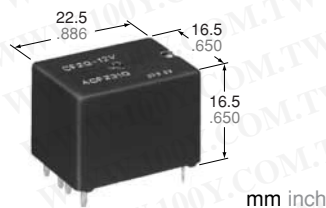


**Panasonic**  
 ideas for life

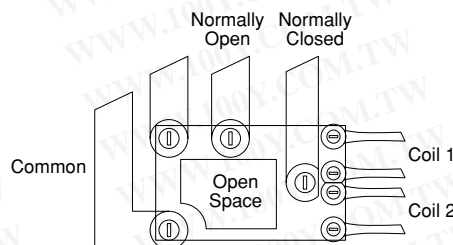
**TWIN POWER  
 AUTOMOTIVE RELAY**

**CF RELAYS**



**FEATURES**

- 7 Amp Steady/30 Amp Inrush current capability
- Simple footprint enables ease of PC board layout



**RoHS Directive compatibility information**  
<http://www.nais-e.com/>

**SPECIFICATIONS**

<b>Contact</b>			
Arrangement	1 Form Cx2 (H bridge)		
Contact material	Ag alloy (Cadmium free)		
Initial contact resistance (Initial) (By voltage drop 6 V DC 1 A)	Typ. 6 mΩ (N.O.) Typ. 9 mΩ (N.C.)		
Initial contact voltage drop	Max. 0.2 V (at 20 A)		
Rating	Nominal switching capacity	N.O.: 20A 14 V DC N.C.: 10A 14 V DC	
	Max. carrying current	30 A (2 minutes), 20 A (1 hour) (coil applied voltage: 12 V, at 20°C) 25 A (2 minutes), 15 A (1 hour) (coil applied voltage: 12 V, at 85°C)	
	Min. switching capacity#1	1 A 12 V DC	
Expected life (min. ope.)	Mechanical (at 120 cpm)	10 <sup>6</sup>	
	Electrical	resistive load	Min.10 <sup>5</sup>
		7 A 14 V DC, Inrush 30 A (Motor load)	2x10 <sup>5</sup>
		20 A 14 V DC (Motor lock)	Min.5x10 <sup>4</sup>

**Characteristics**

Max. operating speed (at rated load)	120 cpm	
Initial insulation resistance*1	Min. 100 MΩ (at 500 V DC)	
Initial breakdown voltage*2	Between open contacts	1,000 Vrms for 1 min.
	Between contacts and coil	1,000 Vrms for 1 min.
Operate time*3 (at nominal voltage)	Max. 10 ms (initial)	
Release time*3 (at nominal voltage)	Max. 10 ms (initial)	
Shock resistance	Functional*4	Min. 100 m/s <sup>2</sup> {10 G}
	Destructive*5	Min. 1,000 m/s <sup>2</sup> {100 G}
Vibration resistance	Functional*6	Approx. 44.1 m/s <sup>2</sup> {4.5 G}, 10 Hz to 100 Hz
	Destructive*7	Approx. 44.1 m/s <sup>2</sup> {4.5 G}, 10 Hz to 500 Hz
Conditions for operation, transport and storage*8 (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	Standard type	Approx. 15 g .529 oz

<b>Coil</b>	
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.

**Remarks**

- \*1 Measurement at same location as "Initial breakdown voltage" section
- \*2 Detection current: 10mA
- \*3 Excluding contact bounce time
- \*4 Half-wave pulse of sine wave: 11ms; detection time: 10μs
- \*5 Half-wave pulse of sine wave: 6ms
- \*6 Detection time: 10μs
- \*7 Time of vibration for each direction;  
 X, Y, direction: 2 hours  
 Z direction: 4 hours



\*8 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).

**TYPICAL APPLICATIONS**

- Power windows
- Auto door lock
- Electrically powered sunroof
- Electrically powered mirrors
- Powered seats
- Lift gates
- Slide door closers, etc.  
(for DC motor forward/reverse control circuits)

**ORDERING INFORMATION**

Ex. CF  -

Contact arrangement	Coil voltage(DC)
1 Form C x 2	12 V

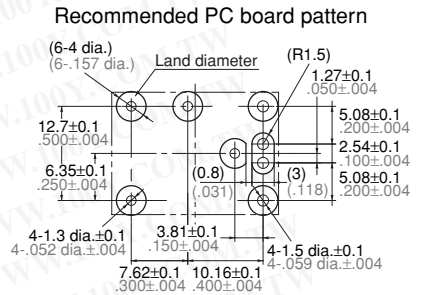
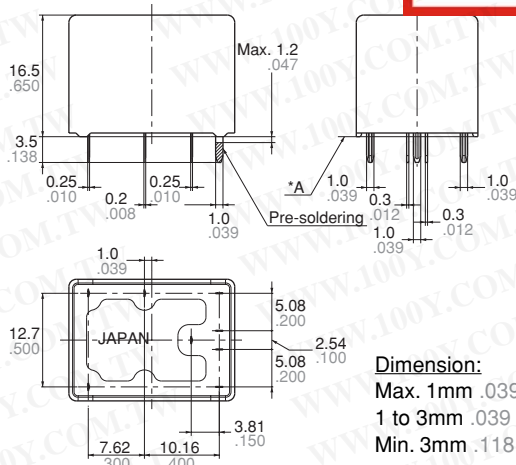
Standard packing: Carton: 35pcs.; Case: 700pcs.

