Panasonic
ideas for life

3 GHz SMALL MICROWAVE RELAY

RX RELAYS (ARX)

FEATURES

1. Excellent high frequency characteristics (~2.5GHz, Impedance 50Ω)

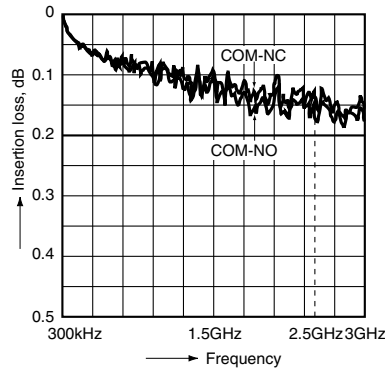| Frequency	to 2.5GHz
V.S.W.R. (Max.)	1.2
Insertion loss (dB, Max.)	0.2
Isolation (dB, Min.)	60

2. Small size
• Size: 20.5(L) × 12.4(W) × 9.4(H) mm
.807(L) × .488(W) × .370(H) inch
3. High sensitivity
• Nominal operating power: 200 mW
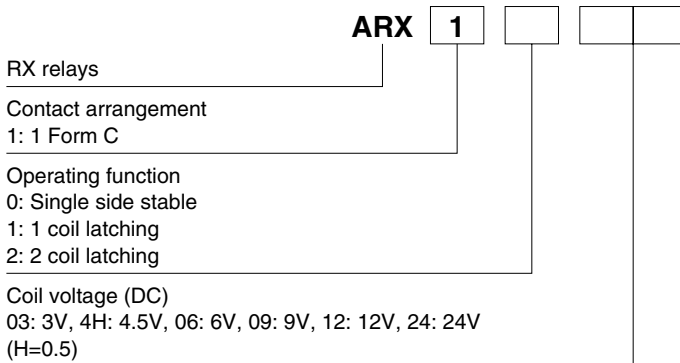### 4. Infrequent switching type is also available. Please inquire.

TYPICAL APPLICATIONS
• Cellular phone base station
• Cellular phone-related measurement devices (SP3T/SP4T switches, etc)
• Wireless LAN
• Wireless Local Loop

If you wish to use in applications with low level loads or with high frequency switching, please consult us.

ORDERING INFORMATION

ARX **1** ☐ ☐ ☐

RX relays

Contact arrangement
1: 1 Form C

Operating function
0: Single side stable
1: 1 coil latching
2: 2 coil latching

Coil voltage (DC)
03: 3V, 4H: 4.5V, 06: 6V, 09: 9V, 12: 12V, 24: 24V
(H=0.5)

TYPES

Nominal coil voltage	Part No.		
	Single side stable	1 coil latching	2 coil latching
3 V DC	ARX1003	ARX1103	ARX1203
4.5V DC	ARX104H	ARX114H	ARX124H
6 V DC	ARX1006	ARX1106	ARX1206
9 V DC	ARX1009	ARX1109	ARX1209
12 V DC	ARX1012	ARX1112	ARX1212
24 V DC	ARX1024	ARX1124	ARX1224

Standard packing: 50 pcs. in an inner package; 500 pcs. in an outer package

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RX (ARX)

RATING

1. Coil data

1) Single side stable

Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 60°C 140°F)
3 V DC			66.7mA	45 Ω		
4.5V DC			44.4mA	101 Ω		
6 V DC	75%V or less of nominal voltage (Initial)	10%V or more of nominal voltage (Initial)	33.3mA	180 Ω	200mW	110%V of nominal voltage
9 V DC			22.2mA	405 Ω		
12 V DC			16.7mA	720 Ω		
24 V DC			8.3mA	2,880 Ω		

2) 1 coil latching type

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 60°C 140°F)
3 V DC			66.7mA	45 Ω		
4.5V DC			44.4mA	101 Ω		
6 V DC	75%V or less of nominal voltage (Initial)	75%V or less of nominal voltage (Initial)	33.3mA	180 Ω	200mW	110%V of nominal voltage
9 V DC			22.2mA	405 Ω		
12 V DC			16.7mA	720 Ω		
24 V DC			8.3mA	2,880 Ω		

3) 2 coil latching type

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 60°C 140°F)
3 V DC			133.3mA	22.5Ω		
4.5V DC			88.9mA	50.6Ω		
6 V DC	75%V or less of nominal voltage (Initial)	75%V or less of nominal voltage (Initial)	66.7mA	90 Ω	400mW	110%V of nominal voltage
9 V DC			44.4mA	202.5Ω		
12 V DC			33.3mA	360 Ω		
24 V DC			16.7mA	1,440 Ω		

