Compact, Industry-Standard 2-pole relay, designed to switch 2A Signal Loads.

- Long terminals for ideal for soldering and mounting reliability. (Surface mounting terminal models)
- Space-saving inside-L terminal. (Surface mounting terminal models)
- Unique terminal structure, designed to withstand IRS soldering processes. (Surface mounting terminal models)
- High dielectric strength (2,000 VAC) and impulse withstand voltage between coil and contacts (2,500 V, 2 × 10 μs: Telcordia requirements).
- Ultra-miniature at 9.4 mm (H) × 7.5 mm (W) × 15 mm (L).
- Models available with BSI (EN62368-1) supplementary insulation certification. (-Y type)

**RoHS Compliant**

### Model Number Legend

<table>
<thead>
<tr>
<th>G6S-□-□-□-□</th>
</tr>
</thead>
</table>

1. **Relay Function**
   - None : Single-side stable
   - U : Single-winding latching
   - K : Double-winding latching

2. **Number of poles/Contact form**
   - 2: 2-pole/DPDT (2c)

3. **Terminal Shape**
   - None : PCB terminals
   - F : Outside-L surface mounting terminals
   - G : Inside-L surface mounting terminals

4. **Approved Standards**
   - None : UL, CSA
   - Y : UL, CSA, BSI (EN62368-1)

### Ordering Information

<table>
<thead>
<tr>
<th>Packing</th>
<th>Tube Packing</th>
<th>Tape Packing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Rated coil voltage</td>
<td>Minimum packing unit</td>
</tr>
<tr>
<td>G6S-2F</td>
<td>3 VDC</td>
<td></td>
</tr>
<tr>
<td>G6S-2G</td>
<td>4.5 VDC</td>
<td>5 VDC</td>
</tr>
<tr>
<td>G6S-2F-Y</td>
<td>12 VDC</td>
<td>24 VDC</td>
</tr>
<tr>
<td>G6SU-2F</td>
<td>3 VDC</td>
<td>5 VDC</td>
</tr>
<tr>
<td>G6SU-2G</td>
<td>4.5 VDC</td>
<td>12 VDC</td>
</tr>
<tr>
<td>G6SU-2F-Y</td>
<td>24 VDC</td>
<td></td>
</tr>
<tr>
<td>G6SU-2G-Y</td>
<td>5 VDC</td>
<td>24 VDC</td>
</tr>
<tr>
<td>G6SK-2F</td>
<td>3 VDC</td>
<td>4.5 VDC</td>
</tr>
<tr>
<td>G6SK-2G</td>
<td>4.5 VDC</td>
<td>5 VDC</td>
</tr>
<tr>
<td></td>
<td>12 VDC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24 VDC</td>
<td></td>
</tr>
</tbody>
</table>

**Note 1.** When ordering, add the rated coil voltage to the model number.

Example: G6S-2F DC3

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

**Note 2.** When ordering tape packing, add -TR to the model number.

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

**Note 3.** When ordering tape packing, minimum order unit is 2 reels (400 pcs × 2 = 800 pcs).

**Note 4.** Surface mounting terminal (SMT) standard models are shipped in moisture-proof package.

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**Application Examples**

- Telecommunication equipment
- Measurement devices
- Office automation machines
- Audio-visual products
- Security equipment
- Building automation equipment
- Industrial equipment
- Amusement equipment
- Home appliances

---

**Enclosure rating**

- Single-side stable
- Fully sealed
- Single-winding latching
- Double-winding latching

**Contact form**

- DPDT (2c)
## G6S Surface-mounting Relay

### PCB Terminal Standard Models

<table>
<thead>
<tr>
<th>Enclosure rating</th>
<th>Contact form</th>
<th>Relay Function</th>
<th>Single-side stable</th>
<th>Single-winding latching</th>
<th>Double-winding latching</th>
<th>Minimum packing unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>G6S Terminal</td>
<td>G6S-2</td>
<td>G6SU-2</td>
<td>G6SK-2</td>
<td>50 pcs/tube</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Model</td>
<td>Rated coil voltage</td>
<td>Model</td>
<td>Model</td>
<td></td>
</tr>
<tr>
<td>Fully sealed</td>
<td>DPDT (2c)</td>
<td>G6S-2</td>
<td>3 VDC</td>
<td>G6SU-2</td>
<td>G6SK-2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.5 VDC</td>
<td>4.5 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 VDC</td>
<td>5 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12 VDC</td>
<td>12 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>24 VDC</td>
<td>24 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>G6S-2-Y</td>
<td>5 VDC</td>
<td>G6SU-2-Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12 VDC</td>
<td>12 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>24 VDC</td>
<td>24 VDC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note 1.** When ordering, add the rated coil voltage to the model number.

