

DATA SHEET

GAS DISCHARGE TUBES
TELEPHONE INTERFACE

2R-5 series

RoHS compliant & free



Product specification— July 12, 2023 V.1



Gas Discharge Tube (GDT) Data Sheet

Features

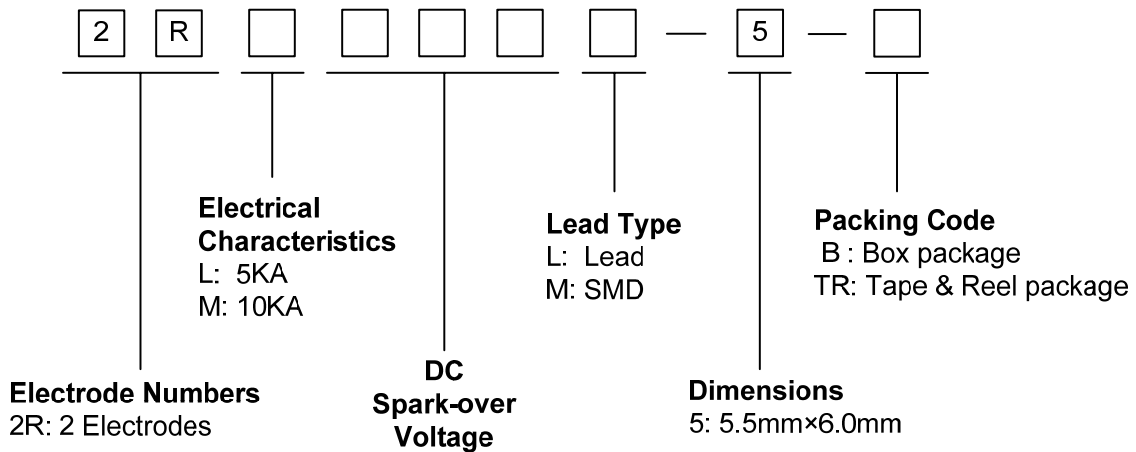
- Provide ultra-fast response to surge voltage from slow-rising surge of 100V/s to rapid-rising surge of 1KV/μs
- Stable breakdown voltage
- High insulation resistance
- Low capacitance (≤1.5pF)
- High holdover voltage
- Large absorbing transient current capability
- Micro-Gap Design
- Size: 5.5mm*6.0mm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

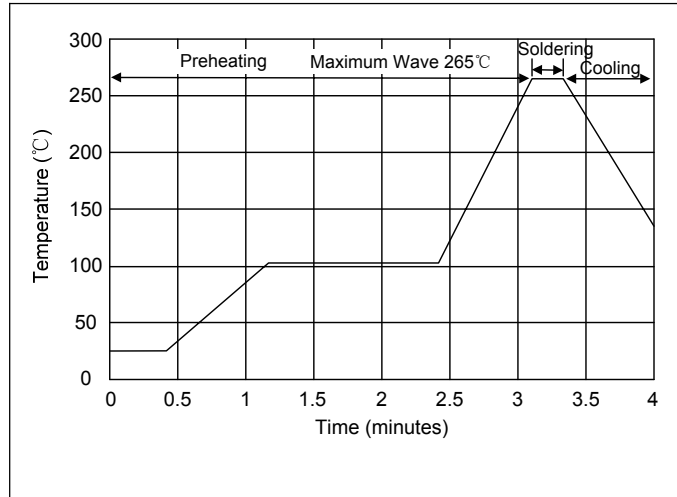
Part Number		DC Spark-over Voltage	Maximum Impulse Spark-over Voltage	Nominal Impulse Discharge Current	Alternating Discharge Current	Impulse Life	Minimum Insulation Resistance		Maximum Capacitance	Device Marking Code						
							100V/s	1000V/μs			8/20μs 10times	50Hz, 1sec	10/1000μs 100A	Test Voltage	(GΩ)	1MHz
							(V)	(V)			(KA)	(A)	(times)	DC(V)		(pF)
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						

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 8/20μs 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	

