

Technical Data

CHW1010-ANT2-1.1

FEATURES

- **CoreHW CHW1010-ANT2** antenna module for Bluetooth® Low Energy 5.1 AoX direction finding systems
- Operating frequency range: 2400-2483 MHz
- CoreHW CHW1010 SP16T Bluetooth AoA/AoD antenna switch
- Connectors for radio frequency signals and CoreHW CHW1010 SP16T GPIO control signals
- Sixteen patch antenna elements
- Low cost 4-layer PCB stack-up structure
- Optimized phase balance between antenna chains
- Firmware support and antenna models available
- PCB dimensions: 150mm x 150mm

GENERAL DESCRIPTION

CoreHW CHW1010-ANT2 is an antenna module consisting of sixteen patch antenna elements. The antenna array PCB is intended for direction and positioning system solution providers.

CHW1010-ANT2 antenna array board contains CoreHW CHW1010 SP16T Bluetooth AoA/AoD capable antenna switch for antenna controls and Bluetooth CTE sampling. The device comprises of very low phase mismatch antenna switch array which enables real high accuracy positioning.

CHW1010-ANT2 antenna module enables system solutions which are insensitive to multipath signal and has outstanding position accuracy down to 10cm level.

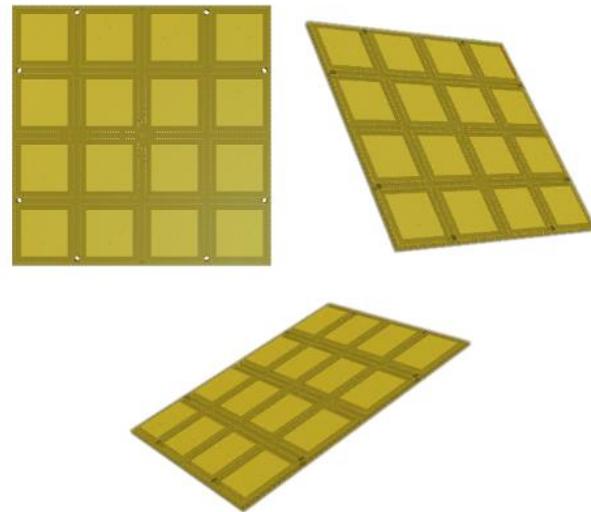
CoreHW offers an AoA reference design system with CoreHW firmware and Windows PC positioning engine SW with user interface (GUI). The reference system contains four patch antenna array-based locators. The reference system can be used for laboratory tests and PoC testing in real use case scenarios.

APPLICATIONS

- *Asset tracking in factories, offices, logistics etc.*
- *Access control*
- *People tracking*
- *Wayfinding*
- *Point-of-interest services*
- *Proximity marketing*
- *Shopping guidance and assistance*
- *Equipment and facilities utilization*
- *Consumer behavior analysis*
- *Security services*
- *Item finding*

www.corehw.com

The antenna elements in this array are all used in normal operation, but never used simultaneously - only one element is active at a time. Normal operation is to sequence through the elements one at a time.



Technical Data

CHW1010-ANT2-1.1

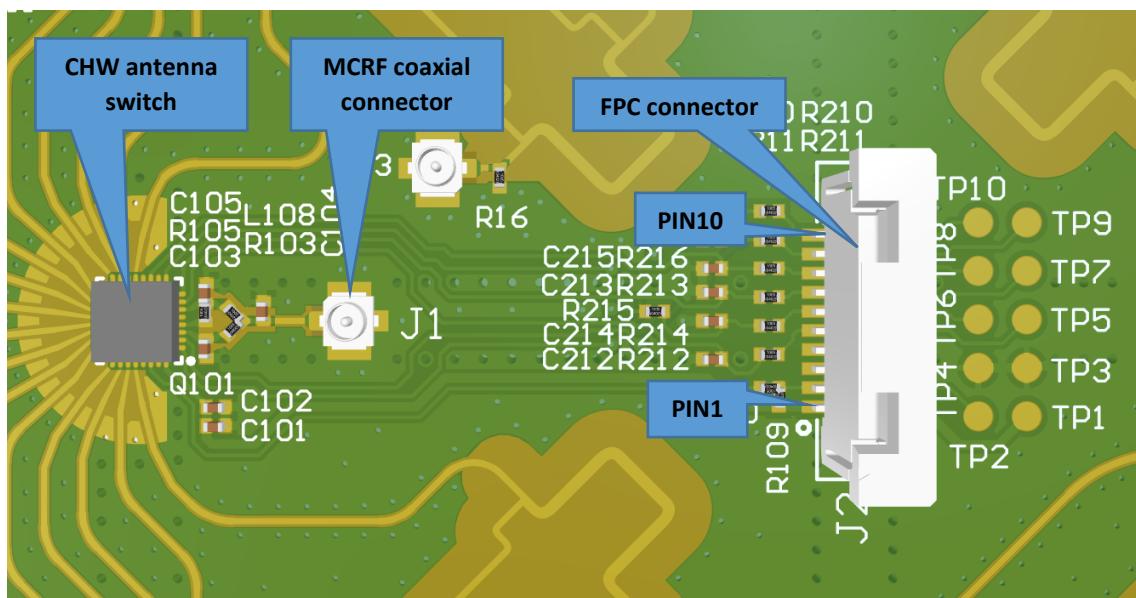
CHW1010-ANT2 PCB CONNECTORS AND SIGNAL PINS

Table 1. Connector types

RF connector	GPIO connector
MCRF coaxial 50 Ohms	FPC vert 10pos, pitch 1mm

Table 2. GPIO pin contacts

Pin	Purpose	Description
1	VBAT	Supply voltage (3V nominal)
2	Unused	Unused
3	GND	GND
4	GND	GND
5	D1	ANT_SEL0
6	D3	ANT_SEL2
7	D2	ANT_SEL1
8	D4	ANT_SEL3
9	D0	Digital control input
10	EN	Chip enable

