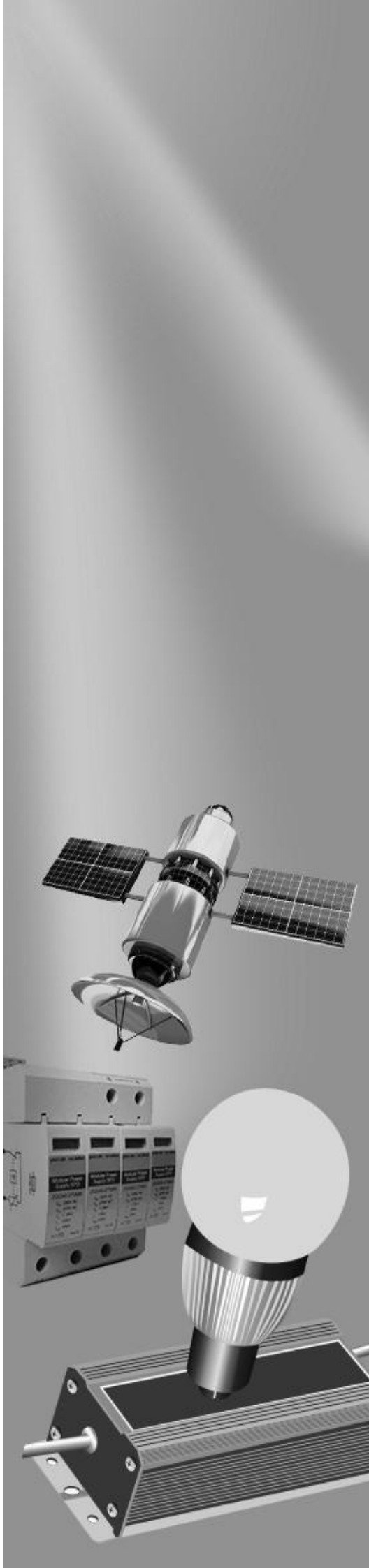
Innovative Service Around the Globe YAGEO

# DATA SHEET

## COMPOSITE SURGE PROTECTIVE UNIT

20D series

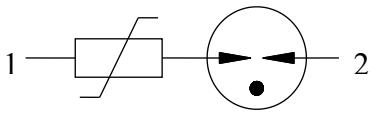
**RoHS compliant & Halogen free**



Product specification– July 22, 2026 V.0

## Features

- Hybrid design
- Low leakage
- Bidirectional protection
- Low capacitance
- RoHS and REACH compliant
- Meets MSL level 1, per J-STD-020
- Operating Temperature：-40℃ ~ +105℃
- Storage Temperature：-40℃ ~ +125℃

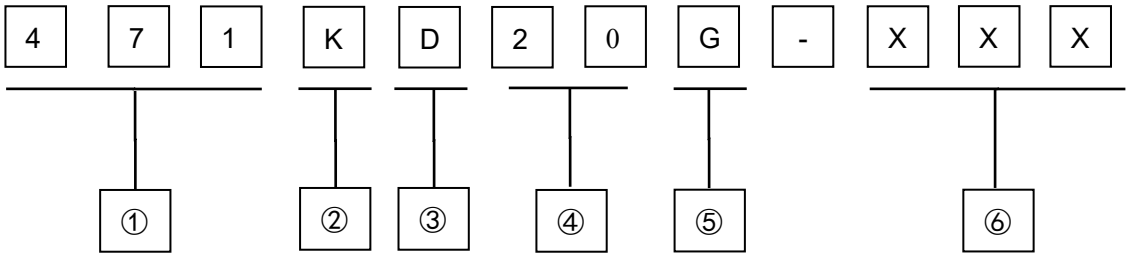



**Circuit Diagram**

## Applications

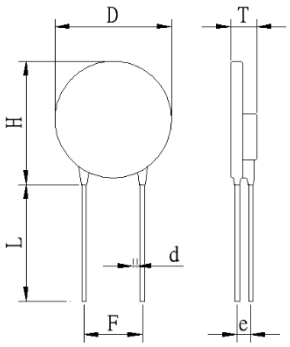
- AC Line Protection
- White goods
- Power line communications
- Smoke alarm systems
- High value consumer goods
- DC Line Protection
- Solar inverters
- Power supplies
- Distribution systems

