Datasheet

Gas Discharge Tube (GDT)

Series / Models	2R-8T(1000~6000V)
Product Code	10.10.79.XXXX 10.10.80.XXXX
Version	A6
Date	2025-08-27
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Version History

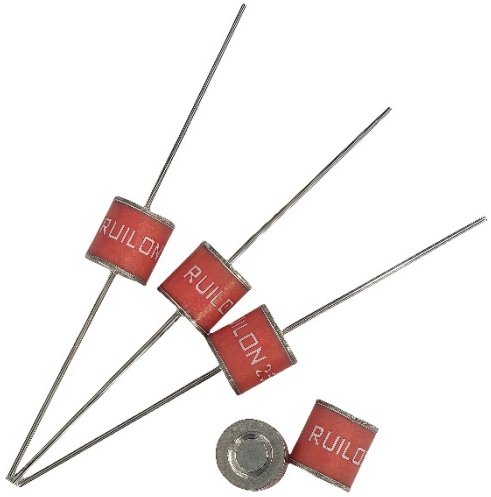
Version	Date	Page	Description	Author
A0	2020-12-01	/	Initial draft	George Hu
A1	2022-06-12	Page 3	Update and refine relevant technical specifications	George Hu
A2	2022-03-28	Page 4	Update Electrical Characteristics	George Hu
A3	2023-03-31	Page 5	Update Certifications table	George Hu
A4	2024-04-16	Page 4	UpdateElectrical Characteristics	Xia Wu
A5	2025-03-24	Page1,2, 4	1. Add cover and version history 2. Update Description 3. Delete some models	Xia Wu
A6	2025-08-27	Page 7,8	UpdateSMD Packaging	Xia Wu

Gas Discharge Tube(GDT) 2R-8T (1000~6000V)

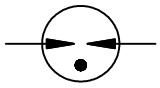
Description

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 2R-8T series GDT is a high-voltage component with two packaging options: axial lead and surface mount. It is easy to install on various printed circuit boards (PCBs) and has excellent performance. High AC withstand voltage and high insulation resistance ensure that the performance of the circuit will not suffer additional losses under normal operating conditions. The 2R-8T series GDT is a high-voltage (1000-6000V) component designed specifically for surge protection and high isolation applications. It is also suitable for applications that typically have bias voltages or signal levels of several hundred volts. It can also be combined with MOV to provide excellent protection performance for AC applications.



Electrical symbol



Features

- Voltage Ranges 1000V to 6000V
- Excellent response to fast rising transients
- 8/20μs Impulsecurrent capability: 5KA/10KA
- Non-Radioactive
- Ultra Low capacitance (<1pF)
- Size: Φ8mm*8mm

Applications

Automotive:

- On-board chargers
- Vehicle charging stations

Others:

- LED lighting
- Power supply
- Photovoltaic
- Air conditioning

Part Number Code

2	R	X	X	X	X	X	-	8	T

- 2R: Electrode Numbers — 2R: 2 Electrodes
- XXXX: DC Spark-over Voltage
- X: Lead Type — T: Lead; S: SMD
- 8T: Product Series — Size:Φ8mm*8mm

Gas Discharge Tube(GDT) 2R-8T (1000~6000V)

