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_{mss} 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.

### Absolute Maximum Ratings (@ T_{A} = 25 °C Unless Otherwise Noted)

<table>
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<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
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<tbody>
<tr>
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<td>Response Time</td>
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<td>Varistor Voltage Tolerance</td>
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### Electrical Characteristics (@ T_{A} = 25 °C Unless Otherwise Noted)

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<th>Bourns Part No.</th>
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<th>Voltage @ 1 mA DC (V)</th>
<th>Voltage @ Class Current (8/20 μs)</th>
<th>Max. Clamping Voltage (V)</th>
<th>One Time</th>
<th>Max. Peak Current (8/20 μs)</th>
<th>Max. Energy (J)</th>
<th>Typ. Cap. (pF)</th>
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Users should verify actual device performance in their specific applications.

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### Specifications

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

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

![Diagram of MOV-20DxxxK Series - Metal Oxide Varistor](image)

**Product Dimensions**

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

<table>
<thead>
<tr>
<th>Straight Leads</th>
<th>Part Number</th>
<th>Dim. H (Max.)</th>
<th>Dim. T (Max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOV-20D180K</td>
<td>26.0 (1.024)</td>
<td>4.2 (.165)</td>
<td></td>
</tr>
<tr>
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<td>4.8 (.189)</td>
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<th>Dim. T (Max.)</th>
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* Not available in Tape & Reel packaging.
**Not available with straight leads.

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**Product Dimensions (Continued)**

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### Kinked Leads (Outward)

![Kinked Leads Diagram]

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<th>Dim. T (Max.)</th>
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### Part Number   | Dim. H (Max.) | Dim. T (Max.) |
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<td>6.0 (2.36)</td>
</tr>
<tr>
<td>MOV-20D561KK</td>
<td>30.0 (1.181)</td>
<td>6.5 (2.56)</td>
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<td>30.0 (1.181)</td>
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<td>7.0 (2.76)</td>
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<td>MOV-20D751KK</td>
<td>30.0 (1.181)</td>
<td>7.2 (2.83)</td>
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<tr>
<td>MOV-20D781KK</td>
<td>30.0 (1.181)</td>
<td>7.4 (2.91)</td>
</tr>
</tbody>
</table>

* Not available in Tape & Reel packaging.

(Kinked Lead Product Dimensions continue on page 4.)
**MOV-20DxxxK Series - Metal Oxide Varistor**

**Product Dimensions (Continued)**

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

**Kinked Leads (In-line)**

![Diagram showing kinked leads](image)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Dim. T (Max.)</th>
<th>Part Number</th>
<th>Dim. T (Max.)</th>
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<tr>
<td>MOV-20D180K</td>
<td>N/A</td>
<td>MOV-20D181K</td>
<td>8.2 (0.323)</td>
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<tr>
<td>MOV-20D220K</td>
<td>N/A</td>
<td>MOV-20D182K</td>
<td>8.7 (0.343)</td>
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<tr>
<td>MOV-20D270K</td>
<td>N/A</td>
<td>MOV-20D112K*</td>
<td>9.2 (0.362)</td>
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<tr>
<td>MOV-20D330K</td>
<td>N/A</td>
<td>MOV-20D152K*</td>
<td>11.4 (0.449)</td>
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<tr>
<td>MOV-20D390K</td>
<td>N/A</td>
<td>MOV-20D182K*</td>
<td>13.0 (0.512)</td>
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<tr>
<td>MOV-20D470K</td>
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<tr>
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<tr>
<td>MOV-20D680K</td>
<td>N/A</td>
<td></td>
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<tr>
<td>MOV-20D820K</td>
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<tr>
<td>MOV-20D101K</td>
<td>7.8 (.307)</td>
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<tr>
<td>MOV-20D182K</td>
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**Typical Part Marking**

<table>
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<td>MOV-20D781K</td>
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<tr>
<td>MOV-20D821K</td>
<td>20D821K</td>
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<tr>
<td>MOV-20D911K</td>
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<td>MOV-20D102K</td>
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<td>MOV-20D112K</td>
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<td>MOV-20D152K</td>
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<tr>
<td>MOV-20D182K</td>
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</tr>
</tbody>
</table>

*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**

### How to Order

<table>
<thead>
<tr>
<th>Model Designator</th>
<th>MOV - 20D nn (n) K (TR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOV = Metal Oxide Varistor</td>
<td></td>
</tr>
<tr>
<td>Disc Diameter</td>
<td>20D = 20 mm</td>
</tr>
<tr>
<td>Nominal Varistor Voltage</td>
<td>See Electrical Characteristics</td>
</tr>
<tr>
<td>Multiplier of Voltage Digits</td>
<td>0 = No multiplier</td>
</tr>
<tr>
<td></td>
<td>1 = nn * 10^1</td>
</tr>
<tr>
<td></td>
<td>2 = nn * 10^2</td>
</tr>
<tr>
<td>Varistor Voltage Tolerance</td>
<td>K = 10%</td>
</tr>
<tr>
<td>Lead Style</td>
<td>Blank = Straight Leads</td>
</tr>
<tr>
<td></td>
<td>K = Kinked Leads</td>
</tr>
<tr>
<td>Packaging</td>
<td>Blank = Bulk</td>
</tr>
<tr>
<td></td>
<td>TR = Tape &amp; Reel*</td>
</tr>
</tbody>
</table>

Examples:
- MOV-20D270KK = 27 V, Kinked Leads, Bulk Pack
- MOV-20D331KTR = 330 V, Straight Leads, Tape & Reel

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

### Environmental Specifications

- Moisture Sensitivity Level: 1
- ESD Classification (HBM): N/A

### Internal Construction

![Internal Construction Diagram](image)

