

G6A

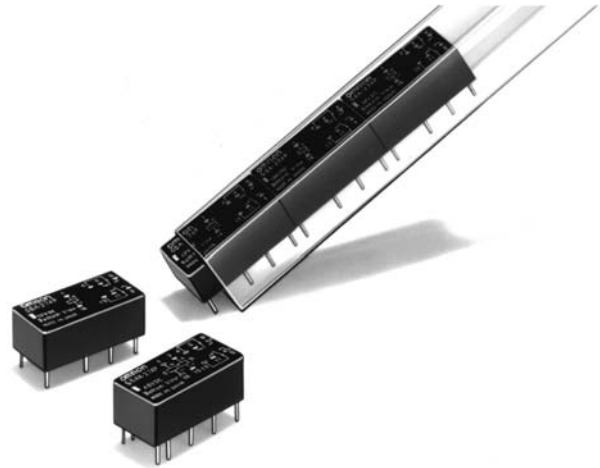
Low Signal Relay



World's Standard Model G6A!

- Resistant to electromagnetic interference, enables high-density mounting.
- Impulse withstand voltage of 1,500V meets FCC requirements.
- Gold-clad twin-contacts provide short contact bounce in addition to its high contact reliability.
- A variety of products that cover a wide range of use.

RoHS Compliant



Model Number Legend

G6A \square - \square \square \square \square - \square - \square
 1 2 3 4 5 6 7

1. Relay Function

- None : Single-side stable
- U : Single-winding latching
- K : Double-winding latching

2. Contact Form

2: DPDT (2c)

3. Contact Type

7: Bifurcated crossbar Ag (Au-Alloy)

4. Protective Structure

4: Fully sealed

5. Terminal Shape

P: PCB Terminals

6. Classification

- None : Standard
- ST : Stand-off 0.64 mm
- 15 : High-sensitivity (150 mW)
- 40 : Low-sensitivity
(Single-side Stable: 400 mW
Double-winding Latching: 360 mW)

7. Approved Standards

- None : Standard
- US : UL/C-UL

Application Examples

- Telecommunication equipment
- Security equipment
- Test & measurement equipment

G
6
A

Ordering Information

UL/C-UL Certified Models

| Relay Function | Classification | Contact form | Model | Rated coil voltage (VDC) | Minimum packing unit |
|------------------------------|------------------|--------------|-------------------|-------------------------------|----------------------|
| Single-side Stable Type | Standard | DPDT (2c) | G6A-274P-ST-US | 3, 4.5, 5, 6, 9, 12, 24 48 | 25 pcs/tube |
| | Low-sensitivity | | G6A-274P-ST40-US | 3, 5, 6, 9, 12, 24 48 | |
| | High-sensitivity | | G6A-274P-ST15-US | 3, 5, 6, 9, 12, 24 48 | |
| Single-winding Latching Type | Standard | | G6AU-274P-ST-US | 3, 4.5, 5, 6, 9, 12, 24 48 | |
| | Standard | | G6AK-274P-ST-US | 3, 4.5, 5, 6, 9, 12, 24 48 | |
| Double-winding Latching Type | Low-sensitivity | | G6AK-274P-ST40-US | 3, 5, 6, 9, 12, 24 48 | |

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

Example: G6A-274P-ST-US DC3

\square Rated coil voltage

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

■ Ratings

● Coil: Single-side Stable (Standard Models)

| Contact form | Rated voltage | Rated current (mA) | Coil resistance (Ω) | Must operate voltage (V) | Must release voltage (V) | Max. voltage (V) | Power consumption (mW) |
|--------------|---------------|--------------------|---------------------|--------------------------|--------------------------|------------------|------------------------|
| | | | | % of rated voltage | | | |
| DPDT (2c) | 3 VDC | 66.7 | 45 | 70% max. | 10% min. | 200% (at 23°C) | Approx. 200 |
| | 4.5 VDC | 44.6 | 101 | | | | |
| | 5 VDC | 40.0 | 125 | | | | |
| | 6 VDC | 33.3 | 180 | | | | |
| | 9 VDC | 22.2 | 405 | | | | |
| | 12 VDC | 16.7 | 720 | | | | |
| | 24 VDC | 8.3 | 2,880 | | | | |
| 48 VDC | 4.9 | 9,750 | Approx. 235 | | | | |

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. The maximum voltage is the highest voltage that can be imposed on the relay coil.

