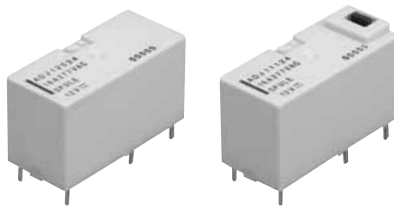




### 1-pole/2-pole 16A polarized power relays

# DJ RELAYS (ADJ)



Without a test button      With a test button

**RoHS compliant**

Protective construction: Flux-resistant type/Sealed type

### FEATURES

- Variety of contact arrangements**  
Wide lineup of 1 Form C, 1 Form A, 1 Form B, 2 Form C, 2 Form A, 2 Form B, 1 Form A 1 Form B.
- Latching operation**  
Latching via a polarized magnetic circuit structure allows remote operation and lower energy consumption
- Compact with high capacity**  
16A (1-pole type) contact rating in a compact 29×13×16.5 mm (L×W×H) size.
- Low power consumption**  
1 coil latching: 150mW  
2 coil latching, single side stable: 250mW
- High insulation**  
Both clearance and creepage distance between coil and contact are at 8 mm min.

- With operation verification function**  
A test button (manual lever) type to facilitate circuit checks is also available (1 Form C, 1 Form A, 1 Form B types only).

### TYPICAL APPLICATIONS

- FA equipment (brake circuits of industrial machine and robots, etc.)**
- Electric power devices (remote surveillance devices, etc.)**
- Household appliance networks (Motor control and lighting control, etc.)**
- Time switches**

### ORDERING INFORMATION

ADJ

Contact arrangement

- 1: 1 Form C
- 2: 1 Form A
- 3: 1 Form B
- 4: 1 Form A 1 Form B
- 5: 2 Form C
- 6: 2 Form A
- 7: 2 Form B

Operating function and protective construction

- 1: 1 coil latching, Flux-resistant type
- 2: 1 coil latching, Sealed type
- 3: 2 coil latching, Flux-resistant type
- 4: 2 coil latching, Sealed type
- 5: Single side stable, Flux-resistant type
- 6: Single side stable, Sealed type

Auxiliary function

- 0: Without a test button
- 1: With a test button

Nominal coil voltage (DC)

- 05: 5 V, 06: 6 V, 12: 12 V, 24: 24 V, 48: 48 V

# DJ (ADJ)

## TYPES

### 1. Without a test button

#### 1) Flux-resistant type

Contact arrangement	Nominal coil voltage	Part No.		
		Single side stable type	1 coil latching type	2 coil latching type
1 Form C	5V DC	ADJ15005	ADJ11005	ADJ13005
	6V DC	ADJ15006	ADJ11006	ADJ13006
	12V DC	ADJ15012	ADJ11012	ADJ13012
	24V DC	ADJ15024	ADJ11024	ADJ13024
	48V DC	ADJ15048	ADJ11048	ADJ13048
1 Form A	5V DC	ADJ25005	ADJ21005	ADJ23005
	6V DC	ADJ25006	ADJ21006	ADJ23006
	12V DC	ADJ25012	ADJ21012	ADJ23012
	24V DC	ADJ25024	ADJ21024	ADJ23024
	48V DC	ADJ25048	ADJ21048	ADJ23048
1 Form B	5V DC	ADJ35005	Please use 1 Form A.	Please use 1 Form A.
	6V DC	ADJ35006		
	12V DC	ADJ35012		
	24V DC	ADJ35024		
	48V DC	ADJ35048		
1 Form A 1 Form B	5V DC	ADJ45005	ADJ41005	ADJ43005
	6V DC	ADJ45006	ADJ41006	ADJ43006
	12V DC	ADJ45012	ADJ41012	ADJ43012
	24V DC	ADJ45024	ADJ41024	ADJ43024
	48V DC	ADJ45048	ADJ41048	ADJ43048
2 Form C	5V DC	ADJ55005	ADJ51005	ADJ53005
	6V DC	ADJ55006	ADJ51006	ADJ53006
	12V DC	ADJ55012	ADJ51012	ADJ53012
	24V DC	ADJ55024	ADJ51024	ADJ53024
	48V DC	ADJ55048	ADJ51048	ADJ53048
2 Form A	5V DC	ADJ65005	ADJ61005	ADJ63005
	6V DC	ADJ65006	ADJ61006	ADJ63006
	12V DC	ADJ65012	ADJ61012	ADJ63012
	24V DC	ADJ65024	ADJ61024	ADJ63024
	48V DC	ADJ65048	ADJ61048	ADJ63048
2 Form B	5V DC	ADJ75005	Please use 2 Form A.	Please use 2 Form A.
	6V DC	ADJ75006		
	12V DC	ADJ75012		
	24V DC	ADJ75024		
	48V DC	ADJ75048		

