

### Features

- I Wide operating voltage ( $V_{1mA}$ ) range from 18V to 1800V
- I Fast responding to transient over-voltage.
- I Large absorbing transient energy capability.
- I Low clamping ratio and no following-on current.



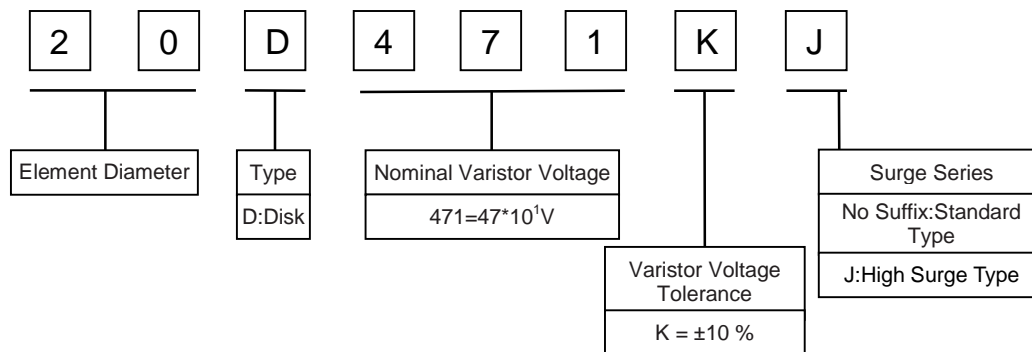
### General Information

- I Surge protection in consumer electronics
- I Surge protection in industrial electronics
- I Relay and electromagnetic valve surge absorption
- I Transistor, diode, IC, thyristor or triac semiconductor protection
- I Surge protection in electronic home appliances, gas and petroleum appliances
- I Agency: CUL( E479668),CQC(22001337054), TUV(J50541477)

### General Characteristics

- I Body: Nickel Plated
- I Devices with No Leads: Nickel Plated
- I Operating Temperature: -40°C to +85°C
- I Storage Temperature: -40 °C to +125°C
- I Axial Devices: Tin Plated

### Part Number Code



### Agency Information

| Agency Information |     | Agency File Number |
|--------------------|-----|--------------------|
|                    | CUL | E479668            |
|                    | CQC | 22001337054        |
|                    | TUV | J50541477          |

