



**THE DATASHEET OF
MOV-20D201K**





Features

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

Applications

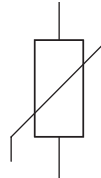
- Power supplies
- Power systems
- Line voltage
- Telecom systems
- White goods / appliances

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 μs) | | Max. Peak Current (8/20 μs) | 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 μs | 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 |

*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.

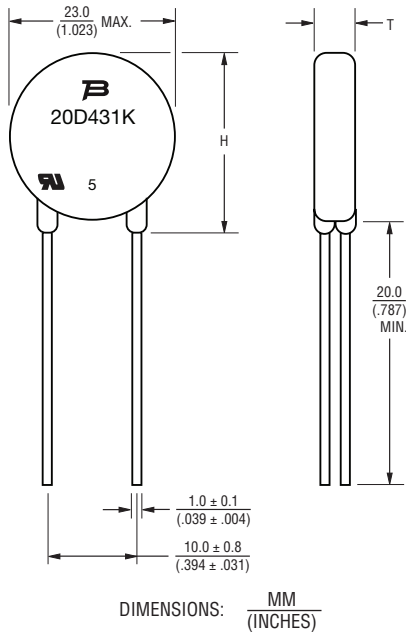
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MOV-20DxxxK Series - Metal Oxide Varistor

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Product Dimensions

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



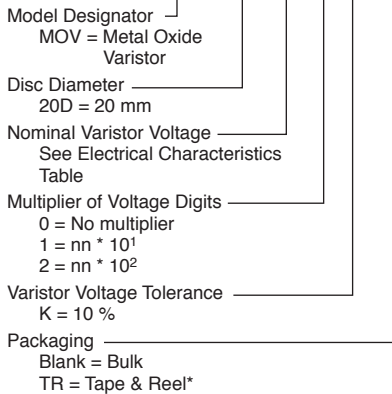
| Part Number | Dim. H (Max.) | Dim. T (Max.) |
|-------------|------------------------|----------------------|
| MOV-20D180K | $\frac{26.0}{(1.024)}$ | $\frac{4.2}{(.165)}$ |
| MOV-20D220K | $\frac{26.0}{(1.024)}$ | $\frac{4.3}{(.169)}$ |
| MOV-20D270K | $\frac{26.0}{(1.024)}$ | $\frac{4.6}{(.181)}$ |
| 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

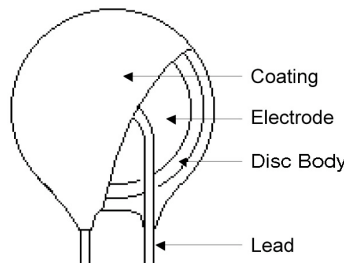
MOV - 20D nn (n) K (TR)



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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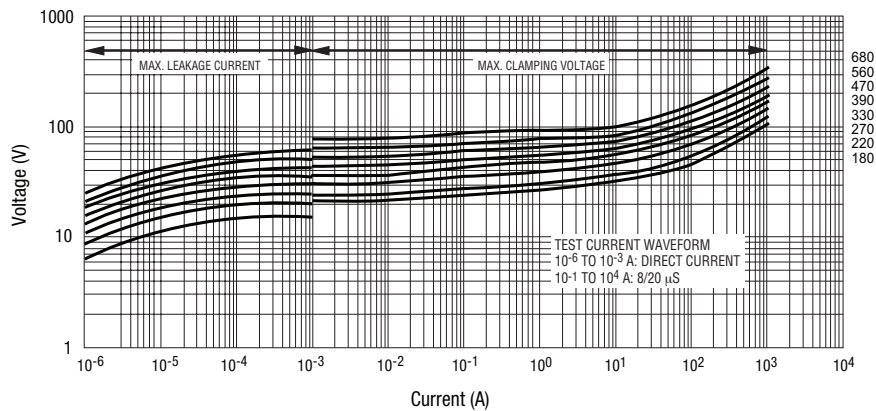
MOV-20DxxxK Series - Metal Oxide Varistor

