A3LSMA165M BT/WIFI Ant Specification

- Antenna Type : LDS
- Antenna Manufacturer : Galtronics

Gain value is measured by Galtronics.
Antenna gain is measured in MTG chamber.

* MTG Chamber

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.

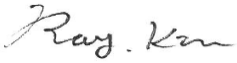
*Test Equipment list

Description	Manufacturer	Model	S/N	Cal Due
Network Analyzer	Agilent Technologies	N5230A	MY45000186	2024.02.19

Test dates
- 2024.08.20

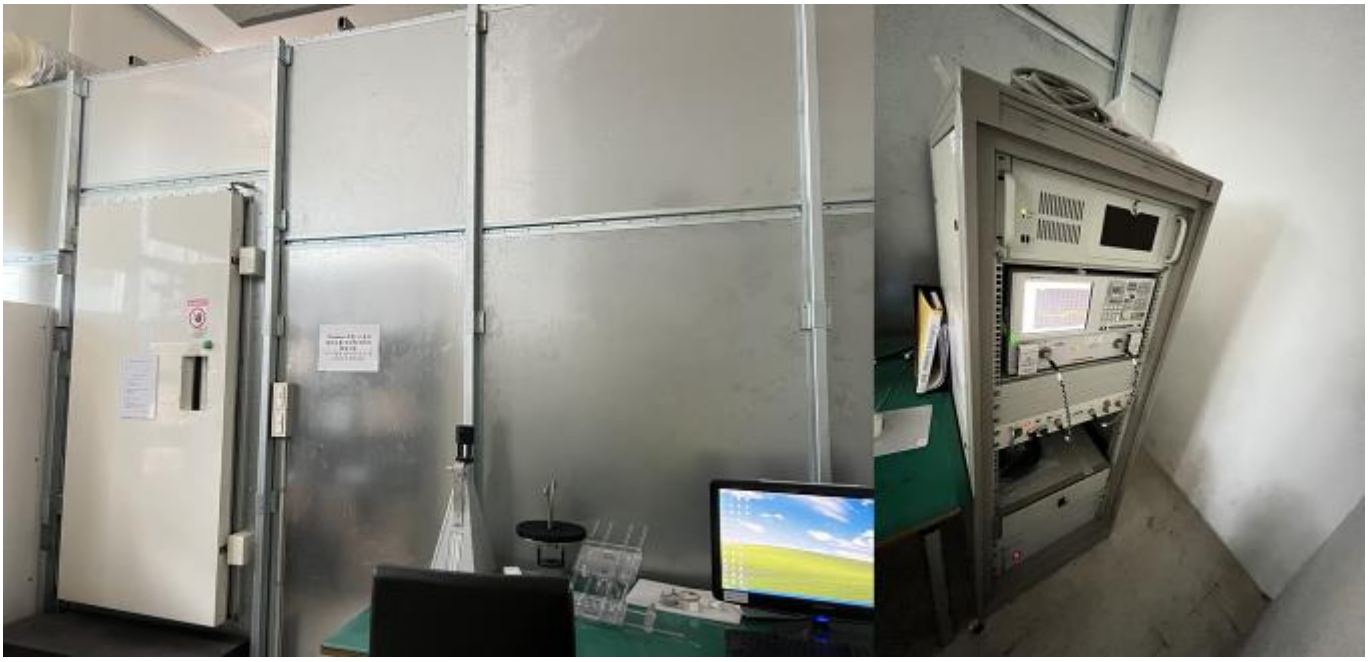
Names of test personnel
- Dohoon Kim

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-A165F 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-A165M is assembled in the same state as the user environment.

Photo (Please refer to the appendix)

- Radiation Pattern Test

Antennas tested for Gain and Efficiency must be assembled into the enclosure and tested in the fully assembled and operating SM-A165M 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.

Photo (Please refer to the appendix)

- Test Method (Manufacturing)
  All measurements are done with SM-A165M 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.

SM-A165M

RF Antenna Gain

Antenna A(WiFi)

- LDS

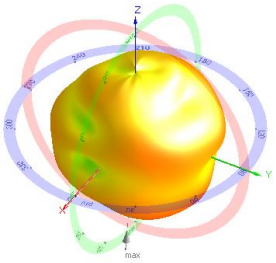
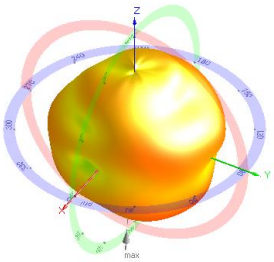
- Manufacturer : Galtronics.

