



## Description

Metal Oxide Varistor (MOV) as one nonlinear resistance element is mainly made of zinc oxide (ZnO), which has very high surge capacity and big nonlinear coefficient. Below the threshold voltage, its resistance is very high, nearly no current flows through, but above the threshold voltage, the resistance reduces sharply, huge current can be discharged. Due to this characteristic, varistor as a protection component in electronic and electrical equipment can absorb abnormal over-voltage and lightning surge.

SETsafe | SETfuse varistor is with High Surge Current Density, Low Clamping Voltage, and Good Surge Capacity. It can also be customized as required.

## Features

- Epoxy Resin Coating
- Silicone Resin Coating
- Low Leakage Current
- Bidirectional and Symmetrical V/I Characteristics
- RoHS & REACH Compliant
- Operating Temperature Range

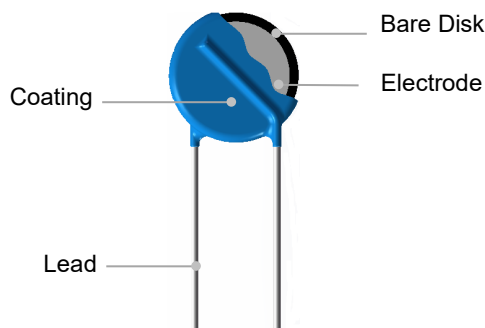
Low Temperature: -40 °C

High Temperature: +85 °C / +105 °C

## Applications

- Power Supplies
- Home Electrical Appliances
- Industrial Devices
- Surge Protectors
- Telecom Devices

## Product Structure



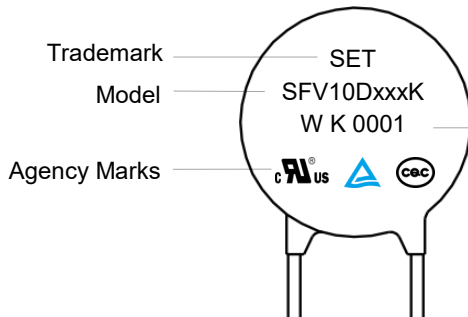
## Lead Types

| Lead Types |                      | Codes |
|------------|----------------------|-------|
|            | Straight Lead        | A     |
|            | Inward Crimp Lead    | B     |
|            | Outward Crimp Lead   | C     |
|            | Inline Crimp Lead    | D     |
|            | Little Straight Lead | I     |

## Agency Approvals

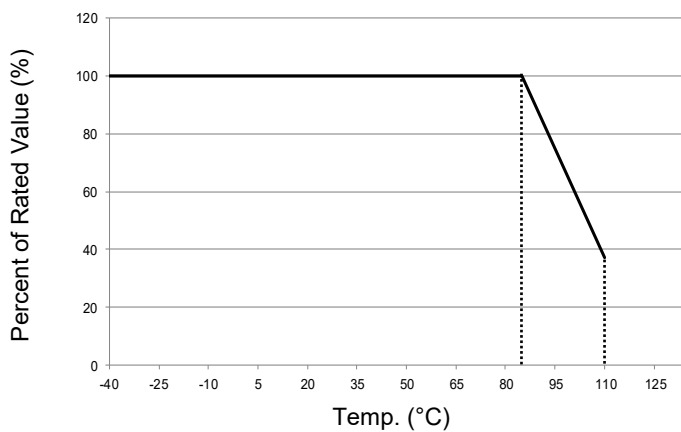
| Agency | Standards                                                                                                           | No.        |
|--------|---------------------------------------------------------------------------------------------------------------------|------------|
|        | UL 1449 4 <sup>th</sup> Edition                                                                                     | on request |
|        | CSA C22.2 NO.269.5-17                                                                                               | on request |
|        | EN 61051-1:2008<br>IEC 61051-1:2007<br>IEC 61051-2:1991+A1<br>IEC 61051-2-2:1991<br>Annex G.8.1 of IEC 62368-1:2018 | on request |
|        | GB/T 10193-1997<br>GB/T 10194-1997<br>GB 4943.1-2011<br>GB 8898-2011                                                | on request |

### Marking



| Internal code |                                                        |
|---------------|--------------------------------------------------------|
| Year Code     | 2000—A                                                 |
|               | .....                                                  |
|               | 2022—W                                                 |
| Surge Level   | S: Normal Type<br>K: Standard Type<br>Q: Advanced Type |
| Serial No.    | (E.G.: 0001)                                           |

### Temp. Derating Curve



For Normal Temp. Series

Note:

When ambient Temp. exceeds 85 °C, the peak surg current and energy rating should be reduced as shown in the left curve.

### General Technical Data

| tem                   | Value       | Unit            |
|-----------------------|-------------|-----------------|
| Operating Temperature | -40 to +85  | °C              |
| Storage Temperature   | -40 to +125 | °C              |
| Voltage Proof         | ≥2500       | V <sub>ac</sub> |
| Insulation Resistance | ≥100        | MΩ              |

## Part Numbering System

SFV 10 D 471 - K T K A BUL - 001

### Other Options

#### \*Packaging & Lead Length

BUL: Bulk + Standard Lead Length (Normal L28)  
 C35: Bulk + Cut to 3.5 mm  
 (Range: 2.5 mm to 6 mm)  
 L30: Bulk + Special Lead Length 30 mm  
 (28 mm to 32 mm)  
 (0/1)AB: Taping + Box (Hole Pitch 12.7 mm)  
 (0/1)EB: Taping + Box (Hole Pitch 15.0 mm)  
 (0/1)AR: Taping + Reel (Hole Pitch 12.7 mm)  
 (0/1)ER: Taping + Reel (Hole Pitch 15.0 mm)  
 Note: 0/1 Means Product Position  
 0: In Middle of Two Holes; 1: Across the Hole

#### Lead Types

A: Straight Lead  
 B: Inward Crimp Lead  
 C: Outward Crimp Lead  
 D: Inline Crimp Lead  
 I: Little Straight Lead

#### Surge Level

S: Normal Type  
 K: Standard Type  
 Q: Advanced Type

#### Operating Temp.

N: Epoxy Coating 85 °C  
 P: Epoxy Coating 105 °C  
 M: Epoxy Coating 125 °C  
 T: Silicone Coating 125 °C

#### Voltage Tolerance

K: ±10%  
 J: ±5%  
 S: Special Tolerance

#### Nominal Varistor Voltage

220:  $22 \times 10^0 = 22 \text{ V}$   
 471:  $47 \times 10^1 = 470 \text{ V}$   
 122:  $12 \times 10^2 = 1200 \text{ V}$

#### Disk Shape

D: Round

#### Bare Disk Dimension

10: 10 mm

#### Product Category

SETfuse Varistor

\*For more details refer to packaging information.

### Glossary

| Item                     | Description                                                                                                                                                                                                                           |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $V_N$                    | <b>Nominal Varistor Voltage</b><br>Voltage, at specified D.C. current used as a reference point in the component characteristics.                                                                                                     |
| $I_L$                    | <b>Leakage Current</b><br>Measuring at 75% of varistor voltage.                                                                                                                                                                       |
| UCT                      | <b>Upper Category Temp.</b><br>Max. ambient temp. for which a varistor has been designed to operate continuously.                                                                                                                     |
| LCT                      | <b>Lower Category Temp.</b><br>Minimum ambient temp. at which a varistor has been designed to operate continuously.                                                                                                                   |
| <b>Max. Peak Current</b> | <b>Max. Peak Current</b><br>Max. current per pulse, which may be passed by a varistor at an ambient temp. of 25 °C, for a given number of pulses.                                                                                     |
| $V_C$                    | <b>Clamping Voltage</b><br>Peak voltage developed across the varistor terminations under standard atmospheric conditions, when passing an 8/20 µs class current pulse.                                                                |
| <b>Voltage Proof</b>     | <b>Voltage Proof</b><br>Max. peak voltage, which may be applied under continuous operating conditions between the varistor terminations and any conducting mounting surface (Applicable only to insulated varistors).                 |
| $C_V$                    | <b>Capacitance</b><br>Capacitance across the MOV measured at a specified frequency and voltage.                                                                                                                                       |
| $V_{ac}$                 | <b>Max. Continuous a.c. Voltage</b><br>Max. a.c. r.m.s. voltage of a substantially sinusoidal waveform (less than 5% total harmonic distortion) which can be applied to the component under continuous operating conditions at 25 °C. |
| $V_{dc}$                 | <b>Max. Continuous d.c. Voltage</b><br>Max. d.c. voltage (with less than 5% ripple) which can be applied to the component under continuous operating conditions at an ambient temp. of 25 °C.                                         |

