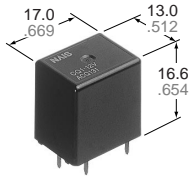


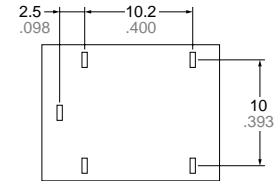
### FEATURES

- **Quiet**  
Noise has been reduced by approximately 20 dB, using our own silencing design.
- **Less space required**  
Measuring only 17(L)×13(W)mm (.669(L)×.512(W) inches), this product ranks first among automotive quiet relays in terms of saving space.
- **Sealed construction**

- **Next-generation standard terminal pitch employed**  
The terminal array used is identical to that used in JJM relays.



mm inch



### SPECIFICATIONS

#### Contact

|  |                            |   |
|--|----------------------------|---|
| Arrangement  | 1 Form C                   |   |
| Contact material   | Silver alloy               |   |
| Initial contact resistance, max. (By voltage drop 6 V DC 1A) | 100 mΩ                     |   |
| Contact voltage drop, max.                                   | 0.2V (at 10 A switching)   |   |
| Rating   | Nominal switching capacity | N.O.: 20 A 14 V DC<br>N.C.: 10 A 14 V DC  |
|  | Max. carrying current      | 35 A for 2 minutes,<br>25 A for 1 hour<br>(12 V, at 20°C 68°F)<br>30 A for 2 minutes,<br>20 A for 1 hour<br>(12 V, at 85°C 185°F) |
| Expected life (min. operations)                              | Mechanical (at 120 cpm)    | Min. 10 <sup>7</sup>  |
|  | Electrical                 | Resistive load: Min. 10 <sup>5</sup> *1<br>Motor load: Min. 3×10 <sup>5</sup> *2  |

#### Coil

|                         |        |
|-------------------------|--------|
| Nominal operating power | 640 mW |
|-------------------------|--------|

#### Remarks

- \* Specifications will vary with foreign standards certification ratings.
- \*1 At nominal switching capacity, operating frequency: 1s ON, 9s OFF
- \*2 N.O.: at 5 A (steady), 30 A (inrush)/N.C.: at 20 A (brake) 14 V DC, operating frequency: 1s ON, 2s OFF
- \*3 Measurement at same location as "Initial breakdown voltage" section
- \*4 Detection current: 10mA
- \*5 Excluding contact bounce time
- \*6 Half-wave pulse of sine wave: 11ms; detection: 10μs
- \*7 Half-wave pulse of sine wave: 6ms
- \*8 Detection time: 10μs

#### Characteristics

|   |                           |  |
|---|---------------------------|--|
| Max. operating speed (at nominal switching capacity)  | 6 cpm                     |  |
| Initial insulation resistance*3   | Min. 100 MΩ (at 500 V DC) |  |
| Initial breakdown voltage*4   | Between open contacts     | 500 Vrms for 1 min.                                |
|   | Between contacts and coil | 500 Vrms for 1 min.                                |
| Operate time*5 (at nominal voltage)(at 20°C68°F)  | Max. 10 ms (initial)      |  |
| Release time (without diode)*5 (at nominal voltage)(at 20°C68°F)                                    | Max. 10 ms (initial)      |  |
| Shock resistance  | Functional*6              | Min. 100 m/s <sup>2</sup> {10G}                    |
|   | Destructive*7             | Min. 1,000 m/s <sup>2</sup> {100G}                 |
| Vibration resistance  | Functional*8              | 10 to 100 Hz,<br>Min. 44.1 m/s <sup>2</sup> {4.5G} |
|   | Destructive*9             | 10 to 500 Hz,<br>Min. 44.1 m/s <sup>2</sup> {4.5G} |
| Conditions for operation, transport and storage*10 (Not freezing and condensing at low temperature) | Ambient temperature       | -40 to +85°C<br>-40 to +185°F                      |
|   | Humidity                  | 5 to 85% R.H.                                      |
| Unit weight   | Approx. 6.5g .23 oz       |  |

