



測試報告

Test Report

客 戶： 大眾電腦股份有限公司

Customer

品 名：Bluetooth antenna*1(Couple)、 2.4GHz WiFi antenna*1(Couple)

Part name

型 號： GY196C098-031、GY196C098-032

Antenna Gain : 2.15dBi(BT) / 2.41dBi(WiFi)

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Rev	Date	Description	Edited by	Tester	Tony
01	2010.06.07	NEW RELEASE	Tony	Checked	Wen
02	2010.08.04	FINE TUNE	Tony	Supervisor	Leo
03	2010.09.02	ADD TYPE & BAND	Tony	Sheet	2 OF 22



I. SUMMARY :

This report to account for the measurement setup and result of the Antenna.

1. The measurement setup includes s-parameter, pattern, and gain measurement.
2. 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.

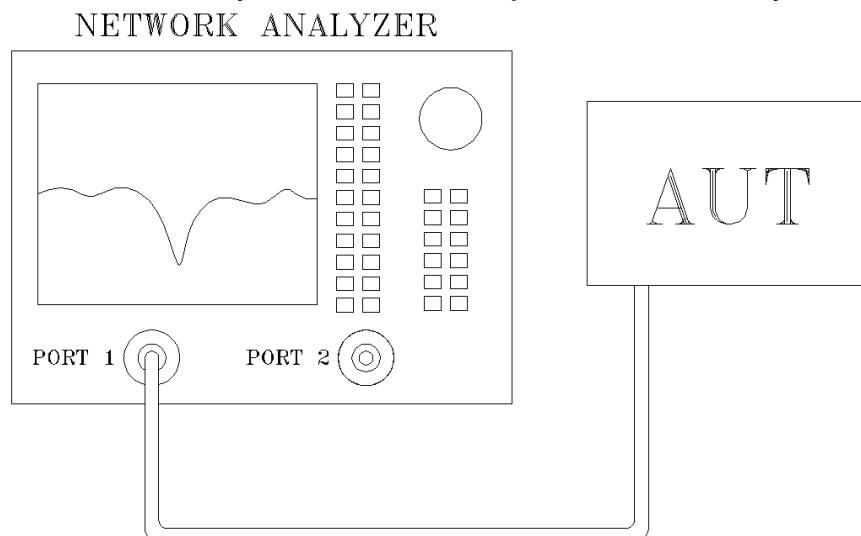


Fig.1 Antenna measured in Network Analyzer

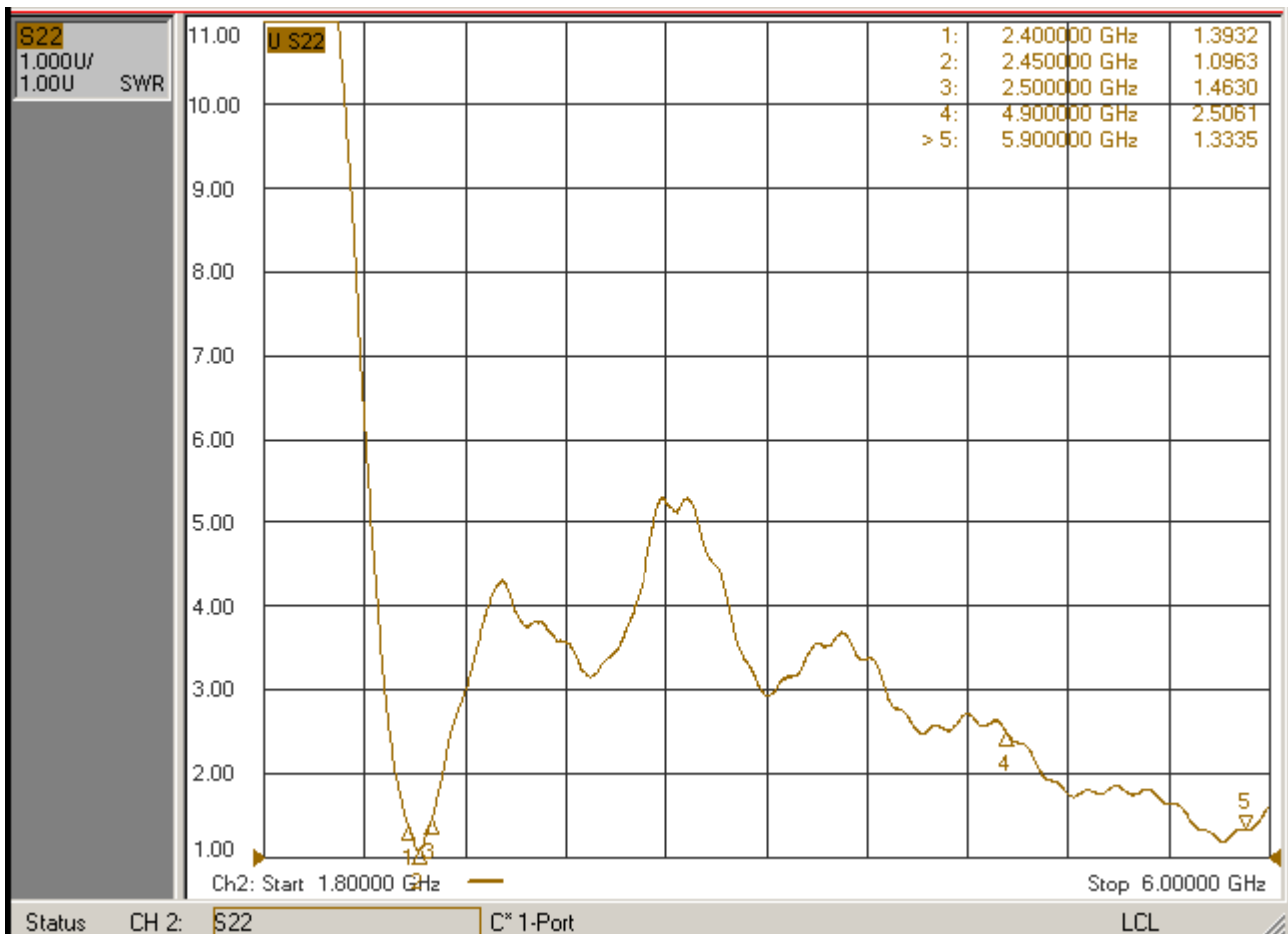


III. S-PARAMETER TEST RESULT :

Antenna VSWR

(a) WiFi Antenna - Black cable :

