



# Datasheet

## Gas Discharge Tube (GDT)

Series / Models	2RD-8 Series
Product Code	10.12.86.XXXX 10.12.87.XXXX
Version	A5
Date	2025-02-19
File Number	SP-GDT-017

Gas Discharge Tube (GDT)

2RD-8 Series

Version History

Version	Date	Page	Description	Author
A0	2017-03-31	/	Initial draft	XianTao Jiang
A1	2020-03-16	Page 4	Update electrical characteristics	XianTao Jiang
A2	2022-06-01	Page 10	Update terms and definitions	George Hu
A3	2023-03-31	Page 4	Add moisture sensitivity level	George Hu
A4	2024-07-16	Page 5	1. Update certifications table	Xia Wu
A5	2025-02-19	Page 1,2,3,4	1. Add cover and version history 2. Update description 3. Delete some models	Xia Wu

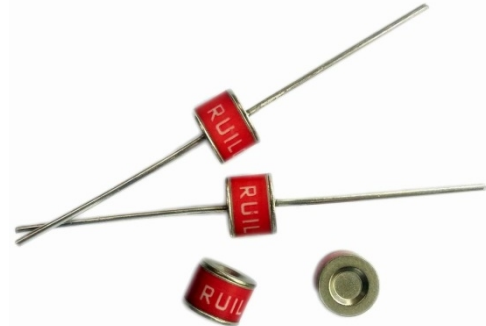
## Gas Discharge Tube (GDT)

## 2RD-8 Series

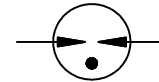
### Description

Gas discharge tubes (GDTs) are generally in a high insulation resistance state, equivalent to an open circuit, which has almost no impact on the normal operation of the circuit. When transient overvoltage occurs in the circuit and the voltage amplitude exceeds the breakdown voltage of the GDT, the gas inside the GDT is ionized, causing the GDT to quickly conduct and limit the overvoltage to a lower level, thereby protecting electronic devices or circuit components connected in parallel from high voltage impact damage. After the overvoltage disappears, the GDT immediately returns to a high insulation resistance state, and the circuit resumes normal operation.

The 2RD-8 series GDT is a device that offers axial leads or surface mount packaging. It is not only small in size and easy to install on various compact printed circuit boards (PCBs), but also has excellent performance. When used in high-frequency communication circuits, the low capacitance characteristic minimizes its impact on the signal. High insulation resistance ensures that the performance of the circuit will not suffer additional losses under normal operating conditions. The 2RD-8 series GDT can not only be used to protect communication interfaces, but its ability to withstand high surge currents (8/20uS, 20KA) also makes it suitable for power protection.



### Electrical symbol



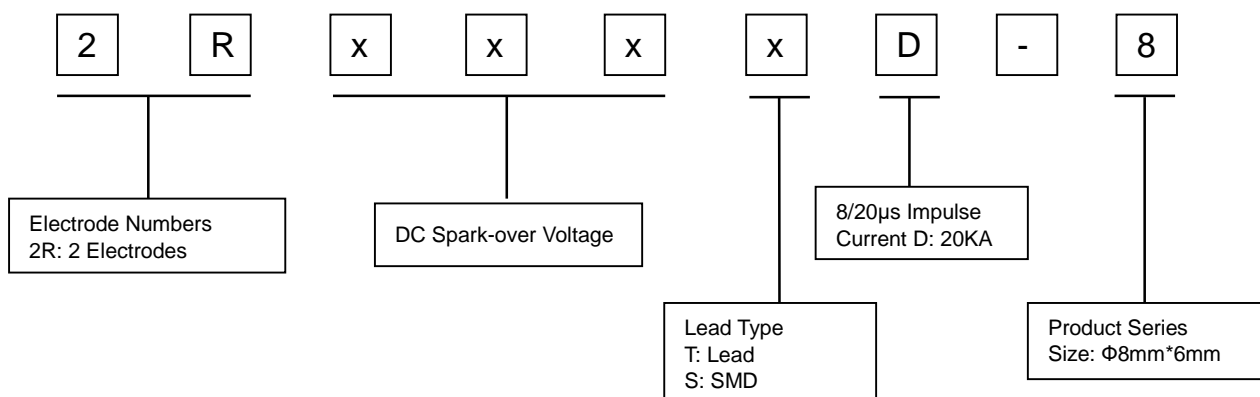
### Features

- I Excellent response to fast rising transients
- I Stable breakdown voltage
- I GHz working frequency
- I 8/20μs Impulse current capability: 20KA
- I Non-Radioactive
- I Ultra Low capacitance (<1.5pF)
- I Size: Φ8mm\*6mm

