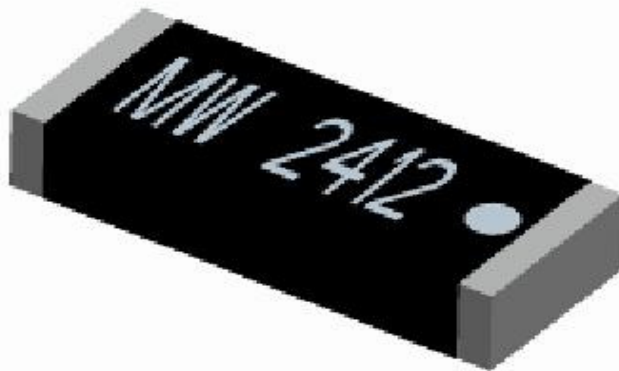


## 2.4GHz Chip Antenna

### 1. Explanation of Product Number

|   |   |     |     |     |     |     |     |   |   |   |   |   |   |   |
|---|---|-----|-----|-----|-----|-----|-----|---|---|---|---|---|---|---|
| R | A | 0   | 0   | L   | P   | F   | A   | 0 | 0 | M | A | 0 | 0 | 0 |
|   |   | (1) | (2) | (3) | (4) | (5) | (6) |   |   |   |   |   |   |   |



✖ The direction of white dot forwards to feed point

Product Code:

(1) Dimensions:

00: 5.0x2.0x1.0(mm)

(2) Polarization:

L: Linear Polarization

(3) Product categories:

PF: Polymer Substrate

(4) Working frequency:

A: 2400~2500MHz

(5) Applications::

00: WiFi IEEE802.11 b/g / Bluetooth / ZigBee

(6) Antenna series:

MA000: serial number

|                                                                                                                                    |                    |                                                                                                                                                                                           |                            |
|------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>Tolerances (Unless otherwise specified)</b><br>X : $\pm 1$ X.X : $\pm 0.1$ X.XX : $\pm 0.01$<br>Angle : $\pm$ Hole Dia. : $\pm$ |                    |  <b>RIFO Technologies Corporation</b><br>Website: <a href="http://www.rifo.com.tw">www.rifo.com.tw</a> |                            |
| Scale :                                                                                                                            | Unit : mm          | THIS SPECIFICATION IS THE PROPERTY OF RIFO TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED IN ALL CIRCUMSTANCES WITHOUT WRITTEN PERMISSION                                   |                            |
| Prepared By : Helen                                                                                                                | Checked By :Jeff   |                                                                                                                                                                                           |                            |
| Designed By :Jason                                                                                                                 | Approved By :Allen |                                                                                                                                                                                           |                            |
| TITLE : 2.4GHz Chip Antenna                                                                                                        |                    | DOCUMENT NO.                                                                                                                                                                              | RA00LPFA00MA000S<br>REV. A |

## 2. Features

- \*Stable and reliable in performances
- \*Compact size
- \*ROHS compliance
- \*Low temperature coefficient of frequency
- \*SMD type

## 3. Applications

- \*WiFi IEEE802.11 b/g / Bluetooth / ZigBee
- \*2.4GHz Wireless Devices

## 4. Description

RIFO's chip antenna series are specially designed for 2.4GHz band application. Based on RIFO's proprietary designs and processes, this chip antenna has excellent stability and sensitivity to consistently provide high signal reception efficiency.

## 5. Electrical Specifications

| No | Item                      | SPEC.       | Unit     |
|----|---------------------------|-------------|----------|
| 1  | Dimensions (LxWxH)        | 5.0x2.0x1.0 | mm       |
| 2  | Operating Frequency Range | 2400~2500   | MHz      |
| 3  | VSWR                      | 2 max.      |          |
| 4  | Impedance                 | 50          | $\Omega$ |
| 5  | Polarization              | Linear      |          |
| 6  | Peak gain                 | 3.2 typ.    | dBi      |
| 7  | Efficiency                | 61 typ.     | %        |
| 8  | Operating Temperature     | -40~85      | °C       |

\*The antenna performance is measured on 40x20mm test Board.

\*Center frequency will be offset to operating frequency according to the conditions of user's ground plane and radome.