### Specification

| Model      | Surge Level | Max. Continuous Operating Voltage |     | Varistor Voltage @1 mA DC |      | Clamping Voltage (Max.) |                | Max. Peak Current (1 time, 8/20 μs) | Max. Energy (10/1000 μs) | Typical Capacitance (For reference only ) @1 kHz | Agency Approvals                                                                    |                                                                                     |                                                                                     |                                                                                     |
|------------|-------------|-----------------------------------|-----|---------------------------|------|-------------------------|----------------|-------------------------------------|--------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|            |             | Vac                               | Vdc | Min.                      | Max. | V <sub>C</sub>          | I <sub>P</sub> | K                                   |                          | (pF)                                             |  |  |  |  |
|            |             | (V)                               | (V) | (V)                       | (V)  | (V)                     | (A)            | (kA)                                | (J)                      |                                                  | UL                                                                                  | cUL                                                                                 | TUV                                                                                 | CQC                                                                                 |
| SFV10D220K | S           | 14                                | 18  | 20                        | 24   | 43                      | 5              | 0.5                                 | 2.5                      | 4500                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D270K | S           | 17                                | 22  | 24                        | 31   | 53                      | 5              | 0.5                                 | 3.0                      | 3700                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D330K | S           | 20                                | 26  | 30                        | 36   | 65                      | 5              | 0.5                                 | 4.0                      | 3000                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D390K | S           | 25                                | 31  | 35                        | 43   | 77                      | 5              | 0.5                                 | 4.6                      | 2400                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D470K | S           | 30                                | 38  | 42                        | 52   | 93                      | 5              | 0.5                                 | 5.5                      | 2100                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D560K | S           | 35                                | 45  | 50                        | 62   | 110                     | 5              | 0.5                                 | 7.0                      | 1800                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D680K | S           | 40                                | 56  | 61                        | 75   | 135                     | 5              | 0.5                                 | 8.2                      | 1500                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D820K | S           | 50                                | 65  | 74                        | 90   | 135                     | 25             | 2.5                                 | 12                       | 1200                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D101K | S           | 60                                | 85  | 90                        | 110  | 165                     | 25             | 2.5                                 | 15                       | 1000                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D121K | S           | 75                                | 100 | 108                       | 132  | 200                     | 25             | 2.5                                 | 18                       | 830                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D151K | S           | 95                                | 125 | 135                       | 165  | 250                     | 25             | 2.5                                 | 22                       | 670                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D181K | S           | 115                               | 150 | 162                       | 198  | 300                     | 25             | 2.5                                 | 27                       | 560                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D201K | S           | 130                               | 170 | 180                       | 220  | 340                     | 25             | 2.5                                 | 30                       | 500                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D221K | S           | 140                               | 180 | 198                       | 242  | 360                     | 25             | 2.5                                 | 32                       | 450                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D241K | S           | 150                               | 200 | 216                       | 264  | 395                     | 25             | 2.5                                 | 35                       | 420                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D271K | S           | 175                               | 225 | 243                       | 297  | 455                     | 25             | 2.5                                 | 40                       | 370                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D301K | S           | 190                               | 250 | 270                       | 330  | 500                     | 25             | 2.5                                 | 40                       | 330                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D331K | S           | 210                               | 275 | 297                       | 363  | 550                     | 25             | 2.5                                 | 43                       | 300                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D361K | S           | 230                               | 300 | 324                       | 396  | 595                     | 25             | 2.5                                 | 47                       | 280                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D391K | S           | 250                               | 320 | 351                       | 429  | 650                     | 25             | 2.5                                 | 60                       | 260                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D431K | S           | 275                               | 350 | 387                       | 473  | 710                     | 25             | 2.5                                 | 65                       | 230                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D471K | S           | 300                               | 385 | 423                       | 517  | 775                     | 25             | 2.5                                 | 70                       | 210                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D511K | S           | 320                               | 415 | 459                       | 561  | 845                     | 25             | 2.5                                 | 70                       | 200                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D561K | S           | 350                               | 460 | 504                       | 616  | 925                     | 25             | 2.5                                 | 70                       | 180                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D621K | S           | 385                               | 505 | 558                       | 682  | 1025                    | 25             | 2.5                                 | 70                       | 160                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D681K | S           | 420                               | 560 | 612                       | 748  | 1120                    | 25             | 2.5                                 | 70                       | 150                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D751K | S           | 460                               | 615 | 675                       | 825  | 1240                    | 25             | 2.5                                 | 75                       | 130                                              | ●                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                   |
| SFV10D821K | S           | 510                               | 670 | 738                       | 902  | 1355                    | 25             | 2.5                                 | 85                       | 120                                              | ●                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                   |
| SFV10D911K | S           | 550                               | 745 | 819                       | 1001 | 1500                    | 25             | 2.5                                 | 93                       | 110                                              | ●                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                   |
| SFV10D102K | S           | 625                               | 825 | 900                       | 1100 | 1650                    | 25             | 2.5                                 | 102                      | 100                                              | ●                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                   |
| SFV10D112K | S           | 680                               | 895 | 990                       | 1210 | 1815                    | 25             | 2.5                                 | 115                      | 90                                               | ●                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                   |
| SFV10D122K | S           | 750                               | 990 | 1080                      | 1320 | 1980                    | 25             | 2.5                                 | 125                      | 55                                               | ●                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                   |

### Specification

| Model      | Surge Level | Max. Continuous Operating Voltage |     | Varistor Voltage @1 mA DC |      | Clamping Voltage (Max.) |                | Max. Peak Current (1 time, 8/20 μs) | Max. Energy (10/1000 μs) | Typical Capacitance (For reference only ) @1 kHz | Agency Approvals                                                                    |                                                                                     |                                                                                     |                                                                                     |
|------------|-------------|-----------------------------------|-----|---------------------------|------|-------------------------|----------------|-------------------------------------|--------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|            |             | Vac                               | Vdc | Min.                      | Max. | V <sub>C</sub>          | I <sub>P</sub> | K                                   |                          | (pF)                                             |  |  |  |  |
|            |             | (V)                               | (V) | (V)                       | (V)  | (V)                     | (A)            | (kA)                                | (J)                      |                                                  | UL                                                                                  | cUL                                                                                 | TUV                                                                                 | CQC                                                                                 |
| SFV10D220K | K           | 14                                | 18  | 20                        | 24   | 43                      | 5              | 1.0                                 | 3.2                      | 4500                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D270K | K           | 17                                | 22  | 24                        | 31   | 53                      | 5              | 1.0                                 | 3.9                      | 3700                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D330K | K           | 20                                | 26  | 30                        | 36   | 65                      | 5              | 1.0                                 | 4.8                      | 3000                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D390K | K           | 25                                | 31  | 35                        | 43   | 77                      | 5              | 1.0                                 | 5.6                      | 2400                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D470K | K           | 30                                | 38  | 42                        | 52   | 93                      | 5              | 1.0                                 | 6.8                      | 2100                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D560K | K           | 35                                | 45  | 50                        | 62   | 110                     | 5              | 1.0                                 | 8.1                      | 1800                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D680K | K           | 40                                | 56  | 61                        | 75   | 135                     | 5              | 1.0                                 | 9.8                      | 1500                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D820K | K           | 50                                | 65  | 74                        | 90   | 135                     | 25             | 3.5                                 | 14                       | 1200                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D101K | K           | 60                                | 85  | 90                        | 110  | 165                     | 25             | 3.5                                 | 17                       | 1000                                             | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D121K | K           | 75                                | 100 | 108                       | 132  | 200                     | 25             | 3.5                                 | 20                       | 830                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D151K | K           | 95                                | 125 | 135                       | 165  | 250                     | 25             | 3.5                                 | 25                       | 670                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D181K | K           | 115                               | 150 | 162                       | 198  | 300                     | 25             | 3.5                                 | 30                       | 560                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D201K | K           | 130                               | 170 | 180                       | 220  | 340                     | 25             | 3.5                                 | 35                       | 500                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D221K | K           | 140                               | 180 | 198                       | 242  | 360                     | 25             | 3.5                                 | 39                       | 450                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D241K | K           | 150                               | 200 | 216                       | 264  | 395                     | 25             | 3.5                                 | 42                       | 420                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D271K | K           | 175                               | 225 | 243                       | 297  | 455                     | 25             | 3.5                                 | 49                       | 370                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D301K | K           | 190                               | 250 | 270                       | 330  | 500                     | 25             | 3.5                                 | 54                       | 330                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D331K | K           | 210                               | 275 | 297                       | 363  | 550                     | 25             | 3.5                                 | 58                       | 300                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D361K | K           | 230                               | 300 | 324                       | 396  | 595                     | 25             | 3.5                                 | 65                       | 280                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D391K | K           | 250                               | 320 | 351                       | 429  | 650                     | 25             | 3.5                                 | 70                       | 260                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D431K | K           | 275                               | 350 | 387                       | 473  | 710                     | 25             | 3.5                                 | 80                       | 230                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D471K | K           | 300                               | 385 | 423                       | 517  | 775                     | 25             | 3.5                                 | 85                       | 210                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D511K | K           | 320                               | 415 | 459                       | 561  | 845                     | 25             | 3.5                                 | 90                       | 200                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D561K | K           | 350                               | 460 | 504                       | 616  | 925                     | 25             | 3.5                                 | 92                       | 180                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D621K | K           | 385                               | 505 | 558                       | 682  | 1025                    | 25             | 3.5                                 | 95                       | 160                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D681K | K           | 420                               | 560 | 612                       | 748  | 1120                    | 25             | 3.5                                 | 98                       | 150                                              | ●                                                                                   | ●                                                                                   | ●                                                                                   | ●                                                                                   |
| SFV10D751K | K           | 460                               | 615 | 675                       | 825  | 1240                    | 25             | 3.5                                 | 100                      | 130                                              | ●                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                   |
| SFV10D821K | K           | 510                               | 670 | 738                       | 902  | 1355                    | 25             | 3.5                                 | 110                      | 120                                              | ●                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                   |
| SFV10D911K | K           | 550                               | 745 | 819                       | 1001 | 1500                    | 25             | 3.5                                 | 130                      | 110                                              | ●                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                   |
| SFV10D102K | K           | 625                               | 825 | 900                       | 1100 | 1650                    | 25             | 3.5                                 | 140                      | 100                                              | ●                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                   |
| SFV10D112K | K           | 680                               | 895 | 990                       | 1210 | 1815                    | 25             | 3.5                                 | 155                      | 90                                               | ●                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                   |
| SFV10D122K | K           | 750                               | 990 | 1080                      | 1320 | 1980                    | 25             | 3.5                                 | 170                      | 55                                               | ●                                                                                   | ●                                                                                   | ○                                                                                   | ●                                                                                   |

