Panasonic
ideas for life

MICRO-ISO AUTOMOTIVE LOW PROFILE RELAY

CV-N RELAYS (ACVN)

Micro ISO 1 Form A type

RoHS compliant

FEATURES

- **Low profile automotive relays for Micro-ISO terminal**
- **Compact and high-capacity load switching**
- **Plastic sealed type**

TYPICAL APPLICATIONS

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

ORDERING INFORMATION

ACVN □ □ □ □

Contact arrangement
5: 1 Form A

Mounting classification
1: Plastic sealed Micro ISO plug-in type

Protective element
0: None
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	Plastic sealed type	Micro ISO plug-in type	ACVN51012

Note: Please use "ACVN∗∗2∗∗" to order with resistor inside 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. 0.5 V DC (Initial)	66.7 mA, 74.7 mA (with resistor)	180Ω, 160.7Ω (with resistor)	0.8 W, 0.9 W (with resistor)	10 to 16V DC

2. Specifications

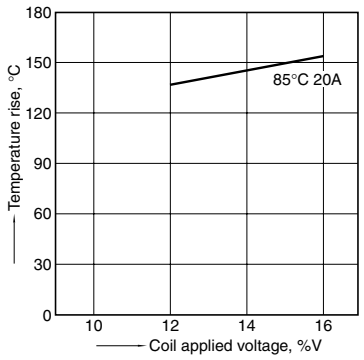
Characteristics	Item		Specifications
Contact	Arrangement		1 Form A
	Contact resistance (Initial)		Typ 3mΩ (By voltage drop 6V DC 1A)
	Contact voltage drop (Initial)		N.O.: Max. 0.5 V (By voltage drop 14 V DC 35 A)
	Contact material		Ag alloy (Cadmium free)
Rating	Nominal switching capacity (resistive load)		N.O.: 35 A 14V DC
	Max. carrying current (at 85°C 185°F, continuous)		N.O.: 20 A 14V DC
	Nominal operating power (at 20°C 68°F)		0.8 W, 0.9 W (with resistor inside type)
	Min. switching capacity (resistive load)*1 (at 20°C 68°F)		1 A 14V DC
Electrical characteristics	Insulation resistance (Initial)		Min. 20 MΩ (at 500V DC, Measurement at same location as “Breakdown voltage” section.)
	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) (at 20°C 68°F)		Max. 10ms (excluding contact bounce time) (Initial)
	Release time (at nominal voltage) (at 20°C 68°F)		Max. 10ms (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. 10^6 (at 120 cpm)
	Electrical		<Resistive load> Min. 10^5 (at nominal switching capacity, operating frequency: 2s ON, 2s OFF)
			<Motor load> Min. 3×10^5 (at 84 A (inrush), 18 A (steady), 14 V DC), Operating frequency: 2s ON, 5s OFF
			<Lamp load> Min. 2×10^5 (at 84 A (inrush), 12 A (steady), 14 V DC), Operating frequency: 1s ON, 14s OFF
Conditions	Conditions for operation, transport and storage*2		Ambient temperature: –40°C to +85°C –40°F to +185°F*3, Humidity: 5% R.H. to 85% R.H. (Not freezing and condensing at low temperature), air pressure: 86 to 106kPa
Mass			Approx. 12 g .42 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.

REFERENCE DATA

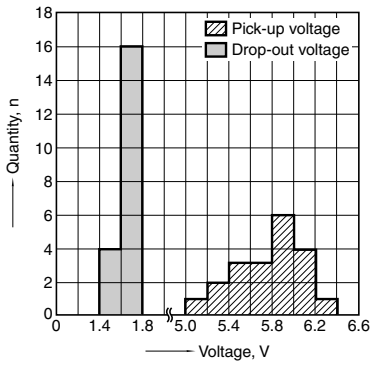
1. Coil temperature rise

Point measured: Inside the coil
Contact carrying current: 20A
Coil applied voltage: 12V, 14V, 16V
Ambient temperature: 85°C 185°F



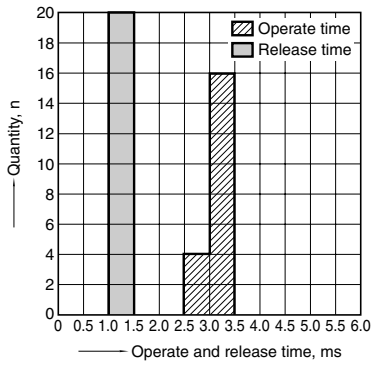
2. Distribution of pick-up and drop-out voltage

Sample: ACVN51012, 20pcs

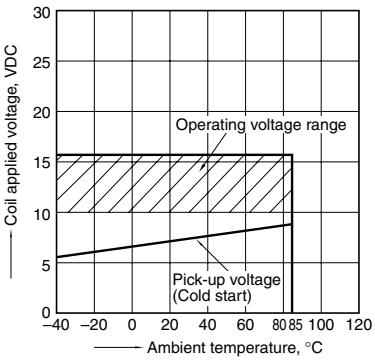


3. Distribution of operate and release time

Sample: ACVN51012, 20pcs.



