



## 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-20DxxxK Series - Metal Oxide Varistor

### General Information

The MOV-20DxxxK Series of 20 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 1800 V and  $V_{rms}$  voltages from 11 V to 1100 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 |

### 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                            | $P_w$     |      |      | 1.00 | Watt                  |
| Varistor Voltage Temperature Coefficient | $V_{TC}$  | 0    | 0.1  | 0.05 | $\% / ^\circ\text{C}$ |
| Response Time                            | $T_r$     |      | 10   | 25   | ns                    |
| Varistor Voltage Tolerance               | $V_{tol}$ | -10  | 0    | 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-20D180K     | 11                          | 14   | 16                    | 18   | 20   | 20  | 36                        | 2000                                    | 11.0               | 34200          |
| MOV-20D220K     | 14                          | 18   | 20                    | 22   | 24   | 20  | 43                        | 2000                                    | 14.0               | 24000          |
| MOV-20D270K     | 17                          | 22   | 24                    | 27   | 30   | 20  | 53                        | 2000                                    | 18.0               | 21600          |
| MOV-20D330K     | 20                          | 26   | 30                    | 33   | 36   | 20  | 65                        | 2000                                    | 23.0               | 19200          |
| MOV-20D390K     | 25                          | 31   | 35                    | 39   | 43   | 20  | 77                        | 2000                                    | 26.0               | 18000          |
| MOV-20D470K     | 30                          | 38   | 42                    | 47   | 52   | 20  | 93                        | 2000                                    | 33.0               | 16800          |
| MOV-20D560K     | 35                          | 45   | 50                    | 56   | 62   | 20  | 110                       | 2000                                    | 41.0               | 13200          |
| MOV-20D680K     | 40                          | 56   | 61                    | 68   | 75   | 20  | 135                       | 2000                                    | 46.0               | 10800          |
| MOV-20D820K     | 50                          | 65   | 74                    | 82   | 90   | 100   | 135                       | 6500                                    | 38.0               | 6000           |
| MOV-20D101K     | 60                          | 85   | 90                    | 100  | 110  | 100   | 165                       | 6500                                    | 45.0               | 5040           |
| MOV-20D121K     | 75                          | 100  | 108                   | 120  | 132  | 100   | 200                       | 6500                                    | 55.0               | 4200           |
| MOV-20D151K     | 95                          | 125  | 135                   | 150  | 165  | 100   | 250                       | 6500                                    | 70.0               | 3240           |
| MOV-20D181K     | 115                         | 150  | 162                   | 180  | 198  | 100   | 300                       | 6500                                    | 85.0               | 2640           |
| MOV-20D201K     | 130                         | 170  | 185                   | 200  | 225  | 100   | 340                       | 6500                                    | 95.0               | 2400           |
| MOV-20D221K     | 140                         | 180  | 198                   | 220  | 242  | 100   | 360                       | 6500                                    | 100.0              | 2160           |
| MOV-20D241K     | 150                         | 200  | 216                   | 240  | 264  | 100   | 395                       | 6500                                    | 108.0              | 1980           |
| MOV-20D271K     | 175                         | 225  | 243                   | 270  | 297  | 100   | 455                       | 6500                                    | 127.0              | 1800           |
| MOV-20D301K     | 190                         | 250  | 270                   | 300  | 330  | 100   | 500                       | 6500                                    | 136.0              | 1560           |
| MOV-20D331K     | 210                         | 275  | 297                   | 330  | 363  | 100   | 550                       | 6500                                    | 150.0              | 1440           |
| MOV-20D361K     | 230                         | 300  | 324                   | 360  | 396  | 100   | 595                       | 6500                                    | 163.0              | 1320           |
| MOV-20D391K     | 250                         | 320  | 351                   | 390  | 429  | 100   | 650                       | 6500                                    | 180.0              | 1200           |
| MOV-20D431K     | 275                         | 350  | 387                   | 430  | 473  | 100   | 710                       | 6500                                    | 190.0              | 1116           |
| MOV-20D471K     | 300                         | 385  | 423                   | 470  | 517  | 100   | 775                       | 6500                                    | 220.0              | 1020           |
| MOV-20D511K     | 320                         | 415  | 459                   | 510  | 561  | 100   | 845                       | 6500                                    | 220.0              | 936            |
| MOV-20D561K     | 350                         | 460  | 504                   | 560  | 616  | 100   | 925                       | 6500                                    | 220.0              | 852            |
| MOV-20D621K     | 385                         | 505  | 558                   | 620  | 682  | 100   | 1025                      | 6500                                    | 220.0              | 780            |
| MOV-20D681K     | 420                         | 560  | 612                   | 680  | 748  | 100   | 1120                      | 6500                                    | 220.0              | 720            |
| MOV-20D751K     | 460                         | 615  | 675                   | 750  | 825  | 100   | 1240                      | 6500                                    | 230.0              | 636            |
| MOV-20D781K     | 485                         | 640  | 702                   | 780  | 858  | 100   | 1290                      | 6500                                    | 255.0              | 612            |
| MOV-20D821K     | 510                         | 670  | 738                   | 820  | 902  | 100   | 1355                      | 6500                                    | 265.0              | 600            |
| MOV-20D911K     | 550                         | 745  | 819                   | 910  | 1001 | 100   | 1500                      | 6500                                    | 282.0              | 528            |
| MOV-20D102K     | 625                         | 825  | 900                   | 1000 | 1100 | 100   | 1650                      | 6500                                    | 310.0              | 480            |
| MOV-20D112K     | 680                         | 895  | 990                   | 1100 | 1210 | 100   | 1815                      | 6500                                    | 342.0              | 432            |
| MOV-20D152K     | 940                         | 1200 | 1350                  | 1500 | 1650 | 100   | 2475                      | 6500                                    | 383.0              | 384            |
| MOV-20D182K     | 1100                        | 1465 | 1620                  | 1800 | 1980 | 100   | 2970                      | 6500                                    | 625.0              | 312            |



