G6D PCB Power Relay

Slim, Miniature Relay, Capable of Relaying Programmable Controller and Temperature Controller Outputs

- Reduced board space, ideal for high-density mounting (45%). (6.5 mm (W) × 17.5 mm (L) × 12.5 mm (H))
- Small, yet switches 5 A at 250 VAC/30 VDC.
- Allows 300,000 operations with a 2A load at 250 VAC or 30 VDC.

RoHS Compliant

Model Number Legend

G6D-□□-□-□

1. Number of Poles
   1: 1-pole
2. Contact Form
   A: SPST-NO (1a)
3. Contact Material
   ASI: Silver alloy
   (cadmium-free)
4. Contact surface
   AP: Au plated

Ordering Information

<table>
<thead>
<tr>
<th>Enclosure rating</th>
<th>Contact form</th>
<th>Terminal shape</th>
<th>Model</th>
<th>Rated coil voltage</th>
<th>Minimum packing unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully sealed</td>
<td>SPST-NO (1a)</td>
<td>PCB terminals</td>
<td>G6D-1A-ASI</td>
<td>5 VDC</td>
<td>25 pcs/tube</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>G6D-1A-ASI-AP</td>
<td>12 VDC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24 VDC</td>
<td></td>
</tr>
</tbody>
</table>

Note. When ordering, add the rated coil voltage to the model number.
Example: G6D-1A-ASI DC5
However, the notation of the coil voltage on the product case as well as on the packing will be marked as □□□ VDC.

Connecting Socket

Applicable relay | Model | Minimum packing unit |
-----------------|-------|----------------------|
G6D-1A-ASI       | P6D-04P | 25 pcs               |

Characteristics

<table>
<thead>
<tr>
<th>Contact resistance</th>
<th>100 mΩ max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operate time</td>
<td>10 ms max.</td>
</tr>
<tr>
<td>Release time</td>
<td>5 ms max.</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>1,000 MΩ min.</td>
</tr>
<tr>
<td>Impulse withstand voltage (between coil and contacts)</td>
<td>6 kV (1.2 x 50 μs)</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>Destruction 10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude)</td>
</tr>
<tr>
<td></td>
<td>Malfunction 10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude)</td>
</tr>
<tr>
<td>Shock resistance</td>
<td>1,000 m/s²</td>
</tr>
<tr>
<td></td>
<td>Malfunction 100 m/s²</td>
</tr>
<tr>
<td>Mechanical</td>
<td>20,000,000 operations min. (at 18,000 operations/hr)</td>
</tr>
<tr>
<td></td>
<td>70,000 operations min. (5 A at 250 VAC, resistive load)</td>
</tr>
<tr>
<td></td>
<td>300,000 operations min. (2 A at 250 VAC, resistive load)</td>
</tr>
<tr>
<td></td>
<td>300,000 operations min. (2 A at 30 VDC, resistive load) (at 1,800 operations/hr)</td>
</tr>
<tr>
<td>Electrical</td>
<td>10 mA at 5 VDC (1 mA at 5 VDC)</td>
</tr>
<tr>
<td></td>
<td>-25°C to 70°C (with no icing or condensation)</td>
</tr>
<tr>
<td></td>
<td>3% to 85%</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 3 g</td>
</tr>
</tbody>
</table>

Note. The data given above are initial values.
*1. Measurement conditions: 5 VDC, 1 A, voltage drop method.
*2. Measurement conditions: The insulation resistance was measured with a 500 VDC megohmmeter at the same locations as the dielectric strength was measured.
*3. This value was measured at a switching frequency of 120 operations/min.
*4. The values indicated in parentheses ( ) are for the G6D-1A-ASI-AP.

Contact resistance *1 100 mΩ max.
Operate time 10 ms max.
Release time 5 ms max.
Insulation resistance *2 1,000 MΩ min.
Dielectric strength Between coil and contacts 3,000 VAC, 50/60 Hz for 1 min
Between contacts of the same polarity
Impulse withstand voltage (between coil and contacts) 6 kV (1.2 x 50 μs)
Vibration resistance Destruction 10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude)
Malfunction 10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude)
Shock resistance Destruction 1,000 m/s²
Malfunction 100 m/s²
Mechanical 20,000,000 operations min. (at 18,000 operations/hr)
70,000 operations min. (5 A at 250 VAC, resistive load)
300,000 operations min. (2 A at 250 VAC, resistive load)
300,000 operations min. (2 A at 30 VDC, resistive load) (at 1,800 operations/hr)
Electrical 10 mA at 5 VDC (1 mA at 5 VDC) *4
Failure rate (P level) (reference value *3)
Ambient operating temperature -25°C to 70°C (with no icing or condensation)
Ambient operating humidity 3% to 85%
Weight Approx. 3 g

Contact Type | Load | Resistive load |
-------------|------|----------------|
Contact material | Ag-Alloy (Cd free) | Ag-Alloy (Cd free) and Au plated* |
Rated load | 5 A at 250 VAC | 5 A at 30 VDC |
Rated carry current | 5 A |
Max. switching voltage | 250 VAC, 30 VDC |
Max. switching current | 5 A |

* The content indicated in parentheses ( ) are for the G6D-1A-ASI-AP

Application Examples

- Ideal for output applications of control equipments.

