

G4A

PCB Power Relay

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

- Capable of Switching Motor Load of 80-A Surge Current and 20A Switching/Cut-off Current
- Miniature, relay with high switching power and long endurance.
- Creepage distance conforms to UL and CSA standards.
- Highly noise-resistive insulation materials employed.
- Standard model available with flux protection construction.

RoHS Compliant

Model Number Legend

G4A-□□-□□-□□
 1 2 3 4

1. Number of Poles

1: 1-pole

2. Contact Form

A: SPST-NO (1a)

3. Terminal Shape

None: #250 quick-connect/
PCB coil terminals

P : PCB terminals/
PCB coil terminals

4. Special Function

E: For long endurance

Ordering Information

Quick-connect/PCB coil terminals

| Contact form | Load Contact Terminal | Coil terminal | Model | Rated voltage | Minimum packing unit |
|--------------|------------------------------|---------------|----------|---------------|----------------------|
| SPST-NO (1a) | #250 quick-connect terminals | PCB terminals | G4A-1A-E | 12, 24 VDC | 50 pcs/tray |

PCB terminals

| Contact form | Load Contact Terminal | Coil terminal | Model | Rated voltage | Minimum packing unit |
|--------------|-----------------------|---------------|-----------|---------------|----------------------|
| SPST-NO (1a) | PCB terminals | PCB terminals | G4A-1A-PE | 12, 24 VDC | 50 pcs/tray |

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

Example: G4A-1A-E DC12

Rated coil voltage

However, the notation of the coil voltage on the product case as well as on the packing will be marked as □□ VDC.

Ratings

Coil

| Item | Rated current (mA) | Coil resistance (Ω) | Must operate voltage (V) | Must release voltage (V) | Max. permissible voltage (V) | Power consumption (W) |
|---------------|--------------------|---------------------|--------------------------|--------------------------|------------------------------|-----------------------|
| Rated voltage | | | % of rated voltage | | | |
| 12 VDC | 75 | 160 | 70% max. | 10% min. | 160% (at 23°C) | 0.9 |
| 24 VDC | 37.5 | 640 | | | | |

Note 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.

2. The inductances shown above are reference values.

3. Operating characteristics are measured at a coil temperature of 23°C.

4. Max. permissible voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

Contacts

| Contact type | Single |
|------------------------|--------------------|
| Contact material | Ag-Alloy (Cd free) |
| Rated carry current | 20 A |
| Max. switching voltage | 250 VAC |
| Max. switching current | 20 A |

Motor Ratings

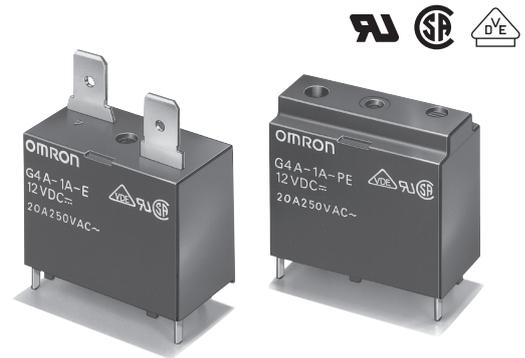
| Load conditions | Switching frequency | Electrical durability |
|--|-------------------------|-----------------------|
| 250 VAC: Inrush current: 80 A, 0.3 s (cosφ=0.7) Break current: 20 A (cosφ = 0.9) | ON: 1.5 s OFF: 1.5 s | 200,000 operations |

Inverter Ratings

| Load conditions | Switching frequency | Electrical durability |
|---|---------------------|-----------------------|
| 100 VAC: Inrush current: 200 A (O.P) Break current: 20 A | ON: 3 s OFF: 5 s | 30,000 operations |

Overload Durability (Reference Value)

