

### High-frequency, High-capacity Coaxial Switch Supporting Bandwidths to 26.5 GHz

- Models available with SPDT or DPDT (transfer) contacts and 26.5-GHz or 18-GHz operation.
- Superior high-frequency characteristics, such as isolation of 60 dB min. at 26.5 GHz, insertion loss of 0.8 dB max., and V.SWR of 1.7 max. at 26.5 GHz (50 Ω).
- Contact carry power of 120 W at 3 GHz.
- Rated power consumption of 700 mW for SPDT failsafe models and 1,500 mW for DPDT failsafe models.
- DPDT (transfer) models available with high-speed operation.
- Models available with high contact reliability for superior repeatability. (Ask your OMRON representative.)



RoHS Compliant

**NEW**

## Ordering Information

### ■ Model Number Legend:

G9YA□-□□-□□-□□□-□□  
 1 2 3 4 5 6 7 8 9

#### 1. Relay Function

- None: Failsafe
- K: Double-winding latching
- T: TTL-driven double-winding latching (with self cut-off function)

#### 2. Contact Form

- 12: SPDT
- 22: DPDT (transfer contacts)

#### 3. Terminal Shape

- S: SMA

#### 4. Frequency

- 4: 26.5 GHz
- 3: 18 GHz

#### 5. Characteristic Impedance

- 5: 50 Ω

#### 6. Operating Terminals

- None: Soldering terminals
- P: Pin terminals (See note 1.)
- C: Connector cable

#### 7. Auxiliary Indicator Terminals

- None: No auxiliary indicator terminals
- N: Auxiliary indicator terminals

#### 8. Data Package

- None: No data package
- D: Data package

#### 9. Operating/Release Time

- None: Standard
- HS: High-speed operation (See note 2.)

**Note:** 1. Pin terminals are available only on SPDT models.

2. High-speed operation is available only with DPDT, latching models. (It is not available with SPDT models or failsafe models.)

## Application Examples

- Mobile communications infrastructure equipment, mobile phone base station equipment, and antenna devices
- Wireless devices, wireless LAN, and disaster prevention wireless equipment
- Test and measurement equipment
- Broadcasting equipment (digital TV, cable TV, and satellite broadcasting)

# List of Models

## SPDT Models

### Standard Models with Soldering Terminals

Classification	Indicator terminals	Data package	Rated coil voltage	Model	Minimum packaging unit
Failsafe	No	No	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45	One per box
		Yes	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45-D	
	Yes	No	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45-N	
		Yes	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45-ND	
Double-winding latching	No	No	4.5, 12, 15, 24, and 28 VDC	G9YAK-12S-45	One per box
		Yes	4.5, 12, 15, 24, and 28 VDC	G9YAK-12S-45-D	
	Yes	No	4.5, 12, 15, 24, and 28 VDC	G9YAK-12S-45-N	
		Yes	4.5, 12, 15, 24, and 28 VDC	G9YAK-12S-45-ND	
TTL-driven double-winding latching (with self cut-off function)	No	No	5, 12, 15, and 24 VDC	G9YAT-12S-45	One per box
		Yes	5, 12, 15, and 24 VDC	G9YAT-12S-45-D	
	Yes	No	5, 12, 15, and 24 VDC	G9YAT-12S-45-N	
		Yes	5, 12, 15, and 24 VDC	G9YAT-12S-45-ND	

### Standard Models with Pin Terminals

Classification	Indicator terminals	Data package	Rated coil voltage	Model	Minimum packaging unit
Failsafe	No	No	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45-P	One per box
		Yes	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45-PD	
	Yes	No	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45-PN	
		Yes	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45-PND	
Double-winding latching	No	No	4.5, 12, 15, 24, and 28 VDC	G9YAK-12S-45-P	One per box
		Yes	4.5, 12, 15, 24, and 28 VDC	G9YAK-12S-45-PD	
	Yes	No	4.5, 12, 15, 24, and 28 VDC	G9YAK-12S-45-PN	
		Yes	4.5, 12, 15, 24, and 28 VDC	G9YAK-12S-45-PND	
TTL-driven double-winding latching (with self cut-off function)	No	No	5, 12, 15, and 24 VDC	G9YAT-12S-45-P	One per box
		Yes	5, 12, 15, and 24 VDC	G9YAT-12S-45-PD	
	Yes	No	5, 12, 15, and 24 VDC	G9YAT-12S-45-PN	
		Yes	5, 12, 15, and 24 VDC	G9YAT-12S-45-PND	

### Standard Models with Connector Cables

Classification	Indicator terminals	Data package	Rated coil voltage	Model	Minimum packaging unit
Failsafe	No	No	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45-C	One per box
		Yes	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45-CD	
	Yes	No	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45-CN	
		Yes	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45-CND	
Double-winding latching	No	No	4.5, 12, 15, 24, and 28 VDC	G9YAK-12S-45-C	One per box
		Yes	4.5, 12, 15, 24, and 28 VDC	G9YAK-12S-45-CD	
	Yes	No	4.5, 12, 15, 24, and 28 VDC	G9YAK-12S-45-CN	
		Yes	4.5, 12, 15, 24, and 28 VDC	G9YAK-12S-45-CND	
TTL-driven double-winding latching (with self cut-off function)	No	No	5, 12, 15, and 24 VDC	G9YAT-12S-45-C	One per box
		Yes	5, 12, 15, and 24 VDC	G9YAT-12S-45-CD	
	Yes	No	5, 12, 15, and 24 VDC	G9YAT-12S-45-CN	
		Yes	5, 12, 15, and 24 VDC	G9YAT-12S-45-CND	

- Note:**
- Models are available with high contact reliability for superior repeatability. Consult with your OMRON representative before using the Switch in an application that requires high repeatability of high-frequency characteristics for a microload. This includes applications in testing and measurement devices (including ATE).
  - Versions with 18-GHz operation are available. Replace "-45" with "-35" when ordering.  
-- Example: Order G9YA-12S-35-PND DC12 instead of G9YA-12S-45-PND DC12.

