

# 天 線

Pcb ANTENNA

## SPECIFICATION

产 品 型 号   Rider 15

P a r t N u m b e r

|       |  |     |      |
|-------|--|-----|------|
| 用户名称  |  | 版本号 | V1.1 |
| 发送日期  |  | 拟 制 |      |
| 发 送 人 |  | 审 核 |      |
| 页 数   |  | 批 准 |      |

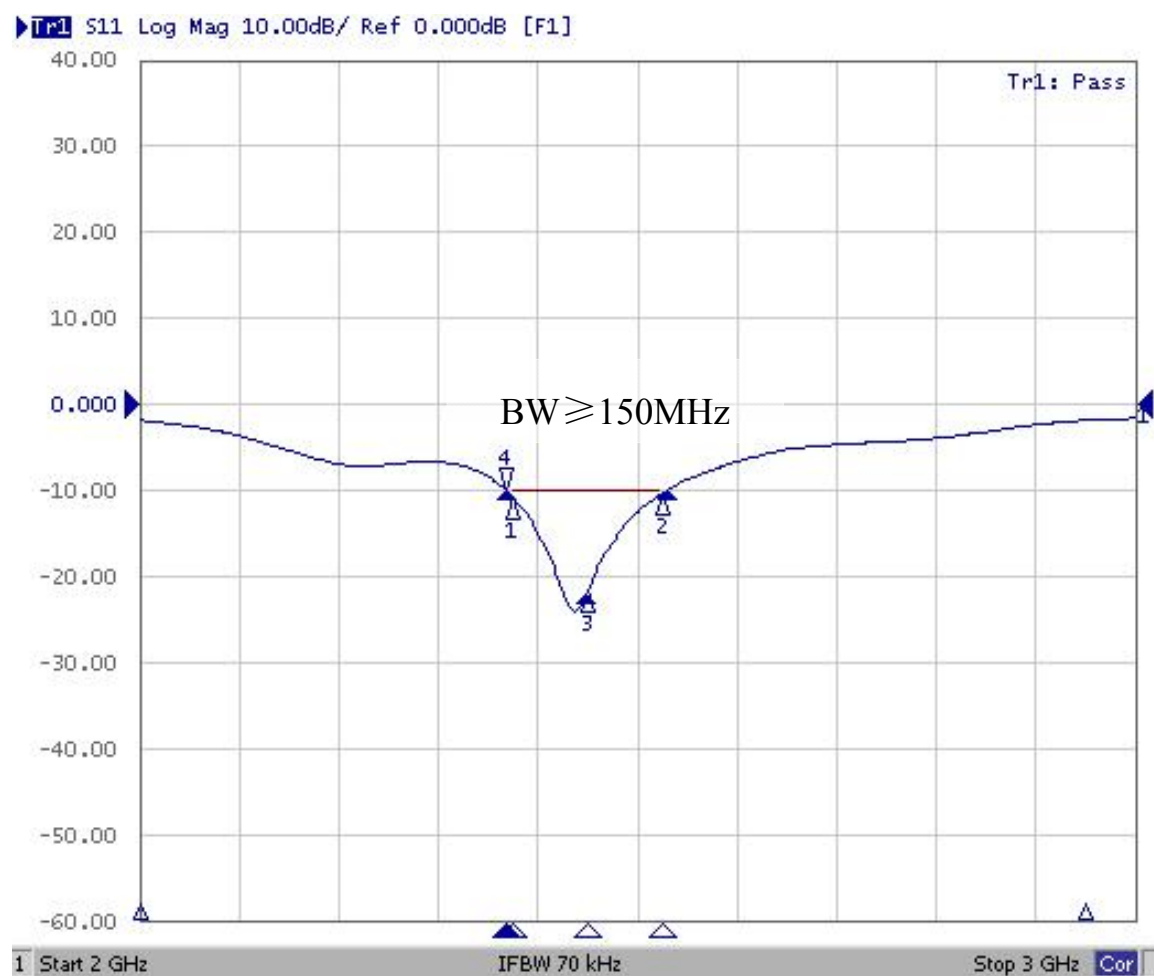
## 电气性能

## Electrical Characteristics

\*本天线在应用 PCB 上通过设计匹配电路，将天线工作频率调整到 2.45GHz 中心工作频率。

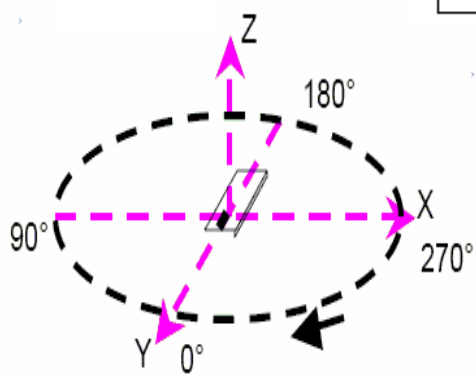
| No. | Item (项目)                        | Specifications (特性)           |
|-----|----------------------------------|-------------------------------|
| 5.1 | Working Central Frequency 中心工作频率 | 2450 MHz                      |
| 5.2 | Band Width 通带宽度                  | $\pm 75$ MHz ( 2375~2525MHz ) |
| 5.3 | Gain 增益                          | 0 dBi                         |
| 5.4 | V.S.W.R (in BW) 驻波比              | $\leq 2.0$                    |
| 5.5 | Polarization 极化方式                | Linear 线性                     |
| 5.6 | Azimuth Beam width 方位角           | Omni-directional 全向           |
| 5.7 | Impedance 阻抗                     | 50 $\Omega$                   |

## 特性曲线 Characteristic curve

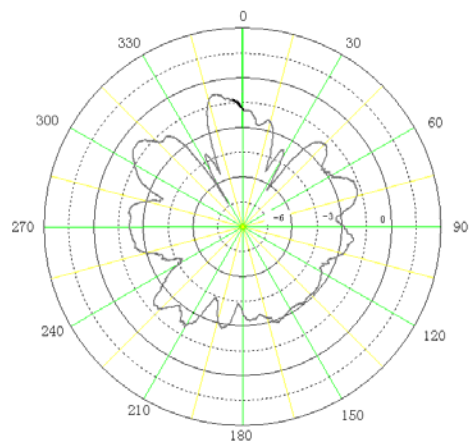


# 方向图      Radiation Pattern

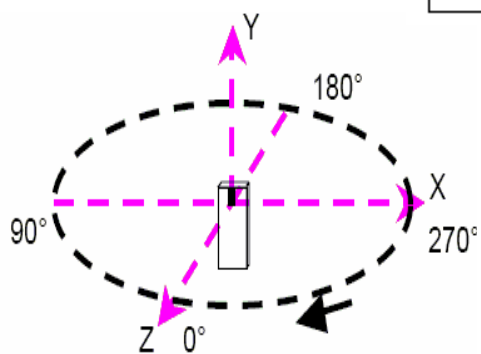
XY-V/XY-H



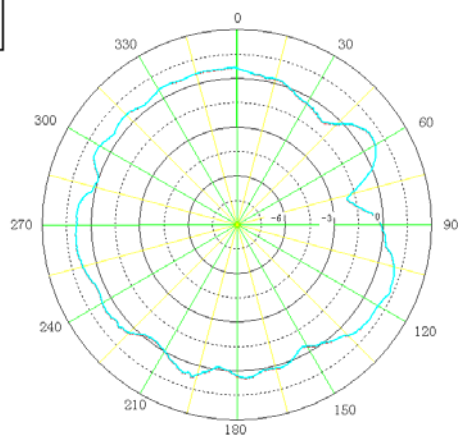
XY cut @2.45GHz  
 — Vertical  
 ..... Horizontal



