

# Data Sheet

Product Type	WLAN antenna
Notebook Model Number	ASUS / L50
Part No. / Yageo / Main / Left	CAN4313794012501B
Part No. / Yageo / Right / Aux	CAN4313794022501B
Part No. / Yageo / MIMO / Left Side	CAN4313 583 032501B

**Yageo (Taiwan) Ltd.**

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**Yageo Electronics (China) Co, Ltd**

No. 10, Zhu Yuan Road, Suzhou New District, Suzhou, PRC

2.45/5GHz Multi Band Antenna with Cable & Connector for IEEE802.11b, 11g, 11a, 11n, UNII	Yageo Corporation SPD		R01	Aug. 14, 08
	Datasheet Current Revision:			
	R01			
	BY /	Stella Kuo	DATE /	Aug. 14, 2008

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# 1. Specifications

## 1.1 Specifications for Antennas

Frequency Range (GHz)	2.40 ~ 2.50 for 802.11b/g/n 5.15 ~ 5.85 for 802.11a
VSWR	2.50 for 2.4GHz band For WL 2.50 for 5.0GHz band For WL
Peak Gain (dBi)	2.91dBi for 2.4GHz band 2.59dBi for 5.0GHz band
MiniPCI Connector	Ipex / Hirose
Impedance	50Ω
Operating Temperature	-40~90°C
Maximum Power	1W
Polarization	Linear
Radiation Pattern	Omni-directional

## 1.2 Antenna Dimension / Cable Length

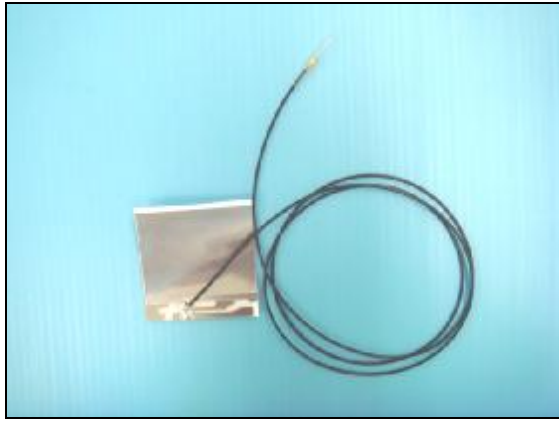
Product	ASUS / L50
Main antenna (LCD)	40.0*8.0*0.4 mm / 725.0 mm, Color Black
Aux antenna (LCD)	40.0*8.0*0.4 mm / 925.0 mm, Color White
MIMO antenna (LCD)	40.0*8.0*0.4 mm / 580.0 mm, Color Gray

## 1.3 Packing Spec.

Product	For Example
Inner tray	60
Carton box	265*100



#### 1.4 Antenna Pictures



**Main Antenna**



**Aux Antenna**



**MIMO Antenna**

## **2. Test Methodology**

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### **2.1 Test equipment**

The equipment for the antenna measurement we used is as follows.

- A. Agilent 8753ET / 8719D Network Analyzer to measure the VSWR and input impedance.
- B. Three-dimensional anechoic chamber to measure the gain  
(Standard dipole and horn were used to calibrate the chamber)
- C. Digital caliper to measure the dimensions.
- D. Climatic chamber for mechanical tests.

### **2.2 Test setup**

#### **2.2.1 Frequency Range**

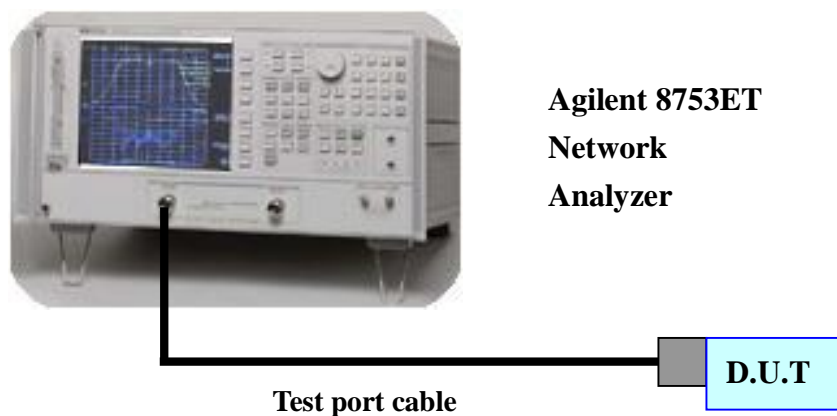
2.40 ~ 2.50GHz, 5.15 ~ 5.85GHz

#### **2.2.2 Antenna configuration**

The antenna basically has two parts; the stamping and the cable assembly with the connector on one side. The detailed drawing is attached.

#### **2.2.3 VSWR**

The VSWR is measured with Agilent 8753ET / 8719D network analyzer. All the measurements are performed with the customer provided fixture. Figure 1 shows the schematic diagram for measuring VSWR.



**Figure 1. The schematic diagram for measuring VSWR**

### 2.2.4 Radiation pattern and gain

The radiation pattern must have the omni-directional characteristic in both positions. The radiation pattern measurements are performed in the three-dimensional anechoic chamber. The chamber provides less than  $-30\text{dB}$  reflectivity from  $800\text{MHz}$  through  $8\text{GHz}$ . The chamber is calibrated using both standard dipole and horn antenna. The gain here is expressed as  $\text{dBi}$  that standardizes the isotropic antenna. The gain measurements are also performed in the same chamber described previously. Figure 2 shows the schematic diagram for measuring radiation pattern and gain.

#### 2D Anechoic chamber

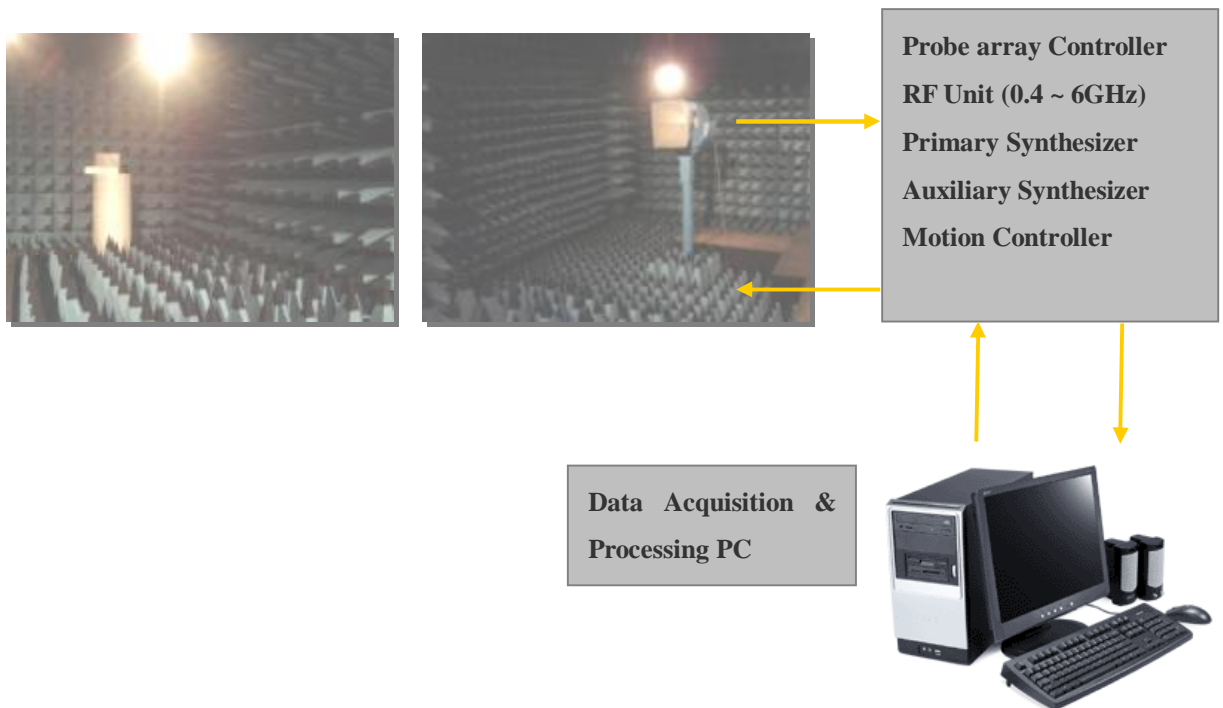
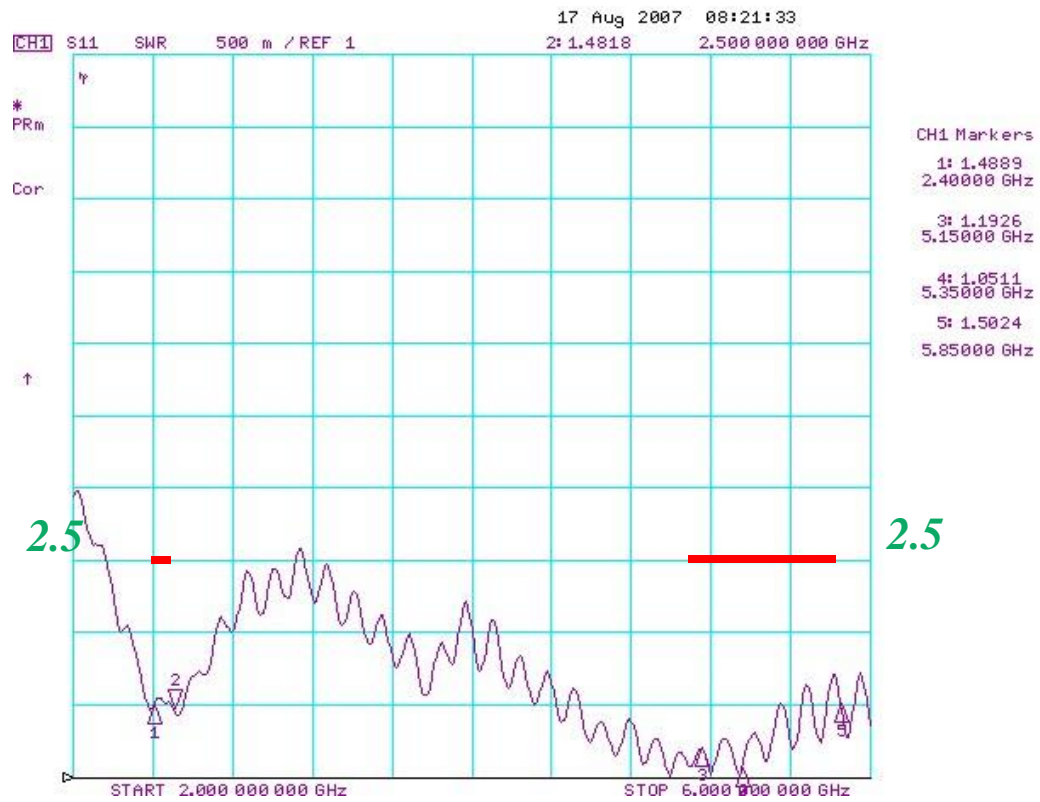


