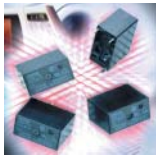
OMRON

Components Catalogue

Contents



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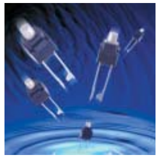

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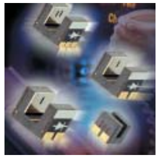
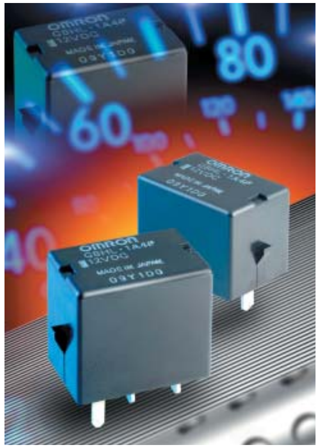


Welcome to the Omron Components Catalogue



Omron Components is a world-class business delivering a wide range of high quality, high performance components utilising latest technologies and backed by full technical, applications and logistical support.

We offer the widest range of relays for power, signal and automotive applications as well as solid-state and MOSFET relays. Our G3VM MOSFETS combine the advantages of mechanical and solid-state technologies allowing design flexibility with either AC or DC load able to be connected in either direction. We are also developing our range of microsensors, and currently offer photomicrosensors and a new range of D8M-D8 micro pressure-sensors which meet stringent safety standards such as working reliably with low pressure, metal casing and flange fitting. Our broad range of switches includes micro, DIP, and tactile options, and you will find a wide selection of connectors to meet industry-standard data interconnect, power transmission and signalling. Omron Double Reflection LEDs feature built-in optical light guide technology that more than doubles effective light output compared with conventional bullet-type LEDs.

Environmental research and experience enabled us to formulate a policy to remove recognised hazardous substances from our products well within the timescales of European Directives. We have identified suitable alternative materials and agreed the changes we need to make to our production processes in order to maintain quality levels. All of our manufacturing sites have achieved ISO14001 certification for the management of environmental protection in our organisation.

Using our website alongside this catalogue, you can be kept fully up-to-date with our range of products, technical capabilities and environmental policy.

www.eu.omron.com/ocb

Omron Electronic Components Europe B.V. reserves the right to make any changes to the specifications, technical information and data of the components described in this catalogue at its sole discretion without prior notice

Although we do strive for perfection, Omron Electronic Components Europe B.V. does not warrant or make any representations regarding the correctness or accuracy of the specifications, technical information and data of the components as described in this catalogue.

Model		G5V-1	G2E		G6E
Features		Slim single in-line miniature relay	Miniature, low-cost relay		Sub-miniature, sensitive relay
Appearance Dimensions (LxWxH)		 12.5 x 7.5 x 10	 15.5 x 10.5 x 11.5		 16 x 10 x 8
Contact Ratings	Contact Form	SPDT	SPDT		SPDT
	Contact Type	Single Crossbar	Single Crossbar	Bifurcated Crossbar	Bifurcated Crossbar
	Contact Material	Ag (Au-clad)	AgPg (Au-clad)		Ag (Au-clad)
	Resistive Load	0.5 A at 125 VAC 1 A at 24 VDC	0.5 A at 110 VAC 1 A at 24 VDC		0.4 A at 125 VAC 12 A at 30 VDC
	Max. Switching Current	1 A	1 A		3 A
	Min. Permissible load	1 mA at 5 VDC	1 mA at 5 VDC	10 µA at 10 mVDC	10 µA at 10 mVDC
	Max. Switching Power	125 VA, 90 W	120 VA, 30 W		50 VA, 60 W
	Max. Switching Voltage	270 VAC, 60 VDC	125 VAC, 60 VDC		250 VAC, 220 VDC
Coil ratings	Rated Voltage	3 to 24 VDC	1.5 to 24 VDC		3 to 48 VDC
	Power Consumption (Approx.)	150 mW	450 mW (200 mW high sensitivity version)		200 to 400 mW
Endura-nce	Electrical (operations)	100,000 min	200,000 min		100,000 min
	Mechanical (operations)	5,000,000 min	10,000,000 min		100,000,000 min
Dialec-tric strength	Between coil and contacts	1,000 VAC	500 VAC		1,500 VAC
	Between contacts of different polarity	–	–		–
	Between contacts of same polarity	400 VAC	500 VAC		1,000 VAC
Ambient temperature (operating)		-40°C to 70°C	-40°C to 70°C		-40°C to 70°C
Variations	Single Side Stable	•	•		•
	Single Winding Latching				•
	Double Winding Latching				•
	Through Hole	•	•		•
	Surface Mount				
	Fully Sealed	•	•		•
Approved Standards		UL, CSA	UL, CSA		UL, CSA
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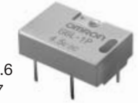
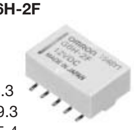
Model		G6L		G6H	
Features		Ultra-thin flat relay		Ultra-small relay with 5mm height	
Appearance Dimensions (LxWxH)		G6L-1P  10.6 x 7 x 3.8	G6L-1F  10.6 x 7 x 4.2	G6H-2F  14.3 x 9.3 x 5.4	G6H-2  14.3 x 9.3 x 6.6
Contact Ratings	Contact Form	SPST-NO		SPST-NO	
	Contact Type	Single Crossbar		Single Crossbar	
	Contact Material	Ag (Au-clad)		Ag (Au-clad)	
	Resistive Load	0.3 A at 125 VAC 1 A at 24 VDC		0.5 A at 125 VAC 1 A at 30 VDC	
	Max. Switching Current	1 A		1 A	
	Min. Permissible load	1 mA at 5 VDC		10 µA at 10 mVDC	
	Max. Switching Power	37.5 VA, 24 W		62.5 VA, 33 W	
	Max. Switching Voltage	125 VAC, 60 VDC		125 VAC, 110 VDC	
Coil ratings	Rated Voltage	3 to 24 VDC		3 to 48 VDC	
	Power Consumption (Approx.)	180 to 230 mW		140 to 280 mW	
Endura-nce	Electrical (operations)	100,000 min		200,000 min	
	Mechanical (operations)	5,000,000 min		100,000,000 min	
Dialec-tric strength	Between coil and contacts	1,000 VAC		1,000 VAC	
	Between contacts of different polarity	–		1,000 VAC	
	Between contacts of same polarity	750 VAC		750 VAC	
Ambient temperature (operating)		-40°C to 70°C		-40°C to 70°C	
Variations	Single Side Stable	•		•	
	Single Winding Latching			•	
	Double Winding Latching			•	
	Through Hole	•		•	
	Surface Mount	•		•	
	Fully Sealed	•		•	
Approved Standards		UL, CSA		UL, CSA	
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Model		G6J		
Features		Ultra compact and slim relay		
Appearance Dimensions (LxWxH)		G6J-2FS  10.3 x 5.2 x 10.0	G6J-2FL  10.3 x 5.2 x 10.0	G6J-2P  10.3 x 5.2 x 9.0
Contact Ratings	Contact Form	DPDT		
	Contact Type	Bifurcated Crossbar		
	Contact Material	Ag (Au alloy contact)		
	Resistive Load	0.3 A at 125 VAC 1 A at 30 VDC		
	Max. Switching Current	1 A		
	Min. Permissible load	1 μA at 10 mVDC		
	Max. Switching Power	37.5 VA, 30 W		
	Max. Switching Voltage	125 VAC, 110 VDC		
Coil ratings	Rated Voltage	3 to 24 VDC		
	Power Consumption (Approx.)	140 to 230 mW		
Endura-nce	Electrical (operations)	100,000 min		
	Mechanical (operations)	50,000,000 min		
Dialec-tric strength	Between coil and contacts	1,500 VAC		
	Between contacts of different polarity	1,000 VAC		
	Between contacts of same polarity	750 VAC		
Ambient temperature (operating)		-40°C to 85°C		
Variations	Single Side Stable	•		
	Single Winding Latching	•		
	Double Winding Latching			
	Through Hole	•		
	Surface Mount	•		
	Fully Sealed	•		
Approved Standards		UL, CSA		
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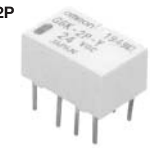
Model		G6K		
Features		Sub-miniature surface mounting relay		
Appearance Dimensions (LxWxH)		G6K-2F  10 x 6.5 x 5.4	G6K-2G  10 x 6.5 x 5.4	G6K-2P  10 x 6.5 x 5
Contact Ratings	Contact Form	DPDT		
	Contact Type	Bifurcated Crossbar		
	Contact Material	Ag (Au alloy)		
	Resistive Load	0.3 A at 125 VAC, 1 A at 30 VDC		
	Max. Switching Current	1 A		
	Min. Permissible load	10 μA at 10 mVDC		
	Max. Switching Power	37.5 VA, 30 W		
	Max. Switching Voltage	125 VAC, 60 VDC		
Coil ratings	Rated Voltage	3 to 24 VDC		
	Power Consumption (Approx.)	100 mW		
Endura-nce	Electrical (operations)	100,000 min		
	Mechanical (operations)	50,000,000 min		
Dialec-tric strength	Between coil and contacts	1,500 VAC		
	Between contacts of different polarity	1,000 VAC		
	Between contacts of same polarity	750 VAC		
Ambient temperature (operating)		-40°C to 70°C		
Variations	Single Side Stable	•		
	Single Winding Latching	•		
	Double Winding Latching			
	Through Hole	•		
	Surface Mount	•		
	Fully Sealed	•		
Approved Standards		UL, CSA		
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Model		G6S		
Features		Surface mounting relay with 2.5kV surge voltage		
Appearance Dimensions (LxWxH)		G6S-2F  15 x 7.5 x 9.4	G6S-2  15 x 7.5 x 9.4	G6S-2G  15 x 7.5 x 9.4
Contact Ratings	Contact Form	DPDT		
	Contact Type	Bifurcated Crossbar		
	Contact Material	Ag (Au alloy contact)		
	Resistive Load	0.5 A at 125 VAC, 1 A at 30 VDC		
	Max. Switching Current	2 A		
	Min. Permissible load	10 µA at 10 mVDC		
	Max. Switching Power	62.5 VA, 60 W		
	Max. Switching Voltage	250 VAC, 220 VDC		
Coil ratings	Rated Voltage	4.5 to 24 VDC		
	Power Consumption (Approx.)	140 to 200 mW		
Endura-nce	Electrical (operations)	100,000 min		
	Mechanical (operations)	100,000,000 min		
Dialec-tric strength	Between coil and contacts	2,000 VAC		
	Between contacts of different polarity	1,500 VAC		
	Between contacts of same polarity	1,000 VAC		
Ambient temperature (operating)		-40°C to 85°C		
Variations	Single Side Stable	•		
	Single Winding Latching	•		
	Double Winding Latching	•		
	Through Hole	•		
	Surface Mount	•		
	Fully Sealed	•		
Approved Standards		UL, CSA		
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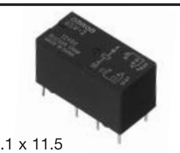
Model		G5A	G5V-2
Features		Sub-miniature relay	Miniature relay for signal circuits
Appearance Dimensions (LxWxH)		 16 x 9.9 x 8.4	 20.5 x 10.1 x 11.5
Contact Ratings	Contact Form	DPDT	DPDT
	Contact Type	Bifurcated Crossbar	Bifurcated Crossbar
	Contact Material	Ag (Au-clad)	Ag (Au-clad)
	Resistive Load	0.5 A at 30 VAC 1 A at 30 VDC	0.5 A at 125 VAC 2 A at 30 VDC
	Max. Switching Current	1 A	2 A
	Min. Permissible load	10 µA at 10 mVDC	10 µA at 10 mVDC
	Max. Switching Power	37.5 VA, 33 W	62.5 VA, 60 W
	Max. Switching Voltage	125 VAC, 60 VDC	125 VAC, 125 VDC
Coil ratings	Rated Voltage	3 to 48 VDC	3 to 48 VDC
	Power Consumption (Approx.)	200 to 280 mW	500 to 580 mW (150 mW high sensitivity version)
Endura-nce	Electrical (operations)	100,000 min	100,000 min
	Mechanical (operations)	50,000,000 min	15,000,000 min
Dialec-tric strength	Between coil and contacts	1,000 VAC	1,000 VAC
	Between contacts of different polarity	1,000 VAC	1,000 VAC
	Between contacts of same polarity	500 VAC	750 VAC
Ambient temperature (operating)		-40°C to 70°C	-25°C to 65°C
Variations	Single Side Stable	•	•
	Single Winding Latching	•	
	Double Winding Latching	•	
	Through Hole	•	•
	Surface Mount		
	Fully Sealed	•	•
Approved Standards		UL, CSA	UL, CSA
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Model		G6A				G6Y
Features		Fully sealed relay with high surge dielectric for use in telecommunications equipment				High frequency relay with high isolation and low insertion loss
Appearance Dimensions (LxWxH)		G6A-2  20.2 x 10.1 x 8.4		G6A-4  35.4 x 10.1 x 8.4		 20.7 x 11.7 x 9.2
Contact Ratings	Contact Form	DPDT		4PDT		SPDT
	Contact Type	Bifurcated Crossbar				Double-braking contact
	Contact Material	Ag (Au-clad)	AgPg (Au-clad)	Ag (Au-clad)	AgPg (Au-clad)	Au
	Resistive Load	0.5 A at 125 VAC 2 A at 30 VDC	0.3 A at 125 VAC 1 A at 30 VDC	0.5 A at 125 VAC 2 A at 30 VDC	0.3 A at 125 VAC 1 A at 30 VDC	10 mA at 30 VAC 10 mA at 30 VDC
	Max. Switching Current	2 A				0.5 A
	Min. Permissible load	10 μA at 10 mVDC				10 μA at 10 mVDC
	Max. Switching Power	125 VA, 60 W				10 VA (AC) 10 W (DC)
	Max. Switching Voltage	250 VAC, 220 VDC				30 VAC, 30 VDC
Coil ratings	Rated Voltage	3 to 48 VDC				3 to 24 VDC
	Power Consumption (Approx.)	200 to 235 mW		360 mW		200 mW
Endura-nce	Electrical (operations)	500,000 min				300,000 min
	Mechanical (operations)	100,000,000 min				50,000,000 min
Dielec-tric strength	Between coil and contacts	1,000 VAC				1,000 VAC
	Between contacts of different polarity	1,000 VAC				1,000 VAC
	Between contacts of same polarity	1,000 VAC				1,000 VAC
Ambient temperature (operating)		-40°C to 70°C				-40°C to 70°C
Variations	Single Side Stable	•				•
	Single Winding Latching	•				
	Double Winding Latching	•				
	Through Hole	•				•
	Surface Mount					
	Fully Sealed	•				•
Approved Standards		UL, CSA				–
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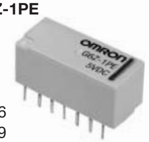
Selection Guide – Signal Relays

Model		G6K(U)-2F-RF	G6Z	
Features		Surface mounting 1GHz band high frequency relay	Surface mountable 2.6GHz band miniature relay	
Appearance Dimensions (LxWxH)		 10.3 x 6.9 x 5.4	G6Z-1FE  20 x 8.6 x 9.3	G6Z-1PE  20 x 8.6 x 8.9
Contact Ratings	Contact Form	DPDT	SPDT	
	Contact Type	Bifurcated Crossbar	Double-braking contact	
	Contact Material	Ag (Au-alloy)	Au-clad (Cu alloy)	
	Resistive Load	0.3 A at 125 VAC 1 A at 30 VDC	10 mA at 30 VAC 10 mA at 30 VDC	
	Max. Switching Current	1 A	0.5 A	
	Min. Permissible load	10 μA at 10 mVDC	10 μA at 10 mVDC	
	Max. Switching Power	1 W	10 VA (AC) 10 W (DC)	
	Max. Switching Voltage	125 VAC, 60 VDC	30 VAC, 30 VDC	
Coil ratings	Rated Voltage	3 to 24 VDC	3 to 24 VDC	
	Power Consumption (Approx.)	100 mW	200 mW	
Endura-nce	Electrical (operations)	100,000 min	300,000 min	
	Mechanical (operations)	50,000,000 min	1,000,000 min	
Dielec-tric strength	Between coil and contacts	750 VAC	1,000 VAC	
	Between contacts of different polarity	750 VAC	500 VAC	
	Between contacts of same polarity	750 VAC	500 VAC	
Ambient temperature (operating)		-40°C to 70°C	-40°C to 70°C	
Variations	Single Side Stable	•	•	
	Single Winding Latching	•	•	
	Double Winding Latching		•	
	Through Hole		•	
	Surface Mount	•	•	
	Fully Sealed		•	
Approved Standards		–	–	
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Model		**G6W**	
Features		Surface mountable 2.5GHz band miniature high-frequency relay	
Appearance		**G6W-1F** 	**G6W-1P** 
Dimensions (LxWxH)		20 x 9.4 x 9.3	20 x 9.4 x 9.3
Contact Ratings	**Contact Form**	SPDT	
	Contact Type	Double-braking single contact	
	Contact Material	Au	
	Resistive Load	10 mA at 30 VAC 10 mA at 30 VDC	
	Max. Switching Current	0.5 A	
	Min. Permissible load	10 µA at 10 mVDC	
	Max. Switching Power	10 VA (AC), 10 W (DC)	
	Max. Switching Voltage	230 VAC, 30 VDC	
Coil ratings	**Rated Voltage**	3 to 48 VDC	
	Power Consumption (Approx.)	200 to 360 mW	360 mW
Endura-nce	**Electrical (operations)**	300,000 min	
	Mechanical (operations)	1,000,000 min	
Dialec-tric strength	**Between coil and contacts**	1,000 VAC	
	Between contacts of different polarity	–	
	Between contacts of same polarity	500 VAC	
Ambient temperature (operating)		-40°C to 70°C	
Variations	**Single Side Stable**	•	
	Single Winding Latching	•	
	Double Winding Latching	•	
	Through Hole	•	
	Surface Mount	•	
	Fully Sealed	•	
Approved Standards		–	
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Ultra-miniature, Highly Sensitive SPDT Relay for Signal Circuits

- 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-clad	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	**Armature OFF**	0.05	0.15	0.20	0.45	0.85	3.48
(H) (ref. value)	**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.

■ Contact Ratings

Load	Resistive load (cosø = 1)
Rated Load	0.5 A at 125 VAC; 1 A at 24 VDC
Contact Material	Ag + Au-clad
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: λ_{60} = 0.1 x 10^{-6}/operation.

■ Characteristics

Contact resistance	100 mΩ max.
Operate time	5 ms max. (mean value: approx. 2.5 ms)
Release time	5 ms max. (mean value: approx. 0.9 ms)
Bounce Time	Operate: Approx. 0.2 ms Release: Approx. 5 ms
Max. operating frequency	Mechanical: 36,000 operations/hr Electrical: 1,800 operations/hr at rated load
Insulation resistance	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

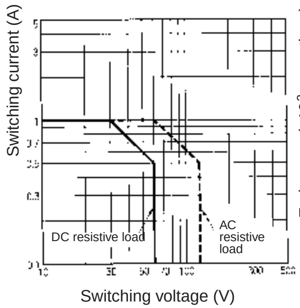
■ Approved Standards

UL1950 (File No. E41515)/CSA C22.2 No.0, No.14 (File No. LR31928)

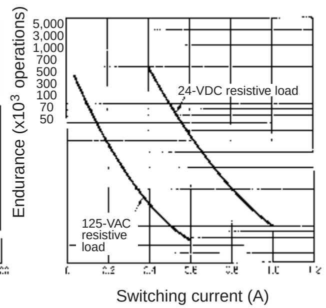
Model	Contact form	Coil ratings	Contact ratings
G5V-1	SPDT	3 to 24 VDC	0.5 A, 125 VAC (general use) 0.3 A, 110 VDC (resistive load) 1 A, 30 VDC (resistive load)

Engineering Data

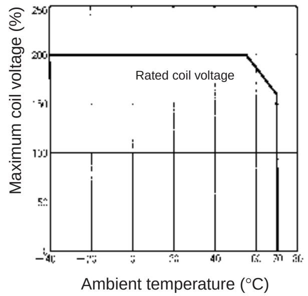
Maximum Switching Power



Endurance



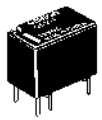
Ambient Temperature vs. Maximum Coil Voltage

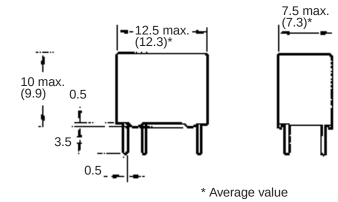


Note: The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

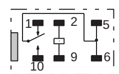
Dimensions

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

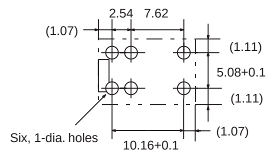




Terminal Arrangement/ Internal Connections (Bottom View)



Mounting Holes (Bottom View)



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Miniature, Low-cost, Single-pole PCB Relay

- Miniature: 15.5 x 10.5 x 11.5 mm (L x W x H).
- Low power consumption: 200 mW.
- Bifurcated crossbar contacts.
- Gold-clad contacts.
- Fully sealed type available.
- Ideal for telecommunications equipment and security systems.

Ordering Information

Contact		General-purpose	High-sensitivity
		Fully sealed	Fully sealed
SPDT	Single crossbar	G2E-184P-M-US	G2E-184P-H-M-US
	Bifurcated crossbar	G2E-134P-M-US	G2E-134P-H-M-US

Note: When ordering, add the rated coil voltage to the model number.
Example: G2E-184P-M-US 12 VDC
Rated coil voltage

Model Number Legend

G2E - □ □ □ □ - □ - □ - □ □ VDC
1 2 3 4 5 6 7 8

1. **Contact Form**
   1: SPDT
2. **Contact Type**
   3: Bifurcated crossbar
   8: Single crossbar
3. **Enclosure Ratings**
   4: Fully sealed
4. **Terminals**
   P: Straight PCB
5. **Power Consumption**
   None: General-purpose (450 mW)
   H: High-sensitivity (200 mW)
6. **Classification**
   M: General-purpose
7. **Approved Standards**
   US: UL, CSA certified
8. **Rated Coil Voltage**
   1.5, 3, 5, 6, 9, 12, 24 VDC

Specifications

■ Coil Rating

General-purpose Relays

Rated voltage		1.5 VDC	3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC
Rated current		300 mA	150 mA	89.3 mA	75 mA	50 mA	37.5 mA	18.8 mA
Coil resistance		5 Ω	20 Ω	56 Ω	80 Ω	180 Ω	320 Ω	1,280 Ω
Coil inductance	**Armature OFF**	0.005	0.017	0.044	0.067	0.137	0.229	0.94
(H) (ref. value)	**Armature ON**	0.009	0.034	0.091	0.136	0.297	0.496	2.1
Must operate voltage		70% max. of rated voltage						
Must release voltage		10% min. of rated voltage						
Max. voltage		120% of rated voltage at 23°C, 110% at 60°C						
Power consumption		Approx. 450 mW						

High-sensitivity Relays

Rated voltage		1.5 VDC	3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC
Rated current		125 mA	66.7 mA	41.7 mA	33.3 mA	22.5 mA	17.1 mA	8.6 mA
Coil resistance		12 Ω	45 Ω	120 Ω	180 Ω	400 Ω	700 Ω	2,800 Ω
Coil inductance	**Armature OFF**	0.005	0.022	0.055	0.083	0.165	0.228	1.465
(H) (ref. value)	**Armature ON**	0.009	0.035	0.092	0.129	0.303	0.504	2.287
Must operate voltage		80% max. of rated voltage						
Must release voltage		10% min. of rated voltage						
Max. voltage		140% of rated voltage at 23°C, 130% at 65°C						
Power consumption		Approx. 200 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.

■ Contact Ratings

Item	Single crossbar	Bifurcated crossbar
Load	Resistive load (cosø = 1)	Resistive load (cosø = 1)
Rated Load	0.5 A at 110 VAC; 1 A at 24 VDC	0.5 A at 110 VAC; 1 A at 24 VDC
Contact Material	AgPd (Au-clad)	
Rated Carry Current	2 A	
Max. switching voltage	125 VAC, 60 VDC	
Max. switching current	1 A	
Max. switching power	120 VA, 30 W	120 VA, 30 W
Failure rate (reference value)	1 mA at 5 VDC	0.1 mA at 0.1 VDC

Note: P level: $\lambda_{60} = 0.1 \times 10^{-6}$/operation.

■ Characteristics

Contact resistance	50 mΩ max.
Operate time	General-purpose type: 5 ms max. (mean value: approx. 2.5 ms) High-sensitivity type: 7 ms max. (mean value: approx. 3.5 ms)
Release time	3 ms max. (mean value: approx. 0.8 ms)
Max. switching frequency	Mechanical: 18,000 operations/hr Electrical: 1,800 operations/hr at rated load
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric withstand voltage	500 VAC, 50/60 Hz for 1 min between coil and contacts 500 VAC, 50/60 Hz for 1 min between contacts of same polarity
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 (approx. 100G) Malfunction: 200 m/s^2 (approx. 20G)
Endurance	Mechanical: 10,000,000 operations min. (at 18,000 operations/hr) Electrical: DC: 500,000 operations min. (1 A at 24 VDC resistive load) AC: 200,000 operations min. (0.5 A at 110 VAC resistive load) (at 1,800 operations/hr)
Ambient temperature	Operating: -25°C to 60°C (with no icing) (high-sensitivity type: -25°C to 65°C)
Ambient humidity	Operating: 5% to 85%
Weight	Approx. 3.7 g

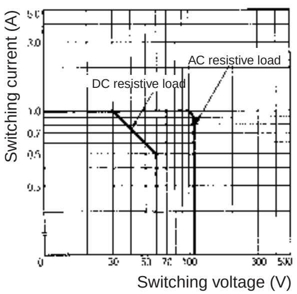
■ Approved Standards

UL114, UL478, UL1950 (File No. E41515)/CSA C22.2 No.0, No.14 (File No. LR34815-97)

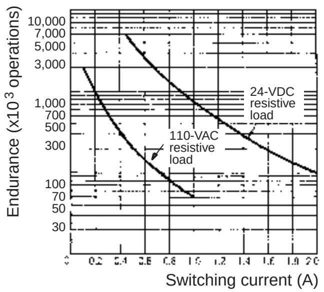
Model	Contact form	Coil ratings	Contact ratings
G2E-184P-M-US G2E-184P-H-M-US G2E-134P-M-US G2E-134P-H-M-US	SPDT	1.5 to 24 VDC	0.5 A, 125 VAC (general use) 1 A, 28 VDC (resistive)

Engineering Data

Maximum Switching Power
G2E-184P-M-US

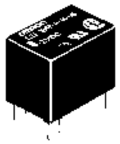


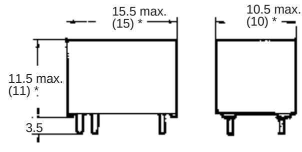
Endurance
G2E-184P-M-US



Dimensions

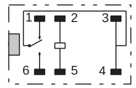
Note: 1. All units are in millimeters unless otherwise indicated.
2. Orientation marks are indicated as follows:





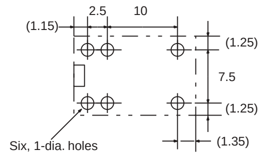
*Average value

Terminal Arrangement/ Internal Connections (Bottom View)



Mounting Holes (Bottom View)

Tolerance: ±0.1



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Sub-miniature, Sensitive SPDT Signal Switching Relay

- 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: G6E-134P-US 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

Specifications

■ Coil Ratings

Single-side Stable, Bifurcated Crossbar Contact Type

Rated voltage		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current		66.7 mA	40 mA	33.3 mA	22.2 mA	16.7 mA	8.3 mA	8.3 mA
Coil resistance		45 Ω	125 Ω	180 Ω	405 Ω	720 Ω	2,880 Ω	5,760 Ω
Coil inductance (H) (ref. value)	Armature OFF	0.08	0.18	0.31	0.62	1.20	4.70	5.35
	Armature ON	0.06	0.17	0.24	0.50	0.99	3.90	5.12
Must operate voltage		70% max. of rated voltage						
Must release voltage		10% min. of rated voltage						
Max. voltage		190% of rated voltage at 23°C						170% of rated voltage at 23°C
Power consumption		Approx. 200 mW						Approx 400 mW

Single-winding Latching, Bifurcated Crossbar Contact Type

Rated voltage		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC
Rated current		66.7 mA	40 mA	33.3 mA	22.2 mA	16.7 mA	8.3 mA
Coil resistance		45 Ω	125 Ω	180 Ω	405 Ω	720 Ω	2,880 Ω
Coil inductance (H) (ref. value)	Armature OFF	0.05	0.13	0.19	0.45	0.84	3.56
	Armature ON	0.04	0.12	0.17	0.40	0.79	3.10
Must set voltage		70% max. of rated voltage					
Must reset voltage		70% max. of rated voltage					
Max. voltage		190% of rated voltage at 23°C					
Power consumption		Approx. 200 mW					

Double-winding Latching, Bifurcated Crossbar Contact Type

Rated voltage			3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC
Set Coil	Rated current		66.7 mA	40 mA	33.3 mA	22.2 mA	16.7 mA	8.3 mA
	Coil resistance		45 Ω	125 Ω	180 Ω	405 Ω	720 Ω	2,880 Ω
	Coil inductance (H) (ref. value)	Armature OFF	0.03	0.09	0.12	0.25	0.44	1.66
		Armature ON	0.03	0.08	0.11	0.22	0.41	1.62
Reset Coil	Rated current		66.7 mA	40 mA	33.3 mA	22.2 mA	16.7 mA	8.3 mA
	Coil resistance		45 Ω	125 Ω	180 Ω	405 Ω	720 Ω	2,880 Ω
	Coil inductance (H) (ref. value)	Armature OFF	0.03	0.09	0.12	0.25	0.44	1.66
		Armature ON	0.03	0.08	0.11	0.22	0.41	1.62
Must set voltage			70% max. of rated voltage					
Must reset voltage			70% max. of rated voltage					
Max. voltage			190% of rated voltage (at 23°C)					
Power consumption			Set coil: Approx. 200 mW Reset coil: Approx. 200 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.

■ Contact Ratings

Load	Resistive load (cosø = 1)	Inductive load (cosø = 0.4; L/R = 7 ms)
Rated Load	0.4 A at 125 VAC; 2 A at 30 VDC	0.2 A at 125 VAC; 1 A at 30 VDC
Contact Material	Ag (Au–clad)	
Rated Carry Current	3 A	
Max. switching voltage	250 VAC, 220 VDC	
Max. switching current	3 A	3 A
Max. switching power	50 VA, 60 W	25 VA, 30 W
Failure rate (reference value)	10μ A at 10m VDC	

Note: P level: λ_{60} = 0.1 x 10^{-6}/operation.

■ Characteristics

Contact resistance	50 mΩ max.
Operate (set*) time	5 ms max. (mean value: approx. 2.9 ms; 48 VDC type: approx. 2.4 ms)
Release (reset*) time	5 ms max. (mean value: approx. 1.3 ms)
Bounce time	Operate: 3 ms max. (mean value: 0.37 ms) Release: 3 ms max. (mean value: 1.12 ms)
Max. operating frequency	Mechanical: 36,000 operations/hr Electrical: 1,800 operations/hr (under rated load)
Insulation resistance	1,000 MΩ min. (at 500 VDC)
Dielectric withstand voltage	1,500 VAC, 50/60 Hz for 1 min between coil and contacts 1,000 VAC, 50/60 Hz for 1 min between contacts of same polarity
Impulse withstand voltage	1,500 V (10 x 160 μs) (conforms to FCC Part 68)
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 2.5mm single amplitude (5mm 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: 300 m/s^2
Endurance	Mechanical: 100,000,000 operations min. (at 36,000 operations/hr) Electrical: 100,000 operations min. (0.4 A at 125 VAC resistive load; 0.2 A at 125 VAC inductive load) 500,000 operations min. (2 A at 30 VDC resistive load; 1 A at 30 VDC inductive load) 200,000 operations min. (3 A at 30 VDC resistive load)
Ambient temperature	Operating: -40°C to 70°C (with no icing)
Ambient humidity	5% to 85%
Weight	Approx. 2.7 g

*Minimum set and reset signals width is 7 ms min.

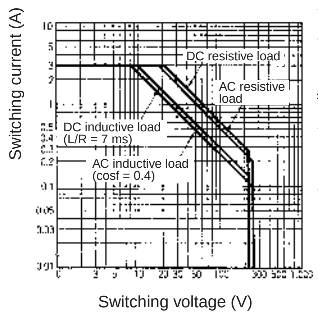
■ Approved Standards

UL508 (File No. E41515)/CSA C22.2, No.14 (File No. LR31928)

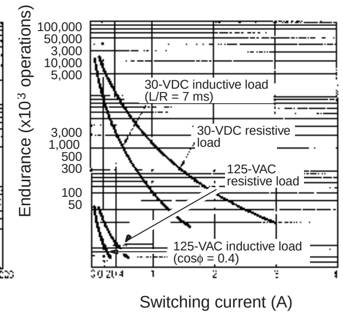
Contact form	Coil ratings	Contact ratings
SPDT	3 to 48 VDC	0.2 A, 250 VAC (general use) 0.6 A, 125 VAC (general use) 2 A, 30 VDC (resistive) 0.6 A, 125 VDC (resistive, Ag contact only)

Engineering Data

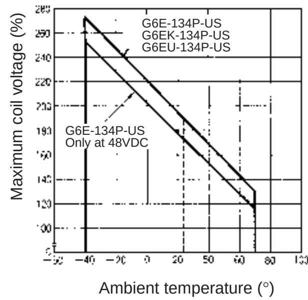
Maximum Switching Power



Endurance



Ambient Temperature vs. Maximum Coil Voltage



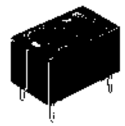
Note: The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

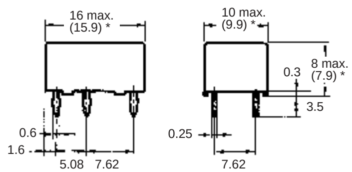
Dimensions

Note: 1. All units are in millimeters unless otherwise indicated.

