

From
XC-HWP/EEA2

Our Reference
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Stuttgart-Weilimdorf
September 22, 2025

Report

Issue V0.3
Topic **Antenna Specification PK Gen3 PKA3AA, PKA3BA**
Description Antenna Characteristics

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1 Antenna Structure

All antennas are company-own PCB antennas. Overview of PCB with its antennas can be taken from Layout.

1.1 UWB

UWB uses three monopole antennas. One for transmission and two for reception (dependent on direction and functionality). The structure of both RX antennas is identical.

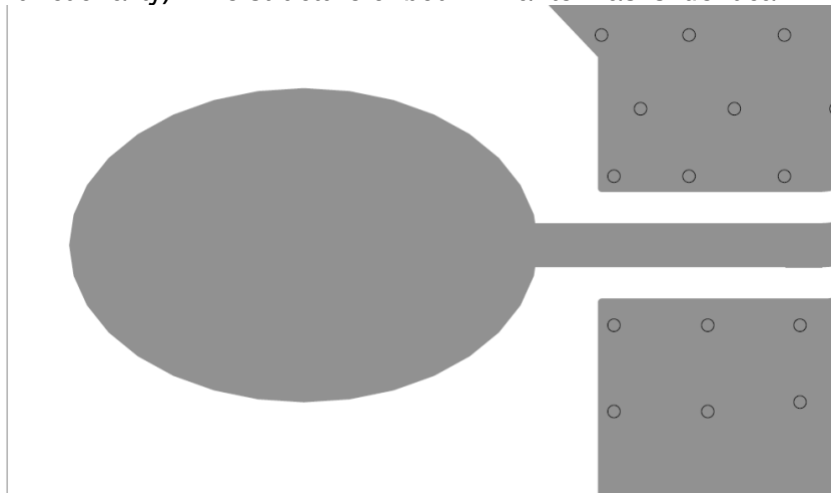


Figure 1: UWB TX monopole antenna

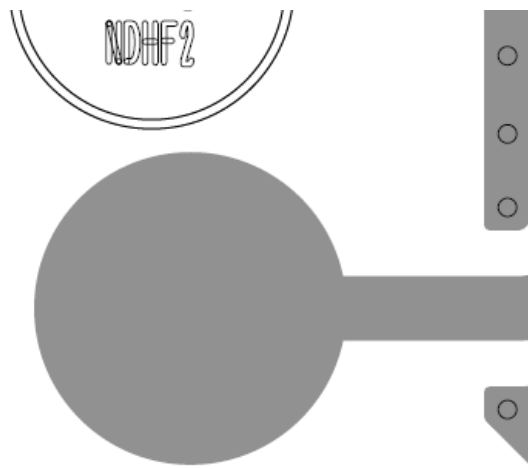


Figure 2: RX antenna (both RX antennas are identical).

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1.2 BLE

As BLE antenna an inverted F antenna is used.

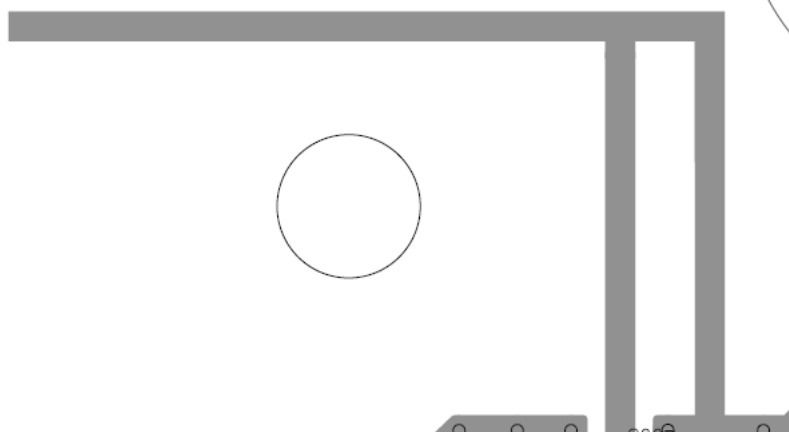


Figure 3: Inverted F antenna.