### Applications

- I MDF modules
- I xDSL equipment
- I RF systems
- I Antenna
- I Base stations
- I Repeaters, Modems
- I Telephone Interface, Line cards
- I Data communication equipment
- I Line test equipment
- I Power supplies
- I Surge protectors, Alarm systems

### Part Number Code



# Gas Discharge Tube (GDT)

# 2RD-8 Series

## Electrical Characteristics

Part Number		DC Spark-over Voltage <sup>1) 2)</sup> @100V/S	Impulse Spark-over Voltage		Insulation Resistance <sup>3)</sup>	Capacitance @1MHz	Glow Voltage @10mA	Arc Voltage @1A	Life Ratings			
			100V/μS	1KV/μS					Impulse Discharge Current @8/20μS		Alternating Discharge Current @50Hz 1S	Impulse Life @10/1000μS
			Max	Max					Nominal ±5 times	Max 1 time	Nominal 10 times	300 times
DIP	SMD	V	V	V	GΩ	pF	V	V	KA	KA	A	A
2R075TD-8	2R075SD-8	75±20%	500	600	1	1.5	60	10	20	25	20	100
2R090TD-8	2R090SD-8	90±20%	500	600	1	1.5	60	10	20	25	20	100
2R150TD-8	2R150SD-8	150±20%	500	600	1	1.5	60	10	20	25	20	100
2R230TD-8	2R230SD-8	230±20%	600	700	1	1.5	60	10	20	25	20	100
2R350TD-8	2R350SD-8	350±20%	800	900	1	1.5	60	10	20	25	20	100
2R470TD-8	2R470SD-8	470±20%	900	1100	1	1.5	60	10	20	25	20	100
2R600TD-8	2R600SD-8	600±20%	1000	1200	1	1.5	60	10	20	25	20	100
2R800TD-8	2R800SD-8	800±20%	1400	1600	1	1.5	60	10	20	25	20	100
Glow to Arc transition Current.....					~0.5A							
Weight.....					DIP ~1.7g SMD ~1.25g							
Operation and storage temperature.....					-40~+125°C							
Climatic category (IEC 60068-1).....					40/125/21							
Marking, red negative.....					<b>RUILON XXX Y</b> XXX -Nominal voltage Y -Year of production							
Surface treatment.....					DIP -Nickel Plated SMD -Matte-tin plated							
Moisture sensitivity level <sup>4)</sup> .....					1							

<sup>1)</sup> At delivery AQL 0.65 level II, DIN ISO 2859.

<sup>2)</sup> In ionized mode.

<sup>3)</sup> Insulation Resistance Measuring Voltage: 75V~150V at DC 50V, other at DC 100V



<sup>4)</sup> Tests according to JEDEC J-STD-020.

Terms in accordance with ITU-T Rec. K.12, IEC 61643-311, GB/T18802.311, GB/T 9043.