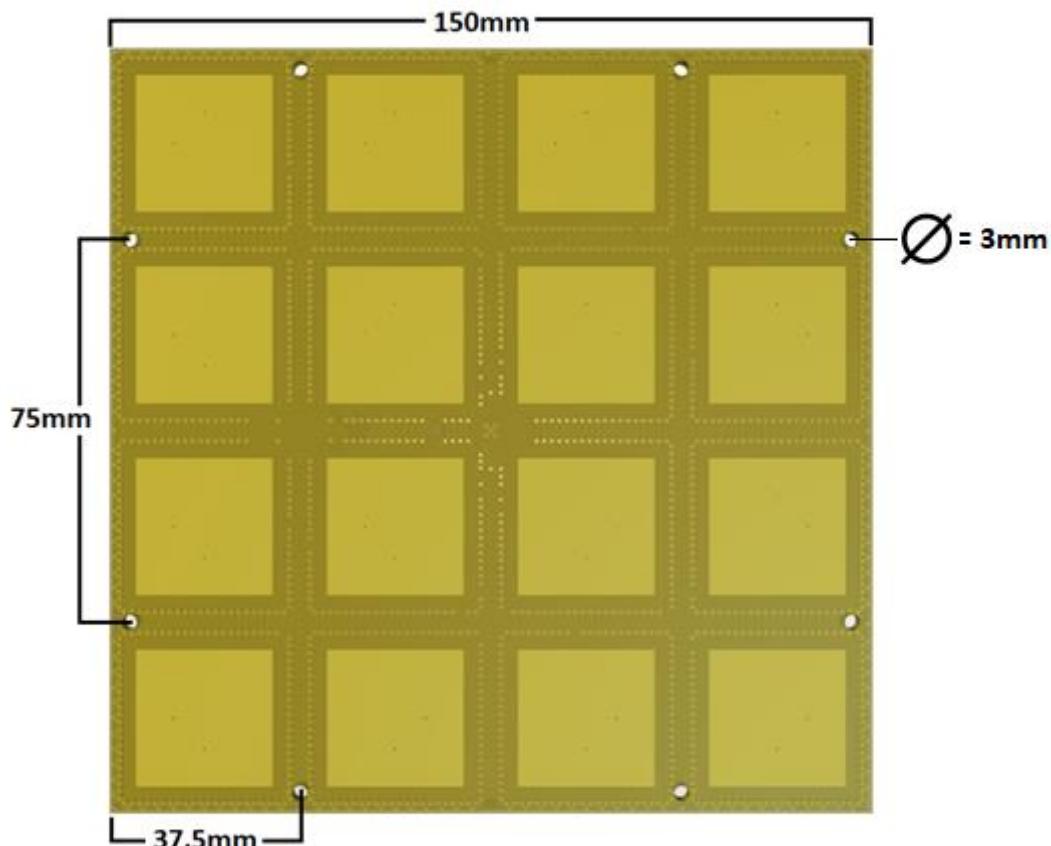


Technical Data

CHW1010-ANT2-1.1

DIMENSIONS

PCB thickness: 3.6 mm

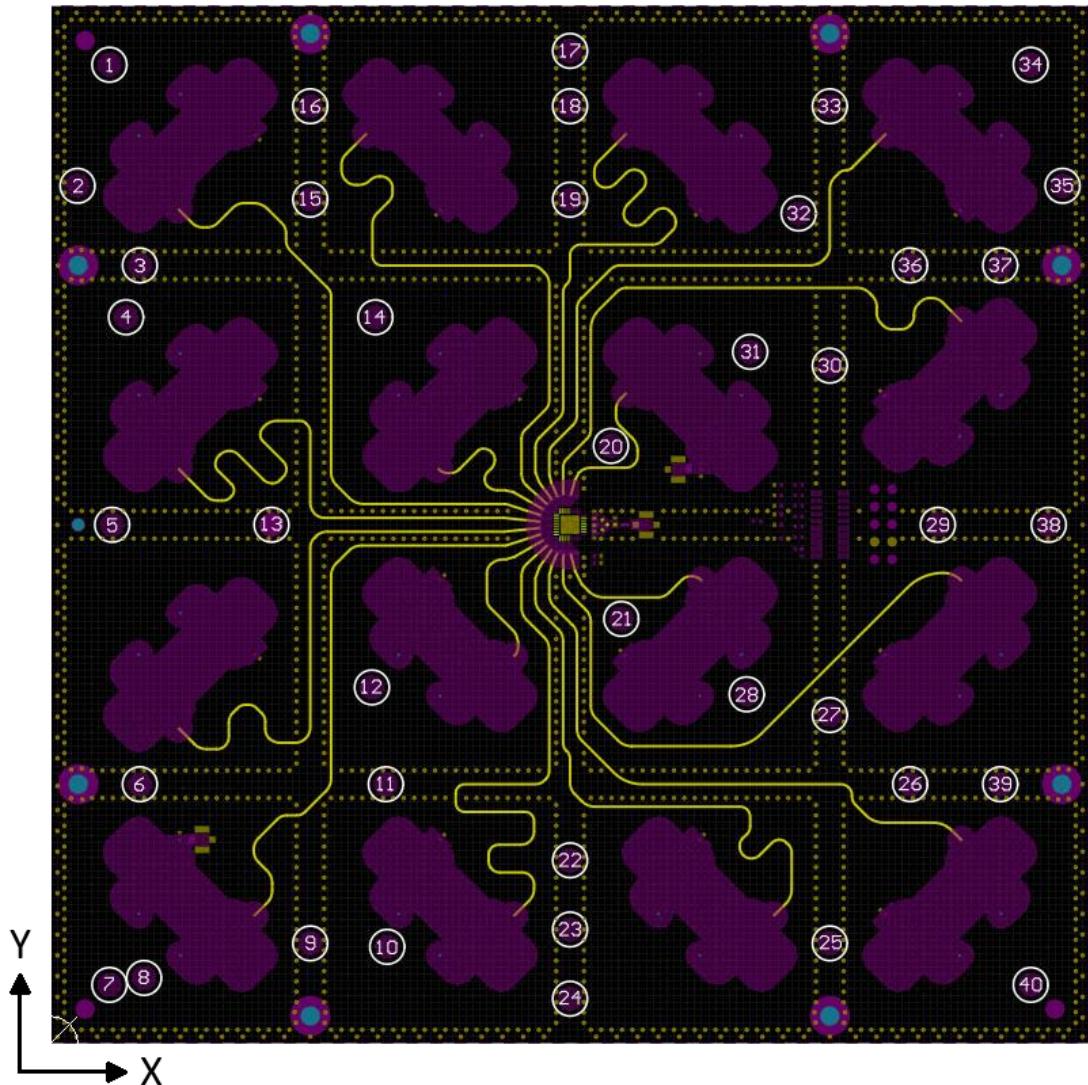


Technical Data

CHW1010-ANT2-1.1

PCB GROUND POINT COORDINATES

GND Points	x [mm]	y [mm]
1	8.5	141.5
2	3.9	124
3	12.9	112.5
4	10.9	105
5	8.9	75
6	12.9	37.5
7	8.5	8.5
8	13.5	9.5
9	37.5	14.5
10	48.6	14
11	48.4	37.5
12	46.4	51.5
13	31.9	75
14	46.9	105
15	37.5	122
16	37.5	135.5
17	75	143.5
18	75	135.5
19	75	122
20	80.9	86.4
21	82.4	61.4
22	75	26.5
23	75	16.5
24	75	6.5
25	112.5	14.5
26	124.1	37.5
27	112.5	47.5
28	100.5	50.5
29	128.1	75
30	112.5	98
31	101	100
32	108	120
33	112.5	135.5
34	141.5	141.5
35	146.1	124
36	124.1	112.5
37	137.1	112.5
38	144.1	75
39	137.1	37.5
40	141.5	8.5



Technical Data

CHW1010-ANT2-1.1

CONTACT DETAILS

Sales

sales@corehw.com

Technical support

product.support@corehw.com

CoreHW Oy
Visiokatu 1
33720 Tampere
Finland

www.corehw.com

Disclaimer

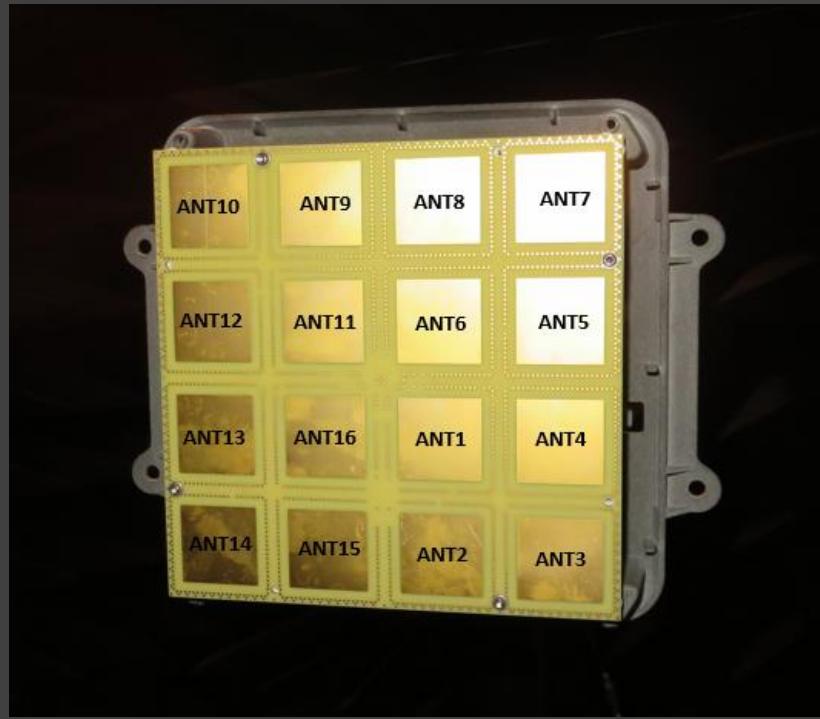
The contents of this document are subject to change without prior notice. CoreHW makes no representation or warranty of any nature whatsoever (neither expressed nor implied) with respect to the matters addressed in this document, including but not limited to warranties of merchantability or fitness for a particular purpose, interpretability or interoperability or, against infringement of third party intellectual property rights, and in no event shall CoreHW be liable to any party for any direct, indirect, incidental and or consequential damages and or loss whatsoever (including but not limited to monetary losses or loss of data), that might arise from the use of this document or the information in it.

© Copyright CoreHW. All rights reserved.

