

## New Product Introduction

July 28, 2010

### ARV Coaxial Switches: 26.5 GHz and Failsafe Versions



#### 1. Features:

- 26.5 GHz and Failsafe versions are now available.

##### • PIN type

| Frequency          | 8GHz               | 18GHz              | 26.5GHz |
|--------------------|--------------------|--------------------|---------|
| Operating function |                    |                    |         |
| Failsafe type      | New                | New                | –       |
| Latching type      | Available for sale | Available for sale | –       |

##### • SMA type

| Frequency          | 8GHz               | 18GHz              | 26.5GHz |
|--------------------|--------------------|--------------------|---------|
| Operating function |                    |                    |         |
| Failsafe type      | New                | New                | New     |
| Latching type      | Available for sale | Available for sale | New     |

- Excellent high frequency characteristics (to 8, 18, 26.5GHz, 50Ω)
- Compact size (Approx.85% less volume compared to previous product.\*)  
PIN type size: L 15.9 x W 15.9 x H 11.2 mm  
L 0.626 x W 0.626 x H 0.441 inch  
\*Compared to previous product (ARD coaxial switch) and PIN type ARV coaxial switch.
- Terminal shape options available (PIN and SMA)\*\*  
\*\*For SMP connector type, please contact us.
- Contact arrangement: SPDT (Standard/Reverse contact)

## 2. 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

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## 3. Effective: July 2010 production basis

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## 4. Product Types: PDF datasheet is attached.

### to 8 GHz type

| Operating function | Contact terminal shape | Nominal operating voltage | Standard contact type    |                       | Reverse contact type     |                       |
|--------------------|------------------------|---------------------------|--------------------------|-----------------------|--------------------------|-----------------------|
|                    |                        |                           | No HF datasheet attached | HF datasheet attached | No HF datasheet attached | HF datasheet attached |
| Failsafe type      | PIN type               | 4.5 V DC                  | ARV10N4H                 | ARV10N4HQ             | ARV13N4H                 | ARV13N4HQ             |
|                    |                        | 12 V DC                   | ARV10N12                 | ARV10N12Q             | ARV13N12                 | ARV13N12Q             |
|                    |                        | 24 V DC                   | ARV10N24                 | ARV10N24Q             | ARV13N24                 | ARV13N24Q             |
|                    | SMA type               | 4.5 V DC                  | ARV10A4H                 | ARV10A4HQ             | ARV13A4H                 | ARV13A4HQ             |
|                    |                        | 12 V DC                   | ARV10A12                 | ARV10A12Q             | ARV13A12                 | ARV13A12Q             |
|                    |                        | 24 V DC                   | ARV10A24                 | ARV10A24Q             | ARV13A24                 | ARV13A24Q             |

### to 18 GHz type

| Operating function | Contact terminal shape | Nominal operating voltage | Standard contact type    |                       | Reverse contact type     |                       |
|--------------------|------------------------|---------------------------|--------------------------|-----------------------|--------------------------|-----------------------|
|                    |                        |                           | No HF datasheet attached | HF datasheet attached | No HF datasheet attached | HF datasheet attached |
| Failsafe type      | PIN type               | 4.5 V DC                  | ARV20N4H                 | ARV20N4HQ             | ARV23N4H                 | ARV23N4HQ             |
|                    |                        | 12 V DC                   | ARV20N12                 | ARV20N12Q             | ARV23N12                 | ARV23N12Q             |
|                    |                        | 24 V DC                   | ARV20N24                 | ARV20N24Q             | ARV23N24                 | ARV23N24Q             |
|                    | SMA type               | 4.5 V DC                  | ARV20A4H                 | ARV20A4HQ             | ARV23A4H                 | ARV23A4HQ             |
|                    |                        | 12 V DC                   | ARV20A12                 | ARV20A12Q             | ARV23A12                 | ARV23A12Q             |
|                    |                        | 24 V DC                   | ARV20A24                 | ARV20A24Q             | ARV23A24                 | ARV23A24Q             |

