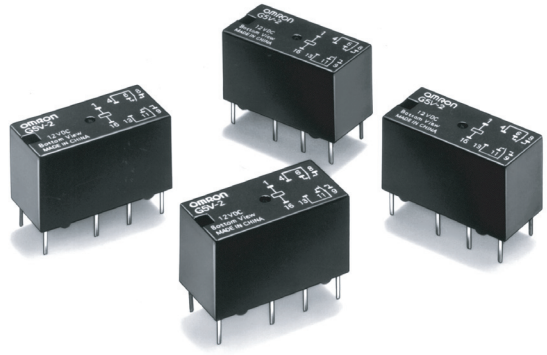
# Low Signal Relay
# G5V-2

## Miniature Relay for Signal Circuits

- Suitable for handling low signals in computer peripherals, telecommunications and security equipment.
- Capable of switching loads 10μA to 2 A.
- Conforms to FCC part 68 1,500 V surge withstand.
- Reliable Ag + Au-clad, bifurcated crossbar contacts.
- Fully-sealed construction.
- RoHS Compliant.



FCC

# Ordering Information

To Order: Select the part number and add the desired coil voltage rating (e.g., G5V-2-*DC12*).

| Type | Contact form | Construction | Model |
|---|---|---|---|
| Standard | DPDT | Fully-sealed | **G5V-2** |
| High-sensitivity | | | **G5V-2-H1** |

**Model Number Legend**

**G5V - □ - □ DC □**
**1 2 3**

1. **Contact Form**
   2: DPDT
2. **Coil type**
   Blank: Standard
   H1: High-sensitivity
3. **Rated Coil Voltage**
   3, 5, 6, 9, 12, 24, 48 VDC

# Specifications

## ■ Contact Data

| Item | Standard | High-sensitivity |
|---|---|---|
| **Load** | Resistive load (p.f. = 1) | |
| **Rated load** | 0.50 A at 125 VAC<br>2 A at 30 VDC | 0.5 A at 125 VAC<br>1 A at 24 VDC |
| **Contact material** | Ag (Au clad) | |
| **Carry current** | 2 A | |
| **Max. operating voltage** | 125 VAC<br>125 VDC | |
| **Max. operating current** | 2 A | 1 A |
| **Max. switching capacity** | 62.5 VA<br>60W | 62.5 VA<br>24W |
| **Min. permissible load (See note)** | 10 μA, 10 mVDC | |

**Note:** P level: $\lambda_{60} = 0.1 \times 10^{-6}$/operation
This value was measured at a switching frequency of 120 operations/min and the criterion of contact resistance is 50 Ω. This value may vary depending on the switching frequency and operating environment. Always double-check relay suitability under actual operating conditions.

## ■ Coil Data

### Standard Type

| Rated voltage (VDC) | Rated current (mA) | Coil resistance (Ω) | Coil inductance (Ref. value) (H) | | Pick-up voltage | Dropout voltage | Maximum voltage | Power consumption (mW) |
|---|---|---|---|---|---|---|---|---|
| | | | Armature OFF | Armature ON | % of rated voltage | | | |
| 3 | 166.70 | 18 | 0.04 | 0.05 | 75% max. | 5% min. | 120% max. at 23°C | Approx. 500 |
| 5 | 100 | 50 | 0.09 | 0.11 | | | | |
| 6 | 83.30 | 72 | 0.16 | 0.19 | | | | |
| 9 | 55.60 | 162 | 0.31 | 0.49 | | | | |
| 12 | 41.70 | 288 | 0.47 | 0.74 | | | | |
| 24 | 20.80 | 1,152 | 1.98 | 2.63 | | | | |
| 48 | 12 | 4,000 | 7.23 | 10.00 | | | | Approx. 580 |

### High-sensitivity Type

| Rated voltage (VDC) | Rated current (mA) | Coil resistance (Ω) | Coil inductance (Ref. value) (H) | | Pick-up voltage | Dropout voltage | Maximum voltage | Power consumption (mW) |
|---|---|---|---|---|---|---|---|---|
| | | | Armature OFF | Armature ON | % of rated voltage | | | |
| 3 | 50 | 60 | 0.18 | 0.57 | 75% max. | 5% min. | 180% max. at 23°C | Approx. 150 |
| 5 | 30 | 166.7 | 0.46 | 0.71 | | | | |
| 6 | 25 | 240 | 0.70 | 0.97 | | | | |
| 9 | 16.70 | 540 | 1.67 | 2.33 | | | | |
| 12 | 12.50 | 960 | 2.90 | 3.99 | | | | |
| 24 | 8.33 | 2,880 | 6.72 | 9.27 | | | | Approx. 200 |
| 48 | 6.25 | 7,680 | 20.10 | 26.70 | | | 150% max. at 23°C | Approx. 300 |