### Specification

| Model      | Surge Level | Max. Continuous Operating Voltage |     | Varistor Voltage @1 mA DC |      | Clamping Voltage (Max.) |                | Pulse Impact Performance (40 times) (1.2/50 μs & 8/20 μs) | Max. Energy (10/1000 μs) | Typical Capacitance (For reference only ) @1 kHz | Agency Approvals |     |                                                                                        |                                                                                         |
|------------|-------------|-----------------------------------|-----|---------------------------|------|-------------------------|----------------|-----------------------------------------------------------|--------------------------|--------------------------------------------------|------------------|-----|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
|            |             | Vac                               | Vdc | Min.                      | Max. | V <sub>C</sub>          | I <sub>P</sub> |                                                           |                          |                                                  |                  |     |                                                                                        |                                                                                         |
|            |             | (V)                               | (V) | (V)                       | (V)  | (V)                     | (A)            |                                                           |                          |                                                  | (kV)             | (J) |  UL |  cUL |
| SFV10D201K | Q           | 130                               | 170 | 180                       | 220  | 340                     | 25             | 4.5                                                       | 35                       | 500                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |
| SFV10D221K | Q           | 140                               | 180 | 198                       | 242  | 360                     | 25             | 4.5                                                       | 39                       | 450                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |
| SFV10D241K | Q           | 150                               | 200 | 216                       | 264  | 395                     | 25             | 4.5                                                       | 42                       | 420                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |
| SFV10D271K | Q           | 175                               | 225 | 243                       | 297  | 455                     | 25             | 4.5                                                       | 49                       | 370                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |
| SFV10D301K | Q           | 190                               | 250 | 270                       | 330  | 500                     | 25             | 4.5                                                       | 54                       | 330                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |
| SFV10D331K | Q           | 210                               | 275 | 297                       | 363  | 550                     | 25             | 4.5                                                       | 58                       | 300                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |
| SFV10D361K | Q           | 230                               | 300 | 324                       | 396  | 595                     | 25             | 4.5                                                       | 65                       | 280                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |
| SFV10D391K | Q           | 250                               | 320 | 351                       | 429  | 650                     | 25             | 4.5                                                       | 70                       | 260                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |
| SFV10D431K | Q           | 275                               | 350 | 387                       | 473  | 710                     | 25             | 4.5                                                       | 80                       | 230                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |
| SFV10D471K | Q           | 300                               | 385 | 423                       | 517  | 775                     | 25             | 4.5                                                       | 85                       | 210                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |
| SFV10D511K | Q           | 320                               | 415 | 459                       | 561  | 845                     | 25             | 4.5                                                       | 90                       | 200                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |
| SFV10D561K | Q           | 350                               | 460 | 504                       | 616  | 925                     | 25             | 4.5                                                       | 92                       | 180                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |
| SFV10D621K | Q           | 385                               | 505 | 558                       | 682  | 1025                    | 25             | 4.5                                                       | 95                       | 160                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |
| SFV10D681K | Q           | 420                               | 560 | 612                       | 748  | 1120                    | 25             | 4.5                                                       | 98                       | 150                                              | ●                | ●   | ●                                                                                      | ●                                                                                       |

MOV

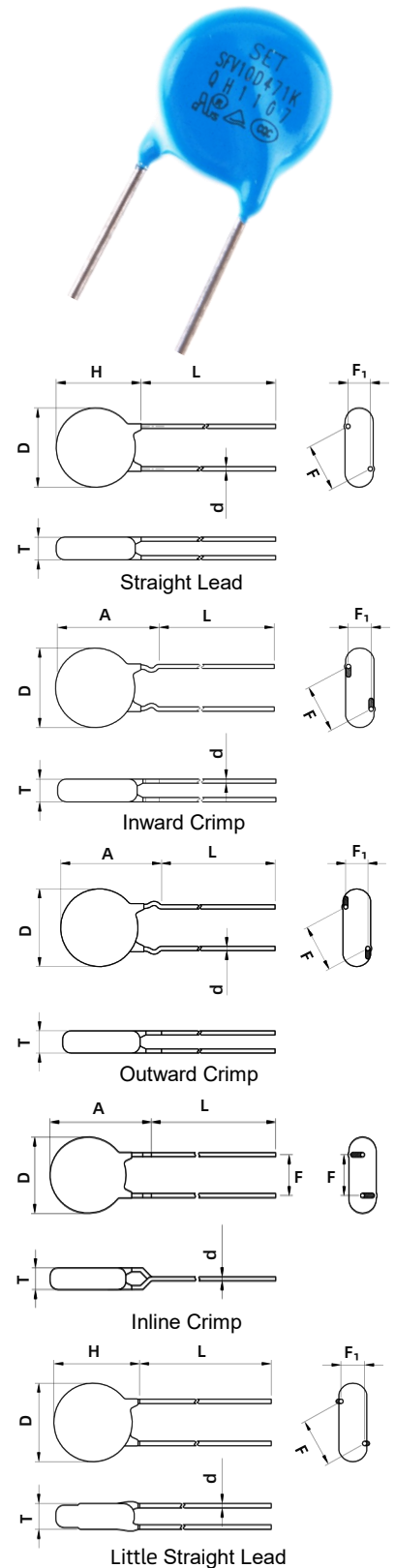
MOV

### Dimensions (mm)

| Model      | L<br>(Min.) | H<br>(Max.) | T<br>(Max.) | D<br>(Max.) | d         | F       | F <sub>1</sub> | A<br>(Max.) |
|------------|-------------|-------------|-------------|-------------|-----------|---------|----------------|-------------|
| SFV10D220K | 20          | 15.5        | 4.5         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.1 - 2.5      | 17.5        |
| SFV10D270K | 20          | 15.5        | 4.8         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.2 - 2.7      | 17.5        |
| SFV10D330K | 20          | 15.5        | 5.1         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.3 - 2.9      | 17.5        |
| SFV10D390K | 20          | 15.5        | 5.4         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.4 - 3.1      | 17.5        |
| SFV10D470K | 20          | 15.5        | 4.6         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.2 - 2.7      | 17.5        |
| SFV10D560K | 20          | 15.5        | 4.8         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.3 - 2.9      | 17.5        |
| SFV10D680K | 20          | 15.5        | 5.1         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.5 - 3.2      | 17.5        |
| SFV10D820K | 20          | 15.5        | 4.4         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.2 - 2.6      | 17.5        |
| SFV10D101K | 20          | 15.5        | 4.6         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.3 - 2.8      | 17.5        |
| SFV10D121K | 20          | 15.5        | 4.8         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.4 - 3.0      | 17.5        |
| SFV10D151K | 20          | 15.5        | 5.1         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.6 - 3.3      | 17.5        |
| SFV10D181K | 20          | 15.5        | 4.4         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.2 - 2.7      | 17.5        |
| SFV10D201K | 20          | 15.5        | 4.6         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.3 - 2.9      | 17.5        |
| SFV10D221K | 20          | 15.5        | 4.7         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.4 - 3.0      | 17.5        |
| SFV10D241K | 20          | 15.5        | 4.8         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.4 - 3.1      | 17.5        |
| SFV10D271K | 20          | 15.5        | 4.9         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.5 - 3.2      | 17.5        |
| SFV10D301K | 20          | 15.5        | 5.1         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.6 - 3.4      | 17.5        |
| SFV10D331K | 20          | 15.5        | 5.3         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.7 - 3.5      | 17.5        |
| SFV10D361K | 20          | 15.5        | 5.4         | 12.5        | 0.80±0.05 | 7.5±0.6 | 1.9 - 3.7      | 17.5        |
| SFV10D391K | 20          | 15.5        | 5.6         | 12.5        | 0.80±0.05 | 7.5±0.6 | 2.0 - 3.9      | 17.5        |
| SFV10D431K | 20          | 15.5        | 5.8         | 12.5        | 0.80±0.05 | 7.5±0.6 | 2.1 - 4.1      | 17.5        |
| SFV10D471K | 20          | 15.5        | 6.1         | 12.5        | 0.80±0.05 | 7.5±0.6 | 2.3 - 4.3      | 17.5        |
| SFV10D511K | 20          | 15.5        | 6.3         | 12.5        | 0.80±0.05 | 7.5±0.6 | 2.5 - 4.5      | 17.5        |
| SFV10D561K | 20          | 15.5        | 6.6         | 12.5        | 0.80±0.05 | 7.5±0.6 | 2.7 - 4.7      | 17.5        |
| SFV10D621K | 20          | 15.5        | 6.9         | 12.5        | 0.80±0.05 | 7.5±0.6 | 3.1 - 5.1      | 17.5        |
| SFV10D681K | 20          | 15.5        | 7.2         | 12.5        | 0.80±0.05 | 7.5±0.6 | 3.4 - 5.4      | 17.5        |
| SFV10D751K | 20          | 15.5        | 7.6         | 12.5        | 0.80±0.05 | 7.5±0.6 | 3.7 - 5.7      | 17.5        |
| SFV10D821K | 20          | 15.5        | 8.0         | 12.5        | 0.80±0.05 | 7.5±0.6 | 4.1 - 6.1      | 17.5        |
| SFV10D911K | 20          | 15.5        | 8.5         | 12.5        | 0.80±0.05 | 7.5±0.6 | 4.6 - 6.6      | 17.5        |
| SFV10D102K | 20          | 15.5        | 9.0         | 12.5        | 0.80±0.05 | 7.5±0.6 | 5.1 - 7.1      | 17.5        |
| SFV10D112K | 20          | 15.5        | 9.6         | 12.5        | 0.80±0.05 | 7.5±0.6 | 5.6 - 7.6      | 17.5        |
| SFV10D122K | 20          | 15.5        | 10.1        | 12.5        | 0.80±0.05 | 7.5±0.6 | 6.1 - 8.1      | 17.5        |

Note:

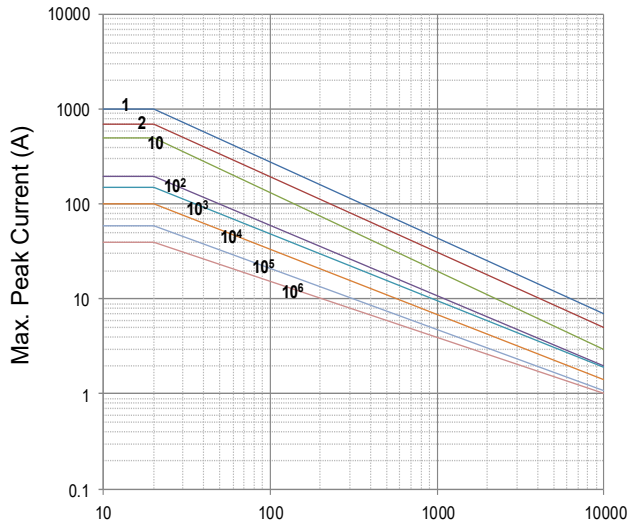
The above data is for reference only.



