

## SPECIFICATION

Part No.	:	<b>TG.22.0112</b>
Product Name	:	Penta-Band Cellular Connector Mount Monopole Helical GSM-DCS-PCS-UMTS-CDMA-GPRS-EDGE-HSPA 824MHz ~2170 MHz
Features	:	2.5dBi Gain SMA(M) Fixed Right Angle plug 50 Ohms ROHS & REACH Compliant



## 1. Introduction

The TG.22.0112 Penta-band GSM-DCS-PCS-UMTS-CDMA-GPRS-EDGE-HSPA 824MHz to 2170MHz monopole helical antenna is a quality robust antenna with high gain in small form factor.

Connection is made via fixed right angle SMA(M) connector with a hardened waterproof PU casing, this antenna is the ideal GSM antenna for telematics devices.

## 2. Antenna Performance

### 2.1 Electrical Specifications

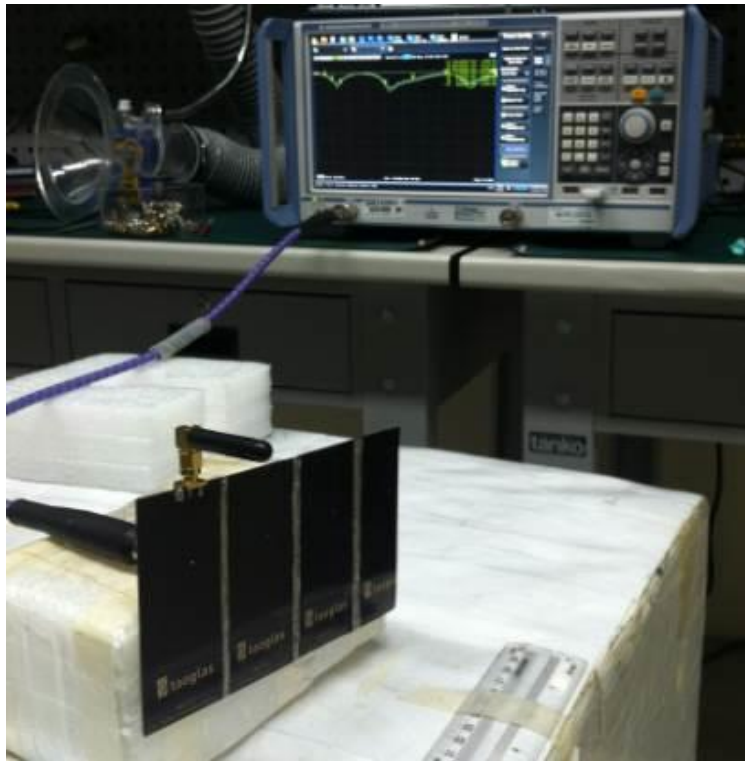
Parameter	Specification				
Bands	GSM850	GSM900	DCS	PCS	WCDMA I
Frequency Range	824~896MHz	880~960MHz	1710~1880MHz	1850~1990MHz	1920~2170MHz
Return Loss	$\leq -5\text{dB}$				
VSWR	$\leq 3.5$				
Peak Gain	1.49dBi	1.93dBi	2.37dBi	2.58dBi	2.23dBi
Efficiency	66.24%	70.86%	70.47%	68.87%	65.40%
Average Gain	-1.81dBi	-1.50dBi	-1.52dBi	-1.63dBi	-1.89dBi
Polarization	Linear				
Power handling	20 W				
Impedance	50 Ohms				
Connector	SMA(M) Right Angle				

\*All the antenna characteristics were measured with 150mm\*90mm ground plane

### 2.2 Environmental & Mechanical Characteristics

Parameter	Specification
Temperature	-40°C to +85°C
Radome Colour	Black
Radome Material	TPEE
Weight	8g

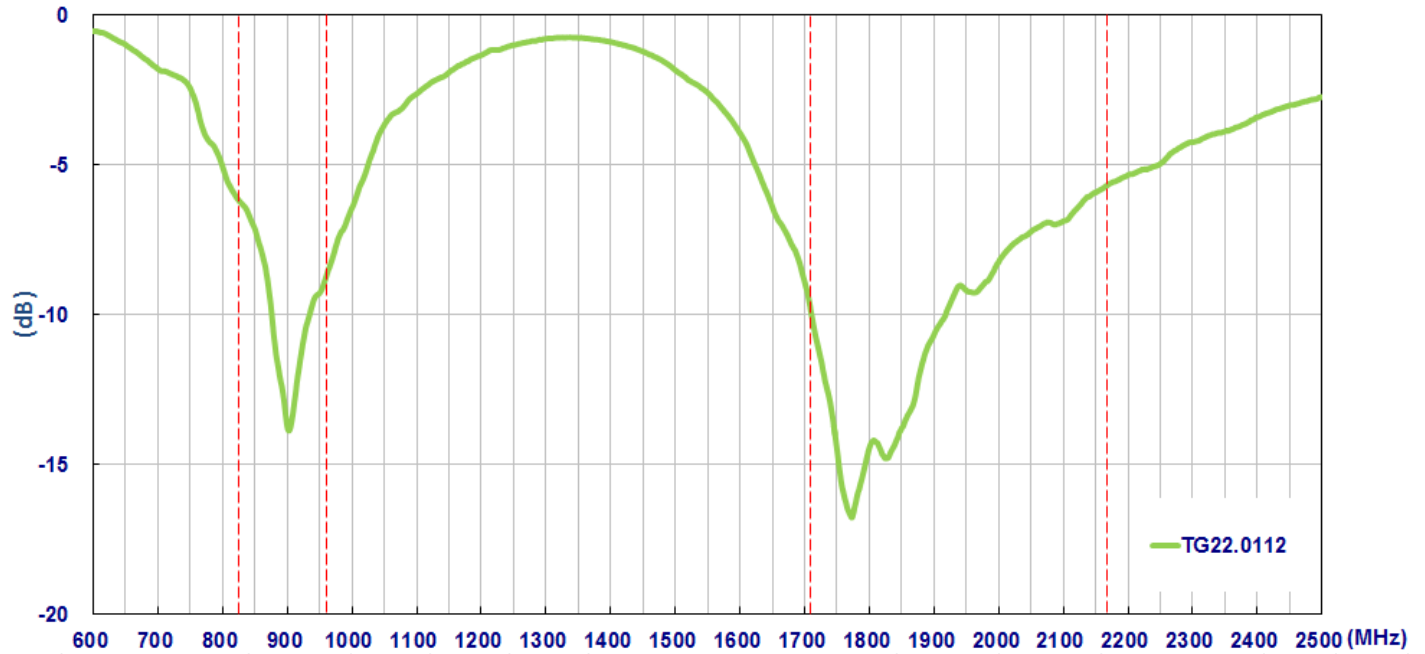
### 3. Test Set Up



**Figure 1.** Impedance and VSWR measurements

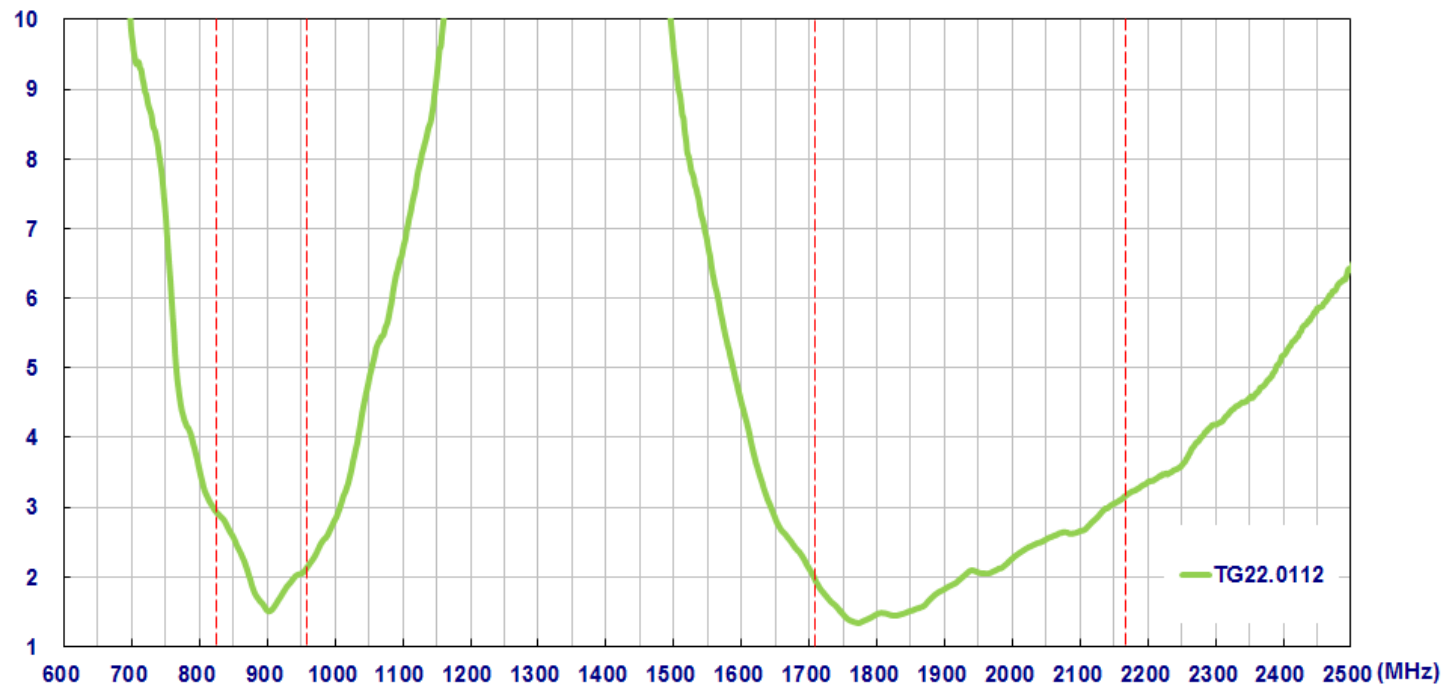
## 4. Performance Measurements

### 4.1 Return Loss



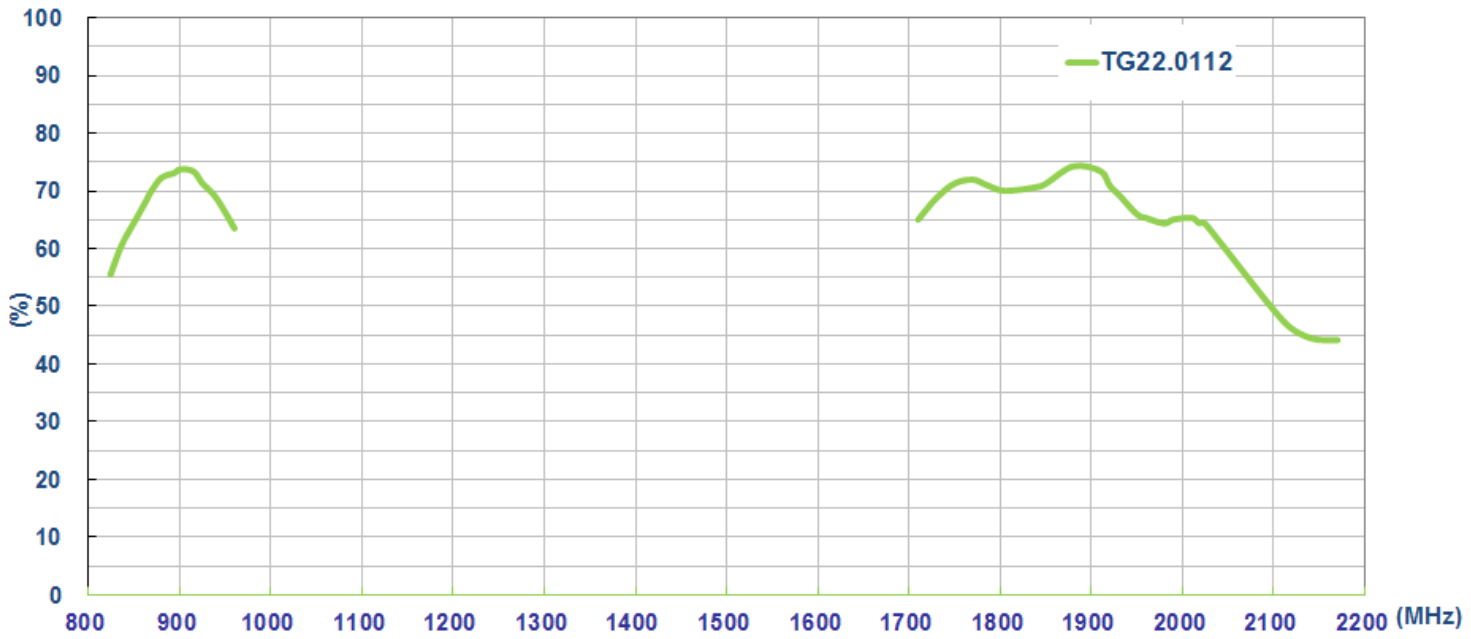
**Figure 2.** Return Loss of TG.22.0112

### 4.2 VSWR



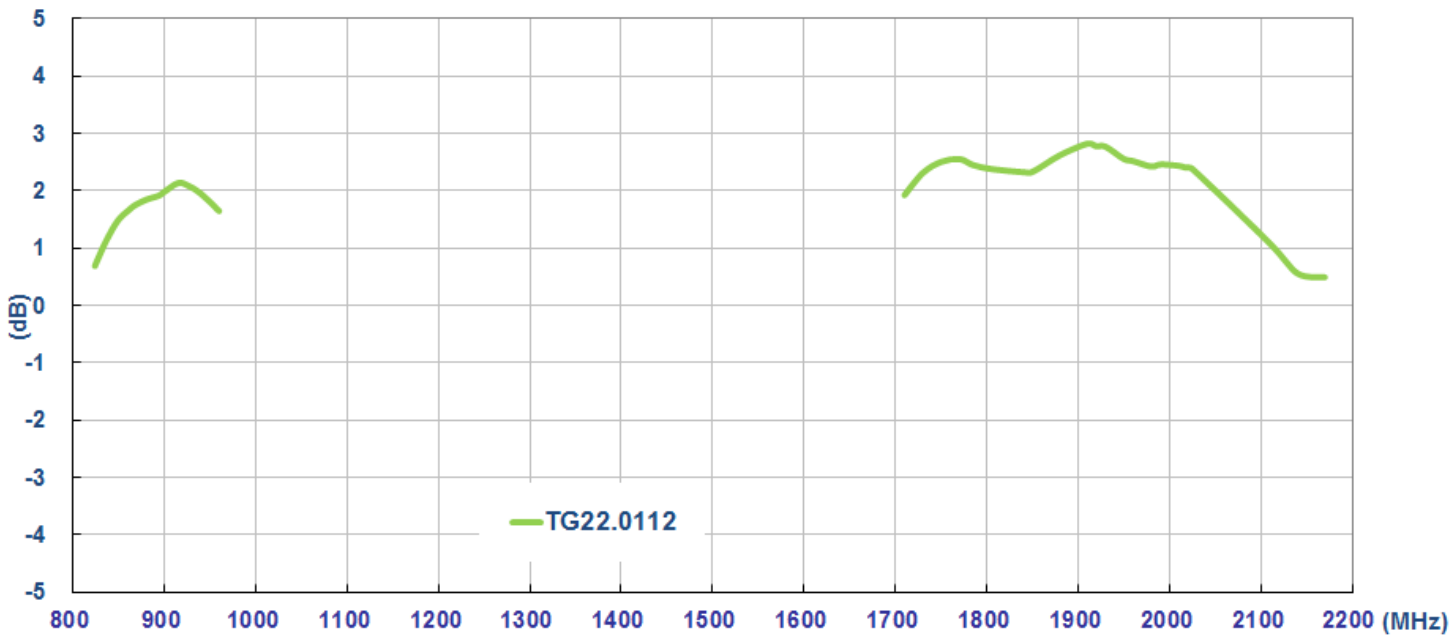
**Figure 3.** VSWR of TG.22.0112

### 4.3 Efficiency (%)



**Figure 4.** Efficiency of TG.22.0112

### 4.4 Peak Gain(dBi)



**Figure 5.** Peak Gain of TG.22.0112

#### 4.5 Average Gain(dBi)

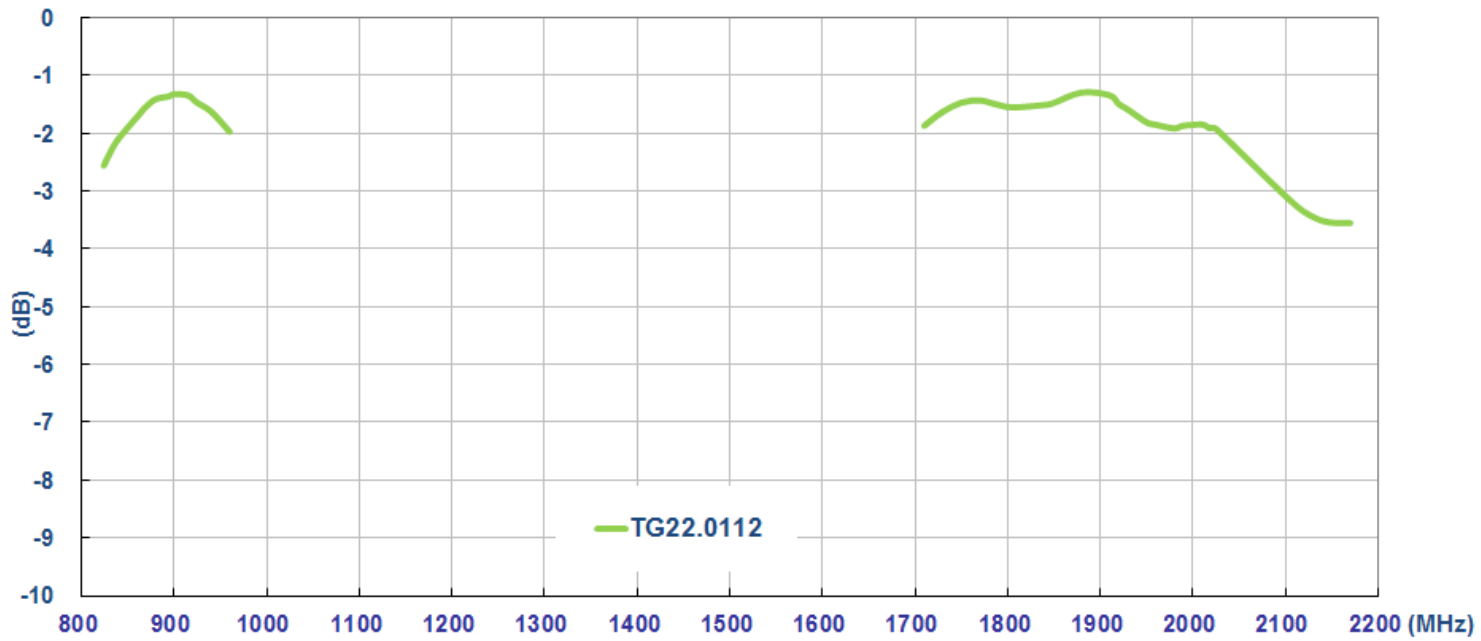
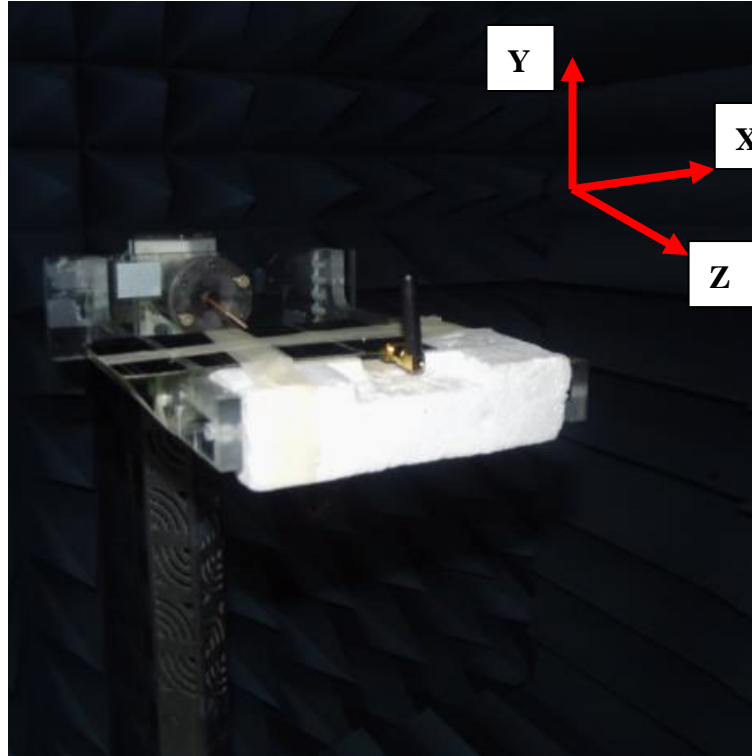


