



RP5200 N41/N71 Radiation Test

Weekly

Nov 11 , 2021

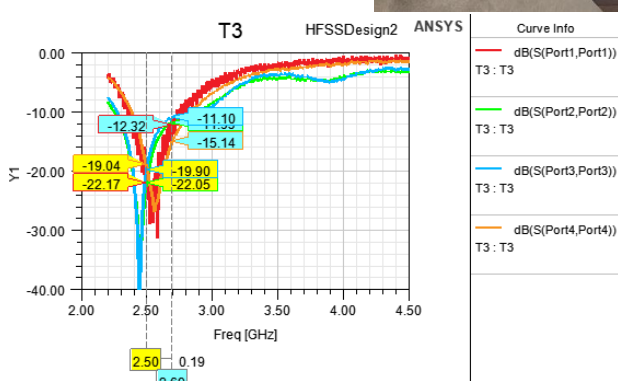
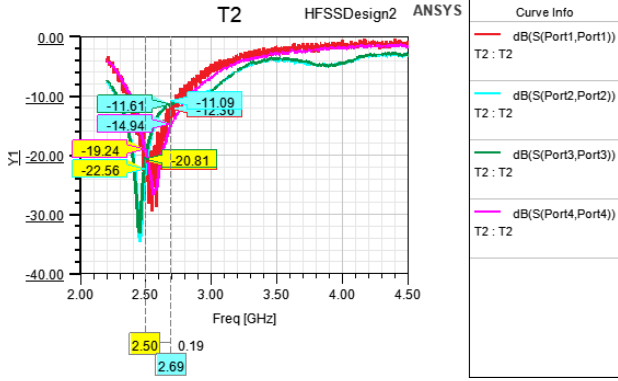
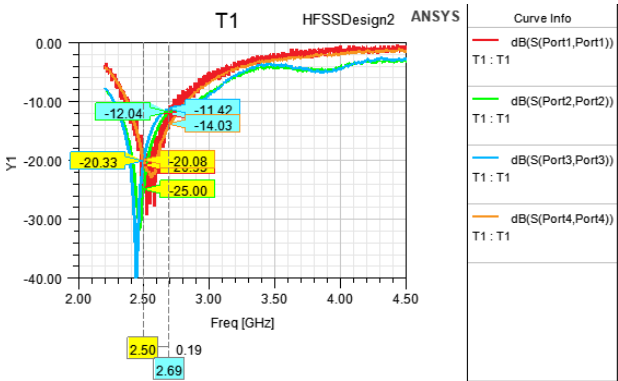
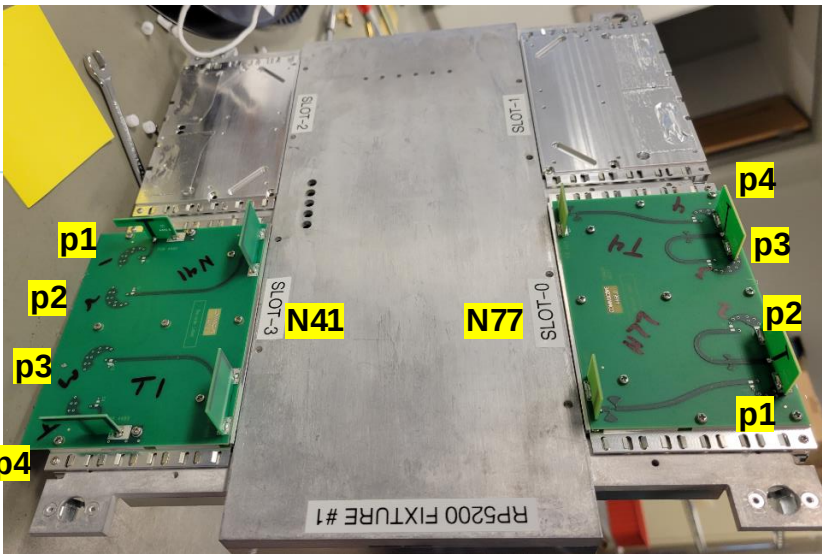
Huan Wang

VCN Small Cell R&D
Richardson, TX

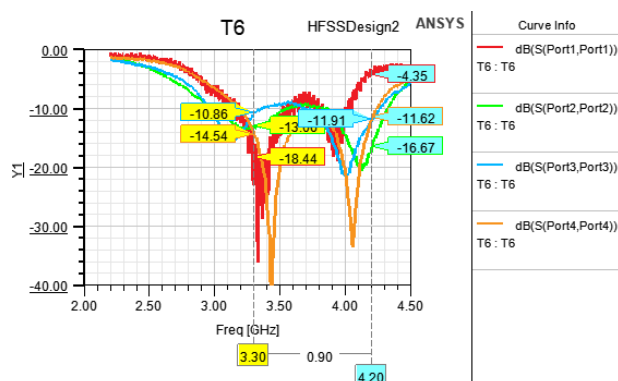
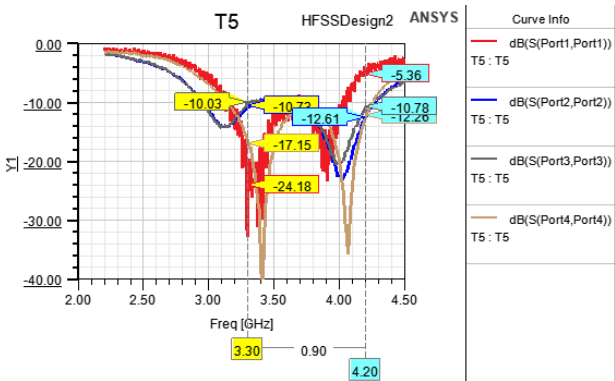
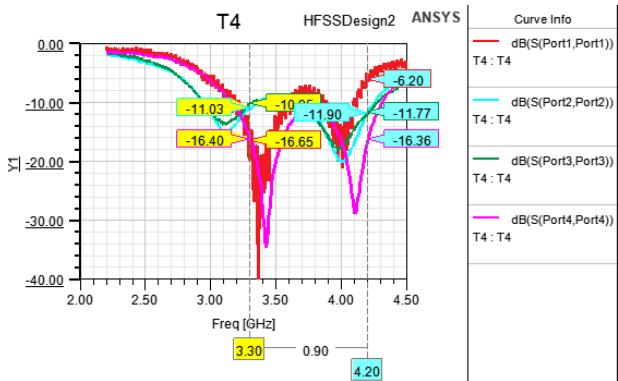


RL (dB) built and tested by Tim Purvis

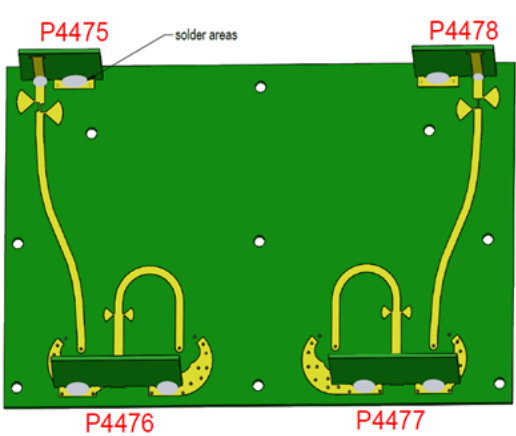
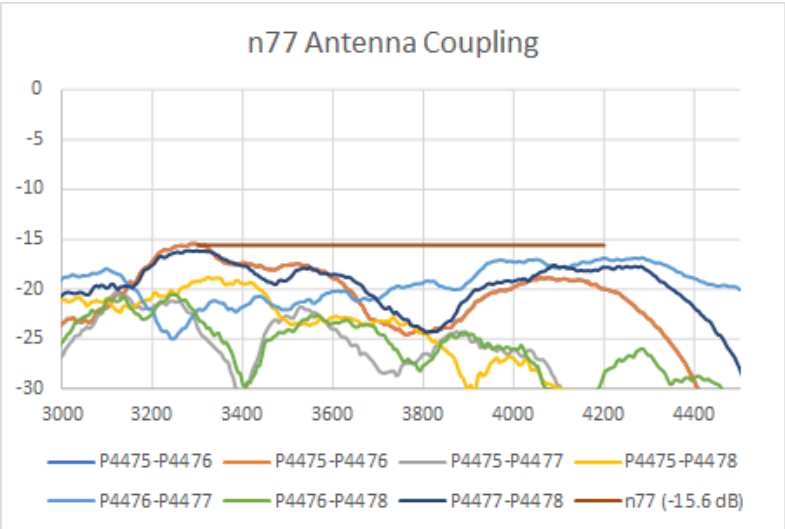
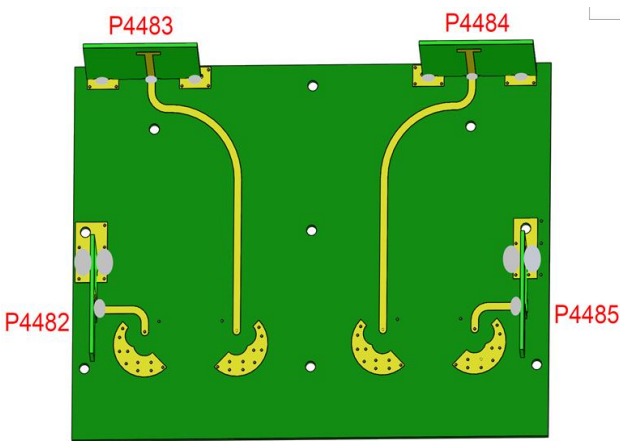
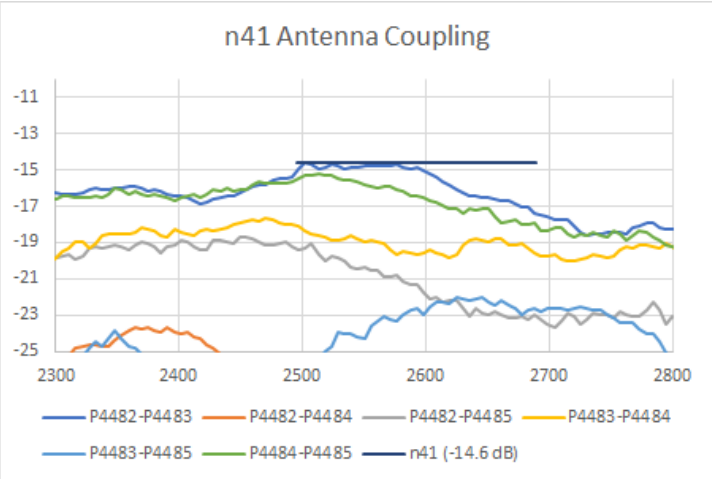
- 3 samples T1, T2, and T3 for N41
- 3 samples T4, T5, and T6 for N77