2. Orientation marks are indicated as follows:

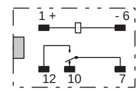
G6E-134P-US
G6E-194P-US



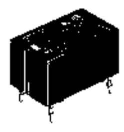


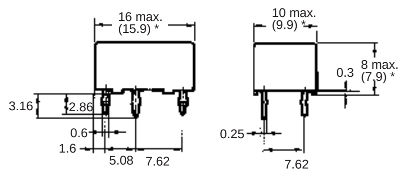
*Average value

Terminal Arrangement/ Internal Connections (Bottom View)



G6E-134C-US
G6E-194C-US

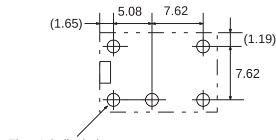




*Average value

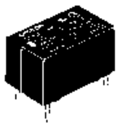
Mounting Holes (Bottom View)

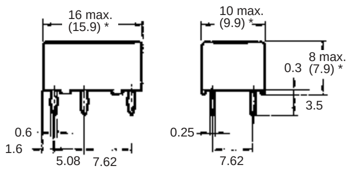
Tolerance: ±0.1



Five, 1.0-dia. holes

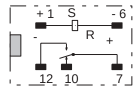
G6EU-134P-US
G6EU-194P-US



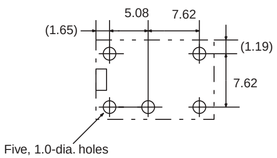


*Average value

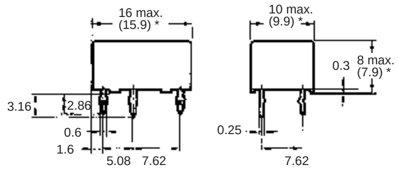
Terminal Arrangement/ Internal Connections (Bottom View)



Mounting Holes (Bottom View)
Tolerance: ±0.1

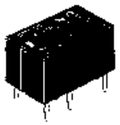


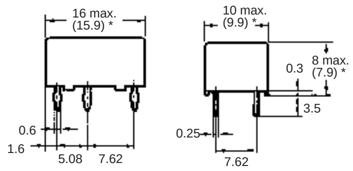
G6EU-134C-US
G6EU-194C-US



*Average value

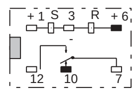
G6EK-134P-US
G6EK-194P-US





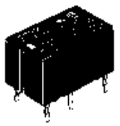
*Average value

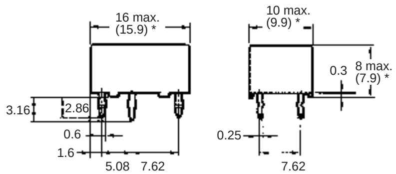
Terminal Arrangement/ Internal Connections (Bottom View)



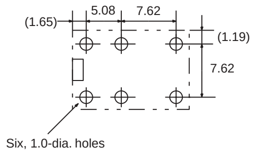
Mounting Holes (Bottom View)
Tolerance: ±0.1

G6EK-134C-US
G6EK-194C-US



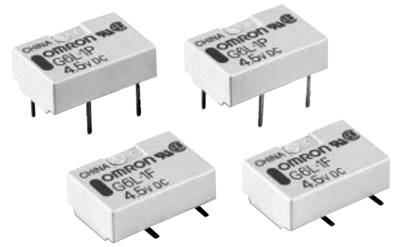


*Average value



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Extremely Thin SPST-NO Flat Relay, One of the Thinnest Relays in the World



- Dimensions of 7.0(W) x 10.6(L) x 4.2(H) (SMD) or 3.8 mm(H) (TH) represent a reduction of approximately 20% in mounting area and approximately 67% in volume compared with the OMRON G5V-1, for higher-density mounting.
- Ensures a dielectric strength between coil and contacts (1,000), and conforms to FCC Part 68 (i.e., withstanding an impulse withstand voltage of 1.5 kW for 10 x160 μs).
- High dielectric strength between contacts of same polarity (750 VAC).
- Surface-Mounting relays are also available.
- Conforms to to UL60950 (File No. E41515 / CSA C222 No. 60950 (File No. LR31928).
- Use of lead completely eliminated.

Ordering Information

Classification			Single-side stable
SPST-NO	Fully sealed	Through-hole terminal	G6L-1P
		Surface-mounting terminal	G6L-1F

Note: **1.** When ordering, add the rated coil voltage to the model number.
Example: G6L-1P 12 VDC
Rated coil voltage

2. When ordering tape packing, add “-TR” to the model number.
Example: G6L-1F-TR 12 VDC
Tape packing

Be sure since “-TR” is not part of the relay model number, it is not marked on the relay case.

Model Number Legend

G6L □ – 1 □ – □
1 2 3 4

1. **Relay Function**
   None: Single-side stable relay
2. **Number of contact poles/ Contact form**
   1: SPST-NO
3. **Terminal shape**
   P: PCB terminals
   F: Surface-mounting terminals, short
4. **Packing state**
   None: Stick packing
   TR: Tape packing

Application Examples

Peripherals of MODEM/PC, telephones, office automation machines, audio-visual products, communications equipment, measurement devices, amusement equipment, or security equipment.

Specifications

■ Contact Ratings

Item/Load	Resistive load
Contact mechanism	Single crossbar
Rated load	0.3 A at 125 VAC, 1 A at 24 VDC
Rated carry current	1 A
Max. switching voltage	125 VAC, 60 VDC
Max. switching current	1 A

■ Coil Ratings

Single-side Stable Relays (G6L-1P, G6L-1F)

Rated voltage	3 VDC	4.5 VDC	5 VDC	12 VDC	24 VDC
Rated current	60.0 mA	40.0 mA	36.0 mA	15.0 mA	9.6 mA
Coil resistance	50.0 Ω	112.5 Ω	139.0 Ω	800.0 Ω	2,504.0 Ω
Must operate voltage	75% max. of rated voltage				
Must release voltage	10% min. of rated voltage				
Max. voltage	150% of rated voltage				130% of rated voltage
Power consumption	Approx. 180 mW				Approx. 230 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 voltage that can be imposed on the Relay coil.

Surface-Mounting Signal Relay – G6L OMRON

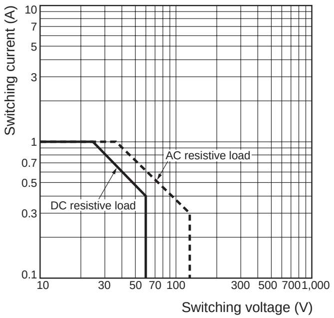
■ Characteristics

Classification		Single-side Stable Relays
Item/Model		G6L-1P, G6L-1F
Contact resistance (See note 1.)		100 mΩ max.
Operating time (See note 2.)		5 ms max. (approx. 1.1 ms)
Release time (See note 2.)		5 ms max. (approx. 0.4 ms)
Insulation resistance (See note 3.)		1,000 MΩ min. (at 500 VDC)
Dielectric strength	**Coils & contacts**	1,000 VAC, 50/60 Hz for 1 min
	Contacts of same polarity	750 VAC, 50/60 Hz for 1 min
Impulse with-stand voltage	**Coil & contacts**	1,500 VAC, 10 x 160 μs
Vibration resistance	**Destruction**	10 to 55 Hz, 1.65-mm single amplitude (3.3mm double amplitude)
	Malfunction	10 to 55 Hz, 1.65-mm 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 36,000 operations/hour)
	Electrical	100,000 operations min. (with a rated load at 1,800 operations/hour)
Failure rate (P level) (See note 4.)		1 mA at 5 VDC
Ambient temperature		Operating: -40˚C to 70˚C (with no icing or condensation)
Ambient humidity		Operating: 5% to 85%
Weight		Approx. 0.6 g

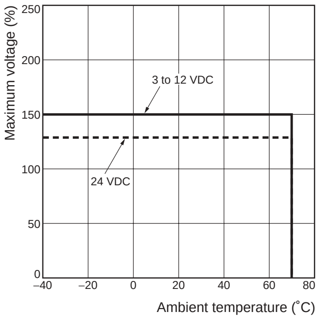
Note: 1. The contact resistance was measured with 10 mA at 1 VDC with a fall-of-potential method.
2. Values in parentheses are actual values.
3. The insulation resistance was measured with a 500-VDC Megger Tester applied to the same parts as those for checking the dielectric strength.
4. This value was measured at a switching frequency of 120 operations/min. This value may vary, depending on switching frequency, operating conditions, expected reliability level of the relay, etc. It is always recommended to double-check relay suitability under actual load conditions.
5. The above values are initial values.

Engineering Data

Maximum Switching Capacity

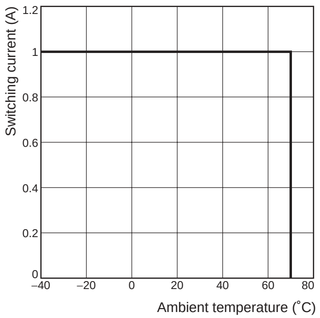


Ambient Temperature vs. Maximum Voltage

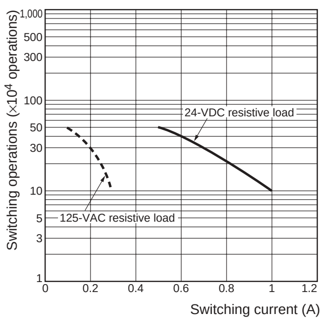


Note: “Maximum voltage” is the maximum voltage that can be applied to the Relay coil.

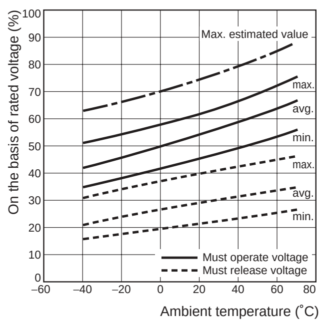
Ambient Temperature vs. Switching Current



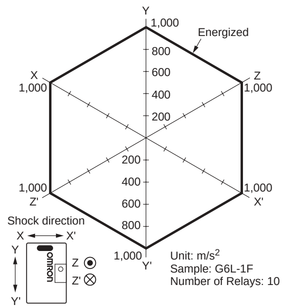
Endurance



Ambient Temperature vs. Must Operate or Must Release Voltage

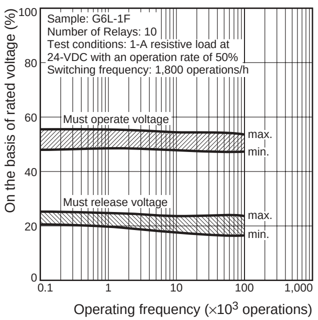


Shock Malfunction

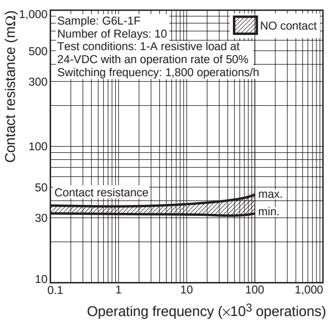


Conditions: Shock is applied in ±X, ±Y, and ±Z directions three times each with and without energizing the Relays to check the number of contact malfunctions.

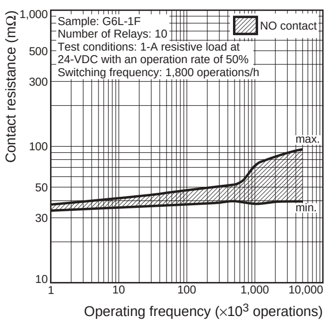
Electrical Endurance (with Must Operate and Must Release Voltage) (See note.)



Electrical Endurance (Contact Resistance) (See note.)

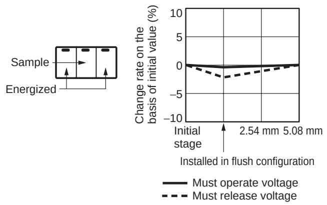


Contact Reliability Test (Contact Resistance) (See note.)

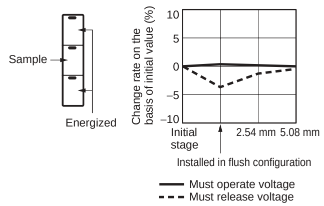


Note: The tests were conducted at an ambient temperature of 23°C.

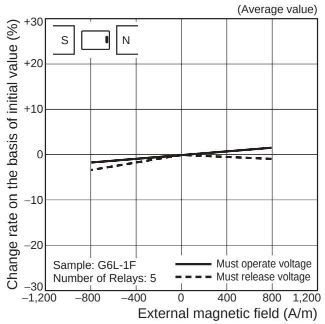
Mutual Magnetic Interference

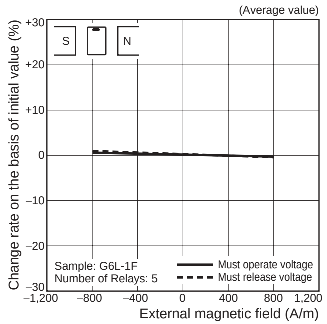


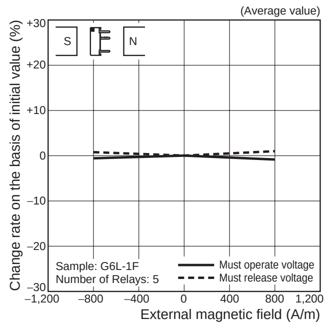
Mutual Magnetic Interference



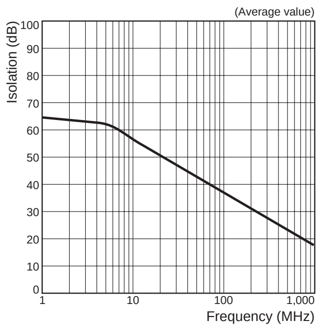
External Magnetic Interference



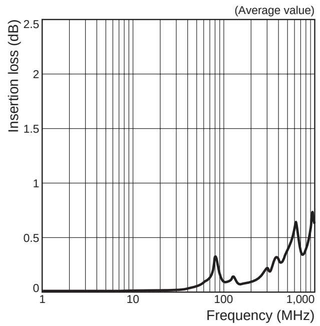




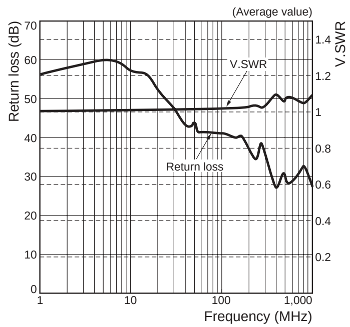
High-frequency Characteristics (Isolation)



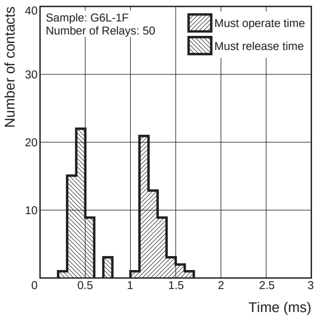
High-frequency Characteristics (Insertion Loss)



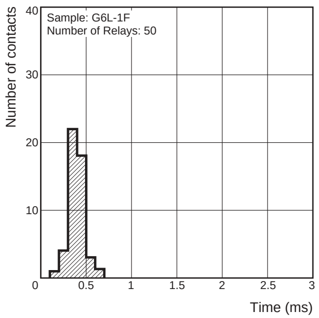
High-frequency Characteristics (Return Loss, V.SWR)



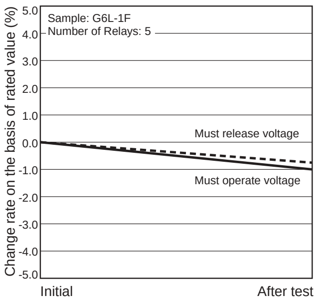
Must Operate and Must Release Time Distribution (See note.)



Distribution of Bounce Time (See note.)



Vibration Resistance

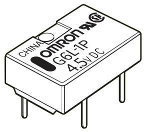


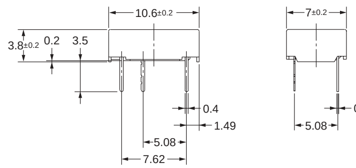
Note: The tests were conducted at an ambient temperature of 23°C.

Dimensions

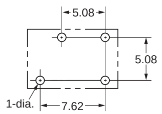
Note: All units are in millimeters unless otherwise indicated.

G6L-1P

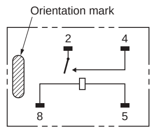




PCB Mounting Holes (Bottom View)
Tolerance: ±0.1 mm

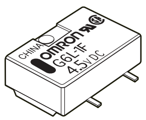


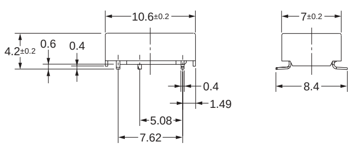
Terminal Arrangement/ Internal Connections (Bottom View)



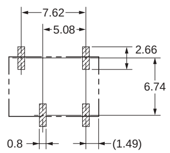
Note: Each value has a tolerance of ±0.3 mm.

G6L-1F

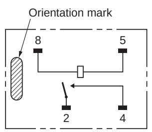




PCB Mounting Holes (Top View)
Tolerance: ±0.1 mm



Terminal Arrangement/ Internal Connections (Top View)



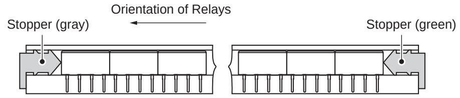
Note: Each value has a tolerance of ±0.3 mm.

Stick Packing and Tape Packing

1. STICK PACKING

Relays in stick packing are arranged so that the orientation mark of each Relay is on the left side.

Always confirm that the Relays are in the correct orientation when mounting the Relays to the PCBs.



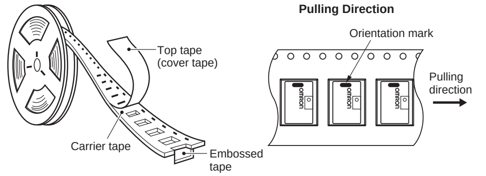
Stick length: 552 mm (stopper not included)
No. of Relays per stick: 50

2. TAPE PACKING (SURFACE-MOUNTING TERMINAL RELAYS)

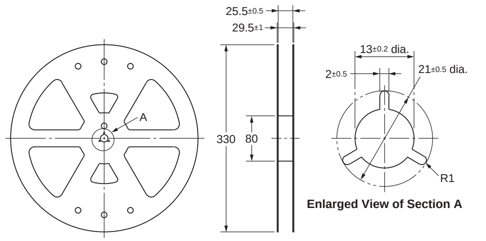
When ordering Relays in tape packing, add the suffix "-TR" to the model number, otherwise the Relays in stick packing will be provided.

Tape type: TB2412R (Refer to EIAJ (Electronic Industries Association of Japan))
Reel type: R24D (Refer to EIAJ (Electronic Industries Association of Japan))
Relays per reel: 1,000

Direction of Relay Insertion

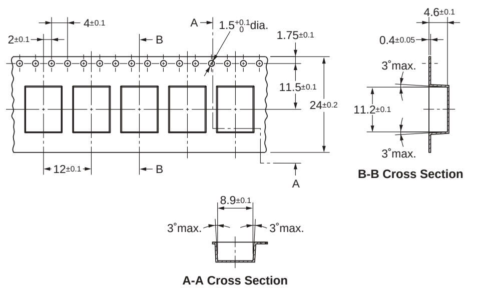


Reel Dimensions



Carrier Tape Dimensions

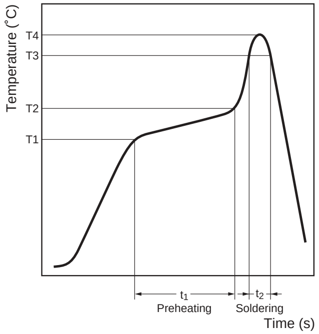
G6L-1F



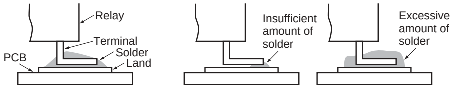
Recommended Soldering Method

TEMPERATURE PROFILE ACCORDING TO IRS

- When performing reflow-soldering, check the profile on an actual device after setting the temperature condition so that the temperatures at the relay terminals and the upper surface of the case do not exceed the limits specified in the following table.



- The thickness of cream solder to be applied should be within a range between 150 and 200 μm on OMRON's recommended PCB pattern.



Visually check that the Relay is properly soldered.

Item/ Measuring position	Preheating (T1 to T2, t1)	Soldering (T3, t_1)	NPeak value (T_2)
Terminal	150°C to 180°C, 120 s max.	180°C to 200°C, 20 to 30 s	245°C max.
Upper surface of case	–	–	250°C max.

■ Approved Standards

UL approval: UL60950 (File No. E41515)

CSA approval: C22.2 No.60950 (File No. LR31928)

Contact form	Coil ratings	Contact ratings	Number of test operations
SPST-NO	G6L-1P and G6L-1F: 3 to 24 VDC	1A at 30 VDC 0.5A at 60 VDC 0.3A at 125 VAC	6,000

Precautions

CORRECT USE

Handling

Leave the Relays packed until just prior to mounting them.

Soldering

Solder: JIS Z3282, H63A

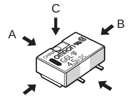
Soldering temperature: Approx. 250ºC (At 260ºC if the DWS method is used.)

Soldering time: Approx. 5 s max. (approx. 2 s for the first time and approx. 3 s for the second time if the DWS method is used.)

Be sure to adjust the level of the molten solder so that the solder will not overflow onto the PCB.

Claw Securing Force During Automatic Insertion

During automatic insertion of Relays, make sure to set the securing force of the claws to the following values so that the Relay characteristics will be maintained.



Direction A: 5.0 N max.

Direction B: 5.0 N max.

Direction C: 5.0 N max.

Secure the claws to the area indicated by shading. Do not attach them to the center area or to only part of the Relay.

Environmental Conditions During Operation, Storage, and Transportation

Protect the Relays from direct sunlight and keep the Relays under normal temperature, humidity, and pressure.

MAXIMUM VOLTAGE

The maximum voltage of the coil can be obtained from the coil temperature increase and the heat-resisting temperature of coil insulating sheath material. (Exceeding the heat-resisting temperature may result in burning or short-circuiting.) The maximum voltage also involves important restrictions which include the following:

- Must not cause thermal changes in or deterioration of the insulating material.
- Must not cause damage to other control devices.
- Must not cause any harmful effect on people.
- Must not cause fire.

Therefore, be sure not to exceed the maximum voltage specified in the catalog.

As a rule, the rated voltage must be applied to the coil. A voltage exceeding the rated value, however, can be applied to the coil provided that the voltage is less than the maximum voltage. It must be noted that continuous voltage application to the coil will cause a coil temperature increase thus affecting characteristics such as electrical life and resulting in the deterioration of coil insulation.

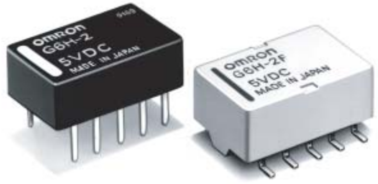
Coating

Relays mounted on PCBs may be coated or washed. Do not apply silicone coating or detergent containing silicone, otherwise the silicone coating or detergent may remain on the surface of the Relays.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Ultracompact, Ultrasensitive DPDT Relay

- Compact size and low 5mm profile.
- Low power consumption (140 mW for single-side stable, 100 to 300 mW for latching type) and high sensitivity.
- Low thermoelectromotive force.
- Low magnetic interference enables high-density mounting.
- Single- and double-winding latching types also available.



Ordering Information

Classification			Single-side stable	Single-winding latching	Double-winding latching
DPDT	Fully Sealed	PCB terminal	G6H-2	G6HU-2	G6HK-2
		Surface mount terminal	G6H-2F	–	–

Note: When ordering, add the rated coil voltage to the model number.
Example: G6HK-2 12 VDC
Rated coil voltage

Model Number Legend

G6H □ - □ □- □ □ VDC
1 2 3 4 5

1. **Relay Function**
   None: Single-side stable
   U: Single-winding latching
   K: Double-winding latching
2. **Contact Form**
   2: DPDT
3. **Terminal Shape**
   None: PCB terminal
   F: Surface mount terminal
4. **Classification**
   U: Ultrasonically cleanable
5. **Rated Coil Voltage**
   3, 5, 6, 9, 12, 24 VDC

Specifications

Coil Ratings

Single-side Stable Type (G6H-2, G6H-2F)

Rated voltage		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC
Rated current		46.7 mA	28.1 mA	23.3 mA	15.5 mA	11.7 mA	8.3 mA
Coil resistance		64.3 Ω	178 Ω	257 Ω	579 Ω	1,028 Ω	2,880 Ω
Coil inductance (H) (ref. value)	**Armature OFF**	0.025	0.065	0.11	0.24	0.43	1.2
	Armature ON	0.022	0.058	0.09	0.20	0.37	1.0
Must operate voltage		75% max. of rated voltage					
Must release voltage		10% min. of rated voltage					
Max. voltage		200% of rated voltage at 23°C					170% of rated voltage at 23°C
Power consumption		Approx. 140 mW					Approx. 200 mW

Note: 48 VDC (single-side stable) model is also available. Consult OMRON for details.

Single-winding Latching Type (G6HU-2)

Rated voltage		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC
Rated current		33.3 mA	20 mA	16.7 mA	11.1 mA	8.3 mA	6.25 mA
Coil resistance		90 Ω	250 Ω	360 Ω	810 Ω	1,440 Ω	3,840 Ω
Coil inductance (H) (ref. value)	**Armature OFF**	0.034	0.11	0.14	0.33	0.60	1.6
	Armature ON	0.029	0.09	0.12	0.28	0.50	1.3
Must operate voltage		75% max. of rated voltage					
Must release voltage		75% min. of rated voltage					
Max. voltage		180% of rated voltage at 23°C					
Power consumption		Approx. 100 mW					Approx. 150 mW

Double-winding Latching Type (G6HK-2)

Rated voltage		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC
Rated current		66.7 mA	40 mA	33.3 mA	22.2 mA	16.7 mA	12.5 mA
Coil resistance		45 Ω	125 Ω	180 Ω	405 Ω	720 Ω	1,920 Ω
Coil inductance (H) (ref. value)	**Armature OFF**	0.014	0.042	0.065	0.16	0.3	0.63
	Armature ON	0.0075	0.023	0.035	0.086	0.16	0.33
Must operate voltage		75% max. of rated voltage					
Must release voltage		75% min. of rated voltage					
Max. voltage		160% of rated voltage at 23°C					130% of rated voltage at 23°C
Power consumption		Approx. 200 mW					Approx. 300 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.

Contact Ratings

Load	Resistive load (cosø = 1)
Rated load	0.5 A at 125 VAC; 1 A at 30 VDC
Contact material	Ag (Au-clad)
Rated carry current	1 A
Max. switching voltage	125 VAC, 110 VDC
Max. switching current	1 A
Max. switching power	62.5 VA, 33 W
Failure rate (reference value)	10 μA at 10 mVDC

Note: P level: λ_{60} = 0.1 x 10^{-6}/operation

■ Characteristics

Contact resistance	50 mΩ max. (G6H-2-U: 100 mΩ max.; G6H-2F: 60 mΩ max.)
Operate (set) time	Single-side stable types: 3 ms max. (mean value: approx. 2 ms) Latching types: 3 ms max. (mean value: approx. 1.5 ms)
Release (reset) time	Single-side stable types: 2 ms max. (mean value: approx. 1 ms) Latching types: 3 ms max. (mean value: approx. 1.5 ms)
Bounce time	Operate: Approx. 0.5 ms Release: Approx. 0.5 ms Set/reset: Approx. 0.5 ms
Min. set/reset signal width	Latching type: 5 ms min. (at 23°C)
Max. operating frequency	Mechanical: 36,000 operations/hr Electrical: 1,800 operations/hr (under rated load)
Insulation resistance	1,000 MΩ min. (at 500 VDC)
Dielectric withstand voltage	1,000 VAC, 50/60 Hz for 1 min between coil and contacts 1,000 VAC, 50/60 Hz for 1 min between contacts of different polarity 750 VAC, 50/60 Hz for 1 min between contacts of same polarity
Impulse withstand voltage	1,500 V (10 x 160 μs) between contacts of same polarity (conforms to FCC Part 68)
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 2.5mm single amplitude (5mm double amplitude) Malfunction: 10 to 55 to 10 Hz, 1.65mm single amplitude (3mm double amplitude)
Shock resistance	Destruction: 1,000 m/s^2 Malfunction: 500 m/s^2
Endurance	Mechanical: 100,000,000 operations min. (at 36,000 operations/hr) Electrical: 200,000 operations min. (at 1,800 operations/hr)
Ambient temperature	Operating: -40˚C to 70˚C (with no icing)
Ambient humidity	Operating: 5% to 85%
Weight	Approx. 1.5 g

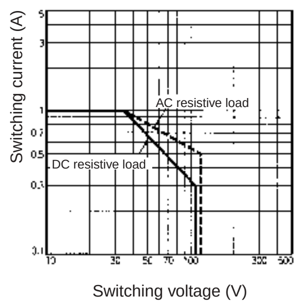
■ Approved Standards

UL114, UL478 (File No. E41515)/CSA C22.2 No.0, No.14 (File No. LR31928)

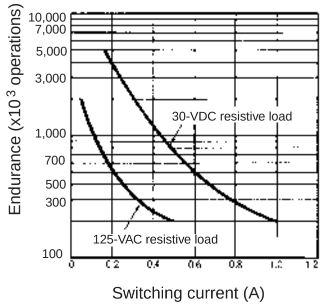
Model	Contact form	Coil ratings	Contact ratings
G6H-2 G6HU-2 G6HK-2 G6H(U/K)-2-U G6H(U/K)-2-100	DPDT	1.5 to 48 VDC	2 A, 30 VDC 0.3 A, 110 VDC 0.5 A, 125 VAC

Engineering Data

Maximum Switching Power

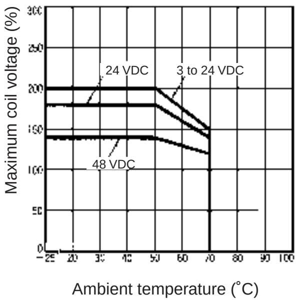


Endurance

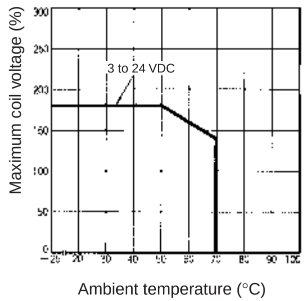


Ambient Temperature vs. Maximum Coil Voltage

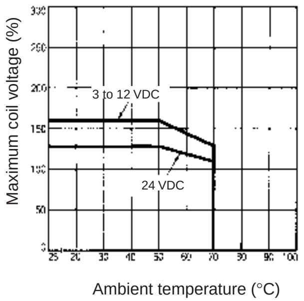
Single-side Stable (G6H-2)



Single-winding Latching (G6HU-2)

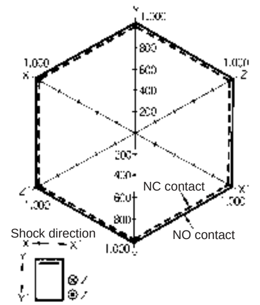


Double-winding Latching (G6HK-2)



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

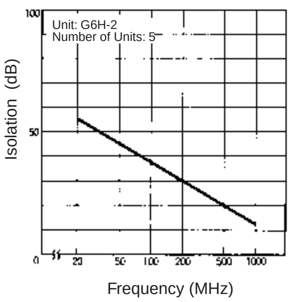
Malfunctioning Shock Resistance (G6H-2)
5 VDC
Number of Units: 10



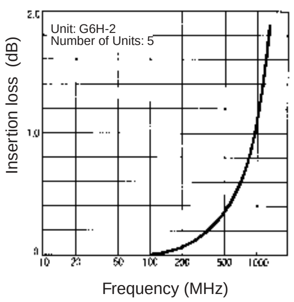
Condition: The Units were shocked at the rate of 500 m/s^2 three times each in the ±X, ±Y, and ±Z directions with and without voltage imposed on the Units until the Units malfunctioned.

High-frequency Characteristics

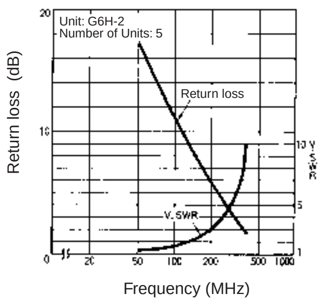
Frequency vs. Isolation



Frequency vs. Insertion Loss

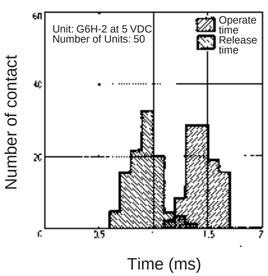


Frequency vs. Return Loss, V.SWR

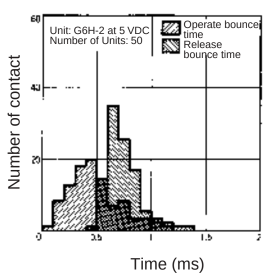


Note: The above characteristics were obtained from the Units inserted into test sockets. The characteristics of G6H-2 Units in actual operation may be different from the above characteristics. Check the characteristics of G6H-2 Units under the actual conditions before use.

