

Antenna Design For

鴻海 U10C093

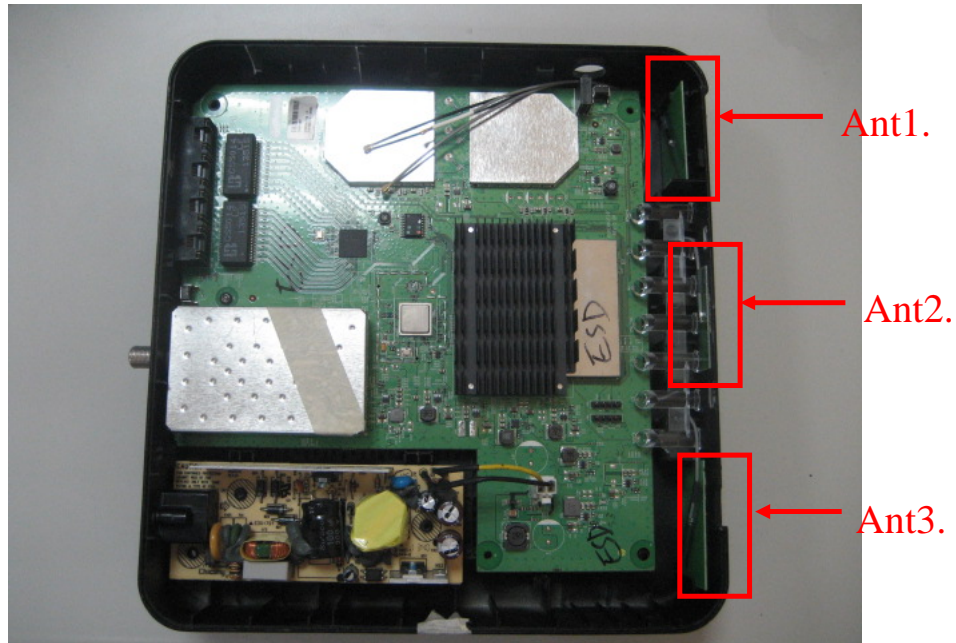
V1.06

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Review by	Sky

Electrical Specification

Rough description	Dual Band PCB antenna for U10C093	
Item	Initial Specification	Final Specification
Dimensions	Ant1. (L)44*(W)35*(H)0.8mm Ant2. (L) 41.65*(W)12.25*(H)0.8mm Ant3. (L)50*(W)35*(H)0.8mm	
Impedance	50Ω	
Test environment	With Housing	
Spectrum	802.11 abcgn	
Freq. Range	2.4~2.5GHz / 4.9~5.825GHz	
Antenna type	PCB ANT	
Gain	6.0Max. @ 2GHz 5.0 Max. @ 5GHz	
VSWR	1.92 : 1	
Radiation	Omni	
Polarization	Linear	
HPBW / H	None	
HPBW / E	None	
Rad. efficiency	60%	
Connector type	I-PEX	
Cable type	Φ1.37mm	
Cable length	None	
Isolation	-20 dB (MAX.)	

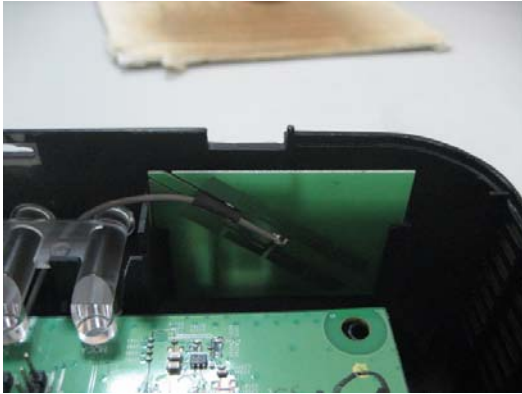
1. Antennas setup and environment



Ant1.
Dimension: (L)44mm*(W)35mm*(H)0.8mm
Φ1.37mm Cable Length: 142mm (Black)