# Gas Discharge Tube (GDT)

## 2RD-8 Series

### Certifications table

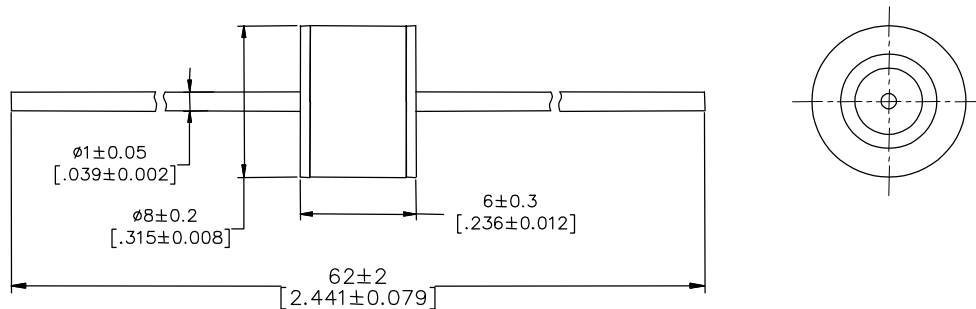
Part Number			
DIP	SMD	UL497B E465335	EN 61643-311 IEC 61643-311 J50637276
2R075TD-8	2R075SD-8	--	--
2R090TD-8	2R090SD-8	◎	--
2R150TD-8	2R150SD-8	◎	--
2R230TD-8	2R230SD-8	◎	--
2R350TD-8	2R350SD-8	◎	--
2R470TD-8	2R470SD-8	◎	--
--	2R600SD-8	◎	--
2R600TD-8	--	◎	◎
2R800TD-8	2R800SD-8	◎	--

Notes:

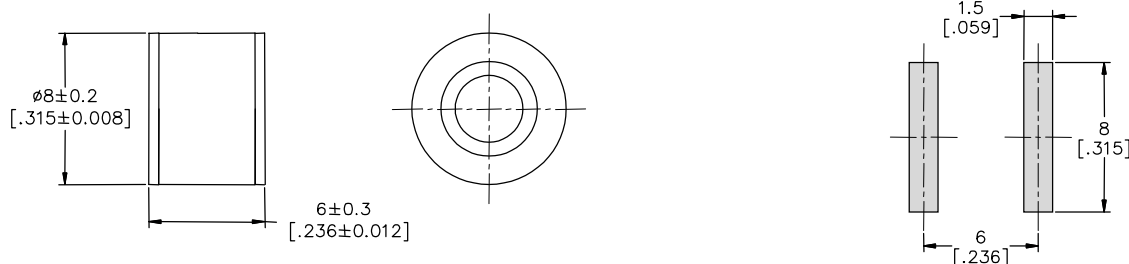
- ◎ indicates that the product has passed the certification.
- indicates that the product is not certified.

### Dimensions (Unit: mm/inch)

#### DIP axial leads series (2RxxxTD-8)



#### SMD Series (2RxxxSD-8)



#### Recommended Soldering Pad Layout

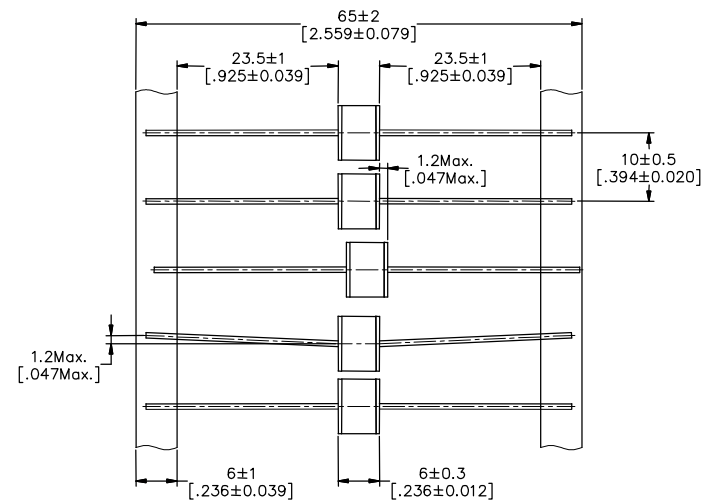
# Gas Discharge Tube (GDT)

