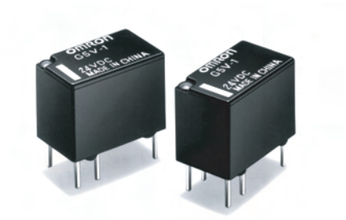
Ultra-miniature, Highly Sensitive SPDT Relay for Signal Circuits

- ROHS compliant.
- Ultra-miniature at 12.5 x 7.5 x 10 mm (L x W x H).
- Wide switching power of 1 mA to 1 A.
- High sensitivity: 150mW nominal coil power.
- Fully sealed construction.
- International 2.54mm terminal pitch.
- Conforms to FCC Part 68 requirements for coil to contacts.



Ordering Information

Classification				Model
Contact form	Contact type	Contact material	Structure	
SPDT	Single crossbar	AG (Au Alloy)	Fully sealed	G5V-1

Note: When ordering, add the rated coil voltage to the model number.
Example: G5V-1 12 VDC
Rated coil voltage

Model Number Legend

G5V - □ □ VDC
1 2

1. Contact Form
1: SPDT

2. Rated Coil Voltage
3, 5, 6, 9, 12, 24 VDC

Specifications

■ Coil Ratings

Rated voltage		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC
Rated current		50 mA	30 mA	25 mA	16.7 mA	12.5 mA	6.25 mA
Coil resistance		60 Ω	167 Ω	240 Ω	540 Ω	960 Ω	3,840 Ω
Coil inductance (H) (ref. value)	Armature OFF	0.05	0.15	0.20	0.45	0.85	3.48
	Armature ON	0.11	0.29	0.41	0.93	1.63	6.61
Must operate voltage		80% max. of rated voltage					
Must release voltage		10% min. of rated voltage					
Max. voltage		200% of rated voltage at 23°C					
Power consumption		Approx. 150 mW					

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

■ Contact Ratings

Load	Resistive load ($\cos\varphi$ = 1)
Rated Load	0.5 A at 125 VAC; 1 A at 24 VDC
Contact Material	Ag (Au alloy)
Rated Carry Current	2 A
Max. switching voltage	125 VAC, 60 VDC
Max. switching current	1 A
Max. switching power	62.5 VA, 30 W
Failure rate (reference value)	1 mA at 5 VDC

Note: P level: $\lambda_{60} = 0.1 \times 10^{-6}$/operation.
This value was measured at a switching frequency of 120 operaions/min and the criterion of contact resistance is 100. This value may vary depending on the operating environment. Always double-check relay suitability under actual operating conditions.

■ Characteristics

Contact resistance (see note 1)	100 mΩ max.
Operate time (see note 2)	5 ms max. (mean value: approx. 2.5 ms)
Release time (see note 2)	5 ms max. (mean value: approx. 0.9 ms)
Max. operating frequency	Mechanical: 36,000 operations/hr Electrical: 1,800 operations/hr at rated load
Insulation resistance (see note 2)	1,000 MΩ min. (at 500 VDC between coil and contacts, at 250 VDC between contacts of same polarity.)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between coil and contacts 400 VAC, 50/60 Hz for 1 min between contacts of same polarity
Impulse withstand voltage	1,500 V (10 x 160 μs) between coil and contacts (conforms to FCC Part 68)
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 1.65mm single amplitude (3.3mm double amplitude) Malfunction: 10 to 55 to 10 Hz, 1.65mm single amplitude (3.3mm double amplitude)
Shock resistance	Destruction: 1,000 m/s^2 Malfunction: 100 m/s^2
Endurance	Mechanical: 5,000,000 operations min. (at 18,000 operations/hr) Electrical: 100,000 operations min. (under rated load, at 1,800 operations/hr)
Ambient temperature	Operating: -40°C to 70°C (with no icing)
Ambient humidity	Operating: 5% to 85%
Weight	Approx. 2 g

Note: 1. The contact resistance was measured wih 10mA at 1VDC with a voltage drop method.
2. Values in parantheses are actual values.
3. The insulation resistance was measured with a 500VDC megohmeter between coil and contacts with a 250VDC megohmeter between contacts with the same polarity applied to the same parts as those used for checking the dielectric strength.

