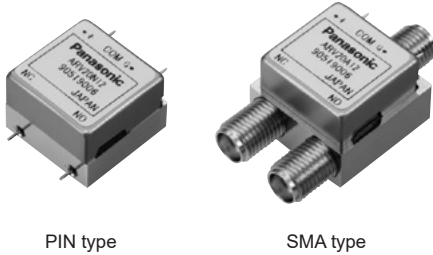


26.5 GHz max. Coaxial switches coming in SPDT and Compact size

## RV COAXIAL SWITCHES (ARV)



PIN type

SMA type

### FEATURES

1. Compact size (Approx. 85% less volume compared to our previous product.\*)  
PIN type size: L 15.9 × W 15.9 × H 11.2 mm L .626 × W .626 × H .441 inch
2. Excellent high frequency characteristics (to 8, 18, 26.5GHz, 50Ω)
3. Terminal shape options available (PIN and SMA)
4. Contact arrangement: SPDT
5. Failsafe type and latching type (2-coil latching type) that reduces operating power are now available.

\* Compared to previous product (RD coaxial switch) and PIN type RV coaxial switch.

### TYPICAL APPLICATIONS

- Compact wireless devices  
Compact measuring instrument  
All types of inspection equipment  
Digital broadcasting
- Broadcasting relay station
  - Broadcasting equipment
- Mobile communication
- Cellular phone base station

If you consider using applications with low level loads or with high frequency switching, please consult us.

## HIGH FREQUENCY CHARACTERISTICS (Impedance 50Ω, Initial)

### 1. PIN type

Frequency	to 4 GHz	4 to 8 GHz	8 to 12.4 GHz*	12.4 to 18 GHz*
V.S.W.R. (max.)	1.3	1.4	1.5	1.7
Insertion loss (dB. max.)	0.3	0.4	0.5	0.7
Isolation (dB. min.)	70	60	50	40

Note: \*8 to 18GHz characteristics can be applied 18GHz type only.

### 2. SMA type

Frequency	to 8 GHz	8 to 12.4 GHz*	12.4 to 18 GHz*	18 to 26.5 GHz**
V.S.W.R. (max.)	1.35	1.6	1.7	1.8
Insertion loss (dB. max.)	0.3	0.5	0.7	0.8
Isolation (dB. min.)	70	60	60	50

Note: \*8 to 18GHz characteristics can be applied 18GHz type and 26.5GHz type only.

\*\*18 to 26.5GHz characteristics can be applied 26.5GHz type only.

## ORDERING INFORMATION

ARV       

## Frequency

1: to 8GHz  
 2: to 18GHz  
 3: to 26.5GHz (SMA type only)

## Operating function

0: Failsafe type/Standard contact  
 2: Latching type/Standard contact  
 3: Failsafe type/Reverse contact

## Terminal shape

N: PIN type  
 A: SMA type

## Nominal operating voltage

4H: 4.5 V DC  
 12: 12 V DC  
 24: 24 V DC

## Operation terminal

Nil: Solder terminal

## HF data attached

Nil: No HF test data attached  
 Q: HF test data attached (Displayed only on inner and outer packaging)

\*Please inquire regarding use with nominal operating voltage of 28 V DC.

