Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



# Contact us

# Panasonic
## ideas for life

Micro ISO
1 Form C type
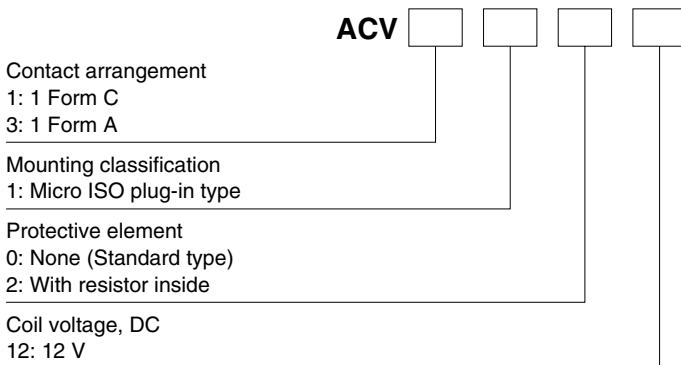
Micro ISO
1 Form A type

**RoHS compliant**

## FEATURES
- **Low profile:**
**22.5 mm(L)×15 mm(W)×15.7 mm(H)**
.886 inch(L)×.591 inch(W)×.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

ACV ☐ ☐ ☐ ☐

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

| Contact arrangement | Coil voltage | Protective construction | Mounting classification | Part No. |
|---|---|---|---|---|
| 1 Form A | 12 V DC | Sealed type | Micro ISO plug-in type | ACV31012 |
| 1 Form C | | | Micro ISO plug-in type | ACV11012 |

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

| 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) | Usable voltage range (at 85°C 185°F) |
|---|---|---|---|---|---|---|
| 12V DC | Max. 7.0 V DC (Initial) | Min. 0.6 V DC (Initial) | 67 mA, 84 mA (with resistor) | 180Ω, 142.3Ω (with resistor) | 0.8 W, 1.0 W (with resistor) | 10 to 16V DC |

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

## 2. Specifications

| Characteristics | Item | | Specifications | |
|---|---|---|---|---|
| | Arrangement | | 1 Form A | 1 Form C |
| Contact | Contact resistance (Initial) | | Typ 3mΩ (By voltage drop 6V DC 1A) | |
| | Contact voltage drop (after electrical life test) | | N.O.: Max. 0.2 V (By voltage drop 14 V DC 20 A) | N.O.: Max. 0.2 V (By voltage drop 14 V DC 20 A)<br>N.C.: Max. 0.5 V (By voltage drop 14 V DC 10 A) |
| | Contact material | | Ag alloy (Cadmium free) | |
| Rating | Nominal switching capacity (resistive load) | | N.O.: 20 A 14V DC | N.O.: 20 A 14V DC, N.C.: 10 A 14V DC |
| | Max. carrying current<br>(at 85°C 185°F, continuous) | | N.O.: 20 A 14V DC | N.O.: 20 A 14V DC<br>N.C.: 10 A 14V DC |
| | Nominal operating power | | 0.8 W, 1.0 W (built-in resistor type) | |
| | Min. switching capacity (resistive load)*1 | | 1 A 12V DC | |
| Electrical characteristics | Insulation resistance (Initial) | | Min. 20 MΩ (at 500V DC) | |
| | Breakdown voltage (Initial) | Between open contacts | 500 Vrms for 1 min. (Detection current: 10mA) | |
| | | Between contacts and coil | 500 Vrms for 1 min. (Detection current: 10mA) | |
| | Operate time (at nominal voltage)<br>(at 20°C 68°F) | | Max. 10ms (excluding contact bounce time) (Initial) | |
| | Release time (at nominal voltage)<br>(at 20°C 68°F) | | Max. 10ms (excluding contact bounce time) (Initial) | |
| Mechanical characteristics | Shock resistance | Functional | Min. 100 m/s² {10G} (Half-wave pulse of sine wave: 11ms; detection time: 10μs) | |
| | | Destructive | Min. 1,000 m/s² {100G} (Half-wave pulse of sine wave: 6ms) | |
| | Vibration resistance | Functional | 10 Hz to 100 Hz, Min. 44.1 m/s² {4.5G} (Detection time: 10μs) | |
| | | Destructive | 10 Hz to 500 Hz, Min. 44.1 m/s² {4.5G}, Time of vibration for each direction; X, Y, Z direction: 4 hours | |
| Expected life | Mechanical | | Min. 10⁶ (at 120 cpm) | |
| | Electrical (at nominal switching capacity) | | Min. 10⁵ (operating frequency: 2s ON, 2s OFF) | |
| Conditions | Conditions for operation, transport and storage*2 | | Ambient temperature: –40°C to +85°C –40°F to +185°F*3,<br>Humidity: 5% R.H. to 85% R.H. (Not freezing and condensing at low temperature),<br>air pressure: 86 to 106kPa | |
| Mass | | | Approx. 15 g .53 oz | |

