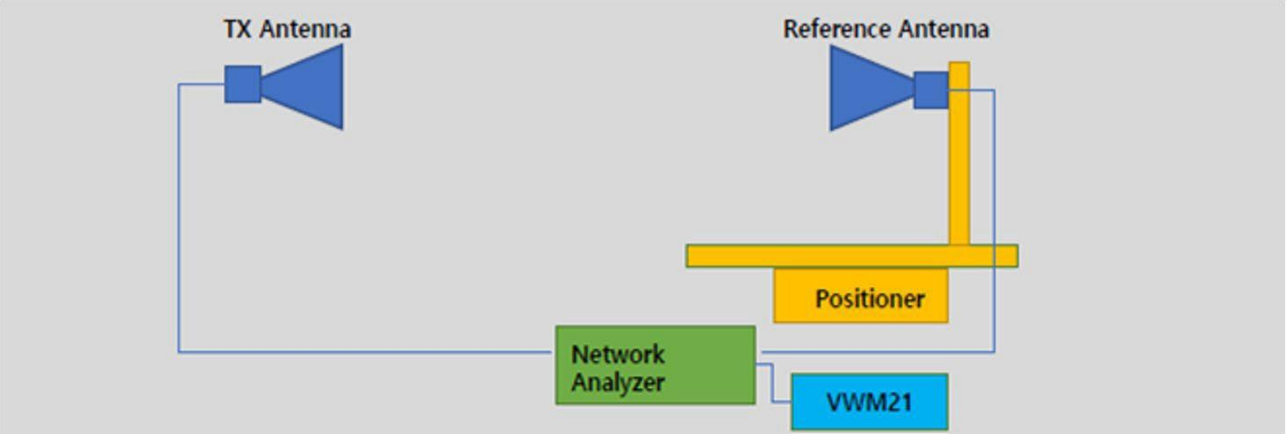
■ FCC ID: A3LSMX516B

■ Model: SM-X516B

1. Table of calibrated equipment



Part	Model Name	Specification	
Tx Antenna	QRH-006M-006G	600MHz to 6GHz	Calibrated date :2022.8.8 / Cal. Due : 2023.12.28
	QRH-002G-018G	2GHz to 18GHz	Calibrated date :2022.8.8 / Cal. Due : 2023.12.28
Reference Antenna	BBHA9120LFA	680MHz to 6500MHz	Calibration Frequency(680MHzto 6GHz) Calibrated date:2022.8.8 / Cal. Due : 2023.12.28
	BBHA9120C	2GHz to 18GHz	Calibration Frequency(2GHz to 8.5GHz) Calibrated date:2022.8.8 / Cal. Due : 2023.12.28
Network Analyzer	Agilent 5071B	300KHz to 8.5GHz	Calibrated date :2022.8.8 / Cal. Due : 2023.12.28
Measurement Software	VWM21		MTG Visual Wave-Mobile(Ver.2.1)

Test dates

2023.06.20

Names of test personnel

JIYEON YUN

Names of commercial test software being used

MTG Visual Wave-Mobile (Ver.2.1)

SM-X516B Antenna specification Test setup photo

2.1. Return Loss & VSWR Test

The VSWR measurement of antennas assembled into a fully operating SM-X516B 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.

