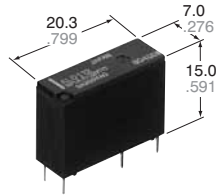


1 FORM A SLIM POWER RELAY

LD RELAYS (ALD)



mm inch

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**
10⁵ 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/s² [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 or more.
- 6. UL/CSA, VDE, TÜV approved.**

TYPICAL APPLICATIONS

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

SPECIFICATIONS

Contact

| | | | |
|--|--|-----------------------------|-------------------|
| Arrangement | 1 Form A | | |
| Initial contact resistance, max. (By voltage drop 6 V DC 1 A) | Max. 100 mΩ | | |
| Contact material | AgNi type | | |
| Rating (resistive load) | Nominal switching capacity | 3 A 277 V AC, 3 A 30V DC | |
| | Max. switching power | 831 V A (AC), 90W (DC) | |
| | Max. switching voltage | 277 V AC, 30 V DC | |
| | Max. switching current | 3 A | |
| | Min. switching capacity#1 | 100 mA, 5 V DC | |
| Expected life (min. operations) | Mechanical (at 180 cpm) | 5×10 ⁶ | |
| | Electrical (at 20 cpm) (at rated load) | 3A 125V AC, 3A 30V DC | 2×10 ⁵ |
| | | 3A 250V AC | 10 ⁵ |
| | 5A 250V AC | 5×10 ⁴ | |

Coil

| | |
|-------------------------|--------|
| Nominal operating power | 200 mW |
|-------------------------|--------|

#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.

Remarks

- * Specifications will vary with foreign standards certification ratings.
- *1 Measurement at same location as "Initial breakdown voltage" section.
- *2 Detection current: 10mA
- *3 Wave is standard shock voltage of ±1.2×50ms according to JEC-212-1981
- *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 Refer to "6. Usage, Storage and Transport Conditions" in [AMBIENT ENVIRONMENT](#) section in [Relay Technical Information](#).

Characteristics

| | | |
|--|---|---|
| Max. operating speed | 20 cpm (at rated load) | |
| Initial insulation resistance*1 | Min. 1,000 MΩ (at 500 V DC) | |
| Initial*2 breakdown voltage | Between open contacts | 750 Vrms for 1 min. |
| | Between contact and coil | 4,000 Vrms for 1 min. |
| Initial surge voltage between contact and coil*3 | Min. 10,000 V | |
| Operate time*4 (at nominal voltage) | Max. 10ms (at 20°C 68°F) | |
| Release time (with diode)*4 (at nominal voltage) | Max. 10ms (at 20°C 68°F) | |
| Temperature rise (at 70°C 158°F) | Max. 45°C with nominal coil voltage and at 3 A contact carrying current (resistance method) | |
| Shock resistance | Functional*5 | Min. 300 m/s ² {approx. 30 G} |
| | Destructive*6 | Min. 1,000 m/s ² {approx. 100 G} |
| Vibration resistance | Functional*7 | 10 to 55Hz at double amplitude of 1.5mm |
| | Destructive | 10 to 55Hz at double amplitude of 1.5mm |
| Conditions for operation, transport and storage*8 (Not freezing and condensing at low temperature) | Ambient temp. | -40°C to +70°C -40°F to +158°F |
| | Humidity | 5 to 85% R.H. |
| Unit weight | Approx. 4 g .14 oz | |

LD (ALD)

ORDERING INFORMATION

Ex. A LD 1 12 W

| Product name | Contact arrangement | Coil voltage (V DC) | Packing style |
|--------------|---------------------|--|--|
| LD | 1: 1 Form A | 4H: 4.5, 09: 9, 24: 24 05: 5, 12: 12 06: 6, 18: 18 | Nil: Tube packing W: Carton packing |

UL/CSA, TÜV, VDE approved type is standard.