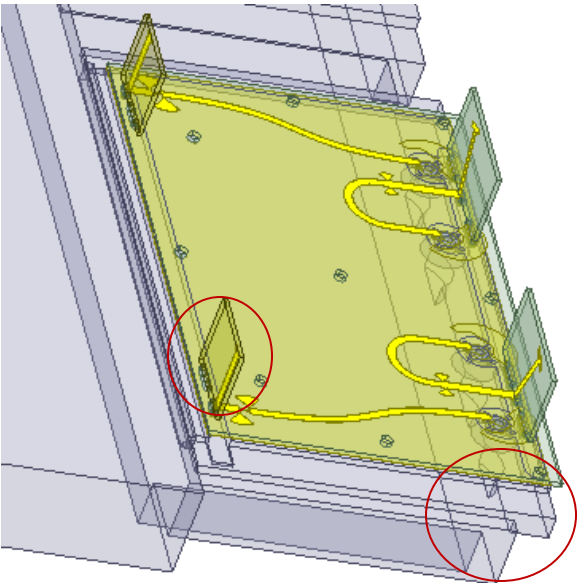
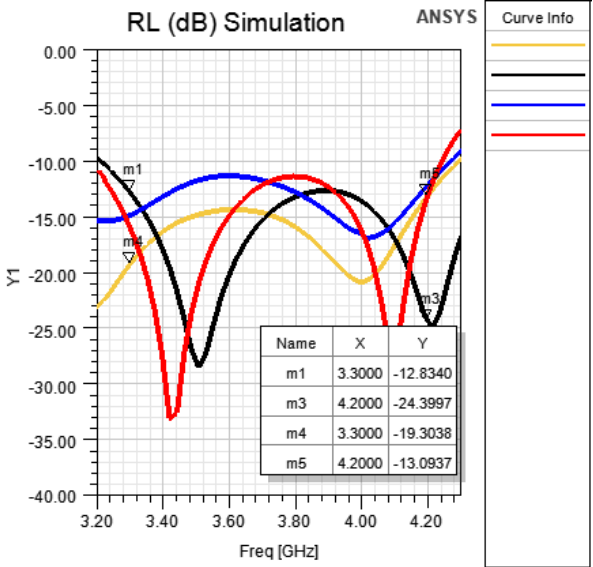
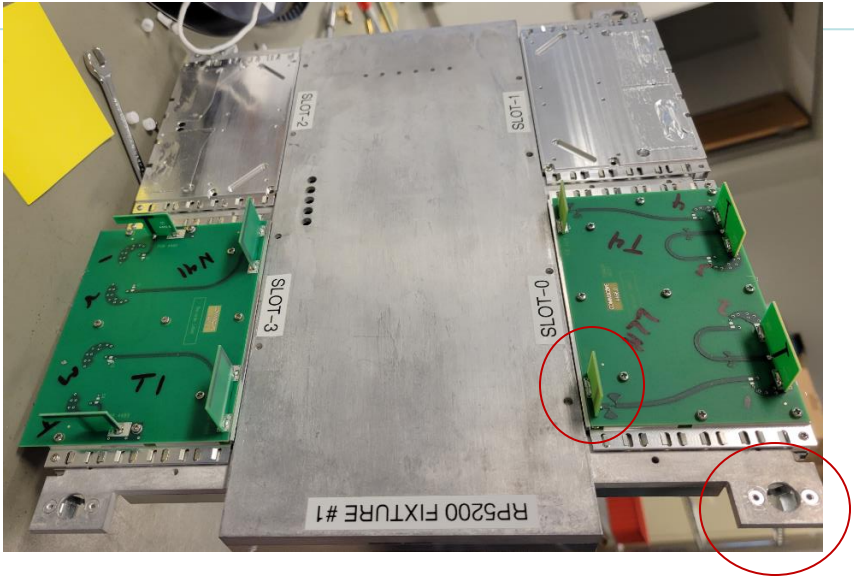
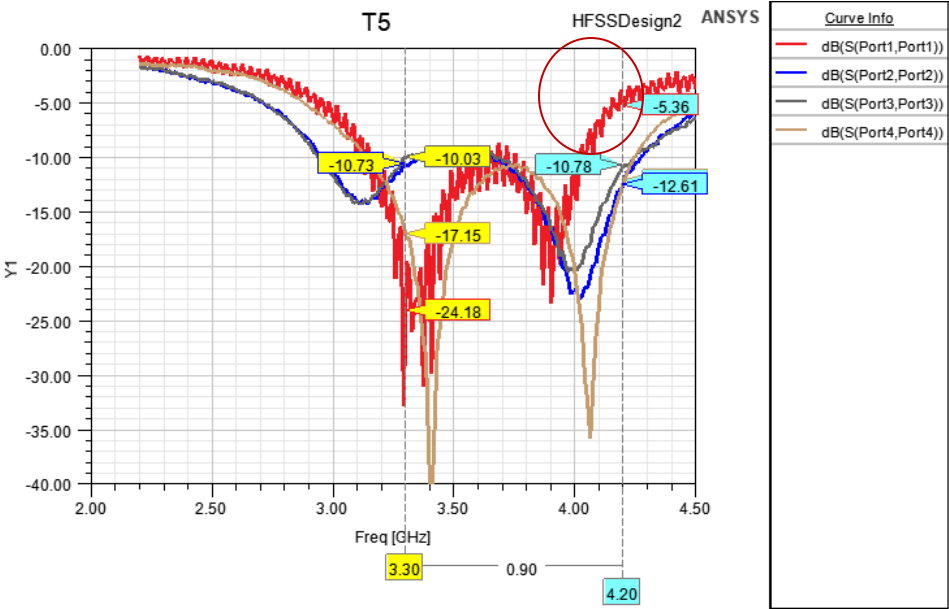


