# Standard MOV Varistor
## Square, 20mm

RoHS Compliant

### 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.

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

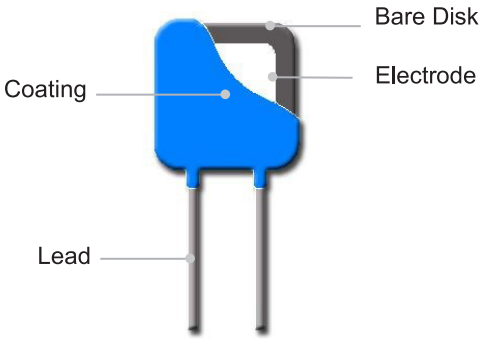
### Applications

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

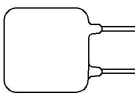
### Features

- Epoxy Resin Coating
- Silicone Resin Coating
- Low Leakage Current
- Bidirectional and Symmetrical V/I Characteristics
- Operating Temperature Range
  Low Temperature: -40°C
  High Temperature: +85°C / +105°C

### Product Structure




### Lead Types

| Lead Types | | Codes |
|---|---|---|
|  | Straight Lead | A |

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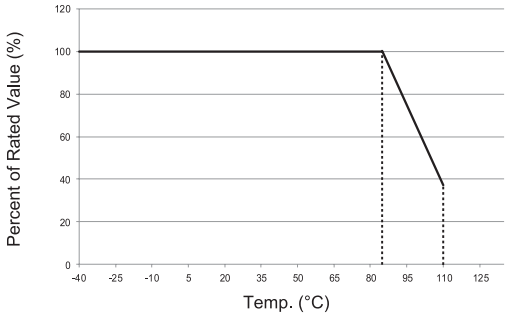
## Temp. Derating Curve




For Normal Temp. Series

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

## General Technical Data

| Item | Value | Unit |
|---|---|---|
| Operating Temperature | -40 to +85 | °C |
| Storage Temperature | -40 to +125 | °C |
| Voltage Proof | ≥2500 | Vac |
| Insulation Resistance | ≥100 | MΩ |

| Item | Description |
|---|---|
| $V_N$ | **Nominal Varistor Voltage**<br>Voltage, at specified D.C. current used as a reference point in the component characteristics. |
| $I_L$ | **Leakage Current**<br>Measuring at 75% of varistor voltage. |
| UCT | **Upper Category Temp.**<br>Max. ambient temp. for which a varistor has been designed to operate continuously. |
| UCT | **Lower Category Temp.**<br>Minimum ambient temp. at which a varistor has been designed to operate continuously. |
| Max. Peak Current | **Max. Peak Current**<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. |
| $V_C$ | **Clamping Voltage**<br>Peak voltage developed across the varistor terminations under standard atmospheric conditions, when passing an 8/20 µs class current pulse. |
| Voltage Proof | **Voltage Proof**<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). |
| $C_V$ | **Capacitance**<br>Capacitance across the MOV measured at a specified frequency and voltage. |
| $V_{ac}$ | **Max. Continuous a.c. Voltage**<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. |
| $V_{dc}$ | **Max. Continuous d.c. Voltage**<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. |

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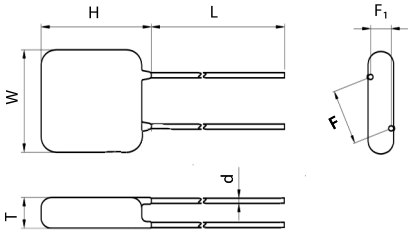
multicomp PRO

### Dimensions

| Model | L (Min.) | W (Max.) | H (Max.) | T (Max.) | d | F | $F_1$ | A (Max.) |
|---|---|---|---|---|---|---|---|---|
| MPV20S820KNK | 20 | 22 | 26 | 4.9 | 1 ±0.05 | 10 ±0.6 | 1.3 - 2.9 | 27.5 |
| MPV20S241KNK | | | | 5.4 | | | 1.7 - 3.5 | |
| MPV20S271KNK | | | | 5.6 | | | 1.8 - 3.6 | |
| MPV20S391KNK | | | | 6.4 | | | 2.3 - 4.3 | |
| MPV20S431KNK | | | | 6.6 | | | 2.6 - 4.6 | |
| MPV20S471KNK | | | | 6.9 | | | 2.8 - 4.8 | |
| MPV20S511KNK | | | | 7.1 | | | 3.1 - 5.1 | |
| MPV20S621KNK | | | | 7.8 | | | 3.7 - 5.7 | |
| MPV20S681KNK | | | | 8.2 | | | 4.1 - 6.1 | |