Distribution of Operate and Release Time



Distribution of Bounce Time

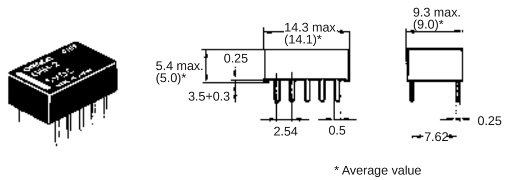


Dimensions

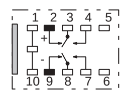
Note: **1.** All units are in millimeters unless otherwise indicated.
2. Orientation marks are indicated as follows:

Single-side Stable Type

G6H-2(-U)

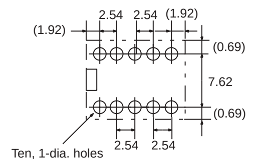


Terminal Arrangement/ Internal Connections (Bottom View)



Mounting Holes (Bottom View)

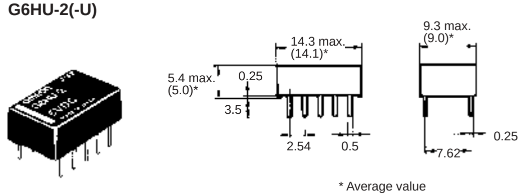
Tolerance: ±0.1

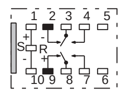


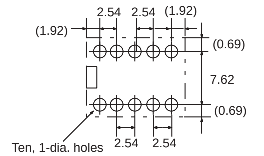
* Average value

Single-winding Latching Type

G6HU-2(-U)



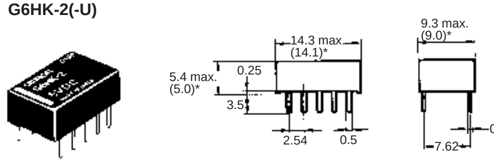


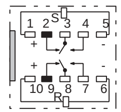


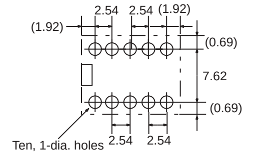
* Average value

Double-winding Latching Type

G6HK-2(-U)



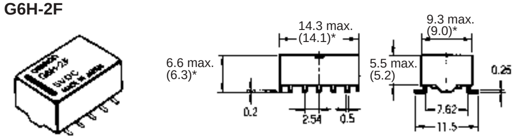


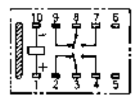


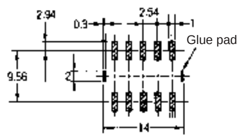
* Average value

Single-side Stable Type

G6H-2F





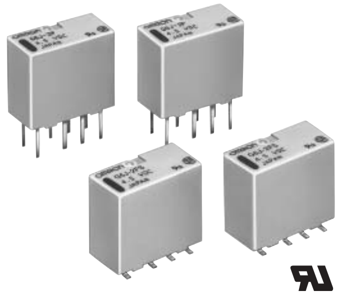


* Average value

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Ultra-compact and Slim DPDT Relay with the World's Smallest Mounting Area*

- Dimensions of 4.8 x 10.3 x 9 mm (WxLxH) represent a reduction of approximately 55% in mounting area compared with the OMRON G6S, for higher-density mounting.
- Dielectric strength of 1,500 VAC and an impulse withstand voltage of 2,500 V for 2 x 10 µs (conforms to North American Telcordia specifications (formerly Bellcore)).
- Conforms to FCC Part 68 (i.e., impulse withstand voltage of 1,500 V for 10 x 160 µs between coil and contacts and between contacts of the same polarity).
- Single-winding latching models to save energy.
- Conforms to UL60950 (File No. E41515)/CSA C22.2 No. 60950 (File No. LR24825).



* The world's smallest mounting area for mechanical relays for DPDT signal use, as determined by comparing the surface-mounting area for models with surface-mounting terminals (short) and models with PCB terminals (as of May 2001, from an OMRON survey).

Ordering Information

Classification				Single-side stable	Single-winding latching
DPDT	Plastic sealed	Through-hole terminal		G6J-2P	G6JU-2P
		Surface mount terminal	Short	G6J-2FS	G6JU-2FS
			Long	G6J-2FL	G6JU-2FL

Note: **1.** When ordering, add the rated coil voltage to the model number.
Example: G6J-2P 12 VDC
Rated coil voltage

2. When ordering tape packing, add "-TR" to the model number.
Example: G6J-2P-TR 12 VDC
Tape packing

When ordering tape packing, add "-TR" to the model number.
Be sure since "-TR" is not part of the relay model number, it is not marked on the relay case.

Model Number Legend

G6H □ – □ □
1 2 3

1. **Relay Function**
   None: Single-side stable
   U: Single-winding latching
2. **Contact form**
   2: DPDT
3. **Terminal shape**
   P: PCB terminals
   FS: Surface-mounting terminals, short
   FL: Surface-mounting terminals, long

Application Examples

Telephones, communications equipment, measurement devices, office automation machines, and audio-visual products.

Standard Specifications

Contact mechanism: Crossbar twin Ag (Au-alloy contact)

Enclosure rating: Plastic-sealed

■ Coil Rating

Single-side Stable Relays (G6J-2P, G6J-2FS, G6J-2FL)

Rated voltage	3 VDC	4.5 VDC	5 VDC	12 VDC	24 VDC
Rated current	48.0 mA	32.1 mA	29.2 mA	12.2 mA	9.2 mA
Coil resistance	62.5 Ω	140.4 Ω	171.1 Ω	979.8 Ω	2,620 Ω
Must operate voltage	75% max. of rated voltage				
Must release voltage	10% min. of rated voltage				
Max. voltage	150% of rated voltage				
Power consumption	Approx. 140 mW				Approx. 230 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 voltage that can be imposed on the Relay coil instantaneously.

Single-winding Latching Relays (G6JU-2P, G6JU-2FS, G6JU-2FL)

Rated voltage	3 VDC	4.5 VDC	5 VDC	12 VDC
Rated current	33.9 mA	21.7 mA	20.4 mA	9.2 mA
Coil resistance	88.5 Ω	207.8 Ω	245.3 Ω	1,309 Ω
Must operate voltage	75% max. of rated voltage			
Must release voltage	75% max. of rated voltage			
Max. voltage	150% of rated voltage			
Power consumption	Approx. 100 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 voltage that can be imposed on the Relay coil instantaneously.

■ Contact Ratings

Load	Resistive load
Rated load	0.3 A at 125 VAC; 1 A at 30 VDC
Rated carry current	1 A
Max. switching voltage	125 VAC, 110 VDC
Max. switching current	1 A

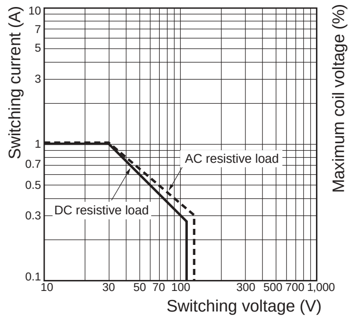
■ Characteristics

Item		Single-side Stable Relays	Single-winding Latching Relays
		G6J-2P, G6J-2FS, G6J-2FL	G6JU-2P, G6JU-2FS, G6JU-2FL
Contact resistance (See note 1.)		100 mΩ max.	
Operating (set) time (See note 2.)		3 ms max. (approx. 1.3 ms)	3 ms max. (approx. 1.3 ms)
Release (reset) time (See note 2.)		3 ms max. (approx. 0.8 ms)	3 ms max. (approx. 1.3 ms)
Minimum set/reset signal width		–	10 ms min.
Insulation resistance (See note 3.)		1,000 MΩ min. (at 500 VDC)	
Dielectric strength	**Coils & contacts**	1,500 VAC, 50/60 Hz for 1 min	
	Contacts of different polarity	1,000 VAC, 50/60 Hz for 1 min	
	Contacts of same polarity	750 VAC, 50/60 Hz for 1 min	
Impulse with stand voltage	**Coils & contacts**	2,500 VAC, 2 x 10 µs	
	Contacts of different polarity	1,500 VAC, 10 x 160 µs	
	Contacts of same polarity		
Vibration resistance		Destruction: 10 to 55 Hz 2.5mm single amplitude (5mm double amplitude) Malfunction: 10 to 55 Hz 1.65mm single amplitude (3.3mm double amplitude)	
Shock resistance		Destruction: 1,000 m/s² (approx. 100G) Malfunction: 750 m/s² (approx. 75G)	
Life expectancy		Mechanical: 50,000,000 operations min. (at 36,000 operations/hour) Electrical: 100,000 operations min. (with a rated load at 1,800 operations/hour)	
Failure rate (P level) (See note 4.)		10 µA at 10 mVDC	
Ambient temperature		-40 to 85°C (with no icing or condensation)	
Ambient humidity		5% to 85%	
Weight		Approx. 0.8 g	

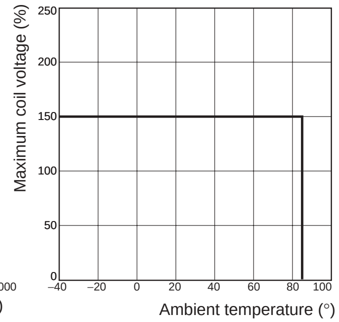
Note: 1. The contact resistance was measured with 10 mA at 1 VDC with a fall-of-potential method.
2. Values in parentheses are actual values.
3. The insulation resistance was measured with a 500-VDC Megger Tester applied to the same parts as those for checking the dielectric strength.
4. This value was measured at a switching frequency of 120 operations/min.
569. The above values are initial values.

Engineering Data

Maximum Switching Capacity

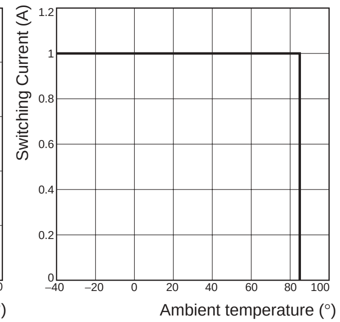


Ambient Temperature vs. Maximum Coil Voltage

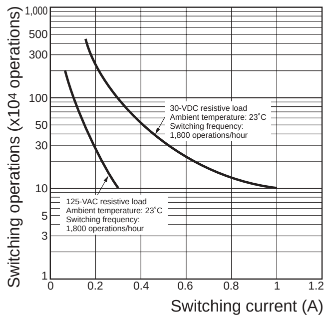


Note: "Maximum voltage" is the maximum voltage that can be applied to the Relay coil.

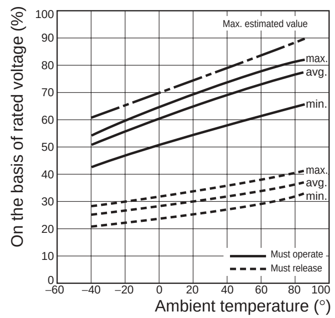
Ambient Temperature vs. Switching Current



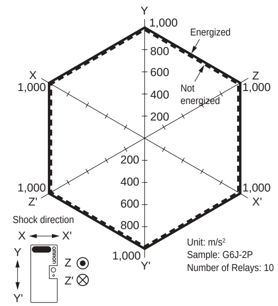
Life Expectancy



Ambient Temperature vs. Must Operate or Must Release Voltage

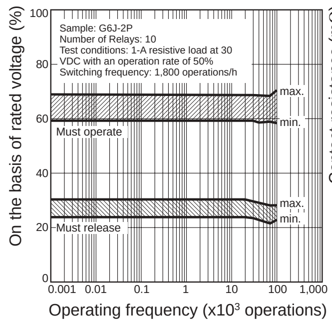


Shock Malfunction

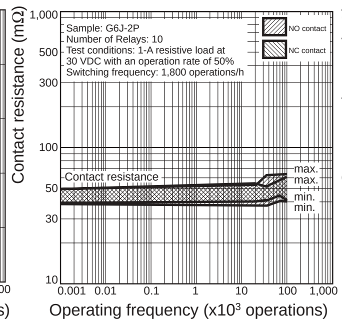


Conditions: Shock is applied in ±X, ±Y, and ±Z directions three times each with and without energizing the Relays to check the number of contact malfunctions.

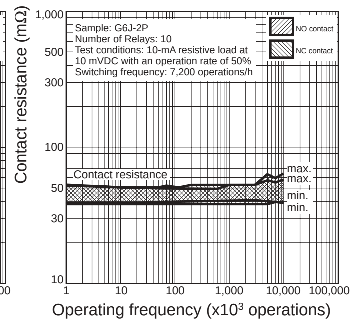
Electrical Life Expectancy (with Must Operate and Must Release Voltage) (See note.)



Electrical Life Expectancy (Contact Resistance) (See note.)

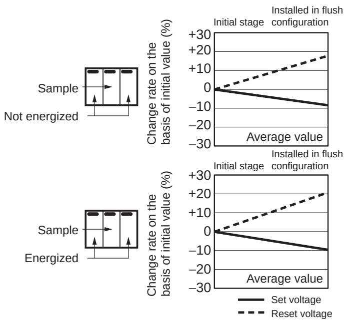


Electrical Life Expectancy (Contact Resistance) (See note.)

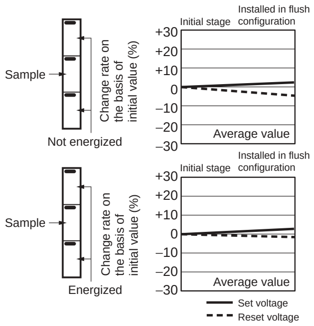


Note: The tests were conducted at an ambient temperature of 23°C.

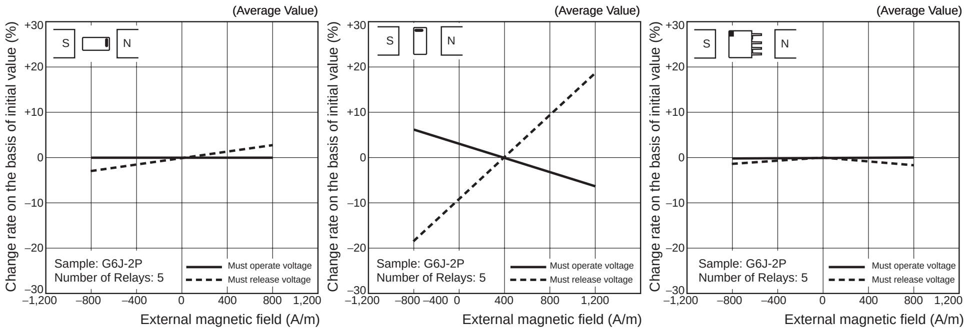
Mutual Magnetic Interference



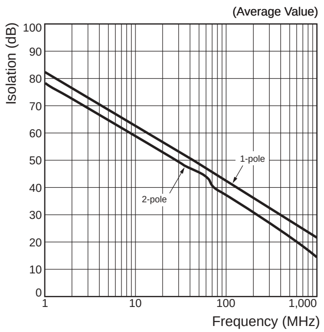
Mutual Magnetic Interference



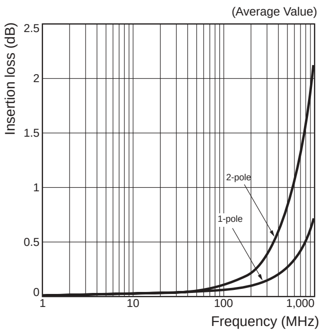
External Magnetic Interference



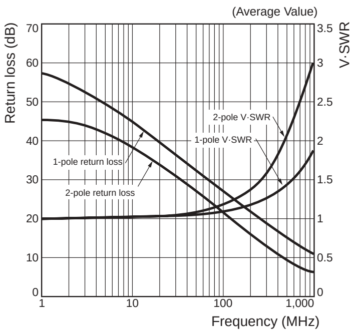
High-frequency Characteristics (Isolation)



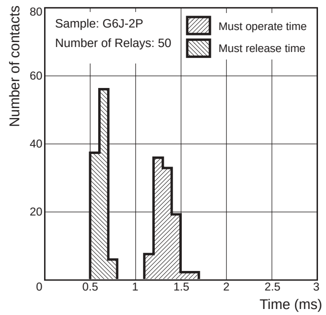
High-frequency Characteristics (Isolation)



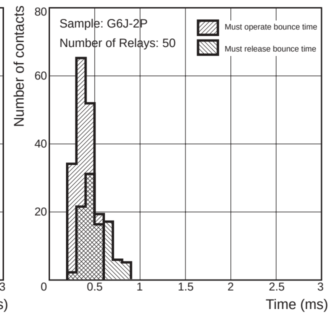
High-frequency Characteristics (Return Loss, V.SWR)



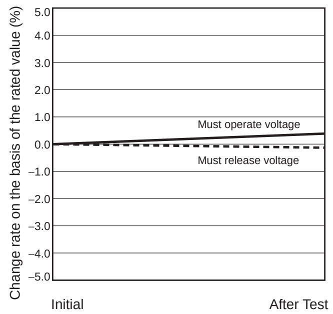
Must Operate and Must Release Time Distribution (See note.)



Must Operate and Must Release Bounce Time Distribution (See note.)



Vibration Resistance

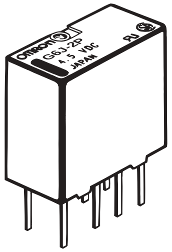


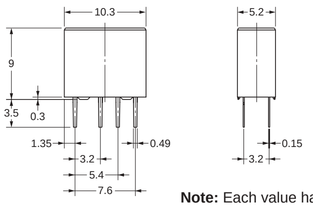
Note: The tests were conducted at an ambient temperature of 23°C.

Dimensions

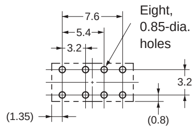
Note: All units are in millimeters unless otherwise indicated.

G6J-2P
G6JU-2P





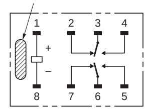
Mounting Dimensions (Bottom View)
Tolerance ±0.1 mm



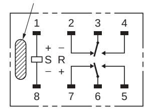
Note: Each value has a tolerance of ±0.3 mm.

Terminal Arrangment/ Internal Connections (Bottom View)

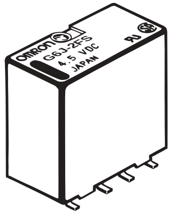
G6J-2P
Orientation mark

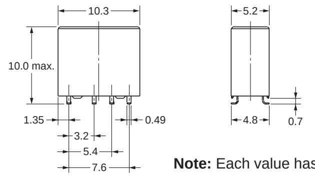


G6U-2P
Orientation mark

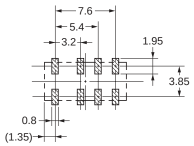


G6J-2FS
G6JU-2FS





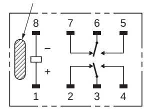
Mounting Dimensions (Top View)
Tolerance ±0.1 mm



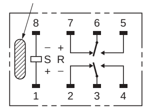
Note: Each value has a tolerance of ±0.3 mm.

Terminal Arrangement/ Internal Connections (Top View)

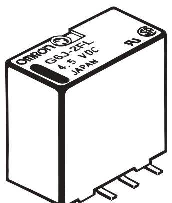
G6J-2FS
Orientation mark

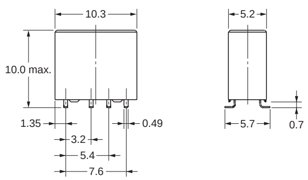


G6JU-2FS
Orientation mark

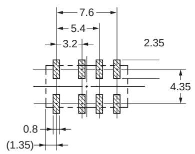


G6J-2FL
G6JU-2FL





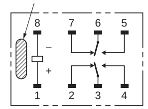
Mounting Dimensions (Bottom View)
Tolerance ±0.1 mm



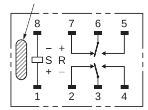
Note: Each value has a tolerance of ±0.3 mm.

Terminal Arrangement/ Internal Connections (Top View)

G6J-2FL
Orientation mark



G6JU-2FL
Orientation mark

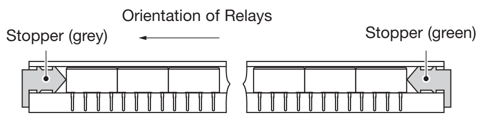


Stick Packing and Tape Packing

1. Stick Packing

Relays in stick packing are arranged so that the orientation mark of each Relay is on the left side.

Always confirm that the Relays are in the correct orientation when mounting the Relays to the PCBs.



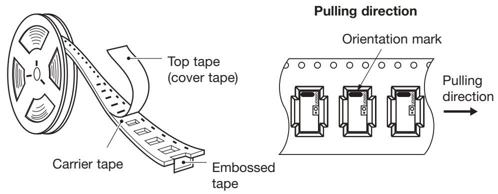
Stick length: 540 mm (stopper not included)
No. of Relays per stick: 50

2. Tape Packing (Surface-mounting Terminal Relays)

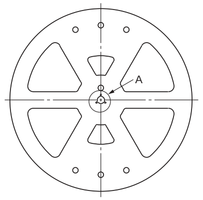
When ordering Relays in tape packing, add the prefix "-TR" to the model number, otherwise the Relays in stick packing will be provided.

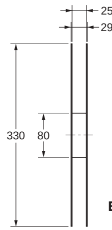
Tape type	TB2412R (EIAJ (Electronic Industrial Association of Japan))
Reel type:	R24D (EIAJ (Electronic Industrial Association of Japan))
Relays per reel:	500

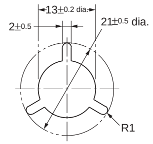
Direction of Relay Insertion



Reel Dimensions



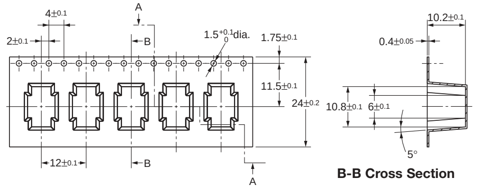




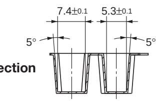
Enlarged View of Section A

Carrier Tape Dimensions

G6J-2FS, G6JU-2FS

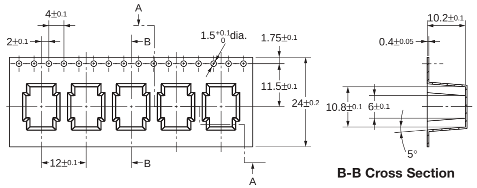


B-B Cross Section

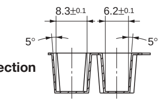


A-A Cross Section

G6J-2FL, G6JU-2FL



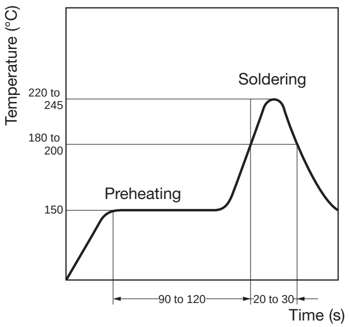
B-B Cross Section



A-A Cross Section

Recommended Soldering Method

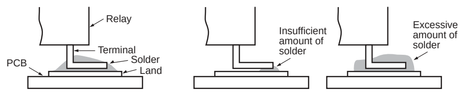
IRS Method (for Surface-Mounting Terminal Relays)



Note: Temperatures indicate the surface temperatures of the PCB

- The thickness of cream solder to be applied should be between 150 and 200 mm on OMRON's recommended PCB pattern.
- In order to perform correct soldering, it is recommended that the correct soldering conditions be maintained as shown below on the left-hand side.

Correct Soldering **Incorrect Soldering**



Visually check that the Relay is properly soldered.

■ Approved Standards

UL approval: UL60950 (File No. E41515)

CSA approval: C22.2 No. 60950 (File No. LR24825)

Contact form	Coil ratings	Contact ratings	Number of test operations
DPDT	G6J-2P, 2FS, 2FL: 3 to 24 VDC G6JU-2P, 2FS, 2FL: 3 to 24 VDC	1 A at 30 VDC 0.5 A at 60 VDC 0.3 A at 125 VAC	6,000

Precautions

CORRECT USE

Handling

Leave the Relays packed until just prior to mounting them.

Soldering

Solder: JIS Z3282, H63A

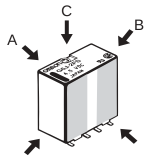
Soldering temperature: Approx. 250°C (At 260°C if the DWS method is used.)

Soldering time: Approx. 5 s max. (Approx. 2 s for the first time and approx. 3 s for the second time if the DWS method is used.)

Be sure to adjust the level of the molten solder so that the solder will not overflow onto the PCB.

Claw Securing Force During Automatic Mounting

During automatic insertion of Relays, make sure to set the securing force of the claws to the following values so that the Relay characteristics will be maintained.



Direction A: 4.90 N max.
Direction B: 9.80 N max.
Direction C: 9.80 N max.

Secure the claws to the area indicated by shading.

Do not attach them to the center area or to only part of the Relay.

Environmental Conditions During Operation, Storage, and Transportation

Protect the Relays from direct sunlight and keep the Relays under normal temperature, humidity, and pressure.

Mounting Latching Relays

Make sure that the vibration or shock that is generated from other devices, such as Relays in operation, on the same panel and imposed on the Latching Relays does not exceed the rated value, otherwise the Latching Relays that have been set may be reset or vice versa. The Latching Relays are reset before shipping. If excessive vibration or shock is imposed, however, the Latching Relays may be set accidentally. Be sure to apply a reset signal before use.

Maximum Allowable Voltage

The maximum voltage of the coil can be obtained from the coil temperature increase and the heat-resisting temperature of coil insulating sheath material. (Exceeding the heat-resisting temperature may result in burning or short-circuiting.) The maximum voltage also involves important restrictions which include the following:

- Must not cause thermal changes or deterioration of the insulating material.
- Must not cause damage to other control devices.
- Must not cause any harmful effect on people.
- Must not cause fire.

Therefore, be sure not to exceed the maximum voltage specified in the catalog.

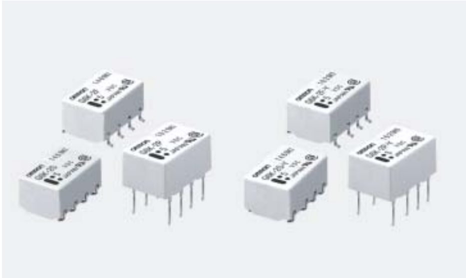
As a rule, the rated voltage must be applied to the coil. A voltage exceeding the rated value, however, can be applied to the coil provided that the voltage is less than the maximum voltage. It must be noted that continuous voltage application to the coil will cause a coil temperature increase thus affecting characteristics such as electrical life and resulting in the deterioration of coil insulation.

Coating

Relays mounted on PCBs may be coated or washed. Do not apply silicone coating or detergent containing silicone, otherwise the silicone coating or detergent may remain on the surface of the Relays.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Surface-Mounting Relay with the World's Smallest Mounting Area and a Height of Only 5.2 mm



- Sub-miniature model as small as 5.2 (H) x 6.5 (W) x 10 (L) mm is ideal for high-density mounting.
- Low profile of 5.2 mm and weight of only 0.7 g combine to improve mounting efficiency.
- Models with inside-L surface mounting terminals are available.
- Consumes approximately 70% the power of a conventional OMRON model and operates at a current that is as low as 100 mW.
- Surface mounting terminal models incorporate a unique terminal structure with high infrared irradiation efficiency which allows the terminal temperature to rise easily when mounting the IRS, thus ensuring excellent soldering.
- Ensures a dielectric strength of 1,500 VAC and conforms to FCC Part 68 (i.e., withstanding an impulse withstand voltage of 1,500 V for 10 x 160 μs).
- New-Y models offer an impulse withstandvoltage of 2,500 V for 2 x 10 μs (conforms to Bellcore specifications) by optimizing the distance between coil and contacts.
- Conforms to UL1950 (File No. E41515)/CSA C22.2 No. 950 (File No. LR24825)

The above specifications are ensured as of August 1999.

Ordering Information

Classification				Single-side stable	Single-winding latching	Single-side stable Bellcore: 2,500 V for 2x10 μs
DPDT	Fully sealed	Through-hole terminal		G6K-2P	G6KU-2P-Y	G6K-2P-Y
		Surface Mounting terminal	Inside-L	G6K-2G	G6KU-2G-Y	G6K-2G-Y
			Outside-L	G6K-2F	G6KU-2F-Y	G6K-2F-Y

Note: 1. When ordering, add the rated coil voltage to the model number.
Example: G6K-2F 12 VDC
Rated coil voltage

2. When ordering tape packing, add -TR" to the model number.
Example: G6K-2F-TR 12 VDC
Tape packing
Be sure since -TR" is not part of the relay model number, it is not marked on the relay case.

Model Number Legend

G6K□-□□-□ □ VDC
1 2 3 4 5

1. **Relay function**
None: Single-side stable model
U: Single-winding latching model
2. **Contact Form**
2: DPDT
3. **Terminal shape**
F: Outside-L surface-mounting terminal
G: Inside-L surface-mounting terminal
P: PCB terminal
4. **Approved standards**
None: UL, CSA
Does not conform to Bellcore specifications
Y: UL, CSA
Conforms to Bellcore specifications:
2,500 V for 2 x 10 μs
5. **Rated Coil Voltage**
3, 4.5, 5, 12, 24 VDC

Application Examples

Telephones, communications equipment, measurement devices, office automation machines, and audio–visual products.

Specifications

Contact mechanism: Bifurcated crossbar Ag (Au-alloy contact)
Enclosure ratings: Fully sealed

■ Coil Ratings

Single-side Stable Models – G6K-2F, G6K-2G, G6K-2P

Rated voltage	3 VDC	4.5 VDC	5 VDC	12 VDC
Rated current	33.0 mA	23.2 mA	21.1 mA	9.1 mA
Coil resistance	91 Ω	194 Ω	237 Ω	1,315 Ω
Must operate voltage	80% max. of rated voltage			
Must release voltage	10% min. of rated voltage			
Max. voltage	150% of rated voltage at 23°C to 70°C			
Power consumption	Approx. 100 mW			

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 instantaneously.

Single-side Stable Models (Bellcore Version) – G6K-2F-Y, G6K-2G-Y, G6K-2P-Y

Rated voltage	3 VDC	4.5 VDC	5 VDC	12 VDC	24 VDC
Rated current	33.0 mA	23.2 mA	21.1 mA	9.1 mA	4.6 mA
Coil resistance	91 Ω	194 Ω	237 Ω	1,315 Ω	5,220 Ω
Must operate voltage	80% max. of rated voltage				
Must release voltage	10% min. of rated voltage				
Max. voltage	150% of rated voltage at 23°C to 70°C				
Power consumption	Approx. 100 mW				

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 instantaneously.

Single-winding Latching Models (Bellcore Version) – G6KU-2F-Y, G6KU-2G-Y, G6KU-2P-Y

Rated voltage	3 VDC	4.5 VDC	5 VDC	12 VDC	24 VDC
Rated current	33.0 mA	23.2 mA	21.1 mA	9.1 mA	4.6 mA
Coil resistance	91 Ω	194 Ω	237 Ω	1,315 Ω	5,220 Ω
Must Set voltage	75% max. of rated voltage				
Must reset voltage	75% max. of rated voltage				
Max. voltage	150% of rated voltage at 23°C to 70°C				
Power consumption	Approx. 100 mW				

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 instantaneously.

■ Contact Ratings

Load	Resistive load
Rated load	0.3 A at 125 VAC; 1 A at 30 VDC
Rated carry current	1 A
Max. switching voltage	125 VAC, 60 VDC
Max. switching current	1 A

■ Characteristics

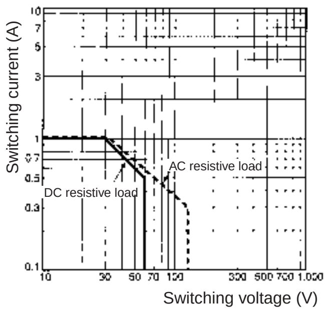
Item		Single-side stable models (double-pole)		Single-winding latching model
		G6K-2F, G6K-2G, G6K-2P	G6K-2F-Y, G6K-2G-Y, G6K-2P-Y	G6KU-2F-Y, G6KU-2G-Y, G6KU-2P-Y
Contact resistance (see note 1)		100 Ω max.		
Operating (set) time (see note 2)		3 ms max. (approx. 1.4 ms)		3 ms max. (approx. 1.2 ms)
Release (reset) time (see note 2)		3 ms max. (approx. 1.3 ms)		3 ms max. (approx. 1.2 ms)
Insulation resistance (see note 3)		1,000 MΩ min. (at 500 VDC)		
Dielectric strength	**Coil & contacts**	1,500 VAC, 50/60 Hz for 1 min		
	Contacts of different polarity	1,000 VAC, 50/60 Hz for 1 min		
	Contacts of same polarity	750 VAC, 50/60 Hz for 1 min		
Impulse withstand voltage	**Coil & contacts**	1,500 V (10 x 160 μs)	2,500 V (2 x 10 μs), 1,500 V (10 x 160 μs)	
	Contacts of different polarity	1,500 V (10 x 160 μs)		
	Contacts of same polarity	–		
Vibration resistance		Destruction: 10 to 55 Hz, 2.5-mm single amplitude (5-mm double amplitude) and 55 to 500 Hz, 300 m/s^2 (approx. 30G) Malfunction: 10 to 55 Hz, 1.65-mm single amplitude (3.3-mm double amplitude) and 55 to 500 Hz, 200 m/s^2 (approx. 20G)		
Shock resistance		Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 750 m/s^2 (approx. 75G)		
Endurance		Mechanical: 50,000,000 operations min. (at 36,000 operations/hour) Electrical: 100,000 operations min. (with a rated load at 1,800 operations/hour)		
Failure rate (P level) (see note 4)		10 μA at 10 mVDC		
Ambient temperature		Operating: -40°C to 70°C (with no icing or condensation)		
Ambient humidity		Operating: 5% to 85%		
Weight		Approx. 0.7 g		

Note: The above values are initial values.

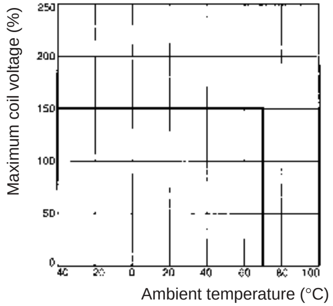
Note: 1. The contact resistance was measured with 10 mA at 1 VDC with a fall-of-potential method.
2. Values in parentheses are actual values.
3. The insulation resistance was measured with a 500-VDC Megger Tester applied to the same parts as those used for checking the dielectric strength.
4. This value was measured at a switching frequency of 120 operations/min.

