

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). (Except G6DN-1A-CF Models)
- Actualize electrical durability 100 Kops (-L type)
- Lineup of high temperature types with an ambient temperature of 105°C (-CF type)



Model Number Legend

G6DN-□□□-□□
1 2 3 4 5

1. Number of Poles

1: 1-pole

2. Contact Form

A: SPST-NO (1a)

3. Enclosure Rating

None: Fully sealed

4. Classification

None: Standard (E-LIFE 80 Kops)
L: High durability type (E-LIFE 100 Kops)
SL: General purpose

5. Coil Insulation Class

None: Class B
CF: Class F (High temperature)

Application Examples

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

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 | |
| General purpose | | | | G6DN-1A-SL | 100pcs/tray |
| High temperature | | | | G6DN-1A-CF | |

Note 1. 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

Note 2. When placing an order, please specify the number in package multiples.

■ 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 | | | | Approx. 180 |
| | 12 VDC | 15.0 | 800 | | | | |
| | 24 VDC | 7.5 | 3,200 | | | | |
| General purpose | 5 VDC | 22.0 | 227 | | | | Approx. 110 |
| | 12 VDC | 9.2 | 1,309 | | | | |
| | 24 VDC | 4.6 | 5,236 | | | | |
| High temperature | 4.5 VDC | 24.4 | 184 | | | | |
| | 5 VDC | 22.0 | 227 | | | | |
| | 12 VDC | 9.2 | 1,309 | | | | |
| | 24 VDC | 4.6 | 5,236 | | | | |

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

| Item | Classification | Standard | | High temperature | |
|------------------------|----------------|---------------------------------|---|---------------------------------|---|
| | | High durability | General purpose | High durability | General purpose |
| Load | | Resistive load | Inductive load (cos φ = 0.4)(L/R = 7 ms) | 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 | 5 A at 250 VAC 5 A at 30 VDC | 1 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 | General purpose | High temperature |
|--|---------------------------------------|---|--|--|---|
| Contact resistance *1 | | 100 mΩ max. | | | |
| Operate time | | 10 ms max. | | | |
| Release time | | 5 ms max. | | | |
| Insulation resistance *2 | | 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) | 50,000 operations min. (5 A at 250 VAC, Resistive load) 50,000 operations min. (5 A at 30 VDC, Resistive load) 100,000 operations min. (2 A at 250 VAC, Inductive load) 100,000 operations min. (2 A at 30 VDC, Inductive load) | 10,000 operations min. (5 A at 250 VAC Resistive load 105°C) 100,000 operations min. (3 A at 250 VAC Resistive load 105°C) 10,000 operations min. (5 A at 30 VDC Inductive load 105°C) 100,000 operations min. (3 A at 30 VDC Resistive load 105°C) 100,000 operations min. (1 A at 250 VAC Inductive load 105°C) 100,000 operations min. (2 A at 30 VDC Inductive load 105°C) |
| Failure rate (P level) (reference value *3) | | 0.1 mA at 0.1 VDC | | | |
| Ambient temperature | Operating | -40°C to +90°C (with no icing or condensation) | | | -40°C to +105°C *4 (with no icing or condensation) |
| Humidity | | 5% RH to 85% RH | | | |
| Weight | | Approx. 3 g | | | |

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

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

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

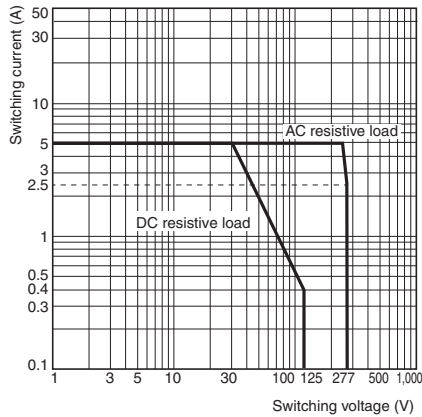
*3. The insulation resistance is measured between coil and contacts and between contacts of the same polarity at 500 VDC.

*4. For installation, please see "● Mounting" on page 6.

Engineering Data

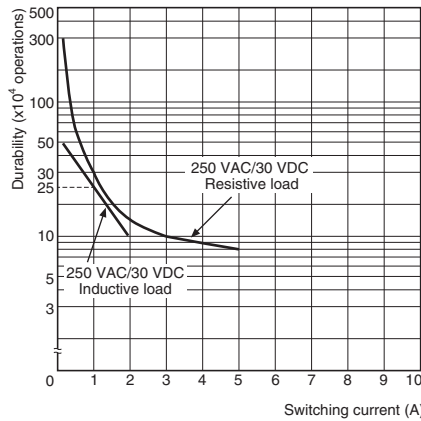
Maximum Switching Capacity

G6DN-1A, G6DN-1A-L, G6DN-1A-CF



Durability

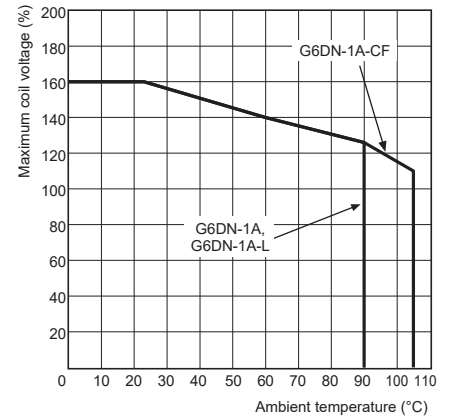
G6DN-1A, G6DN-1A-CF



Note. The durability curve is based on room temperature data.