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.
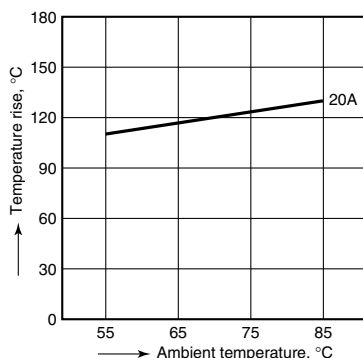*3. Please inquire if you will be using the relay in a high temperature atmosphere.
* Regarding solder, this product is not MIL (Military Standard) compliant. Please evaluate solder mounting by the actual equipment before using.
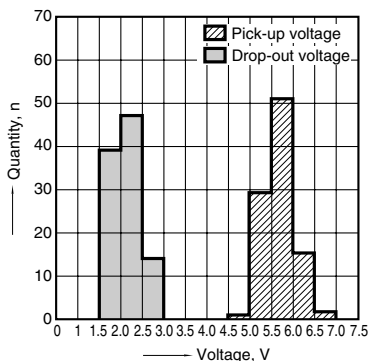
# REFERENCE DATA

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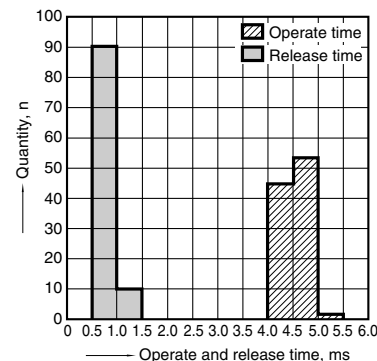Contact carrying current: 20A
Coil applied voltage: 13.5V

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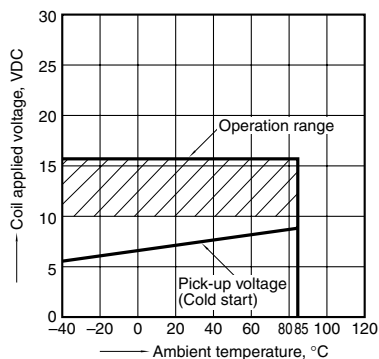Sample: ACV11012, 100pcs

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

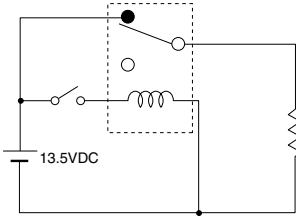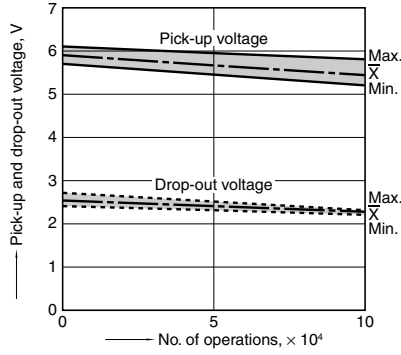### 4. Ambient temperature and operating voltage range