## DPDT (Transfer Contacts) Models

### Standard Models with Soldering Terminals

Classification	Indicator terminals	Data package	Operating time	Rated coil voltage	Model	Minimum packaging unit
Failsafe	No	No	Standard	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45	One per box
		Yes	Standard	4.5, 12, 15, 24, and 28 VDC	G9YA-22S-45-D	
	Yes	No	Standard	4.5, 12, 15, 24, and 28 VDC	G9YA-22S-45-N	
		Yes	Standard	4.5, 12, 15, 24, and 28 VDC	G9YA-22S-45-ND	
Double-winding latching	No	No	Standard	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45	One per box
			High-speed	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-HS	
		Yes	Standard	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-D	
			High-speed	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-D-HS	
	Yes	No	Standard	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-N	
			High-speed	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-N-HS	
		Yes	Standard	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-ND	
			High-speed	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-ND-HS	
TTL-driven double-winding latching (with self cut-off function)	No	No	Standard	4.5, 12, 15, and 24 VDC	G9YAT-22S-45	One per box
			High-speed	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-HS	
		Yes	Standard	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-D	
			High-speed	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-D-HS	
	Yes	No	Standard	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-N	
			High-speed	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-N-HS	
		Yes	Standard	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-ND	
			High-speed	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-ND-HS	

### Standard Models with Connector Cables

Classification	Indicator terminals	Data package	Operating time	Rated coil voltage	Model	Minimum packaging unit
Failsafe	No	No	Standard	4.5, 12, 15, 24, and 28 VDC	G9YA-12S-45-C	One per box
		Yes	Standard	4.5, 12, 15, 24, and 28 VDC	G9YA-22S-45-CD	
	Yes	No	Standard	4.5, 12, 15, 24, and 28 VDC	G9YA-22S-45-CN	
		Yes	Standard	4.5, 12, 15, 24, and 28 VDC	G9YA-22S-45-CND	
Double-winding latching	No	No	Standard	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-C	One per box
			High-speed	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-C-HS	
		Yes	Standard	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-CD	
			High-speed	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-CD-HS	
	Yes	No	Standard	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-CN	
			High-speed	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-CN-HS	
		Yes	Standard	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-CND	
			High-speed	4.5, 12, 15, 24, and 28 VDC	G9YAK-22S-45-CND-HS	
TTL-driven double-winding latching (with self cut-off function)	No	No	Standard	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-C	One per box
			High-speed	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-C-HS	
		Yes	Standard	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-CD	
			High-speed	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-CD-HS	
	Yes	No	Standard	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-CN	
			High-speed	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-CN-HS	
		Yes	Standard	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-CND	
			High-speed	4.5, 12, 15, and 24 VDC	G9YAT-22S-45-CND-HS	

- Note:**
- Models are available with high contact reliability for superior repeatability. Consult with your OMRON representative before using the Switch in an application that requires high repeatability of high-frequency characteristics for a microload. This includes applications in testing and measurement devices (including ATE).
  - Versions with 18-GHz operation are available. Replace "-45" with "-35" when ordering.  
-- Example: Order G9YA-12S-35-PND DC12 instead of G9YA-12S-45-PND DC12.

# Specifications

## ■ Ratings

### SPDT Models

#### Indicator Rating

Rating	100 mA max. at 30 V
Contact resistance	1 Ω max. (See note 2.)

- Note:**
- The above values are initial values.
  - The contact resistance was measured with 10 mA at 1 VDC with a voltage drop method.

#### High-frequency Characteristics

Frequency Item	1 GHz max.	4 GHz max.	8 GHz max.	12.4 GHz max.	18 GHz max.	26.5 GHz max.
Insertion loss	0.2 dB max.		0.3 dB max.	0.4 dB max.	0.5 dB max.	0.8 dB max.
Isolation	85 dB min.	80 dB min.	70 dB min.	65 dB min.	60 dB min.	
V.SWR	1.1 max.	1.15 max.	1.25 max.	1.35 max.	1.5 max.	1.7 max.

- Note:**
- The above values are initial values.
  - Of the above values, the rated values are 18 GHz max. for the 18-GHz models and 26.5 GHz max. for the 26.5-GHz models.
  - Consult with your OMRON representative before using the Switch in an application that requires high repeatability of high-frequency characteristics for a microload. This includes applications in testing and measurement devices (including ATE). OMRON provides models with high contact reliability.

#### Failsafe Models (G9YA-12S-45(35))

Frequency Item	Rated current	Coil resistance	Must operate voltage	Must release voltage	Maximum voltage	Power consumption
4.5 VDC	155.2 mA	29 Ω	80% max. of rated voltage	10% min. of rated voltage	150% of rated voltage	Approx. 700 mW
12 VDC	58.5 mA	205 Ω				
15 VDC	46.7 mA	321 Ω				
24 VDC	29.2 mA	822 Ω				
28 VDC	25.0 mA	1,118 Ω				

- 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 maximum voltage is the highest voltage that can be imposed on the relay coil instantaneously.

