

ELECTRONICS



Glass Gas Discharge

RL302 Series

Glass Gas Discharge - RL302 Series

Features

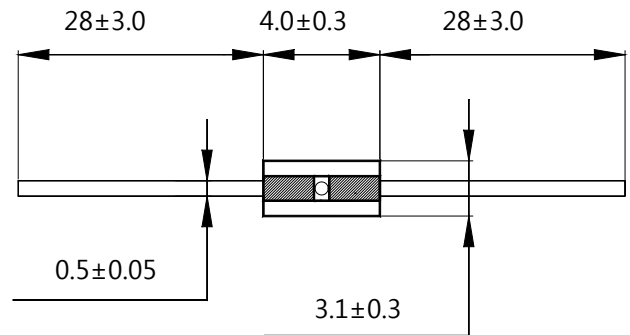
- Compared with other surge absorbers having similar functions has the fast response speed ,largest withstand current and voltage but smallest size.
- All electrical characteristics are very stable even after long period of charge and discharge. There is no need for inspection and exchange periodically.
- 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.



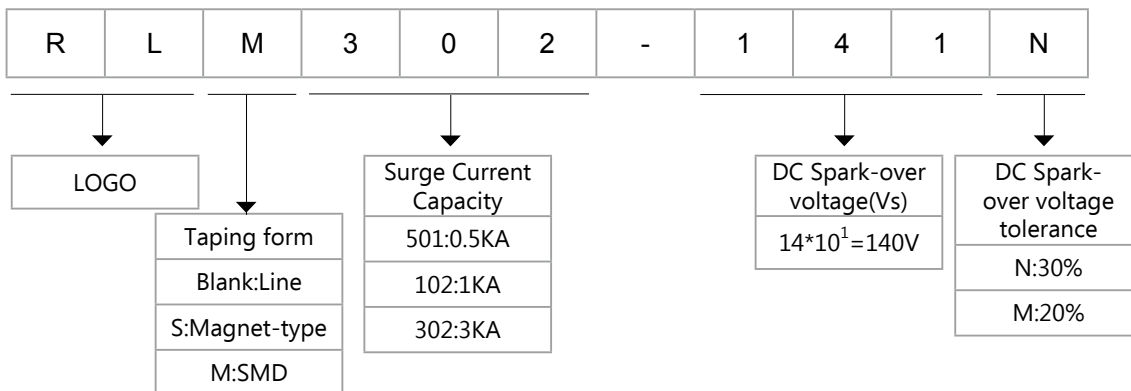
Applications

- 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



Glass Gas Discharge - RL302 Series

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

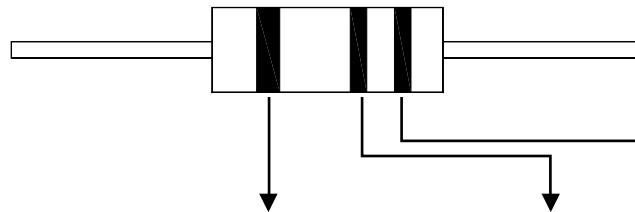
Body: Nickel Plated

Leads: Surface-mount, Axial Devices: Tin Plated

Devices with No Leads: Nickel Plated

Glass Gas Discharge - RL302 Series

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.

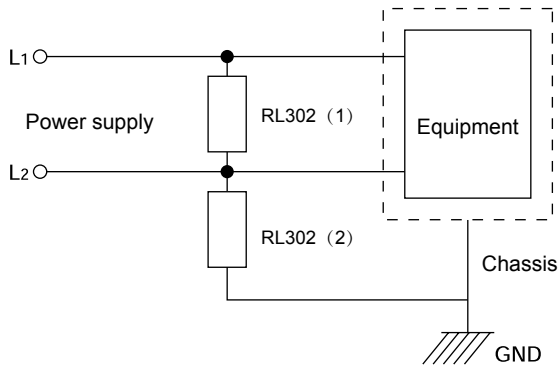
Testing of their product with the latest impulse voltage and current generators that can duplicate the test requirements of the various worldwide standards agencies. From these tests we can recommend the best solution to help you pass requirements.

| Reference standard | Wave form | comments |
|--------------------------|---|----------------------------------|
| JEC standard | 1.2/50 μ s 30kVmax | Indirect lightning protection |
| | 8/20 μ s 6kAmax | |
| IEC61000-4-5 conformance | 1.2/50 μ s 15kV 8/20 μ s 7.5kA | Indirect lightning protection |
| IEC61000-4-2 conformance | 150pF 330 Ω 30kVmax | Static electricity protection |
| FCC standard | 10/560 μ s 800V 100A | Communication related protection |
| FCC standard | 10/160 μ s 1.5kV 200A | Communication related protection |
| FCC standard conformance | 10/700 μ s 15kVmax | Communication related protection |
| IEEE | 0.5 μ -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 μ s 2.5kV 1kA | |
| | 10/200 μ s 20kVmax | |
| | 0.5/700 μ s 6kVmax | |
| | 100/700 μ s 5kVmax | |

