

A3LSMA256E Main RF & BT/WIFI Ant Specification

Main Ant A/B , Sub Ant C/D/E/F/G/H

- Antenna Type : MFA
- Antenna Manufacturer : Galtronics

Gain value is measured by Galtronics.

Gain Value is measured in active call & Antenna selection.

Antenna gain is measured in MTG Chamber.

* MTG Chamer

Anechoic chamber is available for Over The Air Test per CTIA, LTE and WiFi Test. Also it is available for antenna pattern measurement for design and development. It's important to RF shielding, absorbing material, absorber layout, precision mechanical alignment and positioner accuracy, when anechoic chamber is designed and installed. MTG can provide the design and construction of anechoic chamber for customer requirements. MTG has a series of positioners, microwave transmit and receive instruments and measurement data acquisition and analysis software. We have the experience to offer anechoic chamber of any size; from the smallest unit for simple RF test to the largest and most complex custom-build for a research and development laboratory.

*Test Equipment list

Description	Manufacturer	Model	S/N	Cal Due
Network Analyzer	Agilent Technologies	N5230A	MY45000186	2024.02.10

Test dates

- 2023.10.23

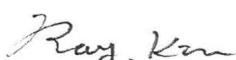
Names of test personnel

- Dohoon Kim / Yeonhyun Song / Suhyun Kim / Jonghyun Lee

Test Lab address

- Galtronics Korea R&D Center, 1-B214, Innoplex Bldg., 306, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675 Korea

Contact person

- Name : Dohoon Kim
- Signature : 

- Return Loss & VSWR Test

The VSWR measurement of antennas assembled into a fully operating SM-A256E&B 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.



- Return Loss & VSWR Test

Galtronics has a system that can measure VSWR using MTG chamber and N5230A 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-A256E&B is assembled in the same state as the user environment

Please refer to appendix file PHOTO A

- Radiation Pattern Test

Antennas tested for Gain and Efficiency must be assembled into the enclosure and tested in the fully assembled and operating SM-A256E&B 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.

Please refer to appendix file PHOTO B

- Test Method (Manufacturing)

All measurements are done with SM-A256E&B 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.

A3LSMA256E

RF Antenna Gain

Antenna A(Main1)

- MFA

- Manufacturer : Galtronics.

Antenna A	Band	B12	B17	B13	B26
	Avg. gain (dBi)	-7.26	-7.19	-7.67	-7.14
	Peak gain (dBi)	-4.16	-4.06	-5.05	-4.36
	Band	B5			
	Avg. gain (dBi)	-7.35			
	Peak gain (dBi)	-4.42			

Antenna B(Main2)

- MFA

- Manufacturer : Galtronics.

Antenna B	Band	B4	B66	B2
	Avg. gain (dBi)	-5.16	-5.11	-4.27
	Peak gain (dBi)	-0.77	-0.58	0.30
	Band	B41	n77	
	Avg. gain (dBi)	-3.66	-9.20	
	Peak gain (dBi)	1.31	-4.41	

Antenna C(Sub1)

- MFA

- Manufacturer : Galtronics.

Antenna C	Band	B2	B4	B5	
	Avg. gain (dBi)	-6.95	-7.20	-8.99	
	Peak gain (dBi)	-3.59	-3.27	-6.20	
	Band	B12	B13	B17	B26
	Avg. gain (dBi)	-8.97	-9.28	-8.98	-8.46
	Peak gain (dBi)	-5.70	-6.08	-5.71	-5.58
	Band	B41	B66		
	Avg. gain (dBi)	-7.00	-7.62		
	Peak gain (dBi)	-3.18	-3.58		

Antenna D(Sub2)

- MFA

- Manufacturer : Galtronics.

Antenna D	Band	B66	n77	B2	B4
	Avg. gain (dBi)	-10.10	-6.72	-8.32	-9.74
	Peak gain (dBi)	-3.88	-2.20	-1.76	-3.33
	Band	GPS			
	Avg. gain (dBi)	-6.02			
	Peak gain (dBi)	-0.87			

Antenna E & F(Main3 & Sub3)

- MFA

- Manufacturer : Galtronics.

Antenna E	Band	B2	B4	B66
	Ave. gain (dBi)	-7.56	-8.33	-8.76
	Peak gain (dBi)	-2.14	-3.50	-3.74

Antenna F	Band	n77
	Ave. gain (dBi)	-3.36
	Peak gain (dBi)	2.73

Antenna G(Sub4)

- MFA

- Manufacturer : Galtronics.

