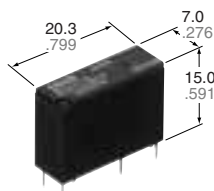


**Panasonic**  
ideas for life

## 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**  
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 (In compliance with IEC65)
  - Surge withstand voltage between contact and coil: 10,000 V or more.
- 6. UL/CSA, VDE, TÜV approved.**

### SPECIFICATIONS

#### Contact

Arrangement	1 Form A		
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)	Max. 100 mΩ		
Contact material	Silver alloy		
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 <sup>#1</sup>	100 mA, 5 V DC	
Expected life (min.operations)	Mechanical (at 180 cpm)		5×10 <sup>6</sup>
	Electrical (at 20 cpm) (at rated load)	3A 125V AC, 3A 30V DC	2×10 <sup>5</sup>
		3A 250V AC	10 <sup>5</sup>

#### Coil

Nominal operating power	200 mW
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#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.
- \*<sup>1</sup> Measurement at same location as "Initial breakdown voltage" section.
- \*<sup>2</sup> Detection current: 10mA
- \*<sup>3</sup> Wave is standard shock voltage of ±1.2×50ms according to JEC-212-1981
- \*<sup>4</sup> Excluding contact bounce time.
- \*<sup>5</sup> Half-wave pulse of sine wave: 11 ms; detection time: 10 μs
- \*<sup>6</sup> Half-wave pulse of sine wave: 6 ms
- \*<sup>7</sup> Detection time: 10 μs
- \*<sup>8</sup> Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT

#### Characteristics

Max. operating speed		20 cpm (at rated load)
Initial insulation resistance* <sup>1</sup>		Min. 1,000 MΩ (at 500 V DC)
Initial* <sup>2</sup> 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* <sup>3</sup>		Min. 10,000 V
Operate time* <sup>4</sup> (at nominal voltage)		Max. 10ms (at 20°C 68°F)
Release time (with diode)* <sup>4</sup> (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* <sup>5</sup>	Min. 300 m/s <sup>2</sup> {approx. 30 G}
	Destructive* <sup>6</sup>	Min. 1,000 m/s <sup>2</sup> {approx. 100 G}
Vibration resistance	Functional* <sup>7</sup>	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* <sup>8</sup> (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

### TYPICAL APPLICATIONS

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

### 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

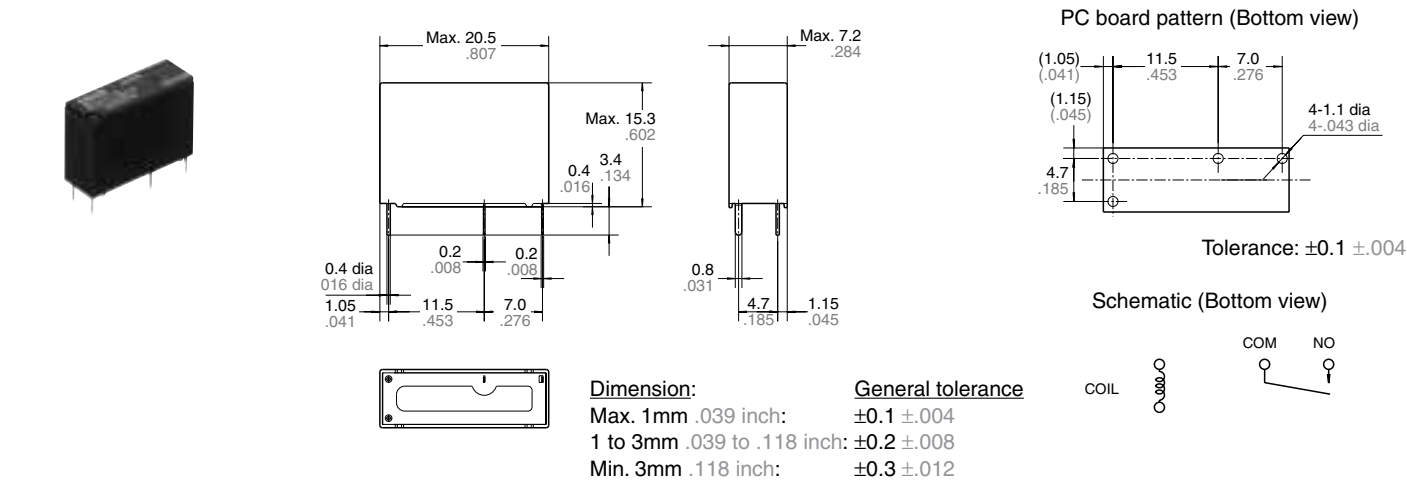
LD (ALD)

