WIESON TECHNOLOGIES CO., LTD.

WIESON 3D CHAMBER TEST REPORT

Customer:	**AMIT**
Project Name:	**CTG531**
WIESON P/N:	
Antenna Type:	**WiFi Antenna(PCB)**

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WIESON TECHNOLOGIES CO., LTD.

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Revision History

Revision	Date	Engineer	Description
A	2011/05/19	Alarn	NEW RELEASE

I. Summary：

This report to account for the measurement setup and result of the Antenna.
The measurement setup includes s-parameter, pattern, and gain measurement.
The measured data for Antenna are presented and analysis.

II. S-Parameter Measurement：

A. Reflection coefficient :

(a) Instrument：Network Analyzer.

(b) Setup：

(1) Calibrate the Network Analyzer by one port calibration using O.S.L. calibration kits.
(2) Connect the antenna under test to the Network Analyzer.
(3) Measure the S11(reflection coefficient) shown in Fig. 1.
(4) Generally, the S11 is less than –10dB to ensure the 90% power into antenna and only less than 10% power back to system.

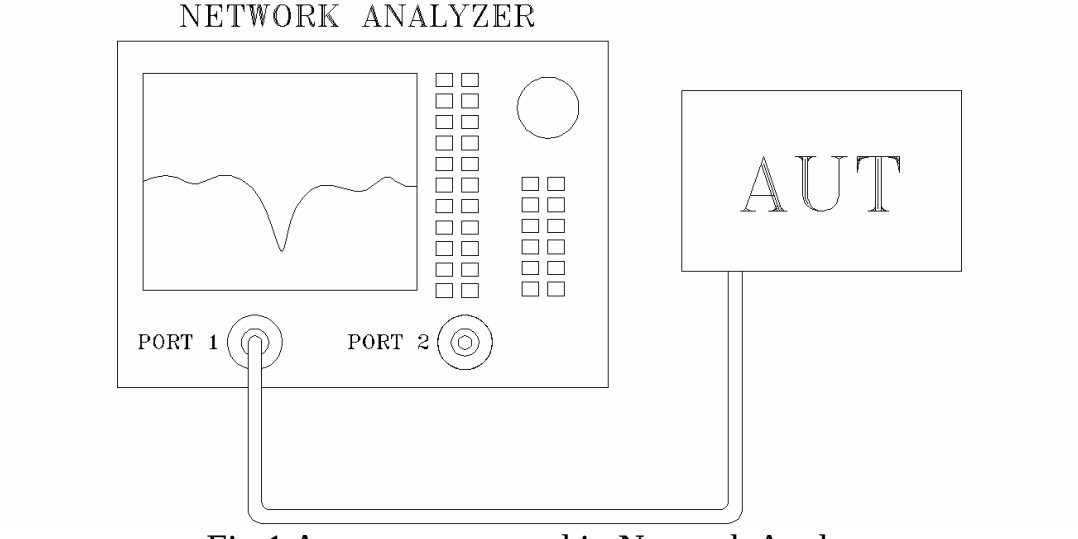
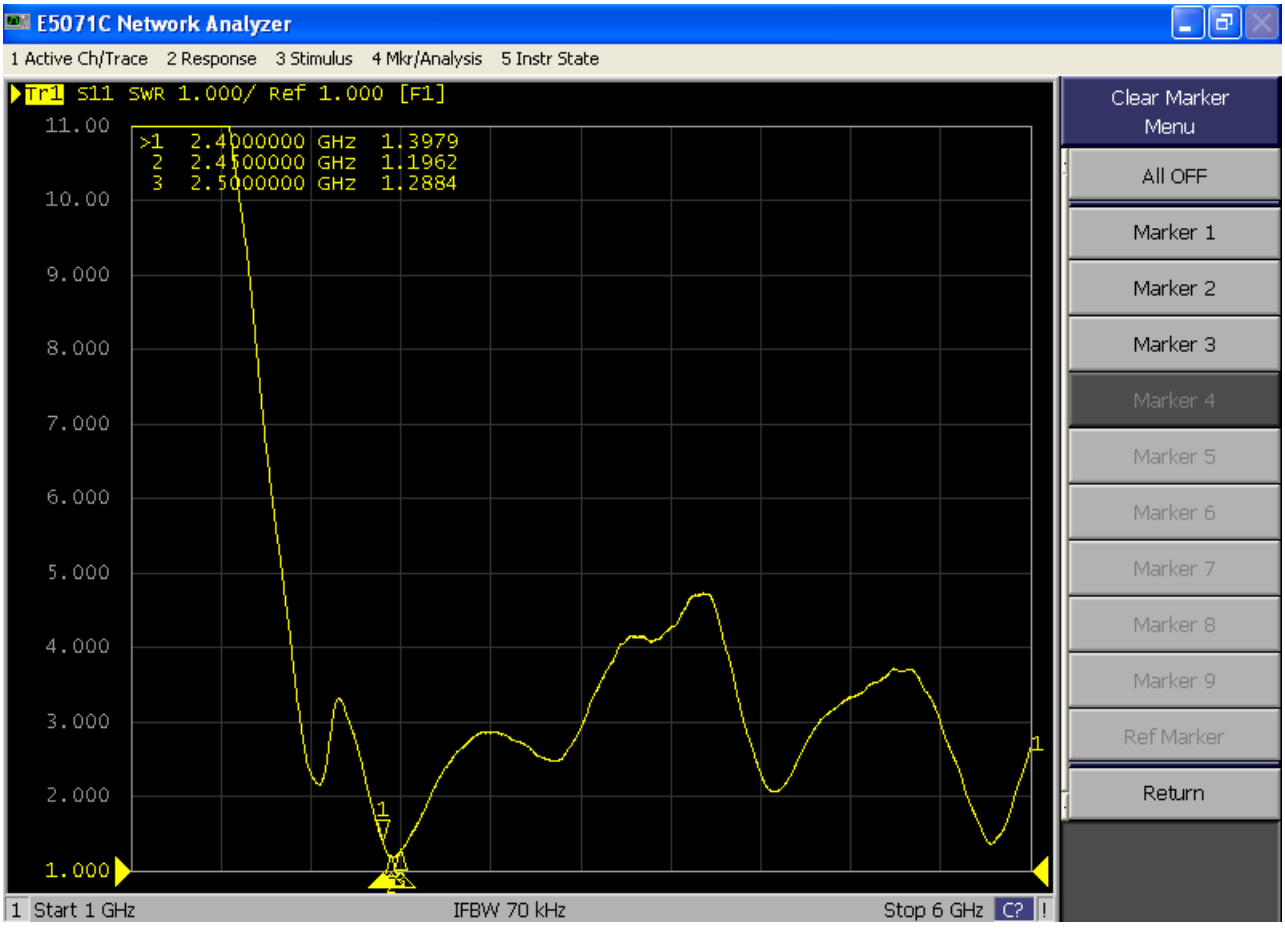