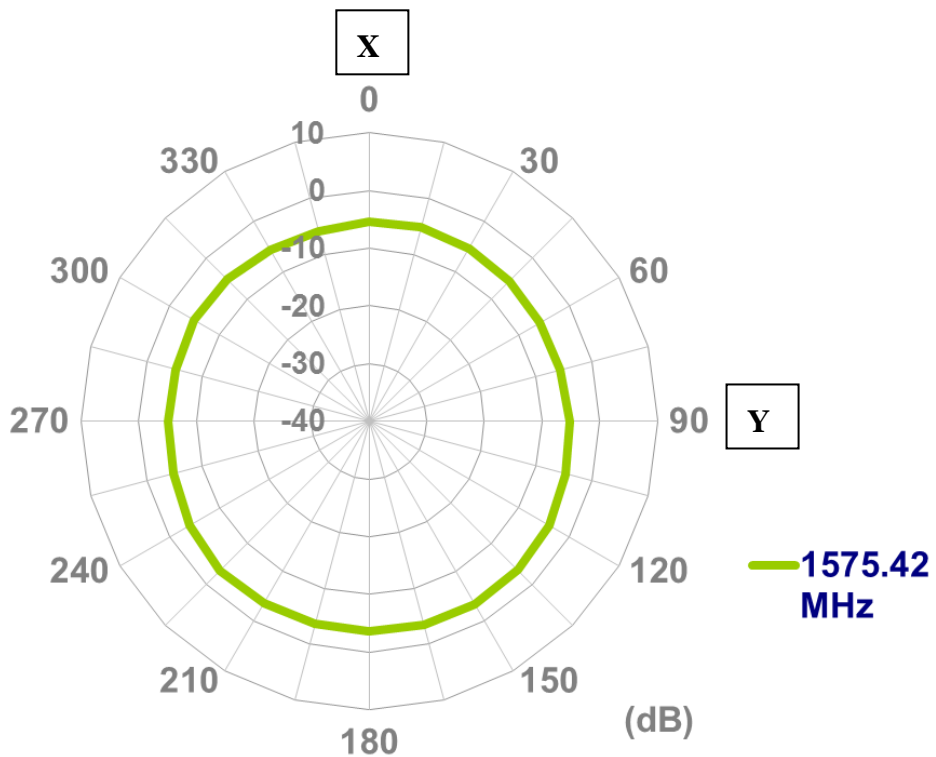
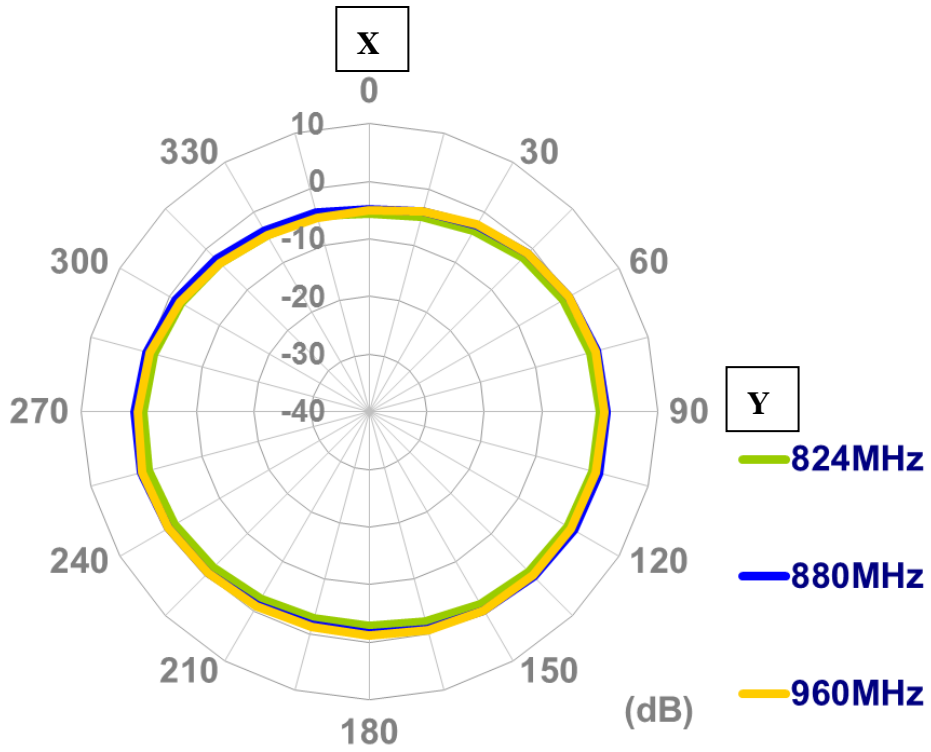
Figure 6. Average Gain of TG.22.0112

## 4.6 Radiation Pattern Data

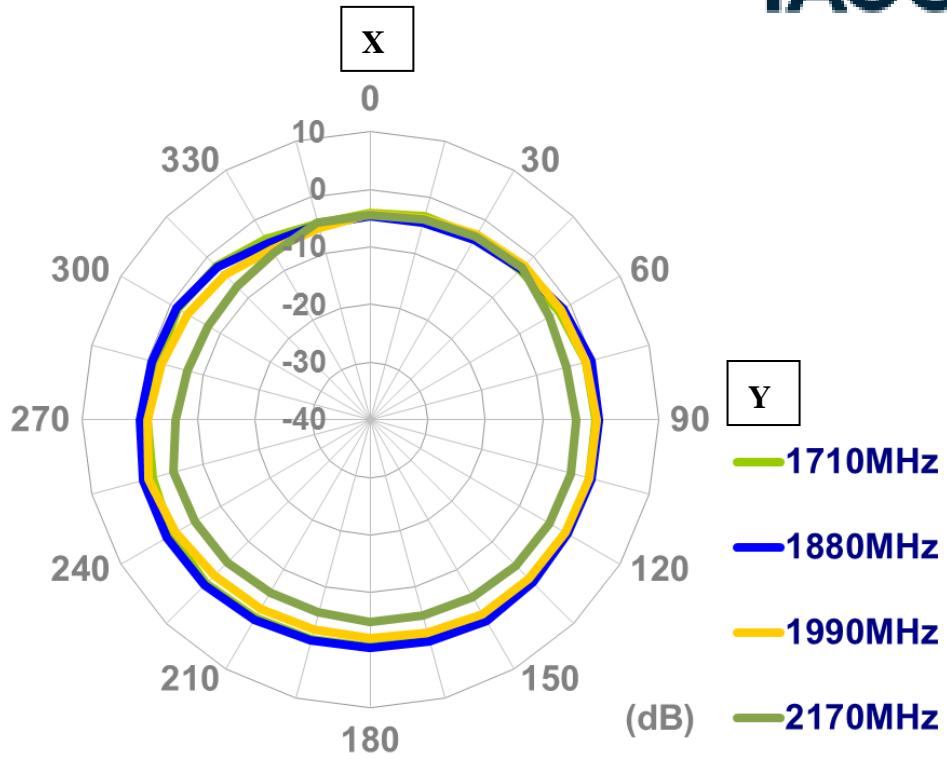


### 4.6.1 Radiation Pattern

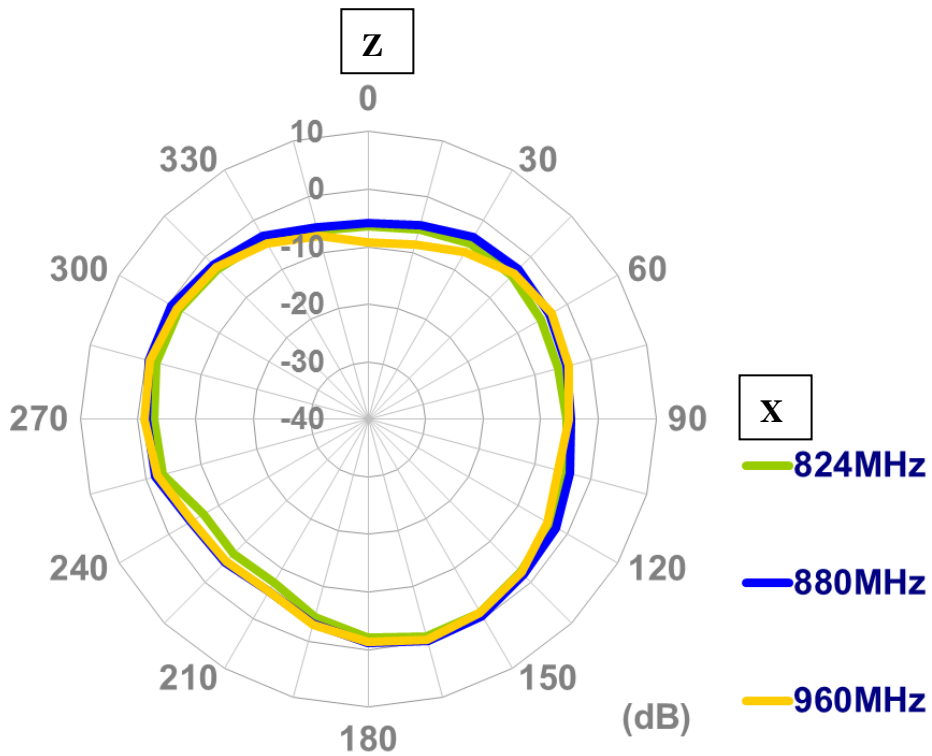
XY-Plane

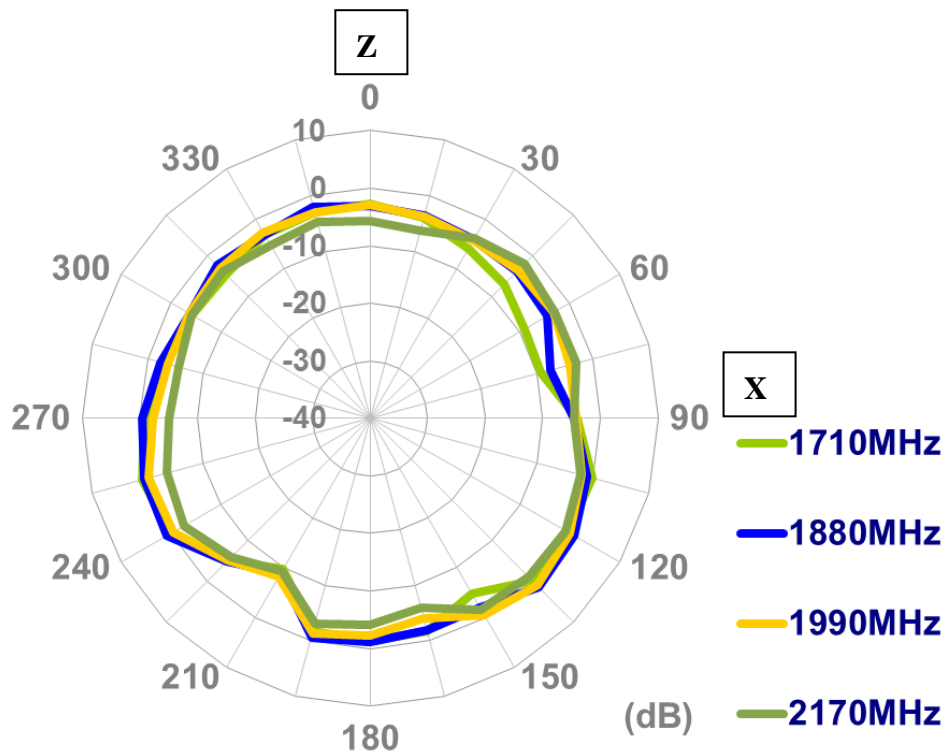
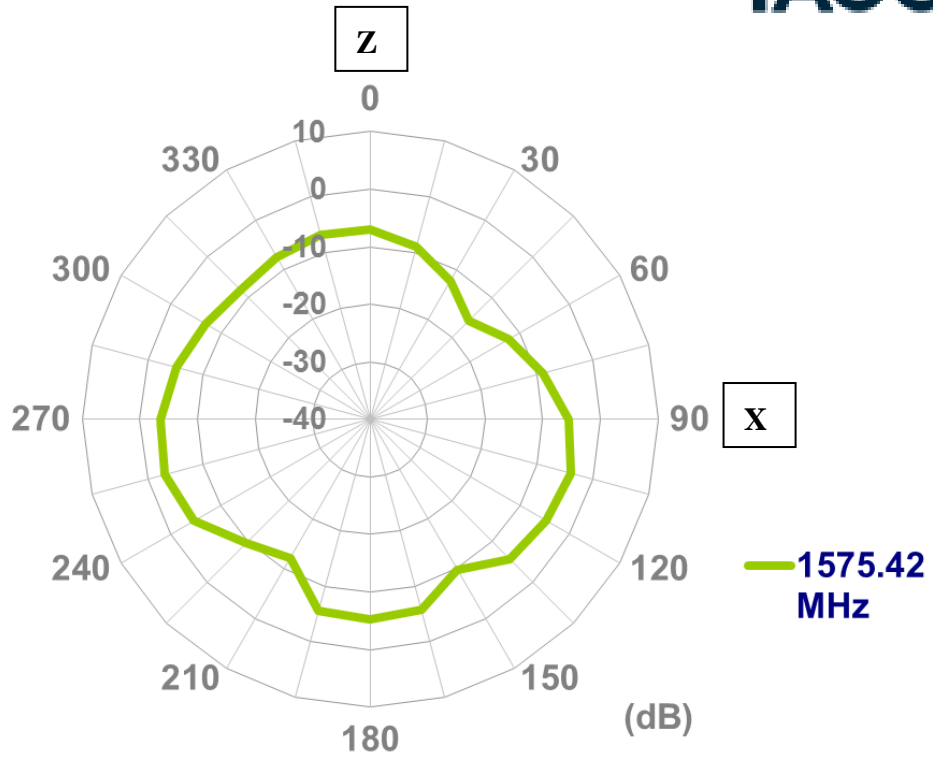




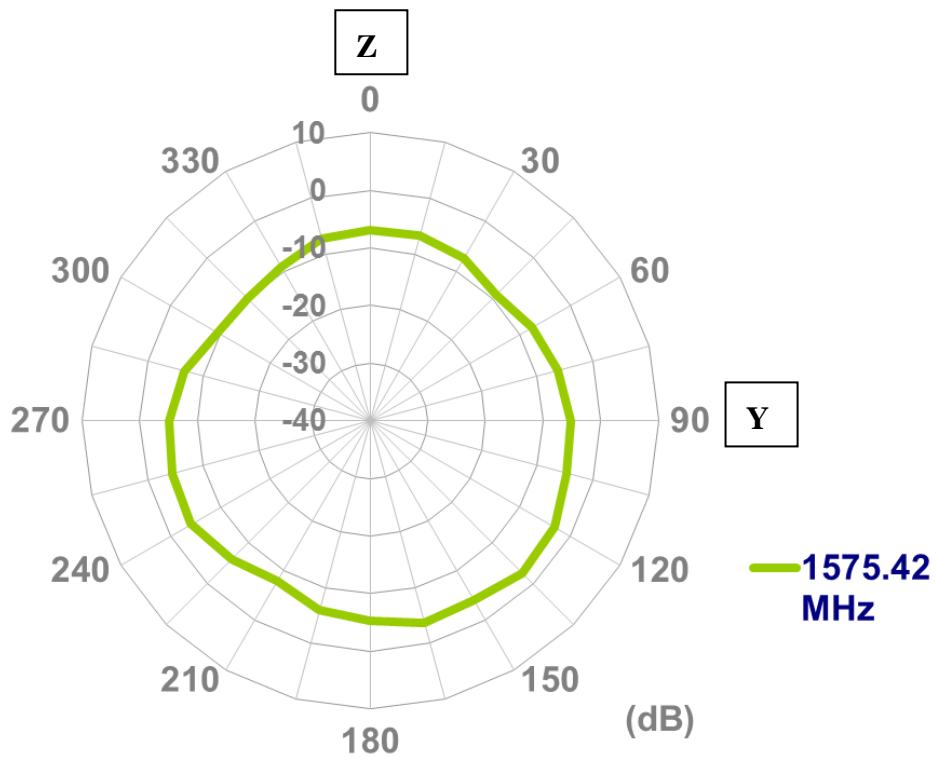
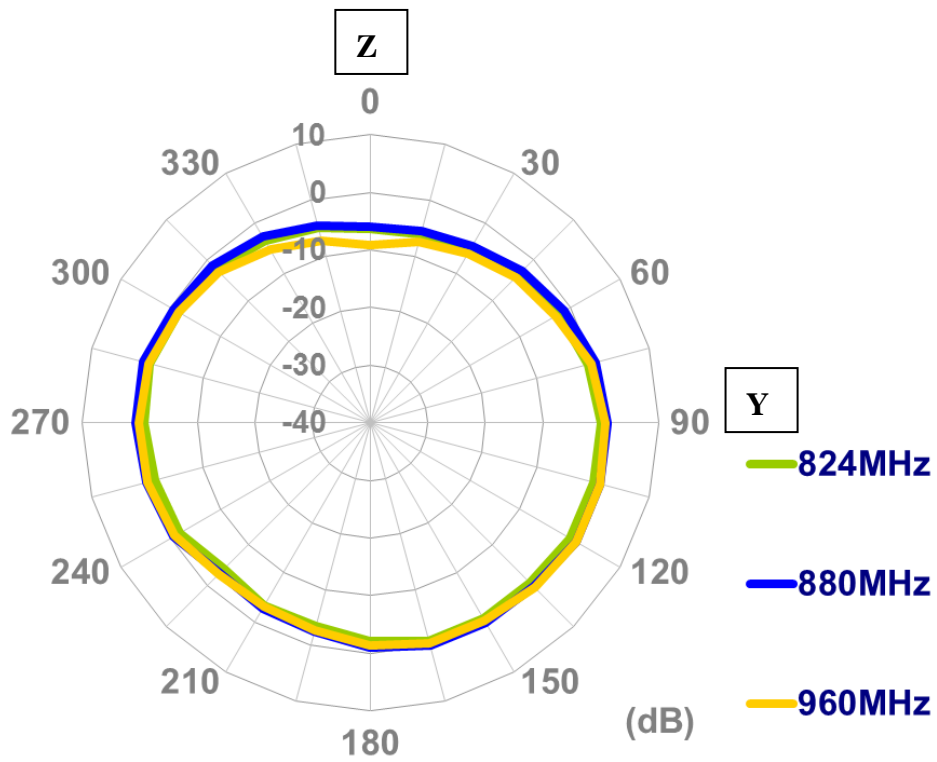