# 2RD-8 Series

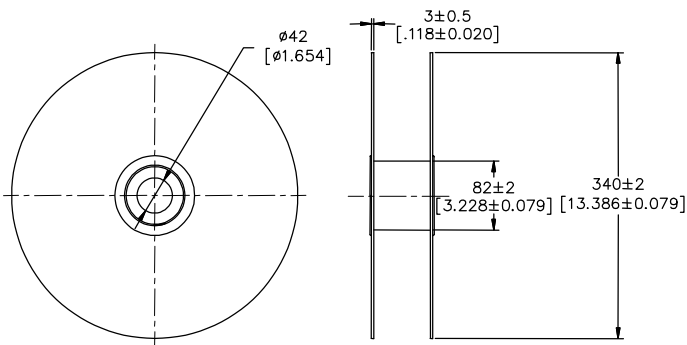
## Packaging Information (Unit: mm/inch)

### DIP axial leads series packaging (Default packaging)

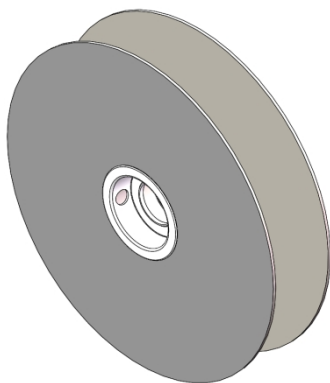
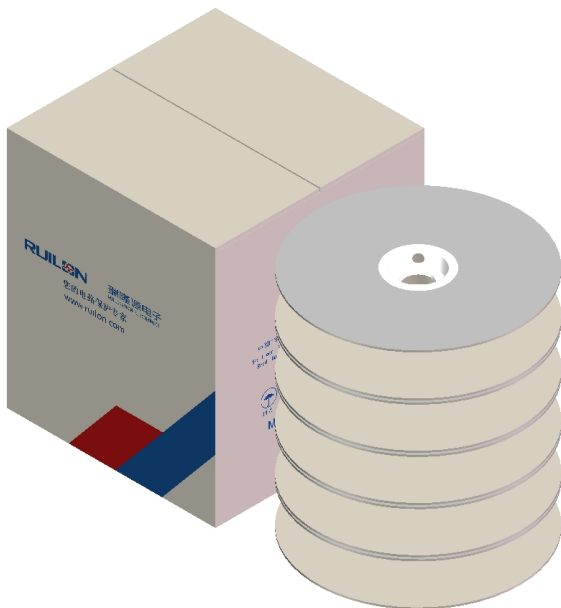
Tape



Reel



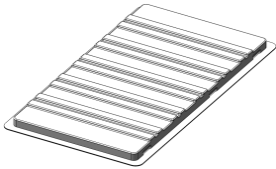
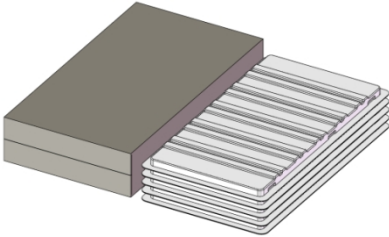
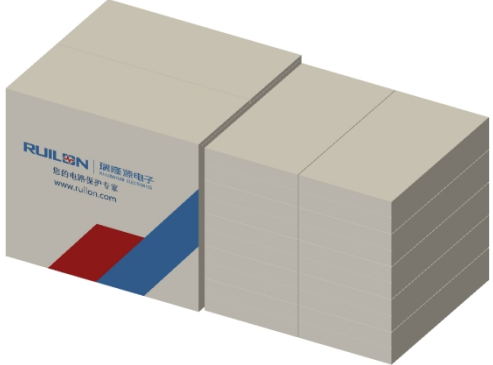
According to IEC 60286-1

	Reel	Carton
Size	340×78mm	350×350×407mm
Quantity	MPQ/MOQ: 1 reel=800pcs	1 Carton=5 reels =4,000pcs
Photos		

