

## Gas Discharge Tube (GDT) Data Sheet

### Features

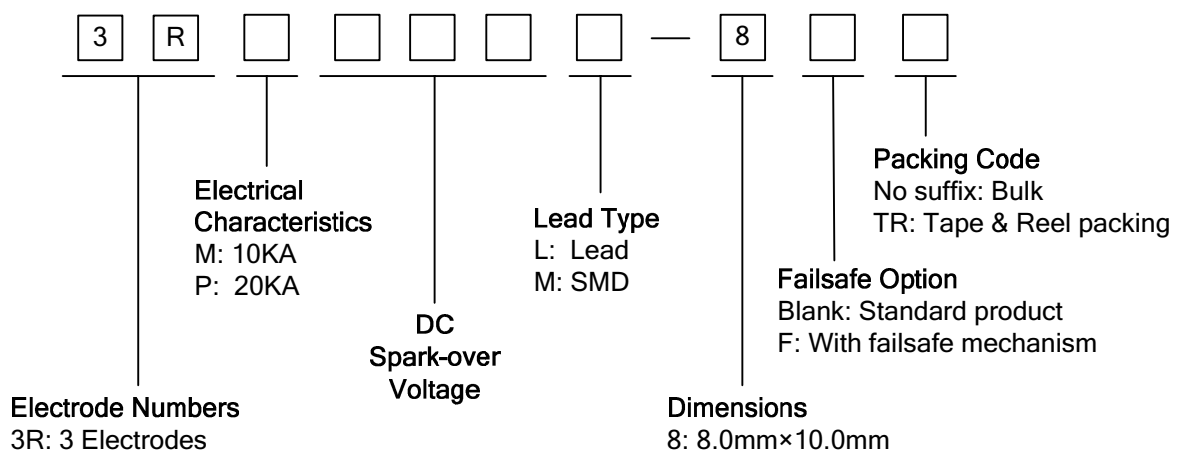
- Provide ultra-fast response to surge voltage from slow-rising surge of 100V/s to rapid-rising surge of 1KV/μs.
- Stable breakdown voltage.
- High insulation resistance.
- Low capacitance (≤2pF)
- High holdover voltage
- Large absorbing transient current capability.
- Micro-Gap Design
- Size: 8.0mm\*10.0mm
- Storage and operating temperature: -40°C ~ +85°C
- Meets MSL level 1, per J-STD-020
- Safety certification: UL: E244458



### Applications

- Repeaters, Modems.
- Telephone Interface, Line cards.
- Data communication equipment.
- Line test equipment

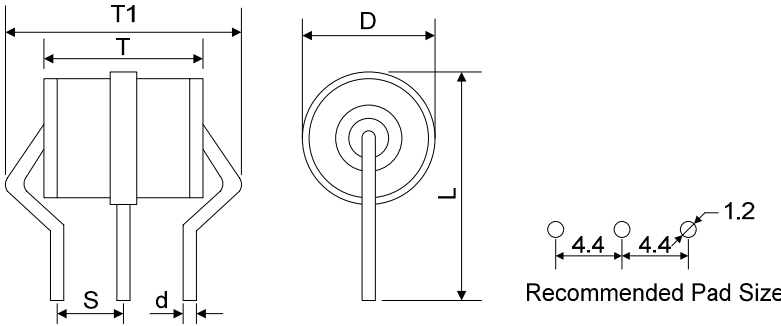
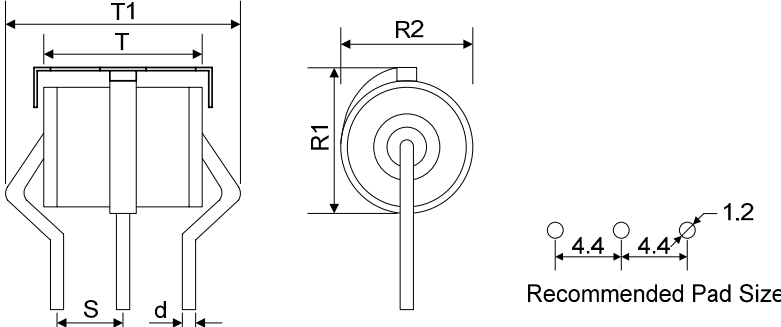
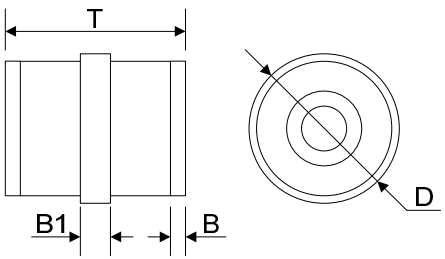
### Part Number Code