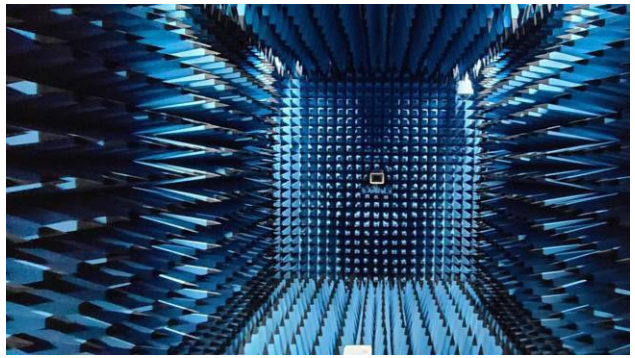
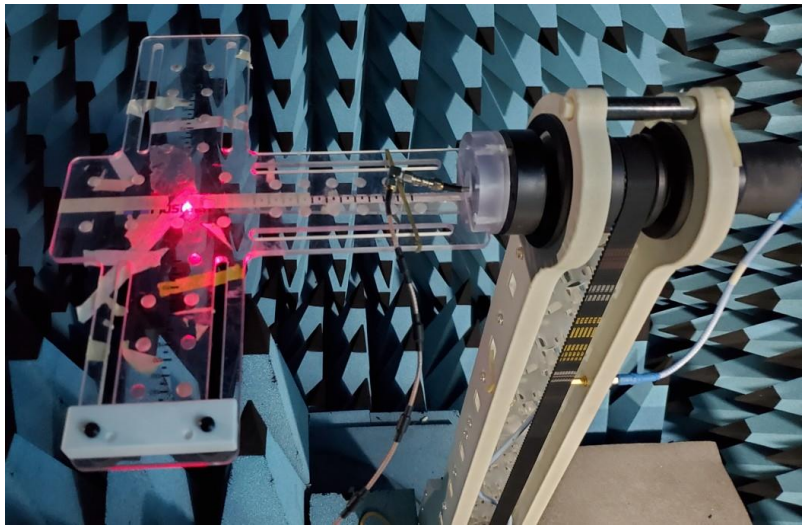


Figure 2: Geometry of Anechoic Chamber for Radiation patterns.

- ✓ Location : Samsung R&D Center R5 bld.
- ✓ Size : 4m x 2.5 x 2.5m (L x W x H)
- ✓ Frequency : 600 MHz -18GHz
- ✓ TX Antenna : 2GHz –18GHz Dual Polarization
- ✓ Quiet zone : 22cm @ 6GHz (Far-Field Length 2m)
- ✓ 2-axis DUT positioner -360°continuous rotation

2.2. Return Loss & VSWR Test

Samsung Antenna Lab has a system that can measure VSWR using Anechoic Chamber and ZNB8 network analyzer. In order to measure the VSWR of each antenna, the antenna 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, the SM-X516B is assembled in the same state as the user environment.

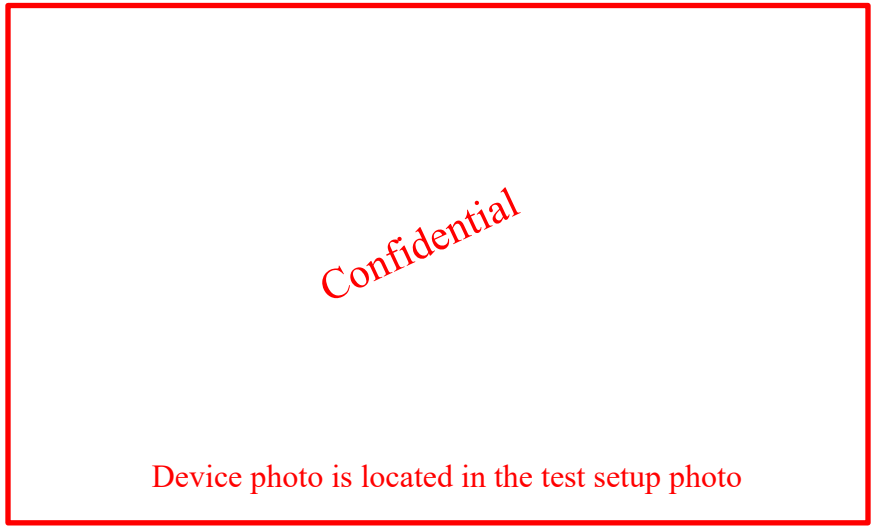


※ Coaxial cables are connected to each antenna.

