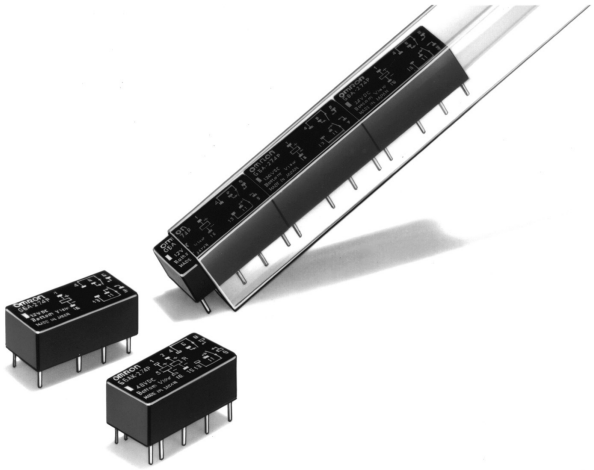
G6A

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.**



■Model Number Legend

G6A□-□□□□-□-□
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

G6A

■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	25 pcs/tube
				48	
	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	
Double-winding Latching Type	Standard		**G6AK-274P-ST-US**	3, 4.5, 5, 6, 9, 12, 24	
				48	
	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
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.

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■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.

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●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

Load / Item	Resistive load	Inductive load (cosφ = 0.4; L/R = 7 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

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■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/s²		
	Malfunction	500 m/s²	300 m/s²	
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 condenstion)		
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.

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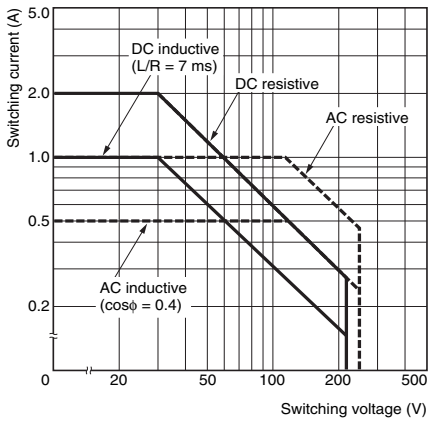
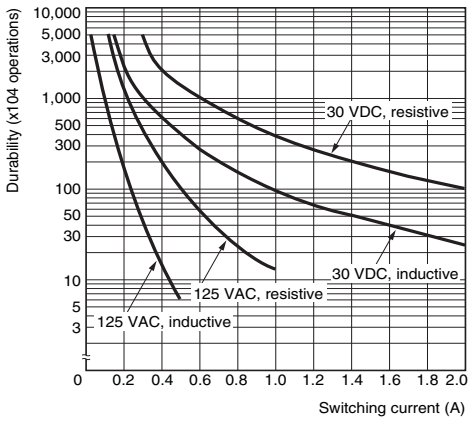
■Engineering Data