● Coil: Single-side Stable (Low-sensitivity Models)

| Contact form | Rated voltage | Rated current (mA) | Coil resistance (Ω) | Must operate voltage (V) | Must release voltage (V) | Max. voltage (V) | Power consumption (mW) |
|--------------|---------------|--------------------|---------------------|--------------------------|--------------------------|------------------|------------------------|
| | | | | % of rated voltage | | | |
| DPDT (2c) | 3 VDC | 133.3 | 22.5 | 70% max. | 10% min. | 150% (at 23°C) | Approx. 400 |
| | 5 VDC | 80 | 62.5 | | | | |
| | 6 VDC | 66.7 | 90 | | | | |
| | 9 VDC | 44.3 | 203 | | | | |
| | 12 VDC | 33.3 | 360 | | | | |
| | 24 VDC | 16.7 | 1,440 | | | | |
| | 48 VDC | 8.3 | 5,760 | | | | |

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. The maximum voltage is the highest voltage that can be imposed on the relay coil.

● Coil: Single-side Stable (High-sensitivity Models)

| Contact form | Rated voltage | Rated current (mA) | Coil resistance (Ω) | Must operate voltage (V) | Must release voltage (V) | Max. voltage (V) | Power consumption (mW) |
|--------------|---------------|--------------------|---------------------|--------------------------|--------------------------|------------------|------------------------|
| | | | | % of rated voltage | | | |
| DPDT (2c) | 3 VDC | 50 | 60 | 80% max. | 10% min. | 200% (at 23°C) | Approx. 150 |
| | 4.5 VDC | 33.3 | 135 | | | | |
| | 5 VDC | 30 | 167 | | | | |
| | 6 VDC | 25 | 240 | | | | |
| | 9 VDC | 16.7 | 540 | | | | |
| | 12 VDC | 12.5 | 960 | | | | |
| | 24 VDC | 6.3 | 3,840 | | | | |
| 48 VDC | 3.2 | 15,000 | | | | | |

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. The maximum voltage is the highest voltage that can be imposed on the relay coil.

● Coil: Single-winding Latching

| Contact form | Rated voltage | Rated current (mA) | Coil resistance (Ω) | Set voltage (V) | Reset voltage (V) | Max. voltage (V) | Power consumption (mW) |
|--------------|---------------|--------------------|---------------------|--------------------|-------------------|------------------|------------------------|
| | | | | % of rated voltage | | | |
| DPDT (2c) | 3 VDC | 33.7 | 89 | 70% max. | 70% max. | 200% (at 23°C) | Approx. 100 |
| | 5 VDC | 20 | 250 | | | | |
| | 6 VDC | 16.7 | 360 | | | | |
| | 9 VDC | 11.1 | 810 | | | | |
| | 12 VDC | 8.3 | 1,440 | | | | |
| | 24 VDC | 4.2 | 5,760 | | | | |
| | 48 VDC | 2.5 | 19,000 | | | | Approx. 120 |

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. The maximum voltage is the highest voltage that can be imposed on the relay coil.

●Coil: Double-winding Latching (Standard Models)

| Contact form | Rated voltage | Rated current (mA) | Coil resistance (Ω) | Set voltage (V) | Reset voltage (V) | Max. voltage (V) | Power consumption (mW) |
|--------------|---------------|--------------------|---------------------|--------------------|-------------------|-------------------|------------------------|
| | | | | % of rated voltage | | | |
| DPDT (2c) | 3 VDC | 66.7 | 45 | 70% max. | 70% max. | 200% (at 23°C) | Approx. 200 |
| | 4.5 VDC | 40.2 | 112 | | | | Approx. 180 |
| | 5 VDC | 36 | 139 | | | | |
| | 6 VDC | 30 | 200 | | | | |
| | 9 VDC | 20 | 450 | | | | |
| | 12 VDC | 15 | 800 | | | | |
| | 24 VDC | 7.5 | 3,200 | | | | |
| | 48 VDC | 4.2 | 11,520 | | | | Approx. 200 |

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. The maximum voltage is the highest voltage that can be imposed on the relay coil.