# Gas Discharge Tube (GDT)

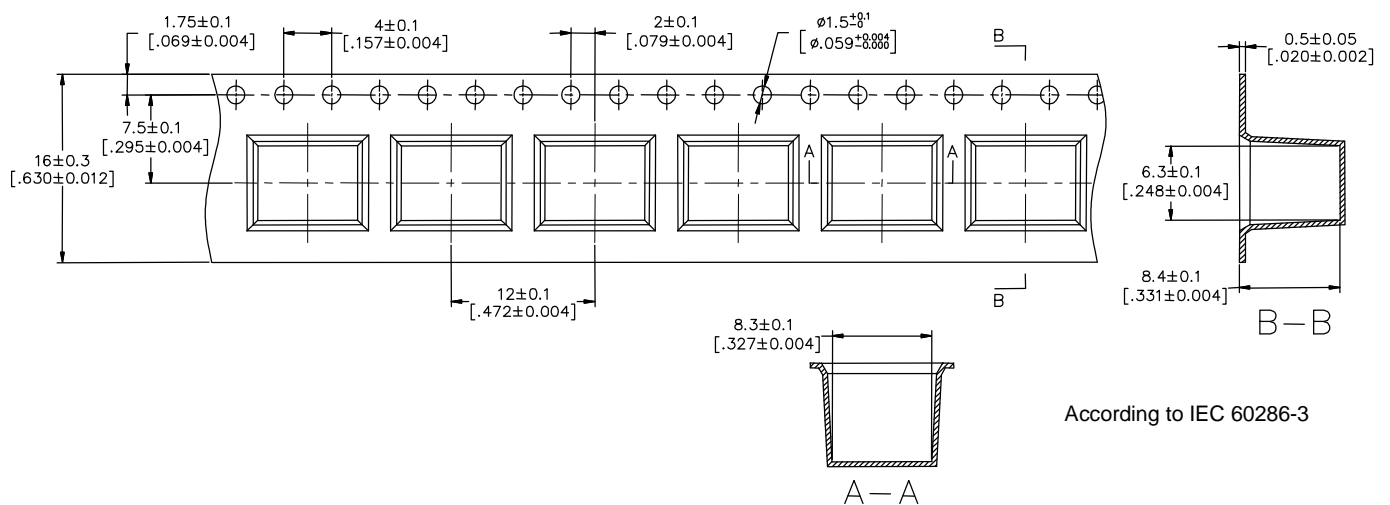
## 2RD-8 Series

### DIP axial leads series packaging (Bulk)

	PVC tray	Inner Box	Carton
Size	265×148×10mm	275×150×50mm	315×290×272mm
Quantity	MPQ: 1 tray=100pcs	MOQ: 1 Inner Box=5 trays=500pcs	1 Carton=10 Inner boxes=5,000pcs
Photos			

