Main Ant Specification for FCC ID: A3LSMA047FN

Main Ant
- Antenna Type : LDS
- 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.

*Test Equipment list

Description	Manufacturer	Model	S/N	Cal Due
Network Analyzer	Agilent Technologies	E5071B	MY4230186	2022.02.11.

- Return Loss & VSWR Test

The VSWR measurement of antennas assembled into a fully operating SM-A047F 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

Galtronics has a system that can measure VSWR using MTG chamber and E5071B 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-A047F is assembled in the same state as the user environment

See Photo #2

- Radiation Pattern Test

Antennas tested for Gain and Efficiency must be assembled into the enclosure and tested in the fully assembled and operating SM-A047F 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.

See Photo #3

- Test Method (Manufacturing)
  All measurements are done with SM-A047F fully assembled. Measure in consideration of theCustomer'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.

Main Antenna

Gain

Antenna (Main)

-LDS

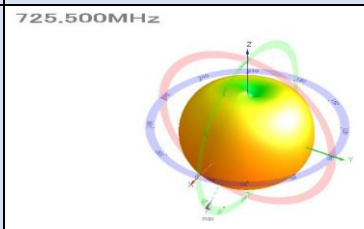
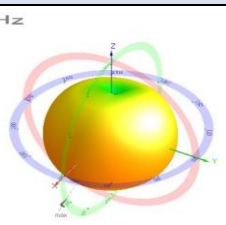
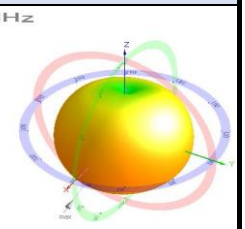
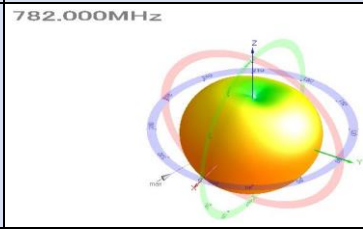
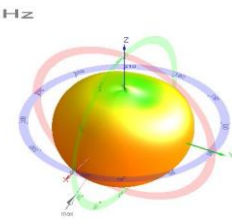
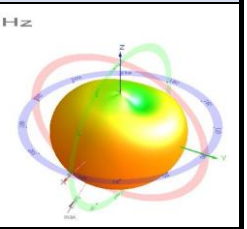
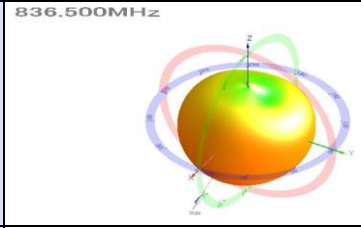
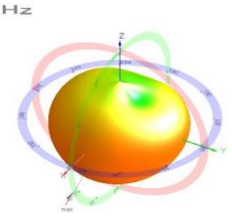
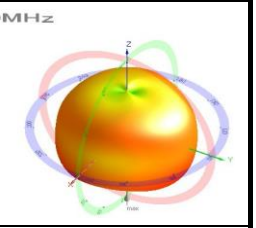
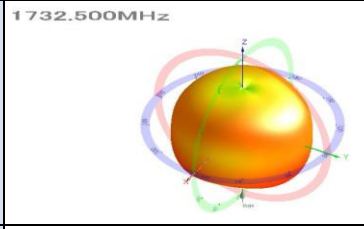
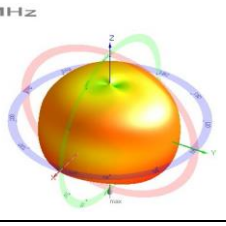
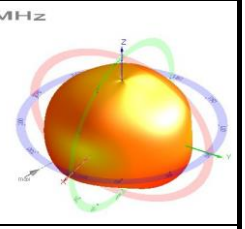
-Manufacturer : Galtronics.

