

# Power PCB Relay G4A

## Miniature Single-pole Relay with 80-A Surge Current and 20-A Switching Current

- Ideal for motor switching.
- Miniature, relay with high switching power and long endurance.
- Creepage distance conforms to UL and CSA standards.
- Highly noise-resistant insulation materials employed.
- Standard model available with flux protection construction.
- RoHS Compliant



## Ordering Information

| Classification                                  | Contact form | Model     |
|---|--------------|-----------|
| #250 Quick Connect terminals/PCB coil terminals | SPST-NO      | G4A-1A-E  |
| PCB terminals/PCB coil terminals                |              | G4A-1A-PE |

**Note:** When ordering, add the rated coil voltage to the model number.

Example: G4A-1A-E DC12

Rated coil voltage

## Model Number Legend

G4A   -   DC

1 2 3 4 5

### 1. Number of Poles

1: 1 Pole

### 3. Terminals

None: #250 Q.C./PCB coil terminals  
P: Straight PCB/PCB coil terminals

### 5. Rated Coil Voltage

5, 12, 24 VDC

### 2. Contact Form

A: SPST-NO

### 4. Special Function

E: For long endurance

## Specifications

### Contact Ratings

|  |                        |
|--|------------------------|
| Rated load   | See "Endurance" tables |
| Rated carry current                                | 20 A                   |
| Max. switching voltage                             | 250 VAC                |
| Max. switching current                             | 20 A                   |
| Min. Permissible Load (reference value - see note) | 100 mA at 5 VDC        |

**Note:** P level:  $\lambda_{60} = 0.1 \times 10^{-6}$ /operation. The value was measured at a switching frequency of 120 operations/minute.

## ■ Coil Ratings

|                        |                                 |        |         |
|------------------------|---------------------------------|--------|---------|
| Rated voltage          | 5 VDC                           | 12 VDC | 24 VDC  |
| Rated current          | 180 mA                          | 75 mA  | 37.5 mA |
| Pick-up voltage (max.) | 70% of rated voltage max.       |        |         |
| Dropout voltage (min.) | 10% of rated voltage min.       |        |         |
| Maximum coil voltage   | 160% of rated voltage at (23°C) |        |         |
| Power consumption      | Approx. 0.9 W                   |        |         |

- Note:** 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.  
 2. Operating characteristics are measured at a coil temperature of 23°C.  
 3. Max. permissible voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

## ■ Endurance

### Motor Load Ratings

| Load conditions   | Switching frequency   | Electrical endurance |
|---|-----------------------|----------------------|
| 250 VAC;<br>Inrush current: 80 A, 0.3 s (cosφ= 0.7)<br>Break current: 20 A (cosφ = 0.9) | ON:1.5 s<br>OFF:1.5 s | 200,000 operations   |

### Inverter Load Ratings

| Load conditions  | Switching frequency | Electrical endurance |
|--|---------------------|----------------------|
| 100 VAC;<br>Inrush current: 200 A (0.P)<br>Break current: 20 A | ON:3 s<br>OFF:5 s   | 30,000 operations    |

### Overload Durability (Reference Value)

| Load conditions  | Switching frequency    | Electrical endurance |
|--|------------------------|----------------------|
| 250 VAC;<br>Inrush current: 80 A<br>Break current: 80 A (cosφ = 0.7) | ON: 1.5 s<br>OFF: 99 s | 1,500 operations     |

## ■ Characteristics

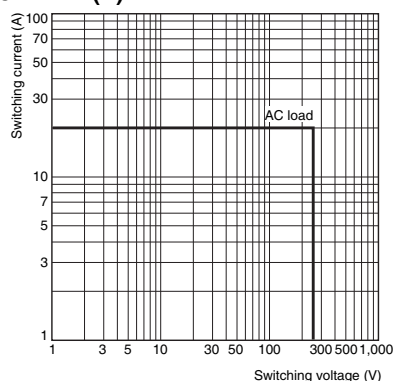
|                                   |   |
|-----------------------------------|---|
| Contact resistance                | 100 mΩ max.   |
| Operate time                      | 20 ms max.  |
| Release time                      | 10 ms max.  |
| Max. operating frequency          | Mechanical: 18,000 operations/hr  |
| Insulation resistance (see note2) | 1,000 MΩ min. (at 500 VDC)  |
| Dielectric strength               | 4,500 VAC 50/60 Hz for 1 min between coil and contacts<br>1,000 VAC 50/60 Hz for 1 min between contacts of same polarity  |
| Impulse Withstand Voltage         | 8.5 kV, 1.2 x 50, between coil and contacts   |
| Vibration resistance              | Destruction: 10 to 55 to 10 Hz, 0.75 mm single amplitude. (1.5 mm double amplitude)<br>Malfunction: 10 to 55 to 10 Hz, 0.75 mm single amplitude. (1.5 mm double amplitude)          |
| Shock resistance                  | Destruction: 1,000 m/s <sup>2</sup><br>Malfunction: 200 m/s <sup>2</sup>  |
| Service Life                      | Mechanical: 2,000,000 operations min. (at 18,000 operations/hr)<br>Motor load: 200,000 operations min. (ON/OFF: 1.5 s)<br>Inverter load: 30,000 operations min. (ON: 3 s, OFF: 5 s) |
| Ambient operating temperature     | Operating: -20°C to 60°C (with no icing or condensation)  |
| Ambient operating humidity        | Operating: 5% to 85%  |
| Weight                            | Approx. 23 g  |

