

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 100 μ A 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)
PAD type: 3.1 mm clearance
3.6 mm creepage distance

SPECIFICATIONS (at 20°C 68°F)

Contacts

Arrangement		1a
Contact material		Au-clad AgNi type
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	2×10 ⁷
	Electrical (at 20 cpm)	3 A 250 V AC, 3 A 30 V DC, 10 ⁵ 5 A 250 V AC, 5 A 30 V DC, 5×10 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 $\pm 1.2 \times 50 \mu$ s according to JEC-212-1981
- *⁴ Excluding contact bounce time
- *⁵ Half-wave pulse of sine wave: 11ms; detection time: 10 μ s
- *⁶ Half-wave pulse of sine wave: 6ms
- *⁷ Detection time: 10 μ s
- *⁸ Refer to 6. Conditions for operation, transport and storage mentioned in [AMBIENT ENVIRONMENT \(p. 19, Relay Technical Information\)](#).

Characteristics

Max. operating speed		20 cpm at rated load
Initial insulation resistance ^{*1}		Min. 1,000 M Ω 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/s ² {15 G}
	Destructive ^{*6}	Min. 980 m/s ² {100 G}
Vibration resistance	Functional ^{*7}	Min. 147 m/s ² {15 G}, 10 to 55 Hz at double amplitude of 2.5 mm
	Destructive	Min. 205.8 m/s ² {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(D) 1a — 12V

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

Notes: 1) The PAD type offers slightly higher clearance (3.1 mm) and creepage distance (3.6 mm).

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

TYPES AND COIL DATA (at 20°C 68°F)

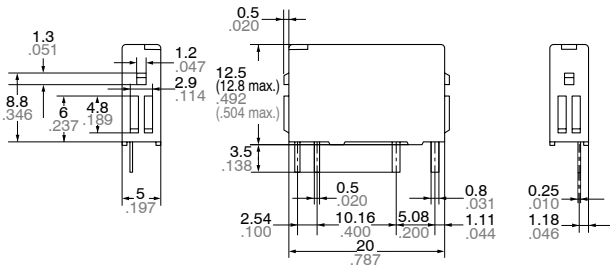
Part No.	Nominal voltage, V DC	Pick-up voltage,* V DC (max.)	Drop-out voltage,* V DC (min.)	Nominal operating current, mA (±10%) PA/PAD	Nominal operating power, mW PA/PAD	Coil resistance, Ω (±10%) PA/PAD	Max. allowable voltage, V DC
PA(D)1a-5V	5	3.5	0.25	24/36	120/180	208/139	6
PA(D)1a-6V	6	4.2	0.3	20/30	120/180	300/200	7.2
PA(D)1a-9V	9	6.3	0.45	13.3/20	120/180	675/450	10.8
PA(D)1a-12V	12	8.4	0.6	10/15	120/180	1,200/800	14.4
PA(D)1a-18V	18	12.6	0.9	6.7/10	120/180	2,700/1,800	21.6
PA(D)1a-24V	24	16.8	1.2	7.5/7.5	180/180	3,200/3,200	28.8

*1 Pulse driving

DIMENSIONS

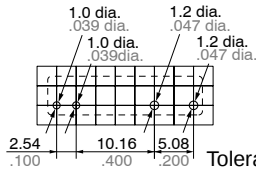
mm inch

1. PA relay



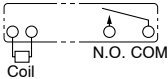
General tolerance: ±0.3 ±.012

PC board pattern (Copper-side view)



Tolerance: ±0.1 ±.004

Schematic (Bottom view)

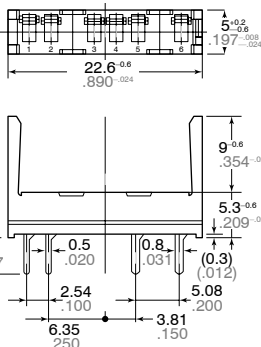


2. Socket

Standard type

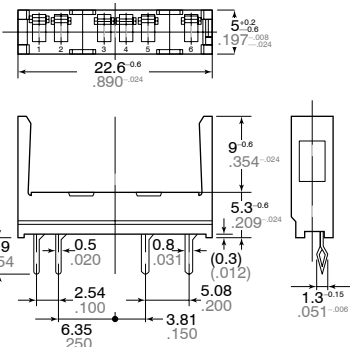


PA1a-PS



PA1a-PS

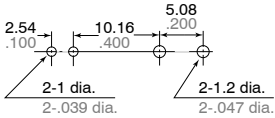
Self clinching type



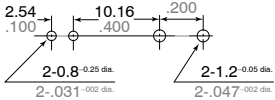
PA1a-PS-H

PC board pattern (Copper-side view)

Standard type



Self clinching type



Tolerance: ±0.1 ±.004

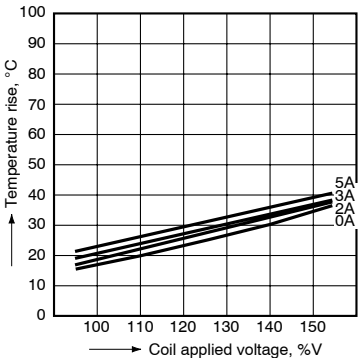
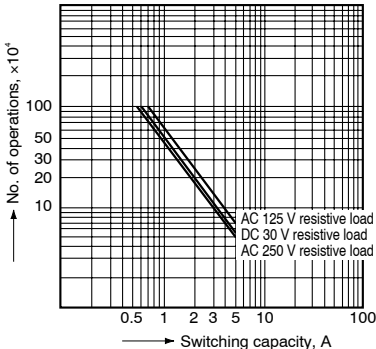
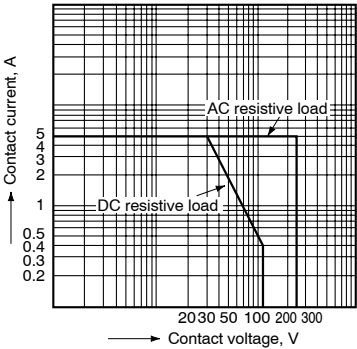
REFERENCE DATA