Fig.1 Antenna measured in Network Analyzer

III. S-Parameter Test Result：

Antenna VSWR

Frequency / Sample	2400 MHz	2450 MHz	2500 MHz
1	1.3979	1.1962	1.2884



IV. The Test Information Anechoic Chamber

A. Scope

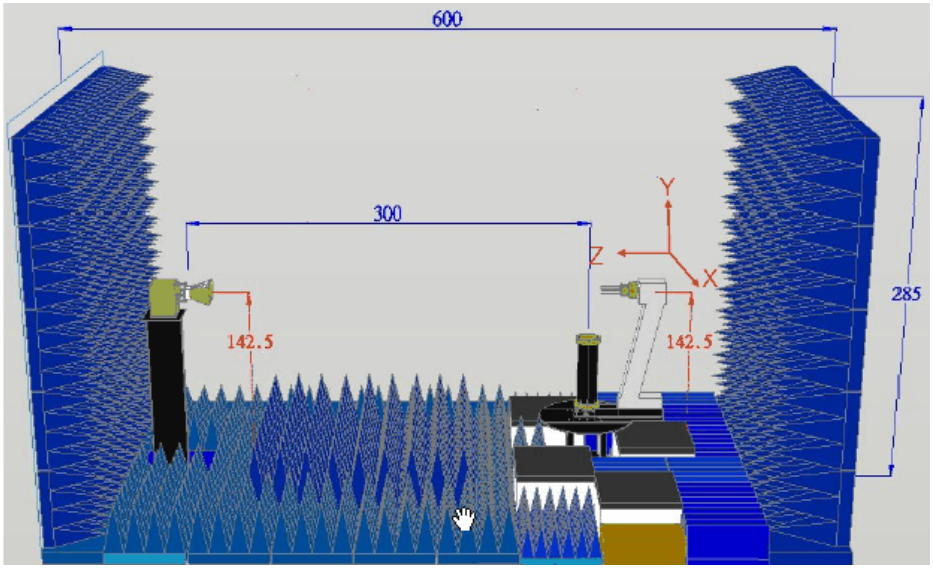
This statement of work defines the requirements of a far-field antenna measurement range, which includes

(1) One 325 cm (W) x 285 cm (H) x 640 cm (L) Antenna Measurement Anechoic Chamber, detailed requirements refer section 2.0 .

