

### 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

**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

#### 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          |

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) |
|-----------------|---------------|--------------------|---------------------|--------------------------|--------------------------|------------------|------------------------|
| 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               |                          |                          |                  |                        |

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<br>5 A at 30 VDC | 2 A at 250 VAC<br>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                                                                                                                                                                                                                                      |
|--------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 <sup>2</sup>                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                      |
|                                            | Malfunction                           | 100 m/s <sup>2</sup>                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                      |
| Durability                                 | Mechanical                            | 20,000,000 operations min. (at 18,000 operations/hr)                                                                                                                                                                                        |                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                      |
|                                            | Electrical                            | 100,000 operations min.<br>(3 A at 250 VAC,<br>3 A at 30 VDC Resistive load)<br>80,000 operations min.<br>(5 A at 250 VAC,<br>5 A at 30 VDC Resistive load)<br>100,000 operations min.<br>(2 A at 250 VAC,<br>2 A at 30 VDC Inductive load) | 100,000 operations min.<br>(5 A at 250 VAC, Resistive load)<br>100,000 operations min.<br>(5 A at 30 VDC, Resistive load)<br>200,000 operations min.<br>(2 A at 250 VAC, Inductive load)<br>200,000 operations min.<br>(2 A at 30 VDC, Inductive load) | 50,000 operations min.<br>(5 A at 250 VAC, Resistive load)<br>50,000 operations min.<br>(5 A at 30 VDC, Resistive load)<br>100,000 operations min.<br>(2 A at 250 VAC, Inductive load)<br>100,000 operations min.<br>(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.

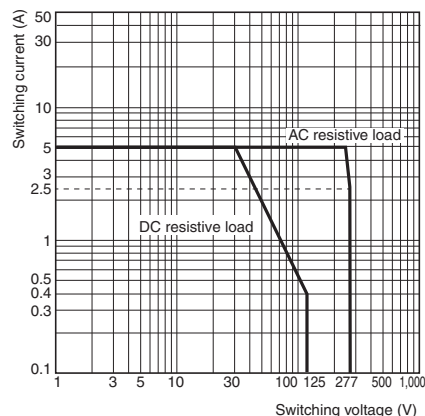
Note 3. The insulation resistance is measured between coil and contacts and between contacts of the same polarity at 500 VDC.

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

## Engineering Data

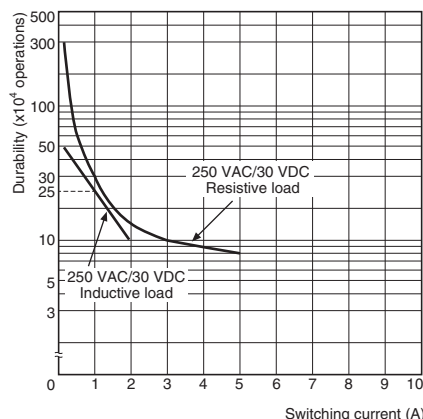
### Maximum Switching Capacity

#### G6DN-1A, G6DN-1A-L



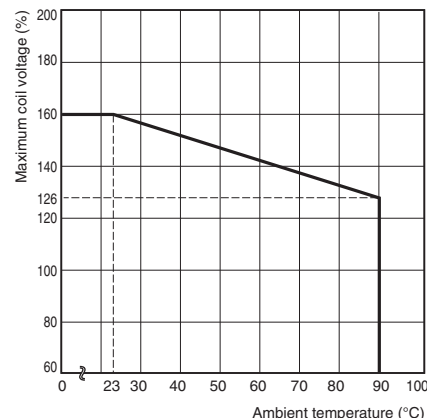
### Durability

#### G6DN-1A



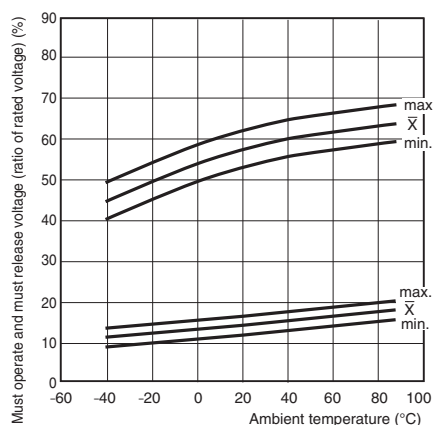
### Ambient Temperature vs. Maximum Coil Voltage

