

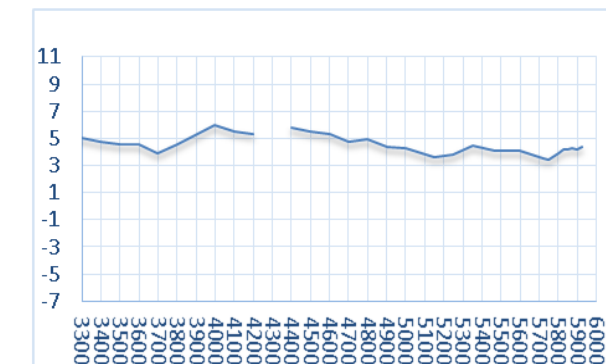
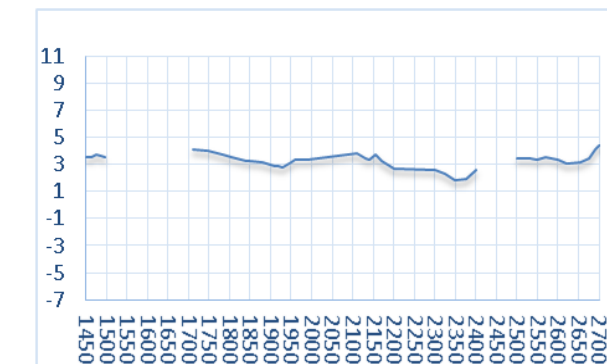
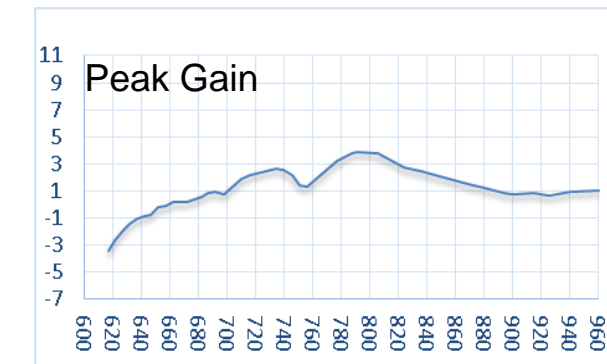
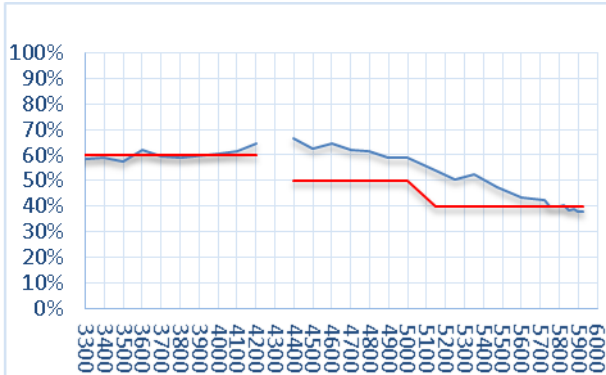
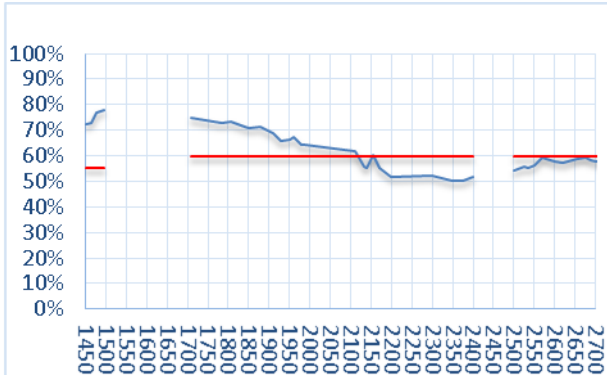
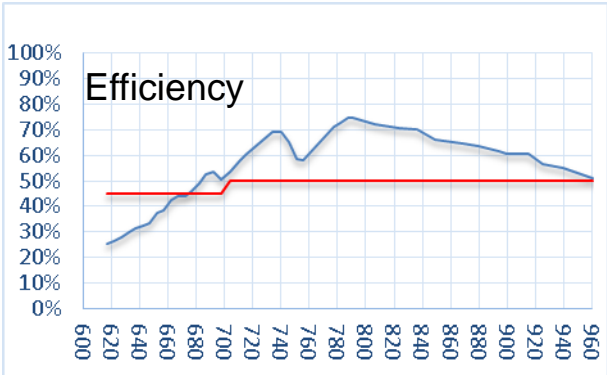
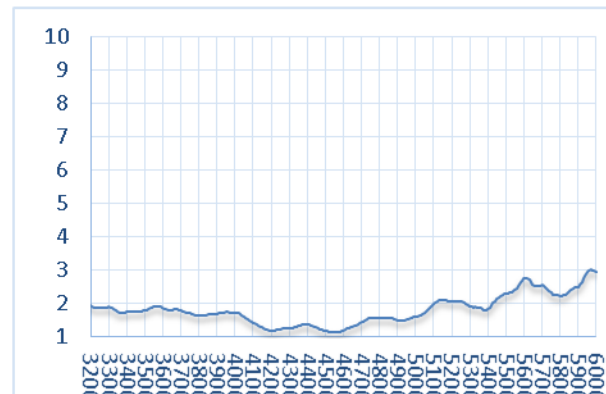
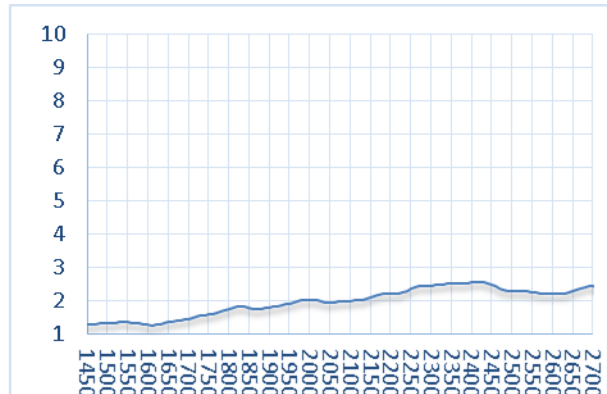
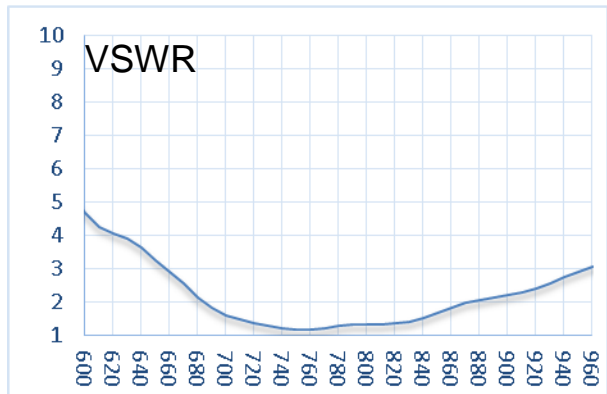
# ***Scarlet witch antenna test report for P2***

2022/04/29



*Smarter Solutions for a Smarter Future*

# Main



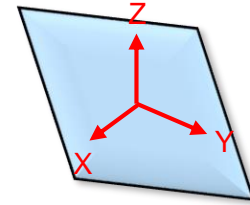
# Gain table (Main)

Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)
617	-3.4	704	1.3	1452	3.5	1710	4.2	2500	3.4	4400	5.8
622	-2.6	710	1.8	1463	3.5	1747	4.0	2525	3.5	4500	5.5
627	-2.0	716	2.2	1476	3.7	1785	3.7	2535	3.4	4600	5.4
632	-1.5	734	2.6	1486	3.6	1805	3.6	2550	3.4	4700	4.8
637	-1.1	740	2.6	1496	3.6	1840	3.3	2570	3.6	4800	4.9
642	-0.9	746	2.2			1850	3.2	2600	3.4	4900	4.4
647	-0.7	751	1.4			1880	3.2	2620	3.0	5000	4.3
652	-0.2	756	1.3			1910	2.9	2655	3.2	5150	3.6
657	-0.1	777	3.2			1920	2.9	2675	3.5	5250	3.8
662	0.2	782	3.5			1930	2.8	2690	4.1	5350	4.5
667	0.2	787	3.8			1950	3.1	2700	4.4	5470	4.1
672	0.1	791	3.9			1960	3.3	3300	5.1	5600	4.1
677	0.4	806	3.8			1980	3.4	3400	4.8	5725	3.6
682	0.6	824	2.8			1990	3.3	3500	4.5	5750	3.5
687	0.9	836	2.5			2110	3.8	3600	4.6	5800	3.9
692	1.0	849	2.1			2132	3.5	3700	3.9	5825	4.2
698	0.7	869	1.5			2140	3.4	3800	4.6	5850	4.2
		880	1.2			2155	3.7	4000	6.0	5875	4.3
		894	0.9			2170	3.3	4100	5.5	5900	4.2
		900	0.8			2200	2.7	4200	5.4	5925	4.4
		915	0.8			2300	2.6				
		925	0.7			2325	2.3				
		940	0.9			2350	1.8				
		960	1.0			2375	1.9				
						2400	2.6				



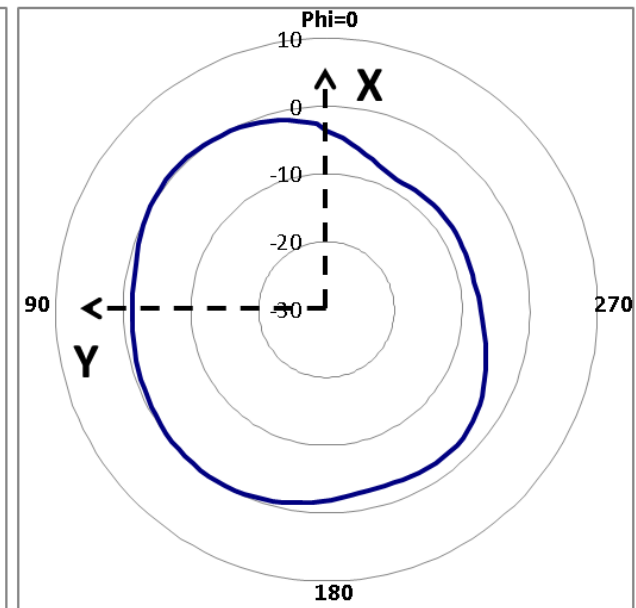
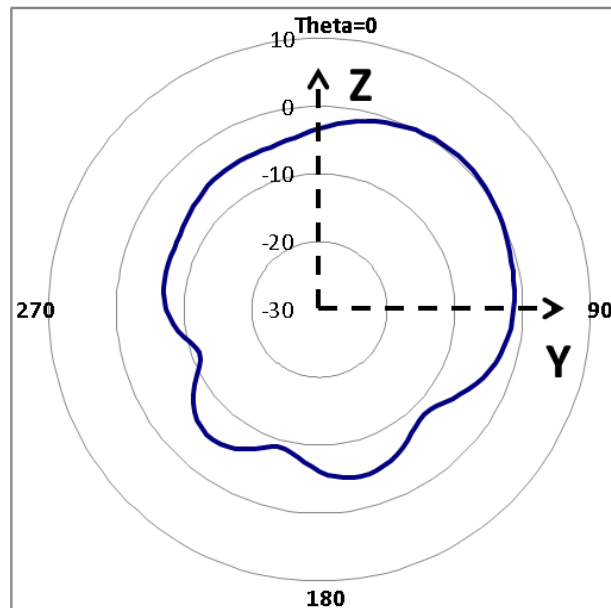
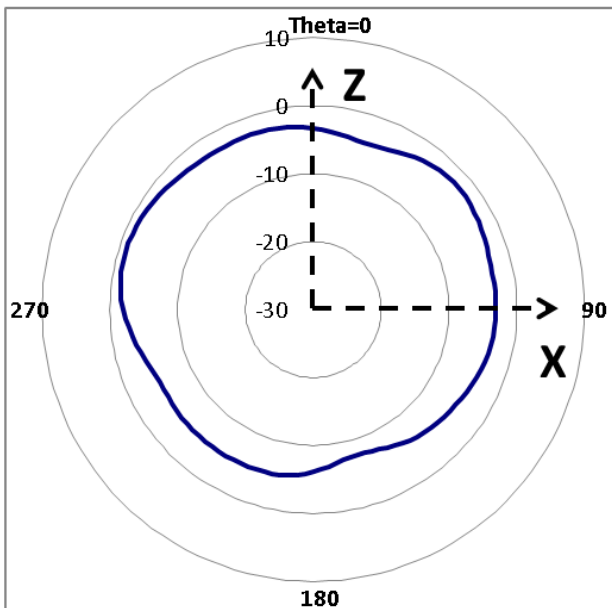
# Radiation Pattern

## Main



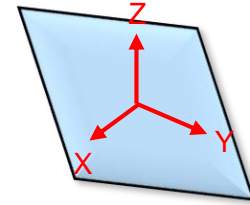
### main Radiation Pattern

— 698MHz



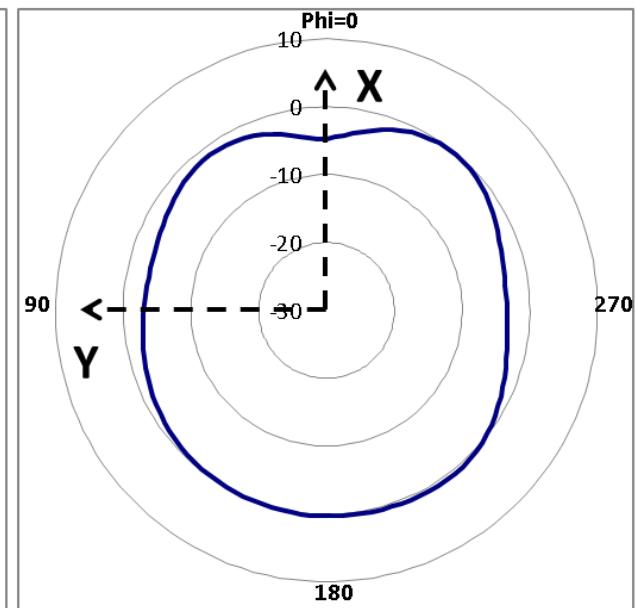
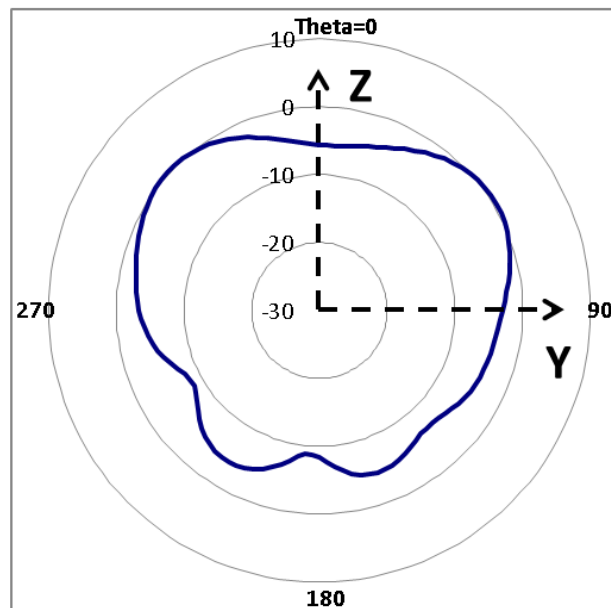
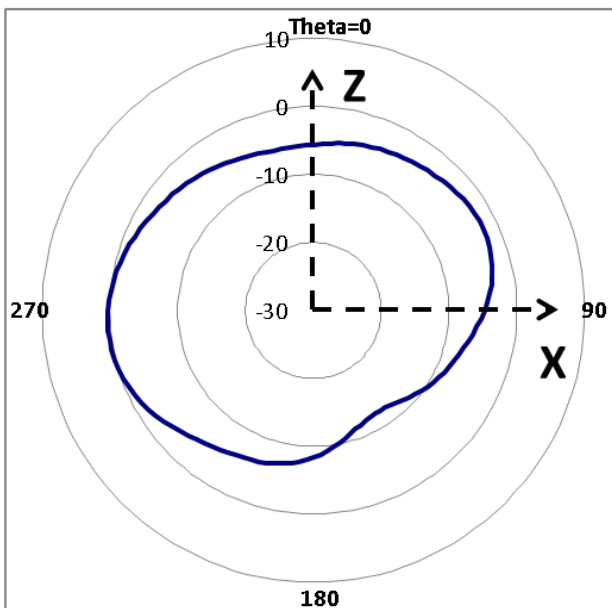
# Radiation Pattern

## Main



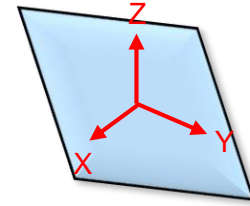
### main Radiation Pattern

— 900MHz



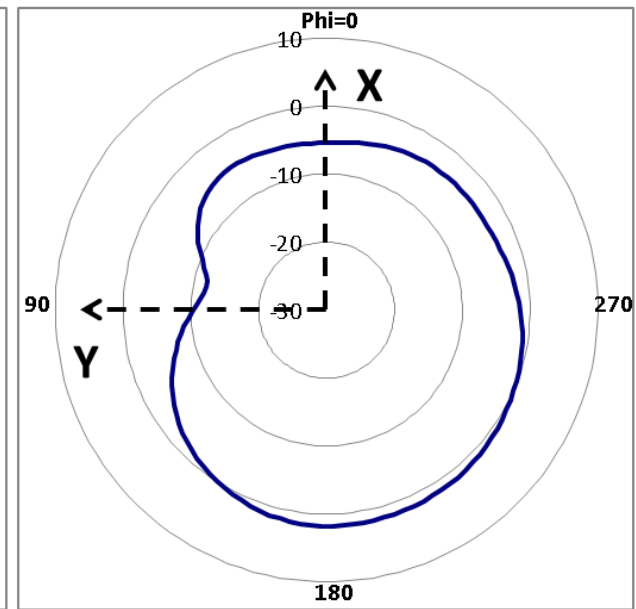
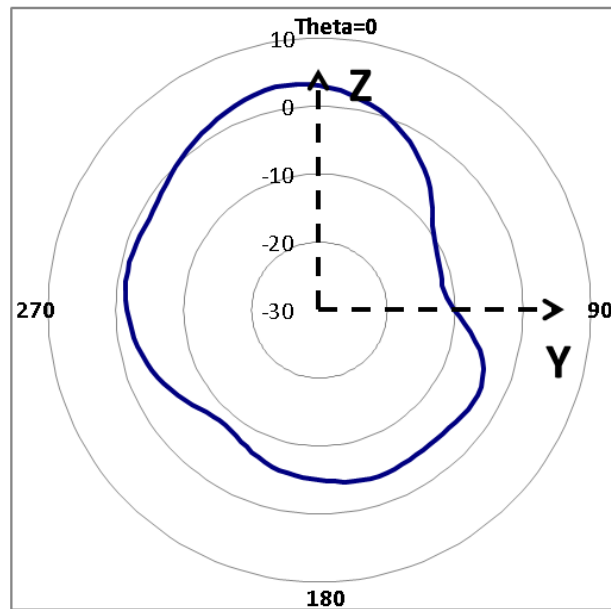
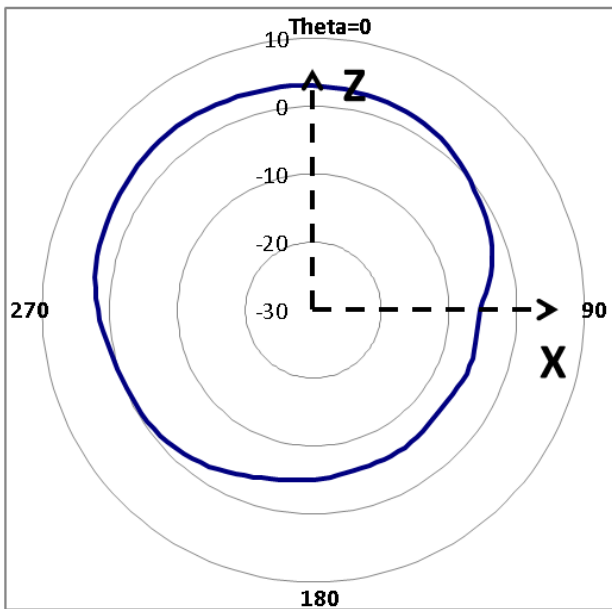
# Radiation Pattern

## Main



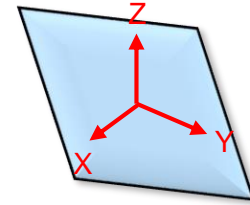
### main Radiation Pattern

— 1710MHz



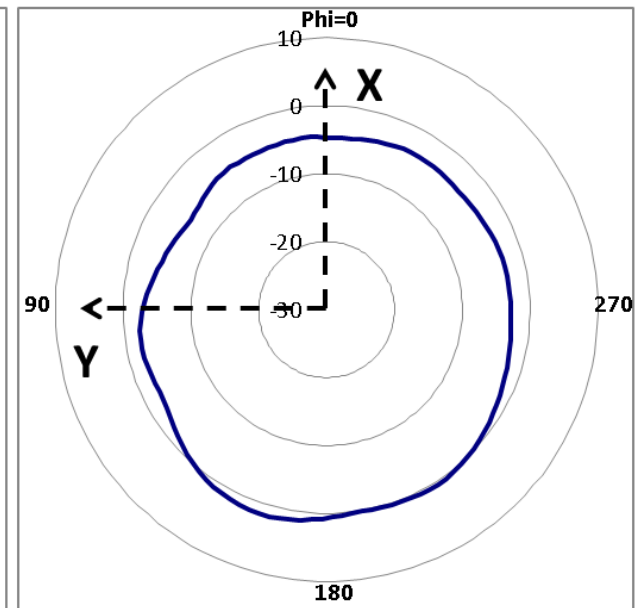
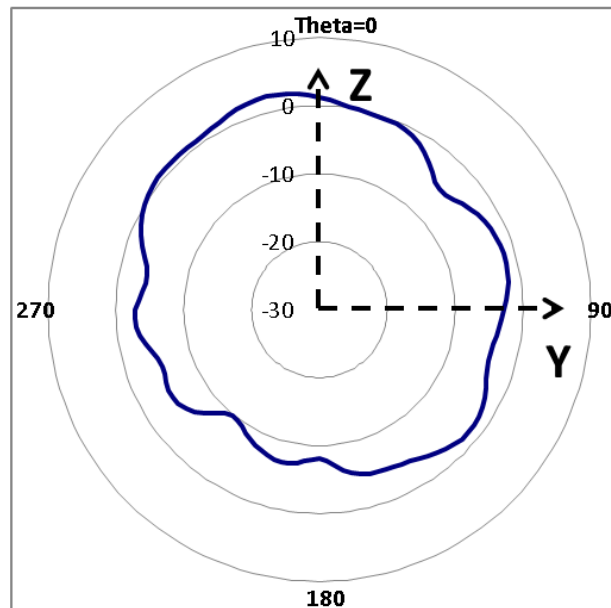
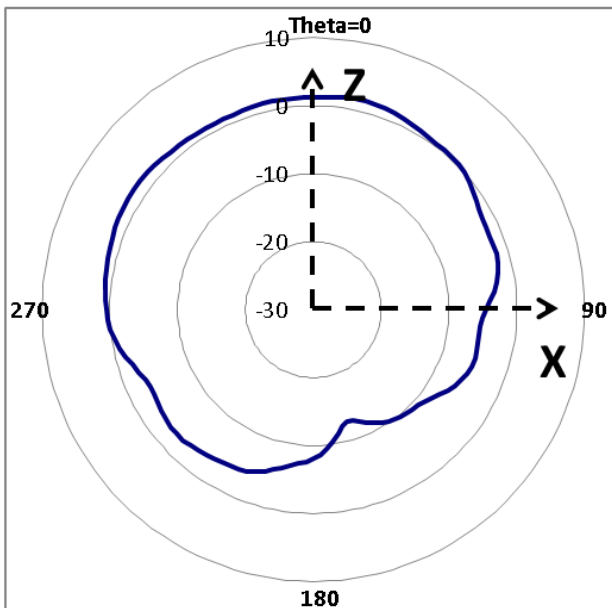
# Radiation Pattern

## Main



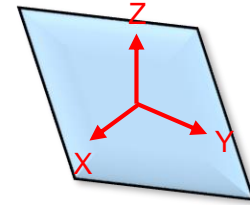
### main Radiation Pattern

— 1910MHz



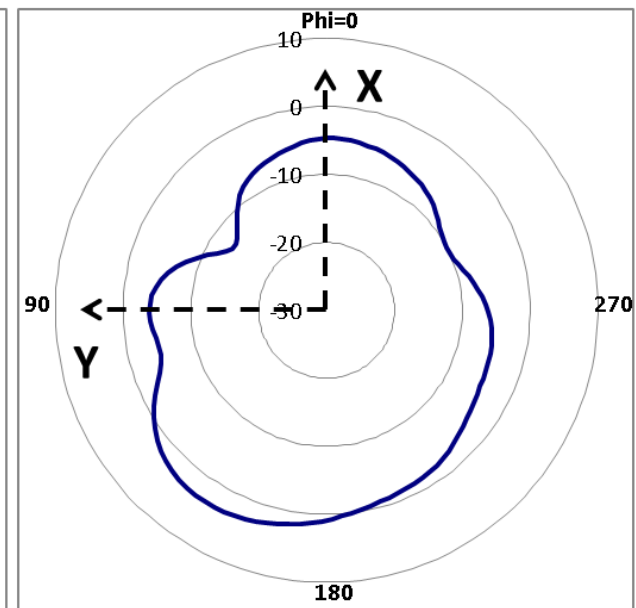
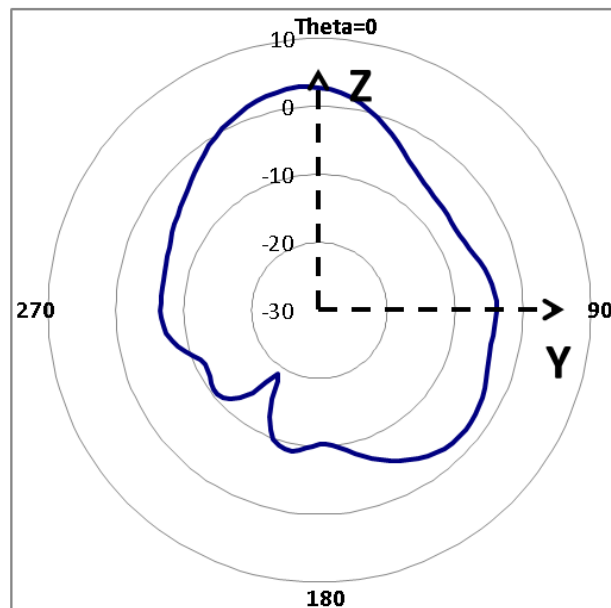
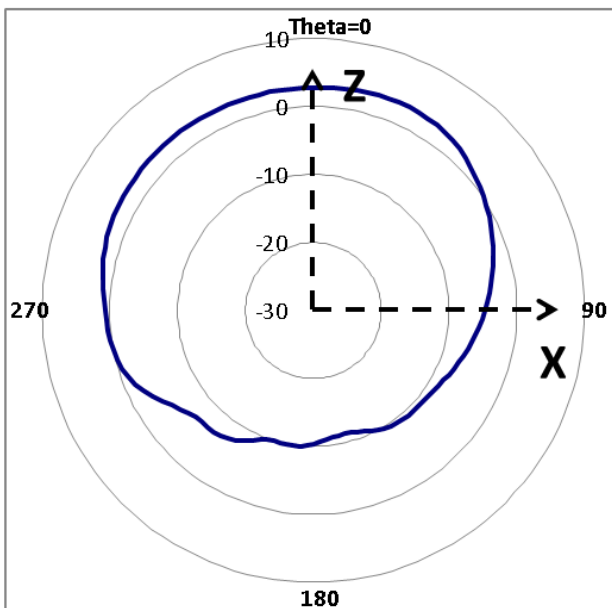
# Radiation Pattern

## Main



### main Radiation Pattern

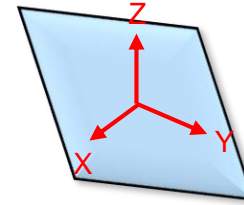
— 2110MHz





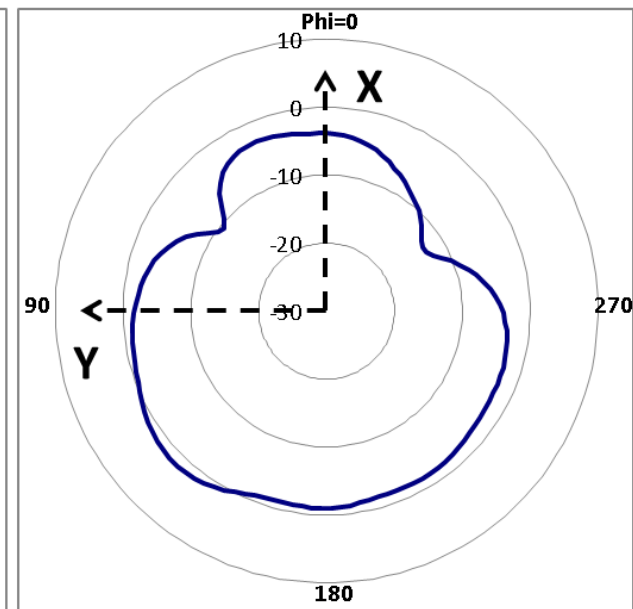
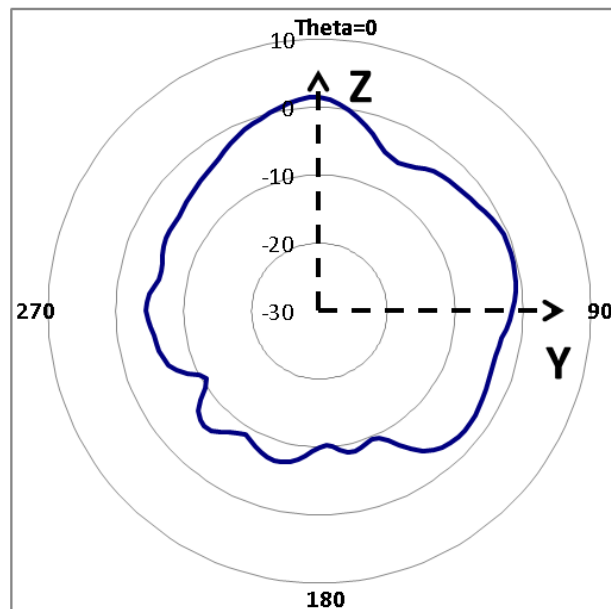
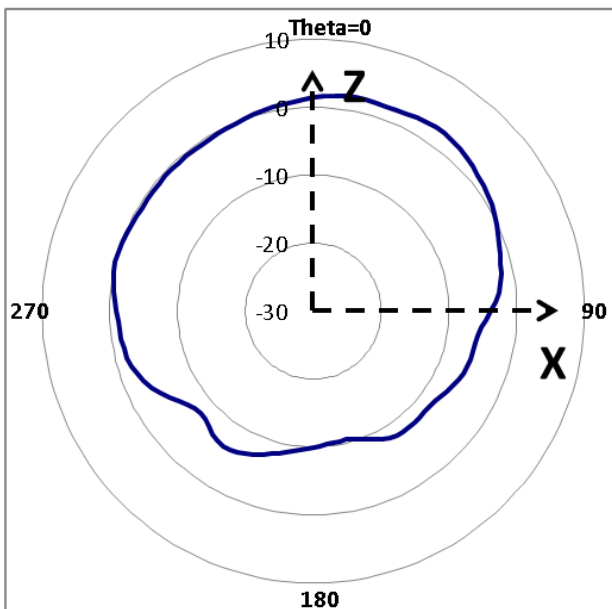
# Radiation Pattern