2. Specifications

Characteristics	Item		Specifications
Contact	Arrangement		1 Form C
	Contact material		Stationary: Gold plating, Movable: Gold clad
	Initial contact resistance, max.		Max. 100mΩ (By voltage drop 10V AC 10mA)
Rating	Contact rating		10W (2.5GHz, Impedance 50Ω, V.S.W.R. ≦ 1.2) 10mA 24V DC (resistive load)
	Contact carrying power		Max. 20W (at 2.5GHz, Impedance 50Ω, V.S.W.R. ≦ 1.2, Average)
	Max. switching voltage		30V DC
	Max. switching current		0.5A DC
	Nominal operating power	Single side stable	200mW
		1 coil latching	200mW
		2 coil latching	400mW
High frequency characteristics (Initial) (~2.5GHz, Impedance 50Ω)	V.S.W.R. (Return loss)		Max. 1.2 (Min. 20.8dB)
	Insertion loss		Max. 0.2dB
	Isolation		Min. 60dB
	Input power		Max. 20W (at 40°C, V.S.W.R. ≦ 1.2, Average)
Electrical characteristics	Insulation resistance (Initial)		Min. 100MΩ (at 500V DC) Measurement at same location as "Initial breakdown voltage" section.
	Breakdown voltage (Initial)	Between open contacts	500 Vrms for 1min. (Detection current: 10mA)
		Between contact and coil	1,000 Vrms for 1min. (Detection current: 10mA)
		Between contact and earth terminal	500 Vrms for 1min. (Detection current: 10mA)
	Temperature rise (at 20°C)		Max. 60°C (By resistive method, nominal voltage applied to the coil: Contact carrying power: 20W, at 2.5GHz, Impedance 50Ω, V.S.W.R. ≦ 1.2)
	Operate time [Set time] (at 20°C)		Max. 10ms (Approx. 6ms) [Max. 10ms (Approx. 5ms)] (Nominal operating voltage applied to the coil, excluding contact bounce time.)
	Release time [Reset time] (at 20°C)		Max. 6ms (Approx. 3ms) [Max. 10ms (Approx. 5ms)] (Nominal operating voltage applied to the coil, excluding contact bounce time.) (without diode)
Mechanical characteristics	Shock resistance	Functional	Min. 200 m/s² {20 G} (Half-wave pulse of sine wave: 11ms; detection time: 10μs.)
		Destructive	Min. 1,000m/s² {100 G} (Half-wave pulse of sine wave: 6ms.)
	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 3mm (Detection time: 10μs.)
		Destructive	10 to 55 Hz at double amplitude of 5mm
Expected life	Mechanical		Min. 5×10⁶ (at 180 cpm)
	Electrical		Min. 10⁵ (10W 2.5 GHz, Impedance 50Ω, V.S.W.R. ≦ 1.2) Min. 3×10⁵ (10mA 24V DC resistive load)
Conditions	Conditions for operation, transport and storage*		Ambient temperature: –40°C to +70°C –40°F to +158°F Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)
Unit weight			Approx. 5 g .18 oz

Note: * The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. Refer to [6] AMBIENT ENVIRONMENT in GENERAL APPLICATION GUIDELINES.
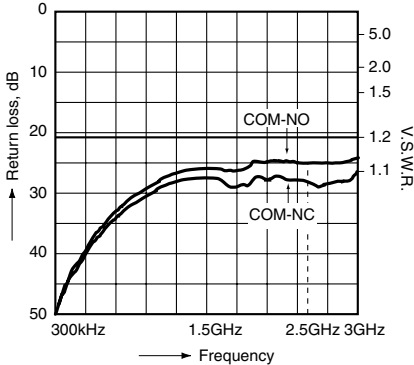
REFERENCE DATA

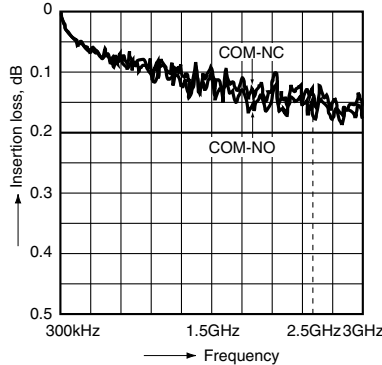1. High frequency characteristics
Sample: ARX1012
Measuring method: Measured with HP network analyzer (HP8753C).

The details for the high frequency characteristics and the measurement
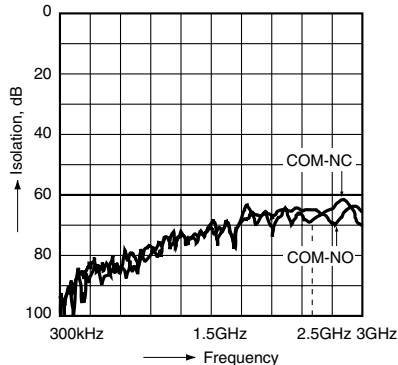procedures and conditions are listed in the RX relay test report.