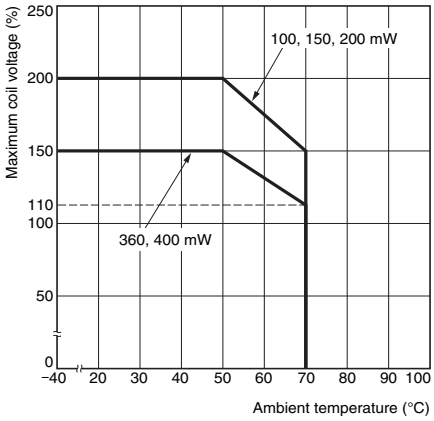
●Maximum Switching Power



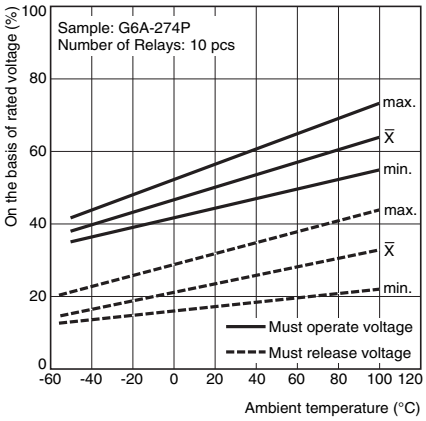
●Durability



●Ambient Temperature vs. Maximum Coil Voltage



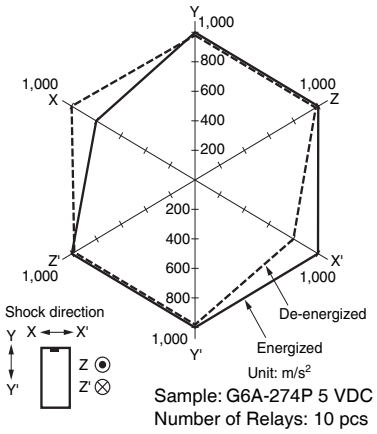
●Ambient Temperature vs. Must Operate or Must Release Voltage



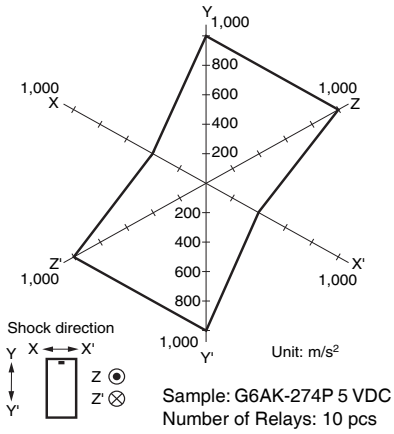
Note: "Maximum voltage" is the maximum voltage that can be applied to the Relay coil.

●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.

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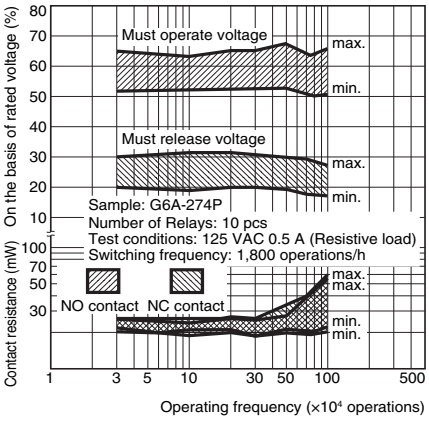
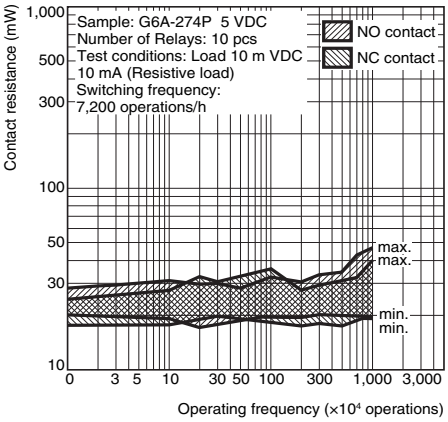
●Electrical Durability Test *1



