

4X4 MiMo 4G/5G Reef Sharkee® Antenna

GPSD[X]4-7-49[X]



Sleek sharkfin design

4x4 MiMo 698-960/1427-4900MHz

Up to 4x4 MiMo WiFi 6e (optional)

GPS/GNSS L1/L5 or L1 only 30dB / 26dB LNA (optional)

Whip position for single, dual or tri-band whips for secure comms

Meets IP69K

The GPSD[X]4-7-49[X] MiMo Reef Sharkee® antenna is designed to be a discrete one size fits all solution for mobile applications. The robust low profile housing contains 4x 4G LTE / 5G NR elements covering 698-960/1427-4900MHz. Versions of the product also contain up to 4x optional WiFi elements supporting WiFi 6e 2.4/5.150-7.125GHz and optional L1 only or L1/L5 GPS/GNSS module. The whip position allows the use of a single, dual or tri-band whip operating across the VHF, UHF and 7/800MHz bands.

The sleek sharkfin design has low visual impact and at only 52mm (2") high the antenna can comply with certain state laws regarding light-bar obscuration on police vehicles.

The product is supplied with low loss flame retardant pigtail cables approved to UN ECE R118 and a variety of extension cables are available for different applications.

The GPSD[X]4-7-49[X] can be installed on conductive or non-conductive panels but installations with a whip require a conductive ground plane.

Technical Drawing

GPSD54-7-49-D Shown

GPSD4-7-49-D

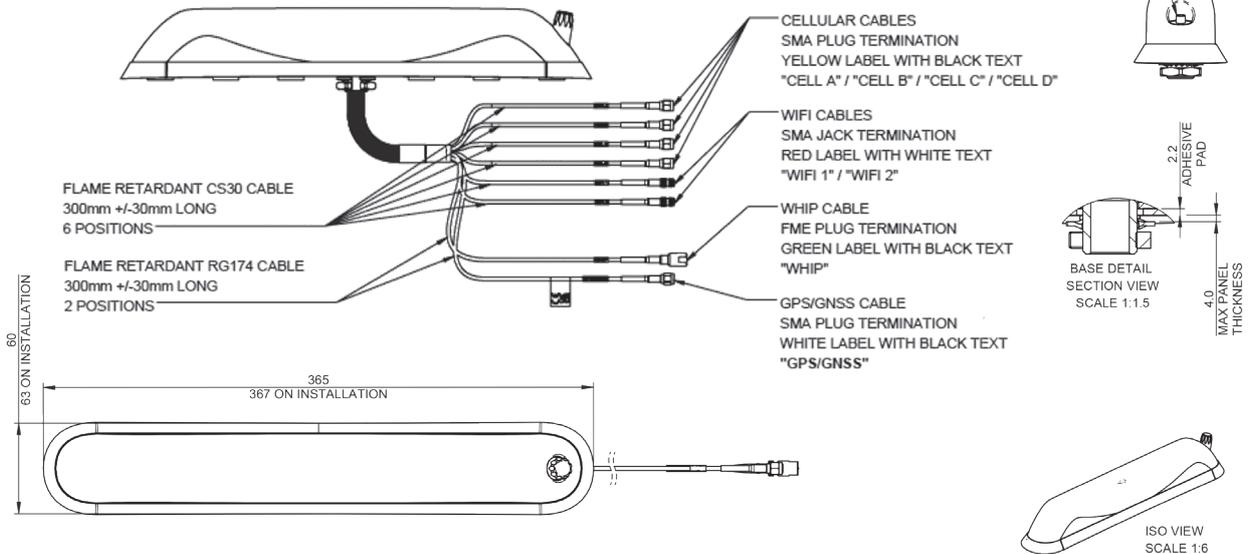
LOW PROFILE 4G/5G 4x4 MIMO SHARKFIN ANT. 2xWiFi 1xGPS/GNSS(L1)

OPERATING FREQUENCIES:

CELL: 698-960 MHz / 1427-4900 MHz

WiFi: 2.4 / 5.0 / 7.2 GHz

GPS/GNSS: 1562-1612 MHz 26dB LNA



4X4 MiMo 4G/5G Reef Sharkee® Antenna

GPSD[X]4-7-49[X]

PANORAMA ANTENNAS

Product Data

Part No.		GPSD4-7-49-Q	GPSD4-7-49-D	GPSD4-7-49	
Electrical Data					
Frequency Range (MHz)	Cell /LTE	4x 698-960 / 1427-4900			
	WiFi	4x 2400-7125	2x 2400-7125	-	
	GPS/GNSS	1x 1559-1612			
Typical VSWR*	Cell Elements	<2.5:1			
	WiFi Elements	< 2.5:1	-		
Isolation**	Cell Elements	≥6dB (698-960MHz) / ≥12dB (1427-4900MHz)			
	Wifi Elements	>25dB (2.4-7.125GHz)	-		
Pattern	Omni-directional				
Impedance	50Ω				
Max Input Power (W)	5 (internal elements) / 60 (whip)				
GPS/GNSS Data					
Frequency Range (MHz)	1559-1612				
Impedance	50Ω				
LNA Gain	26dB				
Voltage / Current	3-5v 17ma Typical				
Polarisation	Right Hand Circular				
Mechanical Data					
Dimensions (mm)	Height (mounted)	52 (2")			
	Width	60 (2.4")			
	Length	365 (14.4")			
Environmental Specification					
Operating Temp (°C)	-40° / +85°C (-40° / +185°F)				
Radome Material	ASA				
Radome Approvals	UL 746C (F1)				
Ingress Protection	IP69K				
Mounting Data					
Fixing	M18 (3/4") Mounting Bush				
Cable Data		4G/5G	WiFi	GPS/GNSS	WHIP
Cable Type		CS30 (Compliant to UN ECE R118)		FR RG174 (Compliant to UN ECE R118)	
Cable Diameter (mm)		2.8 (0.1")		2.8 (0.1")	
Cable Length (m)		0.3m (1')		0.3m (1')	
Termination	4G/5G	4x SMA plug (m)			
	WiFi	4x SMA jack (f)	2x SMA jack (f)	-	
	GPS/GNSS	1x SMA plug (m)			
	Whip	1X FME plug (m)			

*Across 90% of relevant bands for GPSD4-7-49-D measured on a 600x600mm (2'x2') ground plane without additional cable **Worst case isolation for GPSD4-7-49-D measured on a 600x600mm (2'x2') ground plane without additional cable

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GPSD[X]4-7-49[X]

Product Data

Part No.		GPSD54-7-49-Q	GPSD54-7-49-D	GPSD54-7-49	
Electrical Data					
Frequency Range (MHz)	Cell /LTE	4x 698-960 / 1427-4900			
	WiFi	4x 2400-7125	2x 2400-7125	-	
	GPS/GNSS	1x 1164-1189 / 1559-1612			
Typical VSWR*	Cell Elements	<2.5:1			
	WiFi Elements	< 2.5:1		-	
Isolation**	Cell Elements	≥6dB (698-960MHz) / ≥12dB (1427-4900MHz)			
	Wifi Elements	>25dB (2.4-7.125GHz)		-	
Pattern	Omni-directional				
Impedance	50Ω				
Max Input Power (W)	5 (internal elements) / 60 (whip)				
GPS/GNSS Data					
Frequency Range (MHz)	1164-1189 / 1559-1612				
Impedance	50Ω				
LNA Gain	30dB / 26dB				
Voltage / Current	3-5v 37ma Typical				
Polarisation	Right Hand Circular				
Mechanical Data					
Dimensions (mm)	Height	52 (2")			
	Width	60 (2.4")			
	Length	365 (14.4")			
Environmental Specification					
Operating Temp (°C)	-40° / +85°C (-40° / +185°F)				
Radome Material	ASA				
Radome Approvals	UL 746C (F1)				
Ingress Protection	IP69K				
Mounting Data					
Fixing	M18 (3/4") Mounting Bush				
Cable Data		4G/5G	WiFi	GPS/GNSS	WHIP
Cable Type	CS30 (Compliant to UN ECE R118)		FR RG174 (Compliant to UN ECE R118)		
Cable Diameter (mm)	2.8 (0.1")		2.8 (0.1")		
Cable Length (m)	0.3m (1')		0.3m (1')		
Termination	4G/5G	4x SMA plug (m)			
	WiFi	4x SMA jack (f)	2x SMA jack (f)	-	
	GPS/GNSS	1x SMA plug (m)			
	WHIP	1X FME plug (m)			

*Across 90% of relevant bands for GPSD4-7-49-D measured on a 600x600mm (2'x2') ground plane without additional cable **Worst case isolation for GPSD4-7-49-D measured on a 600x600mm (2'x2') ground plane without additional cable

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GPSD[X]4-7-49[X]

PANORAMA  ANTENNAS

Product Data

Part No.		FIND4-7-49
Electrical Data		
Frequency Range (MHz)	Cell /LTE	4x 698-960 / 1427-4900
Typical VSWR*	Cell Elements	<2.5:1
Isolation**	Cell Elements	≥6dB (698-960MHz) / ≥12dB (1427-4900MHz)
Pattern		Omni-directional
Impedance		50Ω
Max Input Power (W)		5 (internal elements) / 60 (whip)
Mechanical Data		
Dimensions (mm)	Height	52 (2")
	Width	60 (2.4")
	Length	365 (14.4")
Environmental Specification		
Operating Temp (°C)		-40° / +85°C (-40° / +185°F)
Radome Material		ASA
Radome Approvals		UL 746C (F1)
Ingress Protection		IP69K
Mounting Data		
Fixing		M18 (3/4") Mounting Bush
Cable Data		
Cable Type		CS30 (Compliant to UN ECE R118)
Cable Diameter (mm)		2.8 (0.1")
Cable Length (m)		0.3m (1')
Termination	4G/5G	4x SMA plug (m)

*Across 90% of relevant bands for GPSD4-7-49-D measured on a 600x600mm (2'x2') ground plane without additional cable **Worst case isolation for GPSD4-7-49-D measured on a 600x600mm (2'x2') ground plane without additional cable

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GPSD[X]4-7-49[X]

Electrical Data- Cell-Ground Plane.

Measurement Conditions	4G/5G Antennas				
GPSD4-7-49-D measured on a 600x600mm (2'x2') ground plane without additional cable	Frequency Range (MHz)	LTE Bands	Antenna Element	Peak Gain (dBi)	Efficiency (%)
	617-698	71, 105	Cell A	2.6	37
			Cell B	2.4	35
			Cell C	1.5	40
			Cell D	3.2	38
	699-798	12,13, 14 17,28	Cell A	4.0	47
			Cell B	2.6	44
			Cell C	2.8	46
			Cell D	4.0	47
	807- 862	5,19,20,26,27	Cell A	4.7	53
			Cell B	2.1	50
			Cell C	1.9	39
			Cell D	3.9	54
	880-960	8	Cell A	5.3	61
			Cell B	4.1	51
			Cell C	2.7	40
			Cell D	5.8	68
	1427-1518	11, 21, 74,75,76	Cell A	4.4	50
			Cell B	6.0	82
			Cell C	7.4	70
			Cell D	4.0	51
1710-1920	2,3,4,9,25,35,39,66	Cell A	4.6	52	
		Cell B	5.3	67	
		Cell C	7.4	64	
		Cell D	4.1	58	
1920-2170	1,23	Cell A	5.3	64	
		Cell B	5.8	65	
		Cell C	5.7	64	
		Cell D	4.7	66	
2300-2400	30,40	Cell A	4.8	59	
		Cell B	5.3	57	
		Cell C	6.1	57	
		Cell D	4.7	54	
2496-2690	7,38,41	Cell A	4.3	58	
		Cell B	5.5	55	
		Cell C	6.8	52	
		Cell D	3.7	48	
3300-4200	22,42,43,48,77,78,79	Cell A	5.9	55	
		Cell B	8.1	54	
		Cell C	9.5	52	
		Cell D	6.4	49	
4400-5000	79	Cell A	7.0	52	
		Cell B	6.5	54	
		Cell C	7.2	55	
		Cell D	7.5	53	

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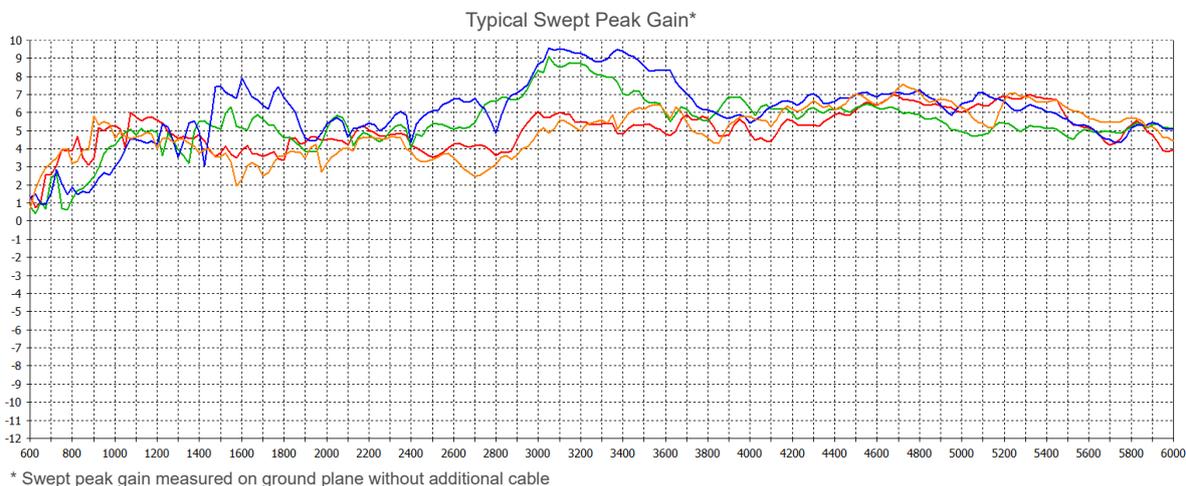
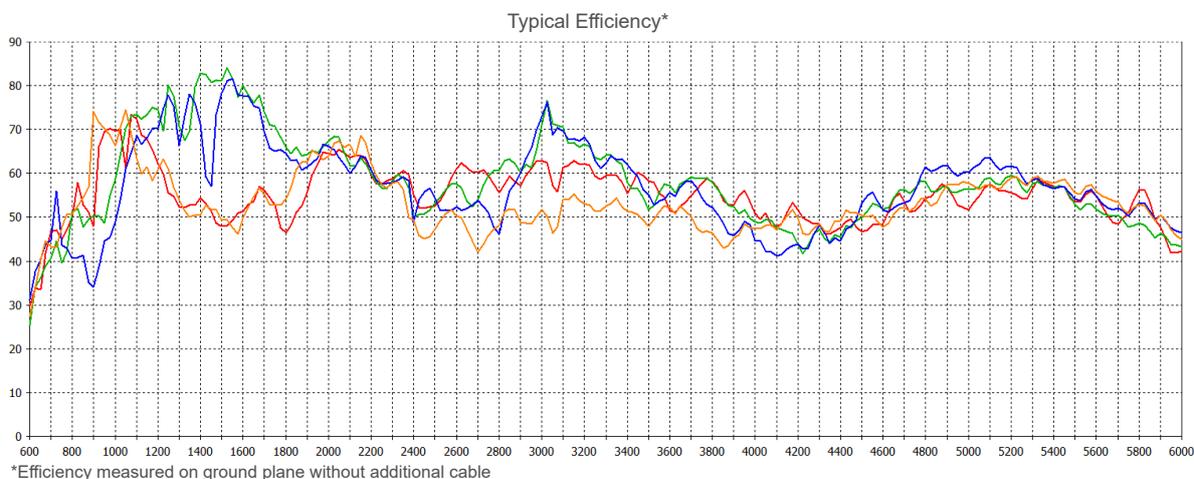
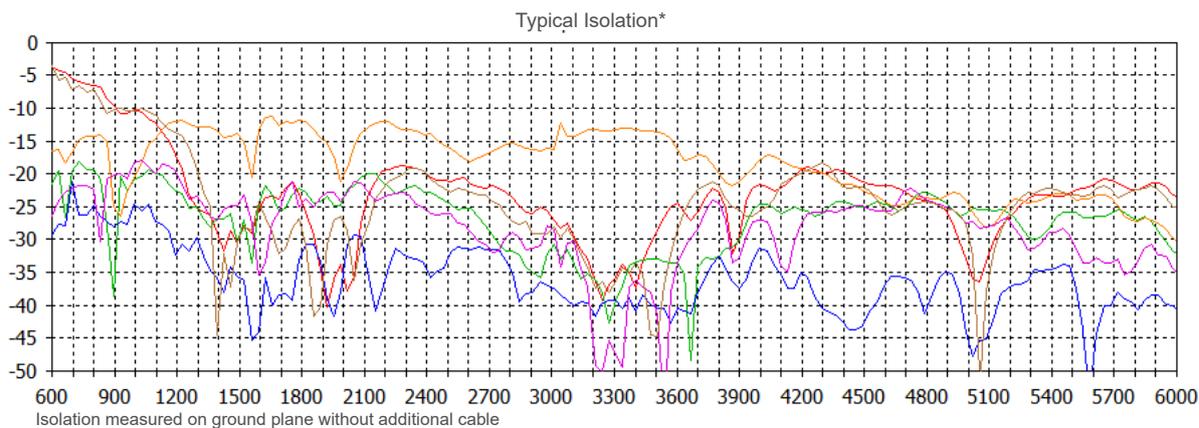
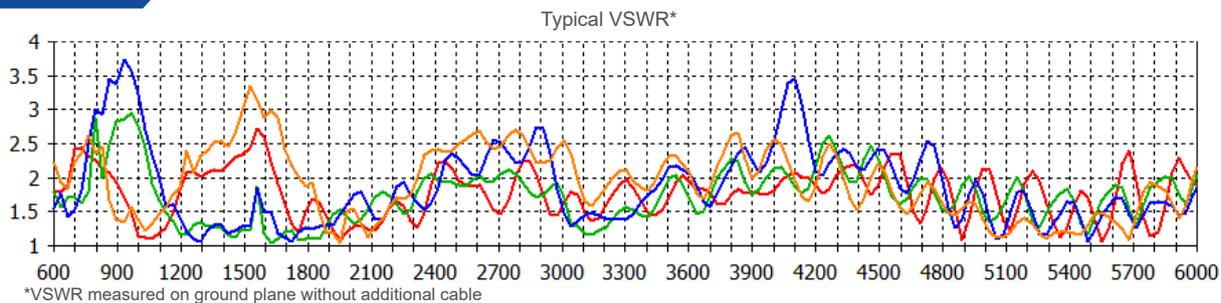
Electrical Data -
WiFi-Ground Plane.

Measurement Conditions	WiFi Antennas				
GPSD4-7-49-D measured on a 600x600mm (2'x2') ground plane without additional cable	Frequency Range (MHz)	WiFi Bands	Antenna Element	Peak Gain (dBi)	Efficiency (%)
	2396-2485	2.4GHz	WiFi 1	2.6	68
			WiFi 2	4.9	60
	5150-5250	UNII-1	WiFi 1	6.4	57
			WiFi 2	8.6	52
	5250-5350	UNII-2A	WiFi 1	6.3	57
			WiFi 2	8.0	49
	5350-5470	UNII-2B	WiFi 1	6.0	54
			WiFi 2	7.5	46
	5470-5725	UNII-2C	WiFi 1	4.9	52
			WiFi 2	7.1	42
	5725-5850	UNII-3	WiFi 1	4.1	52
			WiFi 2	6.1	40
	5850-5925	UNII-4	WiFi 1	3.9	48
			WiFi 2	6.0	40
	5925-6425	UNII-5	WiFi 1	4.0	43
			WiFi 2	5.5	37
6425-6525	UNII-6	WiFi 1	2.8	38	
		WiFi 2	4.0	32	
6525-6875	UNII-7	WiFi 1	3.5	34	
		WiFi 2	4.0	32	
6875-7125	UNII-8	WiFi 1	4.5	39	
		WiFi 2	5.1	36	

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Electrical Data- Cell-
Ground Plane.

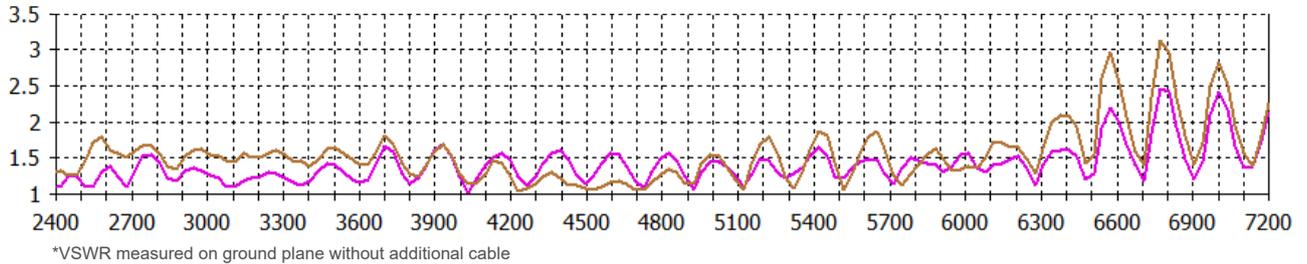


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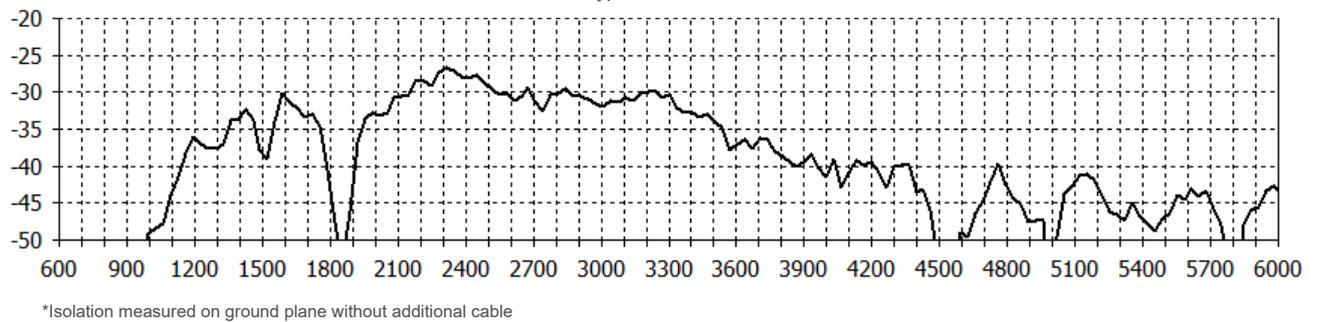
GPSD[X]4-7-49[X]

Electrical Data -
WiFi-Ground Plane.

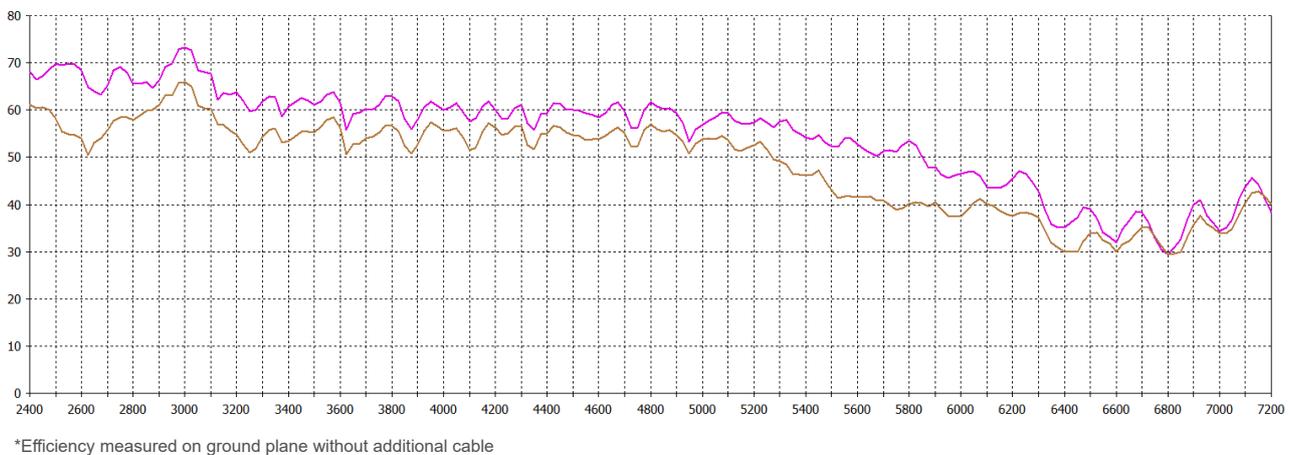
Typical VSWR*



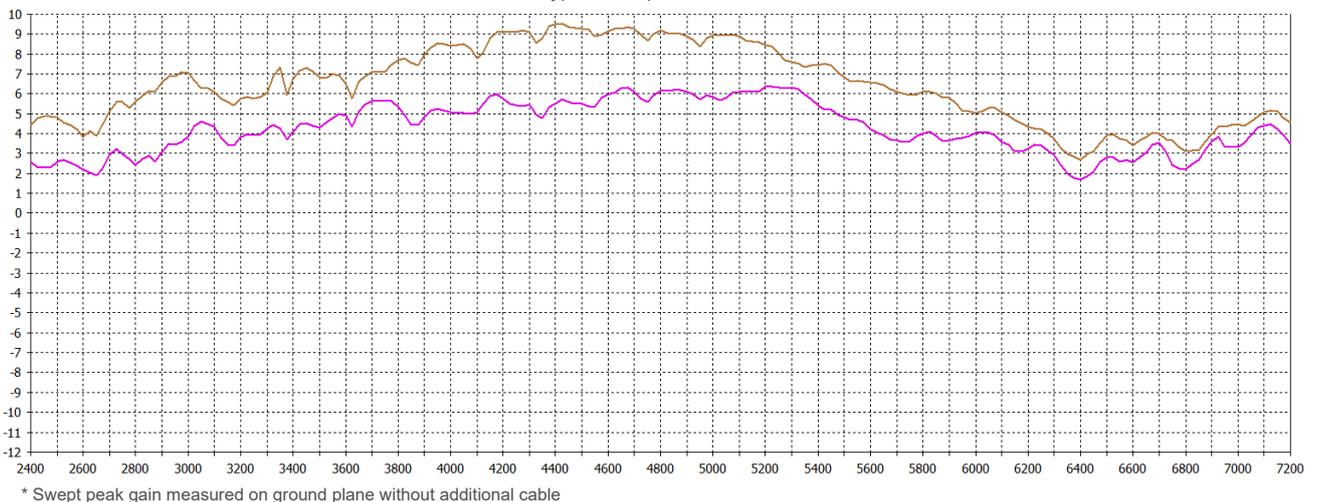
Typical Isolation*



Typical Efficiency*



Typical Swept Peak Gain*

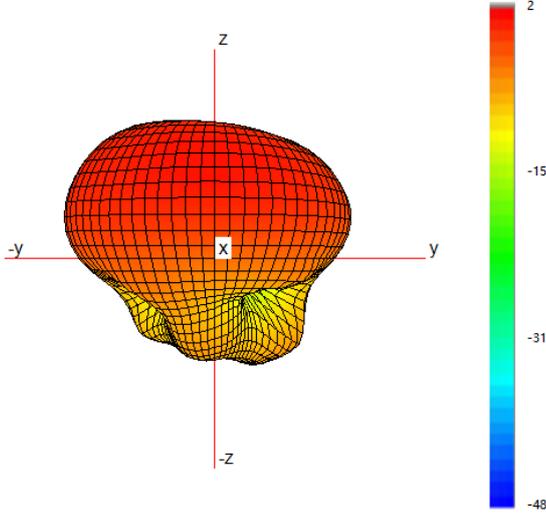


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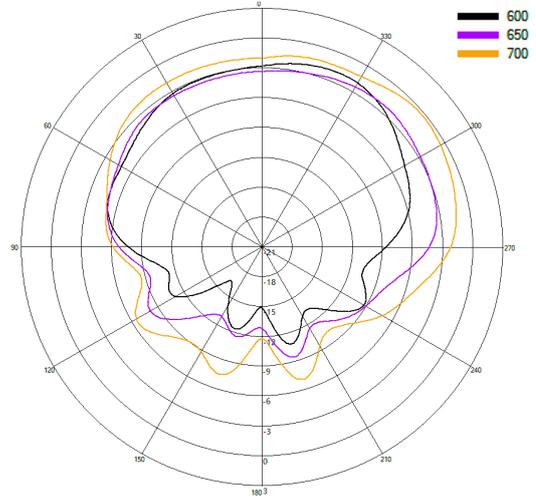
GPSD[X]4-7-49[X]