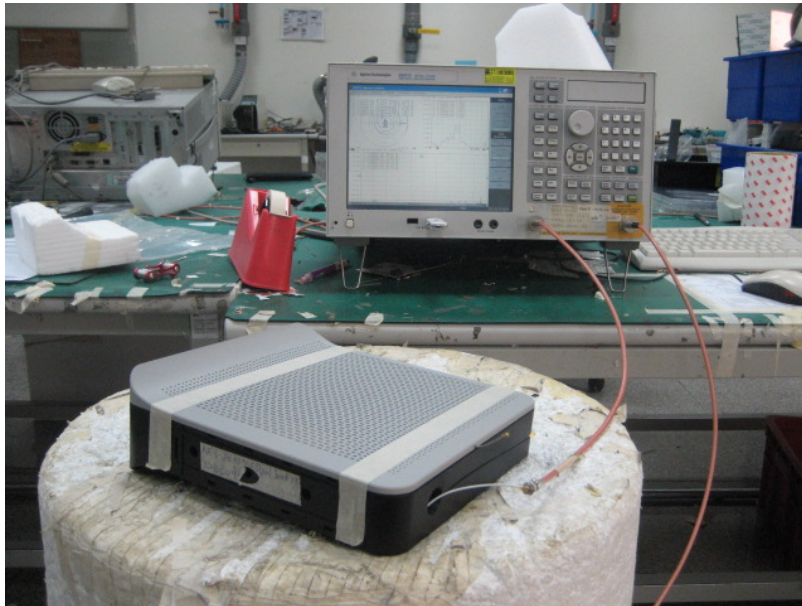


Ant2.
Dimension: (L) 41.65*(W)12.25*(H)0.8mm
Φ1.37mm Cable Length: 243mm (Gray)



Ant3.
Dimension: (L)50mm*(W)35mm*(H)0.8mm
Φ1.37mm Cable Length: 288mm (White)