Engineering Data

Maximum Switching Power

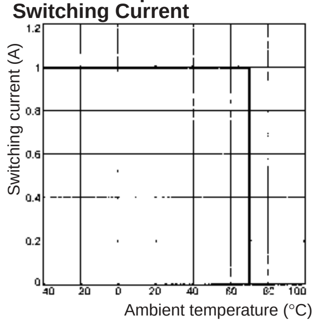


Ambient Temperature vs. Maximum Coil Voltage

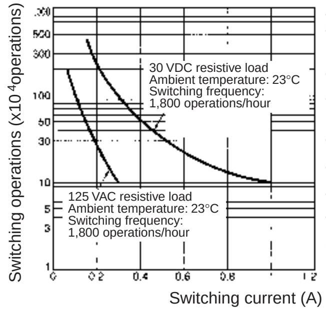


Note: The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

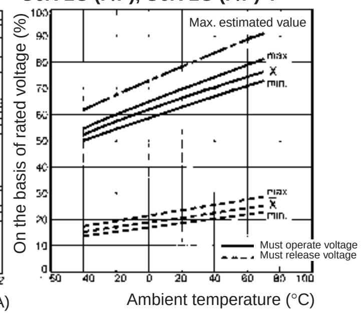
Ambient Temperature vs. Switching Current



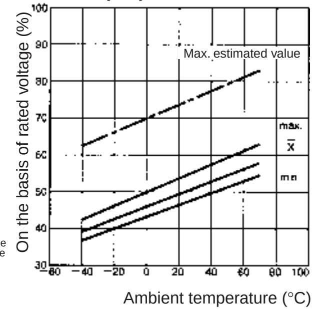
Endurance



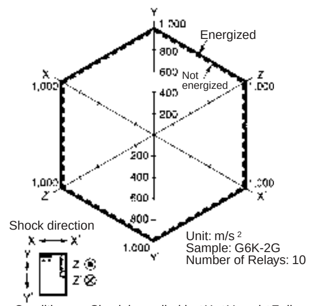
Ambient Temperature vs. Must Operate or Must Release Voltage G6K-2G (F/P), G6K-2G (F/P)-Y



Ambient Temperature vs. Must Set or Must Reset Voltage G6KU-2G (F/P)-Y

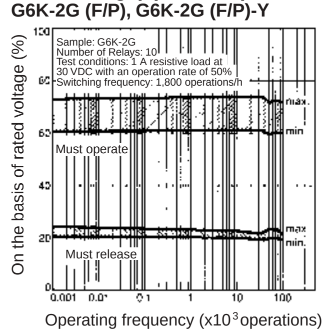


Shock Malfunction

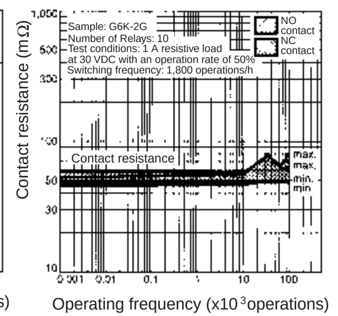


Conditions: Shock is applied in ±X, ±Y, and ±Z directions three times each with and without energizing the Relays to check the number of contact malfunctions.

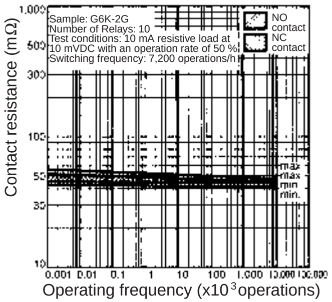
Electrical Endurance (with Must Operate and Must Release Voltage) (see note) G6K-2G (F/P), G6K-2G (F/P)-Y



Electrical Endurance (Contact Resistance) (see note) G6K-2G (F/P), G6K-2G (F/P)-Y

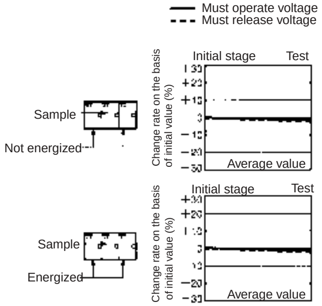


Contact Reliability Test (see note)
G6K-2G (F/P), G6K-2G (F/P)-Y

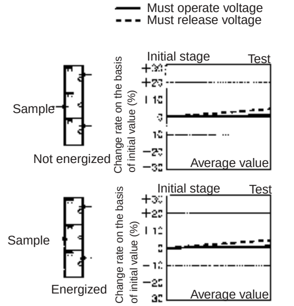


Note: The test was conducted at an ambient temperature of 23°C.

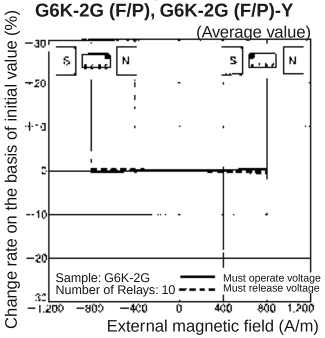
Mutual Magnetic Interference
G6K-2G (F/P), G6K-2G (F/P)-Y

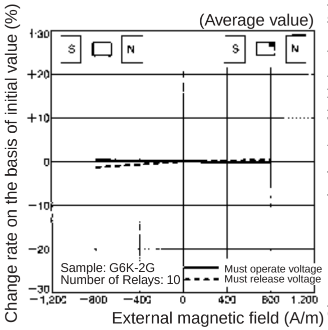


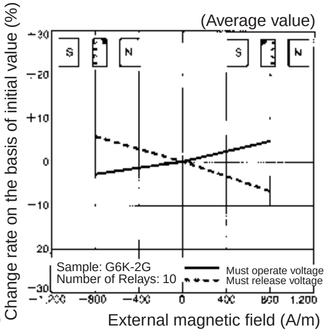
Mutual Magnetic Interference
G6K-2G (F/P), G6K-2G (F/P)-Y



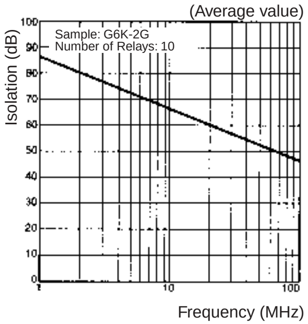
External Magnetic Interference
G6K-2G (F/P), G6K-2G (F/P)-Y



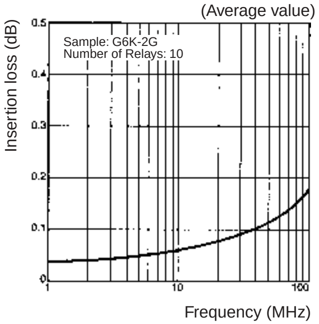




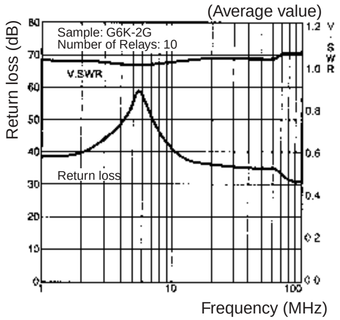
High-frequency Characteristics (Isolation)
G6K-2G (F/P), G6K-2G (F/P)-Y



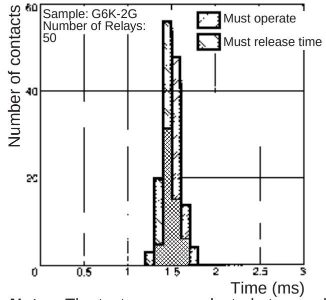
High-frequency Characteristics (Insertion Loss)
G6K-2G (F/P), G6K-2G (F/P)-Y



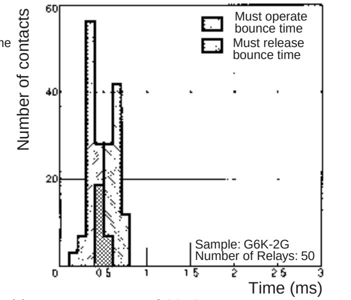
High-frequency Characteristics (Return Loss)
G6K-2G (F/P),G6K-2G (F/P)-Y



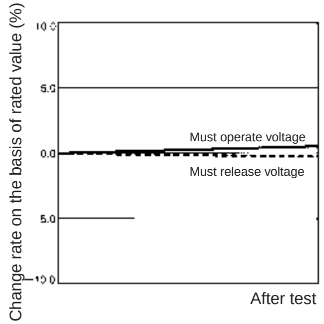
Must Operate and Must Release Time Distribution (see note)
G6K-2G (F/P), G6K-2G (F/P)-Y



Must Operate and Must Release Bounce Time Distribution (see note)
G6K-2G (F/P) , G6K-2G (F/P)-Y



Vibration Resistance
G6K-2G (F/P), G6K-2G (F/P)-Y



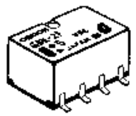
Note: The tests were conducted at an ambient temperature of 23°C.

Dimensions

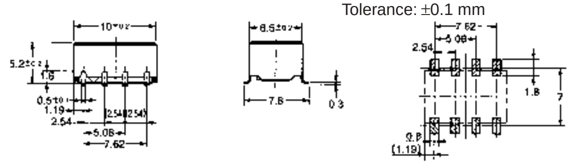
Note: 1. All units are in millimeters unless otherwise indicated.

■ DPOT

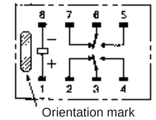
G6K-2F



Mounting Dimensions (Top View)
Tolerance: ±0.1 mm

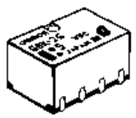


Terminal Arrangement/ Internal Connections (Top View)

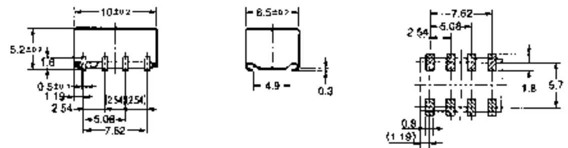


Note: Each value has a tolerance of ±0.3 mm.

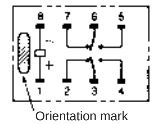
G6K-2G



Mounting Dimensions (Top View)
Tolerance: ±0.1 mm

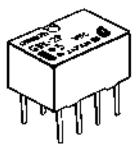


Terminal Arrangement/ Internal Connections (Top View)

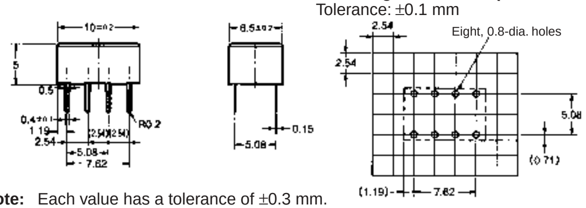


Note: Each value has a tolerance of ±0.3 mm.

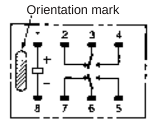
G6K-2P



Mounting Dimensions (Bottom View)
Tolerance: ±0.1 mm

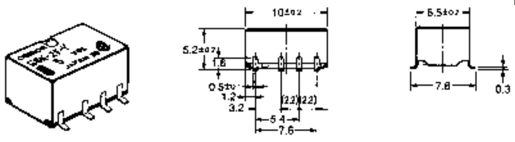


Terminal Arrangement/ Internal Connections (Bottom View)



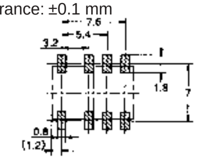
Note: Each value has a tolerance of ±0.3 mm.

G6K-2F-Y

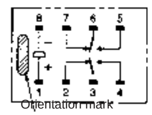


Note: Each value has a tolerance of ±0.3 mm.

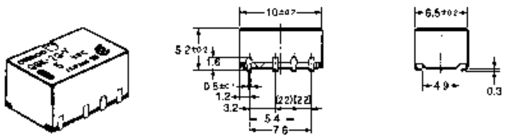
Mounting Dimensions (Top View)
Tolerance: ±0.1 mm



Terminal Arrangement/ Internal Connections (Top View)

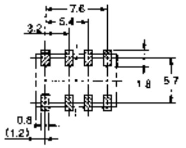


G6K-2G-Y

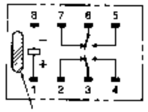


Note: Each value has a tolerance of ±0.3 mm.

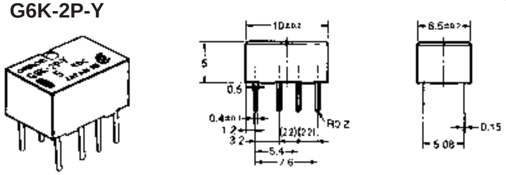
Mounting Dimensions (Top View)
Tolerance: ±0.1 mm



Terminal Arrangement/ Internal Connections (Top View)

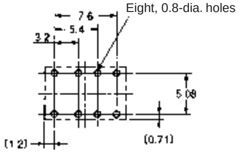


G6K-2P-Y

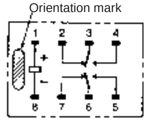


Note: Each value has a tolerance of ±0.3 mm.

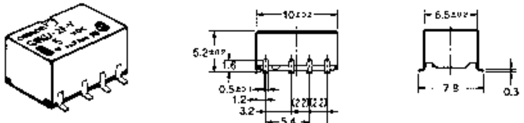
Mounting Dimensions (Bottom View)
Tolerance: ±0.1 mm



Terminal Arrangement/ Internal Connections (Bottom View)

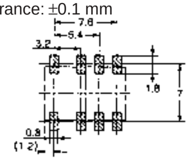


G6KU-2F-Y

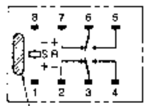


Note: Each value has a tolerance of ±0.3 mm.

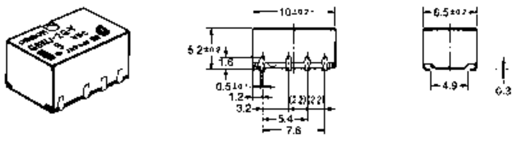
Mounting Dimensions (Top View)
Tolerance: ±0.1 mm



Terminal Arrangement/ Internal Connections (Top View)

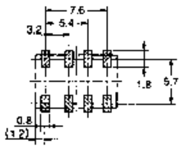


G6KU-2G-Y

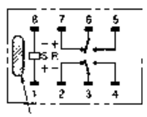


Note: Each value has a tolerance of ±0.3 mm.

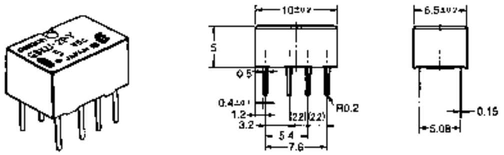
Mounting Dimensions (Top View)
Tolerance: ±0.1 mm



Terminal Arrangement/ Internal Connections (Top View)

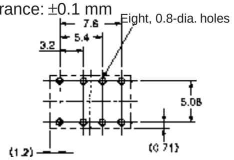


G6KU-2P-Y

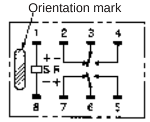


Note: Each value has a tolerance of ±0.3 mm.

Mounting Dimensions (Bottom View)
Tolerance: ±0.1 mm



Terminal Arrangement/ Internal Connections (Bottom View)

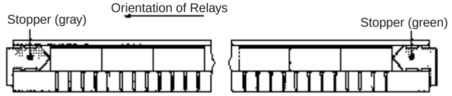


Stick Packing and Tape Packing

Stick Packing

Relays in stick packing are arranged so that the orientation mark of each Relay is on the left side. Fifty Relays are packed on one stick.

Be sure not to make mistakes in Relay orientation when mounting the Relay to the FPCB.



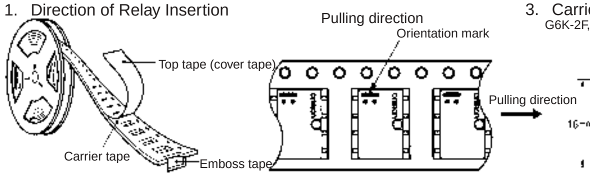
Stick length: 520 mm (stopper not included)
No. of Relays per stick: 50

Tape Packing (Surface-Mounting Terminal Models)

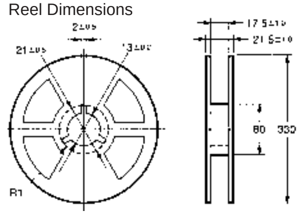
When ordering Relays in tape packing, add the prefix "-TR" to the model number, otherwise the Relays in stick packing will be provided.

Tape Type: ETX7200
(EIAJ (Electronic Industrial Association of Japan))
Reel type: RPM-16D (EIAJ)
Relays per Reel: 900

1. Direction of Relay Insertion

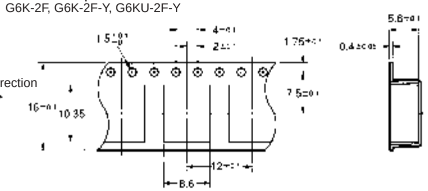


2. Reel Dimensions

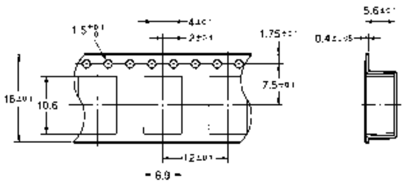


3. Carrier Tape Dimensions

G6K-2F, G6K-2F-Y, G6KU-2F-Y



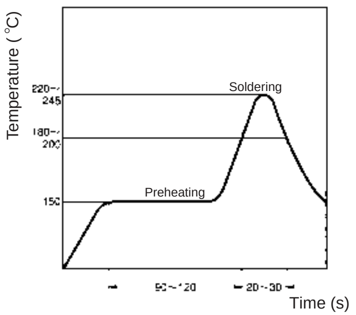
G6K-2G, G6K-2G-Y, G6KU-2G-Y



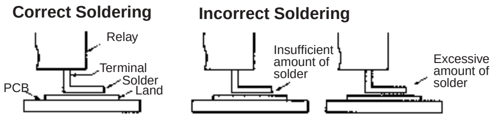
Recommended Soldering Method

Temperatures indicate the surface temperatures of the PCB.

IRS Method (for surface-mounting terminal models)



- The thickness of cream solder to be applied should be within a range between 150 and 200 µm on OMRON's recommended PCB pattern.
- In order to perform correct soldering, it is recommended that the correct soldering conditions be maintained as shown below on the left side.



Visually check that the Relay is properly soldered.

■ Approved Standards

UL approval: UL1950 (File No. E41515)

CSA approval: C22.2 No. 950 (File No. LR24825)

Model	Coil ratings	Contact ratings	Number of test operations
DPDT	G6K-2G(F/P): 3 to 12 VDC G6K(U)-2G(F/P)-Y: 3 to 24 VDC	1 A at 30 VDC 0.5 A at 60 VDC 0.3 A at 125 VAC	6,000

Precautions

CORRECT USE

Handling

Leave the Relay unpacked until mounting it.

Soldering

Solder: JIS Z3282, H63A

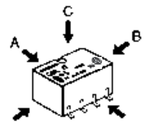
Soldering temperature: Approx. 250°C (260°C if the DWS method is used)

Soldering time: Approx. 5 s max. (approx. 2 s for the first time and approx. 3 s for the second time if the DWS method is used)

Be sure to make a molten solder level adjustment so that the solder will not overflow on the PCB.

Claw Securing Force During Automatic Mounting

During automatic insertion of Relays, make sure to set the securing force of each claw to the following so that the Relays characteristics are maintained.



Direction A: 1.96 N
Direction B: 4.90 N
Direction C: 1.96 N

Environmental Conditions During Operation, Storage, and Transportation

Protect the Relay from direct sunlight and keep the Relay under normal temperature, humidity, and pressure.

If the Relay is stored for a long time in an adverse environment with high temperature, high humidity, organic gases, or sulphide gases, sulphide or oxide films will form on the contact surfaces. These films may result in unstable contact, contact problems, or functional problems. Therefore, operate, store, or transport the product under specified environmental conditions.

Latching Relay Mounting

Make sure that the vibration or shock that is generated from other devices, such as relays in operation, on the same panel and imposed on the Latching Relay does not exceed the rated value, otherwise the Latching Relay that has been set may be reset or vice versa. The Latching Relay is reset before shipping. If excessive vibration or shock is imposed, however, the Latching Relay may be set accidentally. Be sure to apply a reset signal before use.

Maximum Allowable Voltage

The maximum allowable voltage of the coil can be obtained from the coil temperature increase and the heat-resisting temperature of coil insulating sheath material. (Exceeding the heat-resisting temperature may result in burning or short-circuiting.) The maximum allowable voltage also involves important restrictions which include the following:

- Must not cause thermal changes in or deterioration of the insulating material.
- Must not cause damage to other control devices.
- Must not cause any harmful effect on people.
- Must not cause fire.

Therefore, be sure to use the maximum allowable voltage beyond the value specified in the catalog.

As a rule, the rated voltage must be applied to the coil. A voltage exceeding the rated value, however, can be applied to the coil provided that the voltage is less than the maximum allowable voltage. It must be noted that continuous voltage application to the coil will cause a coil temperature increase thus affecting characteristics such as electrical life and resulting in the deterioration of coil insulation.

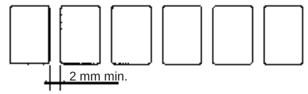
Coating

The Relay mounted on the PCB may be coated or washed but do not apply silicone coating or detergent containing silicone, otherwise the silicone coating or detergent may remain on the surface of the Relay.

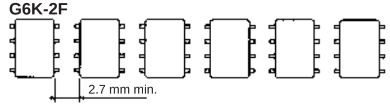
PCB Mounting

If two or more Relays are closely mounted with the long sides of the Relays facing each other and soldering is performed with infrared radiation, the solder may not be properly exposed to the infrared rays. Be sure to keep the proper distance between adjacent Relays as shown below.

G6K-2G



G6K-2F

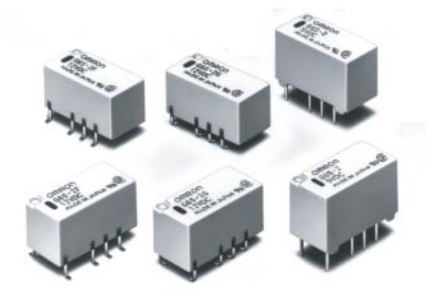


Two or more Relays may be closely mounted with the short sides of the Relays facing each other.

ALL DIMENSIONS SHOWN ARE IN MILLIMETRES.
To convert millimetres into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Surface-Mounting DPDT Relay

- Long terminals ideal for soldering and mounting reliability.
- Space-saving inside-L terminal.
- High dielectric strength between coil and contacts (2,000 VAC), and between contacts of different polarity (1,500 VAC).
- High impulse withstand voltages between coil and contacts, and between contacts of different polarity (2,500 V, 2 10 µs: Bellcore requirements).
- Low power consumption (140 mW).
- Bifurcated crossbar contact (Au-clad) and Fully sealed construction for high reliability.
- Applicable to IRS.
- High sealability after IRS.
- Ultra-miniature at 15 x 7.5 x 9.4 mm (L x W x H).
- Through-hole terminal is available
- EN60950/EN41003 Supplementary Insulation-certified type is available.



Ordering Information

Classification				Single-side Stable	Single-winding latching	Double-winding latching	Single-side stable EN60950/EN41003
DPDT	Fully sealed	Through-hole terminal		G6S-2	G6SU-2	G6SK-2	G6S-2-Y
		Surface mounting terminal	Inside-L	G6S-2G	G6SU-2G	G6SK-2G	G6S-2G-Y
			Outside-L	G6S-2F	G6SU-2F	G6SK-2F	G6S-2F-Y

Note: 1. When ordering, add the rated coil voltage to the model number.
Example: G6S-2F 12 VDC
Rated coil voltage
2. When ordering tape packing, add -TR" to the model number.
Example: G6S-2F-TR 12 VDC
Tape packing
Be sure since -TR" is not part of the relay model number, it is not marked on the relay case.

Model Number Legend

G6S□-□□-□ □VDC
1 2 3 4 5

1. Relay Function

None: Single-side stable
U: Single-winding latching
K: Double-winding latching

2. Contact Form

2: DPDT

3. Terminal Shape

None: Through-hole terminal
G: Inside-L surface mounting terminal
F: Outside-L surface mounting terminal

4. Approved Standards

None: UL/CSA
Y: EN60950/EN41003

5. Rated Coil Voltage

4.5, 5, 12, 24 VDC

Specifications

■ Coil Ratings

Single-side Stable Type (G6S-2, G6S-2F, G6S-2G)

Rated voltage	4.5 VDC	5 VDC	12 VDC	24 VDC
Rated current	31.0 mA	28.1 mA	11.7 mA	8.3 mA
Coil resistance	145 Ω	178 Ω	1,028 Ω	2,880 Ω
Must operate voltage	75% max. of rated voltage			
Must release voltage	10% min. of rated voltage			
Max. voltage	200% of rated voltage at 23°C			170% of rated voltage at 23°C
Power consumption	Approx. 140 mW			Approx. 200 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.

Single-winding Latching Type (G6SU-2, G6SU-2F, G6SU-2G)

Rated voltage		4.5 VDC	5 VDC	12 VDC	24 VDC
Rated current		22.2 mA	20 mA	8.3 mA	6.3 mA
Coil resistance		203 Ω	250 Ω	1,440 Ω	3,840 Ω
Coil inductance (H) (ref. value)	**Armature OFF**	0.27	0.36	2.12	5.80
	Armature ON	0.14	0.18	1.14	3.79
Must set voltage		75% max. of rated voltage			
Must reset voltage		75% min. of rated voltage			
Max. voltage		180% of rated voltage at 23°C			
Power consumption		Approx. 100 mW			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.

Double-winding Latching Type (G6SK-2, G6SK-2F, G6SK-2G)

Rated voltage			4.5 VDC	5 VDC	12 VDC	24 VDC
Rated current			44.4 mA	40 mA	16.7 mA	12.5 mA
Coil resistance			101 Ω	125 Ω	720 Ω	1,920 Ω
Coil inductance (H) (ref. value)	**Set**	**Armature OFF**	0.12	0.14	0.60	1.98
		Armature ON	0.074	0.088	0.41	1.23
	Reset	**Armature OFF**	0.082	0.098	0.46	1.34
		Armature ON	0.14	0.16	0.54	2.23
Must set voltage			75% max. of rated voltage			
Must reset voltage			75% min. of rated voltage			
Max. voltage			170% of rated voltage at 23°C			140% of rated voltage at 23°C
Power consumption			Approx. 200 mW			Approx. 300 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.

Single-side Stable EN60950/EN41003 Approved Type (G6S-2-Y, G6S-2F-Y, G6S-2G-Y)

Rated voltage	5 VDC	12 VDC	24 VDC
Rated current	40 mA	16.7 mA	9.6 mA
Coil resistance	125 Ω	720 Ω	2,504 Ω
Must operate voltage	75% max. of rated voltage		
Must release voltage	10% min. of rated voltage		
Max. voltage	170% of rated voltage at 23°C		170% of rated voltage at 23°C
Power consumption	Approx. 200 mW		Approx. 230 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.

■ Contact Ratings

Load	Resistive load (cosø = 1)
Rated Load	0.5 A at 125 VAC; 2 A at 30 VDC
Contact material	Ag (Au-clad)
Rated Carry Current	2 A
Max. switching voltage	250 VAC, 220 VDC
Max. switching current	2 A
Max. switching power	62.5 VA, 60 W
Failure rate (reference value)	10 μA at 10 mVDC

Note: P level: λ_{60} = 0.1 x 10^{-6}/operation

■ Characteristics

Contact resistance	75 mΩ max.
Operate (set) time	4 ms max. (mean value: approx. 2.5 ms; latching type: approx. 2 ms)
Release (reset) time	4 ms max. (mean value: approx. 1.5 ms; latching type: approx. 2 ms)
Bounce Time	Operate: Approx. 0.5 ms Release: Approx. 0.5 ms Set/Reset: Approx. 0.5 ms
Max. operating frequency	Mechanical: 36,000 operations/hr Electrical: 1,800 operations/hr (under rated load)
Insulation resistance	1,000 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min between coil and contacts 1,000 VAC, 50/60 Hz for 1 min between coil and contacts (double-winding latching) 1,500 VAC, 50/60 Hz for 1 min between contacts of different polarity 1,000 VAC, 50/60 Hz for 1 min between contacts of same polarity 500 VAC, 50/60 Hz for 1 min between set and reset coil (double-winding latching)
Impulse withstand voltage	2,500 V (2 x 10 μs) between coil and contacts 1,500 V (10 x 160 μs) between coil and contacts (double-winding latching) 2,500 V (2 x 10 μs) between contacts of different polarity 1,500 V (10 x 160 μs) between contacts of same polarity (conforms to FCC Part 68)
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 2.5mm single amplitude (5mm 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 (approx. 100G) Malfunction: 750 m/s^2 (approx. 175G)
Endurance	Mechanical: 100,000,000 operations min. (at 36,000 operations/hr) Electrical: 100,000 operations min. (2 A at 30 VDC, resistive load: 1,200 operations/hr) 100,000 operations min. (0.5 A at 125 VAC, resistive load)
Ambient temperature	Operating: -40°C to 85°C (with no icing), -40°C to 70°C (double-winding latching, 24 VDC)
Ambient humidity	Operating: 5% to 85%
Weight	Approx. 2 g

■ Approved Standards

UL1950 (File No. E41515)/CSA C22.2 No.950 (File No. LR24825)

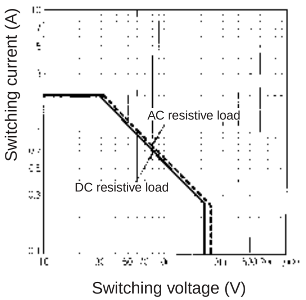
Model	Contact form	Coil ratings	Contact ratings
G6S-2, G6S-2F, G6S-2G	DPDT	1.5 to 48 VDC	2 A, 30 VDC 0.3 A, 110 VDC 0.5 A, 125 VAC
G6SU2, G6SK-2, G6SU-2F G6SU2G, G6SK-2F, G6SK-2G		1.5 to 24 VDC	

EN60950/EN41003

Model	Contact form	Isolation category	Voltage
G6S-2-Y, G6S-2G-Y, G6S-2F-Y	DPDT	Supplementary Isolation	250 VAC

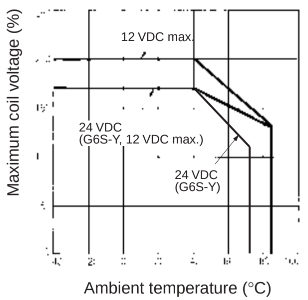
Engineering Data

Maximum Switching Power

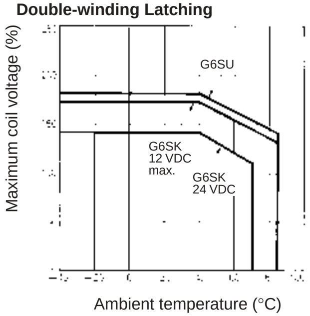


Ambient Temperature vs. Maximum Coil Voltage

Single-side Stable



Single-winding Latching
Double-winding Latching

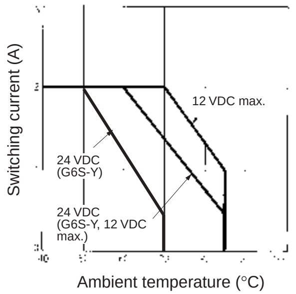


Note: The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

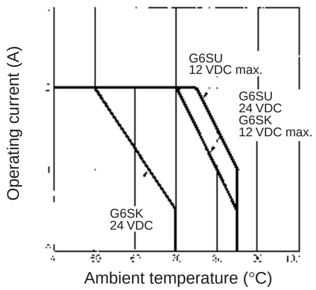
Reference Data

Ambient Temperature vs. Switching Current

Single-side Stable



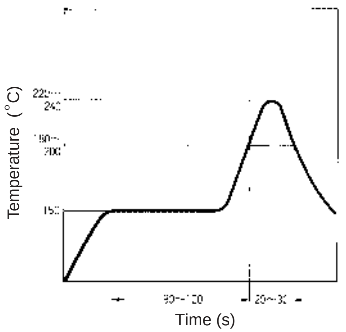
Single-winding Latching
Double-winding Latching



Recommended Soldering Time vs. Surface PCB Temperature

(The temperature profile indicates the temperature on the surface of the PCB.)

IRS

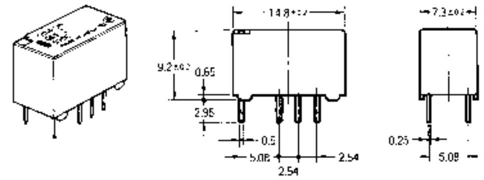


Dimensions

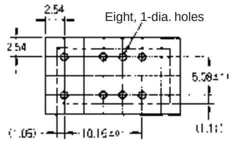
Note: All units are in millimeters unless otherwise indicated.