#### Double-winding Latching Models (G9YAK-12S-45(35))

Frequency Item	Rated current	Coil resistance	Must set voltage	Must reset voltage	Maximum voltage	Power consumption
4.5 VDC	109.8 mA	41 Ω	80% max. of rated voltage	80% max. of rated voltage	150% of rated voltage	Approx. 500 mW
12 VDC	41.7 mA	288 Ω				
15 VDC	33.3 mA	450 Ω				
24 VDC	20.8 mA	1,152 Ω				
28 VDC	17.9 mA	1,568 Ω				

- 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 maximum voltage is the highest voltage that can be imposed on the relay coil instantaneously.
  - Coils with reverse polarity are available for double-winding latching models.

#### TTL-driven Latching Models (G9YAT-12S-45(35))

Frequency Item	TTL logic level		Electronic self cut-off	Switching frequency
	ON	OFF		
5 VDC	2.4 to 5.5 V	0 to 0.5 V	Yes	180 operations per minute max. (ON time: OFF time = 1:1)
12 VDC				
15 VDC				
24 VDC				

#### Models with Indicator Terminals

- Note:** An extra 140 to 300 mW of power consumption is added to models with indicator terminals, due to the operating coil and voltage specifications.

## DPDT (Transfer Contacts) Models

### Indicator Rating

Rating	100 mA max. at 30 V
Contact resistance	1 $\Omega$ max. (See note 2.)

- Note:**
- The above values are initial values.
  - The contact resistance was measured with 10 mA at 1 VDC with a voltage drop method.

### High-frequency Characteristics

Frequency Item	1 GHz max.	4 GHz max.	8 GHz max.	12.4 GHz max.	18 GHz max.	26.5 GHz max.
Insertion loss	0.2 dB max.		0.3 dB max.	0.4 dB max.	0.5 dB max.	0.8 dB max.
Isolation	85 dB min.	80 dB min.	70 dB min.	65 dB min.	60 dB min.	55 dB min.
V.SWR	1.1 max.	1.15 max.	1.25 max.	1.35 max.	1.5 max.	1.7 max.

- Note:**
- The above values are initial values.
  - Of the above values, the rated values are 18 GHz max. for the 18-GHz models and 26.5 GHz max. for the 26.5-GHz models.
  - Consult with your OMRON representative before using the Switch in an application that requires high repeatability of high-frequency characteristics for a microload. This includes applications in testing and measurement devices (including ATE). OMRON provides models with high contact reliability.

### Failsafe Models (G9YA-22S-45(35))

#### Standard Models

Frequency Item	Rated current	Coil resistance	Must operate voltage	Must release voltage	Maximum voltage	Power consumption
4.5 VDC	336 mA	13 $\Omega$	85% max. of rated voltage	10% min. of rated voltage	150% of rated voltage	Approx. 1,500 mW
12 VDC	129 mA	93 $\Omega$				
15 VDC	102 mA	147 $\Omega$				
24 VDC	63 mA	380 $\Omega$				
28 VDC	54 mA	515 $\Omega$				

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

### Double-winding Latching Models (G9YAK-22S-45(35))

#### Standard Models

Frequency Item	Rated current	Coil resistance	Must set voltage	Must reset voltage	Maximum voltage	Power consumption
4.5 VDC	233 mA	20 $\Omega$	80% max. of rated voltage	80% max. of rated voltage	150% of rated voltage	Approx. 1,000 mW
12 VDC	83 mA	144 $\Omega$				
15 VDC	66 mA	227 $\Omega$				
24 VDC	42 mA	574 $\Omega$				
28 VDC	36 mA	784 $\Omega$				

#### High-speed Models

Frequency Item	Rated current	Coil resistance	Must set voltage	Must reset voltage	Maximum voltage	Power consumption
4.5 VDC	331 mA	14 $\Omega$	80% max. of rated voltage	80% max. of rated voltage	150% of rated voltage	Approx. 1,500 mW
12 VDC	125 mA	96 $\Omega$				
15 VDC	100 mA	150 $\Omega$				
24 VDC	63 mA	384 $\Omega$				
28 VDC	54 mA	523 $\Omega$				

- Note:**
- The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of  $\pm 10\%$ .
  - The operating characteristics are measured at a coil temperature of 23°C.
  - The maximum voltage is the highest voltage that can be imposed on the relay coil instantaneously.
  - Coils with reverse polarity are available for double-winding latching models.

## TTL-driven Latching Models (G9YAT-22S-45(35))

## Standard and High-speed Models

Item	TTL logic level		Electronic self cut-off	Switching frequency
	ON	OFF		
4.5 VDC	2.4 to 5.5 V	0 to 0.5 V	Yes	180 operations per minute max. (ON time: OFF time = 1:1)
12 VDC				
15 VDC				
24 VDC				

## Models with Indicator Terminals

**Note:** An extra 140 to 300 mW of power consumption is added to models with indicator terminals, due to the operating coil and voltage specifications.

