

## Gas Discharge Tube (GDT) Data Sheet

### Features

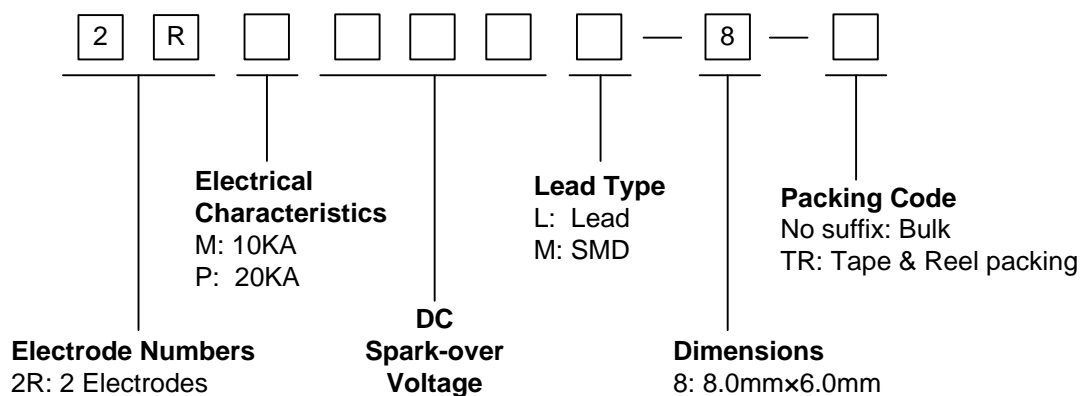
- Provide ultra-fast response to surge voltage from slow-rising surge of 100V/s to rapid-rising surge of 1KV/μs
- Stable breakdown voltage
- High insulation resistance
- Low capacitance (≤1.5pF)
- High holdover voltage
- Large absorbing transient current capability
- Micro-Gap Design
- Size: 8.0mm\*6.0mm
- 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

**B** : BrightKing Logo  
 2RM090-8 : Device Marking Code  
 YXXX : Date Code

**Dimensions**

| L Type | Symbol                      | Dimension (mm) |            |            |
|--------|-----------------------------|----------------|------------|------------|
|        |                             | Spec.          | Tolerance  |            |
|        | D                           | 8.0            | +0.3, -0.5 |            |
|        | T                           | 6.0            | +0.3, -0.5 |            |
|        | d                           | 0.8            | ±0.1       |            |
|        | L                           | 30.0           | Max.       |            |
| M Type | <p>Recommended Pad Size</p> | D              | 8.0        | +0.3, -0.5 |
| T      |                             | 6.0            | +0.3, -0.5 |            |
| B      |                             | 0.5            | ±0.1       |            |

