



**1 Form A 5A
slim power relay
complies with IEC61010
reinforced insulation**

PA-N RELAYS

New



RoHS compliant

Protective construction: Sealed type (RTIII)

FEATURES

- High density mounting**
5mm(W) × 20mm(L) × 12.5mm(H)
.197inch(W) × .787inch(L) × .492inch(H)
- Low operating power**
Nominal operating power: 110mW
- Complies with IEC61010 reinforced insulation standards**
- Long Insulation distance**
 - Clearance: 5.29mm .208inch
 - Creepage distance: 5.35mm .211inch (Between contact and coil)
 - 3,000 V breakdown voltage and 6,000V surge breakdown voltage
- Complies with Standard for Hazardous Location (ANSI/ISA 12.12.01)**

TYPICAL APPLICATIONS

- Output relays for programmable controllers and temperature controllers
- Industrial equipment, office equipment
- Measuring devices and test equipment

ORDERING INFORMATION

APAN 3 1

Contact arrangement

3: 1 Form A (Bifurcated)

Terminals and Nominal operating power

1: PC board terminal (110 mW)

Nominal coil voltage (DC)

03: 3V, 4H: 4.5V, 05: 5V, 06: 6V, 09: 9V, 12: 12V, 18: 18V, 24: 24V

Note: Certified by UL/C-UL and TÜV

TYPES

| Contact arrangement | Nominal coil voltage | Part No. |
|---------------------|----------------------|----------|
| 1 Form A | 3 V DC | APAN3103 |
| | 4.5 V DC | APAN314H |
| | 5 V DC | APAN3105 |
| | 6 V DC | APAN3106 |
| | 9 V DC | APAN3109 |
| | 12 V DC | APAN3112 |
| | 18 V DC | APAN3118 |
| | 24 V DC | APAN3124 |

Standard packing: Tube: 25 pcs.; Case: 1,000 pcs.

* Terminal sockets available.

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 | Max. applied voltage (at 20°C 68°F) |
|----------------------|--|---|---|---------------------------------------|-------------------------|-------------------------------------|
| 3 V DC | 70%V or less of nominal voltage* (Initial) | 5%V or more of nominal voltage* (Initial) | 36.7 mA | 82 Ω | 110mW | 120%V of nominal voltage |
| 4.5 V DC | | | 24.4 mA | 184 Ω | | |
| 5 V DC | | | 22.0 mA | 227 Ω | | |
| 6 V DC | | | 18.3 mA | 327 Ω | | |
| 9 V DC | | | 12.2 mA | 736 Ω | | |
| 12 V DC | | | 9.2 mA | 1,309 Ω | | |
| 18 V DC | | | 6.1 mA | 2,945 Ω | | |
| 24 V DC | | | 4.6 mA | 5,236 Ω | | |

Note: *Pulse drive (JIS C 5442)

2. Specifications

| Characteristics | Item | Specifications | |
|--|---|---|--|
| Contact | Arrangement | 1 Form A (Bifurcated) | |
| | Contact resistance (Initial) | Max. 30 mΩ (By voltage drop 6 V DC 1A) | |
| | Contact material | AgNi type + Au | |
| Rating | Nominal switching capacity (resistive load) | 5 A 250 V AC, 5 A 30 V DC | |
| | Max. switching power (resistive load) | 1,250 VA, 150 W | |
| | Max. switching voltage | 250 V (AC), 110 V (DC) (0.4 A) | |
| | Max. switching current | 5 A (AC, DC) | |
| | Nominal operating power | 110 mW | |
| | Min. switching capacity (Reference value)*1 | 1 mA 5 V DC | |
| Electrical characteristics | Insulation resistance (Initial) | Min. 1,000MΩ (at 500V DC) Measurement at same location as "Breakdown voltage" section. | |
| | Breakdown voltage (Initial) | Between open contacts | 1,000 Vrms for 1min. (Detection current: 10mA.) |
| | | Between contact and coil | 3,000 Vrms for 1min. (Detection current: 10mA.) |
| | Surge breakdown voltage (Initial) (Between contacts and coil)*2 | 6,000 V | |
| | Operate time (at nominal voltage) (at 20°C 68°F) (Initial) | Max. 10 ms (excluding contact bounce time) | |
| Release time (at nominal voltage) (at 20°C 68°F) (Initial) | Max. 5 ms (excluding contact bounce time and without diode) | | |
| Mechanical characteristics | Shock resistance | Functional | Min. 147 m/s ² (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.) |
| | | Destructive | Min. 980 m/s ² (Half-wave pulse of sine wave: 6 ms.) |
| | Vibration resistance | Functional | 10 to 55 Hz at double amplitude of 2.5 mm (Detection time: 10μs.) |
| | | Destructive | 10 to 55 Hz at double amplitude of 3.5 mm |
| Expected life | Mechanical | Min. 2×10 ⁷ (at 180 times/min.) | |
| | Electrical | Min. 10 ⁵ (3 A 250 V AC, 30 V DC, resistive load) Min. 5×10 ⁴ (5 A 250 V AC, 30 V DC, resistive load) (at 20 times/min.)*4 | |
| Conditions | Conditions for operation, transport and storage*3 | Ambient temperature: -40°C to 90°C -40°F to 194°F ; Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature) | |
| | Max. operating speed | 20 times/min. (at nominal switching capacity)*4 | |
| Unit weight | | Approx. 3 g .15 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.