2 Antenna Maximum Gains

2.1 UWB

Maximum antenna Gains can be found in the following table:

Frequency (GHz)	UWB Tx	
	El (dBi)	Az (dBi)
64MHz	-73.9	
125MHz	-62.3	
249MHz	-50.2	
498MHz	-37.9	
1.6	-13.41	-14.51
2.7	0.21	-1.65
2.43GHz	-1.5	
3.49GHz	-0.5	
4.37	0.04	-2.99
4.7	0.03	-3.08
6.115	2.22	-0.09
6.3649	2.32	-0.16
6.489	2.24	-0.12
6.6768	2.18	-0.27
6.988	2.10	-0.08
7.2096	2.11	0.02
7.25	2.13	0.08

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7.488	2.27	0.44
7.587	2.3	0.34
7.662	2.34	0.35
7.987	2.40	0.54
8.4	2.47	0.09
8.498	2.55	0.13
8.5	2.55	0.13
10.25	2.36	-0.34
10.6	1.85	-0.10
10.7	2.02	-0.16
11.7	4.33	-0.54
12.75	2.7	2.02
15.974	4.93	0.16
18	5.46	0.16
26	1.23	0.61

UWB Rx:

Frequency	Ant 1 (PCB side of BLE antenan)		Ant 2 (PCB side of UWB TX antenna)	
	Az Gain (dBi)	El Gain (dBi)	Az Gain (dBi)	El Gain (dBi)
6.489GHz	5	4.6	3.9	3.8
7.987GHz	3.4	4.8	1.9	2.3

2.2 BLE

Due to the SAW filter, the gain is mainly relevant at band frequency.

Frequency	BLE antenna	
	Az Gain (dBi)	El Gain (dBi)
2.44GHz	-2.2	-0.2

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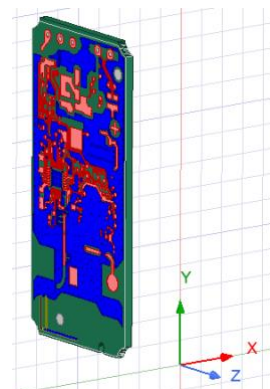
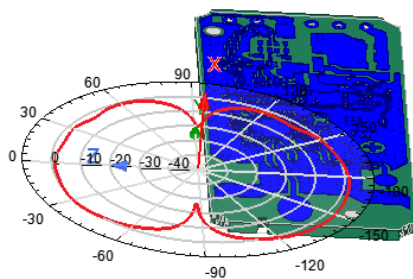
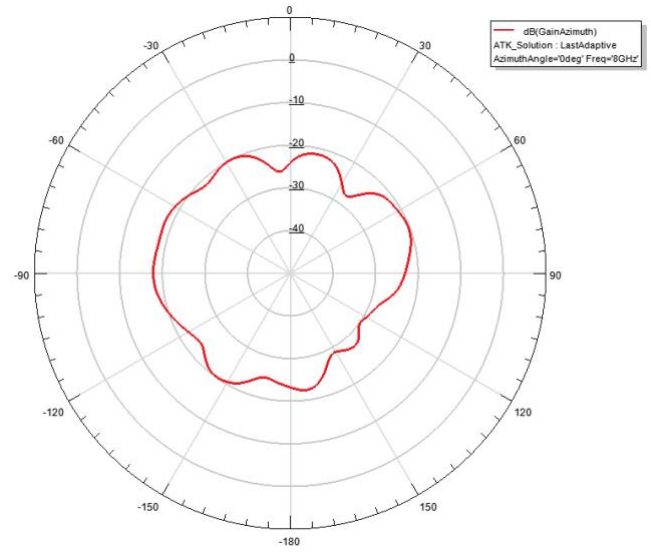
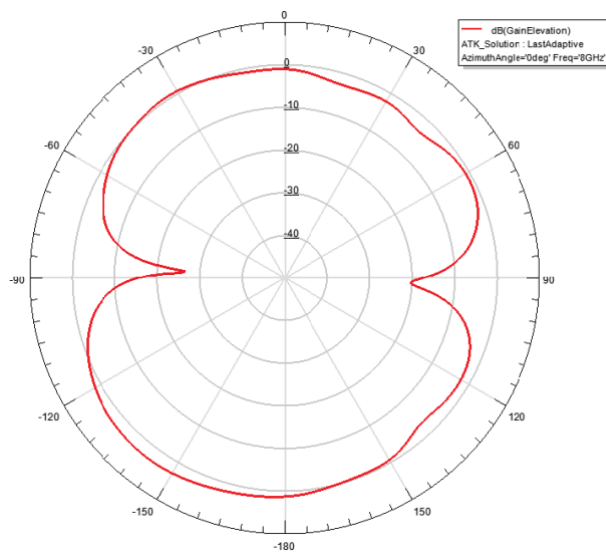
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3 Direction Diagrams

