Panasonic
INDUSTRY

Automotive Relays

TT RELAYS

Product Catalog

IN Your Future

2024.8

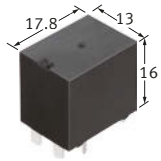
Automotive Relays

RoHS

TT RELAYS

High capacity (60 A) PC board Relay for Smart J/B

[Protective construction]
High heat-resistant type: Sealed
Pin in Paste compliant type: Flux tight



(Unit: mm)

FEATURES

- Compact and high capacity (60 A and supports fuse)
- Contact arrangement:
  Double make contact 2 Form A (1 Form U)
- Pin in Paste compliant type is available.

TYPICAL APPLICATIONS

- Defoggers, Ignitions, Fan motors, Head lamps and Fog lamps etc.

ORDERING INFORMATION (PART NO.)

ACTT ☐ ☐ ☐ ☐

- Contact arrangement
  3: Double make contact 2 Form A (1 Form U)
- Contact type
  C: Standard type (Ag alloy / Cu clad)
- Heat resistance / Protective construction
  H: High heat-resistant type / Sealed
  P: Pin in Paste compliant type / Flux tight
- Coil resistance
  4: 320 Ω

TYPES

Contact arrangement	Contact type	Rated coil voltage	Coil resistance	Part No.		Packing	
				Heat resistance		Carton (1-tube)	Case
				High heat-resistant type	Pin in Paste compliant type		
Double make contact 2 Form A (1 Form U)	Standard type (Ag alloy/Cu clad)	12 V DC	320 Ω	ACTT3CH4	ACTT3CP4	40 pcs.	800 pcs.

RATING

■ Coil data

Rated coil voltage	Operate (Set) voltage (at 20 ℃) (Initial)	Release (Reset) voltage (at 20 ℃) (Initial)	Rated operating current [±10 %] (at 20 ℃)	Coil resistance [±10 %] (at 20 ℃)	Rated operating power (at 20 ℃)	Usable voltage range
12 V DC	Max. 7.0 V DC	Min. 0.5 V DC	37.5 mA	320 Ω	450 mW	10 to 16 V DC

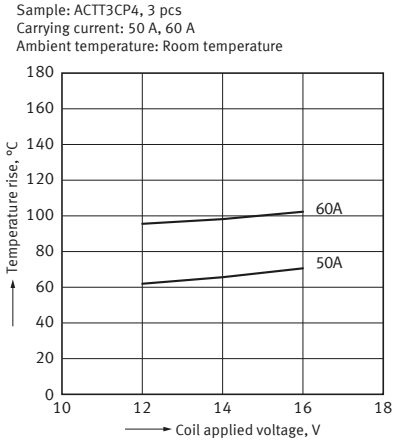
■ Specifications

Item		Specifications
Contact data	Contact arrangement	Double make contact 2 Form A (1 Form U)
	Contact resistance (initial)	Max. 50 mΩ (by voltage drop 1 A 6 V DC)
	Contact material	Ag alloy
	Rated switching capacity (resistive)	60 A 14 V DC
	Max. carrying current (initial) *1	60 A/1 hour (coil applied voltage 12 V DC, at 20 ℃)
	Min. switching load (resistive) *2	1 A 12 V DC (at 20 ℃)
Insulated resistance (initial)		Min. 100 MΩ (at 500 V DC, Measurement at same location as " Dielectric strength " section.)
Dielectric strength (initial)	Between open contacts	500 Vrms for 1 min (detection current: 10 mA)
	Between contacts and coil	500 Vrms for 1 min (detection current: 10 mA)
Time characteristics (initial)	Operate time (at rated voltage)	Max. 10 ms (at 20 ℃, without contact bounce time)
	Release time (at rated voltage)	Max. 15 ms (at 20 ℃, without contact bounce time) (without diode)
Shock resistance	Functional	Min. 98 m/s² { 10 G } (half-wave pulse of sine wave: 11 ms; detection time: 1 ms)
	Destructive	Min. 980 m/s² { 100 G } (half-wave pulse of sine wave: 6 ms)
Vibration resistance	Functional	10 to 100 Hz, Min. 44.1 m/s² { 4.5 G } (detection time: 1 ms)
	Destructive	10 to 500 Hz, Min. 44.1 m/s² { 4.5 G } Time of vibration for each direction; X, Y direction: 2 hours, Z direction: 4 hours
Expected life	Mechanical	Min. 5 × 10⁶ (at 300 times/min)
	Electrical*4	<Resistive load> Min. 10⁵ at rated switching capacity, operating frequency: ON 1 s, OFF 9 s <Lamp load> Min. 10⁵: at 120 A (inrush), 15 A (steady), 14 V DC, operating frequency: ON 1 s, OFF 14 s
Conditions	Conditions for usage, transport and storage*3	High heat-resistant type/Pin in Paste compliant type Ambient temperature: −40 to +110 ℃ Humidity: 2 to 85 % RH (Avoid icing or condensation)
Weight		Approx. 12 g