# CV (ACV)

## 5-(1). Electrical life test (Resistive load)

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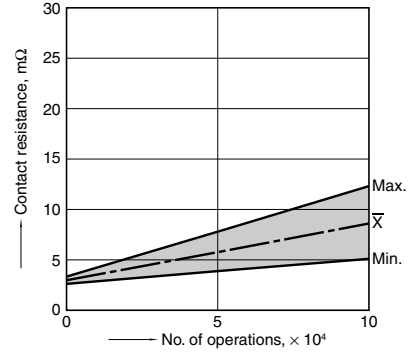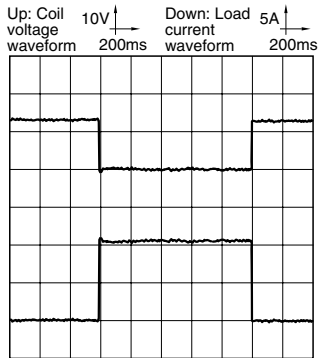Ambient temperature: Room temperature

Circuit


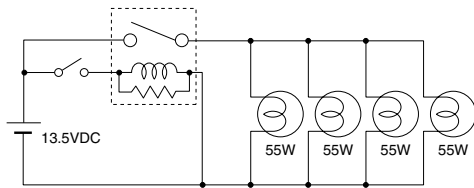
13.5VDC

**Change of pick-up and drop-out voltage**



Pick-up voltage
Max.
X̄
Min.

Drop-out voltage
Max.
X̄
Min.

No. of operations, × 10⁴

**Change of contact resistance**



Max.
X̄
Min.

No. of operations, × 10⁴

### Load current waveform

Up: Coil voltage waveform 10V 200ms    Down: Load current waveform 5A 200ms
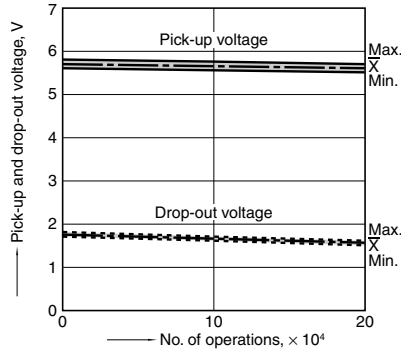


## 5-(2). Electrical life test (Lamp load)

Sample: ACV31212, 3pcs.
Load: 55W×4, inrush: 90A/steady: 20A, lamp actual load
Switching frequency: ON 1s, OFF 14s
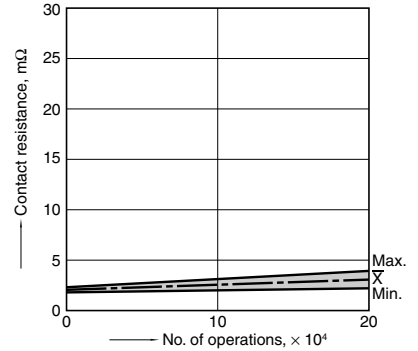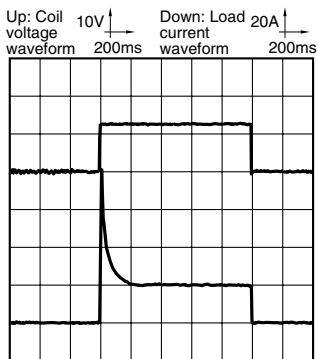Ambient temperature: Room temperature

Circuit



13.5VDC    55W  55W  55W  55W

**Change of pick-up and drop-out voltage**



Pick-up voltage
Max.
X̄
Min.

Drop-out voltage
Max.
X̄
Min.

No. of operations, × 10⁴

**Change of contact resistance**



Max.
X̄
Min.

