

# Antenna Test Report

(DIR-510)

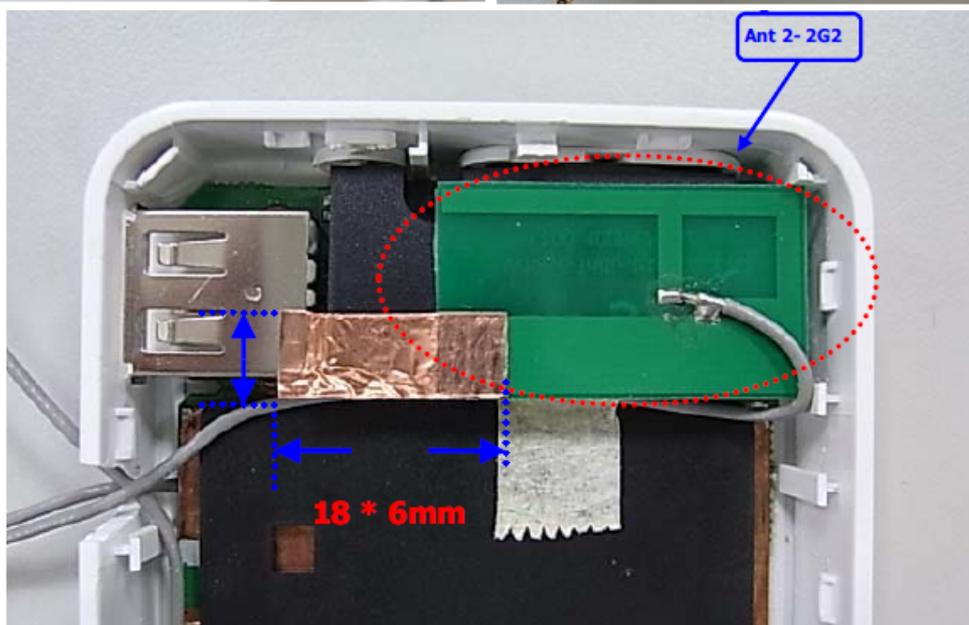
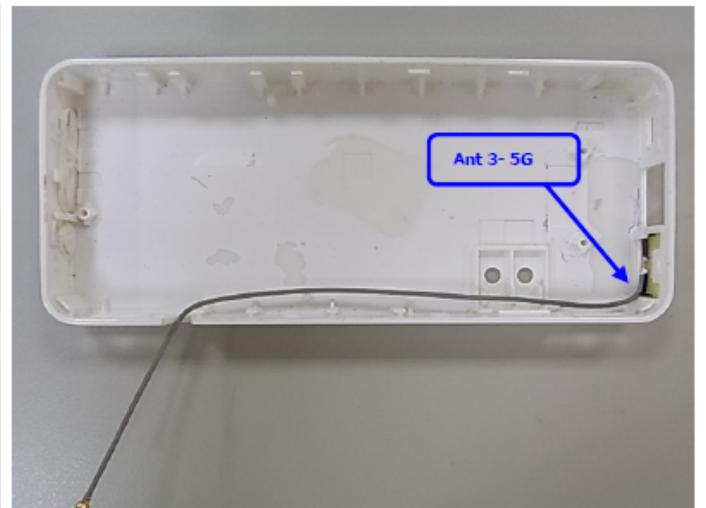
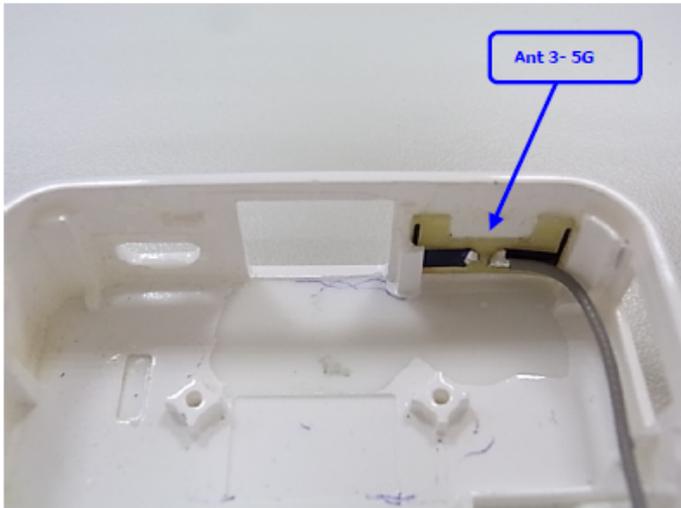
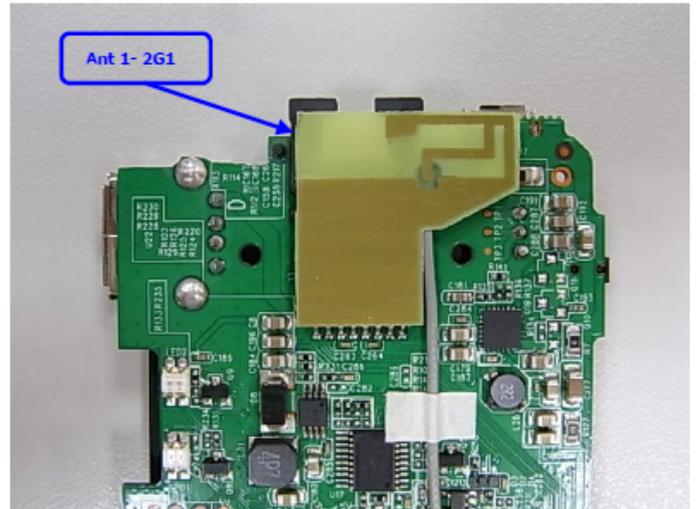
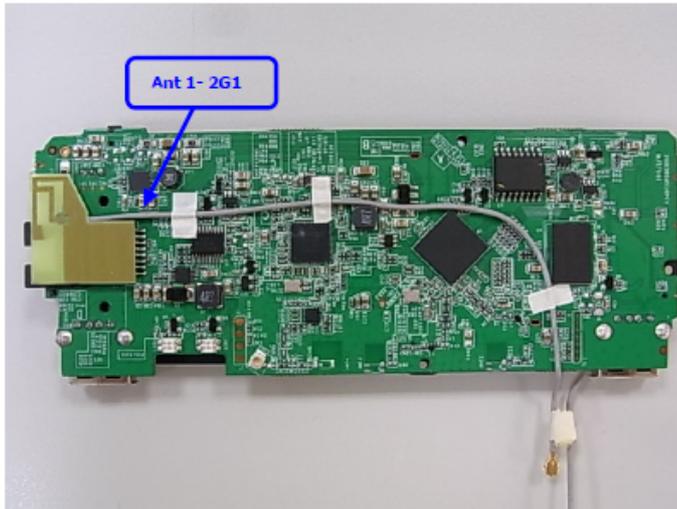
V1.03