## TYPES

## SPDT

Operating function	Contact terminal shape	Nominal operating voltage	to 8 GHz type		to 18 GHz type		to 26.5 GHz type	
			No HF datasheet attached	HF datasheet attached	No HF datasheet attached	HF datasheet attached	No HF datasheet attached	HF datasheet attached
Failsafe type/ Standard contact	PIN type	4.5 V DC	ARV10N4H	ARV10N4HQ	ARV20N4H	ARV20N4HQ	–	–
		12 V DC	ARV10N12	ARV10N12Q	ARV20N12	ARV20N12Q	–	–
		24 V DC	ARV10N24	ARV10N24Q	ARV20N24	ARV20N24Q	–	–
	SMA type	4.5 V DC	ARV10A4H	ARV10A4HQ	ARV20A4H	ARV20A4HQ	ARV30A4H	ARV30A4HQ
		12 V DC	ARV10A12	ARV10A12Q	ARV20A12	ARV20A12Q	ARV30A12	ARV30A12Q
		24 V DC	ARV10A24	ARV10A24Q	ARV20A24	ARV20A24Q	ARV30A24	ARV30A24Q
Latching type/ Standard contact	PIN type	4.5 V DC	ARV12N4H	ARV12N4HQ	ARV22N4H	ARV22N4HQ	–	–
		12 V DC	ARV12N12	ARV12N12Q	ARV22N12	ARV22N12Q	–	–
		24 V DC	ARV12N24	ARV12N24Q	ARV22N24	ARV22N24Q	–	–
	SMA type	4.5 V DC	ARV12A4H	ARV12A4HQ	ARV22A4H	ARV22A4HQ	ARV32A4H	ARV32A4HQ
		12 V DC	ARV12A12	ARV12A12Q	ARV22A12	ARV22A12Q	ARV32A12	ARV32A12Q
		24 V DC	ARV12A24	ARV12A24Q	ARV22A24	ARV22A24Q	ARV32A24	ARV32A24Q
Failsafe type/ Reverse contact	PIN type	4.5 V DC	ARV13N4H	ARV13N4HQ	ARV23N4H	ARV23N4HQ	–	–
		12 V DC	ARV13N12	ARV13N12Q	ARV23N12	ARV23N12Q	–	–
		24 V DC	ARV13N24	ARV13N24Q	ARV23N24	ARV23N24Q	–	–
	SMA type	4.5 V DC	ARV13A4H	ARV13A4HQ	ARV23A4H	ARV23A4HQ	ARV33A4H	ARV33A4HQ
		12 V DC	ARV13A12	ARV13A12Q	ARV23A12	ARV23A12Q	ARV33A12	ARV33A12Q
		24 V DC	ARV13A24	ARV13A24Q	ARV23A24	ARV23A24Q	ARV33A24	ARV33A24Q

Standard packing: Carton: 5 pcs. Case: 50 pcs.

## RATING

### 1. Coil data

- Operating characteristics such as 'Operate voltage' and 'Release voltage' are influenced by mounting conditions, ambient temperature, etc.

Therefore, please use the relay within  $\pm 5\%$  of rated coil voltage.

- 'Initial' means the condition of products at the time of delivery.

### 1) Failsafe type (Standard contact and Reverse contact)

Nominal operating voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal operating current [ $\pm 10\%$ ] (at 20°C 68°F)	Coil resistance [ $\pm 10\%$ ] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 85°C 185°F)
4.5 V DC	75%V or less of nominal voltage*1 (Initial)	10%V or more of nominal voltage*1 (Initial)	155.7 mA	28.9 $\Omega$	700 mW	110%V of nominal voltage
12 V DC			58.3 mA	205.7 $\Omega$		
24 V DC			29.2 mA	822.9 $\Omega$		

### 2) Latching type (Standard contact)

Nominal operating voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)	Nominal operating current [ $\pm 10\%$ ] (at 20°C 68°F)	Coil resistance [ $\pm 10\%$ ] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 85°C 185°F)
4.5 V DC	75%V or less of nominal voltage*1 (Initial)	75%V or less of nominal voltage*1 (Initial)	155.7 mA	28.9 $\Omega$	700 mW	110%V of nominal voltage
12 V DC			58.3 mA	205.7 $\Omega$		
24 V DC			29.2 mA	822.9 $\Omega$		

Notes: \*1. Pulse drive (JIS C5442)

\*2. Please inquire regarding use with nominal operating voltage of 28 V DC.