2. Network Analyzer Measurement Test Environment

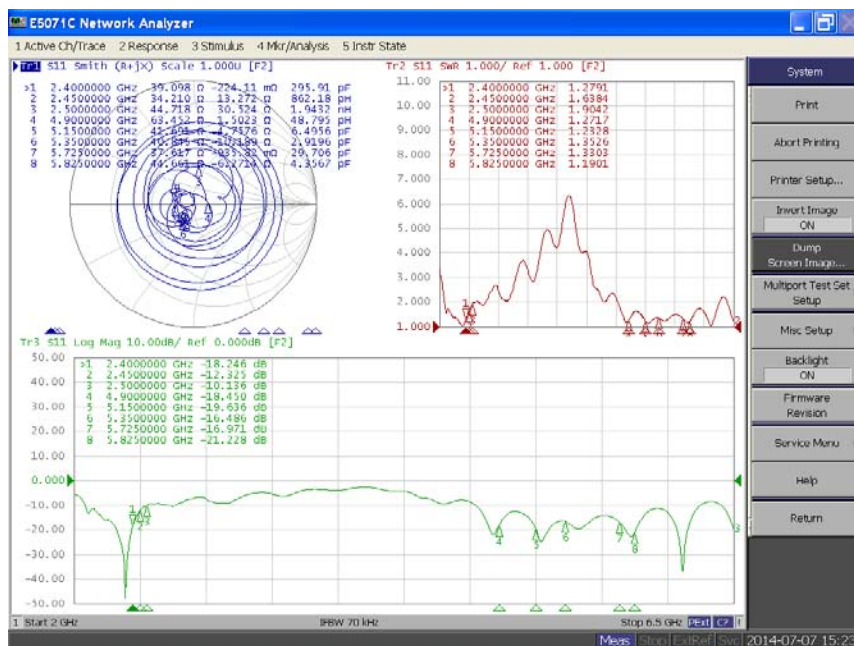


2.1 S-parameter Test Results

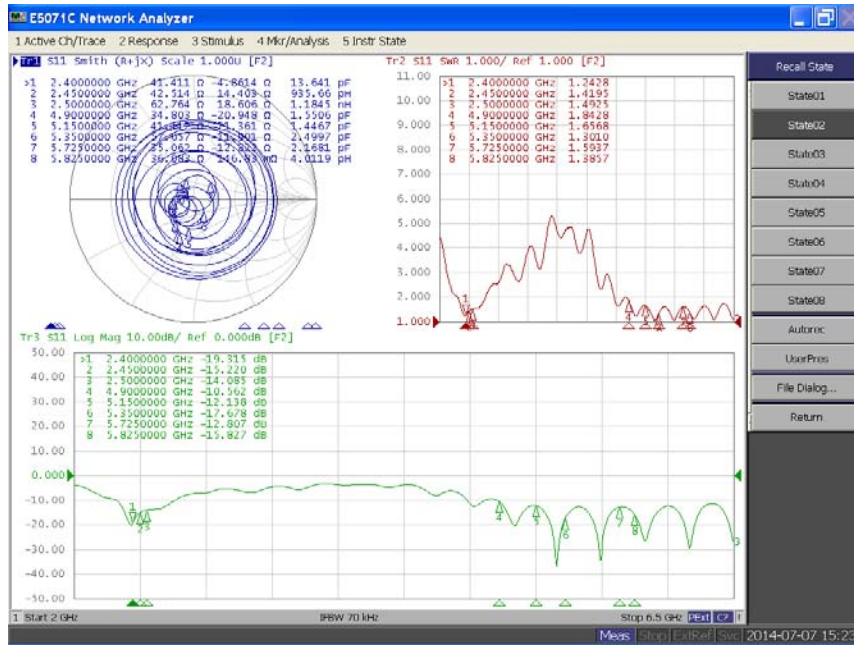
2.1.1 Ant1.



2.1.2 Ant2.



2.1.3 Ant3.



2.2 Isolation

2.2.1 Ant1. & Ant2.



2.2.2 Ant1. & Ant3.



2.2.3 Ant2. & Ant3.



3. Gain & Patterns test results

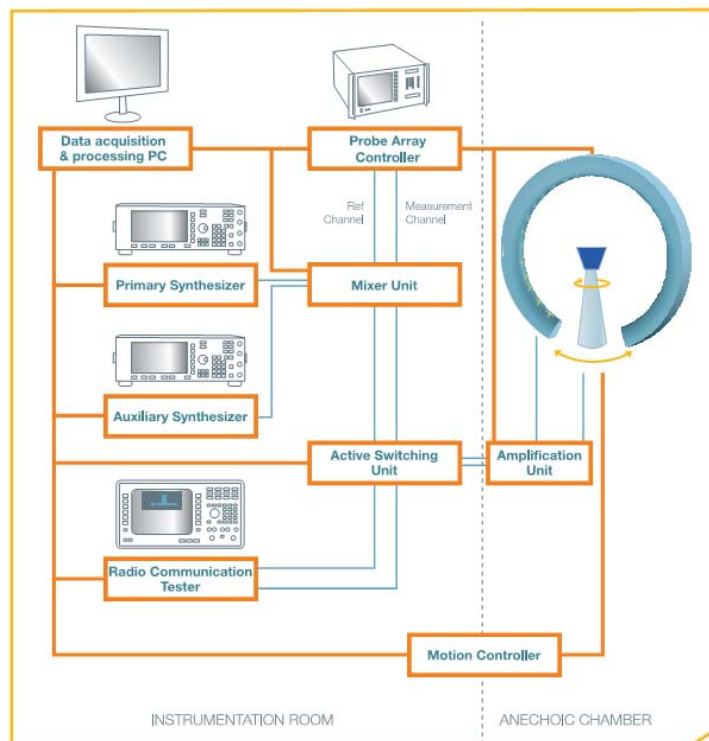
3.1 Lab information

- Lab name : Satimo
- Address : No.326 Sec.2, Kung Tao 5 Road, HsinChu City, Taiwan
- Certification : none (Satimo system certification: CTIA, 3GPP, Wi-Fi alliance and WiMAX Forum)
- Size (LxWxH) : 5m x 5m x 5m
- Isolation level : >100dB
- Normal applications : antenna radiation pattern measurement, OTA performance testing.
- Frequency measurement range : 0.4 to 6 GHz
- EUT scanning method : conical cut method
- Measurement distance : 1.6m
- Measurement antenna specification (for θ and Φ polarization each) : dual polarization antenna for 0.4 to 6.0 GHz frequency range