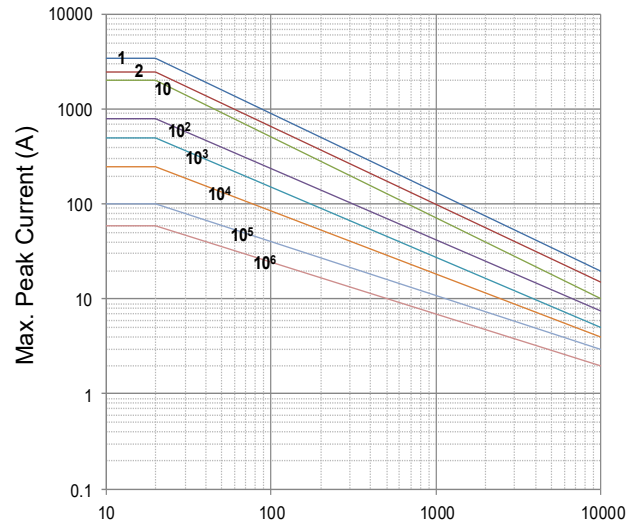


### Performance Curve (For reference only )

- Max. Peak Current Derating Curves



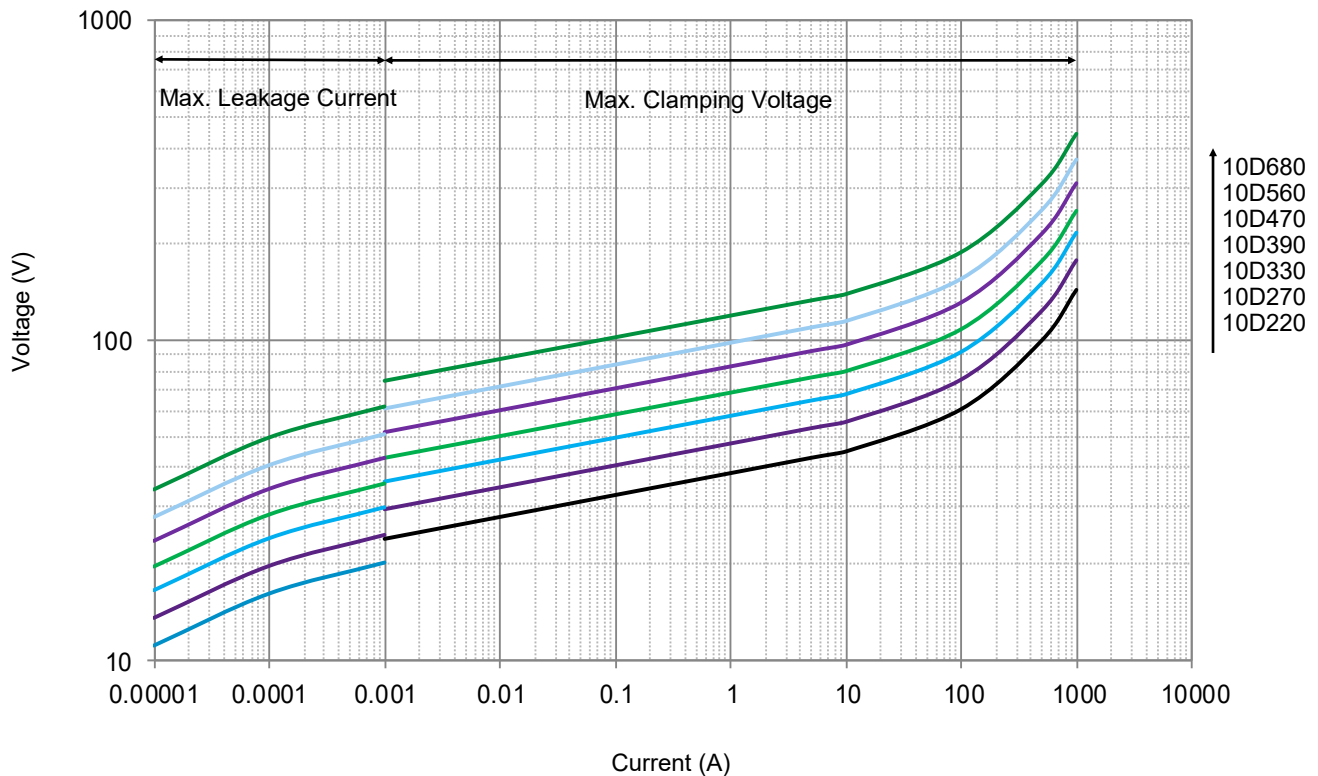
SFV10D220K to SFV10D680K



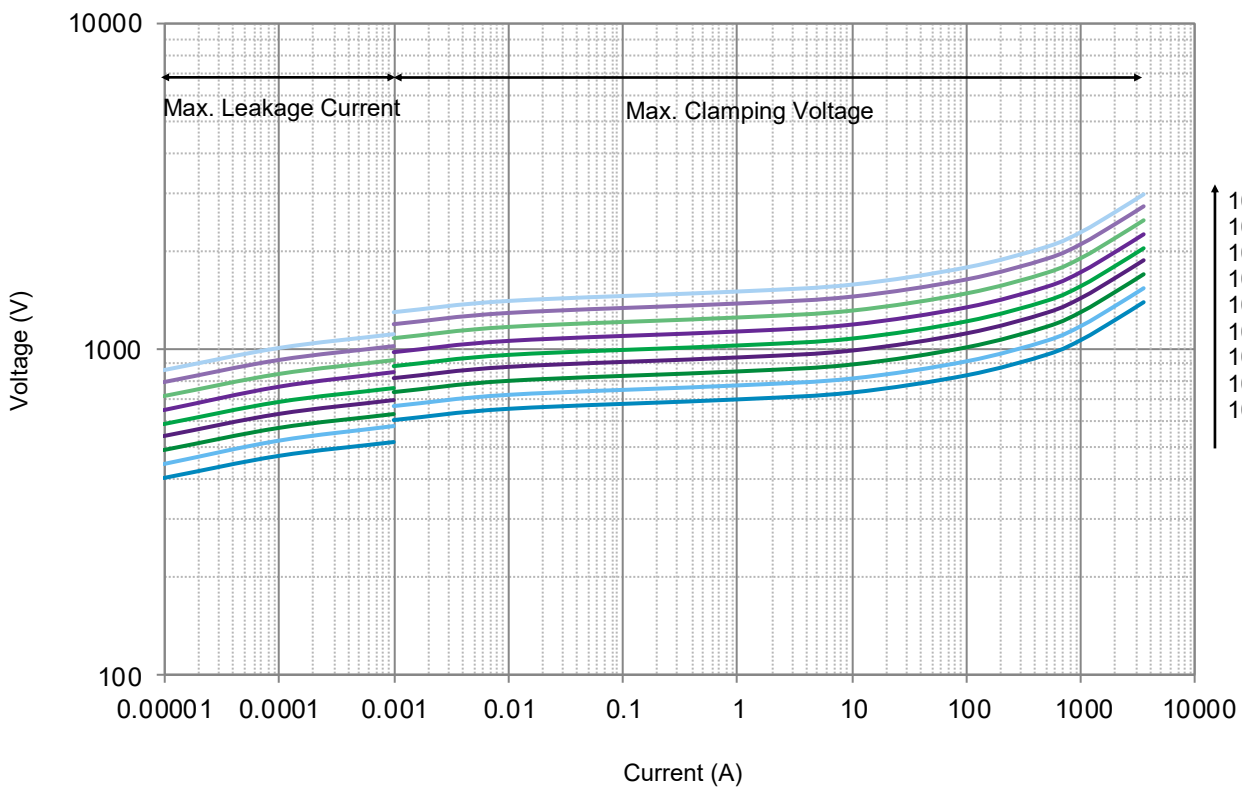
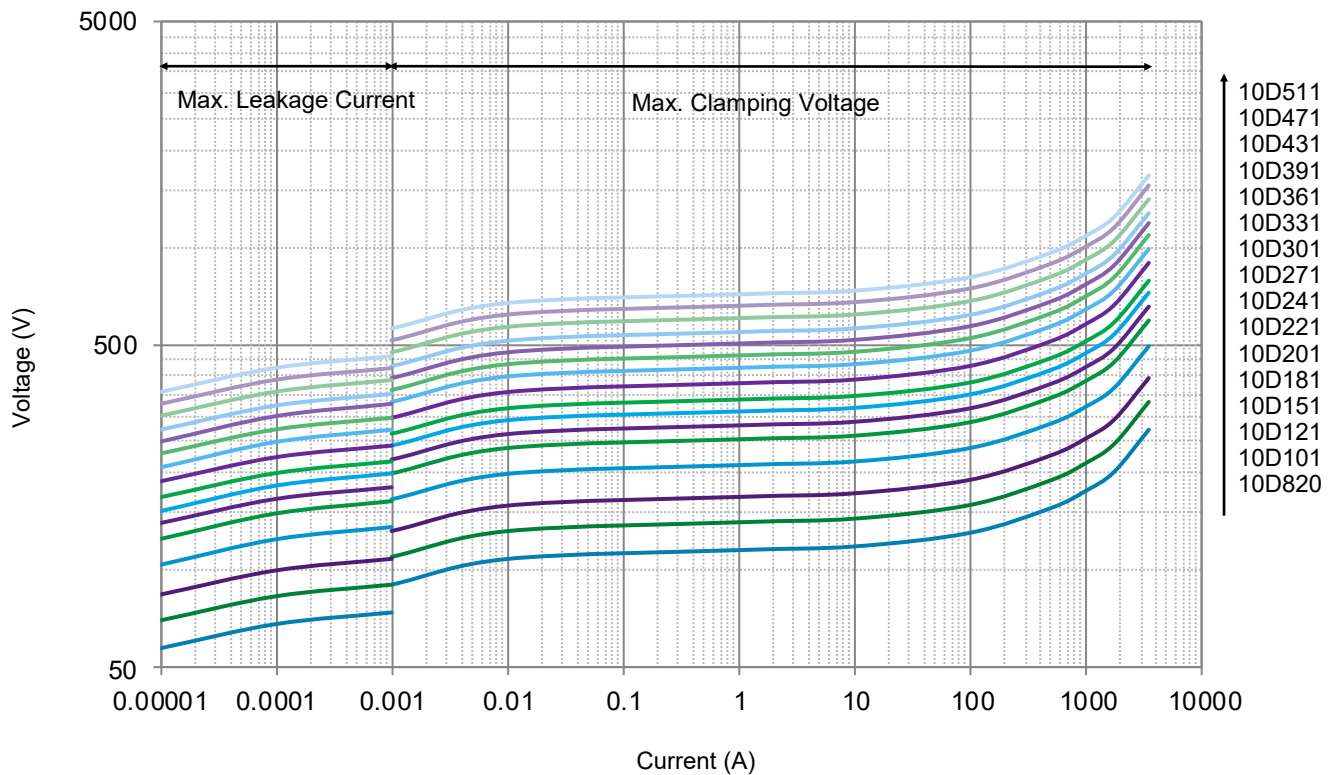
SFV10D820K to SFV10D122K

