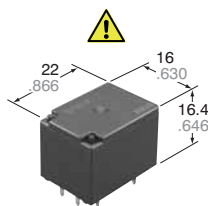




## HIGH CAPACITY PC BOARD TYPE AUTOMOTIVE RELAY

## CY RELAYS (ACY)



mm inch

Product is discontinued.

### FEATURES

#### 1. 30 A nominal switching capacity

Capable of 30 A resistance load switching which is twice that of its predecessor of the same size (JSM Relay)

#### 2. 30 A maximum carrying current

30 A/1 hour, 35 A/2 minutes at 20°C  
25 A/1 hour, 30 A/2 minutes at 85°C  
(for 450mW type, 14 VDC)

#### 3. H/L type ideal for lamp loads

A H/L type is also available in which headlight load switching is possible (60 W × 2 lamps).

#### 4. Designed to be environmentally friendly

With cadmium-free contacts and lead-free solder, environmentally harmful substances are not used.

### TYPICAL APPLICATIONS

- Defoggers (for standard type)
- Heaters (for standard type)
- Headlights (for H/L type)
- Fog lamps (for H/L type)

## SPECIFICATIONS

### Contact

Arrangement		1 Form C, 1 Form A, 1 Form A for H/L type
Contact material		Ag alloy (Cadmium free)
Initial contact resistance (Initial) (By voltage drop 6 V DC 1 A)		Typ. 8 mΩ (N.O.) Typ. 6 mΩ (N.C.)
Rating	Nominal switching capacity	N.O.: 30 A 14 V DC N.C.: 15 A 14 V DC
	Max. carrying current	N.O.: For 450m W 30 A/1 hour, 35 A/2 minutes at 20°C 68°F 25 A/1 hour, 30 A/2 minutes at 85°C 185°F For 640m W 25 A/1 hour, 35 A/2 minutes at 20°C 68°F 20 A/1 hour, 30 A/2 minutes at 85°C 185°F N.C.: For 450m W and 640m W 20 A/1 hour, 25 A/2 minutes at 20°C 68°F 15 A/1 hour, 20 A/2 minutes at 85°C 185°F
	Min. switching capacity#1	1 A 12 V DC
	Expected life (min. operation)	Min. 10 <sup>7</sup>
Coil	Mechanical (at 120 cpm)	Min. 10 <sup>7</sup>
	Electrical (at rated load)	Standard type (resistive load): Min. 10 <sup>5*1</sup> H/L type (lamp load): Min. 10 <sup>5*2</sup>

### Coil

Nominal operating power	450m W (for Pick-up voltage: 7.2 V, Standard type) 640m W (for Pick-up voltage: 6.5 V, Standard type) 640m W (for Pick-up voltage: 7.2 V, H/L type)
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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.

### Characteristics

Max. operating speed (at nominal switching capacity)		6cpm
Initial insulation resistance		Min. 100MΩ (at 500 V DC)
Initial breakdown voltage*3	Between open contacts	500 Vrms for 1min.
	Between contacts and coil	1,500 Vrms for 1min.
Operate time*4 (at nominal voltage) (at 20°C 68°F)		Max. 10ms (initial)
Release time*4 (at nominal voltage) (at 20°C 68°F)		Max. 10ms (initial)
Shock resistance	Functional*5	Min. 100 m/s²{10 G}
	Destructive*6	Min. 1,000 m/s²{100 G}
Vibration resistance	Functional*7	10 Hz to 100 Hz, Min.44.1 m/s² {4.5 G}
	Destructive*8	10 Hz to 500 Hz, Min.44.1 m/s² {4.5 G}
Conditions in case of operation, transport and storage*9 (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. 12g .42 oz

### Remarks

\*1 At nominal switching capacity, operating frequency: 1s ON, 9s OFF

\*2 At 60 W x 2 lamps (Inrush: 70 A, Steady: 10 A 14 VDC), operating frequency: 1s ON, 14s OFF

\*3 Detection current: 10mA

\*4 Excluding contact bounce time.

\*5 Half-wave pulse of sine wave: 11 ms; detection time: 10 μs

\*6 Half-wave pulse of sine wave: 6 ms

\*7 Detection time: 10 μs

\*8 Time of vibration for each direction;

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



\*9 Refer to "6. Usage, Storage and Transport Conditions" in [AMBIENT ENVIRONMENT](#) section in [Relay Technical Information](#).

Please inquire if you will be using the relay in a high temperature atmosphere (110°C 230°F).

## ORDERING INFORMATION

Ex. A CY   3 12

Product name	Contact arrangement	Pick-up voltage, V DC	Coil voltage (V DC)
CY Relay	1: 1 Form C standard 3: 1 Form A standard 8: 1 Form A for H/L type	1: Max. 7.2 2: Max. 6.5	12: 12

Standard packing: Carton (tube package) 40pcs. Case 1,000pcs.

