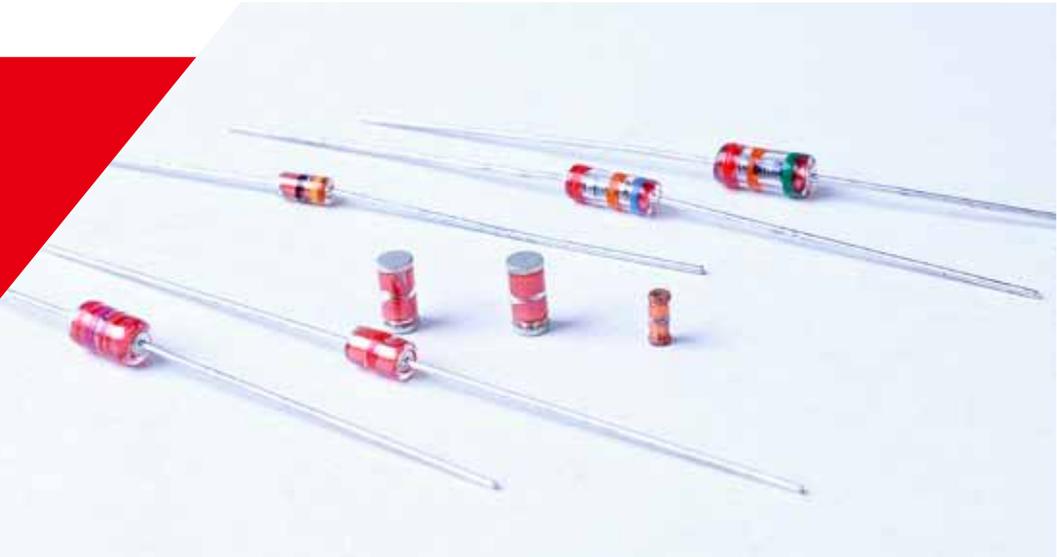


ELECTRONICS



# Glass Gas Discharge

RLM102 Series

## Glass Gas Discharge - RLM102 Series

### Features

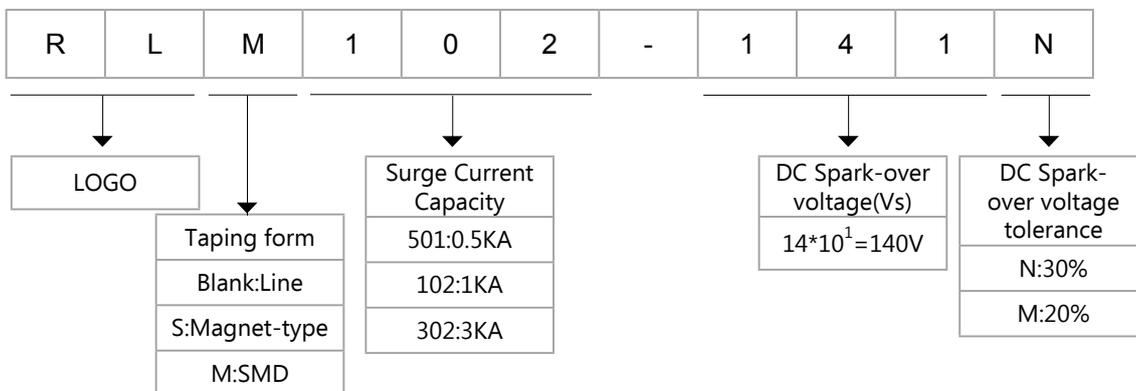
- Approximately zero leaking current before clamping voltage
- Less decay at on/off state.
- High capability to withstand repeated lightning strikes.
- Low electrode capacitance( $\leq 0.8\text{pF}$ ) and high isolation( $\geq 100\text{M}\Omega$ ).
- RoHS compliant.
- Bilateral symmetrical.
- Temperature, humidity and lightness insensitive.
- Operating temperature:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Storage temperature:  $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- Meets MSL level 1, per J-STD-020



### Applications

- Power Supplies
- Motor sparks eliminating
- Relay switching spark absorbing
- Data line pulse guarding
- Electronic devices requiring UL497A and UL497B compliant
- Telephone/Fax/Modem
- High frequency signal transmitters/receivers
- Satellite antenna
- Radio amplifiers
- Alarm systems
- Cathode ray tubes in Monitors/TVs

