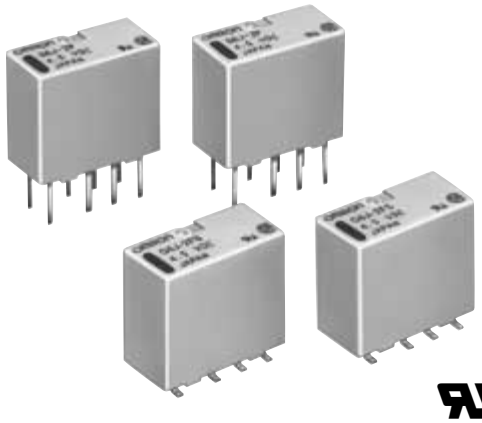
OMRON

Surface-mounting Relay

G6J

Ultra-compact and Slim DPDT Relay with the World's Smallest Mounting Area*

- Dimensions of 4.8 x 10.3 x 9 mm (WxLxH) represent a reduction of approximately 55% in mounting area compared with the OMRON G6S, for higher-density mounting
- Dielectric strength of 1,500 VAC and an impulse withstand voltage of 2,500 V for 2 x 10 μs
- Conforms to FCC Part 68 (i.e., impulse withstand voltage of 1,500 V for 10 x 160 μs between coil and contacts and between contacts of the same polarity)
- Single-winding latching models are available
- Conforms to UL60950 (File No. E41515)/ CSA C22.2 No. 60950 (File No. LR24825)



* The world's smallest mounting area for mechanical relays for DPDT signal use, as determined by comparing the surface-mounting area for models with surface-mounting terminals (short) and models with PCB terminals (as of May 2001, from an OMRON survey).

Ordering Information

Item		Part number	
Terminal	Contact form	Non-latching	Single coil latching
PCB through-hole	DPDT	**G6J-2P**	**G6JU-2P**
SMT Gull-wing		**G6J-2FL**	**G6JU-2FL**
SMT Shortened leads		**G6J-2FS**	**G6JU-2FS**

Note: **1.** When ordering, add the rated coil voltage to the model number.
Example: G6J-2P 12 VDC
└── Rated coil voltage

2. When ordering tape and reel packaging, add "-TR" to the model number.
Example: G6J-2P-TR 12 VDC
└── Tape and reel packaging

3. "-TR" is not part of the relay model number, it is not marked on the relay case.

Model Number Legend:

G6J□-□□
1 2 3

1. Relay function
None: Non-latching, standard
U: Single-coil latching relay

2. Contact form
2: DPDT

3. Terminal shape
P: PCB through-hole terminals
FL: SMT Gull-wing
FS: SMT shortened leads

Application Examples

Communications equipment, measurement devices, computer peripheral devices, office automation equipment, and audio-visual products.

Specifications

■ Contact Data

Rated load	0.3 A @ 125 VAC 1 A @ 30 VDC
Contact material	Ag (Au Clad)
Max. carry current	1 A
Max. operating voltage	125 VAC, 110 VDC
Max. operating current	1 A
Max. switching capacity	37.5 VA, 30 W
Min. permisible load	10m VDC, 10μA

■ Coil Data

G6J Standard, non-latching (G6J-2P, G6J-2FL, G6J-2FS)

Rated voltage (VDC)	Rated current (mA)	Coil resistance (Ω)	Pick-up voltage	Drop-out voltage	Max. voltage	Power consumption (mW)
			% of rated voltage			
3	48.0	62.5	75 % max.	10% min.	150% max.	140
4.5	32.1	140.4				
5	29.2	171.1				
9	15.6	575.5				
12	12.2	979.8				
24	9.2	2,620				230

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

2. The 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 instantaneously.

G6JU Single coil, Latching (G6JU-2P, G6JU-2FL, G6JU-2FS)

Rated voltage (VDC)	Rated current (mA)	Coil resistance (Ω)	Set voltage	Reset voltage	Max. voltage	Power consumption (mW)
			% of rated voltage			
3	33.9	88.5	75 % max.	75% max.	150% max.	100
4.5	21.7	207.4				
5	20.4	245.3				
12	9.2	1,309				
24	6.5	3,672				150