### Tolerances (Unless otherwise specified)

X :  $\pm 1$       X.X :  $\pm 0.1$       X.XX :  $\pm 0.01$

Angle :  $\pm$       Hole Dia. :  $\pm$

Scale :      Unit : mm

Prepared By : Helen      Checked By : Jeff

Designed By : Jason      Approved By : Allen



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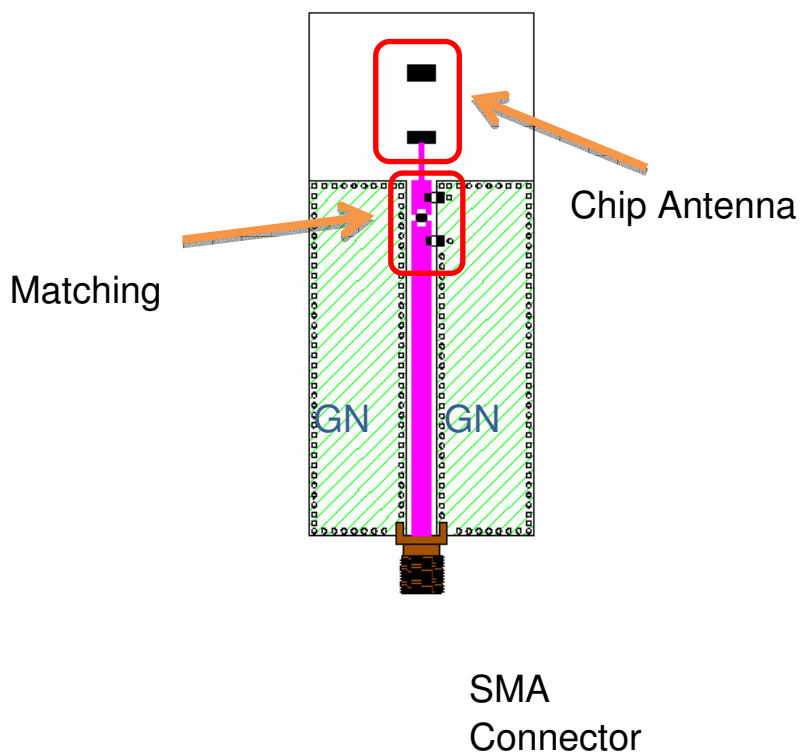
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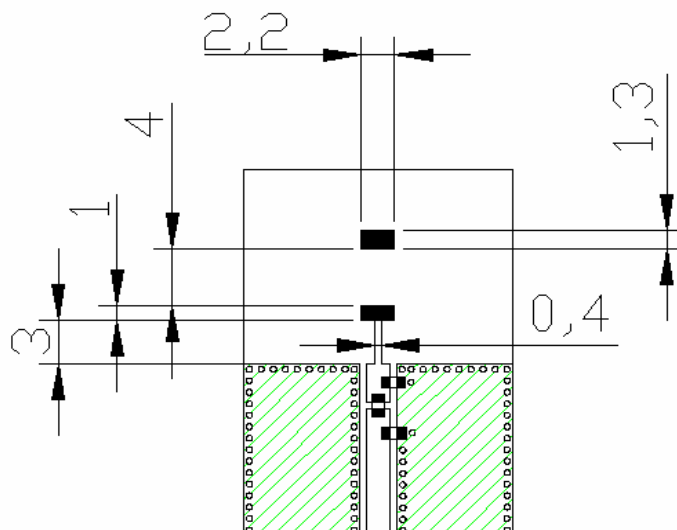
## 6. PCB Design for Measurement

