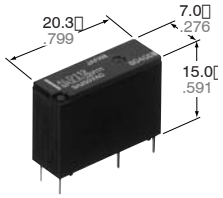
Panasonic
ideas for life

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
10^5 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 (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			$AgSnO_2$ 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. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (p. 19, 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/s²{approx. 30 G}
	Destructive*6		Min. 1,000 m/s²{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

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

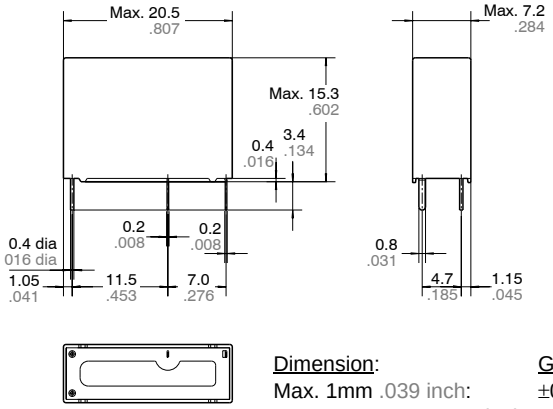
UL/CSA, TÜV, VDE approved type is standard.
Note: Tube packing: Tube: 50pcs, Case: 1,000pcs
Carton packing: Carton: 100pcs, Case: 500pcs

TYPES AND COIL DATA (at 20°C 68°F)

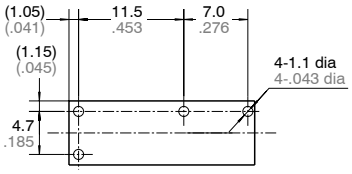
Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.) (Initial)	Drop-out voltage, V DC (min.) (Initial)	Coil resistance, Ω (±10%)	Nominal operating current, mA (±10%)	Nominal operating power, mW	Maximum allowable voltage, V DC (at 20°C 68°F)
ALD14H	4.5	3.38	0.22	101	44.6	200	5.85
ALD105	5	3.75	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

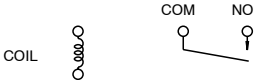


PC board pattern (Bottom view)



Tolerance: ±0.1 ±.004

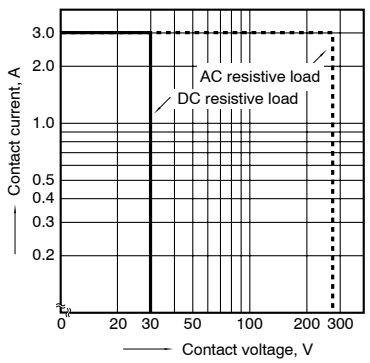
Schematic (Bottom view)



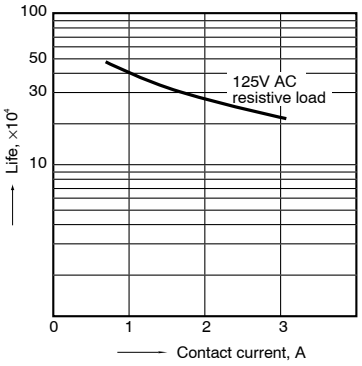
Dimension:	General tolerance
Max. 1mm .039 inch:	±0.1 ±.004
1 to 3mm .039 to .118 inch:	±0.2 ±.008
Min. 3mm .118 inch:	±0.3 ±.012

REFERENCE DATA

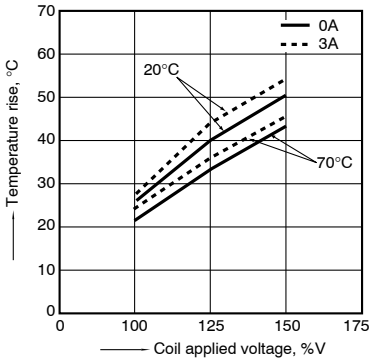
1. Max. switching power



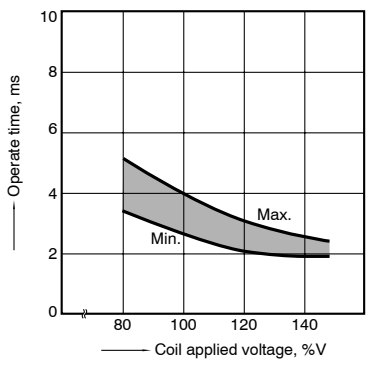
2. Life curve



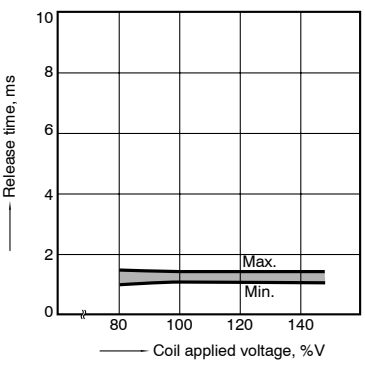
3. Coil temperature rise
Sample: ALD112, 6 pcs.
Point measured: inside the coil
Contact current: 0 A, 3 A