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

2. The 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 instantaneously.

■ Characteristics

Item		Standard non-latching Relays	Single coil latching Relays
		G6J-2P, G6J-2FS, G6J-2FL	G6JU-2P, G6JU-2FS, G6JU-2FL
Contact resistance (initial) (See note 1.)		100 mΩ max.	
Operating (set) time (See note 2.)		3 ms max. (approx. 1.3 ms)	3 ms max. (approx. 1.3 ms)
Release (reset) time (See note 2.)		3 ms max. (approx. 0.8 ms)	3 ms max. (approx. 1.3 ms)
Minimum set/reset pulse width		---	10 ms min. (at 100% rated coil voltage)
Insulation resistance (See note 3.)		1,000 MΩ min. (at 500 VDC)	
Dielectric strength		1,500 VAC, 50/60 Hz for 1 min. between coil and contacts	
		1,000 VAC, 50/60 Hz for 1 min. between contacts of different polarity	
		750 VAC, 50/60 Hz for 1 min. between contacts of the same polarity	
Surge withstand voltage		2,500 VAC, 2 x 10 μs between coil and contacts	
		1,500 VAC, 10 x 160 μs between contacts of the same and different polarity	
Vibration resistance	Mechanical durability	10 to 55 Hz 2.5-mm single amplitude (5-mm double amplitude)	
	Malfunction durability	10 to 55 Hz 1.65-mm single amplitude (3.3-mm double amplitude)	
Shock resistance	Mechanical durability	1,000 m/s^2 (approx. 100G)	
	Malfunction durability	750 m/s^2 (approx. 75G)	
Service life	Mechanical	50,000,000 operations min. (at 36,000 operations/hour)	
	Electrical	100,000 operations min. (with a rated load at 1,800 operations/hour)	
Ambient temperature		−40 to 85°C (-40 to 185°F) with no icing or condensation	
Humidity		5% to 85% RH	
Weight		Approx. 0.8 g	

Note: **1.** The contact resistance was measured with 10 mA at 1 VDC with a fall-of-potential method.

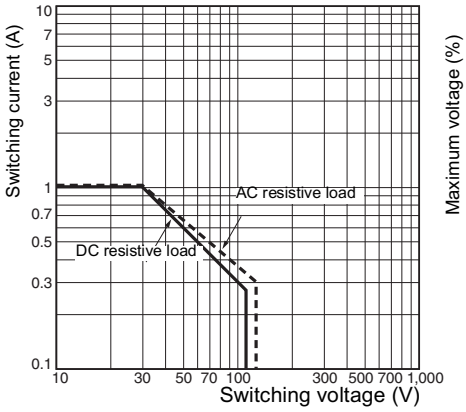
2. Values in parentheses are typical values unless otherwise stated.

3. The insulation resistance was measured with a 500-VDC Megger Tester applied to the same parts as those for checking the dielectric strength.

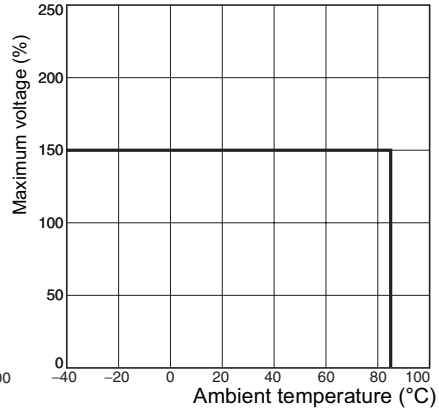
4. The above values are initial values.

