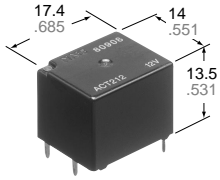
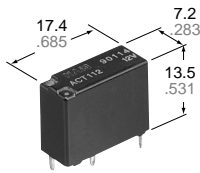


**NAIS****ULTRA SMALL  
AUTOMOTIVE RELAY****CT-RELAYS**

Twin type (8 terminals)



Slim 1c type

mm inch

**FEATURES**• **Ultra small 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

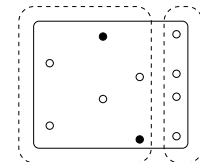
.685(L)×.283(W)×.531(H)inch

• **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



Contact terminal    Coil terminal

○ = 8 terminals

**SPECIFICATIONS**

Contact			
Arrangement	1 Form C×2 (H bridge), 1 Form C		
Contact material	Silver alloy		
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)	100mΩ		
Initial contact voltage drop, max.	0.2 V (at 10 A switching)		
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)	
Expected life (min. operation)	Mechanical (at 120 cpm)		
	Electrical	Resistive load	Min. 10 <sup>7</sup>
		Motor load	Min. 10 <sup>5*1</sup>
		Min. 2×10 <sup>5*2</sup>	
		Min. 10 <sup>5*3</sup>	
Coil			
Nominal operating power	800 mW		
Remarks			
* Specifications will vary with foreign standards certification ratings.			
*1 At nominal switching capacity, operating frequency: 1s ON, 9s OFF			
*2 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			
*3 At 25A 14 V DC (Motor lock), operating frequency: 0.5s ON, 9.5s OFF			
*4 Measurement at same location as "Initial breakdown voltage" section			
*5 Detection current: 10mA			
*6 Excluding contact bounce time			
*7 Half-wave pulse of sine wave: 11ms; detection: 10μs			
*8 Half-wave pulse of sine wave: 6ms			
*9 Detection time: 10μs			
Characteristics			
Max. operating speed (at nominal switching capacity)		6 cpm	
Initial insulation resistance*4		Min. 100 MΩ (at 500 V DC)	
Initial breakdown voltage*5	Between open contacts	500 Vrms for 1 min.	
	Between contacts and coil	500 Vrms for 1 min.	
Operate time*6 (at nominal voltage) (at 20°C 68° F)		Max. 10ms (Initial)	
Release time (without diode)*6 (at nominal voltage) (at 20°C 68° F)		Max. 10ms (Initial)	
Shock resistance	Functional*7	Min. 100 m/s <sup>2</sup> {10G}	
	Destructive*8	Min. 1,000 m/s <sup>2</sup> {100G}	
Vibration resistance	Functional*9	10 to 100 Hz, Min. 44.1m/s <sup>2</sup> {4.5G}	
	Destructive*10	10 to 500 Hz, Min. 44.1m/s <sup>2</sup> {4.5G}	
Conditions for 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 to 85% R.H.	
Unit weight		Approx. 8.0g .28oz (Twin type) Approx. 4.0g .14oz (Slim 1c type)	

\*10 Time of vibration for each direction;

X, Y, direction: 2 hours  
Z direction: 4 hours

\*11 Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 61)

**TYPICAL APPLICATIONS**

- Power windows
- Auto door lock
- Power sunroof
- Electrically powered mirrors

**ORDERING INFORMATION**

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

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

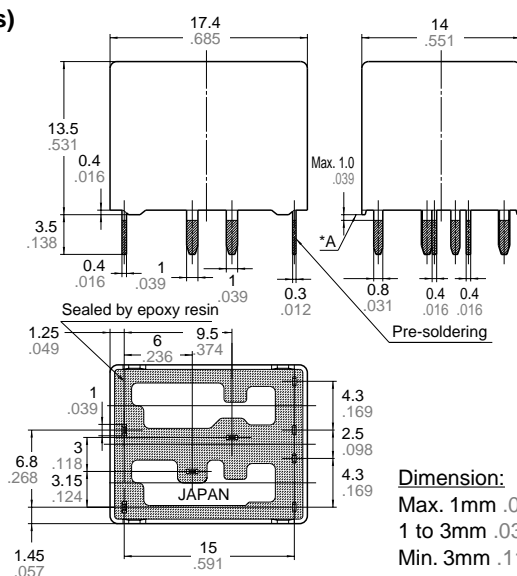
## TYPES AND COIL DATA (at 20°C 68°F)

Contact arrangement	Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, $\Omega$ ( $\pm 10\%$ )	Nominal operating current, mA ( $\pm 10\%$ )	Nominal operating power, mW	Usable voltage range, V DC
1c	ACT112	12	(Initial) 7.2	(Initial) 1.0	180	53.3	800	10 to 16
1c $\times$ 2 (8 terminals type)	ACT212	12	(Initial) 7.2	(Initial) 1.0	180	53.3	800	10 to 16
1c $\times$ 2 (10 terminals type)	ACT512	12	(Initial) 7.2	(Initial) 1.0	180	53.3	800	10 to 16

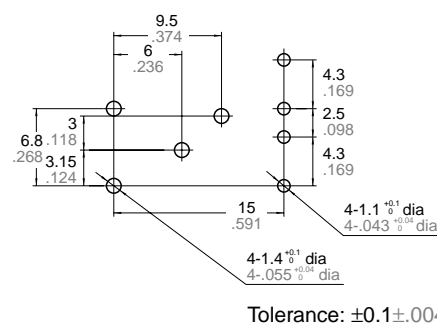
## DIMENSIONS

mm inch

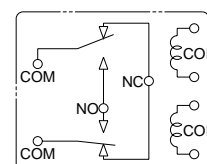
### 1. Twin type (8 terminals)



### PC board pattern (Bottom view)

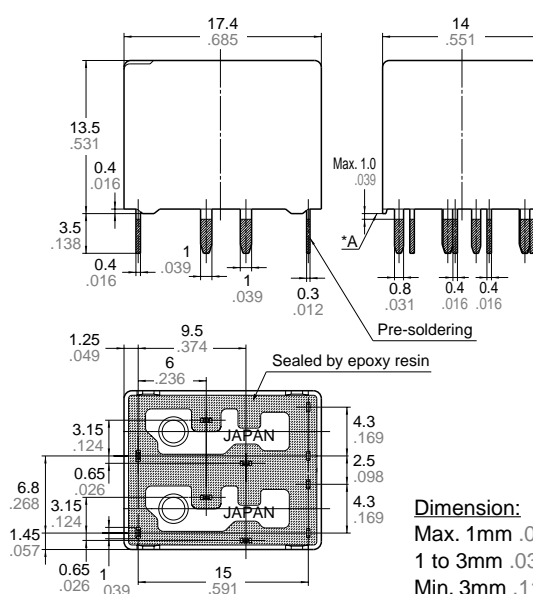


### Schematic (Bottom view)

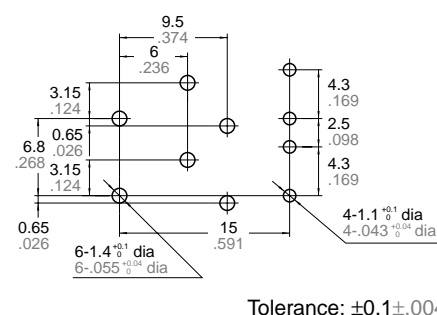


\* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering. Intervals between terminals is measured at A surface level.

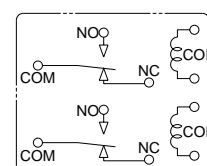
### 2. Twin type (10 terminals)



### PC board pattern (Bottom view)



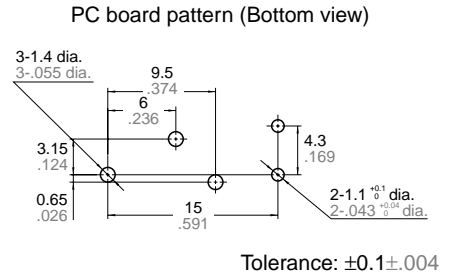
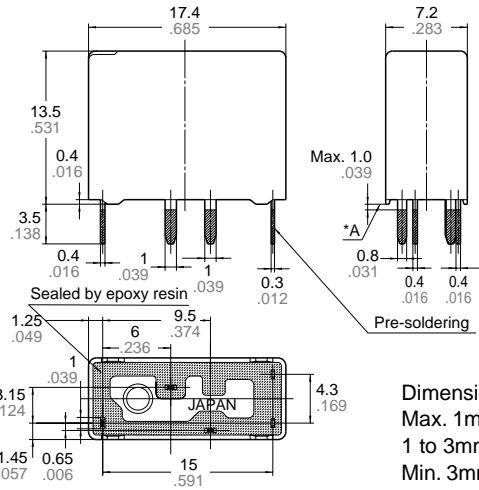
### Schematic (Bottom view)



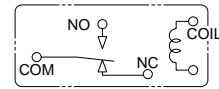
\* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering. Intervals between terminals is measured at A surface level.

3. Slim 1c type

mm inch



Schematic (Bottom view)

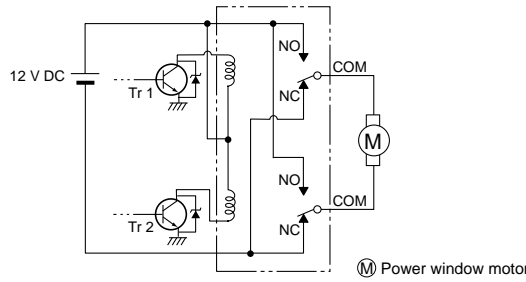


Dimension:  
 Max. 1mm .039 inch:  
 1 to 3mm .039 to .118 inch:  
 Min. 3mm .118 inch:  
 Tolerance  
 $\pm 0.1 \pm .004$   
 $\pm 0.2 \pm .008$   
 $\pm 0.3 \pm .012$

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

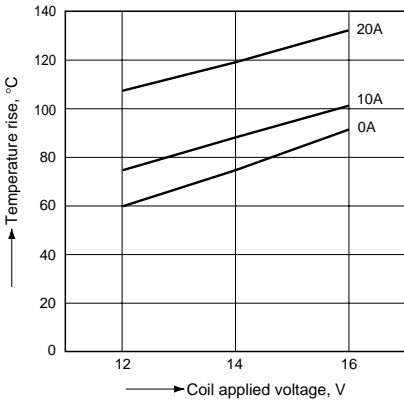
EXAMPLE OF CIRCUIT

Forward/reverse control circuits of DC motor for power windows

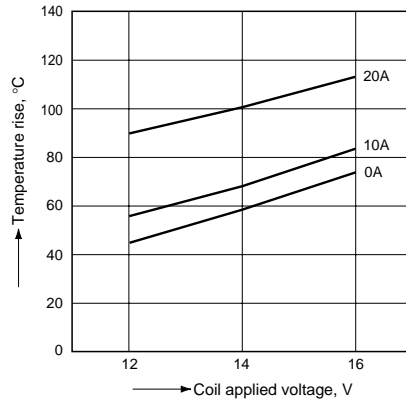


REFERENCE DATA

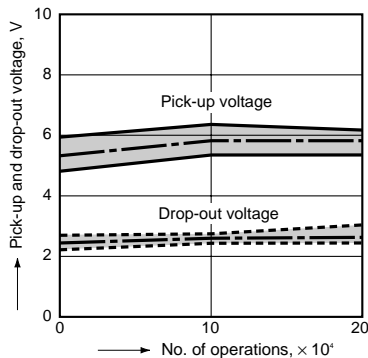
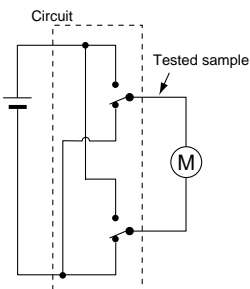
1-(1). Coil temperature rise (at 20°C 68°F)  
 Sample: ACT212, 3pcs  
 Contact carrying current: 0A, 10A, 20A



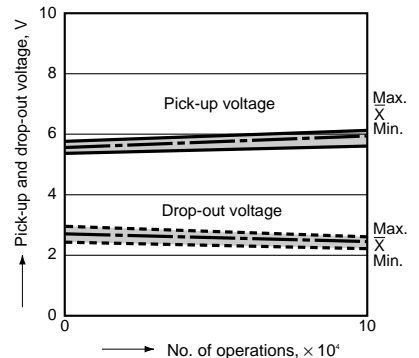
1-(2). Coil temperature rise (at 85°C 185°F)  
 Sample: ACT212, 3pcs  
 Contact carrying current: 0A, 10A, 20A



2-(1). Electrical life test (Motor load)  
 Tested sample: ACT212, 3pcs.  
 Load: 5A steady, Inrush 25A, 14V DC  
 Operating frequency: ON 0.5s, OFF 9.5s



2-(2). Electrical life test (Motor lock)  
 Tested sample: ACT212, 3pcs.  
 Load: 25A, 14V DC  
 Operating frequency: ON 0.5s, OFF 9.5s



For Cautions for use, see Relay Technical Information (Page 48 to 76).