

RP20 lite 2x2 Indoor Panel

PDD61606C-200SMAM Application Guide

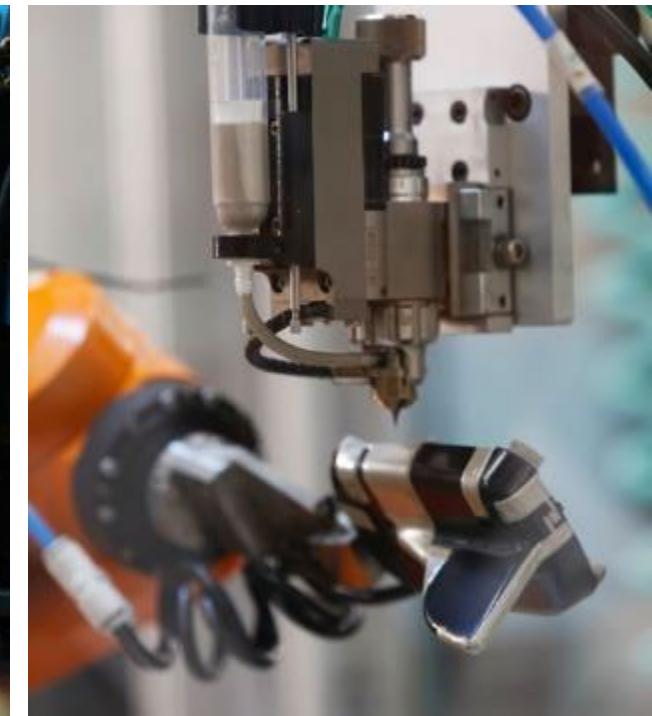
Date: 7-Jun-2022

Revision: 10.0

EVERY CONNECTION COUNTS



Laird™
External Antennas
is now part of



Description

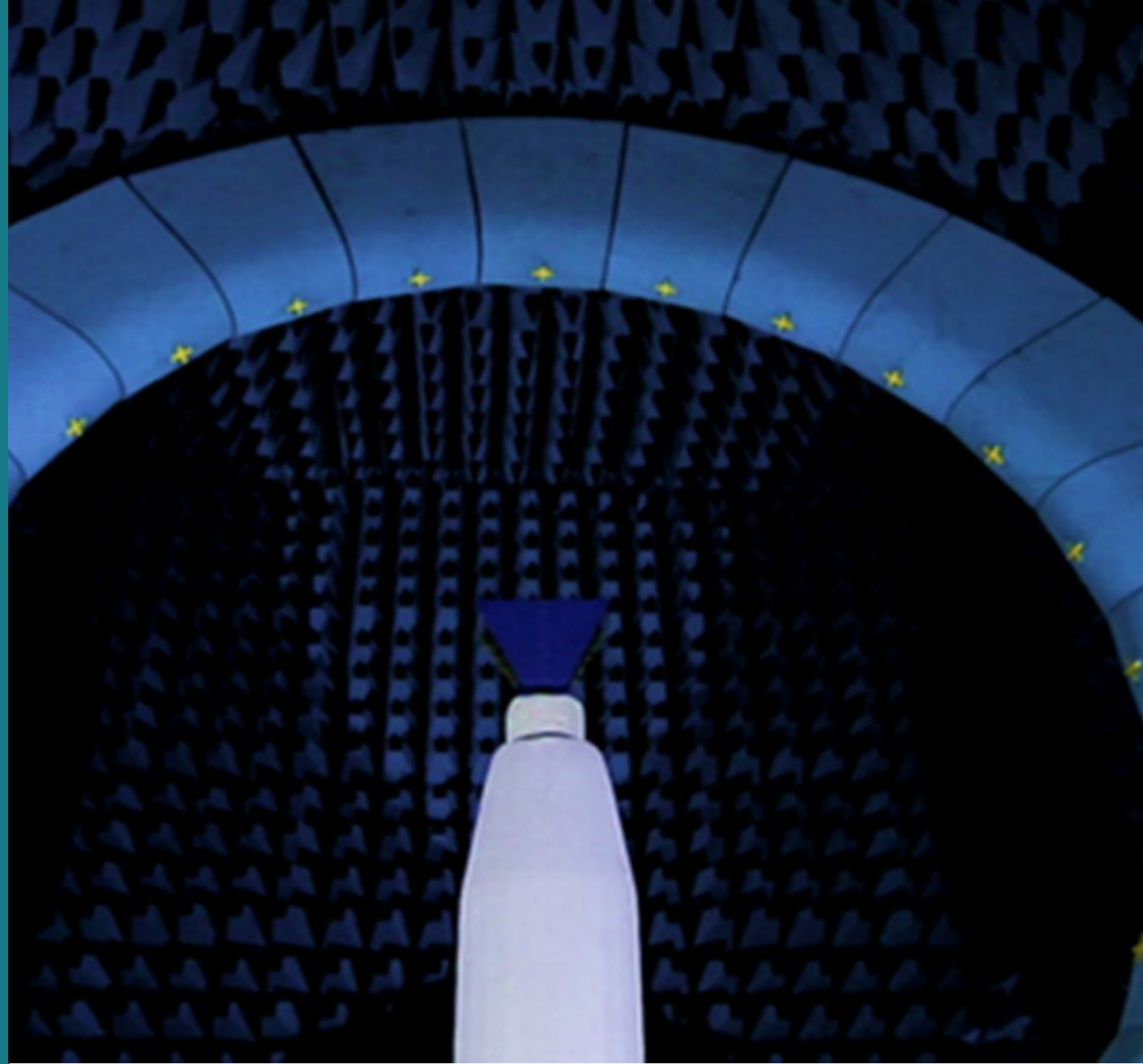
- Antenna (P/N: PDD61606C-200SMAM) used for VSWR/Isolation measurement.
- Below are the test configurations:

Test	Coax Cable	Free Space		Above Metal GP 2ft x 2ft	On Acrylic	On Glass	On PC Plastic	On Plaster
		2m	2ft	2m	2m	2m	2m	2m
VSWR	Bend	Yes	Yes	Yes	No	No	No	No
	Straight	No	No	No	Yes	Yes	Yes	Yes
Gain/ Total Eff.	Bend	Yes	Yes	No	No	No	No	No
	Straight	No	No	No	No	No	No	No

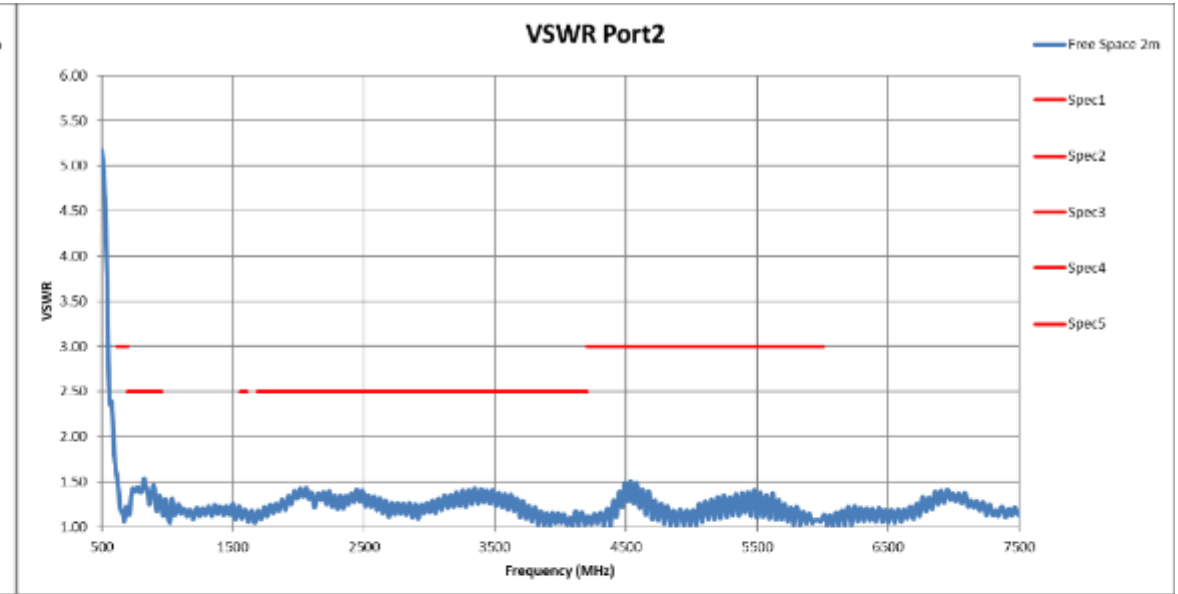
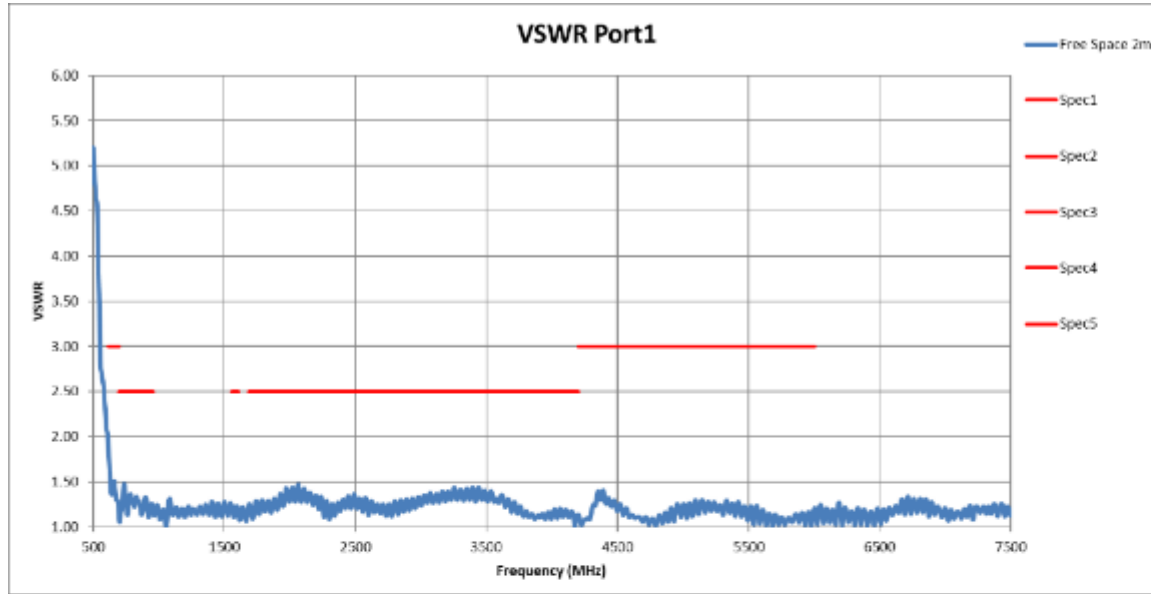
Antenna Performance

VSWR & Port-to-Port Isolation

EVERY CONNECTION COUNTS



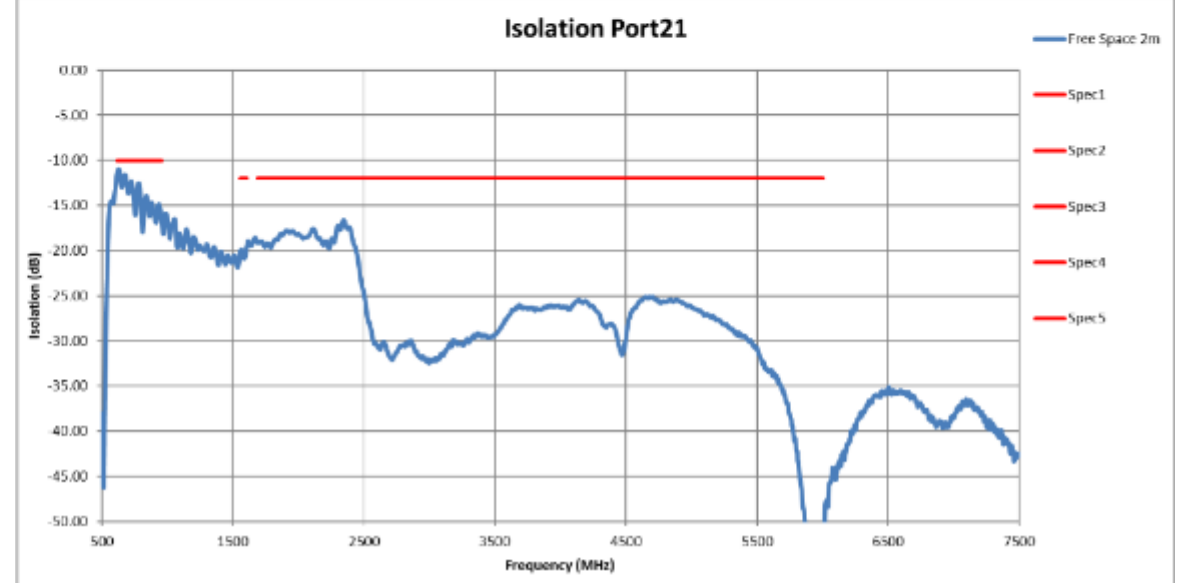
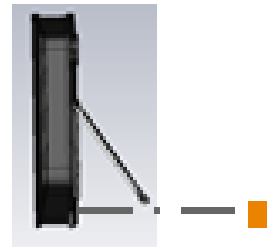
VSWR/Isolation – Free Space 2m Coax Cable



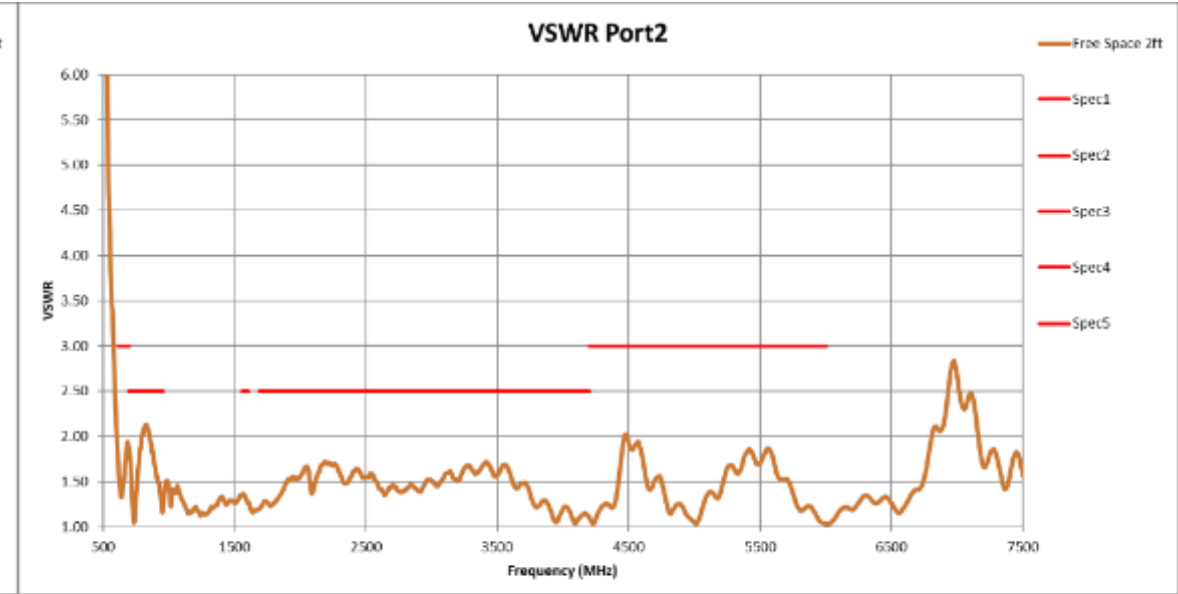
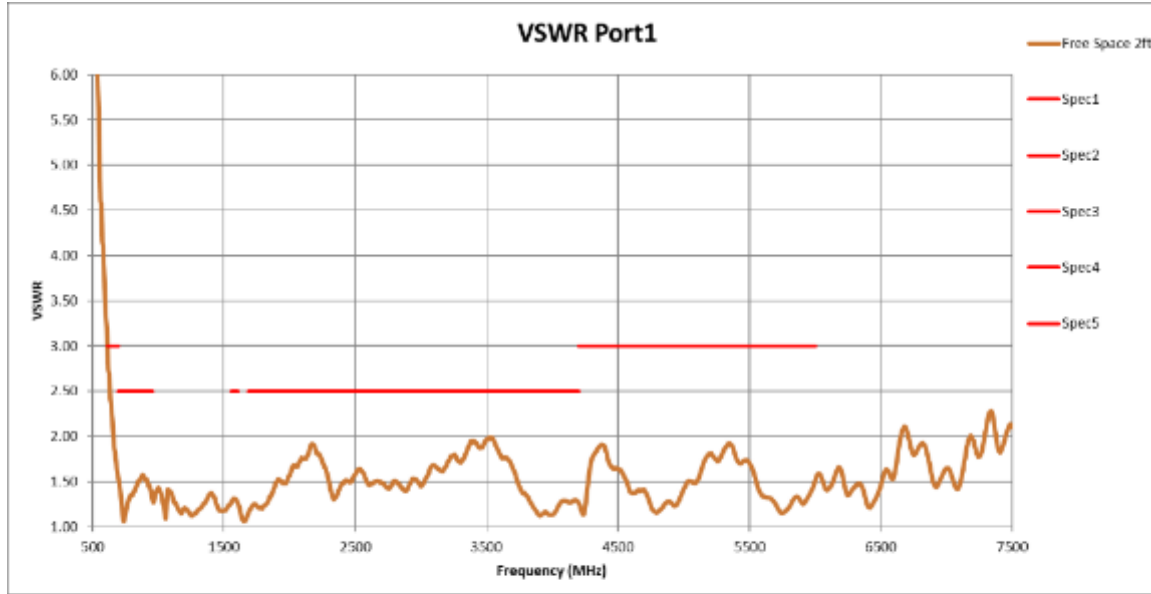
VSWR - Max	Min	Max	Free Space 2m
617-698	< 3.0	< 3.0	< 1.7
698-960	< 2.0	< 2.5	< 1.5
1559-1606	< 2.0	< 2.5	< 1.2
1690-4200	< 2.0	< 2.5	< 1.5
4200-6000	< 3.0	< 3.0	< 1.4

VSWR - Max	Min	Max	Free Space 2m
617-698	< 3.0	< 3.0	< 1.5
698-960	< 2.0	< 2.5	< 1.5
1559-1606	< 2.0	< 2.5	< 1.2
1690-4200	< 2.0	< 2.5	< 1.4
4200-6000	< 3.0	< 3.0	< 1.5

Isolation - Max	Max	Free Space 2m
617-698	> 10	> 11.0
698-960	> 10	> 12.3
1559-1606	> 10	> 19.6
1690-4200	> 10	> 16.6
4200-6000	> 10	> 25.1



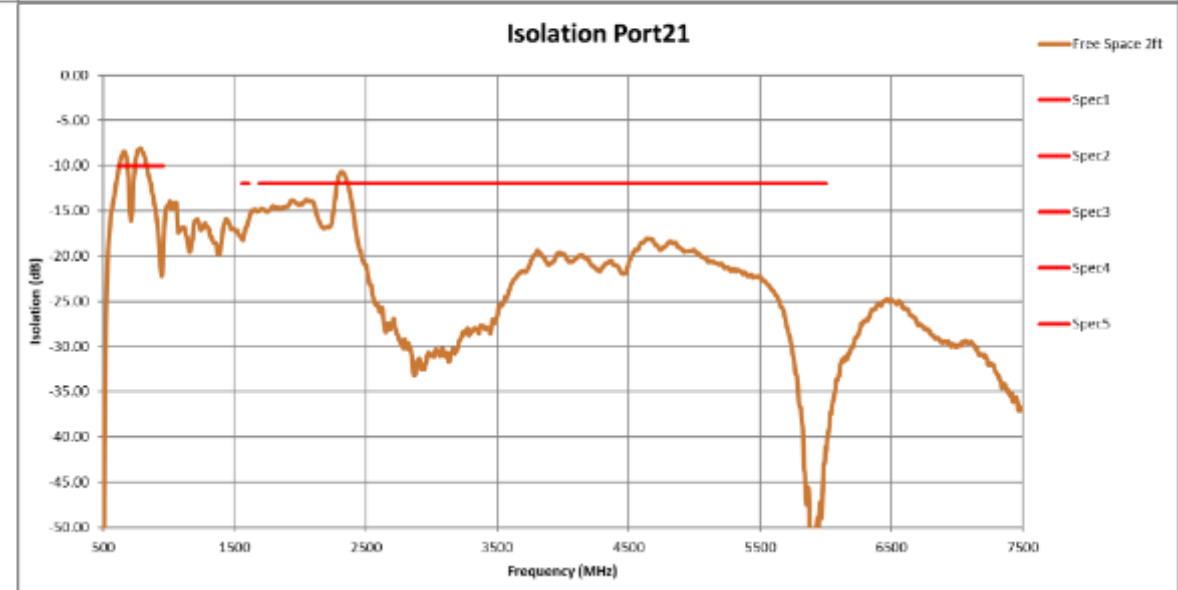
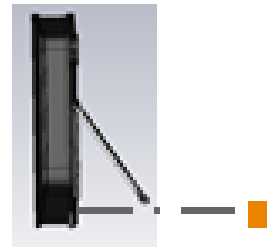
VSWR/Isolation – Free Space 2ft Coax Cable



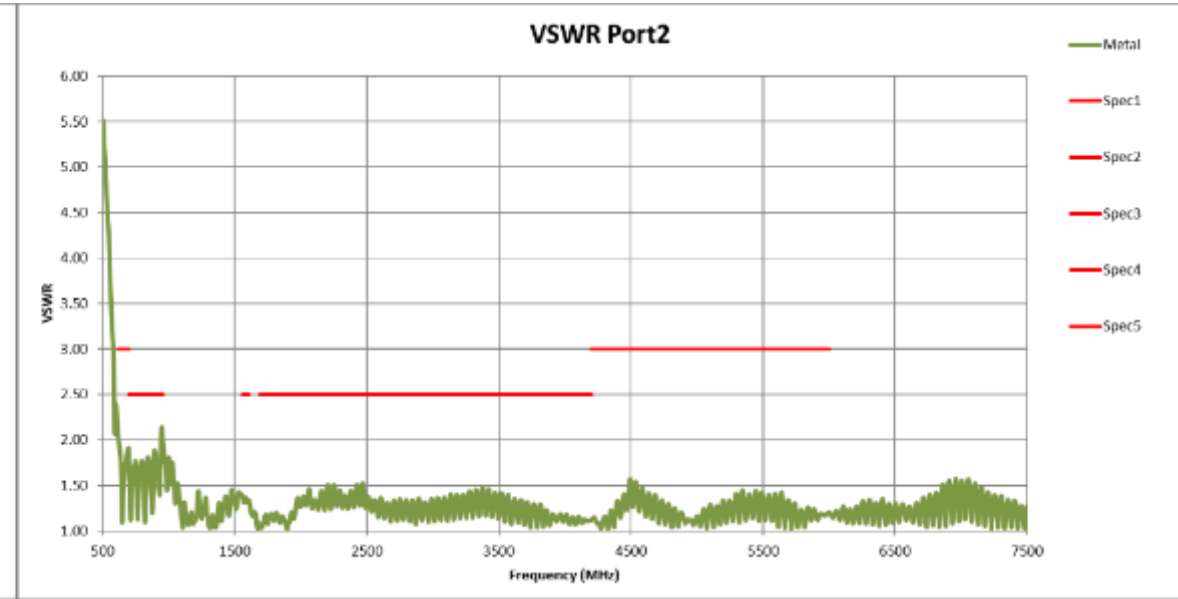
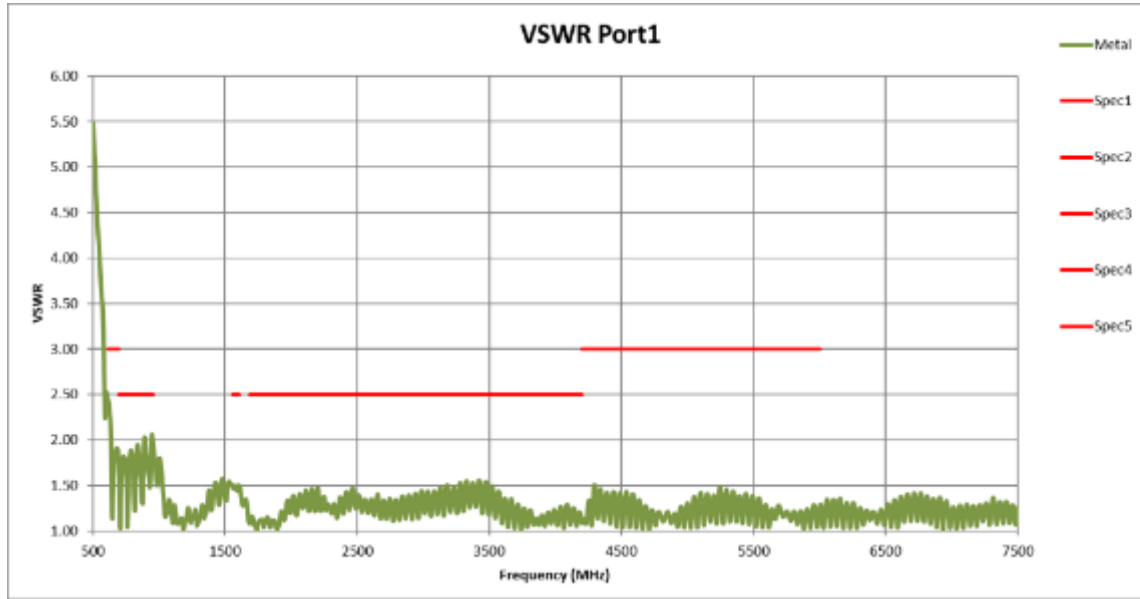
VSWR - Max	Min	Max	Free Space 2ft
617-698	< 3.0	< 3.0	< 2.7
698-960	< 2.0	< 2.5	< 1.6
1559-1606	< 2.0	< 2.5	< 1.3
1690-4200	< 2.0	< 2.5	< 2.0
4200-6000	< 3.0	< 3.0	< 1.9