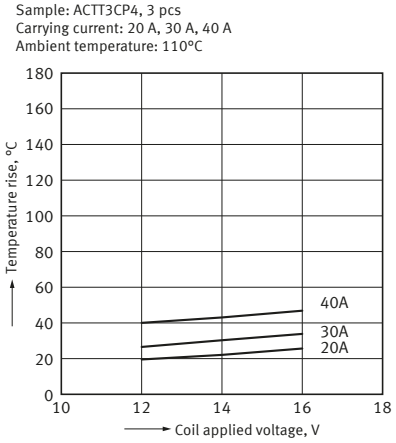
*1: Depends on connection conditions. Also, this does not guarantee repeated switching. We recommend that you confirm operation under actual conditions.
*2: This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.
*3: The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. For details, please refer to the " Automotive Relay Users Guide ".
Please inquire our sales representative if you will be using the relay in a high temperature atmosphere (110 ℃).
*4: Please connect N.O. terminal to (+) side and COM terminal to (−) side.

REFERENCE DATA

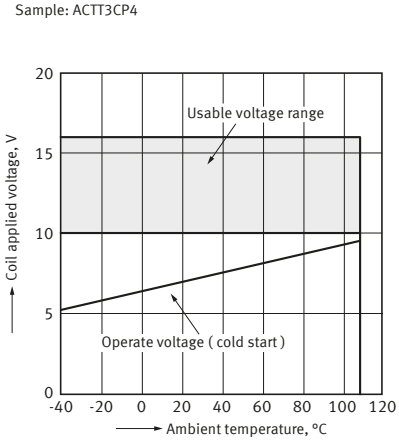
1-1. Coil temperature rise (at room temperature)



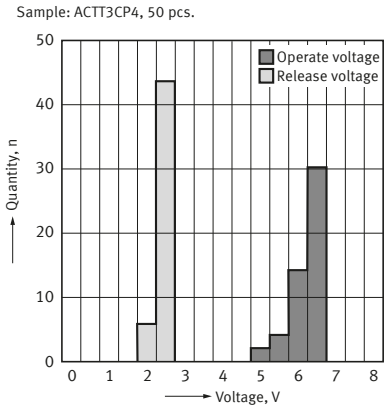
1-2. Coil temperature rise (at 110 ℃)



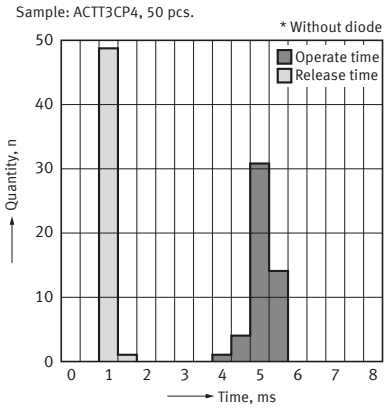
2. Ambient temperature and usable voltage range