## Characteristics

## SPDT Models

Item	Type	Failsafe models	Double-winding latching models	TTL-driven latching models
	Model	G9YA-12S-45(35)	G9YAK-12S-45(35)	G9YAT-12S-45(35)
<b>Contact resistance (See note 4.)</b>		100 mΩ max.		
<b>Operating (set) time</b>		15 ms max.		
<b>Release (reset) time</b>		15 ms max.		
<b>Minimum set/reset pulse time</b>		---	100 ms	
<b>Insulation resistance (See note 5.)</b>		1,000 MΩ min. (at 500 VDC)		
<b>Dielectric strength</b>	<b>Coil and contacts</b>	500 VAC, 50/60 Hz for 1 min		
	<b>Coil and ground, contacts and ground</b>	500 VAC, 50/60 Hz for 1 min		
	<b>Contacts of same polarity</b>	500 VAC, 50/60 Hz for 1 min		
<b>Vibration resistance</b>	<b>Destruction</b>	10 to 55 to 10 Hz, 2.5-mm single amplitude (5.0-mm double amplitude)		
	<b>Malfunction</b>	10 to 55 to 10 Hz, 1.5-mm single amplitude (3.0-mm double amplitude)		
<b>Shock resistance</b>	<b>Destruction</b>	1,000 m/s <sup>2</sup>		
	<b>Malfunction</b>	500 m/s <sup>2</sup>		
<b>Endurance</b>	<b>Mechanical</b>	5,000,000 operations min. (at 36,000 operations/hour)		
	<b>Electrical</b>	5,000,000 operations min. (3 GHz, 5 W, 50 Ω, V.SWR 1.2 max.) at a switching frequency of 1,800 operations/hour		
<b>Contact carry power</b>		120 W (at 3 GHz, 50 Ω, V.SWR ≤ 1.15) with an ambient temperature of 40°C		
<b>Ambient operating temperature</b>		-55 to 85°C (with no icing or condensation)		
<b>Ambient operating humidity</b>		5% to 85%		
<b>Weight</b>		Approx. 50 g		

- Note:**
- The above values are initial values.
  - Rated and characteristic (initial) values are for a standard temperature of 23°C and a humidity of 65% unless otherwise indicated.
  - Models are available with high contact reliability for superior repeatability. Consult with your OMRON representative before using the Switch in an application that requires high repeatability of high-frequency characteristics for a microload. This includes applications in testing and measurement devices (including ATE).
  - The contact resistance was measured with 10 mA at 1 VDC with a voltage drop method.
  - The insulation resistance was measured with a 500-VDC megohmmeter applied to the same parts as those used for checking the dielectric strength.

## DPDT (Transfer Contacts) Models

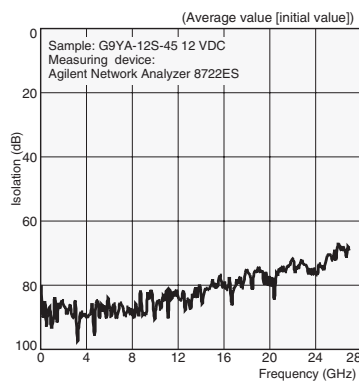
Type		Failsafe models	Double-winding latching models	TTL-driven latching models
Item	Model	G9YA-22S-45(35)	G9YAK-22S-45(35)	G9YAT-22S-45(35)
Contact resistance (See note 4.)		100 mΩ max.		
Operating (set) time		Standard models: 20 ms max., High-speed models: 15 ms max.		
Release (reset) time		Standard models: 20 ms max., High-speed models: 15 ms max.		
Minimum set/reset pulse time		---	100 ms	
Insulation resistance (See note 5.)		1,000 MΩ min. (at 500 VDC)		
Dielectric strength	Coil and contacts	500 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, 2.5-mm single amplitude (5.0-mm double amplitude)		
	Malfunction	10 to 55 to 10 Hz, 2.5-mm single amplitude (5.0-mm double amplitude)		
Shock resistance	Destruction	1,000 m/s <sup>2</sup>		
	Malfunction	500 m/s <sup>2</sup>		
Endurance	Mechanical	5,000,000 operations min. (at 36,000 operations/hour)		
	Electrical	2,500,000 operations min. (3 GHz, 5 W, 50 Ω, V.SWR 1.2 max.) at a switching frequency of 1,800 operations/hour		
Contact carry power		120 W (at 3 GHz, 50 Ω, V.SWR ≤ 1.15) with an ambient temperature of 40°C		
Ambient operating temperature		Standard models: -55 to 85°C (with no icing or condensation) High-speed models: -25 to 65°C (with no icing or condensation)		
Ambient operating humidity		5% to 85%		
Weight		Approx. 100 g		

- Note:**
- The above values are initial values.
  - Rated and characteristic (initial) values are for a standard temperature of 23°C and a humidity of 65% unless otherwise indicated.
  - Models are available with high contact reliability for superior repeatability.  
Consult with your OMRON representative before using the Switch in an application that requires high repeatability of high-frequency characteristics for a microload. This includes applications in testing and measurement devices (including ATE).
  - The contact resistance was measured with 10 mA at 1 VDC with a voltage drop method.
  - The insulation resistance was measured with a 500-VDC megohmmeter applied to the same parts as those used for checking the dielectric strength.