### Marking

**B** : BrightKing Logo  
 3RM090-8 : Device Marking Code  
 YXXX : Date Code

Dimensions

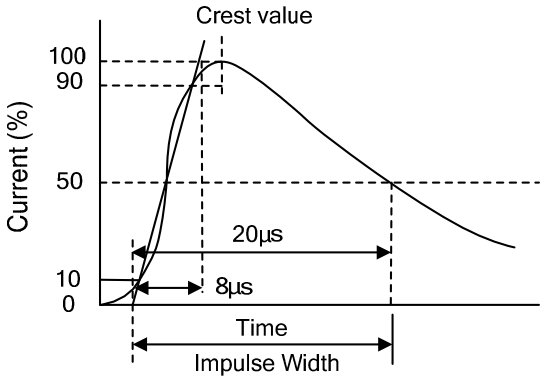
| L Type  | Symbol  | Dimension (mm) |            |            |
|---|---|----------------|------------|------------|
|   |   | Spec.          | Tolerance  |            |
|  | D   | 8.0            | +0.2, -0.8 |            |
|   | T   | 10.0           | ±0.5       |            |
|   | T1  | 12.0           | ±0.5       |            |
|   | L   | 15.0           | ±0.5       |            |
|   | S   | 4.4            | ±0.4       |            |
| L-F Type  |   | d              | 1.0        | ±0.1       |
|   |   | R1             | 9.8        | ±0.4       |
|   |   | R2             | 8.1        | ±0.3       |
|   |   | T              | 10.0       | ±0.5       |
| M Type  |  | B              | 0.5        | ±0.1       |
|   |   | B1             | 1.5        | ±0.2       |
|   |   | D              | 8.0        | +0.2, -0.8 |
|   |   | T              | 10.0       | ±0.5       |

Notes: This type is not suitable for PCB soldering.