**WARNING Cancer and Reproductive Harm**  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

\*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.

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# MOV-20DxxxK 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.



| Part Number | Dim. H (Max.)          | Dim. T (Max.)        |
|-------------|------------------------|----------------------|
| MOV-20D180K | $\frac{26.0}{(1.024)}$ | $\frac{4.2}{(.165)}$ |
| MOV-20D220K | $\frac{26.0}{(1.024)}$ | $\frac{4.3}{(.169)}$ |
| MOV-20D270K | $\frac{26.0}{(1.024)}$ | $\frac{4.6}{(.181)}$ |
| MOV-20D330K | $\frac{26.0}{(1.024)}$ | $\frac{4.2}{(.165)}$ |
| MOV-20D390K | $\frac{26.0}{(1.024)}$ | $\frac{4.4}{(.173)}$ |
| MOV-20D470K | $\frac{26.0}{(1.024)}$ | $\frac{4.6}{(.181)}$ |
| MOV-20D560K | $\frac{26.0}{(1.024)}$ | $\frac{4.7}{(.185)}$ |
| MOV-20D680K | $\frac{26.0}{(1.024)}$ | $\frac{4.8}{(.189)}$ |
| MOV-20D820K | $\frac{26.0}{(1.024)}$ | $\frac{4.2}{(.165)}$ |
| MOV-20D101K | $\frac{26.0}{(1.024)}$ | $\frac{4.4}{(.173)}$ |
| MOV-20D121K | $\frac{26.0}{(1.024)}$ | $\frac{4.6}{(.181)}$ |
| MOV-20D151K | $\frac{26.0}{(1.024)}$ | $\frac{4.8}{(.189)}$ |
| MOV-20D181K | $\frac{26.0}{(1.024)}$ | $\frac{4.0}{(.157)}$ |
| MOV-20D201K | $\frac{26.0}{(1.024)}$ | $\frac{4.2}{(.165)}$ |
| MOV-20D221K | $\frac{26.0}{(1.024)}$ | $\frac{4.3}{(.169)}$ |
| MOV-20D241K | $\frac{26.0}{(1.024)}$ | $\frac{4.4}{(.173)}$ |
| MOV-20D271K | $\frac{26.0}{(1.024)}$ | $\frac{4.6}{(.181)}$ |
| MOV-20D301K | $\frac{26.0}{(1.024)}$ | $\frac{4.8}{(.189)}$ |

| Part Number  | Dim. H (Max.)          | Dim. T (Max.)         |
|--------------|------------------------|-----------------------|
| MOV-20D331K  | $\frac{26.0}{(1.024)}$ | $\frac{5.0}{(.197)}$  |
| MOV-20D361K  | $\frac{26.0}{(1.024)}$ | $\frac{5.2}{(.205)}$  |
| MOV-20D391K  | $\frac{26.0}{(1.024)}$ | $\frac{5.4}{(.213)}$  |
| MOV-20D431K  | $\frac{26.0}{(1.024)}$ | $\frac{5.6}{(.220)}$  |
| MOV-20D471K  | $\frac{26.0}{(1.024)}$ | $\frac{5.9}{(.232)}$  |
| MOV-20D511K  | $\frac{26.0}{(1.024)}$ | $\frac{6.0}{(.236)}$  |
| MOV-20D561K  | $\frac{28.0}{(1.102)}$ | $\frac{6.5}{(.256)}$  |
| MOV-20D621K  | $\frac{28.0}{(1.102)}$ | $\frac{6.9}{(.272)}$  |
| MOV-20D681K  | $\frac{28.0}{(1.102)}$ | $\frac{7.0}{(.276)}$  |
| MOV-20D751K  | $\frac{28.0}{(1.102)}$ | $\frac{7.2}{(.283)}$  |
| MOV-20D781K  | $\frac{28.0}{(1.102)}$ | $\frac{7.4}{(.291)}$  |
| MOV-20D821K  | $\frac{28.0}{(1.102)}$ | $\frac{7.8}{(.307)}$  |
| MOV-20D911K* | $\frac{28.0}{(1.102)}$ | $\frac{8.2}{(.323)}$  |
| MOV-20D102K* | $\frac{28.0}{(1.102)}$ | $\frac{8.7}{(.343)}$  |
| MOV-20D112K* | $\frac{28.0}{(1.102)}$ | $\frac{9.2}{(.362)}$  |
| MOV-20D152K* | $\frac{28.0}{(1.102)}$ | $\frac{10.2}{(.402)}$ |
| MOV-20D182K* | $\frac{28.0}{(1.102)}$ | $\frac{12.2}{(.480)}$ |

\* Not available in Tape & Reel packaging.

