

RoHS compliant

FEATURES

- Smallest in its class, it is extremely compact at approx. 2/3 the size of previous products.

Compared to our previous miniature type CT relay, both the 1 Form C and 10-pin and 8-pin twin types take up approx. two-thirds the space and volume. This makes them ideal for relay unit miniaturization.

- Compact and high-capacity 25 A load switching

High capacity control is possible while being compact and capable of motor lock load switching at 25 A, 14 V DC.

- Pin in Paste* compatible model added

Models compatible with the recently increasing Pin in Paste technique (reflow solder mounting) have been added.

Pin in Paste compatible models are the flux tight type.

* The Pin in Paste method may sometimes be referred to as THR (Through-hole Reflow).

- Environmental protection specifications

Cadmium-free contacts and use of lead-free solder are standard. Environmental pollutants are not used.

TYPICAL APPLICATIONS

- Powered windows
- Automatic door locks
- Electrically powered mirrors
- Powered sunroofs
- Powered seats
- Lift gates
- Smart J/B related products, etc.

TYPES

| Contact arrangement | Nominal coil voltage | Pick-up voltage (at 20°C 68°F) | Part No. | |
|-------------------------------|----------------------|-----------------------------------|---------------|-------------------|
| | | | Standard type | Pin in Paste type |
| 1 Form C | 12 V DC | Max.6.5 V DC (Initial) | ACJ1112 | ACJ1112P |
| | | Max.7.2 V DC (Initial) | ACJ1212 | ACJ1212P |
| 1 Form C x 2 (8 terminal) | | Max.6.5 V DC (Initial) | ACJ2112 | ACJ2112P |
| | | Max.7.2 V DC (Initial) | ACJ2212 | ACJ2212P |
| 1 Form C x 2 (10 terminal) | | Max.6.5 V DC (Initial) | ACJ5112 | ACJ5112P |
| | | Max.7.2 V DC (Initial) | ACJ5212 | ACJ5212P |

Standard packing: Carton (tube): 70 pcs.; Case: 2,800 pcs. (1 Form C), Carton (tube): 40 pcs.; Case: 1,000 pcs. (8 terminal), Carton (tube): 35 pcs.; Case: 1,400 pcs. (10 terminal)

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 (at 20°C 68°F) | Usable voltage range* |
|----------------------|-----------------------------------|------------------------------------|--|--|---|-----------------------|
| 12 V DC | Max. 7.2 V DC (Initial) | Min. 1.0 V DC (Initial) | 53.3 mA | 225Ω | 640 mW | 10 to 16 V DC |
| | Max. 6.5 V DC (Initial) | Min. 0.8 V DC (Initial) | 66.7 mA | 180Ω | 800 mW | 9 to 16 V DC |

* Other usable voltage range types are also available. Please contact us for details.