●Coil: Double-winding Latching (Low-sensitivity Models)

| Contact form | Rated voltage | Rated current (mA) | Coil resistance (Ω) | Set voltage (V) | Reset voltage (V) | Max. voltage (V) | Power consumption (mW) |
|--------------|---------------|--------------------|---------------------|--------------------|-------------------|-------------------|------------------------|
| | | | | % of rated voltage | | | |
| DPDT (2c) | 3 VDC | 120 | 25 | 70% max. | 70% max. | 150% (at 23°C) | Approx. 360 |
| | 4.5 VDC | 79.9 | 56.3 | | | | |
| | 5 VDC | 72.5 | 69 | | | | |
| | 6 VDC | 60 | 100 | | | | |
| | 9 VDC | 40 | 225 | | | | |
| | 12 VDC | 30 | 400 | | | | |
| | 24 VDC | 15 | 1,600 | | | | |
| | 48 VDC | 7.5 | 6,400 | | | | |

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. The maximum voltage is the highest voltage that can be imposed on the relay coil.

●Contacts

| Item | Load | |
|------------------------|------------------------------------|---|
| | Resistive load | Inductive load ($\cos\phi = 0.4;$ $L/R = 7 \text{ ms}$) |
| Contact type | Bifurcated crossbar | |
| Contact material | Ag (Au-Alloy) contact | |
| Rated load | 0.5 A at 125 VAC; 2 A at 30 VDC | 0.3 A at 125 VAC; 1 A at 30 VDC |
| Rated carry current | 3 A | |
| Max. switching voltage | 250 VAC, 220 VDC | |
| Max. switching current | 2 A | 1 A |

■Characteristics

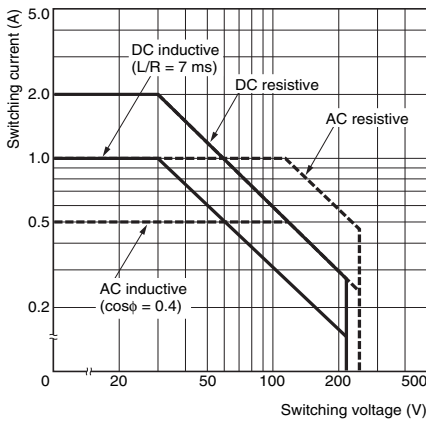
| Item | Classification | Single-side Stable | Single-winding Latching | Double-winding Latching |
|-------------------------------|--|---|-------------------------|-----------------------------|
| Contact resistance *1 | | 50 mΩ max. | | |
| Operate (set) time | | 5 ms max. | 5 ms max. | |
| Release (reset) time | | 3 ms max. | 5 ms max. | |
| Min. set/reset signal width | | – | 10 ms | |
| Insulation resistance *2 | | 1,000 MΩ min. (at 500 VDC); except for set-reset | | |
| Dielectric strength | Between coil and contacts | 1,000 VAC, 50/60 Hz for 1 min | | |
| | Between contacts of the same polarity | 1,000 VAC, 50/60 Hz for 1 min | | |
| | Between contacts of different polarity | 1,000 VAC, 50/60 Hz for 1 min | | |
| | Between set and reset coils | – | – | 250 VAC, 50/60 Hz for 1 min |
| Impulse withstand voltage | | 1,500 V (10 × 160 μs) (conforms to FCC Part 68) | | |
| Vibration resistance | Destruction | 10 to 55 to 10 Hz, 2.5 mm single amplitude (5 mm double amplitude) | | |
| | Malfunction | 10 to 55 to 10 Hz, 1.65 mm single amplitude (3.3 mm double amplitude) | | |
| Shock resistance | Destruction | 1,000 m/s ² | | |
| | Malfunction | 500 m/s ² | 300 m/s ² | |
| Durability | Mechanical | 100,000,000 operations min. (at 36,000 operations/hr) | | |
| | Electrical | 500,000 operations min. (at 1,800 operations/hr) | | |
| Failure rate (P level) *3 | | 10 μA at 10 m VDC | | |
| Ambient operating temperature | | -40°C to 70°C (with no icing or no condensation) | | |
| Ambient operating humidity | | 5% to 85% | | |
| Weight | | Approx. 3.5 g | | |

Note: The data shown above are initial values.