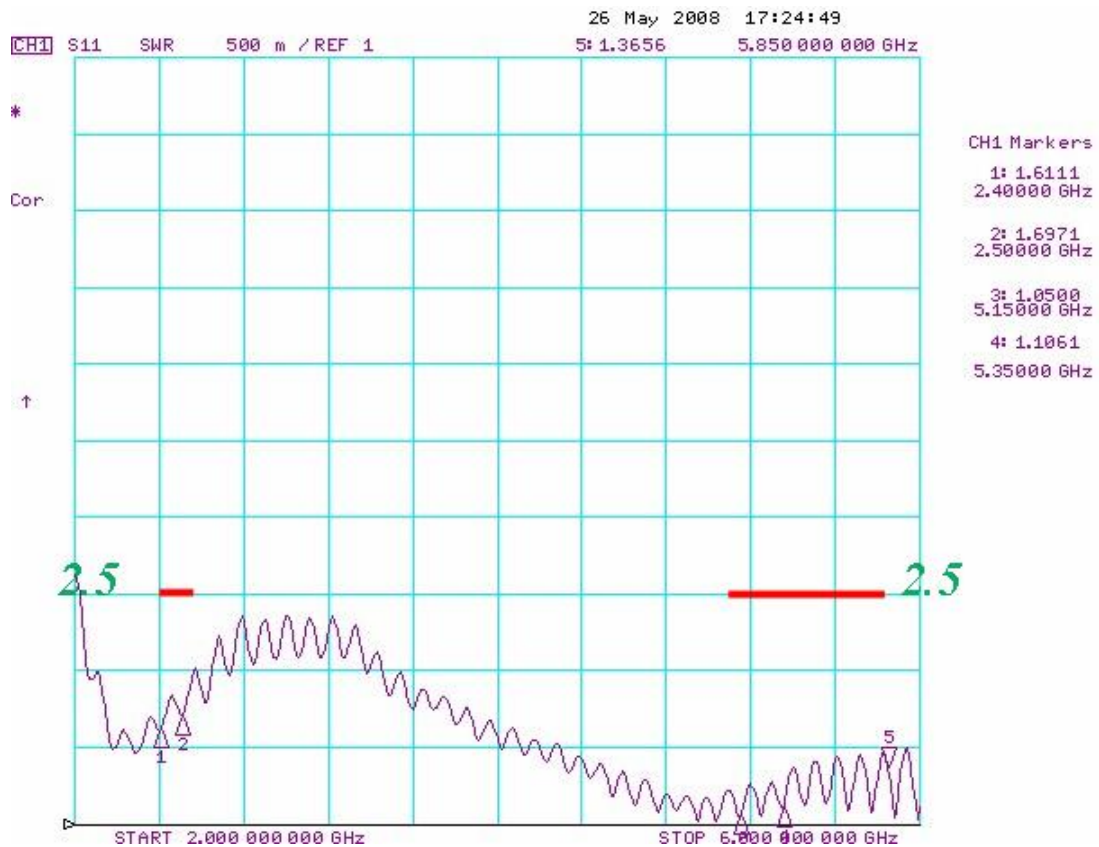
Figure 2. The schematic diagram for measuring radiation pattern and gain

### 3. Performance Data

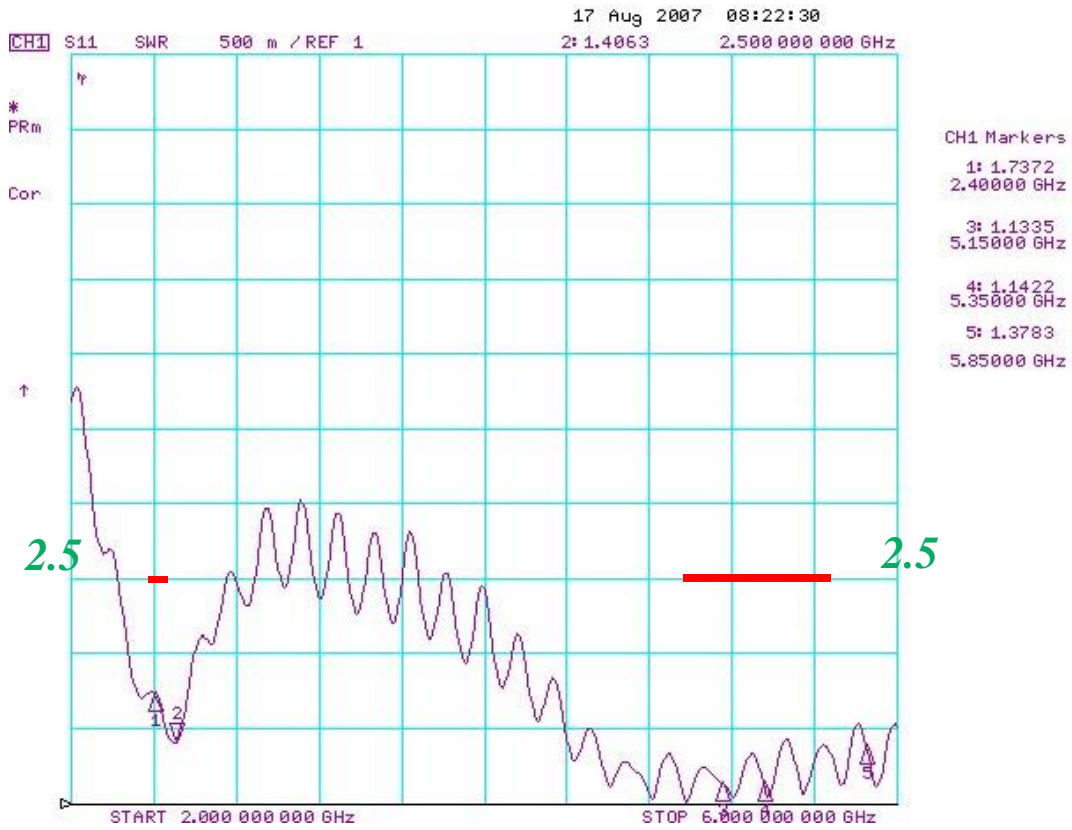
#### 3.1 VSWR in the Fixture (Main antenna)