## 2. Specifications

Characteristics	Item	Specifications							
Contact	Arrangement	SPDT							
	Contact material	Gold plating							
	Contact resistance (Initial)	Max. 100m $\Omega$ (By voltage drop 10V AC 10mA)							
Rating	Contact input power (CW)	Max. 50W (at 3GHz) (V.S.W.R. 1.3 or less, no contact switching, ambient temperature 20°C 68°F)*1							
	Nominal operating power	700mW							
High frequency characteristics (Impedance 50 $\Omega$ )	Frequency	PIN type*2				SMA type			
		to 4 GHz	4 to 8 GHz	8 to 12.4 GHz*3	12.4 to 18 GHz*3	to 8 GHz	8 to 12.4 GHz*4	12.4 to 18 GHz*4	18 to 26.5 GHz*5
	V.S.W.R. (max.)	1.3	1.4	1.5	1.7	1.35	1.6	1.7	1.8
	Insertion loss (dB, max.)	0.3	0.4	0.5	0.7	0.3	0.5	0.7	0.8
	Isolation (dB, min.)	70	60	50	40	70	60	60	50
Electrical characteristics	Insulation resistance (Initial)		Min. 1,000 M $\Omega$ (at 500 V DC) Measurement at same location as "breakdown voltage (Initial)" section.						
	Breakdown voltage (Initial)	Between open contacts	500 Vrms for 1 min. (Detection current: 10mA)						
		Between contact and earth terminal	500 Vrms for 1 min. (Detection current: 10mA)						
		Between contact and coil	500 Vrms for 1 min. (Detection current: 10mA)						
Between coil and earth terminal		500 Vrms for 1 min. (Detection current: 10mA)							
Time characteristics (at 20°C 68°F)	Operate time (Set time)		Max. 15ms (approx. 5ms) (Nominal operating voltage applied to the coil, excluding contact bounce time.)						
	Release time (Reset time)		Max. 15ms (approx. 5ms) (Nominal operating voltage applied to the coil, excluding contact bounce time.) (without diode, only for Release time)						
Mechanical characteristics	Shock resistance	Functional	Min. 500 m/s <sup>2</sup> (Half-wave pulse of sine wave: 11ms, detection time: 10 $\mu$ s.)						
		Destructive	Min. 1,000 m/s <sup>2</sup> (Half-wave pulse of sine wave: 6ms.)						
	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 3mm (Detection time: 10 $\mu$ s.)						
		Destructive	10 to 55 Hz at double amplitude of 5mm/15 to 2,000 Hz [W0 = 2.94 (m/s <sup>2</sup> )/Hz]						
Expected life	Mechanical		Min. 10 <sup>6</sup> (at 180 cpm)						
	Electrical (Hot switch)		Min. 3 $\times$ 10 <sup>5</sup> (1W High frequency load, at 3GHz, impedance 50 $\Omega$ , V.S.W.R.; max. 1.3) (at 20 cpm)						
Conditions	Conditions for operation, transport and storage*6		Ambient temperature: -55°C to +85°C -67°F to +185°F Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature) Air pressure: 86 to 106 kPa						
Unit weight	PIN type: Approx. 12g .42oz				SMA type: Approx. 20g .71oz				

Notes: \*1. Factors such as heating of the connected terminal influence the high frequency characteristics; therefore, please verify under actual conditions of use.

\*2. Measuring method: After installing on dedicated inspection equipment

\*3. 8 to 18GHz characteristics can be applied 18GHz type only.

\*4. 8 to 18GHz characteristics can be applied 18GHz and 26.5GHz types only.

\*5. 18 to 26.5GHz characteristics can be applied 26.5GHz type only.

\*6. The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. Refer to "NOTES".

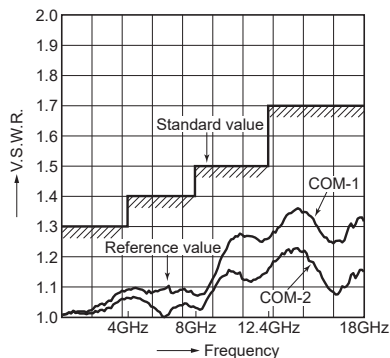
## REFERENCE DATA

1-(1). High frequency characteristics (PIN type)

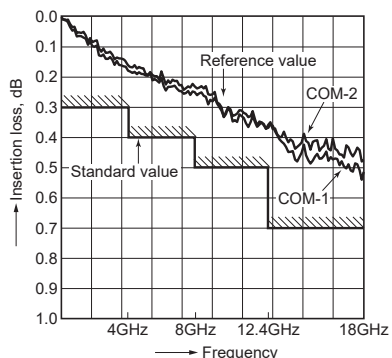
Sample: ARV22N12

Measuring method: Measured with Agilent Technologies network analyzer (E8363B) after installing on dedicated inspection equipment.

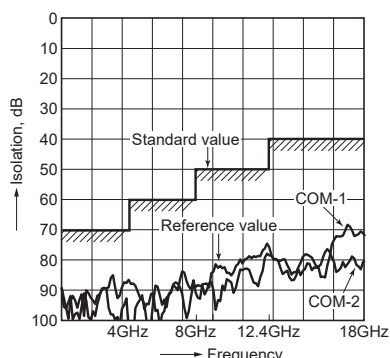
• V.S.W.R.



