**G5NB**

PCB Power Relay

**A Miniature Relay with 1-pole 3A 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**

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**Model Number Legend**

G5NB-□□□□-□

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

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**Application Examples**

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

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**Ordering Information**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Contact Form</th>
<th>Enclosure rating</th>
<th>Model</th>
<th>Rated coil voltage</th>
<th>Minimum packing unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>SPST-NO (1a)</td>
<td>Flux protection</td>
<td>G5NB-1A</td>
<td>5, 12, 18, 24 VDC</td>
<td>100 pcs/Tray</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fully sealed</td>
<td>G5NB-1A4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-capacity</td>
<td></td>
<td>Flux protection</td>
<td>G5NB-1A-E</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fully sealed</td>
<td>G5NB-1A4-E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: When ordering, add the rated coil voltage to the model number.
Example: G5NB-1A 5 VDC

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**Ratings**

- **Coil**

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>Rated current (mA)</th>
<th>Coil resistance (Ω)</th>
<th>Must operate voltage (V)</th>
<th>Must release voltage (V)</th>
<th>Max. voltage (V)</th>
<th>Power consumption (mW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 VDC</td>
<td>40</td>
<td>125</td>
<td>75% max.</td>
<td>10% min.</td>
<td>180% (at 23°C)</td>
<td>Approx. 200</td>
</tr>
<tr>
<td>12 VDC</td>
<td>16.7</td>
<td>720</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 VDC</td>
<td>11.1</td>
<td>1,620</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 VDC</td>
<td>8.3</td>
<td>2,880</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Item</th>
<th>Load</th>
<th>Resistive load</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Standard</td>
</tr>
<tr>
<td>Contact Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact material</td>
<td></td>
<td>Ag-alloy (Cd free)</td>
</tr>
<tr>
<td>Rated load</td>
<td>3 A at 125 VAC</td>
<td>5 A at 250 VAC</td>
</tr>
<tr>
<td></td>
<td>3 A at 30 VDC</td>
<td>3 A at 30 VDC</td>
</tr>
<tr>
<td>Rated carry current</td>
<td>3 A</td>
<td>5 A</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>250 VAC, 30 VDC</td>
<td>5 A</td>
</tr>
<tr>
<td>Max. switching current</td>
<td>3 A</td>
<td>5 A</td>
</tr>
</tbody>
</table>
**Characteristics**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact resistance *1</td>
<td>100 mΩ max.</td>
</tr>
<tr>
<td>Operate time</td>
<td>10 ms max.</td>
</tr>
<tr>
<td>Release time</td>
<td>10 ms max.</td>
</tr>
<tr>
<td>Insulation resistance *2</td>
<td>1,000 MΩ min. (at 500 VDC)</td>
</tr>
</tbody>
</table>

**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

**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: 10 m/s²

**Durability**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical</td>
<td>5,000,000 operations min.</td>
</tr>
</tbody>
</table>
| Electrical (resistive load) | Standard (G5NB-1A, -1A4)
  - 200,000 operations at 125 VAC, 3A
  - 200,000 operations at 30 VDC, 3A
| High-capacity (G5NB-1A-E, -1A4-E) | 100,000 operations at 250 VAC, 5A
  - 200,000 operations at 30 VDC, 3A
  (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 (with no icing or condensation)

**Ambient operating humidity**

- 5% to 85%

**Weight**

- Approx. 4 g

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**Actual Load Life (Reference Values)**

1. **120 VAC** motor and lamp load
   - 2.5A surge and 0.5A normal:
     - 250,000 operations min. (at 23°C)

2. **160 VDC** valve load (with varistor)
   - 0.24A:
     - 250,000 operations min. (at 23°C)

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**Engineering Data**

**Maximum Switching Capacity**

**Standard models**

![Diagram of standard models with switching voltage and current values]

**High-capacity models**

![Diagram of high-capacity models with switching voltage and current values]
Note: The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

Shock malfunction
All models

G5NB-1A

Number of Relays: 5 pcs
Test Method: Shock was applied 3 times in 6 directions along 3 axes and the level at which shock caused malfunction was measured.
Rating: 100 m/s²
### Dimensions

**G5NB-1A(4)(-E)**

![Dimensions Diagram]

- **Dimensions (Unit: mm)**
- **Approved Standards**
- **Precautions**
- **Correct Use**
- **Handling**

### 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)

- **EN/IEC, VDE Certified**:
  - (Registration No. 137575)

### Precautions

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

- **Handling**

  The G5NB is flux-resistant. Do not wash the G5NB with water.

### Model Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Contact form</th>
<th>Coil ratings</th>
<th>Contact ratings</th>
<th>Number of test operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>G5NB-1A(4)</td>
<td>SPST-NO (1a)</td>
<td>5-24V DC</td>
<td>3A 125V AC (Resistive) 70°C</td>
<td>6,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3A 30V DC (Resistive) 70°C</td>
<td></td>
</tr>
<tr>
<td>G5NB-1A(4)-E</td>
<td></td>
<td></td>
<td>5A 250 V AC (Resistive) 85°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5A 30 V DC (Resistive) 70°C</td>
<td></td>
</tr>
</tbody>
</table>

- **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.