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



Application Examples

- Air conditioner

Characteristics

| | | |
|---|---------------------------------------|---|
| Contact resistance *1 | | 100 mΩ max. |
| Operate time | | 20 ms max. |
| Release time | | 10 ms max. |
| Max. operating frequency | Mechanical | 18,000 operations/hr |
| | Insulation resistance *2 | 1,000 MΩ min. |
| Dielectric strength | Between coil and contacts | 4,500 VAC 50/60 Hz for 1 min |
| | Between contacts of the same polarity | 1,000 VAC 50/60 Hz for 1 min |
| Impulse withstand voltage | Between coil and contacts | 8.5 kV 1.2 x 50 |
| Insulation distance | Between coil and contacts | Clearance: 3.2 mm, Creepage: 6.4 mm |
| Vibration resistance | Destruction | 10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude) |
| | Malfunction | 10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude) |
| Shock resistance | Destruction | 1,000 m/s ² |
| | Malfunction | 200 m/s ² |
| Durability | Mechanical | 2,000,000 operations min. (at 18,000 operations/hr) |
| | Motor load | 200,000 operations min. (ON/OFF: 1.5 s) |
| | Inverter load | 30,000 operations min. (ON: 3 s, OFF: 5 s) |
| Failure rate (P level) (reference value *3) | | 100 mA at 5 VDC |
| Ambient operating temperature | | -20°C to 60°C (with no icing or condensation) |
| Ambient operating humidity | | 5% to 85% |
| Weight | | Approx. 23 g |

Note. The data given above are initial values.

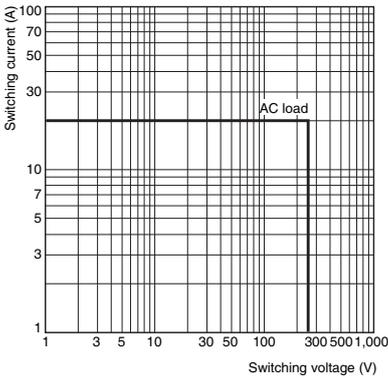
*1. Measurement conditions: 5 VDC, 1 A, voltage drop method.

*2. Measurement conditions: The insulation resistance was measured with a 500 VDC megohmmeter at the same locations as the dielectric strength was measured.

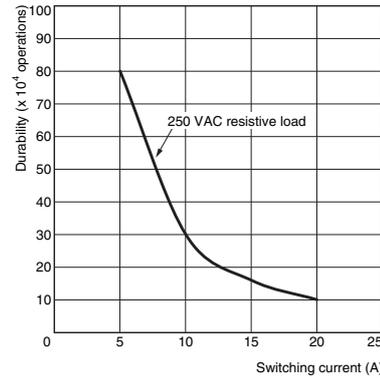
*3. This value was measured at a switching frequency of 120 operations/min.

Engineering Data

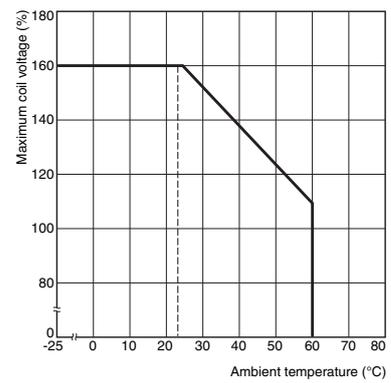
Maximum Switching Capacity G4A-1A-(P)E



Durability G4A-1A-(P)E

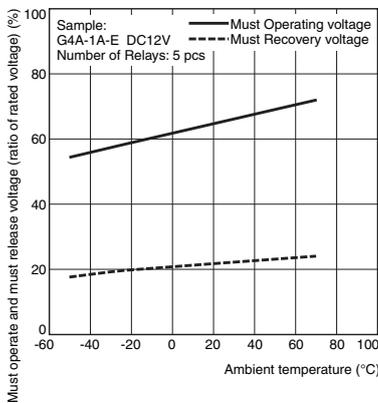


Ambient Temperature vs. Maximum Coil Voltage G4A-1A-(P)E



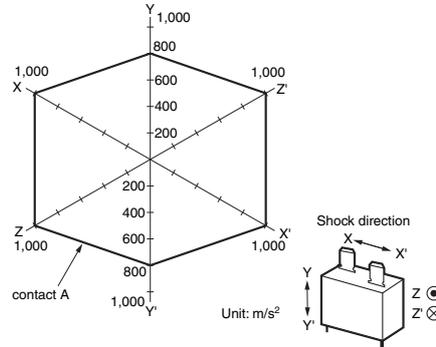
Note. The maximum coil voltage is the maximum voltage that can be applied to the relay coil.

Ambient Temperature vs. Must Operate and Must Release Voltages G4A-1A-(P)E



Shock Malfunction G4A-1A-(P)E

Number of Relays: 5 pcs

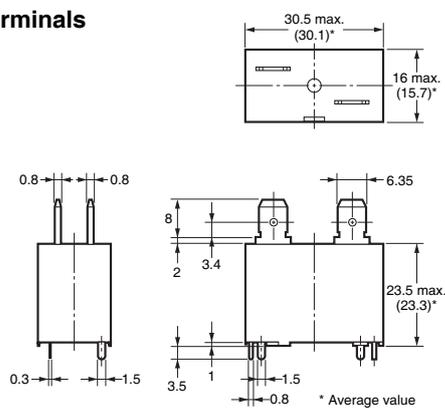


Test conditions: Shock is applied in $\pm X$, $\pm Y$, $\pm Z$ directions three times each with and without energizing the Relays to check the number of malfunctions.

