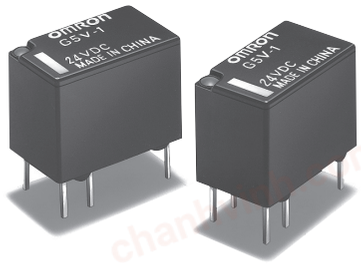
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G5V-1

Low Signal Relay

Ultra-miniature, Highly Sensitive SPDT Relay for Signal Circuits



- Ultra-miniature at 12.5 × 7.5 × 10 mm (L × W × H).
- Wide switching power of 1 mA to 1 A.
- High sensitivity: 150 mW nominal coil power consumption.
- Fully-sealed construction offering environment resistance.
- Conforms to FCC Part 68 requirements for coil to contacts. (1,500 V, 10 × 160 μs)
- Models for ambient temperatures up to 90°C added to series.

RoHS Compliant

■Model Number Legend

G5V-□-□
1 2

1. Number of Poles/Contact Form

1: 1-pole/SPDT (1c)

2. Classification

None: Standard (Ambient operating temperature 70°C max.)

T90: Ambient operating temperature 90°C max.

■Application Examples

- Telecommunication equipment
- Audio-visual products
- Security equipment
- Building automation equipment

■Ordering Information

Classification	Enclosure rating	Contact form	Terminal Shape	Model	Rated coil voltage	Minimum packing unit
Standard	Fully sealed	SPDT (1c)	PCB terminals	**G5V-1**	3 VDC	25 pcs/tube
					5 VDC	
					6 VDC	
					9 VDC	
					12 VDC	
					24 VDC	
G5V-1-T90				**G5V-1-T90**	5 VDC	
					12 VDC	
					24 VDC	

Note: When ordering, add the rated coil voltage to the model number.
Example: G5V-1 DC3
└─Rated coil voltage

However, the notation of the coil voltage on the product case as well as on the packing will be marked as □□ VDC.

■Standard Model Specifications

Contact type: Single crossbar (Au-alloy + Ag)
Enclosure rating: Plastic sealed
Terminal shape: PCB terminals

■Ratings

●Coil

G5V-1 (Standard)

Rated voltage	Rated current (mA)	Coil resistance (Ω)	Must operate voltage (V)	Must release voltage (V)	Max. voltage (V)	Power consumption (mW)
			% of rated voltage			
3 VDC	50	60	80% max.	10% min.	200% at 23°C	Approx. 150
5 VDC	30	167				
6 VDC	25	240				
9 VDC	16.7	540				
12 VDC	12.5	960				
24 VDC	6.25	3,840				

G5V-1-T90

Rated voltage	Rated current (mA)	Coil resistance (Ω)	Must operate voltage (V)	Must release voltage (V)	Max. voltage (V)	Power consumption (mW)
			% of rated voltage			
5 VDC	30	167	70% max.	10% min.	200% at 23°C	Approx. 150
12 VDC	12.5	960				
24 VDC	6.25	3,840				

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.
4. G5V-1-2 types with a must operate voltage of 70% max. are available as special series products.

●Contacts

Item \ Load	Resistive load
Contact type	Single crossbar
Contact material	Au-alloy + Ag
Rated load	0.5 A at 125 VAC; 1 A at 24 VDC
Rated carry current	2 A
Max. switching voltage	125 VAC, 60 VDC
Max. switching current	1 A

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■Characteristics

Contact resistance *1		100 mΩ max.
Operate time		5 ms max.
Release time		5 ms max.
Insulation resistance *2		1,000 MΩ min. (at 500 VDC between coil and contacts, at 250 VDC between contacts of same polarity.)
Dielectric strength	Between coil and contacts	1,000 VAC, 50/60 Hz for 1 min
	Between contacts of the same polarity	400 VAC, 50/60 Hz for 1 min
Vibration resistance	Destruction	10 to 55 to 10 Hz, 1.65 mm single amplitude (3.3 mm double amplitude)
	Malfunction	10 to 55 to 10 Hz, 1.65 mm single amplitude (3.3 mm double amplitude)
Shock resistance	Destruction	1,000 m/s²
	Malfunction	100 m/s²
Durability	Mechanical	5,000,000 operations min. (at 36,000 operations/hr)
	Electrical	100,000 operations min. (under rated load, at 1,800 operations/hr)
Failure rate (P level) (reference value) *3		1 mA at 5 VDC
Ambient operating temperature		-40°C to 70°C (Standard), -40°C to 90°C (G5V-1-T90) (with no icing or condensation)
Ambient operating humidity		5% to 85%
Weight		Approx. 2 g