## Main



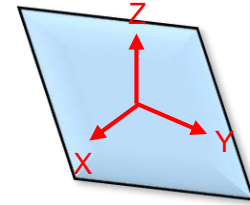
### main Radiation Pattern

— 2300MHz



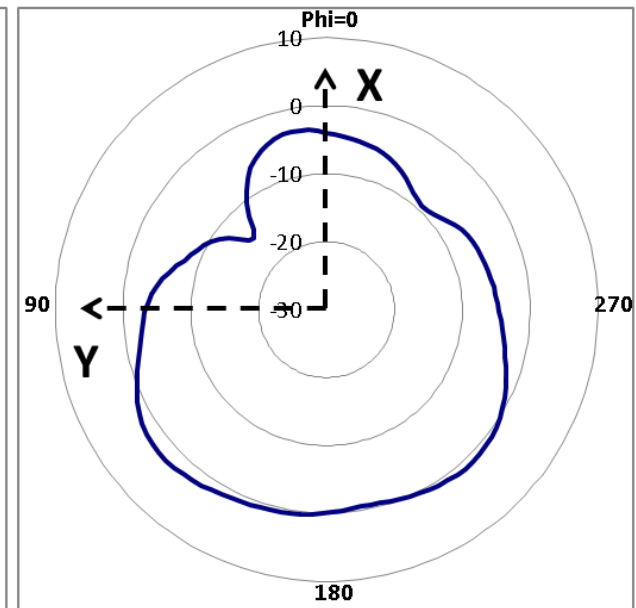
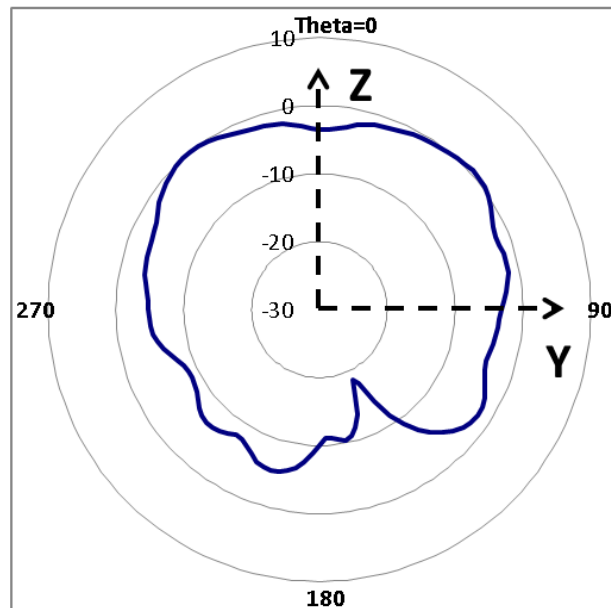
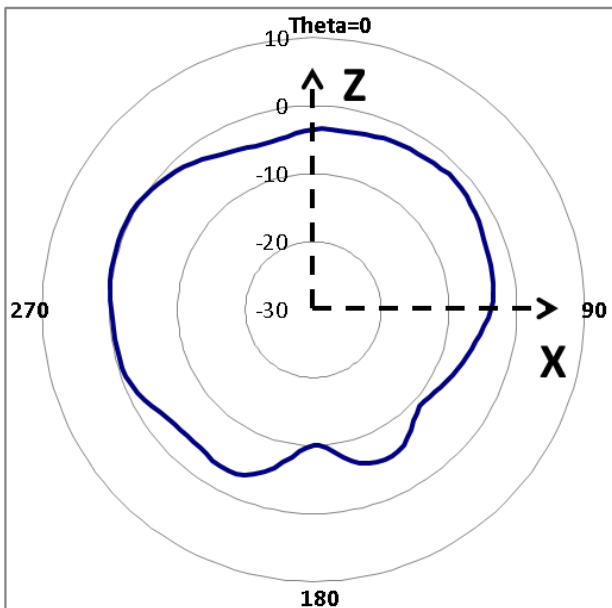
# Radiation Pattern

## Main



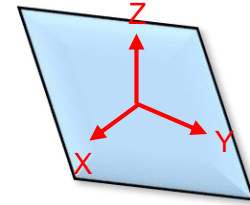
### main Radiation Pattern

— 2600MHz



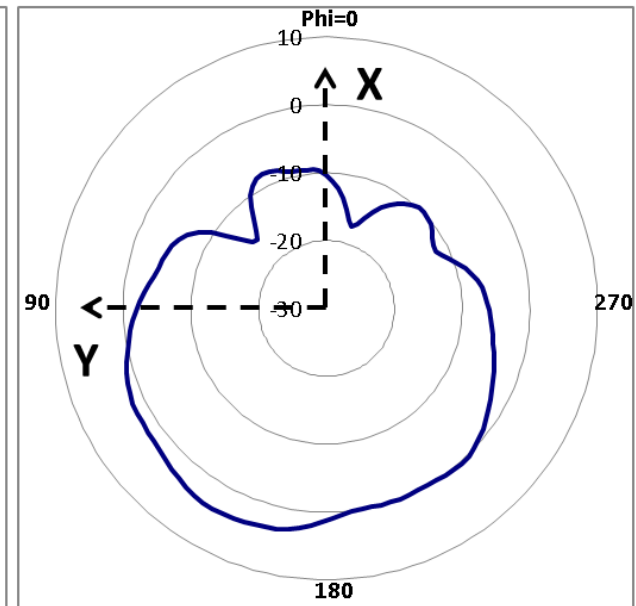
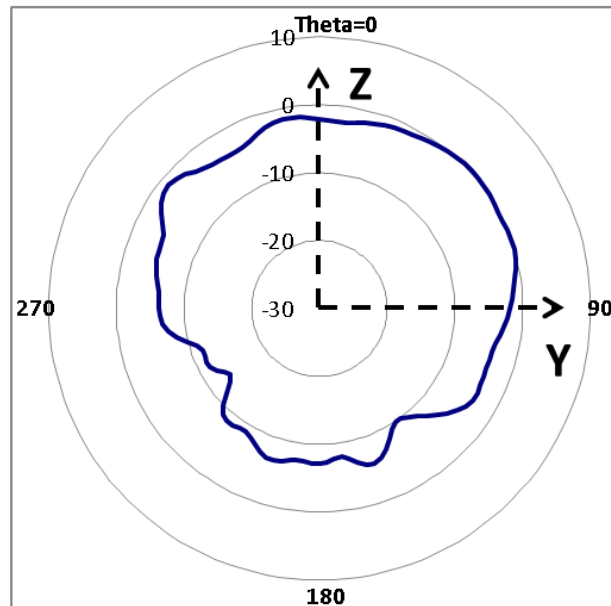
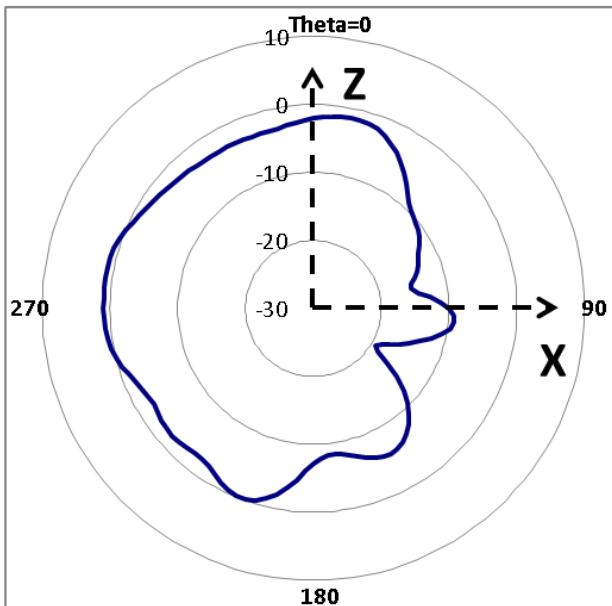
# Radiation Pattern

## Main



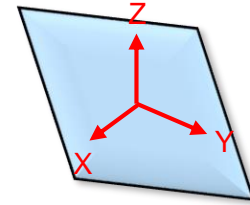
### main Radiation Pattern

— 3300MHz



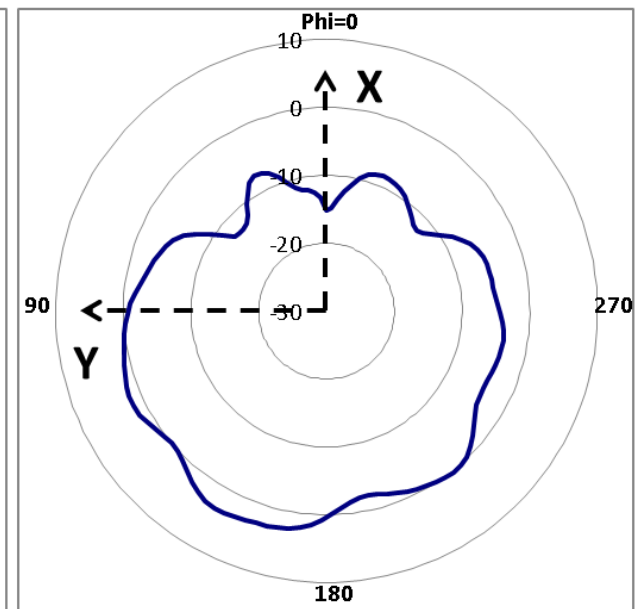
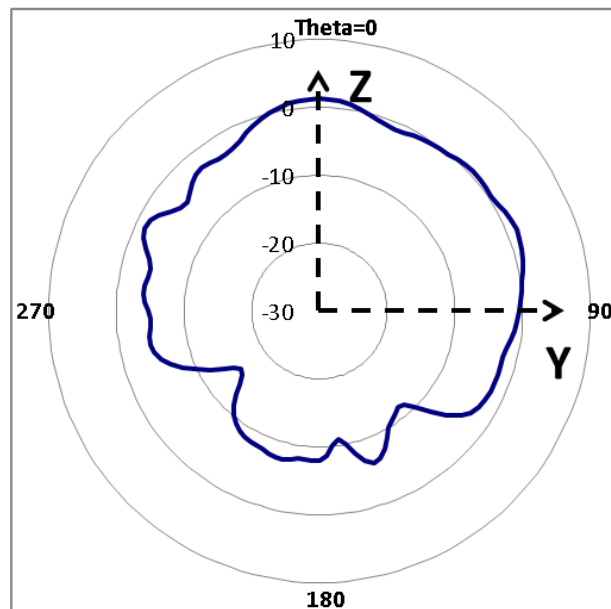
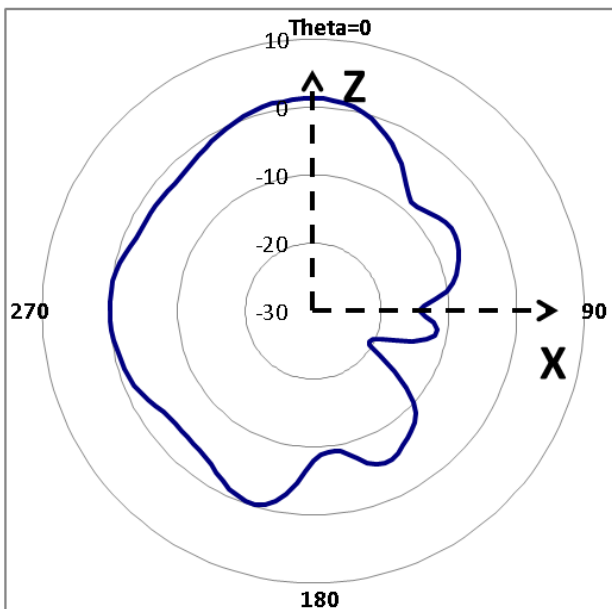
# Radiation Pattern

## Main



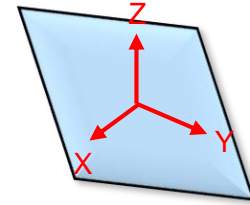
### main Radiation Pattern

— 3500MHz



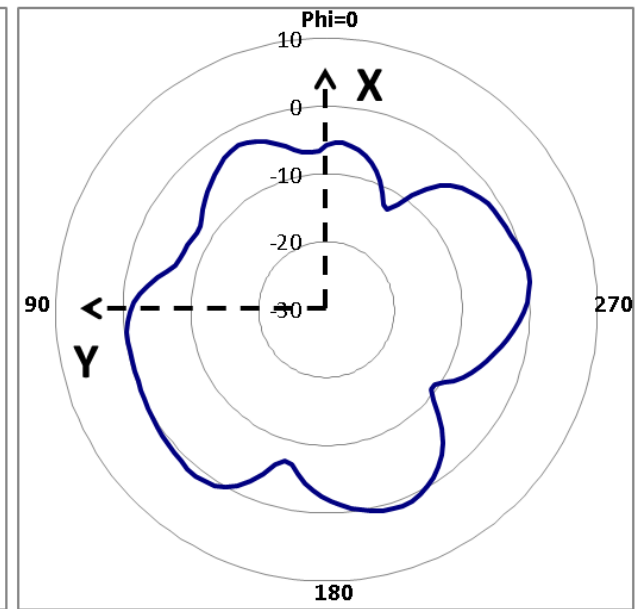
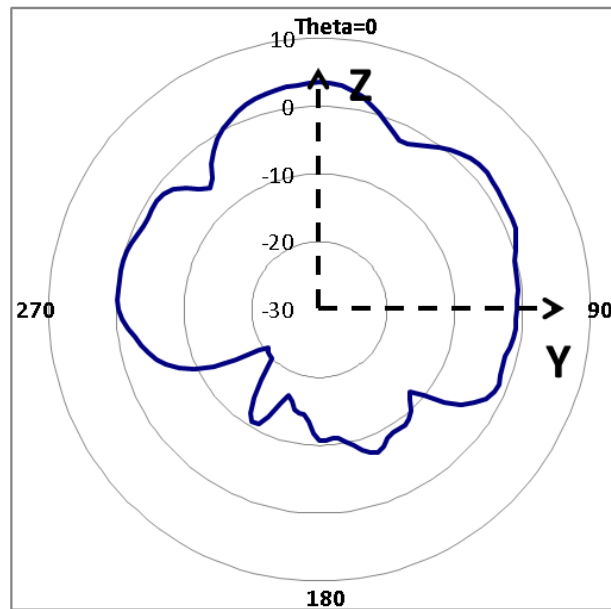
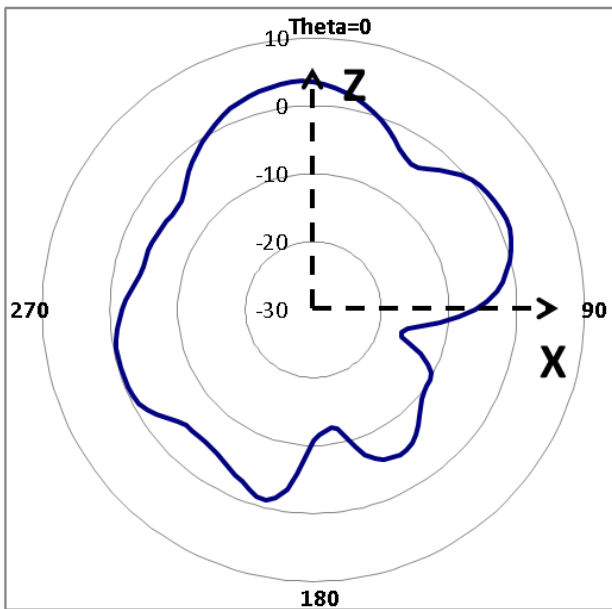
# Radiation Pattern

## Main



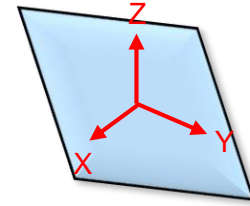
### main Radiation Pattern

— 3800MHz



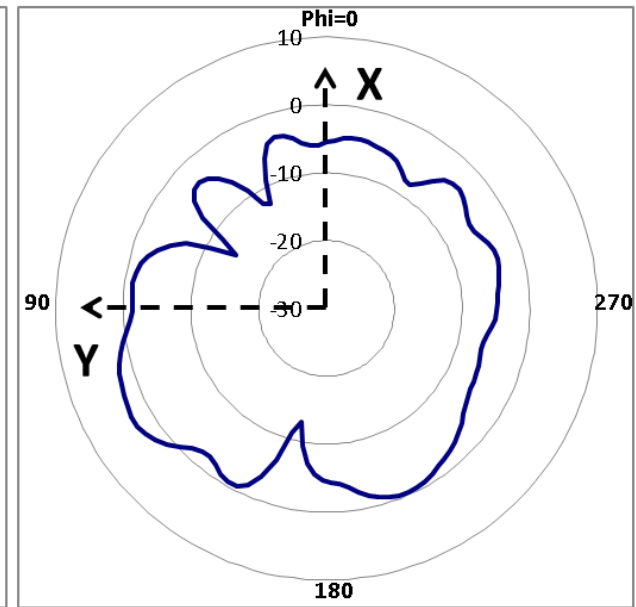
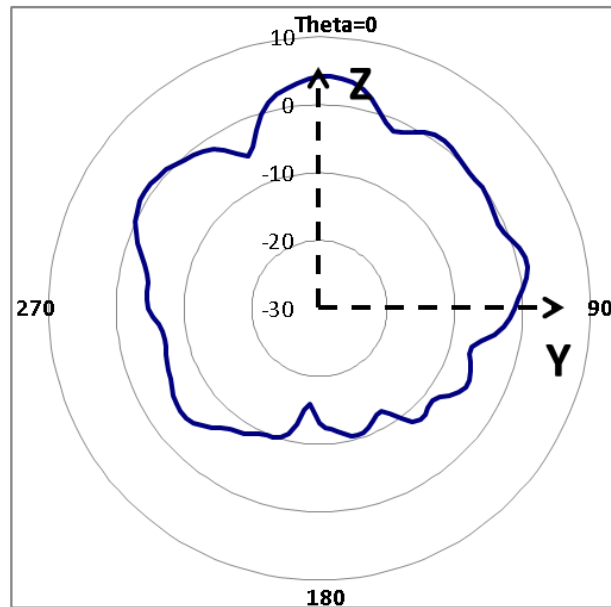
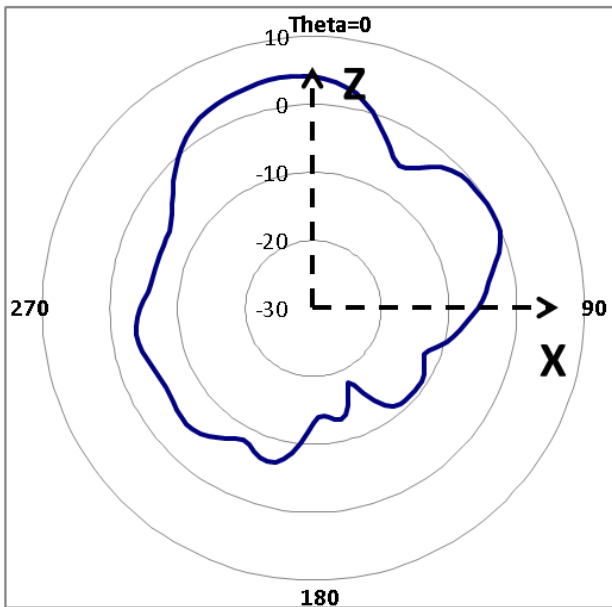
# Radiation Pattern

## Main



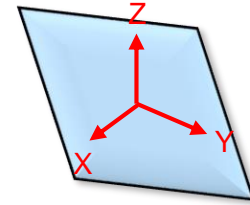
### main Radiation Pattern

— 4700MHz



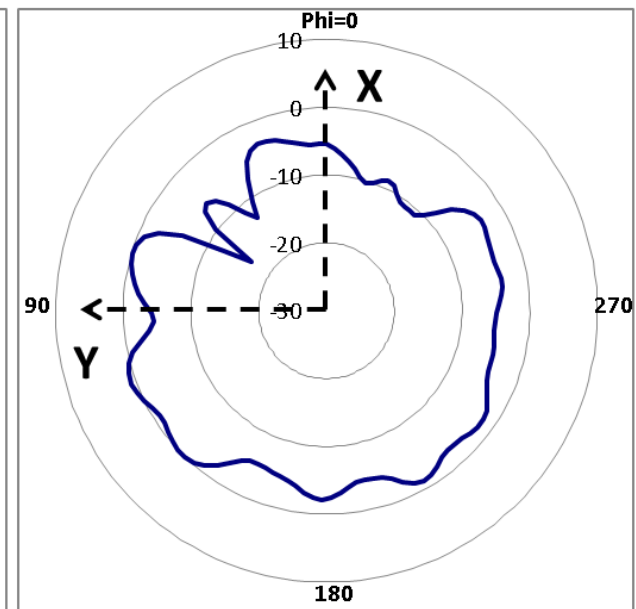
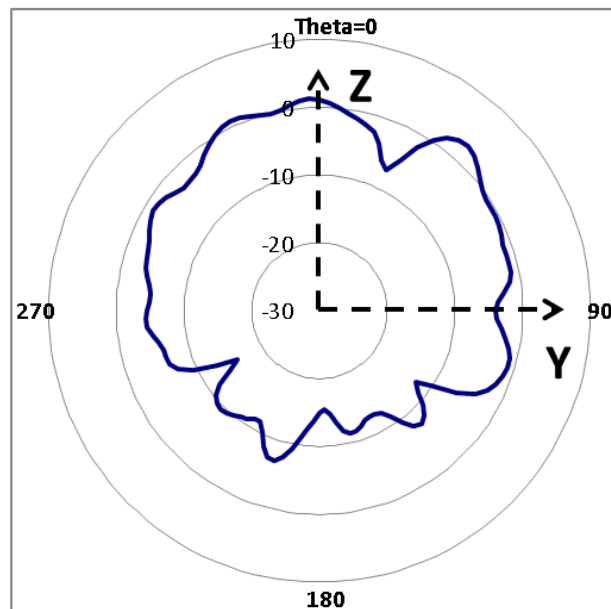
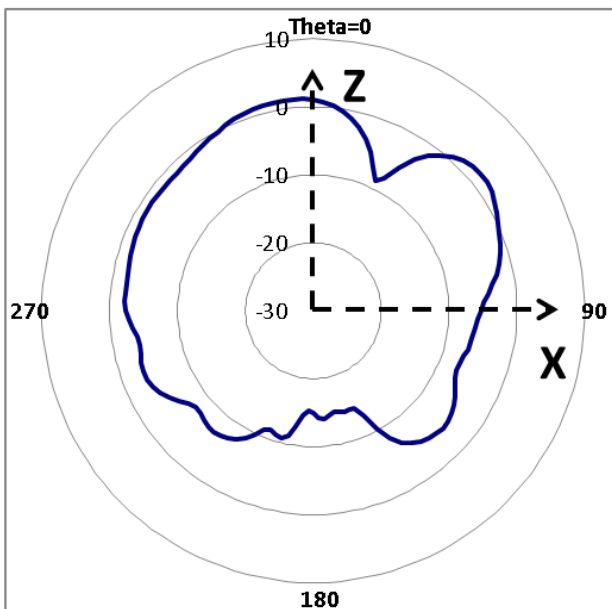
# Radiation Pattern

## Main



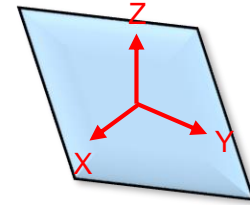
### main Radiation Pattern

— 5250MHz



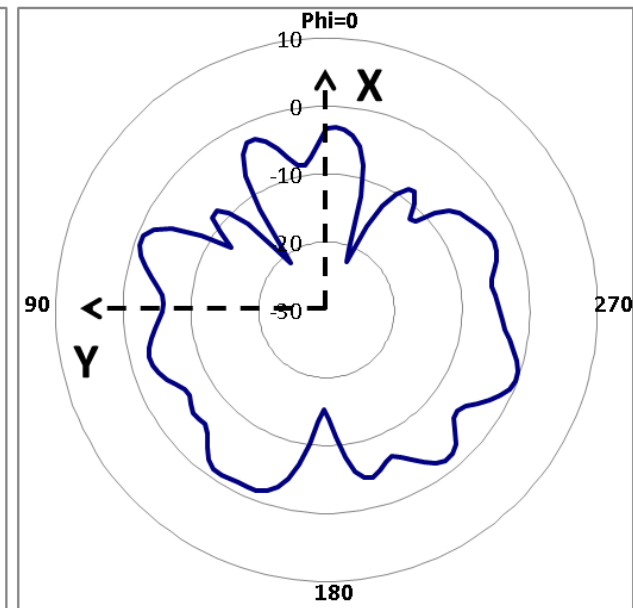
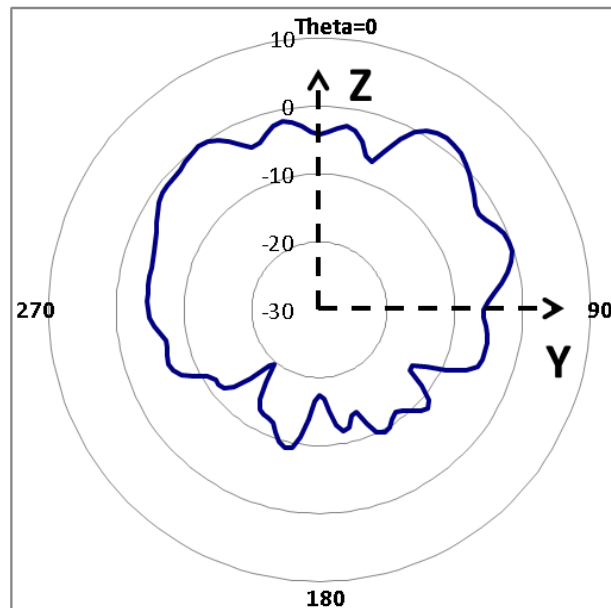
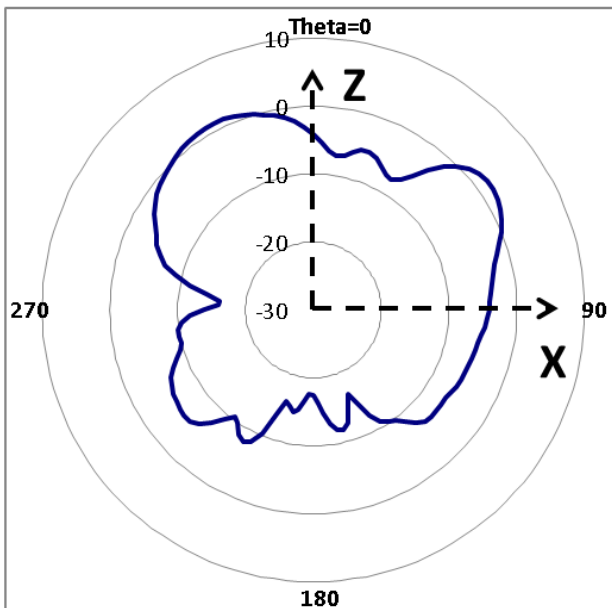
# Radiation Pattern

## Main



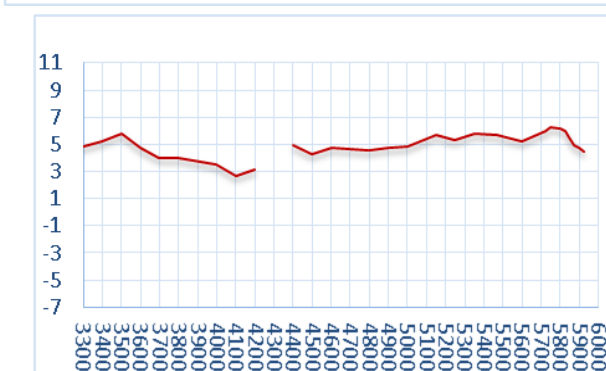
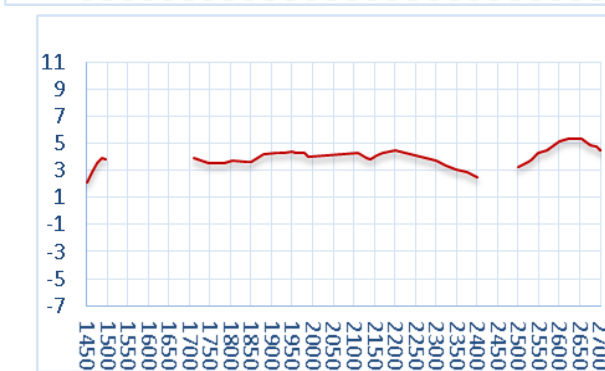
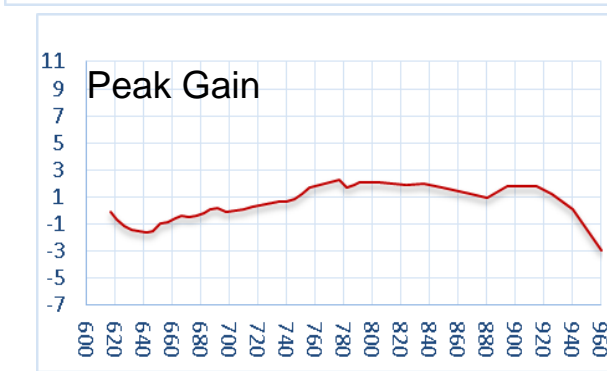
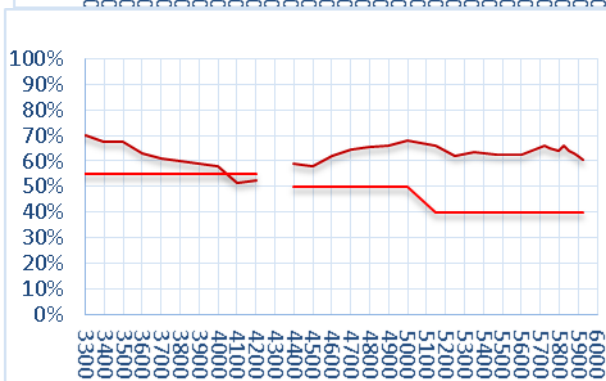
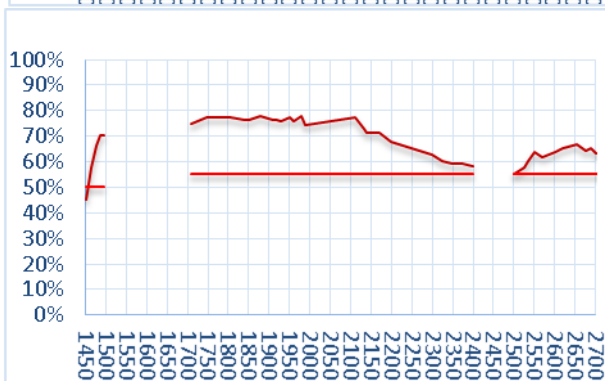
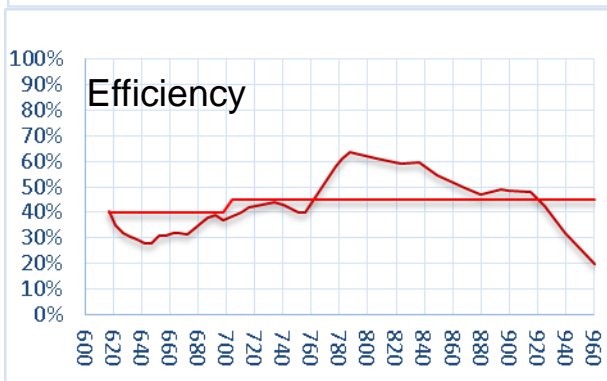
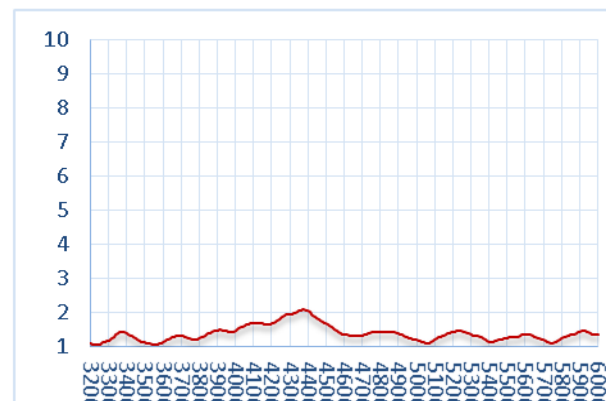
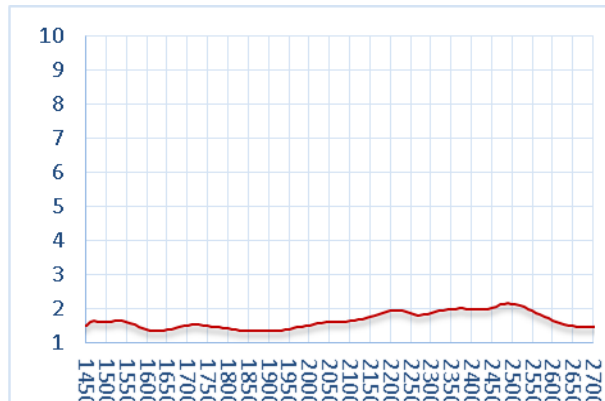
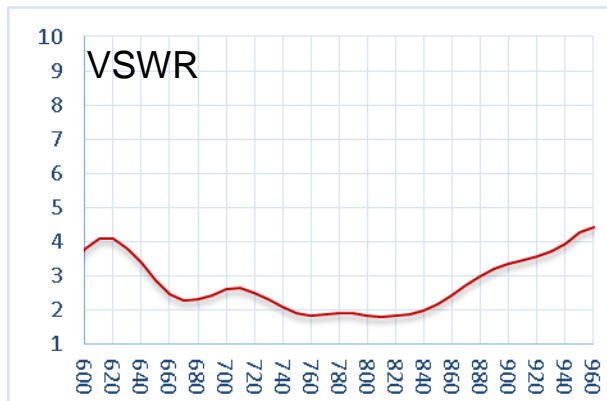
### main Radiation Pattern