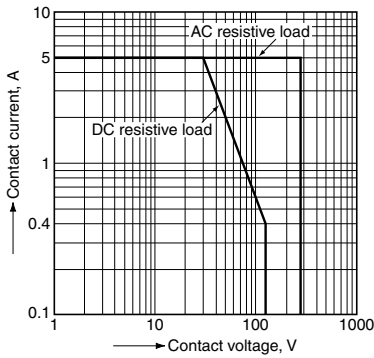
*2. Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981

*3. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.

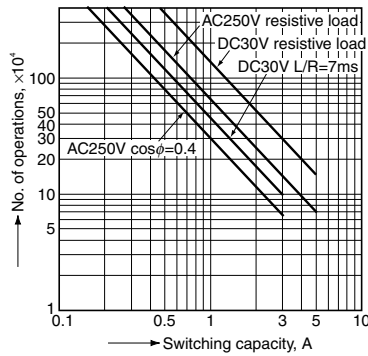
*4. Operating frequency of 5 A 250 V AC is 6 times/min. (ON : OFF = 1 s : 9 s)

REFERENCE DATA

1. Max. switching capacity

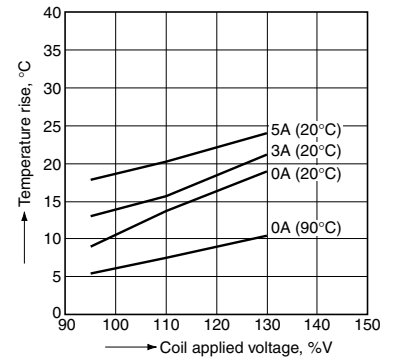


2. Life curve



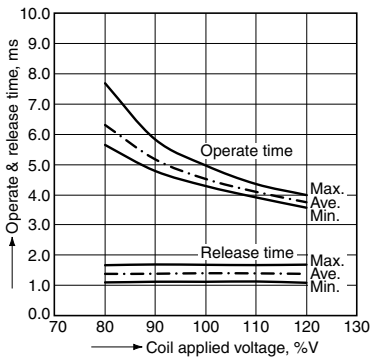
3. Coil temperature rise

Tested sample: APAN3124, 6 pcs.
Measured portion: Inside the coil
Ambient temperature: 20°C 68°F, 90°C 194°F (No contact current)



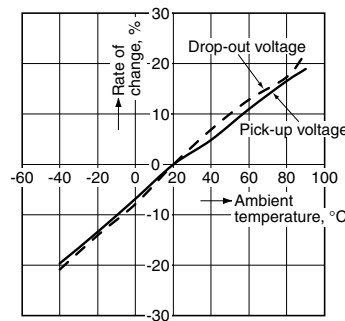
4. Operate & release time

Tested sample: APAN3124, 20 pcs.
Measured direction: Upright



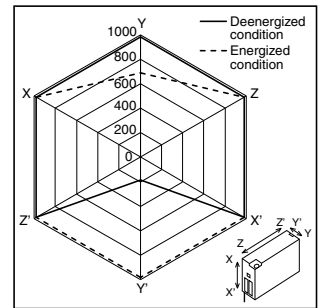
5. Ambient temperature characteristics

Tested sample: APAN3124, 6 pcs.



6. Malfunctional shock

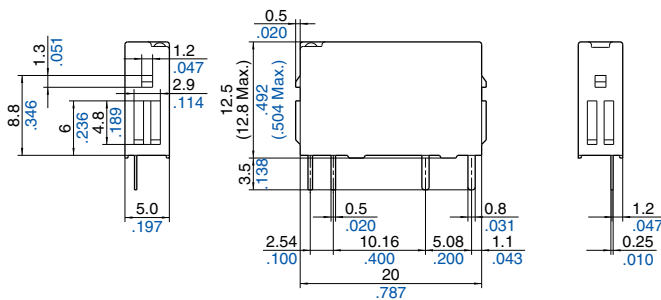
Tested sample: APAN3124, 6 pcs.



