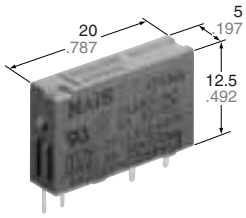
Panasonic
ideas for life

THE SLIM POWER RELAY

# PA RELAYS




mm inch

## FEATURES

- **Slim size (width 5 mm .197 inch, height 12.5 mm .492 inch) permits higher density mounting**
- **Wide switching capacity: Control from 100μA 100 mV to 5 A 250 V AC, 30 V DC**
- **High sensitivity: 120 mW (Nominal) (5 to 18 V DC type)**
- **High surge voltage (4000 V) and high breakdown voltage (2000 V)**
- **Shock & vibration resistance (functional): Min. 147m/s² {15 G}**
- **SIL (single in line) terminal layout**
- **Reinforced according to IEC1131-2 (TÜV)**

## SPECIFICATIONS (at 20°C 68°F)

### Contacts

| | | |
|---|---|---|
| Arrangement | | 1a |
| Contact material | | Gold-clad silver alloy |
| Initial contact resistance, max. (By voltage drop 6 V DC 1 A) | | 30 mΩ |
| Rating (resistive) | Nominal switching capacity | 5 A 250 V AC, 5 A 30 V DC |
| | Maximum switching power | 1250 VA, 150 W |
| | Maximum switching voltage | 250 V AC, 110 V DC |
| | Max. switching current | 5 A |
| | Min. switching capacity#1 | 100μA, 100 mV DC |
| Expected life (min. operations) | Mechanical | $2\times10^7$ |
| | Electrical (at 20 cpm) | 3 A 250 V AC, 3 A 30 V DC, $10^5$<br>5 A 250 V AC, 5 A 30 V DC, $5\times10^4$ |

### Coil (at 25°C 77°F, 50% R.H.)

| | | |
|---|---|---|
| Nominal operating power | 5 to 18 V DC | 120 mW |
| | 24 V DC | 180 mW |

#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.

**Remarks**

* Specifications will vary with foreign standards certification ratings.
*1 Measurement at same location as "Initial breakdown voltage" section
*2 Detection current: 10mA
*3 Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981
*4 Excluding contact bounce time
*5 Half-wave pulse of sine wave: 11ms; detection time: 10μs
*6 Half-wave pulse of sine wave: 6ms
*7 Detection time: 10μs
*8 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT

### Characteristics

| | | |
|---|---|---|
| Max. operating speed | | 20 cpm at rated load |
| Initial insulation resistance*1 | | Min. 1,000 MΩ at 500 V DC |
| Initial breakdown voltage*2 | Between open contacts | 1,000 Vrms |
| | Between contacts and coil | 2,000 Vrms |
| Surge voltage between contacts and coil*3 | | 4,000 V |
| Operate time*4 (at nominal voltage) | | Max. 10 ms |
| Release time (without diode)*4 (at nominal voltage) | | Max. 5 ms |
| Temperature rise | | Max. 45°C with nominal coil voltage across coil and at nominal switching capacity |
| Shock resistance | Functional*5 | Min. 147 m/s² {15 G} |
| | Destructive*6 | Min. 980 m/s² {100 G} |
| Vibration resistance | Functional*7 | Min. 147 m/s² {15 G}, 10 to 55 Hz at double amplitude of 2.5 mm |
| | Destructive | Min. 205.8 m/s² {21 G}, 10 to 55 Hz at double amplitude of 3.5 mm |
| Conditions for operation, transport and storage*8 (Not freezing and condensing at low temperature) | Ambient temp. | –40°C to +70°C –40°F to +158°F |
| | Humidity | 5 to 85%R.H. |
| Unit weight | | Approx. 3 g .15 oz |

## TYPICAL APPLICATIONS

- Interface relays for programmable controllers
- Output relays for measuring equipment, timers, counters and temperature controllers
- Industrial equipment, office equipment

## ORDERING INFORMATION

Ex. PA [1a] —— [12V]

| Contact arrangement | Coil voltage (DC) |
|---|---|
| 1a: 1 Form A | 5, 6, 9, 12, 18, 24V |

Note: Standard packing: Tube: 25 pcs.; Case: 1,000 pcs.
UL/CSA, TÜV approved type is standard.

