

- Excellent high frequency characteristics  
Isolation: Min. 65dB (at 900 MHz)  
Insertion loss: Max. 1.0 (at 900 MHz)
- Wide selection  
Characteristic impedance: 50 Ω type and 75 Ω type  
Coil: Single side stable and latching type
- 1 A 24 V DC switching capacity
- Sealed construction for automatic cleaning
- High sensitivity 350W (1 Form C) in small size

## SPECIFICATIONS

### Contact

|  |                            |                   |            |
|--|----------------------------|-------------------|------------|
| Arrangement  | 1 Form C, 2 Form C         |                   |            |
| Contact material   | Gold-clad silver           |                   |            |
| Initial contact resistance, max.<br>(By voltage drop 6 V DC 1 A) | 100 mΩ                     |                   |            |
| Rating<br>(resistive)  | Max. switching power       | 24 W              |            |
|  | Max. switching voltage     | 24 V DC           |            |
|  | Max. switching current     | 1 A               |            |
|  | Nominal switching capacity | 1 A 24 V DC       |            |
| High frequency characteristics<br>(at 900 MHz)                   |                            | 50 Ω              | 75 Ω       |
|  | Isolation                  | Min. 65 dB        | Min. 65 dB |
|  | Insertion loss             | Max. 1 dB         | Max. 1 dB  |
|  | V.S.W.R.                   | Max. 1.2          | Max. 2.0   |
| Expected life<br>(min. operations)                               | Mechanical                 | 5×10 <sup>6</sup> |            |
|  | Electrical 1 A 24 V DC     | 10 <sup>5</sup>   |            |

### Coil (polarized) (at 25°C, 68°F)

|                    |          |          |
|--------------------|----------|----------|
|                    | 1 Form C | 2 Form C |
| Single side stable | 350 mW   | 400 mW   |
| 1 coil latching    | 175 mW   | 200 mW   |
| 2 coil latching    | 350 mW   | 400 mW   |

### Characteristics

|   |   |  |
|---|---|--|
| Initial insulation resistance* <sup>1</sup>   | Min. 100 MΩ at 500 V DC   |  |
| Initial breakdown voltage* <sup>2</sup>   | Between open contacts   | 1,000 Vrms                                 |
|   | Between contacts and coil   | 2,000 Vrms                                 |
|   | Between contacts and earth terminal   | 500 Vrms                                   |
| Operate time* <sup>3</sup> (at nominal voltage)   | Approx. 10 ms   |  |
| Release time* <sup>3</sup> (at nominal voltage)(without diode)                                      | Approx. 5 ms  |  |
| Set time* <sup>3</sup> (at nominal voltage)   | Approx. 7 ms  |  |
| Reset time* <sup>3</sup> (at nominal voltage)   | Approx. 7 ms  |  |
| Temperature rise (at 20°C)  | Max. 55°C with nominal coil voltage across coil and at nominal switching capacity |  |
| Shock resistance  | Functional* <sup>4</sup>  | Min. 196 m/s <sup>2</sup> {20 G}           |
|   | Destructive* <sup>5</sup>   | Min. 980 m/s <sup>2</sup> {100 G}          |
| Vibration resistance  | Functional* <sup>6</sup>  | 10 to 55 Hz<br>at double amplitude of 2 mm |
|   | Destructive   | 10 to 55 Hz<br>at double amplitude of 2 mm |
| Conditions for operation, transport and storage<br>(Not freezing and condensing at low temperature) | Ambient temp.   | -50°C to 60°C<br>-58°F to 140°F            |
|   | Humidity  | 5 to 85%R.H.                               |
| Unit weight   | 1 C type  | Approx. 8 g .282 oz                        |
|   | 2 C type  | Approx. 10 g .353 oz                       |

### Remarks

- \* Specifications will vary with foreign standards certification ratings.
- \*<sup>1</sup> Measurement at same location as "Initial breakdown voltage" section
- \*<sup>2</sup> Detection current: 10mA
- \*<sup>3</sup> Excluding contact bounce time
- \*<sup>4</sup> Half-wave pulse of sine wave: 11ms; detection time: 10μs
- \*<sup>5</sup> Half-wave pulse of sine wave: 6ms
- \*<sup>6</sup> Detection time: 10μs

