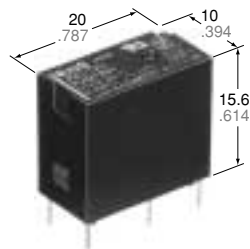


**Panasonic**  
ideas for life

## HIGH ELECTRICAL & MECHANICAL NOISE IMMUNITY RELAY

# JQ RELAYS



mm inch

## FEATURES

- High electrical noise immunity
- High switching capacity in a compact package
- High sensitivity: 200 mW (1a), 400 mW (1c)
- High surge voltage: 8,000 V between contacts and coil
- UL, CSA, VDE, TÜV, SEMKO approved
- Class B coil insulation type available

## SPECIFICATIONS

### Contact

|                                                                  |                                       |                            |                           | Standard type                               | High capacity type                           |               |                                             |                                              |                                             |                   |
|------------------------------------------------------------------|---------------------------------------|----------------------------|---------------------------|---------------------------------------------|----------------------------------------------|---------------|---------------------------------------------|----------------------------------------------|---------------------------------------------|-------------------|
| Arrangement                                                      |                                       |                            |                           | 1 Form A, 1 Form C                          |                                              |               |                                             |                                              |                                             |                   |
| Initial contact resistance, max.<br>(By voltage drop 6 V DC 1 A) |                                       |                            |                           | 100 mΩ                                      |                                              |               |                                             |                                              |                                             |                   |
| Contact material                                                 |                                       |                            |                           | Silver alloy                                |                                              |               |                                             |                                              |                                             |                   |
| Rating<br>(resistive)                                            | Nominal<br>switching<br>capacity      | 1a                         |                           | 5 A 125 V AC<br>2 A 250 V AC<br>5 A 30 V DC | 10 A 125 V AC<br>5 A 250 V AC<br>5 A 30 V DC |               |                                             |                                              |                                             |                   |
|                                                                  |                                       |                            |                           | 1c                                          |                                              | N.O.          | 5 A 125 V AC<br>2 A 250 V AC<br>3 A 30 V AC | 10 A 125 V AC<br>5 A 250 V AC<br>5 A 30 V DC |                                             |                   |
|                                                                  |                                       |                            |                           |                                             |                                              |               | N.C.                                        | 2 A 125 V AC<br>1 A 250 V AC<br>1 A 30 V DC  | 3 A 125 V AC<br>2 A 250 V AC<br>1 A 30 V DC |                   |
|                                                                  |                                       | Max.<br>switching<br>power |                           | 1a                                          |                                              | 625 VA, 150 W |                                             | 1,250 VA, 150 W                              |                                             |                   |
|                                                                  |                                       |                            |                           |                                             |                                              | 1c            |                                             | N.O.                                         | 625 VA, 90 W                                | 1,250 V AC, 150 W |
|                                                                  |                                       |                            |                           |                                             |                                              |               |                                             |                                              | N.C.                                        | 250 VA, 30 W      |
|                                                                  | Max. switching voltage                |                            | 250 V AC, 110 V DC (0.3A) |                                             |                                              |               |                                             |                                              |                                             |                   |
|                                                                  | Max. switching current                |                            | N.O.: 5 A N.C.: 2 A       |                                             | N.O.: 10 A N.C.: 3 A                         |               |                                             |                                              |                                             |                   |
|                                                                  | Min. switching capacity <sup>#1</sup> |                            | 100 mA, 5 V DC            |                                             |                                              |               |                                             |                                              |                                             |                   |
| Expected mechanical life<br>(at 180 cpm)(min. operations)        |                                       |                            |                           | 10 <sup>7</sup>                             |                                              |               |                                             |                                              |                                             |                   |

### Expected electrical life (min. operations)

| Type               |    | Switching capacity | No. of operations                            |                                                           |
|--------------------|----|--------------------|----------------------------------------------|-----------------------------------------------------------|
| Standard type      | 1a | 5 A 125 V AC       | 5×10 <sup>4</sup>                            |                                                           |
|                    |    | 3 A 125 V AC       | 2×10 <sup>5</sup>                            |                                                           |
|                    |    | 2 A 250 V AC       | 2×10 <sup>5</sup>                            |                                                           |
|                    |    | 5 A 30 V DC        | 10 <sup>5</sup>                              |                                                           |
|                    | 1c | N.O.               | 5 A 125 V AC<br>2 A 250 V AC<br>3 A 30 V DC  | 5×10 <sup>4</sup><br>2×10 <sup>5</sup><br>10 <sup>5</sup> |
|                    |    | N.C.               | 2 A 125 V AC<br>1 A 250 V AC<br>1 A 30 V DC  | 2×10 <sup>5</sup><br>2×10 <sup>5</sup><br>10 <sup>5</sup> |
| High capacity type | 1a | 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>                              |                                                           |
|                    | 1c | N.O.               | 10 A 125 V AC<br>5 A 250 V AC<br>5 A 30 V DC | 5×10 <sup>4</sup><br>5×10 <sup>4</sup><br>10 <sup>5</sup> |
|                    |    | N.C.               | 3 A 125 V AC                                 | 2×10 <sup>5</sup>                                         |
|                    |    |                    | 2 A 250 V AC<br>1 A 30 V DC                  | 2×10 <sup>5</sup><br>10 <sup>5</sup>                      |

