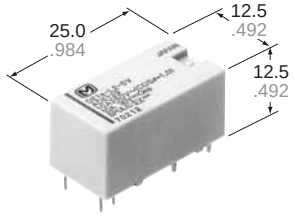
Panasonic
ideas for life

COMPACT HIGH-INSULATION POLARIZED POWER RELAY

DE RELAYS (ADE)



mm inch

FEATURES

- **Conforms to European safety standards (VDE0700 and VDE0631)**
  Insulating distance between coil and contacts:
  Clearance Min. 8mm .315 inch
  Creepage distance Min. 8mm .315 inch
- **Extensive product line-up**
- **Surge voltage between contact and coil 12 kV**
- **Low operating power**
  Nominal operating power at 200 mW (Single side stable, 2 coil latching)
- **Compact body saves space**
  Size: 12.5(W) × 25.0(L) × 12.5(H) mm
  .492(W) × .984(L) × .492(H) inch
- **UL/CSA, VDE approved**

SPECIFICATIONS

Contact

Arrangement		1 Form A	1 Form A 1 Form B	2 Form A
Contact material		$AgSnO_2$ type		
Initial contact resistance, max. (By voltage drop 6V DC 1A)		30mΩ		
Rating (resistive load)	Nominal switching capacity	10A 250V AC, 10A 30V DC	8A 250V AC, 8A 30V DC	8A 250V AC, 8A 30V DC
	Max. switching power	2,500 VA*, 300W	2,000 VA*, 240W	2,000 VA*, 240W
	Max. switching voltage	440V AC, 230V DC	440V AC, 230V DC	440V AC, 230V DC
	Max. switching current	10A (16A)*	8A (16A)*	8A (16A)*
	Min. switching capacity#1	100 mA, 5 V DC		
Expected life (min. operations)	Mechanical (at 300cpm)	10^7		
	Electrical (at 20 cpm) (resistive load)	10^5	10^5(AC) 5×10^4(DC)	
	Electrical (16A / 230 V AC resistive)*	25000	20000	

Coil (at 20°C, 68°F)

	Nominal operating power
Single side stable	200 mW
1 coil latching	100 mW
2 coil latching	200 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.

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 contact sets	4,000 Vrms (2 Form A, 1 Form A 1 Form B)
	Between contact and coil	5,000 Vrms
Surge voltage between contact and coil*3		Min. 12,000 V (initial)
Operate time [Set time]*4		Max. 10ms (typ. 5ms) [Max. 10ms (typ. 4ms)] (at 20°C 68°F)
Release time (without diode) [Reset time]*4		Max. 5ms (typ. 2ms) [Max. 10ms (typ. 4ms)] (at 20°C 68°F)
Temperature rise (at 70°C)*5		Max. 50°C
Shock resistance	Functional*6	Min. 196 m/s²{20 G}
	Destructive*7	Min. 980 m/s²{100 G}
Vibration resistance	Functional*8	10 to 55 Hz at double amplitude of 2 mm
	Destructive	10 to 55 Hz at double amplitude of 3 mm
Conditions for operation, transport and storage*9 (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. 7 g .25 oz

Remarks

* 16A possible for one contact set only with max. 4000 VA switching power.
*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 Nominal operating voltage applied to the coil, excluding contact bounce time.
*5 By resistive method
*6 Half-wave pulse of sine wave: 11ms, detection time: 10ms.
*7 Half-wave pulse of sine wave: 6ms
*8 Detection time: 10ms
*9 Refer to "6. Usage, Storage and Transport Conditions" in AMBIENT ENVIRONMENT section in Relay Technical Information.

TYPICAL APPLICATIONS

- **Temperature controller**
- **Automatic meter reading**
- **OA equipment**
- **FA equipment**

ORDERING INFORMATION

Ex. DE — 1a — L — 3 V

Product name	Contact arrangement	Operating function	Coil voltage, V DC
DE	1a: 1 Form A 1a1b: 1 Form A 1 Form B 2a: 2 Form A	Nil: Single side stable L: 1 coil latching L2: 2 coil latching	1.5, 3, 4.5, 5, 6, 9, 12, 24, 48**

Notes: 1) Standard packing; Carton (tube package) 20 pcs. Case 500 pcs.

2) UL/CSA, VDE approved type is standard.