- *1. The contact resistance was measured with 10 mA at 1 VDC with a voltage drop method.
- *2. The insulation resistance was measured with a 500 VDC megohmmeter applied to the same parts as those used for checking the dielectric strength (except between the set and reset coil).
- *3. This value was measured at a switching frequency of 60 operations/min and the criterion of contact resistance is 50 Ω. This value may vary, depending on switching frequency, operating conditions, expected reliability level of the relay, etc. It is always recommended to double-check relay suitability under actual load conditions.

Engineering Data

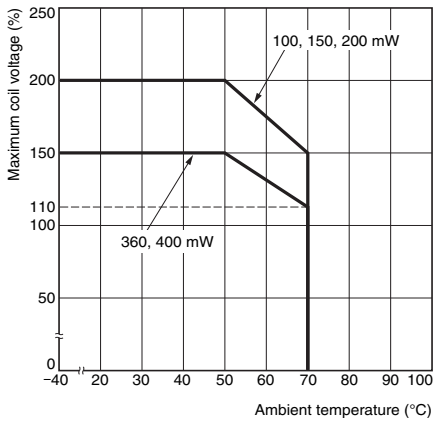
Maximum Switching Power



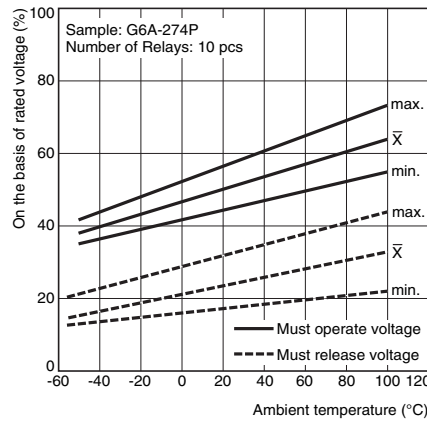
Durability



Ambient Temperature vs. Maximum Coil Voltage



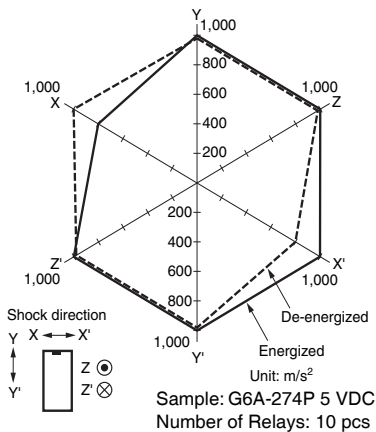
Ambient Temperature vs. Must Operate or Must Release Voltage



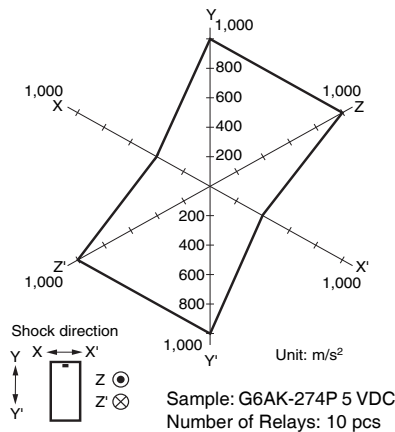
Note: "Maximum voltage" is the maximum voltage that can be applied to the Relay coil.

