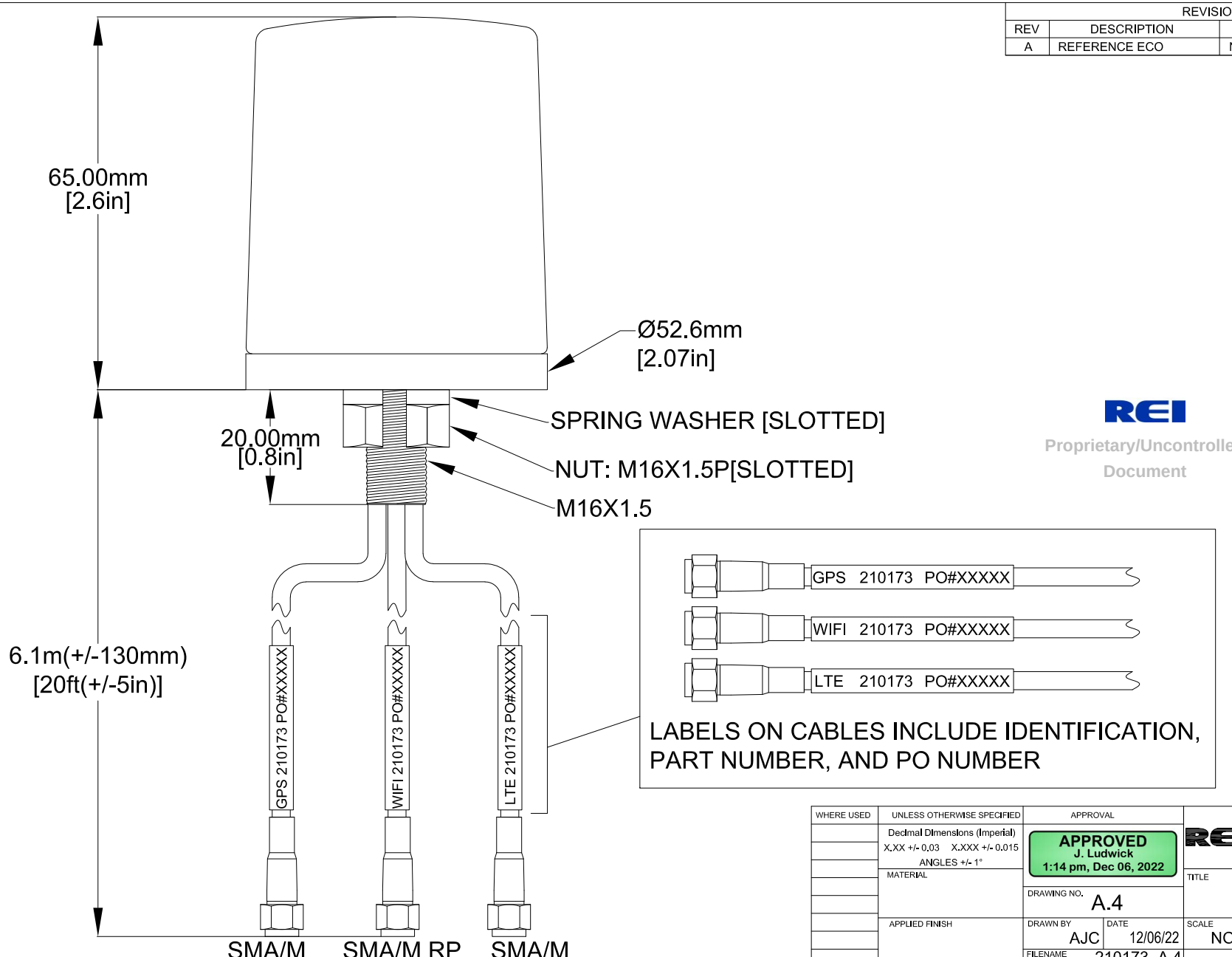
REVISIONS				
REV	DESCRIPTION	ECO #	APPROVAL	DATE
A	REFERENCE ECO	NONE	S.NEAL	07/09/20



REI

Proprietary/Uncontrolled Document

WHERE USED	UNLESS OTHERWISE SPECIFIED	APPROVAL	"Proprietary" property of Radio Engineering Ind., Inc 6534 'L' Street Omaha, NE
	Decimal Dimensions (Imperial) X.XX +/- 0.03 X.XXX +/- 0.015 ANGLES +/- 1°	APPROVED J. Ludwick 1:14 pm, Dec 06, 2022	
	MATERIAL	DRAWING NO. A.4	TITLE ANT, WIFI LTE GPS, 20 FT.
	APPLIED FINISH	DRAWN BY AJC / DATE 12/06/22	SCALE NONE / REI PART # 210173
		FILENAME 210173_A.4	PAGE 1 OF 2