Sample	Frequency	2400 MHz	2450 MHz	2500 MHz
1		1.3932	1.0963	1.4630



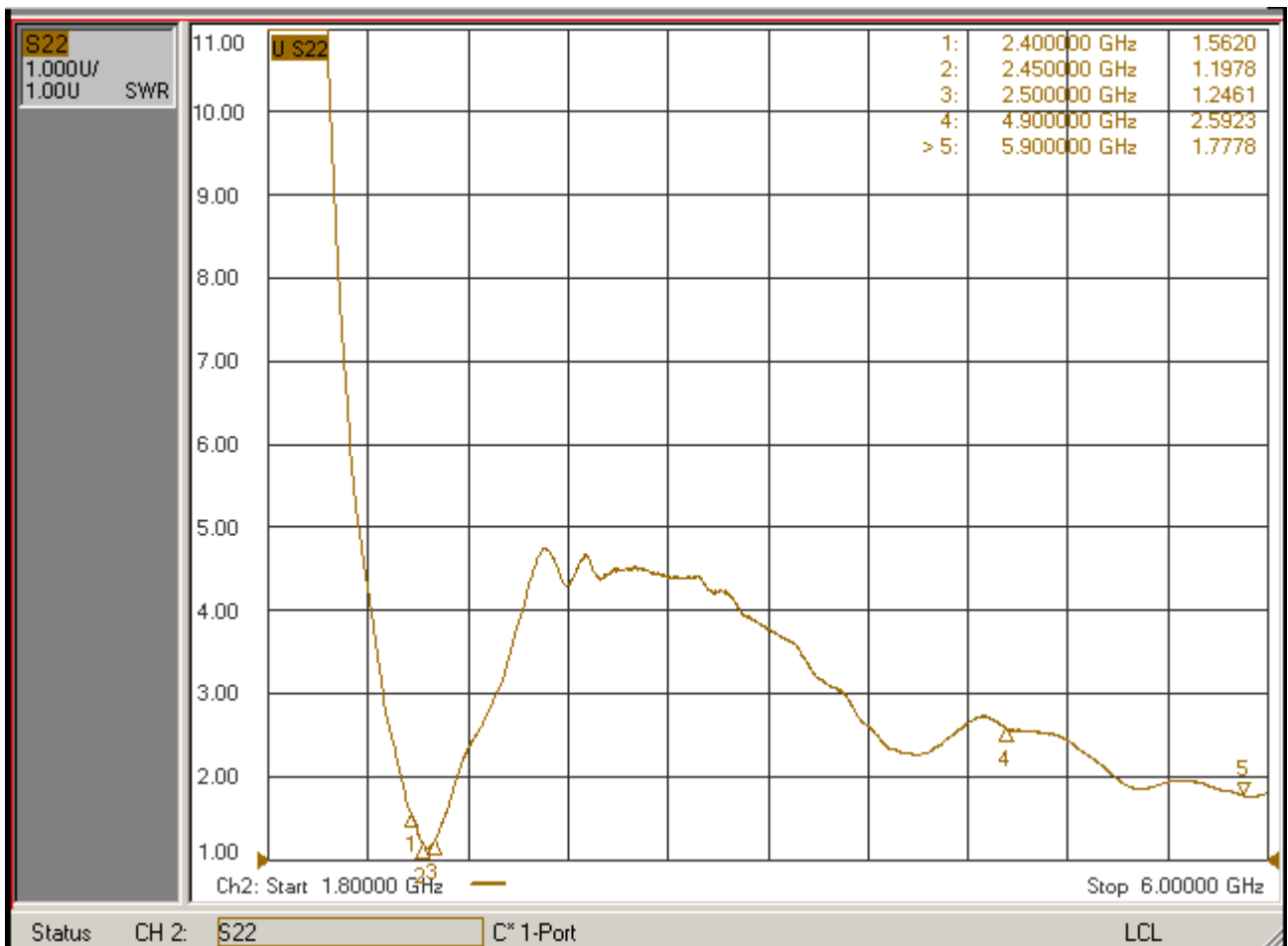


III. S-PARAMETER TEST RESULT :

Antenna VSWR

(b) Bluetooth Antenna - White cable :

