

## Metal Oxide Varistor (MOV) Data Sheet

### Features

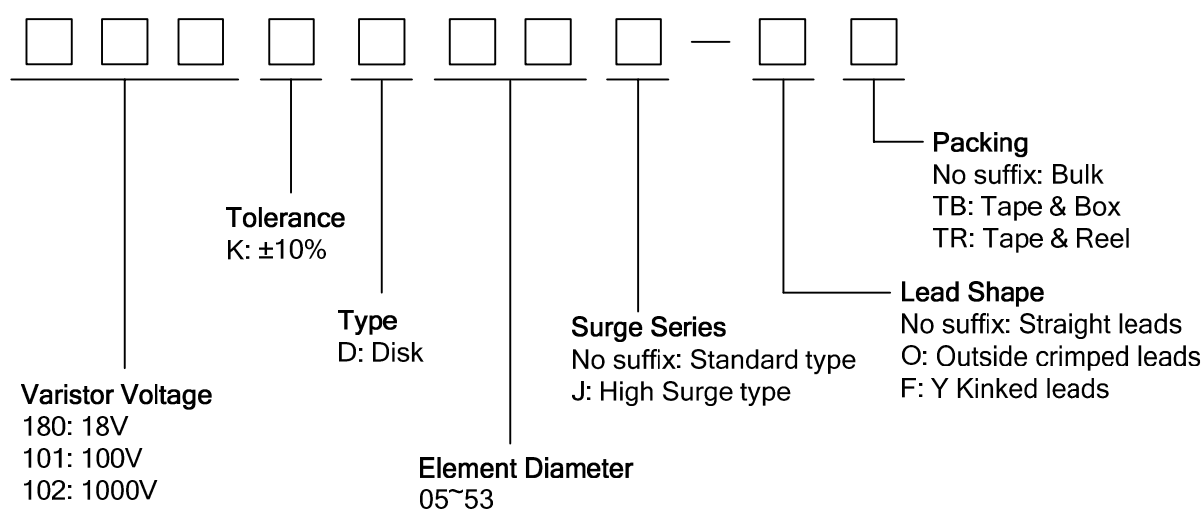
- Wide operating voltage ( $V_{1mA}$ ) range from 18V to 1800V
- Fast responding to transient over-voltage
- Large absorbing transient energy capability
- Low clamping ratio and no follow-on current
- Meets MSL level 1, per J-STD-020
- Operating Temperature:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Storage Temperature:  $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Safety certification: UL: E327997  
CSA: 246579  
VDE: 40027827



### Applications

- 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

### Part Number Code



## Dimensions

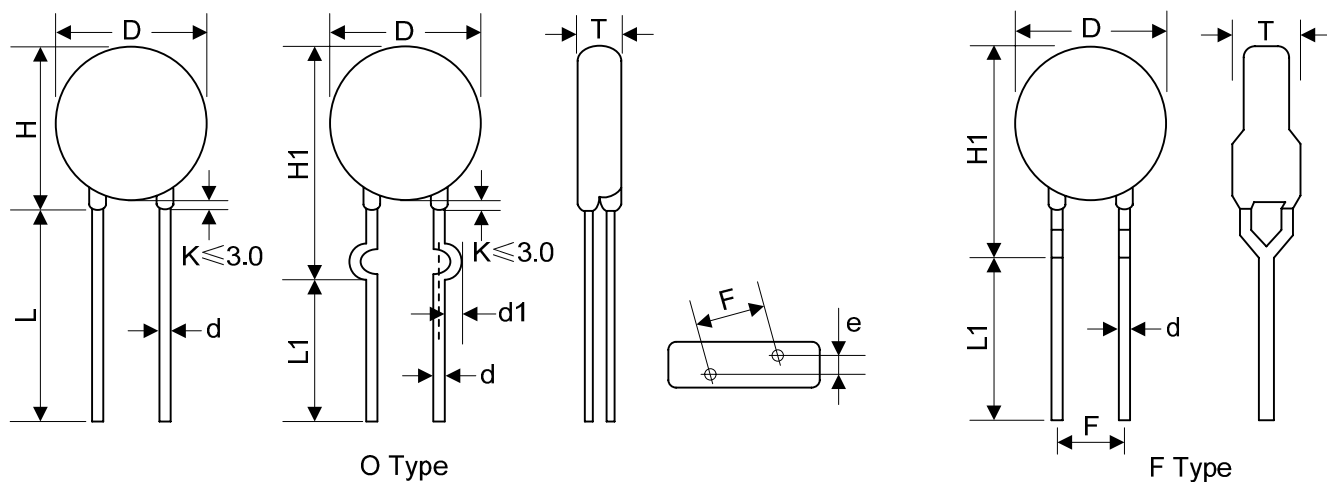


Table 1

Unit: mm

| Symbol   | Dimension      |
|----------|----------------|
| H        | 14.5~20.0 180K |
| H1       | 17.0~21.0 220K |
| L(min.)  | 20.0 270K      |
| L1(min.) | 15.0 330K      |
| D        | 14.0~16.5 390K |
| F(±0.8)  | 7.5 470K       |
| T        | Table 2 560K   |
| e(±0.8)  | Table 2 630K   |
| d(±0.05) | 0.8 820K       |
| d1(±0.4) | 1.4 101K       |