Note: 1, 2, 10,  $10^2$ ,  $10^3$ ,  $10^4$ ,  $10^5$ ,  $10^6$  Stand for Repetitions.

- Voltage-Current Characteristic Curves



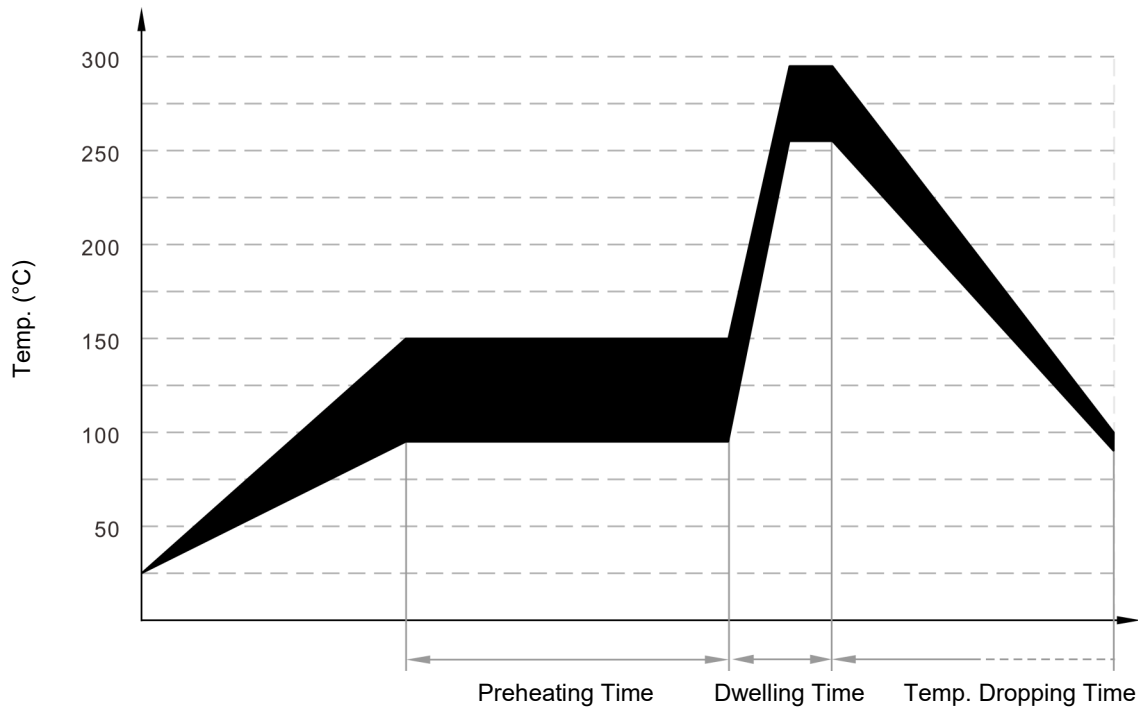
- Voltage-Current Characteristic Curves



### Soldering Parameters

#### Wave Soldering Parameters

The wave soldering parameters are for reference only. When MOV is for practice use, some related validation is recommended.



Wave Soldering Curve

| Item       | Temp. (°C) | Time (s) |
|------------|------------|----------|
| Preheating | 90 to 150  | <150     |
| Dwelling   | 255 to 290 | 3 to 10  |

#### Recommended Hand-Soldering Parameters

| Item                 | Condition        |
|----------------------|------------------|
| Temp. of Solder Head | 350 °C (max.)    |
| Soldering Time       | 4 seconds (max.) |

## Packaging Information

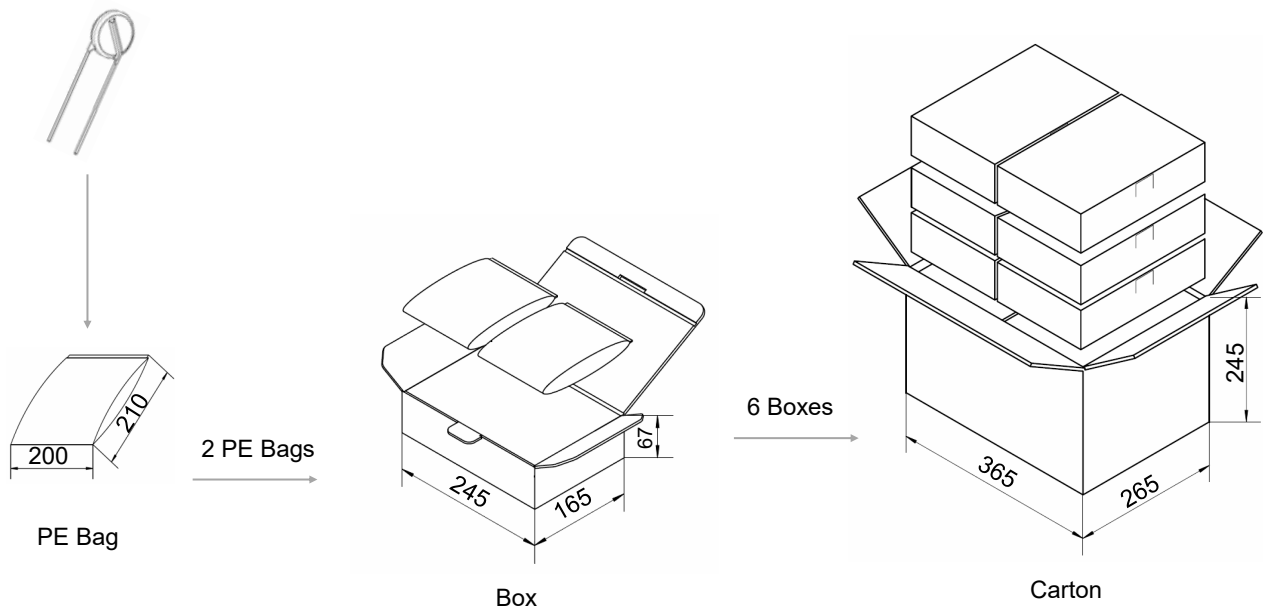
- Bulk Packaging (Code: BUL)
- Bulk Packaging Quantity & Weight.

| Series | Nominal Varistor Voltage | PE Bag | Box   | Carton | G. W / Carton<br>(365 × 265 × 245) |
|--------|--------------------------|--------|-------|--------|------------------------------------|
|        | (V)                      | (PCS)  | (PCS) | (PCS)  | (kg)±10%                           |
| 10D    | 220 - 821                | 500    | 1000  | 6000   | 5 - 13                             |
|        | 911 - 122                | 400    | 800   | 4800   | 13-17                              |

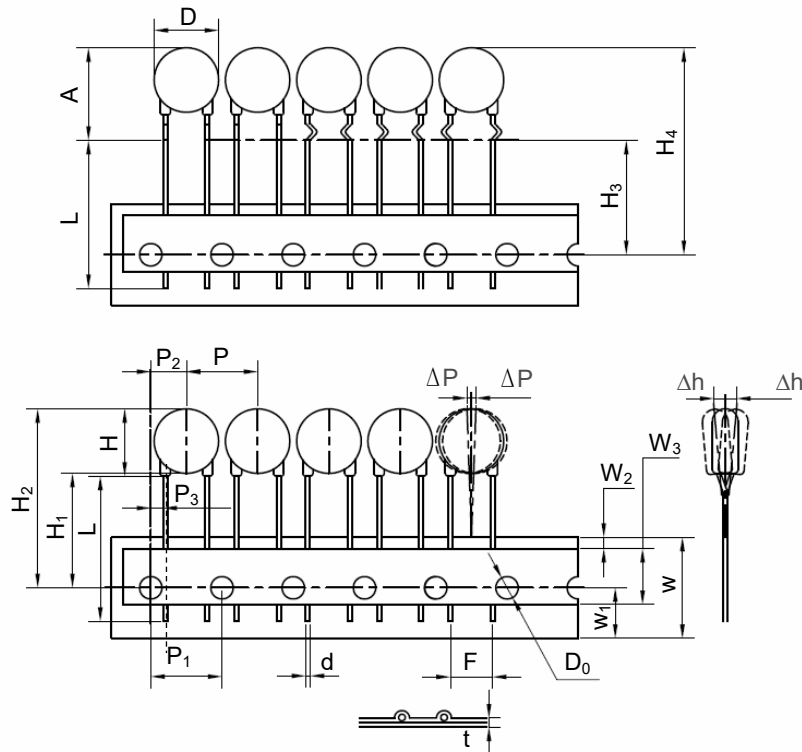
Note:

Other lead length packaging information, please contact SETsafe | SETfuse.