Sample	Frequency	2400 MHz	2450 MHz	2500 MHz
1		1.5620	1.1978	1.2461



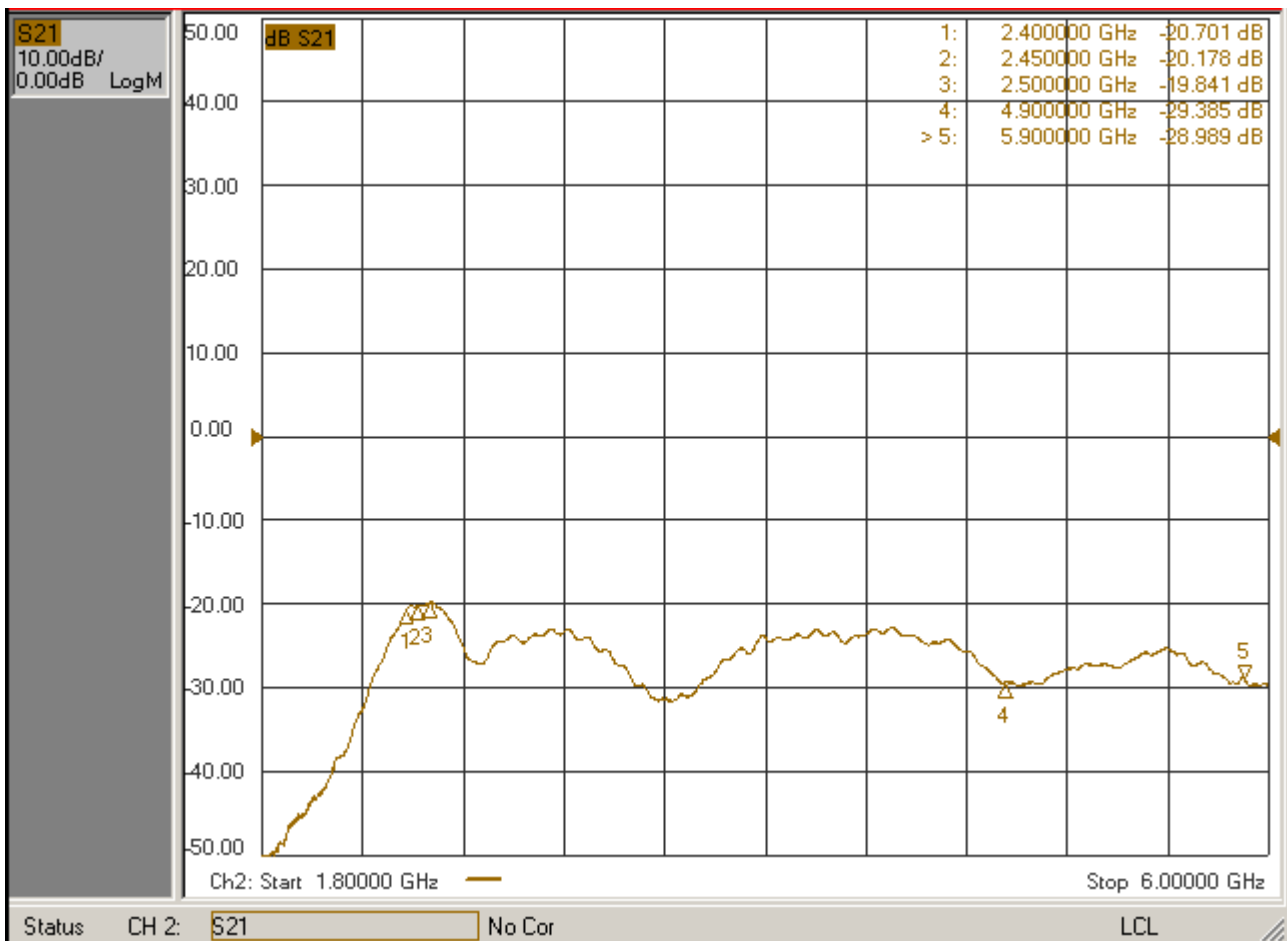


III. S-PARAMETER TEST RESULT :

Antenna Isolation

(c) The isolation of the WiFi antenna and Bluetooth antenna :

Sample	Frequency	2400 MHz	2450 MHz	2500 MHz
1		-20.7	-20.18	-19.84



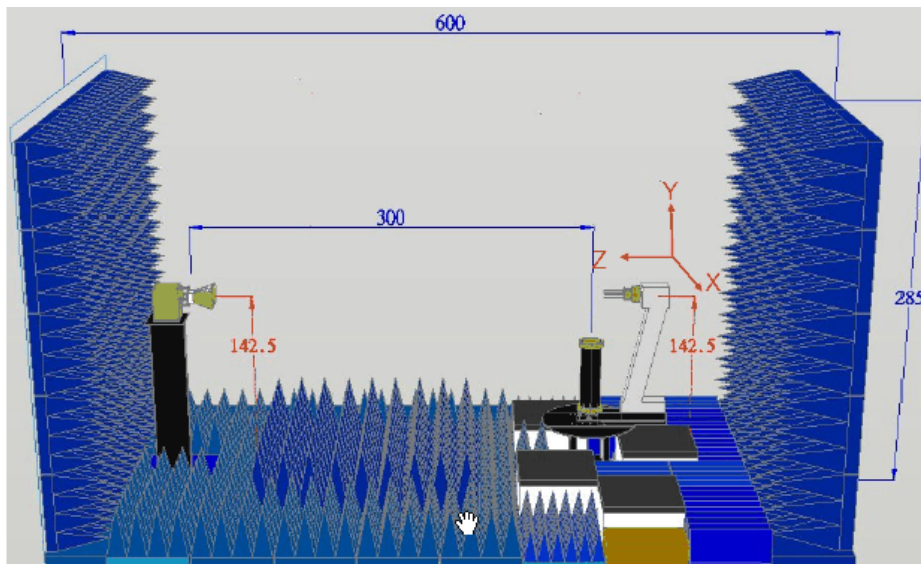


IV. THE TEST INFORMATION IN ANECHOIC CHAMBER

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



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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-field 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



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- *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 Cartesian, 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
- *overlying data, (drag and drop capability is preferable)
- *outputting data to any Windows supported printers

