

Ideal for power supply  
1a/1c/2a/2c/5A/10A  
power relays

## JW RELAYS



RoHS compliant

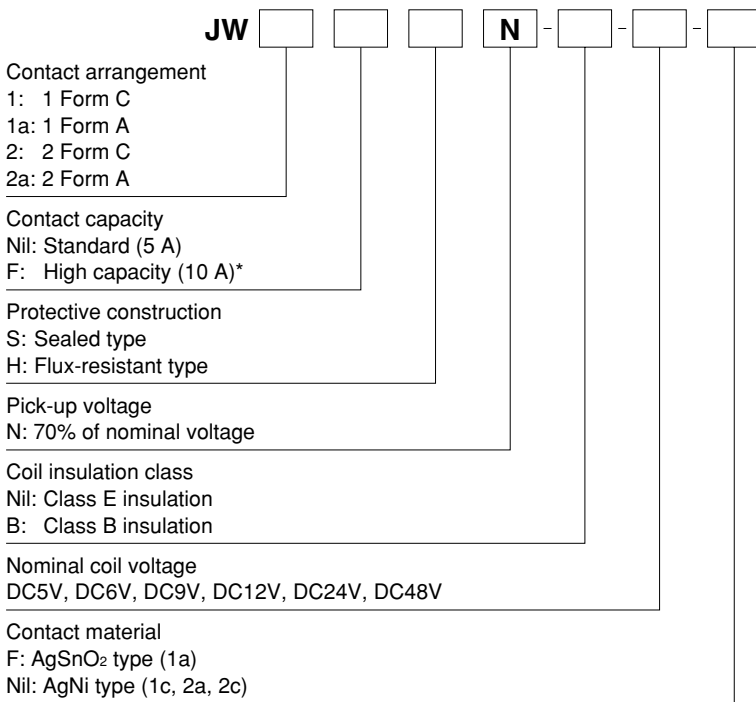
### FEATURES

- Miniature package with universal terminal footprint
- High dielectric withstanding for transient protection:  
10,000 V surge in  $\mu$ s between coil and contact
- Sealed construction
- Class B coil insulation types available
- TV rated (TV-5) types available (only for 1 Form A type)
- VDE, TÜV, SEMKO, SEV, FIMKO, TV-5 also approved
- Sockets are available.

### TYPICAL APPLICATIONS

- 1. Home appliances**  
TV sets, VCR, Microwave ovens
- 2. Office machines**  
Photocopiers, Vending machines
- 3. Industrial equipment**  
NC machines, Robots, Temperature controllers

### ORDERING INFORMATION



\*Only for 1 Form A and 1 Form C type  
Certified by UL, CSA, VDE, SEMKO, FIMKO and SEV  
Note: When ordering TV rated (TV-5) types, add suffix-TV (available only for 1 Form A type).

## TYPES

### 1) 1 Form A Standard (5A) type

| Nominal coil voltage | Sealed type    | Flux-resistant type |
|----------------------|----------------|---------------------|
|                      | Part No.       | Part No.            |
| 5V DC                | JW1aSN-DC5V-F  | JW1aHN-DC5V-F       |
| 6V DC                | JW1aSN-DC6V-F  | JW1aHN-DC6V-F       |
| 9V DC                | JW1aSN-DC9V-F  | JW1aHN-DC9V-F       |
| 12V DC               | JW1aSN-DC12V-F | JW1aHN-DC12V-F      |
| 24V DC               | JW1aSN-DC24V-F | JW1aHN-DC24V-F      |
| 48V DC               | JW1aSN-DC48V-F | JW1aHN-DC48V-F      |

Standard packing: Carton 100 pcs. Case 500 pcs.

### 3) 1 Form C Standard (5A) type

| Nominal coil voltage | Sealed type | Flux-resistant type |
|----------------------|-------------|---------------------|
|                      | Part No.    | Part No.            |
| 5V DC                | JW1SN-DC5V  | JW1HN-DC5V          |
| 6V DC                | JW1SN-DC6V  | JW1HN-DC6V          |
| 9V DC                | JW1SN-DC9V  | JW1HN-DC9V          |
| 12V DC               | JW1SN-DC12V | JW1HN-DC12V         |
| 24V DC               | JW1SN-DC24V | JW1HN-DC24V         |
| 48V DC               | JW1SN-DC48V | JW1HN-DC48V         |

Standard packing: Carton 100 pcs. Case 500 pcs.