### Part Number Code

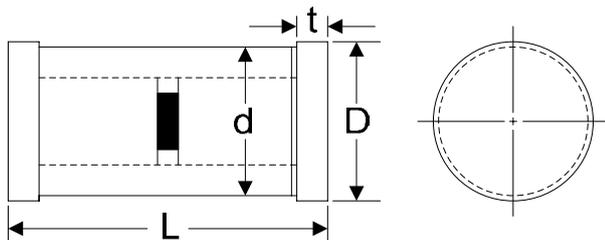


## Glass Gas Discharge - RLM102 Series

### Electrical Characteristics

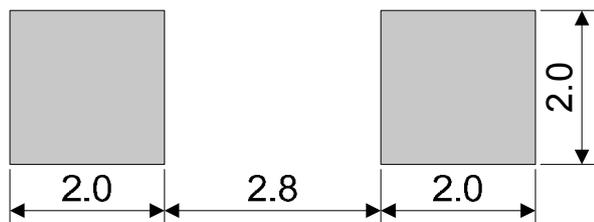
Type Number	DC Spark-Over Voltage	Insulation Resistance		Electrostatic Capacitance 1KHz-6Vmax	Surge current capacity 8/20us	Surge Life Test 1kHz-10KV Max
	V	IR	DC V	pF	A	
RLM102-141N	140±30%	>100MΩmin	50	<1.0	1000	10x700us 4000v 100A 10 time
RLM102-201M	200±20%	>100MΩmin	100	<1.0	1000	
RLM102-301M	300±20%	>100MΩmin	100	<1.0	1000	
RLM102-401M	400±20%	>100MΩmin	250	<1.0	1000	
RLM102-501M	500±20%	>100MΩmin	250	<1.0	1000	
RLM102-701M	700±20%	>100MΩmin	250	<1.0	1000	
RLM102-102M	1000±20%	>100MΩmin	250	<1.0	1000	
RLM102-152M	1500±20%	>100MΩmin	500	<1.0	1000	

### Dimensions



Symbol	Dimension (mm)
L	5.0±0.5
D	Φ2.8±0.5
d	Φ2.6±0.5
t	0.4±0.1

### Soldering footprint



## Glass Gas Discharge - RLM102 Series

### Test Observance Lab

Troubled with surge requirements.

\*Products being developed can't meet UL standards.

\*Need to protect equipment from indirect lightning surges in the field.

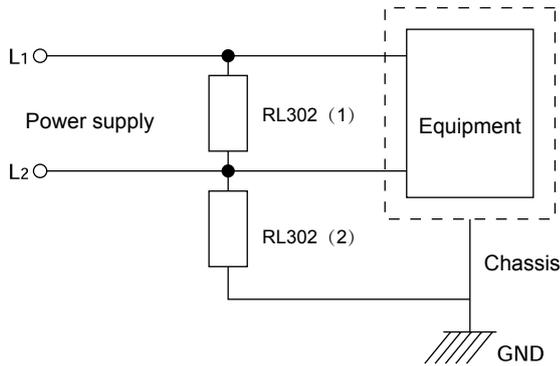
At the Mitsubishi Materials ceramic factory, customers can come and observe testing of their product with the latest impulse voltage and current generators that can duplicate the test requirements of the various worldwide standards agencies. From these tests we can recommend the best solution to help you pass requirements.

Reference standard	Wave form	comments
JEC standard	1.2/50 $\mu$ s 30kVmax	Indirect lightning protection
	8/20 $\mu$ s 6kAmax	
IEC61000-4-5 conformance	1.2/50 $\mu$ s 15kV 8/20 $\mu$ s7.5kA	Indirect lightning protection
IEC61000-4-2 conformance	150pF 330 $\Omega$ 30kVmax	Static electricty protection
FCC standard	10/560 $\mu$ s 800V 100A	Communication related protection
FCC standard	10/160 $\mu$ s 1.5kV 200A	Communication related protection
FCC standard conformance	10/700 $\mu$ s 15kVmax	Communication related protection
IEEE	0.5 $\mu$ -100kHz 6kVmax	-
UL standards	AC600V 40A 1.5s	Communications (AC power cross)
	AC600V 7A 5s	
	AC600V 2.2A 30min	
	Over-voltage to AC600V	
others	Rectangular wave, pulse width 50~1000ns, 4kV max, 30~60Hz	-
	2/10 $\mu$ s 2.5kV 1kA	
	10/200 $\mu$ s 20kVmax	
	0.5/700 $\mu$ s 6kVmax	
	100/700 $\mu$ s 5kVmax	