Standard packing: Carton: 100 pcs.; Case: 500 pcs.

## 2) Sealed type

Contact arrangement	Nominal coil voltage	Part No.		
		Single side stable type	1 coil latching type	2 coil latching type
1 Form C	5V DC	ADJ16005	ADJ12005	ADJ14005
	6V DC	ADJ16006	ADJ12006	ADJ14006
	12V DC	ADJ16012	ADJ12012	ADJ14012
	24V DC	ADJ16024	ADJ12024	ADJ14024
	48V DC	ADJ16048	ADJ12048	ADJ14048
1 Form A	5V DC	ADJ26005	ADJ22005	ADJ24005
	6V DC	ADJ26006	ADJ22006	ADJ24006
	12V DC	ADJ26012	ADJ22012	ADJ24012
	24V DC	ADJ26024	ADJ22024	ADJ24024
	48V DC	ADJ26048	ADJ22048	ADJ24048
1 Form B	5V DC	ADJ36005	Please use 1 Form A.	Please use 1 Form A.
	6V DC	ADJ36006		
	12V DC	ADJ36012		
	24V DC	ADJ36024		
	48V DC	ADJ36048		
1 Form A 1 Form B	5V DC	ADJ46005	ADJ42005	ADJ44005
	6V DC	ADJ46006	ADJ42006	ADJ44006
	12V DC	ADJ46012	ADJ42012	ADJ44012
	24V DC	ADJ46024	ADJ42024	ADJ44024
	48V DC	ADJ46048	ADJ42048	ADJ44048
2 Form C	5V DC	ADJ56005	ADJ52005	ADJ54005
	6V DC	ADJ56006	ADJ52006	ADJ54006
	12V DC	ADJ56012	ADJ52012	ADJ54012
	24V DC	ADJ56024	ADJ52024	ADJ54024
	48V DC	ADJ56048	ADJ52048	ADJ54048
2 Form A	5V DC	ADJ66005	ADJ62005	ADJ64005
	6V DC	ADJ66006	ADJ62006	ADJ64006
	12V DC	ADJ66012	ADJ62012	ADJ64012
	24V DC	ADJ66024	ADJ62024	ADJ64024
	48V DC	ADJ66048	ADJ62048	ADJ64048
2 Form B	5V DC	ADJ76005	Please use 2 Form A.	Please use 2 Form A.
	6V DC	ADJ76006		
	12V DC	ADJ76012		
	24V DC	ADJ76024		
	48V DC	ADJ76048		

Standard packing: Carton: 100 pcs.; Case: 500 pcs.

## 2. With a test button

## Flux-resistant type

Contact arrangement	Nominal coil voltage	Part No.		
		Single side stable type	1 coil latching type	2 coil latching type
1 Form C	5V DC	ADJ15105	ADJ11105	ADJ13105
	6V DC	ADJ15106	ADJ11106	ADJ13106
	12V DC	ADJ15112	ADJ11112	ADJ13112
	24V DC	ADJ15124	ADJ11124	ADJ13124
	48V DC	ADJ15148	ADJ11148	ADJ13148
1 Form A	5V DC	ADJ25105	ADJ21105	ADJ23105
	6V DC	ADJ25106	ADJ21106	ADJ23106
	12V DC	ADJ25112	ADJ21112	ADJ23112
	24V DC	ADJ25124	ADJ21124	ADJ23124
	48V DC	ADJ25148	ADJ21148	ADJ23148
1 Form B	5V DC	ADJ35105	Please use 1 Form A.	Please use 1 Form A.
	6V DC	ADJ35106		
	12V DC	ADJ35112		
	24V DC	ADJ35124		
	48V DC	ADJ35148		

Standard packing: Carton: 100 pcs.; Case: 500 pcs.

