

DATA SHEET

GAS DISCHARGE TUBES TELEPHONE INTERFACE

2R-5 series

RoHS compliant & free



Product specification— March 16, 2021 V.1



Gas Discharge Tube (GDT) Data Sheet

Features

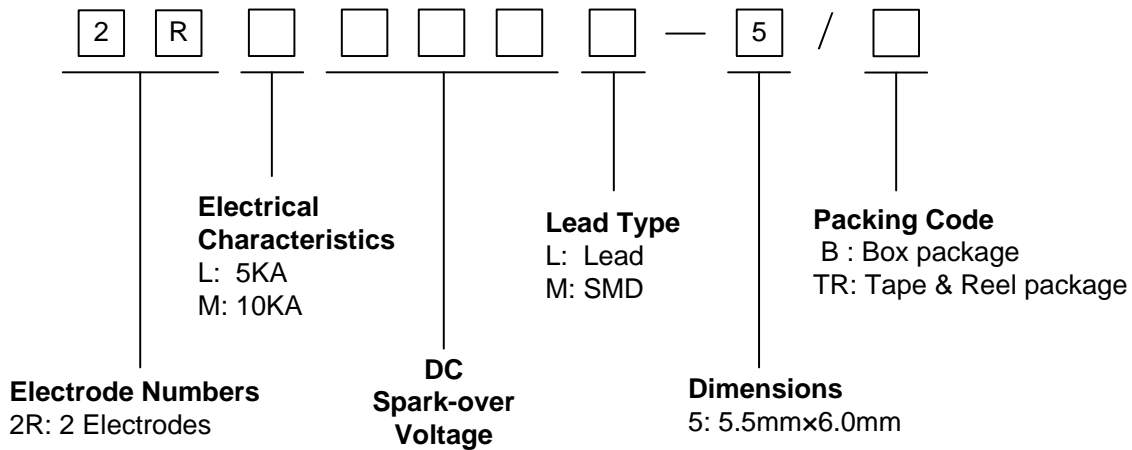
- Provide ultra-fast response to surge voltage from slow-rising surge of 100V/s to rapid-rising surge of 1KV/μs
- Stable breakdown voltage
- High insulation resistance
- Low capacitance (≤1.5pF)
- High holdover voltage
- Large absorbing transient current capability
- Micro-Gap Design
- Size: 5.5mm*6.0mm
- 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



Ordering Code for different package in 2RLxxxxL-5, 2RMxxxxL-5 series

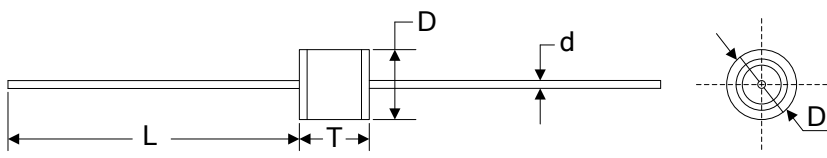
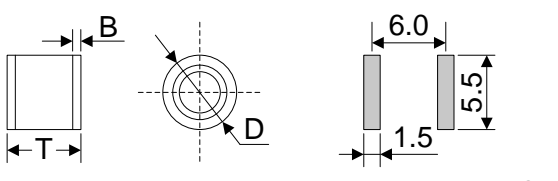
Box package: Add suffix “/B” at the end of the part number, such as 2RL070L-5/B, 2RM070L-5/B

Tape & Reel package: Add suffix “/TR” at the end of the part number, such as 2RL070L-5/TR, 2RM070L-5/TR

Marking

- B** : BrightKing Logo
- 2RL090-5 : Device Marking Code
- XXXX : Internal Control Code

Dimensions

| L Type | Symbol | Dimension (mm) | | |
|--|---|----------------|------------|------------|
| | | Spec. | Tolerance | |
|  | D | 5.5 | +0.3, -0.5 | |
| | T | 6.0 | +0.3, -0.5 | |
| | d | 0.8 | ±0.1 | |
| | L | 30.0 | Max. | |
| M Type |  | D | 5.5 | +0.3, -0.5 |
| | | T | 6.0 | +0.3, -0.5 |
| | | B | 0.5 | ±0.1 |