3. Distribution of operate and release voltage

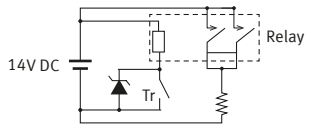


4. Distribution of operate and release time

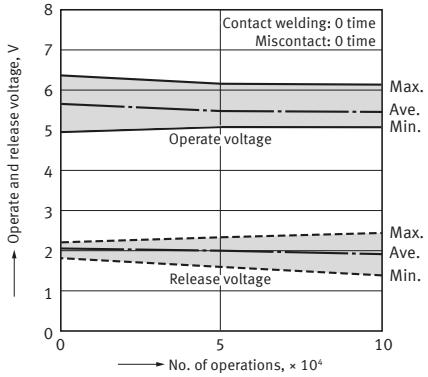


5-1. Electrical life test (Resistive load)

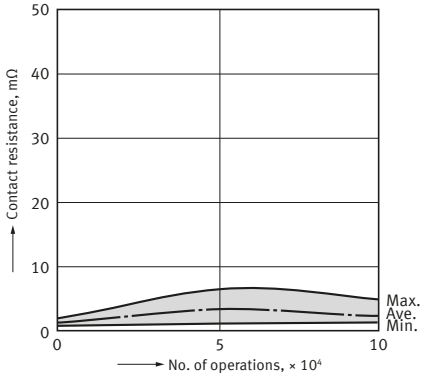
Sample: ACTT3CP4, 6pcs.
Load: Resistive load: 60A 14V DC
Operating frequency: ON 1s, OFF 9s
Ambient temperature: Room temperature
Circuit:



Change of operate and release voltage

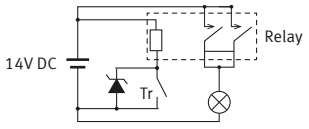


Change of contact resistance

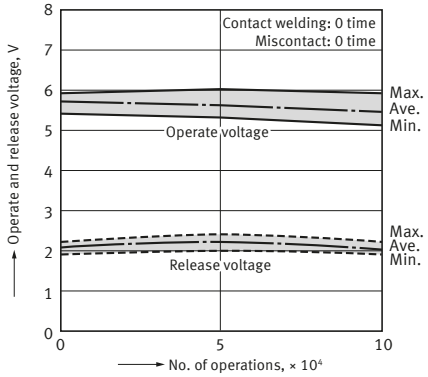


5-2. Electrical life test (Lamp load)

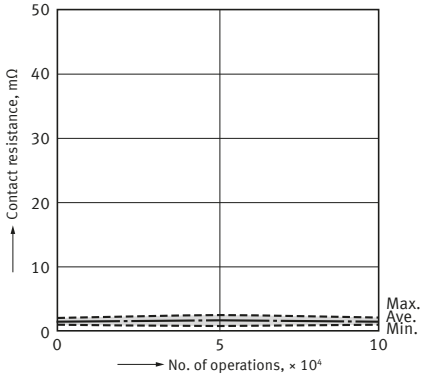
Sample: ACTT3CP4, 6pcs.
Load: Inrush current: 120A, Steady current: 15A
Operating frequency: ON 1s, OFF 14s
Ambient temperature: Room temperature
Circuit:



Change of operate and release voltage



Change of contact resistance



DIMENSIONS (Unit: mm)

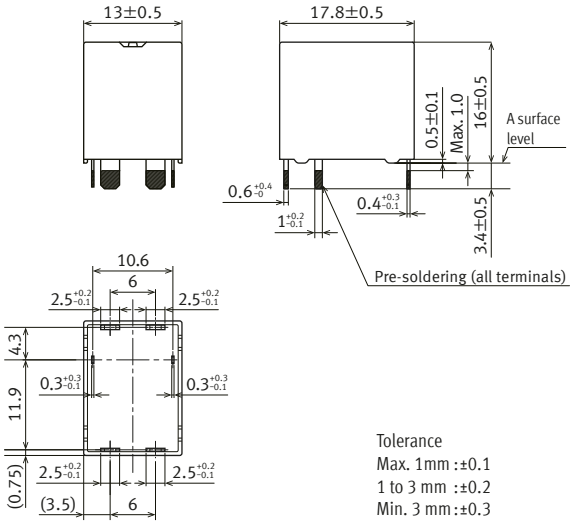
CAD The CAD data of the products with a " CAD " mark can be downloaded from our Website.