#### VSWR in the Fixture (Aux antenna)



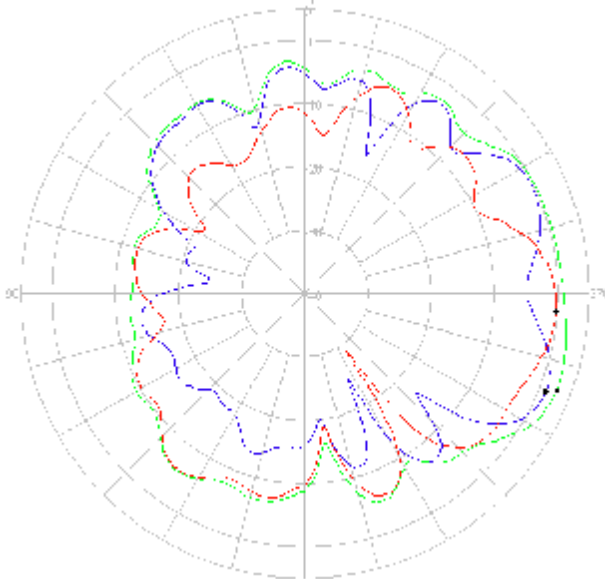
**VSWR in the Fixture (MIMO antenna)**



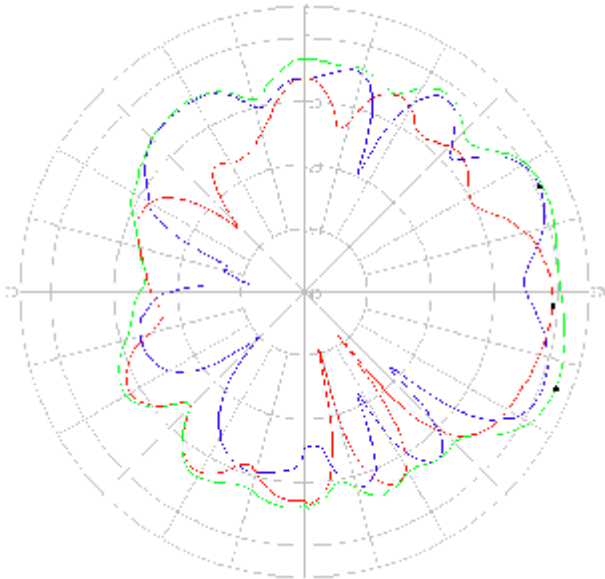


**3.2 Radiation Pattern and Gain**

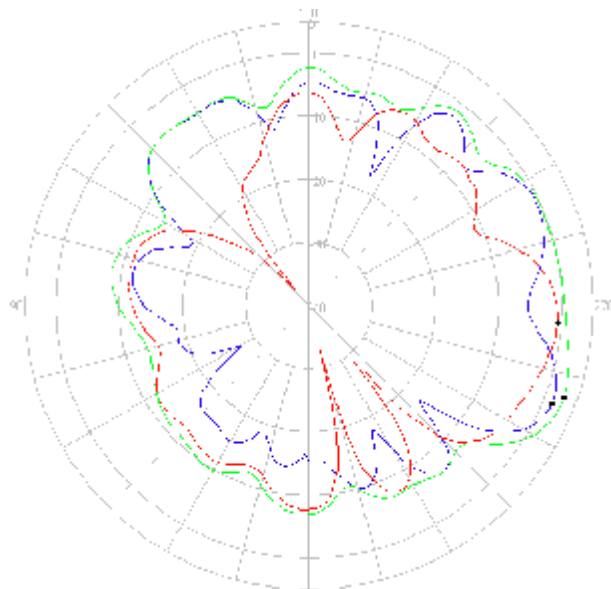
**3.2.1 Low Frequency (2.40GHz~2.50GHz) / Main Antenna**



**2.4GHz**



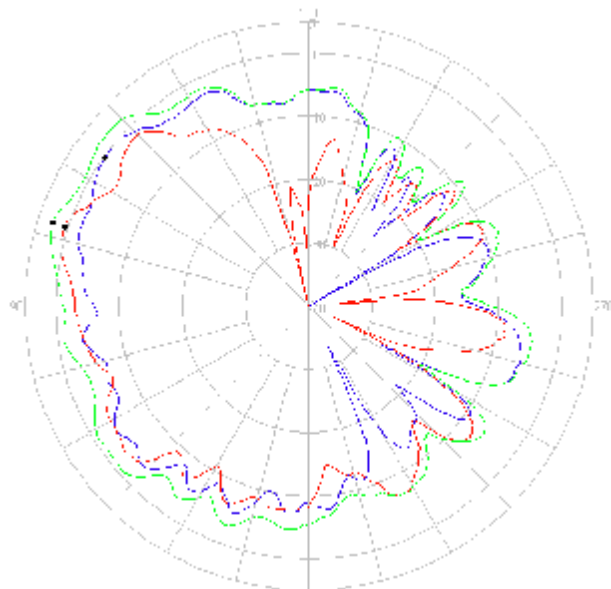
**2.45GHz**



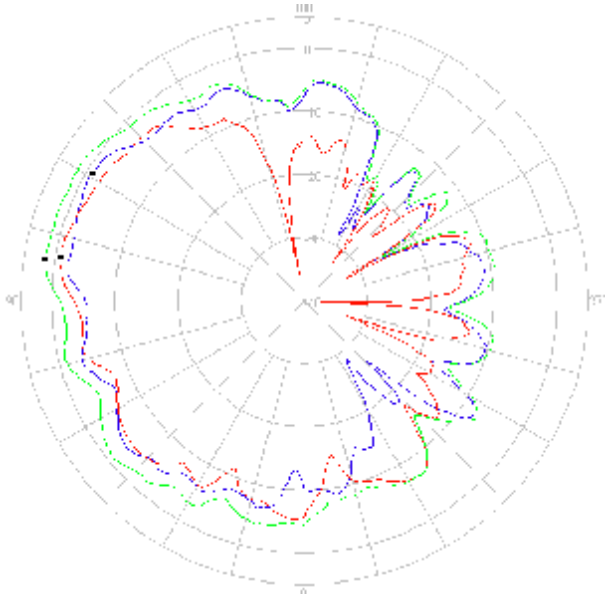
**2.5GHz**

- **Horizontal**
- **Vertical**
- **H+V**

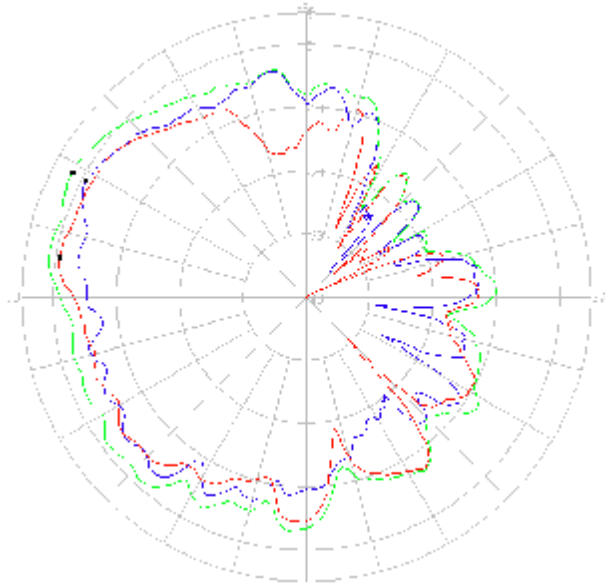
**3.2.2 Middle Frequency (5.15GHz~5.35GHz) / Main Antenna**





