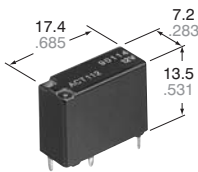


Twin type (8 terminals)



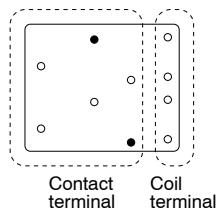
mm inch

Slim 1c type

### FEATURES

- **Small & slim size**  
Twin type: 17.4(L)×14.0(W)×13.5(H)mm  
.685(L)×.551(W)×.531(H)inch  
Slim 1c type: 17.4(L)×7.2(W)×13.5(H)mm  
.685(L)×.283(W)×.531(H)inch
- **Twin (1 Form C × 2)**  
Forward/reverse motor control is possible with a single relay.
- **Simple footprint enables ease of PC board layout**

※ 10 terminals layout



○ = 8 terminals

### TYPICAL APPLICATIONS

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

## SPECIFICATIONS

### Contact

Arrangement	1 Form C×2, 1 Form C		
Contact material	AgSnO <sub>2</sub> type		
Initial contact resistance (By voltage drop 6 V DC 1 A)	Max. 100mΩ		
Initial contact voltage drop	Max. 0.2 V (at 10 A)		
Rating	Nominal switching capacity	N.O.: 20 A 14 V DC N.C.: 10 A 14 V DC	
	Max. carrying current	35 A for 2 minutes, 25 A for 1 hour (14 V, at 20°C 68°F) 30 A for 2 minutes, 20 A for 1 hour (14 V, at 85°C 185°F)	
	Min. switching capacity <sup>#1</sup>	1 A 12 V DC	
Expected life (min. operation)	Mechanical (at 120 cpm)		
	Electrical	Resistive load	Min. 10 <sup>5*1</sup>
		Motor load	Min. 2×10 <sup>5*2</sup> (free) Min. 10 <sup>5*3</sup> (lock)

### Coil

Nominal operating power	800 mW
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<sup>#1</sup> 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

- <sup>\*1</sup> At nominal switching capacity, operating frequency: 1s ON, 9s OFF
- <sup>\*2</sup> N.O.: at 5 A (steady), 25 A (inrush)/N.C.: at 20 A (brake) 14 V DC, operating frequency: 0.5s ON, 9.5s OFF
- <sup>\*3</sup> At 25A 14 V DC (Motor lock), operating frequency: 0.5s ON, 9.5s OFF
- <sup>\*4</sup> Measurement at same location as "Initial breakdown voltage" section
- <sup>\*5</sup> Detection current: 10mA
- <sup>\*6</sup> Excluding contact bounce time
- <sup>\*7</sup> Half-wave pulse of sine wave: 11ms; detection: 10μs
- <sup>\*8</sup> Half-wave pulse of sine wave: 6ms

### Characteristics

Max. operating speed (at nominal switching capacity)		6 cpm
Initial insulation resistance <sup>*4</sup>		Min. 100 MΩ (at 500 V DC)
Initial breakdown voltage <sup>*5</sup>	Between open contacts	500 Vrms for 1 min.
	Between contacts and coil	500 Vrms for 1 min.
Operate time <sup>*6</sup> (at nominal voltage) (at 20°C 68° F)		Max. 10ms (Initial)
Release time <sup>*6</sup> (at nominal voltage) (at 20°C 68° F)		Max. 10ms (Initial)
Shock resistance	Functional <sup>*7</sup>	Min. 100 m/s <sup>2</sup> {10G}
	Destructive <sup>*8</sup>	Min. 1,000 m/s <sup>2</sup> {100G}
Vibration resistance	Functional <sup>*9</sup>	10 Hz to 100 Hz, Min. 44.1m/s <sup>2</sup> {4.5G}
	Destructive <sup>*10</sup>	10 Hz to 500 Hz, Min. 44.1m/s <sup>2</sup> {4.5G}
Conditions for operation, transport and storage <sup>*11</sup> (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. 8.0g .28oz (Twin type) Approx. 4.0g .14oz (Slim 1c type)

<sup>\*9</sup> Detection time: 10μs

<sup>\*10</sup> Time of vibration for each direction;  
X, Y, direction: 2 hours  
Z direction: 4 hours



<sup>\*11</sup> Refer to 6. Conditions for operation, transport and storage mentioned in [AMBIENT ENVIRONMENT \(p. 19, Relay Technical Information\)](#).