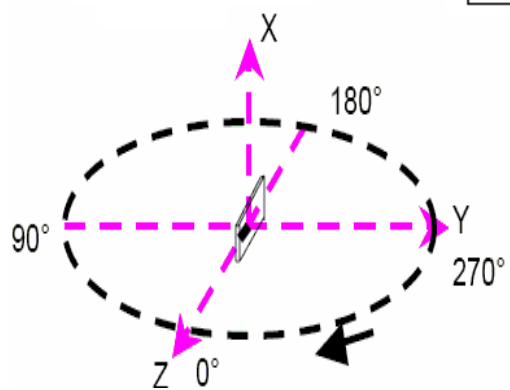
XZ-V/XZ-H



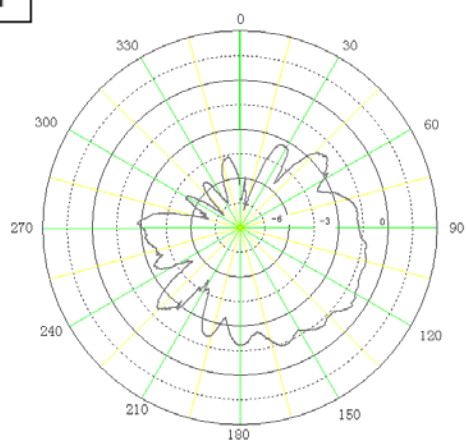
XZ cut @2.45GHz  
 — Vertical  
 ..... Horizontal



YZ-V/YZ-H



XZ cut @2.45GHz  
 — Vertical  
 ..... Horizontal



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| PRODUCT NAME | DCAK0012         | VERSION     | 06         |                                                                                    |   |
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# SPECIFICATION

**SPEC NO.** : SP03AE24425-0020  
**PART NO.** : 03A40D5M00J0210  
**PRODUCT NAME** : DCAK0012  
**DESCRIPTION** : Dielectric Chip Antenna  
(3.05x1.6x0.55 mm)  
ROHS Compliant Product

## REVISION STATUS

| VERSION | DATE       | PAGE  | REVISION DESCRIPTION                  | PREPARED | CHECKED | APPROVED |
|---------|------------|-------|---------------------------------------|----------|---------|----------|
| 01      | 2010.11.15 | Whole | New Issued                            | 徐嫚君      | 黃信嘉     | 徐偉泓      |
| 02      | 2011.03.16 | Whole | Modify P3 Antenna Dimension           | 徐嫚君      | 黃信嘉     | 黃信嘉      |
| 03      | 2011.03.23 | Whole | Modify P3 Antenna Dimension           | 徐嫚君      | 黃信嘉     | 黃信嘉      |
| 04      | 2011.05.27 | Whole | Modify P4 Position 1 Matching Circuit | 徐嫚君      | 吳佳宗     | 黃信嘉      |
| 05      | 2011.05.30 | Whole | Modify P3 Antenna Dimension           | 徐嫚君      | 吳佳宗     | 黃信嘉      |
| 06      | 2012.01.18 | Whole | Modify P17 Delivery mode              | 徐嫚君      | 曾建華     | 黃信嘉      |
|         |            |       |                                       |          |         |          |
|         |            |       |                                       |          |         |          |
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|         |            |       |                                       |          |         |          |
|         |            |       |                                       |          |         |          |

| Prepared By | Checked By | Approved By |
|-------------|------------|-------------|
| 徐嫚君         | 曾建華        | 黃信嘉         |

|              |                  |             |            |                                                                                    |   |
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## CIROCOMM TECHNOLOGY

PART NUMBER : 03A40D5M00J0210

### 1 SCOPE

This specification covers the **dielectric chip antenna** for **BT**

### 2 Name of the product

This product is named "**Dielectric Chip Antenna**".

### 3. Electrical characteristics

#### 3-1 Electrical characteristics of antenna

The antenna has the electrical characteristics given in Table 1 under the **cirocomm** standard installation conditions shown in the figure of Evaluation Board.

Table 1

| No | Parameter             | Specification    |
|----|-----------------------|------------------|
| 1  | Working Frequency     | 2442 MHz         |
| 2  | Dimension             | 3.05×1.6×0.55 mm |
| 3  | Return Loss           | < -10dB          |
| 4  | VSWR                  | 2.0max           |
| 5  | Peak Gain             | 1.0 dBi (typ)    |
| 6  | Polarization          | Linear           |
| 7  | Azimuth               | Omni-directional |
| 8  | Impedance             | 50 Ω             |
| 9  | Operating Temperature | -40~105℃         |

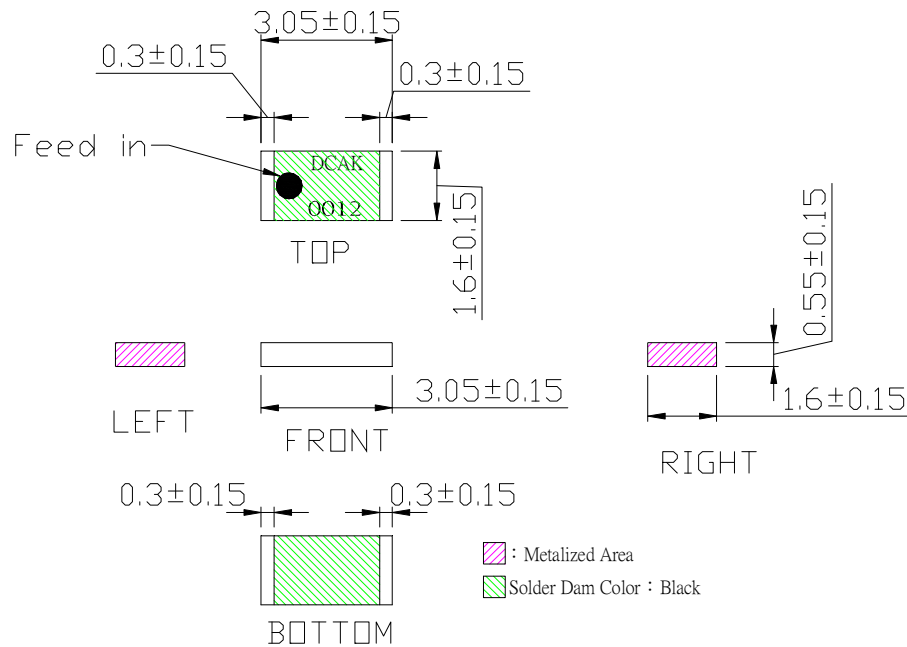
• Data is measured on **Cirocomm STD PCB**.