**TYPES AND COIL DATA (at 20°C 68°F)**

Part No.	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, VDC
CF2-12V	12	Max. 7.2	Min. 1.0	225±10%	53.3±10%	640	10 to 16

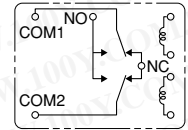
\* Other pick-up voltage types are also available. Please contact us for details.

**DIMENSIONS**



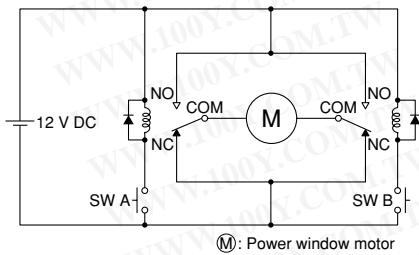
\* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering.  
 Intervals between terminals is measured at A surface level.

**Schematic**



**EXAMPLE OF CIRCUITS**

Forward/reverse control circuits of DC motor for power window



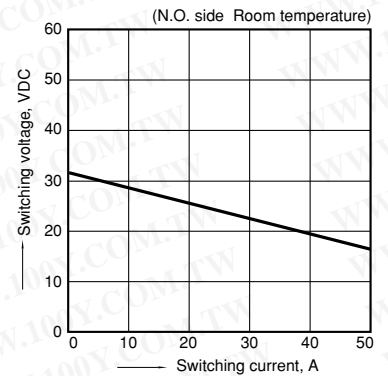
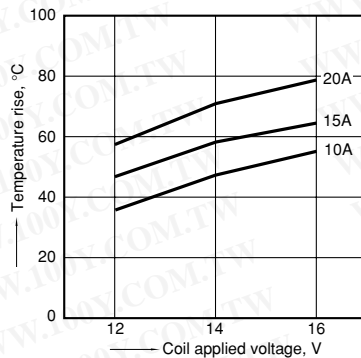
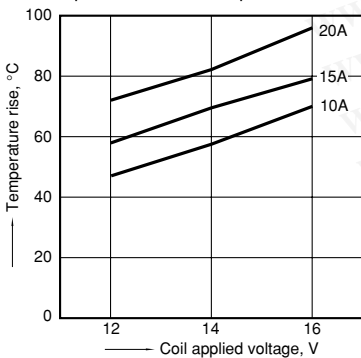
SW A	SW B	Motor
OFF	OFF	Stop
ON	OFF	Forward
OFF	ON	Reverse

**REFERENCE DATA**

1-(1). Coil temperature rise (at room temperature)  
 Sample: CF2-12V, 6pcs.  
 Measured portion: Inside the coil  
 Contact carrying current: 10A, 15A, 20A  
 Ambient temperature: Room temperature

1-(2). Coil temperature rise (at 85°C 185°F)  
 Sample: CF2-12V, 6pcs.  
 Measured portion: Inside the coil  
 Contact carrying current: 10A, 15A, 20A  
 Ambient temperature: 85°C 185°F

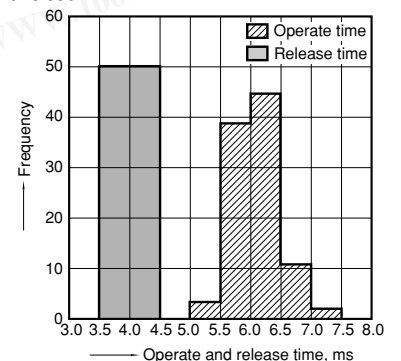
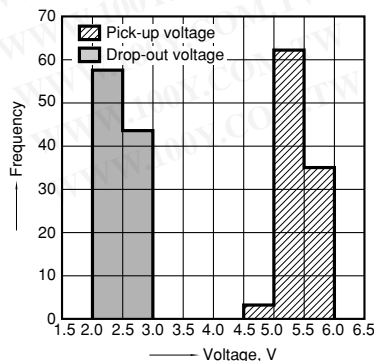
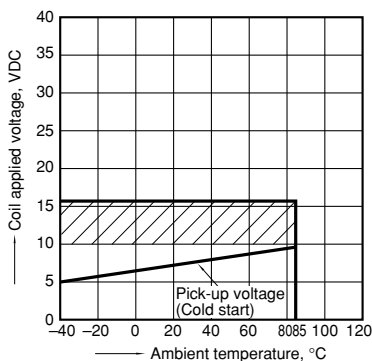
2. Max. switching capability (Resistive load, initial)



3. Ambient temperature and operating temperature range

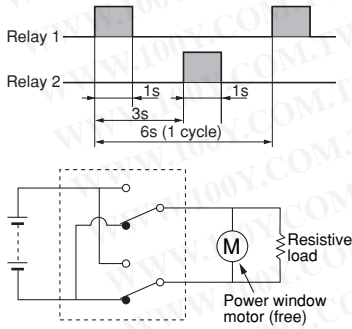
4. Distribution of pick-up and drop-out voltage  
 Sample: CF2-12V, 100pcs.