- Note:** 1. The data shown above are initial values.  
 2. Measurement conditions: The insulation resistance was measured with a 500 VDC megohmmeter at the same locations as the dielectric strength was measured.

# Engineering Data

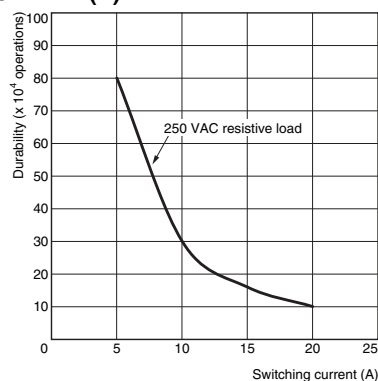
## Maximum Switching Capacity

G4A-1A-(P)E



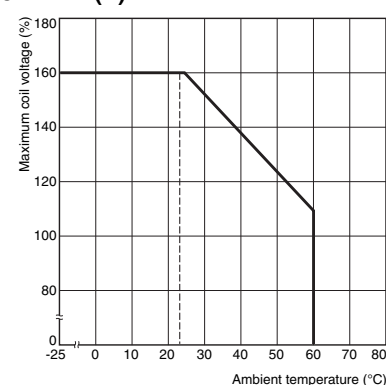
## Durability

G4A-1A-(P)E



## Ambient Temperature vs. Maximum Coil Voltage

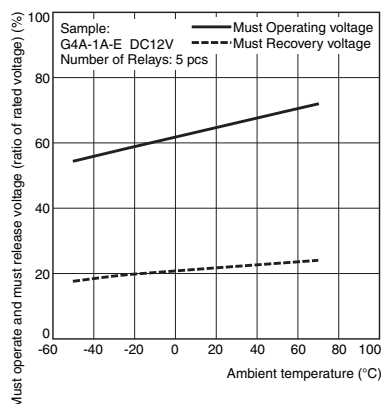
G4A-1A-(P)E



**Note:** The maximum coil voltage is the maximum voltage that can be applied to the relay coil.

## Ambient Temperature vs. Pickup and Drop-out Voltages

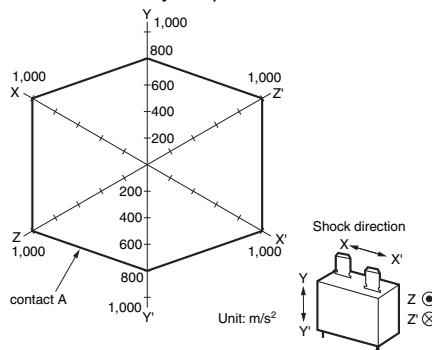
G4A-1A-(P)E



## Shock Malfunction

G4A-1A-(P)E

Number of Relays: 5 pieces



**Test Conditions:** Shock is applied in  $\pm X$ ,  $\pm Y$ ,  $\pm Z$  directions three times each with and without energizing the relays to check the number of malfunctions.

**Requirements:** 200 m/s<sup>2</sup>

# Approved Standards

The rated values approved by each of the safety standards may be different from the performance characteristics individually defined in this datasheet.

UL Recognized (File No. E41643)

| Model                 | Number of Poles | Coil ratings | Contact Ratings                     | Number of test operations |
|-----------------------|-----------------|--------------|-------------------------------------|---------------------------|
| G4A-1A-E<br>G4A-1A-PE | SPST-NO         | 5 to 100 VDC | 20A, 250 VAC (Resistive) 40°C       | 100,000                   |
|                       |                 |              | 15A, 30 VDC (Resistive) 40°C        |                           |
|                       |                 |              | 23A, 277 VAC (General Purpose) 40°C | 30,000                    |

CSA Certified (File No. LR31928)

| Model                 | Number of Poles | Coil ratings | Contact Ratings                     | Number of test operations |
|-----------------------|-----------------|--------------|-------------------------------------|---------------------------|
| G4A-1A-E<br>G4A-1A-PE | SPST-NO         | 5 to 100 VDC | 20A, 250 VAC (Resistive) 40°C       | 100,000                   |
|                       |                 |              | 15A, 30 VDC (Resistive) 40°C        |                           |
|                       |                 |              | 23A, 277 VAC (General Purpose) 40°C | 30,000                    |

