

4X4 MiMo 4G/5G Reef Sharkee® Antenna

PANORAMA ANTENNAS

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.

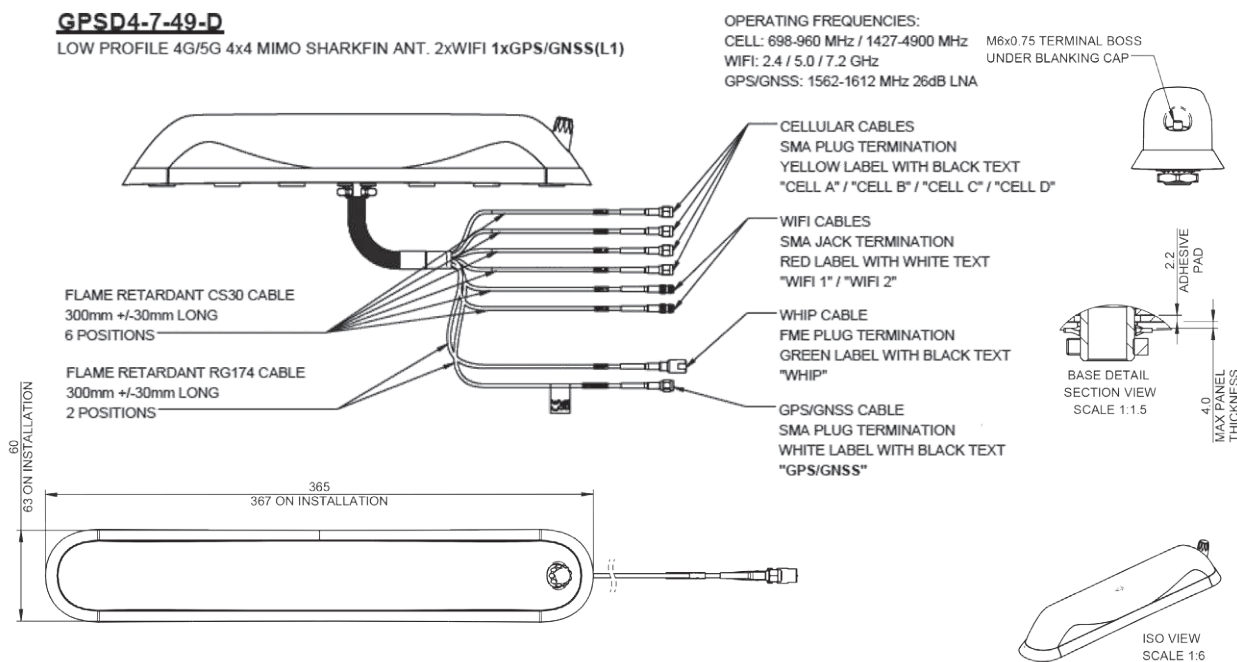
The sleek sharkfin design has low visual impact and at only 52mm (2") high the antenna can comply with certain state laws regarding light-bar obscuration on police vehicles. .

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



4X4 MiMo 4G/5G Reef Sharkee® Antenna

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

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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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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
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]

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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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GPSPD[X]4-7-49[X]

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Electrical Data -
WiFi-Ground Plane.

Measurement Conditions	WiFi Antennas				
GPSPD4-7-49-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

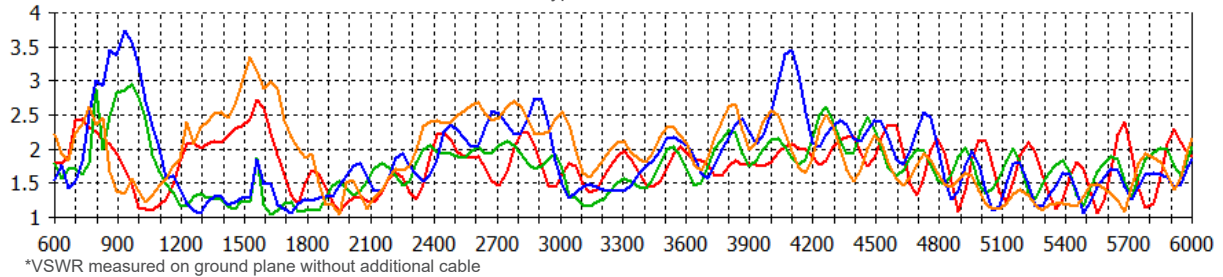
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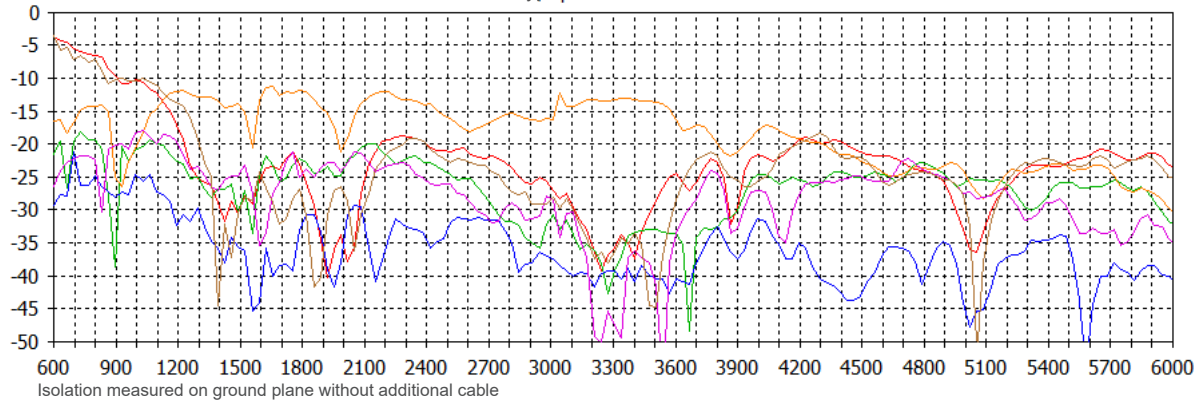
Electrical Data- Cell-
Ground Plane.

Typical VSWR*



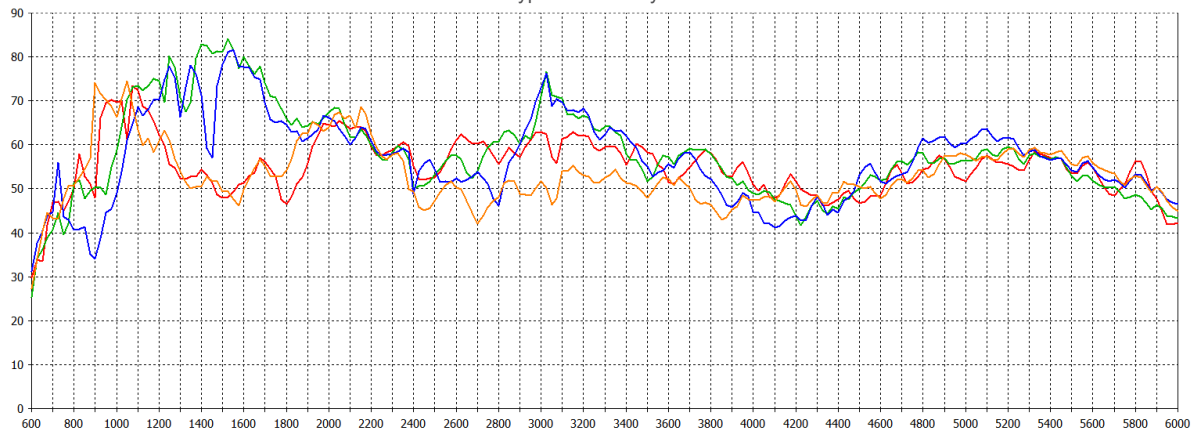
*VSWR measured on ground plane without additional cable

Typical Isolation*



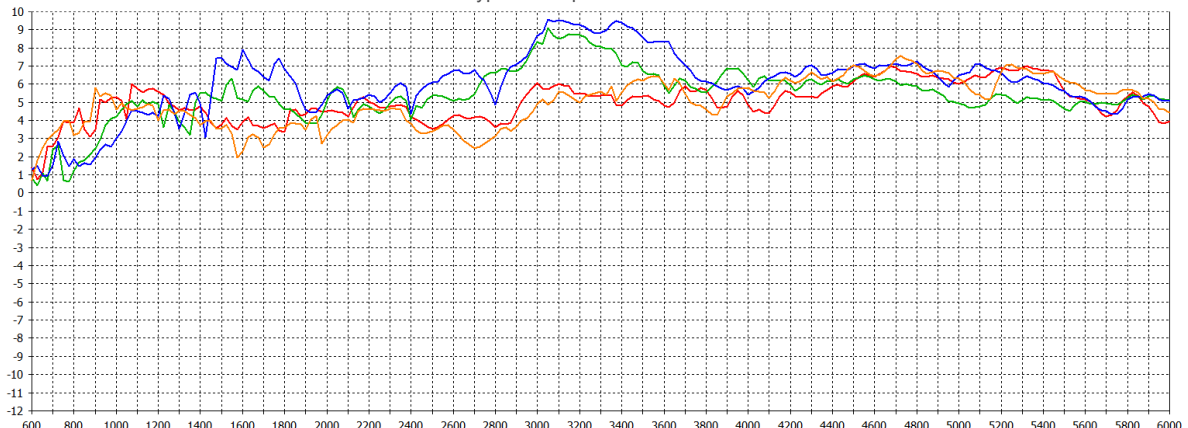
Isolation measured on ground plane without additional cable

Typical Efficiency*



*Efficiency measured on ground plane without additional cable

Typical Swept Peak Gain*



* Swept peak gain measured on ground plane without additional cable

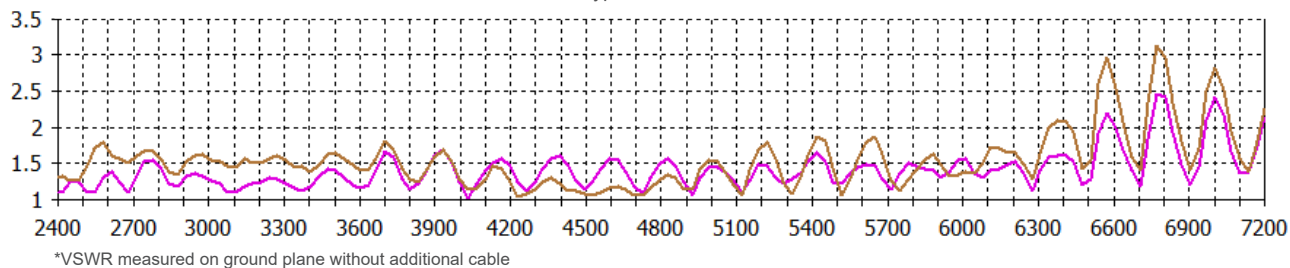
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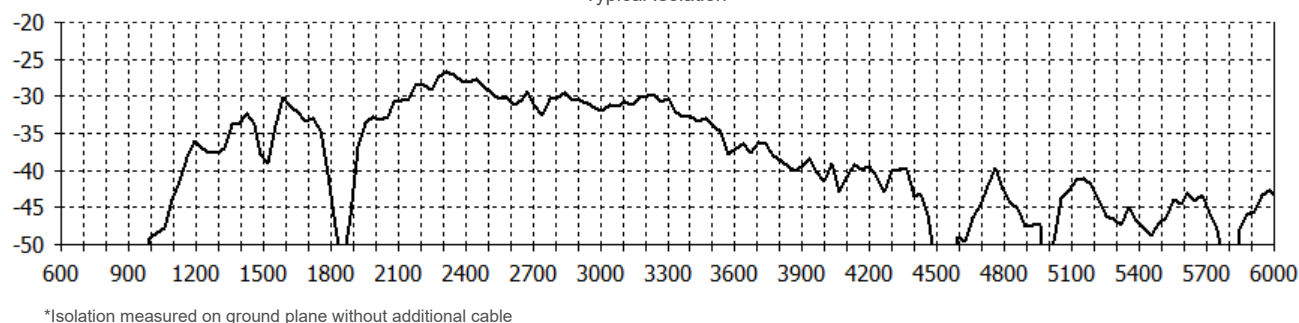
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Electrical Data -
WiFi-Ground Plane.

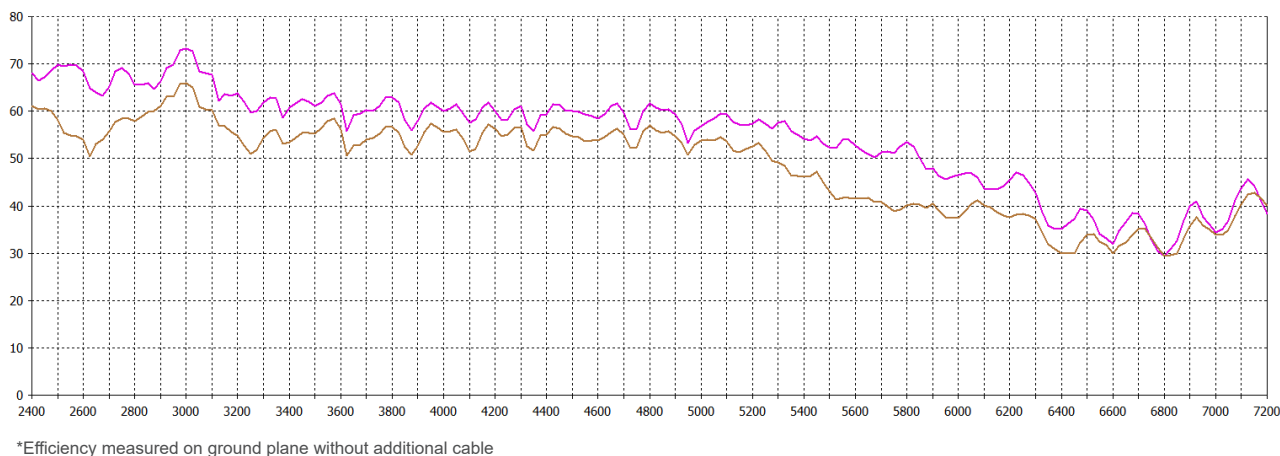
Typical VSWR*



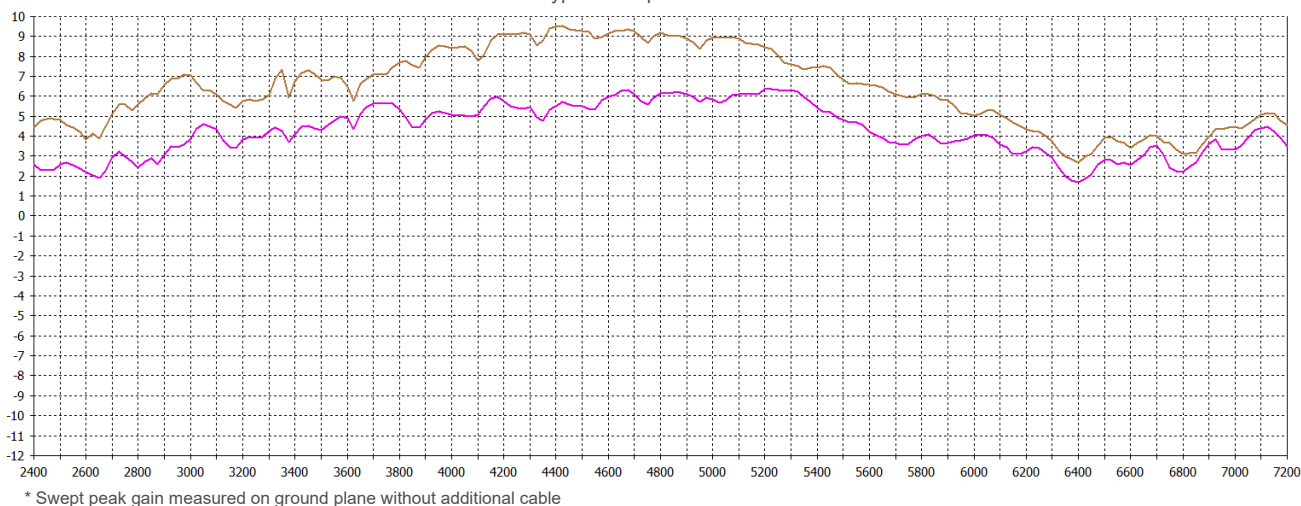
Typical Isolation*



Typical Efficiency*



Typical Swept Peak Gain*



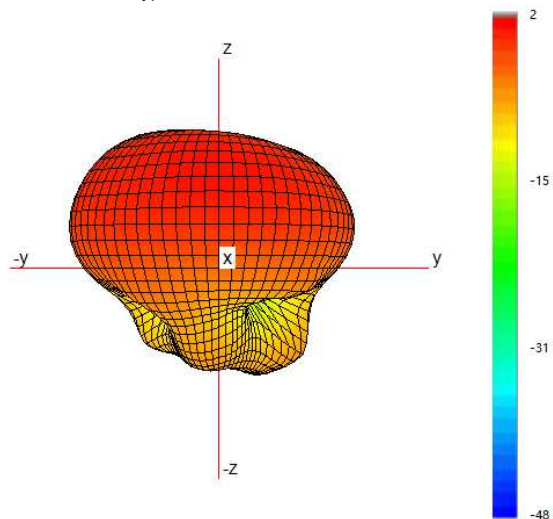
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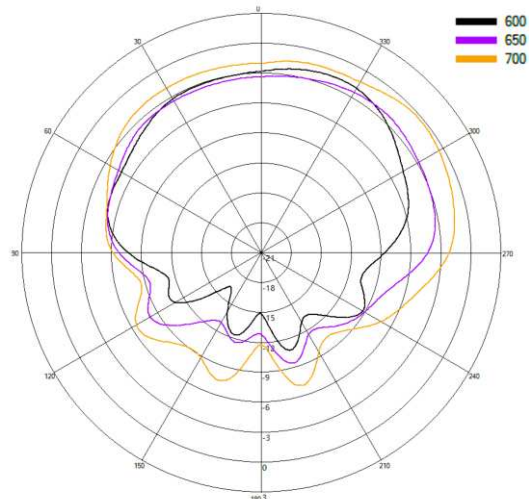
GPSD[X]4-7-49[X]

3D Pattern Data on
Ground Plane Cell A

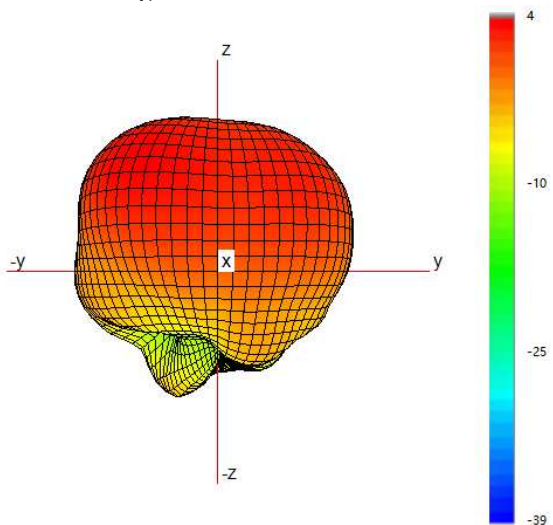
Typical 3D Pattern- Cell A - 650 MHz



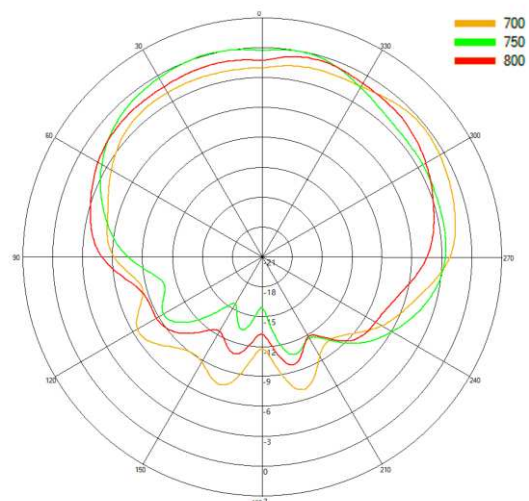
Typical H Plane- Cell A - Patterns- 600-700MHz



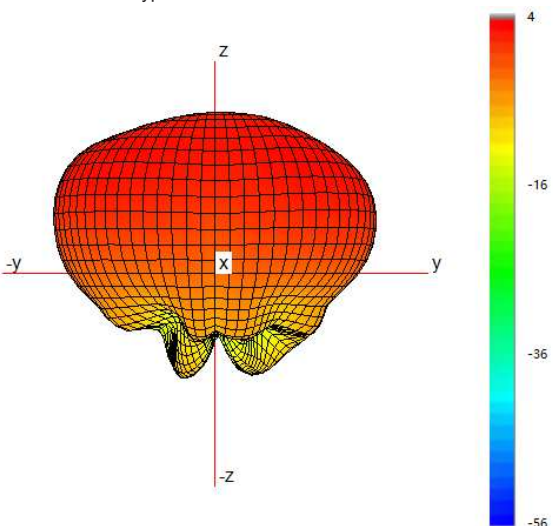
Typical 3D Pattern- Cell A - 750 MHz



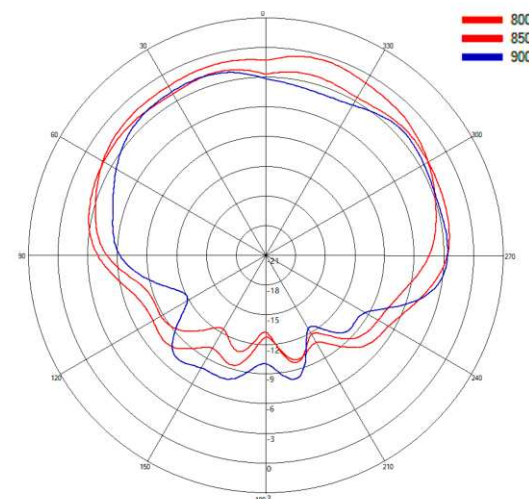
Typical H Plane- Cell A - Patterns- 700-800MHz



Typical 3D Pattern- Cell A - 850 MHz



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



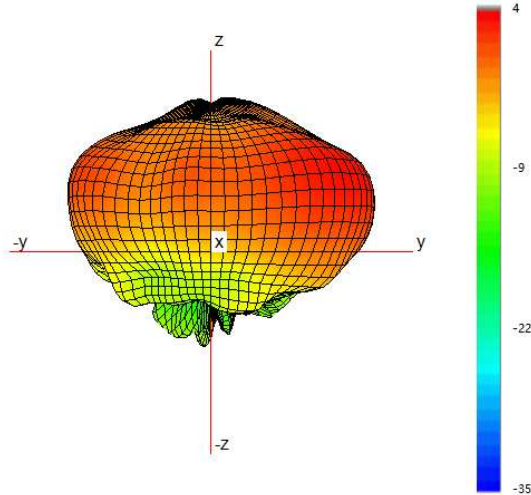
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GPSD[X]4-7-49[X]

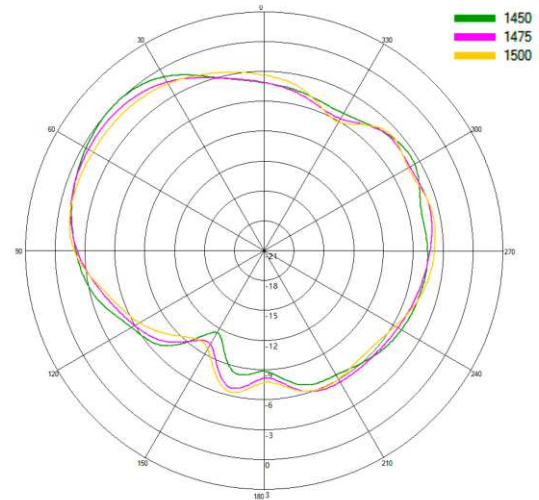
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3D Pattern Data on
Ground Plane Cell A