N41 test

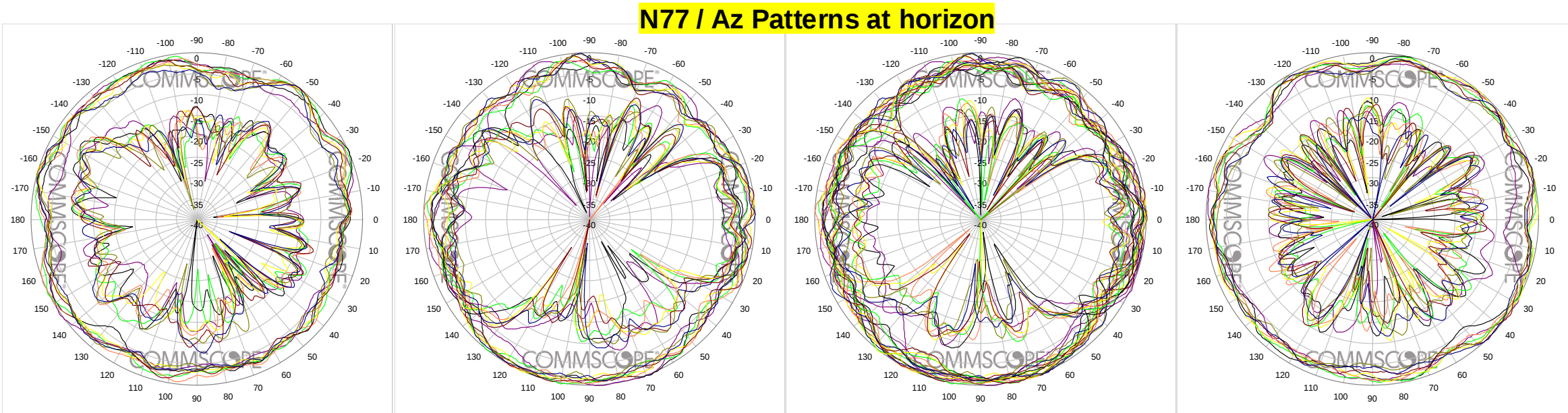
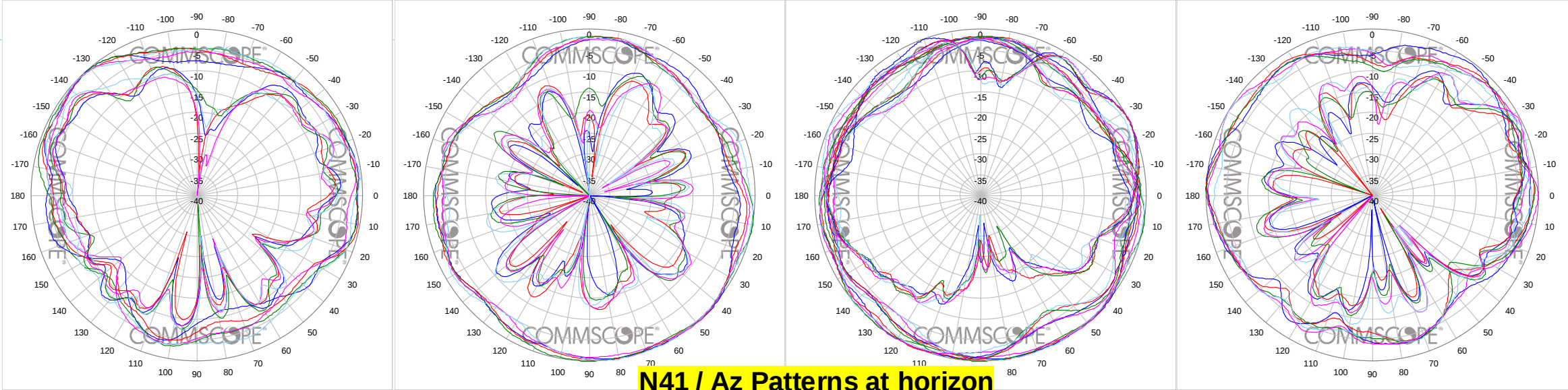


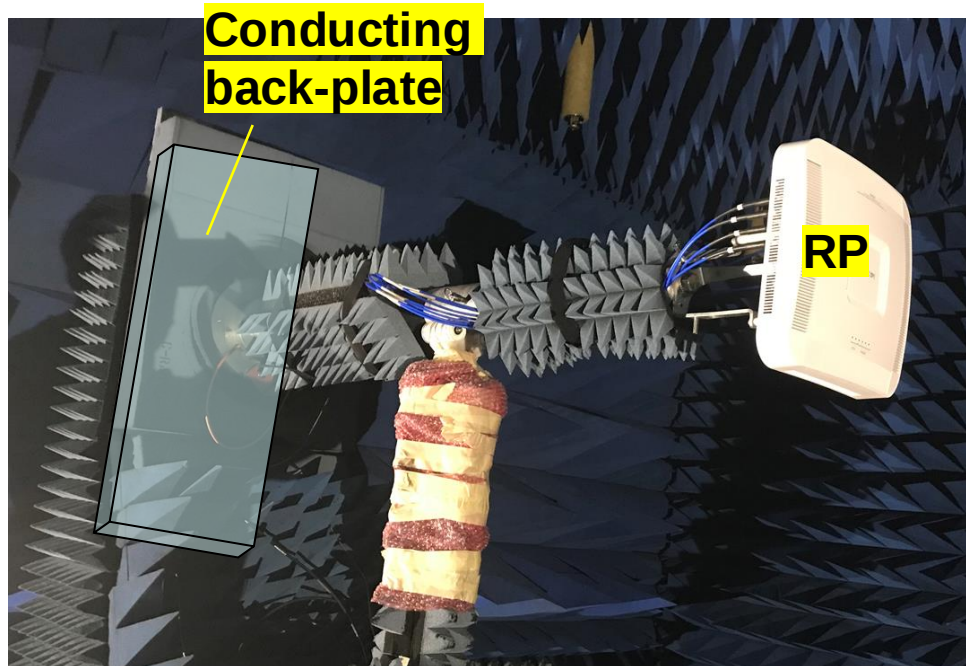
N77 test



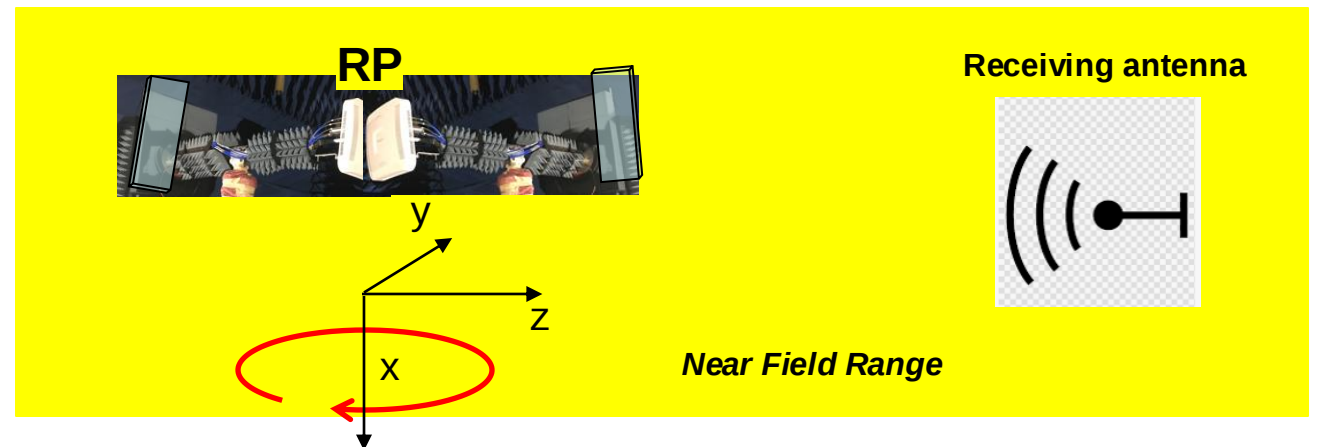


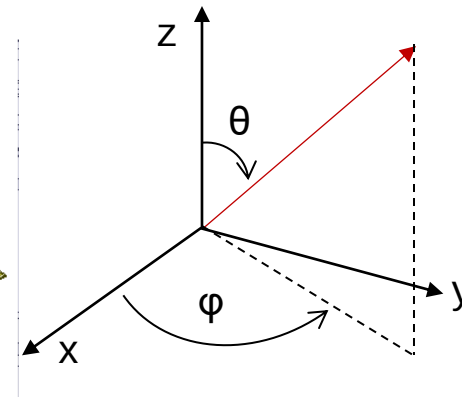
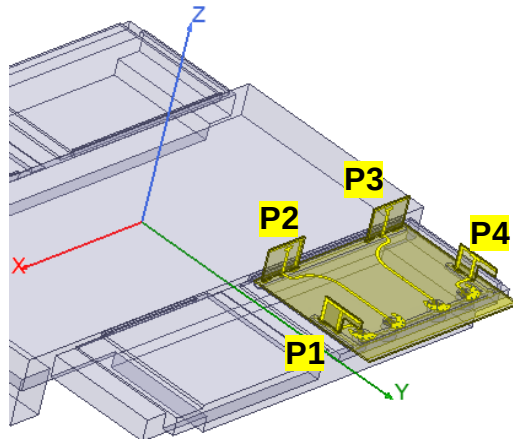
- RL = -5dB @ 4.2 GHz at port 1 was not predicted in the early simulation.
- A possible reason is that the simulation model has a missing part from the real chassis, to be verified...





- There is a chunk of conducting **back-plate** (about 400mm x 1700 mm x 30 mm) supporting the RP antennas
- RP hung along x-axis is rotating around x-axis
- The back-plate is orbiting RP as RP is self-spinning
- Therefore, the back-plate causes pattern-distortion, especially back-lobe distortion

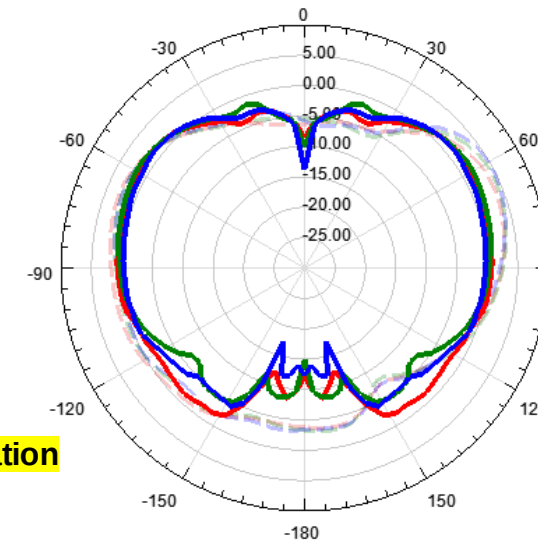




Back-lobe distortion due to the back-plate in the test

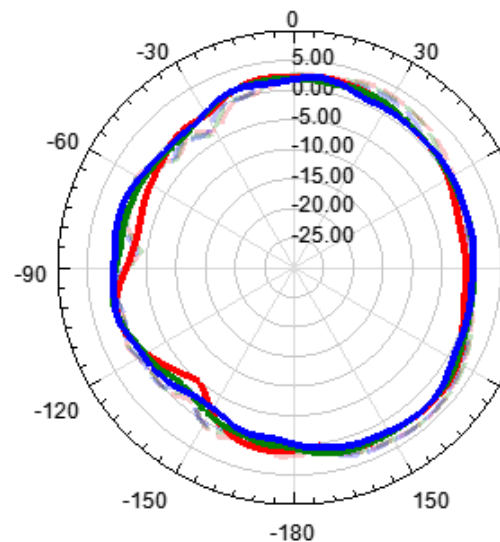
-- Dashed lines : Simulation
— Solid lines: Test

