

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.



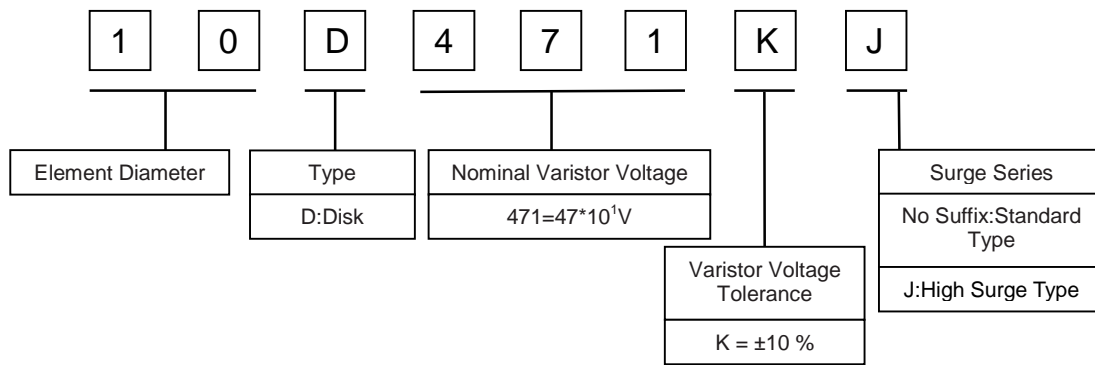
General Information

- 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

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



Electrical Characteristics

| Type Number | | Varistor Voltage | Max. Allowable Voltage | | Max. Energy (2ms) | | Max. Clamping Voltage (8/20µs) | | Withstanding Surge Current (8/20µs) | | Rated Power | Typical Capacitance (Reference) |
|-------------|------------|----------------------|------------------------|---------------------|-------------------|----------------|--------------------------------|--------------------|-------------------------------------|-----------------|-------------|---------------------------------|
| Standard | High Surge | V _{1mA} (V) | V _{Ac} (V) | V _{Dc} (V) | (J) Standard | (J) High Surge | I _p (A) | V _c (V) | I(A) Standard | I(A) High Surge | (W) | @1KHz(pf) |
| 10D180K | / | 16~20 | 11 | 14 | 1.6 | / | 5 | 38 | 500 | / | 0.05 | 7500 |
| 10D220K | / | 20~24 | 14 | 18 | 2.0 | / | 5 | 43 | 500 | / | 0.05 | 6000 |
| 10D270K | / | 24~30 | 17 | 22 | 2.4 | / | 5 | 53 | 500 | / | 0.05 | 4800 |
| 10D330K | / | 30~36 | 20 | 26 | 3.0 | / | 5 | 65 | 500 | / | 0.05 | 4200 |
| 10D390K | / | 35~43 | 25 | 31 | 3.5 | / | 5 | 77 | 500 | / | 0.05 | 3700 |
| 10D470K | / | 42~52 | 30 | 38 | 4.2 | / | 5 | 93 | 500 | / | 0.05 | 3300 |
| 10D560K | / | 50~62 | 35 | 45 | 5.0 | / | 5 | 110 | 500 | / | 0.05 | 2900 |
| 10D680K | / | 61~75 | 40 | 56 | 6.1 | / | 5 | 135 | 500 | / | 0.05 | 2500 |
| 10D820K | 10D820KJ | 74~90 | 50 | 65 | 7.4 | 9.2 | 25 | 135 | 2500 | 3500 | 0.4 | 2100 |
| 10D101K | 10D101KJ | 90~110 | 60 | 85 | 9.0 | 11.3 | 25 | 165 | 2500 | 3500 | 0.4 | 1700 |
| 10D121K | 10D121KJ | 108~132 | 75 | 100 | 10.8 | 13.5 | 25 | 200 | 2500 | 3500 | 0.4 | 1500 |
| 10D151K | 10D151KJ | 135~165 | 95 | 125 | 13.5 | 16.9 | 25 | 250 | 2500 | 3500 | 0.4 | 1300 |
| 10D181K | 10D181KJ | 162~198 | 115 | 150 | 16.2 | 20.3 | 25 | 300 | 2500 | 3500 | 0.4 | 470 |
| 10D201K | 10D201KJ | 180~220 | 130 | 170 | 18.0 | 22.5 | 25 | 340 | 2500 | 3500 | 0.4 | 430 |
| 10D221K | 10D221KJ | 198~242 | 140 | 180 | 19.8 | 24.8 | 25 | 360 | 2500 | 3500 | 0.4 | 390 |