### Coil (at 20°C 68°F)

| Nominal operating power | 1a: 200 mW | 1c: 400 mW |
|-------------------------|------------|------------|
|-------------------------|------------|------------|

### Characteristics

|                                                                                                                |                              |                                                                          |
|----------------------------------------------------------------------------------------------------------------|------------------------------|--------------------------------------------------------------------------|
| Max. operating speed                                                                                           |                              | 20 cpm                                                                   |
| Initial insulation resistance <sup>*1</sup>                                                                    |                              | Min. 1,000 MΩ at 500 V DC                                                |
| Initial breakdown voltage <sup>*2</sup>                                                                        | Between open contacts        | 1a: 1,000 Vrms for 1 min.<br>1c: 750 Vrms for 1 min.                     |
|                                                                                                                | Between contacts and coil    | 4,000 Vrms for 1 min.                                                    |
| Surge voltage between contact and coil <sup>*3</sup>                                                           |                              | 8,000 V                                                                  |
| Operate time <sup>*4</sup> (at nominal voltage)                                                                |                              | Approx. 5 ms                                                             |
| Release time <sup>*4</sup> (at nominal voltage)(without diode)                                                 |                              | Approx. 2 ms                                                             |
| Temperature rise <sup>*5</sup>                                                                                 |                              | Max. 45°C                                                                |
| Shock resistance                                                                                               | Functional <sup>*6</sup>     | Min. 294 m/s <sup>2</sup> {30 G}                                         |
|                                                                                                                | Destructive <sup>*7</sup>    | Min. 980 m/s <sup>2</sup> {100 G}                                        |
| Vibration resistance                                                                                           | Functional <sup>*8</sup>     | 98 m/s <sup>2</sup> {10 G}, 10 to 55 Hz at double amplitude of 1.6 mm    |
|                                                                                                                | Destructive                  | 117.6 m/s <sup>2</sup> {12 G}, 10 to 55 Hz at double amplitude of 2.0 mm |
| Conditions for operation, transport and storage <sup>*9</sup> (Not freezing and condensing at low temperature) | Ambient temp. <sup>*10</sup> | −40°C to +85°C<br>−40°F to +185°F                                        |
|                                                                                                                | Humidity                     | 5 to 85% R.H.                                                            |
| Unit weight                                                                                                    |                              | Approx. 7 g .25 oz                                                       |

<sup>#1</sup> 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: 10 mA

<sup>\*3</sup> Wave is standard shock voltage of ±1.2 × 50μs according to JEC-212-1981

<sup>\*4</sup> Excluding contact bounce time

<sup>\*5</sup> Measured conditions

|                    |                                                                                                  |
|--------------------|--------------------------------------------------------------------------------------------------|
| Standard type      | Resistive, nominal voltage applied to the coil.<br>Contact carrying current: 5 A, at 70°C 158°F  |
| High capacity type | Resistive, nominal voltage applied to the coil.<br>Contact carrying current: 10 A, at 70°C 158°F |

<sup>\*6</sup> Half-wave pulse of sine wave: 11ms; detection time: 10μs

<sup>\*7</sup> Half-wave pulse of sine wave: 6ms

<sup>\*8</sup> Detection time: 10μs

<sup>\*9</sup> Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT

<sup>\*10</sup> 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 allowable voltage range.

