ANAM Electronics

Model Name	DH250
ANAM P/N	ANT 1(330L) : CSA3A083Z ANT 2(470L) : CSA3A084Z

Date: March 28, 2019

PRODUCT SPECIFICATION

Product : Internal WIFI/Bluetooth Antenna

Part No. :ANT 1(330L): KH-WFDI-AN003

ANT 2(470L): KH-WFDI-AN004

RF Eng'r	Mfg. Eng'r	Approved By
		
2019. 03. 28.	-	2019. 03. 28.

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1. General

1.1 The Product

Model Name	DH250 WIFI / Bluetooth Antenna
Part No.	ANT 1(330L): KH-WFDI-AN003 ANT 2(470L): KH-WFDI-AN004
Antenna Type	Dipole Antenna
Applications	WIFI 2.4~2.5 / 5.15~5.825

1.2 Electrical Properties

Frequency Range(Tx)	2.4~2.5 Ghz / 5.15~5.825 Ghz	
Frequency Range(Rx)	2.4~2.5 Ghz / 5.15~5.825 Ghz	
VSWR	2.4~2.5	Less Than 2.0 : 1
	5.15~5.825	Less Than 3.0 : 1
GAIN dBi (Avr. / Peak)	2.4~2.5	-0.7 ~ -1.6 / 3.0 ~ 3.6
	5.15~5.825	-2.9 ~ -4.6 / 0.4 ~ 2.1
Polarization	Vertical	
Impedance	50Ω ± 10Ω	

1.3 Mechanical Properties

Dimension	Ipex Cable : ANT ① = 330L / ANT ② = 470L
	PCB : 40 x 8.0 x 0.8.t
Operational Temperature	-30°C ~ +75°C
Connector Type	Ipex Connector + PCB Type

2. Electrical Properties

2.1 Frequency Band

Band / Service	KH-WFDI-AN003 / KH-WFDI-AN004
Tx (MHz)	2,400 ~ 2,500 5,150 ~ 5,825
Rx (MHz)	2,400 ~ 2,500 5,150 ~ 5,825

2.2 Impedance

2.2.1 Normal Value

50Ω ± 10Ω

2.2.2 Measuring Method

The impedance over the frequency bands shall be as close as possible to 50Ω after matching. Both free space and talk position are considered.

2.3 VSWR

2.3.1 Maximum values in free space

Band / Service	KH-WFDI-AN003 / KH-WFDI-AN004	
	2,400 ~ 2,500	5,150 ~ 5,825
VSWR	2.0 : 1	3.0 : 1

2.3.2 Measuring Method

A 50Ω coaxial cable is connected(soldered) to the 50Ω point, at the duplex-filter on the main PCB. The connection of the coaxial cable shall be done to introduce a minimum of mismatch. As much as possible the coaxial cable arrangement shall prevent influences from induced currents on the cable. In the other end, the coaxial cable is connected to a network analyzer. The measurement is performed at room temperature. The handset, including the PCB, must not in any significant way differ from the mass produced handset, i.e. the antenna feeding network has to be equivalent to the feeding network in mass production. The specification shall be met in the entire frequency band. The free space means that the handset is placed on a non-conductive surface of cellular plastic.

2.4 Gain(dBi)

2.4.1 Typical minimum values in maximum direction

Band / Service	KH-WFDI-AN003 / KH-WFDI-AN004	
	2,400 ~ 2,500	5,150 ~ 5,825
Gain(Avr./Peak)	-0.7 ~ -1.6 / 3.0 ~ 3.6	-2.9 ~ -4.6 / 0.4 ~ 2.1

2.4.2 Measuring Method

The connection is done according to 2.3.2.