### 5) 2 Form A Standard (5A) type

| Nominal coil voltage | Sealed type  | Flux-resistant type |
|----------------------|--------------|---------------------|
|                      | Part No.     | Part No.            |
| 5V DC                | JW2aSN-DC5V  | JW2aHN-DC5V         |
| 6V DC                | JW2aSN-DC6V  | JW2aHN-DC6V         |
| 9V DC                | JW2aSN-DC9V  | JW2aHN-DC9V         |
| 12V DC               | JW2aSN-DC12V | JW2aHN-DC12V        |
| 24V DC               | JW2aSN-DC24V | JW2aHN-DC24V        |
| 48V DC               | JW2aSN-DC48V | JW2aHN-DC48V        |

Standard packing: Carton 100 pcs. Case 500 pcs.

### 2) 1 Form A High capacity (10 A) type

| Nominal coil voltage | Sealed type     | Flux-resistant type |
|----------------------|-----------------|---------------------|
|                      | Part No.        | Part No.            |
| 5V DC                | JW1aFSN-DC5V-F  | JW1aFHN-DC5V-F      |
| 6V DC                | JW1aFSN-DC6V-F  | JW1aFHN-DC6V-F      |
| 9V DC                | JW1aFSN-DC9V-F  | JW1aFHN-DC9V-F      |
| 12V DC               | JW1aFSN-DC12V-F | JW1aFHN-DC12V-F     |
| 24V DC               | JW1aFSN-DC24V-F | JW1aFHN-DC24V-F     |
| 48V DC               | JW1aFSN-DC48V-F | JW1aFHN-DC48V-F     |

Standard packing: Carton 100 pcs. Case 500 pcs.

### 4) 1 Form C High capacity (10 A) type

| Nominal coil voltage | Sealed type   | Flux-resistant type |
|----------------------|---------------|---------------------|
|                      | Part No.      | Part No.            |
| 5V DC                | JW1FNSN-DC5V  | JW1FHNSN-DC5V       |
| 6V DC                | JW1FNSN-DC6V  | JW1FHNSN-DC6V       |
| 9V DC                | JW1FNSN-DC9V  | JW1FHNSN-DC9V       |
| 12V DC               | JW1FNSN-DC12V | JW1FHNSN-DC12V      |
| 24V DC               | JW1FNSN-DC24V | JW1FHNSN-DC24V      |
| 48V DC               | JW1FNSN-DC48V | JW1FHNSN-DC48V      |

Standard packing: Carton 100 pcs. Case 500 pcs.

### 6) 2 Form C Standard (5A) type

| Nominal coil voltage | Sealed type | Flux-resistant type |
|----------------------|-------------|---------------------|
|                      | Part No.    | Part No.            |
| 5V DC                | JW2SN-DC5V  | JW2HN-DC5V          |
| 6V DC                | JW2SN-DC6V  | JW2HN-DC6V          |
| 9V DC                | JW2SN-DC9V  | JW2HN-DC9V          |
| 12V DC               | JW2SN-DC12V | JW2HN-DC12V         |
| 24V DC               | JW2SN-DC24V | JW2HN-DC24V         |
| 48V DC               | JW2SN-DC48V | JW2HN-DC48V         |

Standard packing: Carton 100 pcs. Case 500 pcs.

Note: Class B coil insulation type is available.  
Ex) JW1aSN-B-DC12V-F

\* For sockets, see page 140.

## RATING

### 1. Coil data

| Nominal coil voltage | Pick-up voltage (at 20°C 68°F)            | Drop-out voltage (at 20°C 68°F)           | Nominal operating current [±10%] (at 20°C 68°F) | Coil resistance [±10%] (at 20°C 68°F) | Nominal operating power | Max. applied voltage (at 20°C 68°F)  |
|----------------------|---|---|---|---------------------------------------|-------------------------|--|
| 5V DC                | 70%V or less of nominal voltage (Initial) | 10%V or more of nominal voltage (Initial) | 106mA   | 47Ω                                   | 530mW                   | 130%V of nominal voltage (at 60°C 140°F)<br><br>120%V of nominal voltage (at 85°C 185°F)*4 |
| 6V DC                |   |   | 88mA  | 68Ω                                   |                         |  |
| 9V DC                |   |   | 58mA  | 155Ω                                  |                         |  |
| 12V DC               |   |   | 44mA  | 270Ω                                  |                         |  |
| 24V DC               |   |   | 22mA  | 1,100Ω                                |                         |  |
| 48V DC               |   |   | 11mA  | 4,400Ω                                |                         |  |