### 6.1 Test Board Dimension



- ※ Test Board size is 40\*20mm
- ※ Ground plane size is 30\*20mm

### 6.2 PCB Design Guide



#### Tolerances (Unless otherwise specified)

X :  $\pm 1$       X.X :  $\pm 0.1$       X.XX :  $\pm 0.01$

Angle :  $\pm$       Hole Dia. :  $\pm$



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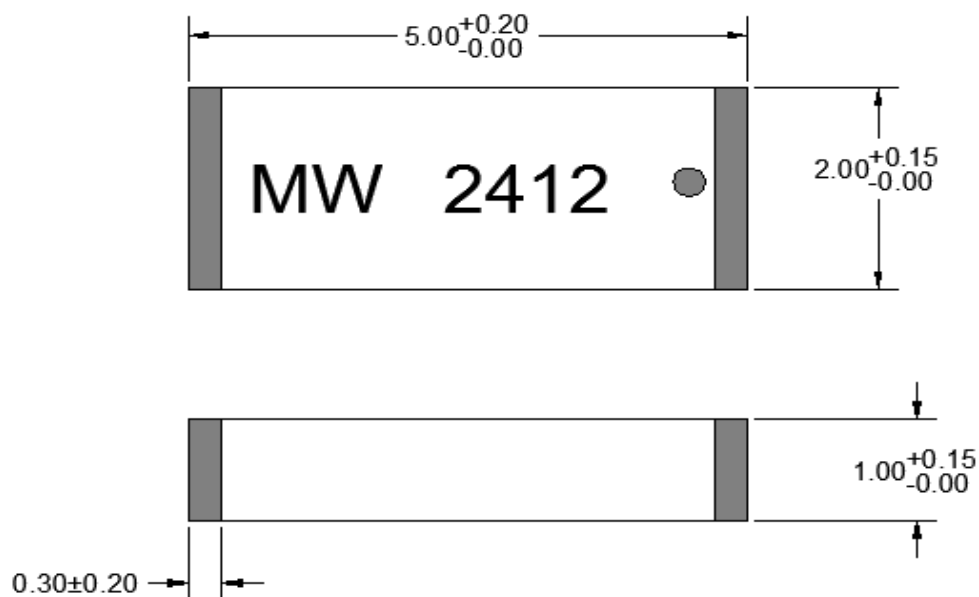
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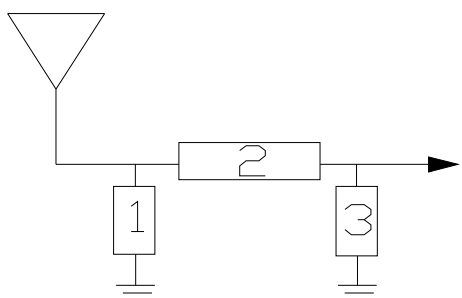
## 6. Antenna Dimensions(unit:mm)



## 8. Measurement Result

### 8.1 Matching circuit

#### Antenna



| System Matching Circuit Component |             |          |
|-----------------------------------|-------------|----------|
| Location                          | Description | Vendor   |
| Antenna                           | 502010      | MW       |
| 1                                 | NC          |          |
| 2                                 | 2.7nH       | 0402 TDK |
| 3                                 | 1.2pf       | 0402TDK  |

#### Tolerances (Unless otherwise specified)

X :  $\pm 1$       X.X :  $\pm 0.1$       X.XX :  $\pm 0.01$

Angle :  $\pm$       Hole Dia. :  $\pm$



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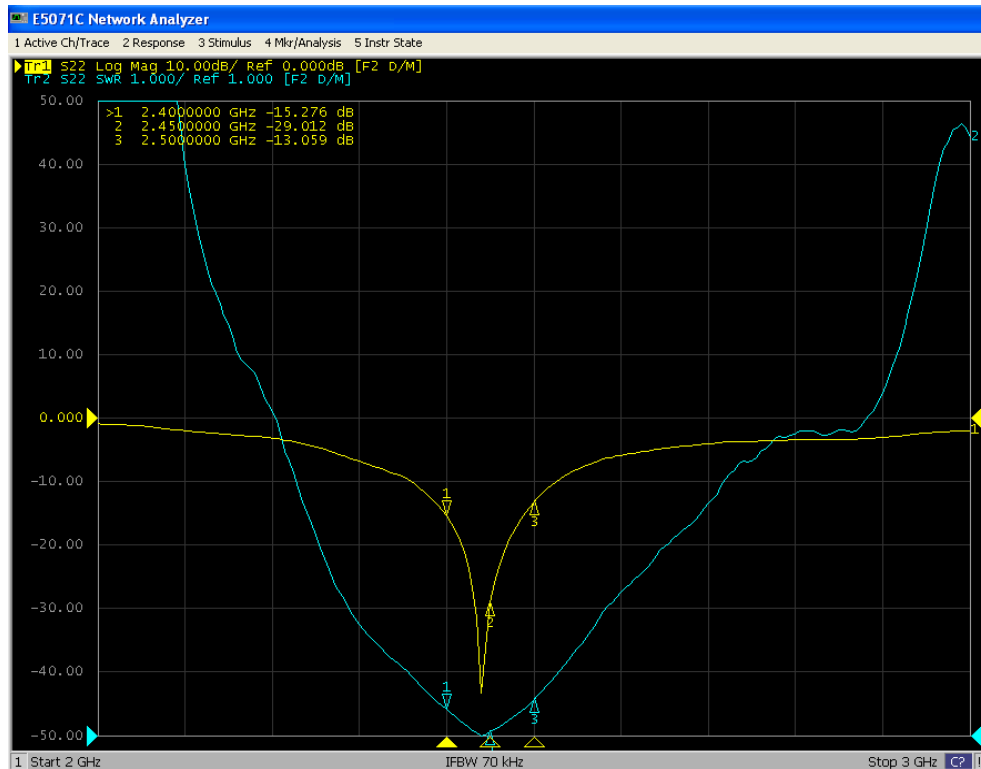
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## 8.2 Return Loss (S11 / VSWR)



|         | 2.4GHz | 2.45GHz | 2.5GHz |
|---------|--------|---------|--------|
| S11(dB) | -16    | -29     | -14    |
| VSWR    | 1.4    | 1.1     | 1.5    |