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# TYPES AND COIL DATA (at 20°C 68°F)

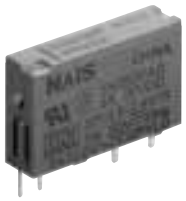
| Part No. | Nominal voltage, V DC | Pick-up voltage,* V DC (max.) | Drop-out voltage,* V DC (min.) | Nominal operating current, mA (±10%) | Nominal operating power, mW | Coil resistance, Ω (±10%) | Max. allowable voltage, V DC |
|---|---|---|---|---|---|---|---|
| PA1a-5V | 5 | 3.5 | 0.25 | 24 | 120 | 208 | 6 |
| PA1a-6V | 6 | 4.2 | 0.3 | 20 | 120 | 300 | 7.2 |
| PA1a-9V | 9 | 6.3 | 0.45 | 13.3 | 120 | 675 | 10.8 |
| PA1a-12V | 12 | 8.4 | 0.6 | 10 | 120 | 1,200 | 14.4 |
| PA1a-18V | 18 | 12.6 | 0.9 | 6.7 | 120 | 2,700 | 21.6 |
| PA1a-24V | 24 | 16.8 | 1.2 | 7.5 | 180 | 3,200 | 28.8 |

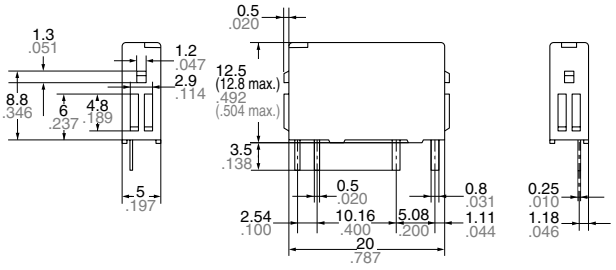
*1 Pulse driving

# DIMENSIONS

mm inch

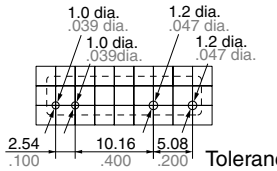
**1. PA relay**





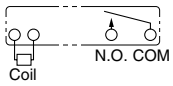

General tolerance: ±0.3 ±.012

PC board pattern (Copper-side view)




Tolerance: ±0.1 ±.004

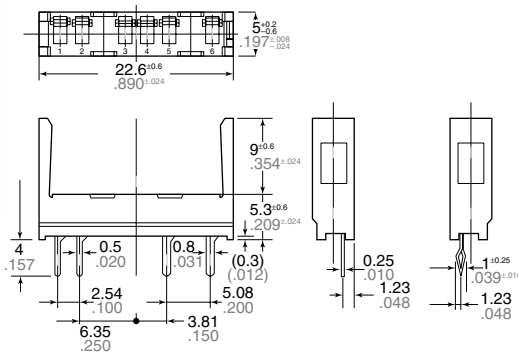
Schematic (Bottom view)




**2. Socket**

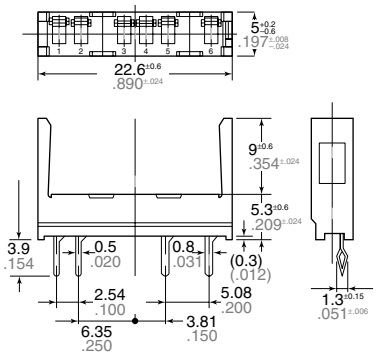
Standard type

PA1a-PS




PA1a-PS

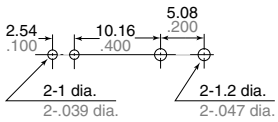
Self clinching type



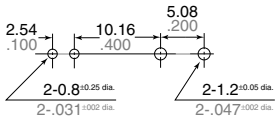

PA1a-PS-H

PC board pattern (Copper-side view)

Standard type



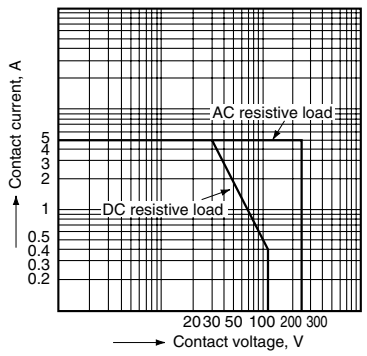

Self clinching type



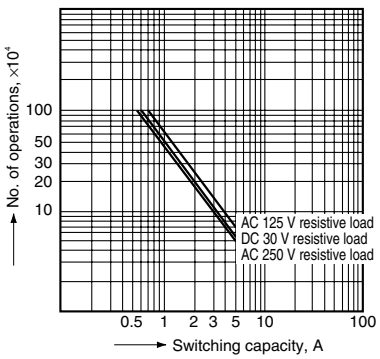

Tolerance: ±0.1 ±.004

# REFERENCE DATA

1. Max. switching capacity

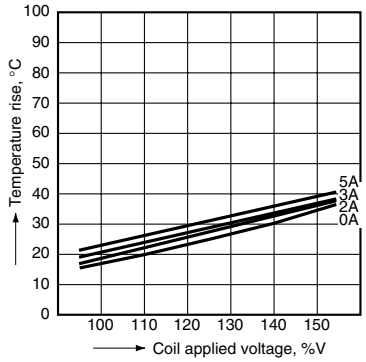



2. Life curve




3.-(1) Coil temperature rise (120 mW)

Sample: PA1a-12V
Ambient temperature: 20°C 68°F
Measured portion: Inside the coil

