

1. Test Information

Applicant: SAGEMCOM BROADBAND SAS

Address: 250 Route de l'Empereur - 92848 RUEIL MALMAISON CEDEX- FRANCE

Equipment: 5GNR CPE Router

Model No.: BGW530-900

Brand Name: SAGEMCOM

Test Date: 2023-09-17 ~ 2023-10-17

Test by: MVG Industries

2. Test Location

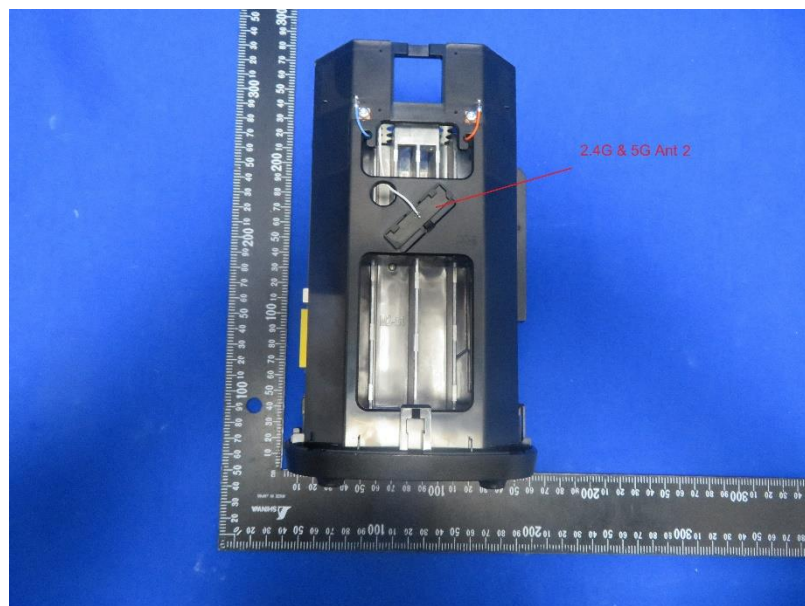
Test Lab: MVG Industries