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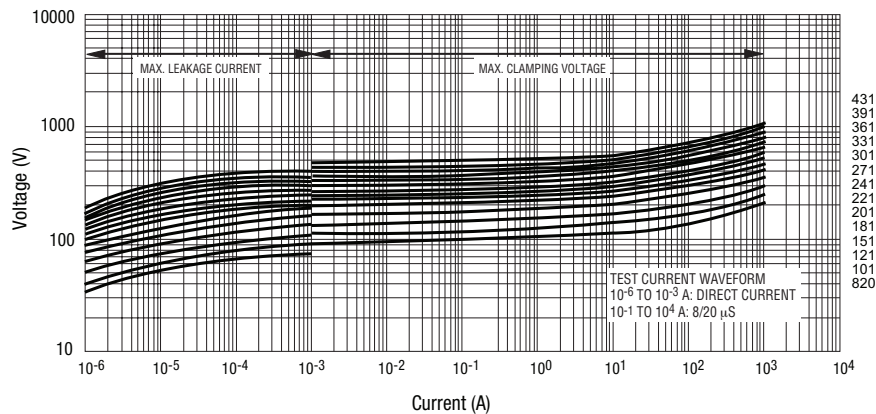
Performance Graphs

V-I Characteristics

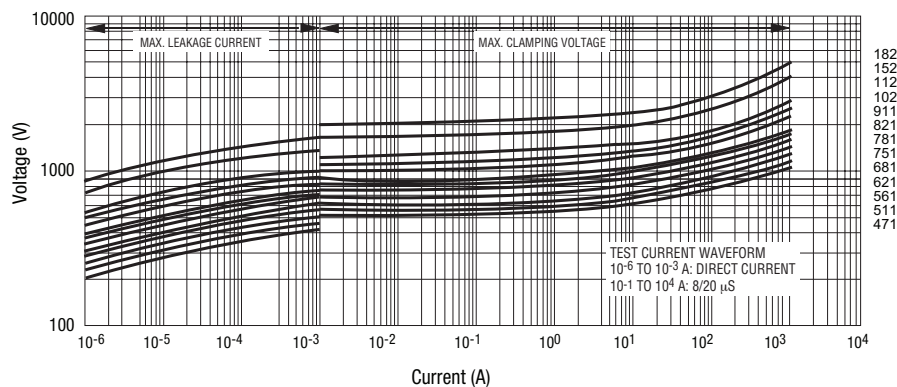
MOV-20D180K to MOV-20D680K



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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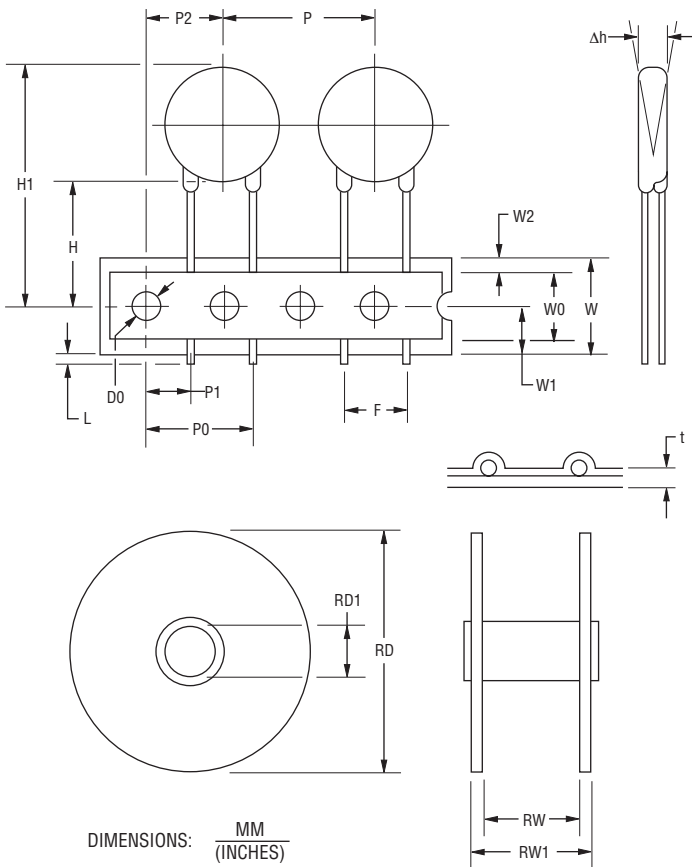
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MOV-20DxxxK Series - Metal Oxide Varistor

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Packaging Information

TAPE & REEL

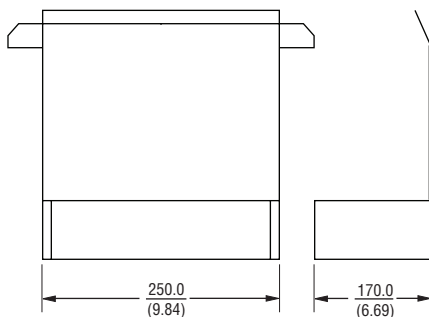


DIMENSIONS: $\frac{\text{MM}}{\text{(INCHES)}}$

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 | Δh | $\frac{4.0}{(0.157)}$ 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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REV. 08/17

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