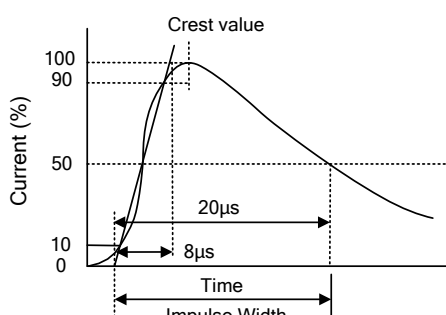
**Electrical Characteristics**

| 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/μs                           | 8/20μs<br>10times                 | 50Hz, 1sec                    | 10/1000μs<br>100A | Test Voltage                  | (GΩ) | 1MHz                |                     |
|             |           | (V)                   | (V)                                | (KA)                              | (A)                           | (times)           | DC(V)                         |      | (pF)                |                     |
| 2RM075L-8   | 2RM075M-8 | 75±20%                | 600                                | 10                                | 10                            | 500               | 25                            | 1.0  | 1.5                 | 2RM075-8            |
| 2RM090L-8   | 2RM090M-8 | 90±20%                | 600                                | 10                                | 10                            | 500               | 50                            | 1.0  | 1.5                 | 2RM090-8            |
| 2RM120L-8   | 2RM120M-8 | 120±20%               | 600                                | 10                                | 10                            | 500               | 50                            | 1.0  | 1.5                 | 2RM120-8            |
| 2RM145L-8   | 2RM145M-8 | 145±20%               | 700                                | 10                                | 10                            | 500               | 100                           | 1.0  | 1.5                 | 2RM145-8            |
| 2RM150L-8   | 2RM150M-8 | 150±20%               | 700                                | 10                                | 10                            | 500               | 100                           | 1.0  | 1.5                 | 2RM150-8            |
| 2RM230L-8   | 2RM230M-8 | 230±20%               | 700                                | 10                                | 10                            | 500               | 100                           | 1.0  | 1.5                 | 2RM230-8            |
| 2RM250L-8   | 2RM250M-8 | 250±20%               | 800                                | 10                                | 10                            | 500               | 100                           | 1.0  | 1.5                 | 2RM250-8            |
| 2RM300L-8   | 2RM300M-8 | 300±20%               | 900                                | 10                                | 10                            | 500               | 100                           | 1.0  | 1.5                 | 2RM300-8            |
| 2RM350L-8   | 2RM350M-8 | 350±20%               | 900                                | 10                                | 10                            | 500               | 100                           | 1.0  | 1.5                 | 2RM350-8            |
| 2RM400L-8   | 2RM400M-8 | 400±20%               | 1000                               | 10                                | 10                            | 500               | 100                           | 1.0  | 1.5                 | 2RM400-8            |
| 2RM470L-8   | 2RM470M-8 | 470±20%               | 1100                               | 10                                | 10                            | 500               | 250                           | 1.0  | 1.5                 | 2RM470-8            |
| 2RM600L-8   | 2RM600M-8 | 600±20%               | 1300                               | 10                                | 10                            | 500               | 250                           | 1.0  | 1.5                 | 2RM600-8            |
| 2RM800L-8   | 2RM800M-8 | 800±20%               | 1500                               | 10                                | 10                            | 500               | 250                           | 1.0  | 1.5                 | 2RM800-8            |