## Part Number Code




| NO. | Description | |
|---|---|---|
| ① | 471 | Varistor Voltag<br>471: 470V |
| ② | K | Tolerance<br>K: ±10% |
| ③ | D | Type<br>D: Disk |
| ④ | 20 | Element Diameter<br>20 |
| ⑤ | G | GDT |
| ⑥ | xxx | No suffix: Standard Type<br>suffix: Internal Control Code |

## Dimensions



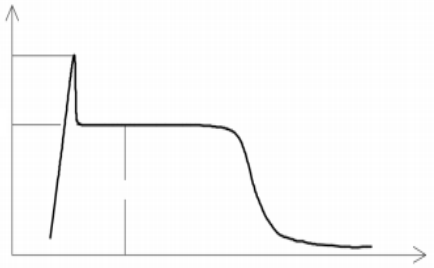

| Table 1 Unit: mm | |
|---|---|
| Symbol | Dimension |
| H | 21.0~26.0 |
| L(min.) | 20.0 |
| D | 20.0~23.0 |
| F(±1.0) | 10 |
| T | Table 2 |
| d(±0.1) | 1.0 |

| | Table 2 Unit: mm | | | | |
|---|---|---|---|---|---|
| Model | T（Max） | e(±1.0) | Model | T（Max） | e(±1.0) |
| 271K | 7.9 | 4.8 | 511K | 9.1 | 6.0 |
| 301K | 8.0 | 5.1 | 561K | 9.3 | 6.3 |
| 361K | 8.3 | 5.5 | 621K | 9.6 | 6.8 |
| 391K | 9.4 | 6.9 | 681K | 9.9 | 7.2 |
| 431K | 8.7 | 5.7 | 751K | 10.4 | 7.5 |
| 471K | 8.9 | 5.8 | | | |