SPECIFICATIONS

ANTENNA, WIFI LTE GPS, 20 FT

REI PART No. 210173

Dimensions (Antenna)	2.07 in. dia. (52.6 mm) X 2.6 in. high (65mm)
Weight	11 oz. (312 g)
Frequency Bands	2.4/5GHz (WiFi) + 690-2700 MHz (LTE)+1575.42 MHz(GPS)
Gain	2-5 dBi (WiFi)/2-5 dBi (Cellular/LTE)/27 dB (GPS)
Impedance	50 ohms
Mount type	Permanent, M16 Stud mount
Construction	IP67 Radome
Cables	2 x 20 ft.(6.1m) CFD195 [WiFi & LTE]
	20 ft. (6.1m) RG-174 [GPS]
Connectors	RP-SMA MALE (WiFi)
	2 X SMA MALE (LTE & GPS)

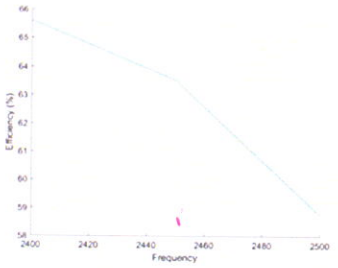
NOTE: Specification and design are subject to modification without notice due to improvements in technology.

12.1 Frequency: 2.4~2.5GHz 2D Radiation Patterns (300mmx300mm Ground Plane)

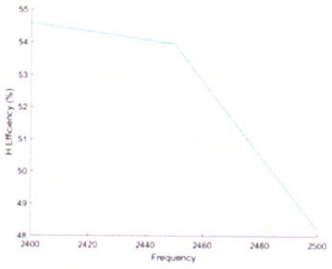
Mobile Station OTA Receiver Performance		
infomation		
Start Time	2023/10/6 14:16	Test List
Finish Time	2023/10/6 14:21	2.4GHz
Lab Name	A8	2.45GHz
Operator	Sean	2.5GHz
Project Number	2023-1006	
Manufacturer	TEST	
Model Name	53X50 WIFI +GRLUND300X300	
Hardware Verson	1	
Software Verson	3.5.6 Beta	
Test Condition	Free Space	
Tempurature	N/A	
Humidity	N/A	
Note	N/A	

Frequency	**2.4GHz**	**2.45GHz**	**2.5GHz**
Horizontal+Vertical			
Efficiency (%)	65.61	63.53	58.75
Gain (dBi)	3.35	3.05	2.71
Horizontal			
H Efficiency (%)	54.58	53.95	48.19
H Gain (dBi)	3.12	2.79	2.58
Vertical			
V Efficiency (%)	11.02	9.64	10.52
V Gain (dBi)	-2.41	-2.95	-1.64

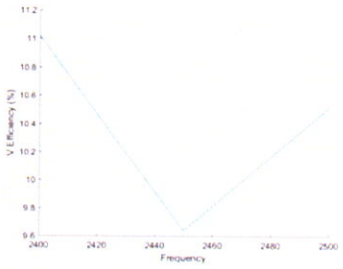
Total_Efficiency (%)



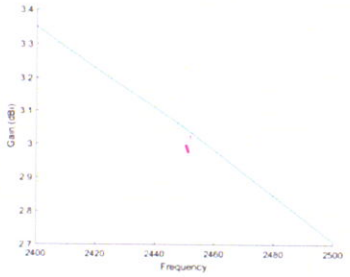
Theta_H Efficiency (%)



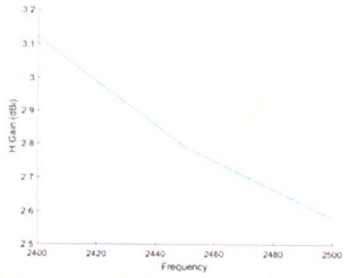
Phi_V Efficiency (%)



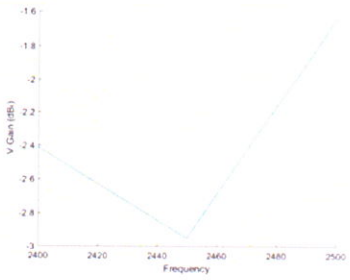
Total_Gain (dBi)



Theta_H Gain (dBi)



Phi_V Gain (dBi)