2. Specifications

| Characteristics | Item | | Specifications |
|-----------------------------------|---|---|--|
| Contact | Arrangement | | 1 Form C, 1 Form Cx2 |
| | Contact resistance (Initial) | | N.O.: Typ7mΩ, N.C.: Typ10mΩ (By voltage drop 6 V DC 1 A) |
| | Contact material | | Ag alloy (Cadmium free) |
| Protective construction | | Standard type: Sealed type Pin in Paste type: Flux tight type | |
| Rating | Nominal switching capacity (resistive load) | | N.O.: 20A 14V DC, N.C.: 10A 14V DC |
| | Max. carrying current (14V DC) | | N.O.: 20 A for 1 hour, 30 A for 2 minutes (at 20°C 68°F) (when coil powered on one side) |
| | Nominal operating power | | 640 mW (for pick-up voltage max. 7.2 V DC), 800 mW (for pick-up voltage max. 6.5 V DC) |
| | Min. switching capacity (resistive load)*1 | | 1A 12V DC |
| Electrical characteristics | Initial insulation resistance | | Min. 100 MΩ (at 500 V DC) |
| | Breakdown voltage (Initial) | Between open contacts | 500 Vrms for 1 min. (Detection current: 10mA) |
| | | Between contacts and coil | 500 Vrms for 1 min. (Detection current: 10mA) |
| | Operate time (at nominal voltage) | | Max. 10ms (at 20°C 68°F, excluding contact bounce time) (Initial) |
| Release time (at nominal voltage) | | Max. 10ms (at 20°C 68°F, excluding contact bounce time) (Initial) | |
| Mechanical characteristics | Shock resistance | Functional | Min. 100 m/s² {10G} (Half-wave pulse of sine wave: 11ms; detection time: 10μs) |
| | | Destructive | Min. 1,000 m/s² {100G} (Half-wave pulse of sine wave: 6ms) |
| | Vibration resistance | Functional | 10 Hz to 100 Hz, Min. 44.1m/s² {4.5G} (Detection time: 10μs) |
| | | Destructive | 10 Hz to 500 Hz, Min. 44.1m/s² {4.5G} Time of vibration for each direction; X, Y direction: 2 hours, Z direction: 4 hours |
| Expected life | Mechanical | | Min. 10⁷ (at 120 cpm) |
| | Electrical | | [Standard type] <Resistive load> Min. 10⁵ (at nominal switching capacity, operating frequency: 1s ON, 9s OFF) <Motor load> N.O. side: Min. 2×10⁵: at 25 A (inrush), 5 A (steady), 14 V DC; Min. 10⁵: at 25 A 14 V DC (Motor lock) N.C. side: Min. 2×10⁵: at 20 A 14 V DC (brake) (Operating frequency: 0.5s ON, 9.5s OFF) [Pin in Paste type] <Resistive load> Min. 10⁵ (at nominal switching capacity, operating frequency: 1s ON, 9s OFF) <Motor load> N.O. side: Min. 10⁵: at 25 A (inrush), 5 A (steady), 14 V DC; Min. 5×10⁴: at 25 A 14 V DC (Motor lock) N.C. side: Min. 10⁵: at 20 A 14 V DC (brake) (Operating frequency: 0.5s ON, 9.5s OFF) |
| | Conditions for operation, transport and storage*2 | | Ambient temperature: -40°C to +85°C -40°F to +185°F Humidity: 5% R.H. to 85% R.H. (Not freezing and condensing at low temperature) |
| | Max. operating speed | | 6 cpm (at nominal switching capacity) |
| Mass | | | 1 Form C type: approx. 3.5 g .12 oz, Twin type: approx. 6.5 g .23 oz |

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. The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. Please refer to "Usage ambient condition" in CAUTIONS FOR USE OF AUTOMOTIVE RELAYS.

Please inquire if you will be using the relay in a high temperature atmosphere (110°C 230°F).

*3. Depends on connection conditions. Also, this does not guarantee repeated switching. We recommend that you confirm operation under actual conditions.

* If the relay is used continuously for long periods of time with coils on both sides in an energized condition, breakdown might occur due to abnormal heating depending on the carrying condition. Therefore, please inquire when using with a circuit that causes an energized condition on both sides simultaneously.

REFERENCE DATA

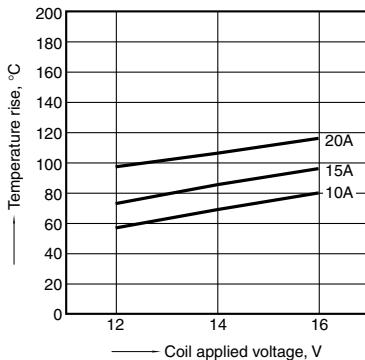
1-(1). Coil temperature rise (at room temperature)

Sample: ACJ1212, 3pcs

Measured portion: Inside the coil

Contact carrying current: 10A, 15A, 20A

Ambient temperature: 25°C 77°F



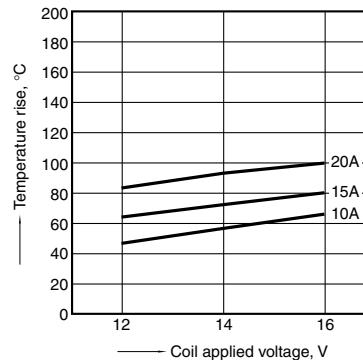
1-(2). Coil temperature rise (at 85°C 185°F)