| 10D241K | 10D241KJ | 216~264 | 150 | 200 | 21.6 | 27.0 | 25 | 395 | 2500 | 3500 | 0.4 | 360 |
| 10D271K | 10D271KJ | 243~297 | 175 | 225 | 24.3 | 30.4 | 25 | 455 | 2500 | 3500 | 0.4 | 330 |
| 10D301K | 10D301KJ | 270~330 | 195 | 250 | 27.0 | 33.8 | 25 | 505 | 2500 | 3500 | 0.4 | 290 |
| 10D331K | 10D331KJ | 297~363 | 210 | 275 | 29.7 | 37.1 | 25 | 550 | 2500 | 3500 | 0.4 | 280 |
| 10D361K | 10D361KJ | 324~396 | 230 | 300 | 32.4 | 40.5 | 25 | 595 | 2500 | 3500 | 0.4 | 260 |
| 10D391K | 10D391KJ | 351~429 | 250 | 320 | 35.1 | 43.9 | 25 | 650 | 2500 | 3500 | 0.4 | 240 |
| 10D431K | 10D431KJ | 387~473 | 275 | 350 | 38.7 | 48.4 | 25 | 710 | 2500 | 3500 | 0.4 | 220 |
| 10D471K | 10D471KJ | 423~517 | 300 | 385 | 42.3 | 52.9 | 25 | 775 | 2500 | 3500 | 0.4 | 190 |
| 10D511K | 10D511KJ | 459~561 | 320 | 418 | 42.3 | 52.9 | 25 | 845 | 2500 | 3500 | 0.4 | 180 |
| 10D561K | 10D561KJ | 504~616 | 350 | 460 | 42.3 | 52.9 | 25 | 920 | 2500 | 3500 | 0.4 | 180 |
| 10D621K | 10D621KJ | 558~682 | 385 | 505 | 42.3 | 52.9 | 25 | 1025 | 2500 | 3500 | 0.4 | 160 |
| 10D681K | 10D681KJ | 612~748 | 420 | 560 | 42.3 | 52.9 | 25 | 1120 | 2500 | 3500 | 0.4 | 140 |
| 10D751K | 10D751KJ | 675~825 | 460 | 615 | 42.3 | 52.9 | 25 | 1240 | 2500 | 3500 | 0.4 | 130 |
| 10D781K | 10D781KJ | 702~858 | 485 | 640 | 42.3 | 52.9 | 25 | 1290 | 2500 | 3500 | 0.4 | 130 |
| 10D821K | 10D821KJ | 738~902 | 510 | 670 | 44.3 | 55.4 | 25 | 1355 | 2500 | 3500 | 0.4 | 130 |
| 10D911K | 10D911KJ | 819~1001 | 550 | 745 | 49.1 | 61.4 | 25 | 1500 | 2500 | 3500 | 0.4 | 120 |
| 10D951K | 10D951KJ | 855~1045 | 580 | 780 | 51.3 | 64.1 | 25 | 1570 | 2500 | 3500 | 0.4 | 110 |
| 10D102K | 10D102KJ | 900~1100 | 625 | 825 | 54.0 | 67.5 | 25 | 1650 | 2500 | 3500 | 0.4 | 100 |
| 10D112K | 10D112KJ | 990~1210 | 680 | 895 | 59.4 | 74.3 | 25 | 1815 | 2500 | 3500 | 0.4 | 90 |
| 10D122K | 10D122KJ | 1080~1320 | 750 | 990 | 90.0 | 95.0 | 25 | 1980 | 2500 | 3500 | 0.4 | 85 |
| 10D152K | 10D152KJ | 1350~1650 | 900 | 1220 | 80.0 | 100.0 | 25 | 2475 | 2500 | 3500 | 0.4 | 80 |
| 10D182K | 10D182KJ | 1620~1980 | 1000 | 1465 | 97.2 | 121.5 | 25 | 2970 | 2500 | 3500 | 0.4 | 60 |