<b>Document Number</b>	<b>NE3-13026</b>
<b>1<sup>st</sup> Released Date</b>	<b>04/03/2013</b>
<b>Last Released Date</b>	<b>05/14/2013</b>
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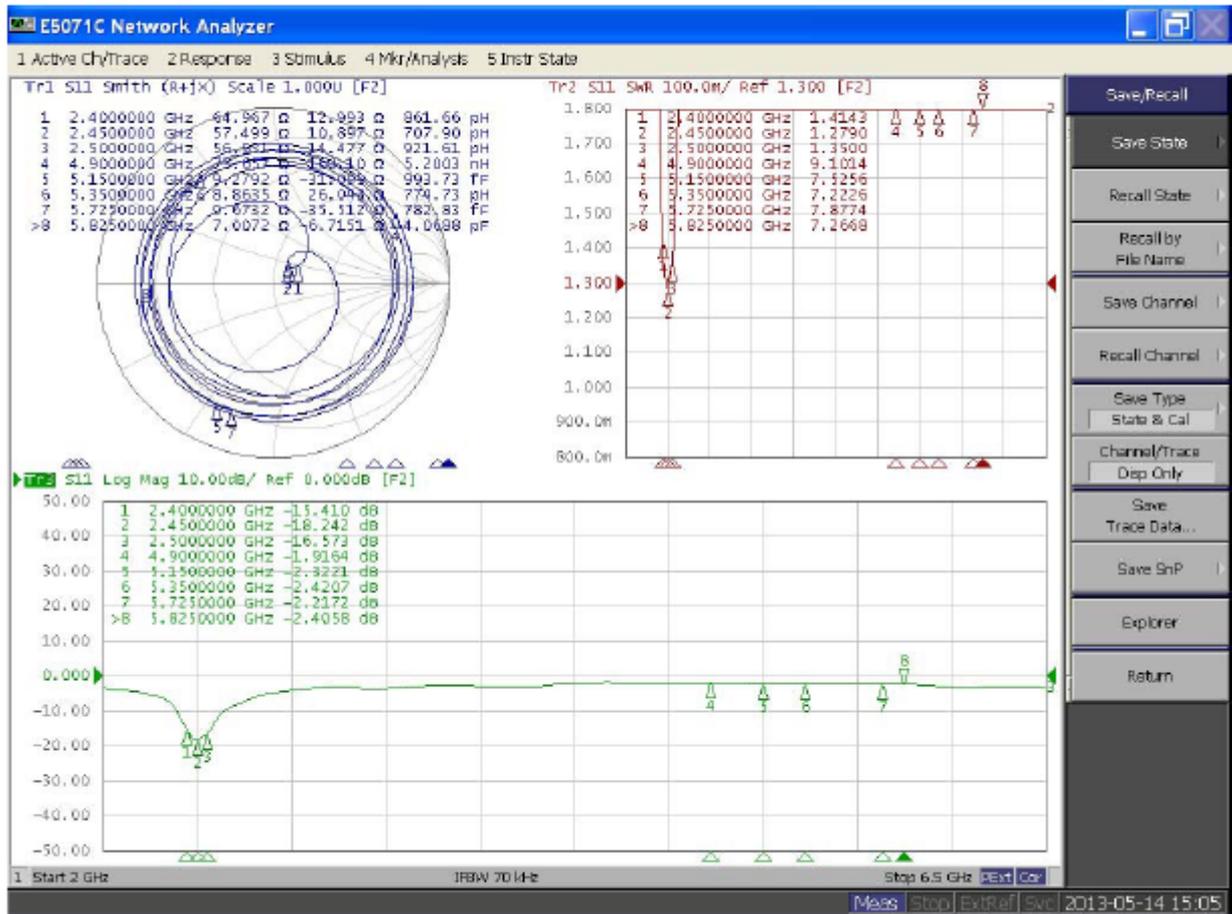
### Electrical Specification

<b>Rough description</b>	None	
<b>Item</b>	Initial Specification	
<b>Dimensions</b>	None	
<b>Impedance</b>	50Ω	
<b>Test environment</b>	With Housing	
<b>Spectrum</b>	Ant 1 & 2- 802.11bg Ant 3 - 802.11a	
<b>Freq. Range</b>	Ant 1 & 2- 2.4~2.5GHz Ant 3 - 4.9~5.825GHz	
<b>Antenna type</b>	Ant 1 & 2- PIFA Ant 3 - Dipole type	
<b>Gain(Peak Gain)</b>	Ant 1- 0.91dBi Ant 2- 3.20dBi Ant 3- 4.88dBi	
<b>VSWR</b>	1.92 : 1	
<b>Radiation</b>	Omni	
<b>Polarization</b>	Linear	
<b>HPBW / H</b>	None	
<b>HPBW / E</b>	None	
<b>Rad. efficiency</b>	None	
<b>Connector type</b>	MHF	
<b>Cable type</b>	φ 1.13	
<b>Cable length</b>	Ant 1- 150mm Ant 2- 150mm Ant 3- 150mm	
<b>Isolation</b>	-20dB	