### SMD Packaging (Tape & Reel)

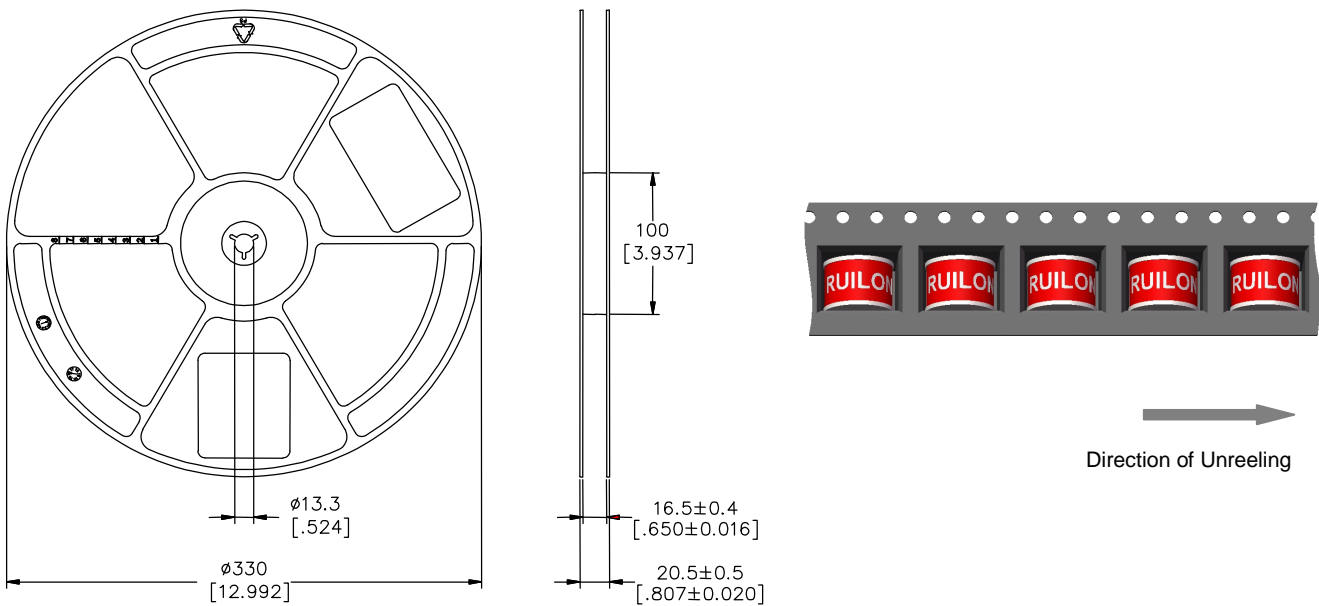
#### Tape

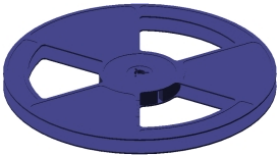

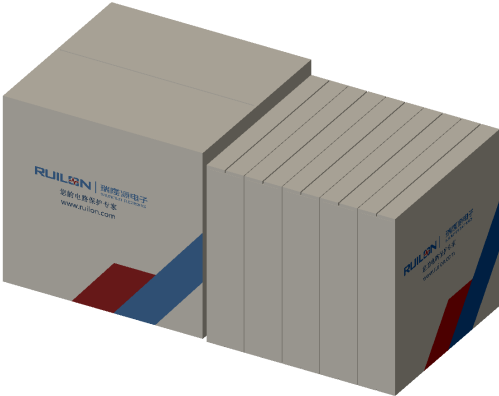


Gas Discharge Tube (GDT)

2RD-8 Series

Reel



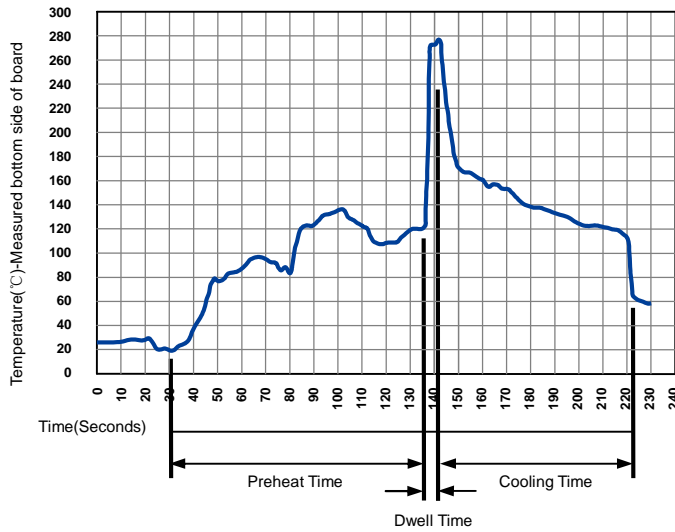
	Reel	Inner Box	Carton
Size	330×20.5mm	340×333×70mm	375×353×380mm
Quantity	MPQ/MOQ: 1 reel=500pcs	1 Inner Box=3 reels=1,500pcs	1 Carton=5 Inner boxes=7,500pcs
Photos			



## Gas Discharge Tube (GDT)

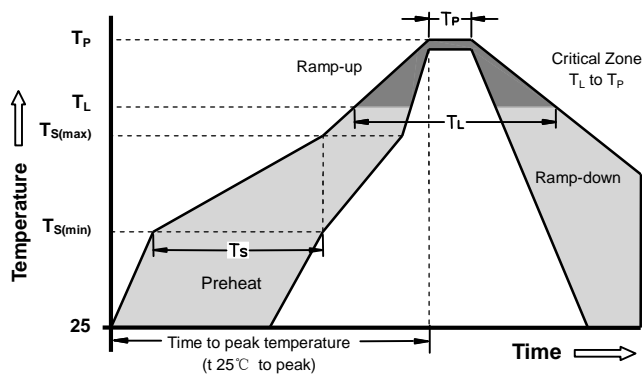
## 2RD-8 Series

### Soldering Parameters - Wave soldering (Thru-Hole Devices)



Wave Soldering Condition		Pb-Free assembly
Preheat	Temperature Min	100°C
	Temperature Max	150°C
	Time (Min to Max)	60-180 Seconds
Solder Pot Temperature		280°C Max
Solder Dwell Time		2-5 Seconds