VSWR - Max	Min	Max	Free Space 2ft
617-698	< 3.0	< 3.0	< 1.9
698-960	< 2.0	< 2.5	< 2.1
1559-1606	< 2.0	< 2.5	< 1.4
1690-4200	< 2.0	< 2.5	< 1.7
4200-6000	< 3.0	< 3.0	< 2.0

Isolation - Max	Max	Free Space 2ft
617-698	> 10	> 8.5
698-960	> 10	> 8.1
1559-1606	> 10	> 16.1
1690-4200	> 10	> 10.7
4200-6000	> 10	> 18.1

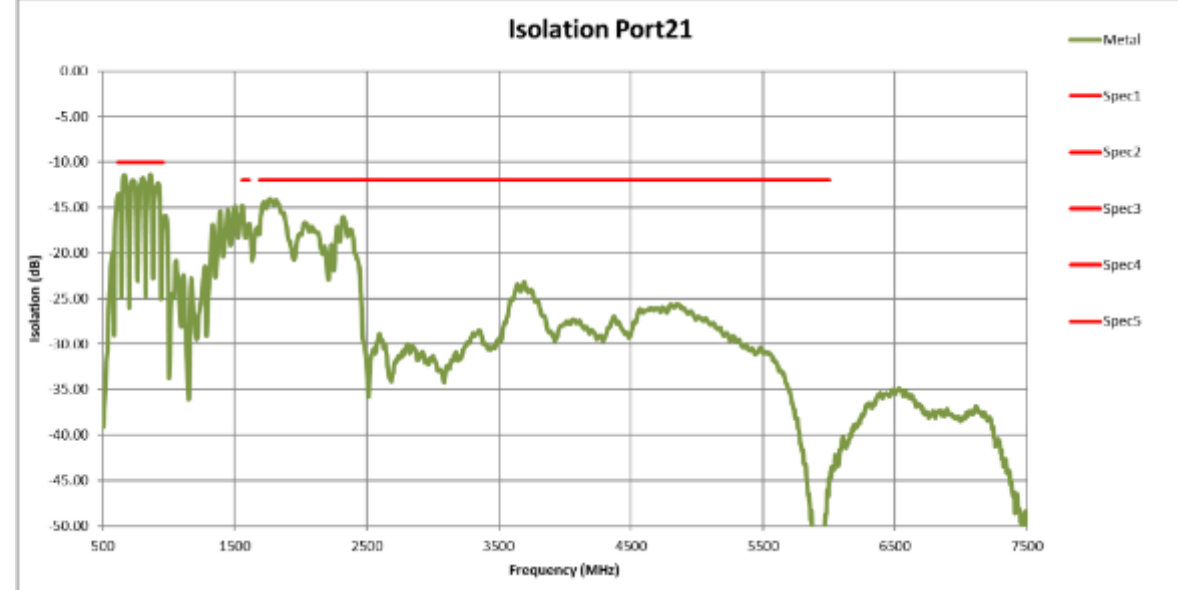
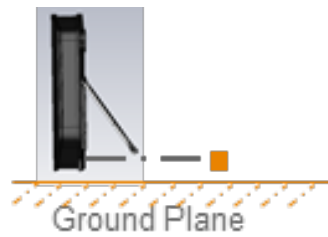


VSWR/Isolation – Above Metal Ground Plane

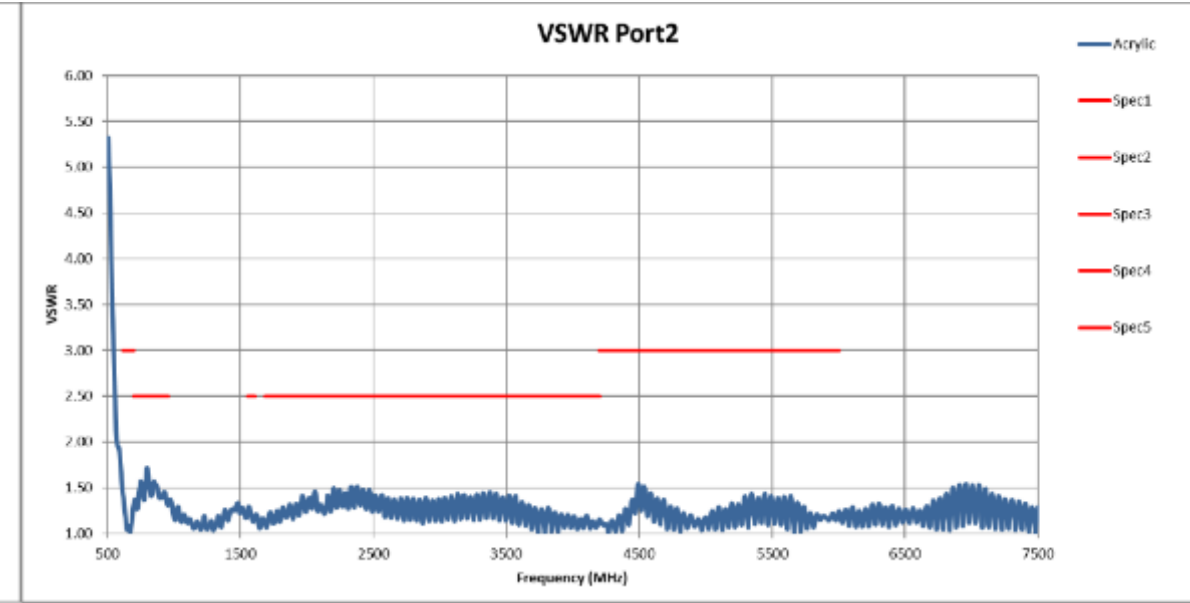
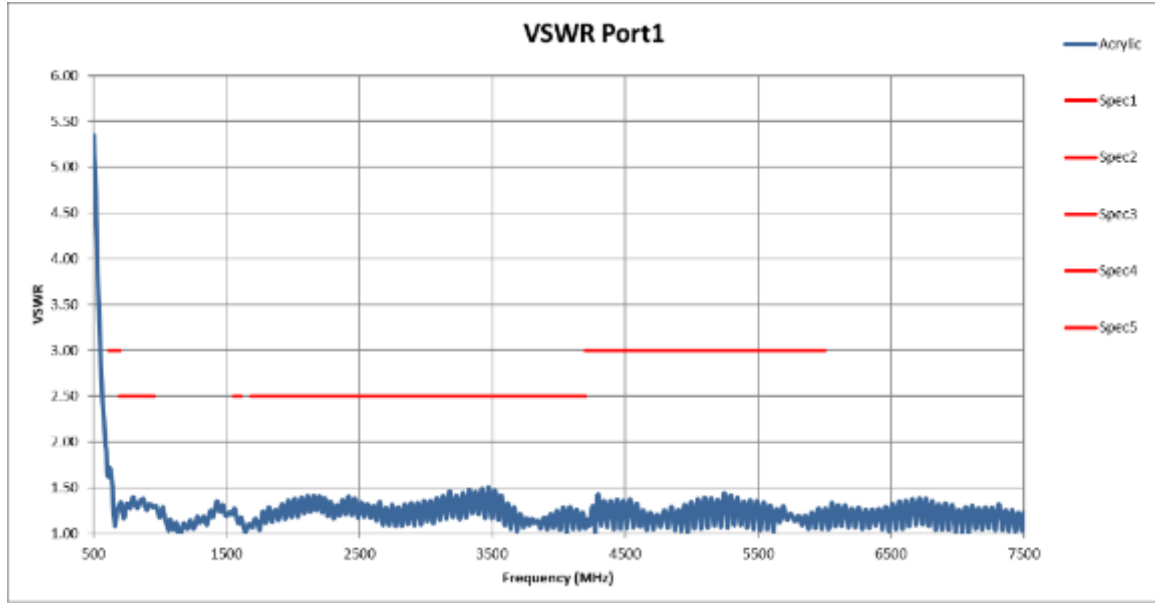


VSWR - Max	Min	Max	Metal	VSWR - Max	Min	Max	Metal
617-698	< 3.0	< 3.0	< 2.4	617-698	< 3.0	< 3.0	< 2.0
698-960	< 2.0	< 2.5	< 2.1	698-960	< 2.0	< 2.5	< 2.1
1559-1606	< 2.0	< 2.5	< 1.5	1559-1606	< 2.0	< 2.5	< 1.4
1690-4200	< 2.0	< 2.5	< 1.6	1690-4200	< 2.0	< 2.5	< 1.5
4200-6000	< 3.0	< 3.0	< 1.5	4200-6000	< 3.0	< 3.0	< 1.6

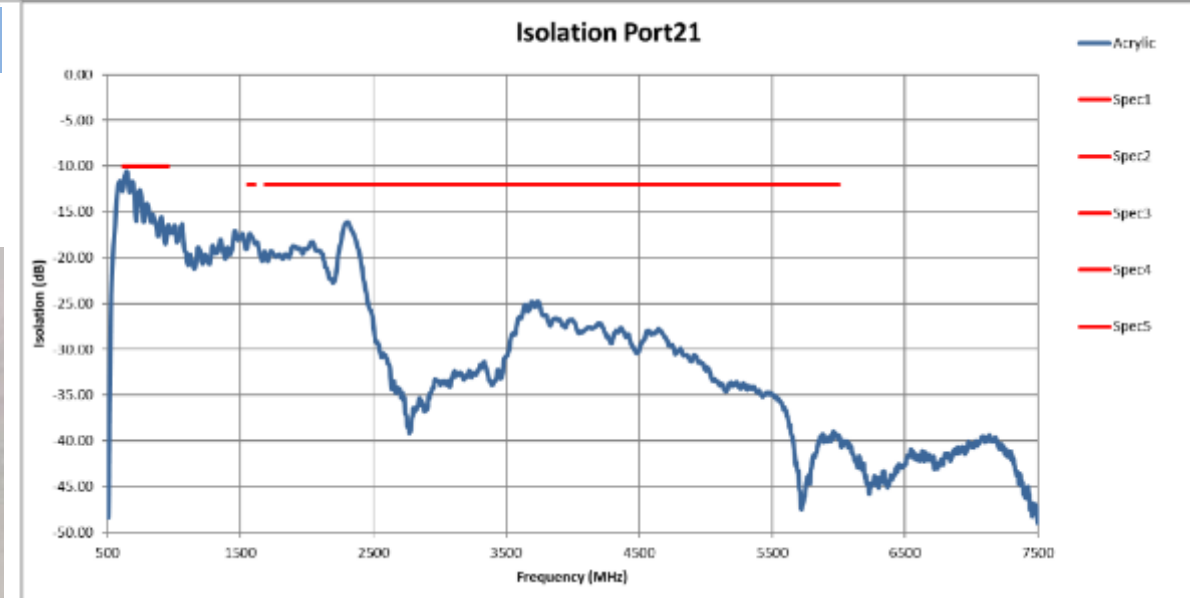
Isolation - Max	Max	Metal
617-698	> 10	> 11.4
698-960	> 10	> 11.4
1559-1606	> 10	> 14.9
1690-4200	> 10	> 14.0
4200-6000	> 10	> 25.6



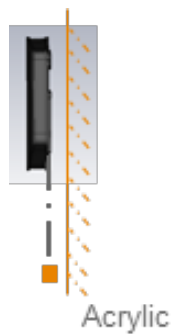
VSWR/Isolation – On Acrylic



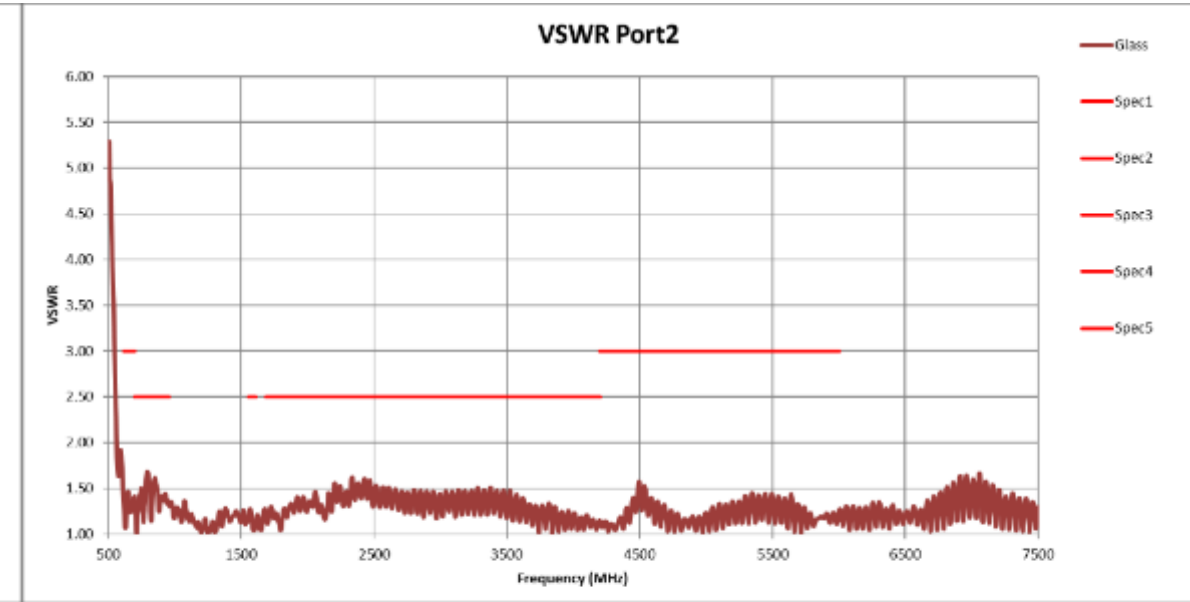
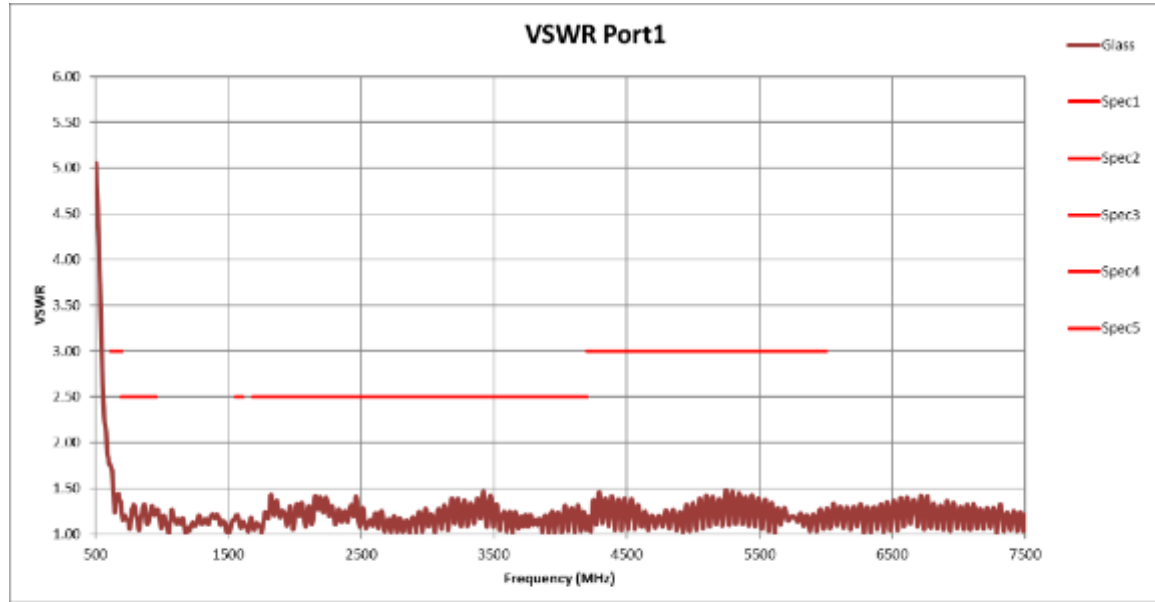
VSWR - Max	Min	Max	Acrylic	VSWR - Max	Min	Max	Acrylic
617-698	< 3.0	< 3.0	< 1.7	617-698	< 3.0	< 3.0	< 1.4
698-960	< 2.0	< 2.5	< 1.4	698-960	< 2.0	< 2.5	< 1.7
1559-1606	< 2.0	< 2.5	< 1.3	1559-1606	< 2.0	< 2.5	< 1.3
1690-4200	< 2.0	< 2.5	< 1.5	1690-4200	< 2.0	< 2.5	< 1.5
4200-6000	< 3.0	< 3.0	< 1.4	4200-6000	< 3.0	< 3.0	< 1.5



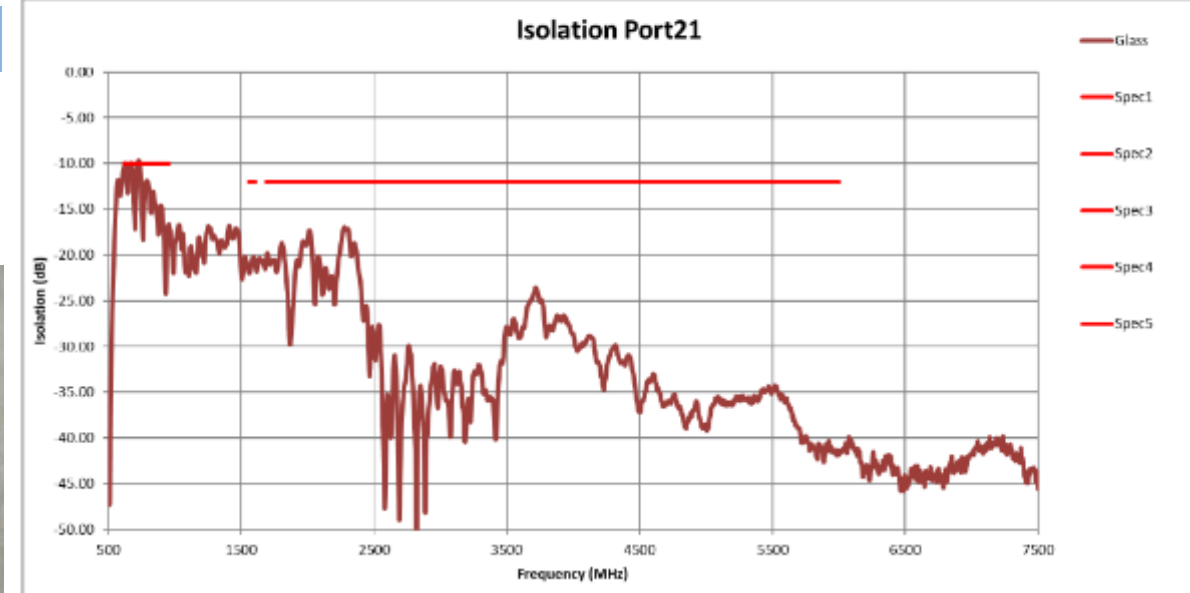
Isolation - Max	Max	Acrylic
617-698	> 10	> 10.6
698-960	> 10	> 12.6
1559-1606	> 10	> 17.4
1690-4200	> 10	> 16.1
4200-6000	> 10	> 27.2



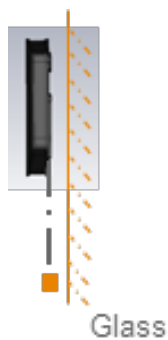
VSWR/Isolation – On Glass



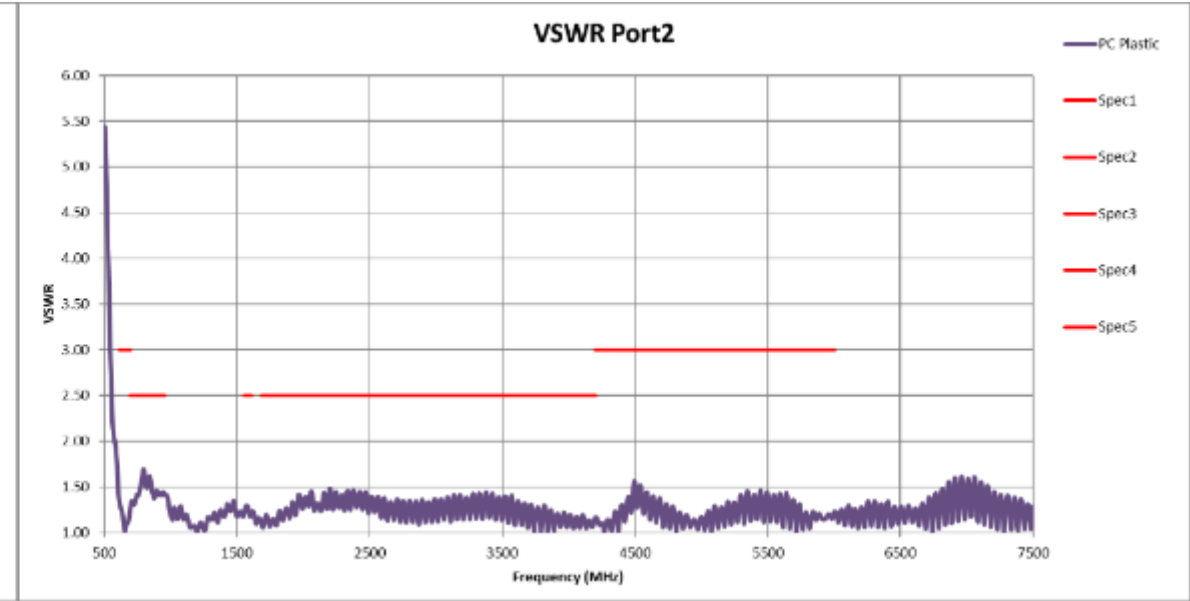
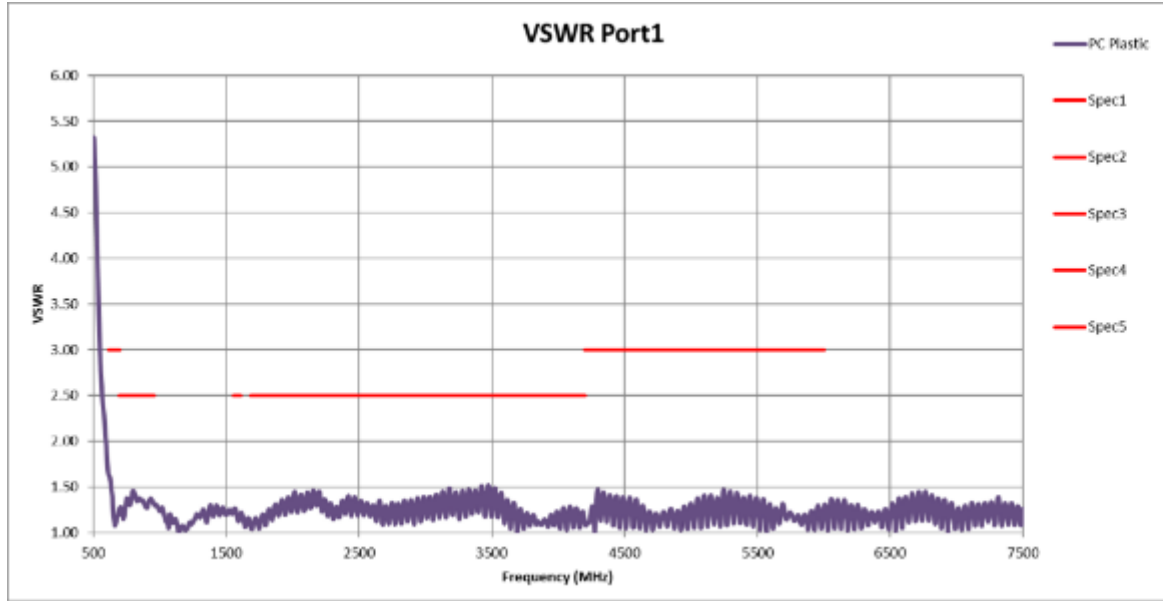
VSWR - Max	Min	Max	Glass	VSWR - Max	Min	Max	Glass
617-698	< 3.0	< 3.0	< 1.7	617-698	< 3.0	< 3.0	< 1.5
698-960	< 2.0	< 2.5	< 1.3	698-960	< 2.0	< 2.5	< 1.7
1559-1606	< 2.0	< 2.5	< 1.2	1559-1606	< 2.0	< 2.5	< 1.3
1690-4200	< 2.0	< 2.5	< 1.5	1690-4200	< 2.0	< 2.5	< 1.6
4200-6000	< 3.0	< 3.0	< 1.5	4200-6000	< 3.0	< 3.0	< 1.6



Isolation - Max	Max	Glass
617-698	> 10	> 9.9
698-960	> 10	> 9.7
1559-1606	> 10	> 20.2
1690-4200	> 10	> 16.9
4200-6000	> 10	> 29.9