Characteristic Data

■ Max. Switching Capacity

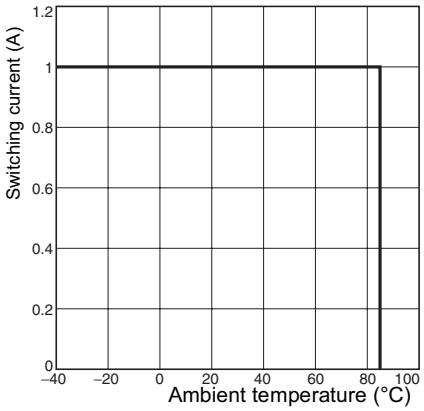


■ Ambient Temperature vs. Maximum Voltage

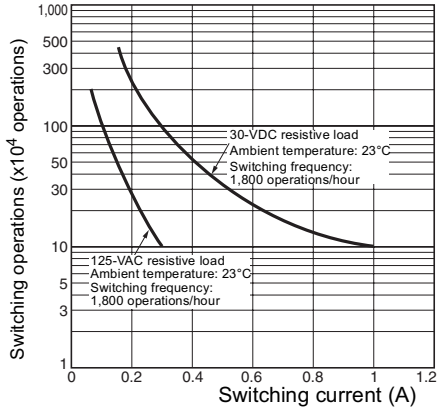


Note: "Maximum voltage" is the maximum voltage that can be applied to the Relay coil.

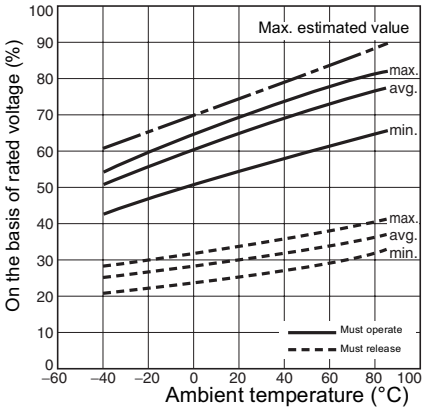
■ Ambient Temperature vs. Switching Current



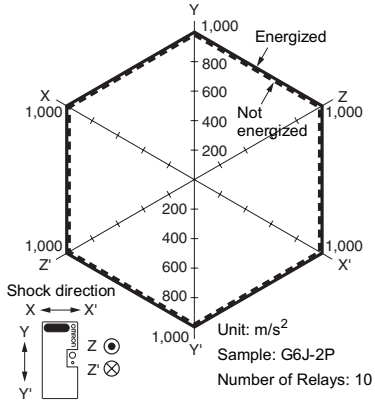
■ Life Expectancy



■ Ambient Temperature vs. Must Operate or Must Release Voltage

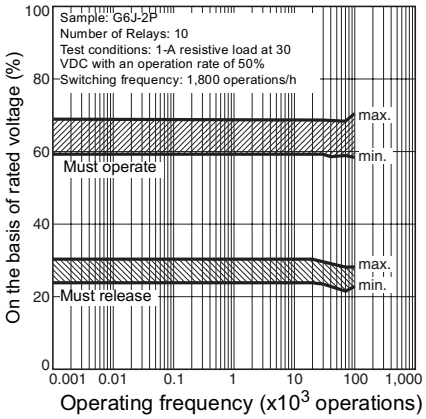


■ Shock Malfunction

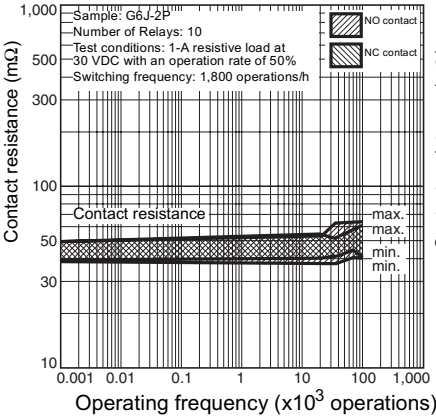


Conditions: Shock is applied in ±X, ±Y, and ±Z directions three times each with and without energizing the Relays to check the number of contact malfunctions.