Electrical Characteristics

Part Number		DC Spark-over Voltage[1) 2)] @100V/S	Impulse Spark-over Voltage		Insulation Resistance[3)]	Capacitance @1MHz	Glow Voltage @10mA	Arc Voltage @1A	AC withstand voltage @5mA 1Min	Life Ratings		
			100V/μS	1KV/μS						Impulse Discharge Current @8/20μS		Alternating Discharge Current @50Hz 1S
			Max	Max	Min	Max	Typical	Typical		±5 times	1 time	10 times
		V	V	V	GΩ	pF	V	V	V	KA	KA	A
2R1000T-8T	2R1000S-8T	1000±20%	1500	1600	1	1	160	20	500	10	15	10
2R1600T-8T	2R1600S-8T	1600±20%	2600	2800	1	1	160	20	800	10	15	10
2R2000T-8T	2R2000S-8T	2000±20%	2800	3000	1	1	160	20	1000	10	15	5
2R2500T-8T	2R2500S-8T	2500±20%	3000	3200	1	1	160	20	1300	10	15	5
2R3000T-8T	2R3000S-8T	3000±20%	3600	3800	1	1	160	20	1600	10	15	5
2R3600T-8T	2R3600S-8T	3600±20%	4300	4500	1	1	160	20	1900	10	15	5
2R4000T-8T	2R4000S-8T	4000±20%	4800	5000	1	1	160	20	2100	10	15	5
2R4500T-8T	2R4500S-8T	4500±20%	5500	5800	1	1	160	20	2300	5	10	2.5
2R5000T-8T	2R5000S-8T	5000±20%	6200	6500	1	1	180	20	2600	5	10	2.5
2R6000T-8T	2R6000S-8T	6000±20%	7500	8000	1	1	180	20	3100	5	10	2.5

Glow to Arc transition Current……....	＜1A
Weight……....	~2.0g
Operation and storage temperature……..….	-40~+125°C
Climatic category (IEC 60068-1)……..	40/125/21
Marking, red negative……....	**RUILON XXX Y** XXX -Nominal voltage Y-Year of production
Surface treatment……....	Nickel Plated
Moisture sensitivity level [4)] ……..	1

1) At delivery AQL 0.65 level II, DIN ISO 2859.

2) In ionized mode.

3) Insulation Resistance Measuring Voltageat DC 100V.

4) Tests according to JEDEC J-STD-020.
Terms in accordance with ITU-T Rec. K.12, IEC 61643-311, GB/T 18802.311.

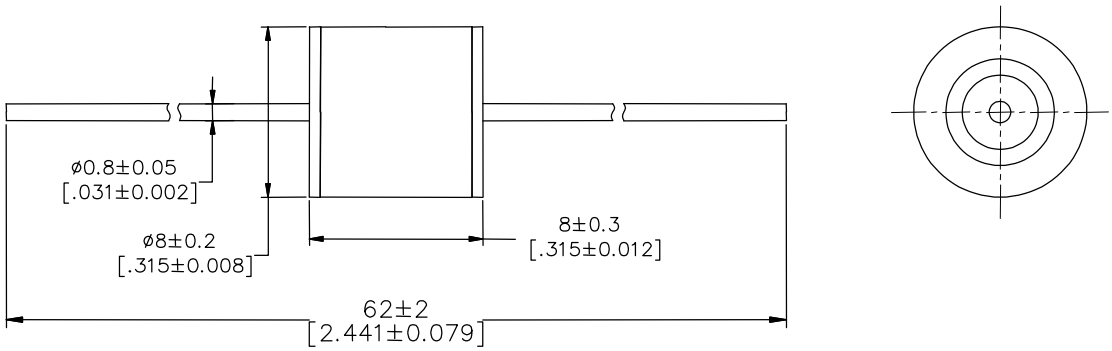
Certifications table

Part Number		
DIP	SMD	UL1449 E479668
2R1000T-8T	2R1000S-8T	◎
2R1600T-8T	2R1600S-8T	◎
2R2000T-8T	2R2000S-8T	◎
2R2500T-8T	2R2500S-8T	◎
2R3000T-8T	2R3000S-8T	◎
2R3600T-8T	2R3600S-8T	◎
2R4000T-8T	2R4000S-8T	◎
2R4500T-8T	2R4500S-8T	◎
2R5000T-8T	2R5000S-8T	◎
2R6000T-8T	2R6000S-8T	◎

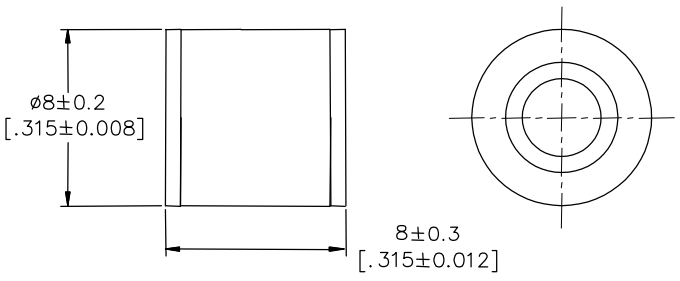
Notes:
1. ◎ indicates that the product has passed the certification.
2. --indicates that the product is not certified.