## RATING

### 1. Coil data

#### 1) Single side stable

Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 20°C 68°F)
5V DC	75%V or less of nominal voltage (Initial)	10%V or more of nominal voltage (Initial)	100Ω	250mW	130%V of nominal voltage
6V DC			144Ω		
12V DC			576Ω		
24V DC			2,304Ω		
48V DC			9,216Ω		

#### 2) 1 coil latching

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 20°C 68°F)
5V DC	70%V or less of nominal voltage (Initial)	70%V or less of nominal voltage (Initial)	167Ω	150mW	130%V of nominal voltage
6V DC			240Ω		
12V DC			960Ω		
24V DC			3,840Ω		
48V DC			15,360Ω		

#### 3) 2 coil latching

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 20°C 68°F)
5V DC	70%V or less of nominal voltage (Initial)	70%V or less of nominal voltage (Initial)	100Ω	250mW	130%V of nominal voltage
6V DC			144Ω		
12V DC			576Ω		
24V DC			2,304Ω		
48V DC			9,216Ω		

## 2. Specifications

Characteristics	Item	Specifications	
Contact	Arrangement	1 Form C, 1 Form A, 1 Form B, 1 Form A 1 Form B, 2 Form C, 2 Form A, 2 Form B	
	Contact resistance (Initial)	Max. 100 mΩ (By voltage drop 6 V DC 1A)	
	Contact material	AgSnO <sub>2</sub> type (1 Form C, 1 Form A, 1 Form B), Au-flashed AgSnO <sub>2</sub> type (1 Form A 1 Form B, 2 Form C, 2 Form A, 2 Form B)	
Rating	Nominal switching capacity (resistive load)	16 A 250V AC (1 Form C, 1 Form A, 1 Form B), 10 A 250V AC (2 Form C, 2 Form A, 2 Form B, 1 Form A 1 Form B)	
	Max. switching power (resistive load)	4,000 V A (1 Form C, 1 Form A, 1 Form B), 2,500 V A (2 Form C, 2 Form A, 2 Form B, 1 Form A 1 Form B)	
	Max. switching voltage	250V AC	
	Max. switching current	16 A (1 Form C, 1 Form A, 1 Form B), 10 A (1 Form A 1 Form B, 2 Form C, 2 Form A, 2 Form B)	
	Nominal operating power	150mW (1 coil latching), 250mW (Single side stable, 2 coil latching)	
	Min. switching capacity (Reference value)*1	100mA 5 V DC	
Electrical characteristics	Insulation resistance (Initial)	Min. 1,000MΩ (at 500V DC) Measurement at same location as "Breakdown voltage" section.	
	Breakdown voltage (Initial)	Between open contacts	1,000 Vrms for 1min. (Detection current: 10mA)
		Between contact and coil	4,000 Vrms for 1min. (Detection current: 10mA)
		Between contact sets	2,000 Vrms for 1min. (Detection current: 10mA) (Only 2 Form C, 2 Form A, 2 Form B, 1 Form A 1 Form B)
	Surge breakdown voltage*2 (Initial)	Between contact and coil	Min. 10,000 V
	Temperature rise (coil) (at 70°C 158°F)		Single side stable type: Max. 50°C 122°F (By resistive method, nominal voltage applied to the coil, max. switching current) 1 coil latching type and 2 coil latching type: Max. 50°C 122°F (By resistive method, coil: de-energized, max. switching current)
	Operate time [Set time] (at 20°C 68°F)		Max. 20 ms [20 ms] (Nominal voltage applied to the coil, excluding contact bounce time.)
Release time [Reset time] (at 20°C 68°F)		Max. 20 ms [20 ms] (Nominal voltage applied to the coil, excluding contact bounce time, without diode.)	
Mechanical characteristics	Shock resistance	Functional	Min. 200 m/s <sup>2</sup> (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.)
		Destructive	Min. 1,000 m/s <sup>2</sup> (Half-wave pulse of sine wave: 6 ms.)
	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 2 mm (Detection time: 10μs.)
		Destructive	10 to 55 Hz at double amplitude of 3 mm
Expected life	Mechanical	Min. 5×10 <sup>6</sup> (at 180 times/min.)	
	Electrical (Resistive load)*3 (at 20 times/min.)	Min. 10 <sup>5</sup> (at 16A 250V AC): 1 Form C, 1 Form A, 1 Form B Min. 10 <sup>5</sup> (at 10A 250V AC): 2 Form C, 2 Form A, 2 Form B, 1 Form A 1 Form B	
Conditions	Conditions for operation, transport and storage*4	Ambient temperature: -40°C to +70°C -40°F to +158°F Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)	
Unit weight		Approx. 14 g .49 oz	