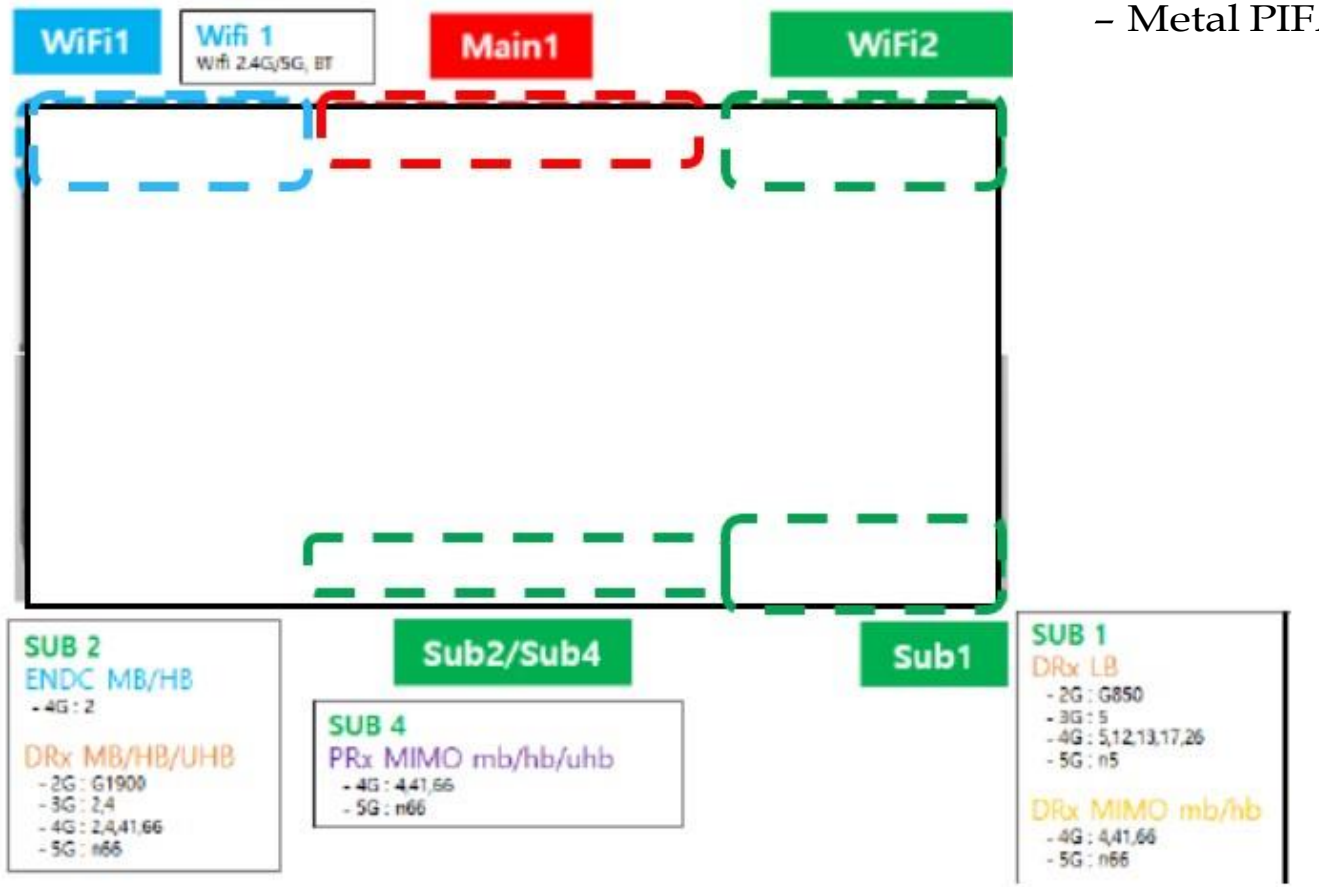
※ The coaxial cable is connected to the RTS60 chamber to measure the VSWR.