Ambient Temperature vs. Maximum Coil Voltage

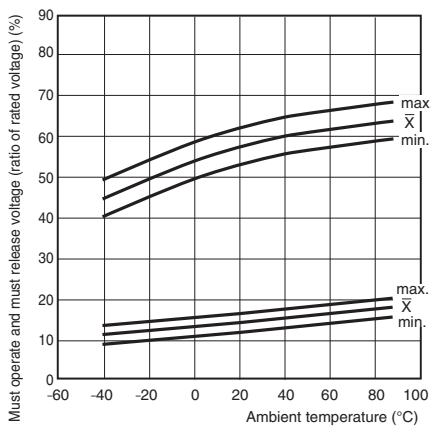
G6DN-1A, G6DN-1A-L, G6DN-1A-CF



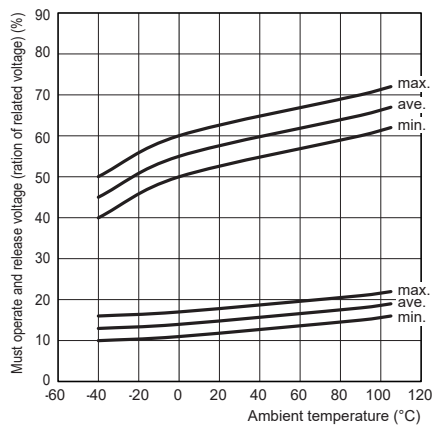
Note. The maximum coil voltage refers to the maximum voltage in a varying range of operating power voltage, not a continuous voltage.

Ambient Temperature vs. Must Operate and Must Release Voltages

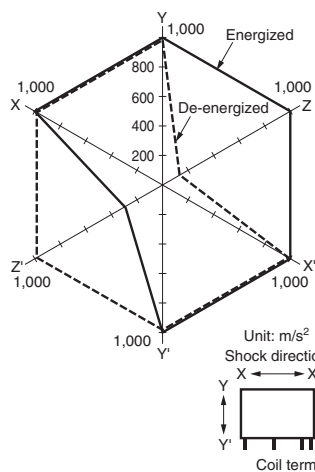
G6DN-1A, G6DN-1A-L



G6DN-1A-CF



Shock Malfunction

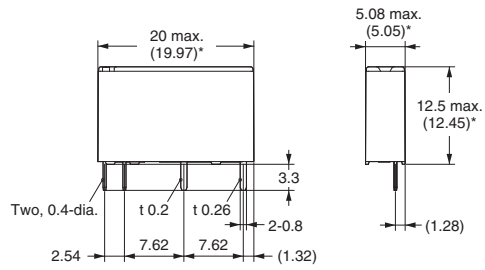


Sample: G6DN-1A
 Number of Relays: 5 pcs
 Test conditions: Impose a shock in the $\pm X$, $\pm Y$, and $\pm Z$ directions three times each with the Relay energized to check the shock values that cause the Relay to malfunction.
 Standard: 100 m/s²

■ Dimensions

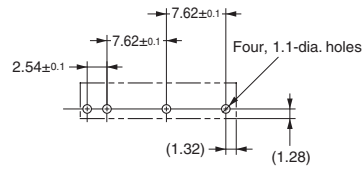
CAD Data Please visit our website, which is noted on the last page.

G6DN-1A(-L)

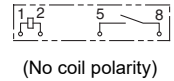


* Average value

PCB Mounting Holes (Bottom View)

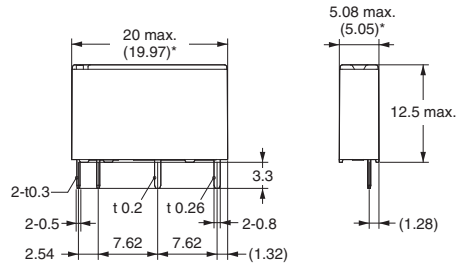


Terminal Arrangement/ Internal Connections (Bottom View)



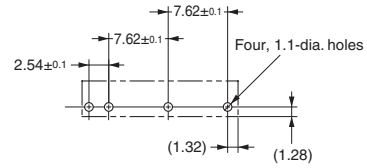
CAD Data

G6DN-1A(-SL)(-CF)

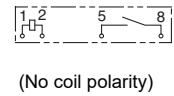


* Average value

PCB Mounting Holes (Bottom View)



Terminal Arrangement/ Internal Connections (Bottom View)



CAD Data


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(-SL)(-CF) | 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 |
| | | | 3A, 250V ac, Resistive 85°C | 100,000 |
| | | | 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 |
| | | | 5 A 250 VAC (Resistive) 105°C | 10,000 |
| | | | 5 A 30 VDC (Resistive) 105°C | 10,000 |
| 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, 5, 12, 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, 12, 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 |

TÜV (EN61810-1)  (Registration No. R 50396359)

| Model | Contact form | Coil ratings | Contact ratings | Operations |
|-------------------|--------------|---------------|----------------------------------|------------|
| G6DN-1A(-SL)(-CF) | SPST-NO | 5, 12, 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 |
| | | | 5 A at 250 VAC (cosφ= 1.0) 105°C | 10,000 |
| | | | 5 A at 30 VDC (cosφ= 1.0) 105°C | 10,000 |

| | |
|---|---|
| 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 (Standard/High durability/General purpose)/Class F (High temperature) |

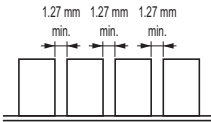
■Precautions

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

Correct Use

●Mounting

When mounting a number of relays on a PCB in 90°C to 105°C, be sure to provide a minimum mounting space of 1.27 mm min. as shown below.



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