Panasonic
ideas for life

COMPACT FLAT SIZE PC BOARD RELAY FOR AUTOMOTIVE

CP RELAYS

Compliance with RoHS Directive

FEATURES

1. Compact flat type
Flat size enables it to be built-in switch units.
<Height>
PC board terminal type:
9.5 mm .374 inch
Surface-mount terminal type:
10.5mm .413inch

2. High capacity
CP Relay provides low profile spacesaving advantages while offering high continuous current of 25A (1 hour).

3. Simple footprint pattern enables ease of PC board layout
Arrangement of coil and contact terminals designed to withstand large capacity which ensures leeway and facilitates PC board design.

4. Sealed construction
Sealed construction suitable for harsh environments

5. "PC board terminal" and "Surface mount terminal" types available
SMD automatic mounting is possible for surface mount terminal types because tape and reel packaging is used.

6. Model available for wiper load.

TYPICAL APPLICATIONS

For automotive system
Power windows, Auto door lock, Power sunroof, Memory seat, Wiper, Defogger, Blower fan, EPS, ABS etc.

ORDERING INFORMATION

CP □ □ - □ - □

Contact arrangement
1: 1 Form C
1a: 1 Form A
1W: 1 Form C for wiper load

Mounting classification
Nil: PC board terminal/wiper load
SA: Surface-mount terminal*1

Coil voltage (DC)
12 V

Packing style*2
Nil: Tube packing
X: Tape and reel packing (picked from the NC terminal side)
Z: Tape and reel packing (picked from the coil terminal side)

TYPES

1. PC board terminal type

Contact arrangement	Coil voltage	Part No.
1 Form A	12V DC	CP1a-12V
1 Form C		CP1-12V
1 Form C for wiper load		CP1W-12V

Standard packing; Carton (tube): 40 pcs.; Case: 1,000 pcs.

2. Surface mount terminal type

Contact arrangement	Coil voltage	Part No.
1 Form C	12V DC	CP1SA-12V-X
		CP1SA-12V-Z

Standard packing; Carton (tape and reel): 300 pcs.; Case: 900 pcs.

Notes: *1. Surface-mount terminal type is available only for 1 form C contact arrangement.
*2. Surface mount terminal type is only supplied in tape and reel packaging. Tube packaging is only available for PC board type. Tape and reel packing symbol "-z" or "-x" are not marked on the relay.

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 (at 85°C 185°F)
12V DC	Max. 7.2V DC (Initial)	Min. 1.0V DC (Initial)	53.3 mA	225Ω	640 mW	10 to 16V DC

Note: Other pick-up voltage types are also available. Please contact us for details.

2. Specifications

1) Standard CP relay

Characteristics	Item		Specifications	
Contact	Arrangement		1 Form A	1 Form C
	Initial contact resistance (Initial)		N.O.: Typ6mΩ, N.C.: Typ8mΩ (By voltage drop 6V DC 1A)	
	Contact material		Ag alloy (Cadmium free)	
Rating	Nominal switching capacity (resistive load)		20A 14V DC	N.O.: 20A 14V DC, N.C.: 10A 14V DC
	Max. carrying current (12V DC initial)*3		N.O.: 40A for 2 minutes, 30A for 1 hour (at 20°C 68°F) 35A for 2 minutes, 25A for 1 hour (at 85°C 185°F)	
	Nominal operating power		640 mW	
	Min. switching capacity (resistive load)*1		1A 12V DC	
Electrical characteristics	Insulation resistance (Initial)		Min. 100 MΩ (at 500V 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: 10μs)	
		Destructive	Min. 1,000 m/s² {100G} (Half-wave pulse of sine wave: 6ms)	
	Vibration resistance	Functional	10 Hz to 100 Hz, Min. 44.1 m/s² {4.5G} (Detection time: 10μs)	
		Destructive	10 Hz to 500 Hz, Min. 44.1 m/s² {4.5G} Time of vibration for each direction; X, Y direction: 2 hours, Z direction: 4 hours	
Expected life	Mechanical		Min. 10^7 (at 120 cpm)	
	Electrical *Motor load does not apply to wiper load applications.		<Resistive load> Min. 10^5 (At nominal switching capacity, operating frequency: 1s ON, 9s OFF) <Motor load*> Min. 2×10^5 (N.O. side, Inrush 25A, steady 5A at 14V DC) Min. 10^5 (N.O. side, 20A 14V DC at motor lock) Min. 2×10^5 (N.C. side, 20A 14V DC at brake current) (Operating frequency: 0.5s ON, 9.5s OFF)	
Conditions	Conditions for operation, transport and storage*2		Ambient temp: –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 rated load)	
Mass			Approx. 4g .14 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. Refer to Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT
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.

2) For wiper load

Anything outside of that given below complies with standard CP relays.

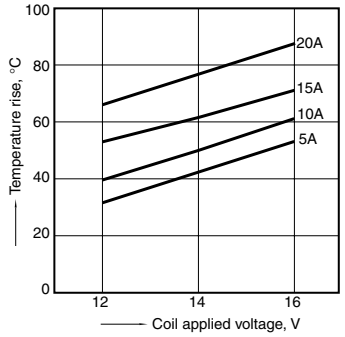
Characteristics	Item	Specifications
Rating	Max. carrying current (12V DC initial)*1	N.O.: 25A for 1 minutes, 15A for 1 hour (at 20°C 68°F)
Expected life	Electrical	<Wiper motor load (L = Approx. 1mH)> N.O. side: Min. 5×10^5 (Inrush 25A, steady 6A at 14V DC) N.C. side: Min. 5×10^5 (12A 14V DC at brake current) (Operating frequency: 1s ON, 9s OFF)

Note: *1. Depends on connection conditions. Also, this does not guarantee repeated switching. We recommend that you confirm operation under actual conditions.

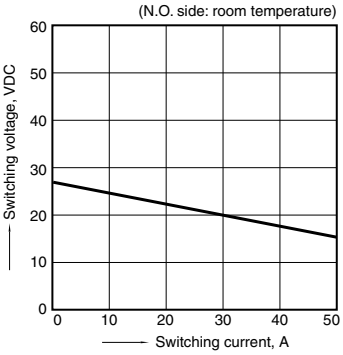
REFERENCE DATA

1. Coil temperature rise

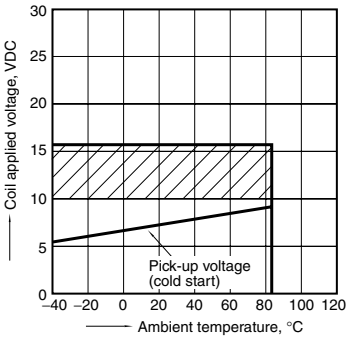
Sample: CP1-12V, 6pcs
Point measured: Inside the coil
Contact carrying current, 5A, 10A, 15A, 20A
Resistance method, ambient temperature 85°C 185°F



2. Max. switching capability (Resistive load)

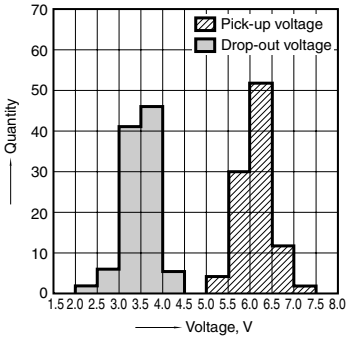


3. Ambient temperature and operating voltage range



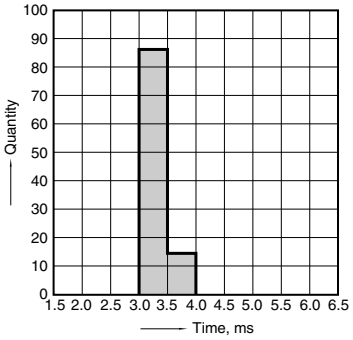
4. Distribution of pick-up and drop-out voltage

Sample: CP1-12V, 100pcs
Ambient temperature: 20°C 68°F



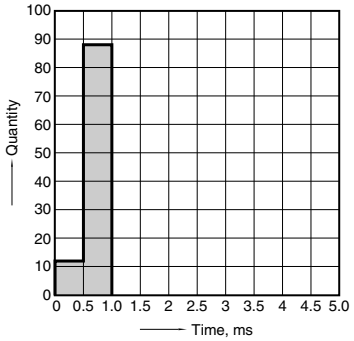
5. Distribution of operate time

Sample: CP1-12V, 100pcs
Ambient temperature: 20°C 68°F



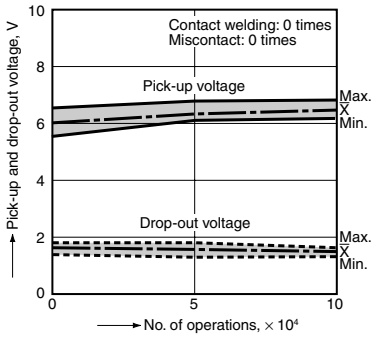
6. Distribution of release time

Sample: CP1-12V, 100pcs
Ambient temperature: 20°C 68°F
* Without diode



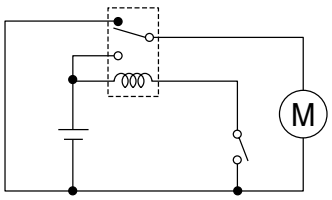
7.-(1) Electrical life test (at resistive load)

Sample: CP1-12V
Quantity: n = 4 (N.C. = 2, N.O. = 2)
Load: Resistive load (N.C. side: 10A 14V DC,
N.O. side: 20A 14V DC)
Operating frequency: ON 1s, OFF 9s
Ambient temperature: Room temperature

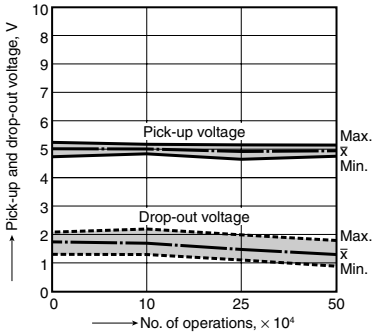


7.-(2) Electrical life test for wiper load (motor free)

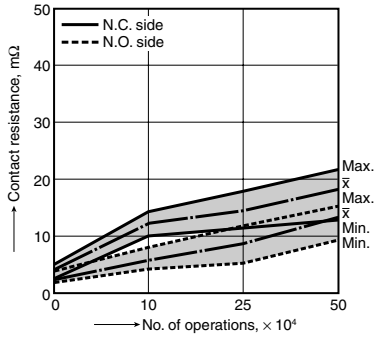
Sample: CP1W-12V
Quantity: n = 5
Load: N.O. side: Inrush 25A, steady 6A 14V DC
Load: N.C. side: Brake current 12A 14V DC
Operating frequency: ON 1s, OFF 9s
Ambient temperature: Room temperature
Circuit



Change of pick-up and drop-out voltage



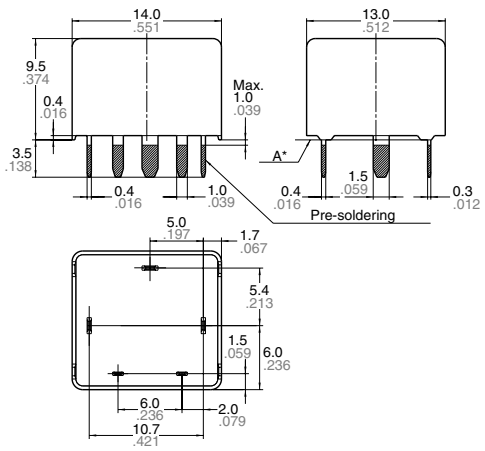
Change of contact resistance



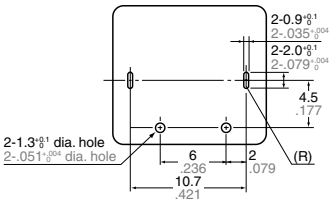
DIMENSIONS (Unit: mm inch)

1. PC board terminal type

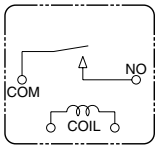
External dimensions



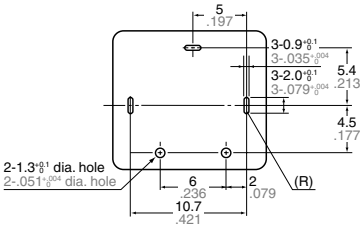
PC board pattern
(Bottom view)
1 Form A



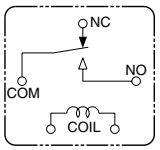
Schematic
(Bottom view)
1 Form A



1 Form C



1 Form C

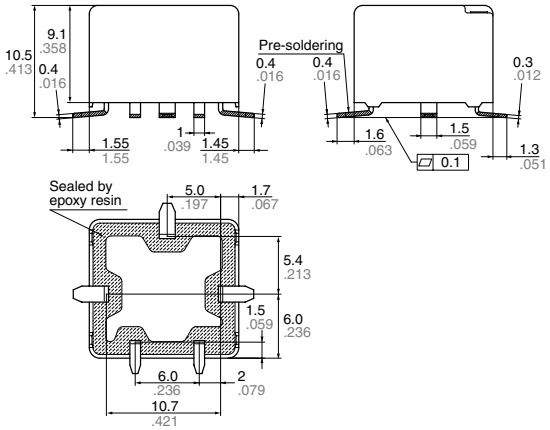


Dimension:	Tolerance
Max. 1mm .039 inch:	±0.1 ±.004
1 to 3mm .039 to .118 inch:	±0.2 ±.008
Min. 3mm .118 inch:	±0.3 ±.012

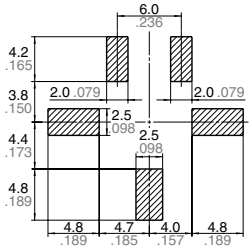
* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering.
Intervals between terminals is measured at A surface level.

2. Surface mount terminal type

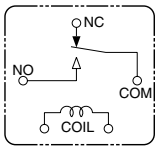
External dimensions



Recommendable mounting pad
(Top view)



Schematic
(Top view)



Dimension:	Tolerance
Max. 1mm .039 inch:	±0.1 ±.004
1 to 3mm .039 to .118 inch:	±0.2 ±.008
Min. 3mm .118 inch:	±0.3 ±.012

For Cautions for Use, see Relay Technical Information.