Characteristics

Contacts

<table>
<thead>
<tr>
<th>Item</th>
<th>Load</th>
<th>Resistive load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Type</td>
<td>Single</td>
<td></td>
</tr>
<tr>
<td>Contact material</td>
<td>Ag-Alloy (Cd free)</td>
<td>Ag-Alloy (Cd free) and Au plated*</td>
</tr>
<tr>
<td>Rated load</td>
<td>5 A at 250 VAC</td>
<td>5 A at 30 VDC</td>
</tr>
<tr>
<td>Rated carry current</td>
<td>5 A</td>
<td></td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>250 VAC, 30 VDC</td>
<td></td>
</tr>
<tr>
<td>Max. switching current</td>
<td>5 A</td>
<td></td>
</tr>
</tbody>
</table>

*1. Measurement conditions: 5 VDC, 1 A, voltage drop method.
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*3. This value was measured at a switching frequency of 120 operations/min.
*4. The values indicated in parentheses ( ) are for the G6D-1A-ASI-AP.
■ Engineering Data

### Maximum Switching Capacity

![Switching current vs. switching voltage graph](image)

- **AC resistive load**
- **DC resistive load**
- **AC inductive load**
- **DC inductive load\(cos\phi=0.4\)**

### Durability

![Durability graph](image)

- **Ambient temperature vs. Maximum Coil Voltage**

### Ambient Temperature vs. Must Operate and Must Release Voltages

**G6D-1A-ASI (-AP)**

- **Sample:** G6D-1A-ASI 24 VDC
- **Number of Relays:** 5 pcs

Test conditions: Impose a shock in the ±X, ±Y, and ±Z directions three times each with the Relay energized to check the shock values that cause the Relay to malfunction.

### Shock Malfunction

**G6D-1A-ASI (-AP)**

Sample: G6D-1A-ASI 24 VDC

- **Number of Relays:** 5 pcs

- **Must Operating Voltage**
- **Must Recovery Voltage**

### Dimensions

#### G6D-1A-ASI (-AP)

![Dimensions diagram](image)

- **PCB Mounting Holes (Bottom View)**
- **Terminal Arrangement/Internal Connections (Bottom View)**

#### Socket P6D-04P

![Socket diagram](image)

- **PCB Mounting Holes (Bottom View)**

Note: Orientation marks are indicated as follows: 0

*Average value*
Approved Standards

The rated values approved by each of the safety standards may be different from the performance characteristics individually defined in this datasheet.

UL Recognized (File No. E41515)

<table>
<thead>
<tr>
<th>Model</th>
<th>Number of poles</th>
<th>Coil ratings</th>
<th>Contact ratings</th>
<th>Number of test operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>G6D-1A-ASI (-AP)</td>
<td>1</td>
<td>5 to 24 VDC</td>
<td>5 A, 250 VAC 40°C</td>
<td>6,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 A, 30 VDC 40°C</td>
<td></td>
</tr>
</tbody>
</table>

CSA Certified (File No. LR31928)

<table>
<thead>
<tr>
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<th>Coil ratings</th>
<th>Contact ratings</th>
<th>Number of test operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>G6D-1A-ASI (-AP)</td>
<td>1</td>
<td>5 to 24 VDC</td>
<td>5 A, 250 VAC (Resistive) 40°C</td>
<td>6,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 A, 30 VDC (Resistive) 40°C</td>
<td></td>
</tr>
</tbody>
</table>

EN/TÜV Certified (Registration No. R50167084)

<table>
<thead>
<tr>
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<th>Coil ratings</th>
<th>Contact ratings</th>
<th>Number of test operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>G6D-1A-ASI (-AP)</td>
<td>1</td>
<td>5, 12, 24 VDC</td>
<td>5 A, 250 VAC (cosθ=1.0) 70°C</td>
<td>70,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 A, 30 VDC (0 ms) 40°C</td>
<td></td>
</tr>
</tbody>
</table>

Precautions

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

Mounting

More than two relays can be closely mounted right side up as shown in the following illustration.

Correct Use

Socket Mounting Height

Mounting to a P6D

The P6D is flux-resistant. Do not wash the P6D with water.

Dismount the relay from the socket before soldering the socket to a PCB.

Socket Mounting Height

Mounting to a P6D

- The P6D is flux-resistive. Do not wash the P6D with water.
- Dismount the relay from the socket before soldering the socket to a PCB.

Use Surge Killer Diode when switching a DC inductive load in micro load (about 10 to 100 mA). (Carbon deposition may decrease the contact reliability.)
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.