Datasheet

Gas Discharge Tube (GDT)

Series / Models	RL102MTW-1
Product Code	10.12.97.1020
Version	A0
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Version History

Version	Date	Page	Description	Author
A0	2026-01-08	/	Initial draft	Xia Wu

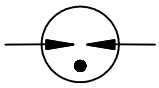
Gas Discharge Tube (GDT) RL102MTW-1

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.

RL102MTW-1 is a small-sized ultra-thin GDT surface mount package. It is not only small in size and easy to install on various compact printed circuit boards (PCBs), but also has excellent performance. The ultra-thin design meets some application scenarios that require strict spatial dimensions, such as compact electronic devices. 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 RL102MTW-1 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 protection.

Electrical symbol



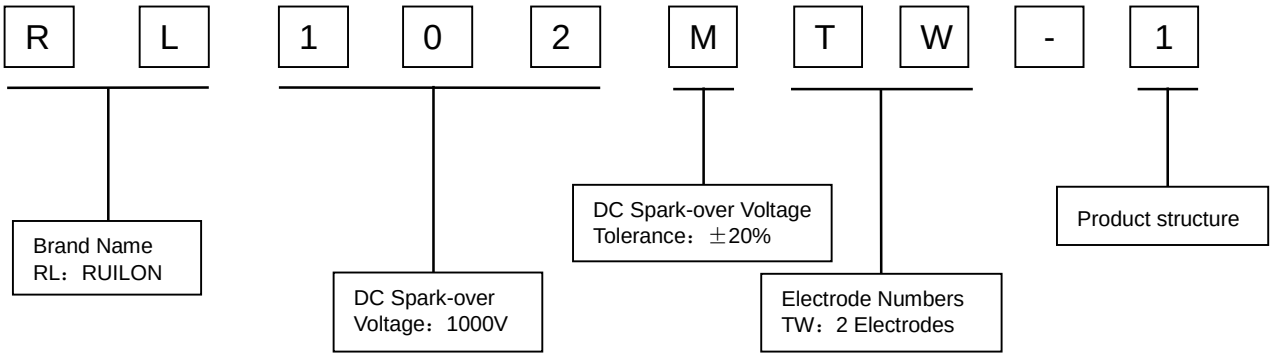
Features

- Excellent response to fast rising transients
- Stable breakdown voltage
- GHz working frequency
- 8/20μs Impulse current capability: 10KA
- Ultra Low capacitance (<3pF)
- Size: Φ8mm*2.2mm

Applications

- Telecom CPE
- Communication equipment
- Surge Protective Devices
- High density PCB assemblies

Part Number Code



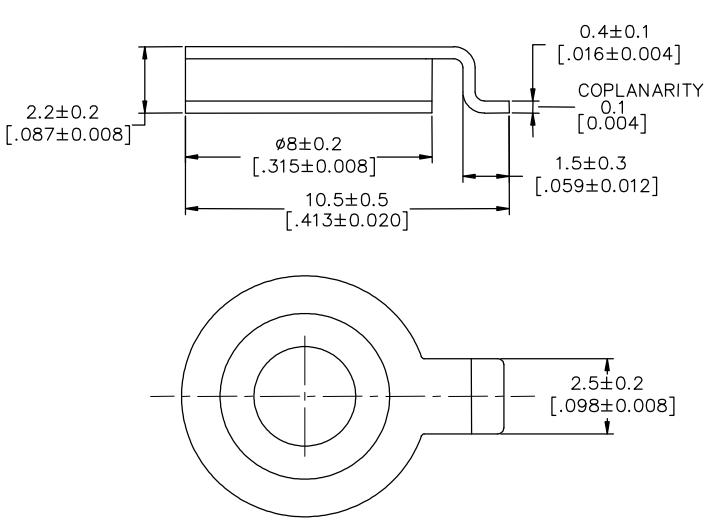
Gas Discharge Tube (GDT) RL102MTW-1

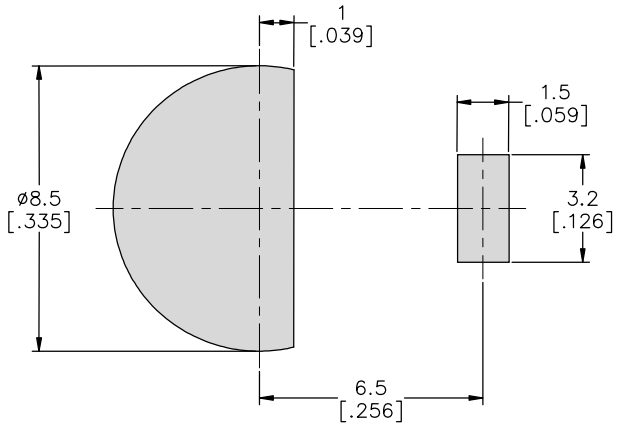
Electrical Characteristics

DC Spark-over Voltage [1) 2)]		at 100V/S	1000±20%	V
Impulse Spark-over Voltage	at 1KV/μS	for 99% of measured values	≤2000	V
	at 1KV/μS	Typical values of distribution	≤1900	V
Impulse Discharge Current	at 8/20μS	±5 times	10	KA
Insulation Resistance		at DC 100V	≥1	GΩ
Capacitance		at 1MHz	≤3	pF
Weight			~0.5	g
Operation temperature			-40~+125	°C
Climatic category (IEC60068-1)			40/125/21	
Marking			without	
Surface treatment			Matte-tin plated	
Moisture sensitivity level [3)]			1	

1) At delivery AQL 0.65 level II, DIN ISO 2859.
2) In ionized mode.
3) 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.