DIMENSIONS (mm inch)

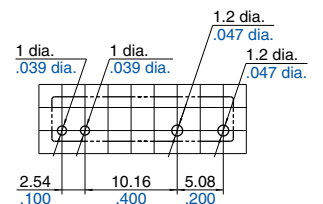
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

CAD Data



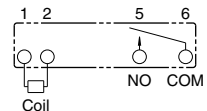
General tolerance: $\pm 0.3 \pm 0.12$

PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm 0.004$

Schematic (Bottom view)



SAFETY STANDARDS

| UL/C-UL (Recognized) | | | | TÜV (Certified) | | | |
|----------------------|---|------------|-------------------|------------------|-------------------------|------------|-------------------|
| File No. | Contact ratings | Temp. | Cycles | File No. | Contact ratings | Temp. | Cycles |
| E43149 | 5 A 250 V AC Resistive | 40°C 104°F | 5×10 ⁴ | B16 01 13461 348 | 5 A 250 V AC (cosφ=1.0) | 40°C 104°F | 5×10 ⁴ |
| | 5 A 250 V AC Resistive | 90°C 194°F | 10 ⁴ | | 5 A 250 V AC (cosφ=1.0) | 90°C 194°F | 10 ⁴ |
| | 5 A 30 V DC General use | 40°C 104°F | 5×10 ⁴ | | 5 A 30 V DC (0 ms) | 40°C 104°F | 5×10 ⁴ |
| | 5 A 30V DC, 3 A 250 V AC General use | 90°C 194°F | 10 ⁴ | | 5 A 30 V DC (0 ms) | 90°C 194°F | 10 ⁴ |
| | 3 A 250 V AC Resistive | 40°C 104°F | 10 ⁵ | | 3 A 250 V AC (cosφ=1.0) | 40°C 104°F | 10 ⁵ |
| | 3 A 30 V DC General use | 40°C 104°F | 10 ⁵ | | 3 A 30 V DC (0 ms) | 40°C 104°F | 10 ⁵ |
| | B300, R300 Pilot duty | 40°C 104°F | — | | | | |
| E479891 | Class I, Division 2, Groups A, B, C, D Hazardous Location (ANSI/ISA 12.12.01-2015, CAN/CSA C22.2 No.213-15) | | | | | | |

Insulation distance (between contact and coil)

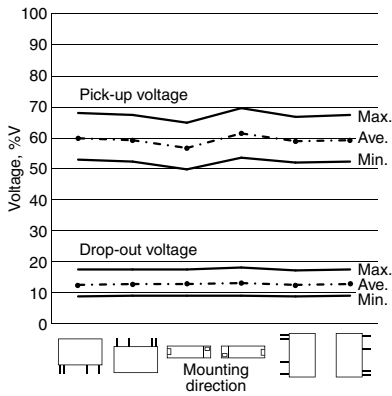
• UL/C-UL: Clearance distance: 5.29 mm **.208 inch**, Creepage distance: 5.35 mm **.211 inch**

• TÜV: Clearance distance: 5.29 mm **.208 inch**, Creepage distance: 5.35 mm **.211 inch**

NOTES

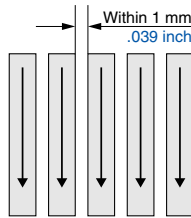
- For cautions for use, please read “GENERAL APPLICATION GUIDELINES”.
- If it includes ripple, the ripple factor should be less than 5%.
- Specification values for pick-up and drop-out voltages are for the relay mounting with its terminals below.

Tested sample: APAN3124, 6 pcs.
Ambient temperature: 20°C 68°F
Measured direction: 6 direction

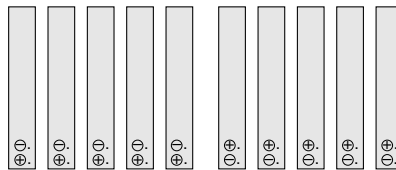


- When mounting the relays within 1 mm **.039 inch**, please notice the condition below.

- Mount the relays in the same direction.



- Coil terminals (Terminal No. 1 & 2) polarity should be arranged in the same direction.



Please contact

Panasonic Corporation

Electromechanical Control Business Division

■ 1006, Oaza Kadoma, Kadoma-shi, Osaka 571-8506, Japan
industrial.panasonic.com/ac/e/

Panasonic[®]

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