2. Specifications

| Characteristics                                  | Item   | Specifications   |  |  |
|--|--|--|--|--|
|  |  | Standard type  | High capacity type   |  |
| Contact  | Contact material   | 1 Form A: AgSnO <sub>2</sub> type<br>1 Form C, 2 Form A and 2 Form C: AgNi type  |  |  |
|  | Arrangement  | 1 Form A, 1 Form C, 2 Form A and 2 Form C  | 1 Form A and 1 Form C  |  |
|  | Contact resistance (Initial)                                   | Max. 100 mΩ (By voltage drop 6 V DC 1A)  |  |  |
| Rating   | Nominal switching capacity (resistive load)                    | 5A 250V AC, 5A 30V DC  | 10A 250V AC, 10A 30V DC  |  |
|  | Max. switching power (resistive load)                          | 1,250VA, 150W  | 2,500VA, 300W  |  |
|  | Max. switching voltage   | 250V AC, 30V DC  |  |  |
|  | Max. switching current   | 5A   | 10A  |  |
|  | Min. switching capacity (reference value)*1                    | 100mA, 5V DC   |  |  |
| Electrical characteristics                       | Insulation resistance (Initial)                                | Min. 1,000MΩ (at 500V DC) Measurement at same location as "Breakdown voltage" section.   |  |  |
|  | Breakdown voltage (Initial)                                    | Between open contacts  | 1,000 Vrms for 1 min. (Detection current: 10 mA)   |  |
|  |  | Between contact and coil   | 5,000 Vrms for 1 min. (Detection current: 10 mA)   |  |
|  |  | Between contact sets   | 3,000 Vrms for 1 min. (2 Form A, 2 Form C) (Detection current: 10 mA)  |  |
|  | Temperature rise (coil)  | 1 Form A: Max. 45°C 113°F,<br>1 Form C, 2 Form A and 2 Form C:<br>Max. 55°C 131°F<br>(resistive method, with nominal coil voltage and at nominal switching capacity, at 20°C 68°F)     | 1 Form A: Max. 45°C 113°F,<br>1 Form C: Max. 55°C 131°F<br>(resistive method, with nominal coil voltage and at nominal switching capacity, at 20°C 68°F) |  |
|  | Surge breakdown voltage*2 (Between contact and coil) (Initial) | 10,000 V   |  |  |
|  | Operate time (at nominal voltage) (at 20°C 68°F)               | Max. 15 ms (excluding contact bounce time.)  |  |  |
| Release time (at nominal voltage) (at 20°C 68°F) | Max. 5 ms (excluding contact bounce time) (Without diode)      |  |  |  |
| Mechanical characteristics                       | Shock resistance   | Functional   | 98 m/s <sup>2</sup> (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.)   |  |
|  |  | Destructive  | 980 m/s <sup>2</sup> (Half-wave pulse of sine wave: 6 ms.)   |  |
|  | Vibration resistance   | Functional   | 10 to 55 Hz at double amplitude of 1.6 mm (Detection time: 10μs.)  |  |
|  |  | Destructive  | 10 to 55 Hz at double amplitude of 2.0 mm  |  |
| Expected life                                    | Mechanical (at 180 times/min.)                                 | Min. 5×10 <sup>6</sup>   |  |  |
|  | Electrical (at 6 times/min.)                                   | Min. 10 <sup>5</sup> (at resistive load)   |  |  |
| Conditions                                       | Conditions for operation, transport and storage*3              | Ambient temperature*: -40°C to +60°C -40°F to 140°F (Class E),<br>(Class B: -40°C to +85°C -40°F to 185°F)<br>Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature) |  |  |
|  | Max. operating speed (at nominal switching capacity)           | Flux-resistant type: 20 times/min., Sealed type: 6 times/min.  |  |  |
| Unit weight                                      |  | Approx. 13 g .46 oz  |  |  |

\* Specifications will vary with foreign standards certification ratings.