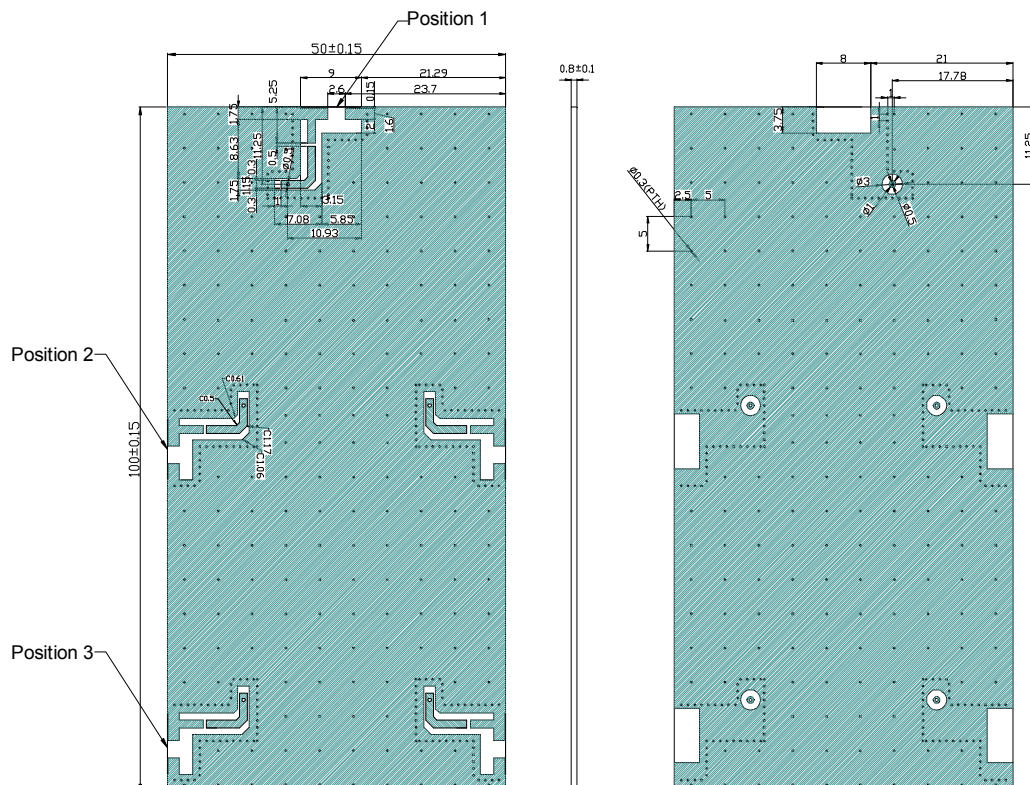
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#### 4. Antenna& Demo Board Dimension

##### 4-1 Antenna Dimension



##### 4-2 Demo Board Dimension



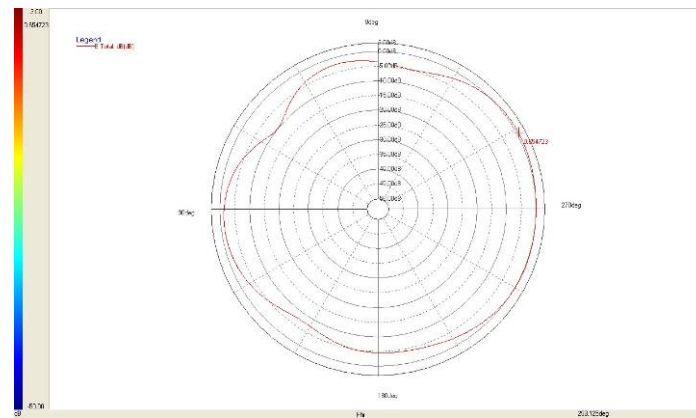




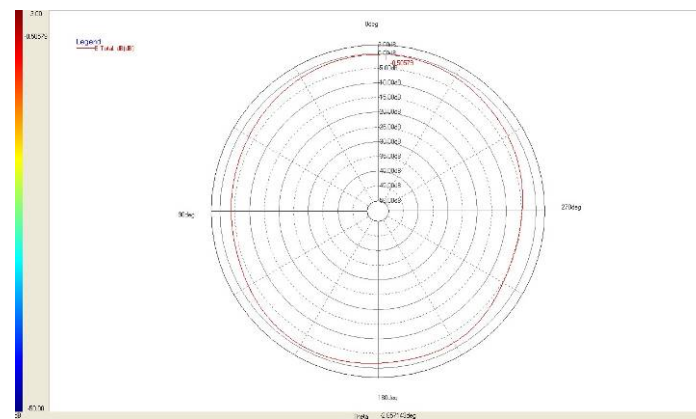
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|--------------|------------------|-------------|------------|---|
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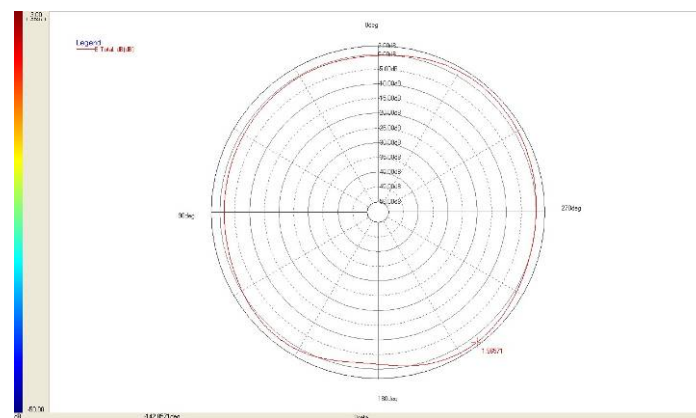
## 5-1-2 Electrical performance



XY-Plane 2442MHz



XZ-Plane 2442MHz



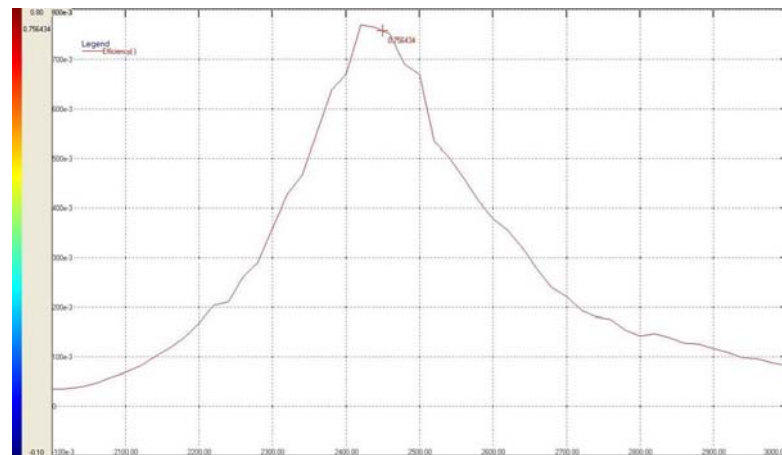
YZ-Plane 2442MHz

| 2442MHz  | Peak Gain |
|----------|-----------|
| XZ-Plane | -0.50     |
| YZ-Plane | 1.96      |
| XY-Plane | 0.65      |

