

SMD zinc oxide varistor: SMD3225 specification

Feature

1. Advanced packaging technology, packaging materials meet UL94-V0
2. Compact structure, small size, space saving
3. Superior high temperature and high humidity performance
4. Strong ability to suppress high surge and high current
5. SMD tray packaging, suitable for lead-free reflow soldering/wave soldering automatic placement
6. Comply with RoSH, REACH
7. Safety certification: CQC, CUL, TUV (certification in progress)

Application

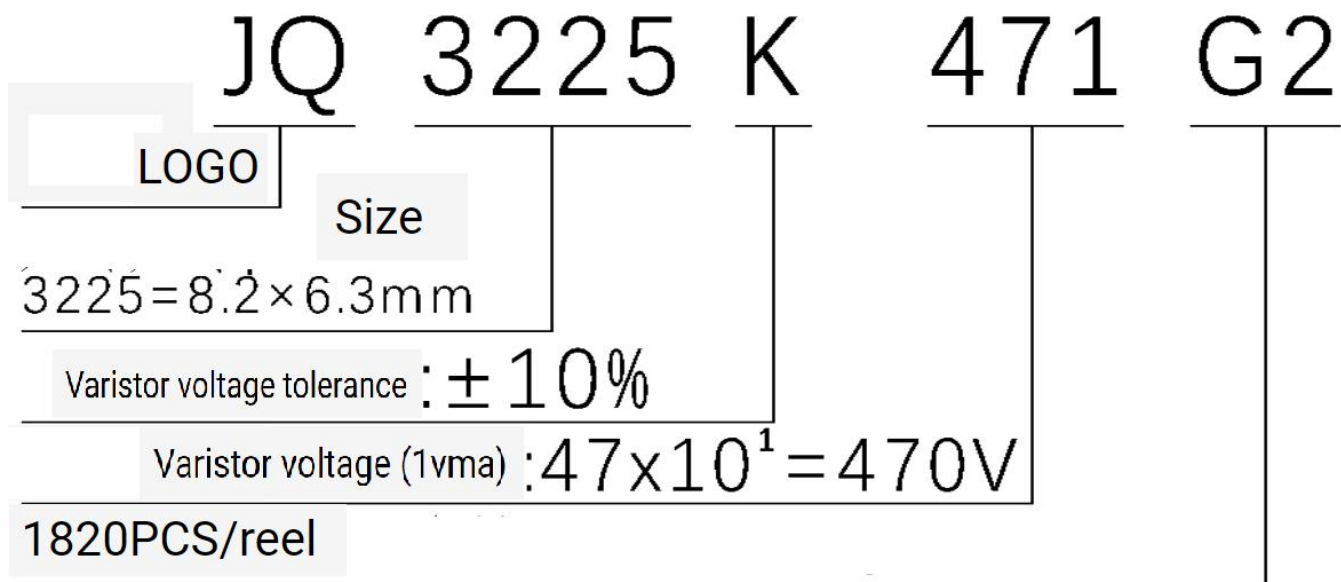
1. LED circuit protection
2. Industrial equipment
3. Communication equipment
4. Automotive Electronics

Applicable standards

1. UL1449
2. IEC61051-1, -2, -2-2, IEC60950-1 Annex Q
3. GB/T10193, GB/T10194, GB4943.1, GB8898
4. IEC61000-4-5



How to order

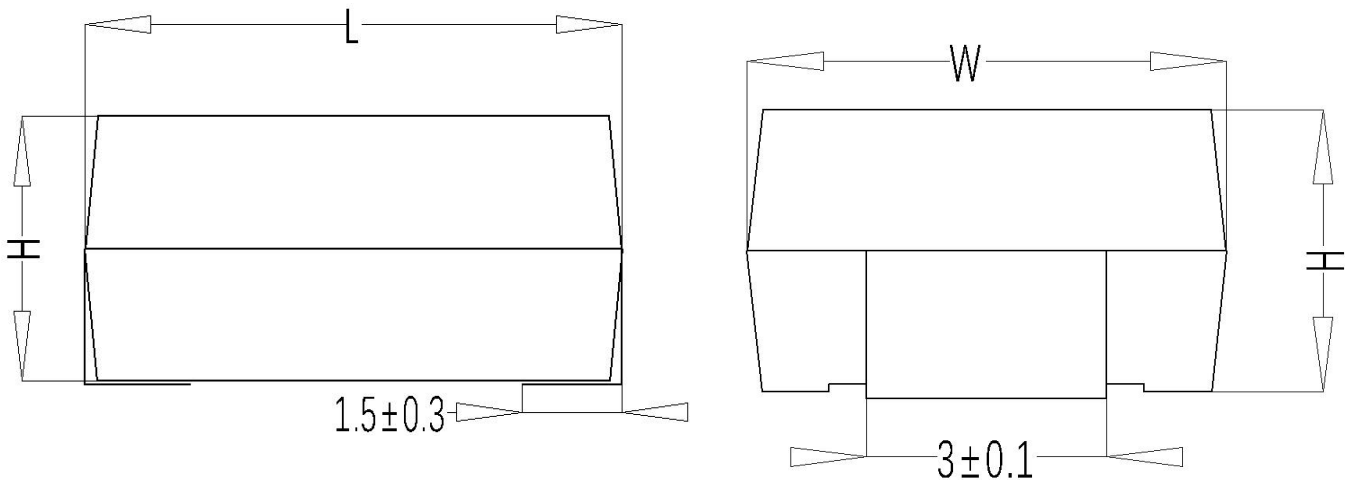


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General Technical data

| Item | Parameter value | Unit |
|-----------------------|-----------------|-------------------|
| Working temperature | -55 — +125 | °C |
| Storage temperature | -55 — +125 | °C |
| Allowable Voltage | ≥2.5 | KV _{RMS} |
| Insulation resistance | ≥100 | MΩ |

