

# MINIATURE RELAY

## 2 POLES—1 to 2 A (FOR SIGNAL SWITCHING)

### RY SERIES

RoHS compliant



#### FEATURES

- Ultra high sensitivity
- UL, CSA recognized
- Conforms to FCC rules and regulations Part 68 —Surge strength 1,500 V
- High dielectric strength type available (RY-WF type)
- Contact arrangement MBB type available (RY-D type)
- High reliability-bifurcated contacts
- Wide operating range
- DIL pitch terminals
- Plastic sealed type
- RoHS compliant since date code: 0438B9  
Please see page 8 for more information



#### ORDERING INFORMATION

[Example]  $\frac{RY}{(a)}$  -  $\frac{12}{(*)}$   $\frac{WF}{(b)}$  -  $\frac{K}{(d)}$

|     |                           |   |
|-----|---------------------------|---|
| (a) | Series Name               | RY : RY Series  |
| (b) | Nominal Voltage           | Refer to the COIL DATA CHART  |
| (c) | Coil and Contact Function | W : High sensitive type<br>WZ : Nominal 0.5 W type<br>WF : High dielectric strength type<br>WFZ : 2 A type<br>D : 2 FORM D (2 MBB type) |
| (d) | Enclosure                 | K : Plastic sealed type   |

Note: Actual marking omits the hyphen (-) of (\*)  
For movable and stationary contact with gold overlay type, add suffix “-OH”.

# RY SERIES

## ■ COIL DATA CHART

|                          | MODEL       | Nominal voltage | Coil resistance (±10%) | Must operate voltage | Must release voltage | Nominal power |
|--------------------------|-------------|-----------------|------------------------|----------------------|----------------------|---------------|
| High Sensitive Type      | RY-4.5 W-K  | 4.5 VDC         | 135Ω                   | 3.2 VDC              | 0.23 VDC             | 150 mW        |
|                          | RY- 5 W-K   | 5 VDC           | 165Ω                   | 3.6 VDC              | 0.25 VDC             | 150 mW        |
|                          | RY- 6 W-K   | 6 VDC           | 240Ω                   | 4.3 VDC              | 0.3 VDC              | 150 mW        |
|                          | RY- 9 W-K   | 9 VDC           | 540Ω                   | 6.4 VDC              | 0.45 VDC             | 150 mW        |
|                          | RY- 12 W-K  | 12 VDC          | 960Ω                   | 8.5 VDC              | 0.6 VDC              | 150 mW        |
|                          | RY- 18 W-K  | 18 VDC          | 1,620Ω                 | 12.6 VDC             | 0.9 VDC              | 200 mW        |
|                          | RY- 24 W-K  | 24 VDC          | 2,880Ω                 | 16.8 VDC             | 1.2 VDC              | 200 mW        |
|                          | RY- 48 W-K  | 48 VDC          | 7,680Ω                 | 32.6 VDC             | 2.4 VDC              | 300 mW        |
| 500 mW Type              | RY- 3 WZ-K  | 3 VDC           | 18Ω                    | 1.5 VDC              | 0.15 VDC             | 500 mW        |
|                          | RY-4.5 WZ-K | 4.5 VDC         | 36Ω                    | 2.25 VDC             | 0.23 VDC             | 560 mW        |
|                          | RY- 5 WZ-K  | 5 VDC           | 45Ω                    | 2.5 VDC              | 0.25 VDC             | 560 mW        |
|                          | RY- 6 WZ-K  | 6 VDC           | 66Ω                    | 3.0 VDC              | 0.3 VDC              | 550 mW        |
|                          | RY- 9 WZ-K  | 9 VDC           | 140Ω                   | 4.5 VDC              | 0.45 VDC             | 580 mW        |
|                          | RY- 12 WZ-K | 12 VDC          | 280Ω                   | 6.0 VDC              | 0.6 VDC              | 510 mW        |
|                          | RY- 18 WZ-K | 18 VDC          | 560Ω                   | 9.0 VDC              | 0.9 VDC              | 580 mW        |
|                          | RY- 24 WZ-K | 24 VDC          | 1,070Ω                 | 12.0 VDC             | 1.2 VDC              | 540 mW        |
| High Dielectric Strength | RY- 3 WF-K  | 3 VDC           | 18Ω                    | 1.9 VDC              | 0.15 VDC             | 500 mW        |
|                          | RY- 6 WF-K  | 6 VDC           | 80Ω                    | 4.0 VDC              | 0.3 VDC              | 450 mW        |
|                          | RY- 9 WF-K  | 9 VDC           | 180Ω                   | 6.0 VDC              | 0.45 VDC             | 450 mW        |
|                          | RY- 12 WF-K | 12 VDC          | 320Ω                   | 8.0 VDC              | 0.6 VDC              | 450 mW        |
|                          | RY- 18 WF-K | 18 VDC          | 720Ω                   | 12.0 VDC             | 0.9 VDC              | 450 mW        |
|                          | RY- 24 WF-K | 24 VDC          | 1,260Ω                 | 15.9 VDC             | 1.2 VDC              | 450 mW        |
|                          | RY- 48 WF-K | 48 VDC          | 5,000Ω                 | 33.0 VDC             | 2.4 VDC              | 460 mW        |
|                          | 2 A Type    | RY- 3 WFZ-K     | 3 VDC                  | 18Ω                  | 1.9 VDC              | 0.15 VDC      |
| RY-4.5 WFZ-K             |             | 4.5 VDC         | 36Ω                    | 2.9 VDC              | 0.23 VDC             | 560 mW        |
| RY- 5 WFZ-K              |             | 5 VDC           | 45Ω                    | 3.2 VDC              | 0.25 VDC             | 560 mW        |
| RY- 6 WFZ-K              |             | 6 VDC           | 66Ω                    | 3.8 VDC              | 0.3 VDC              | 550 mW        |
| RY- 9 WFZ-K              |             | 9 VDC           | 140Ω                   | 5.7 VDC              | 0.45 VDC             | 580 mW        |
| RY- 12 WFZ-K             |             | 12 VDC          | 280Ω                   | 7.6 VDC              | 0.6 VDC              | 510 mW        |
| RY- 18 WFZ-K             |             | 18 VDC          | 560Ω                   | 11.4 VDC             | 0.9 VDC              | 580 mW        |
| RY- 24 WFZ-K             |             | 24 VDC          | 1,070Ω                 | 15.2 VDC             | 1.2 VDC              | 540 mW        |
| RY -48 WFZ-K             |             | 48 VDC          | 4,000Ω                 | 36.0 VDC             | 2.4 VDC              | 580 mW        |