Notes: \*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.

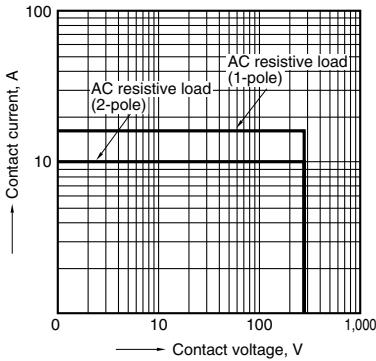
\*2. Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981

\*3. In order to obtain the full rated life cycles, the relay should be properly vented by removing the vent nib. More detail, please look at caution for NOTES.

\*4. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.

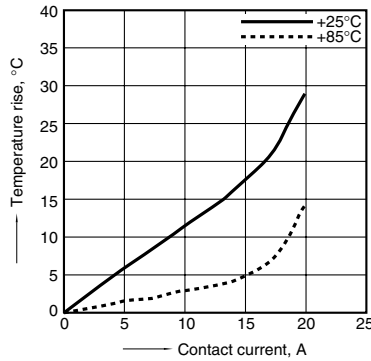
# REFERENCE DATA

## 1. Max. switching capacity



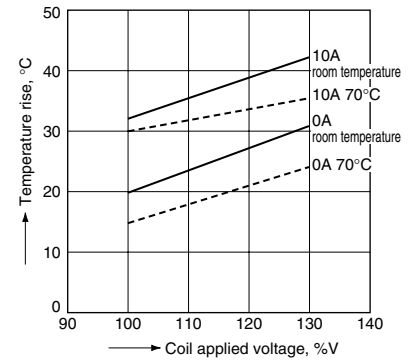
## 2. Temperature rise

Tested sample: ADJ12024, 6 pcs.  
Coil applied voltage: 0%V, Contact current: 16 A, 20 A  
Measured portion: Contact, Ambient temperature: 25°C 77°F, 85°C 185°F



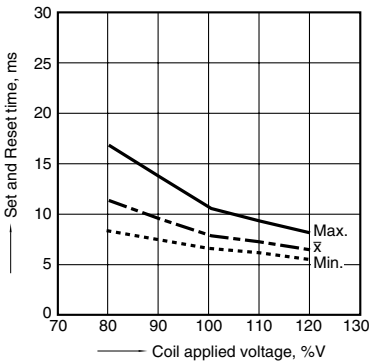
## 3. Coil temperature rise

Tested sample: ADJ56024, 6 pcs.  
Coil applied voltage: 100%V, 130%V of rating  
Contact current: 0 A, 10 A  
Measured portion: Inside the coil, Ambient temperature: Room temperature, 70°C 158°F



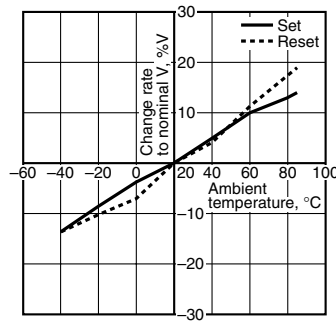
## 4. Set and Reset time

Tested sample: ADJ12024, 10 pcs  
Coil applied voltage: 80%V, 100%V, 120%V of rating