2D_pattern_N41_P1_eL_phi=0deg



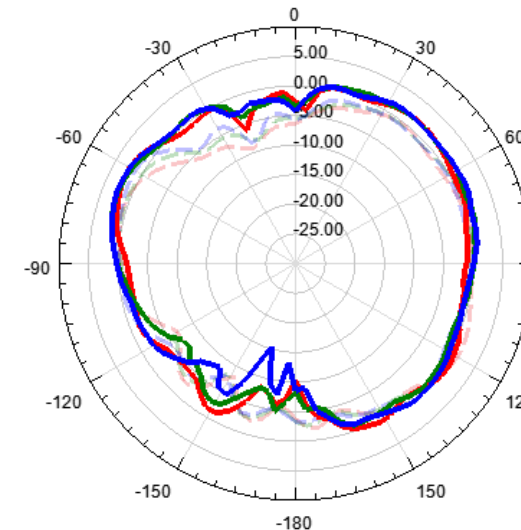
Curve Info	
-- Setup1 : LastAdaptive	Freq="2.496GHz" p1="1W" p2="0W" p3="0W" p4="0W"
-- Setup1 : LastAdaptive	Freq="2.593GHz" p1="1W" p2="0W" p3="0W" p4="0W"
-- Setup1 : LastAdaptive	Freq="2.69GHz" p1="1W" p2="0W" p3="0W" p4="0W"
— EL_3D_pattern_N41_P1_2.496GHz : Table	'Tb(Phi)'="0deg"
— EL_3D_pattern_N41_P1_2.593GHz : Table	'Tb(Phi)'="0deg"
— EL_3D_pattern_N41_P1_2.69GHz : Table	'Tb(Phi)'="0deg"

2D_pattern_N41_P1_az_theta = 88 deg N41_model_EM0924 ANSYS

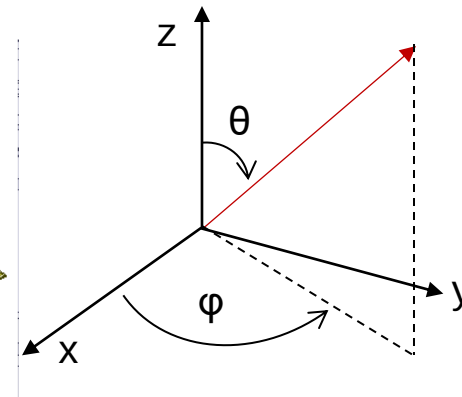
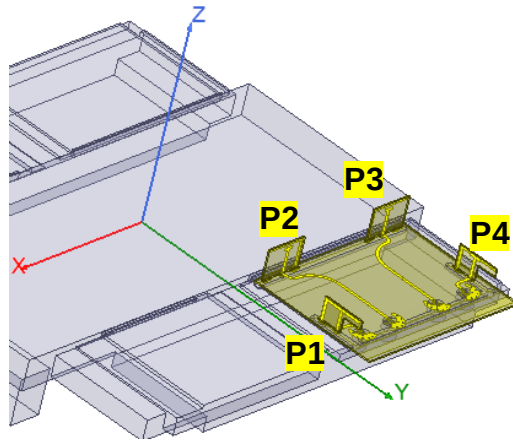


Curve Info	
-- Setup1 : LastAdaptive	Freq="2.496GHz" p1="1W" p2="0W" p3="0W" p4="0W"
-- Setup1 : LastAdaptive	Freq="2.593GHz" p1="1W" p2="0W" p3="0W" p4="0W"
-- Setup1 : LastAdaptive	Freq="2.69GHz" p1="1W" p2="0W" p3="0W" p4="0W"
— 5200-SB-FF-SW1-P1-0DT-2496_TOTx : Table	'Tb(Theta)'="88deg"
— 5200-SB-FF-SW1-P1-0DT-2593_TOTx : Table	'Tb(Theta)'="88deg"
— 5200-SB-FF-SW1-P1-0DT-2690_TOTx : Table	'Tb(Theta)'="88deg"

2D_pattern_N41_P1_eL_phi=88deg



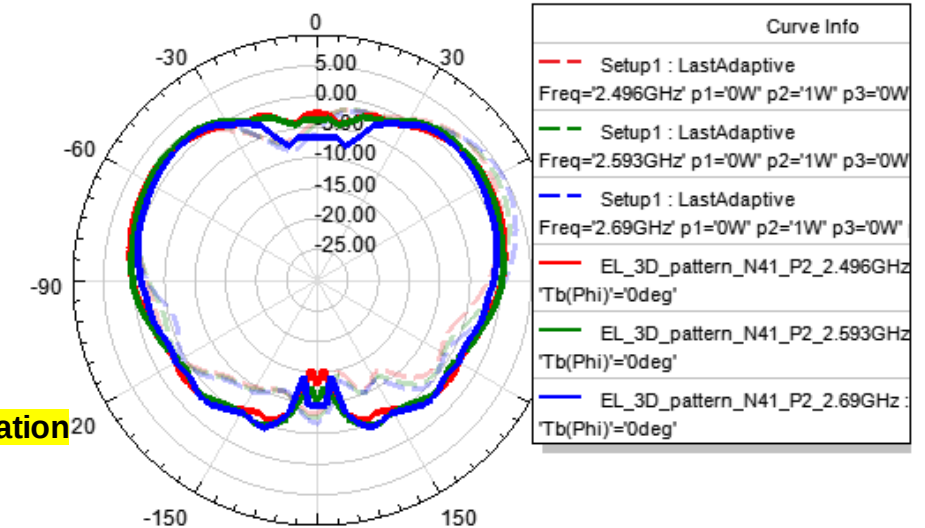
Curve Info	
-- Setup1 : LastAdaptive	Freq="2.496GHz" p1="1W" p2="0W" p3="0W" p4="0W"
-- Setup1 : LastAdaptive	Freq="2.593GHz" p1="1W" p2="0W" p3="0W" p4="0W"
-- Setup1 : LastAdaptive	Freq="2.69GHz" p1="1W" p2="0W" p3="0W" p4="0W"
— EL_3D_pattern_N41_P1_2.496GHz : Table	'Tb(Phi)'="88deg"
— EL_3D_pattern_N41_P1_2.593GHz : Table	'Tb(Phi)'="88deg"
— EL_3D_pattern_N41_P1_2.69GHz : Table	'Tb(Phi)'="88deg"



Back-lobe distortion due to the back-plate in the test

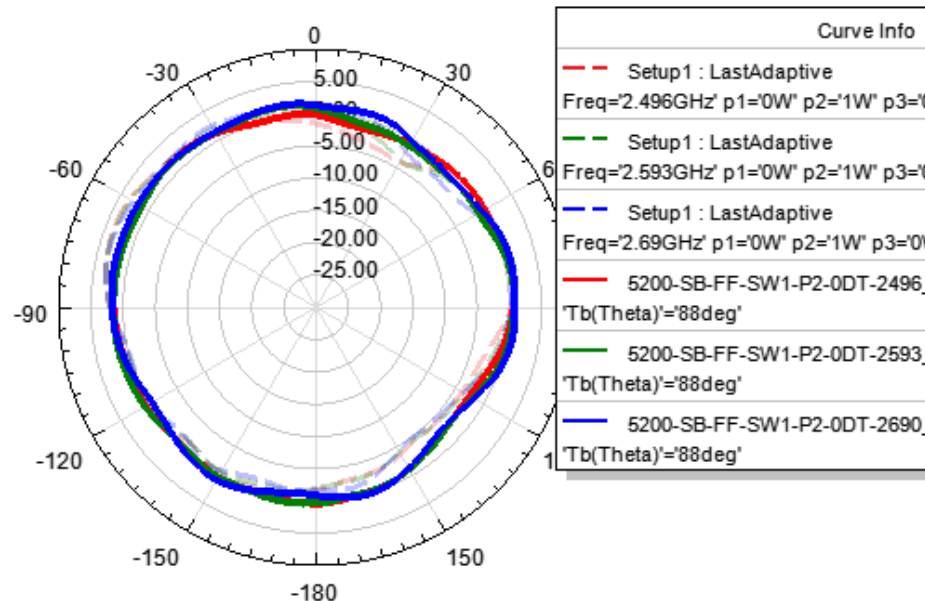
-- Dashed lines : Simulation
— Solid lines: Test

