# SPECIFICATION

| | | |
|---|---|---|
| Part No. | : | **WCM.01.0151W** |
| Product Name: | : | 2.4GHz Button Antenna |
| Features | : | Smallest External Wi-Fi/Bluetooth Antenna<br>2dBi~5dBi Peak Gain<br>Dims: 19.8*14.3*16.4mm<br>2400MHz to 2500MHz Antenna<br>Wi-Fi/Bluetooth<br>60%+ Efficiency<br>RP SMA(M) Connector<br>IP67 Housing<br>Omnidirectional<br>ROHS Compliant<br>*Gain varies depending on ground-plane size |

# 1. Introduction

The WCM.01w 2.4GHz antenna is the smallest RP-SMA(M) external antenna in the market, fitting into spaces other traditional monopole, dipole or rubber ducky antenna cannot go. A unique PIFA design ensures omnidirectional gain across 2.4GHz to 2.5GHz ensuring constant reception and transmission to make it a great antenna for 2.4GHz Wi-Fi and Bluetooth applications.

This antenna features greater than 60% efficiency when connected directly to the ground plane of the device.

Typical Applications

- Application Points
- Routers
- IoT M2M devices
- Smart Home applications

This antenna comes with an RP SMA(M) to be compatible with most Wi-Fi applications and routers in the market. The WCM.01 antenna housing is also IP67 water resistant. The antenna should be mounted on the edge of the main PCB ground-plane of the device. Due to its monopole design, relatively larger ground-planes will increase the efficiency and peak gain of the antenna.

The ideal position for the antenna to radiate is mounted clear of metal housings. Connector is customizable subject to minimum order quantities and possible NRE.

Contact your Taoglas regional sales office for more information.

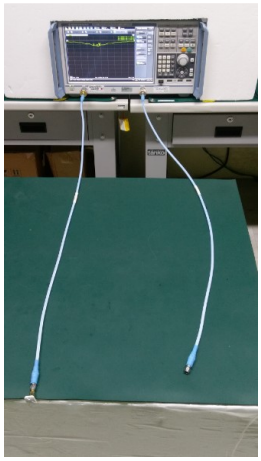
# 2. Specification

| ELECTRICAL | | | | |
|---|---|---|---|---|
| Frequency (MHz) | | 2400 | 2450 | 2500 |
| **Efficiency (%)** | | | | |
| In free space | | 33.30 | 30.36 | 29.65 |
| On the 10*10cm | Ground plane(center edge) | 63.43 | 71.44 | 66.85 |
| On the 10*10cm | Ground plane(off center edge) | 55.85 | 68.43 | 61.73 |
| On the 20*20cm | Ground plane(center edge) | 64.20 | 71.40 | 63.97 |
| On the 20*20cm | Ground plane(off center edge) | 62.55 | 81.30 | 69.73 |
| On the 30*30cm | Ground plane(center edge) | 58.31 | 70.49 | 60.87 |
| On the 30*30cm | Ground plane(off center edge) | 62.11 | 73.46 | 61.90 |
| **Average Gain (dBi)** | | | | |
| In free space | | -4.78 | -5.18 | -5.28 |
| On the 10*10cm | Ground plane(center edge) | -1.98 | -1.46 | -1.75 |
| On the 10*10cm | Ground plane(off center edge) | -2.53 | -1.65 | -2.10 |
| On the 20*20cm | Ground plane(center) | -1.92 | -1.46 | -1.94 |
| On the 20*20cm | Ground plane(off center edge) | -2.04 | -0.90 | -1.57 |
| On the 30*30cm | Ground plane(center edge) | -2.34 | -1.52 | -2.16 |
| On the 30*30cm | Ground plane(off center edge) | -2.07 | -1.34 | -2.08 |
| **Peak Gain (dBi)** | | | | |
| In free space | | 0.89 | 0.40 | 0.12 |
| On the 10*10cm | Ground plane(center edge) | 2.02 | 2.45 | 2.37 |
| On the 10*10cm | Ground plane(off ceter edge) | 3.46 | 4.09 | 3.47 |
| On the 20*20cm | Ground plane(center edge) | 4.26 | 4.54 | 3.69 |
| On the 20*20cm | Ground plane(off center edge) | 4.02 | 5.40 | 4.65 |
| On the 30*30cm | Ground plane(center edge) | 3.64 | 4.85 | 4.06 |
| On the 30*30cm | Ground plane(off center edge) | 3.79 | 4.23 | 3.15 |
| Radiation | | Omnidirectional | | |
| Polarization | | Linear | | |
| Impedance | | 50Ω | | |
| Max Input Power | | 10W | | |
| MECHANICAL | | | | |
| Antenna Dimension | | 19.8*14.3*16.4mm | | |
| Casing | | ABS | | |
| Connector | | RP-SMA(M) | | |
| Weight | | 6g | | |
| Ingress Protection Rating | | IP67 (Housing only) | | |

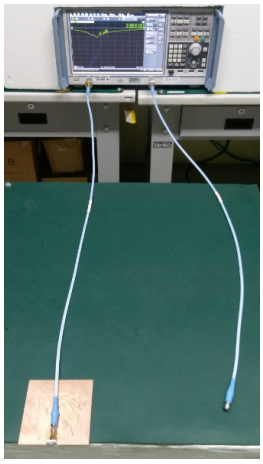
| ENVIRONMENTAL | |
|---|---|
| Operation Temperature | -40°C ~ + 85°C |
| Storage Temperature | -40°C ~ + 85°C |
| Humidity | Non-condensing 65°C 95% RH |

# 3. Antenna Characteristics

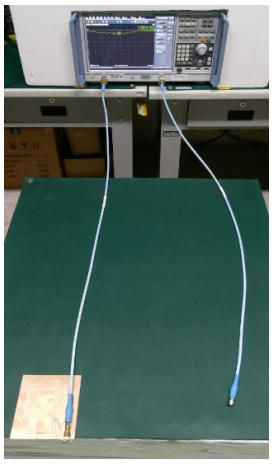
## 3.1 Testing Setup



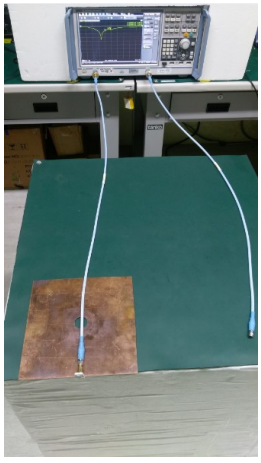
a) In free space



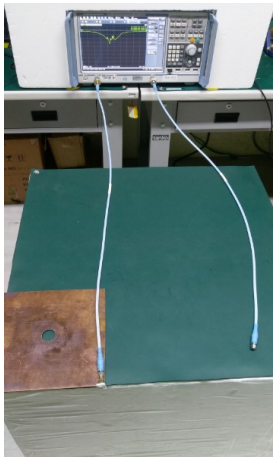
b) With 10*10cm ground plane center edge



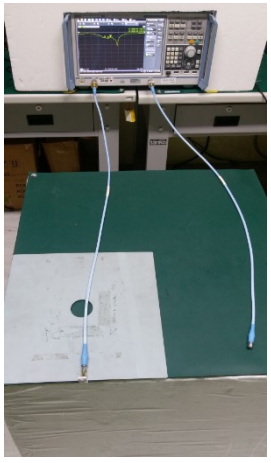
c) With 10*10cm ground plane off center edge



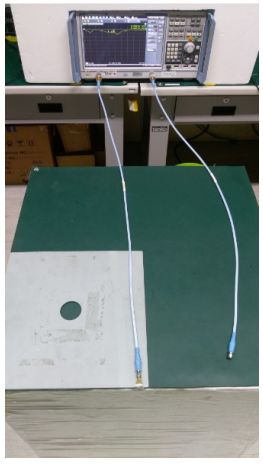
d) With 20*20cm ground plane center edge