Note: The values here are initial values.

*1. Measured with 10 mA at 1 VDC with a voltage drop method.

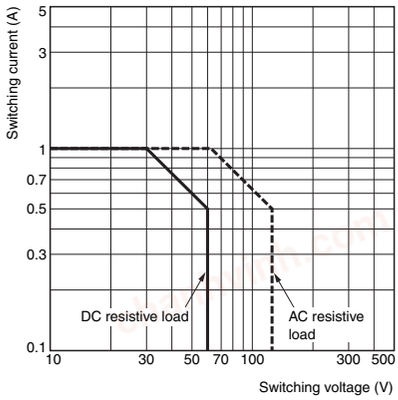
*2. Measured with a 500 VDC megohmmeter between coil and contacts and a 250 VDC megohmmeter between contacts with the same polarity applied to the same parts as those used for checking the dielectric strength.

*3. This value was measured at a switching frequency of 120 operations/min and the criterion of contact resistance is 100 Ω.
This value may vary depending on the switching frequency and operating environment. Always double-check relay suitability under actual operating conditions.

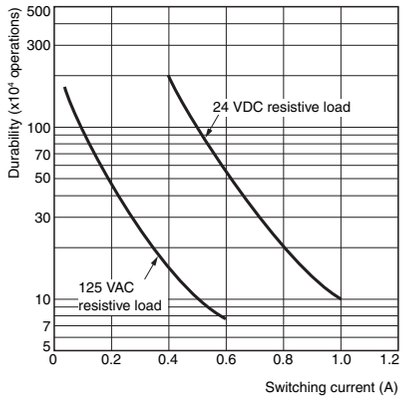
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■Engineering Data

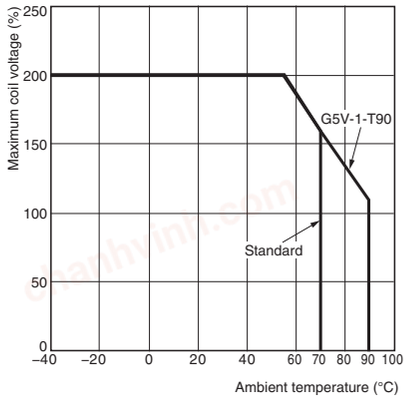
●Maximum Switching Capacity



●Durability



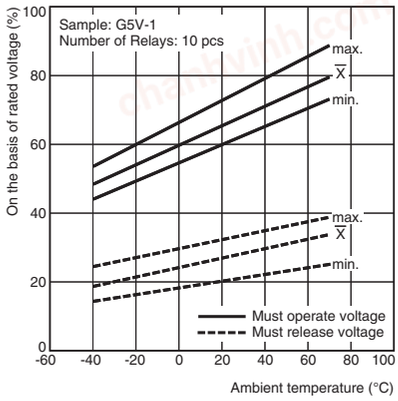
●Ambient Temperature vs. Maximum Coil Voltage



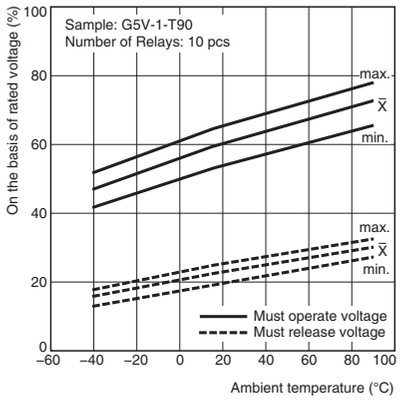
Note: The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