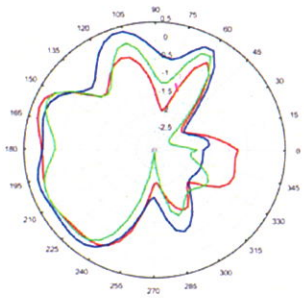
Total Polarization	XY Plane		XZ Plane		YZ Plane		Efficiency	Efficiency
Frequency	Peak Gain (dBi)	Average Gain (dBi)	Peak Gain (dBi)	Average Gain (dBi)	Peak Gain (dBi)	Average Gain (dBi)	(dBi)	(%)
2.4GHz	0.25	-0.76	3.35	-2.57	2.64	-2.37	-1.83	65.61
2.45GHz	0.35	-0.64	3.05	-2.99	2.88	-2.4	-1.97	63.53
2.5GHz	0.11	-0.95	2.41	-3.18	2.71	-2.53	-2.31	58.75

2.4GHz

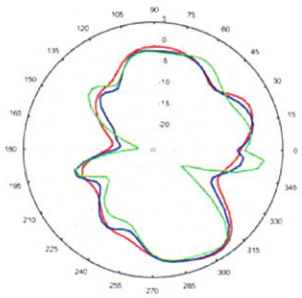
2.45GHz

2.5GHz

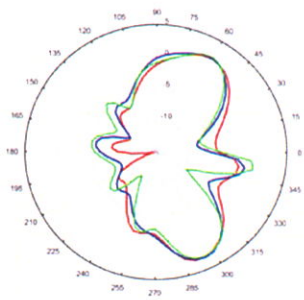
Total_Polar Graph_H_XY Plane



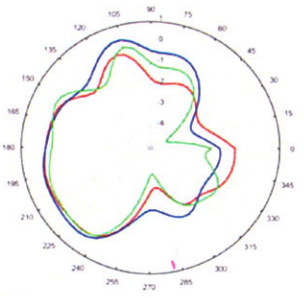
Total_Polar Graph_E1_XZ Plane



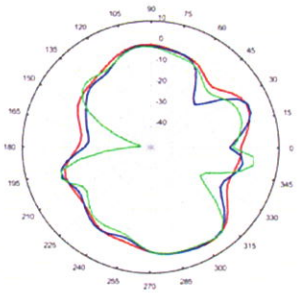
Total_Polar Graph_E2_YZ Plane



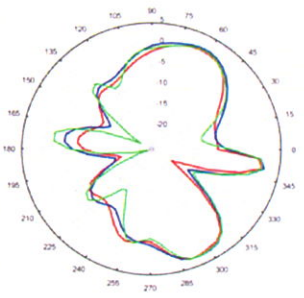
Theta_Polar Graph_H_XY Plane



Theta_Polar Graph_E1_XZ Plane

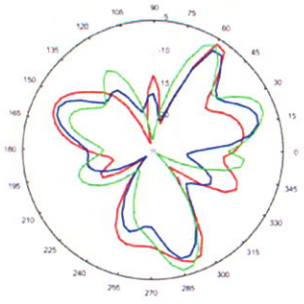


Theta_Polar Graph_E2_YZ Plane

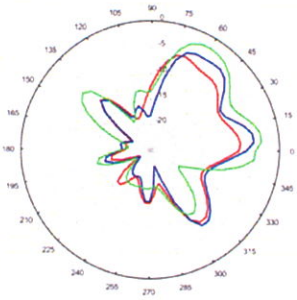


Phi_Polar Graph_E1_XZ Plane

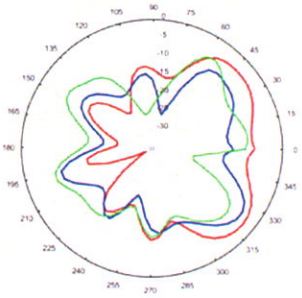
Phi_Polar Graph_E2_YZ Plane



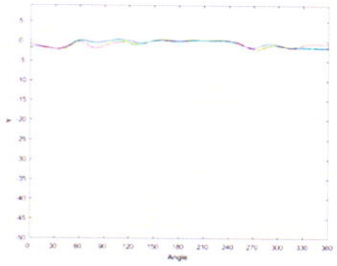
Total_XY Graph_H_XY Plane



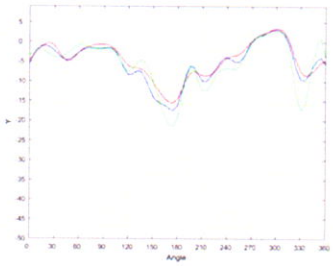
Total_XY Graph_E1_XZ Plane



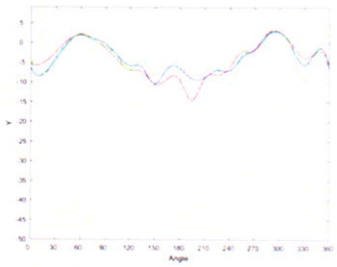
Total_XY Graph_E2_YZ Plane



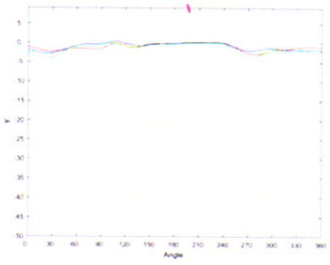
Theta_XY Graph_H_XY Plane



