

# DATA SHEET

GAS DISCHARGE TUBES  
TELEPHONE INTERFACE  
3R-5-S series

RoHS compliant & free



Product specification— July 12, 2023 V.1



## Gas Discharge Tube (GDT) Data Sheet

### Features

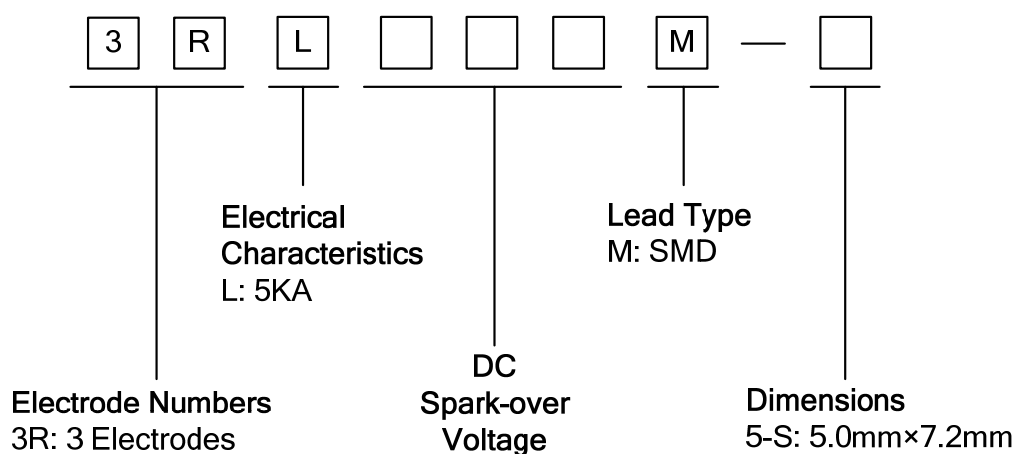
- Provide ultra-fast response to surge voltage from slow-rising surge of 100V/s to rapid-rising surge of 1KV/ $\mu$ s
- Stable breakdown voltage
- High insulation resistance
- Low capacitance ( $\leq 2$ pF)
- High holdover voltage
- Large absorbing transient current capability
- Micro-Gap Design
- Size: 5.0mm\*7.2mm
- Storage and operating temperature: -40°C ~ +85°C
- Meets MSL level 1, per J-STD-020
- Safety certification: UL