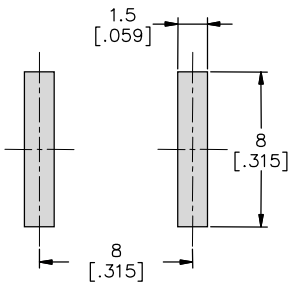
Dimensions(Unit: mm/inch)

DIP axial leads series (2RxxxxT-8T)



SMD Series (2RxxxxS-8T)





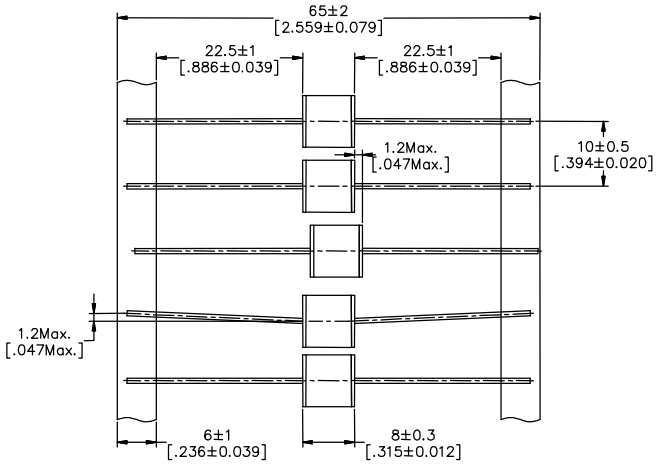
Recommended Soldering Pad Layout

Gas Discharge Tube(GDT) 2R-8T (1000~6000V)

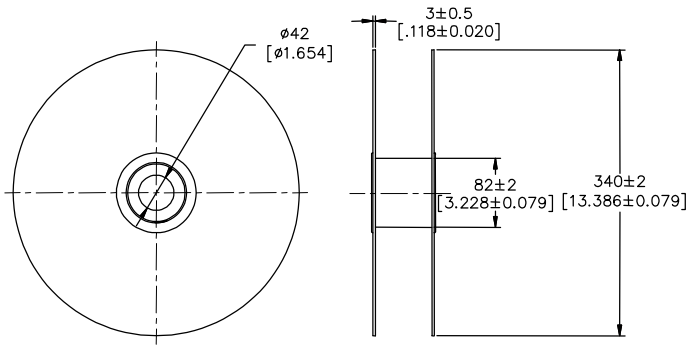
Packaging Information (Unit: mm/inch)

DIP axial leadsseries packaging (Default packaging)

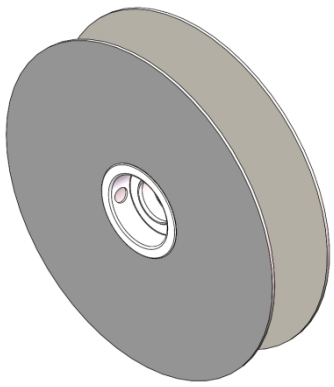
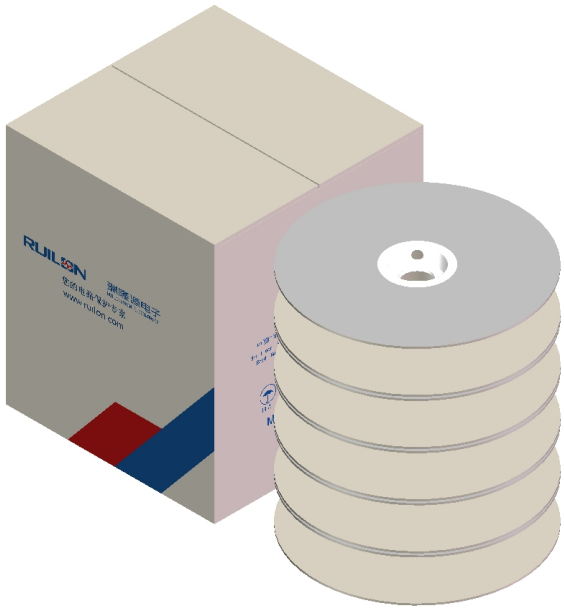
Tape



