

Gas Discharge Tube (GDT) Data Sheet

Features

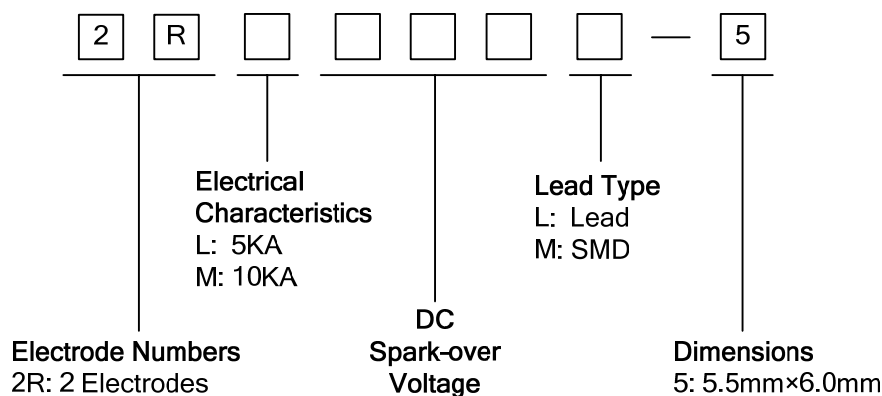
- Provide ultra-fast response to surge voltage from slow-rising surge of 100V/s to rapid-rising surge of 1KV/ μ s.
- Stable breakdown voltage.
- High insulation resistance.
- Low capacitance (≤ 1.5 pF)
- High holdover voltage
- Large absorbing transient current capability.
- Micro-Gap Design
- Size: 5.5mm*6.0mm
- Storage and operational temperature: -40°C ~ +85°C
- Meets MSL level 1, per J-STD-020
- Safety certification: UL: E244458



Applications

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

Part Number Code



Marking

B : BrightKing Logo
 2RL090-5 : Device Marking Code
 YXXX : Date 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 |

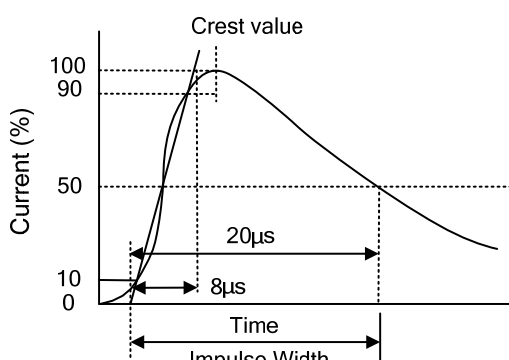
Electrical Characteristics

| 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 |
| 2RM070L-5 | 2RM070M-5 | 70±20% | 600 | 10 | 5.0 | 500 | 25 | 1.0 | 1.5 | 2RM070-5 |
| 2RM075L-5 | 2RM075M-5 | 75±20% | 600 | 10 | 5.0 | 500 | 25 | 1.0 | 1.5 | 2RM075-5 |
| 2RM090L-5 | 2RM090M-5 | 90±20% | 600 | 10 | 10 | 500 | 50 | 1.0 | 1.5 | 2RM090-5 |
| 2RM120L-5 | 2RM120M-5 | 120±20% | 600 | 10 | 10 | 500 | 50 | 1.0 | 1.5 | 2RM120-5 |
| 2RM145L-5 | 2RM145M-5 | 145±20% | 700 | 10 | 10 | 500 | 100 | 1.0 | 1.5 | 2RM145-5 |