e) With 20*20cm ground plane off center edge



f) With 30*30cm ground plane center edge



g) With 30*30cm ground plane off center edge

**Figure.1** Antenna Measurement Setup

### 3.2 Return Loss (In free space)

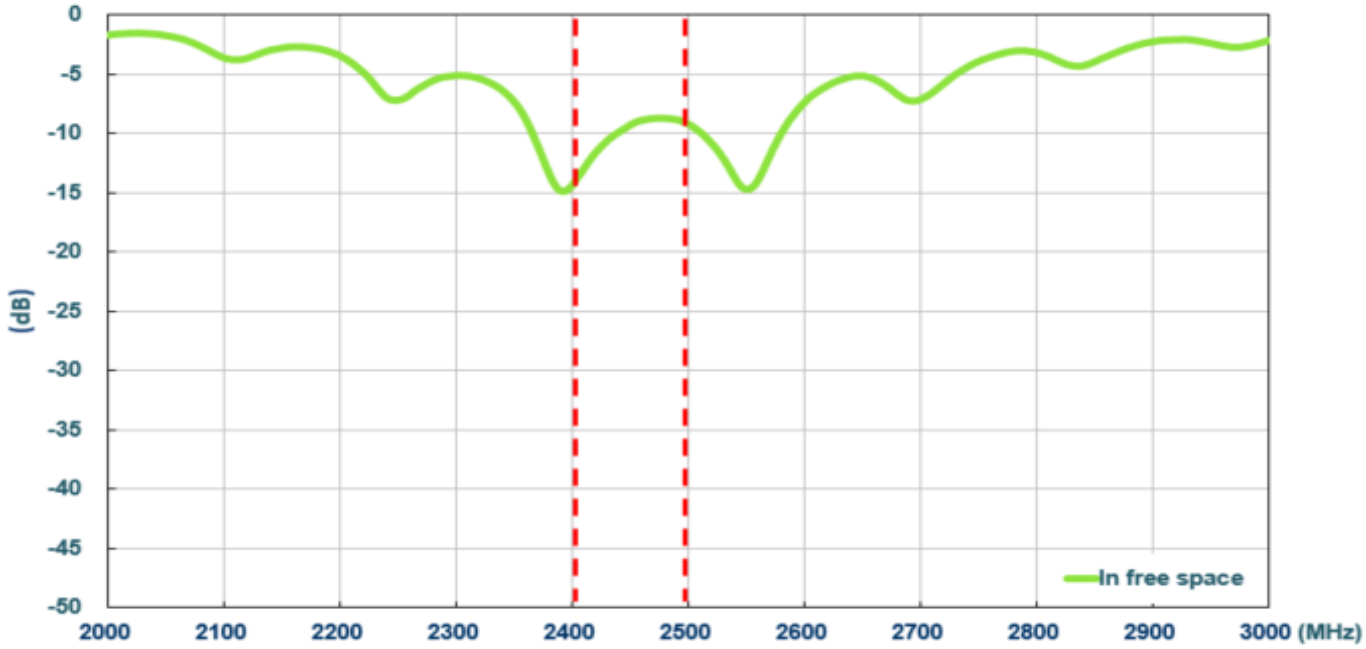



**Figure 2.** Return loss of WCM.01 antenna

### 3.3 Return Loss(On ground plane center edge)

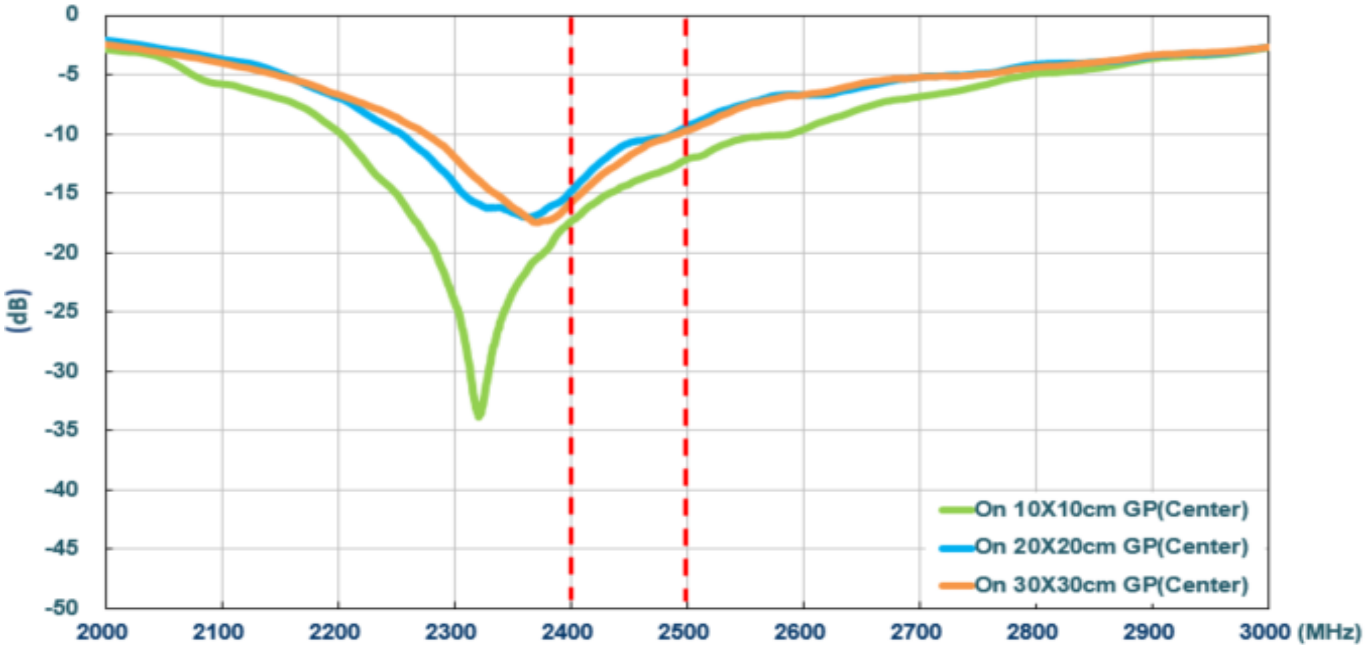



**Figure 3.** Return loss of WCM.01 antenna with different ground plane size

## 3.4 Return Loss (On ground plane off center edge)

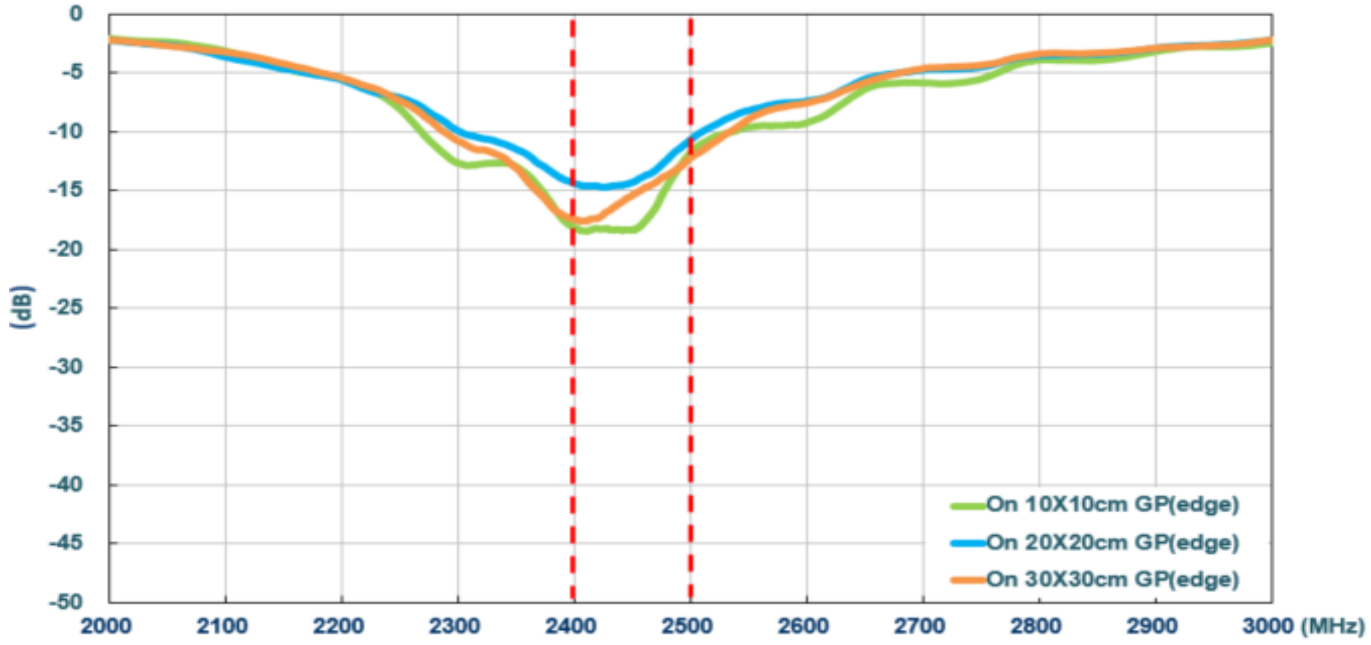



**Figure 4.** Return loss of WCM.01 antenna with different ground plane size

## 3.5 Efficiency (In free space)

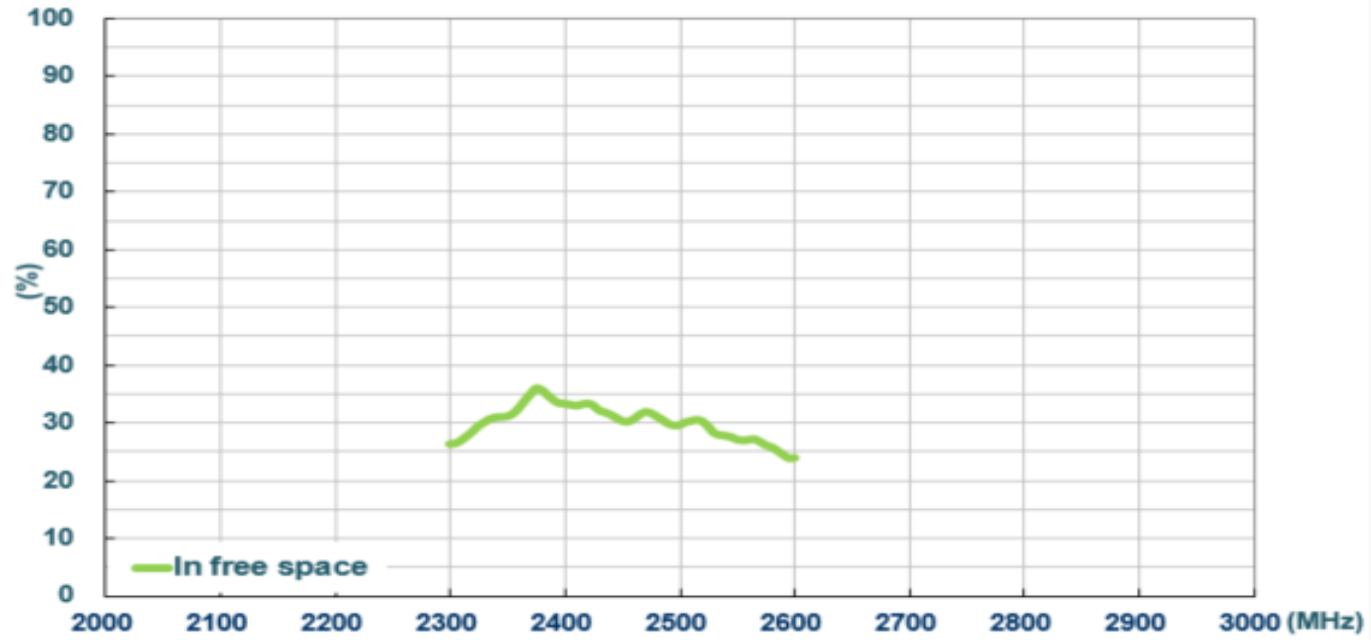



**Figure 5.** Efficiency of WCM.01 antenna

## 3.6 Efficiency (On ground plane center edge)

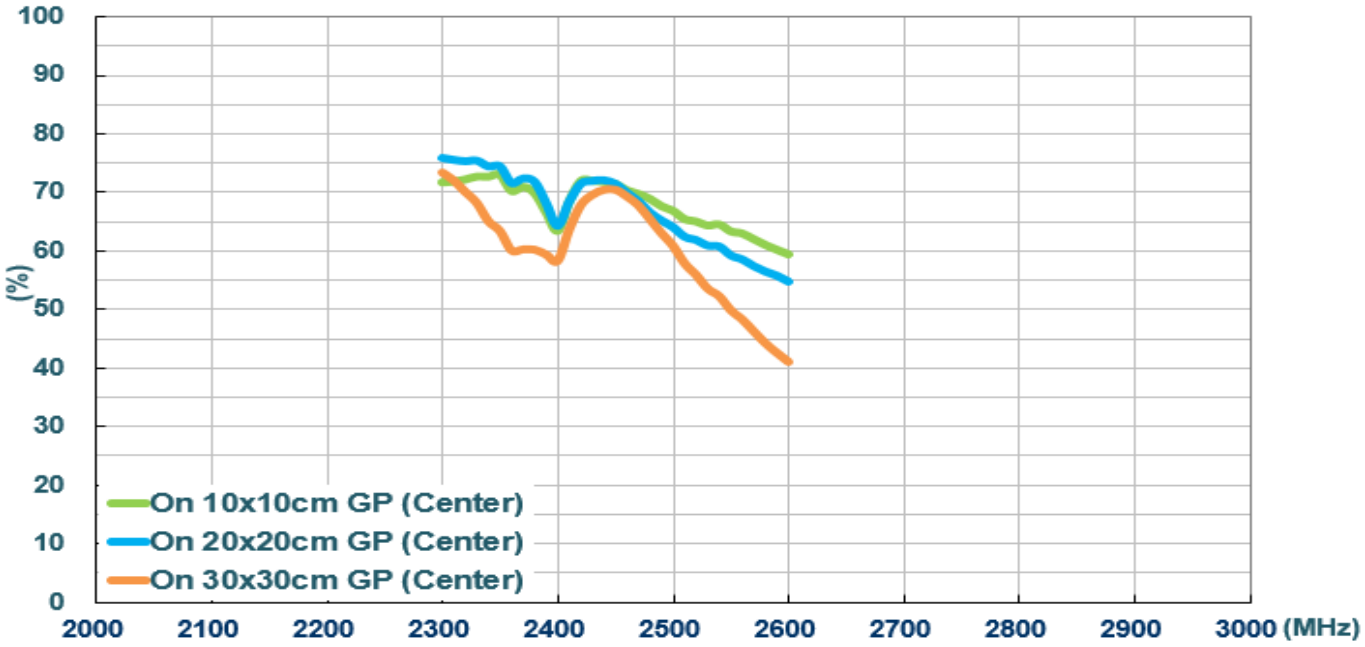



**Figure 6.** Return loss of WCM.01 antenna with different ground plane size

## 3.7 Efficiency (On ground plane off center edge)

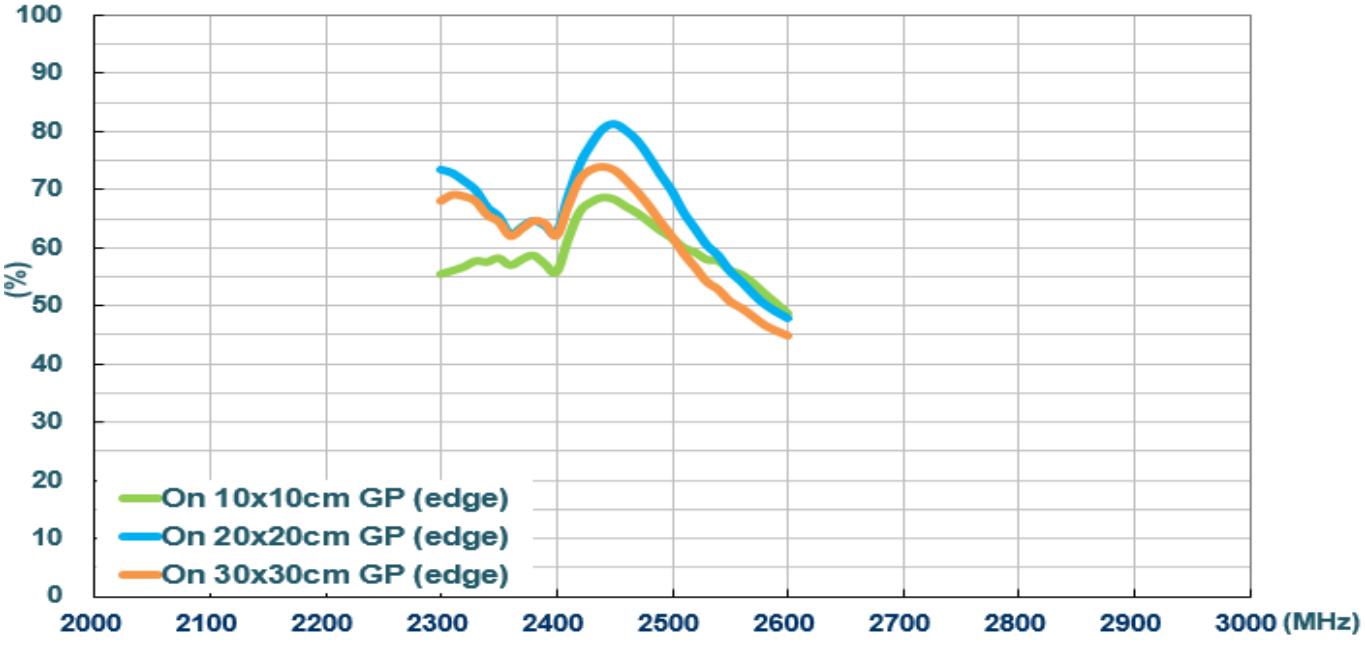