**Note: 1.** The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.
**2.** The operating characteristics are measured at a coil temperature of 23°C.
**3.** The maximum voltage is the highest voltage that can be imposed on the relay coil.

# Characteristics

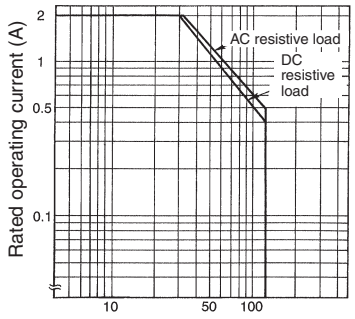
| | | |
|---|---|---|
| **Contact resistance (See note 1)** | | 50 mΩ max. (G5V-2); 100 mΩ max. (G5V-2-H1) |
| **Operate time (See note 2)** | | 7 ms max. (mean value: approx. 3.5 ms) |
| **Release time (See note 2)** | | 3 ms max. (mean value: approx. 0.8 ms) |
| **Operating frequency (max.)** | **Mechanical** | 36,000 operations/hour |
| | **Electrical** | 1,800 operations/hour (under rated load) |
| **Insulation resistance (See note 3)** | | 1,000 MΩ min (at 500 VDC) |
| **Dielectric strength** | | 1,000 VAC, 50/60 Hz for 1 minute between coil and contacts<br>1,000 VAC, 50/60 Hz for 1 minute between contacts of different poles<br>750 VAC, 50/60 Hz for 1 minute between contacts of same poles<br>(500 VAC, 50/60 Hz for 1 minute between contacts of same poles for high-sensitive type) |
| **Surge withstand voltage** | | 1,500 V (10 X 160 μs) between coil and contacts (conforms to part 68 of FCC rules) |
| **Vibration** | **Mechanical durability** | 10 to 55 Hz, 1.50 mm double amplitude |
| | **Malfunction durability** | |
| **Shock** | **Mechanical durability** | 1,000 m/s² (approx. 100 G) |
| | **Malfunction durability** | 200 m/s² (approx. 20 G), 100 m/s² (approx. 10 G) for high-sensitive type |
| **Ambient temperature** | **Operating/storage** | -25° to 70°C ("-H1" versions) with no icing<br>-25° to 65°C (standard versions) with no icing |
| **Humidity** | | 5% to 85% RH |
| **Service life** | **Mechanical** | 15 million operations min. (at operating frequency of 36,000 operations/hour) |
| | **Electrical** | 100,000 operations min. (at 1,800 operations/hr), standard models. See "Characteristic Data" |
| **Weight** | | Approx. 5 g |

**Note: 1.** The contact resistance was measured with 10 mA at 1 VDC with a fall-of-potential method.
**2.** Values in parentheses are typical values unless otherwise stated.
**3.** The insulation resistance was measured with a 500-VDC megohmmeter applied to the same parts as those for checking the dielectric strength.
**4.** The above values are initial values.

