BT Earbud

Antenna Return Loss

& Radiation Pattern Report

Version: 0.2

Project Name : Anacapa EARBUD

Test Date :2006/09/18

Specification :V0.2

Test Engineer :Eric Cheng

Reviewed by :

Approved by :

CONTENT

Document History

Rev.	Date	Author	Reason for Changes
0.1	2006/8/22	Wanson Hsu	• First Release
0.2	2006/9/18	Eric Cheng	• Renew MMS7301-ES1

1 TEST SETUP

1.1 Test Unit

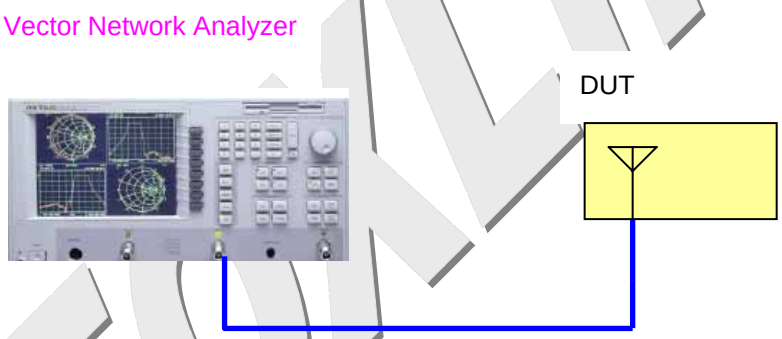
1. Sample Phase: EARBUD (or ES1)
2. Hardware Version:V2R1
3. Housing:CNC0.2
4. PCB: Shin Puu
5. Speaker: AAC
6. Microphone: Nessie

1.2 Return Loss (VSWR) Test

1.2.1 Test Equipment

1. Vector Network Analyzer, Anritsu

1.2.2 Test Architecture



1.2.2.1 Test Procedure

1. Calibrate the vector network analyzer for one port reflection calibration with frequency range from 1GHz to 6GHz.
2. Solder a 50-ohm RF cable with a SMA connector on PCBA and assemble all the accessories and the housing.
3. Connect the network analyzer cable to the DUT through an SMA connector to antenna.
4. Measure and record S11 (return loss).

