

Antenna Report for LHP TP2

1. Test Date and Test Person

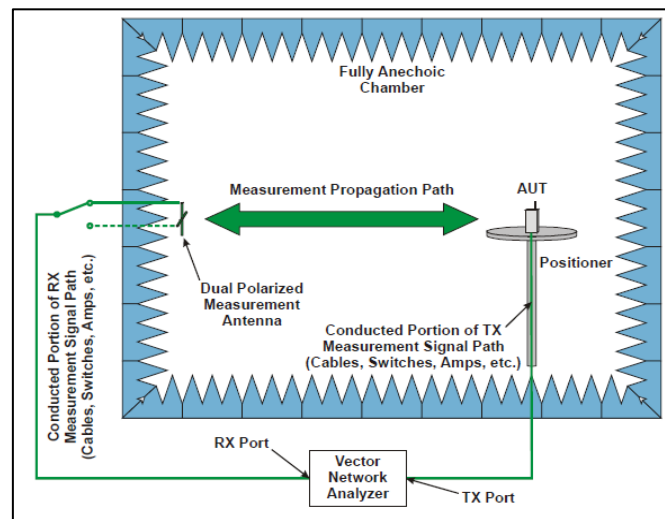
Test date: 17-Oct-2023

Test person: Pei Chee TAN

2. Test setup and Equipment

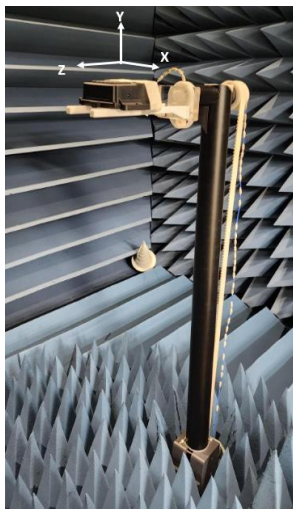
Equipment	Manufacturer	Model
ENA Series Network Analyzer	Keysight	E5063A
PCI antenna measurement system	ETS-Lindgren	AMS8500
EMQuest test software	ETS-Lindgren	V1.13

Setup Overview of Antenna Measurement System (AMS 8500) for Gain, Total Efficiency, and Radiation Pattern



Setup Description:

1. Fix the DUT on the bracket of the anechoic chamber.



2. The antenna of interest is connected to the coaxial line at the transmitter end of the anechoic chamber.
3. Close the anechoic chamber door to avoid external signal interference.
4. Open EM-Quest test software and power on network analyser, select frequency range to test.
5. Total efficiency, gain and radiation pattern can be seen in EM-Quest test software.
6. Repeat steps 1-5 for all the antenna and record the results obtained.

3. Antenna Specifications

3.1. Bluetooth and Wi-Fi Dual-Band Antenna

Antenna manufacturer name & address:

Green Antenna Pte Ltd

29 Mandai Estate #07-09, Singapore 729932

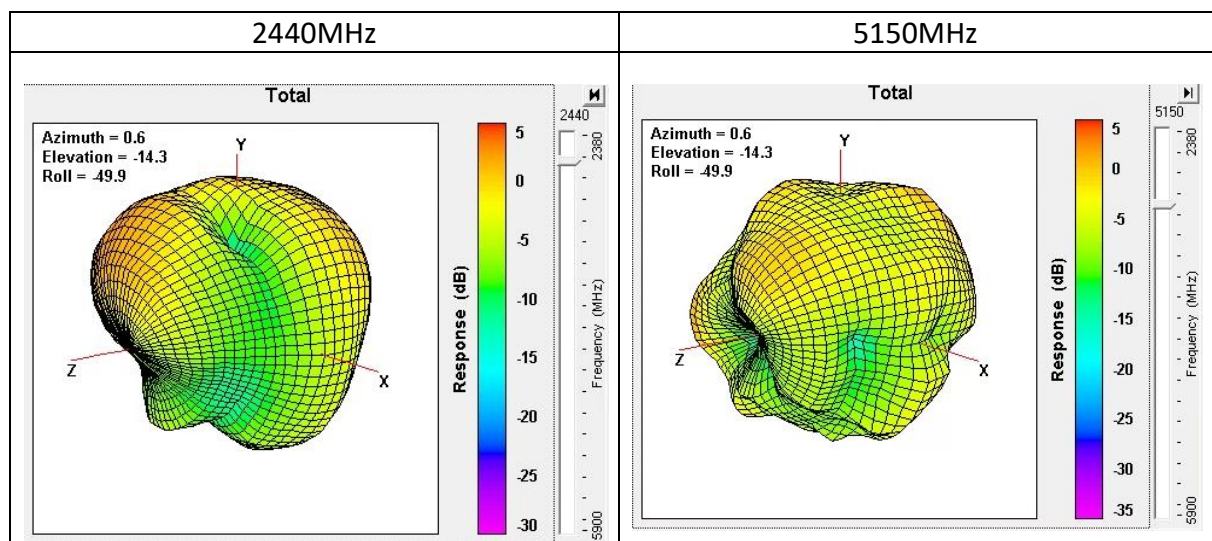
Antenna Specification:

Antenna Model No.	GADWIFI-DP01
Antenna Type	FPC antenna
Frequency	2.4 – 2.485 GHz; 5.15 – 5.85 GHz
S11	< -7dB; <-10dB
Peak Gain	2.96dBi@2.485GHz; 4.67dBi@5.705GHz
Total Efficiency	~50%@2.4GHz; ~50%@5GHz
Cable length, Diameter	110mm, 1.37mm
Connector	MMCX Right Angle Plug

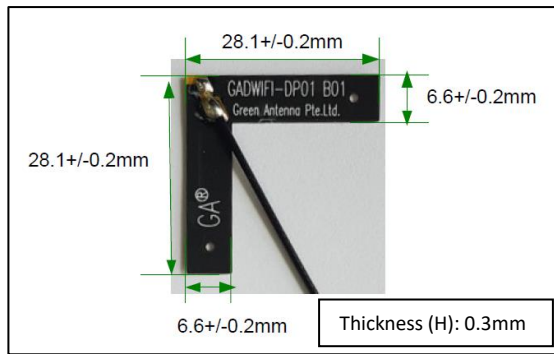
Peak Gain:

Frequency (MHz)	Peak Gain (dBi)
2400-2485	2.96
5150-5250	3.07
5250-5350	2.85
5470-5725	4.67
5725-5825	4.53

Radiation Pattern:



Antenna Dimension:



3.2. GPS Antenna

Antenna manufacturer name & address:

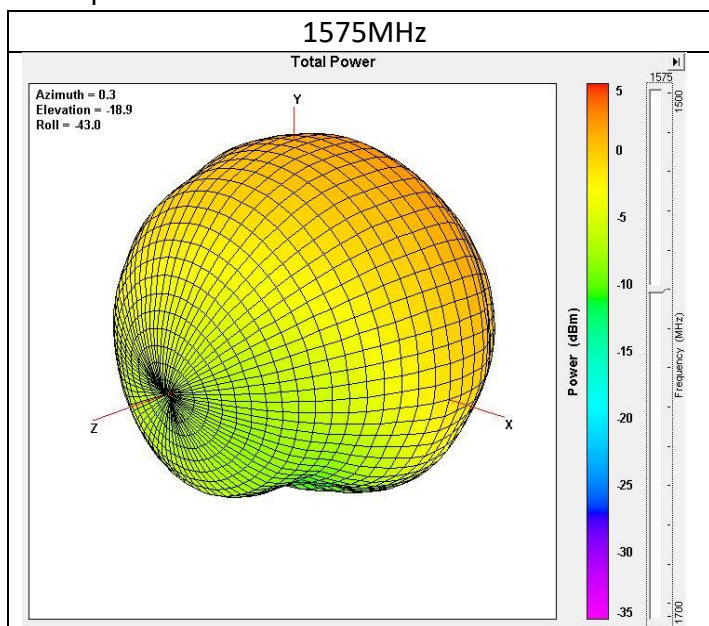
Green Antenna Pte Ltd

29 Mandai Estate #07-09, Singapore 729932

Specifications:

Antenna Model	GA252504GPSC02
Antenna Type	Patch Antenna
Frequency	1.559 GHz, 1.575GHz, 1.606GHz
S11	-3.58dB, -7.31dB, -4.42dB
Peak Gain	2.69dBi@1.585GHz
Total Efficiency	~41%, ~55.2%, ~35.7%
Dimension	25mm x 25mm x4.0 mm