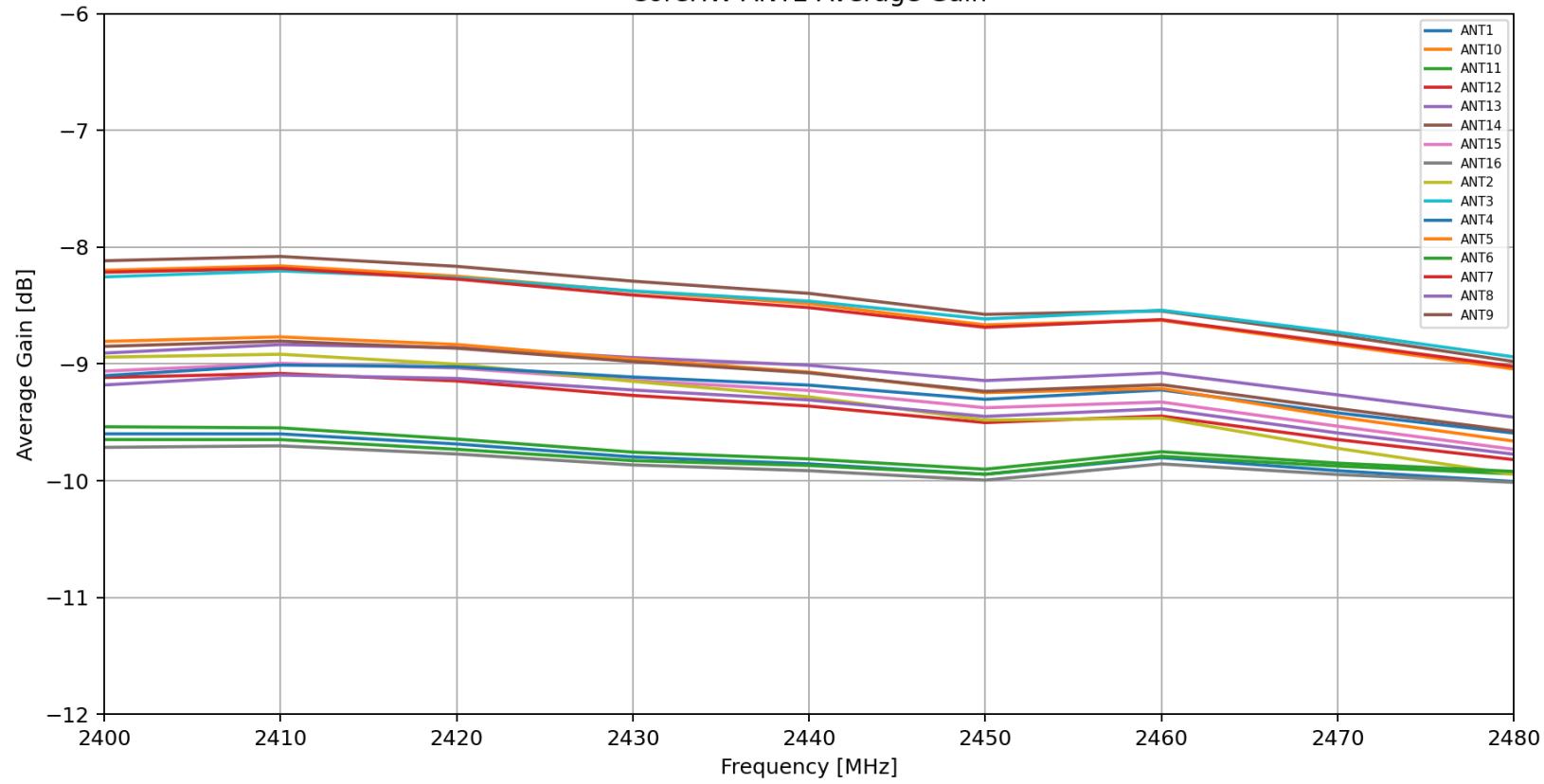
CoreHW

CoreHW ANT2 Average Gain and Maximum Gain

CoreHW ANT2 Antenna Array Elements



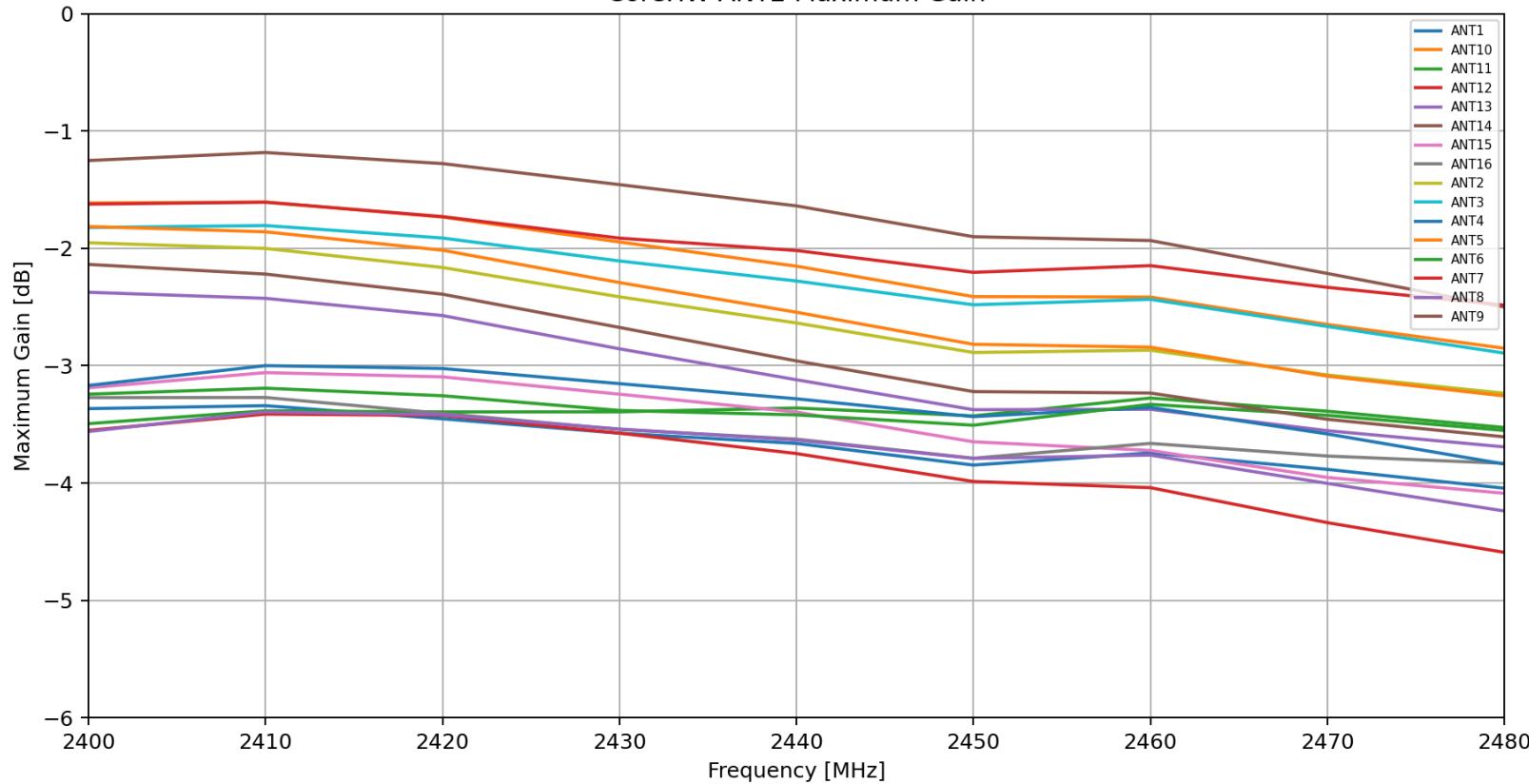
CoreHW ANT2 Average Gain



Average Gain [dB]

	2400 [MHz]	2410 [MHz]	2420 [MHz]	2430 [MHz]	2440 [MHz]	2450 [MHz]	2460 [MHz]	2470 [MHz]	2480 [MHz]
ANT1	-9.60	-9.60	-9.69	-9.80	-9.86	-9.95	-9.80	-9.91	-10.01
ANT2	-8.94	-8.92	-9.00	-9.15	-9.28	-9.48	-9.46	-9.72	-9.95
ANT3	-8.26	-8.20	-8.26	-8.37	-8.46	-8.62	-8.54	-8.73	-8.94
ANT4	-9.10	-9.01	-9.02	-9.11	-9.18	-9.30	-9.22	-9.42	-9.59
ANT5	-8.81	-8.77	-8.83	-8.96	-9.07	-9.25	-9.21	-9.45	-9.66
ANT6	-9.54	-9.55	-9.64	-9.76	-9.81	-9.90	-9.75	-9.85	-9.92
ANT7	-8.22	-8.18	-8.27	-8.41	-8.52	-8.69	-8.62	-8.82	-9.02
ANT8	-9.18	-9.10	-9.12	-9.22	-9.31	-9.45	-9.38	-9.59	-9.77
ANT9	-8.85	-8.81	-8.87	-8.98	-9.08	-9.24	-9.18	-9.38	-9.57
ANT10	-8.20	-8.16	-8.25	-8.38	-8.48	-8.67	-8.63	-8.84	-9.04
ANT11	-9.65	-9.65	-9.73	-9.83	-9.87	-9.95	-9.79	-9.88	-9.94
ANT12	-9.12	-9.08	-9.15	-9.27	-9.36	-9.50	-9.45	-9.65	-9.82
ANT13	-8.91	-8.84	-8.86	-8.95	-9.01	-9.14	-9.08	-9.27	-9.46
ANT14	-8.12	-8.08	-8.16	-8.29	-8.40	-8.58	-8.55	-8.75	-8.98
ANT15	-9.06	-9.00	-9.04	-9.14	-9.23	-9.38	-9.33	-9.53	-9.73
ANT16	-9.71	-9.70	-9.77	-9.87	-9.91	-10.00	-9.86	-9.95	-10.01

CoreHW ANT2 Maximum Gain



Maximum Gain [dB]

	2400 [MHz]	2410 [MHz]	2420 [MHz]	2430 [MHz]	2440 [MHz]	2450 [MHz]	2460 [MHz]	2470 [MHz]	2480 [MHz]
ANT1	-3.37	-3.34	-3.45	-3.58	-3.66	-3.85	-3.74	-3.88	-4.04
ANT2	-1.95	-2.00	-2.16	-2.41	-2.64	-2.89	-2.87	-3.08	-3.24
ANT3	-1.82	-1.81	-1.91	-2.11	-2.28	-2.48	-2.43	-2.67	-2.89
ANT4	-3.17	-3.00	-3.02	-3.15	-3.28	-3.43	-3.36	-3.58	-3.84
ANT5	-1.81	-1.86	-2.02	-2.29	-2.54	-2.82	-2.84	-3.09	-3.26
ANT6	-3.24	-3.19	-3.26	-3.38	-3.42	-3.51	-3.33	-3.42	-3.55
ANT7	-1.62	-1.61	-1.73	-1.91	-2.02	-2.20	-2.15	-2.33	-2.48
ANT8	-3.56	-3.39	-3.42	-3.54	-3.63	-3.79	-3.76	-4.00	-4.24
ANT9	-2.14	-2.22	-2.39	-2.67	-2.96	-3.22	-3.23	-3.46	-3.61
ANT10	-1.61	-1.61	-1.73	-1.95	-2.15	-2.41	-2.42	-2.65	-2.85
ANT11	-3.49	-3.38	-3.39	-3.39	-3.36	-3.43	-3.28	-3.39	-3.53
ANT12	-3.55	-3.41	-3.42	-3.58	-3.75	-3.99	-4.04	-4.34	-4.59
ANT13	-2.37	-2.43	-2.57	-2.86	-3.12	-3.38	-3.37	-3.55	-3.69
ANT14	-1.25	-1.18	-1.28	-1.46	-1.64	-1.90	-1.93	-2.21	-2.50
ANT15	-3.19	-3.06	-3.10	-3.24	-3.40	-3.65	-3.72	-3.95	-4.09
ANT16	-3.27	-3.27	-3.41	-3.54	-3.63	-3.79	-3.66	-3.77	-3.83

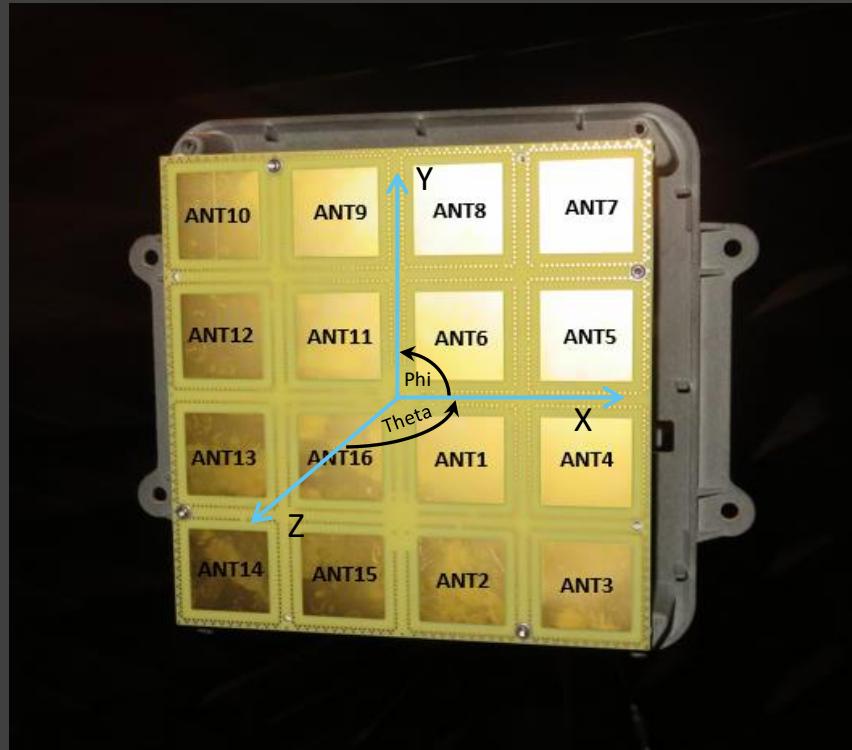
DISCLAIMER

The contents of this document are subject to change without prior notice. CoreHW makes no representation or warranty of any nature whatsoever (neither expressed nor implied) with respect to the matters addressed in this document, including but not limited to warranties of merchantability or fitness for a particular purpose, interpretability or interoperability or, against infringement of third party intellectual property rights, and in no event shall CoreHW be liable to any party for any direct, indirect, incidental and or consequential damages and or loss whatsoever (including but not limited to monetary losses or loss of data), that might arise from the use of this document or the information in it.

