



**THE DATASHEET OF  
MOV-10D820KTR**





## Features

- High voltage rating
- High current rating
- Bidirectional
- Surge protection
- Fast response time
- RoHS compliant\*
- Agency listing: US

## Applications

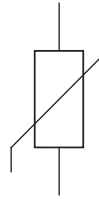
- Power supplies
- Power systems
- Line voltage
- Telecom systems
- White goods / appliances

# MOV-10DxxxK Series - Metal Oxide Varistor

### General Information

The MOV-10DxxxK Series of 10 mm radial leaded varistor devices protects against overvoltage transients such as lightning, power contact and power induction. The metal oxide varistors offer a choice of varistor voltages from 18 V to 820 V and  $V_{RMS}$  voltages from 11 V to 510 V.

The devices have a high current handling, high energy absorption capability and fast response times to protect against transient faults up to rated limits.



### Industry Standard Compliance

| Standard    | UL 1449 |
|-------------|---------|
| File Number | E313168 |

| Standard   | ITU-T K.20, K.21, K.45  |
|--|---|
| MOV-10D201K<br>MOV-10D361K<br>MOV-10D391K<br>MOV-10D431K | Will pass 600 V rms, 600 ohm, 1 A, 0.2 s, 5 cycles, every 1 minute condition. |

### Absolute Maximum Ratings (@ $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

| Parameter                                | Symbol    | Min. | Typ. | Max. | Unit                  |
|--|-----------|------|------|------|-----------------------|
| Operating Temperature                    | $T_{OPR}$ | -40  | 25   | +105 | $^\circ\text{C}$      |
| Storage Temperature                      | $T_{STG}$ | -40  | 25   | +125 | $^\circ\text{C}$      |
| Rated Wattage                            | $P_w$     |      |      | 0.40 | Watt                  |
| Varistor Voltage Temperature Coefficient | $V_{TC}$  | 0    |      | 0.05 | $\% / ^\circ\text{C}$ |
| Response Time                            | $T_r$     |      | 10   | 25   | ns                    |
| Varistor Voltage Tolerance               | $V_{tol}$ | -10  |      | 10   | $\%$                  |

### Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

| Bourns Part No. | Max. Continuous Voltage (V) |      | Voltage @ 1 mA DC (V) |      |      | Voltage @ Class Current (8/20 $\mu\text{s}$ ) |                           | Max. Peak Current (8/20 $\mu\text{s}$ ) | Max. Energy (J)    | Typ. Cap. (pF) |
|-----------------|-----------------------------|------|-----------------------|------|------|---|---------------------------|---|--------------------|----------------|
|                 | r.m.s.                      | d.c. | Min.                  | Nom. | Max. | Class Current (A)                             | Max. Clamping Voltage (V) | One Time                                | 8/20 $\mu\text{s}$ | 1 kHz          |
|                 |                             |      |                       |      |      |   |                           |   |                    |                |
| MOV-10D180K     | 11                          | 14   | 16                    | 18   | 20   | 5   | 36                        | 500                                     | 2.1                | 8160           |
| MOV-10D220K     | 14                          | 18   | 20                    | 22   | 24   | 5   | 43                        | 500                                     | 2.5                | 6000           |
| MOV-10D270K     | 17                          | 22   | 24                    | 27   | 30   | 5   | 53                        | 500                                     | 3.0                | 5280           |
| MOV-10D330K     | 20                          | 26   | 30                    | 33   | 36   | 5   | 65                        | 500                                     | 4.0                | 4800           |
| MOV-10D390K     | 25                          | 31   | 35                    | 39   | 43   | 5   | 77                        | 500                                     | 4.6                | 3840           |
| MOV-10D470K     | 30                          | 38   | 42                    | 47   | 52   | 5   | 93                        | 500                                     | 5.5                | 3600           |
| MOV-10D560K     | 35                          | 45   | 50                    | 56   | 62   | 5   | 110                       | 500                                     | 7.0                | 2640           |
| MOV-10D680K     | 40                          | 56   | 61                    | 68   | 75   | 5   | 135                       | 500                                     | 8.2                | 1920           |
| MOV-10D820K     | 50                          | 65   | 74                    | 82   | 90   | 25  | 135                       | 2500                                    | 12                 | 1440           |
| MOV-10D101K     | 60                          | 85   | 90                    | 100  | 110  | 25  | 165                       | 2500                                    | 15                 | 1200           |
| MOV-10D121K     | 75                          | 100  | 108                   | 120  | 132  | 25  | 200                       | 2500                                    | 18                 | 996            |
| MOV-10D151K     | 95                          | 125  | 135                   | 150  | 165  | 25  | 250                       | 2500                                    | 22                 | 804            |
| MOV-10D181K     | 115                         | 150  | 162                   | 180  | 198  | 25  | 300                       | 2500                                    | 27                 | 672            |
| MOV-10D201K     | 130                         | 170  | 185                   | 200  | 225  | 25  | 340                       | 2500                                    | 30                 | 600            |
| MOV-10D221K     | 140                         | 180  | 198                   | 220  | 242  | 25  | 360                       | 2500                                    | 32                 | 540            |
| MOV-10D241K     | 150                         | 200  | 216                   | 240  | 264  | 25  | 395                       | 2500                                    | 35                 | 504            |
| MOV-10D271K     | 175                         | 225  | 243                   | 270  | 297  | 25  | 455                       | 2500                                    | 40                 | 444            |
| MOV-10D301K     | 190                         | 250  | 270                   | 300  | 330  | 25  | 500                       | 2500                                    | 40                 | 396            |
| MOV-10D331K     | 210                         | 275  | 297                   | 330  | 363  | 25  | 550                       | 2500                                    | 43                 | 360            |
| MOV-10D361K     | 230                         | 300  | 324                   | 360  | 396  | 25  | 595                       | 2500                                    | 47                 | 336            |
| MOV-10D391K     | 250                         | 320  | 351                   | 390  | 429  | 25  | 650                       | 2500                                    | 60                 | 312            |
| MOV-10D431K     | 275                         | 350  | 387                   | 430  | 473  | 25  | 710                       | 2500                                    | 65                 | 276            |
| MOV-10D471K     | 300                         | 385  | 423                   | 470  | 517  | 25  | 775                       | 2500                                    | 70                 | 252            |
| MOV-10D511K     | 320                         | 415  | 459                   | 510  | 561  | 25  | 845                       | 2500                                    | 70                 | 240            |
| MOV-10D561K     | 350                         | 460  | 504                   | 560  | 616  | 25  | 925                       | 2500                                    | 70                 | 216            |
| MOV-10D621K     | 385                         | 505  | 558                   | 620  | 682  | 25  | 1025                      | 2500                                    | 70                 | 192            |
| MOV-10D681K     | 420                         | 560  | 612                   | 680  | 748  | 25  | 1120                      | 2500                                    | 70                 | 180            |
| MOV-10D751K     | 460                         | 615  | 675                   | 750  | 825  | 25  | 1240                      | 2500                                    | 75                 | 156            |
| MOV-10D781K     | 485                         | 640  | 702                   | 780  | 858  | 25  | 1290                      | 2500                                    | 80                 | 156            |
| MOV-10D821K     | 510                         | 670  | 738                   | 820  | 902  | 25  | 1355                      | 2500                                    | 85                 | 132            |

\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

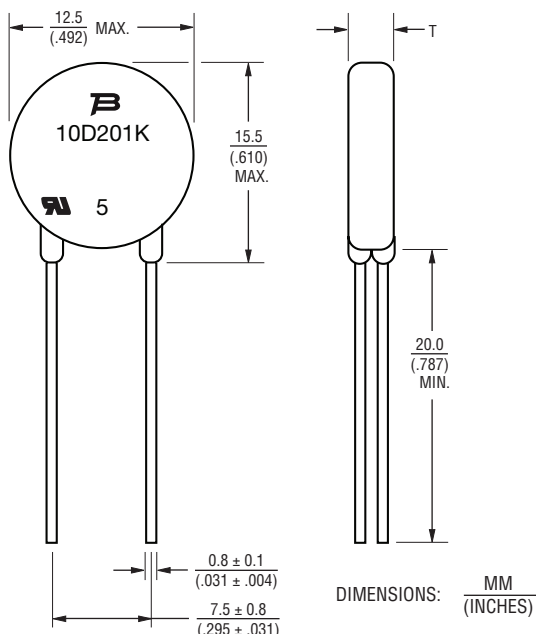
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# MOV-10DxxxK Series - Metal Oxide Varistor

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## Product Dimensions

This is an RoHS compliant molded radial package with 100 % Sn plating on the terminations.