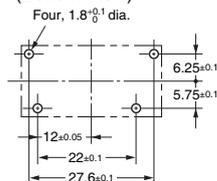
Requirement: 200 m/s²

Dimensions

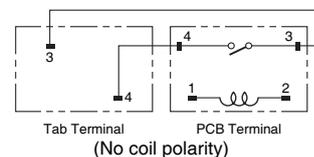
#250 quick-connect/PCB coil terminals G4A-1A-E



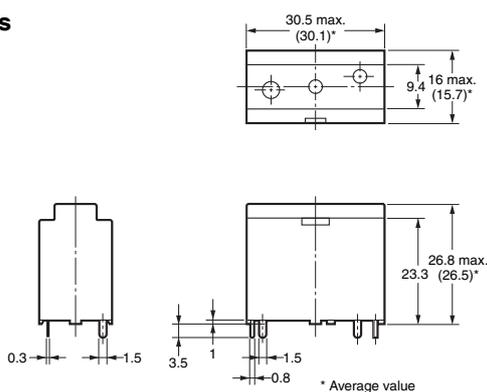
Mounting Holes (Bottom View)



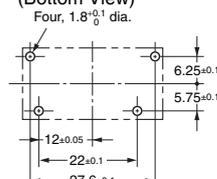
Terminal Arrangement/Internal Connections (Top View) (Bottom View)



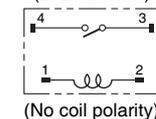
Straight PCB/PCB coil terminals G4A-1A-PE



PCB Mounting Holes (Bottom View)



Terminal Arrangement/ Internal Connections (Bottom View)



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 G4A-1A-PE | SPST-NO (1a) | 12 to 24 VDC | 20 A, 250 VAC (Resistive) 40°C | 100,000 |
| | | | 15 A, 30 VDC (Resistive) 40°C | |
| | | | 23 A, 277 VAC (General Purpose) 40°C | 30,000 |
| | | | TV-15 120 V AC 40°C | 25,000 |

CSA Certified (File No. LR31928)

| Model | Number of poles | Coil ratings | Contact ratings | Number of test operations |
|-----------------------|-----------------|--------------|---|---------------------------|
| G4A-1A-E G4A-1A-PE | SPST-NO (1a) | 12 to 24 VDC | 20 A, 250 VAC (Resistive) 40°C | 10,000 |
| | | | 15 A, 30 VDC (Resistive) 40°C | |
| | | | 23 A, 277 VAC (General Purpose) 40°C | 30,000 |
| | | | TV-15 120 V AC 40°C | 25,000 |

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

| Model | Number of poles | Coil ratings | Contact ratings | Number of test operations |
|-----------------------|-----------------|--------------|----------------------------------|---------------------------|
| G4A-1A-E G4A-1A-PE | SPST-NO (1a) | 12, 24 VDC | 20 A, 250 VAC (cosφ=1.0) 50°C | 100,000 |

Precautions

●Please refer to “PCB Relays Common Precautions” for correct use.

Correct Use

●Mounting

- When mounting more than two Relays side by side, keep a 3 mm gap horizontally and vertically between Relays to ensure a good heat dissipation. It may cause a malfunction if heat is not dissipated smoothly from the Relay.

●Terminals

- 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 to the terminals when mounting or dismounting 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 recommendations of connectors made by OMRON.

| Type | Receptacle terminals | Housing |
|------------------------------------|--|---------------|
| #250 terminals (width: 6.35 mm) | XT3W-S441-12 XT3W-S442-12 XT3W-S443-12 | XT3B-1S white |

●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 micro loads less than 100 mA, such as in signal applications.

• Application examples provided in this document are for reference only. In actual applications, confirm equipment functions and safety before using the product.
• Consult your OMRON representative before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems or equipment that may have a serious influence on lives and property if used improperly. Make sure that the ratings and performance characteristics of the product provide a margin of safety for the system or equipment, and be sure to provide the system or equipment with double safety mechanisms.

Note: Do not use this document to operate the Unit.

OMRON Corporation
Electronic and Mechanical Components Company

Contact: www.omron.com/ecb

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