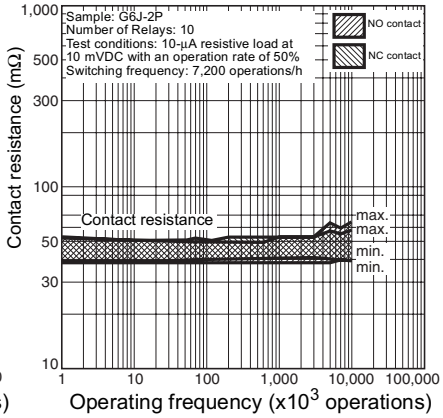
■ Electrical Life Expectancy (with Must Operate and Must Release Voltage)



■ Electrical Life Expectancy (Contact Resistance) (See note.)

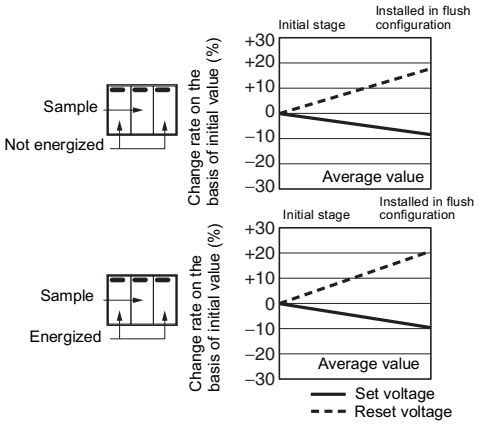


■ Contact Reliability Test (See note.)

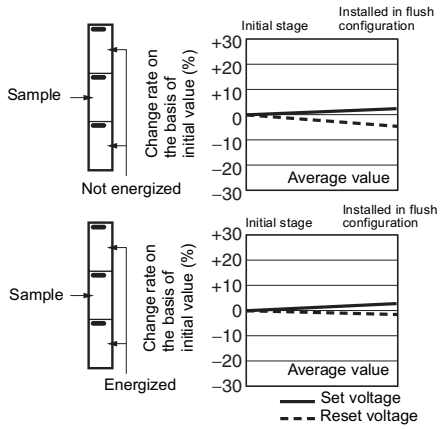


Note: The tests were conducted at an ambient temperature of 23°C.