Notes: \*1. This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

\*2. Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981

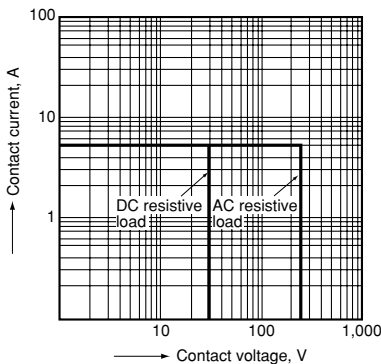
\*3. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.

\*4. The pick-up and drop out voltages rise approximately 0.4% for every 1°C 33.8°F given a standard ambient temperature of 20°C 68°F. Therefore, when using relays where the ambient temperature is high, please take into consideration the rise in pick-up and drop out voltages and keep the coil applied voltage within the maximum applied voltage.

REFERENCE DATA

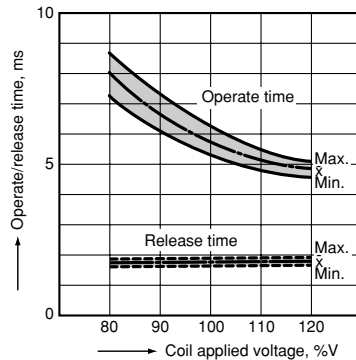
JW 1 Form A Standard (5A) type

1. Maximum operating power



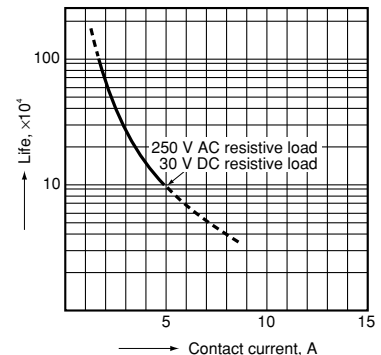
2. Operate/release time

Sample: JW1aSN-DC12V-F, 10 pcs.  
Ambient temperature: 20°C 68°F



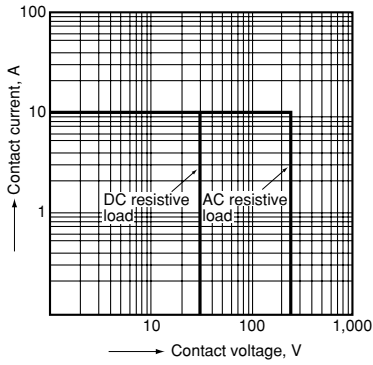
3. Life curve

1 Form A Standard (5 A) type



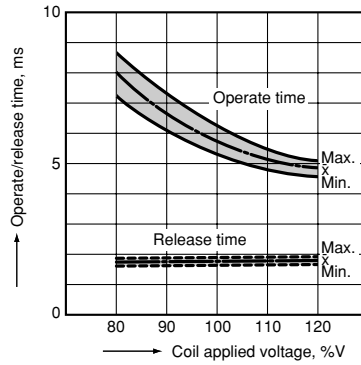
**JW 1 Form A High Capacity (10 A) type**

1. Maximum operating power

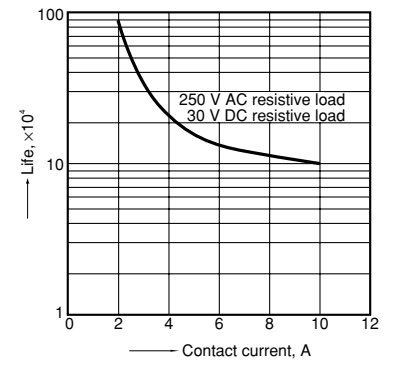


2. Operate/release time

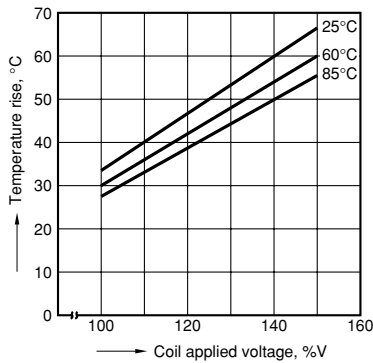
Sample: JW1aFSN-DC12V, 10 pcs.  
Ambient temperature: 20°C 68°F



