

# Antenna specification

## 1. Antenna location drawing

See the following documents:

- 10\_Operatioal Description\_Antenna Drawing\_APYHRO00324.pdf

## 2. Working principle of multiple antennas

2.1 Antenna Diversity: None.

2.2 Power Mode: None.

## 3. Maximum antenna gain

WWAN antenna:

Band	Tx (Etotal)
GSM 850	-5.6 dBi
GSM 1900	-2.6 dBi
B2 (WCDMA/LTE)	-2.6 dBi
B4 (WCDMA/LTE)	-2.0 dBi
B5 (WCDMA/LTE)	-5.1 dBi
B12 (LTE)	-8.5 dBi
B13 (LTE)	-3.5 dBi
B17 (LTE)	-8.5 dBi
B38 (LTE)	-2.7 dBi
B41 (LTE)	-2.2 dBi
B66(LTE)	-1.5 dBi
n5	-5.1 dBi
n41	-2.2 dBi

WLAN antenna:

Band (MHz)	ANT4 (Etotal)	ANT8 (Etotal)
2412-2472	-3.4 dBi	-0.4 dBi
5150-5250	-4.9 dBi	-4.3 dBi
5250-5350	-4.6 dBi	-4.4 dBi
5470-5725	-2.9 dBi	-3.5 dBi
5725-5850	-2.5 dBi	-3.5 dBi
5925-7125	0 dBi	-1.3 dBi

#### Bluetooth antenna:

Band (MHz)	ANT4 (Etotal)	ANT8 (Etotal)
2402-2480	-3.4 dBi	-0.4 dBi

#### UWB antenna:

Band (MHz)	ANT6 (Etotal)
7737.6-8236.8	1.0 dBi

#### 4. Maximum beamforming gain

Don' t use beamforming technology.

#### 5. The state of antenna simultaneous transmission

See the following documents :

- 16\_Simultaneous\_Tx\_Combination\_List\_APYHRO00324.pdf

Note : WiFi 2.4GHz and BT are time-division exclusive control, so they will not operate at the same time.

#### 5.Type of antenna

All antenna: PIFA

These antennas designed by Sharp.

Manufacturer : Techno Associe Co., Ltd.