Note: Tube packing: Tube: 50pcs, Case: 1,000pcs

Carton packing: Carton: 100pcs, Case: 500pcs

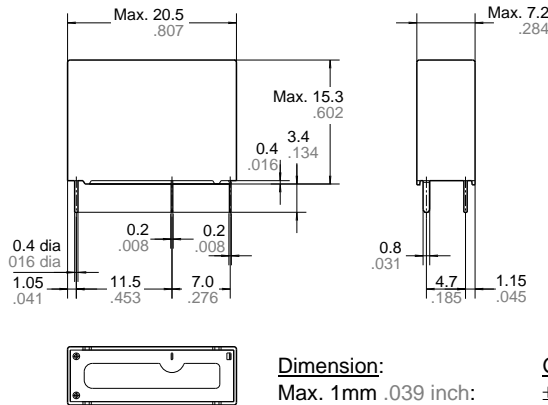
TYPES AND COIL DATA (at 20°C 68°F)

| Part No. | Nominal voltage, V DC | Pick-up voltage, V DC (max.) (Initial) | Drop-out voltage, V DC (min.) (Initial) | Coil resistance, Ω (±10%) | Nominal operating current, mA (±10%) | Nominal operating power, mW | Maximum allowable voltage, V DC (at 20°C 68°F) |
|----------|-----------------------|--|---|---------------------------|--------------------------------------|-----------------------------|--|
| ALD14H | 4.5 | 3.38 | 0.22 | 101 | 44.6 | 200 | 5.85 |
| ALD105 | 5 | 3.75 | 0.25 | 125 | 40.0 | 200 | 6.5 |
| ALD106 | 6 | 4.5 | 0.3 | 180 | 33.3 | 200 | 7.8 |
| ALD109 | 9 | 6.75 | 0.45 | 405 | 22.2 | 200 | 11.7 |
| ALD112 | 12 | 9 | 0.6 | 720 | 16.7 | 200 | 15.6 |
| ALD118 | 18 | 13.5 | 0.9 | 1,620 | 11.1 | 200 | 23.4 |
| ALD124 | 24 | 18 | 1.2 | 2,880 | 8.3 | 200 | 31.2 |

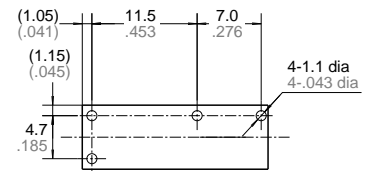
DIMENSIONS (mm inch) Interested in CAD data? You can obtain CAD data for all products with a CAD Data mark from [your local Panasonic Electric Works representative](#).



CAD Data

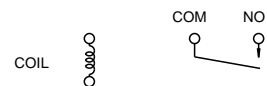


PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm 0.004$

Schematic (Bottom view)



Dimension:

Max. 1mm .039 inch: $\pm 0.1 \pm 0.004$

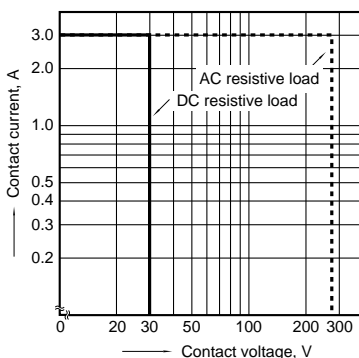
1 to 3mm .039 to .118 inch: $\pm 0.2 \pm 0.008$

Min. 3mm .118 inch: $\pm 0.3 \pm 0.012$

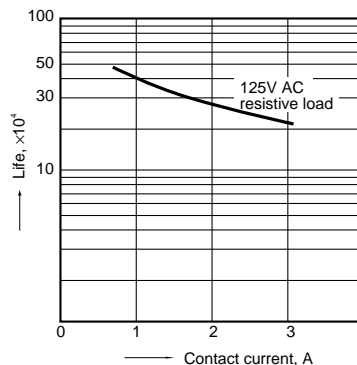
General tolerance

REFERENCE DATA

1. Max. switching power



2. Life curve

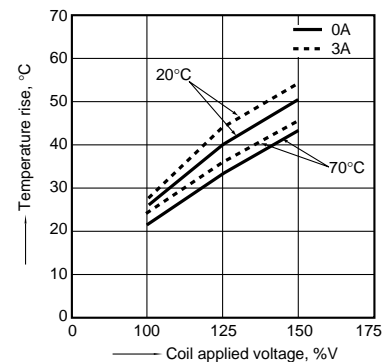


3. Coil temperature rise

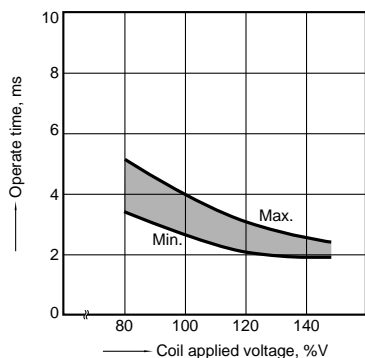
Sample: ALD112, 6 pcs.