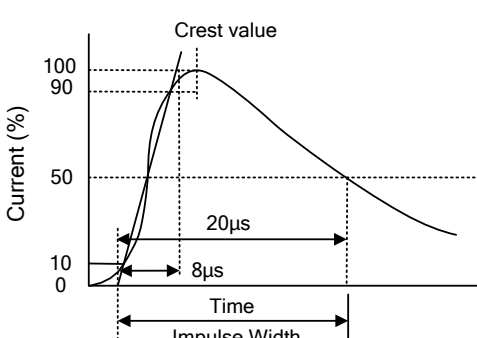
Electrical Characteristics

| 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 10times | 50Hz, 1sec | 10/1000μs 100A | Test Voltage | (GΩ) | 1MHz | |
| | | (V) | (V) | (KA) | (A) | (times) | DC(V) | | (pF) | |
| 2RL070L-5 | 2RL070M-5 | 70±20% | 800 | 5.0 | 5.0 | 300 | 25 | 1.0 | 1.5 | 2RL070-5 |
| 2RL075L-5 | 2RL075M-5 | 75±20% | 800 | 5.0 | 5.0 | 300 | 25 | 1.0 | 1.5 | 2RL075-5 |
| 2RL090L-5 | 2RL090M-5 | 90±20% | 700 | 5.0 | 5.0 | 300 | 50 | 1.0 | 1.5 | 2RL090-5 |
| 2RL120L-5 | 2RL120M-5 | 120±20% | 700 | 5.0 | 5.0 | 300 | 50 | 1.0 | 1.5 | 2RL120-5 |
| 2RL145L-5 | 2RL145M-5 | 145±20% | 700 | 5.0 | 5.0 | 300 | 100 | 1.0 | 1.5 | 2RL145-5 |
| 2RL150L-5 | 2RL150M-5 | 150±20% | 700 | 5.0 | 5.0 | 300 | 100 | 1.0 | 1.5 | 2RL150-5 |
| 2RL230L-5 | 2RL230M-5 | 230±20% | 700 | 5.0 | 5.0 | 300 | 100 | 1.0 | 1.5 | 2RL230-5 |
| 2RL250L-5 | 2RL250M-5 | 250±20% | 700 | 5.0 | 5.0 | 300 | 100 | 1.0 | 1.5 | 2RL250-5 |
| 2RL300L-5 | 2RL300M-5 | 300±20% | 900 | 5.0 | 5.0 | 300 | 100 | 1.0 | 1.5 | 2RL300-5 |
| 2RL350L-5 | 2RL350M-5 | 350±20% | 900 | 5.0 | 5.0 | 300 | 100 | 1.0 | 1.5 | 2RL350-5 |
| 2RL400L-5 | 2RL400M-5 | 400±20% | 1000 | 5.0 | 5.0 | 300 | 100 | 1.0 | 1.5 | 2RL400-5 |
| 2RL470L-5 | 2RL470M-5 | 470±20% | 1100 | 5.0 | 5.0 | 300 | 250 | 1.0 | 1.5 | 2RL470-5 |
| 2RL600L-5 | 2RL600M-5 | 600±20% | 1500 | 5.0 | 5.0 | 300 | 250 | 1.0 | 1.5 | 2RL600-5 |
| 2RL800L-5 | 2RL800M-5 | 800±20% | 1700 | 5.0 | 5.0 | 300 | 250 | 1.0 | 1.5 | 2RL800-5 |