— 5725MHz





# Aux



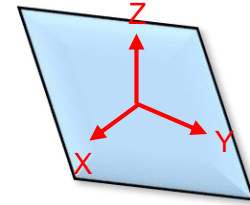
# Gain table (Aux)

Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)
617	-0.1	704	0.0	1452	2.1	1710	3.9	2500	3.3	4400	4.9
622	-0.7	710	0.1	1463	2.8	1747	3.5	2525	3.6	4500	4.3
627	-1.1	716	0.3	1476	3.5	1785	3.5	2535	3.8	4600	4.8
632	-1.4	734	0.6	1486	3.9	1805	3.8	2550	4.3	4700	4.6
637	-1.5	740	0.7	1496	3.8	1840	3.7	2570	4.5	4800	4.6
642	-1.7	746	0.8			1850	3.7	2600	5.1	4900	4.7
647	-1.5	751	1.2			1880	4.2	2620	5.4	5000	4.8
652	-1.0	756	1.7			1910	4.3	2655	5.4	5150	5.7
657	-0.9	777	2.2			1920	4.3	2675	4.9	5250	5.3
662	-0.6	782	1.6			1930	4.3	2690	4.8	5350	5.8
667	-0.4	787	1.8			1950	4.4	2700	4.5	5470	5.7
672	-0.5	791	2.0			1960	4.3	3300	4.8	5600	5.2
677	-0.4	806	2.1			1980	4.3	3400	5.3	5725	6.0
682	-0.2	824	1.9			1990	4.0	3500	5.7	5750	6.2
687	0.0	836	1.9			2110	4.3	3600	4.8	5800	6.2
692	0.2	849	1.7			2132	3.9	3700	4.0	5825	6.0
698	-0.1	869	1.2			2140	3.8	3800	4.0	5850	5.5
		880	1.0			2155	4.1	4000	3.5	5875	5.0
		894	1.8			2170	4.3	4100	2.7	5900	4.8
		900	1.7			2200	4.5	4200	3.1	5925	4.5
		915	1.8			2300	3.8				
		925	1.2			2325	3.4				
		940	0.1			2350	3.1				
		960	-2.9			2375	2.9				
						2400	2.5				



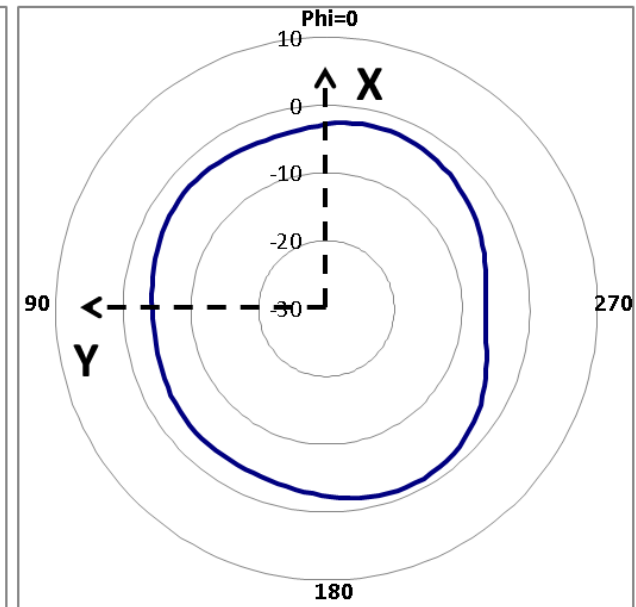
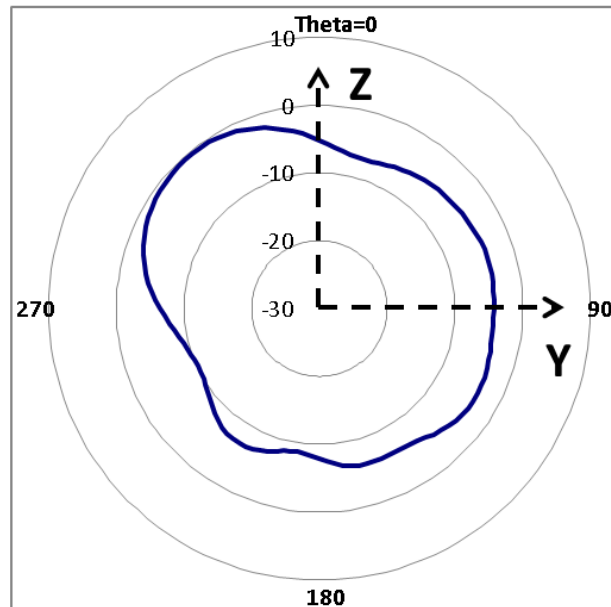
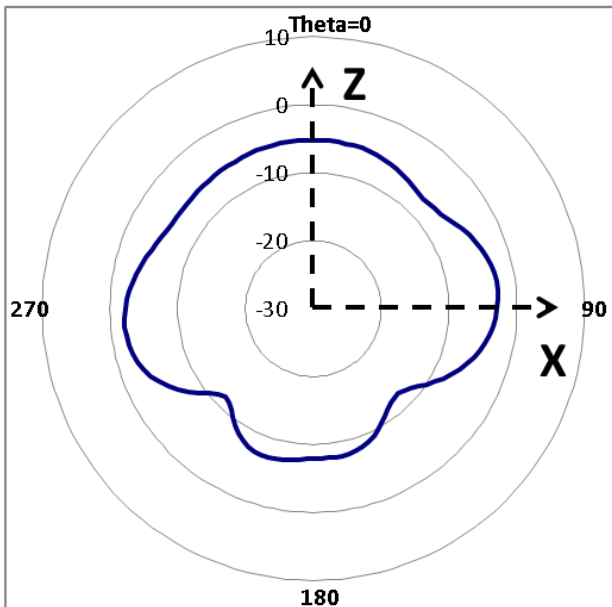
# Radiation Pattern

## Aux



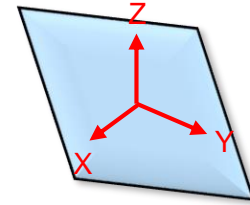
### aux Radiation Pattern

— 698MHz



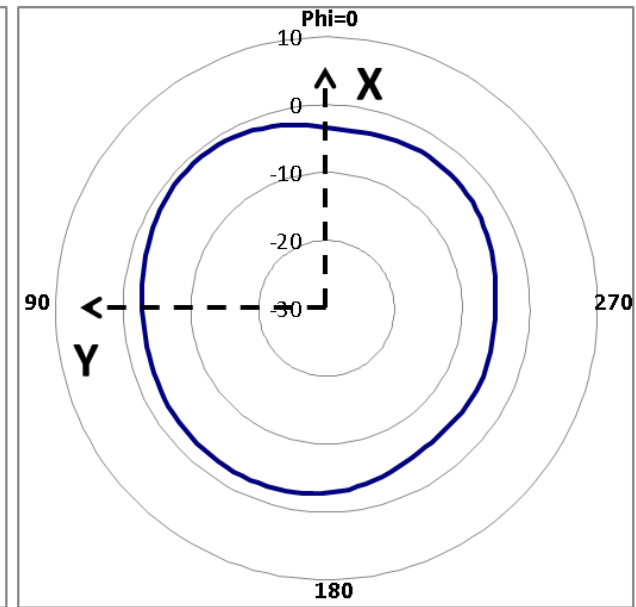
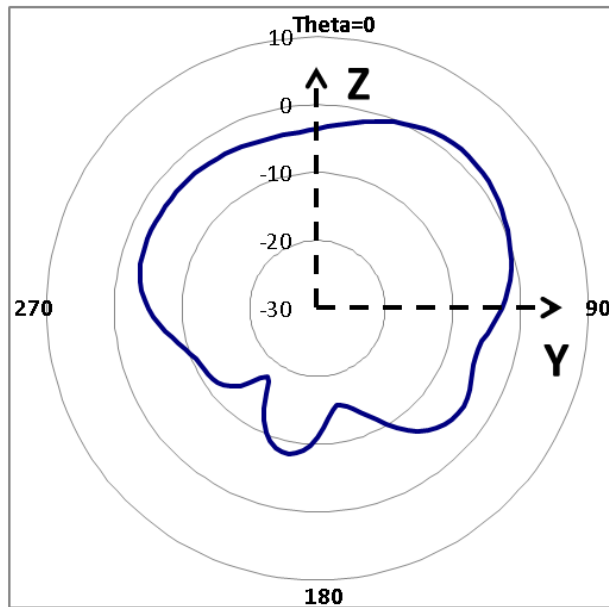
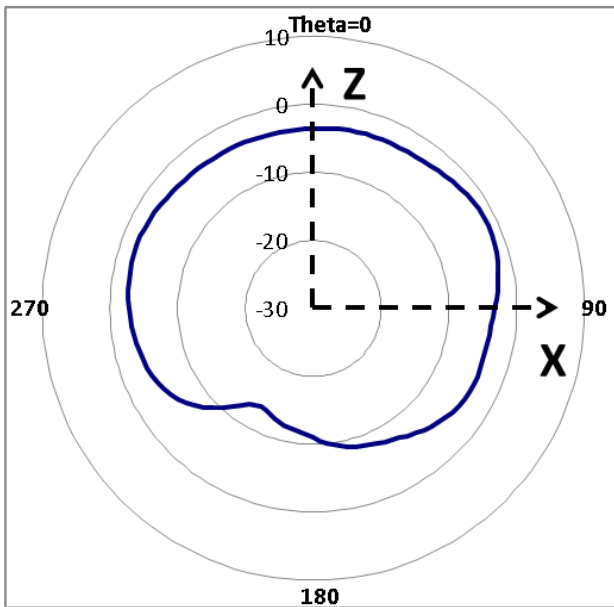
# Radiation Pattern

## Aux



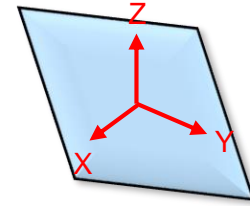
### aux Radiation Pattern

— 900MHz



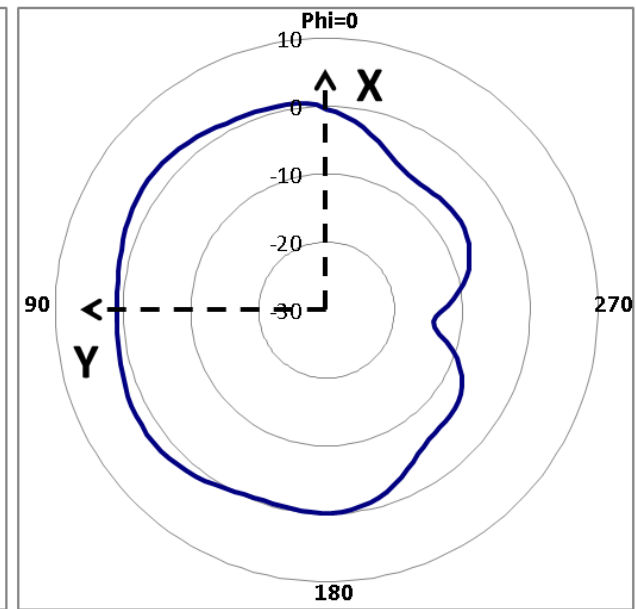
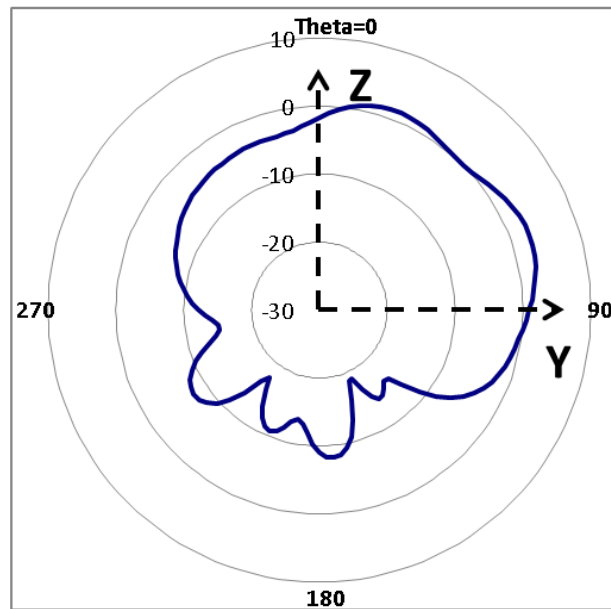
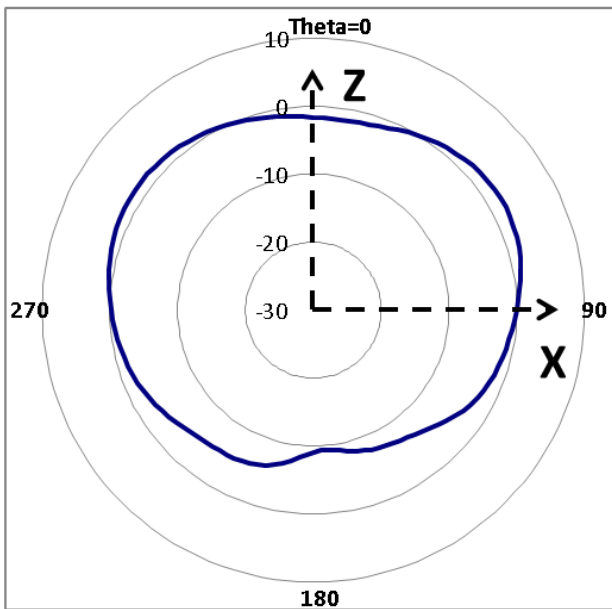
# Radiation Pattern

## Aux



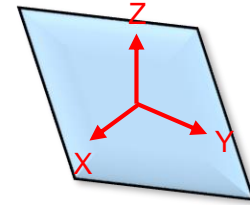
### aux Radiation Pattern

— 1710MHz



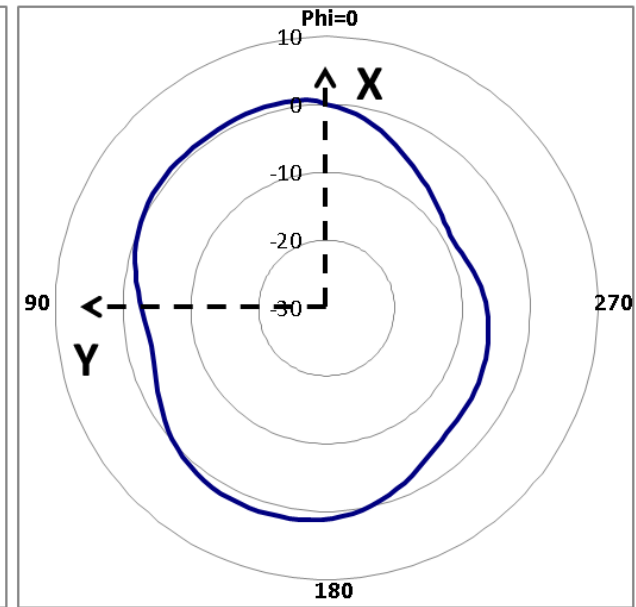
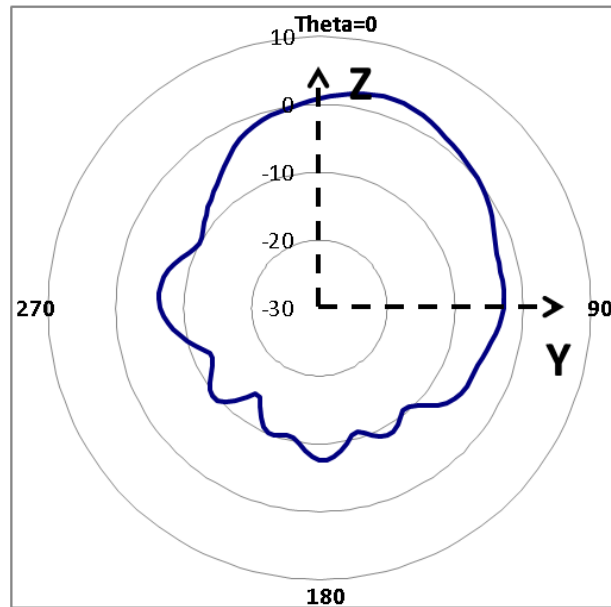
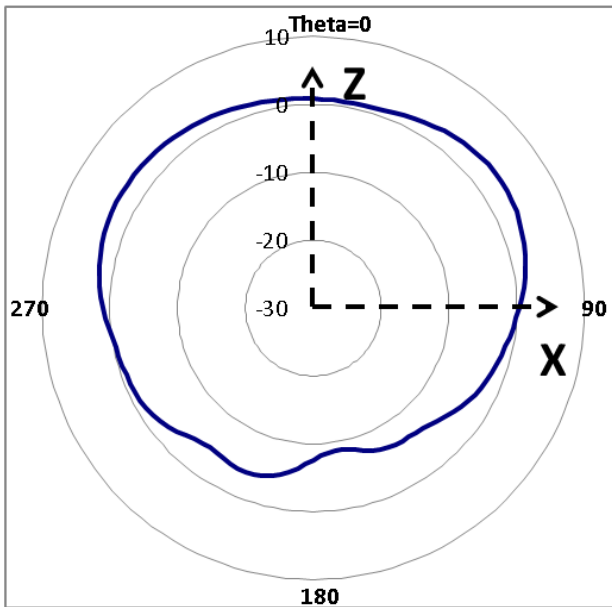
# Radiation Pattern

## Aux



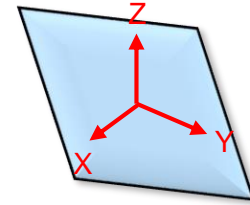
### aux Radiation Pattern

— 1910MHz



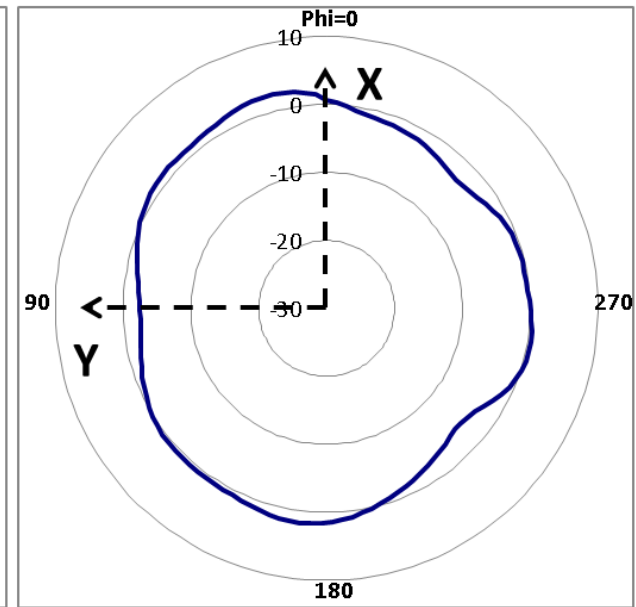
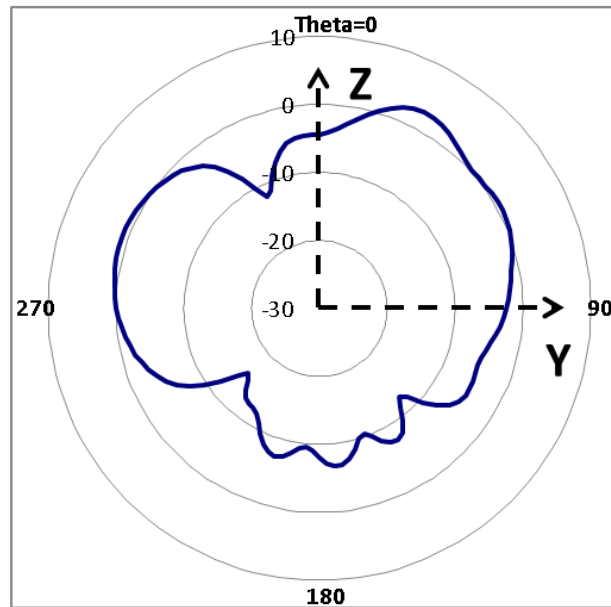
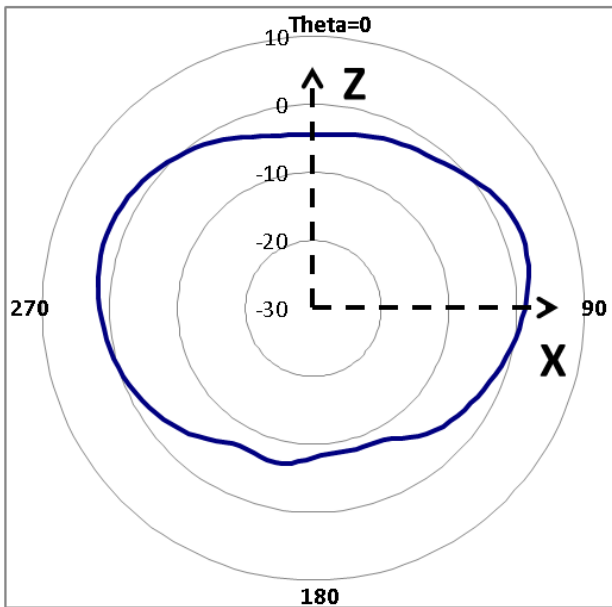
# Radiation Pattern

## Aux



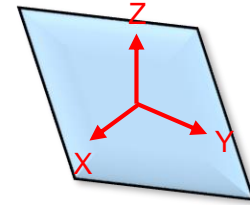
### aux Radiation Pattern

— 2110MHz



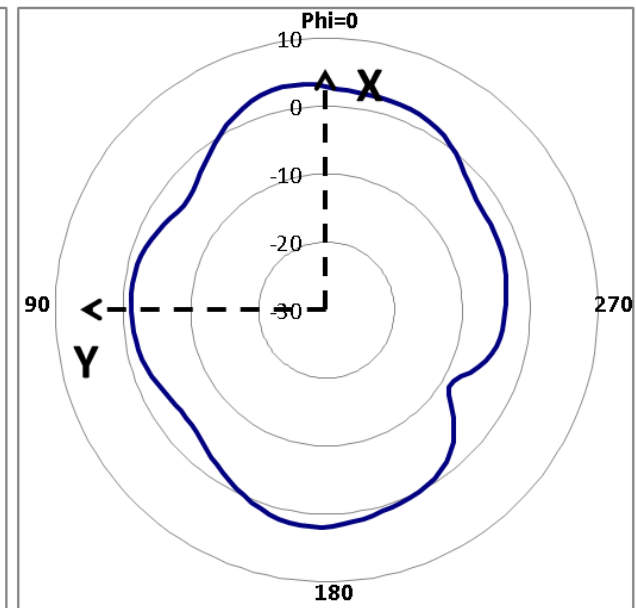
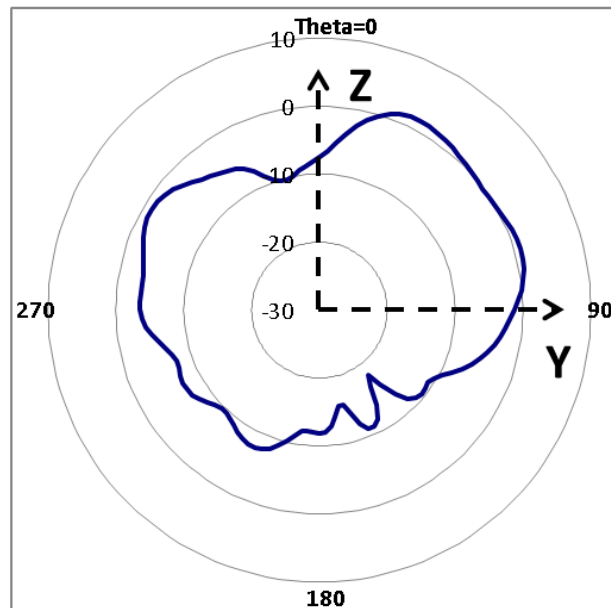
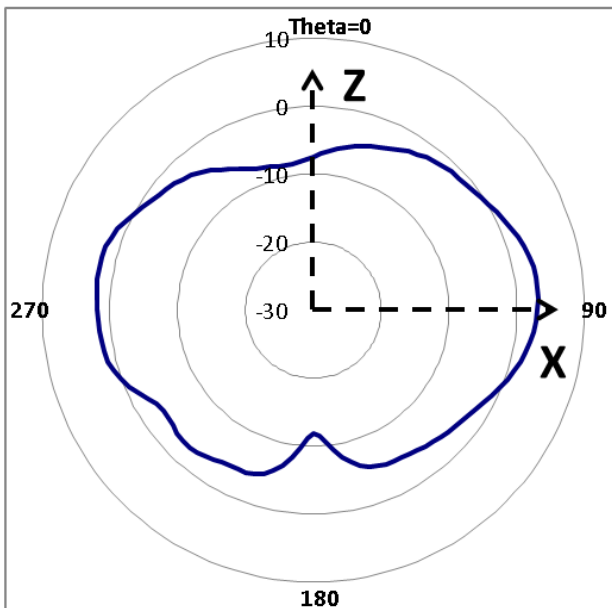
# Radiation Pattern

## Aux



### aux Radiation Pattern

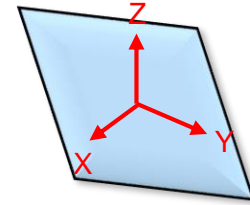
— 2300MHz





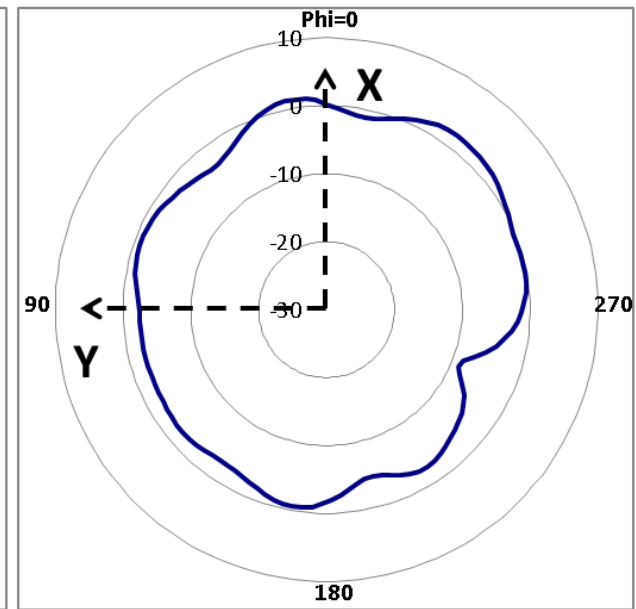
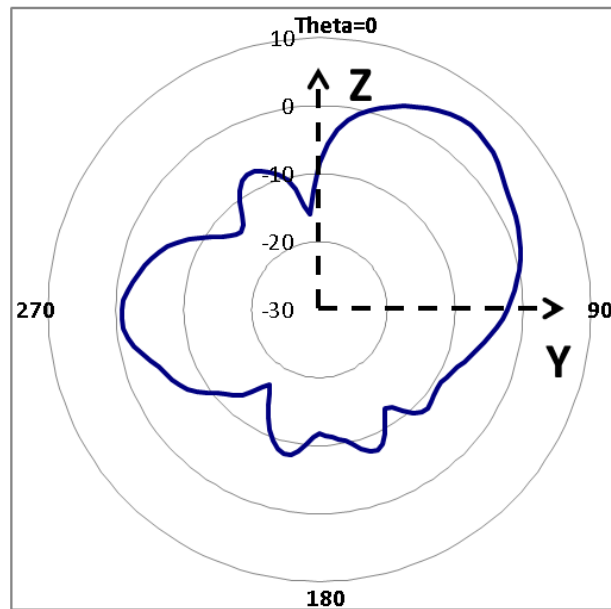
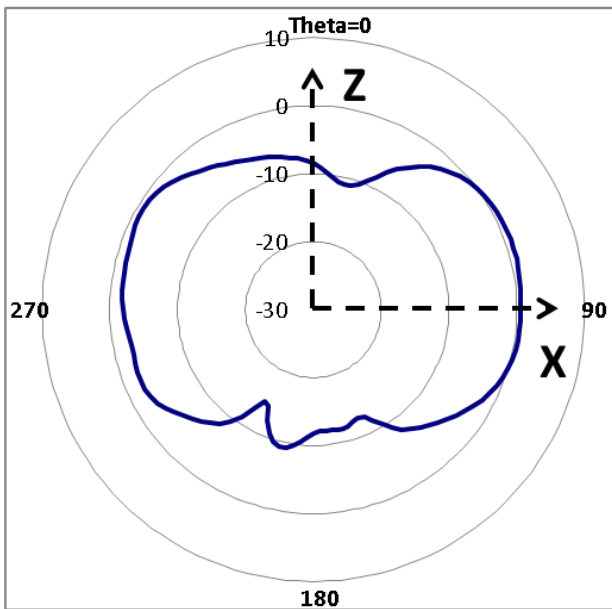
# Radiation Pattern

## Aux



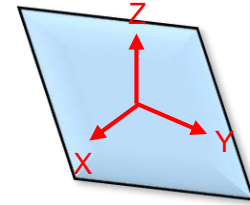
### aux Radiation Pattern

— 2600MHz



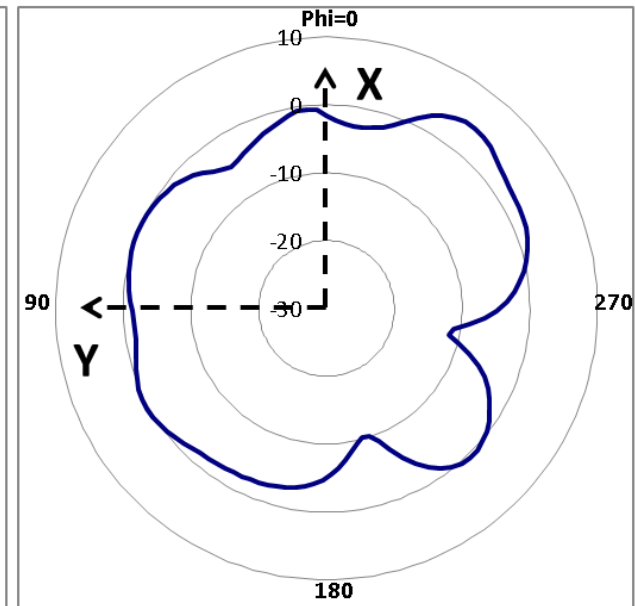
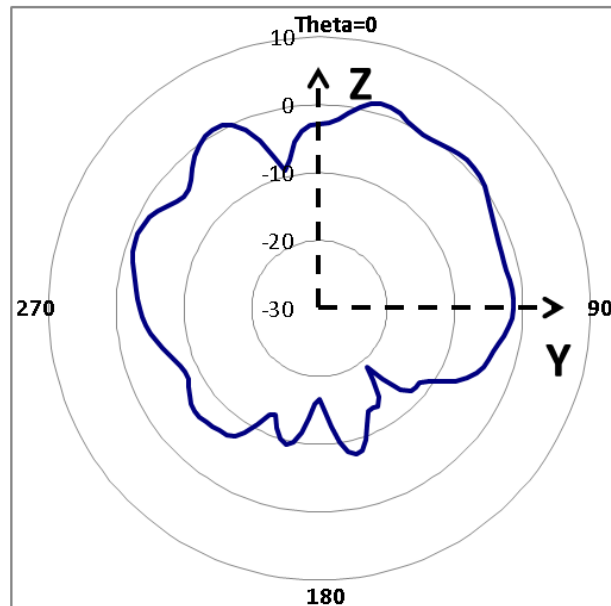
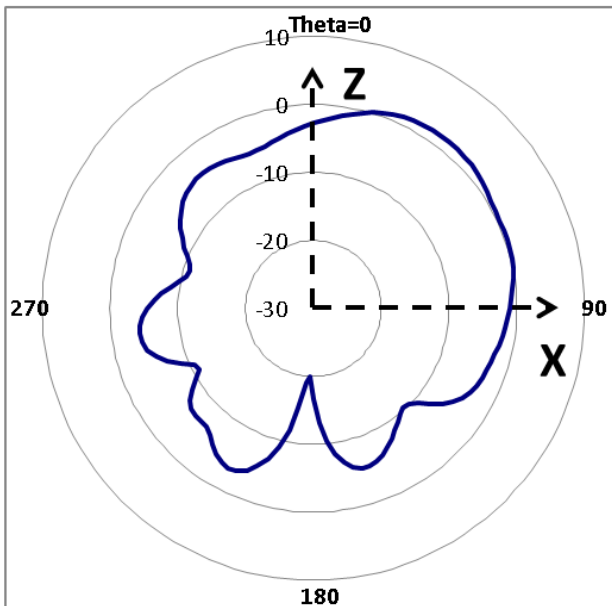
# Radiation Pattern