# CT (ACT)

## ORDERING INFORMATION

Ex. A CT 1 12

Product name	Contact arrangement	Coil voltage (V DC)
CT	1: 1 Form C 2: 1 Form C × 2 (8 terminals type) 5: 1 Form C × 2 (10 terminals type)	12: 12

Standard packing; 1 Form C: Carton (tube package) 30pcs. Case 1,500pcs.  
1 Form C × 2: Carton (tube package) 30pcs. Case 900pcs.

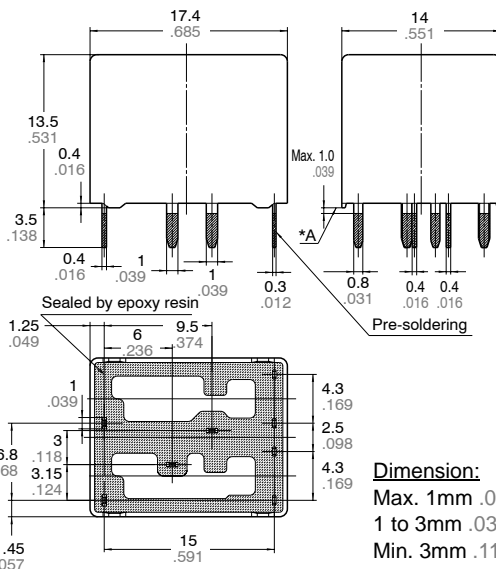
## TYPES AND COIL DATA (at 20°C 68°F)

Contact arrangement	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, V DC
1c	ACT112	12	Max. 7.2	Min. 1.0	180±10%	66.7±10%	800	10 to 16
1c × 2 (8 terminals type)	ACT212	12	Max. 7.2	Min. 1.0	180±10%	66.7±10%	800	10 to 16
1c × 2 (10 terminals type)	ACT512	12	Max. 7.2	Min. 1.0	180±10%	66.7±10%	800	10 to 16

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

## DIMENSIONS

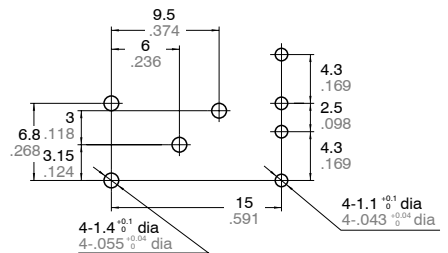
### 1. Twin type (8 terminals)



**Dimension:**  
Max. 1mm .039 inch:  
1 to 3mm .039 to .118 inch:  
Min. 3mm .118 inch:

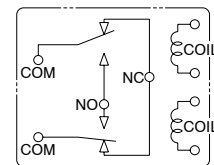
**Tolerance**  
±0.1 ±.004  
±0.2 ±.008  
±0.3 ±.012

### PC board pattern (Bottom view)



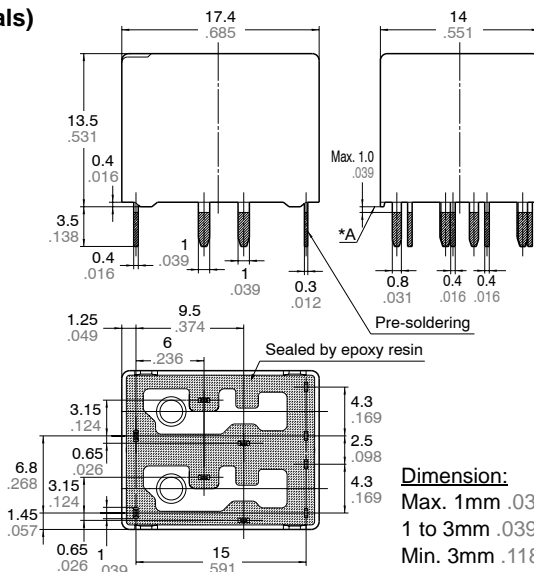
Tolerance: ±0.1 ±.004

### Schematic (Bottom view)



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

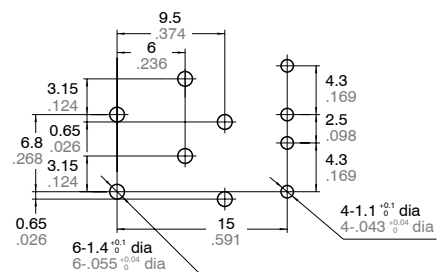
### 2. Twin type (10 terminals)