Single-side Stable

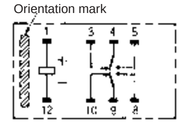
G6S-2, G6S-2-Y
Tolerance: ±0.3



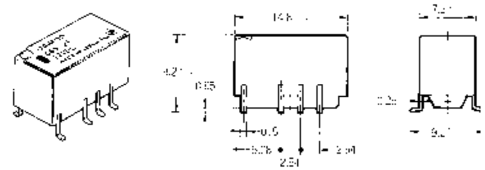
Footprint (Bottom View)
Tolerance: ±0.1



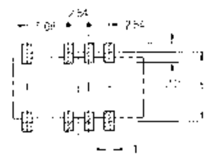
Terminal Arrangement/ Internal Connections (Bottom View)



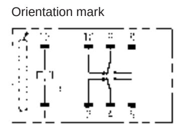
G6S-2F, G6S-2F-Y
Tolerance: ±0.3



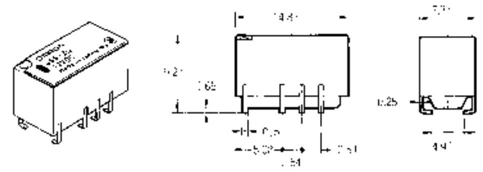
Footprint (Top View)
Tolerance: ±0.1



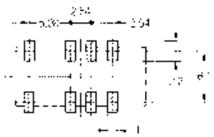
Terminal Arrangement/ Internal Connections (Top View)



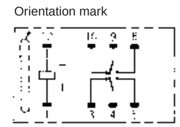
G6S-2G, G6S-2G-Y
Tolerance: ±0.3



Footprint (Top View)
Tolerance: ±0.1



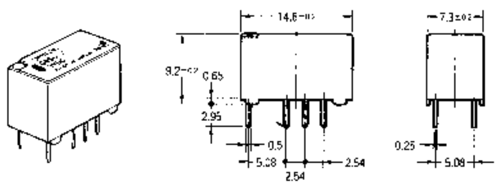
Terminal Arrangement/ Internal Connections (Top View)



Single-winding Latching

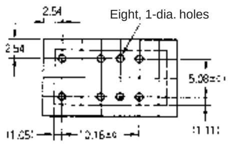
G6SU-2

Tolerance: ±0.3

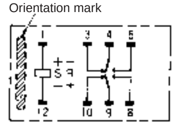


Footprint (Bottom View)

Tolerance: ±0.1

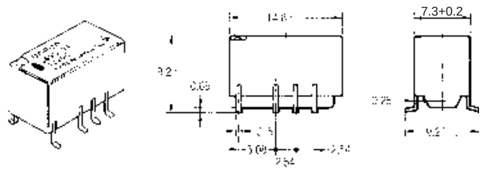


Terminal Arrangement/ Internal Connections (Bottom View)



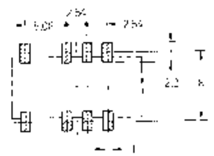
G6SU-2F

Tolerance: ±0.3

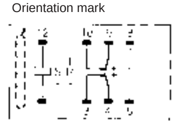


Footprint (Top View)

Tolerance: ±0.1

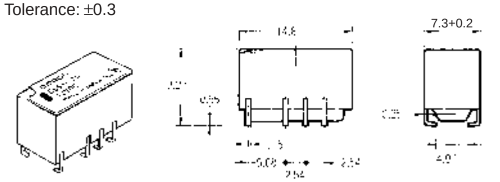


Terminal Arrangement/ Internal Connections (Top View)



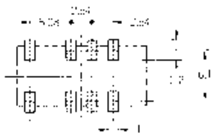
G6SU-2G

Tolerance: ±0.3

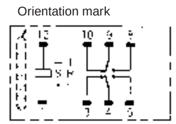


Footprint (Top View)

Tolerance: ±0.1



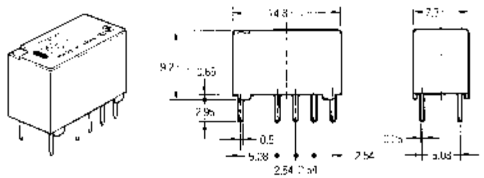
Terminal Arrangement/ Internal Connections (Top View)



Double-winding Latching

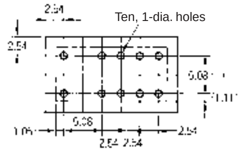
G6SK-2

Tolerance: ±0.3

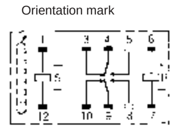


Footprint (Bottom View)

Tolerance: ±0.1

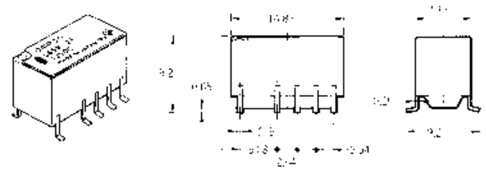


Terminal Arrangement/ Internal Connections (Bottom View)



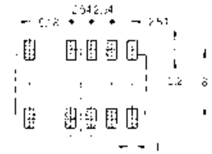
G6SK-2F

Tolerance: ±0.3

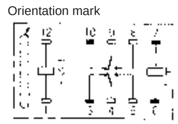


Footprint (Top View)

Tolerance: ±0.1

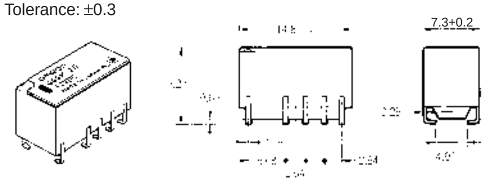


Terminal Arrangement/ Internal Connections (Top View)



G6SK-2G

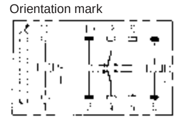
Tolerance: ±0.3



Footprint (Top View)

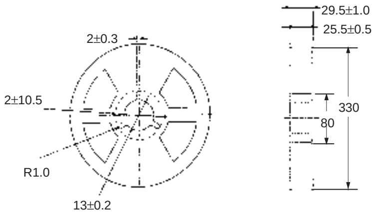
Tolerance: ±0.1

Terminal Arrangement/ Internal Connections (Top View)

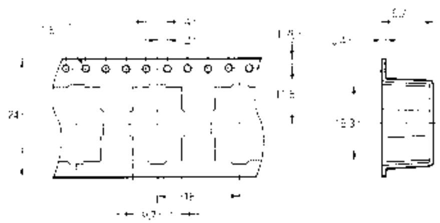


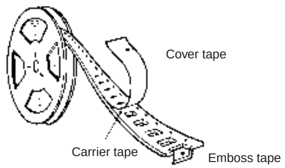
■ Tape Packing

When ordering, add “-TR” before the rated coil voltage for tape packing.
Tape type: TE2416R (Refer to EIAJ)
Reel type: R24E (Refer to EIAJ)
Relays per reel: 400

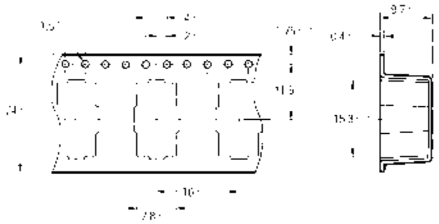


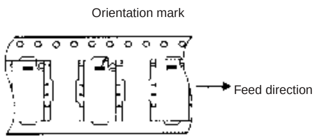
G6S-2F, G6SU-2F, G6SK-2F, G6S-2F-Y





G6S-2G, G6SU-2G, G6SK-2G, G6S-2G-Y





Precautions

Use a DC power supply with 5% or less ripple factor to operate the coil.

Do not use the G6S where subject to strong external magnetic fields.

Do not use the G6S where subject to magnetic particles or excessive amounts of dust.

Do not reverse the polarity of the coil (+, -).

Latching types are delivered in the reset position. We recommend that a reset voltage be applied in advance to start operation.

Do not drop the G6S or otherwise subject it to excessive shock.

Remove the relay from the packing immediately prior to usage.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Sub-miniature Relay (16 x 9.9 x 8.4 mm (L x W x H)) with DPDT Contact

- ■ Unique moving-loop armature reduces relay size, magnetic interference and contact bounce time.
- ■ Miniature permissible load: 0.01 mA 10 mVDC.
- ■ Bifurcated gold-clad crossbar contact.
- ■ International 2.54mm terminal pitch.
- ■ Special models available for FCC Part 68 compliance.

FCC

Ordering Information

Classification		Single-side stable	Single-winding latching	Double-winding latching
DPDT	Fully sealed	G5A-234P	G5AU-234P	G5AK-234P

Note: When ordering, add the rated coil voltage to the model number.
Example: G5A-234P 12 VDC
Rated coil voltage

Model Number Legend

G5A □ - □ □ □ □ - □ □ VDC
1 2 3 4 5 6 7

1. **Relay Function**
   None: Single-side stable
   U: Single-winding latching
   K: Double-winding latching
2. **Contact Form**
   2: DPDT
3. **Contact Type**
   3: Bifurcated crossbar Ag (Au-clad)
4. **Enclosure Ratings**
   4: Fully sealed
5. **Terminals**
   P: Straight PCB
   C: Self-clinching PCB
6. **Special Function**
   None: General-purpose
   FC: FCC part 68 compliance
   U: For ultrasonically cleanable
7. **Rated Coil Voltage**
   3, 5, 6, 9, 12, 24, 48 VDC

Specifications

■ Coil Ratings

Single-side Stable Types

Rated voltage		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current		66.7 mA	40 mA	33.3 mA	22.2 mA	16.7 mA	8.3 mA	5.8 mA
Coil resistance		45 Ω	125 Ω	180 Ω	405 Ω	720 Ω	2,880 Ω	8,230 Ω
Coil inductance (H) (ref. value)	Armature OFF	0.048	0.13	0.17	0.43	0.71	2.76	7.44
	Armature ON	0.043	0.12	0.16	0.4	0.68	2.70	7.25
Must operate voltage		70% max. of rated voltage						
Must release voltage		10% min. of rated voltage						
Max. voltage		200% of rated voltage at 23°C						170% of rated voltage at 23°C
Power consumption		Approx. 200 mW						Approx. 280 mW

Single/Double–winding Latching Types

		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC
Rated voltage		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC
Rated current		66.7 mA	40 mA	33.3 mA	22.2 mA	16.7 mA	8.3 mA
Coil resistance		45 Ω	125 Ω	180 Ω	405 Ω	720 Ω	2,880 Ω
Coil inductance (H) (ref. value)	**Armature OFF**	0.02	0.06	0.08	0.17	0.29	1.1
	Armature ON	0.02	0.05	0.07	0.14	0.24	0.85
Must operate voltage		80% max. of rated voltage					
Must release voltage		80% min. of rated voltage					
Max. voltage		200% of rated voltage at 23°C					
Power consumption		Approx. 200 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.

■ Contact Ratings

Load	Resistive load (cosø = 1)	Inductive load (cosø = 0.4) (L/R = 7 ms)
Rated Load	0.5 A at 30 VAC; 1 A at 30 VDC	0.1 A at 30 VAC; 0.2 A at 30 VDC
Contact Material	Ag (Au-clad)	
Rated Carry Current	1 A	
Max. switching voltage	125 VAC, 125 VDC	
Max. switching current	1 A	0.5 A
Max. switching power	37.5 VA, 33 W	12.5 VA, 11 W
Failure rate (reference value)	0.01 mA at 10 mVDC	

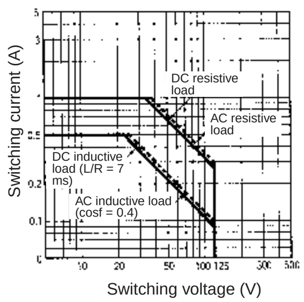
Note: P level: $\lambda_{60} = 0.1 \times 10^{-6}$/operation.

■ Characteristics

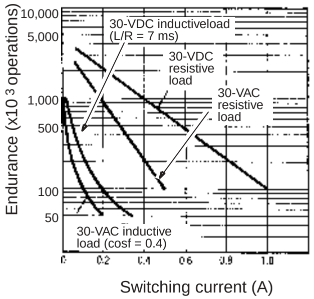
Contact resistance	50 mΩ max.
Operate (set) time	Single-side stable types: 5 ms max. (mean value: approx. 2.4 ms) Latching types: 5 ms max. (mean value: approx. 2 ms)
Release (reset) time	Single-side stable types: 5 ms max. (mean value: approx. 1.1 ms) Latching types: 5 ms max. (mean value: approx. 1.8 ms)
Bounce Time	Operate: Approx. 0.5 ms Release: Approx. 0.5 ms
Min. set/reset signal width	Latching type: 7 ms
Max. operating frequency	Mechanical: 36,000 operations/hr Electrical: 1,800 operations/hr (under rated load)
Insulation resistance	1,000 MΩ min. (at 500 VDC)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between coil and contacts 1,000 VAC, 50/60 Hz for 1 min between contacts of different polarity 500 VAC, 50/60 Hz for 1 min between contacts of same polarity 100 VAC, 50/60 Hz for 1 min between set and reset coils (double-winding type only)
Impulse withstand voltage	1,500 V (10 x 160 μs) between contacts of same polarity (conforms to FCC Part 68)
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 0.75mm single amplitude (1.5mm double amplitude) Malfunction: 10 to 55 to 10 Hz, 0.75mm single amplitude (1.5mm double amplitude)
Shock resistance	Destruction: 1,000 m/s² (approx. 100G) Malfunction: 300 m/s² (approx. 30G)
Endurance	Mechanical: 50,000,000 operations min. (at 36,000 operations/hr) Electrical: 100,000 operations min. (at 1,800 operations/hr)
Ambient temperature	Operating: -40°C to 70°C (with no icing)
Ambient humidity	Operating: 5% to 85%
Weight	Approx. 3 g

Engineering Data

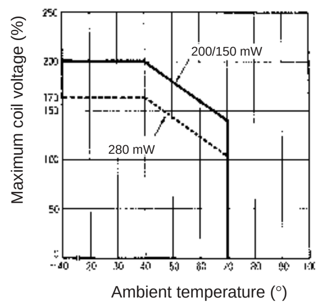
Maximum Switching Power



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.

■ Approved Standards

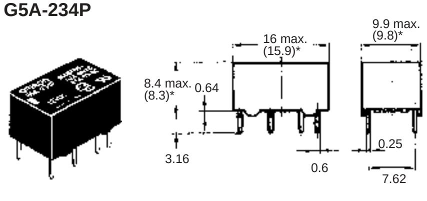
UL114, UL478 (File No.E41515)/CSA C22.2 No.0, No.14 (File No.LR24825)

Model	Contact form	Coil ratings	Contact ratings
G5A-234P	DPDT	3 to 48 VDC	0.5 A, 60 VAC 0.5 A, 60 VDC 1 A, 30 VDC
G5AU-234P G5AK-234P		3 to 24 VDC	

Dimensions

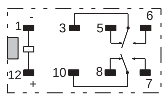
Note: 1. All units are in millimeters unless otherwise indicated.
2. Orientation marks are indicated as follows:

G5A-234P



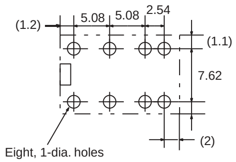
*Average value

Terminal Arrangement/ Internal Connections (Bottom View)

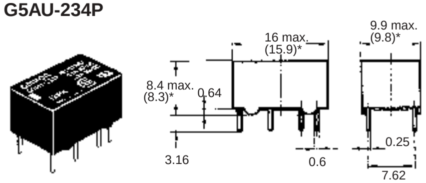


Mounting Holes (Bottom View)

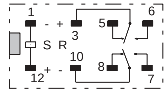
Tolerance: ±0.1

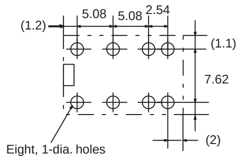


G5AU-234P

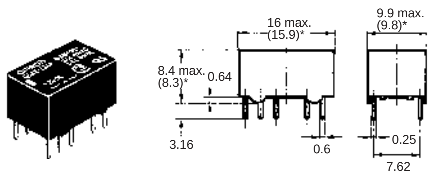


*Average value

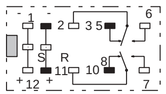




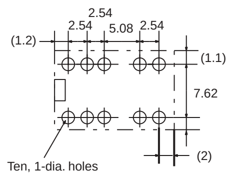
G5AK-234P



*Average value



S: Set coil
R: Reset coil



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Miniature Relay for Signal Circuits

- Wide switching power of 10 μA to 2 A.
- High dielectric strength coil-contacts:1,000 VAC; open contacts: 750 VAC.
- Conforms to FCC Part 68 requirements.
- Ag + Au clad bifurcated crossbar contacts and fully sealed for high contact reliability.
- New 150-mW relays with high-sensitivity.

FCC

Ordering Information

Classification	Contact form	Contact type	Contact material	Enclosure Rating	Model
Standard	DPDT	Bifurcated crossbar	Ag + Au-clad	Fully sealed	G5V-2
High-sensitivity					G5V-2-H1

Note: When ordering, add the rated coil voltage to the model number.
Example: G5V-2 12 VDC
Rated coil voltage

Model Number Legend

G5V - □ - □ □ VDC
1 2 3

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

Specifications

■ Coil Rating

Standard Models

Rated voltage		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current		166.7 mA	100 mA	83.3 mA	55.6 mA	41.7 mA	20.8 mA	12 mA
Coil resistance (W)		18 Ω	50 Ω	72 Ω	162 Ω	288 Ω	1,152 Ω	4,000 Ω
Coil inductance	Armature OFF	0.04	0.09	0.16	0.31	0.47	1.98	7.23
(H) (ref. value)	Armature ON	0.05	0.11	0.19	0.49	0.74	2.63	10.00
Must operate voltage		70% max. of rated voltage						
Must release voltage		5% min. of rated voltage						
Max. voltage		120% of rated voltage at 23°C						
Power consumption		Approx. 500 mW						Approx. 580 mW

High Sensitivity Models

Rated voltage		3 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current		50 mA	30 mA	25 mA	16.7 mA	12.5 mA	8.33 mA	6.25 mA
Coil resistance		60 Ω	166.7 Ω	240 Ω	540 Ω	960 Ω	2,880 Ω	7,680 Ω
Coil inductance	Armature OFF	0.18	0.46	0.70	1.67	2.90	6.72	20.1
(H) (ref. value)	Armature OFF	0.57	0.71	0.97	2.33	3.99	9.27	26.7
Must operate voltage		75% max. of rated voltage						
Must release voltage		5% min. of rated voltage						
Max. voltage		180% of rated voltage at 23°C						150% of rated voltage (at 23°C)
Power consumption		Approx. 150 mW					Approx. 200 mW	Approx. 580 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.

■ Contact Ratings

Item	Standard models	High sensitivity models
Load	Resistive load (cosø = 1)	
Rated load	0.5 A at 125 VAC; 2 A at 30 VDC	0.5 A at 125 VAC; 1 A at 24 VDC
Contact material	Ag + Au-clad	
Rated carry current	2 A	
Max. switching voltage	125 VAC, 125 VDC	
Max. switching current	2 A	1 A
Max. switching power	62.5 VA, 60 W	62.5 VA, 24 W
Failure rate (reference value)	0.01 mA at 10 mVDC	

Note: P level: λ_{60} = 0.1 x 10^{-6}/operation

■ Characteristics

Item	Standard models	High sensitivity models
Contact resistance	50 mΩ max.	100 mΩ max.
Operate time	7 ms max.	
Release time	3 ms max.	
Bounce Time	Operate: approx. 0.3 ms Release: approx. 1.5 ms	
Max. operating frequency	Mechanical: 36,000 operations/hr Electrical: 1,800 operations/hr (under rated load)	
Insulation resistance	1,000 MΩ min. (at 500 VDC)	
Dielectric strength	1,500 VAC, 50/60 Hz for 1 min between coil and contacts 1,000 VAC, 50/60 Hz for 1 min between contacts of different polarity 750 VAC, 50/60 Hz for 1 min between contacts of same polarity	1,000 VAC, 50/60 Hz for 1 min between coil and contacts 1,000 VAC, 50/60 Hz for 1 min between contacts of different polarity 500 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, 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/s^2 (approx. 100G) Malfunction: 200 m/s^2 (approx. 20G)	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 100 m/s^2 (approx. 10G)
Endurance	Mechanical: 15,000,000 operations min. (at 36,000 operations/hr) Electrical: 100,000 operations min. (at 1,800 operations/hr)	
Ambient temperature	Operating: -25°C to 65°C (with no icing)	Operating: -25°C to 70°C (with no icing)
Ambient humidity	Operating: 5% to 85%	
Weight	Approx. 5 g	

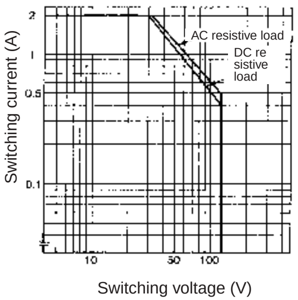
■ Approved Standards

UL478, UL1950, UL508 (File No. E41515)/CSA C22.2 No.0, No.14 (File No. LR24825)

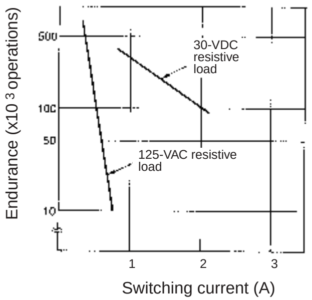
Contact form	Coil rating	Contact rating	
		G5V-2	G5V-2-H1
DPDT	3 to 48 VDC	0.6 A, 125 VAC (general use) 0.6 A, 110 VDC (resistive load) 2 A, 30 VDC (resistive load)	0.5 A, 125 VAC (general use) 0.2 A, 110 VDC (resistive load) 1 A, 24 VDC (resistive load)

Engineering Data

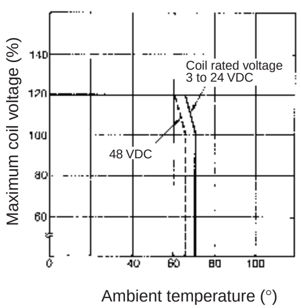
Maximum Switching Power
G5V-2



Endurance
G5V-2

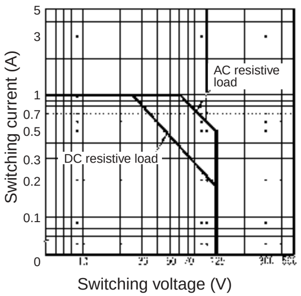


Ambient Temperature vs. Maximum Coil Voltage
G5V-2

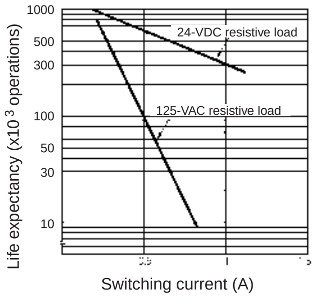


Note: The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

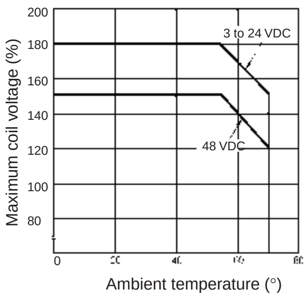
G5V-2-H1



G5V-2-H1



G5V-2-H1

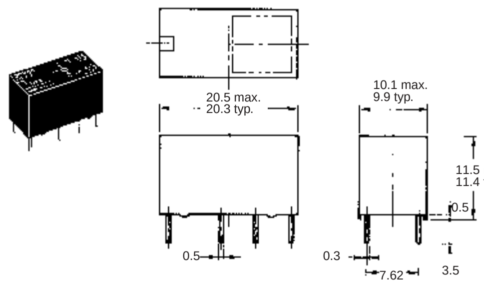


Note: The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

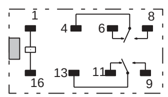
Dimensions

Note: 1. All units are in millimeters unless otherwise indicated.

2. Orientation marks are indicated as follows:

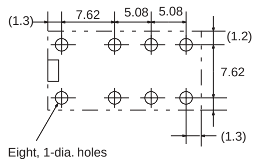


Terminal Arrangement/ Internal Connections (Bottom View)



Mounting Holes (Bottom View)

Tolerance: ±0.1



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Fully sealed Relay with High Impulse Dielectric for Use in Telecommunications Equipment

- High sensitivity can be driven by digital circuits.
- Horizontal design allows use in 1/2-inch PCB racks.
- Impulse withstand voltage meets FCC Part 68 requirements.
- Relays can be mounted side-by-side due to low magnetic leakage.
- Single- and double-winding latching relays also available.
- Special models available for low thermoelectromotive force.

FCC

Ordering Information

Single-side Stable Type

Contact		Ag + Au-clad	AgPd + Au-clad
General purpose	DPDT	G6A-274P-ST-US	G6A-234P-ST-US
	4PDT	G6A-474P-ST-US	G6A-434P-ST-US
Low-sensitivity	DPDT	G6A-274P-ST40-US	G6A-234P-ST40-US
	4PDT	G6A-474P-ST40-US	G6A-434P-ST40-US

Single-winding Latching Type

Contact		Ag + Au-clad	AgPd + Au-clad
General purpose	DPDT	G6AU-274P-ST-US	G6AU-234P-ST-US
	4PDT	G6AU-474P-ST-US	G6AU-434P-ST-US

Double-winding Latching Type

Contact		Ag + Au-clad	AgPd + Au-clad
General purpose	DPDT	G6AK-274P-ST-US	G6AK-234P-ST-US
	4PDT	G6AK-474P-ST-US	G6AK-434P-ST-US
Low-sensitivity	DPDT	G6AK-274P-ST40-US	G6AK-234P-ST40-US
	4PDT	G6AK-474P-ST40-US	G6AK-434P-ST40-US

Note: When ordering, add the rated coil voltage to the model number.
Example: G6A-274P-ST-US 12 VDC
Rated coil voltage

Model Number Legend

G6A ☐ - ☐ ☐ ☐ ☐ - ☐ ☐ - ☐ ☐ 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**
   2: DPDT
   4: 4PDT
3. **Contact Type**
   7: Bifurcated crossbar Ag (Au-clad) contact
   3: Bifurcated crossbar AgPd (Au-clad) contact
4. **Enclosure Ratings**
   4: Fully sealed
5. **Terminals**
   P: Straight PCB
6. **Stand-off**
   ST: Stand-off 0.64 mm
7. **Special Function**
   40: Low-sensitivity (400 mW)
   LT: Low thermoelectromotive force
8. **Approved Standards**
   US: UL, CSA certified
9. **Rated Coil Voltage**
   3, 4.5, 5, 6, 9, 12, 24, 48 VDC

Specifications

■ Coil Ratings

General-purpose, DPDT Relays

Rated voltage		3 VDC	4.5 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current		66.7 mA	44.6 mA	40 mA	33.3 mA	22.2 mA	16.7 mA	8.3 mA	4.9 mA
Coil resistance		45 Ω	101 Ω	125 Ω	180 Ω	405 Ω	720 Ω	2,880 Ω	9,750 Ω
Coil inductance	Armature OFF	0.07	0.16	0.2	0.29	0.63	1.1	4.5	13.7
(H) (ref. value)	Armature ON	0.065	0.14	0.18	0.26	0.57	1.06	4.1	12.5
Must operate voltage		70% max. of rated voltage							
Must release voltage		10% min. of rated voltage							
Max. voltage		200% of rated voltage at 23°C							
Power consumption		Approx. 200 mW							Approx. 235 mW

General-purpose, 4PDT Relays

Rated voltage		3 VDC	4.5 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current		120 mA	79.9 mA	72.5 mA	60 mA	40 mA	30 mA	15 mA	7.5 mA
Coil resistance		25 Ω	56.3 Ω	69 Ω	100 Ω	225 Ω	400 Ω	1,600 Ω	6,400 Ω
Coil inductance	Armature OFF	0.05	0.11	0.14	0.2	0.45	0.8	3.2	12.8
(H) (ref. value)	Armature ON	0.045	0.095	0.12	0.17	0.38	0.68	2.7	10.9
Must operate voltage		70% max. of rated voltage							
Must release voltage		10% min. of rated voltage							
Max. voltage		150% of rated voltage at 23°C							
Power consumption		Approx. 360 mW							

Low-sensitivity DPDT Relays

Rated voltage		3 VDC	4.5 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current		133.3 mA	88.9 mA	80 mA	66.7 mA	44.3 mA	33.3 mA	16.7 mA	8.3 mA
Coil resistance		22.5 Ω	50.6 Ω	62.5 Ω	90 Ω	203 Ω	360 Ω	1,440 Ω	5,760 Ω
Coil inductance	Armature OFF	0.03	0.065	0.08	0.11	0.27	0.52	2.1	7.5
(H) (ref. value)	Armature ON	0.02	0.06	0.07	0.1	0.23	0.43	1.8	6.4
Must operate voltage		70% max. of rated voltage							
Must release voltage		10% min. of rated voltage							
Max. voltage		150% of rated voltage at 23°C							
Power consumption		Approx. 400 mW							

Low-sensitivity 4PDT Relays

Rated voltage		3 VDC	4.5 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current		133.3 mA	88.9 mA	80 mA	66.7 mA	44.3 mA	33.3 mA	16.7 mA	8.3 mA
Coil resistance		22.5 Ω	50.6 Ω	62.5 Ω	90 Ω	203 Ω	360 Ω	1,440 Ω	5,760 Ω
Coil inductance	Armature OFF	0.035	0.1	0.12	0.17	0.42	0.7	2.8	10.2
(H) (ref. value)	Armature ON	0.02	0.07	0.09	0.13	0.3	0.52	2.2	8.6
Must operate voltage		70% max. of rated voltage							
Must release voltage		10% min. of rated voltage							
Max. voltage		150% of rated voltage at 23°C							
Power consumption		Approx. 400 mW							

Single-winding Latching, DPDT Relays

Rated voltage		3 VDC	4.5 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current		33.7 mA	22.2 mA	20 mA	16.7 mA	11.1 mA	8.3 mA	4.2 mA	2.5 mA
Coil resistance		89 Ω	202 Ω	250 Ω	360 Ω	810 Ω	1,440 Ω	5,760 Ω	19,000 Ω
Coil inductance	Armature OFF	0.15	0.34	0.44	0.64	1.38	2.5	9.2	28.5
(H) (ref. value)	Armature ON	0.11	0.25	0.35	0.48	1.07	2	7.2	22
Must operate voltage		70% max. of rated voltage							
Must release voltage		70% max. of rated voltage							
Max. voltage		200% of rated voltage at 23°C							
Power consumption		Approx. 100 mW							Approx. 125 mW

Single-winding Latching, 4PDT Relays

Rated voltage		3 VDC	4.5 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current		106.8 mA	71.2 mA	64 mA	53.3 mA	35.6 mA	26.7 mA	13.3 mA	6.7 mA
Coil resistance		28.1 Ω	63.2 Ω	78.1 Ω	112.5 Ω	253 Ω	450 Ω	1,800 Ω	7,200 Ω
Coil inductance	Armature OFF	0.03	0.06	0.08	0.11	0.25	0.45	1.8	7
(H) (ref. value)	Armature ON	0.02	0.04	0.06	0.08	0.18	0.32	1.3	5.2
Must operate voltage		70% max. of rated voltage							
Must release voltage		70% max. of rated voltage							
Max. voltage		150% of rated voltage at 23°C							
Power consumption		Approx. 320 mW							

Double-winding Latching, DPDT Relays

Rated voltage			3 VDC	4.5 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current			66.7 mA	40.2 mA	36 mA	30 mA	20 mA	15 mA	7.5 mA	4.2 mA
Coil resistance			45 Ω	112 Ω	139 Ω	200 Ω	450 Ω	800 Ω	3,200 Ω	11,520 Ω
Coil inductance	Set	Armature OFF	0.037	0.09	0.11	0.16	0.38	0.6	2.1	8.5
(H) (ref. value)		Armature ON	0.027	0.065	0.08	0.12	0.28	0.45	1.5	6.3
	Reset	Armature OFF	0.027	0.065	0.08	0.12	0.28	0.45	1.5	6.3
		Armature On	0.037	0.09	0.11	0.16	0.38	0.6	2.1	8.5
Must operate voltage			70% max. of rated voltage							
Must release voltage			70% max. of rated voltage							
Max. voltage			200% of rated voltage at 23°C							
Power consumption			Approx. 200 mW	Approx. 180 mW						Approx. 200 mW

Double-winding Latching, 4PDT Relays

Rated voltage			3 VDC	4.5 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current			106.8 mA	71.2 mA	64 mA	53.3 mA	35.6 mA	26.7 mA	13.3 mA	6.7 mA
Coil resistance			28.1 Ω	63.2 Ω	78.1 Ω	112.5 Ω	253 Ω	450 Ω	1,800 Ω	7,200 Ω
Coil inductance	Set	Armature OFF	0.03	0.06	0.08	0.11	0.25	0.45	1.8	7
(H) (ref. value)		Armature ON	0.02	0.04	0.06	0.08	0.18	0.32	1.3	5.2
	Reset	Armature OFF	0.02	0.04	0.06	0.08	0.18	0.32	1.3	5.2
		Armature ON	0.03	0.06	0.08	0.11	0.25	0.45	1.8	7
Must operate voltage			70% max. of rated voltage							
Must release voltage			70% max. of rated voltage							
Max. voltage			150% of rated voltage at 23°C							
Power consumption			Approx. 320 mW							

Double-winding Latching, Low-sensitivity DPDT Relays

Rated voltage			3 VDC	4.5 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current			120 mA	79.9 mA	72.5 mA	60 mA	40 mA	30 mA	15 mA	7.5 mA
Coil resistance			25 Ω	56.3 Ω	69 Ω	100 Ω	225 Ω	400 Ω	1,600 Ω	6,400 Ω
Coil inductance	Set	Armature OFF	0.015	0.04	0.05	0.07	0.16	0.28	1.1	4
(H) (ref. value)		Armature ON	0.01	0.025	0.035	0.05	0.12	0.2	0.75	2.9
	Reset	Armature OFF	0.01	0.025	0.035	0.05	0.12	0.2	0.75	2.9
		Armature ON	0.015	0.04	0.05	0.07	0.16	0.28	1.1	4
Must operate voltage			70% max. of rated voltage							
Must release voltage			70% max. of rated voltage							
Max. voltage			150% of rated voltage at 23°C							
Power consumption			Approx. 360 mW							

Double-winding Latching, Low-sensitivity 4PDT Relays

Rated voltage			3 VDC	4.5 VDC	5 VDC	6 VDC	9 VDC	12 VDC	24 VDC	48 VDC
Rated current			120 mA	79.9 mA	72.5 mA	60 mA	40 mA	30 mA	15 mA	7.5 mA
Coil resistance			25 Ω	56.3 Ω	69 Ω	100 Ω	225 Ω	400 Ω	1,600 Ω	6,400 Ω
Coil inductance	Set	Armature OFF	0.02	0.045	0.065	0.09	0.18	0.3	1.2	4.4
(H) (ref. value)		Armature ON	0.015	0.035	0.05	0.075	0.14	0.23	0.82	3.2
	Reset	Armature OFF	0.015	0.035	0.05	0.075	0.14	0.23	0.82	3.2
		Armature ON	0.02	0.045	0.065	0.09	0.18	0.3	1.2	4.4
Must operate voltage			70% max. of rated voltage							
Must release voltage			70% max. of rated voltage							
Max. voltage			150% of rated voltage at 23°C							
Power consumption			Approx. 360 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.