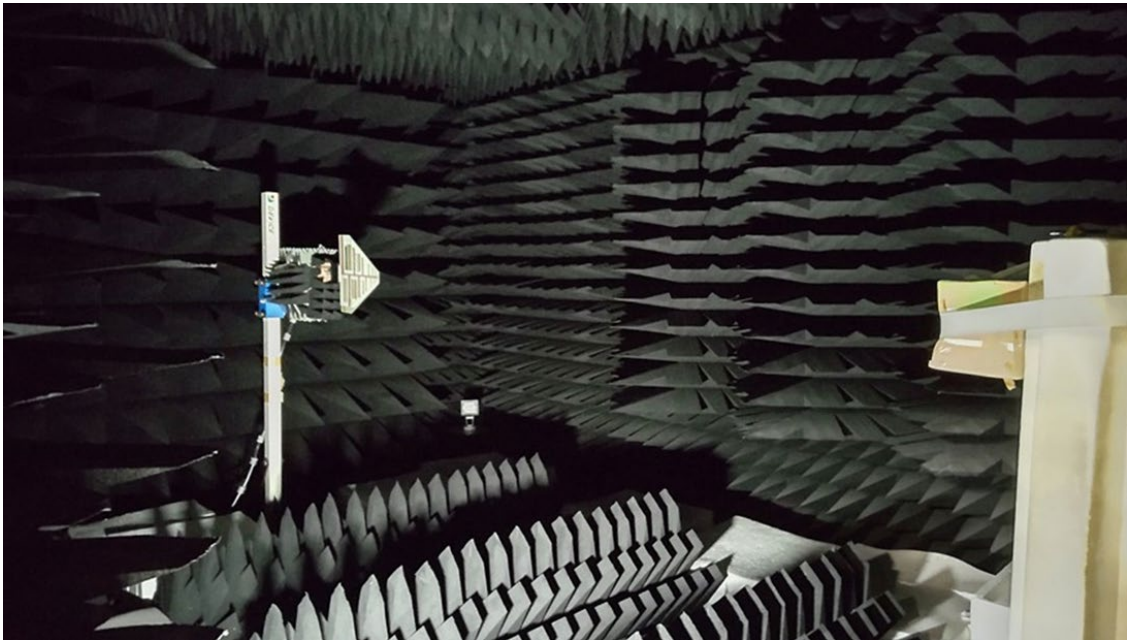
Brand Name : Sharp

Model Number : GCABAB638AFSA

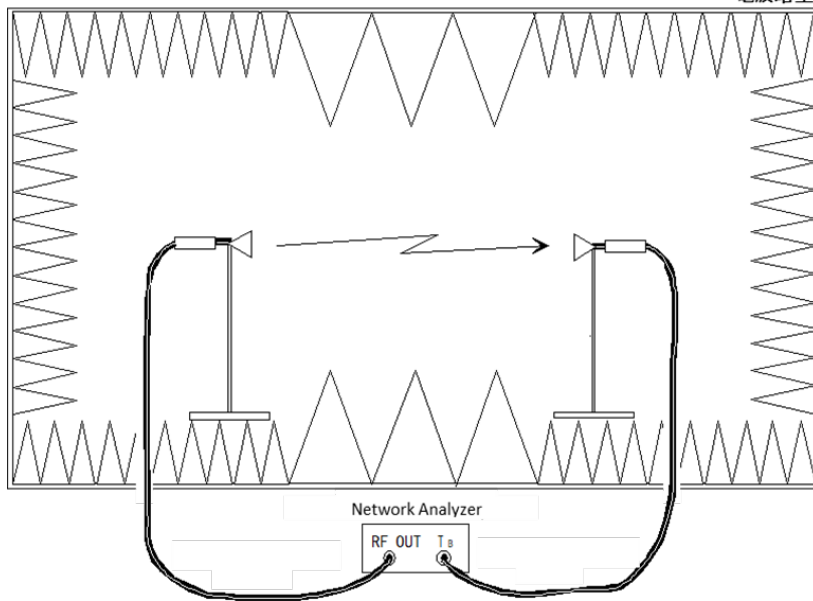
## 6. Radiation Pattern Test

The antenna is tested in free space in the anechoic chamber in Each Polarizations.  
The radiation patterns are measured at the center of transmit and receive bands.  
Following shows the geometry for this device is included in the test setup.

### Chamber Information & Equipment list

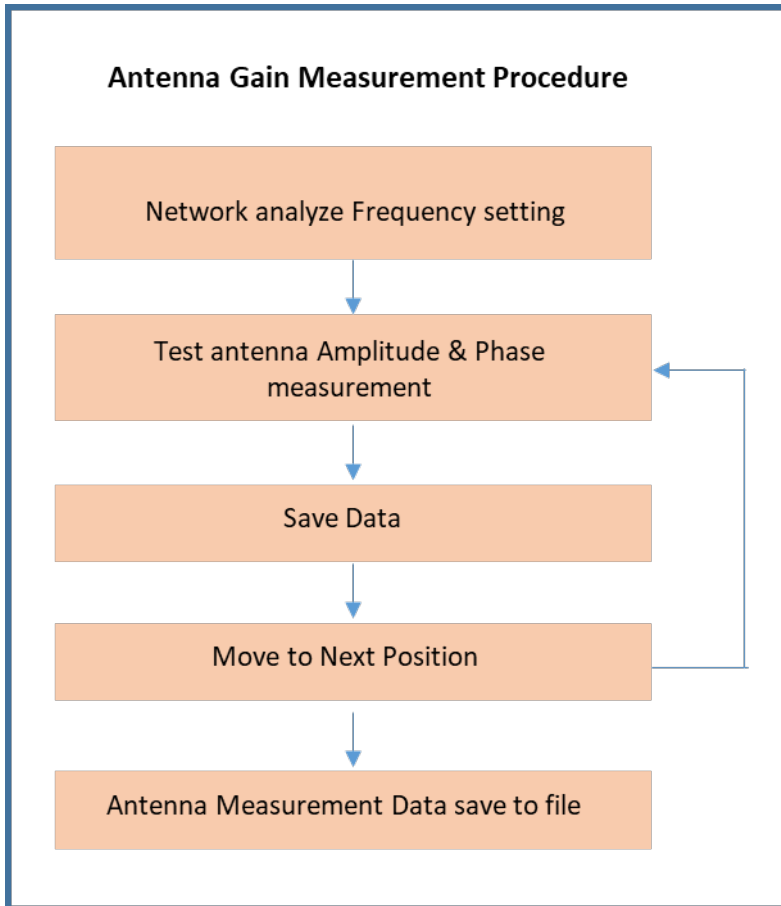


- Location : Sharp Makuhari bld.
- Size : 7m x 4.5m x 3.4m (L x W x H)
- Frequency : 150kHz – 40GHz
- Tx Antenna : 0.5GHz – 8GHz LPDA Single Polarization
- Quiet Zone : 60cm @ 3GHz (Far Field Length 2m)
- 2-axis DUT Positioner 360deg continuous rotation



Part	Model	Specification
Tx Antenna	LPDA	500MHz to 8GHz
	Double Ridge horn ETS-LINDGREN Model 3164-04	400MHz to 6GHz
Reference Antenna	Anritsu Dipole	For Each band
Network Analyzer	Agilent E5071C	300kHz to 8.5GHz

## Antenna Gain Measurement Procedure



Test Dates

2023.03.07

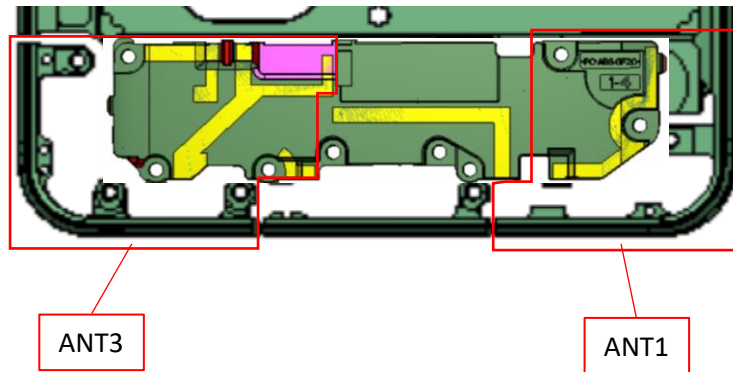
Names of test personnel

Naoki Sotoma

# Cellular

## 1.1 Antenna Photos

Figure 1

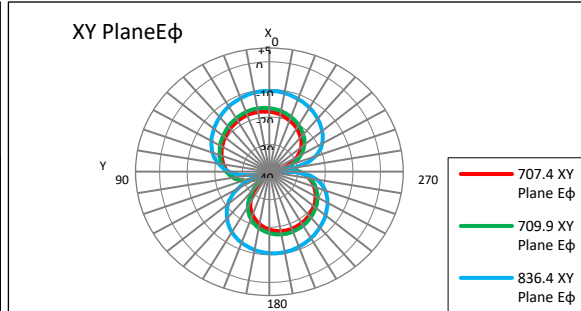
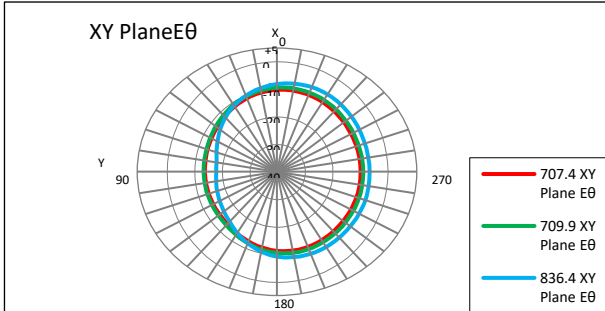