3. Radiation Pattern Test

Antennas tested for Gain and Efficiency must be assembled into the enclosure and tested in the fully assembled and operating SM-X516B handset. The antenna is tested in free space in the anechoic chamber in the H, E1 and, E2 planes. The radiation patterns are measured at the center of transmit and receive bands.



5. Antenna location

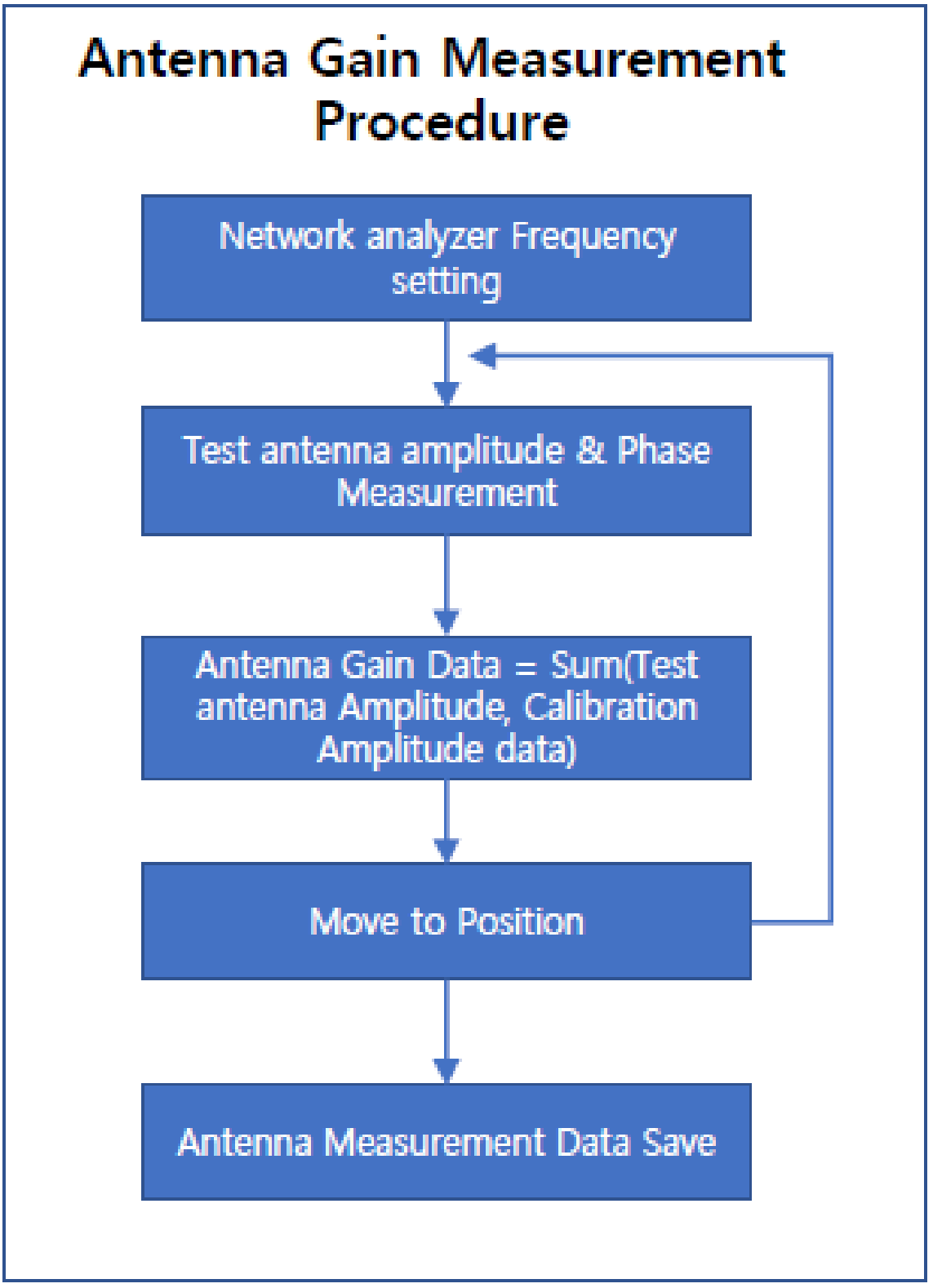


■ Antenna Manufacture
-Main1 Ant : SAMSUNG
-Metal PIFA

-WIFI1(BT/WIFI) Antenna: SAMSUNG
– Metal PIFA

-WIFI2(WIFI/GPS) Antenna: SAMSUNG
– Metal PIFA

6. Antenna Gain Measurement Procedure



7.Radiation Patterns

Ant	Band	Freq. (MHz)	EFF	AVG	Peak
M1	LTE B12, B17	699	24.0	-6.2	-4.6
		707	23.4	-6.3	-4.7
		716	28.8	-5.4	-3.2
		729	27.5	-5.6	-3.1
		737	26.3	-5.8	-3.4
		746	25.7	-5.9	-4.0
	LTE B13	746	33.1	-4.8	-2.8
		751	34.7	-4.6	-2.9
		756	35.5	-4.5	-2.7
		777	37.2	-4.3	-2.4
		782	38.9	-4.1	-2.1
		787	38.0	-4.2	-2.0
	G850 WB5 LTE B5, B26 N5	814	39.8	-4.0	-2.2
		831	37.2	-4.3	-1.8
		849	37.2	-4.3	-2.2
		859	39.8	-4.0	-1.9
		876	35.5	-4.5	-2.7
		894	31.6	-5.0	-3.5