#### G6DN-1A, G6DN-1A-L

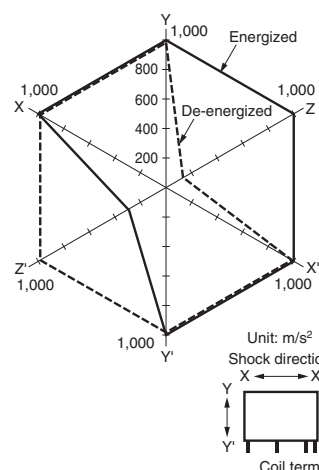


Note. The maximum coil voltage refers to the maximum voltage in a varying range of operating power voltage, not a continuous voltage.

### Ambient Temperature vs. Must Operate and Must Release Voltages G6DN-1A, G6DN-1A-L



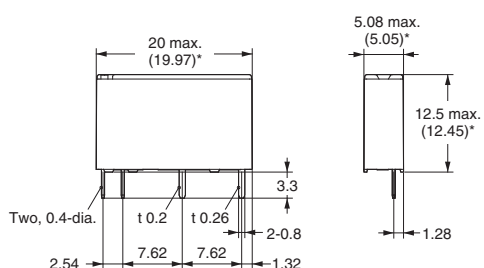
### Shock Malfunction



Sample: G6DN-1A  
Number of Relays: 5 pcs  
Test conditions: Impose a shock in the  $\pm X$ ,  $\pm Y$ , 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/s<sup>2</sup>

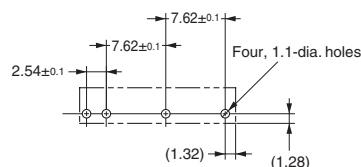
## Dimensions

### G6DN-1A(-L)

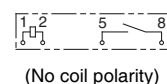


\* Average value

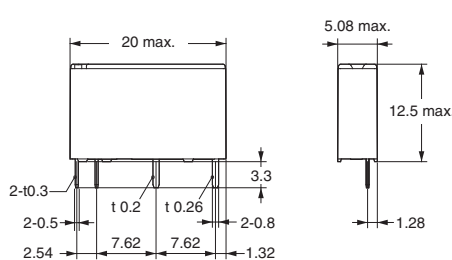
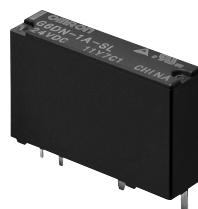
### PCB Mounting Holes (Bottom View)



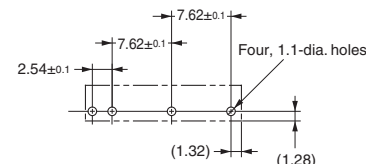
### Terminal Arrangement/ Internal Connections (Bottom View)



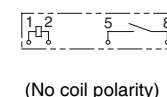
### G6DN-1A-SL



### 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(-SL) | 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      |
| 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 ( $\cos\phi=1.0$ ) 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 ( $\cos\phi=1.0$ ) 90°C    | 100,000    |
|           |              |                    | 2 A 250 VAC ( $\cos\phi=0.4$ ) 90°C    | 100,000    |
|           |              |                    | 2 A 250 VAC ( $\cos\phi=0.6$ ) 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 | SPST-NO      | 5, 12, 24 VDC | 5 A at 250 VAC ( $\cos\phi=1.0$ ) 90°C | 10,000     |
|            |              |               | 5 A at 30 VDC (L/R = 0 ms) 90°C        | 10,000     |

|                                                 |                     |
|-------------------------------------------------|---------------------|
| Clearance distance                              | 3.5 mm min.         |
| Creepage distance                               | 3.6 mm min.         |
| Type of insulation coil-contact circuit         | Basic (PD.2)        |
| open contact circuit                            | 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.

Please check each region's Terms & Conditions by region website.

## OMRON Corporation

Electronic and Mechanical Components Company

### Regional Contact

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