Radiation patterns are measured at 6 different frequencies : Txmin, Txmid, Txmax, Rxmin, Rxmid and Rxmax. The antenna is measured in the 3D

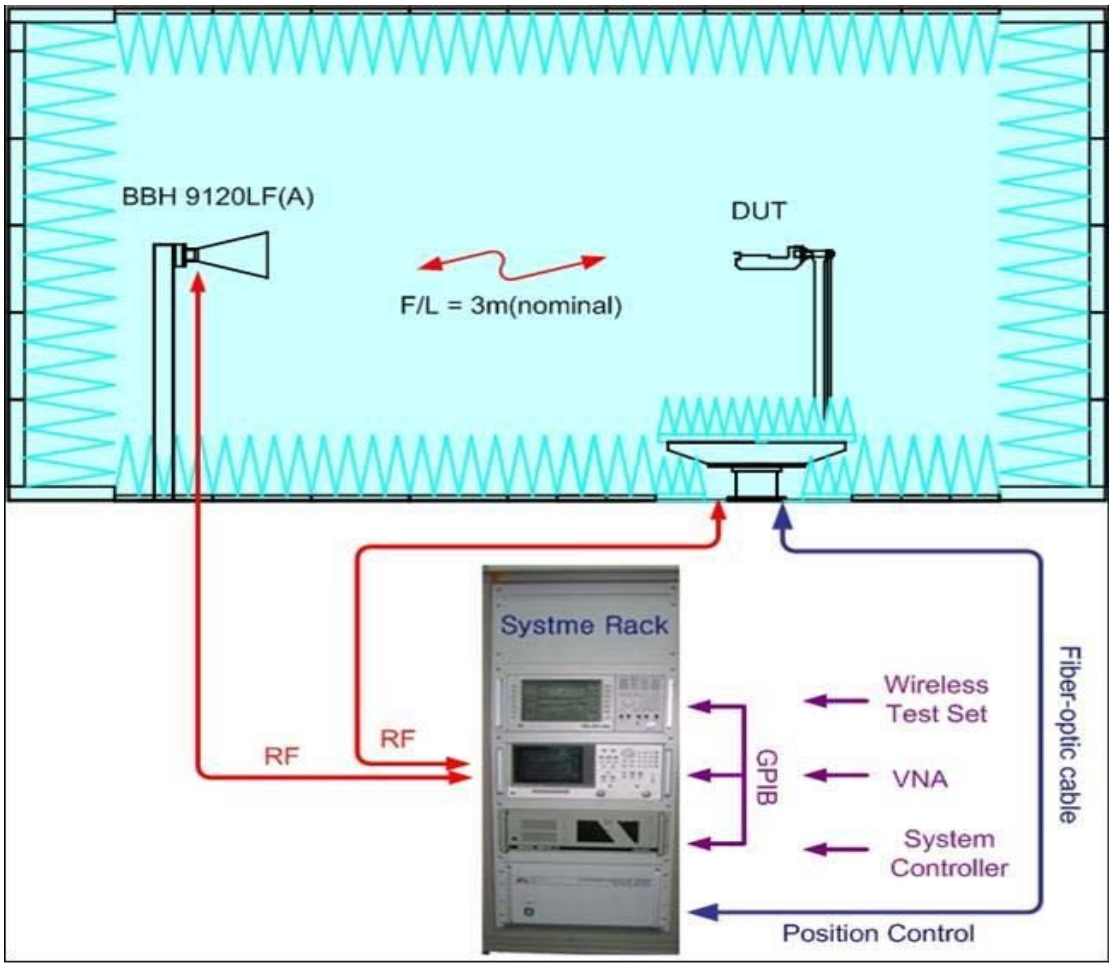
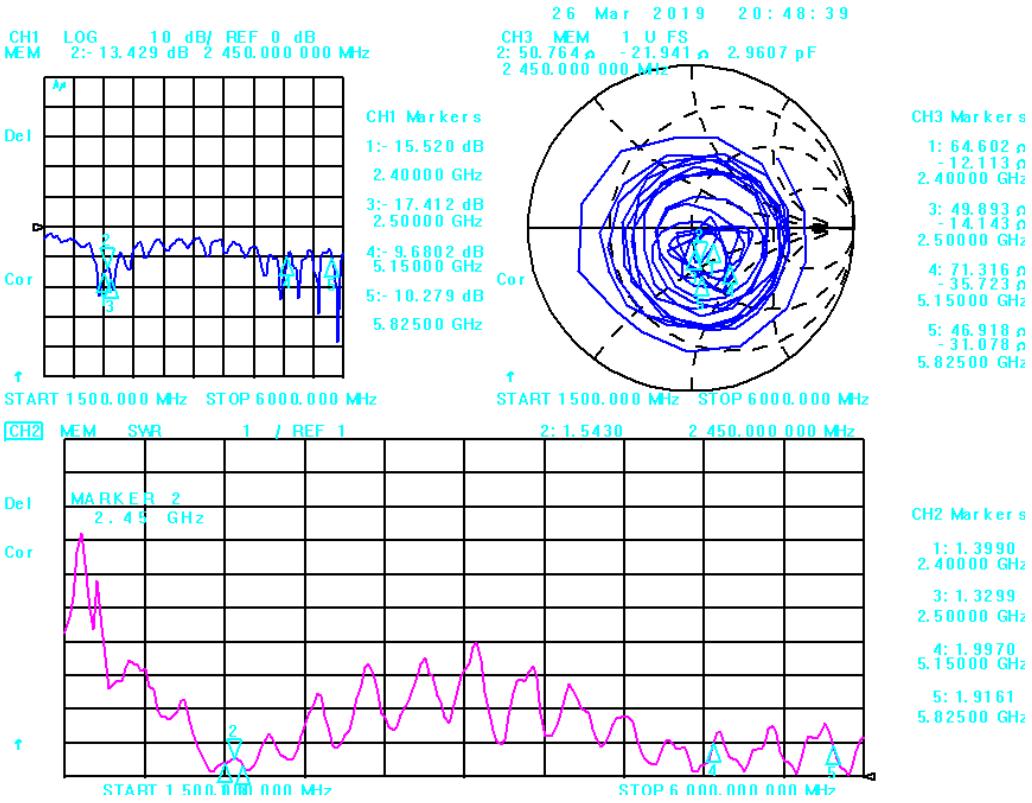