• Insertion loss



• Isolation

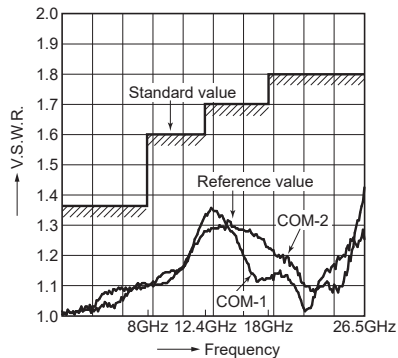


1-(2). High frequency characteristics (SMA type)

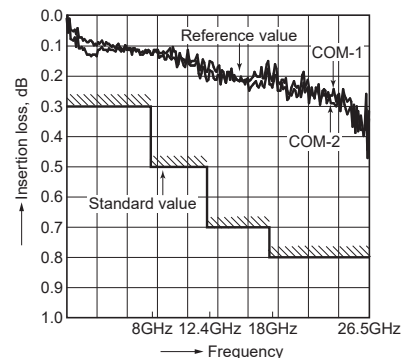
Sample: ARV32A12

Measuring method: Measured with Agilent Technologies network analyzer (E8363B).

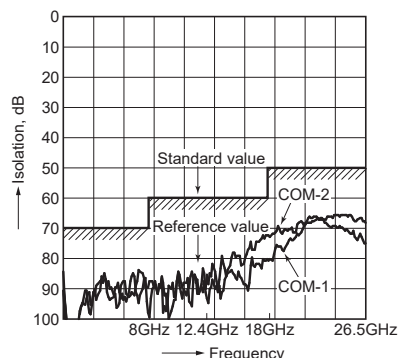
• V.S.W.R.



• Insertion loss



• Isolation

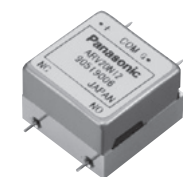


## DIMENSIONS (mm inch)

The CAD data of the products with a **CAD Data** mark can be downloaded from <https://industrial.panasonic.com/ac/e/>

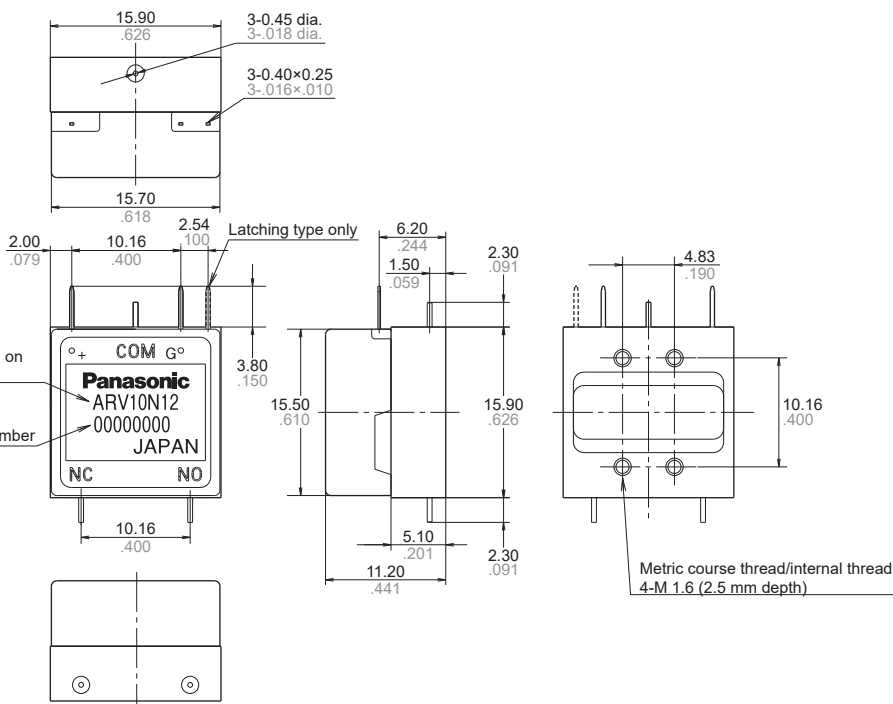
### 1. PIN type

**CAD Data**



The part number depend on the type and voltage.