3D Pattern Data on Ground Plane Cell A

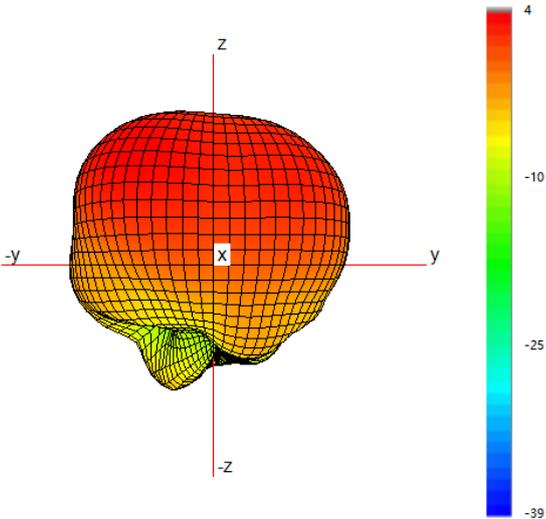
Typical 3D Pattern- Cell A - 650 MHz



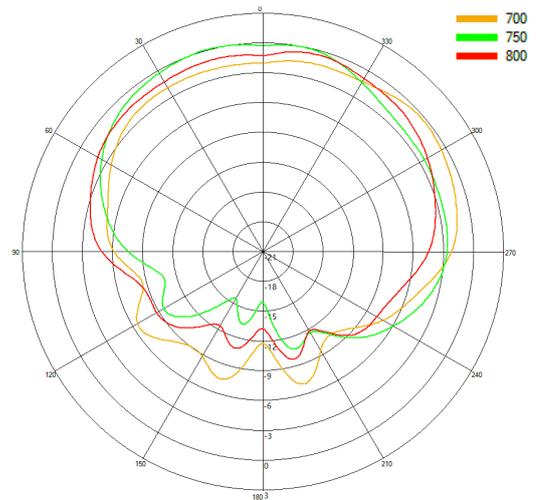
Typical H Plane- Cell A - Patterns- 600-700MHz



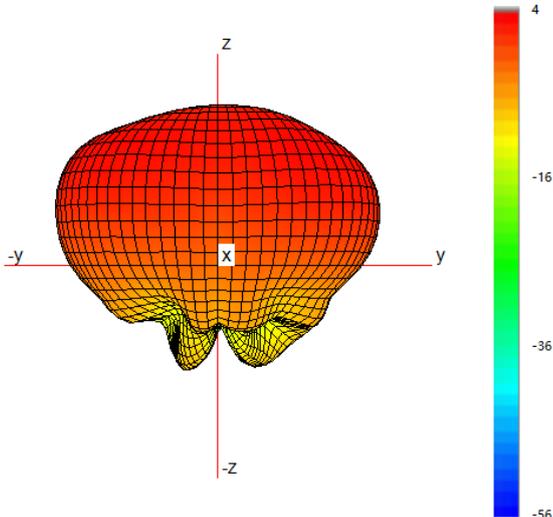
Typical 3D Pattern- Cell A - 750 MHz



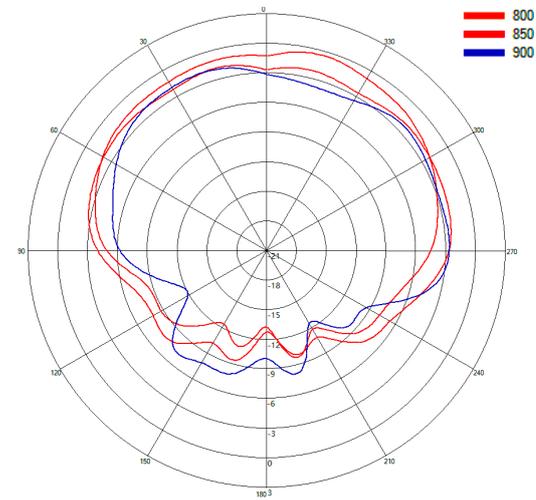
Typical H Plane- Cell A - Patterns- 700-800MHz



Typical 3D Pattern- Cell A - 850 MHz



Typical H Plane- Cell A- Patterns- 800-900 MHz

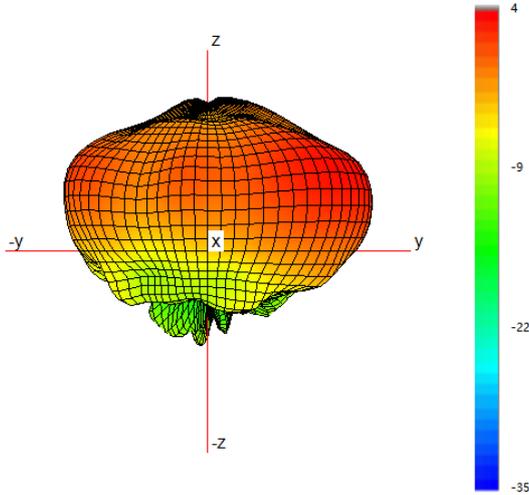


4X4 MiMo 4G/5G Reef Sharkee® Antenna

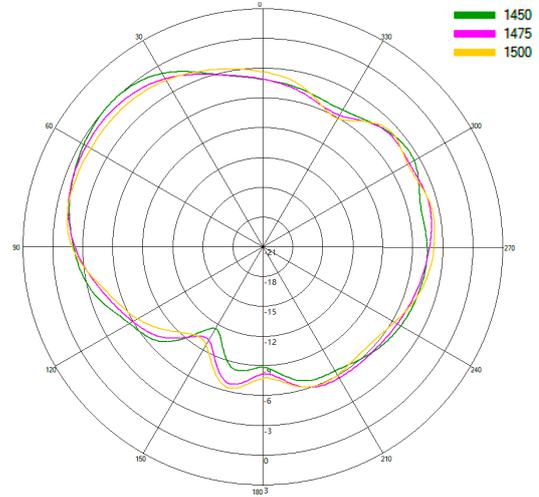
GPSD[X]4-7-49[X]

3D Pattern Data on Ground Plane Cell A

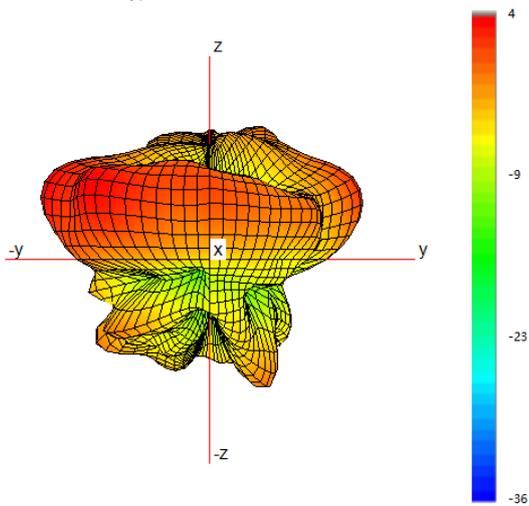
Typical 3D Pattern- Cell A - 1475 MHz



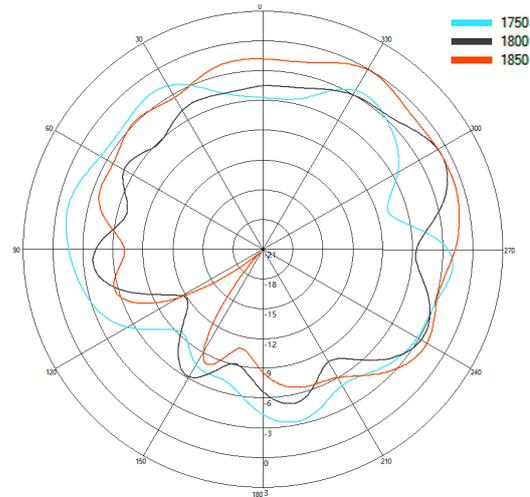
Typical H Plane- Cell A- Patterns- 1450-1500 MHz



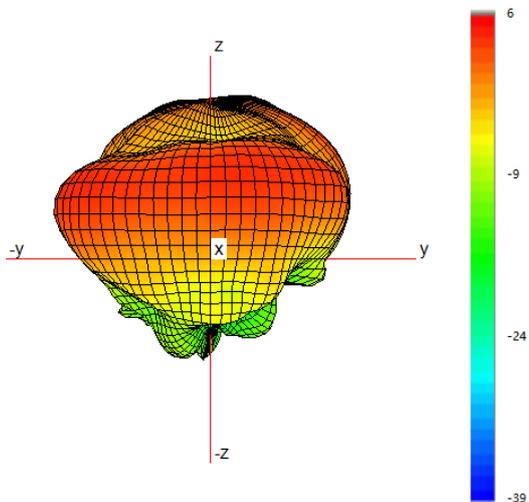
Typical 3D Pattern- Cell A - 1800 MHz



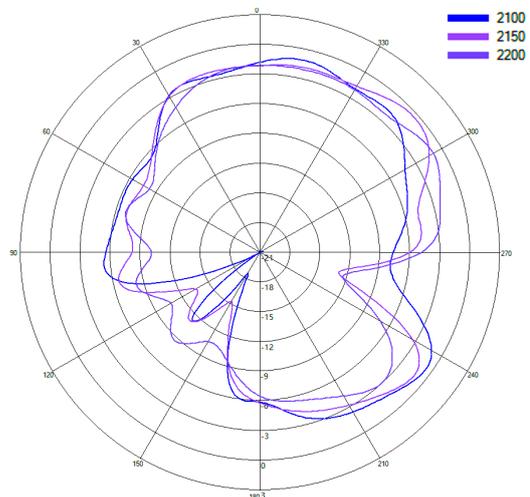
Typical H Plane- Cell A- Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell A - 2150 MHz



Typical H Plane- Cell A- Patterns- 2100-2200 MHz

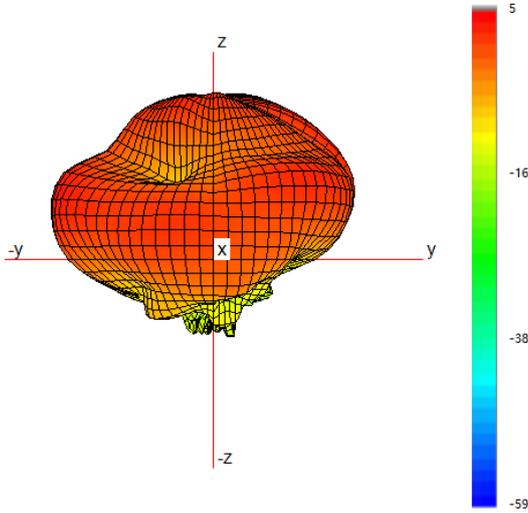


4X4 MiMo 4G/5G Reef Sharkee® Antenna

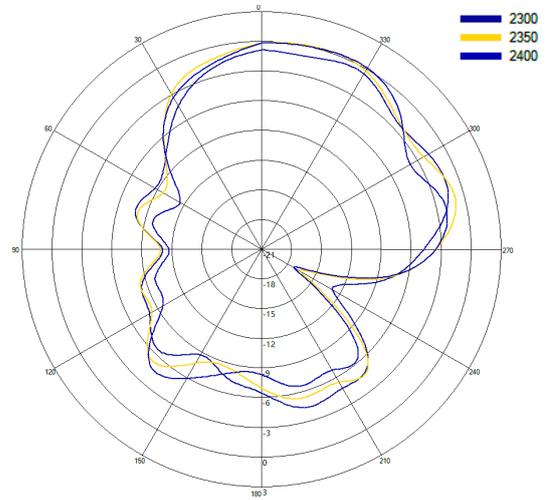
GPSD[X]4-7-49[X]

3D Pattern Data on Ground Plane Cell A

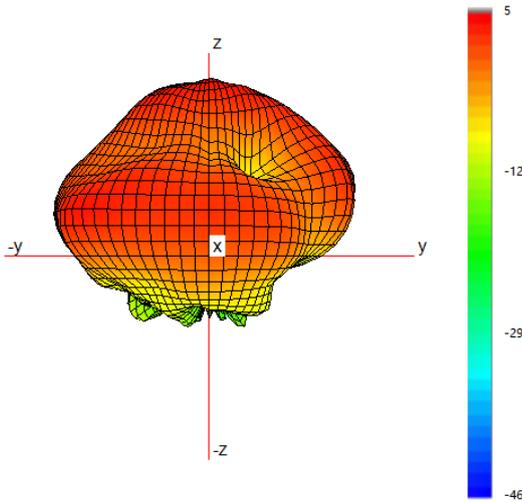
Typical 3D Pattern- Cell A - 2350 MHz



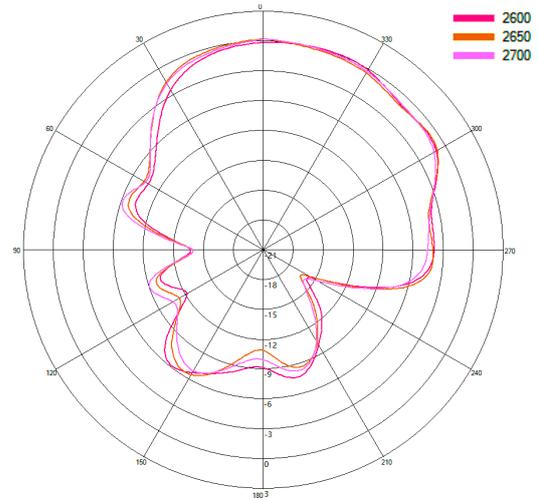
Typical H Plane- Cell A - Patterns- 2300-2400 MHz



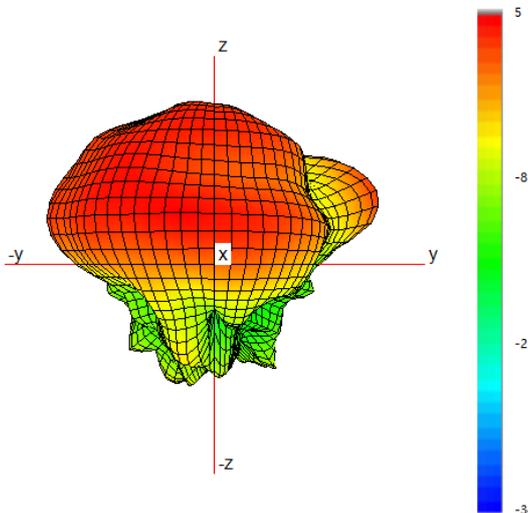
Typical 3D Pattern- Cell A - 2650 MHz



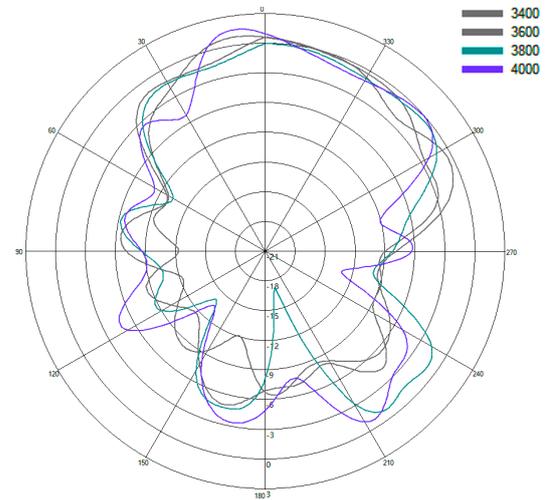
Typical H Plane- Cell A - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell A - 3600 MHz



Typical H Plane- Cell A - Patterns- 3400-4000 MHz

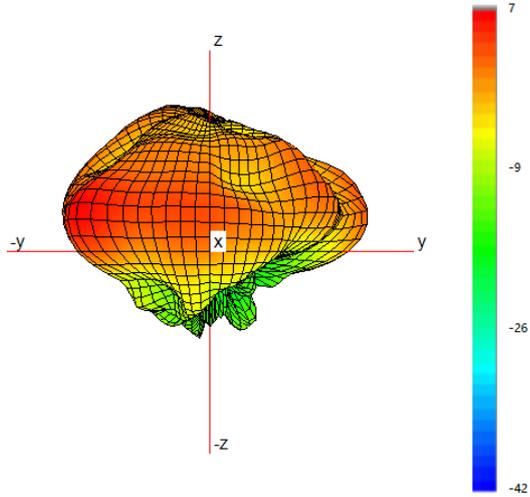


4X4 MiMo 4G/5G Reef Sharkee® Antenna

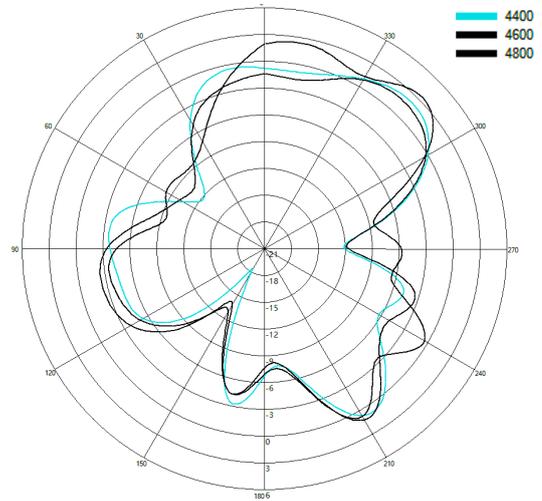
GPSD[X]4-7-49[X]

3D Pattern Data on
Ground Plane Cell A

Typical 3D Pattern- Cell A - 4700 MHz



Typical H Plane- Cell A - Patterns- 4400-4800 MHz

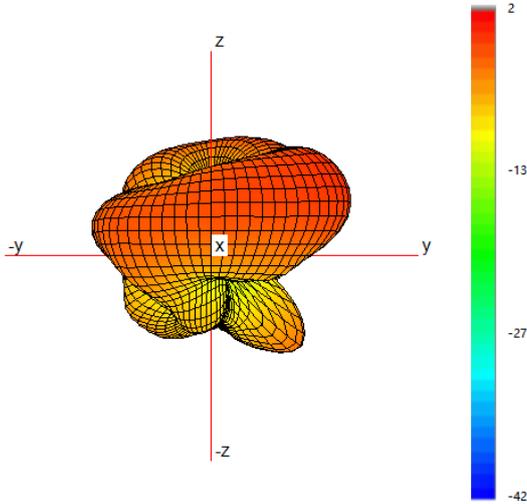


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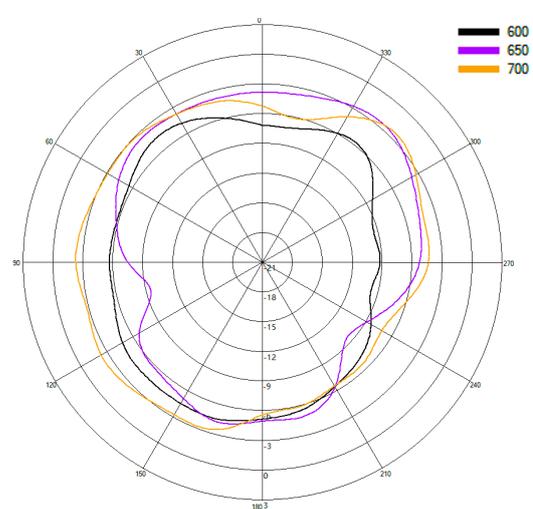
GPSD[X]4-7-49[X]

3D Pattern Data on Ground Plane Cell B

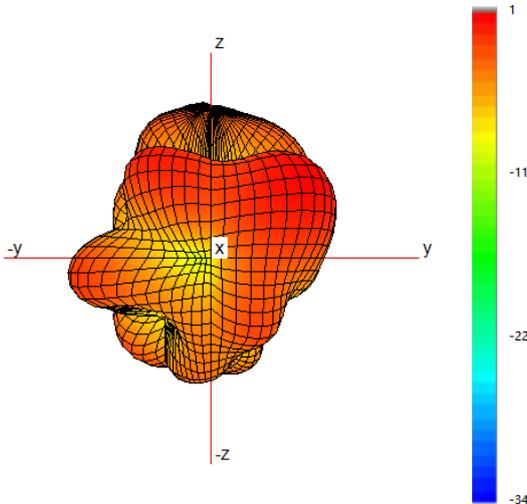
Typical 3D Pattern- Cell B - 650 MHz



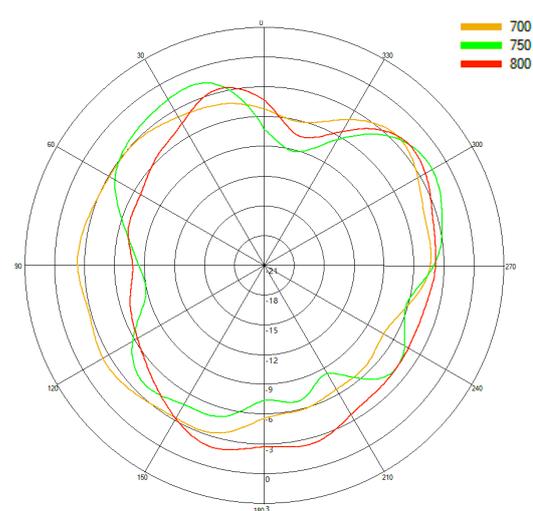
Typical H Plane- Cell B - Patterns- 600-700MHz



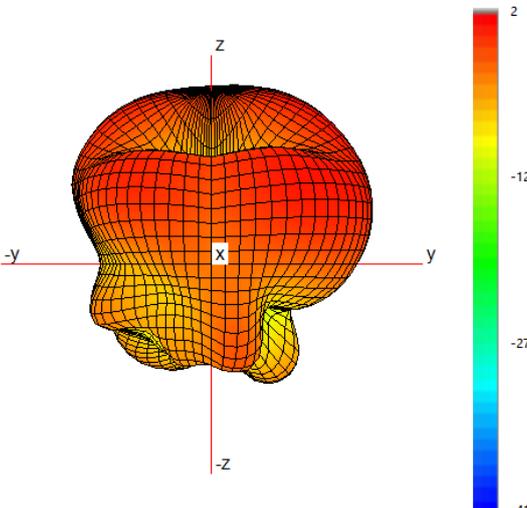
Typical 3D Pattern- Cell B - 750 MHz



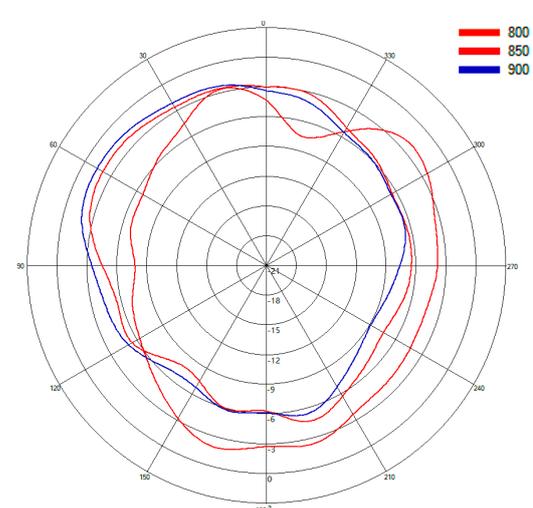
Typical H Plane- Cell B - Patterns- 700-800MHz



Typical 3D Pattern- Cell B - 850 MHz



Typical H Plane- Cell B - Patterns- 800-900 MHz

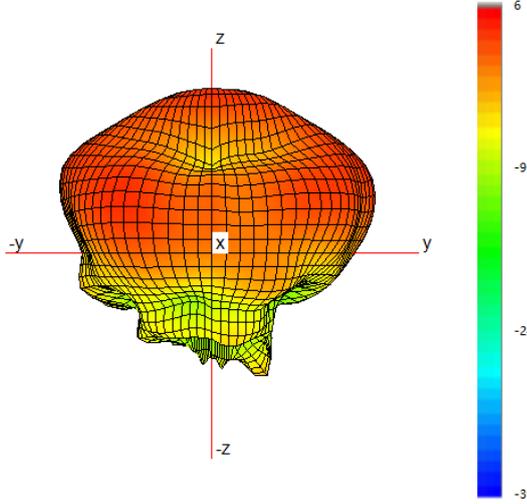


4X4 MiMo 4G/5G Reef Sharkee® Antenna

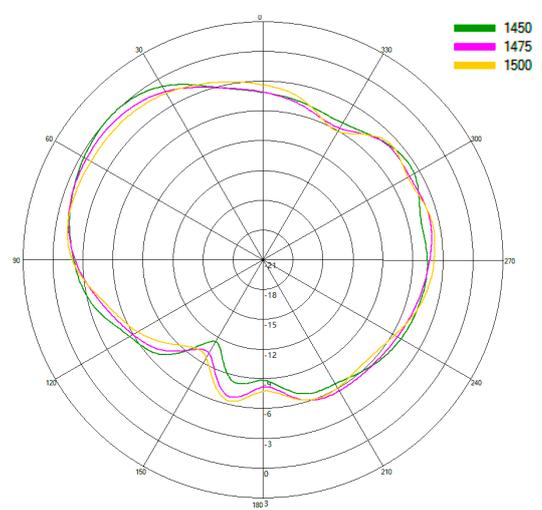
GPSD[X]4-7-49[X]

3D Pattern Data on Ground Plane Cell B

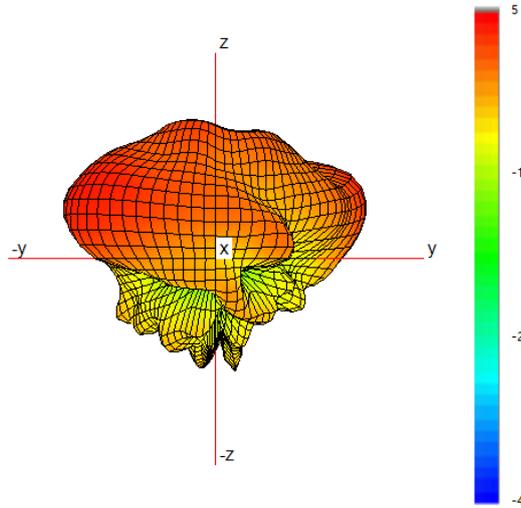
Typical 3D Pattern- Cell B - 1475 MHz



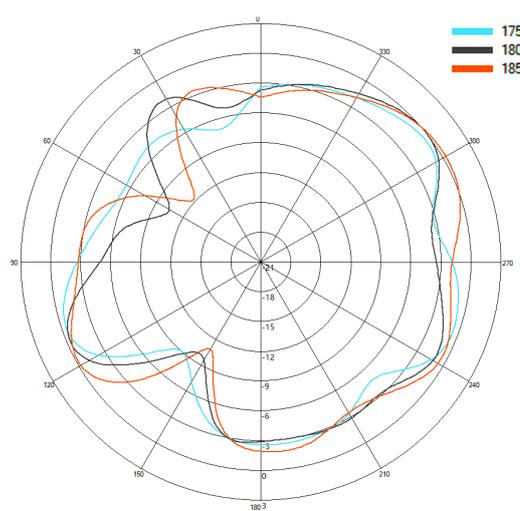
Typical H Plane- Cell B- Patterns- 1450-1500 MHz



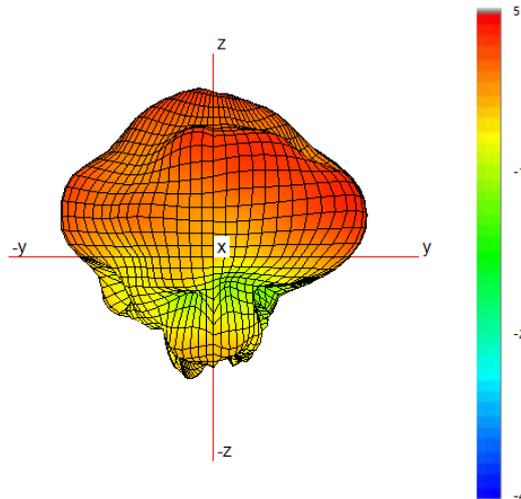
Typical 3D Pattern- Cell B - 1800 MHz



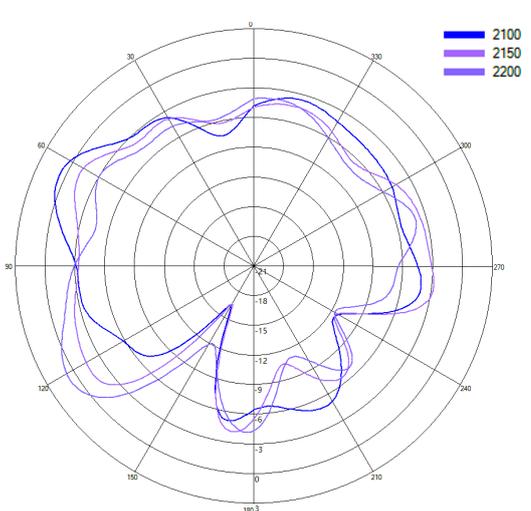
Typical H Plane- Cell B- Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell B - 2150 MHz