Figure 1. 3D Antenna Gain Test

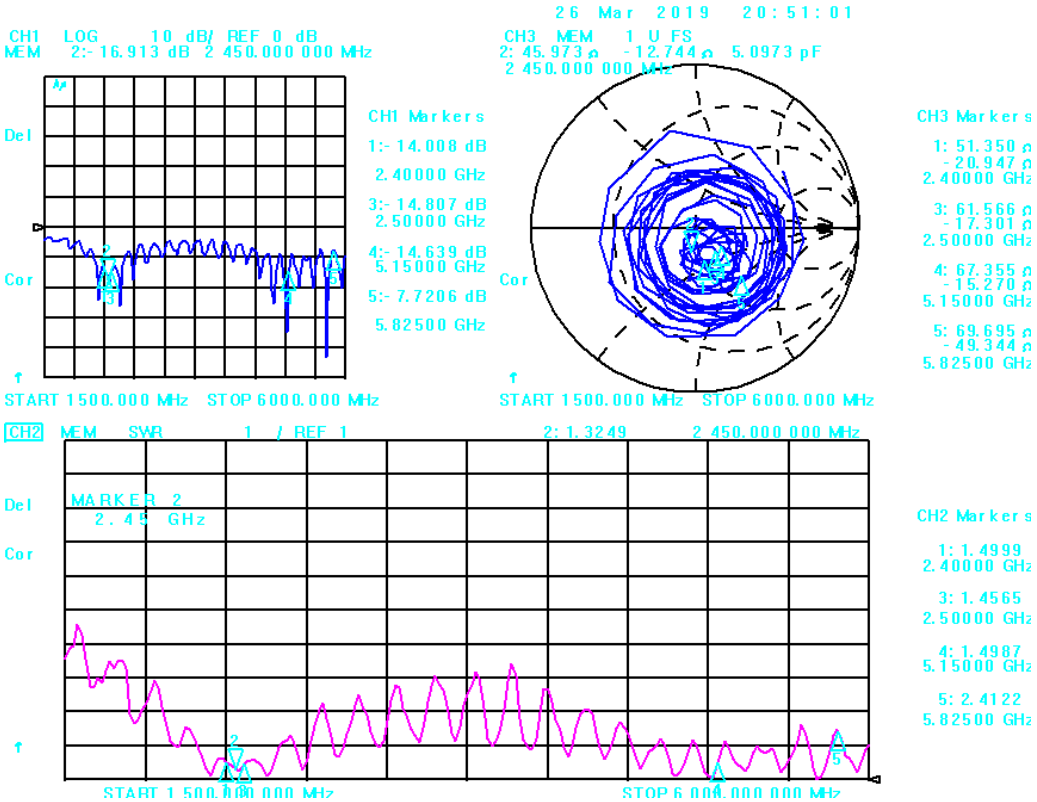
3. Test Data

3.1 Network Data

- KH-WFDI-AN003 (ANT 1)



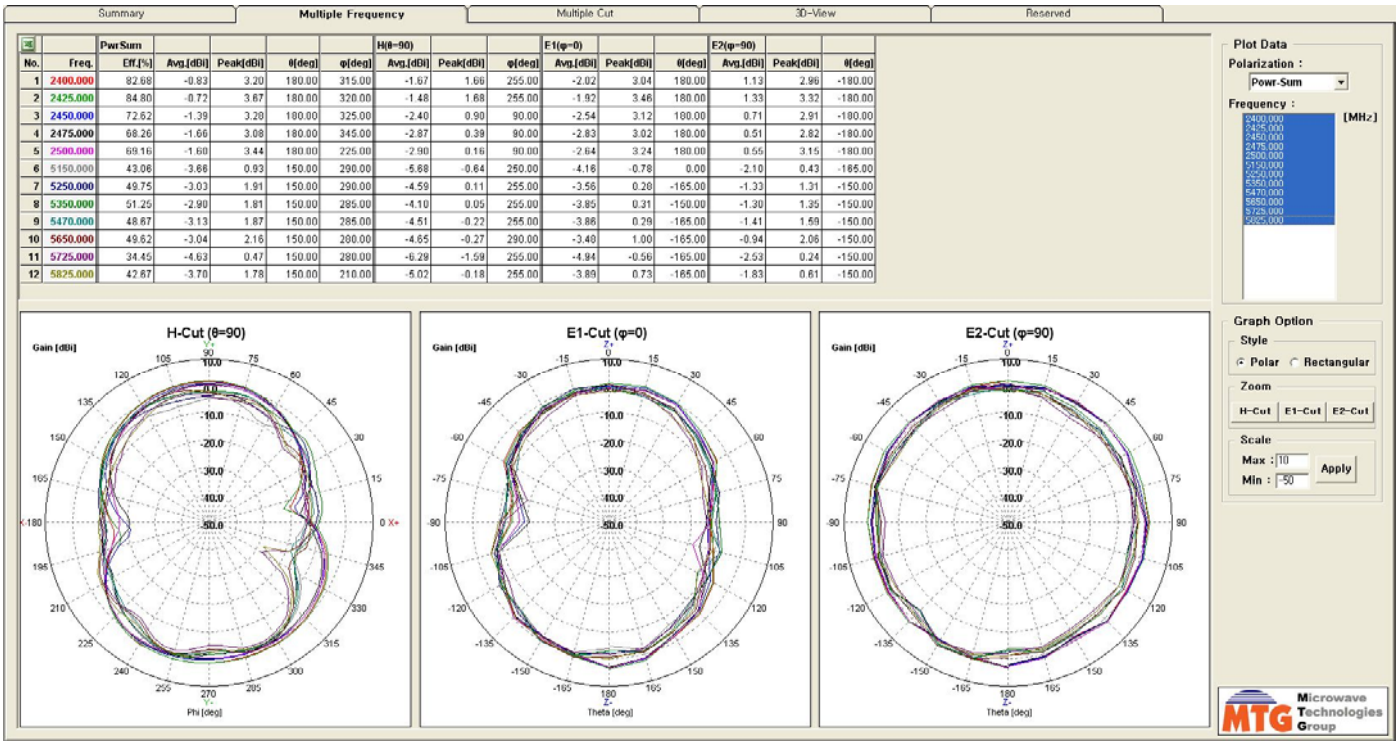
- KH-WFDI-AN004 (ANT 2)