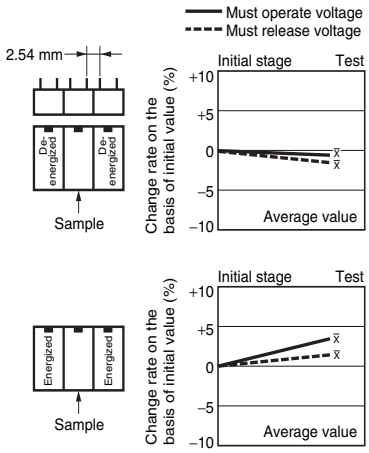
●Contact Reliability Test *1, *2



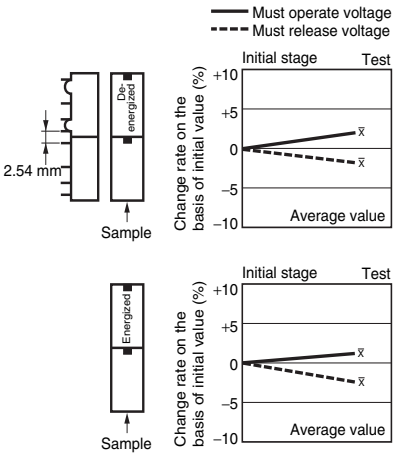
*1. The tests were conducted at an ambient temperature of 23ºC.
*2. The contact resistance data are periodically measured reference values and are not values from each monitoring operation. Contact resistance values will vary according to the switching frequency and operating environment, so be sure to check operation under the actual operating conditions before use.

●Mutual Magnetic Interference

G6A-274P

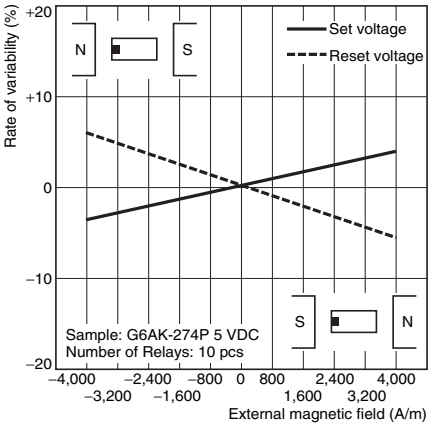


G6A-274P

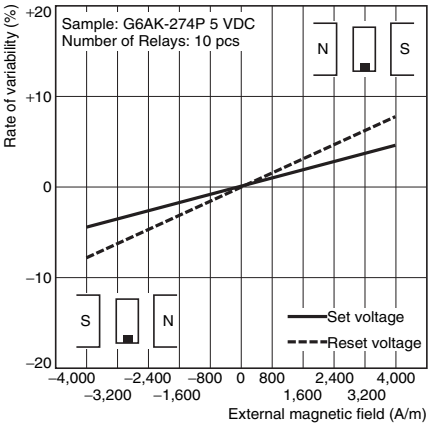


●External Magnetic Interference

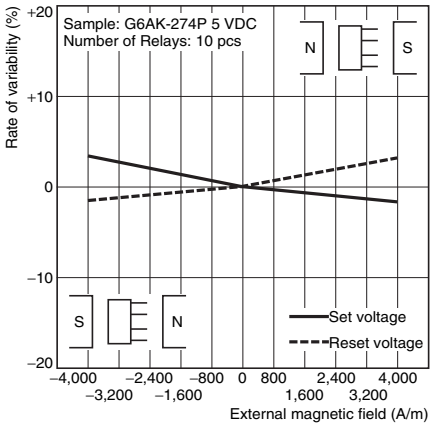
G6AK-274P (Average value)



G6AK-274P (Average value)



G6AK-274P (Average value)



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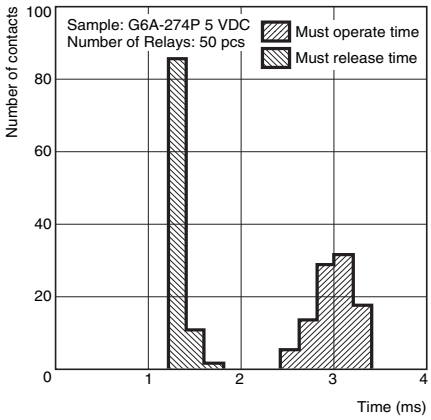
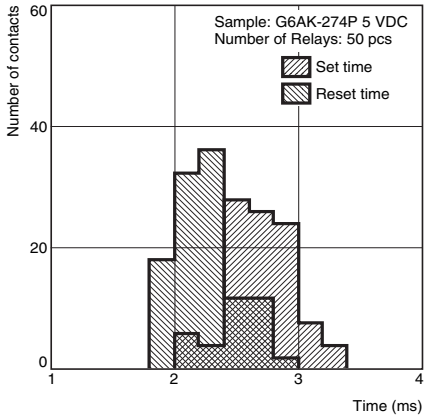
●Time distribution of Operating and Release/Set and Reset *1