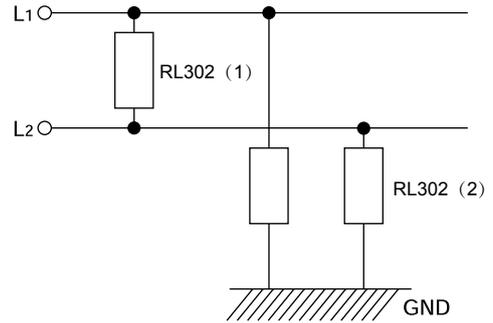
# Glass Gas Discharge - RLM102 Series

## Surge Applications

1. Power supply requiring AC withstanding voltage test



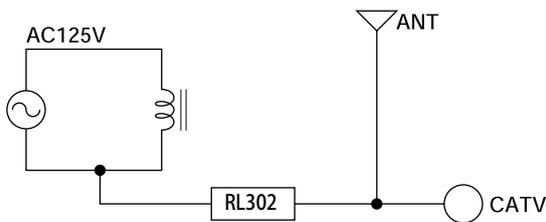
2. High quality supply



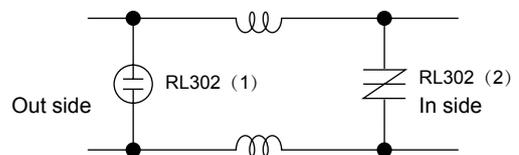
Conditions		AC125V	AC250V
Normal mode (Between L1 and L2)	RL302 (2)	RL302-301M	RL302-501M
	RL302 (1)	Test is not required	RL302-501M
Common mod (Between L1, L2-GND)	AC1200V	RL302-242M	RL302-242M
	AC withstanding voltage test condition		
	AC1500V	RL302-302M	RL302-302M
	AC1800V	RL302-362M	RL302-362M
	AC2000V	RL302-452M	RL302-452M

Applications : SW power supply, inverter power supply, power supply of office and home appliance

3. TV tuner circuit : cold chassis



4. Sensor and data line

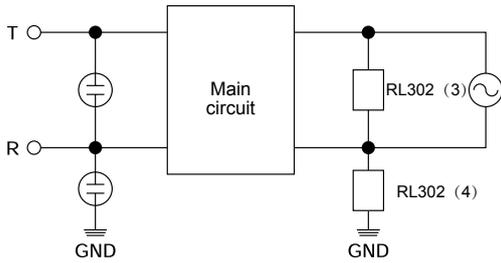


SA1:RL302-201M  
SA2:P0300EA

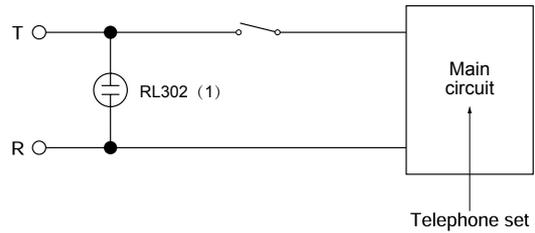
# Glass Gas Discharge - RLM102 Series

## Surge Applications

### 5. Telecommunication equipment (FAX, KTS, PBX)

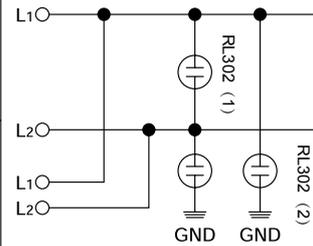


### Telephone (One piece, cordless, answering machine)



	Telecommunication interface			Power supply	
				AC125V	AC250V
Normal mode	Between T and R. RL302 (1)	Japan, USA, EU and South East Asia	RL102-301M	RL302 (3)	RL302-301M
		Canada	RL102-401M		RL302-501M
Common mode	Between T, R and GND. RL302 (2)	AC withstanding test is not required	DSA=RL302	RL302 (3)	RL302-301M
		AC withstanding test is required	AC1200V→ RL302-242M AC1500V→ RL302-302M		RL302-302M RL302-362M