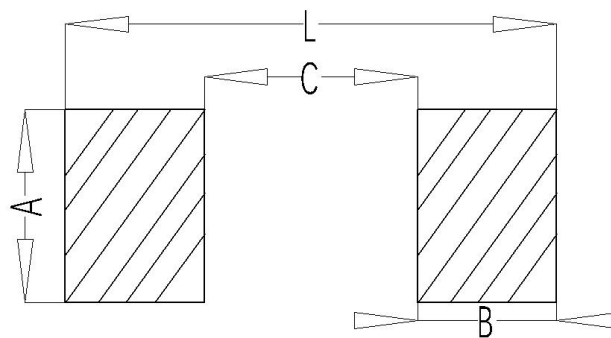
Structure and Dimensions



(Unit: mm)

| Size Code | Varistor Voltage (V) | L | W | H |
|-----------|---------------------------|---------|---------|---------|
| 3225 | V _{1ma} =201—681 | 8.2±0.3 | 6.3±0.3 | 3.8±0.3 |
| | V _{1ma} =751—821 | | | 5.2±0.3 |

Dimensions



(unit: mm)

| Model number | A | B | C | L |
|--------------|-----|-----|-----|------|
| 3225 | 3.5 | 2.8 | 4.5 | 10.1 |

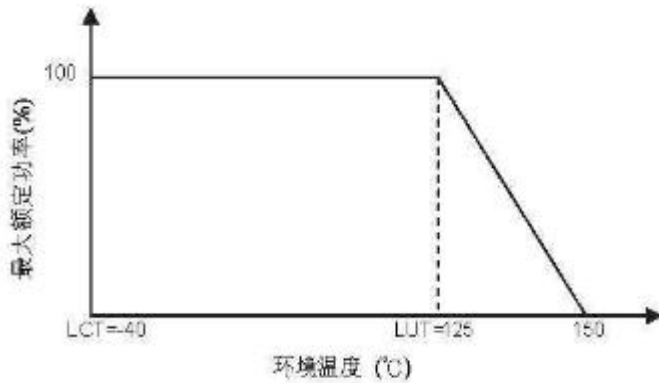
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Electrical characteristics

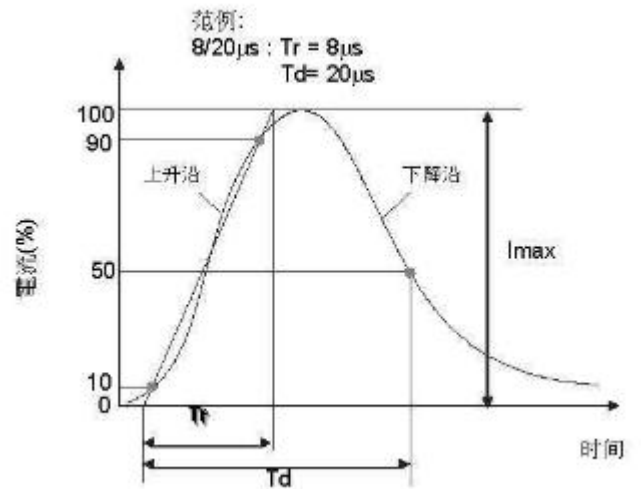
| Part No. | Varistor Voltage (@1mA DC) | Maximal Allowable Voltage | | Maximum Clamping Voltage (8/20 μ s) | | Maximum Peak Current (8/20 μ s) | Maximum Energy (10/1000 μ s) | Rated Power | Typical capacitance Reference @1KHZ |
|-----------------|----------------------------|---------------------------|---------------------|---|--------------------|-------------------------------------|----------------------------------|-------------|-------------------------------------|
| | V _{1mA} (V) | V _{AC} (V) | V _{DC} (V) | V _p (V) | I _p (A) | I _{max} (A) | W _{max} (J) | P (W) | C(pF) |
| 3225K201 | 200(180-220) | 130 | 170 | 340 | 10 | 1200 | 15.0 | 0.25 | 200 |
| 3225K221 | 220(198-242) | 140 | 180 | 360 | 10 | 1200 | 18.0 | 0.25 | 180 |
| 3225K241 | 240(216-264) | 150 | 200 | 395 | 10 | 1200 | 18.5 | 0.25 | 170 |
| 3225K271 | 270(243-297) | 175 | 225 | 455 | 10 | 1200 | 21.0 | 0.25 | 150 |
| 3225K361 | 360(324-396) | 230 | 300 | 595 | 10 | 1200 | 23.0 | 0.25 | 115 |
| 3225K391 | 390(351-429) | 250 | 320 | 650 | 10 | 1200 | 25.0 | 0.25 | 105 |
| 3225K431 | 430(387-473) | 275 | 350 | 710 | 10 | 1200 | 29.0 | 0.25 | 95 |
| 3225K471 | 470(423-517) | 300 | 385 | 775 | 10 | 1200 | 30.0 | 0.25 | 90 |
| 3225K511 | 510(459-561) | 320 | 410 | 845 | 10 | 1200 | 33.0 | 0.25 | 85 |
| 3225K561 | 560(504-616) | 350 | 450 | 930 | 10 | 1200 | 33.0 | 0.25 | 80 |
| 3225K621 | 620(558-682) | 395 | 510 | 1020 | 10 | 1200 | 35.0 | 0.25 | 78 |
| 3225K681 | 680(612-748) | 420 | 560 | 1120 | 10 | 1200 | 35.0 | 0.25 | 75 |
| 3225K751 | 750(675-825) | 460 | 615 | 1235 | 10 | 1200 | 50.0 | 0.25 | 70 |
| 3225K781 | 780(702-858) | 485 | 640 | 1290 | 10 | 1200 | 51.0 | 0.25 | 65 |
| 3225K821 | 820(738-902) | 510 | 670 | 1355 | 10 | 1200 | 52.0 | 0.25 | 60 |