**Dimension:**  
Max. 1mm .039 inch:  
1 to 3mm .039 to .118 inch:  
Min. 3mm .118 inch:

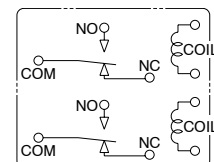
**Tolerance**  
±0.1 ±.004  
±0.2 ±.008  
±0.3 ±.012

### PC board pattern (Bottom view)



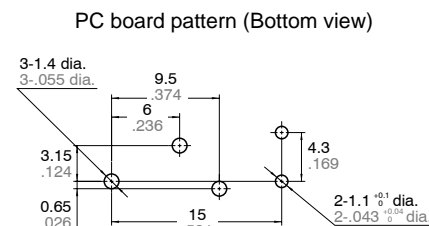
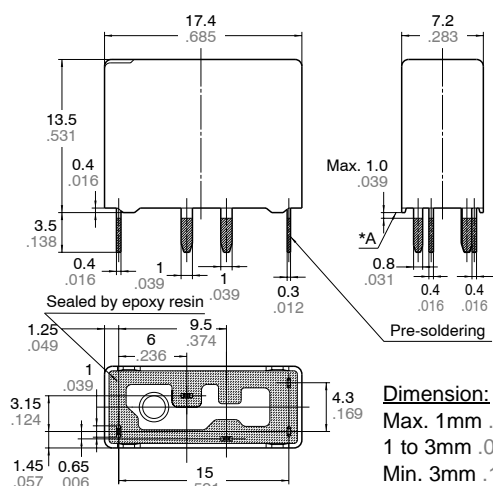
Tolerance: ±0.1 ±.004

### Schematic (Bottom view)



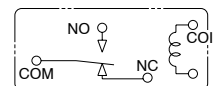
\* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering. Intervals between terminals is measured at A surface level.

## 3. Slim 1c type



Tolerance:  $\pm 0.1 \pm .004$

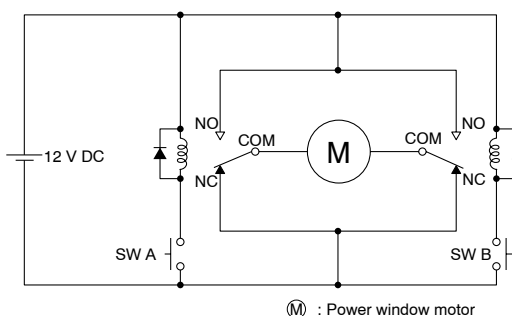
### Schematic (Bottom view)



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

## EXAMPLE OF CIRCUIT

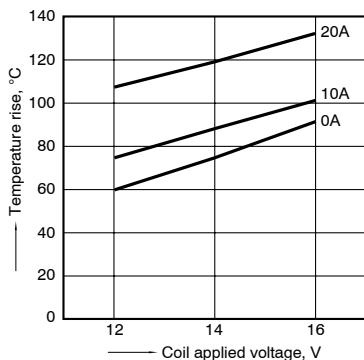
Forward/reverse control circuits of DC motor for power windows



## REFERENCE DATA

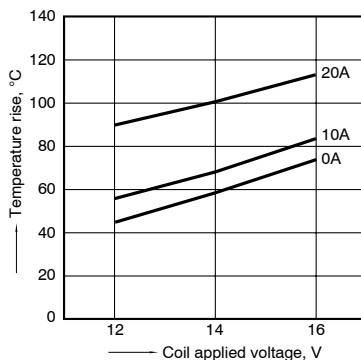
1-(1). Coil temperature rise (at room temperature)

Sample: ACT212, 3pcs.  
 Contact carrying current: 0A, 10A, 20A

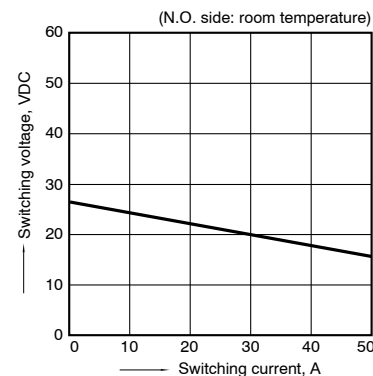


1-(2). Coil temperature rise (at 85°C 185°F)

