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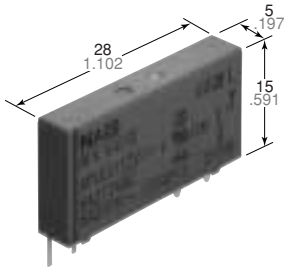
Panasonic
ideas for life

THE SLIM POWER RELAY

PE RELAYS (APE)



FEATURES

- **Slim size**
  28 mm (L)×5 mm (W)×15 mm (H)
  1.102 inch (L)×.197 inch (W)×.591 inch (H)
  permits high density mounting
- **Wide switching capacity:**
  100 mA/12 V DC-6A/250 V AC
- **High sensitivity: 170mW**
- **High breakdown (4,000 V) and surge (6,000 V) voltage between contacts and coil**
- **Clearance/creepage distance: 8/8 mm**
- **1 Form A/1 Form C contact.**

Insulation complying to following standards:
EN 60255 General specification for electrical relays
EN 60335 For use in house-hold appliances
EN 60730 For use in temperature sensing appliances
EN 60950 For use in electrical business equipment
EN 60065 For use in entertainment electronics (radio, HiFi-sets)
EN 50178 For use in industrial range

SPECIFICATIONS

Contacts

Arrangement		1 Form A, 1 Form C	
Contact material		Silver alloy	Au-plated silver alloy
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)		100 mΩ	30 mΩ
Rating (resistive)	Nominal switching capacity	6 A 250 V AC	
	Maximum switching power	1,500 VA	
	Maximum switching voltage	250V AC	
	Max. switching current	6 A (AC)	
	Min. switching capacity#1	100 mA, 5 V DC	1 mA, 1 V DC
Expected life (min. operations)	Mechanical (at 180 cpm)	5×10^6	
	Electrical (at 6 cpm) (at rated load)	N.O.: 5×10^4 N.C.: 3×10^4	

Coil (at 25°C 77°F, 50% R.H.)

Nominal operating power	170 mW (4.5 to 24 V DC) 217 mW (48 V DC)

#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 "Intial 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: 50ms; detection time: 10μs
*6 Half-wave pulse of sine wave: 11ms
*7 Detection time: 10μs
*8 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT

Characteristics

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	4,000 Vrms
Surge voltage between contacts and coil*3		Min. 6,000 V (Initial)
Operate time*4 (at nominal voltage)		Max. 8 ms (approx. 5 ms)
Release time (without diode)*4 (at nominal voltage)		Max. 4 ms (approx. 2.5 ms)
Temperature rise		Max. 30°C with nominal coil voltage across coil and at nominal switching capacity
Shock resistance	Functional*5	1 Form C: Min. 49 m/s²{5 G} 1 Form A: Min. 98 m/s²{10 G}
	Destructive*6	Min. 980 m/s² {100 G}
Vibration resistance	Functional*7	10 to 55 Hz at double amplitude of 1.0 mm/6 G
	Destructive	10 to 55 Hz at double amplitude of 1.5 mm/9 G
Conditions for operation, transport and storage*8 (Not freezing and condensing at low temperature)	Ambient temp.	–40°C to +85°C –40°F to +185°F
	Humidity	5 to 85%R.H.
Unit weight		Approx. 4 g .14 oz

TYPICAL APPLICATIONS

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

ORDERING INFORMATION

Ex. APE □ 0 □ □□

Contact arrangement	Contact type	Contact material	Coil voltage (DC)
1: 1 Form A 3: 1 Form C	0: Single contact	0: Silver alloy 1: Au-plated silver alloy	4H: 4.5 V 18: 18 V 06: 6 V 24: 24 V 12: 12 V 48: 48 V

(Notes) 1. Standard packing: Tube: 20 pcs.; Case: 1,000 pcs.
2. 5 V, 60 V type is also available.

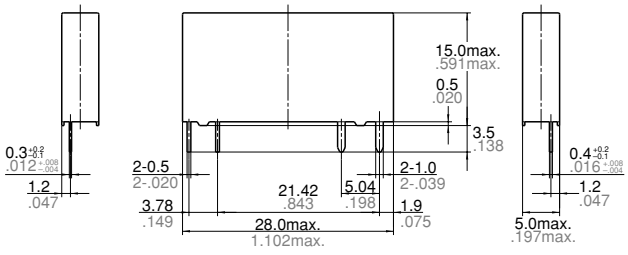
TYPES AND COIL DATA (at 20°C 68°F)