## TYPICAL APPLICATIONS

- Measuring instrument
- Testing equipment
- CATV converter
- Audio visual equipment
- TV game set

## ORDERING INFORMATION

|                          |                          |  |                              |
|--------------------------|--------------------------|--|------------------------------|
| Ex. RG 1 T L 5V          |                          |  |                              |
| Contact arrangement      | Characteristic impedance | Operating function   | Coil voltage                 |
| 1:1 Form C<br>2:2 Form C | Nil: 75 Ω<br>T: 50 Ω     | Nil: Single side stable<br>L: 1 coil latching<br>L2: 2 coil latching | DC: 3, 5, 6, 9, 12, 24, 48 V |

Note: Standard packing; Carton: 50 pcs. Case 500 pcs.

# RG

## TYPES ANE COIL DATA (at 20°C 68°F)

1 Form C

### Single side stable

| Part No.            | Nominal voltage<br>V DC | Pick-up voltage, max.<br>V DC | Drop-out voltage, min.<br>V DC | Coil resistance,<br>$\Omega$ ( $\pm 10\%$ ) | Nominal operating current, mA | Nominal operating power, mW | Maximum allowable voltage, V DC<br>(40°C 104°F) |
|---------------------|-------------------------|-------------------------------|--------------------------------|---|-------------------------------|-----------------------------|---|
| RG1-3V<br>RG1T-3V   | 3                       | 2.4                           | 0.3                            | 25.7  | 117                           | 350                         | 3.6   |
| RG1-5V<br>RG1T-5V   | 5                       | 4.0                           | 0.5                            | 71.4  | 70                            | 350                         | 6.0   |
| RG1-6V<br>RG1T-6V   | 6                       | 4.8                           | 0.6                            | 103   | 58.3                          | 350                         | 7.2   |
| RG1-9V<br>RG1T-9V   | 9                       | 7.2                           | 0.9                            | 231   | 38.9                          | 350                         | 10.8  |
| RG1-12V<br>RG1T-12V | 12                      | 9.6                           | 1.2                            | 411   | 29.2                          | 350                         | 14.4  |
| RG1-24V<br>RG1T-24V | 24                      | 19.2                          | 2.4                            | 1,646                                       | 14.6                          | 350                         | 28.8  |
| RG1-48V<br>RG1T-48V | 48                      | 38.4                          | 4.8                            | 6,583                                       | 7.3                           | 350                         | 57.6  |

### 1 coil latching

| Part No.                | Nominal voltage<br>V DC | Set and reset voltage,<br>V DC (max.) | Coil resistance,<br>$\Omega$ ( $\pm 10\%$ ) | Nominal operating current, mA | Nominal operating power, mW | Maximum allowable voltage, V DC<br>(40°C 104°F) |
|-------------------------|-------------------------|---------------------------------------|---|-------------------------------|-----------------------------|---|
| RG1-L-3V<br>RG1T-L-3V   | 3                       | 2.4                                   | 51.4  | 58.3                          | 175                         | 3.6   |
| RG1-L-5V<br>RG1T-L-5V   | 5                       | 4.0                                   | 142.8                                       | 35                            | 175                         | 6.0   |
| RG1-L-6V<br>RG1T-L-6V   | 6                       | 4.8                                   | 206   | 29.2                          | 175                         | 7.2   |
| RG1-L-9V<br>RG1T-L-9V   | 9                       | 7.2                                   | 462   | 19.4                          | 175                         | 10.8  |
| RG1-L-12V<br>RG1T-L-12V | 12                      | 9.6                                   | 822   | 14.6                          | 175                         | 14.4  |
| RG1-L-24V<br>RG1T-L-24V | 24                      | 19.2                                  | 3,292                                       | 7.3                           | 175                         | 28.8  |
| RG1-L-48V<br>RG1T-L-48V | 48                      | 38.4                                  | 13,166                                      | 3.6                           | 175                         | 57.6  |

