

Main Ant Specification for FCC ID: A3LSMA047F

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 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.

Main Antenna

Gain

Antenna (Main)

-LDS

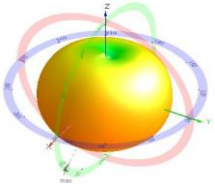
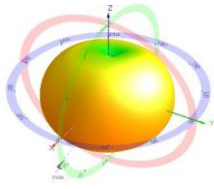
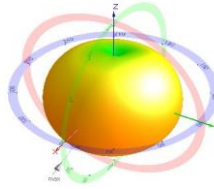
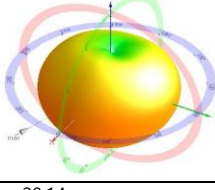
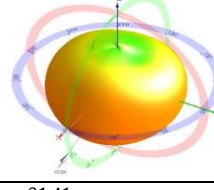
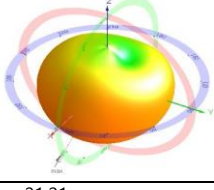
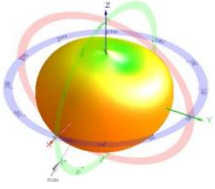
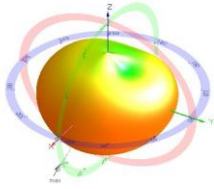
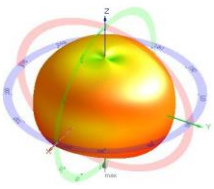
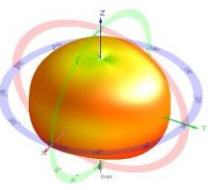
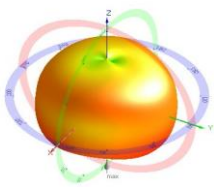
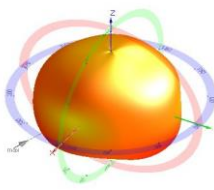
-Manufacturer : Galtronics.

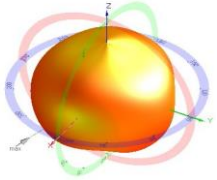
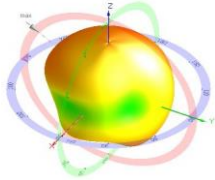
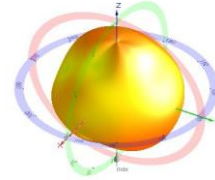
Antenna main	Band	LTE B28	LTE B17	LTE B12	LTE B13	LTE B26	LTE B20	GSM850 WCDMA5 LTE B5
	Peak gain (dBi)	-4.42	-4.78	-4.83	-4.31	-3.67	-3.47	-3.42
	Ave. gain (dBi)	-7.33	-7.74	-7.75	-6.96	-6.69	-6.73	-6.57
	Band	GSM900 WCDMA8 LTE B8	DCS1800 LTE B3	WCDMA4 LTE B4	LTE B66	PCS1900 WCDMA2 B2	WCDMA1 B1	LTE 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				

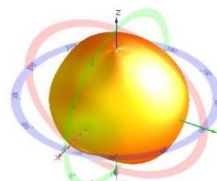
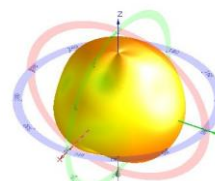
● Radiation Pattern

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

Antenna (Main)

주파수 대역 (Frequency Band)	LTE B28 725.5 MHz	LTE B17 710 MHz	LTE B12 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 (Frequency Band)	LTE B13 782 MHz	LTE B26 831.5 MHz	LTE B20 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 (Frequency Band)	GSM850 / WCDMA5 / LTE B5 836.5 MHz	GSM900 / WCDMA8 / LTE B8 897.5 MHz	DCS1800 / LTE B3 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 (Frequency Band)	WCDMA4 / LTE B4 1732.5 MHz	LTE B66 1745 MHz	PCS1900 / WCDMA2 / LTE B2 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 (Frequency Band)	WCDMA1 / LTE B1 1950 MHz	LTE B40 2350 MHz	LTE B38 2595 MHz
3D Radiation Pattern	1950.000MHz 	2350.000MHz 	2595.000MHz 
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 (Frequency Band)	LTE B7 2535 MHz	LTE B41 2593 MHz
3D Radiation Pattern	2535.000MHz 	2593.000MHz 
Efficiency[%]	25.16	16.64
Avg Gain [dBi]	-5.99	-7.79
Peak Gain [dBi]	0.48	-1.44