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

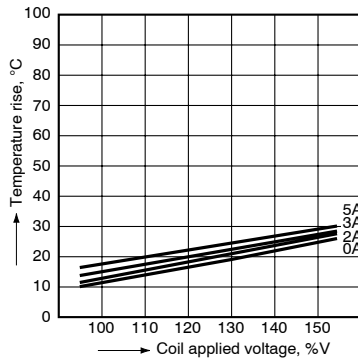


3.-(2) Coil temperature rise (180 mW)

Sample: PA1a-24V

Ambient temperature: 20°C 68°F

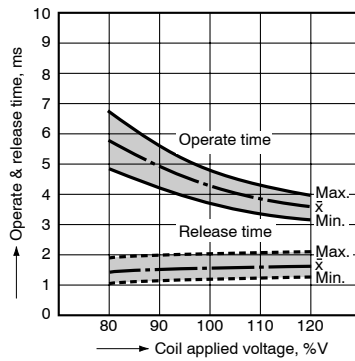
Measured portion: Inside the coil



4.-(1) Operate & release time (120 mW)

Sample: PA1a-12V

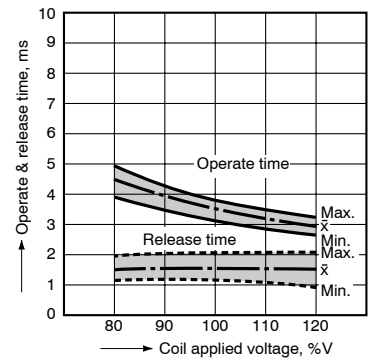
No. of samples: n = 20



4.-(2) Operate & release time (180 mW)

Sample: PA1a-24V

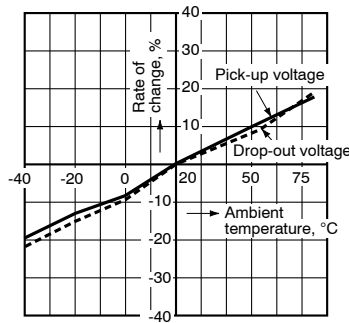
No. of samples: n = 20



5. Ambient temperature characteristics

Sample: PA1a-12V

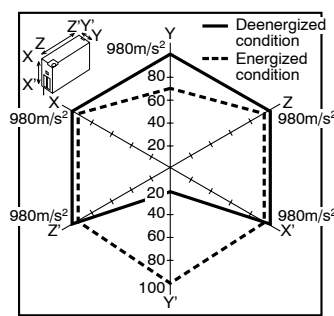
No. of samples: n = 6



6. Malfunctional shock

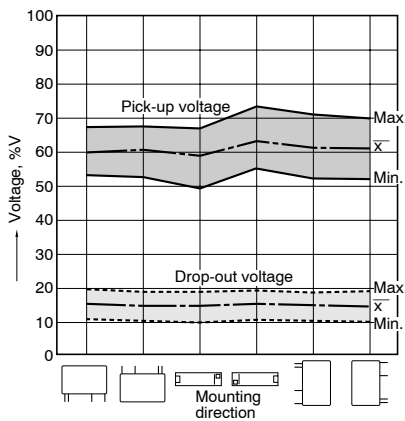
Sample: PA1a-12V

No. of samples: n = 6



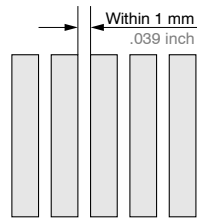
NOTES

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

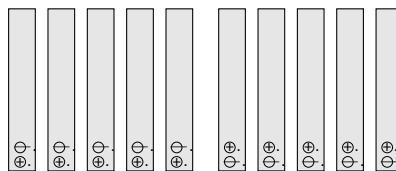


2. When mounting the relays within 1 mm .039 inch, please notice the condition below.

1) Mount the relays in the same direction.

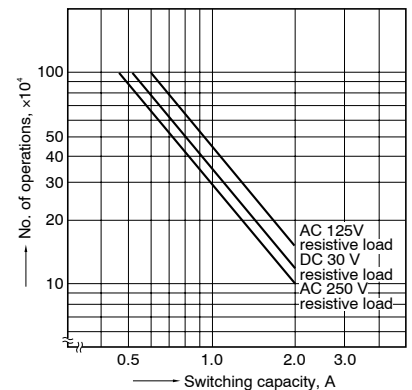
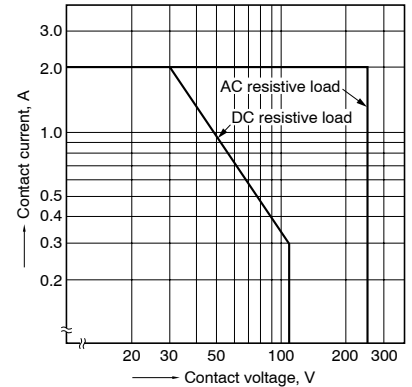


2) Coil terminals (Terminal No. 1 & 2) polarity should be arranged in the same direction.



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](#).