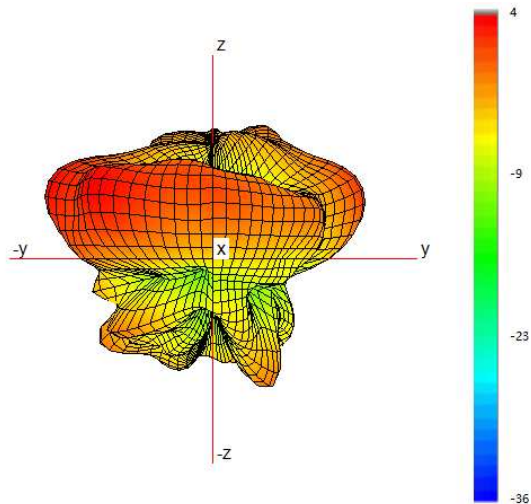
Typical 3D Pattern- Cell A - 1475 MHz



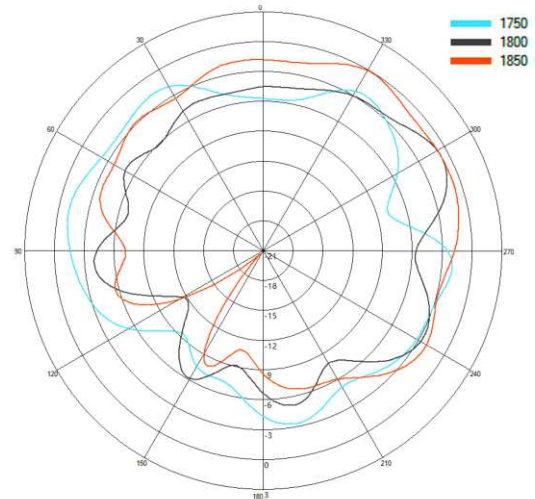
Typical H Plane- Cell A- Patterns- 1450-1500 MHz



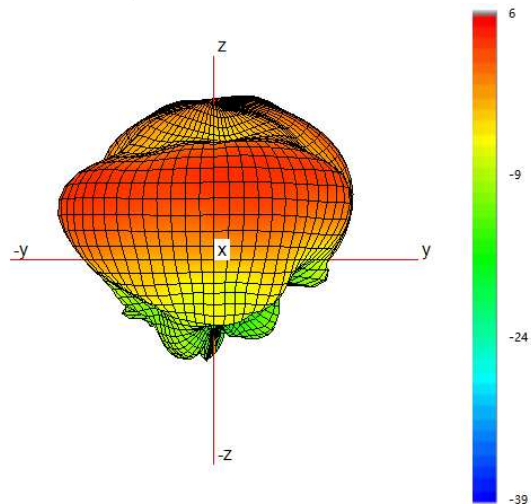
Typical 3D Pattern- Cell A - 1800 MHz



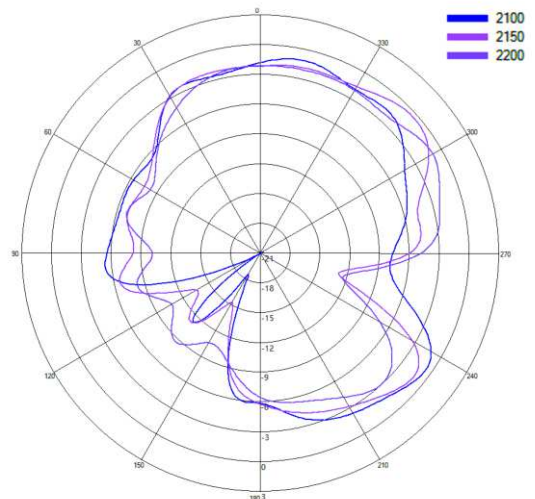
Typical H Plane- Cell A- Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell A - 2150 MHz



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



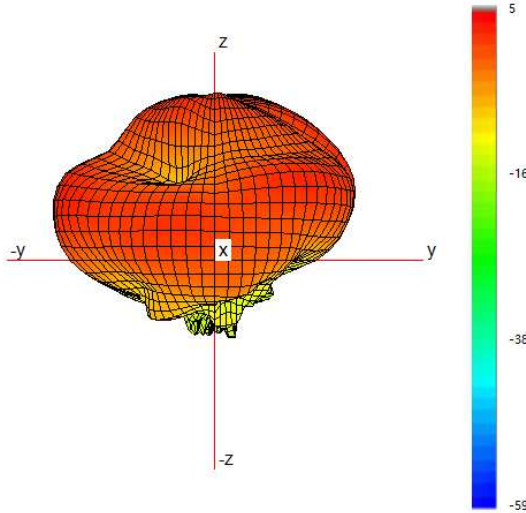
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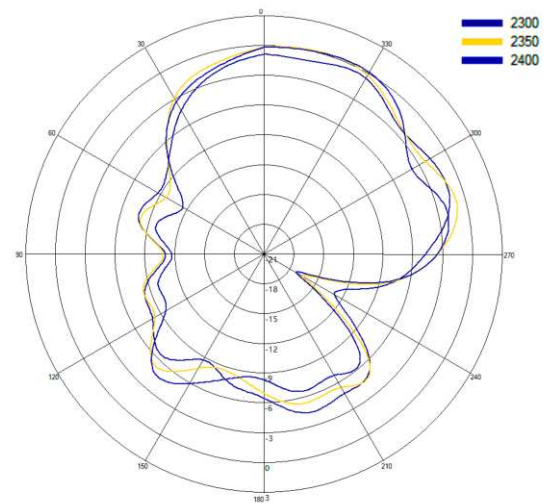
GPSD[X]4-7-49[X]

3D Pattern Data on
Ground Plane Cell A

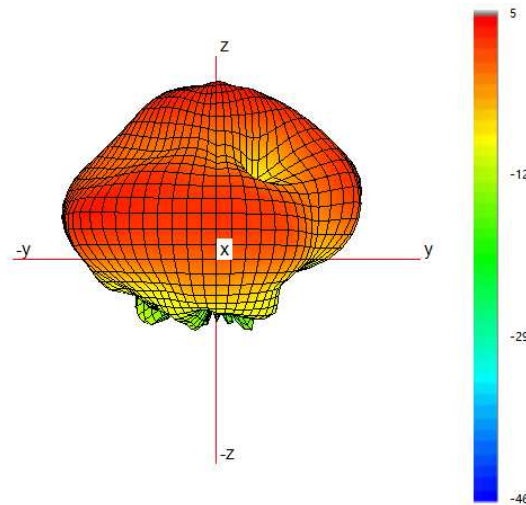
Typical 3D Pattern- Cell A - 2350 MHz



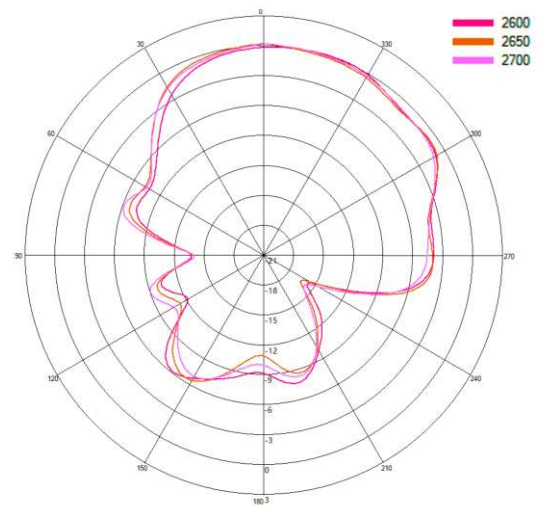
Typical H Plane- Cell A - Patterns- 2300-2400 MHz



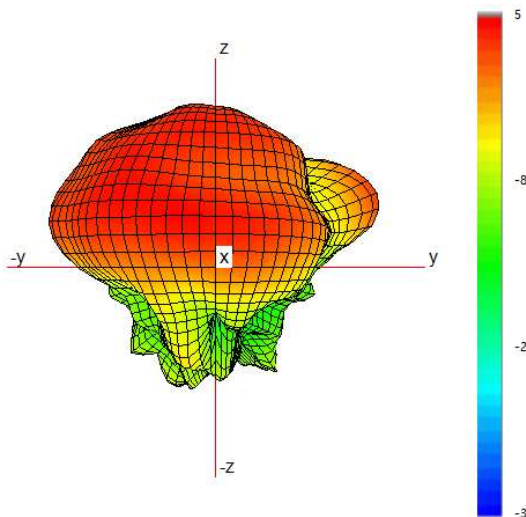
Typical 3D Pattern- Cell A - 2650 MHz



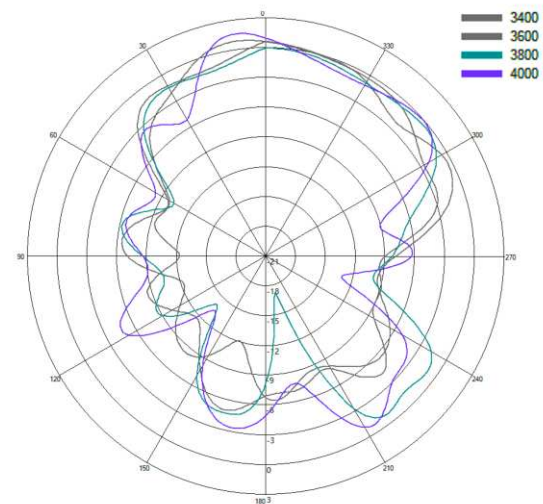
Typical H Plane- Cell A - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell A - 3600 MHz



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

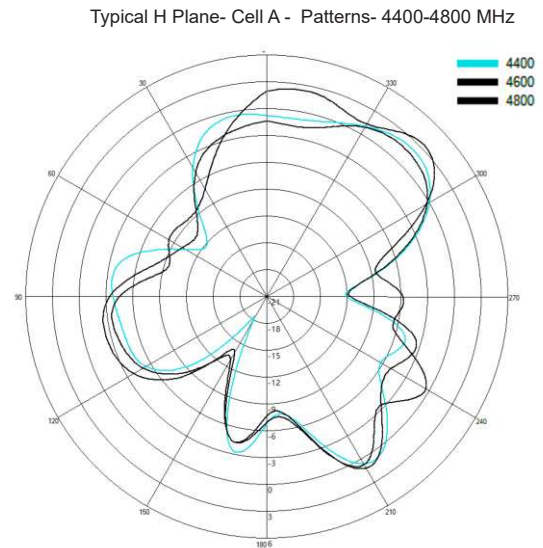
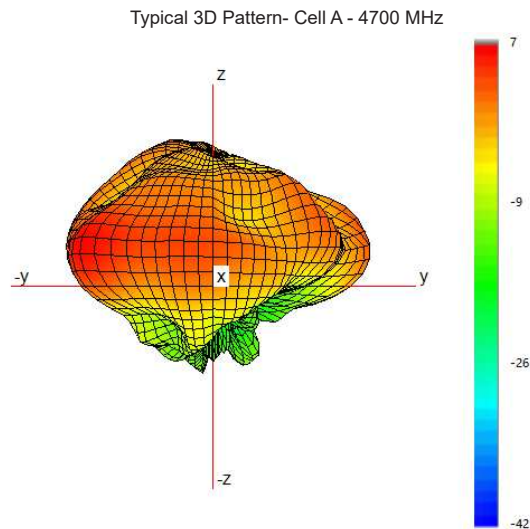


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3D Pattern Data on
Ground Plane Cell A



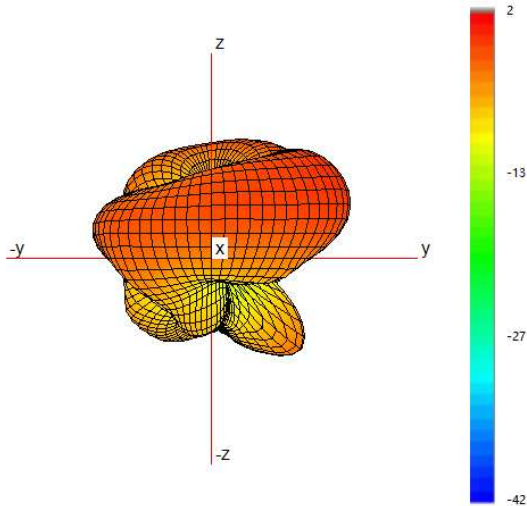
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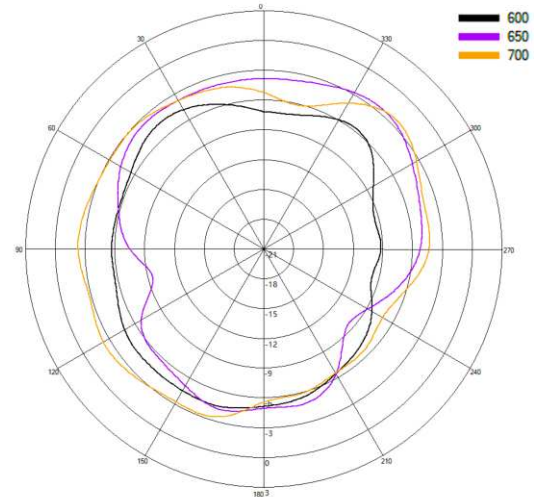
GPSD[X]4-7-49[X]

3D Pattern Data on
Ground Plane Cell B

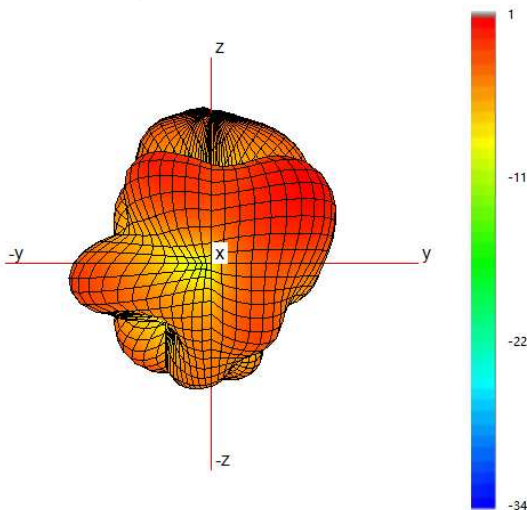
Typical 3D Pattern- Cell B - 650 MHz



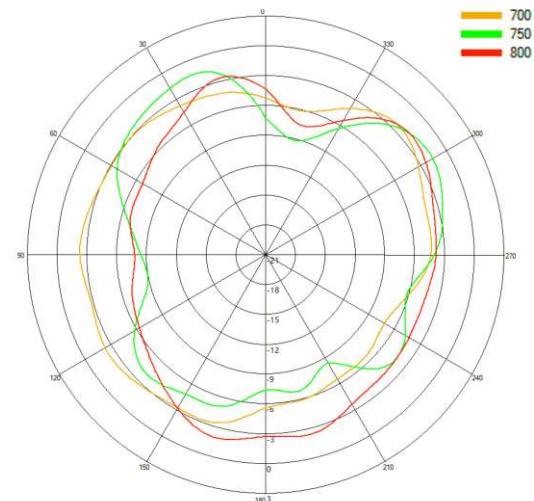
Typical H Plane- Cell B - Patterns- 600-700MHz



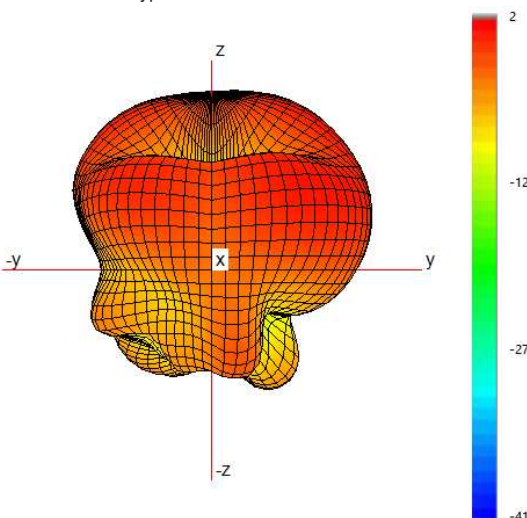
Typical 3D Pattern- Cell B - 750 MHz



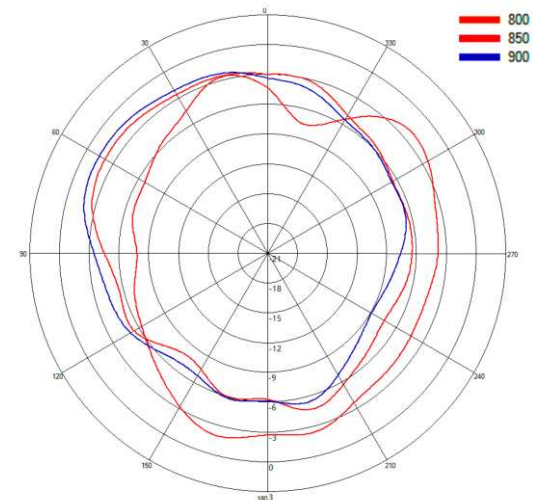
Typical H Plane- Cell B - Patterns- 700-800MHz



Typical 3D Pattern- Cell B - 850 MHz



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



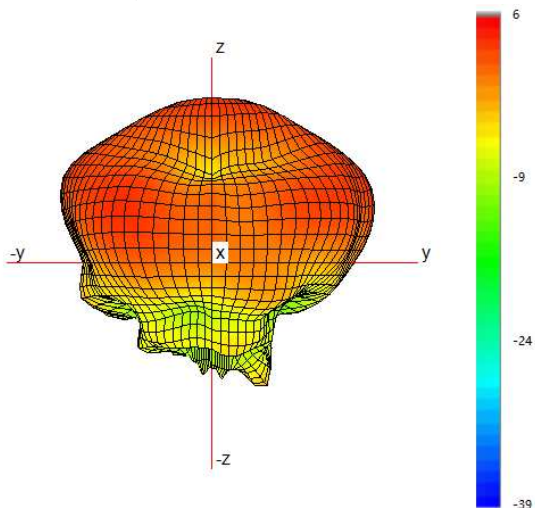
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GPSP[X]4-7-49[X]

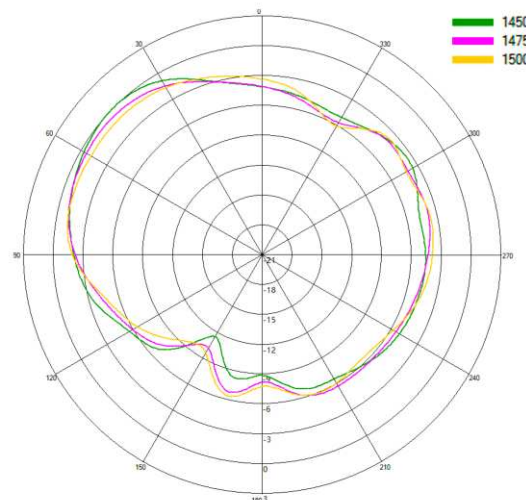
PANORAMA ANTENNAS

3D Pattern Data on
Ground Plane Cell B

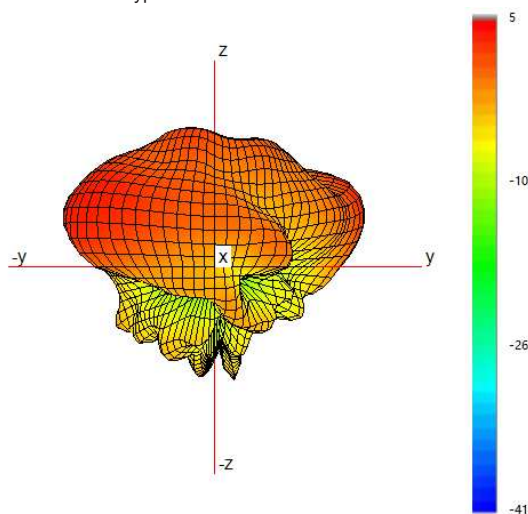
Typical 3D Pattern- Cell B - 1475 MHz



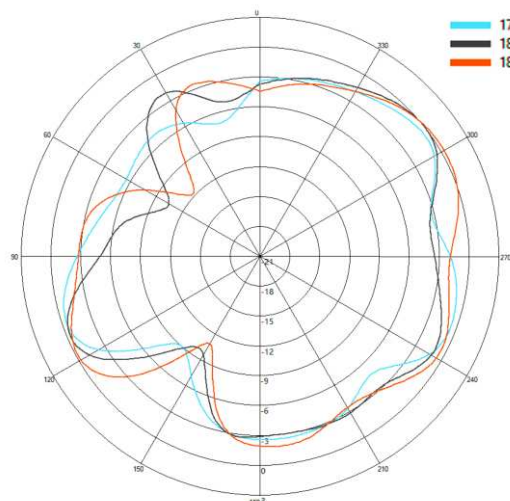
Typical H Plane- Cell B- Patterns- 1450-1500 MHz



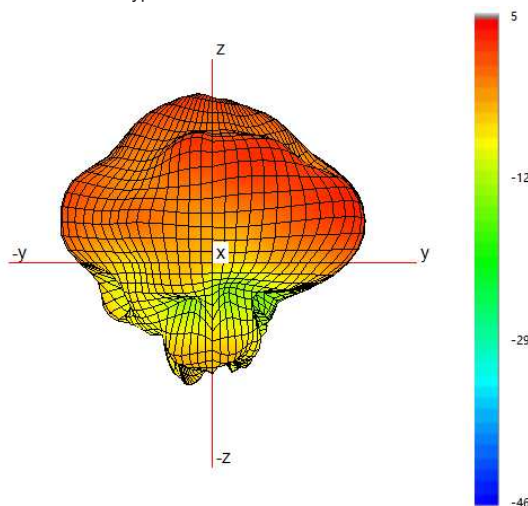
Typical 3D Pattern- Cell B - 1800 MHz



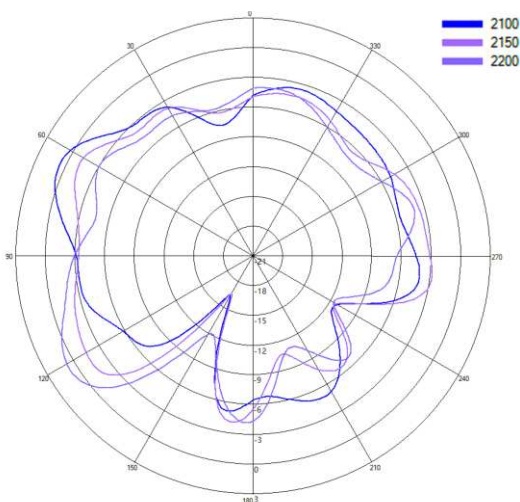
Typical H Plane- Cell B- Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell B - 2150 MHz



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



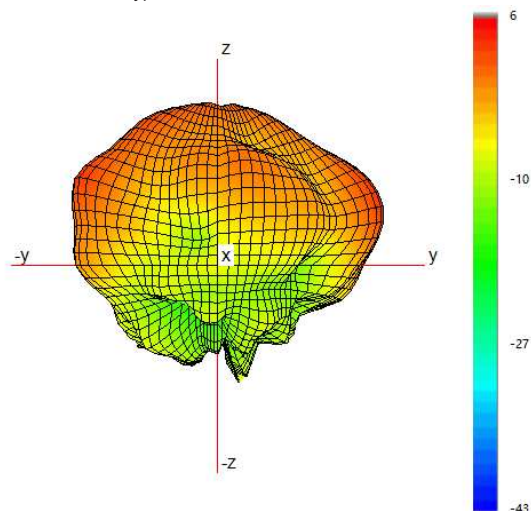
4X4 MiMo 4G/5G Reef Sharkee® Antenna

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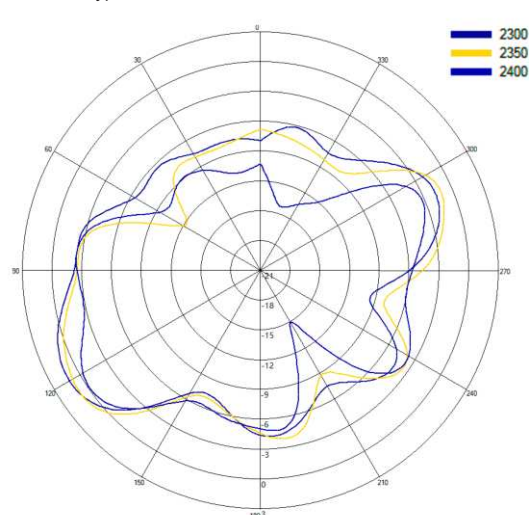
GPSD[X]4-7-49[X]