(2) One Far-field Antenna Measurement System with spinning linear CP measurement capabilities, detailed requirement refer section 3.0 .

(3) One broad-band transmitted antenna, detailed requirements refer section 8.0 .

(4) Three NRL-4433 standard gain antennas, detailed requirements refer section 9.0 .



B. Antenna Measurement Anechoic Chamber

Fully anechoic chamber with dimension 325 cm in width, 285 cm in height and 640 cm in length. The quiet zone of this Chamber shall be greater than

70 cm @ 0.9 GHz, 50 cm @1.8 GHz, 44 cm @2.4 GHz, 28 cm @5.8 GHz, 16 cm @18 GHz. Contractor should be aware of this anechoic chamber is going to be used for performing far-filed antenna measurement.

C. Electrical specifications

Frequency Range: 800 MHz to 18 GHz,
Quiet zone size: >70 cm @ 0.9 GHz, >50 cm @1.8 GHz, >44 cm @2.4 GHz, >28 cm @5.8 GHz, >16 cm @18 GHz.
Quiet zone ripple: < +/- 0.5 dB @1.5~2.4 GHz, < +/- 0.25 dB @2.4~18GHz

Field Probing Frequency	Peak-to-Peak Amplitude Ripple (within specified Quiet Zone Area)	Quiet Zone Size (cm)	Compliant
0.9 GHz	< 0.8 dB	70	Yes
1.575 GHz	< 0.6 dB	55	Yes
1.8 GHz	< 0.5 dB	50	Yes
2.45 GHz	< 0.4 dB	44	Yes
4.8 GHz	< 0.3 dB	31	Yes
5.8 GHz	< 0.3 dB	28	Yes

D. Absorbers

We shall design and install proper absorbers on the inner walls of the chamber to guarantee the electrical specifications . However, the absorbers height shall be no less than 24" which enables the space in the chamber to be around 203 cm (W) x 163 cm (H) x 533 cm (L). All the absorber used shall meet NRL-8093 fire retardant regulations

E. Far-field Antenna Measurement System

We shall supply all the hardware and software which are capable of characterizing antenna radiation patterns from 30 KHz to 6 GHz or 18GHz using the existed Agilent 5230A PNA-L or Agilent 8753ES Vector Network Analyzer. The system shall be able to automatically measure and plot single axis amplitude and phase antenna patterns in either Cartesian or polar formats.

F. Far-field measurement software

The software consists of the control or data acquisition software and the data plotting software.

(1) The data acquisition software shall at least be capable of the following functions:
*measuring single frequency per cut - single axis (azimuth); system can automatically switch frequency at the end of a scan.
*measuring data in Uni-direction or bi-direction
*measuring data at least with azimuth 360 degrees. (+/- 180 degrees or 0-360 degrees)
*real time plot in Cartesian or polar format
*screen shows real time angle position

*system automatically calculates S/N ratio level based on measured signal fluctuation
*function to set positioner zero position
*operator can set data taking velocity and data sampling interval
*entry to allow positioner offset to any angle

(2) The data plotting software shall at least be capable of the following functions:
*Editing plot data
*plotting data in Carttesian, Polar or delimited ASCII output with header information
*plotting data in linear or dB scales
*normalizing data to peak (dB), standard gain reference (dBi), or no normalization
*overlaying data, (drag and dorp capability is preferable)
*outputting data to any Windows supported printers