3.2 Radiation Pattern Data

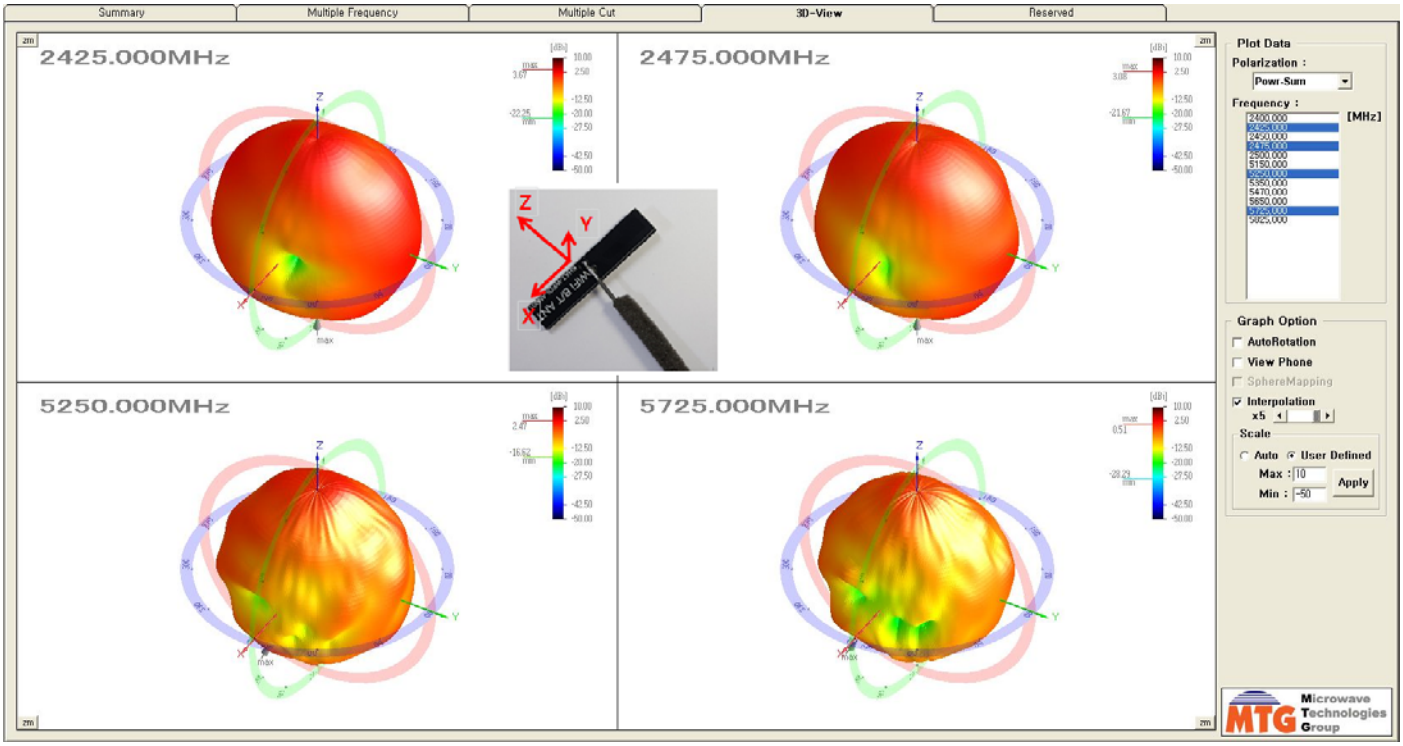
- KH-WFDI-AN003 (ANT 1)