G. Broadband Transmitted antenna

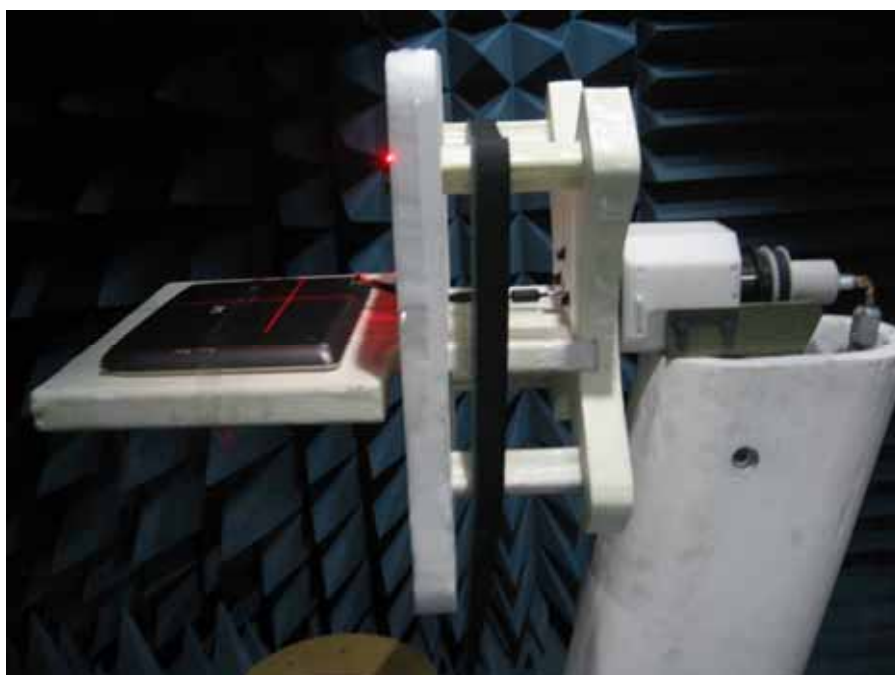
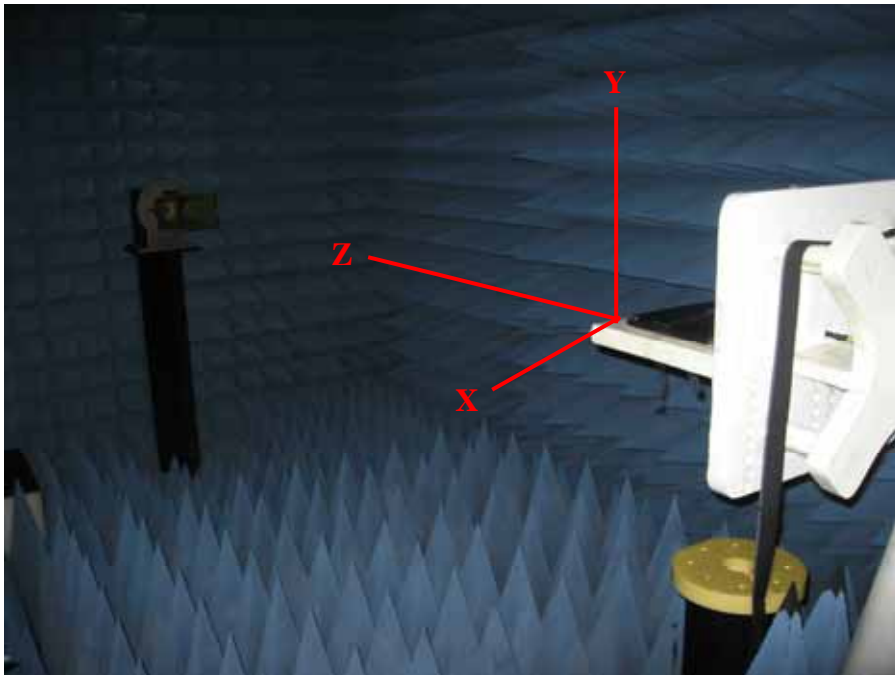
We shall provide a linear-polarized broadband antenna with the specifications better than those listed hereafter in this article, Frequency: 1-18 GHz, Gain: >12 dBi @10 GHz, VSWR:<2,0:1, Front to Back Ratio > 20 dB

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 PICTURE





VI. CHAMBER TEST RESULT

(a) WiFi 2.4GHz Antenna - Black cable

Frequency (GHz)	2.4	2.45	2.5
Peak Gain (dBi)	1.05	1.99	2.41
Avg. Gain (dBi)	-3.65	-3.58	-3.56
Efficiency(%)	43	44	44

Frequency (GHz)	5.15	5.25	5.35	5.47	5.6	5.725	5.785	5.85
Peak Gain (dBi)	3.4	4.09	3.81	3.68	3.84	4.01	4.37	4.42
Avg. Gain (dBi)	-3.5	-3.13	-3.76	-3.59	-3.91	-3.32	-3.21	-3.7
Efficiency(%)	45	49	42	44	41	47	48	43



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(b) Bluetooth Antenna - White cable

Frequency (GHz)	2.4	2.45	2.5
Peak Gain (dBi)	2.04	2.15	2.06
Avg. Gain (dBi)	-3.33	-3.35	-3.35
Efficiency(%)	46	46	46

Frequency (GHz)	5.15	5.25	5.35	5.47	5.6	5.725	5.785	5.85
Peak Gain (dBi)	3.08	4.02	4.71	4.19	3.67	3.7	4.1	4.42
Avg. Gain (dBi)	-4.24	-3.93	-3.61	-3.65	-3.93	-3.82	-3.57	-3.13
Efficiency(%)	38	40	44	43	41	41	44	49