**5.15GHz**



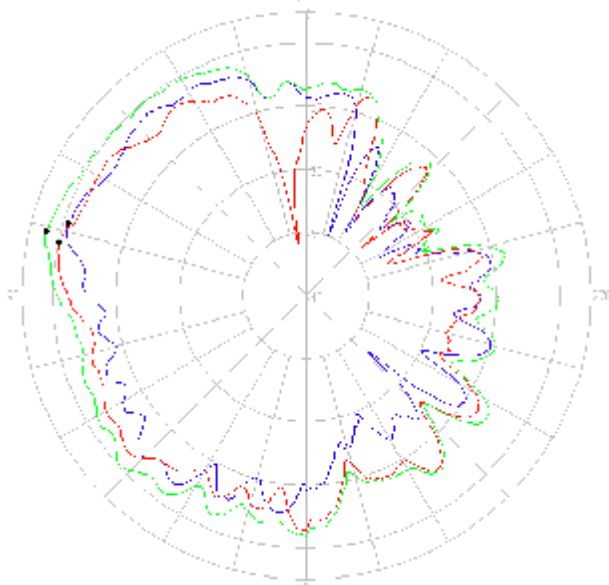
**5.25GHz**



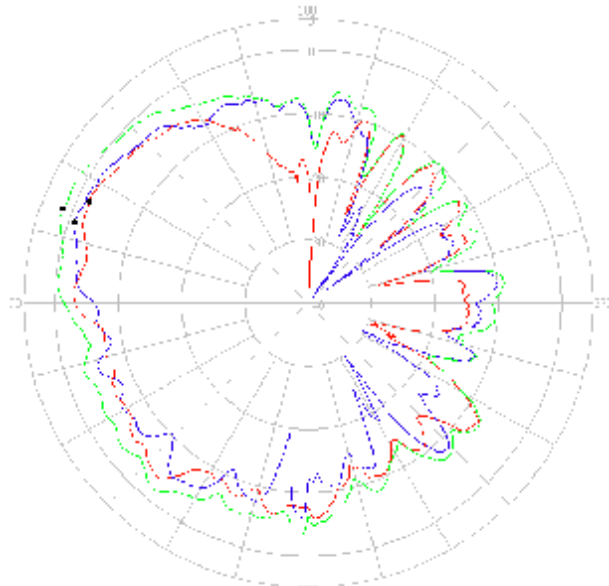
**5.35GHz**

-  **Horizontal**
-  **Vertical**
-  **H+V**

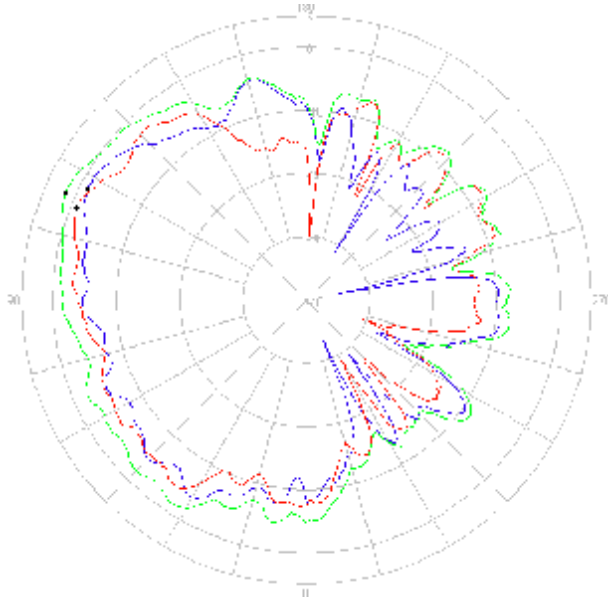
**3.2.3 High Frequency (5.47GHz~5.85GHz) / Main Antenna**



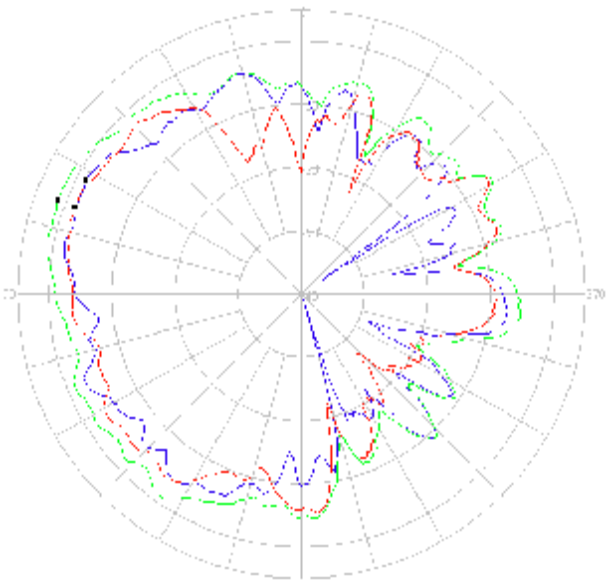
**5.47GHz**



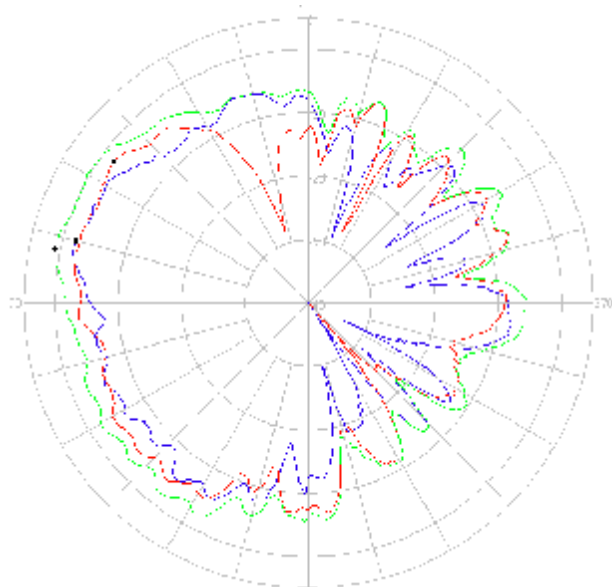
**5.6GHz**



**5.725GHz**



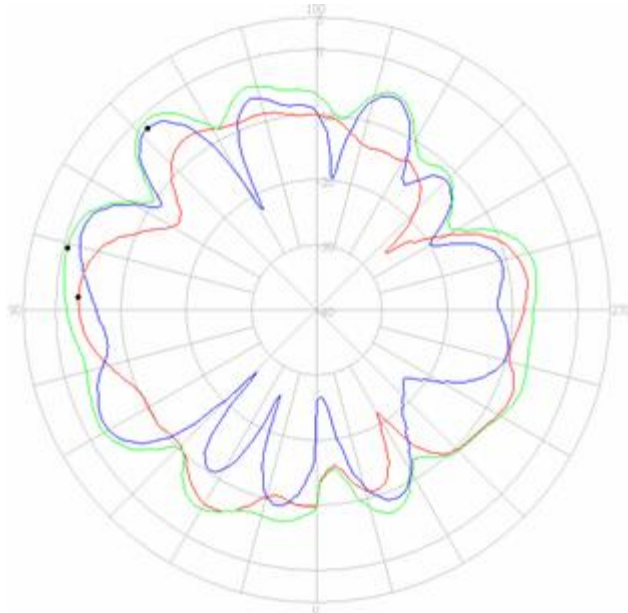
**5.785GHz**



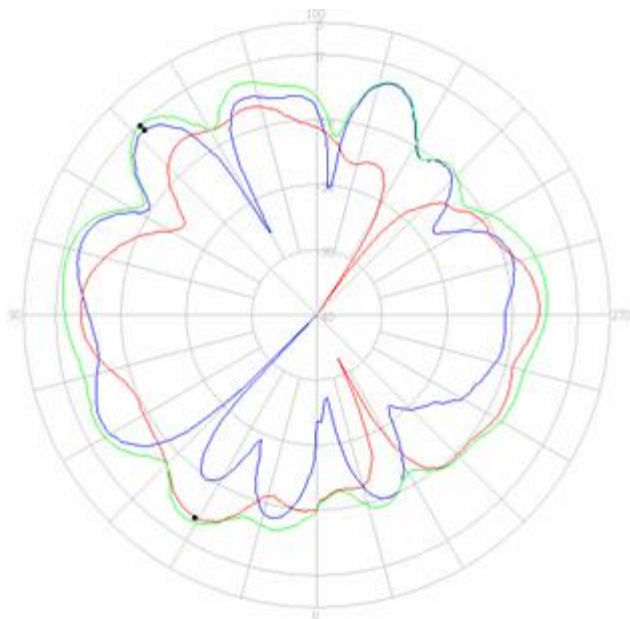
**5.85GHz**

- Horizontal**
- Vertical**
- H+V**

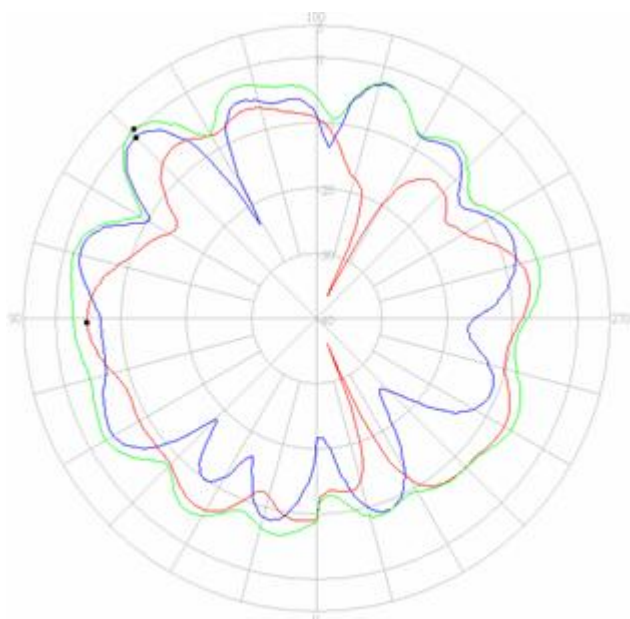
**3.2.4 Low Frequency (2.40GHz~2.50GHz) / Aux (Right) Antenna**