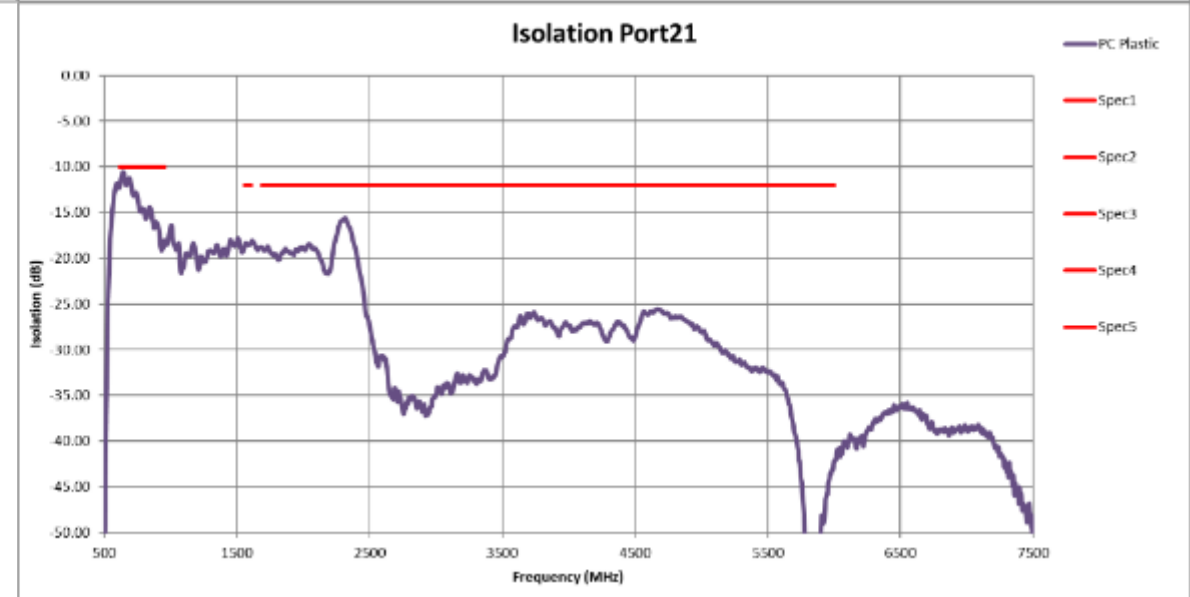
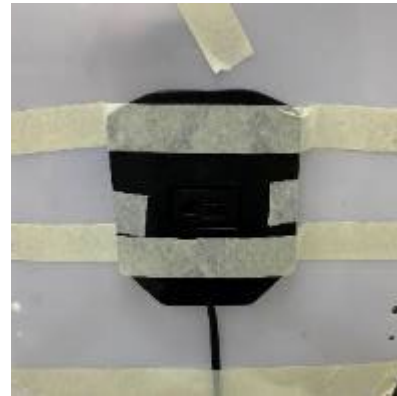
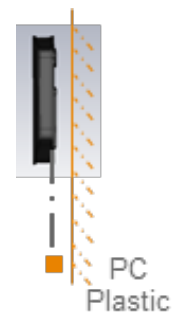
VSWR/Isolation – On PC Plastic



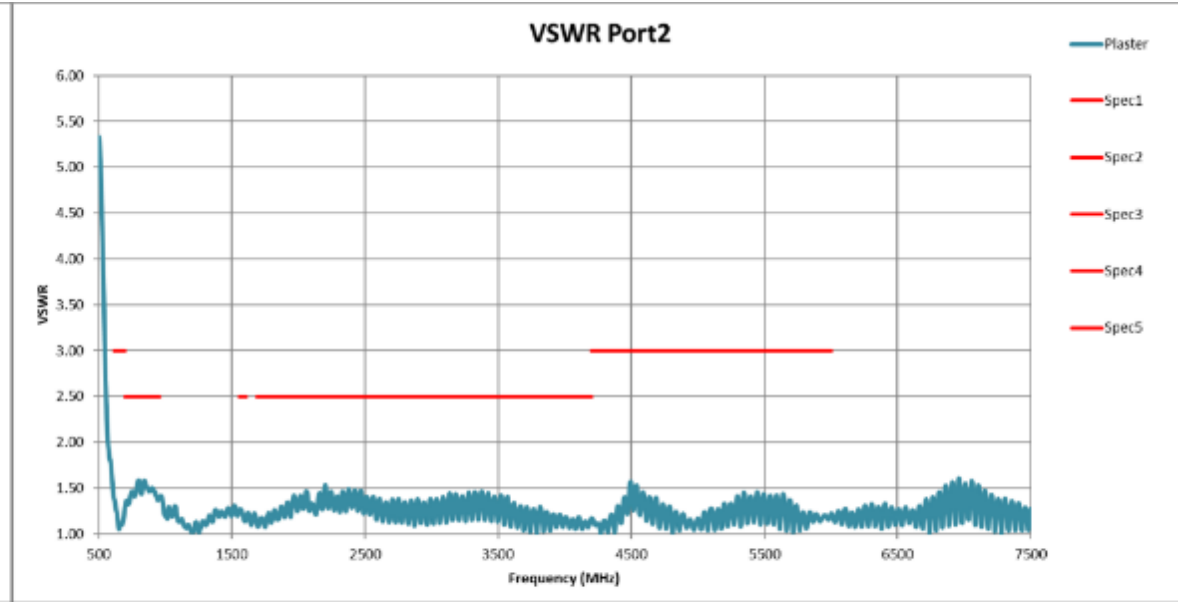
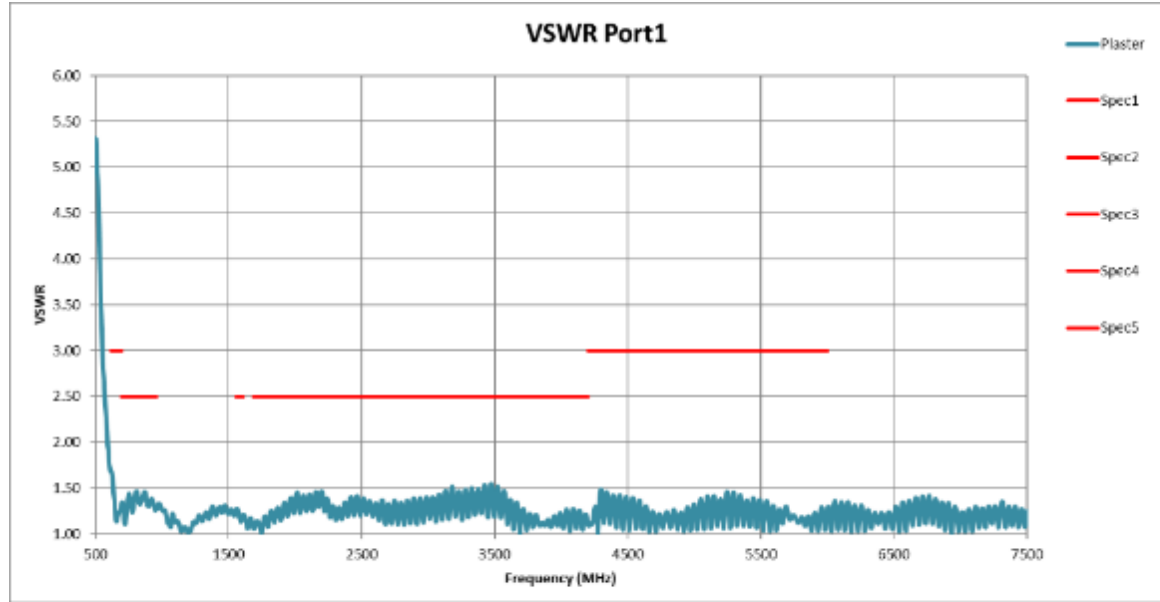
VSWR - Max	Min	Max	PC Plastic
617-698	< 3.0	< 3.0	< 1.6
698-960	< 2.0	< 2.5	< 1.5
1559-1606	< 2.0	< 2.5	< 1.3
1690-4200	< 2.0	< 2.5	< 1.5
4200-6000	< 3.0	< 3.0	< 1.5

VSWR - Max	Min	Max	PC Plastic
617-698	< 3.0	< 3.0	< 1.3
698-960	< 2.0	< 2.5	< 1.7
1559-1606	< 2.0	< 2.5	< 1.3
1690-4200	< 2.0	< 2.5	< 1.5
4200-6000	< 3.0	< 3.0	< 1.6

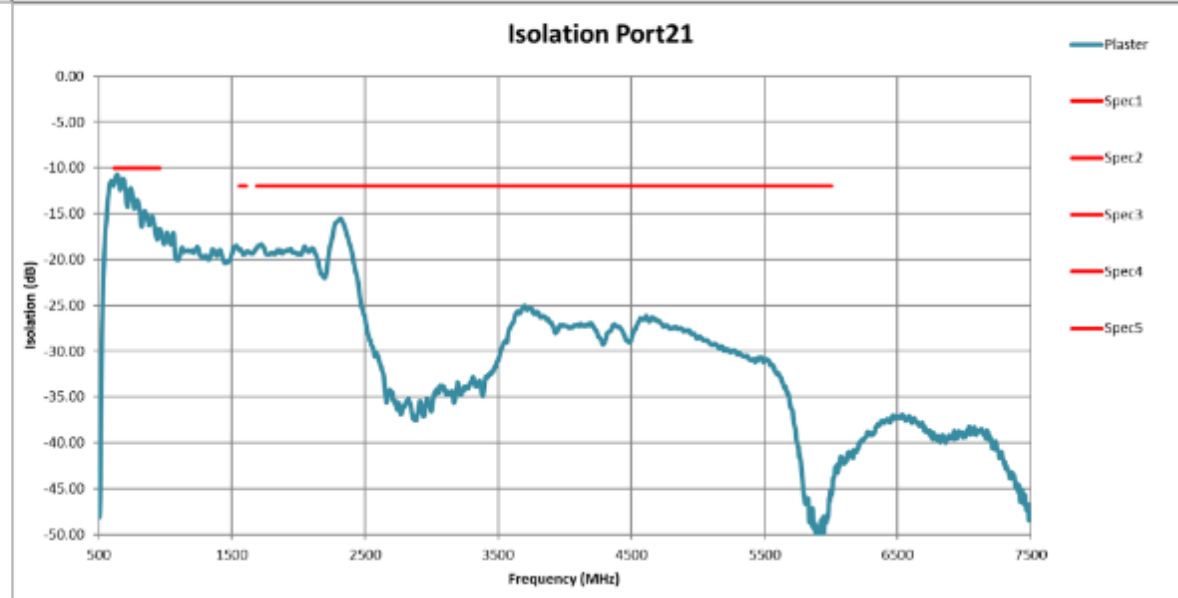
Isolation - Max	Max	PC Plastic
617-698	> 10	> 10.6
698-960	> 10	> 11.8
1559-1606	> 10	> 18.3
1690-4200	> 10	> 15.6
4200-6000	> 10	> 25.6



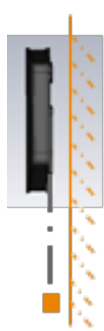
VSWR/Isolation – On Plaster Ceiling Board



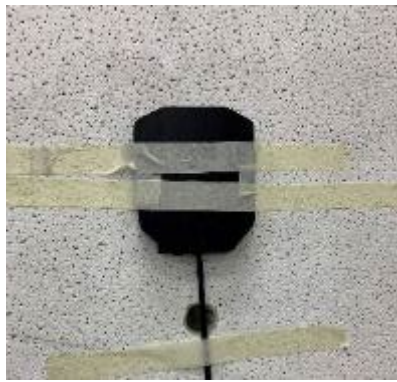
VSWR - Max	Min	Max	Plaster	VSWR - Max	Min	Max	Plaster
617-698	< 3.0	< 3.0	< 1.7	617-698	< 3.0	< 3.0	< 1.4
698-960	< 2.0	< 2.5	< 1.5	698-960	< 2.0	< 2.5	< 1.6
1559-1606	< 2.0	< 2.5	< 1.3	1559-1606	< 2.0	< 2.5	< 1.3
1690-4200	< 2.0	< 2.5	< 1.5	1690-4200	< 2.0	< 2.5	< 1.5
4200-6000	< 3.0	< 3.0	< 1.5	4200-6000	< 3.0	< 3.0	< 1.6



Isolation - Max	Max	Plaster
617-698	> 10	> 10.7
698-960	> 10	> 12.2
1559-1606	> 10	> 18.8
1690-4200	> 10	> 15.5
4200-6000	> 10	> 26.2



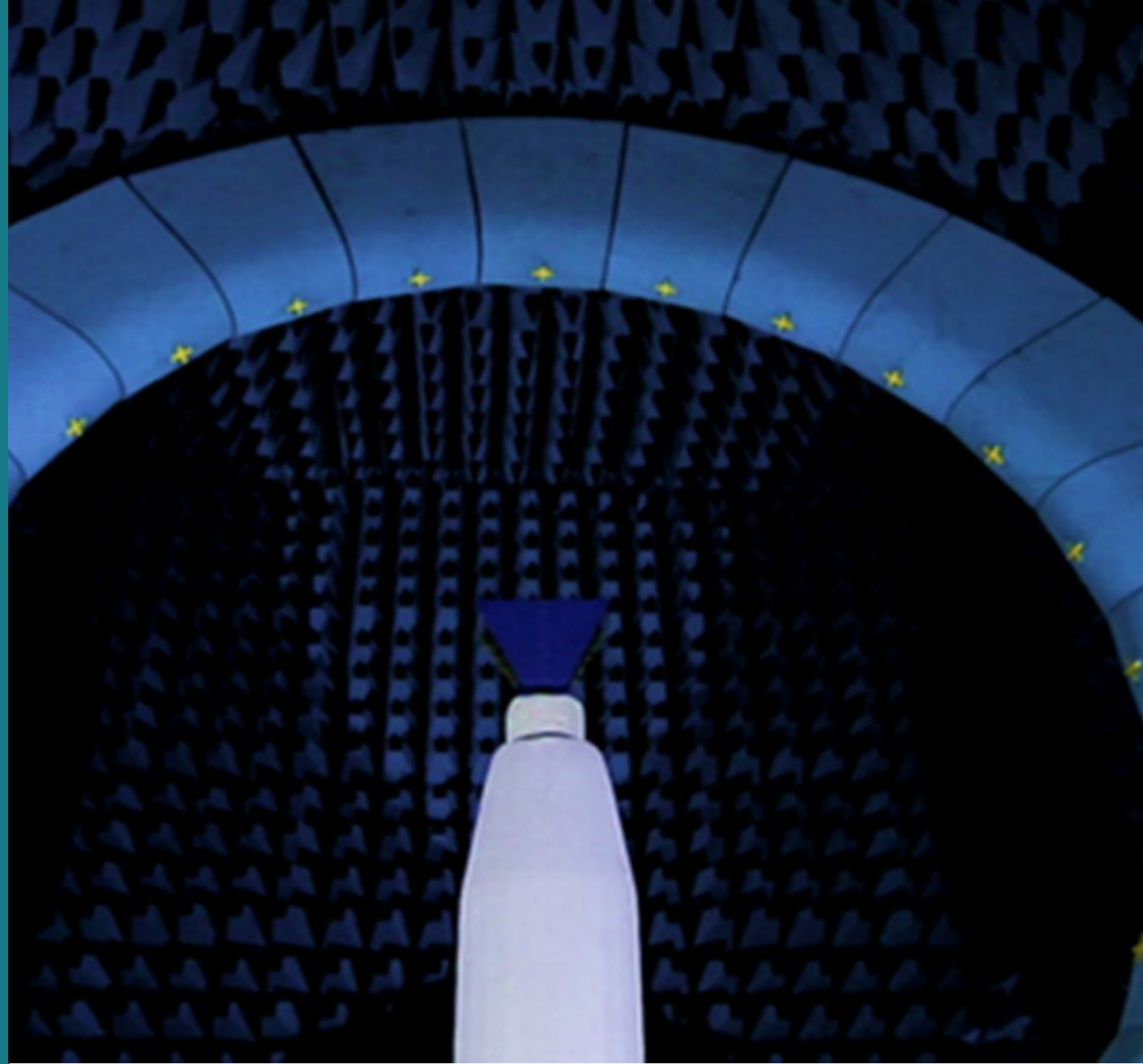
Plaster



Antenna Performance

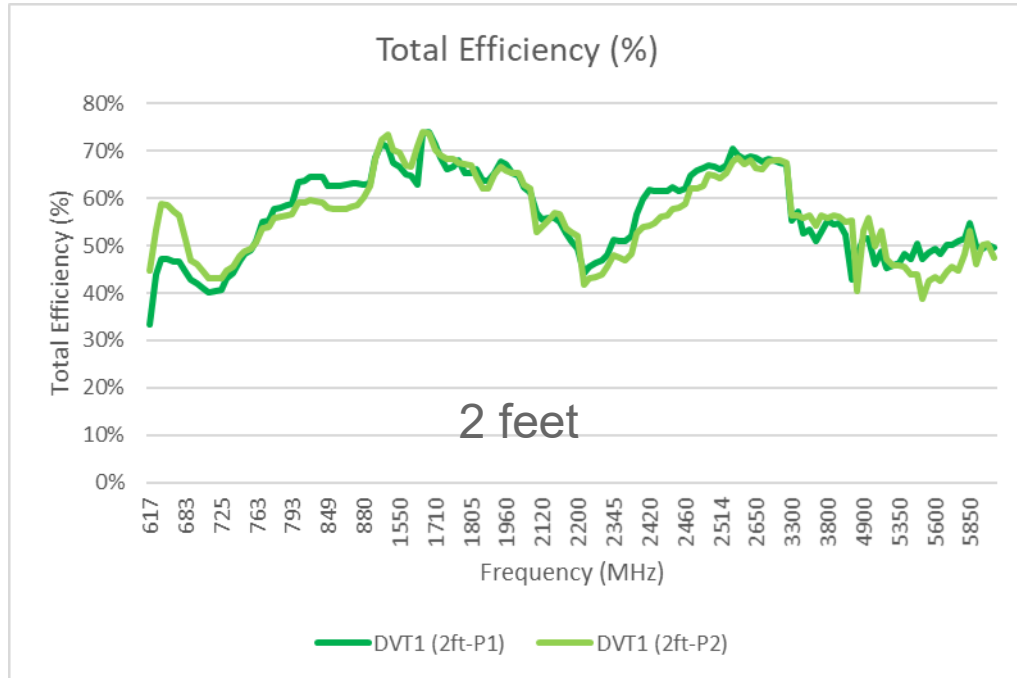
Total Efficiency & Gain

EVERY CONNECTION COUNTS



Total Efficiency, %

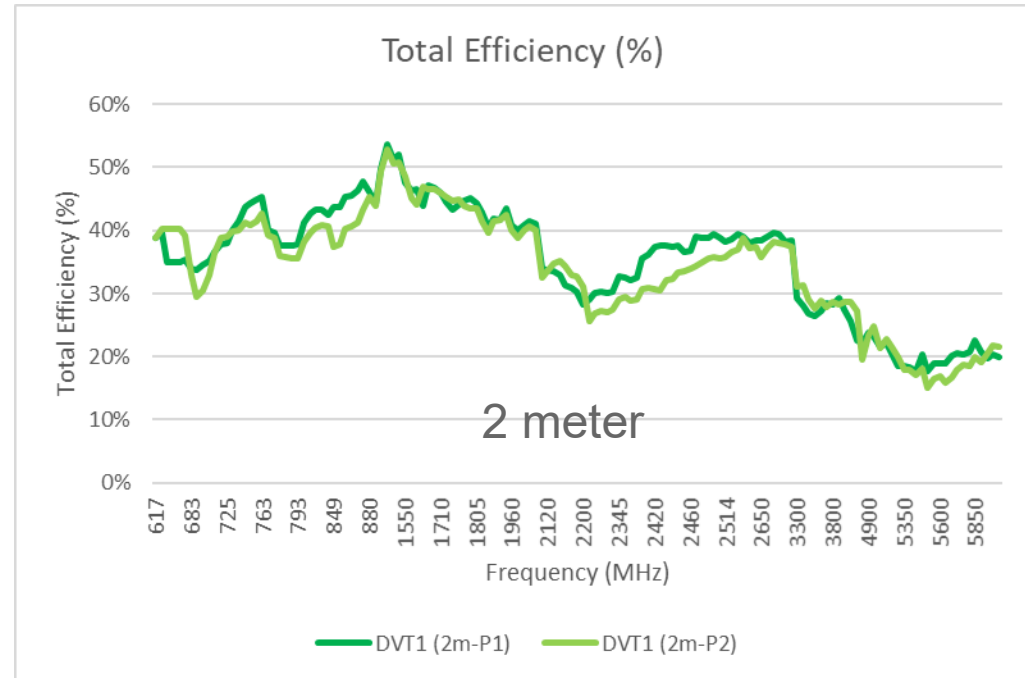
Free Space 2 ft RG174T



3D Total Efficiency	DVT1 (2ft- P1) DVT1 (2ft- P2)	
(%)	(%)	(%)
- Average		
617-960	54%	55%
1559-1606	65%	69%
1690-6000	58%	56%

3D Total Efficiency	DVT1 (2ft- P1) DVT1 (2ft- P2)	
(%)	(%)	(%)
- Min		
617-960	33%	43%
1559-1606	63%	67%
1690-6000	43%	39%

Free Space 2 m RG174T

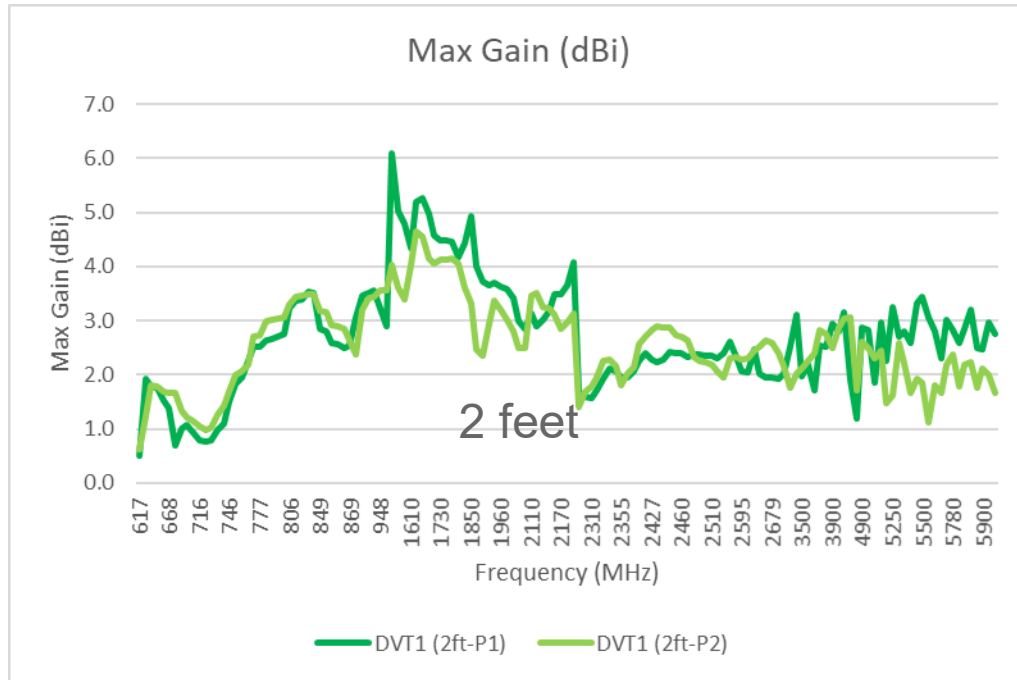


3D Total Efficiency	DVT1 (2m- P1) DVT1 (2m- P2)	
(%)	(%)	(%)
- Average		
617-960	41%	40%
1559-1606	46%	46%
1690-6000	32%	31%

3D Total Efficiency	DVT1 (2m- P1) DVT1 (2m- P2)	
(%)	(%)	(%)
- Min		
617-960	34%	30%
1559-1606	44%	44%
1690-6000	18%	15%

3D Gain, dBi

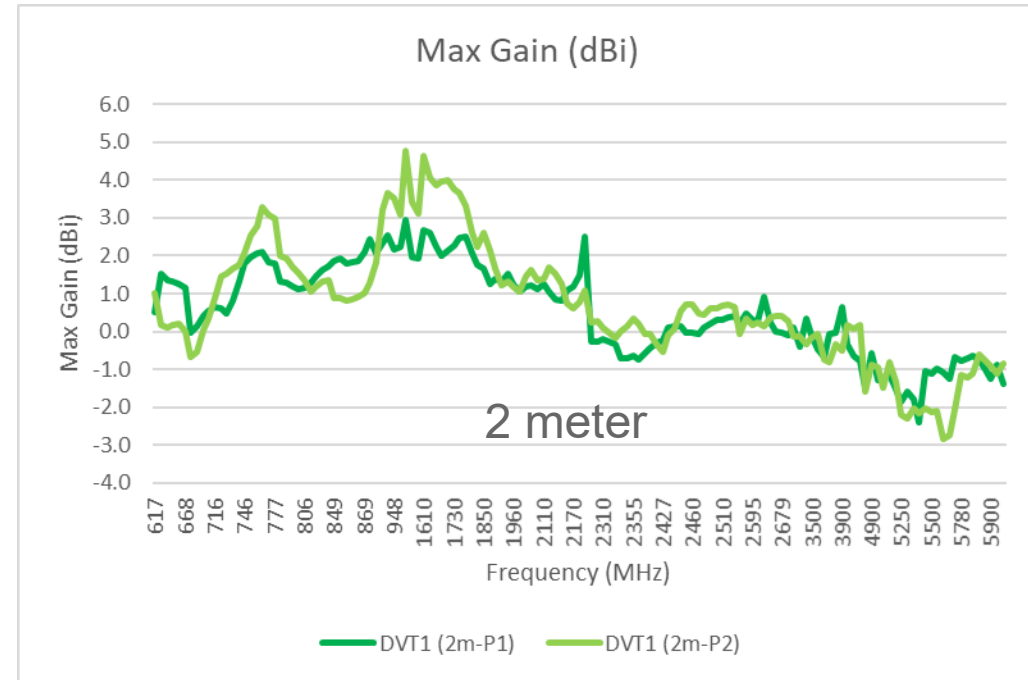
Free Space 2 ft RG174T



3D Max Gain (dBi)	DVT1 (2ft-P1)	DVT1 (2ft-P2)
617-960	3.6	3.6
1559-1606	6.1	4.0
1690-6000	5.3	4.6

3D Max Gain (dBi)	DVT1 (2ft-P1)	DVT1 (2ft-P2)
- Average	2.3	2.5
617-960	2.3	2.5
1559-1606	5.1	3.8
1690-6000	2.9	2.6