# Cellular

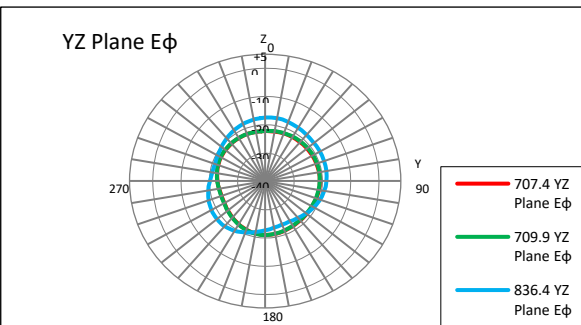
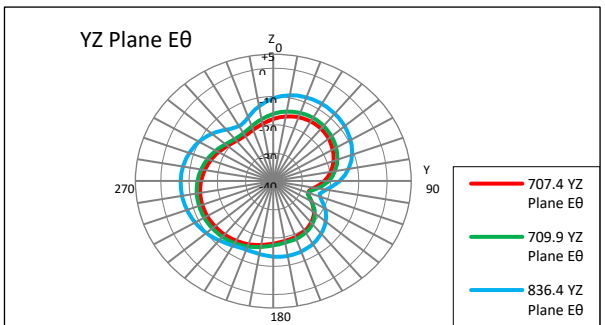
## 1.2 Antenna Pattern

ANT3\_707.4/709.9/836.4MHz

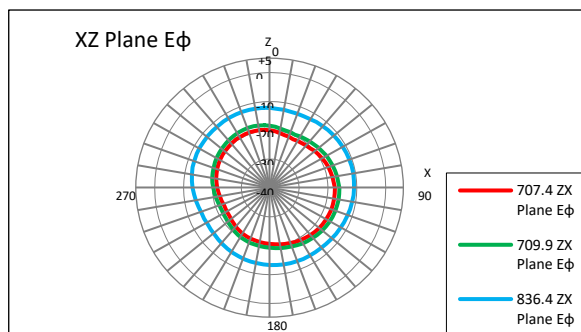
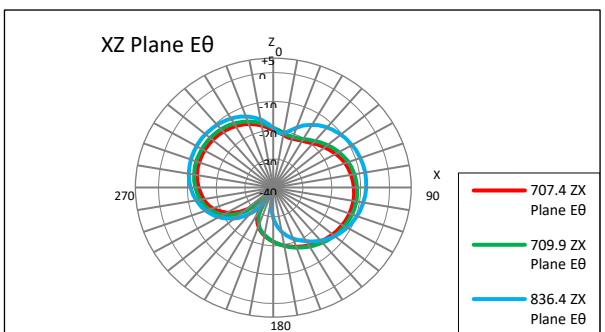
### XY Plane



### YZ Plane

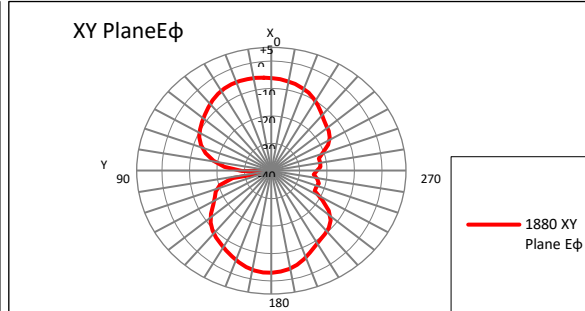
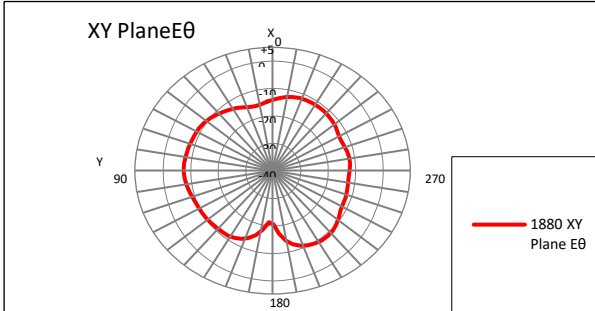


### XZ Plane

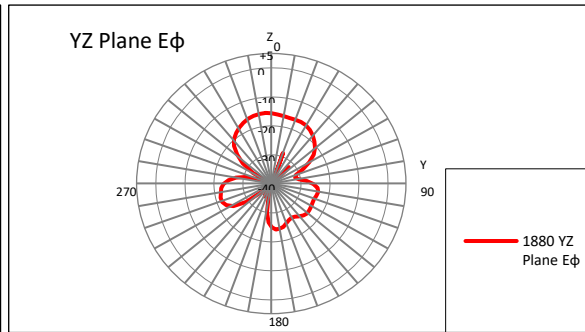
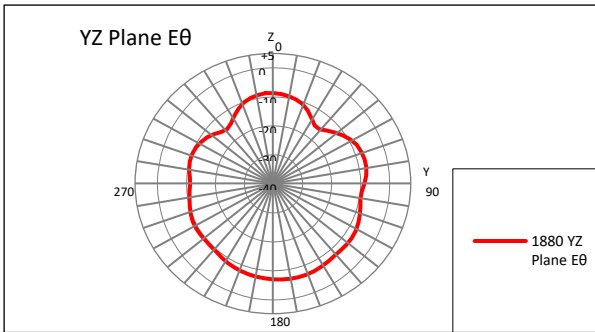