## Electrical Characteristics

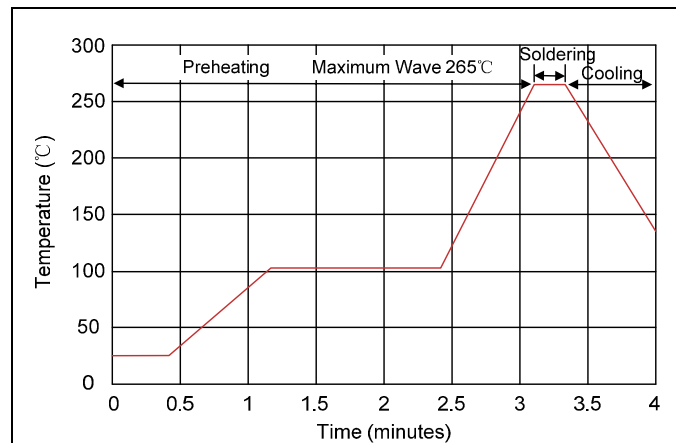
| Part Number |           | DC Spark-over Voltage | Maximum Impulse Spark-over Voltage | Nominal Impulse Discharge Current | Alternating Discharge Current | Impulse Life            | Minimum Insulation Resistance |               | Maximum Capacitance | Device Marking Code |
|-------------|-----------|-----------------------|------------------------------------|-----------------------------------|-------------------------------|-------------------------|-------------------------------|---------------|---------------------|---------------------|
|             |           | 100V/s                | 1000V/ $\mu$ s                     | 8/20 $\mu$ s<br>10times           | 50Hz, 1sec                    | 10/1000 $\mu$ s<br>100A | Test Voltage                  | (G $\Omega$ ) | 1MHz                |                     |
|             |           | (V)                   | (V)                                | (KA)                              | (A)                           | (times)                 | DC(V)                         |               | (pF)                |                     |
| 3RM075L-8   | 3RM075M-8 | 75 $\pm$ 20%          | 700                                | 10                                | 10                            | 300                     | 25                            | 1.0           | 2.0                 | 3RM075-8            |
| 3RM090L-8   | 3RM090M-8 | 90 $\pm$ 20%          | 700                                | 10                                | 10                            | 300                     | 50                            | 1.0           | 2.0                 | 3RM090-8            |
| 3RM150L-8   | 3RM150M-8 | 150 $\pm$ 20%         | 700                                | 10                                | 10                            | 300                     | 100                           | 1.0           | 2.0                 | 3RM150-8            |
| 3RM200L-8   | 3RM200M-8 | 200 $\pm$ 20%         | 700                                | 10                                | 10                            | 300                     | 100                           | 1.0           | 2.0                 | 3RM200-8            |
| 3RM230L-8   | 3RM230M-8 | 230 $\pm$ 20%         | 700                                | 10                                | 10                            | 300                     | 100                           | 1.0           | 2.0                 | 3RM230-8            |
| 3RM350L-8   | 3RM350M-8 | 350 $\pm$ 20%         | 850                                | 10                                | 10                            | 300                     | 100                           | 1.0           | 2.0                 | 3RM350-8            |
| 3RM400L-8   | 3RM400M-8 | 400 $\pm$ 20%         | 850                                | 10                                | 10                            | 300                     | 100                           | 1.0           | 2.0                 | 3RM400-8            |
| 3RM470L-8   | 3RM470M-8 | 470 $\pm$ 20%         | 950                                | 10                                | 10                            | 300                     | 250                           | 1.0           | 2.0                 | 3RM470-8            |
| 3RM600L-8   | 3RM600M-8 | 600 $\pm$ 20%         | 1300                               | 10                                | 10                            | 300                     | 250                           | 1.0           | 2.0                 | 3RM600-8            |
| 3RM800L-8   | 3RM800M-8 | 800 $\pm$ 20%         | 1500                               | 10                                | 10                            | 300                     | 250                           | 1.0           | 2.0                 | 3RM800-8            |
| 3RP075L-8   | 3RP075M-8 | 75 $\pm$ 20%          | 700                                | 20                                | 20                            | 300                     | 25                            | 1.0           | 2.0                 | 3RP075-8            |
| 3RP090L-8   | 3RP090M-8 | 90 $\pm$ 20%          | 700                                | 20                                | 20                            | 300                     | 50                            | 1.0           | 2.0                 | 3RP090-8            |
| 3RP150L-8   | 3RP150M-8 | 150 $\pm$ 20%         | 700                                | 20                                | 20                            | 300                     | 100                           | 1.0           | 2.0                 | 3RP150-8            |
| 3RP200L-8   | 3RP200M-8 | 200 $\pm$ 20%         | 700                                | 20                                | 20                            | 300                     | 100                           | 1.0           | 2.0                 | 3RP200-8            |
| 3RP230L-8   | 3RP230M-8 | 230 $\pm$ 20%         | 700                                | 20                                | 20                            | 300                     | 100                           | 1.0           | 2.0                 | 3RP230-8            |
| 3RP350L-8   | 3RP350M-8 | 350 $\pm$ 20%         | 850                                | 20                                | 20                            | 300                     | 100                           | 1.0           | 2.0                 | 3RP350-8            |
| 3RP400L-8   | 3RP400M-8 | 400 $\pm$ 20%         | 850                                | 20                                | 20                            | 300                     | 100                           | 1.0           | 2.0                 | 3RP400-8            |
| 3RP470L-8   | 3RP470M-8 | 470 $\pm$ 20%         | 950                                | 20                                | 20                            | 300                     | 250                           | 1.0           | 2.0                 | 3RP470-8            |
| 3RP600L-8   | 3RP600M-8 | 600 $\pm$ 20%         | 1300                               | 20                                | 20                            | 300                     | 250                           | 1.0           | 2.0                 | 3RP600-8            |
| 3RP800L-8   | 3RP800M-8 | 800 $\pm$ 20%         | 1500                               | 20                                | 20                            | 300                     | 250                           | 1.0           | 2.0                 | 3RP800-8            |