### 2 coil latching

| Part No.                  | Nominal voltage<br>V DC | Set and reset voltage,<br>V DC (max.) | Coil resistance, $\Omega$ ( $\pm 10\%$ ) |        | Nominal operating current, mA | Nominal operating power, mW | Maximum allowable voltage, V DC<br>(40°C 104°F) |
|---------------------------|-------------------------|---------------------------------------|--|--------|-------------------------------|-----------------------------|---|
|                           |                         |                                       | Coil 1                                   | Coil 2 |                               |                             |   |
| RG1-L2-3V<br>RG1T-L2-3V   | 3                       | 2.4                                   | 25.7                                     | 25.7   | 117                           | 350                         | 3.6   |
| RG1-L2-5V<br>RG1T-L2-5V   | 5                       | 4.0                                   | 71.4                                     | 71.4   | 70                            | 350                         | 6.0   |
| RG1-L2-6V<br>RG1T-L2-6V   | 6                       | 4.8                                   | 103                                      | 103    | 58.3                          | 350                         | 7.2   |
| RG1-L2-9V<br>RG1T-L2-9V   | 9                       | 7.2                                   | 231                                      | 231    | 38.9                          | 350                         | 10.8  |
| RG1-L2-12V<br>RG1T-L2-12V | 12                      | 9.6                                   | 411                                      | 411    | 29.2                          | 350                         | 14.4  |
| RG1-L2-24V<br>RG1T-L2-24V | 24                      | 19.2                                  | 1,646                                    | 1,646  | 14.6                          | 350                         | 28.8  |
| RG1-L2-48V<br>RG1T-L2-48V | 48                      | 38.4                                  | 6,583                                    | 6,583  | 7.3                           | 350                         | 57.6  |

2 Form C

### Single side stable

| Part No.            | Nominal voltage<br>V DC | Pick-up voltage, max.<br>V DC | Drop-out voltage, min.<br>V DC | Coil resistance,<br>$\Omega$ ( $\pm 10\%$ ) | Nominal operating current, mA | Nominal operating power, mW | Maximum allowable voltage, V DC<br>(40°C 104°F) |
|---------------------|-------------------------|-------------------------------|--------------------------------|---|-------------------------------|-----------------------------|---|
| RG2-3V<br>RG2T-3V   | 3                       | 2.4                           | 0.3                            | 22.5  | 133                           | 400                         | 3.6   |
| RG2-5V<br>RG2T-5V   | 5                       | 4.0                           | 0.5                            | 62.5  | 80                            | 400                         | 6.0   |
| RG2-6V<br>RG2T-6V   | 6                       | 4.8                           | 0.6                            | 90  | 66.7                          | 400                         | 7.2   |
| RG2-9V<br>RG2T-9V   | 9                       | 7.2                           | 0.9                            | 202.5                                       | 44.4                          | 400                         | 10.8  |
| RG2-12V<br>RG2T-12V | 12                      | 9.6                           | 1.2                            | 360   | 33.3                          | 400                         | 14.4  |
| RG2-24V<br>RG2T-24V | 24                      | 19.2                          | 2.4                            | 1,440                                       | 16.7                          | 400                         | 28.8  |
| RG2-48V<br>RG2T-48V | 48                      | 38.4                          | 4.8                            | 5,760                                       | 8.3                           | 400                         | 57.6  |

**1 coil latching**

| Part No.                | Nominal voltage V DC | Set and reset voltage, V DC (max.) | Coil resistance, Ω (±10%) | Nominal operating current, mA | Nominal operating power, mW | Maximum allowable voltage, V DC (40°C 104°F) |
|-------------------------|----------------------|------------------------------------|---------------------------|-------------------------------|-----------------------------|--|
| RG2-L-3V<br>RG2T-L-3V   | 3                    | 2.4                                | 45                        | 66.7                          | 200                         | 3.6  |
| RG2-L-5V<br>RG2T-L-5V   | 5                    | 4.0                                | 125                       | 40                            | 200                         | 6.0  |
| RG2-L-6V<br>RG2T-L-6V   | 6                    | 4.8                                | 180                       | 33.3                          | 200                         | 7.2  |
| RG2-L-9V<br>RG2T-L-9V   | 9                    | 7.2                                | 405                       | 22.2                          | 200                         | 10.8   |
| RG2-L-12V<br>RG2T-L-12V | 12                   | 9.6                                | 720                       | 16.7                          | 200                         | 14.4   |
| RG2-L-24V<br>RG2T-L-24V | 24                   | 19.2                               | 2,880                     | 8.3                           | 200                         | 28.8   |
| RG2-L-48V<br>RG2T-L-48V | 48                   | 38.4                               | 11,520                    | 4.2                           | 200                         | 57.6   |