Shock Malfunction

G6A-274P



G6AK-274P

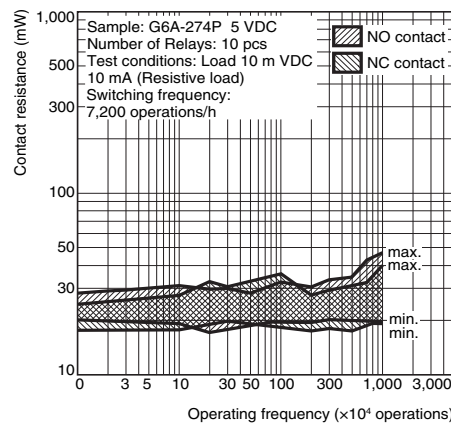


Test Conditions: Shock is applied in ±X, ±Y, and ±Z directions three times each with and without energizing the Relays to check the number of contact malfunctions.

●Electrical Durability Test *1



●Contact Reliability Test *1, *2



*1. The tests were conducted at an ambient temperature of 23°C.

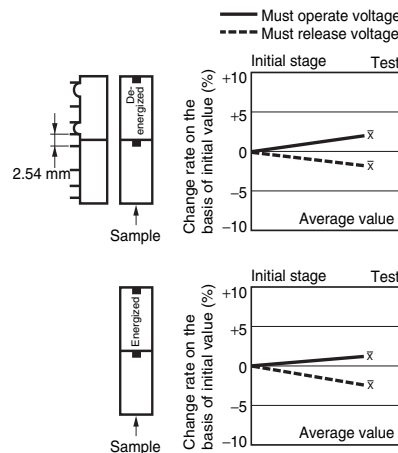
*2. The contact resistance data are periodically measured reference values and are not values from each monitoring operation. Contact resistance values will vary according to the switching frequency and operating environment, so be sure to check operation under the actual operating conditions before use.

●Mutual Magnetic Interference

G6A-274P



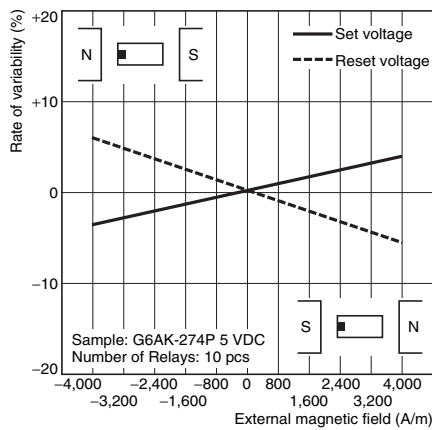
G6A-274P



●External Magnetic Interference

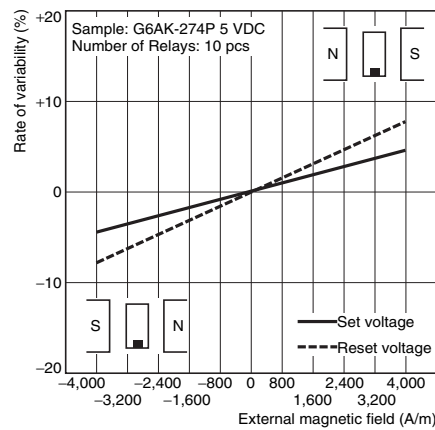
G6AK-274P

(Average value)



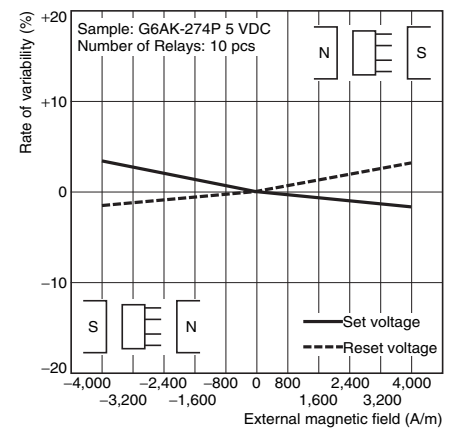
G6AK-274P

(Average value)



G6AK-274P

(Average value)