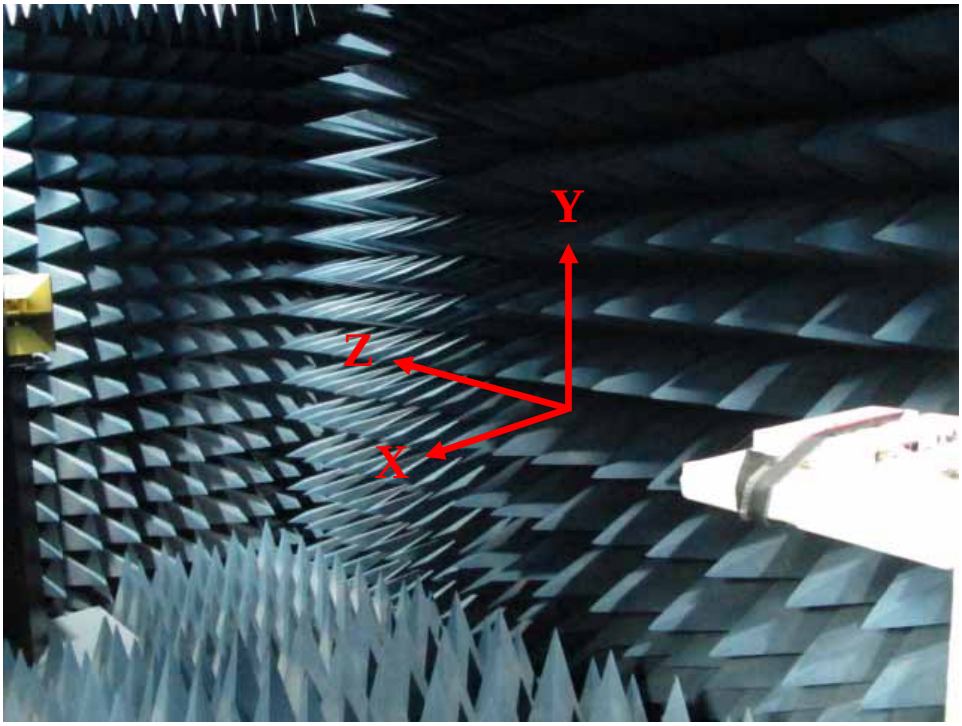
G. Broadband Transmitted antenna

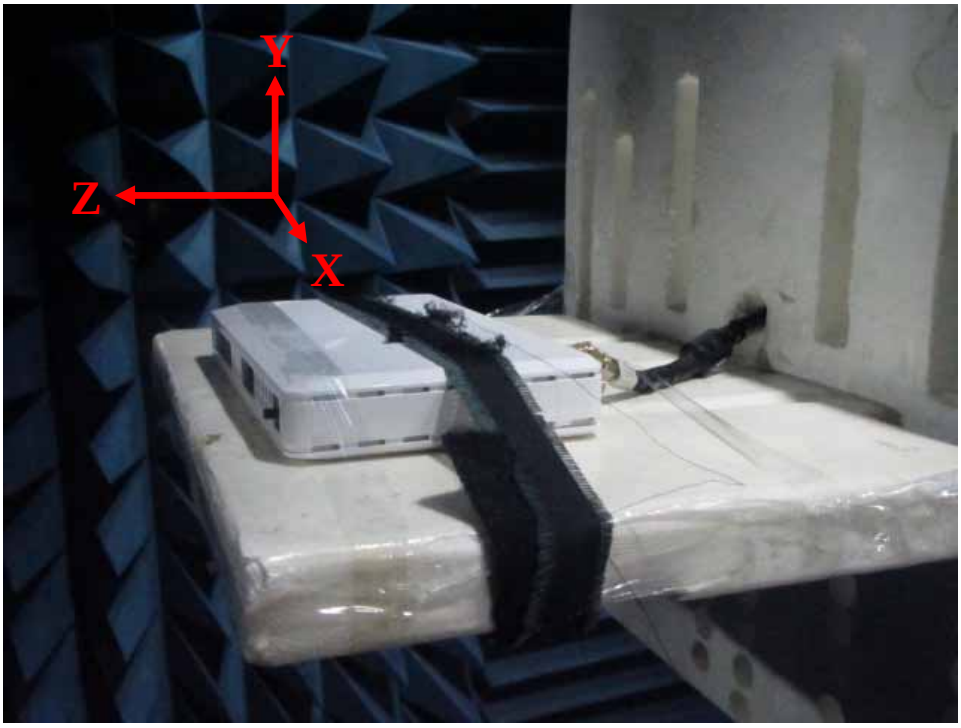
We shall provide a linear-polarized broadband antenna with the specifications better than those listed hereafter in this article,
Frequency: 1-18 GHz, Gain: >12 dBi @10 GHz, VSWR:<2,0:1, Front to Back Ration > 20 dB

H. NRL4433 Standard Gain Horns

We shall provide one WR-430, WR-187 one DRH0118 standard gain horns which meets the specifications of NRL-4433 report. The operating frequency of WR-430 standard gain horn is from 1.7 to 2.6 GHz, and WR-187 from 3.95 to 5.85 GHz, and DRH-0118 from 0.8 to 18GHz. We shall also provide NRL-4433 theoretical gain curves and tables for the standard gain horns.