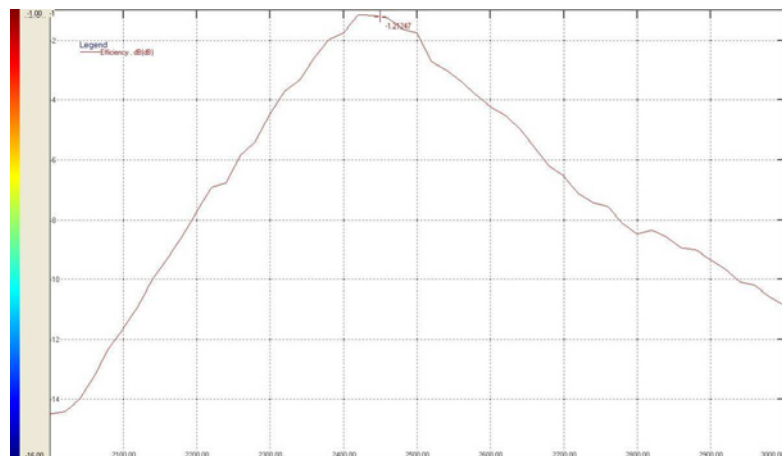
(Unit : dBi)



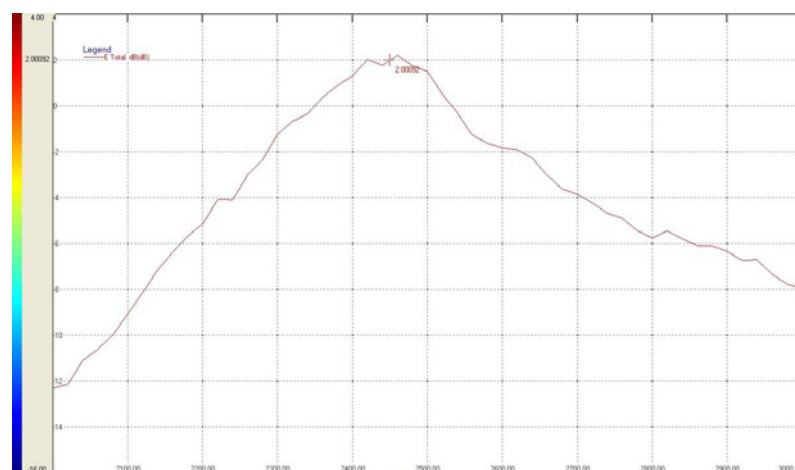
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Efficiency



Average Gain



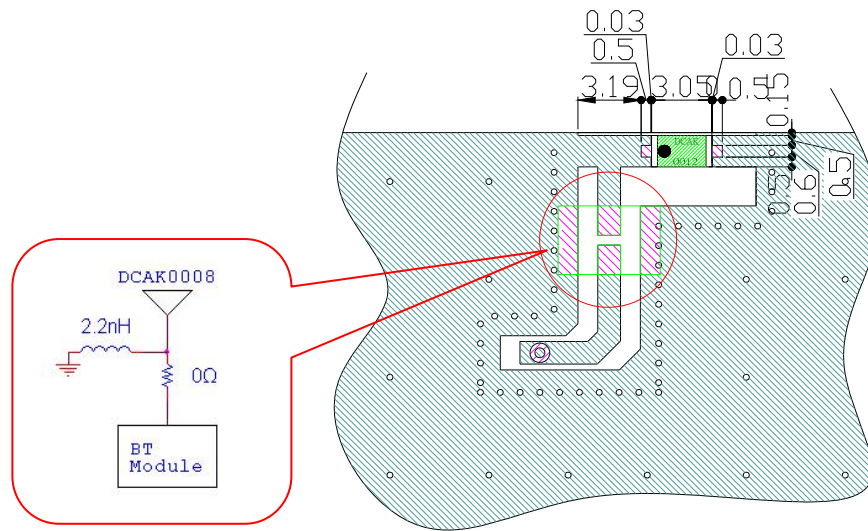
Peak Gain

| Item  | Efficiency | Average  | Peak Gain |
|-------|------------|----------|-----------|
| Value | 75.64%     | -1.21dBi | 2.00dBi   |

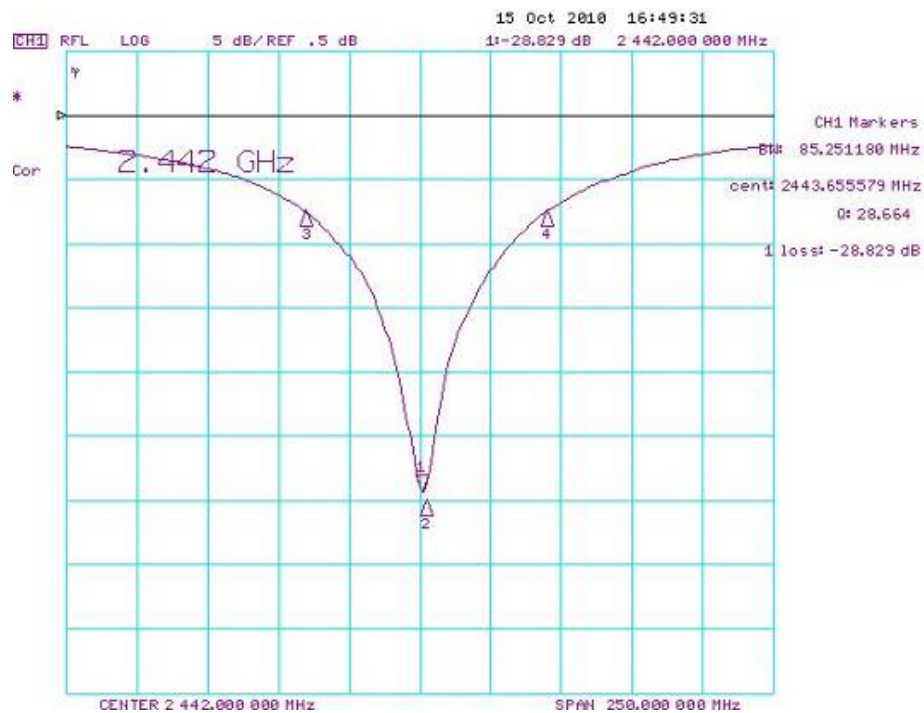


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|--------------|------------------|-------------|------------|------------------------------------------------------------------------------------|---|
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## 5-2 Position 2 Matching Circuit