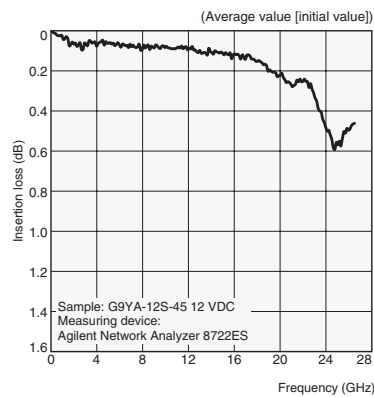
# Engineering Data

## SPDT Models

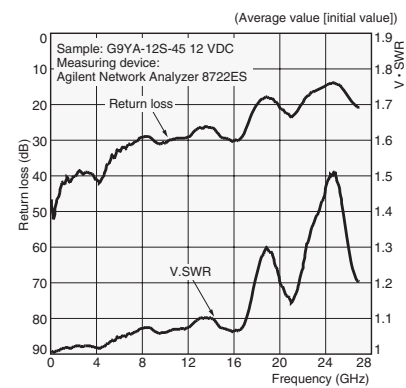
### High-frequency Characteristics (Isolation) (See notes 1 and 2.)



### High-frequency Characteristics (Insertion Loss) (See notes 1 and 2.)



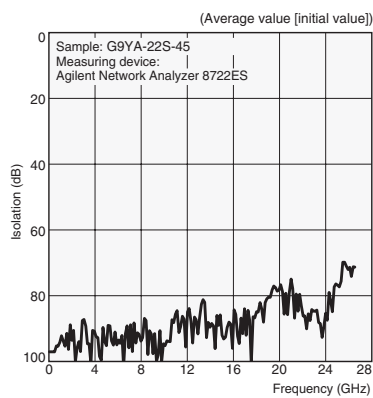
### High-frequency Characteristics (Return Loss, V.SWR) (See notes 1 and 2.)



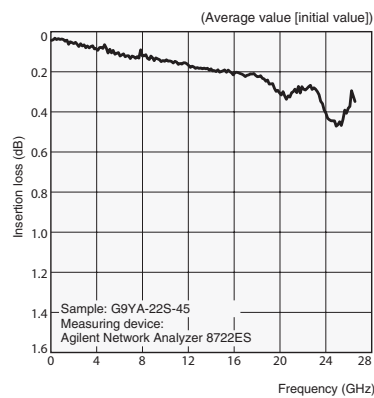
- Note:**
1. The tests were conducted at an ambient temperature of 23°C.
  2. The high-frequency characteristics will vary according to the connectors. Be sure to check operation including durability at the actual device before use.

## DPDT (Transfer Contacts) Models

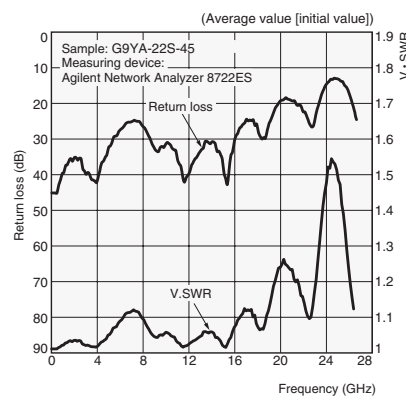
### High-frequency Characteristics (Isolation) (See notes 1 and 2.)



### High-frequency Characteristics (Insertion Loss) (See notes 1 and 2.)



### High-frequency Characteristics (Return Loss, V.SWR) (See notes 1 and 2.)



- Note:**
1. The tests were conducted at an ambient temperature of 23°C.
  2. The high-frequency characteristics will vary according to the connectors. Be sure to check operation including durability at the actual device before use



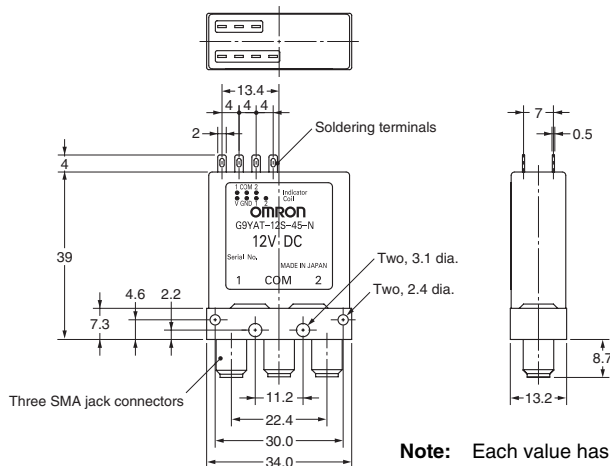
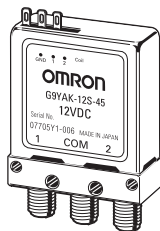
# Dimensions

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

## SPDT Models

### Models with Soldering Terminals

- G9YA-12S-45(35)-□
- G9YAK-12S-45(35)-□
- G9YAT-12S-45(35)-□



**Note:** Each value has a tolerance of  $\pm 0.3$  mm.

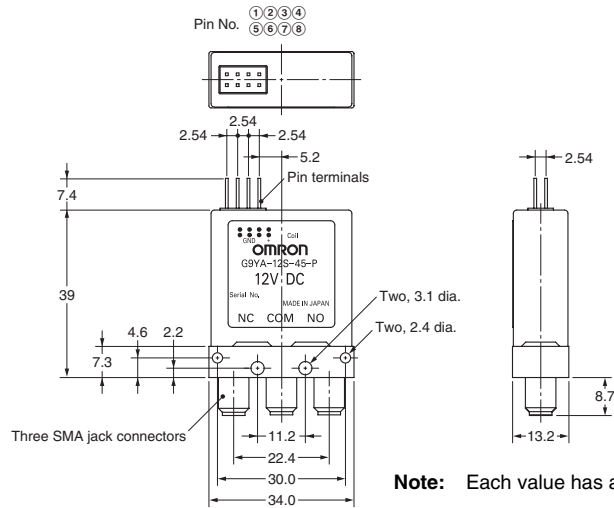
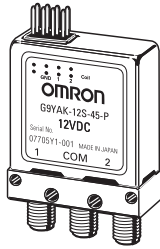
### Soldering Terminal Arrangement