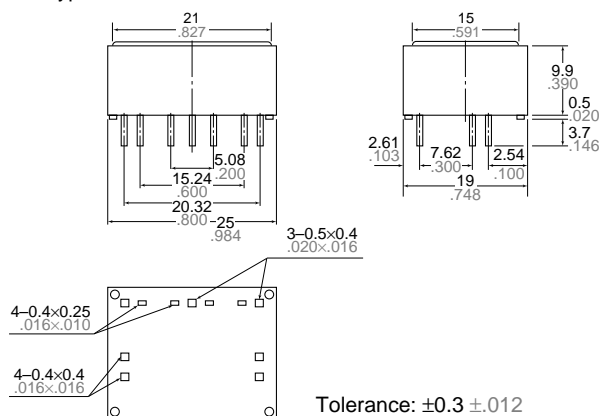
**2 coil latching**

| Part No.                  | Nominal voltage V DC | Set and reset voltage, V DC (max.) | Coil resistance, Ω (±10%) |        | Nominal operating current, mA | Nominal operating power, mW | Maximum allowable voltage, V DC (40°C 104°F) |
|---------------------------|----------------------|------------------------------------|---------------------------|--------|-------------------------------|-----------------------------|--|
|                           |                      |                                    | Coil 1                    | Coil 2 |                               |                             |  |
| RG2-L2-3V<br>RG2T-L2-3V   | 3                    | 2.4                                | 22.5                      | 22.5   | 133                           | 400                         | 3.6  |
| RG2-L2-5V<br>RG2T-L2-5V   | 5                    | 4.0                                | 62.5                      | 62.5   | 80                            | 400                         | 6.0  |
| RG2-L2-6V<br>RG2T-L2-6V   | 6                    | 4.8                                | 90                        | 90     | 66.7                          | 400                         | 7.2  |
| RG2-L2-9V<br>RG2T-L2-9V   | 9                    | 7.2                                | 203                       | 202.5  | 44.4                          | 400                         | 10.8   |
| RG2-L2-12V<br>RG2T-L2-12V | 12                   | 9.6                                | 360                       | 360    | 33.3                          | 400                         | 14.4   |
| RG2-L2-24V<br>RG2T-L2-24V | 24                   | 19.2                               | 1,440                     | 1,440  | 16.7                          | 400                         | 28.8   |
| RG2-L2-48V<br>RG2T-L2-48V | 48                   | 38.4                               | 5,760                     | 5,760  | 8.3                           | 400                         | 57.6   |

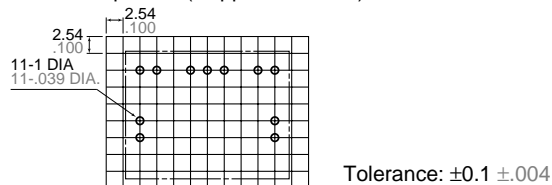
**DIMENSIONS**

mm inch

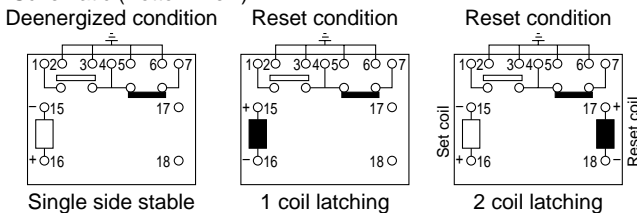
1 Form C type



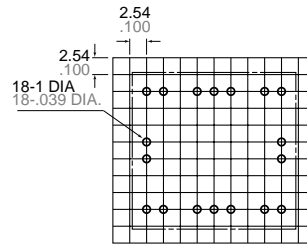
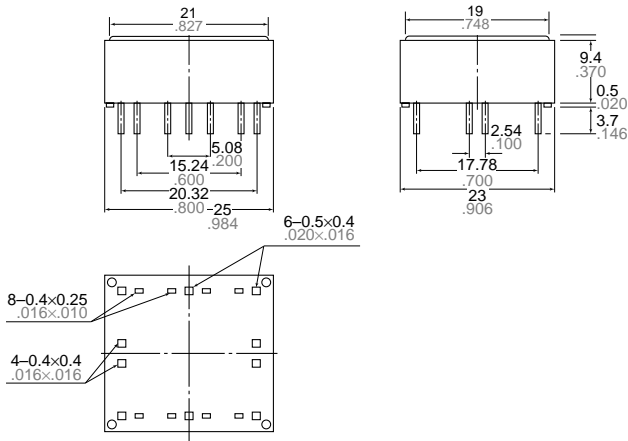
PC board pattern (Copper-side view)



