# Gas Discharge Tube (GDT) Data Sheet

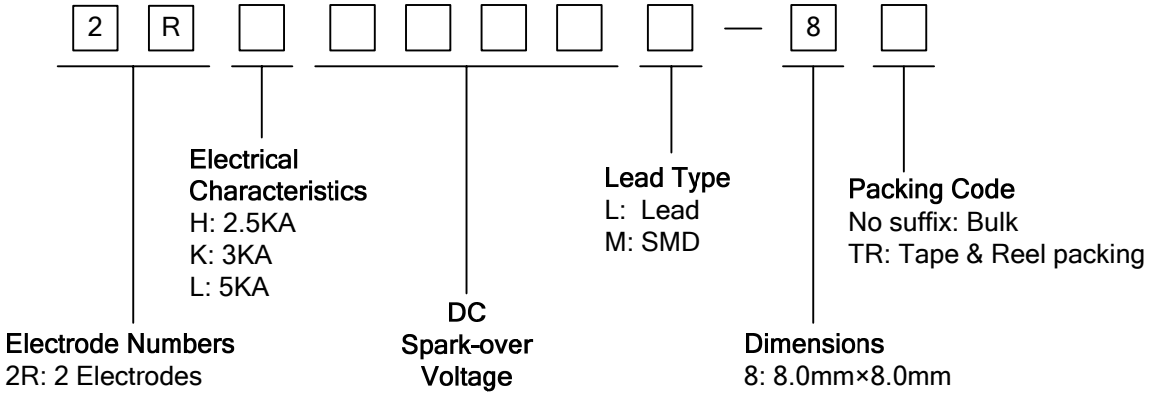
## Features

- 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*8.0mm
- Storage and operational temperature: -40℃ ~ +85℃
- Meets MSL level 1, per J-STD-020
- Safety certification: UL: E327997

## Applications

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

## Part Number Code

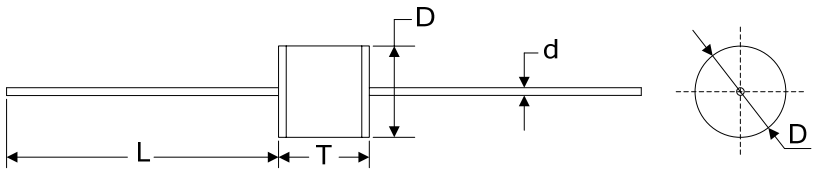



## Marking

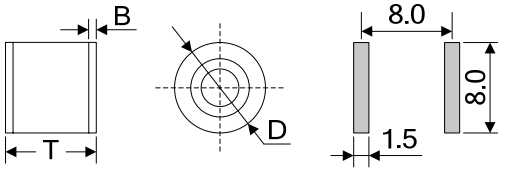
: BrightKing Logo
2RL1000-8 : Device Marking Code
YXXX : Date Code

## Dimensions

L Type




M Type




Recommended Pad Size

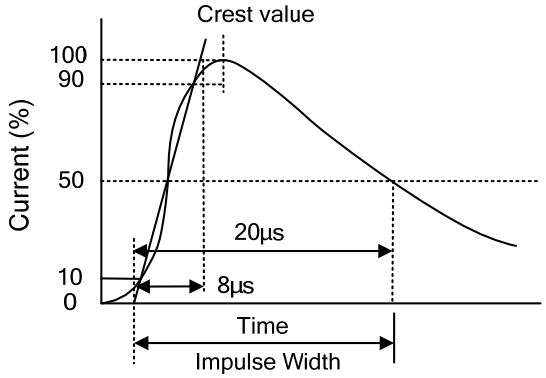
| Symbol | Dimension (mm) | |
|---|---|---|
| | Spec. | Tolerance |
| D | 8.0 | +0.3, -0.5 |
| T | 8.0 | +0.6, -0.1 |
| d | 0.8 | ±0.05 |
| | 1.0 | ±0.05 |
| L | 30.0 | Max. |
| D | 8.0 | +0.3, -0.5 |
| T | 8.0 | +0.6, -0.1 |
| B | 1.1 | ±0.4 |