**Electrical Characteristics**

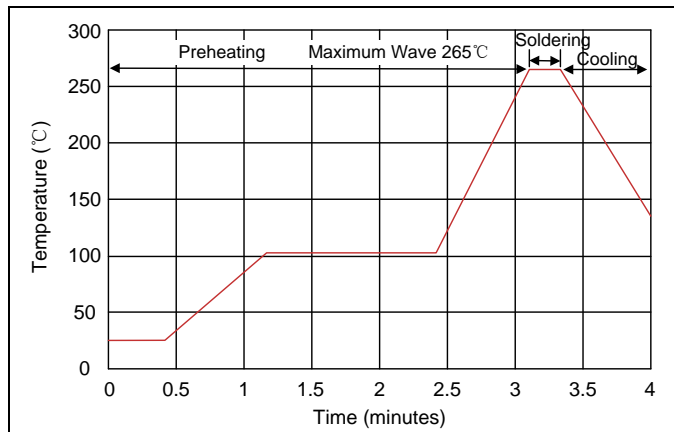
| Part Number |           | DC Spark-over Voltage | Maximum Impulse Spark-over Voltage | Nominal Impulse Discharge Current | Alternating Discharge Current | Impulse Life            | Minimum Insulation Resistance |               | Maximum Capacitance | Device Marking Code |
|-------------|-----------|-----------------------|------------------------------------|-----------------------------------|-------------------------------|-------------------------|-------------------------------|---------------|---------------------|---------------------|
|             |           | 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)                |                     |
| 2RP075L-8   | 2RP075M-8 | 75 $\pm$ 20%          | 600                                | 20                                | 20                            | 500                     | 25                            | 1.0           | 1.5                 | 2RP075-8            |
| 2RP090L-8   | 2RP090M-8 | 90 $\pm$ 20%          | 600                                | 20                                | 20                            | 500                     | 50                            | 1.0           | 1.5                 | 2RP090-8            |
| 2RP120L-8   | 2RP120M-8 | 120 $\pm$ 20%         | 600                                | 20                                | 20                            | 500                     | 50                            | 1.0           | 1.5                 | 2RP120-8            |
| 2RP145L-8   | 2RP145M-8 | 145 $\pm$ 20%         | 700                                | 20                                | 20                            | 500                     | 100                           | 1.0           | 1.5                 | 2RP145-8            |
| 2RP150L-8   | 2RP150M-8 | 150 $\pm$ 20%         | 700                                | 20                                | 20                            | 500                     | 100                           | 1.0           | 1.5                 | 2RP150-8            |
| 2RP230L-8   | 2RP230M-8 | 230 $\pm$ 20%         | 700                                | 20                                | 20                            | 500                     | 100                           | 1.0           | 1.5                 | 2RP230-8            |
| 2RP250L-8   | 2RP250M-8 | 250 $\pm$ 20%         | 800                                | 20                                | 20                            | 500                     | 100                           | 1.0           | 1.5                 | 2RP250-8            |
| 2RP300L-8   | 2RP300M-8 | 300 $\pm$ 20%         | 900                                | 20                                | 20                            | 500                     | 100                           | 1.0           | 1.5                 | 2RP300-8            |
| 2RP350L-8   | 2RP350M-8 | 350 $\pm$ 20%         | 900                                | 20                                | 20                            | 500                     | 100                           | 1.0           | 1.5                 | 2RP350-8            |
| 2RP400L-8   | 2RP400M-8 | 400 $\pm$ 20%         | 1000                               | 20                                | 20                            | 500                     | 100                           | 1.0           | 1.5                 | 2RP400-8            |
| 2RP470L-8   | 2RP470M-8 | 470 $\pm$ 20%         | 1100                               | 20                                | 20                            | 500                     | 250                           | 1.0           | 1.5                 | 2RP470-8            |
| 2RP600L-8   | 2RP600M-8 | 600 $\pm$ 20%         | 1300                               | 20                                | 20                            | 500                     | 250                           | 1.0           | 1.5                 | 2RP600-8            |
| 2RP800L-8   | 2RP800M-8 | 800 $\pm$ 20%         | 1500                               | 20                                | 20                            | 500                     | 250                           | 1.0           | 1.5                 | 2RP800-8            |

**Electrical Ratings**

| Items                              | Test Condition/Description   | Requirement                 |
|------------------------------------|--|-----------------------------|
| DC Spark-over Voltage              | The voltage is measured with voltage ramp $dv/dt=100V/s$ .   | To meet the specified value |
| Maximum Impulse Spark-over Voltage | The maximum impulse spark-over voltage is measured with voltage ramp $dv/dt=1000V/\mu s$ .   |                             |
| Impulse Discharge Current          | Maximum 8/20 $\mu s$ surge current that can be applied between two electrodes, 5 positive and 5 negative surges, with 3 minutes interval time, without causing the DC spark-over voltage to change more than 25% from its initial value.<br> |                             |
| Alternating Discharge Current      | 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 $\pm 25\%$ from its initial value. $IR > 10^8$ ohms (-20%, +30% for 70~90V).   |                             |
| Insulation Resistance              | The resistance of gas tube shall be measured between two electrodes.   |                             |
| Capacitance                        | The capacitance of gas tube shall be measured between two electrodes. Test frequency: 1MHz   |                             |