Lot number

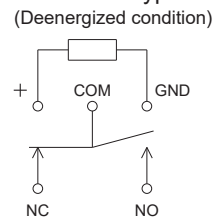


Tolerance:  $\pm 0.3 \pm 0.12$

#### Schematic (Top view)

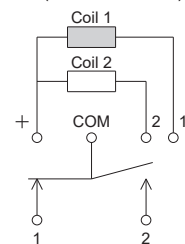
<Standard contact>

Failsafe type



Latching type

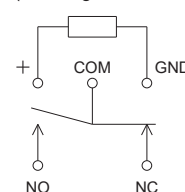
(Reset condition)



<Reverse contact>

Failsafe type

(Deenergized condition)



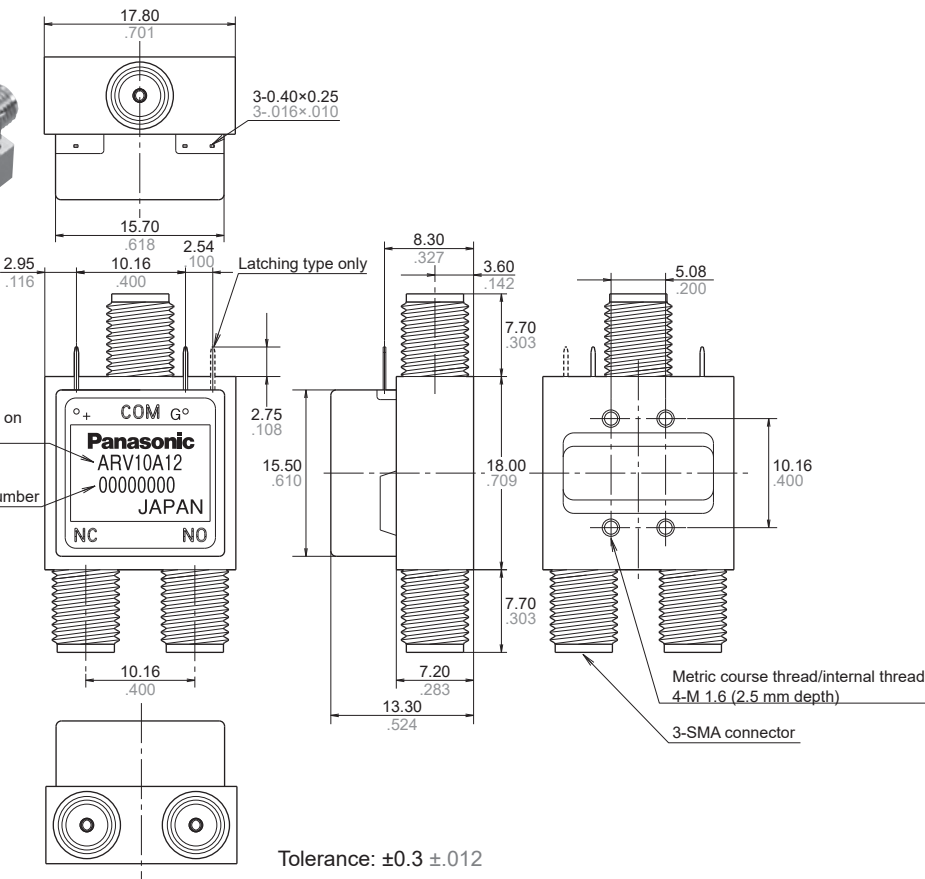
### 2. SMA type

**CAD Data**



The part number depend on the type and voltage.

Lot number

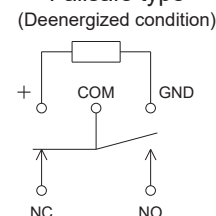


Tolerance:  $\pm 0.3 \pm 0.12$

#### Schematic (Top view)

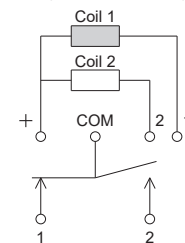
<Standard contact>

Failsafe type



Latching type

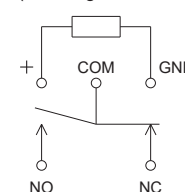
(Reset condition)



<Reverse contact>

Failsafe type

(Deenergized condition)



\*For SMP connector type, please consult us.

## NOTES

1. For general cautions for use, please refer to the "General Application Guidelines".

### 2. Coil operating power

Pure DC current should be applied to the coil. The wave form should be rectangular. If it includes ripple, the ripple factor should be less than 5%.

However, check it with the actual circuit since the characteristics may be slightly different. The nominal operating voltage should be applied to the coil for more than 50 ms to set/reset the latching type. Please use the latching type for circuits that are continually powered for long periods of time.