121K

151K

181K

201K

221K

241K

271K

301K

331K

Table 2

Unit: mm

| Model   | T   | e    | Model    | T       | e   |
|---------|-----|------|----------|---------|-----|
| 2.0~3.  | 9   | 1.5  | 361K     | 2.9~5.2 | 2.7 |
| 2.1~4.  | 0   | 1.6  | 391K     | 3.0~5.4 | 2.8 |
| 2.1~4.  | 1   | 1.8  | 431K     | 3.2~5.6 | 3.0 |
| 2.2~4.  | 3   | 1.7  | 471K     | 3.3~5.8 | 3.2 |
| 2.1~4.1 |     | 1.8  | 511K     | 3.4~6.1 | 3.4 |
| 2.2~4.  | 3   | 1.9  | 561K     | 3.6~6.4 | 3.6 |
| 2.3~4.  | 6   | 2.1  | 621K     | 3.8~6.8 | 3.9 |
| 2.4~    | 4.8 | 2.4  | 681K     | 4.0~7.1 | 4.2 |
| 2.1~    | 4.1 | 1.8  | 751K     | 4.3~7.2 | 4.3 |
| 2.4~4.  | 2   | 2.0  | 781K     | 4.4~7.3 | 4.4 |
| 2.4~4.4 | 2.2 | 821K | 4.6~7.5  | 4.6     |     |
| 2.2~4.1 | 1.8 | 911K | 4.8~7.5  | 5.0     |     |
| 2.3~4.2 | 1.9 | 102K | 5.4~8.0  | 5.0     |     |
| 2.4~4.3 | 2.0 | 112K | 5.8~8.5  | 5.4     |     |
| 2.5~4.4 | 2.1 | 122K | 5.9~9.0  | 5.8     |     |
| 2.6~4.5 | 2.2 | 142K | 6.9~10.5 | 6.6     |     |
| 2.6~4.6 | 2.4 | 162K | 7.4~11.0 | 7.4     |     |
| 2.7~4.6 | 2.5 | 182K | 7.6~12.0 | 8.2     |     |
| 2.7~5.0 | 2.5 |      |          |         |     |

## Electrical Characteristics

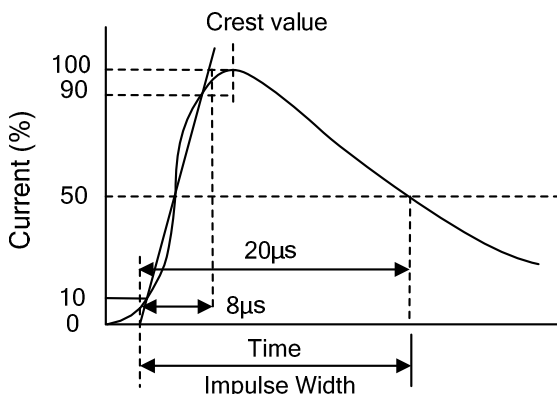
| Part Number |            | Maximum Allowable Voltage |                     | Varistor Voltage     | Maximum Clamping Voltage |                    | Withstanding Surge Current |                  | Maximum Energy (10/1000μs) |                | Rated Power | Typical Capacitance (Reference) |
|-------------|------------|---------------------------|---------------------|----------------------|--------------------------|--------------------|----------------------------|------------------|----------------------------|----------------|-------------|---------------------------------|
| Standard    | High Surge | V <sub>AC</sub> (V)       | V <sub>DC</sub> (V) | V <sub>1mA</sub> (V) | I <sub>P</sub> (A)       | V <sub>C</sub> (V) | I (A) Standard             | I (A) High Surge | (J) Standard               | (J) High Surge | (W)         | @1KHz (pf)                      |
| 180KD14     | 180KD14J   | 11                        | 14                  | 18(15~21.6)          | 10                       | 36                 | 1000                       | 2000             | 4.0                        | 7.0            | 0.1         | 11100                           |
| 220KD14     | 220KD14J   | 14                        | 18                  | 22(19.5~26)          | 10                       | 43                 | 1000                       | 2000             | 5.0                        | 8.0            | 0.1         | 9100                            |
| 270KD14     | 270KD14J   | 17                        | 22                  | 27(24~31)            | 10                       | 53                 | 1000                       | 2000             | 6.0                        | 10.0           | 0.1         | 7400                            |
| 330KD14     | 330KD14J   | 20                        | 26                  | 33(29.5~36.5)        | 10                       | 65                 | 1000                       | 2000             | 7.5                        | 12.0           | 0.1         | 6100                            |
| 390KD14     | 390KD14J   | 25                        | 31                  | 39(35~43)            | 10                       | 77                 | 1000                       | 2000             | 8.6                        | 13.0           | 0.1         | 5100                            |
| 470KD14     | 470KD14J   | 30                        | 38                  | 47(42~52)            | 10                       | 93                 | 1000                       | 2000             | 10.0                       | 17.0           | 0.1         | 4300                            |
| 560KD14     | 560KD14J   | 35                        | 45                  | 56(50~62)            | 10                       | 110                | 1000                       | 2000             | 11.0                       | 20.0           | 0.1         | 3600                            |
| 680KD14     | 680KD14J   | 40                        | 56                  | 68(61~75)            | 10                       | 135                | 1000                       | 2000             | 14.0                       | 24.0           | 0.1         | 2900                            |
| 820KD14     | 820KD14J   | 50                        | 65                  | 82(74~90)            | 50                       | 135                | 4500                       | 6000             | 22.0                       | 27.0           | 0.6         | 2400                            |
| 101KD14     | 101KD14J   | 60                        | 85                  | 100(90~110)          | 50                       | 165                | 4500                       | 6000             | 28.0                       | 33.0           | 0.6         | 2000                            |
| 121KD14     | 121KD14J   | 75                        | 100                 | 120(108~132)         | 50                       | 200                | 4500                       | 6000             | 32.0                       | 40.0           | 0.6         | 1700                            |
| 151KD14     | 151KD14J   | 95                        | 125                 | 150(135~165)         | 50                       | 250                | 4500                       | 6000             | 40.0                       | 53.0           | 0.6         | 1300                            |
| 181KD14     | 181KD14J   | 115                       | 150                 | 180(162~198)         | 50                       | 300                | 4500                       | 6000             | 50.0                       | 60.0           | 0.6         | 1100                            |
| 201KD14     | 201KD14J   | 130                       | 170                 | 200(180~220)         | 50                       | 340                | 4500                       | 6000             | 57.0                       | 70.0           | 0.6         | 1000                            |
| 221KD14     | 221KD14J   | 140                       | 180                 | 220(198~242)         | 50                       | 360                | 4500                       | 6000             | 60.0                       | 78.0           | 0.6         | 900                             |
| 241KD14     | 241KD14J   | 150                       | 200                 | 240(216~264)         | 50                       | 395                | 4500                       | 6000             | 63.0                       | 84.0           | 0.6         | 830                             |
| 271KD14     | 271KD14J   | 175                       | 225                 | 270(243~297)         | 50                       | 455                | 4500                       | 6000             | 70.0                       | 99.0           | 0.6         | 740                             |
| 301KD14     | 301KD14J   | 190                       | 250                 | 300(270~330)         | 50                       | 500                | 4500                       | 6000             | 77.0                       | 108            | 0.6         | 670                             |
| 331KD14     | 331KD14J   | 210                       | 275                 | 330(297~363)         | 50                       | 550                | 4500                       | 6000             | 85.0                       | 115            | 0.6         | 610                             |
| 361KD14     | 361KD14J   | 230                       | 300                 | 360(324~396)         | 50                       | 595                | 4500                       | 6000             | 93.0                       | 130            | 0.6         | 560                             |
| 391KD14     | 391KD14J   | 250                       | 320                 | 390(351~429)         | 50                       | 650                | 4500                       | 6000             | 100                        | 140            | 0.6         | 510                             |
| 431KD14     | 431KD14J   | 275                       | 350                 | 430(387~473)         | 50                       | 710                | 4500                       | 6000             | 115                        | 155            | 0.6         | 460                             |
| 471KD14     | 471KD14J   | 300                       | 385                 | 470(423~517)         | 50                       | 775                | 4500                       | 6000             | 118                        | 175            | 0.6         | 430                             |
| 511KD14     | 511KD14J   | 320                       | 415                 | 510(459~561)         | 50                       | 845                | 4500                       | 6000             | 121                        | 180            | 0.6         | 390                             |
| 561KD14     | 561KD14J   | 350                       | 460                 | 560(504~616)         | 50                       | 925                | 4500                       | 6000             | 125                        | 185            | 0.6         | 360                             |
| 621KD14     | 621KD14J   | 385                       | 505                 | 620(558~682)         | 50                       | 1025               | 4500                       | 6000             | 128                        | 190            | 0.6         | 320                             |
| 681KD14     | 681KD14J   | 420                       | 560                 | 680(612~748)         | 50                       | 1120               | 4500                       | 6000             | 130                        | 200            | 0.6         | 290                             |
| 751KD14     | 751KD14J   | 460                       | 615                 | 750(675~825)         | 50                       | 1240               | 4500                       | 6000             | 143                        | 210            | 0.6         | 270                             |
| 781KD14     | 781KD14J   | 485                       | 640                 | 780(702~858)         | 50                       | 1290               | 4500                       | 6000             | 148                        | 220            | 0.6         | 260                             |
| 821KD14     | 821KD14J   | 510                       | 670                 | 820(738~902)         | 50                       | 1355               | 4500                       | 6000             | 157                        | 235            | 0.6         | 240                             |
| 911KD14     | 911KD14J   | 550                       | 745                 | 910(819~1001)        | 50                       | 1500               | 4500                       | 6000             | 175                        | 255            | 0.6         | 220                             |
| 102KD14     | 102KD14J   | 625                       | 825                 | 1000(900~1100)       | 50                       | 1650               | 4500                       | 6000             | 190                        | 280            | 0.6         | 200                             |
| 112KD14     | 112KD14J   | 680                       | 895                 | 1100(990~1210)       | 50                       | 1815               | 4500                       | 6000             | 213                        | 310            | 0.6         | 180                             |
| 122KD14     | 122KD14J   | 750                       | 990                 | 1200(1080~1320)      | 50                       | 1980               | 4500                       | 6000             | 232                        | 324            | 0.6         | 160                             |
| 142KD14     | 142KD14J   | 880                       | 1140                | 1400(1260~1540)      | 50                       | 2310               | 4500                       | 6000             | 238                        | 327            | 0.6         | 150                             |
| 162KD14     | 162KD14J   | 1000                      | 1280                | 1600(1440~1760)      | 50                       | 2640               | 4500                       | 6000             | 243                        | 331            | 0.6         | 140                             |
| 182KD14     | 182KD14J   | 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. Varistor voltage  $\geq 1200V$ , structure diagram is F type.