Electrical Characteristics

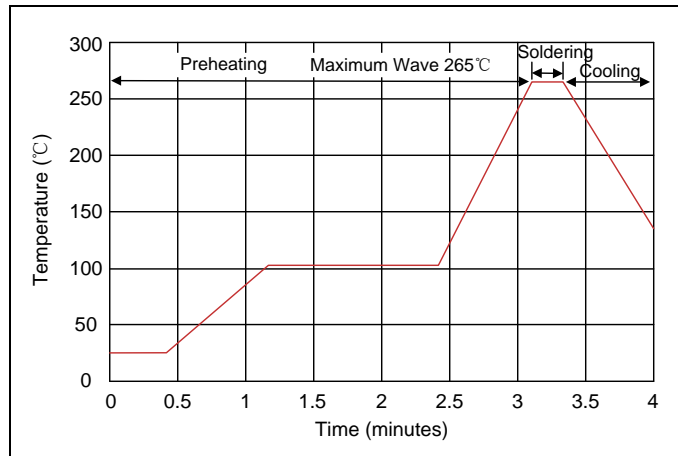
| Part Number | | DC Spark-over Voltage | Maximum Impulse Spark-over Voltage | Nominal Impulse Discharge Current | Alternating Discharge Current | Impulse Life | Minimum Insulation Resistance | | Maximum Capacitance | Device Marking Code |
|-------------|-----------|-----------------------|------------------------------------|-----------------------------------|-------------------------------|-------------------------|-------------------------------|---------------|---------------------|---------------------|
| | | 100V/s | 1000V/ μ s | 8/20 μ s 10times | 50Hz, 1sec | 10/1000 μ s 100A | Test Voltage | (G Ω) | 1MHz | |
| | | (V) | (V) | (KA) | (A) | (times) | DC(V) | | (pF) | |
| 2RM070L-5 | 2RM070M-5 | 70 \pm 20% | 600 | 10 | 5.0 | 500 | 25 | 1.0 | 1.5 | 2RM070-5 |
| 2RM075L-5 | 2RM075M-5 | 75 \pm 20% | 600 | 10 | 5.0 | 500 | 25 | 1.0 | 1.5 | 2RM075-5 |
| 2RM090L-5 | 2RM090M-5 | 90 \pm 20% | 600 | 10 | 10 | 500 | 50 | 1.0 | 1.5 | 2RM090-5 |
| 2RM120L-5 | 2RM120M-5 | 120 \pm 20% | 600 | 10 | 10 | 500 | 50 | 1.0 | 1.5 | 2RM120-5 |
| 2RM145L-5 | 2RM145M-5 | 145 \pm 20% | 700 | 10 | 10 | 500 | 100 | 1.0 | 1.5 | 2RM145-5 |
| 2RM150L-5 | 2RM150M-5 | 150 \pm 20% | 700 | 10 | 10 | 500 | 100 | 1.0 | 1.5 | 2RM150-5 |
| 2RM230L-5 | 2RM230M-5 | 230 \pm 20% | 700 | 10 | 10 | 500 | 100 | 1.0 | 1.5 | 2RM230-5 |

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 μs surge current that can be applied between two electrodes, 5 positive and 5 negative surges, with 3 minutes interval time.  | |
| 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 | |