Note : All values in the table are measured at 20°C.

# RY SERIES

|                       | MODEL      | Nominal voltage | Coil resistance ( $\pm 10\%$ ) | Must operate voltage | Must release voltage | Nominal power |
|-----------------------|------------|-----------------|--------------------------------|----------------------|----------------------|---------------|
| Continuous (MBB) Type | RY-4.5 D-K | 4.5 VDC         | 45 $\Omega$                    | 3.0 VDC              | 0.23 VDC             | 450 mW        |
|                       | RY- 5 D-K  | 5 VDC           | 55 $\Omega$                    | 3.3 VDC              | 0.25 VDC             | 450 mW        |
|                       | RY- 6 D-K  | 6 VDC           | 80 $\Omega$                    | 3.95 VDC             | 0.3 VDC              | 450 mW        |
|                       | RY- 9 D-K  | 9 VDC           | 180 $\Omega$                   | 5.9 VDC              | 0.45 VDC             | 450 mW        |
|                       | RY- 12 D-K | 12 VDC          | 320 $\Omega$                   | 7.9 VDC              | 0.6 VDC              | 450 mW        |
|                       | RY- 18 D-K | 18 VDC          | 720 $\Omega$                   | 11.8 VDC             | 0.9 VDC              | 450 mW        |
|                       | RY- 24 D-K | 24 VDC          | 1,280 $\Omega$                 | 15.8 VDC             | 1.2 VDC              | 450 mW        |
|                       | RY- 48 D-K | 48 VDC          | 4,800 $\Omega$                 | 31.8 VDC             | 2.4 VDC              | 480 mW        |

Note : All values in the table are measured at 20°C.