Sample: ACJ1212, 3pcs

Measured portion: Inside the coil

Contact carrying current: 10A, 15A, 20A

Ambient temperature: 85°C 185°F



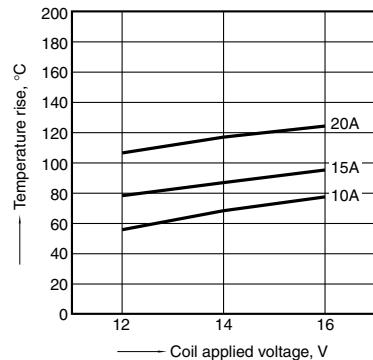
1-(3). Coil temperature rise (at room temperature)

Sample: ACJ2212, 3pcs

Measured portion: Inside the coil

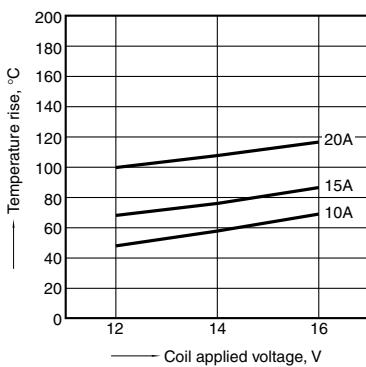
Contact carrying current: 10A, 15A, 20A

Ambient temperature: 25°C 77°F

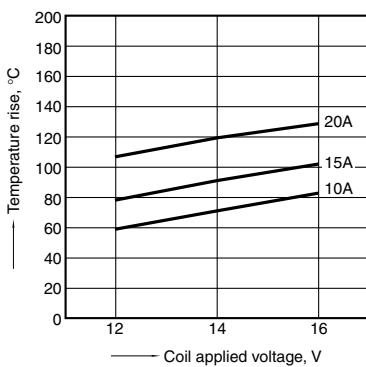


CJ (ACJ)

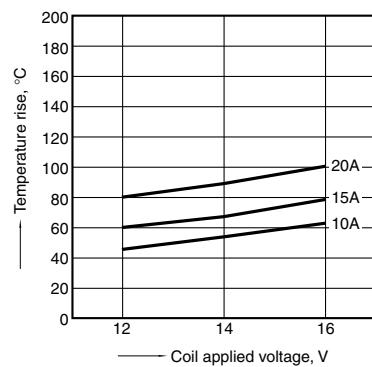
1-(4). Coil temperature rise (at 85°C 185°F)
 Sample: ACJ2212, 3pcs
 Measured portion: Inside the coil
 Contact carrying current: 10A, 15A, 20A
 Ambient temperature: 85°C 185°F



1-(5). Coil temperature rise (at room temperature)
 Sample: ACJ5212, 3pcs
 Measured portion: Inside the coil
 Contact carrying current: 10A, 15A, 20A
 Ambient temperature: 25°C 77°F

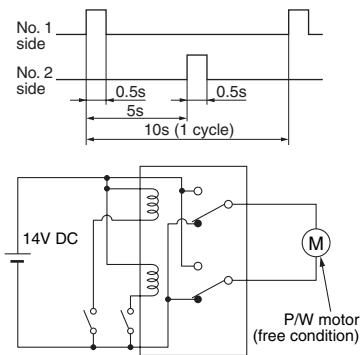


1-(6). Coil temperature rise (at 85°C 185°F)
 Sample: ACJ5212, 3pcs
 Measured portion: Inside the coil
 Contact carrying current: 10A, 15A, 20A
 Ambient temperature: 85°C 185°F

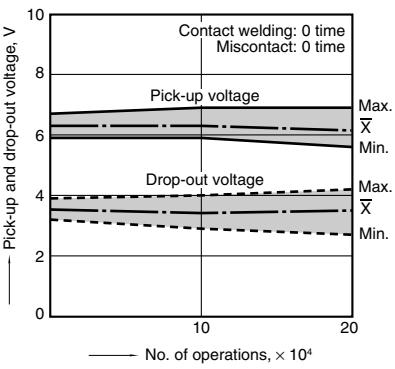


2-(1). Electrical life test (Motor free)