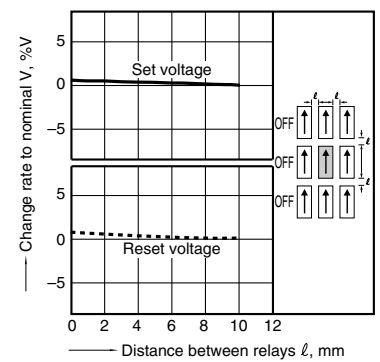
## 5. Ambient temperature characteristics

Tested sample: ADJ12024, 6 pcs  
Ambient temperature: -40°C to 85°C -40°F to 185°F



## 6. Influence of adjacent mounting

Tested sample: ADJ12024, 6 pcs  
Ambient temperature: Room temperature



# DIMENSIONS (mm inch)

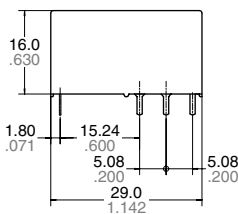
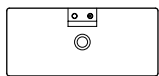
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

## 1. 1 Form C, without a test button

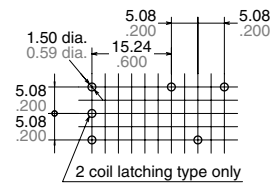
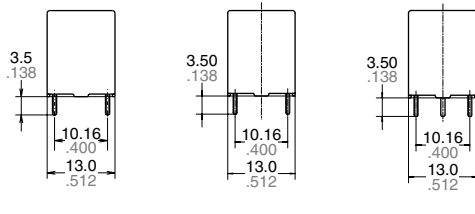
**CAD Data**

External dimensions

PC board pattern (Bottom view)



Single side stable type    1 coil latching type    2 coil latching type

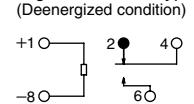


Tolerance:  $\pm 0.1 \pm 0.04$

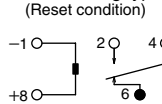
General tolerance:  $\pm 0.3 \pm 0.12$

Schematic (Bottom view)

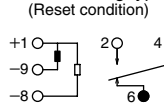
Single side stable type (Deenergized condition)



1 coil latching type (Reset condition)



2 coil latching type (Reset condition)



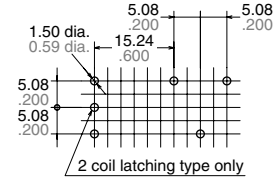
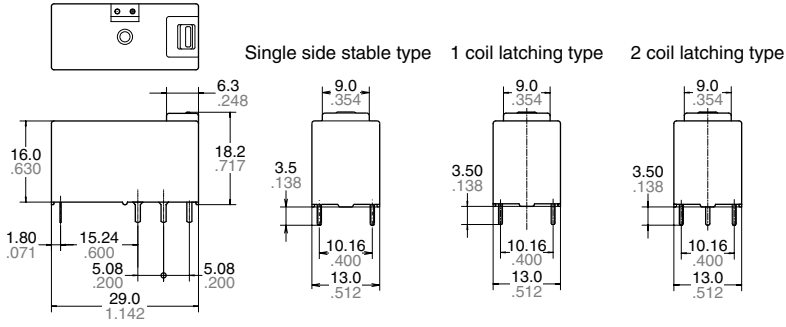
# DJ (ADJ)

## 2. 1 Form C, with a test button

### CAD Data

### External dimensions

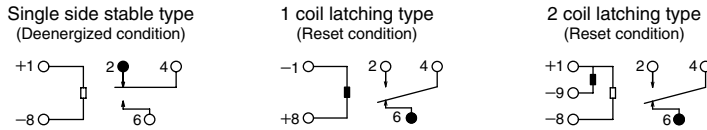
### PC board pattern (Bottom view)