# ANT1\_1880MHz

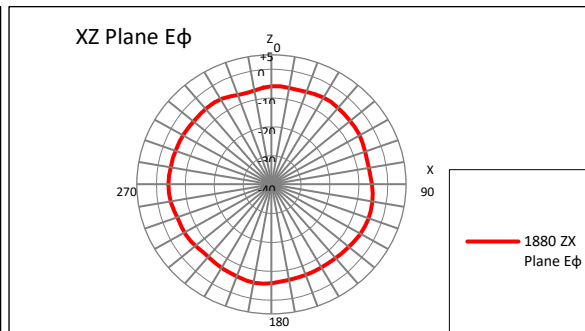
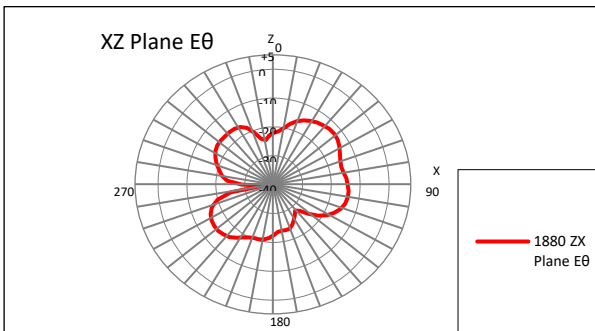
## XY Plane