### 5-2-1 S11 Response curve ( Work Frequency )

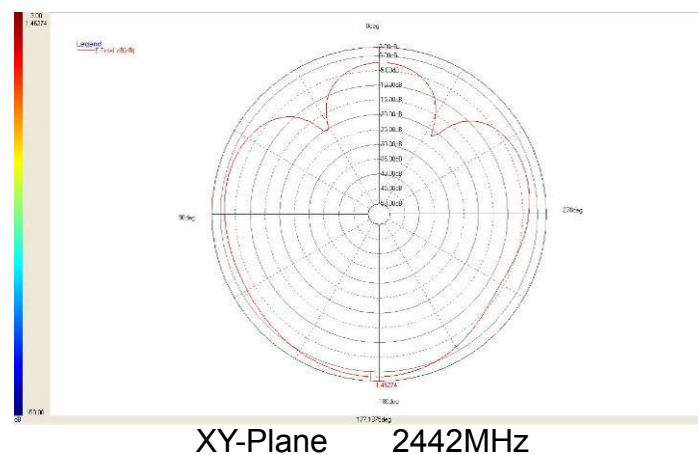
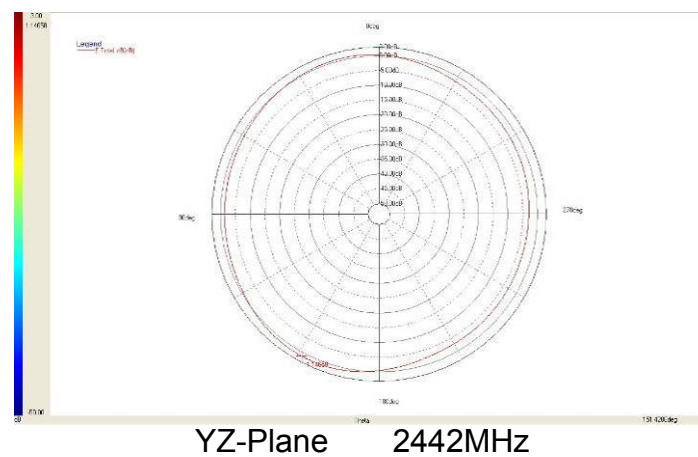
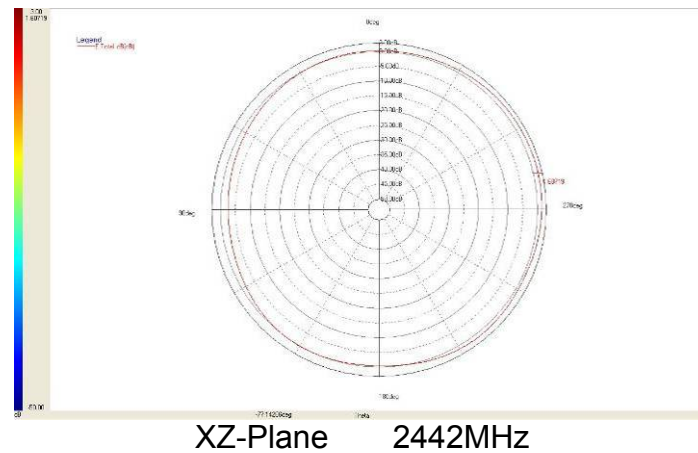


| Item  | Frequency | Return Loss | Bandwidth |
|-------|-----------|-------------|-----------|
| Value | 2442 MHz  | -28.82 dB   | 85.25 MHz |

|              |                  |             |            |   |
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## 5-2-2 Electrical performance

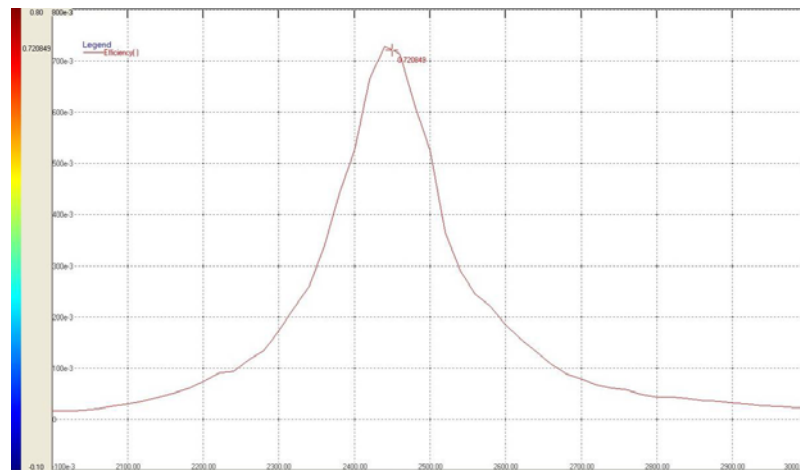


| 2442MHz  | Peak Gain |
|----------|-----------|
| XZ-Plane | 1.60      |
| YZ-Plane | 1.14      |
| XY-Plane | 1.46      |

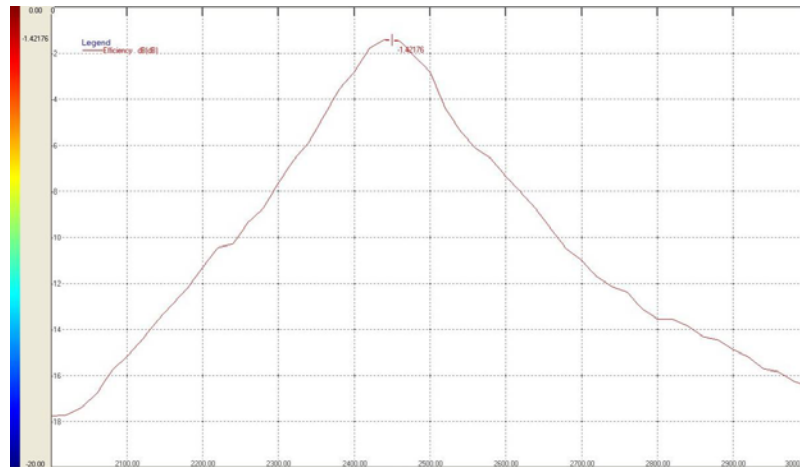
(Unit : dBi)



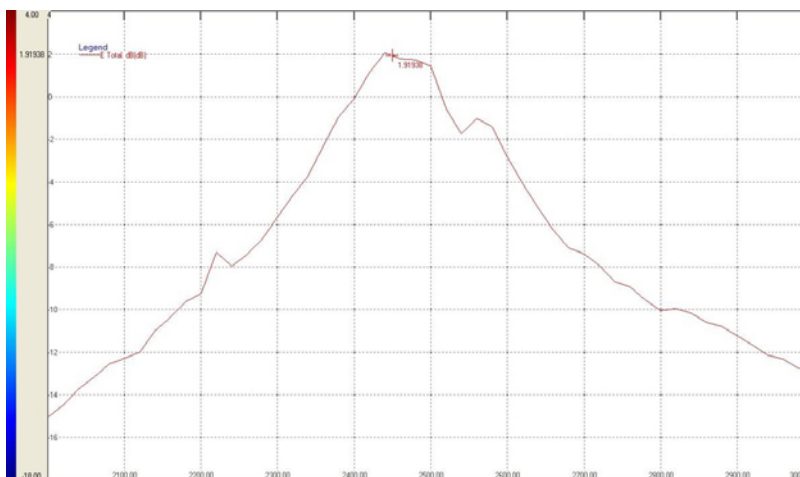
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Efficiency