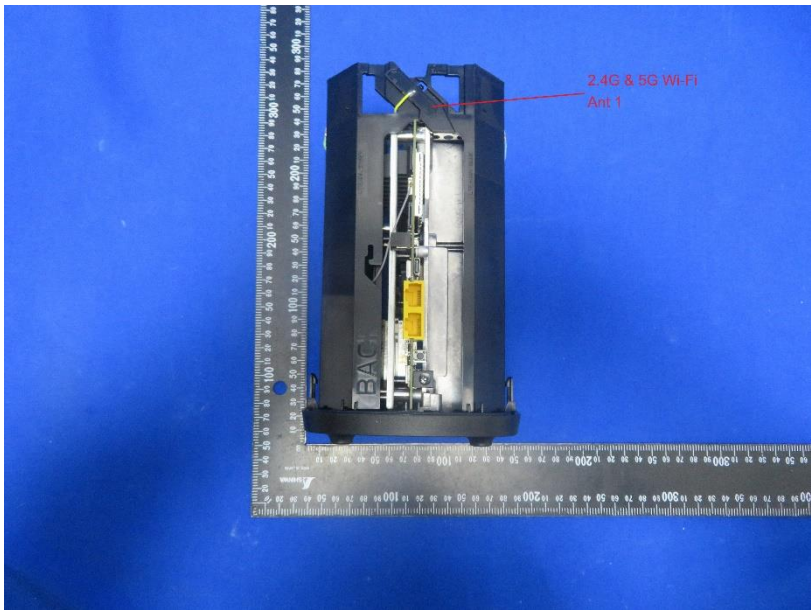
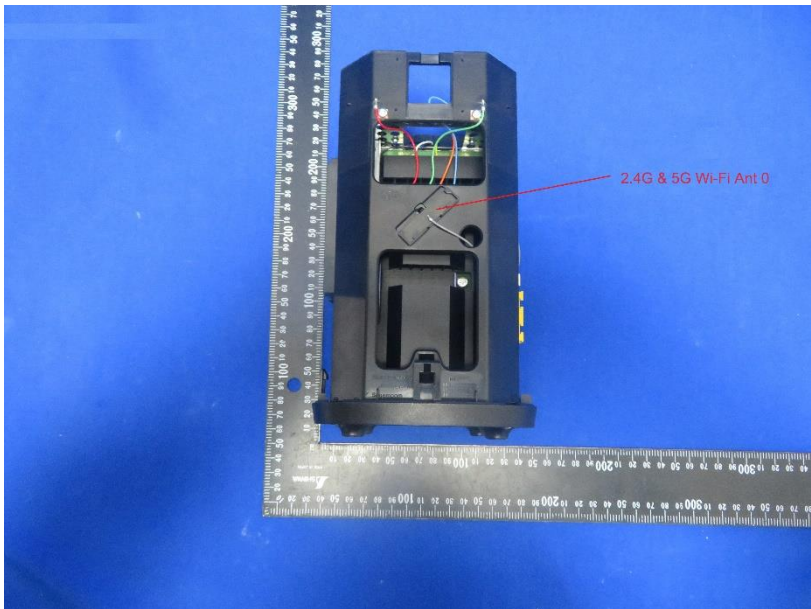
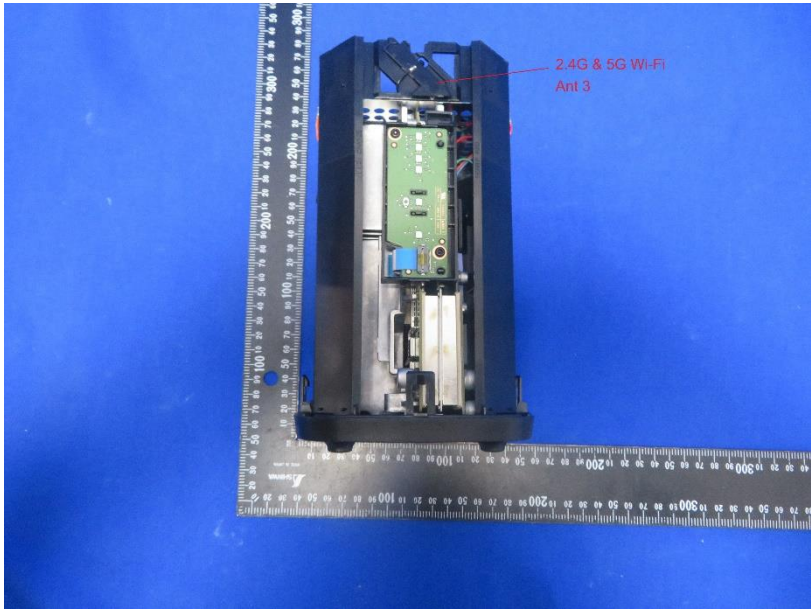
Address: 13 rue du Zephyr 91140 Villejust, FRANCE

3. Test Frequency

Band (MHz)	Test Frequency (MHz)
2412 ~ 2462	2412, 2437, 2462
5150 ~ 5250	5180, 5240
5250 ~ 5350	5320
5470 ~ 5725	5500, 5600, 5700
5725 ~ 5850	5825