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Power derating curve

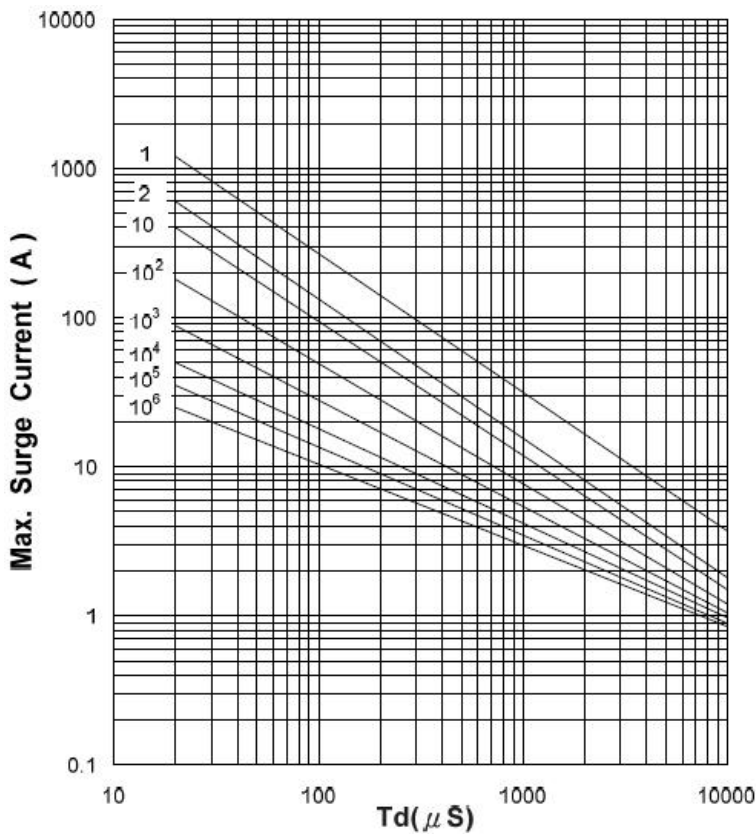


Standard Waveform of Impulse Current

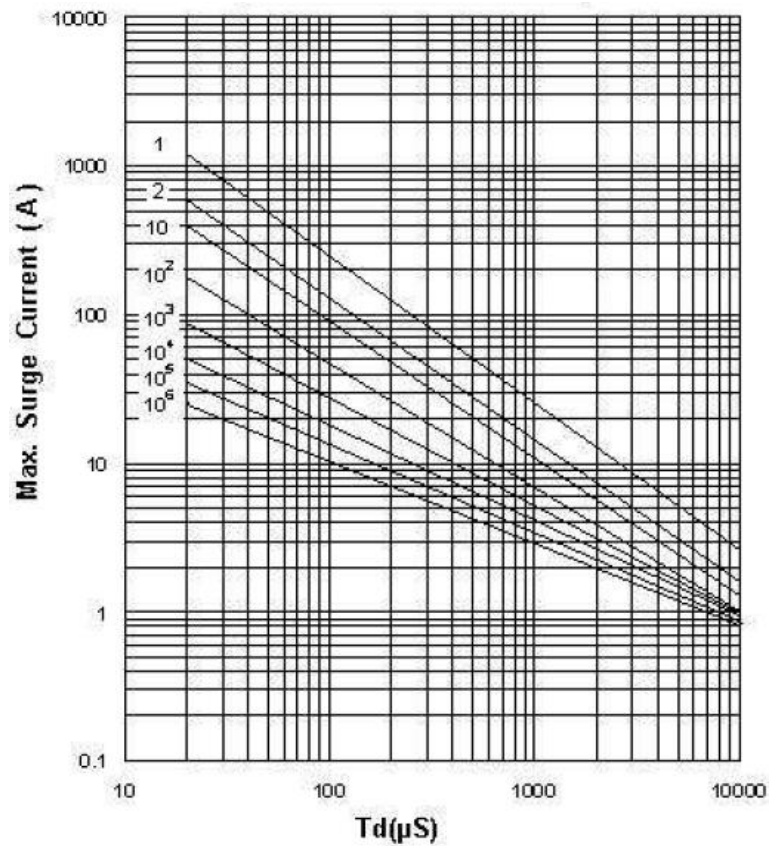


Maximum impulse current derating curve