## YZ Plane



## XZ Plane

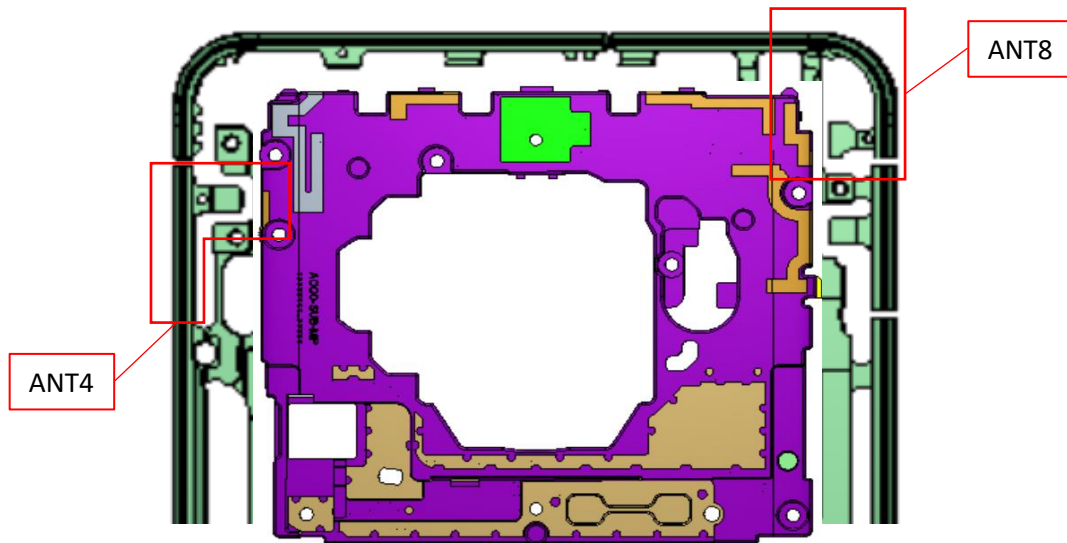




WiFi

## 2.1 Antenna Photos

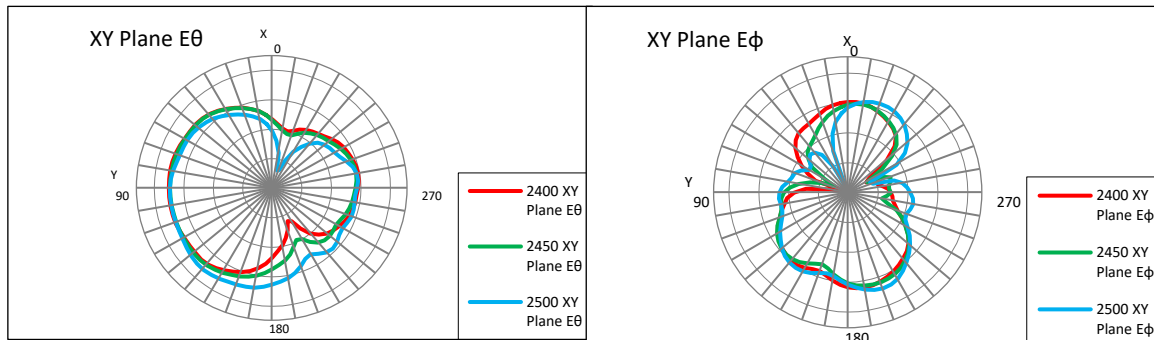
Figure 2



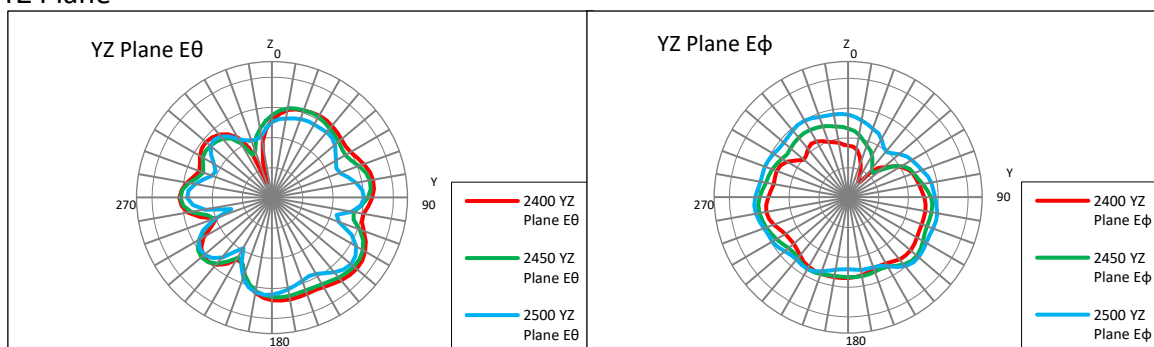
## 2.2 Antenna Pattern

ANT4 (2400-2500MHz)