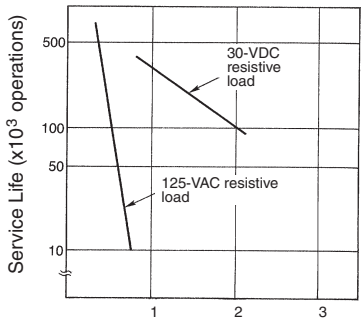
# ■ Characteristic Data

## G5V-2

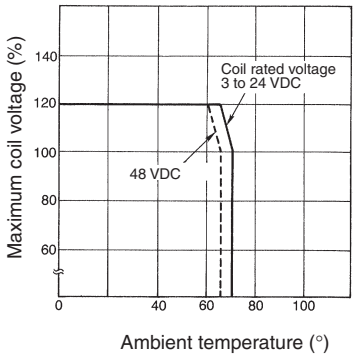
### Maximum Switching Capacity




### Electrical Service Life



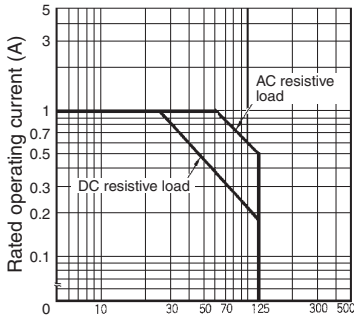

### Ambient Temperature vs. Maximum Coil Voltage



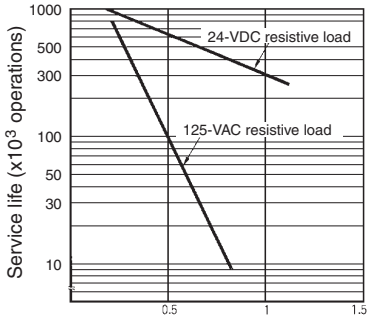

**Note:** The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

## G5V-2-H1

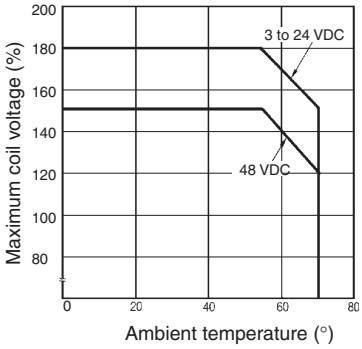
### Maximum Switching Capacity




### Electrical Service Life




### Ambient Temperature vs. Maximum Coil Voltage

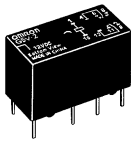


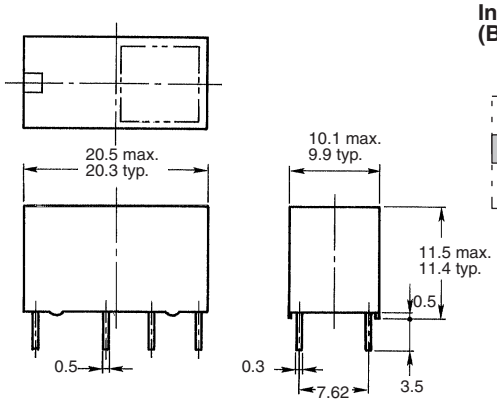

**Note:** The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

# Dimensions

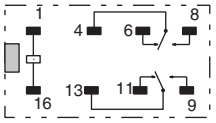
**Note: 1.** All units are in millimeters unless otherwise indicated.
**2.** Tolerance: ±0.1
**3.** Orientation marks are indicated as follows:

**G5V-2, G5V-2-H1**



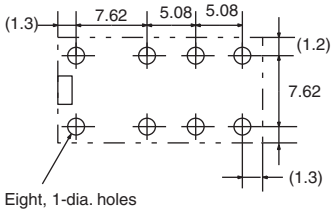



**Terminal Arrangement/ Internal Connections (Bottom View)**




**Mounting Holes (Bottom View)**

Tolerance: ±0.1




## ■ Approvals

**UL Recognized (File No. E41515) / CSA Certified (File No. LR31928) - - Ambient Temp. = 40°C**

| Type | Contact form | Coil rating | Contact ratings |
|---|---|---|---|
| G5V-2 | DPDT | 3 to 48 VDC | 0.6 A at 125 VAC (General Use)<br>0.6 A at 110 VDC (Resistive)<br>2 A at 30 VDC (Resistive) |
| G5V-2-H1 | | 3 to 48 VDC | 0.5 A at 125 VAC (General Use)<br>0.2 A at 110 VDC (Resistive)<br>1 A at 24 VDC (Resistive) |

**Note: 1.** The rated values approved by each of the safety standards may be different from the performance characteristics individually defined in this catalog.
**2.** In the interest of product improvement, specifications are subject to change.

