SDMC - GPON GEN8v2-Mainstream

Antenna System Design

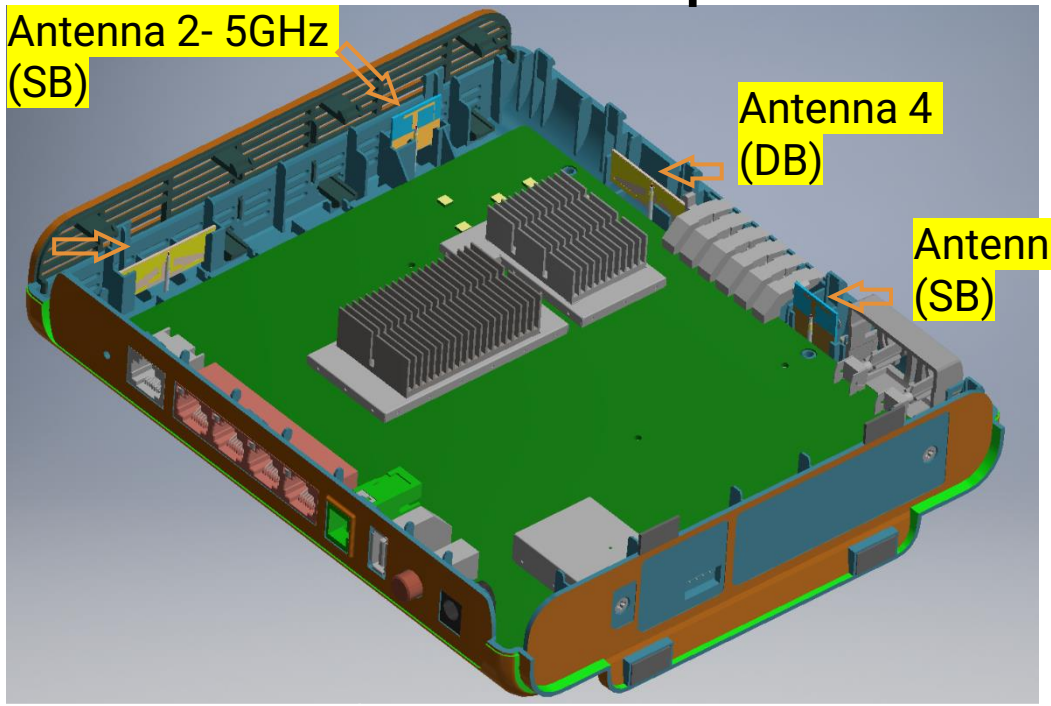
2023 March, 22

altice labs

Version control

Version	date	Description
1.0	DEC 2022 05th	Document creation - v1 spec
2.0	JAN 2023, 16	UPDATE DOCUMENT with P/N
2.1	Fev 2023, 01	Antenna placement picture update
2.2	Fev 2023, 07	Antenna pigtail length update - SDMC proposal
3.0	March 2023, 22	Pigtail length update and add Total antenna Gain and Efficiency

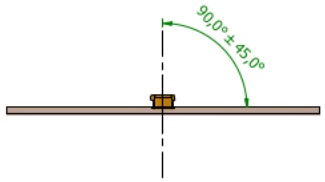
GPONv2 – Mainstream: Antenna placement

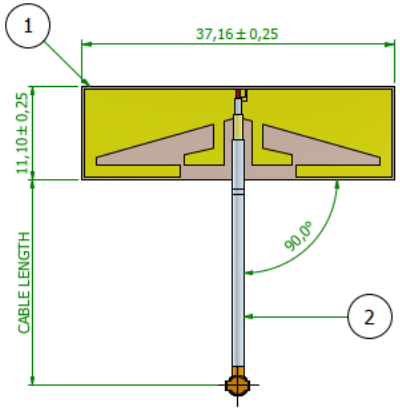


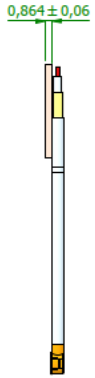
P/N	Description	Qty
W24DB50P130GY4-BW	Antenna 1 - DB 2.4GHz + 5GHz - 130mm Grey - PCB2210 v2.0	1
W50HB00P40BK3-BW	Antenna 2 - SB 5GHz - 40mm Black - PCB1477 v3.0	1
W50HB00P210GY3-BW	Antenna 3 - SB 5GHz - 210mm Grey - PCB1477 v3.0	1
W24DB50P120BK4-BW	Antenna 4 - DB 2.4GHz + 5GHz - 120mm Black - PCB2210 v2.0	1

