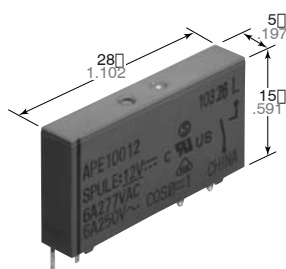


Panasonic
ideas for life

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

Notes / Rating

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

SPECIFICATIONS

Contacts

Arrangement	1 Form A, 1 Form C	
Contact material	AgSnO ₂ type	Au-plated AgNi type
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) 175 mW (60 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.
- *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: 50ms; detection time: 10μs
- *⁶ Half-wave pulse of sine wave: 11ms

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/s ² {5 G} 1 Form A: Min. 98 m/s ² {10 G}
	Destructive ^{*6}	Min. 980 m/s ² {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

*⁷ Detection time: 10μs

*⁸ Refer to 6. Conditions for operation, transport and storage mentioned in [AMBIENT ENVIRONMENT \(p. 19, Relay Technical Information\)](#).

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 1 0 1 4H

Contact arrangement	Contact type	Contact material	Coil voltage, V 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 05: 5 V 24: 24 V 06: 6 V 48: 48 V 12: 12V 60: 60 V

Notes: 1. Standard packing: Tube: 20 pcs.; Case: 1,000 pcs.
2. 1 Form B is also available.

PE (APE)

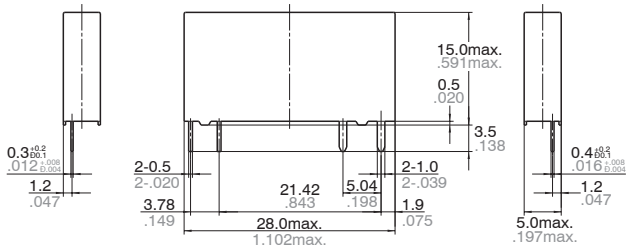
TYPES AND COIL DATA (at 20°C 68°F)

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
APE10005		5	3.3	0.25	34		148	6
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
APE10060		60	39.6	3	3	175	20,572	72
APE1014H	1 Form A (with Au-plated)	4.5	2.97	0.225	38	170	119	5.4
APE10105		5	3.3	0.25	34		148	6
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
APE10160		60	39.6	3	3	175	20,572	72
APE3004H	1 Form C (without Au-plated)	4.5	2.97	0.225	38	170	119	5.4
APE30005		5	3.3	0.25	34		148	6
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
APE30060		60	39.6	3	3	175	20,572	72
APE3014H	1 Form C (with Au-plated)	4.5	2.97	0.225	38	170	119	5.4
APE30105		5	3.3	0.25	34		148	6
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
APE30160		60	39.6	3	3	175	20,570	72

DIMENSIONS

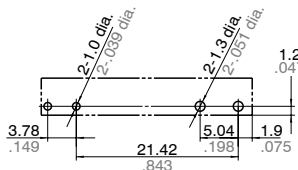
mm inch

1. 1 Form A type



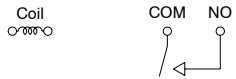
General tolerance: ±0.3 ±.012

PC board pattern (Bottom view)

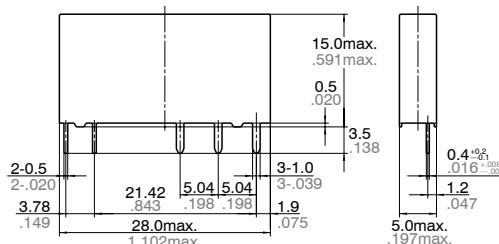
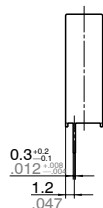


Tolerance: ±0.1 ±.004

Schematic (Bottom view)