-Radiation



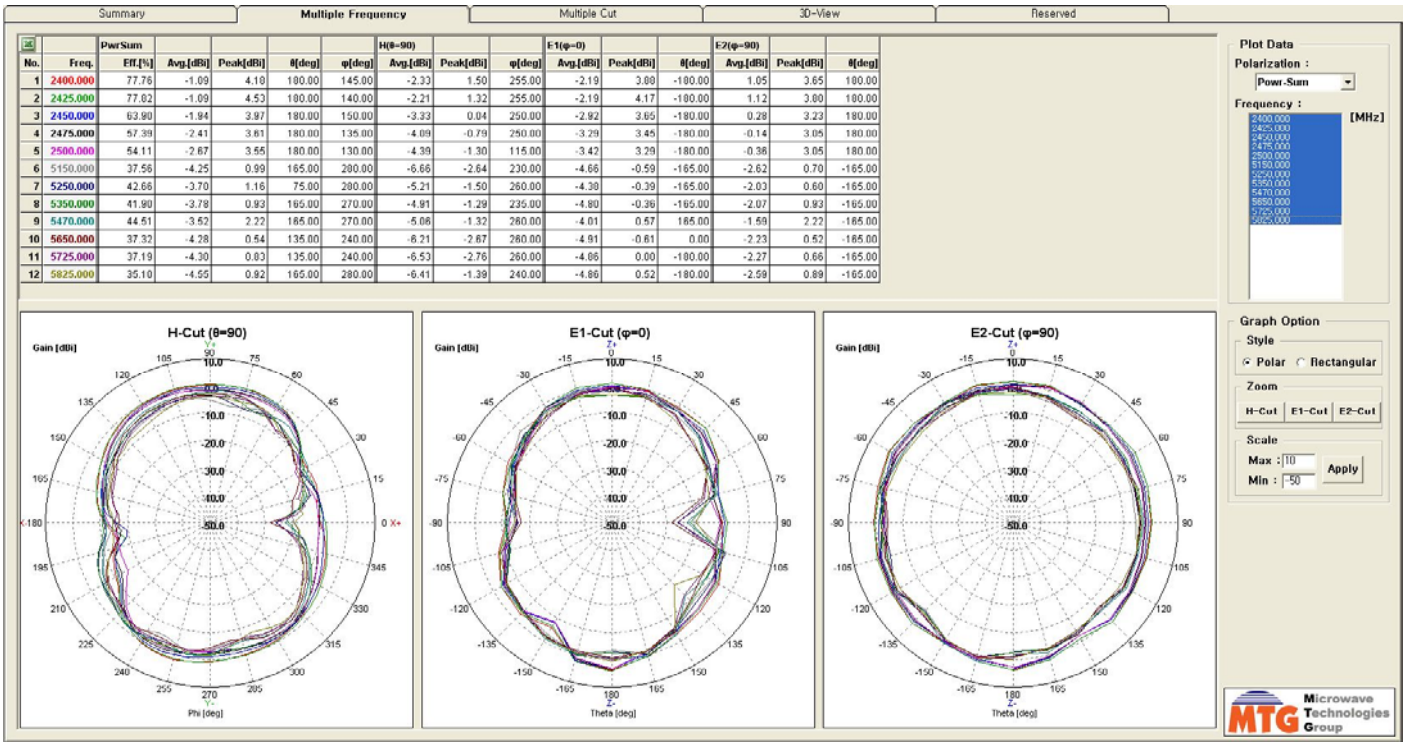
No.	Freq.	PwrSum Eff.[%]	H(θ=90) Avg.[dBi]	H(θ=90) Peak[dBi]	H(θ=90) θ[deg]	H(θ=90) φ[deg]	E1(φ=0) Avg.[dBi]	E1(φ=0) Peak[dBi]	E1(φ=0) φ[deg]	E2(φ=90) Avg.[dBi]	E2(φ=90) Peak[dBi]	E2(φ=90) θ[deg]
1	2400.000	82.68	-0.83	3.20	180.00	315.00	-1.67	1.66	255.00	-2.02	3.04	180.00	1.13	2.96	-180.00
2	2425.000	84.80	-0.72	3.67	180.00	320.00	-1.48	1.68	255.00	-1.92	3.46	180.00	1.33	3.32	-180.00
3	2450.000	72.62	-1.39	3.28	180.00	325.00	-2.40	0.90	90.00	-2.54	3.12	180.00	0.71	2.91	-180.00
4	2475.000	68.26	-1.66	3.08	180.00	345.00	-2.87	0.39	90.00	-2.83	3.02	180.00	0.51	2.82	-180.00
5	2500.000	69.16	-1.60	3.44	180.00	225.00	-2.90	0.16	90.00	-2.64	3.24	180.00	0.55	3.15	-180.00
6	5150.000	43.06	-3.66	0.93	150.00	290.00	-5.68	-0.64	250.00	-4.16	-0.78	0.00	-2.10	0.43	-165.00
7	5250.000	49.75	-3.03	1.91	150.00	290.00	-4.59	0.11	255.00	-3.56	0.20	-165.00	-1.33	1.31	-150.00
8	5350.000	51.25	-2.90	1.81	150.00	285.00	-4.10	0.05	255.00	-3.85	0.31	-150.00	-1.30	1.35	-150.00
9	5470.000	48.67	-3.13	1.87	150.00	285.00	-4.51	-0.22	255.00	-3.86	0.29	-165.00	-1.41	1.59	-150.00
10	5650.000	49.62	-3.04	2.16	150.00	280.00	-4.65	-0.27	290.00	-3.40	1.00	-165.00	-0.94	2.06	-150.00
11	5725.000	34.45	-4.63	0.47	150.00	280.00	-6.29	-1.59	255.00	-4.94	-0.56	-165.00	-2.53	0.24	-150.00
12	5825.000	42.67	-3.70	1.78	150.00	210.00	-5.02	-0.18	255.00	-3.89	0.73	-165.00	-1.83	0.61	-150.00