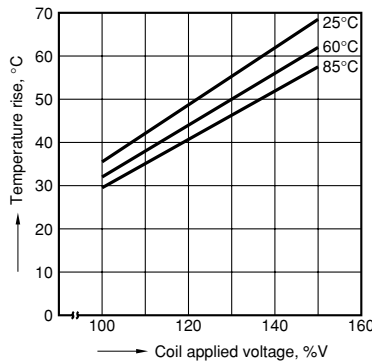
3. Life curve



4-(1). Coil temperature rise  
(Contact carrying current: 5A)  
Sample JW1aFSN-DC12V-F, 6 pcs.  
Point measured: Inside the coil

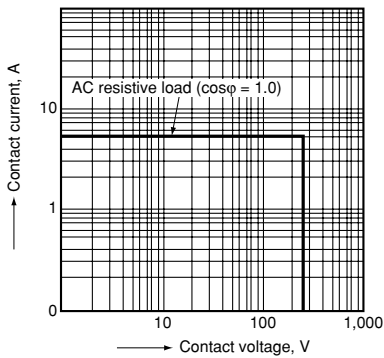


4-(2). Coil temperature rise  
(Contact carrying current: 10 A)  
Sample: JW1aFSN-DC12V-F, 6 pcs.  
Point measured: Inside the coil



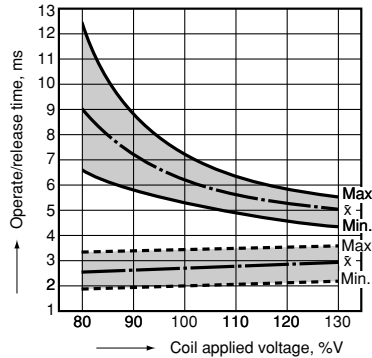
**JW 1 Form C Standard (5 A) type**

1-(3). Maximum operating power



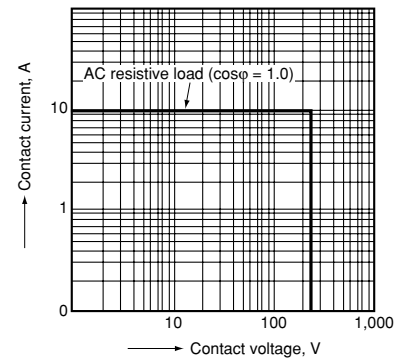
2. Operate/release time

Sample: JW1SN-DC12V-F, 6 pcs.  
Ambient temperature: 20°C 68°F



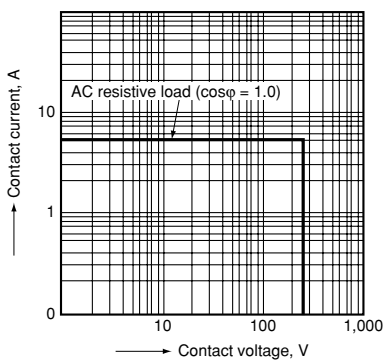
**JW 1 Form C High Capacity (10 A) type**