Antenna G	Band	B41
	Ave. gain (dBi)	-7.93
	Peak gain (dBi)	-3.96

Antenna H(Sub5)

- MFA

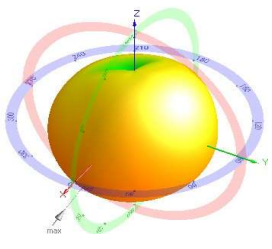
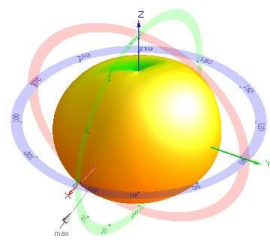
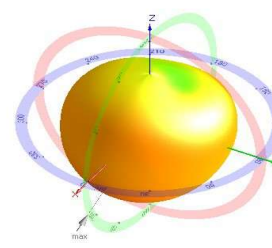
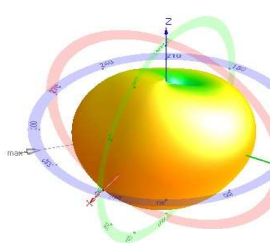
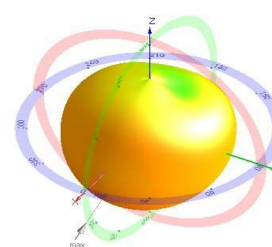
- Manufacturer : Galtronics.

Antenna H	Band	B41	n77	WiFi 2G	WiFi 5G
	Ave. gain (dBi)	-11.60	-9.91	-8.60	-7.77
	Peak gain (dBi)	-5.99	-4.84	-7.29	-6.24

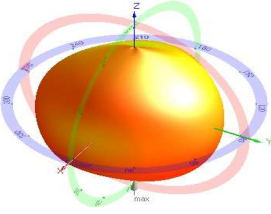
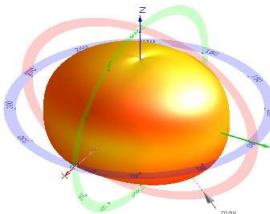
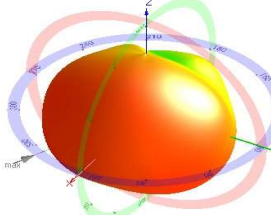
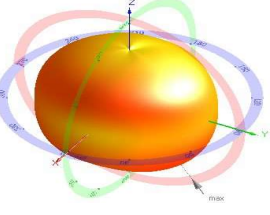
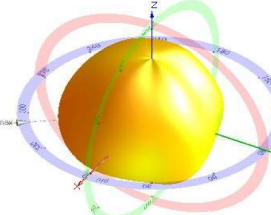
● Radiation Pattern

There is Radiation Pattern due to passive measurement with MTG chamber.

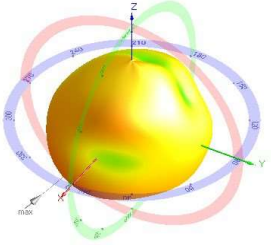
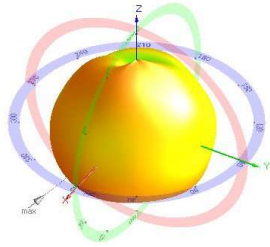
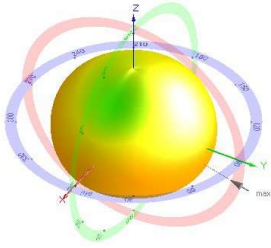
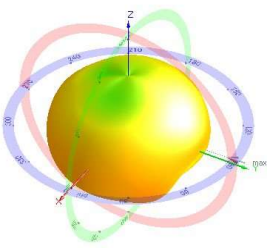
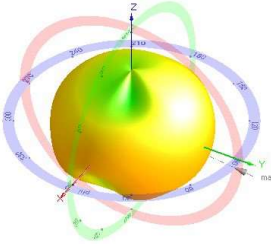
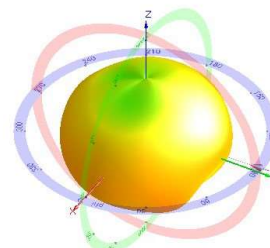
Antenna A(Main1)