Point measured: inside the coil

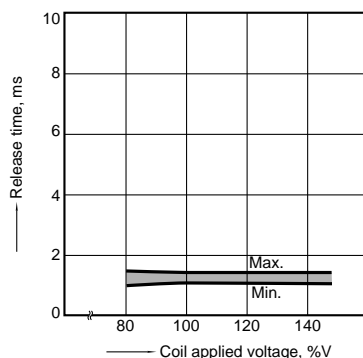
Contact current: 0 A, 3 A



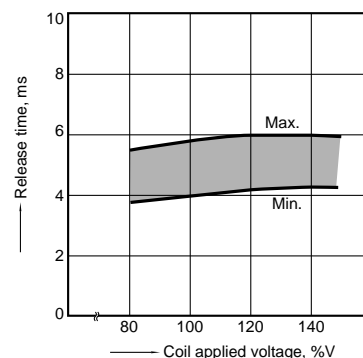
4-(1). Operate time
Sample: ALD112, 6 pcs.



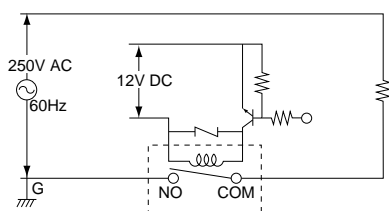
4-(2). Release time (without diode)
Sample: ALD112, 6 pcs.



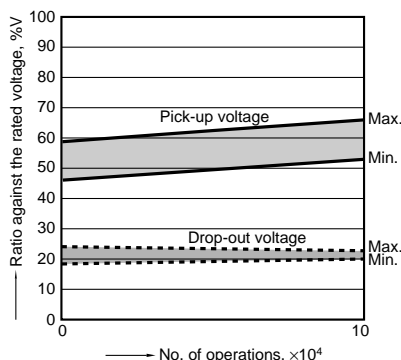
4-(3). Release time (with diode)
Sample: ALD112, 6 pcs.



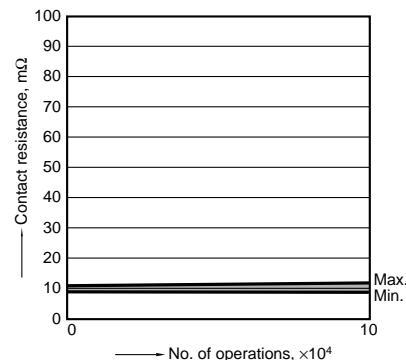
5-(1). Electrical life test
(3 A 250 V AC, resistive load)
Sample: ALD112, 6 pcs.
Operating speed: 20 cpm
Ambient temperature: room temperature
circuit:



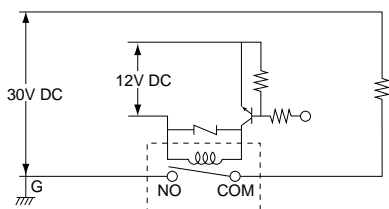
Change of pick-up and drop-out voltage



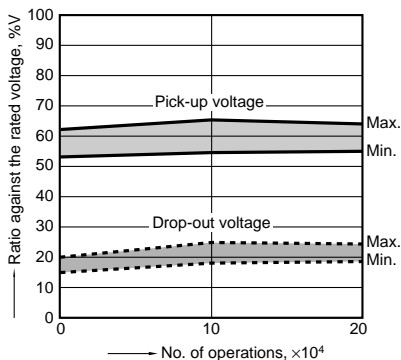
Change of contact resistance



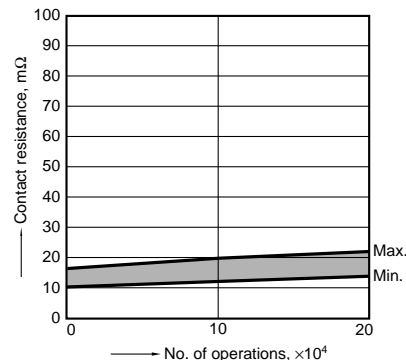
5-(2). Electrical life test
(3 A 30 V DC, resistive load)
Sample: ALD112, 6 pcs.
Operating speed: 20 cpm
Ambient temperature: room temperature
circuit:



Change of pick-up and drop-out voltage



Change of contact resistance



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 3A 30V DC | LR26550 etc. | 3A 277V AC 3A 30V DC | 40014384 | 3A 250V AC ($\cos\phi = 1.0$) 3A 30V DC (0ms) | B 10 02 13461 274 | 3A 250V AC ($\cos\phi = 1.0$) 3A 30V DC (0ms) |

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