Example: G6S-2 DC3

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

**Note 2.** PCB terminal standard types do not require moisture proof packaging and therefore shipped in non-moisture-proof package.

### Ratings

#### Single-side Stable Model

<table>
<thead>
<tr>
<th>Model</th>
<th>Rated voltage</th>
<th>Rated current (mA)</th>
<th>Coil resistance (Ω)</th>
<th>Must operate voltage (V)</th>
<th>Must release voltage (V)</th>
<th>Max. voltage (V)</th>
<th>Power consumption (mW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G6S-2</td>
<td>DC</td>
<td>3</td>
<td>46.7</td>
<td>64.3</td>
<td>75% max.</td>
<td>200% (at 23°C)</td>
<td>Approx. 140</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.5</td>
<td>31</td>
<td>146</td>
<td>75% max.</td>
<td>170% (at 23°C)</td>
<td>Approx. 200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>28.1</td>
<td>178</td>
<td>75% max.</td>
<td>170% (at 23°C)</td>
<td>Approx. 200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>11.7</td>
<td>1,028</td>
<td>75% max.</td>
<td>170% (at 23°C)</td>
<td>Approx. 200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
<td>8.3</td>
<td>2,880</td>
<td>75% max.</td>
<td>170% (at 23°C)</td>
<td>Approx. 200</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. 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.

#### Single-winding Latching Model

<table>
<thead>
<tr>
<th>Model</th>
<th>Rated voltage</th>
<th>Rated current (mA)</th>
<th>Coil resistance (Ω)</th>
<th>Must operate voltage (V)</th>
<th>Must release voltage (V)</th>
<th>Max. voltage (V)</th>
<th>Power consumption (mW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G6SU-2</td>
<td>DC</td>
<td>3</td>
<td>33.3</td>
<td>90</td>
<td>75% max.</td>
<td>180% (at 23°C)</td>
<td>Approx. 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.5</td>
<td>22.2</td>
<td>203</td>
<td>75% max.</td>
<td>180% (at 23°C)</td>
<td>Approx. 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>20</td>
<td>250</td>
<td>75% max.</td>
<td>180% (at 23°C)</td>
<td>Approx. 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>8.3</td>
<td>1,440</td>
<td>75% max.</td>
<td>180% (at 23°C)</td>
<td>Approx. 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
<td>6.3</td>
<td>3,840</td>
<td>75% max.</td>
<td>180% (at 23°C)</td>
<td>Approx. 100</td>
</tr>
<tr>
<td>G6SU-2-Y</td>
<td>DC</td>
<td>5</td>
<td>28.1</td>
<td>178</td>
<td>75% max.</td>
<td>200% (at 23°C)</td>
<td>Approx. 140</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>11.7</td>
<td>1,028</td>
<td>75% max.</td>
<td>200% (at 23°C)</td>
<td>Approx. 140</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
<td>5.8</td>
<td>4,114</td>
<td>75% max.</td>
<td>200% (at 23°C)</td>
<td>Approx. 140</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. 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.

#### Double-winding Latching Model

<table>
<thead>
<tr>
<th>Model</th>
<th>Rated voltage</th>
<th>Rated current (mA)</th>
<th>Coil resistance (Ω)</th>
<th>Must operate voltage (V)</th>
<th>Must release voltage (V)</th>
<th>Max. voltage (V)</th>
<th>Power consumption (mW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G6SK-2</td>
<td>DC</td>
<td>3</td>
<td>66.6</td>
<td>45</td>
<td>75% max.</td>
<td>170% (at 23°C)</td>
<td>Approx. 200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.5</td>
<td>44.4</td>
<td>101</td>
<td>75% max.</td>
<td>140% (at 23°C)</td>
<td>Approx. 300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>40</td>
<td>125</td>
<td>75% max.</td>
<td>140% (at 23°C)</td>
<td>Approx. 300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>16.7</td>
<td>720</td>
<td>75% max.</td>
<td>140% (at 23°C)</td>
<td>Approx. 300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
<td>12.5</td>
<td>1,920</td>
<td>75% max.</td>
<td>140% (at 23°C)</td>
<td>Approx. 300</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. 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