3225K201 – 3225K471

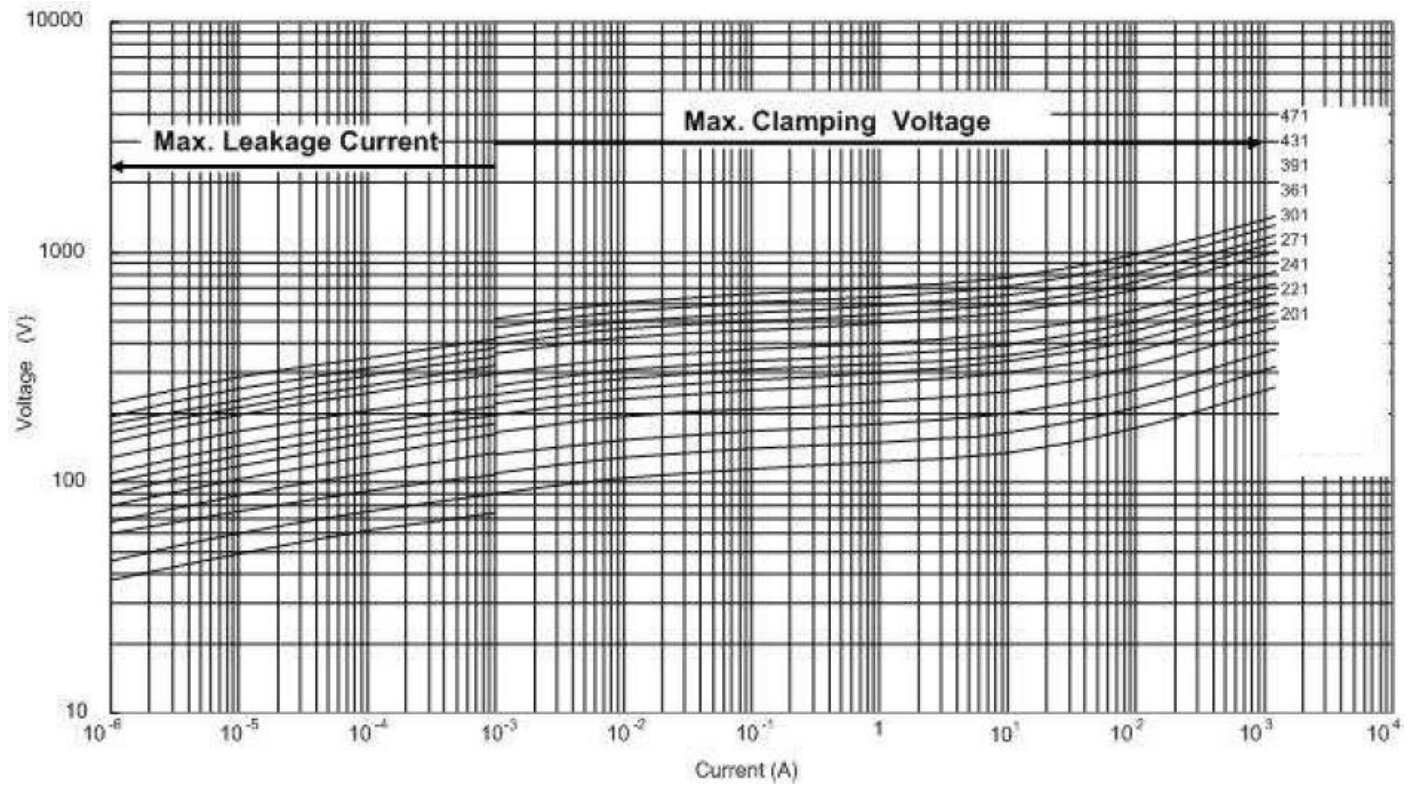


3225K511 – 3225K821

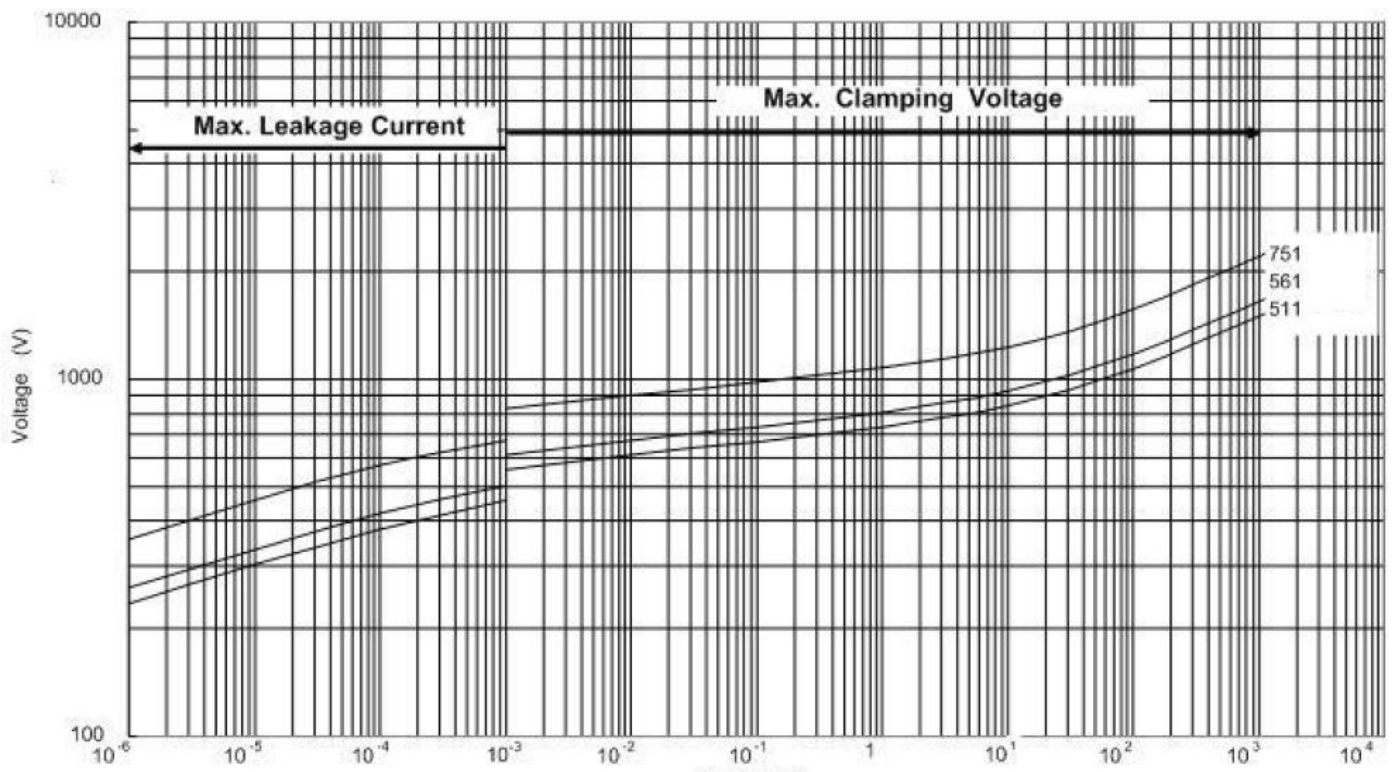


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Maximum leakage current and maximum allowable voltage 3225K201 – 3225K471



