

**Panasonic**  
**ideas for life**

**1a 3A slim power relays**

**LD RELAYS (ALD)**



**RoHS compliant**

## FEATURES

- 1. Slim type: Width 7 mm .276 inch.**  
20.3(L)×7.0(W)×15.0(H) mm  
.799(L)×.276(W)×.591(H) inch
- 2. Perfect for small load switching of home appliances**  
10<sup>5</sup> switching operations possible with a 3A 250V AC resistive load.
- 3. Low operating power**  
Compact size, nominal operating power as low as 200mW.
- 4. High shock resistance**  
The relay withstands a functional shock resistance of 300m/s<sup>2</sup> [approx. 30 G more]

- 5. High insulation resistance**
  - Creepage distance and clearances between contact and coil: Min. 6 mm .236 inch
  - Surge withstand voltage between contact and coil: 10,000 V
- 6. UL, CSA, VDE, TÜV approved.**

## TYPICAL APPLICATIONS

- Air conditioner
- Refrigerator
- Hot water units
- Microwave ovens
- Fan heaters

## ORDERING INFORMATION

|                                                             |     |   |  |  |   |
|-------------------------------------------------------------|-----|---|--|--|---|
|                                                             | ALD | 1 |  |  | W |
| LD relay                                                    |     |   |  |  |   |
| Contact arrangement                                         |     |   |  |  |   |
| 1: 1 Form A                                                 |     |   |  |  |   |
| Nominal coil voltage (DC)                                   |     |   |  |  |   |
| 4H: 4.5V, 05: 5V, 06: 6V, 09: 9V, 12: 12V, 18: 18V, 24: 24V |     |   |  |  |   |
| Packing style                                               |     |   |  |  |   |
| W: Carton packing                                           |     |   |  |  |   |

Note: Certified by UL, CSA, TÜV and VDE

## TYPES

| Contact arrangement | Nominal coil voltage | Part No. |
|---------------------|----------------------|----------|
| 1 Form A            | 4.5V DC              | ALD14HW  |
|                     | 5V DC                | ALD105W  |
|                     | 6V DC                | ALD106W  |
|                     | 9V DC                | ALD109W  |
|                     | 12V DC               | ALD112W  |
|                     | 18V DC               | ALD118W  |
|                     | 24V DC               | ALD124W  |

Packing quantity: Carton 100 pieces, Case 500 pieces

Note: The "W" at the end of the part number only appears on the inner and outer packaging. It does not appear on the relay itself.  
Please consult with our sales office on a tube packing type.

## RATING

### 1. Coil data

| Nominal coil voltage | Pick-up voltage<br>(at 20°C 68°F)         | Drop-out voltage<br>(at 20°C 68°F)       | Nominal operating current<br>[±10%] (at 20°C 68°F) | Coil resistance<br>[±10%] (at 20°C 68°F) | Nominal operating power | Max. applied voltage<br>(at 20°C 68°F) |
|----------------------|-------------------------------------------|------------------------------------------|----------------------------------------------------|------------------------------------------|-------------------------|----------------------------------------|
| 4.5V DC              | 75%V or less of nominal voltage (Initial) | 5%V or more of nominal voltage (Initial) | 44.6mA                                             | 101Ω                                     | 200mW                   | 130%V of nominal voltage               |
| 5V DC                |                                           |                                          | 40.0mA                                             | 125Ω                                     |                         |                                        |
| 6V DC                |                                           |                                          | 33.3mA                                             | 180Ω                                     |                         |                                        |
| 9V DC                |                                           |                                          | 22.2mA                                             | 405Ω                                     |                         |                                        |
| 12V DC               |                                           |                                          | 16.7mA                                             | 720Ω                                     |                         |                                        |
| 18V DC               |                                           |                                          | 11.1mA                                             | 1,620Ω                                   |                         |                                        |
| 24V DC               |                                           |                                          | 8.3mA                                              | 2,880Ω                                   |                         |                                        |

