Datasheet

Gas Discharge Tube (GDT)

Series / Models	2RD-8S Series
Product Code	10.12.81.XXXX
Version	A3
Date	2025-02-24
File Number	SP-GDT-013

Version History

Version	Date	Page	Description	Author
A0	2017-01-18	/	Initial draft	XianTao Jiang
A1	2022-05-26	Page 4	Update electrical characteristics	George Hu
A2	2023-11-02	Page 4	Update electrical characteristics	Xia Wu
A3	2025-02-24	Page 1,2,3,4	1. Add cover and version history 2. Update description 3. Delete some models	Xia Wu

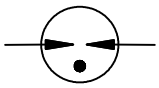
Gas Discharge Tube (GDT) 2RD-8S Series

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-8S series GDT is a surface mount packaged component. Not only is it small in size and easy to install on various compact printed circuit boards (PCBs), but it also has excellent performance. The low capacitance characteristic minimizes its impact on signals when used in high-frequency communication circuits. High insulation resistance ensures that the performance of the circuit will not suffer additional losses under normal operating conditions. The 2RD-8S 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 supply protection.

Electrical symbol



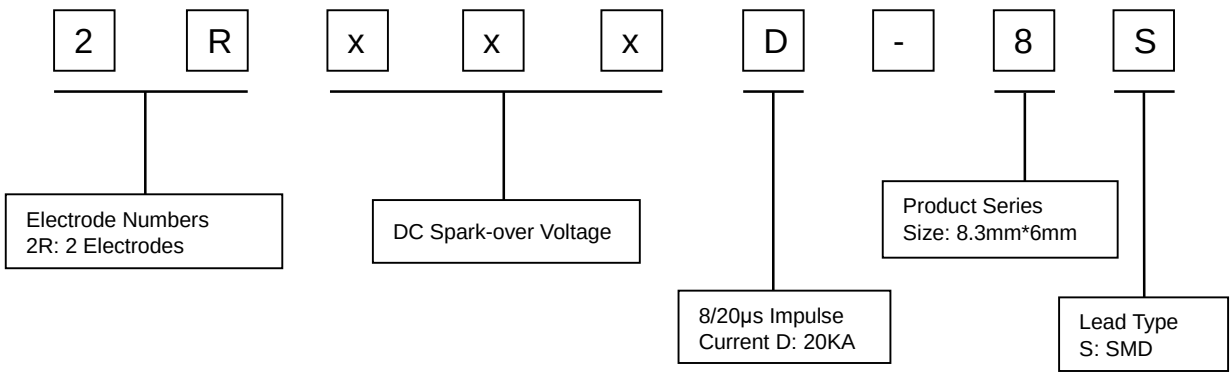
Features

- Excellent response to fast rising transients
- Stable breakdown voltage
- GHz working frequency
- 8/20μs Impulse current capability: 20KA
- Non-Radioactive
- Ultra Low capacitance (<1.5pF)
- Size: 8.3mm*6mm

Applications

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

Part Number Code



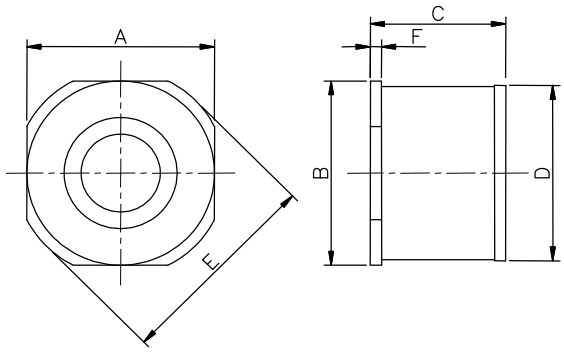
Electrical Characteristics

Part Number	DC Spark-over Voltage [1) 2)] @100V/S	Impulse Spark-over Voltage		Insulation Resistance [3)]	Capacitance @1MHz	Life Ratings					
		100V/μS	1KV/μS			Impulse Discharge Current @8/20μS		Impulse Voltage @1.2/50μS	Impulse Discharge Current @10/350μS	Alternating Discharge Current @50Hz 1S	Impulse Life @10/1000μS
		Max	Max	Min	Max	±5 times	1 time	±5 times	±5 times	10 times	300 times
	V	V	V	GΩ	pF	KA	KA	KV	KA	A	A
2R075D-8S	75±20%	500	600	1	1.5	20	25	40	5	20	200
2R090D-8S	90±20%	500	600	1	1.5	20	25	40	5	20	200
2R150D-8S	150±20%	500	600	1	1.5	20	25	40	5	20	200
2R230D-8S	230±20%	600	700	1	1.5	20	25	40	5	20	200
2R350D-8S	350±20%	800	900	1	1.5	20	25	40	4	20	200
2R470D-8S	470±20%	900	1000	1	1.5	20	25	40	4	20	200
2R600D-8S	600±20%	1000	1200	1	1.5	20	25	40	4	20	200
2R800D-8S	800±20%	1200	1400	1	1.5	20	25	40	4	20	200
2R1000D-8S	1000±20%	1500	1600	1	1.5	20	25	40	4	20	200

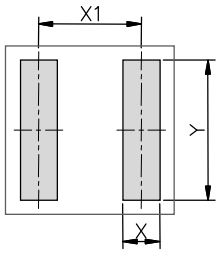
Glow Voltage at 10mA.....	~60V
Arc Voltage at 1A.....	~10V
Glow to Arc transition Current…….....	<1.0A
Weight…….....	~1.38g
Operation temperature……	-40~+125°C
Recommended storage [4)]	
- Temperature ……	+5~+35°C
- Humidity ……..	45~+80%
- Period…….....	≤ 2 years
Climatic category (IEC 60068-1)……..	40/125/21
Marking, red negative…….....	**RUILON XXX Y** XXX -Nominal voltage Y -Year of production
Surface treatment…….....	Matte-tin plated
Moisture sensitivity level [5)] …….....	1

1) At delivery AQL 0.65 level II, DIN ISO 2859.
2) In ionized mode.
3) Insulation resistance measuring voltage: nominal voltage 75V~150V at DC 50V, other at DC 100V.
4) Specified in terms of corrosion against tin plating.
5) Tests according to JEDEC J-STD-020.
Terms in accordance with ITU-T K.12, IEC 61643-311, GB/T 9043, GB/T18802.311.