1.3 Radiation Pattern (Gain) Test

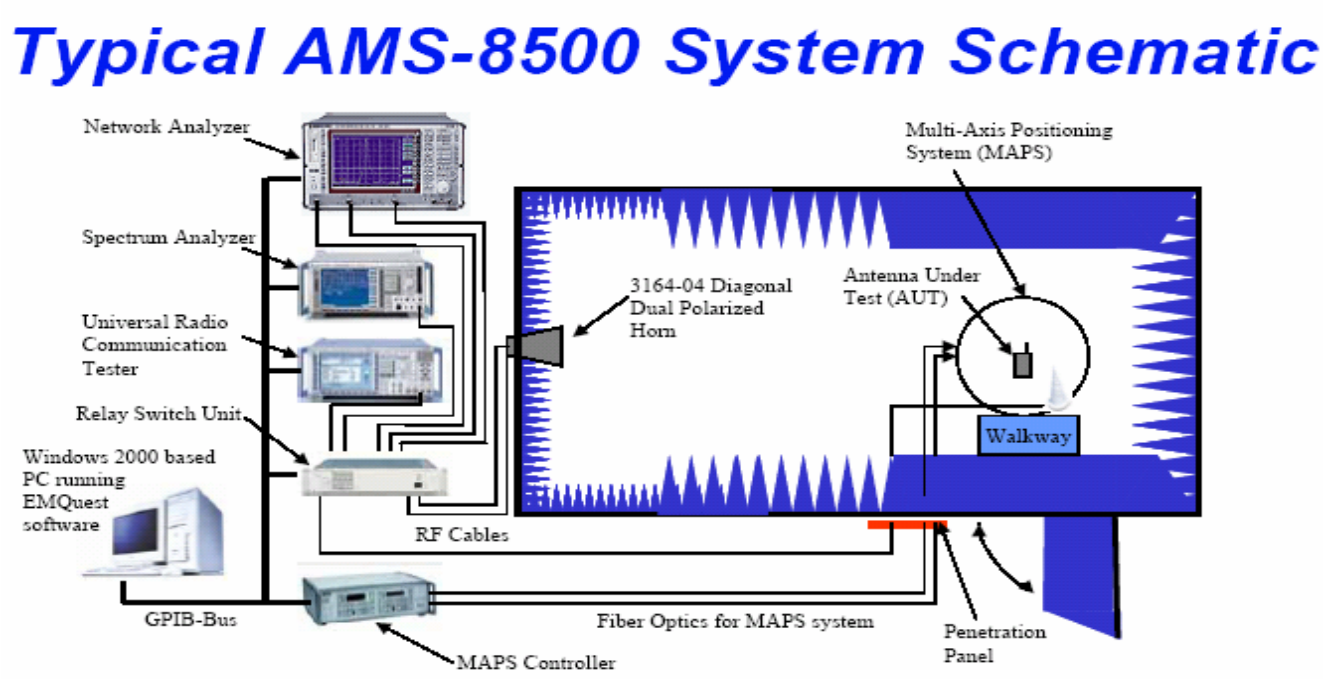
1.3.1 Test Equipment

1. AMS-8500 System
   - Rectangular anechoic chamber
   - Multi-Axis Positioning System (MAPS)
   - EMQuest EMQ-100 Data Acquisiton and Analysis Software
   - ETS-Lindgren EMCO 3164-04 dual-polarized quad-ridged horn antenna
2. Network Analyzer: Agilent PNA, 300kHz ~ 6GHz
3. Signal Generator: R&S SMT6, 5kHz ~ 6GHz
4. Spectrum Analyzer: R&S FSP, 9kHz ~ 13.6GHz
5. Phantom Head: IEEE SCC34 “SAM” phantom per IEEE 1528-2002 specifications.

1.3.2 Test Lab & Method:

1. **Test Lab: Foxlink RTC Lab**
2. **Test Method: 3D radiation pattern**

1.3.3 Test Architecture



2 TEST RESULT AND SUMMARY

2.1 Return Loss Test Summary

	Free Space			Phantom		
	Return Loss (dB) at 2400 MHz	Return Loss (dB) at 2441 MHz	Return Loss (dB) at 2480 MHz	Return Loss (dB) at 2400 MHz	Return Loss (dB) at 2441 MHz	Return Loss (dB) at 2480 MHz
Limits	<-6	<-8	<-6	<-6	<-7	<-6
V2R1	-14.344	-13.966	-14.940	-12.140	-14.451	-19.720
V2R2	-12.107	-12.586	-14.428	-13.470	-13.877	-14.896

2.2 Radiation Pattern at 2441MHz

Free Space:

	Peak Gain (dBi) at 2400 MHz	Average Gain (dBi) at 2400 MHz	Peak Gain (dBi) at 2441 MHz	Average Gain (dBi) at 2441 MHz	Peak Gain (dBi) at 2480 MHz	Average Gain (dBi) at 2480 MHz
Limits	>0	>-3	>0	>-3	>0	>-3
V2R1	2.88938	-2.38218	2.7669	-2.40956	2.33426	-2.9776
V2R2	4.04148	-2.05571	4.32057	-1.83166	4.15547	-1.58789

