Surface-mounting Relay

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 North American Telcordia specifications (formerly Bellcore)).
- 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 to save energy.
- 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

<table>
<thead>
<tr>
<th>Classification</th>
<th>Single-side stable</th>
<th>Single-winding latching</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPDT Plastic sealed Through-hole terminal</td>
<td>G6J-2P</td>
<td>G6JU-2P</td>
</tr>
<tr>
<td>Surface mount terminal Short</td>
<td>G6J-2FS</td>
<td>G6JU-2FS</td>
</tr>
<tr>
<td>Long</td>
<td>G6J-2FL</td>
<td>G6JU-2FL</td>
</tr>
</tbody>
</table>

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

2. When ordering tape packing, add “-TR” to the model number.
Example: G6J-2P-TR 12 VDC

Be sure since “-TR” is not part of the relay model number, it is not marked on the relay case.

Model Number Legend:

G6J□□□□
1. Relay function
None: Single-side stable relay
U: Single-winding latching relay
2. Contact form
2: DPDT
3. Terminal shape
P: PCB terminals
FS: Surface-mounting terminals, short
FL: Surface-mounting terminals, long

Application Examples
Telephones, communications equipment, measurement devices, office automation machines, and audio-visual products.
Specifications

- **Contact mechanism:** Crossbar twin Ag (Au-alloy contact)
- **Enclosure rating:** Plastic-sealed

### Coil Ratings

**Single-side Stable Relays (G6J-2P, G6J-2FS, G6J-2FL)**

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>3 VDC</th>
<th>4.5 VDC</th>
<th>5 VDC</th>
<th>12 VDC</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated current</td>
<td>48.0 mA</td>
<td>32.1 mA</td>
<td>29.2 mA</td>
<td>12.2 mA</td>
<td>9.2 mA</td>
</tr>
<tr>
<td>Coil resistance</td>
<td>62.5 Ω</td>
<td>140.4 Ω</td>
<td>171.1 Ω</td>
<td>979.8 Ω</td>
<td>2,620 Ω</td>
</tr>
<tr>
<td>Must operate voltage</td>
<td>75% max. of rated voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Must release voltage</td>
<td>10% min. of rated voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. voltage</td>
<td>150% of rated voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>Approx. 140 mW</td>
<td>Approx. 230 mW</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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.

**Single-winding Latching Relays (G6JU-2P, G6JU-2FS, G6JU-2FL)**

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>3 VDC</th>
<th>4.5 VDC</th>
<th>5 VDC</th>
<th>12 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated current</td>
<td>33.9 mA</td>
<td>21.7 mA</td>
<td>20.4 mA</td>
<td>9.2 mA</td>
</tr>
<tr>
<td>Coil resistance</td>
<td>88.5 Ω</td>
<td>207.8 Ω</td>
<td>245.3 Ω</td>
<td>1,309 Ω</td>
</tr>
<tr>
<td>Must operate voltage</td>
<td>75% max. of rated voltage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Must release voltage</td>
<td>75% max. of rated voltage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. voltage</td>
<td>150% of rated voltage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>Approx. 100 mW</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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.

### Contact Ratings

<table>
<thead>
<tr>
<th>Load</th>
<th>Resistive load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated load</td>
<td>0.3 A at 125 VAC, 1 A at 30 VDC</td>
</tr>
<tr>
<td>Rated carry current</td>
<td>1 A</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>125 VAC, 110 VDC</td>
</tr>
<tr>
<td>Max. switching current</td>
<td>1 A</td>
</tr>
</tbody>
</table>
# Characteristics