### to 26.5 GHz type

| Operating function | Contact terminal shape | Nominal operating voltage | Standard contact type    |                       | Reverse contact type     |                       |
|--------------------|------------------------|---------------------------|--------------------------|-----------------------|--------------------------|-----------------------|
|                    |                        |                           | No HF datasheet attached | HF datasheet attached | No HF datasheet attached | HF datasheet attached |
| Failsafe type      | SMA type               | 4.5 V DC                  | ARV30A4H                 | ARV30A4HQ             | ARV33A4H                 | ARV33A4HQ             |
|                    |                        | 12 V DC                   | ARV30A12                 | ARV30A12Q             | ARV33A12                 | ARV33A12Q             |
|                    |                        | 24 V DC                   | ARV30A24                 | ARV30A24Q             | ARV33A24                 | ARV33A24Q             |
| Latching type      | SMA type               | 4.5 V DC                  | ARV32A4H                 | ARV32A4HQ             | —                        | —                     |
|                    |                        | 12 V DC                   | ARV32A12                 | ARV32A12Q             | —                        | —                     |
|                    |                        | 24 V DC                   | ARV32A24                 | ARV32A24Q             | —                        | —                     |

## 5. Rating:

### Coil data

#### 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 [±10%] (at 20°C 68°F) | Coil resistance [±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) | 155.7mA                                         | 28.9Ω                                 | 700mW                   | 110%V of nominal voltage             |
| 12 V DC                   |                                             |                                             | 58.3mA                                          | 205.7Ω                                |                         |                                      |
| 24 V DC                   |                                             |                                             | 29.2mA                                          | 822.9Ω                                |                         |                                      |

#### 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 [±10%] (at 20°C 68°F) | Coil resistance [±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) | 155.7mA                                         | 28.9Ω                                 | 700mW                   | 110%V of nominal voltage             |
| 12 V DC                   |                                             |                                             | 58.3mA                                          | 205.7Ω                                |                         |                                      |
| 24 V DC                   |                                             |                                             | 29.2mA                                          | 822.9Ω                                |                         |                                      |

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

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

## 6. Specifications:

| Characteristics                                | Item                                              |                                    | Specifications                                                                                                                                                 |            |                 |                  |                             |                 |                  |                  |
|------------------------------------------------|---------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------|------------------|-----------------------------|-----------------|------------------|------------------|
| Contact                                        | Arrangement                                       |                                    | SPDT                                                                                                                                                           |            |                 |                  |                             |                 |                  |                  |
|                                                | Contact material                                  |                                    | Gold plating                                                                                                                                                   |            |                 |                  |                             |                 |                  |                  |
|                                                | Contact resistance (Initial)                      |                                    | Max. 100mΩ (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 50Ω) |                                                   |                                    | PIN type*2                                                                                                                                                     |            |                 |                  | SMA type                    |                 |                  |                  |
|                                                | Frequency                                         |                                    | 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 MΩ (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: 10μs.)                                                                          |            |                 |                  |                             |                 |                  |                  |
|                                                |                                                   | 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: 10μs.)                                                                                                 |            |                 |                  |                             |                 |                  |                  |
|                                                |                                                   | 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 × 10 <sup>5</sup> (1W High frequency load, at 3GHz, impedance 50Ω, 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<br>Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)<br>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.