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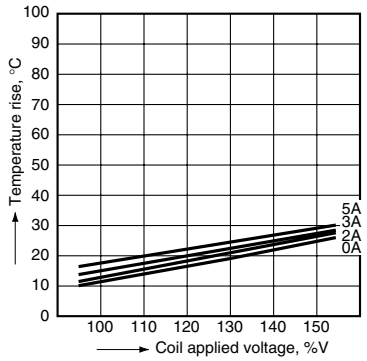
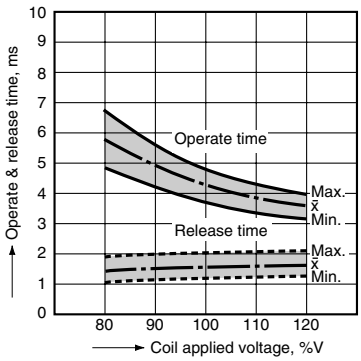
# PA

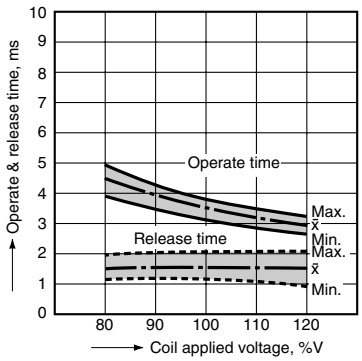
3.-(2) Coil temperature rise (180 mW)
Sample: PA1a-24V
Ambient temperature: 20°C 68°F
Measured portion: Inside the coil



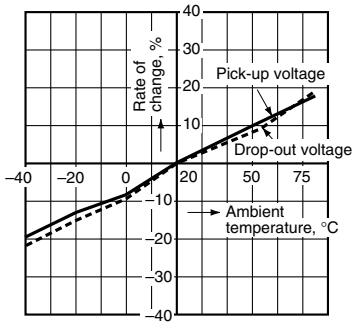

4.-(1) Operate & release time (120 mW)
Sample: PA1a-12V
No. of samples: n = 20



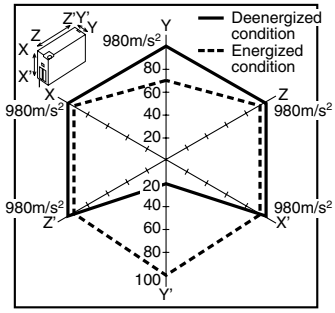

4.-(2) Operate & release time (180 mW)
Sample: PA1a-24V
No. of samples: n = 20




5. Ambient temperature characteristics
Sample: PA1a-12V
No. of samples: n = 6

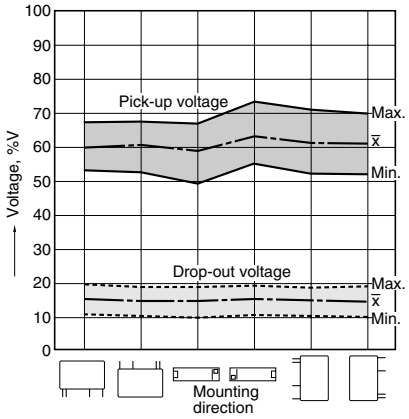



6. Malfunctional shock
Sample: PA1a-12V
No. of samples: n = 6

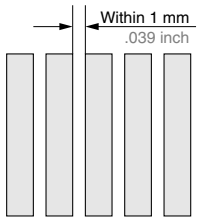



## NOTES

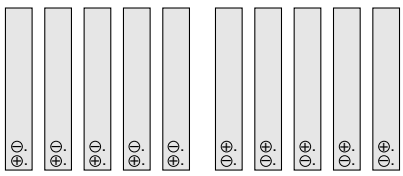
1. Specification values for pick-up and drop-out voltages are for the relay mounting with its terminals below.



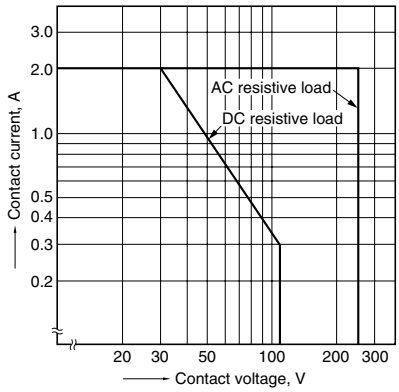

2. When mounting the relays within 1 mm .039 inch, please notice the condition below.
1) Mount the relays in the same direction.

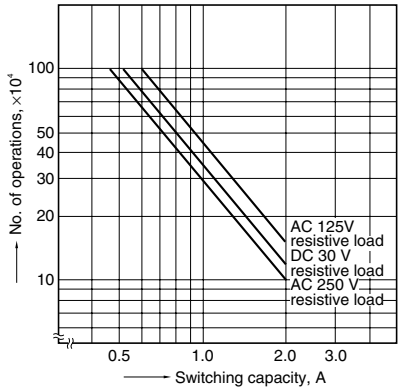



2) Coil terminals (Terminal No. 1 & 2) polarity should be arranged in the same direction.



3) Allowable contact current is 2 A.
4) About the electrical life for close mounting, please refer to data below.




**For Cautions for Use, see Relay Technical Information (Page 60).**

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