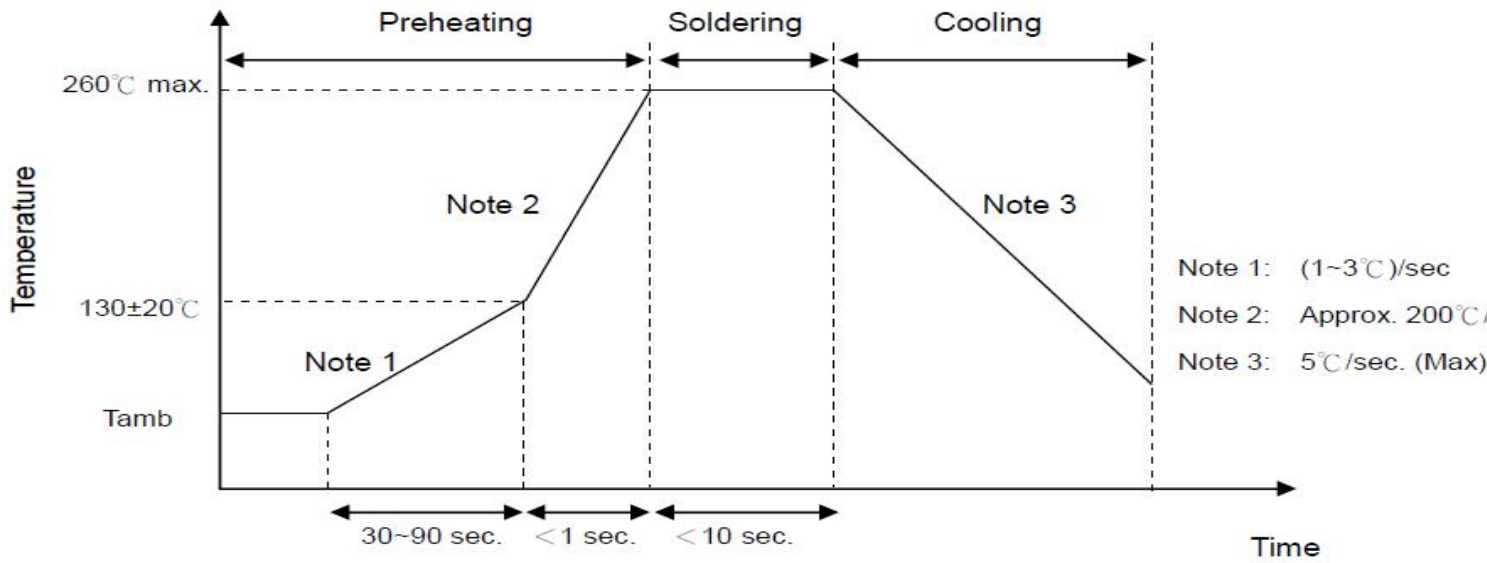
3225K511 – 3225K751



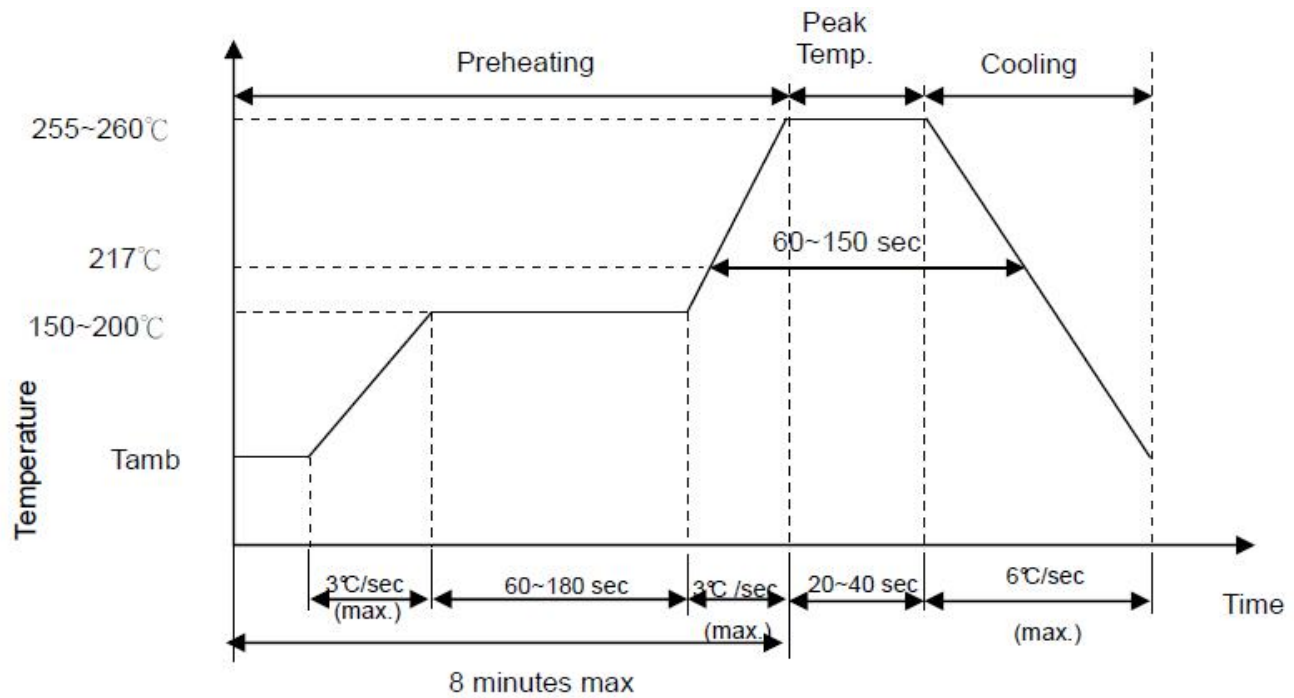
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Recommended soldering conditions

Wave soldering



Lead-free reflow soldering



Soldering iron heavy industry welding conditions

| Item | Temperature |
|--------------------------------|-------------|
| Soldering iron tip temperature | 360°C (max) |
| Welding time | 3s(max) |
| Diameter of soldering iron tip | Φ3mm(max) |

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Reliability Test and Environmental Features