G6A-274P

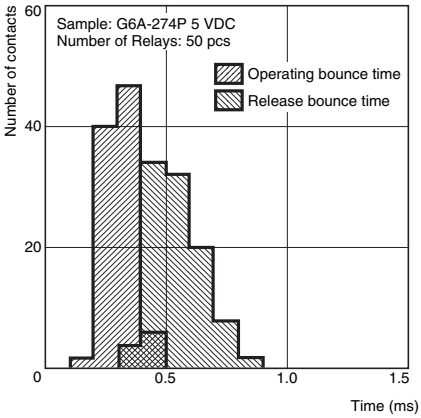


G6AK-274P

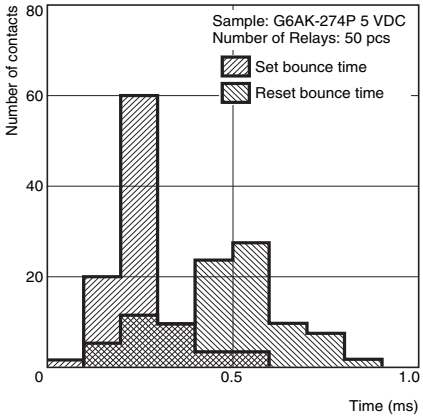


●Bounce Time distribution of Operating and Release/Set and Reset *1

G6A-274P

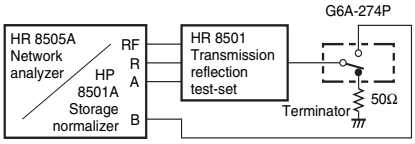


G6AK-274P



●High-frequency Characteristics

• Measurement Conditions

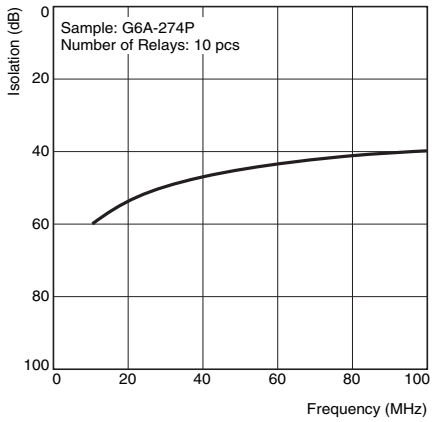


Terminals which were not being measured were terminated with 50 Ω.
Measuring impedance: 50 Ω

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.

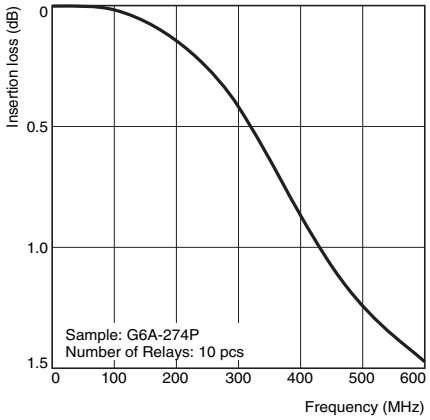
●High-frequency Characteristics (Isolation) *1, *2

(Average value (initial))



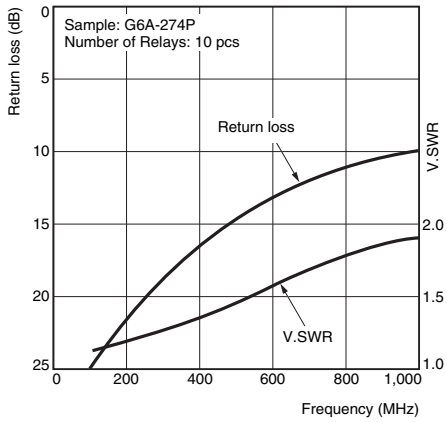
●High-frequency Characteristics (Insertion Loss) *1, *2

(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.