# RY SERIES

## ■ SPECIFICATIONS

| Item                   |   | High Sensitive Type   | 500 mW Type                                       | High Dielectric Strength                                       | 2 A Type                                      | Continuous (MBB) Type  |                 |
|------------------------|---|---|---|--|---|--|-----------------|
|                        |   | RY-( ) W-K  | RY-( ) WZ-K                                       | RY-( ) WF-K  | RY-( ) WFZ-K                                  | RY-( ) D-K   |                 |
| Contact                | Arrangement   | 2 form C (DPDT)   |   |  |   | 2 Form D (2 MBB)   |                 |
|                        | Material  | Gold overlay silver-palladium   |   |  | Gold overlay silver-nickel                    | Gold overlay silver-palladium  |                 |
|                        | Style   | Bifurcated (cross bar)  |   |  |   | Single   |                 |
|                        | Resistance (initial)  | Maximum 100 mΩ (at 1 A 6 VDC)   |   |  |   |  |                 |
|                        | Maximum Carrying Current  | 1.25 A  |   |  | 2 A   | 0.6 A  |                 |
|                        | Rating (resistive)  | 1 A 24 VD<br>0.5 A 120 VAC  |   | 1 A 24 VDC<br>0.25 A 120 VAC                                   | 2 A 30 VDC<br>0.5 A 125 VAC                   | 0.15 A 48 VDC<br>0.3 A 120 VAC   |                 |
|                        | Maximum Switching Power   | 60 VA/24 W  |   | 30 VA/24 W   | 62.5 VA/60 W                                  |  | 36 VA/7.2 W     |
|                        | Maximum Switching Voltage   | 120 VAC, 60 VDC   |   |  | 125 VAC, 150 VDC                              |  | 120 VAC, 60 VDC |
|                        | Maximum Switching Current   | 1 A   |   |  | 2 A   | 0.6 A  |                 |
|                        | Minimum Switching Load*1  | 0.01 mA 10 mVDC   |   |  |   | 0.1 mA 10 mVDC   |                 |
| Capacitance (at 10MHz) | Approx. 0.9 pF (between open contacts) 1.4 pF (adjacent contacts)<br>Approx. 1.9 pF (between coil and contacts) |   |   |  |   |  |                 |
| Coil                   | Nominal Power (at 20°C)   | 150 to 300 mW   | 500 to 580 mW                                     | 450 to 460 mW  | 500 to 580 mW                                 | 450 to 480 mW  |                 |
|                        | Operate Power (at 20°C)   | 75 to 140 mW  | 125 to 145 mW                                     | 200 to 210 mW  | 200 to 324 mW                                 | 200 to 210 mW  |                 |
|                        | Operating Temperature (No frost)  | -30°C to +90°C<br>(*+80°C)  | -30°C to +60°C (refer to the CHARACTERISTIC DATA) |  |   | -30°C to +70°C<br>(*2 +65°C)   |                 |
| Time Value             | Operate (at nominal voltage)  | Maximum 6 ms  |   |  |   |  |                 |
|                        | Release (at nominal voltage)  | Maximum 3 ms  |   |  |   |  |                 |
| Life                   | Mechanical  | 2 × 10 <sup>7</sup> ops. min. 1 × 10 <sup>7</sup> operations minimum                          |   |  |   | 1 × 10 <sup>6</sup> ops. min.  |                 |
|                        | Electrical (at contact rating)  | 2 × 10 <sup>5</sup> ops. min. (0.5 A 120 VAC)<br>5 × 10 <sup>5</sup> ops. min. ( 1 A 24 VD C) |   | 5 × 10 <sup>5</sup> ops. min.<br>(0.25 A 120 VAC<br>1 A 24 VDC | 1 × 10 <sup>5</sup> ops. min.<br>(2 A 30 VDC) | 2 × 10 <sup>5</sup> opsmin.<br>(0.3 A 120 VAC)<br>5 × 10 <sup>5</sup> ops. min.<br>(0.15 A 48 VDC) |                 |
| Other                  | Vibration   | Misoperation  | 10 to 55 Hz (double amplitude of 1.5 mm)          |  |   |  |                 |
|                        | Resistance  | Endurance   | 10 to 55 Hz (double amplitude of 4.5 mm)          |  |   |  |                 |
|                        | Shock   | Misoperation  | 100 m/s <sup>2</sup> (11±1 ms)                    |  |   |  |                 |
|                        | Resistance  | Endurance   | 1,000 m/s <sup>2</sup> ( 6±1 ms)                  |  |   |  |                 |
|                        | Weight  | Approximately 5 g   |   |  |   |  |                 |

\*1 Minimum switching loads mentioned above are reference values. Please perform the confirmation test with the actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

