

## Gas Discharge Tube (GDT) Data Sheet

### Features

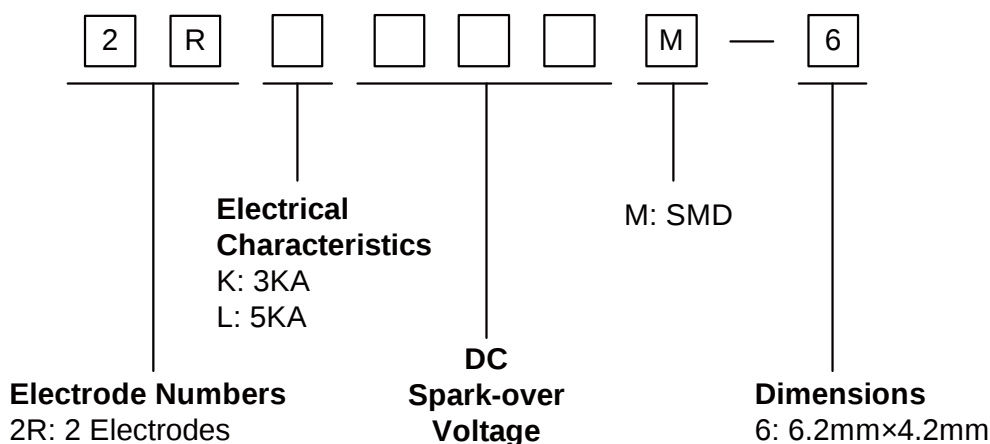
- Provide ultra-fast response to surge voltage from slow-rising surge of 100V/s to rapid-rising surge of 1KV/μs.
- Stable breakdown voltage.
- High insulation resistance.
- Low capacitance ( $\leq 1\text{pF}$ )
- High holdover voltage
- Large absorbing transient current capability.
- Micro-Gap Design
- Size: 6.2mm\*4.2mm
- Storage and operating temperature:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Meets MSL level 1, per J-STD-020
- Safety certification: E244458 & E327997



### Applications

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

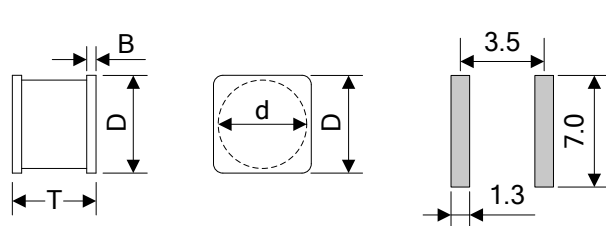
### Part Number Code



### Marking

**B** : BrightKing Logo  
 2RL090-6 : Device Marking Code  
 YXXX : Date Code

## Dimensions



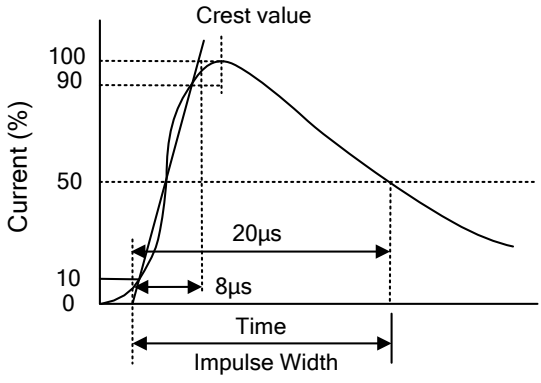
Recommended Pad Size

| Symbol | Dimension (mm) |           |
|--------|----------------|-----------|
|        | Spec.          | Tolerance |
| D      | 6.2            | ±0.2      |
| T      | 4.2            | ±0.2      |
| B      | 0.6            | ±0.1      |
| d      | 6.0            | ±0.2      |