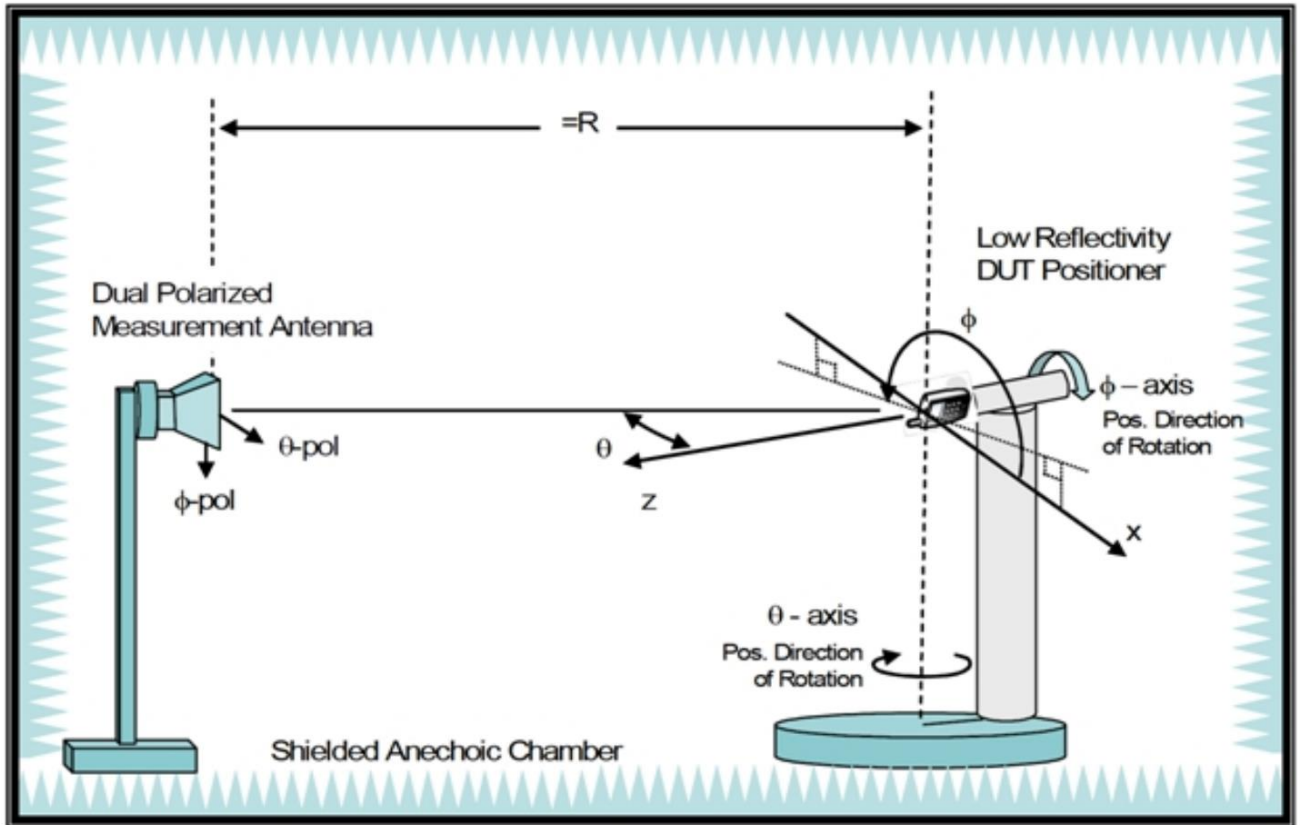
4. Antenna System



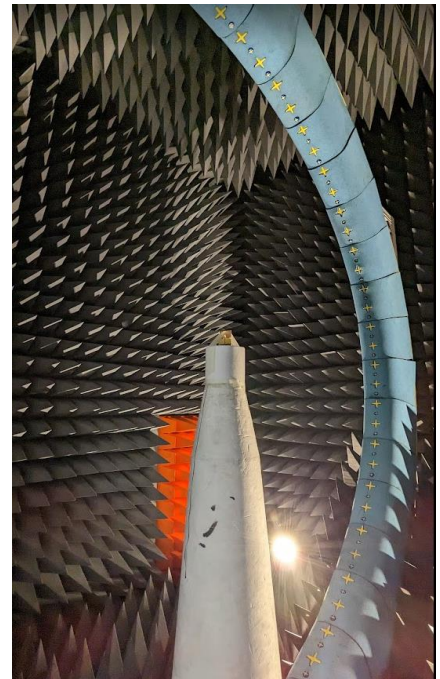
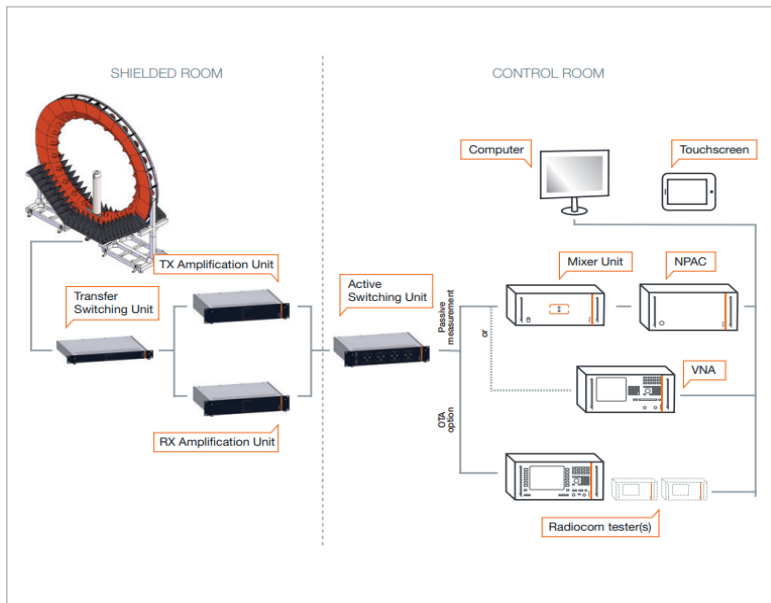