**Figure 7.** Return loss of WCM.01 antenna with different ground plane size

## 3.8 Peak Gain (In free space)

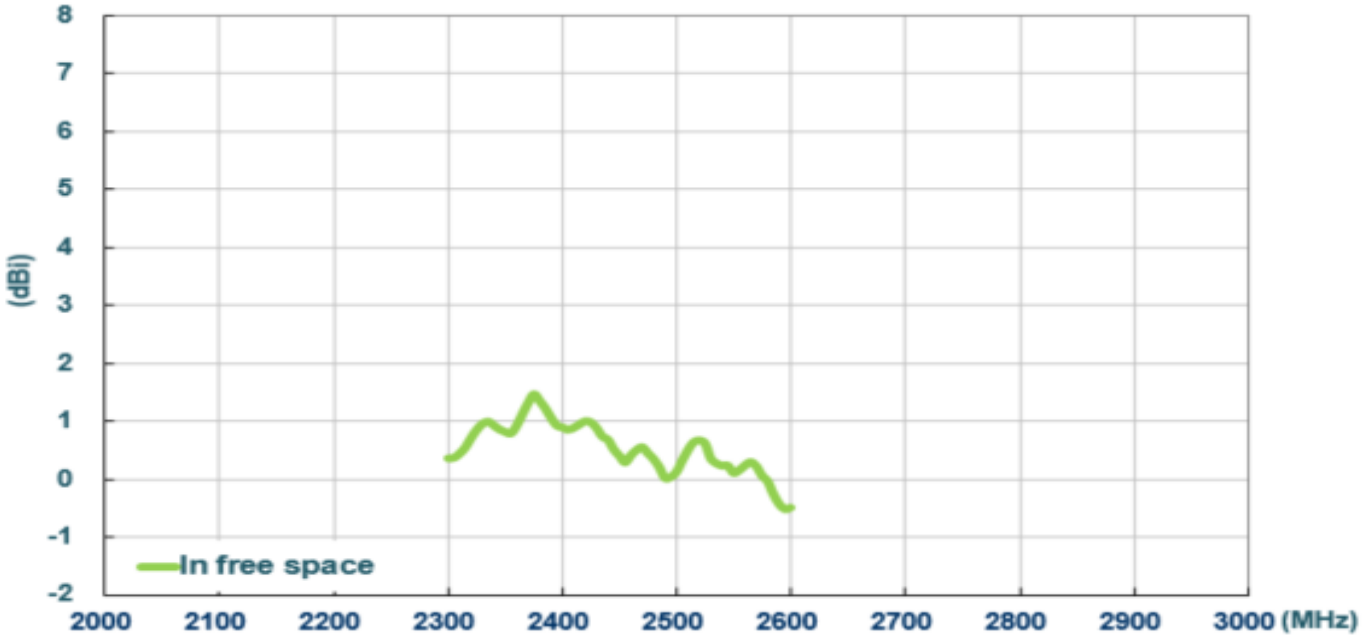



**Figure 8.** Peak gain of WCM.01 antenna with different ground plane size

## 3.9 Peak Gain (On ground plane center edge)

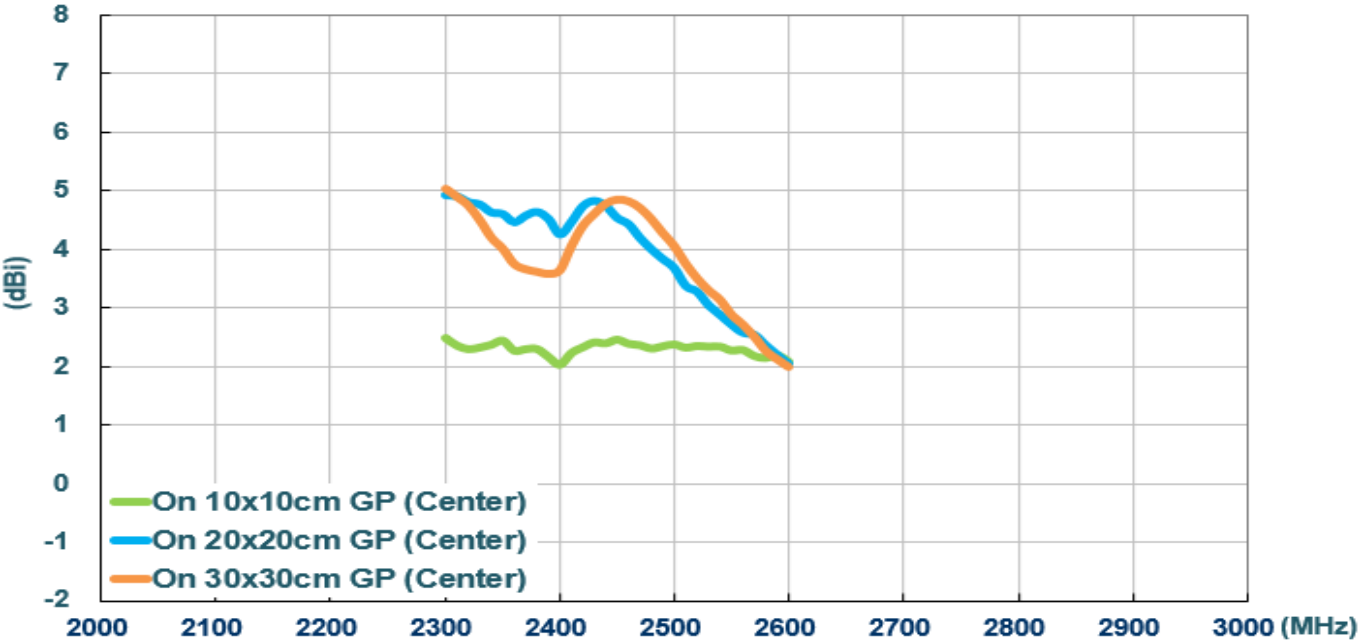



**Figure 9.** Peak gain of WCM.01 antenna with different ground plane size

## 3.10 Peak Gain (On ground plane off center edge)

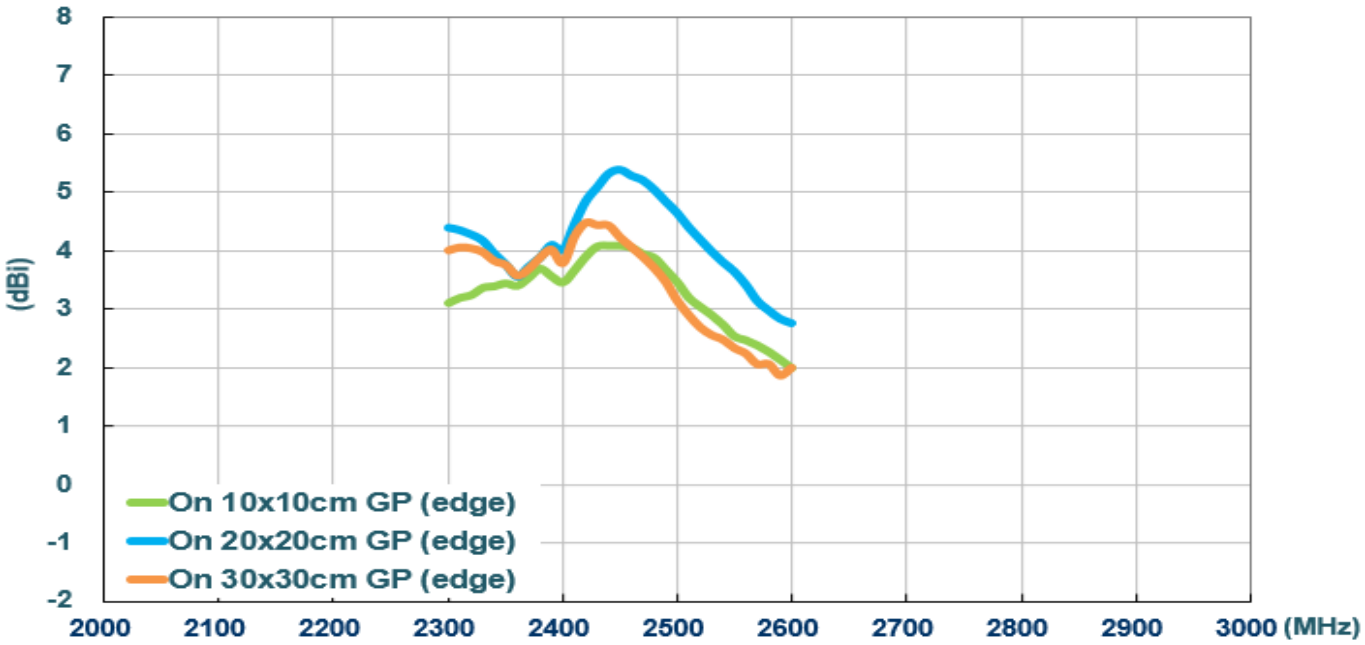



**Figure 10.** Peak gain of WCM.01 antenna with different ground plane size

## 3.11 Average Gain (In free space)

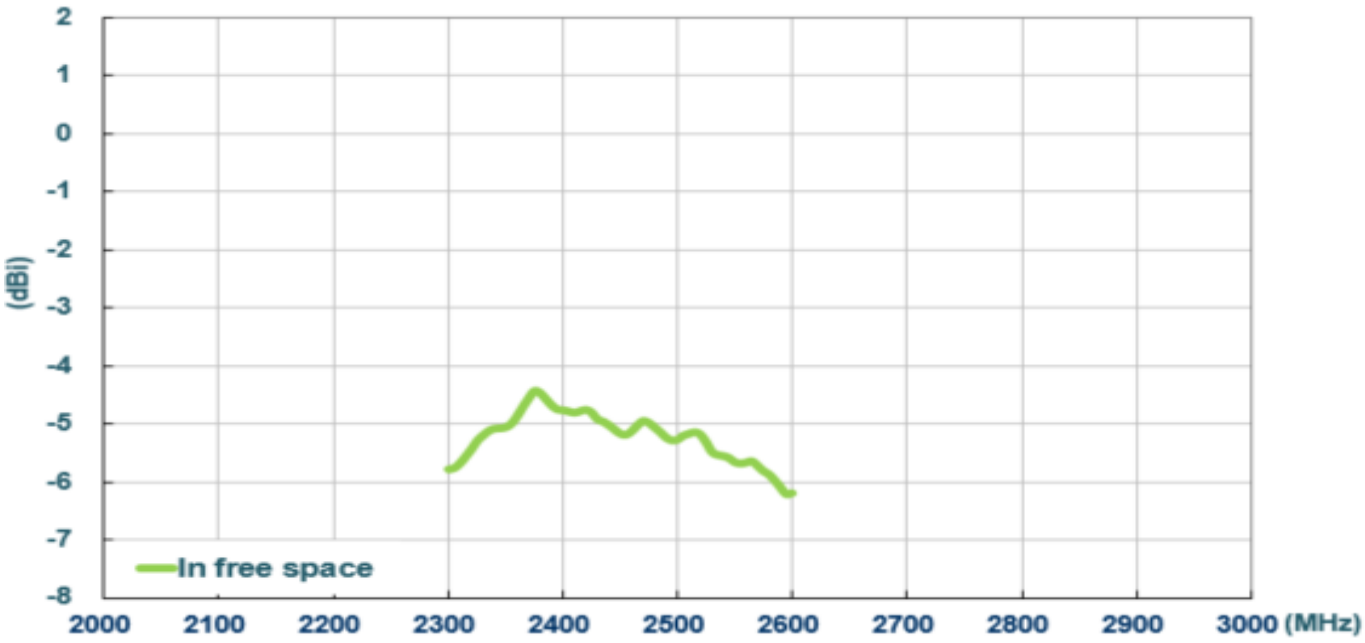



**Figure 11.** Average gain of WCM.01

## 3.12 Average Gain (On ground plane center edge)

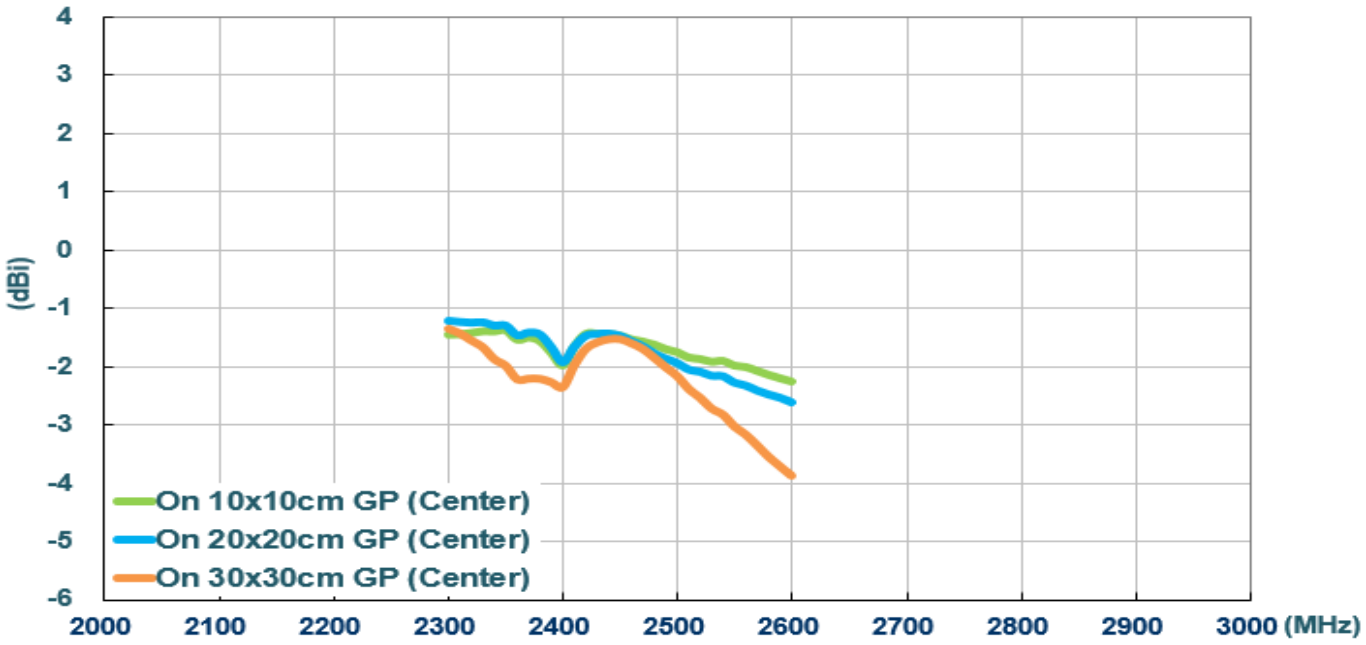



**Figure 12.** Average gain of WCM.01 antenna with different ground plane size

## 3.13 Average Gain (On ground plane off center edge)

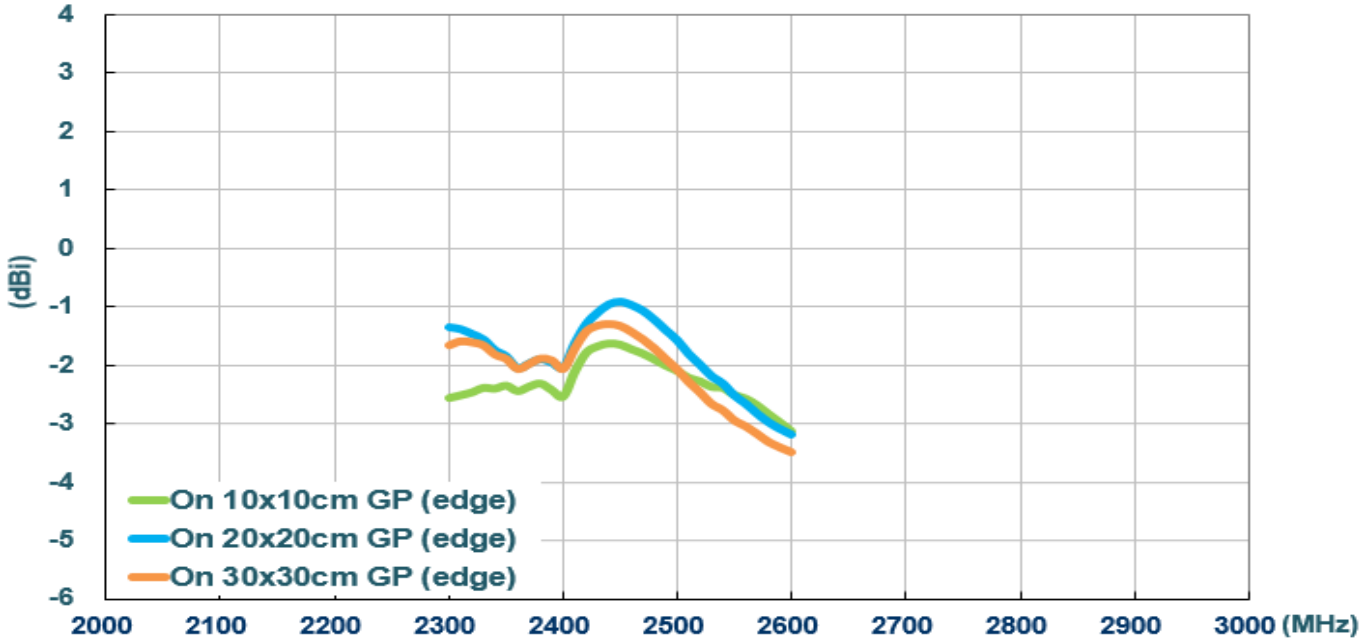