### 3. Coil connection

Since this product is polarized, please be aware of the plus/minus polarity of the coil.

### 4. Connection and washing conditions for coil and PIN type contact terminals

1) The connection of coil and PIN type contact terminals shall be done by soldering.

Soldering conditions

Max. 260°C 500°F (solder temp) within 10sec (soldering time)

Max. 350°C 662°F (solder temp) within 3sec (soldering time)

2) This product is not sealed type, therefore washing is not allowed.

### 5. Conditions for operation, transport and storage conditions

1) Temperature:

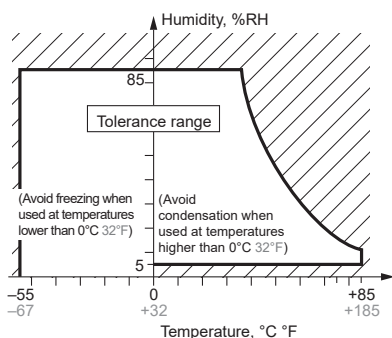
–55 to +85°C –67 to +185°F

2) Humidity: 5 to 85% RH

(Avoid freezing and condensation.)

The humidity range varies with the temperature. Use within the range indicated in the graph below.

3) Atmospheric pressure: 86 to 106 kPa  
Temperature and humidity range for usage, transport, and storage:



### 4) Condensation

Condensation forms when there is a sudden change in temperature under high temperature and high humidity conditions. Condensation will cause deterioration of coaxial switch insulation.

### 5) Freezing

Condensation or other moisture may freeze on coaxial switch when the temperature is lower than 0°C 32°F. This causes problems such as sticking of movable parts or operational time lags.

### 6) Low temperature, low humidity environments.

The plastic may become brittle if coaxial switch is exposed to a low temperature, low humidity environment for long periods of time.

### 6. Other handling precautions.

1) Coaxial switch's on/off service life is based on standard test conditions

(temperature: 15 to 35°C 59 to 95°F, humidity: 25 to 75%) specified in JIS C5442-1996. Life will depend on many factors of your system: coil drive circuit, type of load, switching intervals, switching phase, ambient conditions, to name a few.

2) Use coaxial switch within specifications such as coil rating, contact rating and on/off service life. If used beyond limits, coaxial switch may overheat, generate smoke or catch fire.

3) Be careful not to drop coaxial switch. If accidentally dropped, carefully check its appearance and characteristics before use.

4) Be careful to wire coaxial switch correctly. Otherwise, malfunction, overheat, fire or other trouble may occur.

5) The latching type product is shipped in the reset position. But jolts during transport or impacts during installation can move it to the set position. It is, therefore, advisable to build a circuit in which coaxial switch can be initialized (set and reset) just after turning on the power.

6) If coaxial switch stays on in a circuit for many months or years at a time without being activated, circuit design should be reviewed so that the coaxial switch can remain deenergized. A coil that receives current all the time heats, which degrades insulation earlier than expected. A latching type is recommended for such circuits.

7) For SMA connectors (SMA type only), we recommend a torque of 0.90±0.1 N·m for installation, which falls within the prescribed torque of MIL-C-39012.

Please be aware that conditions might be different depending on the connector materials and how it interacts with surrounding materials.

8) Please do not use silicon based substances such as silicon rubber, silicon oil, silicon coatings and silicon fillings, in the vicinity of the coaxial switch. Doing so may cause volatile silicon gas to form which may lead to contact failure due to the adherence of silicon on the contacts when they open and close in this atmosphere.

9) In order to ensure stable signal communication on contact, it is recommended that the monitoring of contact signal should be started from Min. 100 ms after coil rated voltage is applied.

Please refer to "the latest product specifications" when designing your product.

• Requests to customers :

<https://industrial.panasonic.com/ac/e/salespolicies/>

# GUIDELINES FOR MICROWAVE DEVICES USAGE

For cautions for use, please read "GUIDELINES FOR RELAY USAGE".

[https://industrial.panasonic.com/ac/e/control/relay/cautions\\_use/index.jsp](https://industrial.panasonic.com/ac/e/control/relay/cautions_use/index.jsp)

## Precautions for Coil Input

### ■ Long term current carrying

A circuit that will be carrying a current continuously for long periods without relay or microwave device switching operation. (circuits for emergency lamps, alarm devices and error inspection that, for example, revert only during malfunction and output warnings with form B contacts) Continuous, long-term current to the coil will facilitate deterioration of coil insulation and characteristics due to heating of the coil itself.