Free Space 2 m RG174T

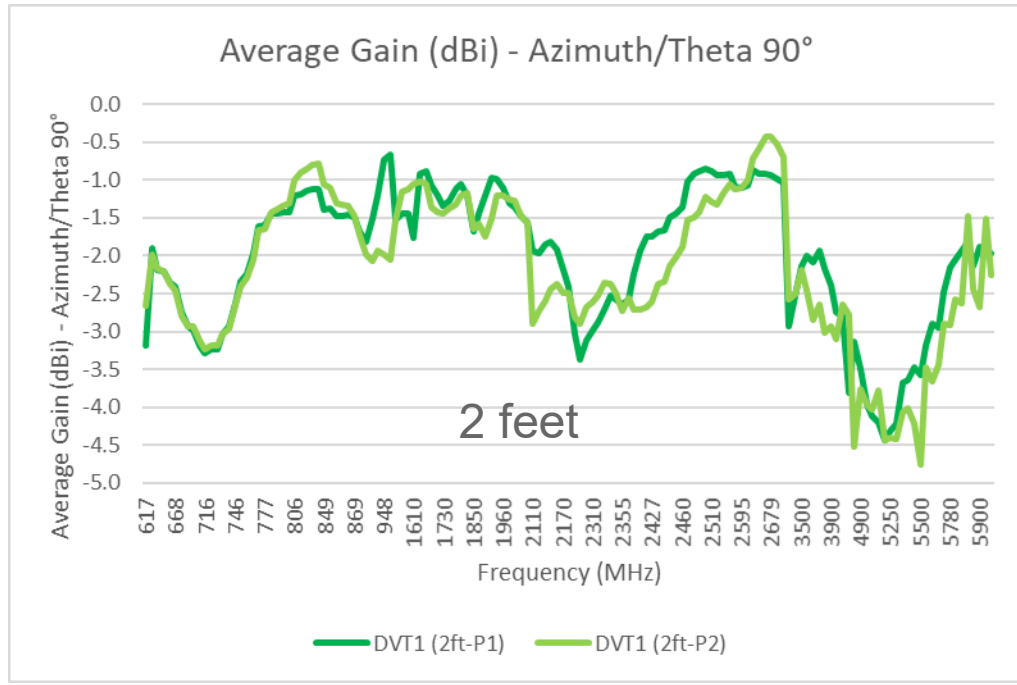


3D Max Gain (dBi)	DVT1 (2m-P1)	DVT1 (2m-P2)
617-960	2.5	3.7
1559-1606	3.0	4.8
1690-6000	2.6	4.1

3D Max Gain (dBi)	DVT1 (2m-P1)	DVT1 (2m-P2)
- Average	1.5	1.6
617-960	1.5	1.6
1559-1606	2.4	4.0
1690-6000	0.3	0.5

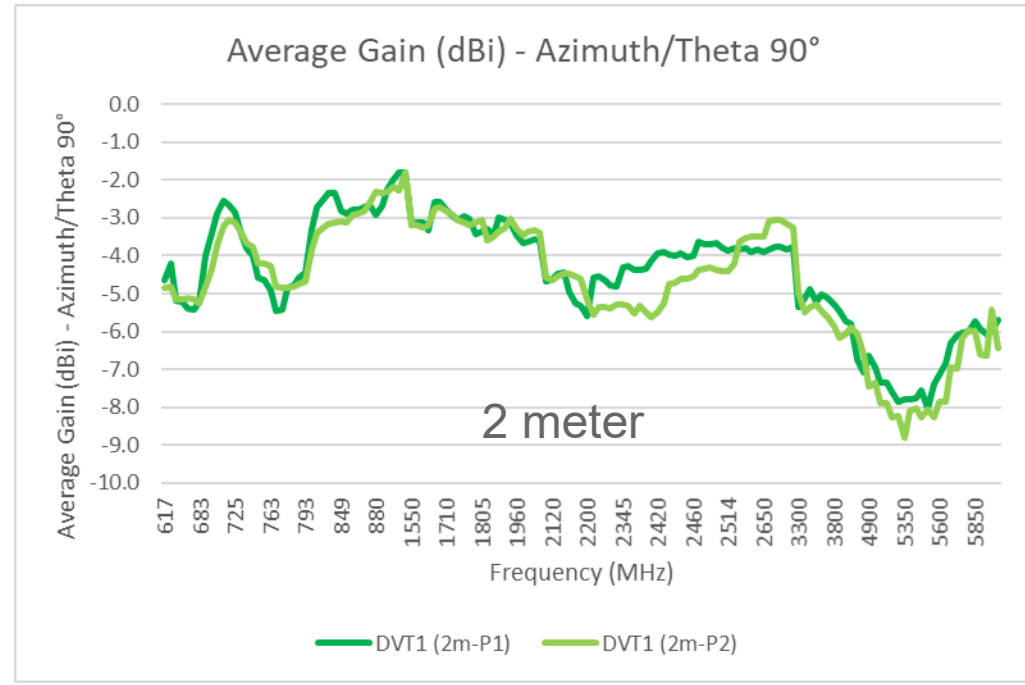
Azimuth/Theta 90° Average Gain, dBi

Free Space 2 ft RG174T



Average Gain (dBi) - Azimuth/Theta 90°	DVT1 (2ft-P1)	DVT1 (2ft-P2)
617-960	-1.9	-1.9
1559-1606	-1.5	-1.2
1690-6000	-1.9	-2.2

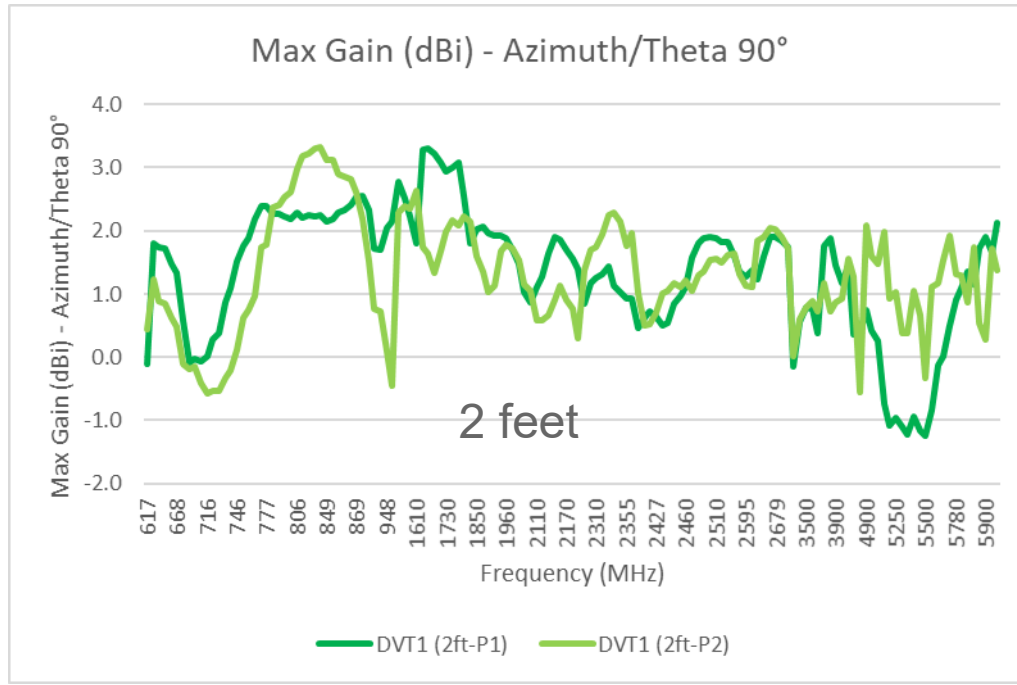
Free Space 2 m RG174T



Average Gain (dBi) - Azimuth/Theta 90°	DVT1 (2m-P1)	DVT1 (2m-P2)
617-960	-3.5	-3.6
1559-1606	-3.2	-3.2
1690-6000	-4.6	-4.8

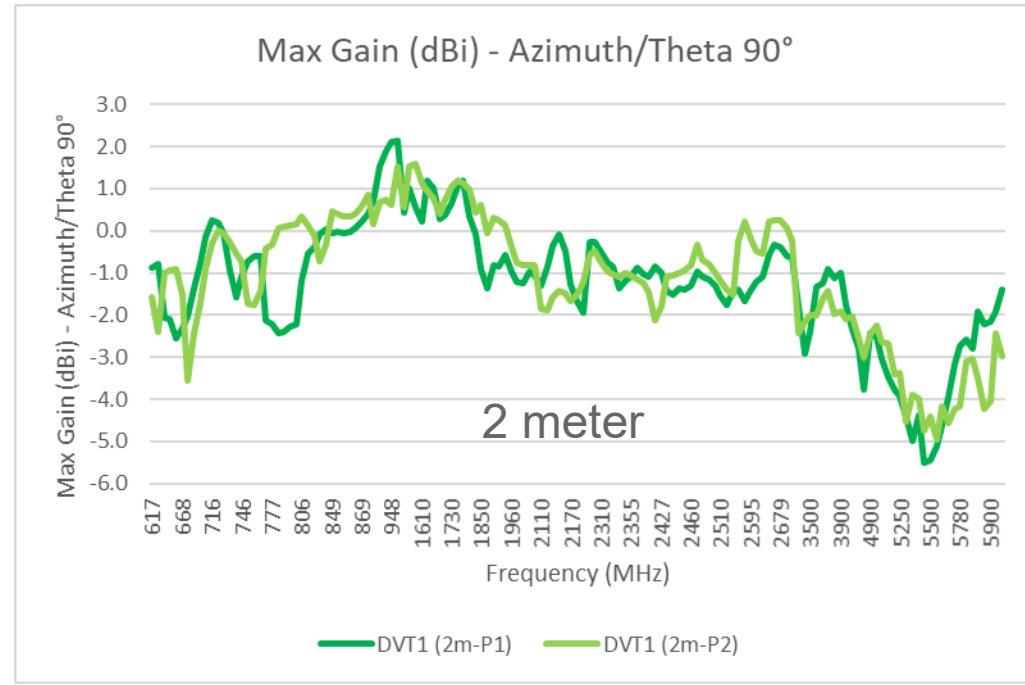
Azimuth/Theta 90° Max Gain, dBi

Free Space 2 ft RG174T



Max Gain (dBi) - Azimuth/Theta 90°	DVT1 (2ft- P1)	DVT1 (2ft- P2)
617-960	2.6	3.3
1559-1606	2.8	2.6
1690-6000	3.3	2.3

Free Space 2 m RG174T

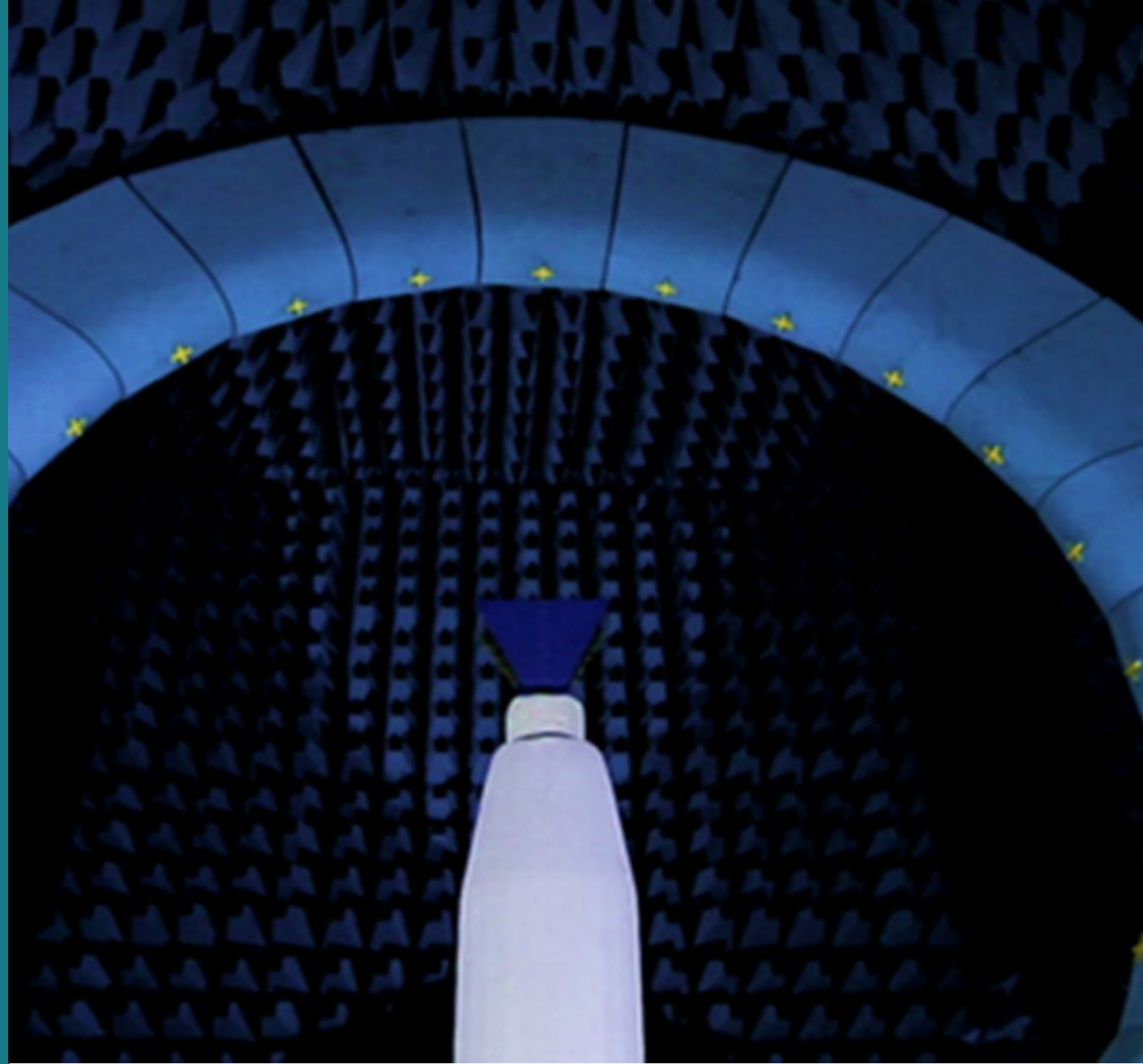


Max Gain (dBi) - Azimuth/Theta 90°	DVT1 (2m- P1)	DVT1 (2m- P2)
617-960	2.1	1.5
1559-1606	1.0	1.6
1690-6000	1.2	1.2

