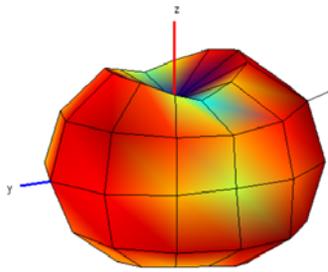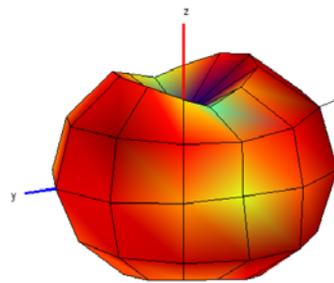◼ FCC ID: A3LSMA346M

◼ Antenna Manufacturer

 - Main Metal Ant : SAMSUNG / SUB METAL Ant : SAMSUNG / SUB LDS Ant: Kyocera AVX inc.

MAIN1(METAL) LTE B2, NR N2, PCS 1900, W2	1	2
Frequency(MHz)	1880	1960
Efficiency(dB)	-5.0	-5.1
Efficiency(%)	31.5	30.6
Peak Gain(dBi)	-4.8	-4.8

1

2

MAIN1(METAL) LTE B4, W4	1	2
Frequency(MHz)	1747.5	1842.5
Efficiency(dB)	-5.1	-5.8
Efficiency(%)	30.6	26.3
Peak Gain(dBi)	-4.7	-5.5
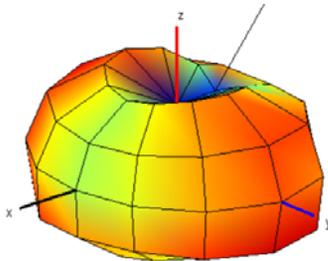
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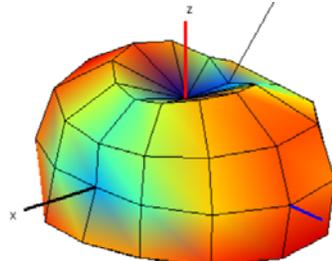
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MAIN1(METAL) B1, NR N1, W1	1	2
Frequency(MHz)	1920	1980
Efficiency(dB)	-4.1	-5.5
Efficiency(%)	38.5	28.2
Peak Gain(dBi)	-3.8	-5.2
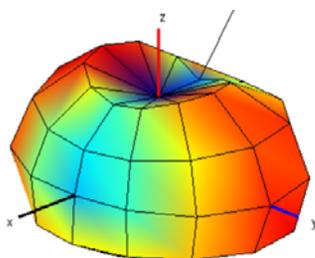
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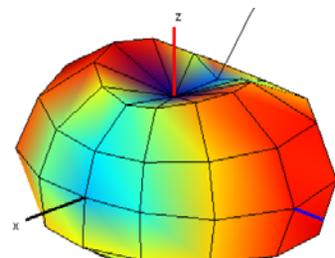
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MAIN1(METAL) B3, NR N3, DCS1800	1	2
Frequency(MHz)	1710	1785
Efficiency(dB)	-5.0	-5.1
Efficiency(%)	31.5	30.9
Peak Gain(dBi)	-4.5	-4.7
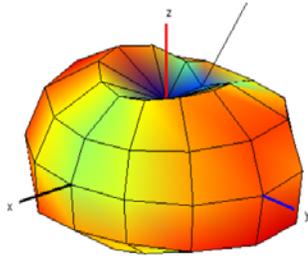
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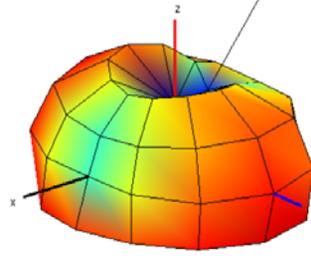
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MAIN1(METAL) B28, NR N28	1	2
Frequency(MHz)	703	748
Efficiency(dB)	-6.4	-8.3
Efficiency(%)	23.1	14.8
Peak Gain(dBi)	-5.9	-7.6