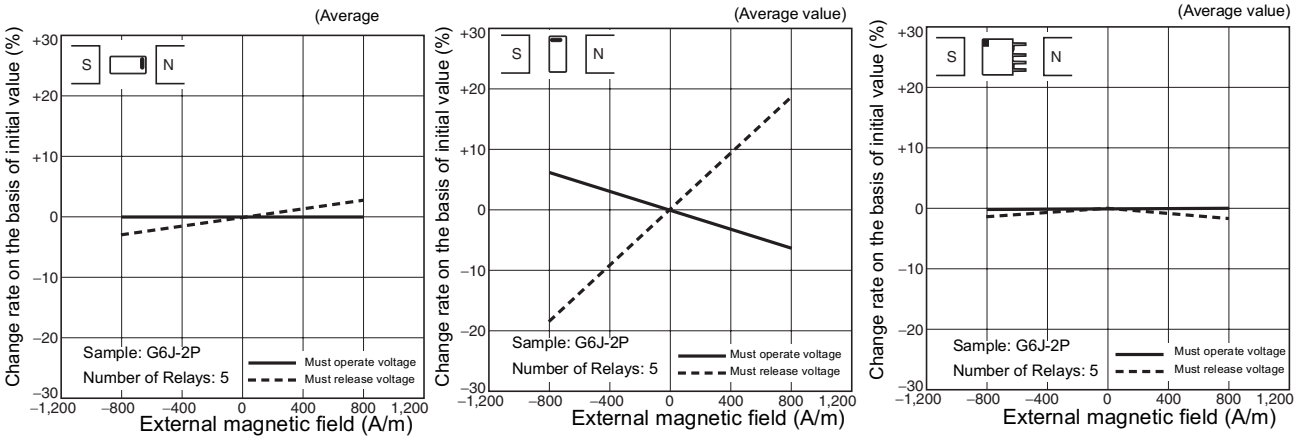
■ Mutual Magnetic Interference



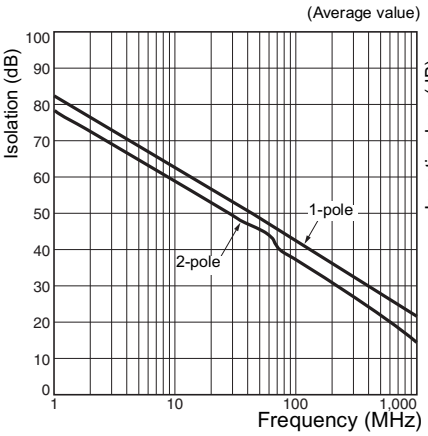
■ Mutual Magnetic Interference



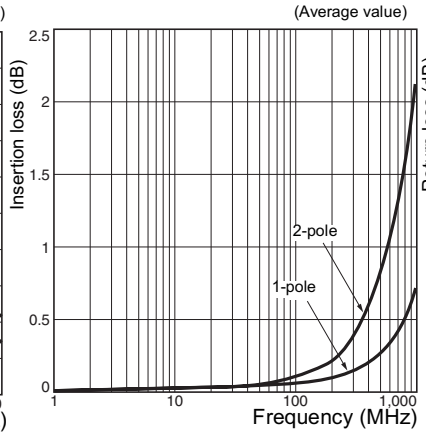
■ External Magnetic Interference



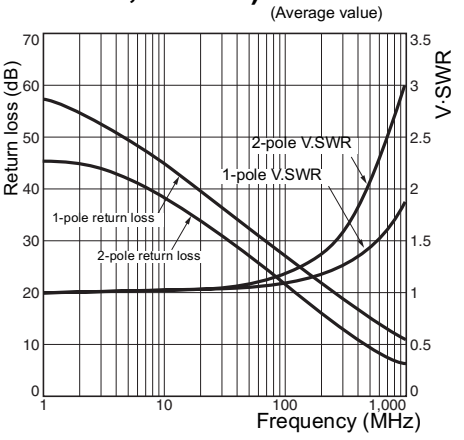
■ High-frequency Characteristics (Isolation)



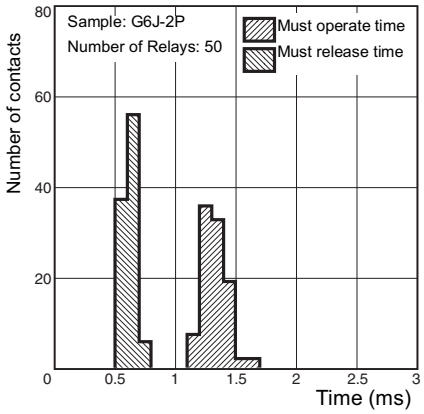
■ High-frequency Characteristics (Isolation)



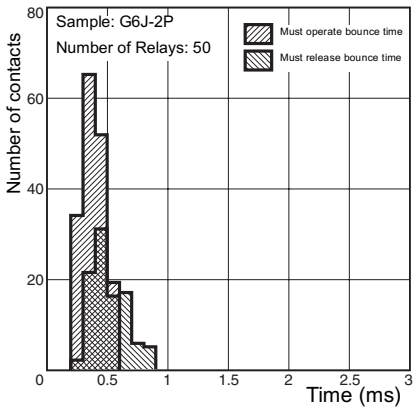
■ High-frequency Characteristics (Return Loss, V.SWR)



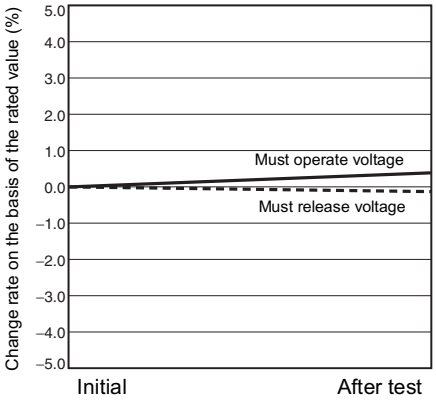
■ Must Operate and Must Release Time Distribution (See note.)



■ Must Operate and Must Release Bounce Time Distribution (See note.)



■ Vibration Resistance



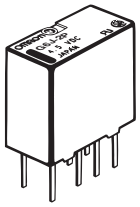
Note: The tests were conducted at an ambient temperature of 23°C.