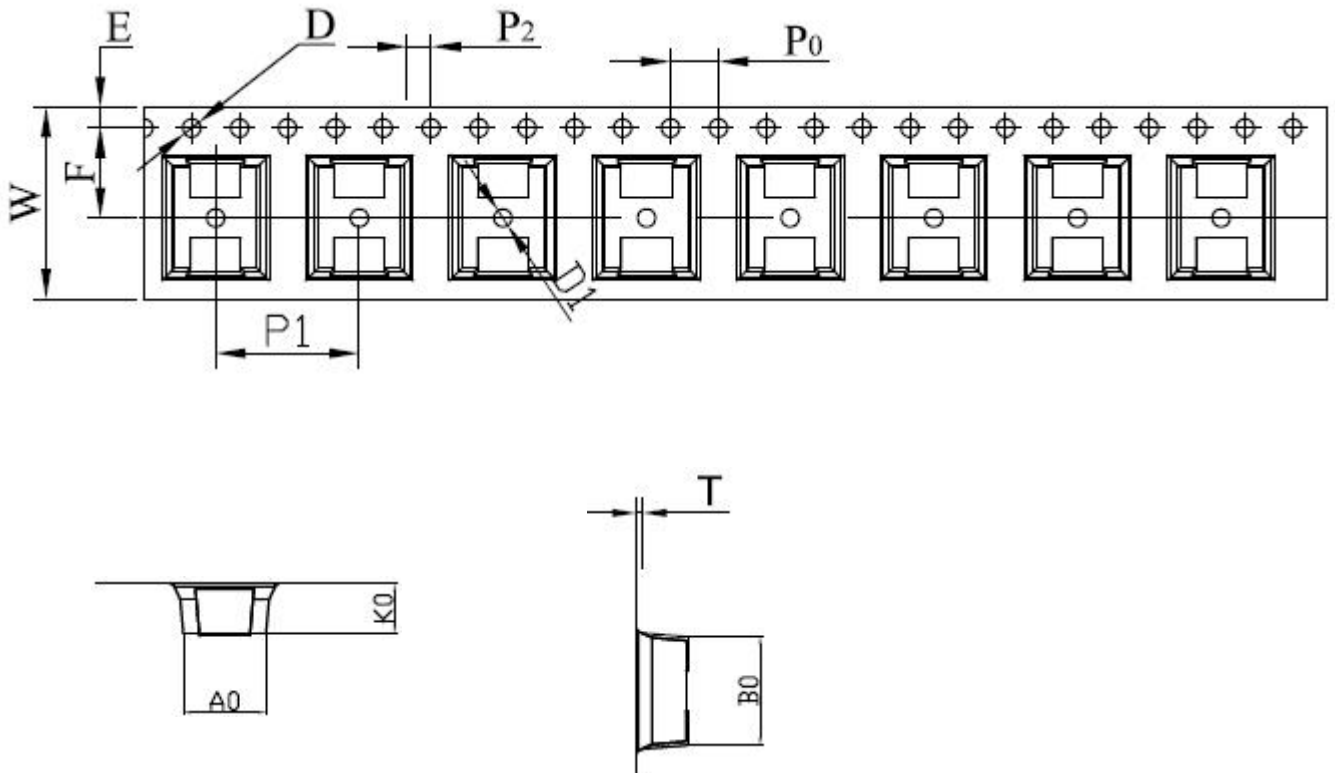
| Item | Test Standard | Test Method | Test Result | | | | | | | | | | | | | | | |
|---------------------------------|-----------------------------------|---|--|-----------------------------------|-----------------|---|-------------|------------|---|------------------|-----------|---|--------------|------------|---|------------------|-----------|---|
| Vibration resistance | IEC 1051-1 | Place the finished product on a vibrating machine, apply a single resonance (amplitude: 0.75mm) and 1.5mm amplitude vibration, with a vibration frequency cycle of 10Hz—55Hz—10Hz, test for each of the three vertical directions for 2 hours, and then test the finished product external damage | $ \Delta V/V_{1mA} \leq 5\%$ No external damage | | | | | | | | | | | | | | | |
| Solderability | IEC 60068-2-20 | Immerse the finished pins in the soldering liquid at $235^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 2 ± 0.5 seconds and take it out | tin is uniform and the area $\geq 95\%$ | | | | | | | | | | | | | | | |
| Soldering heat resistance | IEC 60068-2-20 | Immerse the finished pins in the solder solution at $350^{\circ}\text{C} \pm 10^{\circ}\text{C}$ for 10 ± 1 seconds and take them out | $ \Delta V/V_{1mA} \leq 5\%$ | | | | | | | | | | | | | | | |
| High temperature storage | IEC 60068-2-2 | Put the finished product in an oven at $125 \pm 5^{\circ}\text{C}$ for 1000 hours, take it out and leave it at room temperature for 1-2 hours, then measure the varistor voltage | $ \Delta V/V_{1mA} \leq 5\%$ | | | | | | | | | | | | | | | |
| Moisture resistance(Doble 85) | IEC60068-2-3 | 1. Place the finished product in an environment with a temperature of $85 \pm 2^{\circ}\text{C}$ and a humidity of 85% for 1000 hours 2. Place the finished product in an environment with a temperature of $85 \pm 2^{\circ}\text{C}$ and a humidity of 85%, and apply the maximum allowable working voltage for 1000 hours | No external damage $\Delta V/V_{1mA} \leq 10\%$ insulation resistance $\geq 100\text{M}\Omega$ | | | | | | | | | | | | | | | |