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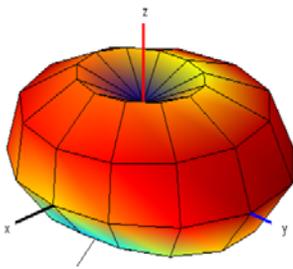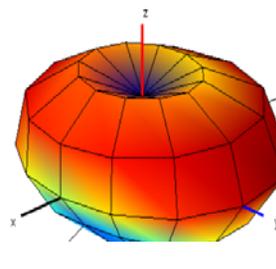
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MAIN1(METAL) LTE B5, NR N5, GSM 850, W5	1	2
Frequency(MHz)	836.5	881.5
Efficiency(dB)	-6.1	-6.6
Efficiency(%)	24.6	22.0
Peak Gain(dBi)	-5.5	-6.3

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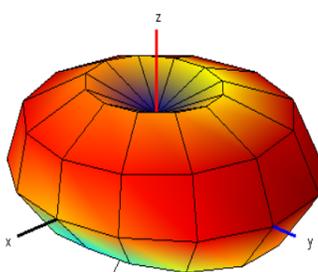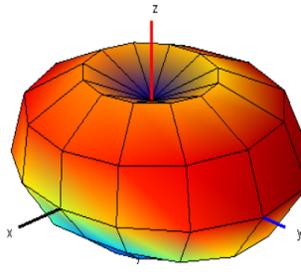
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MAIN1(METAL) LTE B8, NR N8, W8, GSM900	1	2
Frequency(MHz)	880	915
Efficiency(dB)	-6.8	-6.6
Efficiency(%)	20.6	21.8
Peak Gain(dBi)	-6.2	-5.9

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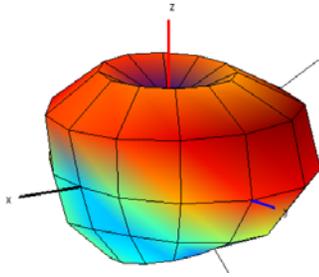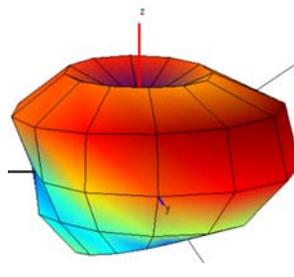
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MAIN1(METAL) LTE B12, B13, B17	1	2
Frequency(MHz)	707.5	737.5
Efficiency(dB)	-6.3	-6.9
Efficiency(%)	23.6	20.3
Peak Gain(dBi)	-5.9	-6.4

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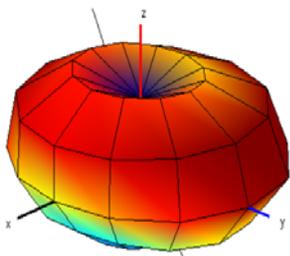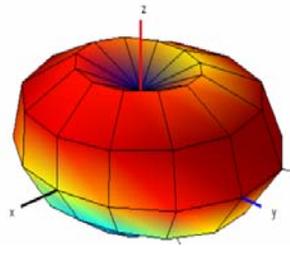
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MAIN1(METAL) LTE B26, B20	1	2
Frequency(MHz)	831.5	876.5
Efficiency(dB)	-7.1	-6.4
Efficiency(%)	19.5	23.0
Peak Gain(dBi)	-6.5	-6.1

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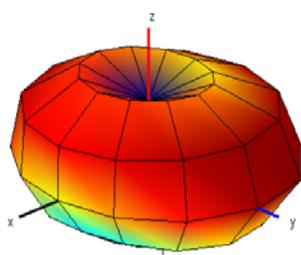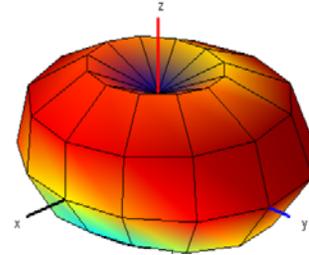
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MAIN1(METAL) LTE B66, NR N66	1	2
Frequency(MHz)	1745	2155
Efficiency(dB)	-5.4	-12.1
Efficiency(%)	29.2	6.2
Peak Gain(dBi)	-5.0	-11.5