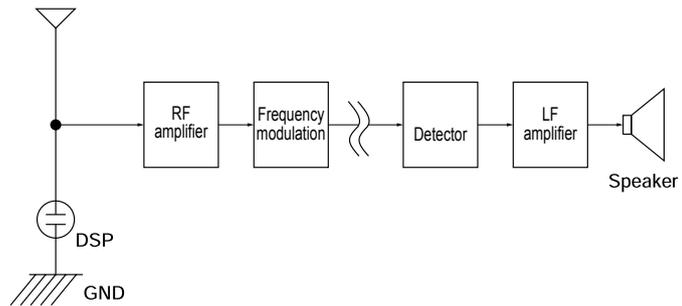
### Modem



Applications : key telephone system, PBX, modem, answering phone, cordless telephone, normal telephone etc.

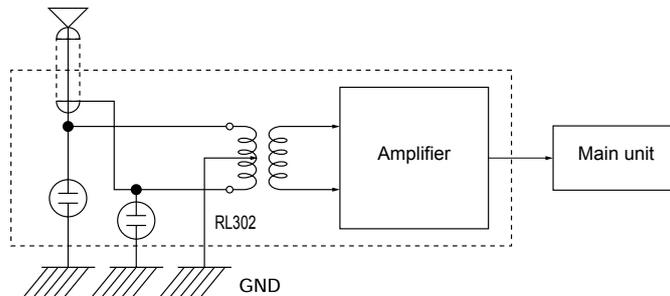
### 6. Car radio, radio cassette, wireless

absorber will protect the semiconductor (front-inserted in the antenna input terminal, the surge end IC or FET, etc.) against failure due to static surge entering from the antenna.



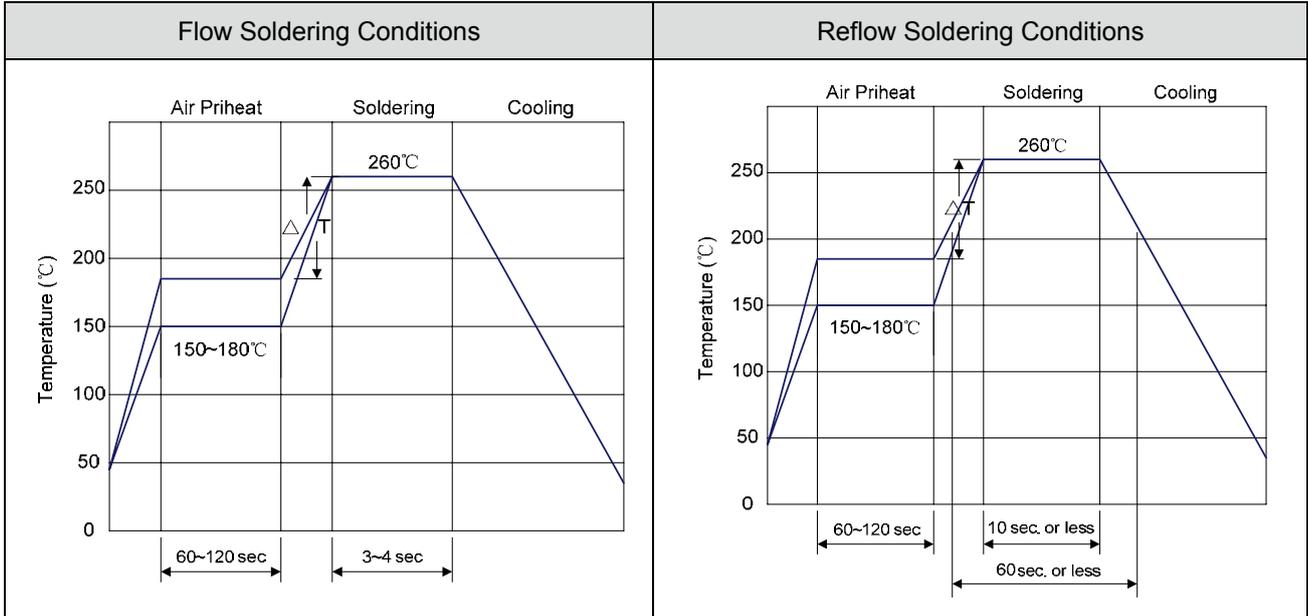
### 7. Boosters (for satellite broadcasting and general TV equipment)

In this application, the surge absorber protects the semiconductor against small surge energies from the vicinity of the antenna or against static electricity due to human contact. The recent use of high-sensitivity FET has led to a stronger requirement for surge protection.



