TUV

## Panasonic ideas for life

## 1 FORM A SLIM POWER RELAY

LD RELAYS (ALD)

## FEATURES

1. Slim type: Width 7 mm .276 inch. $20.3(\mathrm{~L}) \times 7.0(\mathrm{~W}) \times 15.0(\mathrm{H}) \mathrm{mm}$ $.799(\mathrm{~L}) \times .276(\mathrm{~W}) \times .591(\mathrm{H})$ 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 200 mW .

## 4. High shock resistance

The relay withstands a functional shock resistance of $300 \mathrm{~m} / \mathrm{s}^{2}$ [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

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. $100 \mathrm{~m} \Omega$ |
| Contact material |  |  | AgNi type |
| Rating (resistive load) | Nominal switching capacity |  | $\begin{gathered} 3 \text { A } 277 \mathrm{~V} \mathrm{AC}, \\ 3 \text { A } 30 \mathrm{~V} \text { DC } \end{gathered}$ |
|  | Max. switching power |  | $\begin{gathered} 831 \mathrm{~V} \text { A (AC), } \\ 90 \mathrm{~W}(\mathrm{DC}) \end{gathered}$ |
|  | Max. switching voltage |  | 277 V AC, 30 V DC |
|  | Max. switching current |  | 3 A |
|  | Min. switching capacity\#1 (Reference value) |  | $100 \mathrm{~mA}, 5 \mathrm{~V}$ DC |
| Expected life (min.operations) | Mechanical (at 180 cpm ) |  | $5 \times 10^{6}$ |
|  | Electrical (at 20 cpm ) | $\begin{aligned} & \text { 3A 125V AC, } \\ & \text { 3A 30V DC } \end{aligned}$ | $2 \times 10^{5}$ |
|  | (at rated load) | 3A 250V AC | $10^{5}$ |

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.
${ }^{*}$ Measurement at same location as "Initial breakdown voltage" section.
${ }^{*}$ D Detection current: 10 mA
${ }^{*} 3$ Wave is standard shock voltage of $\pm 1.2 \times 50 \mathrm{~ms}$ according to JEC-212-1981
${ }^{*}$ Excluding contact bounce time.
${ }^{*}$ Half-wave pulse of sine wave: 11 ms ; detection time: $10 \mu \mathrm{~s}$
${ }^{* 6}$ Half-wave pulse of sine wave: 6 ms
${ }^{* 7}$ Detection time: $10 \mu \mathrm{~s}$
${ }^{*}$ 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*1 |  |  |  | Min. 1,000 M 2 (at 500 V DC) |
| Initial** 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* ${ }^{\star 3}$ |  |  |  | 10,000 V |
| Operate time ${ }^{*} 4$ (at nominal voltage) |  |  |  | Max. $10 \mathrm{~ms} \mathrm{(at} 20^{\circ} \mathrm{C} 68^{\circ} \mathrm{F}$ ) |
| Release time (with diode)*4 (at nominal voltage) |  |  |  | Max. 10 ms (at $20^{\circ} \mathrm{C} 68^{\circ} \mathrm{F}$ ) |
| Temperature rise (at $70^{\circ} \mathrm{C} 158^{\circ} \mathrm{F}$ ) |  |  |  | Max. $45^{\circ} \mathrm{C}$ with nominal coil voltage and at 3 A contact carrying current (resistance method) |
| Shock resistance |  |  | tional*5 | $300 \mathrm{~m} / \mathrm{s}^{2}$ \{approx. 30 G \} |
|  |  |  | tructive*6 | $1,000 \mathrm{~m} / \mathrm{s}^{2}$ \{approx. 100 G \} |
| Vibration resistance |  |  | ctional*7 | $10 \text { to } 55 \mathrm{~Hz}$ <br> at double amplitude of 1.5 mm |
|  |  |  | structive | $10 \text { to } 55 \mathrm{~Hz}$ <br> at double amplitude of 1.5 mm |
| Conditions for operation, transport and storage*8 (Not freezing and condensing at low temperature) |  |  | Ambient temp. | $\begin{aligned} & -40^{\circ} \mathrm{C} \text { to }+70^{\circ} \mathrm{C} \\ & -40^{\circ} \mathrm{F} \text { to }+158^{\circ} \mathrm{F} \end{aligned}$ |
|  |  |  | Humidity | 5 to 85\% R.H. |
| Unit weight |  |  |  | Approx. 4 g .14 oz |

## TYPICAL APPLICATIONS ORDERING INFORMATION

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


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 $20^{\circ} \mathrm{C} 68^{\circ}$ F)

| Part No. | Nominal voltage, V DC | Pick-up voltage, V DC (max.) (Initial) | Drop-out voltage, V DC (min.) (Initial) | Coil resistance, $\Omega$ ( $\pm 10 \%$ ) | Nominal operating current, $\mathrm{mA}( \pm 10 \%)$ | Nominal operating power, mW | Maximum allowable voltage, V DC (at $20^{\circ} \mathrm{C} 68^{\circ} \mathrm{F}$ ) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ALD14H | 4.5 | 3.38 | 0.22 | 101 | 44.4 | 200 | 5.85 |
| ALD105 | 5 | 3.75 | 0.25 | 125 | 40.0 |  | 6.5 |
| ALD106 | 6 | 4.5 | 0.3 | 180 | 33.3 |  | 7.8 |
| ALD109 | 9 | 6.75 | 0.45 | 405 | 22.2 |  | 11.7 |
| ALD112 | 12 | 9 | 0.6 | 720 | 16.7 |  | 15.6 |
| ALD118 | 18 | 13.5 | 0.9 | 1,620 | 11.1 |  | 23.4 |
| ALD124 | 24 | 18 | 1.2 | 2,880 | 8.3 |  | 31.2 |

## DIMENSIONS



## REFERENCE DATA



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

2. Life curve


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

3. Coil temperature rise

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


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



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