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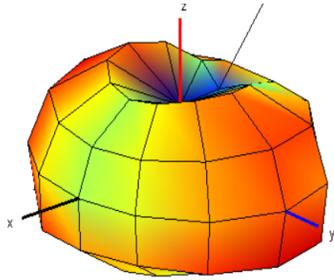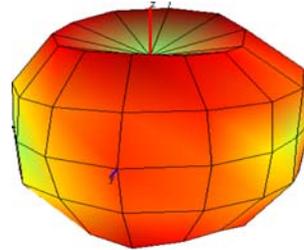
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MAIN2(METAL) LTE B7, NR N7	1	2
Frequency(MHz)	2535	2655
Efficiency(dB)	-5.6	-5.4
Efficiency(%)	27.6	29.0
Peak Gain(dBi)	-4.9	-5.1

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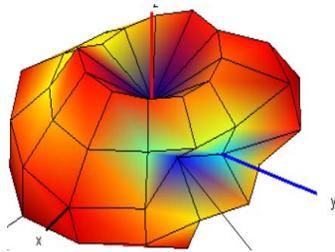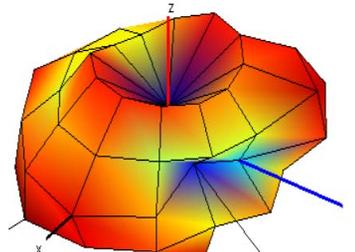
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MAIN2(METAL) LTE B38, B41, NR N41	1	2
Frequency(MHz)	2595	
Efficiency(dB)	-5.1	
Efficiency(%)	30.9	
Peak Gain(dBi)	-4.8	
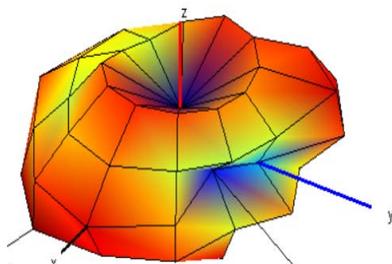
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MAIN2(METAL) LTE B40, NR N40	1	2
Frequency(MHz)	2350	
Efficiency(dB)	-6.6	
Efficiency(%)	21.8	
Peak Gain(dBi)	-6.3	
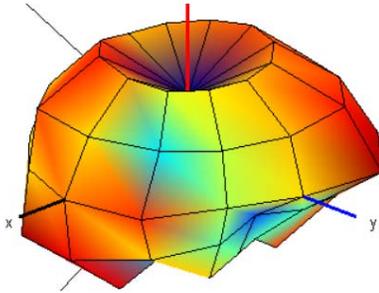
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SUB3(METAL) NR N78	1	2
Frequency(MHz)	3300	3800
Efficiency(dB)	-4.5	-5.3
Efficiency(%)	34.9	29.3
Peak Gain(dBi)	-4.2	-4.9
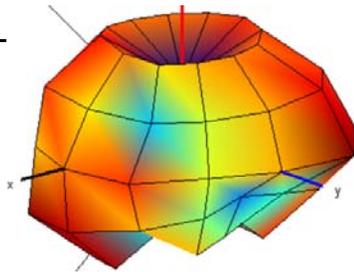
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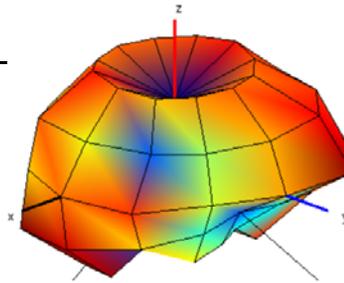