## Aux



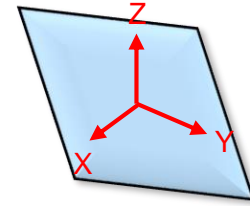
### aux Radiation Pattern

— 3300MHz



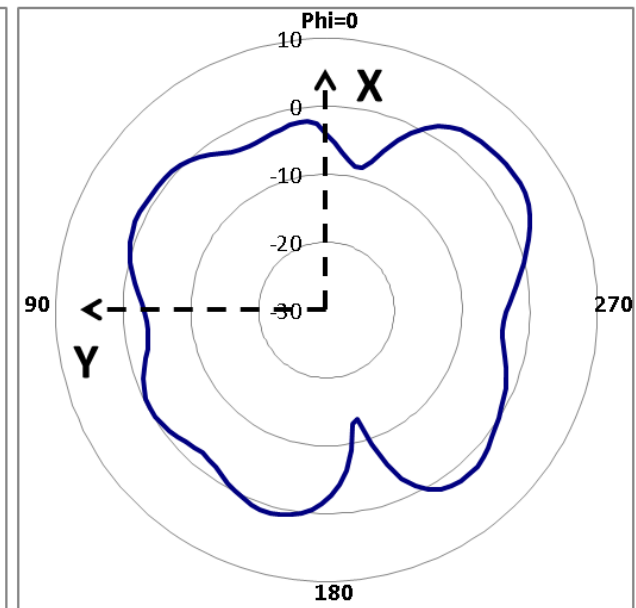
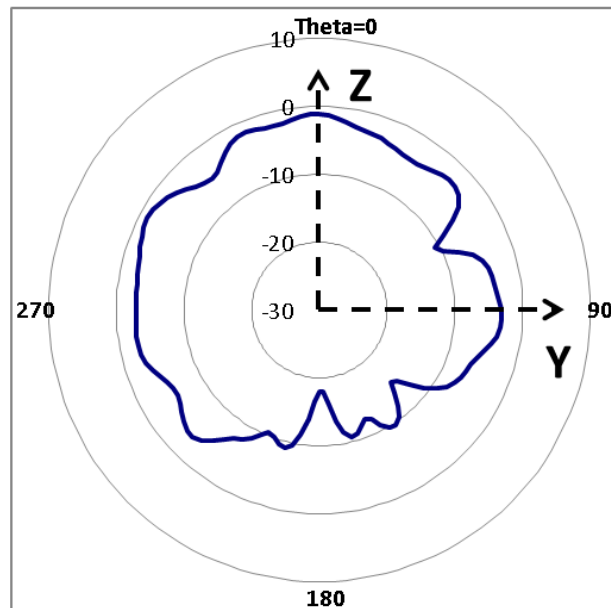
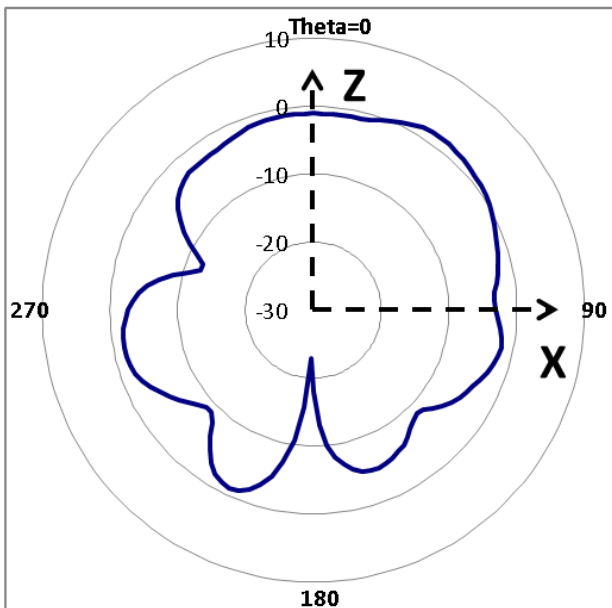
# Radiation Pattern

## Aux



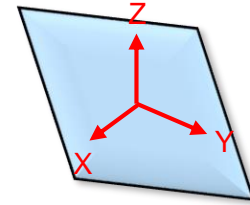
### aux Radiation Pattern

— 3500MHz



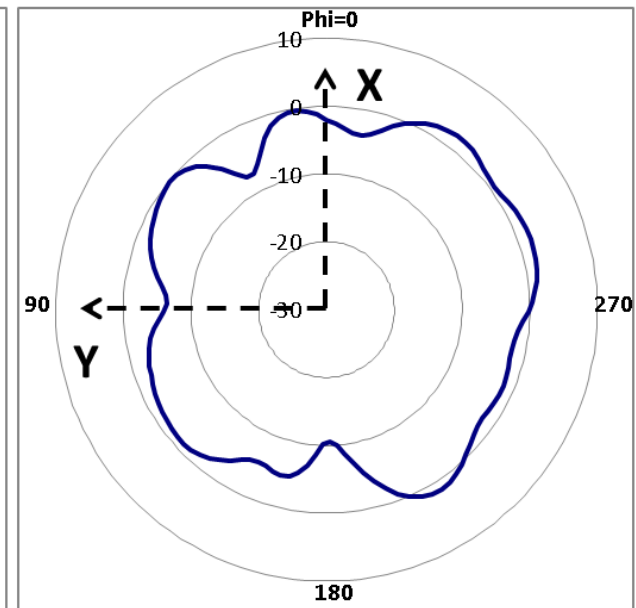
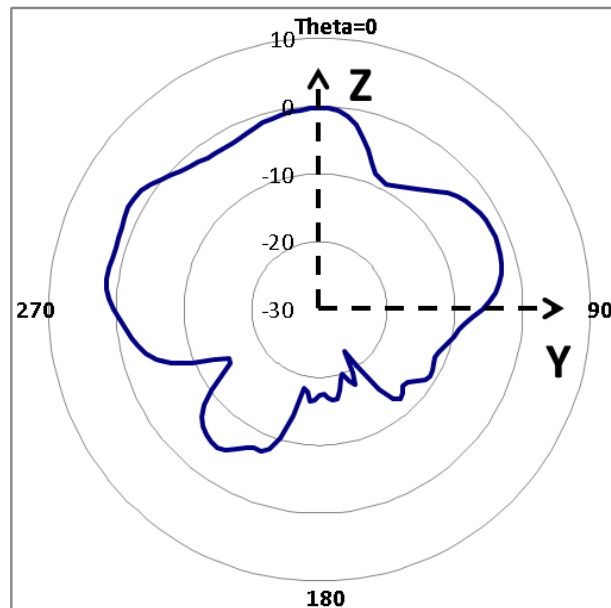
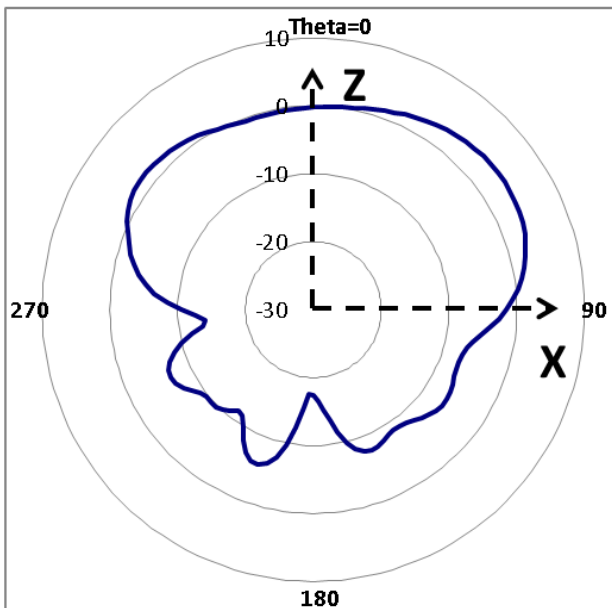
# Radiation Pattern

## Aux



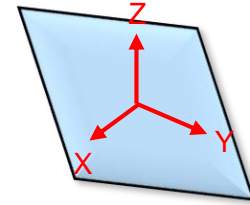
### aux Radiation Pattern

— 3800MHz



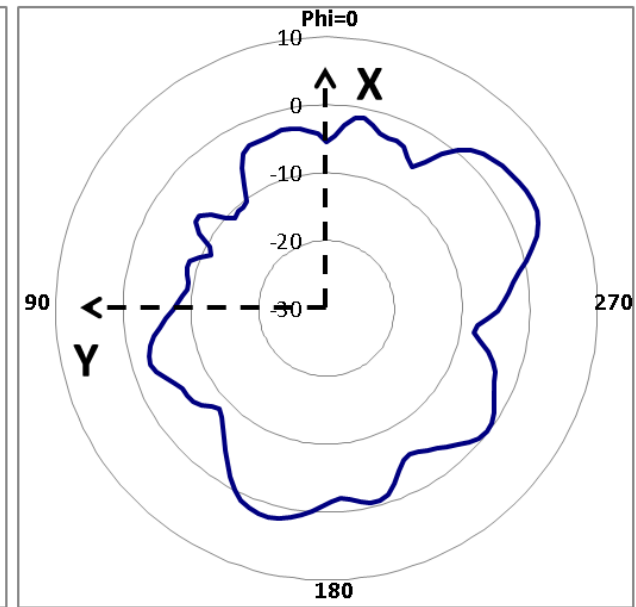
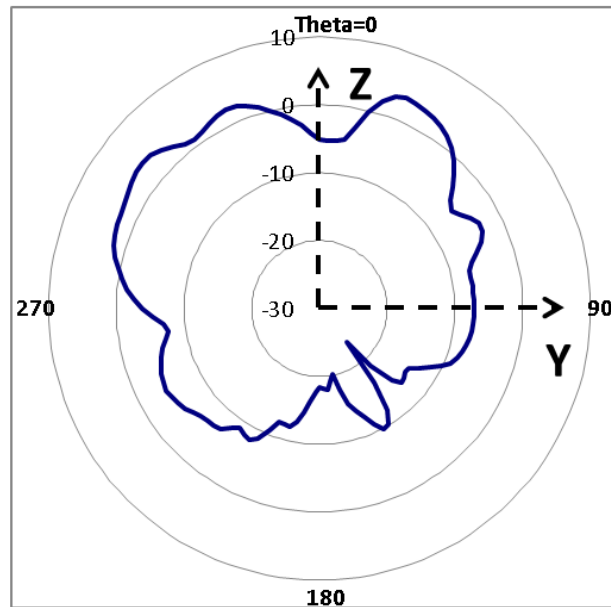
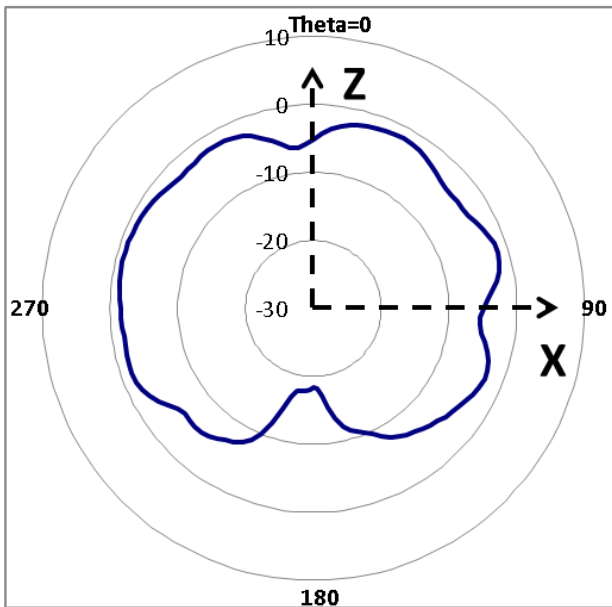
# Radiation Pattern

## Aux



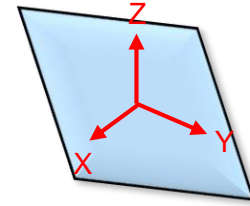
### aux Radiation Pattern

— 4700MHz



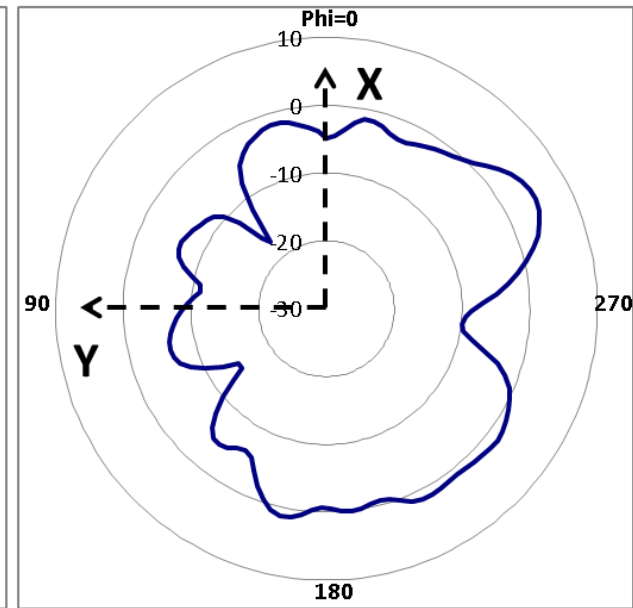
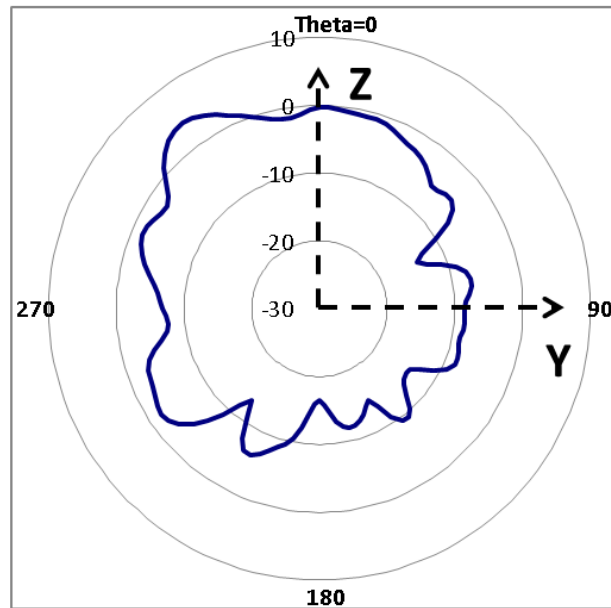
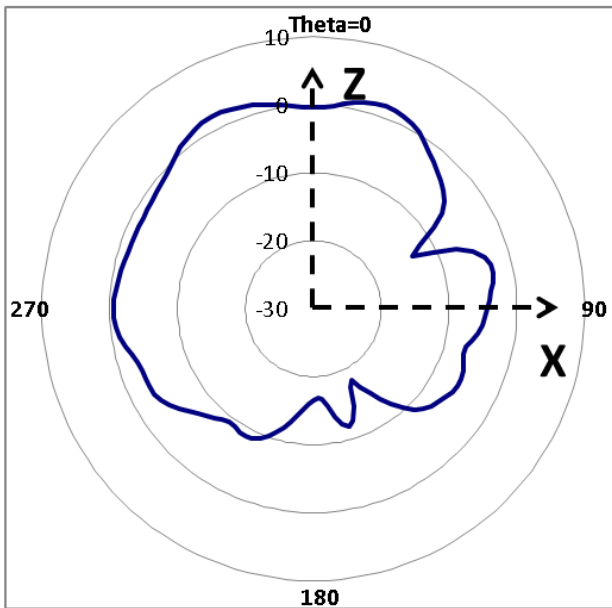
# Radiation Pattern

## Aux



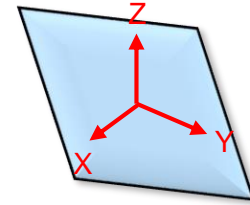
### aux Radiation Pattern

— 5250MHz



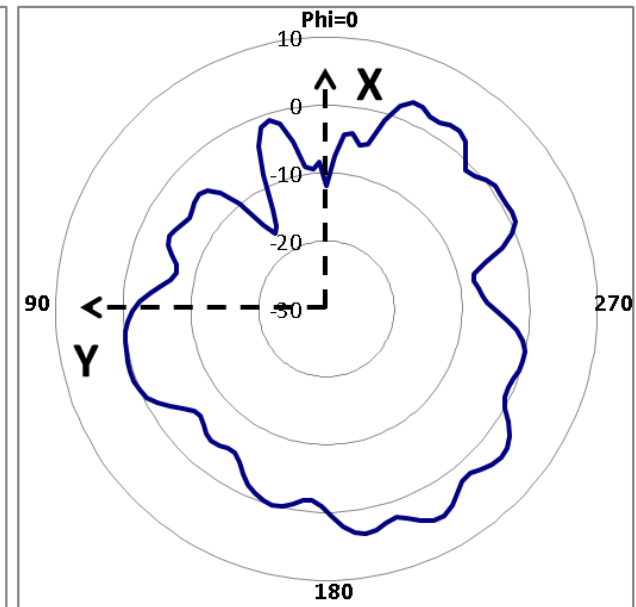
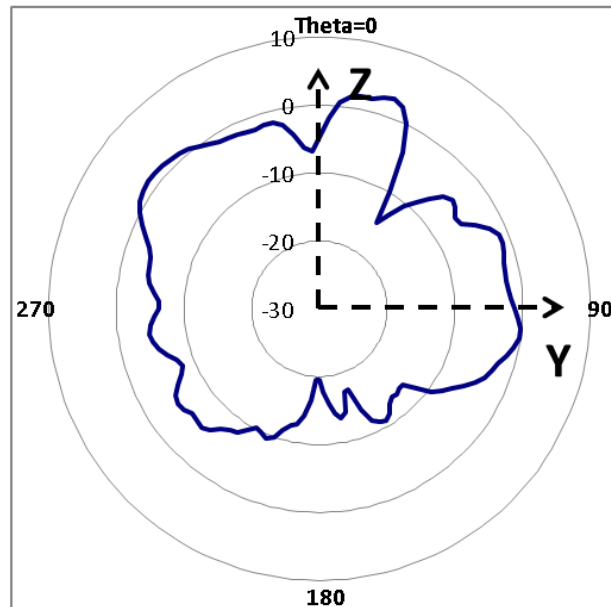
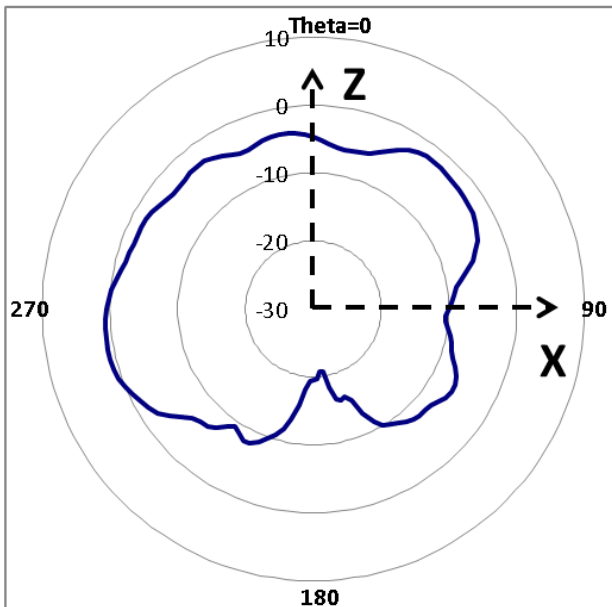
# Radiation Pattern

## Aux

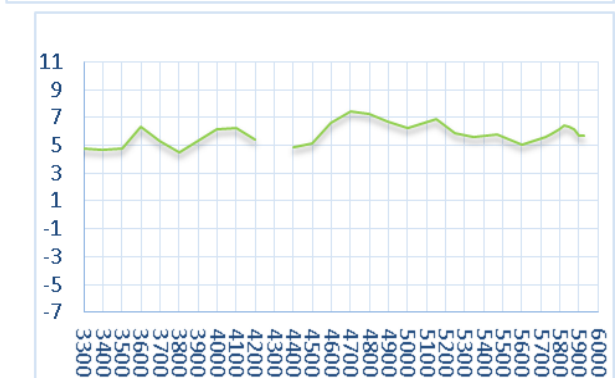
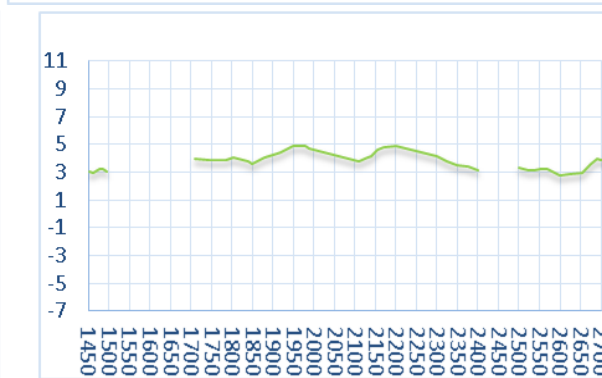
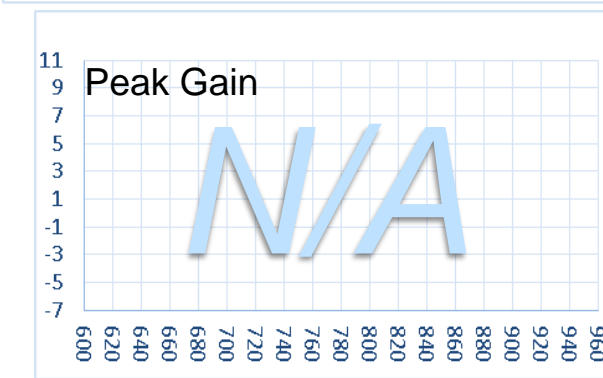
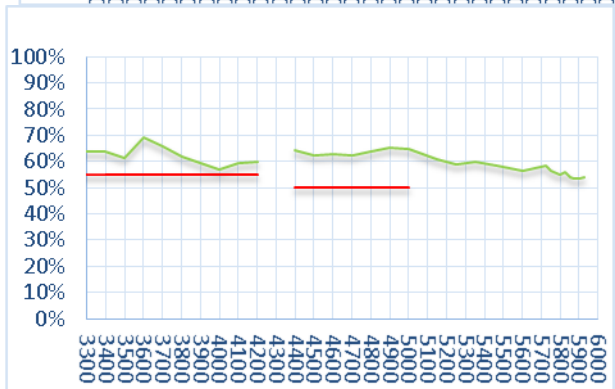
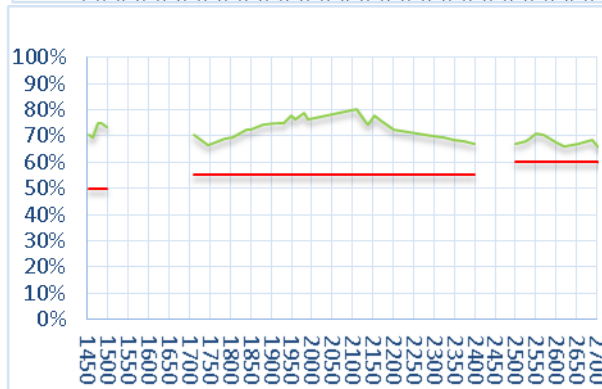
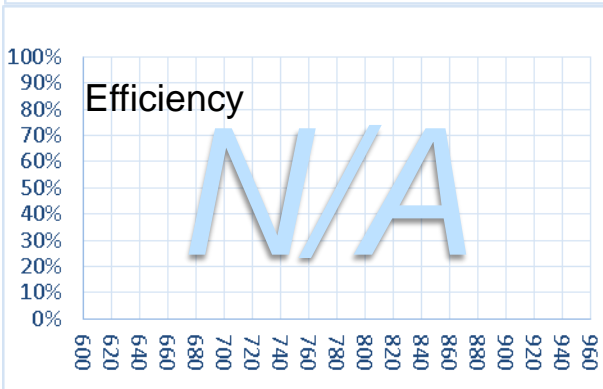
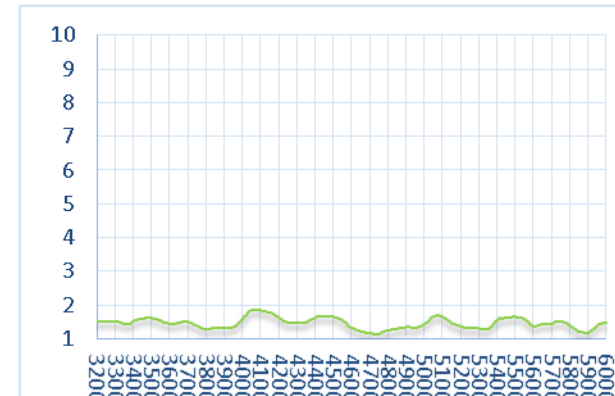
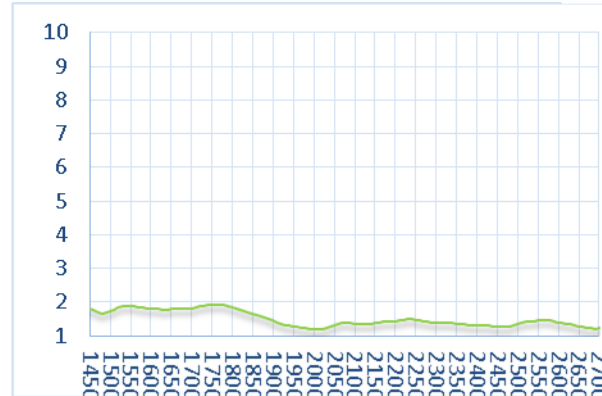
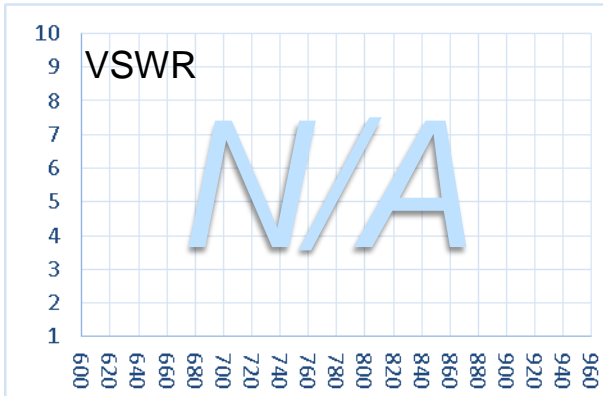


### aux Radiation Pattern

— 5725MHz



# MIMO1





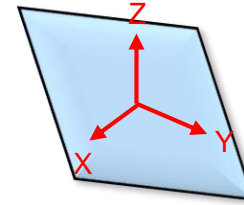
# Gain table (MIMO1)

Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)
1452	3.0	1710	4.0	2500	3.3	4400	4.9
1463	2.9	1747	3.9	2525	3.1	4500	5.1
1476	3.2	1785	3.9	2535	3.1	4600	6.6
1486	3.2	1805	4.0	2550	3.2	4700	7.5
1496	3.1	1840	3.8	2570	3.3	4800	7.3
		1850	3.6	2600	2.8	4900	6.7
		1880	4.1	2620	2.9	5000	6.2
		1910	4.4	2655	2.9	5150	6.9
		1920	4.4	2675	3.6	5250	5.9
		1930	4.6	2690	3.9	5350	5.6
		1950	4.9	2700	3.9	5470	5.8
		1960	4.8	3300	4.8	5600	5.1
		1980	4.9	3400	4.7	5725	5.6
		1990	4.7	3500	4.8	5750	5.8
		2110	3.8	3600	6.3	5800	6.1
		2132	4.0	3700	5.3	5825	6.4
		2140	4.1	3800	4.5	5850	6.3
		2155	4.6	4000	6.1	5875	6.1
		2170	4.8	4100	6.3	5900	5.7
		2200	4.9	4200	5.4	5925	5.7
		2300	4.2				
		2325	3.8				
		2350	3.5				
		2375	3.4				
		2400	3.1				



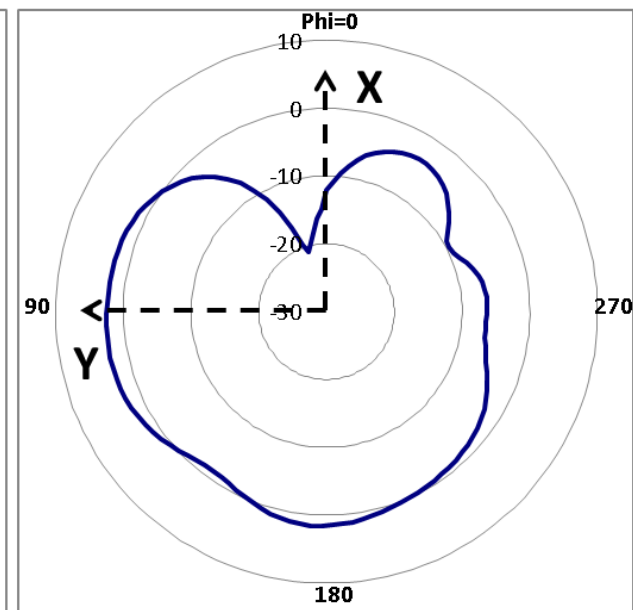
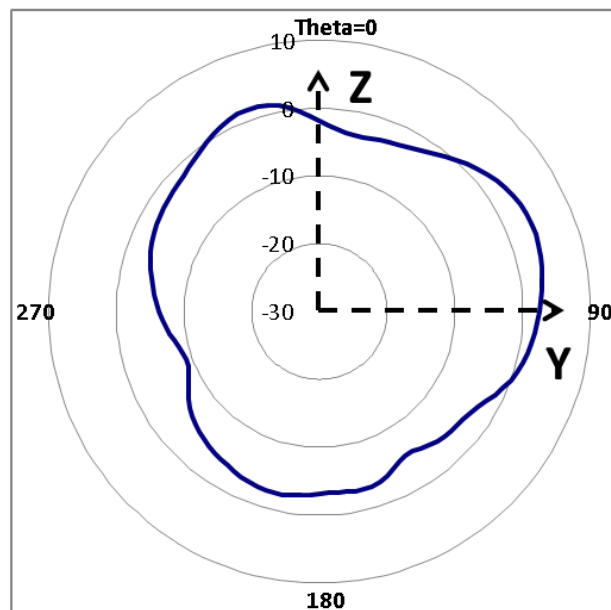
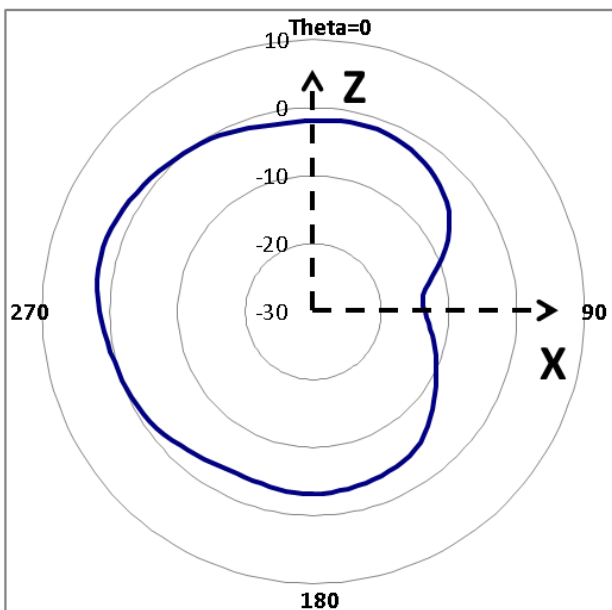
# Radiation Pattern