## Typical Part Marking

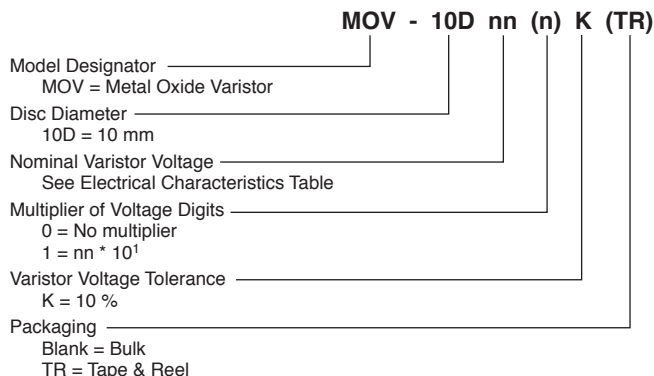
| Bourns Part Number | Bourns Part Marking |
|--------------------|---------------------|
| MOV-10D180K        | 10D180K             |
| MOV-10D220K        | 10D220K             |
| MOV-10D270K        | 10D270K             |
| MOV-10D330K        | 10D330K             |
| MOV-10D390K        | 10D390K             |
| MOV-10D470K        | 10D470K             |
| MOV-10D560K        | 10D560K             |
| MOV-10D680K        | 10D680K             |
| MOV-10D820K        | 10D820K             |
| MOV-10D101K        | 10D101K             |
| MOV-10D121K        | 10D121K             |
| MOV-10D151K        | 10D151K             |
| MOV-10D181K        | 10D181K             |
| MOV-10D201K        | 10D201K             |
| MOV-10D221K        | 10D221K             |
| MOV-10D241K        | 10D241K             |
| MOV-10D271K        | 10D271K             |
| MOV-10D301K        | 10D301K             |
| MOV-10D331K        | 10D331K             |
| MOV-10D361K        | 10D361K             |
| MOV-10D391K        | 10D391K             |
| MOV-10D431K        | 10D431K             |
| MOV-10D471K        | 10D471K             |
| MOV-10D511K        | 10D511K             |
| MOV-10D561K        | 10D561K             |
| MOV-10D621K        | 10D621K             |
| MOV-10D681K        | 10D681K             |
| MOV-10D751K        | 10D751K             |
| MOV-10D781K        | 10D781K             |
| MOV-10D821K        | 10D821K             |

NOTE: The "5" marking on MOV products is for traceability of production assembly for quality assurance compliance.

| Bourns Part Number | Dim. T (Max.) |
|--------------------|---------------|
| MOV-10D180K        | 3.8<br>(.150) |
| MOV-10D220K        | 3.9<br>(.154) |
| MOV-10D270K        | 4.2<br>(.165) |
| MOV-10D330K        | 3.8<br>(.150) |
| MOV-10D390K        | 4.0<br>(.157) |
| MOV-10D470K        | 4.2<br>(.165) |
| MOV-10D560K        | 4.3<br>(.169) |
| MOV-10D680K        | 4.4<br>(.173) |
| MOV-10D820K        | 3.8<br>(.150) |
| MOV-10D101K        | 4.0<br>(.157) |
| MOV-10D121K        | 4.2<br>(.165) |
| MOV-10D151K        | 4.4<br>(.173) |
| MOV-10D181K        | 3.6<br>(.142) |
| MOV-10D201K        | 3.8<br>(.150) |
| MOV-10D221K        | 3.9<br>(.154) |

| Bourns Part Number | Dim. T (Max.) |
|--------------------|---------------|
| MOV-10D241K        | 4.0<br>(.157) |
| MOV-10D271K        | 4.2<br>(.165) |
| MOV-10D301K        | 4.4<br>(.173) |
| MOV-10D331K        | 4.6<br>(.181) |
| MOV-10D361K        | 4.8<br>(.189) |
| MOV-10D391K        | 5.0<br>(.197) |
| MOV-10D431K        | 5.2<br>(.205) |
| MOV-10D471K        | 5.4<br>(.213) |
| MOV-10D511K        | 5.5<br>(.217) |
| MOV-10D561K        | 5.9<br>(.232) |
| MOV-10D621K        | 6.2<br>(.244) |
| MOV-10D681K        | 6.4<br>(.252) |
| MOV-10D751K        | 6.6<br>(.260) |
| MOV-10D781K        | 6.8<br>(.268) |
| MOV-10D821K        | 7.2<br>(.283) |