## PRODUCT TYPES

Contact arrangement	Nominal voltage, V DC	Pick-up voltage, V DC (max. Initial) (at 20°C 68°F)	Part No.
1 Form C	12 V	7.2	ACY11312
		6.5	ACY12312
1 Form A		7.2	ACY31312
		6.5	ACY32312
1 Form A for H/L type*		7.2	ACY81312

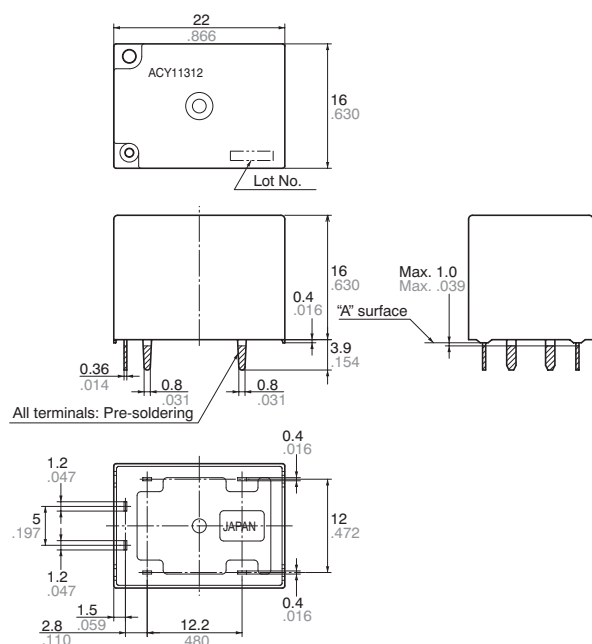
Note) \* H/L type: for head lights and fog lamps

## TYPES AND COIL DATA (at 20°C 68°F)

	Nominal voltage, V DC	Pick-up voltage, V DC (max. Initial)	Drop-out voltage, V DC (min. Initial)	Nominal operating current, mA (±10%)	Coil resistance, Ω (±10%)	Nominal operating power, mW	Usable voltage range, V DC
Standard type	12	7.2	1.2	37.5	320	450	10 to 16
		6.5	1.0	53.3	225	640	
H/L type		7.2	1.2	53.3	225	640	

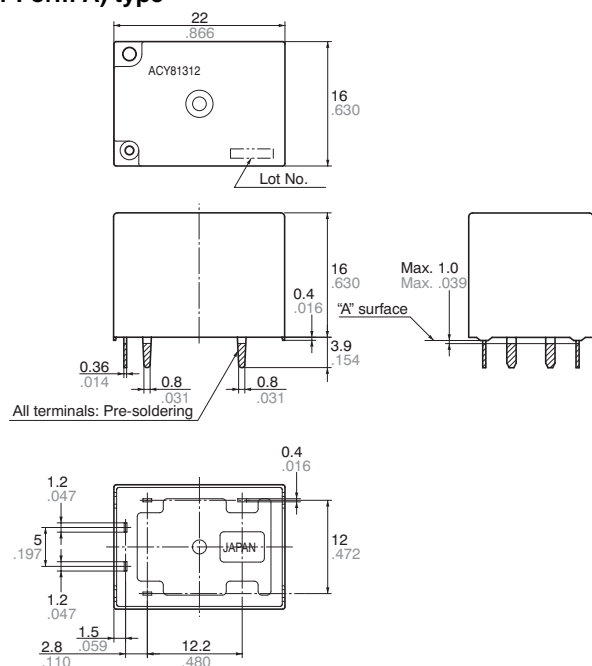
## DIMENSIONS

### 1. Standard type



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

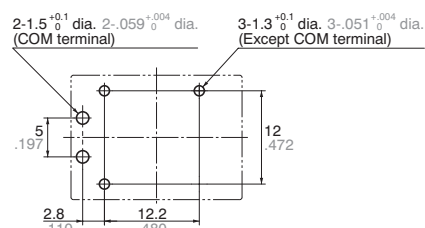
## 2. H/L (1 Form A) type



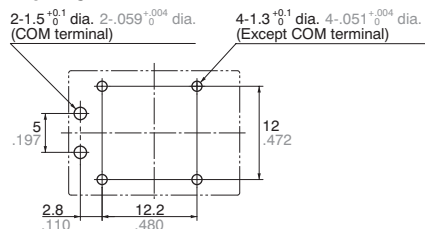
\* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering. Intervals between terminals is measured at A surface level.