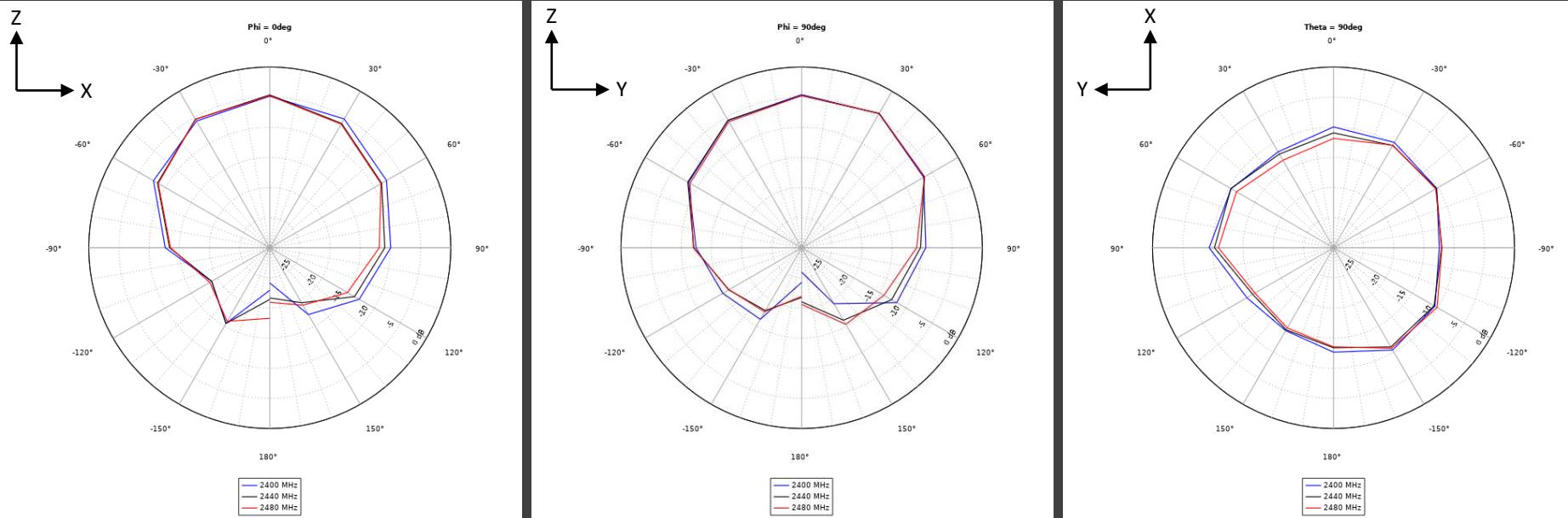
CoreHW

CoreHW ANT2 2D Radiation Patterns

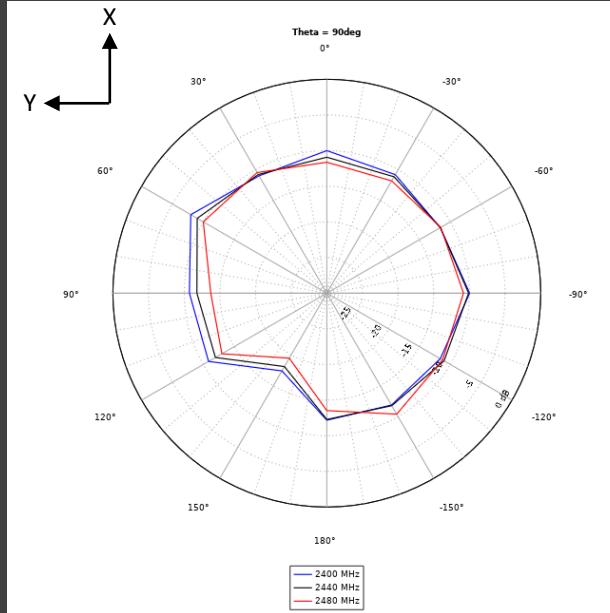
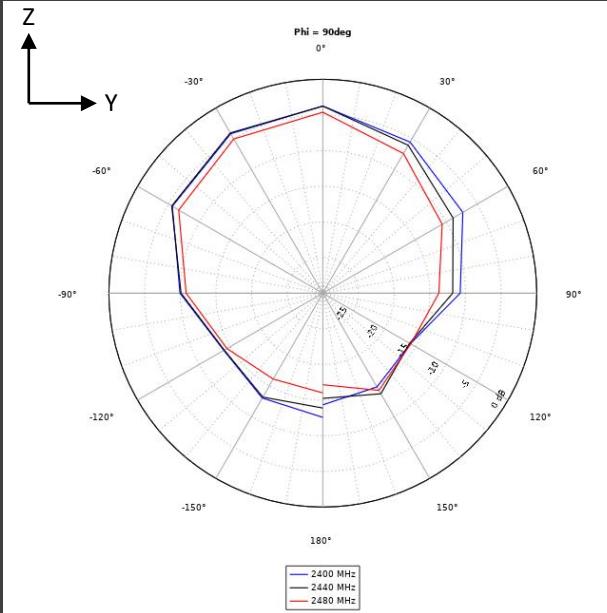
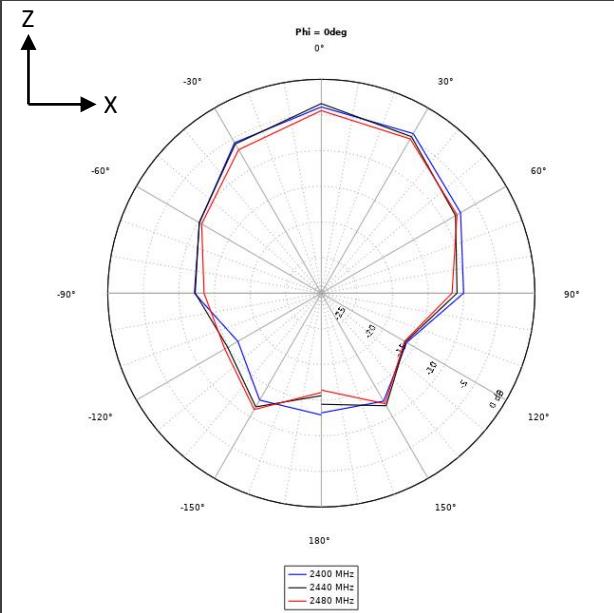
Theta 0 degree and Phi 0 degree position



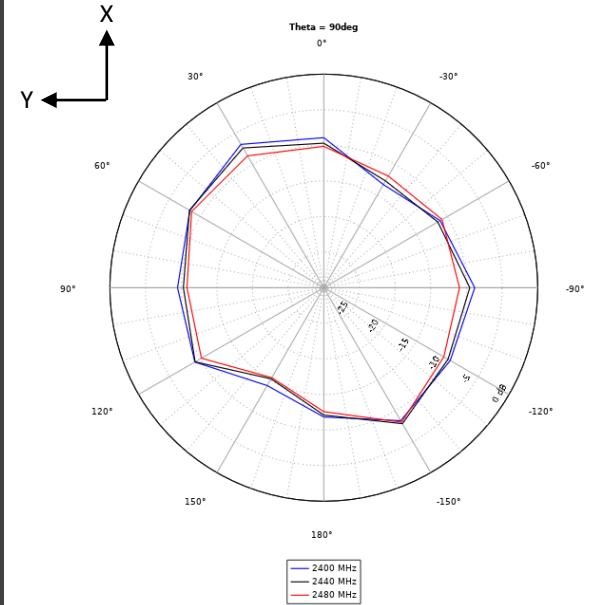
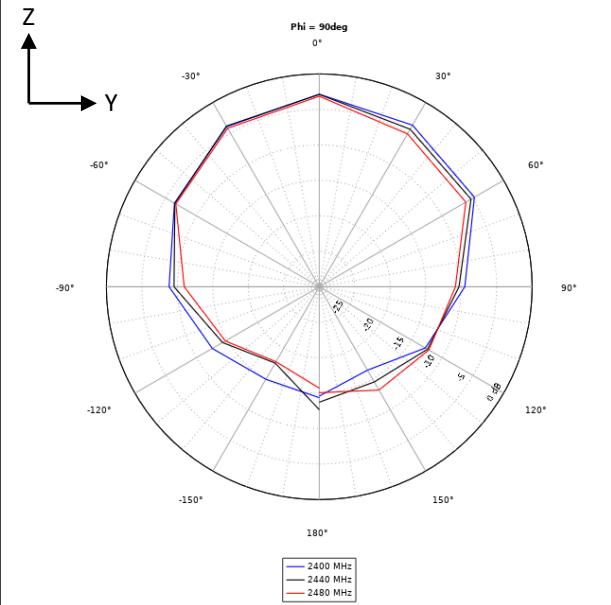
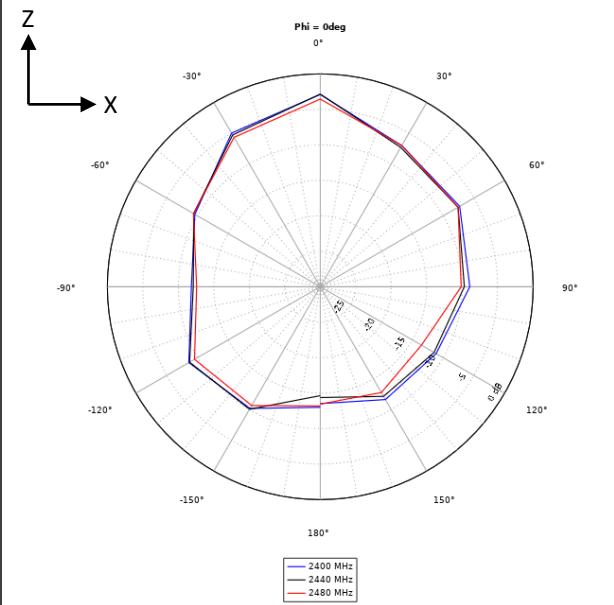
ANT1