### Diagram



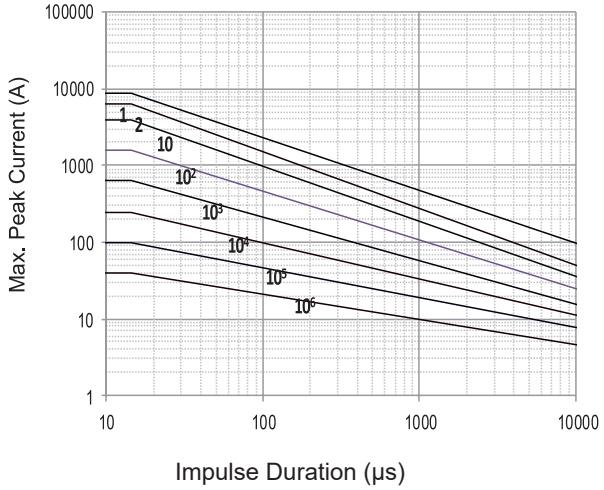

Straight Lead

### Specification

| Model | Max. Continuous Operating Voltage | | Varistor Voltage @1 mA DC | | Clamping Voltage (Max.) | | Max. Discharge Current (8/20 µs) | | Max. Energy (10/1000 µs) | Typical Capacitance (For reference only ) @1 kHz |
|---|---|---|---|---|---|---|---|---|---|---|
| | Vac | Vdc | Min. | Max. | Vc | Ip | In | Imax | (J) | (pF) |
| | (V) | (V) | (V) | (V) | (V) | (V) | (kA) | | | |
| MPV20S820KNK | 50 | 65 | 74 | 90 | 135 | 125 | 8 | 15 | 67 | 5880 |
| MPV20S241KNK | 150 | 200 | 216 | 264 | 395 | | | | 200 | 2000 |
| MPV20S271KNK | 175 | 225 | 243 | 297 | 455 | | | | 230 | 1800 |
| MPV20S391KNK | 250 | 320 | 351 | 429 | 650 | | | | 330 | 1200 |
| MPV20S431KNK | 275 | 350 | 387 | 473 | 710 | | | | 365 | 1160 |
| MPV20S471KNK | 300 | 385 | 423 | 517 | 775 | | | | 420 | 1020 |
| MPV20S511KNK | 320 | 415 | 459 | 561 | 845 | | | | 430 | 935 |
| MPV20S621KNK | 385 | 505 | 558 | 682 | 1025 | | | | 465 | 780 |
| MPV20S681KNK | 420 | 560 | 612 | 748 | 1120 | | | | | |

