



## Features

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

## Applications

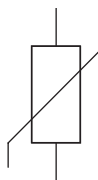
- Power supplies
- Power systems
- Line voltage
- Telecom systems
- White goods / appliances

## 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.

Users should verify actual device performance in their specific applications.

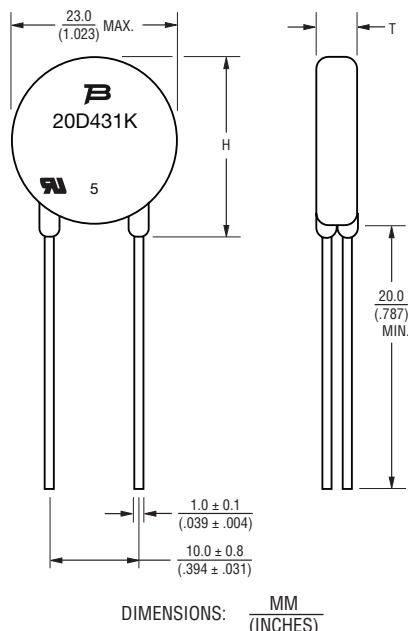
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# MOV-20DxxxK Series - Metal Oxide Varistor

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## Product Dimensions

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



## How to Order

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

Model Designator  
MOV = Metal Oxide Varistor

Disc Diameter  
20D = 20 mm

Nominal Varistor Voltage  
See Electrical Characteristics Table

Multiplier of Voltage Digits  
0 = No multiplier  
1 = nn \* 10<sup>1</sup>  
2 = nn \* 10<sup>2</sup>

Varistor Voltage Tolerance  
K = 10 %

Packaging  
Blank = Bulk  
TR = Tape & Reel\*

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

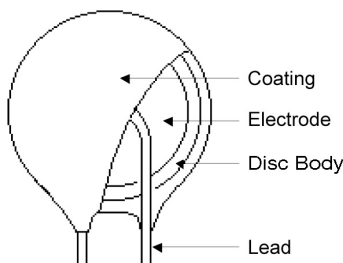
\* Models MOV-20D911K, 102K, 112K, 152K and 182K are not available in Tape & Reel packaging.

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

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

\* Not available in Tape & Reel packaging.

## Internal Construction



## Environmental Specifications

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

Specifications are subject to change without notice.

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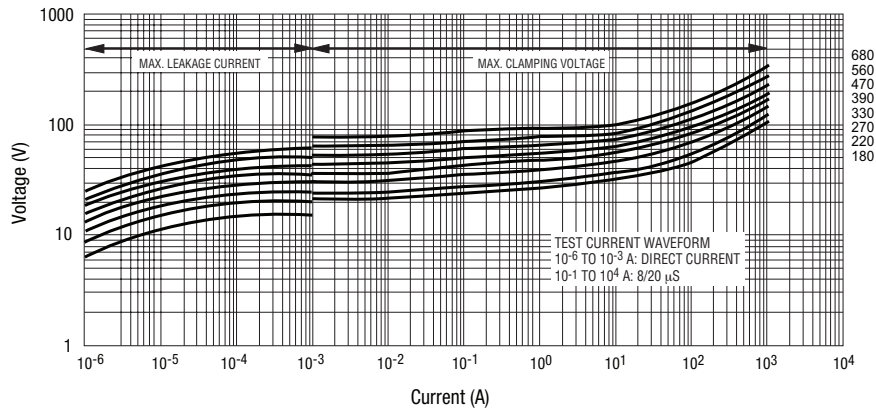
# MOV-20DxxxK Series - Metal Oxide Varistor

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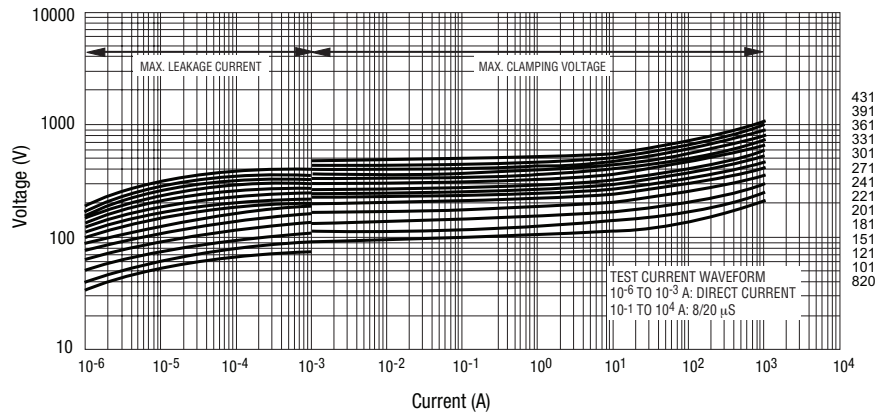
## Performance Graphs