■ Double make contact 2 Form A (1 Form U)

● High heat-resistant type

CAD

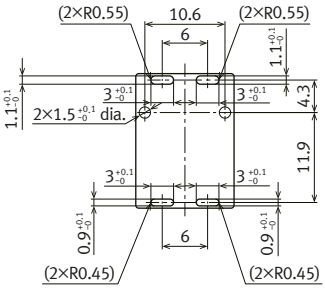
External dimensions



Tolerance
Max. 1mm : ±0.1
1 to 3 mm : ±0.2
Min. 3 mm : ±0.3

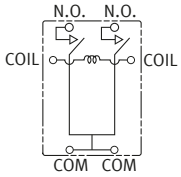
* Dimensions (thickness and width) of terminal is measured after pre-soldering. Intervals between terminals is measured at A surface level.

PC board pattern
(BOTTOM VIEW)



Tolerance: ± 0.1

Schematic
(BOTTOM VIEW)

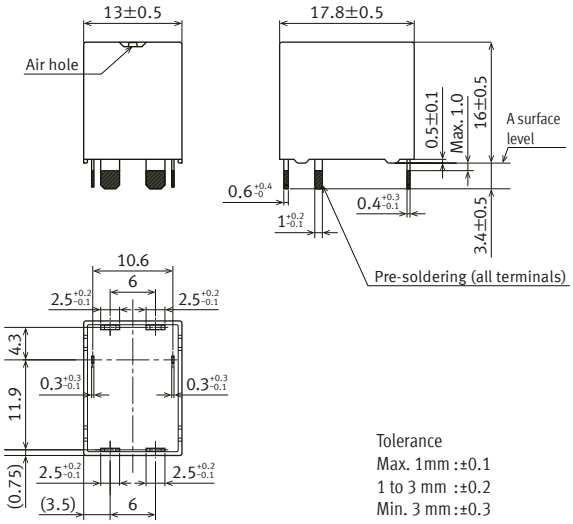


* Please connect N.O. terminal to (+) side and COM terminal to (–) side.

● Pin in Paste compliant type

CAD

External dimensions



Tolerance
Max. 1mm : ±0.1
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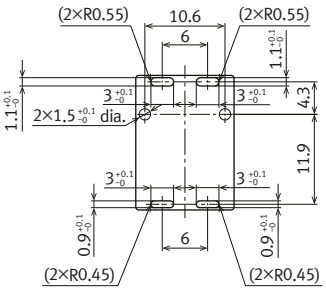
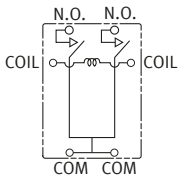
PC board pattern
(BOTTOM VIEW)



Tolerance: ± 0.1

Schematic
(BOTTOM VIEW)



* Please connect N.O. terminal to (+) side and COM terminal to (–) side.

GUIDELINES FOR USAGE

■ For general cautions for use, please refer to the " Automotive Relay Users Guide ".

■ Precautions when using TT relays

● **Coil operating power**

Pure DC current should be applied to the coil. If it includes ripple, the ripple factor should be less than 5 %. However, check it with the actual circuit since the characteristics may be slightly different. Also, the power waveform should be rectangular.

● **Coil applied voltage**

To ensure proper operation, the voltage applied to the coil should be the rated operating voltage of the coil. Also, be aware that the pick-up and drop-out voltages will fluctuate depending on the ambient temperature and operating conditions.

● **Expected life**

Check this with the real device as it is affected by coil driving circuit, load type, activation frequency, activation phase, ambient conditions and other factors.

● **Soldering**

When soldering the relays, ensure conformance with the conditions listed.

