Datasheet

Gas Discharge Tube (GDT)

Series / Models	3RB-8 Series
Product Code	10.13.80.XXXX
Version	A6
Date	2025-09-16
File Number	SP-GDT-026

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Version History

Version	Date	Page	Description	Author
A0	2017-03-28	/	Initial draft	XianTao Jiang
A1	2020-02-27	Page 4	Update and refine relevant technical specifications.	XianTao Jiang
A2	2022-05-26	Page 4	Update electrical characteristics	George Hu
A3	2023-03-31	Page 5	Update certifications table	George Hu
A4	2023-11-02	Page 3	Update terms and definitions	Xia Wu
A5	2025-03-19	Page 1,2,3,4	1. Add cover and version history 2. Update Description 3. Delete some models	Xia Wu
A6	2025-09-16	Page 6	Update “DIP-T Series” Packaging	Xia Wu

Gas Discharge Tube (GDT) 3RB-8 Series

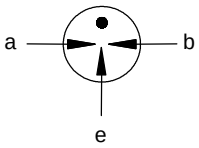
Description

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 3RB-8 series 3-electrode GDT is a lead component. Standardized pin spacing and dimensions. It is not only easy to install on printed circuit boards (PCBs), but 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 3RB-8 series GDT can not only be used to protect communication interfaces, but its ability to withstand high surge currents (8/20uS, 10KA) also makes it suitable for power supply protection.



Electrical symbol



a = Tip
b = Ring
e = Ground
(center electrode)

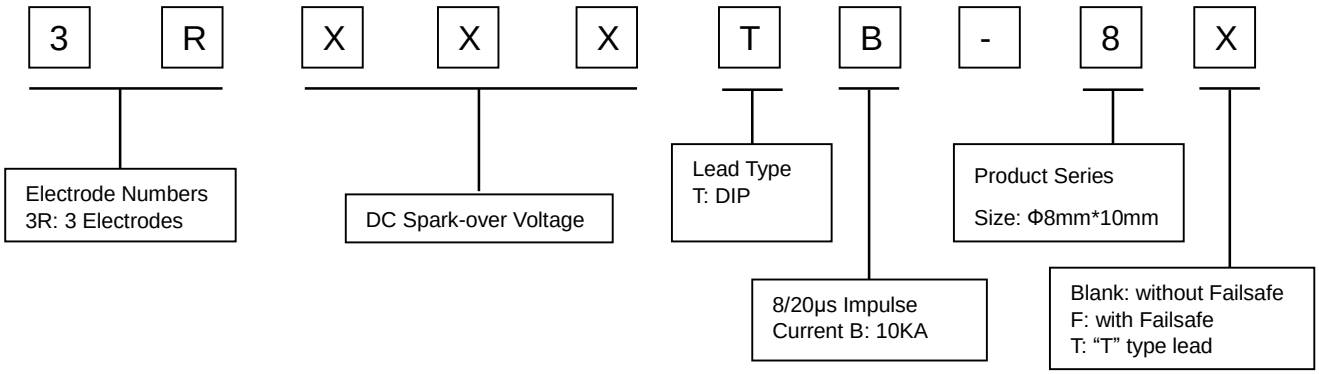
Features

- Excellent response to fast rising transients
- Stable breakdown voltage
- GHz working frequency
- 8/20μs Impulse current capability: 10KA
- Non-Radioactive
- Ultra Low capacitance (<1.5pF)
- High insulation resistance
- Size: Φ8mm*10mm

Applications

- Communication equipment
- CATV equipment
- Data lines
- Power supplies
- Telecom SLIC protection
- Broadband equipment
- ADSL equipment, including ADSL2+
- XDSL equipment
- Satellite and CATV equipment
- Test equipment
- Consumer electronics

Part Number Code



Electrical Characteristics

Part Number			DC Spark-over Voltage [1) 2) 3)] @100V/S	Impulse Spark-over Voltage [3)]		Insulation Resistance [4)]	Capacitance @1MHz	Life Ratings			
				100V/μS	1KV/μS			Impulse Discharge Current @8/20μs [5)]		Alternating Discharge Current @50Hz 1S [5)]	Impulse Life @10/1000μS
				Max	Max	Min	Max	±5 times	1 time	10 times	300 times
DIP	DIP-F	DIP-T	V	V	V	GΩ	pF	KA	KA	A	A
3R075TB-8	3R075TB-8F	3R075TB-8T	75±20%	500	600	1	1.5	10	20	10	200
3R090TB-8	3R090TB-8F	3R090TB-8T	90±20%	500	600	1	1.5	10	20	10	200
3R150TB-8	3R150TB-8F	3R150TB-8T	150±20%	500	600	1	1.5	10	20	10	200
3R230TB-8	3R230TB-8F	3R230TB-8T	230±20%	600	700	1	1.5	10	20	10	200
3R250TB-8	3R250TB-8F	3R250TB-8T	250±20%	600	700	1	1.5	10	20	10	200
3R350TB-8	3R350TB-8F	3R350TB-8T	350±20%	800	900	1	1.5	10	20	10	200
3R420TB-8	3R420TB-8F	3R420TB-8T	420±20%	850	950	1	1.5	10	20	10	200
3R470TB-8	3R470TB-8F	3R470TB-8T	470±20%	900	1000	1	1.5	10	20	10	200
3R600TB-8	3R600TB-8F	3R600TB-8T	600±20%	1100	1200	1	1.5	10	20	10	200
3R800TB-8	3R800TB-8F	3R800TB-8T	800±20%	1400	1500	1	1.5	10	20	10	200