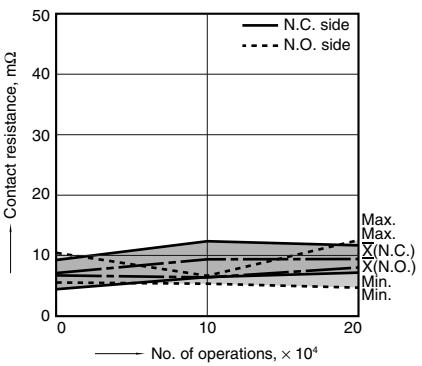
Sample: ACJ2212, 3pcs
 Load: Inrush current: 25A/Steady current: 5A,
 Power window motor actual load (free condition)
 Tested voltage: 14V DC
 Switching frequency: ON 0.5s, OFF 9.5s
 Switching cycle: 2×10^5
 Ambient temperature: Room temperature
 Circuit



Change of pick-up and drop-out voltage

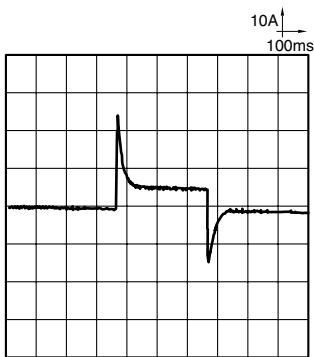


Change of contact resistance



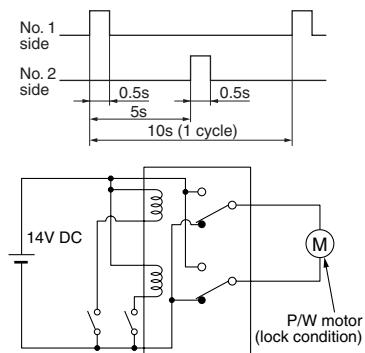
Load current waveform

Inrush current: 25A, Steady current: 6A,
 Brake current: 13A



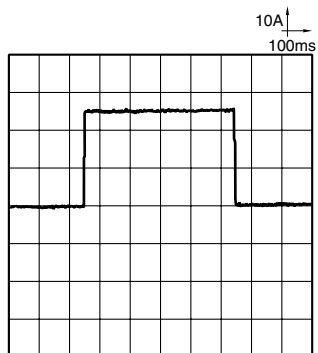
2-(2). Electrical life test (Motor lock)

Sample: ACJ2212, 3pcs
Load: Steady current: 25A, Power window motor
actual load (lock condition)
Tested voltage: 14V DC
Switching frequency: ON 0.5s, OFF 9.5s
Switching cycle: 10^5
Ambient temperature: Room temperature
Circuit

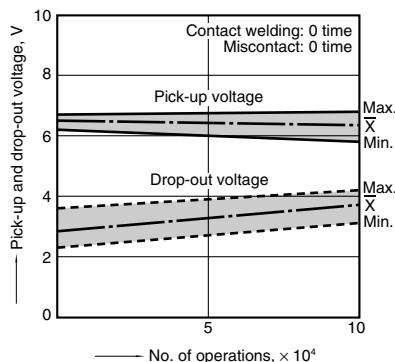


Load current waveform

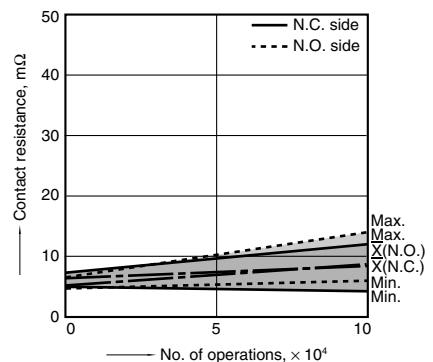
Current value: 25A



Change of pick-up and drop-out voltage



Change of contact resistance



DIMENSIONS (mm inch)

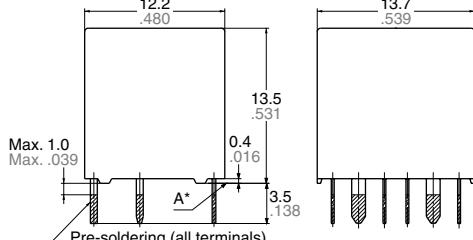
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ace>