Tolerance:  $\pm 0.1 \pm 0.04$

General tolerance:  $\pm 0.3 \pm 0.012$

### Schematic (Bottom view)

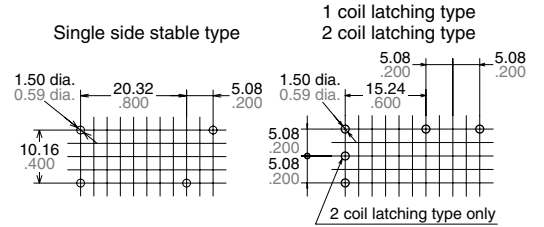
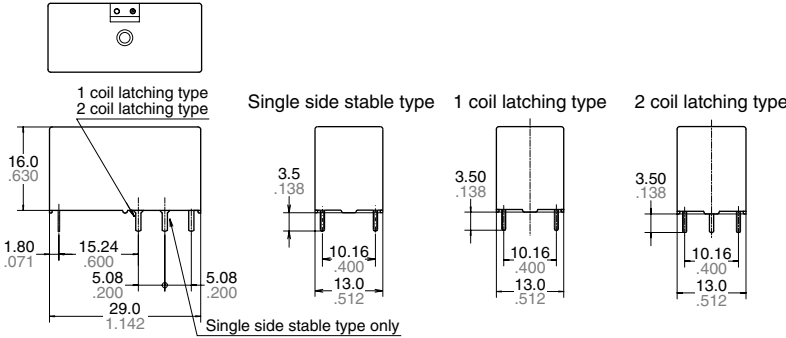


## 3. 1 Form A, without a test button

### CAD Data

### External dimensions

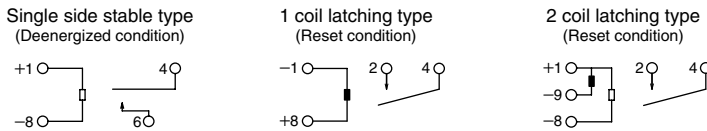
### PC board pattern (Bottom view)



Tolerance:  $\pm 0.1 \pm 0.04$

General tolerance:  $\pm 0.3 \pm 0.012$

### Schematic (Bottom view)

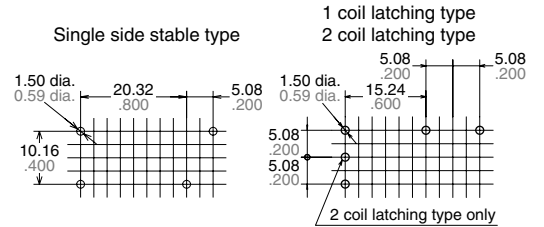
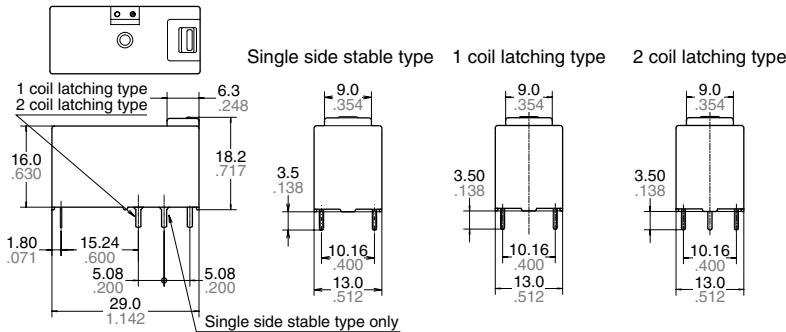


## 4. 1 Form A, with a test button

### CAD Data

### External dimensions

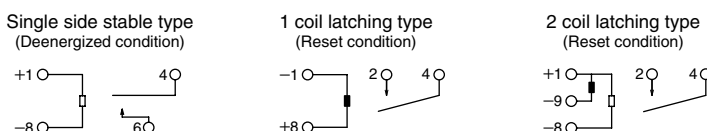
### PC board pattern (Bottom view)



Tolerance:  $\pm 0.1 \pm 0.04$

General tolerance:  $\pm 0.3 \pm 0.012$

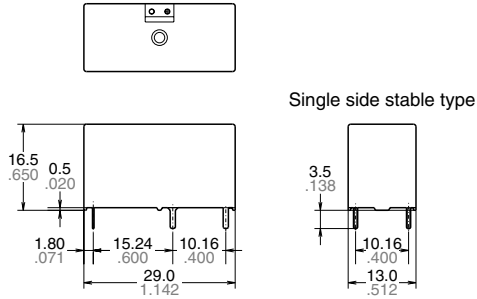
### Schematic (Bottom view)



