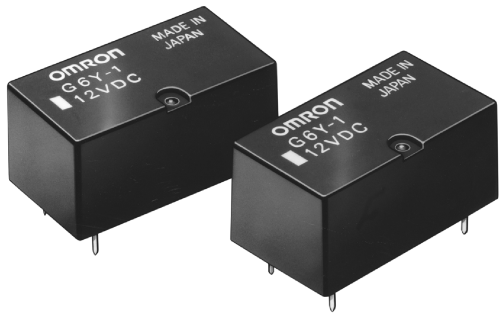
High Frequency Relay
G6Y

Design Based on Micro Strip Line Technology



- 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.
- Improved shock-resistance.
- Applications include cable TV, cellular communication, HDTV, fax machine, satellite communications, pay TV, VCRs, and test and measurement equipment.
- Form, fit and function replacement to G5Y relay with improved characteristics.
- RoHs Compliant.

Ordering Information

To order: Select the part number and add the desired coil voltage rating (e.g. G6Y-1-DC12).

Type	Contact form	Construction	**Part number**
Standard	SPDT	Fully-sealed	**G6Y-1**

Specifications

■ COIL DATA

Rated voltage (VDC)	Rated current (mA)	Coil resistance (Ω)	Must operate voltage	Must dropout voltage	Maximum voltage	Power consumption (mW)
			% of rated voltage			
5	40.0	125	75% max.	10% min.	150 at 23°C (73°F) 130 at 70°C (158°F)	Approx. 200
6	33.3	180				
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 DATA

Load	Resistive load (p.f. = 1)
Rated load	0.01 A at 30 VAC 0.01 A at 30 VDC 900 MHz, 1 W (See Note.)
Contact material	Au clad Cu alloy
Max. carry current	0.5 A
Max. operating voltage	30 VAC 30 VDC
Max. operating current	0.5 A
Max. switching capacity	AC10 VA DC10 W
Min. permissible load	10 mA at 10 mVDC

Note: This value is for a load with VSWR ≦ 1.2.

■ HIGH-FREQUENCY CHARACTERISTICS

Item	250 MHz	900 MHz	2.8 GHz
Isolation	80 dB min.	65 dB min.	30 dB min.
Insertion loss	0.5 dB max.	0.5 dB max.	consult factory
VSWR	1.5 max.	1.5 max.	
Max. carry power	10 W		
Max. operating power	10 W (See Note 2.)		

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

■ CHARACTERISTICS

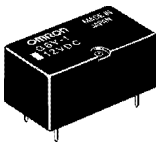
Contact resistance (See Note 2.)		100 mΩ max.
Operating time		10 ms max. (approx. 5 ms)
Release time		5 ms max. (approx. 1 ms)
Insulation resistance		100 MΩ min. (at 500 VDC)
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min between coil and contacts
		500 VAC, 50/60 Hz for 1 min between contacts of 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 Hz, 1.5 mm double amplitude Malfunction: 10 Hz to 55 Hz, 1.5 mm double amplitude
Shock resistance		Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 1,000 m/s^2 (approx. 100G)
Life expectancy		Mechanical: 1,000,000 operations min. (at 1,800 operations/hr.) Electrical: 300,000 operations min. (under rated load at 1,800 operations/hr.)
Ambient temperature	Operating	−40°C to 70°C (−40°F to 158°F) with no icing
	Storage	−40°C to 70°C (−40°F to 158°F) with no icing
Ambient humidity	Operating	10 to 85%
	Storage	10 to 85%
Weight		Approx. 5 g

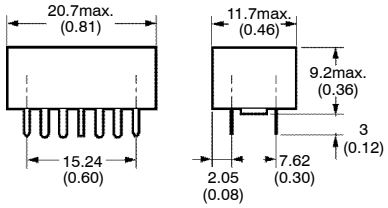
Note: 1. The table above shows preliminary values at room temperature unless otherwise specified.
2. Measurement Conditions: 5 VDC, 100 mA, voltage drop method.

Dimensions

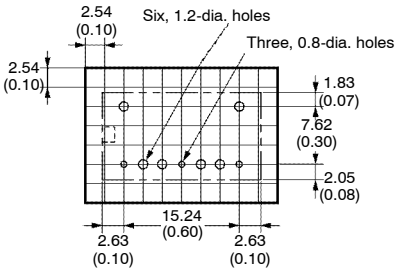
Unit: mm (inch)

■ G6Y-1



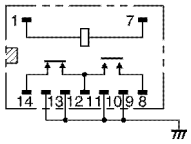


PCB Dimensions (Bottom View)
Tolerances: ±0.1 mm.



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

Terminal Arrangement/ Internal Connections (Bottom View)



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

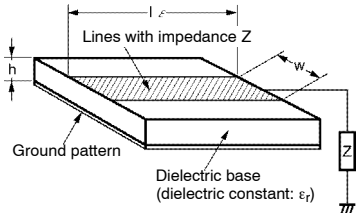
Precautions

■ CORRECT USE

Seal integrity during cleaning will last for 1 minute at 70°C.

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 achieved 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.

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

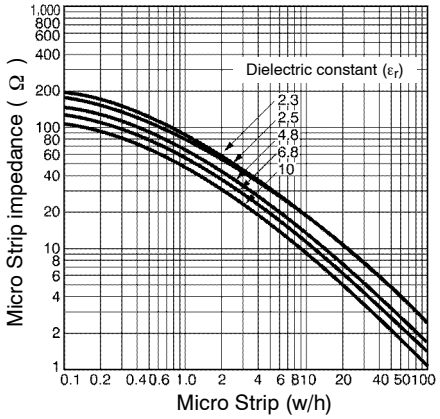
W: Line width

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. In addition, 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.