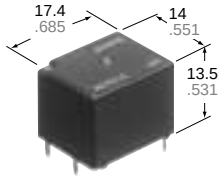
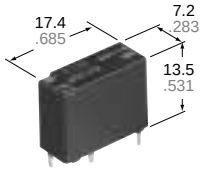
NAiS

ULTRA SMALL AUTOMOTIVE RELAY

CT-RELAYS



Twin type (8 terminals)



mm inch

Slim 1c type

FEATURES

• Ultra small size

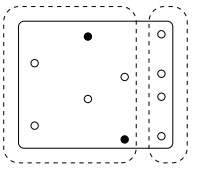
Twin type: 17.4(L)x14.0(W)x13.5(H)mm
.685(L)x.551(W)x.531(H)inch
Slim 1c type: 17.4(L)x7.2(W)x13.5(H)mm
.685(L)x.283(W)x.531(H)inch

• Twin (1 Form C x 2)

Forward/reverse motor control is possible with a single relay.

• Simple footprint enables ease of PC board layout

※10 terminals layout



○ = 8 terminals

SPECIFICATIONS

Contact

Arrangement			1 Form Cx2 (H bridge), 1 Form C
Contact material			Silver alloy
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)			100mOhm
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	Resistive load	Min. 10^5*1
		Motor load	Min. $2x10^5$*2
			Min. 10^5*3

Coil

Nominal operating power	800 mW

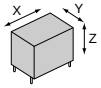
Remarks

* Specifications will vary with foreigh 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 MOhm (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/s² {10G}
	Destructive*8	Min. 1,000 m/s² {100G}
Vibration resistance	Functional*9	10 to 100 Hz, Min. 44.1m/s² {4.5G}
	Destructive*10	10 to 500 Hz, Min. 44.1m/s² {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	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.

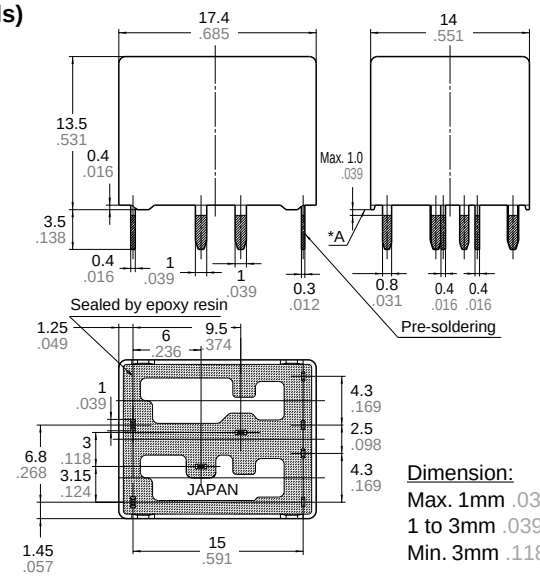
TYPES AND COIL DATA (at 20°C 68°F)

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

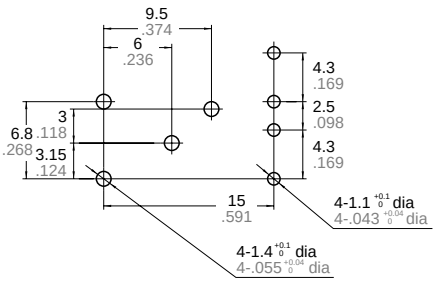
DIMENSIONS

mm inch

1. Twin type (8 terminals)



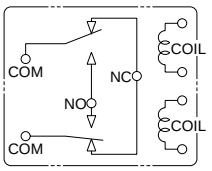
PC board pattern (Bottom view)



Tolerance: ±0.1±.004

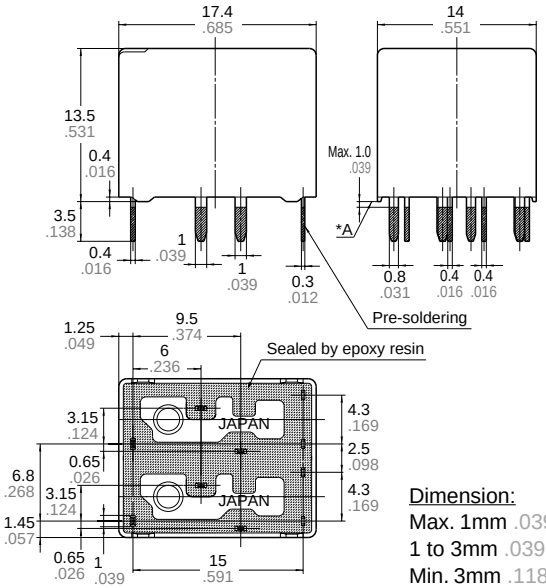
Dimension:	Tolerance
Max. 1mm .039 inch:	±0.1 ± .004
1 to 3mm .039 to .118 inch:	±0.2 ± .008
Min. 3mm .118 inch:	±0.3 ± .012

Schematic (Bottom view)

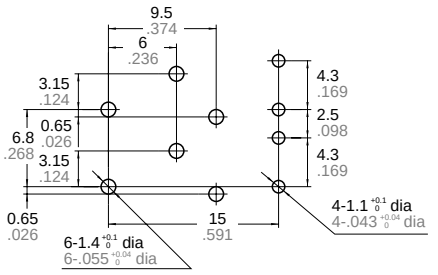


* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering.
Intervals between terminals is measured at A surface level.

