

G6DN

PCB Power Relay



SPST Slim Power Relay for 5 A switching

- Slim 5-mm width and miniature size. (20 × 5.08 × 12.5 mm)
- High switching capability 5 A (250 VAC and 30 VDC), and high contact reliability by crossbar-twin contact.
- Low power consumption 110 mW.
- Meets application standards EN61010-1 and EN61010-2-201 for reinforced insulation (CTI 600 V min. and Rated insulation voltage 300 V).
- Actualize electrical durability 100 Kops (-L type)



Model Number Legend

G6DN-□□□□-□
1 2 3 4

- | | |
|---|--|
| 1. Number of Poles 1: 1-pole | 3. Enclosure Rating None: Fully sealed |
| 2. Contact Form A: SPST-NO (1a) | 4. Classification None: Standard (E-LIFE 80 Kops) L: High durability type (E-LIFE 100 Kops) |

Application Examples

- Programmable Controller output
- Temperature Controller
- Building Automation
- Output of control system

G6DN

Ordering Information

| Classification | Contact form | Enclosure rating | Terminal shapes | Model | Minimum packing unit |
|-----------------|--------------|------------------|-----------------|-----------|----------------------|
| Standard | SPST-NO (1a) | Fully sealed | PCB terminal | G6DN-1A | 25 pcs/ tube |
| High durability | | | | G6DN-1A-L | |

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

Example: G6DN-1A DC5
Rated coil voltage

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

Example: G6DN-1A 5VDC

Ratings

Coil

| Classification | 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 | | | |
| Standard | 4.5 VDC | 24.4 | 184 | 70% max. * | 5% min. | 160% | Approx. 110 |
| | 5 VDC | 22.0 | 227 | | | | |
| | 12 VDC | 9.2 | 1,309 | | | | |
| | 24 VDC | 4.6 | 5,236 | | | | |
| High durability | 5 VDC | 36.0 | 139 | 70% max. * | 5% min. | 160% | Approx. 180 |
| | 12 VDC | 15.0 | 800 | | | | |
| | 24 VDC | 7.5 | 3,200 | | | | |

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

* Operating voltage is less than 72% when the relay is sideways and the marking is right way.

Contacts

| | Resistive load | Inductive load (cos φ = 0.4, L/R = 7 ms) |
|------------------------|---------------------------------|--|
| Contact Type | Cross bar twin | |
| Contact material | Ag-Alloy and Au plating * | |
| Rated load | 5 A at 250 VAC 5 A at 30 VDC | 2 A at 250 VAC 2 A at 30 VDC |
| Rated carry current | 5 A | |
| Max. switching voltage | 277 VAC, 125 VDC | |
| Max. switching current | 5 A | |

* Au plating is applied to stationary contact.

■Characteristics

| | | Standard | High durability |
|--|---------------------------------------|--|--|
| Contact resistance | | 100 mΩ max. | |
| Operate time | | 10 ms max. | |
| Release time | | 5 ms max. | |
| Insulation resistance | | 1,000 MΩ min. (at 500 VDC) | |
| Dielectric strength | Between coil and contacts | 3,000 VAC, 50/60 Hz for 1 min | |
| | Between contacts of the same polarity | 750 VAC, 50/60 Hz for 1 min | |
| Surge withstand voltage | Between coil and contacts | 6 kV (1.2 × 50 μs) | |
| Vibration resistance | Destruction | 10 to 55 to 10 Hz, 2.5 mm single amplitude (5.0 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/s ² | |
| | Malfunction | 100 m/s ² | |
| Durability | Mechanical | 20,000,000 operations min. (at 18,000 operations/hr) | |
| | Electrical | 100,000 operations min. (3 A at 250 VAC, 3 A at 30 VDC Resistive load) 80,000 operations min. (5 A at 250 VAC, 5 A at 30 VDC Resistive load) 100,000 operations min. (2 A at 250 VAC, 2 A at 30 VDC Inductive load) | 100,000 operations min. (5 A at 250 VAC, Resistive load) 100,000 operations min. (5 A at 30 VDC, Resistive load) 200,000 operations min. (2 A at 250 VAC, Inductive load) 200,000 operations min. (2 A at 30 VDC, Inductive load) |
| Failure rate (P level) (reference value) * | | 0.1 mA at 0.1 VDC | |
| Ambient temperature | Operating | -40°C to +90°C (with no icing or condensation) | |
| Humidity | | 5% RH to 85% RH | |
| Weight | | Approx. 3 g | |

Note 1. Values in the above table are initial values.