### Tolerances (Unless otherwise specified)

X :  $\pm 1$       X.X :  $\pm 0.1$       X.XX :  $\pm 0.01$

Angle :  $\pm$       Hole Dia. :  $\pm$

Scale :      Unit : mm

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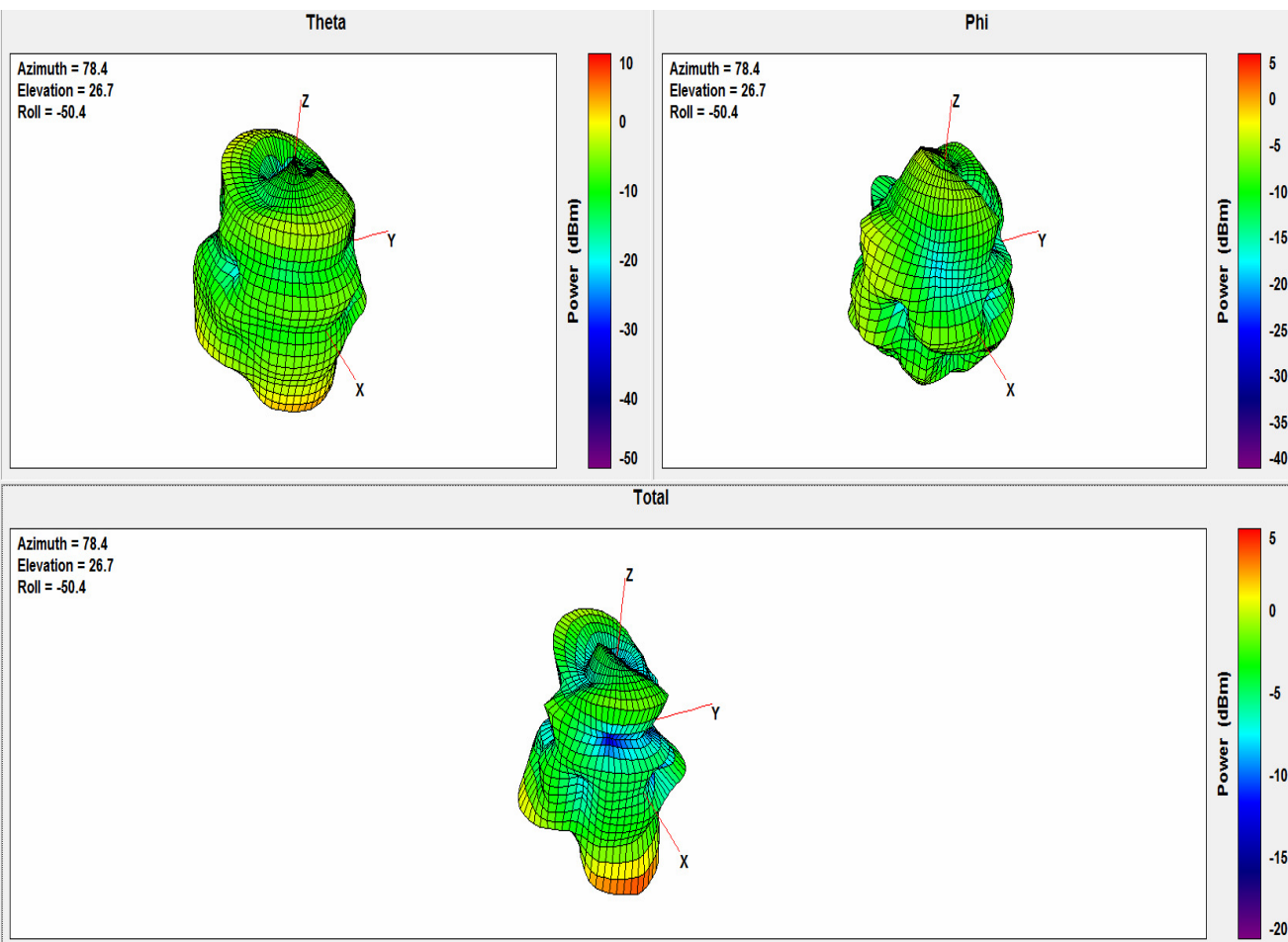
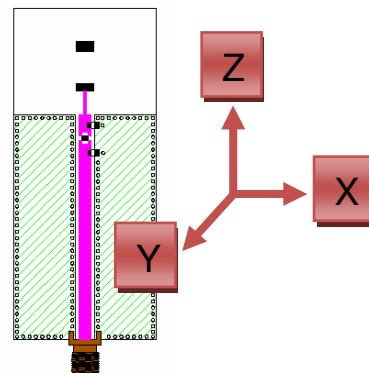
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## 9. Radiation Pattern(@2450MHz)