## MIMO1



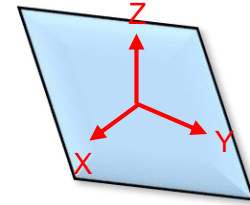
### white mimo1 Radiation Pattern

— 1710MHz



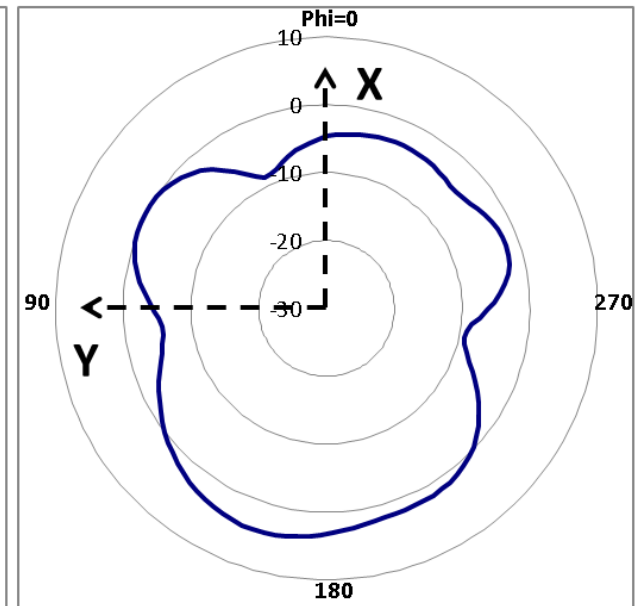
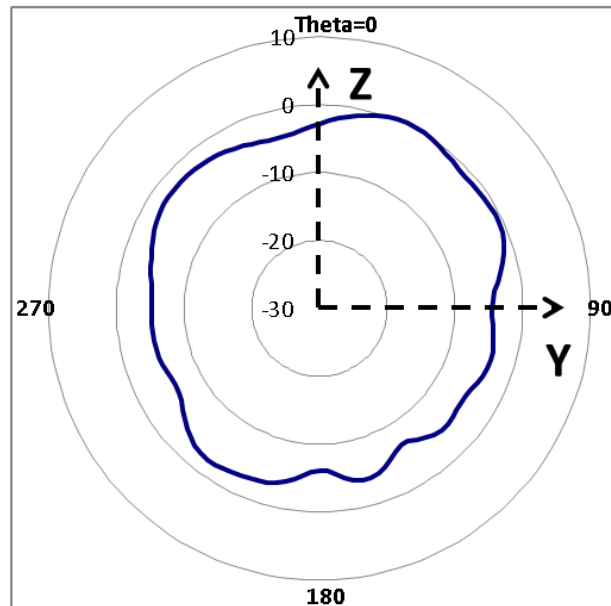
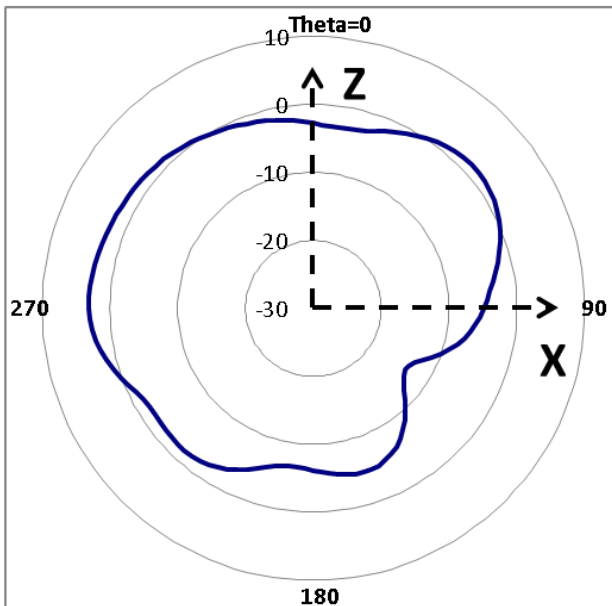
# Radiation Pattern

## MIMO1



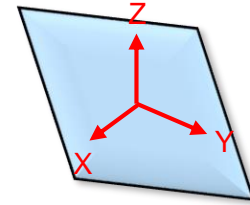
### white mimo1 Radiation Pattern

— 1910MHz



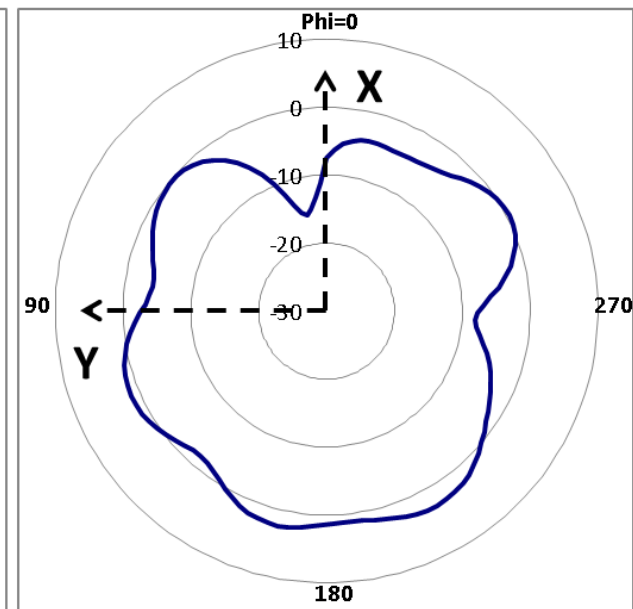
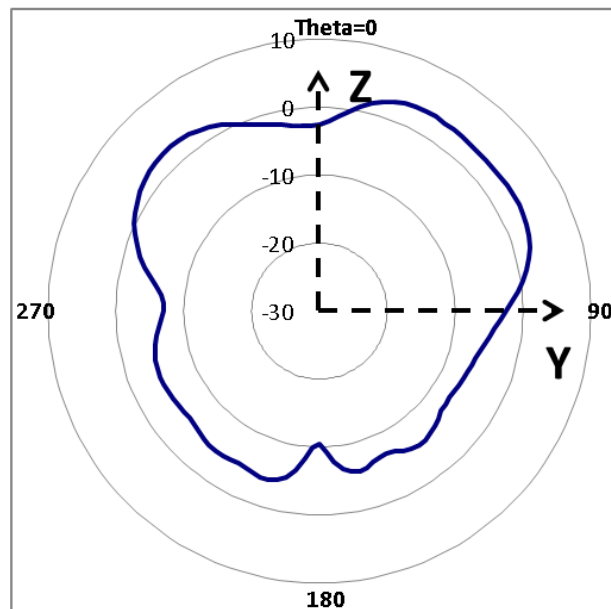
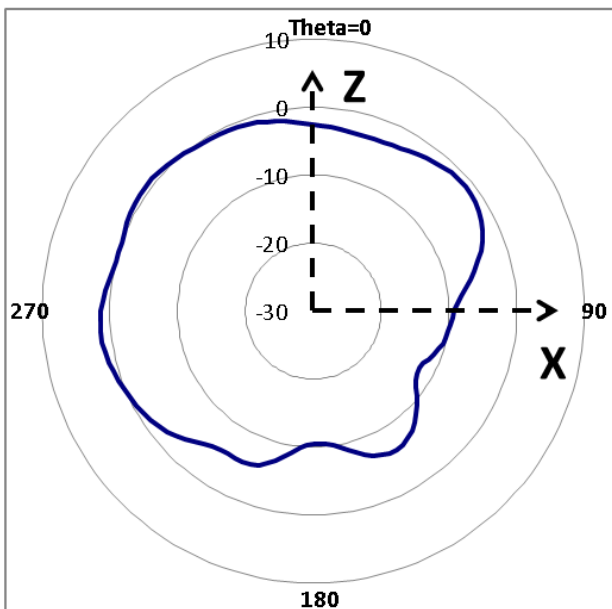
# Radiation Pattern

## MIMO1



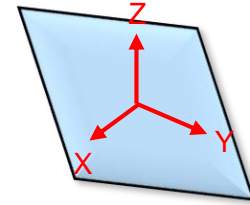
### white mimo1 Radiation Pattern

— 2110MHz



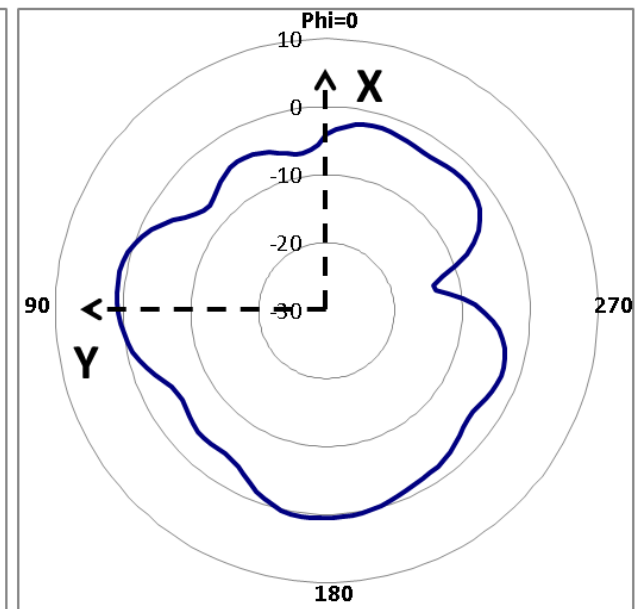
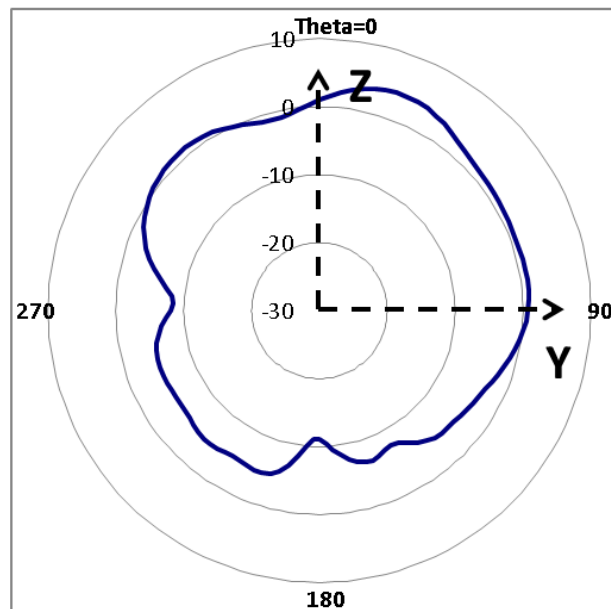
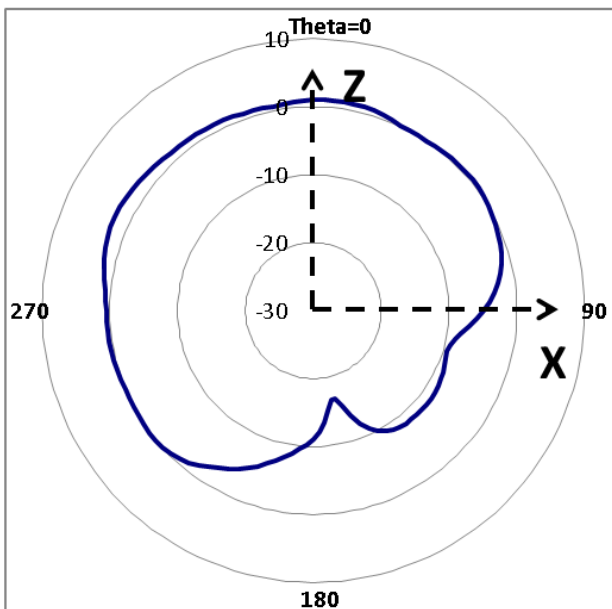
# Radiation Pattern

## MIMO1



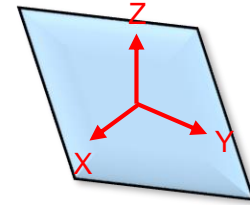
### white mimo1 Radiation Pattern

— 2300MHz



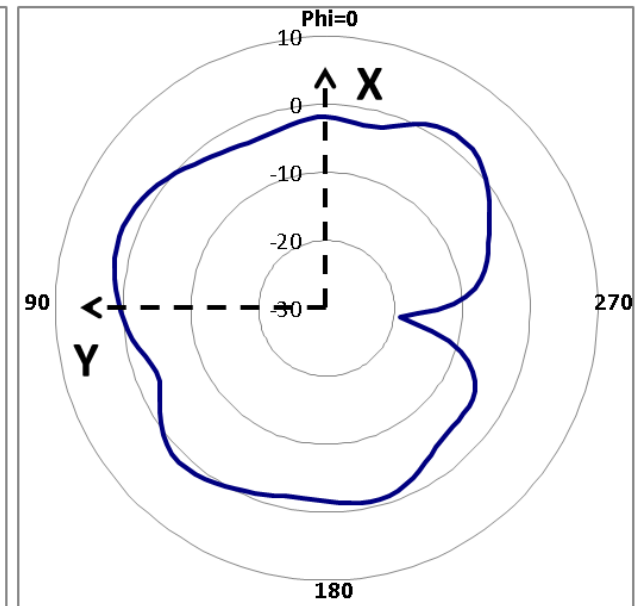
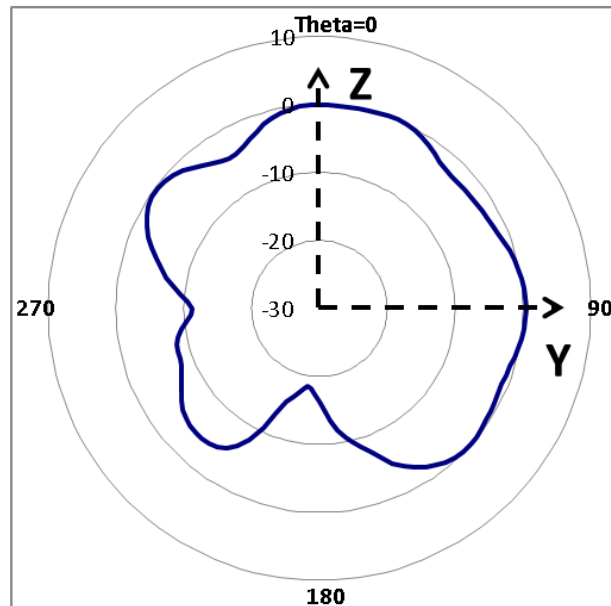
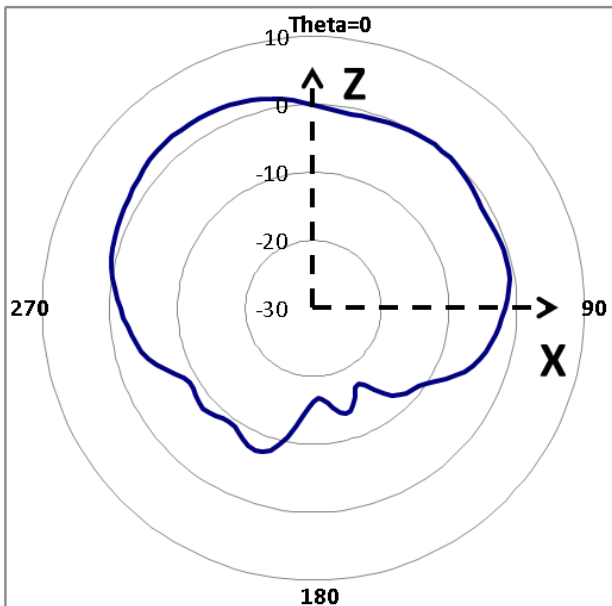
# Radiation Pattern

## MIMO1



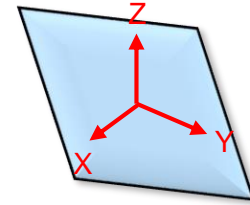
### white mimo1 Radiation Pattern

— 2600MHz



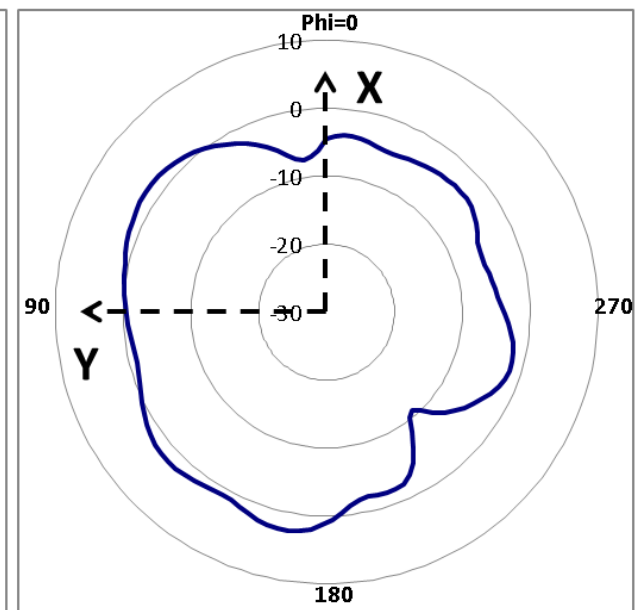
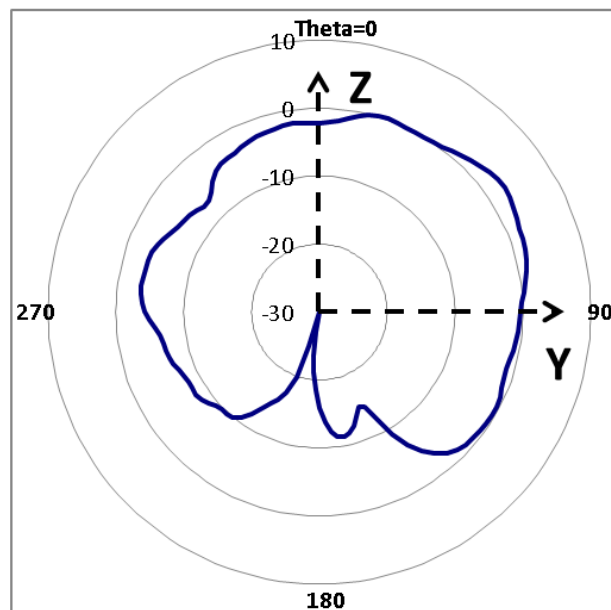
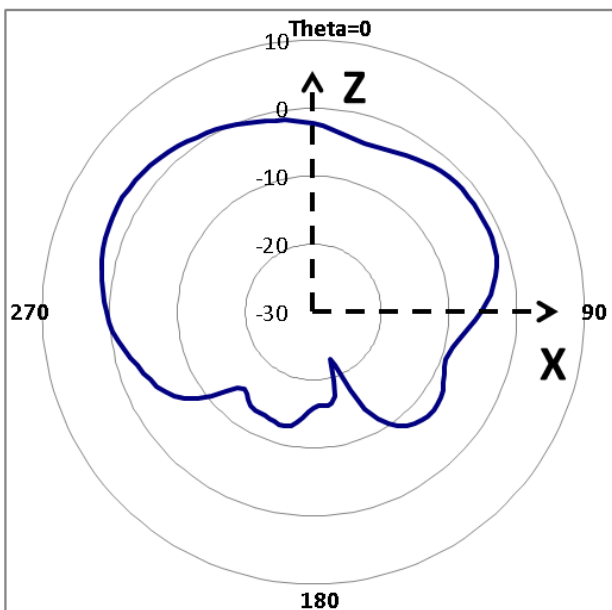
# Radiation Pattern

## MIMO1



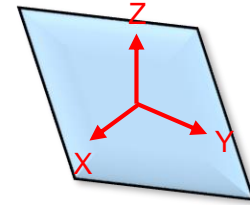
### white mimo1 Radiation Pattern

— 3300MHz



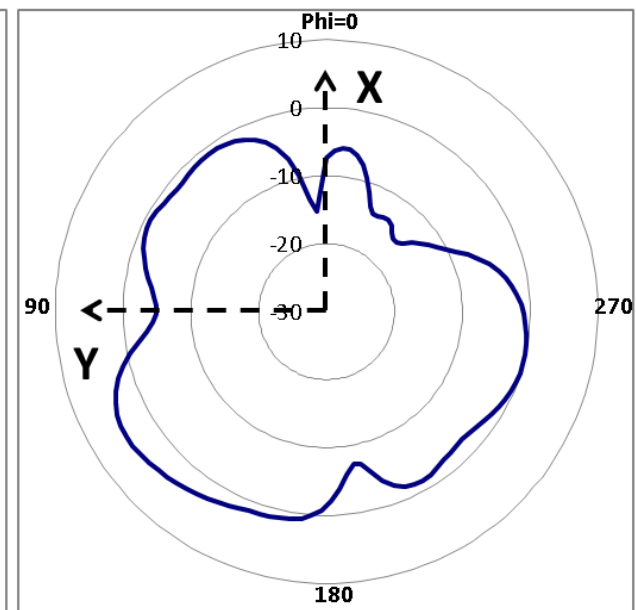
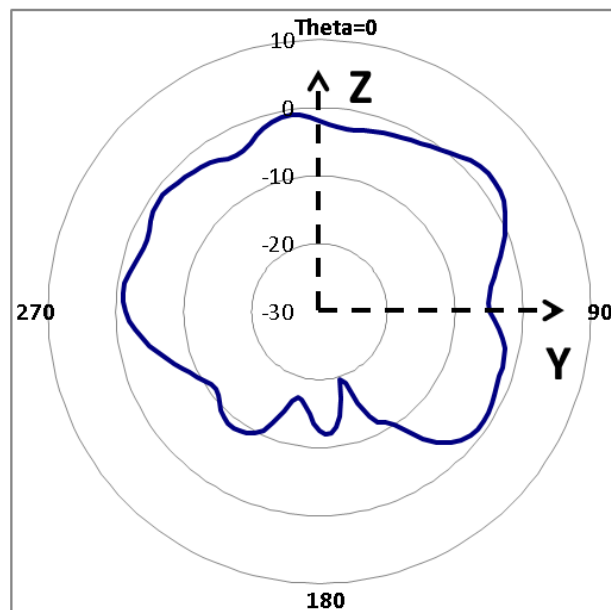
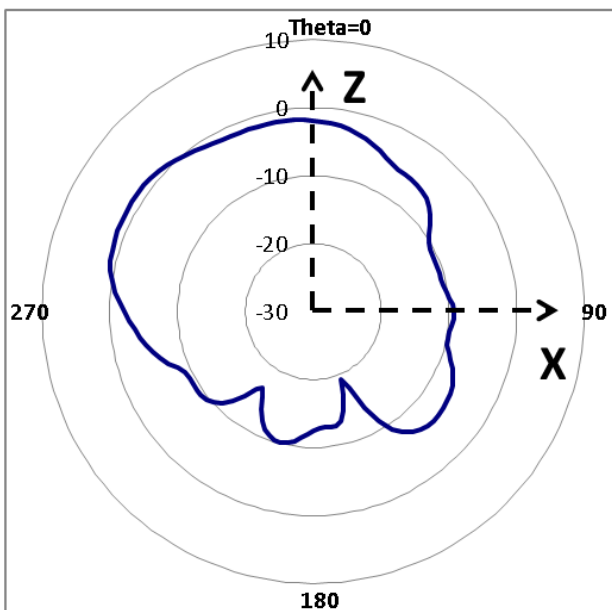
# Radiation Pattern

## MIMO1



### white mimo1 Radiation Pattern

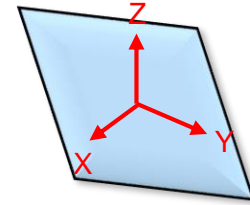
— 3500MHz





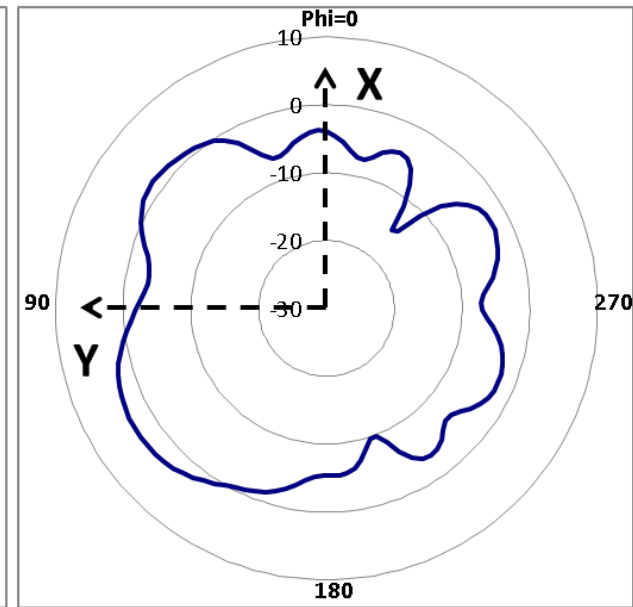
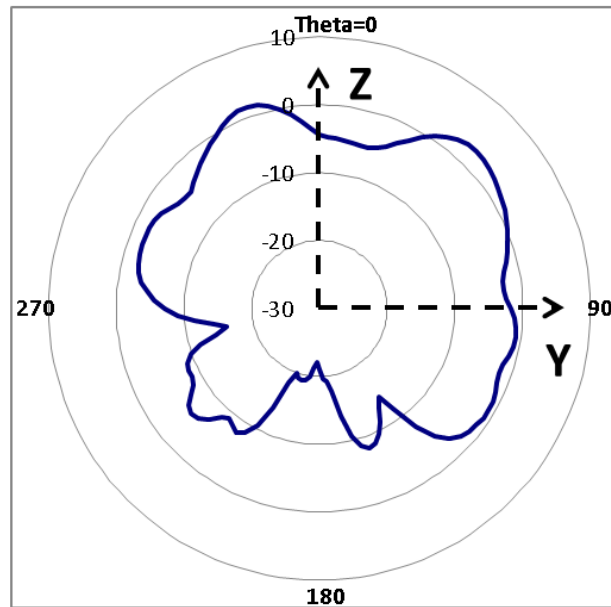
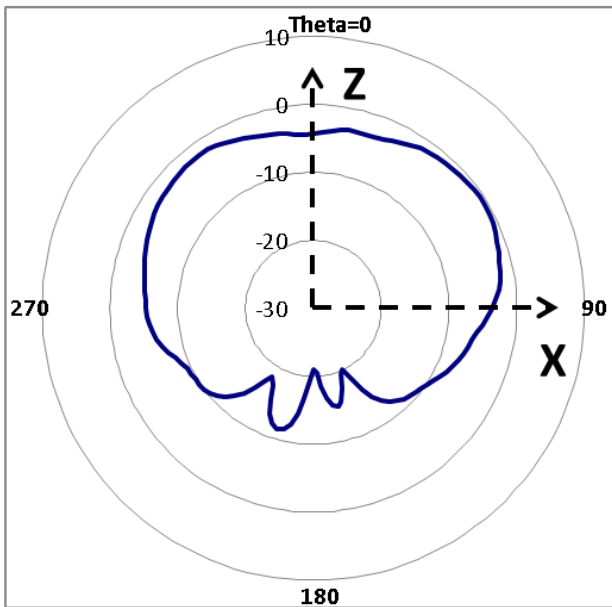
# Radiation Pattern

## MIMO1



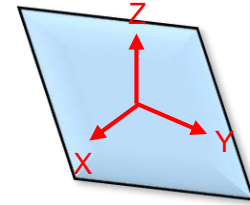
### white mimo1 Radiation Pattern

— 3800MHz



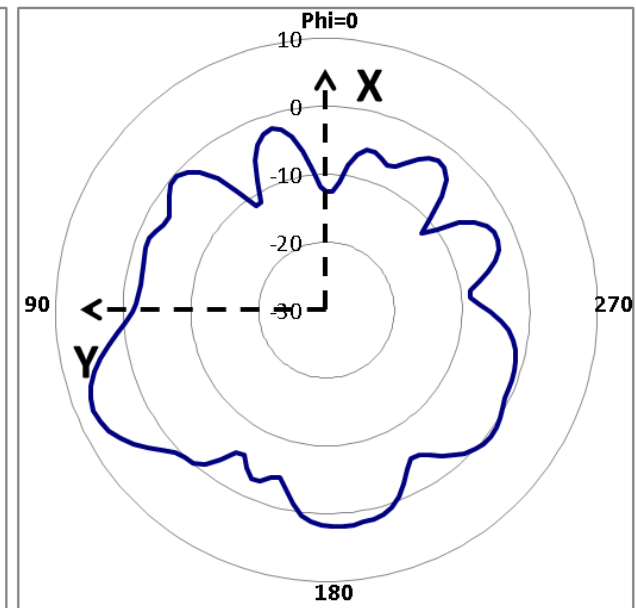
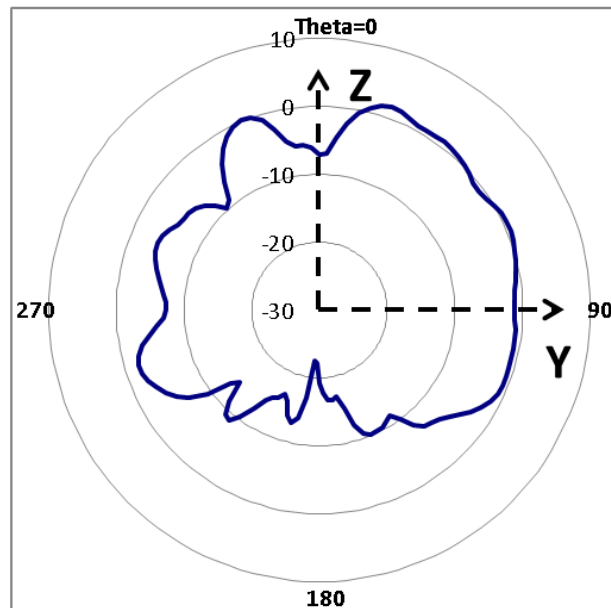
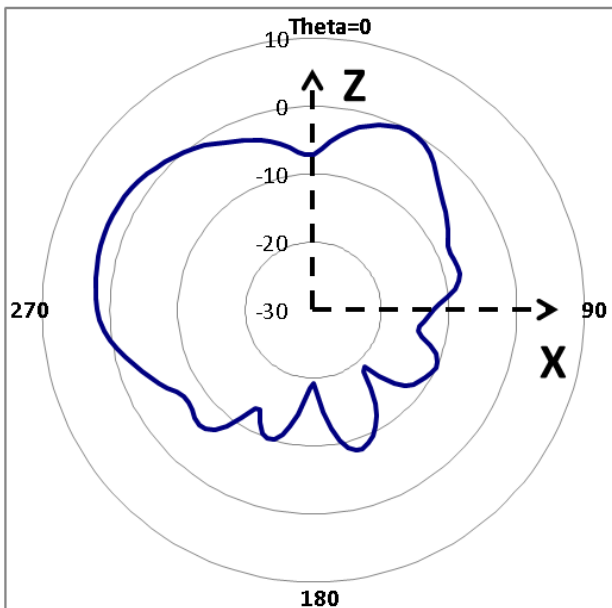
# Radiation Pattern