Average Gain



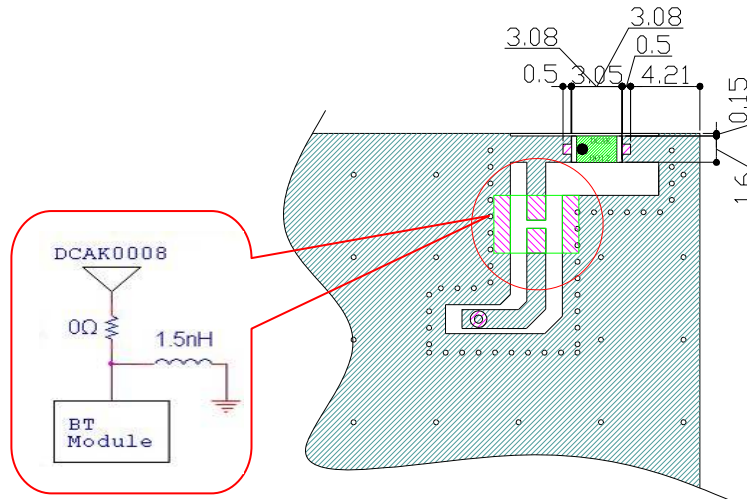
Peak Gain

| Item  | Efficiency | Average  | Peak Gain |
|-------|------------|----------|-----------|
| Value | 72.08%     | -1.42dBi | 1.91dBi   |

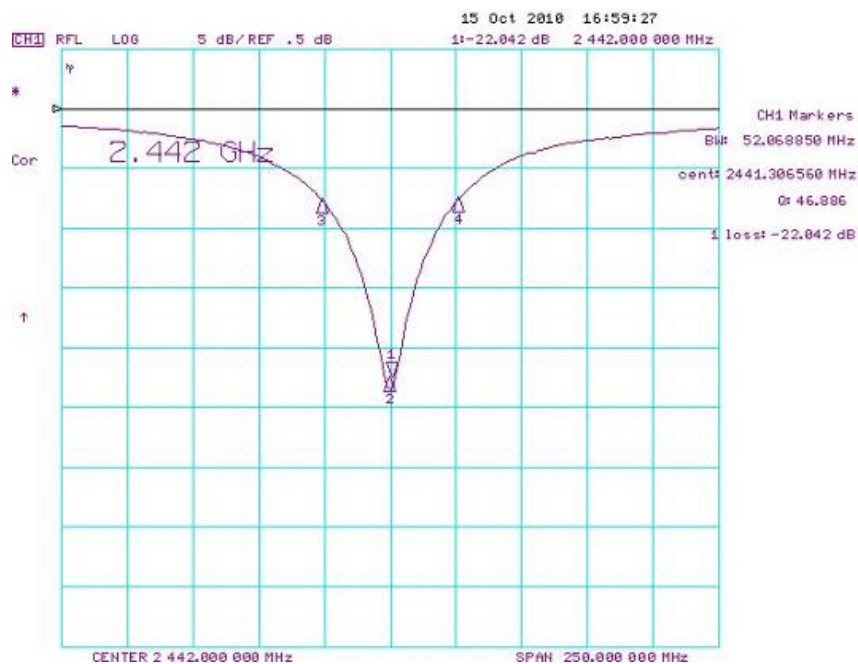


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### 5-3 Position 3 Matching Circuit



#### 5-3-1 S11 Response curve ( Work Frequency )



| Item  | Frequency | Return Loss | Bandwidth |
|-------|-----------|-------------|-----------|
| Value | 2442 MHz  | -22.04 dB   | 52.06 MHz |

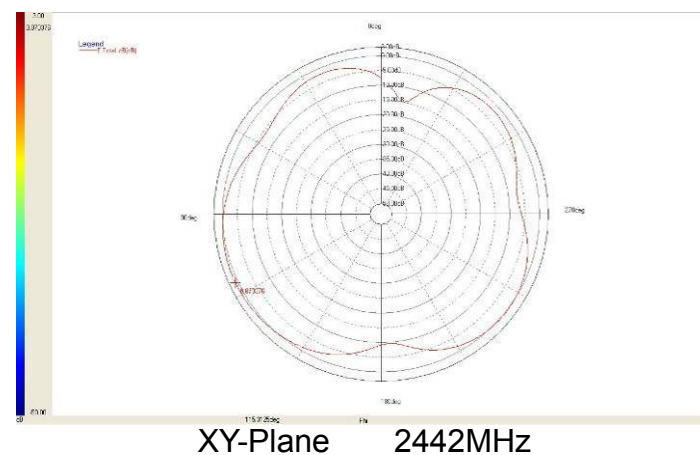
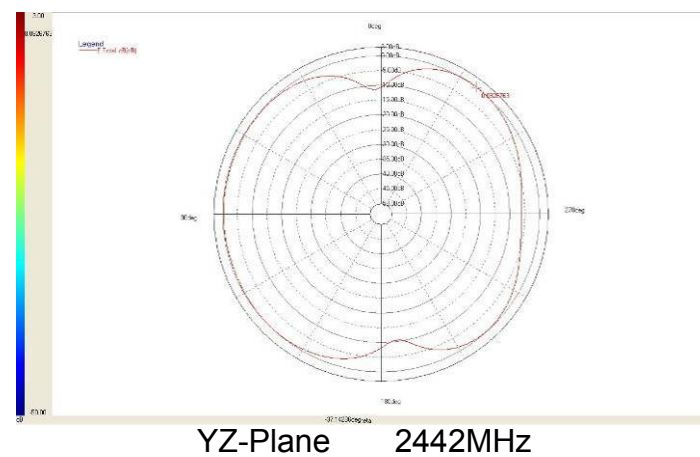
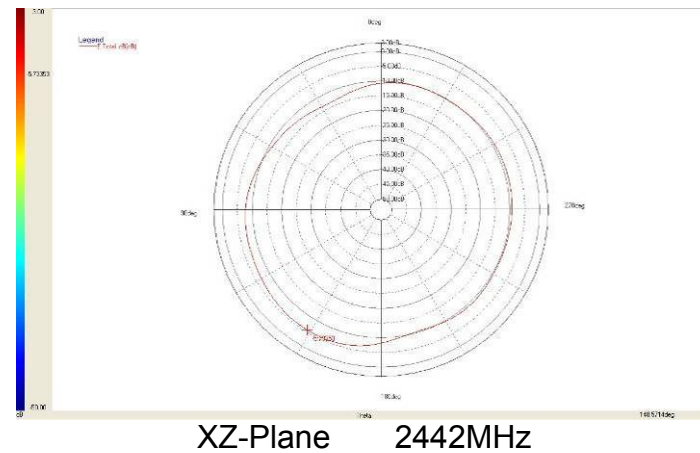




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### 5-3-2 Electrical performance