Electrical Characteristics

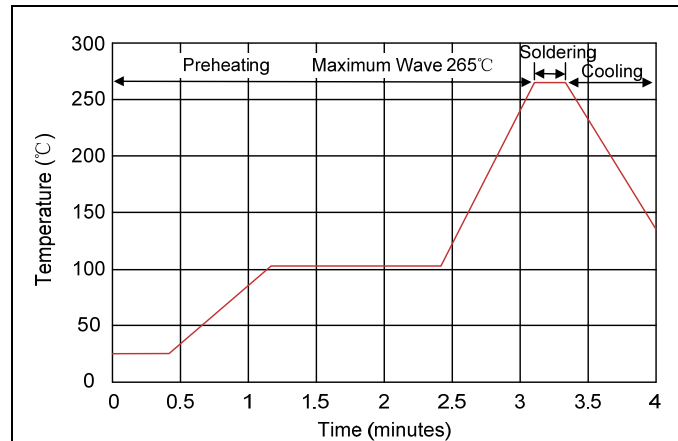
| Part Number | | DC Spark-over Voltage | Maximum Impulse Spark-over Voltage | Nominal Impulse Discharge Current | Alternating Discharge Current | Impulse Life | Minimum Insulation Resistance | | Maximum Capacitance | Device Marking Code |
|-------------|-----------|-----------------------|------------------------------------|-----------------------------------|-------------------------------|-------------------------|-------------------------------|---------------|---------------------|---------------------|
| | | 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) | |
| 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 |
| 2RM250L-5 | 2RM250M-5 | 250 \pm 20% | 700 | 10 | 10 | 500 | 100 | 1.0 | 1.5 | 2RM250-5 |
| 2RM300L-5 | 2RM300M-5 | 300 \pm 20% | 900 | 10 | 10 | 500 | 100 | 1.0 | 1.5 | 2RM300-5 |
| 2RM350L-5 | 2RM350M-5 | 350 \pm 20% | 900 | 10 | 10 | 500 | 100 | 1.0 | 1.5 | 2RM350-5 |
| 2RM400L-5 | 2RM400M-5 | 400 \pm 20% | 1000 | 10 | 10 | 500 | 100 | 1.0 | 1.5 | 2RM400-5 |
| 2RM470L-5 | 2RM470M-5 | 470 \pm 20% | 1200 | 10 | 10 | 500 | 250 | 1.0 | 1.5 | 2RM470-5 |
| 2RM600L-5 | 2RM600M-5 | 600 \pm 20% | 1300 | 10 | 10 | 500 | 250 | 1.0 | 1.5 | 2RM600-5 |
| 2RM800L-5 | 2RM800M-5 | 800 \pm 20% | 1500 | 10 | 10 | 500 | 250 | 1.0 | 1.5 | 2RM800-5 |

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 | <p>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.</p>  | |
| 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 | |