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Performance Graphs

V-I Characteristics

MOV-20D180K to MOV-20D680K

MOV-20D820K to MOV-20D431K

MOV-20D471K to MOV-20D182K

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

### Packaging Information

**TAPE & REEL - Straight Leads**

![Diagram of Tape & Reel Packaging]

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>20 mm Disc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reel Outside Diameter</td>
<td>RD</td>
<td>355 (1.398)</td>
</tr>
<tr>
<td>Reel Inner Diameter</td>
<td>RD1</td>
<td>30</td>
</tr>
<tr>
<td>Tape Width</td>
<td>RW</td>
<td>55 (2.118)</td>
</tr>
<tr>
<td>Reel Width</td>
<td>RW1</td>
<td>63 max. (2.48 max.)</td>
</tr>
<tr>
<td>Pitch of Component</td>
<td>P</td>
<td>25.4 ± 1.0</td>
</tr>
<tr>
<td>Feed Hole Pitch</td>
<td>P0</td>
<td>12.7 ± 0.2</td>
</tr>
<tr>
<td>Feed Hole Center to Pitch</td>
<td>P1</td>
<td>7.77 ± 0.7</td>
</tr>
<tr>
<td>Feed Hole Center to Component Center</td>
<td>P2</td>
<td>12.7 ± 0.7</td>
</tr>
<tr>
<td>Lead to Lead Distance</td>
<td>F</td>
<td>10.0 ± 0.8</td>
</tr>
<tr>
<td>Component Alignment</td>
<td>Δh</td>
<td>4.0 max. (0.16 max.)</td>
</tr>
<tr>
<td>Tape Width</td>
<td>W</td>
<td>18.0 ± 0.5</td>
</tr>
<tr>
<td>Hole Down Tape Width</td>
<td>W0</td>
<td>12.0 ± 0.8</td>
</tr>
<tr>
<td>Hole Position</td>
<td>W1</td>
<td>9.0 ± 0.5</td>
</tr>
<tr>
<td>Hole Down Tape Position</td>
<td>W2</td>
<td>3.0 max. (0.12 max.)</td>
</tr>
<tr>
<td>Height From Center to Component Base</td>
<td>H</td>
<td>19.0 ± 1.0</td>
</tr>
<tr>
<td>Component Height</td>
<td>H1</td>
<td>47.0 max. (1.85 max.)</td>
</tr>
<tr>
<td>Feed Hole Diameter</td>
<td>D0</td>
<td>4.0 ± 0.2</td>
</tr>
<tr>
<td>Total Tape Thickness</td>
<td>t</td>
<td>0.6 ± 0.3</td>
</tr>
<tr>
<td>Quantity per Reel</td>
<td>-</td>
<td>250</td>
</tr>
</tbody>
</table>

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

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Packaging Information (Continued)

TAPE & REEL - Kinked Leads

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>20 mm Disc</th>
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</thead>
<tbody>
<tr>
<td>Reel Outside Diameter</td>
<td>RD</td>
<td>355 (13.98)</td>
</tr>
<tr>
<td>Reel Inner Diameter</td>
<td>RD1</td>
<td>30 (1.181)</td>
</tr>
<tr>
<td>Tape Width</td>
<td>RW</td>
<td>55</td>
</tr>
<tr>
<td>Reel Width</td>
<td>RW1</td>
<td>63 (2.48) max.</td>
</tr>
<tr>
<td>Pitch of Component</td>
<td>P</td>
<td>25.4 ± 1.0 (1.00 ± 0.04)</td>
</tr>
<tr>
<td>Feed Hole Pitch</td>
<td>P0</td>
<td>12.7 ± 0.2 (0.50 ± 0.008)</td>
</tr>
<tr>
<td>Feed Hole Center to Pitch</td>
<td>P1</td>
<td>7.77 ± 0.7 (0.31 ± 0.03)</td>
</tr>
<tr>
<td>Feed Hole Center to Component Center</td>
<td>P2</td>
<td>12.7 ± 0.7 (0.50 ± 0.03)</td>
</tr>
<tr>
<td>Lead to Lead Distance</td>
<td>F</td>
<td>10.0 ± 0.8 (0.39 ± 0.03)</td>
</tr>
<tr>
<td>Component Alignment</td>
<td>Δh</td>
<td>4.0 (0.157) max.</td>
</tr>
<tr>
<td>Tape Width</td>
<td>W</td>
<td>16.0 ± 0.5 (0.71 ± 0.02)</td>
</tr>
<tr>
<td>Hole Down Tape Width</td>
<td>W0</td>
<td>12.0 ± 0.8 (0.47 ± 0.03)</td>
</tr>
<tr>
<td>Hole Position</td>
<td>W1</td>
<td>9.0 ± 0.5 (0.39 ± 0.02)</td>
</tr>
<tr>
<td>Hole Down Tape Position</td>
<td>W2</td>
<td>3.0 (0.12) max.</td>
</tr>
<tr>
<td>Height From Component Top to Kinked Base</td>
<td>H</td>
<td>28.0 (1.10) max.</td>
</tr>
<tr>
<td>Height From Component Top to Kinked Base</td>
<td>H</td>
<td>30.0 (1.18) max.</td>
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<tr>
<td>Seating Plane Height</td>
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<td>47.5 (1.88) max.</td>
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<tr>
<td>Feed Hole Diameter</td>
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<td>4.0 ± 0.2 (0.16 ± 0.08)</td>
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<tr>
<td>Total Tape Thickness</td>
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<td>0.6 ± 0.3 (0.02 ± 0.01)</td>
</tr>
<tr>
<td>Quantity per Reel</td>
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<td>250</td>
</tr>
</tbody>
</table>

NOTE: Models MOV-20D911KK, 102KK, 112KK, 152KK and 182KK are not available in Tape & Reel packaging.

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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