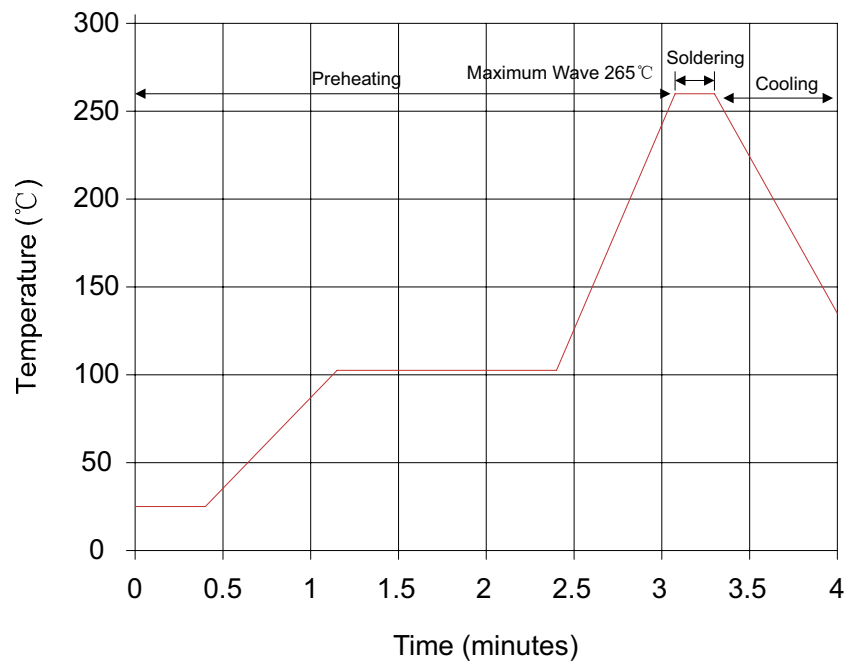
3. Leakage Current (@83% of V<sub>1mA</sub>): IR $\leq 50\mu A$  (180K~680K) ; IR $\leq 25\mu A$  (820K~182K)