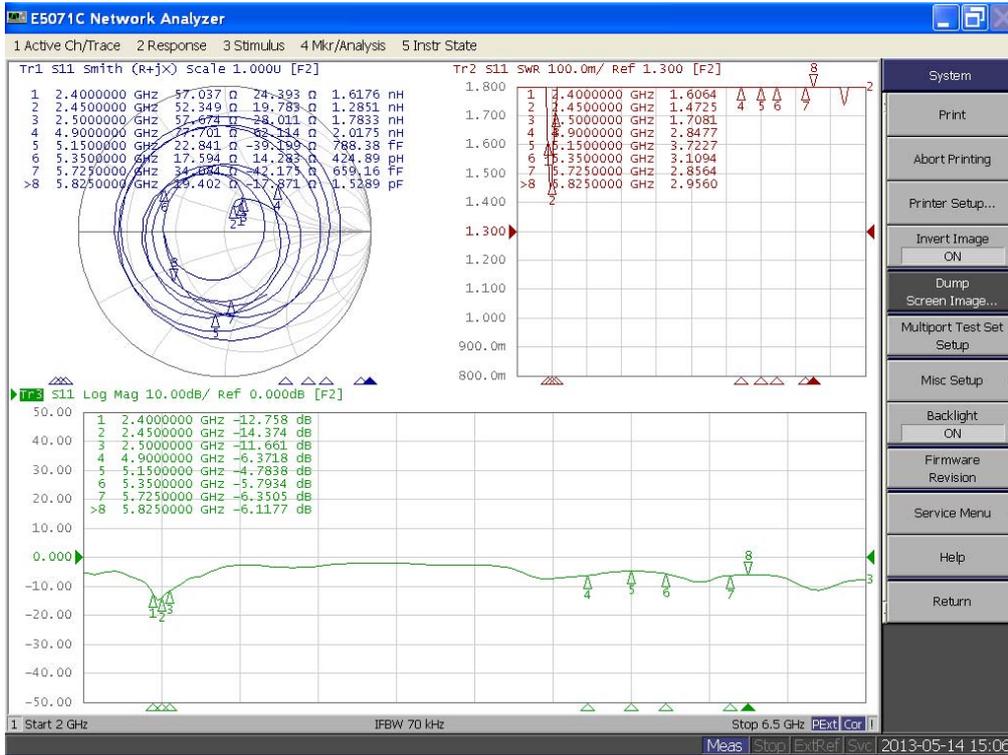


## 2. Network Analyzer Measurement

### 2.1 S11 Test Results



【Ant 1】

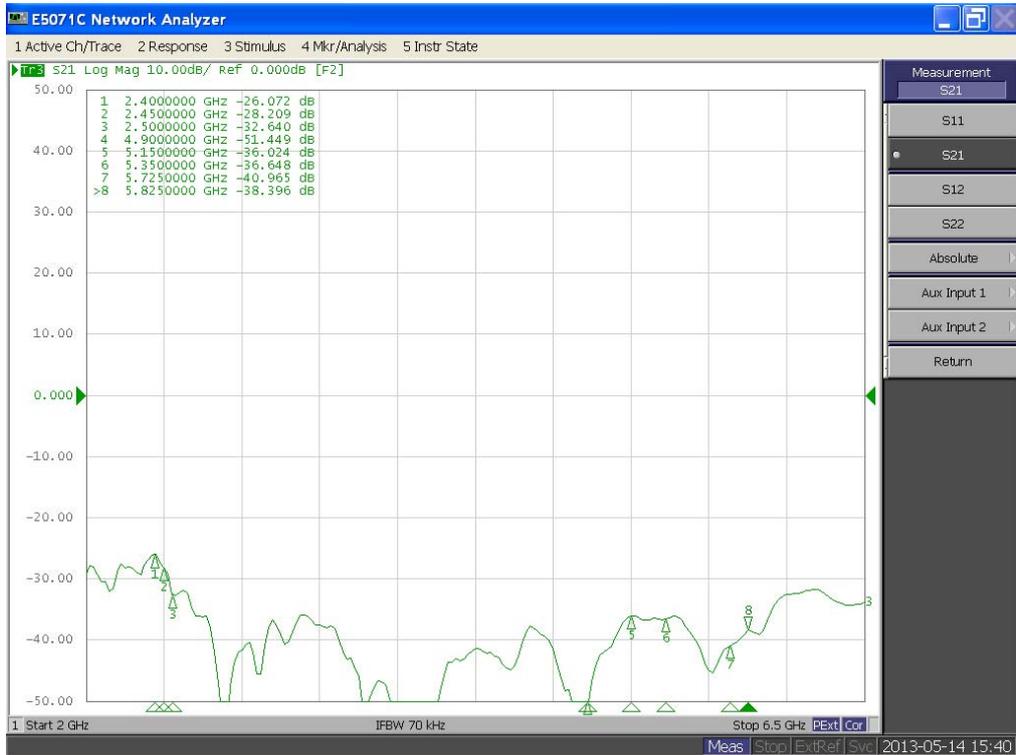


【Ant 2】

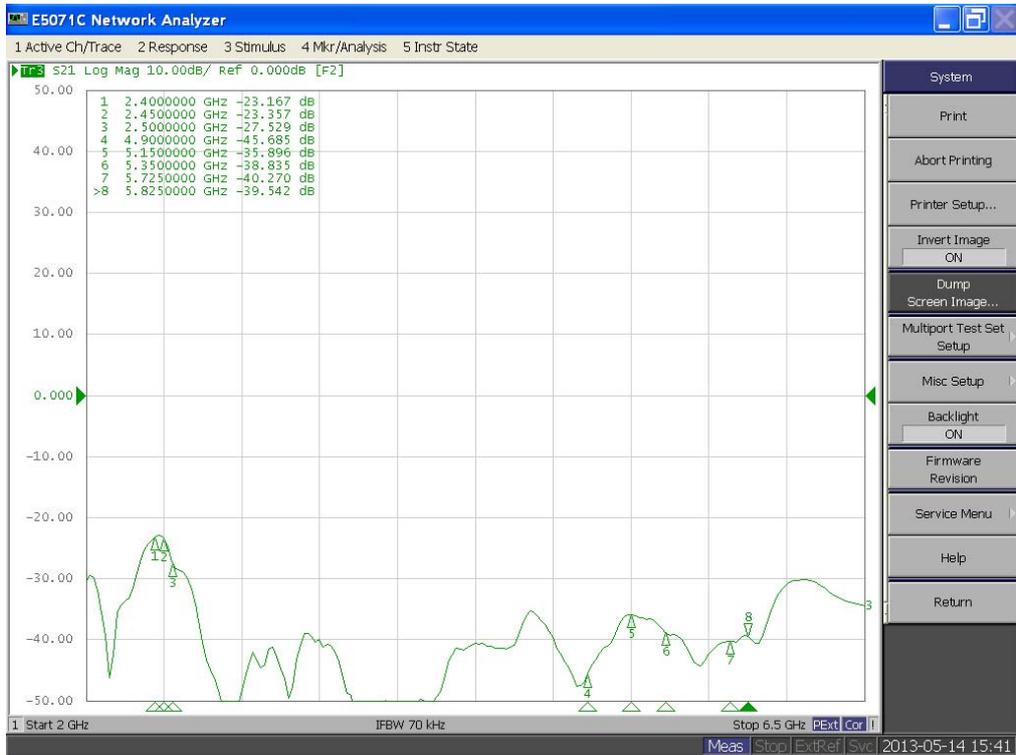


【Ant 3】

## 2.2 Isolation test results



【Ant 1 & Ant 2】