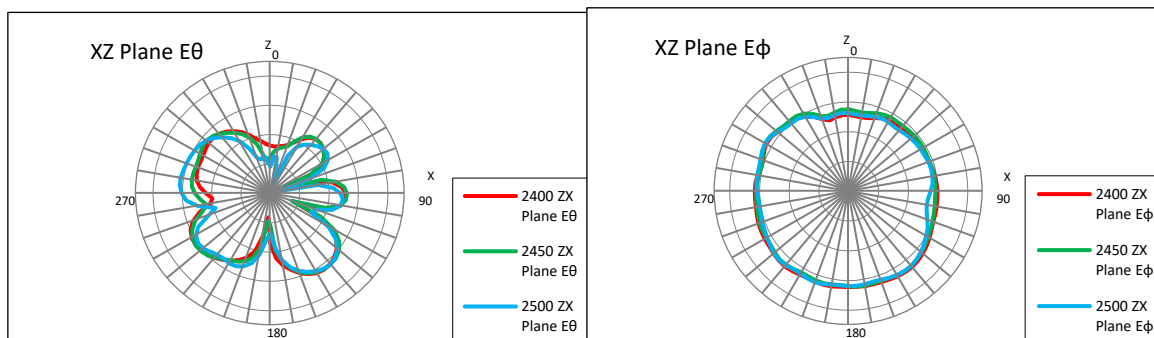
### XY Plane



### YZ Plane

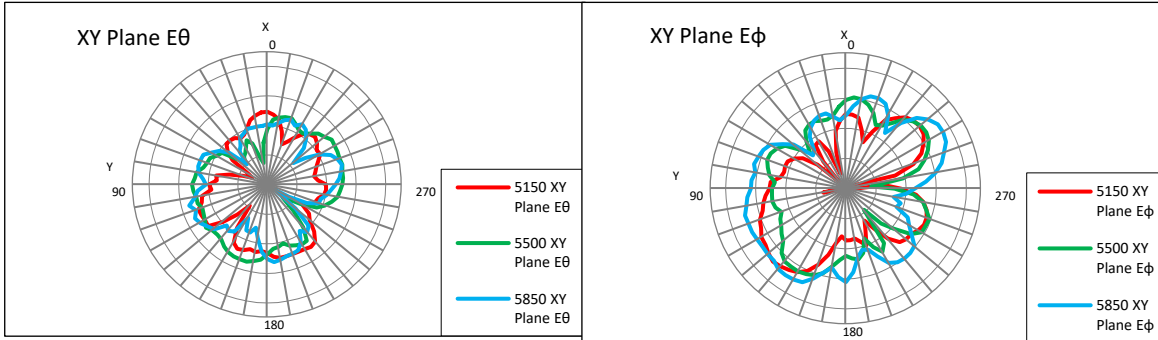


### XZ Plane

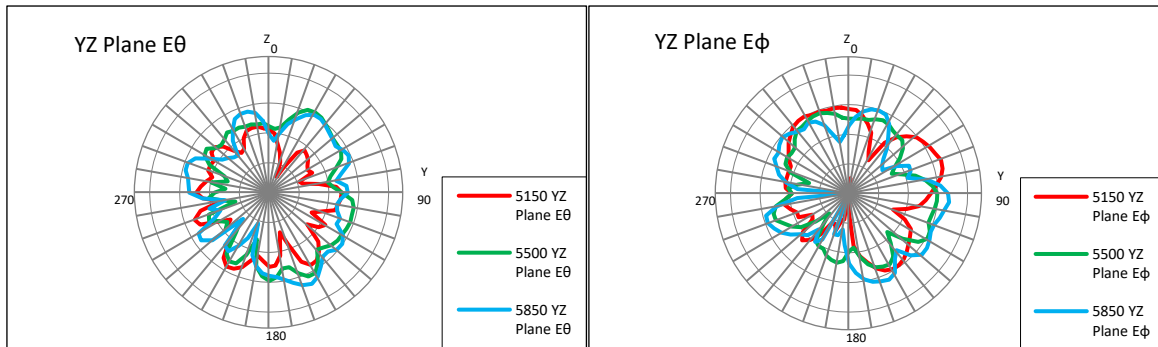


# ANT4 (5150-5850MHz)

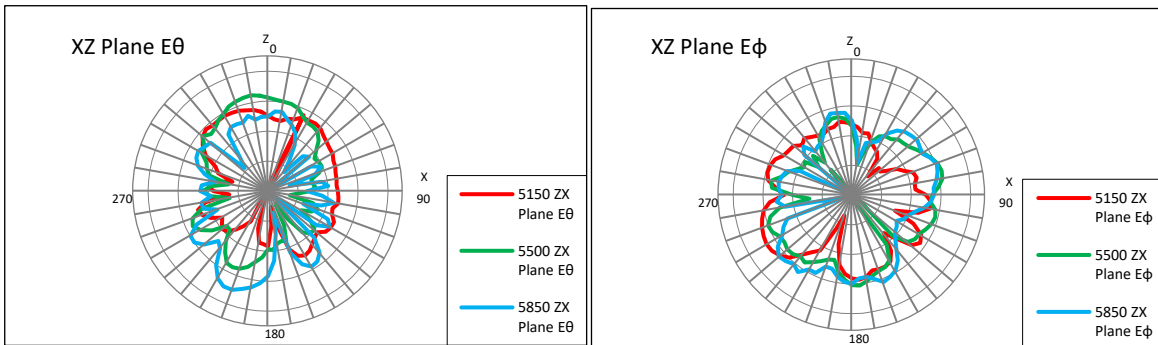
## XY Plane



## YZ Plane

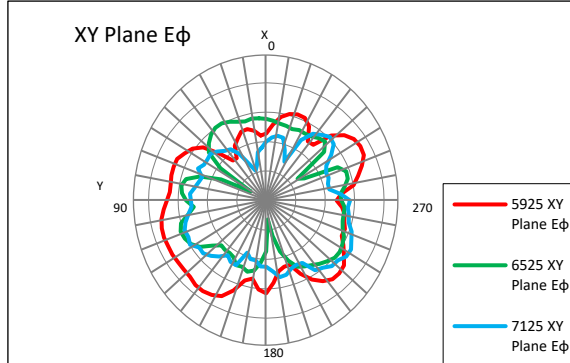
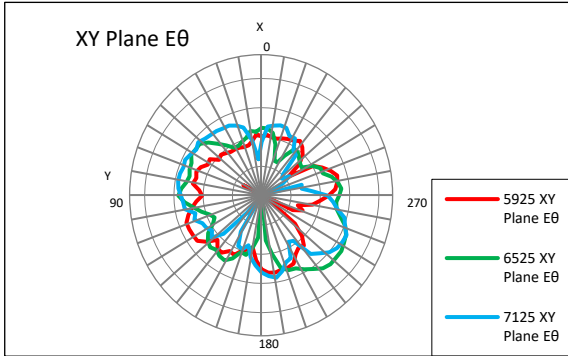


## XZ Plane

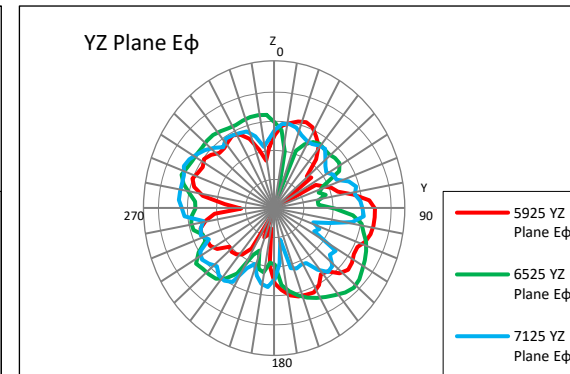
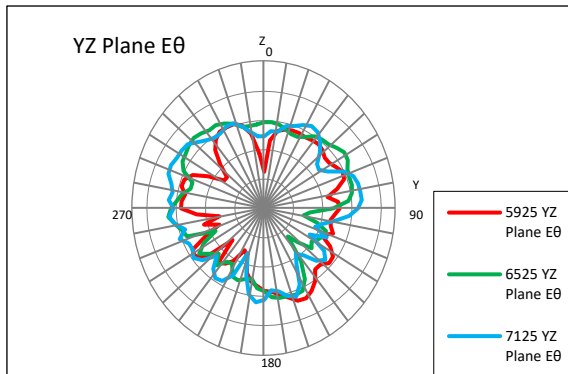


## ANT4 (5925-7125MHz)

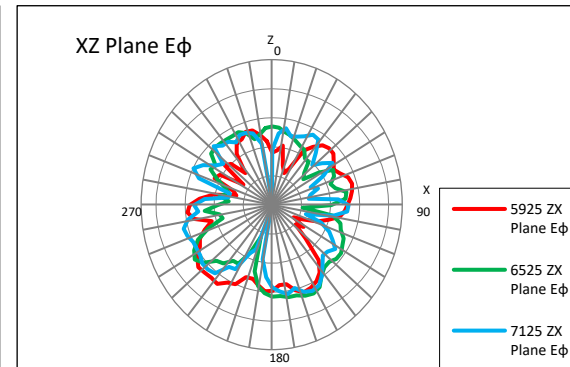
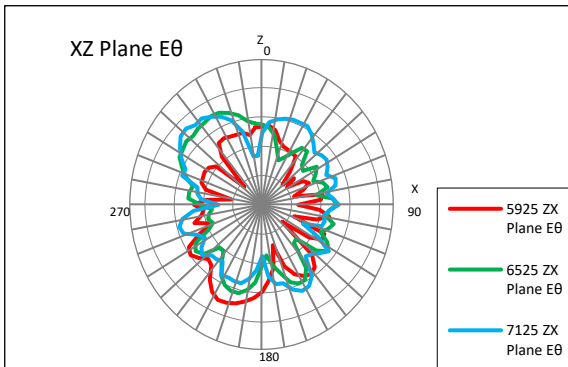
### XY Plane