Reel

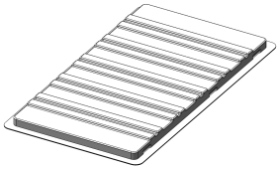
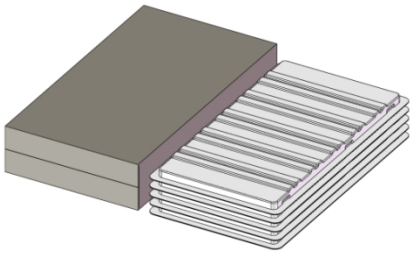
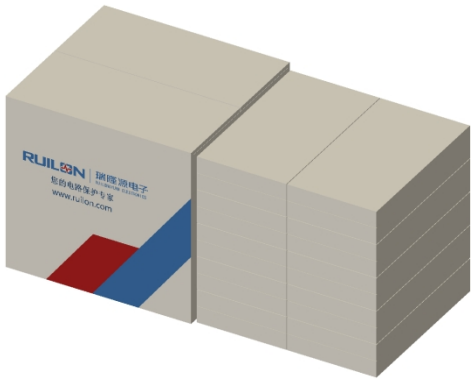


According to IEC 60286-1

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

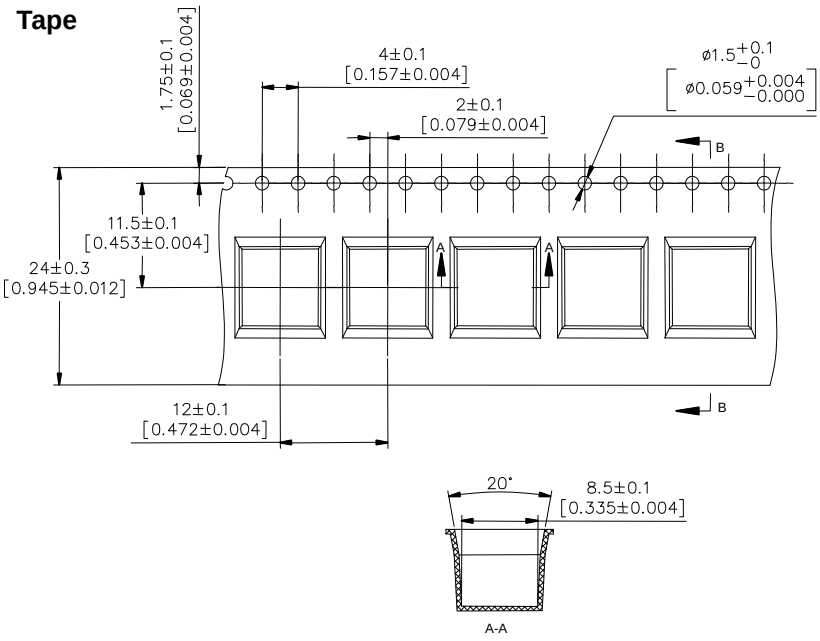
Gas Discharge Tube(GDT) 2R-8T (1000~6000V)

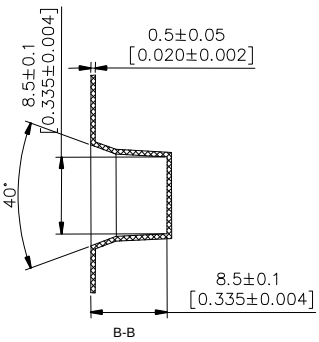
DIP axial leadsseries packaging(Bulk)