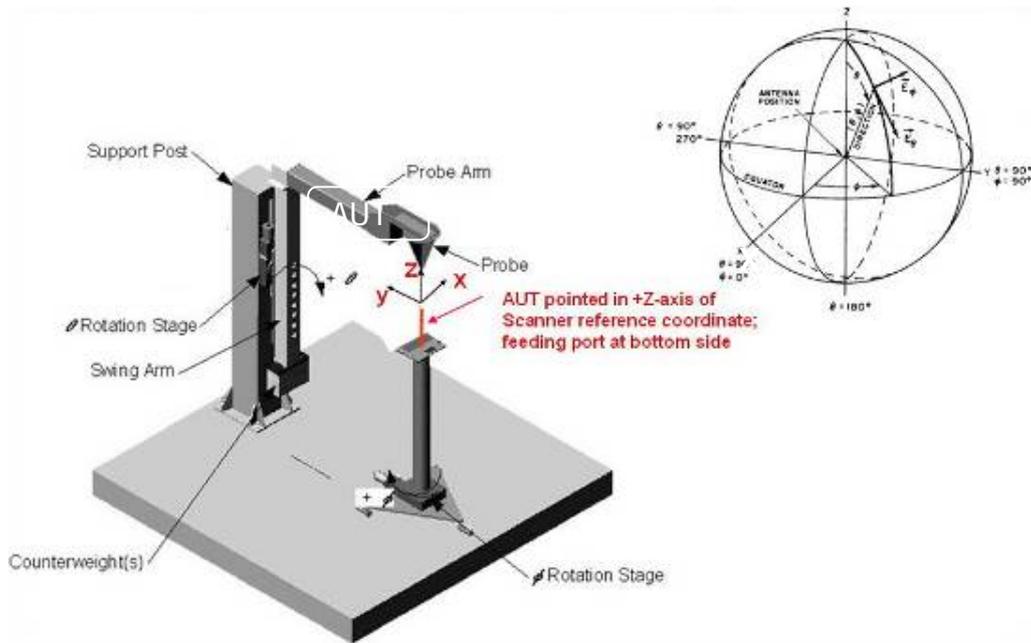
【Ant 1 & Ant 3】



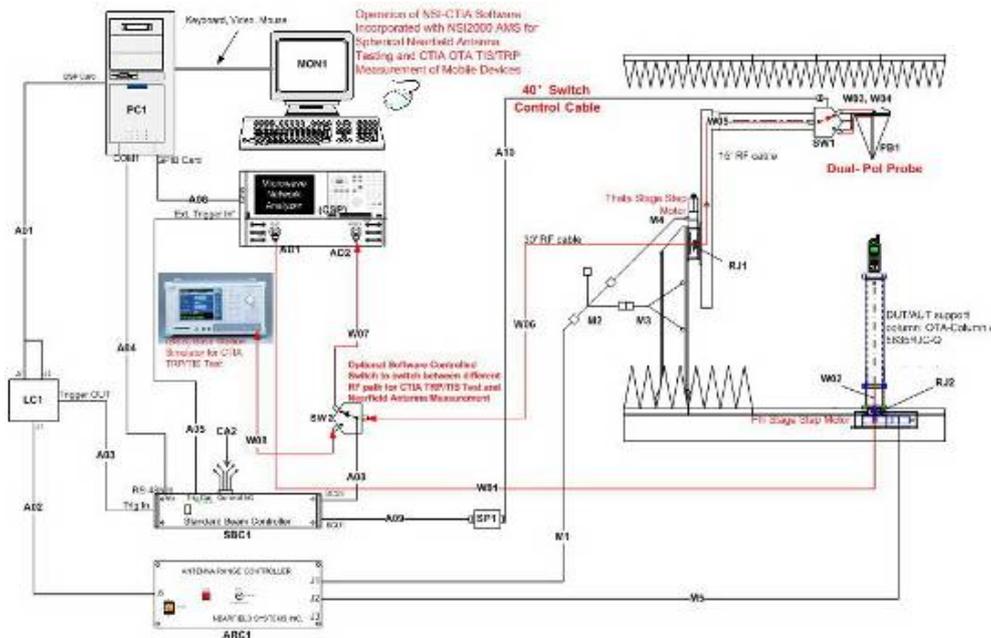
【 Ant 2 & Ant 3 】

### 3. Gain & Patterns test results

#### 3.1 Lab information

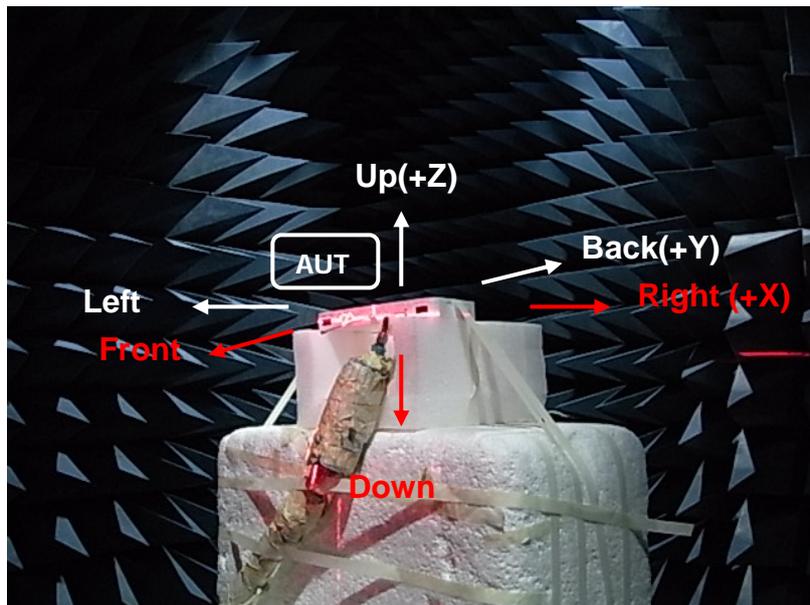
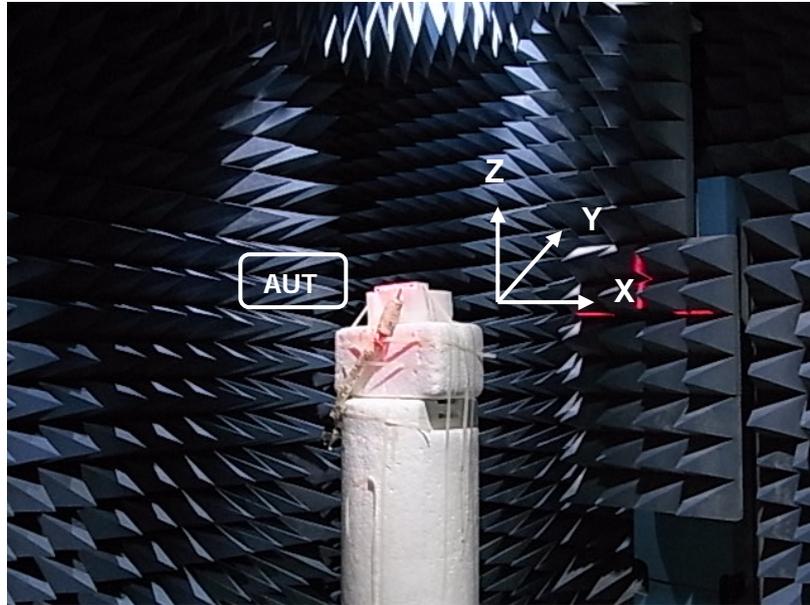


### NFC-500S 3D Chamber Coordinate System Definition



### Configuration of NFC-500S 3D Chamber

### 3.2 Measurement setting

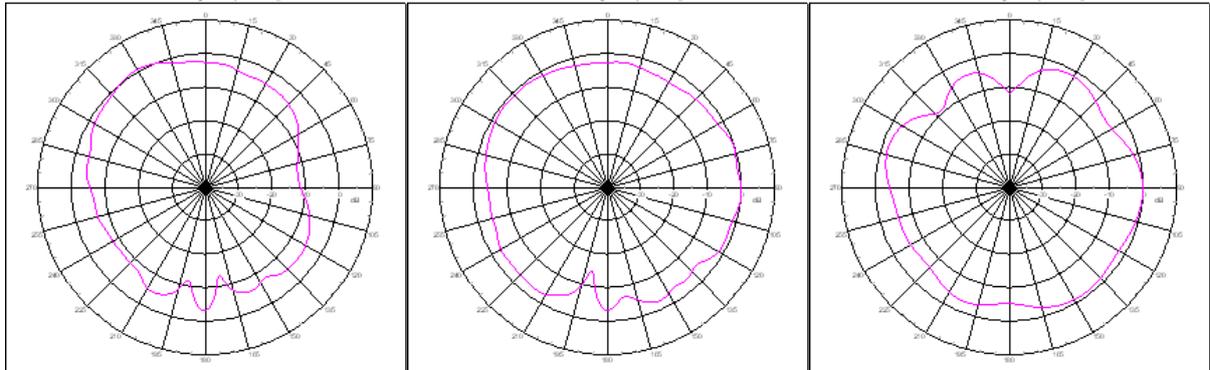


	XY	YZ	XZ
0°	Right	Up	Up
90°	Back	Back	Right
180°	Left	Down	Down
270°	Front	Front	Left