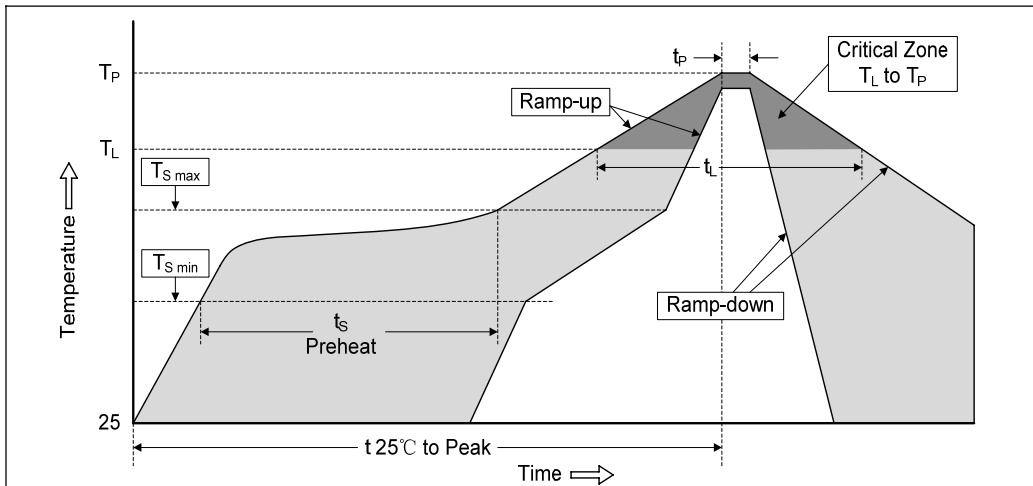
Recommended Soldering Conditions

Wave Soldering



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

Reflow Soldering

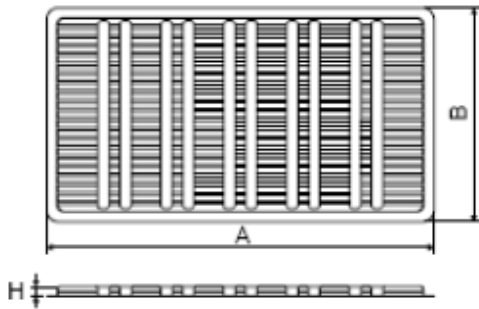


Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_s)	150°C 200°C 60-180 seconds
$T_{S\ max}$ to T_L -Ramp-up Rate	3°C/second max.
Time maintained above: -Temperature (T_L) -Time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

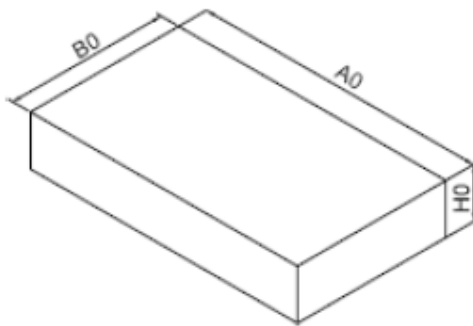
Skin packing



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

Quantity: 100pcs

Inner box

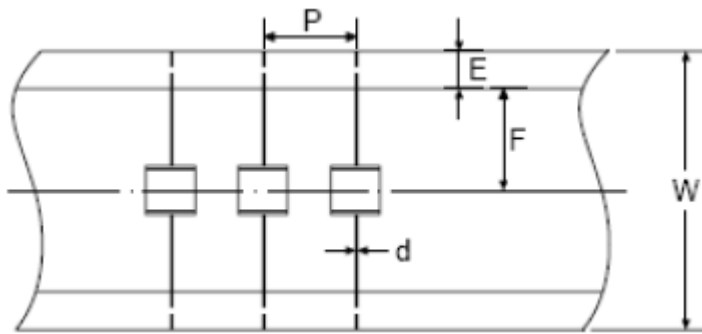


A0	270.0	±2.0
B0	150.0	±2.0
H0	50.0	±2.0

Quantity: 500pcs

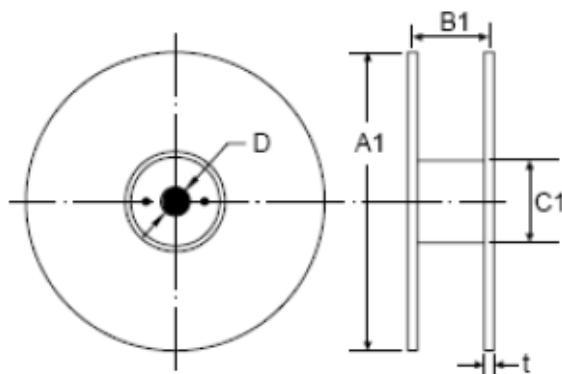
Axial Packing (Tape & Reel)

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

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	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	
	Reel	D	330.00	±2.00
		d	13.00	±0.50
		L	20.00	±2.00
t		2.00	±0.20	
		Quantity: 800pcs		

LEGAL DISCLAIMER

YAGEO, its distributors and agents (collectively, "YAGEO"), hereby disclaims any and all liabilities for any errors, inaccuracies or incompleteness contained in any product related information, including but not limited to product specifications, datasheets, pictures and/or graphics. YAGEO may make changes, modifications and/or improvements to product related information at any time and without notice.

YAGEO makes no representation, warranty, and/or guarantee about the fitness of its products for any particular purpose or the continuing production of any of its products. To the maximum extent permitted by law, YAGEO disclaims (i) any and all liability arising out of the application or use of any YAGEO product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for a particular purpose, non-infringement and merchantability.

YAGEO products are designed for general purpose applications under normal operation and usage conditions. Please contact YAGEO for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property: Aerospace equipment (artificial satellite, rocket, etc.), Atomic energy-related equipment, Aviation equipment, Disaster prevention equipment, crime prevention equipment, Electric heating apparatus, burning equipment, Highly public information network equipment, data-processing equipment, Medical devices, Military equipment, Power generation control equipment, Safety equipment, Traffic signal equipment, Transportation equipment and Undersea equipment, or for any other application or use in which the failure of YAGEO products could result in personal injury or death, or serious property damage. Particularly **YAGEO Corporation and its affiliates do not recommend the use of commercial or automotive grade products for high reliability applications or manned space flight.**

Information provided here is intended to indicate product specifications only. YAGEO reserves all the rights for revising this content without further notification, as long as products are unchanged. Any product change will be announced by PCN.