3D Pattern Data on
Ground Plane Cell B

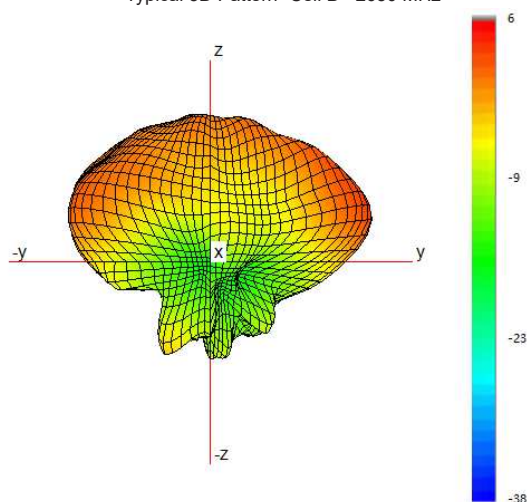
Typical 3D Pattern- Cell B - 2350 MHz



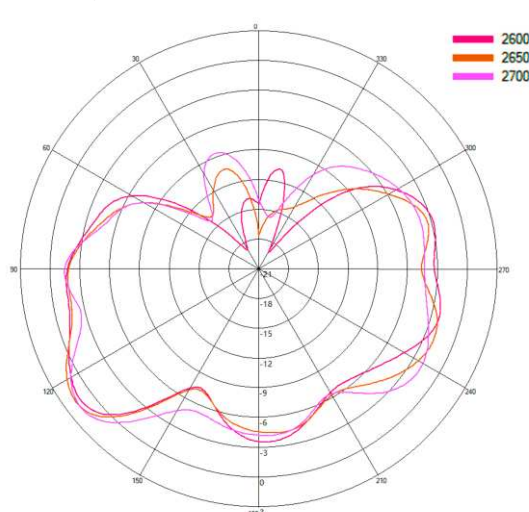
Typical H Plane- Cell B - Patterns- 2300-2400 MHz



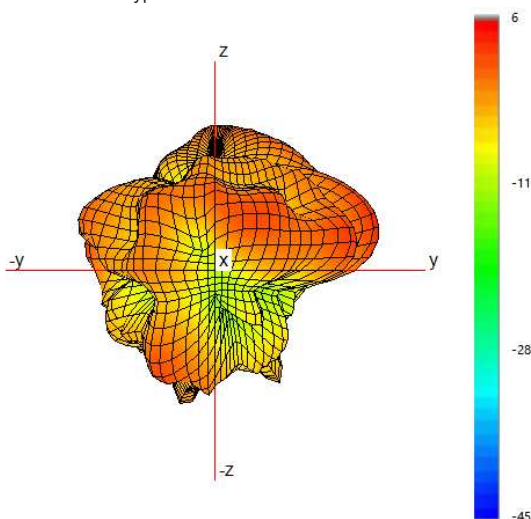
Typical 3D Pattern- Cell B - 2650 MHz



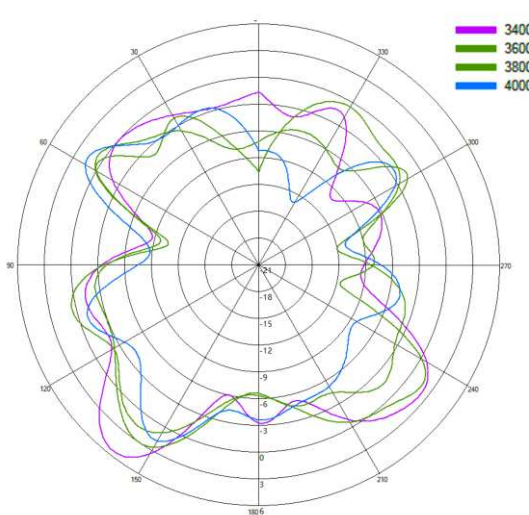
Typical H Plane- Cell B - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell B - 3600 MHz



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



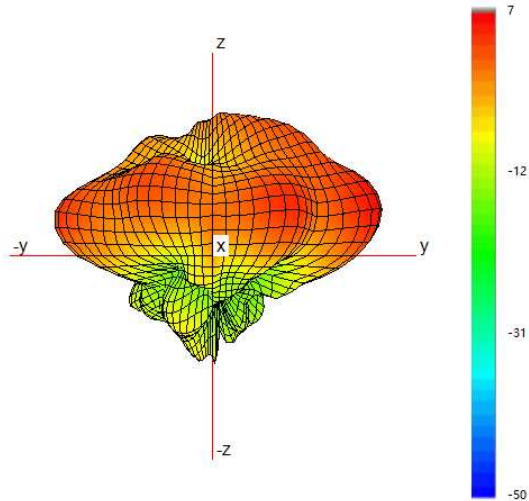
4X4 MiMo 4G/5G Reef Sharkee® Antenna

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

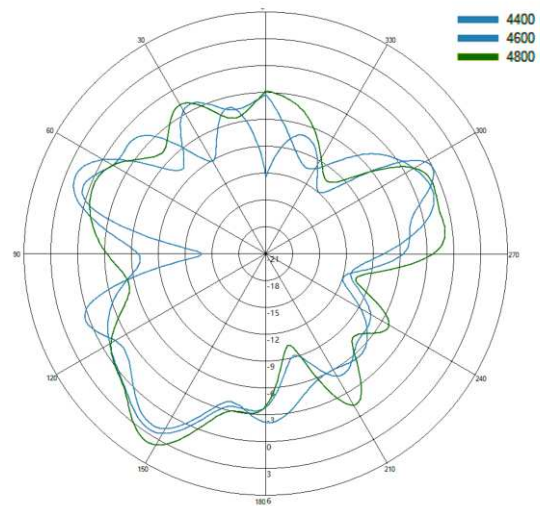
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3D Pattern Data on
Ground Plane Cell B

Typical 3D Pattern- Cell B - 4700 MHz



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



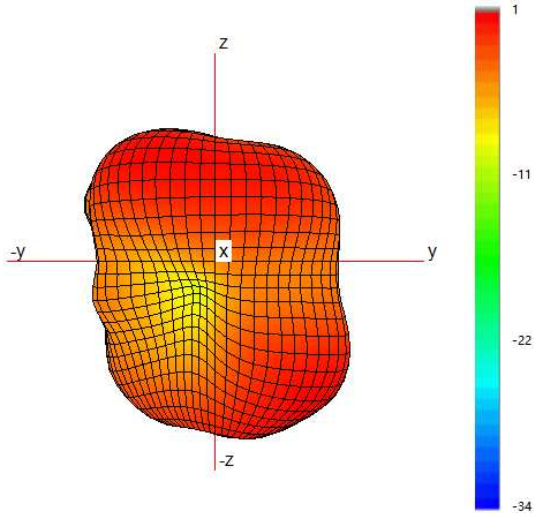
4X4 MiMo 4G/5G Reef Sharkee® Antenna

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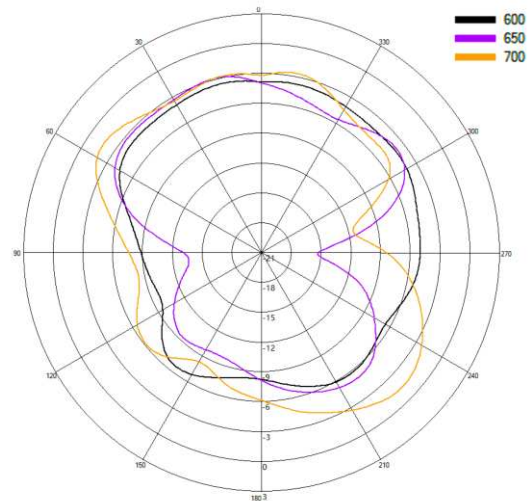
GPSD[X]4-7-49[X]

3D Pattern Data on
Ground Plane Cell C

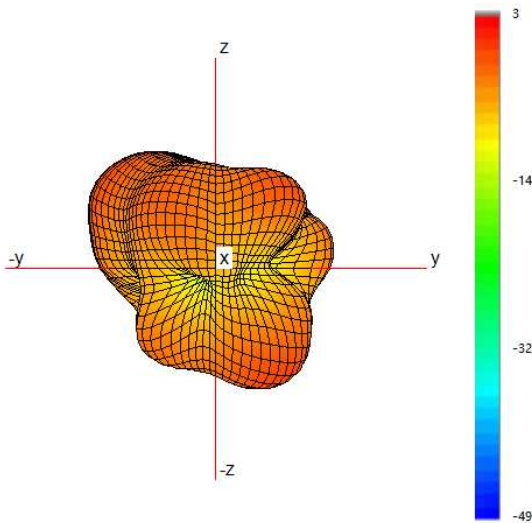
Typical 3D Pattern- Cell C - 650 MHz



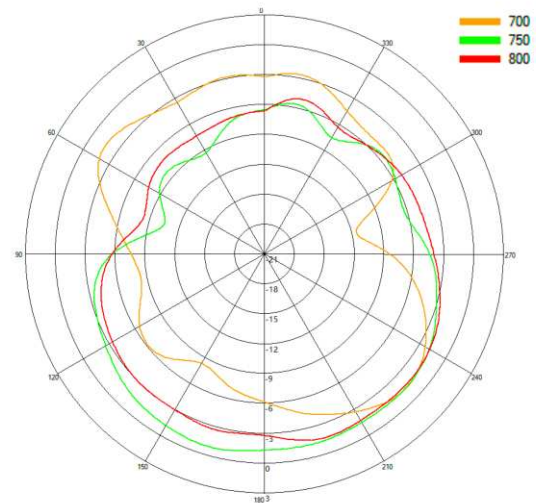
Typical H Plane- Cell C - Patterns- 600-700MHz



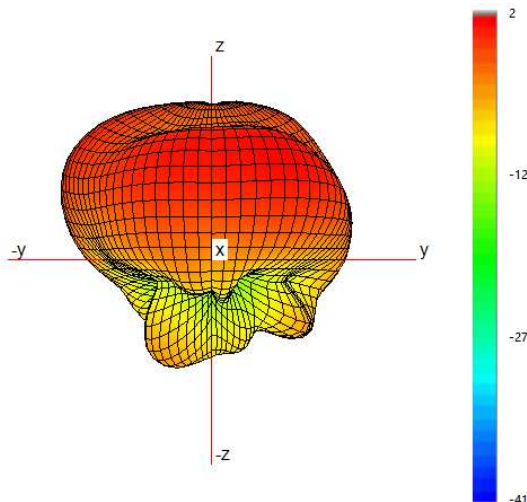
Typical 3D Pattern- Cell C - 750 MHz



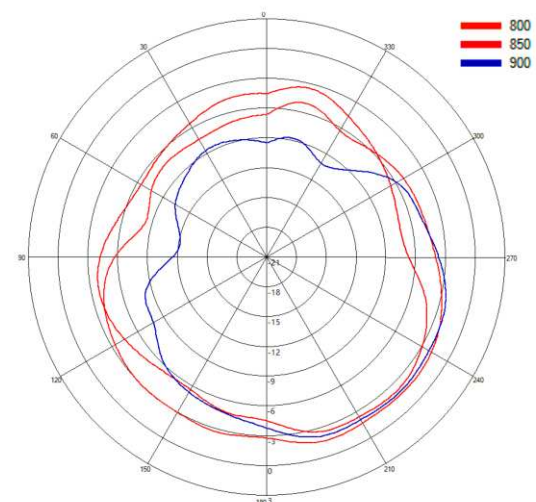
Typical H Plane- Cell C - Patterns- 700-800MHz



Typical 3D Pattern- Cell C - 850 MHz



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



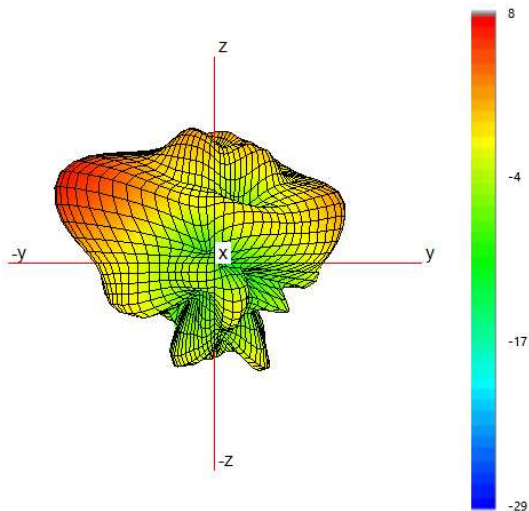
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GPSP[X]4-7-49[X]

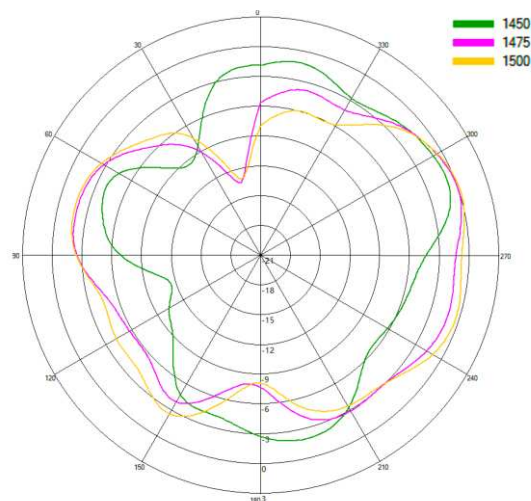
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3D Pattern Data on
Ground Plane Cell C

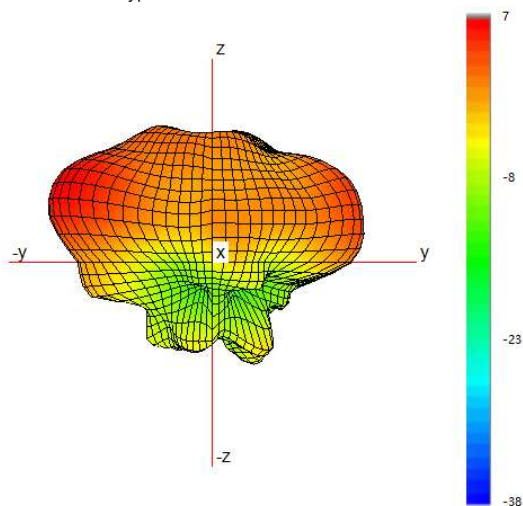
Typical 3D Pattern- Cell C - 1475 MHz



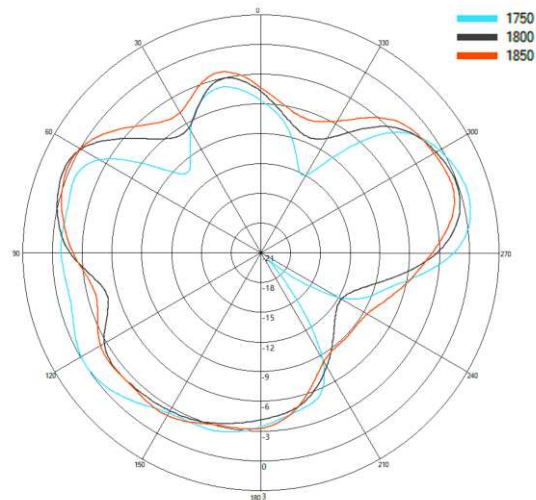
Typical H Plane- Cell C - Patterns- 1450-1500 MHz



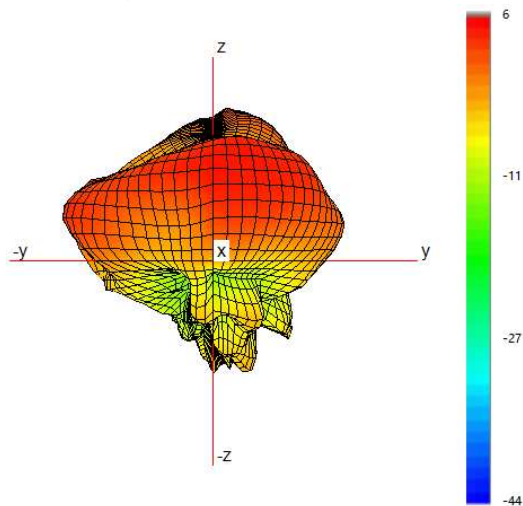
Typical 3D Pattern- Cell C - 1800 MHz



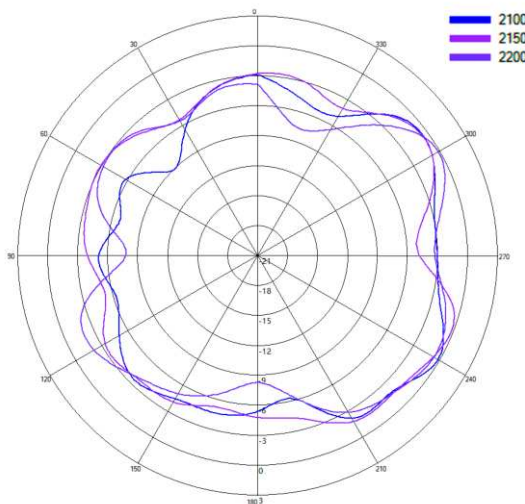
Typical H Plane- Cell C - Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell C - 2150 MHz



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



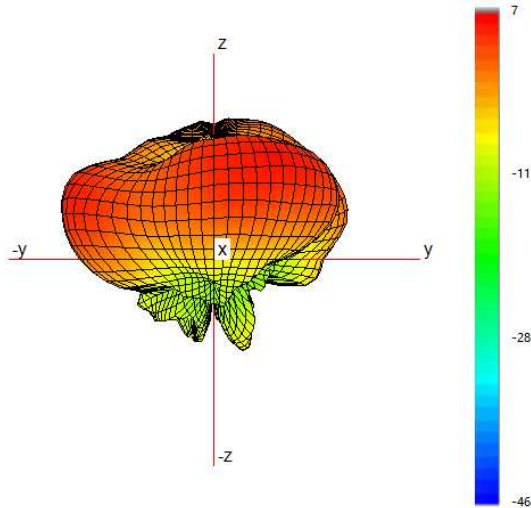
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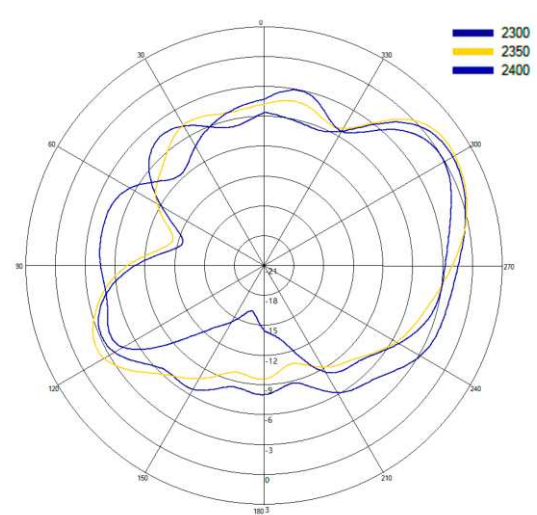
GPSD[X]4-7-49[X]

3D Pattern Data on
Ground Plane Cell C

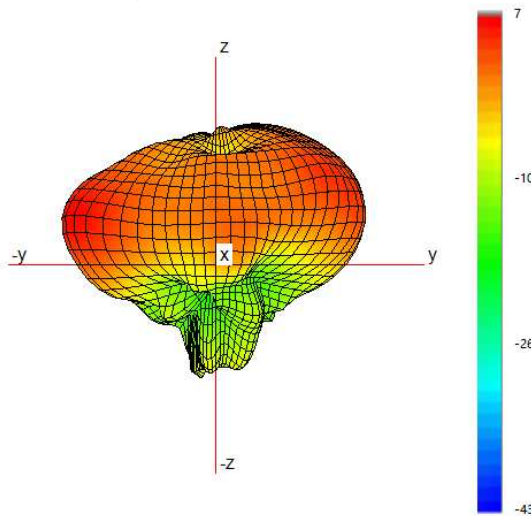
Typical 3D Pattern- Cell C - 2350 MHz



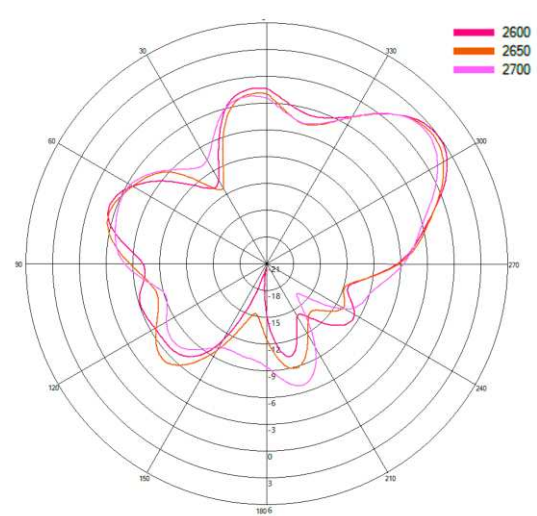
Typical H Plane- Cell C - Patterns- 2300-2400 MHz



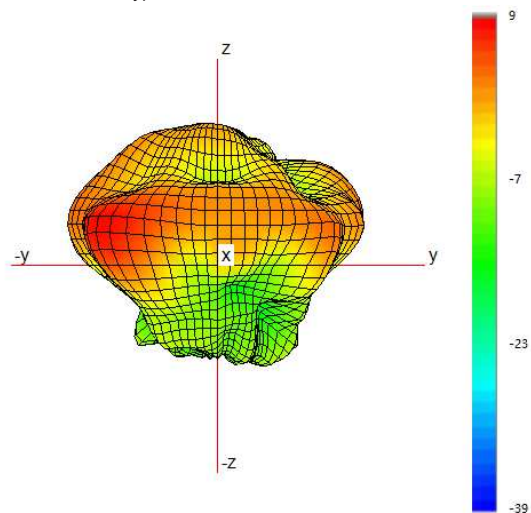
Typical 3D Pattern- Cell C - 2650 MHz



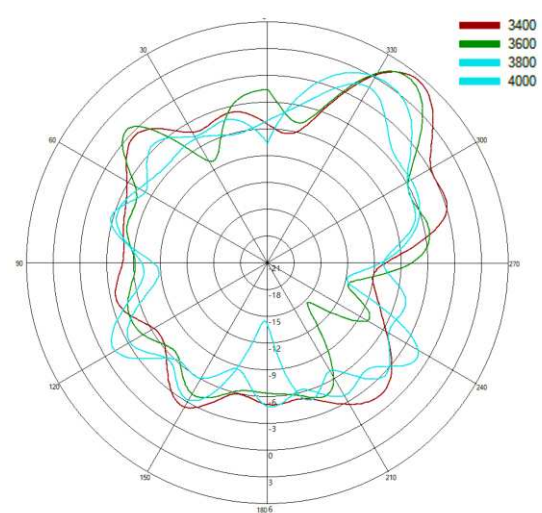
Typical H Plane- Cell C - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell C - 3600 MHz



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

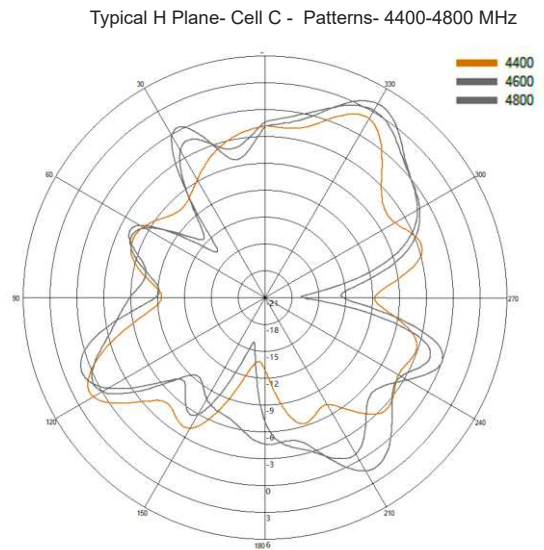
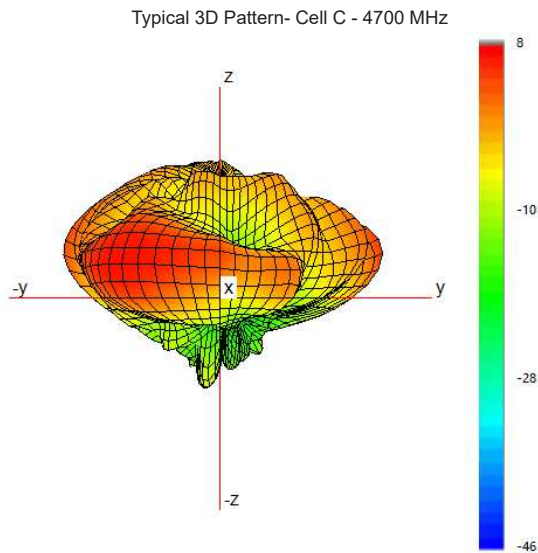