All Dimensions in mm

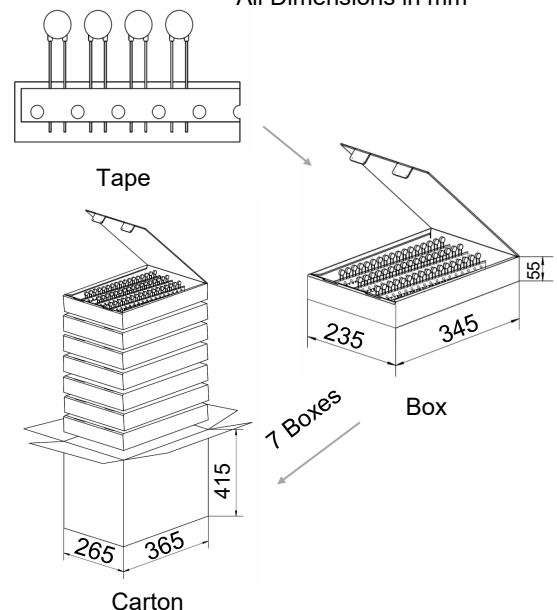


- Tape Packaging (Code: 0AB)



| Dimensions (mm)       |                                    |
|-----------------------|------------------------------------|
| Symbol                | Dimensions                         |
| P                     | 12.7±1.0                           |
| P <sub>1</sub>        | 12.7±0.3                           |
| P <sub>2</sub>        | 6.35±1.30                          |
| P <sub>3</sub>        | 2.6±0.7                            |
| ΔP(max.)              | 1.0                                |
| W                     | 18.0±1.0                           |
| W <sub>1</sub>        | 9.0±1.0                            |
| W <sub>2</sub> (max.) | 3.0                                |
| W <sub>3</sub>        | 10.0±2.0                           |
| H(max.)               | 15.5                               |
| H <sub>1</sub>        | 18.0 <sup>+2.0</sup> <sub>-0</sub> |
| H <sub>2</sub> (max.) | 36.0                               |
| H <sub>3</sub>        | 18.0 <sup>+2.0</sup> <sub>-0</sub> |
| H <sub>4</sub> (max.) | 38.0                               |
| Δh(max.)              | 2.0                                |
| t(max.)               | 0.6                                |
| D(max.)               | 12.5                               |
| D <sub>0</sub>        | 4.0±0.2                            |
| d                     | 0.80±0.05                          |
| A(max.)               | 17.5                               |
| F                     | 7.5±1.0                            |
| L(min.)               | Taping                             |

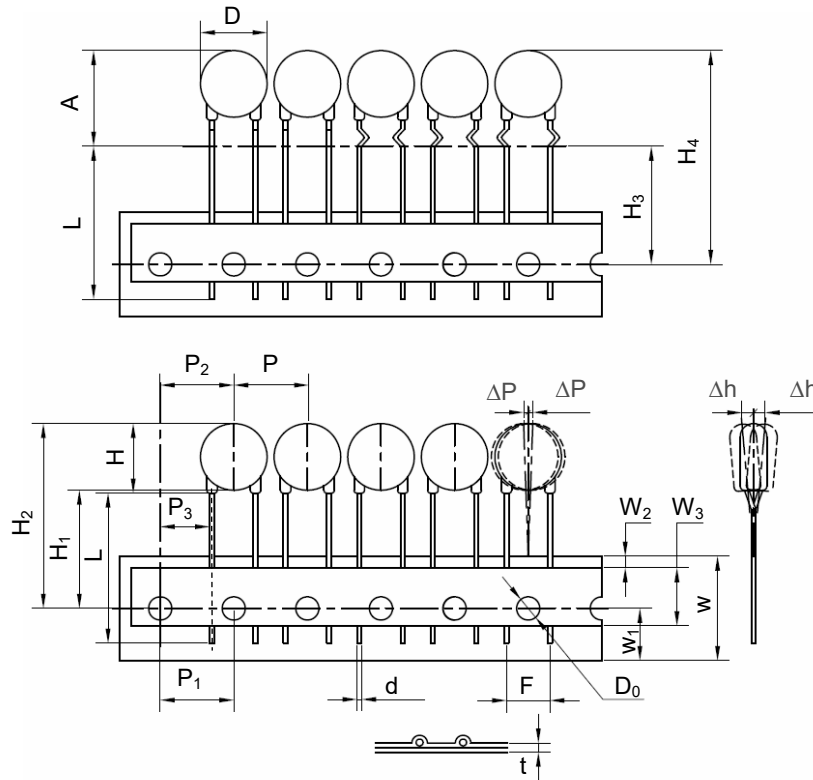
All Dimensions in mm



| Series | Nominal Varistor Voltage | Box    | Carton | G. W / Carton<br>(365 × 265 × 415) |
|--------|--------------------------|--------|--------|------------------------------------|
| 10D    | (V)                      | (PCS)  | (PCS)  | (kg)±10%                           |
|        | 112 - 122                | 550    | 3850   | 12 - 13                            |
|        | 911 - 102                | 600    | 4200   | 11 - 13                            |
|        | 751 - 821                | 700    | 4900   | 11 - 13                            |
|        | 471 - 681                | 800    | 5600   | 9 - 13                             |
|        | 391 - 431                | 1000   | 7000   | 10 - 11                            |
|        | 331 - 361                | 1100   | 7700   | 10 - 11                            |
|        | 680                      |        |        |                                    |
|        | 271 - 301                | 1200   | 8400   | 10 - 11                            |
|        | 151                      |        |        |                                    |
|        | 560                      |        |        |                                    |
|        | 180 - 241                |        |        |                                    |
|        | 820 - 121                | 8 - 10 |        |                                    |
|        | 220 - 470                | 7 - 11 |        |                                    |

## Packaging Information

- Tape Packaging (Code: 1AB)

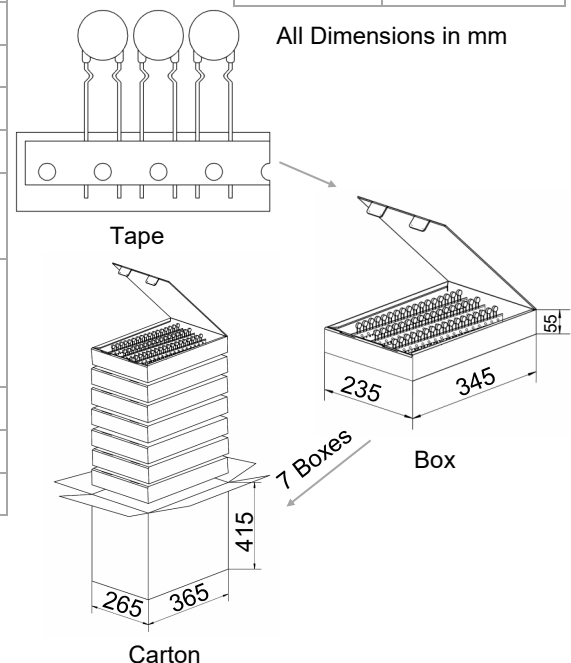


## Dimensions (mm)

| Symbol                | Dimensions                         |
|-----------------------|------------------------------------|
| P                     | 12.7±1.0                           |
| P <sub>1</sub>        | 12.7±0.3                           |
| P <sub>2</sub>        | 12.7±1.30                          |
| P <sub>3</sub>        | 8.95±0.7                           |
| ΔP(max.)              | 1.0                                |
| W                     | 18.0±1.0                           |
| W <sub>1</sub>        | 9.0±1.0                            |
| W <sub>2</sub> (max.) | 3.0                                |
| W <sub>3</sub>        | 10.0±2.0                           |
| H(max.)               | 15.5                               |
| H <sub>1</sub>        | 18.0 <sup>+2.0</sup> <sub>-0</sub> |
| H <sub>2</sub> (max.) | 36.0                               |
| H <sub>3</sub>        | 18.0 <sup>+2.0</sup> <sub>-0</sub> |
| H <sub>4</sub> (max.) | 38.0                               |
| Δh(max.)              | 2.0                                |
| t (max.)              | 0.6                                |
| D(max.)               | 12.5                               |
| D <sub>0</sub>        | 4.0±0.2                            |
| d                     | 0.80±0.05                          |
| A(max.)               | 17.5                               |
| F                     | 7.5±1.0                            |
| L(min.)               | Taping                             |

