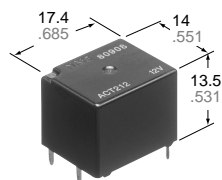


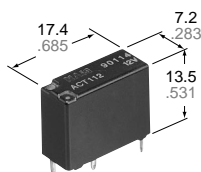
NAIS

ULTRA SMALL AUTOMOTIVE RELAY

CT-RELAYS



Twin type (8 terminals)



Slim 1c type

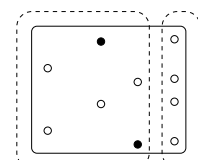
mm inch

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)	Min. 10 ⁷
		Electrical

Coil

Nominal operating power	800 mW
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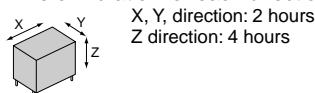
Remarks

- * 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 ² {10G}
	Destructive*8	Min. 1,000 m/s ² {100G}
Vibration resistance	Functional*9	10 to 100 Hz, Min. 44.1m/s ² {4.5G}
	Destructive*10	10 to 500 Hz, Min. 44.1m/s ² {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;



*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	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.

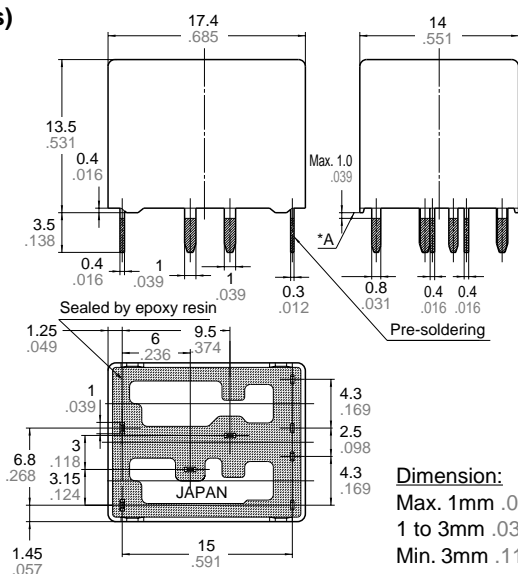
TYPES AND COIL DATA (at 20°C 68°F)

Contact arrangement	Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, Ω (±10%)	Nominal operating current, mA (±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 × 2 (8 terminals type)	ACT212	12	(Initial) 7.2	(Initial) 1.0	180	53.3	800	10 to 16
1c × 2 (10 terminals type)	ACT512	12	(Initial) 7.2	(Initial) 1.0	180	53.3	800	10 to 16

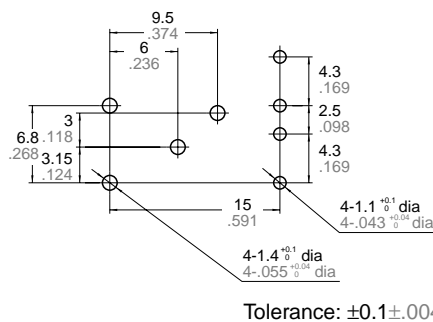
DIMENSIONS

mm inch

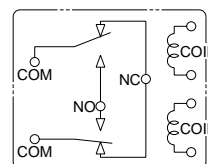
1. Twin type (8 terminals)



PC board pattern (Bottom view)

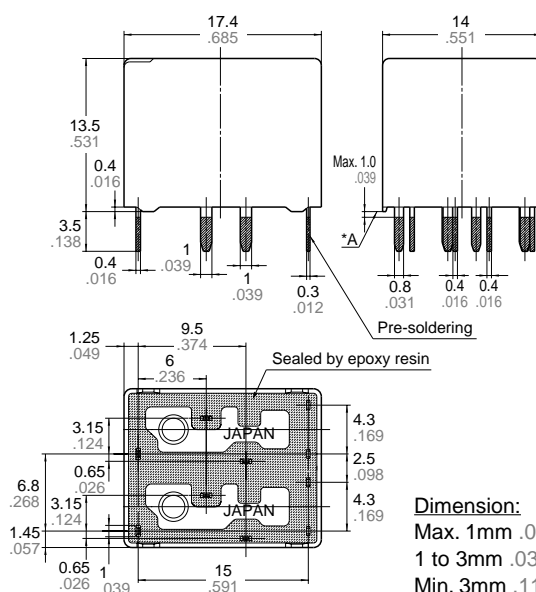


Schematic (Bottom view)

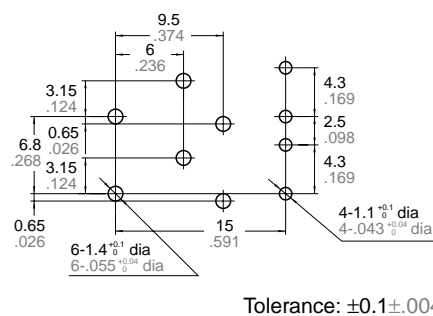


* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering. Intervals between terminals is measured at A surface level.