**2.4GHz**



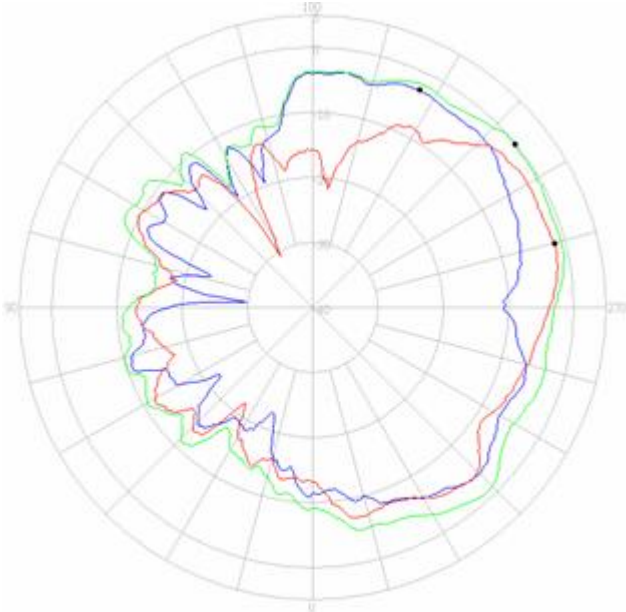
2.45GHz



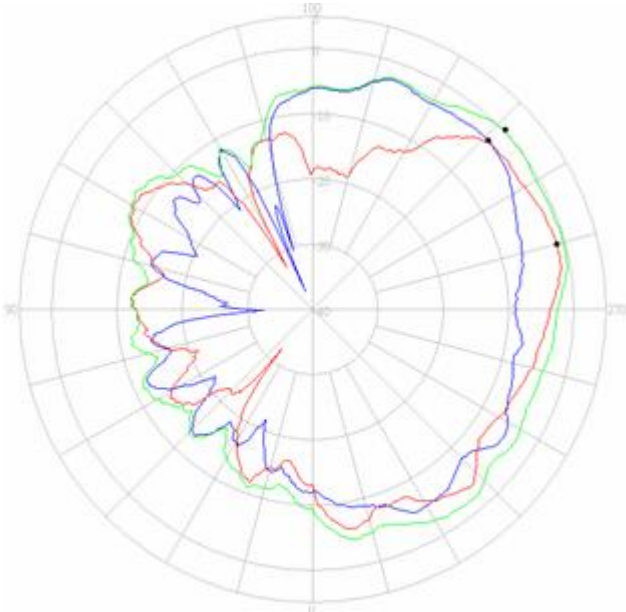
2.5GHz

- **Horizontal**
- **Vertical**
- **H+V**

**3.2.5 Middle Frequency (5.15GHz~5.35GHz) / Aux (Right) Antenna**

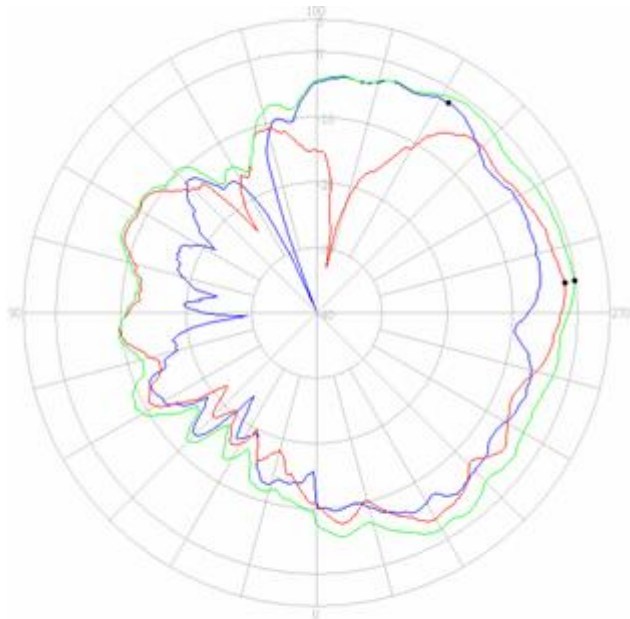


5.15GHz



5.25GHz

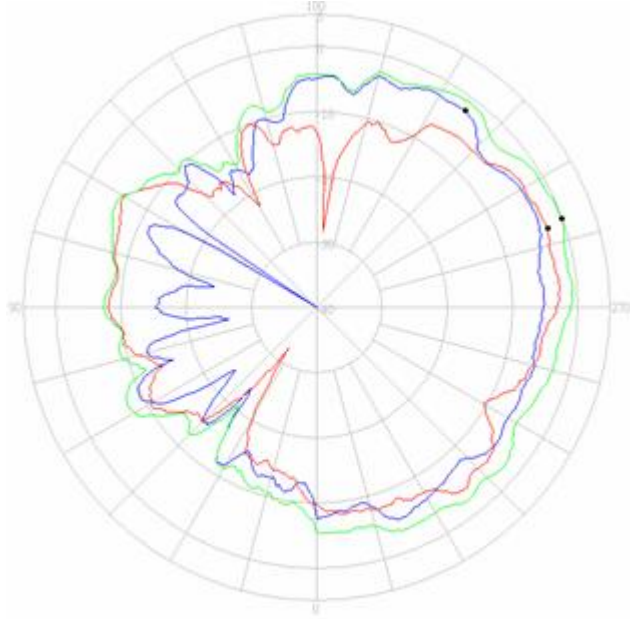




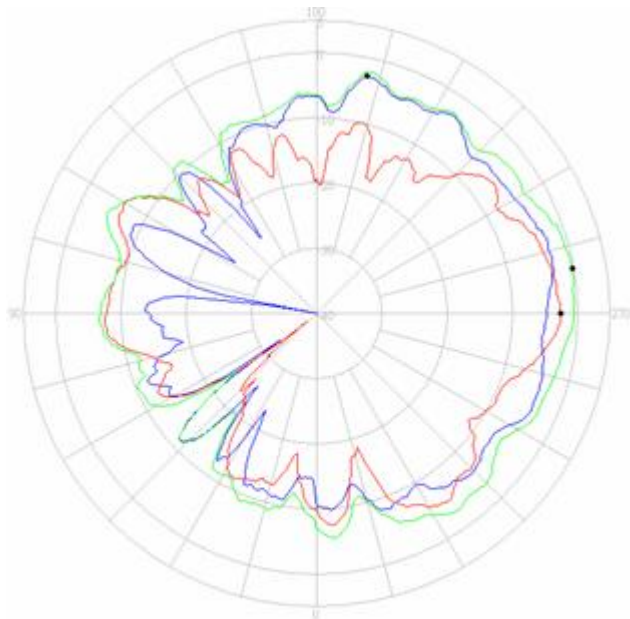
5.35GHz

- Horizontal
- Vertical
- H+V

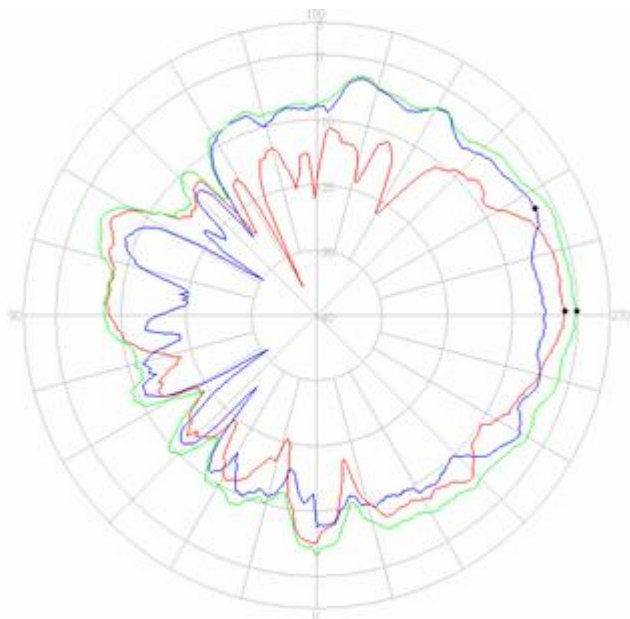
3.2.6 High Frequency (5.47GHz~5.85GHz) / Aux (Right) Antenna