Part No.	Contact arrangement	Nominal voltage, V DC	Pick-up voltage, (Initial) V DC (max.)	Drop-out voltage, (Initial) V DC (min.)	Nominal operating current, mA (±10%)	Nominal operating power, mW	Coil resistance, Ω (±10%)	Max. allowable voltage, V DC
APE1004H	1 Form A (without Au-plated)	4.5	2.97	0.225	38	170	119	5.4
APE10006		6	3.96	0.3	28		212	7.2
APE10012		12	7.92	0.6	14		847	14.4
APE10018		18	11.88	0.9	9		1,906	21.6
APE10024		24	15.84	1.2	7		3,388	28.8
APE10048		48	31.68	2.4	5	217	10,618	57.6
APE1014H	1 Form A (with Au-plated)	4.5	2.97	0.225	38	170	119	5.4
APE10106		6	3.96	0.3	28		212	7.2
APE10112		12	7.92	0.6	14		847	14.4
APE10118		18	11.88	0.9	9		1,906	21.6
APE10124		24	15.84	1.2	7		3,388	28.8
APE10148		48	31.68	2.4	5	217	10,618	57.6
APE3004H	1 Form C (without Au-plated)	4.5	2.97	0.225	38	170	119	5.4
APE30006		6	3.96	0.3	28		212	7.2
APE30012		12	7.92	0.6	14		847	14.4
APE30018		18	11.88	0.9	9		1,906	21.6
APE30024		24	15.84	1.2	7		3,388	28.8
APE30048		48	31.68	2.4	5	217	10,618	57.6
APE3014H	1 Form C (with Au-plated)	4.5	2.97	0.225	38	170	119	5.4
APE30106		6	3.96	0.3	28		212	7.2
APE30112		12	7.92	0.6	14		847	14.4
APE30118		18	11.88	0.9	9		1,906	21.6
APE30124		24	15.84	1.2	7		3,388	28.8
APE30148		48	31.68	2.4	5	217	10,618	57.6

DIMENSIONS

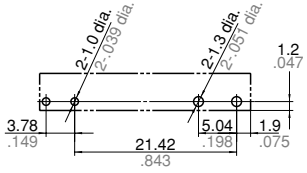
mm inch

1. 1 Form A type



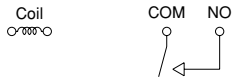
General tolerance: ±0.3 ±.012

PC board pattern (Bottom view)

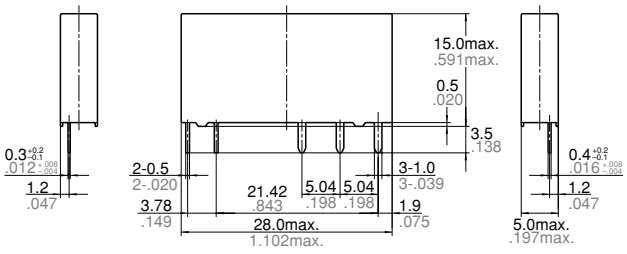


Tolerance: ±0.1 ±.004

Schematic (Bottom view)

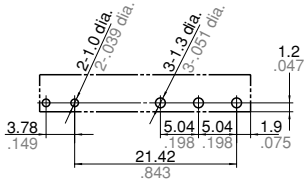


2. 1 Form C type



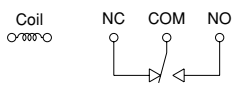
General tolerance: ±0.3 ±.012

PC board pattern (Bottom view)



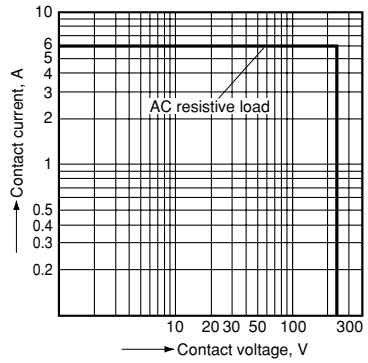
Tolerance: ±0.1 ±.004

Schematic (Bottom view)



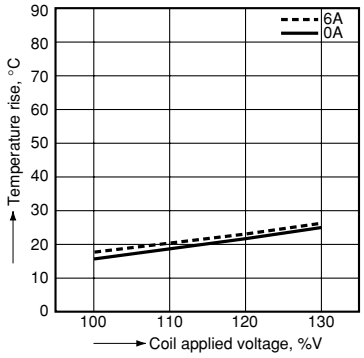
REFERENCE DATA

1. Max. switching capacity



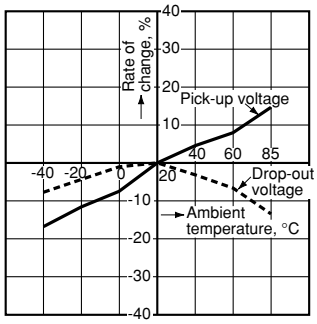
2. Coil temperature rise

Sample: APE30012
Measured portion: Inside the coil
Ambient temperature: 28°C 82°F



3. Ambient temperature characteristics

Sample: APE30012
No. of samples: n = 6



NOTES

Rating

Standard	File No.	Rating
UL	E43149	6 A 277 V AC
VDE	122402ÜG	6 A 250 V AC ($\cos\phi$ = 1) 1 A 250 V AC ($\cos\phi$ = 0.4)
SEV	CH-99.1 10483.2A1	6 A 250 V AC ($\cos\phi$ = 1)

For Cautions for Use, see Relay Technical Information