## 2. Specifications

| Characteristics            | Item                                                           | Specification                                                                                                                    |
|----------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Contact                    | Arrangement                                                    | 1 Form A                                                                                                                         |
|                            | Contact resistance (Initial)                                   | Max. 100 mΩ (By voltage drop 6 V DC 1A)                                                                                          |
|                            | Contact material                                               | AgNi type                                                                                                                        |
| Rating                     | Nominal switching capacity (resistive load)                    | 3A 277V AC, 3A 30V DC                                                                                                            |
|                            | Max. switching power (resistive load)                          | 831VA (AC), 90W (DC)                                                                                                             |
|                            | Max. switching voltage                                         | 277V AC, 30V DC                                                                                                                  |
|                            | Max. switching current                                         | 3A                                                                                                                               |
|                            | Min. switching capacity*1                                      | 100mA, 5V DC                                                                                                                     |
| Electrical characteristics | Insulation resistance (Initial)                                | Min. 1,000MΩ (at 500V DC) Measurement at same location as "Breakdown voltage" section.                                           |
|                            | Breakdown voltage (Initial)                                    | Between open contacts<br>750 Vrms for 1 min. (Detection current: 10 mA)                                                          |
|                            |                                                                | Between contact and coil<br>4,000 Vrms for 1 min. (Detection current: 10 mA)                                                     |
|                            | Temperature rise (coil)                                        | Max. 45°C 113°F (By resistive method, nominal coil voltage applied to the coil; contact carrying current: 3A, at 70°C 158°F)     |
|                            | Surge breakdown voltage*2 (Between contact and coil) (Initial) | 10,000 V                                                                                                                         |
|                            | Operate time (at nominal voltage) (at 20°C 68°F)               | Max. 10 ms (excluding contact bounce time.)                                                                                      |
|                            | Release time (at nominal voltage) (at 20°C 68°F)               | Max. 10 ms (excluding contact bounce time) (With diode)                                                                          |
| Mechanical characteristics | Shock resistance                                               | Functional<br>300 m/s <sup>2</sup> (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.)                                  |
|                            |                                                                | Destructive<br>1,000 m/s <sup>2</sup> (Half-wave pulse of sine wave: 6 ms.)                                                      |
|                            | Vibration resistance                                           | Functional<br>10 to 55 Hz at double amplitude of 1.5 mm (Detection time: 10μs.)                                                  |
|                            |                                                                | Destructive<br>10 to 55 Hz at double amplitude of 1.5 mm                                                                         |
| Expected life              | Mechanical (at 180 times/min.)                                 | Min. 5×10 <sup>6</sup>                                                                                                           |
|                            | Electrical (at 20 times/min.)                                  | Min. 2×10 <sup>5</sup> (3A 125V AC, 3A 30V DC at rated load), Min. 10 <sup>5</sup> (3A 250V AC at rated load)                    |
| Conditions                 | Conditions for operation, transport and storage*3              | Ambient temperature: -40°C to +70°C -40°F to +158°F,<br>Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature) |
|                            | Max. operating speed                                           | 20 times/min. (at nominal switching capacity)                                                                                    |
| Unit weight                |                                                                | Approx. 4 g .14 oz                                                                                                               |

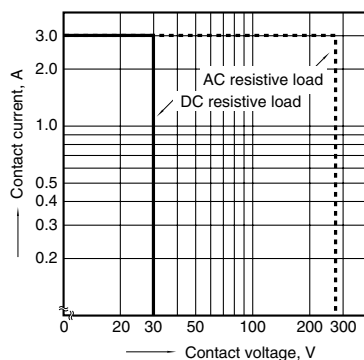
Notes: \*1. This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

\*2. Wave is standard shock voltage of  $\pm 1.2 \times 50\mu\text{s}$  according to JEC-212-1981

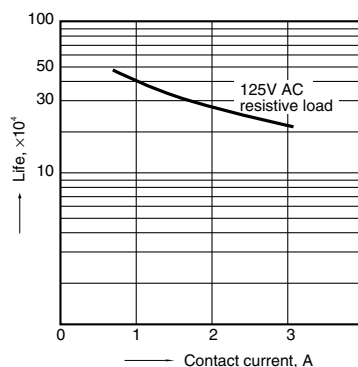
\*3. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.