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GPSD[X]4-7-49[X]

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3D Pattern Data on
Ground Plane Cell C



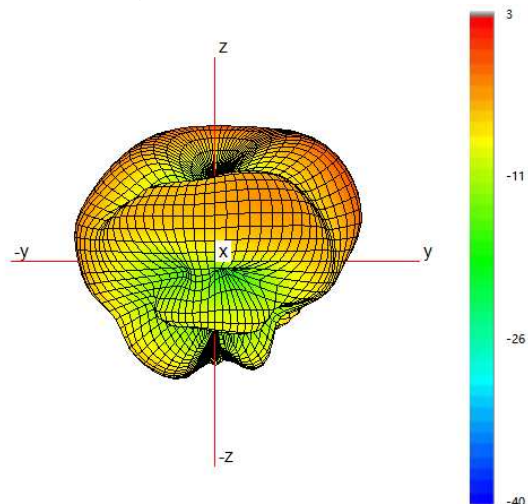
4X4 MiMo 4G/5G Reef Sharkee® Antenna

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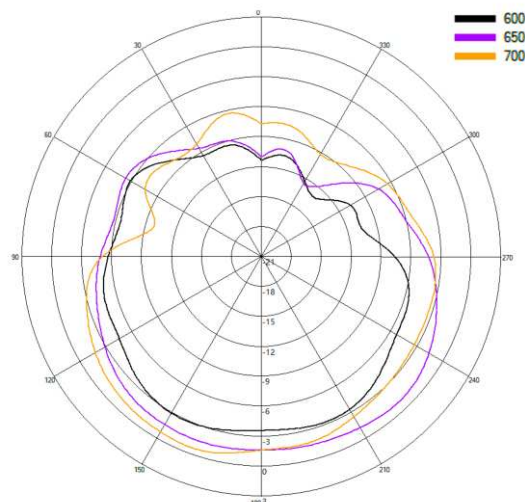
GPSD[X]4-7-49[X]

3D Pattern Data on
Ground Plane Cell D

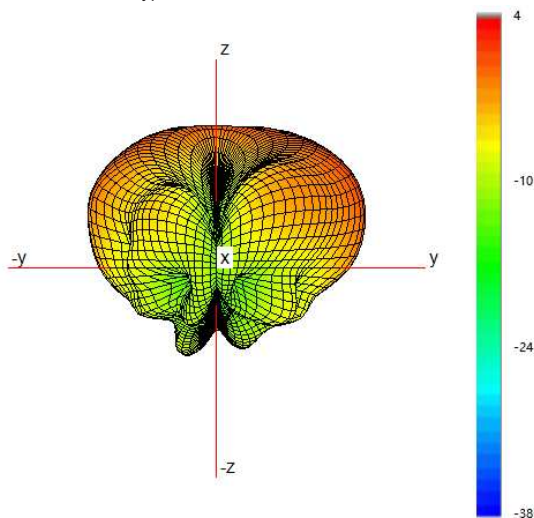
Typical 3D Pattern- Cell D - 650 MHz



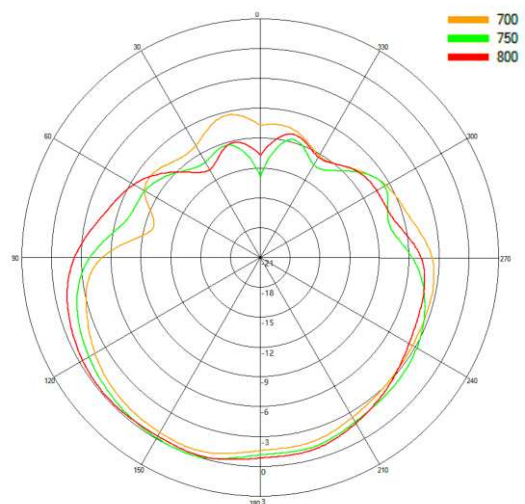
Typical H Plane- Cell D - Patterns- 600-700MHz



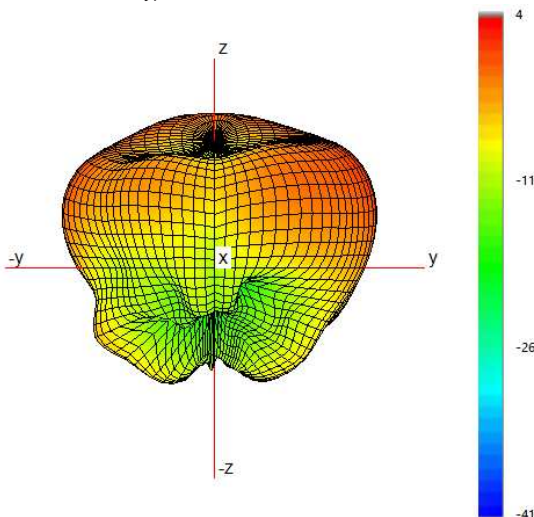
Typical 3D Pattern- Cell D - 750 MHz



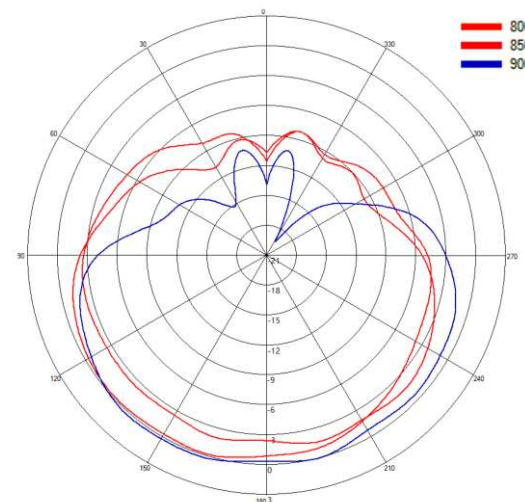
Typical H Plane- Cell D - Patterns- 700-800MHz



Typical 3D Pattern- Cell D - 850 MHz



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



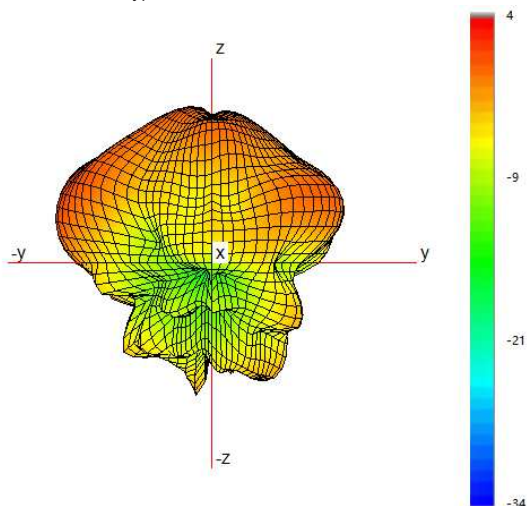
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GPSP[X]4-7-49[X]

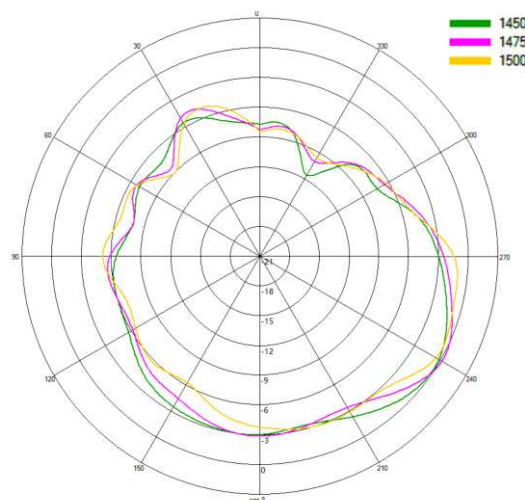
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3D Pattern Data on
Ground Plane Cell D

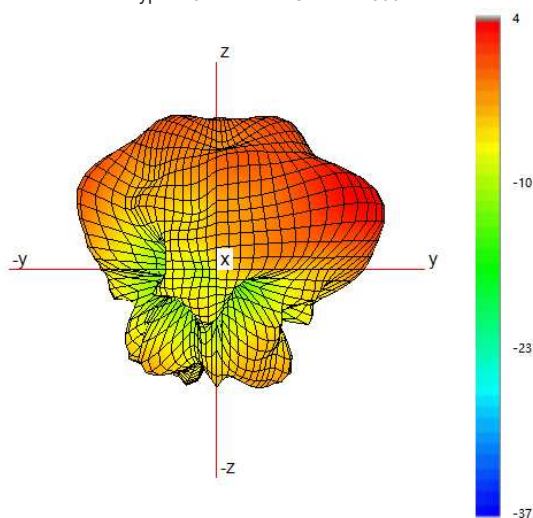
Typical 3D Pattern- Cell D - 1475 MHz



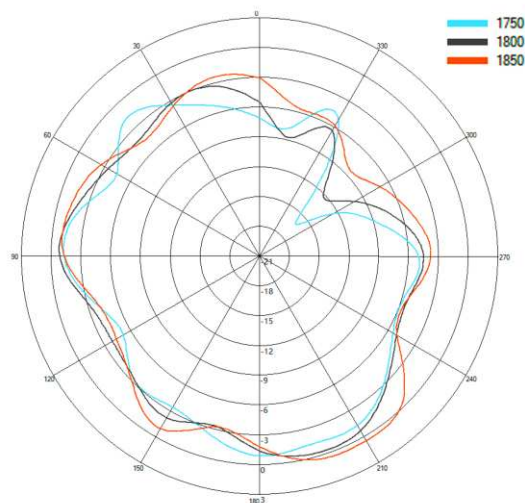
Typical H Plane- Cell D - Patterns- 1450-1500 MHz



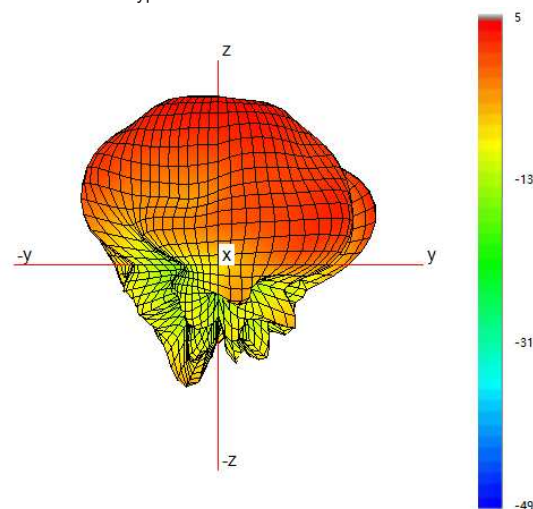
Typical 3D Pattern- Cell D - 1800 MHz



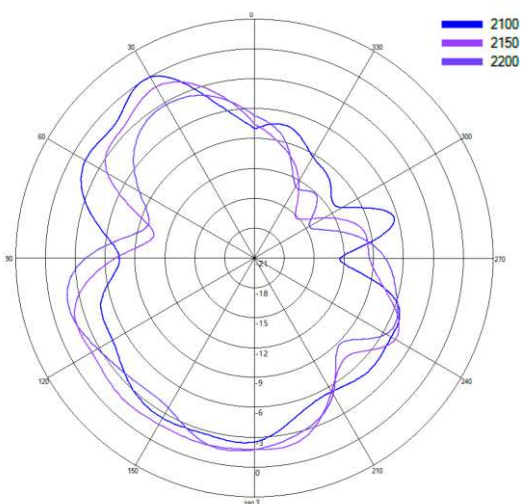
Typical H Plane- Cell D - Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell D - 2150 MHz



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



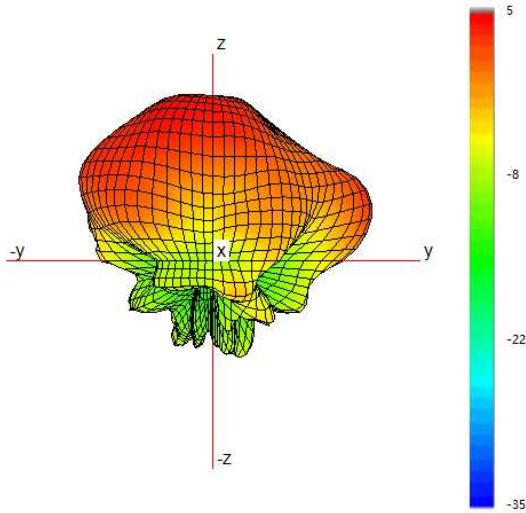
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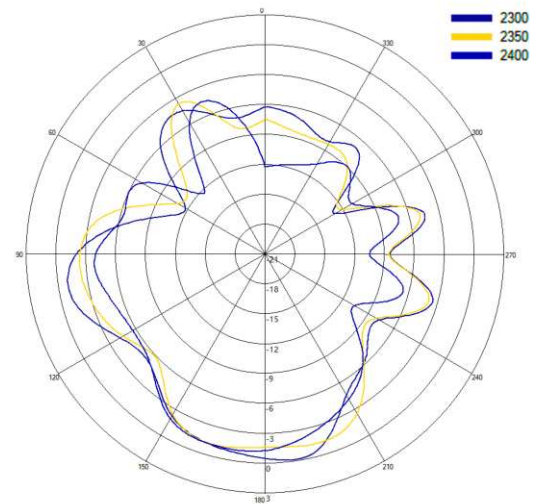
GPSD[X]4-7-49[X]

3D Pattern Data on
Ground Plane Cell D

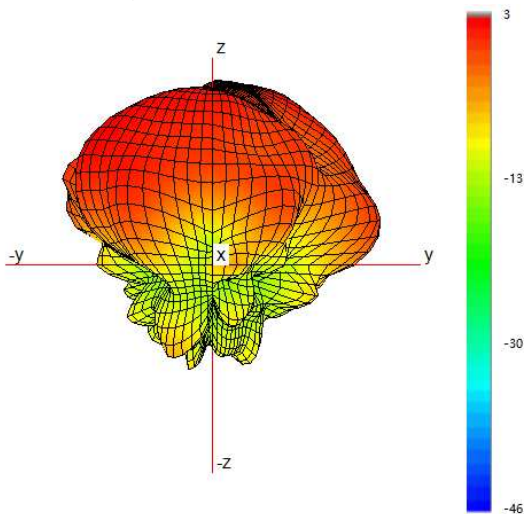
Typical 3D Pattern- Cell D - 2350 MHz



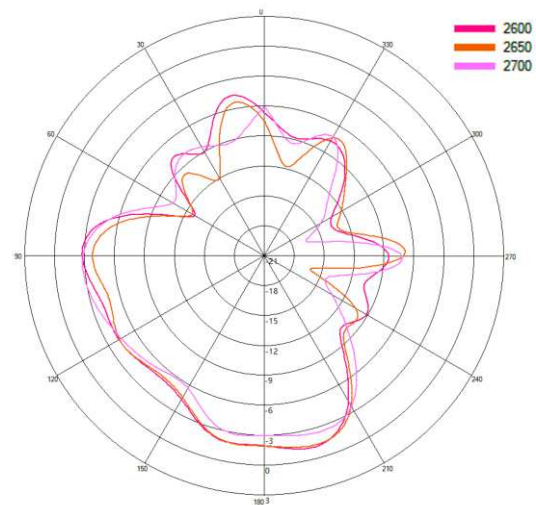
Typical H Plane- Cell D - Patterns- 2300-2400 MHz



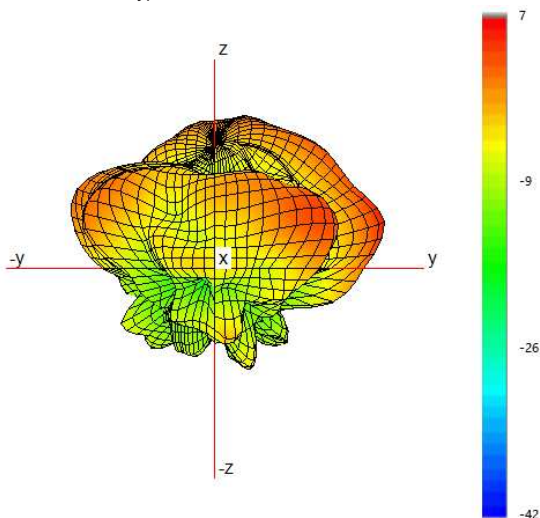
Typical 3D Pattern- Cell D - 2650 MHz



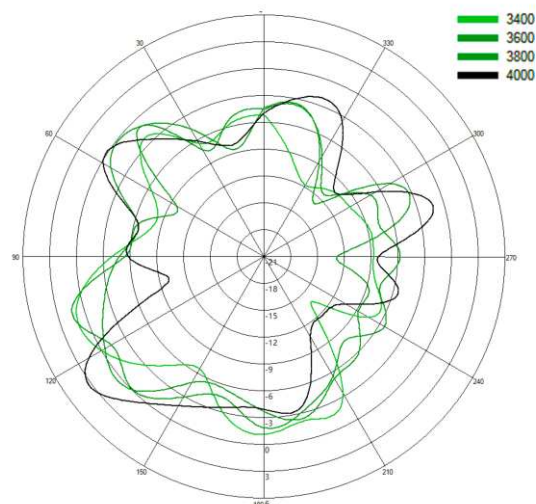
Typical H Plane- Cell D - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell D - 3600 MHz



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



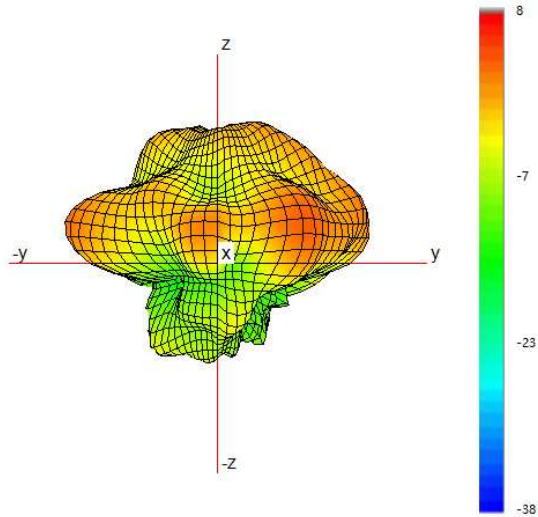
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GPSPD[X]4-7-49[X]

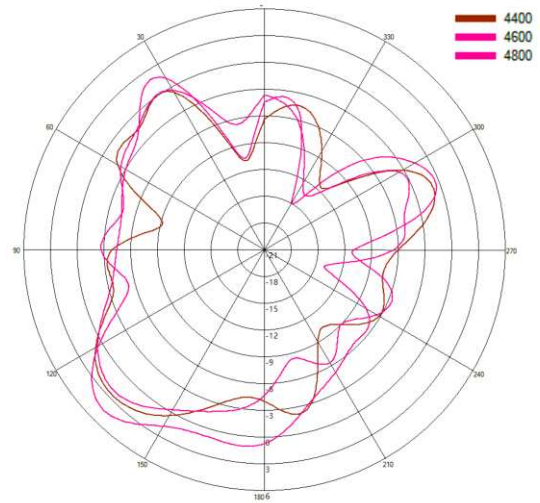
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3D Pattern Data on
Ground Plane Cell D

Typical 3D Pattern- Cell D - 4700 MHz



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



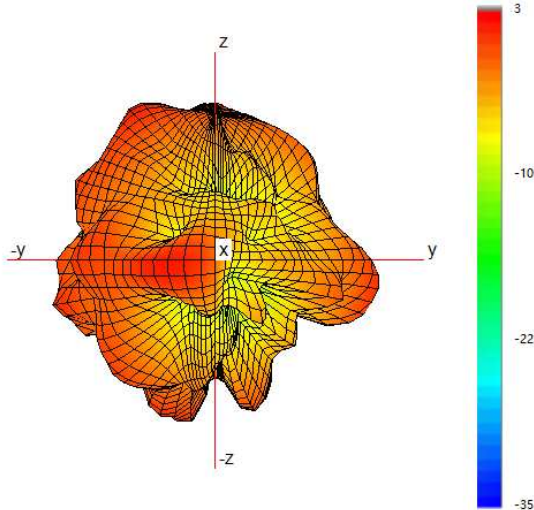
4X4 MiMo 4G/5G Reef Sharkee® Antenna

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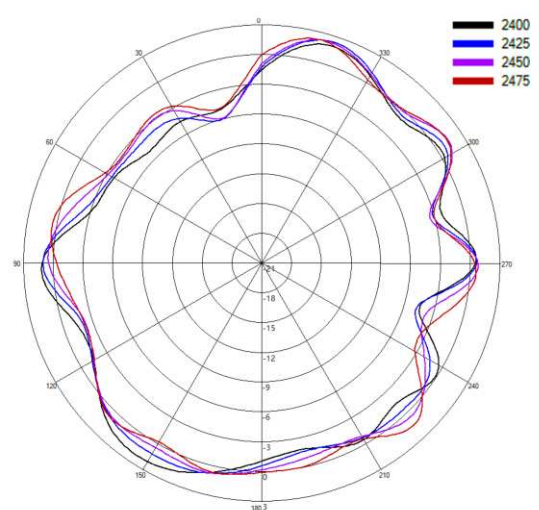
GPSD[X]4-7-49[X]

WiFi Pattern-Data on
Ground Plane -WiFi -1

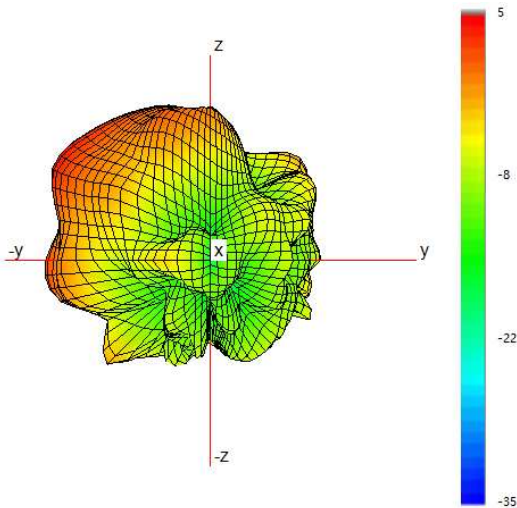
Typical 3D Pattern- WiFi - 1 - 2450 MHz



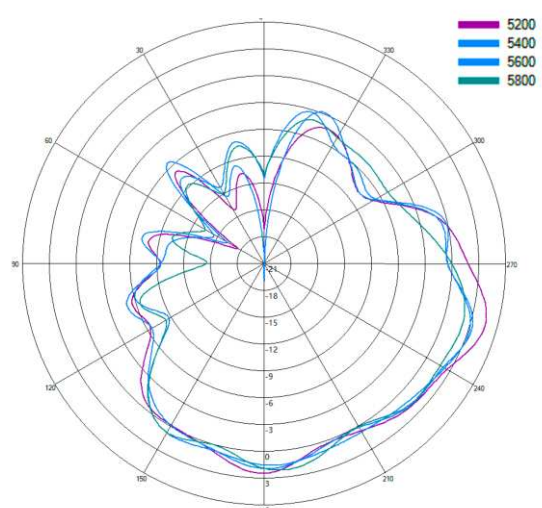
Typical H Plane- WiFi - 1 - Patterns- 2400-2475MHz



