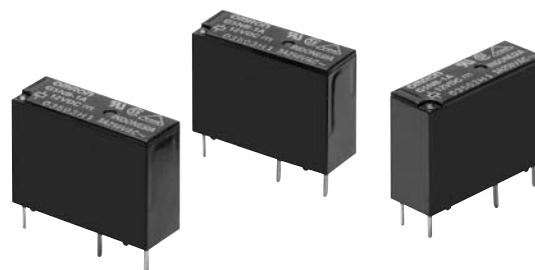




## A Miniature Relay with 1-pole 3A/5A Switching Capability and 10 kV Impulse Withstand Voltage

- Highly efficient magnetic circuit for high sensitivity (200 mW).
- Small, yet provides 10-kV impulse withstand voltage (between coil and contacts).
- Standard model conforms to UL/CSA/VDE standards.
- Satisfies EN61010 reinforced insulation requirements.



RoHS Compliant

### Model Number Legend

G5NB-□□□-□  
1 2 3 4

#### 1. Number of Poles

1: 1-pole

#### 2. Contact Form

A: SPST-NO (1a)

#### 3. Enclosure rating

None: Flux protection

4 : Fully sealed

#### 4. Classification

None: Standard

E : High-capacity

### Application Examples

- Water heaters
- Refrigerators
- Air conditioners
- Home appliances
- Small electric appliances

G  
5  
N  
B

### Ordering Information

| Classification | Item<br>Contact<br>form | Enclosure rating | Model      | Rated coil voltage | Minimum<br>packing unit |
|----------------|-------------------------|------------------|------------|--------------------|-------------------------|
| Standard       | SPST-NO<br>(1a)         | Flux protection  | G5NB-1A    | 5, 12, 18, 24 VDC  | 100 pcs/Tray            |
|                |                         | Fully sealed     | G5NB-1A4   |                    |                         |
| High-capacity  |                         | Flux protection  | G5NB-1A-E  |                    |                         |
|                |                         | Fully sealed     | G5NB-1A4-E |                    |                         |

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

Example: G5NB-1A 5 VDC

Rated coil voltage

### Ratings

#### Coil

| Item          | Rated current<br>(mA) | Coil resistance<br>(Ω) | Must operate voltage<br>(V) | Must release voltage<br>(V) | Max. voltage<br>(V)                                             | Power consumption<br>(mW) |
|---------------|-----------------------|------------------------|-----------------------------|-----------------------------|-----------------------------------------------------------------|---------------------------|
| Rated voltage |                       |                        | % of rated voltage          |                             |                                                                 |                           |
| 5 VDC         | 40                    | 125                    | 75% max.                    | 10% min.                    | Standard:<br>180% (at 23°C)<br>High-capacity:<br>170% (at 23°C) | Approx. 200               |
| 12 VDC        | 16.7                  | 720                    |                             |                             |                                                                 |                           |
| 18 VDC        | 11.1                  | 1,620                  |                             |                             |                                                                 |                           |
| 24 VDC        | 8.3                   | 2,880                  |                             |                             |                                                                 |                           |

Note 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.

Note 2. The operating characteristics are measured at a coil temperature of 23°C.

Note 3. The "Max. voltage" is the maximum voltage that can be applied to the relay coil.

#### Contacts

| Item                   | Load | Resistive load     |                |
|------------------------|------|--------------------|----------------|
|                        |      | Standard           | High-capacity  |
| Contact Type           |      | Single             |                |
| Contact material       |      | Ag-alloy (Cd free) |                |
| Rated load             |      | 3 A at 125 VAC     | 5 A at 250 VAC |
|                        |      | 3 A at 30 VDC      | 3 A at 30 VDC  |
| Rated carry current    |      | 3 A                | 5 A            |
| Max. switching voltage |      | 250 VAC, 30 VDC    |                |
| Max. switching current |      | 3 A                | 5 A            |