V. Chamber Test Photo





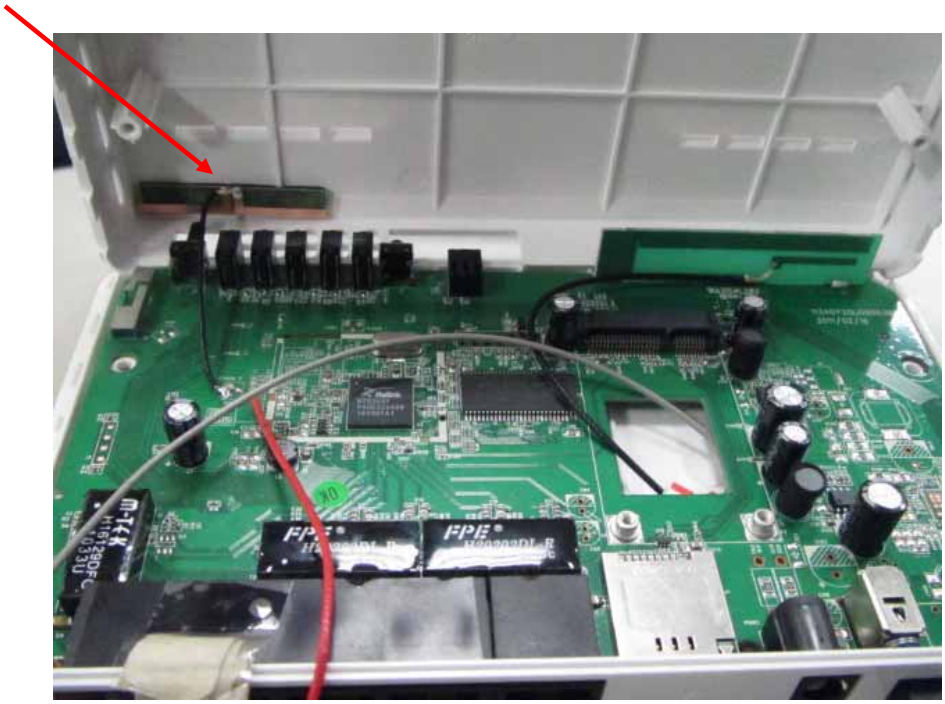
VI. Chamber Test Result

WiFi Antenna

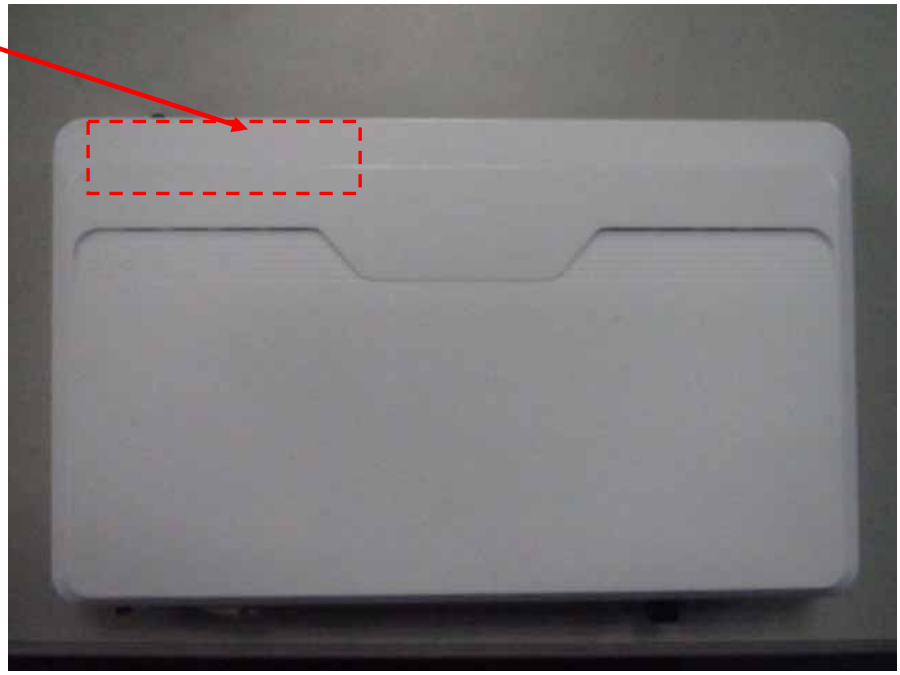
Freq(GHz)	Power Gain(dBi)	3D-avgGain(dBi)	Total Rad. Efficiency(%)
2.4	2	-2.47	57
2.45	3.43	-1.81	66
2.5	3.79	-2.23	60