5. Test Configuration

Reference to CTIA "ctia-test-plan-for-wireless-device-over-the-air-performance-ver-3-7-1



6. Test Setup



7. Test Method

The EUT set on multi-axis positioner. Measurement antenna set at phi polarization and 1.5 meter height. Port 1 of Network analyzer connect to antenna of EUT. Record S21 value every 5 degree 0 to 355 degree on Phi

Spatial Multiplexing DG calculations

If antenna gains are not equal & each transmit antenna is driven by only one spatial stream

$$DG = 10 \log \left[\frac{\sum_{j=1}^{N_{ANT}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

angle and 0 to 180 on theta angle of multi-axis positioner. Then set measurement antenna to theta polarization and repeat process. Repeat process to each antenna of EUT

8. Summary of Test Result

Calculate directional gain of 4TX antennas by same angle according to FCC KDB662911 D01 Multiple Transmitter Output v02r01 The maximum DG gain was selected and recorded in following table

Antenna Type	Frequency Band (GHz)	Antenna Gain (dBi)				Directional Gain (dBi)
		Ant 0	Ant 1	Ant 2	Ant 3	
Wi-Fi Internal Antenna (2.4GHz 3*3 MIMO, 5GHz 4*4 MIMO)						
PCB Antenna	2400 ~ 2483.5	3.26	4.83	6.72	3.7	7.15
	5150 ~ 5250	3.9	3.1	3.57	5.41	5.94
	5250 ~ 5350	3.77	3.58	4.43	5.53	5.67
	5470 ~ 5725	4.2	4.62	3.84	3.86	6.09
	5725 ~ 5850	3.34	5.33	3.67	4.75	5.88
Note 1: The EUT supports Cyclic Delay Diversity (CDD) mode for 802.11a/b/g/n/ac/ax and SISO Mode (Ant 0) for 802.11a/b.						
Note 2: If transmit signals are correlated, then Directional gain = $10 \log \left[\frac{(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2}{N_{ANT}} \right]$ dBi [Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]						

9. RAW DATA and Calculation DATA

Table with 28 columns (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z) and 100 rows. Header includes '17-2012 M06' and 'Adaptive (THz)'. Contains numerical data for various parameters.

Table with 28 columns (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z) and 100 rows. Header includes '17-2012 M06' and 'Adaptive (THz)'. Contains numerical data for various parameters.