**just for single side stable

TYPES AND COIL DATA (at 20°C 68°F)

• Single side stable type

1 Form A, 1 Form A 1 Form B, 2 Form A

Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.) (initial)	Drop-out voltage, V DC (min.) (initial)	Coil resistance, Ω (±10%)	Nominal operating current, mA (±10%)	Nominal operating power, mW	Max. allowable voltage, V DC
DE❑-1.5V	1.5	1.05	0.15	11.3	132.7	200	1.95
DE❑-3V	3	2.1	0.3	45	66.6	200	3.9
DE❑-4.5V	4.5	3.15	0.45	101	44.5	200	5.85
DE❑-5V	5	3.5	0.5	125	40	200	6.5
DE❑-6V	6	4.2	0.6	180	33.3	200	7.8
DE❑-9V	9	6.3	0.9	405	22.2	200	11.7
DE❑-12V	12	8.4	1.2	720	16.6	200	15.6
DE❑-24V	24	16.8	2.4	2,880	8.3	200	31.2
DE❑-48V	48	33.6	4.8	11,520	4.2	200	62.4

• 1 coil latching type

1 Form A

Part No.	Nominal voltage, V DC	Set voltage, V DC (max.) (initial)	Reset voltage, V DC (min.) (initial)	Coil resistance, Ω (±10%)	Nominal operating current, mA (±10%)	Nominal operating power, mW	Max. allowable voltage, V DC
DE❑-L-1.5V	1.5	1.05	1.05	22.5	66.6	100	1.95
DE❑-L-3V	3	2.1	2.1	90	33.3	100	3.9
DE❑-L-4.5V	4.5	3.15	3.15	202	22.3	100	5.85
DE❑-L-5V	5	3.5	3.5	250	20	100	6.5
DE❑-L-6V	6	4.2	4.2	360	16.7	100	7.8
DE❑-L-9V	9	6.3	6.3	812	11.1	100	11.7
DE❑-L-12V	12	8.4	8.4	1,440	8.3	100	15.6
DE❑-L-24V	24	16.8	16.8	5,760	4.2	100	31.2

• 2 coil latching type

1 Form A

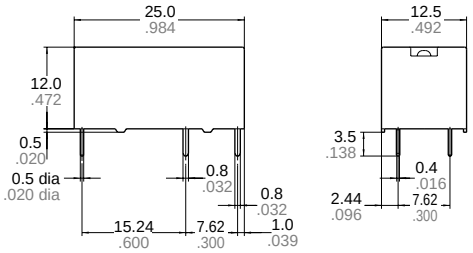
Part No.	Nominal voltage, V DC	Set voltage, V DC (max.) (initial)	Reset voltage, V DC (min.) (initial)	Coil resistance, Ω (±10%)		Nominal operating current, mA (±10%)		Nominal operating power, mW		Max. allowable voltage, V DC
				Set coil	Reset coil	Set coil	Reset coil	Set coil	Reset coil	
DE❑-L2-1.5V	1.5	1.05	1.05	11.3	11.3	66.6	66.6	200	200	1.95
DE❑-L2-3V	3	2.1	2.1	45	45	66.6	66.6	200	200	3.9
DE❑-L2-4.5V	4.5	3.15	3.15	101	101	44.5	44.5	200	200	5.85
DE❑-L2-5V	5	3.5	3.5	125	125	40	40	200	200	6.5
DE❑-L2-6V	6	4.2	4.2	180	180	33.3	33.3	200	200	7.8
DE❑-L2-9V	9	6.3	6.3	405	405	22.2	22.2	200	200	11.7
DE❑-L2-12V	12	8.4	8.4	720	720	16.6	16.6	200	200	15.6
DE❑-L2-24V	24	16.8	16.8	2,880	2,880	8.3	8.3	200	200	31.2

Note: Insert contact arrangement, e.g.1a, 1a1b, 2a, in ❑ for contact form required.

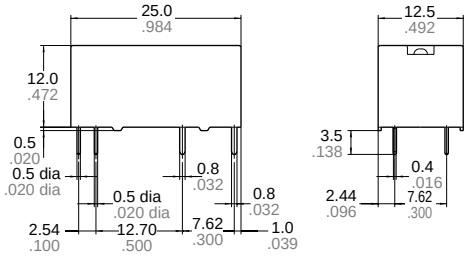
DIMENSIONS

mm inch

Single side stable
1 coil latching type



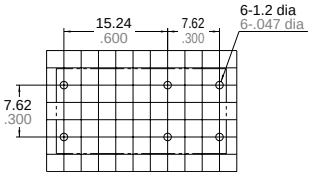
2 coil latching type



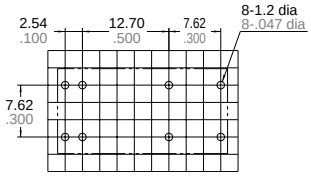
Tolerance: ±0.3 ±.012

PC board pattern (Bottom view)