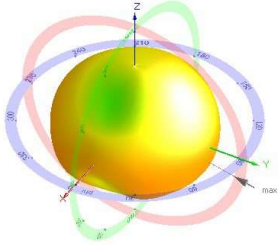
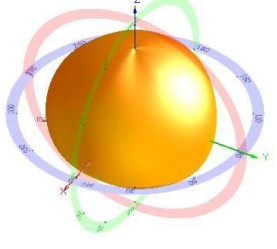
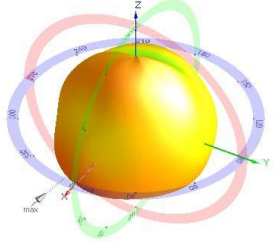
주파수 대역	Main1	
(Frequency Band)	B12	B17
3D Radiation Pattern	707.500MHz 	710.000MHz 
Efficiency[%]	18.78	19.08
Avg Gain [dBi]	-7.26	-7.19
Peak Gain [dBi]	-4.16	-4.06
주파수 대역	Main1	
(Frequency Band)	B26	B13
3D Radiation Pattern	831.500MHz 	782.000MHz 
Efficiency[%]	19.31	17.11
Avg Gain [dBi]	-7.14	-7.67
Peak Gain [dBi]	-4.36	-5.05
주파수 대역	Main1	
(Frequency Band)	B5	
3D Radiation Pattern	836.500MHz 	
Efficiency[%]	18.41	
Avg Gain [dBi]	-7.35	
Peak Gain [dBi]	-4.42	

Antenna B(Main2)

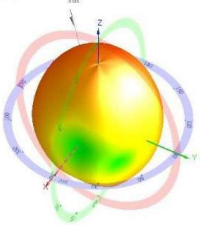
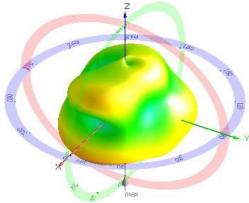
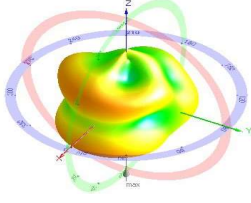
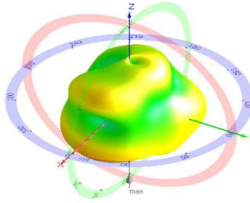
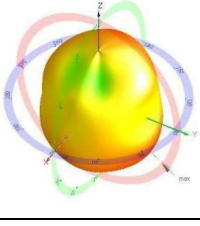
주파수 대역	Main2	
(Frequency Band)	B2	B4
3D Radiation Pattern	1880.000MHz 	1732.500MHz 
Efficiency[%]	37.44	30.45
Avg Gain [dBi]	-4.27	-5.16
Peak Gain [dBi]	0.30	-0.77
주파수 대역	Main2	
(Frequency Band)	B41	B66
3D Radiation Pattern	2593.000MHz 	1745.000MHz 
Efficiency[%]	43.07	30.86
Avg Gain [dBi]	-3.66	-5.11
Peak Gain [dBi]	1.31	-0.58
주파수 대역	Main2	
(Frequency Band)	n77	
3D Radiation Pattern	3750.000MHz 	
Efficiency[%]	12.02	
Avg Gain [dBi]	-9.2	
Peak Gain [dBi]	-4.41	

Antenna C(Sub1)

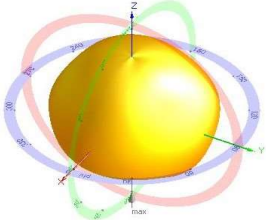
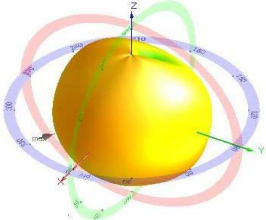
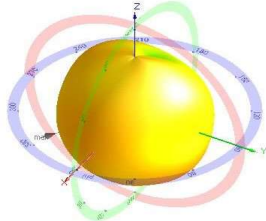
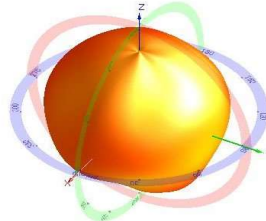
주파수 대역	Sub1	
(Frequency Band)	B2	B4
3D Radiation Pattern	1960.000MHz 	2132.500MHz 
	Efficiency[%]	20.19
	Avg Gain [dBi]	-6.95
	Peak Gain [dBi]	-3.59
주파수 대역	Sub1	
(Frequency Band)	B5	B12
3D Radiation Pattern	881.500MHz 	737.500MHz 
	Efficiency[%]	12.63
	Avg Gain [dBi]	-8.99
	Peak Gain [dBi]	-6.20
주파수 대역	Sub1	
(Frequency Band)	B13	B17
3D Radiation Pattern	751.000MHz 	740.000MHz 
	Efficiency[%]	11.80
	Avg Gain [dBi]	-9.28
	Peak Gain [dBi]	-6.08