3.1 UWB

UWB TX antenna ZY Cut (dBi) @ 8GHz:



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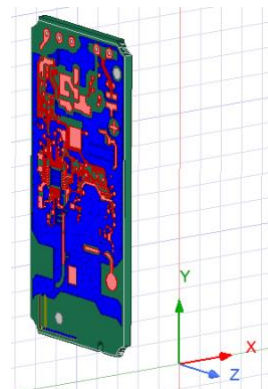
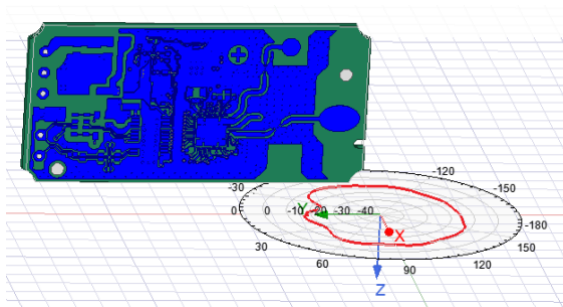
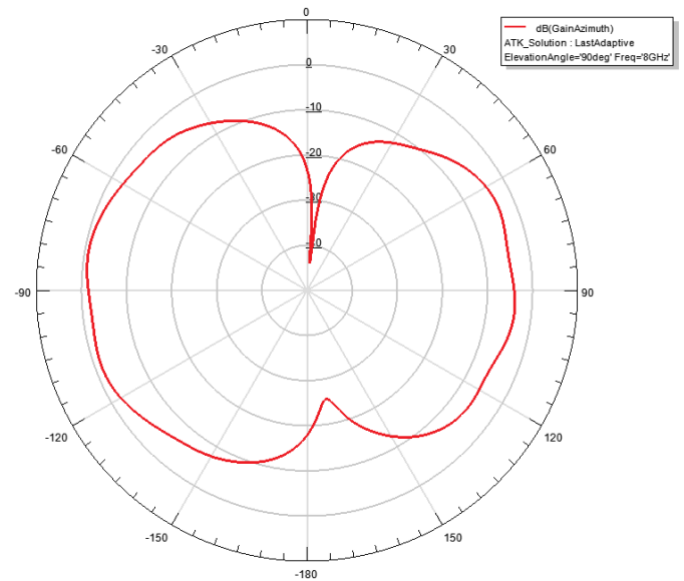
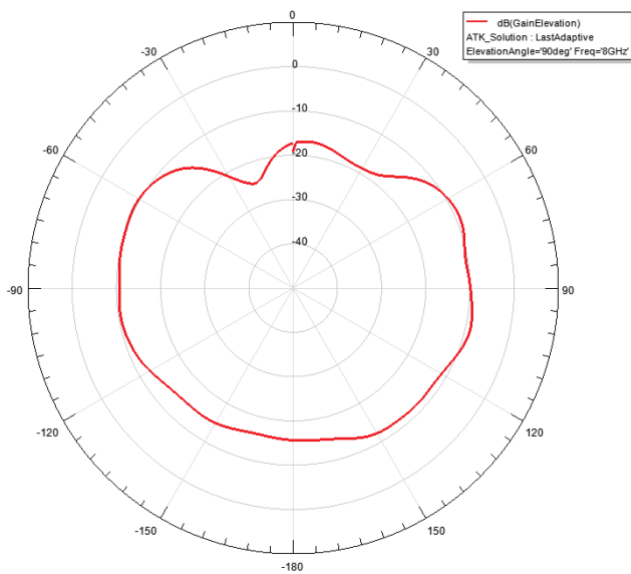
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UWB TX antenna XY Cut (dBi) @ 8GHz:



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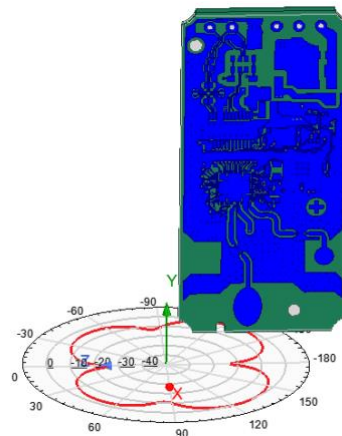
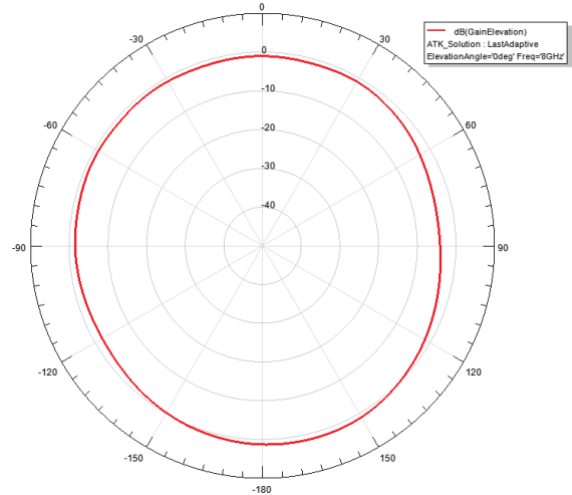
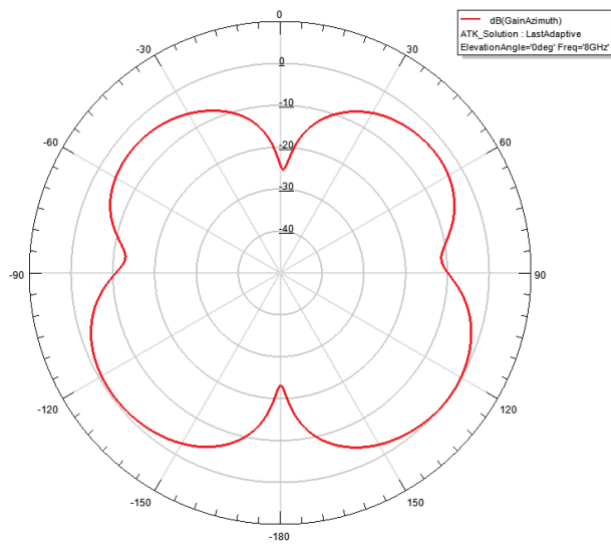
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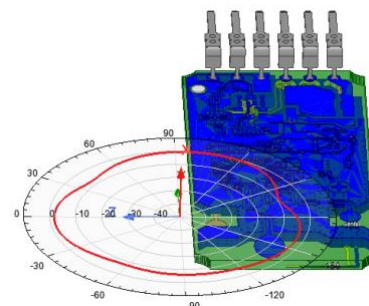
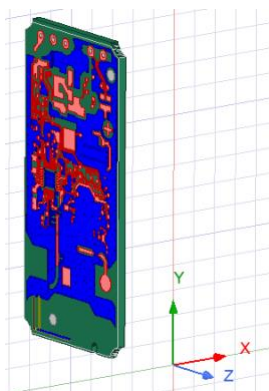
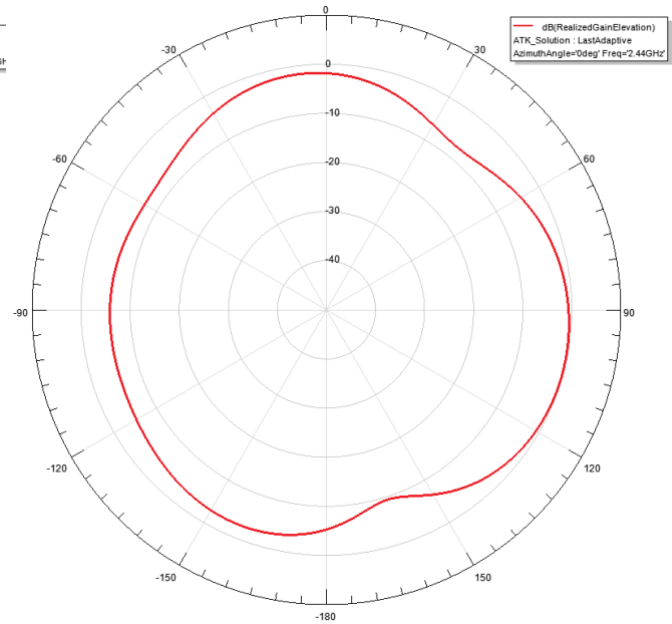
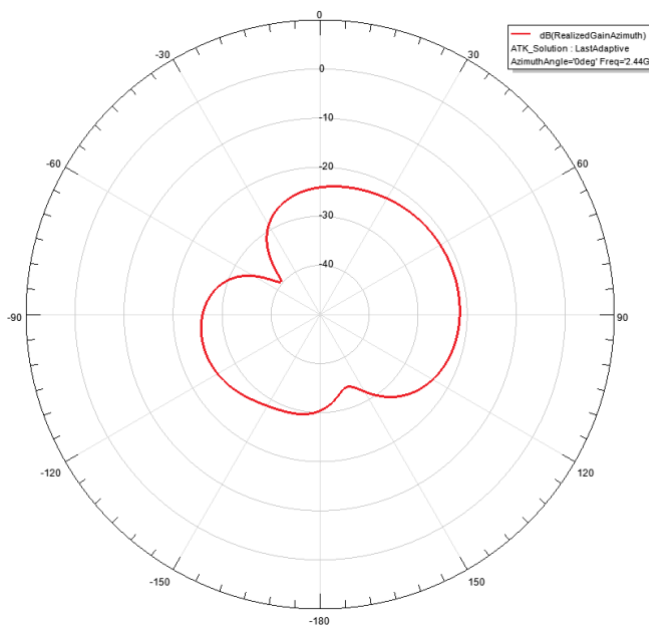
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3.2 BLE