PC board pattern (Bottom view)

1 Form A



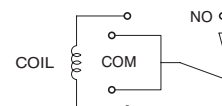
1 Form C



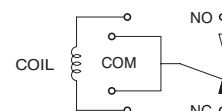
Tolerance:  $\pm 0.1 \pm .004$

Schematic (Bottom view)

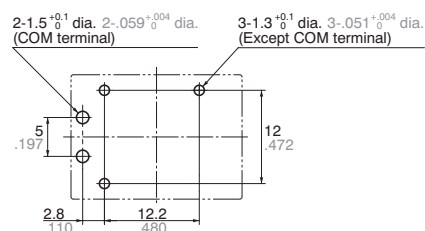
1 Form A



1 Form C

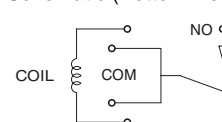


PC board pattern (Bottom view)



Tolerance:  $\pm 0.1 \pm .004$

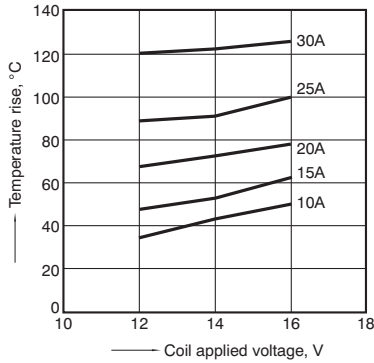
Schematic (Bottom view)



## REFERENCE DATA

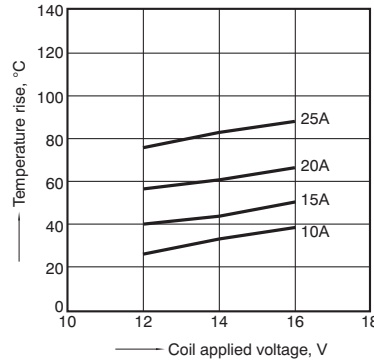
### 1-(1). Coil temperature rise (at 27°C 80.6°F)

Sample: ACY11312, 3pcs  
Measured portion: Inside the coil  
Ambient temperature: 27°C 80.6°F

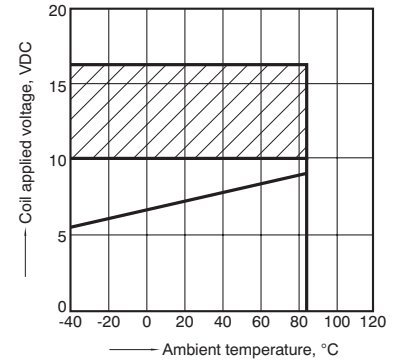


### 1-(2). Coil temperature rise (at 85°C 185°F)

Sample: ACY11312, 3pcs  
Measured portion: Inside the coil  
Ambient temperature: 85°C 185°F

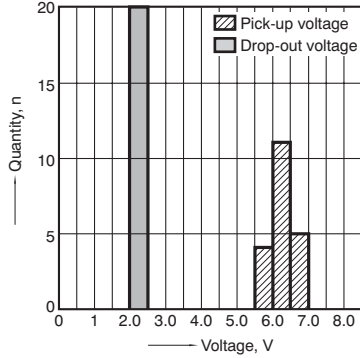


### 2. Ambient temperature and operating voltage range



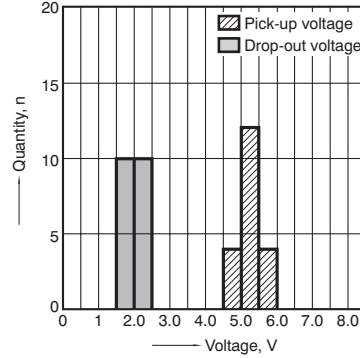
### 3-(1). Distribution of pick-up and drop-out voltage

Sample: ACY11312, 20pcs.



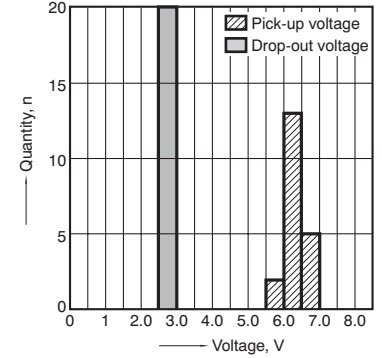
### 3-(2). Distribution of pick-up and drop-out voltage

Sample: ACY12312, 20pcs.



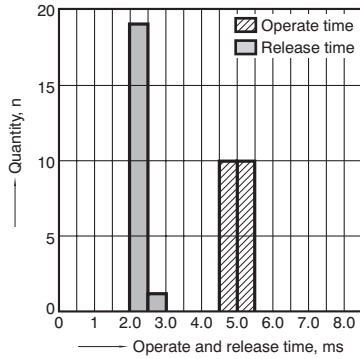
### 3-(3). Distribution of pick-up and drop-out voltage

Sample: ACY81312, 20pcs.