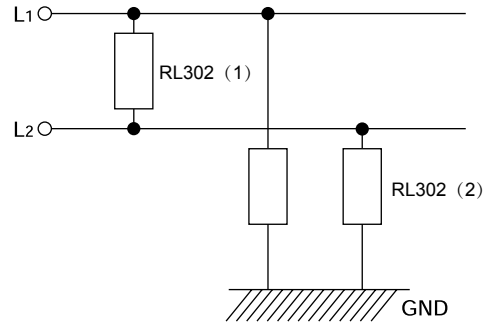
Glass Gas Discharge - RL302 Series

Surge Applications

1. Power supply requiring AC withstanding voltage test



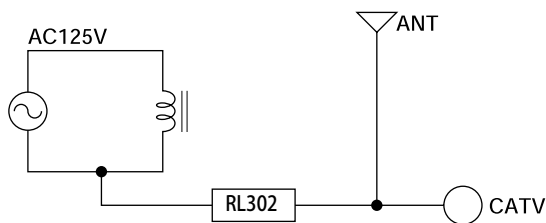
2. High quality supply



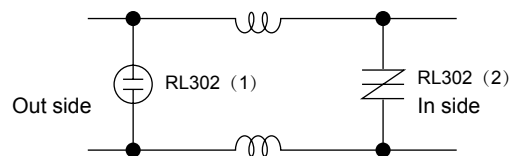
| Conditions | | AC125V | AC250V | |
|--|---|----------------------|------------|------------|
| Normal mode (Between L1 and L2) | RL302 (2) | RL302-301M | RL302-501M | |
| AC withstanding voltage test condition | Common mod (Between L1, L2-GND) RL302 (1) | Test is not required | RL302-301M | RL302-501M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

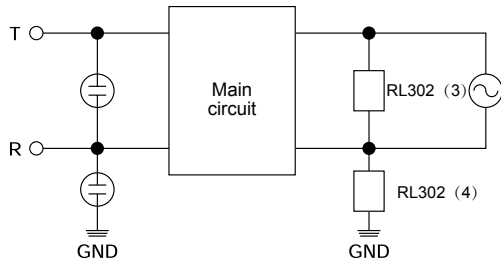


SA1:RL302-201M
SA2:P0300EA

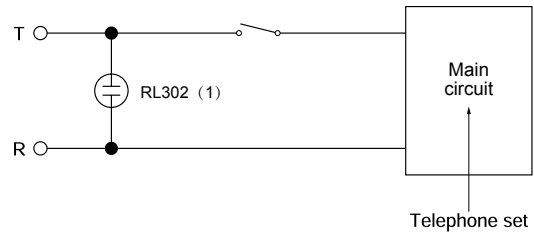
Glass Gas Discharge - RL302 Series

Surge Applications

5. Telecommunication equipment (FAX, KTS, PBX)

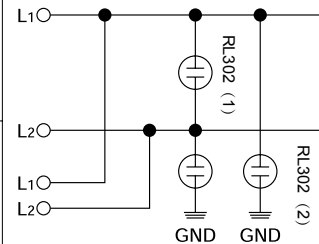


Telephone (One piece, cordless, answering machine)



| | 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 | | |

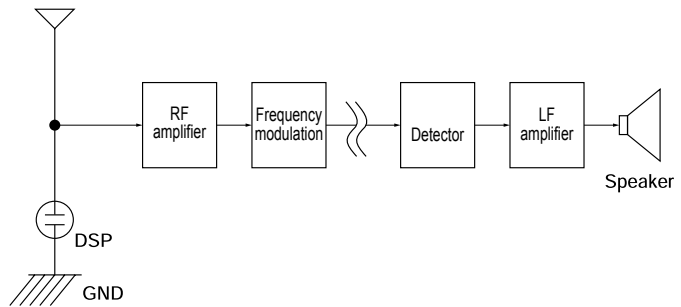
Modem



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

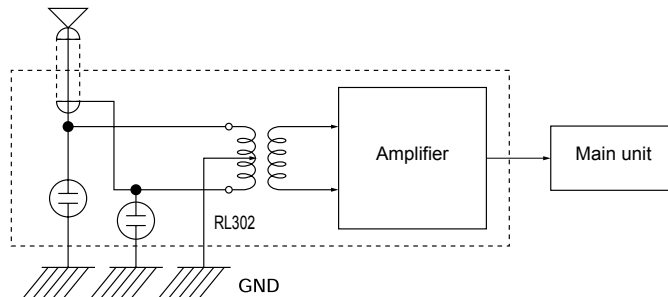
6. Car radio, radio cassette, wireless

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.