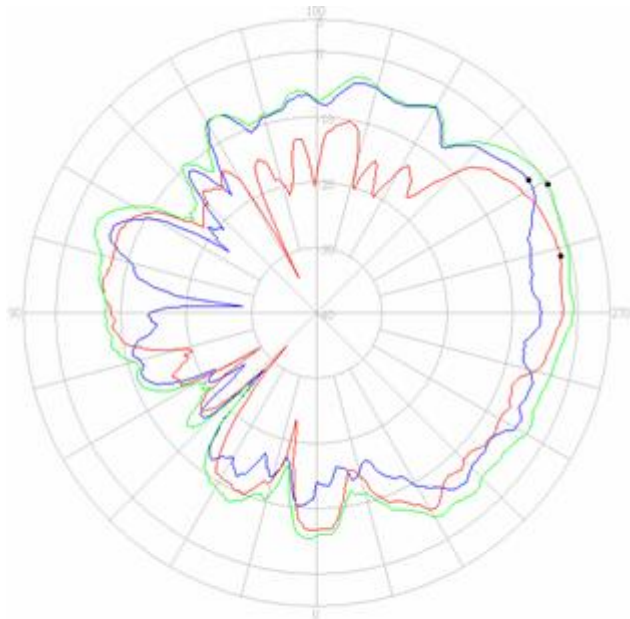
5.47GHz



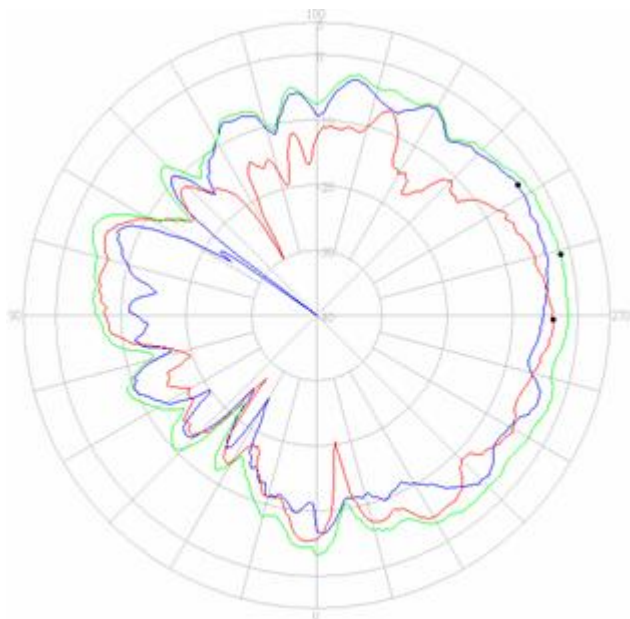
5.6GHz



5.725GHz



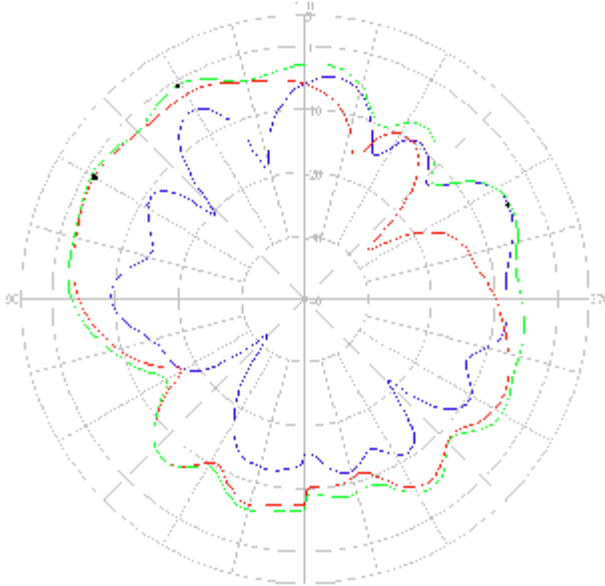
5.785GHz



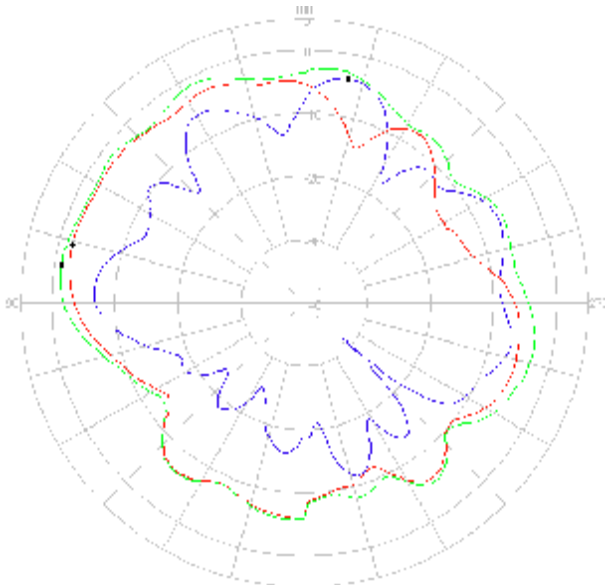
5.85GHz

- **Horizontal**
- **Vertical**
- **H+V**

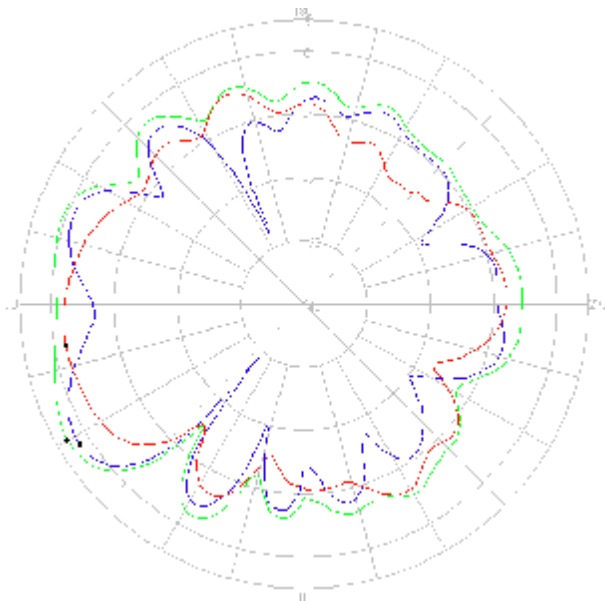
**3.2.7 Low Frequency (2.40GHz~2.50GHz) / MIMO Antenna**