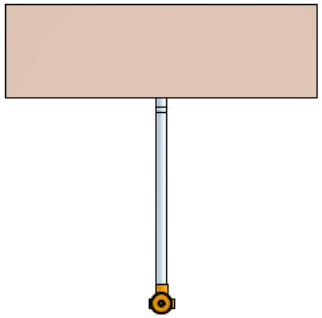
Antenna spec: W24DB50Pxxxxx4-BW (w/o) Glue - dual band 2.4/5GHz

Revision History			
REV	DATE	BY	DESCRIPTION
V2.0.0			





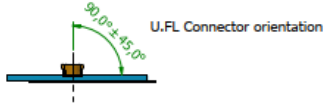


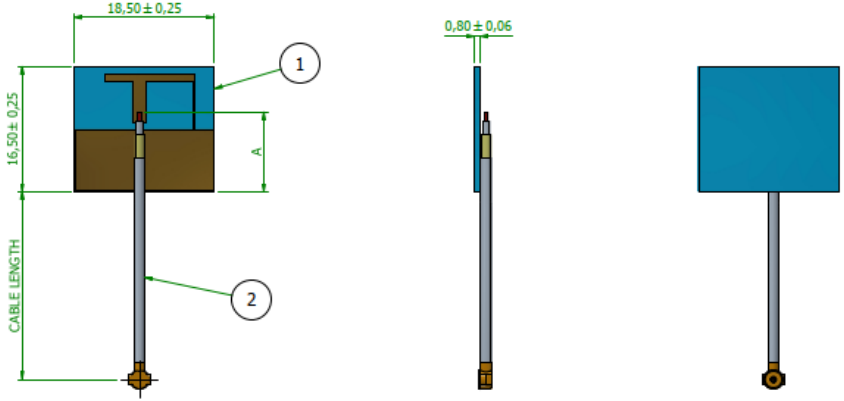


ITEM	PART NUMBER	DESCRIPTION	NOTES
1	W24DB50Pxxxxx4-BW	Dual band 2.4Ghz + 5Ghz	Material FR4, Finish Solder & Mask
2	Pigtail coax cable w/ U.FL	Ø1.37mm O.D cable with U.FL connector	Observe length and color (Impedance: 50ohms)

Antenna spec: W50HB00Pxxxxx3-BW (w/o) Glue - Single band 5GHz

Revision History			
REV	DATE	BY	DESCRIPTION
V3.0.0			





ITEM	PART NUMBER	DESCRIPTION	NOTES
1	W50HBxxxxxxxxx-BW PCB1477-V3.0	Antenna Single Band 5GHz	Material FR4, Finish Solder & Mask
2	Pigtail coax cable w/ U.FL	Ø1.37mm O.D cable with U.FL connector	Observe length (Impedance: 50ohms)

Notes:
Tolerances of ±0,2mm, unless otherwise specified.
Rounded corners with a typical radius of 0,2mm.
Remove all sharp edges and burrs.