Typical H Plane- Cell B- Patterns- 2100-2200 MHz

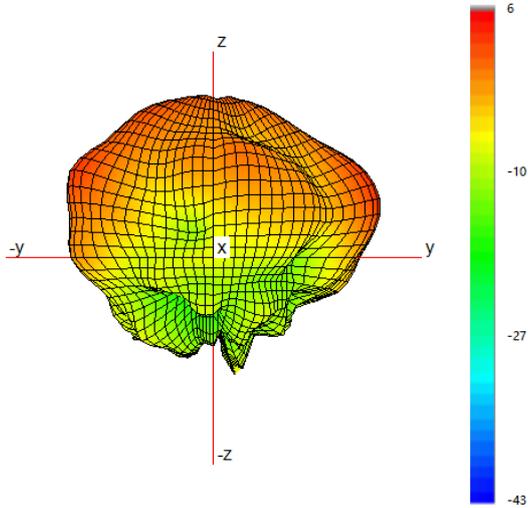


4X4 MiMo 4G/5G Reef Sharkee® Antenna

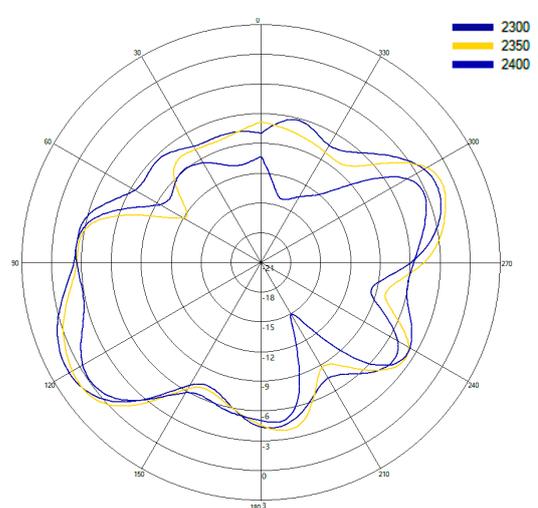
GPSD[X]4-7-49[X]

3D Pattern Data on Ground Plane Cell B

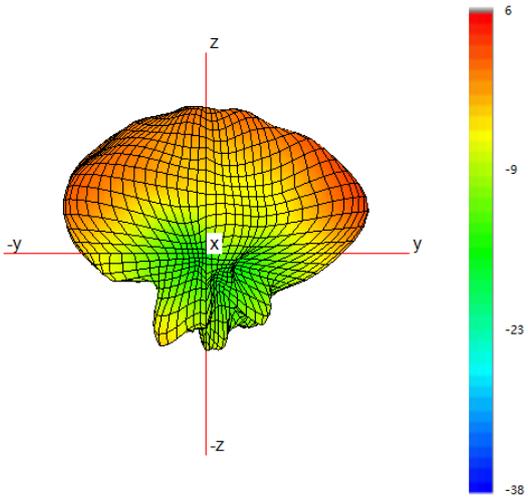
Typical 3D Pattern- Cell B - 2350 MHz



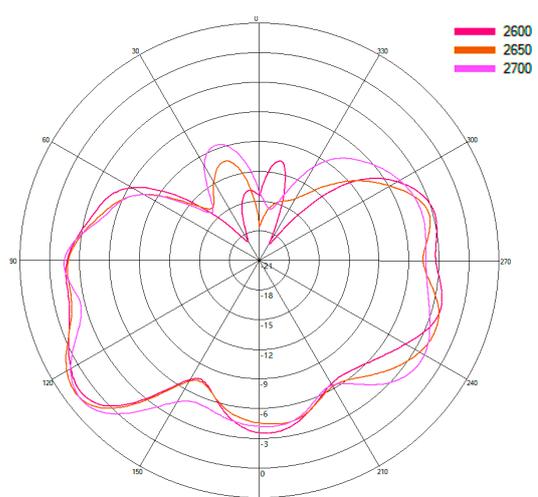
Typical H Plane- Cell B - Patterns- 2300-2400 MHz



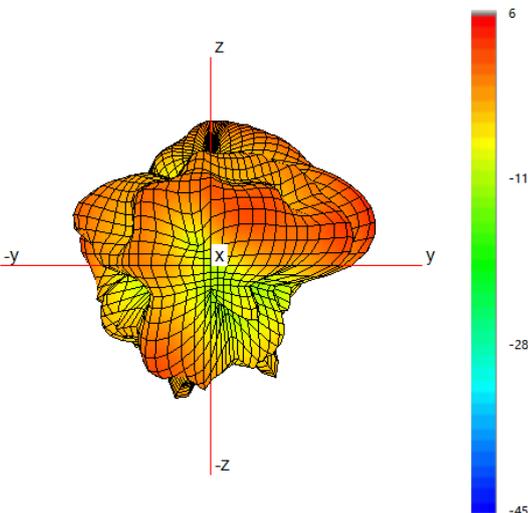
Typical 3D Pattern- Cell B - 2650 MHz



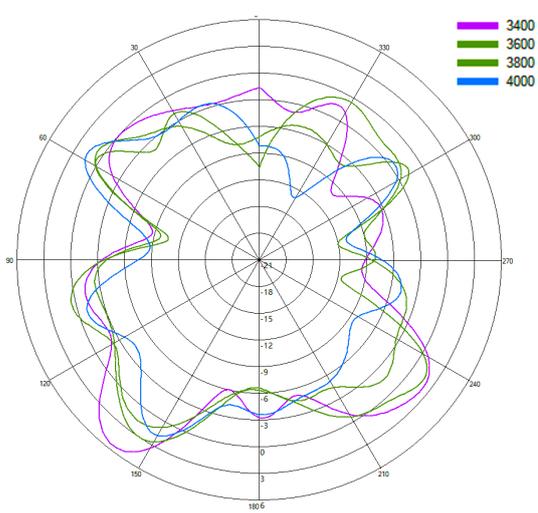
Typical H Plane- Cell B - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell B - 3600 MHz



Typical H Plane- Cell B - Patterns- 3400-4000 MHz

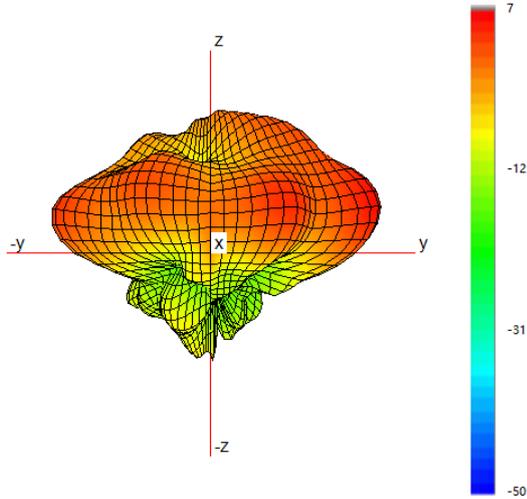


4X4 MiMo 4G/5G Reef Sharkee® Antenna

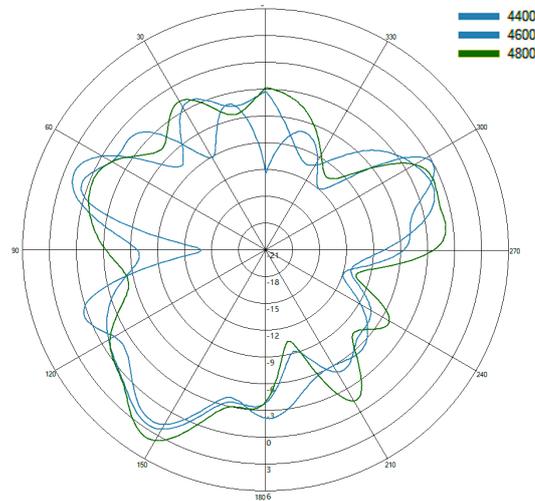
GPSD[X]4-7-49[X]

3D Pattern Data on
Ground Plane Cell B

Typical 3D Pattern- Cell B - 4700 MHz



Typical H Plane- Cell B - Patterns- 4400-4800 MHz

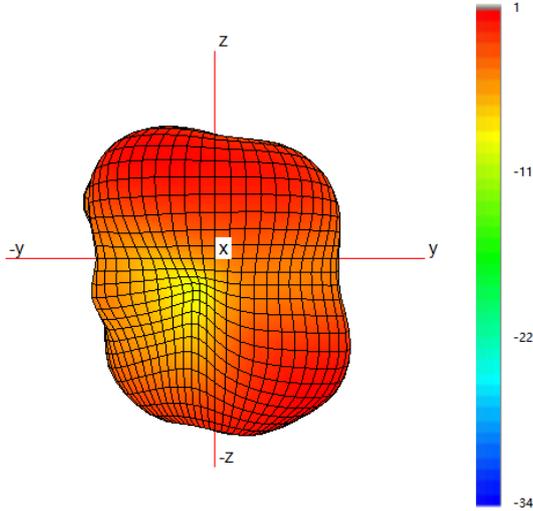


4X4 MiMo 4G/5G Reef Sharkee® Antenna

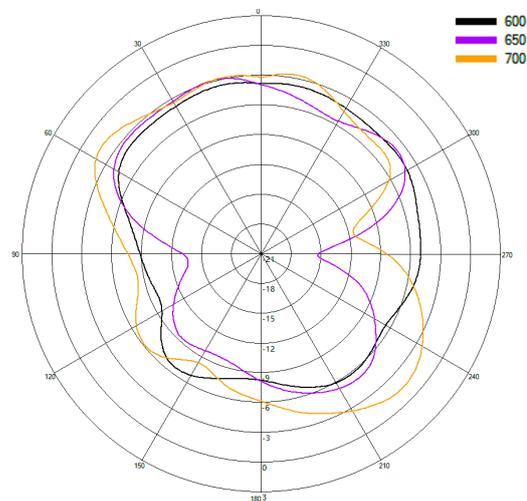
GPSD[X]4-7-49[X]

3D Pattern Data on Ground Plane Cell C

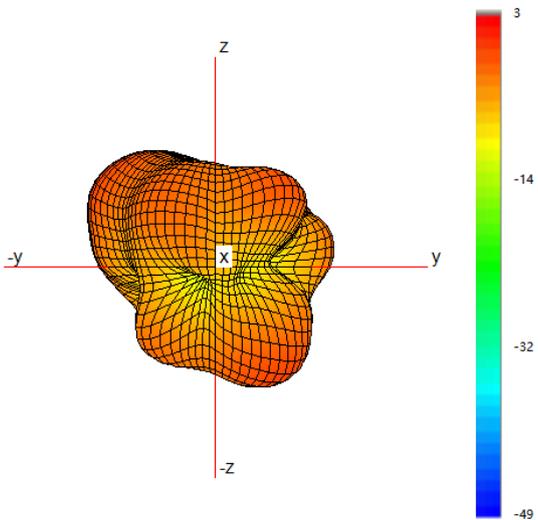
Typical 3D Pattern- Cell C - 650 MHz



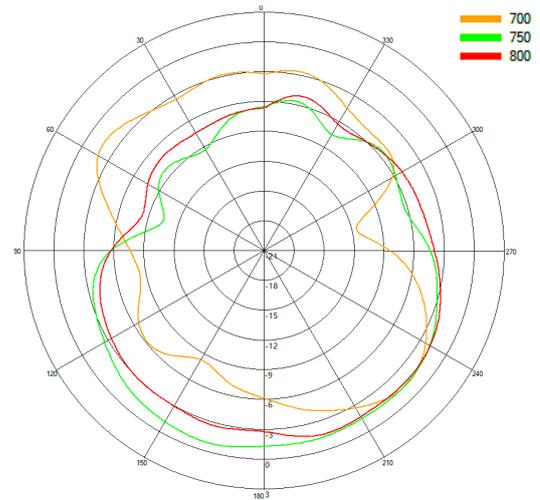
Typical H Plane- Cell C - Patterns- 600-700MHz



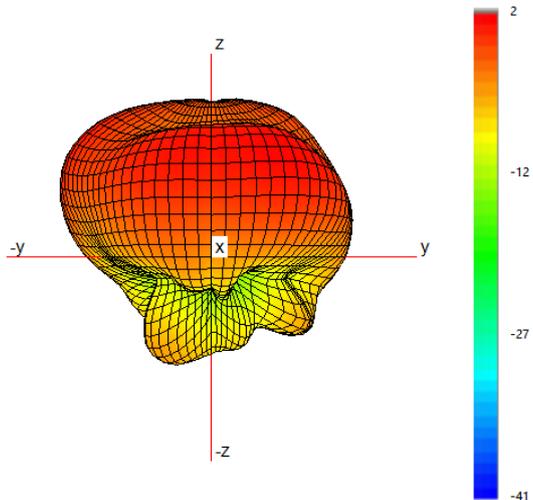
Typical 3D Pattern- Cell C - 750 MHz



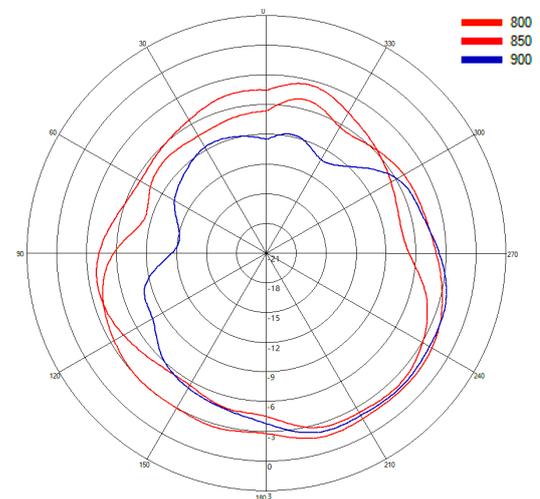
Typical H Plane- Cell C - Patterns- 700-800MHz



Typical 3D Pattern- Cell C - 850 MHz



Typical H Plane- Cell C - Patterns- 800-900 MHz

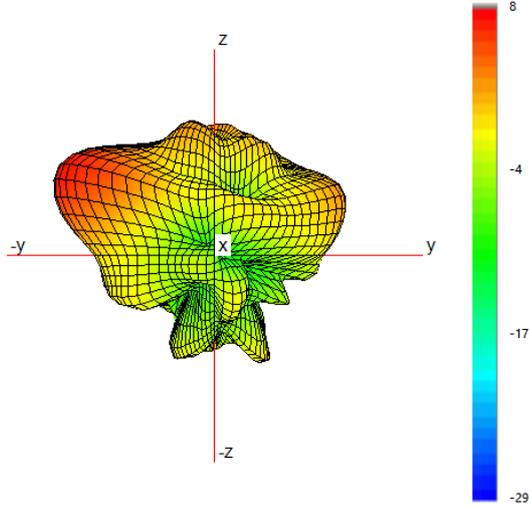


4X4 MiMo 4G/5G Reef Sharkee® Antenna

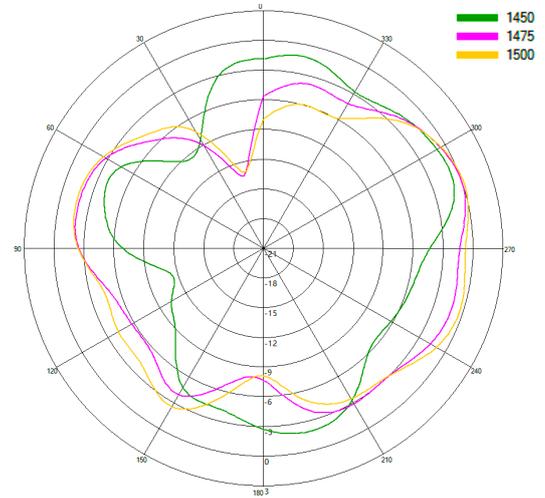
GPSD[X]4-7-49[X]

3D Pattern Data on Ground Plane Cell C

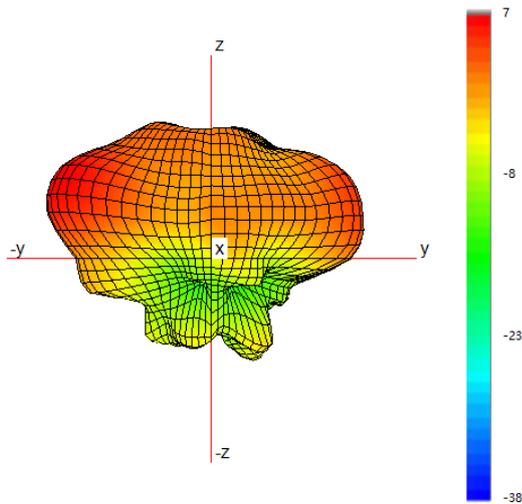
Typical 3D Pattern- Cell C - 1475 MHz



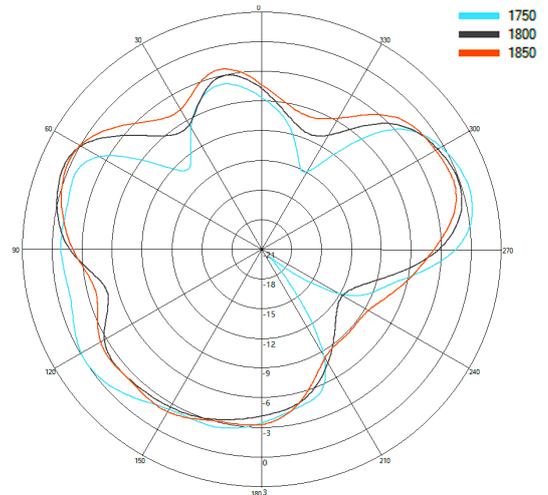
Typical H Plane- Cell C - Patterns- 1450-1500 MHz



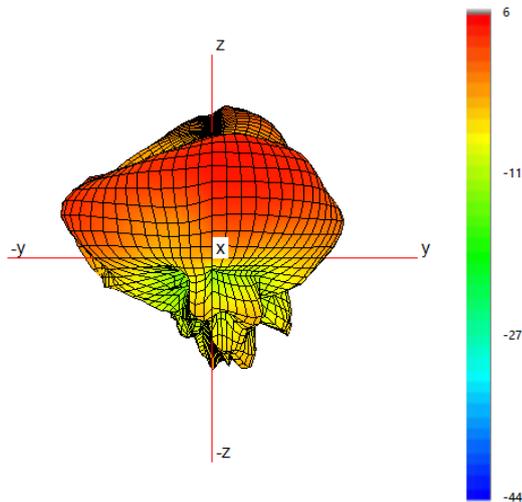
Typical 3D Pattern- Cell C - 1800 MHz



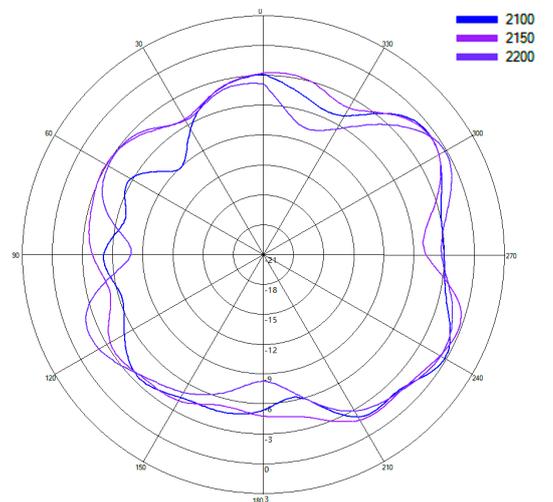
Typical H Plane- Cell C - Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell C - 2150 MHz



Typical H Plane- Cell C - Patterns- 2100-2200 MHz

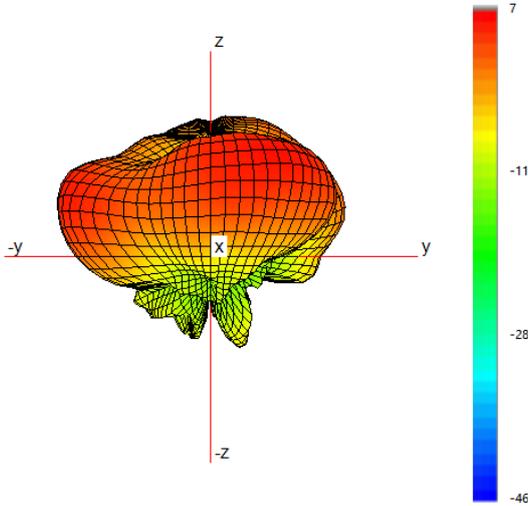


4X4 MiMo 4G/5G Reef Sharkee® Antenna

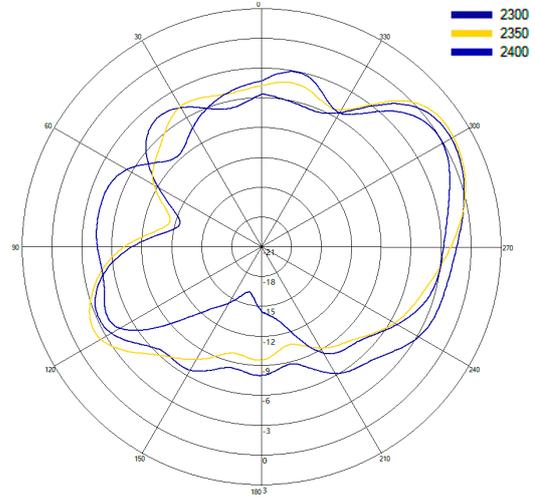
GPSD[X]4-7-49[X]

3D Pattern Data on Ground Plane Cell C

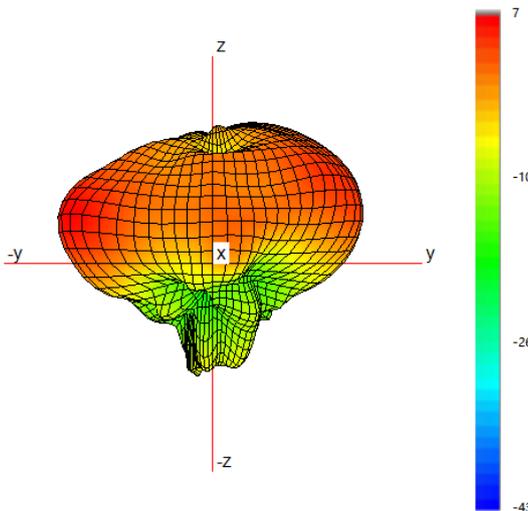
Typical 3D Pattern- Cell C - 2350 MHz



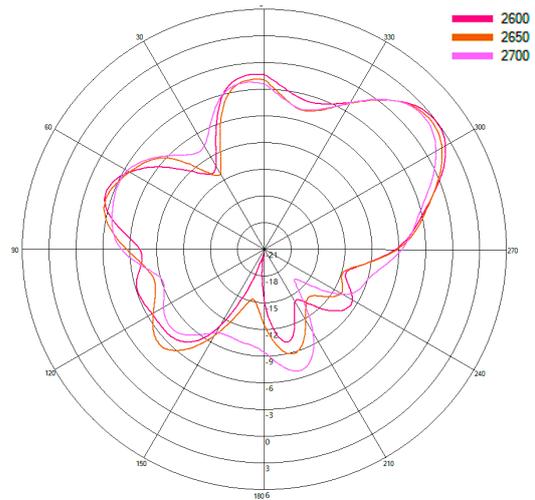
Typical H Plane- Cell C - Patterns- 2300-2400 MHz



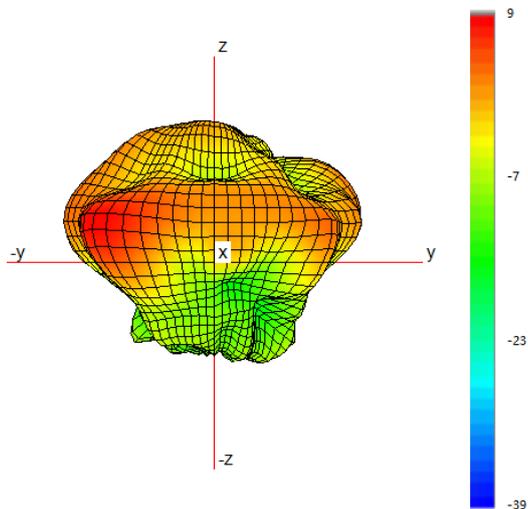
Typical 3D Pattern- Cell C - 2650 MHz



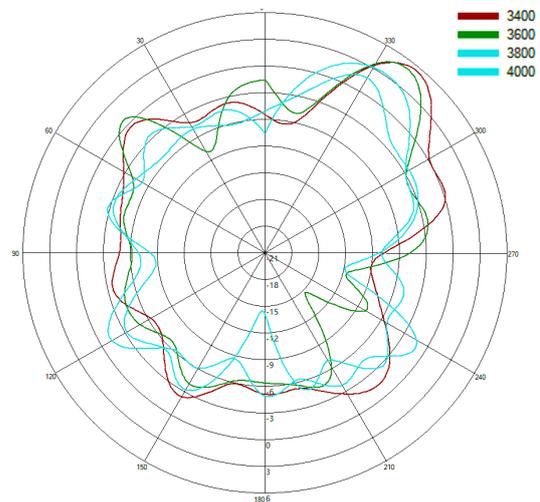
Typical H Plane- Cell C - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell C - 3600 MHz



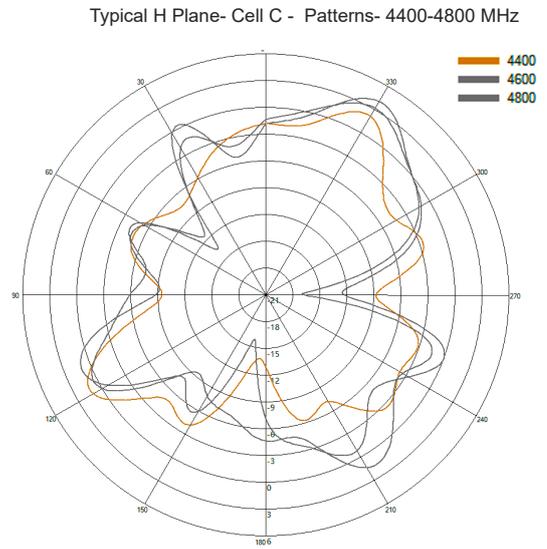
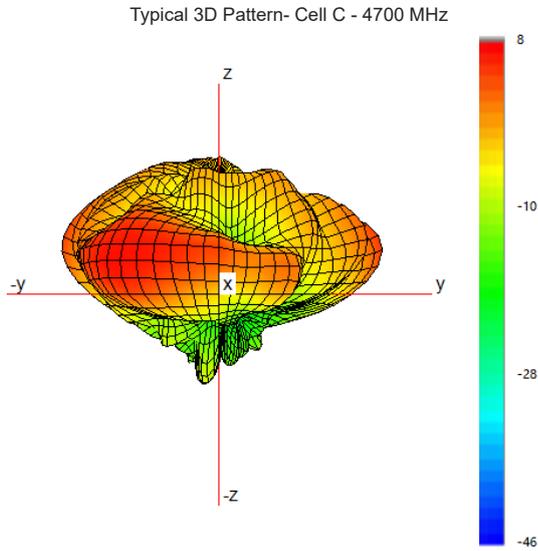
Typical H Plane- Cell C - Patterns- 3400-4000 MHz



4X4 MiMo 4G/5G Reef Sharkee® Antenna

GPSD[X]4-7-49[X]

3D Pattern Data on
Ground Plane Cell C

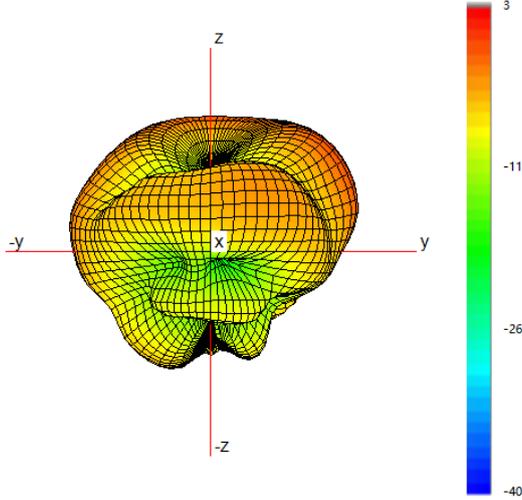


4X4 MiMo 4G/5G Reef Sharkee® Antenna

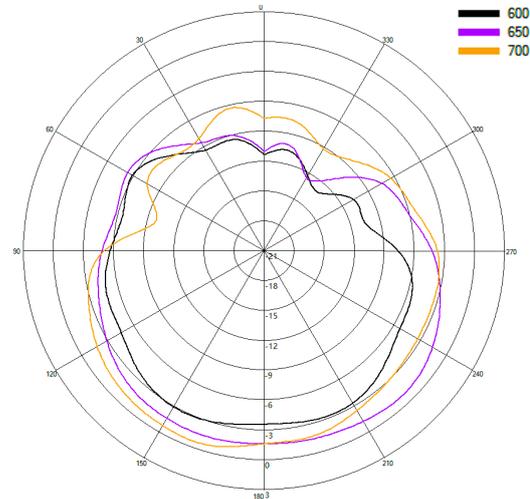
GPSD[X]4-7-49[X]