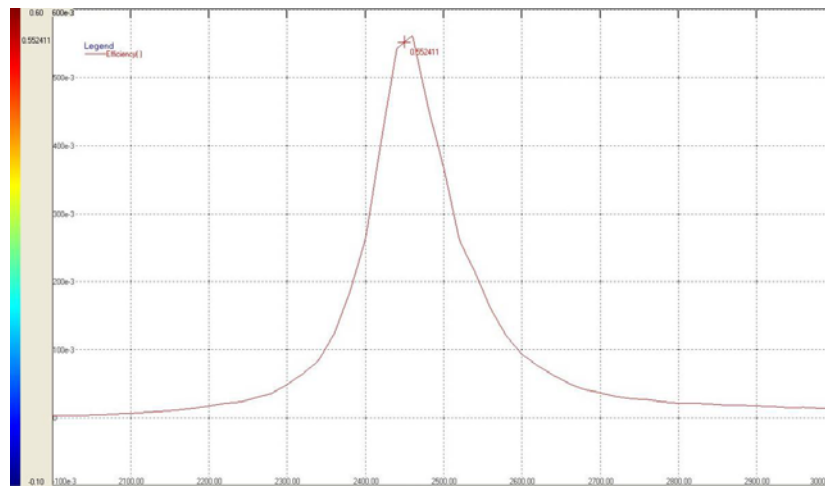


| 2450MHz  | Peak Gain |
|----------|-----------|
| XZ-Plane | -5.73     |
| YZ-Plane | 0.08      |
| XY-Plane | 0.8       |

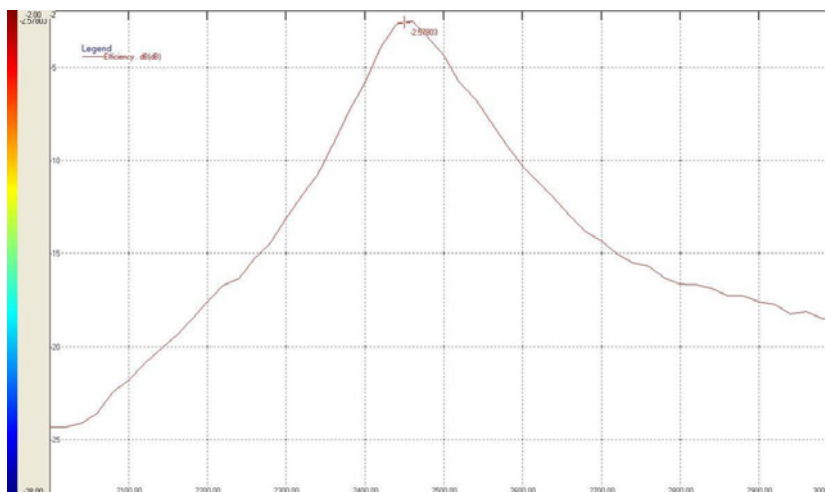
(Unit : dBi)



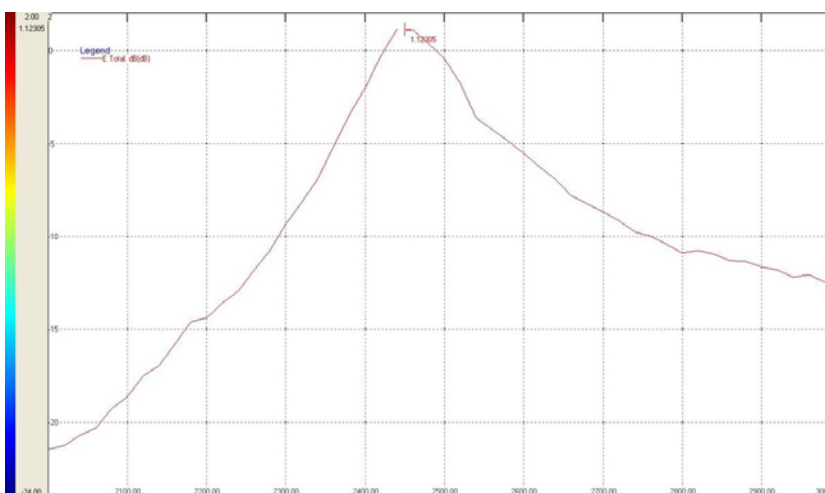
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Efficiency



Average Gain



Peak Gain

| Item  | Efficiency | Average  | Peak Gain |
|-------|------------|----------|-----------|
| Value | 55.24%     | -2.57dBi | 1.12dBi   |

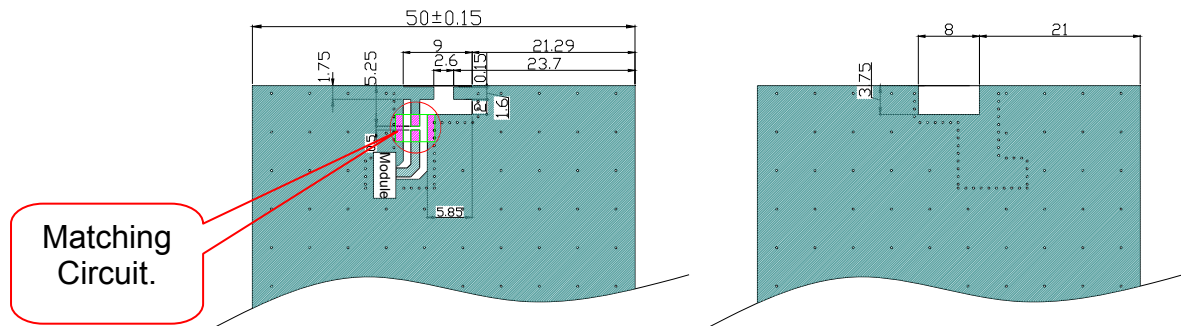




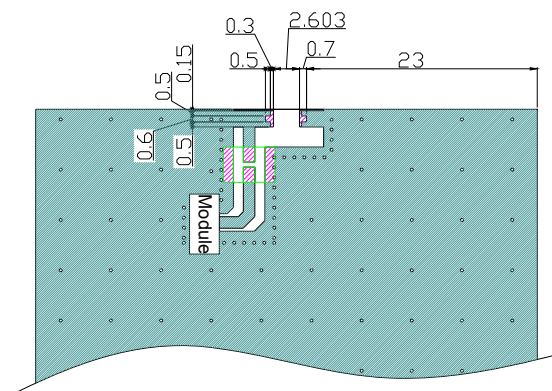
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## 6. Customer's Requirement Layout Dimension