Glow Voltage at 10mA.....	~60V
Arc Voltage at 1A.....	~10V
Glow to Arc transition Current……..	~1A
Operation and storage temperature……..…..	-40~+125°C
Climatic category (IEC60068-1)……....	40/125/21
Marking, blue negative.……	**RUILON** **xxx Y** xxx -Nominal voltage Y -Year of production
Weight……..	DIP ~2.10g DIP-F ~2.35g DIP-T ~2.15g
Surface treatment……...……	Nickel Plated
Moisture sensitivity level [6)] …….....	1

1) At delivery AQL 0.65 level II, DIN ISO 2859
2) In ionized mode
3) Tip or ring electrode to center electrode
4) Insulation Resistance Measuring Voltage: 75V~150V at DC 50V，Other at DC 100V
5) Total current through center electrode, half value through tip respectively ring electrode.
6) 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.

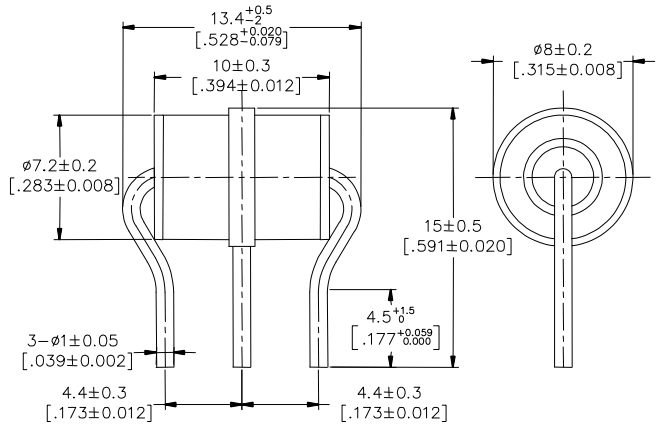
Certifications table

Part Number	UL497B E465335
3R075TB-8	◎
3R090TB-8	◎
3R150TB-8	◎
3R230TB-8	◎
3R250TB-8	--
3R350TB-8	◎
3R420TB-8	◎
3R470TB-8	◎
3R600TB-8	◎
3R800TB-8	--

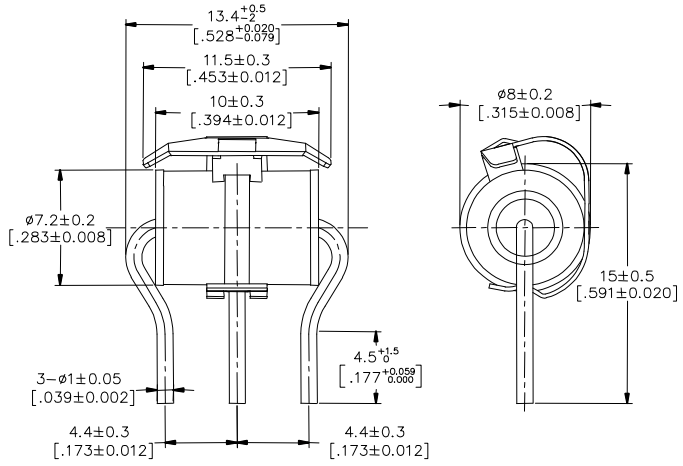
Notes:
1. ◎ indicates that the product has passed the certification.
2. -- indicates that the product is not certified.