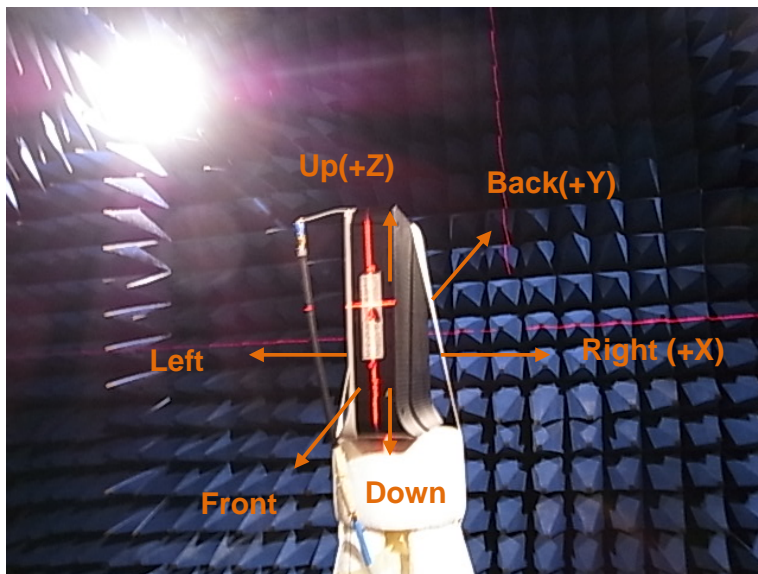
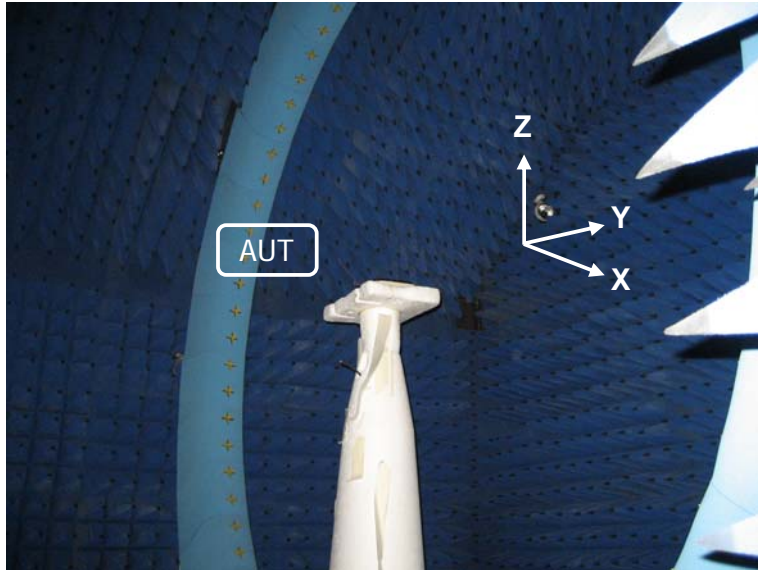


