

ELECTRONICS



# Glass Gas Discharge

RL302 Series

## Glass Gas Discharge - RL302 Series

### Features

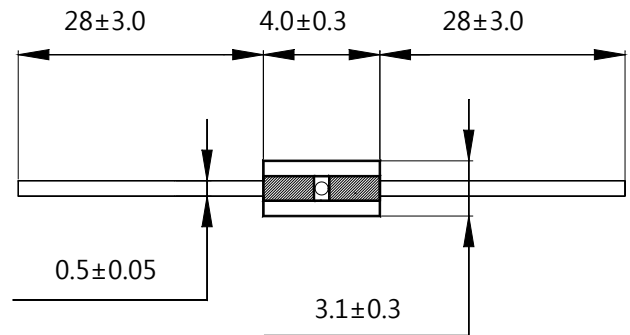
- Compared with other surge absorbers having similar functions has the fast response speed ,largest withstand current and voltage but smallest size.
- All electrical characteristics are very stable even after long period of charge and discharge. There is no need for inspection and exchange periodically.
- Super capability to withstand repeated lightning strikes.
- Stable and very Small electrostatic capacitance (<0.8pf) and great isolation (>100MΩ).
- No pollution material.
- Bilateral and symmetrical.
- Completely insensitive to weather, temperature, humidity and lightness.



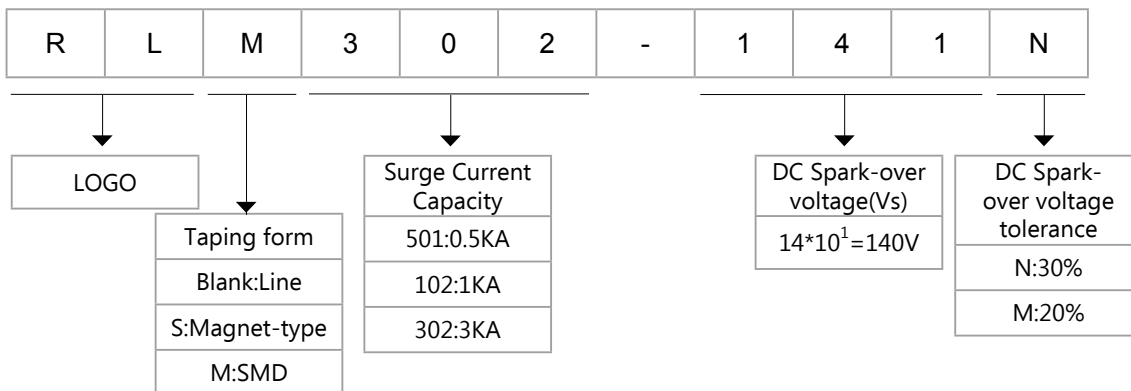
### Applications

- 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

### Dimensions



### Part Number Code



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### Electrical Characteristics

Type Number	DC Spark-Over Voltage	Insulation Resistance IR		Electrostatic Capacitance 1KHz-6Vmax	Surge current capacity 8/20us	AC withstanding voltage test condition	UL	Surge Life Test
	V	MΩ	DC V	pF	A	A		
RL302-141N	140±30%	>100MΩmin	50	<1.0	3000	-	-	10/700 6000V 150A 20time
RL302-201M	200±20%	>100MΩmin	100	<1.0	3000	-	O	
RL302-301M	300±20%	>100MΩmin	100	<1.0	3000	-	O	
RL302-401M	400±20%	>100MΩmin	250	<1.0	3000	-	O	
RL302-501M	500±20%	>100MΩmin	250	<1.0	3000	-	O	
RL302-701M	700±20%	>100MΩmin	250	<1.0	3000	-	-	
RL302-102M	1000±20%	>100MΩmin	500	<1.0	3000	-	-	
RL302-152M	1500±20%	>100MΩmin	500	<1.0	3000	-	-	
RL302-182M	1800±20%	>100MΩmin	500	<1.0	3000	-	-	
RL302-202M	2000±20%	>100MΩmin	500	<1.0	3000	-	-	
RL302-242M	2400±20%	>100MΩmin	250	<1.0	3000	1200	-	8/20us 150A 300time
RL302-272M	2700±20%	>100MΩmin	250	<1.0	3000	1200	-	
RL302-302M	3000±20%	>100MΩmin	500	<1.0	3000	1500	-	
RL302-362M	3600±20%	>100MΩmin	500	<1.0	3000	1800	O	
RL302-402M	4000±20%	>100MΩmin	500	<1.0	3000	2000	-	
RL302-452M	4500±20%	>100MΩmin	500	<1.0	3000	2000	-	