3D Pattern Data on Ground Plane Cell D

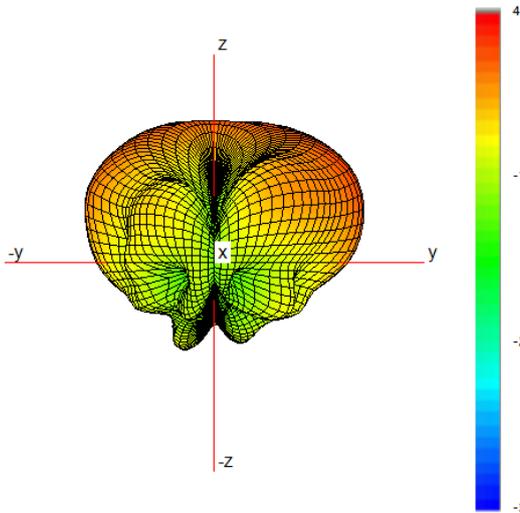
Typical 3D Pattern- Cell D - 650 MHz



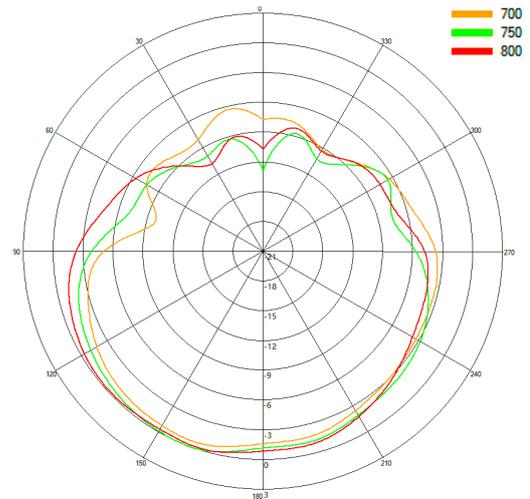
Typical H Plane- Cell D - Patterns- 600-700MHz



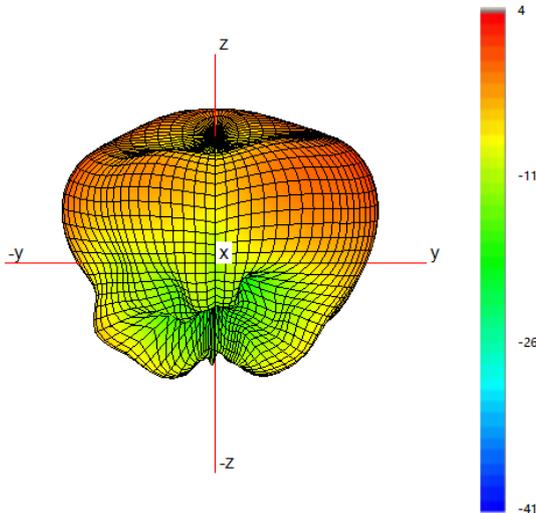
Typical 3D Pattern- Cell D - 750 MHz



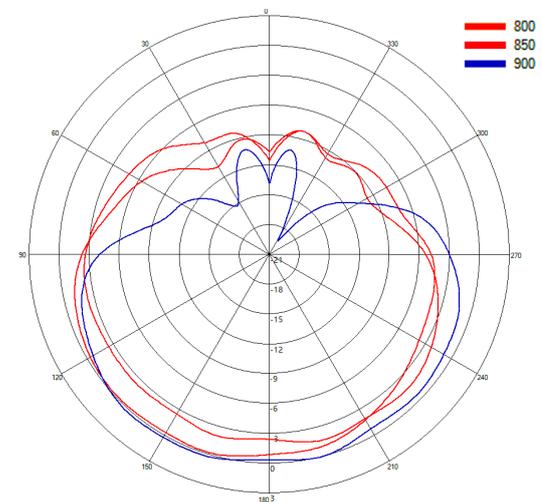
Typical H Plane- Cell D - Patterns- 700-800MHz



Typical 3D Pattern- Cell D - 850 MHz



Typical H Plane- Cell D - Patterns- 800-900 MHz

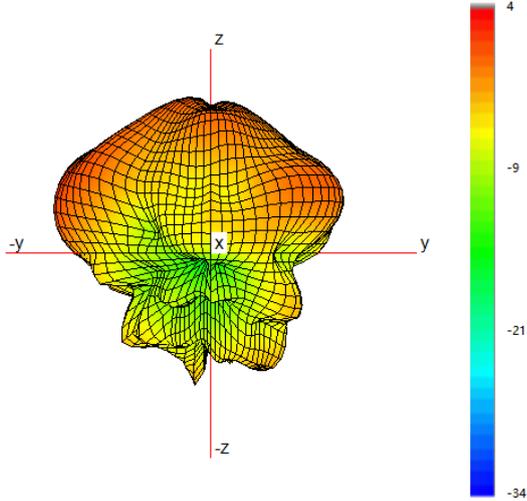


4X4 MiMo 4G/5G Reef Sharkee® Antenna

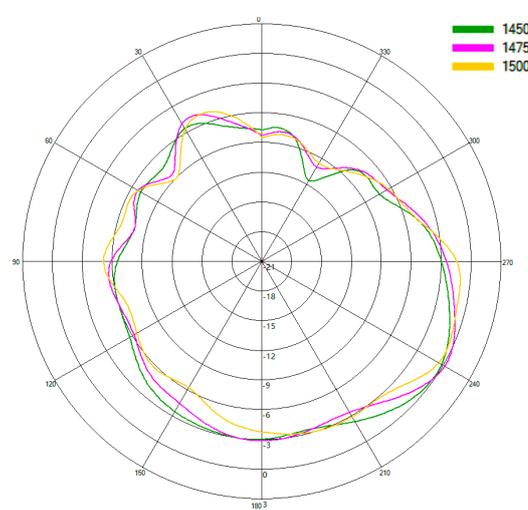
GPSD[X]4-7-49[X]

3D Pattern Data on Ground Plane Cell D

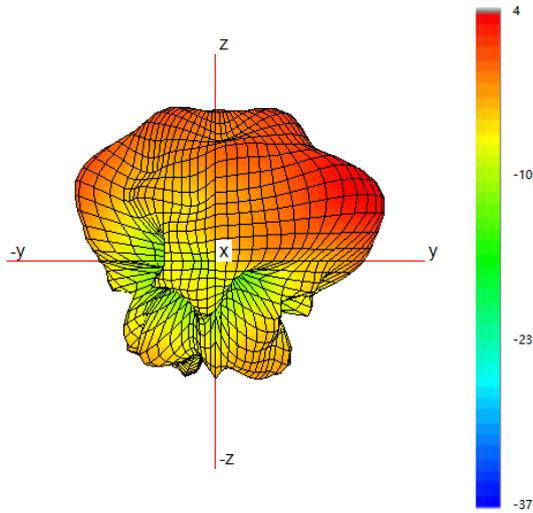
Typical 3D Pattern- Cell D - 1475 MHz



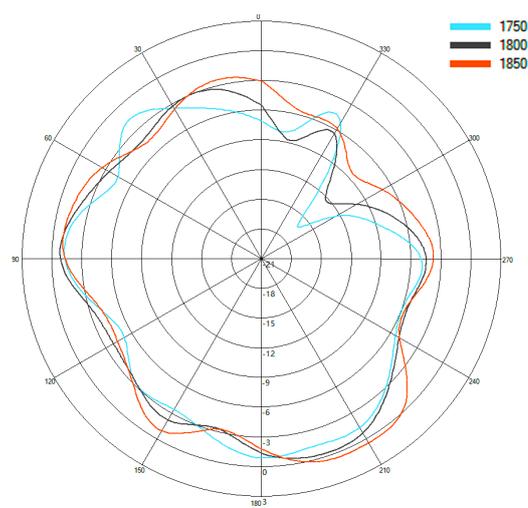
Typical H Plane- Cell D - Patterns- 1450-1500 MHz



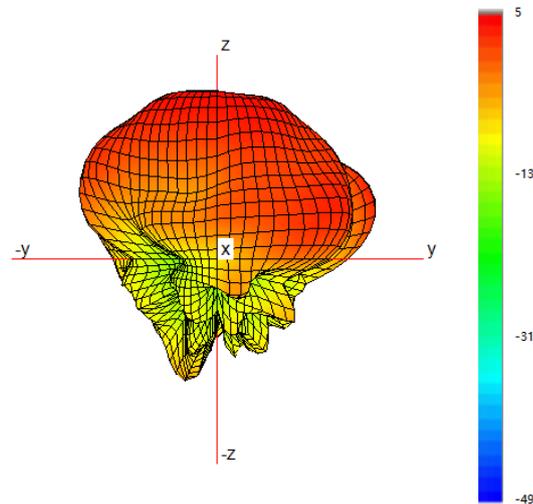
Typical 3D Pattern- Cell D - 1800 MHz



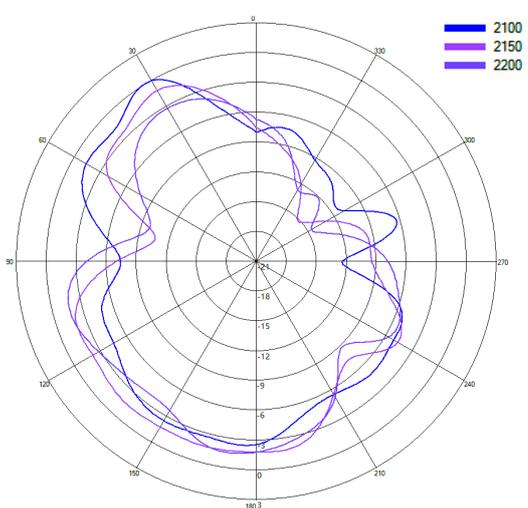
Typical H Plane- Cell D - Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell D - 2150 MHz



Typical H Plane- Cell D - Patterns- 2100-2200 MHz

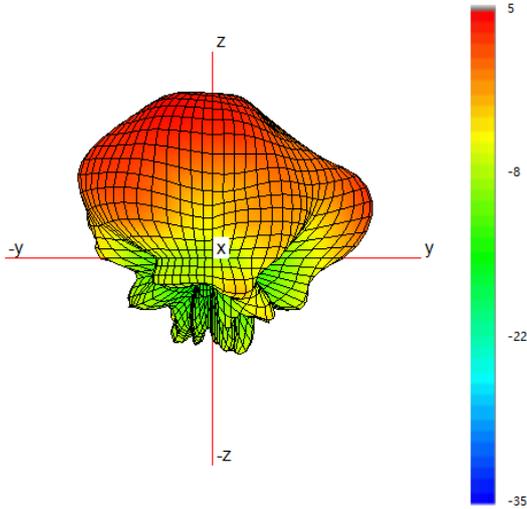


4X4 MiMo 4G/5G Reef Sharkee® Antenna

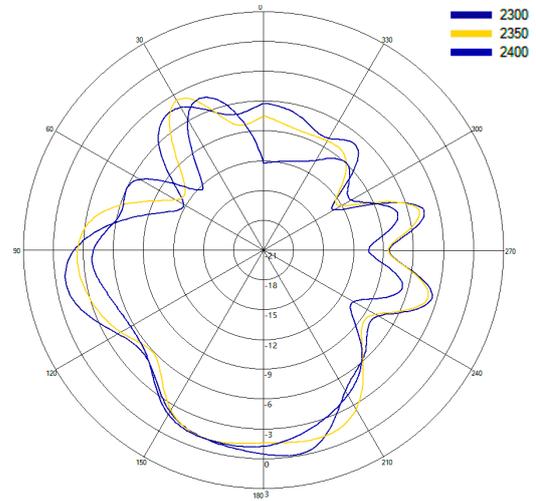
GPSD[X]4-7-49[X]

3D Pattern Data on Ground Plane Cell D

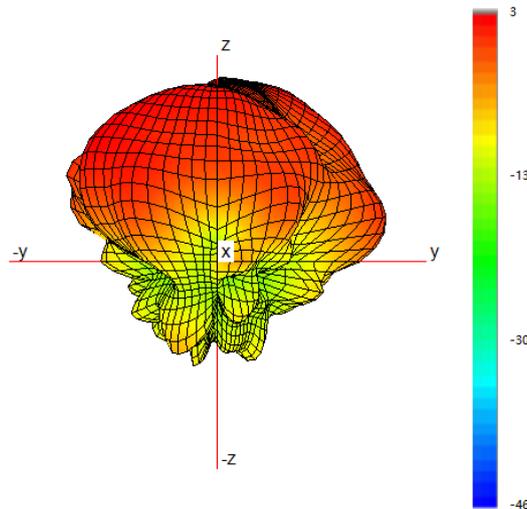
Typical 3D Pattern- Cell D - 2350 MHz



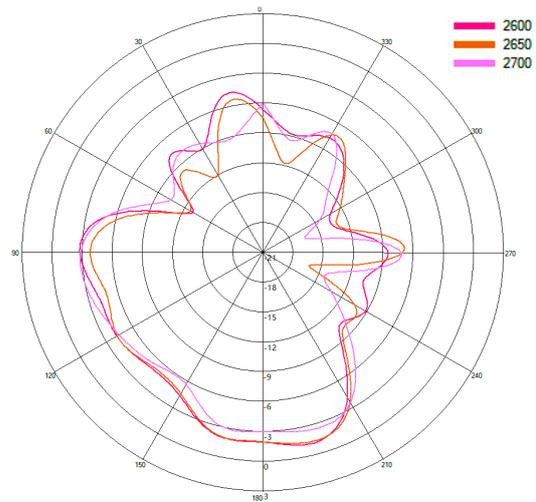
Typical H Plane- Cell D - Patterns- 2300-2400 MHz



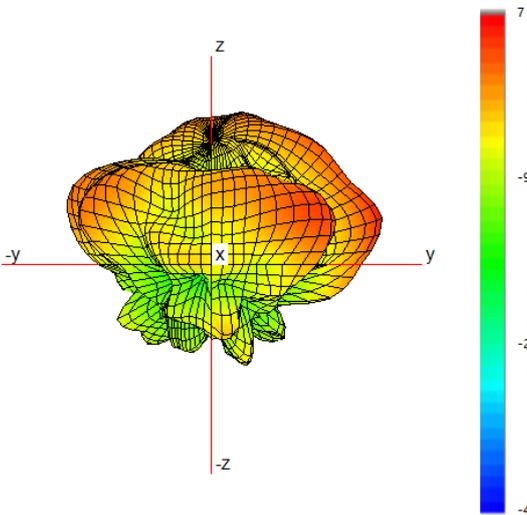
Typical 3D Pattern- Cell D - 2650 MHz



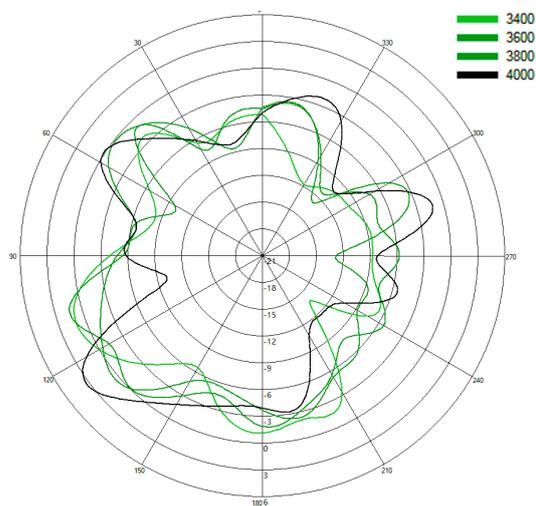
Typical H Plane- Cell D - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell D - 3600 MHz



Typical H Plane- Cell D - Patterns- 3400-4000 MHz

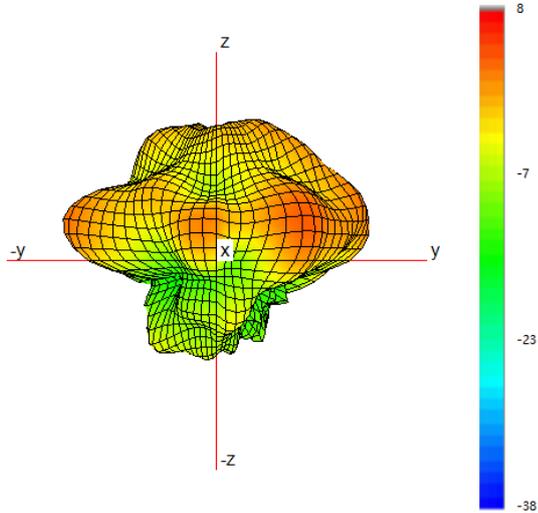


4X4 MiMo 4G/5G Reef Sharkee® Antenna

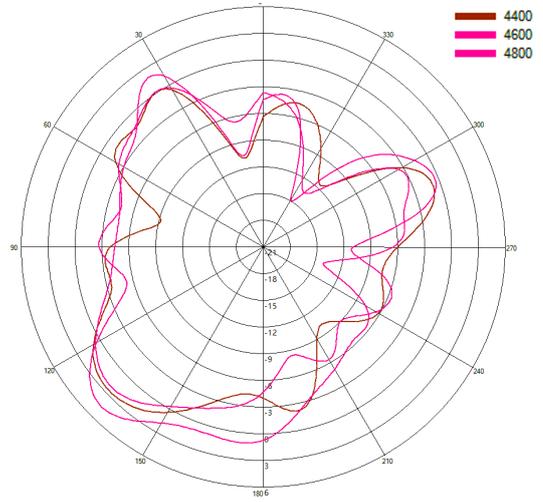
GPSD[X]4-7-49[X]

3D Pattern Data on
Ground Plane Cell D

Typical 3D Pattern- Cell D - 4700 MHz



Typical H Plane- Cell D - Patterns- 4400-4800 MHz

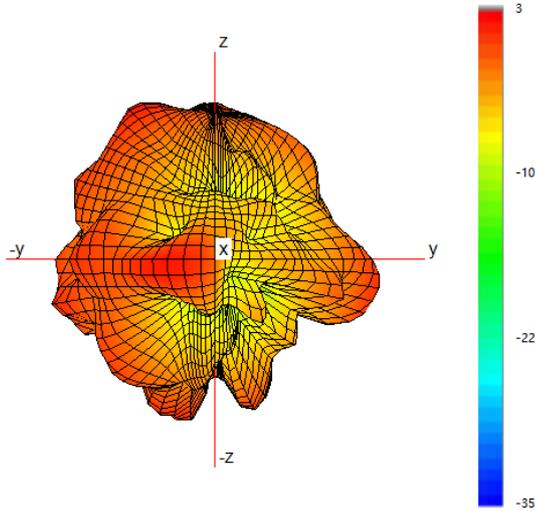


4X4 MiMo 4G/5G Reef Sharkee® Antenna

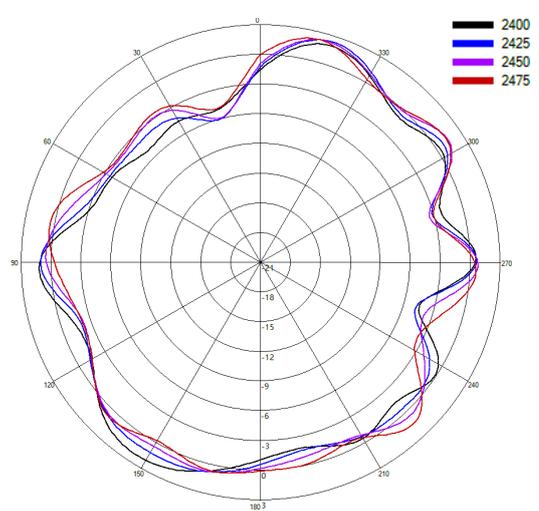
GPSD[X]4-7-49[X]

WiFi Pattern-Data on Ground Plane -WiFi -1

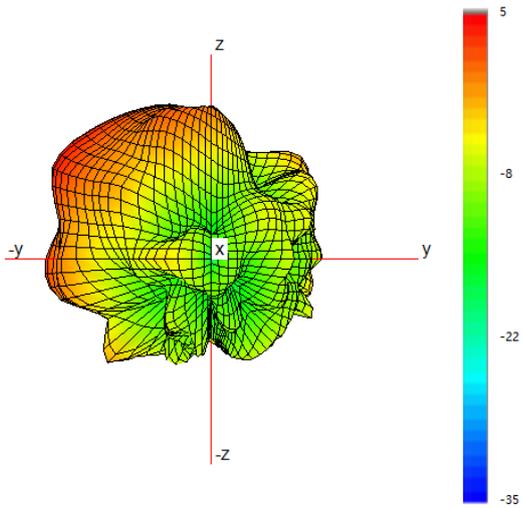
Typical 3D Pattern- WiFi - 1 - 2450 MHz



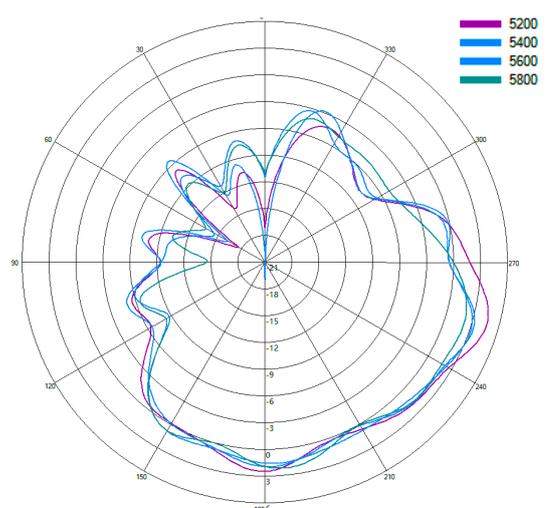
Typical H Plane- WiFi - 1 - Patterns- 2400-2475MHz



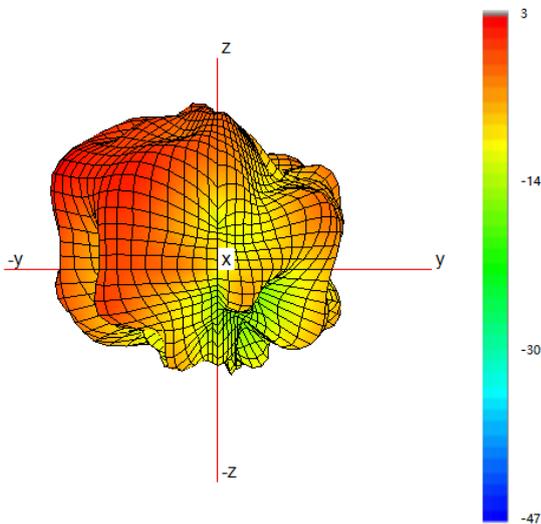
Typical 3D Pattern- WiFi - 1 - 5500 MHz



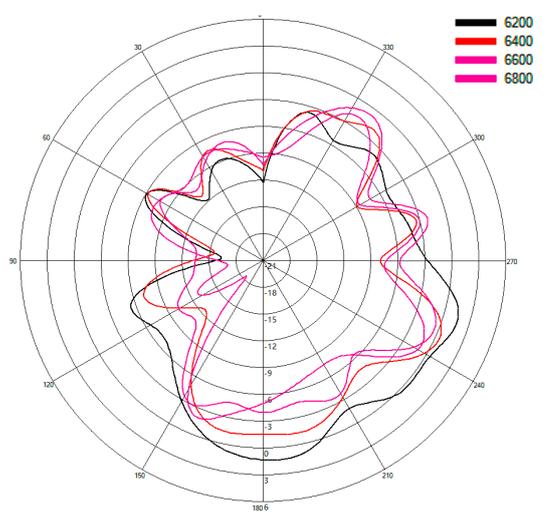
Typical H Plane- WiFi - 1 - Patterns- 5200-5800MHz



Typical 3D Pattern- WiFi - 1 - 6500 MHz



Typical H Plane- WiFi - 1 - Patterns- 6200-6800MHz

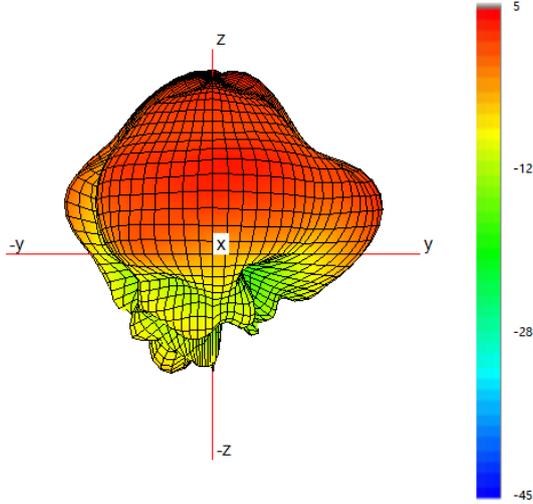


4X4 MiMo 4G/5G Reef Sharkee® Antenna

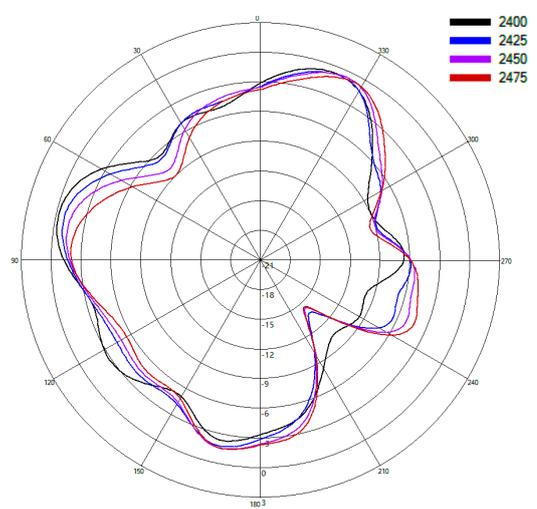
GPSD[X]4-7-49[X]

WiFi Pattern-Data on Ground Plane -WiFi -2

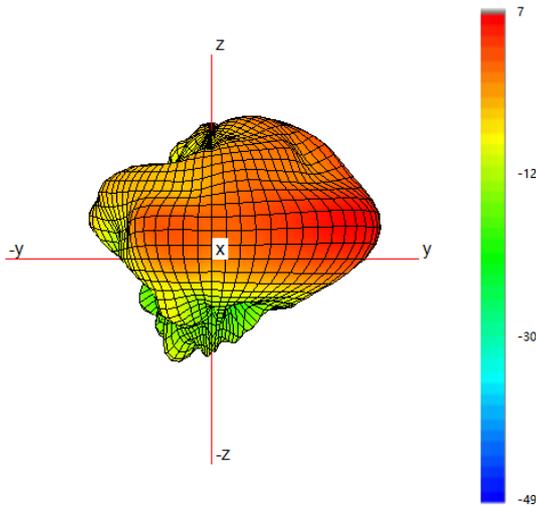
Typical 3D Pattern- WiFi - 2 - 2450 MHz



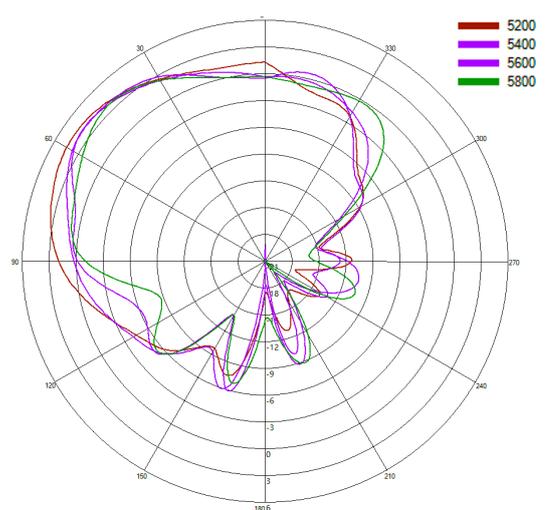
Typical H Plane- WiFi - 2 - Patterns- 2400-2475MHz