## 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) | |
| 2RH1400L-8 | 2RH1400M-8 | 1400±20% | 2200 | 2.5 | 2.5 | 100 | 500 | 1.0 | 1.5 | 2RH1400-8 |
| 2RH1600L-8 | 2RH1600M-8 | 1600±20% | 2400 | 2.5 | 2.5 | 100 | 500 | 1.0 | 1.5 | 2RH1600-8 |
| 2RH2000L-8 | 2RH2000M-8 | 2000±20% | 2800 | 2.5 | 2.5 | 100 | 500 | 1.0 | 1.5 | 2RH2000-8 |
| 2RH2500L-8 | 2RH2500M-8 | 2500±20% | 3600 | 2.5 | 2.5 | 100 | 500 | 1.0 | 1.5 | 2RH2500-8 |
| 2RH2700L-8 | 2RH2700M-8 | 2700±20% | 3800 | 2.5 | 2.5 | 300* | 1000 | 1.0 | 1.5 | 2RH2700-8 |
| 2RH3000L-8 | 2RH3000M-8 | 3000±20% | 4200 | 2.5 | 2.5 | 100 | 1000 | 1.0 | 1.5 | 2RH3000-8 |
| 2RH3500L-8 | 2RH3500M-8 | 3500±20% | 5000 | 2.5 | 2.5 | 100 | 1000 | 1.0 | 1.5 | 2RH3500-8 |
| 2RK2700L-8 | 2RK2700M-8 | 2700±20% | 3800 | 3.0 | 3.0 | 300* | 1000 | 1.0 | 1.5 | 2RK2700-8 |
| 2RK3000L-8 | 2RK3000M-8 | 3000±20% | 4200 | 3.0 | 3.0 | 300* | 1000 | 1.0 | 1.5 | 2RK3000-8 |
| 2RK3500L-8 | 2RK3500M-8 | 3500±20% | 5000 | 3.0 | 3.0 | 100 | 1000 | 1.0 | 1.5 | 2RK3500-8 |
| 2RK4000L-8 | 2RK4000M-8 | 4000±20% | 5500 | 3.0 | 3.0 | 100 | 1000 | 1.0 | 1.5 | 2RK4000-8 |
| 2RK5000L-8 | 2RK5000M-8 | 5000±20% | 6400 | 3.0 | 3.0 | 100 | 1000 | 1.0 | 1.5 | 2RK5000-8 |
| 2RK6000L-8 | 2RK6000M-8 | 6000±20% | 7800 | 3.0 | 3.0 | 100 | 1000 | 1.0 | 1.5 | 2RK6000-8 |
| 2RL1000L-8 | 2RL1000M-8 | 1000±20% | 1400 | 5.0 | 5.0 | 100 | 500 | 1.0 | 1.5 | 2RL1000-8 |
| 2RL1400L-8 | 2RL1400M-8 | 1400±20% | 2200 | 5.0 | 5.0 | 100 | 500 | 1.0 | 1.5 | 2RL1400-8 |
| 2RL1600L-8 | 2RL1600M-8 | 1600±20% | 2400 | 5.0 | 5.0 | 100 | 500 | 1.0 | 1.5 | 2RL1600-8 |
| 2RL2000L-8 | 2RL2000M-8 | 2000±20% | 2800 | 5.0 | 5.0 | 100 | 500 | 1.0 | 1.5 | 2RL2000-8 |
| 2RL2500L-8 | 2RL2500M-8 | 2500±20% | 3600 | 5.0 | 5.0 | 100 | 1000 | 1.0 | 1.5 | 2RL2500-8 |

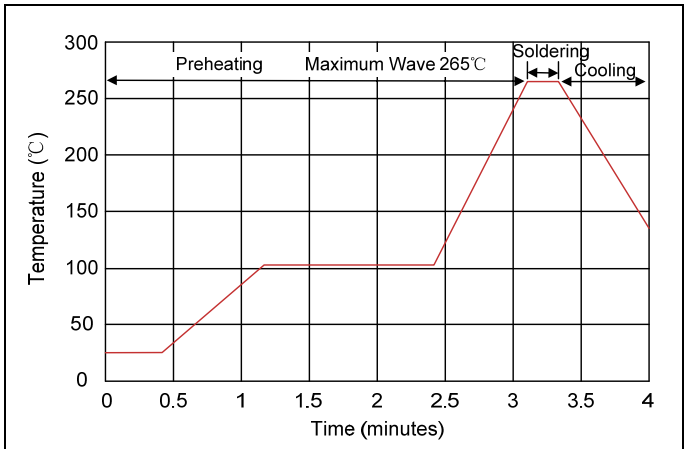
* Measured with an 8/20μs waveform, 100A