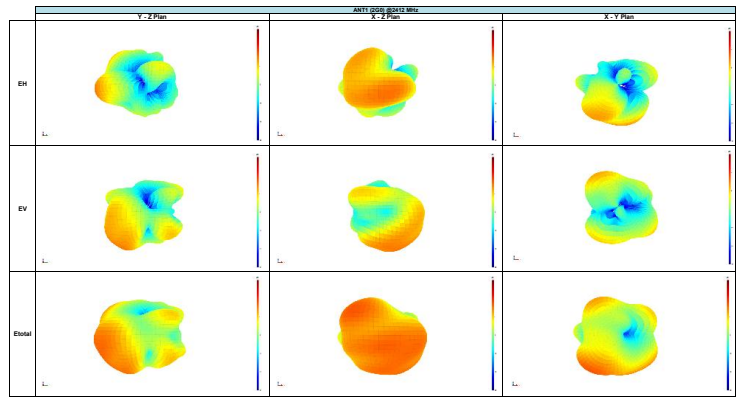


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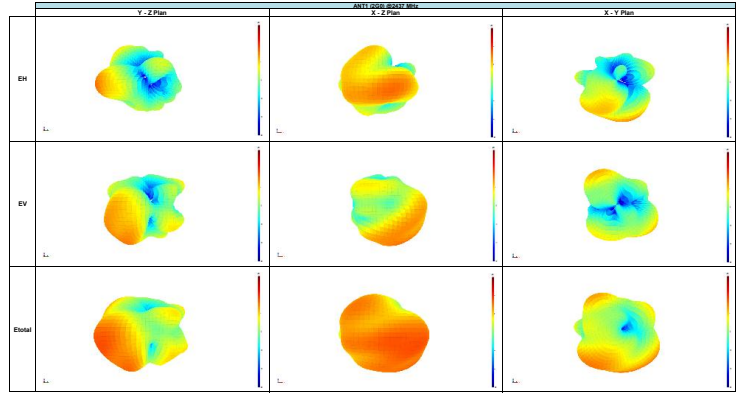
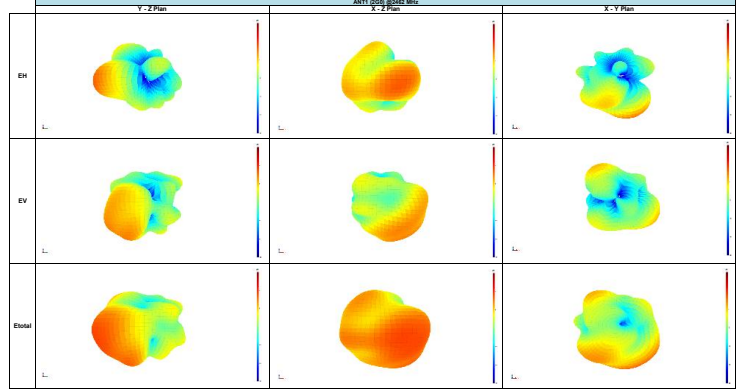


Table with 28 columns (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z) and 100 rows. Header includes '17-2012 M06' and 'Adaptive (THz)'. Contains numerical data for various parameters.

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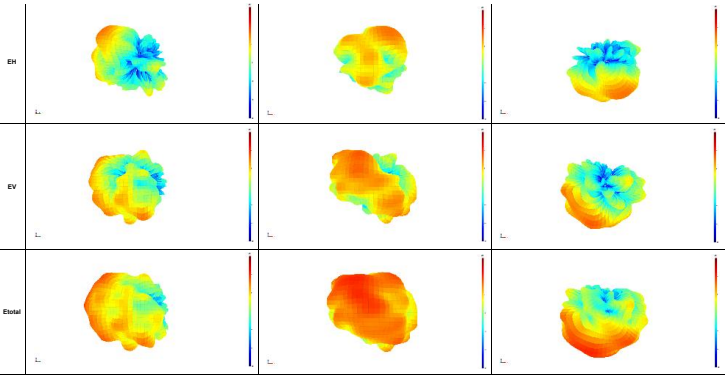
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2017	2	2017	2
2017	3	2017	3
2017	4	2017	4
2017	5	2017	5
2017	6	2017	6
2017	7	2017	7
2017	8	2017	8
2017	9	2017	9
2017	10	2017	10
2017	11	2017	11
2017	12	2017	12
2018	1	2018	1
2018	2	2018	2
2018	3	2018	3
2018	4	2018	4
2018	5	2018	5
2018	6	2018	6
2018	7	2018	7
2018	8	2018	8
2018	9	2018	9
2018	10	2018	10
2018	11	2018	11
2018	12	2018	12