5. Distribution of operate and release time  
 Sample: CF2-12V, 100pcs.  
 \* With diode

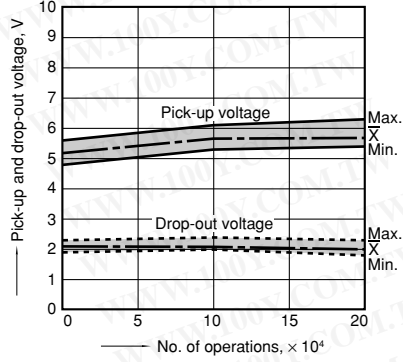


6-(1). Electrical life test (Motor free)

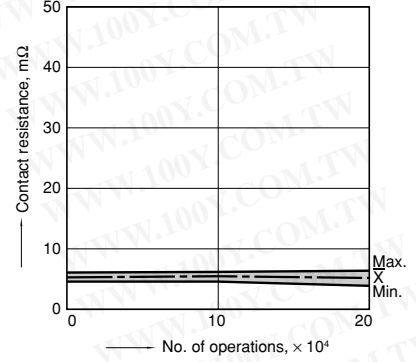
Sample: CF2-12V, 3pcs.  
 Load: Inrush current: 30A, Steady current: 7A,  
 Power window motor actual load (free condition)  
 Switching frequency: (ON:OFF = 1s:5s)  
 Ambient temperature: Room temperature  
 Circuit



Change of pick-up and drop-out voltage

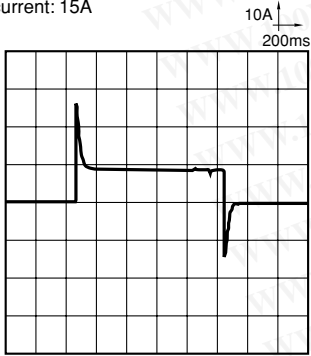


Change of contact resistance



Load current waveform

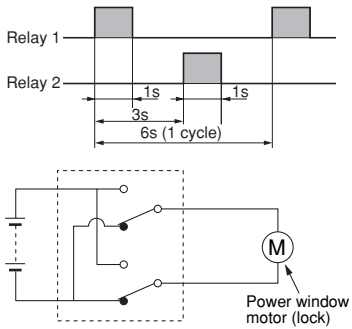
Inrush current: 27A, Steady current: 8.4A  
 Brake current: 15A



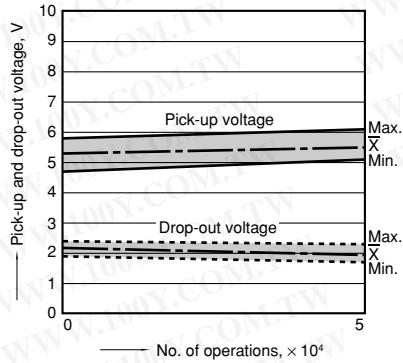
勝特力材料 886-3-5753170  
 勝特力电子(上海) 86-21-54151736  
 勝特力电子(深圳) 86-755-83298787  
[Http://www.100y.com.tw](http://www.100y.com.tw)

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

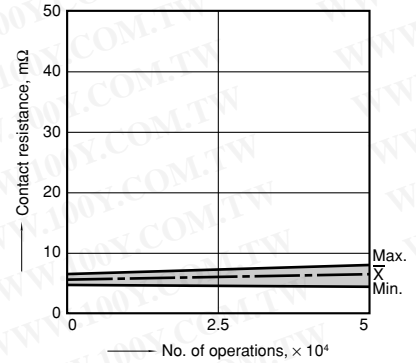
Sample: CF2-12V, 3pcs.  
 Load: 20A 14V DC,  
 Power window motor actual load (lock condition)  
 Switching frequency: (ON:OFF = 1s:5s)  
 Ambient temperature: Room temperature  
 Circuit



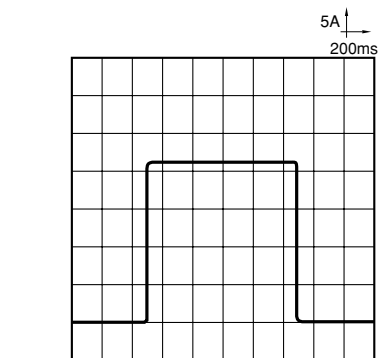
Change of pick-up and drop-out voltage



Change of contact resistance



Load current waveform



**For Cautions for Use, see Relay Technical Information.**