<table>
<thead>
<tr>
<th>Item</th>
<th>Single-side Stable Relays</th>
<th>Single-winding Latching Relays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact resistance (See note 1.)</td>
<td>100 mΩ max.</td>
<td></td>
</tr>
<tr>
<td>Operating (set) time (See note 2.)</td>
<td>3 ms max. (approx. 1.3 ms)</td>
<td>3 ms max. (approx. 1.3 ms)</td>
</tr>
<tr>
<td>Release (reset) time (See note 2.)</td>
<td>3 ms max. (approx. 0.8 ms)</td>
<td>3 ms max. (approx. 1.3 ms)</td>
</tr>
<tr>
<td>Minimum set/reset signal width</td>
<td>---</td>
<td>10 ms min.</td>
</tr>
<tr>
<td>Insulation resistance (See note 3.)</td>
<td>1,000 MΩ min. (at 500 VDC)</td>
<td></td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>Coil and contacts</td>
<td>1,500 VAC, 50/60 Hz for 1 min</td>
</tr>
<tr>
<td></td>
<td>Contacts of different polarity</td>
<td>1,000 VAC, 50/60 Hz for 1 min</td>
</tr>
<tr>
<td></td>
<td>Contacts of same polarity</td>
<td>750 VAC, 50/60 Hz for 1 min</td>
</tr>
<tr>
<td>Impulse withstand voltage</td>
<td>Coil and contacts</td>
<td>2,500 VAC, 2 x 10 µs</td>
</tr>
<tr>
<td></td>
<td>Contacts of different polarity</td>
<td>1,500 VAC, 10 x 160 µs</td>
</tr>
<tr>
<td></td>
<td>Contacts of same polarity</td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>Destruction: 10 to 55 Hz 2.5-mm single amplitude (5-mm double amplitude)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Malfunction: 10 to 55 Hz 1.65-mm single amplitude (3.3-mm double amplitude)</td>
<td></td>
</tr>
<tr>
<td>Shock resistance</td>
<td>Destruction: 1,000 m/s² (approx. 100G)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Malfunction: 750 m/s² (approx. 75G)</td>
<td></td>
</tr>
<tr>
<td>Life expectancy</td>
<td>Mechanical: 50,000,000 operations min. (at 36,000 operations/hour)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electrical: 100,000 operations min. (with a rated load at 1,800 operations/hour)</td>
<td></td>
</tr>
<tr>
<td>Failure rate (P level) (See note 4.)</td>
<td>10 µA at 10 mVDC</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>−40 to 85°C (with no icing or condensation)</td>
<td></td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>5% to 85%</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 0.8 g</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
1. The contact resistance was measured with 10 mA at 1 VDC with a fall-of-potential method.
2. Values in parentheses are actual values.
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. This value was measured at a switching frequency of 120 operations/min.
5. The above values are initial values.
Engineering Data

Max. Switching Capacity

Ambient Temperature vs. Maximum Voltage

Ambient Temperature vs. Switching Current

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

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) (See note.)

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

Sample: Not energized
Initial stage Installed in flush configuration
Change rate on the basis of initial value (%)
Set voltage - Reset voltage

Sample: Energized
Initial stage Installed in flush configuration
Change rate on the basis of initial value (%)
Set voltage - Reset voltage

External Magnetic Interference

(Average value)
Sample: G6J-2P
Number of Relays: 5
External magnetic field (A/m)
Change rate on the basis of initial value (%)
Set voltage - Reset voltage

High-frequency Characteristics
(Isolation)
Frequency (MHz)
Isolation (dB)
1-pole
2-pole

High-frequency Characteristics
(Return Loss, V.SWR)
Frequency (MHz)
Return loss (dB)
V.SWR
Note: The tests were conducted at an ambient temperature of 23°C.
### Dimensions

**Note:** All units are in millimeters unless otherwise indicated.

#### G6J-2P

**Mounting Dimensions (Bottom View)**
- Tolerance ±0.1 mm

#### G6JU-2P

**Terminal Arrangement/Internal Connections (Bottom View)**
- Orientation mark

#### G6J-2FS

**Mounting Dimensions (Top View)**
- Tolerance ±0.1 mm

#### G6JU-2FS

**Terminal Arrangement/Internal Connections (Top View)**
- Orientation mark

#### G6J-2FL

**Mounting Dimensions (Top View)**
- Tolerance ±0.1 mm

#### G6JU-2FL

**Terminal Arrangement/Internal Connections (Top View)**
- Orientation mark

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

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Each value has a tolerance of ±0.3 mm.

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Eight, 0.85-dia. holes
Stick Packing and Tape Packing

1. Stick Packing
Relays in stick packing 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.

Stick length: 540 mm (stopper not included)
No. of Relays per stick: 50

2. Tape Packing (Surface-mounting Terminal Relays)
When ordering Relays in tape packing, add the prefix "-TR" to the model number, otherwise the Relays in stick packing 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

Carrier Tape Dimensions
G6J-2FS, G6JU-2FS

Reel Dimensions
Recommended Soldering Method

IRS Method (for Surface-mounting Terminal Relays)

- 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**

Visually check that the Relay is properly soldered.

**Incorrect Soldering**

Note: Temperatures indicate the surface temperatures of the PCB

### Approved Standards

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

<table>
<thead>
<tr>
<th>Contact form</th>
<th>Coil rating</th>
<th>Contact rating</th>
<th>Number of test operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPDT</td>
<td>G6J-2P, 2FS, 2FL: 3 to 24 VDC</td>
<td>1 A at 30 VDC</td>
<td>6,000</td>
</tr>
<tr>
<td></td>
<td>G6JU-2P, 2FS, 2FL: 3 to 24 VDC</td>
<td>0.5 A at 60 VDC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.3 A at 125 VAC</td>
<td></td>
</tr>
</tbody>
</table>
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 the Relays packed until just prior to mounting them.

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.

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, otherwise 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.

Coating

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

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.

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

Secure the claws to the area indicated by shading.

Direction A: 4.90 N max.
Direction B: 9.80 N max.
Direction C: 9.80 N max.
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.