Designed by	03/09/2021	Luis Henriques	Project PCB1477-V3.0
Checked by			

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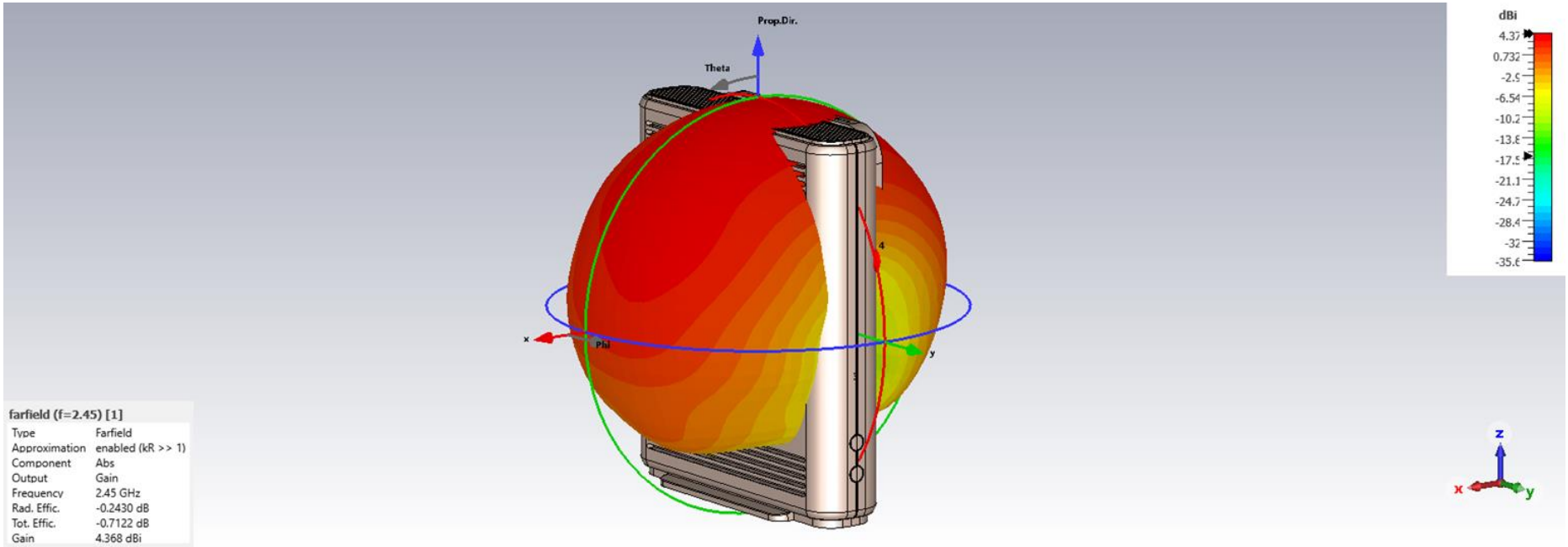
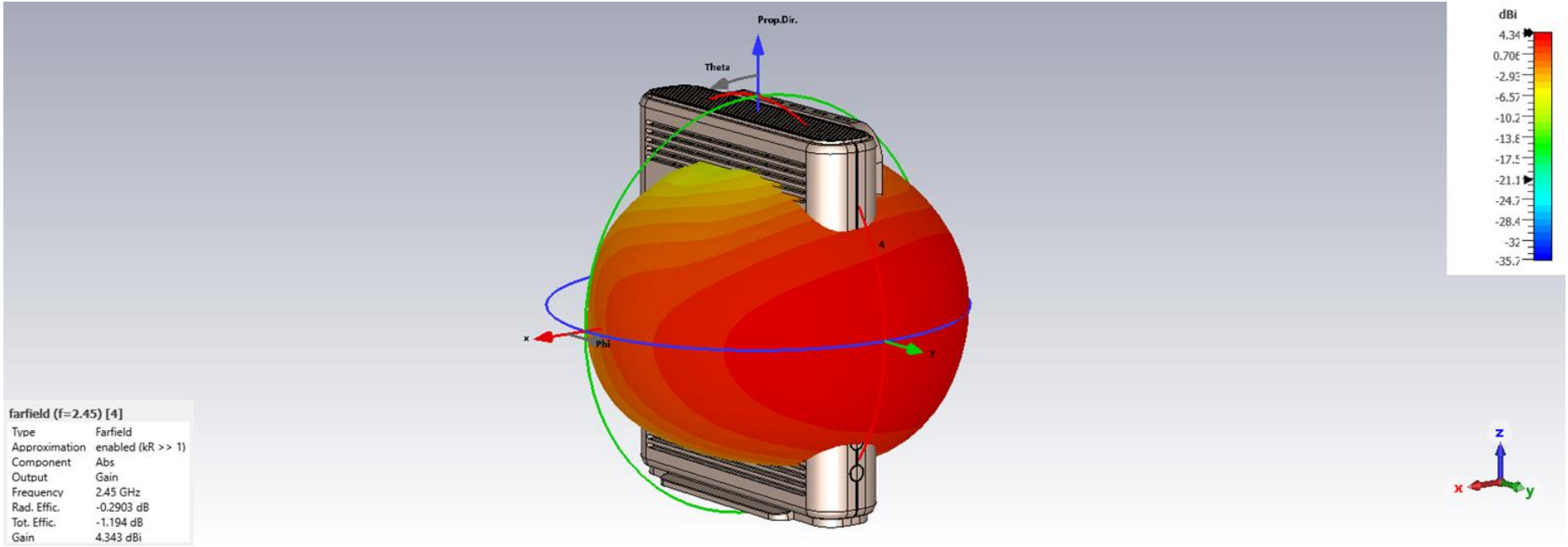
3D system coverage @2.450GHz (Ant1)



farfield (f=2.45) [1]