Electrical Ratings

| Items                              | Test Condition/Description   | Requirement                 |
|------------------------------------|--|-----------------------------|
| DC Spark-over Voltage              | The voltage is measured with voltage ramp $dv/dt=100V/s$ . Test is between each side electrode and center electrode.   | To meet the specified value |
| Maximum Impulse Spark-over Voltage | The maximum impulse spark-over voltage is measured with voltage ramp $dv/dt=1000V/\mu s$ . Test is between each side electrode and center electrode.   |                             |
| Impulse Discharge Current          | <p>Maximum surge current that can be applied through center electrode with 8/20<math>\mu s</math> waveform, for 10 times with 3min interval time, which will be equally divided between each side electrode to center electrode, without causing the DC breakdown voltage to change more than 25% from its initial measured value.</p>  |                             |
| Alternating Discharge Current      | <p>Rated RMS value of AC current at 50Hz, 1 sec. for 10 times with interval time 3 min. DC spark-over voltage shall not change more than <math>\pm 25\%</math> from its initial value. Test is between each side electrode and center electrode.</p> <p><math>IR &gt; 10^8</math> ohms (-20%, +30% for 70~90V).</p>  |                             |
| Insulation Resistance              | The resistance of gas tube shall be measured between each side electrodes and center electrode.  |                             |
| Capacitance                        | <p>The capacitance of gas tube shall be measured between each side electrodes and center electrode.</p> <p>Test frequency: 1MHz</p>  |                             |