## Electrical Characteristics

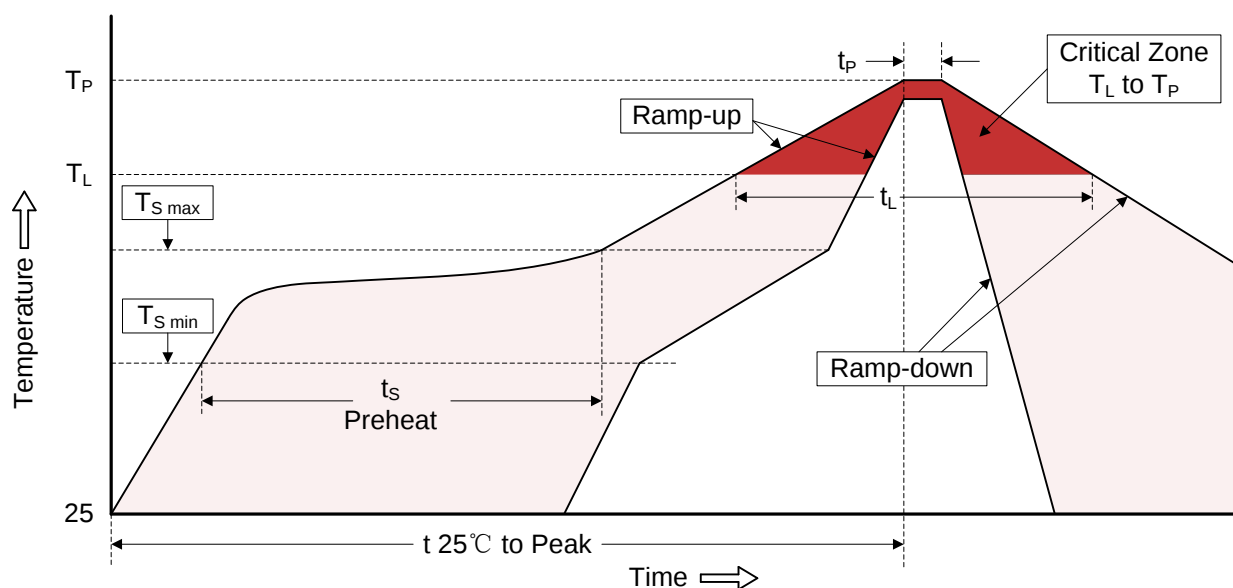
| Part Number | DC Spark-over Voltage | Maximum Impulse Spark-over Voltage | Nominal Impulse Discharge Current | Alternating Discharge Current | Impulse Life   | Minimum Insulation Resistance |      | Maximum Capacitance | Device Marking Code |
|-------------|-----------------------|------------------------------------|-----------------------------------|-------------------------------|----------------|-------------------------------|------|---------------------|---------------------|
|             | 100V/s                | 1000V/μs                           | 8/20μs 10times                    | 50Hz, 1sec                    | 10/1000μs 100A | Test Voltage                  | (GΩ) | 1MHz                |                     |
|             | (V)                   | (V)                                | (KA)                              | (A)                           | (times)        | DC(V)                         |      | (pF)                |                     |
| 2RL075M-6   | 75±20%                | 700                                | 5                                 | 5                             | 500            | 25                            | 1    | 1.0                 | 2RL075-6            |
| 2RL090M-6   | 90±20%                | 700                                | 5                                 | 5                             | 500            | 50                            | 1    | 1.0                 | 2RL090-6            |
| 2RL145M-6   | 145±20%               | 700                                | 5                                 | 5                             | 500            | 100                           | 1    | 1.0                 | 2RL145-6            |
| 2RL150M-6   | 150±20%               | 700                                | 5                                 | 5                             | 500            | 100                           | 1    | 1.0                 | 2RL150-6            |
| 2RL230M-6   | 230±20%               | 650                                | 5                                 | 5                             | 500            | 100                           | 1    | 1.0                 | 2RL230-6            |
| 2RL250M-6   | 250±20%               | 650                                | 5                                 | 5                             | 500            | 100                           | 1    | 1.0                 | 2RL250-6            |
| 2RL300M-6   | 300±20%               | 700                                | 5                                 | 5                             | 500            | 100                           | 1    | 1.0                 | 2RL300-6            |
| 2RL350M-6   | 350±20%               | 750                                | 5                                 | 5                             | 500            | 100                           | 1    | 1.0                 | 2RL350-6            |
| 2RL400M-6   | 400±20%               | 800                                | 5                                 | 5                             | 500            | 100                           | 1    | 1.0                 | 2RL400-6            |
| 2RL470M-6   | 470±20%               | 900                                | 5                                 | 5                             | 500            | 250                           | 1    | 1.0                 | 2RL470-6            |
| 2RL600M-6   | 600±20%               | 1000                               | 5                                 | 5                             | 500            | 250                           | 1    | 1.0                 | 2RL600-6            |
| 2RL800M-6   | 800±20%               | 1200                               | 5                                 | 5                             | 500            | 250                           | 1    | 1.0                 | 2RL800-6            |
| 2RK1000M-6  | 1000±20%              | 1600                               | 3                                 | 3                             | 300            | 500                           | 1    | 1.0                 | 2RK1000-6           |
| 2RK1200M-6  | 1200±20%              | 1800                               | 3                                 | 3                             | 300            | 500                           | 1    | 1.0                 | 2RK1200-6           |
| 2RK1800M-6  | 1800±20%              | 2600                               | 3                                 | 3                             | 300            | 500                           | 1    | 1.0                 | 2RK1800-6           |
| 2RK2000M-6  | 2000±20%              | 2800                               | 3                                 | 3                             | 300            | 500                           | 1    | 1.0                 | 2RK2000-6           |
| 2RK2500M-6  | 2500±20%              | 3200                               | 3                                 | 3                             | 300            | 1000                          | 1    | 1.0                 | 2RK2500-6           |
| 2RK2700M-6  | 2700±20%              | 3400                               | 3                                 | 3                             | 300            | 1000                          | 1    | 1.0                 | 2RK2700-6           |
| 2RK3000M-6  | 3000±20%              | 3700                               | 3                                 | 3                             | 300            | 1000                          | 1    | 1.0                 | 2RK3000-6           |

