



Datasheet

Gas Discharge Tube (GDT)

Series / Models	3RL-5T (2000~3600V)
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Version History

Version	Date	Page	Description	Author
A0	2025-10-29	/	Initial draft	Xia Wu

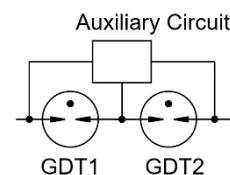
Description

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.



3RL-5T is specifically designed for power supply. By connecting two gas discharge tubes in series and pairing them with appropriate triggering auxiliary circuits, it improves the AC withstand voltage of the discharge tubes and reduces residual voltage. This enhances the overall surge protection capability and stability of the customer's product. High AC withstand voltage and low residual voltage level make it suitable for various applications that require strict voltage protection levels. Encapsulated with epoxy resin, it has better electrical insulation and can effectively isolate GDTs from the outside world. It can be applied in harsh environments.

Schematic Diagram



Features

- █ Excellent response to fast rising transients
- █ High AC withstand voltage
- █ 8/20μs Impulse current capability: 3KA
- █ Non-Radioactive
- █ Ultra Low capacitance (<2.0pF)
- █ Size: 12mm(L)*6mm(W)*6.6mm(H)

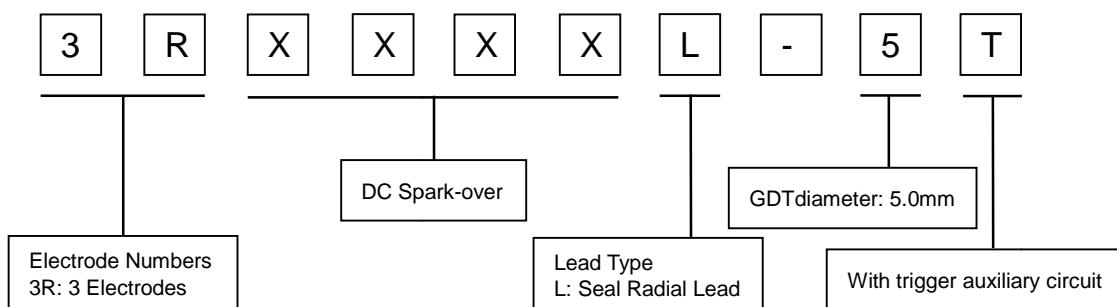
Applications

- Automotive:**
 - █ On-board chargers
 - █ Vehicle charging stations
- Others:**
 - █ LED lighting
 - █ Power supply
 - █ Photovoltaic
 - █ Air conditioning

Constructions

- █ Main components: GDTs
- █ Leads: Tinned copper clad steel wire

Part Number Code



Gas Discharge Tube (GDT)

3RL-5T (2000~3600V)

Electrical Characteristics

Model	3R2000L-5T	3R3000L-5T	3R3600L-5T	Units
DC Spark-over Voltage ^{1) 2)} at 100V/S	1800~2700	2500~3600	3000~4300	V
Impulse Spark-over Voltage at 1KV/μS	<2000	<3000	<3600	V
Front of wave spark-over voltage at 1.2/50 μs, 6 KV				
Arrester only	<1800	<2300	<2500	V
In series with a 14D561 MOV	<1800	<2300	<2500	V
Service life				
Impulse discharge current 8/20μs ±5 times	3	3	3	KA
8/20μs 1 time	5	5	5	KA
8/20μs 100 times	100	100	100	A
Impulse discharge voltage 1.2/50μS ,2Ω ³⁾ 40 times	6	6	6	KV
1.2/50μS ,12Ω ³⁾ 80 times	6	6	6	KV
AC withstand voltage at 5mA, 1minute				
Arrester only	1200	1700	2000	V
Connect a 560V MOV in series	1500	2000	2300	V
Capacitance at 1MHz	<2.0	<2.0	<2.0	pF
Weight	~0.7	~0.7	~0.7	g
Operation and storage temperature	-40~+125	-40~+125	-40~+125	°C
Climatic category (IEC60068-1)	40/125/21	40/125/21	40/125/21	
Marking, Laser marking	Without			
Moisture sensitivity level ⁴⁾	1			

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

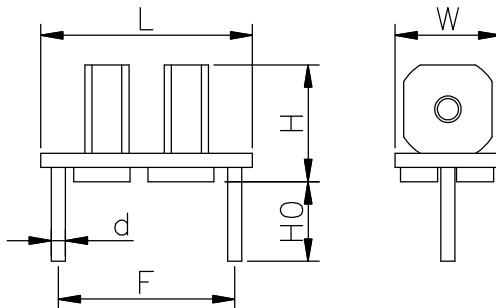
²⁾ In ionized mode.

³⁾ Tested at AC220V with MOVs.

⁴⁾ Tests according to JEDEC J-STD-020.

Terms in accordance with ITU-T Rec. K.12, IEC 61643-311.

Dimensions

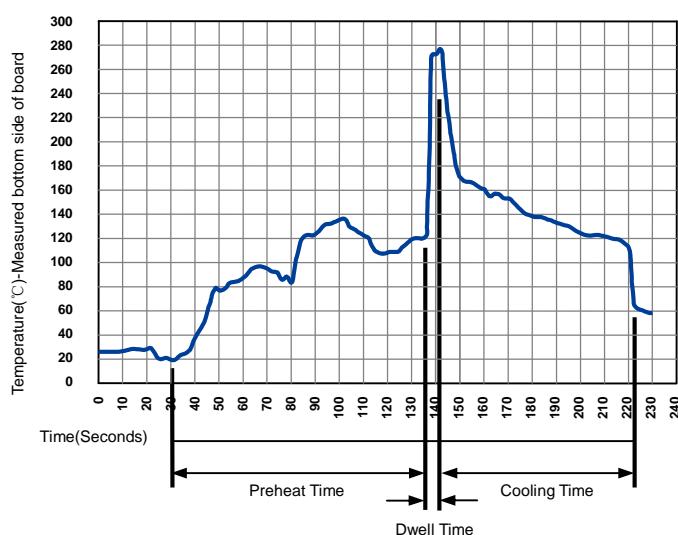


Symbol	Millimeters	Inches
L	12±0.5	0.472±0.020
W	6±0.5	0.236±0.020
H	6.6±0.5	0.260±0.020
H0	4.5±0.5	0.177±0.020
d	φ0.8±0.05	φ0.031±0.002
F	10±0.5	0.394±0.020

Packaging Information

Packing bulk: 1000 PCS per package

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 μ s and a nominal time to half-value of 20 μ s.
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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