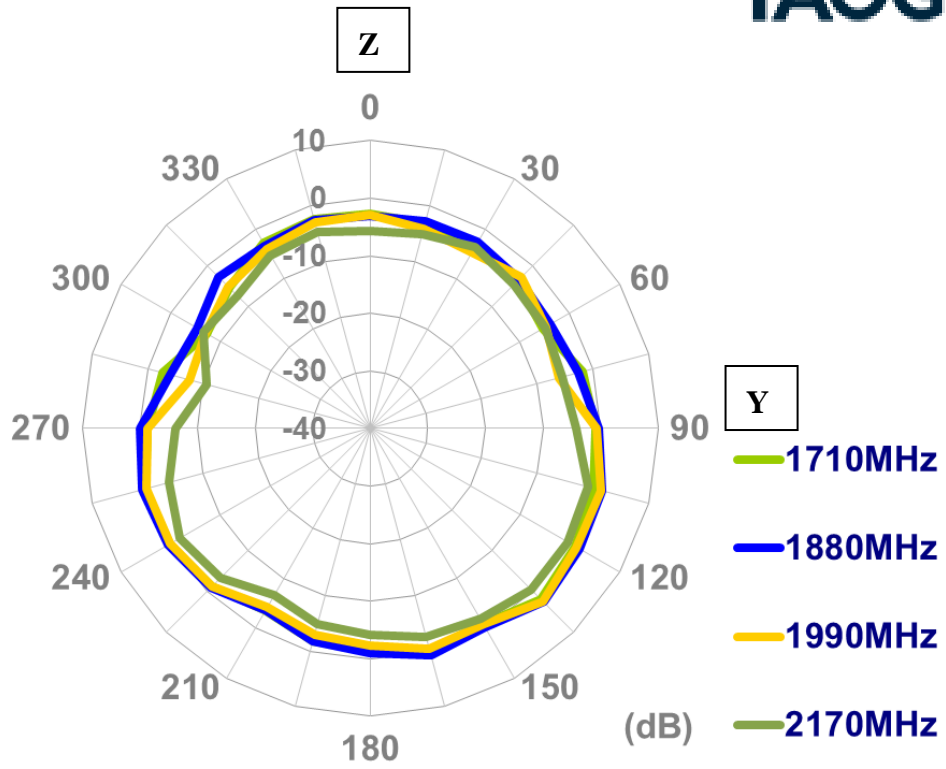
**XZ-Plane**



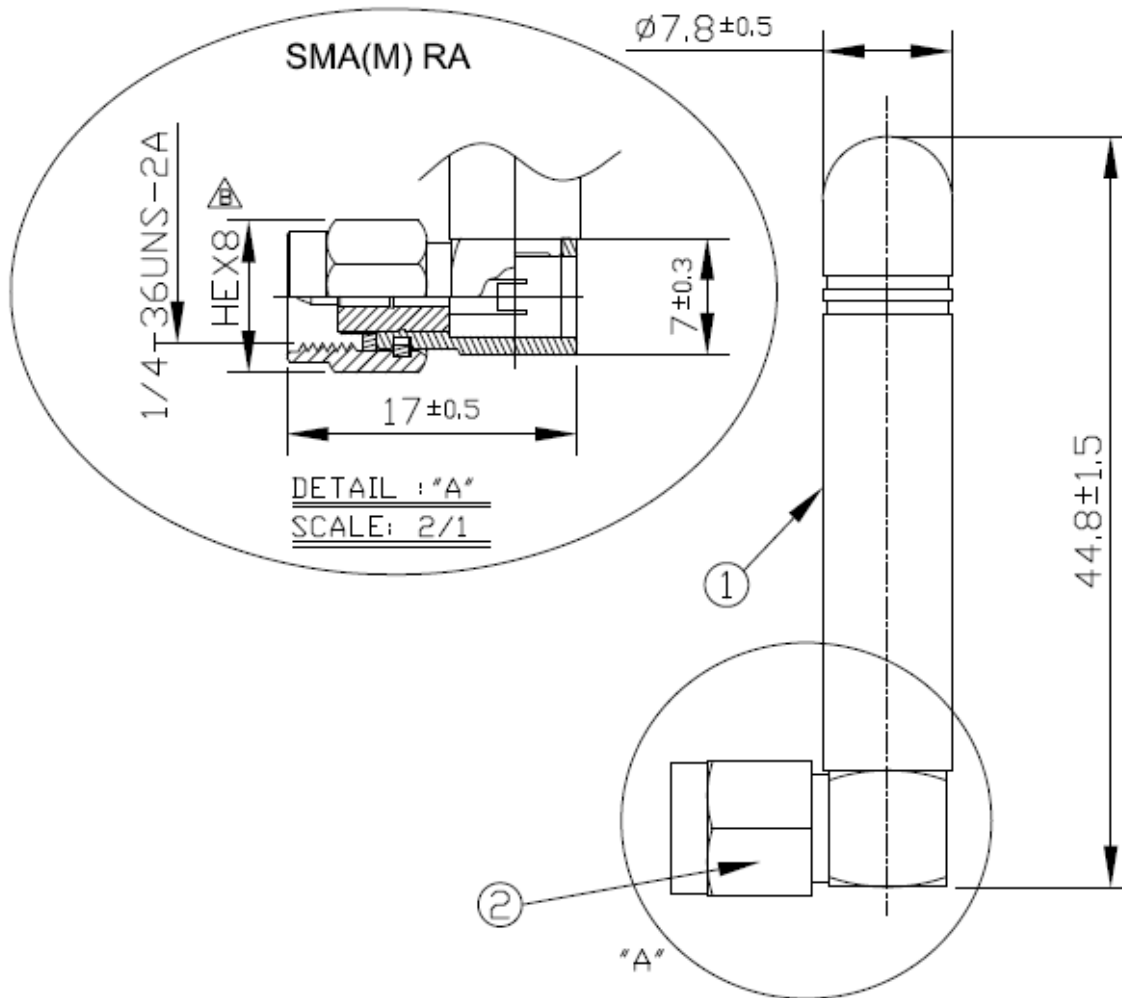


**YZ-Plane**





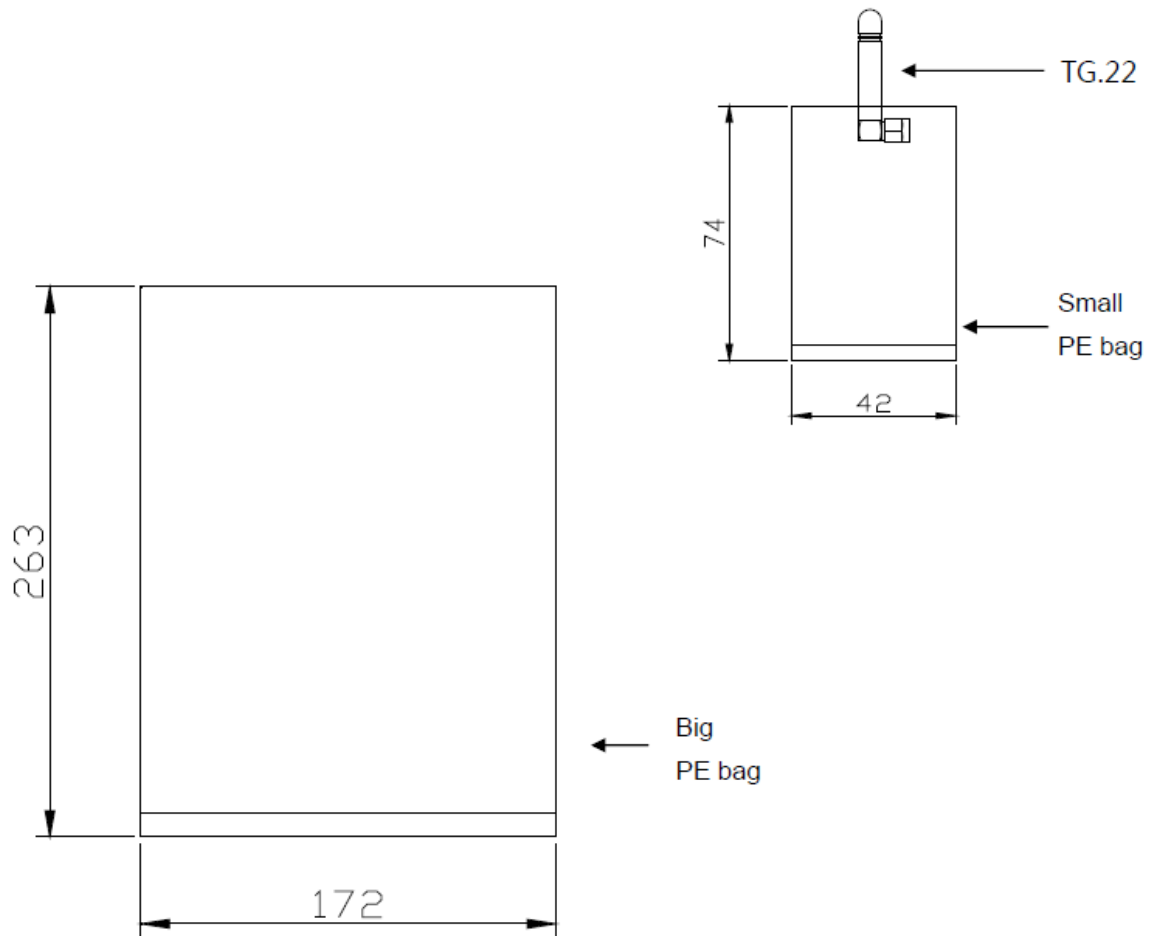
## 5. Mechanical Drawing



	Name	P/N	Material	Finish	QTY
①	Antenna Housing	000111F030002A	TPEE	Black	1
②	SMA(M) RA	210211G010002A	Brass	Gold	1

unit:mm

## 6. Packaging



1pcs antennas per small PE bag.

100 small PE bags per big PE bag.

100pcs antennas per big sealed PE bag.

## 7. Installation

- 1) Use hand to screw the SMA connector.  
Tighten it until it feels a little tight.



- 2) Use torque wrench which has 0.9 Nm torque limit to tighten it.



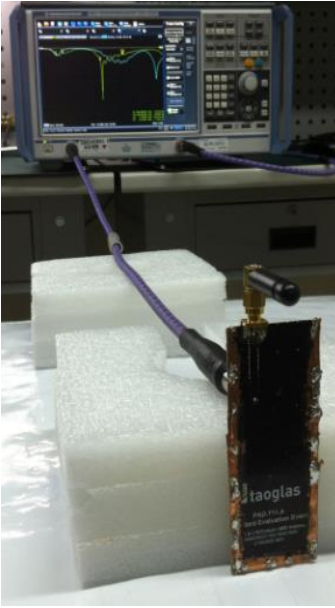
- 3) Do not use normal wrench.



## 8. Application Note

This section, Taoglas provides the ground variation effects to TG.22.0112 antenna. Detail setup is setup as below.

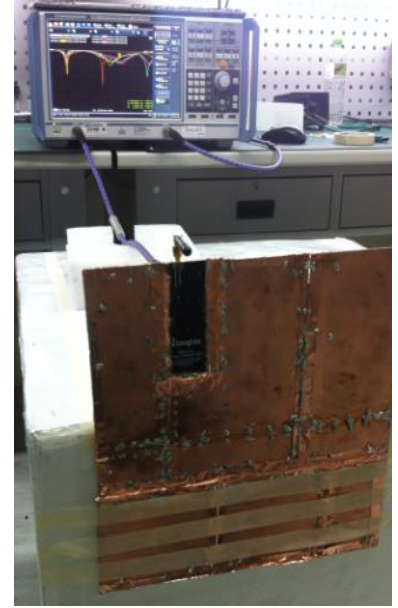
Ground Plane Dimensions:



10cm\*4cm



20cm\*20cm



30cm\*30cm



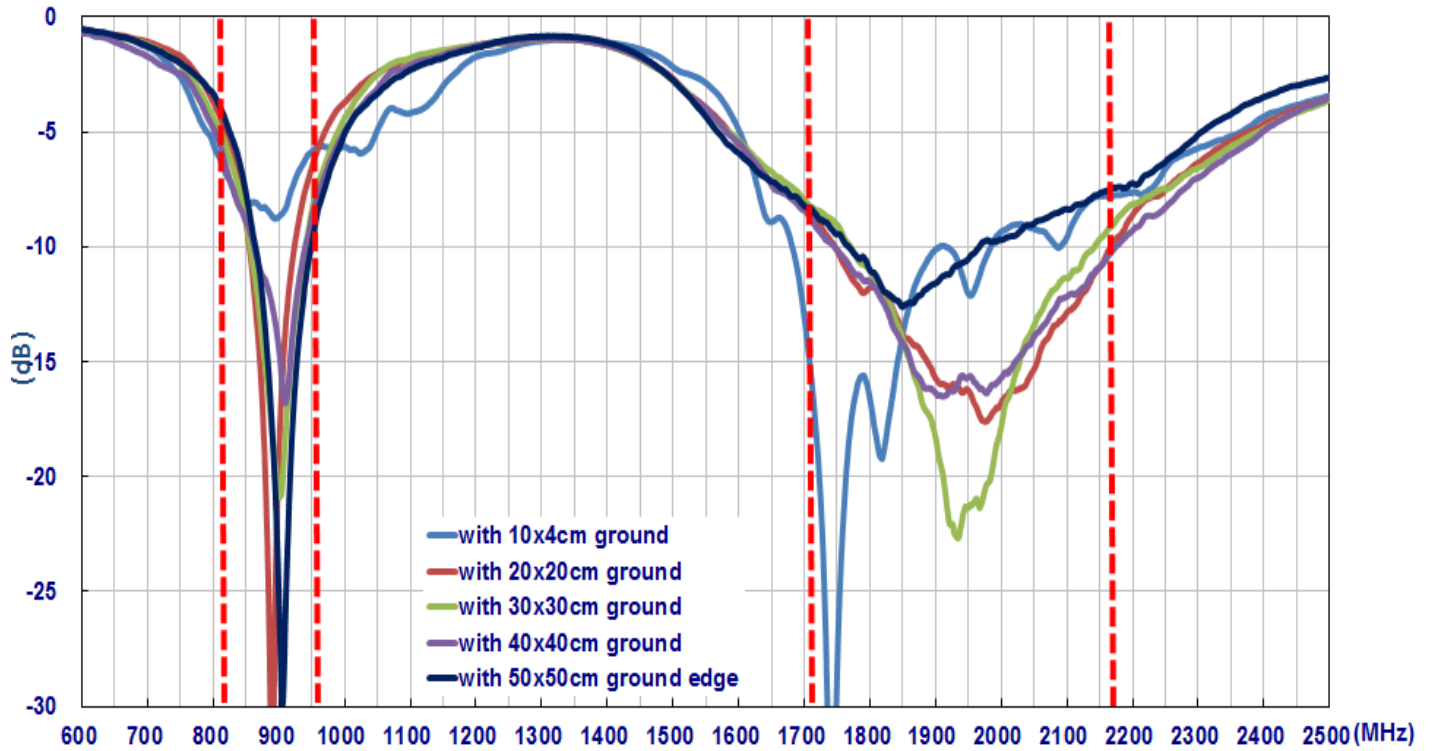
40cm\*40cm



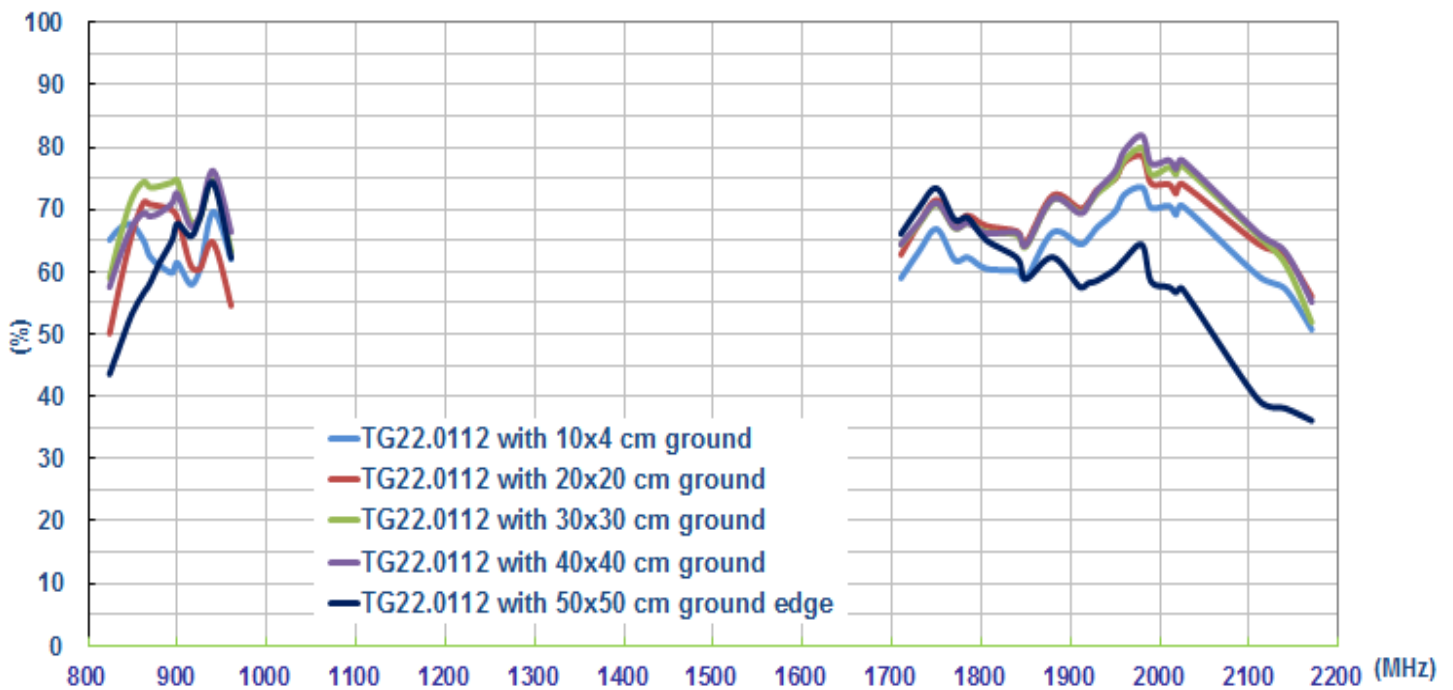
50cm\*50cm edge



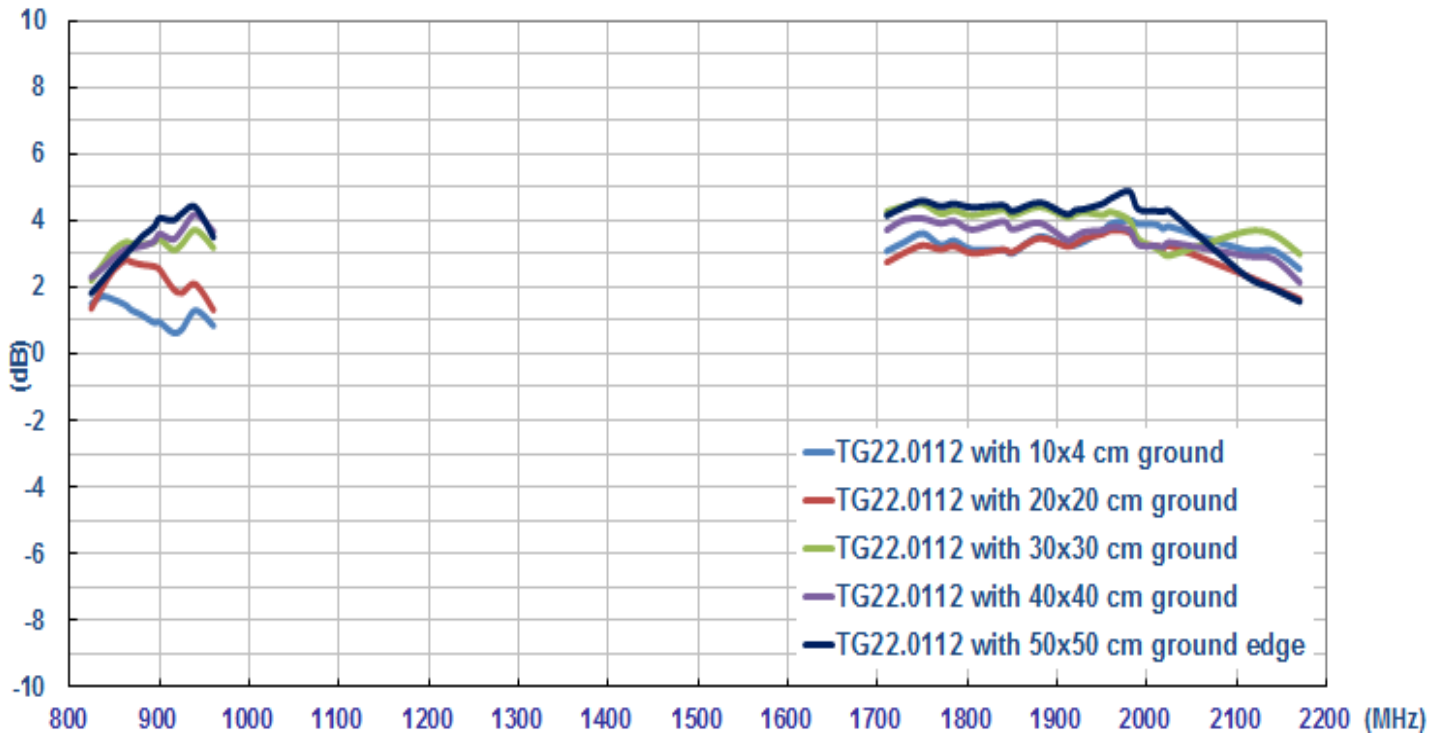
Return Loss:



Efficiency:



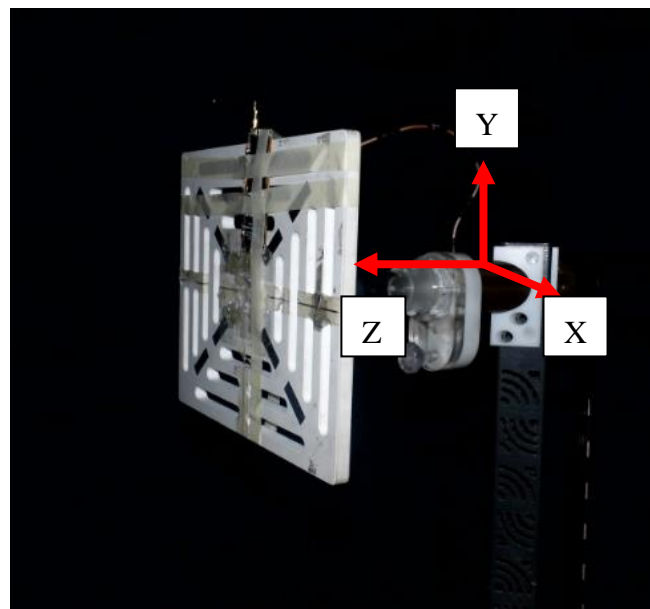
Peak Gain:



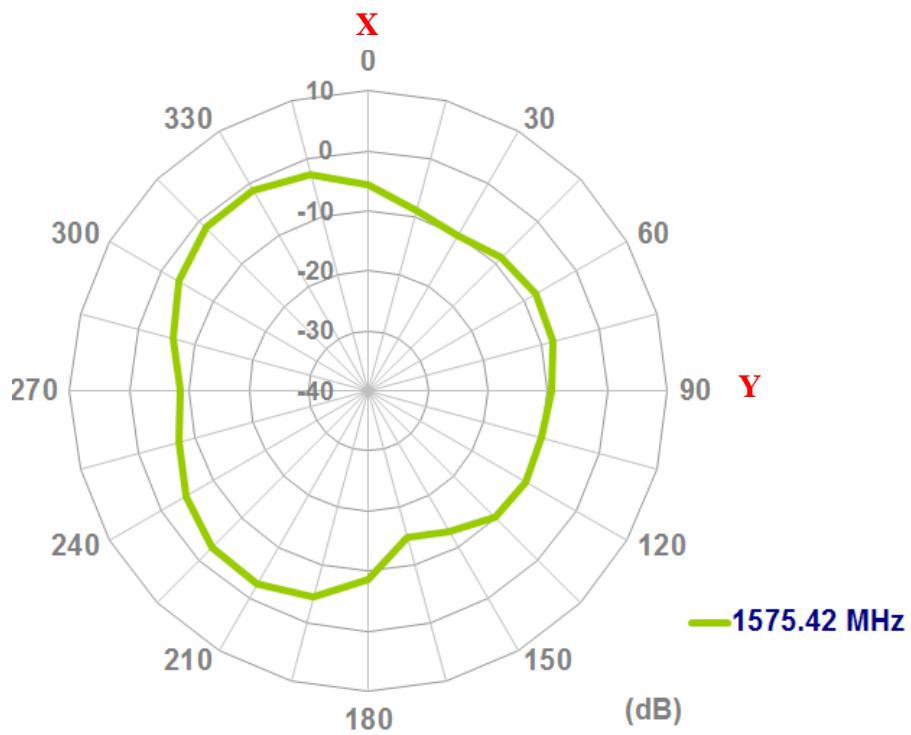
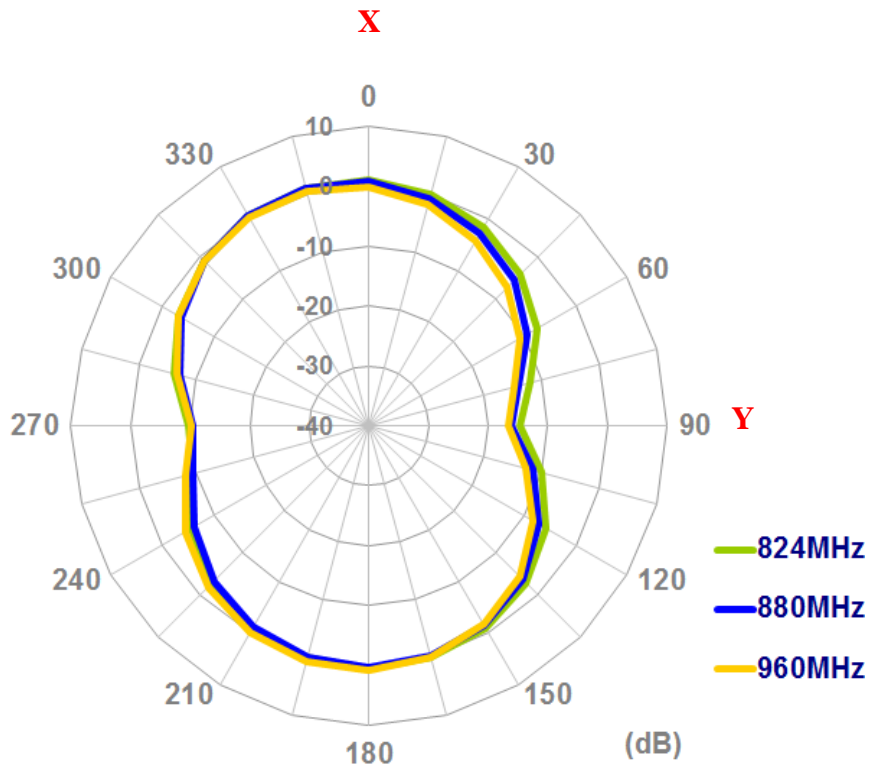
Radiation Pattern Measurement Setup:

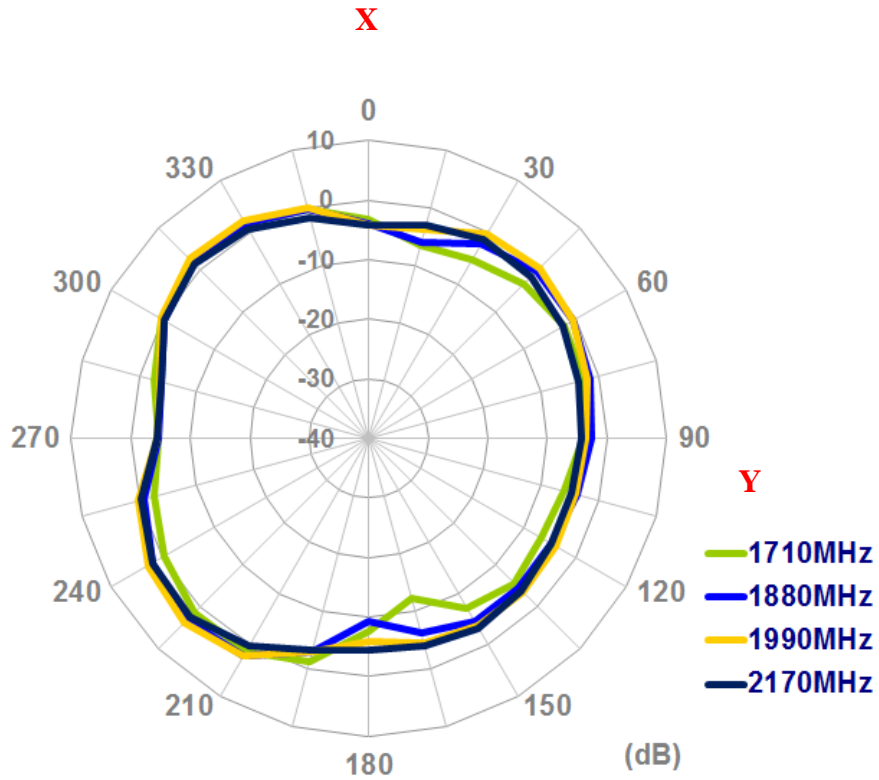
**10cm\*4cm Ground Plane**

Setup

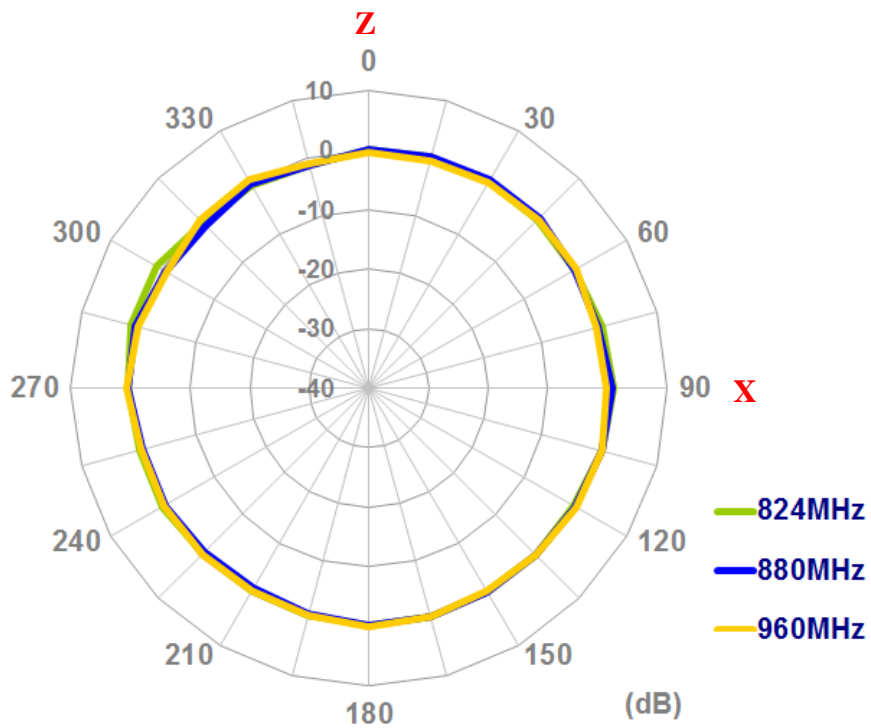


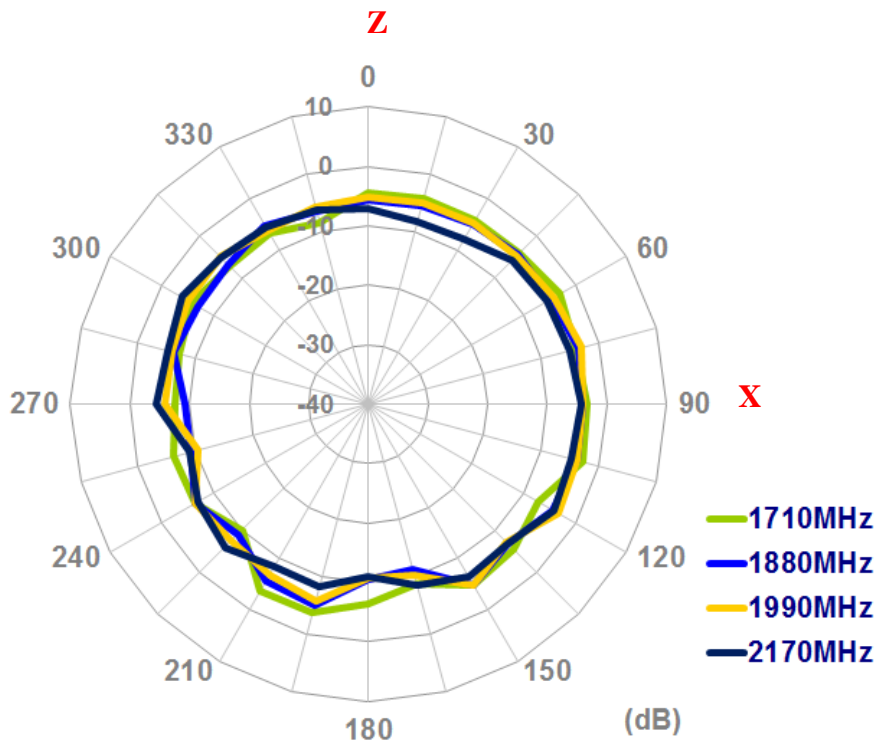
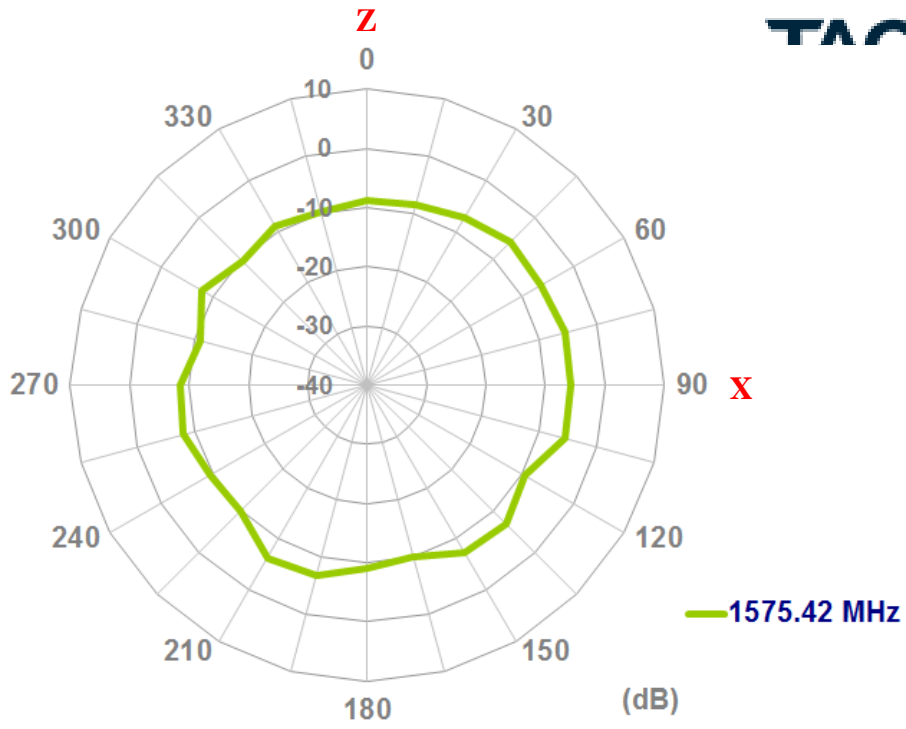
XY-Plane



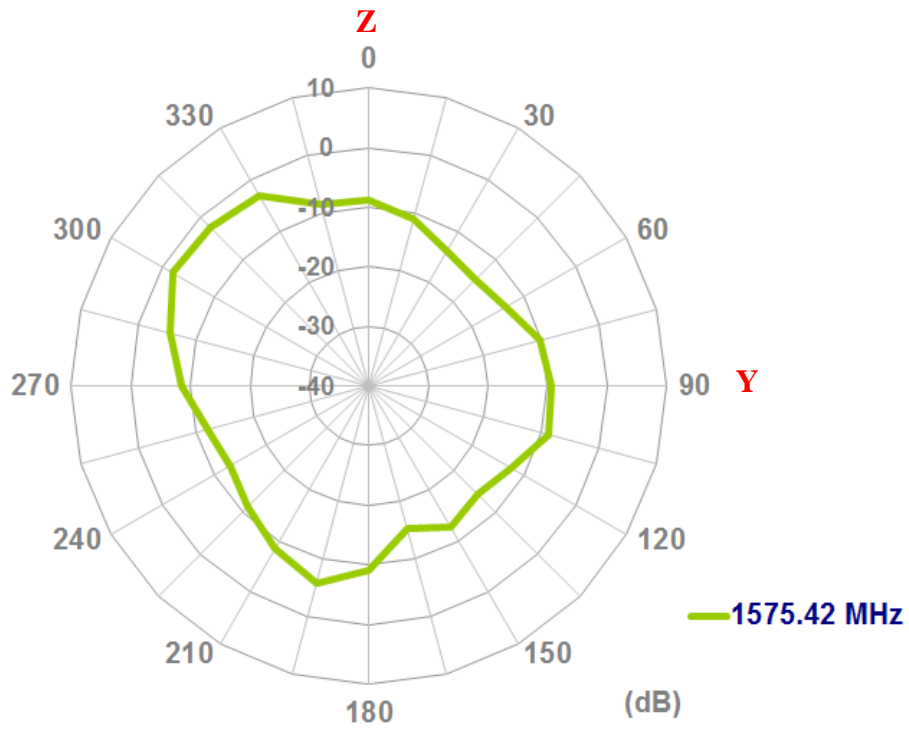
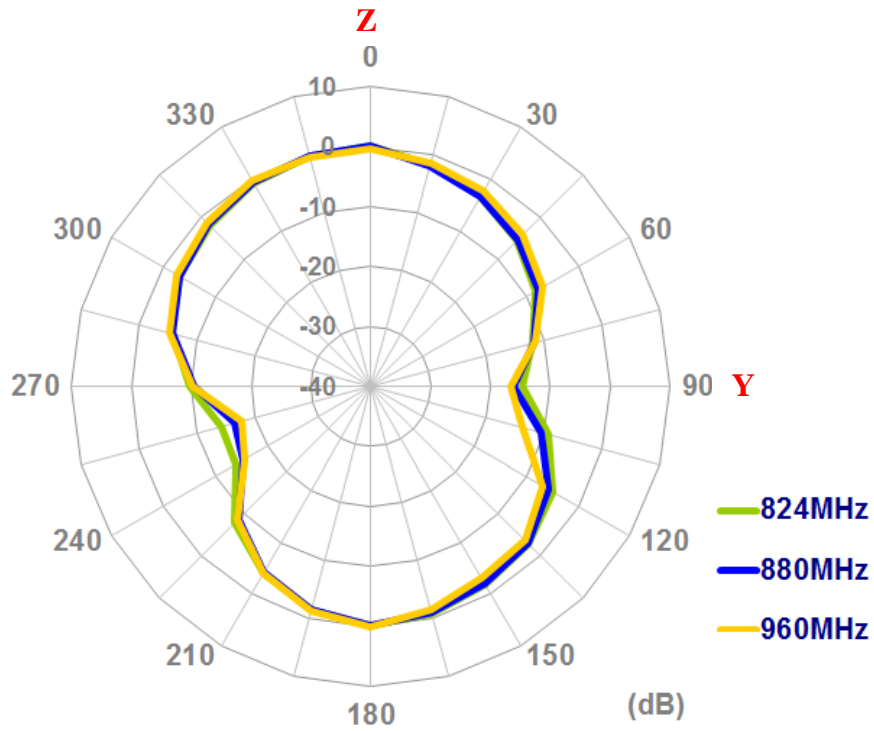