### YZ Plane

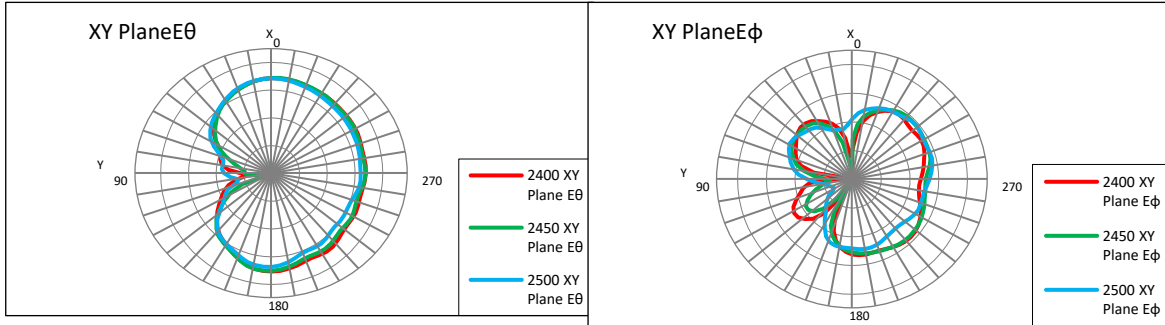


### XZ Plane

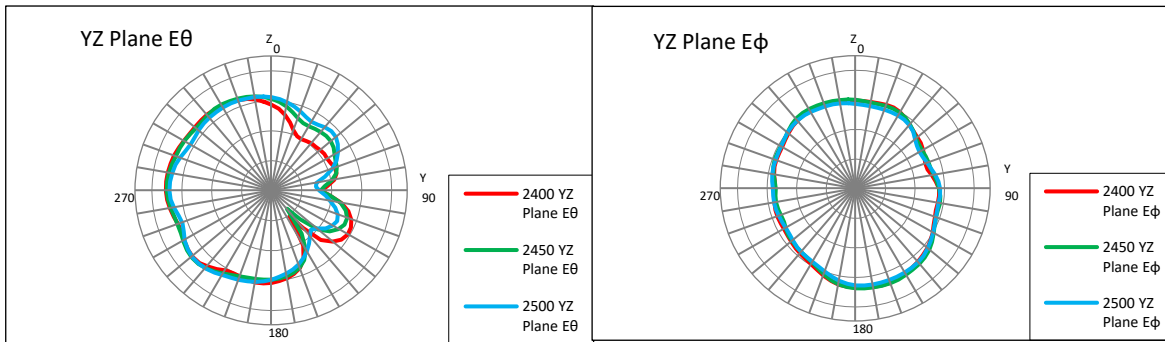


# ANT8 (2400-2500MHz)

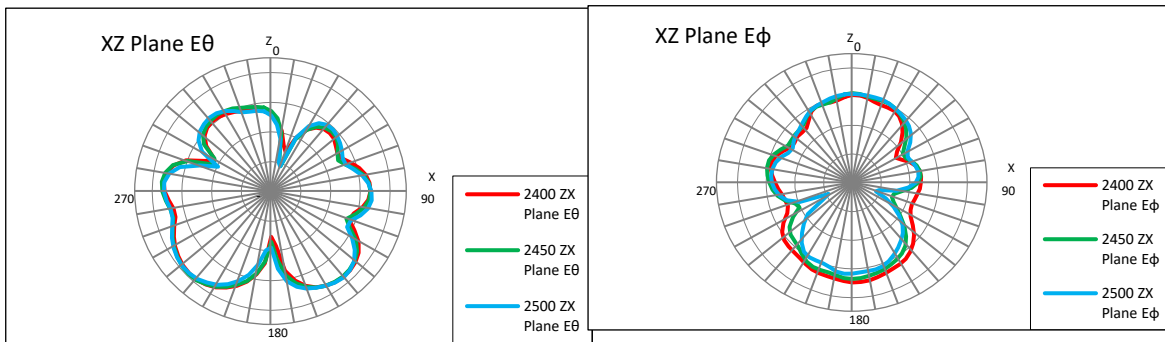
## XY Plane



## YZ Plane

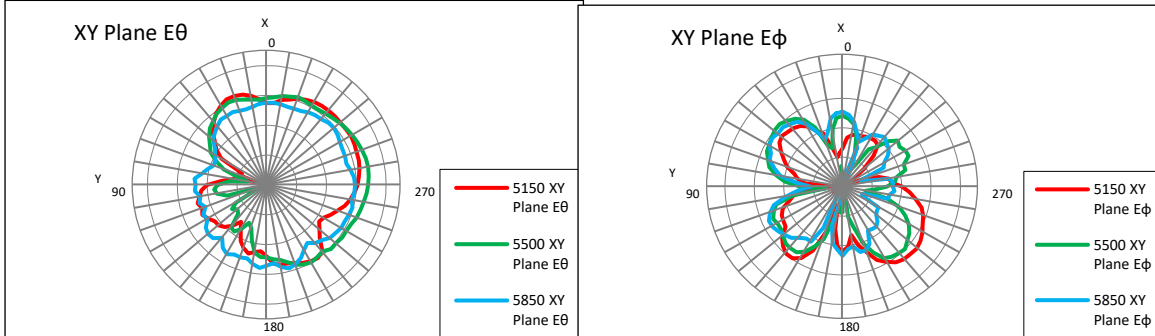


## XZ Plane

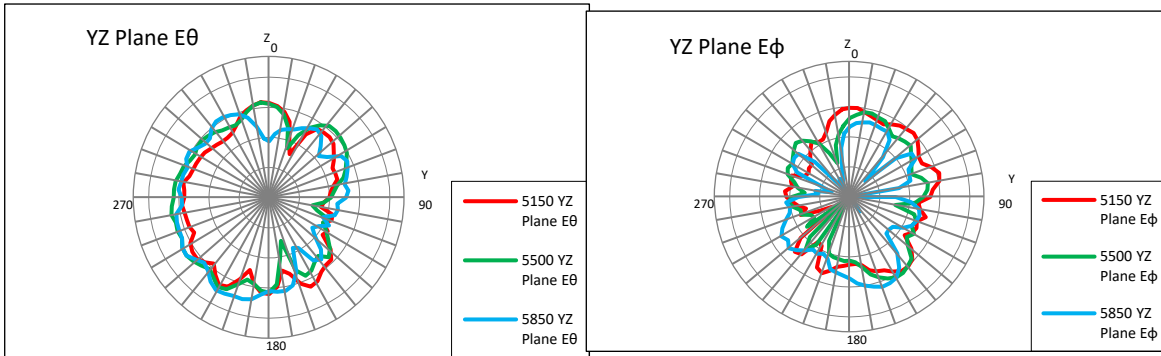