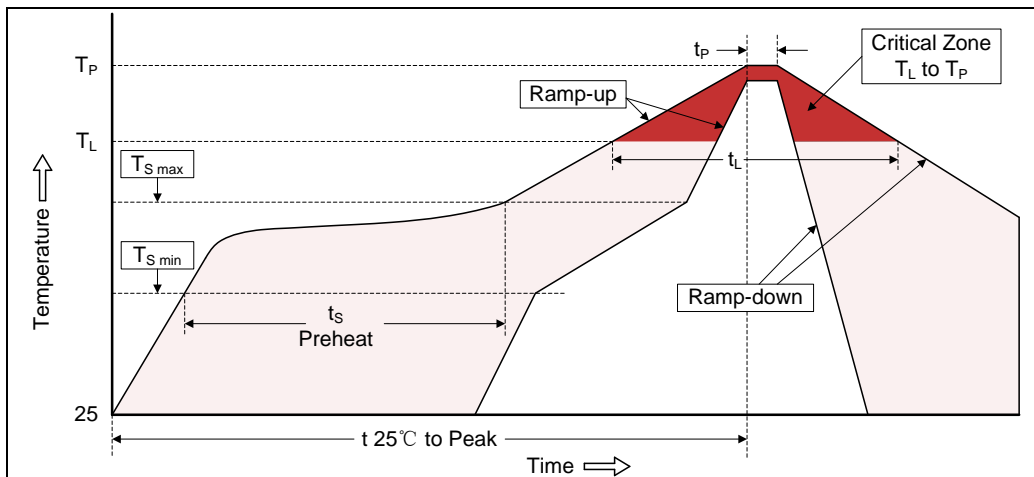
**Recommended Soldering Conditions**

**Wave Soldering**



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

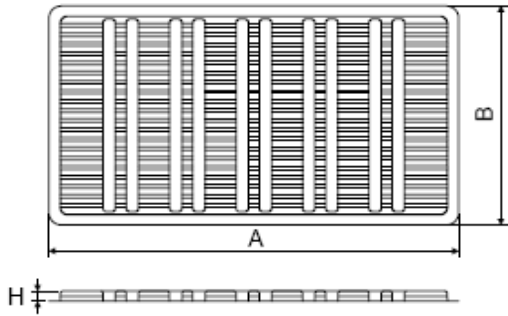
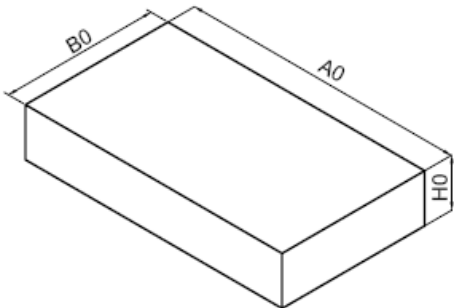
**Reflow Soldering**



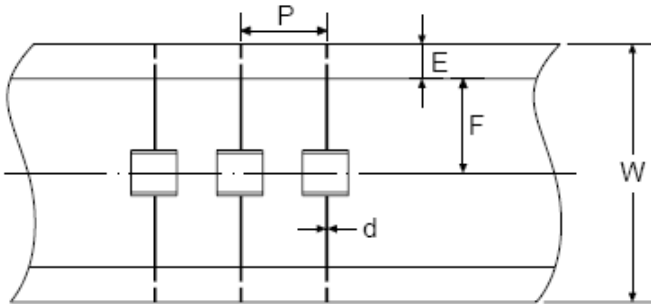
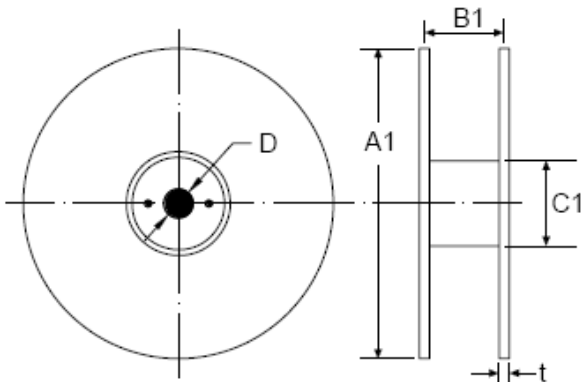
| Profile Feature                                      | Pb-Free Assembly |
|--|------------------|
| Average ramp-up rate ( $T_L$ to $T_P$ )              | 3°C/second max.  |
| Preheat  |                  |
| -Temperature Min ( $T_{S\ min}$ )                    | 150°C            |
| -Temperature Max ( $T_{S\ max}$ )                    | 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                | 265.0 ±5.0        |
|   | B                | 146.0 ±5.0        |
|   | H                | 8.5 ±0.5          |
| Quantity: 100pcs  |                  |                   |
| Inner box<br>   | A0               | 270.0 ±2.0        |
|   | B0               | 150.0 ±2.0        |
|   | H0               | 50.0 ±2.0         |
|   | Quantity: 500pcs |                   |