|                | X-Y plane | Y-Z plane | X-Z plane |
|----------------|-----------|-----------|-----------|
| Avg. gain(dBi) | -2.95     | -0.61     | -2.03     |
| Peak gain(dBi) | 1.43      | 3.20      | 2.18      |

### Tolerances (Unless otherwise specified)

X :  $\pm 1$       X.X :  $\pm 0.1$       X.XX :  $\pm 0.01$

Angle :  $\pm$       Hole Dia. :  $\pm$

Scale :      Unit : mm

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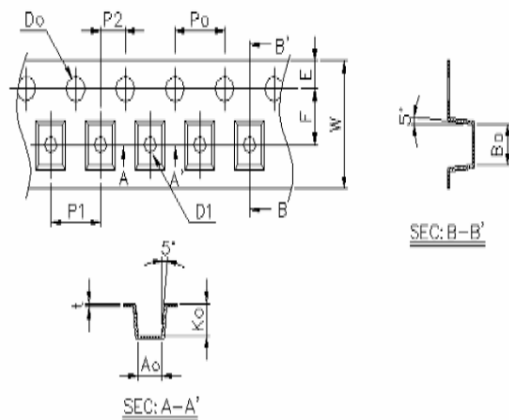
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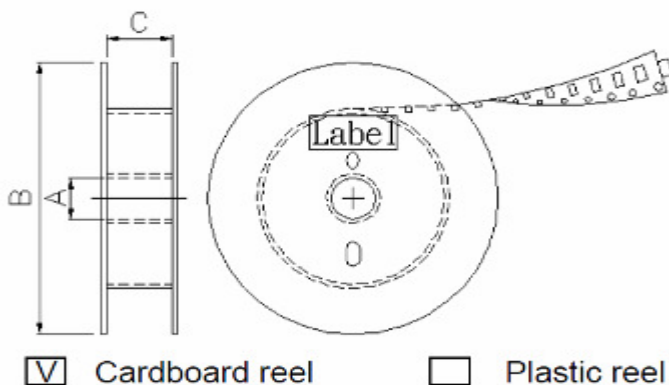
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## 10. Package

### 5.1 Dimension (Unit: mm)



### 5.2 Reel & Packing Specification



| Item    | Specifications | Tolerance<br>s |
|---------|----------------|----------------|
| W       | 12.00          | $\pm 0.20$     |
| E       | 1.75           | $\pm 0.10$     |
| F       | 5.50           | $\pm 0.05$     |
| D0      | 1.50           | $+0.10, -0$    |
| D1      | 1.50           | $\pm 0.10$     |
| P0      | 4.00           | $\pm 0.05$     |
| P1      | 4.00           | $\pm 0.10$     |
| P2      | 2.00           | $\pm 0.05$     |
| P0 x 10 | 40.00          | $\pm 0.20$     |
| t       | 0.25           | $\pm 0.05$     |
| A0      | 2.20           | $\pm 0.10$     |
| B0      | 5.10           | $\pm 0.10$     |
| K0      | 1.40           | $\pm 0.10$     |

Product code: 1101 - Polycarbonate natural transparent.  
1201 - Polycarbonate conductive black.  
Surface resistivity 10E4 to E6 ohm/sq.

| Reel Dimensions |     |    |
|-----------------|-----|----|
| A               | 77  | mm |
| B               | 560 | mm |
| C               | 96  | mm |

| Packing       |     |        |
|---------------|-----|--------|
| Length / Roll | 700 | meters |
| Each Carton   | 3   | rolls  |

| Carton Dimension (mm) |                      |  |
|-----------------------|----------------------|--|
| V                     | 575(L)*345(W)*585(H) |  |

#### Tolerances (Unless otherwise specified)

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