## Electrical Ratings

| Items                              | Test Condition/Description                                                                                                                                                                                                                                                                                                                                                     | Requirement                 |              |              |              |               |                                    |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------|--------------|--------------|---------------|------------------------------------|
| Varistor Voltage                   | The voltage between two terminals with the specified measuring current 1mA.DC applied is called Vb.                                                                                                                                                                                                                                                                            | 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           | <p>The maximum voltage between two terminals with the specification standard impulse current.<br/>Applied waveform: 8/20μs</p>                                                                                                                                                              |                             |              |              |              |               |                                    |
| 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% with the standard impulse current (8/20μs) applied one time.                                                                                                                                                                                                                                                    |                             |              |              |              |               |                                    |
| Varistor Voltage Temp. Coefficient | $\left  \frac{V_{1mA@85^{\circ}C} - V_{1mA@25^{\circ}C}}{V_{1mA@25^{\circ}C}} \times \frac{1}{60} \times 100\% (\%/^{\circ}C) \right $ $\left  \frac{V_{1mA@-40^{\circ}C} - V_{1mA@25^{\circ}C}}{V_{1mA@25^{\circ}C}} \times \frac{1}{65} \times 100\% (\%/^{\circ}C) \right $                                                                                                 | ≤0.05%/°C                   |              |              |              |               |                                    |
| Surge Life                         | <p>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.</p> <table border="1" data-bbox="438 1892 1204 2016"> <tr> <td rowspan="2">14Φ series</td><td>180K to 680K</td><td>75A (8/20μs)</td></tr> <tr> <td>820K to 182K</td><td>150A (8/20μs)</td></tr> </table> | 14Φ series                  | 180K to 680K | 75A (8/20μs) | 820K to 182K | 150A (8/20μs) | $\frac{\Delta V_b}{V_b} \leq 10\%$ |
| 14Φ series                         | 180K to 680K                                                                                                                                                                                                                                                                                                                                                                   |                             | 75A (8/20μs) |              |              |               |                                    |
|                                    | 820K to 182K                                                                                                                                                                                                                                                                                                                                                                   | 150A (8/20μs)               |              |              |              |               |                                    |

## Soldering Recommendation

### Wave Lead Free Soldering Recommendation



| Item             | Conditions        |
|------------------|-------------------|
| Peak Temperature | 265°C             |
| Dipping Time     | 10 seconds (max.) |
| Soldering        | 1 time            |