VII. Product Photo

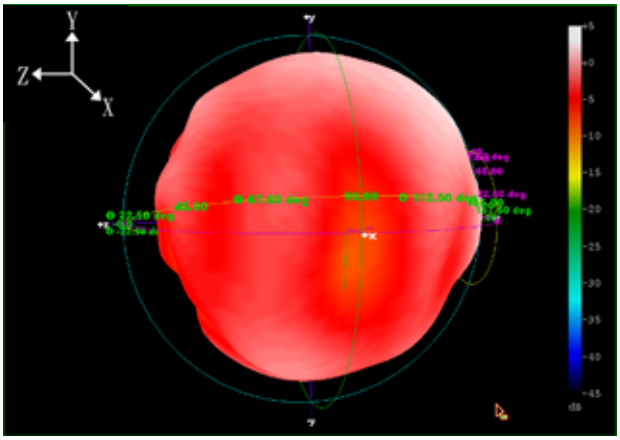
WiFi Antenna



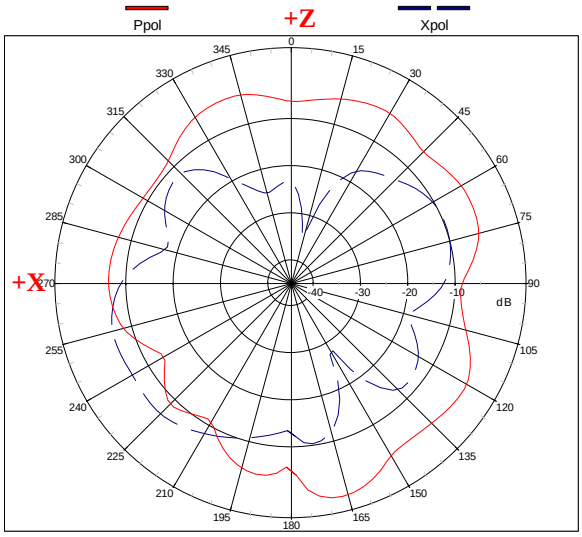
WiFi Antenna



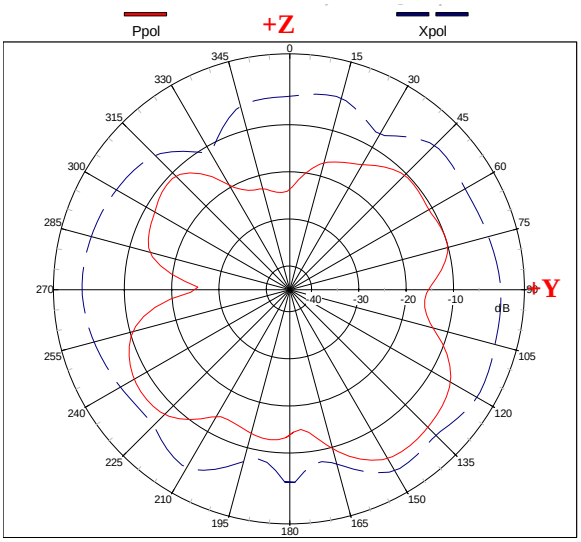
2400MHz



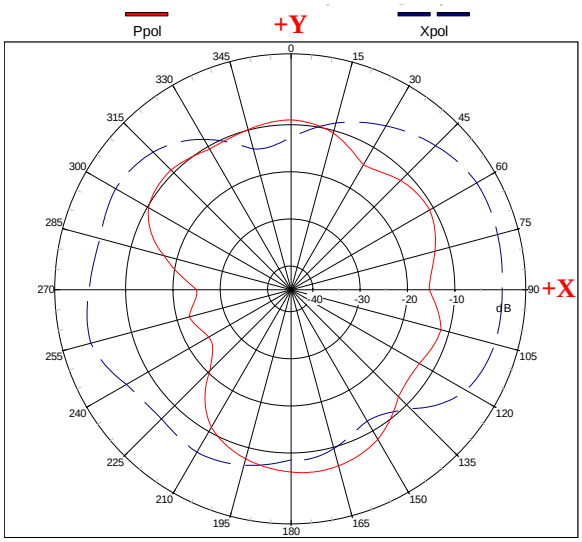
Far-field Pattern @ Phi=0 deg(E-Theta Plane-Cut)



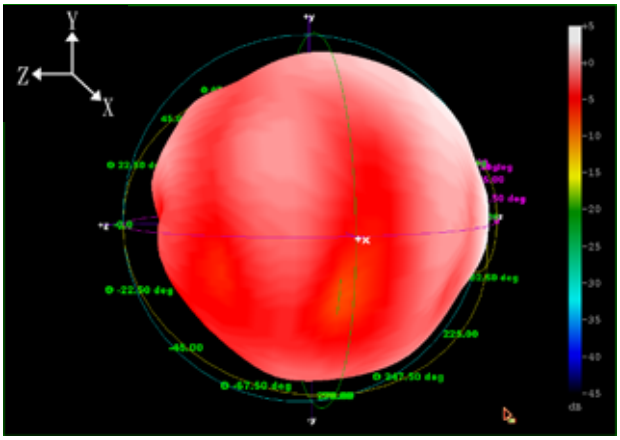
Far-field Pattern @ Phi=90 deg(E-Theta Plane-Cut)



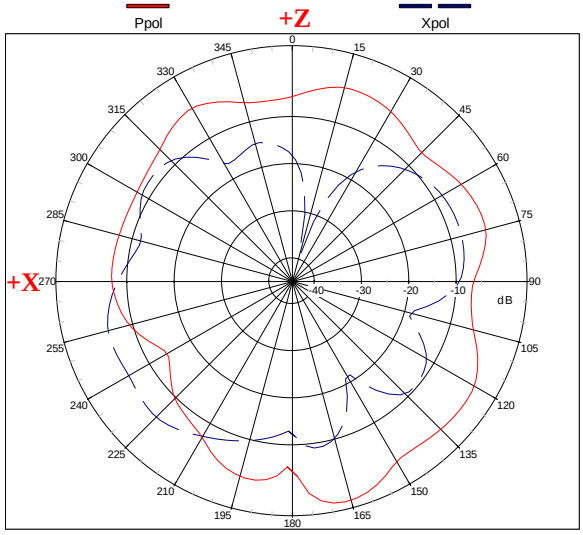
Far-field Pattern @ Theta=90 deg(E-Phi Plane-Cut)



