

## Gas Discharge Tube (GDT) Data Sheet

### Features

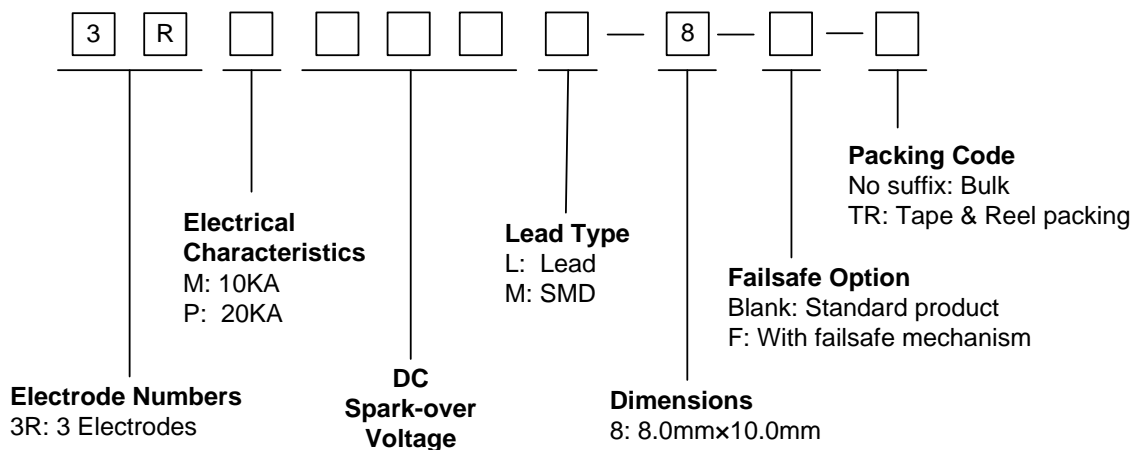
- Provide ultra-fast response to surge voltage from slow-rising surge of 100V/s to rapid-rising surge of 1KV/μs
- Stable breakdown voltage
- High insulation resistance
- Low capacitance (≤2pF)
- High holdover voltage
- Large absorbing transient current capability
- Micro-Gap Design
- Size: 8.0mm\*10.0mm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



### Applications

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

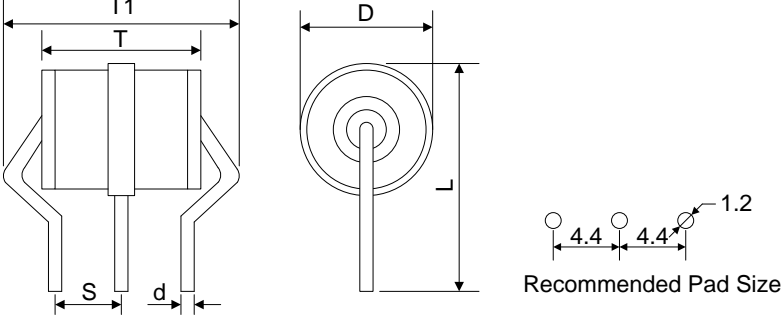
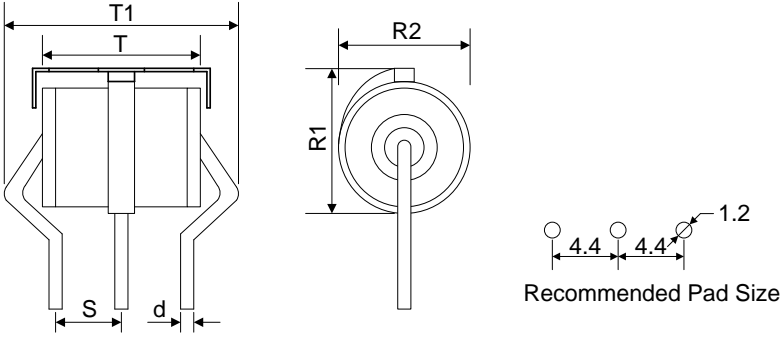
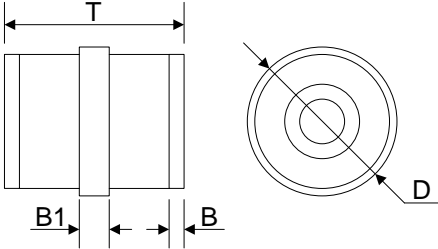
### Part Number Code