Note: The energy (10/1000µs) is about 1.4 times of energy(2ms)



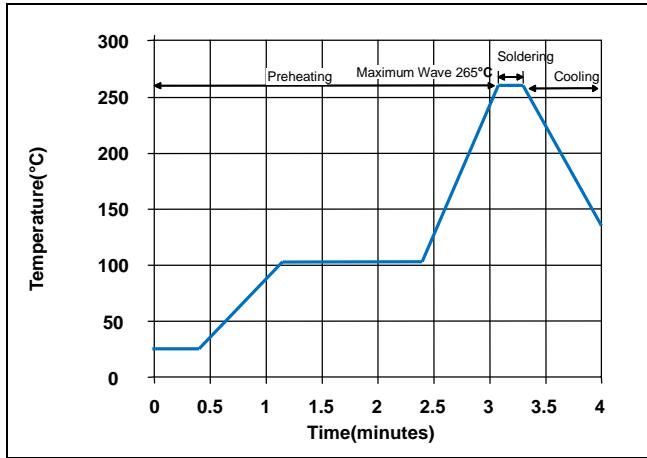
Electrical Ratings

| 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;"> $T1 = 1.25 \cdot T = 8\mu s \pm 20\%$ $T2 = 20\mu s \pm 20\%$ </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;"> <tbody> <tr> <td rowspan="2" style="text-align: center;">10Φ series</td> <td style="text-align: center;">180K to 680K</td> <td style="text-align: center;">50A (8/20μs)</td> </tr> <tr> <td style="text-align: center;">820K to 112K</td> <td style="text-align: center;">100A (8/20μs)</td> </tr> </tbody> </table> | | 10Φ series | 180K to 680K | 50A (8/20μs) | 820K to 112K | 100A (8/20μs) |
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| | 820K to 112K | 100A (8/20μs) | | | | | |



Soldering Recommendation

Wave Lead Free Soldering Recommendation

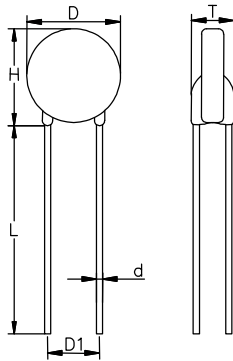


| Item | Conditions |
|------------------|-------------------|
| Peak Temperature | 265°C |
| Dipping Time | 10 seconds (max.) |
| Soldering | 1 time |

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 | Millimeters | Inches |
|----------|-------------|--------|
| H(max) | 15.0 | 0.591 |
| L(min) | 15.0 | 0.591 |
| D(max) | 12.0 | 0.472 |
| D1(±1.0) | 7.5 | 0.295 |
| T(max) | TABLE 2 | |
| d(±0.1) | 0.8 | 0.031 |

Packaging Quantity: 500pcs/bag

TABLE 2---T(max.)

| Model | Millimeters | Inches | Model | Millimeters | Inches |
|-----------|-------------|--------|-----------|-------------|--------|
| 180K~390K | 6.5 | 0.256 | 431K~561K | 9.0 | 0.354 |
| 470K~680K | 7.0 | 0.276 | 621K~781K | 9.5 | 0.374 |
| 820K~151K | 7.5 | 0.295 | 821K~122K | 10.0 | 0.394 |
| 181K~271K | 8.0 | 0.315 | 152K | 10.5 | 0.413 |
| 331K~391K | 8.5 | 0.335 | 182K | 11.0 | 0.433 |



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