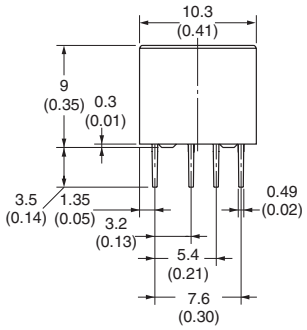
Dimensions

Unit: mm (inch)

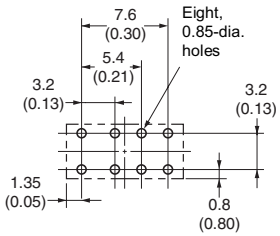
Note: A tolerance of ±0.3 (±0.01) applies to every dimension in the following drawings unless otherwise stated.

■ G6J-2P
G6JU-2P



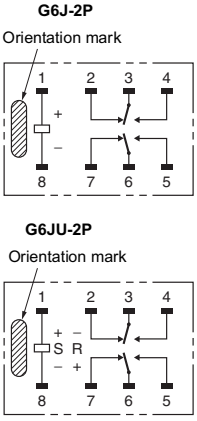


Mounting Dimensions (Bottom View)*

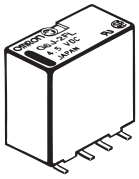


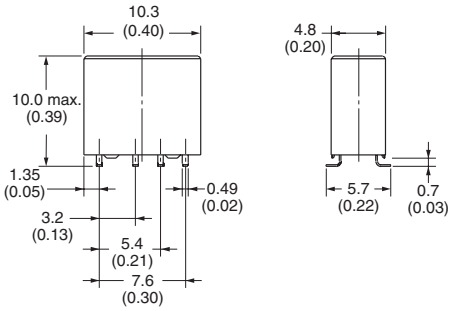
*Tolerance ±0.1 (0.04)

Terminal Arrangement/ Internal Connections (Bottom View)

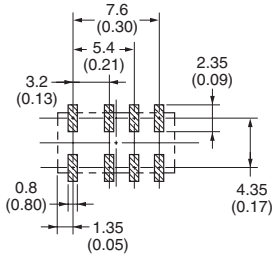


■ G6J-2FL
G6JU-2FL



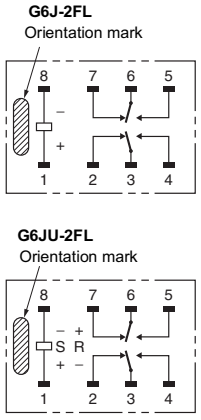


Mounting Dimensions (Top View)*

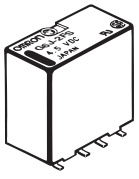


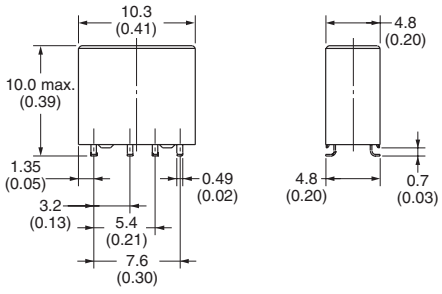
*Tolerance ±0.1 (0.04)

Terminal Arrangement/ Internal Connections (Top View)

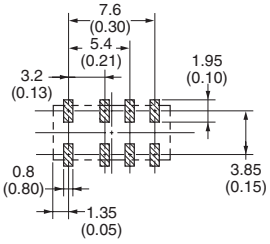


■ G6J-2FS
G6JU-2FS



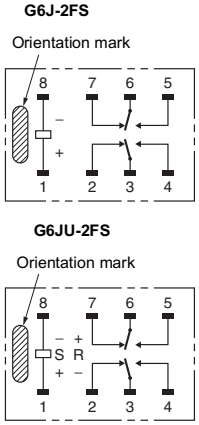


Mounting Dimensions (Top View)*



*Tolerance ±0.1 (0.04)

Terminal Arrangement/ Internal Connections (Top View)

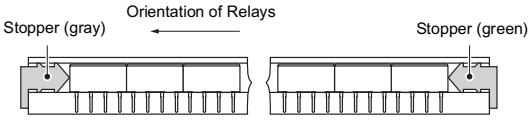


Tube Packaging and Tape Packaging

■ Tube Packaging

Relays in tube packaging are arranged so that the orientation mark of each Relay is on the left side.