### Electrical Characteristics

| Type Number |            | Varistor Voltage     | Max. Allowable Voltage |                     | Max. Energy (10/1000µs) |                | Max. Clamping Voltage (8/20µs) |                    | Withstanding Surge Current (8/20µs) |                 | Rated Power (W) | Typical Capacitance (Reference) @1KHz(pf) |
|-------------|------------|----------------------|------------------------|---------------------|-------------------------|----------------|--------------------------------|--------------------|-------------------------------------|-----------------|-----------------|---|
|             |            |                      | V <sub>Ac</sub> (V)    | V <sub>Dc</sub> (V) | (J) Standard            | (J) High Surge | I <sub>p</sub> (A)             | V <sub>c</sub> (V) | I(A) Standard                       | I(A) High Surge |                 |   |
| Standard    | High Surge | V <sub>1mA</sub> (V) |                        |                     |                         |                |                                |                    |                                     |                 |                 |   |
| 20D180K     | /          | 16~20                | 11                     | 14                  | 11                      | /              | 25                             | 38                 | 2000                                | /               | 0.2             | 39000                                     |
| 20D220K     | /          | 20~24                | 14                     | 18                  | 14                      | /              | 25                             | 43                 | 2000                                | /               | 0.2             | 32000                                     |
| 20D270K     | /          | 24.3~31.1            | 17                     | 22                  | 18                      | /              | 25                             | 53                 | 2000                                | /               | 0.2             | 22000                                     |
| 20D330K     | /          | 29.7~37.9            | 20                     | 26                  | 23                      | /              | 25                             | 65                 | 2000                                | /               | 0.2             | 18000                                     |
| 20D390K     | /          | 35.2~44.8            | 25                     | 31                  | 26                      | /              | 25                             | 77                 | 2000                                | /               | 0.2             | 16000                                     |
| 20D470K     | /          | 43~53                | 30                     | 38                  | 33                      | /              | 25                             | 93                 | 2000                                | /               | 0.2             | 14000                                     |
| 20D560K     | /          | 51~63                | 35                     | 45                  | 41                      | /              | 25                             | 110                | 2000                                | /               | 0.2             | 12000                                     |
| 20D680K     | /          | 62~76                | 40                     | 56                  | 46                      | /              | 25                             | 135                | 2000                                | /               | 0.2             | 10000                                     |
| 20D820K     | 20D820KJ   | 74~90                | 50                     | 65                  | 48                      | 67             | 100                            | 135                | 6500                                | 10000           | 1.0             | 5800                                      |
| 20D101K     | 20D101KJ   | 90~110               | 60                     | 85                  | 52                      | 73             | 100                            | 165                | 6500                                | 10000           | 1.0             | 4800                                      |
| 20D121K     | 20D121KJ   | 108~132              | 75                     | 100                 | 56                      | 78             | 100                            | 200                | 6500                                | 10000           | 1.0             | 3800                                      |
| 20D151K     | 20D151KJ   | 135~165              | 95                     | 125                 | 71                      | 99             | 100                            | 250                | 6500                                | 10000           | 1.0             | 3000                                      |
| 20D181K     | 20D181KJ   | 162~198              | 115                    | 150                 | 86                      | 152            | 100                            | 300                | 6500                                | 10000           | 1.0             | 2600                                      |
| 20D201K     | 20D201KJ   | 185~225              | 130                    | 170                 | 97                      | 175            | 100                            | 340                | 6500                                | 10000           | 1.0             | 2400                                      |
| 20D221K     | 20D221KJ   | 198~242              | 140                    | 180                 | 102                     | 185            | 100                            | 360                | 6500                                | 10000           | 1.0             | 1800                                      |
| 20D241K     | 20D241KJ   | 216~264              | 150                    | 200                 | 110                     | 198            | 100                            | 395                | 6500                                | 10000           | 1.0             | 1500                                      |
| 20D271K     | 20D271KJ   | 243~297              | 175                    | 225                 | 130                     | 220            | 100                            | 455                | 6500                                | 10000           | 1.0             | 1400                                      |
| 20D301K     | 20D301KJ   | 270~330              | 195                    | 250                 | 139                     | 245            | 100                            | 505                | 6500                                | 10000           | 1.0             | 1350                                      |
| 20D331K     | 20D331KJ   | 297~363              | 210                    | 275                 | 153                     | 268            | 100                            | 550                | 6500                                | 10000           | 1.0             | 1300                                      |
| 20D361K     | 20D361KJ   | 324~396              | 230                    | 300                 | 166                     | 315            | 100                            | 595                | 6500                                | 10000           | 1.0             | 1250                                      |
| 20D391K     | 20D391KJ   | 351~429              | 250                    | 320                 | 184                     | 350            | 100                            | 650                | 6500                                | 10000           | 1.0             | 1180                                      |
| 20D431K     | 20D431KJ   | 387~473              | 275                    | 350                 | 194                     | 380            | 100                            | 710                | 6500                                | 10000           | 1.0             | 1100                                      |
| 20D471K     | 20D471KJ   | 423~517              | 300                    | 385                 | 224                     | 405            | 100                            | 775                | 6500                                | 10000           | 1.0             | 1050                                      |
| 20D511K     | 20D511KJ   | 459~561              | 320                    | 418                 | 224                     | 445            | 100                            | 842                | 6500                                | 10000           | 1.0             | 1000                                      |
| 20D561K     | 20D561KJ   | 504~616              | 350                    | 460                 | 224                     | 475            | 100                            | 920                | 6500                                | 10000           | 1.0             | 970                                       |
| 20D621K     | 20D621KJ   | 558~682              | 385                    | 505                 | 224                     | 490            | 100                            | 1025               | 6500                                | 10000           | 1.0             | 950                                       |
| 20D681K     | 20D681KJ   | 612~748              | 420                    | 560                 | 235                     | 500            | 100                            | 1120               | 6500                                | 10000           | 1.0             | 900                                       |
| 20D751K     | 20D751KJ   | 675~825              | 460                    | 615                 | 260                     | 525            | 100                            | 1240               | 6500                                | 10000           | 1.0             | 850                                       |
| 20D781K     | 20D781KJ   | 702~858              | 485                    | 640                 | 269                     | 530            | 100                            | 1290               | 6500                                | 10000           | 1.0             | 750                                       |
| 20D821K     | 20D821KJ   | 738~902              | 510                    | 670                 | 288                     | 545            | 100                            | 1355               | 6500                                | 10000           | 1.0             | 700                                       |
| 20D911K     | 20D911KJ   | 819~1001             | 550                    | 745                 | 316                     | 595            | 100                            | 1500               | 6500                                | 10000           | 1.0             | 600                                       |
| 20D951K     | 20D951KJ   | 855~1045             | 580                    | 780                 | 328                     | 610            | 100                            | 1570               | 6500                                | 10000           | 1.0             | 580                                       |
| 20D102K     | 20D102KJ   | 900~1100             | 625                    | 825                 | 349                     | 650            | 100                            | 1650               | 6500                                | 10000           | 1.0             | 500                                       |
| 20D112K     | 20D112KJ   | 990~1210             | 680                    | 895                 | 391                     | 720            | 100                            | 1815               | 6500                                | 10000           | 1.0             | 450                                       |
| 20D122K     | 20D122KJ   | 1080~1320            | 740                    | 975                 | 425                     | 730            | 100                            | 2010               | 6500                                | 10000           | 1.0             | 440                                       |
| 20D142K     | 20D142KJ   | 1260~1540            | 870                    | 1150                | 481                     | 750            | 100                            | 2310               | 6500                                | 10000           | 1.0             | 410                                       |
| 20D152K     | 20D152KJ   | 1350~1650            | 900                    | 1220                | 516                     | 790            | 100                            | 2475               | 6500                                | 10000           | 1.0             | 400                                       |
| 20D182K     | 20D182KJ   | 1620~1980            | 1000                   | 1465                | 632                     | 850            | 100                            | 2970               | 6500                                | 10000           | 1.0             | 220                                       |