### Recommendation Reworking Conditions with Soldering Iron

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

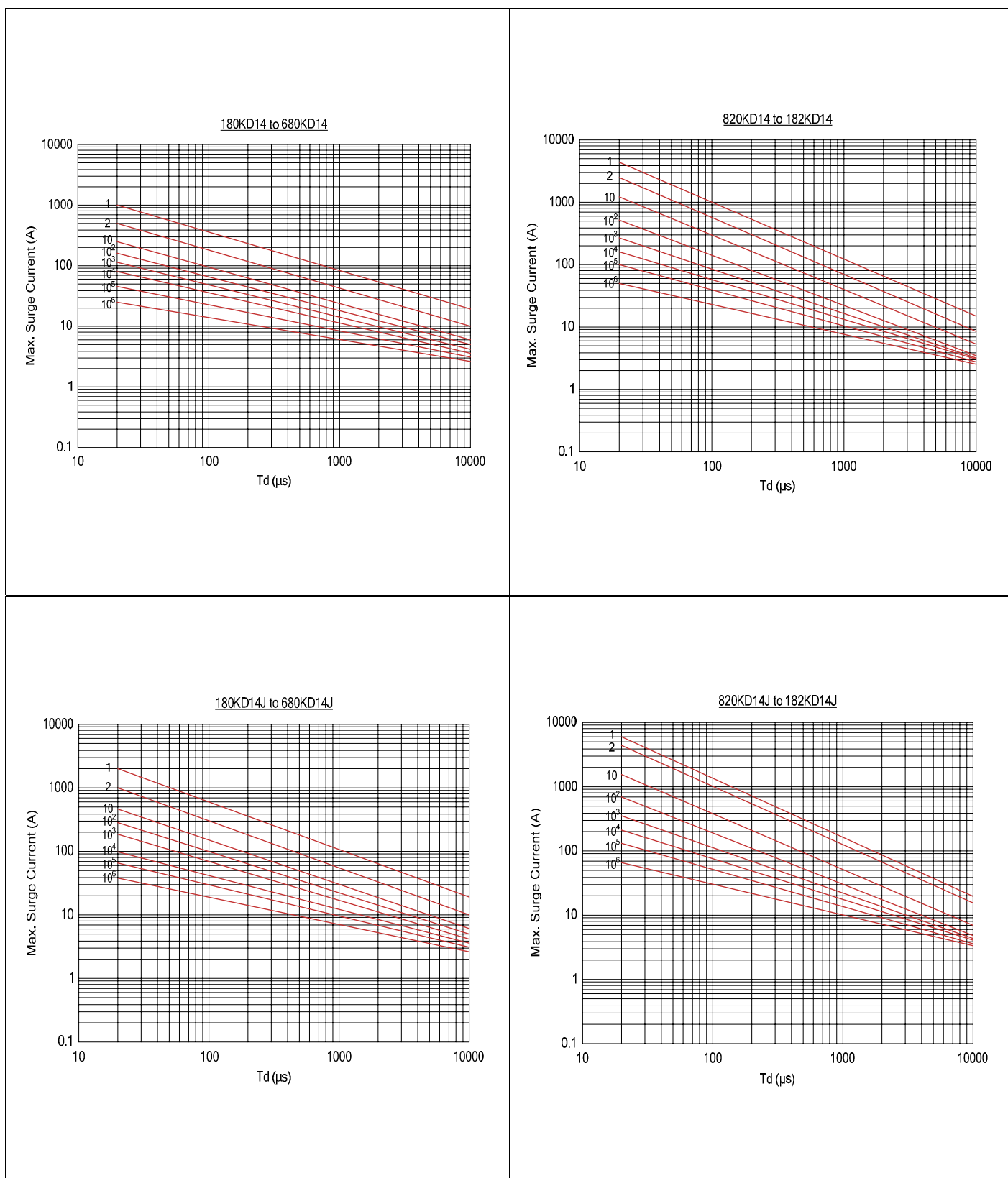
## Mechanical Characteristics

| Items                         | Test conditions / Methods                                                                                                                                                                                                                                                                                                                                                                                       | Specifications                                                                  |                   |           |     |            |     |        |     |                                                                                |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------|-----------|-----|------------|-----|--------|-----|--------------------------------------------------------------------------------|
| Tensile Strength of Terminals | <div>Gradually applying the force specified and keeping the unit fixed for 10±1 sec.</div> <table><tr><td><u>Terminal diameter (mm)</u></td><td><u>Force (kg)</u></td></tr><tr><td>0.5&lt;d≤0.8</td><td>1.0</td></tr><tr><td>0.8&lt;d≤1.25</td><td>2.0</td></tr><tr><td>1.25&lt;d</td><td>4.0</td></tr></table>                                                                                                 | <u>Terminal diameter (mm)</u>                                                   | <u>Force (kg)</u> | 0.5<d≤0.8 | 1.0 | 0.8<d≤1.25 | 2.0 | 1.25<d | 4.0 | <div>No visible damage</div> <div> ΔV<sub>1mA</sub>/V<sub>1mA</sub>  ≤5%</div> |
| <u>Terminal diameter (mm)</u> | <u>Force (kg)</u>                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                 |                   |           |     |            |     |        |     |                                                                                |
| 0.5<d≤0.8                     | 1.0                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                 |                   |           |     |            |     |        |     |                                                                                |
| 0.8<d≤1.25                    | 2.0                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                 |                   |           |     |            |     |        |     |                                                                                |
| 1.25<d                        | 4.0                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                 |                   |           |     |            |     |        |     |                                                                                |
| Bending Strength of Terminals | <div>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.</div> <table><tr><td><u>Terminal diameter (mm)</u></td><td><u>Force (kg)</u></td></tr><tr><td>0.5&lt;d≤0.8</td><td>0.5</td></tr><tr><td>0.8&lt;d≤1.25</td><td>1.0</td></tr><tr><td>1.25&lt;d</td><td>2.0</td></tr></table> | <u>Terminal diameter (mm)</u>                                                   | <u>Force (kg)</u> | 0.5<d≤0.8 | 0.5 | 0.8<d≤1.25 | 1.0 | 1.25<d | 2.0 | <div>No visible damage</div> <div> ΔV<sub>1mA</sub>/V<sub>1mA</sub>  ≤5%</div> |
| <u>Terminal diameter (mm)</u> | <u>Force (kg)</u>                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                 |                   |           |     |            |     |        |     |                                                                                |
| 0.5<d≤0.8                     | 0.5                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                 |                   |           |     |            |     |        |     |                                                                                |
| 0.8<d≤1.25                    | 1.0                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                 |                   |           |     |            |     |        |     |                                                                                |
| 1.25<d                        | 2.0                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                 |                   |           |     |            |     |        |     |                                                                                |
| Vibration                     | <div>Frequency range: 10~55 Hz</div> <div>Amplitude: 0.75mm or 98m/s<sup>2</sup></div> <div>Direction: 3 mutually perpendicular directions, 2hrs each.</div>                                                                                                                                                                                                                                                    | <div>No visible damage</div> <div> ΔV<sub>1mA</sub>/V<sub>1mA</sub>  ≤5%</div>  |                   |           |     |            |     |        |     |                                                                                |
| Solder ability                | <div>Solder Temp: 245±5℃</div> <div>Dipping Time: 2±0.5 sec</div>                                                                                                                                                                                                                                                                                                                                               | <div>At least 95% of terminal electrode is covered by new solder</div>          |                   |           |     |            |     |        |     |                                                                                |
| Resistance to Soldering Heat  | <div>Solder Temp: 260±5℃</div> <div>Dipping Time: 10±1 sec</div>                                                                                                                                                                                                                                                                                                                                                | <div>No visible damage</div> <div> ΔV<sub>1mA</sub>/V<sub>1mA</sub>  ≤10%</div> |                   |           |     |            |     |        |     |                                                                                |