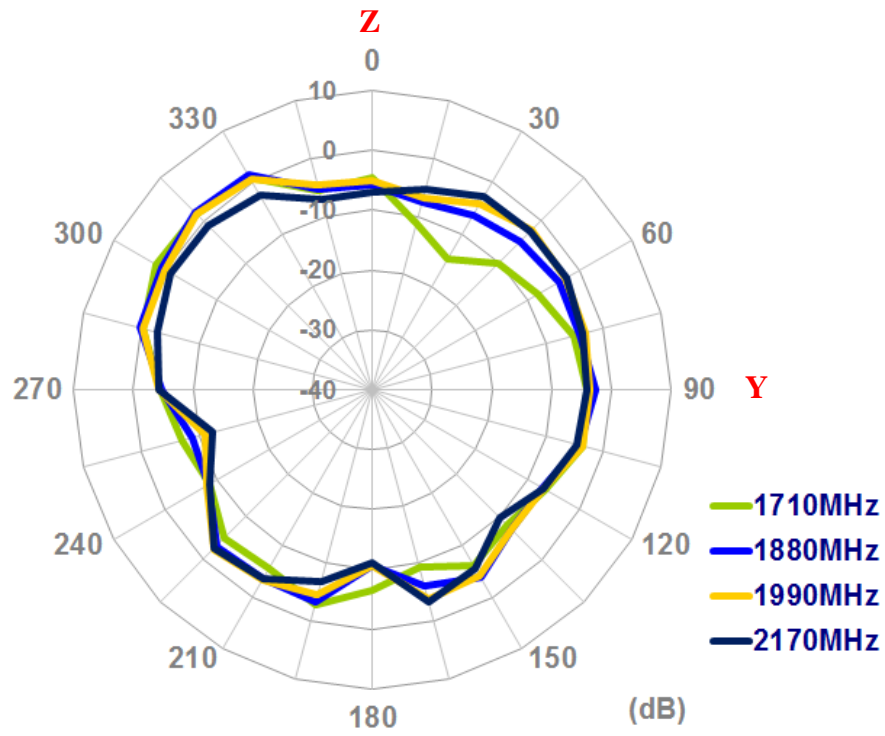
XZ-Plane





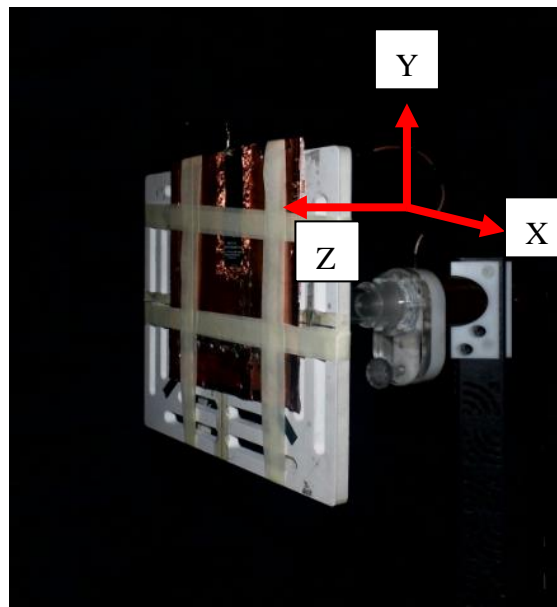
YZ-Plane



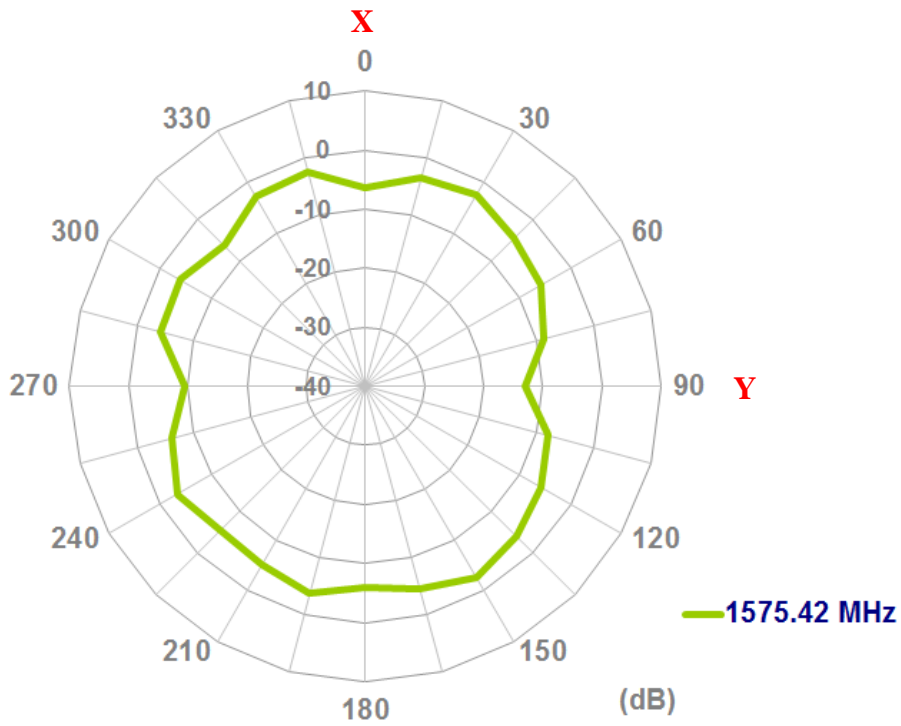
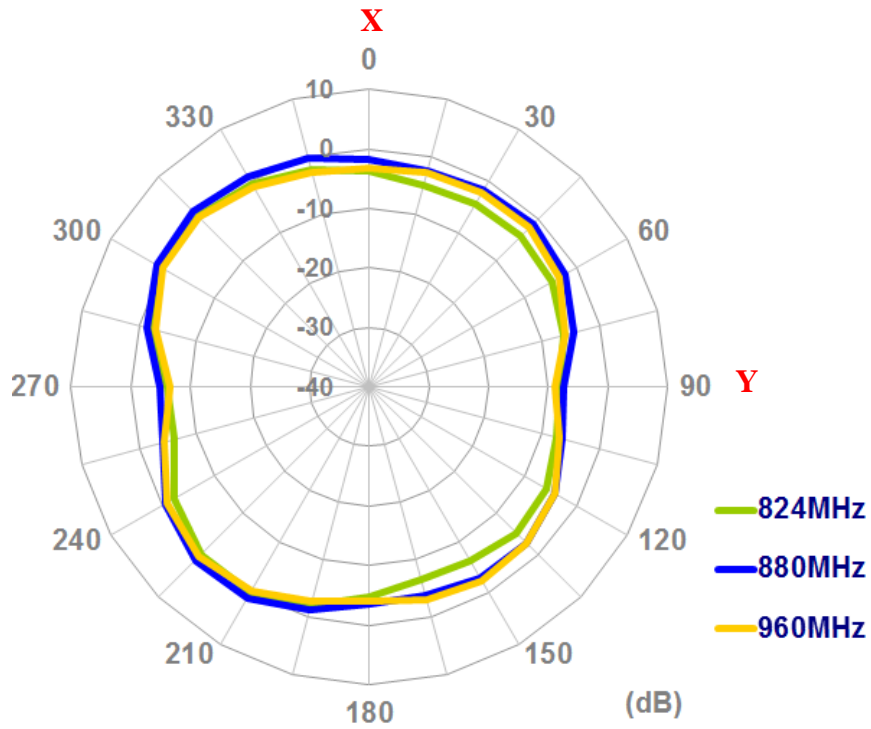


**20cm\*20cm Ground Plane**

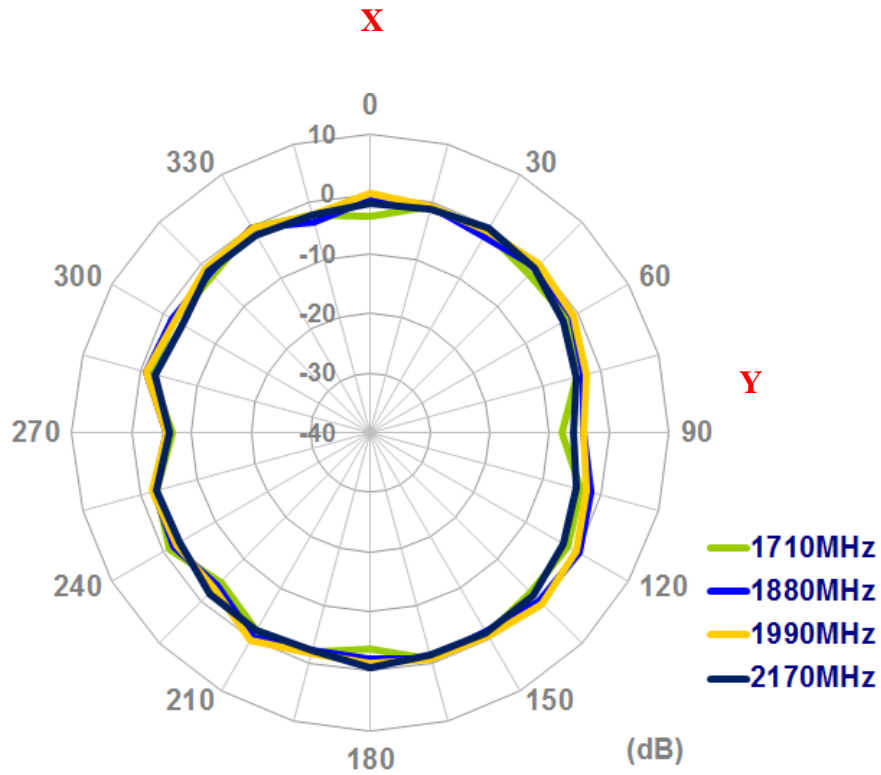
Setup



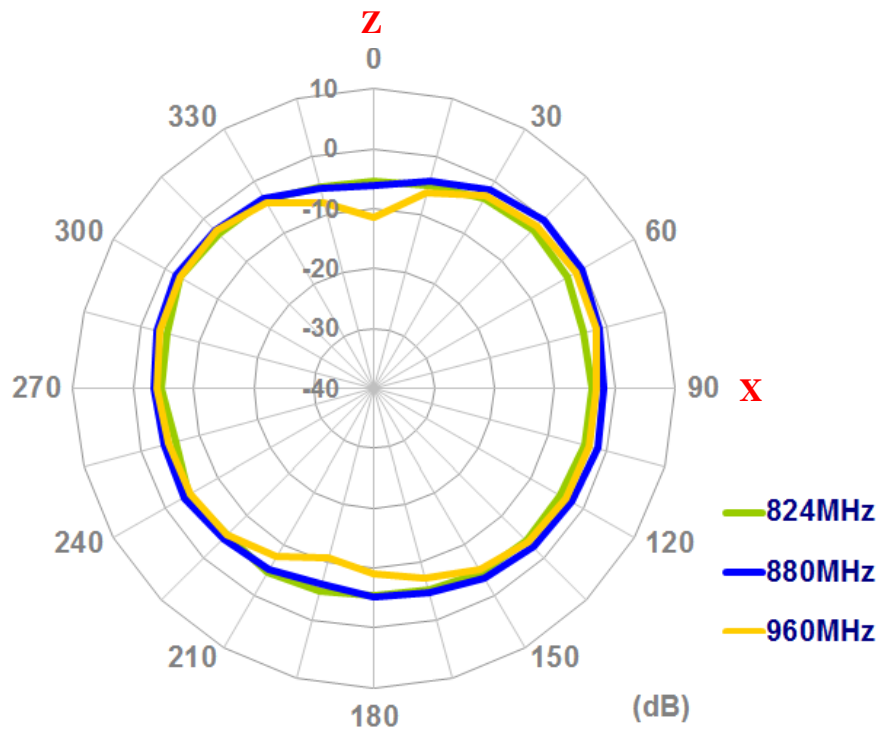
XY-Plane

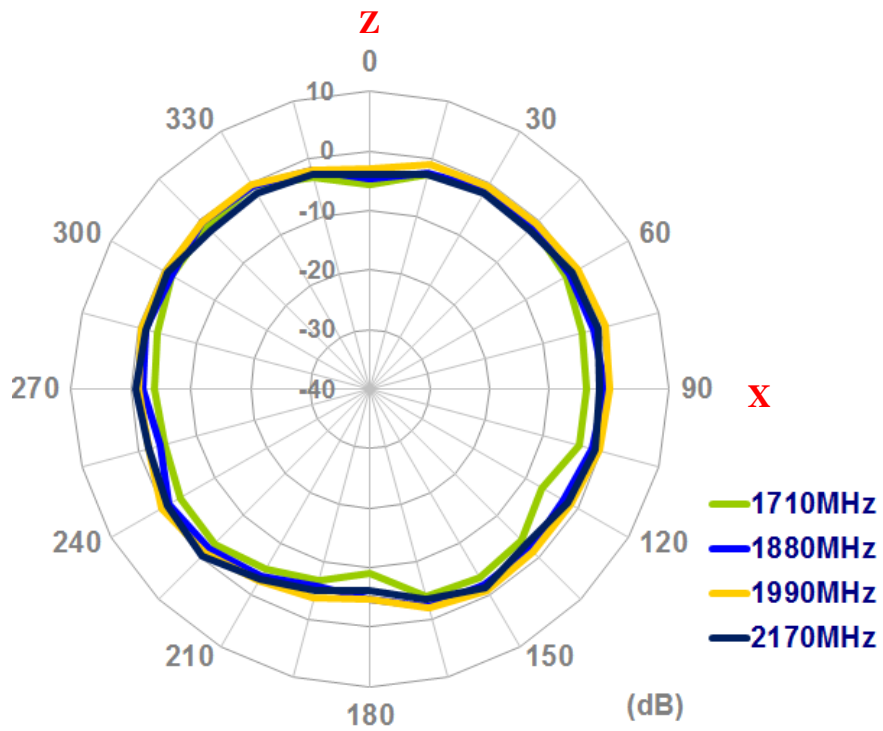
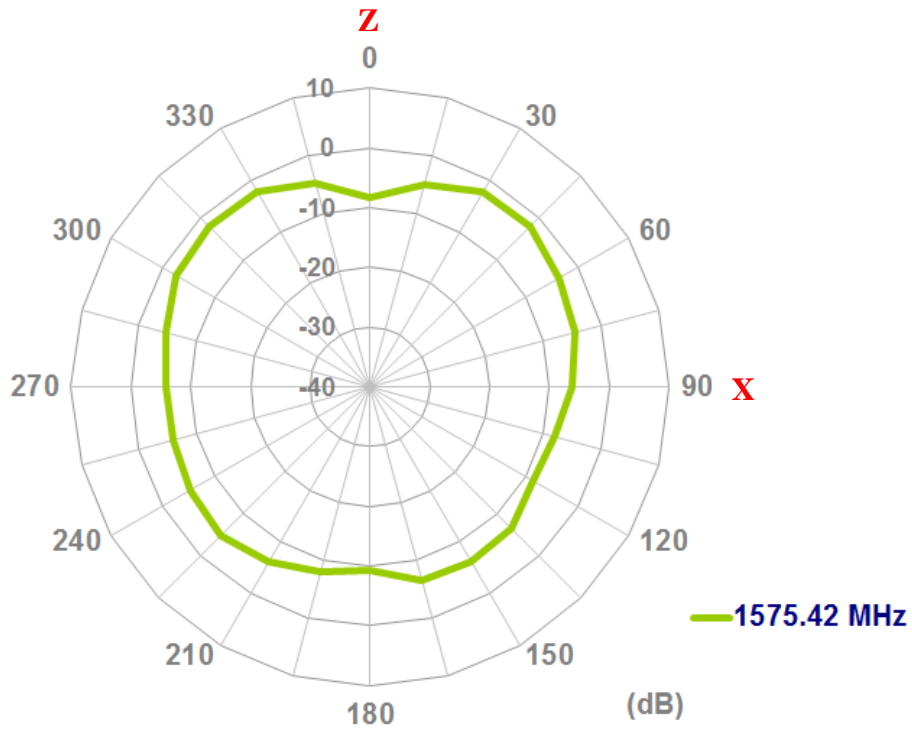




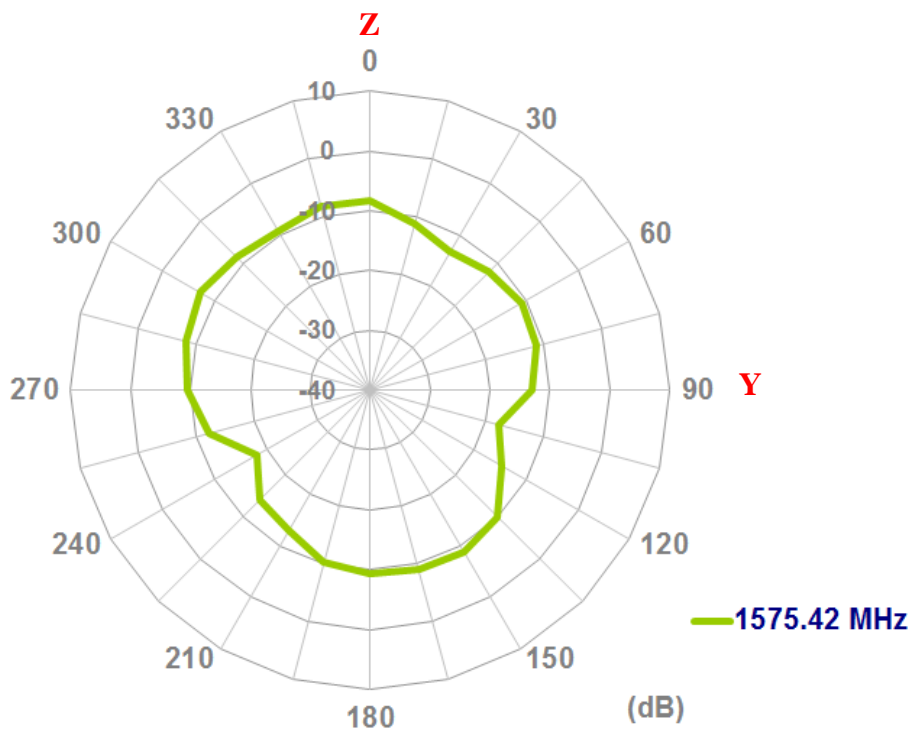
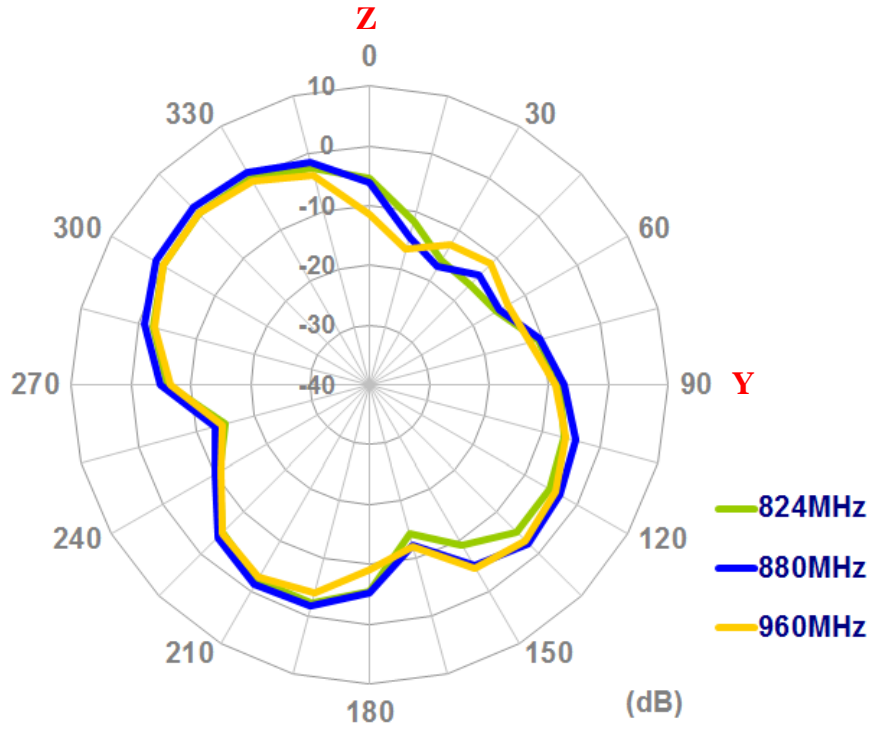