### Marking

: 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       |
| <b>L-F Type</b><br> | S      | 4.4            | ±0.4       |
|   | d      | 1.0            | ±0.1       |
|   | R1     | 9.8            | ±0.4       |
|   | R2     | 8.1            | ±0.3       |
| <b>M Type</b><br>  | D      | 8.0            | +0.2, -0.8 |
|   | T      | 10.0           | ±0.5       |
|   | B      | 0.5            | ±0.1       |
|   | B1     | 1.5            | ±0.2       |

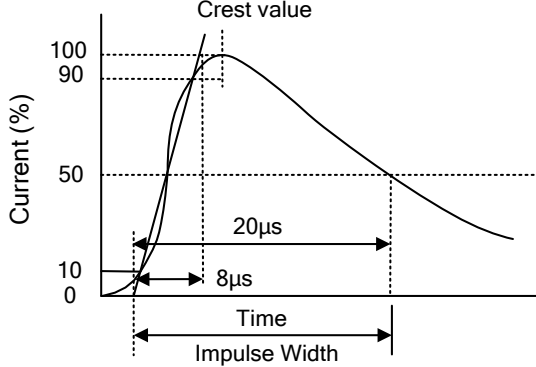
Notes: This type is not suitable for PCB soldering.

## 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            |

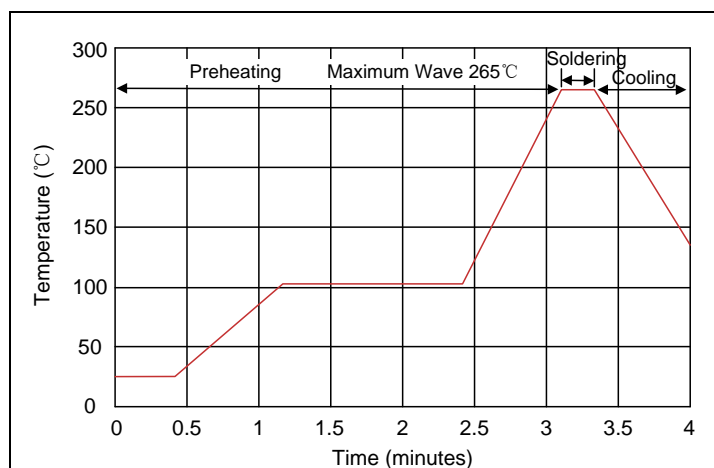
## Electrical Ratings

| 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. |                             |

|                                      |   |  |
|--------------------------------------|---|--|
| <p>Impulse Discharge Current</p>     | <p>Maximum surge current that can be applied through center electrode with 8/20μs 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>  |  |
| <p>Alternating Discharge Current</p> | <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 ±25% from its initial value. Test is between each side electrode and center electrode. IR &gt; 10<sup>8</sup> ohms (-20%, +30% for 70~90V).</p>  |  |
| <p>Insulation Resistance</p>         | <p>The resistance of gas tube shall be measured between each side electrodes and center electrode.</p>  |  |
| <p>Capacitance</p>                   | <p>The capacitance of gas tube shall be measured between each side electrodes and center electrode.<br/>Test frequency: 1MHz</p>  |  |