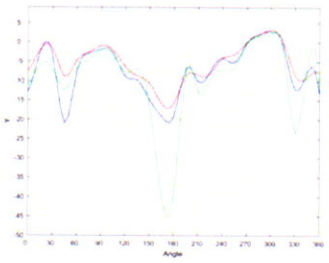
Theta_XY Graph_E1_XZ Plane



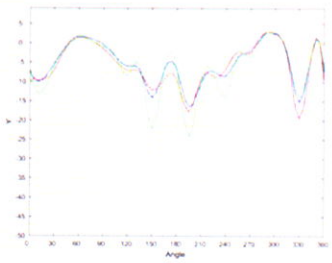
Theta_XY Graph_E2_YZ Plane



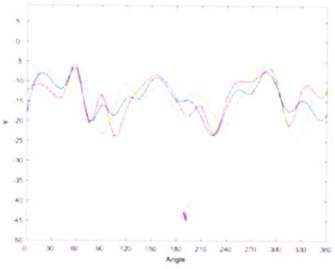
Phi_XY Graph_H_XY Plane

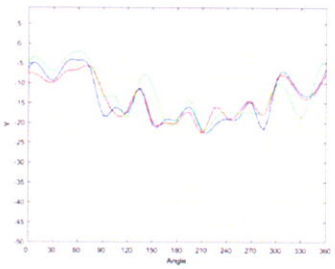


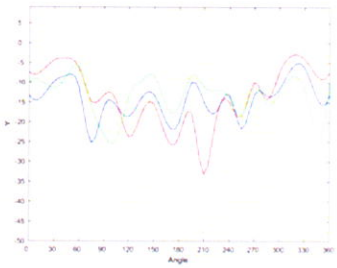
Phi_XY Graph_E1_XZ Plane



Phi_XY Graph_E2_YZ Plane





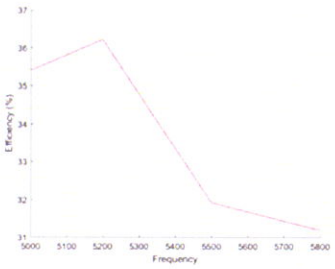


12.2 Frequency: 5.0~5.8GHz 2D Radiation Patterns (300mmx300mm Ground Plane)

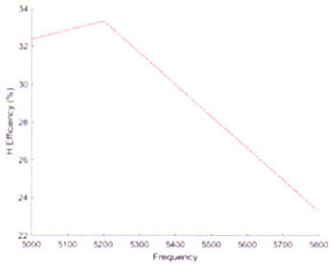
Mobile Station OTA Receiver Performance		
infomation		
Start Time	2023/10/6 14:16	Test List
Finish Time	2023/10/6 14:21	5GHz
Lab Name	A8	5.2GHz
Operator	Sean	5.5GHz
Project Number	2023-1006	5.8GHz
Manufacturer	TEST	
Model Name	53X50 WIFI +GRLUND300X300	
Hardware Verson	1	
Software Verson	3.5.6 Beta	
Test Condition	Free Space	
Tempurature	N/A	
Humidity	N/A	
Note	N/A	

Frequency	**5GHz**	**5.2GHz**	**5.5GHz**	**5.8GHz**
Horizontal+Vertical				
Efficiency (%)	35.4	36.22	31.92	31.19
Gain (dBi)	1.72	1.5	0.62	1.12
Horizontal				
H Efficiency (%)	32.36	33.34	28.31	23.28
H Gain (dBi)	1.65	1.45	0.4	-0.19
Vertical				
V Efficiency (%)	3.1	2.87	3.61	7.93
V Gain (dBi)	-6.05	-6.65	-4.57	-1.49

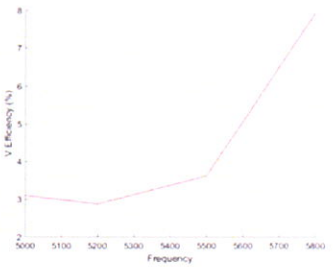
Total_Efficiency (%)