	WB4 LTE B4, B66 N66	1710	46.8	-3.3	-1.7
		1745	46.8	-3.3	-1.5
		1780	46.8	-3.3	-1.4
		2110	30.2	-5.2	-3.2
		2155	24.5	-6.1	-4.6
		2200	20.9	-6.8	-4.6
	G1900 WB2 LTE B2	1850	47.9	-3.2	-1.5
		1880	44.7	-3.5	-1.1
		1915	44.7	-3.5	-1.1
		1930	43.7	-3.6	-1.8
		1960	41.7	-3.8	-1.4
		1995	39.8	-4.0	-1.5
	LTE B41	2500	30.9	-5.1	-3.1
		2540	27.5	-5.6	-4.0
		2580	30.2	-5.2	-3.1
		2620	28.2	-5.5	-3.6
		2660	28.8	-5.4	-3.7
		2700	30.2	-5.2	-2.9

Ant	Band	Freq. (MHz)	EFF	AVG	Peak
Sub2	LTE B2	1852	20.9	-6.8	-5.2
		1880	21.9	-6.6	-4.2
		1907	22.4	-6.5	-4.2

Ant	Band	Freq. (MHz)	AVG	Peak
Wifi1	2.4G	2400	-6.3	-5.2
		2451	-6.4	-4.9
		2473	-6.6	-4.8
		2480	-6.5	-5.0
	5G	5150	-6.8	-5.5
		5350	-7.8	-6.0
		5500	-8.8	-5.9
		5700	-8.2	-6.0
		5795	-8.7	-6.3
		5815	-7.9	-6.6
		5825	-7.9	-6.2
		5850	-6.9	-6.4
		5885	-7.3	-6.5
Wifi2	2.4G	2400	-6.5	-5.2
		2451	-6.3	-5.5
		2473	-6.6	-5.2
		2480	-6.6	-5.2
	5G	5150	-8.1	-6.5
		5350	-8.7	-6.1
		5500	-8.9	-6.4
		5700	-8.8	-6.2
		5795	-8.9	-6.3
		5815	-8.5	-6.0
		5825	-8.7	-6.1
		5850	-8.8	-6.2
		5885	-8.5	-6.7

8. Contact person

■ Name: Dongsuk Lee

■ Signature: 이동석