



### 1 Form A/1 Form C 10A Small power relays

## LQ RELAYS (ALQ)



RoHS compliant

Protective construction: Sealed type

### FEATURES

- Miniature size and small:** 10(W) × 20(L) × 16(H) mm .394(W) × .787(L) × .630(H) inch
- Compact with high capacity:**  
1 Form A and 1 Form C, 10 A
- Class "F" coil is available**
- Contact rating at 105°C 221°F is approved by UL/C-UL (Class "F" coil only)**  
Please refer to "SAFETY STANDARDS" about the detail of contact rating.
- Surge 8,000 V, High breakdown voltage 4,000 V (Between contact and coil)**

### TYPICAL APPLICATIONS

- Home appliances**
  - Refrigerators
  - Cooking ovens
  - Washing machine
  - Air conditioners
- Industrial equipment**
  - Motor control
  - Robot
  - Power supply

### ORDERING INFORMATION

ALQ

Contact arrangement

1: 1 Form C

3: 1 Form A

Coil insulation class

Nil: Class B insulation

F: Class F insulation

Nominal coil voltage (DC)

05: 5V, 06: 6V, 09: 9V, 12: 12V, 18: 18V, 24: 24V

Note: Certified by UL/C-UL, VDE and CQC

### TYPES

| Nominal coil voltage | Part No. |          |
|----------------------|----------|----------|
|                      | 1 Form A | 1 Form C |
| 5V DC                | ALQ305   | ALQ105   |
| 6V DC                | ALQ306   | ALQ106   |
| 9V DC                | ALQ309   | ALQ109   |
| 12V DC               | ALQ312   | ALQ112   |
| 18V DC               | ALQ318   | ALQ118   |
| 24V DC               | ALQ324   | ALQ124   |

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

# RATING

## 1. Coil data

| Contact arrangement | Nominal coil voltage | Pick-up voltage (at 20°C 68°F)            | Drop-out voltage (at 20°C 68°F)          | Nominal operating current [±10%] (at 20°C 68°F) | Coil resistance [±10%] (at 20°C 68°F) | Nominal operating power (at 20°C 68°F) | Max. applied voltage                                                                |
|---------------------|----------------------|-------------------------------------------|------------------------------------------|-------------------------------------------------|---------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|
| 1 Form A            | 5V DC                | 75%V or less of nominal voltage (Initial) | 5%V or more of nominal voltage (Initial) | 40.0mA                                          | 125 Ω                                 | 200mW                                  | 180% of nominal voltage (at 20°C 68°F)<br>130% of nominal voltage (at 85°C 185°F)*4 |
|                     | 6V DC                |                                           |                                          | 33.3mA                                          | 180 Ω                                 |                                        |                                                                                     |
|                     | 9V DC                |                                           |                                          | 22.2mA                                          | 405 Ω                                 |                                        |                                                                                     |
|                     | 12V DC               |                                           |                                          | 16.7mA                                          | 720 Ω                                 |                                        |                                                                                     |
|                     | 18V DC               |                                           |                                          | 11.1mA                                          | 1,620 Ω                               |                                        |                                                                                     |
|                     | 24V DC               |                                           |                                          | 8.3mA                                           | 2,880 Ω                               |                                        |                                                                                     |
| 1 Form C            | 5V DC                | 75%V or less of nominal voltage (Initial) | 5%V or more of nominal voltage (Initial) | 80.0mA                                          | 62.5Ω                                 | 400mW                                  | 150% of nominal voltage (at 20°C 68°F)<br>110% of nominal voltage (at 85°C 185°F)*4 |
|                     | 6V DC                |                                           |                                          | 66.7mA                                          | 90 Ω                                  |                                        |                                                                                     |
|                     | 9V DC                |                                           |                                          | 44.4mA                                          | 202.5Ω                                |                                        |                                                                                     |
|                     | 12V DC               |                                           |                                          | 33.3mA                                          | 360 Ω                                 |                                        |                                                                                     |
|                     | 18V DC               |                                           |                                          | 22.2mA                                          | 810 Ω                                 |                                        |                                                                                     |
|                     | 24V DC               |                                           |                                          | 16.7mA                                          | 1,440 Ω                               |                                        |                                                                                     |