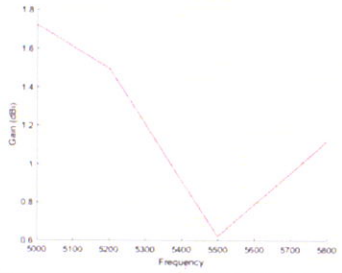
Theta_H Efficiency (%)



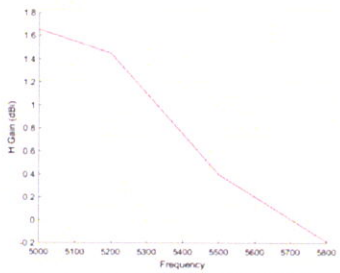
Phi_V Efficiency (%)



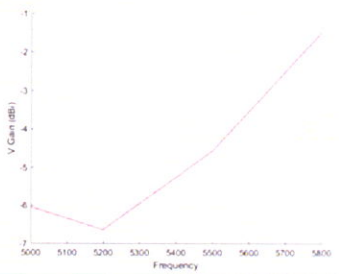
Total_Gain (dBi)



Theta_H Gain (dBi)



Phi_V Gain (dBi)



Total Polarization	XY Plane		XZ Plane		YZ Plane		Efficiency	Efficiency
Frequency	Peak Gain (dBi)	Average Gain (dBi)	Peak Gain (dBi)	Average Gain (dBi)	Peak Gain (dBi)	Average Gain (dBi)	(dBi)	(%)
5GHz	-0.32	-2.03	-1.17	-5.47	1.71	-4.61	-4.51	35.4
5.2GHz	0.16	-1.7	-1.24	-5.93	0.37	-4.78	-4.41	36.22
5.5GHz	0.62	-2.21	-1.56	-5.84	0.13	-5.57	-4.96	31.92
5.8GHz	-0.29	-3.27	0.17	-5.66	-1.11	-5.77	-5.06	31.19