-3D View



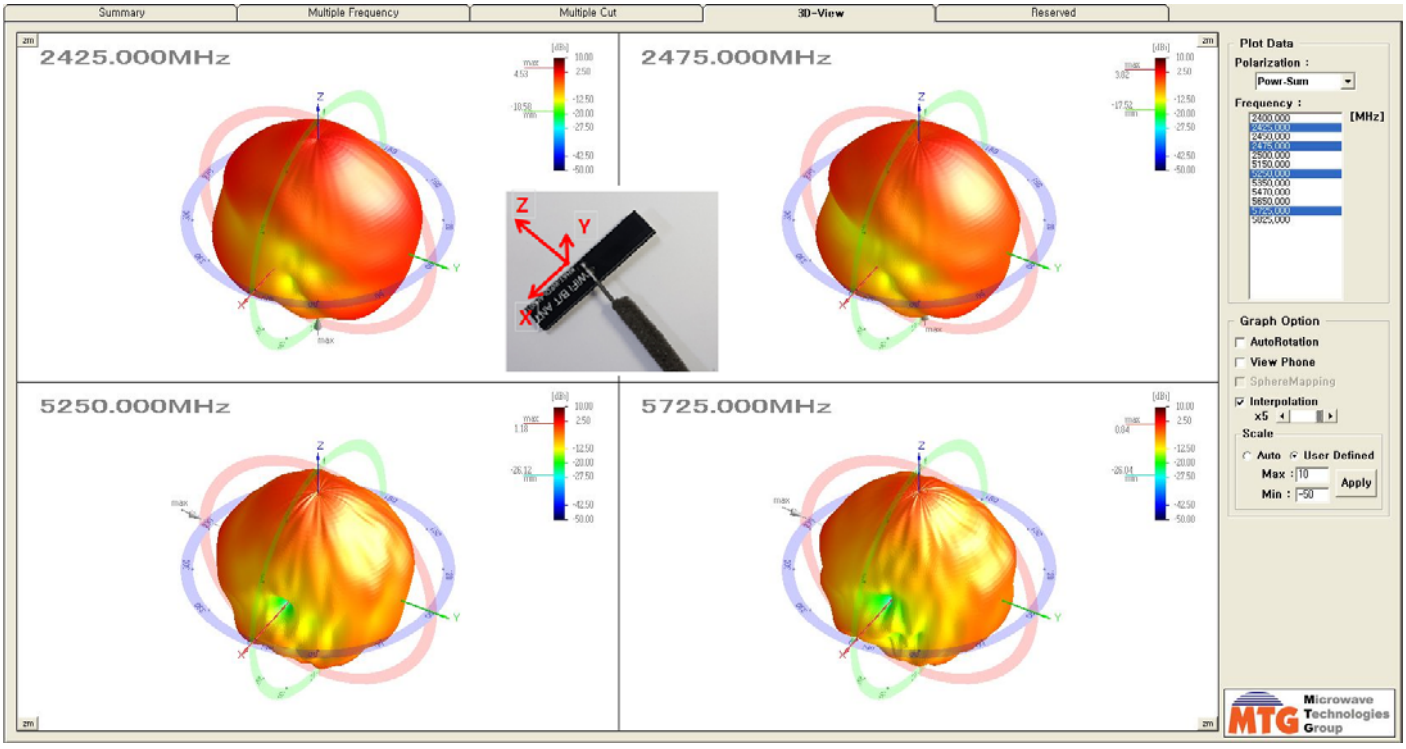
- KH-WFDI-AN004 (ANT 2)