# ANT8 (5150-5850MHz)

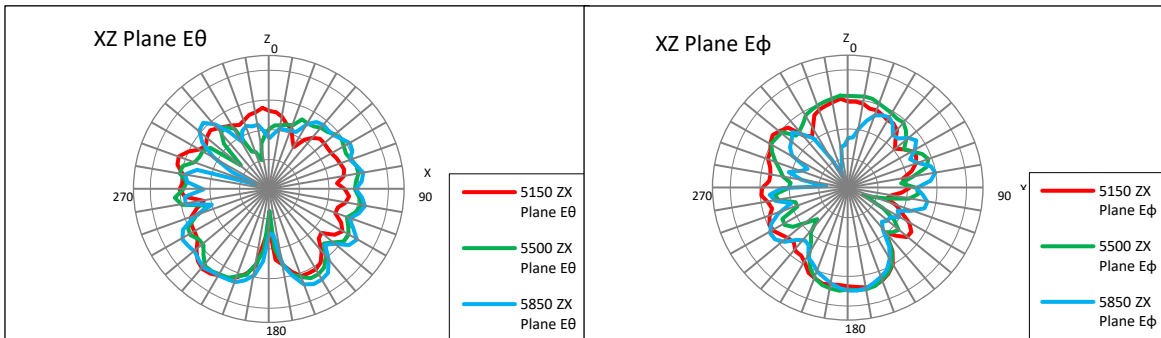
## XY Plane



## YZ Plane

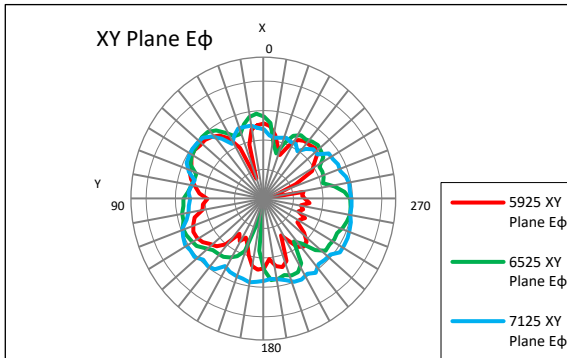
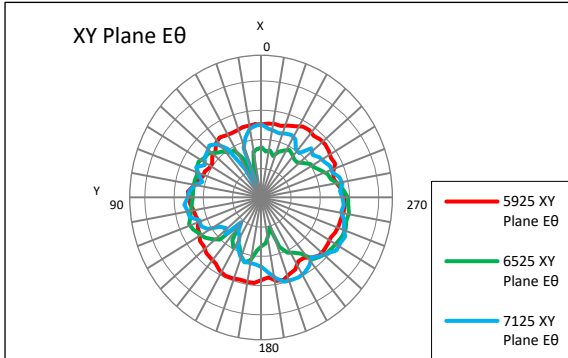


## XZ Plane

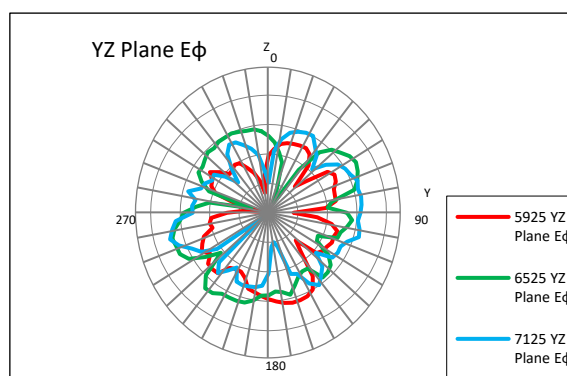
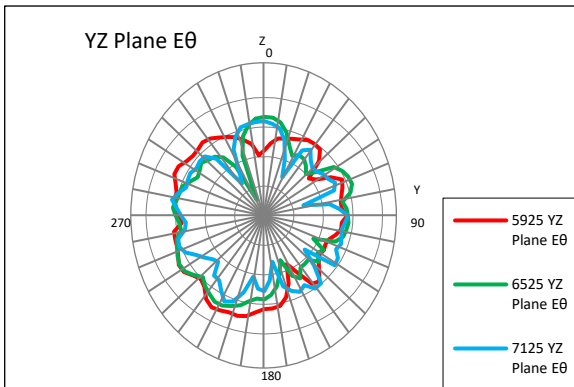


## ANT8 (5925-7125MHz)

### XY Plane



### YZ Plane



### XZ Plane