## ■Characteristics

|                                             |                                       |                                                                                                                                                                                                                                                                 |
|---------------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contact resistance *1                       |                                       | 100 mΩ max.                                                                                                                                                                                                                                                     |
| Operate time                                |                                       | 10 ms max.                                                                                                                                                                                                                                                      |
| Release time                                |                                       | 10 ms max.                                                                                                                                                                                                                                                      |
| Insulation resistance *2                    |                                       | 1,000 MΩ min.                                                                                                                                                                                                                                                   |
| Dielectric strength                         | Between coil and contacts             | 4,000 VAC, 50/60 Hz for 1 min                                                                                                                                                                                                                                   |
|                                             | Between contacts of the same polarity | 750 VAC, 50/60 Hz for 1 min                                                                                                                                                                                                                                     |
| Insulation distance                         | Between coil and contacts             | Clearance: 5.5 mm, Creepage: 6 mm                                                                                                                                                                                                                               |
| Impulse withstand voltage                   | Between coil and contacts             | 10 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                                                                                                                                                                                                                                                        |
| Durability                                  | Mechanical                            | 5,000,000 operations min.                                                                                                                                                                                                                                       |
|                                             | Electrical (resistive load)           | Standard (G5NB-1A, -1A4)<br>200,000 operations at 125 VAC, 3A<br>200,000 operations at 30 VDC, 3A<br>High-capacity (G5NB-1A-E, -1A4-E)<br>100,000 operations at 250 VAC, 5A<br>200,000 operations at 30 VDC, 3A<br>(with a rated load at 1,800 operations/hour) |
| Failure rate (P level) (reference value) *3 |                                       | DC5V 10mA                                                                                                                                                                                                                                                       |
| Ambient operating temperature               |                                       | -40°C to 70°C<br>(with no icing or condensation)                                                                                                                                                                                                                |
| Ambient operating humidity                  |                                       | 5% to 85%                                                                                                                                                                                                                                                       |
| Weight                                      |                                       | Approx. 4 g                                                                                                                                                                                                                                                     |

Note. The data shown above are initial value.

\*1. Measurement conditions: 5 VDC, 1 A, voltage drop method

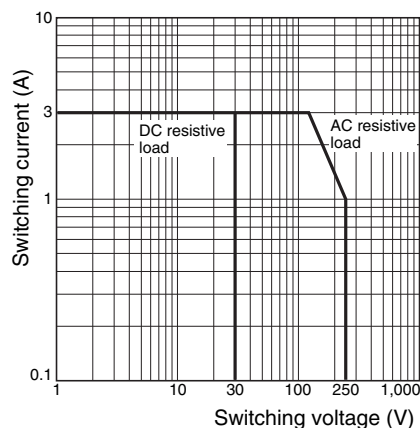
\*2. Measurement conditions: Measured at the same points as the dielectric strength using a 500 VDC ohmmeter.

\*3. This value was measured at a switching frequency of 120 operations/min.