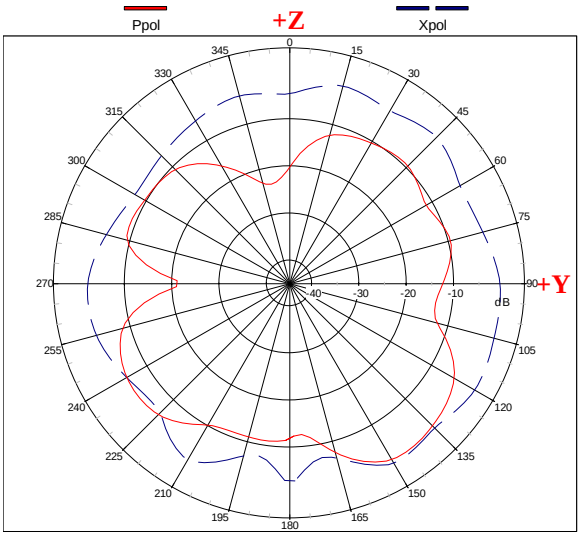
2450MHz



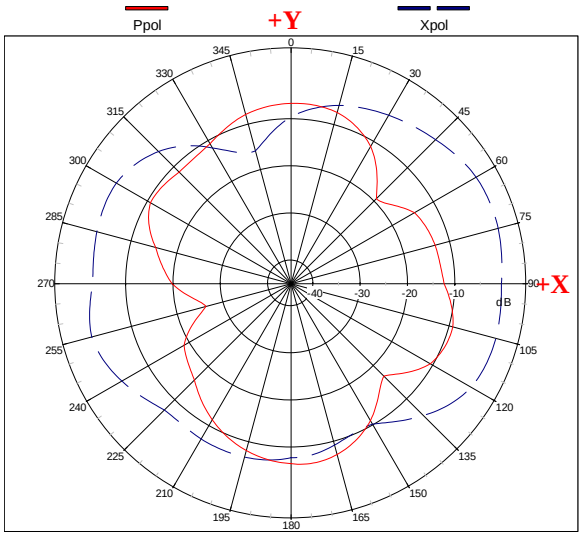
Far-field Pattern @ Phi=0 deg(E-Theta Plane-Cut)



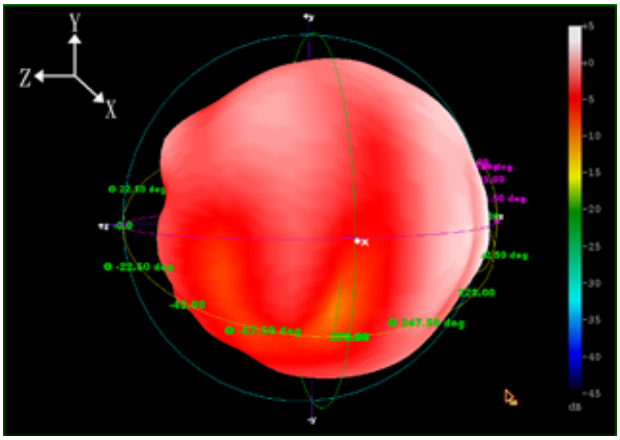
Far-field Pattern @ Phi=90 deg(E-Theta Plane-Cut)



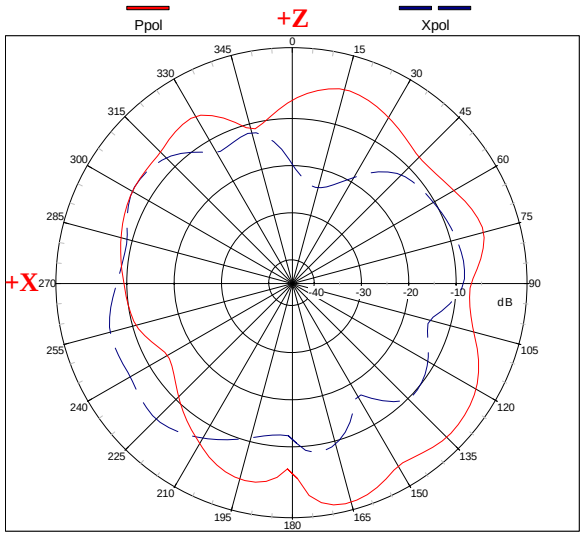
Far-field Pattern @ Theta=90 deg(E-Phi Plane-Cut)



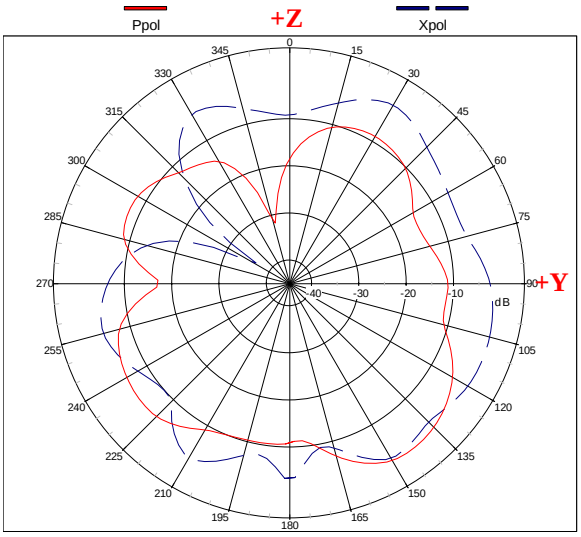
2500MHz



Far-field Pattern @ Phi=0 deg(E-Theta Plane-Cut)



Far-field Pattern @ Phi=90 deg(E-Theta Plane-Cut)



Far-field Pattern @ Theta=90 deg(E-Phi Plane-Cut)