

## New Product Introduction

July 26, 2012

### **ALQ (LQ) series: 1 Form A / 1 Form C, 10A Small Power Relays**



---

#### **1. Features:**

- 1 Form A / 1 Form C
- 10A rating
- Compact size same as JQ relays and terminal compatible
- 8,000V surge voltage between contacts and coil
- 4,000V breakdown voltage between contacts and coil

---

#### **2. Applications:**

- Household appliances
- Fan heaters
- Inverters
- Hot water units

---

#### **3. Release Date:** July 2012

---

#### 4. 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

#### 5. Technical Information: PDF datasheet is attached.

#### 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) 130% of nominal voltage (at 85°C 185°F) <sup>14</sup>
	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		
1 Form C	24V DC	75%V or less of nominal voltage (Initial)	5%V or more of nominal voltage (Initial)	8.3mA	2,880 Ω	400mW	150% of nominal voltage (at 20°C 68°F) 110% of nominal voltage (at 85°C 185°F) <sup>14</sup>
	5V DC			80.0mA	62.5Ω		
	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		
		1 Form A	1 Form C	
Contact	Arrangement	1 Form A		
	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: 10 A 125 V AC, 5 A 250 V AC, 5 A 30 V DC N.C. side: 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 N.C. side: 30 W, 500 VA	
	Max. switching voltage	250 V AC		
	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. (Detection current: 10 mA)	750 Vrms for 1 min. (Detection current: 10 mA)
		Between contact and coil	4,000 Vrms for 1 min. (Detection current: 10 mA)	
	Temperature rise (coil)*4	Max. 45°C 113°F (By resistive method, nominal coil voltage applied to the coil; contact carrying current: 10A, at 85°C 185°F)		
	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/s <sup>2</sup> , 1 Form C: 196 m/s <sup>2</sup> (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.)	
		Destructive	980 m/s <sup>2</sup> (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 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  $\pm 1.2 \times 50\mu s$  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.

\*4. When using relays in a high ambient temperature, consider the pick-up voltage rise due to the high temperature (a rise of approx. 0.4% V for each 1°C 33.8°F with 20°C 68°F as a reference) and use a coil impressed voltage that is within the maximum applied voltage range.

## 3. Expected electrical life

Condition: Resistive load, at 20°C 68°F, at 20 times/min., with diode

Type		Switching capacity	No. of operations
1 Form A (at 20 times/min.)		10 A 125 V AC	5×10 <sup>4</sup>
		5 A 250 V AC	5×10 <sup>4</sup>
		5 A 30 V DC	10 <sup>5</sup>
1 Form C (at 20 times/min.)	N.O.	10 A 125 V AC	5×10 <sup>4</sup>
		5 A 250 V AC	5×10 <sup>4</sup>
		5 A 30 V DC	10 <sup>5</sup>
	N.C.	3 A 125 V AC	2×10 <sup>5</sup>
		2 A 250 V AC	2×10 <sup>5</sup>
		1 A 30 V DC	10 <sup>5</sup>

# DIMENSIONS (mm inch)

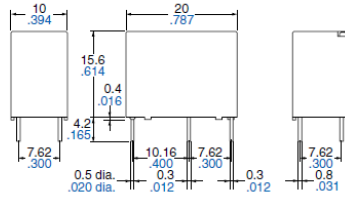
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

**CAD Data**

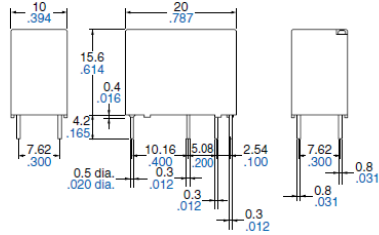


## External dimensions

1 Form A

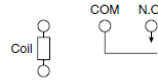


1 Form C

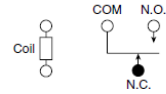


## Schematic (Bottom view)

1 Form A

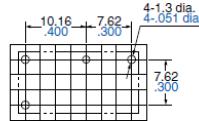


1 Form C

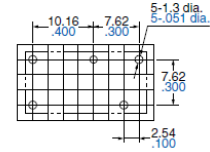


## PC board pattern (Bottom view)

1 Form A



1FormC



Tolerance:  $\pm 0.1 \pm .004$

**Dimension:**  
 Less than 1mm **.039inch**:  
 Min. 1mm **.039inch** less than 5mm **.197 inch**:  
 Min. 5mm **.197 inch**:  
**General tolerance**  
 $\pm 0.2 \pm .008$   
 $\pm 0.3 \pm .012$   
 $\pm 0.4 \pm .016$

Any questions, please contact your local Panasonic Electric Works Sales representatives.

Ref#: M-415