Schematic (Bottom view)



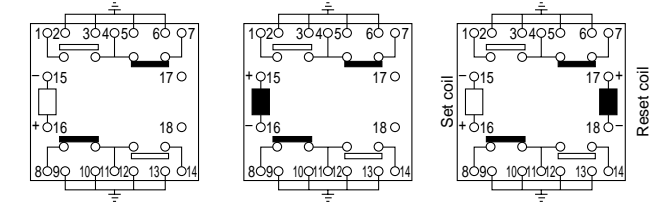
PC board pattern (Copper-side view)



Tolerance:  $\pm 0.1 \pm .004$

General tolerance:  $\pm 0.3 \pm .012$

Schematic (Bottom view)

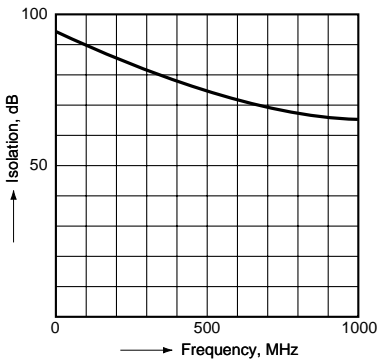


Single side stable Deenergized condition      1 coil latching Reset condition      2 coil latching Reset condition

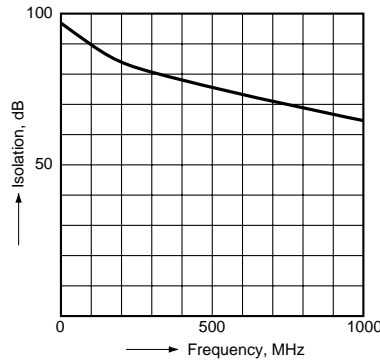
## REFERENCE DATA

### 1. Isolation

RG2-12V  
75  $\Omega$  characteristic impedance

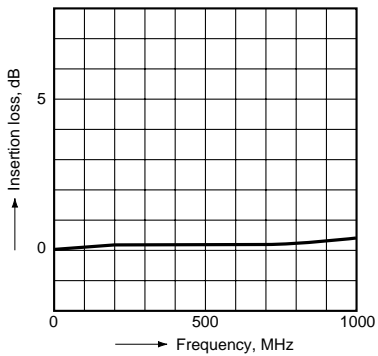


RG2T-12V  
50  $\Omega$  characteristic impedance

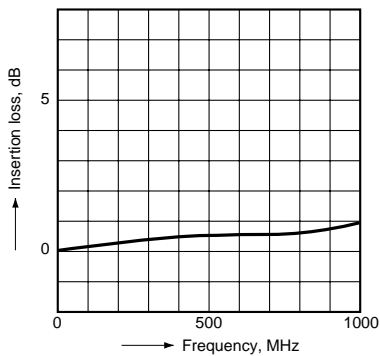


### 2. Insertion loss

RG2-12V  
75  $\Omega$  characteristic impedance

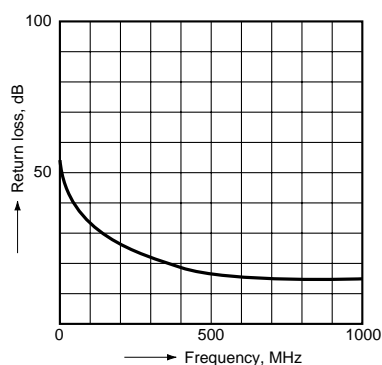


RG2T-12V  