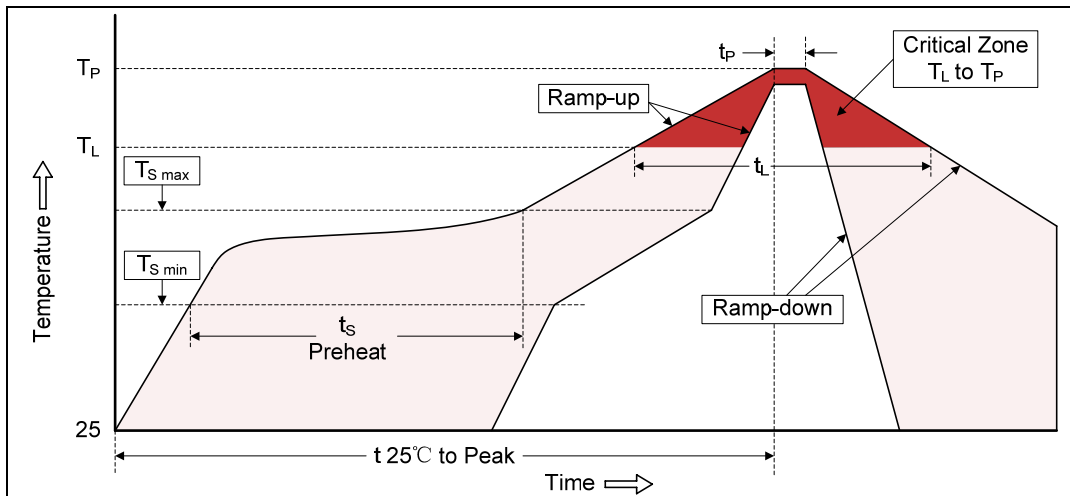
Recommended Soldering Conditions

Wave Soldering



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

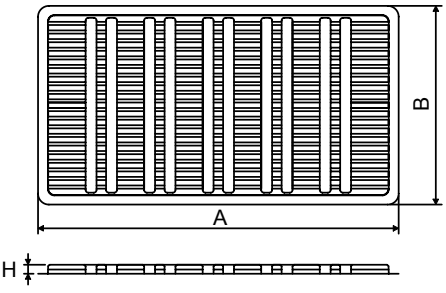
Reflow Soldering



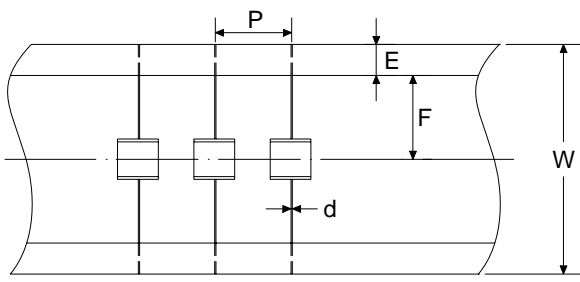
| Profile Feature | Pb-Free Assembly |
|---|------------------|
| Average ramp-up rate (TL to TP) | 3°C/second max. |
| Preheat | |
| -Temperature Min (TS min) | 150°C |
| -Temperature Max (TS max) | 200°C |
| -Time (min to max) (ts) | 60-180 seconds |
| TS max to TL | |
| -Ramp-up Rate | 3°C/second max. |
| Time maintained above: | |
| -Temperature (TL) | 217°C |
| -Time (tL) | 60-150 seconds |
| Peak Temperature (TP) | 260°C |
| Time within 5°C of actual Peak Temperature (tp) | 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 | Symbol | Dimension (mm) | |
|---|------------------|----------------|-----------|
| | | Spec. | Tolerance |
|  | A | 264.0 | ±1.0 |
| | B | 145.0 | ±1.0 |
| | H | 6.5 | ±0.5 |
| | Quantity: 100pcs | | |
| Inner box | Symbol | Dimension (mm) | |
| | | Spec. | Tolerance |
| | | A0 | 270.0 |
| | B0 | 150.0 | ±1.0 |
| H0 | 50.0 | ±1.0 | |
| Quantity: 500pcs | | | |

Axial Packing (Tape & Reel)

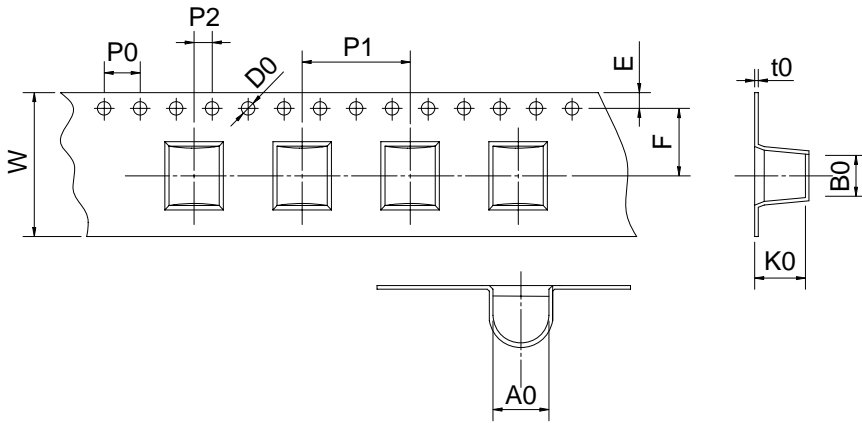
| Tape | Symbol | Dimension (mm) | | |
|---|-------------------|----------------|-----------|------|
| | | Spec. | Tolerance | |
|  | P | 10.0 | ±0.1 | |
| | W | 65.0 | ±0.3 | |
| | E | 6.0 | ±0.5 | |
| | F | 26.5 | ±0.1 | |
| | d | 0.8 | ±0.05 | |
| | Quantity: 1000pcs | | | |
| Reel | Symbol | Dimension (mm) | | |
| | | Spec. | Tolerance | |
| | | A1 | 330.0 | ±1.0 |
| | | B1 | 70.0 | ±1.0 |
| | | C1 | 82.0 | ±1.0 |
| | D | 25.0 | ±0.2 | |
| t | 3.0 | ±0.2 | | |
| Quantity: 1000pcs | | | | |

Packaging

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 | 5.85 | ±0.10 |
| K0 | 6.20 | ±0.10 |
| B0 | 7.00 | ±0.10 |
| t0 | 0.50 | ±0.10 |
| D | 330.00 | ±1.00 |
| d | 13.00 | ±0.50 |
| L | 20.00 | ±0.50 |
| t | 2.00 | ±0.20 |
| Quantity: 800pcs | | |

Tape



Reel