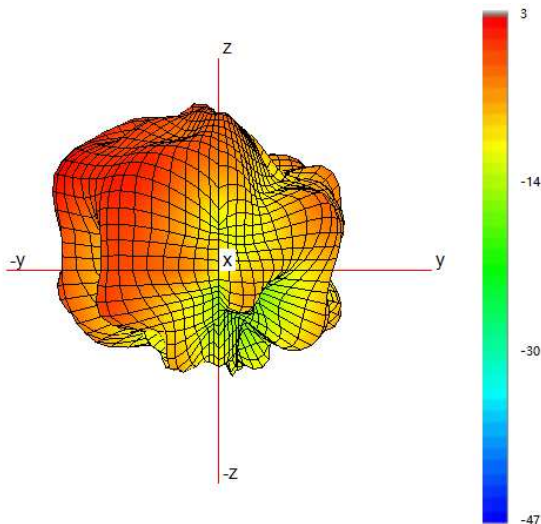
Typical 3D Pattern- WiFi - 1 - 5500 MHz



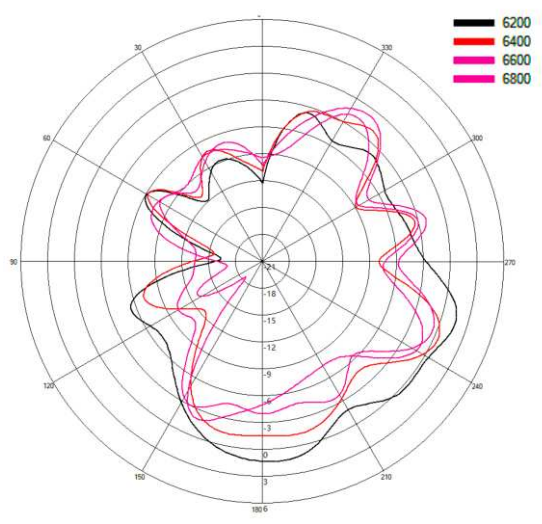
Typical H Plane- WiFi - 1 - Patterns- 5200-5800MHz



Typical 3D Pattern- WiFi - 1 - 6500 MHz



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



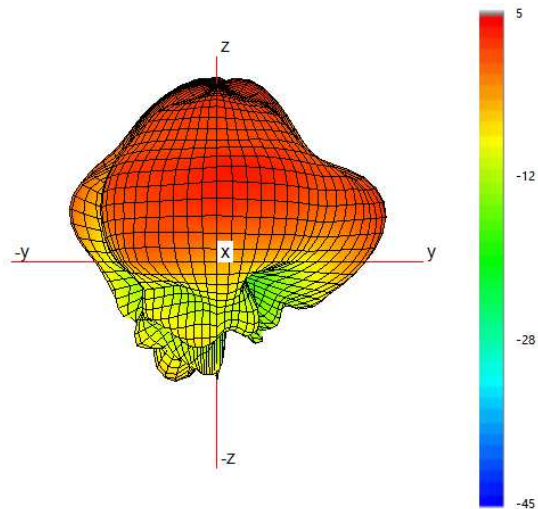
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GPSPD[X]4-7-49[X]

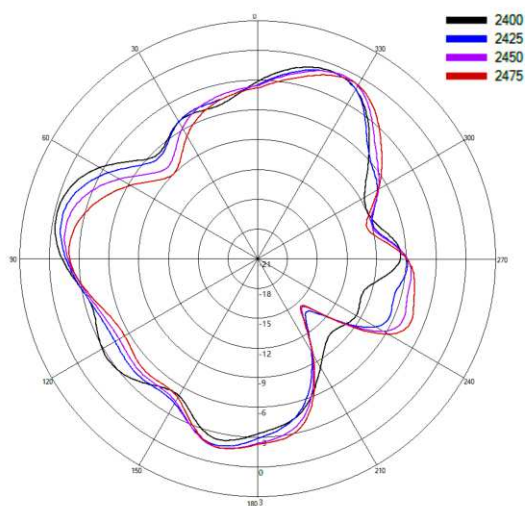
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WiFi Pattern-Data on
Ground Plane -WiFi -2

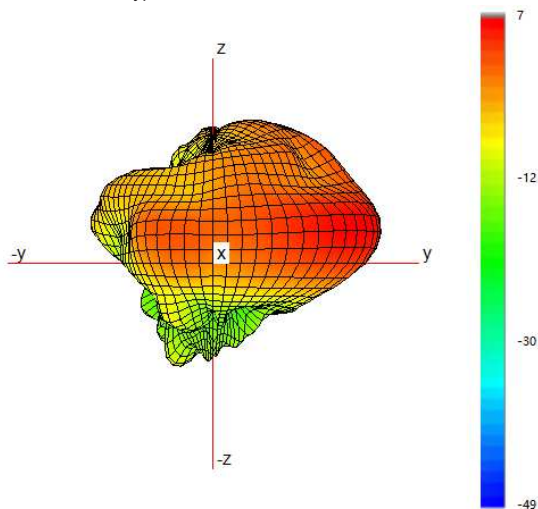
Typical 3D Pattern- WiFi - 2 - 2450 MHz



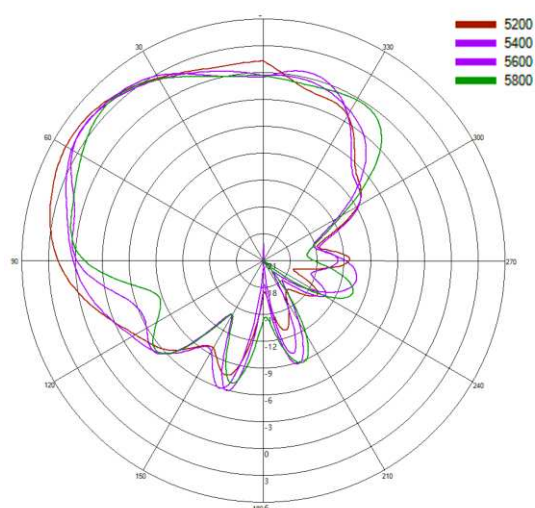
Typical H Plane- WiFi - 2 - Patterns- 2400-2475MHz



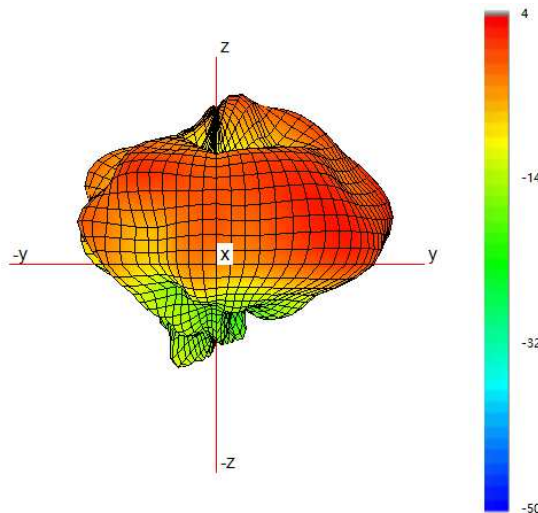
Typical 3D Pattern- WiFi - 2 - 5500 MHz



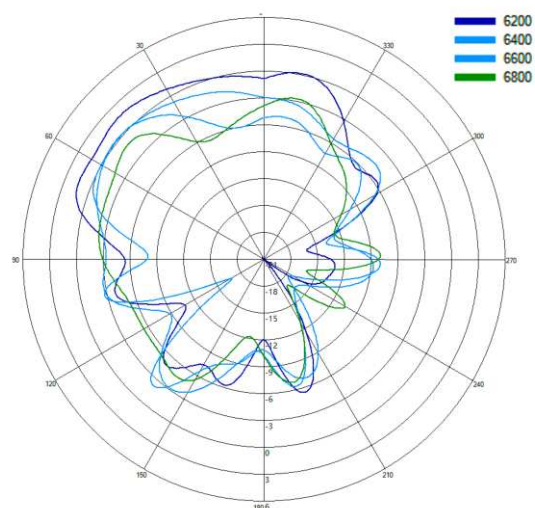
Typical H Plane- WiFi - 2 - Patterns- 5200-5800MHz



Typical 3D Pattern- WiFi - 2 - 6500 MHz



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



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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]

PANORAMA ANTENNAS

Electrical Data -
WiFi-Free Space

Measurement Conditions	WiFi Antennas				
GPSP4-7-49-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

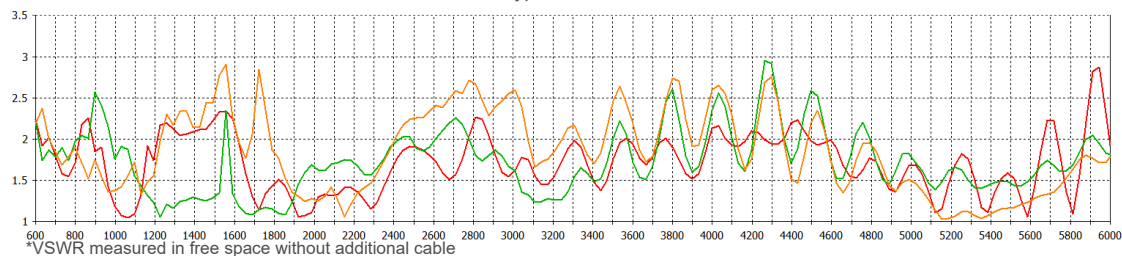
4X4 MiMo 4G/5G Reef Sharkee® Antenna

PANORAMA ANTENNAS

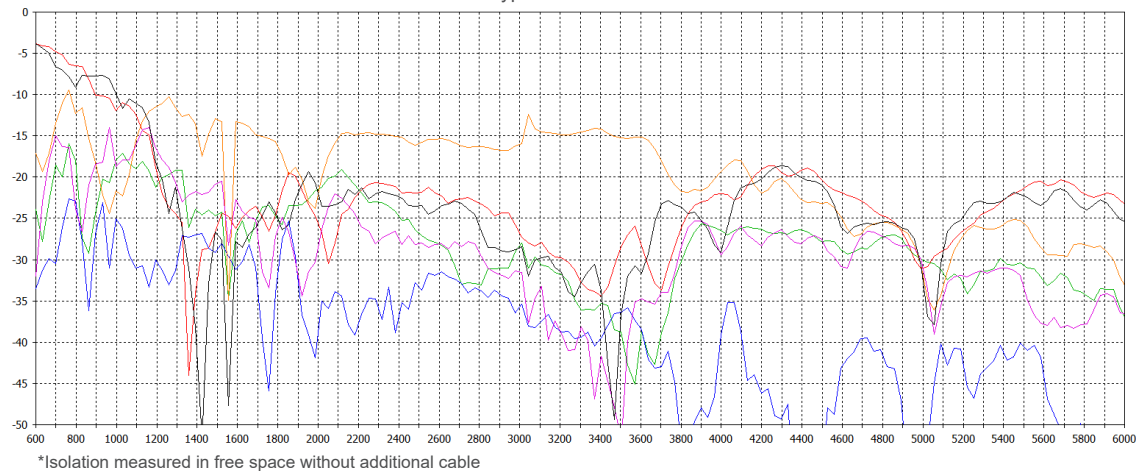
GPSD[X]4-7-49[X]

Electrical Data- Cell-
Free space

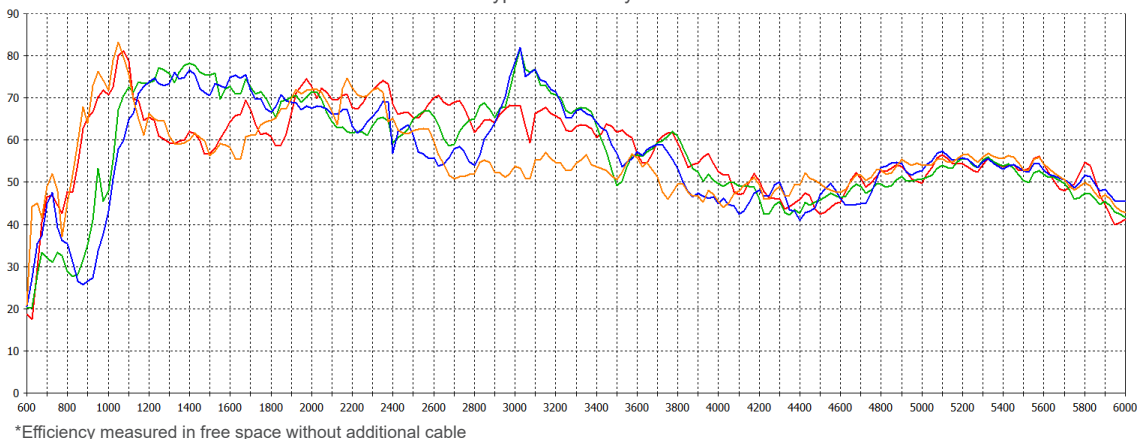
Typical VSWR*



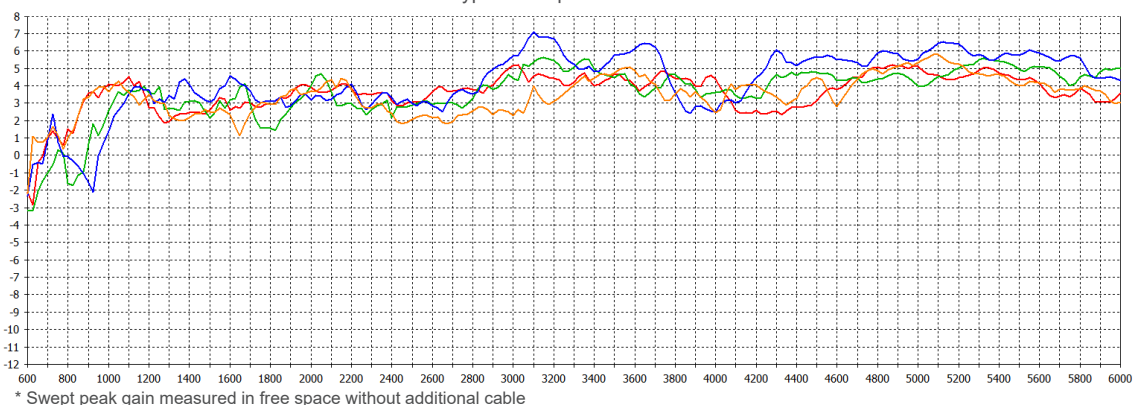
Typical Isolation*



Typical Efficiency*



Typical Swept Peak Gain*



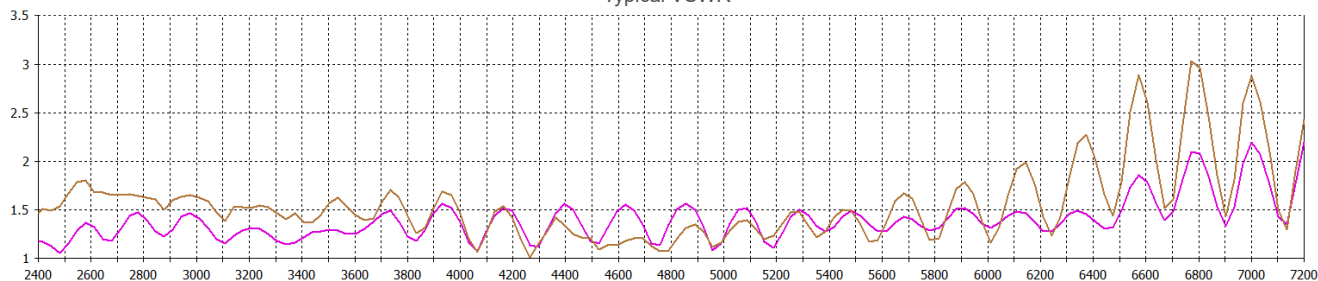
4X4 MiMo 4G/5G Reef Sharkee® Antenna

GPSPD[X]4-7-49[X]

PANORAMA ANTENNAS

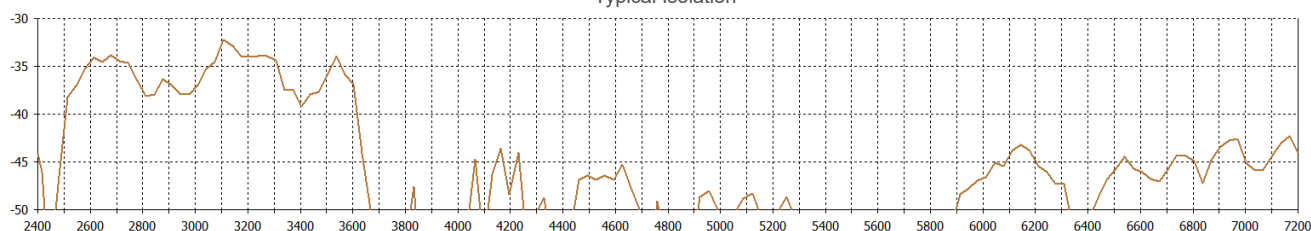
Electrical Data -
WiFi-Free Space

Typical VSWR*



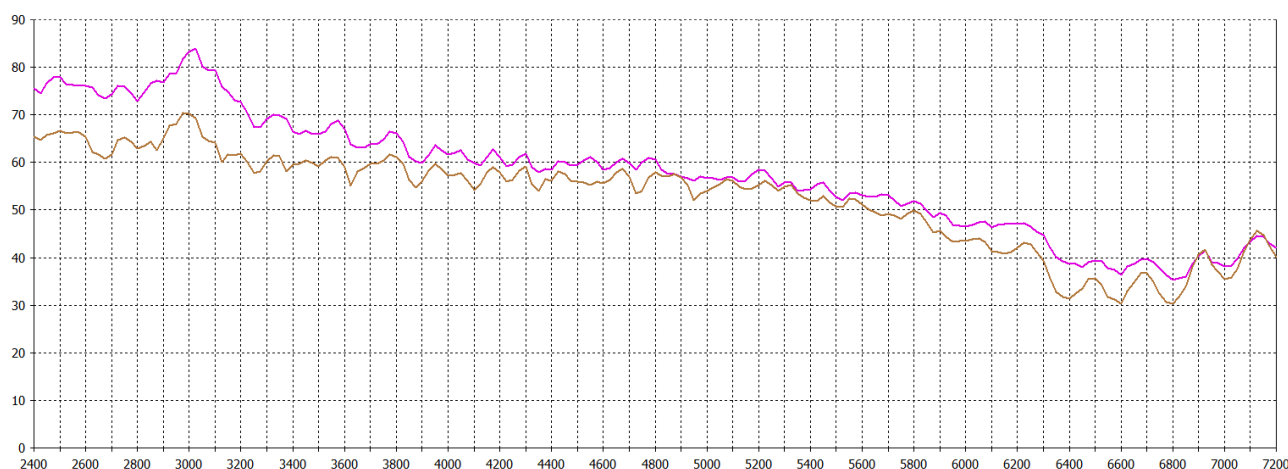
*VSWR measured in free space without additional cable

Typical Isolation*



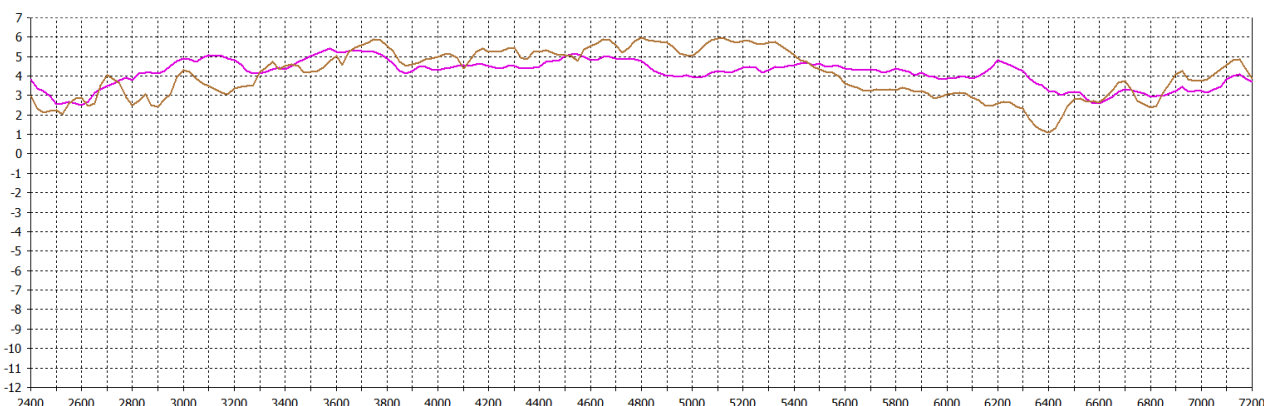
*Isolation measured in free space without additional cable

Typical Efficiency*



*Efficiency measured in free space without additional cable

Typical Swept Peak Gain*



* Swept peak gain measured in free space without additional cable

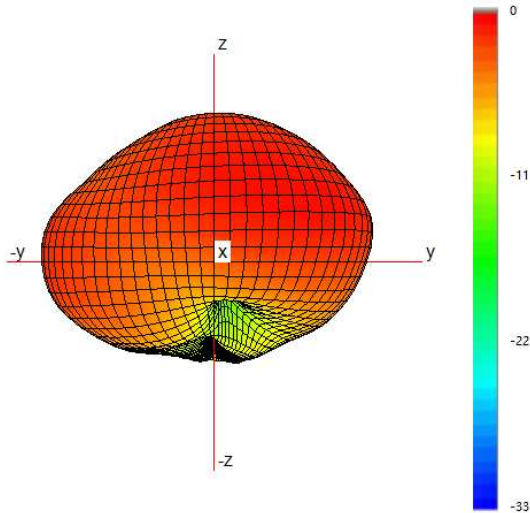
4X4 MiMo 4G/5G Reef Sharkee® Antenna

PANORAMA ANTENNAS

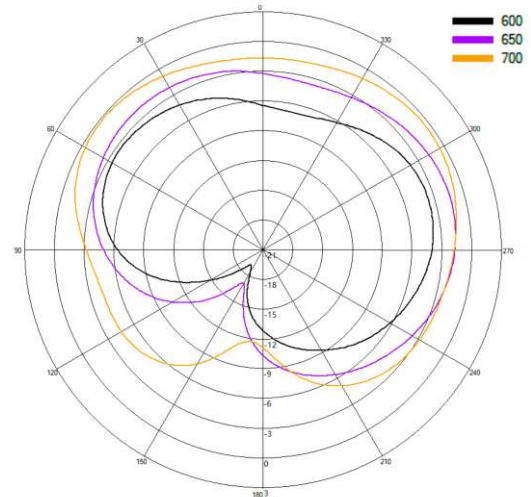
GPSD[X]4-7-49[X]

3D Pattern Data in
Free Space Cell A

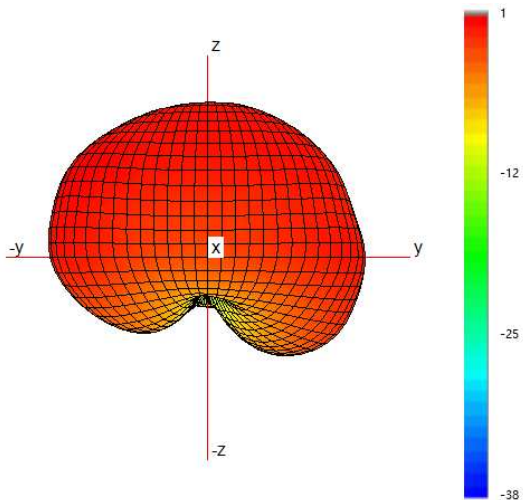
Typical 3D Pattern- Cell A - 650 MHz



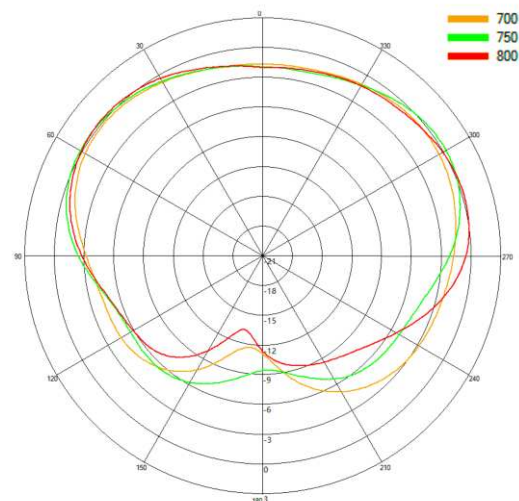
Typical H Plane- Cell A - Patterns- 600-700MHz