Type	Farfield
Approximation	enabled (kR >> 1)
Component	Abs
Output	Gain
Frequency	2.45 GHz
Rad. Effic.	-0.2430 dB
Tot. Effic.	-0.7122 dB
Gain	4.368 dBi

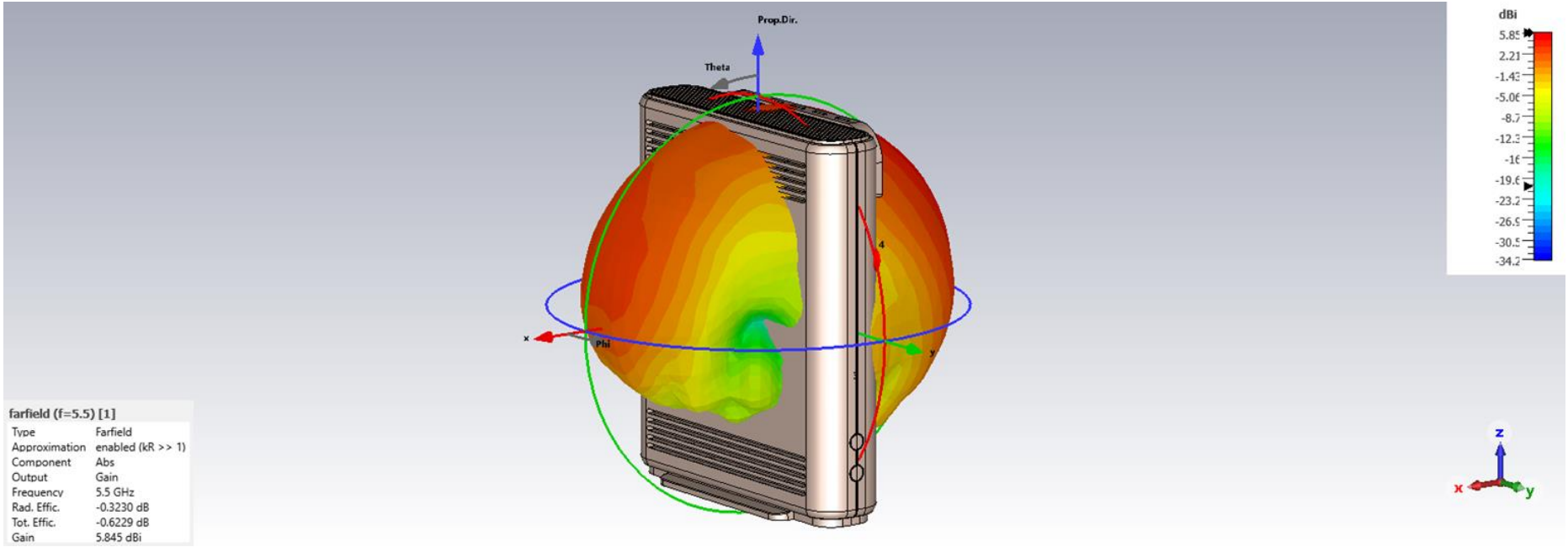
3D system coverage @2.450GHz (Ant4)



farfield (f=2.45) [4]