## MIMO1



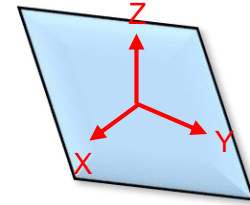
### white mimo1 Radiation Pattern

— 4700MHz



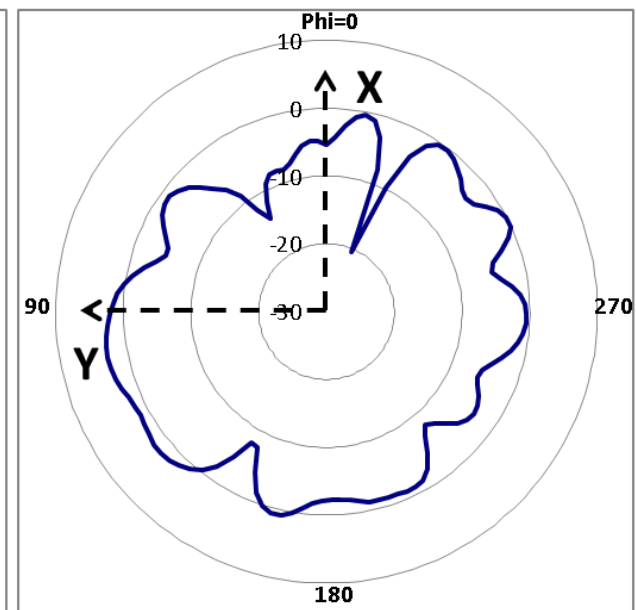
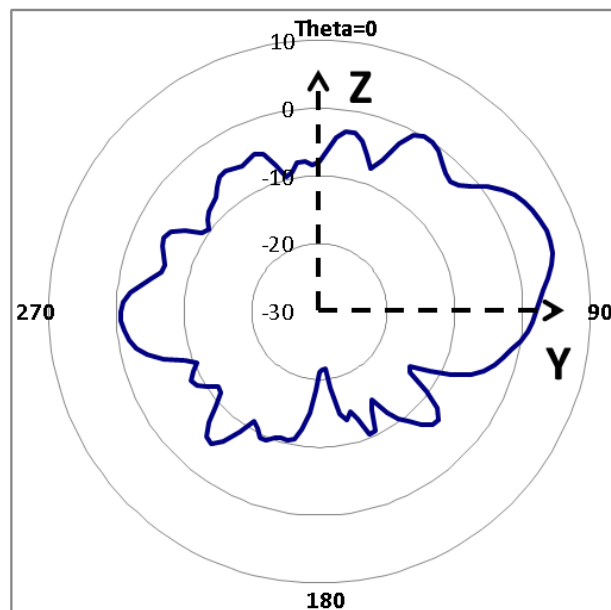
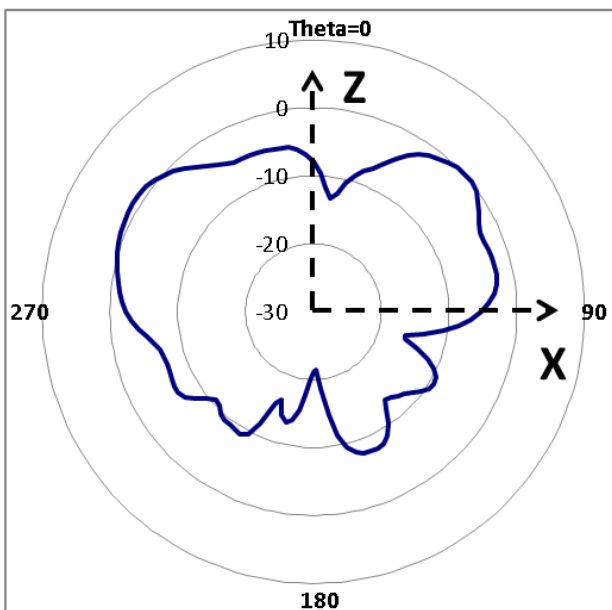
# Radiation Pattern

## MIMO1



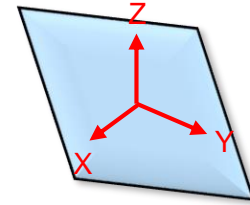
### white mimo1 Radiation Pattern

— 5250MHz



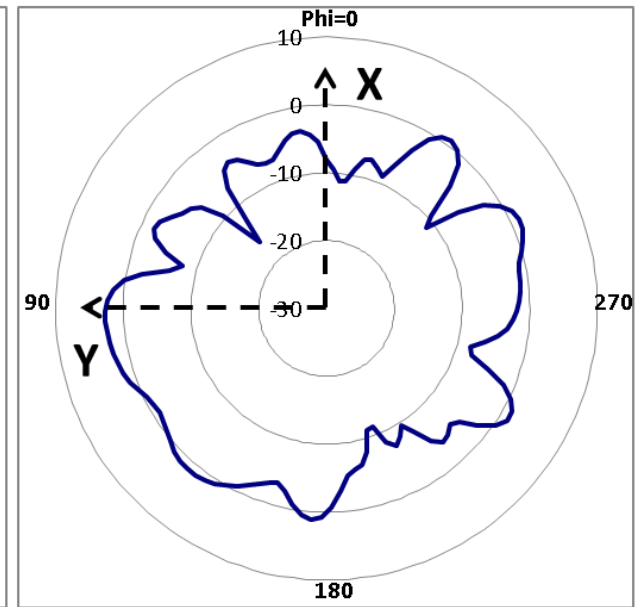
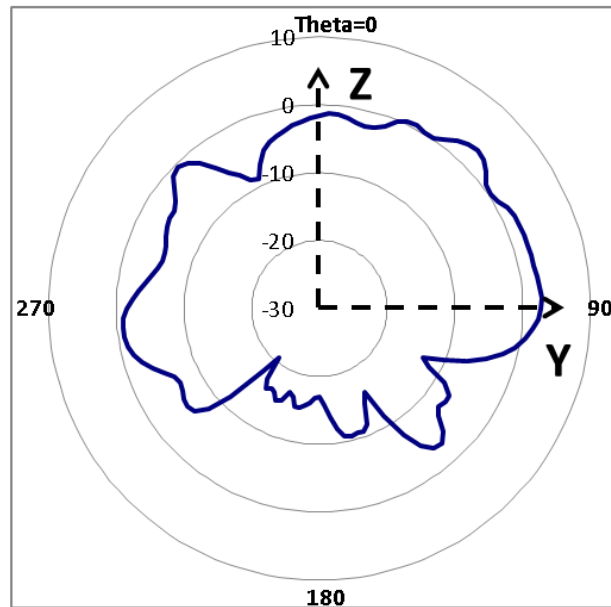
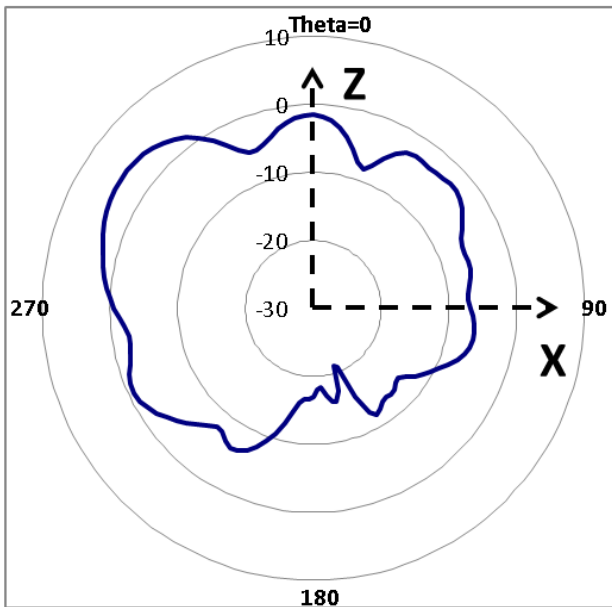
# Radiation Pattern

## MIMO1

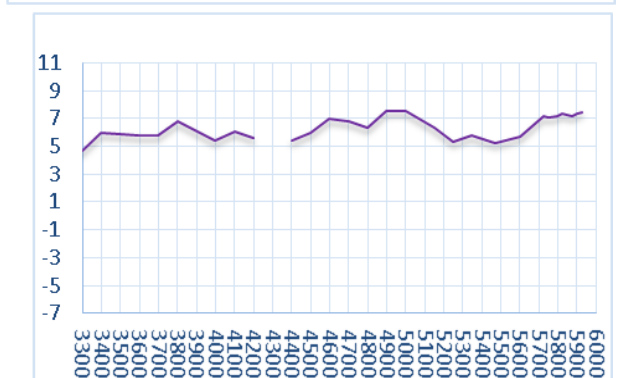
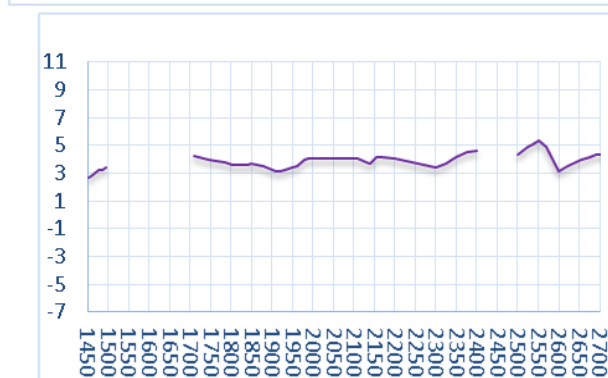
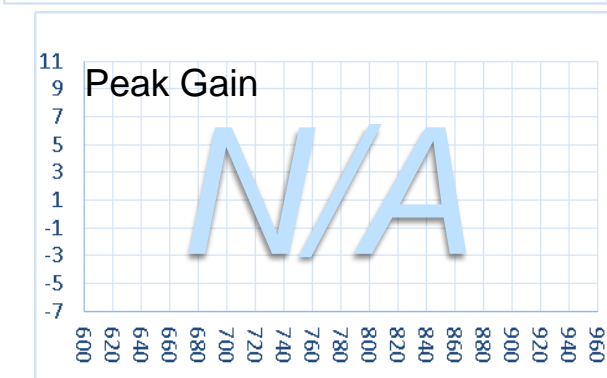
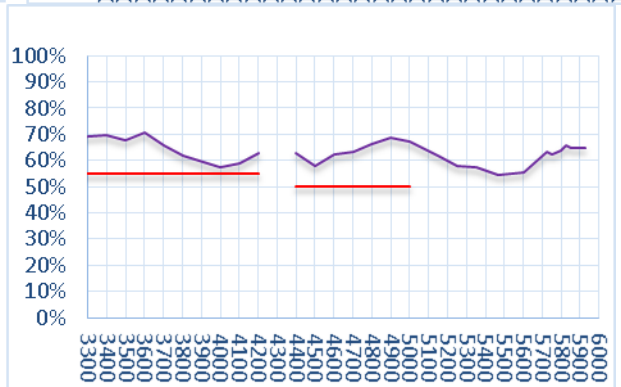
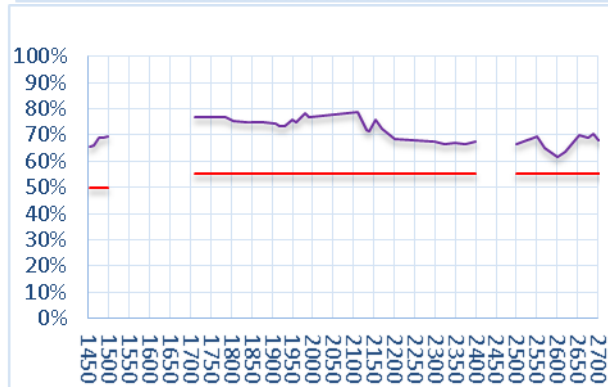
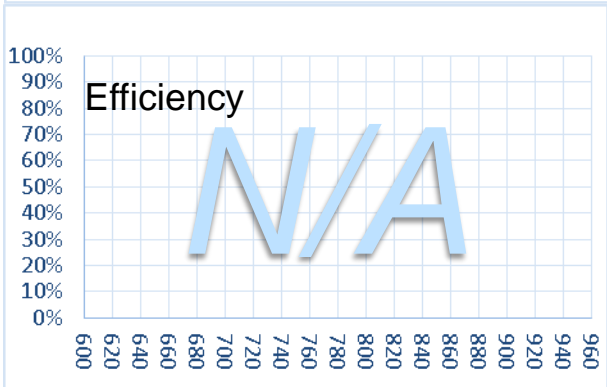
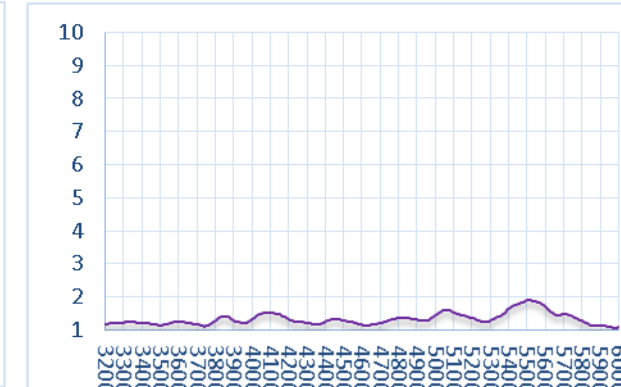
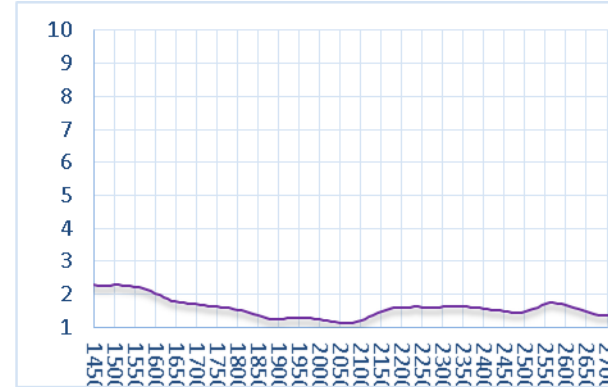
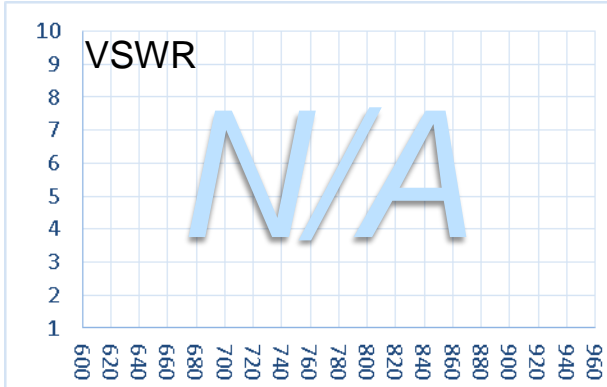


### white mimo1 Radiation Pattern

— 5725MHz



# MIMO2



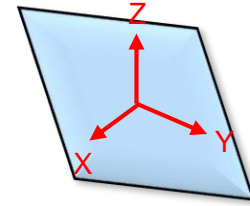
# Gain table (MIMO2)

Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)	Frequency (MHz)	Peak gain (dBi)
1452	2.7	1710	4.2	2500	4.3	4400	5.4
1463	2.8	1747	4.0	2525	4.9	4500	5.9
1476	3.2	1785	3.8	2535	5.1	4600	6.9
1486	3.2	1805	3.6	2550	5.3	4700	6.8
1496	3.4	1840	3.6	2570	4.9	4800	6.4
		1850	3.6	2600	3.1	4900	7.5
		1880	3.5	2620	3.5	5000	7.6
		1910	3.1	2655	4.0	5150	6.4
		1920	3.1	2675	4.1	5250	5.3
		1930	3.2	2690	4.3	5350	5.8
		1950	3.4	2700	4.3	5470	5.2
		1960	3.5	3300	4.7	5600	5.7
		1980	4.0	3400	6.0	5725	7.1
		1990	4.0	3500	5.9	5750	7.1
		2110	4.1	3600	5.8	5800	7.2
		2132	3.7	3700	5.8	5825	7.3
		2140	3.7	3800	6.8	5850	7.3
		2155	4.1	4000	5.4	5875	7.1
		2170	4.2	4100	6.0	5900	7.3
		2200	4.1	4200	5.6	5925	7.4
		2300	3.4				
		2325	3.7				
		2350	4.2				
		2375	4.5				
		2400	4.6				



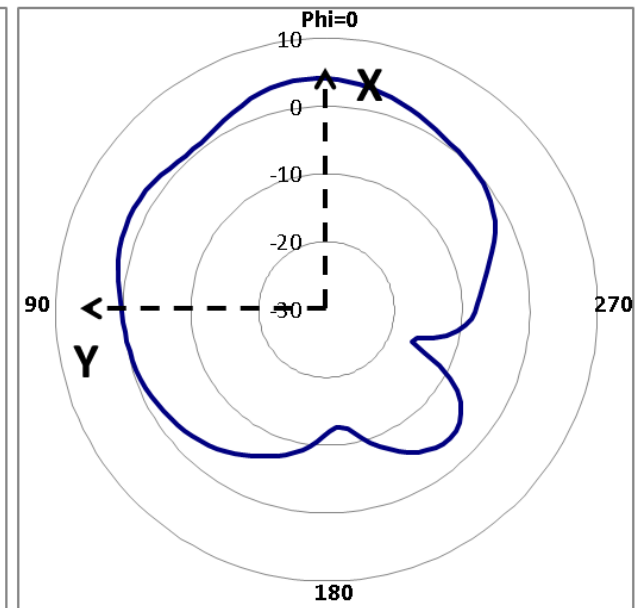
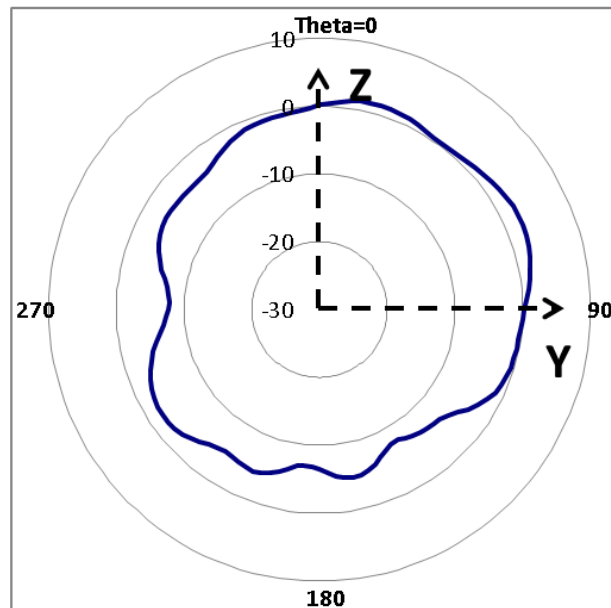
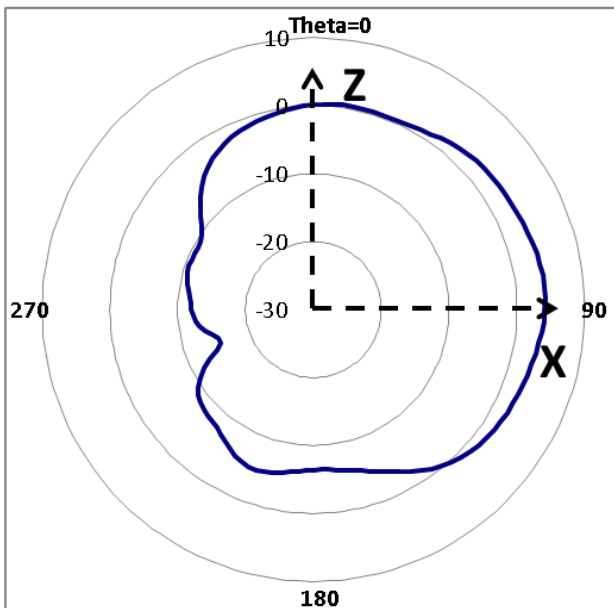
# Radiation Pattern

## MIMO2



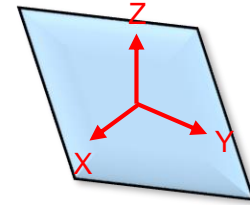
### blue mimo2 Radiation Pattern

— 1710MHz



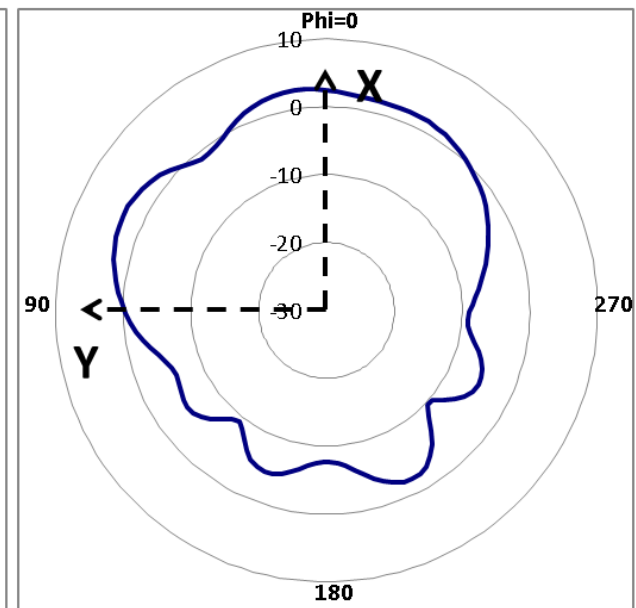
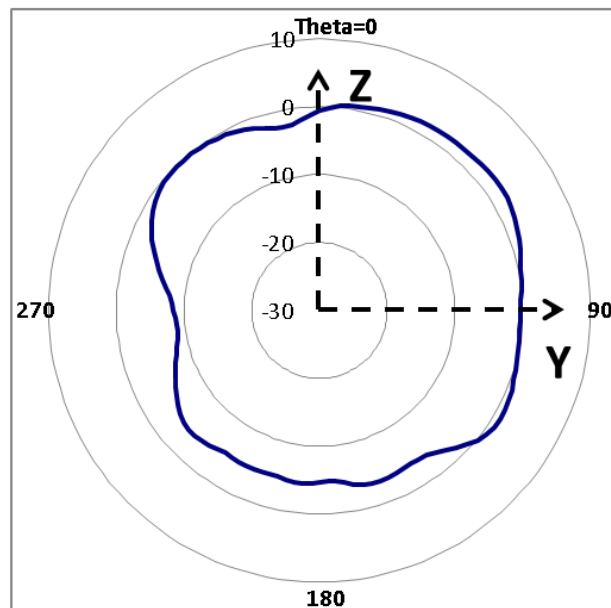
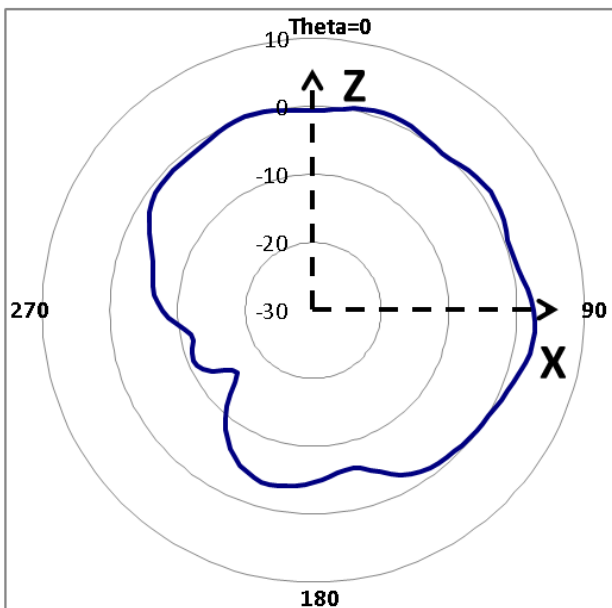
# Radiation Pattern

## MIMO2



### blue mimo2 Radiation Pattern

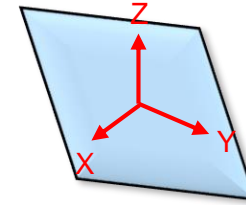
— 1910MHz





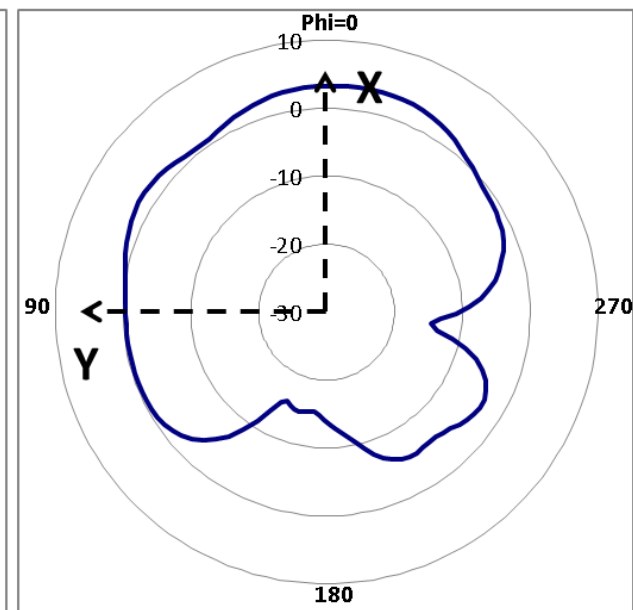
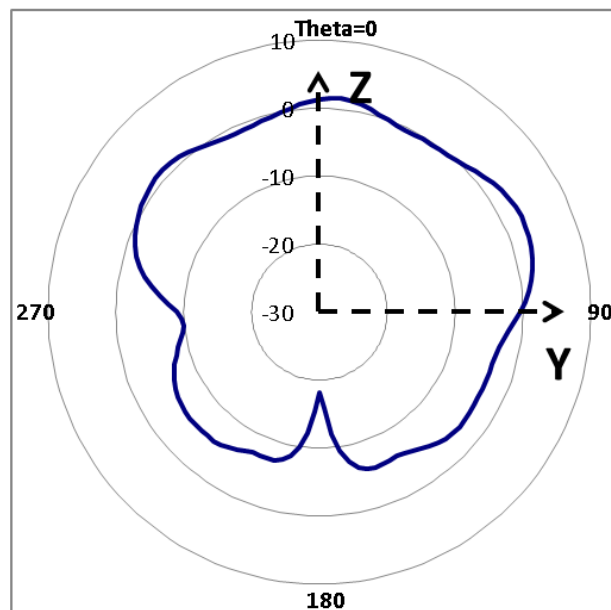
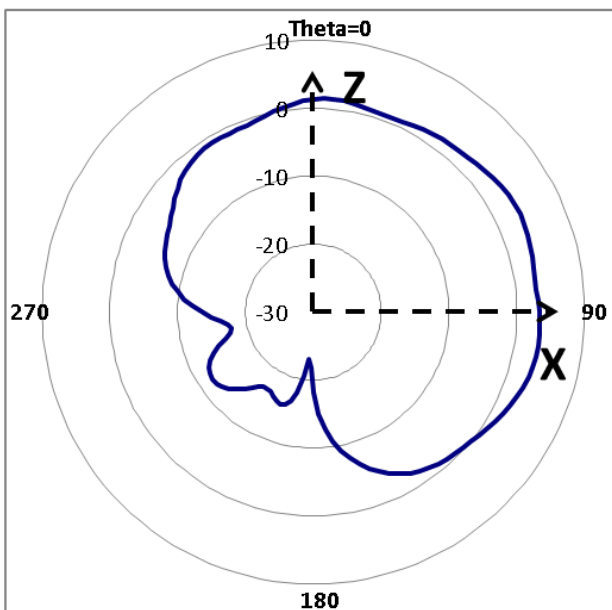
# Radiation Pattern

## MIMO2



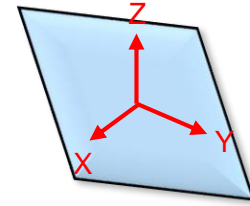
### blue mimo2 Radiation Pattern

— 2110MHz



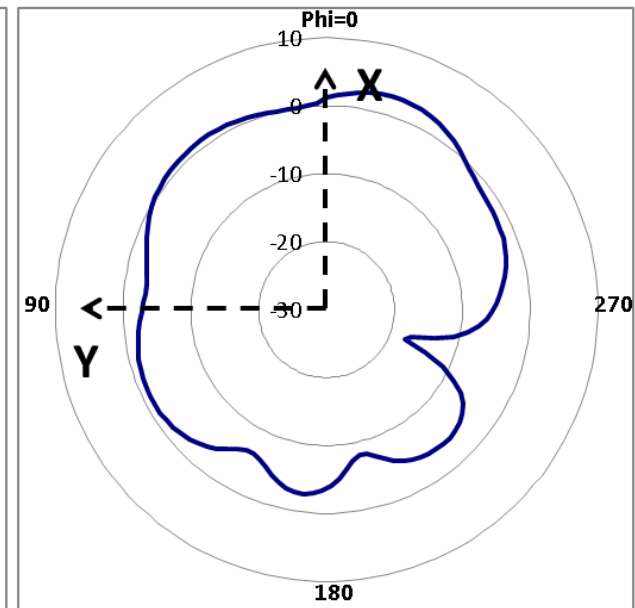
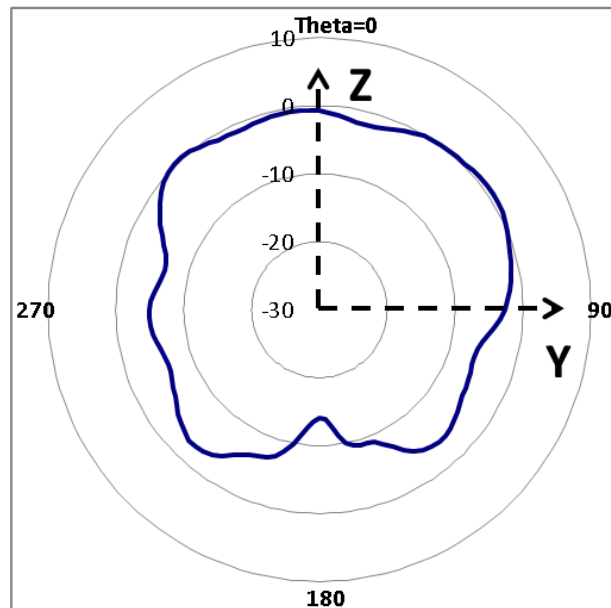
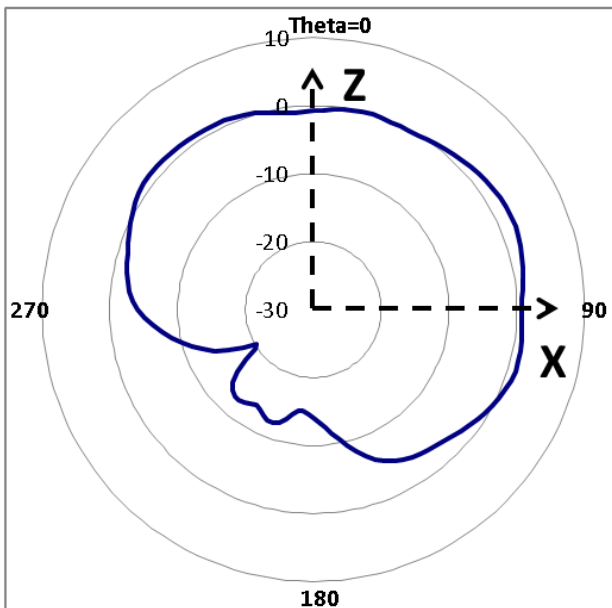
# Radiation Pattern