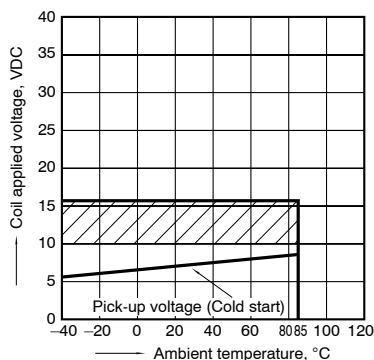
Sample: ACT212, 3pcs.  
 Contact carrying current: 0A, 10A, 20A



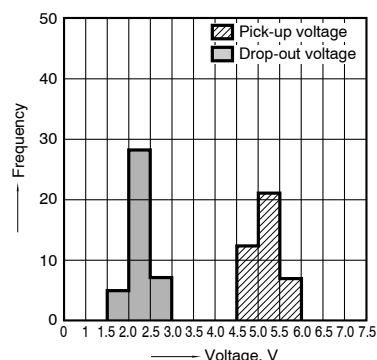
2. Max. switching capability (Resistive load)



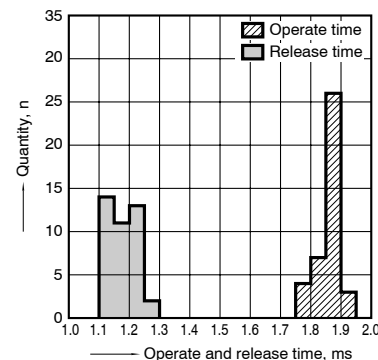
3. Ambient temperature and operating voltage range



4. Distribution of pick-up and drop-out voltage  
 Sample: ACT212, 40pcs.



5. Distribution of operate and release time  
 Sample: ACT212, 40pcs.  
 \* Without diode

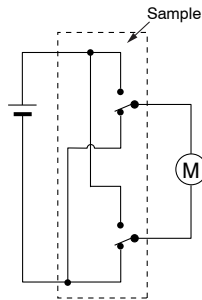


# CT (ACT)

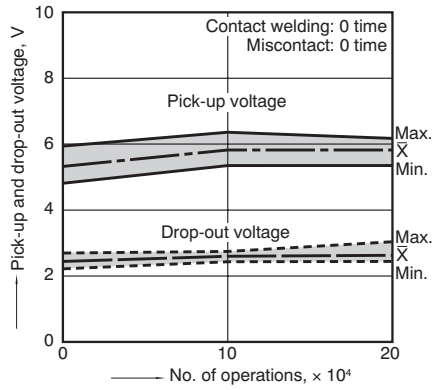
## 6-(1). Electrical life test (Motor free)

Sample: ACT212, 3pcs.  
 Load: 5A steady, Inrush 25A, 14V DC  
 Brake current: 13A 14V DC,  
 Power window motor actual load (free condition)  
 Operating frequency: (ON : OFF = 0.5s : 9.5s)  
 Ambient temperature: Room temperature

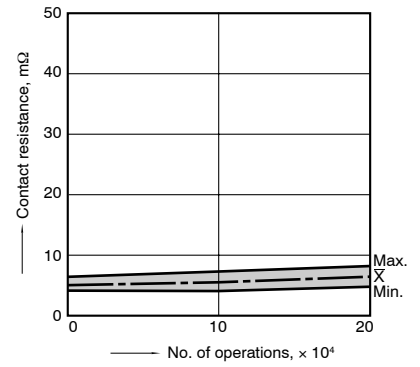
Circuit:



## Change of pick-up and drop-out voltage

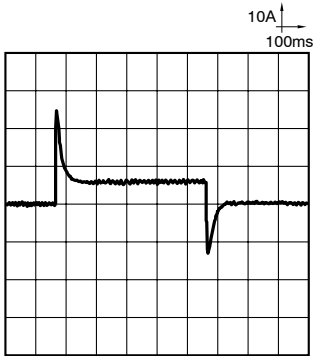


## Change of contact resistance



## Load current waveform

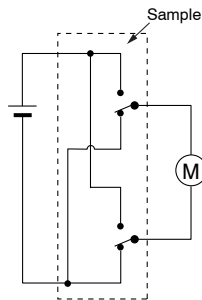
Inrush current: 25A, Steady current: 6A  
 Brake current: 13A