Radiation pattern:



3.3 Cellular Antenna

Antenna manufacturer name & address:

Green Antenna Pte Ltd

29 Mandai Estate #07-09, Singapore 729932

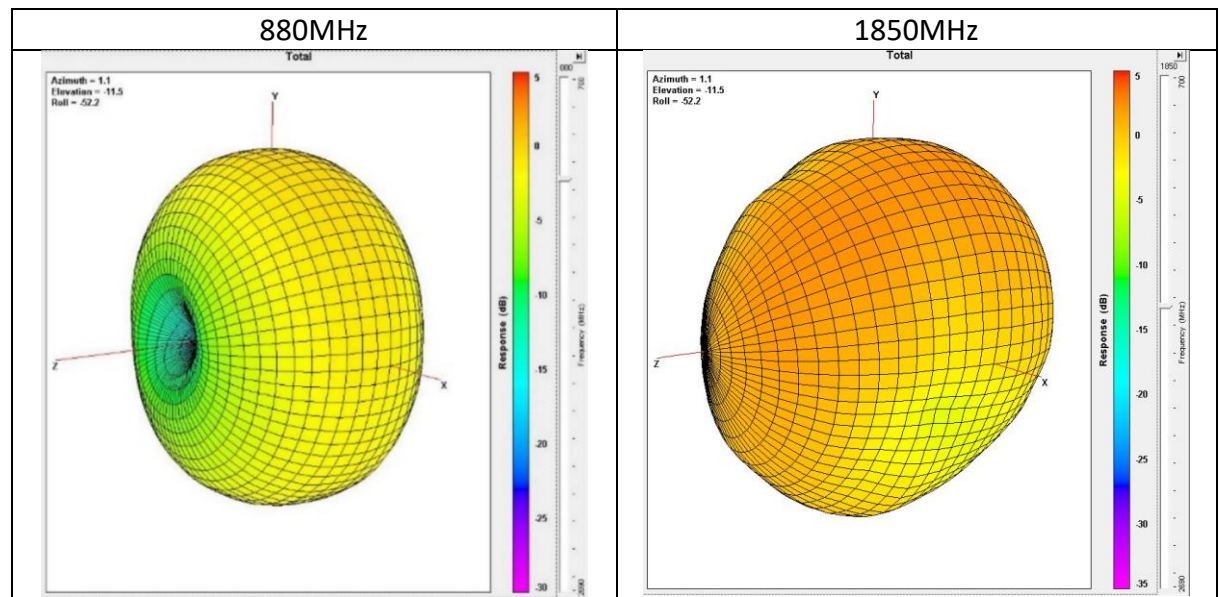
Specifications:

Antenna Model	GALHPTE02
Antenna Type	Metal Stamp Antenna
Frequency	0.699 - 0.96GHz, 1.71 - 2.69GHz
S11	<-2.2dB, <-4dB
Peak Gain	0.48dBi@0.8GHz; 4.39dBi@2.32GHz
Total Efficiency	~50%, ~67%

Peak Gain:

Bands	Transmit Frequency (MHz)	Peak Gain (dBi)
WCDMA B1	1920-1980	2.61
WCDMA B2	1850-1910	2.61
WCDMA B3	1710-1785	2.78
WCDMA B4	1710-1755	2.75
WCDMA B5	824-849	0.15
WCDMA B6	830-840	0.11
WCDMA B8	880-915	-0.14
WCDMA B19	830-845	-0.14
LTE FDD B1	1920-1980	2.61
LTE FDD B2	1850-1910	2.61
LTE FDD B3	1710-1785	2.78
LTE FDD B4	1710-1755	2.75
LTE FDD B5	824-849	0.15
LTE FDD B7	2500-2570	1.96
LTE FDD B8	880-915	-0.14
LTE FDD B12	698-716	-1.54
LTE FDD B13	777-787	0.19
LTE FDD B18	815-830	0.22
LTE FDD B19	830-845	-0.14
LTE FDD B20	832-862	0.04
LTE FDD B26	814-849	0.22
LTE FDD B28	703-748	-0.79
LTE FDD B66	1710-1780	2.78
LTE TDD B38	2570-2620	1.75
LTE TDD B40	2300-2400	4.42
LTE TDD B41	2496-2690	1.96

Radiation Pattern:



Antenna Dimensions:

