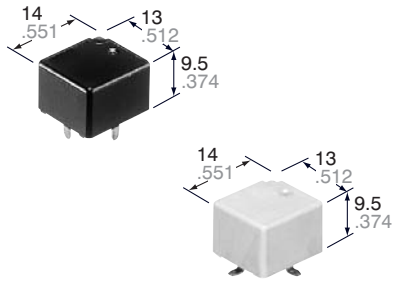
Panasonic
ideas for life

MINIATURE, LOW PROFILE AUTOMOTIVE RELAY

CP RELAYS



mm inch

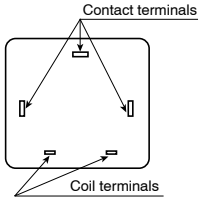
FEATURES

• Low profile
<Height>
PC board terminal type:
9.5 mm .374 inch
Surface-mount terminal type:
10.5mm .413inch

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

• Sealed construction suitable for harsh environments

• Simple footprint pattern enables ease of PC board layout



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

TYPICAL APPLICATIONS

- Power windows
- Auto door lock
- Power sunroof
- Memory sheet
- Wiper
- Defogger
- Blower fan
- EPS
- ABS etc.

SPECIFICATIONS

Contact

Arrangement			1 Form A	1 Form C
Contact material			$AgSnO_2$ type	
Initial contact resistance (By voltage drop 6V DC 1A)			Max. 100 mΩ	
Rating	Nominal switching capacity		20 A 14 V DC	20 A 14 V DC (N.O.) 10 A 14 V DC (N.C.)
	Max. switching voltage		16 V DC	
	Max. carrying current		40 A for 2 minutes 30 A for 1 hour (12 V at 20°C 68°F) 35 A for 2 minutes 25 A for 1 hour (12 V at 85°C 185°F)	
	Min. switching capacity#1		1 A 12 V DC	
Expected life (min. operations)	Mechanical (at 120cpm)		10^7	
	Electrical (at 6cpm)	Resistive load	Min. 10^5*1	
		Motor load	Min. 2×10^5*2	
			Min. 10^5*3	
		Lamp load	Min. 10^5*4	

Coil

Nominal operating power	640 mW

#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.

Characteristics

Max. operating speed (at rated load)		6cpm
Initial insulation resistance*5		Min. 100MΩ (at 500 V DC)
Initial breakdown voltage*6	Between open contacts	500 Vrms for 1min.
	Between contact and coil	500 Vrms for 1min.
Operate time*7		Max. 10ms (at 20°C 68°F)
Release time (without diode)*7 (at nominal voltage)		Max. 10ms (at 20°C 68°F)
Shock resistance	Functional*8	Min. 100 m/s² {10 G}
	Destructive*9	Min. 1,000 m/s² {100 G}
Vibration resistance	Functional*10	10 Hz to 100 Hz, Min.44.1 m/s² {4.5 G}
	Destructive	10 Hz to 500 Hz, Min.44.1 m/s² {4.5 G}
Conditions in case of operation, transport and storage*11 (Not freezing and condensing at low temperature)	Ambient temp	–40°C to +85°C –40°F to +185°F
	Humidity	5% R.H. to 85% R.H.
Mass		Approx. 4g .14 oz

Remarks

*1 At nominal switching capacity, operating frequency: 1s ON, 9s OFF
*2 N.O.: at 5A (steady), 25A (inrush)/N.C.: at 20A (brake) 14V DC, operating frequency: 0.5s ON, 9.5s OFF
*3 At 20A 14V DC (Motor lock), operating frequency: 0.5s ON, 9.5s OFF
*4 N.O.: at 5A (steady), 40A (inrush)14V DC, operating frequency: 1s ON, 14s OFF
*5 Measurement at same location as "Initial breakdown voltage" section
*6 Detection current: 10mA
*7 Excluding contact bounce time
*8 Half-wave pulse of sine wave: 11ms; detection time: 10μs
*9 Half-wave pulse of sine wave: 6ms
*10 Detection time: 10μs
*11 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (p. 19, Relay Technical Information).

ORDERING INFORMATION

Ex. CP [1a] [SA] — [12V] — [X]

Contact arrangement	Mounting classification	Coil voltage (DC)	Packing style
1a: 1 Form A 1: 1 Form C	Nil: PC board terminal SA: Surface-mount terminal	12 V	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)

Notes: 1. Tube packing: Carton (Tube): 40 pcs.; Case: 1,000 pcs. * PC board terminal type only.
2. Tape and reel packing: Carton (Tape and reel): 300 pcs.; Case: 900 pcs. * Surface-mount terminal type only.
3. Surface-mount terminal type is available only for 1 form C contact arrangement.

TYPES

1. PC board terminal type

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

2. Surface mount terminal type

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

Notes:
1. *1 24V DC type is also available by request. Please contact us for details.
2. Tape and reel packing symbol "-z" or "-x" are not marked on the relay.

COIL DATA (at 20°C 68°F)

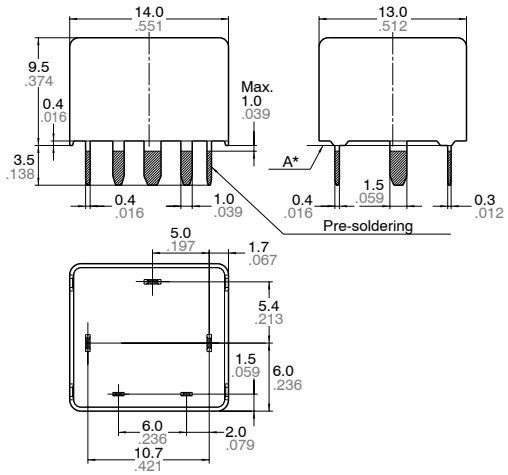
Nominal voltage, V DC	Pick-up voltage, V DC (Initial)	Drop-out voltage, V DC (Initial)	Coil resistance Ω	Nominal operating current mA	Nominal operating power mW	Usable voltage range, V DC
12	Max. 7.2	Min. 1.0	225±10%	53.3±10%	640	10 to 16

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

DIMENSIONS

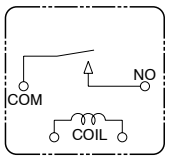
mm inch

1. PC board terminal type

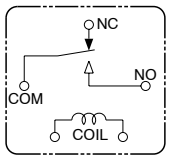


Schematic (Bottom view)

1a

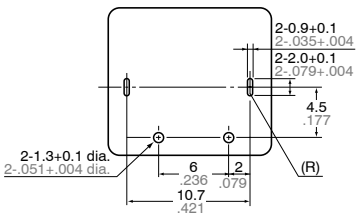


1c

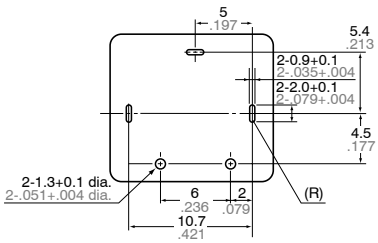


PC board pattern (Bottom view)

1a



1c

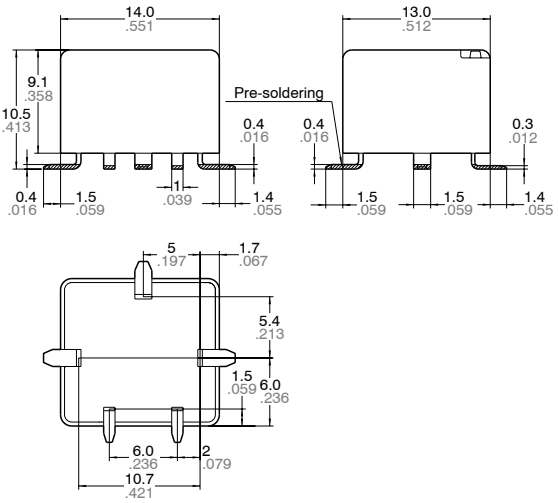


Dimension:	General tolerance
Max. 1mm .039 inch:	±0.1 ±.004
1 to 3mm .039 to .118 inch:	±0.2 ±.008
Min. 3mm .118 inch:	±0.3 ±.012

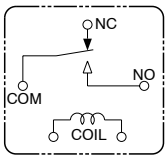
* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering.
Intervals between terminals is measured at A surface level.

2. Surface mount terminal type

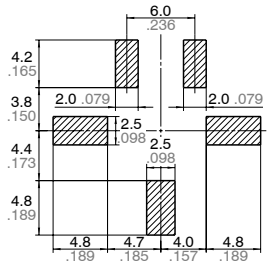
mm inch



Schematic



Recommendable mounting pad
(Top view)

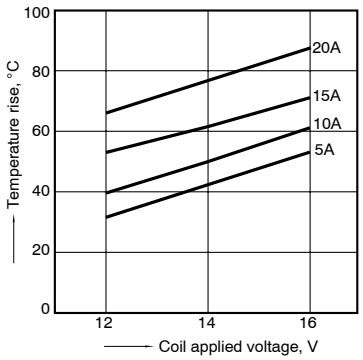


Dimension:	General tolerance
Max. 1mm .039 inch:	±0.1 ±.004
1 to 3mm .039 to .118 inch:	±0.2 ±.008
Min. 3mm .118 inch:	±0.3 ±.012

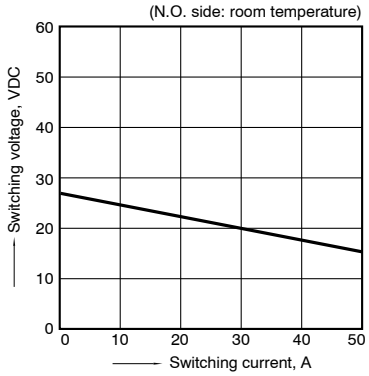
REFERENCE DATA

1. Coil temperature rise

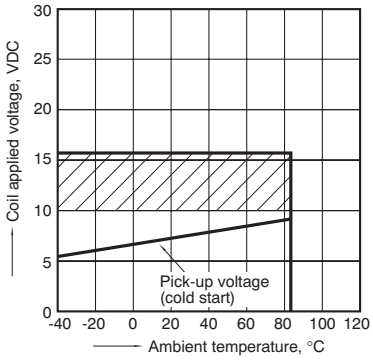
Sample : CP1-12V, 6pcs
Point measured : Inside the coil
Contact carrying current, 5A, 10A, 15A, 20A
Resistance method, ambient temperature 85°C 185°F