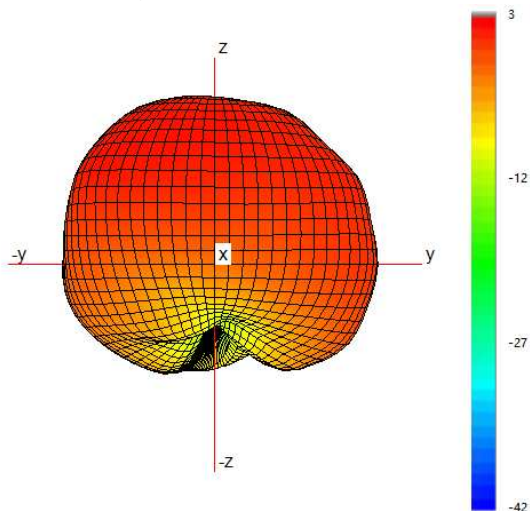
Typical 3D Pattern- Cell A - 750 MHz



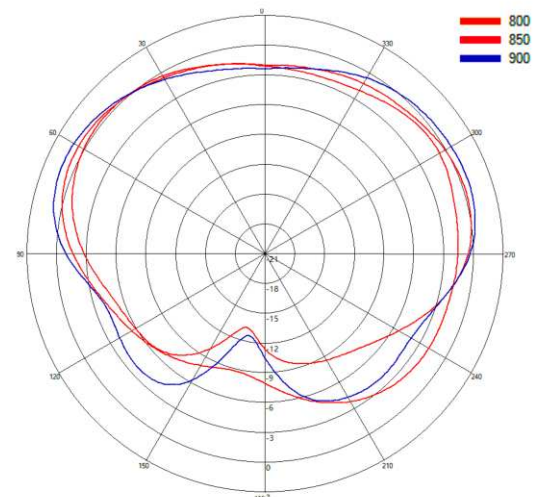
Typical H Plane- Cell A - Patterns- 700-800MHz



Typical 3D Pattern- Cell A - 850 MHz



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



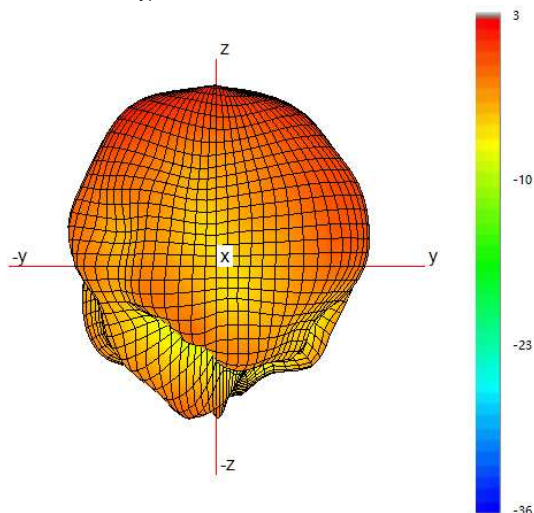
4X4 MiMo 4G/5G Reef Sharkee® Antenna

GPSPD[X]4-7-49[X]

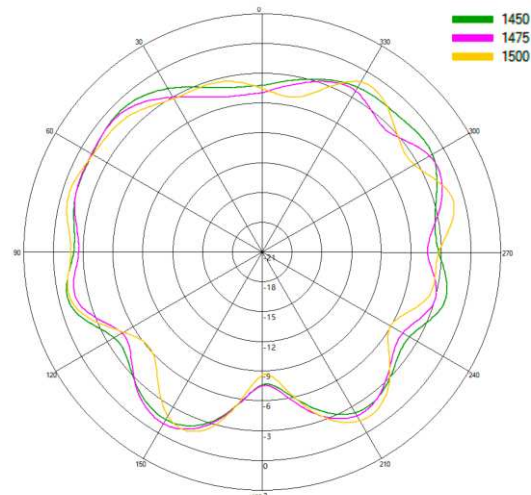
PANORAMA ANTENNAS

3D Pattern Data in
Free Space Cell A

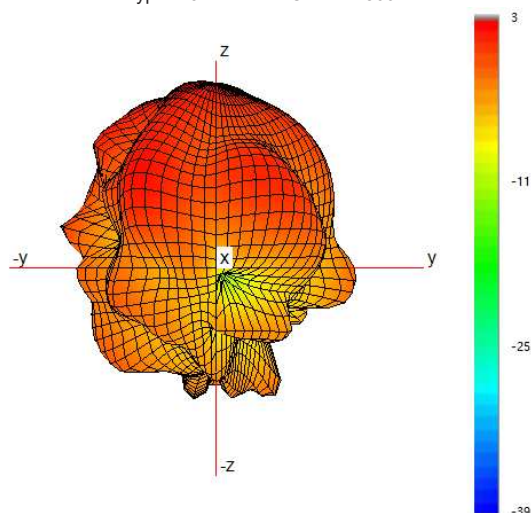
Typical 3D Pattern- Cell A - 1475 MHz



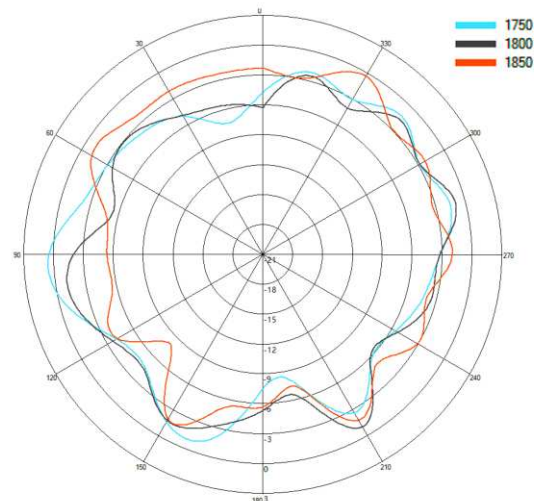
Typical H Plane- Cell A- Patterns- 1450-1500 MHz



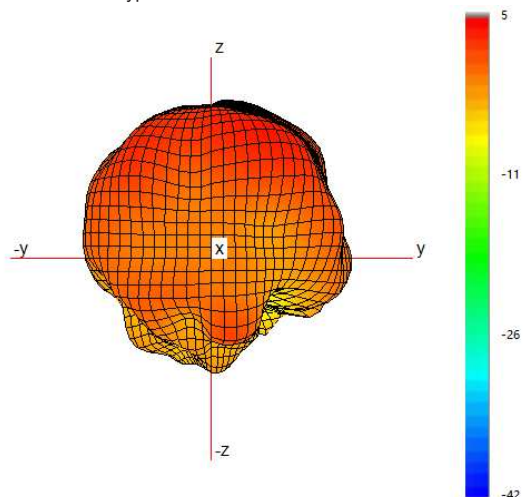
Typical 3D Pattern- Cell A - 1800 MHz



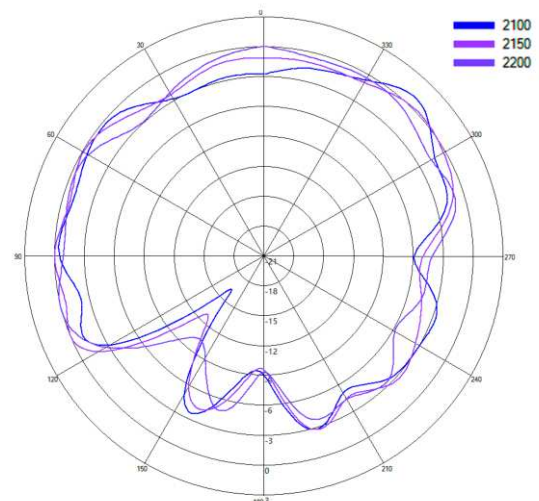
Typical H Plane- Cell A- Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell A - 2150 MHz



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



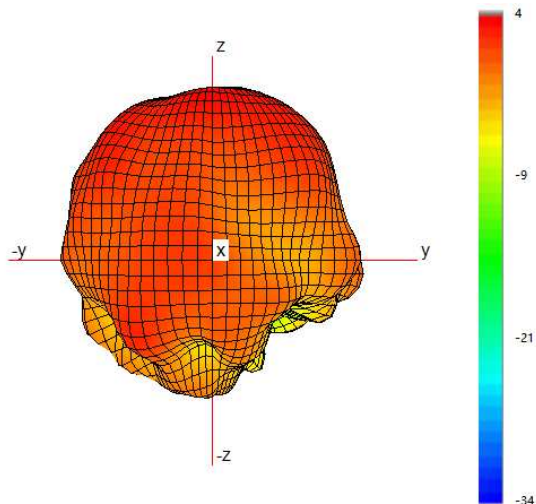
4X4 MiMo 4G/5G Reef Sharkee® Antenna

PANORAMA ANTENNAS

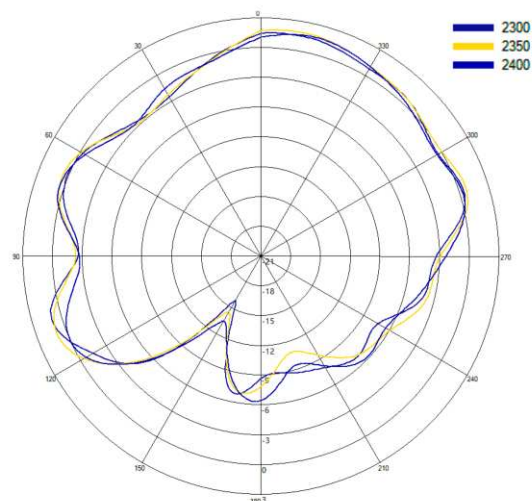
GPSD[X]4-7-49[X]

3D Pattern Data in
Free Space Cell A

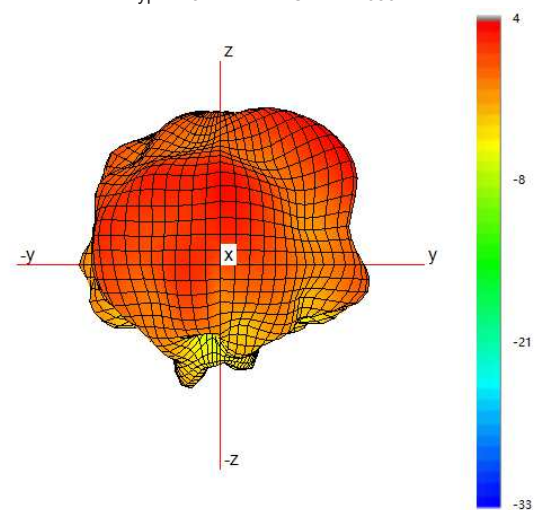
Typical 3D Pattern- Cell A - 2350 MHz



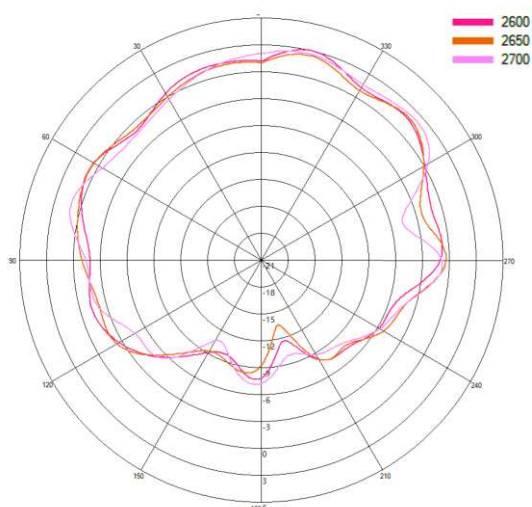
Typical H Plane- Cell A - Patterns- 2300-2400 MHz



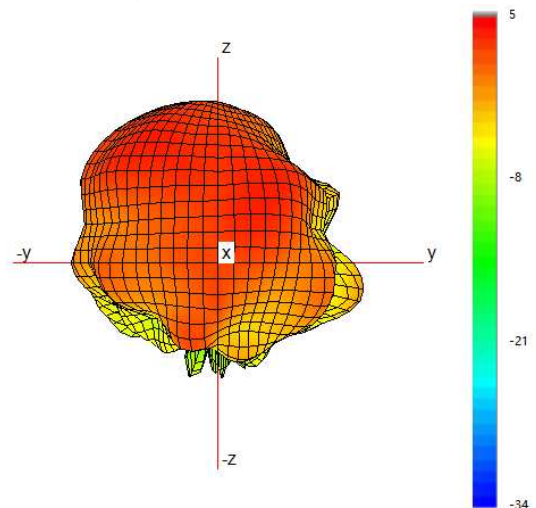
Typical 3D Pattern- Cell A - 2650 MHz



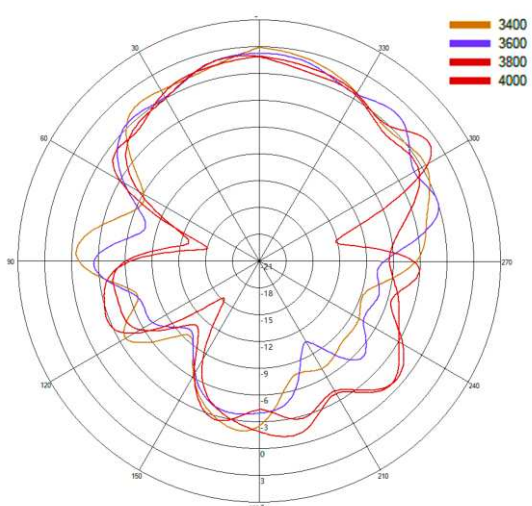
Typical H Plane- Cell A - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell A - 3600 MHz



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



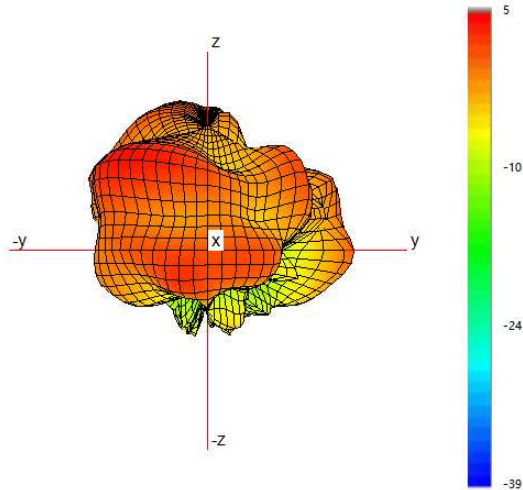
4X4 MiMo 4G/5G Reef Sharkee® Antenna

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

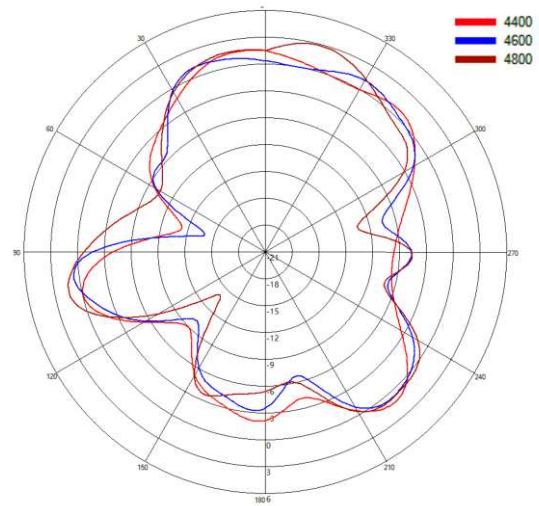
PANORAMA  ANTENNAS

3D Pattern Data in
Free Space Cell A

Typical 3D Pattern- Cell A - 4700 MHz



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



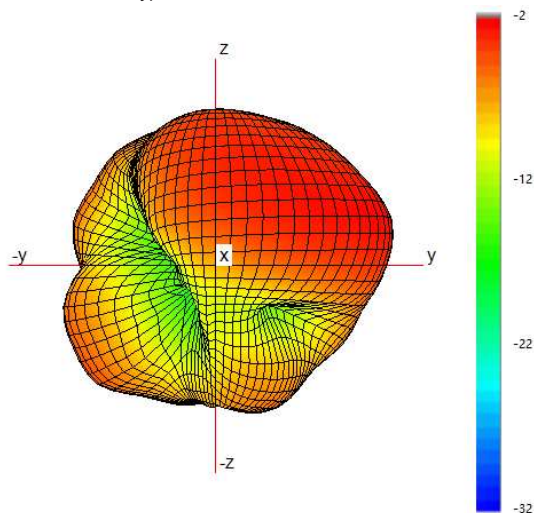
4X4 MiMo 4G/5G Reef Sharkee® Antenna

PANORAMA ANTENNAS

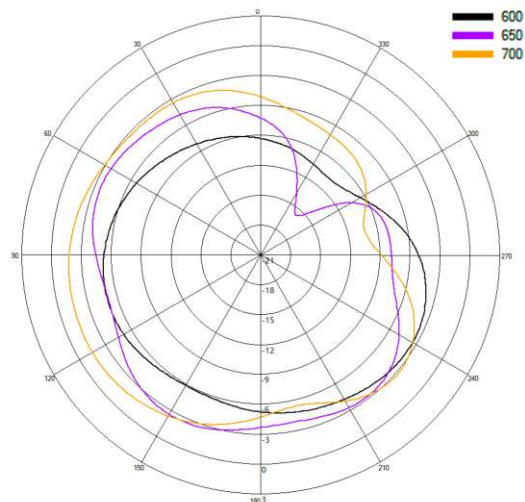
GPSD[X]4-7-49[X]

3D Pattern Data in
Free Space Cell B

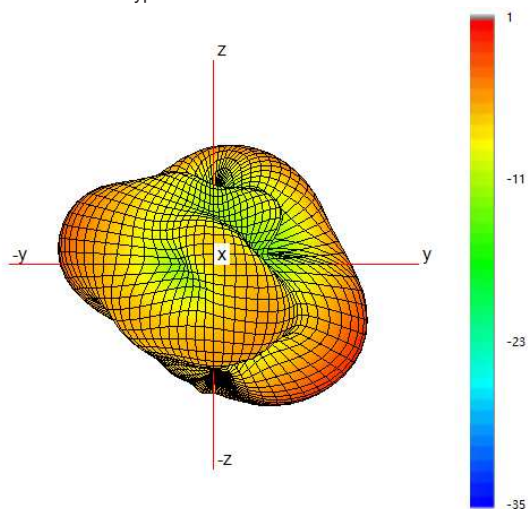
Typical 3D Pattern- Cell B - 650 MHz



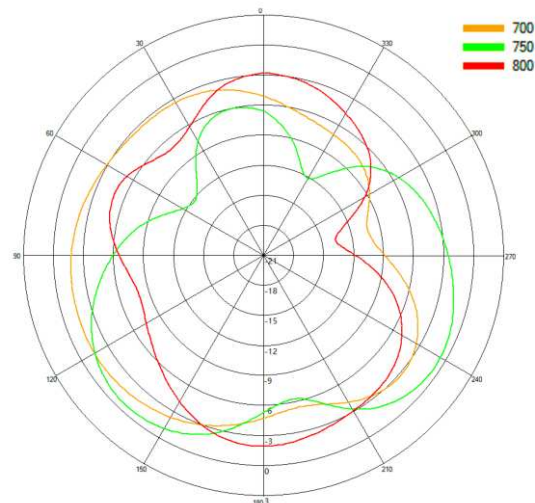
Typical H Plane- Cell B - Patterns- 600-700MHz



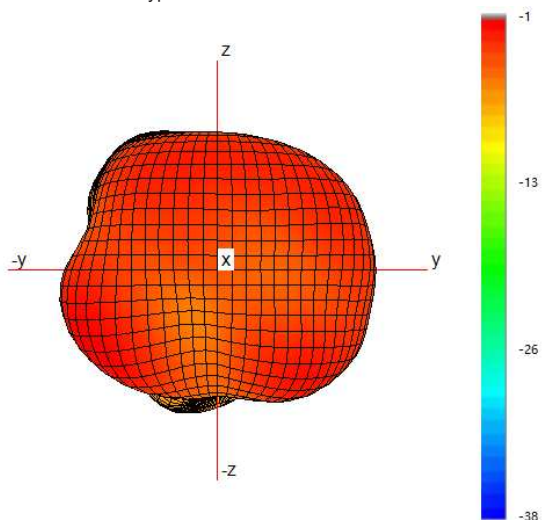
Typical 3D Pattern- Cell B - 750 MHz



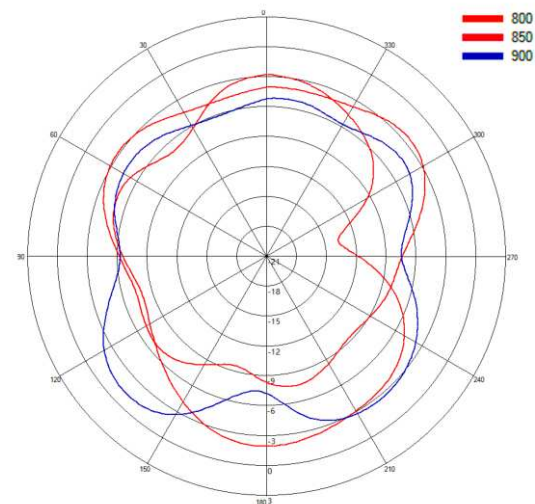
Typical H Plane- Cell B - Patterns- 700-800MHz



Typical 3D Pattern- Cell B - 850 MHz



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



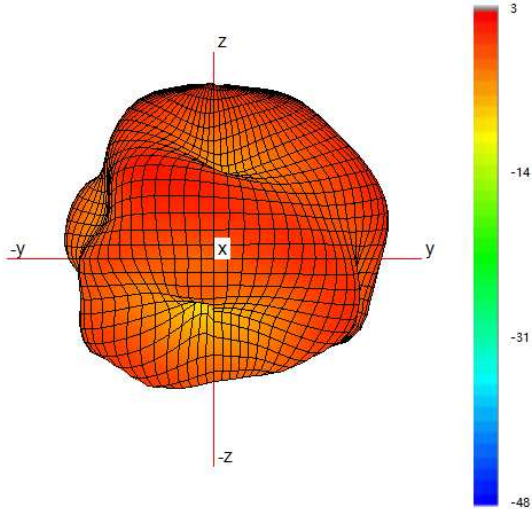
4X4 MiMo 4G/5G Reef Sharkee® Antenna

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

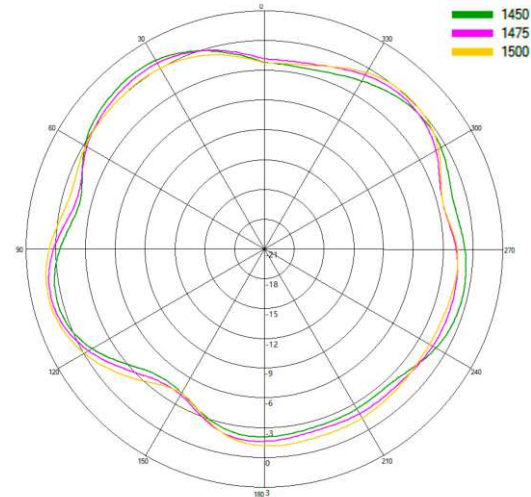
PANORAMA ANTENNAS

3D Pattern Data in
Free Space Cell B

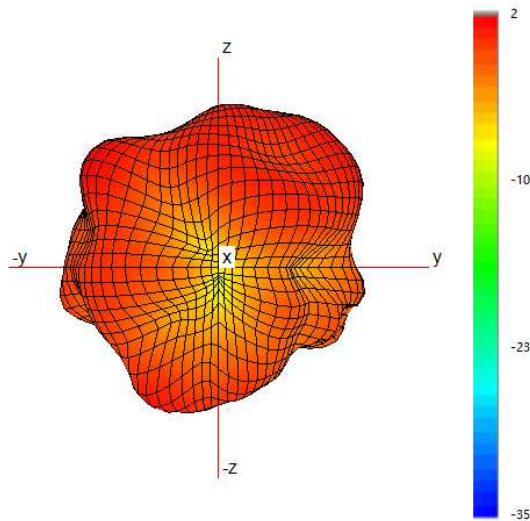
Typical 3D Pattern- Cell B - 1475 MHz



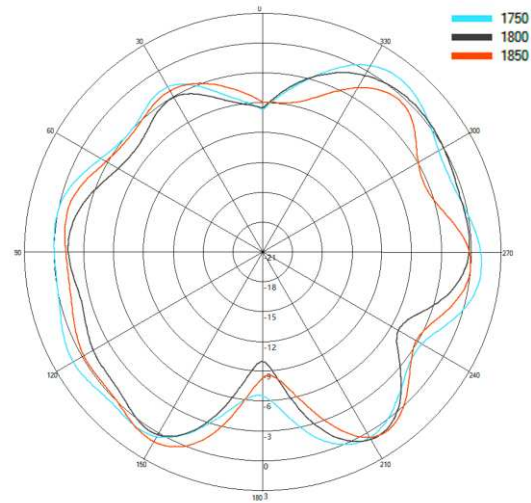
Typical H Plane- Cell B- Patterns- 1450-1500 MHz