## Electrical Characteristics

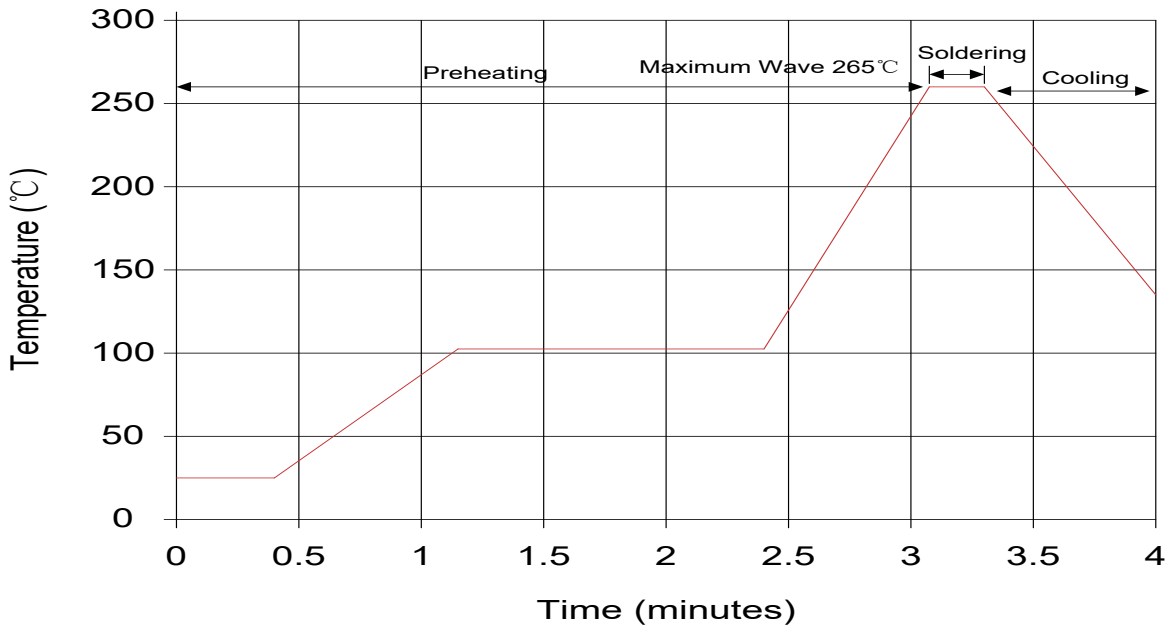
| Part Number | Operating | | | | Component Parameters | | Protection | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Maximum Continuous Operating Voltage (MCOV) | | Maximum Leakage (MCOV) | Maximum Capacitance | MOV Voltage（±10%） | GDT DCBD（±20%） | Inom UL 1449/4th | Imax | Ring Wave Surge IEEE 62.41 | Peak Voltage | Platform Voltage | Clamp Transition Time |
| | $V_{rms}$ | $V_{DC}$ | $A_{rms}$ | 1 MHz | $V_{1mA}$ | $V_{100V/S}$ | 15 Ops | 1 Ops | 200A | Max. | Typ. | |
| | V | V | μA | PF | V | V | A | A | Ops | Vfp | Vc | μs |
| 271KD20G | 175 | 225 | < 1 | 4 | 270 | 600 | 5000 | 10000 | ± 250 | 1200 | 475 | 0.3 |
| 301KD20G | 210 | 275 | | | 300 | 600 | | | | 1200 | 535 | |
| 361KD20G | 250 | 320 | | | 360 | 600 | | | | 1200 | 630 | |
| 391KD20G | 275 | 350 | | | 390 | 600 | | | | 1200 | 680 | |
| 431KD20G | 300 | 385 | | | 430 | 600 | | | | 1200 | 740 | |
| 471KD20G | 320 | 415 | | | 470 | 600 | | | | 1200 | 810 | |
| 511KD20G | 350 | 460 | | | 510 | 800 | | | | 1600 | 870 | |
| 561KD20G | 385 | 505 | | | 560 | 800 | | | | 1600 | 950 | |
| 621KD20G | 420 | 560 | | | 620 | 800 | | | | 1600 | 1050 | |
| 681KD20G | 460 | 615 | | | 680 | 1200 | | | | 2200 | 1150 | |
| 751KD20G | 510 | 670 | | | 750 | 1500 | | | | 2200 | 1330 | |