## How to Order

**MOV - 20D nn (n) K (TR)**



Examples: MOV-20D270K = 27 V, Bulk Pack  
MOV-20D331KTR = 330 V, Tape & Reel

\* Models MOV-20D911K, 102K, 112K, 152K and 182K are not available in Tape & Reel packaging.

## Internal Construction



## Environmental Specifications

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

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# MOV-20DxxxK Series - Metal Oxide Varistor

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## Performance Graphs

### V-I Characteristics

#### MOV-20D180K to MOV-20D680K



#### MOV-20D820K to MOV-20D431K



#### MOV-20D471K to MOV-20D182K



## Typical Part Marking

| Bourns Part Number | Bourns Part Marking |
|--------------------|---------------------|
| MOV-20D180K        | 20D180K             |
| MOV-20D220K        | 20D220K             |
| MOV-20D270K        | 20D270K             |
| MOV-20D330K        | 20D330K             |
| MOV-20D390K        | 20D390K             |
| MOV-20D470K        | 20D470K             |
| MOV-20D560K        | 20D560K             |
| MOV-20D680K        | 20D680K             |
| MOV-20D820K        | 20D820K             |
| MOV-20D101K        | 20D101K             |
| MOV-20D121K        | 20D121K             |
| MOV-20D151K        | 20D151K             |
| MOV-20D181K        | 20D181K             |
| MOV-20D201K        | 20D201K             |
| MOV-20D221K        | 20D221K             |
| MOV-20D241K        | 20D241K             |
| MOV-20D271K        | 20D271K             |
| MOV-20D301K        | 20D301K             |
| MOV-20D331K        | 20D331K             |
| MOV-20D361K        | 20D361K             |
| MOV-20D391K        | 20D391K             |
| MOV-20D431K        | 20D431K             |
| MOV-20D471K        | 20D471K             |
| MOV-20D511K        | 20D511K             |
| MOV-20D561K        | 20D561K             |
| MOV-20D621K        | 20D621K             |
| MOV-20D681K        | 20D681K             |
| MOV-20D751K        | 20D751K             |
| MOV-20D781K        | 20D781K             |
| MOV-20D821K        | 20D821K             |
| MOV-20D911K        | 20D821K             |
| MOV-20D102K        | 20D102K             |
| MOV-20D112K        | 20D112K             |
| MOV-20D152K        | 20D152K             |
| MOV-20D182K        | 20D182K             |

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

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# MOV-20DxxxK Series - Metal Oxide Varistor

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## Packaging Information

### TAPE & REEL



DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

NOTE: Models MOV-20D911K, 102K, 112K, 152K and 182K are not available in Tape & Reel packaging.

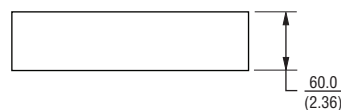
| Item                                 | Symbol     | 20 mm Disc                             |
|--------------------------------------|------------|--|
| Reel Outside Diameter                | RD         | $\frac{355}{(13.98)}$                  |
| Reel Inner Diameter                  | RD1        | $\frac{30}{(11.81)}$                   |
| Tape Width                           | RW         | $\frac{55}{(2.165)}$                   |
| Reel Width                           | RW1        | $\frac{63}{(2.48)}$                    |
| Pitch of Component                   | P          | $\frac{25.4 \pm 1.0}{(1.00 \pm 0.04)}$ |
| Feed Hole Pitch                      | P0         | $\frac{12.7 \pm 1.0}{(0.50 \pm 0.04)}$ |
| Feed Hole Center to Pitch            | P1         | $\frac{7.7 \pm 0.7}{(0.303 \pm 0.03)}$ |
| Feed Hole Center to Component Center | P2         | $\frac{12.7 \pm 1.0}{(0.50 \pm 0.04)}$ |
| Lead to Lead Distance                | F          | $\frac{10.0 \pm 0.8}{(0.39 \pm 0.03)}$ |
| Component Alignment                  | $\Delta h$ | $\frac{4.0}{(0.157)}$ max.             |
| 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         | $\frac{16.0 \pm 0.5}{(0.63 \pm 0.02)}$ |
| Component Height                     | H1         | $\frac{47.0}{(1.85)}$ 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                    | -          | 250                                    |

### BULK



#### QUANTITY:

MOV-20D180K – 20D301K = 500 PCS. PER BOX  
 MOV-20D331K – 20D431K = 400 PCS. PER BOX  
 MOV-20D471K – 20D821K = 300 PCS. PER BOX  
 MOV-20D911K – 20D182K = 200 PCS. PER BOX



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- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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