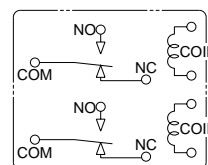
2. Twin type (10 terminals)



PC board pattern (Bottom view)



Schematic (Bottom view)

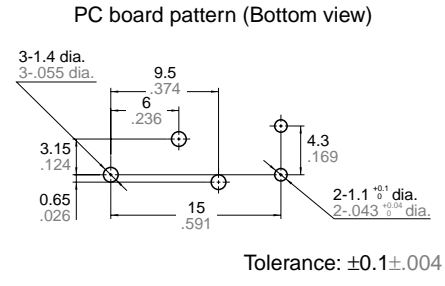
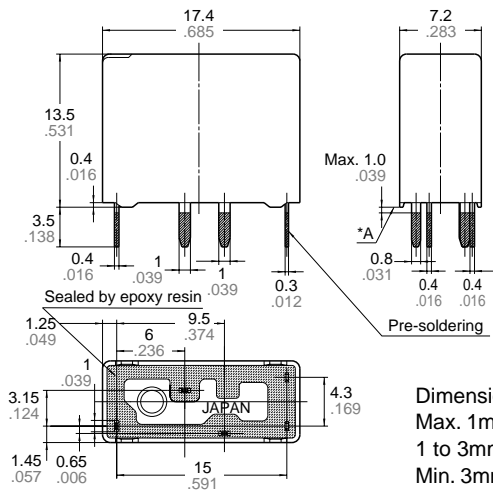


* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering. Intervals between terminals is measured at A surface level.

CT

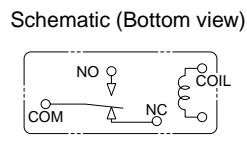
3. Slim 1c type

mm inch



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

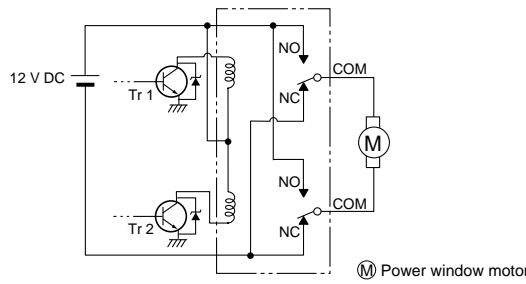
Tolerance
 ±0.1 ± .004
 ±0.2 ± .008
 ±0.3 ± .012



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

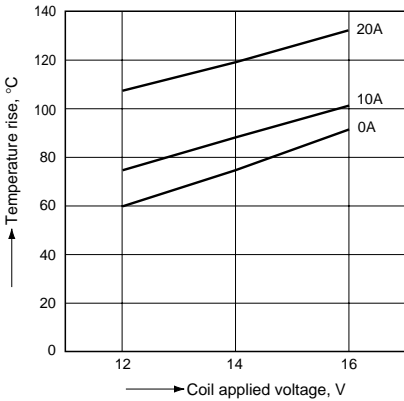
EXAMPLE OF CIRCUIT

Forward/reverse control circuits of DC motor for power windows

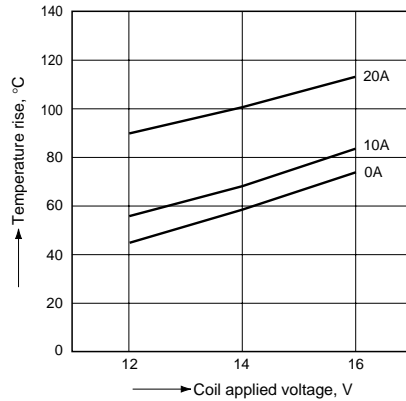


REFERENCE DATA

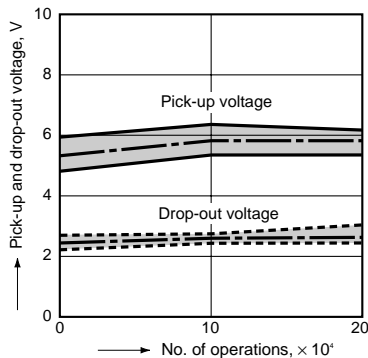
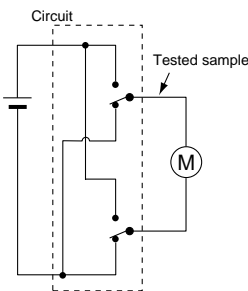
1-(1). Coil temperature rise (at 20°C 68°F)
 Sample: ACT212, 3pcs
 Contact carrying current: 0A, 10A, 20A



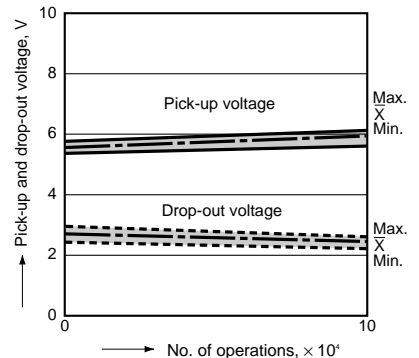
1-(2). Coil temperature rise (at 85°C 185°F)
 Sample: ACT212, 3pcs
 Contact carrying current: 0A, 10A, 20A



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).