### Applications

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

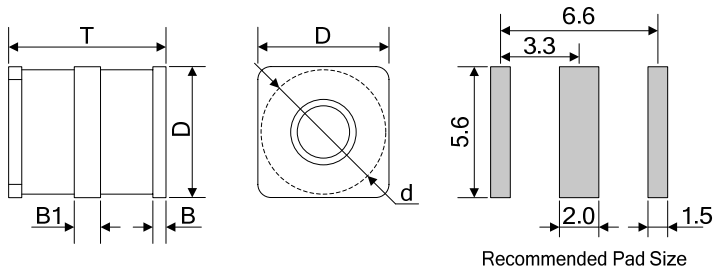
### Part Number Code



### Marking

**B** : BrightKing Logo  
3SL090M : Device Marking Code  
XXXX : Internal Control Code

## Dimensions

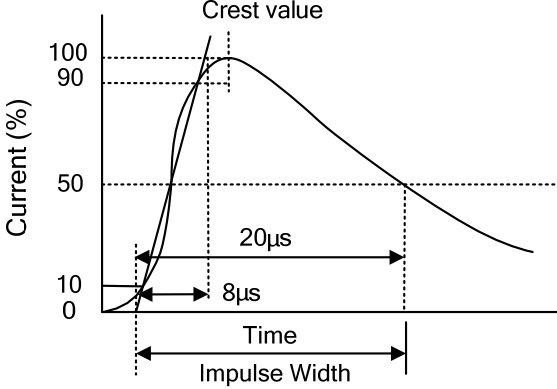
| M Type                                                                            | Symbol | Dimension (mm) |           |
|-----------------------------------------------------------------------------------|--------|----------------|-----------|
|                                                                                   |        | Spec.          | Tolerance |
|  | D      | 5.0            | ±0.2      |
|                                                                                   | T      | 7.2            | ±0.3      |
|                                                                                   | B      | 0.4            | ±0.1      |
|                                                                                   | B1     | 1.5            | ±0.2      |
|                                                                                   | d      | 4.8            | ±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 10times                    | 50Hz, 1sec                    | 10/1000μs 100A | Test Voltage                  | (GΩ) | 1MHz                |                     |
|             | (V)                   | (V)                                | (KA)                              | (A)                           | (times)        | DC(V)                         |      | (pF)                |                     |
| 3RL075M-5-S | 75±20%                | 700                                | 5                                 | 5                             | 300            | 25                            | 1.0  | 2.0                 | 3SL075M             |
| 3RL090M-5-S | 90±20%                | 600                                | 5                                 | 5                             | 300            | 50                            | 1.0  | 2.0                 | 3SL090M             |
| 3RL120M-5-S | 120±20%               | 600                                | 5                                 | 5                             | 300            | 50                            | 1.0  | 2.0                 | 3SL120M             |
| 3RL150M-5-S | 150±20%               | 600                                | 5                                 | 5                             | 300            | 100                           | 1.0  | 2.0                 | 3SL150M             |
| 3RL200M-5-S | 200±20%               | 650                                | 5                                 | 5                             | 300            | 100                           | 1.0  | 2.0                 | 3SL200M             |
| 3RL230M-5-S | 230±20%               | 650                                | 5                                 | 5                             | 300            | 100                           | 1.0  | 2.0                 | 3SL230M             |
| 3RL250M-5-S | 250±20%               | 650                                | 5                                 | 5                             | 300            | 100                           | 1.0  | 2.0                 | 3SL250M             |
| 3RL300M-5-S | 300±20%               | 800                                | 5                                 | 5                             | 300            | 100                           | 1.0  | 2.0                 | 3SL300M             |
| 3RL350M-5-S | 350±20%               | 800                                | 5                                 | 5                             | 300            | 100                           | 1.0  | 2.0                 | 3SL350M             |
| 3RL400M-5-S | 400±20%               | 900                                | 5                                 | 5                             | 300            | 100                           | 1.0  | 2.0                 | 3SL400M             |
| 3RL420M-5-S | 420±20%               | 900                                | 5                                 | 5                             | 300            | 250                           | 1.0  | 2.0                 | 3SL420M             |
| 3RL470M-5-S | 470±20%               | 900                                | 5                                 | 5                             | 300            | 250                           | 1.0  | 2.0                 | 3SL470M             |
| 3RL600M-5-S | 600±20%               | 1000                               | 5                                 | 5                             | 300            | 250                           | 1.0  | 2.0                 | 3SL600M             |