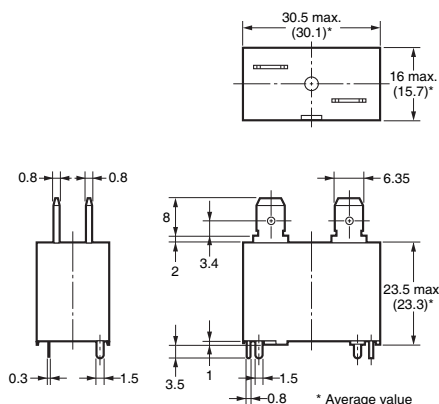
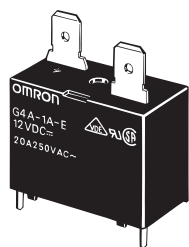
EN/IEC, VDE Certified (Registration No. 107293)

| Model                 | Number of Poles | Coil ratings      | Contact Ratings                | Number of test operations |
|-----------------------|-----------------|-------------------|--------------------------------|---------------------------|
| G4A-1A-E<br>G4A-1A-PE | SPST-NO         | 5, 12, 18, 24 VDC | 20A, 250 VAC (cosφ = 1.0) 50°C | 100,000                   |

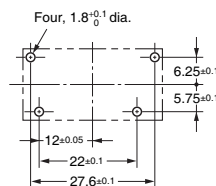
# Dimensions

**Note:** All units are in millimeters unless otherwise indicated; dimensions shown in parentheses are in inches.

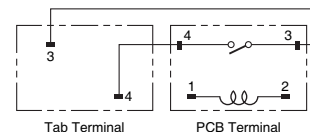
## G4A-1A-E



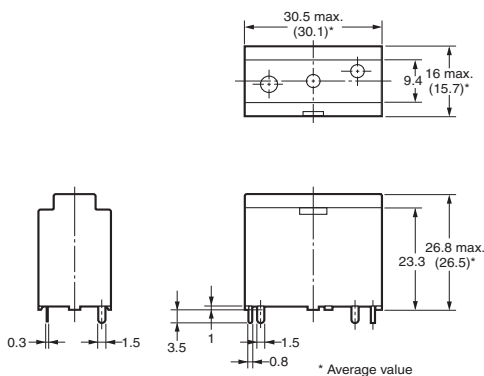
### Mounting Holes (Bottom view)



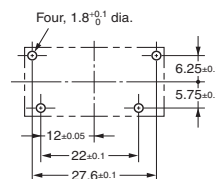
### Terminal Arrangement/Internal Connections (Top view) (Bottom view)



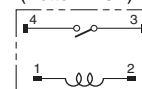
## G4A-1A-PE



### PCB Mounting Holes (Bottom view)



### Terminal Arrangement/Internal Connections (Bottom view)



# Precautions

## Mounting

When mounting two or more relays side by side, provide a minimum space of 3 mm horizontally and vertically between relays to ensure a good heat dissipation. Malfunction may occur if heat is not dissipated smoothly from the relay.

## Terminal Connection

The terminals fit FASTON receptacle 250 and are suitable for positive-lock mounting. Use only Faston terminals with the specified numbers. Select leads for connecting Faston receptacles with wire diameters that are within the allowable range for the load current.

Do not apply excessive force on the terminals when mounting or dismantling the Faston receptacle. Insert and remove terminals carefully one at a time. Do not insert terminals at an angle, or insert/remove multiple terminals at the same time.

Refer to the following table for examples of positive-lock connectors made by AMP. Contact the manufacturer directly for details on connectors, including availability.

| Type                            | Receptacle terminals  | Positive housing   |
|---------------------------------|---|--|
| #250 terminals (width: 6.35 mm) | AMP 170333-1 (170327-1)<br>AMP 170334-1 (170328-1)<br>AMP 170335-1 (170329-1) | AMP 172076-1 natural color<br>AMP 172076-4 yellow<br>AMP 172076-5 green<br>AMP 172076-6 blue |

**Note:** The numbers shown in parentheses are for air-feeding.

## Other Precautions

This relay is suitable for power load switching of air-conditioning compressors and power supplies, etc. Do not use the G4A to switch microloads less than 100 mA, such as in signal applications.



All sales are subject to Omron Electronic Components LLC standard terms and conditions of sale, which can be found at [http://www.components.omron.com/components/web/webfiles.nsf/sales\\_terms.html](http://www.components.omron.com/components/web/webfiles.nsf/sales_terms.html)

**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**  
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

---

**OMRON**<sup>®</sup>

**OMRON ELECTRONIC  
COMPONENTS LLC**

55 E. Commerce Drive, Suite B  
Schaumburg, IL 60173

**847-882-2288**

**OMRON ON-LINE**

Global - <http://www.omron.com>

USA - <http://www.components.omron.com>



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.