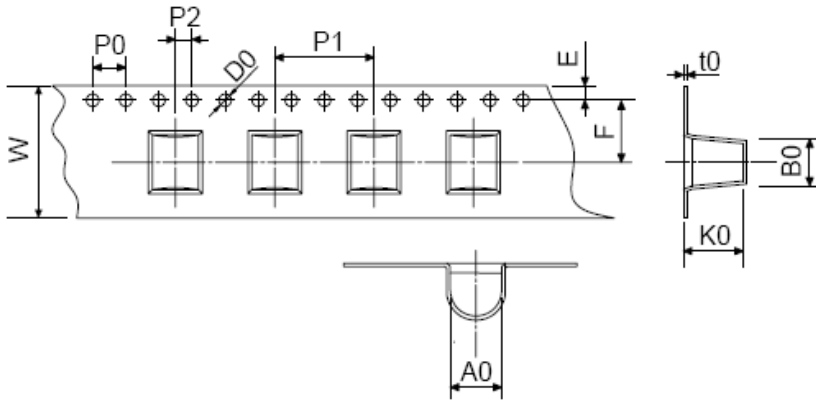
**Axial Packing (Tape & Reel)**

| Tape<br> | Dimension (mm)   |                   |
|---|------------------|-------------------|
|   | Symbol           | Spec. / Tolerance |
|   | P                | 10.0 ±0.5         |
|   | W                | 65.0 ±1.0         |
|   | E                | 6.0 ±0.5          |
|   | F                | 26.5 ±0.5         |
| d   | 0.8 ±0.1         |                   |
| Reel<br> | A1               | 330.0 ±2.0        |
|   | B1               | 70.0 ±2.0         |
|   | C1               | 82.0 ±2.0         |
|   | D                | 25.0 ±0.5         |
|   | t                | 2.0 ±0.2          |
|   | Quantity: 500pcs |                   |

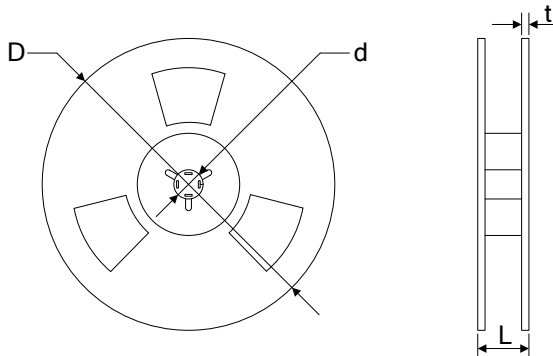
SMD Packing (Tape & Reel)

| Symbol           | Dimension (mm) |           |
|------------------|----------------|-----------|
|                  | Spec.          | Tolerance |
| W                | 16.00          | ±0.20     |
| P0               | 4.00           | ±0.10     |
| P1               | 12.00          | ±0.20     |
| P2               | 2.00           | ±0.10     |
| D0               | 1.55           | ±0.05     |
| E                | 1.75           | ±0.10     |
| F                | 7.50           | ±0.10     |
| A0               | 8.20           | ±0.10     |
| K0               | 8.50           | ±0.10     |
| B0               | 7.50           | ±0.10     |
| t0               | 0.50           | ±0.10     |
| D                | 330.00         | ±2.00     |
| d                | 13.00          | ±0.50     |
| L                | 20.00          | ±2.00     |
| t                | 2.00           | ±0.20     |
| Quantity: 500pcs |                |           |

Tape



Reel



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