Dimensions (Unit: mm/inch)

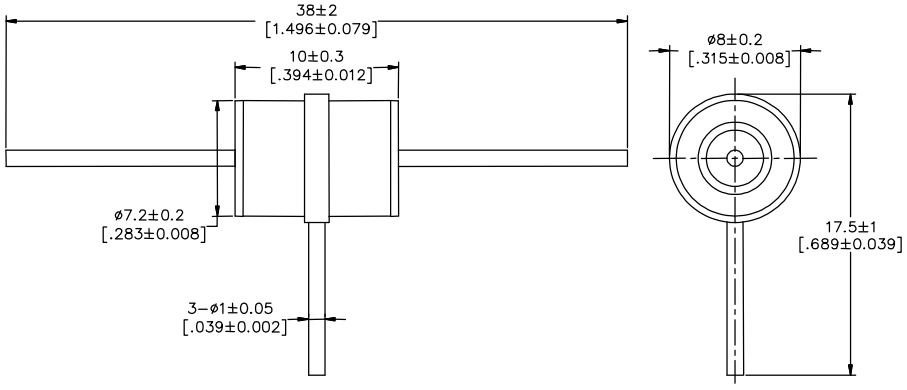
DIP Series (3RxxxTB-8)



DIP-F Series (3RxxxTB-8F)

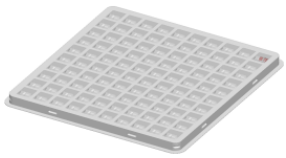
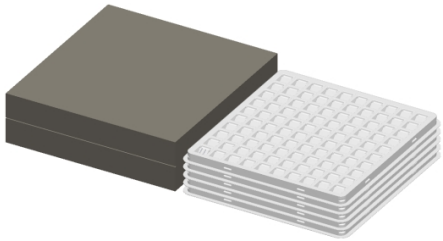
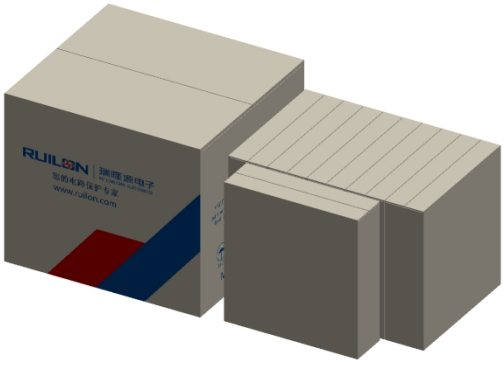


DIP-T Series (3RxxxTB-8T)

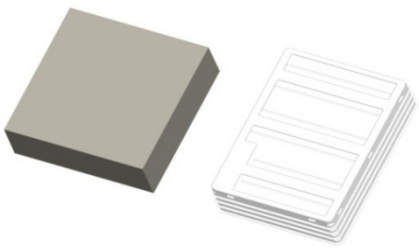
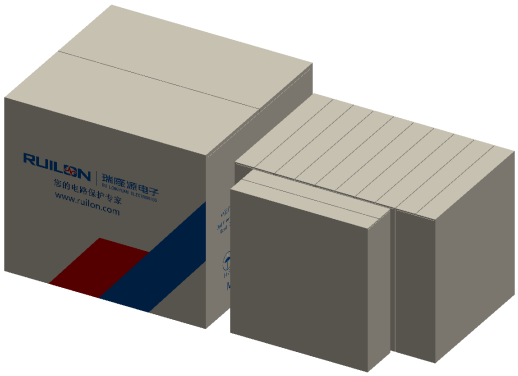


Packaging Information

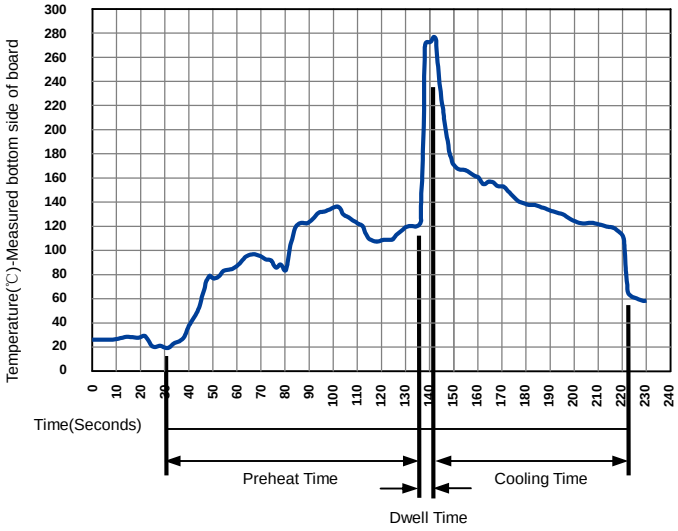
"DIP Series" and "DIP-F Series" Packaging (Bulk)

	PVC tray	Inner Box	Carton
Size	220×210×12mm	225×215×62mm	315×290×272mm
Quantity	MPQ: 1 tray=100pcs	MOQ: 1 Inner Box=5 trays=500pcs	1 Carton=6 Inner boxes=3,000pcs
Photos			

"DIP-T Series" Packaging

	PVC tray	Inner Box	Carton
Size	258×205×16.2mm	225×215×62mm	315×290×272mm
Quantity	MPQ: 1 tray=50pcs	MOQ: 1 Inner Box=4 trays=200pcs	1 Carton=6 Inner boxes=1,200pcs
Photos			

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

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 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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