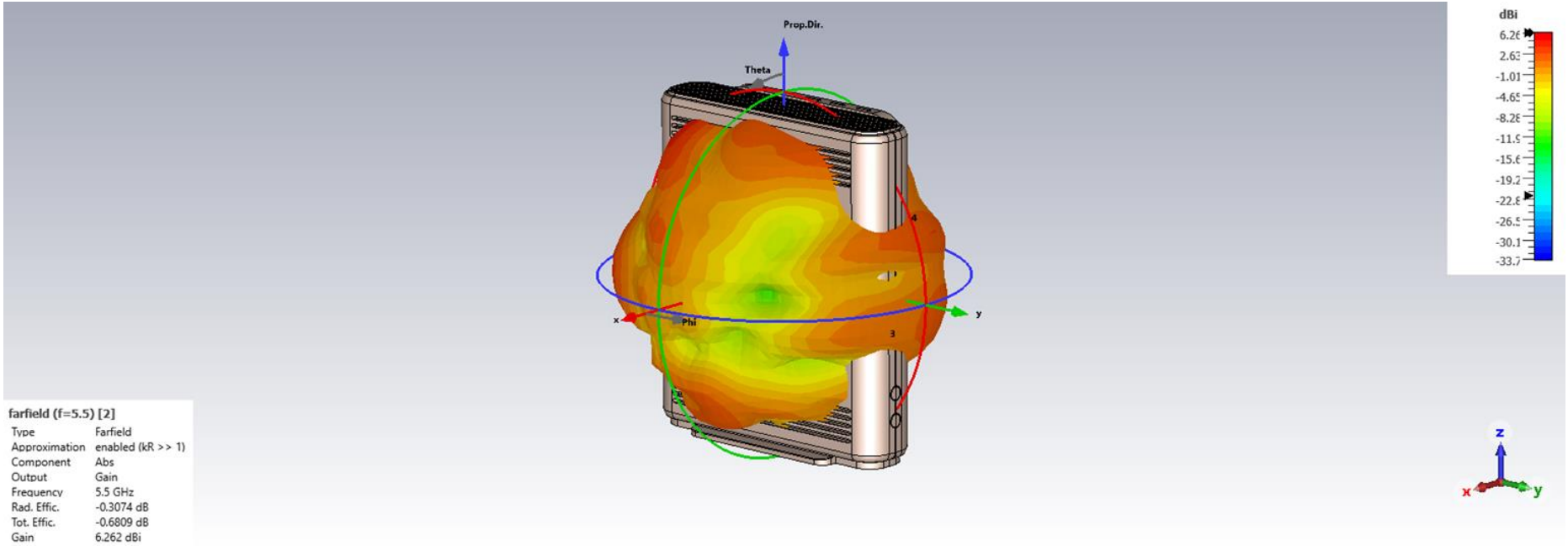
Type	Farfield
Approximation	enabled (kR >> 1)
Component	Abs
Output	Gain
Frequency	2.45 GHz
Rad. Effic.	-0.2903 dB
Tot. Effic.	-1.194 dB
Gain	4.343 dBi

3D system coverage @5.500GHz (Ant1)



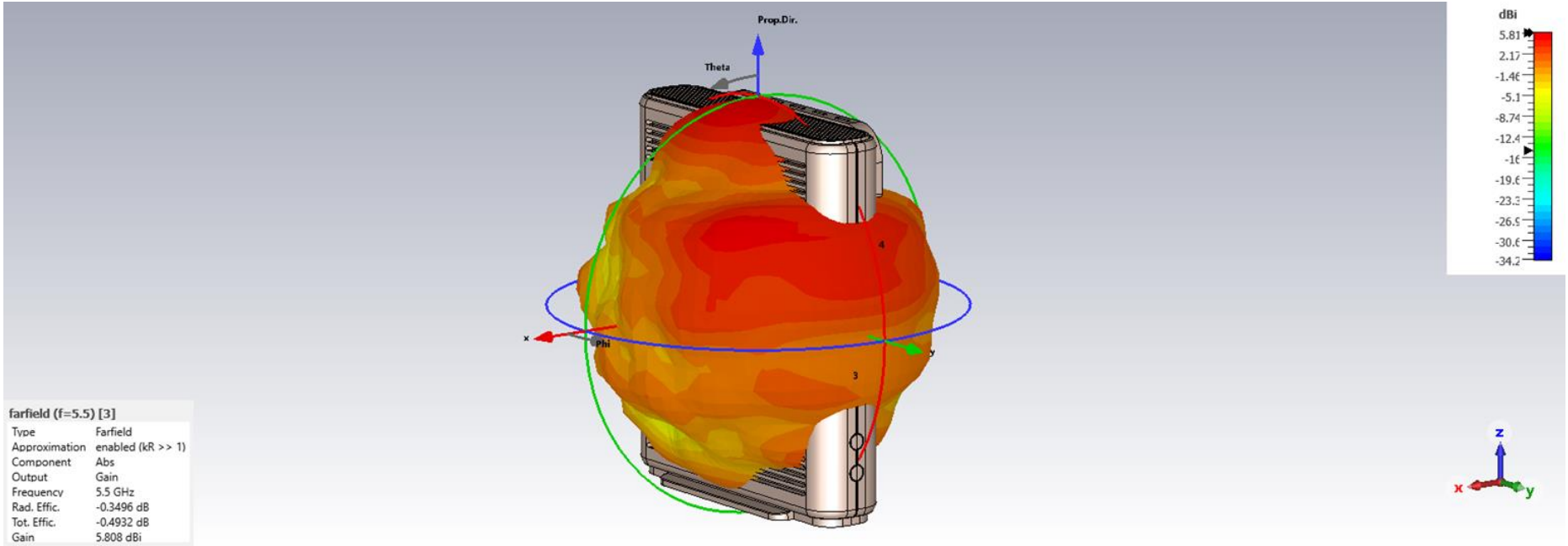
farfield (f=5.5) [1]	
Type	Farfield
Approximation	enabled (kR >> 1)
Component	Abs
Output	Gain
Frequency	5.5 GHz
Rad. Effic.	-0.3230 dB
Tot. Effic.	-0.6229 dB
Gain	5.845 dBi