### Electrical Characteristics

No Radioactive Material

Storage Temperature: -55°C to +125°C

Operating Temperature: -55°C to +85°C

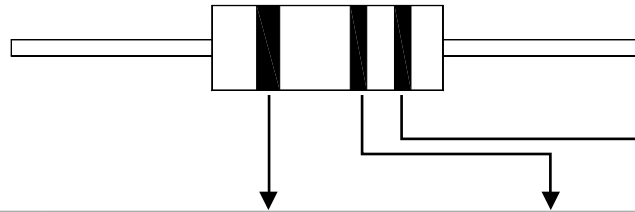
Body: Nickel Plated

Leads: Surface-mount, Axial Devices: Tin Plated

Devices with No Leads: Nickel Plated

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### Marking of color code



Type Number	1st Band	2nd Band	3rd Band
RL302-141N	Black	Yellow	-
RL302-201M	Red	-	-
RL302-301M	Orange	-	-
RL302-401M	Yellow	-	-
RL302-501M	Green	-	-
RL302-701M	Blue	-	-
RL302-102M	Black	-	-
RL302-152M	Black	Green	Red
RL302-182M	Brown	Gray	Red
RL302-202M	Red	Black	Red
RL302-242M	Red	Yellow	Red
RL302-272M	Red	Purple	Red
RL302-302M	Orange	Black	Red
RL302-362M	Orange	Blue	Red
RL302-402M	Yellow	Black	Red
RL302-452M	Yellow	Green	Red

## Glass Gas Discharge - RL302 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.

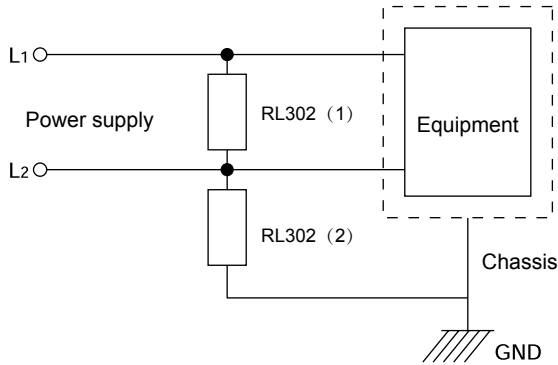
Testing of their product with the latest impulse voltage and current generators that can duplicate the test requirements of the various worldwide standards agencies. From these tests we can recommend the best solution to help you pass requirements.

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 electricy 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	

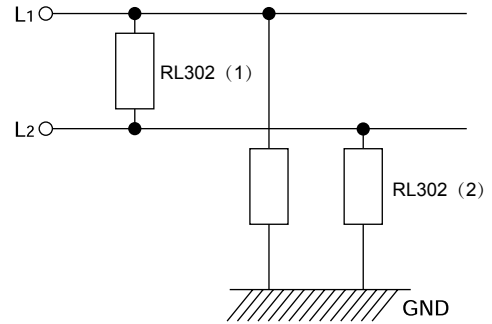
# Glass Gas Discharge - RL302 Series

## Surge Applications

1. Power supply requiring AC withstanding voltage test



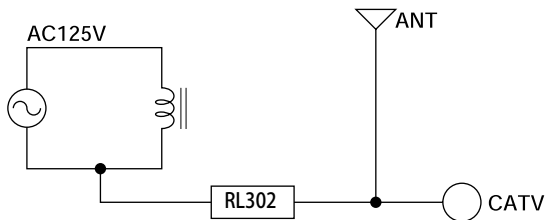
2. High quality supply



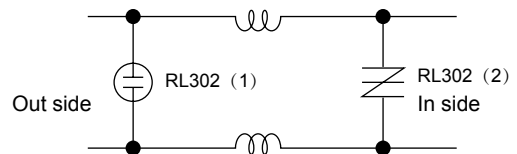
Conditions		AC125V	AC250V	
Normal mode (Between L1 and L2)	RL302 (2)	RL302-301M	RL302-501M	
AC withstanding voltage test condition	Common mod (Between L1, L2-GND) RL302 (1)	Test is not required	RL302-301M	RL302-501M
		AC1200V	RL302-242M	RL302-242M
	AC1500V	RL302-302M	RL302-302M	
	AC1800V	RL302-362M	RL302-362M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