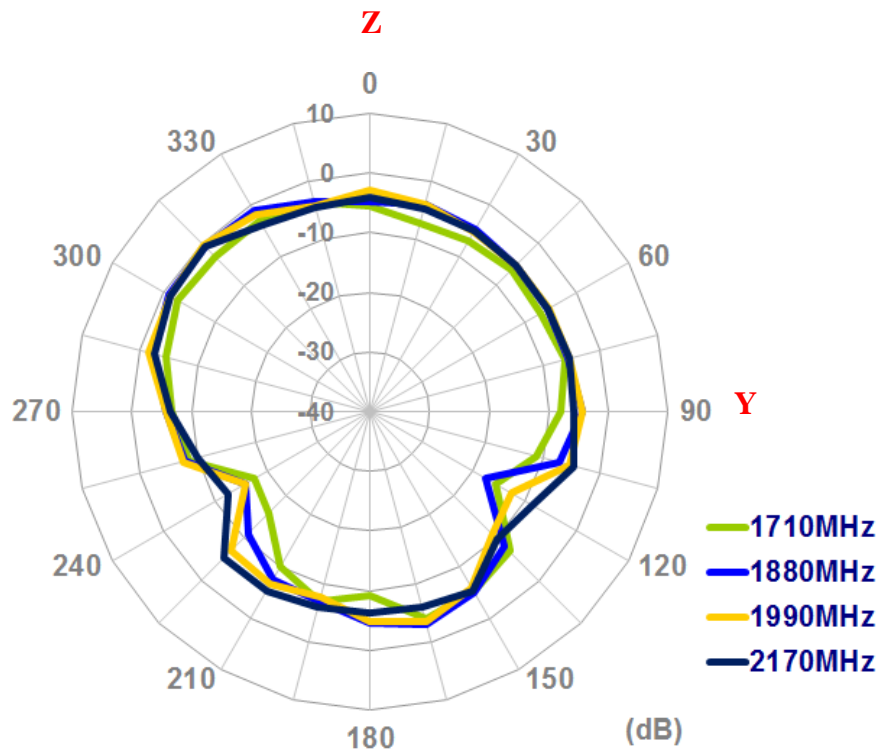
XZ-Plane





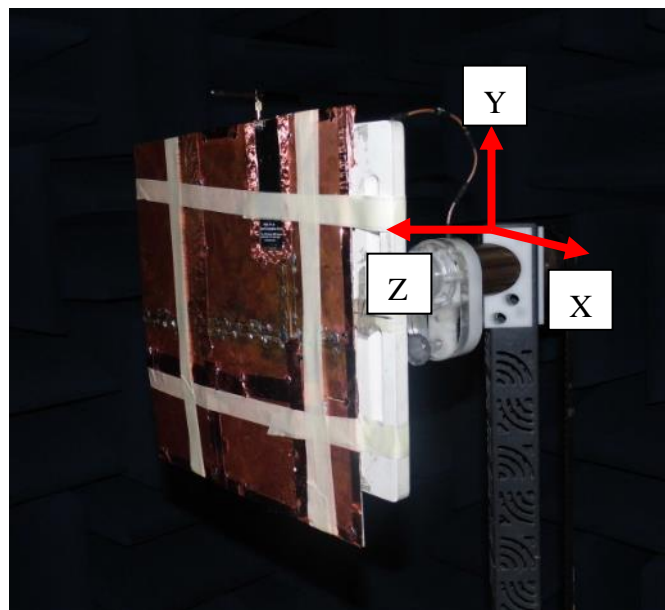
YZ-Plane



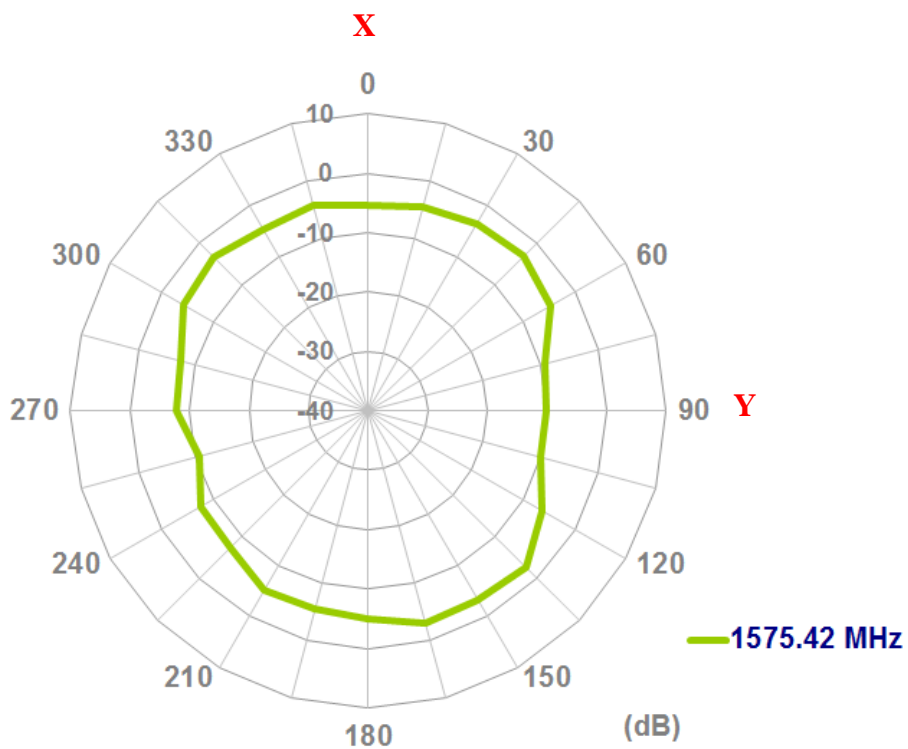
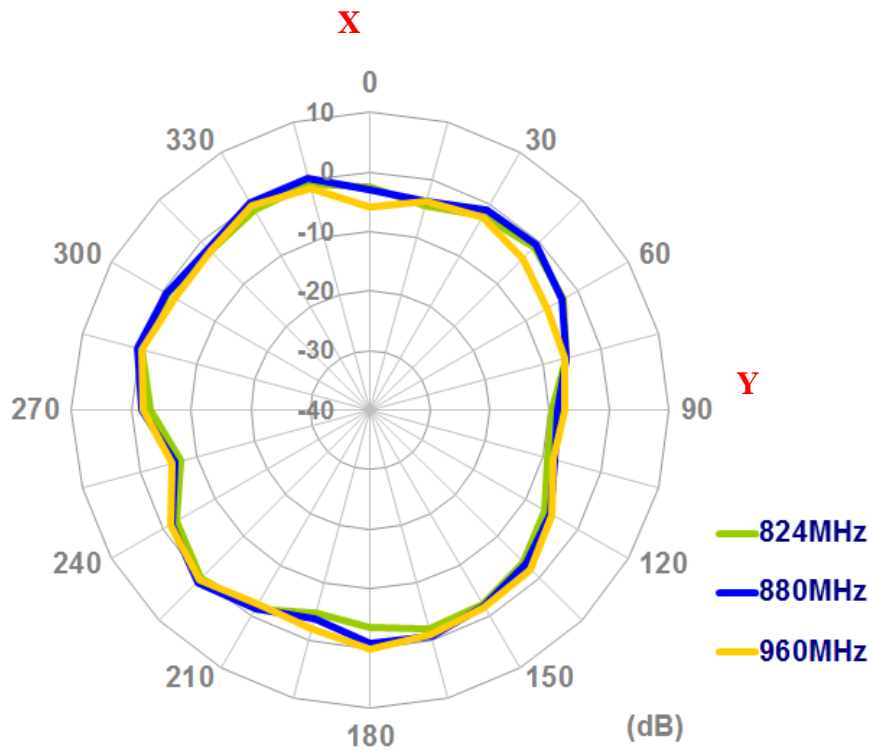


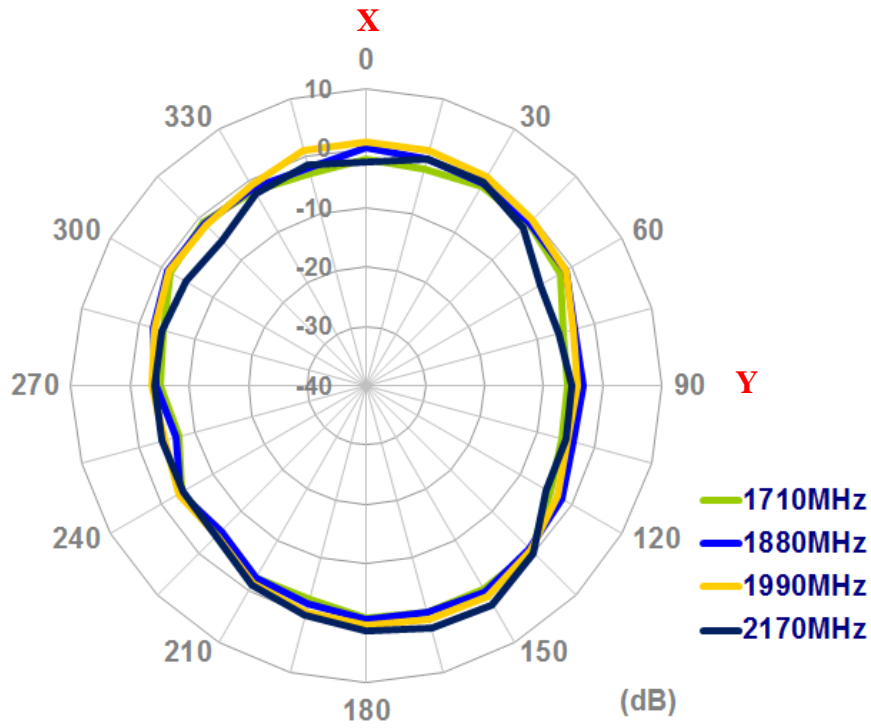
**30cm\*30cm Ground Plane**

Setup

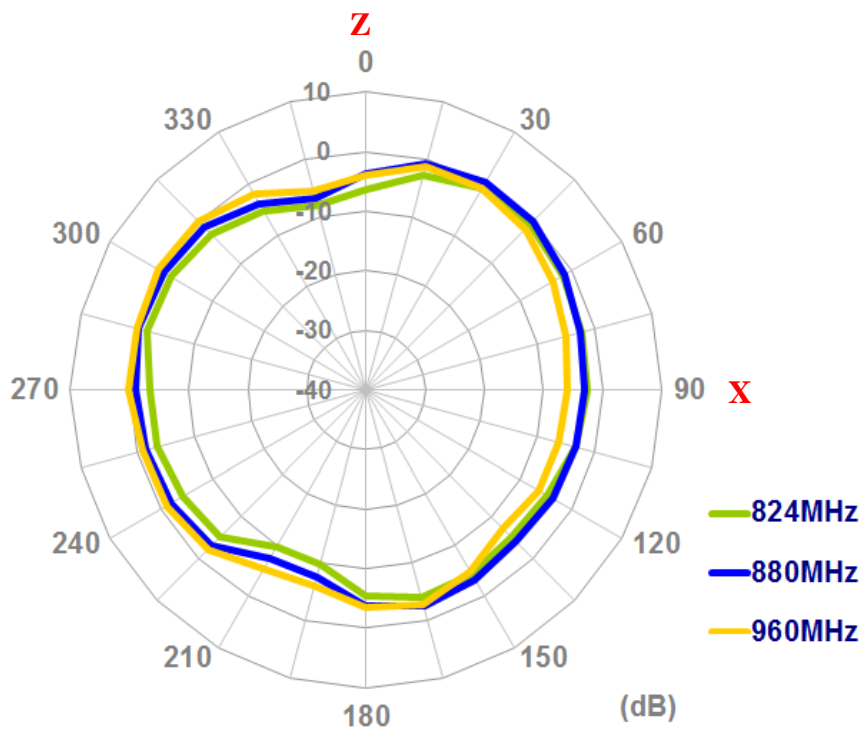


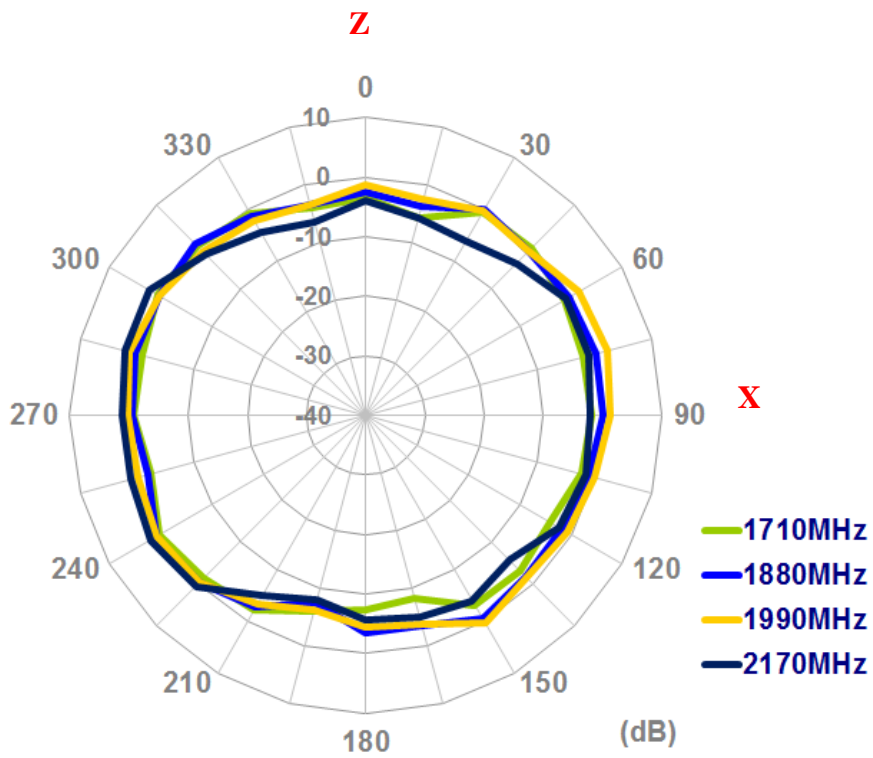
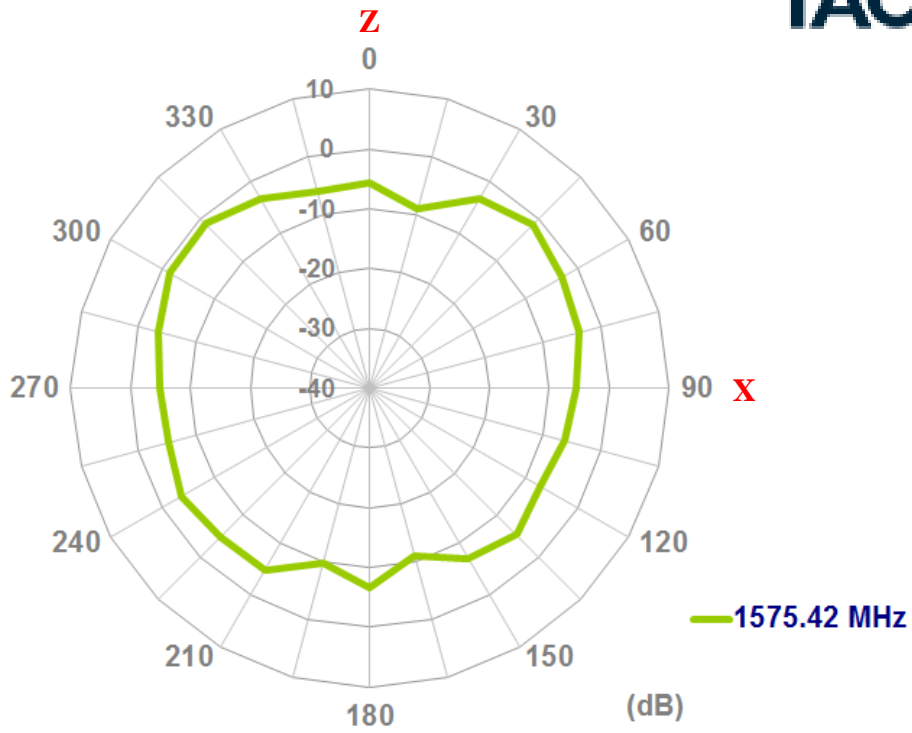
XY-Plane