**Reliability**

<table>
<tr><th>NO.</th><th>Item</th><th>Test method</th><th>Performance</th></tr>
<tr><td>1</td><td>Peak Voltage ($V_{fp}$)<br>Platform Voltage($V_C$)</td><td>The voltage is measured with voltage ramp dv/dt=1KV/us.<br>Peak Voltage<br>Platform Voltage<br></td><td>$V_{fp}$ measured value is less than the specification maximum value<br>$V_C$ measured values is the specification average</td></tr>
<tr><td>2</td><td>Tensile Strength of Terminals</td><td>Gradually applying the force specified and keeping the unit fixed for 10±1 sec.<table><tr><th>Terminal diameter(mm)</th><th>Force(N)</th></tr><tr><td>0.5＜d≤0.8</td><td>10</td></tr><tr><td>0.8＜d≤1.25</td><td>20</td></tr><tr><td>1.25＜d</td><td>40</td></tr></table></td><td rowspan="4">No visible damage</td></tr>
<tr><td>3</td><td>Bending Strength of Terminals</td><td>Hold specimen and apply the force specified below to each lead. Bend the specimen to 90°, then return to the original position. Repeat the procedure in the opposite direction.<table><tr><th>Terminal diameter(mm)</th><th>Force (Kg)</th></tr><tr><td>0.5＜d≤0.8</td><td>5</td></tr><tr><td>0.8＜d≤1.25</td><td>10</td></tr><tr><td>1.25＜d</td><td>20</td></tr></table></td></tr>
<tr><td>4</td><td>Resistance Vibration</td><td>Frequency range:10Hz-55Hz, Amplitude: 0.75mm or 98m/s$^2$, three direction, Total duration: 6h.</td></tr>
<tr><td>5</td><td>Solder ability</td><td>Solder bath method 245±5℃,3±0.3 sec.</td><td>At least 95% of terminal electrode is covered by new solder.</td></tr>
<tr><td>6</td><td>Resistance to soldering heat</td><td>260±5℃, 10±1ses.Depth of immersion: up to 2.0～2.5mm from the root of the lead wire covered with thermal screen .Speed of immersion:25±2.5mm/sec.</td><td rowspan="6">No visible damage</td></tr>
<tr><td>7</td><td>Damp Heat Load</td><td>40±2℃ , 90~95% RH,at 10%VDC ,1344±24 hrs</td></tr>
<tr><td>8</td><td>High temperature</td><td>Ambient Temp: 125±2℃ Duration: 1000±24hrs</td></tr>
<tr><td>9</td><td>Low temperature</td><td>Ambient Temp: -40±2℃ Duration: 1000±24hrs</td></tr>
<tr><td>10</td><td>High Temperature load</td><td>Ambient Temp: 105±2℃ Duration: 1000±24hrs<br>Load: Max. Allowable Voltage In AC.</td></tr>
<tr><td>11</td><td>Temperature cycling</td><td>The conditions shown below shall be repeated 1000 cycles.<table><tr><th>Step</th><th>Temperature</th><th>Period</th></tr><tr><td>1</td><td>-40±3℃</td><td>30min</td></tr><tr><td>2</td><td>Room temperature</td><td>15min</td></tr><tr><td>3</td><td>+85±2℃</td><td>30min</td></tr><tr><td>4</td><td>Room temperature</td><td>15min</td></tr></table></td></tr>
<tr><td>12</td><td>Voltage Proof</td><td>Metal balls method.<br>2500Vac 1 min.</td><td>No visible damage</td></tr>
</table>

## Soldering Recommendation

Lead-free Wave Soldering Recommendation

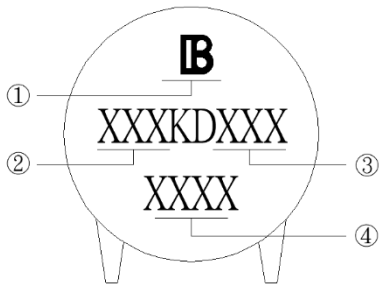



| Item | Conditions |
|---|---|
| Peak Temperature | 265℃ |
| Dipping Time | 10 seconds (max.) |
| Soldering | 1 time |

Recommendation Reworking Conditions with Soldering Iron

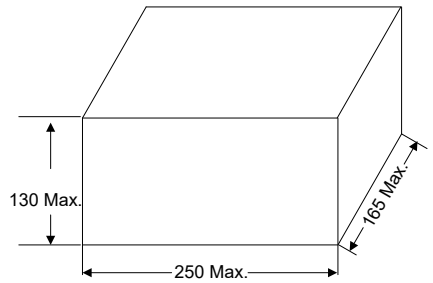
| Item | Conditions |
|---|---|
| Temperature of Soldering Iron-tip | 360℃ (max.) |
| Soldering Time | 3 seconds (max.) |
| Distance from Varistor | 2mm (min.) |

## Marking Code




① Brightking Logo
② Varistor Voltage
③ Disk Size
④ Internal Control Code

## Quantity

| Packaging Dimensions (Unit: mm) | Quantity |
|---|---|
|  | 100pcs/bag<br>2bags/box |

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