Model	G9YA-12S-45(35)-□	G9YAK-12S-45(35)-□ (See note.)	G9YAT-12S-45(35)-□
<b>Auxiliary indicator terminals</b> Type	<b>Failsafe</b>	<b>Double-winding latching</b>	<b>TTL-driven double-winding latching</b>
<b>No auxiliary indicator terminals</b>			
<b>Auxiliary indicator terminals</b>			

**Note:** Coils with reverse polarity are available for double-winding latching models.

Models with Pin Terminals

- G9YA-12S-45(35)-P□
- G9YAK-12S-45(35)-P□
- G9YAT-12S-45(35)-P□



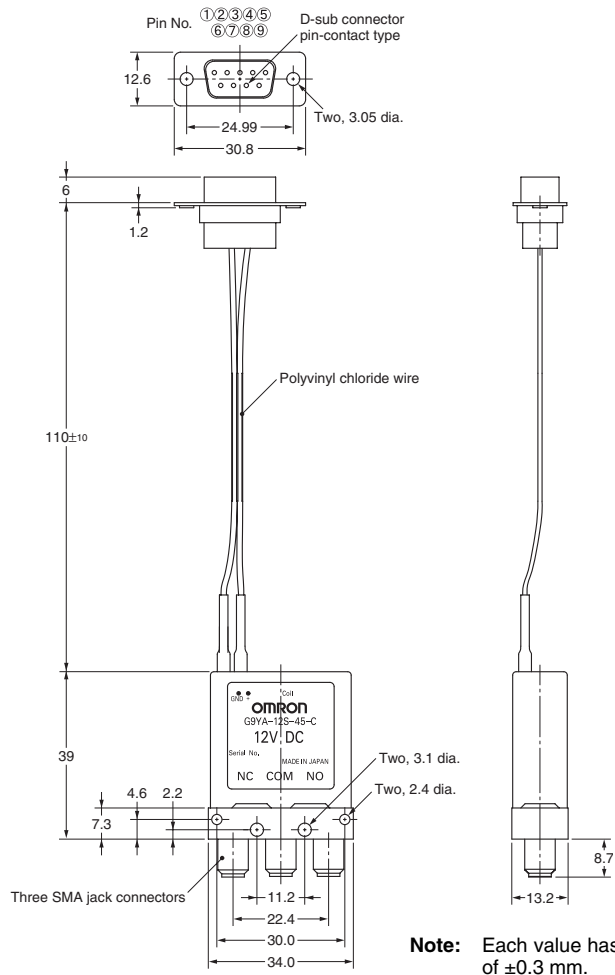
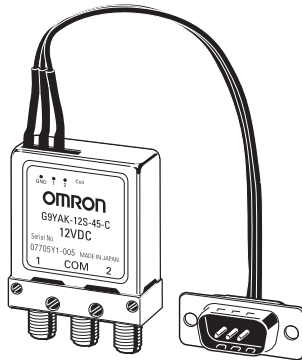
**Note:** Each value has a tolerance of  $\pm 0.3$  mm.

Pin Terminal Arrangement

Pin number		Indicator				Coil			
		①	②	③	④	⑤	⑥	⑦	⑧
No auxiliary indicator terminals	Failsafe						GND		+
	Double-winding latching						GND	1	2
	TTL-driven double-winding latching					V	GND	Logic 1	Logic 2
Auxiliary indicator terminals	Failsafe		NC	COM	NO		GND		+
	Double-winding latching		1	COM	2		GND	1	2
	TTL-driven double-winding latching		1	COM	2	V	GND	Logic 1	Logic 2

Models with Connector Cables

- G9YA-12S-45(35)-C□
- G9YAK-12S-45(35)-C□
- G9YAT-12S-45(35)-C□



**Note:** Each value has a tolerance of  $\pm 0.3$  mm.

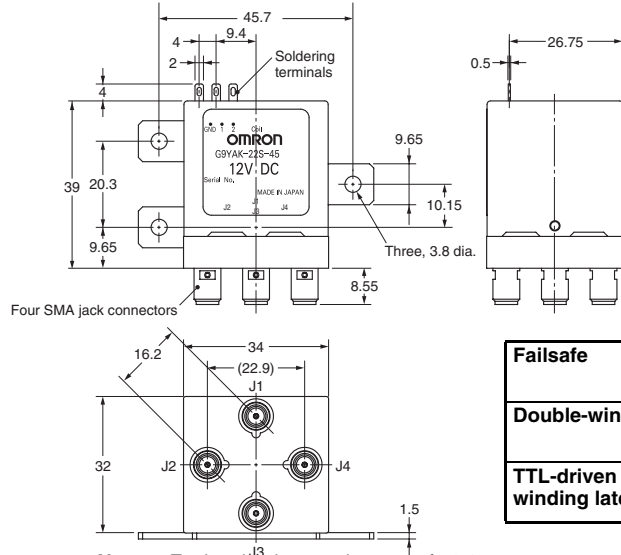
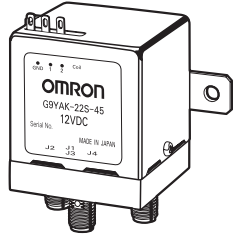
Pin Terminal Arrangement