<table>
<thead>
<tr>
<th>Item</th>
<th>Load</th>
<th>Resistive load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated load</td>
<td>0.5 A at 125 VAC; 2 A at 30 VDC</td>
<td></td>
</tr>
<tr>
<td>Rated carry current</td>
<td>2 A</td>
<td></td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>250 VAC, 220 VDC</td>
<td></td>
</tr>
<tr>
<td>Max. switching current</td>
<td>2 A</td>
<td></td>
</tr>
</tbody>
</table>
### Characteristics

<table>
<thead>
<tr>
<th>Item</th>
<th>Relay Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact resistance *1</td>
<td>Single-side Stable G6S-2, G6S-2F, G6S-2G</td>
</tr>
<tr>
<td>Operate (set) time</td>
<td>7.5 mΩ max.</td>
</tr>
<tr>
<td>Release (reset) time</td>
<td>4 ms max.</td>
</tr>
<tr>
<td>Min. set/reset pulse width</td>
<td>10 ms</td>
</tr>
<tr>
<td>Insulation resistance *2</td>
<td>1,000 MΩ max. (min. 500 VDC)</td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>Between coil and contacts 2,000 VAC, 50/60 Hz for 1 min</td>
</tr>
<tr>
<td></td>
<td>Between contacts of different polarity 1,500 VAC, 50/60 Hz for 1 min</td>
</tr>
<tr>
<td></td>
<td>Between contacts of the same polarity 1,000 VAC, 50/60 Hz for 1 min</td>
</tr>
<tr>
<td></td>
<td>Between set and reset coil 500 VAC, 50/60 Hz for 1 min</td>
</tr>
<tr>
<td>Insulation distance</td>
<td>Between coil and contacts Clearance: 1 mm, Creepage: 1.5 mm</td>
</tr>
<tr>
<td>Impulse withstand voltage</td>
<td>2,500 V (2 × 10 μs); 1,500 V (10 × 16 μs)</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>Malfunction 10 to 55 to 10 Hz, 2.5 mm single amplitude (5 mm double amplitude)</td>
</tr>
<tr>
<td>Shock resistance</td>
<td>Destruction 1,000 m/s²</td>
</tr>
<tr>
<td>Durability</td>
<td>Mechanical 100,000 operations min. (at 38,000 operations/hr)</td>
</tr>
<tr>
<td></td>
<td>Electrical 100,000 operations min. for AC (at 1,800 operations/h with rated load)</td>
</tr>
<tr>
<td></td>
<td>100,000 operations min. for DC (at 1,200 operations/h with rated load)</td>
</tr>
<tr>
<td>Failure rate (P level)</td>
<td>10 μA at 10 m VDC</td>
</tr>
<tr>
<td>Ambient operating temperature</td>
<td>-40°C to 65°C (with no icing or condensation) and -40°C to 70°C (with no icing or condensation) only for double-winding latching 24 VDC and -Y type 24 VDC</td>
</tr>
<tr>
<td>Ambient operating humidity</td>
<td>5% to 85%</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 2 g</td>
</tr>
</tbody>
</table>

Note: The above values are initial values.

*1. The contact resistance was measured with 10 mΩ 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 120 operations/min and the criterion of contact resistance is 50 mΩ. 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 Capacity

![Maximum Switching Capacity Graph](image1)

#### Durability G6S-2F(G)

![Durability G6S-2F(G) Graph](image2)

#### Ambient Temperature vs. Maximum Voltage (Single-side Stable)

![Ambient Temperature vs. Maximum Voltage (Single-side Stable) Graph](image3)

#### Ambient Temperature vs. Must Operate or Must Release Voltage G6S-2F(G)

![Ambient Temperature vs. Must Operate or Must Release Voltage G6S-2F(G) Graph](image4)

#### Shock Malfunction G6S-2F(G)

![Shock Malfunction G6S-2F(G) Graph](image5)

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

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.
Surface-mounting Relay

- **Electrical Endurance (with Must Operate and Must Release Voltage)**
  - **G6S-2F(G)**

- **Contact Reliability Test (Contact Resistance)**
  - **G6S-2F(G)**

- **Mutual Magnetic Interference**
  - **G6S-2F(G)**

- **High-frequency Characteristics (Isolation)**
  - **G6S-2F(G)** (Average value)

- **High-frequency Characteristics (Insertion Loss)**
  - **G6S-2F(G)** (Average value)

- **High-frequency Characteristics (Return Loss, V.SWR)**
  - **G6S-2F(G)** (Average value)

---

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.
3. 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
**G6S-2F**
**G6S-2F-Y**

![Diagram of G6S-2F](image)

**G6S-2G**
**G6S-2G-Y**

![Diagram of G6S-2G](image)

### Single-winding Latching
**G6SU-2F**
**G6SU-2F-Y**

![Diagram of G6SU-2F](image)

**G6SU-2G**
**G6SU-2G-Y**

![Diagram of G6SU-2G](image)

**G6SU-2**
**G6SU-2-Y**

![Diagram of G6SU-2](image)

---

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

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

Note 1. Each value has a tolerance of ±0.3 mm.
Note 2. The coplanarity of the terminals is 0.1 mm max.