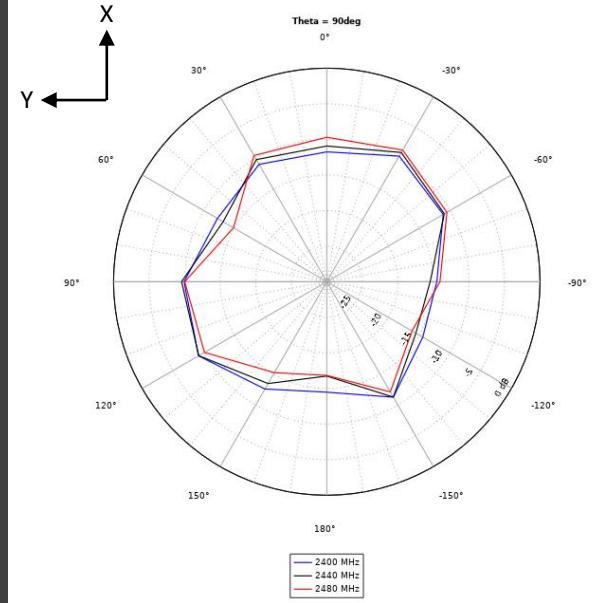
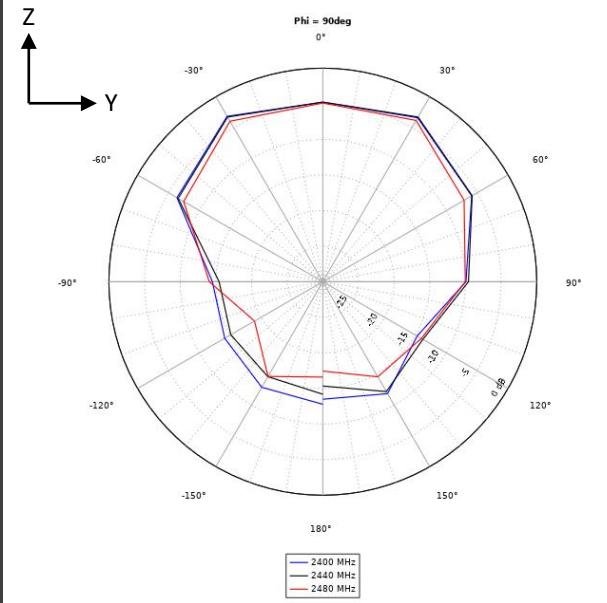
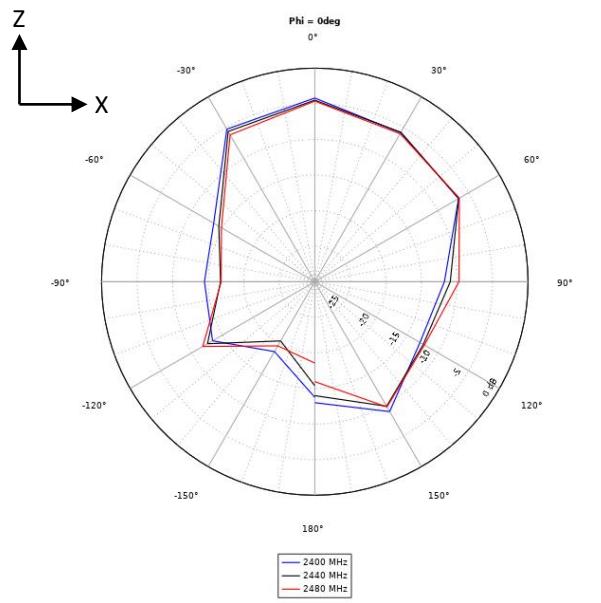
ANT2



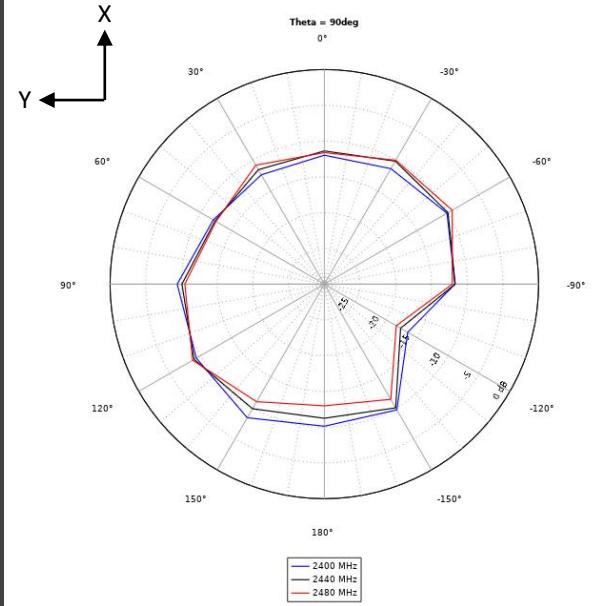
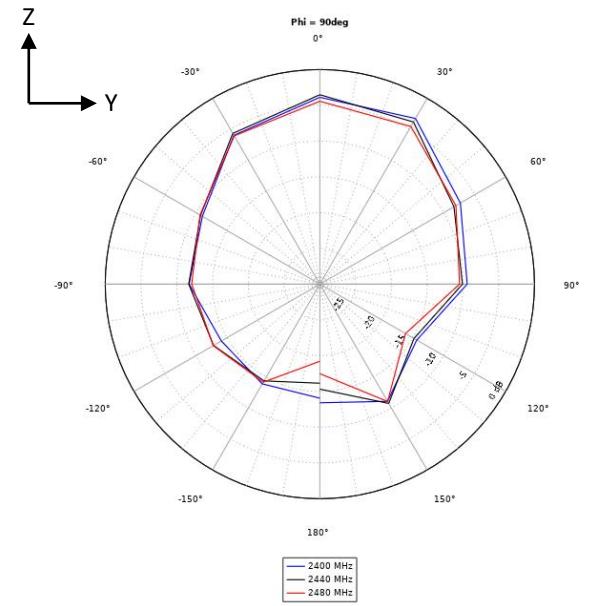
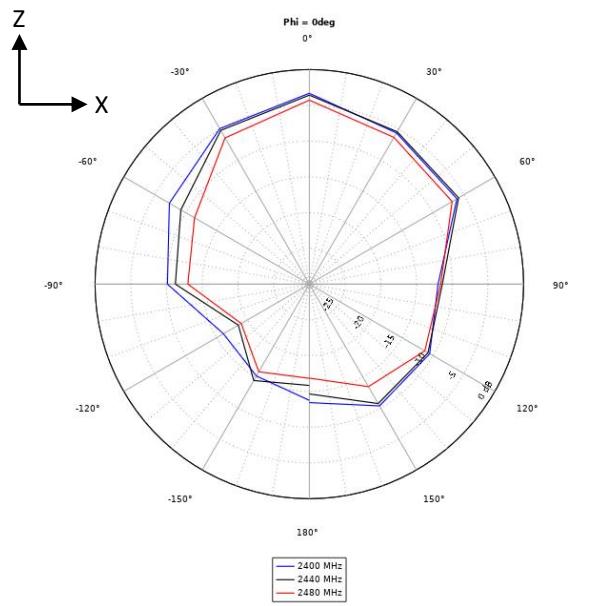
ANT3



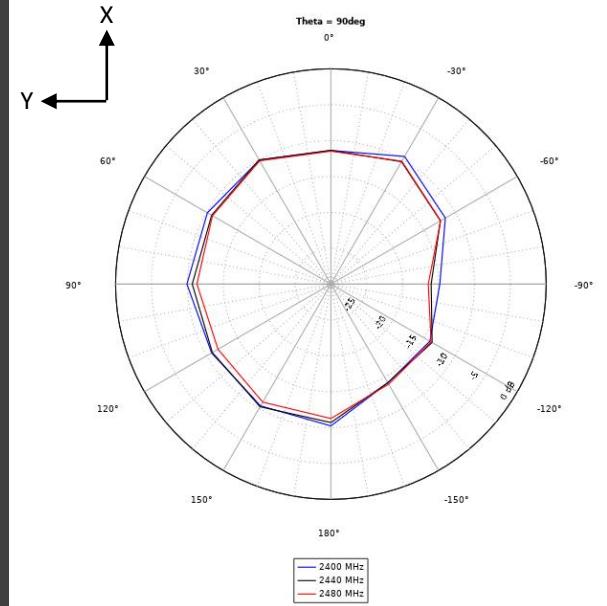
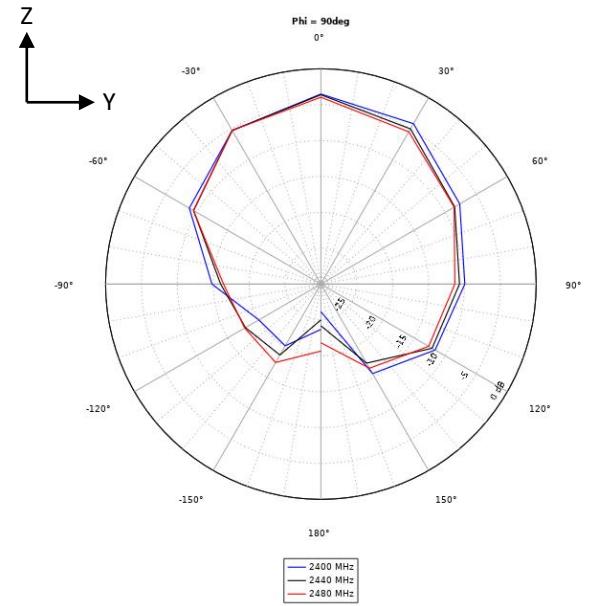
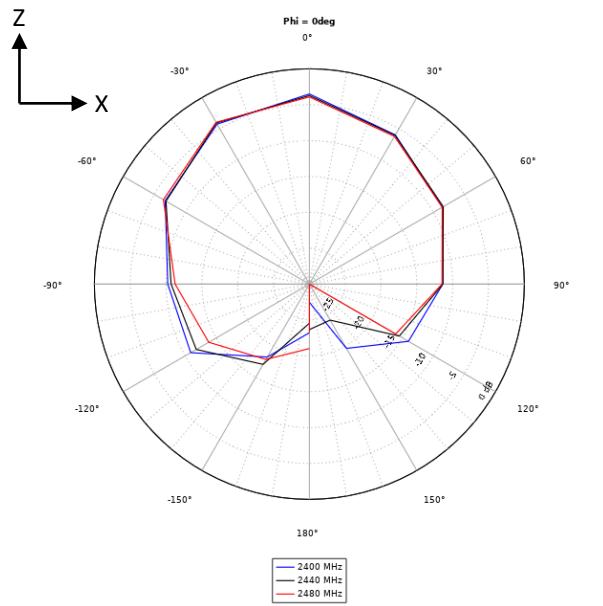
ANT4