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SUB4(METAL+LDS) WiFi 5G_ANT	1	2	3
Frequency(MHz)	5150	5500	5825
Efficiency(dB)	-9.25	-9.05	-9.42
Efficiency(%)	12.24	12.43	12.01
Peak Gain(dBi)	-8.89	-8.7	-9.03
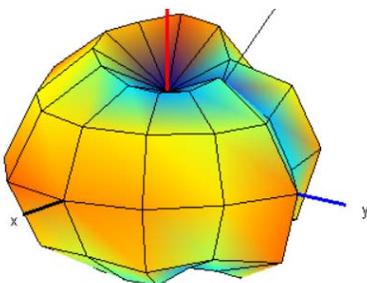
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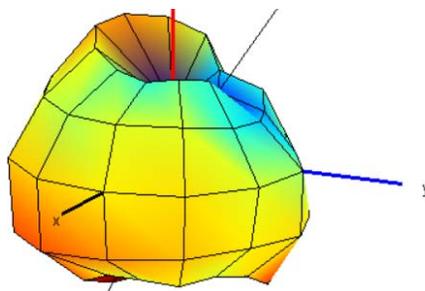
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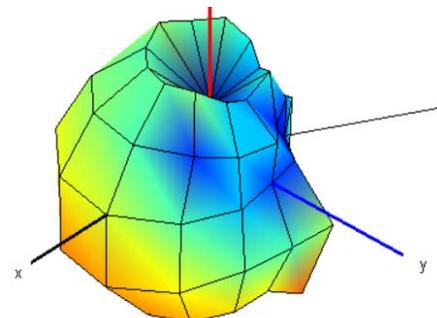
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SUB5(METAL+LDS) BT/WiFi 2.4G_ANT, 5G_ANT	1	2	3	1	2	3
Frequency(MHz)	2400	2440	2480	5150	5500	5825
Efficiency(dB)	-9.85	-9.93	-9.88	-9.95	-9.85	-9.72
Efficiency(%)	10.15	10.33	10.24	10.28	10.43	10.65
Peak Gain(dBi)	-9.52	-9.43	-9.68	-9.78	-9.51	-9.43
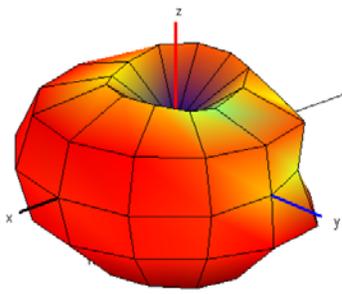
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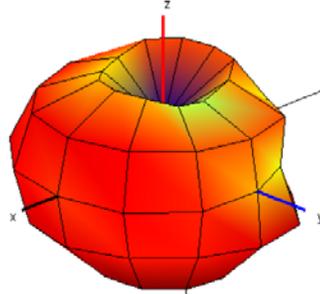
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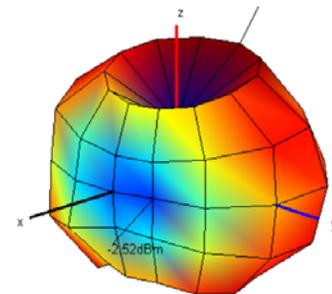
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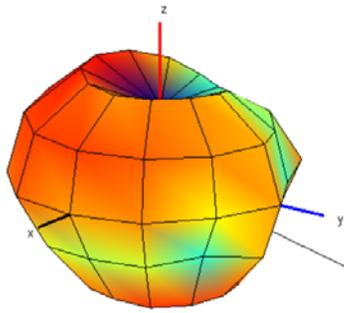
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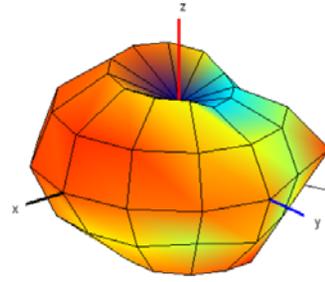
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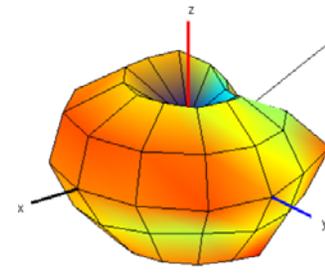
5G_ 3