### 3.3 2D Patterns

#### 3.3.1 Ant 1

2400MHz

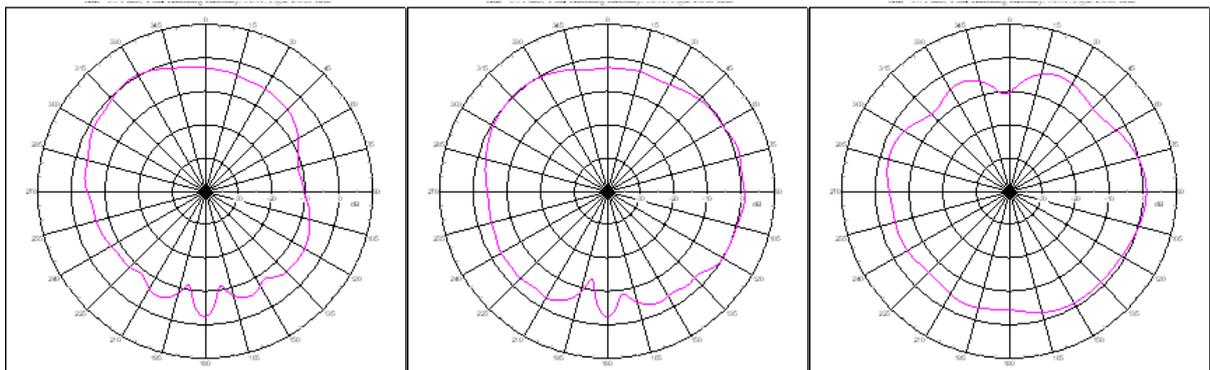


**X-Z Plane (E-total)**

**Y-Z Plane (E-total)**

**X-Y Plane (E-total)**

2450MHz

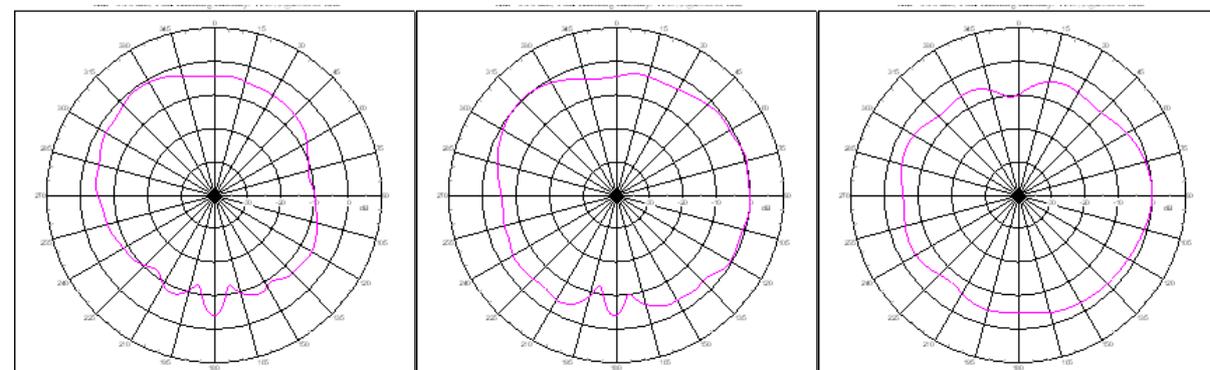


**X-Z Plane (E-total)**

**Y-Z Plane (E-total)**

**X-Y Plane (E-total)**

2500MHz

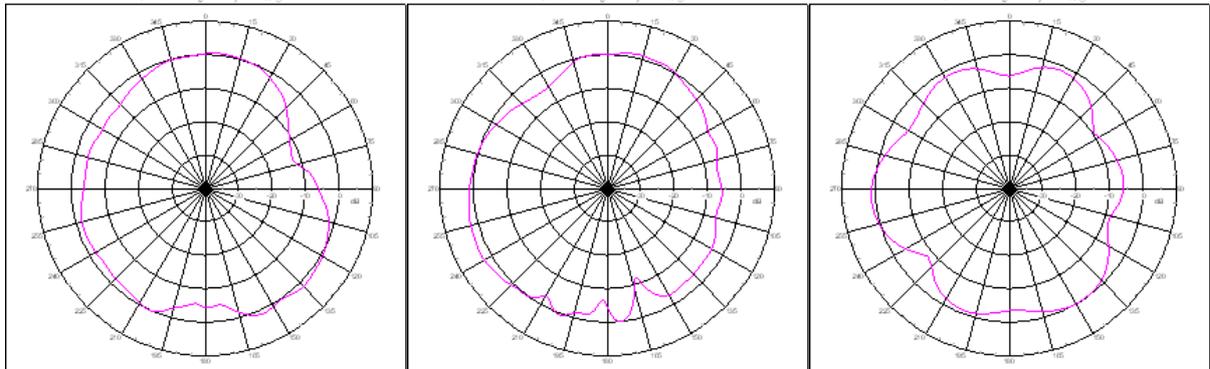


**X-Z Plane (E-total)**

**Y-Z Plane (E-total)**

**X-Y Plane (E-total)**

3.3.2 Ant 2  
2400MHz

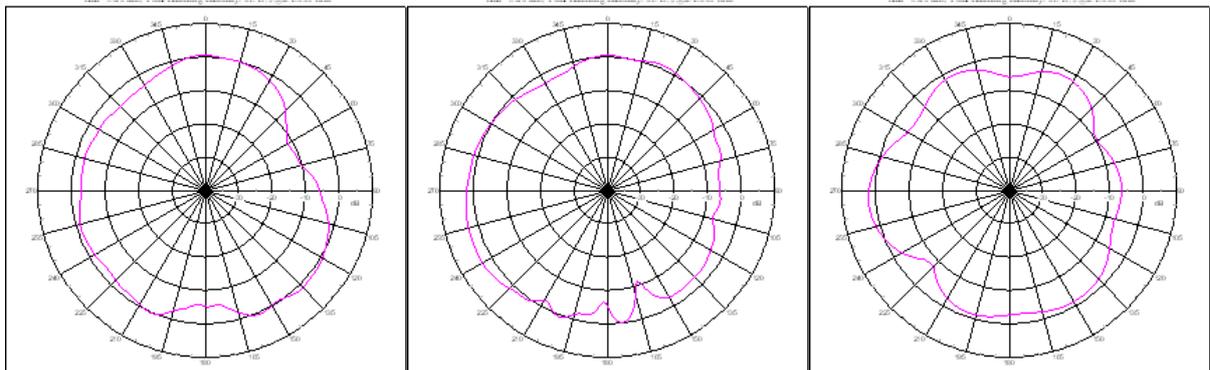


**X-Z Plane (E-total)**

**Y-Z Plane (E-total)**

**X-Y Plane (E-total)**

2450MHz

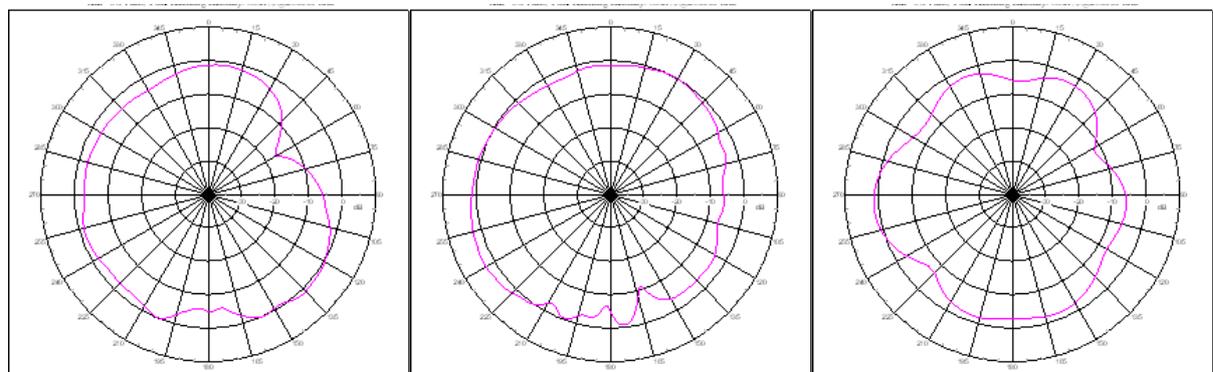


**X-Z Plane (E-total)**

**Y-Z Plane (E-total)**

**X-Y Plane (E-total)**

2500MHz

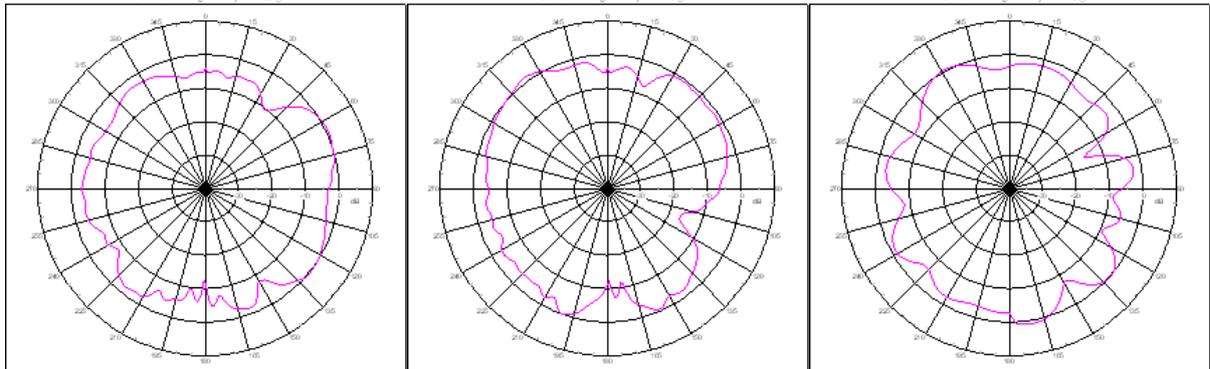