### V-I Characteristics

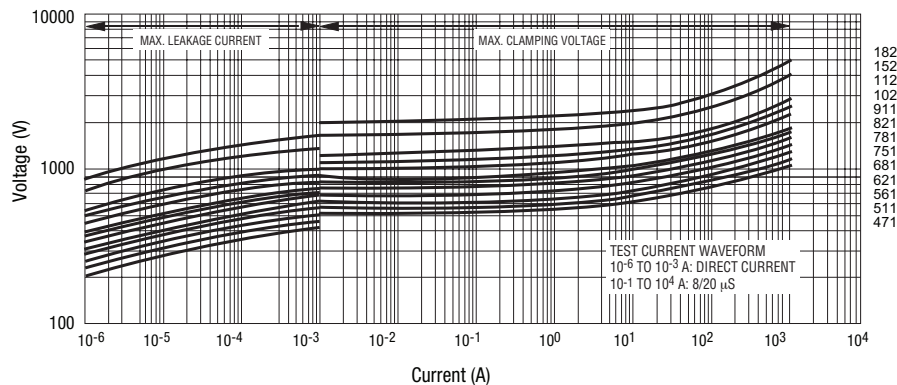
#### MOV-20D180K to MOV-20D680K



#### 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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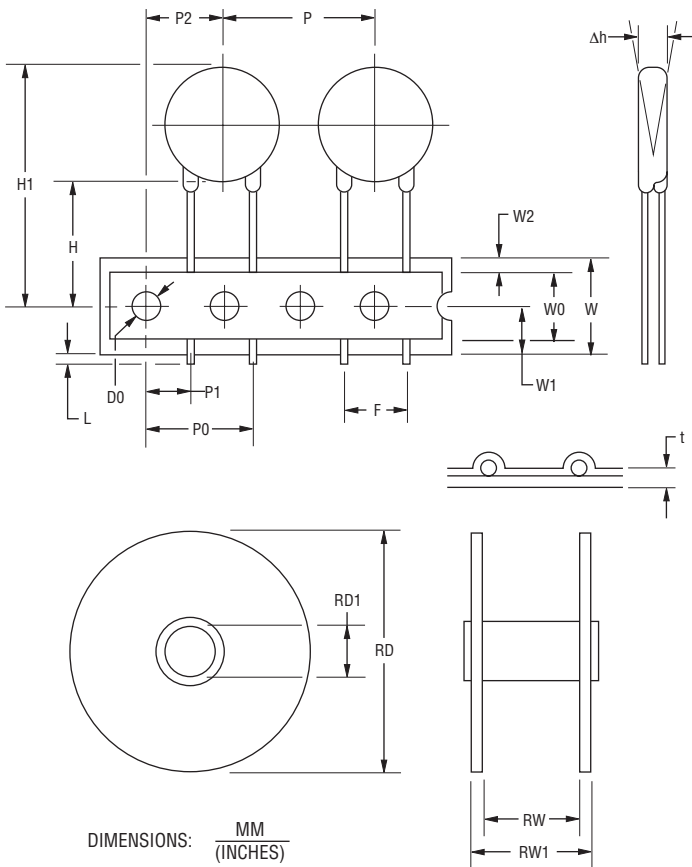
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# MOV-20DxxxK Series - Metal Oxide Varistor

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## Packaging Information

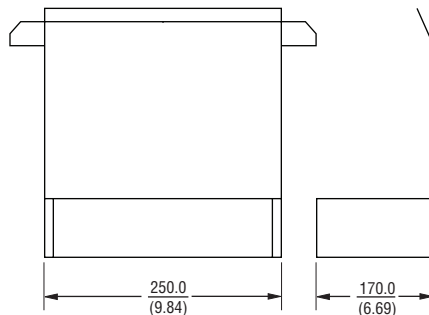
### TAPE & REEL



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

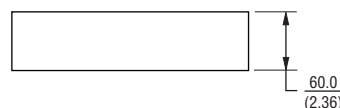
| Item                                 | Symbol | 20 mm Disc                  |
|--------------------------------------|--------|-----------------------------|
| Reel Outside Diameter                | RD     | 355<br>(13.98)              |
| Reel Inner Diameter                  | RD1    | 30<br>(11.81)               |
| Tape Width                           | RW     | 55<br>(2.165)               |
| Reel Width                           | RW1    | 63<br>(2.48)                |
| Pitch of Component                   | P      | 25.4 ± 1.0<br>(1.00 ± 0.04) |
| Feed Hole Pitch                      | P0     | 12.7 ± 1.0<br>(0.50 ± 0.04) |
| Feed Hole Center to Pitch            | P1     | 7.7 ± 0.7<br>(0.303 ± 0.03) |
| Feed Hole Center to Component Center | P2     | 12.7 ± 1.0<br>(0.50 ± 0.04) |
| Lead to Lead Distance                | F      | 10.0 ± 0.8<br>(0.39 ± 0.03) |
| Component Alignment                  | Δh     | 4.0<br>(0.157) max.         |
| Tape Width                           | W      | 18.0 ± 0.5<br>(0.71 ± 0.02) |
| Hole Down Tape Width                 | W0     | 12.0 ± 0.8<br>(0.47 ± 0.03) |
| Hole Position                        | W1     | 9.0 ± 0.5<br>(0.35 ± 0.02)  |
| Hole Down Tape Position              | W2     | 3.0<br>(0.12) max.          |
| Height From Center to Component Base | H      | 19.0 ± 1.0<br>(0.75 ± 0.04) |
| Seating Plane Height                 | H0     | 16.0 ± 0.5<br>(0.63 ± 0.02) |
| Component Height                     | H1     | 47.0<br>(1.85) max.         |
| Crimp Length                         | C      | 2.60<br>(0.10) typ.         |
| Feed Hole Diameter                   | D0     | 4.0 ± 0.2<br>(0.16 ± 0.08)  |
| Total Tape Thickness                 | t      | 0.6 ± 0.3<br>(0.02 ± 0.01)  |
| Length of Clipped Height             | L      | 1.0<br>(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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