For circuits such as these, please use a magnetic-hold type latching relay. If you need to use a single stable relay, use a sealed type relay that is not easily affected by ambient conditions and make a failsafe circuit design that considers the possibility of contact failure or disconnection.

### ■ DC Coil operating power

Steady state DC current should be applied to the coil. The wave form should be rectangular. If it includes ripple, the ripple factor should be less than 5%.

However, please check with the actual circuit since the electrical characteristics may vary. The rated coil voltage should be applied to the coil and the set/reset pulse time of latching type relay differs for each relays, please refer to the relay's individual specifications.

### ■ Coil connection

When connecting coils of polarized relays, please check coil polarity (+,-) at the internal connection diagram (Schematic). If any wrong connection is made, it may cause unexpected malfunction, like abnormal heat, fire and so on, and circuit do not work. Avoid impressing voltages to the set coil and reset coil at the same time.

### ■ Maximum allowable voltage and temperature rise

Proper usage requires that the rated coil voltage be impressed on the coil. Note, however, that if a voltage greater than or equal to the maximum continuous voltage is impressed on the coil, the coil may burn or its layers short due to the temperature rise. Furthermore, do not exceed the usable ambient temperature range listed in the catalog.

#### ● Maximum allowable voltage for coil

In addition to being a requirement for relay operation stability, the maximum continuous impressed coil voltage is an important constraint for the prevention of such problems as thermal deterioration or deformity of the insulation material, or the occurrence of fire hazards.

## Ambient Environment

### ● Dew condensation

Condensation occurs when the ambient temperature drops suddenly from a high temperature and humidity, or the relay and microwave device is suddenly transferred from a low ambient temperature to a high temperature and humidity. Condensation causes the failures like insulation deterioration, wire disconnection and rust etc.

Panasonic Corporation does not guarantee the failures caused by condensation.

The heat conduction by the equipment may accelerate the cooling of device itself, and the condensation may occur.

Please conduct product evaluations in the worst condition of the actual usage. (Special attention should be paid when high temperature heating parts are close to the device. Also please consider the condensation may occur inside of the device.)

### ● Icing

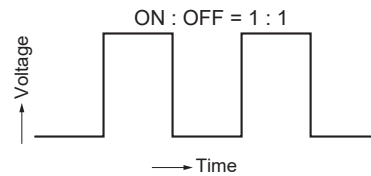
Condensation or other moisture may freeze on relays when the temperature become lower than 0°C. This icing causes the sticking of movable portion, the operation delay and the contact conduction failure etc. Panasonic Corporation does not guarantee the failures caused by the icing.

The heat conduction by the equipment may accelerate the cooling of relay itself and the icing may occur. Please conduct product evaluations in the worst condition of the actual usage.

### ● Temperature rise due to pulse voltage

When a pulse voltage with ON time of less than 2 minutes is used, the coil temperature rise bears no relationship to the ON time. This varies with the ratio of ON time to OFF time, and compared with continuous current passage, it is rather small. The various relays are essentially the same in this respect.

Current passage time	(%)
For continuous passage	Temperature rise value is 100%
ON : OFF = 3 : 1	About 80%
ON : OFF = 1 : 1	About 50%
ON : OFF = 1 : 3	About 35%



### ■ Operate voltage change due to coil temperature rise (Hot start)

In DC relays, after continuous passage of current in the coil, if the current is turned OFF, then immediately turned ON again, due to the temperature rise in the coil, the pick-up voltage will become somewhat higher. Also, it will be the same as using it in a higher temperature atmosphere. The resistance/temperature relationship for copper wire is about 0.4% for 1°C, and with this ratio the coil resistance increases. That is, in order to operate of the relay, it is necessary that the voltage be higher than the pick-up voltage and the pick-up voltage rises in accordance with the increase in the resistance value. However, for some polarized relays, this rate of change is considerably smaller.

### ● Low temperature and low humidity

The plastic becomes brittle if the switch is exposed to a low temperature, low humidity environment for long periods of time.

### ● High temperature and high humidity

Storage for extended periods of time (including transportation periods) at high temperature or high humidity levels or in atmospheres with organic gases or sulfide gases may cause a sulfide film or oxide film to form on the surfaces of the contacts and/or it may interfere with the functions. Check out the atmosphere in which the units are to be stored and transported.