**X-Z Plane (E-total)**

**Y-Z Plane (E-total)**

**X-Y Plane (E-total)**

3.3.3 Ant 3  
4900MHz

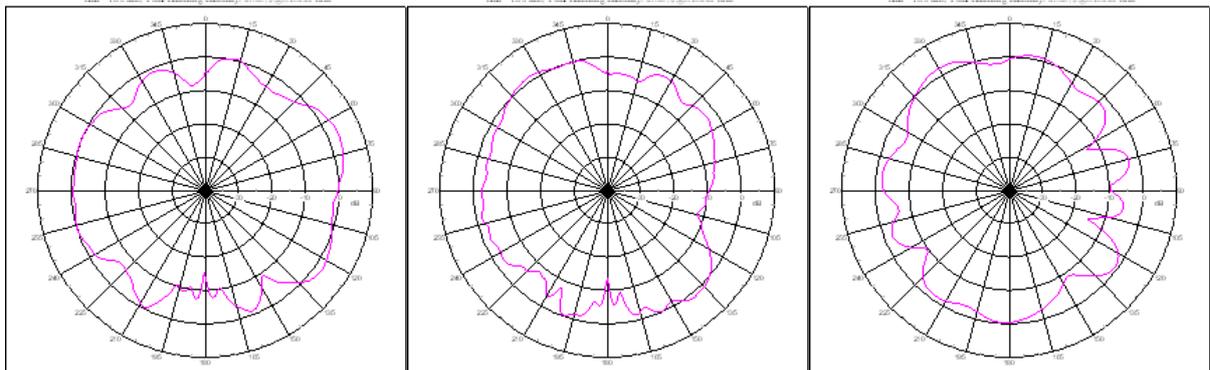


**X-Z Plane (E-total)**

**Y-Z Plane (E-total)**

**X-Y Plane (E-total)**

5150MHz

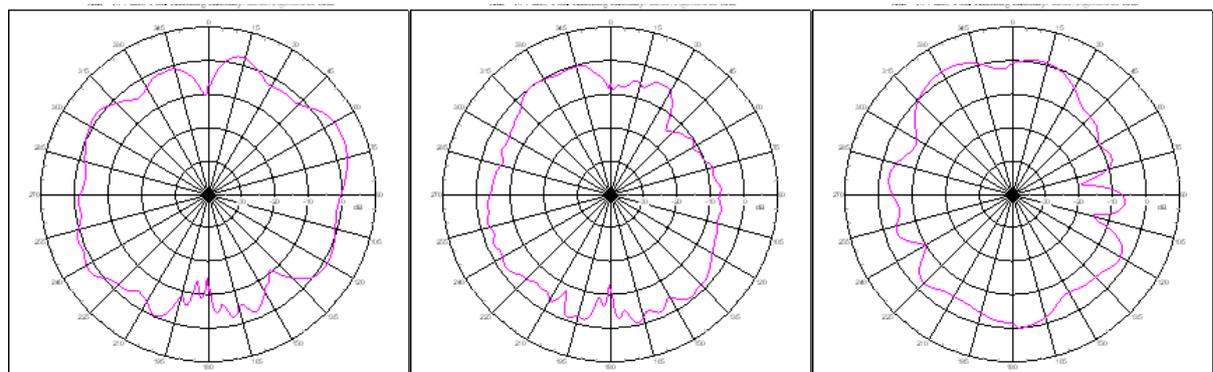


**X-Z Plane (E-total)**

**Y-Z Plane (E-total)**

**X-Y Plane (E-total)**

5350MHz

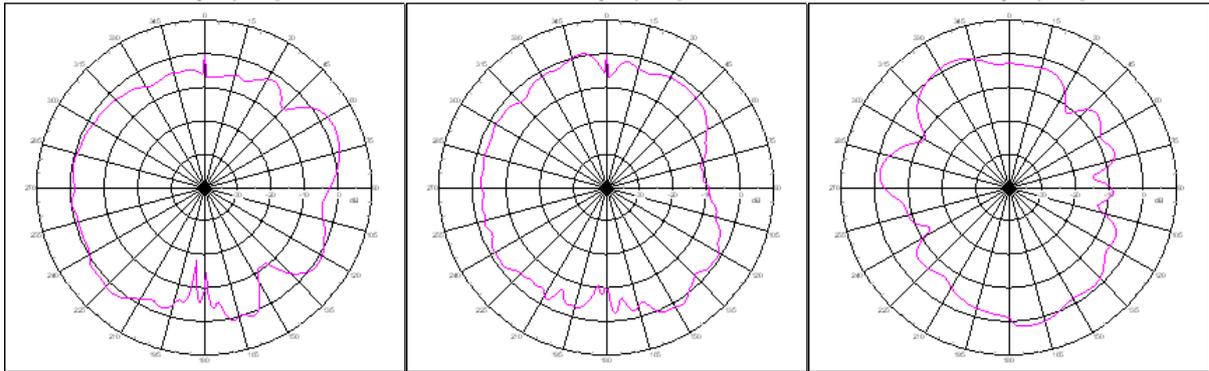


**X-Z Plane (E-total)**

**Y-Z Plane (E-total)**

**X-Y Plane (E-total)**

5725MHz

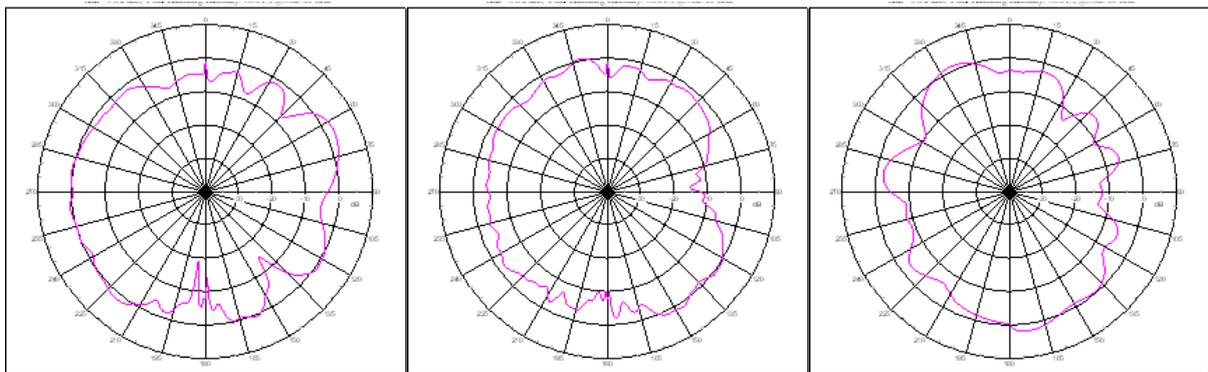


X-Z Plane (E-total)

Y-Z Plane (E-total)

X-Y Plane (E-total)

5825MHz



X-Z Plane (E-total)

Y-Z Plane (E-total)

X-Y Plane (E-total)

4. Summary

4.1 Return Loss

Frequency	Antenna 1	Antenna 2
2400MHz	-15.4	-12.7
2450MHz	-18.2	-14.3