Single side stable
1 coil latching type



2 coil latching type

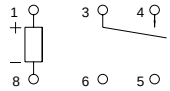


Tolerance : ±0.1 ±.004

Schematic (Bottom view)

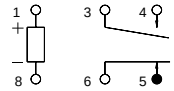
Single side stable

(1 Form A)



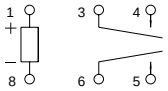
(5,6: dummy terminal)

(1 Form A 1 Form B)



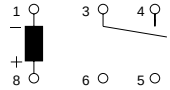
(Deenergized condition)

(2 Form A)



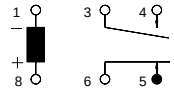
1coil latching type

(1 Form A)



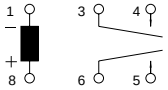
(5,6: dummy terminal)

(1 Form A 1 Form B)



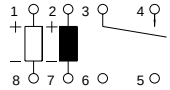
(Reset condition)

(2 Form A)



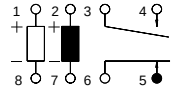
2coil latching type

(1 Form A)



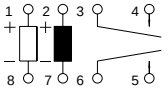
(5,6: dummy terminal)

(1 Form A 1 Form B)



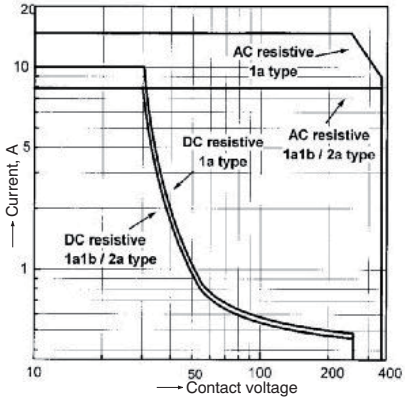
(Reset condition)

(2 Form A)

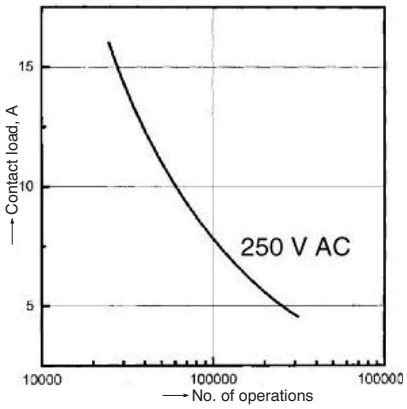


REFERENCE DATA

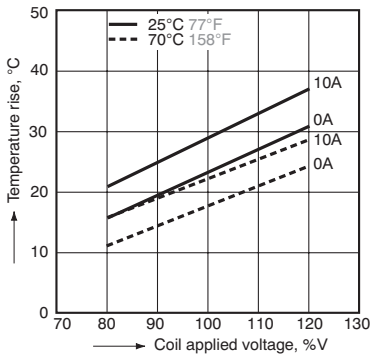
1. Max. switching power



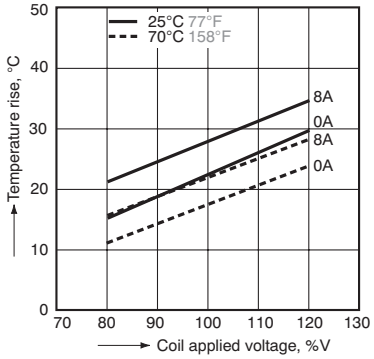
2. Life curve



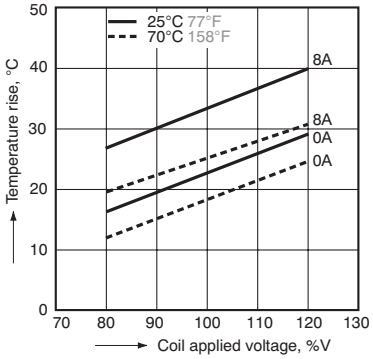
3.-(1) Coil temperature rise (1 Form A)
Tested sample: ADE109
Quantity: n=6
Ambient temperature: 25°C to 70°C 77°F to 158°F