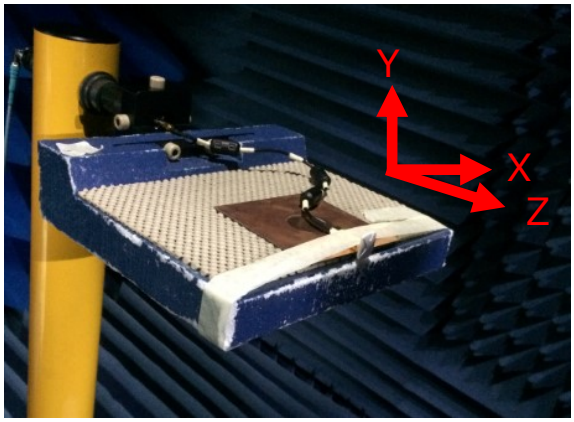



**Figure 13.** Average gain of WCM.01 antenna with different ground plane size

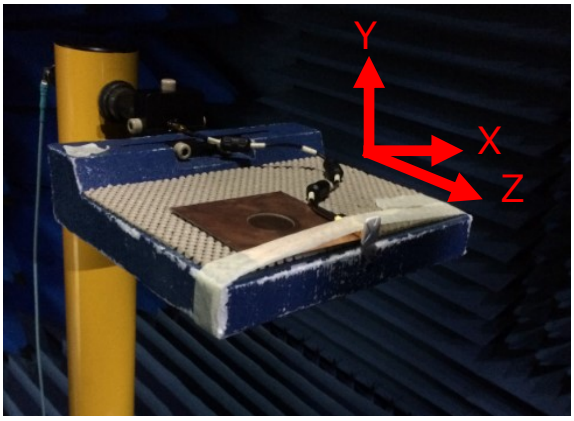
# 4. Antenna Radiation Patterns

The antenna radiation patterns were measured in a CTIA certified ETS Anechoic Chamber. The measurement setup is shown below.

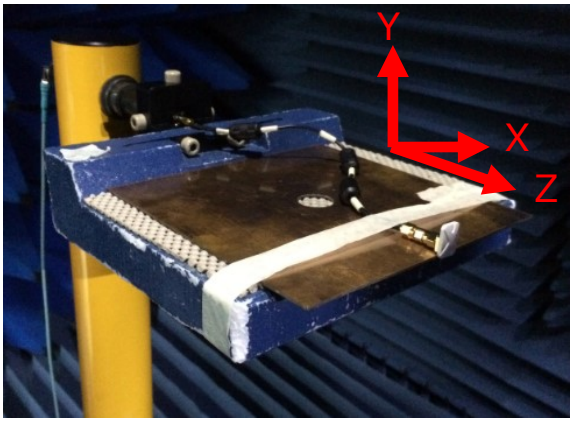

In Free Space



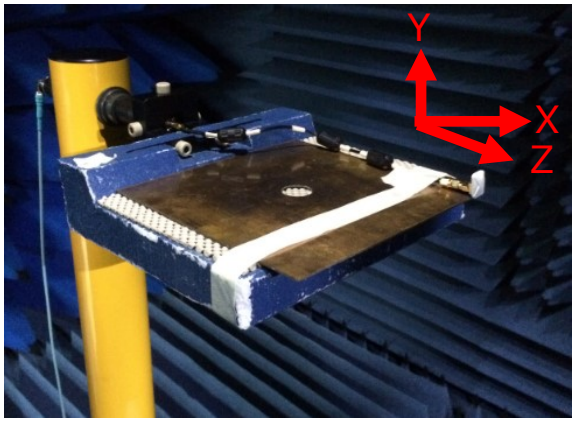

On 10*10cm ground plane (Center Edge



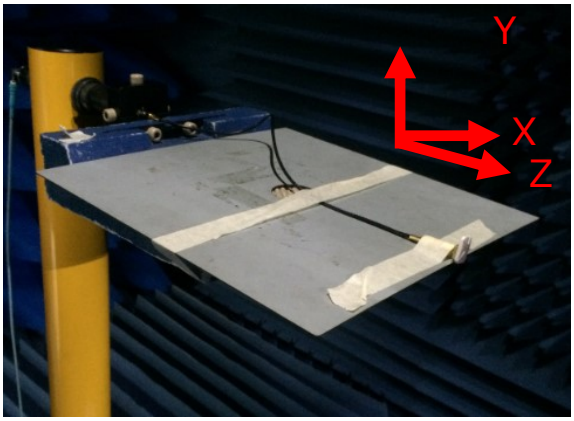

On 10*10cm ground plane (Off Center Edge)



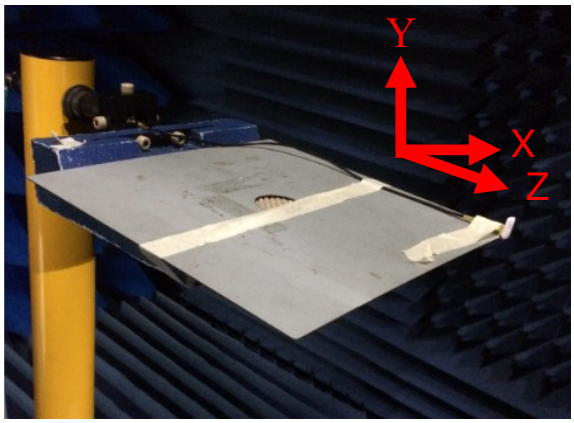

On 20*20cm ground plane (Center Edge)




On 20*20cm ground plane (Off Center Edge)




On 30*30cm ground plane (Center Edge)

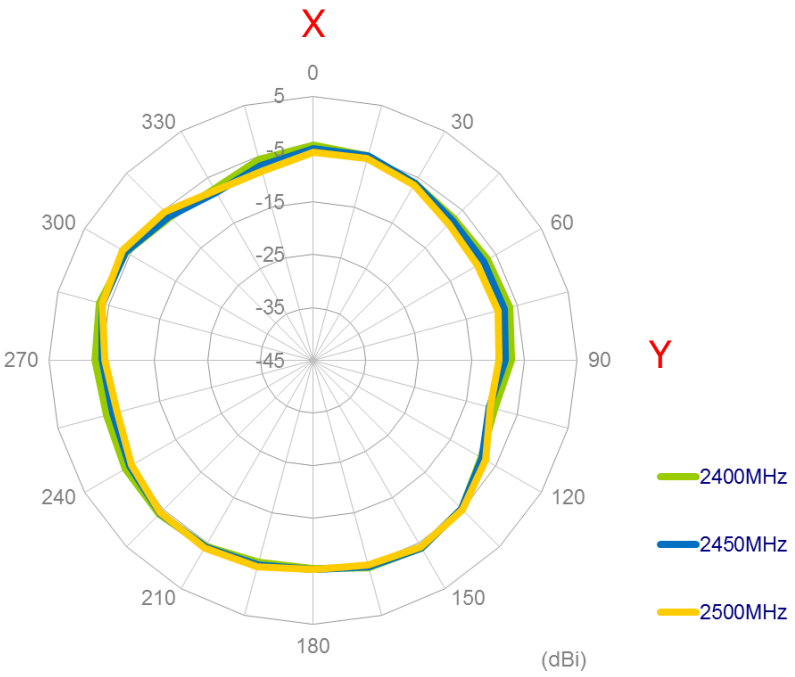



On 30*30cm ground plane (Off Center Edge)

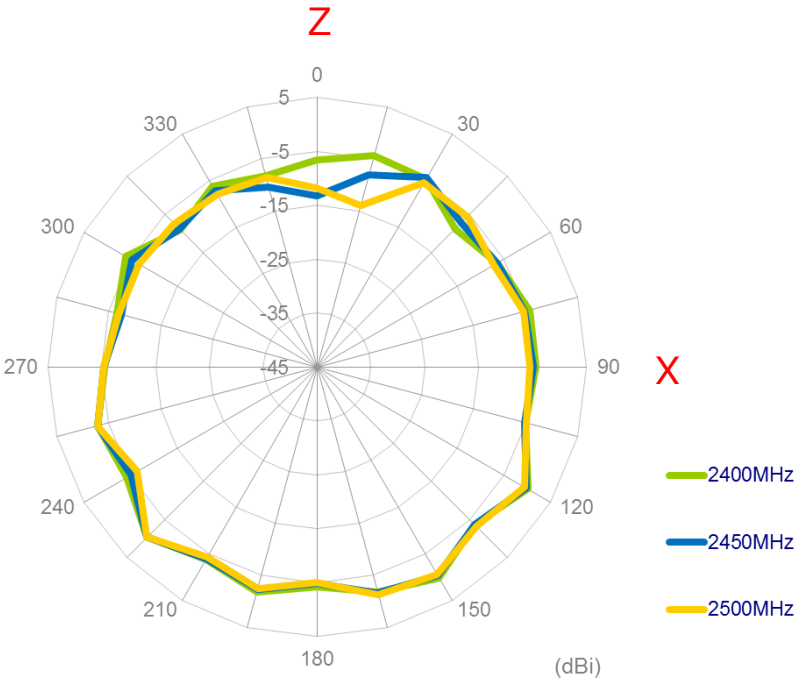
**Figure.14.** Testing Setup in ETS Anechoic Chamber