	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

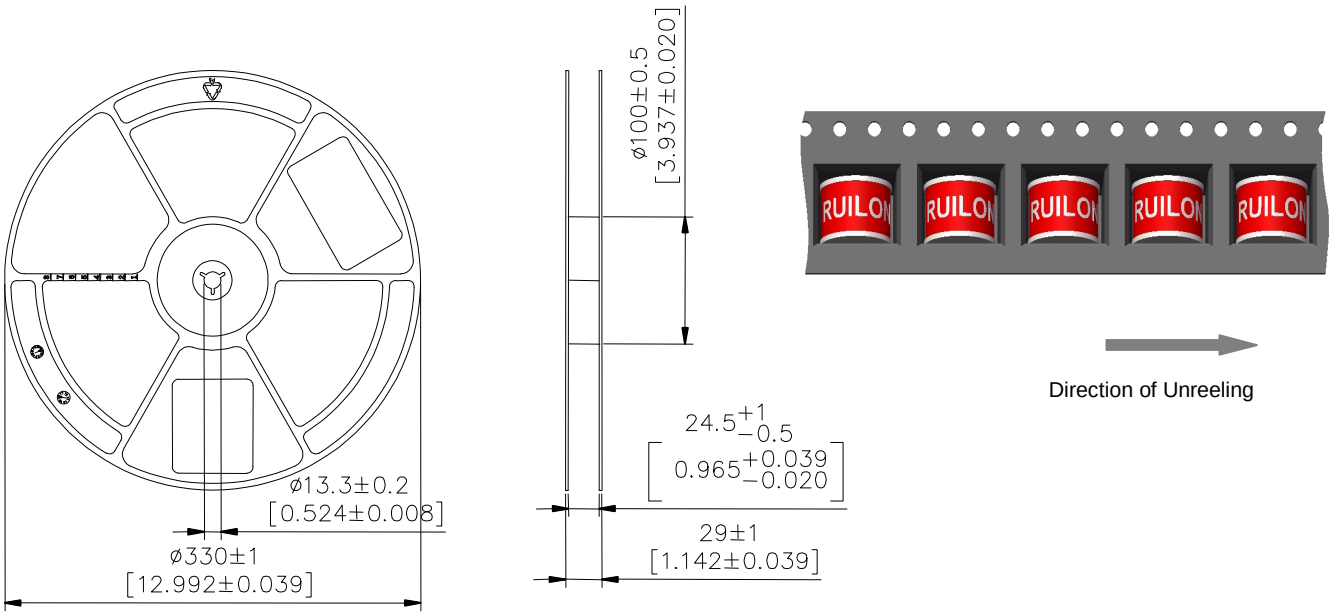


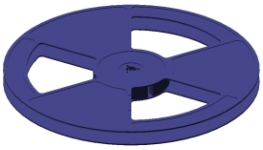
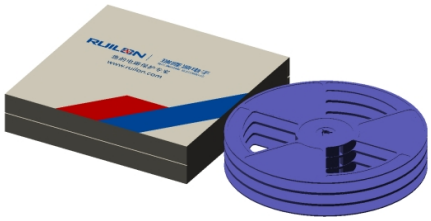
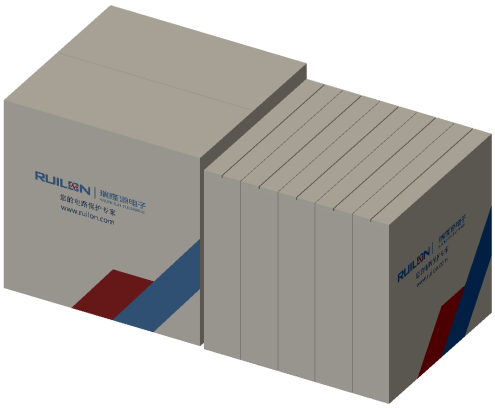