**PCB Mounting Holes (Bottom View)**
Eight, 1-dia. holes

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

Note: Check carefully the coil polarity of the Relay.
Double-winding Latching
G6SK-2F

Mounting Dimensions (Top View)
Tolerance: ±0.1 mm

Terminal Arrangement/ Internal Connections
(Top View)
Orientation mark

Note: Each value has a tolerance of ±0.3 mm.
Note 2: The coplanarity of the terminals is 0.1 mm max.

Note: Check carefully the coil polarity of the Relay.

G6SK-2G

Mounting Dimensions (Top View)
Tolerance: ±0.1 mm

Terminal Arrangement/ Internal Connections
(Top View)
Orientation mark

Note: Each value has a tolerance of ±0.3 mm.
Note 2: The coplanarity of the terminals is 0.1 mm max.

Note: Check carefully the coil polarity of the Relay.

G6SK-2

PCB Mounting Holes
(Bottom View)

Terminal Arrangement/ Internal Connections
(Bottom View)
Orientation mark

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

Note: Check carefully the coil polarity of the Relay.
Surface-mounting Relay

Tube Packing and Tape Packing

Surface mounting terminal (SMT) standard models are shipped in moisture-proof package, and PCB terminal standard types do not require moisture proof packaging and therefore shipped in non-moisture-proof package. Please refer to “Correct Use” for handling after opening moisture-proof packaging for Surface mounting terminal (SMT) models.

1. Tube Packing
- Relays in tube packing are arranged so that the orientation mark of each Relay is on the left side.
- Be sure not to make mistakes in Relay orientation when mounting the Relay to the PCB.

   Tube length: 772 mm (stopper not included)
   No. of Relays per tube: 50 pcs

2. Tape Packing (Surface Mounting Terminal Models)
- When ordering Relays in tape packing, add the prefix “-TR” to the model number, otherwise the Relays in tube packing will be provided.
- Relays per Reel: 400 pcs
- Minimum packing unit: 2 reels (800 pcs)

1. Direction of Relay Insertion

2. Reel Dimensions

3. Carrie Tape Dimensions

G6S-2F(-Y), G6SU-2F, G6SK-2F

G6S-2G(-Y), G6SU-2G, G6SK-2G
Recommended Soldering Method

(1) IRS Method (Mounting Solder: Lead)

- The thickness of cream solder to be applied should be within a range 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 side.

Correct Soldering

Incorrect Soldering

Visually check that the Relay is properly soldered.

(2) IRS Method (Mounting Solder: Lead-free)

Approved Standards

UL recognized: (File No. E41515)
CSA certified: (File No. LR31928)

Precautions

- Please refer to “PCB Relays Common Precautions” for 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

- Use the Relay as soon as possible after opening the moistureproof package. (As a guideline, use the Relay within one week at 30°C or less and 60% RH or less.) If the Relay is left for a long time after opening the moisture-proof package, the appearance may suffer and seal failure may occur after the solder mounting process. To store the Relay after opening the moisture-proof package, place it into the original package and sealed the package with adhesive tape.
- 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.

Claw Securing Force During Automatic Mounting

Contact form | Coil ratings | Contact ratings | Number of test operations
--- | --- | --- | ---
DPDT (2c) | 3 to 24 VDC | 3 A, 30 VDC at 40°C 0.3 A, 110 VDC at 40°C 0.5 A, 125 VAC at 40°C | 6,000

BSI (EN62368-1) (File No. VC657351) (-Y type)

Contact form | Isolation category | Voltage
--- | --- | ---
DPDT (2c) | Supplementary Insulation | 250 VAC
During automatic insertion of Relays, be sure to set the securing force of each claw to the following so that the Relay's characteristics will be maintained.

Dimension A: 1.96 N max.
Dimension B: 4.90 N max.
Dimension C: 1.96 N max.

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