\*9 Time of vibration for each direction;  
X, Y direction: 2 hours  
Z direction: 4 hours



\*10 Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 61)

### TYPICAL APPLICATIONS

- Intermittent wiper
- Cruise control
- Power windows
- Auto door lock
- Car stereo
- Car air-conditioner

### ORDERING INFORMATION

Ex. CQ 1 - 12 V

|                     |                  |
|---------------------|------------------|
| Contact arrangement | Coil voltage(DC) |
| 1 Form C            | 12 V             |

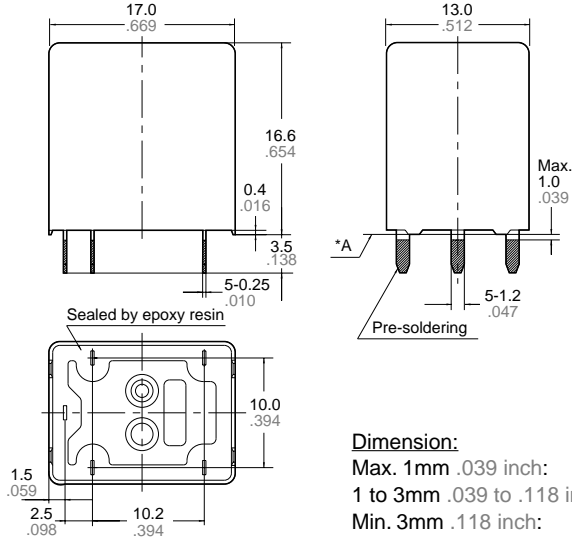
Standard packing: Carton(tube package) 40pcs. Case: 800pcs.

**TYPES AND COIL DATA (at 20°C 68°F)**

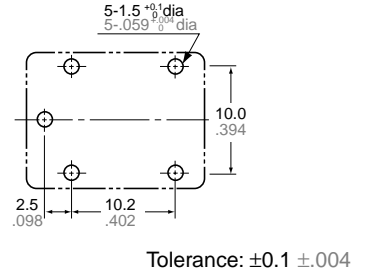
| Part No. | Nominal voltage, V DC | Pick-up voltage, V DC (max.) | Drop-out voltage, V DC (min.) | Coil resistance, Ω (±10%) | Nominal operating current, mA (±10%) | Nominal operating power, mW | Usable voltage range, V DC |
|----------|-----------------------|------------------------------|-------------------------------|---------------------------|--------------------------------------|-----------------------------|----------------------------|
| CQ1-12V  | 12                    | (Initial) 7.2                | (Initial) 1.0                 | 225                       | 53.3                                 | 640                         | 10 to 16                   |

**DIMENSIONS**

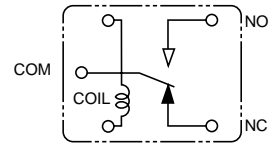
mm inch



PC board pattern (Bottom view)



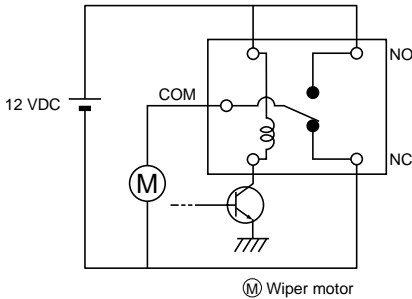
Schematic (Bottom view)



\* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering. Intervals between terminals is measured at A surface level.