주파수 대역	Sub1	
(Frequency Band)	B26	B41
3D Radiation Pattern	876.500MHz 	2593.000MHz 
Efficiency[%]	14.26	19.96
Avg Gain [dBi]	-8.46	-7.00
Peak Gain [dBi]	-5.58	-3.18
주파수 대역	Sub1	
(Frequency Band)	B66	
3D Radiation Pattern	2155.000MHz 	
Efficiency[%]	17.28	
Avg Gain [dBi]	-7.62	
Peak Gain [dBi]	-3.58	

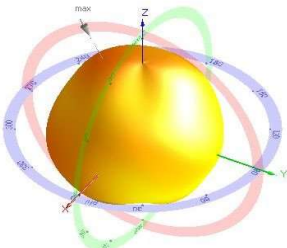
Antenna D(Sub2)

주파수 대역	Sub2	
(Frequency Band)	n77	B66
3D Radiation Pattern	3750.000MHz 	2155.000MHz 
Efficiency[%]	21.26	9.77
Avg Gain [dBi]	-6.72	-10.1
Peak Gain [dBi]	-2.20	-3.88
주파수 대역	Sub2	
(Frequency Band)	B2	B4
3D Radiation Pattern	1960.000MHz 	2132.500MHz 
Efficiency[%]	14.71	10.63
Avg Gain [dBi]	-8.32	-9.74
Peak Gain [dBi]	-1.76	-3.33
주파수 대역	Sub2	
(Frequency Band)	GPS	
3D Radiation Pattern	1575.000MHz 	
Efficiency[%]	25.03	
Avg Gain [dBi]	-6.02	
Peak Gain [dBi]	-0.87	

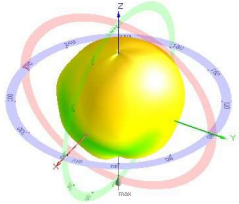
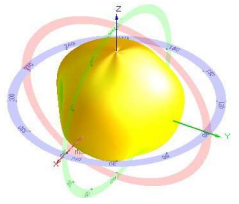
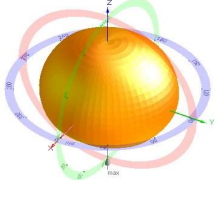
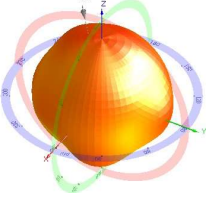
Antenna E & F (Main3 & Sub3)

주파수 대역	Main3	
(Frequency Band)	B2	B4
3D Radiation Pattern	1960.000MHz 	2132.500MHz 
	Efficiency[%]	17.56
	Avg Gain [dBi]	-7.56
	Peak Gain [dBi]	-2.14
주파수 대역	Main3	
(Frequency Band)	B66	n77
3D Radiation Pattern	2155.000MHz 	3750.000MHz 
	Efficiency[%]	13.32
	Avg Gain [dBi]	-8.76
	Peak Gain [dBi]	-3.74

Antenna G (Sub4)

주파수 대역	Sub4	
(Frequency Band)	B41	
3D Radiation Pattern	2593.000MHz 	
	Efficiency[%]	16.11
	Avg Gain [dBi]	-7.93
	Peak Gain [dBi]	-3.96

Antenna H (Sub5)

주파수 대역	Sub5	
(Frequency Band)	B41	n77
3D Radiation Pattern	2593.000MHz 	3750.000MHz 
	Efficiency[%]	6.91
	Avg Gain [dBi]	-11.60
	Peak Gain [dBi]	-5.99
주파수 대역	Sub5	
(Frequency Band)	WiFi 2.4GHz	WiFi 5GHz
3D Radiation Pattern	2437.000MHz 	5500.000MHz 
	Efficiency[%]	14.68
	Avg Gain [dBi]	-8.60
	Peak Gain [dBi]	-7.29
	Efficiency[%]	16.87
	Avg Gain [dBi]	-7.77
	Peak Gain [dBi]	-6.24