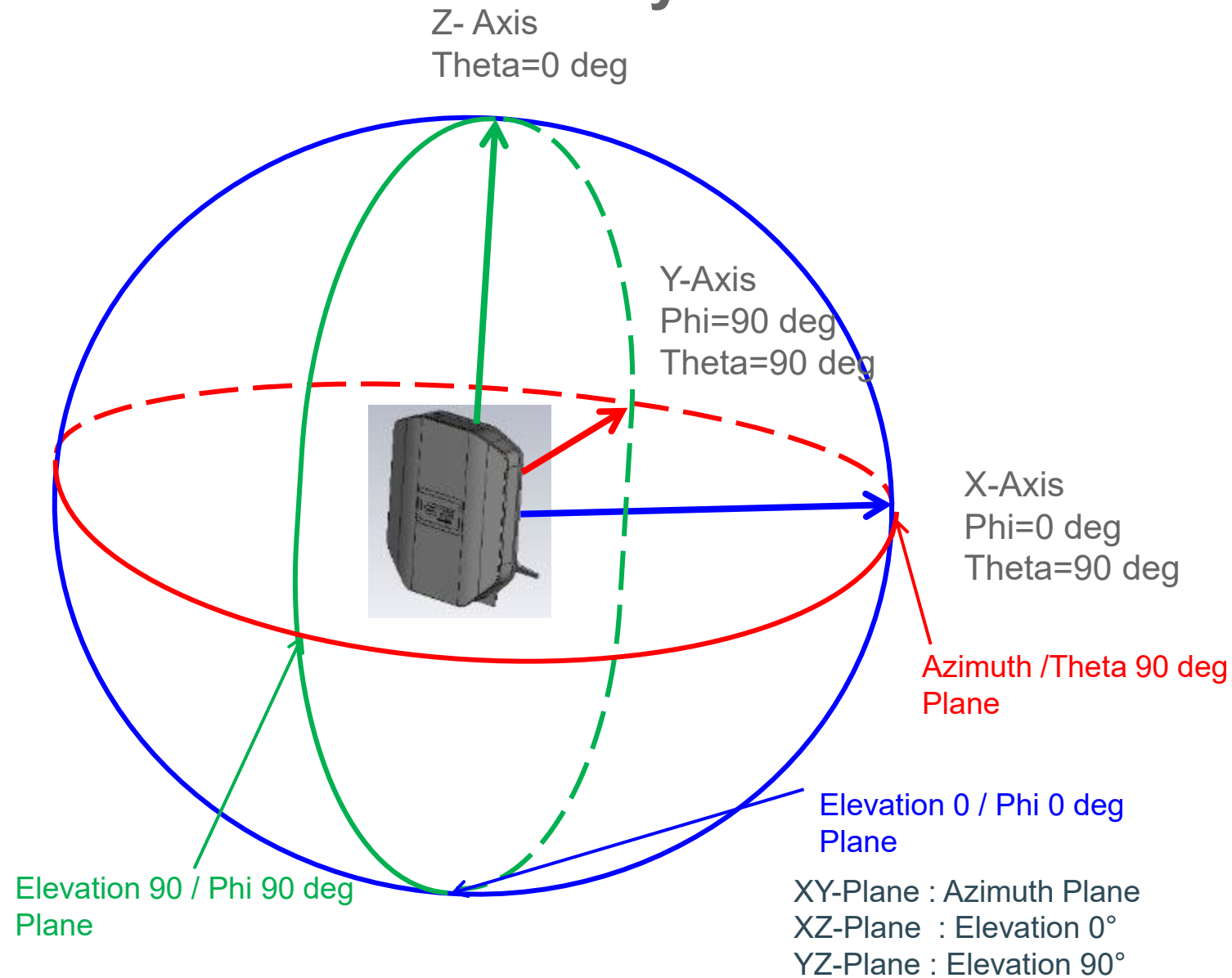
Antenna Performance

Radiation Pattern

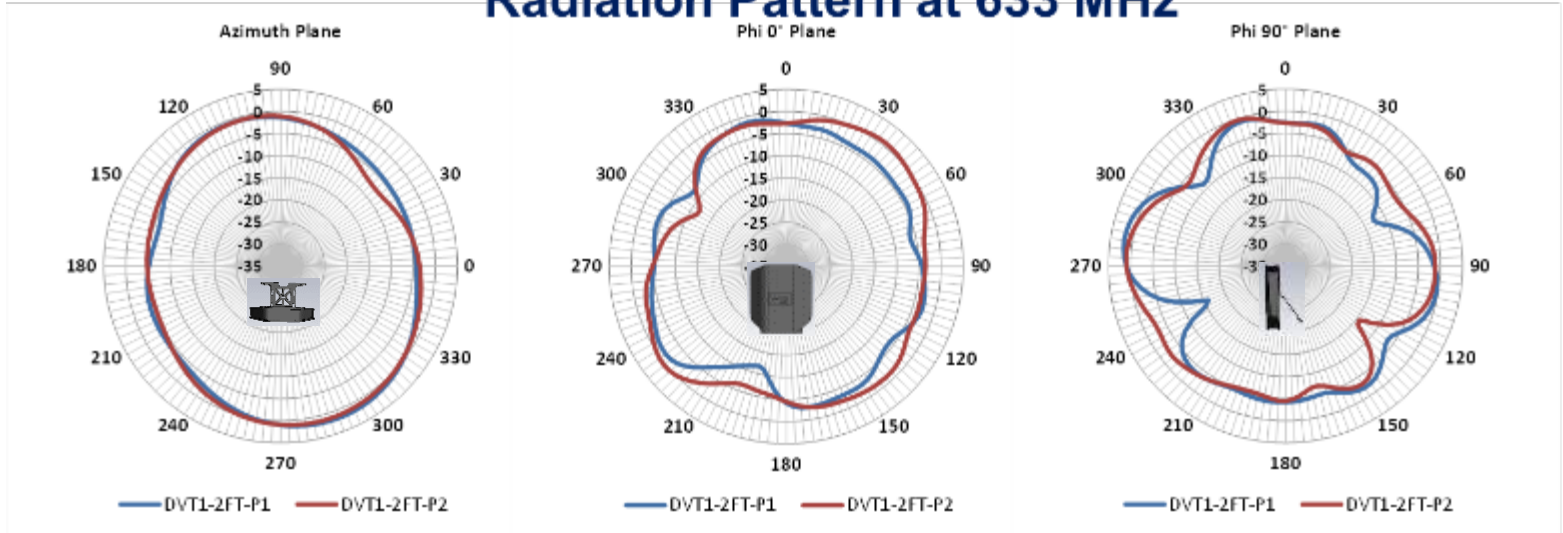
EVERY CONNECTION COUNTS



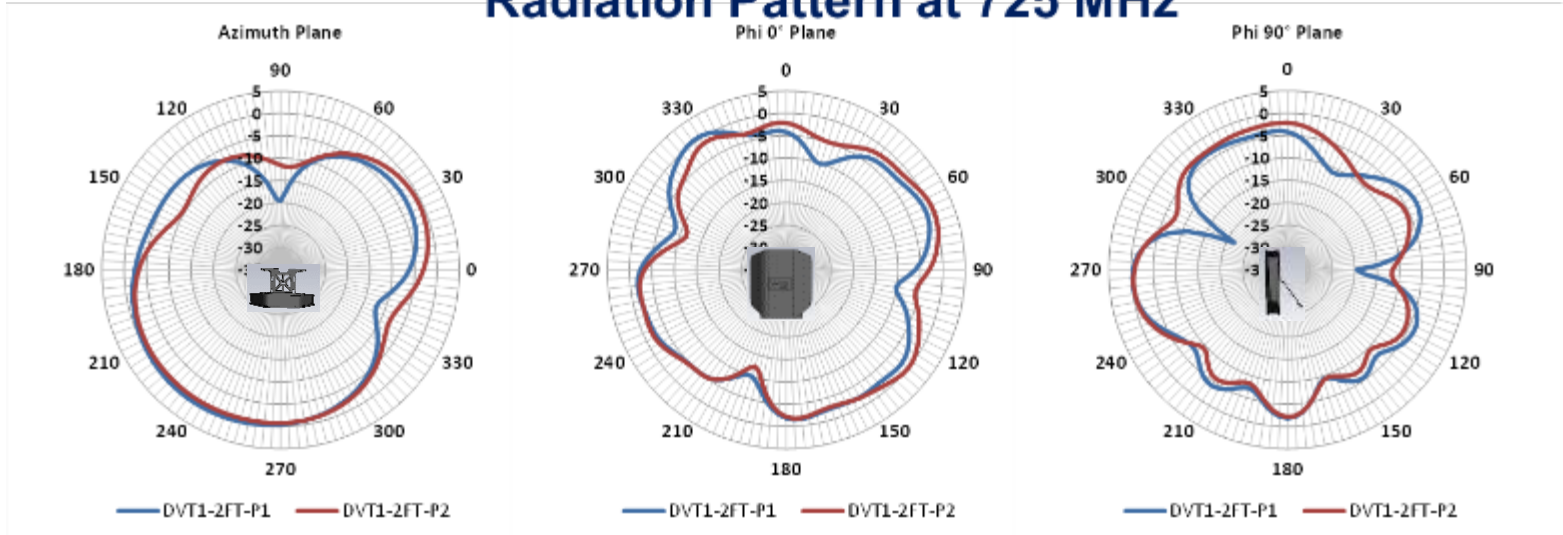
3D Gain Measurement Coordinate System



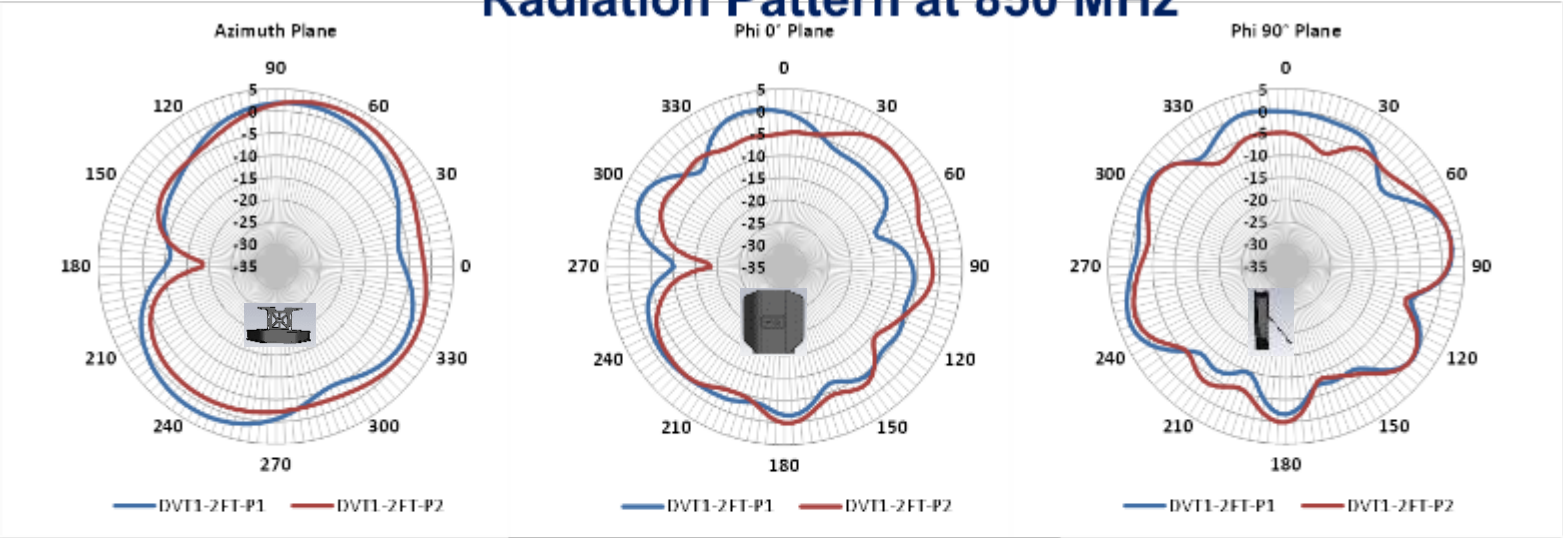
Radiation Pattern at 633 MHz



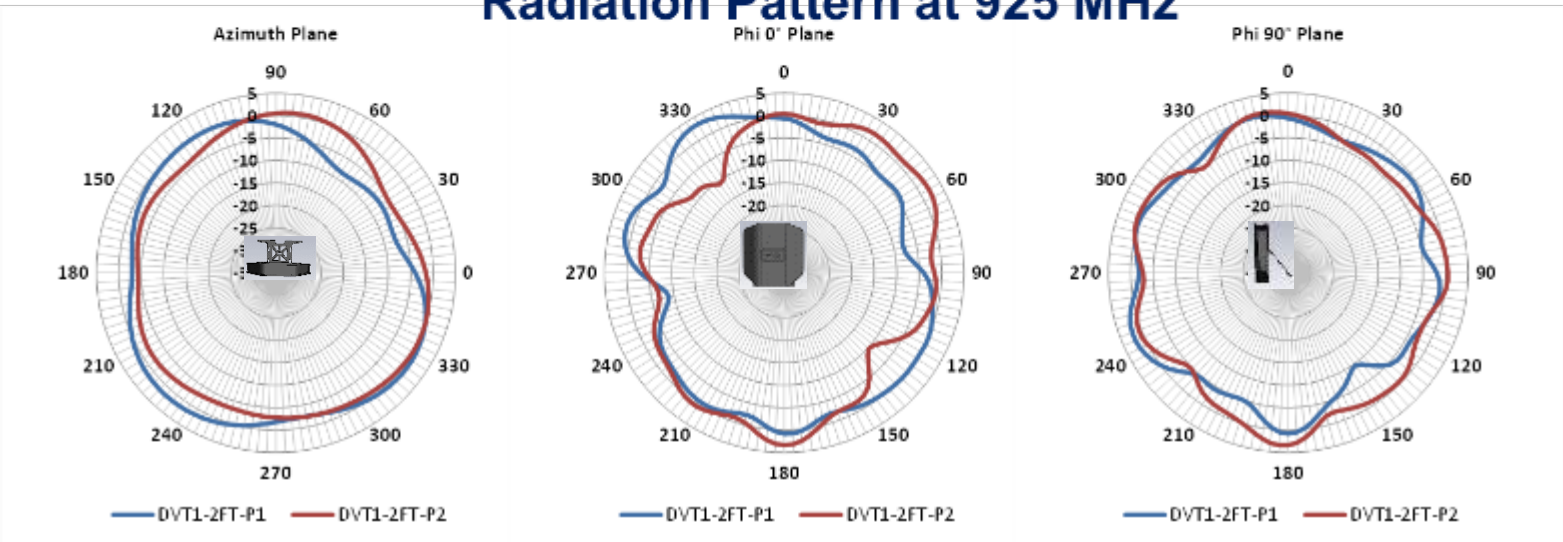
Radiation Pattern at 725 MHz



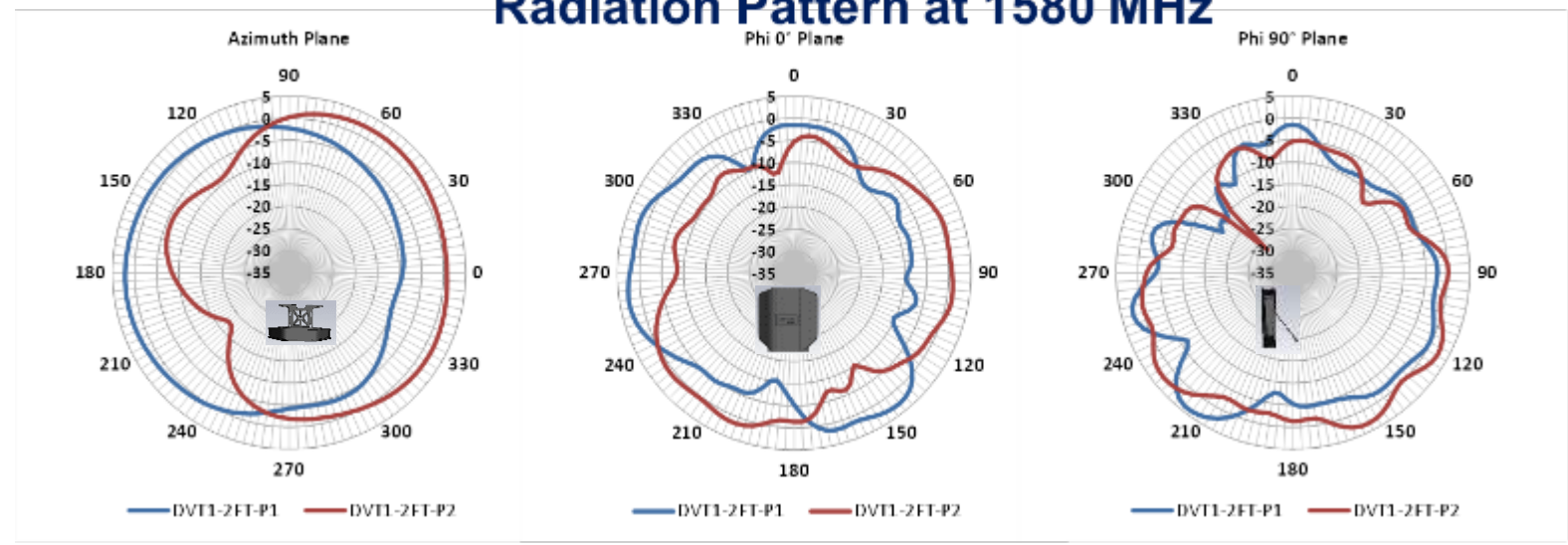
Radiation Pattern at 850 MHz



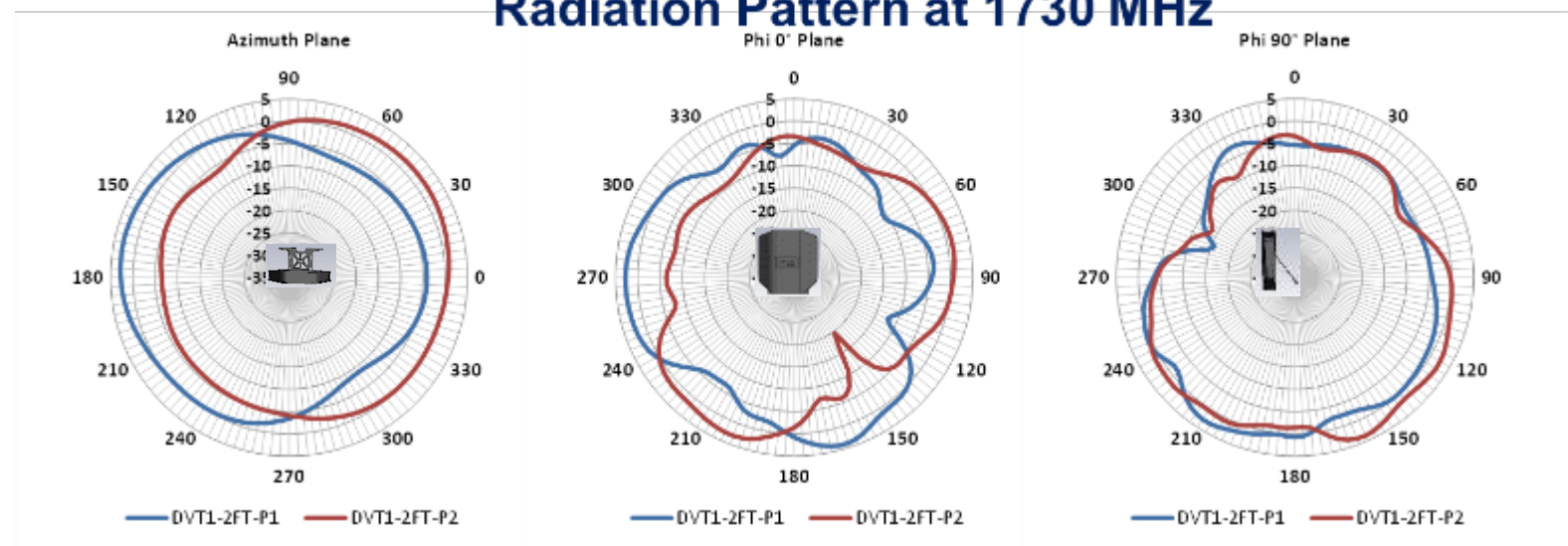
Radiation Pattern at 925 MHz



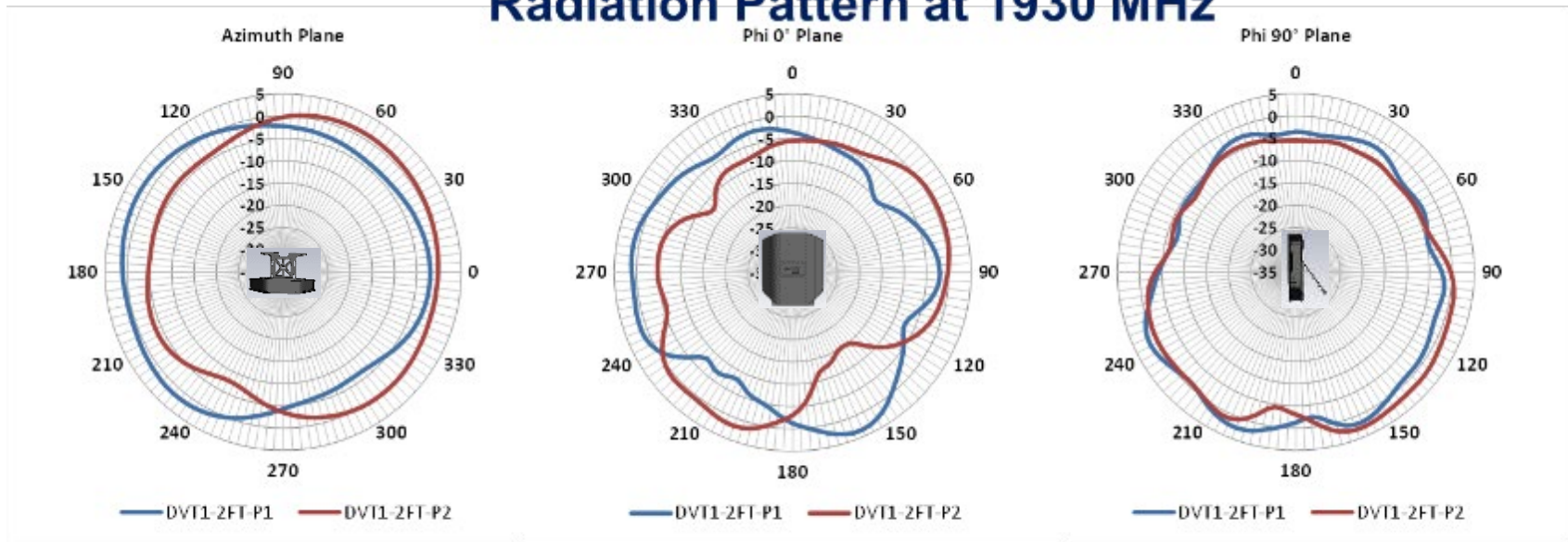
Radiation Pattern at 1580 MHz



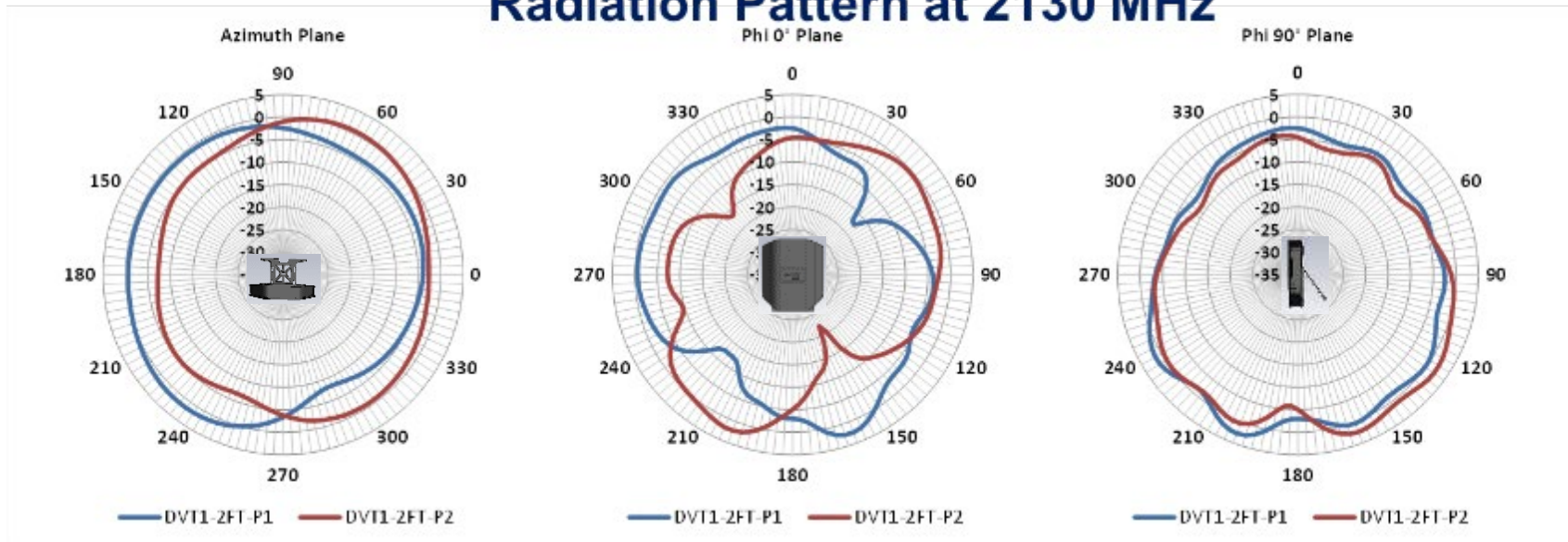
Radiation Pattern at 1730 MHz



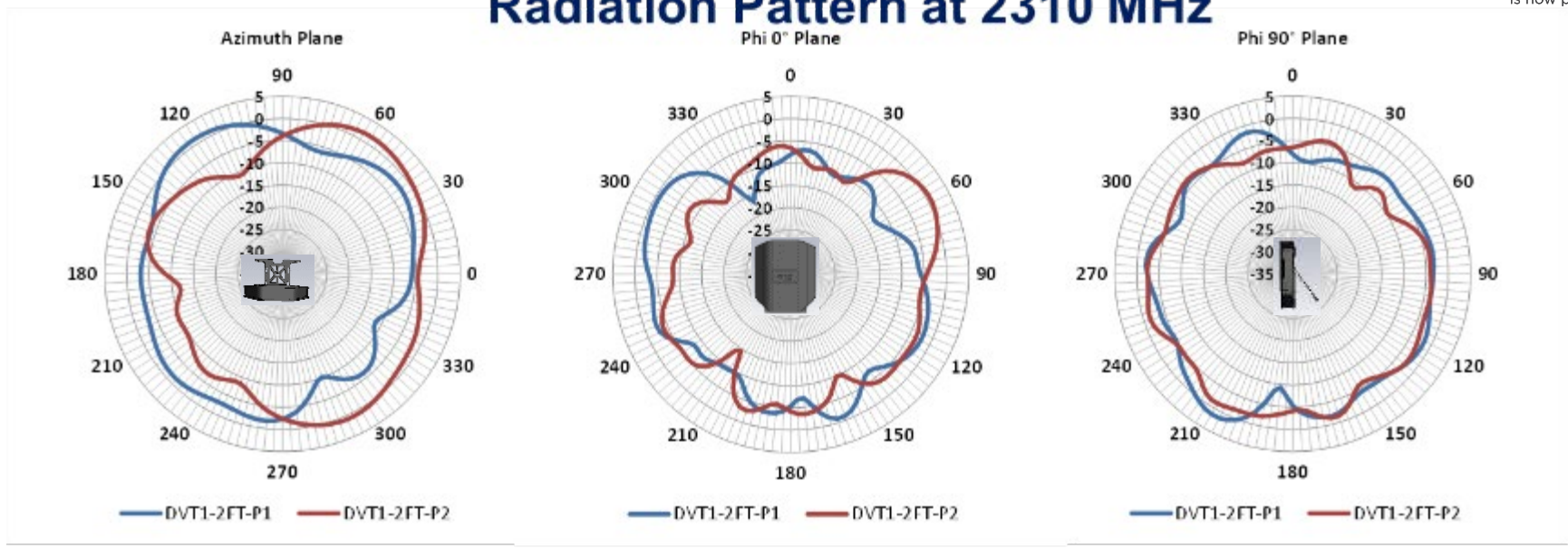
Radiation Pattern at 1930 MHz



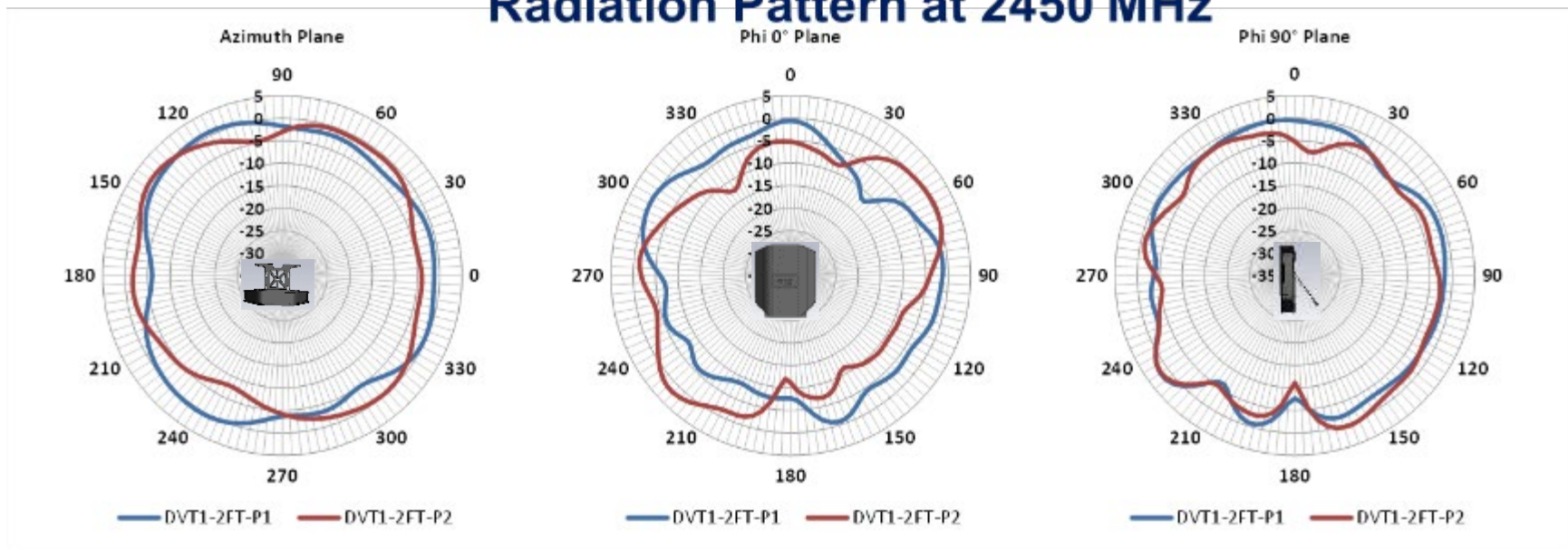