1. Maximum operating power



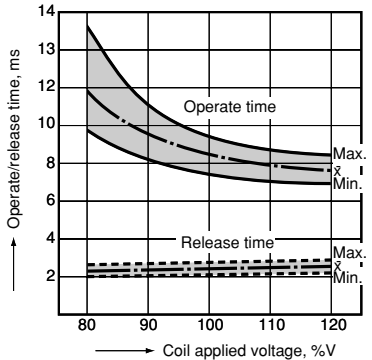
**JW 2 Form A Standard (5 A) type**

1. Maximum operating power



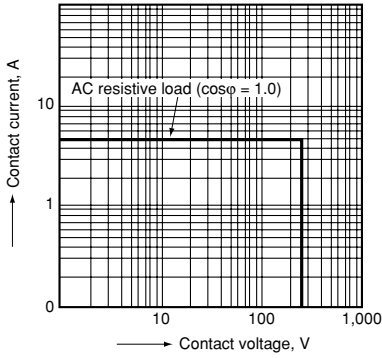
2. Operate/release time

Sample: JW2aSN-DC24V-F, 6 pcs.  
Ambient temperature: 20°C 68°F



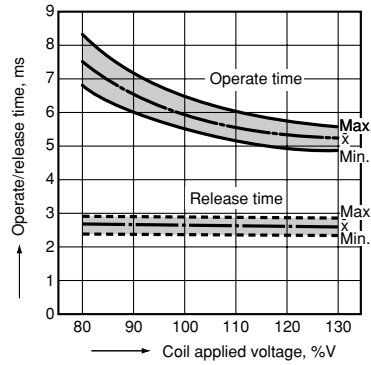
**JW 2 Form C Standard (5 A) type**

1. Maximum operating power



2. Operate/release time

Sample: JW2SN-DC12V-F, 6 pcs.  
Ambient temperature: 20°C 68°F



**DIMENSIONS** (mm inch)

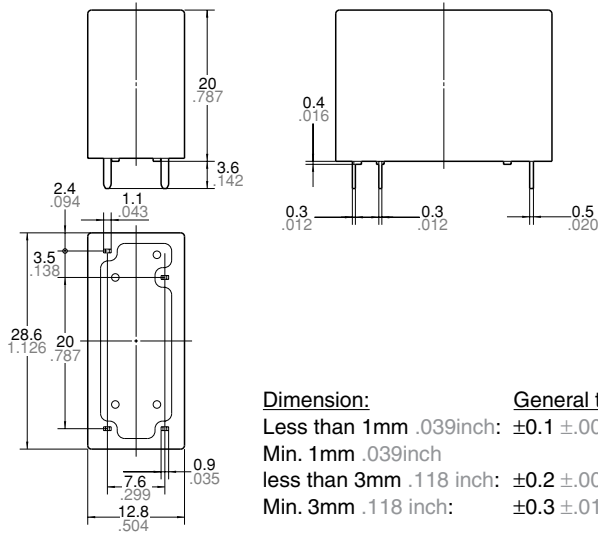
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

**JW 1 Form A**

**CAD Data**



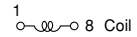
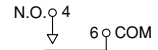
External dimensions



**Dimension:**  
 Less than 1mm .039inch:  $\pm 0.1 \pm .004$   
 Min. 1mm .039inch  
 less than 3mm .118 inch:  $\pm 0.2 \pm .008$   
 Min. 3mm .118 inch:  $\pm 0.3 \pm .012$

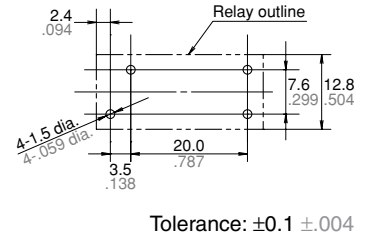
**General tolerance**  
 $\pm 0.1 \pm .004$

Wiring diagram (Bottom view)



Note: Terminal numbers are not indicated on the relay.

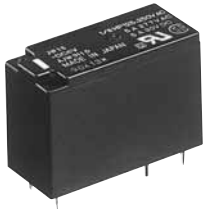
PC board pattern (Bottom view)



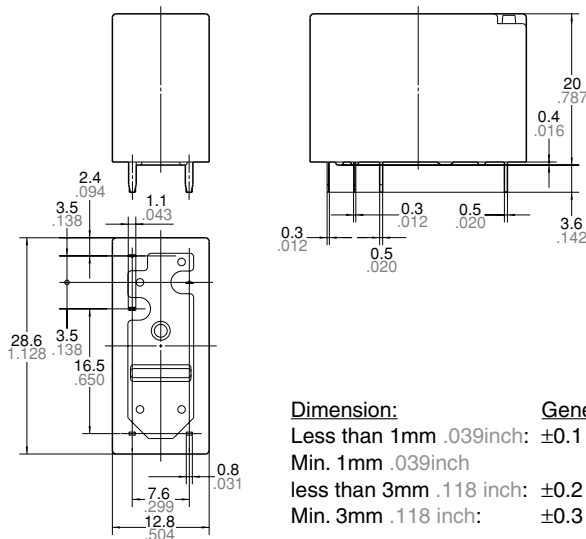
Tolerance:  $\pm 0.1 \pm .004$

**JW 1 Form C**

**CAD Data**



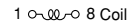
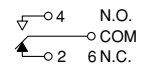
External dimensions



**Dimension:**  
 Less than 1mm .039inch:  $\pm 0.1 \pm .004$   
 Min. 1mm .039inch  
 less than 3mm .118 inch:  $\pm 0.2 \pm .008$   
 Min. 3mm .118 inch:  $\pm 0.3 \pm .012$

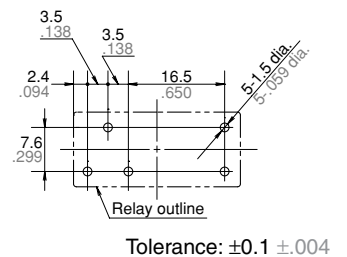
**General tolerance**  
 $\pm 0.1 \pm .004$

Wiring diagram (Bottom view)



Note: Terminal numbers are not indicated on the relay.