## 4.1 2D Radiation Pattern (In free space)

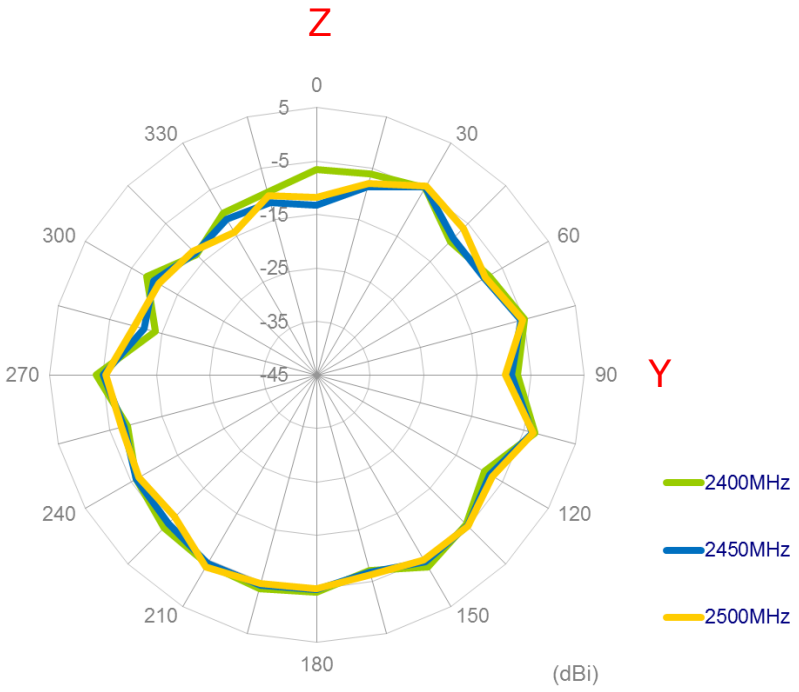
XY Plane



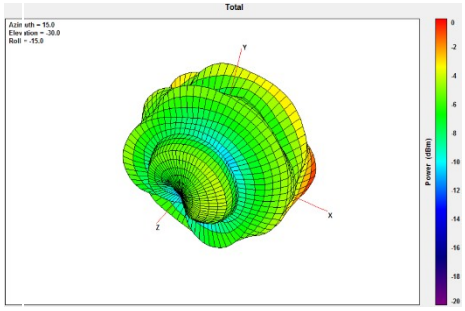

XZ Plane



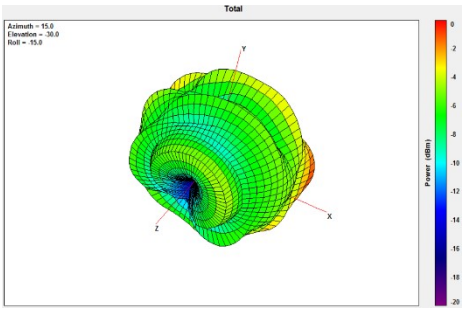
YZ Plane



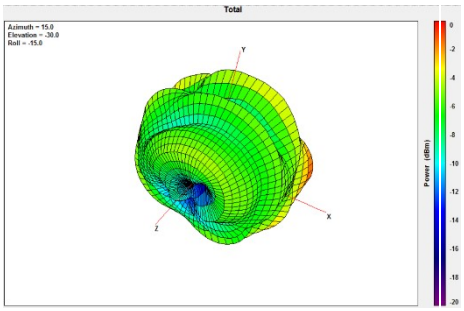

## 4.2 3D Radiation Pattern (In free space)




2400MHz



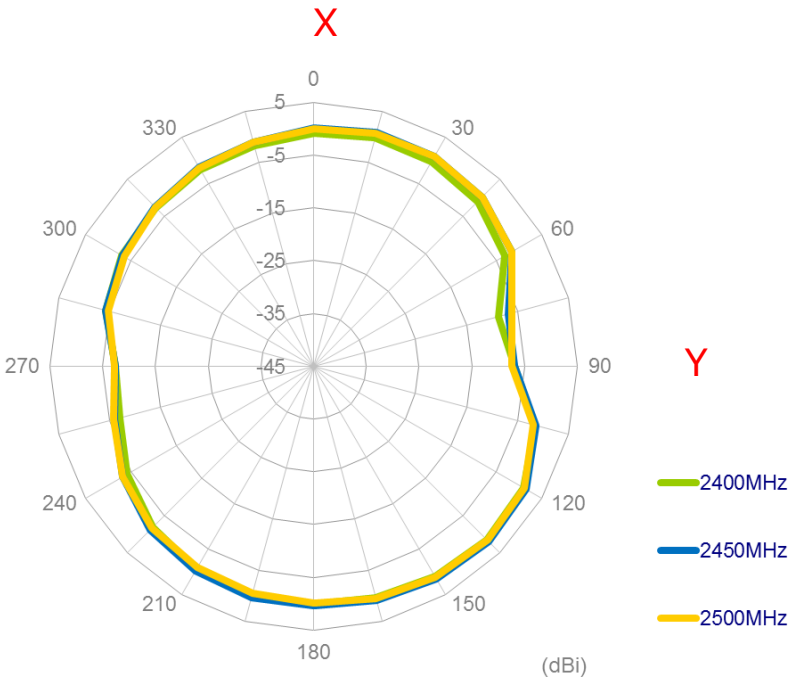

2450MHz



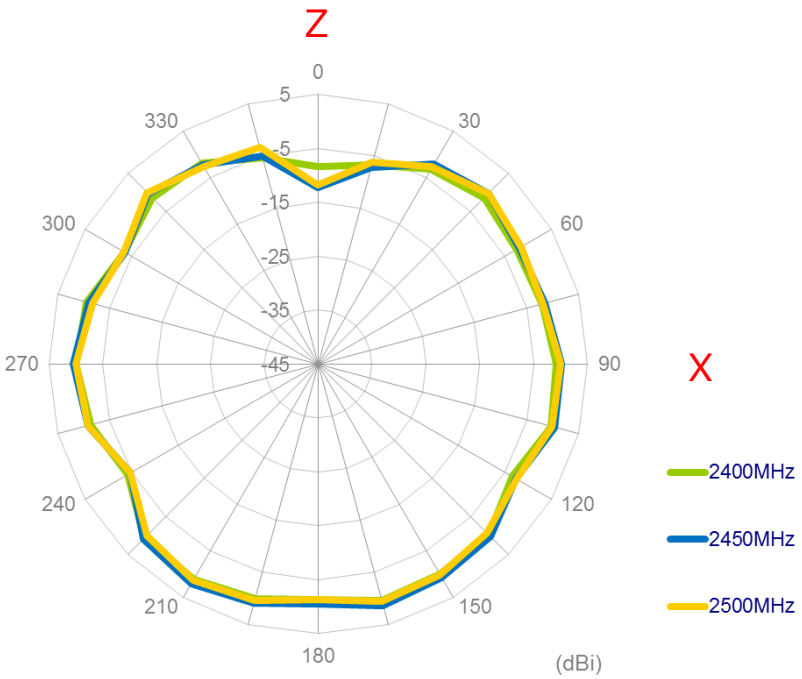

2500MHz

## 4.3 2D Radiation Pattern (On 10*10cm ground plane center edge)

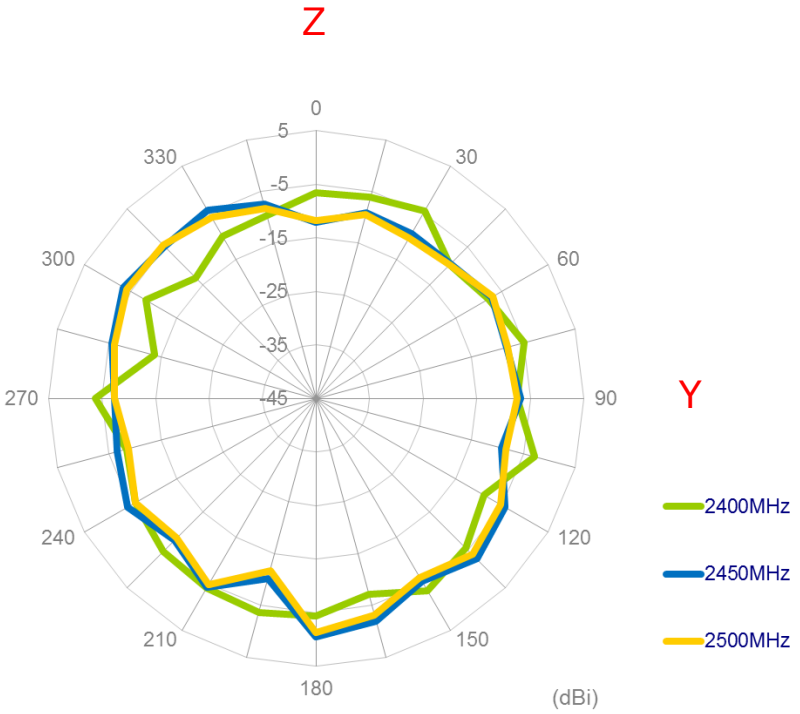
XY Plane



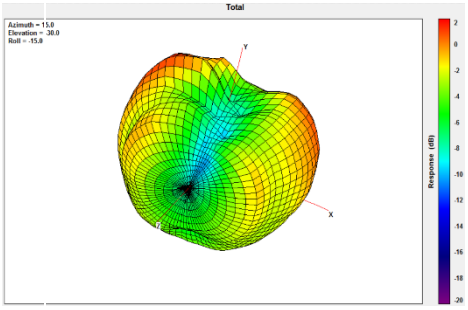

XZ Plane



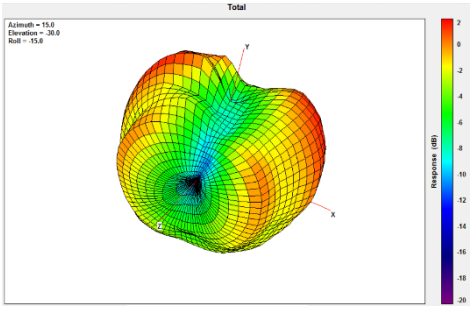
YZ Plane



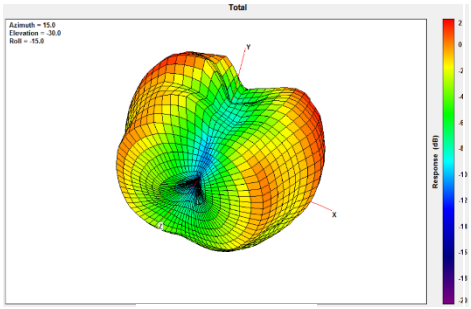

## 4.4 3D Radiation Pattern (On 10*10cm ground plane center edge)



2400MHz



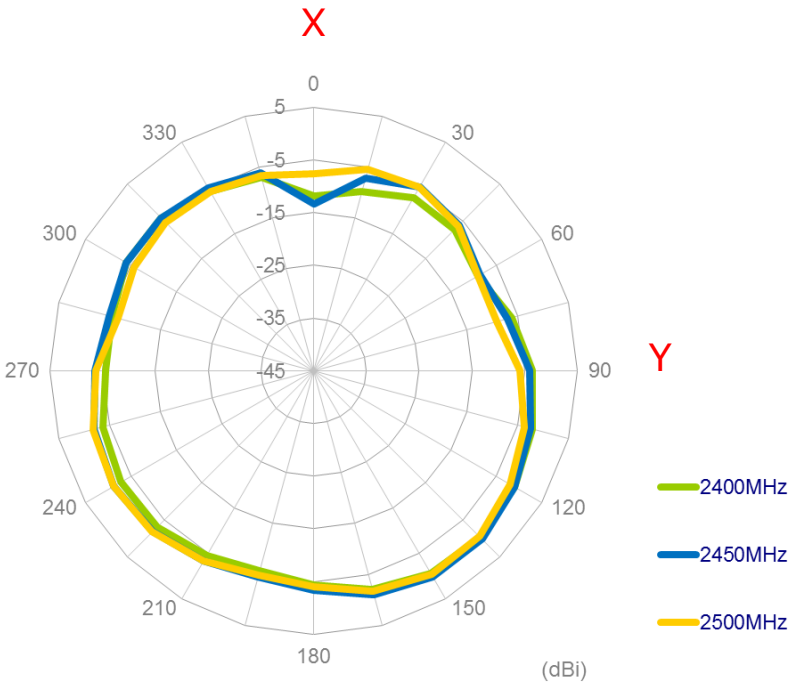
2450MHz



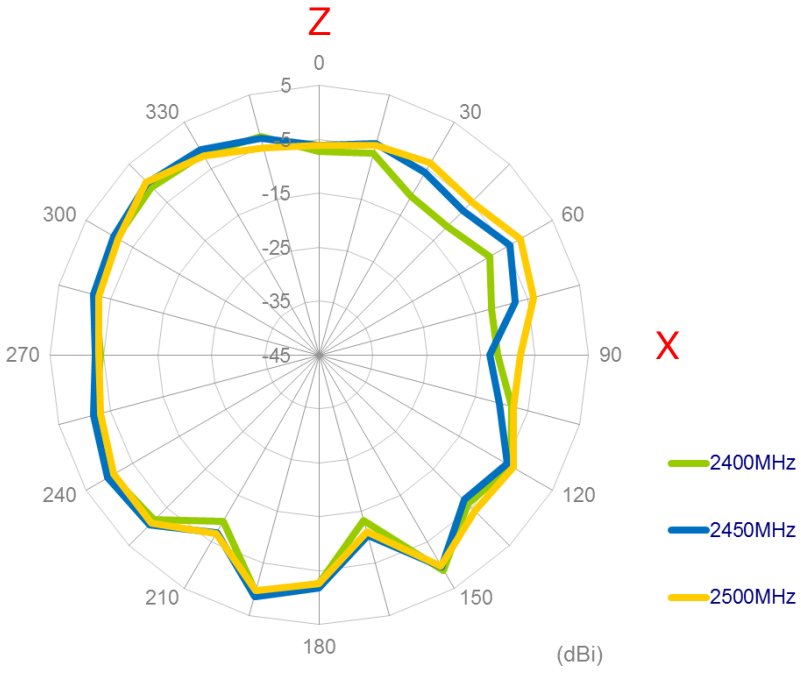
2500MHz

## 4.5 2D Radiation Pattern (On 10*10cm ground plane off center edge)

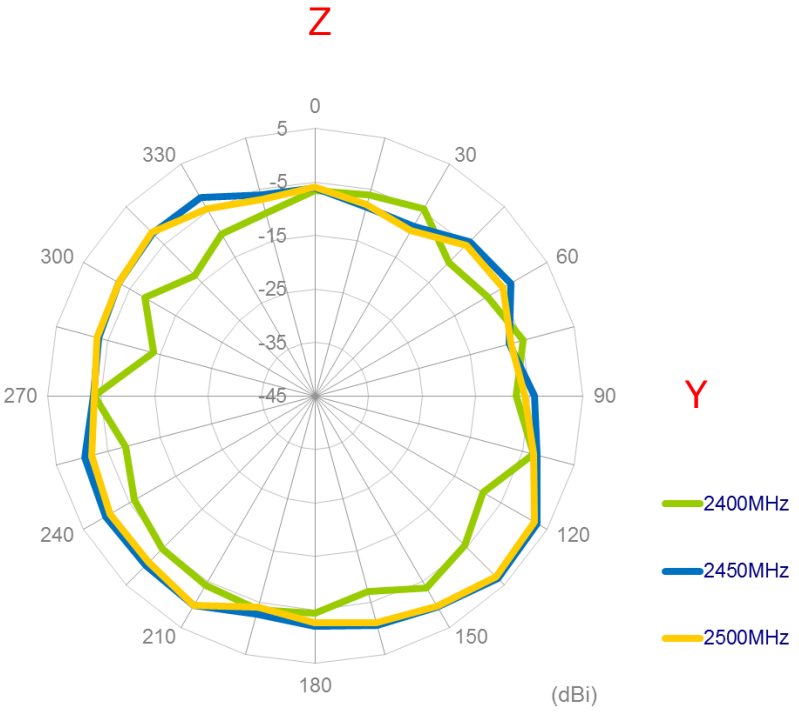
XY Plane



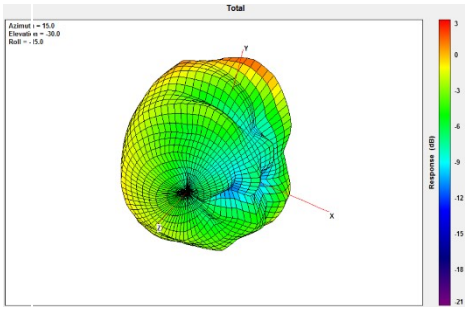

XZ Plane



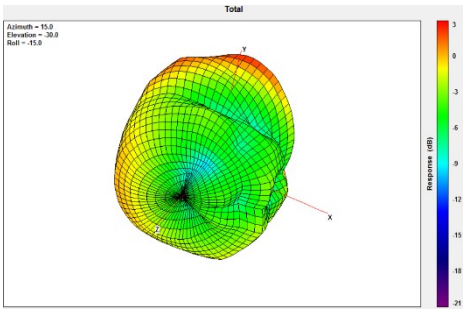
YZ Plane



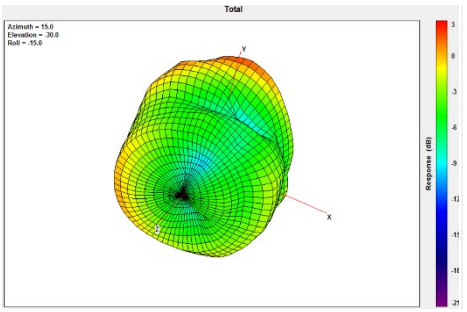