2018-2019		2018-2019	
Year	Month	Year	Month
2018	1	2018	1
2018	2	2018	2
2018	3	2018	3
2018	4	2018	4
2018	5	2018	5
2018	6	2018	6
2018	7	2018	7
2018	8	2018	8
2018	9	2018	9
2018	10	2018	10
2018	11	2018	11
2018	12	2018	12
2019	1	2019	1
2019	2	2019	2
2019	3	2019	3
2019	4	2019	4
2019	5	2019	5
2019	6	2019	6
2019	7	2019	7
2019	8	2019	8
2019	9	2019	9
2019	10	2019	10
2019	11	2019	11
2019	12	2019	12

2019-2020		2019-2020	
Year	Month	Year	Month
2019	1	2019	1
2019	2	2019	2
2019	3	2019	3
2019	4	2019	4
2019	5	2019	5
2019	6	2019	6
2019	7	2019	7
2019	8	2019	8
2019	9	2019	9
2019	10	2019	10
2019	11	2019	11
2019	12	2019	12
2020	1	2020	1
2020	2	2020	2
2020	3	2020	3
2020	4	2020	4
2020	5	2020	5
2020	6	2020	6
2020	7	2020	7
2020	8	2020	8
2020	9	2020	9
2020	10	2020	10
2020	11	2020	11
2020	12	2020	12

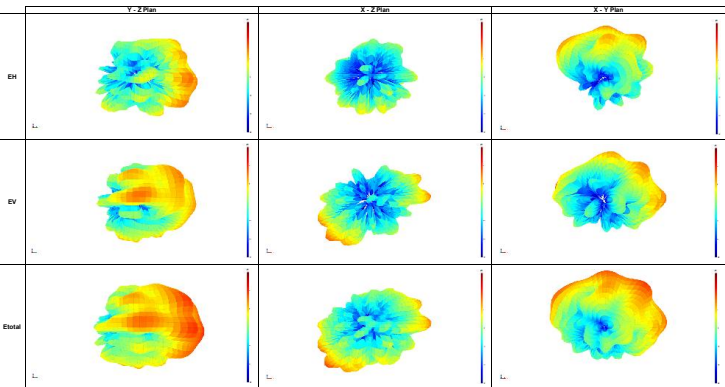
Iteration	Energy	Force	Displacement	Time	... (repeated for all 4000 iterations)
1
2
...
4000

Iteration	Energy	Force	Displacement	Time	... (repeated for all 4000 iterations)
1
2
...
4000



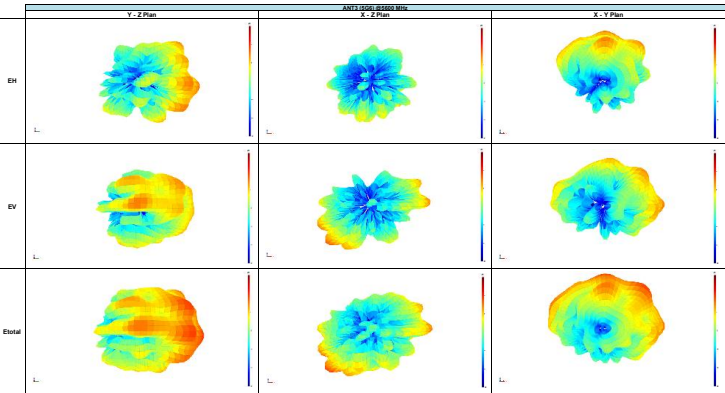
	Amplitude (Psi)											
	1	2	3	4	5	6	7	8	9	10	11	12
...

	Amplitude (Psi)											
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...



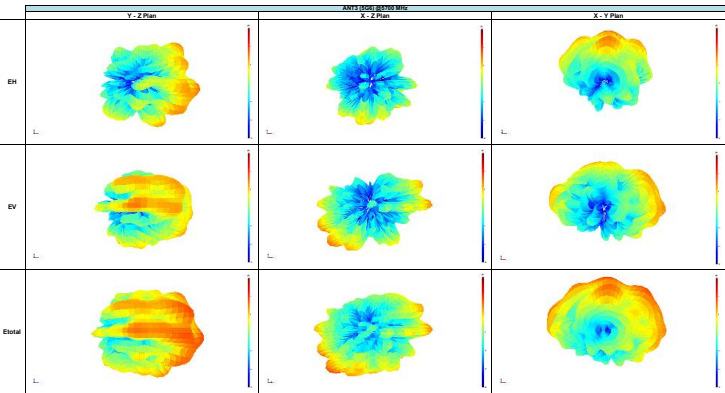
	Amplitude (Psi)											
	1	2	3	4	5	6	7	8	9	10	11	12
...