5. 1 Form B, without a test button

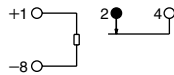
CAD Data

External dimensions

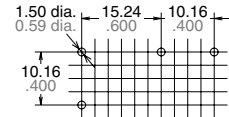


General tolerance:  $\pm 0.3 \pm 0.12$

Schematic (Bottom view)  
(Deenergized condition)



PC board pattern (Bottom view)

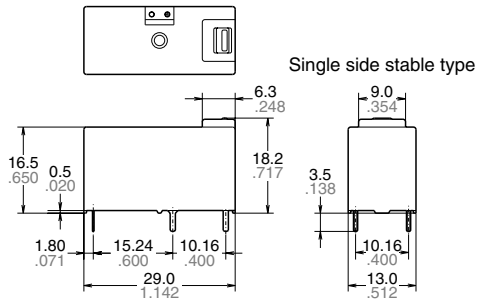


Tolerance:  $\pm 0.1 \pm 0.04$

6. 1 Form B, with a test button

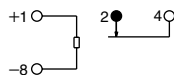
CAD Data

External dimensions

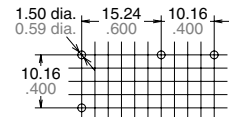


General tolerance:  $\pm 0.3 \pm 0.12$

Schematic (Bottom view)  
(Deenergized condition)



PC board pattern (Bottom view)

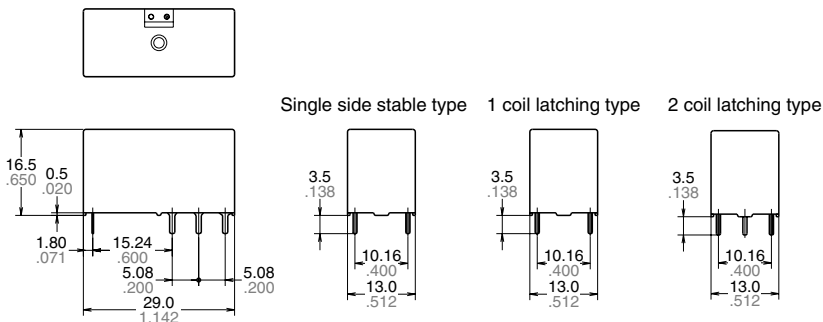


Tolerance:  $\pm 0.1 \pm 0.04$

7. 1 Form A 1 Form B, without a test button

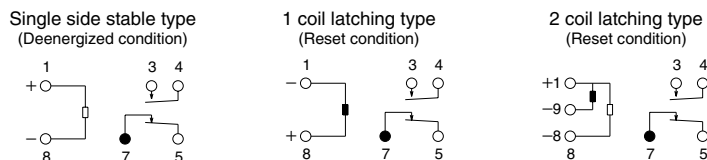
CAD Data

External dimensions

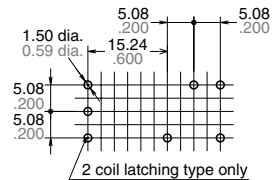


General tolerance:  $\pm 0.3 \pm 0.12$

Schematic (Bottom view)



PC board pattern (Bottom view)

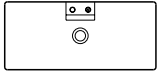


Tolerance:  $\pm 0.1 \pm 0.04$

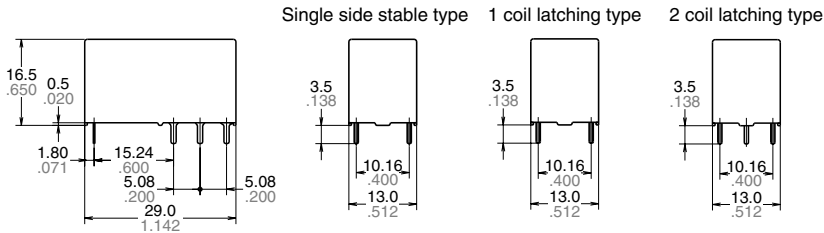
# DJ (ADJ)