2. Max. switching capability (Resistive load)

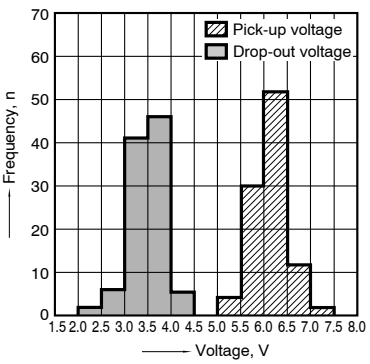


3. Ambient temperature and operating voltage range



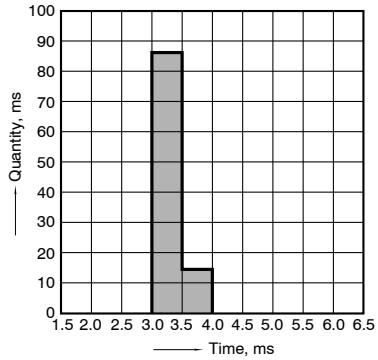
4. Distribution of pick-up and drop-out voltage

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



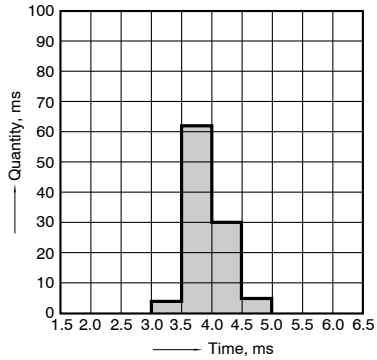
5. Distribution of operate time

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



6. Distribution of release time

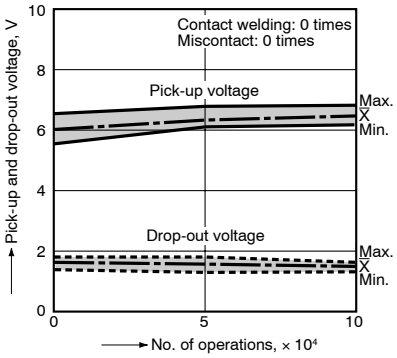
Sample : CP1-12V, 100pcs
Ambient temperature : 20°C 68°F
* With diode



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

Sample : CP1-12V
Quantity : n = 4 (NC = 2, NO = 2)
Load : Resistive load (NC side : 10A 14 V DC, NO side : 20 A 14 V DC)
Operating frequency : ON 1s, OFF 9s

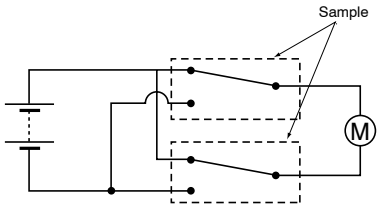
Ambient temperature : Room temperature

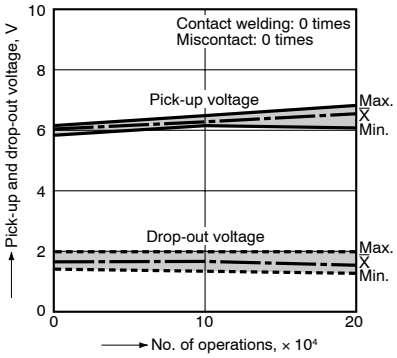


7-(2). Electrical life test (Motor free)

Sample : CP1-12V, 3pcs.
Load : 5A, Inrush 25A, Brake current 15A,
Power window motor load (Free condition).
Operating frequency : (ON : OFF = 0.5s : 9.5s)
Ambient temperature : Room temperature

Circuit :

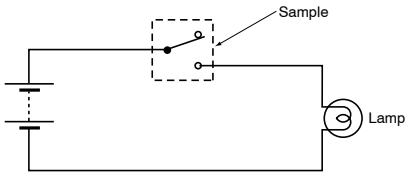


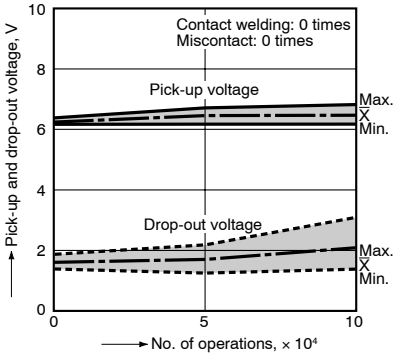


7-(3). Electrical life test (Lamp load)

Sample : CP1-12V, 3pcs.
Load : 5A, Inrush 40A, 14VDC lamp load
Operating frequency : (ON : OFF = 1s : 14s)
Ambient temperature : Room temperature

Circuit :





For Cautions for Use, see Relay Technical Information.