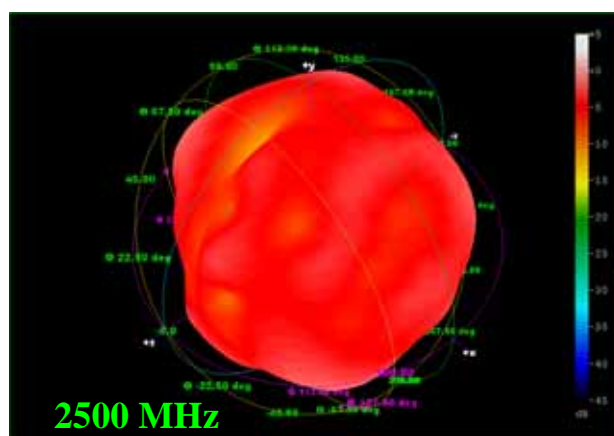
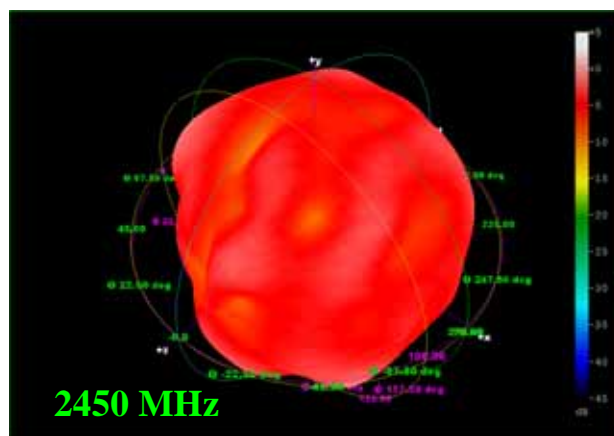
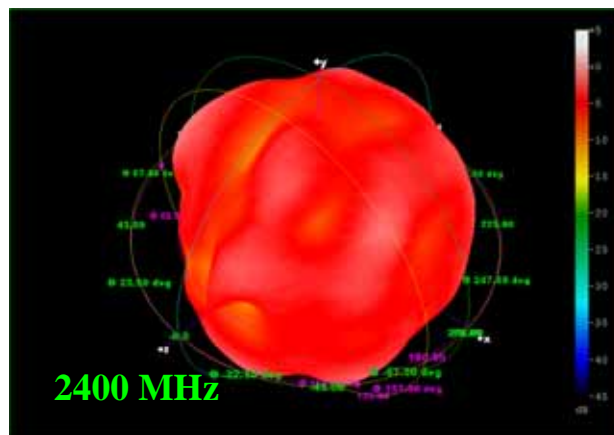


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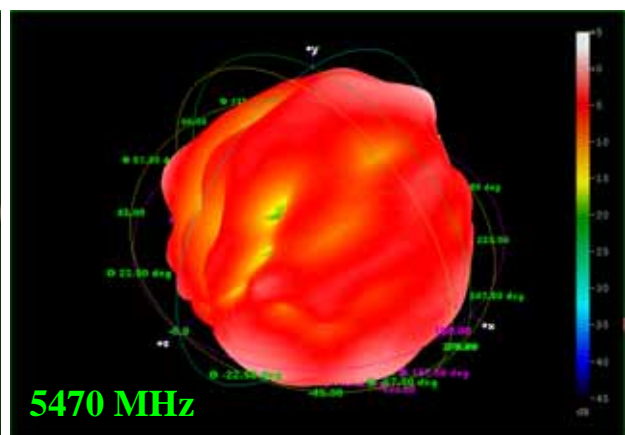
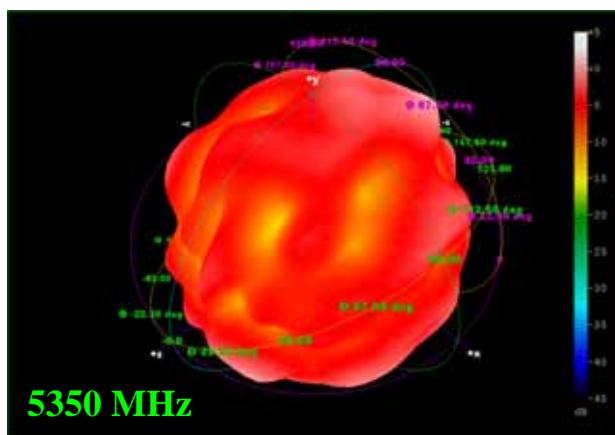
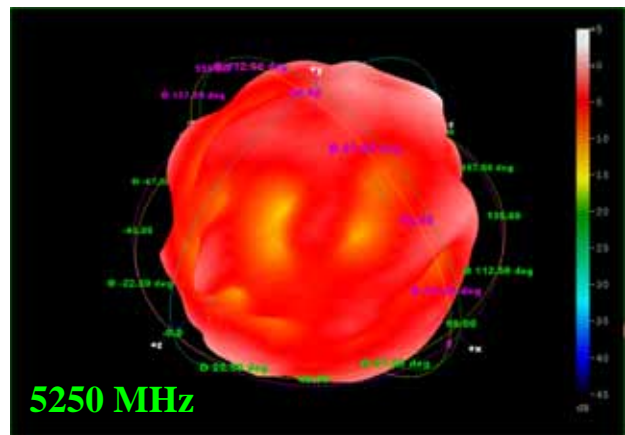
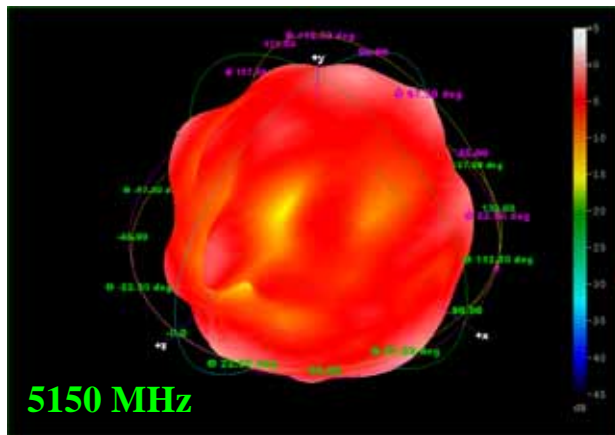
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(a) Wi-Fi 2.4GHz Antenna Pattern - Black cable