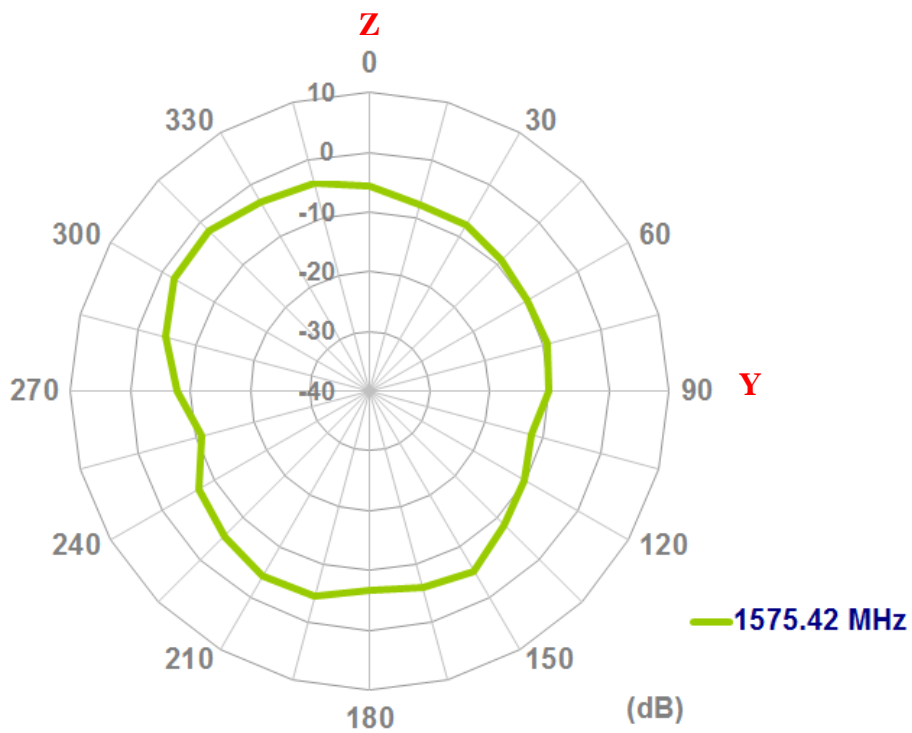
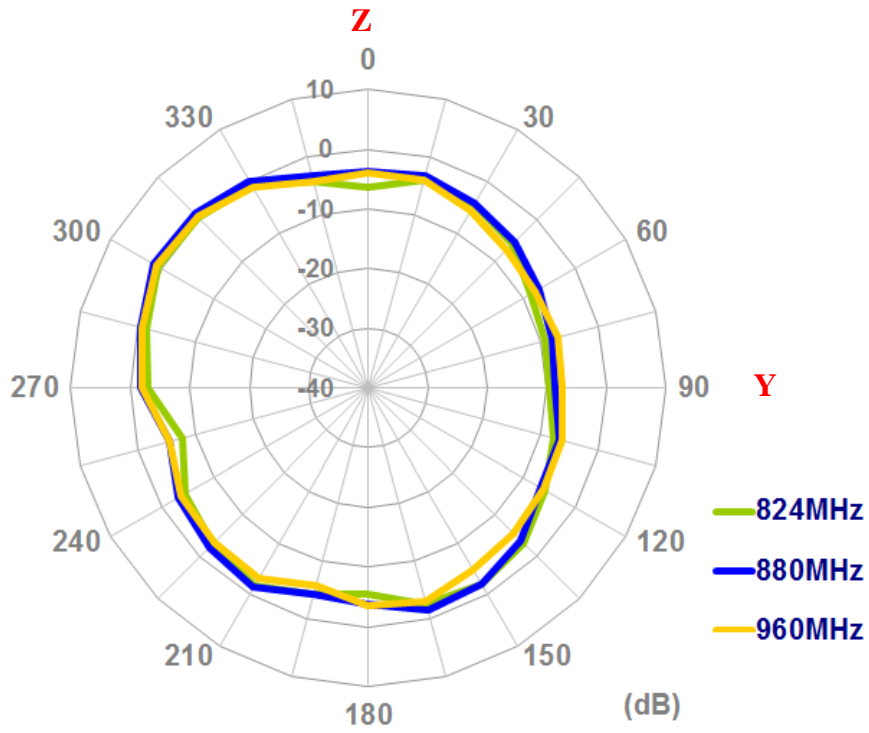


XZ-Plane

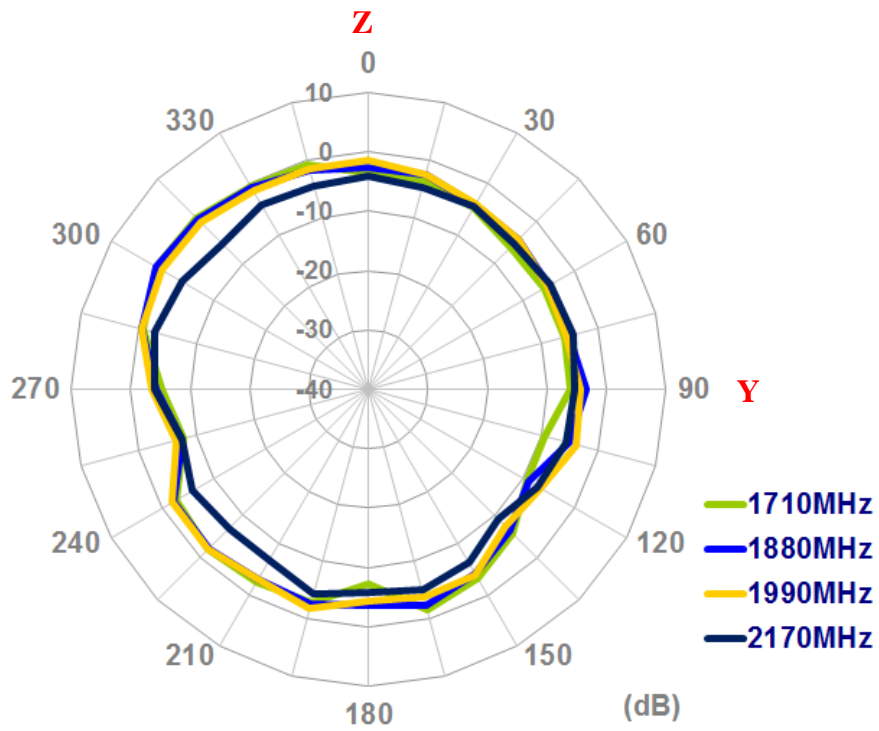




YZ-Plane

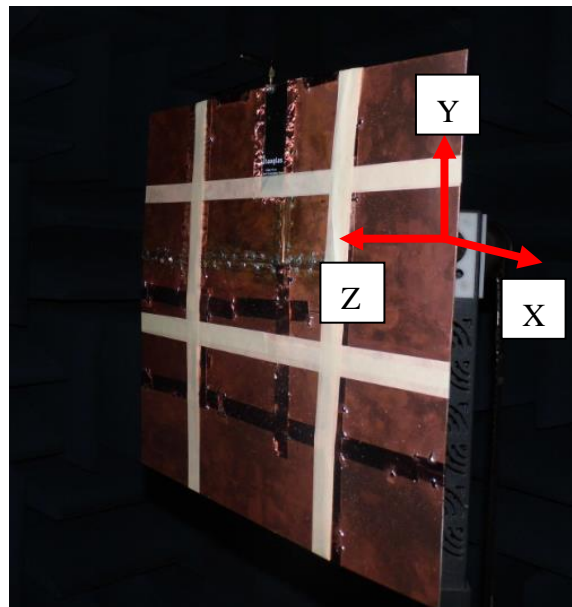




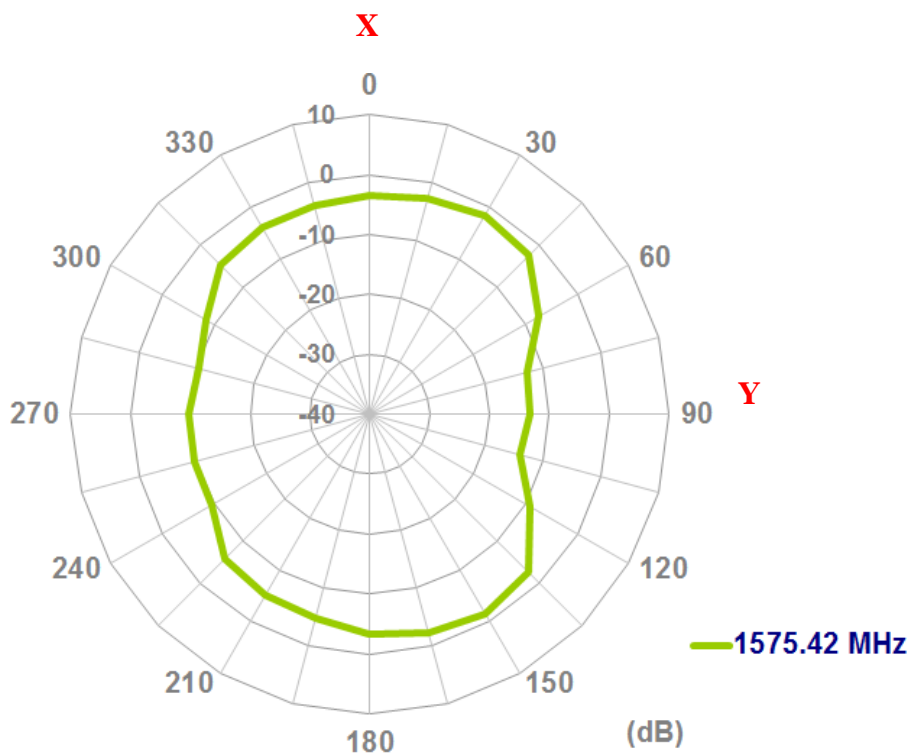
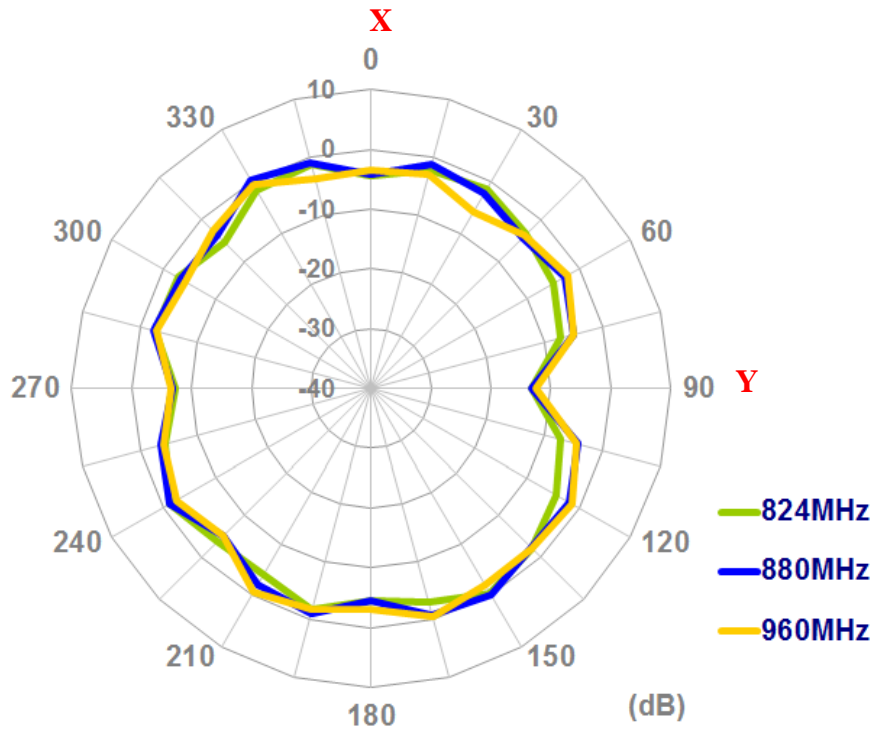


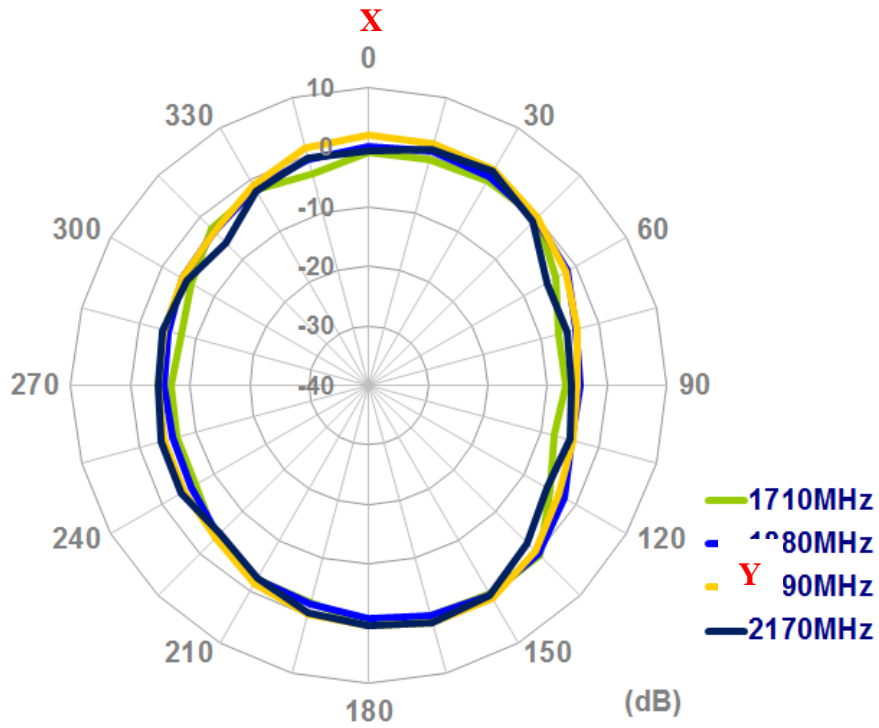
**40cm\*40cm Ground Plane**

Setup

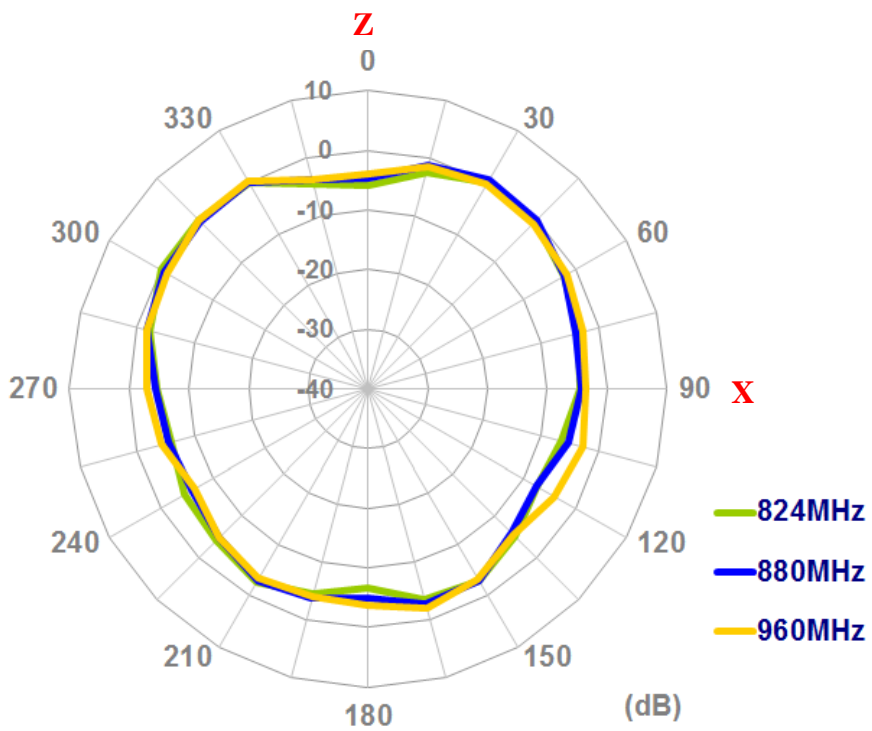


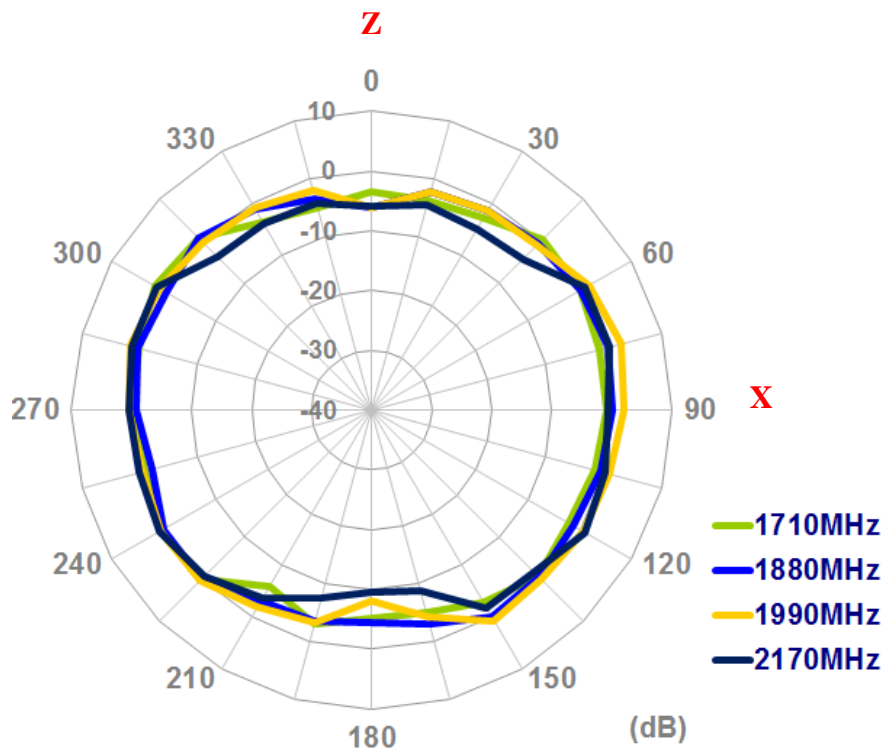
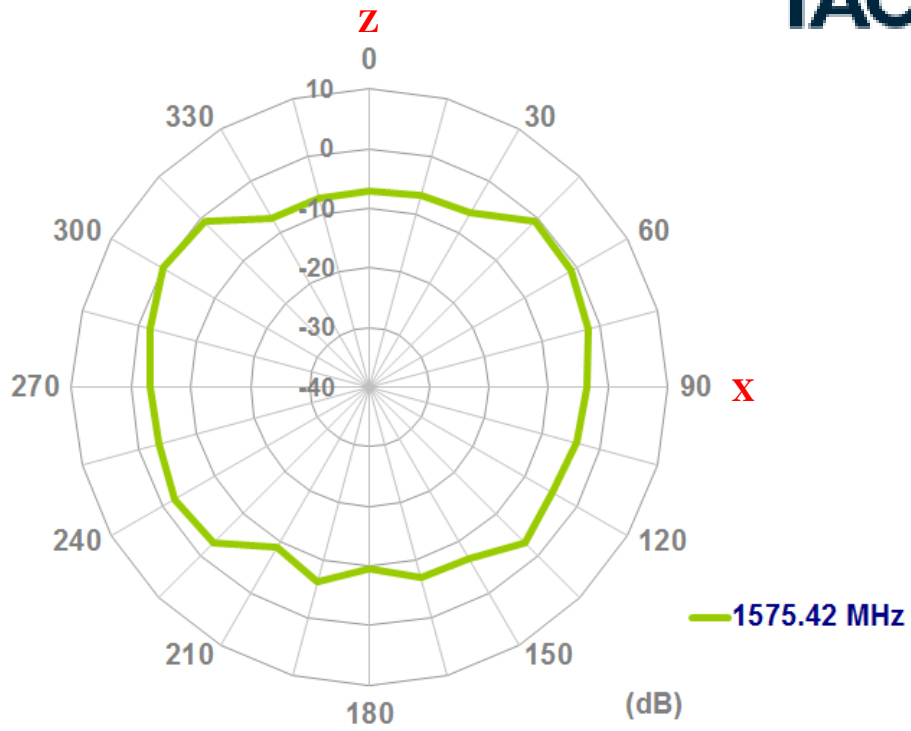
XY-Plane