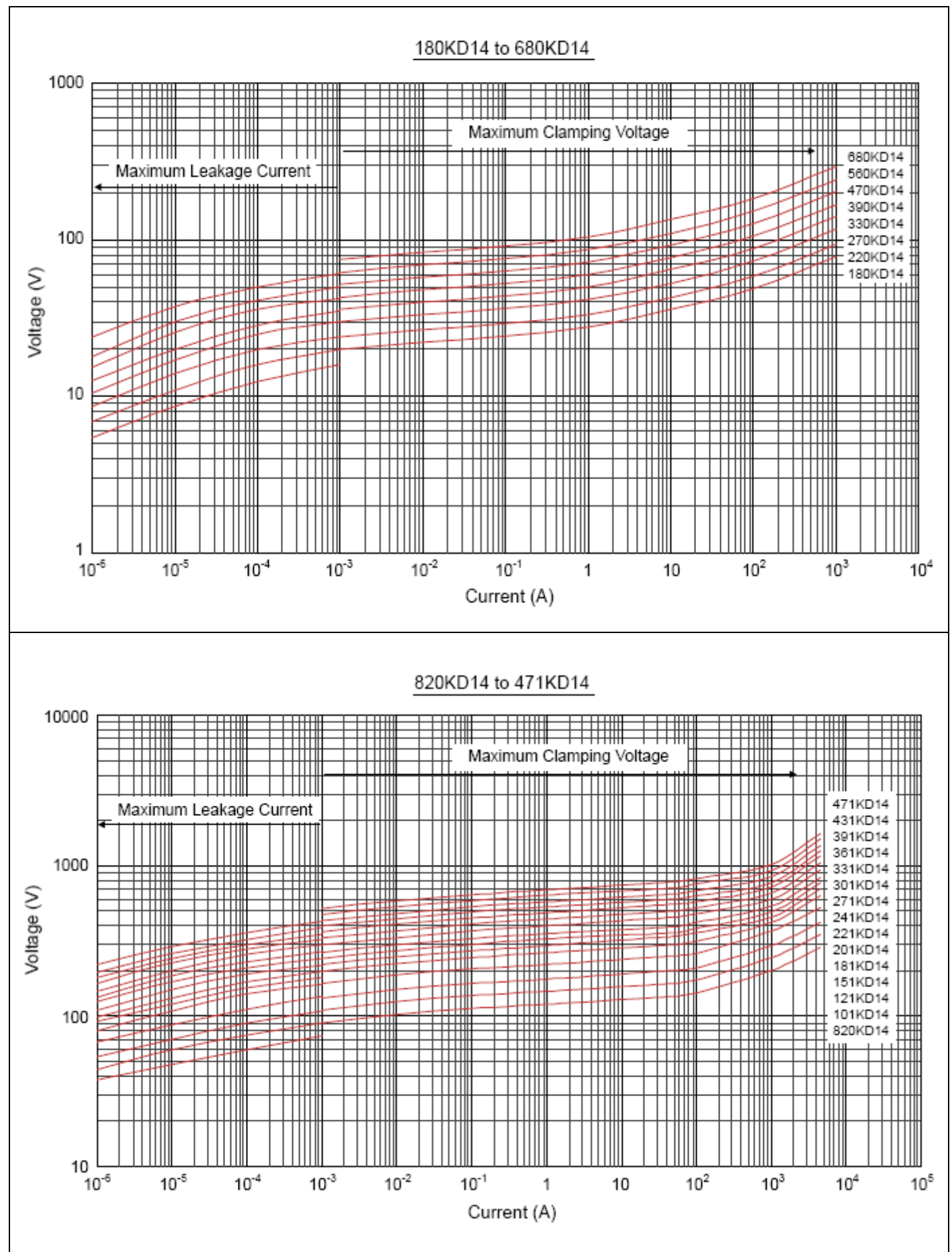
## Reliability

| Items                    | Test conditions / Methods                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Specifications                                            |                            |                  |   |            |           |   |                  |           |   |            |           |   |                  |           |                                                          |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------|------------------|---|------------|-----------|---|------------------|-----------|---|------------|-----------|---|------------------|-----------|----------------------------------------------------------|
| High Temperature Storage | Ambient Temp: $125\pm 2^\circ C$<br>Duration: 1000hrs                                                                                                                                                                                                                                                                                                                                                                                                                                        | $ \Delta V_{1mA}/V_{1mA}  \leq 5\%$                       |                            |                  |   |            |           |   |                  |           |   |            |           |   |                  |           |                                                          |
| Low Temperature Storage  | Ambient Temp: $-40\pm 2^\circ C$<br>Duration: 1000hrs                                                                                                                                                                                                                                                                                                                                                                                                                                        | $ \Delta V_{1mA}/V_{1mA}  \leq 5\%$                       |                            |                  |   |            |           |   |                  |           |   |            |           |   |                  |           |                                                          |
| Humidity                 | Ambient Temp: $40\pm 2^\circ C$ , 90~95% R.H.<br>Duration: 1000hrs                                                                                                                                                                                                                                                                                                                                                                                                                           | $ \Delta V_{1mA}/V_{1mA}  \leq 5\%$                       |                            |                  |   |            |           |   |                  |           |   |            |           |   |                  |           |                                                          |
| Temperature Cycle        | The conditions shown below shall be repeated 5 cycles<br><table> <tr> <th>Step</th><th>Temperature (<math>^\circ C</math>)</th><th>Period (minutes)</th></tr> <tr> <td>1</td><td><math>-40\pm 3</math></td><td><math>30\pm 3</math></td></tr> <tr> <td>2</td><td>Room temperature</td><td><math>15\pm 3</math></td></tr> <tr> <td>3</td><td><math>125\pm 3</math></td><td><math>30\pm 3</math></td></tr> <tr> <td>4</td><td>Room temperature</td><td><math>15\pm 3</math></td></tr> </table> | Step                                                      | Temperature ( $^\circ C$ ) | Period (minutes) | 1 | $-40\pm 3$ | $30\pm 3$ | 2 | Room temperature | $15\pm 3$ | 3 | $125\pm 3$ | $30\pm 3$ | 4 | Room temperature | $15\pm 3$ | No visible damage<br>$ \Delta V_{1mA}/V_{1mA}  \leq 5\%$ |
| Step                     | Temperature ( $^\circ C$ )                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Period (minutes)                                          |                            |                  |   |            |           |   |                  |           |   |            |           |   |                  |           |                                                          |
| 1                        | $-40\pm 3$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | $30\pm 3$                                                 |                            |                  |   |            |           |   |                  |           |   |            |           |   |                  |           |                                                          |
| 2                        | Room temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | $15\pm 3$                                                 |                            |                  |   |            |           |   |                  |           |   |            |           |   |                  |           |                                                          |
| 3                        | $125\pm 3$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | $30\pm 3$                                                 |                            |                  |   |            |           |   |                  |           |   |            |           |   |                  |           |                                                          |
| 4                        | Room temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | $15\pm 3$                                                 |                            |                  |   |            |           |   |                  |           |   |            |           |   |                  |           |                                                          |
| High Temperature Load    | Ambient Temp: $105\pm 2^\circ C$ Duration: 1000hrs<br>Load: Max. Allowable Voltage In AC eara.                                                                                                                                                                                                                                                                                                                                                                                               | $ \Delta V_{1mA}/V_{1mA}  \leq 10\%$                      |                            |                  |   |            |           |   |                  |           |   |            |           |   |                  |           |                                                          |
| Damp Heat Load           | Ambient Temp: $40\pm 2^\circ C$ , 90~95% R.H.<br>Duration: 1000hrs    Load: Max. Allowable Voltage                                                                                                                                                                                                                                                                                                                                                                                           | No visible damage<br>$ \Delta V_{1mA}/V_{1mA}  \leq 10\%$ |                            |                  |   |            |           |   |                  |           |   |            |           |   |                  |           |                                                          |
| Voltage Proof            | Metal balls method, 2500Vac 1 min.                                                                                                                                                                                                                                                                                                                                                                                                                                                           | No visible damage                                         |                            |                  |   |            |           |   |                  |           |   |            |           |   |                  |           |                                                          |