Contact Ratings

Item	G6A-234P-ST(40)-US/434P-ST(40)-US		G6A-274P-ST(40)-US/474P-ST(40)-US	
Load	Resistive load (cosø = 1)	Inductive load (cosø = 0.4; L/R = 7 ms)	Resistive load (cosø = 1)	Inductive load (cosø = 0.4; L/R = 7 ms)
Rated Load	0.3 A at 125 VAC; 1 A at 30 VDC	0.2 A at 125 VAC; 0.5 A at 30 VDC	0.5 A at 125 VAC; 2 A at 30 VDC	0.3 A at 125 VAC; 1 A at 30 VDC
Contact Material	AgPd (Au-clad)		Ag (Au-clad)	
Rated Carry Current	3 A			
Max. switching voltage	250 VAC, 220 VDC			
Max. switching current	2 A	1 A	2 A	1 A
Max. switching power	125 VA, 60 W	62.5 VA, 30 W	125 VA, 60 W	62.5 VA, 30 W
Failure rate (reference value)	0.01 mA at 10 mVDC			

Item	G6AK-234P-ST(40)-US/G6AK-434P-ST(40)-US G6AU-234P–ST-US/G6AU-434P-ST-US		GG6AK-274P-ST(40)-US/G6AK-474P-ST(40)-U G6AU-274P-ST-US/G6AU-474P-ST-US	
Load	Resistive load (cosø = 1)	Inductive load (cosø = 0.4; L/R = 7 ms)	Resistive load (cosø = 1)	Inductive load (cosø = 0.4; L/R = 7 ms)
Rated Load	0.3 A at 125 VAC; 1 A at 30 VDC	0.2 A at 125 VAC; 0.5 A at 30 VDC	0.5 A at 125 VAC; 2 A at 30 VDC	0.25 A at 125 VAC; 1 A at 30 VDC
Contact Material	AgPd (Au-clad)		Ag (Au-clad)	
Rated Carry Current	3 A		3 A	
Max. switching voltage	250 VAC, 220 VDC		250 VAC, 220 VDC	
Max. switching current	2 A	1 A	2 A	1 A
Max. switching power	125 VA, 60 W	62.5 VA, 30 W	125 VA, 60 W	62.5 VA, 30 W
Failure rate (reference value)	0.01 mA at 10 mVDC		0.01 mA at 10 mVDC	

Note: P level: $\lambda_{60} = 0.1 \times 10^{-6}$/operation.

Characteristics

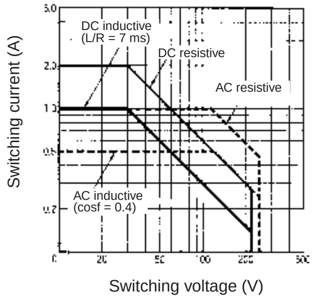
Contact resistance	50 mΩ max.
Operate (set) time	**Single-side stable types:** DPDT: 5 ms max. (mean value: approx. 3 ms) 4PDT: 7 ms max. (mean value: approx. 3.8 ms) **Latching types:** DPDT: 5 ms max. (mean value: approx. 2.5 ms) 4PDT: 7 ms max. (mean value: approx. 3.3 ms)
Release (reset) time	**Single-side stable types:** DPDT: 3 ms max. (mean value: approx. 1.2 ms) 4PDT: 5 ms max. (mean value: approx. 1.3 ms) **Latching types:** DPDT: 5 ms max. (mean value: approx. 2.5 ms) 4PDT: 7 ms max. (mean value: approx. 2.7 ms)
Bounce Time	Operate: mean value: approx. 0.5 ms Release: mean value: approx. 0.5 ms
Min. set/reset signal width	DPDT: 7 ms min. 4PDT: 15 ms min.
Max. operating frequency	Mechanical: 36,000 operations/hr Electrical: 1,800 operations/hr (under rated load)
Insulation resistance	1,000 MΩ min. (at 500 VDC); except for set-reset
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between coil and contacts 1,000 VAC, 50/60 Hz for 1 min between contacts of different polarity 1,000 VAC, 50/60 Hz for 1 min between contacts of same polarity 250 VAC, 50/60 Hz for 1 min between set and reset coils
Impulse withstand voltage	1,500 V (10 x 160 µs) (conforms to FCC Part 68)
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 2.5-mm single amplitude (5-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/s^2 (approx. 100G) Malfunction: DPDT: 500 m/s^2 (approx. 50G) 4PDT, Latching type: 300 m/s^2 (approx. 30G)
Endurance	Mechanical: 100,000,000 operations min. (at 36,000 operations/hr) Electrical: 500,000 operations min. (at 1,800 operations/hr)
Ambient temperature	Operating: -40°C to 70°C (with no icing)
Ambient humidity	Operating: 5% to 85%
Weight	DPDT: Approx. 3.5 g 4PDT: Approx. 6 g

Approved Standards
UL114, UL478 (File No. E41515)/CSA C22.2 No.0, No.14 (File No. LR24825

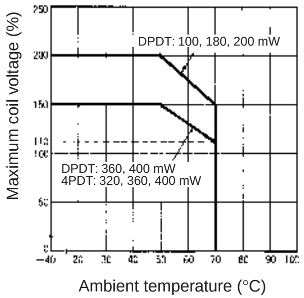
Model	Contact form	Coil ratings	Contact ratings
G6A-234P-ST(40)-US G6AK-234P-ST(40)-US G6AU-234P-ST-US	DPDT	3 to 48 VDC	0.6 A, 125 VAC 1 A, 30 VDC 0.6 A, 110 VDC
G6A-274P-ST(40)-US G6AK-274P-ST(40)-US G6AU-274P-ST-US	DPDT		0.6 A, 125 VAC 2 A, 30 VDC 0.6 A, 110 VDC
G6A-434P-ST(40)-US G6AK-434P-ST(40)-US G6AU-434P-ST-US	4PDT		0.6 A, 125 VAC 1 A, 30 VDC 0.6 A, 110 VDC
G6A-474P-ST(40)-US G6AK-474P-ST(40)-US G6AU-474P-ST-US	4PDT		0.6 A, 125 VAC 2 A, 30 VDC 0.6 A, 110 VDC

Engineering Data

Maximum Switching Power DPDT, 4PDT

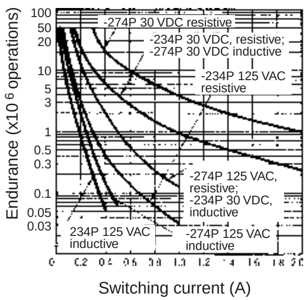


Ambient Temperature vs. Maximum Coil Voltage

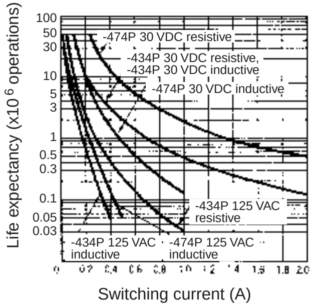


Note: The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

Endurance DPDT



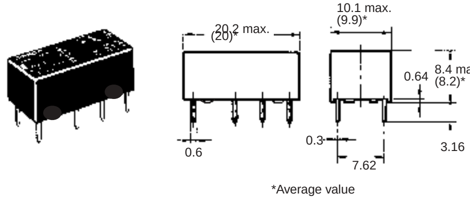
4PDT



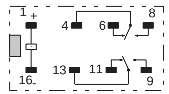
Dimensions

Note: 1. All units are in millimeters unless otherwise indicated.
2. Orientation marks are indicated as follows:

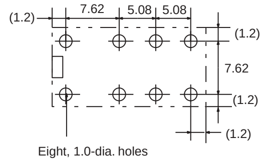
G6A-234P-ST(40)-US, G6A-274P-ST(40)-US



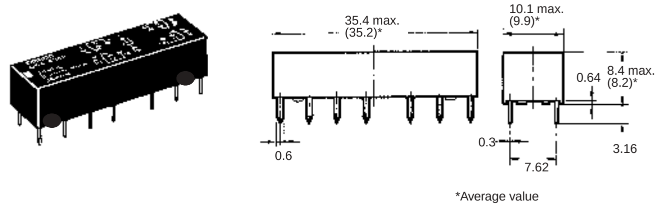
Terminal Arrangement/ Internal Connections (Bottom View)



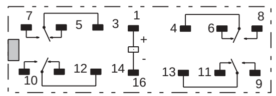
Mounting Holes (Bottom View)
Tolerance: ±0.1



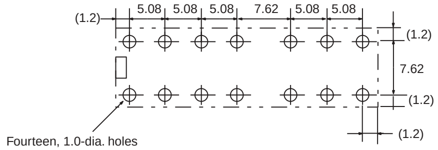
G6A-434P-ST(40)-US, G6A-474P-ST-US



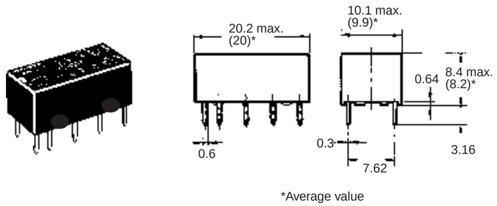
Terminal Arrangement/ Internal Connections (Bottom View)



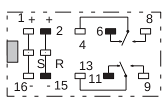
Mounting Holes (Bottom View)
Tolerance: ±0.1



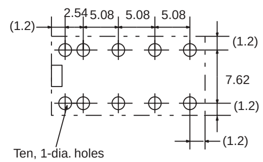
G6AK-234P-ST(40)-US, G6AK-274P-ST(40)-US



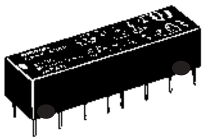
Terminal Arrangement/ Internal Connections (Bottom View)

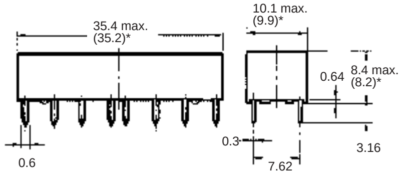


Mounting Holes (Bottom View)
Tolerance: ±0.1



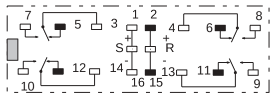
G6AK-434P-ST(40)-US,
G6AK-474P-ST(40)-US





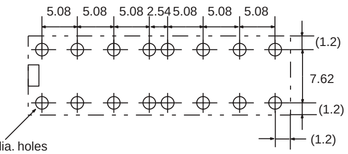
*Average value

Terminal Arrangement/
Internal Connections
(Bottom View)



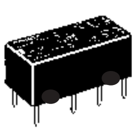
Mounting Holes
(Bottom View)

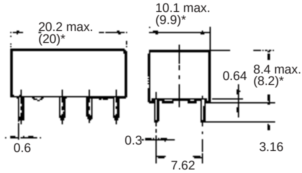
Tolerance: ±0.1



Sixteen, 1.0-dia. holes

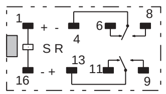
G6AU-234P-ST-US,
G6AU-274P-ST-US





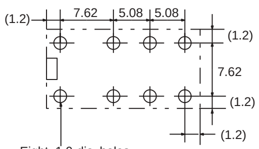
*Average value

Terminal Arrangement/
Internal Connections
(Bottom View)



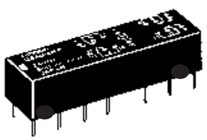
Mounting Holes
(Bottom View)

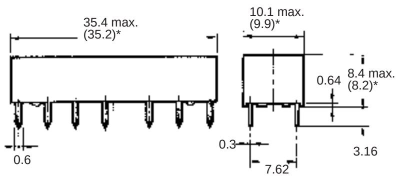
Tolerance: ±0.1



Eight, 1.0-dia. holes

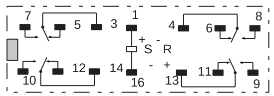
G6AU-434P-US,
G6AU-474P-ST-US





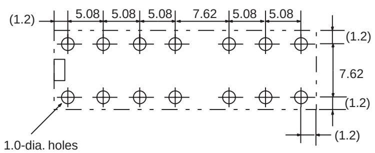
*Average value

Terminal Arrangement/
Internal Connections
(Bottom View)



Mounting Holes
(Bottom View)

Tolerance: ±0.1



Fourteen, 1.0-dia. holes

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Switching Structure Based on the Micro Strip Line is Used to Combine High Performance and Cost-effectiveness

- Isolation characteristics of 65 dB or better at 900 MHz.
- Effective insertion loss characteristics of 0.2 dB or better at 900 MHz (half the loss of earlier models).
- Fully sealed construction provides excellent environmental resistance.
- Improved shock-resistance (double the resistance of earlier models).

Ordering Information

Class	Sealing	Fully sealed	
	Contact configuration	Rated coil voltage	Model
Basic Type	SPDT	4.5 VDC	G6Y-1
		5 VDC	
		9 VDC	
		12 VDC	
		24 VDC	

Model Number Legend

G6Y-□□ VDC
1 2

1. Number of contact poles

1: Single pole (SPDT contact)

2. Rated Coil Voltage

4.5, 5, 9, 12, 24 VDC

■ Basic Specifications

- Contact Mechanism: Double-braking bifurcated contact
- Contact Material: Gold alloy
- Sealing: Fully sealed
- Terminal Configuration: Printed circuit board terminal configuration

Application Examples

Signal Switching in Various Communications Equipment

- Wired Communications: Cable TV, captain systems, and video response systems (VRS)
- Wireless Communications: Transceivers, ham radio, car telephones, high-level TV, fax machines, satellite broadcasting, text multiplex broadcasting, and pay TV
- Public Equipment: VCRs, TVs, video disk players, and TV games
- Industrial Equipment: Measuring equipment, test equipment, and multiplex transmission devices

■ Ratings

Operational Coil

Class		Item Rated voltage (V)	Rated current (mA)	Coil resistance (Ω)	Operating voltage (V)	Release voltage (V)	Max. allowed voltage (V)	Power consumption (mW)
Basic Type	DC	4.5	44.4	101	75% max.	10% min.	150% of rated voltage at 23°C	Approx. 200
		5	40.0	125				
		9	22.2	405				
		12	16.7	720				
		24	8.3	2,880				

Note: The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.
The operating characteristics are measured at a coil temperature of 23°C.
The "Max. allowed voltage" is the maximum voltage that can be applied to the relay coil. It is not the maximum voltage that can be applied continuously.

Contact Ratings

Load	Resistive load
Rated voltage	0.01 A at 30 VAC 0.01 A at 30 VDC 900 MHz, 1 W (see note)
Rated carry current	0.5 A
Max. switching voltage	30 VAC 30 VDC
Max. switching current	0.5 A
Max. switching power (reference value)	AC10VA DC10W

Note: This value is for a load with V.SWR x 1.2.

High-frequency Characteristics

Item	250 MHz	900 MHz	2.5 GHz
Isolation	80 db min.	65 dB min.	30 dB min.
Insertion loss	0.5 dB max.	0.5 dB max.	–
V.SWR	1.5 max.	1.5 max.	–
Max. carry power	10 W		–
Max. switching power	10 W (see note 3)		–

Note: 1. The impedance of the measuring system is 50 Ω.
2. The table above shows preliminary values.
3. This value is for a load with V.SWR x 1.2

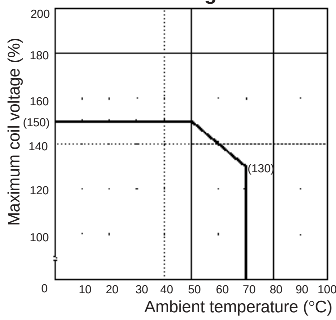
■ Characteristics

Contact resistance (see note 1)	100 mΩ max.
Operating time	10 ms max. (approx. 5 ms)
Release time	5 ms max. (approx. 1 ms)
Insulation resistance (see note 2)	100 mΩ min.
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between coil and contacts 500 VAC, 50/60 Hz for 1 min between contacts of same polarity 500 VAC, 50/60 Hz for 1 min between coil and ground and between contacts and ground
Vibration resistance	Destruction: 10 Hz to 55 to 10 Hz, 0.75-mm single amplitude (1.5 mm double amplitude) Malfunction: 10 Hz to 55 to 10 Hz, 0.75-mm single amplitude (1.5 mm double amplitude)
Shock resistance	Destruction: 1,000 m/s^2 Malfunction: 500 m/s^2
Endurance	Mechanical: 1,000,000 operations min. (at 1,800 operations/hr) Electrical: 300,000 operations min. (under rated load at 1,800 operations/hr)
Failure rate (reference value (see note 3))	10 mVDC, 10 µA
Ambient temperature	Operating: -40°C to 70°C (with no icing)
Ambient humidity	Operating: 5% to 85%
Weight	Approx. 5 g

Note: The table above shows preliminary values.
1. Measurement Conditions: 5 VDC, 100 mA, voltage drop method
2. Measurement Conditions: Measured at the same points as the dielectric strength using a 500-VDC ohmmeter.
3. This value is for a switching frequency of 120 operations/minute.

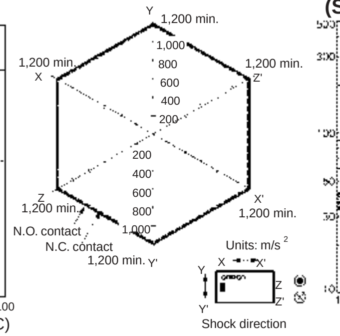
Engineering Data

Ambient Temperature vs. Maximum Coil Voltage



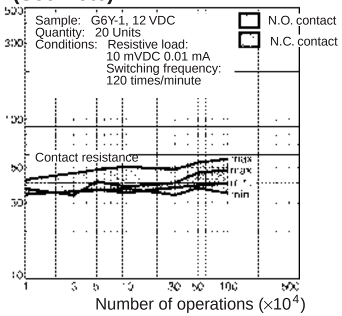
Note: The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

Malfunctioning Shock

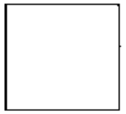


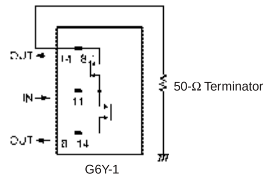
Quantity Tested: 10 Units
Test Method: Shock was applied 3 times in each direction with and with out excitation and the level at which the shock caused mal function was measured.
Rating: 500 m/s^2

Contact Reliability Test (See Note)



Note: Ambient temperature of 23°C

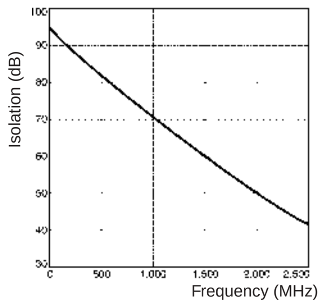




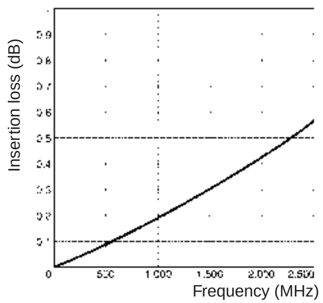
Terminals which were not being measured were terminated with 50 Ω.

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.

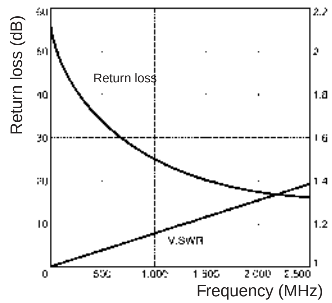
Isolation Characteristics (Average Values)



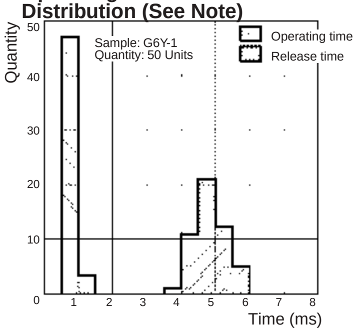
Insertion Loss Characteristics (Average Values)



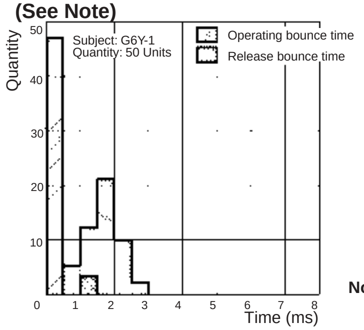
V.SWR, Return Loss Characteristics (Average Values)



Operating/Release Time Distribution (See Note)



Bounce Time Distribution (See Note)

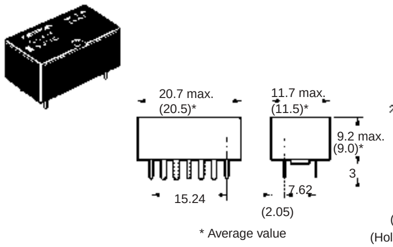


Note: Ambient temperature: 23°C

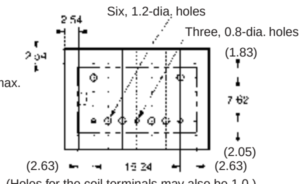
Dimensions

Note: All units are in millimeters unless otherwise indicated.

G6Y-1

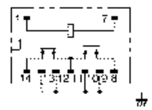


PCB Dimensions (Bottom View)
Tolerances: ±0.1 mm.



(Holes for the coil terminals may also be 1.0.)

Terminal Arrangement/ Internal Connections (Bottom View)



(There is no polarity to the coil.)

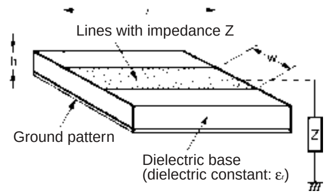
Note: The shaded and unshaded parts indicate the product's directional marks.

■ Correct Use

Airtightness when cleaning will last 1 minute at 70°C. Complete cleaning within these conditions.

MICRO STRIP LINE DESIGN

- It is advantageous to use the Micro Strip Line in high–frequency transmission circuits because a low-loss transmission can be constructed with this method. By etching the dielectric base which has copper foil attached to both sides, the Micro Strip Line will have a concentrated electric field between the lines and ground as shown in the following diagram.

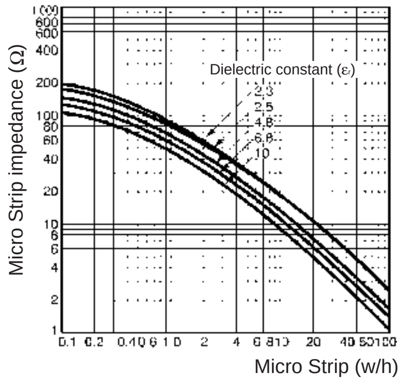


- The characteristic impedance of the lines Z_O is determined by the kind of base (dielectric constant), the base's thickness, and the width of the lines, as expressed in the following equation.

$$Z_O = \frac{377}{\sqrt{\varepsilon_r}\,\frac{W}{H}\left\{1+\frac{2H}{\pi W}\left[1+\ln\frac{\pi W}{H}\right]\right\}}$$

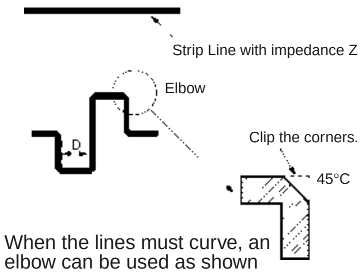
W: Line width
ε_r: Effective dielectric constant
H: Dielectric base thickness
The copper foil thickness must be less than H.

- The following graph shows this relationship.



- For example, when creating 50 Ω lines using a glass epoxy base with a thickness of 1.6 mm, the above graph will yield a w/h ratio of 1.7 for a dielectric constant of 4.8. Since the base thickness is 1.6 mm, the width will be h ∞ 1.7 ≈ 2.7 mm.
- The thickness of the copper foil "t" is ignored in this design method, but it must be considered because large errors will occur in extreme cases such as a foil thickness of t ≈ w. Furthermore, with the Micro Strip Line design, the lines are too short for the G6Y's intended frequency bandwidths, so we can ignore conductive losses and the line's attenuation constant.
- The spacing of the Strip Lines and ground pattern should be comparable to the width of the Strip Lines.
- Design the pattern with the shortest possible distances. Excessive distances will adversely effect the high-frequency characteristics.
- Spread the ground patterns as widely as possible so that potential differences are unlikely to develop between the ground patterns.
- To avoid potential short-circuits, do not place the pattern's leads near the point where the bottom of the Relay attaches to the board.

BENDING THE MICRO STRIP LINE



When the lines must curve, an elbow can be used as shown in the diagram. A distance (D) between the lines of approximately twice the line width is sufficient.

EXAMPLES OF MOUNTING DESIGNS

Since this example emphasizes reducing mounting costs, expensive mounting methods such as through-hole boards are not shown. If such methods are to be used, the characteristics must be studied carefully using the actual board configuration.

Using a Double-sided Paper Epoxy Board

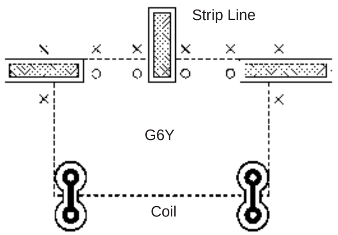
When double-sided paper epoxy boards are used, the dielectric constant will be approximately the same as that of glass epoxy boards ($\varepsilon_r = 4.8$).

The width of the Strip Lines for a board with t=1.6 mm is 2.7 mm for 50 Ω and 1.3 mm for 75 Ω. For a board with t=1.0 mm the width is 1.7 mm for 50 Ω and 0.8 mm for 75 Ω.

The following diagram shows an example pattern and the Micro Strip Lines connected to the contact terminals are formed with pattern widths derived from the description above. The width between the Micro Strip Lines and ground patterns are comparable to the Micro Strip Line width.

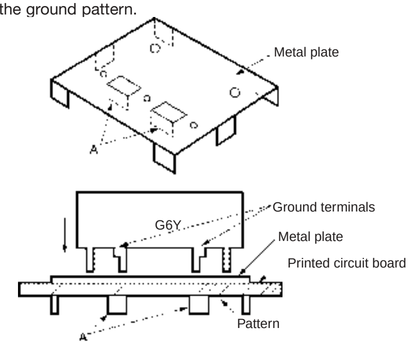
There are jumpers between the upper and lower patterns at the points marked with Xs in the diagram. Improved characteristics can be obtained with more jumper locations. This method yields isolation characteristics of 65 dB to 75 dB at 500 MHz and 50 dB at 900 MHz.

At this point in the diagram the component side is the entire ground pattern side, but set aside approximately 2.0 mm ∞ 2.0 mm of the pattern for the contact terminals and coil terminals.



Using a Single-sided Board

When a single-sided board is used, isolation characteristics of only 60 dB to 70 dB at 200 MHz can be obtained. When high frequency bands are to be used with a single-sided board, a metal plate can be placed between the base and Relay and connected to the ground pattern.



With this method a metal plate is placed between the Relay and base and connected to the pattern, as shown in the above diagram. The important point here is that 3 locations (the G6Y's ground terminal, the metal plate's bent tabs (A), and the ground pattern) are soldered together at the same time. This method combines an inexpensive single-sided board and inexpensive metal plate to yield the same characteristics as a double-sided board and good characteristics are obtained by grounding the G6Y's ground terminal and metal plate in the same place.

The metal plate must be attached to the base as described here. From this point, the methods used for Strip Line design are the same as for the double-sided board.

Mounting Precautions

Be sure to securely attach the Relay's base surface to the board during installation. The isolation characteristics will be affected if the Relay lifts off the board.

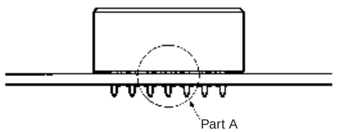
As shown in the enlarged illustration of the cross-section of part A, the G6Y is designed to ensure better high-frequency characteristics if the stand-off part of the G6Y is in contact with the ground pattern of the PCB. Therefore, the ground terminal and stand-off part are electrically connected internally.

Should the through hole electrically connected to the contact terminal come in contact with the stand-off part, the contact will be short-circuited with the ground, which may cause an accident.

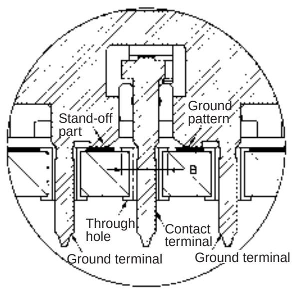
As a preventive measure, keep at least a distance of 0.3 mm between the stand-off part and the through hole or land.

For example, if the terminal hole on the PCB is 1 mm in diameter and the length B shown in the illustration is 1.4 mm, a distance of 0.3 mm or more will be provided between the through hole and stand-off part.

PCB Mounting

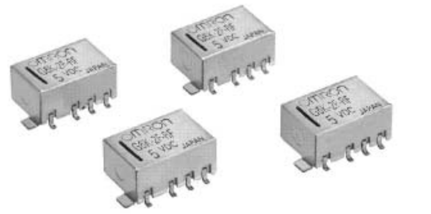


Cross-section of Part A



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Surface-mounting, 1-GHz-Band, Miniature, DPDT, High-frequency Relay



- Superior high-frequency characteristics (at 1 GHz), such as an isolation of 20 dB min. between contacts of the same polarity or 30 dB min. between contacts of different polarity with an insertion loss of 0.2 dB max.
- Miniaturized to 10.3 x 6.9 x 5.4 mm (L x W x H).
- Rated power consumption of 100 mW with high sensitivity.
- Single-side stable and single-winding latching models available.

Ordering Information

Model Number Legend

G6K□-□□-□
1 2 3 4

1. Relay Function

None: Single-side stable
U: Single-winding latching

2. Classification

2: DPDT

3. Terminal Shape

F: Surface-mounting terminals

4. Special Function

RF: High-frequency compatible

■ List of Models

Standard Models with Surface-mounting Terminals

Classification	Structure	Contact form	Rated coil voltage	Model
Single-side stable	Plastic sealed	DPDT	3, 4.5, 5, 12, and 24 VDC	G6K-2F-RF
Single-winding latching			3, 4.5, 5, 12, and 24 VDC	G6KU-2F-RF

Application Examples

- Measurement devices
- Communications devices
- Broadcasting and audio-visual devices

Specifications

■ Contact Ratings

Load	Resistive load
Rated load	125 VAC, 0.3 A 30 VDC, 1 A 1 GHz, 1 W (See note.)
Rated carry current	1 A
Max. switching voltage	125 VAC or 60 VDC
Max. switching current	1 A

Note: This value is for a V.SWR of 1.2 max. at the load.

■ High-frequency Characteristics

Item		Frequency: 1 GHz
Isolation	Between contacts of the same polarity	20 dB min.
	Between contacts of different polarity	30 dB min.
Insertion loss		0.2 dB max.
V.SWR		1.2 max.
Maximum carry power		3 W (See note 3.)
Maximum switching power		1 W (See note 3.)

Note:
1. The impedance of the measurement system is 50 Ω.
2. The above values are initial values.
3. These values are for a V.SWR of 1.2 max. at the load.

■ Coil Ratings

Single-side Stable Models

G6K-2F-RF

Rated voltage (VDC)	3	4.5	5	12	24
Rated current (mA)	33.0	23.2	21.1	9.1	4.6
Coil resistance (Ω)	91	194	237	1,315	5,220
Must operate voltage (V)	80% max. of rated voltage				
Must release voltage (V)	10% min. of rated voltage				
Maximum voltage (V)	150% of rated voltage				
Power consumption (mW)	Approx. 100 mW				

Single-winding Latching Models

G6KU-2F-RF

Rated voltage (VDC)	3	4.5	5	12	24
Rated current (mA)	33.0	23.2	21.1	9.1	4.6
Coil resistance (Ω)	91	194	237	1,315	5,220
Must operate voltage (V)	75% max. of rated voltage				
Must release voltage (V)	75% max. of rated voltage				
Maximum voltage (V)	150% of rated voltage				
Power consumption (mW)	Approx. 100 mW				

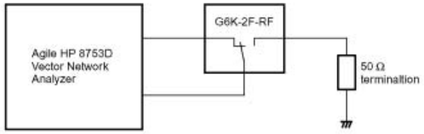
Note:
1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.
2. The operating characteristics are measured at a coil temperature of 23°C.
3. The maximum voltage is the highest voltage that can be imposed on the Relay coil instantaneously.

■ Characteristics

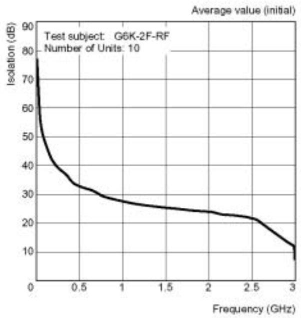
Item		Single-side stable models	Single-winding latching models
		G6KU-2F-RF	G6KU-2F-RF
Contact resistance (See note 2.)		100 mΩ max.	
Operating (set) time (See note 3.)		3 ms max. (approx. 1.4 ms)	3 ms max. (approx. 1.2 ms)
Release (reset) time (See note 3.)		3 ms max. (approx. 1.3 ms)	3 ms max. (approx. 1.2 ms)
Minimum set/reset pulse time		---	10 ms
Insulation resistance (See note 4.)		1,000 MΩ min. (at 500 VDC)	
Dielectric strength	Between coil and contacts	750 VAC, 50/60 Hz for 1 min	
	Between contacts of different polarity	750 VAC, 50/60 Hz for 1 min	
	Between contacts of the same polarity	750 VAC, 50/60 Hz for 1 min	
	Between ground and coil/contacts	500 VAC, 50/60 Hz for 1 min	
Vibration resistance		Destruction: 10 to 55 to 10 Hz, 2.5-mm single amplitude (5-mm double amplitude) and 55 to 500 to 55 Hz, 300 m/s^2 Malfunction: 10 to 55 to 10 Hz, 1.65-mm single amplitude (3.3-mm double amplitude) and 55 to 500 to 55 Hz, 200 m/s^2	
Shock resistance		Destruction: 1,000 m/s^2 Malfunction: 750 m/s^2	
Endurance		Mechanical: 50,000,000 operations min. (at a switching frequency of 36,000 operations/hour) Electrical: 100,000 operations min. (at a switching frequency of 1,800 operations/hour)	
Ambient temperature		Operating: –40°C to 70°C (with no icing or condensation)	
Ambient humidity		Operating: 5% to 85%	
Weight		Approx. 0.95 g	

Note:
1. The above values are initial values.
2. The contact resistance was measured with 10 mA at 1 VDC with a voltage drop method.
3. Values in parentheses are actual values.
4. The insulation resistance was measured with a 500-VDC megohmmeter applied to the same parts as those used for checking the dielectric strength.