## 4.6 3D Radiation Pattern (On 10*10cm ground plane off center edge)



2400MHz



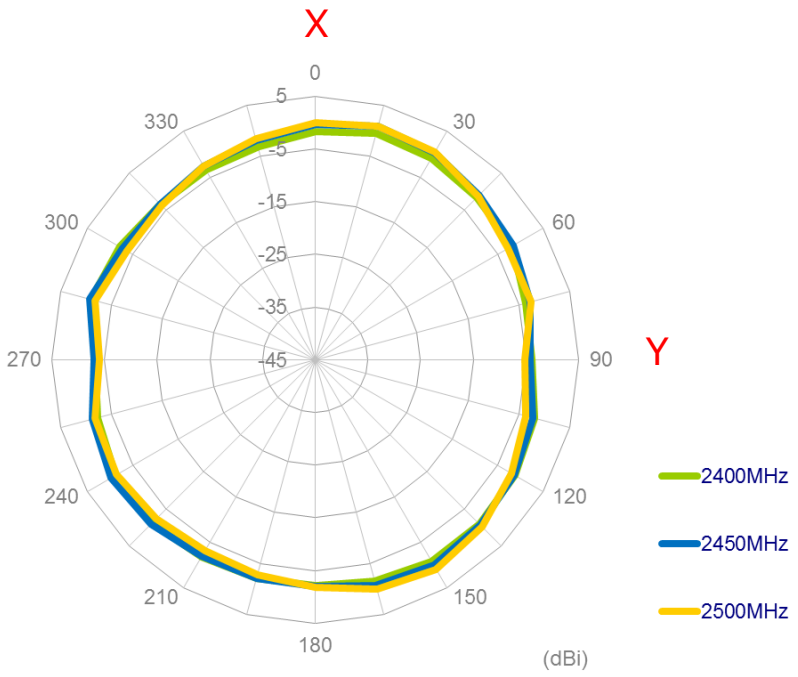
2450MHz



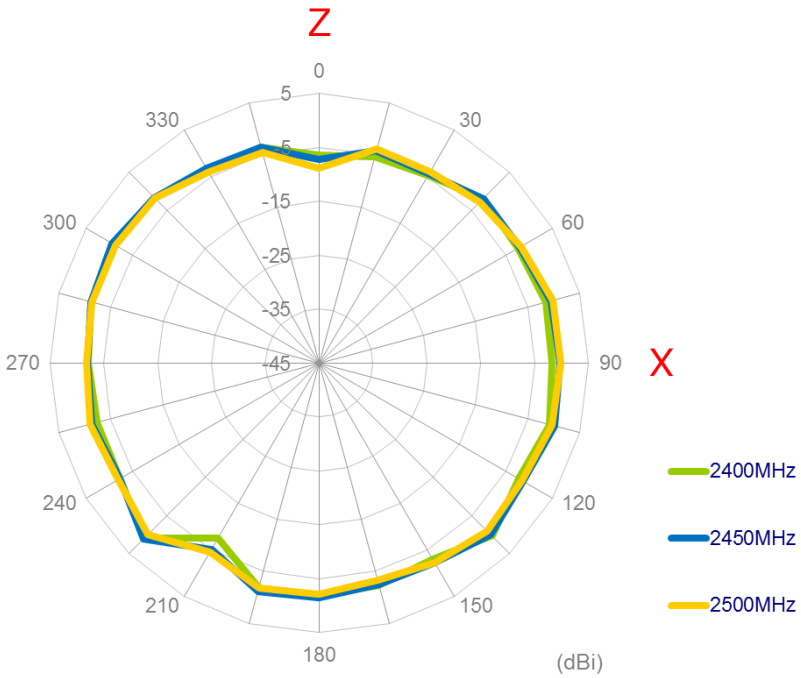
2500MHz

## 4.7 2D Radiation Pattern (On the 20*20cm ground plane center edge)

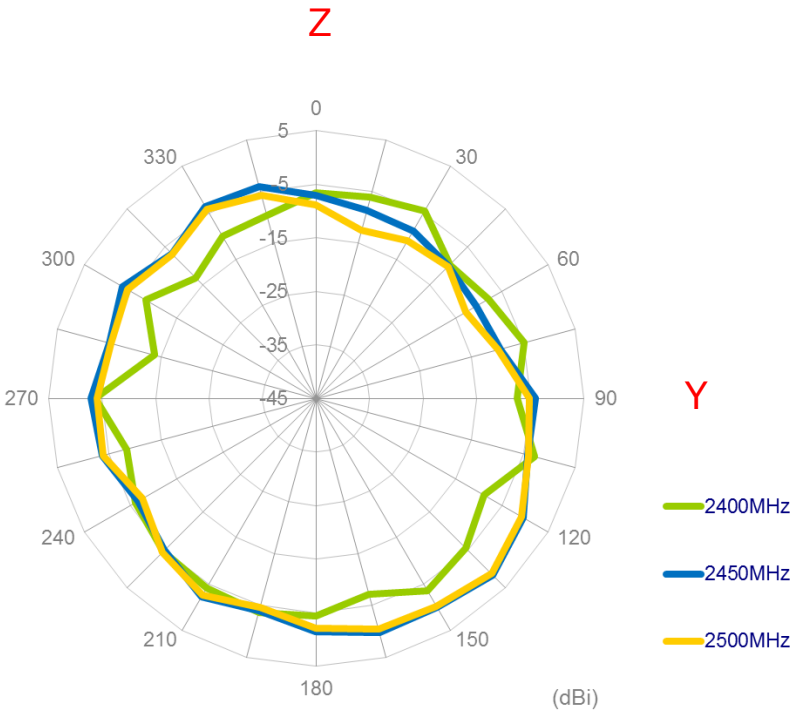
XY Plane



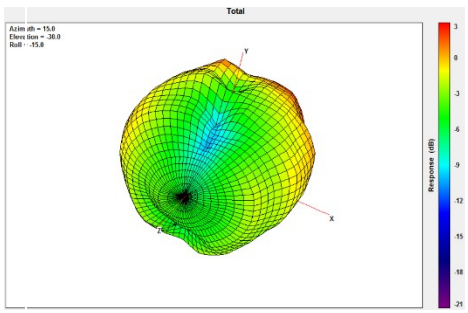

XZ Plane



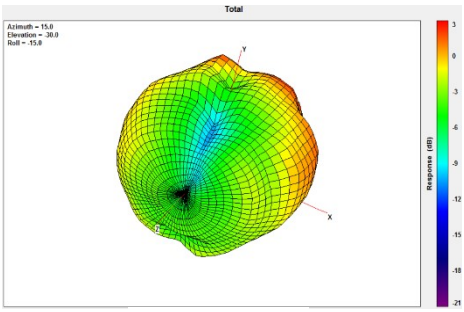
YZ Plane



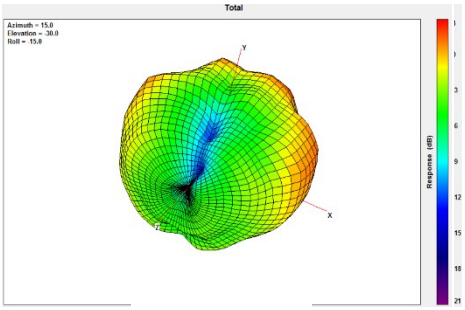

## 4.8 3D Radiation Pattern (On 20*20cm ground plane center edge)



2400MHz



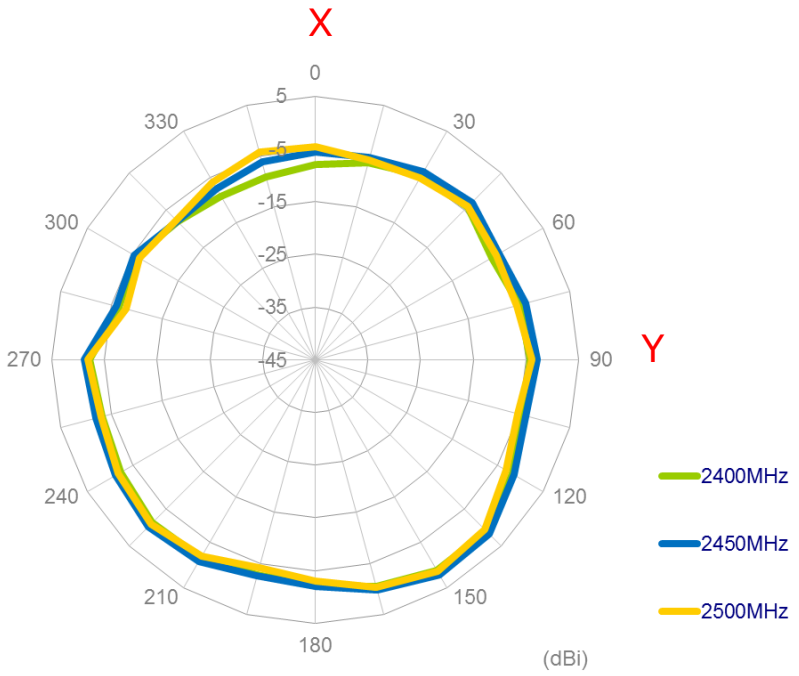
2450MHz



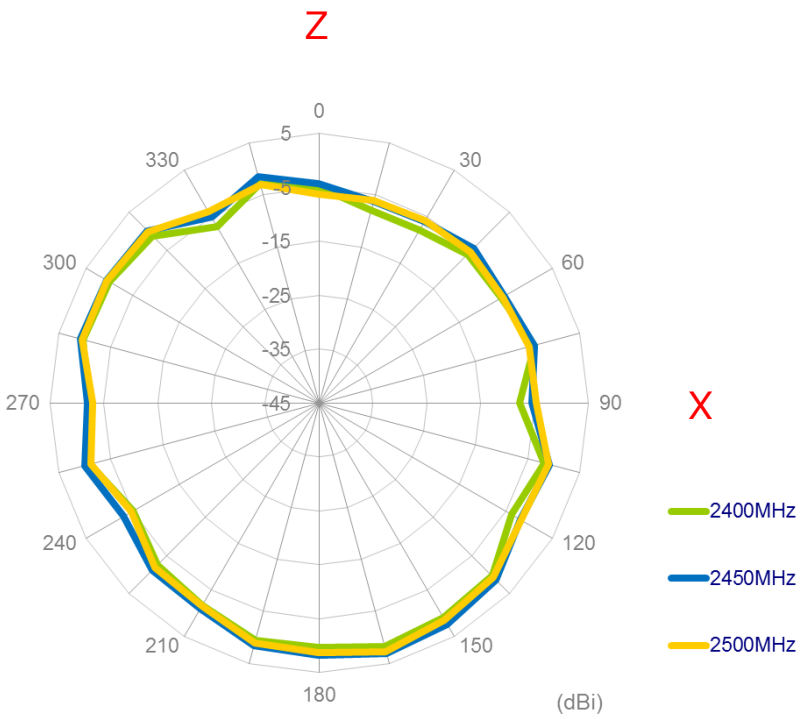
2500MHz

## 4.9 2D Radiation Pattern (On 20*20cm ground plane off center edge)

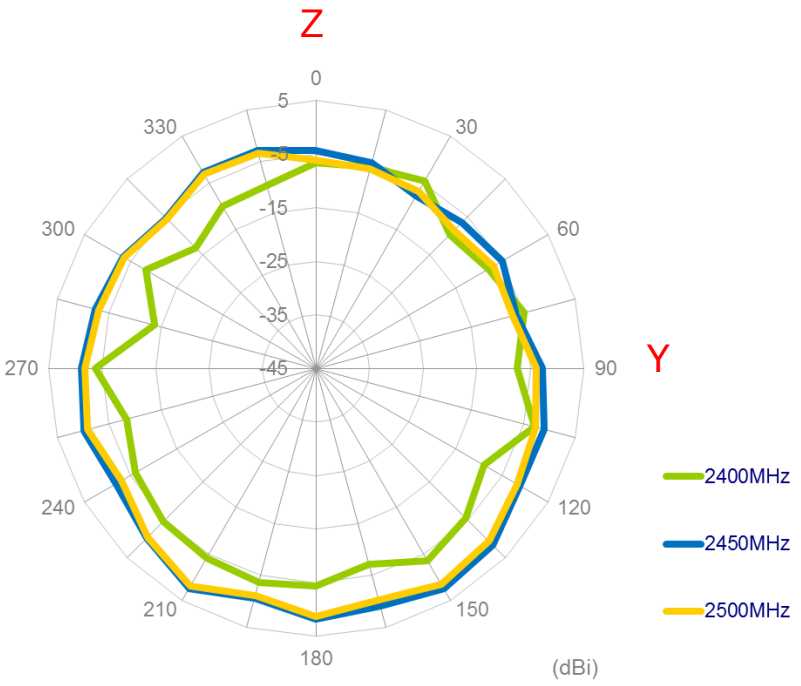
XY Plane



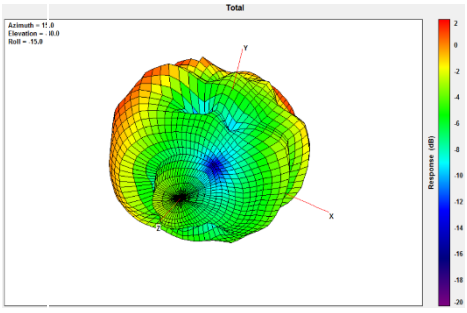

XZ Plane



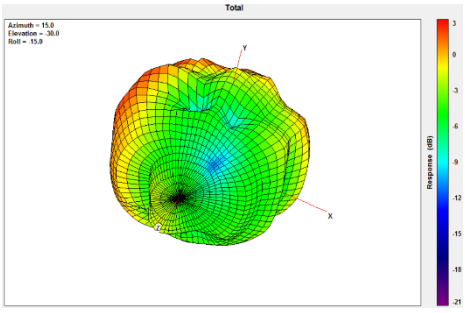
YZ Plane



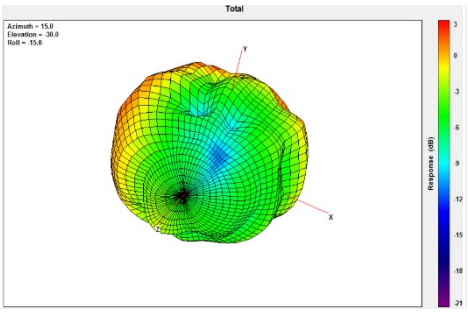

## 4.10 3D Radiation Pattern (On 20*20cm ground plane off center edge)



2400MHz



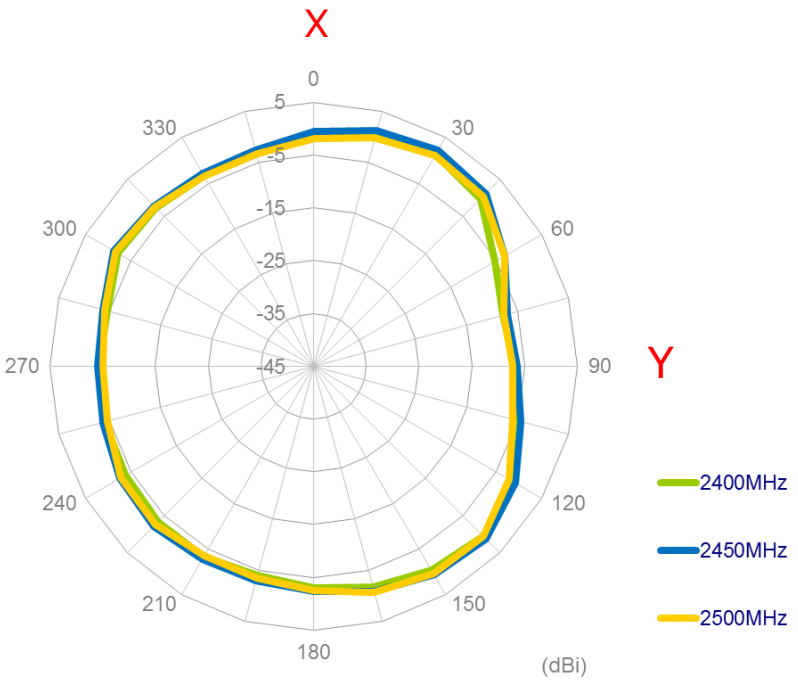
2450MHz



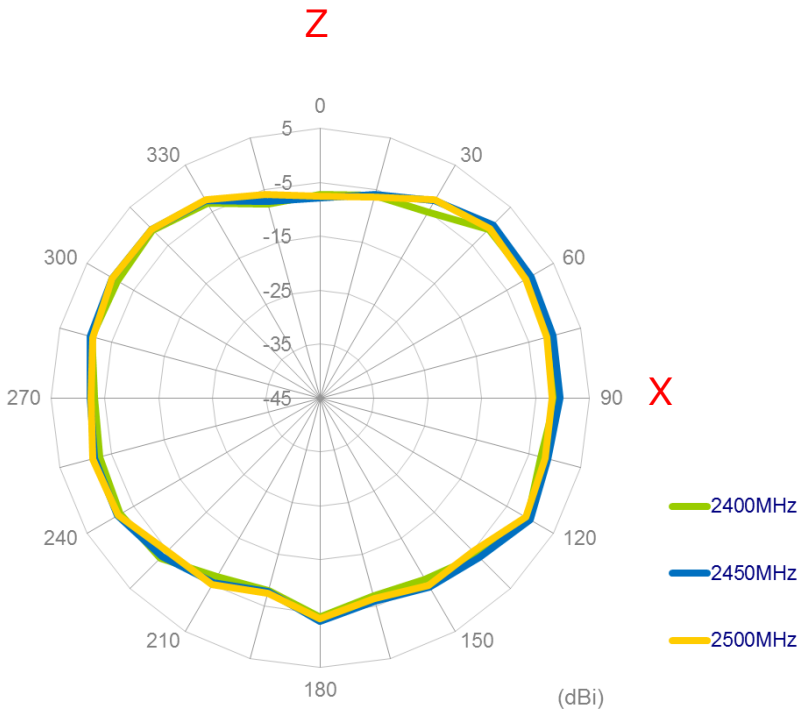
2500MHz

