

# DATA SHEET

## GAS DISCHARGE TUBES TELEPHONE INTERFACE

2R-5 series

RoHS compliant & Halogen free



Product specification— April 25, 2019 V.0



## Gas Discharge Tube (GDT) Data Sheet

### Features

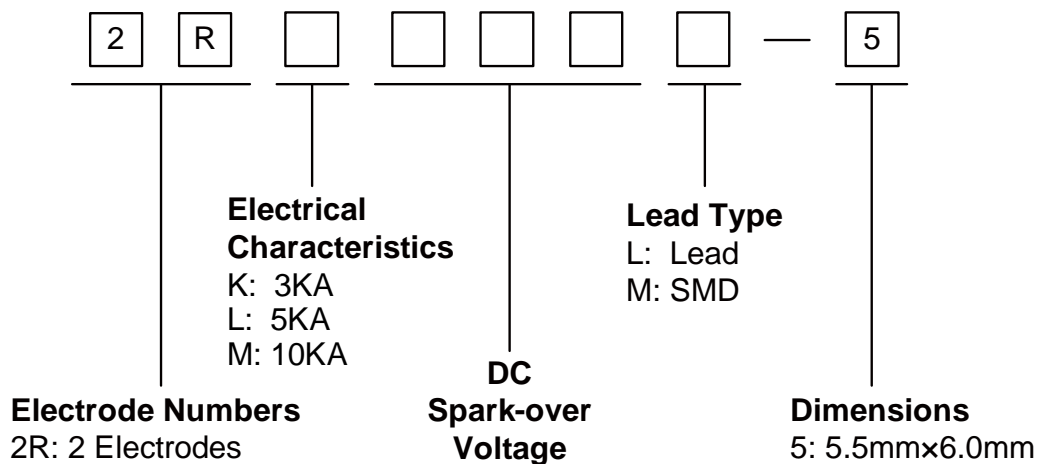
- Provide ultra-fast response to surge voltage from slow-rising surge of 100V/s to rapid-rising surge of 1KV/μs.
- Stable breakdown voltage.
- High insulation resistance.
- Low capacitance (≤1.5pF)
- High holdover voltage
- Large absorbing transient current capability.
- Micro-Gap Design
- Size: 5.5mm\*6.0mm
- Storage and operating temperature: -40°C ~ +85°C
- Meets MSL level 1, per J-STD-020
- Safety certification: E244458 & E327997



### 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, and 2RKxxxxL-5 series

Box package: Add suffix “/B” at the end of the part number, such as 2RL070L-5/B, 2RM070L-5/B, or 2RK3600L-5/B

Reel package: Add suffix “/TR” at the end of the part number, such as 2RL070L-5/TR, 2RM070L-5/TR, or 2RK3600L-5/TR

**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
	B	0.5	±0.1

Recommended Pad Size

**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	
						Test Voltage	(GΩ)			
						(V)	(V)	(KA)		(A)
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
2RM150L-5	2RM150M-5	150±20%	700	10	10	500	100	1.0	1.5	2RM150-5
2RM230L-5	2RM230M-5	230±20%	700	10	10	500	100	1.0	1.5	2RM230-5

**GAS DISCHARGE TUBS**

2R-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
							Test Voltage	(GΩ)		
(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	AC Withstanding Voltage	Device Marking Code
							Test Voltage	(GΩ)			
(V)	(V)	(KA)	(A)	(times)	DC(V)	(pF)					
2RK3000L-5	3000±20%	5500	3.0	-	300	1000	1.0	1.5	AC1500, 1s	2RK3000-5	
2RK3000M-5	3000±20%	5500	3.0	-	300	1000	1.0	1.5	AC1500, 1s	2RK3000-5	
2RK3600L-5	3600±20%	5000	3.0	-	300	1000	1.0	1.5	AC1800, 1s	2RK3600-5	
2RK3600M-5	3600±20%	5000	3.0	-	300	1000	1.0	1.5	AC1800, 1s	2RK3600-5	

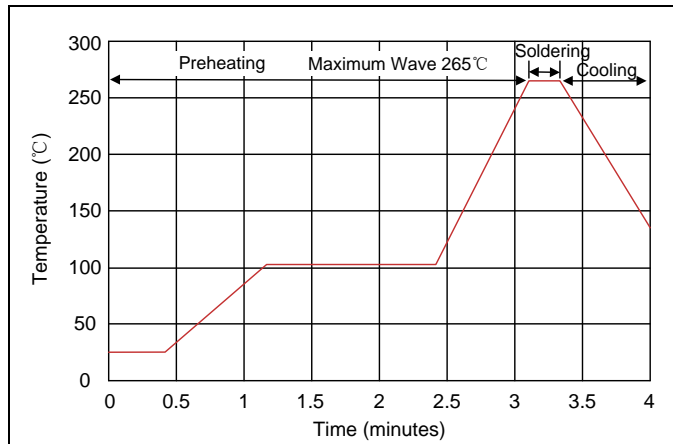
Notes: The surface for 2RXXXXM-5 series products is default for nickel plating, please change to use tin plating if used on PCB boards while soldering, and adding the code "Sn" as suffix of the part number to distinguish. Such as "2RL090M-5 Sn".