**2.4GHz**



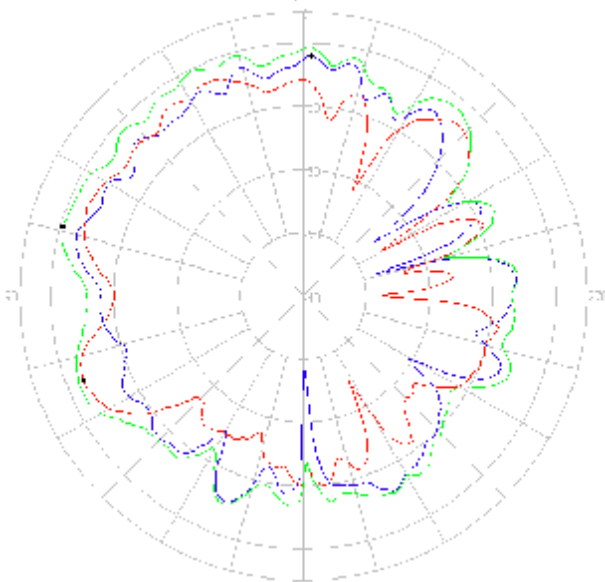
**2.45GHz**



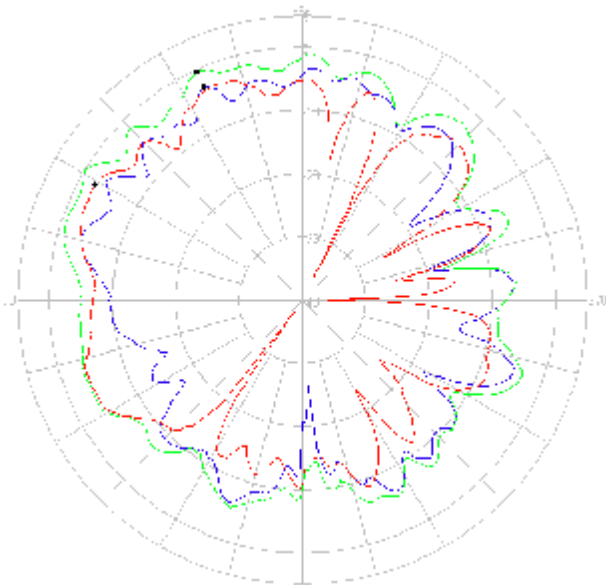
**2.5GHz**

- Horizontal
- Vertical
- H+V

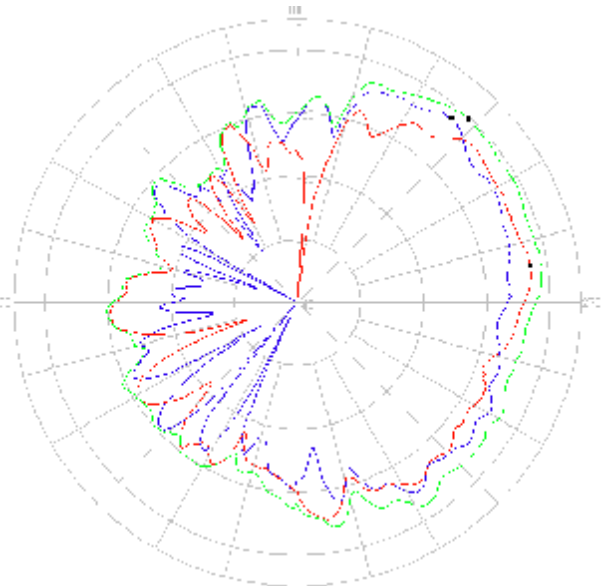
**3.2.8 Middle Frequency (5.15GHz~5.35GHz) / MIMO Antenna**



**5.15GHz**



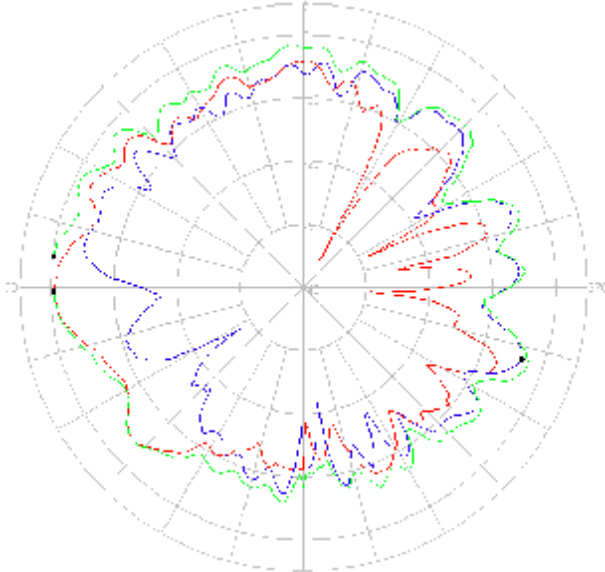
**5.25GHz**



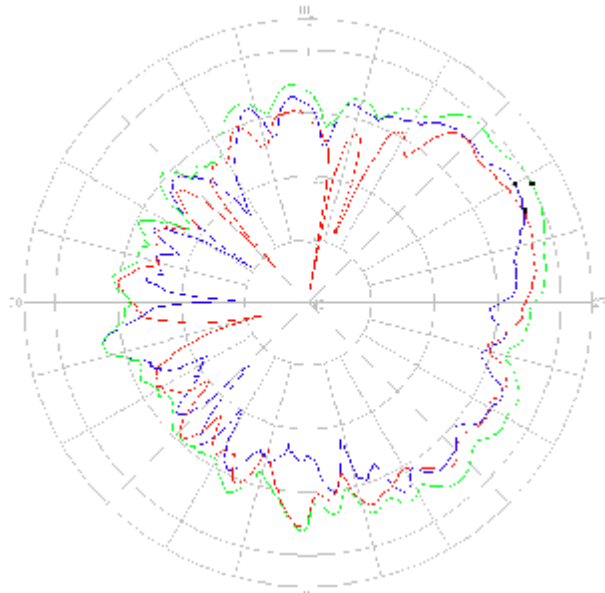
**5.35GHz**

- Horizontal
- Vertical
- H+V

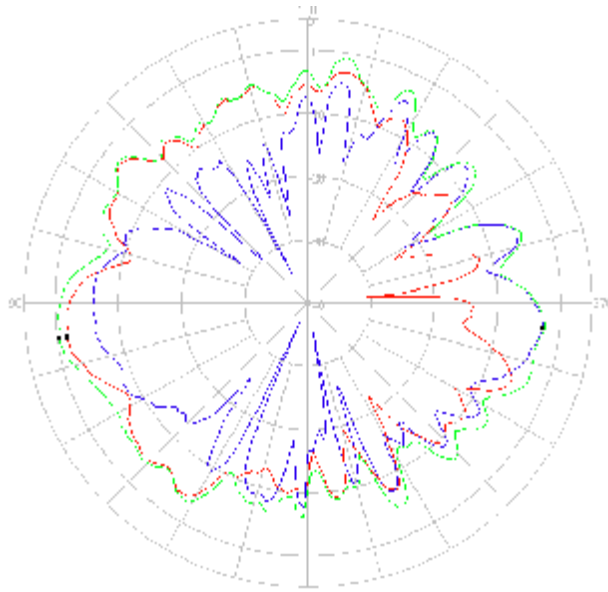
**3.2.9 High Frequency (5.47GHz~5.85GHz) / MIMO Antenna**