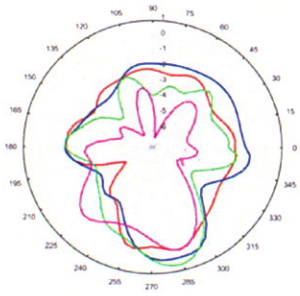
5GHz

5.2GHz

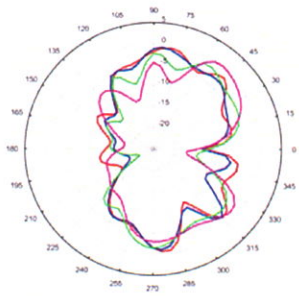
5.5GHz

5.8GHz

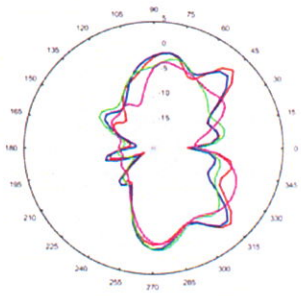
Total_Polar Graph_H_XY Plane



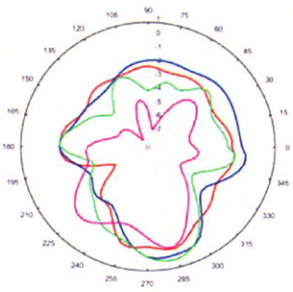
Total_Polar Graph_E1_XZ Plane



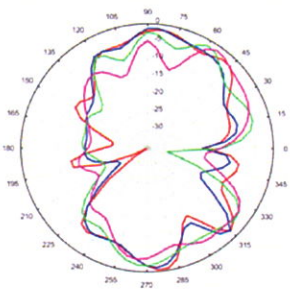
Total_Polar Graph_E2_YZ Plane



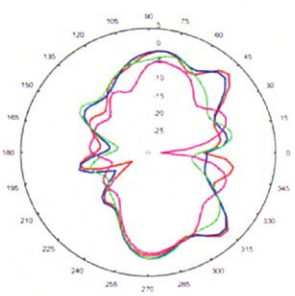
Theta_Polar Graph_H_XY Plane



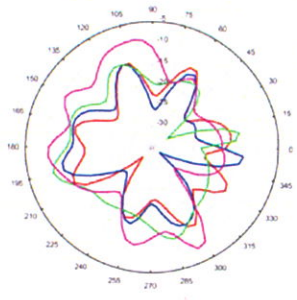
Theta_Polar Graph_E1_XZ Plane



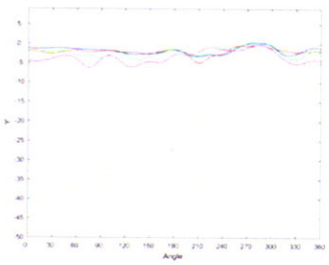
Theta_Polar Graph_E2_YZ Plane



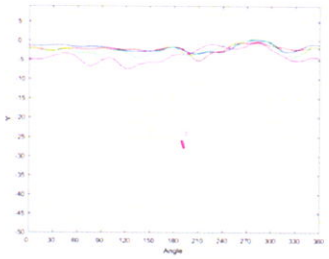
Phi_Polar Graph_H_XY Plane



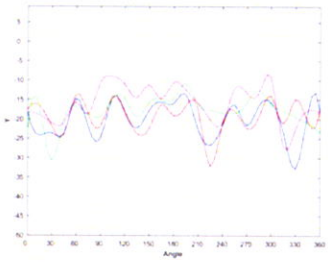
Total_XY Graph_H_XY Plane



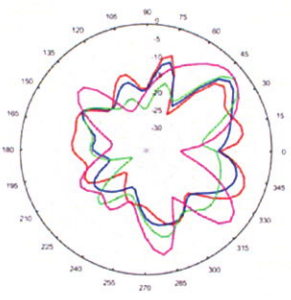
Theta_XY Graph_H_XY Plane



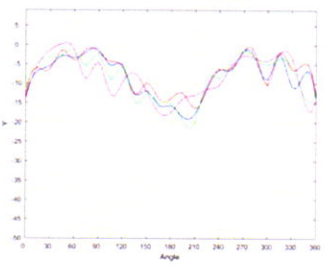
Phi_XY Graph_H_XY Plane



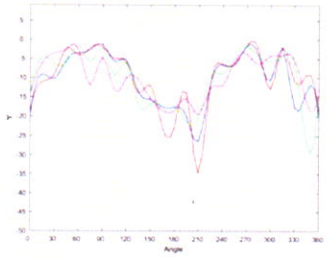
Phi_Polar Graph_E1_XZ Plane



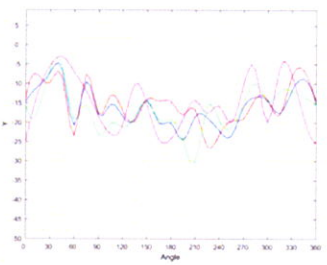
Total_XY Graph_E1_XZ Plane



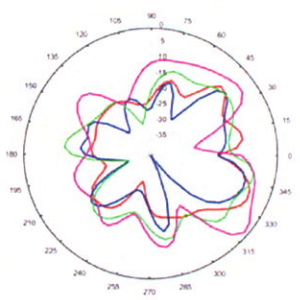
Theta_XY Graph_E1_XZ Plane



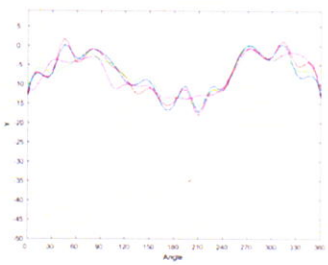
Phi_XY Graph_E1_XZ Plane



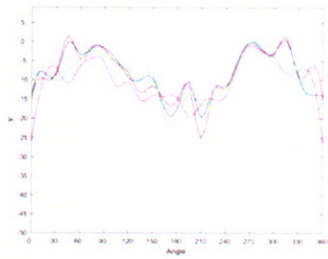
Phi_Polar Graph_E2_YZ Plane



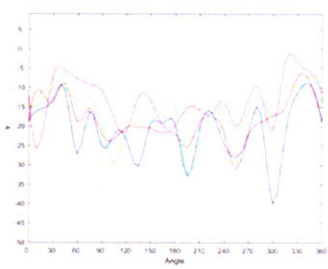
Total_XY Graph_E2_YZ Plane



Theta_XY Graph_E2_YZ Plane



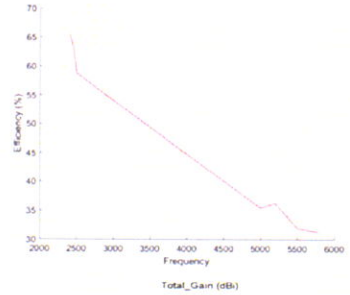
Phi_XY Graph_E2_YZ Plane



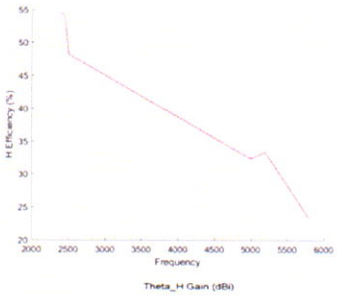
12.3 Frequency: 2.4/5.0/5.8 GHz 3D Radiation Patterns (300mmx300mm Ground Plane)