50  $\Omega$  characteristic impedance

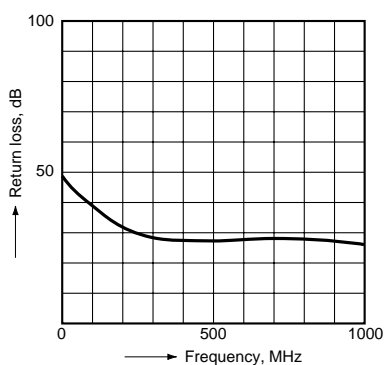


3. Return loss

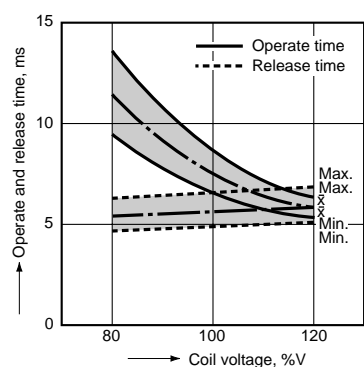
RG2-12V  
75 Ω characteristic impedance



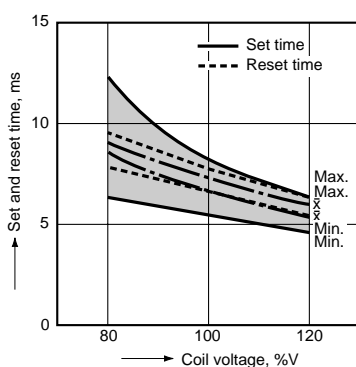
RG2T-12V  
50 Ω characteristic impedance



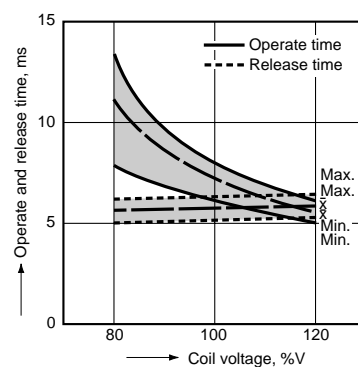
4-(1). Operate and release time (1C)  
RG1-12V 6 pcs.



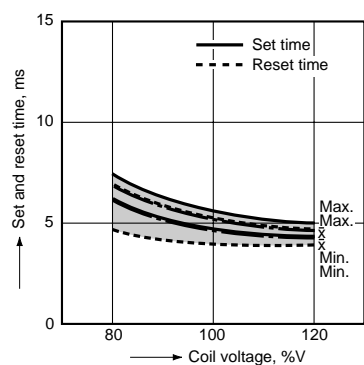
4-(2). Set and reset time (1C)  
RG1-L2-12V 6 pcs.



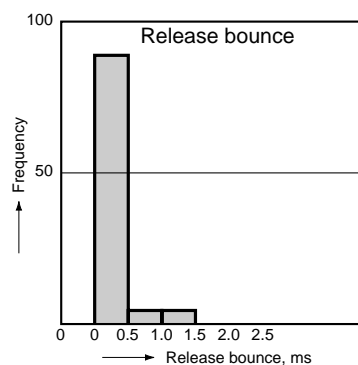
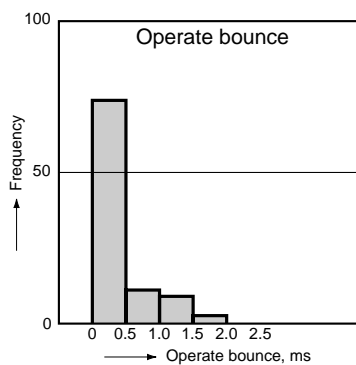
4-(3). Operate and release time  
(Without diode) (2C)  
RG2-12V 6 pcs.



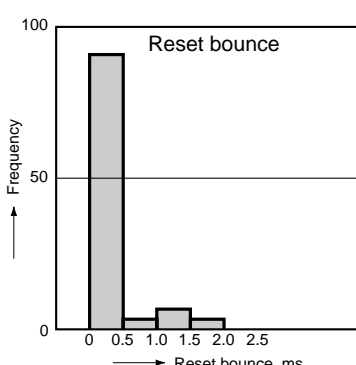
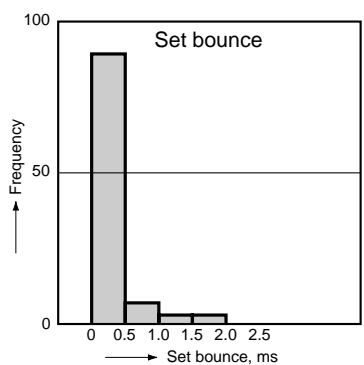
4-(4). Set and reset time (2C)  
RG2-L2-12V 6 pcs.