2D_pattern_N41_P2_eL_phi=0deg



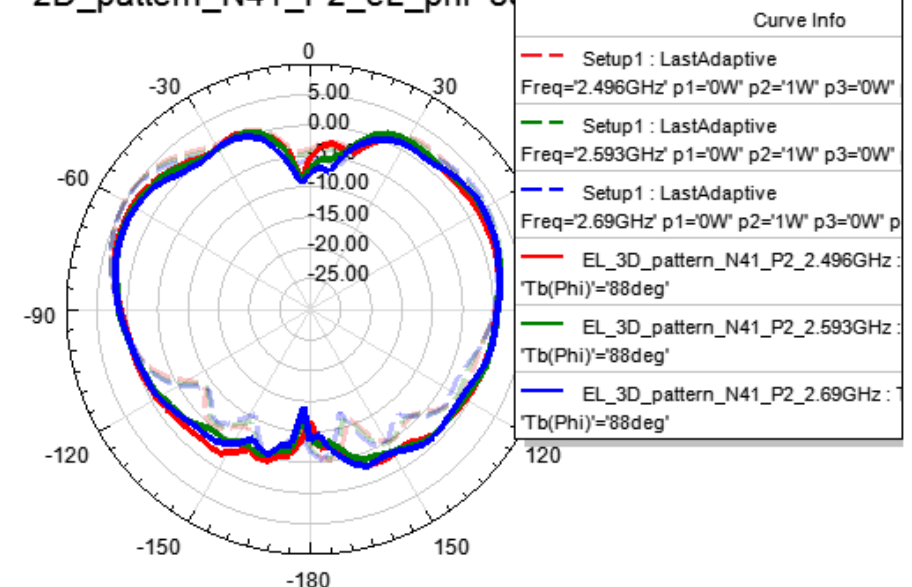
2D_pattern_N41_P2_az_theta=88 deg

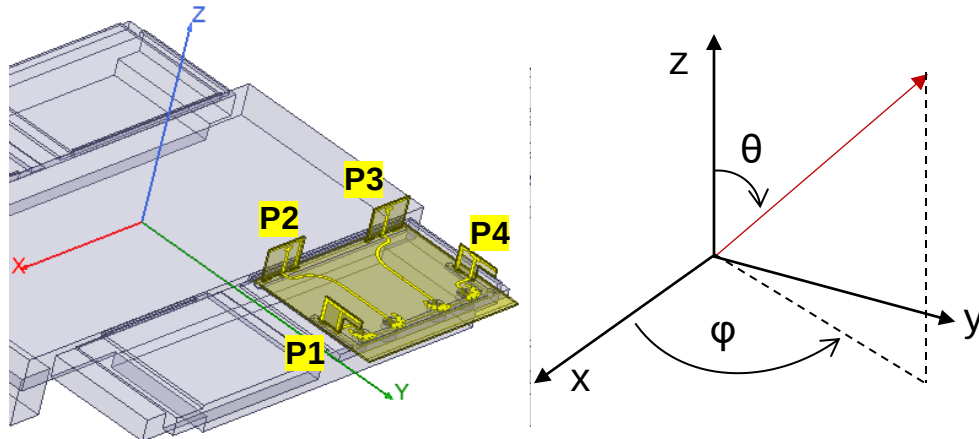
ANSYS



2D_pattern_N41_P2_eL_phi=88deg

ANSYS



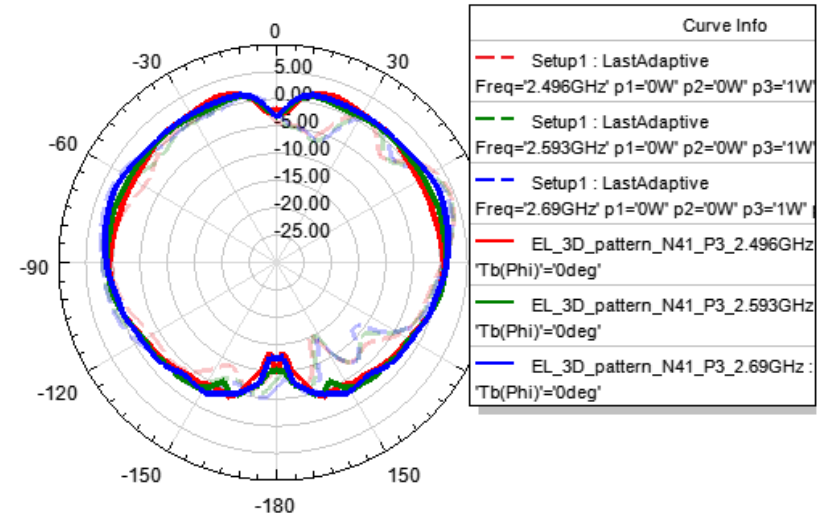


Back-lobe distortion due to the **back-plate** in the test

-- Dashed lines : Simulation
— Solid lines: Test

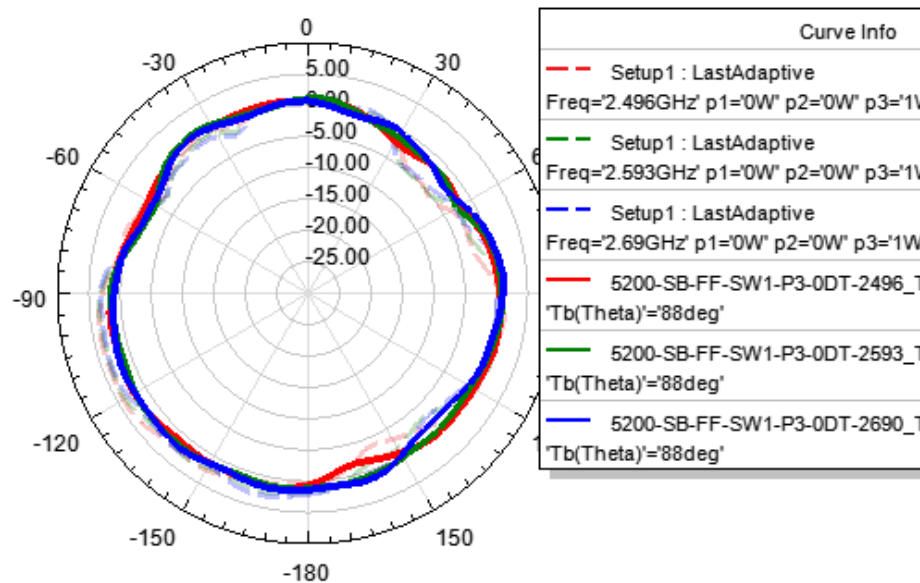
2D_pattern_N41_P3_eL_phi=0deg

ANSYS



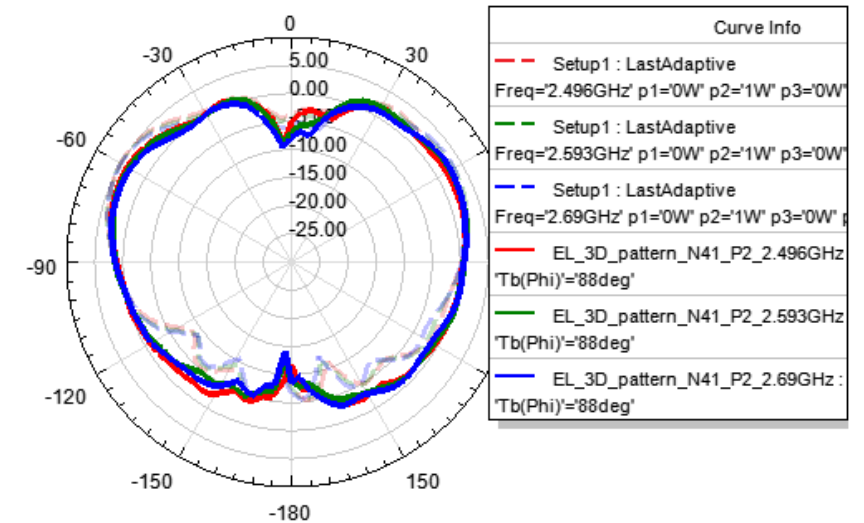
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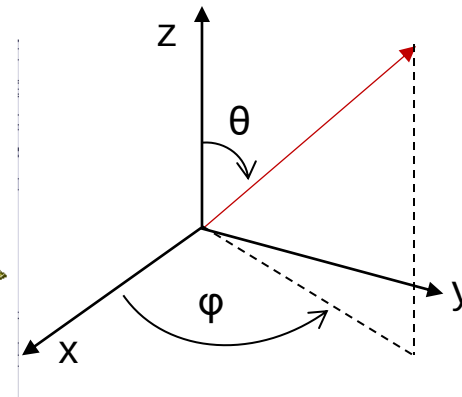
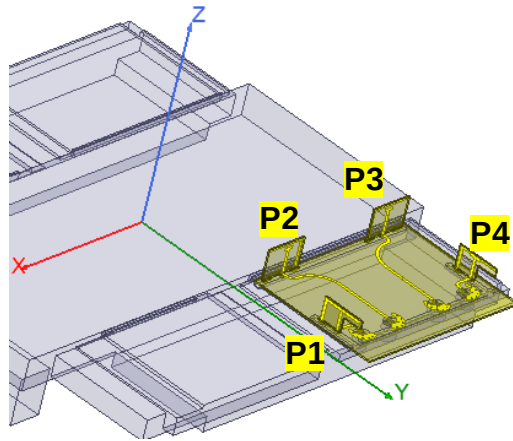
ANSYS