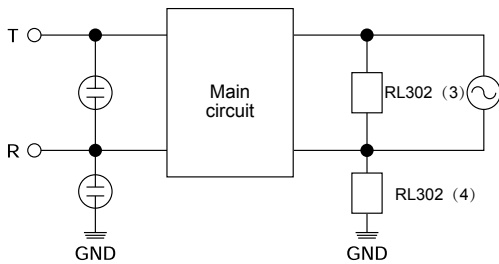


SA1:RL302-201M  
SA2:P0300EA

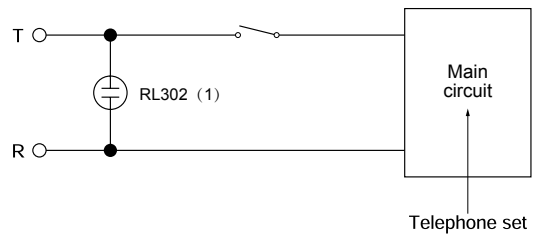
# Glass Gas Discharge - RL302 Series

## Surge Applications

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

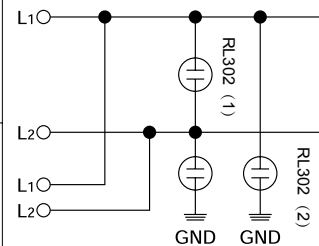


### Telephone (One piece, cordless, answering machine)



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

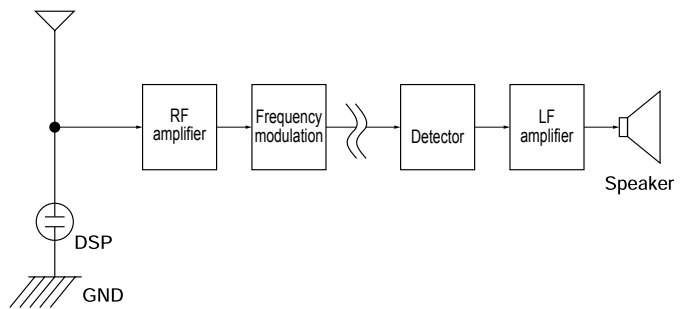
### Modem



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

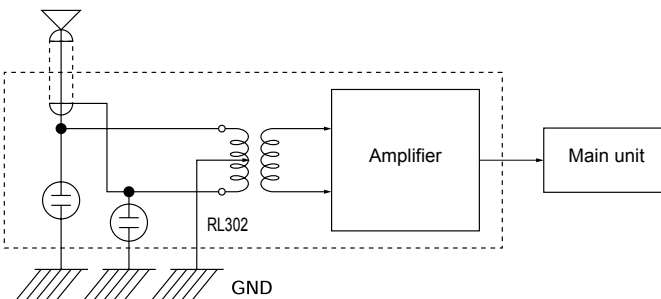
### 6. Car radio, radio cassette, wireless

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.



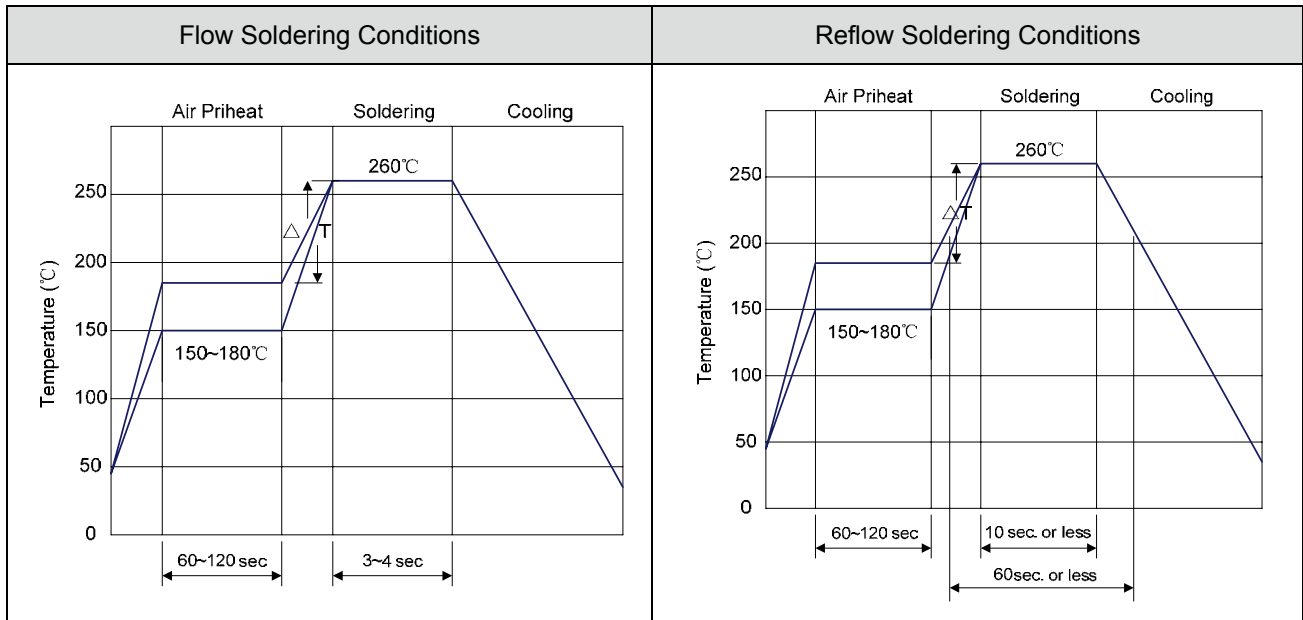
### 7. Boosters (for satellite broadcasting and general TV equipment)