**EXAMPLE OF CIRCUIT**

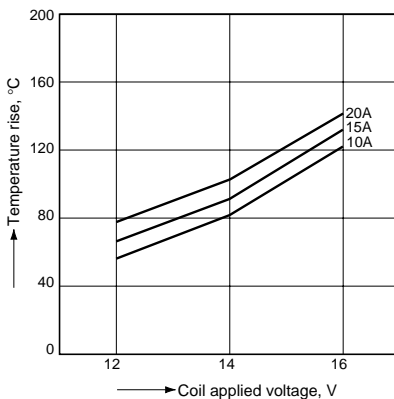
Control circuit for intermittent wiper motor



**REFERENCE DATA**

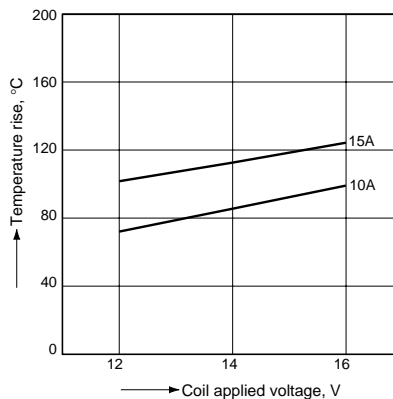
1-(1). Coil temperature rise (at 20°C 68°F)

Sample: CQ1-12V, 5pcs  
 Contact carrying current: 10A, 15A, 20A

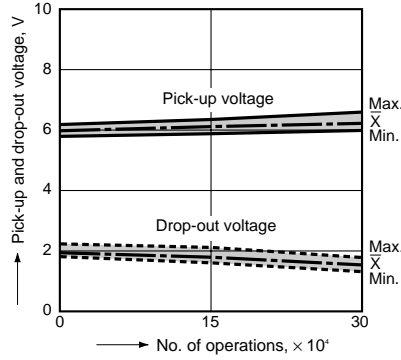
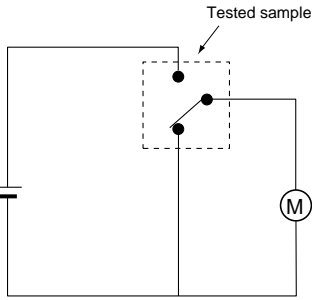


1-(2). Coil temperature rise (at 85°C 185°F)

Sample: CQ1-12V, 5pcs  
 Contact carrying current: 10A, 15A

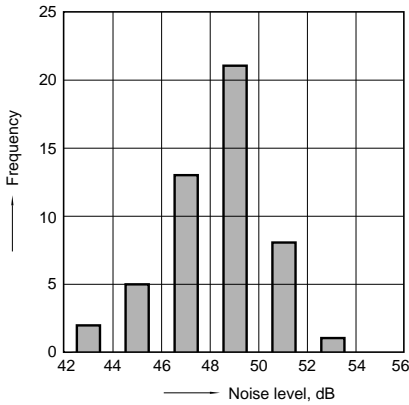


2. Electrical Test (Motor load)  
 Tested sample: CQ1-12V, 3pcs  
 Load: 5A steady, Inrush 30A, 14V DC  
 Operating frequency: ON 1s, OFF 2s

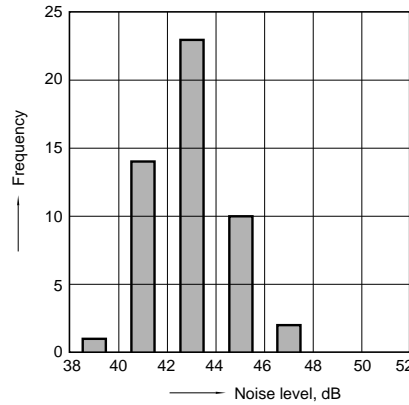


Contact welding: 0 time  
 Miscontact: 0 time

3-(1). Operation noise distribution  
 When operate

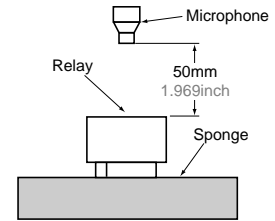


3-(2). Operation noise distribution  
 When release



**Measuring conditions**

Tested sample: CQ1-12 V, 50 pcs.  
 Equipment setting: "A" weighted, Fast, Max. hold  
 Coil voltage: 12V DC  
 Coil connection device: Diode  
 Background noise: Approx. 20dB



**For Cautions for use, see Relay Technical Information (Page 48 to 76).**