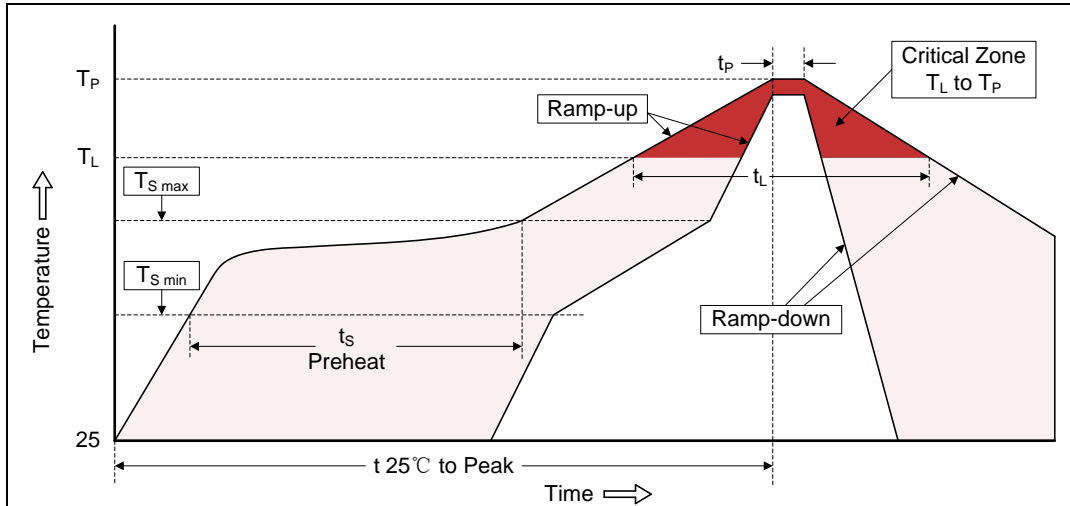
**Recommended Soldering Conditions**

Wave Soldering



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

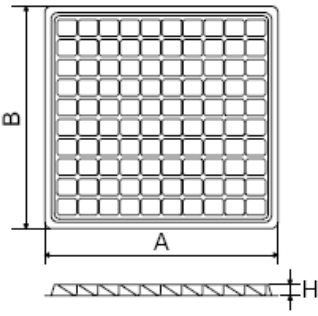
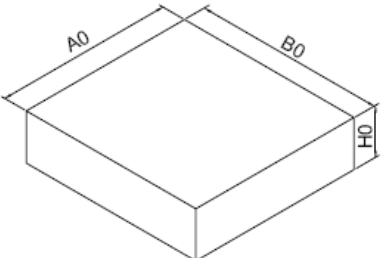
Reflow Soldering



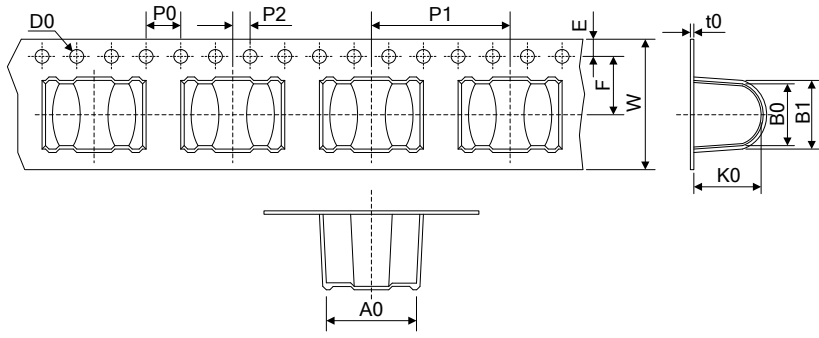
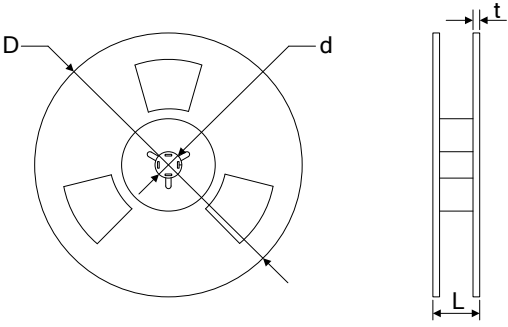
| Profile Feature                                      | Pb-Free Assembly |
|--|------------------|
| Average ramp-up rate ( $T_L$ to $T_P$ )              | 3°C/second max.  |
| Preheat  |                  |
| -Temperature Min ( $T_{S\ min}$ )                    | 150°C            |
| -Temperature Max ( $T_{S\ max}$ )                    | 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)**

| Skin packing<br> | Dimension (mm)   |       |           |
|---|------------------|-------|-----------|
|   | Symbol           | Spec. | Tolerance |
|   | A                | 217.0 | ±2.0      |
|   | B                | 207.0 | ±2.0      |
|   | H                | 10.3  | ±0.5      |
| Quantity: 100pcs  |                  |       |           |
| Inner box<br>    | A0               | 225.0 | ±2.0      |
|   | B0               | 210.0 | ±2.0      |
|   | H0               | 60.0  | ±2.0      |
|   | Quantity: 500pcs |       |           |

**SMD Packing (Tape & Reel)**

| Tape<br> | Dimension (mm)   |        |           |
|---|------------------|--------|-----------|
|   | Symbol           | 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               | 11.60  | ±0.10     |
|   | K0               | 8.90   | ±0.10     |
|   | B0               | 8.60   | ±0.10     |
|   | B1               | 10.00  | ±0.10     |
|   | t0               | 0.50   | ±0.05     |
| Reel<br> | D                | 330.00 | ±2.00     |
|   | d                | 13.00  | ±0.50     |
|   | L                | 20.00  | ±2.00     |
|   | t                | 2.00   | ±0.20     |
|   | Quantity: 300pcs |        |           |

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