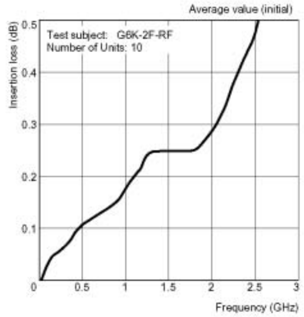
Engineering Data



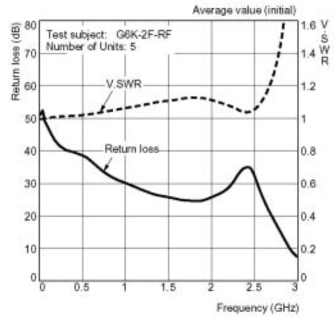
High-frequency Characteristics (Isolation)



High-frequency Characteristics (Insertion Loss)



High-frequency Characteristics (Return Loss, V.SWR)

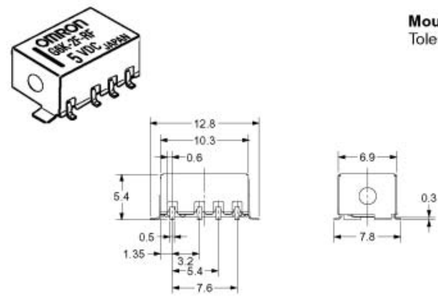


Note: Refer to the G6K specifications for basic specifications not shown above.

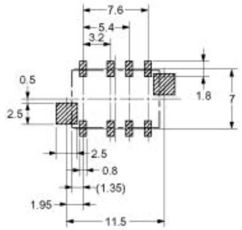
Dimensions

Note: All units are in millimeters unless otherwise indicated.

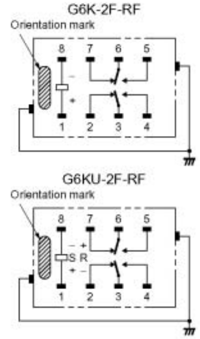
G6K-2F-RF
G6KU-2F-RF



Mounting Dimensions (Top View)
Tolerance: ±0.1 mm



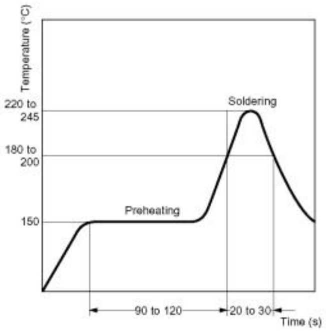
Terminal Arrangement/Internal Connections (Top View)



Note:
1. Each value has a tolerance of ±0.3 mm.
2. The coplanarity of the terminals is 0.15 mm max.

Recommended Soldering Method

Recommended Conditions for IRS Method (Surface-mounting Terminals)

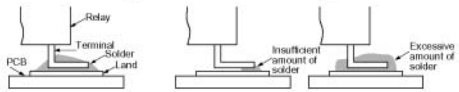


Note: The temperature profile indicates the temperature on the circuit board surface.

The thickness of cream solder to be applied should be between 200 and 250 µm and the land pattern should be based on OMRON's recommended PCB pattern.

To maintain the correct soldering joint shown in the following diagram, we recommend applying solder with the soldering conditions shown on the left.

Correct Soldering **Incorrect Soldering**



Check the soldering in the actual mounting conditions before use.

Safety Precautions

■ Precautions for Correct Use

Handling

Remove the Relay from its packaging just before installation.

Environmental Conditions for Usage, Storage, and Transport

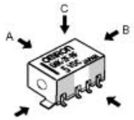
Avoid direct sunlight when using, storing, or transporting the Relay and maintain normal temperature, humidity, and pressure conditions.

Long-term, Continuous ON Contacts

Using the Relay in a circuit where the Relay will be ON continuously for long periods (rather than switching) can lead to unstable contacts because the heat generated by the coil itself will affect the insulation and can cause a film to develop on the contact surfaces. We recommend using a latching relay (magnetic-holding relay) in this kind of circuit. If a single-side stable model must be used in this kind of circuit, we recommend adding fail-safe circuits in case the contact fails or the coil burns out.

Claw Securing Force During Automatic Mounting

During automatic insertion of Relays, be sure to set the securing force of each claw to the following so that the Relay's characteristics will be maintained.



Direction A: 1.96 N max.
Direction B: 4.90 N max.
Direction C: 1.96 N max.

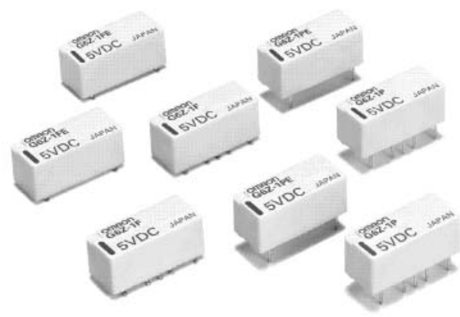
Secure the claws to the shaded area.
Do not attach them to the center of the Relay or just one part of the Relay.

Coating

Do not use silicone coating to coat the Relay when it is mounted to the PCB. Do not wash the PCB after the Relay is mounted using detergent containing silicone. Otherwise, the detergent may remain on the surface of the Relay.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Surface-mounting, 2.6-GHz-Band, Miniature, SPDT, High-frequency Relay



- Superior high-frequency characteristics, such as an isolation of 30 dB min., insertion loss of 0.5 dB max., and V.SWR of 1.5 max. at 2.6 GHz.
- Surface-mounting terminals and superior high frequency characteristics combined using semi triplate strip transmission lines.
- Miniature dimensions of 20 x 8.6 x 8.9 mm (L x W x H).
- Choose from a lineup that includes single-winding latching models (200 mW), double-winding latching models (360 mW), and models with a reverse contact arrangement.
- Series includes models with an E-shape terminal structure (same as existing models), and models with a Y-shape terminal structure, allowing greater freedom with PCB design.
- Models with 75-Ω impedance and models with 50-Ω impedance are available.

Ordering Information

Model Number Legend

G6Z-□-□□□-□□
1 2 3 4 5 6

1. Relay Function

None: Single-side stable
U: Single-winding latching
K: Double-winding latching

2. Contact Form

1: SPDT

3. Terminal Shape

F: Surface-mounting terminals
P: PCB terminals

4. Terminal Structure

None: Y-shape terminal structure
E: E-shape terminal structure

5. Characteristic Impedance

None: 75 Ω
A: 50 Ω

6. Contact Arrangement

None: Standard contact arrangement
R: Reverse contact arrangement

■ List of Models

Standard Models with PCB Terminals

Classification	Structure	Contact form	Terminal arrangement	Characteristic impedance	Rated coil voltage	Model
Single-side stable	Plastic sealed	SPDT	E-shape	75 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6Z-1PE
				50 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6Z-1PE-A
			Y-shape	75 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6Z-1P
				50 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6Z-1P-A
Single-winding latching			E-shape	75 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZU-1PE
				50 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZU-1PE-A
			Y-shape	75 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZU-1P
				50 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZU-1P-A
Double-winding latching			E-shape	75 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZK-1PE
				50 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZK-1PE-A
			Y-shape	75 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZK-1P
				50 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZK-1P-A

Standard Models with Surface-mounting Terminals

Classification	Structure	Contact form	Terminal arrangement	Characteristic impedance	Rated coil voltage	Model
Single-side stable	Plastic sealed	SPDT	E-shape	75 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6Z-1FE
				50 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6Z-1FE-A
			Y-shape	75 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6Z-1F
				50 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6Z-1F-A
Single-winding latching			E-shape	75 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZU-1FE
				50 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZU-1FE-A
			Y-shape	75 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZU-1F
				50 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZU-1F-A
Double-winding latching			E-shape	75 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZK-1FE
				50 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZK-1FE-A
			Y-shape	75 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZK-1F
				50 Ω	3, 4.5, 5, 9, 12, and 24 VDC	G6ZK-1F-A

Note: When ordering tape packing (surface-mounting models), add "-TR" to the model number. "-TR" does not appear on the Relay itself.

Application Examples

These Relays can be used for switching signals in media equipment.

- **Wire communications:**
  Cable TV (STB and broadcasting infrastructure), cable modems, and VRS (video response systems)
- **Wireless communications:**
  Transceivers, ham radios, car telephones, ETC, ITS, high-level TV, satellite broadcasting, text multiplex broadcasting, pay TV, mobile phone stations, TV broadcasting facilities, and community antenna systems
- **Public equipment:**
  TVs, TV games, satellite radio units, car navigation systems
- **Industrial equipment:**
  Measuring equipment, test equipment, and multiplex transmission devices

Specifications

■ Contact Ratings

Load	Resistive load
Rated load	10 mA at 30 VAC; 10 mA at 30 VDC; 10 W at 900 MHz (See note.)
Rated carry current	0.5 A
Max. switching voltage	30 VAC, 30 VDC
Max. switching current	0.5 A

Note: This value is for an impedance of 50 Ω or 75 Ω with a V.SWR of 1.2 max.

■ High-frequency Characteristics

Item	Frequency	900 MHz				2.6 GHz			
		TH		SMD		TH		SMD	
		E-shape	Y-shape	E-shape	Y-shape	E-shape	Y-shape	E-shape	Y-shape
Isolation	75 Ω	65 dB min.		60 dB min.		35 dB min.	45 dB min.	30 dB min.	40 dB min.
	50 Ω	60 dB min.							
Insertion loss (not including substrate loss)	75 Ω	0.2 dB max.				0.5 dB max.			
	50 Ω	0.1 dB max.				0.3 dB max.			
V.SWR	75 Ω	1.2 max.				1.5 max.			
	50 Ω	1.1 max.				1.3 max.			
Return loss	75 Ω	20.8 dB max.				14.0 dB max.			
	50 Ω	26.4 dB max.				17.7 dB max.			
Maximum carry power		10 W (See note 2.)							
Maximum switching power		10 W (See note 2.)							

Note: 1. The above values are initial values.

2. These values are for an impedance of 50 Ω or 75 Ω with a V.SWR of 1.2 max.

■ Coil Ratings

Single-side Stable Models

G6Z-1P(E), G6Z-1F(E)

Raged voltage	3 VDC	4.5 VDC	5 VDC	9 VDC	12 VDC	24 VDC
Rated current	66.7 mA	44.4 mA	40.0 mA	22.2 mA	16.7 mA	8.3 mA
Coil resistance	45 Ω	101 Ω	125 Ω	405 Ω	720 Ω	2,880 Ω
Must operate voltage	75% max. of rated voltage					
Must release voltage	10% min. of rated voltage					
Maximum voltage	150% of rated voltage					
Power consumption	Approx. 200 mW					

Single-winding Latching Models

G6ZU-1P(E), G6ZU-1F(E)

Raged voltage	3 VDC	4.5 VDC	5 VDC	9 VDC	12 VDC	24 VDC
Rated current	66.7 mA	44.4 mA	40.0 mA	22.2 mA	16.7 mA	8.3 mA
Coil resistance	45 Ω	101 Ω	125 Ω	405 Ω	720 Ω	2,880 Ω
Must operate voltage	75% max. of rated voltage					
Must release voltage	75% max. of rated voltage					
Maximum voltage	150% of rated voltage					
Power consumption	Approx. 200 mW					

Double-winding Latching Models

G6ZK-1P(E), G6ZK-1F(E)

Raged voltage	3 VDC	4.5 VDC	5 VDC	9 VDC	12 VDC	24 VDC
Rated current	120 mA	80 mA	72 mA	40 mA	30 mA	15 mA
Coil resistance	25 Ω	56 Ω	69 Ω	225 Ω	400 Ω	1,600 Ω
Must operate voltage	75% max. of rated voltage					
Must release voltage	75% max. of rated voltage					
Maximum voltage	150% of rated voltage					
Power consumption	Approx. 360 mW					

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 instantaneously.

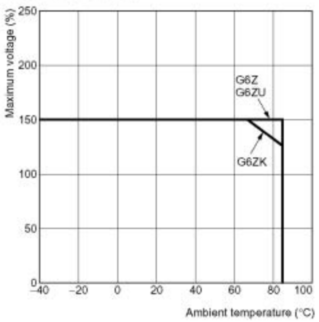
■ Characteristics

Item		Single-side stable models	Single-winding latching models	Double-winding latching models
		G6Z-1P(E), G6Z-1F(E)	**G6ZU-1P(E), G6ZU-1F(E)**	**G6ZK-1P(E), G6ZK-1F(E)**
Contact resistance (See note 2.)		100 mΩ max.		
Operating (set) time (See note 3.)		10 ms max. (approx. 3.5 ms)	10 ms max. (approx. 2.5 ms)	
Release (reset) time (See note 3.)		10 ms max. (approx. 2.5 ms)		
Minimum set/reset pulse time		---	12 ms	
Insulation resistance (See note 4.)		100 MΩ min. (at 500 VDC)		
Dielectric strength	**Coil and contacts**	1,000 VAC, 50/60 Hz for 1 min		
	Coil and ground, contacts and ground	500 VAC, 50/60 Hz for 1 min		
	Contacts of same polarity	500 VAC, 50/60 Hz for 1 min		
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/s^2 Malfunction:500 m/s^2		
Endurance		Mechanical:1,000,000 operations min. (at 36,000 operations/hour) Electrical: 300,000 operations min. (30 VAC, 10 mA/30 VDC, 10 mA), 100,000 operations min. (900 MHz, 10 W) at a switching frequency of 1,800 operations/hour		
Ambient temperature		Operating: –40°C to 70°C (with no icing or condensation)		
Ambient humidity		Operating: 5% to 85%		
Weight		Approx. 2.8 g		

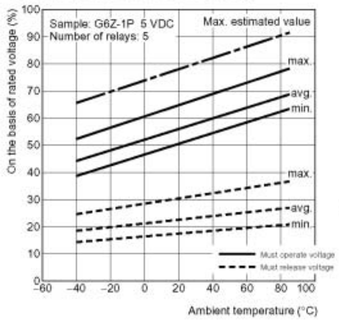
Note: **1.** The above values are initial values.
2. The contact resistance was measured with 10 mA at 1 VDC with a voltage drop method.
3. Values in parentheses are actual values.
4. The insulation resistance was measured with a 500-VDC megohmmeter applied to the same parts as those used for checking the dielectric strength.

Engineering Data

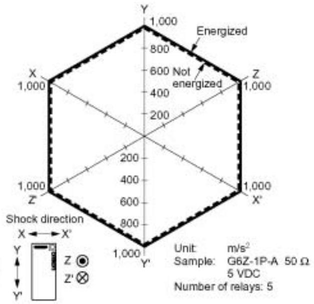
Ambient Temperature vs. Maximum Voltage



Ambient Temperature vs. Must Operate or Must Release Voltage

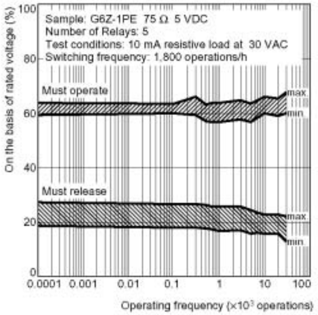


Shock Malfunction

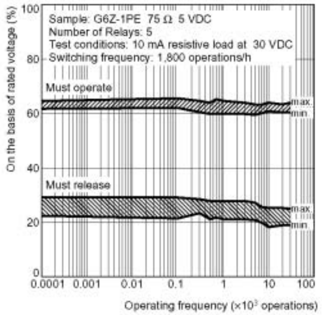


Conditions: Shock is applied in ±X, ±Y, and ±Z directions three times each with and without energizing the Relays to check for contact malfunctions.

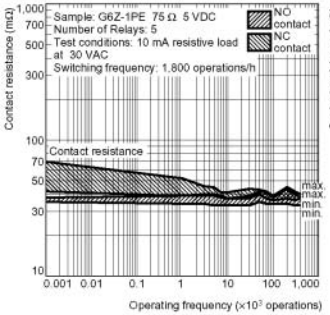
Electrical Endurance (with Must Operate and Must Release Voltage)



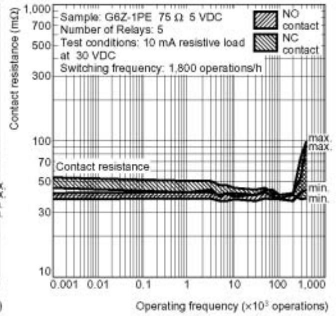
Electrical Endurance (with Must Operate and Must Release Voltage)



Electrical Endurance (Contact Resistance)

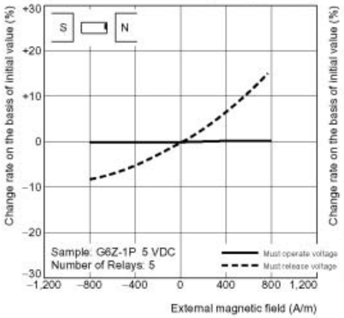


Electrical Endurance (Contact Resistance)

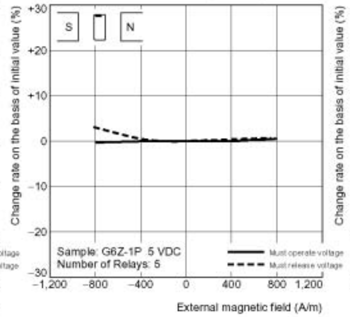


External Magnetic Interference

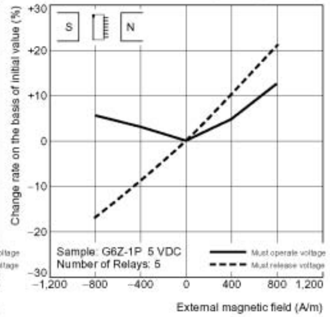
(Average value)



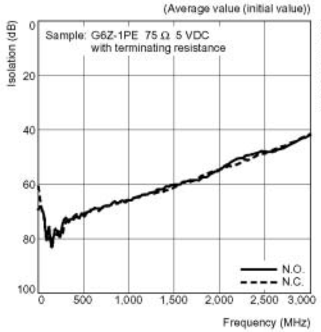
(Average value)



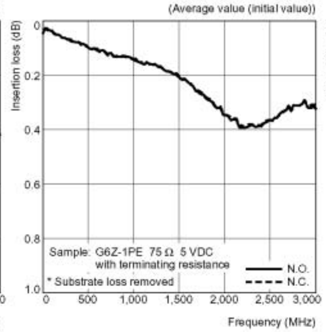
(Average value)



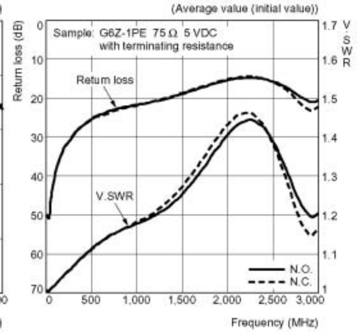
High-frequency Characteristics at 75 Ω (Isolation)



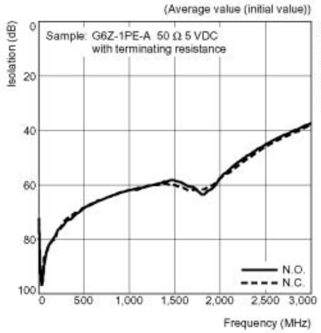
High-frequency Characteristics at 75 Ω (Insertion Loss)



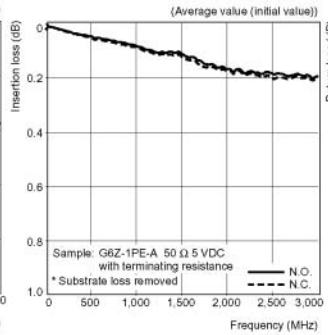
High-frequency Characteristics at 75 Ω (Return Loss, V.SWR)



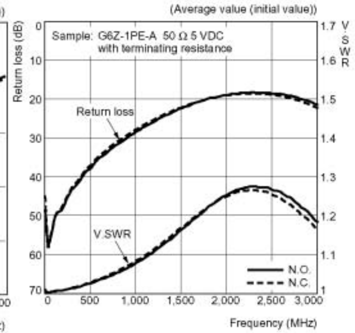
High-frequency Characteristics at 50 Ω (Isolation)



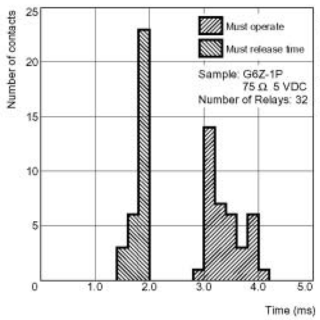
High-frequency Characteristics at 50 Ω (Insertion Loss)



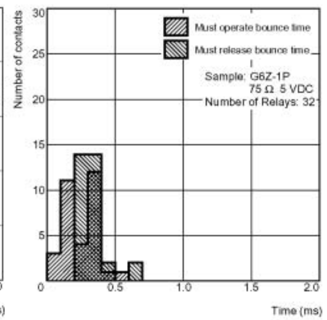
High-frequency Characteristics at 50 Ω (Return Loss, V.SWR)



Must Operate and Must Release Time Distribution (See note.)



Must Operate and Must Release Bounce Time Distribution (See note.)



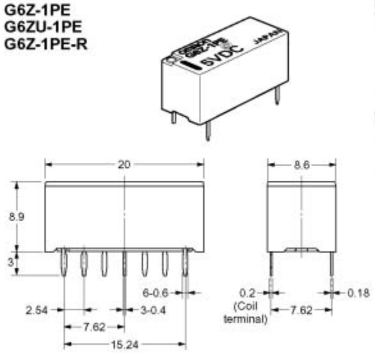
Note: The tests were conducted at an ambient temperature of 23°C.

Dimensions

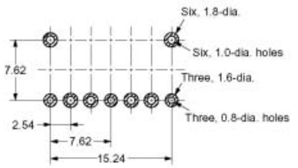
Note: All units are in millimeters unless otherwise indicated.

■ Models with PCB Terminals

G6Z-1PE
G6ZU-1PE
G6Z-1PE-R

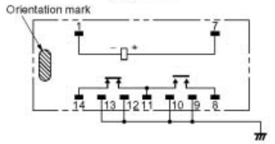


Mounting Dimensions (Bottom View)
Tolerance: ±0.1 mm

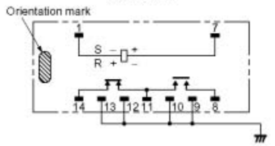


Terminal Arrangement/Internal Connections (Bottom View)

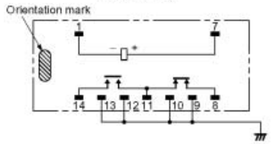
G6Z-1PE



G6ZU-1PE

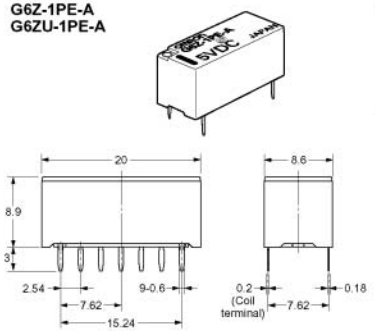


G6Z-1PE-R

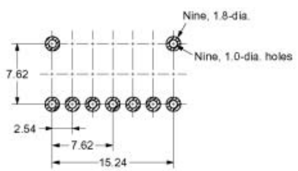


Note: Each value has a tolerance of ±0.3 mm.

G6Z-1PE-A
G6ZU-1PE-A

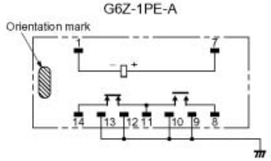


Mounting Dimensions (Bottom View)
Tolerance: ±0.1 mm

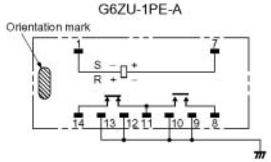


Terminal Arrangement/Internal Connections (Bottom View)

G6Z-1PE-A

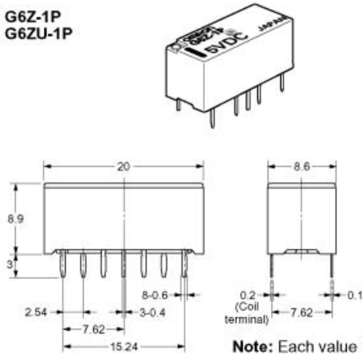


G6ZU-1PE-A

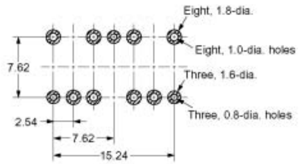


Note: Each value has a tolerance of ±0.3 mm.

G6Z-1P
G6ZU-1P

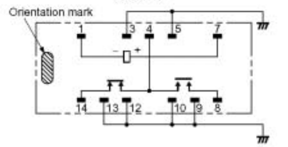


Mounting Dimensions (Bottom View)
Tolerance: ±0.1 mm

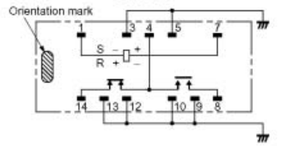


Terminal Arrangement/Internal Connections (Bottom View)

G6Z-1P

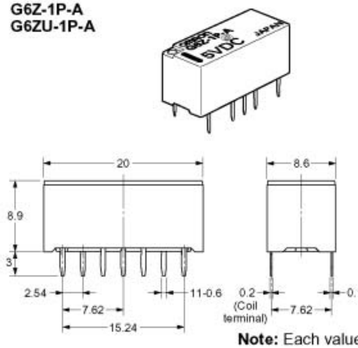


G6ZU-1P

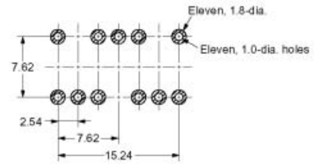


Note: Each value has a tolerance of ±0.3 mm.

G6Z-1P-A
G6ZU-1P-A

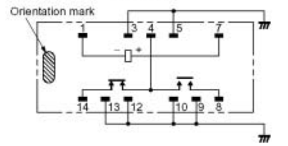


Mounting Dimensions (Bottom View)
Tolerance: ±0.1 mm

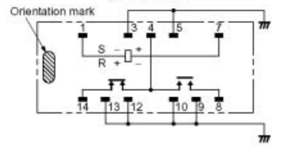


Terminal Arrangement/Internal Connections (Bottom View)

G6Z-1P-A

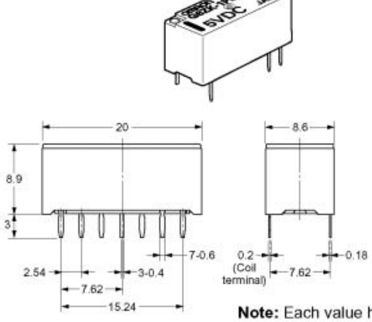


G6ZU-1P-A

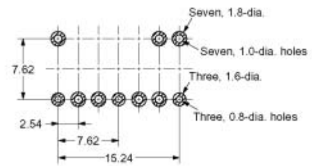


Note: Each value has a tolerance of ±0.3 mm.

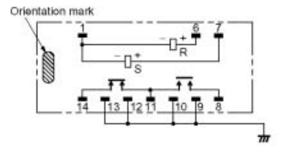
G6ZK-1PE



Mounting Dimensions (Bottom View)
Tolerance: ±0.1 mm

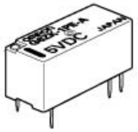


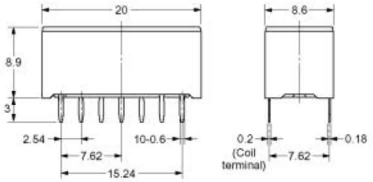
Terminal Arrangement/Internal Connections (Bottom View)



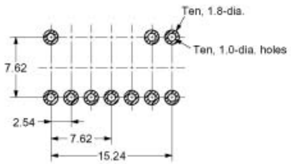
Note: Each value has a tolerance of ±0.3 mm.

G6ZK-1PE-A

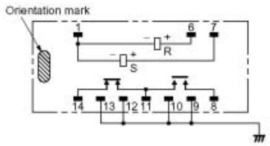




Mounting Dimensions (Bottom View)
Tolerance: ±0.1 mm

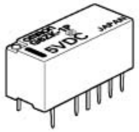


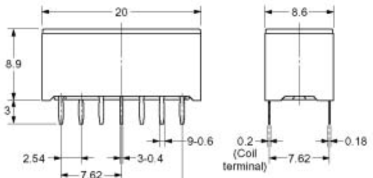
Terminal Arrangement/Internal Connections (Bottom View)



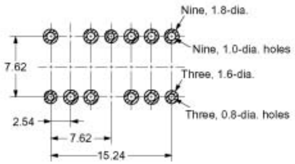
Note: Each value has a tolerance of ±0.3 mm.

G6ZK-1P

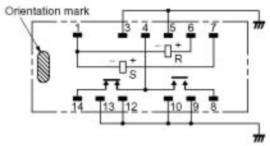




Mounting Dimensions (Bottom View)
Tolerance: ±0.1 mm

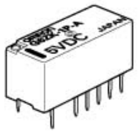


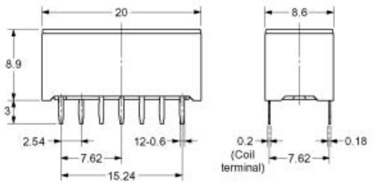
Terminal Arrangement/Internal Connections (Bottom View)



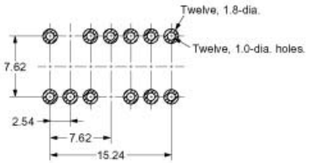
Note: Each value has a tolerance of ±0.3 mm.

G6ZK-1P-A

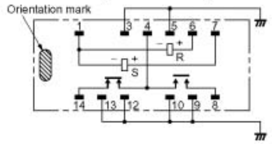




Mounting Dimensions (Bottom View)
Tolerance: ±0.1 mm



Terminal Arrangement/Internal Connections (Bottom View)

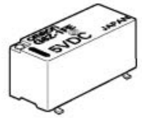


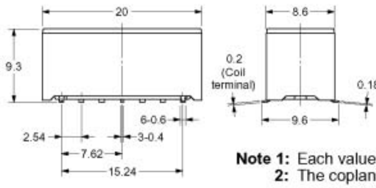
Note: Each value has a tolerance of ±0.3 mm.

Surface-mounting High-frequency Relay – G6Z OMRON

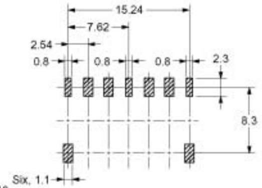
■ Models with Surface-mounting Terminals

G6Z-1FE
G6ZU-1FE





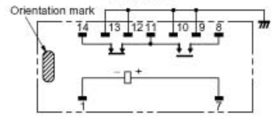
Mounting Dimensions (Top View)
Tolerance: ±0.1 mm



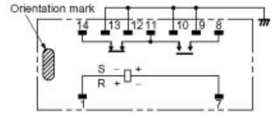
Note 1: Each value has a tolerance of ±0.3 mm.
2: The coplanarity of the terminals is 0.1 mm max.

Terminal Arrangement/Internal Connections (Top View)

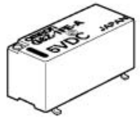
G6Z-1FE

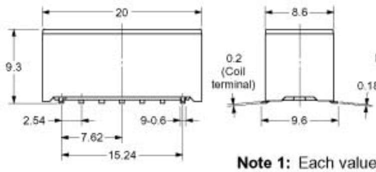


G6ZU-1FE

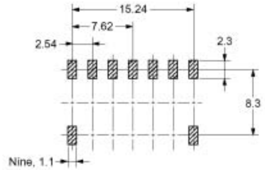


G6Z-1FE-A
G6ZU-1FE-A





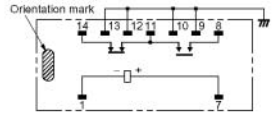
Mounting Dimensions (Top View)
Tolerance: ±0.1 mm



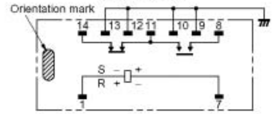
Note 1: Each value has a tolerance of ±0.3 mm.
2: The coplanarity of the terminals is 0.1 mm max.

Terminal Arrangement/Internal Connections (Top View)

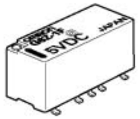
G6Z-1FE-A

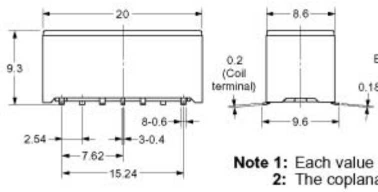


G6ZU-1FE-A

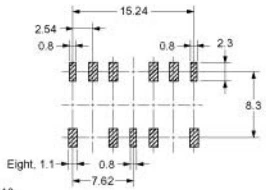


G6Z-1F
G6ZU-1F





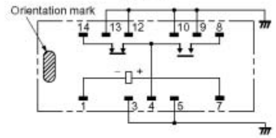
Mounting Dimensions (Top View)
Tolerance: ±0.1 mm



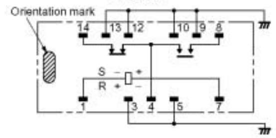
Note 1: Each value has a tolerance of ±0.3 mm.
2: The coplanarity of the terminals is 0.1 mm max.

Terminal Arrangement/Internal Connections (Top View)

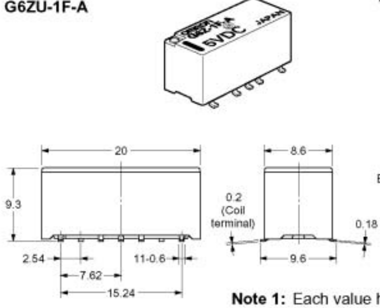
G6Z-1F



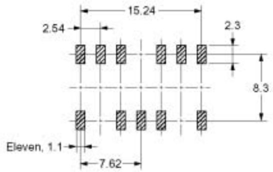
G6ZU-1F



G6Z-1F-A
G6ZU-1F-A

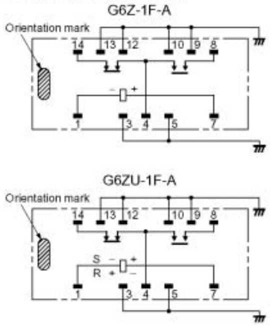


Mounting Dimensions (Top View)
Tolerance: ±0.1 mm

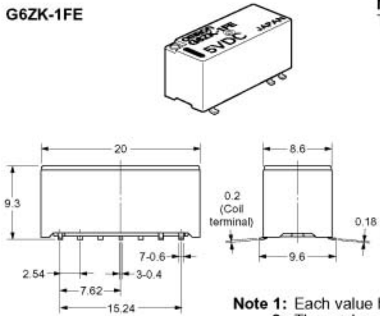


Note 1: Each value has a tolerance of ±0.3 mm.
2: The coplanarity of the terminals is 0.1 mm max.