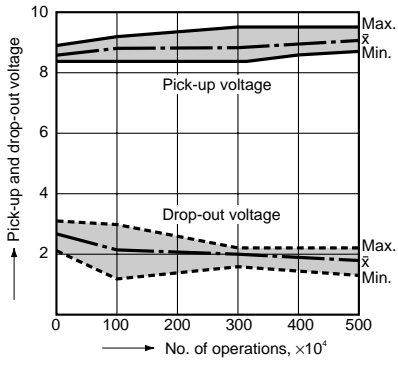
5-(1). Bounce time (2C)  
RG2-12V 100 pcs.  
Nominal voltage is applied.



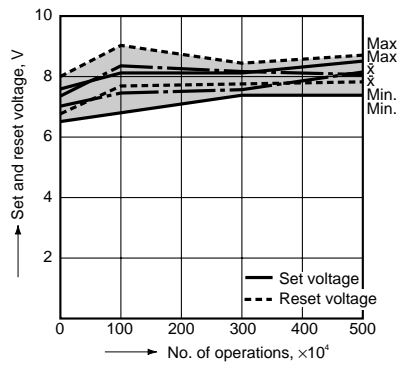
5-(2). Bounce time (2C)  
RG2-L2-12V 100 pcs.  
Nominal voltage is applied.



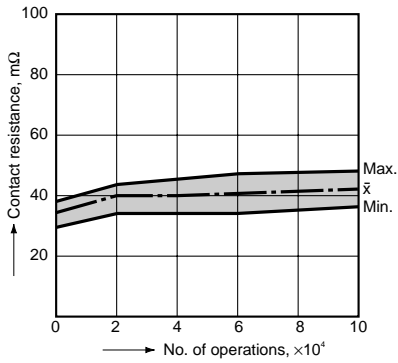
6-(1). Mechanical life (1C)  
RG1-12V 12 pcs.



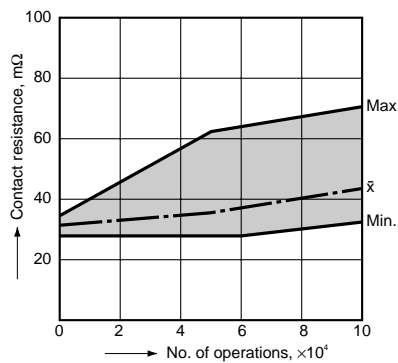
6-(2). Mechanical life (1C latching type)  
RG1-L2-12V 6 pcs.



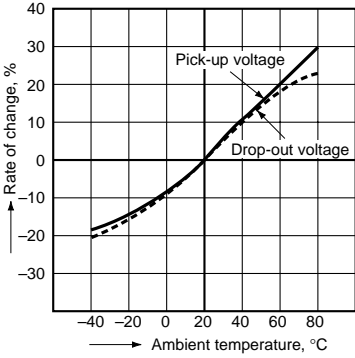
7-(1). Electrical life (10 mA 24 V DC resistive load)  
RG2-12V 6 pcs.



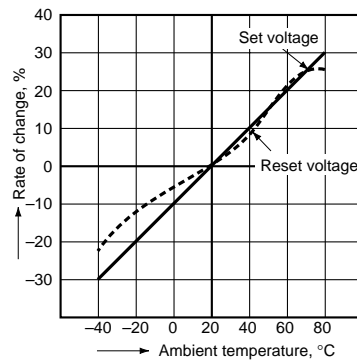
7-(2). Electrical life (1 A 24 V DC resistive load)  
RG2-12V 6 pcs.



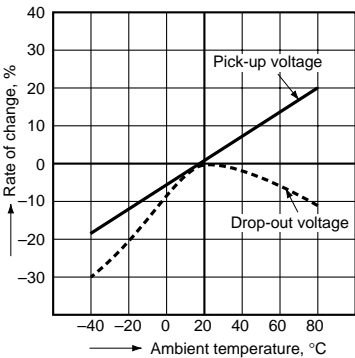
8-(1). Rate of change in pick-up and drop-out voltage (1C)  
RG1-12V 5 pcs.