Radiation Pattern at 2130 MHz



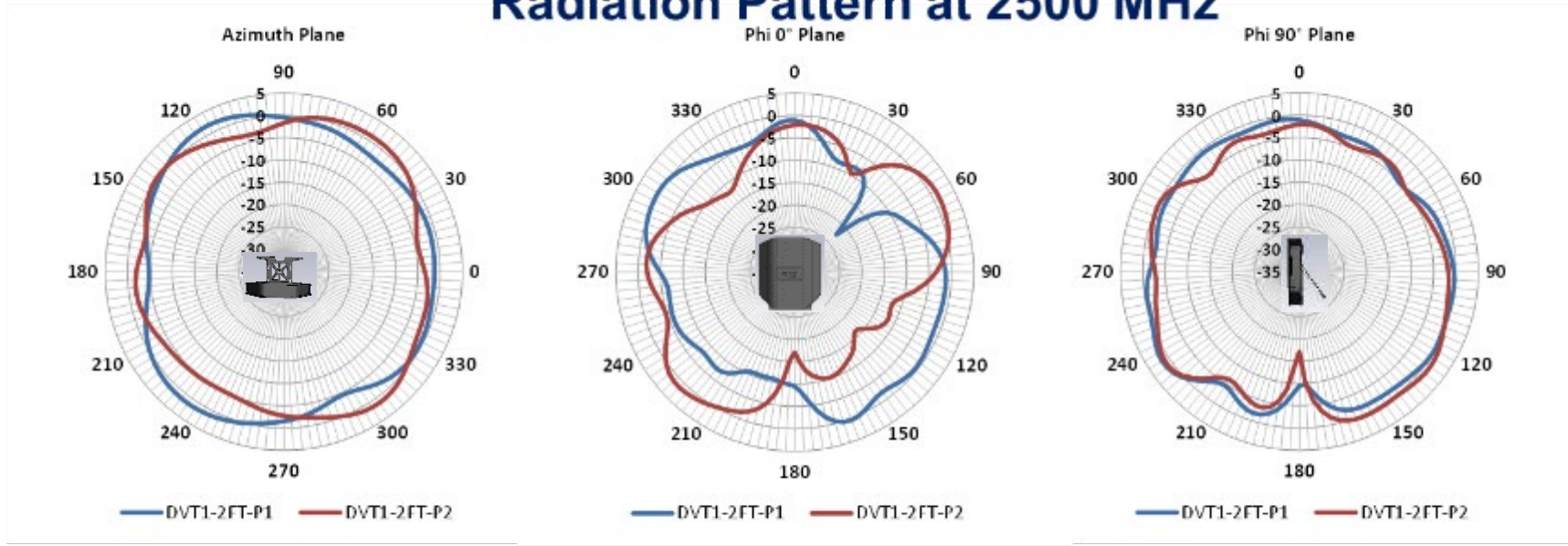
Radiation Pattern at 2310 MHz



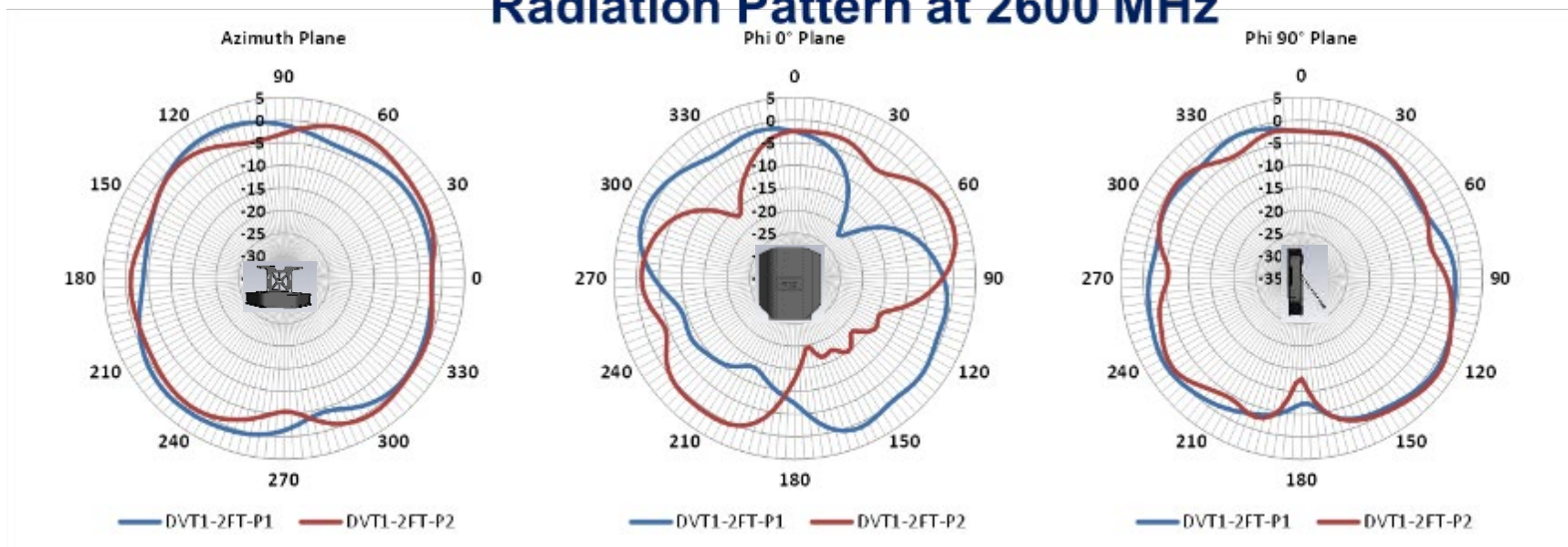
Radiation Pattern at 2450 MHz



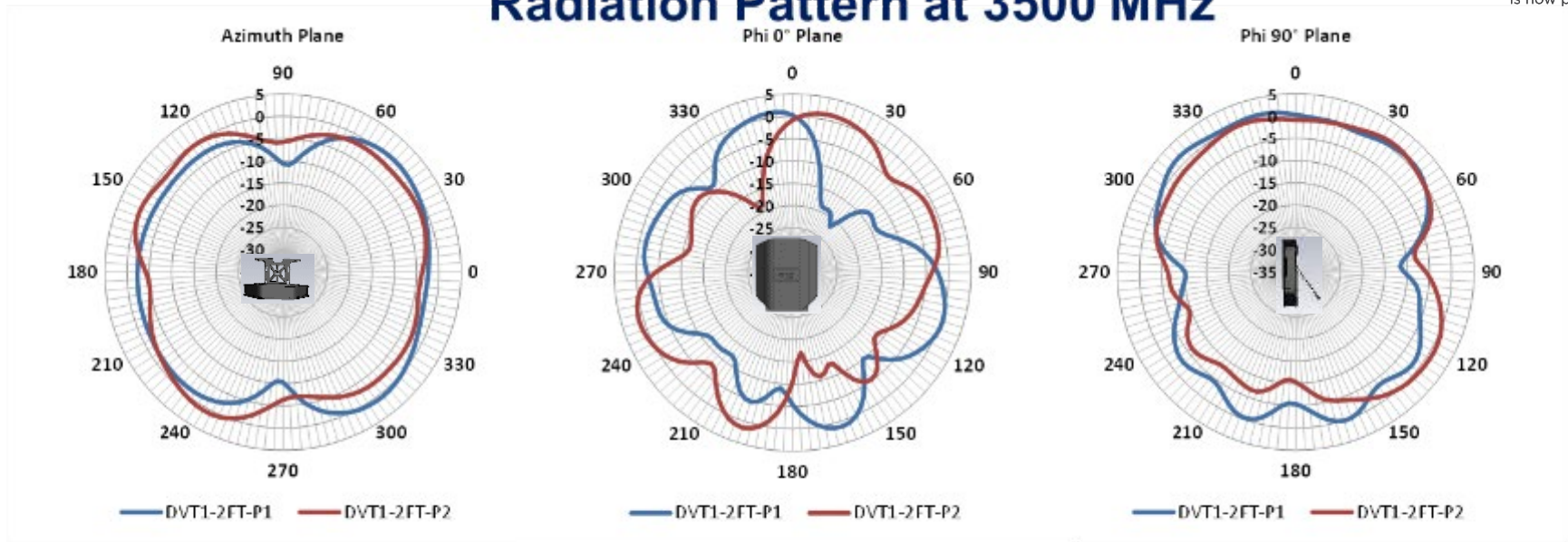
Radiation Pattern at 2500 MHz



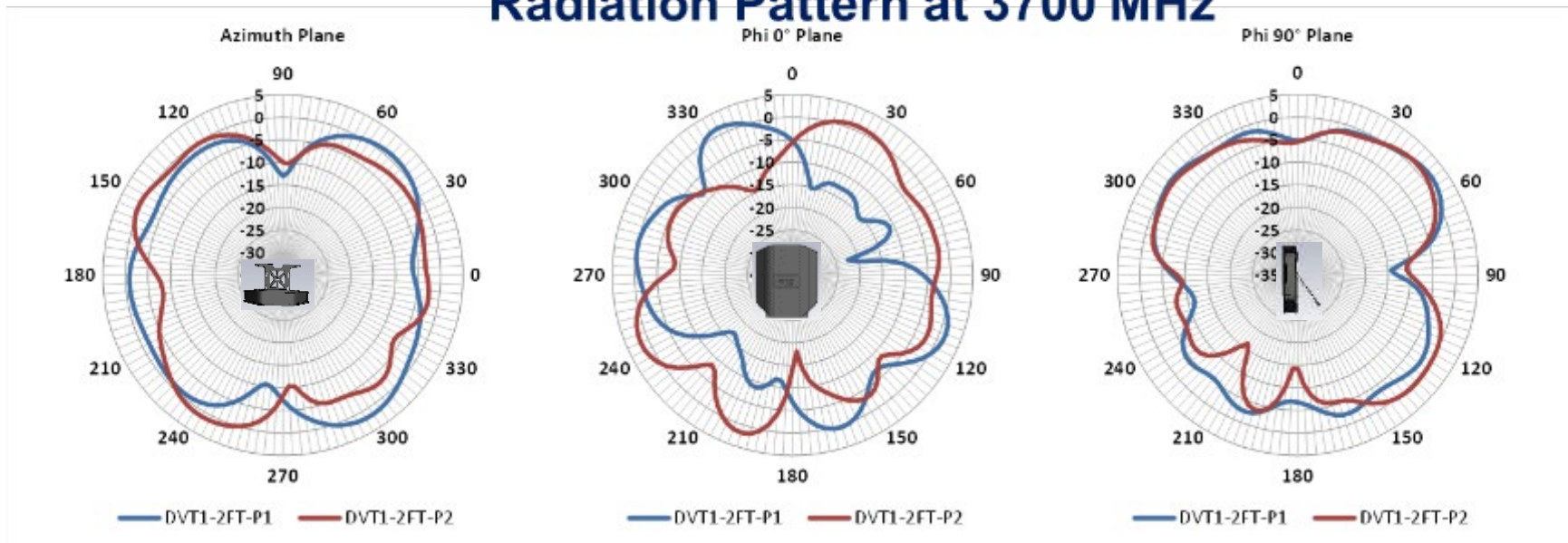
Radiation Pattern at 2600 MHz



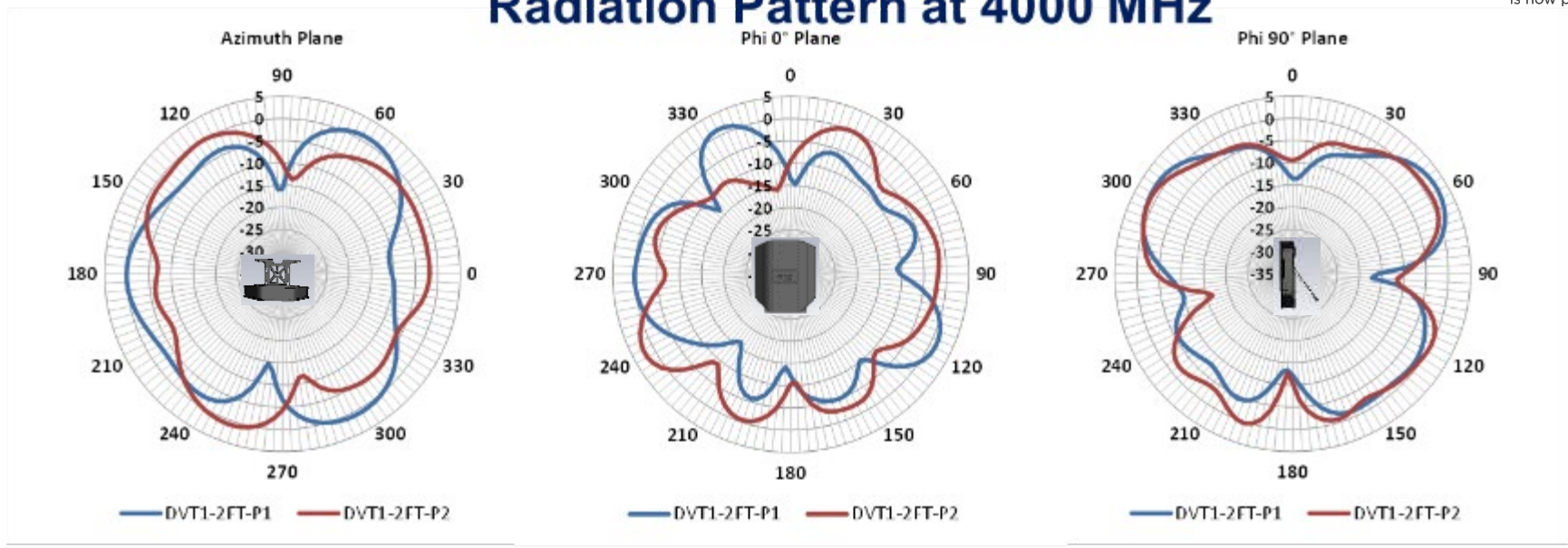
Radiation Pattern at 3500 MHz



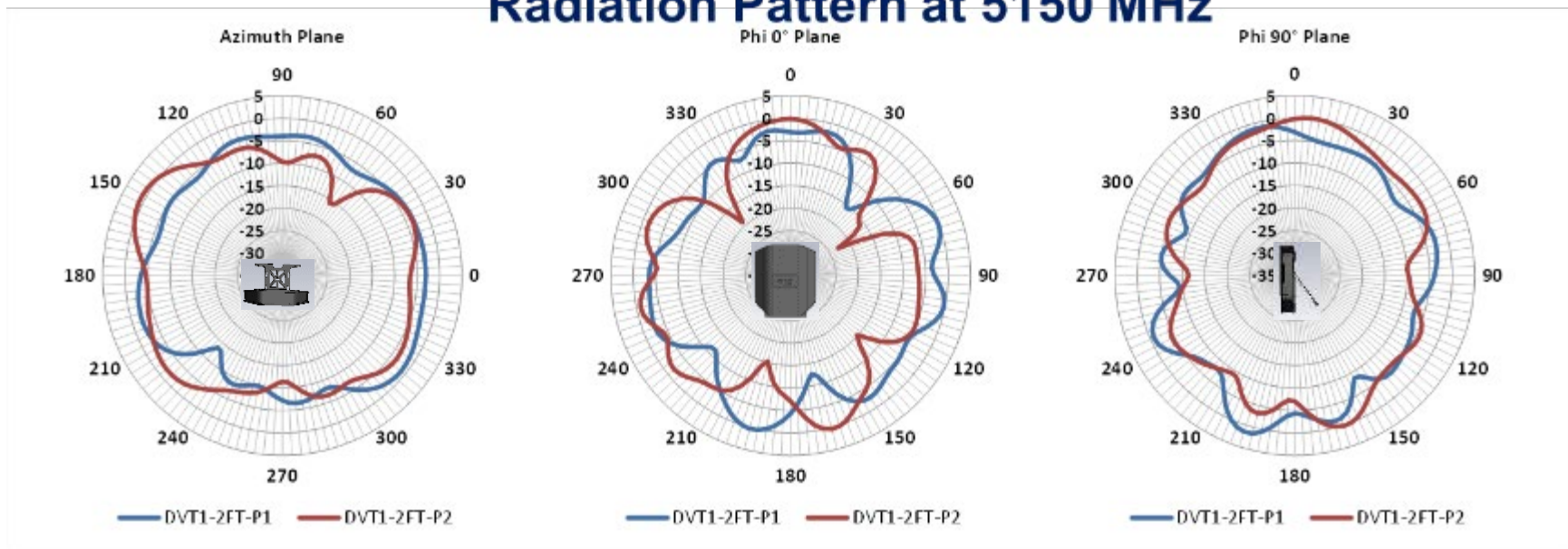
Radiation Pattern at 3700 MHz



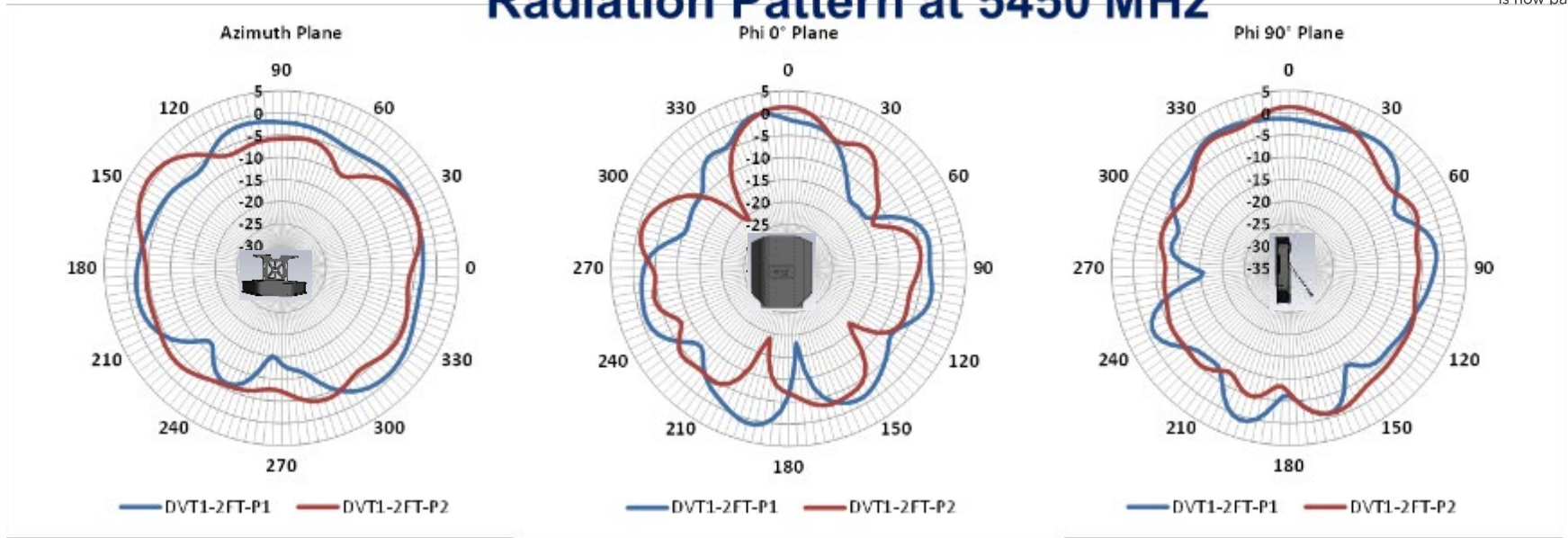
Radiation Pattern at 4000 MHz



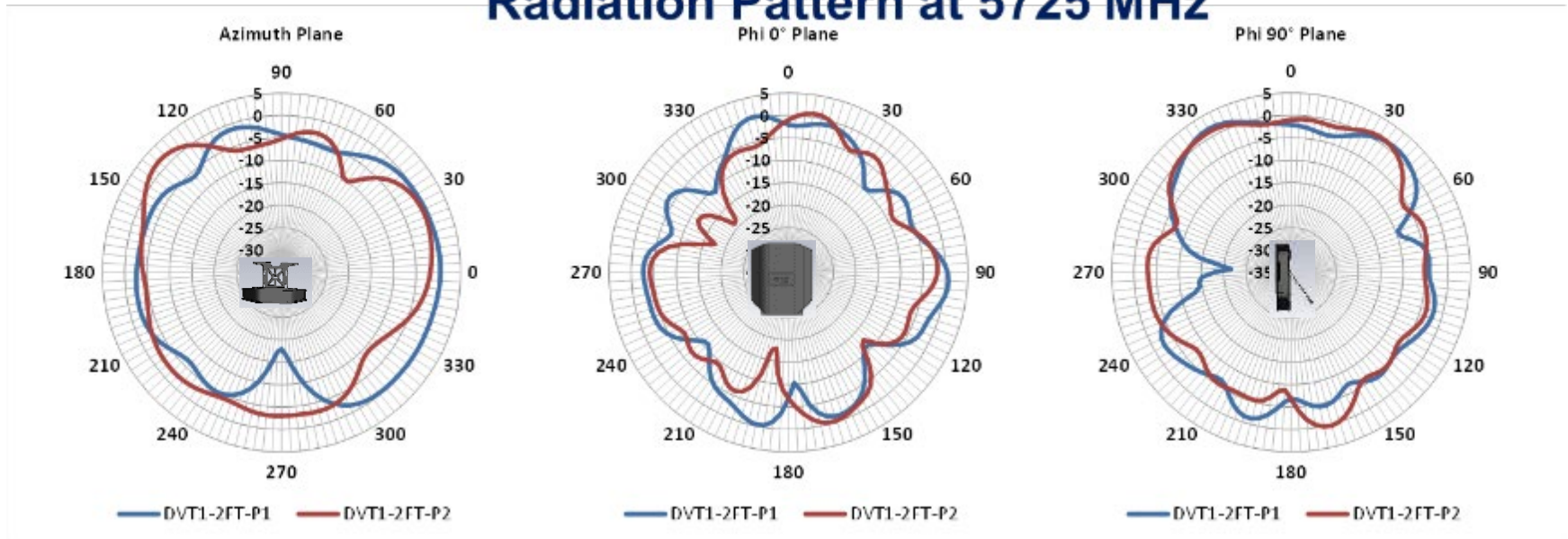
Radiation Pattern at 5150 MHz



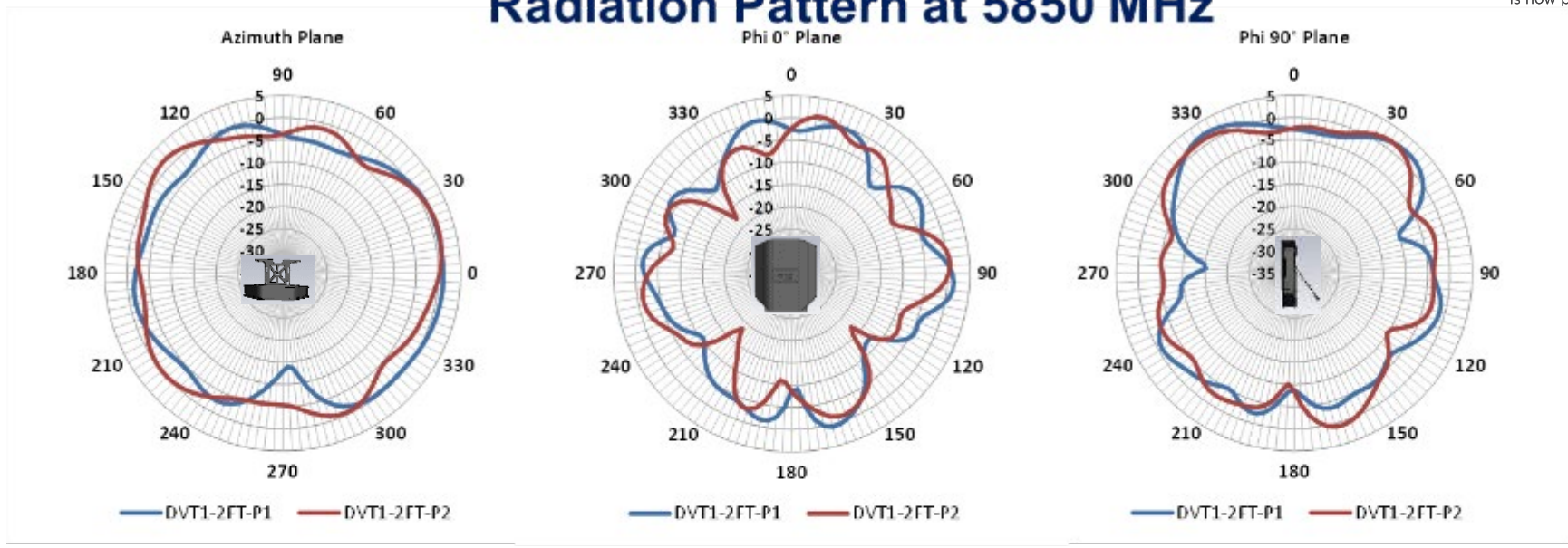
Radiation Pattern at 5450 MHz



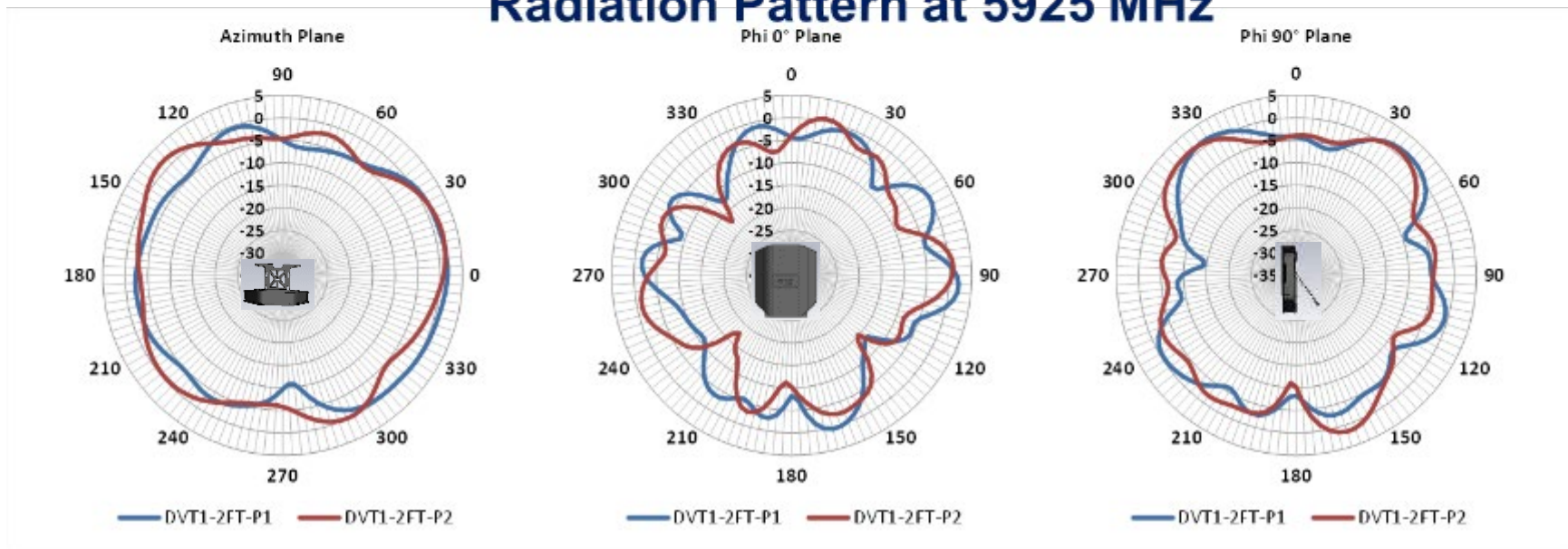
Radiation Pattern at 5725 MHz



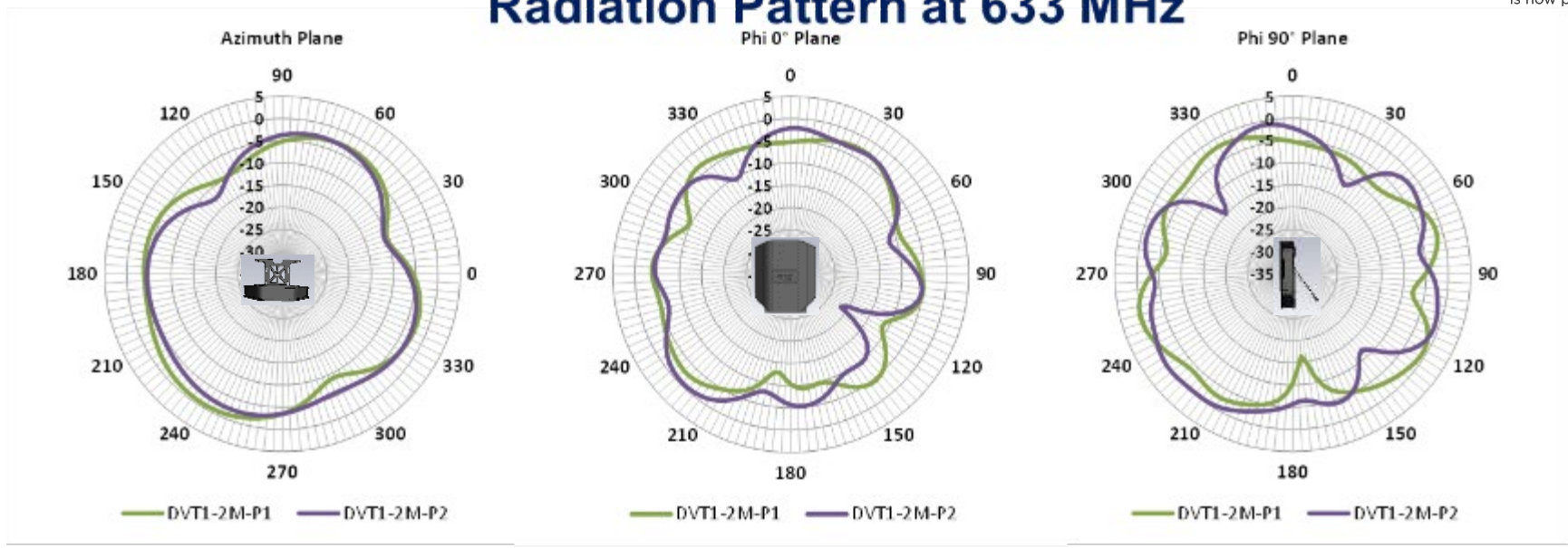