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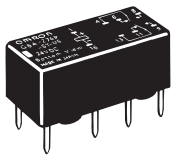
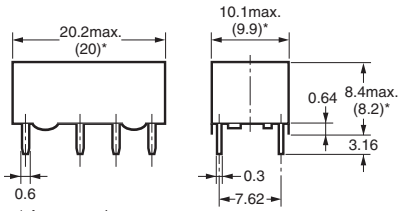
■Dimensions

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

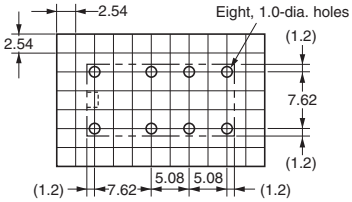




* Average value

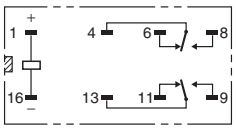
Note: Each value has a tolerance of ±0.3 mm.

PCB Mounting Holes
(BOTTOM VIEW)
Tolerance: ±0.1



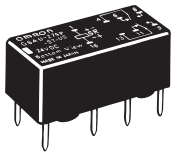
Note: Orientation marks are indicated as follows:

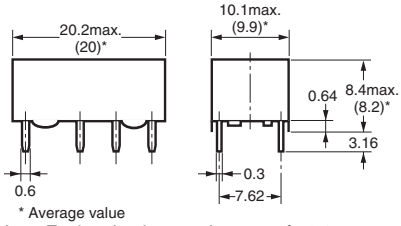
Terminal Arrangement/ Internal Connections
(BOTTOM VIEW)



Note: Check carefully the coil polarity of the Relay.

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

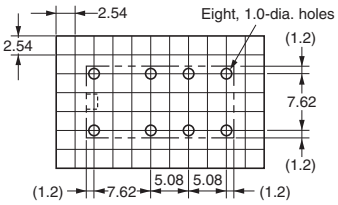




* Average value

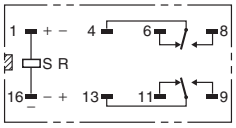
Note: Each value has a tolerance of ±0.3 mm.

PCB Mounting Holes
(BOTTOM VIEW)
Tolerance: ±0.1



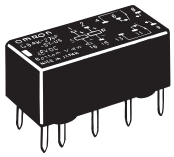
Note: Orientation marks are indicated as follows:

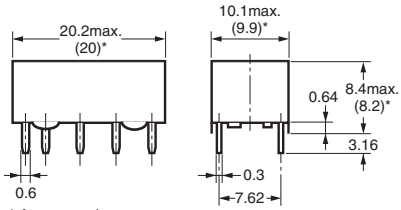
Terminal Arrangement/ Internal Connections
(BOTTOM VIEW)



Note: Check carefully the coil polarity of the Relay.

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

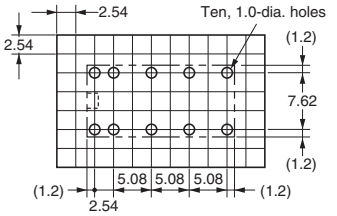




* Average value

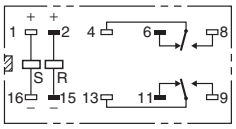
Note: Each value has a tolerance of ±0.3 mm.

PCB Mounting Holes
(BOTTOM VIEW)
Tolerance: ±0.1



Note: Orientation marks are indicated as follows:

Terminal Arrangement/ Internal Connections
(BOTTOM VIEW)



Note: Check carefully the coil polarity of the Relay.

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■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.

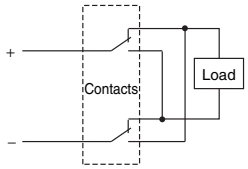
●Relay Handling

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.



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