	Amplitude (Psi)											
	1	2	3	4	5	6	7	8	9	10	11	12
...



	Amplitude (Psi)											
	1	2	3	4	5	6	7	8	9	10	11	12
...

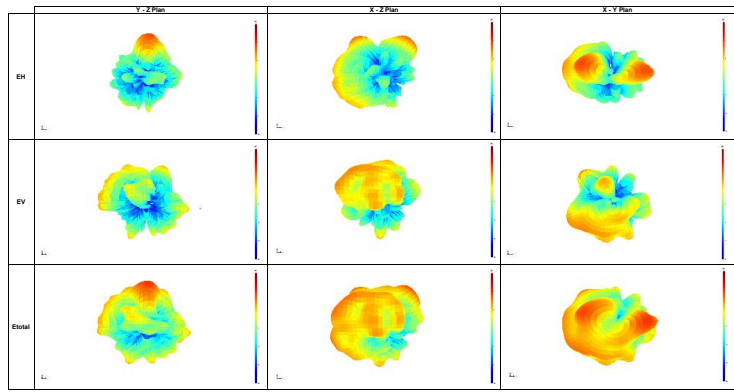
	Amplitude (Psi)											
	1	2	3	4	5	6	7	8	9	10	11	12
...



ANSYS 15800 Mesh

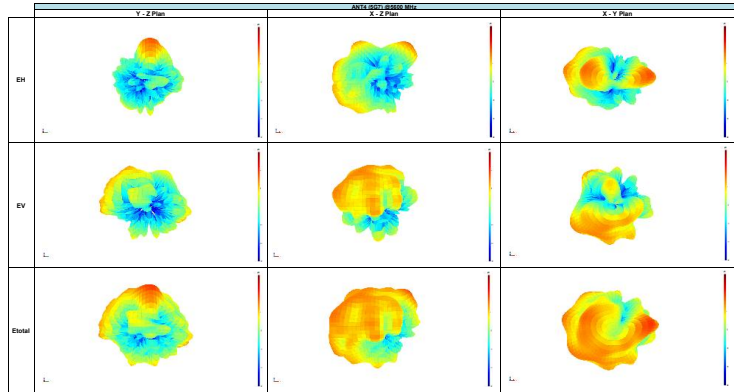
		Altitude (ft)																													
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Pressure (hPa)	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25

		Altitude (ft)																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Pressure (hPa)	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25



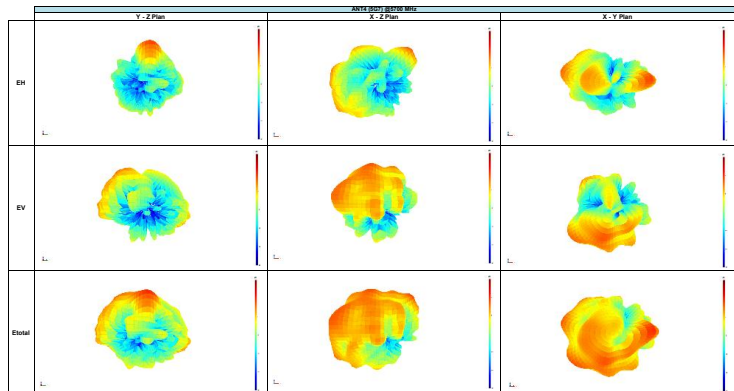
		Altitude (ft)																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Pressure (hPa)	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25

		Altitude (ft)																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Pressure (hPa)	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25



		Altitude (ft)																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Pressure (hPa)	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25

		Altitude (ft)																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Pressure (hPa)	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25



		Altitude (ft)																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Pressure (hPa)	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25

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		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Pressure (hPa)	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25

		Altitude (ft)																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Pressure (hPa)	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25	1013.25

Table with 10 columns and 10 rows of numerical data.

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