➤ 0.4 to 6.0 GHz probe

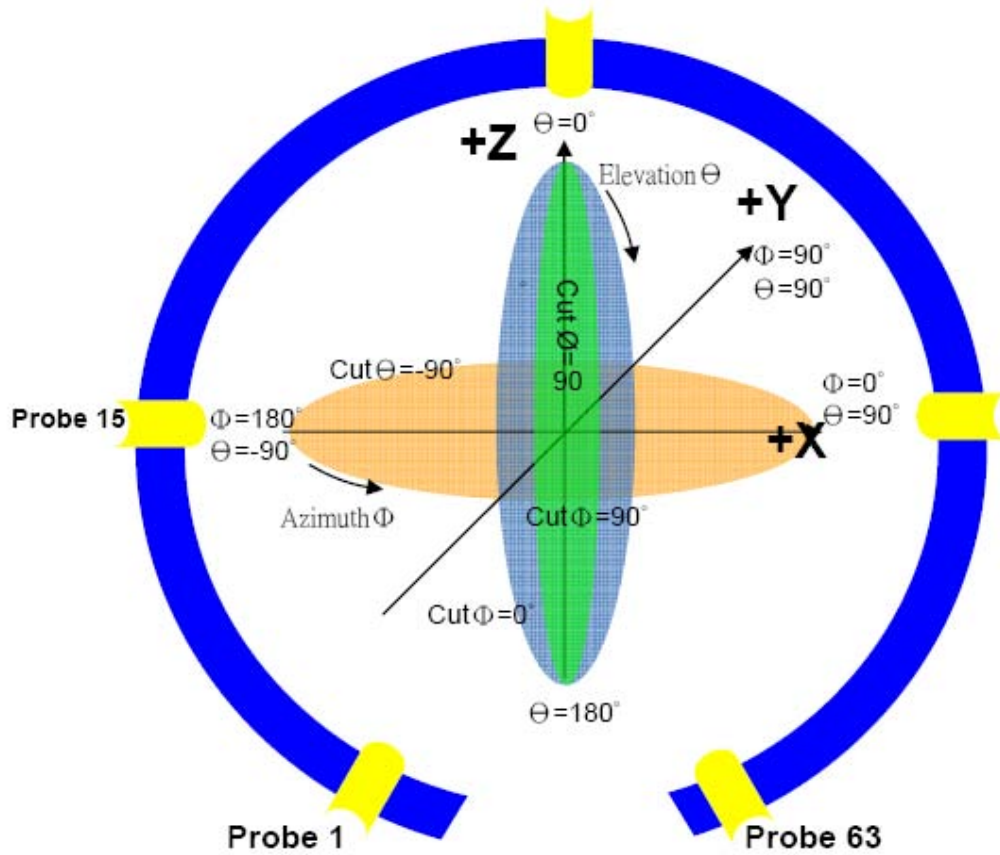
- Equipment list :



3.2 Measurement setting



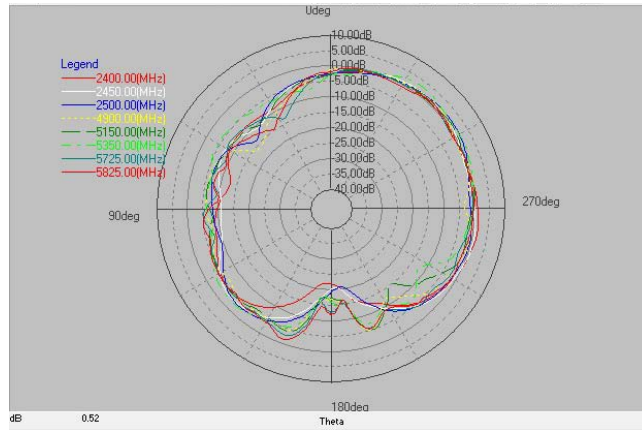
	XY	YZ	XZ
0°	Right	Up	Up
90°	Back	Back	Right
180°	Left	Down	Down
270°	Front	Front	Left



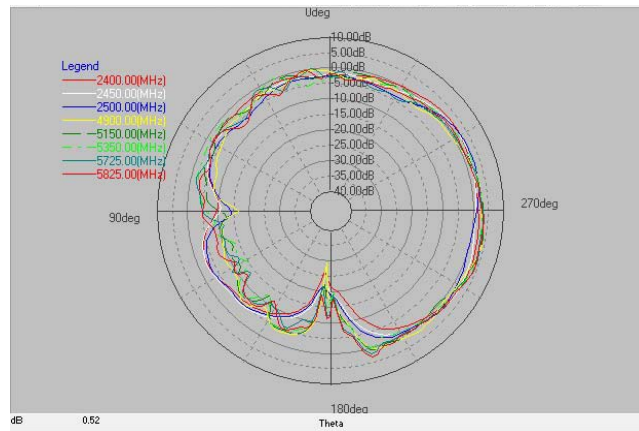
	θ	ϕ
Total angle	175°	360°
How many angle scan one point	5°	5°
Total scan point	36	73

3.3 2D patterns

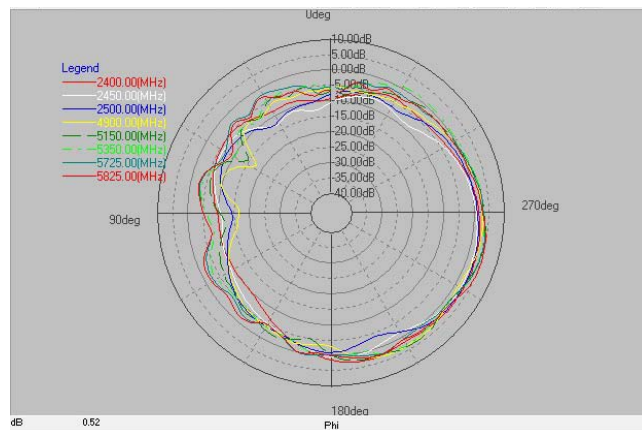
3.3.1 Ant1.