# Precautions

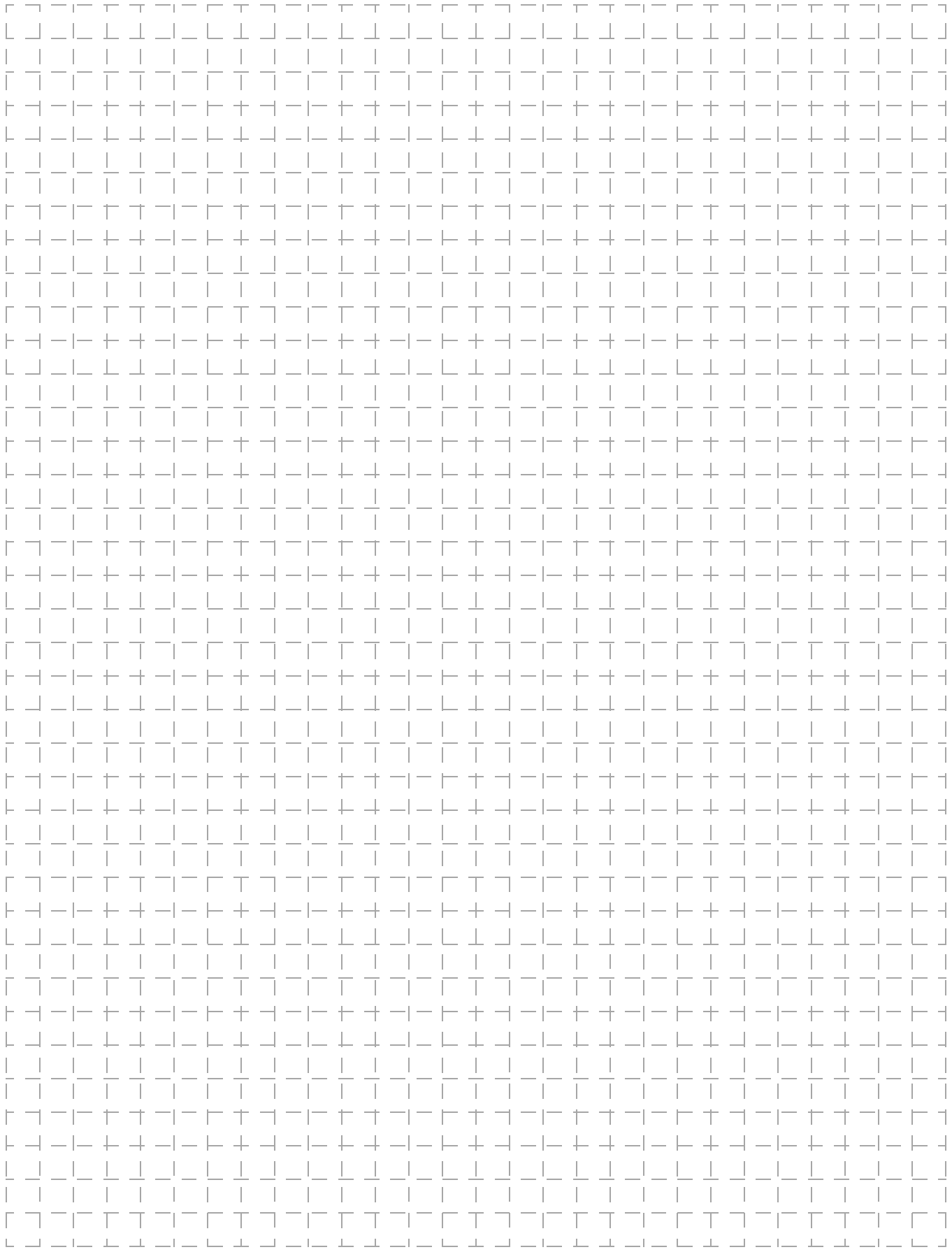
### Long-term Continuously ON Contacts

Using the Relay in a circuit where the Relay will be ON continuously for long periods (without switching) can lead to unstable contacts because the heat generated by the coil itself will affect the insulation, causing a film to develop on the contact surfaces. Be sure to use a fail-safe circuit design that provides protection against contact failure or coil burnout.

### Relay Handling

When washing the product after soldering the Relay to a PCB, use a water-based solvent or alcohol-based solvent, and keep the solvent temperature to less than 40°C. Do not put the Relay in a cold cleaning bath immediately after soldering.

MEMO



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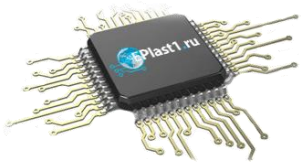


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**Телефон:** 8 (812) 309 58 32 (многоканальный)
**Факс:** 8 (812) 320-02-42
**Электронная почта:** org@eplast1.ru
**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.