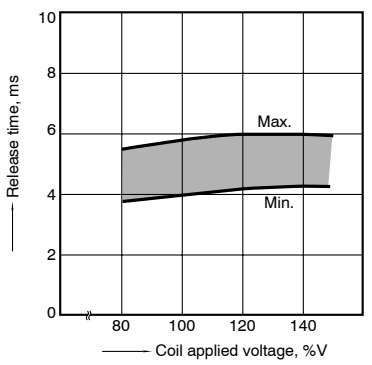
4-(1). Operate time
Sample: ALD112, 6 pcs.



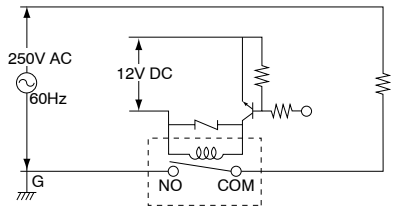
4-(2). Release time (without diode)
Sample: ALD112, 6 pcs.



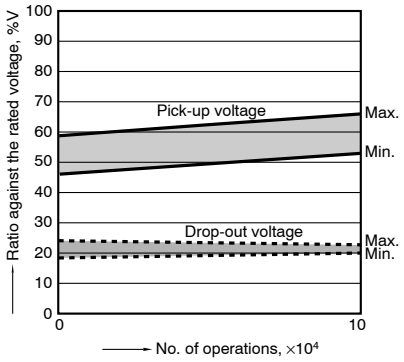
4-(3). Release time (with diode)
Sample: ALD112, 6 pcs.



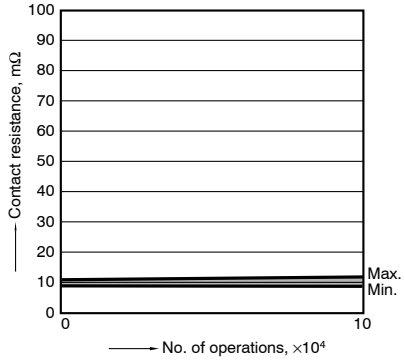
5-(1). Electrical life test
(3 A 250 V AC, resistive load)
Sample: ALD112, 6 pcs.
Operating speed: 20 cpm
Ambient temperature: room temperature
circuit:



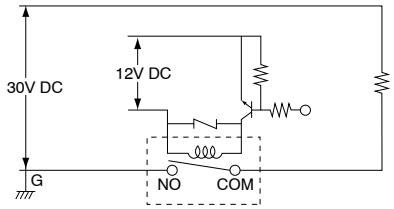
Change of pick-up and drop-out voltage



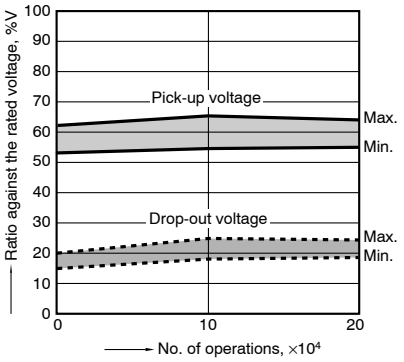
Change of contact resistance



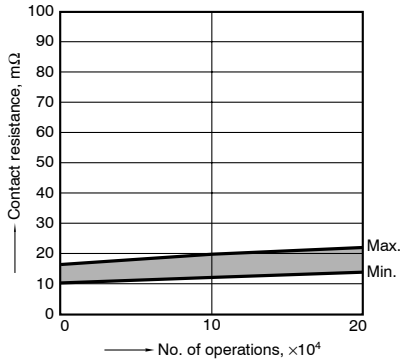
5-(2). Electrical life test
(3 A 30 V DC, resistive load)
Sample: ALD112, 6 pcs.
Operating speed: 20 cpm
Ambient temperature: room temperature
circuit:



Change of pick-up and drop-out voltage



Change of contact resistance



For Cautions for Use, see Relay Technical Information.