Dimensions



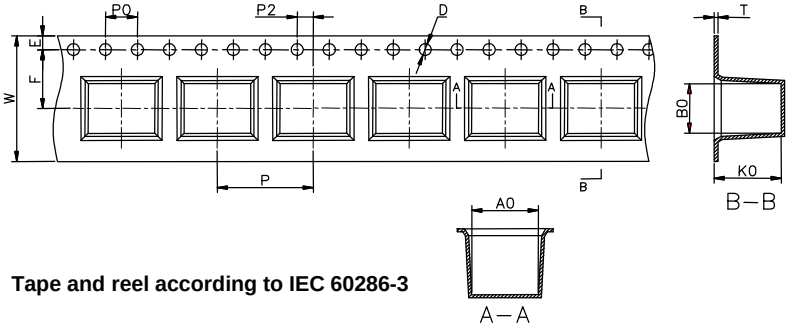
Symbol	Millimeters	Inches
A	8.3±0.2	0.327±0.008
B	8.3±0.2	0.327±0.008
C	6±0.3	0.236±0.012
D	Φ8±0.2	Φ0.315±0.008
E	Φ9.3±0.2	Φ0.366±0.008
F	0.5±0.1	0.020±0.004
X	1.2	0.047
X1	5.8	0.228
Y	9.0	0.354



Recommended Soldering Pad Layout

Packaging Information

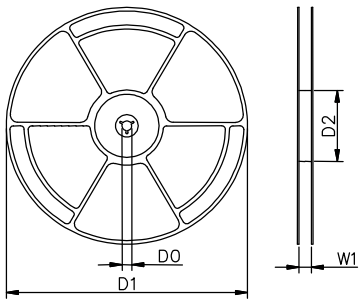
Tape Specifications

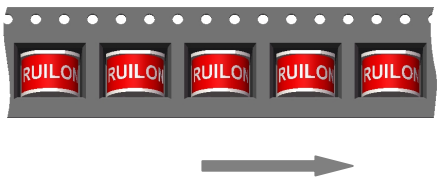


Tape and reel according to IEC 60286-3

Symbol	Millimeters	Inches
W	16±0.3	0.630±0.012
A0	8.3±0.1	0.327±0.004
B0	6.3±0.1	0.248±0.004
K0	8.4±0.1	0.331±0.004
P	12±0.1	0.472±0.004
F	7.5±0.1	0.295±0.004
E	1.75±0.1	0.069±0.004
D	1.5+0.1/-0.0	0.059+0.004/-0.0
P0	4±0.1	0.157±0.004
P2	2±0.1	0.079±0.004
T	0.5±0.1	0.020±0.004
D0	13.3±0.15	0.524±0.006
D1	330±2	12.992±0.079
D2	100+1/-2	3.937+0.039/-0.079
W1	16.5±0.4	0.65±0.016

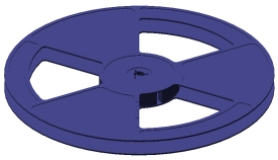
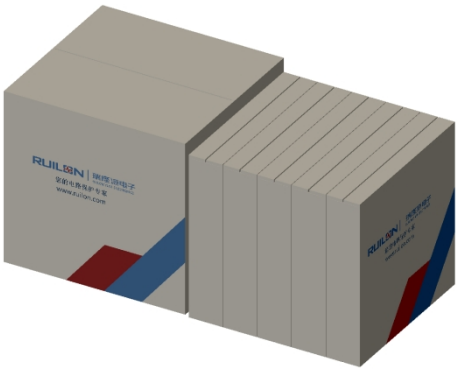
Reel Specifications



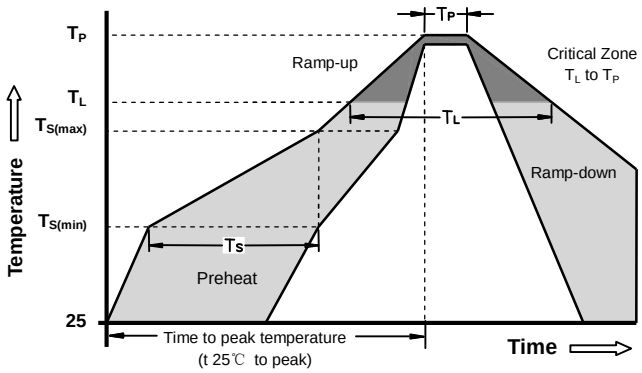


Direction of Unreeling

Gas Discharge Tube (GDT) 2RD-8S Series

	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			

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

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 current 8/20μs**	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 gas discharge tubes.
- 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.
- Gas discharge tubes must be handled with care and must not be dropped.
- Do not continue to use damaged gas discharge tubes.
- 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.
- SMD gas discharge tubes should be soldered within 24 month after shipment.
- 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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