621K)
		250pcs/bag 2bags/box (681K~112K)
		150pcs/bag 2bags/box (122K~182K)
Tape & Box 		750pcs/box (180K~331K)
		500pcs/box (361K~621K)
		500pcs/box (681K~112K)
		500pcs/box (122K~182K)

Reel size	Inner box size	Outer box size	Quantity
Tape & Reel 			750 pcs/reel (180K~331K)
			500 pcs/reel (361K~621K)
			500 pcs/reel (681K~112K)
			500 pcs/reel (122K~182K)