Frequency	2.4GHz	2.45GHz	2.5GHz	5GHz	5.2GHz	5.5GHz	5.8GHz
Horizontal+Vertical							
Efficiency (%)	65.61	63.53	58.75	35.4	36.22	31.92	31.19
Gain (dBi)	3.35	3.05	2.71	1.72	1.5	0.62	1.12
Horizontal							
H Efficiency (%)	54.58	53.95	48.19	32.36	33.34	28.31	23.28
H Gain (dBi)	3.12	2.79	2.58	1.65	1.45	0.4	-0.19
Vertical							
V Efficiency (%)	11.02	9.64	10.52	3.1	2.87	3.61	7.93
V Gain (dBi)	-2.41	-2.95	-1.64	-6.05	-6.65	-4.57	-1.49

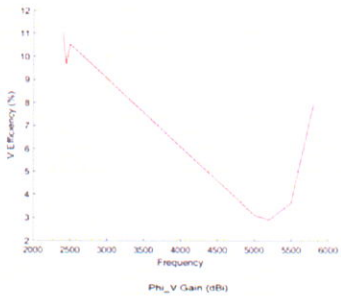
Total_Efficiency (%) Theta_H Efficiency (%) Phi_V Efficiency (%)



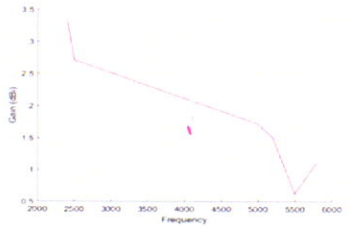
Total_Gain (dBi)

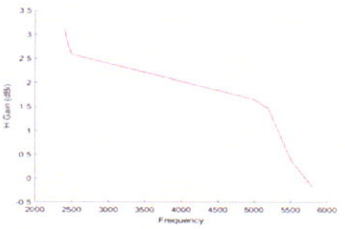


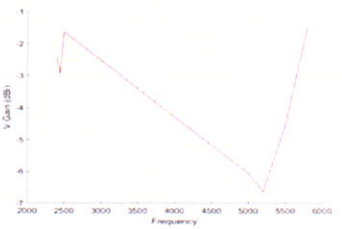
Theta_H Gain (dBi)



Phi_V Gain (dBi)