2D_pattern_N41_P2_eL_phi=88deg

ANSYS

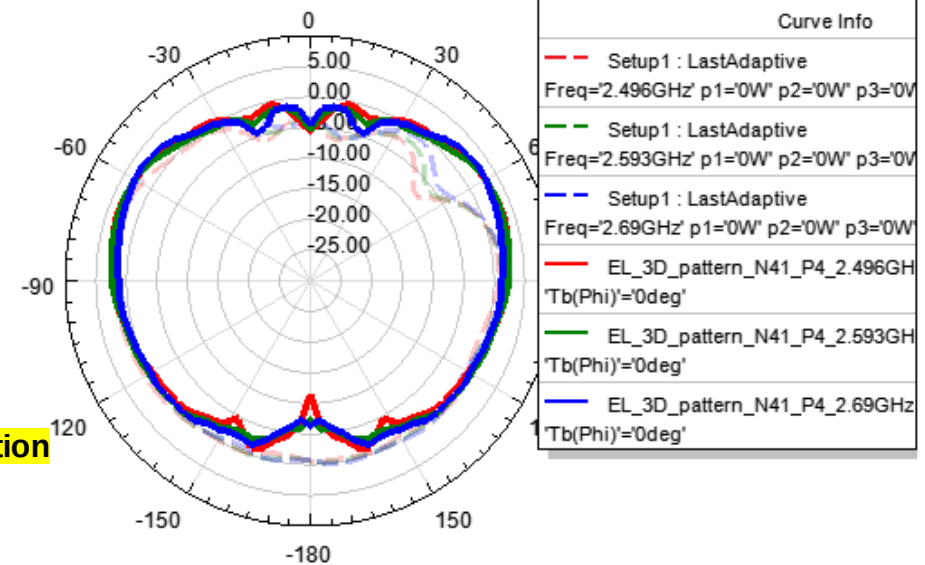




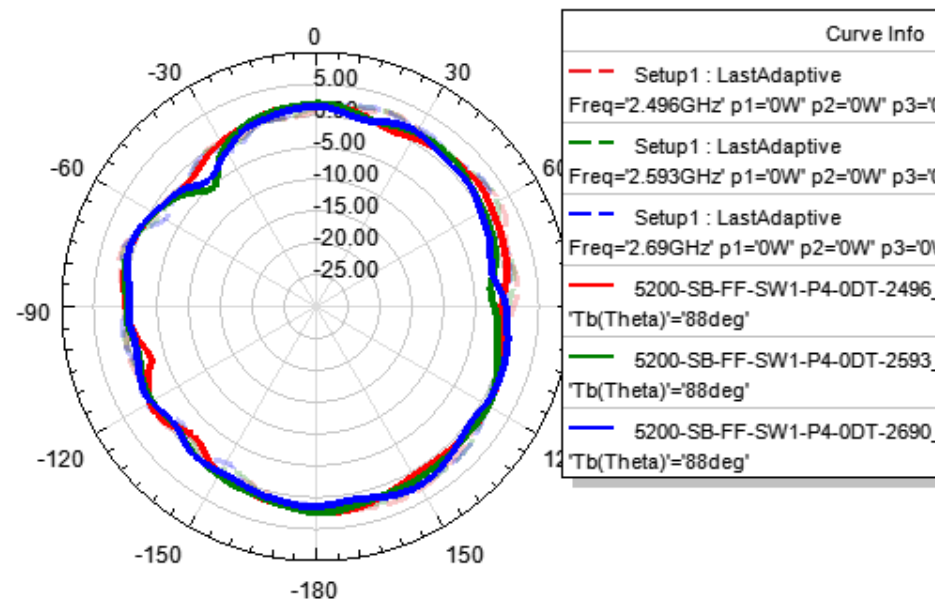
Back-lobe distortion due to the back-plate in the test

-- Dashed lines : Simulation
— Solid lines: Test

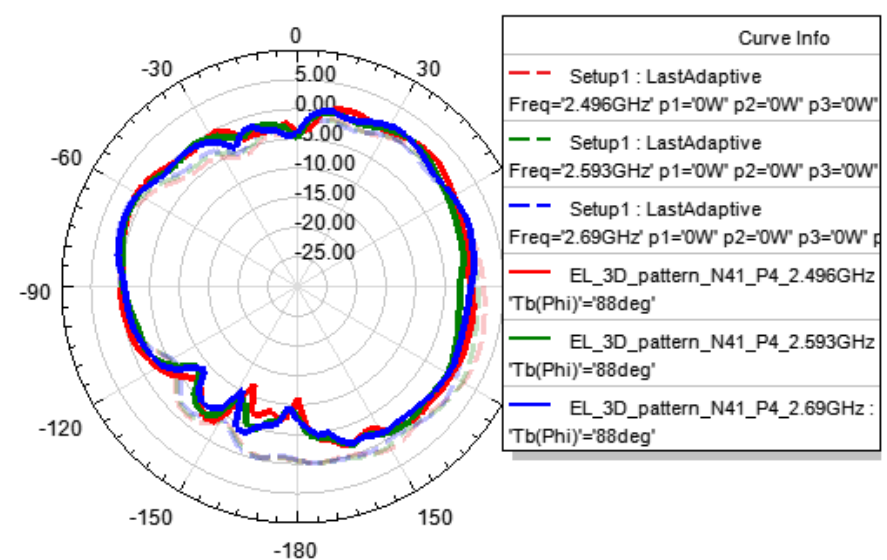
2D_pattern_N41_P4_eL_phi=0deg

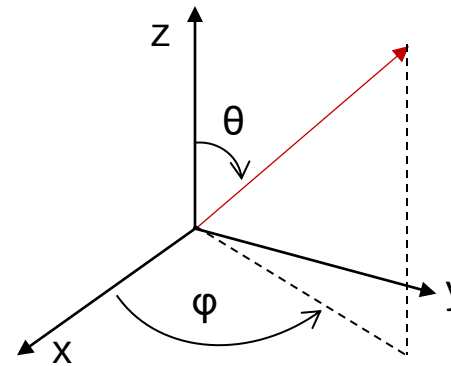


2D_pattern_N41_P4_az_theta=88 deg

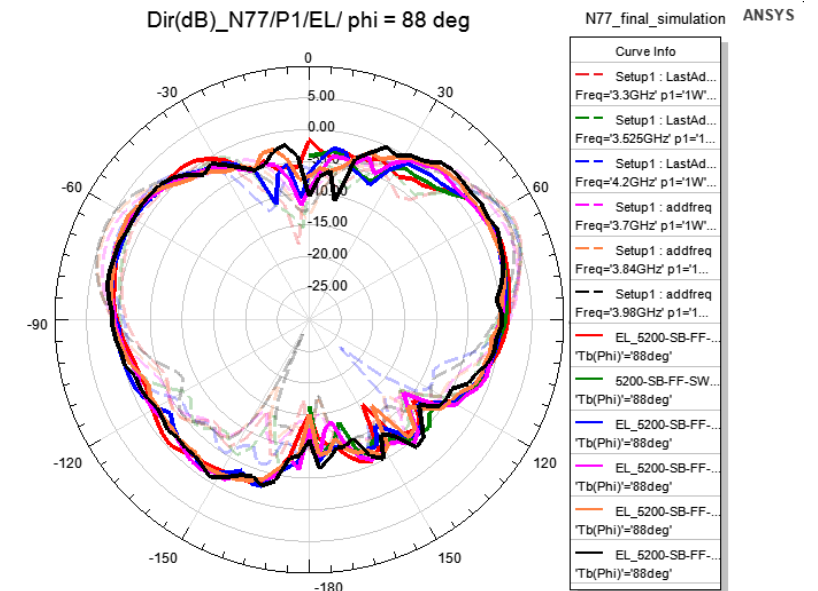
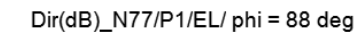