Always confirm that the Relays are in the correct orientation when mounting the Relays to the PCBs.



Tube length: 540 mm (21.26 in), stopper not included.

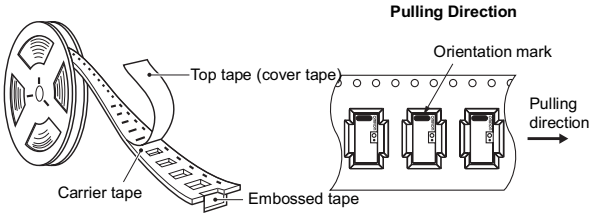
No. of Relays per tube: 50

■ Tape and Reel Packaging (Surface Mount Terminal Relays)

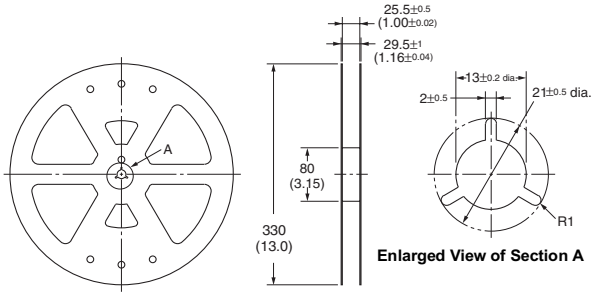
When ordering Relays in tape and reel packaging, add the suffix "-TR" to the model number, or the Relays in tube packaging will be provided.

Tape type: TB2412R (EIAJ (Electronic Industrial Association of Japan))
Reel type: R24D (EIAJ (Electronic Industrial Association of Japan))
Relays per reel: 500