●Time distribution of Operating and Release/Set and Reset *1

G6A-274P



G6AK-274P



●Bounce Time distribution of Operating and Release/Set and Reset *1

G6A-274P

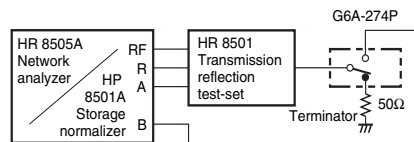


G6AK-274P



●High-frequency Characteristics

• Measurement Conditions



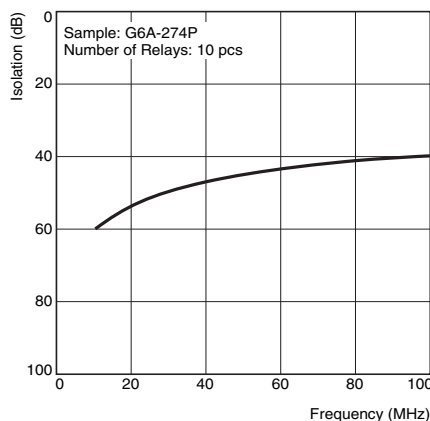
Terminals which were not being measured were terminated with 50 Ω.
Measuring impedance: 50 Ω

Note: The high-frequency characteristics data were measured using a dedicated circuit board and actual values will vary depending on the usage conditions. Check the characteristics of the actual equipment being used.

●High-frequency Characteristics

(Isolation) *1, *2

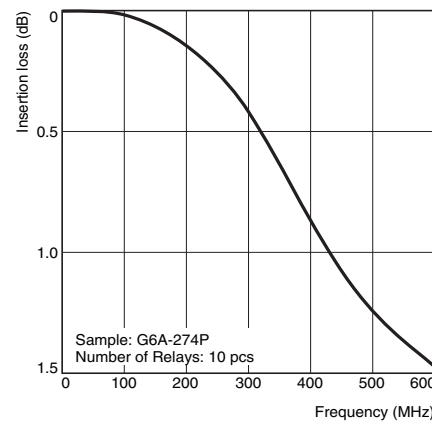
(Average value (initial))



●High-frequency Characteristics

(Insertion Loss) *1, *2

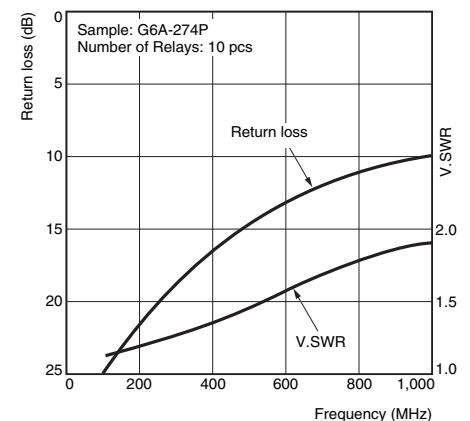
(Average value (initial))



●High-frequency Characteristics

(Return Loss, V.SWR) *1, *2

(Average value (initial))

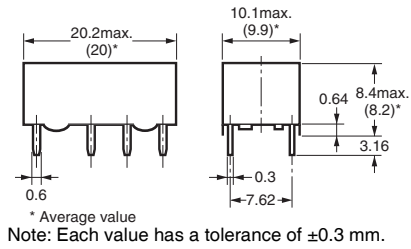
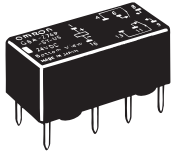


*1. The tests were conducted at an ambient temperature of 23°C.

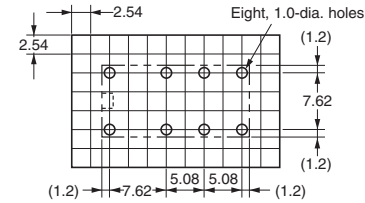
*2. High-frequency characteristics depend on the PCB to which the Relay is mounted. Always check these characteristics, including durability, in the actual machine before use.

■Dimensions

Single-side stable
G6A-274P-ST-US
G6A-274P-ST40-US
G6A-274P-ST15-US



PCB Mounting Holes
(BOTTOM VIEW)
Tolerance: ± 0.1

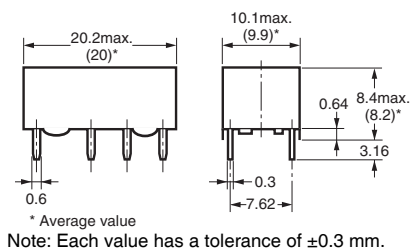
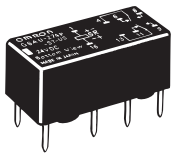


Terminal Arrangement/
Internal Connections
(BOTTOM VIEW)

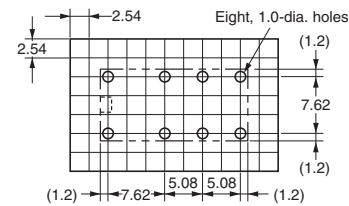


Note: Check carefully the coil polarity of the Relay.