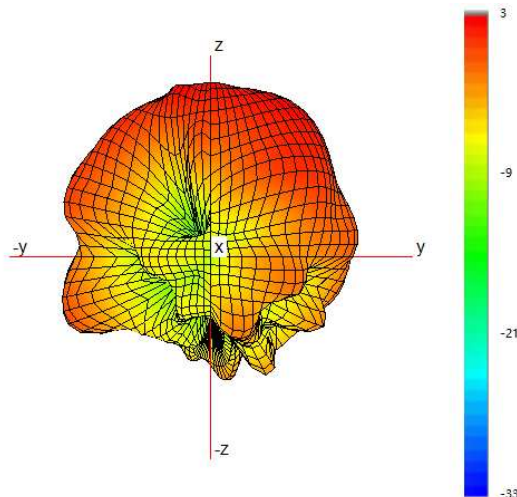
Typical 3D Pattern- Cell B - 1800 MHz



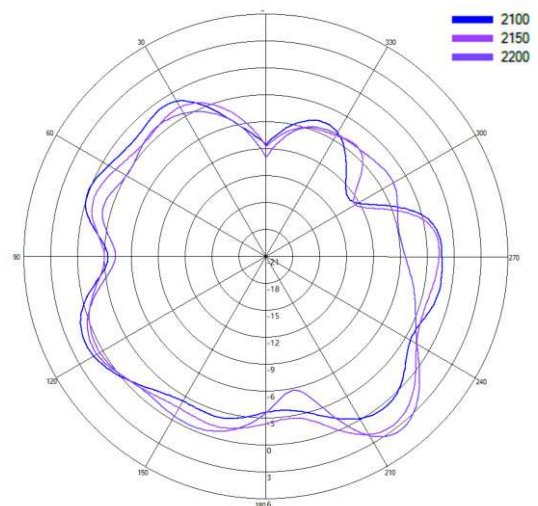
Typical H Plane- Cell B- Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell B - 2150 MHz



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



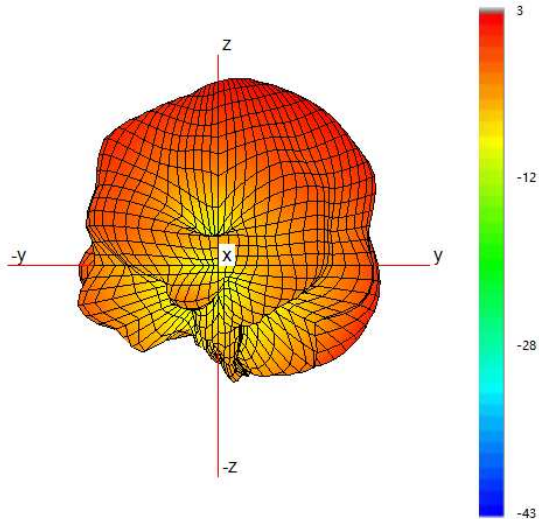
4X4 MiMo 4G/5G Reef Sharkee® Antenna

PANORAMA ANTENNAS

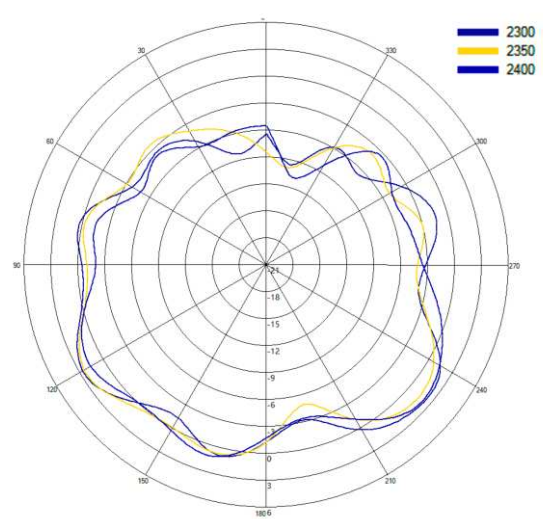
GPSD[X]4-7-49[X]

3D Pattern Data in
Free Space Cell B

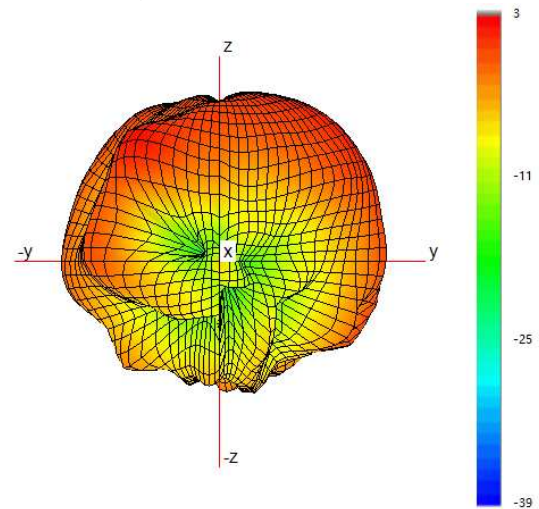
Typical 3D Pattern- Cell B - 2350 MHz



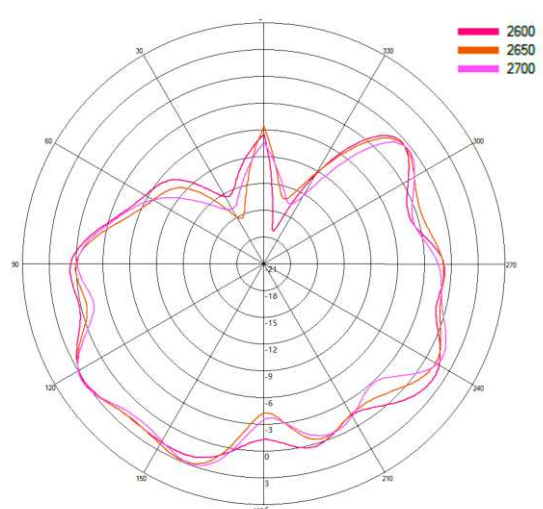
Typical H Plane- Cell B - Patterns- 2300-2400 MHz



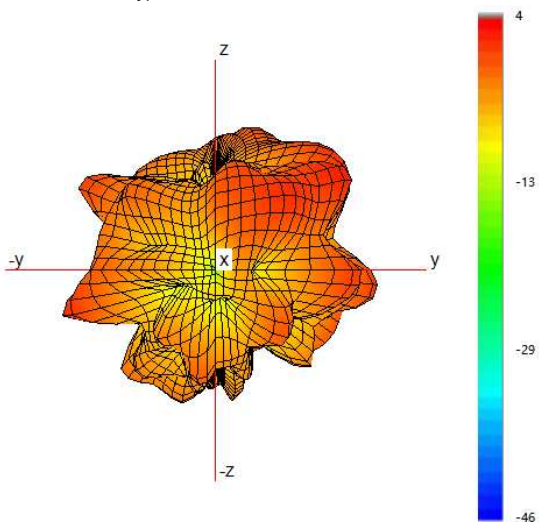
Typical 3D Pattern- Cell B - 2650 MHz



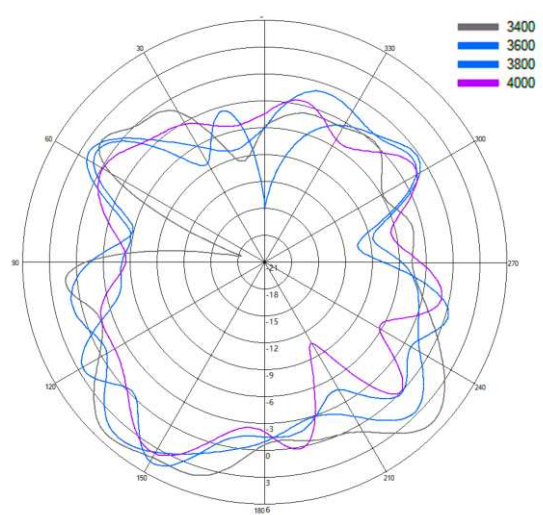
Typical H Plane- Cell B - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell B - 3600 MHz



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



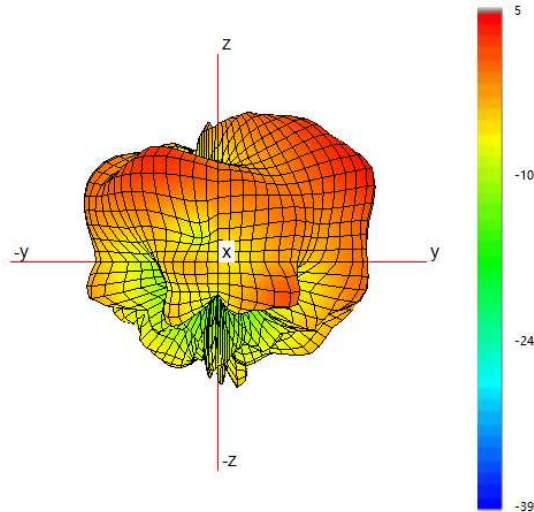
4X4 MiMo 4G/5G Reef Sharkee® Antenna

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

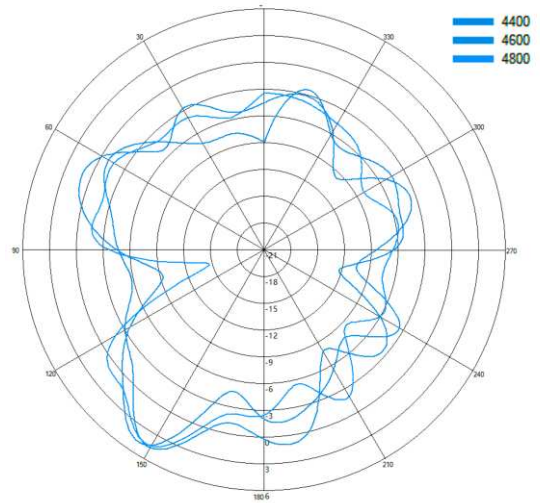
PANORAMA  ANTENNAS

3D Pattern Data in
Free Space Cell B

Typical 3D Pattern- Cell B - 4700 MHz



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



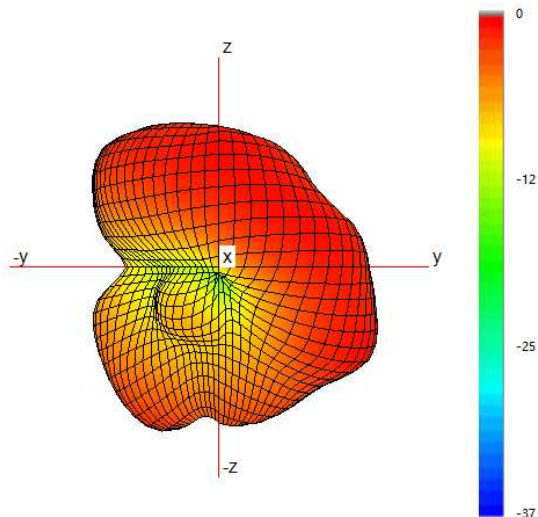
4X4 MiMo 4G/5G Reef Sharkee® Antenna

PANORAMA ANTENNAS

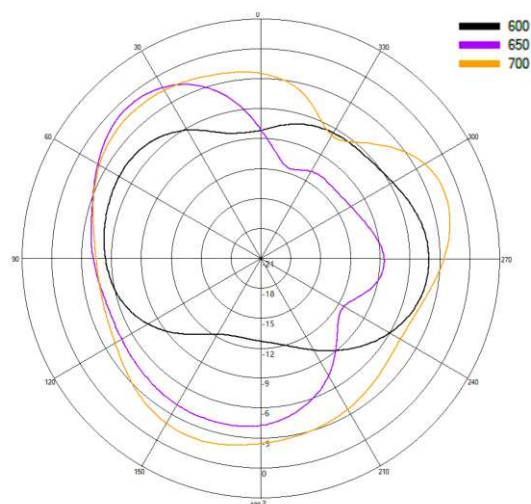
GPSD[X]4-7-49[X]

3D Pattern Data in
Free Space Cell C

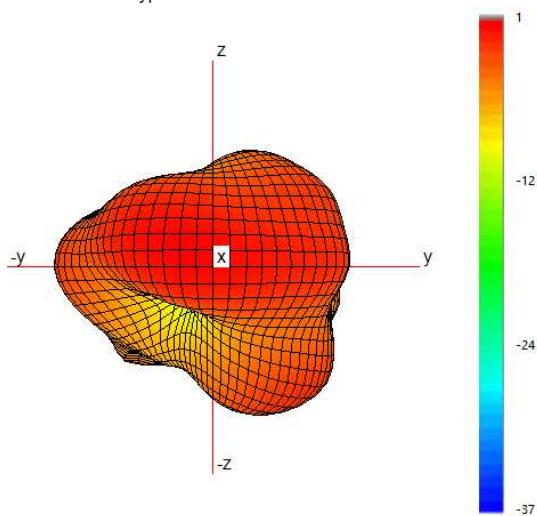
Typical 3D Pattern- Cell C - 650 MHz



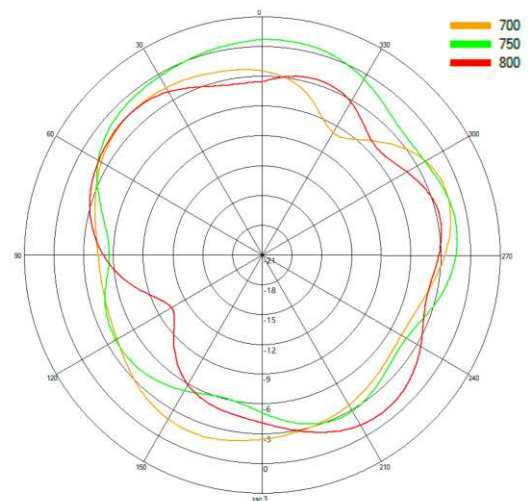
Typical H Plane- Cell C - Patterns- 600-700MHz



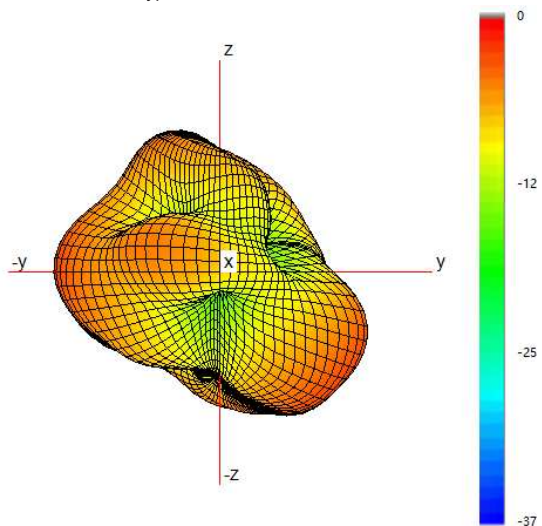
Typical 3D Pattern- Cell C - 750 MHz



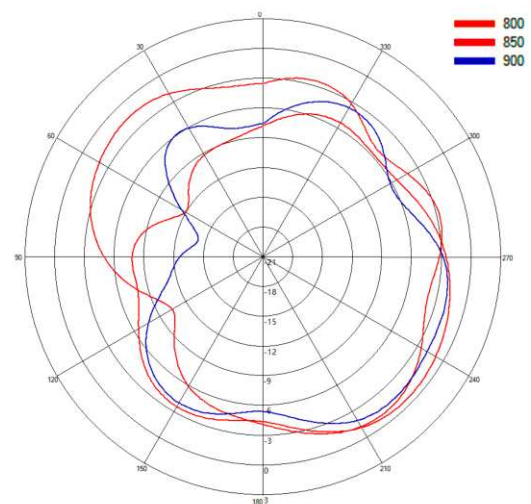
Typical H Plane- Cell C - Patterns- 700-800MHz



Typical 3D Pattern- Cell C - 850 MHz



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



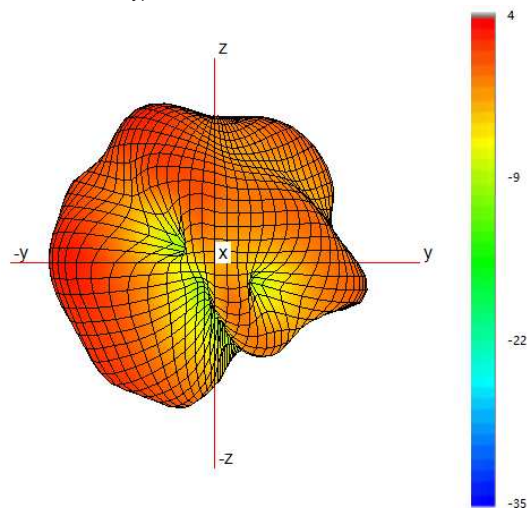
4X4 MiMo 4G/5G Reef Sharkee® Antenna

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

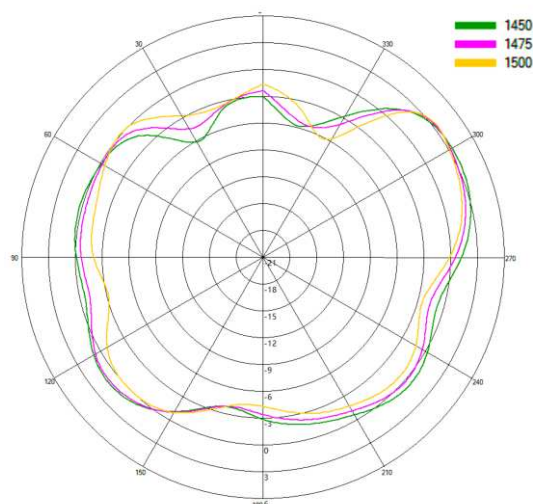
PANORAMA ANTENNAS

3D Pattern Data in
Free Space Cell C

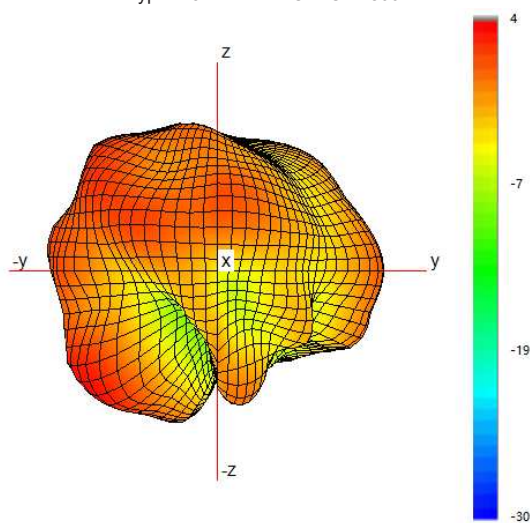
Typical 3D Pattern- Cell C - 1475 MHz



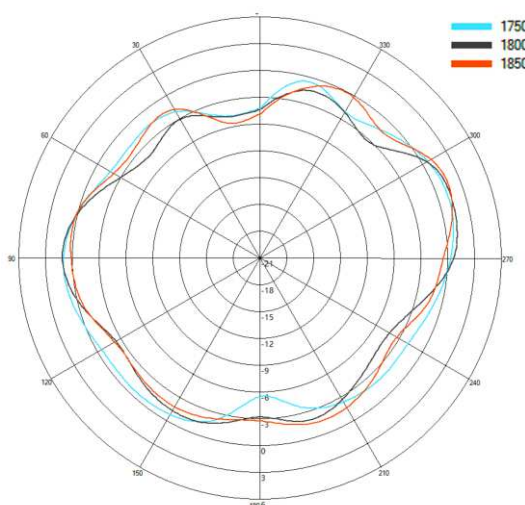
Typical H Plane- Cell C - Patterns- 1450-1500 MHz



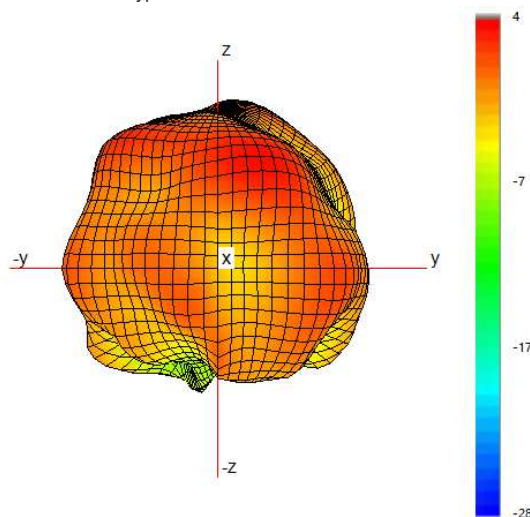
Typical 3D Pattern- Cell C - 1800 MHz



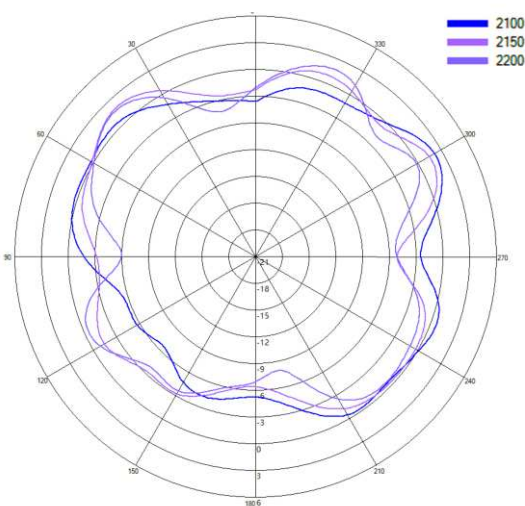
Typical H Plane- Cell C - Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell C - 2150 MHz



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



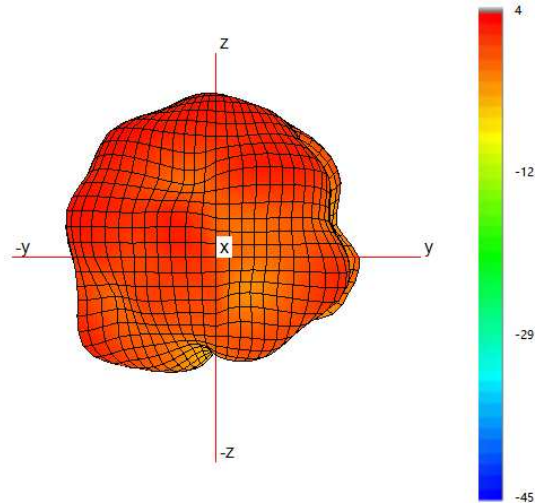
4X4 MiMo 4G/5G Reef Sharkee® Antenna

PANORAMA ANTENNAS

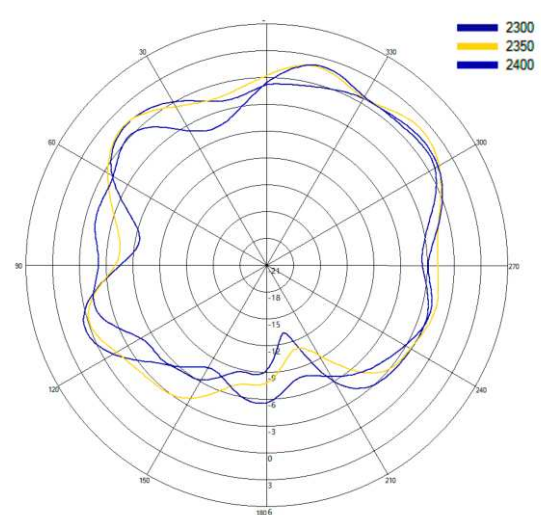
GPSD[X]4-7-49[X]