BLE ZY Cut (dBi) @ 2.44GHz



Note: BLE antenna on backside of PCB in above image

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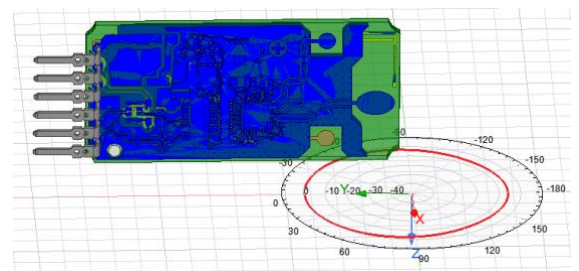
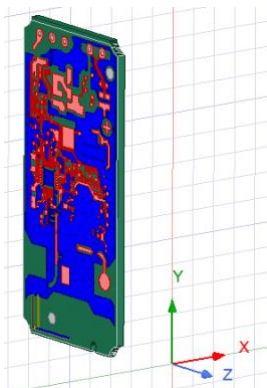
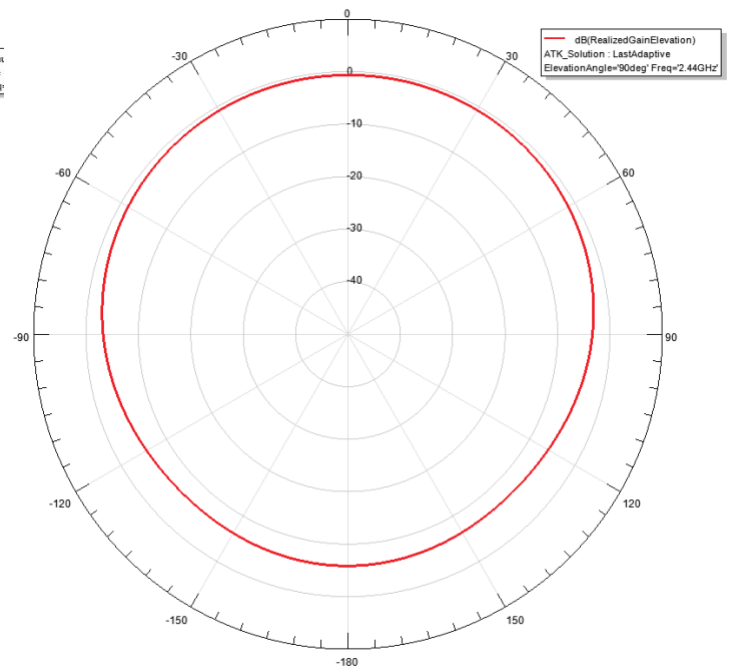