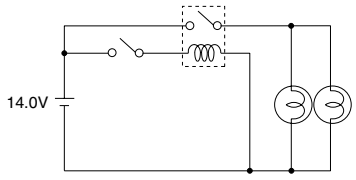
4. Ambient temperature and operating voltage range



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

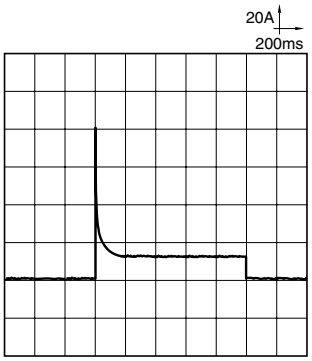
Sample: ACVN51012, 3pcs.
Load: 60W×2 (halogen lamp load), Inrush: 84A/ steady: 12A
Switching frequency: ON 1s, OFF 14s
Ambient temperature: 85°C 185°F

Circuit

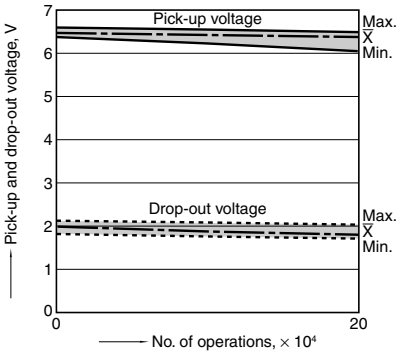


Load current waveform

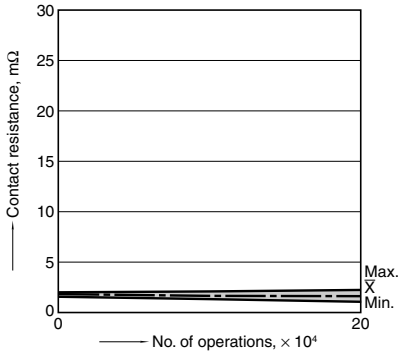
Inrush current: 84A, steady current: 12A



Change of pick-up and drop-out voltage

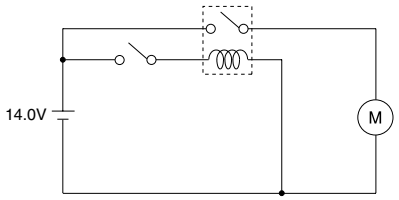


Change of contact resistance

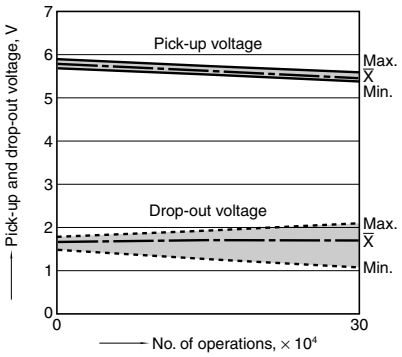


5.-(2) Electrical life test (Motor load)
Sample: ACVN51012, 3pcs.
Inrush: 80A/steady: 18A,
radiator fan motor (motor free)
Switching frequency: ON 1s, OFF 4s
Ambient temperature: 85°C 185°F

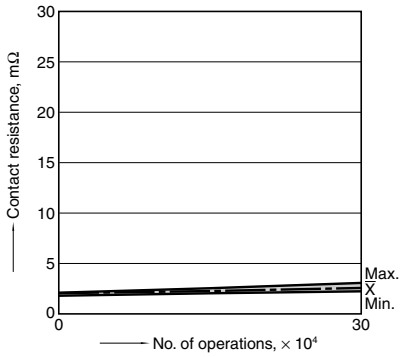
Circuit



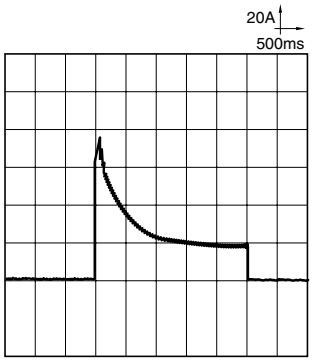
Change of pick-up and drop-out voltage



Change of contact resistance



Load current waveform
Inrush current: 80A, steady current: 18A



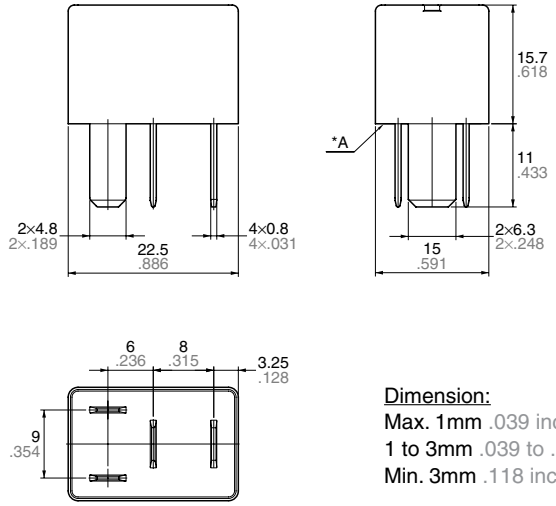
DIMENSIONS (mm inch)

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

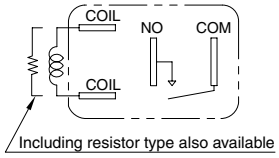
1. Micro ISO plug-in type

CAD Data

External dimensions



Schematic (Bottom view)



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

Note: Intervals between terminals is measured at A surface level.

For general cautions for use, please refer to the "CAUTIONS FOR USE OF AUTOMOTIVE RELAYS"