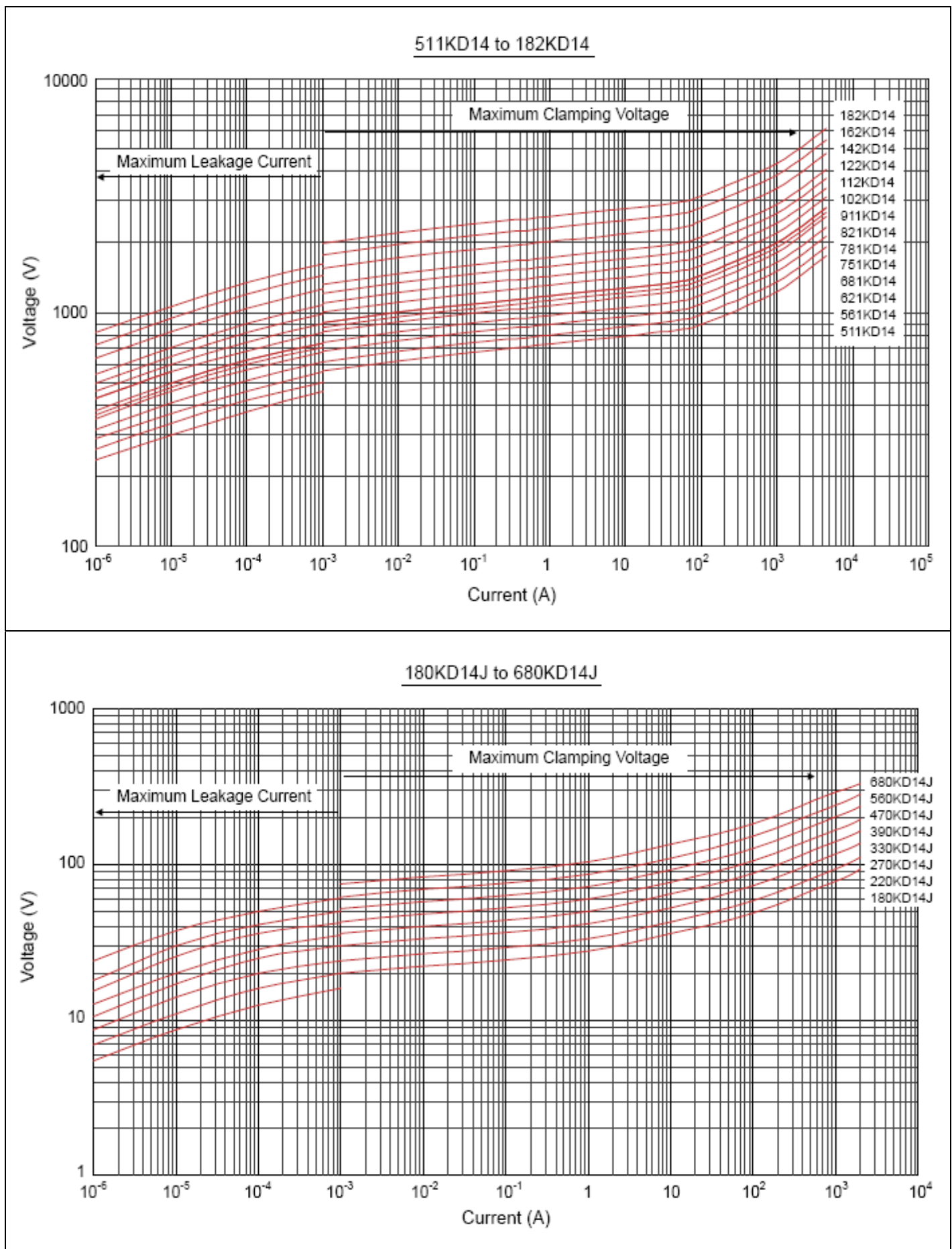
## Maximum Surge Current Derating Curve



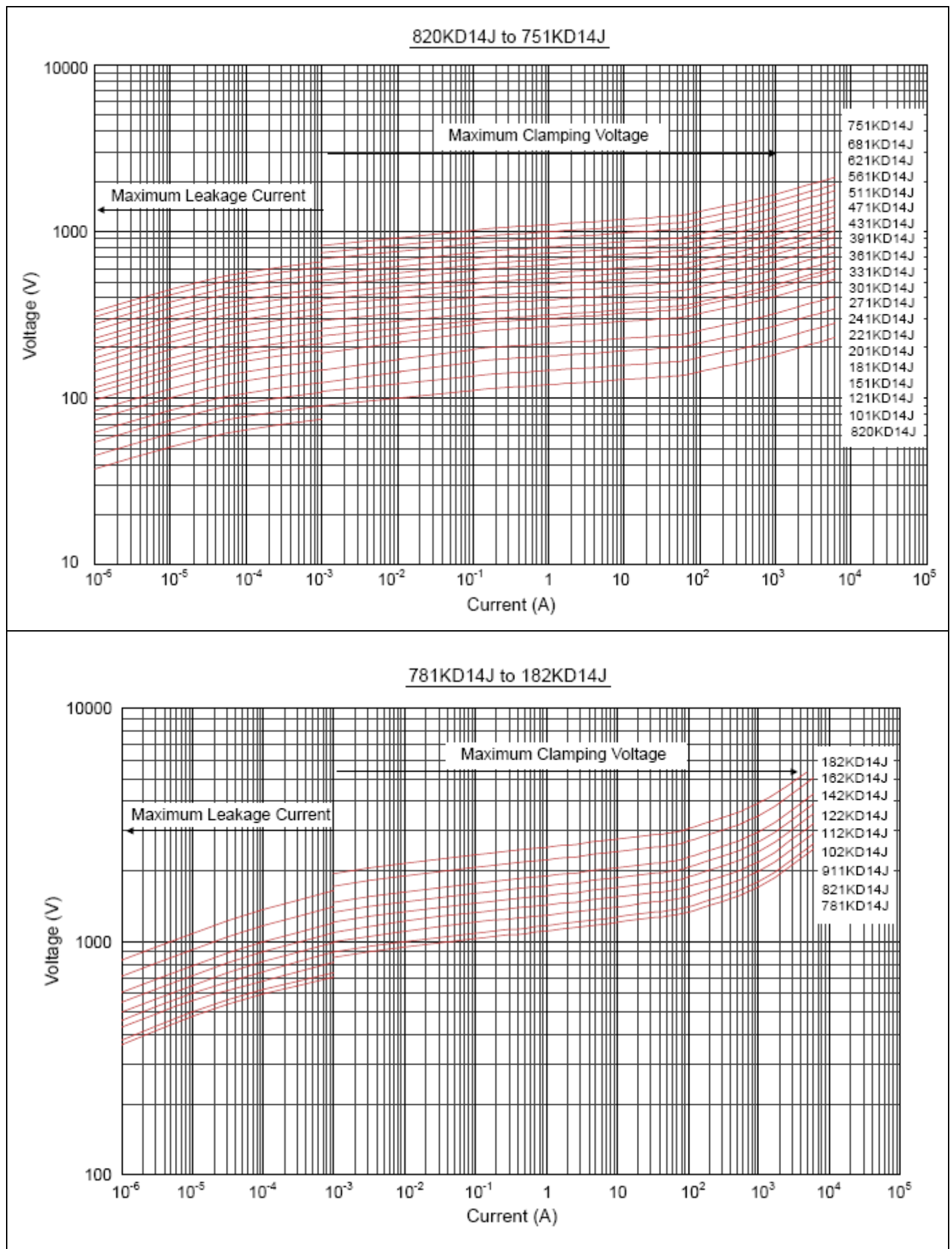
## Maximum Leakage Current and Maximum Clamping Voltage Curve