-Radiation



No.	Freq.	PwrSum Eff.[%]	PwrSum Avg.[dBi]	PwrSum Peak[dBi]	PwrSum θ[deg]	PwrSum φ[deg]	H(θ=90) Avg.[dBi]	H(θ=90) Peak[dBi]	H(θ=90) φ[deg]	E1(φ=0) Avg.[dBi]	E1(φ=0) Peak[dBi]	E1(φ=0) θ[deg]	E2(φ=90) Avg.[dBi]	E2(φ=90) Peak[dBi]	E2(φ=90) θ[deg]
1	2400.000	77.76	-1.09	4.19	180.00	145.00	-2.33	1.50	255.00	-2.19	3.88	-180.00	1.05	3.65	180.00
2	2425.000	77.82	-1.09	4.53	180.00	140.00	-2.21	1.32	255.00	-2.19	4.17	-180.00	1.12	3.80	180.00
3	2450.000	63.90	-1.94	3.97	180.00	150.00	-3.33	0.04	250.00	-2.92	3.65	-180.00	0.28	3.23	180.00
4	2475.000	57.39	-2.41	3.61	180.00	135.00	-4.09	-0.79	250.00	-3.29	3.45	-180.00	-0.14	3.05	180.00
5	2500.000	54.11	-2.67	3.55	180.00	130.00	-4.39	-1.30	115.00	-3.42	3.29	-180.00	-0.36	3.05	180.00
6	5150.000	37.56	-4.25	0.99	165.00	280.00	-6.66	-2.64	230.00	-4.66	-0.59	-165.00	-2.62	0.70	-165.00
7	5250.000	42.66	-3.70	1.16	75.00	280.00	-5.21	-1.50	260.00	-4.38	-0.39	-165.00	-2.03	0.60	-165.00
8	5350.000	41.90	-3.78	0.93	165.00	270.00	-4.91	-1.29	235.00	-4.80	-0.36	-165.00	-2.07	0.93	-165.00
9	5470.000	44.51	-3.52	2.22	165.00	270.00	-5.06	-1.32	260.00	-4.01	0.57	165.00	-1.59	2.22	-165.00
10	5650.000	37.32	-4.28	0.54	135.00	240.00	-6.21	-2.67	260.00	-4.91	-0.61	0.00	-2.23	0.52	-165.00
11	5725.000	37.19	-4.30	0.83	135.00	240.00	-6.53	-2.76	260.00	-4.86	0.00	-180.00	-2.27	0.66	-165.00
12	5825.000	35.10	-4.55	0.92	165.00	280.00	-6.41	-1.39	240.00	-4.86	0.52	-180.00	-2.59	0.89	-165.00

-3D View



4. Mechanical Drawing