SUB8(LDS) BT/WiFi 2.4G_ANT	1	2	3
Frequency(MHz)	2400	2440	2480
Efficiency(dB)	-9.55	-9.53	-9.92
Efficiency(%)	10.03	10.23	10.01
Peak Gain(dBi)	-9.24	-9.03	-9.38
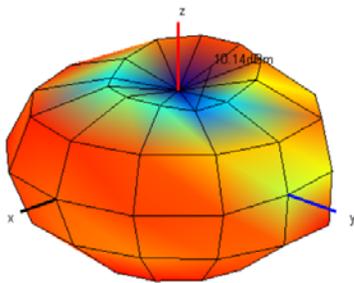
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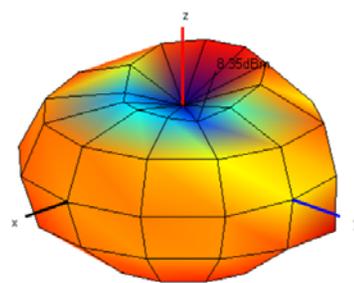
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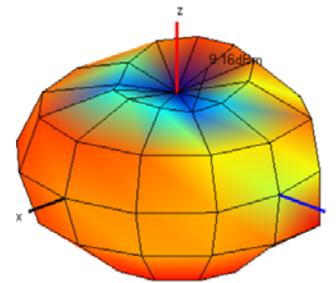
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SUB2(METAL) LTE B2, B4, B66, NR N66	1	2	3	4	5	6
Frequency(MHz)	1710	1780	1880	1960	2155	2132.5
Efficiency(dB)	-6.1	-5.9	-6.1	-6.2	-7.3	-6.6
Efficiency(%)	24.5	25.6	24.5	24	18.4	21.7
Peak Gain(dBi)	-2.1	-1.9	-2.1	-2.1	-2.6	-2.3
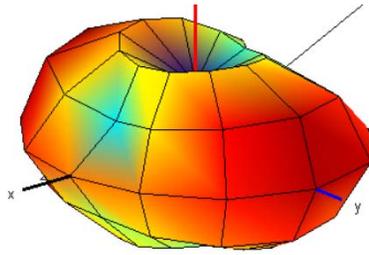
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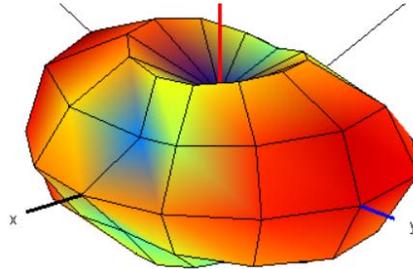
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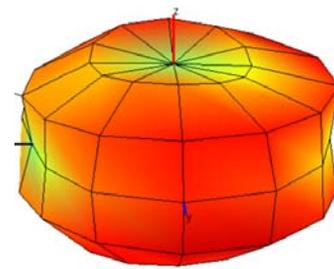
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6

■ Antenna Measurement information

- **Measurement information**

Gain value is measured by Samsung Electronics.
Gain Value is measured in active call & Antenna selection.
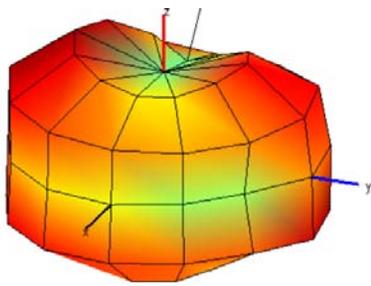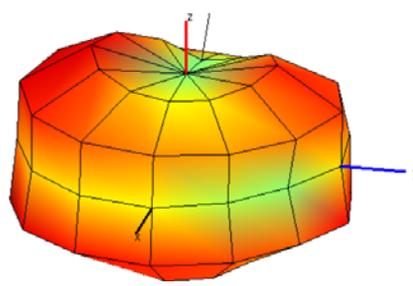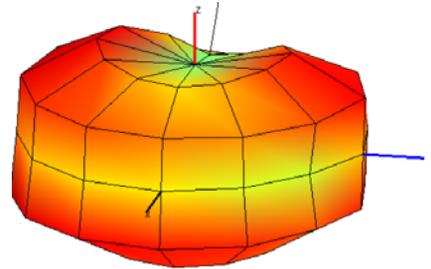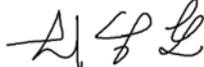
Antenna gain is measured in RTS60 Chamber.

*Test Equipment list

| Description	Manufacturer	Model	S/N	Cal Date
Network Analyzer	R&S	ZNB 8	001-A-129	2022.02.16.