Electrical Ratings

| Items                      | Test Condition/Description   | Requirement   |                             |               |              |               |  |
|----------------------------|--|---------------|-----------------------------|---------------|--------------|---------------|--|
| Varistor Voltage           | The voltage between two terminals with the specified measuring current 1mA.DC applied is called Vb.  |               |                             |               |              |               |  |
| Maximum Allowable Voltage  | The recommended maximum sine wave voltage (RMS) or the Maximum DC voltage can be applied continuously.   |               |                             |               |              |               |  |
| Maximum Clamping Voltage   | <p>The maximum voltage between two terminals with the specification standard impulse current. Applied waveform: 8/20μs</p> <p style="text-align: center;"> <math>T_1=1.25 \cdot T=8\mu s \pm 20\%</math><br/> <math>T_2=20\mu s \pm 20\%</math> </p>   |               | To meet the Specified value |               |              |               |  |
| Rated Wattage              | The maximum average power that can be applied within the specified ambient temperature.  |               |                             |               |              |               |  |
| Energy                     | The maximum energy within the varistor voltage change of $\pm 10\%$ when one impulse of 10/1000μs or 2ms is applied.   |               |                             |               |              |               |  |
| Withstanding Surge Current | The maximum current within the varistor voltage change of $\pm 10\%$ with the standard impulse current (8/20μs) applied one time.  |               |                             |               |              |               |  |
| Surge Life                 | <p>The change of Vb shall be measured after the impulse listed below which is applied 10,000 times continuously with the interval of ten seconds at room temperature.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2" style="text-align: center;">20Φ series</td> <td style="text-align: center;">180K to 680K</td> <td style="text-align: center;">100A (8/20μs)</td> </tr> <tr> <td style="text-align: center;">820K to 182K</td> <td style="text-align: center;">200A (8/20μs)</td> </tr> </table> | 20Φ series    | 180K to 680K                | 100A (8/20μs) | 820K to 182K | 200A (8/20μs) | $\frac{\Delta V_b}{V_b} \leq \pm 10\%$ |
| 20Φ series                 | 180K to 680K   |               | 100A (8/20μs)               |               |              |               |  |
|                            | 820K to 182K   | 200A (8/20μs) |                             |               |              |               |  |

**Soldering Recommendation**

**Wave Lead Free Soldering Recommendation**

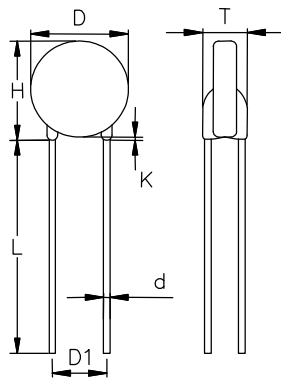


| Item             | Conditions        |
|------------------|-------------------|
| Peak Temperature | 265°C             |
| Dipping Time     | 10 seconds (max.) |
| Soldering        | 1 time            |

**Recommendation Reworking Conditions with Soldering Iron**

| Item                              | Conditions       |
|-----------------------------------|------------------|
| Temperature of Soldering Iron-tip | 360°C (max.)     |
| Soldering Time                    | 3 seconds (max.) |
| Distance from Varistor            | 2mm (min.)       |

**Dimensions**



| Symbol   | Millimeter | Inches |
|----------|------------|--------|
| H(max)   | 26.0       | 1.024  |
| L(min)   | 15.0       | 0.591  |
| D(max)   | 23.0       | 0.906  |
| D1(±1.0) | 10.0       | 0.394  |
| K(max)   | 2.0        | 0.079  |
| T(max)   | TABLE 2    |        |
| d(±0.1)  | 1.0        | 0.039  |

Packaging Quantity: 250pcs/bag

TABLE 2---T(max.)

| Model     | Millimeters | Inches | Model       | Millimeters | Inches |
|-----------|-------------|--------|-------------|-------------|--------|
| 18V~39V   | 5.1         | 0.201  | 430V~560V   | 6.7         | 0.264  |
| 47V~68V   | 5.6         | 0.220  | 620V~780V   | 7.7         | 0.303  |
| 82V~150V  | 5.1         | 0.201  | 820V~1200V  | 8.9         | 0.350  |
| 180V~270V | 5.7         | 0.224  | 1300V~1500V | 10          | 0.394  |
| 330V~390V | 6.1         | 0.240  | 1600V~1800V | 11.8        | 0.465  |



Taping Dimensions



| Symbol             | Millimeters | Inches      |
|--------------------|-------------|-------------|
| W                  | 18±1.0      | 0.709±0.039 |
| W0(max.)           | 9.0         | 0.354       |
| W1                 | 8.0±0.5     | 0.315±0.02  |
| P                  | 25.4±1.0    | 1.0±0.039   |
| P0                 | 12.7±1.0    | 0.50±0.039  |
| P1                 | 7.7±0.7     | 0.303±0.028 |
| F                  | 10.0±1.0    | 0.39±0.039  |
| D0                 | 4.0±0.3     | 0.157±0.012 |
| H                  | 20.0±1.3    | 0.787±0.051 |
| H1(max.)           | 45.0        | 1.772       |
| Packaging Quantity | 180K~301K   | 500pcs/reel |
|                    | 331K~122K   | 250pcs/reel |

## Looking for pricing, stock, or lifecycle information?

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