2D_pattern_N41_P4_eL_phi=88deg

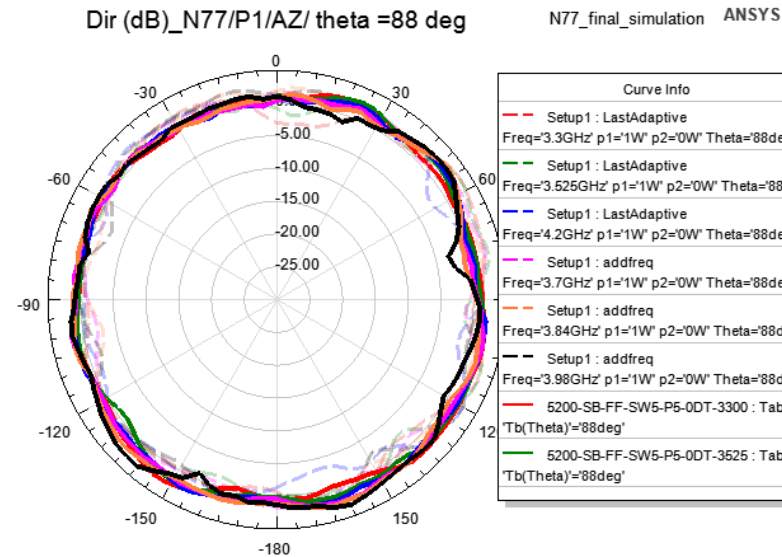




— Solid lines: Test

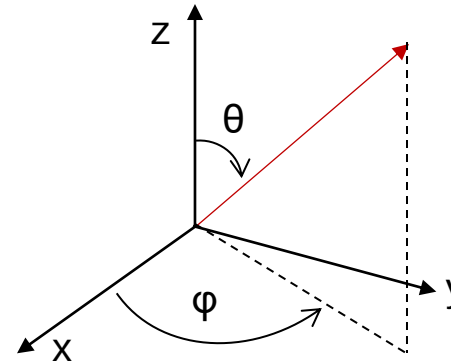
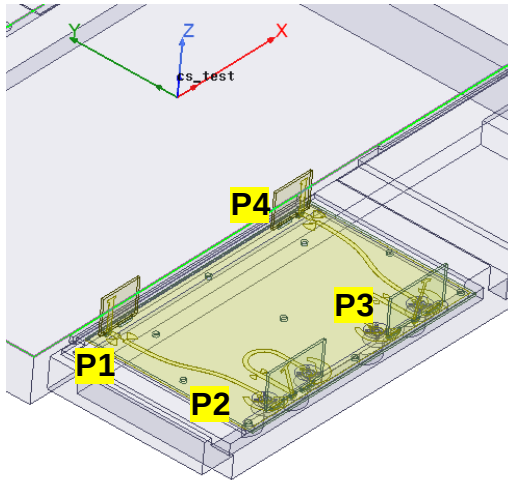


Dir (dB)_N77/P1/AZ/ theta =88 deg

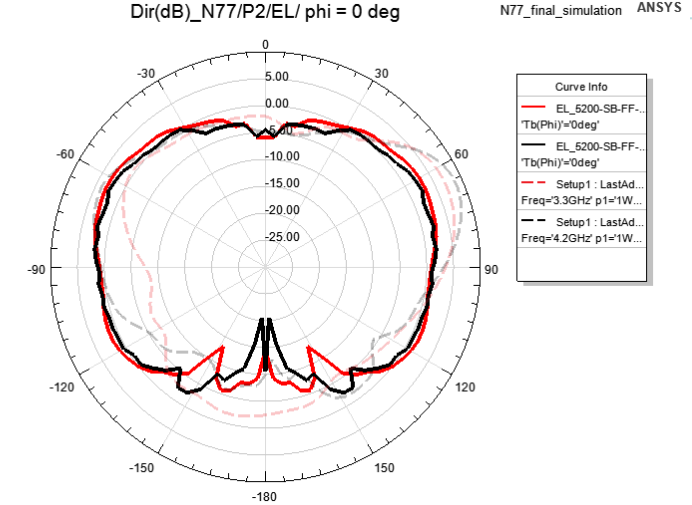


N77 / Test vs Simulation / P2 / Directivity (dB)

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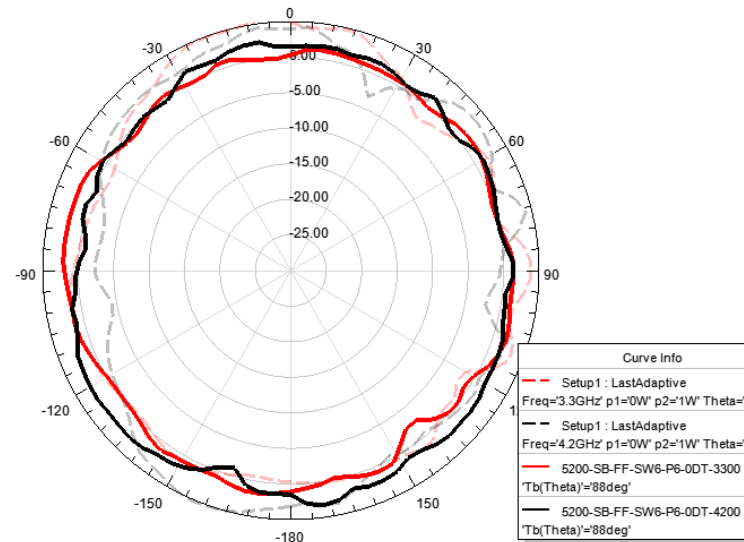


- - Dashed lines : Simulation
— Solid lines: Test



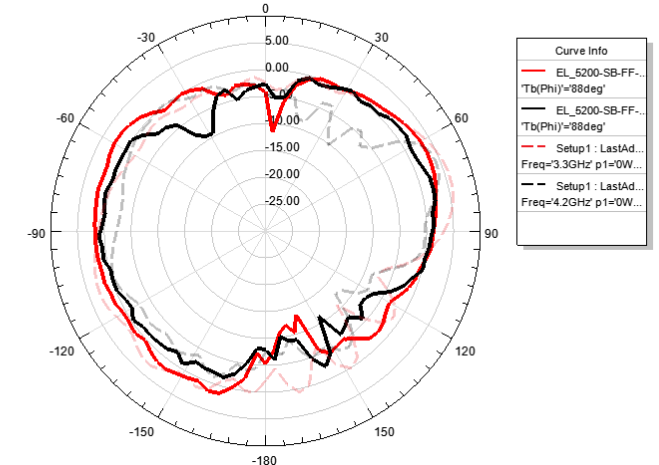
Dir (dB)_N77/P2/AZ/ theta =88 deg

N77_final_simulation ANSYS



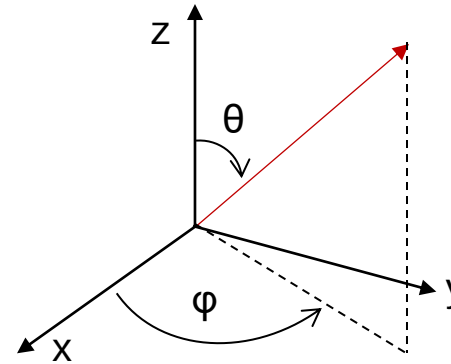
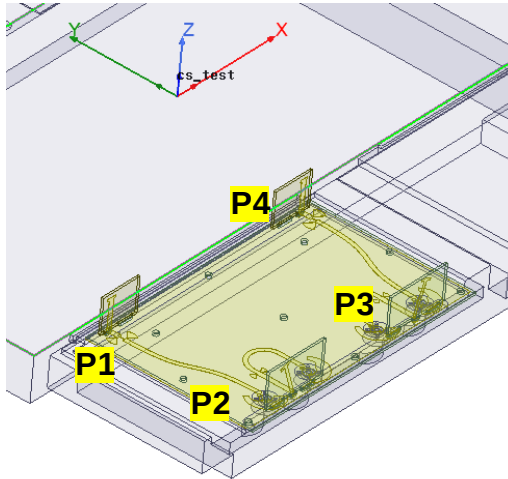
Dir(dB)_N77/P2/EL/ phi = 88 deg

N77_final_simulation ANSYS



Greater simulation/test mismatch than that from N41

N77 / Test vs Simulation / P3 / Directivity (dB)