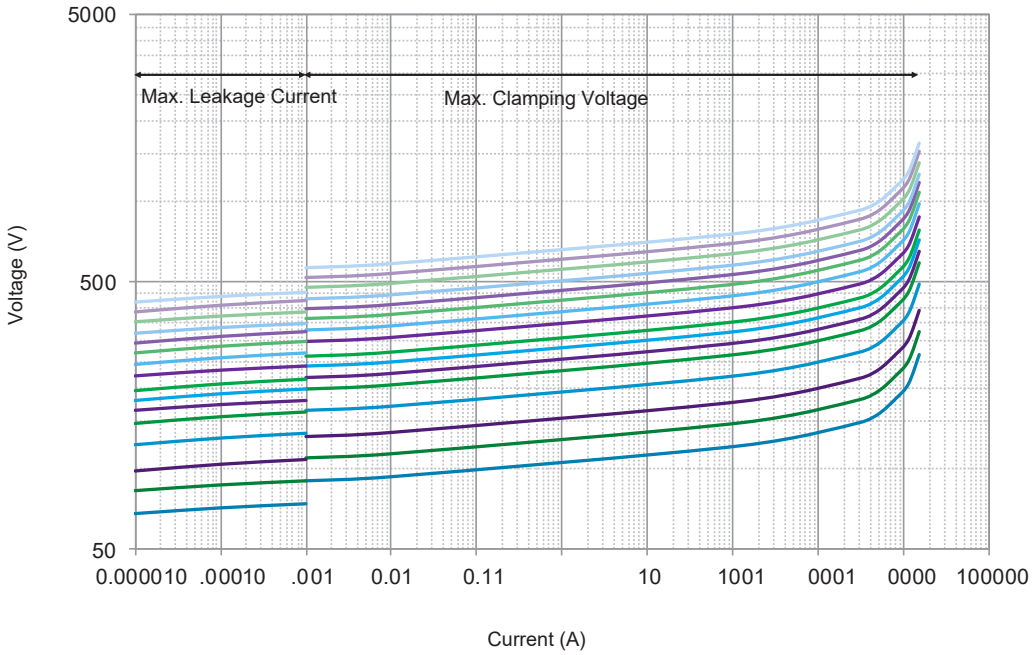
## Performance Curve

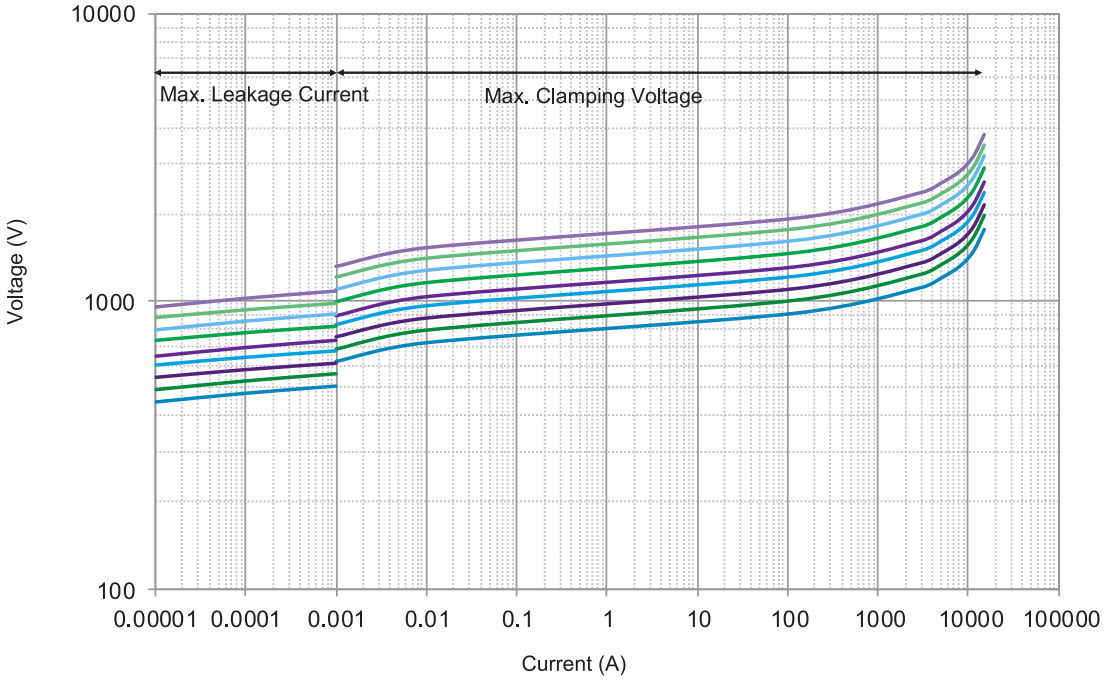
Max. Peak Current Derating Curves




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

## Voltage-Current Characteristic Curves






### Part Number Table

| Description | Part Number |
|---|---|
| Varistor, 820V | MPV20S820KNK |
| Varistor, 240V | MPV20S241KNK |
| Varistor, 270V | MPV20S271KNK |
| Varistor, 390V | MPV20S391KNK |
| Varistor, 430V | MPV20S431KNK |
| Varistor, 470V | MPV20S471KNK |
| Varistor, 510V | MPV20S511KNK |
| Varistor, 620V | MPV20S621KNK |
| Varistor, 680V | MPV20S681KNK |