Automatic soldering

Conditions	Preheating	Soldering
Temperature	Max. 100 ℃ (surface of PC board)	Max. 260 ℃
Time	within 120 s	within 5 s

● **Usage, transport and storage conditions**

1) Ambient temperature, humidity and air pressure during usage, transport, and storage of the relay

(1) Temperature

−40 to +110 ℃

(2) Humidity

2 to 85 % RH

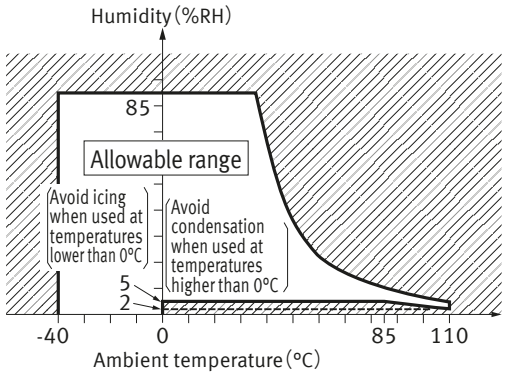
(Avoid icing and condensation)

(3) Air pressure

86 to 106 kPa

Note) The humidity range varies with the temperature. Use within the range indicated in the graph.

[Temperature and humidity range for usage, transport, and storage]



2) Water condensation

Water condensation occurs when the ambient temperature drops suddenly from a high temperature and humidity, or the relay is suddenly transferred from a low ambient temperature to a high temperature and humidity. Condensation causes the failures like insulation deterioration, wire disconnection and rust etc.

Panasonic Industry Co., Ltd. does not guarantee the failures caused by condensation.

The heat conduction by the equipment may accelerate the cooling of relay itself, and the condensation may occur. Please confirm no condensation in the worst condition of the actual usage. (Special attention should be paid when high temperature heating parts are close to the relay. Also, please consider the condensation may occur inside of the relay.)

3) Icing
Please check the icing when an ambient temperature is lower than 0 ℃. Icing means, the moisture contained in the surrounding environment and inside the relay freezes when the ambient temperature falls below the freezing point.
The icing causes the sticking of movable portion, the operation delay and the contact conduction failure etc. Panasonic Industry Co., Ltd. does not guarantee the failures caused by the icing.
The heat conduction by the equipment may accelerate the cooling of relay itself and the icing may occur. Icing condition is changed by ambient environment, please make sure to confirm no icing in the worst condition of the actual usage.

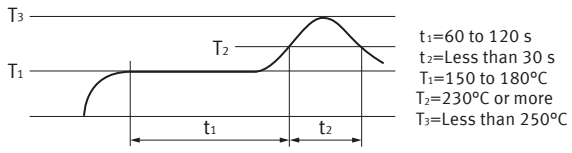
4) Low temperature and low humidity environments
The plastic becomes brittle if the relay is exposed to a low temperature, low humidity environment for long periods of time.

5) Following is the conditions of ambient temperature and humidity in case of tube packaging
(1) Ambient temperature; 0 ℃ to 40 ℃ (not condensation)
(2) Humidity; Max. 85 % RH

● **Mounting and cleaning conditions for Pin in Paste compliant type**

When soldering this relay, please observe the following conditions.

[I.R.S method (recommended)]
(Recommended number of reflow: 1 time)



1) Cautions for mounting
(1) The temperature profile shows the temperature at the soldering portion on the PC board surface.
(2) Depending on the mounting density condition, reflow heating method, and PC board type (metal etc.), the relay's exterior and interior temperature may become extremely high. Therefore, please confirm well under the actual use condition before use.

2) The other cautions of reflow soldering
(1) When soldering condition is out of recommendation, the relay performance may be adversely affected. If soldering conditions are out of our recommendation, please contact our sales office before operation.
(2) Please check the effect at the actual soldering because heat stress to relay is changed by PC board type and manufacturing process conditions.
(3) Solder creepage, wettability or soldering strength will be affected by the mounting condition or soldering material. Please check the actual production condition in detail.
(4) Do not wash the relay as failures may occur.
(5) This product is not plastic sealed type. Please perform coating with sufficient attention to avoid infiltration of the solvent to the inside. Also, please pay careful attention to use and store them with no contamination of foreign material.

● **Other handling precautions**

Do not use relays that have been dropped, because doing so may be a cause of faulty operation.

Please refer to **" the latest product specifications "** when designing your product.
• Requests to customers:
https://industry.panasonic.com/global/en/salespolicies

■ Global Sales Network Information: industry.panasonic.com/global/en/salesnetwork/globalnetwork

Panasonic
INDUSTRY

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Specifications are subject to change without notice.
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