## Glass Gas Discharge - RLM102 Series

### Recommended Soldering Conditions



- 1) Time shown in the above figures is measured from the point when chip surface reaches temperature.
- 2) Temperature difference in high temperature part should be within 110°C.
- 3) After soldering, do not force cool, allow the parts to cool gradually.

#### Hand Soldering

Solder iron temperature: 350±5°C

Heating time: 3 seconds max.

#### General attention to soldering

- High soldering temperatures and long soldering times can cause leaching of the termination, decrease in adherence strength, and the change of characteristic may occur.
- For soldering, please refer to the soldering curves above. However, please keep exposures to temperatures exceeding 200°C to fewer than 50 seconds.
- Please use a mild flux (containing less than 0.2wt% Cl). Also, if the flux is water soluble, be sure to wash thoroughly to remove any residue from the underside of components that could affect resistance.

#### Cleaning

When using ultrasonic cleaning, the board may resonate if the output power is too high. Since this vibration can cause cracking or a decrease in the adherence of the termination, we recommend that you use the conditions below.

Frequency: 40kHz max.

Output power: 20W/liter

Cleaning time: 5 minutes max.

## Glass Gas Discharge - RLM102 Series

### Test Methods And Results

ITEM	TEST METHOD	STANDARD
Static Life	10KV with 1500pf condenser is discharged through 2KΩ resistor. 200 times at an interval of 10sec.	Rate-of-change, within±30% insulation resistance & capacitance, conformed to rated spec.
Cold Resistance	Measurement after -40°C/1000 HRS & normal temperature/2 HRS.	Features are conformed to rated spec.
Heat Resistance	Measurement after 125°C/1000 HRS & normal temperature/2 HRS.STANDARD	
Humidity Resistance	Measurement after humidity 90~95%(45°C)/1000 HRS & normal temperature/2 HRS.	
Temperature Cycle	10 times repetition of cycle -40°C/30min normal,temp/2 min →125°C/30min,measurement after normal temp/2 HRS.	
Solder Ability	Apply flux and immerse in molten solder230±5°C for 3sec up to the point of 1.5mmFrom body. Check for solder adhesion.	Lead wire is evenly covered by solder.
Solder Heat	Measurement after lead wire is dipped up to the point of 1.5mm from body into 260±5°C solder for 10sec.	Conformed to rated spec.
Pull Strength	Apply 0.5kg load for 10sec.	Lead shall not pull out or snap.
Flexural Strength	Bend lead wire at the point of 2mm from body under 0.25 load and back to its original point. Repeat 1 time.	

## Glass Gas Discharge - RLM102 Series

### Ordering Information

Symbol	Dimension (mm)
W	12.00±0.20
P0	4.00±0.10
P1	4.00±0.10
P2	2.00±0.10
D0	□1.5±0.10
D1	□1.5±0.10
E	1.75±0.10
F	5.50±0.05
A0	3.00±0.10
B0	6.00±0.10
K0	3.00±0.10
T	0.30±0.05
D	178.0
d	13.0
L	15.0
Quantity: 1500PCS	

### Warehouse Storage Conditions of Products

- Storage Conditions:
  1. Storing temperature range: -25°C+85°C.
  2. Relative Humidity: ≤75%RH
  3. Keep away from corrosive atmosphere and sunlight.
  4. Period of Storage: 1 year

## RuiLongYuan Electronics Co., Ltd.

---

- Reproducing and modifying information of the document is prohibited without permission from Ruilongyuan International Inc.
  - Ruilongyuan International Inc. reserves the rights to make changes of the content herein the document anytime without notification. Please refer to our website for the latest document.
  - Ruilongyuan International Inc. disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
  - Ruilongyuan International Inc. does not assume any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
  - Applications shown on the herein document are examples of standard use and operation. Customers are responsible in comprehending the suitable use in particular applications. Ruilongyuan International Inc. makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
  - The products shown herein are not designed and authorized for equipments requiring high level of reliability or relating to human life and for any applications concerning life-saving or life-sustaining, such as medical instruments, transportation equipment, aerospace machinery et cetera. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Ruilongyuan International Inc. for any damages resulting from such improper use or sale.
-