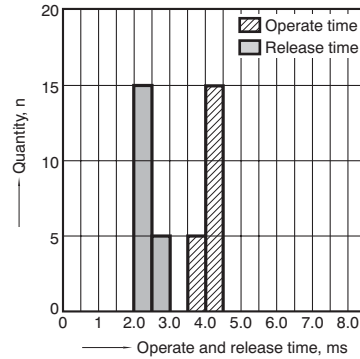
### 4-(1). Distribution of operate and release time

Sample: ACY11312, 20pcs.  
Without diode



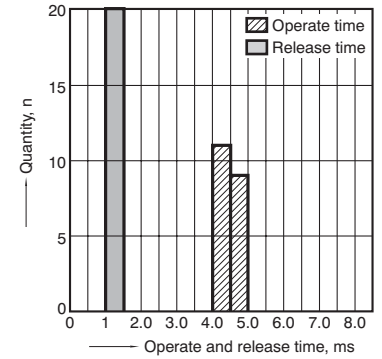
### 4-(2). Distribution of operate and release time

Sample: ACY12312, 20pcs.  
Without diode



### 4-(3). Distribution of operate and release time

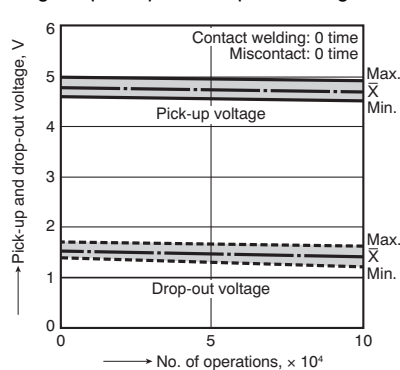
Sample: ACY81312, 20pcs.  
Without diode



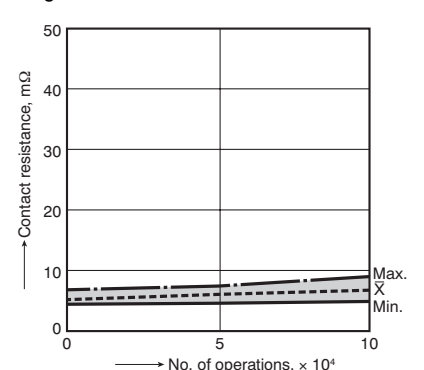
### 5-(1). Electrical life test (Resistive load)

Sample: ACY11312, 6pcs.  
Load: Resistive load (NO side: 30A 14V DC)  
Operating frequency: (ON : OFF = 1s : 9s)  
Ambient temperature: Room temperature

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

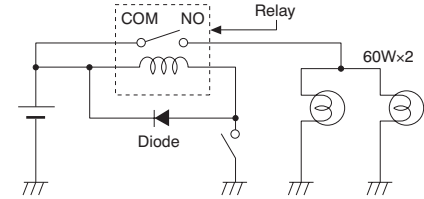


### Change of contact resistance

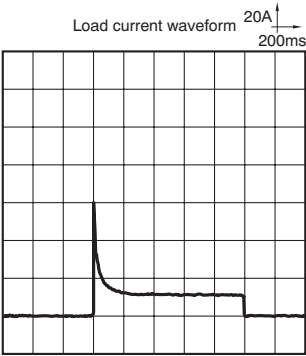


5-(2). Electrical life test (Lamp load)  
Sample: ACY81312, 6pcs.  
Load: 60W×2, inrush: 70A/steady: 10A  
Switching frequency: (ON : OFF = 1s : 14s)  
Ambient temperature: Room temperature

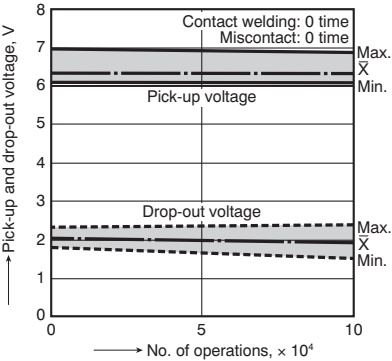
Circuit



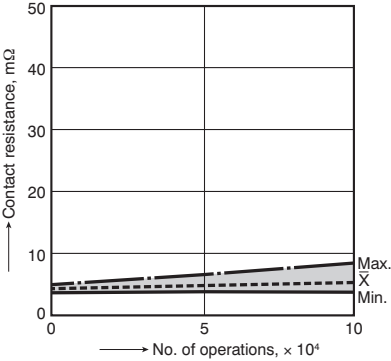
Load current waveform



Change of pick-up and drop-out voltage



Change of contact resistance



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