●Ambient Temperature vs. Must Operate or Must Release Voltage

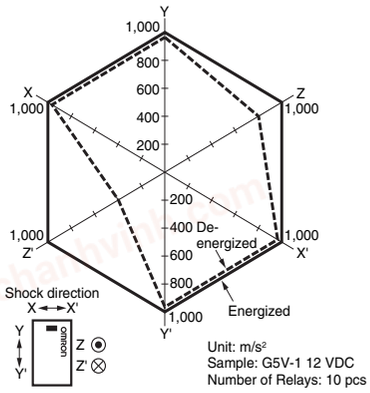
G5V-1



G5V-1-T90

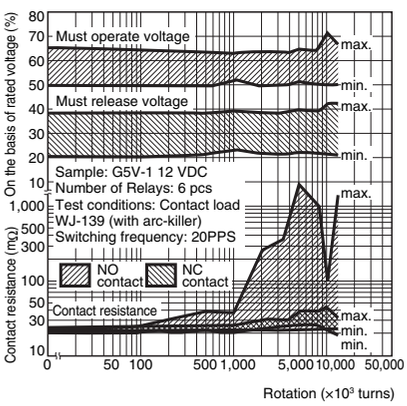


●Shock Malfunction

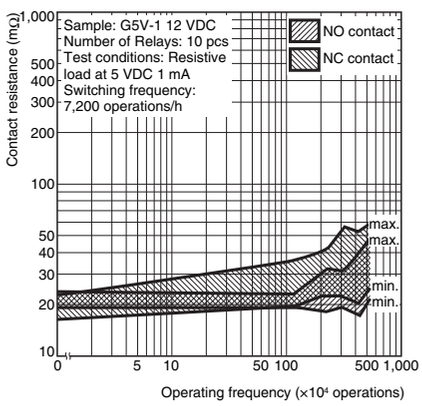


Test conditions: Shock is applied in ±X, ±Y, and ±Z directions three times each with and without energizing the Relays to check the number of contact malfunctions.

●Dial Pulse Test *1



●Contact Reliability Test *1, *2

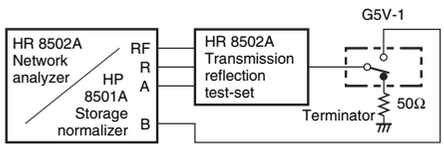


*1. The tests were conducted at an ambient temperature of 23°C.

*2. The contact resistance data are periodically measured reference values and are not values from each monitoring operation. Contact resistance values will vary according to the switching frequency and operating environment, so be sure to check operation under the actual operating conditions before use.

●High-frequency Characteristics

• Test Conditions

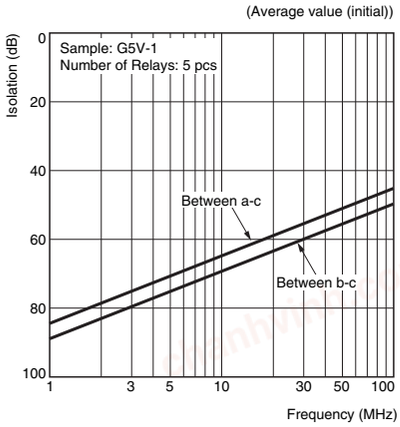


Terminals which were not being measured were terminated with 50 Ω.
Measuring impedance: 50 Ω

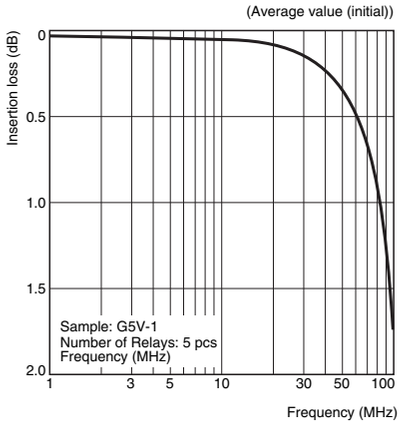
Note: The high-frequency characteristics data were measured using a dedicated circuit board and actual values will vary depending on the usage conditions. Check the characteristics of the actual equipment being used.