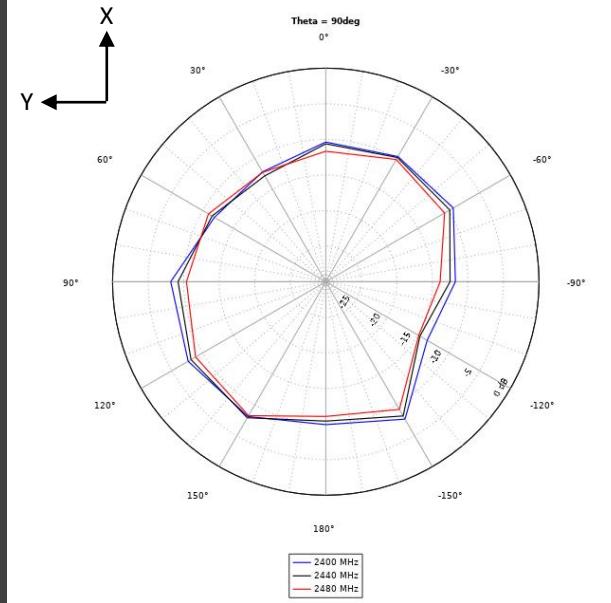
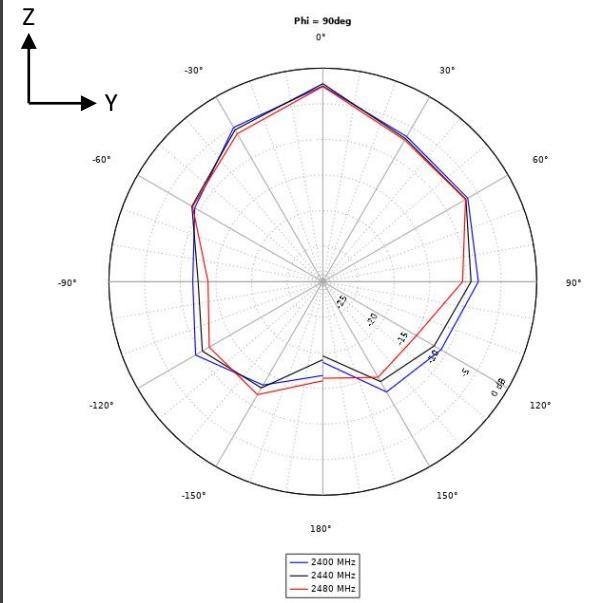
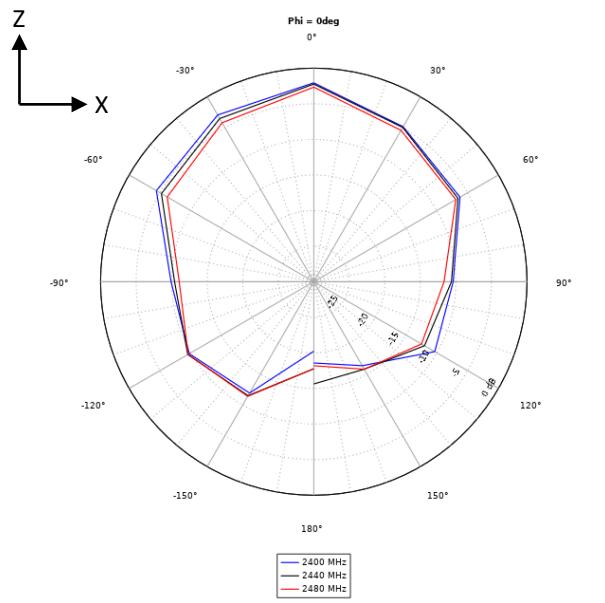
ANT5



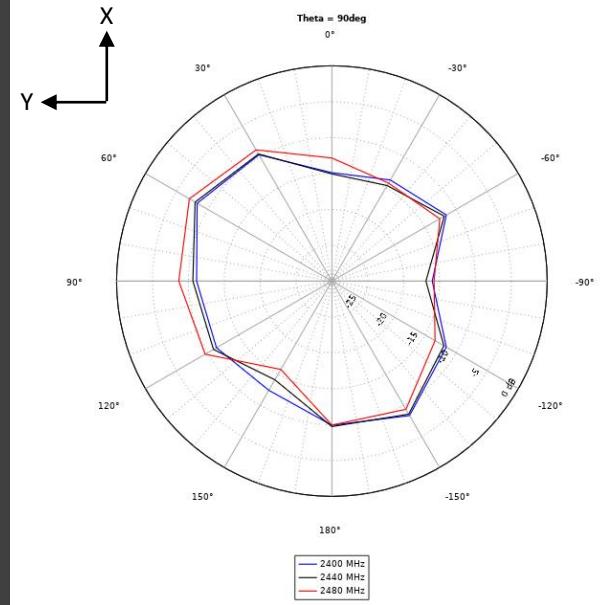
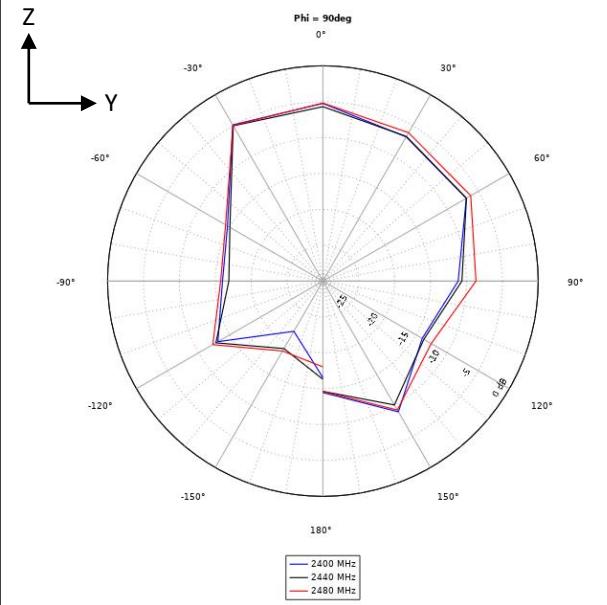
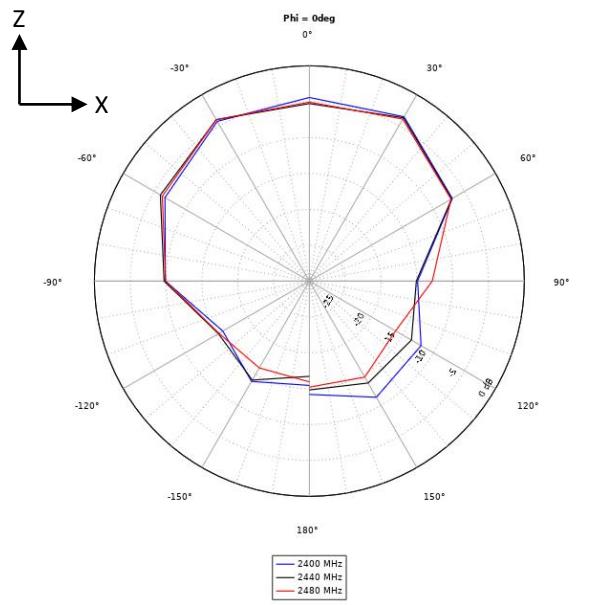
ANT6



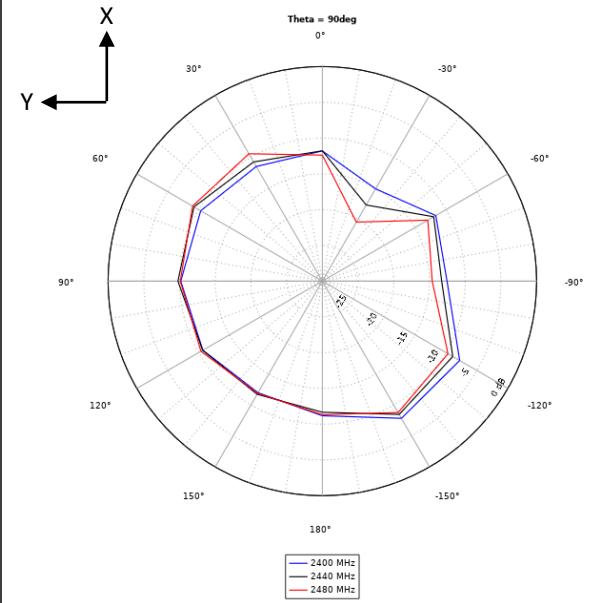
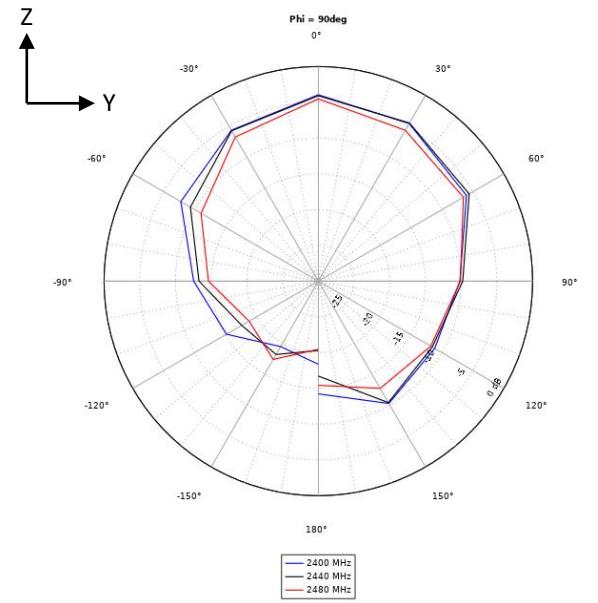
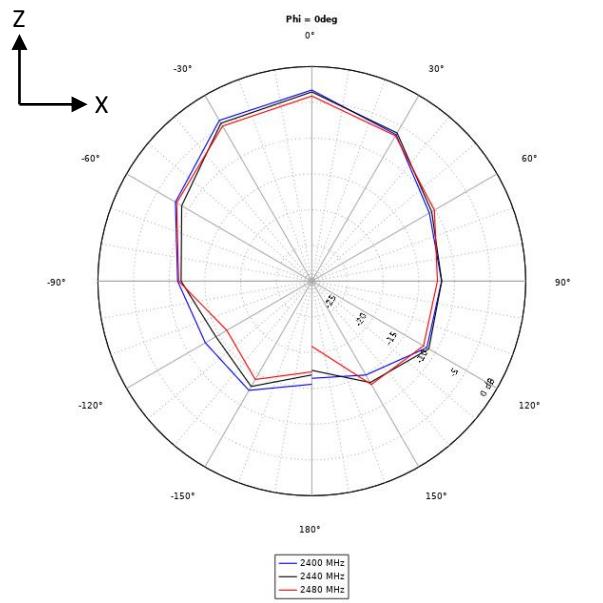
ANT7