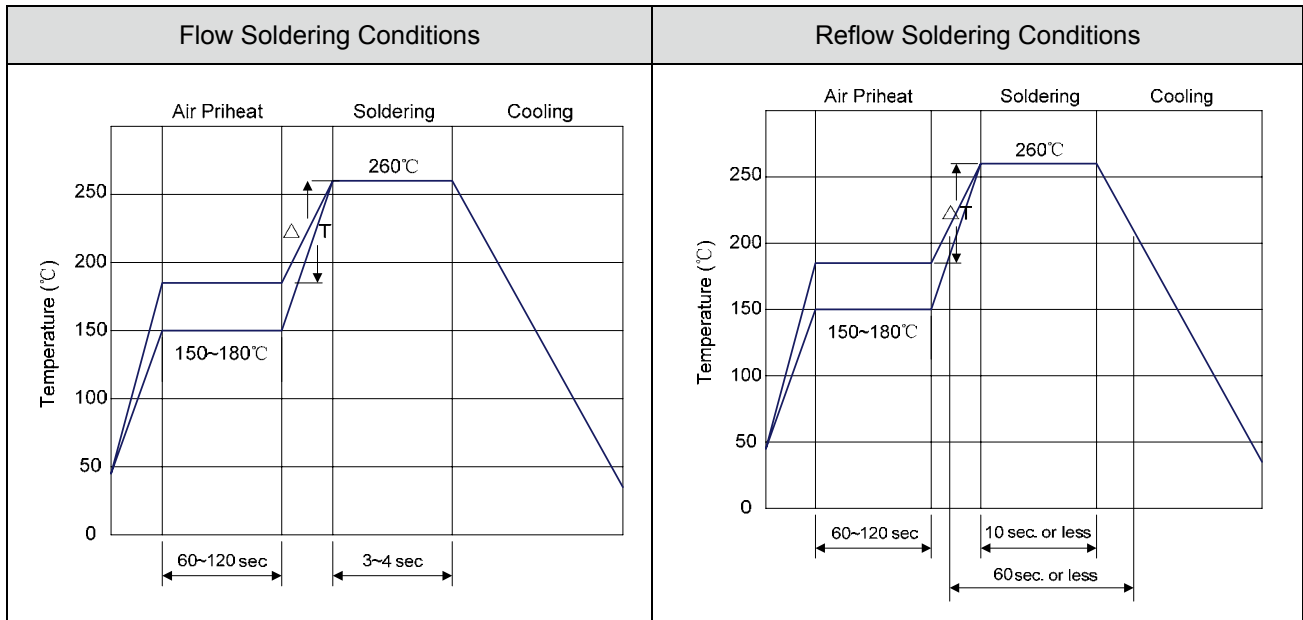
7. Boosters (for satellite broadcasting and general TV equipment)

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.



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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 - RL302 Series

Test Methods And Results

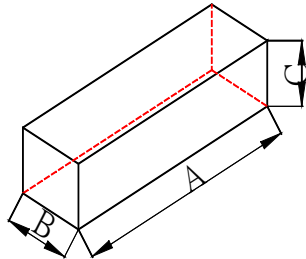
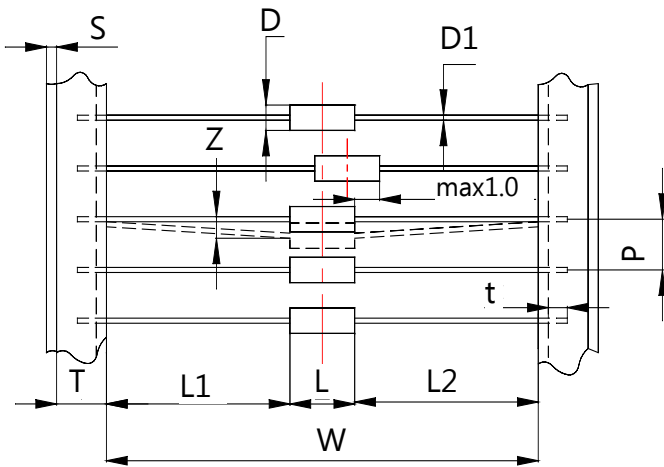
| ITEM | TEST METHOD | STANDARD |
|---------------------|---|---|
| Static Life | 10KV with 1500pf condenser is discharged through 2K Ω resistor. 200 times at an interval of 10sec. | Rate-of-change, within $\pm 30\%$ insulation resistance & capacitance, conformed to rated spec. |
| Cold Resistance | 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°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. | 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 $260 \pm 5^{\circ}\text{C}$ 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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