## TYPICAL APPLICATIONS

- Air conditioners
- Refrigerators
- Microwave ovens
- Heaters

## ORDERING INFORMATION

Ex. JQ 1a P — B — 12 V — F

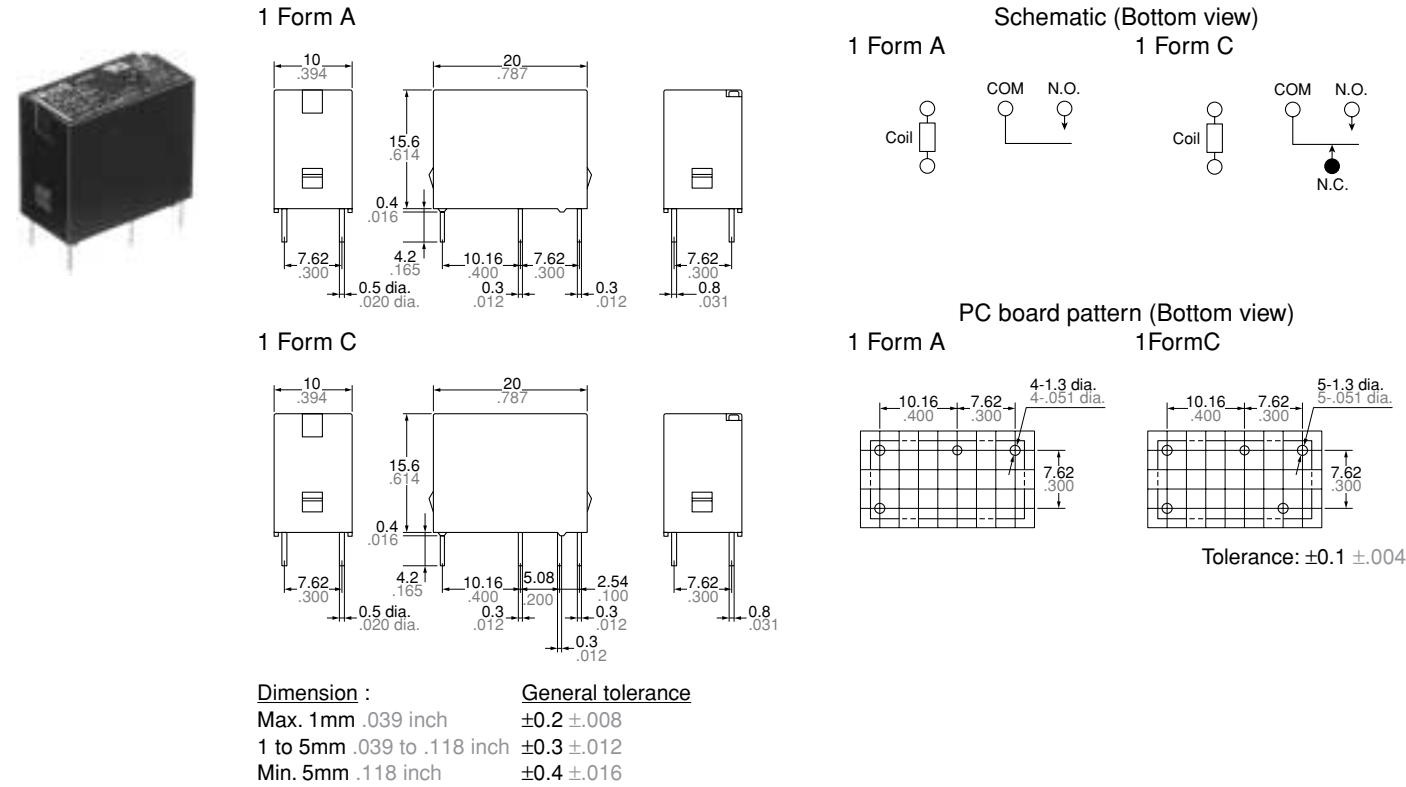
| Contact arrangement         | Contact capacity                  | Coil insulation class                                      | Coil voltage (DC)          | Environmental support                                                                                               |
|-----------------------------|-----------------------------------|------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------|
| 1a: 1 Form A<br>1: 1 Form C | Nil: Standard<br>P: High capacity | Nil: Class E coil insulation<br>B: Class B coil insulation | 5, 6, 9, 12, 18, 24, 48* V | F: RoHS Directive conforming type (AgSnO <sub>2</sub> type)<br>Nil: RoHS Directive non-conforming type (AgCdO type) |

UL/CSA, VDE, SEMKO approved type is standard.