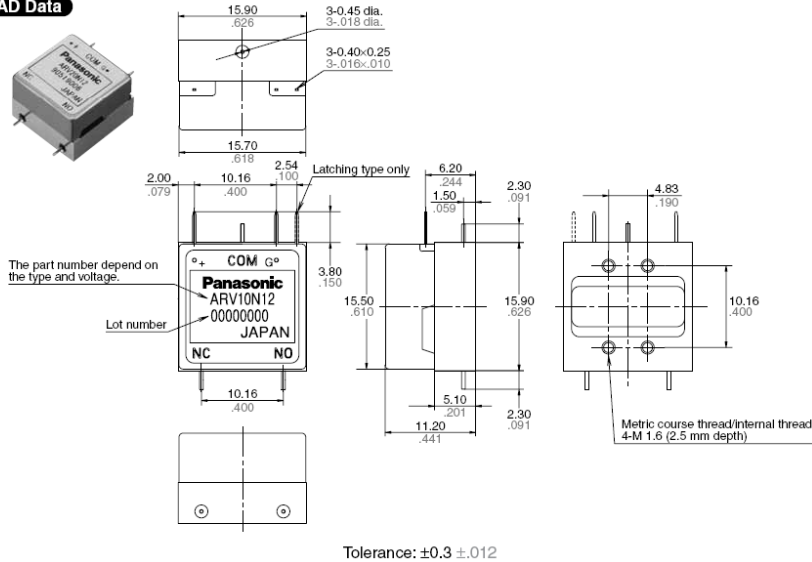
\*6. The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. Refer to "NOTES".

## 7. Dimensions (mm inch):

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

### 1. PIN type

**CAD Data**

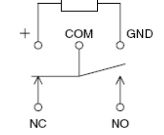


### Schematic (Top view)

<Standard contact>

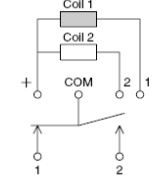
Failsafe type

(Deenergized condition)



Latching type

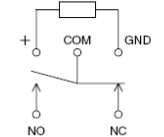
(Reset condition)



<Reverse contact>

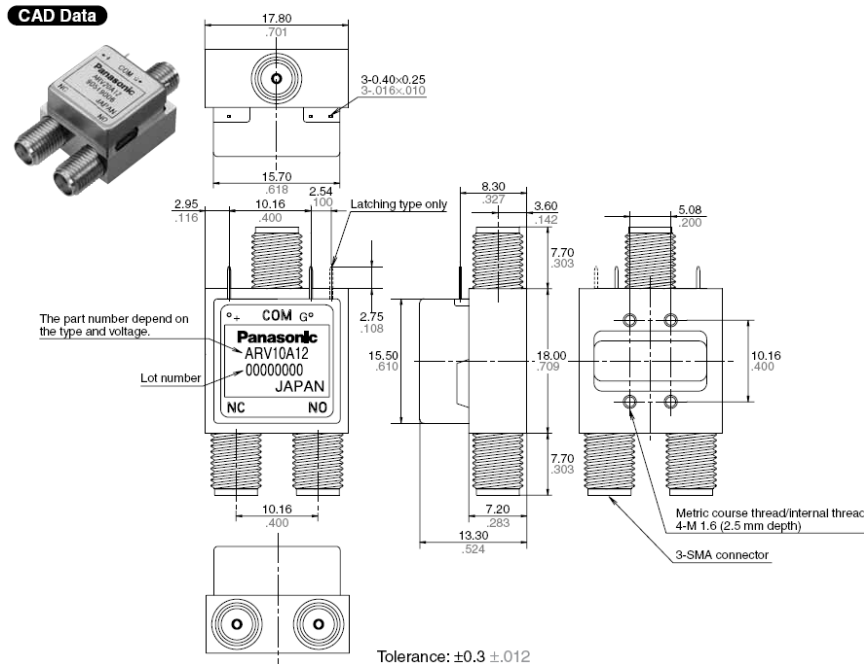
Failsafe type

(Deenergized condition)



### 2. SMA type

**CAD Data**

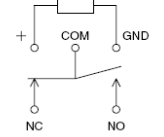


### Schematic (Top view)

<Standard contact>

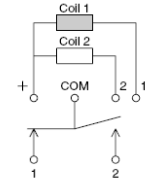
Failsafe type

(Deenergized condition)



Latching type

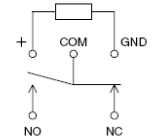
(Reset condition)



<Reverse contact>

Failsafe type

(Deenergized condition)



\*For SMP connector type, please consult us.

Any questions, please contact your local Panasonic Electric Works Sales representatives.

Ref#: M-388