## 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/μs. | |
| Impulse Discharge Current | Maximum 8/20μs 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.   | |
| 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 ±25% from its initial value.<br>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 | |

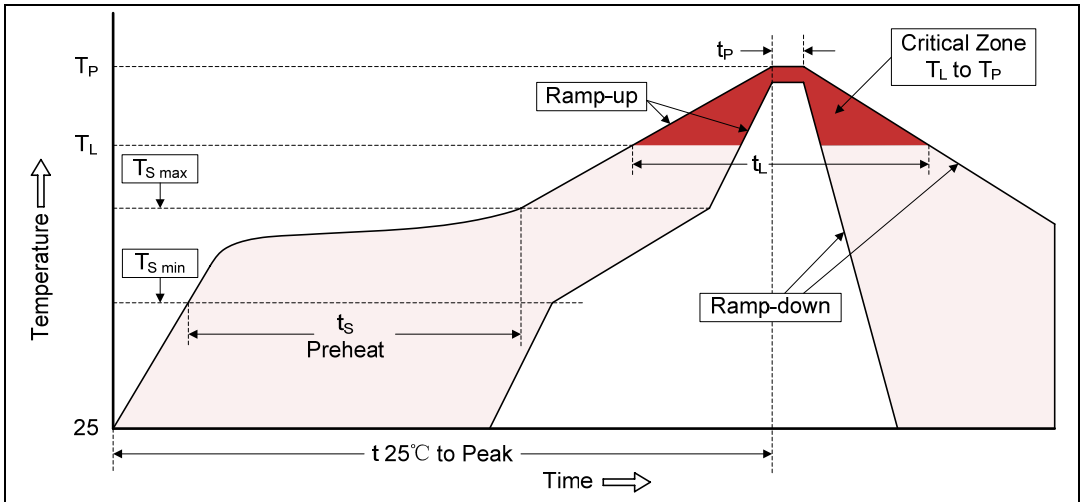
## Recommended Soldering Conditions

### Wave Soldering




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

### Reflow Soldering

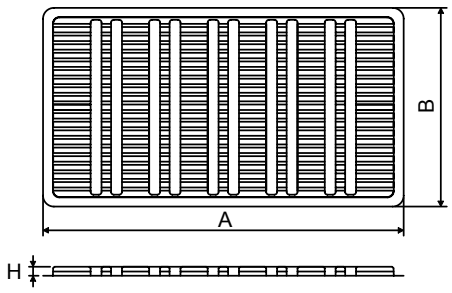



| Profile Feature | Pb-Free Assembly |
|---|---|
| Average ramp-up rate ($T_L$ to $T_P$) | 3℃/second max. |
| Preheat<br>-Temperature Min ($T_{S\ min}$)<br>-Temperature Max ($T_{S\ max}$)<br>-Time (min to max) (ts) | <br>150℃<br>200℃<br>60-180 seconds |
| $T_{S\ max}$ to $T_L$<br>-Ramp-up Rate | <br>3℃/second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

## Packaging

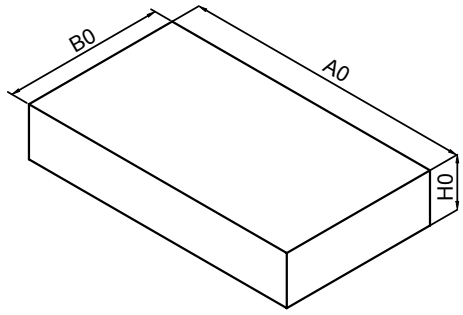
Axial Packing (Bulk)

Skin packing




| Symbol | Dimension (mm) | |
|---|---|---|
| | Spec. | Tolerance |
| A | 264.0 | ±1.0 |
| B | 145.0 | ±1.0 |
| H | 6.5 | ±0.5 |
| Quantity: 100pcs | | |

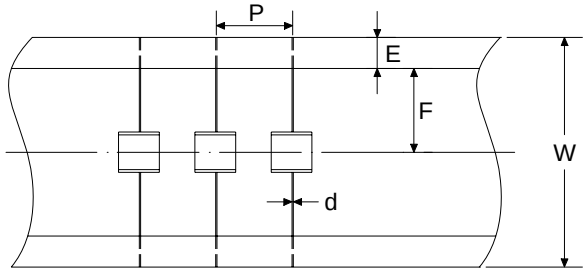
Inner box




| | | |
|---|---|---|
| A0 | 270.0 | ±2.0 |
| B0 | 150.0 | ±1.0 |
| H0 | 50.0 | ±1.0 |
| Quantity: 500pcs | | |