Radiation Pattern at 5850 MHz



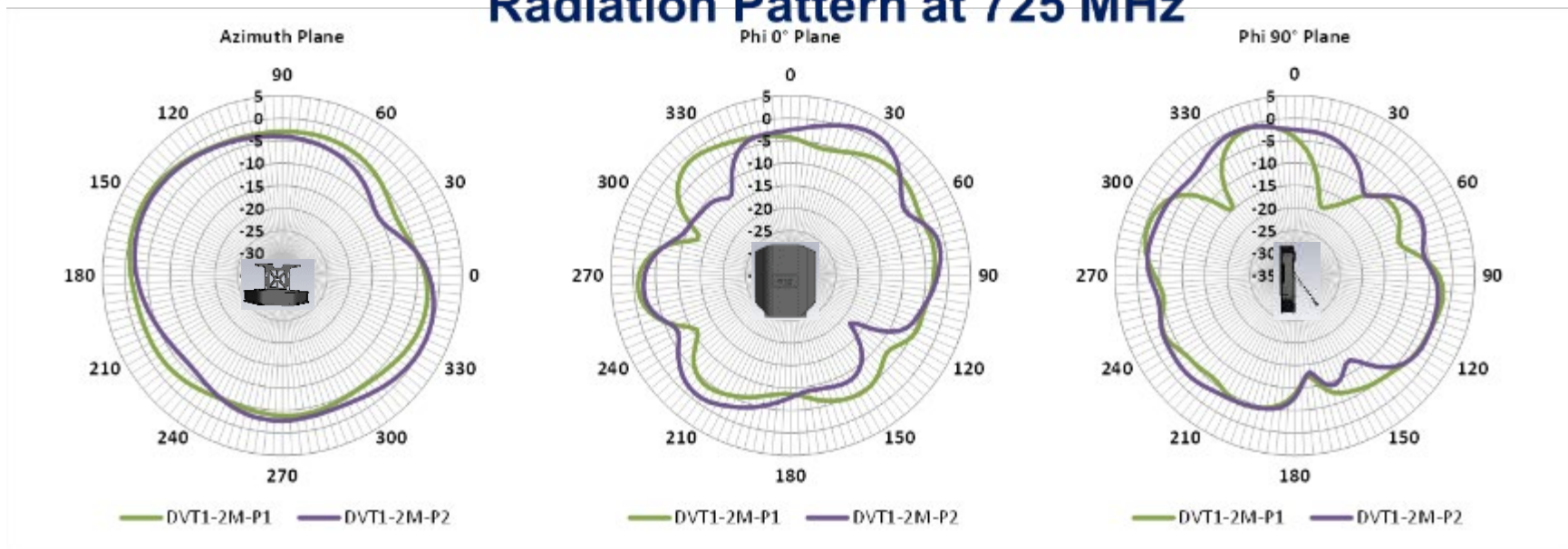
Radiation Pattern at 5925 MHz



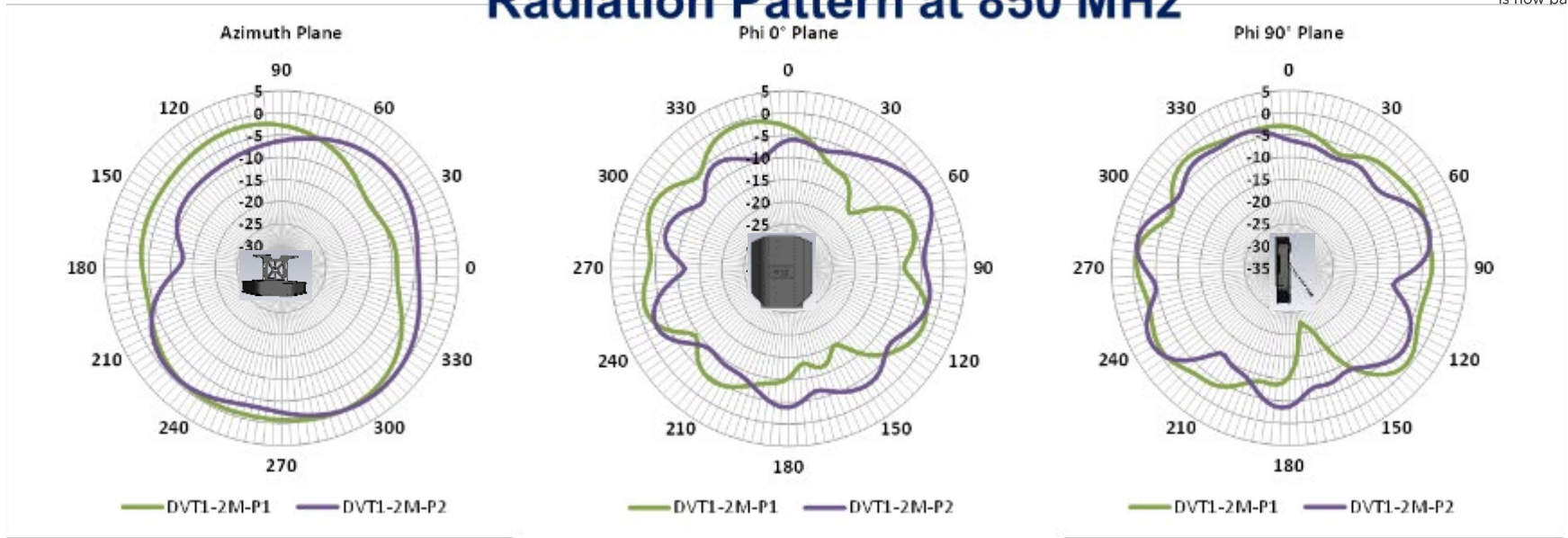
Radiation Pattern at 633 MHz



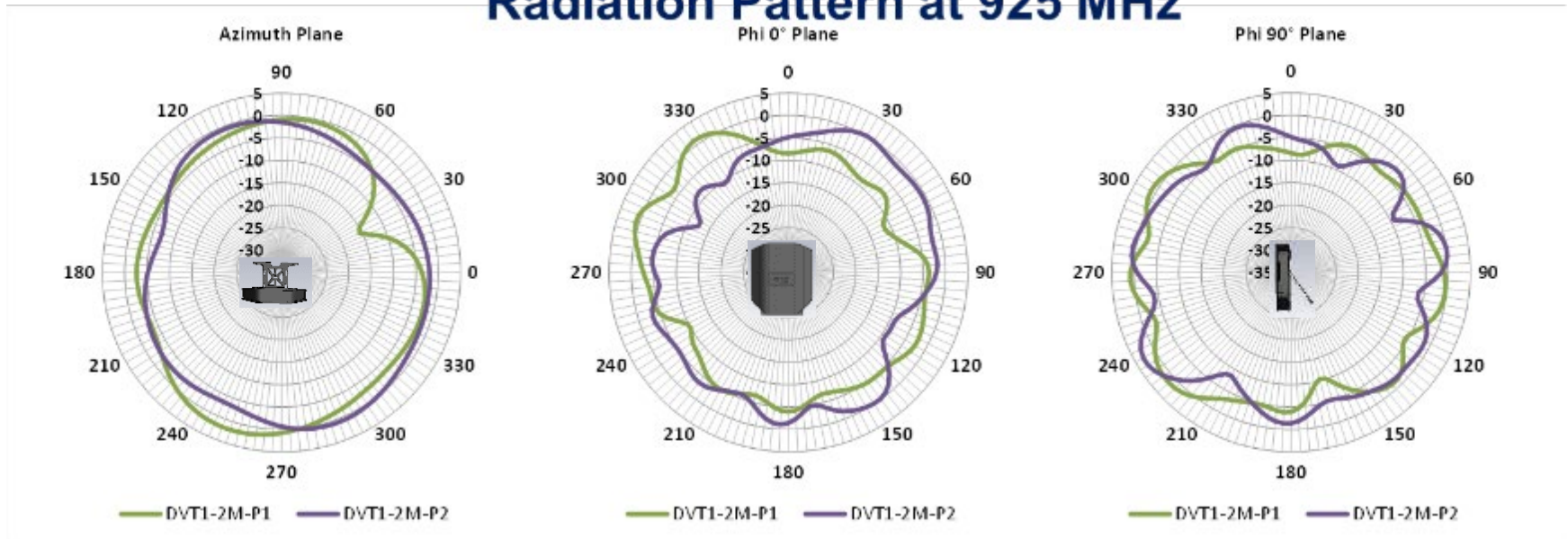
Radiation Pattern at 725 MHz



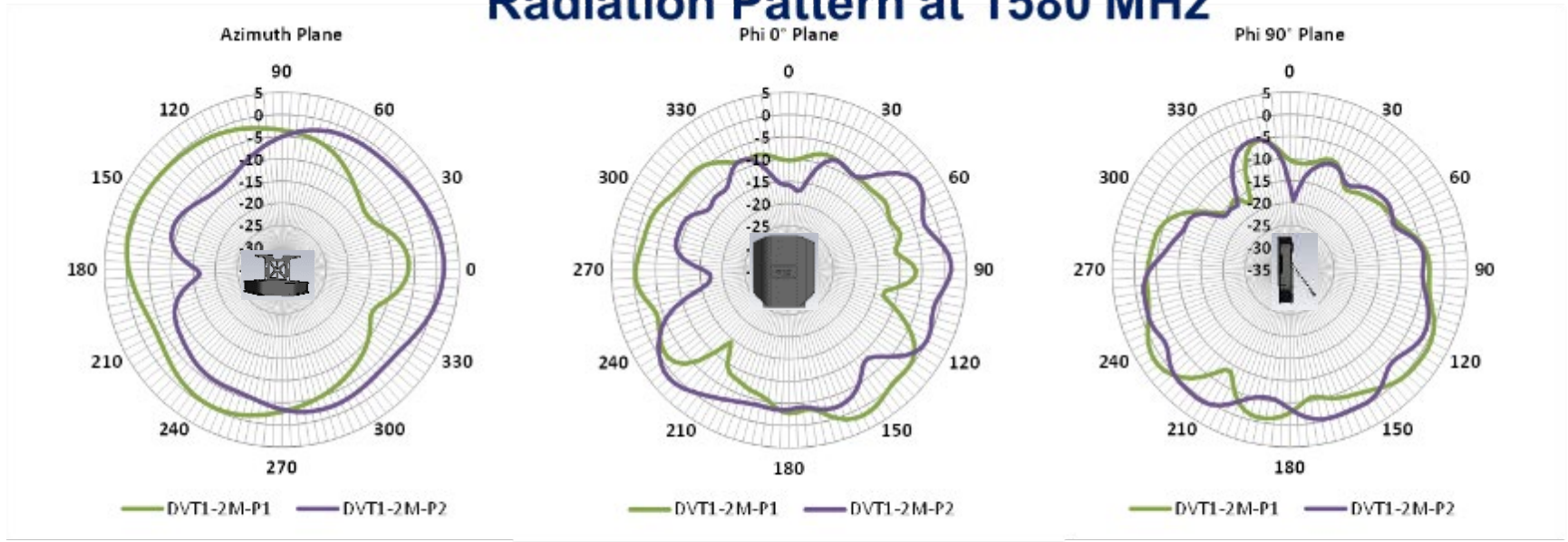
Radiation Pattern at 850 MHz



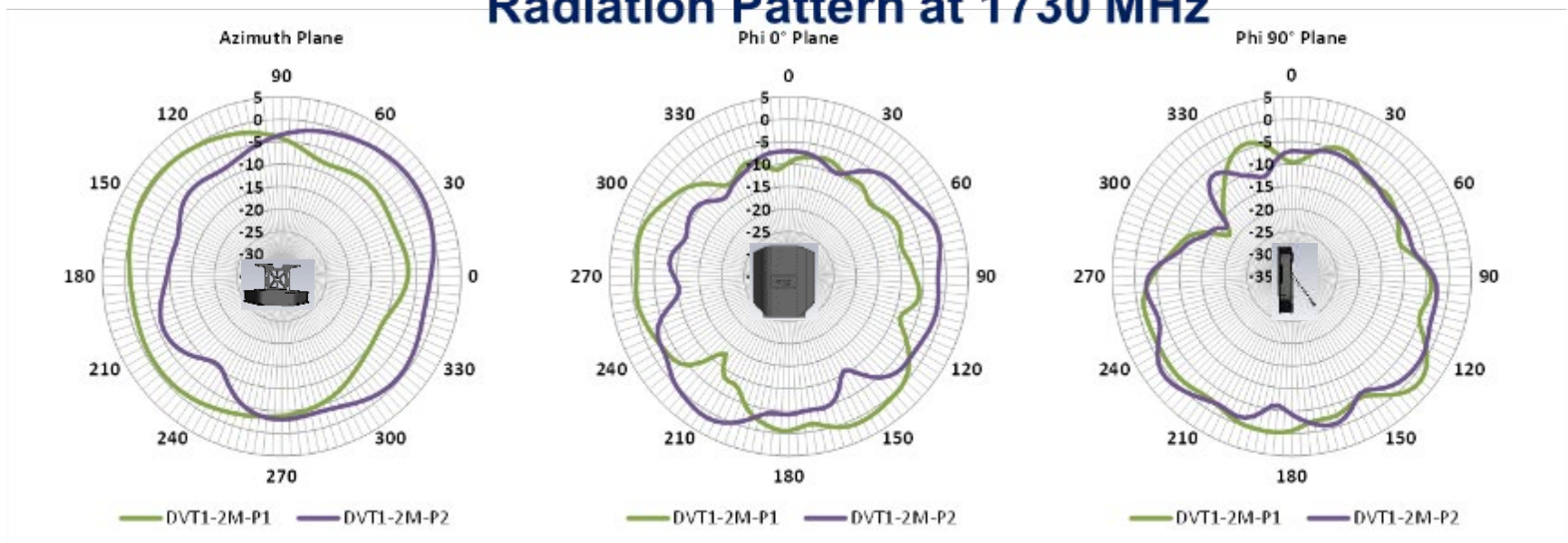
Radiation Pattern at 925 MHz



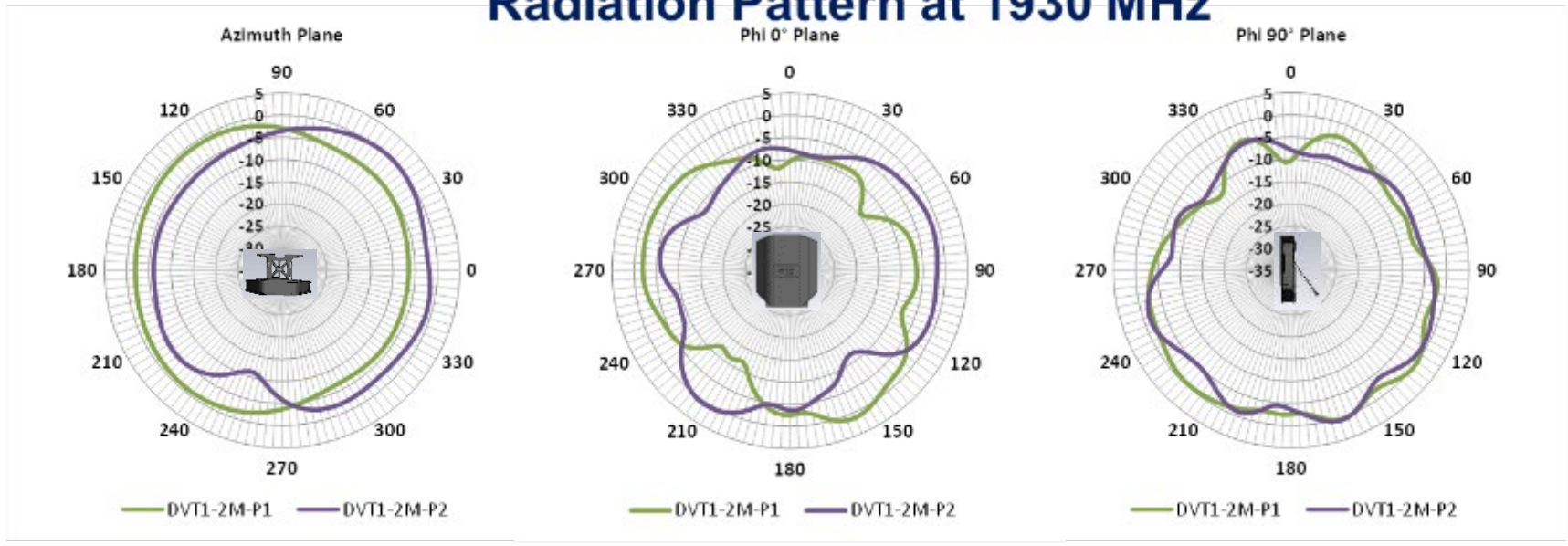
Radiation Pattern at 1580 MHz



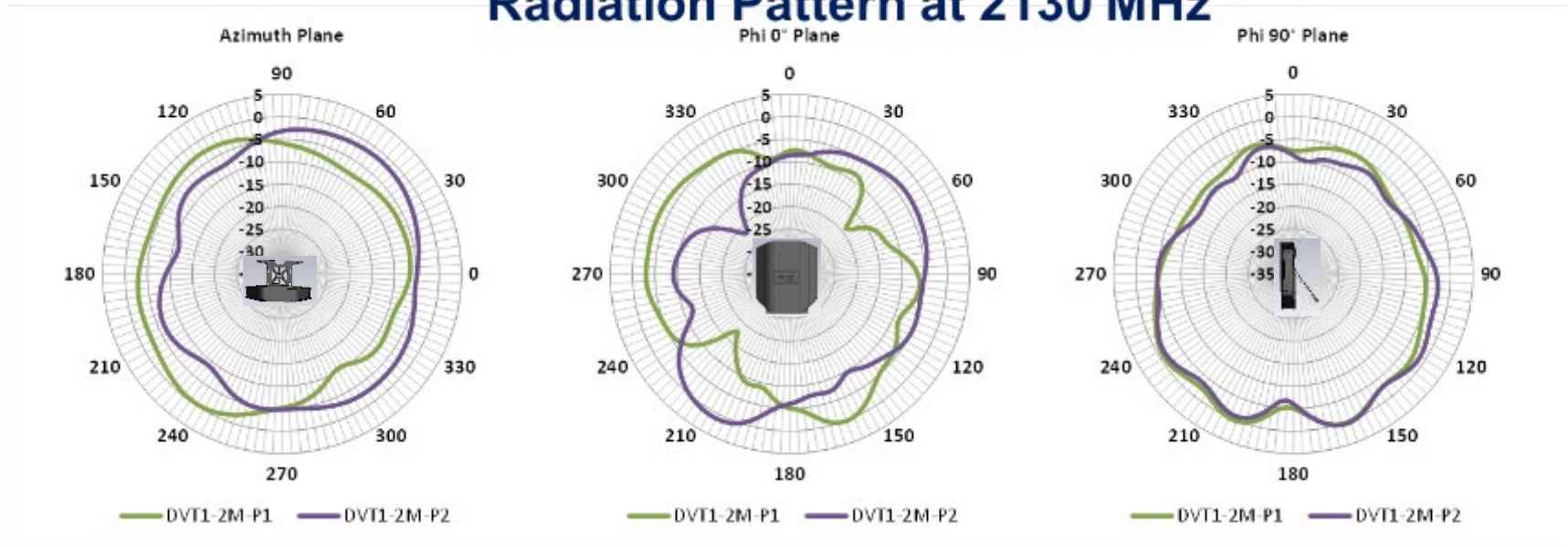
Radiation Pattern at 1730 MHz



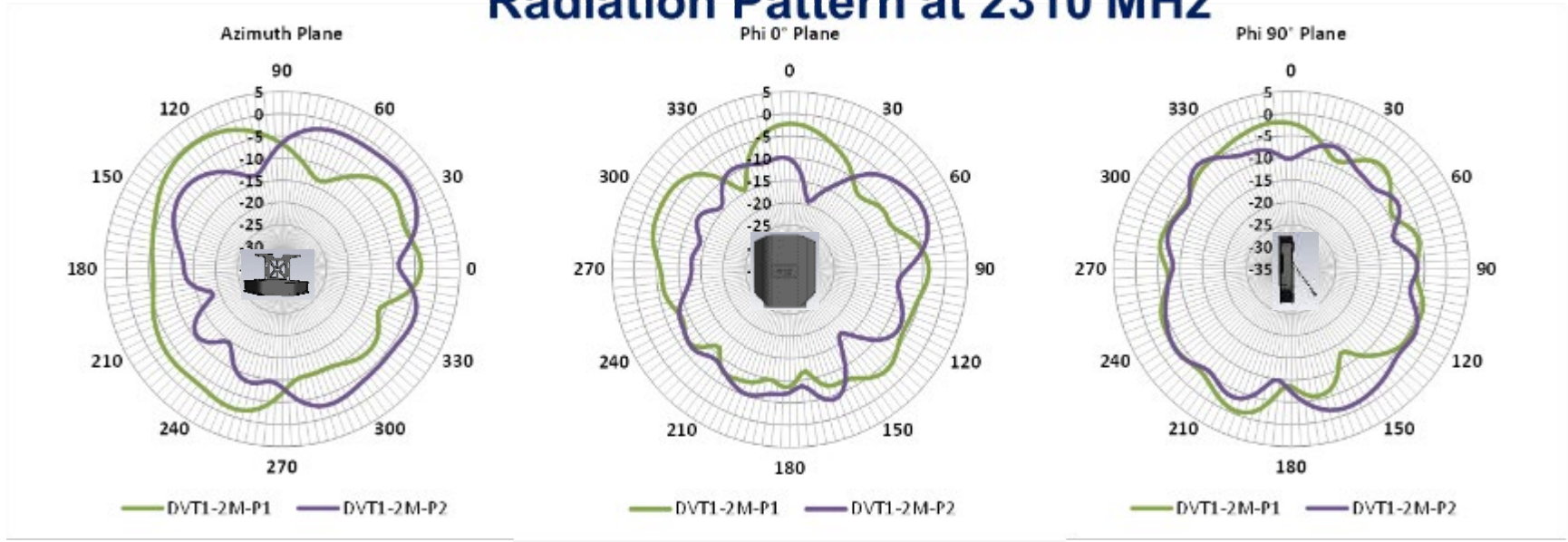
Radiation Pattern at 1930 MHz



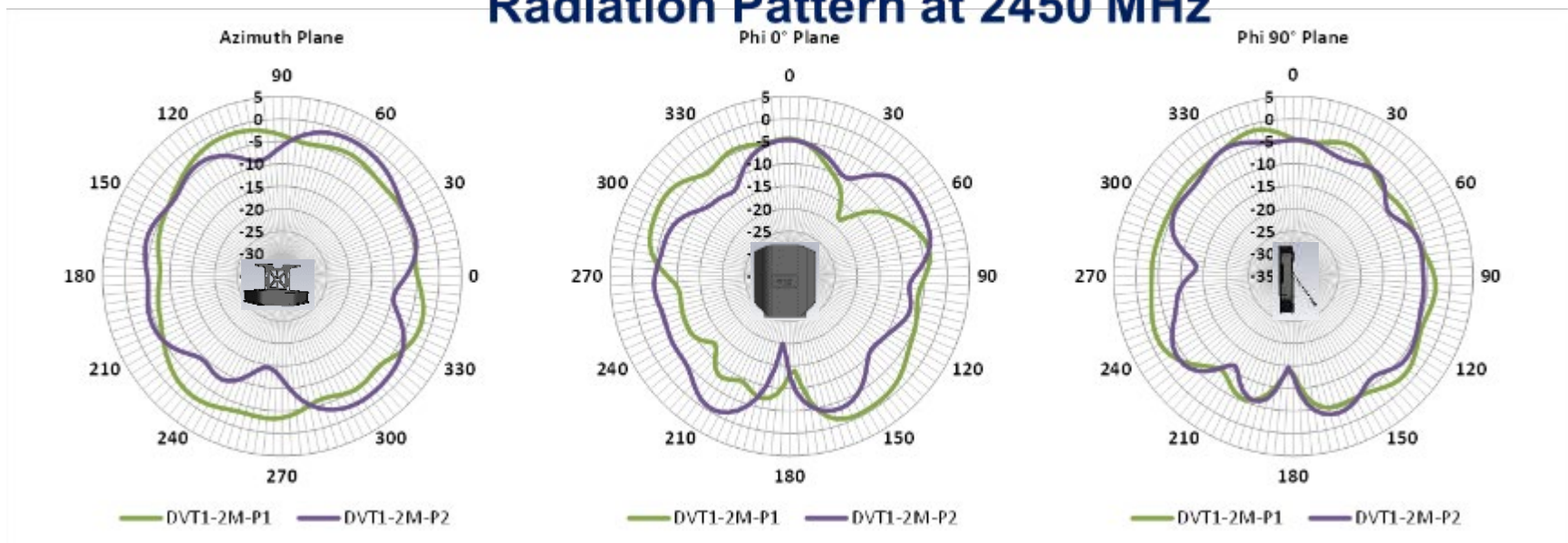
Radiation Pattern at 2130 MHz



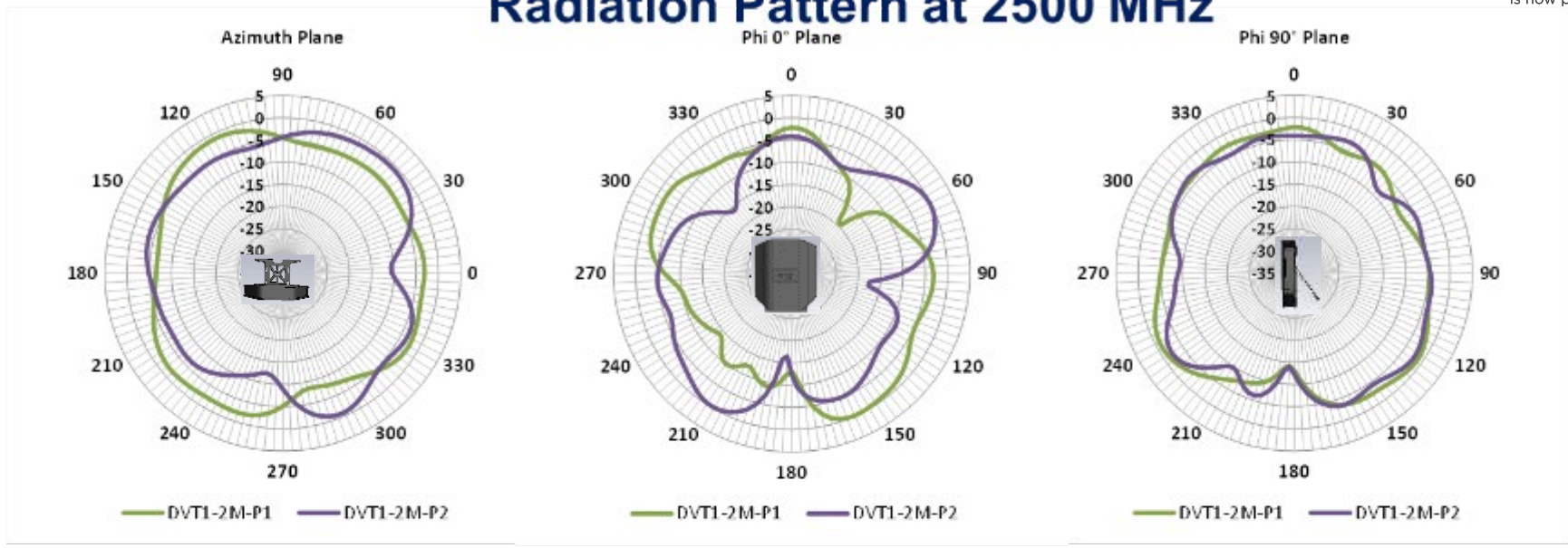
Radiation Pattern at 2310 MHz