2500MHz	-16.5	-11.6

Frequency	Antenna 3
4900MHz	-12.7
5150MHz	-10.3
5350MHz	-14.0
5725MHz	-24.6
5825MHz	-19.0

## 4.2 Isolation test results

Frequency	Ant 1 & Ant 2	Ant 1 & Ant 3	Ant 2 & Ant 3
2400MHz	-26.0	-23.1	-31.8
2450MHz	-28.2	-23.3	-27.3
2500MHz	-32.6	-27.5	-26.1
4900MHz	-51.4	-45.6	-25.6
5150MHz	-36.0	-35.8	-30.0
5350MHz	-36.6	-38.8	-27.3
5725MHz	-40.9	-40.2	-26.0
5825MHz	-38.3	-39.5	-25.8

## 4.3 3D total Peak Gain & Efficiency

Frequency	Antenna 1		Antenna 2	
	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)
2400MHz	0.78	48.5	2.54	60.1
2450MHz	0.91	51.9	3.20	61.4
2500MHz	0.18	44.1	3.04	53.2

Frequency	Antenna 3	
	Peak Gain (dBi)	Efficiency (%)
4900MHz	2.66	51.0
5150MHz	4.88	67.8
5350MHz	4.77	66.8
5725MHz	4.11	56.2
5825MHz	3.82	53.6