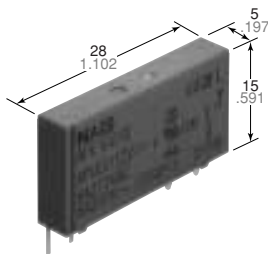


# Panasonic

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)
Expected life (min. operations)	Mechanical (at 180 cpm)	5×10 <sup>6</sup>
	Electrical (at 6 cpm) (at rated load)	N.O.: 5×10 <sup>4</sup> N.C.: 3×10 <sup>4</sup>

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

#### Characteristics

Initial insulation resistance* <sup>1</sup>		Min. 1,000 MΩ at 500 V DC
Initial breakdown voltage* <sup>2</sup>	Between open contacts	1,000 Vrms
	Between contacts and coil	4,000 Vrms
Surge voltage between contacts and coil* <sup>3</sup>		Min. 6,000 V (Initial)
Operate time* <sup>4</sup> (at nominal voltage)		Max. 8 ms (approx. 5 ms)
Release time (without diode)* <sup>4</sup> (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* <sup>5</sup>	1 Form C: Min. 49 m/s <sup>2</sup> {5 G} 1 Form A: Min. 98 m/s <sup>2</sup> {10 G}
	Destructive* <sup>6</sup>	Min. 980 m/s <sup>2</sup> {100 G}
Vibration resistance	Functional* <sup>7</sup>	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* <sup>8</sup> (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.

# PE (APE)

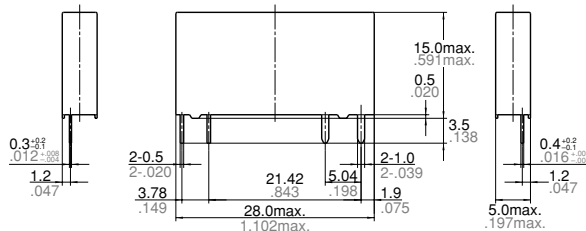
## TYPES AND COIL DATA (at 20°C 68°F)

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		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		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		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		10,618	57.6

## DIMENSIONS

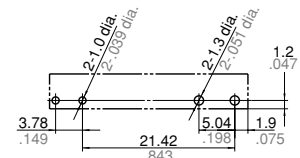
mm inch

### 1. 1 Form A type



General tolerance: ±0.3 ±.012

PC board pattern (Bottom view)

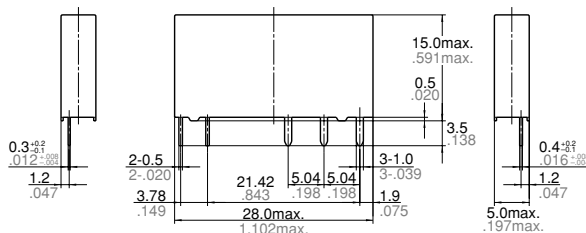


Tolerance: ±0.1 ±.004

Schematic (Bottom view)

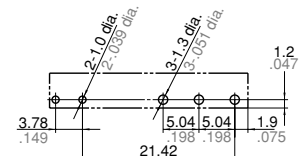


### 2. 1 Form C type



General tolerance: ±0.3 ±.012

PC board pattern (Bottom view)



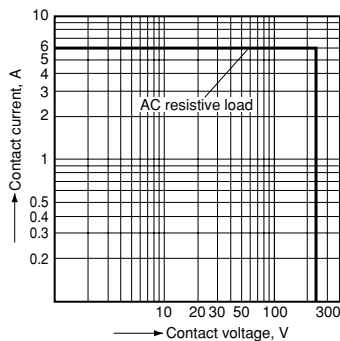
Tolerance: ±0.1 ±.004

Schematic (Bottom view)



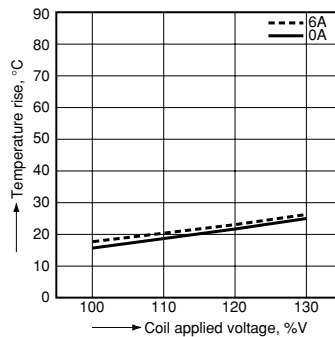
## REFERENCE DATA

### 1. Max. switching capacity



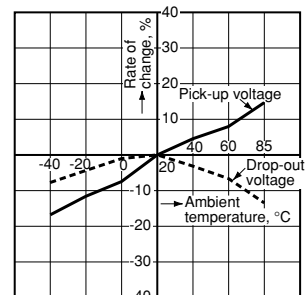
### 2. Coil temperature rise

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**