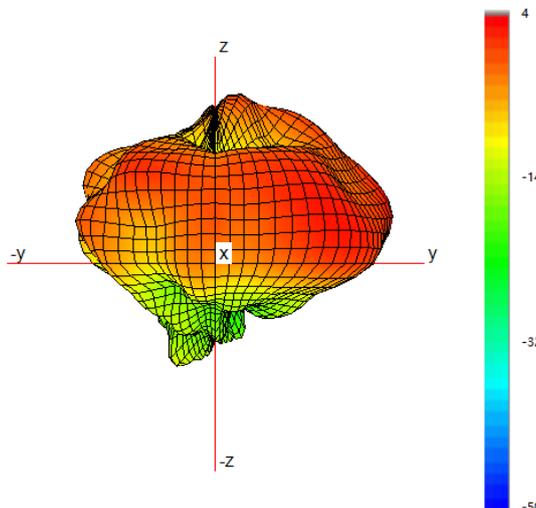
Typical 3D Pattern- WiFi - 2 - 5500 MHz



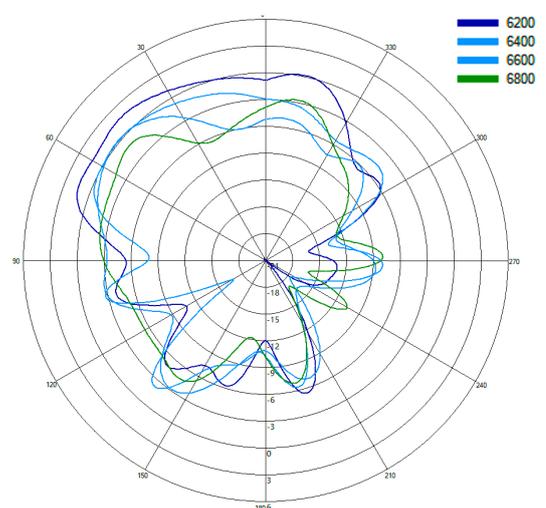
Typical H Plane- WiFi - 2 - Patterns- 5200-5800MHz



Typical 3D Pattern- WiFi - 2 - 6500 MHz



Typical H Plane- WiFi - 2 - Patterns- 6200-6800MHz



4X4 MiMo 4G/5G Reef Sharkee® Antenna

GPSD[X]4-7-49[X]

Electrical Data- Cell- Free space

Measurement Conditions	4G/5G Antennas				
GPSD4-7-49-D measured in free space without additional cable	Frequency Range (MHz)	LTE Bands	Antenna Element	Peak Gain (dBi)	Efficiency (%)
	617-698	71, 105	Cell A	1.0	31
			Cell B	-1.0	27
			Cell C	0.9	33
			Cell D	1.1	40
	699-798	12,13, 14 17,28	Cell A	1.5	46
			Cell B	0.3	32
			Cell C	2.4	41
			Cell D	1.7	46
	807- 862	5,19,20,26,27	Cell A	3.1	53
			Cell B	-1.0	29
			Cell C	0.0	30
			Cell D	3.2	56
	880-960	8	Cell A	3.8	67
			Cell B	1.8	41
			Cell C	0.7	30
			Cell D	4.0	71
	1427-1518	11, 21, 74,75,76	Cell A	2.9	59
			Cell B	3.1	76
			Cell C	3.6	73
			Cell D	2.6	59
1710-1920	2,3,4,9,25,35,39,66	Cell A	3.9	63	
		Cell B	3.1	69	
		Cell C	3.3	69	
		Cell D	3.8	66	
1920-2170	1,23	Cell A	4.1	71	
		Cell B	4.7	67	
		Cell C	3.9	67	
		Cell D	4.4	71	
2300-2400	30,40	Cell A	3.6	72	
		Cell B	3.2	64	
		Cell C	3.6	66	
		Cell D	3.0	69	
2496-2690	7,38,41	Cell A	3.9	68	
		Cell B	3.1	64	
		Cell C	3.5	56	
		Cell D	2.3	58	
3300-4200	22,42,43,48,77,78,79	Cell A	4.8	57	
		Cell B	5.6	56	
		Cell C	6.4	54	
		Cell D	5.1	50	
4400-5000	79	Cell A	5.2	49	
		Cell B	4.8	48	
		Cell C	6.0	49	
		Cell D	5.3	51	

4X4 MiMo 4G/5G Reef Sharkee® Antenna

GPSD[X]4-7-49[X]

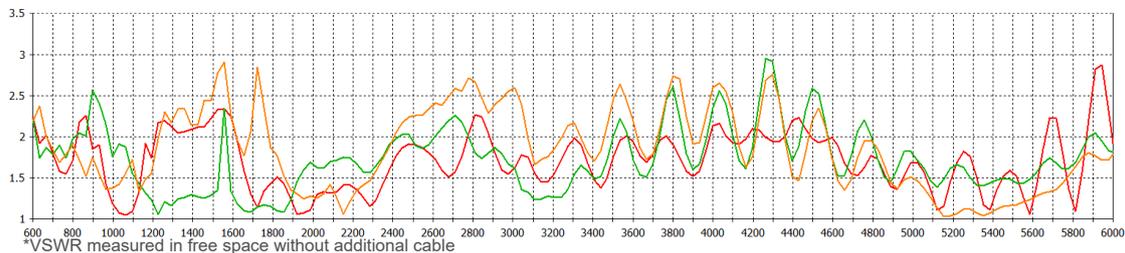
Measurement Conditions	WiFi Antennas				
GPSD4-7-49-D measured in free space without additional cable	Frequency Range (MHz)	WiFi Bands	Antenna Element	Peak Gain (dBi)	Efficiency (%)
	2396-2485	2.4GHz	WiFi 1	3.8	77
			WiFi 2	3.0	66
	5150-5250	UNII-1	WiFi 1	4.5	57
			WiFi 2	5.8	55
	5250-5350	UNII-2A	WiFi 1	4.5	55
			WiFi 2	5.8	55
	5350-5470	UNII-2B	WiFi 1	4.7	55
			WiFi 2	5.6	52
	5470-5725	UNII-2C	WiFi 1	4.6	53
			WiFi 2	4.5	50
	5725-5850	UNII-3	WiFi 1	4.4	51
			WiFi 2	3.4	49
	5850-5925	UNII-4	WiFi 1	4.2	49
			WiFi 2	3.3	46
	5925-6425	UNII-5	WiFi 1	4.8	45
			WiFi 2	3.1	40
6425-6525	UNII-6	WiFi 1	3.2	39	
		WiFi 2	2.8	34	
6525-6875	UNII-7	WiFi 1	3.3	38	
		WiFi 2	3.7	33	
6875-7125	UNII-8	WiFi 1	4.0	40	
		WiFi 2	4.8	40	

4X4 MiMo 4G/5G Reef Sharkee® Antenna

GPSD[X]4-7-49[X]

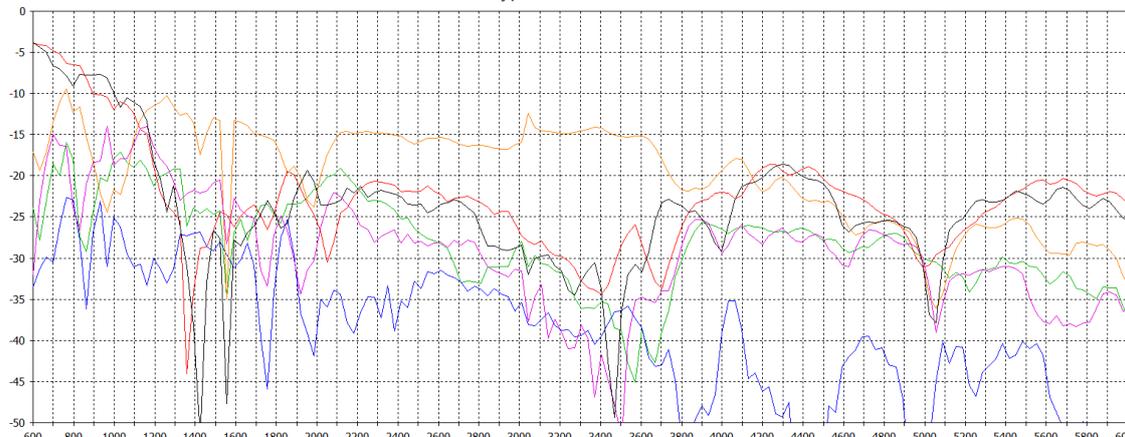
Electrical Data- Cell-
Free space

Typical VSWR*



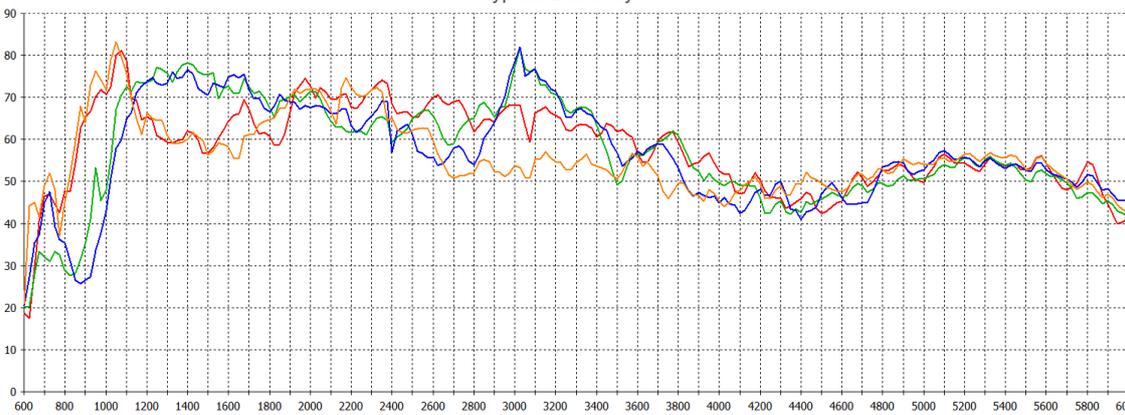
*VSWR measured in free space without additional cable

Typical Isolation*



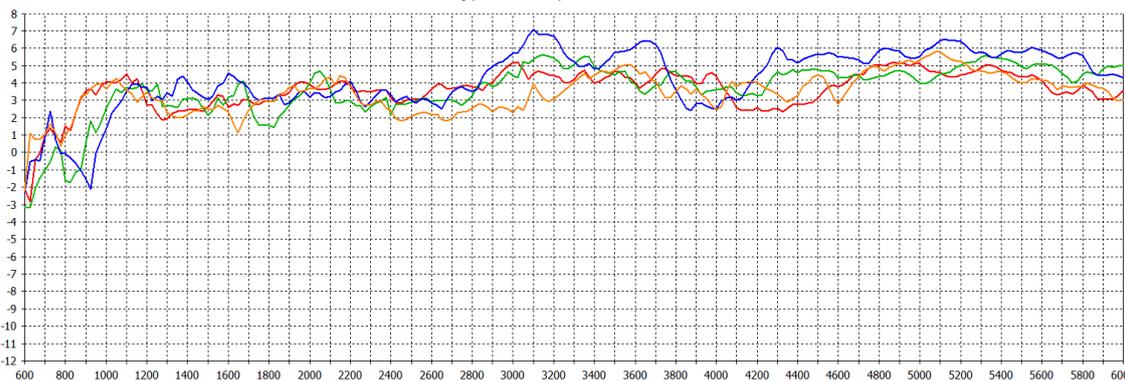
*Isolation measured in free space without additional cable

Typical Efficiency*



*Efficiency measured in free space without additional cable

Typical Swept Peak Gain*



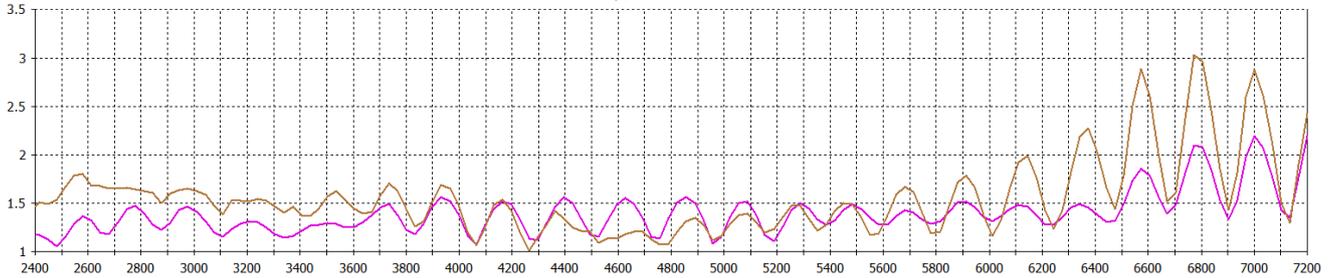
* Swept peak gain measured in free space without additional cable

4X4 MiMo 4G/5G Reef Sharkee® Antenna

GPSD[X]4-7-49[X]

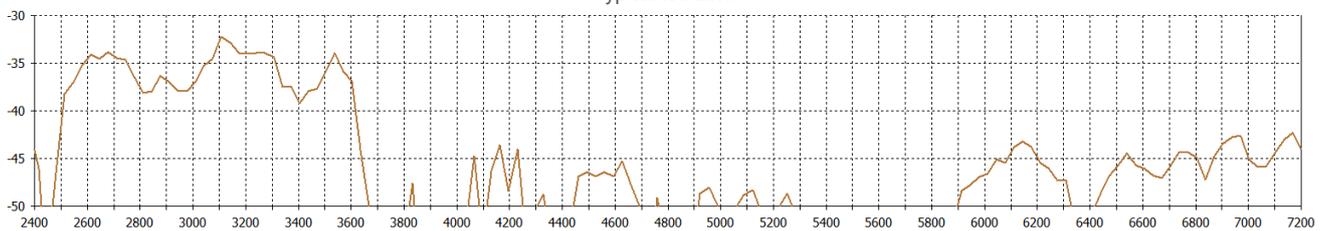
Electrical Data - WiFi-Free Space

Typical VSWR*



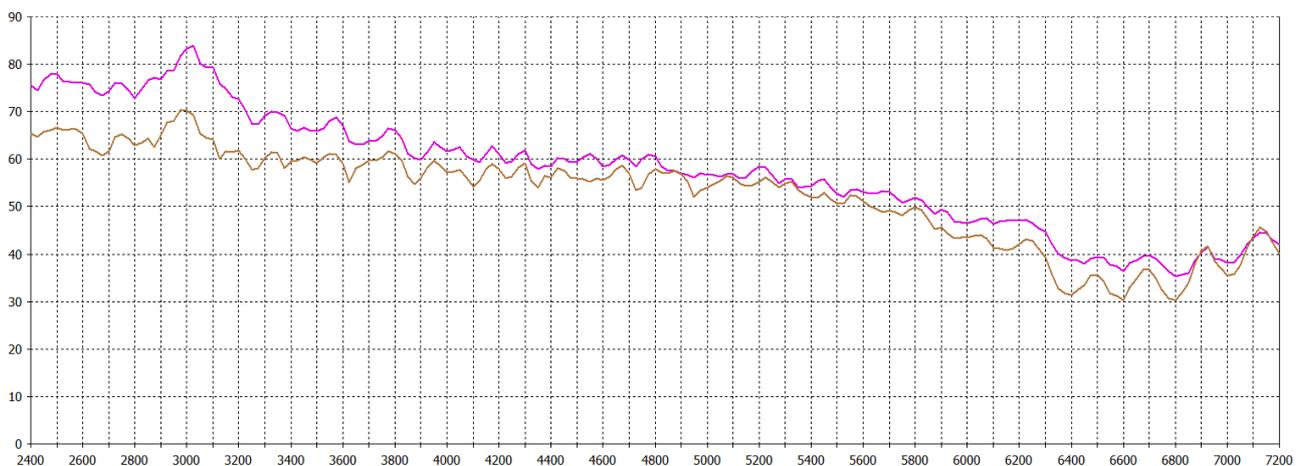
*VSWR measured in free space without additional cable

Typical Isolation*



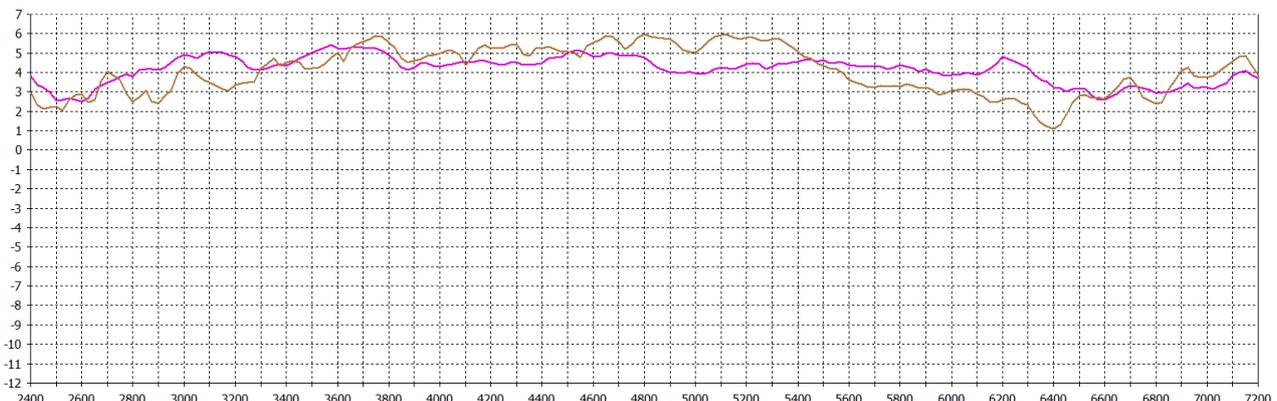
*Isolation measured in free space without additional cable

Typical Efficiency*



*Efficiency measured in free space without additional cable

Typical Swept Peak Gain*



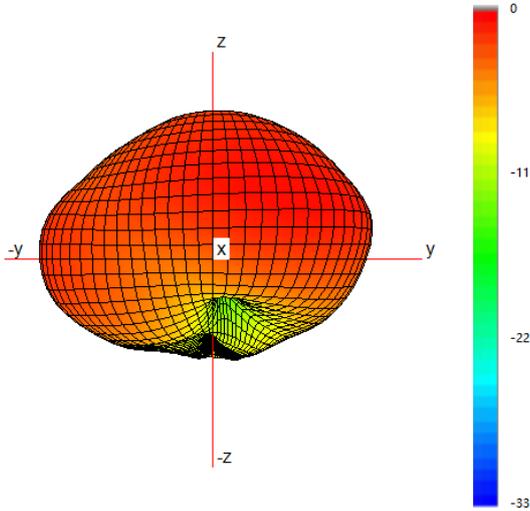
* Swept peak gain measured in free space without additional cable

4X4 MiMo 4G/5G Reef Sharkee® Antenna

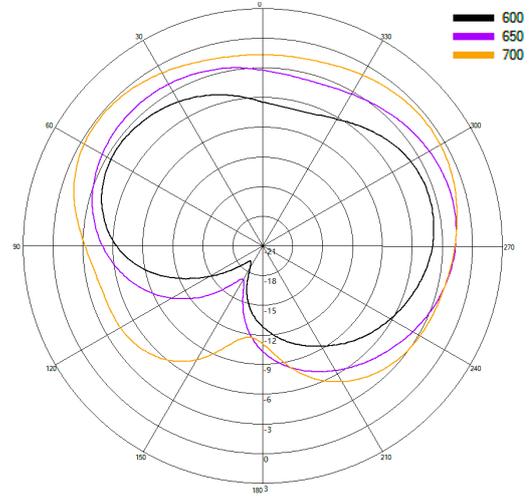
GPSD[X]4-7-49[X]

3D Pattern Data in Free Space Cell A

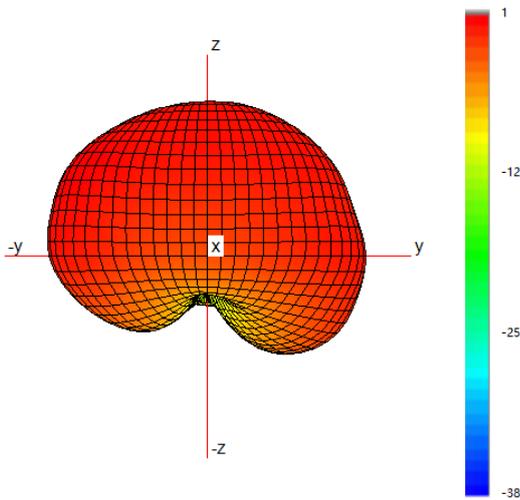
Typical 3D Pattern- Cell A - 650 MHz



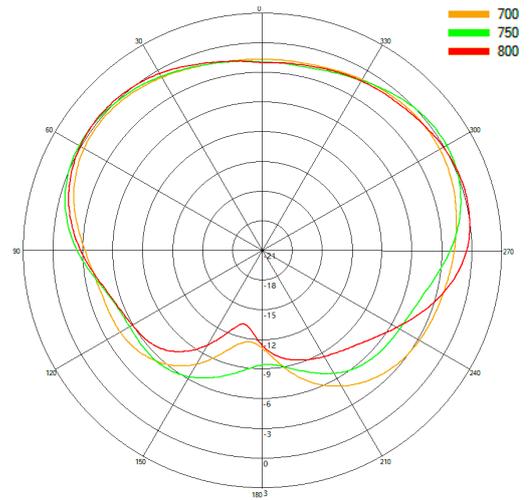
Typical H Plane- Cell A - Patterns- 600-700MHz



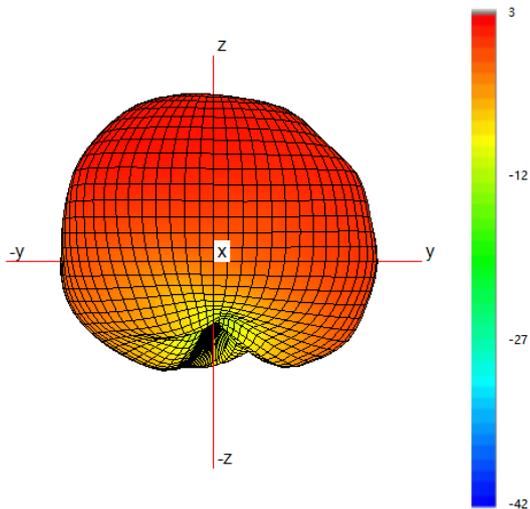
Typical 3D Pattern- Cell A - 750 MHz



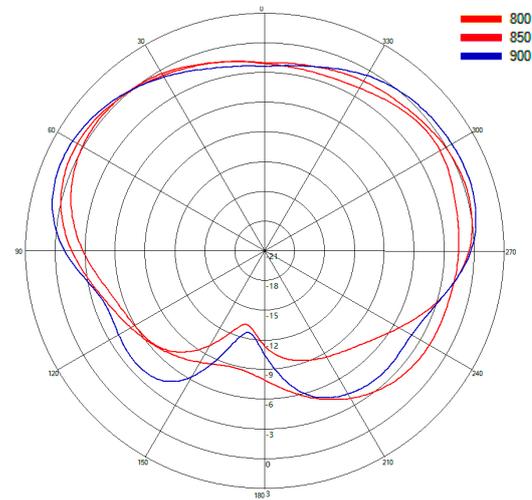
Typical H Plane- Cell A - Patterns- 700-800MHz



Typical 3D Pattern- Cell A - 850 MHz



Typical H Plane- Cell A- Patterns- 800-900 MHz

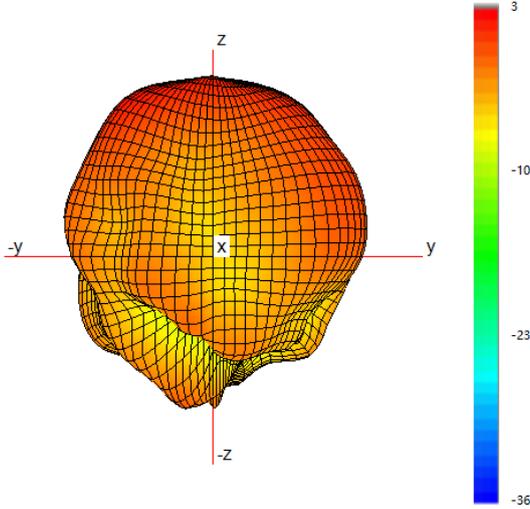


4X4 MiMo 4G/5G Reef Sharkee® Antenna

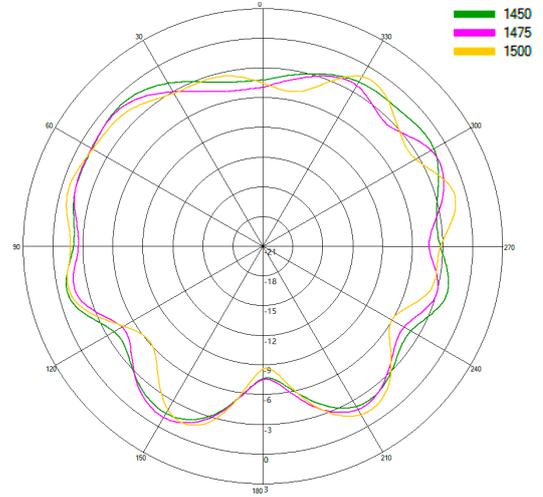
GPSD[X]4-7-49[X]

3D Pattern Data in Free Space Cell A

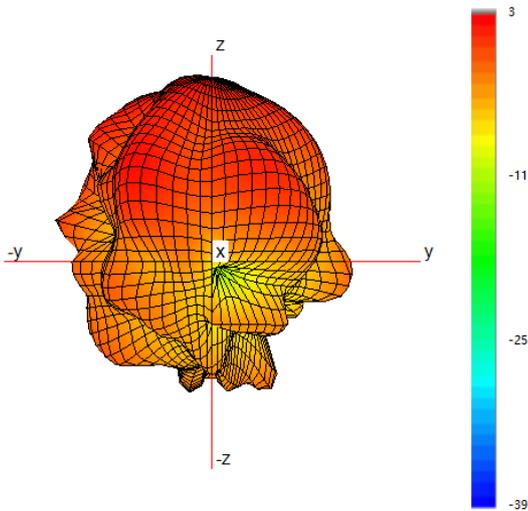
Typical 3D Pattern- Cell A - 1475 MHz



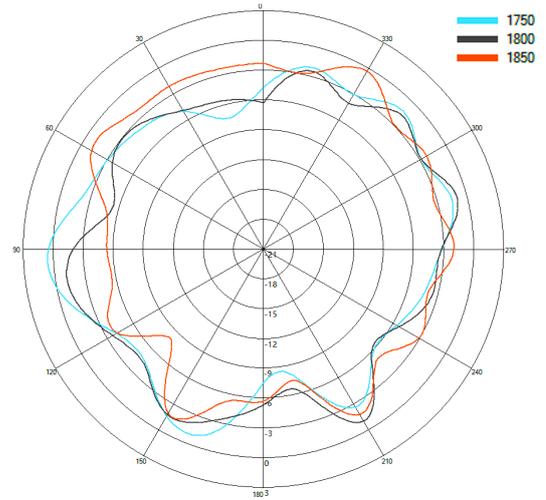
Typical H Plane- Cell A- Patterns- 1450-1500 MHz



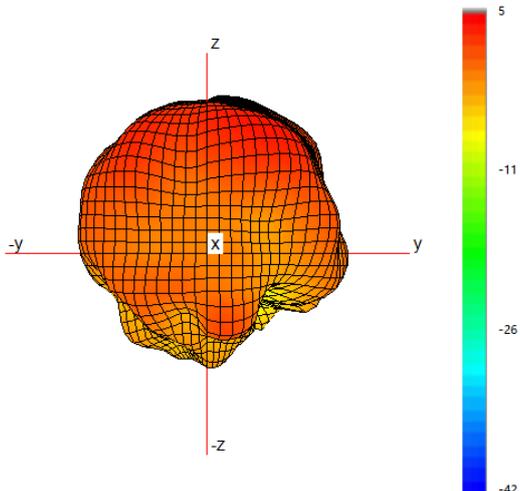
Typical 3D Pattern- Cell A - 1800 MHz



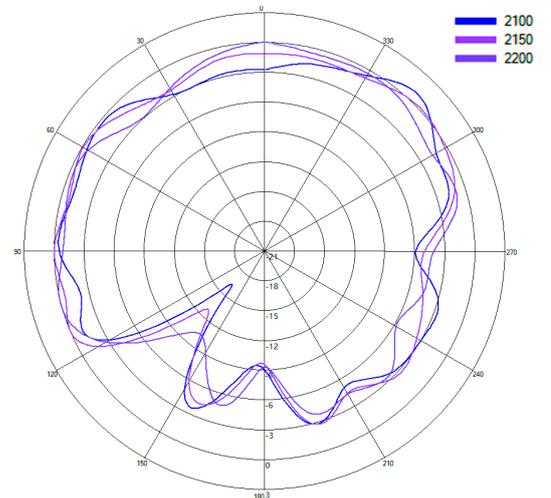
Typical H Plane- Cell A- Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell A - 2150 MHz