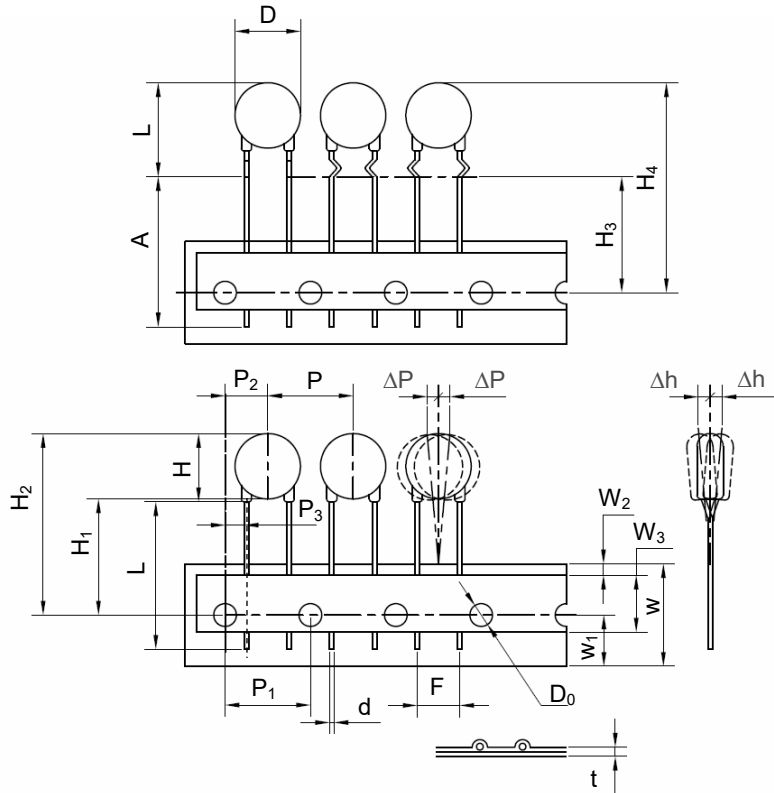
- Tape Packaging Quantity & Weight.

| Series | Nominal Varistor Voltage | Box   | Carton | G. W / Carton (365 × 265 × 415) |
|--------|--------------------------|-------|--------|---------------------------------|
|        | (V)                      | (PCS) | (PCS)  | (kg)±10%                        |
| 10D    | 112 - 122                | 550   | 3850   | 12 - 13                         |
|        | 911 - 102                | 600   | 4200   | 11 - 13                         |
|        | 751 - 821                | 700   | 4900   | 11 - 13                         |
|        | 471 - 681                | 800   | 5600   | 9 - 13                          |
|        | 391 - 431                | 1000  | 7000   | 10 - 11                         |
|        | 331 - 361                | 1100  | 7700   | 10 - 11                         |
|        | 680                      |       |        |                                 |
|        | 271 - 301                |       |        |                                 |
|        | 151                      | 1200  | 8400   | 10 - 11                         |
|        | 560                      |       |        |                                 |
|        | 180 - 241                |       |        |                                 |
|        | 820 - 121                | 1300  | 9100   | 9 - 11                          |
|        | 220 - 470                |       |        | 8 - 10                          |
|        |                          |       |        | 7 - 11                          |



## Packaging Information

- Tape Packaging (Code: 0EB)

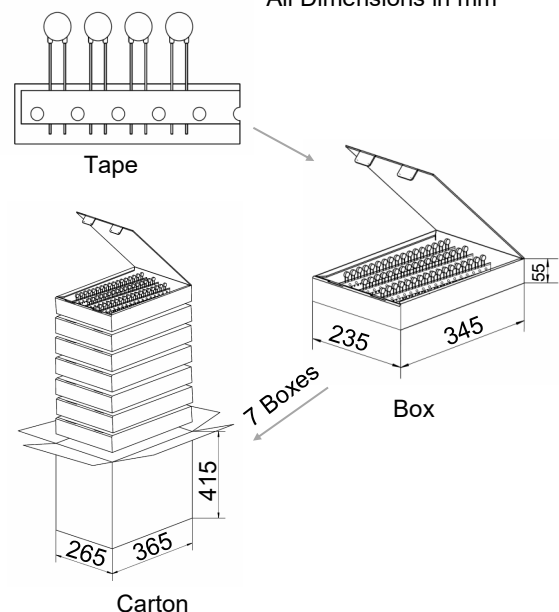


## Dimensions (mm)

| Symbol                | Dimensions                         |
|-----------------------|------------------------------------|
| P                     | 15.0±1.0                           |
| P <sub>1</sub>        | 15.0±0.3                           |
| P <sub>2</sub>        | 7.5±1.3                            |
| P <sub>3</sub>        | 3.75±1.0                           |
| ΔP(max.)              | 1.0                                |
| W                     | 18.0±1.0                           |
| W <sub>1</sub>        | 9.0±1.0                            |
| W <sub>2</sub> (max.) | 3.0                                |
| W <sub>3</sub>        | 10.0±2.0                           |
| H(max.)               | 15.5                               |
| H <sub>1</sub>        | 18.0 <sup>+2.0</sup> <sub>-0</sub> |
| H <sub>2</sub> (max.) | 36.0                               |
| H <sub>3</sub>        | 18.0 <sup>+2.0</sup> <sub>-0</sub> |
| H <sub>4</sub> (max.) | 38.0                               |
| Δh(max.)              | 2.0                                |
| t (max.)              | 0.6                                |
| D(max.)               | 12.5                               |
| D <sub>0</sub>        | 4.0±0.2                            |
| d                     | 0.80±0.05                          |
| A(max.)               | 17.5                               |
| F                     | 7.5±1.0                            |
| L(min.)               | Taping                             |

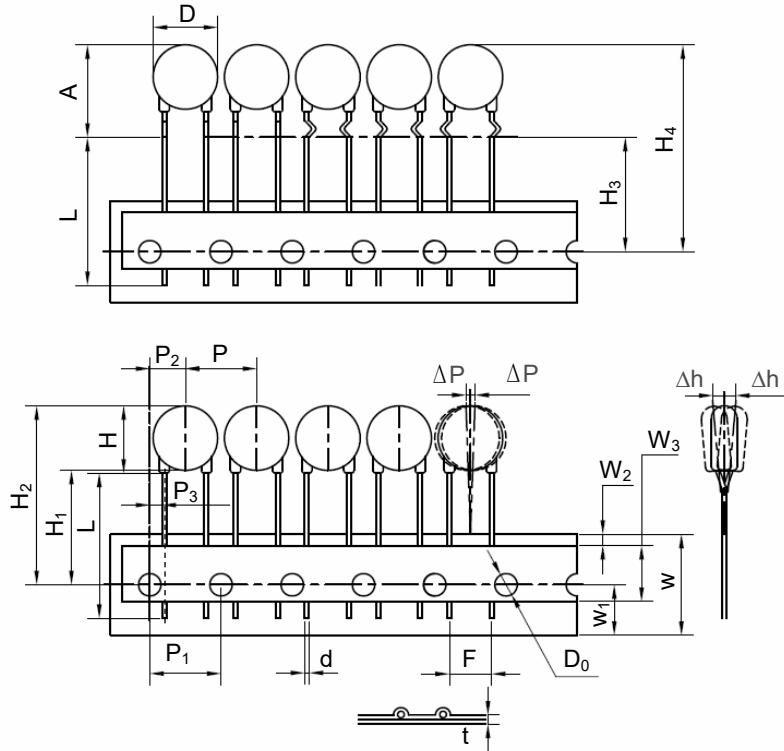
- Tape Packaging Quantity & Weight.

| Series | Nominal Varistor Voltage | Box   | Carton | G. W / Carton<br>(365 × 265 × 415) |
|--------|--------------------------|-------|--------|------------------------------------|
|        | (V)                      | (PCS) | (PCS)  | (kg)±10%                           |
| 10D    | 911 - 122                | 500   | 3500   | 9 - 12                             |
|        | 751 - 821                | 600   | 4200   | 10 - 11                            |
|        | 621 - 681                | 700   | 4900   | 10 - 11                            |
|        | 431 - 561                | 800   | 5600   | 8 - 11                             |
|        | 271 - 391                | 1000  | 7000   | 8 - 10                             |
|        | 151                      |       |        | 9                                  |
|        | 560 - 680                |       |        | 9 - 10                             |
|        | 201 - 241                | 1100  | 7700   | 8 - 9                              |
|        | 121                      |       |        |                                    |
|        | 390-470                  |       |        |                                    |
|        | 181                      | 1200  | 8400   | 7 - 8                              |
|        | 820 - 101                |       |        |                                    |
|        | 330                      |       |        |                                    |
|        | 220-270                  | 1300  | 9100   | 7 - 8                              |



## Packaging Information

- Reel Packaging (Code:0AR)

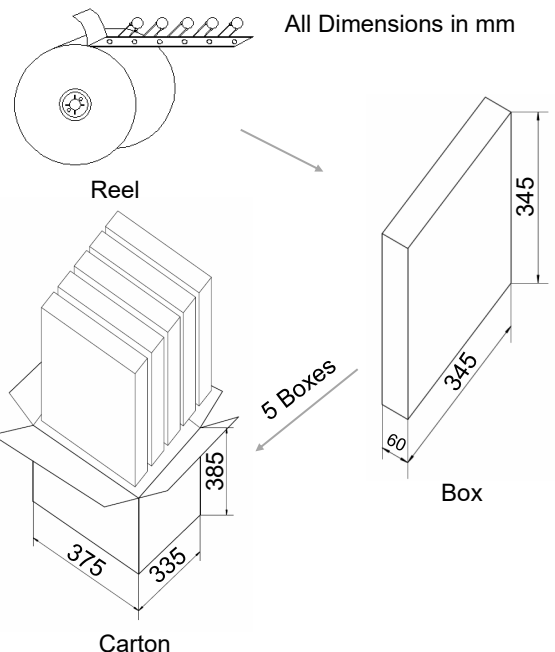
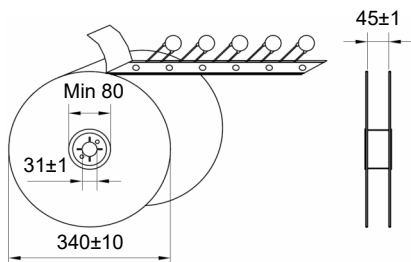