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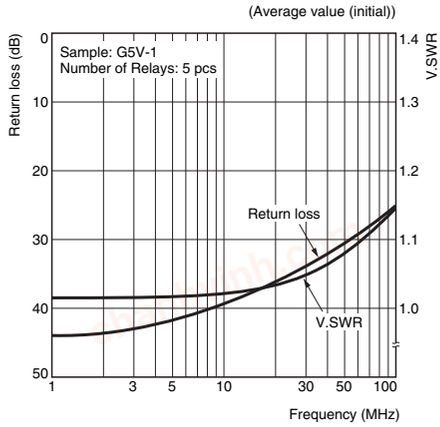
●High-frequency Characteristics (Isolation) *1, *2



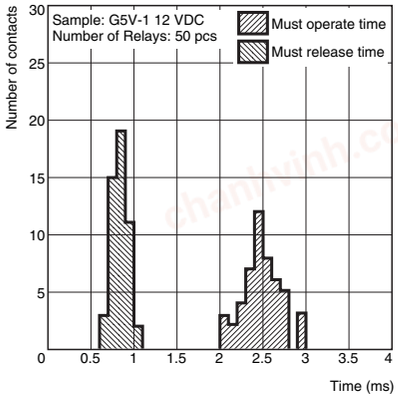
●High-frequency Characteristics (Insertion Loss) *1, *2



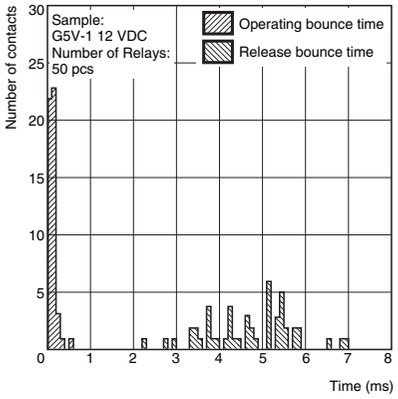
●High-frequency Characteristics (Return Loss, V.SWR) *1, *2



●Must Operate and Must Release Time Distribution *1



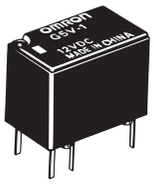
●Distribution of Bounce Time *1

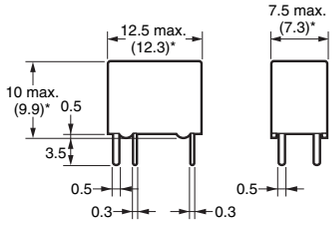


*1. The tests were conducted at an ambient temperature of 23°C.
*2. High-frequency characteristics depend on the PCB to which the Relay is mounted. Always check these characteristics, including endurance, in the actual machine before use.

■Dimensions

G5V-1

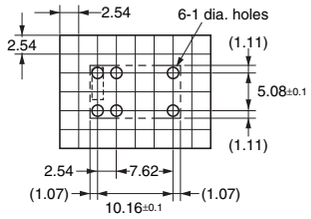




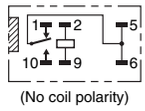
* Average value

Note: Each value has a tolerance of ±0.3 mm.

PCB Mounting Holes
(Bottom View)



Terminal Arrangement/ Internal Connections
(Bottom View)



(No coil polarity)

Note: ⬚ ▨ indicate the product's directional marks.

■Approved Standards

UL recognized: (File No. E41515)
CSA certified: (File No. LR31928)

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G5V-1	SPDT (1c)	3 to 24 VDC	1 A, 30 VDC at 40°C 0.3 A, 110 VDC at 40°C	6,000
			0.5 A, 125 VAC at 40°C	100,000
G5V-1-T90	SPDT (1c)	5 to 24 VDC	1 A, 30 VDC at 90°C	100,000
			0.5 A, 125 VAC at 90°C	100,000

■Precautions

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

Correct Use

- **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.

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- 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.

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