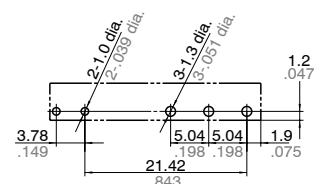


2. 1 Form C type



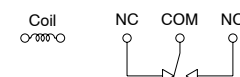
General tolerance: $\pm 0.3 \pm 0.12$

PC board pattern (Bottom view)



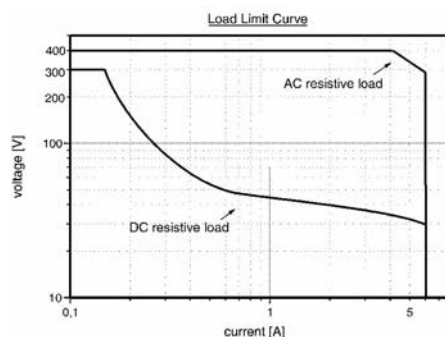
Tolerance: $\pm 0.1 \pm 0.04$

Schematic (Bottom view)



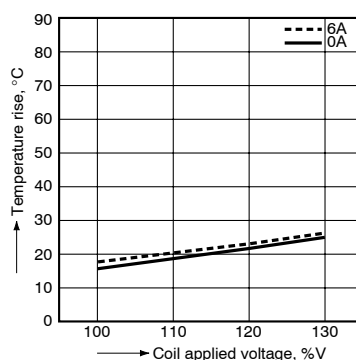
REFERENCE DATA

1. Max. switching capacity



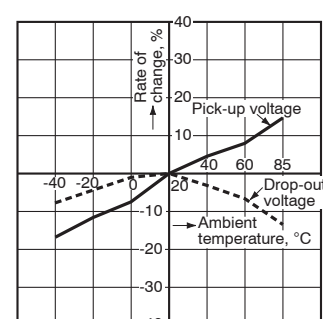
2. Coil temperature rise

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



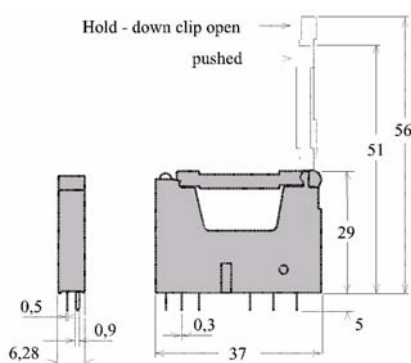
3. Ambient temperature characteristics

Sample: APE30012
No. of samples: n = 6

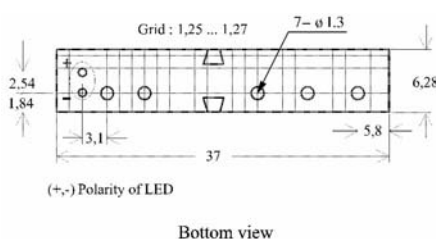


PE RELAY SOCKET

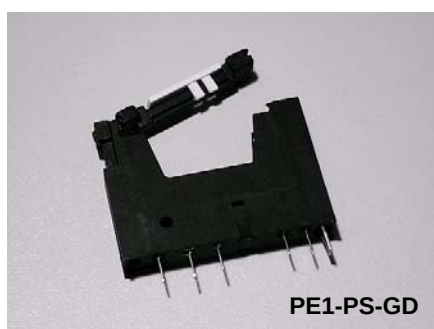
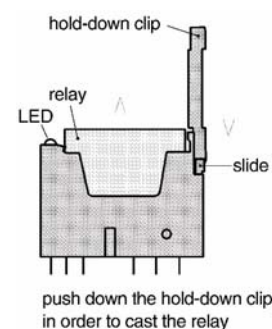
1. Dimensions



2. Pin Layout



3. Handling



Specifications

LED		Pins rating
nominal voltage	24 V DC	see above
nominal current	appr. 4.2 mA	
diameter	3 mm	
colour	green*	

*other LED-colours on request

Socket incorporates LED-indication, hold-down clip and an integrated casting mechanism; PCB-mounting.

For Cautions for Use, see [Relay Technical Information](#).