Test dates : 2022.12.04 ~ 2022.12.07

Names of test personnel : Sanghoon Choi   Signature:

Lab Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

- **Return Loss & VSWR Test**

The VSWR measurement of antennas assembled into a fully operating SM-A346B phone handset is measured on the Network Analyzer. The handset is set up with a 50 Ohm coaxial cable connected to the 50 Ohm point. Calibration is done at the end of the 50 Ohm coaxial cable connection. The other end of the 50 Ohm coaxial cable is connected to a network analyzer. The handset is positioned on a non-conductive table for free space measurements.

See Photo #1
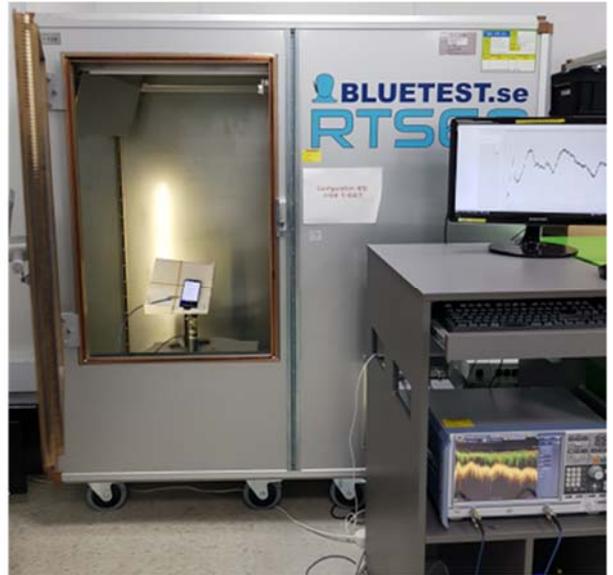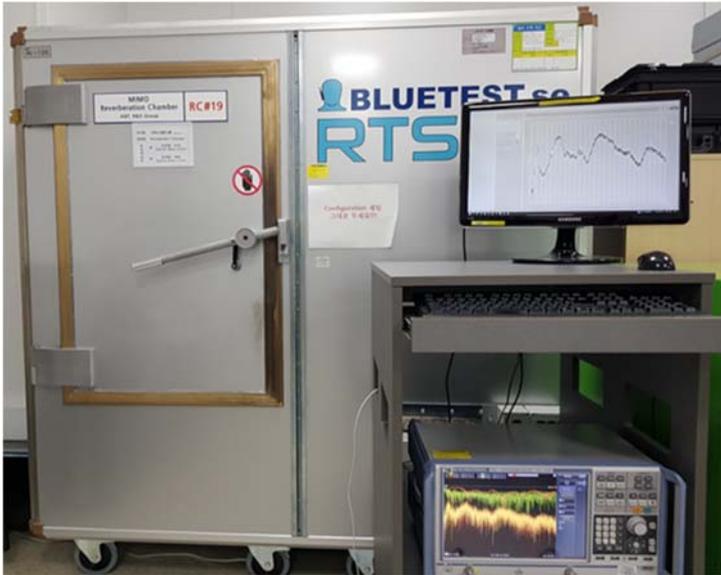
- **Return Loss & VSWR Test**

Samsung has a system that can measure VSWR using RTS60 chamber and ZNB 8 network analyzer for passive measurement. In order to measure the VSWR of each antenna, the lab connects the coaxial cable to the point in contact with the antenna on the main board. The VSWR is measured through the coaxial cable connected in the set. At this time, SM-A346B is assembled in the same state as the user environment

See Photo : Appendix Antenna specification Setup photo

- **Radiation Pattern Test**

The AC chamber has an axis because the cradle moves left and right up and down, and the RC chamber (RTS60) we use does not have an axis because the cradle does not move.

- **Test Method (Manufacturing)**

All measurements are done with SM-A346B fully assembled. Measure in consideration of the Customer's usage environment. Use a fully shielded chamber environment to prevent any noise-induced errors. Typically. The electrical properties of antenna are measured using a jig that can hold the set.

- **Radiation Pattern**

There is no Radiation Pattern due to passive measurement with RC chamber.