2. Twin type (10 terminals)



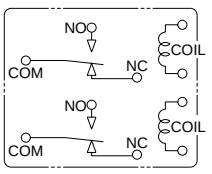
PC board pattern (Bottom view)



Tolerance: ±0.1±.004

Dimension:	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

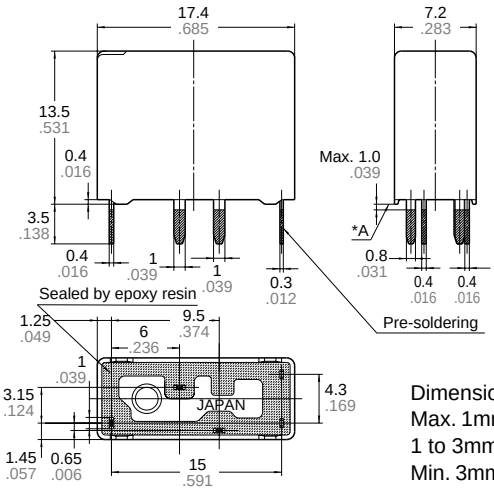
Schematic (Bottom view)



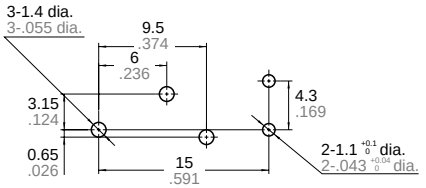
* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering.
Intervals between terminals is measured at A surface level.

3. Slim 1c type

mm inch

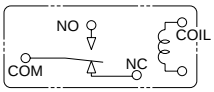


PC board pattern (Bottom view)



Tolerance: ±0.1±.004

Schematic (Bottom view)

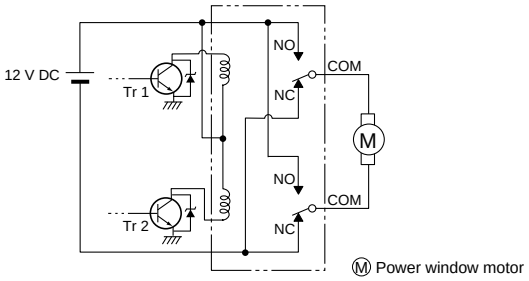


Dimension:	Tolerance
Max. 1mm .039 inch:	±0.1 ± .004
1 to 3mm .039 to .118 inch:	±0.2 ± .008
Min. 3mm .118 inch:	±0.3 ± .012

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

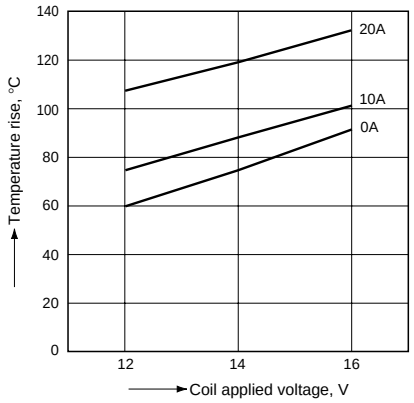
EXAMPLE OF CIRCUIT

Forward/reverse control circuits of DC motor for power windows

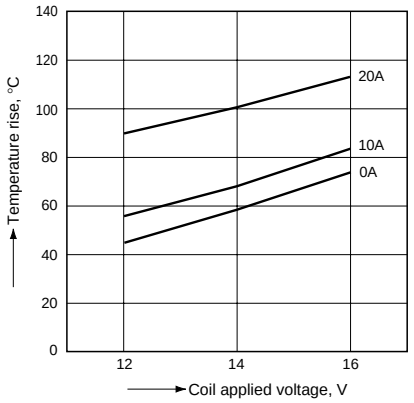


REFERENCE DATA

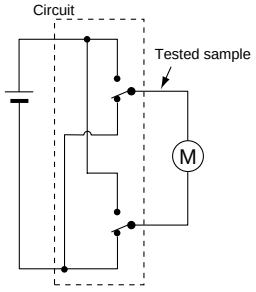
1-(1). Coil temperature rise (at 20°C 68°F)
Sample: ACT212, 3pcs
Contact carrying current: 0A, 10A, 20A

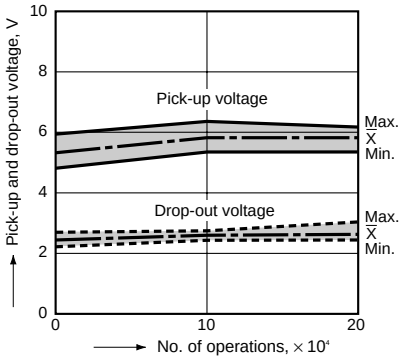


1-(2). Coil temperature rise (at 85°C 185°F)
Sample: ACT212, 3pcs
Contact carrying current: 0A, 10A, 20A



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