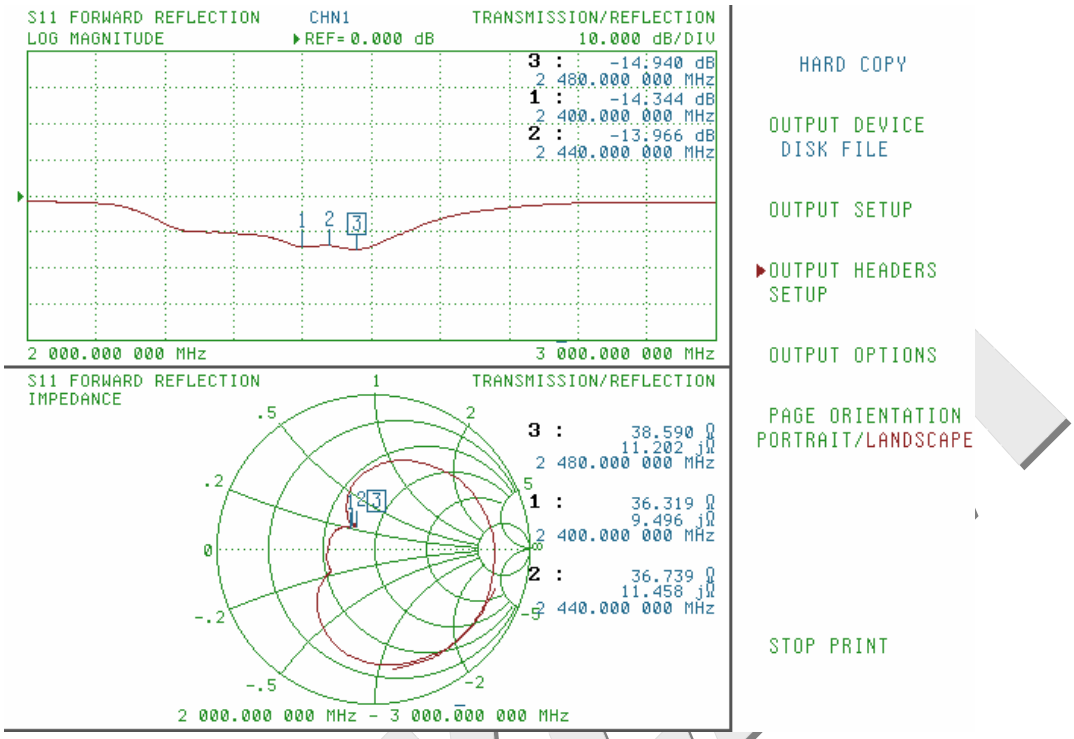
Phantom:

	Peak Gain (dBi) at 2400 MHz	Average Gain (dBi) at 2400 MHz	Peak Gain (dBi) at 2441 MHz	Average Gain (dBi) at 2441 MHz	Peak Gain (dBi) at 2480 MHz	Average Gain (dBi) at 2480 MHz
Limits	>-2	>-5	>-2	>-5	>-2	>-5
V2R1	4.68551	-4.80778	5.44925	-4.08659	5.3143	-4.30585
V2R2	3.55409	-5.81559	3.79508	-5.34338	3.65987	-5.38891