| Thermal Shock | IEC 60068-2-14 | Test the finished product 5 times with the temperature cycle shown in the table below, and then place it at room temperature for 1-2 hours to measure the varistor voltage <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Step</th> <th>Temperature($^{\circ}\text{C}$)</th> <th>Period(minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40 ± 3</td> <td>30 ± 3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>5 ± 3</td> </tr> <tr> <td>3</td> <td>$+125 \pm 2$</td> <td>30 ± 3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>5 ± 3</td> </tr> </tbody> </table> | Step | Temperature($^{\circ}\text{C}$) | Period(minutes) | 1 | -40 ± 3 | 30 ± 3 | 2 | Room temperature | 5 ± 3 | 3 | $+125 \pm 2$ | 30 ± 3 | 4 | Room temperature | 5 ± 3 | No external damage $\Delta V/V_{1mA} \leq 5\%$ |
| Step | Temperature($^{\circ}\text{C}$) | Period(minutes) | | | | | | | | | | | | | | | | |
| 1 | -40 ± 3 | 30 ± 3 | | | | | | | | | | | | | | | | |
| 2 | Room temperature | 5 ± 3 | | | | | | | | | | | | | | | | |
| 3 | $+125 \pm 2$ | 30 ± 3 | | | | | | | | | | | | | | | | |
| 4 | Room temperature | 5 ± 3 | | | | | | | | | | | | | | | | |
| High temperature load | IEC61051-4.20 | Put the finished product in an oven with a temperature of $125 \pm 2^{\circ}\text{C}$ for 1000 hours after applying the maximum allowable voltage, and then place it at room temperature for 1-2 hours to measure the varistor voltage | $ \Delta V/V_{1mA} \leq 10\%$ | | | | | | | | | | | | | | | |
| Voltage temperature coefficient | Specification Standard | $\frac{V_{1mA} \text{ at } 125^{\circ}\text{C} - V_{1mA} \text{ at } 25^{\circ}\text{C}}{V_{1mA} \text{ at } 25^{\circ}\text{C}} \times \frac{1}{100} \times 100 (\%/^{\circ}\text{C})$ | $-0.05 \leq T_c \leq 0 (\%/^{\circ}\text{C})$ | | | | | | | | | | | | | | | |
| Voltage | IEC61051-4.8 | The finished surface encapsulation body is wound into a tight coil with metal wire, and the input voltage AC2500V is applied to the coil end and pin end for 1 minute | No external damage | | | | | | | | | | | | | | | |