X-Z Plane (E-total)

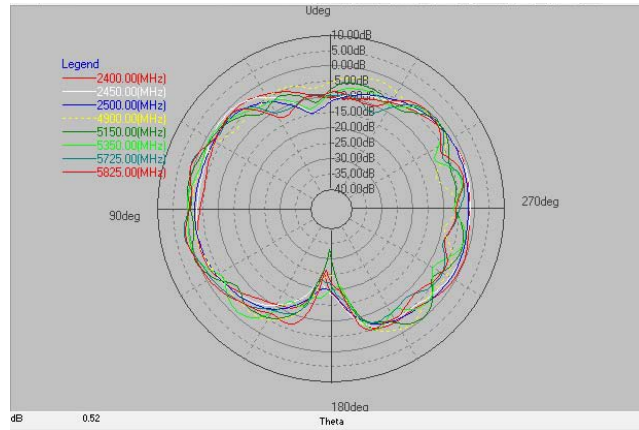


Y-Z Plane (E-total)

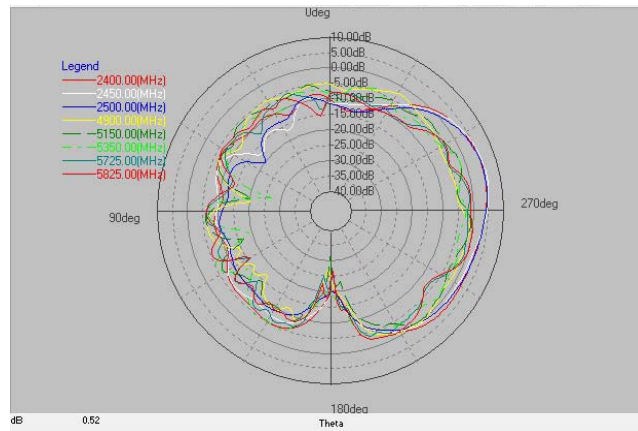


X-Y Plane (E-total)

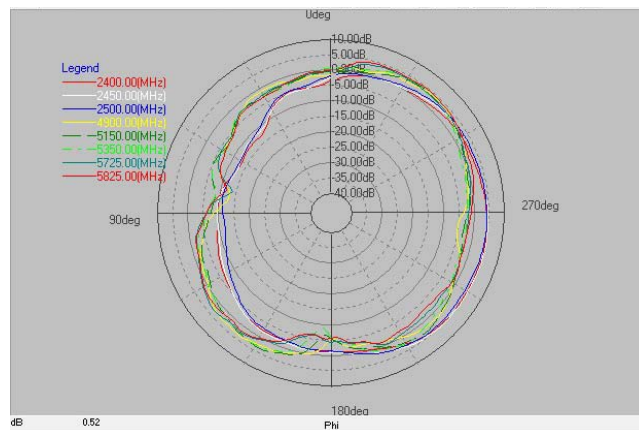
3.3.2 Ant2.



X-Z Plane (E-total)

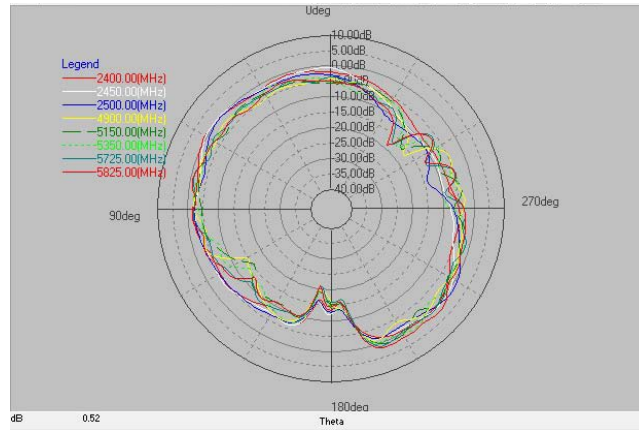


Y-Z Plane (E-total)