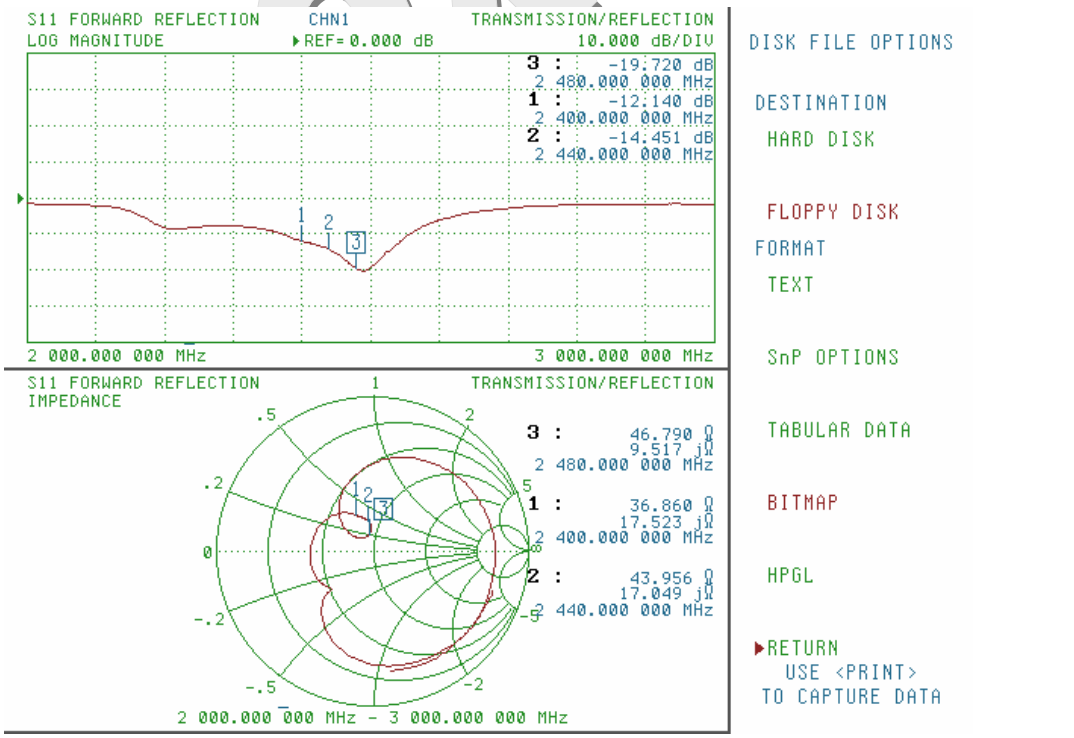
2.3 Return Loss and Radiation Pattern Results

2.3.1 Return Loss Result (Example)-V2R1

Free Space:

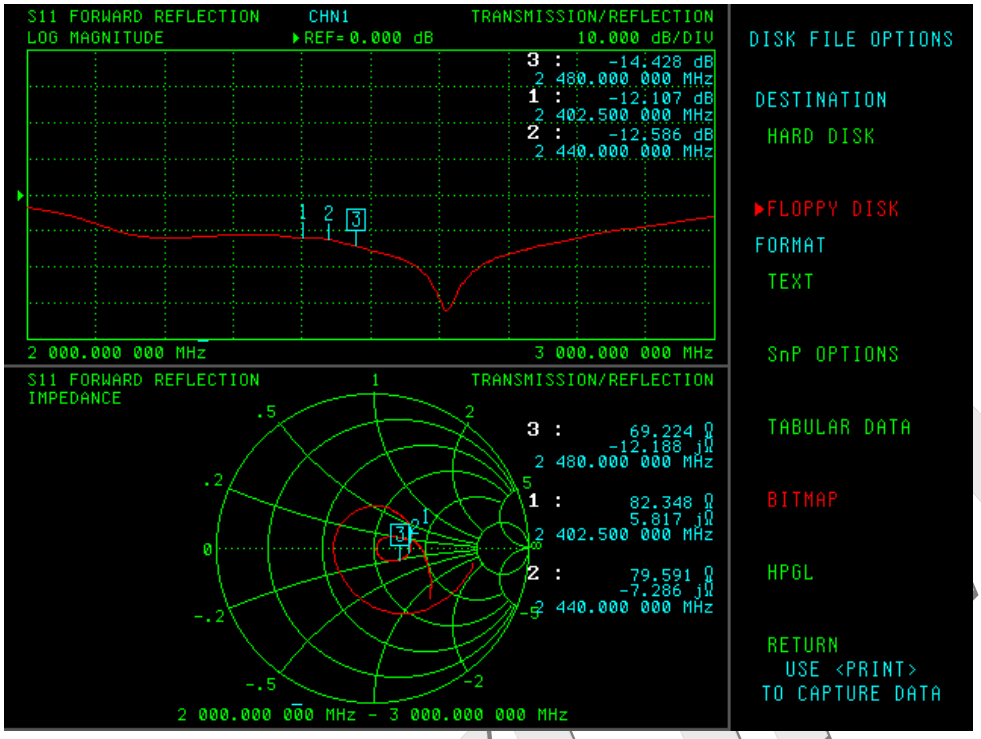


Phantom Head:

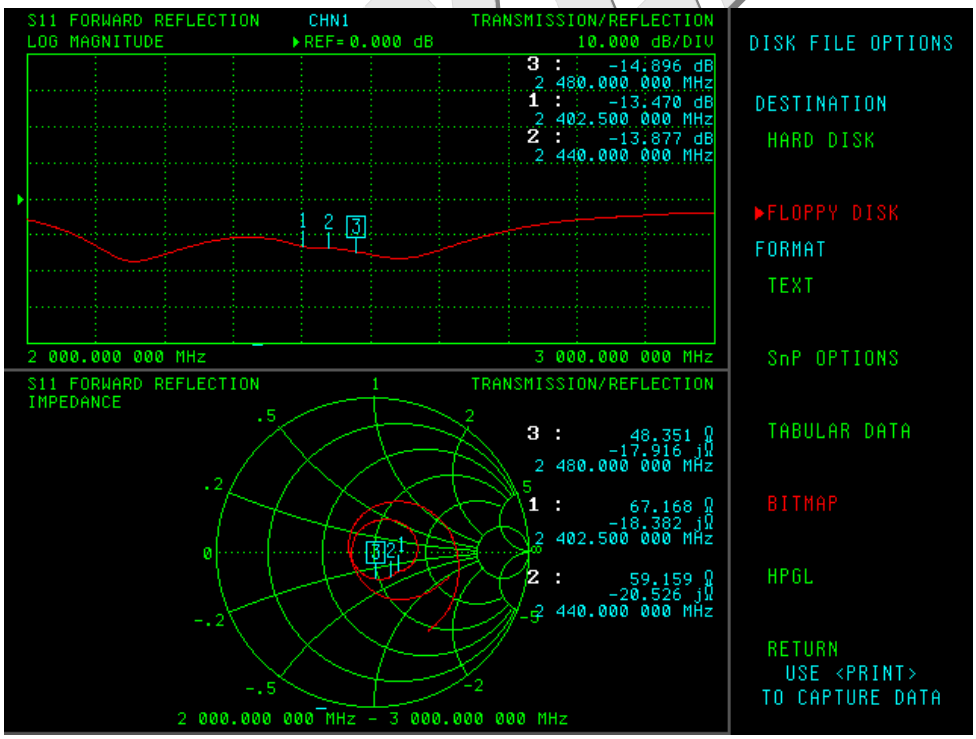


2.3.2 Return Loss Result (Example)-V2R2