\*2 48VDC type

## ■ INSULATION

| Item                | Sensitive                                      | 500mW            | High Isolation | 2A               | MBB            |
|---------------------|--|------------------|----------------|------------------|----------------|
| Isolation (initial) | Minimum 1,000 MΩ (at 500VDC)                   |                  |                |                  |                |
| Dielectric Strength | open contact                                   | 500VAC 1 min.,   |                | 1,000VAC 1 min., | 500VAC 1 min., |
|                     | coil and contact/<br>adjacent contacts         | 1,000VAC 1 min., |                |                  |                |
| Surge Voltage       | 1500V (coil-contact) (10/160 μs standard wave) |                  |                |                  |                |

## SAFETY STANDARDS

| Type | Compliance                | Contact rating  |
|------|---------------------------|---|
| UL   | UL 478, UL 508<br>E 45026 | Flammability: UL 94-V0 (plastics)<br>[RY-W, RY-WZ]  |
| CSA  | C22.2 No. 14<br>LR 35579  | 0.5A, 120VAC (resistive)<br>1A, 24VDC (resistive)<br>0.3A, 60VDC (resistive)<br>[RY-WF]<br>0.25A, 120VAC (resistive)<br>1A, 24VDC (resistive)<br>0.3A, 60VDC (resistive)<br>[RY-D]<br>0.3A, 120VAC (resistive)<br>0.2A, 60VDC (resistive)<br>[RY-WFZ] (only CSA)<br>0.5A, 125VAC (resistive)<br>2A, 30VDC (resistive)<br>0.6A, 110VDC (resistive) |

## CHARACTERISTIC DATA



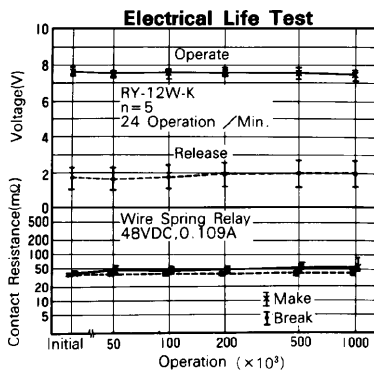
## CHARACTERISTIC DATA



## REFERENCE DATA

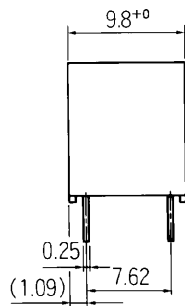


## ■ REFERENCE DATA



## ■ DIMENSIONS

### ● Dimensions



### ● Schematics (Bottom view)



### ● PC board mounting hole layout (Bottom view)



Unit: mm

## RoHS Compliance and Lead Free Relay Information

### 1. General Information

- Relays produced after the specific date code that is indicated on each data sheet are lead-free now. Most of our signal and power relays are lead-free. Please refer to Lead-Free Status Info. (<http://www.fujitsu.com/us/downloads/MICRO/fcai/relays/lead-free-letter.pdf>)
- Lead free solder paste currently used in relays is Sn-3.0Ag-0.5Cu.
- All signal and most power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 5 hazardous materials that are restricted by RoHS directive (lead, mercury, chromium IV, PBB, PBDE).
- It has been verified that using lead-free relays in leaded assembly process will not cause any problems (compatible).
- "LF" is marked on each outer and inner carton. (No marking on individual relays).
- To avoid leaded relays (for lead-free sample, etc.) please consult with area sales office.
- We will ship leaded relays as long as the leaded relay inventory exists.

Note: Cadmium was exempted from RoHS on October 21, 2005. (Amendment to Directive 2002/95/EC)

### 2. Recommended Lead Free Solder Profile

- Recommended solder paste Sn-3.0Ag-0.5Cu.

#### Reflow Solder condition

**Flow Solder condition:**

Pre-heating: maximum 120°C  
Soldering: dip within 5 sec. at  
260°C solder bath

**Solder by Soldering Iron:**

Soldering Iron  
Temperature: maximum 360°C  
Duration: maximum 3 sec.

**We highly recommend that you confirm your actual solder conditions**

### 3. Moisture Sensitivity

- Moisture Sensitivity Level standard is not applicable to electromechanical relays.

### 4. Tin Whisker

- Dipped SnAgCu solder is known as low risk tin whisker. No considerable length whisker was found by our in house test.



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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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