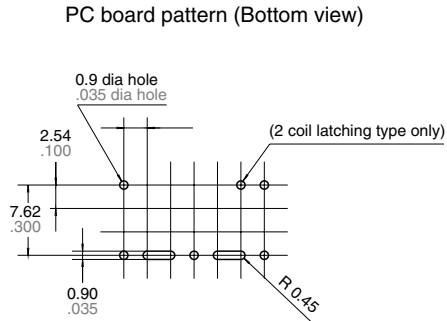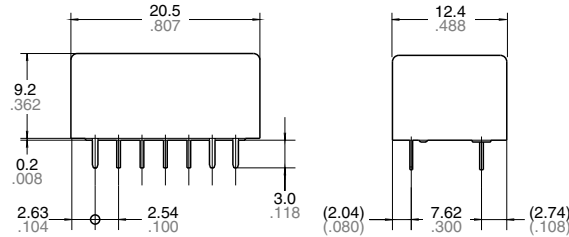• V.S.W.R. (Return loss)

• Insertion loss
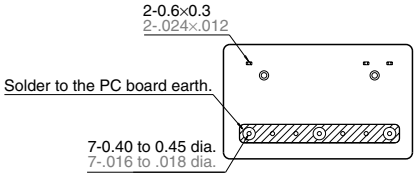
• Isolation

DIMENSIONS (mm inch)

The CAD data of the products with a **CAD Data** mark can be downloaded from: http://panasonic-electric-works.net/ac

CAD Data

PC board pattern (Bottom view)

20.5 .807
12.4 .488
9.2 .362
0.2 .008
2.63 .104
2.54 .100
3.0 .118
(2.04) (.080)
7.62 .300
(2.74) (.108)

0.9 dia hole
.035 dia hole
2.54 .100
7.62 .300
(2 coil latching type only)
0.90 .035
R 0.45

Tolerance: ±0.1 ±.004

General tolerance: ±0.3 ±.012

2-0.6×0.3
2-.024×.012
Solder to the PC board earth.
7-0.40 to 0.45 dia.
7-.016 to .018 dia.

Schematic (Bottom view)

Single side stable — (Deenergized condition)
1 coil latching — (Reset condition)
2 coil latching — (Reset condition)
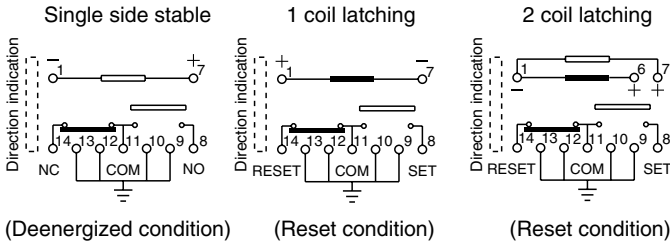
RX (ARX)

NOTES

1. 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 30 ms to set/reset the latching type relay.

2. Coil connection
When connecting coils, refer to the wiring diagram to prevent mis-operation or malfunction.

3. External magnetic field
Since RX relays are highly sensitive polarized relays, their characteristics will be affected by a strong external magnetic field. Avoid using the relay under that condition.

4. Cleaning
For automatic cleaning, the boiling method is recommended. Avoid ultrasonic cleaning which subjects the relays to high frequency vibrations, which may cause the contacts to stick.
It is recommended that a fluorinated hydrocarbon or other alcoholic solvents be used.

5. Soldering
The manual soldering shall be performed under following condition.
Max. 260°C 500°F 10s
Max. 350°C 662°F 3s
In addition, when soldering the case to the PC board, the plating may swell depending on the soldering conditions.

6. Conditions for operation, transport and storage conditions
1) Ambient temperature, humidity, and atmospheric pressure during usage, transport, and storage of the relay:
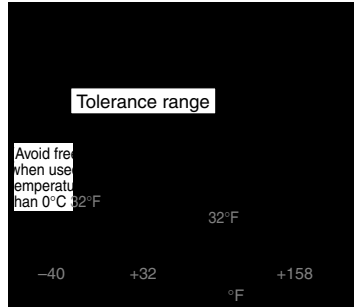(1) Temperature:
–40 to +70°C –40 to +158°F
(2) Humidity: 5 to 85% RH
(Avoid freezing and condensation.)
The humidity range varies with the temperature. Use within the range indicated in the graph below.
(3) Atmospheric pressure: 86 to 106 kPa
Temperature and humidity range for usage, transport, and storage:

2) Condensation
Condensation forms when there is a sudden change in temperature under high temperature and high humidity conditions. Condensation will cause deterioration of the relay insulation.
3) Freezing
Condensation or other moisture may freeze on the relay when the temperature is lower than 0°C 32°F. This causes problems such as sticking of movable parts or operational time lags.

4) Low temperature, low humidity environments
The plastic becomes brittle if the relay is exposed to a low temperature, low humidity environment for long periods of time.

7. Latching relay
In order to assure proper operating regardless of changes in the ambient usage temperature and usage conditions, nominal operating voltage should be applied to the coil for more than 30 ms to set/reset the latching type relay.

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