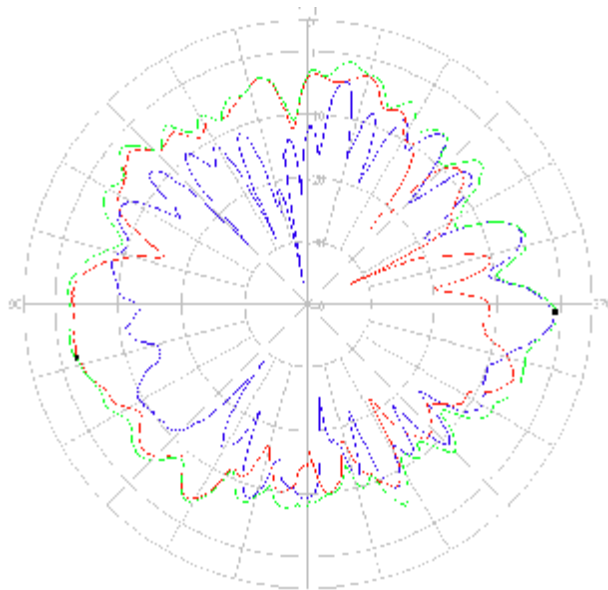
**5.47GHz**



**5.6GHz**

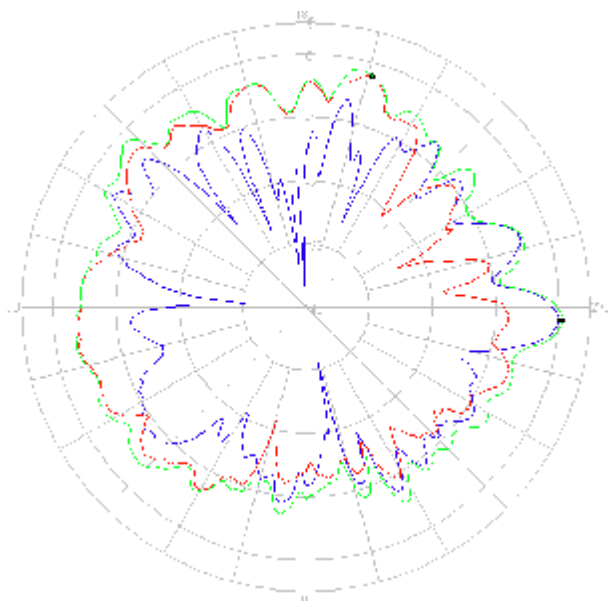


**5.725GHz**



**5.785GHz**





**5.85GHz**

- **Horizontal**
- **Vertical**
- **H+V**

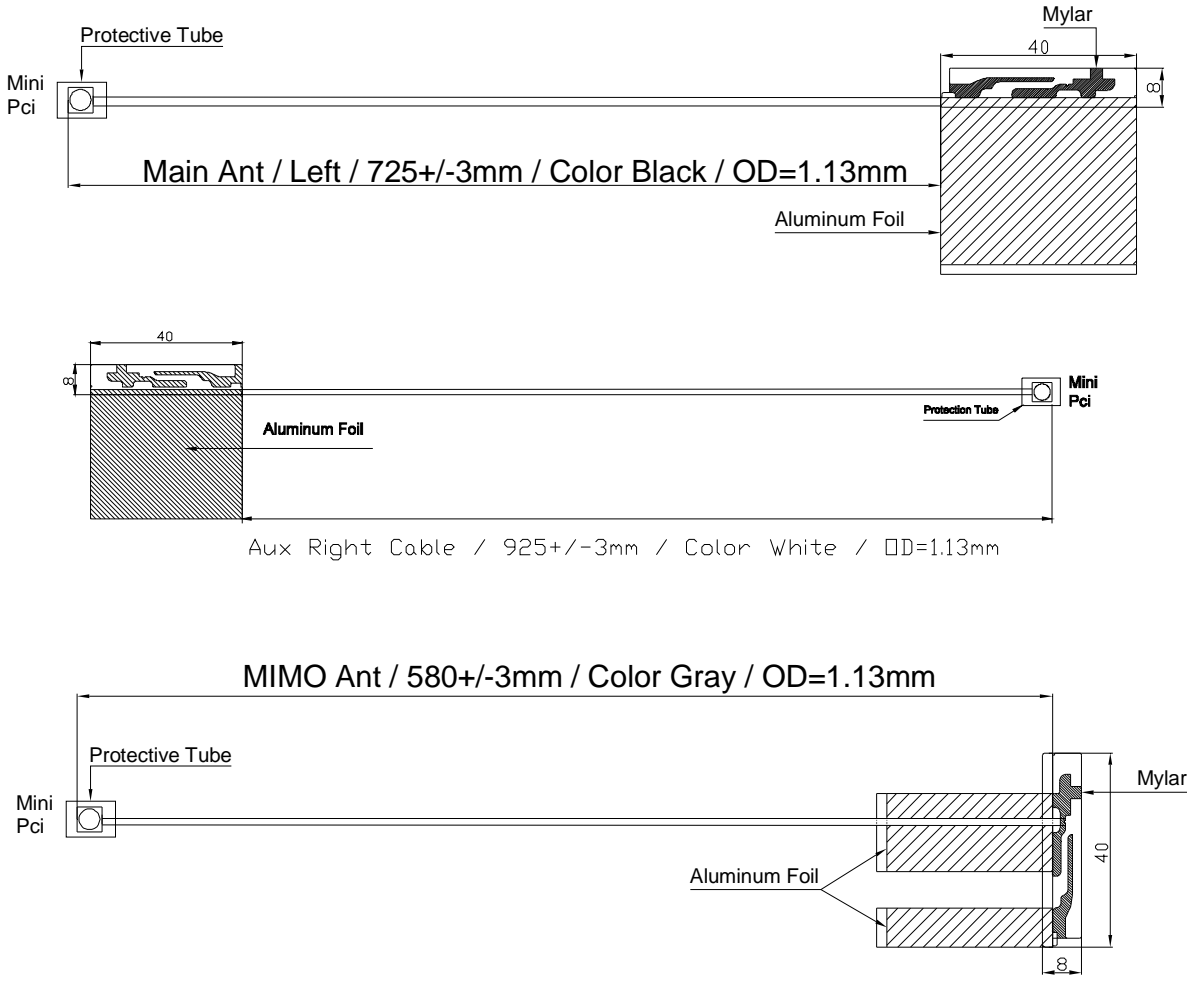
### 3.2.10 Average Gain (dBi) Summary

Main Antenna Gain						
Frequency	Max Value (dBi)			Average (dBi)		
	H-pol	V-pol	Total	H-pol	V-pol	Total
2400(MHz)	1.14	-0.14	2.74	-6.19	-7.01	-3.57
2450(MHz)	0.73	-0.76	2.52	-5.89	-7.27	-3.52
2500(MHz)	1.45	-0.57	2.91	-5.99	-7.80	-3.69
5150(MHz)	0.04	0.63	2.59	-6.23	-6.92	-3.55
5250(MHz)	-0.78	-0.74	1.66	-6.68	-7.35	-3.99
5350(MHz)	-0.65	-0.59	1.90	-7.16	-7.00	-4.07
5470(MHz)	-0.62	-0.08	2.36	-6.95	-6.35	-3.63
5600(MHz)	-0.85	-1.74	1.53	-7.66	-7.82	-4.73
5725(MHz)	-1.13	-0.87	1.70	-7.76	-7.45	-4.60
5785(MHz)	-1.39	-1.50	1.43	-7.14	-7.03	-4.08
5850(MHz)	-1.86	-1.96	0.92	-8.27	-7.44	-4.82

Aux Antenna Gain						
Frequency	Max Value (dBi)			Average (dBi)		
	H-pol	V-pol	Total	H-pol	V-pol	Total
2400(MHz)	-1.85	-3.40	-0.55	-8.20	-8.93	-5.54
2450(MHz)	-1.24	-3.69	-0.24	-7.43	-8.47	-4.91
2500(MHz)	-0.70	-4.76	0.33	-7.39	-8.83	-5.04
5150(MHz)	-2.71	-1.61	0.04	-7.81	-7.85	-4.82
5250(MHz)	-2.55	-1.21	0.38	-8.01	-7.59	-4.79
5350(MHz)	-1.98	-1.62	-0.09	-7.77	-7.62	-4.68
5470(MHz)	-2.14	-2.50	-0.03	-7.34	-7.74	-4.53
5600(MHz)	-2.77	-2.53	-0.15	-7.58	-8.90	-5.18
5725(MHz)	-2.66	-1.86	-0.10	-7.62	-8.37	-4.97
5785(MHz)	-1.58	-1.56	0.55	-7.81	-8.08	-4.93
5850(MHz)	-3.14	-3.67	-1.35	-7.32	-8.57	-4.89

MIMO Antenna Gain						
Frequency	Max Value (dBi)			Average (dBi)		
	H-pol	V-pol	Total	H-pol	V-pol	Total
2400(MHz)	-4.50	-1.51	-0.76	-10.03	-6.38	-4.82
2450(MHz)	-3.86	-2.03	-1.06	-9.97	-6.23	-4.70
2500(MHz)	-2.64	-0.35	0.61	-8.87	-5.47	-3.84
5150(MHz)	-2.06	-2.68	-0.30	-6.92	-7.61	-4.24
5250(MHz)	-2.90	-2.39	-0.21	-7.66	-7.73	-4.68
5350(MHz)	-3.85	-2.07	-0.56	-7.81	-8.06	-4.92
5470(MHz)	-3.50	-0.48	-0.19	-8.17	-7.19	-4.64
5600(MHz)	-2.70	-2.26	-0.44	-8.67	-7.20	-4.86
5725(MHz)	-2.51	-1.50	-0.21	-9.19	-7.35	-5.16
5785(MHz)	-1.05	-2.40	-0.65	-9.44	-7.22	-5.18
5850(MHz)	0.13	-2.07	0.77	-9.48	-7.19	-4.85

**4. Antenna Drawing**



## 5. Reliability Data For Antenna Patch (Reference To IEC)

IEC 384-10/ CECC 32 100 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
4.12	4(Na)	Rapid change of temperature	-40 °C (30 minutes) to +90 °C (30 minutes); 5 cycles	No visible damage Central Freq. Change ± 6%
4.14	3(Ca)	Damp heat	500 ± 12 hours at 40 °C; 90 to 95 % RH	No visible damage 2 hours recovery Central Freq. Change ± 6%
4.15		Endurance	500 ± 12 hours at 90 °C;	No visible damage 2 hours recovery Central Freq. Change ± 6%

## **6. Ordering Information: Yageo Ordering P/N Code**

The antennas may be ordered by using the Yageo P/N ordering code. These code numbers can be determined by the following rules:

**CAN4313    7 94    01 250 1B**  
**F C MS    T A P**

### **F. Family Code**

**CAN43 = Antenna**

### **C. Packing Type Code**

**13 = Bulk (1000 pcs)**

### **M. Materials Code**

**7 = High Frequency Material**

### **S. Size/Series Code**

**94 = 40.0\*8.0\*0.4mm Main / Aux / MIMO Antenna**

### **T. Tolerance/Cable**

**01 = Main Antenna, Left, Black; Aux Antenna, Right, White; MIMO Antenna, Left Side, Gray**

### **A. Working Frequency**

**250 = 2.45/5 GHz Dual Band**

### **P. Packing**

**1B = 1000 pcs packing**

**7. Revision Control**

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<b>Revision</b>	<b>Date</b>	<b>Content</b>	<b>Remark</b>
R01	Aug. 14, 2008	New Issued, Metal Antenna	N/A.