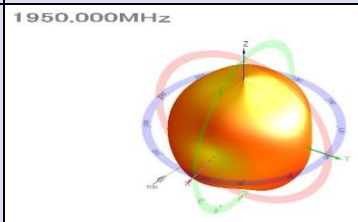
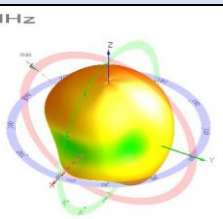
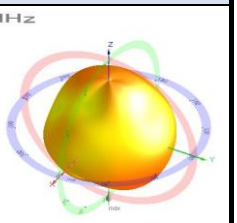
Antenna main	Band	LTE B28	LTE B17	LTE B12	LTE B13	LTE B26	LTE B20	GSM850 WCDMA5 LTE B5
	Peak gain (dBi)	-4.42	-4.78	-4.83	-4.31	-3.67	-3.47	-3.42
	Ave. gain (dBi)	-7.33	-7.74	-7.75	-6.96	-6.69	-6.73	-6.57
	Band	GSM900 WCDMA8 LTE B8	DCS1800 LTE B3	WCDMA4 LTE B4	LTE B66	PCS1900 WCDMA2 B2	WCDMA1 B1	LTE B40
	Peak gain (dBi)	-3.12	0.59	0.67	0.59	0.66	0.03	-4.05
	Ave. gain (dBi)	-5.96	-4.59	-4.56	-4.59	-3.44	-3.71	-7.82
	Band	LTE B38	LTE B7	LTE B41				
	Peak gain (dBi)	0.31	0.48	-1.44				
	Ave. gain (dBi)	-6.69	-5.99	-7.79				

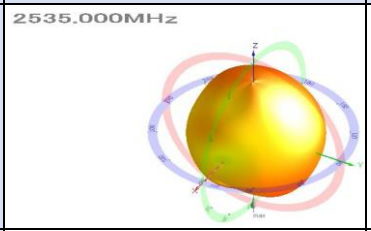
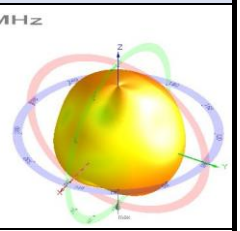
● Radiation Pattern

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

Antenna (Main)

주파수 대역	LTE B28	LTE B17	LTE B12
(Frequency Band)	725.5 MHz	710 MHz	707.5 MHz
3D Radiation Pattern			
Efficiency[%]	18.51	16.81	16.8
Avg Gain [dBi]	-7.33	-7.74	-7.75
Peak Gain [dBi]	-4.42	-4.78	-4.83
주파수 대역	LTE B13	LTE B26	LTE B20
(Frequency Band)	782 MHz	831.5 MHz	847 MHz
3D Radiation Pattern			
Efficiency[%]	20.14	21.41	21.21
Avg Gain [dBi]	-6.96	-6.69	-6.73
Peak Gain [dBi]	-4.31	-3.67	-3.47
주파수 대역	GSM850 / WCDMA5 / LTE B5	GSM900 / WCDMA8 / LTE B8	DCS1800 / LTE B3
(Frequency Band)	836.5 MHz	897.5 MHz	1747.5 MHz
3D Radiation Pattern			
Efficiency[%]	22.04	25.36	34.74
Avg Gain [dBi]	-6.57	-5.96	-4.59
Peak Gain [dBi]	-3.42	-3.12	0.59
주파수 대역	WCDMA4 / LTE B4	LTE B66	PCS1900 / WCDMA2 / LTE B2
(Frequency Band)	1732.5 MHz	1745 MHz	1880 MHz
3D Radiation Pattern			
Efficiency[%]	35.02	34.74	45.29
Avg Gain [dBi]	-4.56	-4.59	-3.44
Peak Gain [dBi]	0.67	0.59	0.66

주파수 대역	WCDMA1 / LTE B1	LTE B40	LTE B38
(Frequency Band)	1950 MHz	2350 MHz	2595 MHz
3D Radiation Pattern			
Efficiency[%]	42.55	16.53	21.41
Avg Gain [dBi]	-3.71	-7.82	-6.69
Peak Gain [dBi]	0.03	-4.05	0.31

주파수 대역	LTE B7	LTE B41
(Frequency Band)	2535 MHz	2593 MHz
3D Radiation Pattern		
Efficiency[%]	25.16	16.64
Avg Gain [dBi]	-5.99	-7.79
Peak Gain [dBi]	0.48	-1.44