## Dimensions (mm)

| Symbol                | Dimensions                         |
|-----------------------|------------------------------------|
| P                     | 12.7±1.0                           |
| P <sub>1</sub>        | 12.7±0.3                           |
| P <sub>2</sub>        | 6.35±1.30                          |
| P <sub>3</sub>        | 2.6±0.7                            |
| ΔP(max.)              | 1.0                                |
| W                     | 18.0±1.0                           |
| W <sub>1</sub>        | 9.0±1.0                            |
| W <sub>2</sub> (max.) | 3.0                                |
| W <sub>3</sub>        | 10.0±1.0                           |
| H(max.)               | 15.5                               |
| H <sub>1</sub>        | 18.0 <sup>+2.0</sup> <sub>-0</sub> |
| H <sub>2</sub> (max.) | 36.0 <sup>+2.0</sup> <sub>-0</sub> |
| H <sub>3</sub>        | 18.0                               |
| H <sub>4</sub> (max.) | 38.0                               |
| Δh(max.)              | 2.0                                |
| t(max.)               | 0.6                                |
| D(max.)               | 12.5                               |
| D <sub>0</sub>        | 4.0±0.2                            |
| d                     | 0.80±0.05                          |
| A(max.)               | 17.5                               |
| F                     | 7.5±1.0                            |
| L(min.)               | Taping                             |

- Reel Packaging Quantity & Weight.

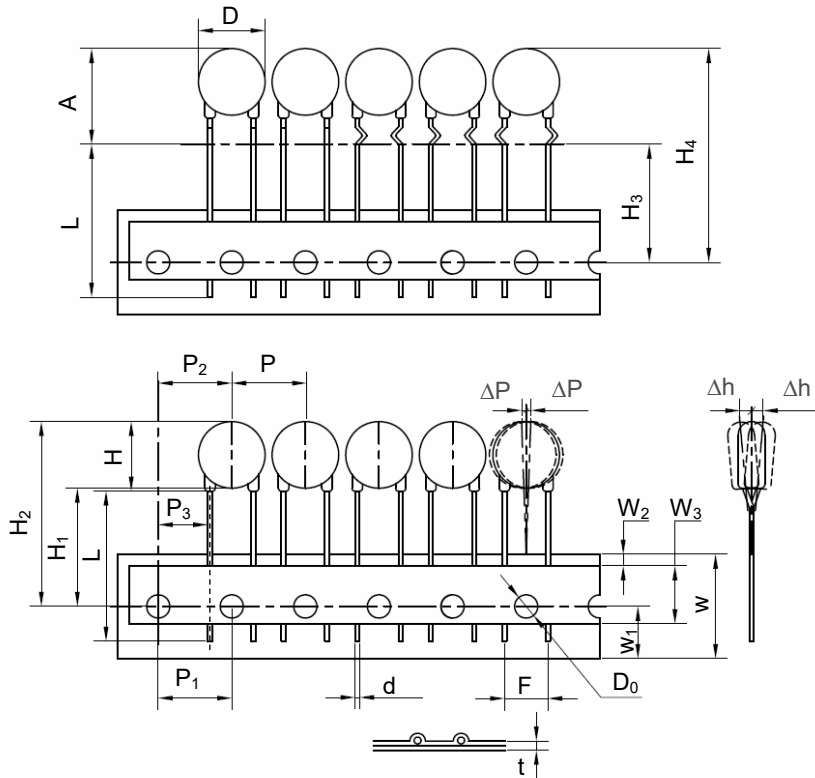
| Series | Nominal Varistor Voltage | Box   | Carton | G. W / Carton (375 × 335 × 385) |
|--------|--------------------------|-------|--------|---------------------------------|
|        | (V)                      | (PCS) | (PCS)  | (kg)±10%                        |
| 10D    | 220 - 391                | 1500  | 7500   | 6 - 11                          |
|        | 431 - 561                | 1000  | 5000   | 8 - 10                          |
|        | 621 - 821                | 800   | 4000   | 8 - 11                          |
|        | 911 - 122                | 500   | 2500   | 7 - 9                           |





## Packaging Information

- Reel Packaging (Code:1AR)



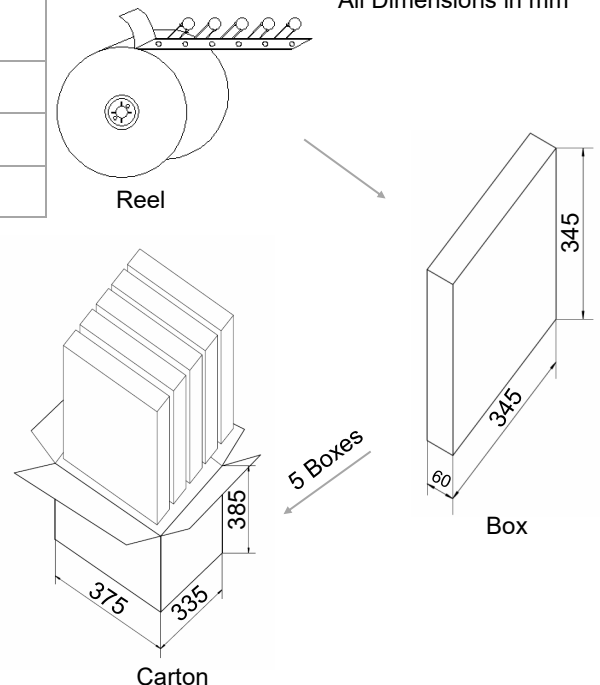
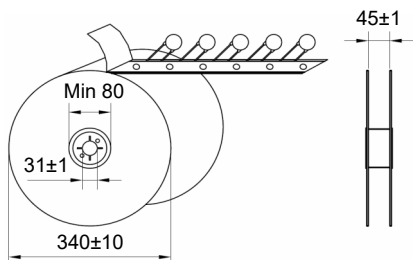
### Dimensions (mm)

| Symbol                | Dimensions                         |
|-----------------------|------------------------------------|
| P                     | 12.7±1.0                           |
| P <sub>1</sub>        | 12.7±0.3                           |
| P <sub>2</sub>        | 12.7±1.30                          |
| P <sub>3</sub>        | 8.95±0.7                           |
| ΔP(max.)              | 1.0                                |
| W                     | 18.0±1.0                           |
| W <sub>1</sub>        | 9.0±1.0                            |
| W <sub>2</sub> (max.) | 3.0                                |
| W <sub>3</sub>        | 10.0±2.0                           |
| H(max.)               | 15.5                               |
| H <sub>1</sub>        | 18.0 <sup>+2.0</sup> <sub>-0</sub> |
| H <sub>2</sub> (max.) | 36.0                               |
| H <sub>3</sub>        | 18.0 <sup>+2.0</sup> <sub>-0</sub> |
| H <sub>4</sub> (max.) | 38.0                               |
| Δh(max.)              | 2.0                                |
| t(max.)               | 0.6                                |
| D(max.)               | 12.5                               |
| D <sub>0</sub>        | 4.0±0.2                            |
| d                     | 0.80±0.05                          |
| A(max.)               | 17.5                               |
| F                     | 7.5±1.0                            |
| L(min.)               | Taping                             |

- Reel Packaging Quantity & Weight.

| Series | Nominal Varistor Voltage | Box   | Carton | G. W / Carto (375 × 335 × 385) |
|--------|--------------------------|-------|--------|--------------------------------|
|        | (V)                      | (PCS) | (PCS)  | (kg)±10%                       |
| 10D    | 220 - 391                | 1500  | 7500   | 6 - 11                         |
|        | 431 - 561                | 1000  | 5000   | 8 - 10                         |
|        | 621 - 821                | 800   | 4000   | 8 - 11                         |
|        | 911 - 122                | 500   | 2500   | 7 - 9                          |

All Dimensions in mm





# ATTENTION

## Usage

1. Varistor must operated in the specified ambient temp.
2. Do not clean the varistor with strong polar solvent such as ketone, esters, benzene and halogenated hydrocarbon.
3. Please do not apply severe vibration, shock or pressure to MOV.
4. Please fix lead wires when bending or cutting. The distance between the bending point and the sealing of MOV shall be greater than 2 mm.

## Replacement

If varistor is visually damaged, please replace it.

## Storage

1. Storage Temp. Range: (-40 to +125) °C
2. Relative Humidity : ≤75% RH
3. Altitude: <2000 m
4. Do not store the MOV at the high temp., high humidity or corrosive gas environment, to avoid influencing the solder-ability of the lead wires, the product shall be used up within 1 year after receiving the goods.

## Environmental Conditions

1. Varistor should neither be exposed to the open air, nor direct sunshine.
2. Varistor should avoid rain, water vapor or other condition of high temp. and high humidity.
3. Varistor should avoid sand dust, salt spray, or other harmful gases.

### Max. Typical Capacitance of Varistor

The typical capacitance of varistor is listed in the specifications. Designers may refer to it when designing MOV in high frequency circuit.

### Installation

#### Mechanical Stress

Do not knock MOV when installing, to avoid mechanical damage.