## MIMO2



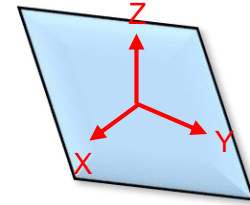
### blue mimo2 Radiation Pattern

— 2300MHz



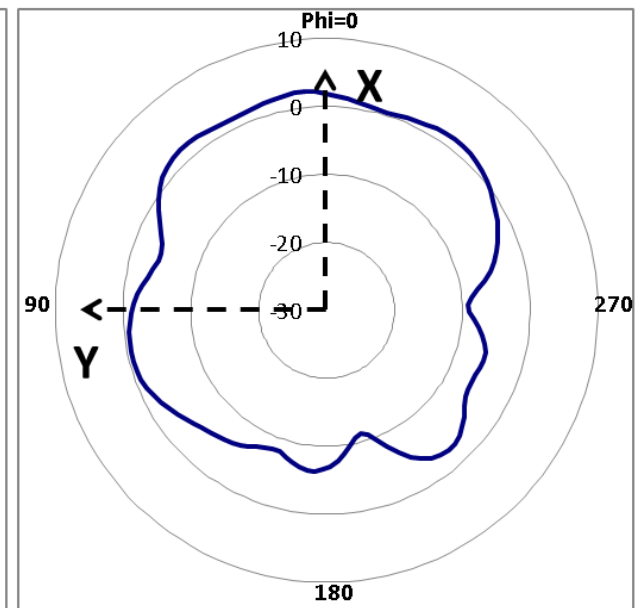
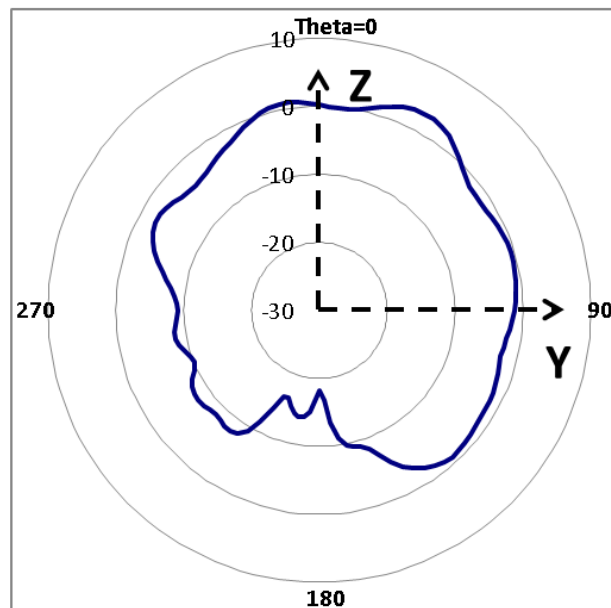
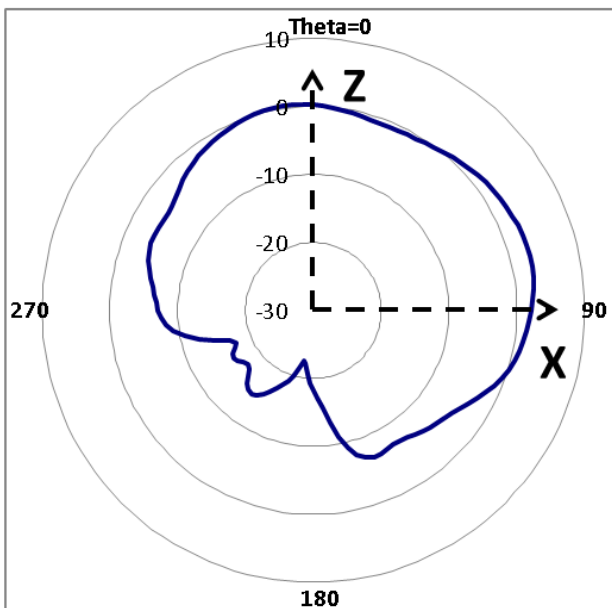
# Radiation Pattern

## MIMO2



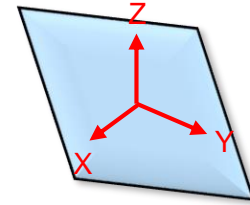
### blue mimo2 Radiation Pattern

— 2600MHz



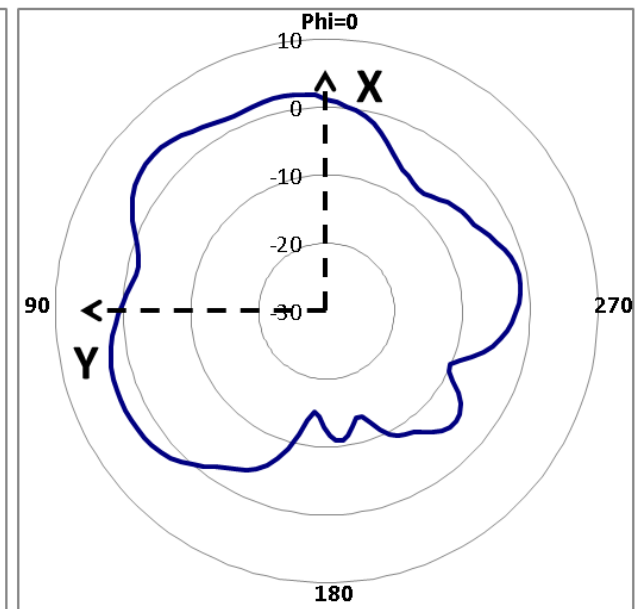
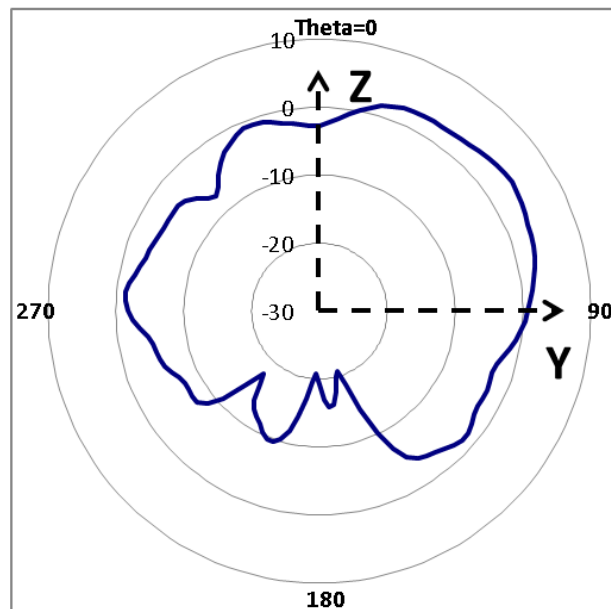
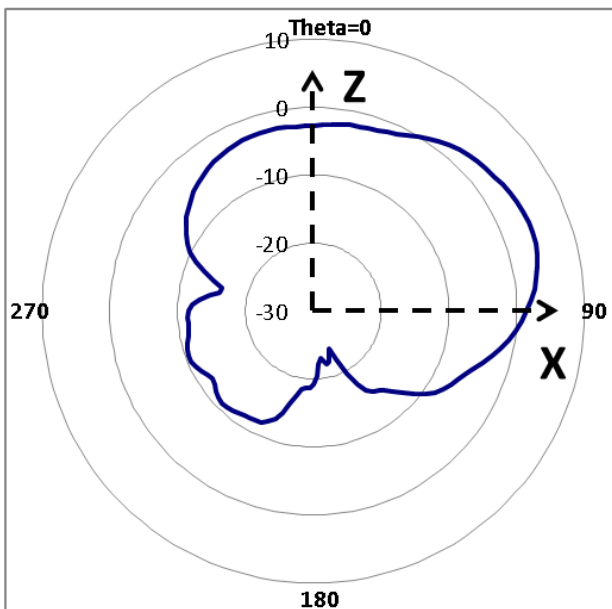
# Radiation Pattern

## MIMO2



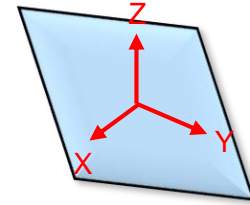
### blue mimo2 Radiation Pattern

— 3300MHz



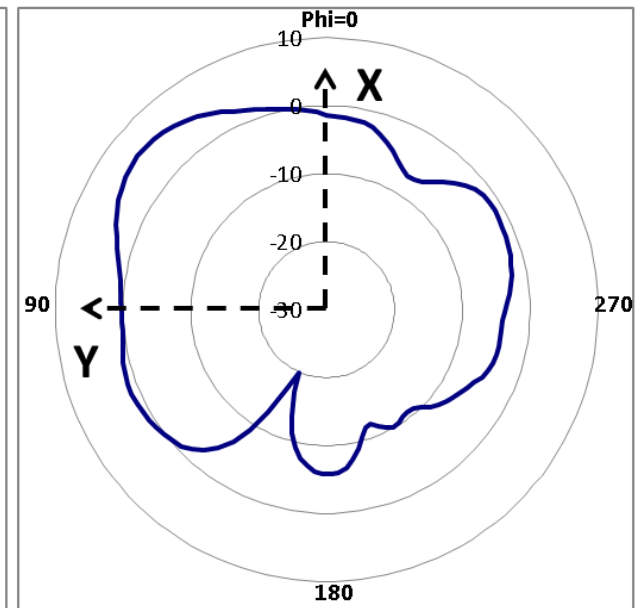
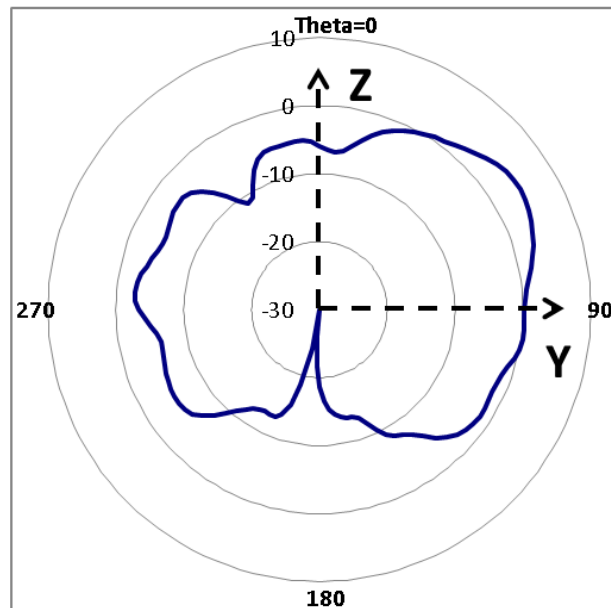
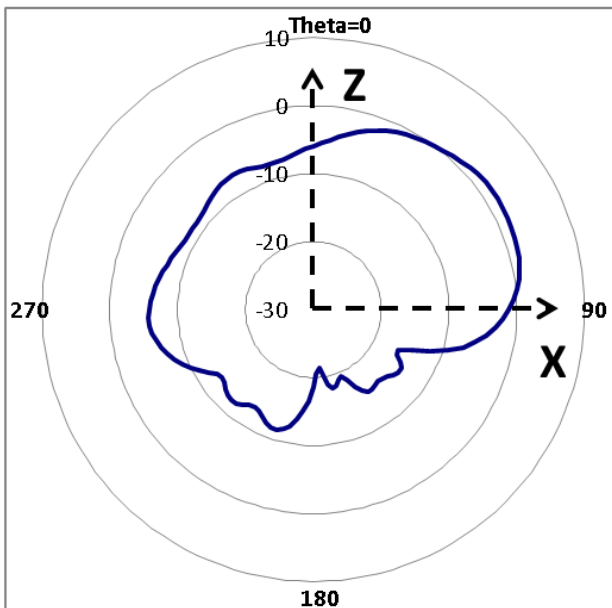
# Radiation Pattern

## MIMO2



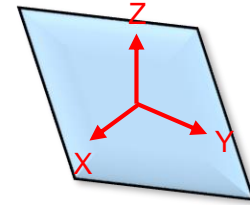
### blue mimo2 Radiation Pattern

— 3500MHz



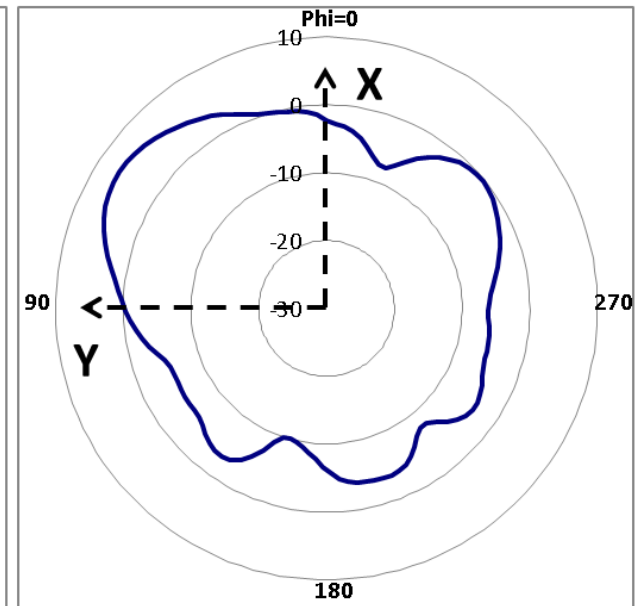
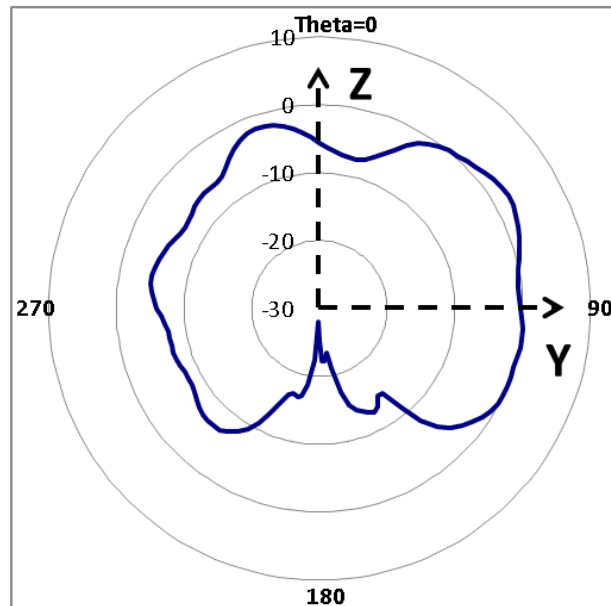
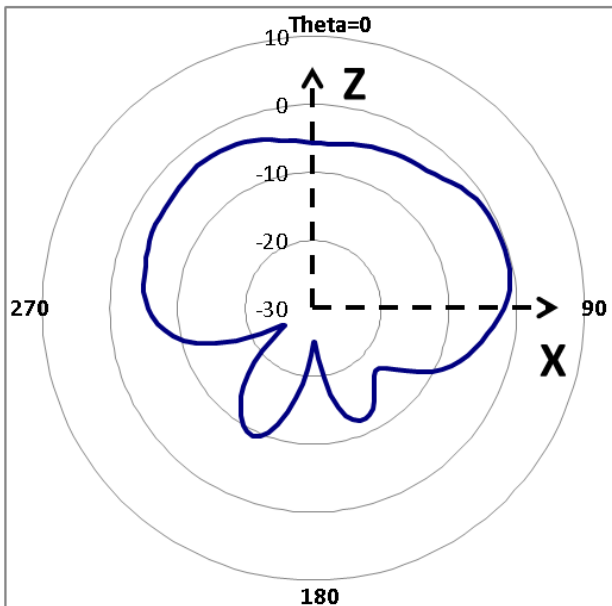
# Radiation Pattern

## MIMO2



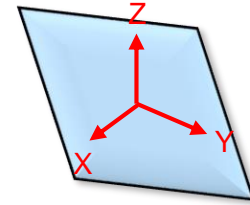
### blue mimo2 Radiation Pattern

— 3800MHz



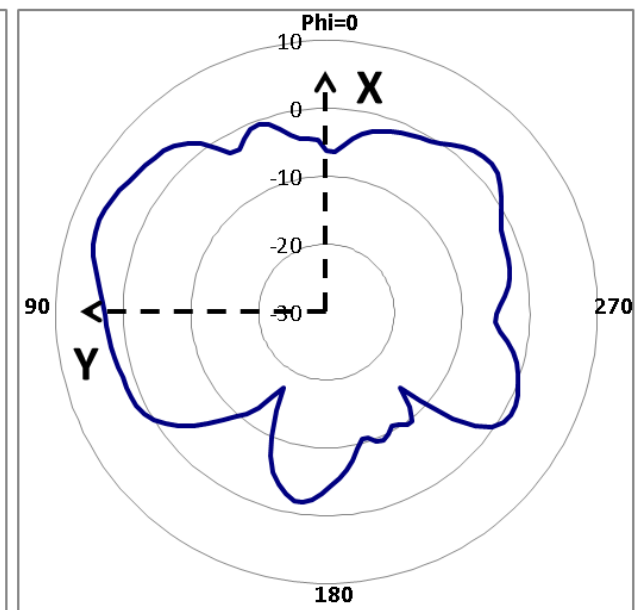
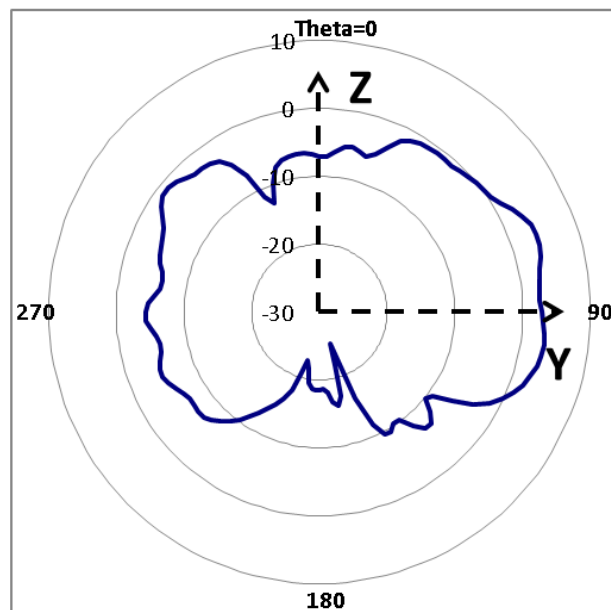
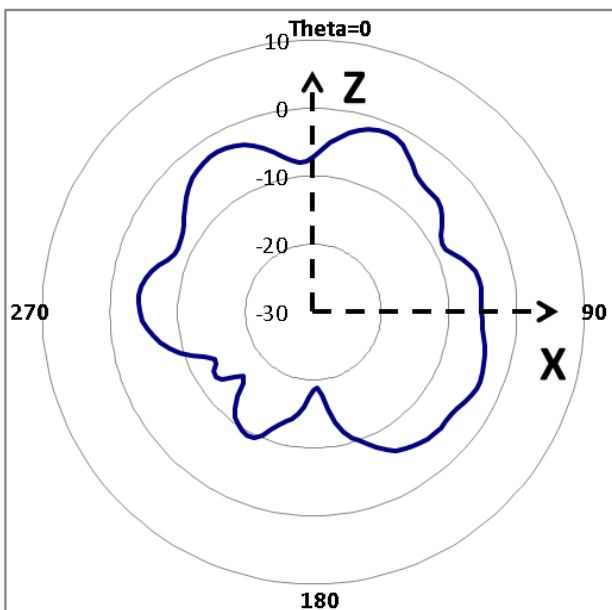
# Radiation Pattern

## MIMO2



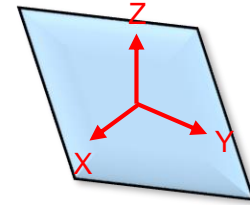
### blue mimo2 Radiation Pattern

— 4700MHz



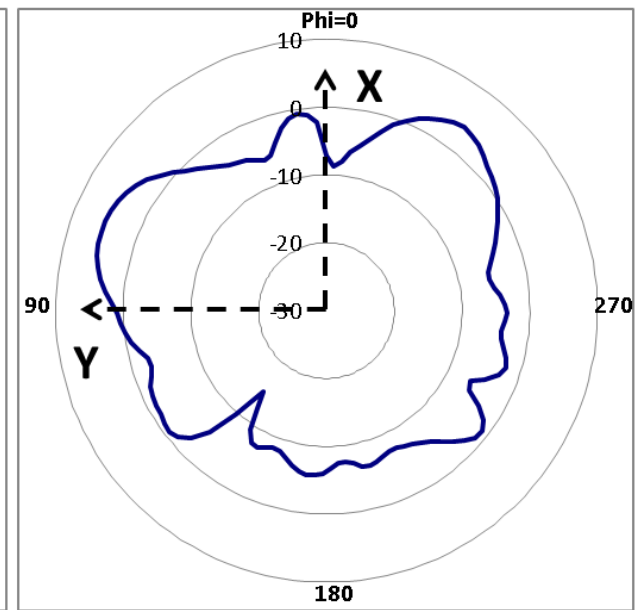
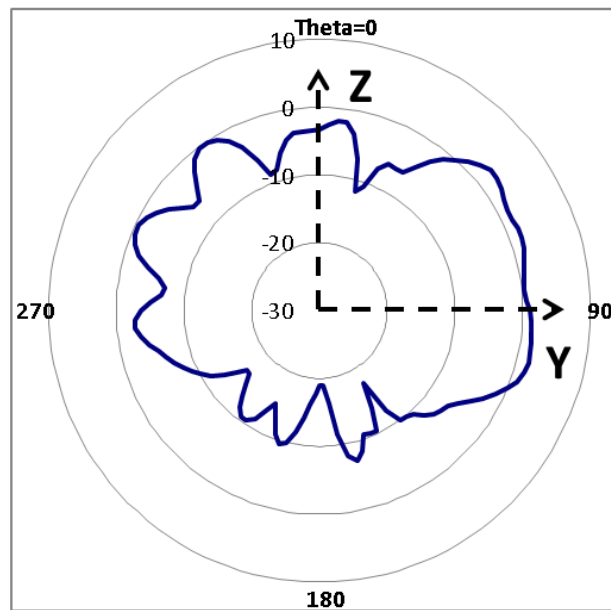
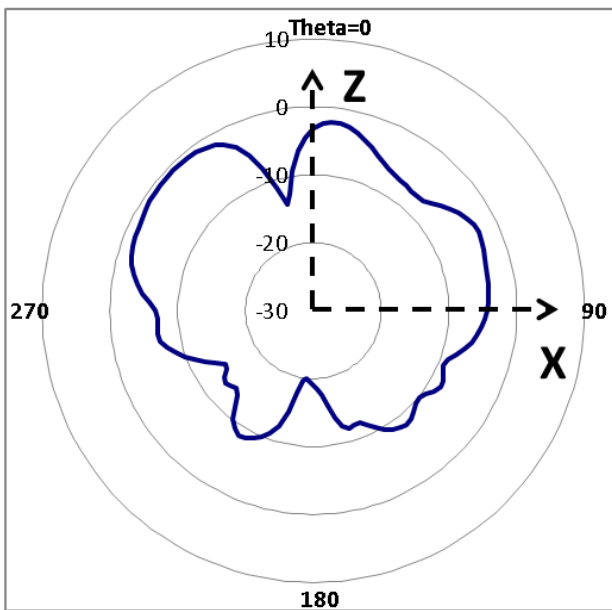
# Radiation Pattern

## MIMO2



### blue mimo2 Radiation Pattern

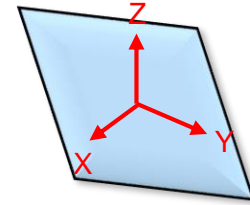
— 5250MHz





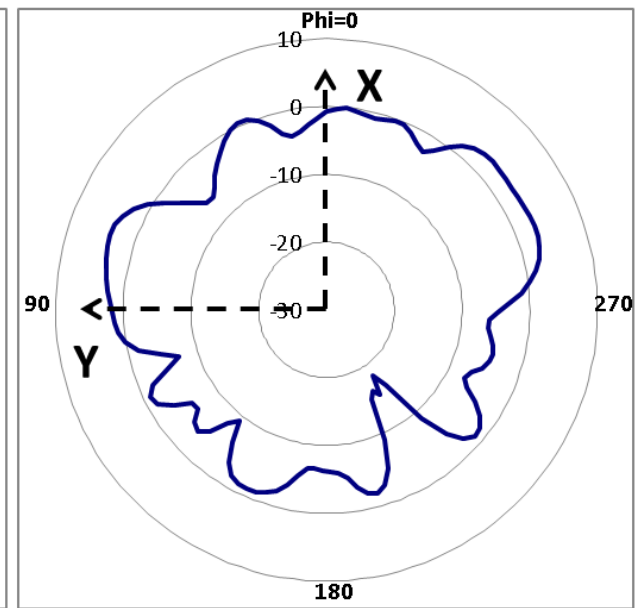
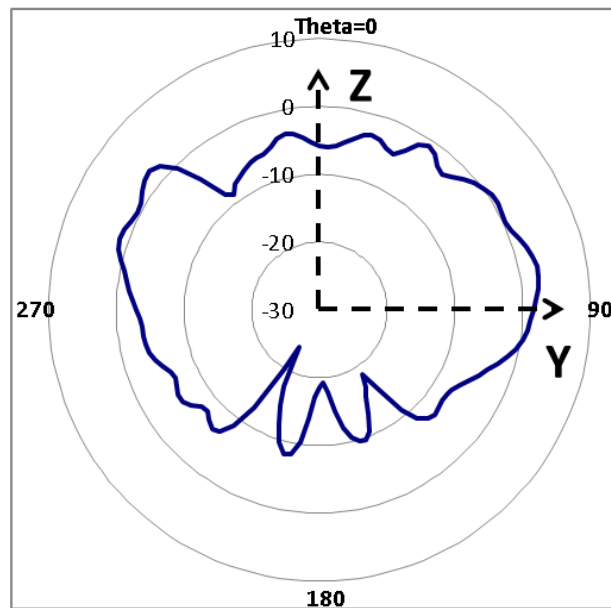
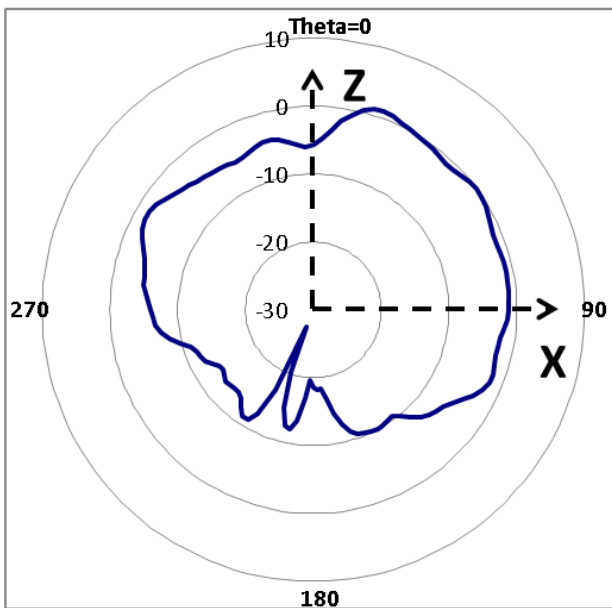
# Radiation Pattern

## MIMO2

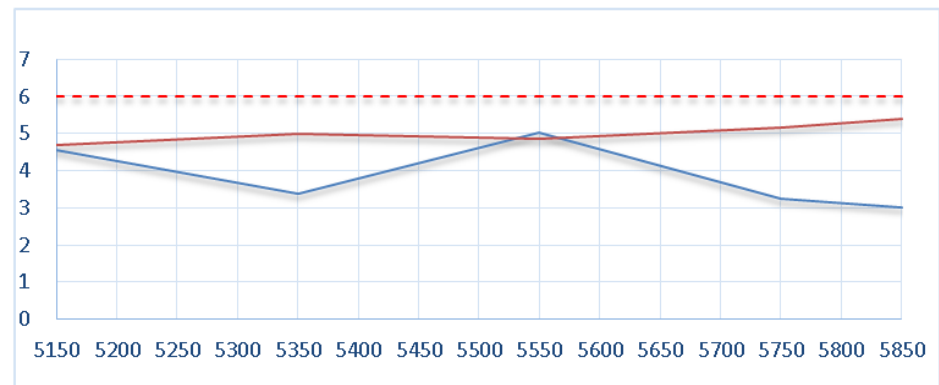
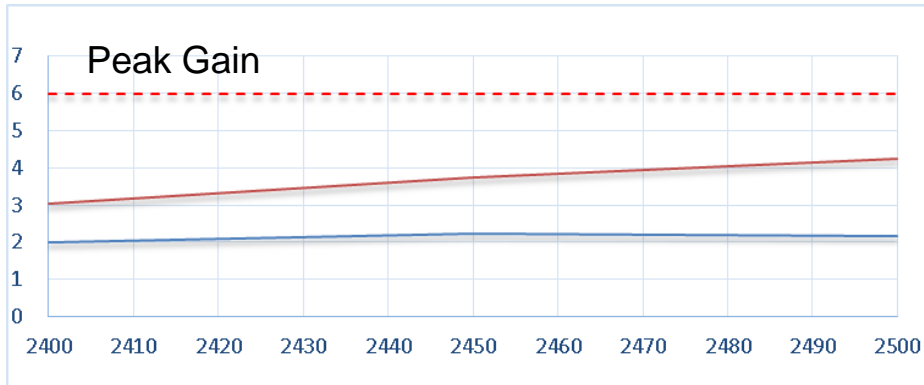
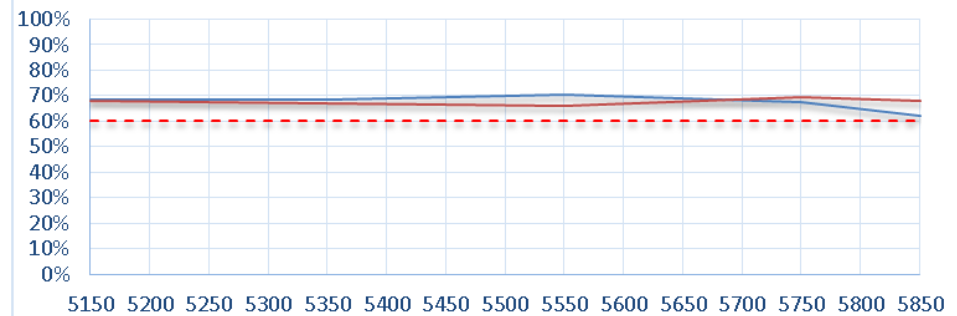
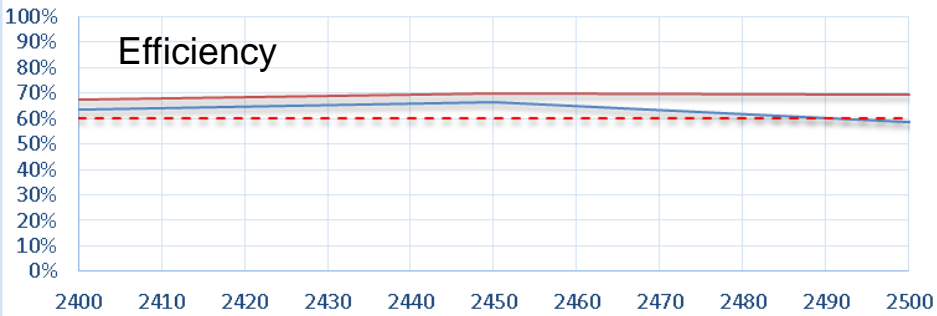
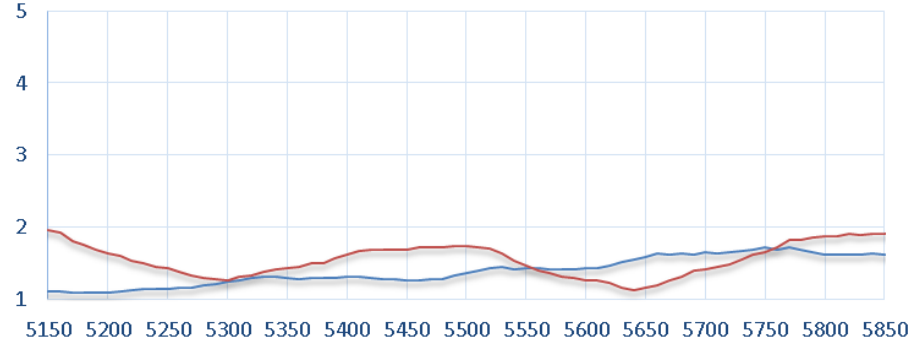
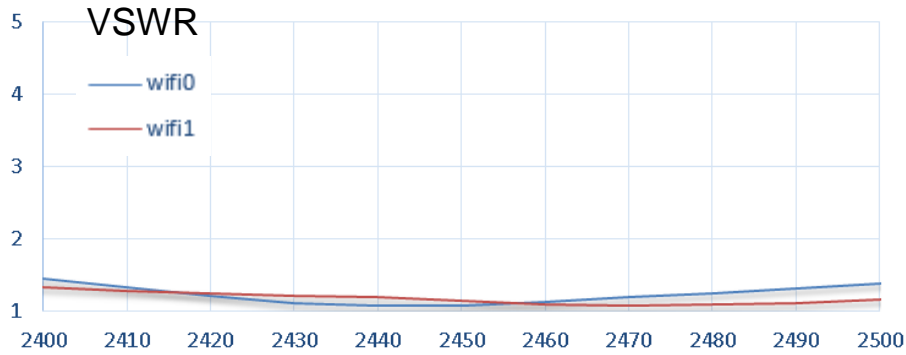