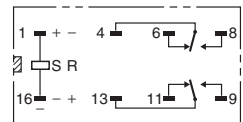
Single-winding latching
G6AU-274P-ST-US



PCB Mounting Holes
(BOTTOM VIEW)
Tolerance: ± 0.1

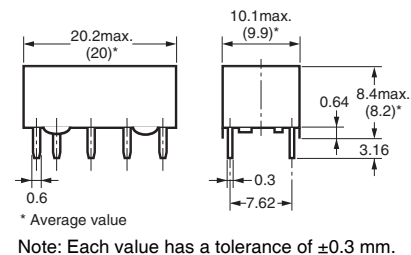
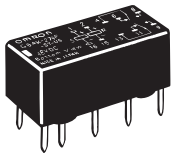


Terminal Arrangement/
Internal Connections
(BOTTOM VIEW)

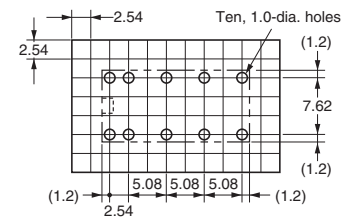


Note: Check carefully the coil polarity of the Relay.

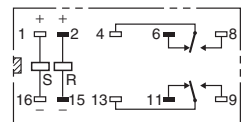
Double-winding latching
G6AK-274P-ST-US
G6AK-274P-ST40-US



PCB Mounting Holes
(BOTTOM VIEW)
Tolerance: ± 0.1



Terminal Arrangement/
Internal Connections
(BOTTOM VIEW)



Note: Check carefully the coil polarity of the Relay.

Approved Standards

To order the model that is certified for the UL/C-UL standards, add “-US” to the end of the model number.

UL/C-UL Recognized.  (File No.E41515)

| Classification | Contact form | Coil ratings | Model | Contact ratings | Number of test operations |
|--------------------|--------------|--------------|------------------------------------|---|---------------------------|
| Single-side stable | DPDT (2c) | 3 to 48 VDC | G6A-274P-ST-US | 0.6 A, 125 VAC at 40°C 2 A, 30 VAC at 40°C 0.6 A, 110 VAC at 40°C | 6,000 |
| Latching | | | G6AK-274P-ST-US G6AU-274P-ST-US | | |
| Low-sensitivity | | | G6A(K)-274P-ST40-US | | |
| High-sensitivity | | | G6A-274P-ST15-US | | |

Precautions

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

Correct Use

●Long-term Continuously ON Contacts

Using the Relay in a circuit where the Relay will be ON continuously for long periods (without switching) can lead to unstable contacts because the heat generated by the coil itself will affect the insulation, causing a film to develop on the contact surfaces. We recommend using a latching relay (magnetic-holding relay) in this kind of circuit. If a single-side stable model must be used in this kind of circuit, we recommend using a fail-safe circuit design that provides protection against contact failure or coil burnout.

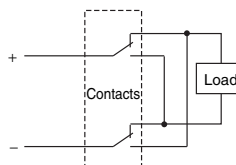
●Relay Handling

When washing the product after soldering the Relay to a PCB, use a water-based solvent or alcohol-based solvent, and keep the solvent temperature to less than 40°C. Do not put the Relay in a cold cleaning bath immediately after soldering.

●Double-switching load in two poles

Double-switching in two poles as shown in the figure below, one pole and two pole interval may become MBB (Make Before Break) mechanically according to the timing of the point of contact switching (By the short-circuit mode), and the malfunction might be caused.

In such a circuit, direct electric switching should be avoided, and concern for contact to be carried after the contact of Relay absolutely switches in condition of no load.



• 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.

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