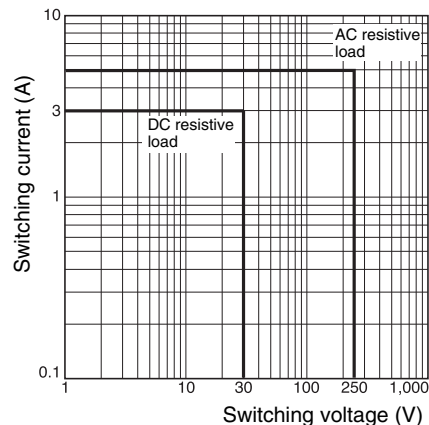
## ■Engineering Data

### ●Maximum Switching Capacity

#### Standard models



#### High-capacity models

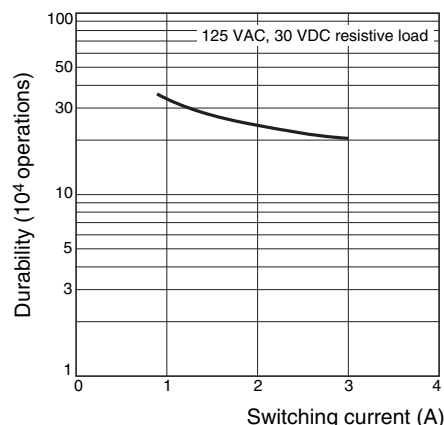


## ■Actual Load Life (Reference Values)

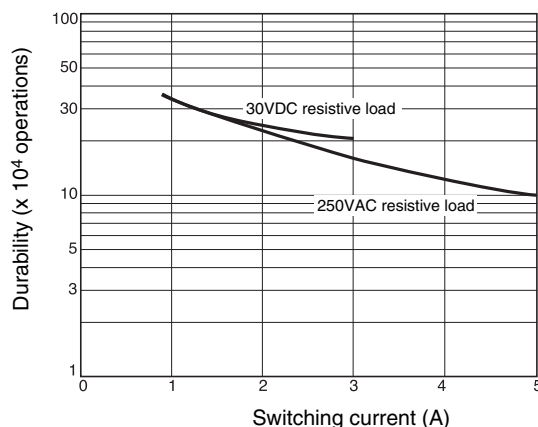
- 120 VAC** motor and lamp load  
2.5A surge and 0.5A normal:  
250,000 operations min. (at 23°C)
- 160 VDC** valve load (with varistor)  
0.24A:  
250,000 operations min. (at 23°C)
- 140 VAC** pump load  
Inrush: 5.4 A (o-p), Steady state: 1.6 A  
200,000 operations min. (Ambient temperature: 23°C)
- 100 VAC** motor load  
Inrush: 10.7 A (o-p), Steady state: 1.1 A  
200,000 operations min. (Ambient temperature: 23°C)