Pin number		Indicator				Coil				
		①	②	③	④	⑤	⑥	⑦	⑧	⑨
No auxiliary indicator terminals	Failsafe							GND	+	
	Double-winding latching							GND	1	2
	TTL-driven double-winding latching						V	GND	Logic 1	Logic 2
Auxiliary indicator terminals	Failsafe		NC	COM	NO			GND	+	
	Double-winding latching		1	COM	2			GND	1	2
	TTL-driven double-winding latching		1	COM	2		V	GND	Logic 1	Logic 2

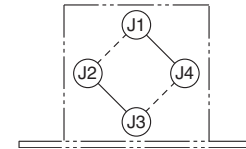
**DPDT (Transfer Contacts) Models**

**Models with Soldering Terminals**

- G9YA-22S-45(35)-□
- G9YAK-22S-45(35)-□
- G9YAT-22S-45(35)-□



**Connector Arrangement/  
Internal Circuits  
(Bottom View)**



<b>Failsafe</b>	<b>NC</b>	J1-J2, J3-J4
	<b>NO</b>	J1-J4, J2-J3
<b>Double-winding latching</b>	<b>POS1</b>	J1-J2, J3-J4
	<b>POS2</b>	J1-J4, J2-J3
<b>TTL-driven double-winding latching</b>	<b>POS1</b>	J1-J2, J3-J4
	<b>POS2</b>	J1-J4, J2-J3

**Note:** Each value has a tolerance of  $\pm 0.3$  mm.

**Soldering Terminal Arrangement**

Model	G9YA-22S-45(35)-□	G9YAK-22S-45(35)-□ (See note.)	G9YAT-22S-45(35)-□
<b>Indicator terminals</b> Type	<b>Failsafe</b>	<b>Double-winding latching</b>	<b>TTL-driven double-winding latching</b>
<b>No auxiliary indicator terminals</b>			
<b>Auxiliary indicator terminals</b>			

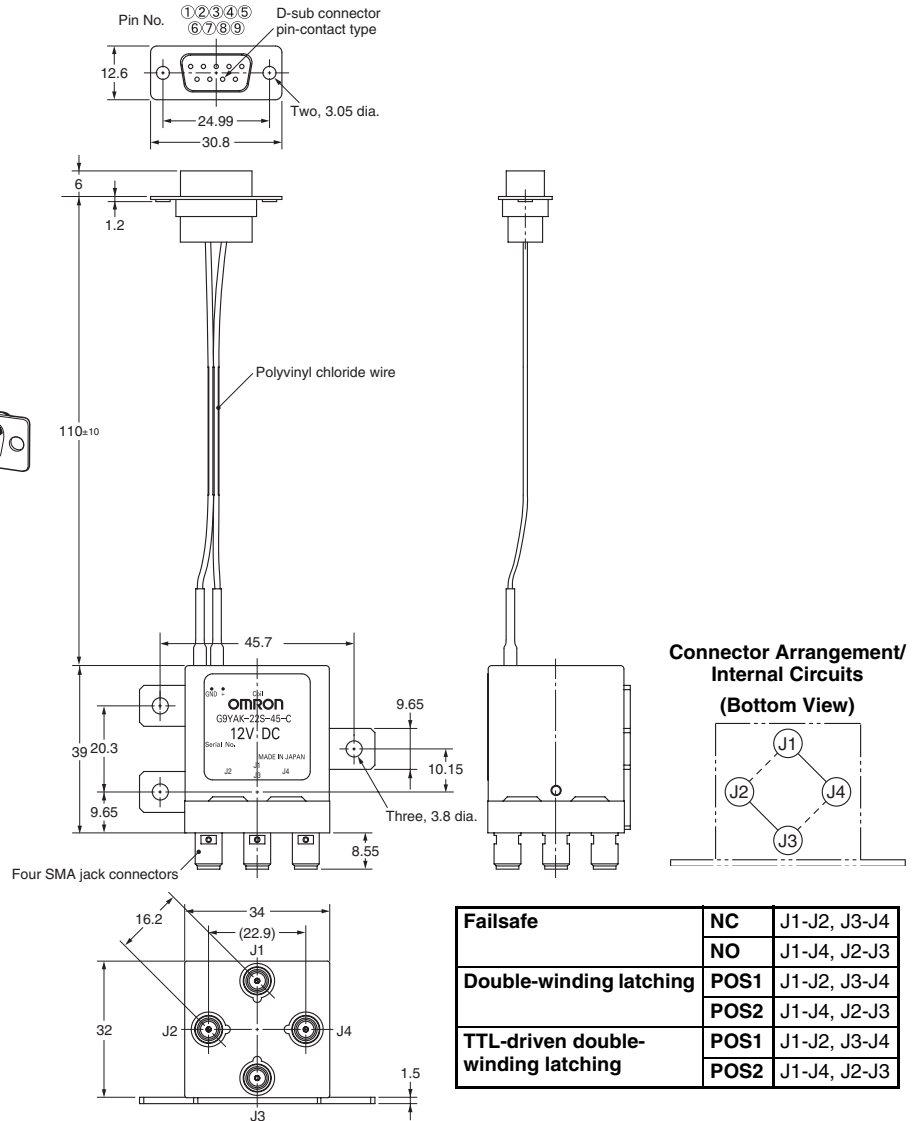
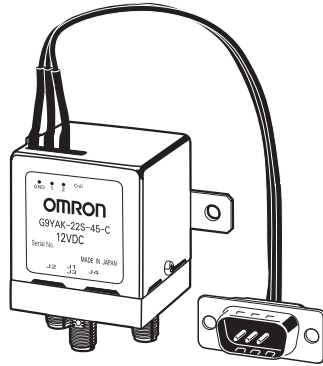
**Note:** Coils with reverse polarity are available for double-winding latching models.