### Soldering Parameters - Reflow Soldering (Surface Mount Devices)



Reflow Condition		Pb - Free assembly
Preheat	-Temperature Min ( $T_{s(min)}$ )	150°C
	-Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 -180 Seconds
Average ramp up rate ( Liquids Temp $T_L$ to peak		3°C/second max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		5°C/second max
Reflow	- Temperature ( $T_L$ ) (Liquids)	217°C
	- Time (min to max) ( $t_s$ )	60 -150 Seconds
Peak Temperature ( $T_P$ )		260 +0/-5°C
Time within 5°C of actual peak Temperature ( $t_p$ )		10 - 30 Seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature ( $T_P$ )		8 minutes Max
Do not exceed		260°C

Surface mounted components (SMD) may exhibit a temporary increase in the DC spark-over voltage after the solder reflow process. The components will recover within 24 hours. There is no quality defect nor change in protection levels during the temporary change in DC spark-over voltage.

# Gas Discharge Tube (GDT)

## 2RD-8 Series

### Terms and definitions

NO.	Item	Definitions
1	<b>Gas discharge tube(GDT)</b>	A gap, or several gaps, in an enclosed discharge medium, other than air at atmospheric pressure, designed to protect apparatus or personnel, or both, from high transient voltages. Also referred to as "gas tube surge arrester".
2	<b>DC Spark-over Voltage</b>	The voltage at which the gas discharge tube sparks over with slowly increasing d.c. voltage.
3	<b>Impulse Spark-over Voltage</b>	The highest voltage which appears across the terminals of a gas discharge tube in the period between the application of an impulse of given wave-shape and the time when current begins to flow.
5	<b>Arc voltage</b>	Voltage drop across the GDT during arc current flow.
6	<b>Glow voltage</b>	Peak value of voltage drop across the GDT when a glow current is flowing.
7	<b>Impulse discharge current 8/20μs</b>	Current impulse with a nominal virtual front time of 8 μs and a nominal time to half-value of 20 μs.
8	<b>Alternating Discharge Current</b>	The rms value of an approximately sinusoidal alternating current passing through the gas discharge tube.
9	<b>Insulation Resistance</b>	Insulation resistance shall be measured from each terminal to every other terminal of the GDT. The test is performed with DC50V when normal spark-over Voltage 70~150V, others with DC100V.
10	<b>Capacitance</b>	The capacitance shall be measured once at 1 MHz between all terminals unless otherwise specified.

## Cautions

- I Do not operate gas discharge tubes in power supply networks, whose maximum operating voltage exceeds the minimum spark-over voltage of the gas discharge tubes.
- I Gas discharge tubes may become hot in the event of longer periods of current stress (burn risk). In the event of overload the connectors may fail or the component may be destroyed.
- I Gas discharge tubes must be handled with care and must not be dropped.
- I Do not continue to use damaged gas discharge tubes.
- I The shown SMD pad dimensions represent a safe way to mount the arrester and are a recommendation of the manufacturer. During the reflow process it must be assured that no solder material reduces the insulation distance between the pads below the arrester.
- I SMD gas discharge tubes should be soldered within 24 month after shipment.
- I The electrical characteristics described in this datasheet are only typical characteristics, and all of these characteristics have been confirmed through testing and inspection. If the customer's usage requirements are different from this or have special requirements, please contact Ruilongyuan Electronics Co., Ltd. If protection failure or circuit damage occurs as a result, our company is not responsible for it.
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