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



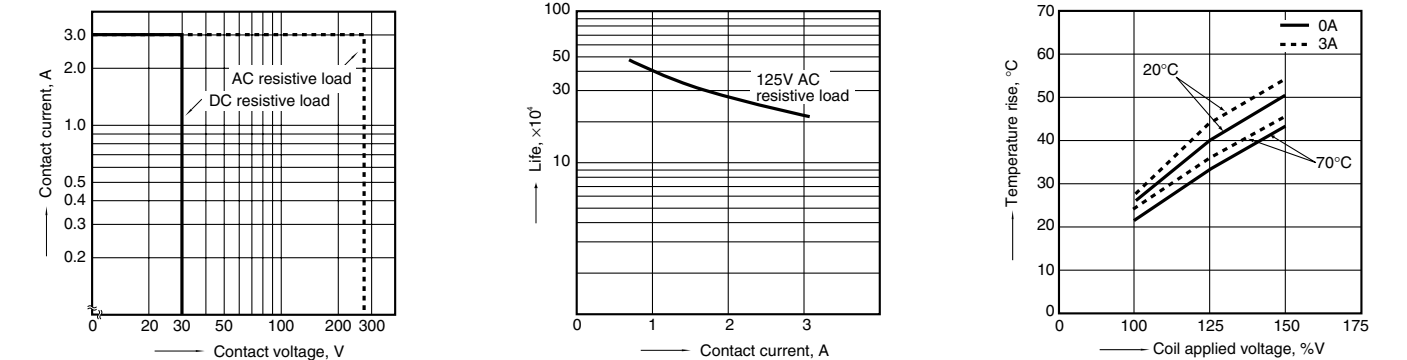
REFERENCE DATA

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

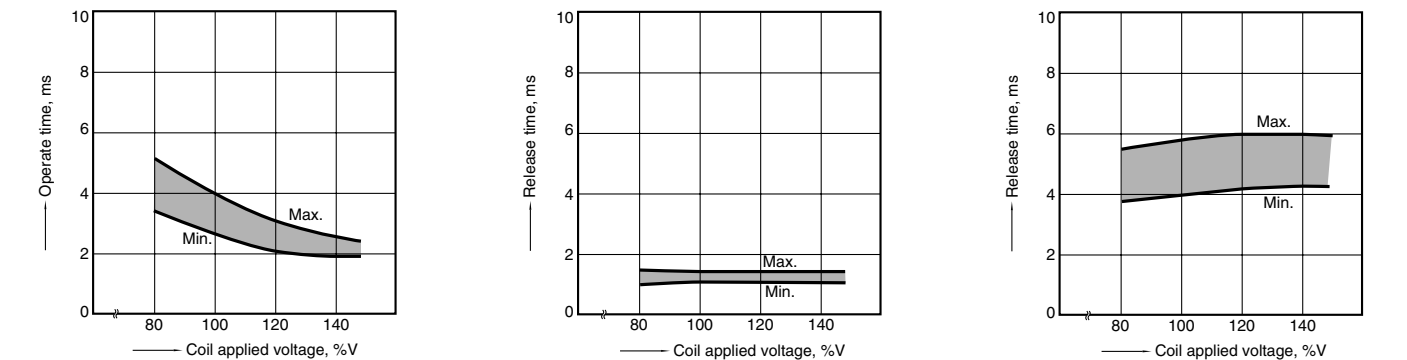
Sample: ALD112, 6 pcs.

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

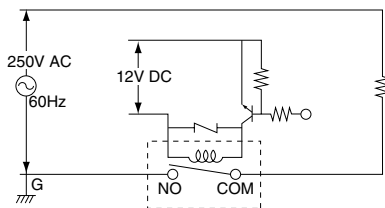
Sample: ALD112, 6 pcs.

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

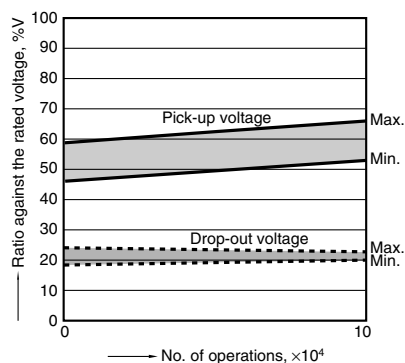
Sample: ALD112, 6 pcs.



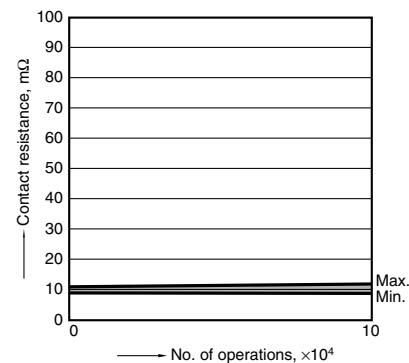
5-(1). Electrical life test  
 (3 A 250 V AC, resistive load)  
 Sample: ALD112, 6 pcs.  
 Operating speed: 20 cpm  
 Ambient temperature: room temperature  
 circuit:



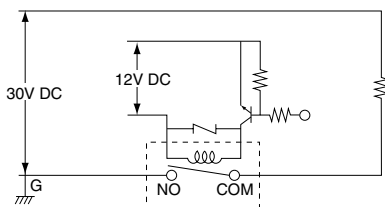
Change of pick-up and drop-out voltage



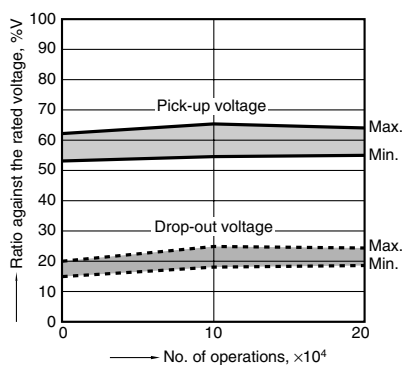
Change of contact resistance



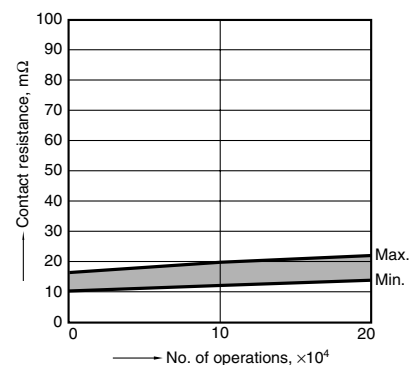
5-(2). Electrical life test  
 (3 A 30 V DC, resistive load)  
 Sample: ALD112, 6 pcs.  
 Operating speed: 20 cpm  
 Ambient temperature: room temperature  
 circuit:



Change of pick-up and drop-out voltage



Change of contact resistance



**For Cautions for Use, see Relay Technical Information**