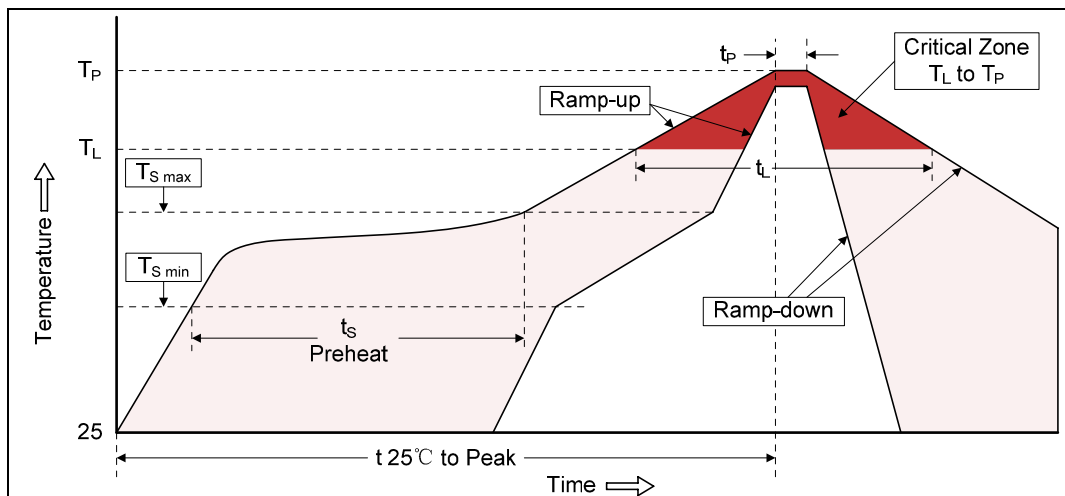
Recommended Soldering Conditions

Wave Soldering



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

Reflow Soldering



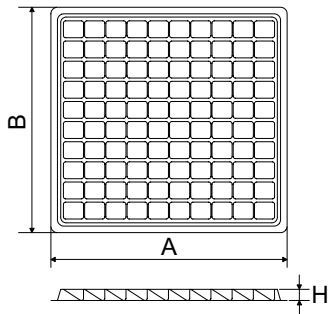
| Profile Feature                                      | Pb-Free Assembly |
|--|------------------|
| Average ramp-up rate ( $T_L$ to $T_P$ )              | 3°C/second max.  |
| Preheat  |                  |
| -Temperature Min ( $T_{S\ min}$ )                    | 150°C            |
| -Temperature Max ( $T_{S\ max}$ )                    | 200°C            |
| -Time (min to max) ( $t_s$ )                         | 60-180 seconds   |
| $T_{S\ max}$ to $T_L$                                |                  |
| -Ramp-up Rate  | 3°C/second max.  |
| Time maintained above:                               |                  |
| -Temperature ( $T_L$ )                               | 217°C            |
| -Time ( $t_L$ )                                      | 60-150 seconds   |
| Peak Temperature ( $T_P$ )                           | 260°C            |
| Time within 5°C of actual Peak Temperature ( $t_P$ ) | 20-40 seconds    |
| Ramp-down Rate                                       | 6°C/second max.  |
| Time 25°C to Peak Temperature                        | 8 minutes max.   |

Packaging

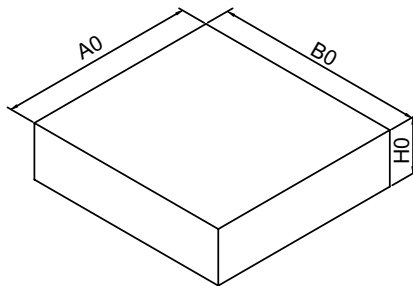
Axial Packing (Bulk)

| Symbol           | Dimension (mm) |           |
|------------------|----------------|-----------|
|                  | Spec.          | Tolerance |
| A                | 217.0          | ±1.0      |
| B                | 207.0          | ±1.0      |
| H                | 10.3           | ±0.2      |
| Quantity: 100pcs |                |           |
| A0               | 338.0          | ±1.0      |
| B0               | 336.0          | ±1.0      |
| H0               | 58.0           | ±1.0      |
| Quantity: 500pcs |                |           |

Skin packing



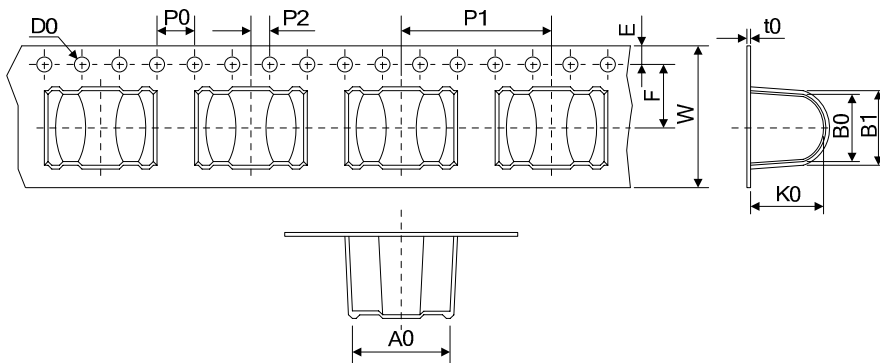
Inner box



SMD Packing (Tape & Reel)

| Symbol           | Dimension (mm) |           |
|------------------|----------------|-----------|
|                  | Spec.          | Tolerance |
| W                | 16.00          | ±0.20     |
| P0               | 4.00           | ±0.10     |
| P1               | 16.00          | ±0.10     |
| P2               | 2.00           | ±0.10     |
| D0               | 1.55           | ±0.05     |
| E                | 1.75           | ±0.10     |
| F                | 7.50           | ±0.10     |
| A0               | 11.6           | ±0.10     |
| K0               | 8.90           | ±0.10     |
| B0               | 8.60           | ±0.10     |
| B1               | 10.00          | ±0.10     |
| t0               | 0.50           | ±0.05     |
| D                | 330.00         | ±1.00     |
| d                | 13.00          | ±0.50     |
| L                | 20.00          | ±0.50     |
| t                | 2.00           | ±0.20     |
| Quantity: 300pcs |                |           |

Tape



Reel