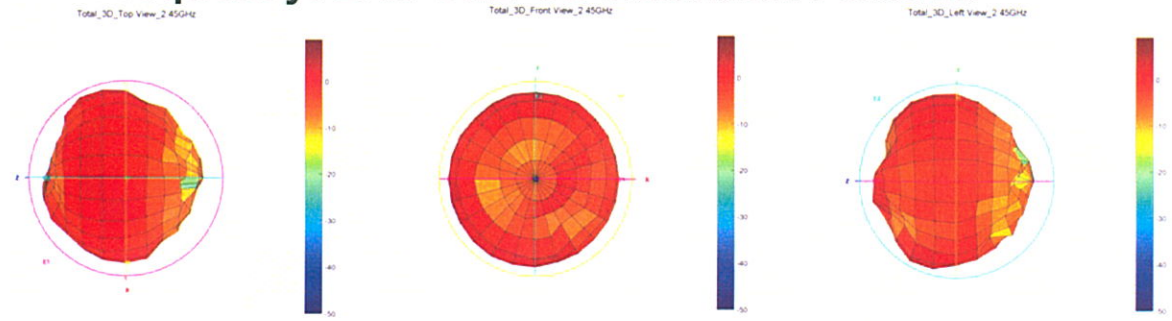


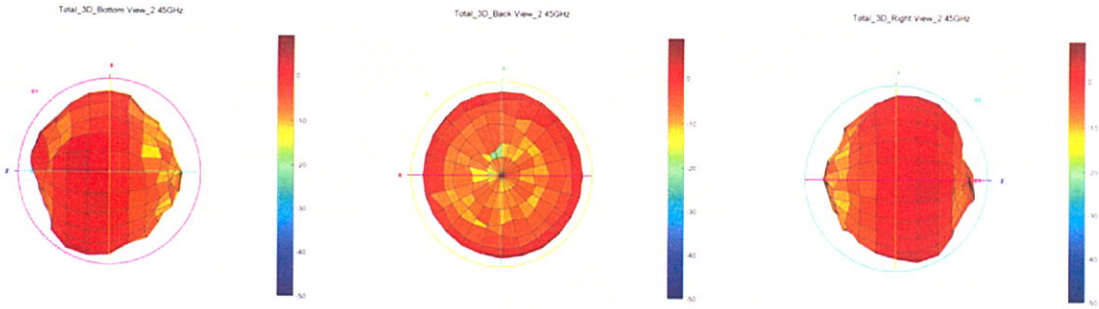


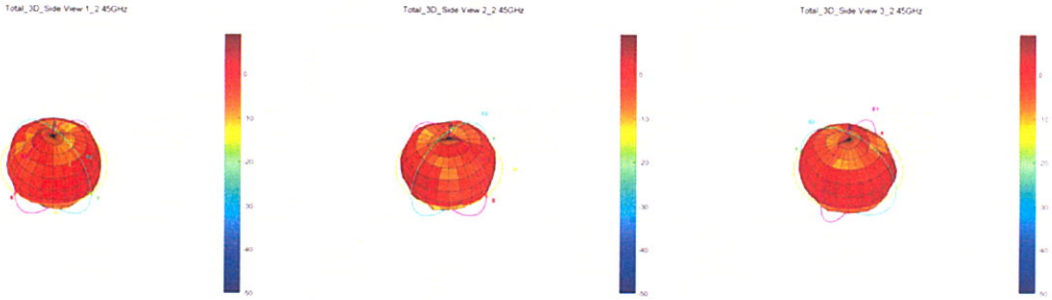


12.4 Frequency: 2.45 GHz 3D Radiation Patterns

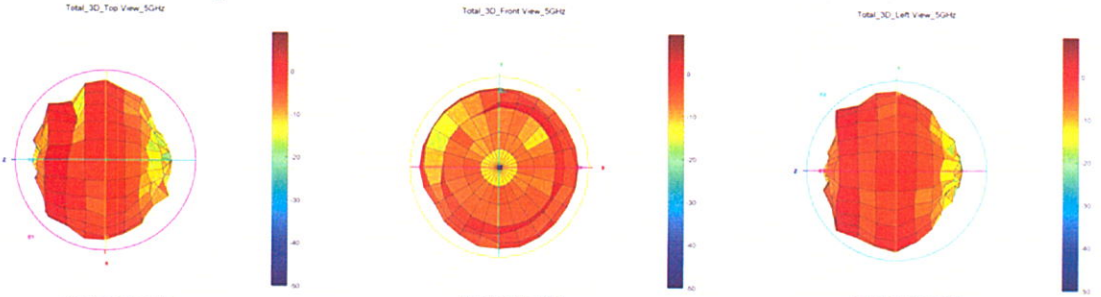
Total_3D_Top View_2.45GHz Total_3D_Front View_2.45GHz Total_3D_Left View_2.45GHz

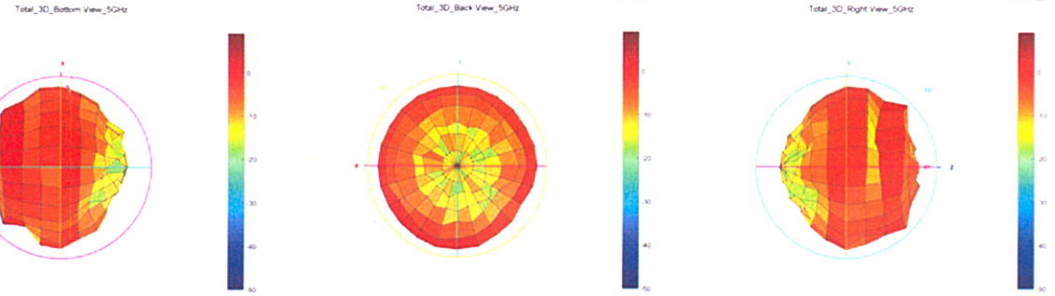


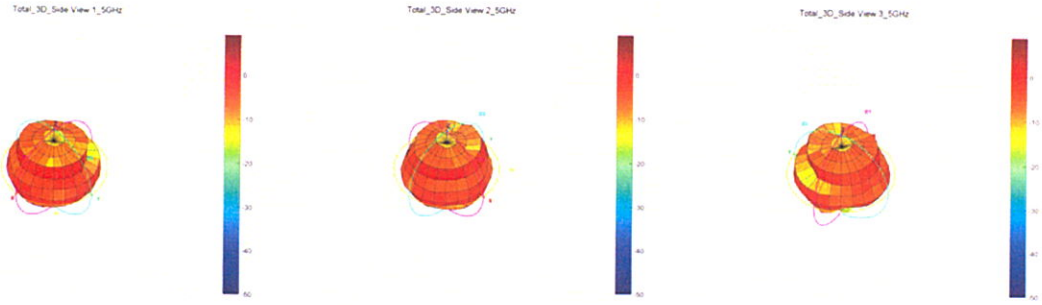




12.5 Frequency: 5.2 GHz 3D Radiation Patterns







12.6 Frequency: 5.8 GHz 3D Radiation Patterns