3D system coverage @5.500GHz (Ant2)

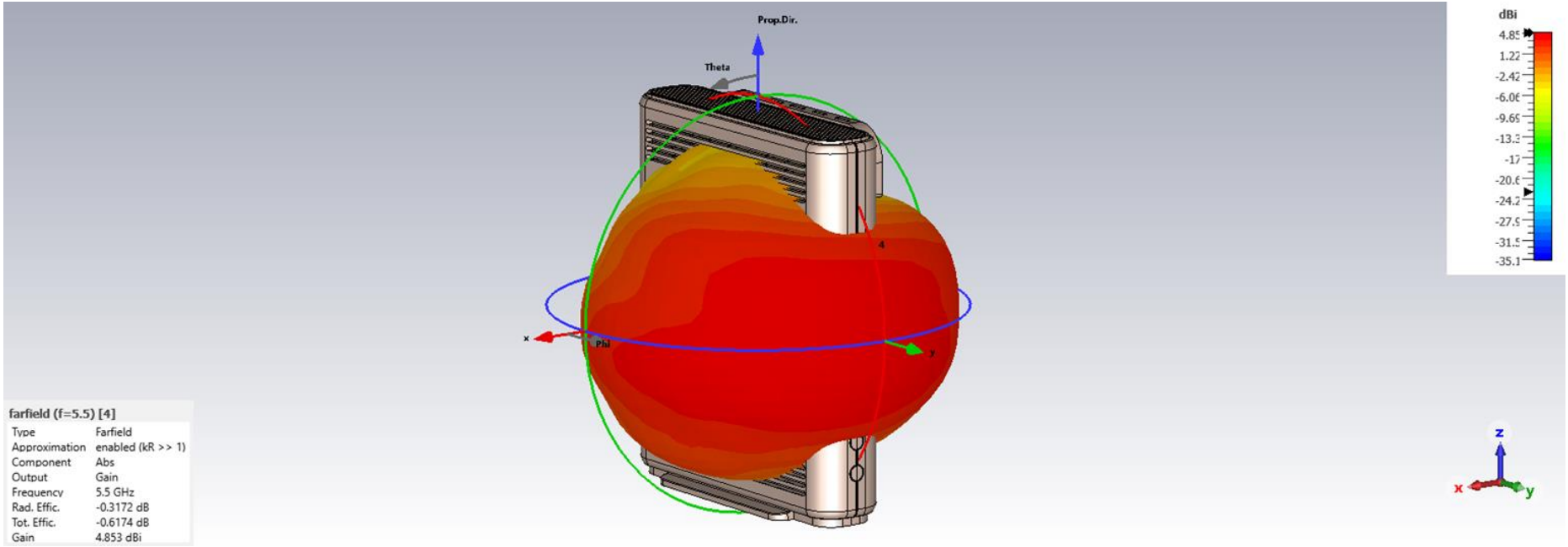


farfield (f=5.5) [2]	
Type	Farfield
Approximation	enabled (kR >> 1)
Component	Abs
Output	Gain
Frequency	5.5 GHz
Rad. Effic.	-0.3074 dB
Tot. Effic.	-0.6809 dB
Gain	6.262 dBi

3D system coverage @5.500GHz (Ant3)



3D system coverage @5.500GHz (Ant4)



farfield (f=5.5) [4]	
Type	Farfield
Approximation	enabled (kR >> 1)
Component	Abs
Output	Gain
Frequency	5.5 GHz
Rad. Effic.	-0.3172 dB
Tot. Effic.	-0.6174 dB
Gain	4.853 dBi

Total efficiency and gain

Antenna	Efficiency % @2450MHz	Efficiency % @5500MHz	Gain (dBi) @2450MHz	Gain (dBi) @5500MHz
1	84.5	86.5	3.92	5.45
2	-	85.4	-	5.89
3	-	78.6	-	5.65
4	75.6	86.6	3.42	4.59

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