3.-(2) Coil temperature rise (1 Form A 1 Form B)
Tested sample: ADE309
Quantity: n=6
Ambient temperature: 25°C to 70°C 77°F to 158°F

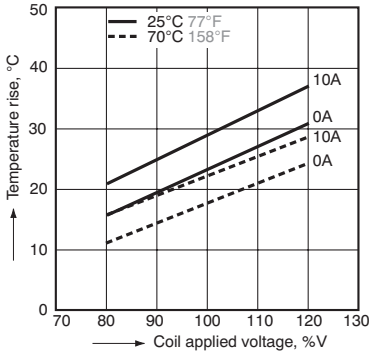


3.-(3) Coil temperature rise (2 Form A)
Tested sample: ADE209
Quantity: n=6
Ambient temperature: 25°C to 70°C 77°F to 158°F

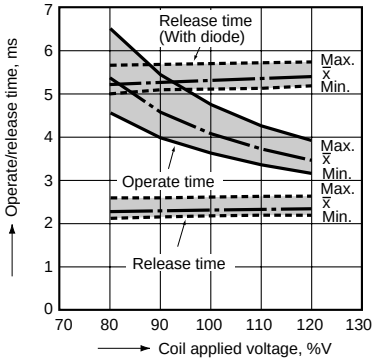


DE (ADE)

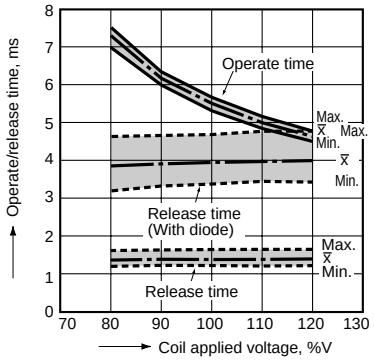
4-1. Operate/release time (1 Form A)
Tested sample: DE1a-5V
Quantity: n=5



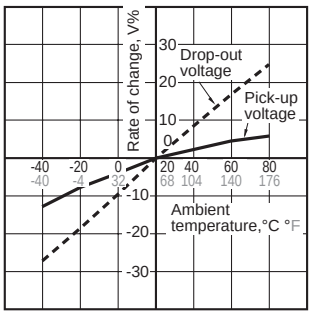
4-2. Operate/release time (1 Form A 1 Form B)
Tested sample: DE1a1b-5V, Quantity: n=5



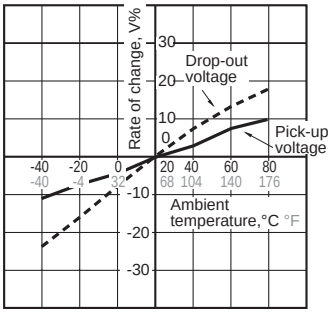
4-3. Operate/release time (2 Form A)
Tested sample: DE2a-5V, Quantity: n=5



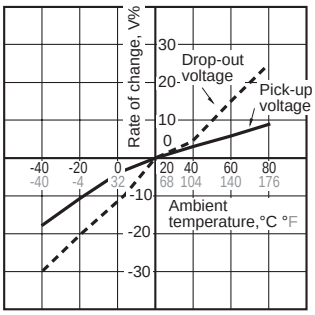
5-1. Ambient temperature characteristics (1 Form A)
Tested sample: DE1a-5V, Ambient temperature: –40°C to 80°C –40°F to 176°F, Quantity: n=6



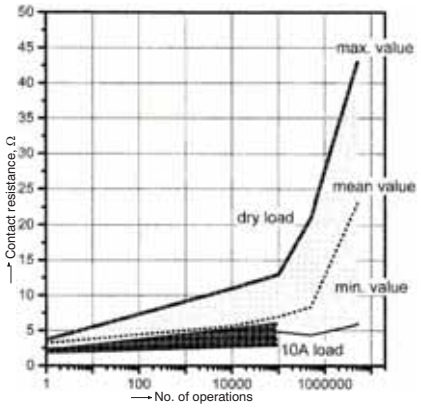
5-2. Ambient temperature characteristics (1 Form A 1 Form B)
Tested sample: DE1a1b-5V, Ambient temperature: –40°C to 80°C –40°F to 176°F, Quantity: n=6



5-3. Ambient temperature characteristics (2 Form A)
Tested sample: DE2a-5V, Ambient temperature: –40°C to 80°C –40°F to 176°F, Quantity: n=6



6. Change of contact resistance



For Cautions for Use, see Relay Technical Information.