1. Twin type (8-pin)

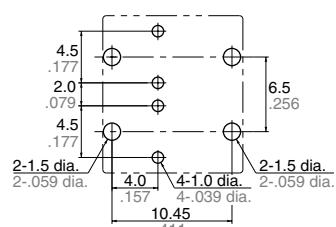
CAD Data



External dimensions

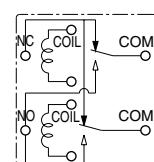


PC board pattern (Bottom view)



Tolerance: ± 0.1 $\pm .004$

Schematic (Bottom view)



| Dimension: | Tolerance |
|-----------------------------|-----------------------|
| Max. 1mm .039 inch: | ± 0.1 ± 0.004 |
| 1 to 3mm .039 to .118 inch: | ± 0.2 ± 0.008 |
| Min. 3mm .118 inch: | ± 0.3 ± 0.12 |

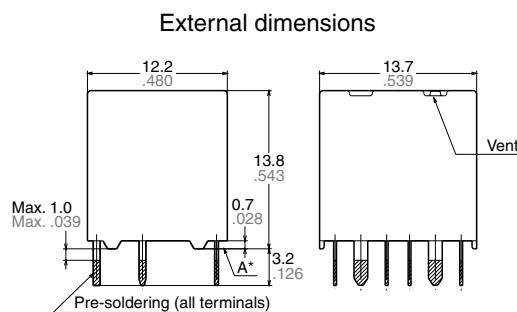
* Dimensions (thickness and width) of terminal is measured before pre-soldering.

Dimensions (thickness and width) of terminal is measured at A surface level. Intervals between terminals is measured at A surface level.

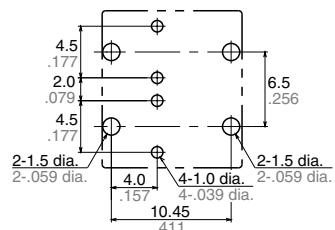
CJ (ACJ)

2. Twin type (8-pin) Pin in Paste type

CAD Data

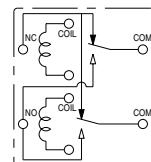


PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm 0.04$

Schematic (Bottom view)

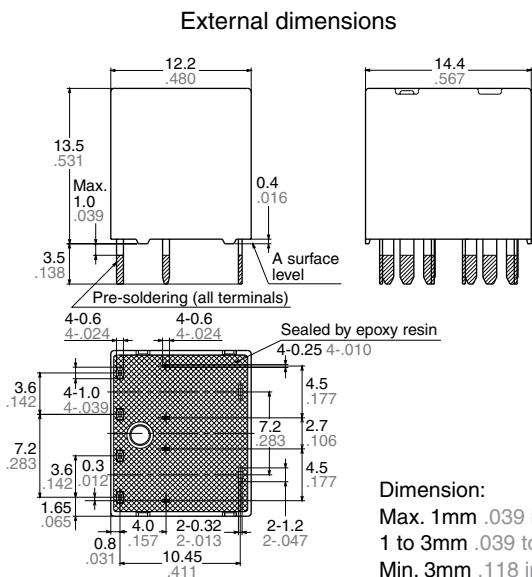


Dimension: Tolerance
Max. 1mm .039 inch: $\pm 0.1 \pm 0.04$
1 to 3mm .039 to .118 inch: $\pm 0.2 \pm 0.08$
Min. 3mm .118 inch: $\pm 0.3 \pm 0.12$

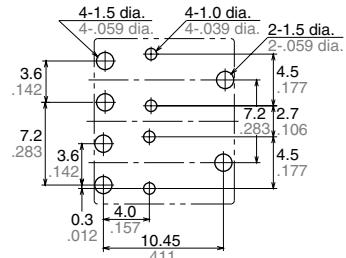
* Dimensions (thickness and width) of terminal is measured before pre-soldering.
Intervals between terminals is measured at A surface level.