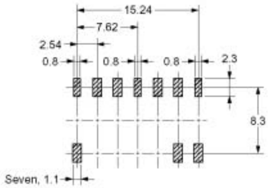
Terminal Arrangement/Internal Connections (Top View)



G6ZK-1FE

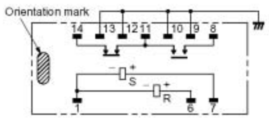


Mounting Dimensions (Top View)
Tolerance: ±0.1 mm

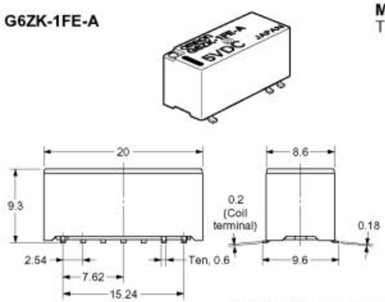


Note 1: Each value has a tolerance of ±0.3 mm.
2: The coplanarity of the terminals is 0.1 mm max.

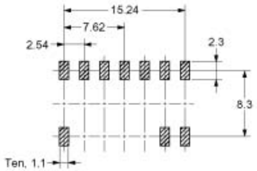
Terminal Arrangement/Internal Connections (Top View)



G6ZK-1FE-A

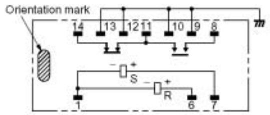


Mounting Dimensions (Top View)
Tolerance: ±0.1 mm

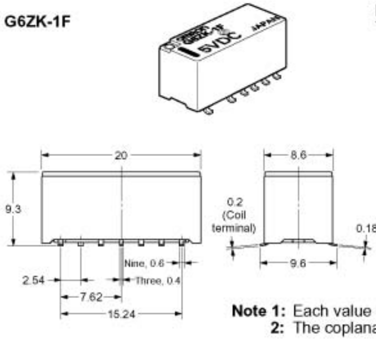


Note 1: Each value has a tolerance of ±0.3 mm.
2: The coplanarity of the terminals is 0.1 mm max.

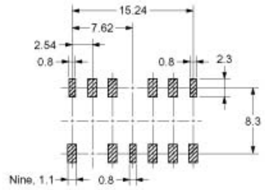
Terminal Arrangement/Internal Connections (Top View)



G6ZK-1F

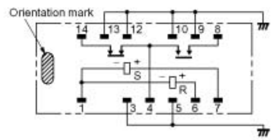


Mounting Dimensions (Top View)
Tolerance: ±0.1 mm

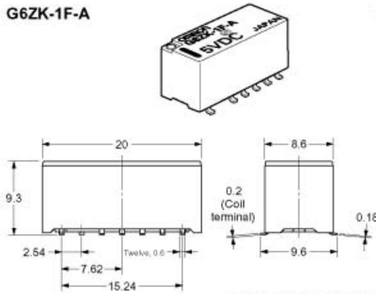


Note 1: Each value has a tolerance of ±0.3 mm.
2: The coplanarity of the terminals is 0.1 mm max.

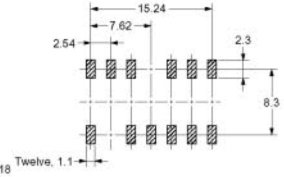
Terminal Arrangement/Internal Connections (Top View)



G6ZK-1F-A

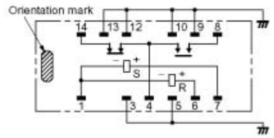


Mounting Dimensions (Top View)
Tolerance: ±0.1 mm



Note 1: Each value has a tolerance of ±0.3 mm.
2: The coplanarity of the terminals is 0.1 mm max.

Terminal Arrangement/Internal Connections (Top View)

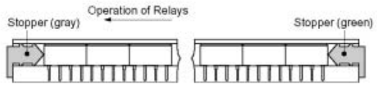


Stick Packing and Tape Packing

Stick Packing

Relays in stick packing are arranged so that the orientation mark of each Relay in on the left side.

Be sure not to make mistakes in Relay orientation when mounting the Relay to the PCB.



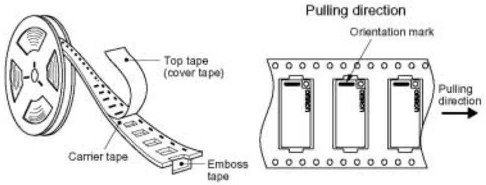
Stick length: 530 mm (stopper not included)
No. of Relays per stick: 25

Tape Packing (Surface-mounting Terminal Models)

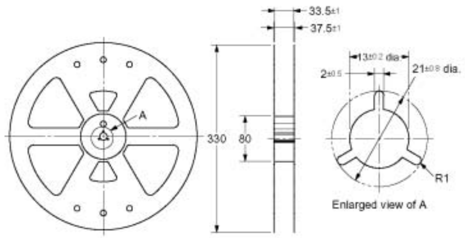
When ordering Relays in tape packing, add the prefix "-TR" to the model number, otherwise the Relays in stick packing will be provided.

Relays per Reel: 300

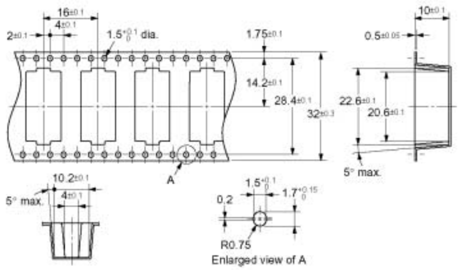
Direction of Relay Insertion



Reel Dimensions



Carrier Tape Dimensions

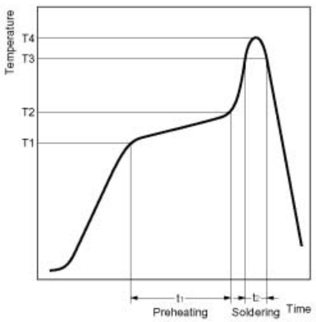


Note: The radius of the unmarked corner is 0.3 mm.

Recommended Soldering Method

Temperature Conditions for IRS Method

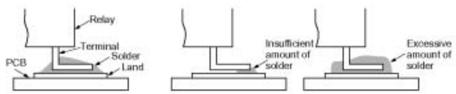
When using reflow soldering, ensure that the Relay terminals and the top of the case stay below the following curve. Check that these conditions are actually satisfied before soldering the terminals.



Measured part	Preheating (T1 → T2, t1)	Soldering (T3, t2)	Maximum peak (T4)
Terminals	150 → 180°C, 120 s max.	230°C min, 30 s max.	250°C max.
Top of case	---	---	255°C max.

Do not quench the terminals after mounting. Clean the Relay using alcohol or water no hotter than 40°C max.

The thickness of cream solder to be applied should be between 150 and 200 μm on OMRON's recommended PCB pattern.



Check the soldering in the actual mounting conditions before use.

Safety Precautions

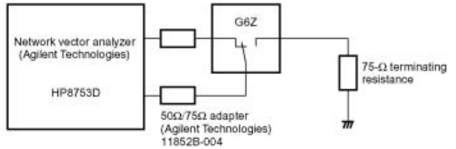
■ Precautions for Correct Use

Please observe the following precautions to prevent failure to operate, malfunction, or undesirable effect on product performance.

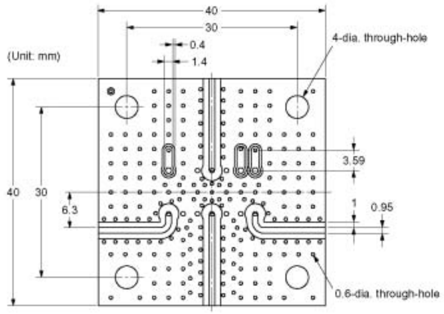
High-frequency Characteristics Measurement Method and Measurement Substrate

High-frequency characteristics for the G6Z are measured in the way shown below. Consult your OMRON representative for details on 50-Ω models.

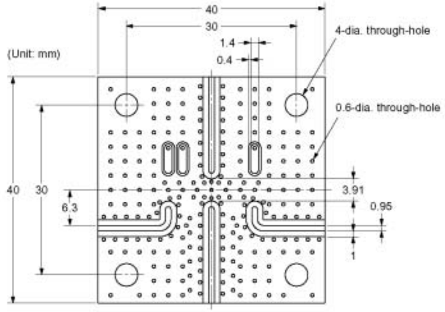
Measurement Method for 75-Ω Models



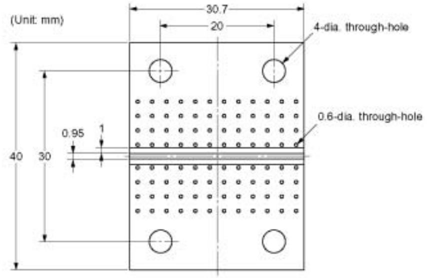
Through-hole Substrate (75-Ω Models, E-shape or Y-shape)



SMD-type Substrate (75-Ω Models, E-shape or Y-shape)



Substrate for High-frequency Characteristic Compensation (75-Ω Models, E-shape or Y-shape)



Substrate Types

Material: FR-4 glass epoxy (glass cloth impregnated with epoxy resin and copper laminated to its outer surface)

Thickness: 1.6 mm

Thickness of copper plating:18 μm

Note:
1. The compensation substrate is used when measuring the Relay's insertion loss. The insertion loss is obtained by subtracting the measured value for the compensation substrate from the measured value with the Relay mounted to the high-frequency measurement substrate.
2. For convenience, the diagrams of the high-frequency measurement substrates given here apply both to models with an E-shape terminal structure and to models with a Y-shape terminal structure.
3. Be sure to mount a standoff tightly to the through-hole substrate.
4. Use measuring devices, connectors, and substrates that are appropriate for 50 Ω and 75 Ω respectively.
5. Ensure that there is no pattern under the Relay. Otherwise, the impedance may be adversely affected and the Relay may not be able to attain its full characteristics.

Handling

Do not use the Relay if it has been dropped. Dropping the Relay may adversely affect its functionality.

Protect the Relay from direct sunlight and keep the Relay under normal temperature, humidity, and pressure.

Flow Soldering

Solder: JIS Z3282, H63A

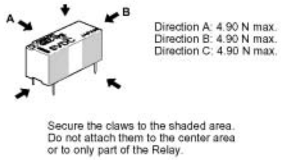
Soldering temperature: Approx. 250°C (260°C if the DWS method is used)

Soldering time: Approx. 5 s max. (approx. 2 s for the first time and approx. 3 s for the second time if the DWS method is used)

Be sure to make a molten solder level adjustment so that the solder will not overflow on the PCB.

Claw Securing Force During Automatic Mounting

During automatic insertion of Relays, be sure to set the securing force of each claw to the following so that the Relay's characteristics will be maintained.



Latching Relay Mounting

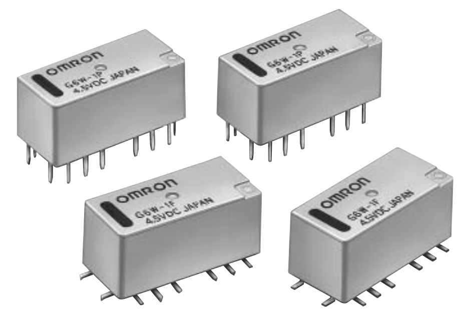
Make sure that the vibration or shock that is generated from other devices, such as Relays, on the same panel or substrate and imposed on the Latching Relay does not exceed the rated value, otherwise the set/reset status of the Latching Relay may be changed. The Latching Relay is reset before shipping. If excessive vibration or shock is imposed, however, the Latching Relay may be set accidentally. Be sure to apply a reset signal before use.

Coating

Do not use silicone coating to coat the Relay when it is mounted to the PCB. Do not wash the PCB after the Relay is mounted using detergent containing silicone. Otherwise, the detergent may remain on the surface of the Relay.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Surface-Mountable 2.5GHz Band Miniature SPDT High-frequency Relay



- Superior high-frequency characteristics, such as an isolation of 60 dB min., insertion loss of 0.2 dB max., and V.S.W.R. of 1.2 max. at 2.5 GHz (50 Ω).
- Surface-mounting terminals and superior high-frequency characteristics combined through adoption of tri-plate micro strip type transmission lines.
- Ultra-miniature at 20 x 9.4 x 8.9 mm (L x W x H).
- Serialised relay lineup consisting of single-winding latching type (200 mW), double-winding latching type (360 mW), and reverse-arrangement contact type.
- Y-shape terminal arrangement that simplifies wiring to PCBs.

Ordering Information

Classification				Single-side stable	Single-winding latching	Double-winding latching
SPDT	Fully Sealed	Through-hole terminal	Y-shape terminal	G6W-1P	G6WU-1P	G6WK-1P
		Surface-mounting terminal	Y-shape terminal	G6W-1F	G6WU-1F	G6WK-1F

Note: When ordering, add the rated coil voltage to the model number.
Example: G6W-1P 12 VDC
Rated coil voltage

Model Number Legend

G6W □-□□□-□
1 2 3 4 5

1. Relay Function

None: Single-side stable
U: Single-winding latching
K: Double-winding latching

2. Contact Form

2: SPDT

3. Terminal Shape

F: Surface-mounting terminals
P: PCB terminals

4. Terminal Arrangement

None: Y-shape terminal arrangement (standard)

5. Classification

None: Standard contact arrangement
R: Reverse contact arrangement

Application Examples

Mobile phone base station (W-Cdma, UMTS, Cdma-2000, PCS), wireless LAN, and measurement devices.

Specifications

■ Contact Ratings

Item / Load	Resistive load
Rated load	10 mA at 30 VAC 10 mA at 30 VDC 2.5 GHz, 50 Ω, 10 W (See note 2.)
Rated carry current	0.5 A
Max. switching voltage	30 VDC, 30 VAC
Max. switching current	0.5 A

■ High-frequency Characteristics

Item / Frequency	2.0 GHz	2.5 GHz
Isolation	65 dB min.	60 dB min.
Insertion loss	0.2 dB max.	
V.SWR	1.2 max.	
Max. carry power	20 W (See note 2.)	
Max. switching power	10 W (See note 2.)	

Note: **1.** The above values are initial values.
2. This values is for a load with V.SWR ≤ 1.2 at the impedance of 50 Ω.

■ Coil Ratings

Single-side Stable Relays (G6W-1F, G6W-1P)

Rated voltage	3 VDC	4.5 VDC	9 VDC	12 VDC	24 VDC
Rated current	66.7 mA	44.4 mA	22.2 mA	16.7 mA	8.3 mA
Coil resistance	45 Ω	101 Ω	405 Ω	720 Ω	2,880 Ω
Must operate voltage	80% max. of rated voltage				
Must release voltage	10% min. of rated voltage				
Max. voltage	150% of rated voltage				
Power consumption	Approx. 200 mW				

Single-winding Latching Relays (G6WU-1F, G6WU-1P)

Rated voltage	9 VDC	12 VDC
Rated current	22.2 mA	16.7 mA
Coil resistance	405 Ω	720 Ω
Must operate voltage	80% max. of rated voltage	
Must reset voltage	80% max. of rated voltage	
Max. voltage	150% of rated voltage	
Power consumption	Approx. 200 mW	

Double-winding Latching Relays (G6WK-1F, G6WK-1P)

Rated voltage	3 VDC	4.5 VDC	9 VDC	12 VDC	24 VDC
Rated current	120 mA	80 mA	40 mA	30 mA	15 mA
Coil resistance	25 Ω	56 Ω	225 Ω	400 Ω	1,600 Ω
Must set voltage	80% max. of rated voltage				
Must reset voltage	80% max. of rated voltage				
Max. voltage	150% of rated voltage				
Power consumption	Approx. 360 mW				

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.

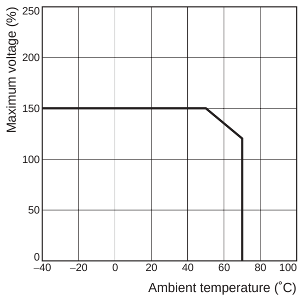
■ Characteristics

Classification		Single-side Stable	Single-winding Latching	Double-winding Latching
Model		G6W-1F, G6W-1P	G6WU-1F, G6WU-1P	G6WK-1F, G6WK-1P
Contact resistance (See note 1.)		100 mΩ max.		
Operate (set) time (See note 2.)		10 ms max. (Approx. 3.5 ms)	10 ms max. (Approx. 2.5 ms)	
Release (reset) time (See note 2.)		10 ms max. (Approx. 2.5 ms)		
Minimum set/reset signal width		–	12 ms	
Insulation resistance (See note 3.)		100 MΩ min. (at 500 VDC)		
Dielectric strength	**Coil and contacts**	1,000 VAC, 50/60 Hz for 1 min		
	Coil and ground, contacts and ground	500 VAC, 50/60 Hz for 1 min		
	Contacts of same polarity	500 VAC, 50/60 Hz for 1 min		
Vibration resistance	**Destruction**	10 to 55 Hz, 2-mm double amplitude		
	Malfunction	10 to 55 Hz, 1.5-mm double amplitude		
Shock resistance	**Destruction**	1,000 m/s²		
	Malfunction	500 m/s²		
Endurance	**Mechanical**	1,000,000 operations min. (at 36,000 operations/hour)		
	Electrical	300,000 operations min. (30 VAC 10 mA/ 30 VDC 10 mA), 100,000 operations min. (2.5 GHz, 50Ω, 10 W)		
Ambient temperature		Operating: -40ºC to 70ºC (with no icing or condensation)		
Ambient humidity		Operating: 5% to 85%		
Weight		Approx. 3 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 actual values.
3. The insulation resistance was measured with a 500-VDC Megger Tester applied to the same parts as those used for checking the dielectric strength.
4. The above values are initial values.

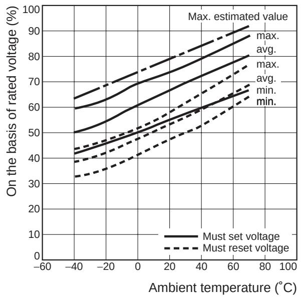
Engineering Data

Ambient Temperature vs. Maximum Voltage

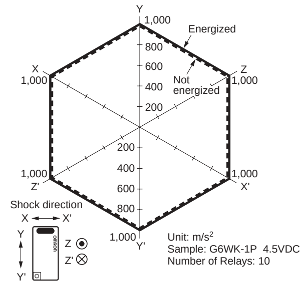


Note: "Maximum voltage" is the maximum voltage that can be applied to the Relay coil.

Ambient Temperature vs. Must Set or Must Reset Voltage

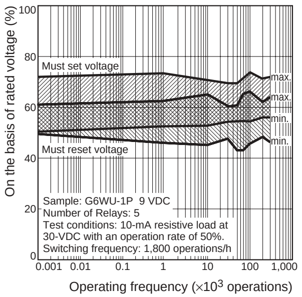


Shock Malfunction

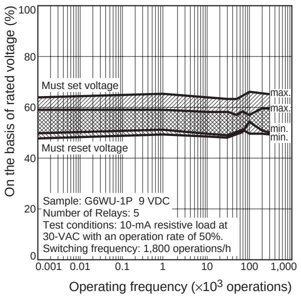


Conditions: Shock is applied in ±X, ±Y, and ±Z directions three times each with and without energizing the Relays to check the number of contact malfunctions.

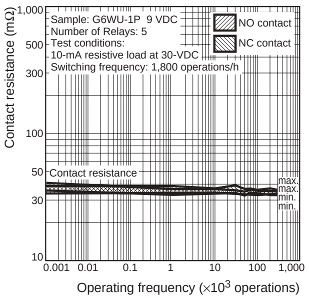
Electrical Endurance (With Must Set and Must Reset Voltage)



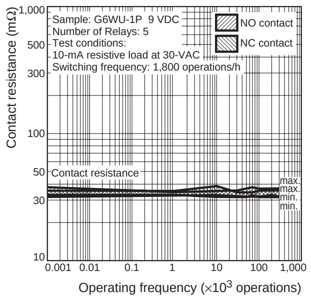
Electrical Endurance (With Must Set and Must Reset Voltage)



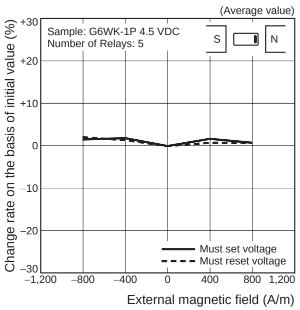
Electrical Endurance (Contact Resistance)

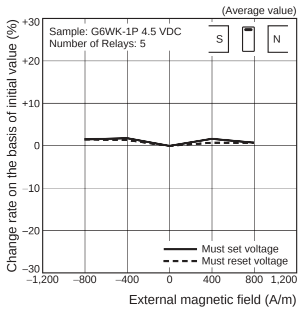


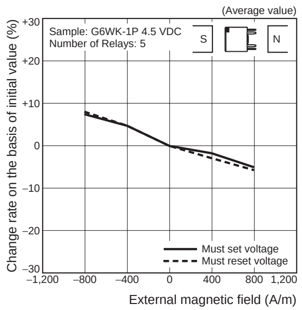
Electrical Endurance (Contact Resistance)



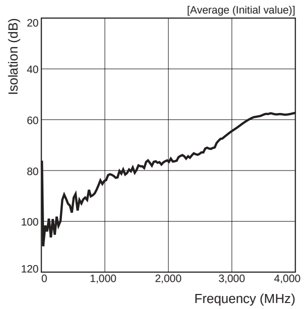
External Magnetic Interference



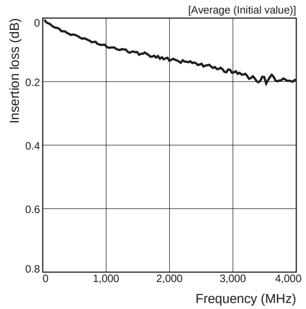




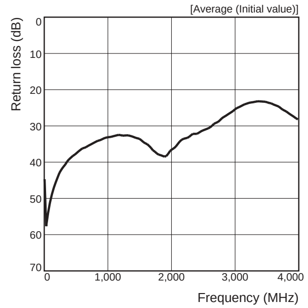
High-frequency Characteristics (Isolation)



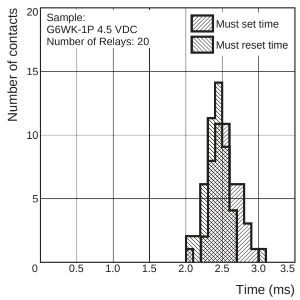
High-frequency Characteristics (Insertion Loss)



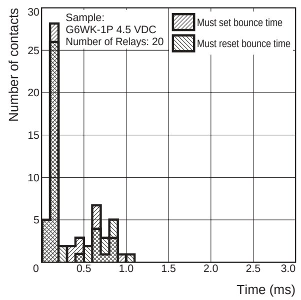
High-frequency Characteristics (Return Loss)



Must Set and Must Reset Time Distribution (See note.)



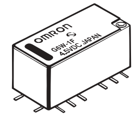
Must Set and Must Reset Bounce Time Distribution (See note.)

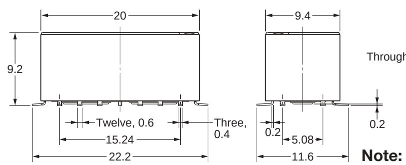


Dimensions

Note: All units are in millimeters unless otherwise indicated.

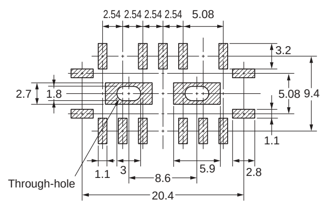
G6W-1F
G6WU-1F





PCB Mounting Holes (Top View)

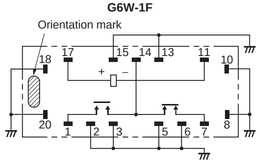
Tolerance: ±0.1 mm



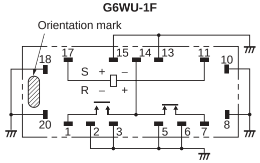
Note: Each value has a tolerance of ±0.3 mm.

Terminal Arrangement/Internal Connections (Top View)

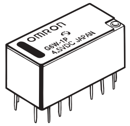
G6W-1F

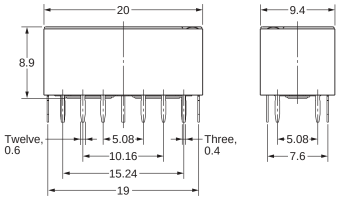


G6WU-1F

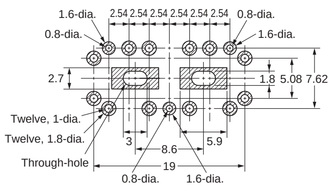


G6W-1P
G6WU-1P



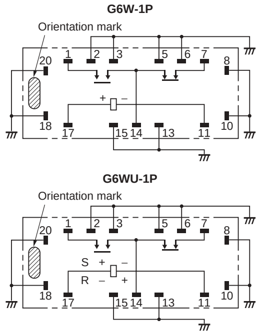


PCB Mounting Holes (Bottom View)
Tolerance: ±0.1 mm

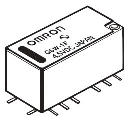


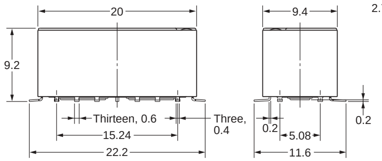
Tolerance: ±0.3 mm unless specified.

Terminal Arrangement/Internal Connections (Bottom View)

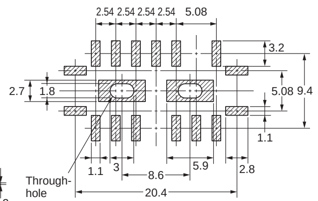


G6WK-1F



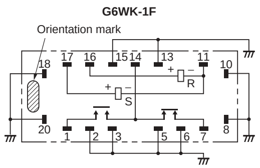


PCB Mounting Holes (Top View)
Tolerance: ±0.1 mm

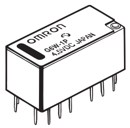


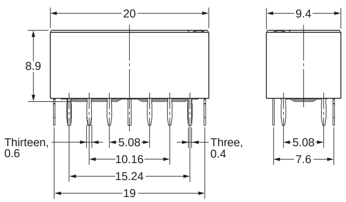
Note: Each value has a tolerance of ±0.3 mm.

Terminal Arrangement/Internal Connections (Top View)

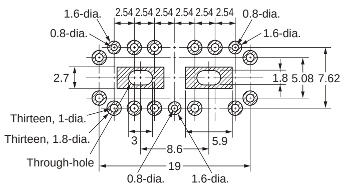


G6WK-1P



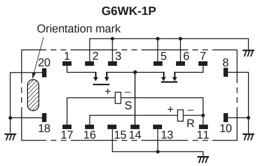


PCB Mounting Holes (Bottom View)
Tolerance: ±0.1 mm



Tolerance: ±0.3 mm unless specified.

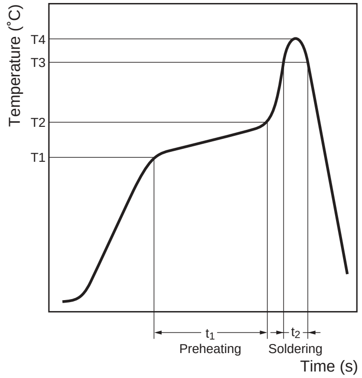
Terminal Arrangement/Internal Connections (Bottom View)



Recommended Soldering Method

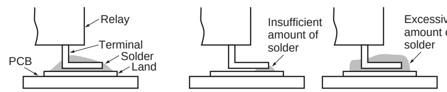
TEMPERATURE PROFILE ACCORDING TO IRS METHOD

- When performing reflow-soldering, check the profile on an actual device after setting the temperature condition so that the temperatures at the relay terminals and the upper surface of the case do not exceed the limits specified in the following table.



Item / Measuring position	Preheating (T1 to T2, t_1)	Soldering (T3, t_2)	Peak value (T4)
Terminal	150ºC to 180ºC, 120 s max.	230ºC min., 30 s max.	250ºC max.
Upper surface of case	–	–	255ºC max.

- The thickness of cream solder to be applied should be within a range between 150 and 200 mm on OMRON's recommended PCB pattern.



Visually check that the Relay is properly soldered.

BOTTOM GROUND SOLDERING CONDITIONS

Soldering iron: 50 W

Iron temperature: 380ºC to 400ºC

Soldering time: 10 s max.

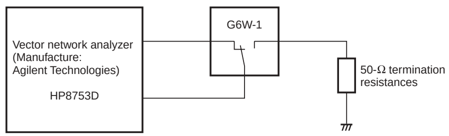
Note: The above conditions are given for reference only; it is recommended to double-check the suitability under actual conditions.

Precautions

CORRECT USE

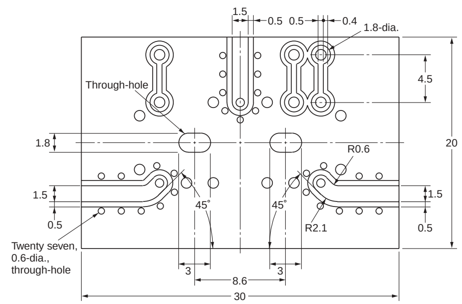
High-frequency Characteristics Measurement Method and Substrate to be Measured

High-frequency Characteristics for G6W are measured as shown below.

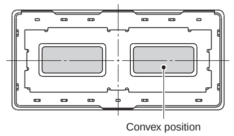


Through-hole substrate

Substrate: t-0.8 BT resin (Dielectric constant at 2 GHz: 3.37)

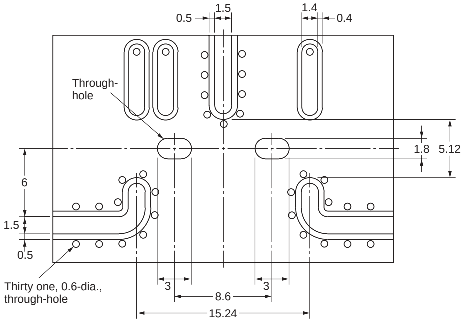


Undersurface of relay

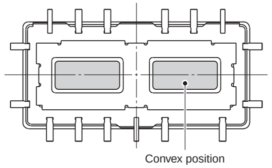


SMD-type substrate

Substrate: t-0.8 BT resin (Dielectric constant at 2 GHz: 3.37

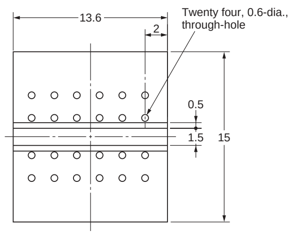


Undersurface of relay



Note: To obtain high-frequency characteristics close to the charts shown on page ?, solder the convex point on the undersurface of the relay to the ground pattern of the substrate..

Base plate for high-frequency characteristic compensation



Note: The above compensation plate is used to measure the loss by the relay.

The relay loss is determined by subtracting the data measured for a compensation base plate from those for a high-frequency characteristics measuring substrate mounted with a relay.

Handling

Leave the Relays packed until just prior to mounting them.

Dropping the relay may cause damage to its functional capability. Never use the relay if it is dropped.

Protect the relays from direct sunlight during operation, storage, and transportation and keep the relays under normal temperature, humidity, and pressure.

Soldering

Solder: JIS Z3282, H63A

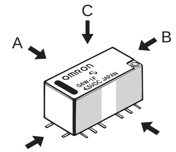
Soldering temperature: Approx. 250ºC (At 260ºC if the DWS method is used.)

Soldering time: Approx. 5 s max. (approx. 2 s for the first time and approx. 3 s for the second time if the DWS method is used.)

Be sure to adjust the level of the molten solder so that the solder will not overflow onto the PCB.

Claw Securing Force During Automatic Insertion

During automatic insertion of Relays, make sure to set the securing force of the claws to the following values so that the Relay characteristics will be maintained.



Direction A: 4.90 N max.
Direction B: 9.80 N max.
Direction C: 9.80 N max.

Secure the claws to the area indicated by shading.

Do not attach them to the center area or to only part of the Relay.

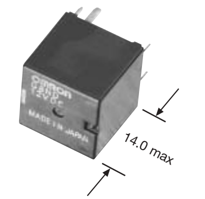
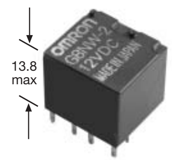
Latching Relay Mounting

Make sure that the vibration or shock that is generated from other devices, such as relays in operation, on the same panel and imposed on the Latching Relay does not exceed the rated value, otherwise the Latching Relay that has been set may be reset or vice versa. The Latching Relay is reset before shipping. If excessive vibration or shock is imposed, however, the Latching Relay may be set accidentally. Be sure to apply a reset signal before use.

Coating

Relays mounted on PCBs may be coated or washed. Do not apply silicone coating or detergent containing silicone, otherwise the silicone coating or detergent may remain on the surface of the Relays.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Classification		Ultra-Miniature PCB Relay		
Model		**G8N1**	**G8ND2**	**G8NW**
Features		Fully sealed construction Fully automated assembly 25A motor lock load		Twin automotive relay suitable for polarity reversal control
Appearance				
Dimensions (LxW)		14.3 x 7.5 max	14.5 x 14.1 max	15.7 x 14.3 max
Contact Ratings	**Contact Form**	SPDT	Dual Contact	SPDT x 2
	Contact Type	Single	Single	Twin Contact
	Max switching current (motor lock condition)	30 A	30 A	30 A
	Max switching current (under resistive load)	–	–	–
Coil ratings	**Rated Voltage**	12VDC	12VDC	12VDC
Endura-nce	**Electrical (under rated load)**	100,000 operations		
	Mechanical	1,000,000 operations		
Ambient temperature (operating)		-40˚C to 85˚C		-40°C to 85°C
Variations		• High sensitivity • High temperature	• Suppression resistor • Suppression diode • Mounting bracket with resistor • Weatherproof with Resistor	• High sensitivity • High temperature
Magazine Packaging		80	40	36
Weight		4.1g	7.5g	8.0g
Page		278	283	288