## 4.11 2D Radiation Pattern (On 30*30cm ground plane off center edge)

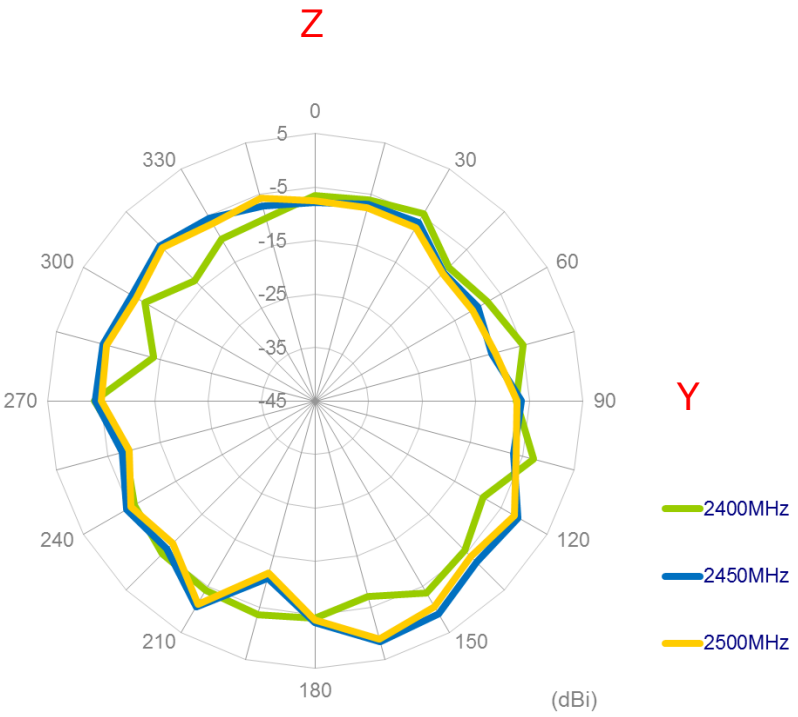
XY Plane



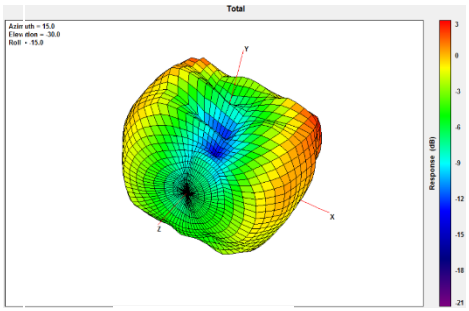

XZ Plane



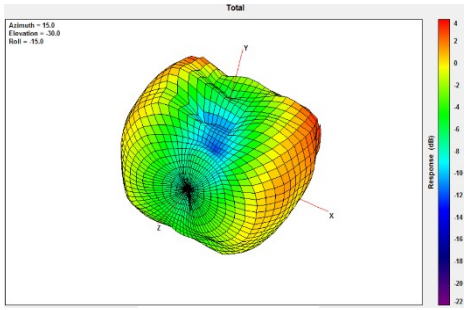
YZ Plane



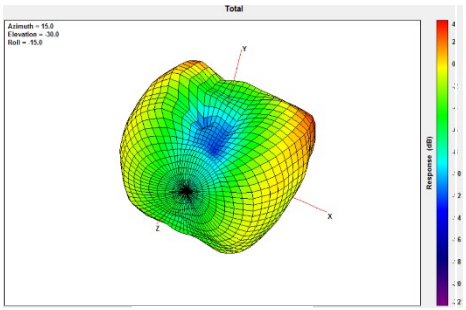

## 4.12 3D Radiation Pattern (On 30*30cm ground plane center edge)



2400MHz



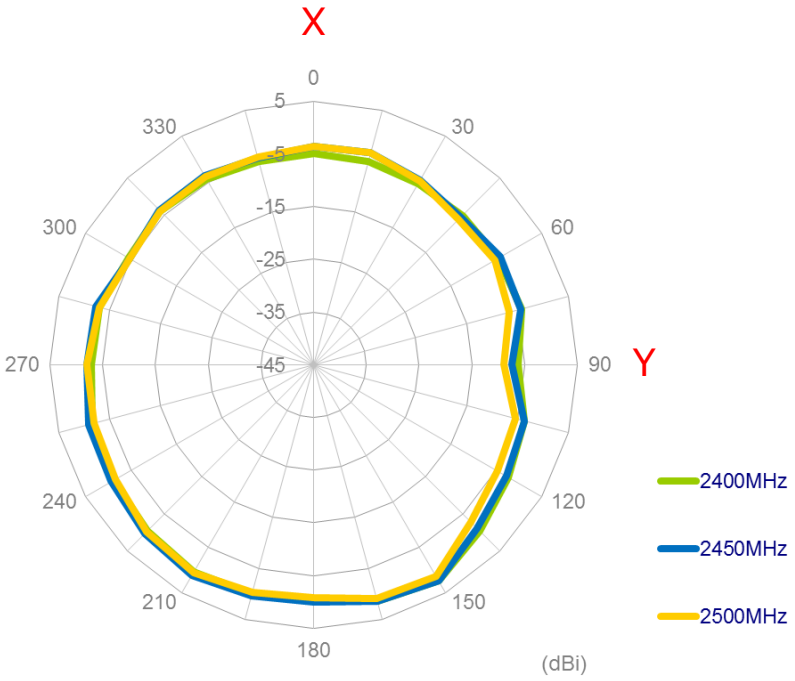
2450MHz



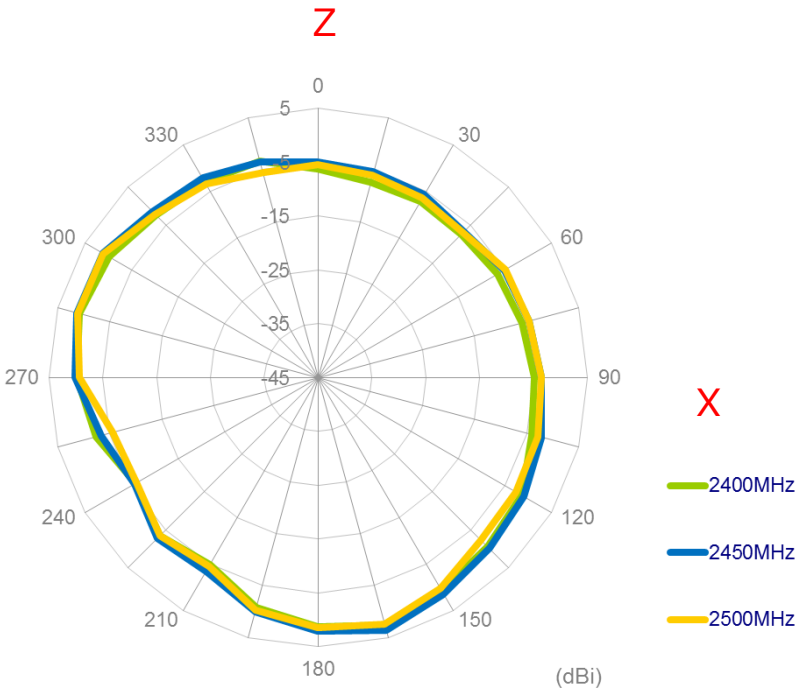
2500MHz

## 4.13 2D Radiation Pattern (On 30*30cm ground plane off center edge)

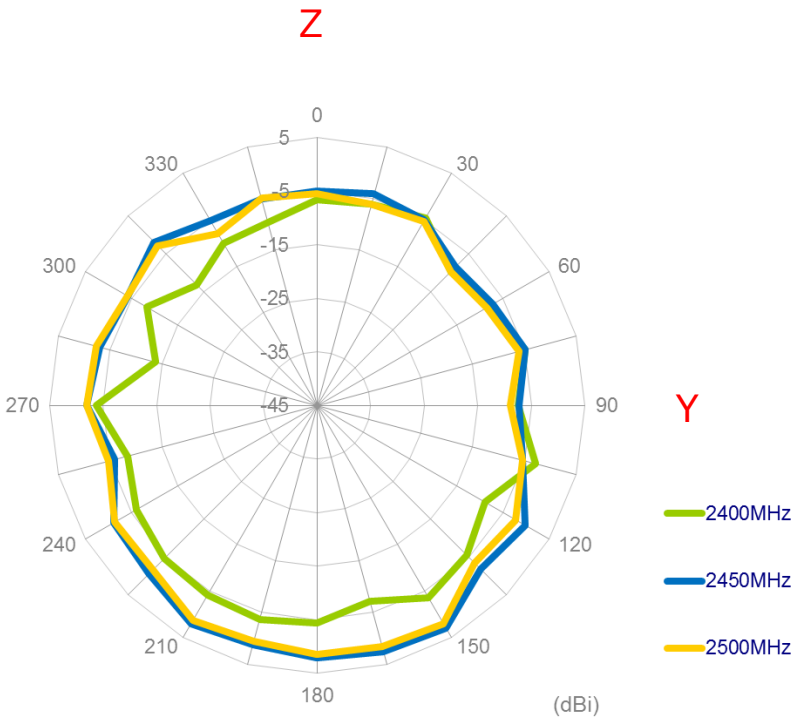
XY Plane



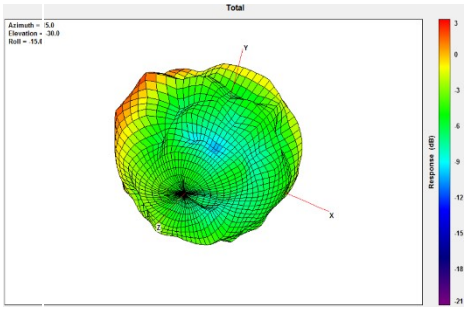

XZ Plane



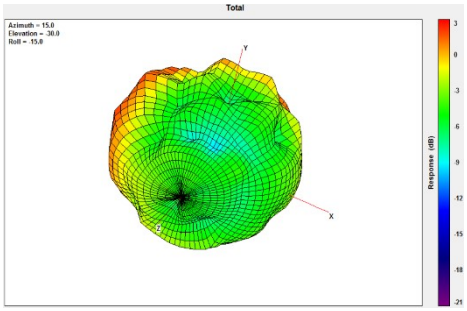
YZ Plane



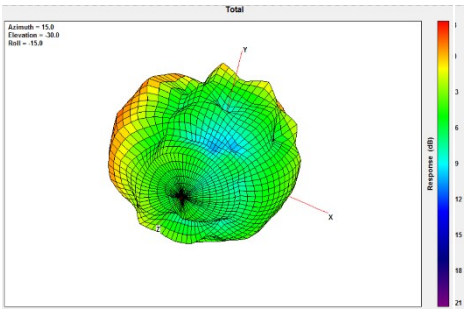

## 4.14 3D Radiation Pattern (On 30*30cm ground plane off center edge)




2400MHz



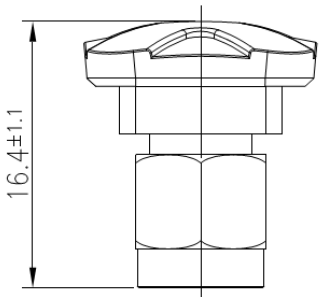

2450MHz



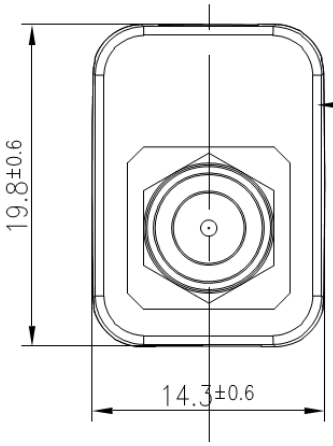

2500MHz

# 5. DRAWING (Unit: mm)

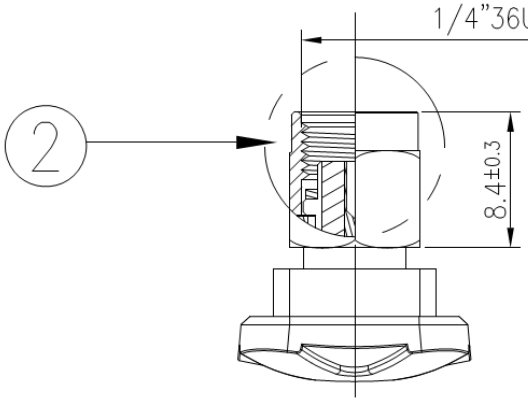
3D View




Top View




Side View

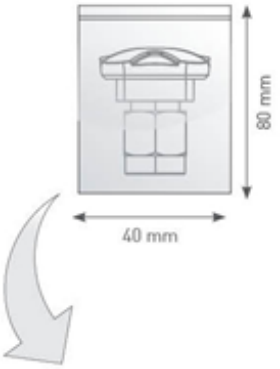



Bottom View

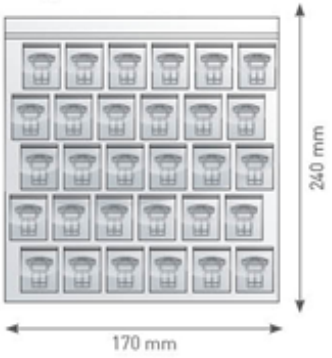
| | Name | Material | Finish | QTY |