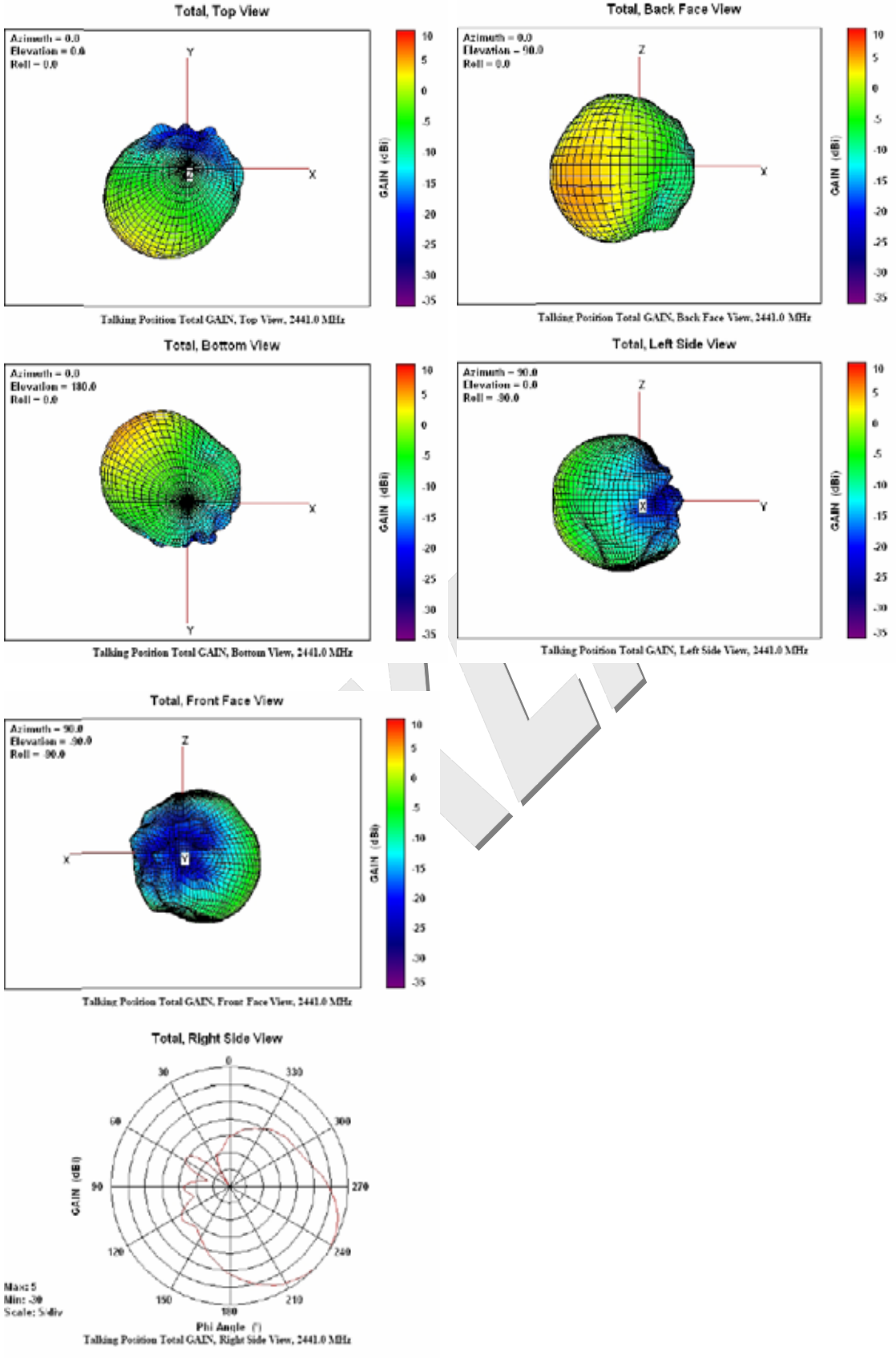
Free Space:



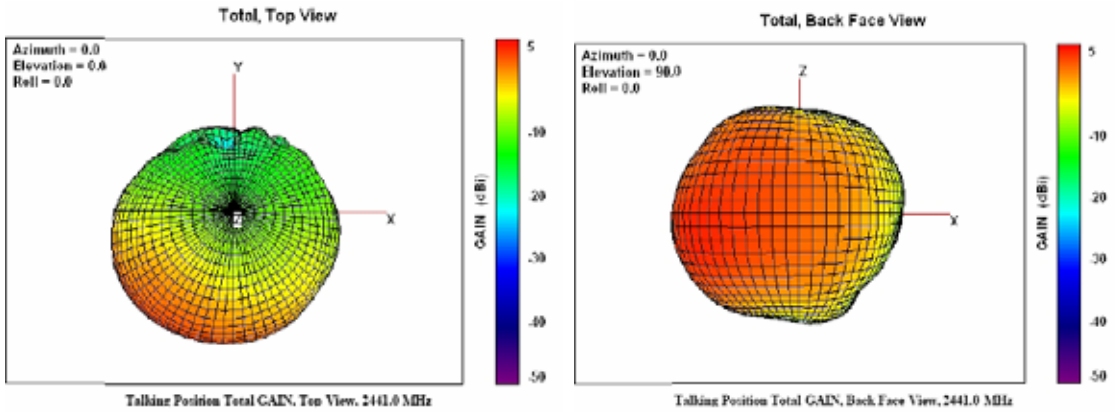
Phantom Head:



2.3.3 3D Radiation Pattern @ 2441MHz (Example)-V2R1

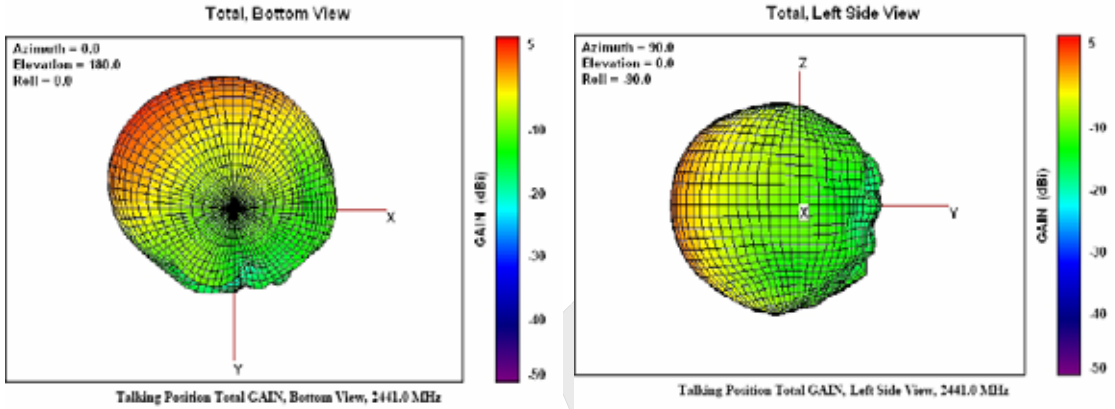


2.3.4 3D Radiation Pattern @ 2441MHz (Example)-V2R2



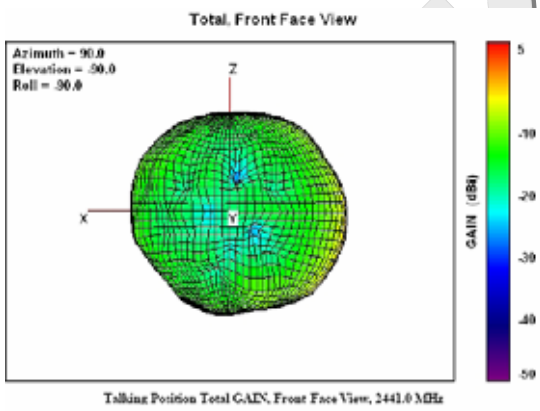
Talking Position Total GAIN, Top View, 2441.0 MHz

Talking Position Total GAIN, Back Face View, 2441.0 MHz

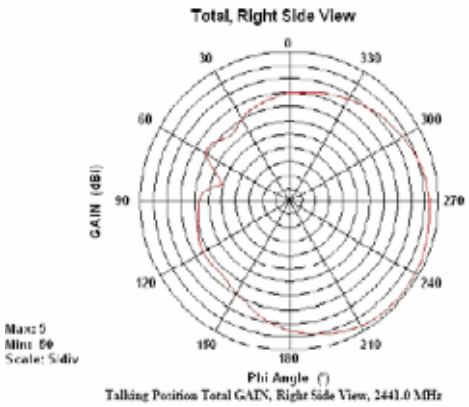


Talking Position Total GAIN, Bottom View, 2441.0 MHz

Talking Position Total GAIN, Left Side View, 2441.0 MHz



Talking Position Total GAIN, Front Face View, 2441.0 MHz



Talking Position Total GAIN, Right Side View, 2441.0 MHz

3. Test summay

This test data are judged according to Peak Gain and Average Gain, V2R1 edition is better.