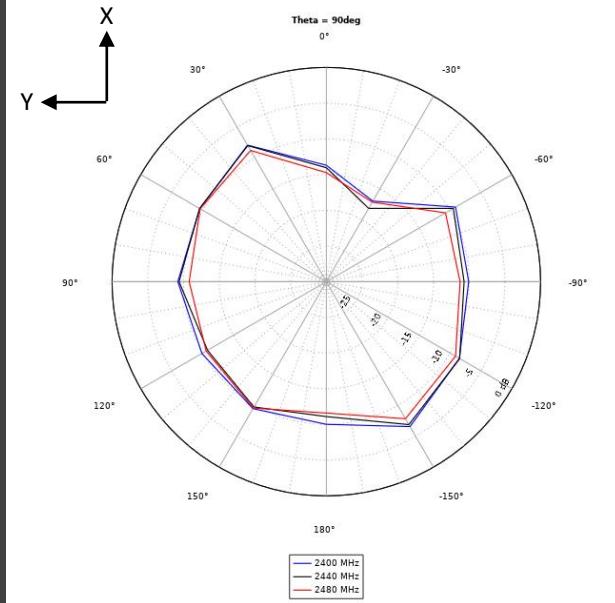
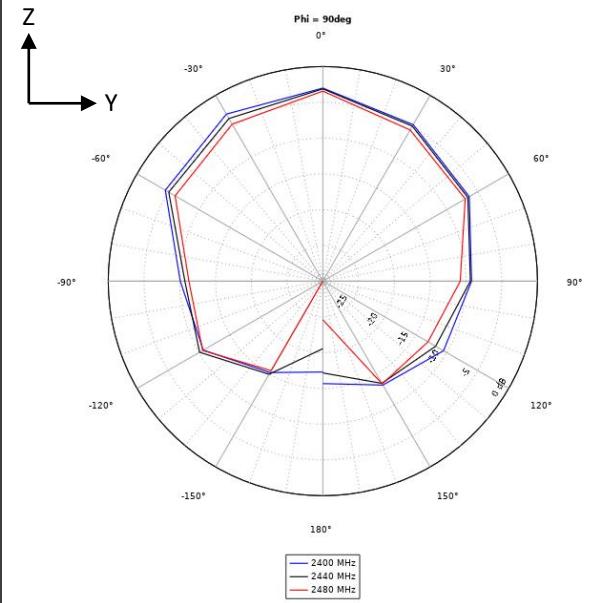
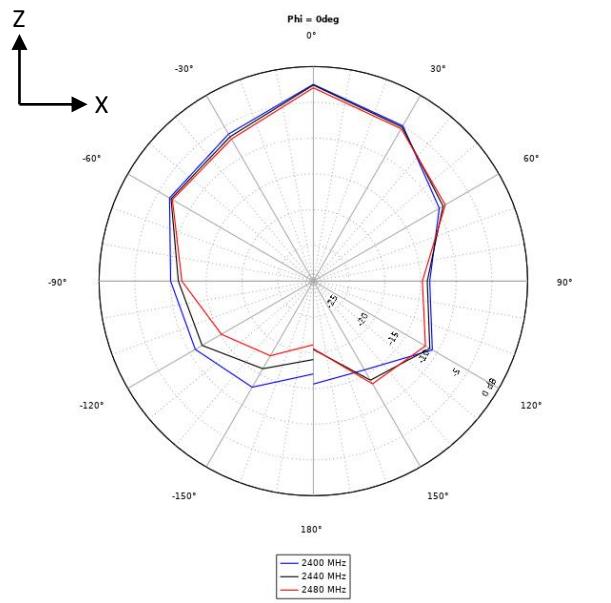
ANT8



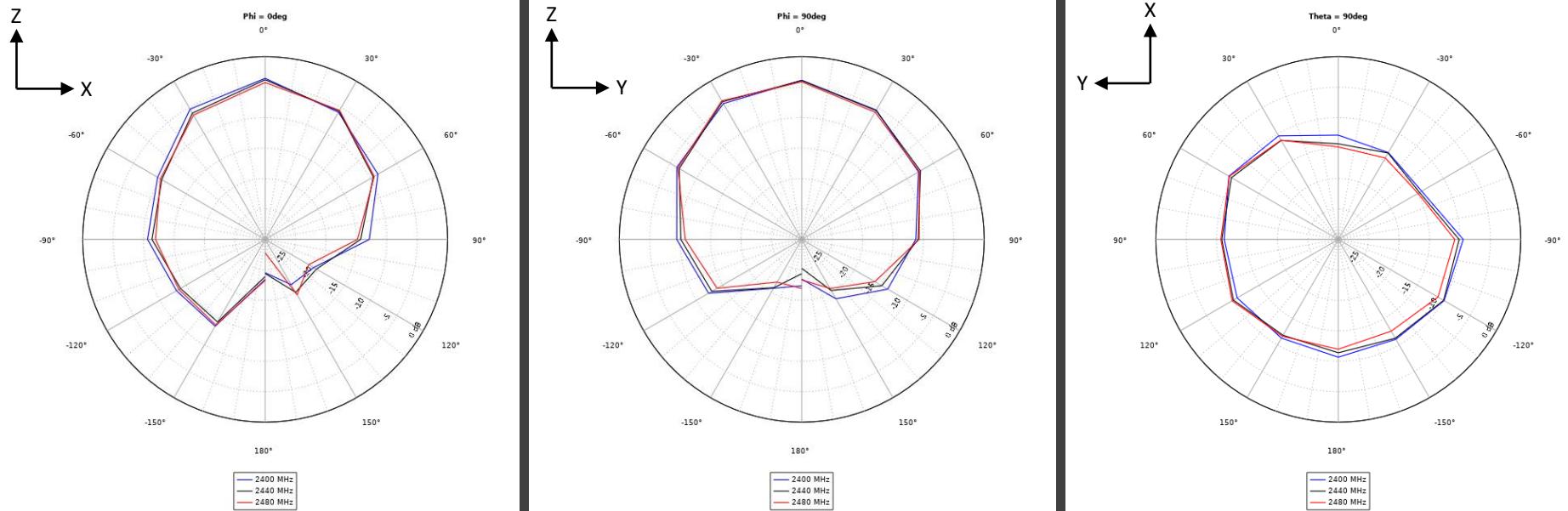
ANT9



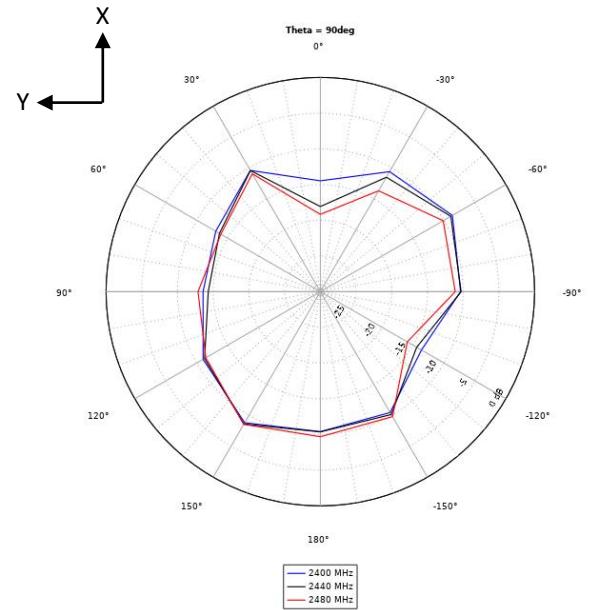
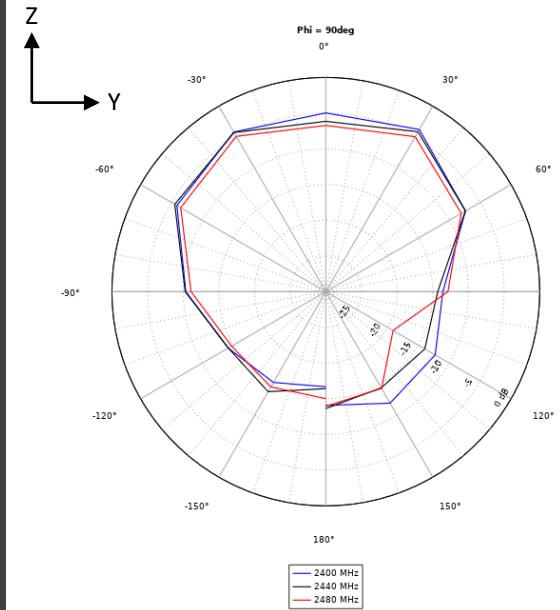
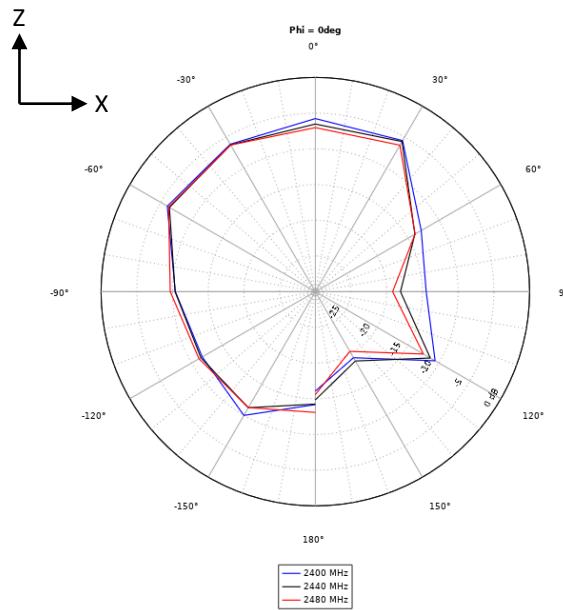
ANT10



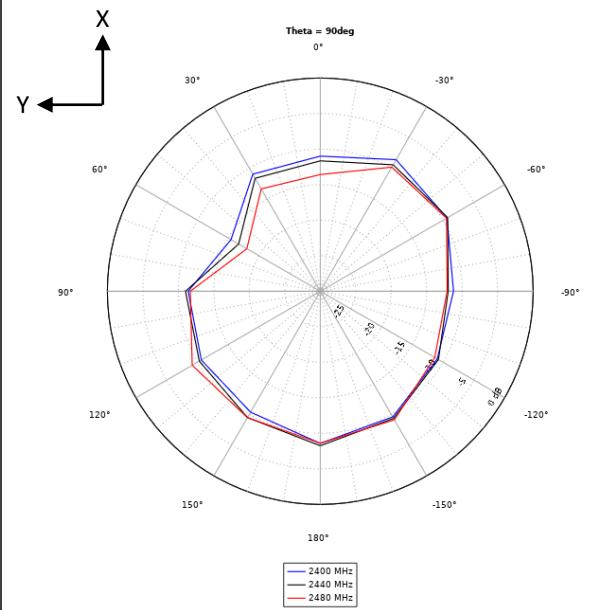
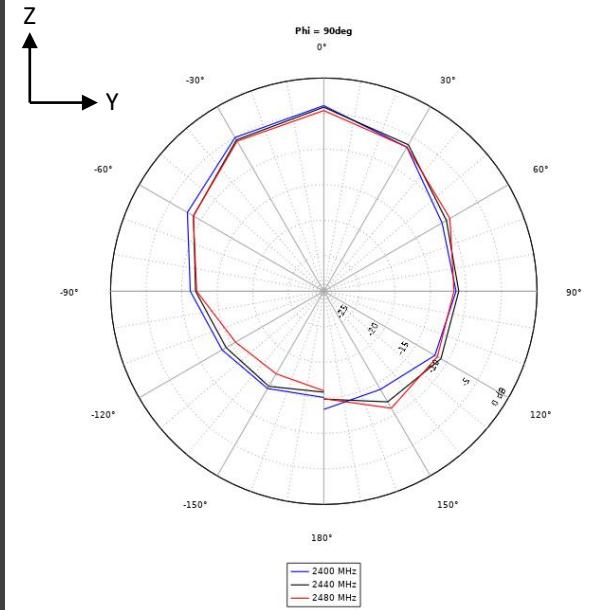
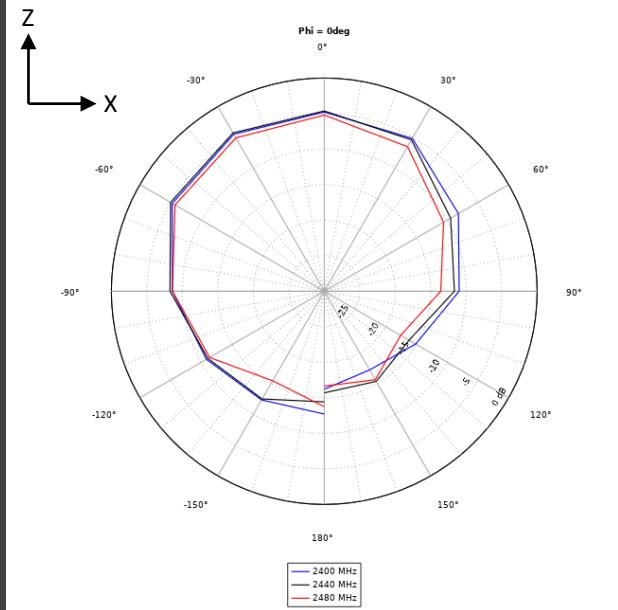
ANT11