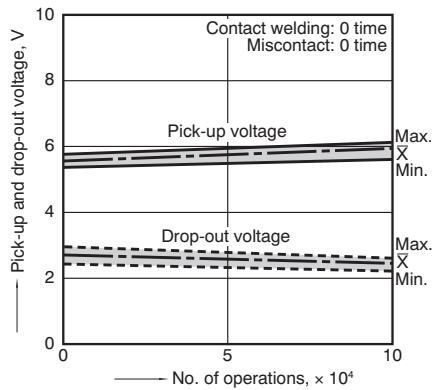
## 6-(2). Electrical life test (Motor lock)

Sample: ACT212, 3pcs.  
 Load: 25A 14V DC  
 Switching frequency: (ON : OFF = 0.5s : 9.5s)  
 Ambient temperature: Room temperature

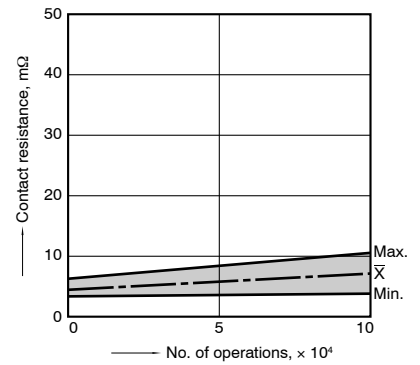
Circuit:



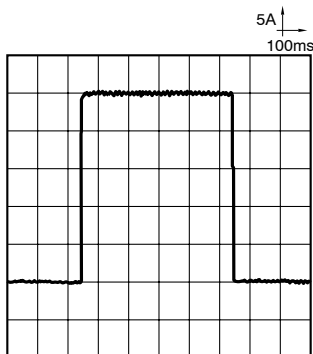
## Change of pick-up and drop-out voltage



## Change of contact resistance



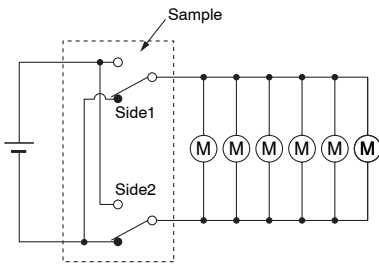
## Load current waveform



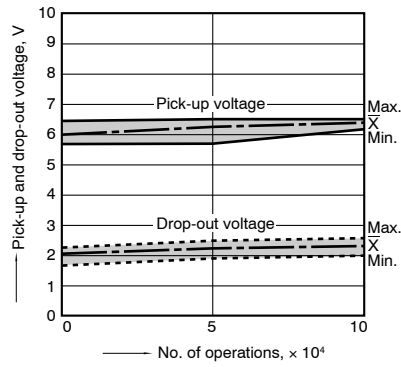
6-(3). Electrical life test (Motor lock)

Sample: ACT212, 3pcs.  
 Load: 20A 14V DC,  
 door lock motor actual load (Lock condition)  
 Switching frequency: (ON : OFF = 0.3s : 19.7s)  
 Ambient temperature: Room temperature

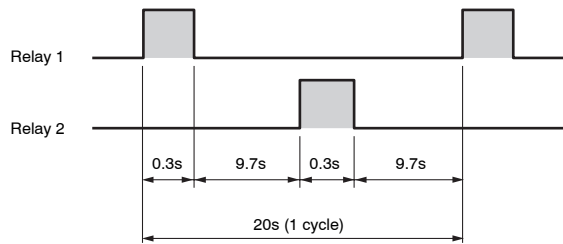
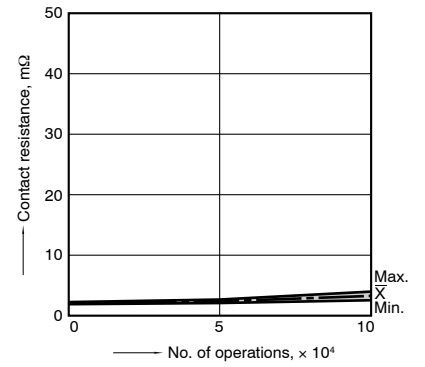
Circuit:



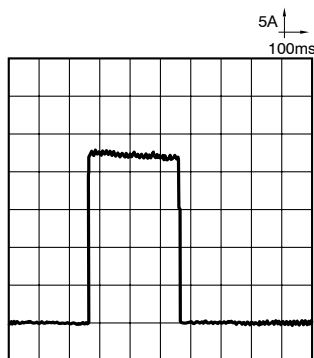
Change of pick-up and drop-out voltage



Change of contact resistance



Load current waveform



For Cautions for Use, see [Relay Technical Information](#).