Note 2. The contact resistance is measured with 1 A applied at 5 VDC using a fall-of-potential method.

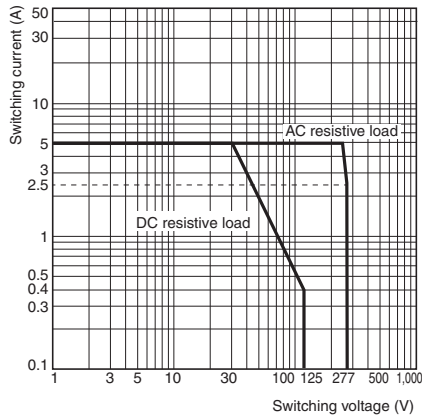
Note 3. The insulation resistance is measured between coil and contacts and between contacts of the same polarity at 500 VDC.

* This value was measured at a switching frequency of 120 operations/min.

Engineering Data

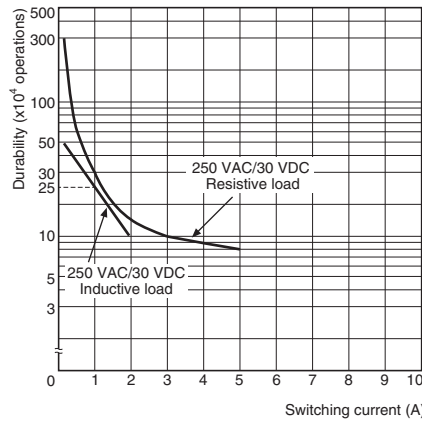
Maximum Switching Capacity

G6DN-1A, G6DN-1A-L



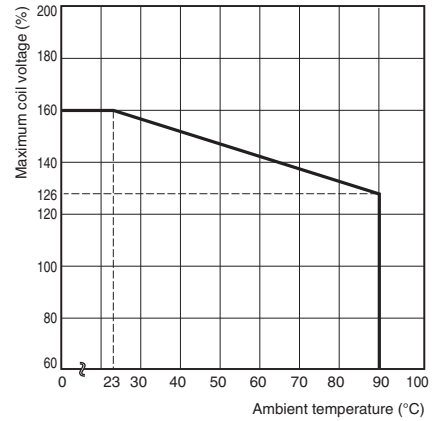
Durability

G6DN-1A



Ambient Temperature vs. Maximum Coil Voltage

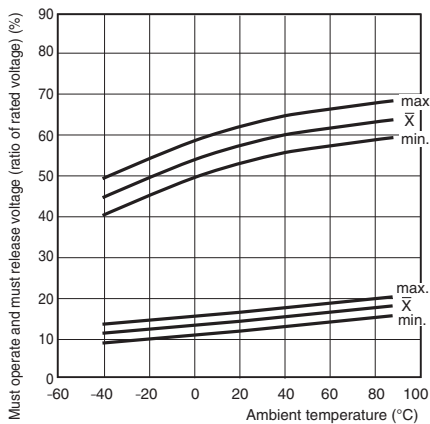
G6DN-1A, G6DN-1A-L



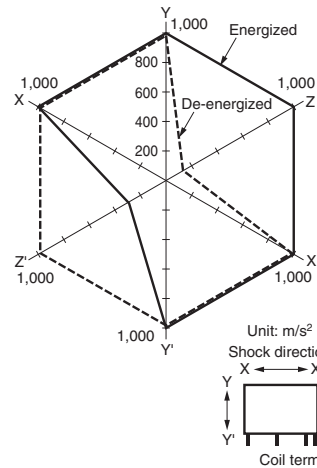
Note. The maximum coil voltage refers to the maximum voltage in a varying range of operating power voltage, not a continuous voltage.