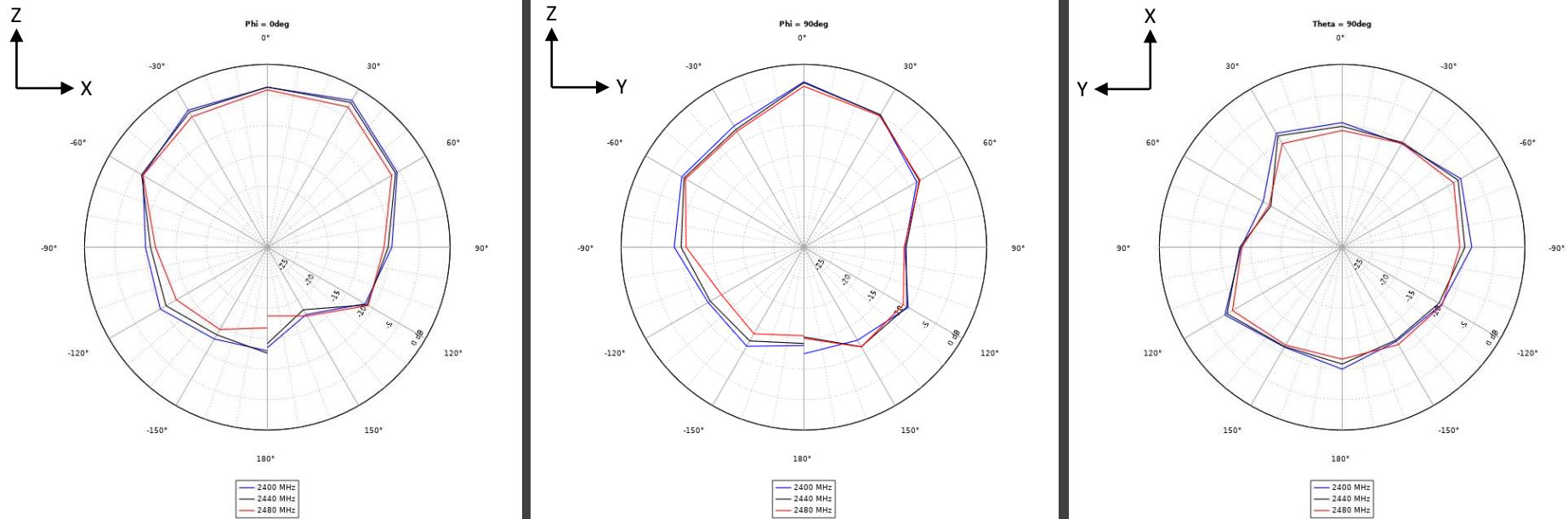
ANT12



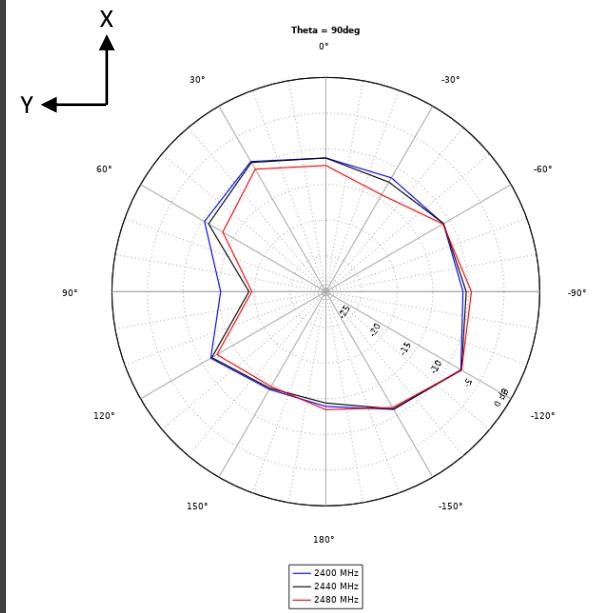
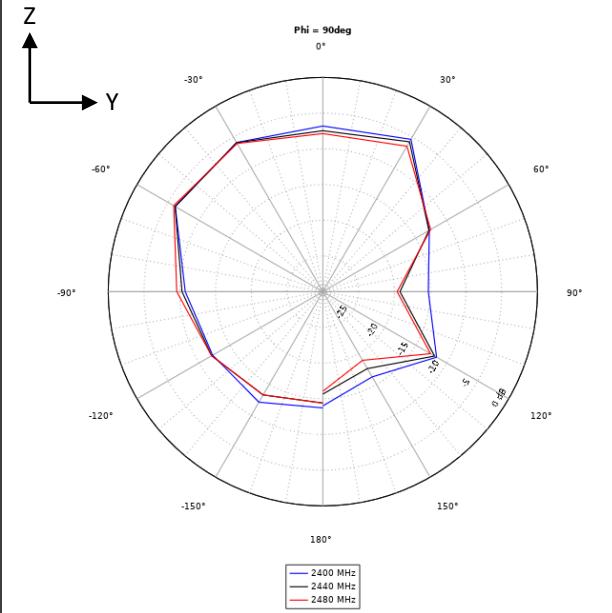
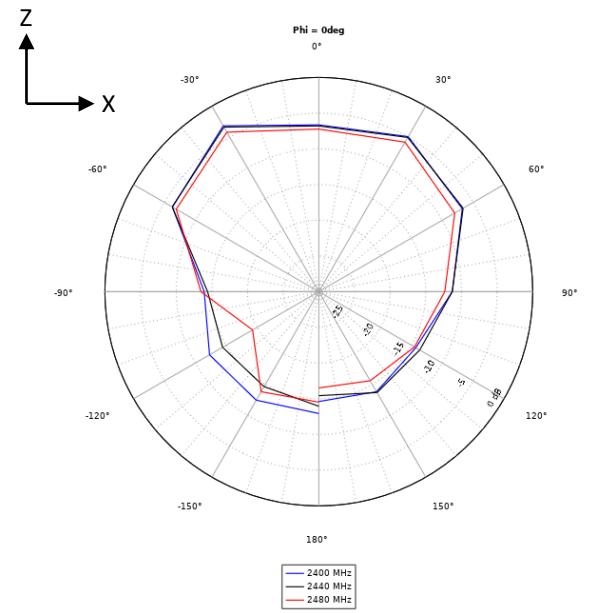
ANT13



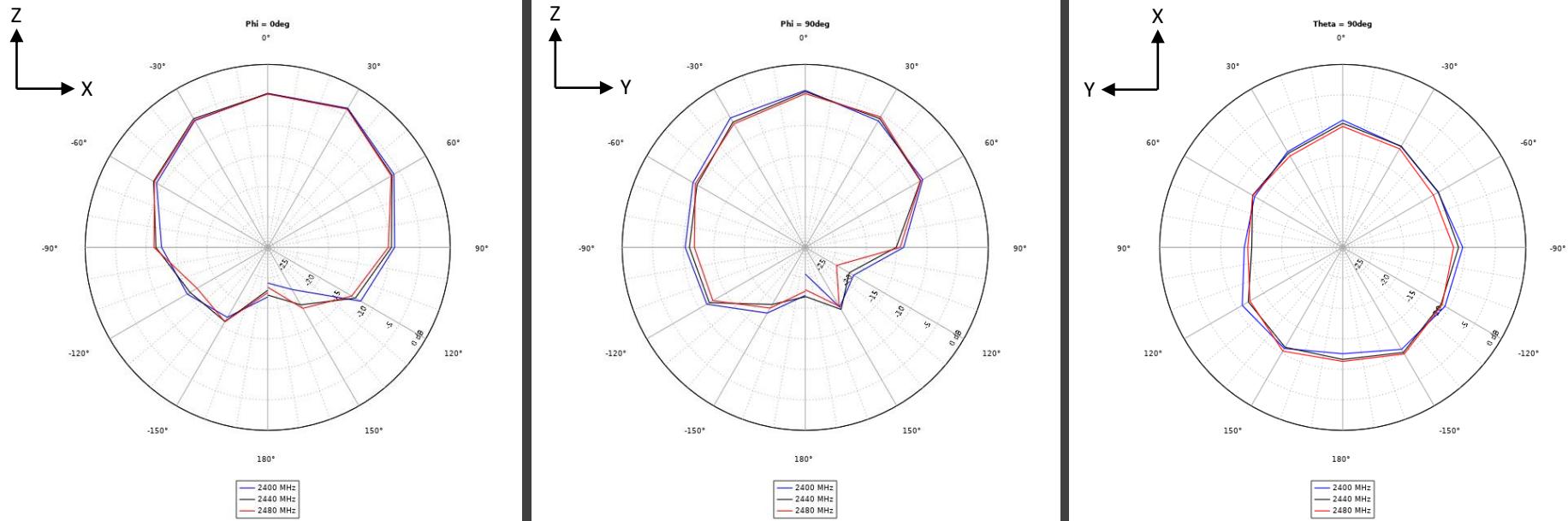
ANT14



ANT15



ANT16



DISCLAIMER

The contents of this document are subject to change without prior notice. CoreHW makes no representation or warranty of any nature whatsoever (neither expressed nor implied) with respect to the matters addressed in this document, including but not limited to warranties of merchantability or fitness for a particular purpose, interpretability or interoperability or, against infringement of third party intellectual property rights, and in no event shall CoreHW be liable to any party for any direct, indirect, incidental and or consequential damages and or loss whatsoever (including but not limited to monetary losses or loss of data), that might arise from the use of this document or the information in it.