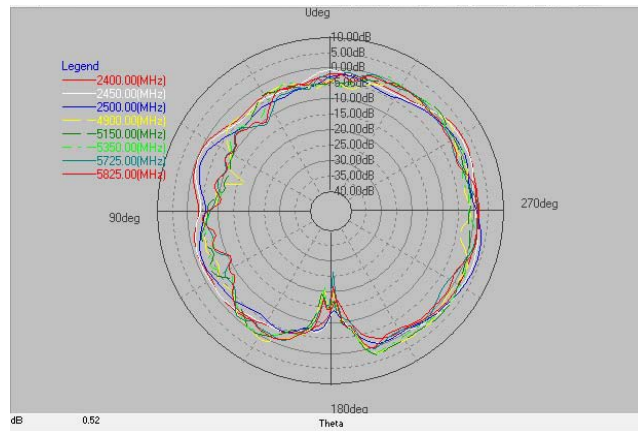


X-Y Plane (E-total)

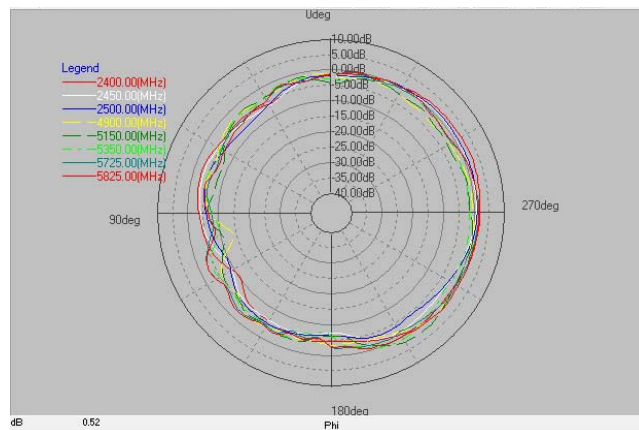
3.3.3 Ant3.



X-Z Plane (E-total)



Y-Z Plane (E-total)



X-Y Plane (E-total)

4. Summary

4.1 Return Loss

Frequency	Ant 1 (dB)	Ant 2 (dB)	Ant 3 (dB)
2400MHz	-24.2	-18.2	-19.3
2450MHz	-19.5	-12.3	-15.2
2500MHz	-14.1	-10.1	-14.0
4900MHz	-11.3	-18.4	-10.5
5150MHz	-11.5	-19.6	-12.1
5350MHz	-15.0	-16.4	-17.6
5725MHz	-11.5	-16.9	-12.8
5825MHz	-13.9	-21.2	-15.8

4.2 Isolation

Frequency	Isolation Ant 1&Ant2 (dB)	Isolation Ant 1&Ant3 (dB)	Isolation Ant 2&Ant3 (dB)
2400MHz	-22.6	-27.2	-24.3
2450MHz	-24.2	-23.8	-23.8
2500MHz	-27.9	-23.5	-23.8
4900MHz	-29.8	-31.4	-33.3
5150MHz	-31.2	-28.2	-35.9
5350MHz	-32.6	-28.0	-33.2
5725MHz	-29.1	-30.0	-30.2
5825MHz	-28.6	-29.2	-31.3

4.3 3D total Peak Gain & Efficiency

Frequency	Ant 1		Ant2		Ant3	
	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)	Peak Gain (dBi)	Efficiency (%)
2400MHz	4.5	70.6	5.5	73.7	3.2	70.7
2450MHz	4.8	67.1	6.0	73.9	3.2	67.6
2500MHz	5.6	63.4	5.3	69.1	4.0	61.9
4900MHz	4.2	65.9	4.1	62.6	2.8	60.7
5150MHz	4.6	68.7	4.8	69.2	4.4	64.2
5350MHz	4.3	73.5	4.3	64.6	4.4	64.1
5725MHz	4.4	65.5	4.5	62.0	4.0	60.4
5825MHz	5.0	69.2	4.8	66.2	4.3	65.3