## REFERENCE DATA

### 1. Max. switching power

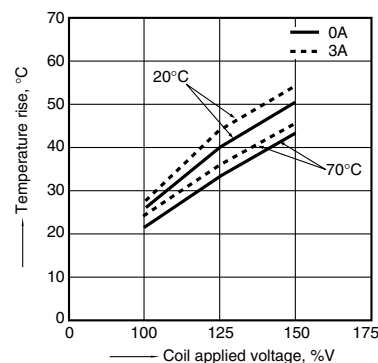


### 2. Life curve



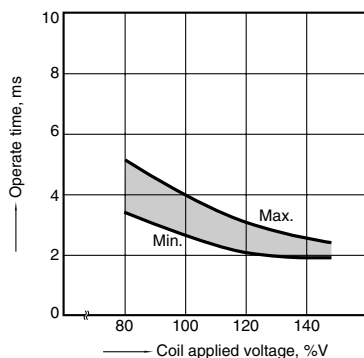
### 3. Coil temperature rise

Sample: ALD112W, 6 pcs.  
 Point measured: inside the coil  
 Contact current: 0 A, 3 A



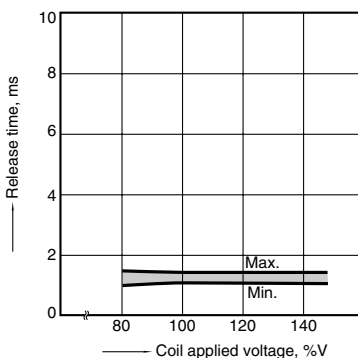
### 4-(1). Operate time

Sample: ALD112W, 6 pcs.



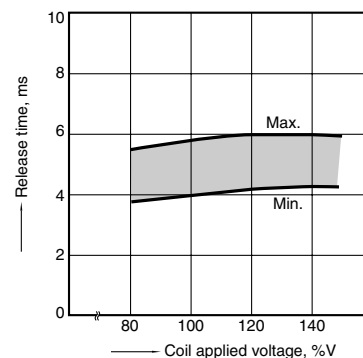
### 4-(2). Release time (without diode)

Sample: ALD112W, 6 pcs.



### 4-(3). Release time (with diode)

Sample: ALD112W, 6 pcs.

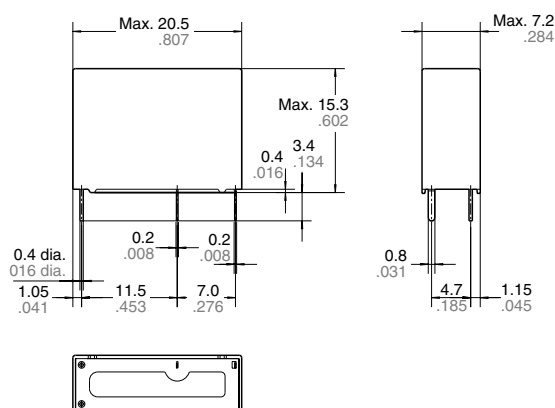


## DIMENSIONS (mm inch)

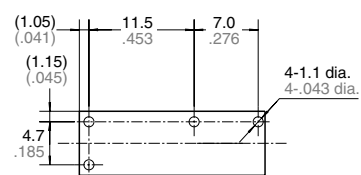
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

### CAD Data

### External dimensions



### PC board pattern (Bottom view)



Tolerance:  $\pm 0.1 \pm 0.004$

### Schematic (Bottom view)



### Dimension:

Less than 1mm .039inch:

Min. 1mm .039inch less than 3mm .118 inch:  $\pm 0.2 \pm 0.008$

Min. 3mm .118 inch:

### General tolerance

$\pm 0.1 \pm 0.004$

$\pm 0.2 \pm 0.008$

$\pm 0.3 \pm 0.012$

## SAFETY STANDARDS

| UL/C-UL (Recognized) |                         | CSA (Certified) |                         | VDE (Certified) |                                                    | TÜV (Certified)      |                                                    |
|----------------------|-------------------------|-----------------|-------------------------|-----------------|----------------------------------------------------|----------------------|----------------------------------------------------|
| File No.             | Contact rating          | File No.        | Contact rating          | File No.        | Contact rating                                     | File No.             | Rating                                             |
| E43028               | 3A 277V AC<br>3A 30V DC | LR26550<br>etc. | 3A 277V AC<br>3A 30V DC | 40014384        | 3A 250V AC ( $\cos\phi = 1.0$ )<br>3A 30V DC (0ms) | B 11 03<br>13461 289 | 3A 250V AC ( $\cos\phi = 1.0$ )<br>3A 30V DC (0ms) |

## For Cautions for Use.