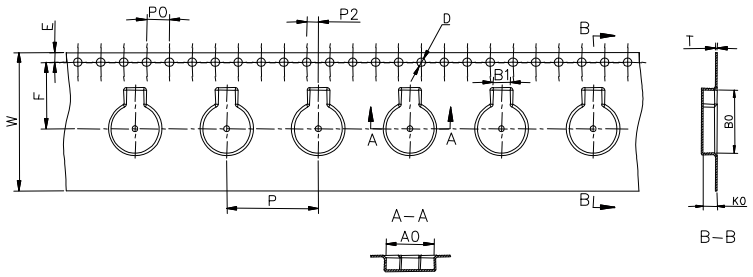
Dimensions (Unit: mm)

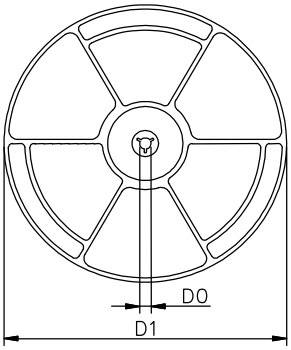


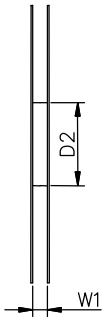


Recommended Soldering Pad Layout

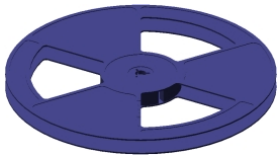
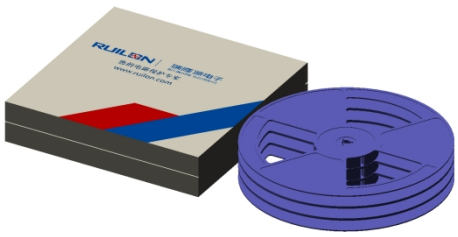
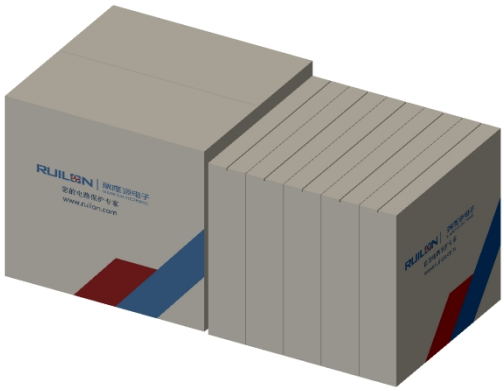
Packaging Information



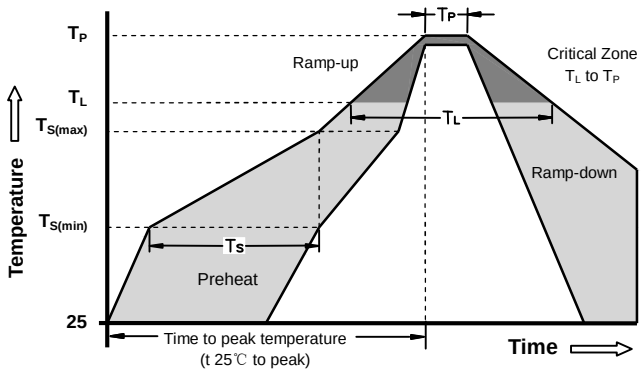




Symbol	Millimeters	Inches
W	24±0.3	0.945±0.012
A0	8.3±0.2	0.328±0.008
B0	10.95±0.3	0.431±0.012
D	Φ1.5±0.2	0.059±0.008
K0	2.7±0.2	0.106±0.008
P	12±0.2	0.472±0.008
F	11.5±0.2	0.453±0.008
E	1.75±0.2	0.069±0.008
P0	4.0±0.2	0.157±0.008
P2	2.0±0.2	0.079±0.008
T	0.3	0.012
D0	Φ13.0±0.5	Φ0.512±0.02
D1	Φ330	Φ13
D2	Φ100Min	Φ1.97Min
W1	24.8±2.0	0.976±0.079

	Reel	Inner Box	Carton
Size	330×20.5mm	340×333×70mm	375×353×380mm
Quantity	MPQ:1 reel=2,000pcs	1 Inner Box=3 reels=6,000pcs	1Carton=5 Inner boxes=30,000pcs
Photos			

Soldering Parameters - Reflow Soldering (Surface Mount Devices)



Reflow Condition		Pb - Free assembly
Pre Heat	-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 are no quality defects or changes in protection level during the temporary change of 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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