|---|---|---|---|---|
| 1 | External housing | ABS | White | 1 |
| 2 | RP-SMA(M) | Brass | Au Plated | 1 |

# 6. Packaging

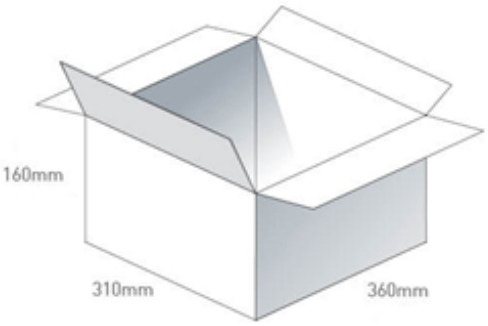
1 pcs WCM.01.0151W per PE Bag
PE Bag Dimensions - 80*40mm
Weight - .007g



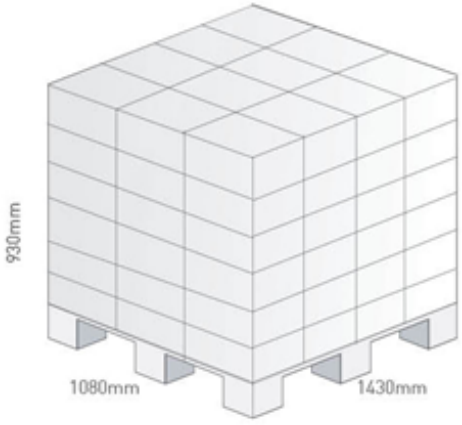

100 PE Bags per Large PE Bag
100 pcs WCM.01.0151W per Large PE Bag
Large Polybag Dimensions - 240*170mm
Weight - 0.7kg




15 Large PE bags per carton
1500 pcs WCM.01.0151W per carton
Carton Dimensions - 360*310*160mm
Weight - 11kg




Pallet Dimensions 1080mm*930m*1430mm
72 Cartons per Pallet
12 Cartons per layer
6 Layers



# OCEAN CHIPS
## Океан Электроники
## Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «**JONHON**», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «**FORSTAR**».

AVIC JONHON

**«JONHON»** (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

**«FORSTAR»** (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

FORSTAR®

Телефон: 8 (812) 309-75-97 (многоканальный)
Факс: 8 (812) 320-03-32
Электронная почта: ocean@oceanchips.ru
Web: http://oceanchips.ru/
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А