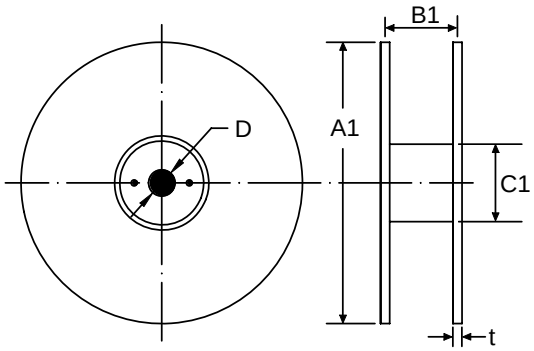
Axial Packing (Tape & Reel)

Tape




| Symbol | Dimension (mm) | |
|---|---|---|
| | Spec. | Tolerance |
| P | 10.0 | ±0.1 |
| W | 65.0 | ±0.1 |
| E | 6.0 | ±0.1 |
| F | 26.5 | ±0.1 |
| d | 0.8/1.0 | ±0.05 |

Reel

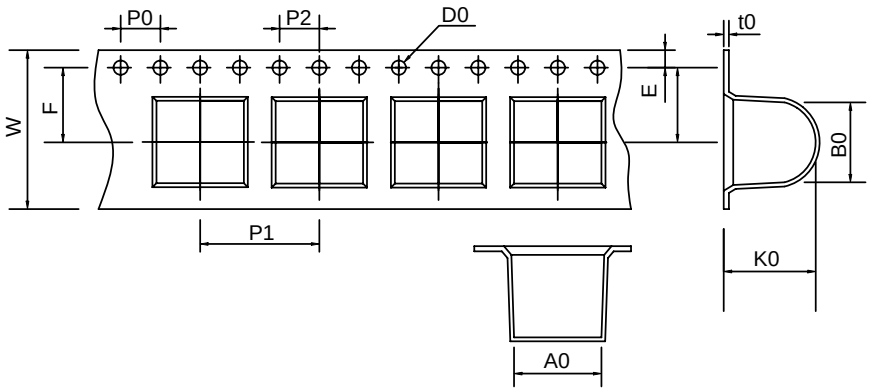



| | | |
|---|---|---|
| A1 | 330.0 | ±1.0 |
| B1 | 70.0 | ±1.0 |
| C1 | 82.0 | ±1.0 |
| D | 25.0 | ±0.2 |
| t | 2.0 | ±0.2 |
| Quantity: 500pcs | | |

## Packaging

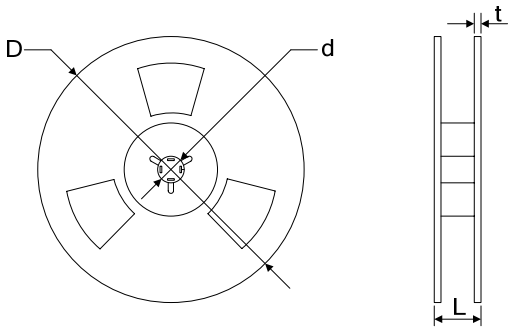
SMD Packing (Tape & Reel)

Tape




| Symbol | Dimension (mm) | |
|---|---|---|
| | Spec. | Tolerance |
| W | 16.00 | ±0.20 |
| P0 | 4.00 | ±0.10 |
| P1 | 12.00 | ±0.20 |
| P2 | 4.00 | ±0.10 |
| D0 | 1.45 | ±0.1 |
| E | 1.75 | ±0.10 |
| F | 7.50 | ±0.10 |
| A0 | 8.80 | ±0.10 |
| K0 | 8.30 | ±0.10 |
| B0 | 8.30 | ±0.10 |
| t0 | 0.50 | ±0.10 |

Reel




| | | |
|---|---|---|
| D | 330.00 | ±1.00 |
| d | 13.00 | ±0.50 |
| L | 20.00 | ±0.50 |
| t | 2.00 | ±0.20 |

Quantity: 500pcs