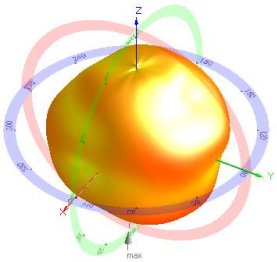
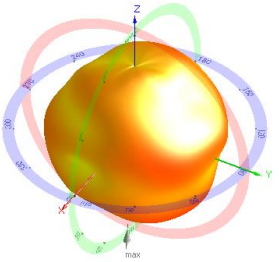
Antenna A	Frequency(MHz)	2400	2412	2437	2467	2485	2500
	Avg. gain (dBi)	-7.25	-6.50	-5.48	-5.35	-5.92	-6.42
	Peak gain (dBi)	-3.12	-2.97	-2.08	-2.02	-2.11	-2.84
	Frequency(MHz)	5150	5220	5350	5500	5700	5805
	Avg. gain (dBi)	-6.52	-5.84	-5.38	-3.47	-2.31	-3.10
	Peak gain (dBi)	-2.86	-2.80	-2.28	-1.98	-1.84	-1.75
	Frequency(MHz)	5825	5850				
	Avg. gain (dBi)	-3.23	2.44				
	Peak gain (dBi)	-2.04	-1.97				

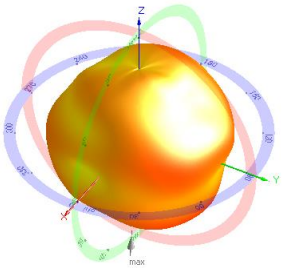
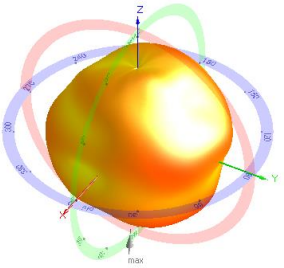
● Radiation Pattern

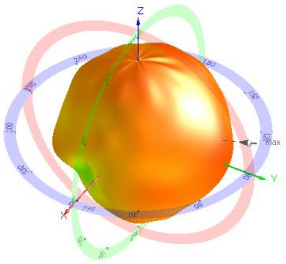
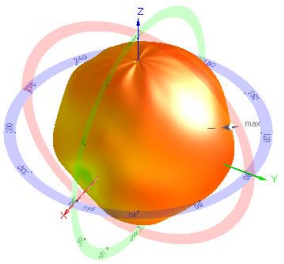
There is Radiation Pattern due to passive measurement with MTG chamber.

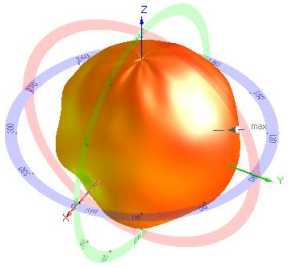
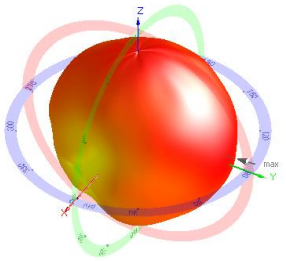
Antenna A

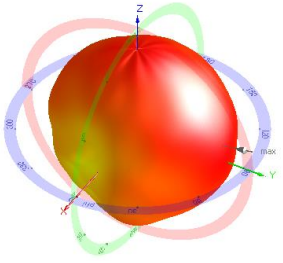
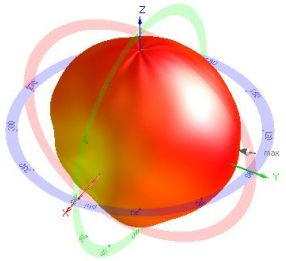
Band	WiFi	
Frequency[MHz]	2400	2412
3D Radiation Pattern		
Efficiency[%]	18.83	22.40
Avg Gain [dBi]	-7.25	-6.50
Peak Gain [dBi]	-3.12	-2.97

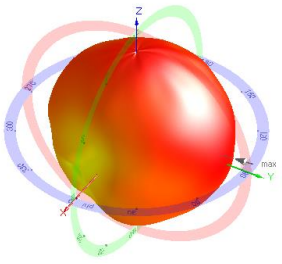
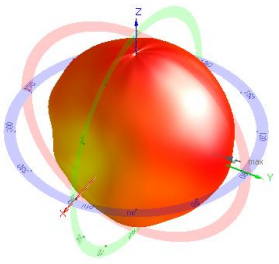
Band	WiFi	
Frequency[MHz]	2437	2467
3D Radiation Pattern		
Efficiency[%]	28.31	29.16
Avg Gain [dBi]	-5.48	-5.35
Peak Gain [dBi]	-2.08	-2.02

Band	WiFi	
Frequency[MHz]	2485	2500
3D Radiation Pattern		
Efficiency[%]	25.61	22.82
Avg Gain [dBi]	-5.92	-6.42
Peak Gain [dBi]	-2.11	-2.84

Band	WiFi	
Frequency[MHz]	5150	5220
3D Radiation Pattern		
Efficiency[%]	22.30	26.09
Avg Gain [dBi]	-6.52	-5.84
Peak Gain [dBi]	-2.86	-2.80

Band	WiFi	
Frequency[MHz]	5350	5500
3D Radiation Pattern		
Efficiency[%]	28.96	44.97
Avg Gain [dBi]	-5.38	-3.47
Peak Gain [dBi]	-2.28	-1.98

Band	WiFi	
Frequency[MHz]	5700	5805
3D Radiation Pattern		
Efficiency[%]	58.71	49.02
Avg Gain [dBi]	-2.31	-3.10
Peak Gain [dBi]	-1.84	-1.75

Band	WiFi	
Frequency[MHz]	5825	5850
3D Radiation Pattern		
Efficiency[%]	47.56	46.68
Avg Gain [dBi]	-3.23	2.44
Peak Gain [dBi]	-2.04	-1.97