**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 <math>8/20\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 is labeled 'Current (%)' with values 0, 10, 50, 90, and 100. The x-axis is labeled 'Time' with markers for 8µs and 20µs. A 'Crest value' is indicated at the peak of the curve, which reaches 100%. A horizontal dashed line at 50% current intersects the curve at the 20µs mark. Another horizontal dashed line at 10% current intersects the curve at the 8µs mark. The 'Impulse Width' is shown as the time interval from the start of the surge to the point where the current has decayed to 10%.</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	

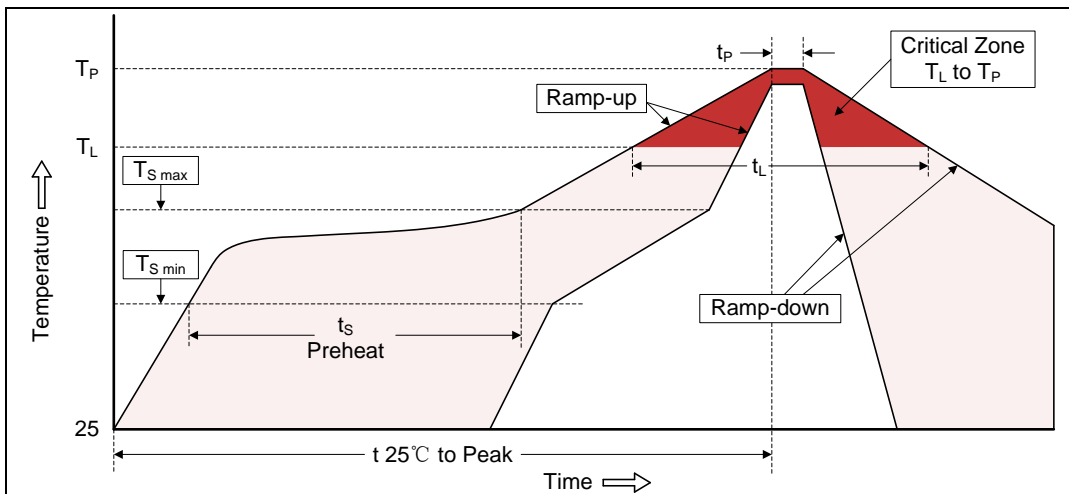
## Recommended Soldering Conditions

### Wave Soldering



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

### Reflow Soldering

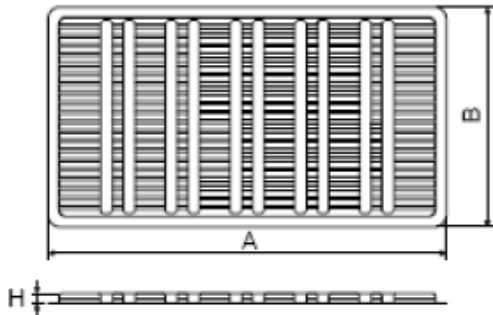


Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat	
-Temperature Min ( $T_{S\ min}$ )	150°C
-Temperature Max ( $T_{S\ max}$ )	200°C
-Time (min to max) ( $t_s$ )	60-180 seconds
$T_{S\ max}$ to $T_L$	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature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

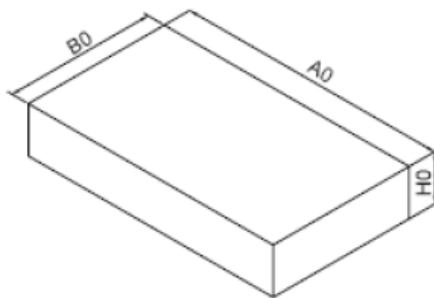
Skin packing



Symbol	Dimension (mm)	
	Spec.	Tolerance
A	264.0	±1.0
B	145.0	±1.0
H	6.5	±0.5

Quantity: 100pcs

Inner box

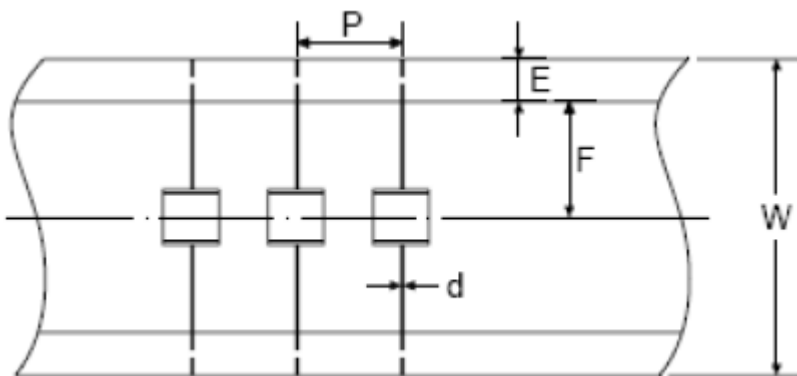


A0	270.0	±2.0
B0	150.0	±1.0
H0	50.0	±1.0

Quantity: 500pcs

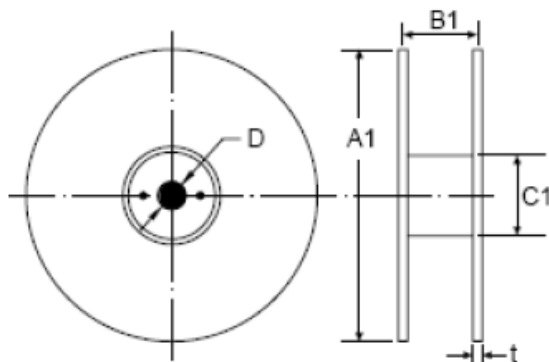
Axial Packing (Tape & Reel)

Tape



Symbol	Dimension (mm)	
	Spec.	Tolerance
P	10.0	±0.1
W	65.0	±0.3
E	6.0	±0.5
F	26.5	±0.1
d	0.8	±0.05

Reel



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		

