AUTOMOTIVE LOW PROFILE MICRO-ISO RELAY

CV RELAYS (ACV)

FEATURES

• Low profile:
  22.5 mm(L) x 15 mm(W) x 15.7 mm(H)
  .886 inch(L) x .591 inch(W) x .618 inch(H)

• Low temperature rise
  Terminal temperature has been reduced compared with using our conventional product.

• Low sound pressure level
  Noise level has been reduced approx. 10dB compared with using our conventional product.

• Wide line-up
  Micro ISO terminal types and resistor inside type.

• Plastic sealed type
  Plastically sealed for automatic cleaning.

• Compact and high-capacity 20A load switching
  N.O.: 20A 14V DC, N.C.: 10A 14V DC
  (Max. carrying current: at 85°C 185°F)

TYPICAL APPLICATIONS

• Headlights
• Magnetic clutches
• Radiator fans
• Blowers
• Fog lamps
• Tail lights
• Heaters
• Defoggers
• Horns
• Condenser fans, etc.

ORDERING INFORMATION

Contact arrangement
1: 1 Form C
3: 1 Form A

Mounting classification
1: Micro ISO plug-in type

Protective element
0: None (Standard type)
2: With resistor inside

Coil voltage, DC
12: 12 V

TYPES

<table>
<thead>
<tr>
<th>Contact arrangement</th>
<th>Coil voltage</th>
<th>Protective construction</th>
<th>Mounting classification</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Form A</td>
<td>12 V DC</td>
<td>Sealed type</td>
<td>Micro ISO plug-in type</td>
<td>ACV31012</td>
</tr>
<tr>
<td>1 Form C</td>
<td>12 V DC</td>
<td>Sealed type</td>
<td>Micro ISO plug-in type</td>
<td>ACV11012</td>
</tr>
</tbody>
</table>

Note: Please use “ACV+=212” to order built-in resistor type. (Asterisks “∗” should be filled in from ORDERING INFORMATION.)

Standard packing: Carton: 50 pcs.; Case: 200 pcs.

RATING

1. Coil data

<table>
<thead>
<tr>
<th>Nominal coil voltage</th>
<th>Pick-up voltage* (at 20°C 68°F)</th>
<th>Drop-out voltage (at 20°C 68°F)</th>
<th>Nominal operating current ≤10% (at 20°C 68°F)</th>
<th>Coil resistance ≤10% (at 20°C 68°F)</th>
<th>Nominal operating power (at 20°C 68°F)</th>
<th>Usable voltage range (at 85°C 185°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 V DC</td>
<td>Max. 7.0 V DC (Initial)</td>
<td>Min. 0.6 V DC (Initial)</td>
<td>67 mA, 84 mA (with resistor)</td>
<td>180Ω, 142.3Ω (with resistor)</td>
<td>0.8 W, 1.0 W (with resistor)</td>
<td>10 to 16V DC</td>
</tr>
</tbody>
</table>

Note: * Other pick-up voltage types are also available. Please contact us for details.

RoHS compliant
## 2. Specifications

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contact</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact resistance (Initial)</td>
<td>1 Form A</td>
<td>Typ 3mΩ (By voltage drop 6V DC 1A)</td>
</tr>
<tr>
<td>Contact voltage drop (after electrical life test)</td>
<td>N.O.: Max. 0.2 V (By voltage drop 14 V DC 20 A)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N.C.: Max. 0.5 V (By voltage drop 14 V DC 10 A)</td>
<td></td>
</tr>
<tr>
<td>Contact material</td>
<td>1 Form C</td>
<td>Ag alloy (Cadmium free)</td>
</tr>
<tr>
<td><strong>Rating</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal switching capacity (resistive load)</td>
<td>N.O.: 20 A 14V DC</td>
<td></td>
</tr>
<tr>
<td>Max. carrying current (at 85°C 185°F, continuous)</td>
<td>N.O.: 20 A 14V DC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N.C.: 10 A 14V DC</td>
<td></td>
</tr>
<tr>
<td>Nominal operating power</td>
<td>0.8 W, 1.0 W (built-in resistor type)</td>
<td></td>
</tr>
</tbody>
</table>

### 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. The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. Please refer to "Usage ambient condition" in CAUTIONS FOR USE OF AUTOMOTIVE RELAYS.
3. Please inquire if you will be using the relay in a high temperature atmosphere.
4. Regarding solder, this product is not MIL (Military Standard) compliant. Please evaluate solder mounting by the actual equipment before using.

### REFERENCE DATA

1. **Coil temperature rise (20A)**
   - Point measured: Inside the coil
   - Contact carrying current: 20A
   - Coil applied voltage: 13.5V

   ![Temperature rise graph](image)

2. **Distribution of pick-up and drop-out voltage**
   - Sample: ACV11012, 100pcs

   ![Voltage distribution graph](image)

3. **Distribution of operate and release time**
   - Sample: ACV11012, 100pcs

   ![Time distribution graph](image)

4. **Ambient temperature and operating voltage range**

   ![Operating range diagram](image)
5-(1). Electrical life test (Resistive load)

Sample: ACV11012, 3pcs.
Load: Resistive load (NC switching) 10A
Switching frequency: ON 1s, OFF 1s
Ambient temperature: Room temperature

Circuit

Load current waveform

Change of pick-up and drop-out voltage

Change of contact resistance

5-(2). Electrical life test (Lamp load)

Sample: ACV31212, 3pcs.
Load: 55Wx4, inrush: 90A/steady: 20A,
lamp actual load
Switching frequency: ON 1s, OFF 14s
Ambient temperature: Room temperature

Circuit

Load current waveform

Inrush current: 90A, steady current: 20A
For Cautions for Use, see Relay Technical Information.