## 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          | <p>Maximum 8/20<math>\mu s</math> surge current that can be applied between two electrodes, 5 positive and 5 negative surges, with 3 minutes interval time.</p>  <p>The graph shows a typical 8/20 microsecond surge current waveform. The y-axis represents Current (%) from 0 to 100. The x-axis represents Time in microseconds. The curve starts at 0, rises to a crest value of 100% at 8 microseconds, and then decays to 50% at 20 microseconds. The impulse width is indicated as 20 microseconds.</p> |                             |
| Alternating Discharge Current      | Rated RMS value of AC current at 50Hz, 1 sec. for 10 times with interval time 3 min.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |
| 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

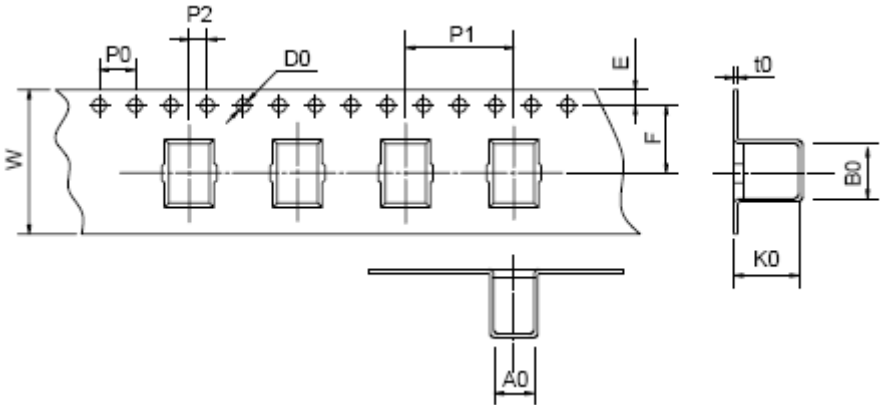
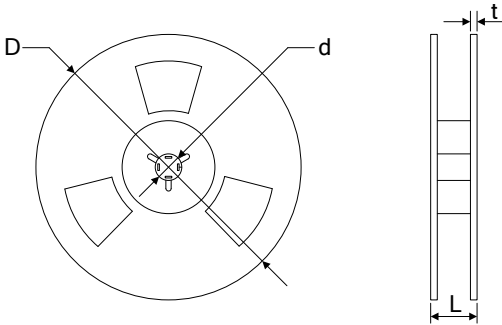
### Reflow Soldering



### Recommended Conditions

| Profile Feature                                                                                                                                                                                         | Pb-Free Assembly                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Average ramp-up rate ( $T_L$ to $T_P$ )                                                                                                                                                                 | 3°C/second max.                  |
| Preheat <ul style="list-style-type: none"> <li>-Temperature Min (<math>T_{S\ min}</math>)</li> <li>-Temperature Max (<math>T_{S\ max}</math>)</li> <li>-Time (min to max) (<math>t_s</math>)</li> </ul> | 150°C<br>200°C<br>60-180 seconds |
| $T_{S\ max}$ to $T_L$ <ul style="list-style-type: none"> <li>-Ramp-up Rate</li> </ul>                                                                                                                   | 3°C/second max.                  |
| Time maintained above: <ul style="list-style-type: none"> <li>-Temperature (<math>T_L</math>)</li> <li>-Time (<math>t_L</math>)</li> </ul>                                                              | 217°C<br>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

|                                                                                                     |                  |                |           |
|-----------------------------------------------------------------------------------------------------|------------------|----------------|-----------|
| Tape <div></div>   | 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               | 4.44           | ±0.10     |
|                                                                                                     | K0               | 6.37           | ±0.10     |
|                                                                                                     | B0               | 6.48           | ±0.10     |
|                                                                                                     | t0               | 0.50           | ±0.10     |
| Reel <div></div> | D                | 330.00         | ±1.00     |
|                                                                                                     | d                | 13.00          | ±0.50     |
|                                                                                                     | L                | 20.00          | ±0.50     |
|                                                                                                     | t                | 2.00           | ±0.20     |
|                                                                                                     | Quantity: 800pcs |                |           |
|                                                                                                     |                  |                |           |