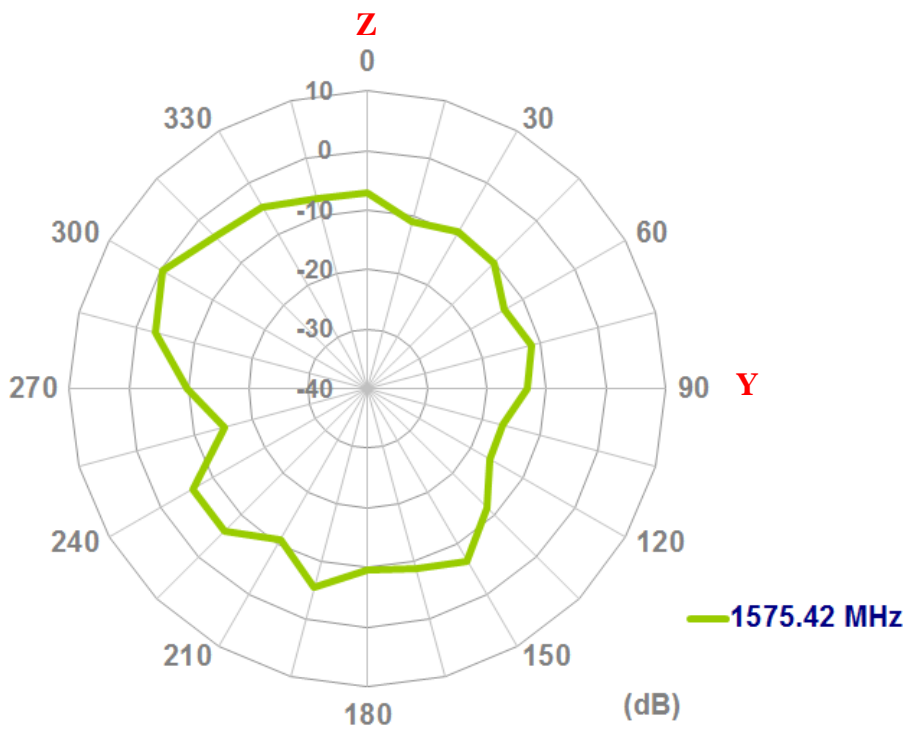
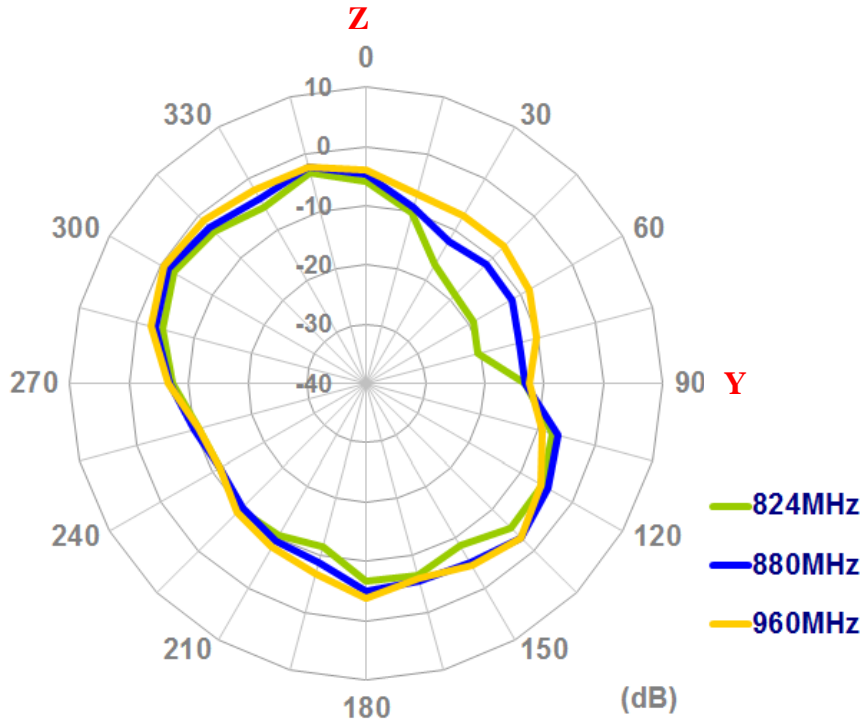


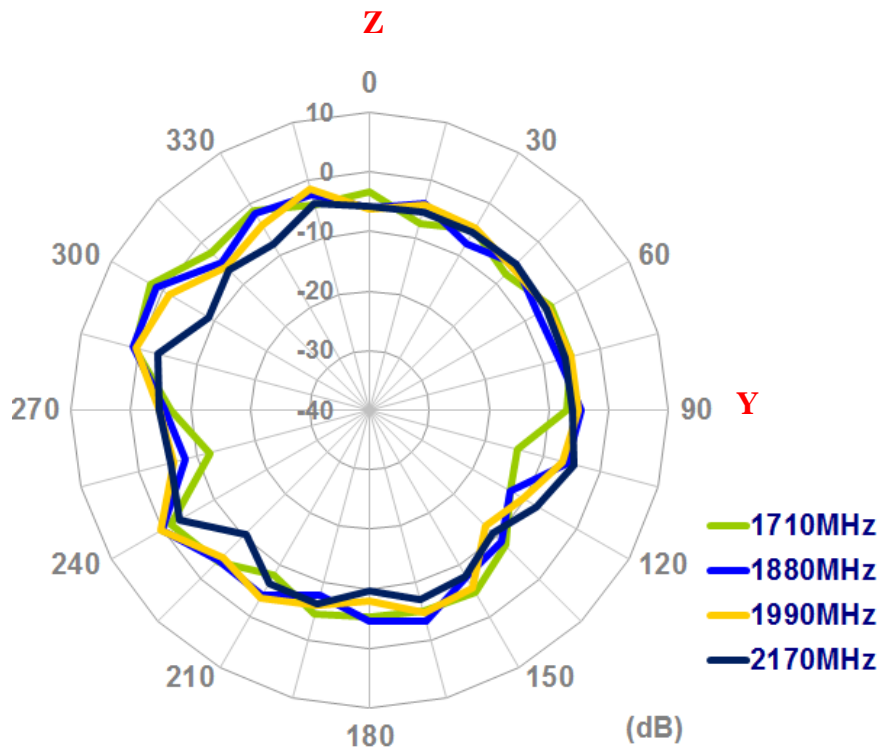
XZ-Plane





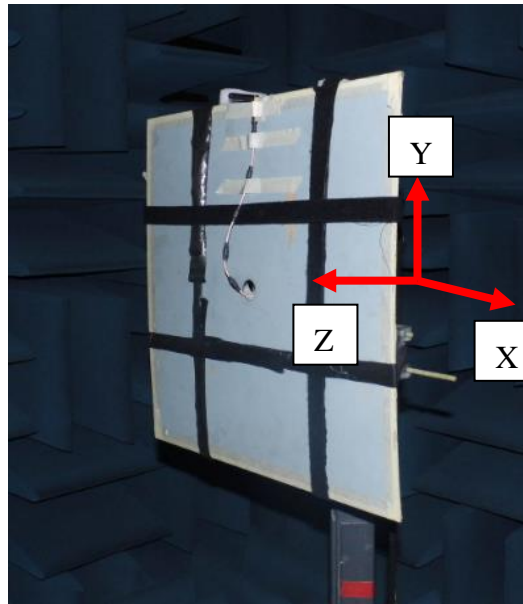
YZ-Plane



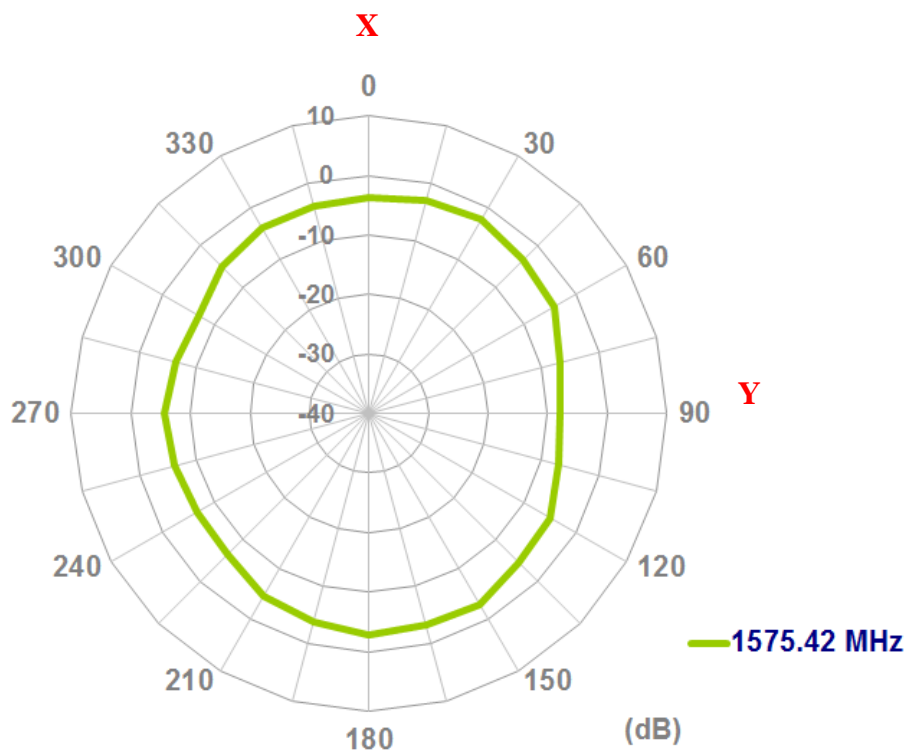
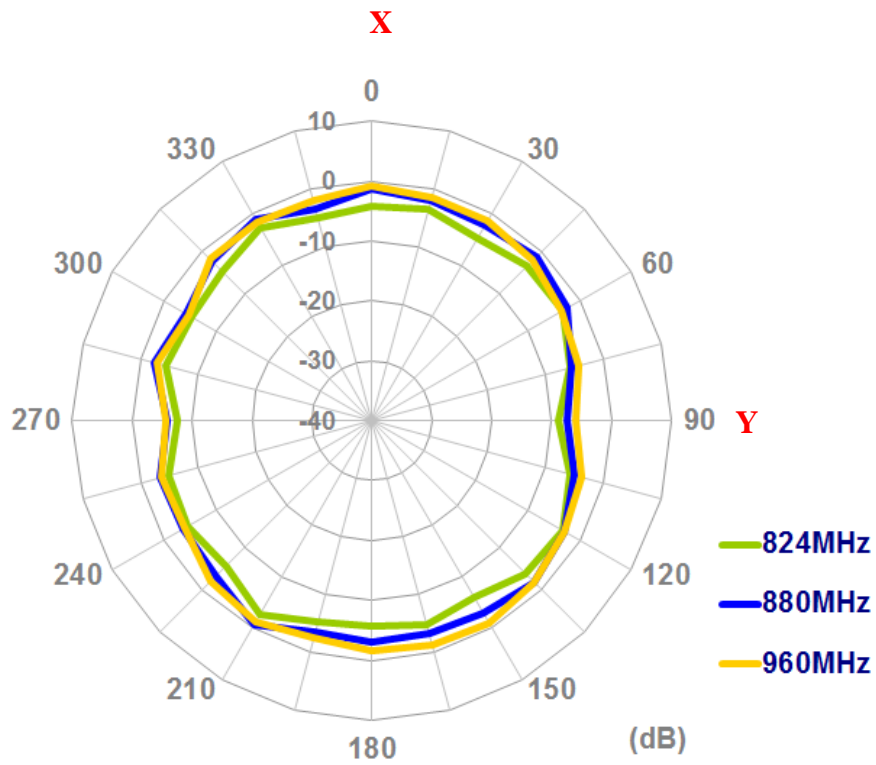


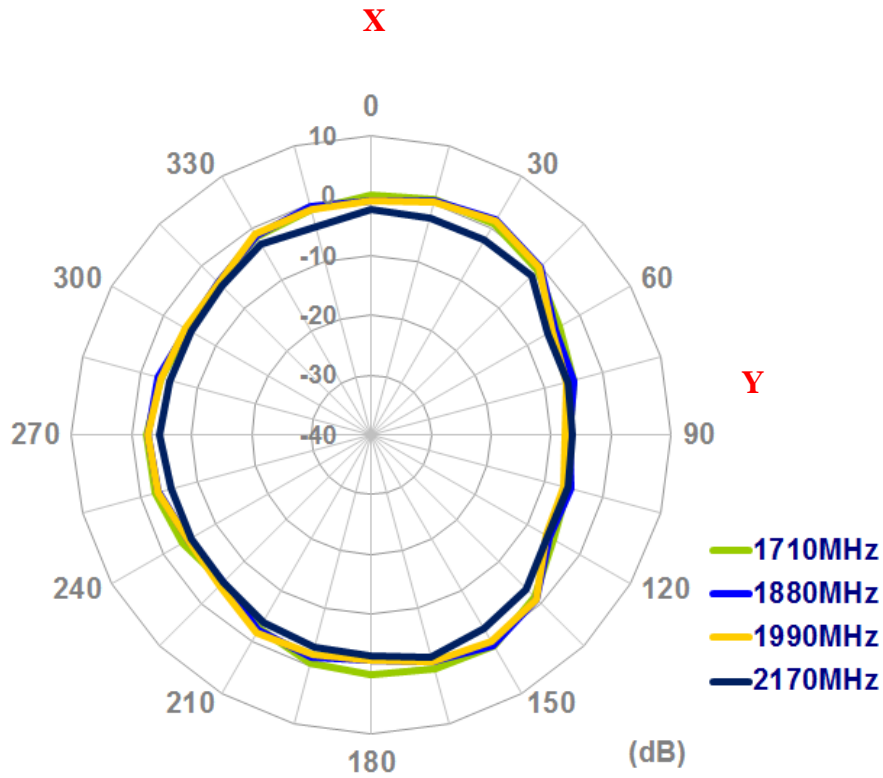
### 50cm\*50cm Ground Plane Edge

Setup

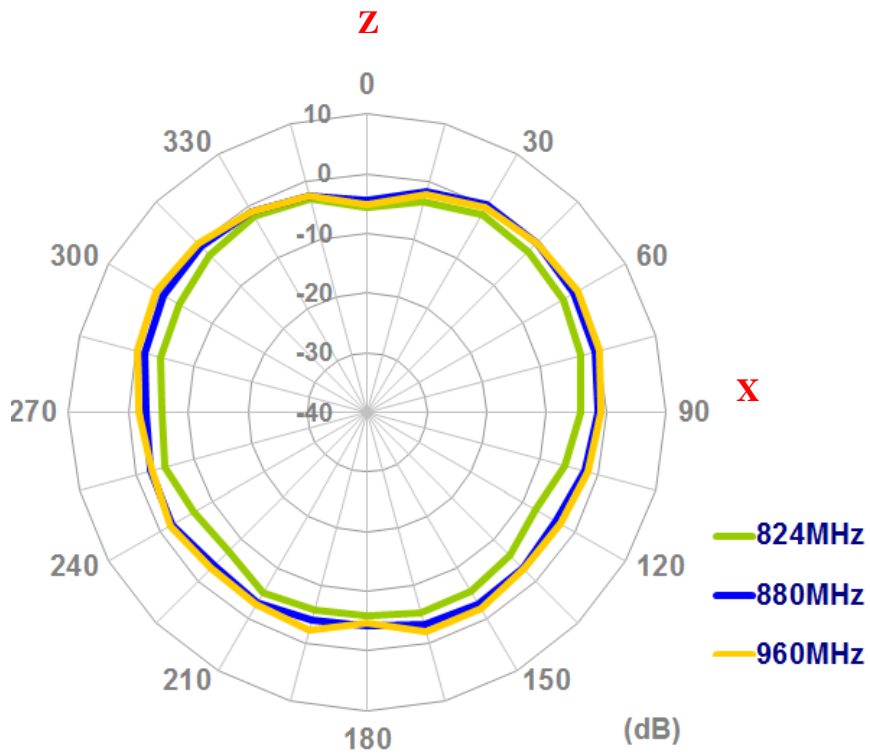


XY-Plane

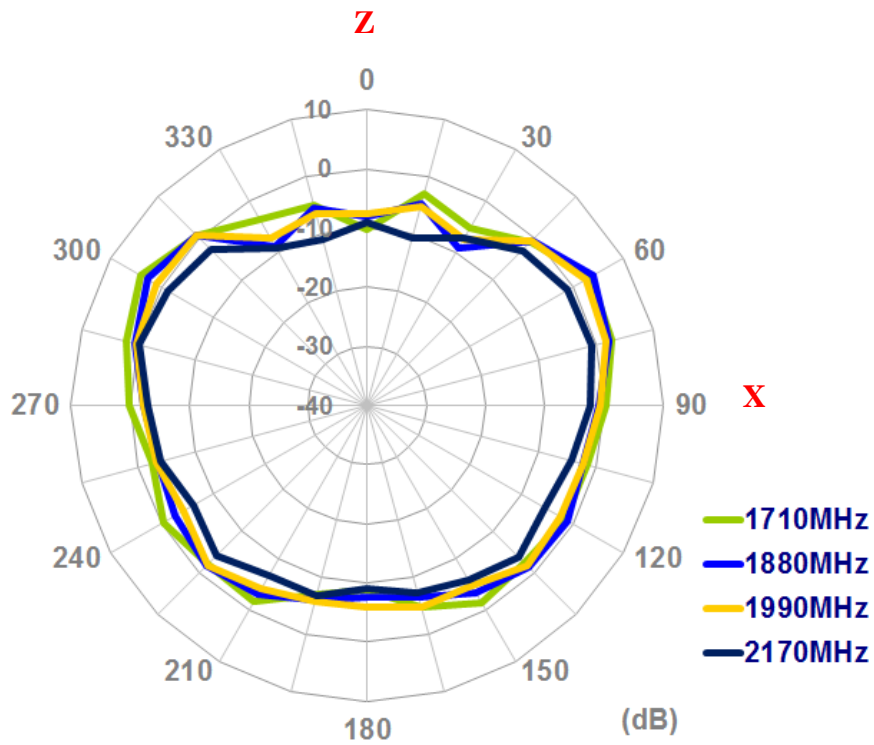
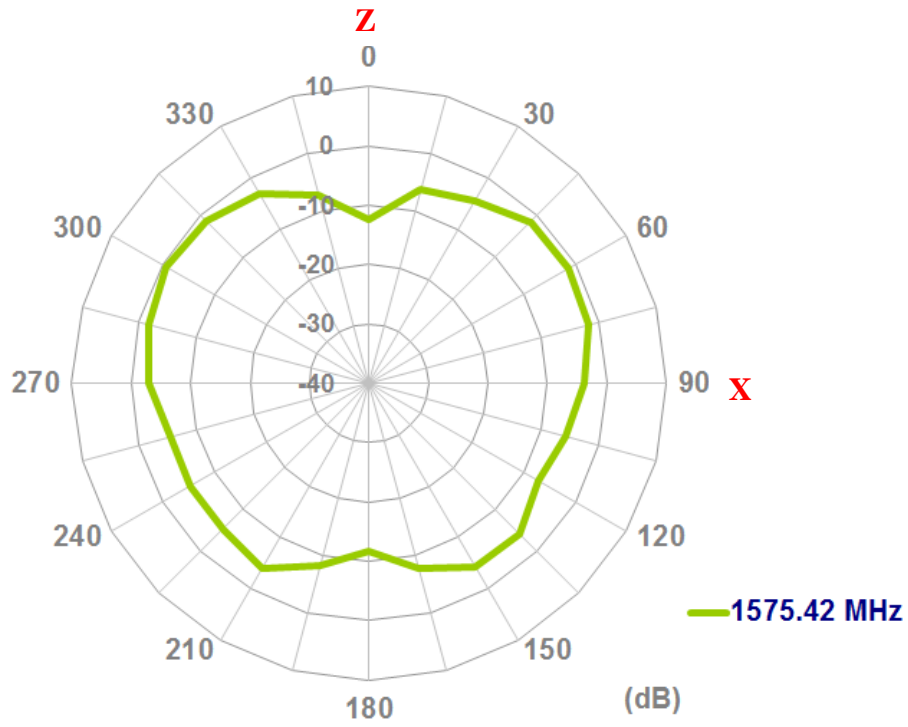




XZ-Plane







YZ-Plane