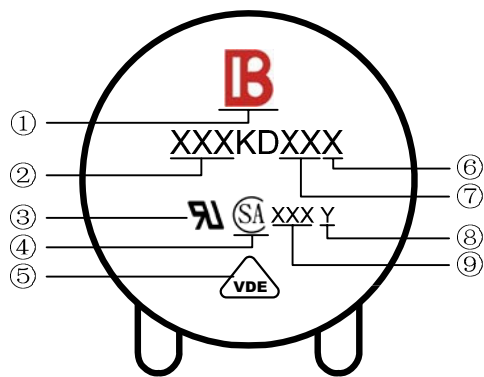
## Maximum Leakage Current and Maximum Clamping Voltage Curve



## Maximum Leakage Current and Maximum Clamping Voltage Curve

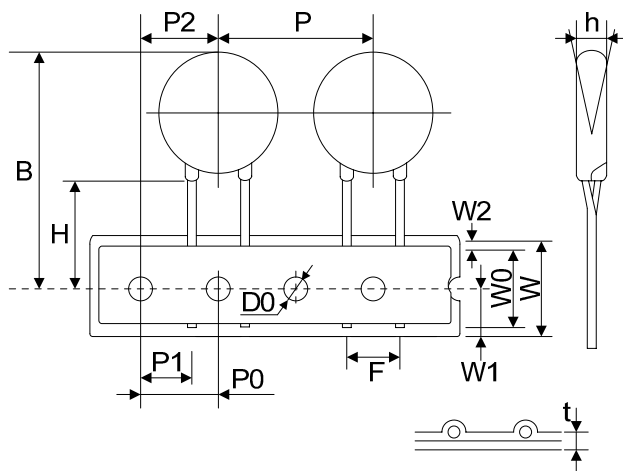


## Marking Code



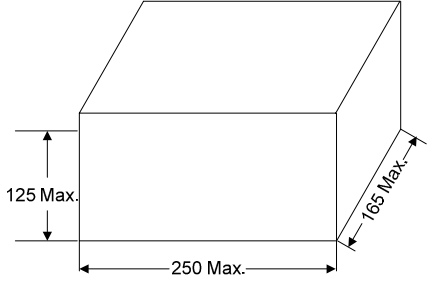
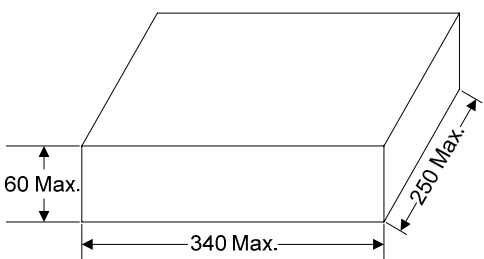
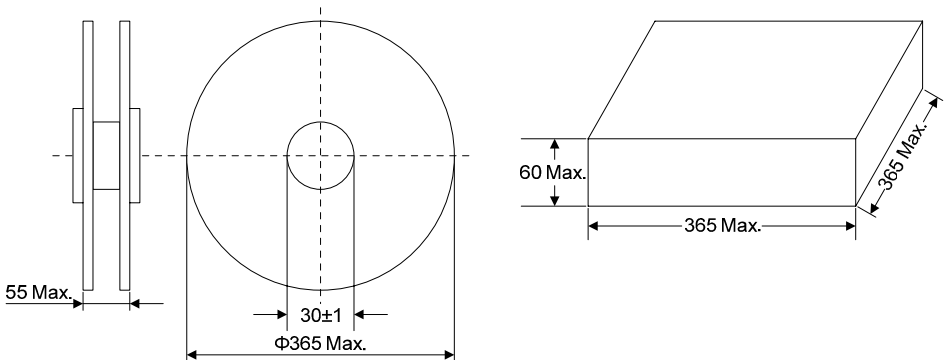
- ① Brightking Logo
- ② Varistor Voltage
- ③ UL Accreditation Logo
- ④ CSA Accreditation Logo
- ⑤ VDE Accreditation Logo
- ⑥ “J” is High Surge Code, no “J” is Standard Surge
- ⑦ Disk Size
- ⑧ Product Line Code (“Y” may be A(a) thru Z(z))
- ⑨ Date Code

## Taping Dimensions



| Symbol | Dimensions (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        |
| D0     | 4.0±0.2         |
| t      | 0.6±0.3         |
| B      | 40max           |

## Quantity

| Packaging Dimensions (Unit: mm)                                                                                | Quantity                               |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Exposure in bulk<br><br>      | 400pcs/bag<br>4bags/box<br>(180K~331K) |
|                                                                                                                | 300pcs/bag<br>4bags/box<br>(361K~621K) |
|                                                                                                                | 250pcs/bag<br>4bags/box<br>(681K~112K) |
|                                                                                                                | 150pcs/bag<br>4bags/box<br>(122K~182K) |
| Cut the feet in bulk<br><br> | 400pcs/bag<br>4bags/box<br>(180K~331K) |
|                                                                                                                | 300pcs/bag<br>4bags/box<br>(361K~621K) |
|                                                                                                                | 250pcs/bag<br>4bags/box<br>(681K~112K) |
|                                                                                                                | 150pcs/bag<br>4bags/box<br>(122K~182K) |
| Tape & Box<br><br>          | 750pcs/box<br>(180K~331K)              |
|                                                                                                                | 500pcs/box<br>(361K~621K)              |
|                                                                                                                | 400pcs/box<br>(681K~751K)              |
| Tape & Reel<br><br>        | 1000pcs/reel<br>(180K~331K)            |
|                                                                                                                | 750pcs/reel<br>(361K~621K)             |
|                                                                                                                | 500pcs/reel<br>(681K~751K)             |