## 8.2 Form C, without a test button

### CAD Data

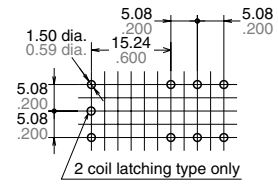


### External dimensions



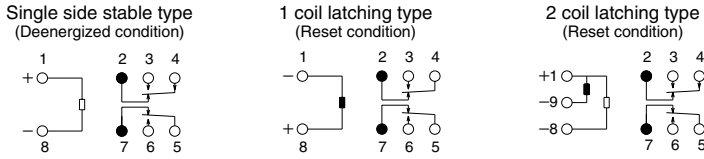
General tolerance:  $\pm 0.3 \pm 0.012$

### PC board pattern (Bottom view)



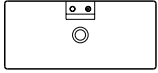
Tolerance:  $\pm 0.1 \pm 0.004$

### Schematic (Bottom view)

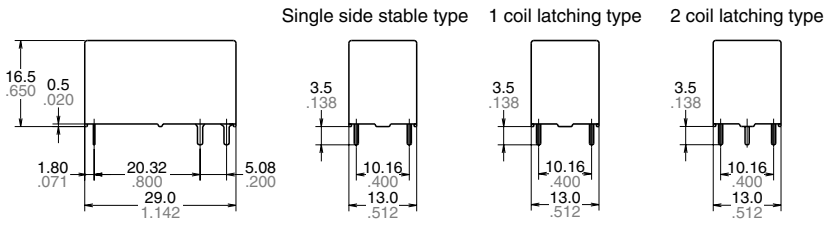


## 9.2 Form A, without a test button

### CAD Data

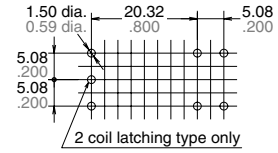


### External dimensions



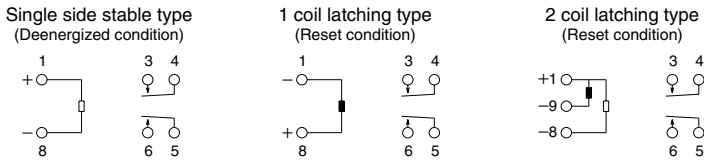
General tolerance:  $\pm 0.3 \pm 0.012$

### PC board pattern (Bottom view)



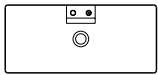
Tolerance:  $\pm 0.1 \pm 0.004$

### Schematic (Bottom view)

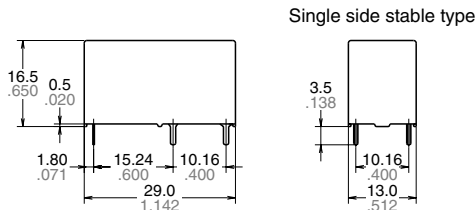


## 10.2 Form B, without a test button

### CAD Data

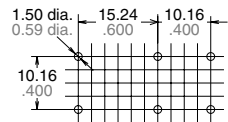


### External dimensions



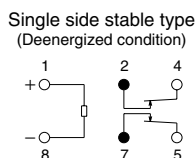
General tolerance:  $\pm 0.3 \pm 0.012$

### PC board pattern (Bottom view)



Tolerance:  $\pm 0.1 \pm 0.004$

### Schematic (Bottom view)





# SAFETY STANDARDS

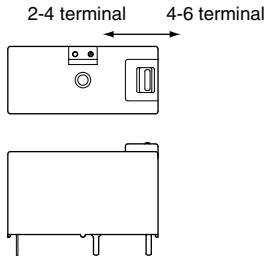
UL/C-UL (Recognized)		VDE (Certified)	
File No.	Contact rating	File No.	Contact rating
E43149	16A 277V AC R (1 pole), 10A 277V AC R (2 poles)	40009736	250V AC 16A (cosφ=1) (1 pole), 250V AC 10A (cosφ=1) (2 poles) 230V AC 20A (cosφ=1) (1 Form A)

\* CSA standard: Certified by C-UL

## NOTES

**1. For cautions for use, please read “GENERAL APPLICATION GUIDELINES” on page B-1.**

**2. Test button (manual lever) operation**  
The relay contacts switch over as follows:



**3. Electrical life (Sealed type)**

In order to obtain the full rated life cycles, the relay should be properly vented by removing the vent nib after the soldering/washing process.