## How to Order



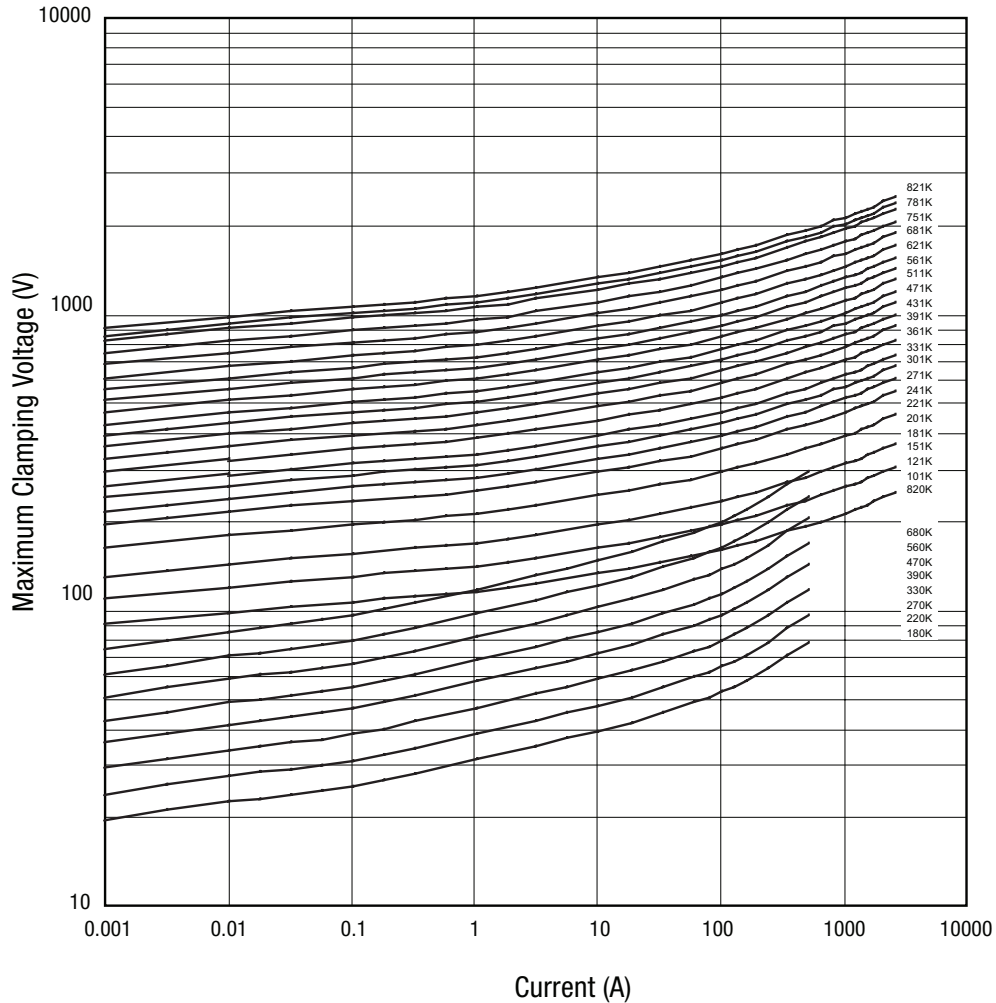
Examples: MOV-10D270K = 27 V, Bulk Pack  
 MOV-10D331KTR = 330 V, Tape & Reel

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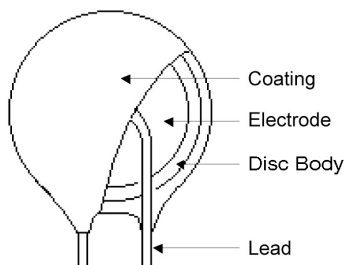
# MOV-10DxxxK Series - Metal Oxide Varistor

**BOURNS®**

## Performance Graphs



## Internal Construction



## Environmental Specifications

|                                 |   |
|---------------------------------|---|
| Moisture Sensitivity Level..... | 1 |
| ESD Classification (HBM).....   | 6 |