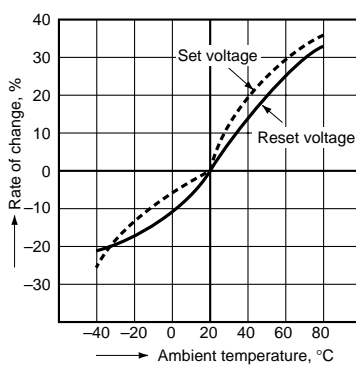
RG1-L2-12V 5 pcs.



8-(2). Rate of change in pick-up and drop-out voltage (2C)  
RG2-12V 5 pcs.

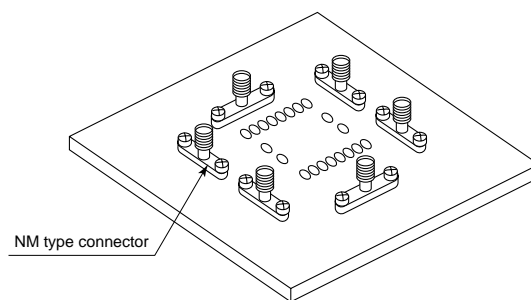
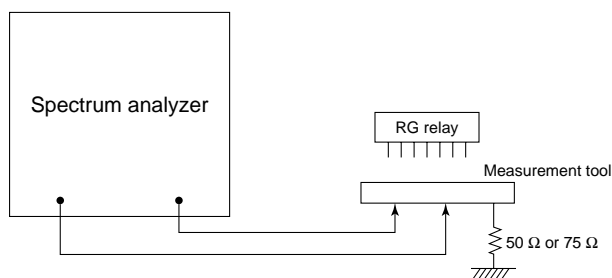


RG2-L2-12V 5 pcs.

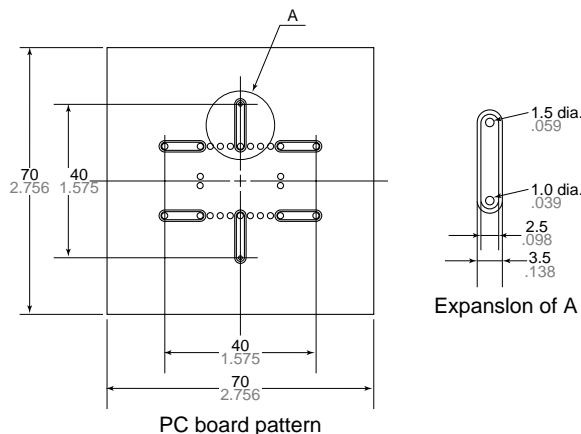


Test condition

mm inch



1. Characteristic impedance of all the measuring devices (signal generator and cable) is 50Ω or 75Ω.
2. The PC board for the test is double side copper clad phenolic paper laminate with thickness of 1.6 mm.
3. Grounding terminal holes are plated through.
4. Grounding terminal and one of the coil terminals are soldered to the PC board to be grounded.
5. Connection with measurement instrument is made with semi-rigid cable (Uniform Tube UT 141A) and high frequency NM type connector.



NOTES

1. Soldering

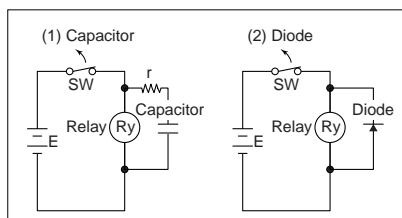
Perform soldering under the conditions below.

- Within 10s at 250°C 482°F
- Within 5s at 300°C 572°F
- Within 3s at 350°C 662°F

2. Counter voltage of DC relays

If input is cut off in DC relays, a counter voltage is developed across the coil as a result of the collapse of the magnetic field. If the coil is used in a transistor circuit, the reverse voltage produced from the coil can cause a serious circuit malfunction.

This counter voltage can be reduced considerably by connecting a capacitor or a diode in parallel with the coil. The level of reduction must be determined either by calculation if the coil data is available or by experiment.



3. Latching relay

In order to assure proper operating regardless of changes in the ambient usage temperature and usage conditions, nominal operating voltage should be applied to the coil for more than 40 ms to set/reset the latching type relay.

**For Cautions for Use, see Relay Technical Information (Page 48 to 76).**