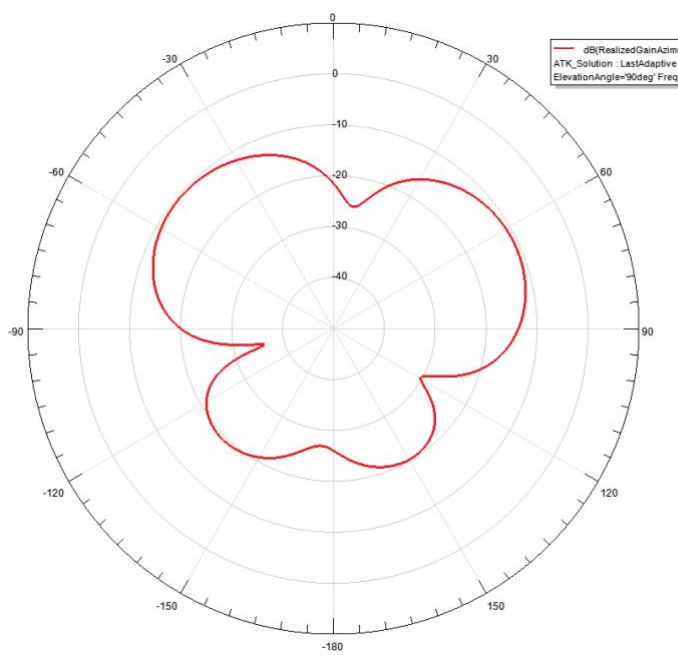
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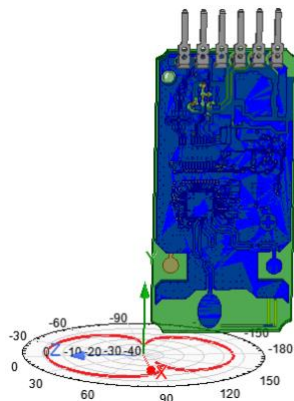
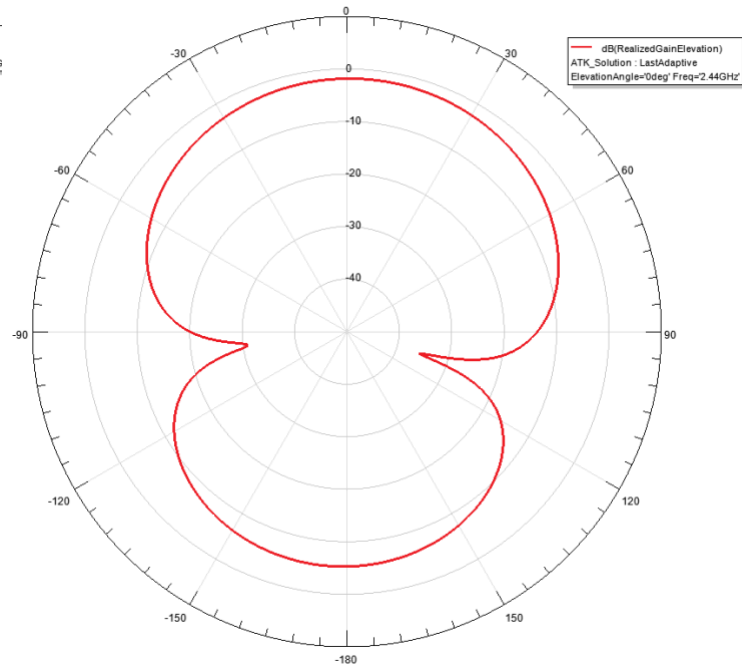
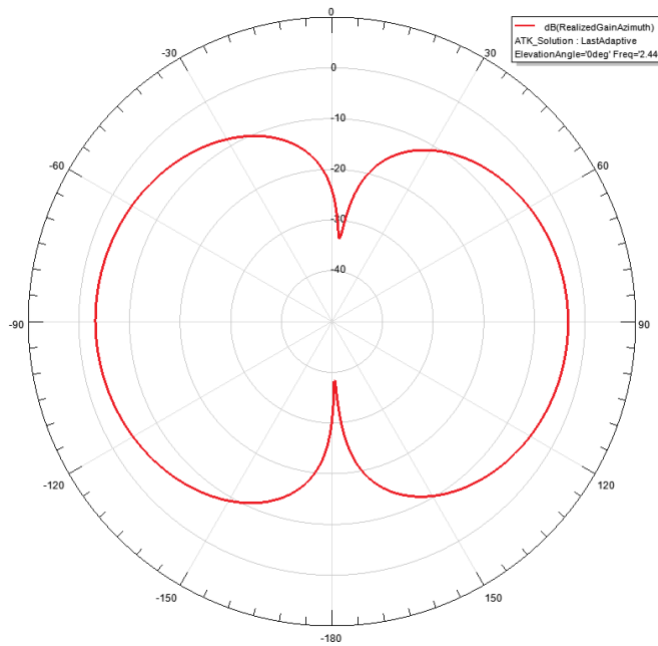
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