PC board pattern (Bottom view)



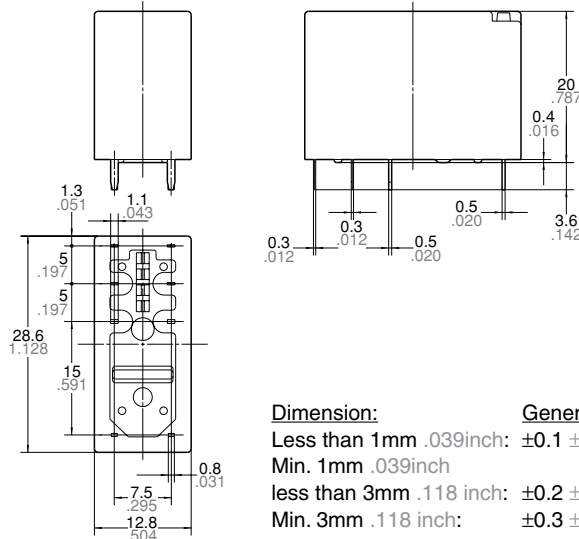
Tolerance:  $\pm 0.1 \pm .004$

JW 2 Form A and 2 Form C

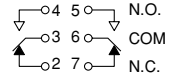
CAD Data



External dimensions



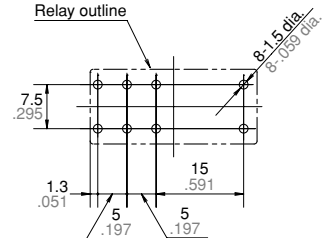
Wiring diagram (Bottom view)



1 ○—○ 8 Coil

Note: Terminal numbers are not indicated on the relay.

PC board pattern (Bottom view)



Note: JW 2 Form A is as shown in the diagram above except the N.C. terminals are not present.