Direction of Relay Insertion

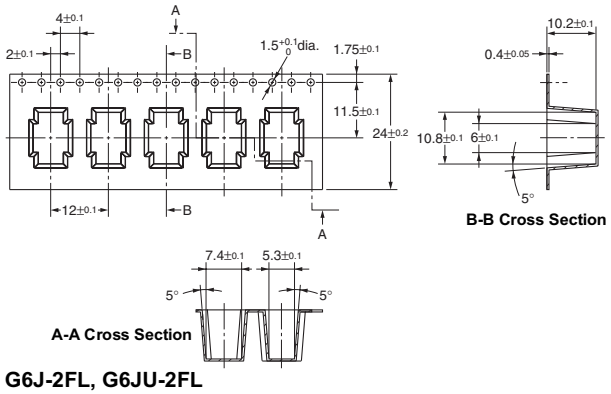


Reel Dimensions

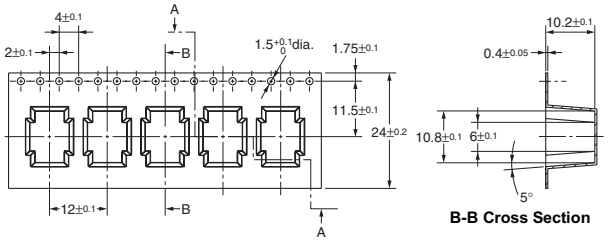


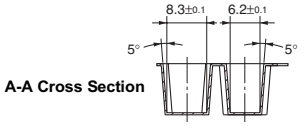
Carrier Tape Dimensions

G6J-2FS, G6JU-2FS



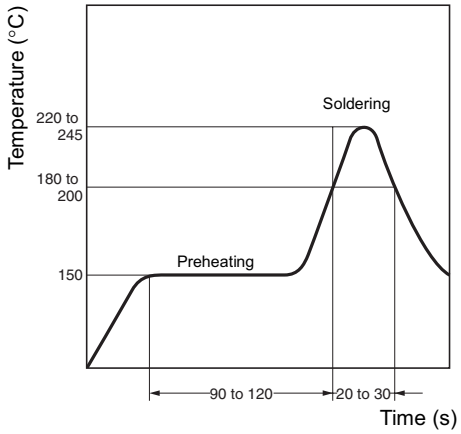
G6J-2FL, G6JU-2FL





Recommended Soldering Method

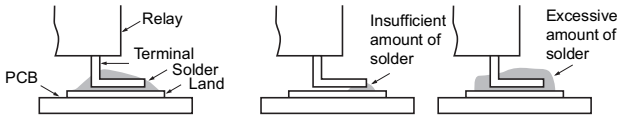
■ IRS Method (for Surface Mount Terminal Relays)



Note: Temperatures indicate the surface temperatures of the PCB

- The thickness of cream solder to be applied should be between 150 and 200 μm on OMRON's recommended PCB pattern.
- In order to perform correct soldering, it is recommended that the correct soldering conditions be maintained as shown below on the left-hand side.

Correct Soldering **Incorrect Soldering**



Visually check that the Relay is properly soldered.

■ Approvals

UL approval: UL60950 (File No. E41515)
CSA approval: C22.2 No. 60950 (File No. LR24825)

Contact form	Coil rating	Contact rating
DPDT	G6J-2P, 2FS, 2FL: 3 to 24 VDC G6JU-2P, 2FS, 2FL: 3 to 24 VDC	1 A at 30 VDC 0.5 A at 60 VDC 0.3 A at 125 VAC

Precautions

For general precautions, refer to the *PCB Relay Catalog* (X033). Familiarize yourself with the precautions and glossary before using the G6J.

■ Correct Use

Handling

Leave Relays in their packaging until you are ready to mount them on the PCB.

Soldering

Solder: JIS Z3282, H63A

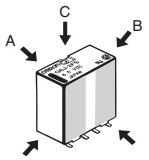
Soldering temperature: Approx. 250°C (At 260°C if the DWS method is used.)

Soldering time: Approx. 5 s max. (Approx. 2 s for the first time and approx. 3 s for the second time if the DWS method is used.)

Be sure to adjust the level of the molten solder so that the solder will not overflow onto the PCB.

Claw Securing Force During Automatic Insertion

During automatic insertion of Relays, make sure to set the securing force of the claws to the following values so that the Relay characteristics will be maintained.



Direction A: 4.90 N max.
Direction B: 9.80 N max.
Direction C: 9.80 N max.

Secure the claws to the area indicated by shading.
Do not attach them to the center area or to only part of the Relay.

Environmental Conditions During Operation, Storage, and Transportation

Protect the Relays from direct sunlight and keep the Relays under normal temperature, humidity, and pressure.

Mounting Latching Relays

Make sure that the vibration or shock that is generated from other devices, such as Relays in operation, on the same panel and imposed on the Latching Relays does not exceed the rated value, or the Latching Relays that have been set may be reset or vice versa. The Latching Relays are reset before shipping. If excessive vibration or shock is imposed, however, the Latching Relays may be set accidentally. Be sure to apply a reset signal before use.

Maximum Voltage

The maximum voltage of the coil can be obtained from the coil temperature increase and the heat-resisting temperature of coil insulating sheath material. (Exceeding the heat-resisting temperature may result in burning or short-circuiting.) The maximum voltage also involves important restrictions which include the following:

- Must not cause thermal changes or deterioration of the insulating material.
- Must not cause damage to other control devices.
- Must not cause any harmful effect on people.
- Must not cause fire.

Therefore, be sure not to exceed the maximum voltage specified in the catalog.

As a rule, the rated voltage must be applied to the coil. A voltage exceeding the rated value, however, can be applied to the coil provided that the voltage is less than the maximum voltage. It must be noted that continuous voltage application to the coil will cause a coil temperature increase thus affecting characteristics such as electrical life and resulting in the deterioration of coil insulation.

Coating

Relays mounted on PCBs may be coated or washed. Do not apply silicone coating or detergent containing silicone, or the silicone coating or detergent may remain on the surface of the Relays.

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

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