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Packing

Taping Packaging

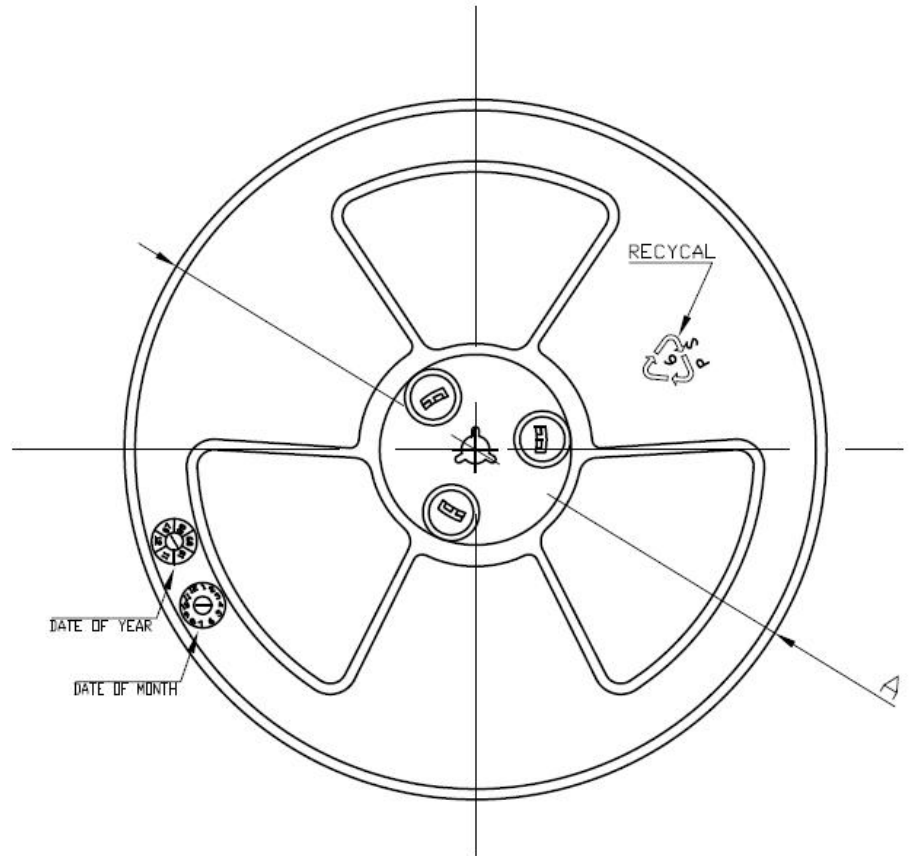
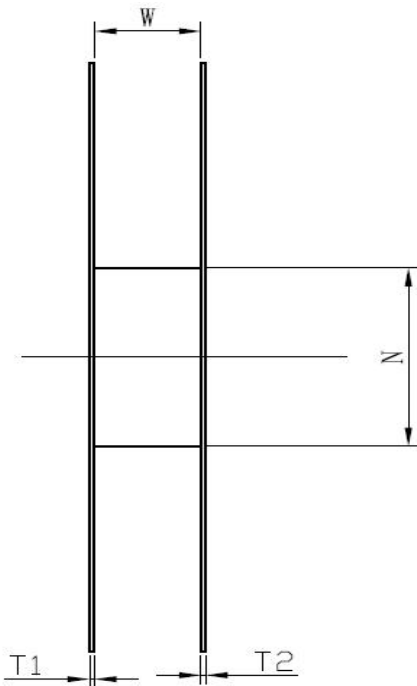
16mm Carrier tape Dimensions



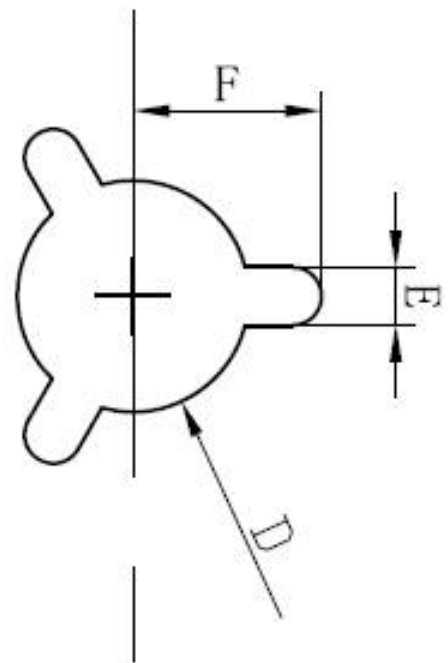
| | | | | | | | |
|--------|-----------|-----------|-----------|-----------|------------------------------------|-----------|----------|
| symbol | AO | BO | KO | PO | P1 | P2 | 长度/盘 |
| Spec | 6.60±0.1 | 8.70±0.1 | 4.50±0.1 | 4.00±0.10 | 12.0±0.10 | 2.00±0.10 | 24000mm |
| symbol | W | T | E | F | DO | D1 | 元件/盘 |
| Spec | 16.0±0.3 | 0.40±0.05 | 1.75±0.10 | 7.5±0.1 | 1.50 ^{+0.1} ₋₀ | 1.50±0.10 | 1820 pcs |

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15 inch plastic tray size



| | |
|-------------------------------|-------|
| SPEC | 16 |
| E±0.5 | 2.3 |
| F±0.5 | 10.75 |
| W±0.2 | 16.4 |
| T1±0.3 | 2.2 |
| T2±0.3 | 2.2 |
| A ⁺⁰ ₋₂ | ∅380 |
| N±3.0 | ∅100 |
| D±0.3 | 13.3 |



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Carton Packing