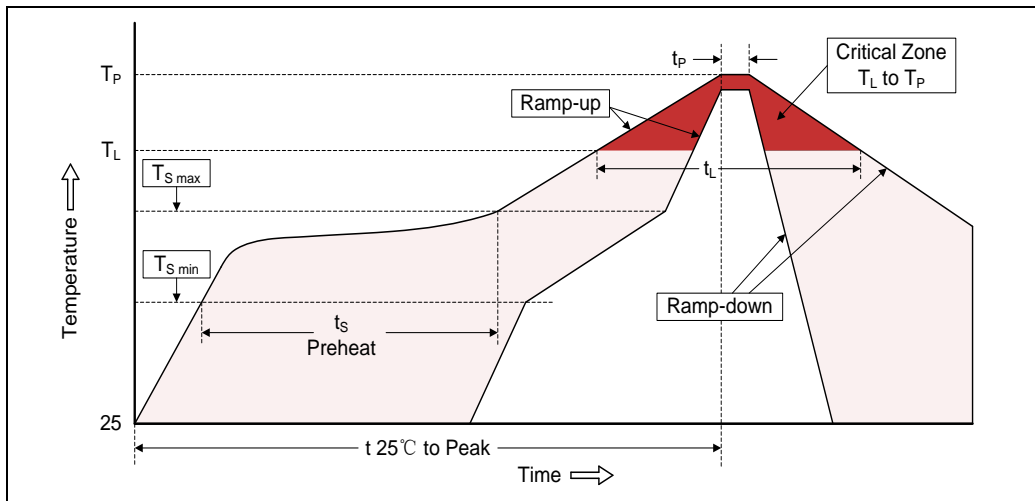
Recommended Soldering Conditions

Wave Soldering



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

Reflow Soldering

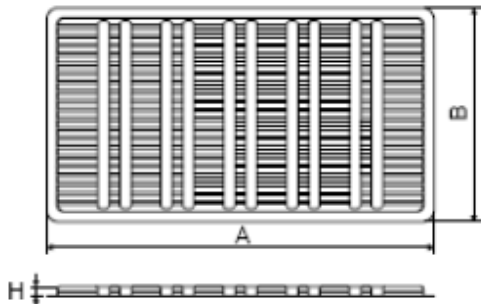


| Profile Feature | Pb-Free Assembly |
|---|----------------------------------|
| Average ramp-up rate (T_L to T_P) | 3°C/second max. |
| Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_s) | 150°C 200°C 60-180 seconds |
| $T_{S\ max}$ to T_L -Ramp-up Rate | 3°C/second max. |
| Time maintained above: -Temperature (T_L) -Time (t_L) | 217°C 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 (Box)

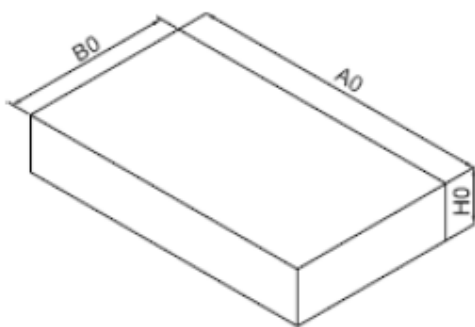
Skin packing



| Symbol | Dimension (mm) | |
|--------|----------------|-----------|
| | Spec. | Tolerance |
| A | 265.0 | ±5.0 |
| B | 146.0 | ±5.0 |
| H | 6.8 | ±0.5 |

Quantity: 100pcs

Inner box

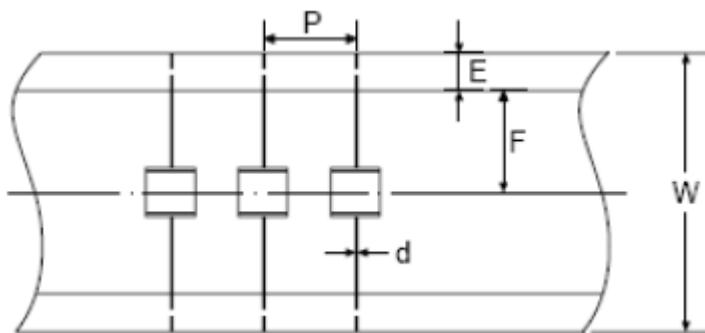


| | | |
|----|-------|------|
| A0 | 270.0 | ±2.0 |
| B0 | 150.0 | ±2.0 |
| H0 | 50.0 | ±2.0 |

Quantity: 500pcs

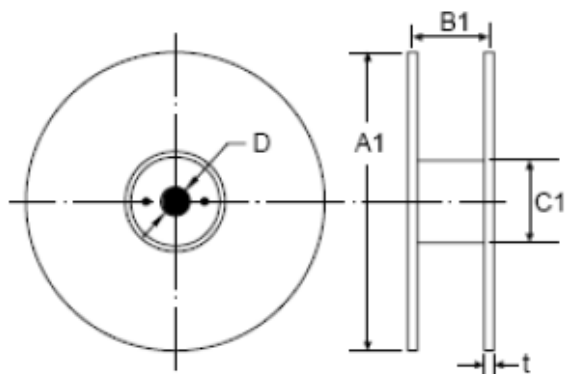
Axial Packing (Tape & Reel)

Tape



| Symbol | Dimension (mm) | |
|--------|----------------|-----------|
| | 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



| | | |
|----|-------|------|
| 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: 1000pcs