According to IEC 60286-3

Gas Discharge Tube(GDT) 2R-8T (1000~6000V)

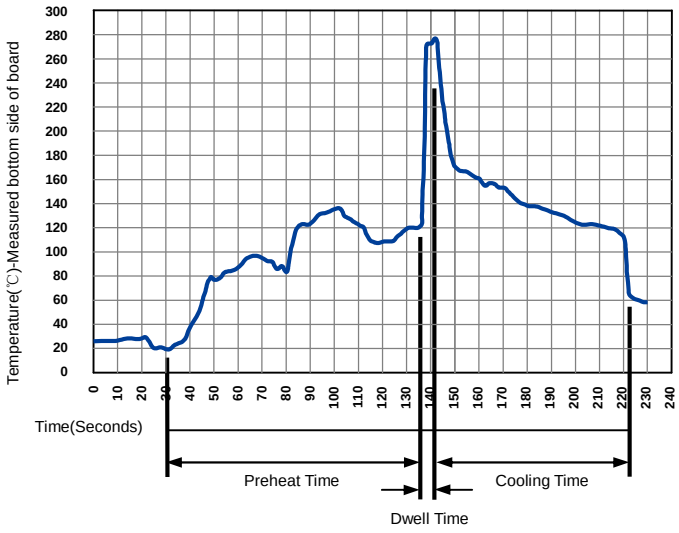
Reel



	Reel	Inner Box	Carton
Size	330×24.5mm	340×333×70mm	375×353×380mm
Quantity	MPQ/MOQ: 1 reel=500pcs	1 Inner Box=2 reels=1,000pcs	1Carton=5 Inner boxes=5,000pcs
Photos			

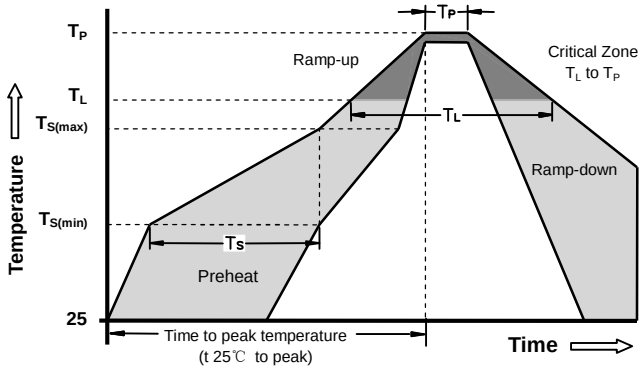
Gas Discharge Tube(GDT) 2R-8T (1000~6000V)

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 TL - 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.

Terms and definitions

NO.	Item	Definitions
1	**Gas discharge tube(GDT)**	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	**DC Spark-over Voltage**	The voltage at which the gas discharge tube sparks over with slowly increasing d.c. voltage.
3	**Impulse Spark-over Voltage**	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	**Arc voltage**	Voltage drop across the GDT during arc current flow.
6	**Glow voltage**	Peak value of voltage drop across the GDT when a glow current is flowing.
7	**Impulse discharge current8/20μs**	Current impulse with a nominal virtual front time of 8 μs and a nominal time to half-value of 20 μs.
8	**Alternating Discharge Current**	The rms value of an approximately sinusoidal alternating current passing through the gas discharge tube.
9	**Insulation Resistance**	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	**Capacitance**	The capacitance shall be measured once at 1 MHz between all terminals unless otherwise specified.

Cautions

- Do not operate Gas discharge tubes in power supply networks, whose maximum operating voltage exceeds the minimum spark-over voltage of the surge arresters.

- 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.

- Electromagnetic fields and ionizing radiation may affect the electrical characteristics of the gas discharge tubes. The impact of such effects (inductive and capacitive field distortion from adjacent components) must be avoided by appropriate circuit design measures.

- If the contacts of the gas discharge tubes are defective, current load can cause sparks and loud noises.

- Gas discharge tubes must be handled with care and must not be dropped.

- Damaged gas discharge tubes must not be re-used.

- 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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