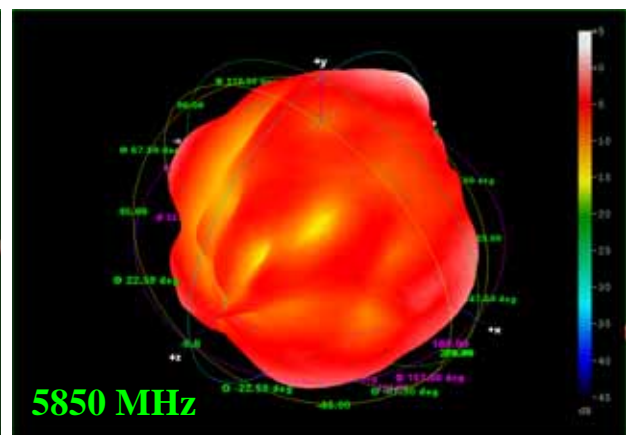
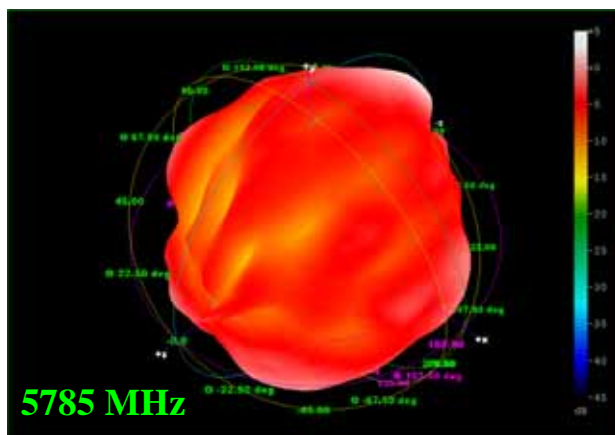
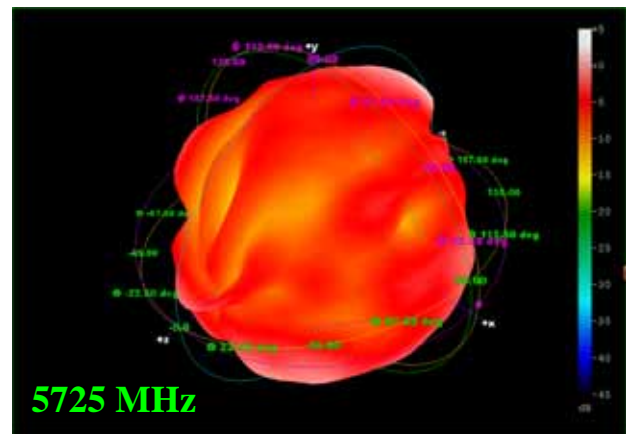
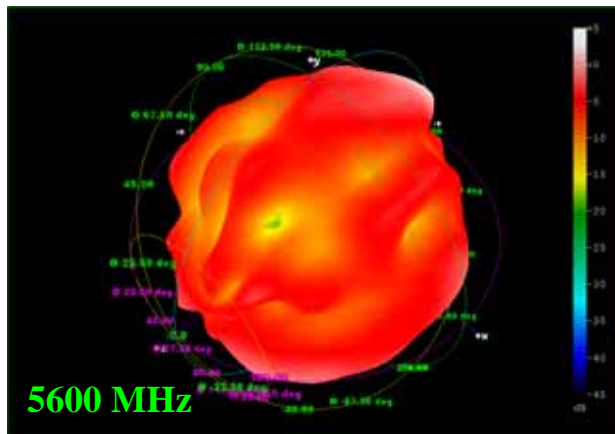


(a) Wi-Fi 2.4GHz Antenna Pattern - Black cable



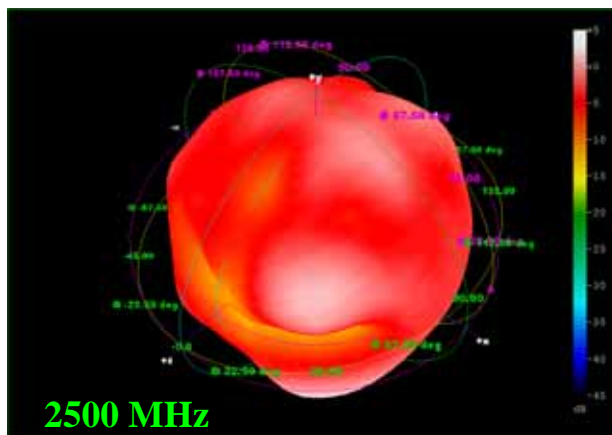
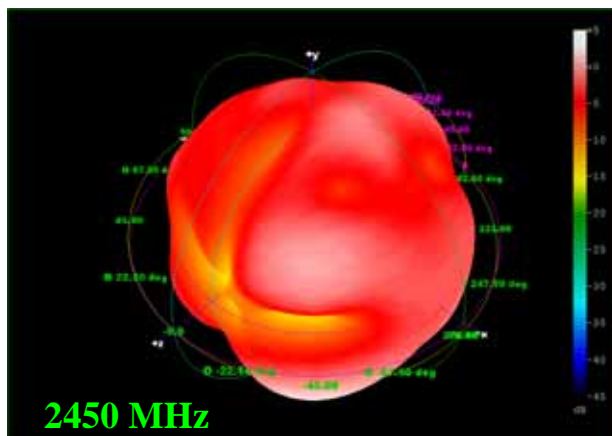
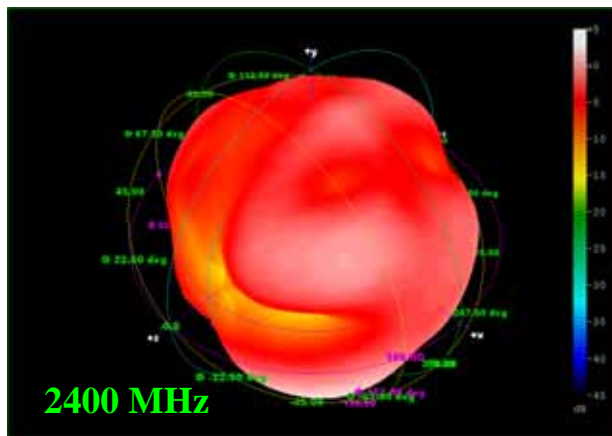