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 - RL302 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.



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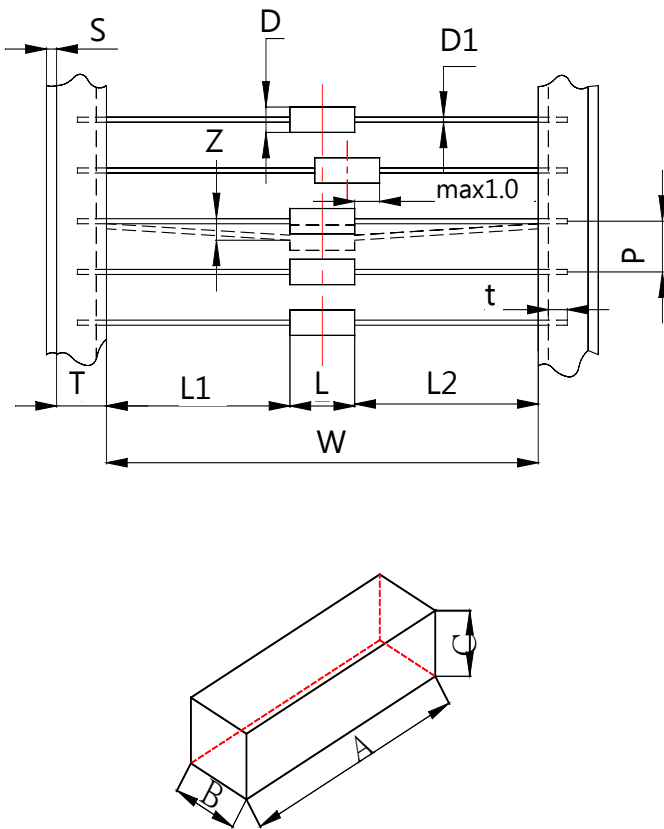
### Test Methods And Results

ITEM	TEST METHOD	STANDARD
Static Life	10KV with 1500pf condenser is discharged through 2K $\Omega$ resistor. 200 times at an interval of 10sec.	Rate-of-change, within $\pm 30\%$ insulation resistance & capacitance, conformed to rated spec.
Cold Resistance	Measurement after $-40^{\circ}\text{C}/1000$ HRS & normal temperature/2 HRS.	Features are conformed to rated spec.
Heat Resistance	Measurement after $125^{\circ}\text{C}/1000$ HRS & normal temperature/2 HRS. STANDARD	
Humidity Resistance	Measurement after humidity 90~95%( $45^{\circ}\text{C}$ )/1000 HRS & normal temperature/2 HRS.	
Temperature Cycle	10 times repetition of cycle $-40^{\circ}\text{C}/30\text{min}$ normal,temp/2 min $\rightarrow 125^{\circ}\text{C}/30\text{min}$ , measurement after normal temp/2 HRS.	
Solder Ability	Apply flux and immerse in molten solder $230 \pm 5^{\circ}\text{C}$ for 3sec up to the point of 1.5mm from body. Check for solder adhesion.	
Solder Heat	Measurement after lead wire is dipped up to the point of 1.5mm from body into $260 \pm 5^{\circ}\text{C}$ 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.	

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### Ordering Information

Symbol	Dimension (mm)
W	52.0±1.5
P	5.0±0.5
L1-L2	1.0max.
T	6.0±1.0
Z	1.2max.
R	Terminals must not project from tape.
t	3.2max.
S	0.8max.
D	φ 3.1max.
D1	φ 0.5±0.05
L	4.0max.
A	255.0
B	75.0
C	68 .0
Antity: 1500PCS	



### Warehouse Storage Conditions of Products

- Storage Conditions:
  1. Storage Temperature: -10°C~+40°C
  2. Relative Humidity: ≤75%RH
  3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year

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