\* Available only for 1 Form C type

## TYPES AND COIL DATA at 20°C 68°F

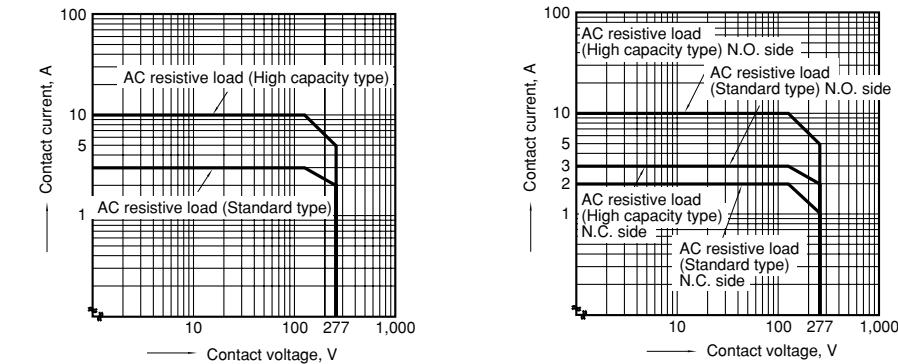
|          | Part No.           | Nominal voltage, V DC | Pick-up voltage, V DC (min.) | Drop-out voltage, V DC (min.) | Nominal operating current, mA | Nominal operating power, mW | Coil resistance, Ω (±10%) | Max. allowable voltage, V DC            |
|----------|--------------------|-----------------------|------------------------------|-------------------------------|-------------------------------|-----------------------------|---------------------------|-----------------------------------------|
| 1 Form A | Standard type      | JQ1a-5V (-F)          | 5                            | 3.75                          | 40                            | 200                         | 125                       | 180% of nominal voltage (at 20°C 68°F)  |
|          |                    | JQ1a-6V (-F)          | 6                            | 4.5                           | 33.3                          |                             | 180                       |                                         |
|          |                    | JQ1a-9V (-F)          | 9                            | 6.75                          | 22.2                          |                             | 405                       |                                         |
|          |                    | JQ1a-12V (-F)         | 12                           | 9                             | 16.7                          |                             | 720                       |                                         |
|          |                    | JQ1a-18V (-F)         | 18                           | 13.5                          | 11.1                          |                             | 1,620                     |                                         |
|          |                    | JQ1a-24V (-F)         | 24                           | 18                            | 8.3                           |                             | 2,880                     |                                         |
|          | High capacity type | JQ1aP-5V (-F)         | 5                            | 4                             | 40                            | 200                         | 125                       | 130% of nominal voltage (at 85°C 185°F) |
|          |                    | JQ1aP-6V (-F)         | 6                            | 4.8                           | 33.3                          |                             | 180                       |                                         |
|          |                    | JQ1aP-9V (-F)         | 9                            | 7.2                           | 22.2                          |                             | 405                       |                                         |
|          |                    | JQ1aP-12V (-F)        | 12                           | 9.6                           | 16.7                          |                             | 720                       |                                         |
|          |                    | JQ1aP-18V (-F)        | 18                           | 14.4                          | 11.1                          |                             | 1,620                     |                                         |
|          |                    | JQ1aP-24V (-F)        | 24                           | 19.2                          | 8.3                           |                             | 2,880                     |                                         |
| 1 Form C | Standard type      | JQ1-5V (-F)           | 5                            | 3.75                          | 80                            | 400                         | 62.5                      | 150% of nominal voltage (at 20°C 68°F)  |
|          |                    | JQ1-6V (-F)           | 6                            | 4.5                           | 66.7                          |                             | 90                        |                                         |
|          |                    | JQ1-9V (-F)           | 9                            | 6.75                          | 44.4                          |                             | 202.5                     |                                         |
|          |                    | JQ1-12V (-F)          | 12                           | 9                             | 33.3                          |                             | 360                       |                                         |
|          |                    | JQ1-18V (-F)          | 18                           | 13.5                          | 22.2                          |                             | 810                       |                                         |
|          |                    | JQ1-24V (-F)          | 24                           | 18                            | 16.7                          |                             | 1,440                     |                                         |
|          | High capacity type | JQ1P-5V (-F)          | 5                            | 4                             | 80                            | 400                         | 62.5                      | 110% of nominal voltage (at 85°C 185°F) |
|          |                    | JQ1P-6V (-F)          | 6                            | 4.8                           | 66.7                          |                             | 90                        |                                         |
|          |                    | JQ1P-9V (-F)          | 9                            | 7.2                           | 44.4                          |                             | 202.5                     |                                         |
|          |                    | JQ1P-12V (-F)         | 12                           | 9.6                           | 33.3                          |                             | 360                       |                                         |
|          |                    | JQ1P-18V (-F)         | 18                           | 14.4                          | 22.2                          |                             | 810                       |                                         |
|          |                    | JQ1P-24V (-F)         | 24                           | 19.2                          | 16.7                          |                             | 1,440                     |                                         |
|          |                    | JQ1P-48V (-F)         | 48                           | 38.4                          | 8.3                           |                             | 5,760                     |                                         |



REFERENCE DATA

Max. switching capacity (1 Form A type)

Max. switching capacity (1 Form C type)



Standard type

1-(1). Operate & release time (1 Form A type)  
Tested sample: JQ1a-12V, 25 pcs.

1-(2). Operate & release time (1 Form C type)  
Tested sample: JQ1-24V, 25 pcs.

2. Life curve  
Ambient temperature: room temperature