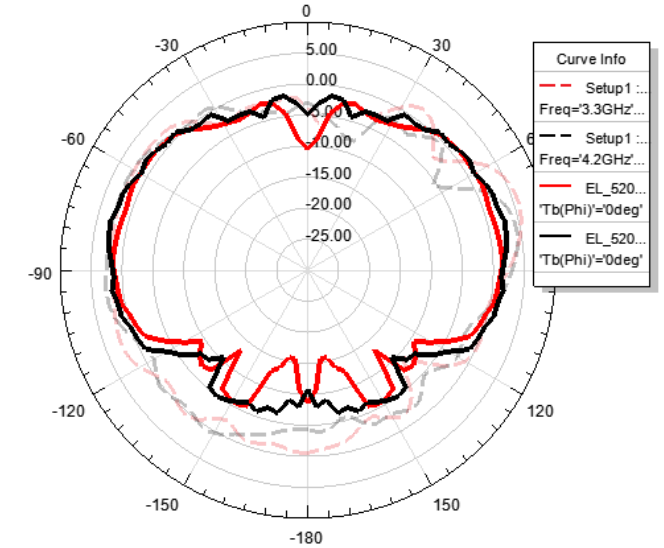


-- Dashed lines : Simulation
— Solid lines: Test

COMMSCOPE®

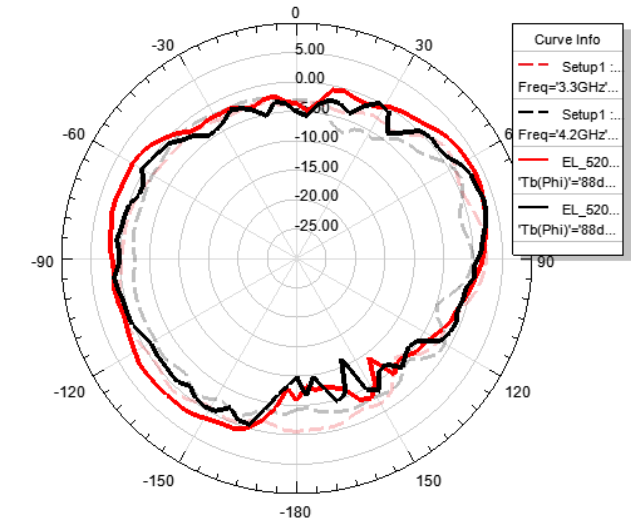
Dir(dB)_N77/P3/EL/ phi = 0 deg

ANSYS



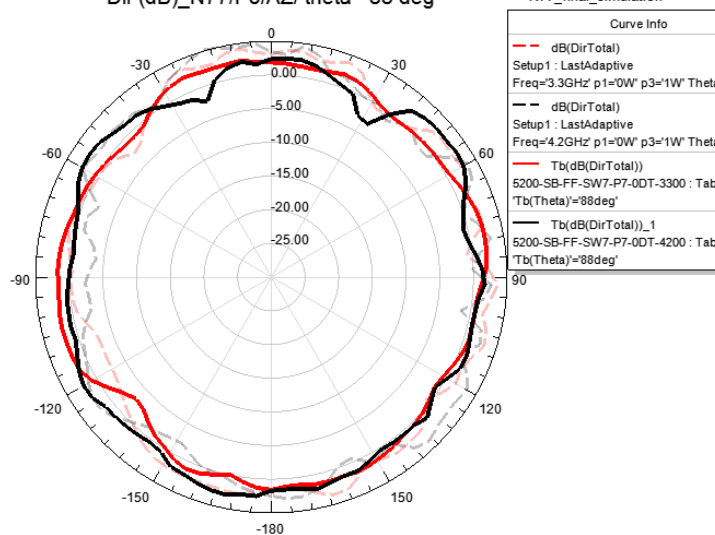
Dir(dB)_N77/P3/EL/ phi = 88 deg

ANSYS



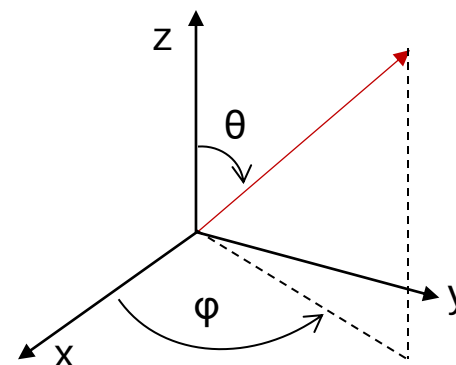
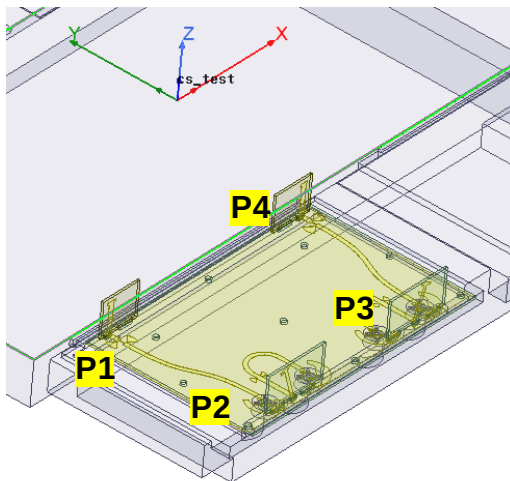
Dir (dB)_N77/P3/AZ/ theta = 88 deg

N77_final_simulation ANSYS



Greater simulation/test mismatch than from N41

N77 / Test vs Simulation / P4 / Directivity (dB)

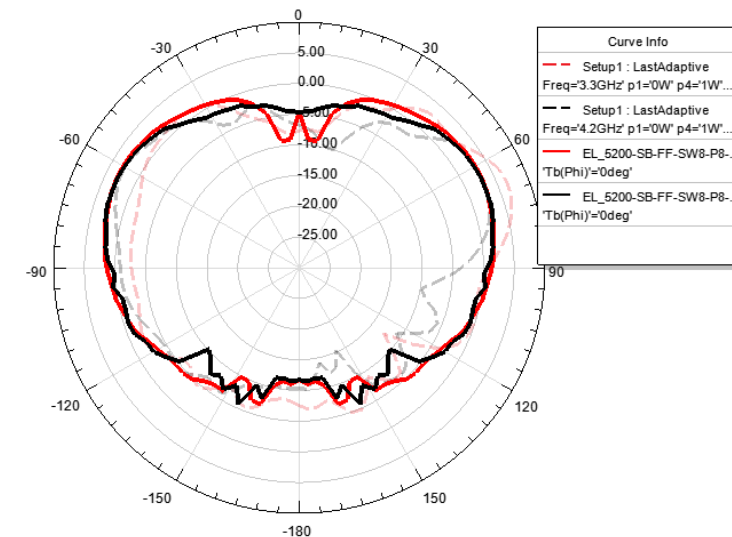


- - Dashed lines : Simulation
— Solid lines: Test

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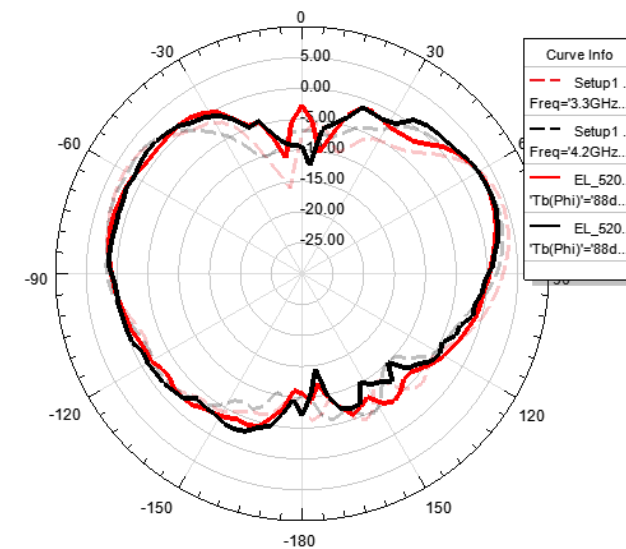
Dir(dB)_N77/P4/EL/ phi = 0 deg

N77_final_simulation ANSYS



Dir(dB)_N77/P4/EL/ phi = 88 deg

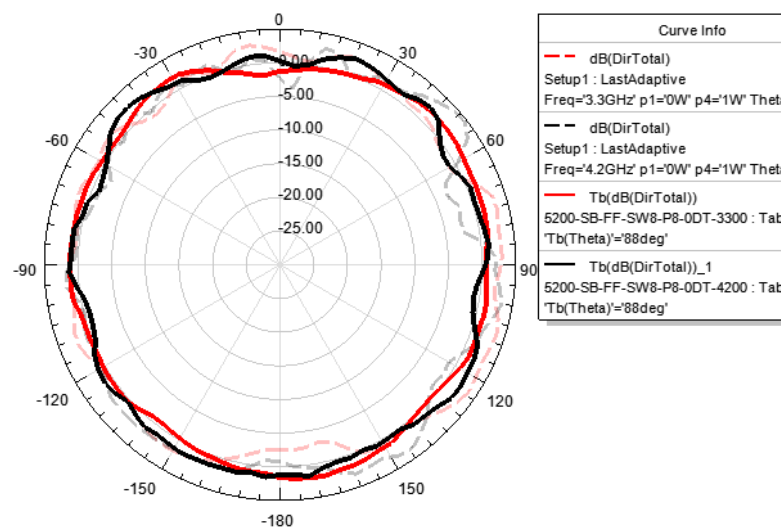
ANSYS

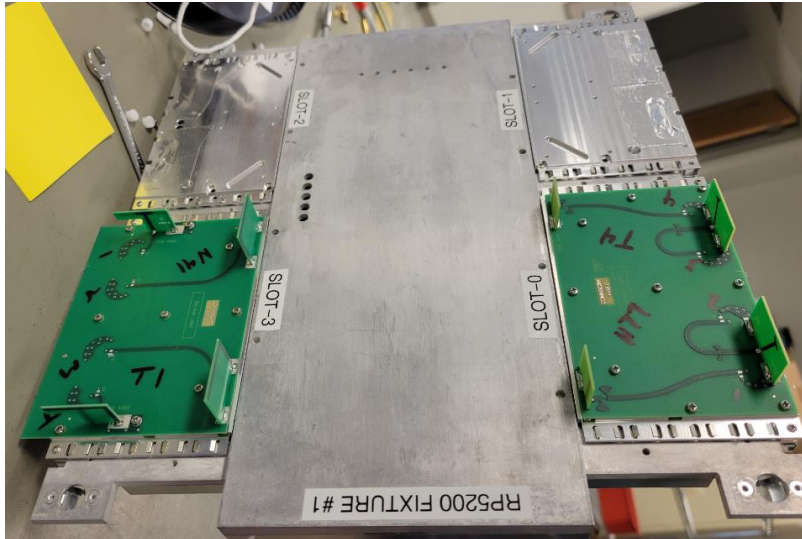


Greater simulation/test mismatch than from N41

Dir (dB)_N77/P4/AZ/ theta =88 deg

N77_final_simulation ANSYS





Beside the range setup disruption, pattern discrepancy between test and simulation might be caused by below reason.

- **Both N41 and N71 antennas were present on the same chassis in the same test**
- **N41 antennas were absent in the simulation of N44**
- **N77 antennas were absent in the simulation of N77**

To be verified...