Typical H Plane- Cell A- Patterns- 2100-2200 MHz

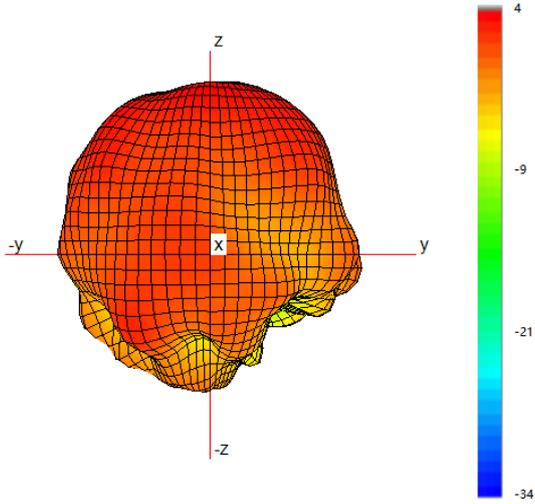


4X4 MiMo 4G/5G Reef Sharkee® Antenna

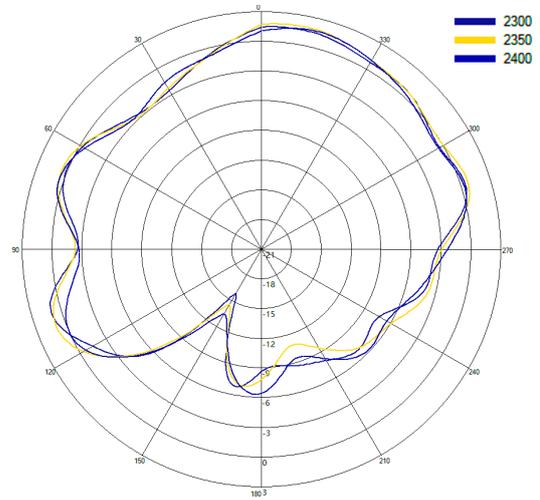
GPSD[X]4-7-49[X]

3D Pattern Data in Free Space Cell A

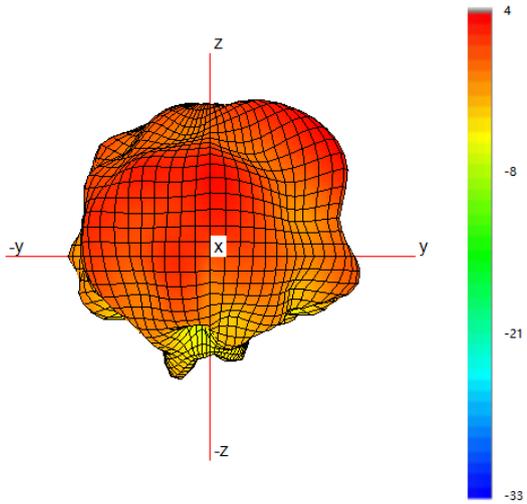
Typical 3D Pattern- Cell A - 2350 MHz



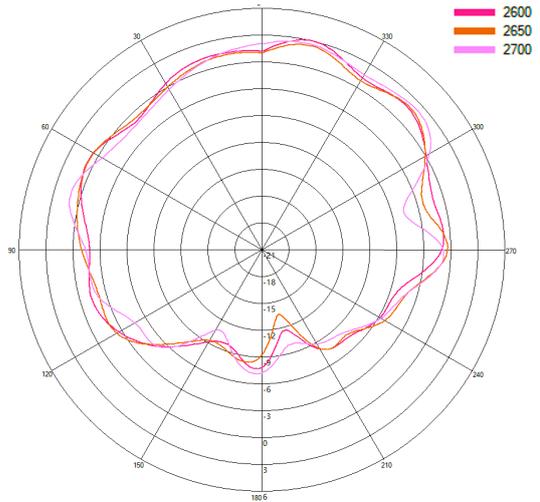
Typical H Plane- Cell A - Patterns- 2300-2400 MHz



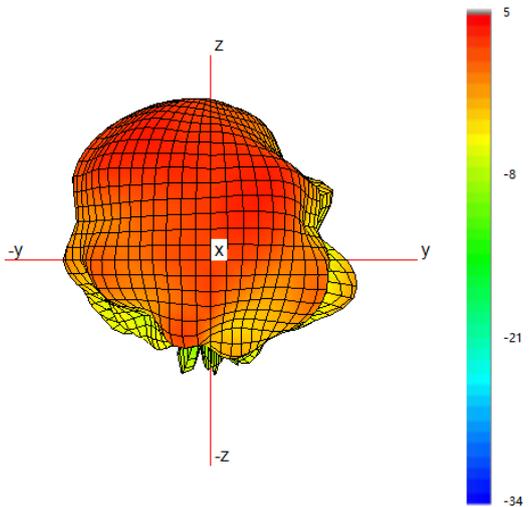
Typical 3D Pattern- Cell A - 2650 MHz



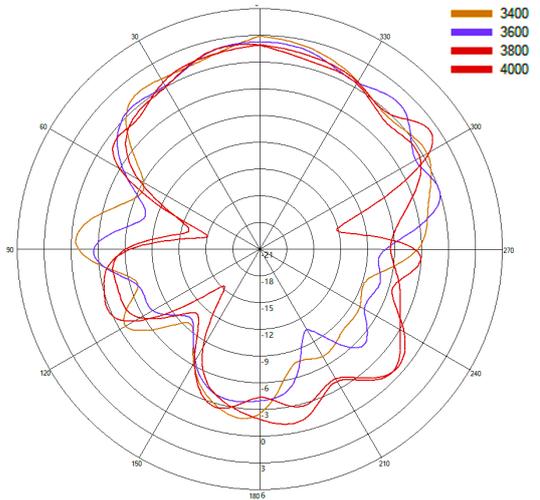
Typical H Plane- Cell A - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell A - 3600 MHz



Typical H Plane- Cell A - Patterns- 3400-4000 MHz

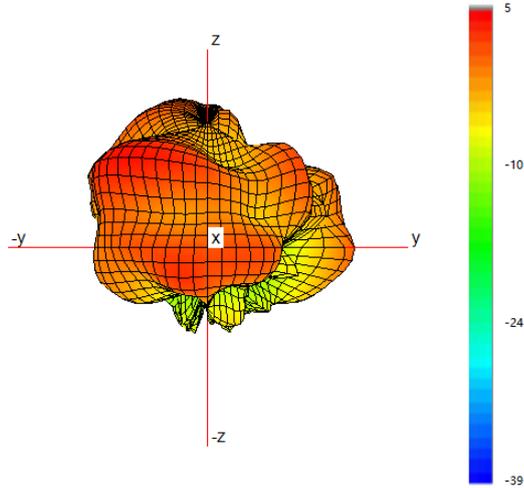


4X4 MiMo 4G/5G Reef Sharkee® Antenna

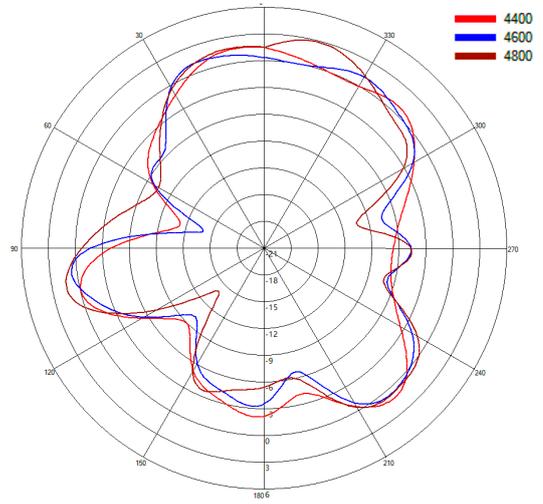
GPSD[X]4-7-49[X]

3D Pattern Data in
Free Space Cell A

Typical 3D Pattern- Cell A - 4700 MHz



Typical H Plane- Cell A - Patterns- 4400-4800 MHz

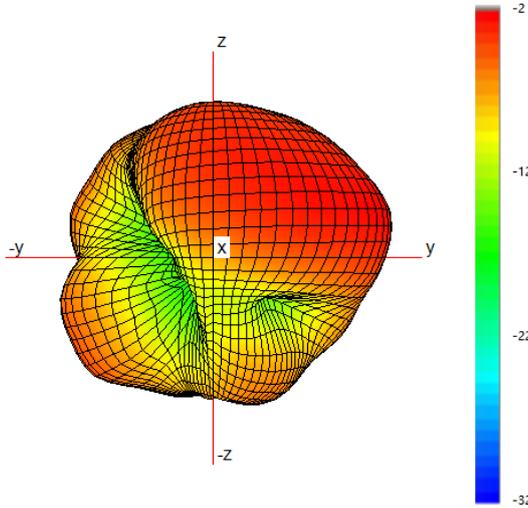


4X4 MiMo 4G/5G Reef Sharkee® Antenna

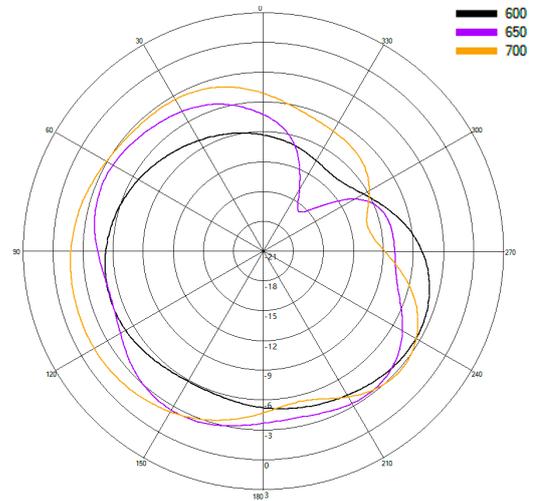
GPSD[X]4-7-49[X]

3D Pattern Data in Free Space Cell B

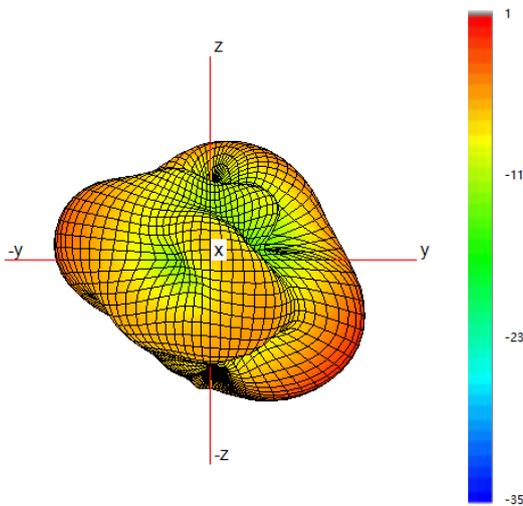
Typical 3D Pattern- Cell B - 650 MHz



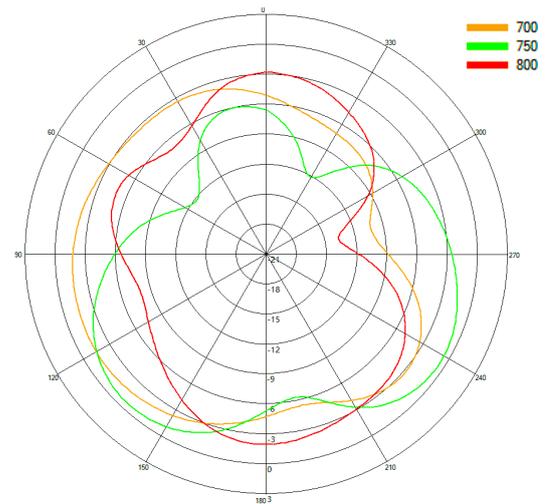
Typical H Plane- Cell B - Patterns- 600-700MHz



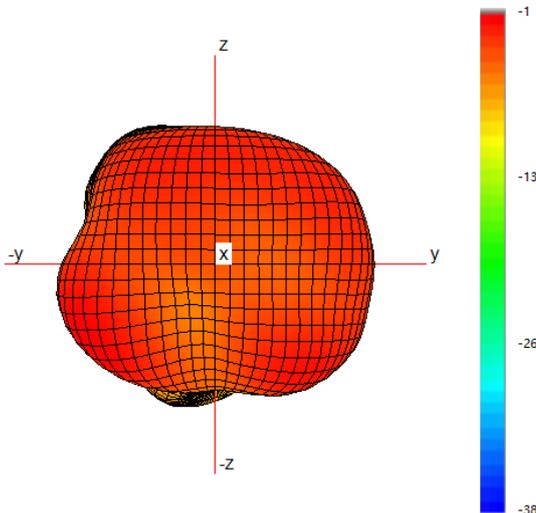
Typical 3D Pattern- Cell B - 750 MHz



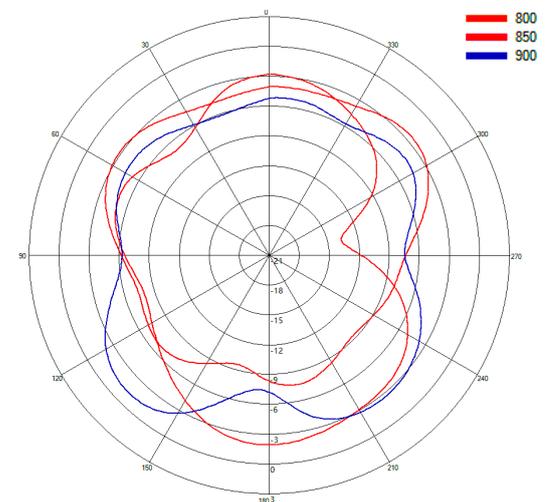
Typical H Plane- Cell B - Patterns- 700-800MHz



Typical 3D Pattern- Cell B - 850 MHz



Typical H Plane- Cell B - Patterns- 800-900 MHz

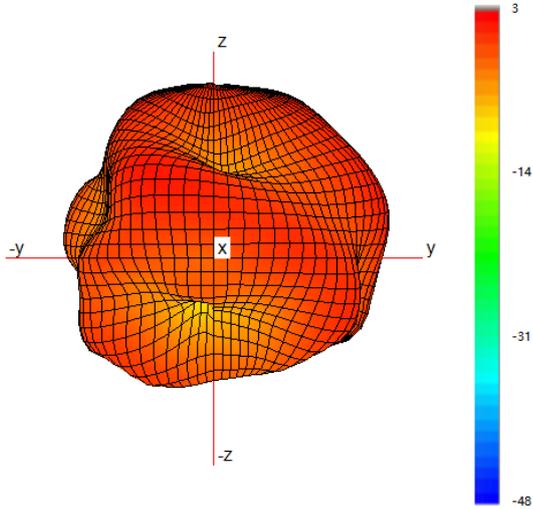


4X4 MiMo 4G/5G Reef Sharkee® Antenna

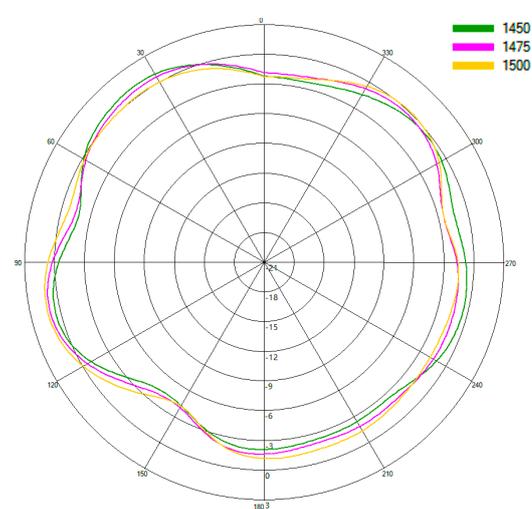
GPSD[X]4-7-49[X]

3D Pattern Data in Free Space Cell B

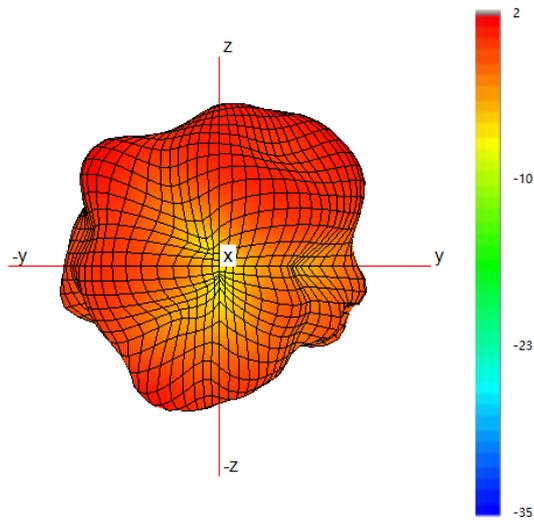
Typical 3D Pattern- Cell B - 1475 MHz



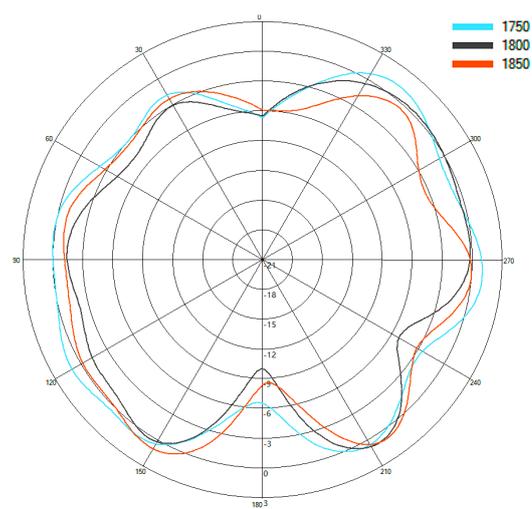
Typical H Plane- Cell B- Patterns- 1450-1500 MHz



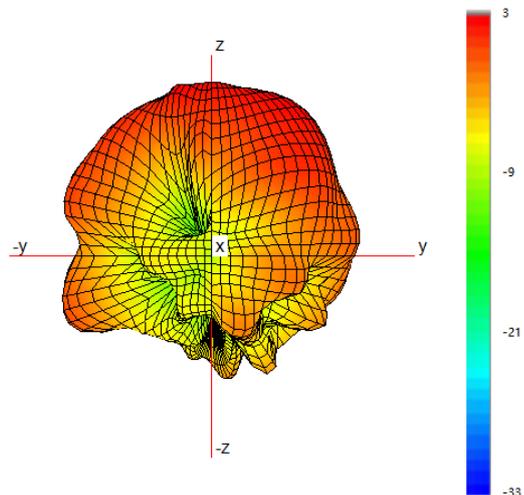
Typical 3D Pattern- Cell B - 1800 MHz



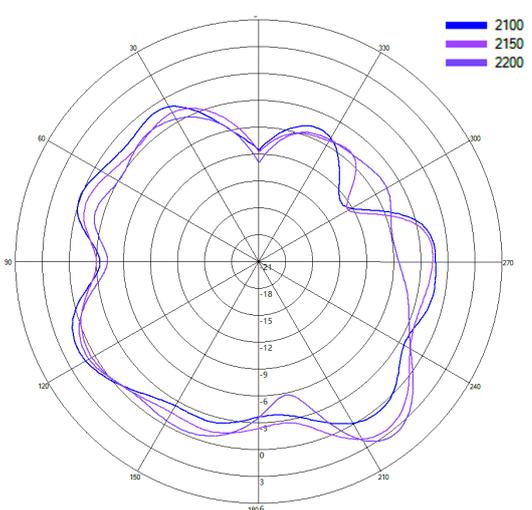
Typical H Plane- Cell B- Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell B - 2150 MHz



Typical H Plane- Cell B- Patterns- 2100-2200 MHz

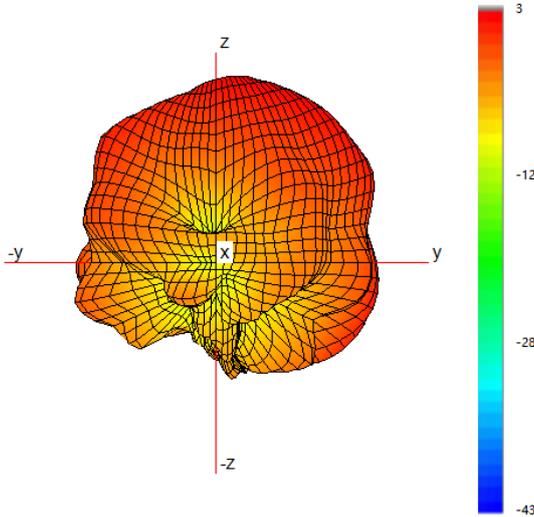


4X4 MiMo 4G/5G Reef Sharkee® Antenna

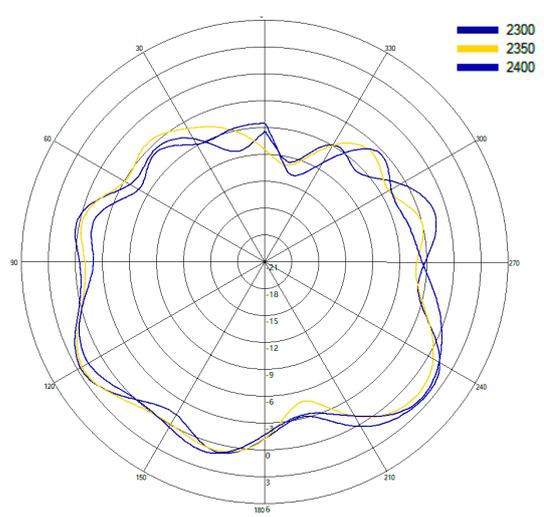
GPSD[X]4-7-49[X]

3D Pattern Data in Free Space Cell B

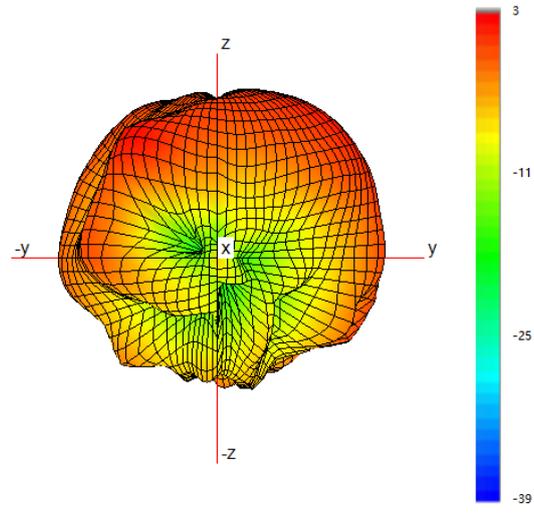
Typical 3D Pattern- Cell B - 2350 MHz



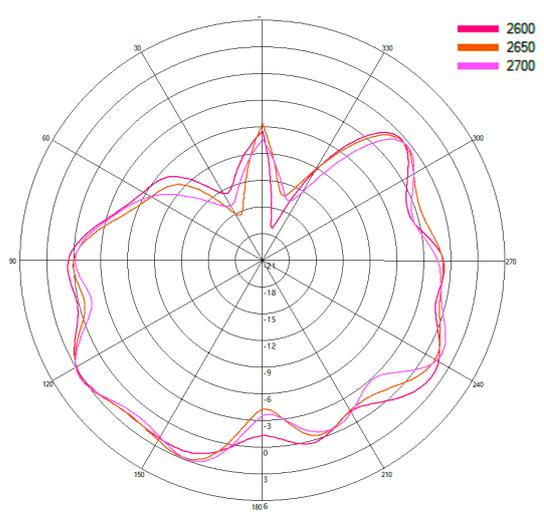
Typical H Plane- Cell B - Patterns- 2300-2400 MHz



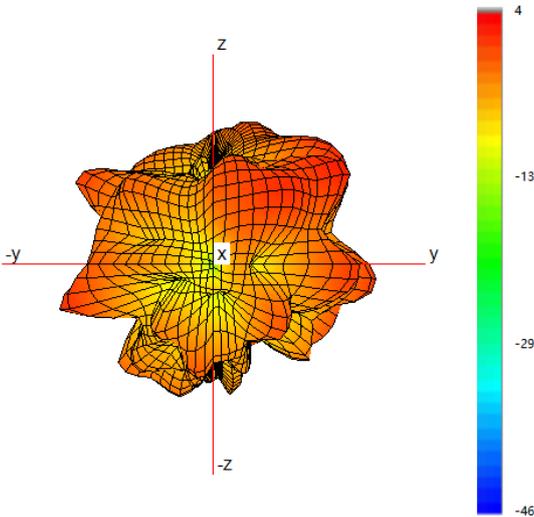
Typical 3D Pattern- Cell B - 2650 MHz



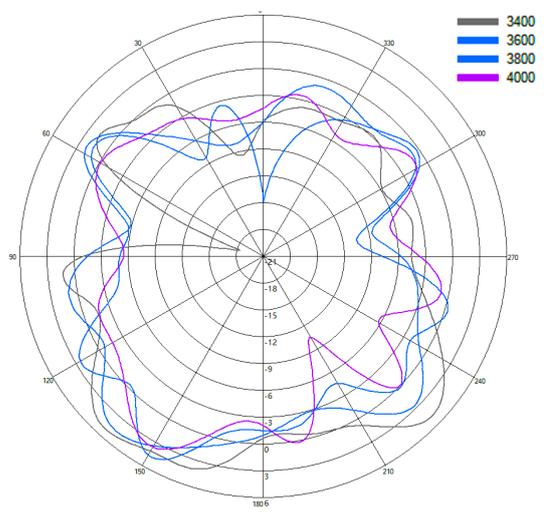
Typical H Plane- Cell B - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell B - 3600 MHz



Typical H Plane- Cell B - Patterns- 3400-4000 MHz

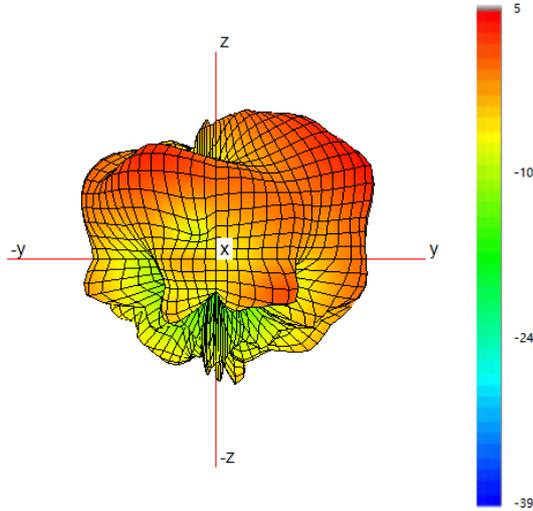


4X4 MiMo 4G/5G Reef Sharkee® Antenna

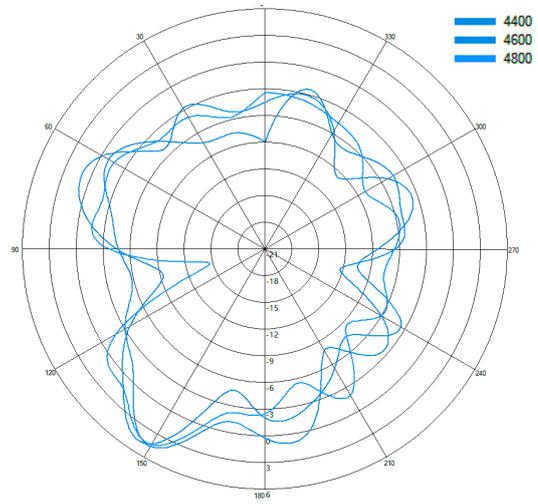
GPSD[X]4-7-49[X]

3D Pattern Data in
Free Space Cell B

Typical 3D Pattern- Cell B - 4700 MHz



Typical H Plane- Cell B - Patterns- 4400-4800 MHz

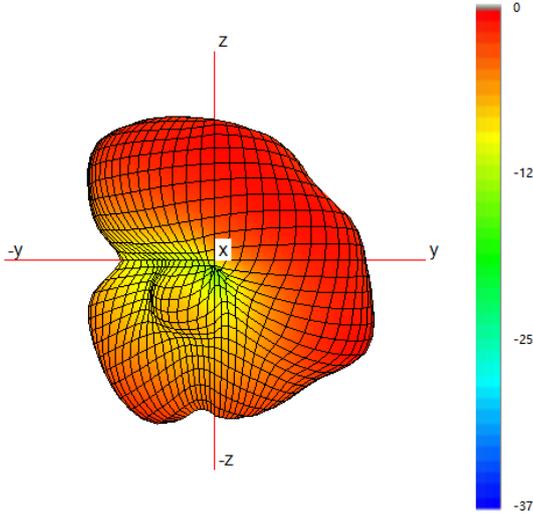


4X4 MiMo 4G/5G Reef Sharkee® Antenna

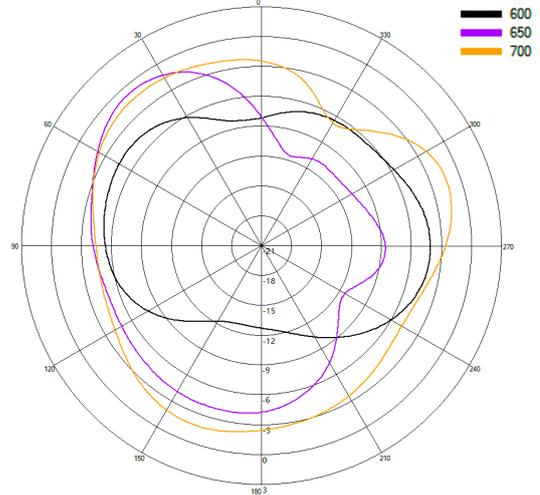
GPSD[X]4-7-49[X]