Ambient Temperature vs. Must Operate and Must Release Voltages

G6DN-1A, G6DN-1A-L



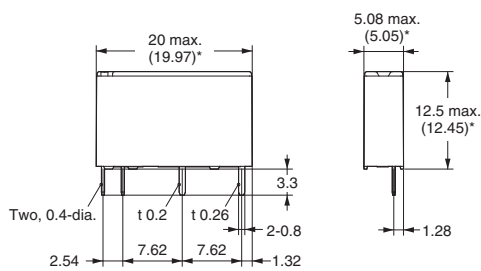
Shock Malfunction



Sample: G6DN-1A
 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.
 Standard: 100 m/s²

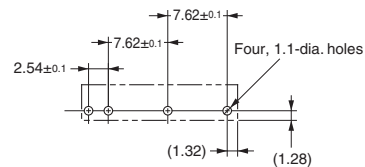
Dimensions

G6DN-1A(-L)

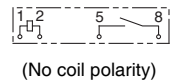


* Average value

PCB Mounting Holes (Bottom View)



Terminal Arrangement/ Internal Connections (Bottom View)




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/C-UL-approved models  (File No. E41515)

| Model | Contact form | Coil ratings | Contact ratings | Operations |
|-----------|--------------|---------------|---------------------------------|------------|
| G6DN-1A | SPST-NO | 4.5 to 24 VDC | 5 A at 277 VAC (Resistive) 95°C | 6,000 |
| | | | 5 A at 30 VDC (Resistive) 90°C | 6,000 |
| | | | 1/10 hp 125 VAC 95°C | 1,000 |
| | | | 1/10 hp 277 VAC 95°C | 1,000 |
| | | | D300 120 VAC/240 VAC 95°C | 6,000 |
| | | | C300 120 VAC/240 VAC 95°C | 6,000 |
| | | | R300 125 VDC/250 VDC 95°C | 6,000 |
| G6DN-1A-L | SPST-NO | 5 to 24 VDC | 5 A 250 VAC (Resistive) 95°C | 100,000 |
| | | | 2 A 250 VAC (General Use) 95°C | 100,000 |
| | | | 2 A 30 VDC (General Use) 95°C | 100,000 |
| | | | 1/10 hp 120 VAC 40°C | 6,000 |
| | | | C300 120 VAC/240 VAC 95°C | 6,000 |
| | | | D150 120 VAC 95°C | 6,000 |
| | | | R150 125 VDC 95°C | 6,000 |

Note. CSA certification CSA 22.2 No.14 can be recognized by C-UL.

VDE (EN61810-1)  (Certificate No. 40042696)

| Model | Contact form | Coil ratings | Contact ratings | Operations |
|-----------|--------------|---------------|---------------------------------|------------|
| G6DN-1A | SPST-NO | 4.5 to 24 VDC | 5 A at 250 VAC (cosφ= 1.0) 90°C | 10,000 |
| | | | 5 A at 30 VDC (L/R = 0 ms) 90°C | 10,000 |
| G6DN-1A-L | SPST-NO | 5 to 24 VDC | 5 A 250 VAC (cosφ= 1.0) 90°C | 100,000 |
| | | | 2 A 250 VAC (cosφ= 0.4) 90°C | 100,000 |
| | | | 2 A 250 VAC (cosφ= 0.6) 90°C | 100,000 |
| | | | 5 A 30 VDC (L/R = 0 ms) 90°C | 100,000 |
| | | | 2 A 30 VDC (L/R = 7 ms) 90°C | 100,000 |

| | |
|---|-------------------------------------|
| Clearance distance | 3.5 mm min. |
| Creepage distance | 3.6 mm min. |
| Type of insulation coil-contact circuit open contact circuit | Basic (PD.2) Micro disconnection |
| Rated Insulation voltage | 300 V |
| Pollution degree | 2 |
| Rated voltage system | 250 V |
| Over voltage category | II |
| Category of protection according to IEC 61810-1 | RT III (Sealed) |
| Insulation material group | I |
| Tracking resistance according to IEC 60112 | CTI 600 V min. |
| Flammability class according to UL94 | V-0 |
| Coil insulation system according to UL | Class B |

Precautions

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

• 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.