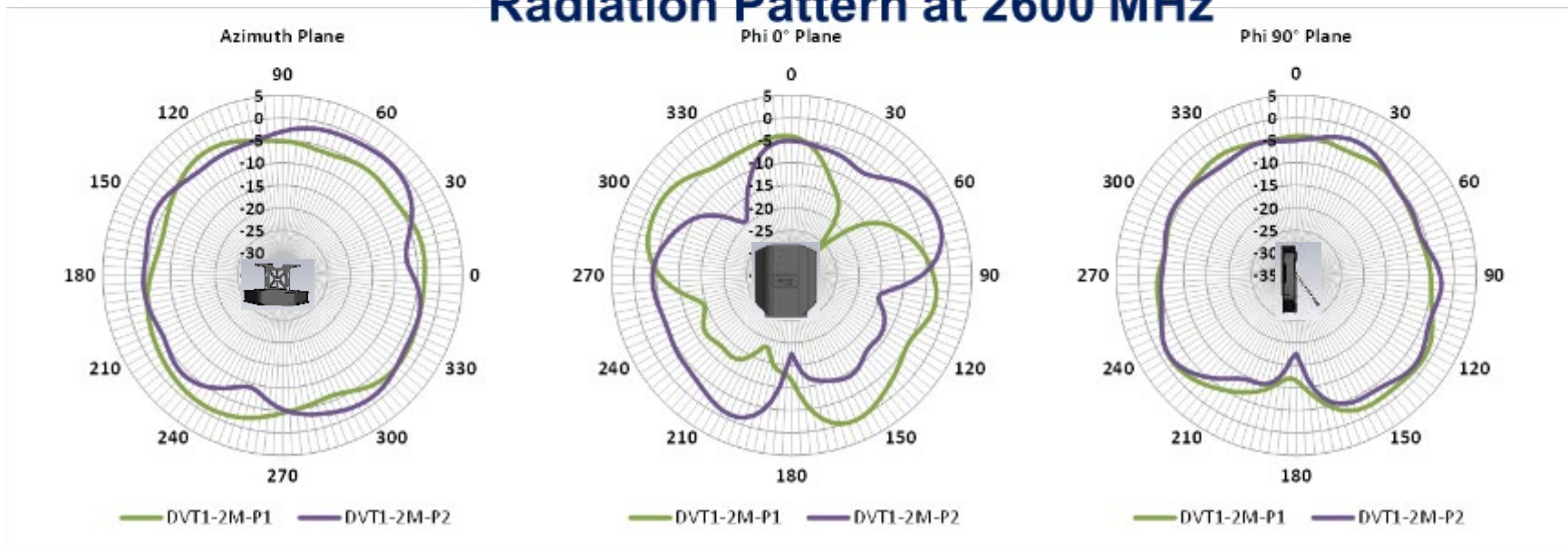
Radiation Pattern at 2450 MHz



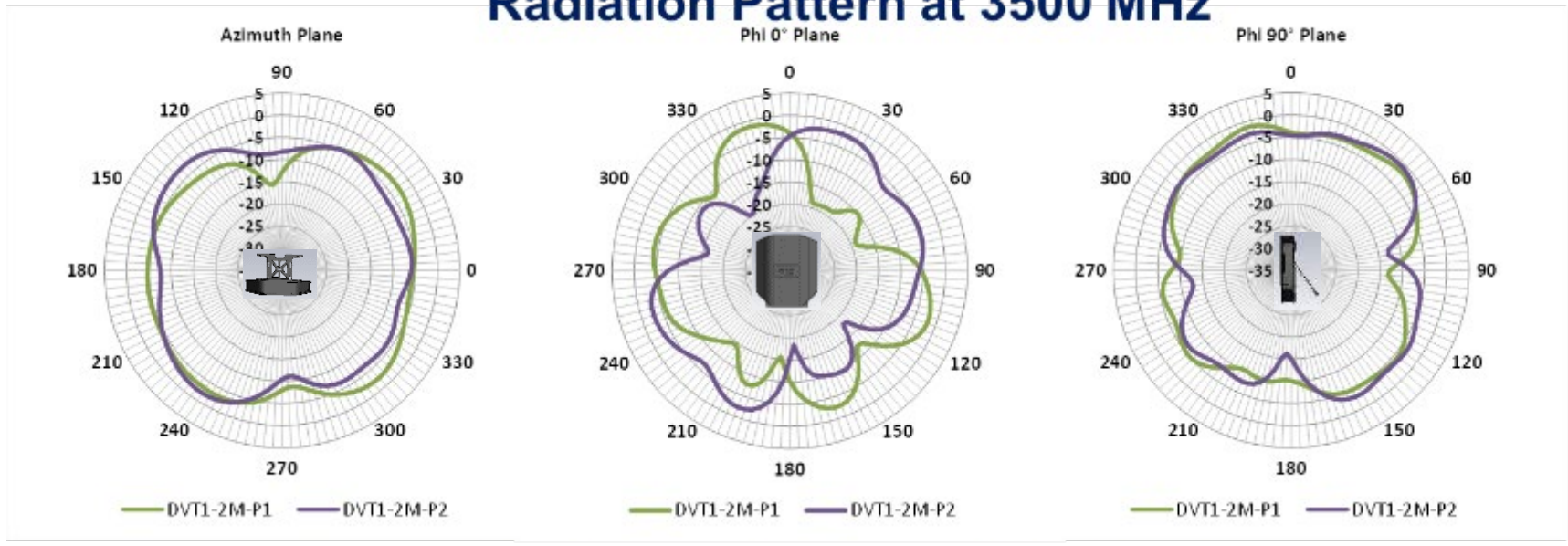
Radiation Pattern at 2500 MHz



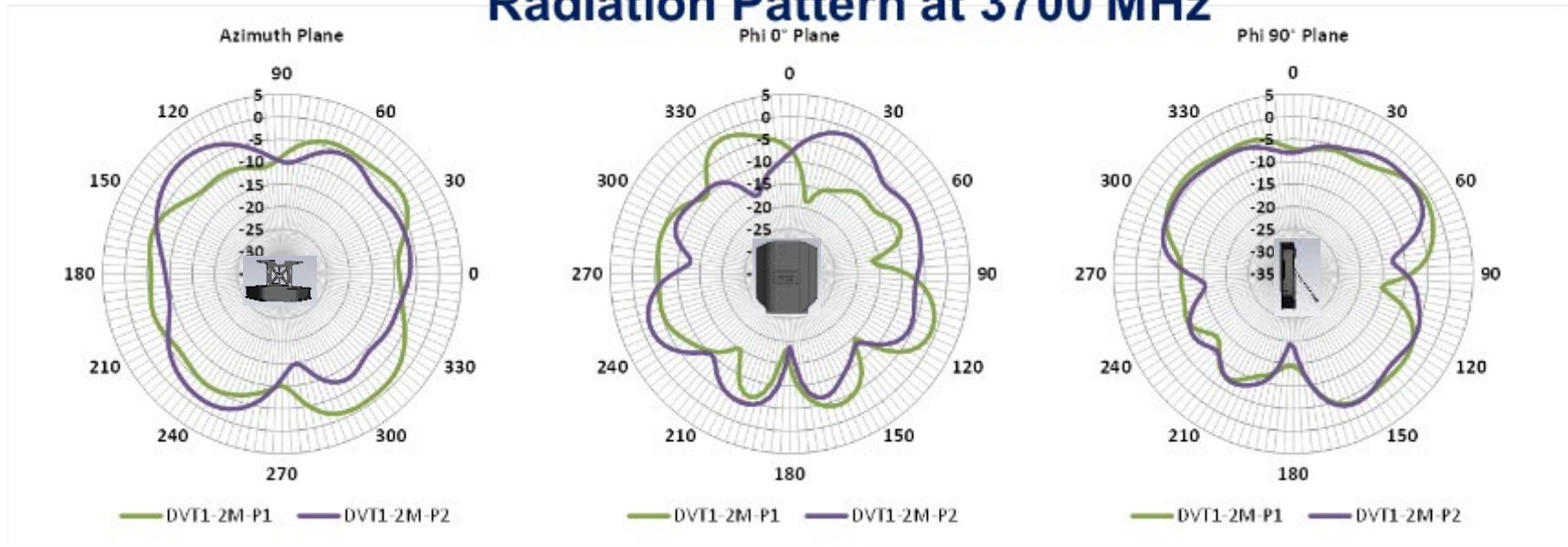
Radiation Pattern at 2600 MHz



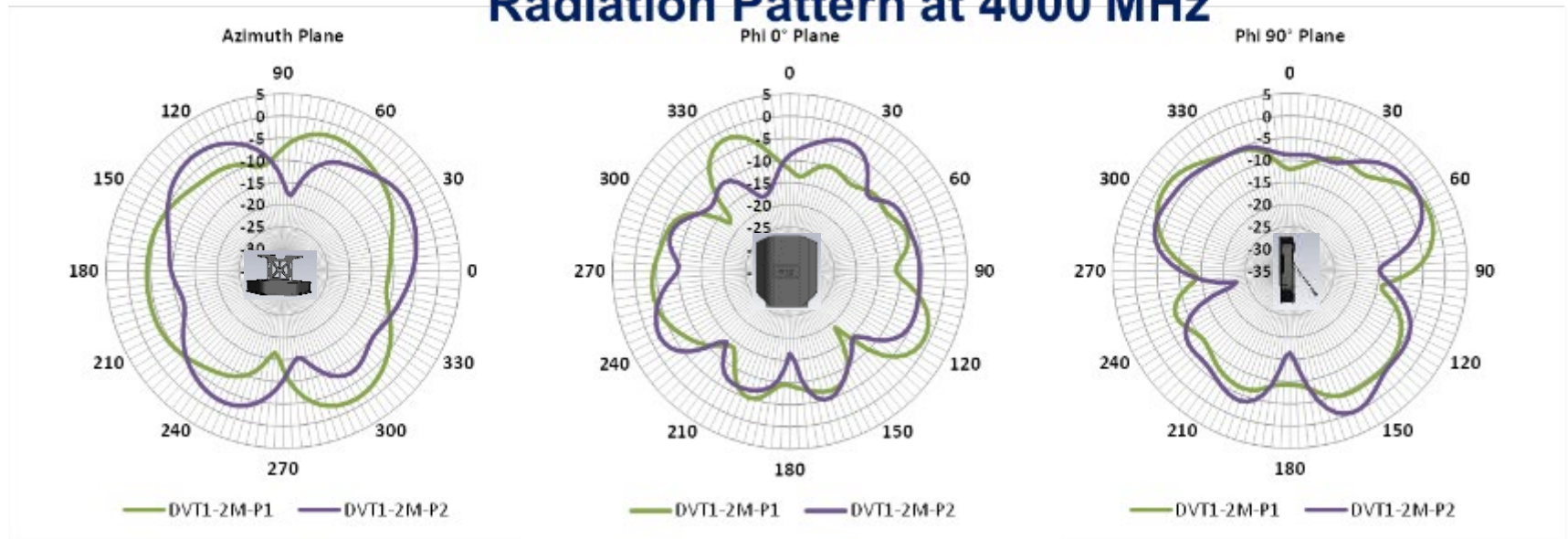
Radiation Pattern at 3500 MHz



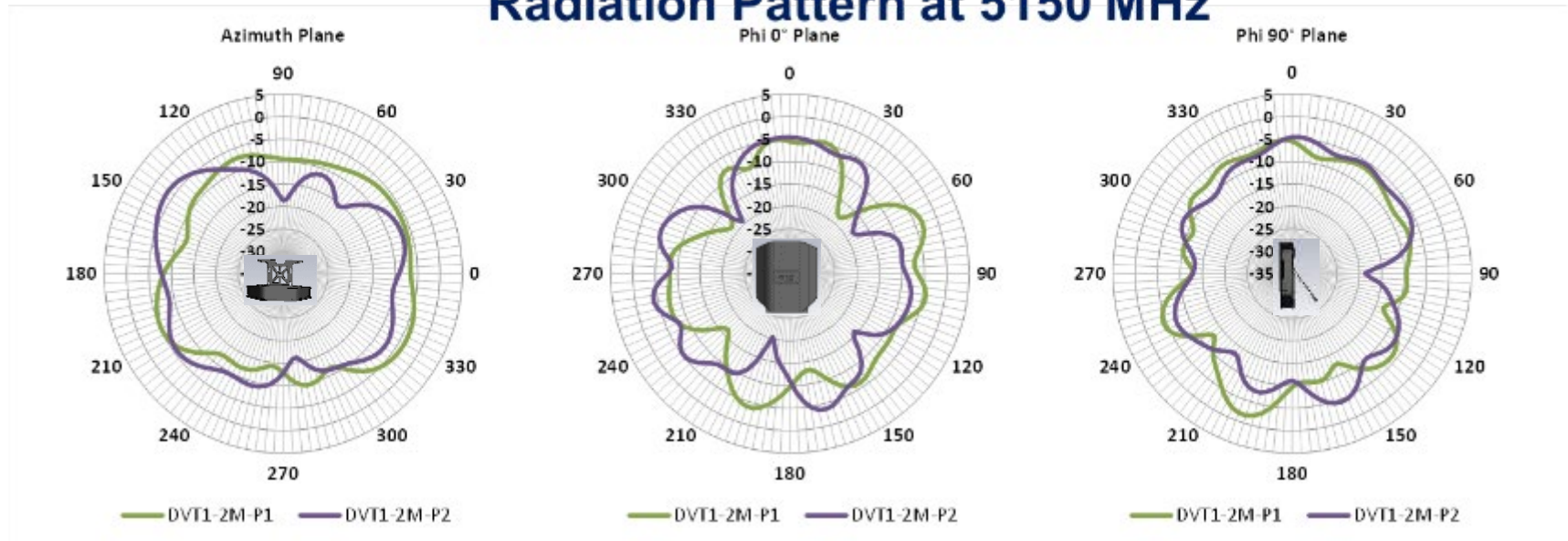
Radiation Pattern at 3700 MHz



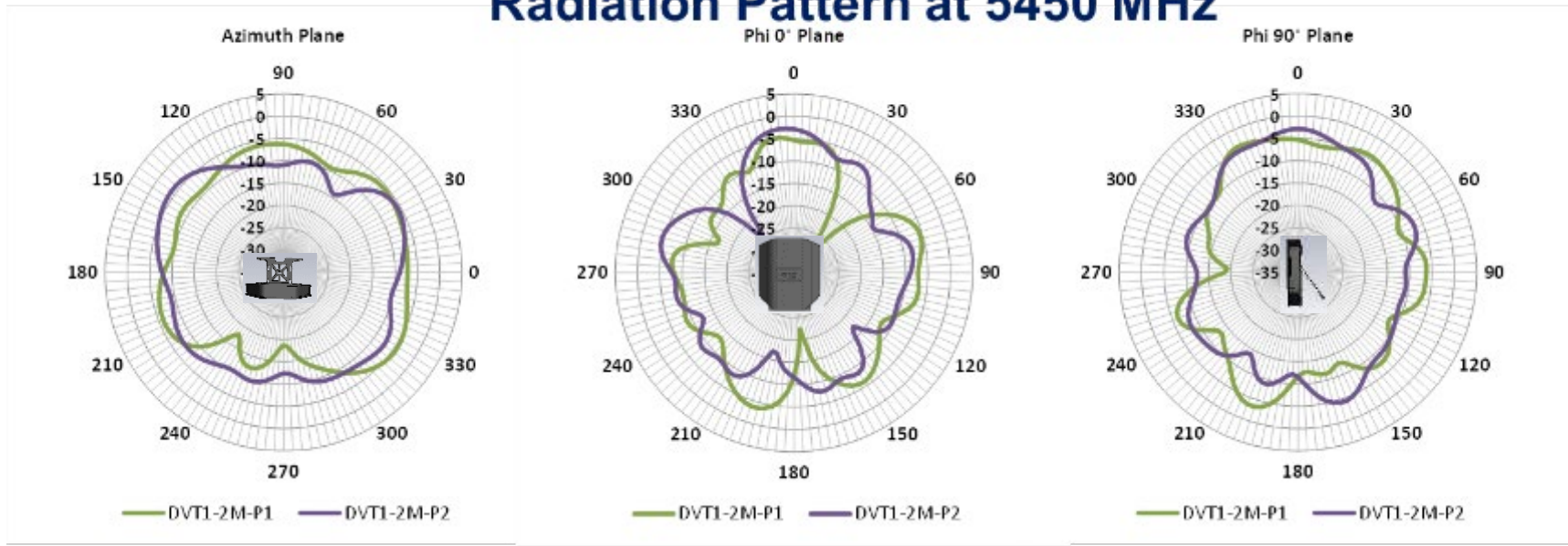
Radiation Pattern at 4000 MHz



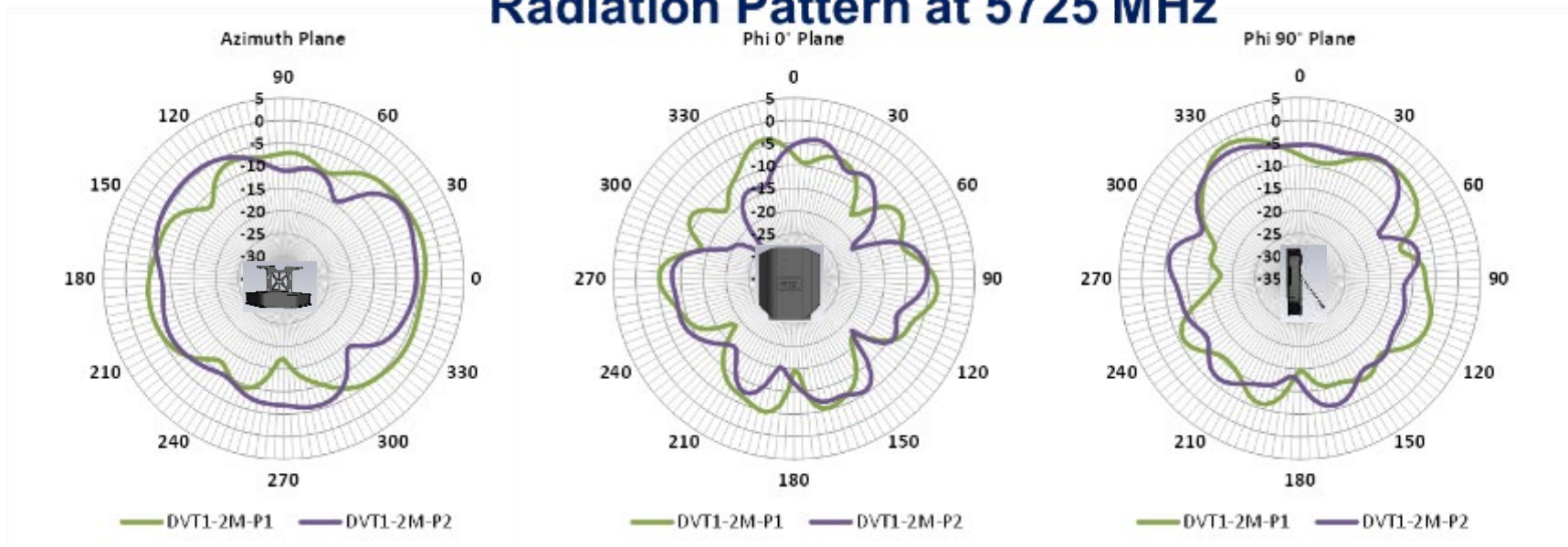
Radiation Pattern at 5150 MHz



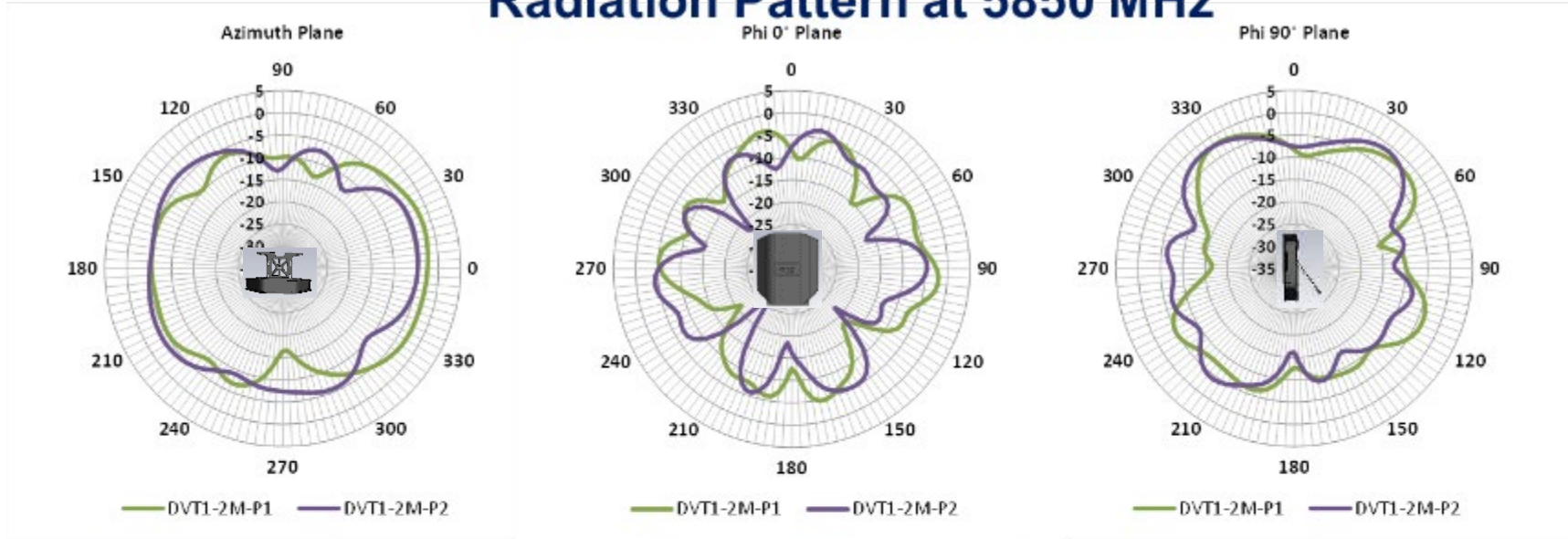
Radiation Pattern at 5450 MHz



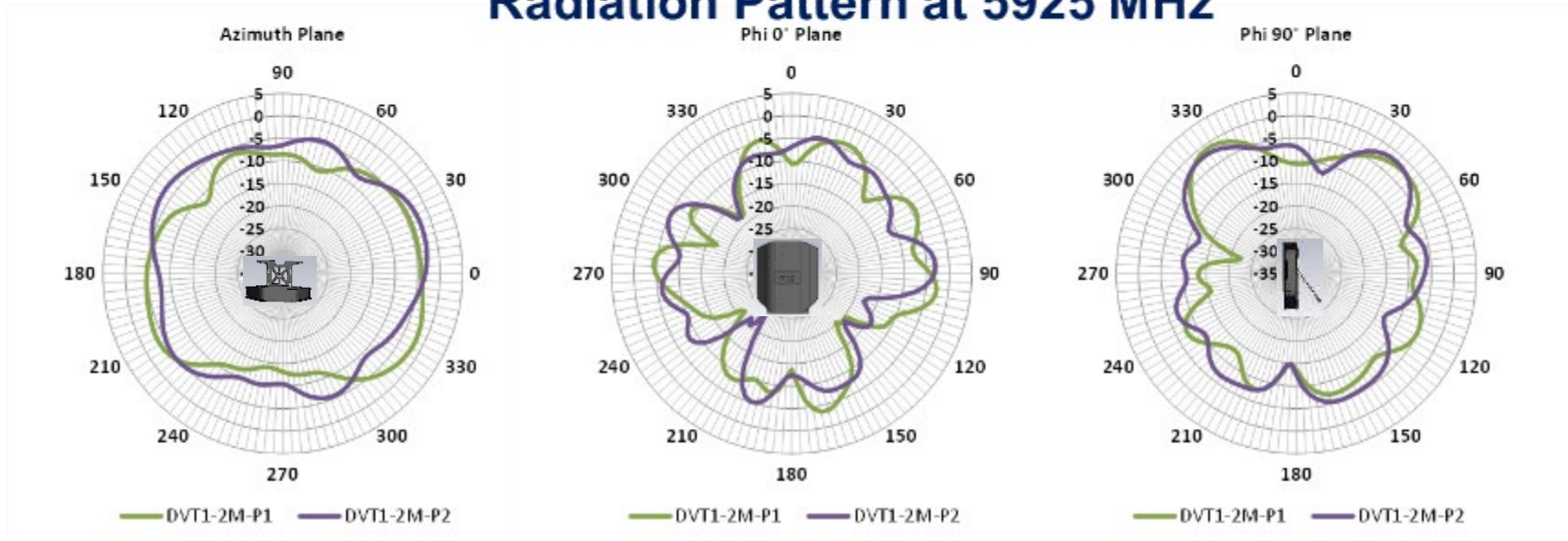
Radiation Pattern at 5725 MHz



Radiation Pattern at 5850 MHz



Radiation Pattern at 5925 MHz



**ANY
CONNECTION
CAN CHANGE
THE WORLD**

EVERY CONNECTION COUNTS