3D Pattern Data in Free Space Cell C

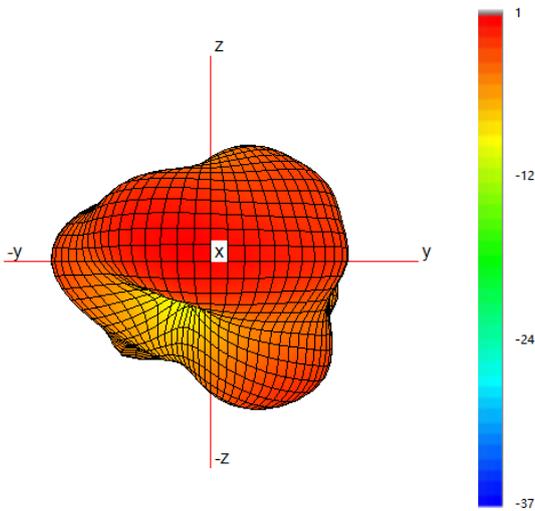
Typical 3D Pattern- Cell C - 650 MHz



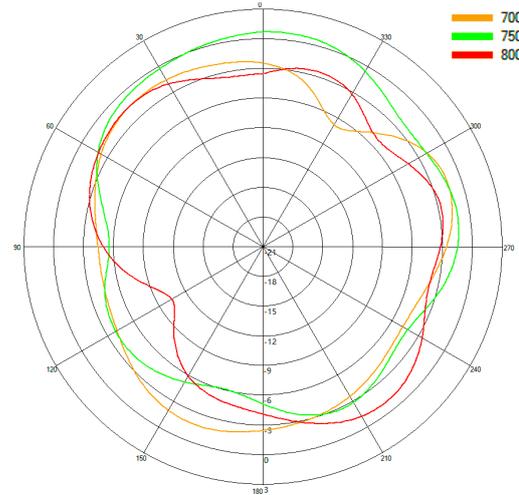
Typical H Plane- Cell C - Patterns- 600-700MHz



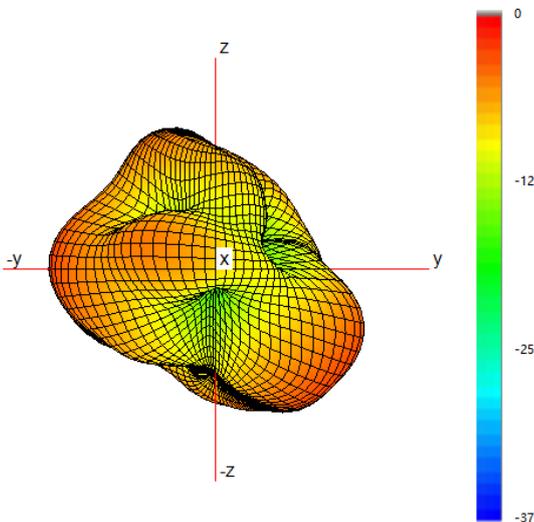
Typical 3D Pattern- Cell C - 750 MHz



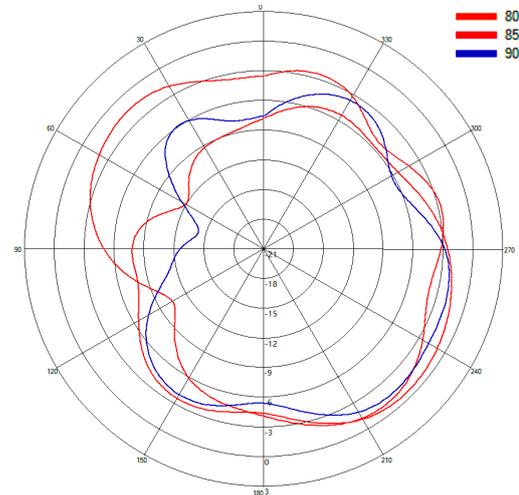
Typical H Plane- Cell C - Patterns- 700-800MHz



Typical 3D Pattern- Cell C - 850 MHz



Typical H Plane- Cell C - Patterns- 800-900 MHz

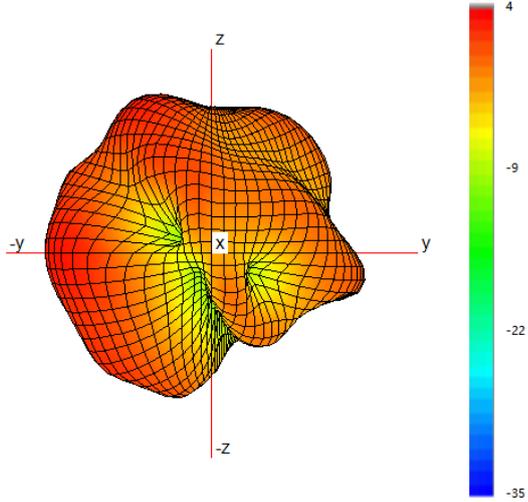


4X4 MiMo 4G/5G Reef Sharkee® Antenna

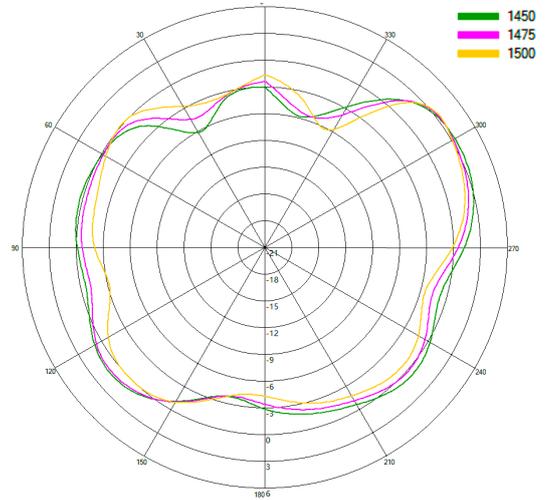
GPSD[X]4-7-49[X]

3D Pattern Data in Free Space Cell C

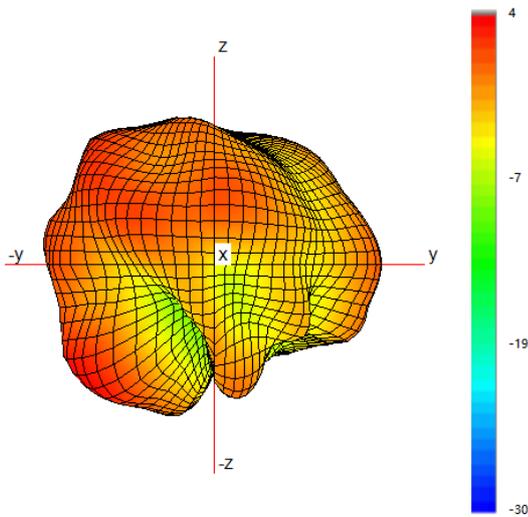
Typical 3D Pattern- Cell C - 1475 MHz



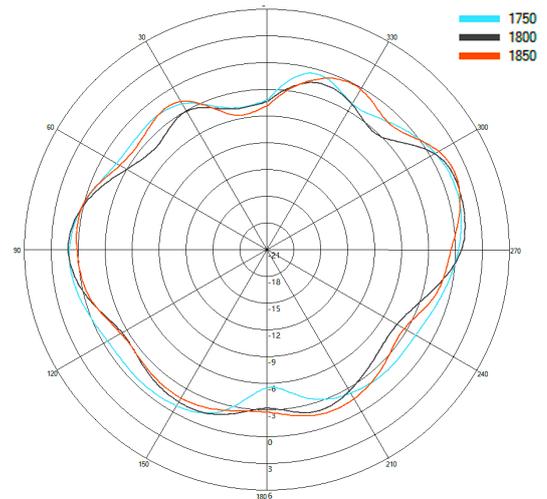
Typical H Plane- Cell C - Patterns- 1450-1500 MHz



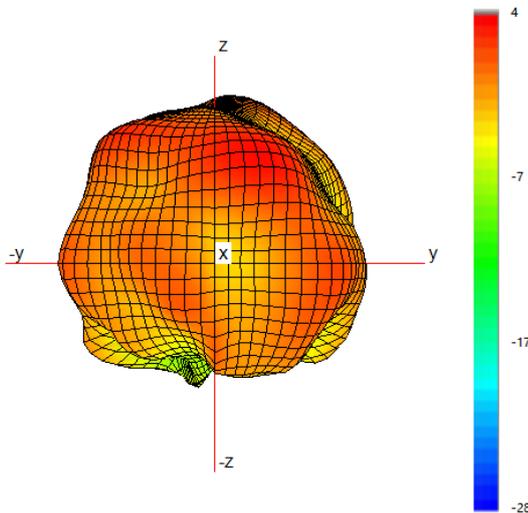
Typical 3D Pattern- Cell C - 1800 MHz



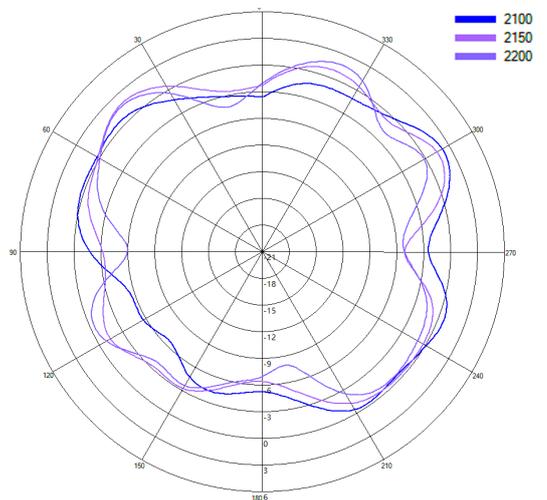
Typical H Plane- Cell C - Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell C - 2150 MHz



Typical H Plane- Cell C - Patterns- 2100-2200 MHz

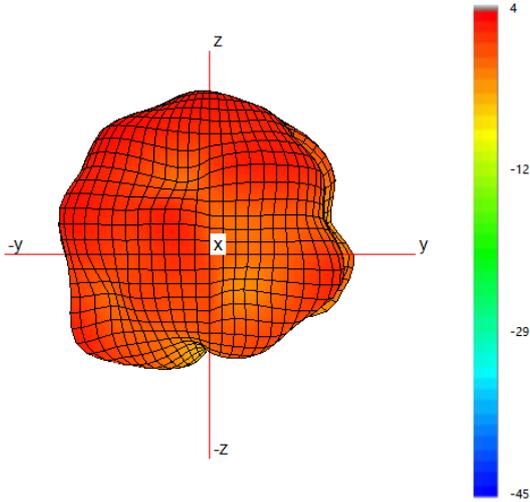


4X4 MiMo 4G/5G Reef Sharkee® Antenna

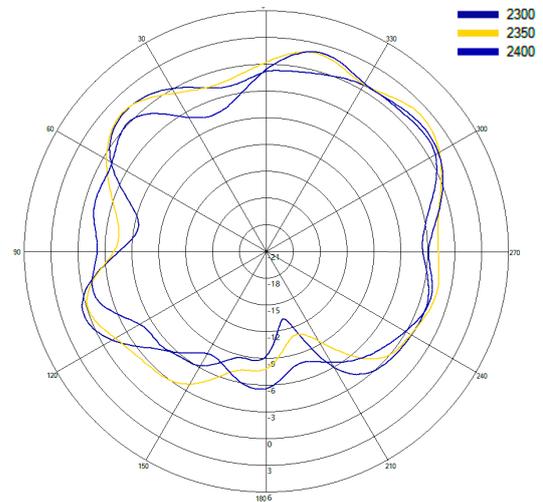
GPSD[X]4-7-49[X]

3D Pattern Data in Free Space Cell C

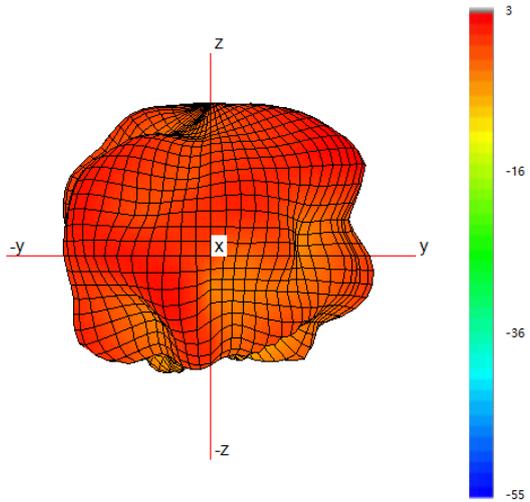
Typical 3D Pattern- Cell C - 2350 MHz



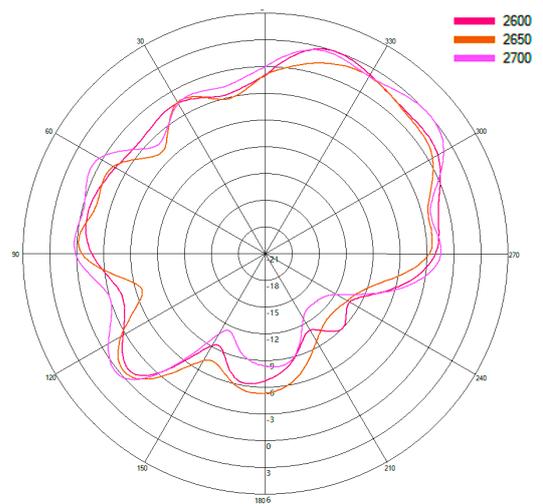
Typical H Plane- Cell C - Patterns- 2300-2400 MHz



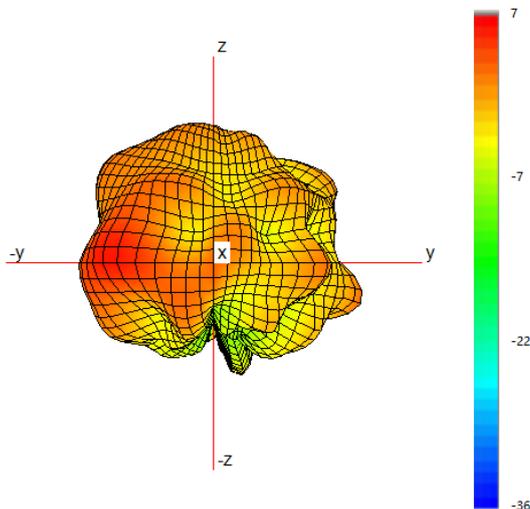
Typical 3D Pattern- Cell C - 2650 MHz



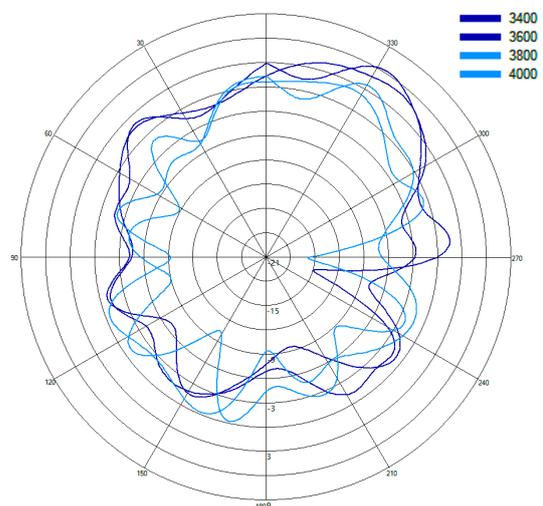
Typical H Plane- Cell C - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell C - 3600 MHz



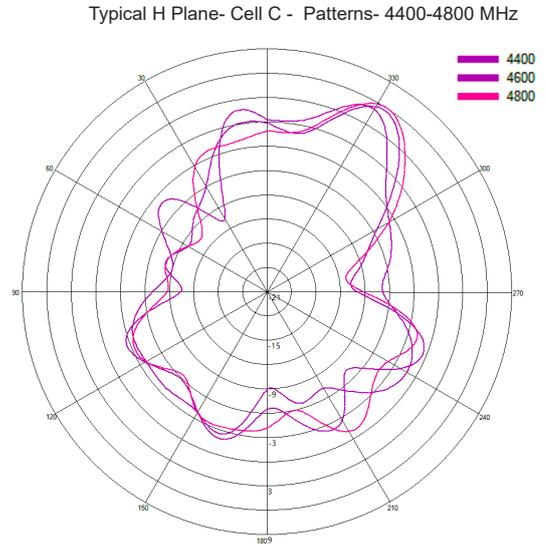
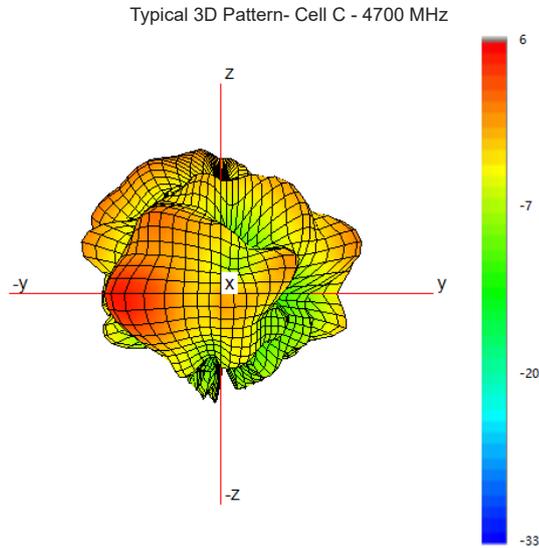
Typical H Plane- Cell C - Patterns- 3400-4000 MHz



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GPSD[X]4-7-49[X]

3D Pattern Data in
Free Space Cell C

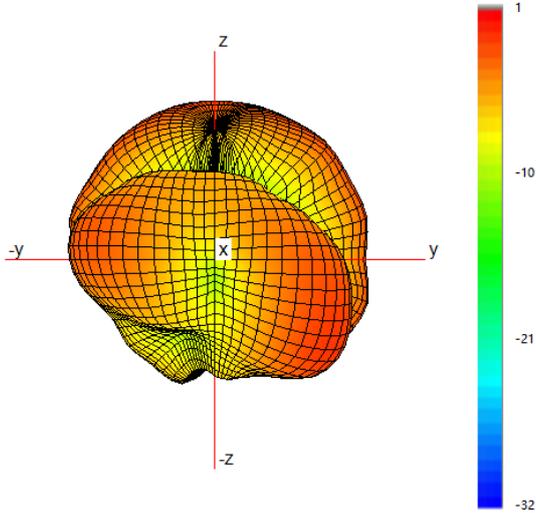


4X4 MiMo 4G/5G Reef Sharkee® Antenna

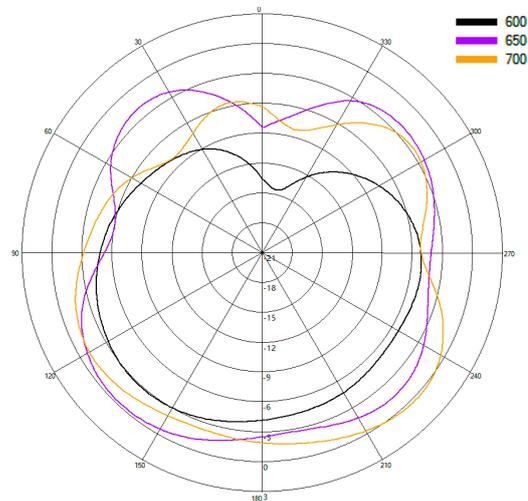
GPSD[X]4-7-49[X]

3D Pattern Data in Free Space Cell D

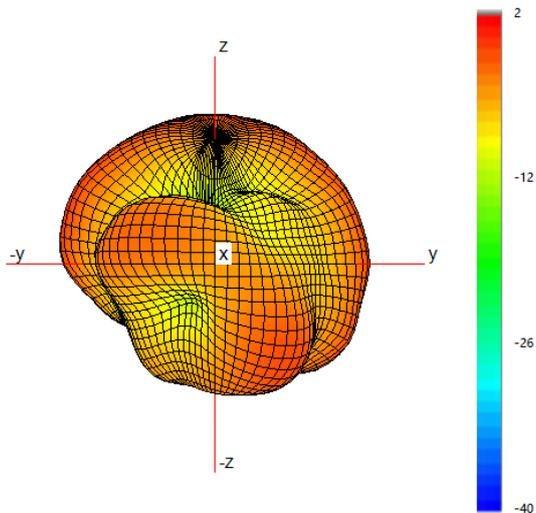
Typical 3D Pattern- Cell D - 650 MHz



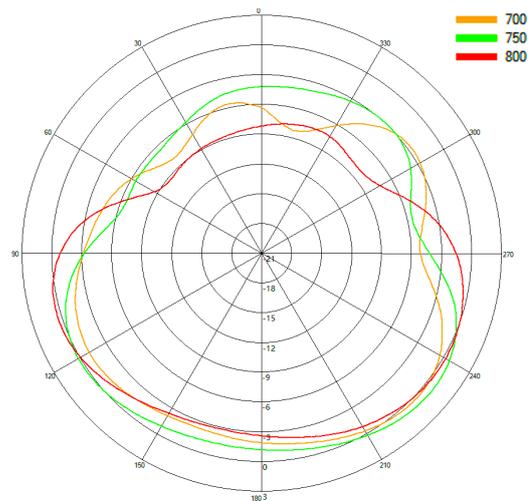
Typical H Plane- Cell D - Patterns- 600-700MHz



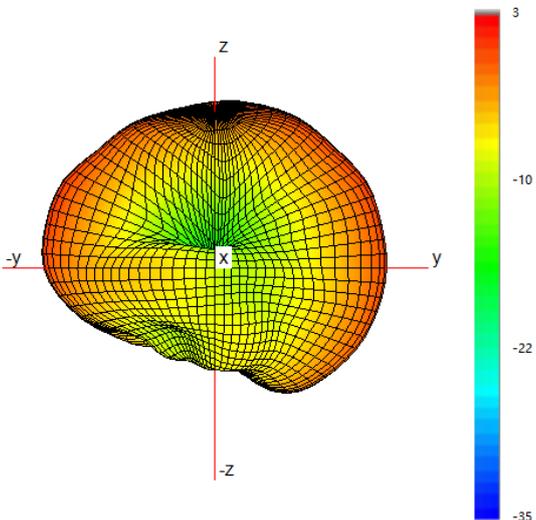
Typical 3D Pattern- Cell D - 750 MHz



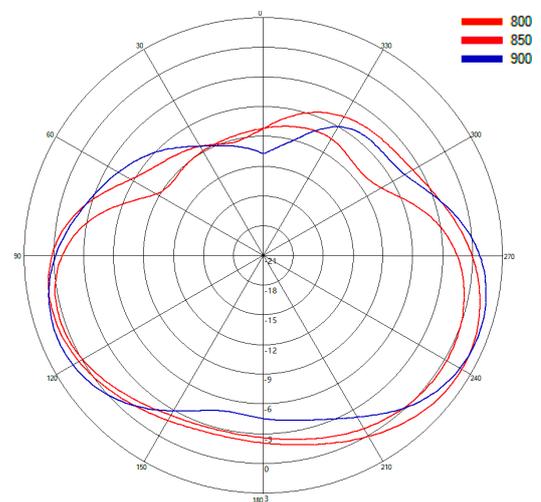
Typical H Plane- Cell D - Patterns- 700-800MHz



Typical 3D Pattern- Cell D - 850 MHz



Typical H Plane- Cell D - Patterns- 800-900 MHz

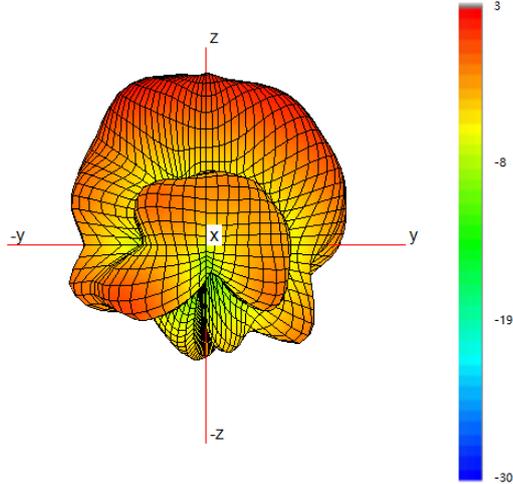


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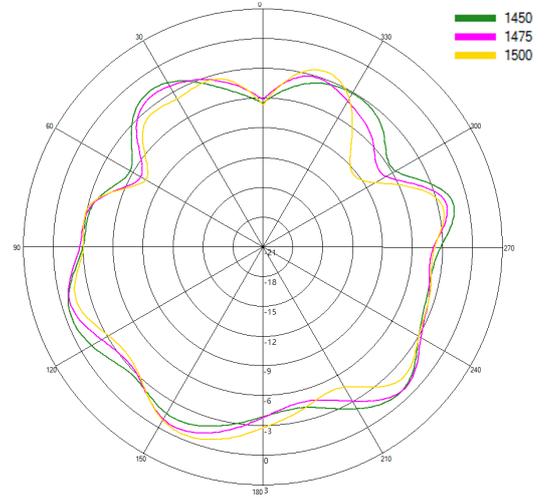
GPSD[X]4-7-49[X]

3D Pattern Data in Free Space Cell D

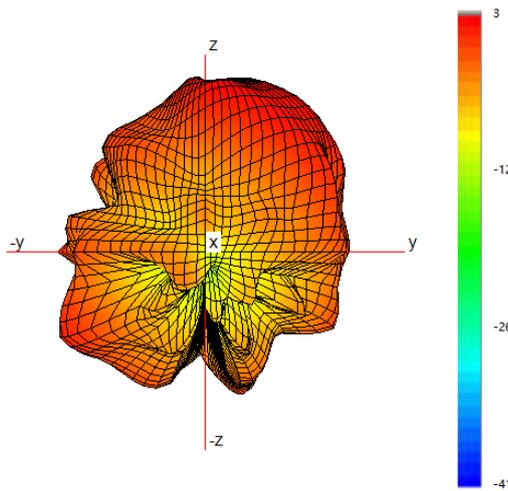
Typical 3D Pattern- Cell D - 1475 MHz



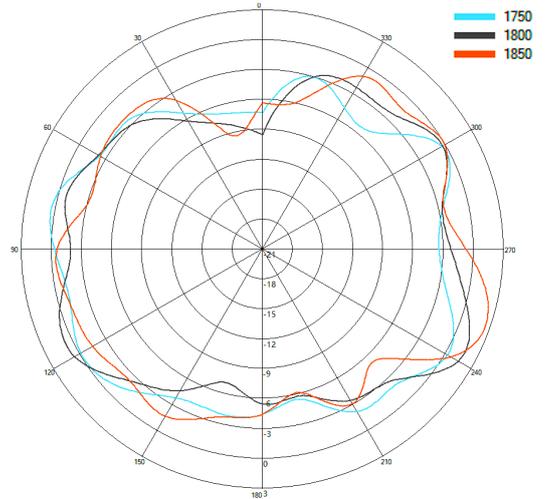
Typical H Plane- Cell D - Patterns- 1450-1500 MHz



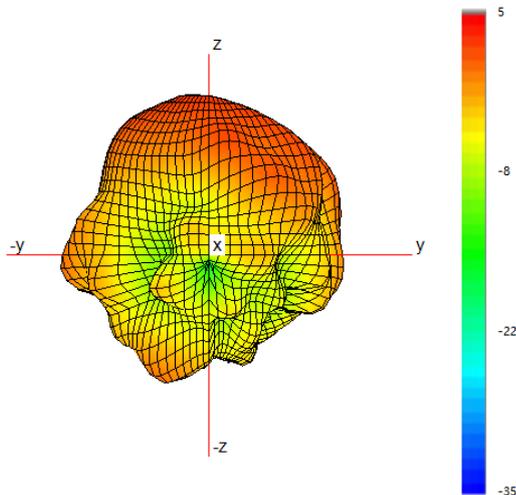
Typical 3D Pattern- Cell D - 1800 MHz



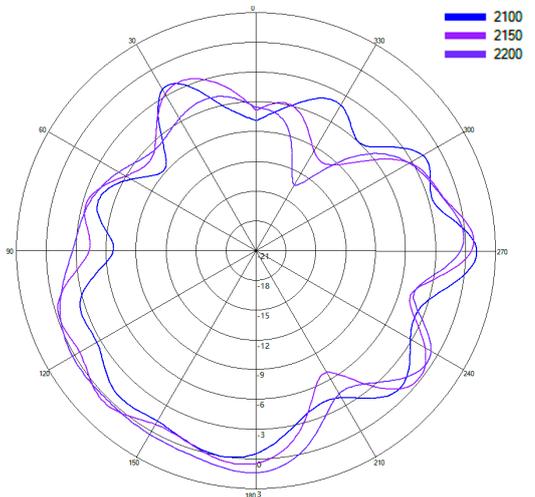
Typical H Plane- Cell D - Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell D - 2150 MHz