■ Approved Standards

UL (File No. E41515)/CSA C22.2 No.0, No.14 (File No. LR31928)

Model	Contact form	Coil ratings	Contact ratings
G5V-1	SPDT	3 to 24 VDC	0.5 A, 125 VAC (general use) 0.3 A, 110 VDC (resistive load) 1 A, 30 VDC (resistive load)

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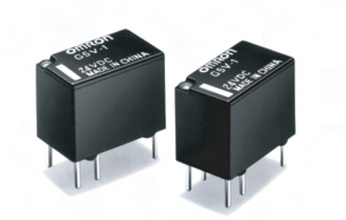

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Example: G5V-1 12 VDC
Rated coil voltage

Model Number Legend

G5V - □ □ VDC
1 2

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1: SPDT

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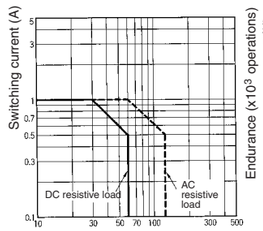
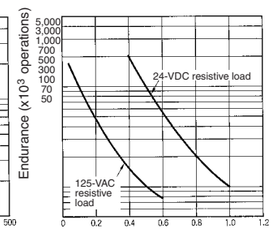
Engineering Data

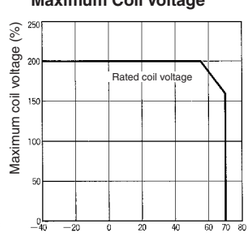
Maximum Switching Power



Endurance



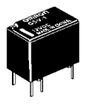
Ambient Temperature vs. Maximum Coil Voltage

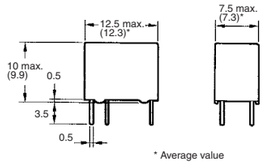


Note: The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

Dimensions

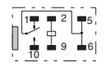
Note: 1. All units are in millimetres unless otherwise indicated.
2. Numbers in parentheses are reference values.
3. Tolerance: ±0.1
4. Orientation marks are indicated as follows:



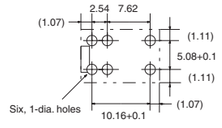


* Average value

Terminal Arrangement/ Internal Connections (Bottom View)



Mounting Holes (Bottom View)



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.

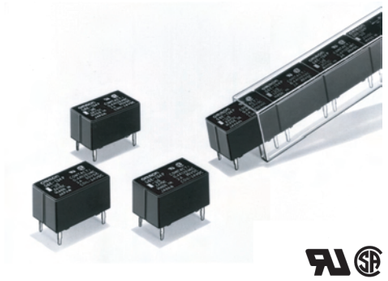
Relay Handling

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.

CAT. No. K048-E2-02A-X

Sub-miniature, Sensitive SPDT Signal Switching Relay

- ROHS compliant.
- High sensitivity: 98mW pickup coil power.
- Impulse withstand voltage meets FCC Part 68 requirements.
- Fully sealed construction.
- Unique moving loop armature reduces relay size, magnetic interference, and contact bounce time.
- Single- and double-winding latching types also available.



Ordering Information

Contact form		Terminal	Single-side stable	Single-winding latching	Double-winding latching
SPDT	Bifurcated crossbar	Straight terminal	G6E-134P-US	G6EU-134P-US	G6EK-134P-US
		Self-clinching terminal	G6E-134C-US	G6EU-134C-US	G6EK-134C-US

Note: When ordering, add the rated coil voltage to the model number.
Example: G4A-1A-E 12 VDC
Rated coil voltage

Model Number Legend

G6E □ - □ □ □ □ □ - □ - □ □ VDC
1 2 3 4 5 6 7 8 9

1. Relay Function
None: Single-side stable
U: Single-winding latching
K: Double-winding latching

2. Contact Form
1: SPDT

3. Contact Type
3: Bifurcated crossbar Ag (Au-clad) contact
9: Bifurcated crossbar AgNi (Au-clad) contact

4. Enclosure Ratings
4: Fully sealed

5. Terminals
P: Straight PCB
C: Curved tail

6. Special Function
L: Low sensitivity coil (400 mW)

7. Approved Standards
US: UL, CSA certified

8. Special Function
U: For ultrasonically cleanable

9. Rated Coil Voltage
3, 5, 6, 9, 12, 24, 48 VDC

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