(a) Wi-Fi 2.4GHz Antenna Pattern - Black cable



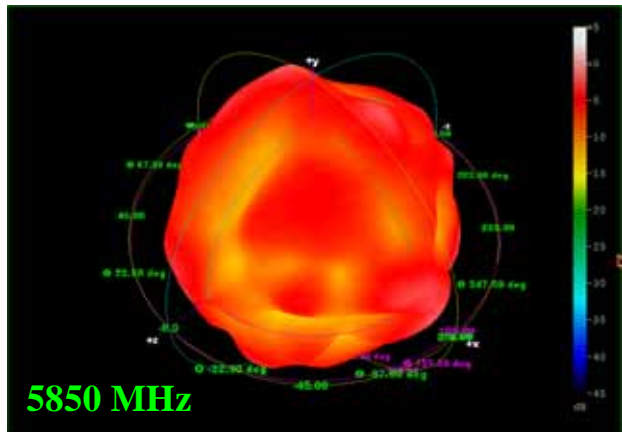
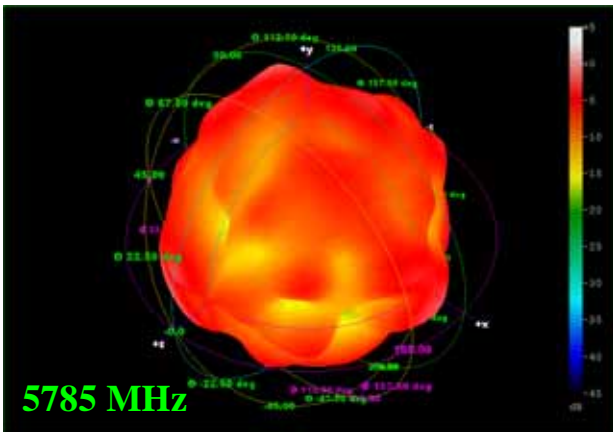
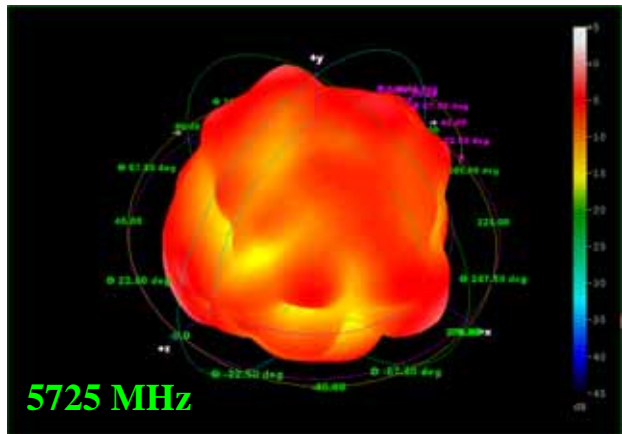
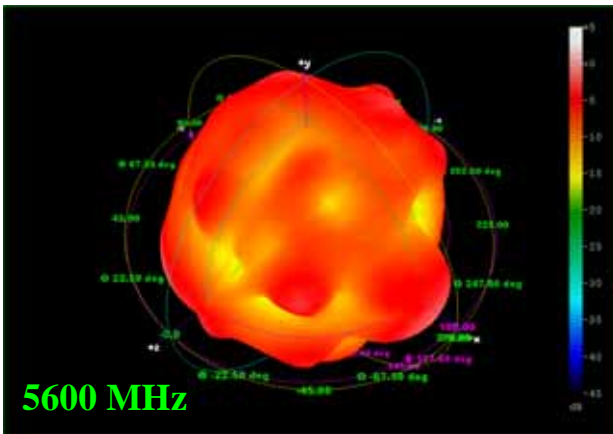


(b) Bluetooth Antenna Pattern - White cable





(b) Bluetooth Antenna Pattern - White cable





VII. ANTENNA PHOTO



Bluetooth antenna - white cable
GY196C098-031



WiFi 2.4GHz Antenna - black cable
GY196C098-032



Bluetooth Antenna
-White cable
GY196C098-031

WiFi 2.4GHz Antenna
-Black cable
GY196C098-032



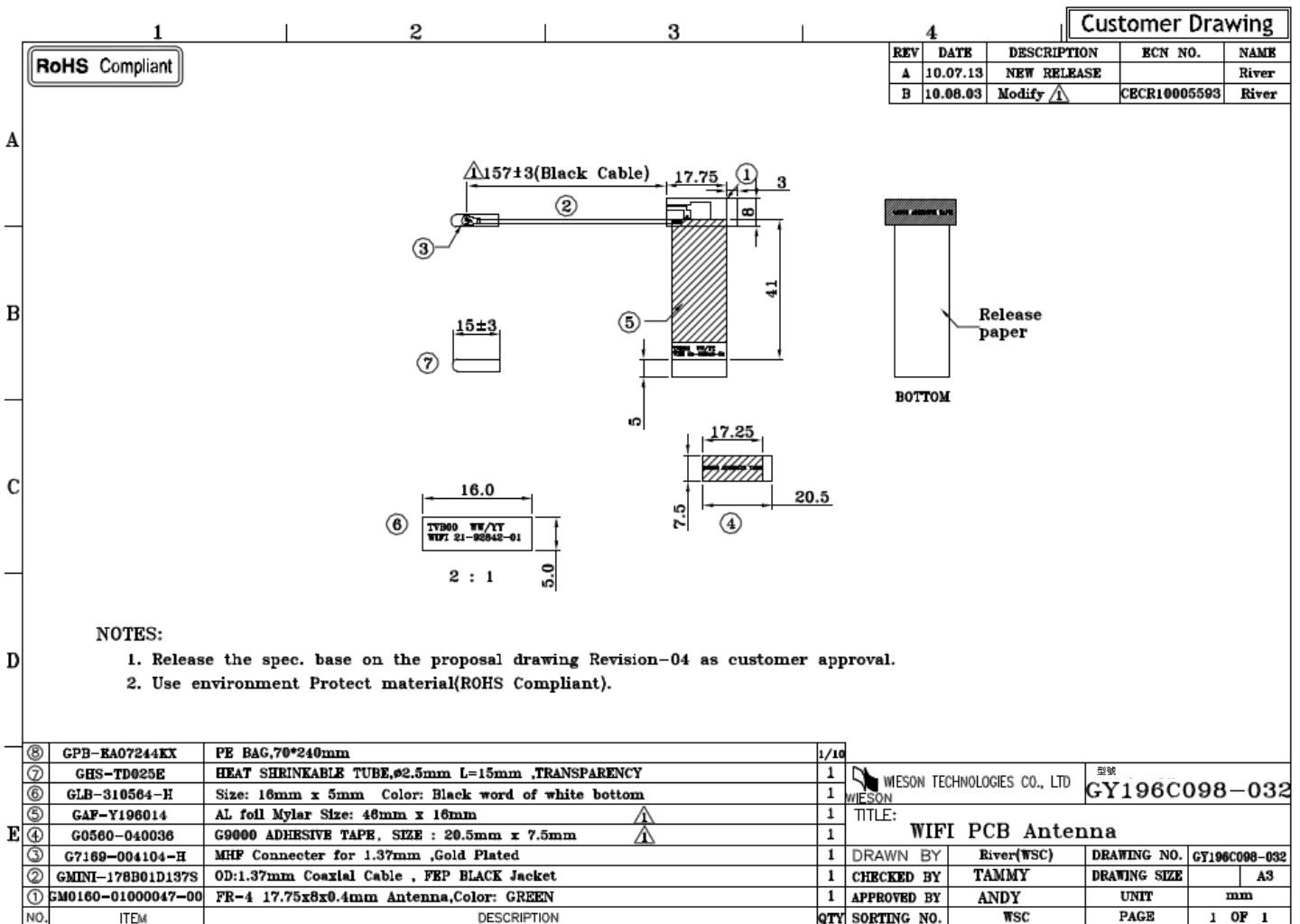
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VIII. ANTENNA 2D Drawing