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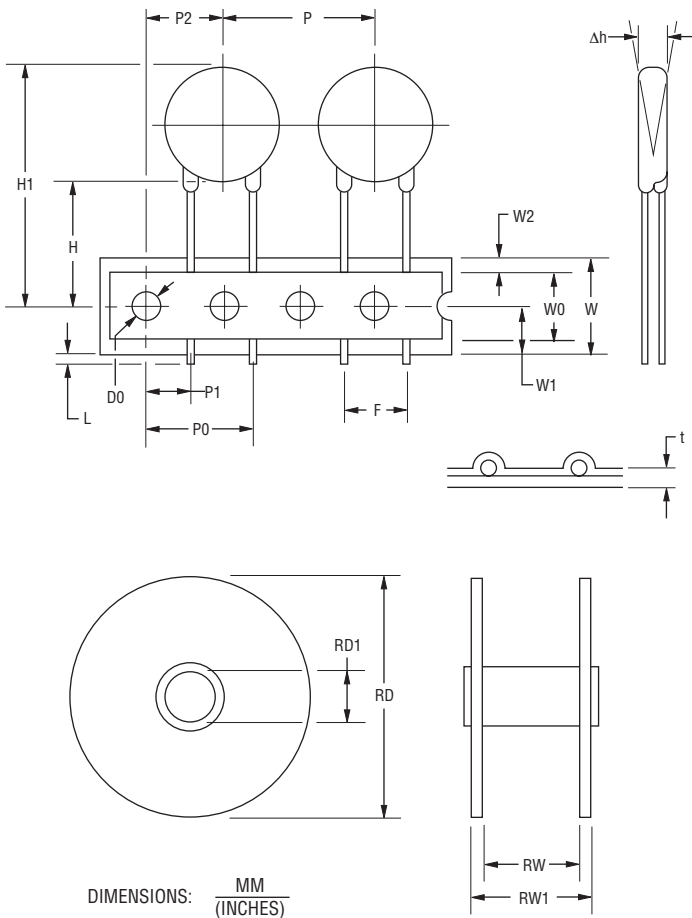
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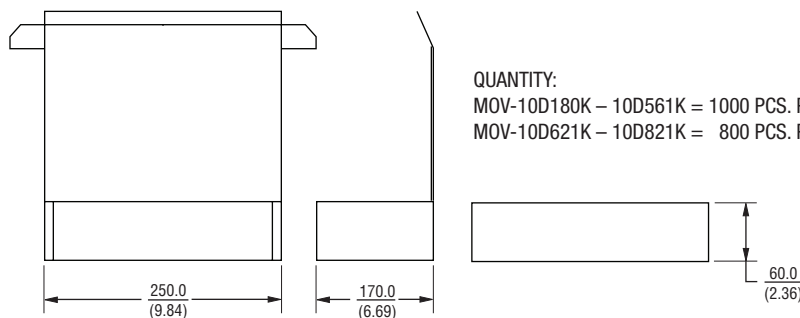
## Packaging Information

### TAPE & REEL



| Item                                     | Symbol     | 10 mm Disc                              |
|--|------------|---|
| Reel Outside Diameter                    | RD         | $\frac{355}{(13.98)}$                   |
| Reel Inner Diameter                      | RD1        | $\frac{30}{(1.181)}$                    |
| Tape Width                               | RW         | $\frac{55}{(2.16)}$                     |
| Reel Width                               | RW1        | $\frac{63}{(2.48)}$ max.                |
| Pitch of Component                       | P          | $\frac{25.4 \pm 0.7}{(1.00 \pm 0.03)}$  |
| Feed Hole Pitch                          | P0         | $\frac{12.7 \pm 1.0}{(0.50 \pm 0.04)}$  |
| Feed Hole Center to Pitch                | P1         | $\frac{8.95 \pm 0.7}{(0.352 \pm 0.03)}$ |
| Feed Hole Center to Component Center     | P2         | $\frac{12.7 \pm 1.0}{(0.50 \pm 0.04)}$  |
| Lead to Lead Distance                    | F          | $\frac{7.50 \pm 0.8}{(0.30 \pm 0.03)}$  |
| Component Alignment                      | $\Delta h$ | $\frac{2.0}{(0.079)}$                   |
| Tape Width                               | W          | $\frac{18.0 \pm 0.5}{(0.71 \pm 0.02)}$  |
| Hole Down Tape Width                     | W0         | $\frac{12.0 \pm 0.8}{(0.47 \pm 0.03)}$  |
| Hole Position                            | W1         | $\frac{9.0 \pm 0.5}{(0.35 \pm 0.02)}$   |
| Hole Down Tape Position                  | W2         | $\frac{3.0}{(0.12)}$ max.               |
| Height From Center to Component Base     | H          | $\frac{19.0 \pm 1.0}{(0.75 \pm 0.04)}$  |
| Seating Plane Height                     | H0         | $\frac{16.0 \pm 1.0}{(0.63 \pm 0.04)}$  |
| Component Height                         | H1         | $\frac{36.0}{(1.42)}$ max.              |
| Crimp Length                             | C          | $\frac{2.60}{(0.10)}$ typ.              |
| Feed Hole Diameter                       | D0         | $\frac{4.0 \pm 0.2}{(0.16 \pm 0.08)}$   |
| Total Tape Thickness                     | t          | $\frac{0.6 \pm 0.3}{(0.02 \pm 0.01)}$   |
| Length of Clipped Height                 | L          | $\frac{1.0}{(0.04)}$ max.               |
| Quantity per Reel<br>(10D180K – 10D361K) | -          | 1000                                    |
| Quantity per Reel<br>(10D391K – 10D821K) | -          | 500                                     |

### BULK



REV. 08/17

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