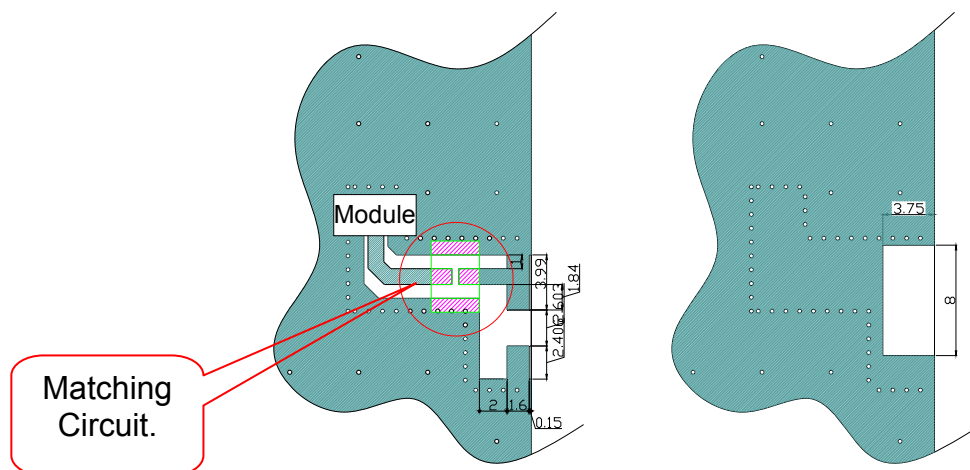
### 6-1 Layout 1 Dimension



#### 6-1-1 Single and Pad Layout Dimension

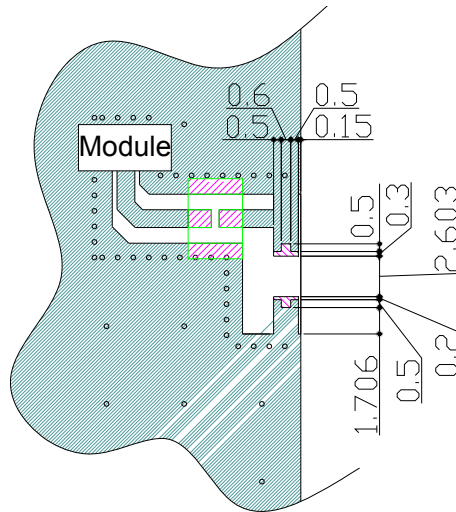


### 6-2 Layout 2 Dimension

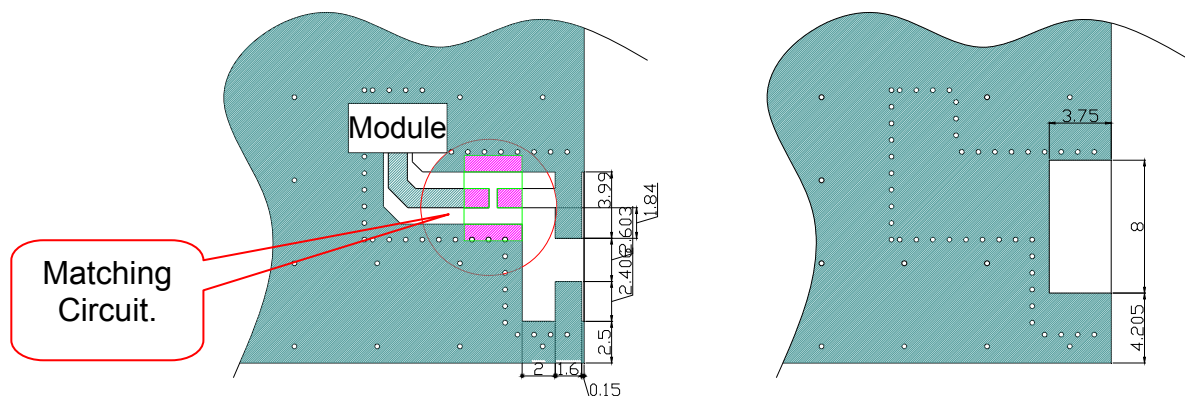


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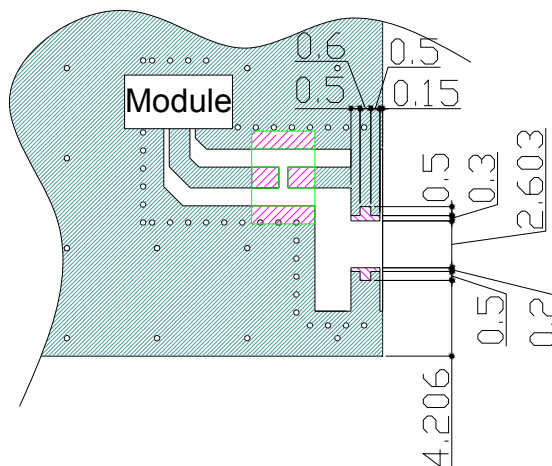
### 6-2-1 Single and Pad Layout Dimension



### 6-3 Layout 3 Dimension



### 6-3-1 Single and Pad Layout Dimension



|              |                  |             |            |                                                                                    |   |
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## 7. Environmental conditions

### 7-1 Operating conditions

The antenna has the electrical characteristics given in Tables 1 in the temperature range of -40°C to +85°C and under the environmental conditions of +40°C and 0-95% relative humidity.

### 7-2 Storage temperature range

The storage temperature range of product is -40°C to +85°C.

## 8. Reliability tests

### 8-1 Low-temperature test

Expose the specimen to -40°C for 500 hours and then to normal temperature/humidity for 24 hours or more. After this test, examine its appearance and functions.

### 8-2 High-temperature test

Expose the specimen to +85°C for 500 hours and then to normal temperature /humidity for 24 hours or more. After this test, examine its appearance and functions.

### 8-3 High-temperature/high-humidity test

Subject the object to the environmental conditions of +85°C and 90-95% relative humidity for 96 hours, then expose it to normal temperature/humidity for 24 hours or more. After this test, examine its appearance and functions.

### 8-4 Thermal shock test

Subject the object to cyclic temperature change (-40°C, 30 minutes ⇄ +85°C, 30 minutes) for 5 cycles, then expose to normal temperature/ humidity for 24 hours or more.

### 8-5 Vibration test

#### 8-5-1 Sinusoidal vibration test

Subject the object to vibrations of 5 to 200 to 5Hz swept in 10 minutes, 4.5G at maximum (2mm amplitude), in X and Y directions for two hours each and in Z direction for four hours. After this test, examine its appearance functions.

#### 8-5-2 Vibration test in packaged condition

Subject the object, which is packaged as illustrated, to vibrations of 15 to 60 to 15Hz swept in 6 minutes, 4G at maximum (2mm amplitude at maximum), applied in X, Y and Z directions for two hours each, i.e. six hours in total. After this test, examine its appearance and functions.

### 8-6 Free fall test in packaged condition

Drop the object, which is packaged as illustrated, to a concrete surface from the height of 90 cm, on one corner, three edges and six faces once each, i.e. 10 times in total. After this test, examine its appearance and functions.



|              |                  |             |            |                                                                                    |   |
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#### 8-7 Soldering heat resistance test

The lead pins of the unit are soaked in solder bath at  $260 \pm 5^{\circ}\text{C}$  for 10 seconds.  
After this test, examine its appearance and functions.

#### 8-8 Adhesion test

The device is subjected to be soldered on test PCB. Then apply 0.5Kg (5N) of force for  $5 \pm 1$  seconds in the direction of parallel to the substrate. (The soldering should be done by reflow and be conducted with care so that the soldering is uniform and free of defect by stress such as heat shock).

#### 9. Warranty

If any defect occurs from the product during proper use within a year after delivery, it will be repaired or replaced free of charge.

#### 10. Other

Any question arising from this specification manual shall be solved by arrangement made by both parties.

#### 11. Precautions for use

- Antenna pattern use an Ag / Ni / Sn electrode.
- Please don't use the corrosion gas (sulfur gas, chlorine gas) in the atmosphere.
- Please don't direct solder onto the silver electrode of antenna pattern.

|              |                  |             |            |                                 |
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## Delivery mode

- 1 Blister tape to IEC 286-3 , polyester .
- 2 Pieces/tape : 5000