### blue mimo2 Radiation Pattern

— 5725MHz



# VSWR 、 Efficiency 、 Peak Gain



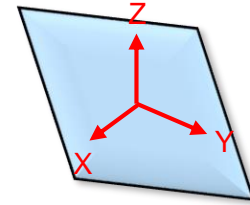
# Efficiency 、 Peak Gain

	Frequency	2400	2450	2500	Avg.	5150	5350	5550	5750	5850	Avg.
Wifi0	Efficiency	63%	66%	61%	63%	68%	68%	70%	68%	62%	59%
	Average Gain	-2.0	-1.8	-2.1		-1.7	-1.6	-1.5	-1.7	-2.1	
	Peak Gain	2.0	2.2	2.2		4.6	3.4	5.0	3.3	3.0	
Wifi1	Efficiency	67%	70%	70%	69%	68%	67%	66%	70%	68%	54%
	Average Gain	-1.7	-1.6	-1.6		-1.7	-1.8	-1.8	-1.6	-1.7	
	Peak Gain	3.1	3.8	4.3		4.7	5.0	4.9	5.2	5.4	
Corr. Composite	Total	5.0	5.2	5.5		5.7	4.6	6.0	5.8	5.7	



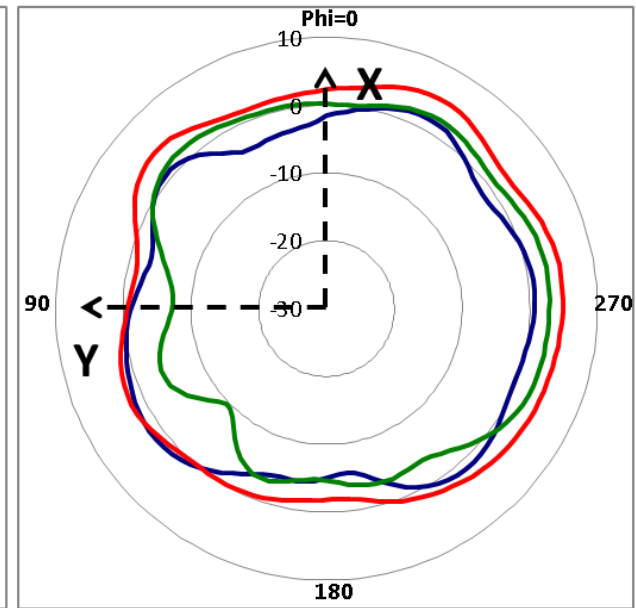
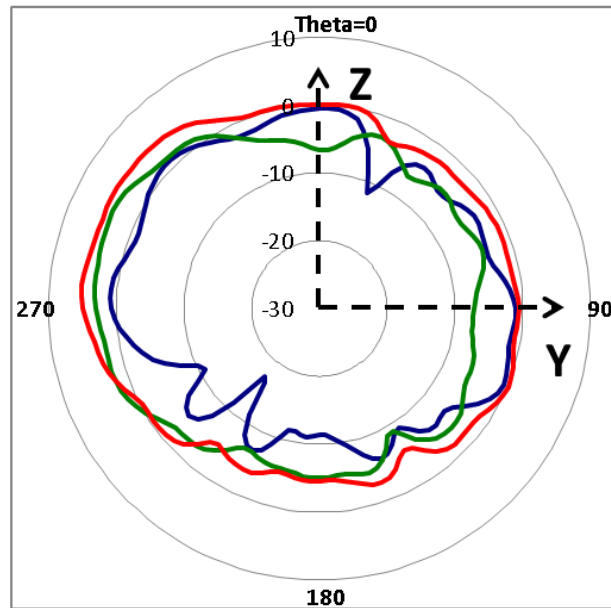
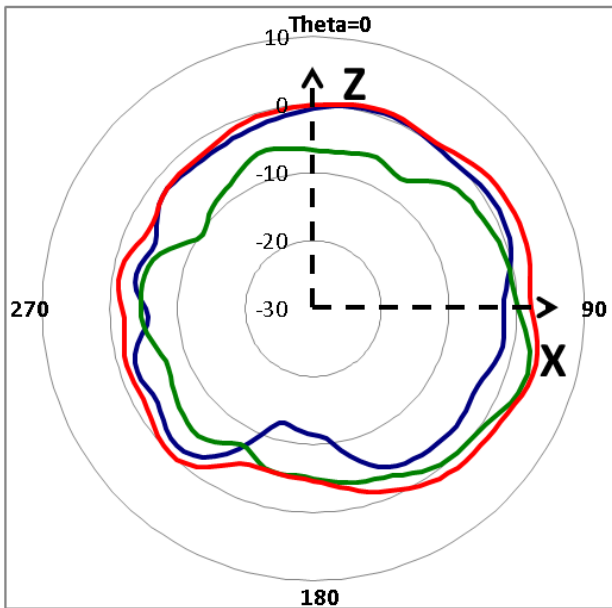
# Radiation Pattern

## Wifi 2.45GHz



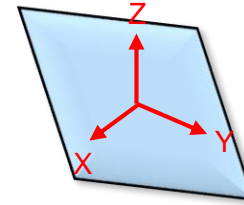
### 2450 MHz Radiation Pattern

- Directional Gain
- wifi0
- wifi1



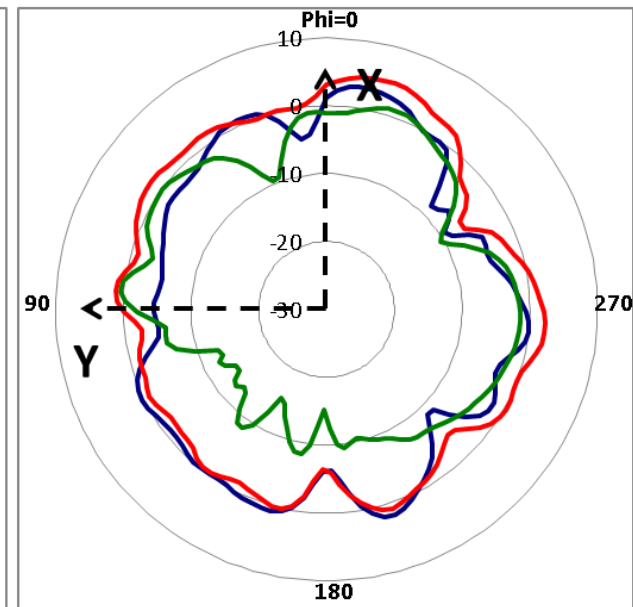
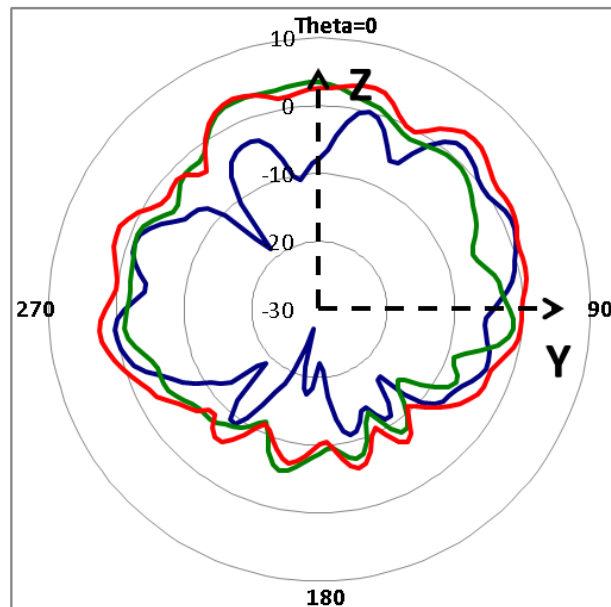
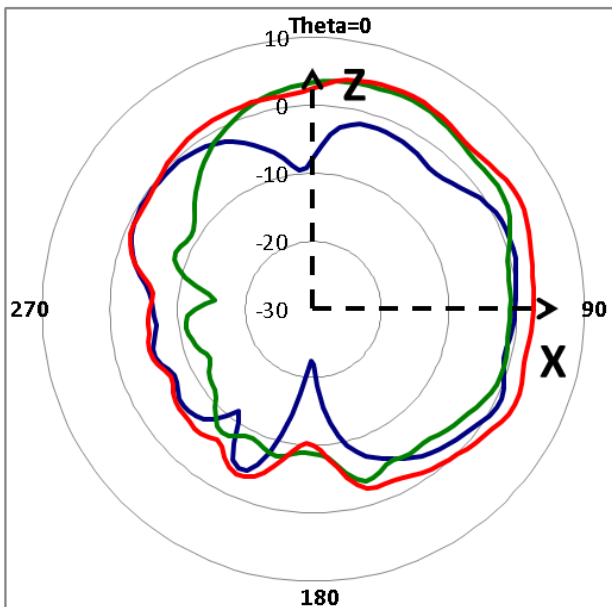
# Radiation Pattern

## Wifi 5.25GHz



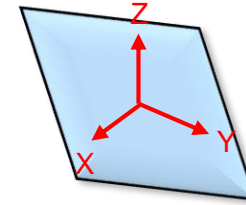
### 5250 MHz Radiation Pattern

- Directional Gain
- wifi0
- wifi1



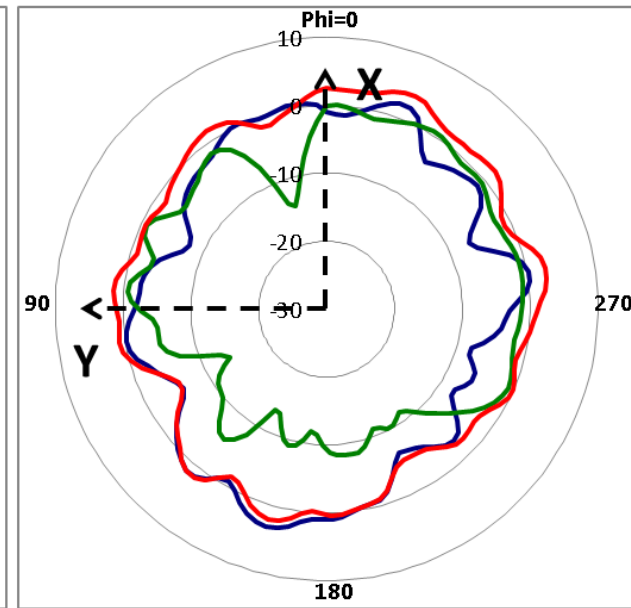
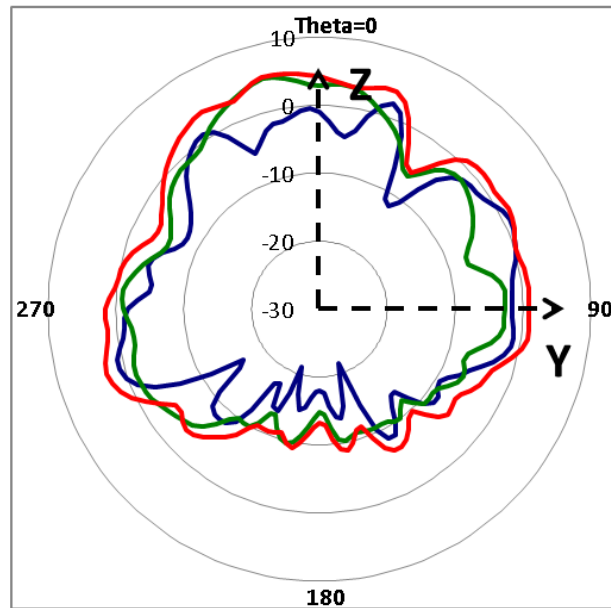
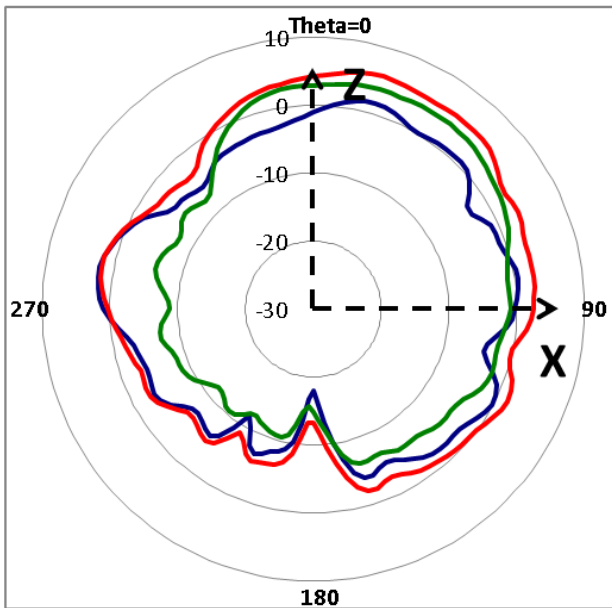
# Radiation Pattern

## Wifi 5.75GHz

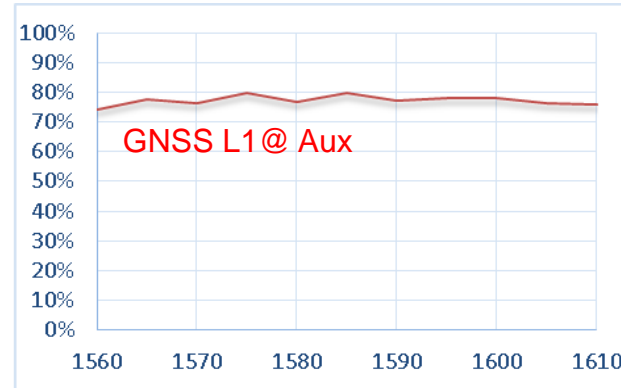
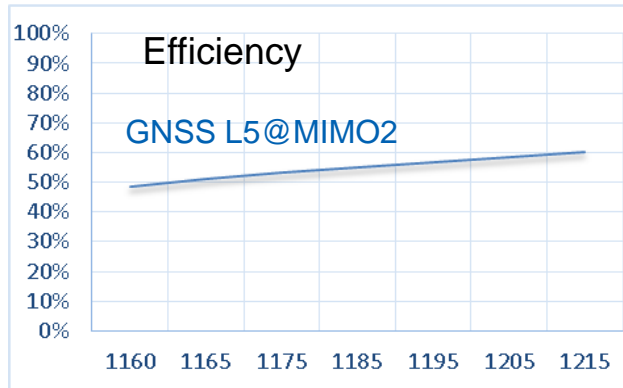
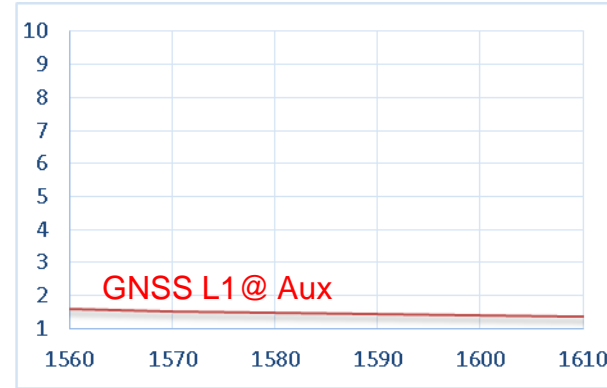
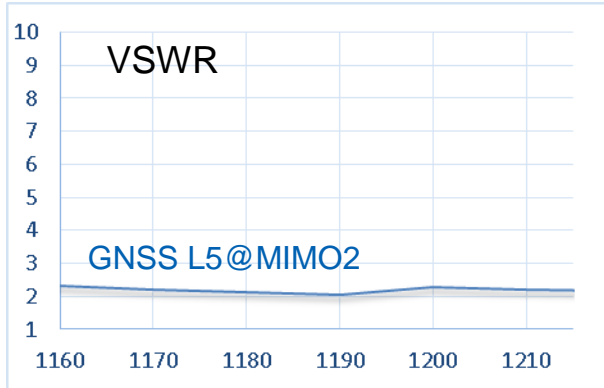


### 5750 MHz Radiation Pattern

- Directional Gain
- wifi0
- wifi1



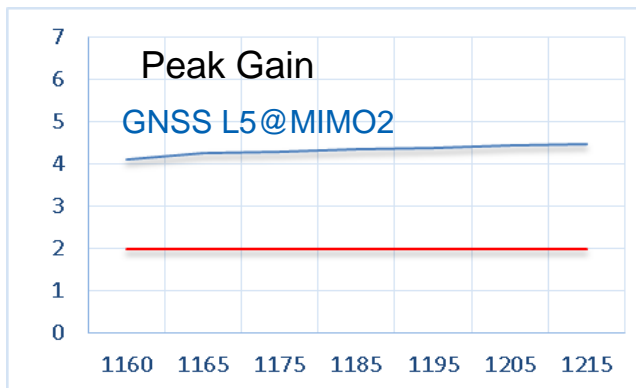
# VSWR、Efficiency



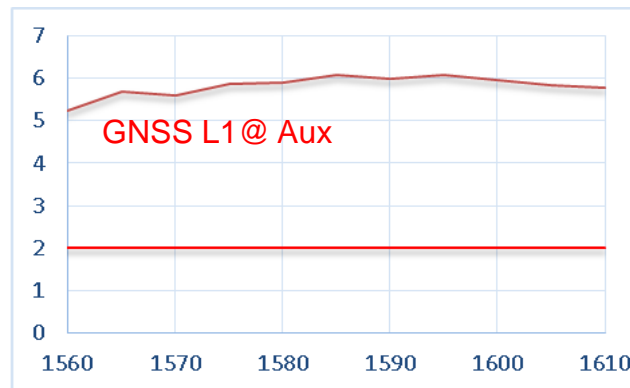
*\* Mounted on 600x835mm ground plate.*



# Peak Gain



GNSS L5@MIMO2	
Frequency (MHz)	Peak gain (dBi)
1160	4.12
1165	4.28
1175	4.30
1185	4.34
1195	4.37
1205	4.45
1215	4.48



GNSS L1@Aux	
Frequency (MHz)	Peak gain (dBi)
1560	5.25
1565	5.69
1570	5.61
1575	5.87
1580	5.90
1585	6.09
1590	6.00
1595	6.10
1600	5.96
1605	5.86
1610	5.77

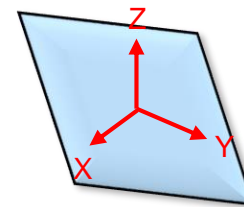
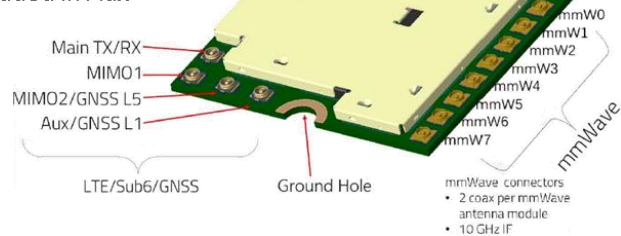
*\* Mounted on 600x835mm ground plate.*





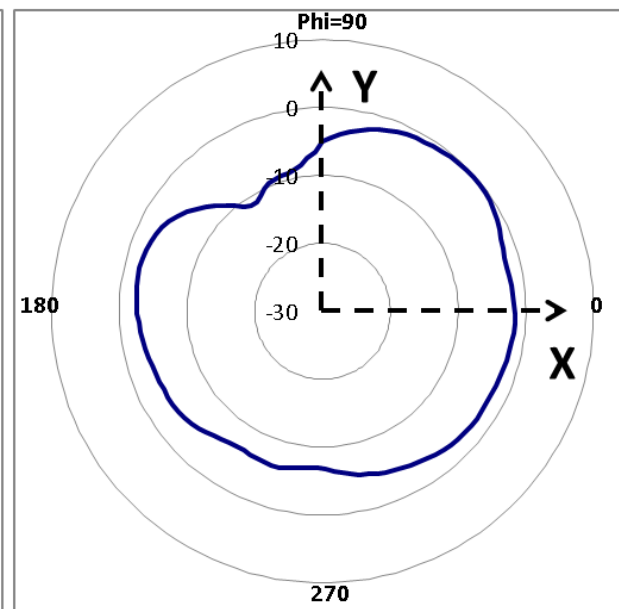
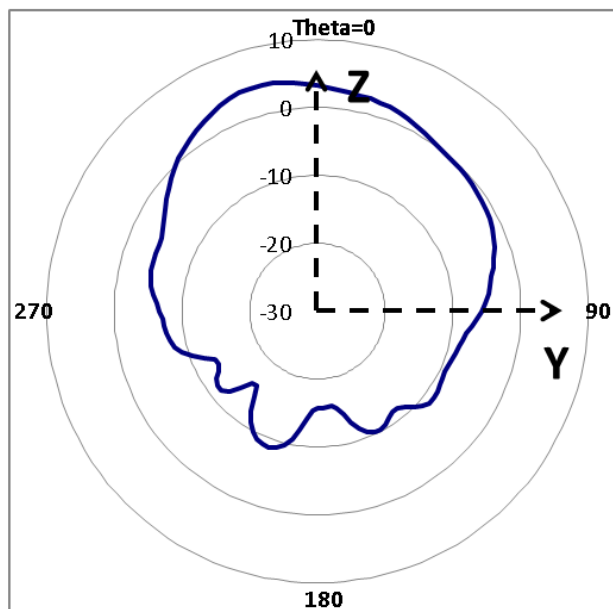
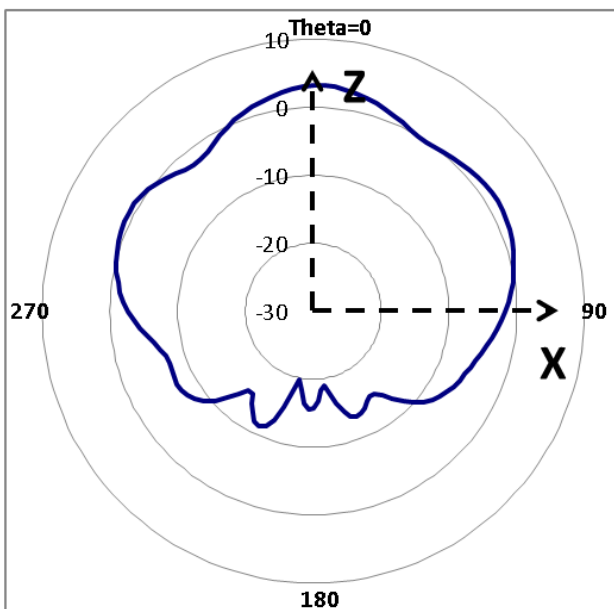
# Radiation Pattern

EM9190  
 GNSS L5 is included in MIMO2  
 GNSS L1 is included in Aux



## GNSS L5 on mimo2 Radiation Pattern

— 1176MHz

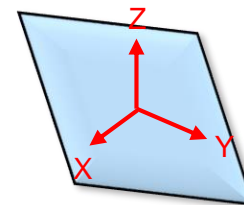
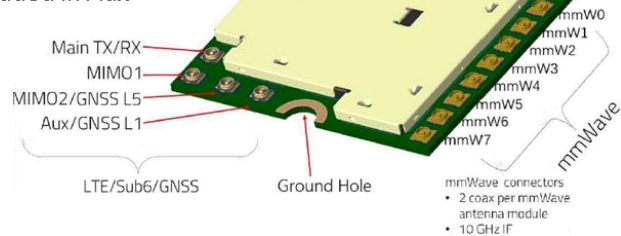


\* Mounted on 600x835mm ground plate.



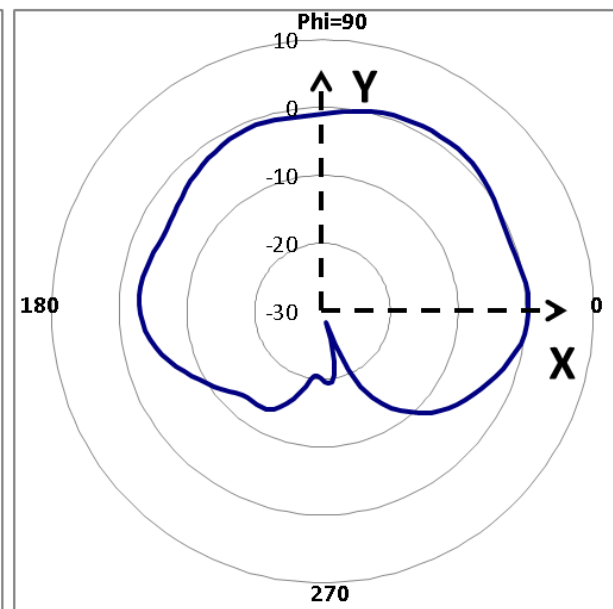
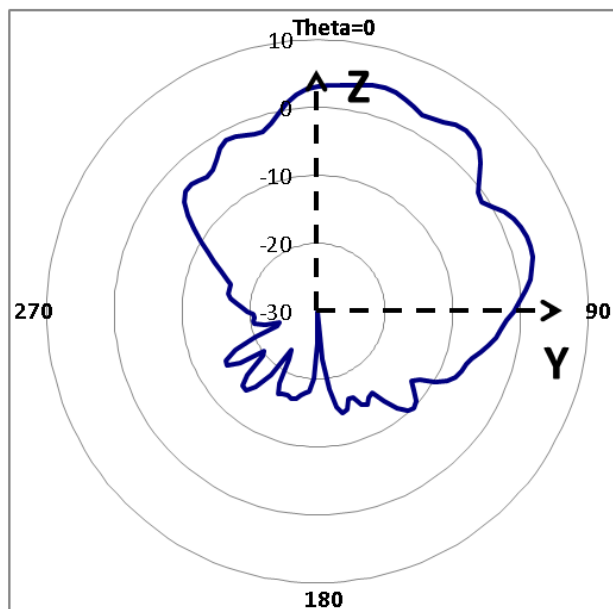
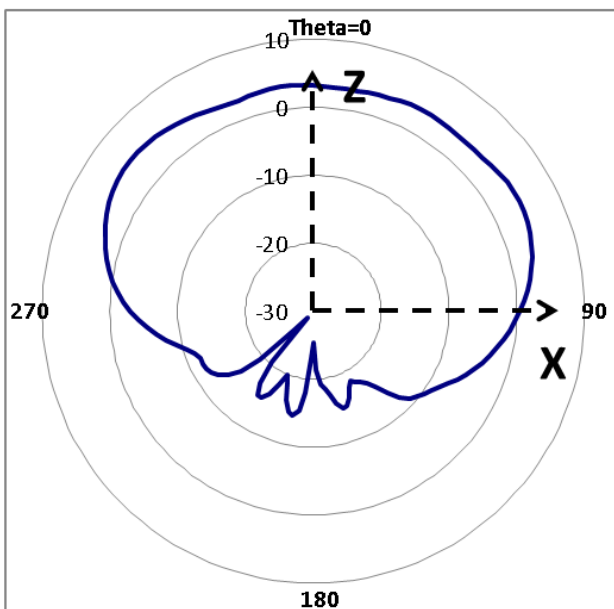
# Radiation Pattern

EM9190  
 GNSS L5 is included in MIMO2  
 GNSS L1 is included in Aux



## GNSS L1 on aux Radiation Pattern

— 1575MHz

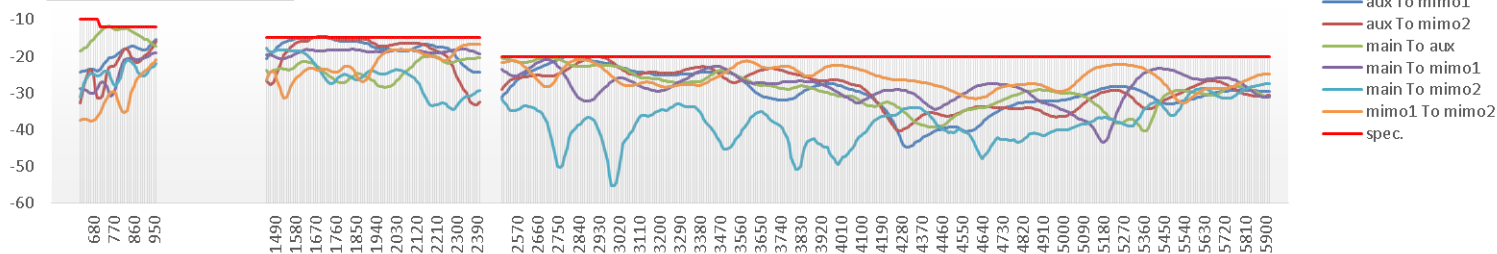


\* Mounted on 600x835mm ground plate.

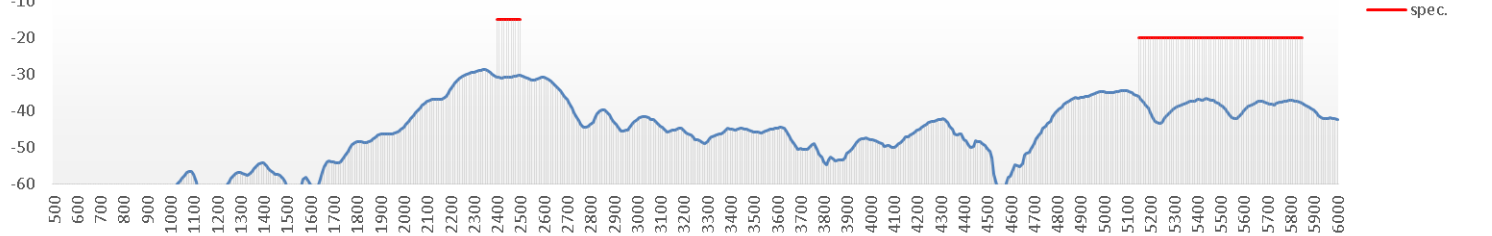


# Isolation

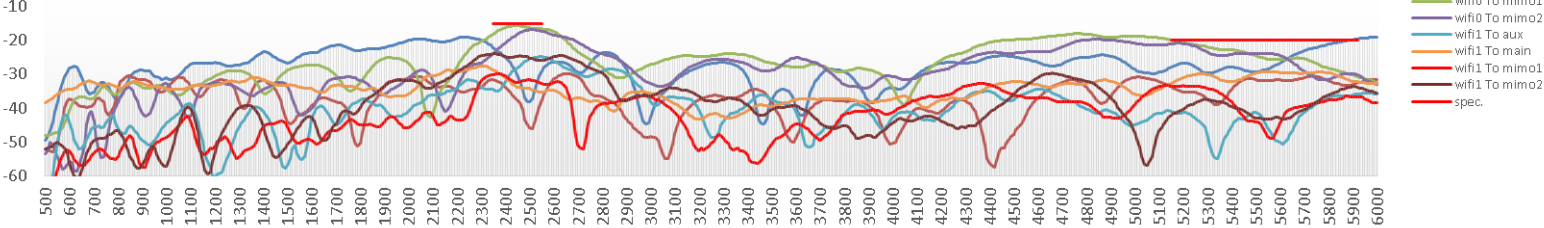
## Cellular element



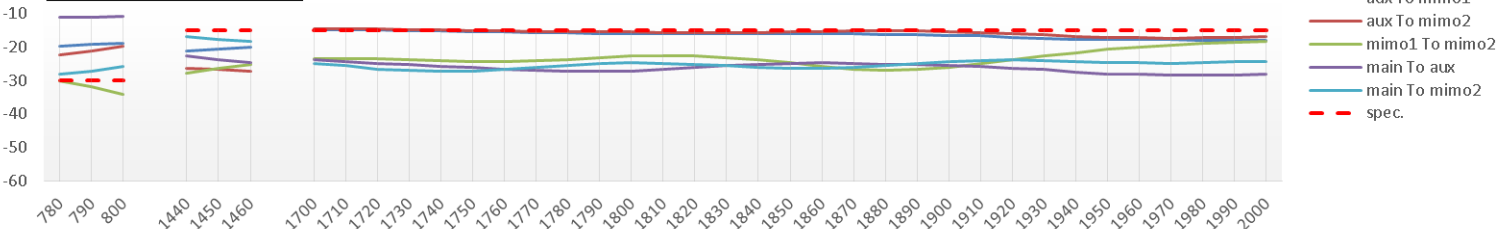
## WiFi element



## Cellular to WiFi element



## GNSS to Cellular



# WNC

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