## 2. Specifications

| Characteristics            | Item                                                 |                          | Specifications                                                                                                                  |                                                                                                                 |
|----------------------------|------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Contact                    | Arrangement                                          |                          | 1 Form A                                                                                                                        | 1 Form C                                                                                                        |
|                            | Contact resistance (Initial)                         |                          | Max. 100mΩ (By voltage drop 6 V DC 1 A)                                                                                         |                                                                                                                 |
|                            | Contact material                                     |                          | AgNi type                                                                                                                       |                                                                                                                 |
| Rating                     | Nominal switching capacity (resistive load)          |                          | 5 A 30 V DC, 10 A 125 V AC, 5 A 250 V AC                                                                                        | N.O. side:<br>10 A 125 V AC, 5 A 250 V AC, 5 A 30 V DC<br>N.C. side:<br>3 A 125 V AC, 2 A 250 V AC, 1 A 30 V DC |
|                            | Max. switching power (resistive load)                |                          | 150 W, 1,250 VA                                                                                                                 | N.O. side: 150 W, 1,250 VA<br>N.C. side: 30 W, 500 VA                                                           |
|                            | Max. switching voltage                               |                          | 250 V AC, 30 V DC                                                                                                               |                                                                                                                 |
|                            | Max. switching current                               |                          | N.O.: 10 A (125V AC), N.C.: 3 A (125V AC)                                                                                       |                                                                                                                 |
|                            | Nominal operating power                              |                          | 200 mW                                                                                                                          | 400 mW                                                                                                          |
|                            | Min. switching capacity (reference value)*1          |                          | 100 mA, 5 V DC                                                                                                                  |                                                                                                                 |
| Electrical characteristics | Insulation resistance (Initial)                      |                          | Min. 1,000 MΩ (at 500 V DC) Measurement at same location as “Breakdown voltage” section.                                        |                                                                                                                 |
|                            | Breakdown voltage (Initial)                          | Between open contacts    | 1,000 Vrms for 1 min.<br>(Detection current: 10 mA)                                                                             | 750 Vrms for 1 min.<br>(Detection current: 10 mA)                                                               |
|                            |                                                      | Between contact and coil | 4,000 Vrms for 1 min. (Detection current: 10 mA)                                                                                |                                                                                                                 |
|                            | Surge breakdown voltage*2 (Between contact and coil) |                          | 8,000 V (Initial)                                                                                                               |                                                                                                                 |
|                            | Operate time (at nominal voltage) (at 20°C 68°F)     |                          | Max. 20 ms (excluding contact bounce time.) (Initial)                                                                           |                                                                                                                 |
|                            | Release time (at nominal voltage) (at 20°C 68°F)     |                          | Max. 20 ms (excluding contact bounce time, with diode) (Initial)                                                                |                                                                                                                 |
| Mechanical characteristics | Shock resistance                                     | Functional               | 1 Form A: 294 m/s², 1 Form C: 196 m/s²<br>(Half-wave pulse of sine wave: 11 ms; detection time: 10μs.)                          |                                                                                                                 |
|                            |                                                      | Destructive              | 980 m/s² (Half-wave pulse of sine wave: 6 ms.)                                                                                  |                                                                                                                 |
|                            | Vibration resistance                                 | Functional               | 10 to 55 Hz at double amplitude of 1.6 mm (Detection time: 10μs.)                                                               |                                                                                                                 |
|                            |                                                      | Destructive              | 10 to 55 Hz at double amplitude of 2.0 mm                                                                                       |                                                                                                                 |
| Expected life              | Mechanical                                           |                          | Min. 10 <sup>7</sup> (at 180 times/min.)                                                                                        |                                                                                                                 |
| Conditions                 | Conditions for operation, transport and storage*3    |                          | Ambient temperature: -40°C to +85°C -40°F to +185°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. 7 g .25 oz                                                                                                              |                                                                                                                 |

\* Specifications will vary with foreign standards certification ratings.

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 ±1.2×50μs 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.