Models with Pin terminals

G9YA-22S-45 (35)-C□

G9YAK-22S-45 (35)-C□

G9YAT-22S-45 (35)-C□



Failsafe	NC	J1-J2, J3-J4
	NO	J1-J4, J2-J3
Double-winding latching	POS1	J1-J2, J3-J4
	POS2	J1-J4, J2-J3
TTL-driven double-winding latching	POS1	J1-J2, J3-J4
	POS2	J1-J4, J2-J3

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

Pin Terminal Arrangement

Pin number		Indicator				Coil				
		①	②	③	④	⑤	⑥	⑦	⑧	⑨
No auxiliary indicator terminals	Failsafe							GND	+	
	Double-winding latching							GND	1	2
	TTL-driven double-winding latching						V	GND	Logic 1	Logic 2
Auxiliary indicator terminals	Failsafe		NC	COM	NO			GND	+	
	Double-winding latching		1	COM	2			GND	1	2
	TTL-driven double-winding latching		1	COM	2		V	GND	Logic 1	Logic 2

# Precautions

**Note:** For general precautions refer to precautions for Relays in *PCB Relays Group Catalog* (Cat. No. X033).

## ■ Precautions for Correct Use

### Relay Handling

- Relays are precision components. Do not subject the Relay to vibration or shock in excess of the standard values, whether before or after mounting. The original performance cannot be maintained if the Relay is subjected to abnormal vibration or shock or dropped. Also, do not subject the Relay to vibration or shock in excess of the rated values when it is still packaged.
- Avoid subjecting the Relay to direct sunlight when it is being used, stored or transported. Keep the Relay at conditions of normal temperature, humidity, and pressure.
- The Relay is not sealed. It cannot be washed.
- Be absolutely sure not to wire the Relay incorrectly. Incorrect wiring will result in failure of Relay functions and damage or fire in the Relay, in addition to affecting external circuits.
- Recommended torque for mounting the SMA connectors is the MIL-C-39012 standard of  $0.90 \pm 0.1$  N·m. The conditions, however, depend on the compatibility with the material of the connectors.
- Use of two or more Relays may result in change in the Relay characteristics due to interference in the magnetic fields generated by the Relays. Be sure to check operation using the actual devices before use.
- Use a power supply for the coil operating power supply with a maximum ripple of 5%. Be sure to check operation using the actual devices before use.
- Operation in excess of the coil ratings, contact ratings, switching service life or other specifications may result in abnormal heat generation, smoke, or fire.
- For DPDT models, both outputs may be ON for several milliseconds. Incorporate this possibility into the safety design so that the equipment is not damaged.

### Latching Relay Mounting

Make sure that the vibration or shock generated from other devices (e.g., Relays) on the same panel during operation or resetting do not exceed the values provided in the catalog, 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.

### Long-term Continuously ON Contacts

Using the Relay in a circuit where the Relay will be ON continuously for long periods (without switching) can lead to unstable contacts because the heat generated by the coil itself will deteriorate the insulation, causing a film to develop on the contact surfaces. We recommend using a latching Relay (magnetic-holding Relay) in this kind of circuit. If a failsafe Relay must be used in this kind of circuit, use a full-loop circuit design to provide protection against possible poor connections and coil disconnection.

### Using Relays in an Atmosphere Containing Corrosive Gas (Silicon, Sulfuric, or Organic Gas)

Do not use Relays in a location where silicon gas, sulfuric gas ( $\text{SO}_2$ ,  $\text{H}_2\text{S}$ ), or organic gas is present. If Relays are used for a long period in an atmosphere of sulfuric gas or organic gas, contact surfaces may become corroded and cause contact instability and obstruction, and terminal soldering characteristics may be degraded. If Relays are stored or used for a long time in an atmosphere of silicon gas, a silicon coating will be generated on contact surfaces, causing contact failure.

### Connecting to Coil Terminals and Indicator Terminals

#### I. Models with Soldering Terminals

Perform manual soldering under the following conditions.

- Soldering iron tip temperature: 280 to 300°C
- Soldering time: Approx. 3 s max.

#### II. Models with Pin Terminals

Heed the following precautions when using models with pin terminals.

1. Connectors for use: Straight dip type for panels  
Male connectors: HKP-8M29 (Honda Tsushin Kogyo)  
Refer to the general catalog of Honda Tsushin Kogyo for connector models and specifications.
2. The sockets do not have a lock mechanism. Pulling the lead wires, shock, or long-term vibration may cause the connectors to become disconnected. Heed the following precautions.
  - Securely fix the Relay and connectors and make sure that no force is pulling on the lead wires during use.
  - Fully insert the socket into the Relay connector.
3. Do not solder the lead wires directly to the pin connectors.

### Repeatability

Consult with your OMRON representative before using the Switch in an application that requires high repeatability of high-frequency characteristics for a microload. This includes applications in testing and measurement devices (including ATE). OMRON provides models with high contact reliability.



**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. K131-E1-03 **In the interest of product improvement, specifications are subject to change without notice.**

## **OMRON RELAY & DEVICES Corporation**

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