SAFETY STANDARDS

| Item                        | UL/C-UL (Recognized) |   | CSA (Certified) |   | VDE (Certified) |   | TV rating (UL/CSA)            |         | TÜV (Certified)      |   | SEMKO (Certified) |  | FIMKO    |   | SEV      |                        |
|-----------------------------|----------------------|---|-----------------|---|-----------------|---|-------------------------------|---------|----------------------|---|-------------------|--|----------|---|----------|------------------------|
|                             | File No.             | Contact rating  | File No.        | Contact rating  | File No.        | Contact rating  | File No.                      | Rating  | File No.             | Rating  | File No.          | Contact rating   | File No. | Contact rating                            | File No. | Contact rating         |
| Standard type 1 Form A      | E43028               | 5A 277V AC<br>5A 30V DC<br>1/2HP 125V AC<br>1/2HP 250V AC         | LR26550 etc.    | 5A 277V AC<br>5A 30V DC<br>1/2HP 125V AC<br>1/2HP 250V AC<br>B300   | 40013854        | 5A 250V AC (cosφ=1.0)<br>3A 250V AC (cosφ=0.4)<br>Standard type<br>5A 30V DC (0ms)        | UL E43028<br>CSA LR26550 etc. | 1a→TV-5 | B 11 05<br>13461 305 | 5A 250V AC (cosφ=1.0)<br>3A 250V AC (cosφ=0.4)<br>5A 30V DC (0ms)   | 817817            | 5A 250V AC (cosφ=1.0)<br>3A 250V AC (0ms)<br>5A 30V DC (0ms) | 24965    | 5A 250V AC (cosφ=1.0)<br>5A 30V DC (0ms)  | 11.0262  | 5A 250V AC (cosφ=1.0)  |
| Standard type 1 Form C      | E43028               | 5A 277V AC<br>5A 30V DC<br>1/2HP 125V AC<br>1/2HP 250V AC         | LR26550 etc.    | 5A 277V AC<br>5A 30V DC<br>1/2HP 125V AC<br>1/2HP 250V AC<br>B300   | 40013854        | 5A 250V AC (cosφ=1.0)<br>3A 250V AC (cosφ=0.4)<br>Standard type<br>5A 30V DC (0ms)        | —                             | —       | B 11 05<br>13461 305 | 5A 250V AC (cosφ=1.0)<br>3A 250V AC (cosφ=0.4)<br>5A 30V DC (0ms)   | 817817            | 5A 250V AC (cosφ=1.0)<br>3A 250V AC (0ms)<br>5A 30V DC (0ms) | 24965    | 5A 250V AC (cosφ=1.0)<br>5A 30V DC (0ms)  | 11.0262  | 5A 250V AC (cosφ=1.0)  |
| Standard type 2 Form A      | E43028               | 5A 277V AC<br>5A 30V DC<br>1/2HP 125V AC<br>1/2HP 250V AC<br>B300 | LR26550 etc.    | 5A 277V AC<br>5A 30V DC<br>1/2HP 125V AC<br>1/2HP 250V AC<br>B300   | 40013854        | 5A 250V AC (cosφ=1.0)<br>3A 250V AC (cosφ=0.4)<br>Standard type<br>5A 30V DC (0ms)        | —                             | —       | B 11 05<br>13461 305 | 5A 250V AC (cosφ=1.0)<br>3A 250V AC (cosφ=0.4)<br>5A 30V DC (0ms)   | 817817            | 5A 250V AC (cosφ=1.0)<br>3A 250V AC (0ms)<br>5A 30V DC (0ms) | 24965    | 5A 250V AC (cosφ=1.0)<br>5A 30V DC (0ms)  | 11.0262  | 5A 250V AC (cosφ=1.0)  |
| Standard type 2 Form C      | E43028               | 5A 277V AC<br>5A 30V DC<br>1/2HP 125V AC<br>1/2HP 250V AC<br>B300 | LR26550 etc.    | 5A 277V AC<br>5A 30V DC<br>1/2HP 125V AC<br>1/2HP 250V AC<br>B300   | 40013854        | 5A 250V AC (cosφ=1.0)<br>3A 250V AC (cosφ=0.4)<br>Standard type<br>5A 30V DC (0ms)        | —                             | —       | B 11 05<br>13461 305 | 5A 250V AC (cosφ=1.0)<br>3A 250V AC (cosφ=0.4)<br>5A 30V DC (0ms)   | 817817            | 5A 250V AC (cosφ=1.0)<br>3A 250V AC (0ms)<br>5A 30V DC (0ms) | 24965    | 5A 250V AC (cosφ=1.0)<br>5A 30V DC (0ms)  | 11.0262  | 5A 250V AC (cosφ=1.0)  |
| High capacity type 1 Form A | E43028               | 10A 277V AC<br>10A 30V DC<br>1/2HP 125V AC<br>1/2HP 250V AC       | LR26550 etc.    | 10A 277V AC<br>10A 30V DC<br>1/2HP 125V AC<br>1/2HP 250V AC<br>B300 | 40013854        | 10A 250V AC (cosφ=1.0)<br>7A 250V AC (cosφ=0.4)<br>High capacity type<br>10A 30V DC (0ms) | UL E43028<br>CSA LR26550      | 1a→TV-5 | B 11 05<br>13461 305 | 10A 250V AC (cosφ=1.0)<br>7A 250V AC (cosφ=0.4)<br>10A 30V DC (0ms) | 817817            | 10A 250V AC (cosφ=1.0)<br>10A 30V DC (0ms)                   | 24965    | 10A 250V AC (cosφ=1.0)<br>5A 30V DC (0ms) | 11.0262  | 10A 250V AC (cosφ=1.0) |
| High capacity type 1 Form C | E43028               | 10A 277V AC<br>10A 30V DC<br>1/2HP 125V AC<br>1/2HP 250V AC       | LR26550 etc.    | 10A 277V AC<br>10A 30V DC<br>1/2HP 125V AC<br>1/2HP 250V AC<br>B300 | 40013854        | 10A 250V AC (cosφ=1.0)<br>7A 250V AC (cosφ=0.4)<br>High capacity type<br>10A 30V DC (0ms) | —                             | —       | B 11 05<br>13461 305 | 10A 250V AC (cosφ=1.0)<br>7A 250V AC (cosφ=0.4)<br>10A 30V DC (0ms) | 817817            | 10A 250V AC (cosφ=1.0)<br>10A 30V DC (0ms)                   | 24965    | 10A 250V AC (cosφ=1.0)<br>5A 30V DC (0ms) | 11.0262  | 10A 250V AC (cosφ=1.0) |