## ●Durability

### Standard models

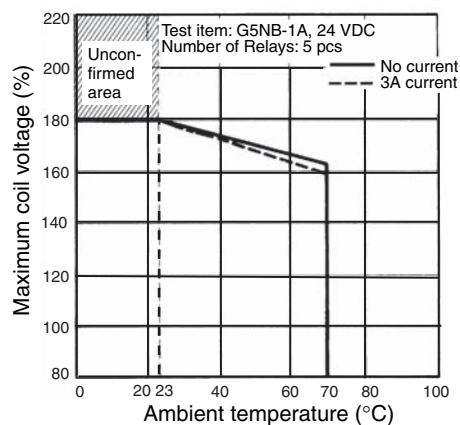


### High-capacity models

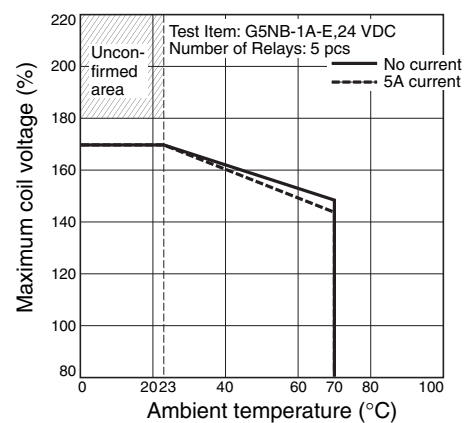


## ●Ambient Temperature vs. Maximum Coil Voltage

### Standard models



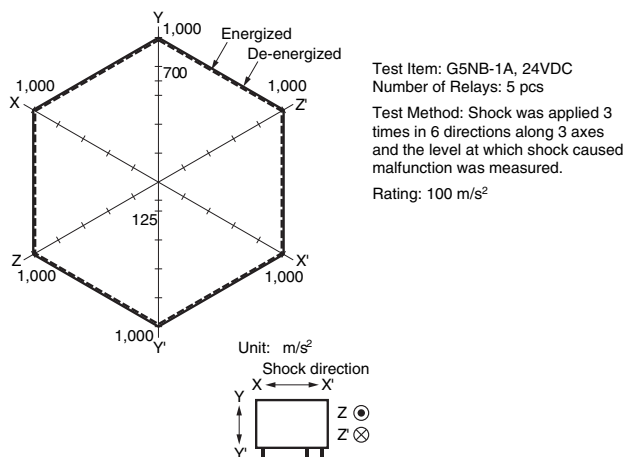
### High-capacity models



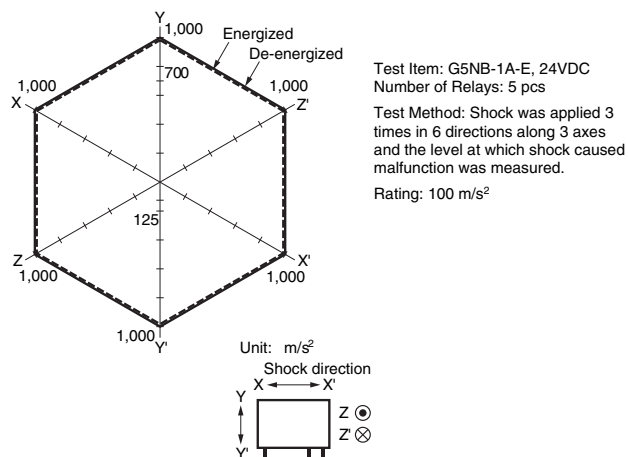
**Note:** The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

## ●Shock malfunction

### Standard models



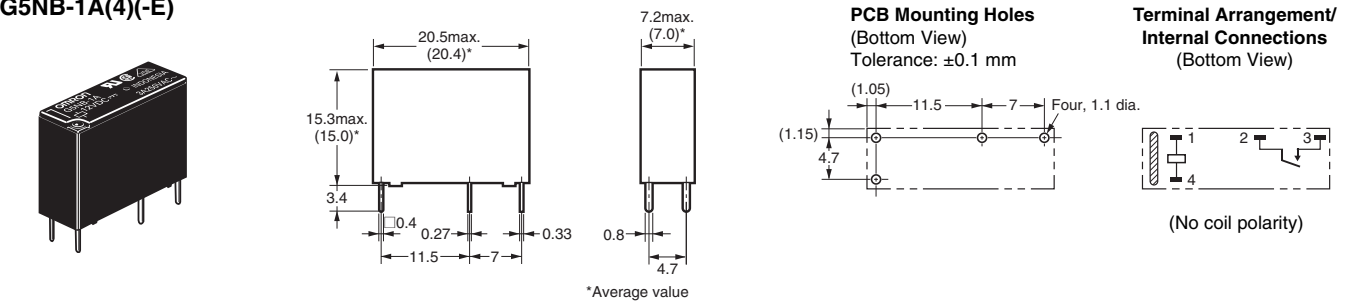
### High-capacity models



■Dimensions

(Unit: mm)

G5NB-1A(4)(-E)



■Approved Standards

The approval rating values for overseas standards are different from the performance values determined individually. Confirm the values before use.

●UL Recognized: (File No. E41515)  
CSA Certified: (File No. LR31928)

| Model        | Contact form    | Coil ratings | Contact ratings                                             | Number of test operations |
|--------------|-----------------|--------------|-------------------------------------------------------------|---------------------------|
| G5NB-1A(4)   | SPST-NO<br>(1a) | 5~24V DC     | 3A 125V AC (Resistive) 70°C<br>3A 30V DC (Resistive) 70°C   | 6,000                     |
| G5NB-1A(4)-E |                 |              | 5A 250 V AC (Resistive) 85°C<br>5A 30 V DC (Resistive) 70°C |                           |

●EN/IEC, VDE Certified (Registration No. 137575)

| Model        | Contact form    | Coil ratings         | Contact ratings                                             | Number of test operations |
|--------------|-----------------|----------------------|-------------------------------------------------------------|---------------------------|
| G5NB-1A(4)   | SPST-NO<br>(1a) | 5, 12, 18, 24V<br>DC | 3A 250V AC (Resistive) 85°C<br>3A 30V DC (Resistive) 85°C   | 100,000                   |
| G5NB-1A(4)-E |                 |                      | 5A 250 V AC (Resistive) 85°C<br>5A 30 V DC (Resistive) 85°C | 10,000                    |
|              |                 |                      | 3A 250V AC (Resistive) 85°C                                 | 100,000                   |

■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.