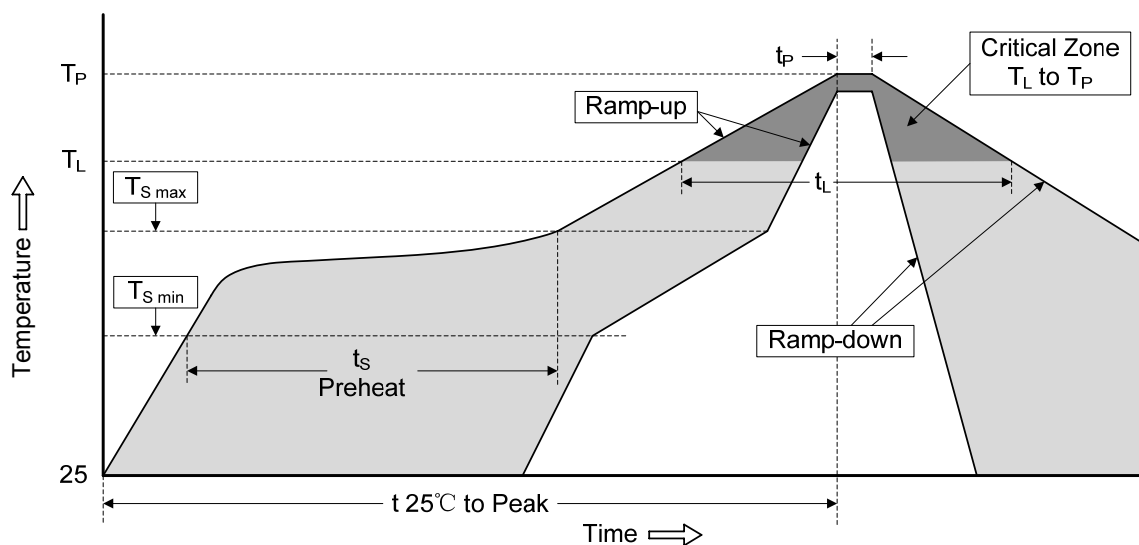
## Electrical Ratings

| 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</math>s waveform, for 10 times with 3min interval time, which will be equally divided between each side electrode to center electrode.</p>  |
| Alternating Discharge Current | Rated RMS value of AC current at 50Hz, 1 sec. for 10 times with interval time 3 min. Test is between each side electrode and center electrode.                                                                                                                                                                         |
| Insulation Resistance         | The resistance of gas tube shall be measured between each side electrodes and center electrode.                                                                                                                                                                                                                        |
| Capacitance                   | The capacitance of gas tube shall be measured between each side electrodes and center electrode. Test frequency: 1MHz                                                                                                                                                                                                  |

### Recommended Soldering Conditions

#### Reflow Soldering

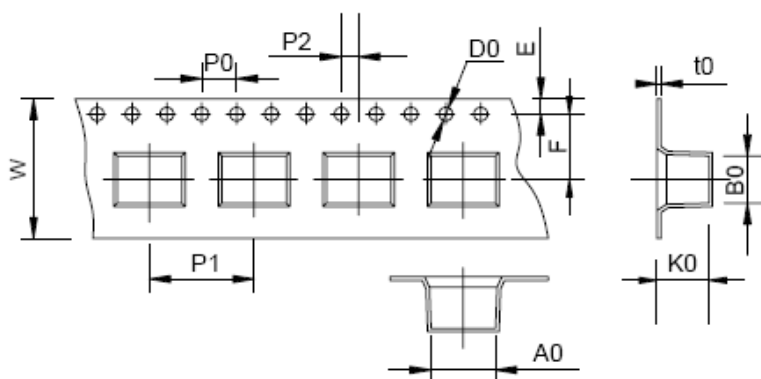


## Recommended Conditions

| 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) (ts)</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.                   |

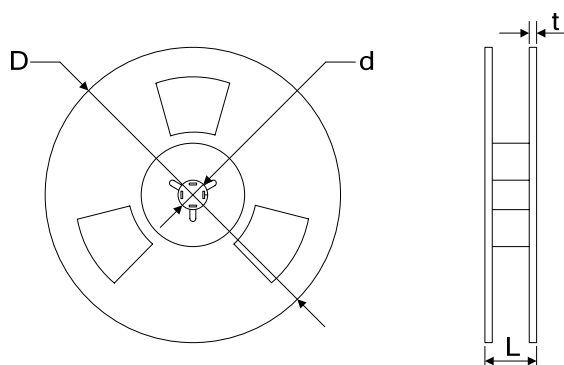
## Packaging

## Tape



| 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     | 7.40           | ±0.10     |
| K0     | 5.50           | ±0.10     |
| B0     | 5.40           | ±0.10     |
| t0     | 0.50           | ±0.10     |

## Reel



|   |        |       |
|---|--------|-------|
| D | 330.00 | ±2.00 |
| d | 13.00  | ±0.50 |
| L | 20.00  | ±2.00 |
| t | 2.00   | ±0.20 |

Quantity: 900pcs

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