### ● Package

In terms of the packing format used, make every effort to keep the effects of moisture, organic gases and sulfide gases to the absolute minimum.

# GUIDELINES FOR MICROWAVE DEVICES USAGE

## ●Storage requirements

Since the SMD type is sensitive to humidity it is packaged with tightly sealed anti-humidity packaging. However, when storing, please be careful of the following.

1) Please use promptly once the anti-humidity pack is opened. (within 72 hours, Max. 30°C/70% R.H.). If left with the pack open, the relay will absorb moisture which will cause thermal stress when reflow mounting and thus cause the case to expand. As a result, the seal may break.

\*For RE relays, after this bag is opened, the product must be used within 24 hours.

2) If relays will not be used within 72 hours, please store relays in a humidity controlled desiccator or in an anti-humidity bag to which silica gel has been added.

\*If the relay is to be soldered after it has been exposed to excessive humidity atmosphere, cracks and leaks can occur. Be sure to mount the relay under the required mounting conditions

\*For RE relays, after this bag is opened, the product must be used within 24 hours.

3) The following cautionary label is affixed to the anti-humidity pack.

## ●Silicon

When a source of silicone substances (silicone rubber, silicone oil, silicone coating materials and silicone filling materials etc.) is used around the relay, the silicone gas (low molecular siloxane etc.) may be produced.

This silicone gas may penetrate into the inside of the relay. When the relay is kept and used in this condition, silicone compound may adhere to the relay contacts which may cause the contact failure. Do not use any sources of silicone gas around the relay (Including plastic seal types).

## ●NOx Generation

When relay is used in an atmosphere high in humidity to switch a load which easily produces an arc, the NOx created by the arc and the water absorbed from outside the relay combine to produce nitric acid. This corrodes the internal metal parts and adversely affects operation. Avoid use at an ambient humidity of 85%RH or higher (at 20°C). If use at high humidity is unavoidable, please contact our sales representative.

\*RE Relays only

**C a u t i o n**

This vacuum-sealed bag contains

**Moisture Sensitive Products**

After this bag is opened, the product must be used

**within 7 2 h o u r s**

If product is not used within 72 hours, baking is necessary.  
For baking conditions please contact us.

**C a u t i o n**

This vacuum-sealed bag contains

**Moisture Sensitive Products**

After this bag is opened, the product must be used

**within 2 4 h o u r s**

If product is not used within 24 hours, baking is necessary.  
For baking conditions please contact us.

## Others

### ■Cleaning

1) Although the environmentally sealed type relay (plastic sealed type, etc.) can be cleaned, avoid immersing the relay into cold liquid (such as cleaning solvent) immediately after soldering. Doing so may deteriorate the sealing performance.

2) Surface mount terminal type relay is sealed type and it can be cleaned by immersion. Use pure water or alcohol-based cleaning solvent.

3) Cleaning with the boiling method is recommended (The temperature of cleaning liquid should be 40°C or lower).

Avoid ultrasonic cleaning on relays. Use of ultrasonic cleaning may cause breaks in the coil or slight sticking of the contacts due to the ultrasonic energy.

### ■Other handling precautions

- Expected switching life is defined under the standard test conditions (temperature 15 to 35°C, humidity: 25 to 75%) specified in JIS C 5442.

Expected switching life is depend on usage conditions; coil driving circuit, load type, activation frequency, activation phase, ambient conditions and other factors. Please check relays and microwave devices on the actual circuit.

Also, pay special attention loads such as those listed below.

- When used for AC load-operating and the operating phase is synchronous, rocking and fusing can easily occur due to contact shifting.

- Frequent switching under load condition

When high frequently switched under load condition that can cause arc at the contacts, nitrogen and oxygen in the air is fused by the arc energy and HNO<sup>3</sup> is formed. This can corrode metal materials. Countermeasures for these are.

1. Incorporate an arc-extinguishing circuit.
2. Lower the operating frequency
3. Lower the ambient humidity

- When used for "Dry switching" without load current, please contact our sales representative.

- Please avoid relays to be used outside of the specification ranges such as the coil rating, contact rating and switching life that may cause abnormal heating, smoke, and fire.

- In case relays and microwave devices are dropped, please do not use.

Please refer to "**the latest product specifications**" when designing your product.

•Requests to customers:

<https://industrial.panasonic.com/ac/e/salespolicies/>



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Please contact .....

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