No. of operations, × 10⁴

### Load current waveform

Inrush current: 90A, steady current: 20A

Up: Coil voltage waveform 10V 200ms    Down: Load current waveform 20A 200ms
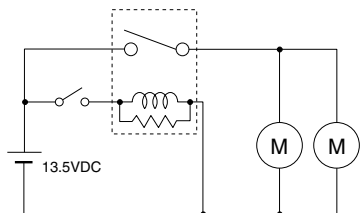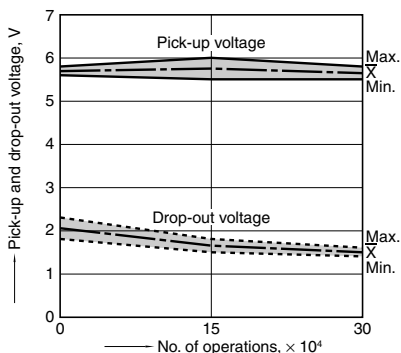
## 5-(3). Electrical life test (Motor load)

Sample: ACV31212, 3pcs.
Load: inrush: 80A/steady: 18A,
radiator fan actual load (motor free)
Switching frequency: ON 2s, OFF 6s
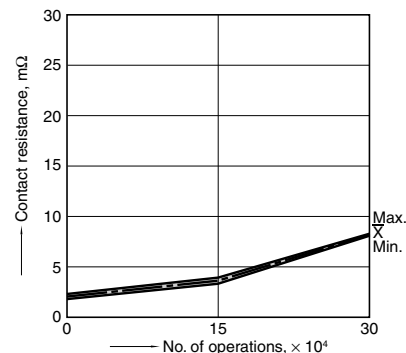Ambient temperature: Room temperature

### Circuit



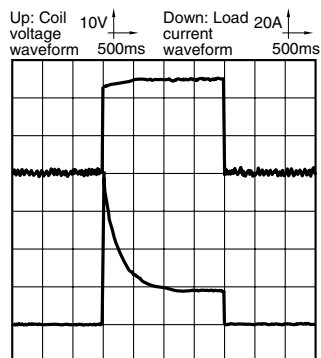13.5VDC    M  M

### Change of pick-up and drop-out voltage



Pick-up voltage

Drop-out voltage

No. of operations, × 10⁴

### Change of contact resistance



No. of operations, × 10⁴

### Load current waveform

Inrush current: 80A, steady current: 18A

Up: Coil voltage waveform   10V   500ms   Down: Load current waveform   20A   500ms



# DIMENSIONS (mm inch)

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

## 1. Micro ISO plug-in type

**CAD Data**



### External dimensions



15.7 .618

11 .433

4.8 .189

0.8 .031

*A

6.3 .248

0.8 .031

22.5 .886

15 .591

6 .236   8 .315   3.25 .128

9 .354

Sealed by epoxy resin

| Dimension: | Tolerance |
|---|---|
| Max. 1mm .039 inch: | ±0.1 ±.004 |
| 1 to 3mm .039 to .118 inch: | ±0.2 ±.008 |
| Min. 3mm .118 inch: | ±0.3 ±.012 |
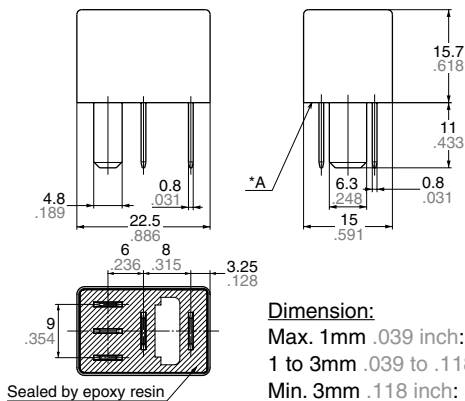
### Schematic (Bottom view)

#### 1 Form A



Including resistor type also available

#### 1 Form C



Including resistor type also available
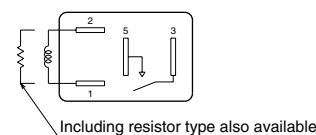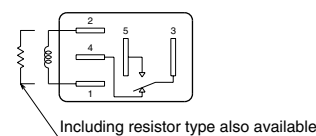
Note: Intervals between terminals is measured at A surface level.

# For Cautions for Use, see Relay Technical Information.