3. Twin type (10-pin) Standard type

CAD Data

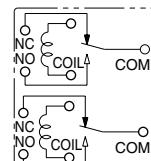


PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm 0.04$

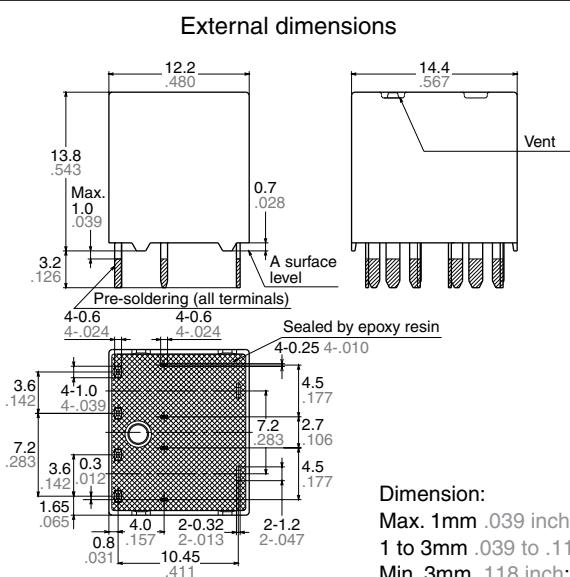
Schematic (Bottom view)



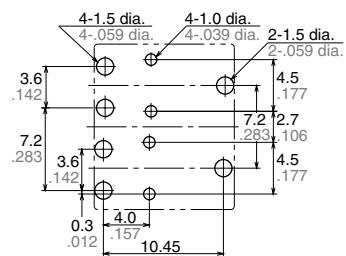
Dimension: Tolerance
Max. 1mm .039 inch: $\pm 0.1 \pm 0.04$
1 to 3mm .039 to .118 inch: $\pm 0.2 \pm 0.08$
Min. 3mm .118 inch: $\pm 0.3 \pm 0.12$

4. Twin type (10-pin) Pin in Paste type

CAD Data

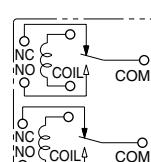


PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm 0.04$

Schematic (Bottom view)



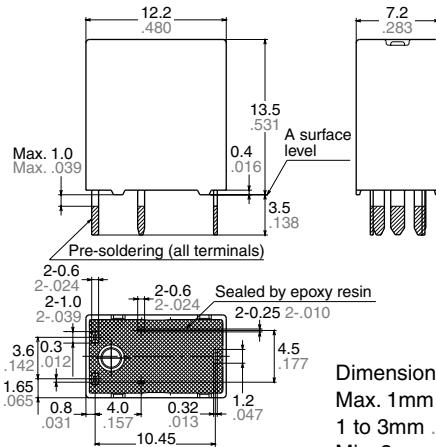
Dimension: Tolerance
Max. 1mm .039 inch: $\pm 0.1 \pm 0.04$
1 to 3mm .039 to .118 inch: $\pm 0.2 \pm 0.08$
Min. 3mm .118 inch: $\pm 0.3 \pm 0.12$

5. Slim 1 Form C
Standard type

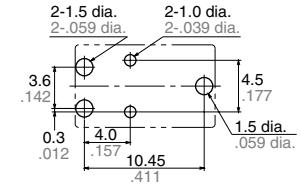
CAD Data



External dimensions

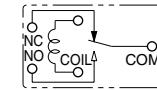


PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm 0.004$

Schematic (Bottom view)

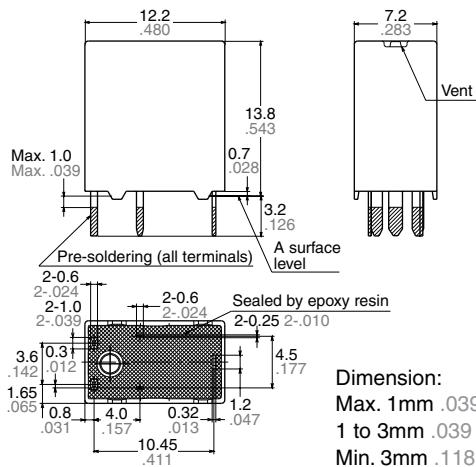


6. Slim 1 Form C
Pin in Paste type

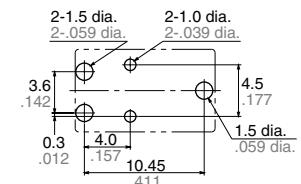
CAD Data



External dimensions

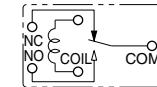


PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm 0.004$

Schematic (Bottom view)



For Cautions for Use.