(a) Wi-Fi 2.4GHz Antenna 2D Drawing



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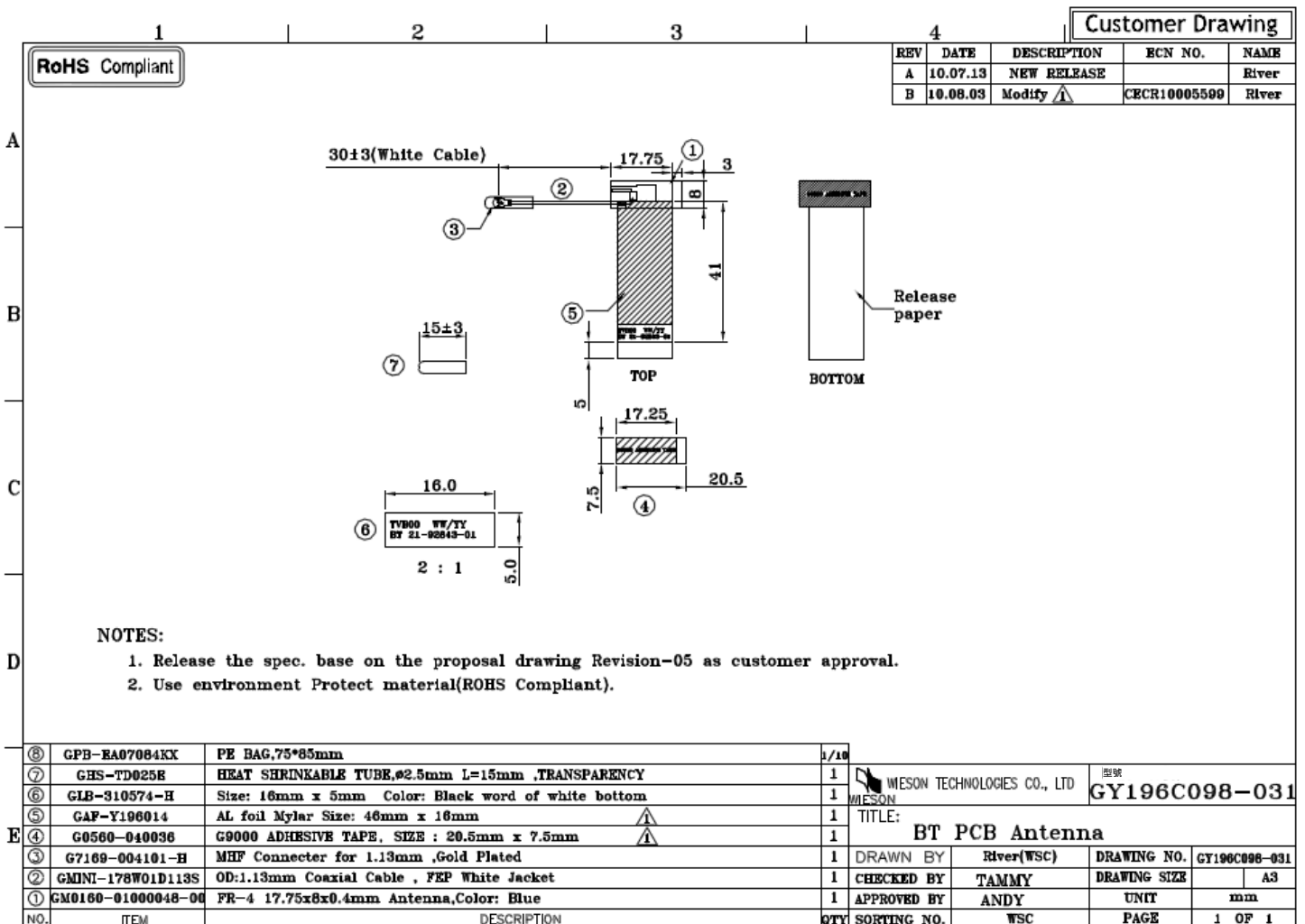
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VIII. ANTENNA 2D Drawing

(b) Bluetooth Antenna 2D Drawing



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