Typical H Plane- Cell D - Patterns- 2100-2200 MHz

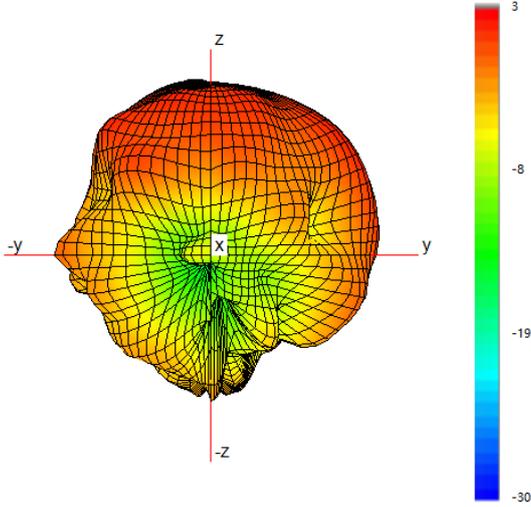


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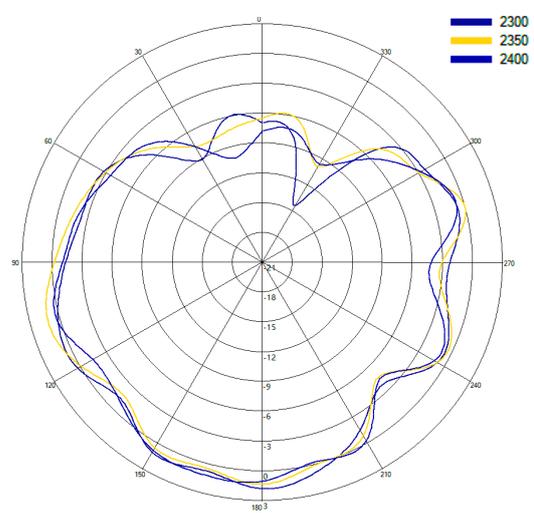
GPSD[X]4-7-49[X]

3D Pattern Data in Free Space Cell D

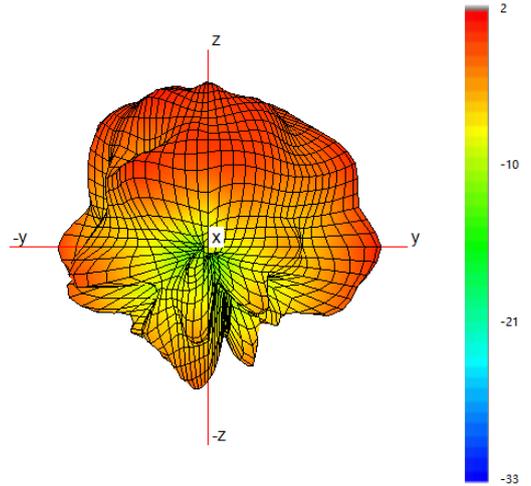
Typical 3D Pattern- Cell D - 2350 MHz



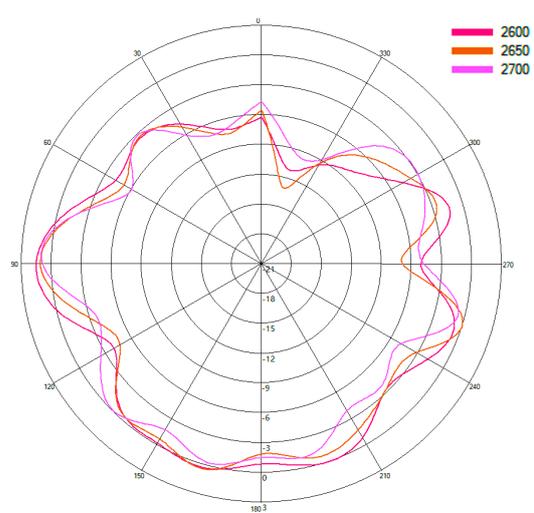
Typical H Plane- Cell D - Patterns- 2300-2400 MHz



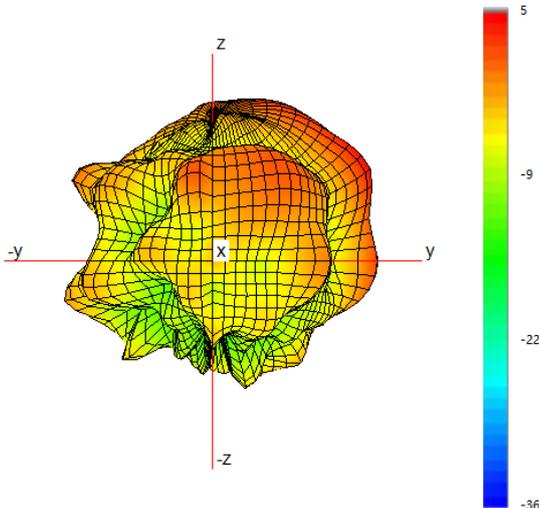
Typical 3D Pattern- Cell D - 2650 MHz



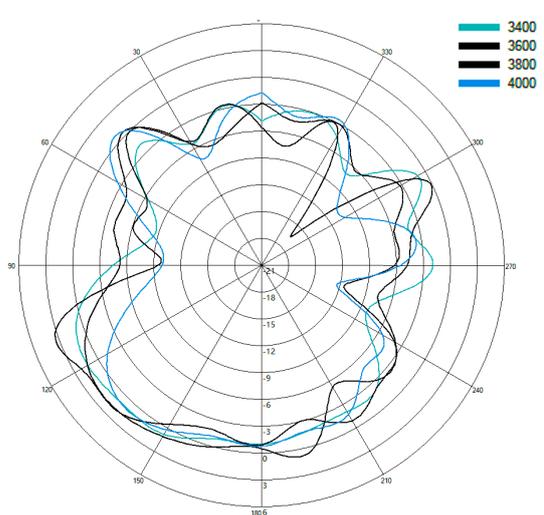
Typical H Plane- Cell D - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell D - 3600 MHz



Typical H Plane- Cell D - Patterns- 3400-4000 MHz

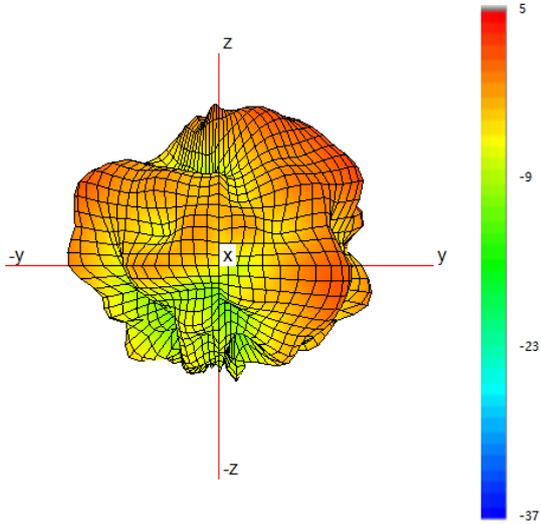


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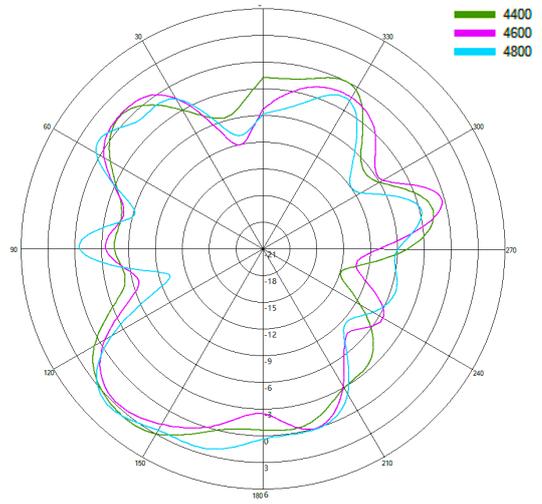
GPSD[X]4-7-49[X]

3D Pattern Data in
Free Space Cell D

Typical 3D Pattern- Cell D - 4700 MHz



Typical H Plane- Cell D - Patterns- 4400-4800 MHz

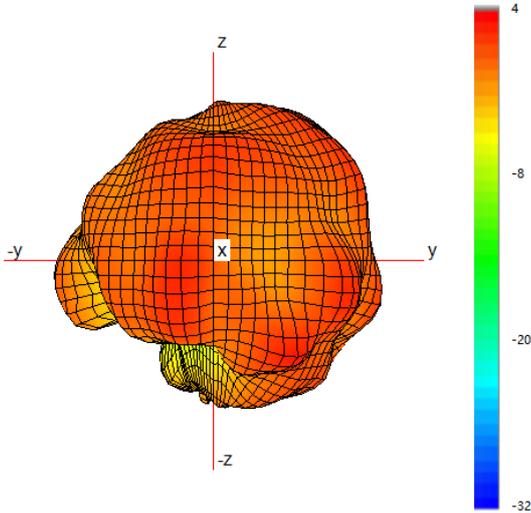


4X4 MiMo 4G/5G Reef Sharkee® Antenna

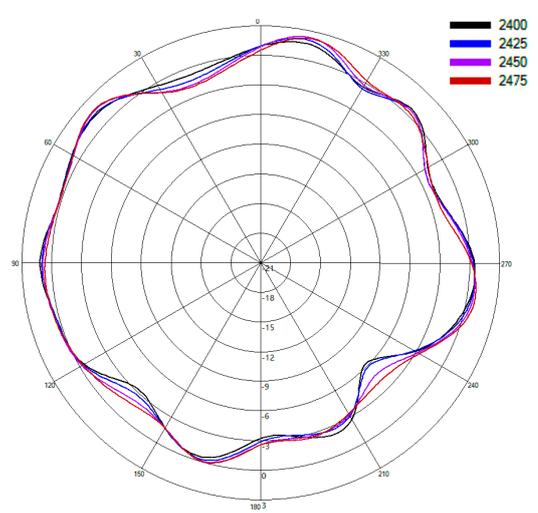
GPSD[X]4-7-49[X]

WiFi Pattern-Data in Free Space -WiFi -1

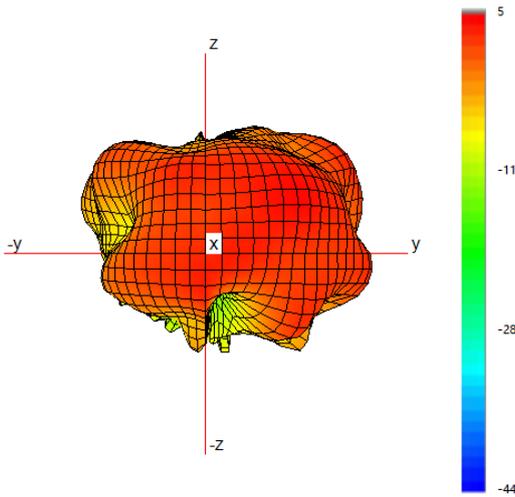
Typical 3D Pattern- WiFi - 1 - 2450 MHz



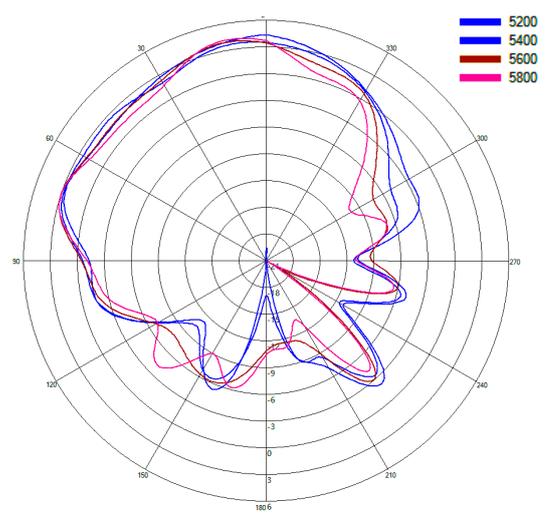
Typical H Plane- WiFi - 1 - Patterns- 2400-2475MHz



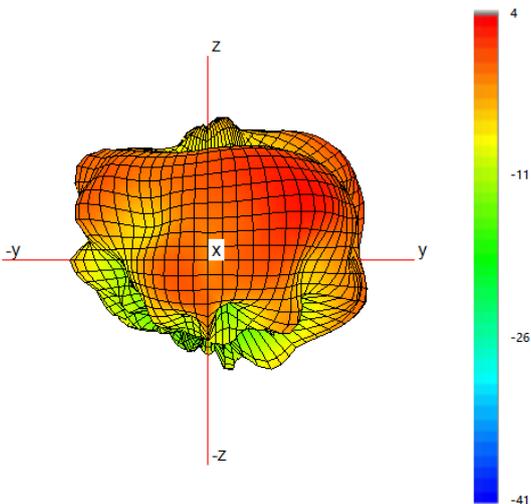
Typical 3D Pattern- WiFi - 1 - 5500 MHz



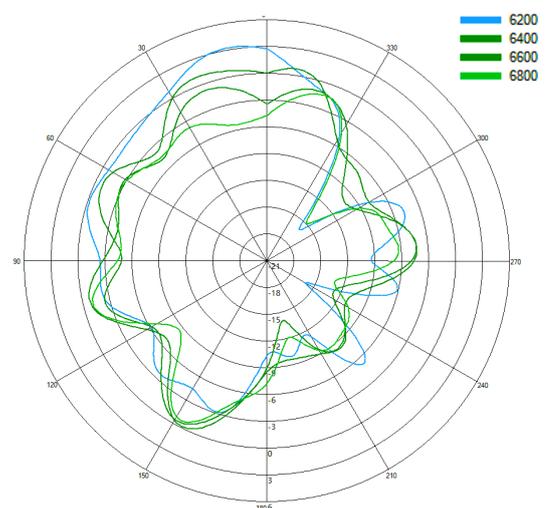
Typical H Plane- WiFi - 1 - Patterns- 5200-5800MHz



Typical 3D Pattern- WiFi - 1 - 6500 MHz



Typical H Plane- WiFi - 1 - Patterns- 6200-6800MHz

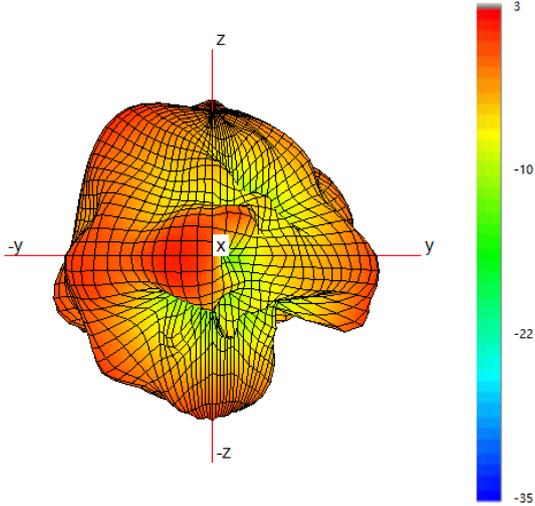


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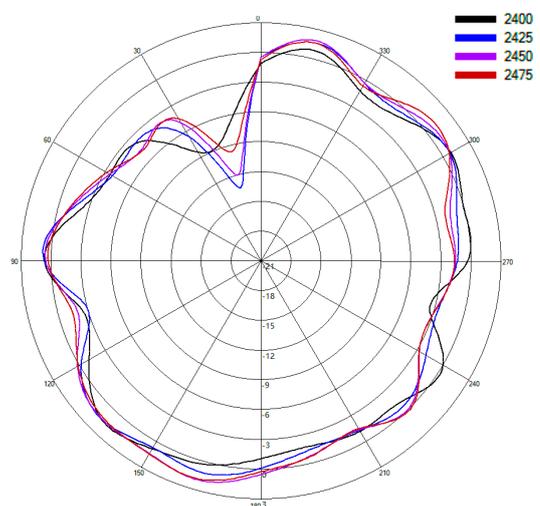
GPSD[X]4-7-49[X]

WiFi Pattern-Data in Free Space -WiFi -2

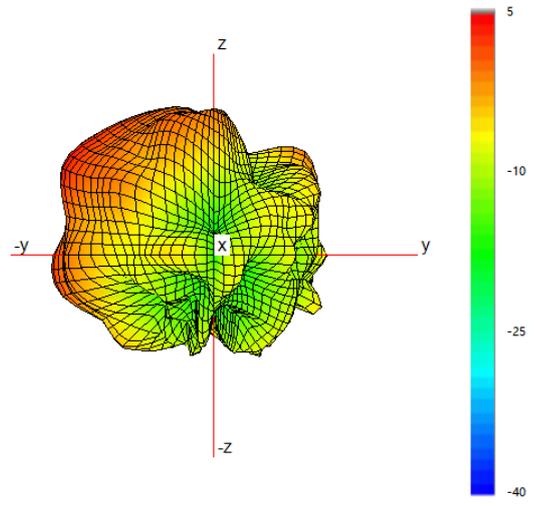
Typical 3D Pattern- WiFi - 2 - 2450 MHz



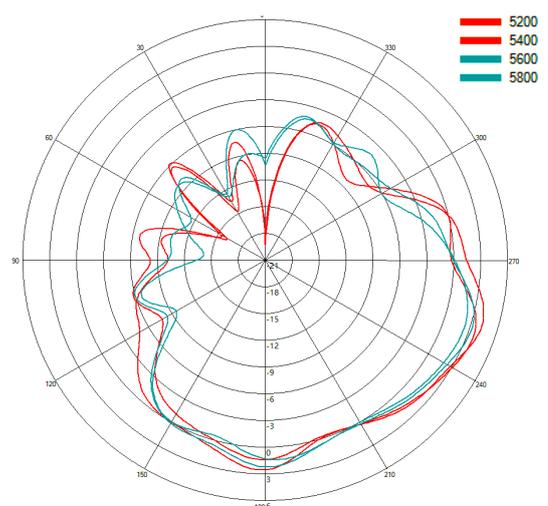
Typical H Plane- WiFi - 2 - Patterns- 2400-2475MHz



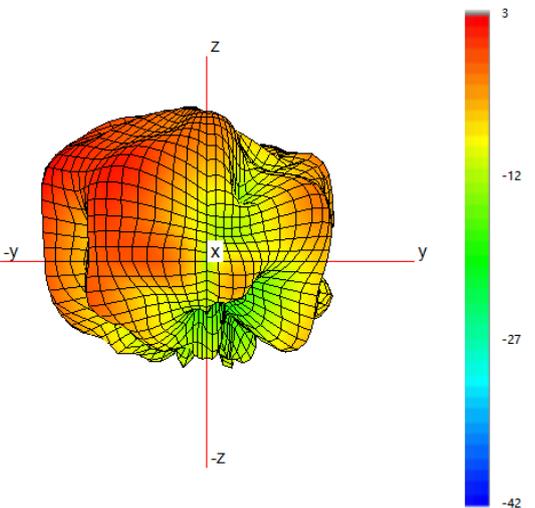
Typical 3D Pattern- WiFi - 2 - 5500 MHz



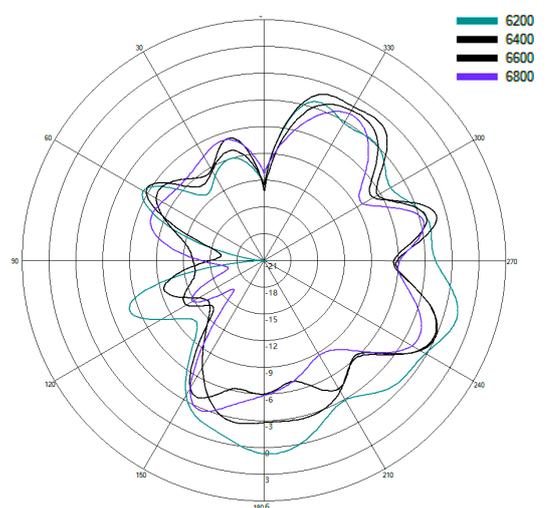
Typical H Plane- WiFi - 2 - Patterns- 5200-5800MHz



Typical 3D Pattern- WiFi - 2 - 6500 MHz



Typical H Plane- WiFi - 2 - Patterns- 6200-6800MHz

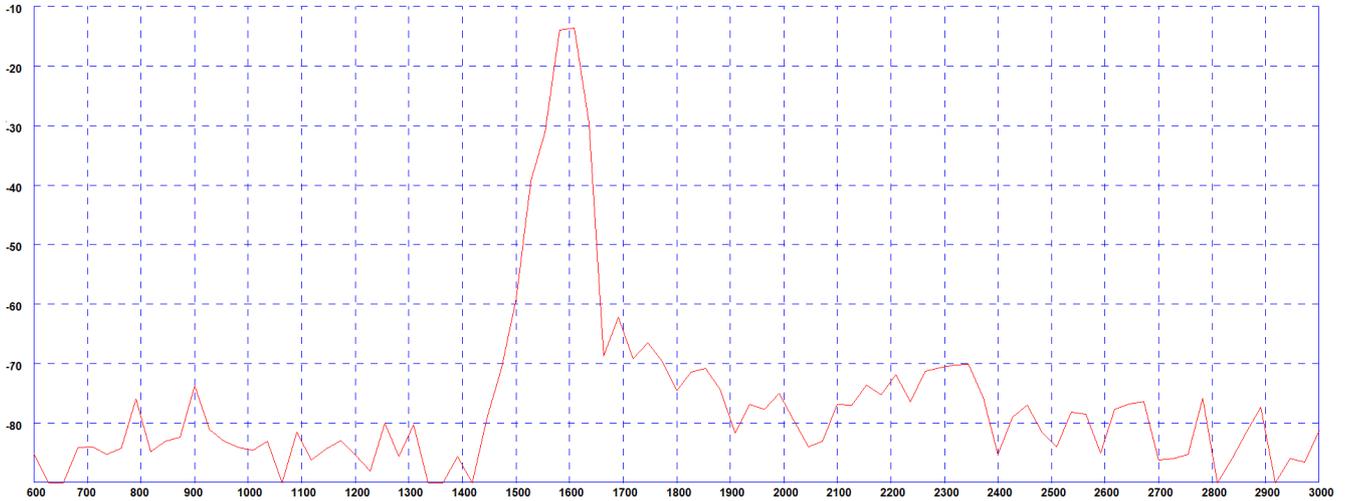


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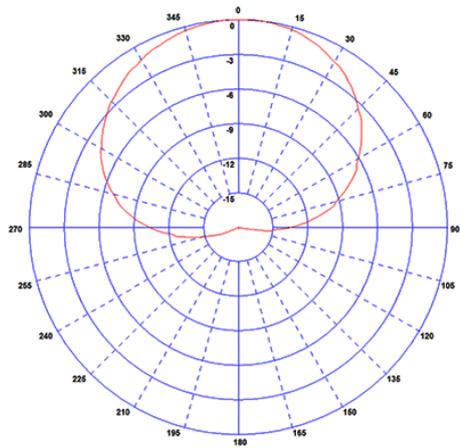
GPSD[X]4-7-49[X]

Electrical Data- L1
GPS/GNSS

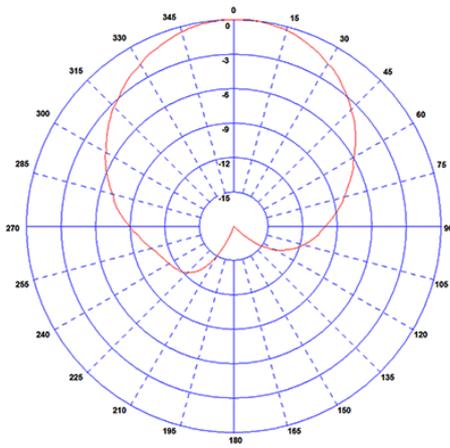
Swept Gain GPS/GNSS



Typical E Plane Pattern - GPS/GNSS 1575 MHz



Typical E Plane Pattern - GPS/GNSS 1602 MHz

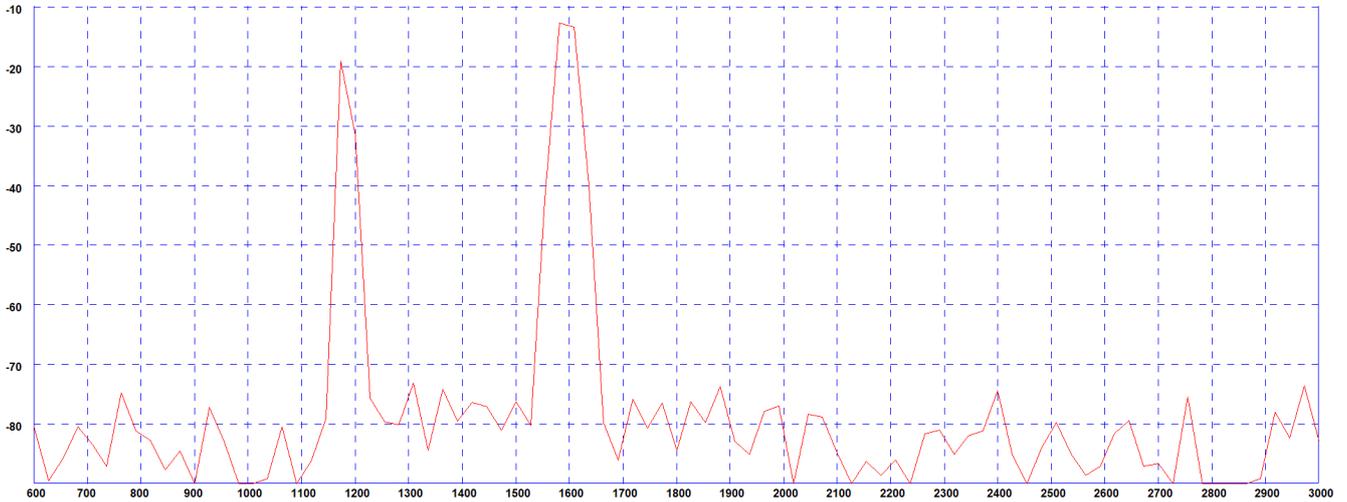


GPS/GNSS Measurements taken on 190x190mm (7.4" x 7.4") ground plane excluding cable loss

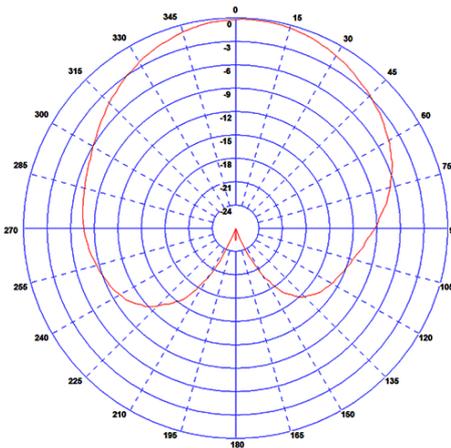
4X4 MiMo 4G/5G Reef Sharkee® Antenna

GPSD[X]4-7-49[X]

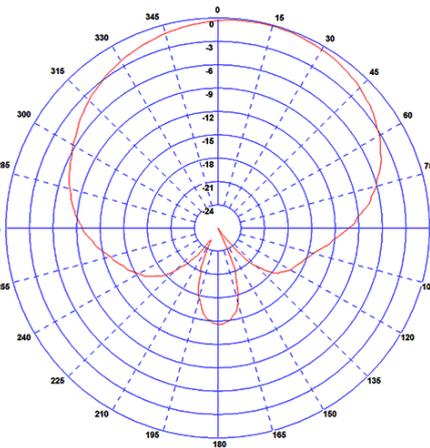
Swept Gain GPS/GNSS



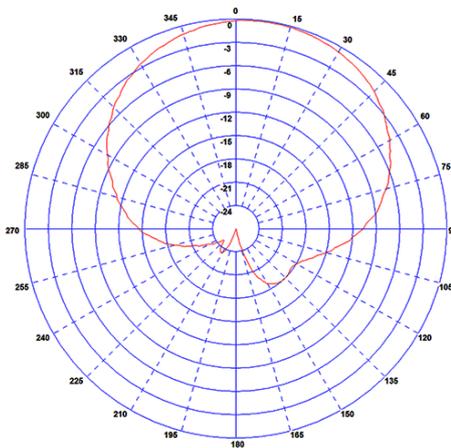
Typical E Plane Pattern - GPS/GNSS 1575 MHz



Typical E Plane Pattern - GPS/GNSS 1602 MHz



Typical E Plane Pattern - GPS/GNSS 1176 MHz



GPS/GNSS Measurements taken on 190x190mm (7.4" x 7.4") ground plane excluding cable loss