3D Pattern Data in
Free Space Cell C

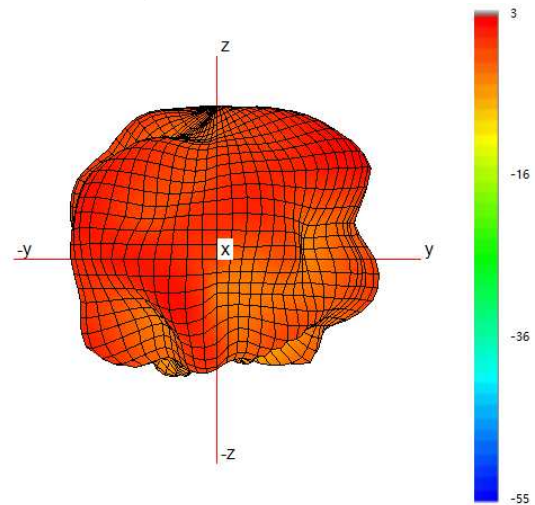
Typical 3D Pattern- Cell C - 2350 MHz



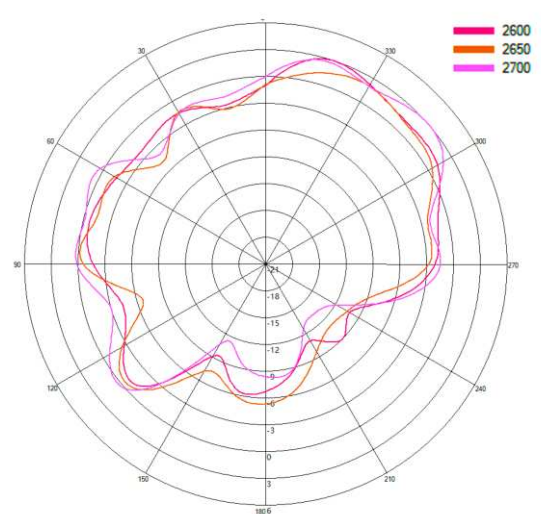
Typical H Plane- Cell C - Patterns- 2300-2400 MHz



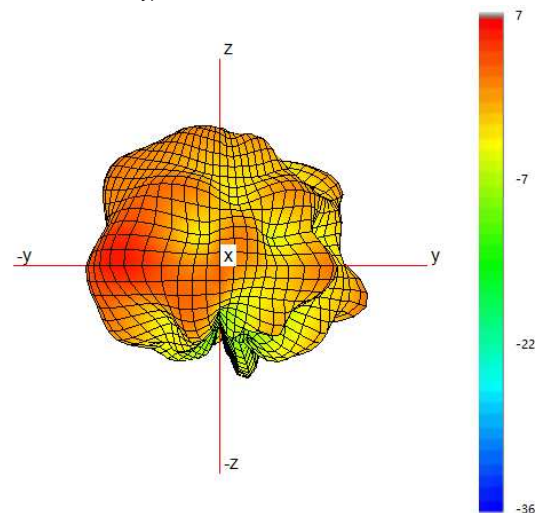
Typical 3D Pattern- Cell C - 2650 MHz



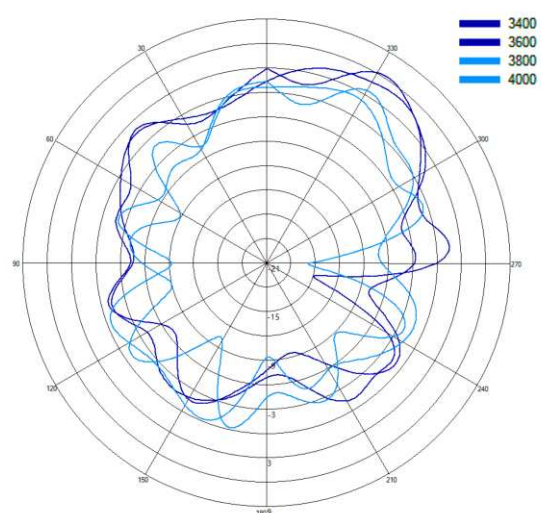
Typical H Plane- Cell C - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell C - 3600 MHz



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



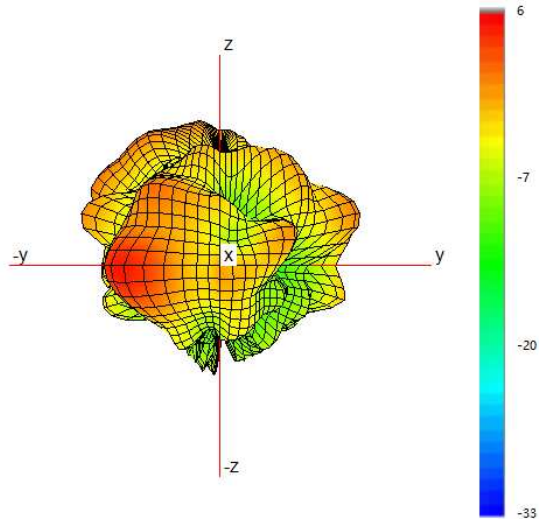
4X4 MiMo 4G/5G Reef Sharkee® Antenna

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

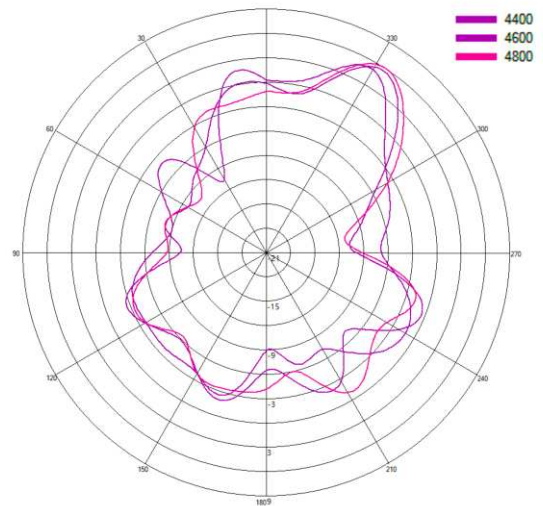
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3D Pattern Data in
Free Space Cell C

Typical 3D Pattern- Cell C - 4700 MHz



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



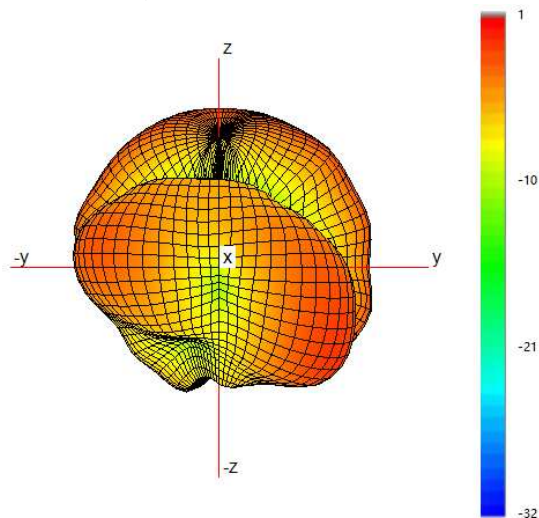
4X4 MiMo 4G/5G Reef Sharkee® Antenna

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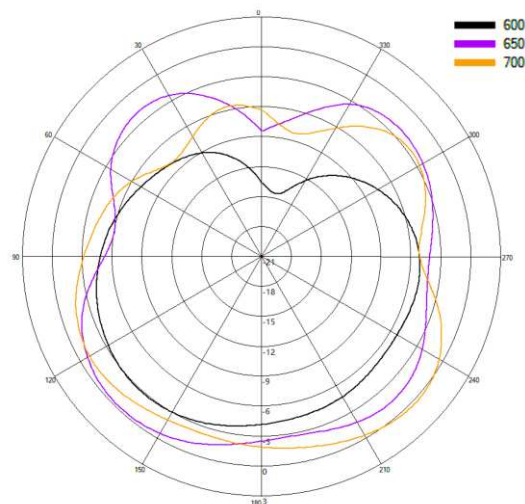
GPSD[X]4-7-49[X]

3D Pattern Data in
Free Space Cell D

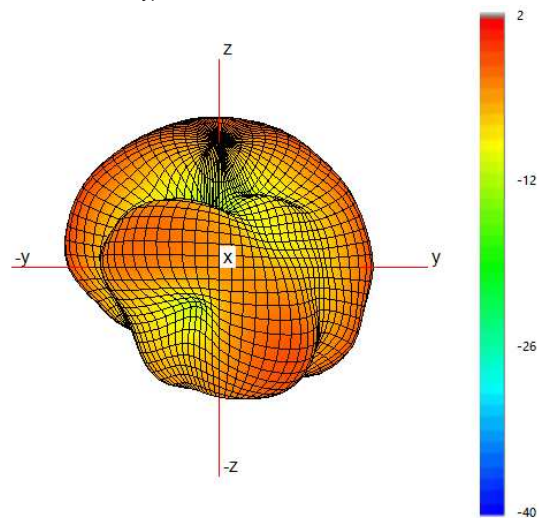
Typical 3D Pattern- Cell D - 650 MHz



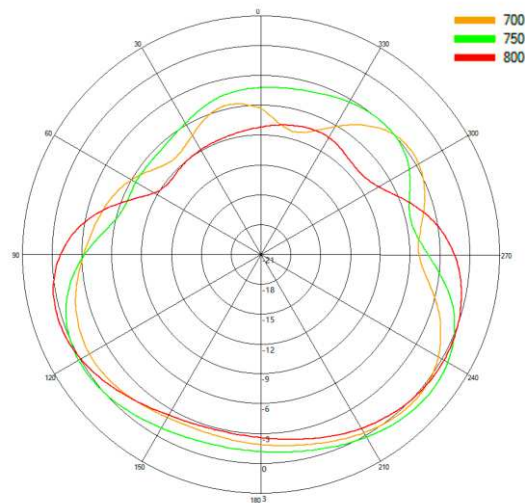
Typical H Plane- Cell D - Patterns- 600-700MHz



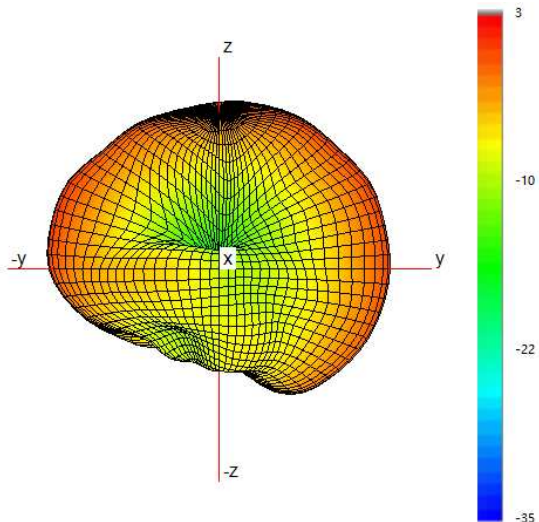
Typical 3D Pattern- Cell D - 750 MHz



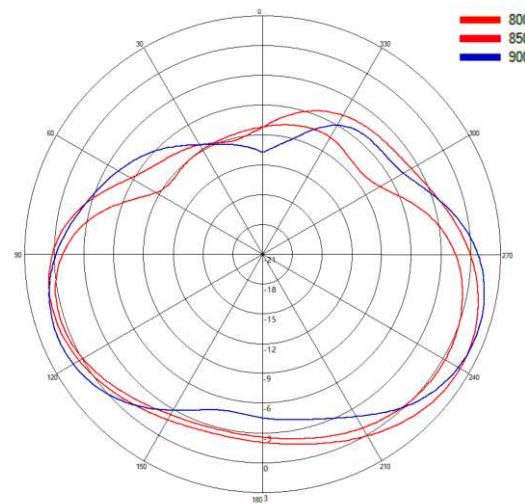
Typical H Plane- Cell D - Patterns- 700-800MHz



Typical 3D Pattern- Cell D - 850 MHz



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



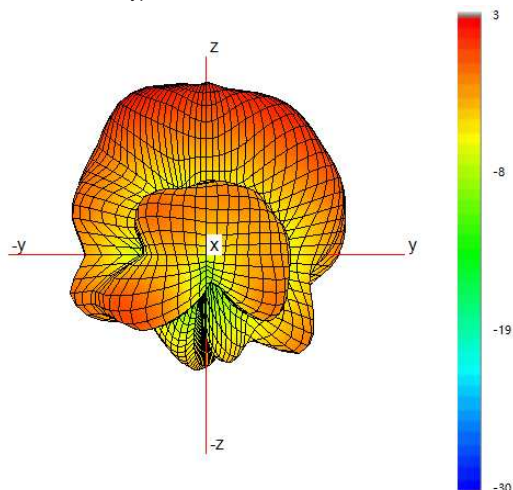
4X4 MiMo 4G/5G Reef Sharkee® Antenna

GPSPD[X]4-7-49[X]

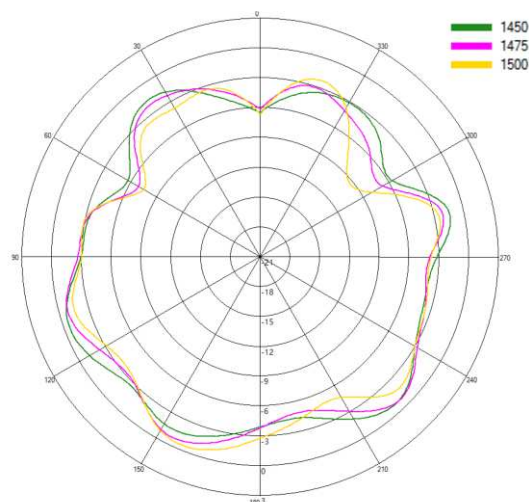
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3D Pattern Data in
Free Space Cell D

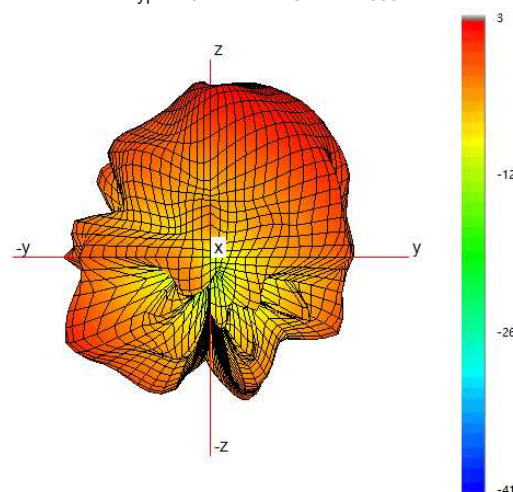
Typical 3D Pattern- Cell D - 1475 MHz



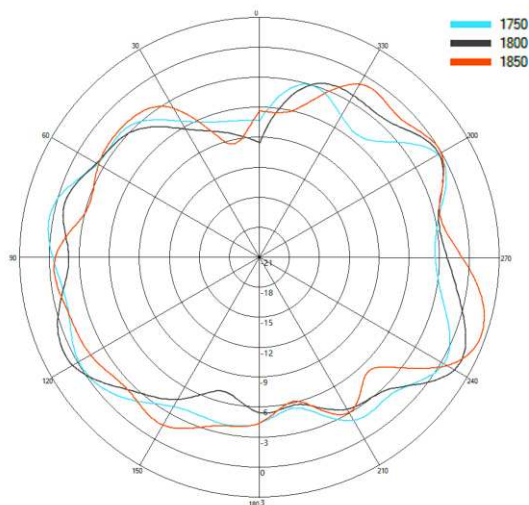
Typical H Plane- Cell D - Patterns- 1450-1500 MHz



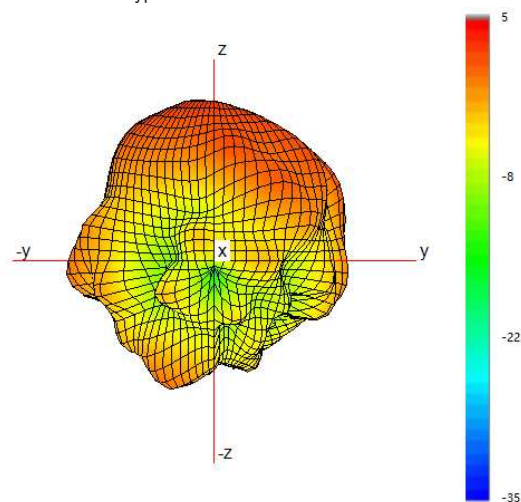
Typical 3D Pattern- Cell D - 1800 MHz



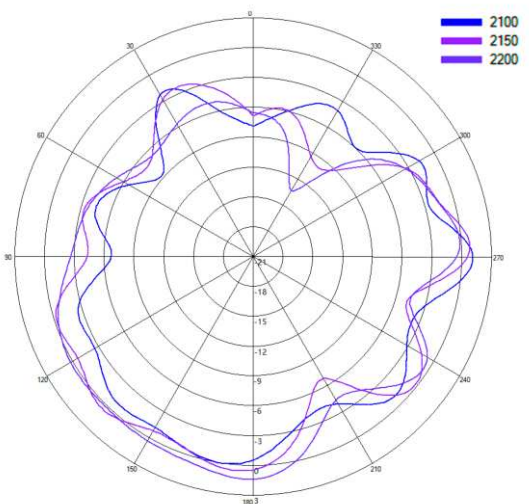
Typical H Plane- Cell D - Patterns- 1750-1850 MHz



Typical 3D Pattern- Cell D - 2150 MHz



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



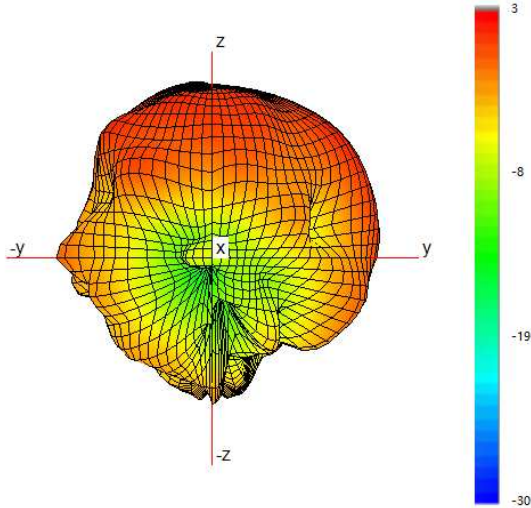
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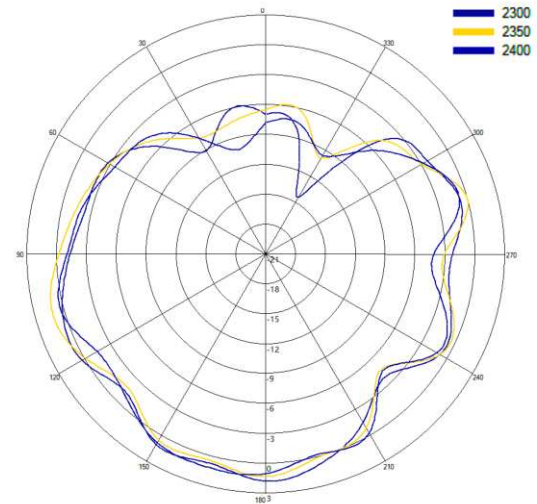
GPSD[X]4-7-49[X]

3D Pattern Data in
Free Space Cell D

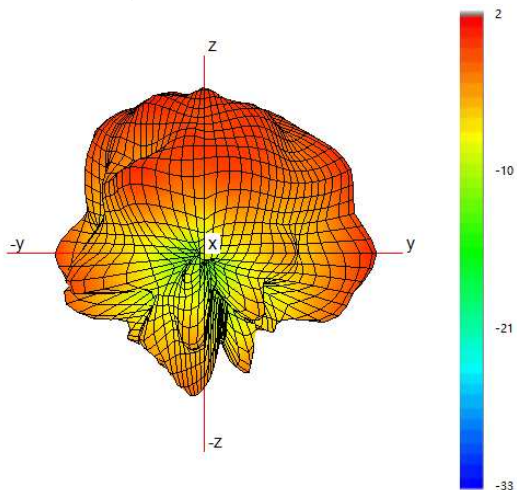
Typical 3D Pattern- Cell D - 2350 MHz



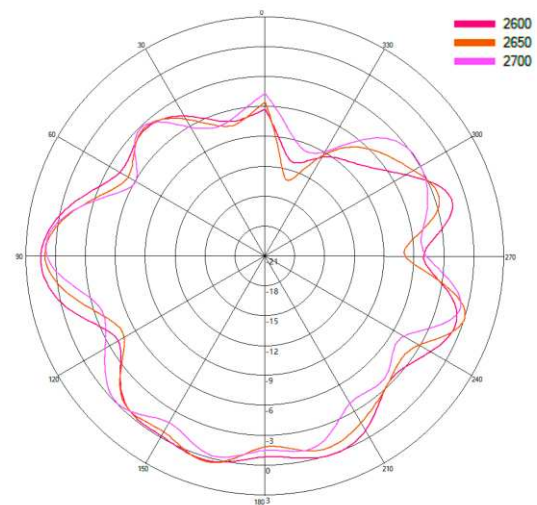
Typical H Plane- Cell D - Patterns- 2300-2400 MHz



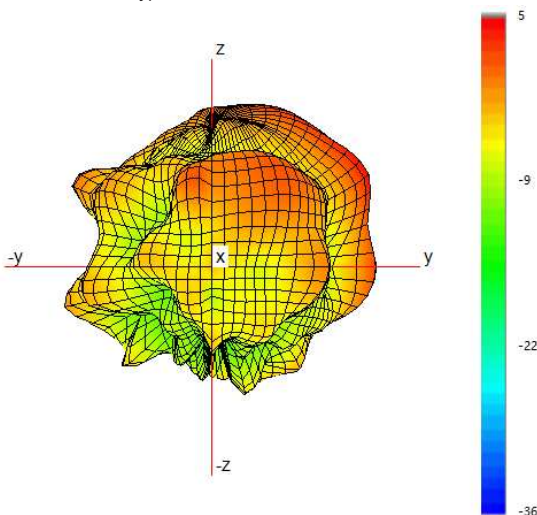
Typical 3D Pattern- Cell D - 2650 MHz



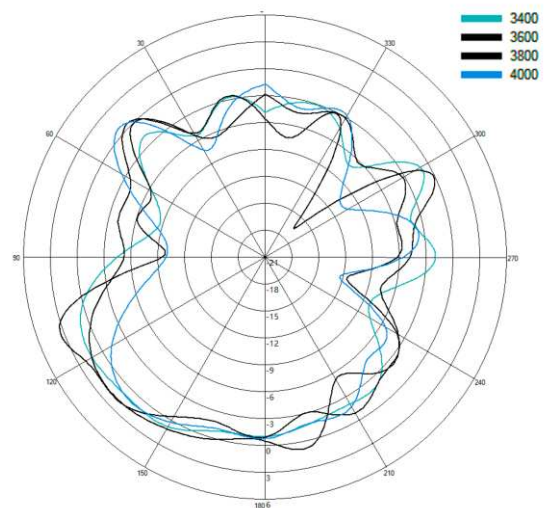
Typical H Plane- Cell D - Patterns- 2600-2700 MHz



Typical 3D Pattern- Cell D - 3600 MHz



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



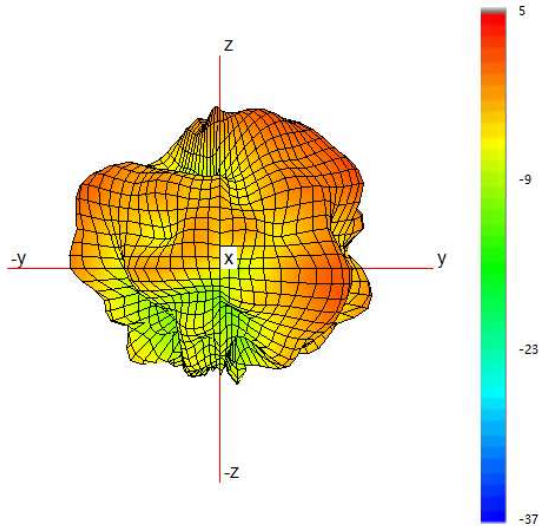
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GPSD[X]4-7-49[X]

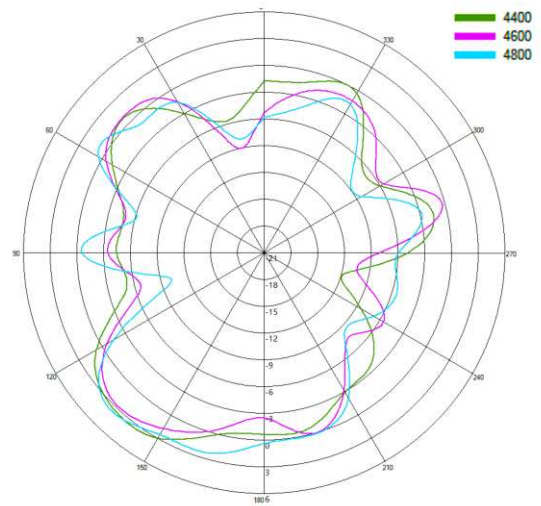
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3D Pattern Data in
Free Space Cell D

Typical 3D Pattern- Cell D - 4700 MHz



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



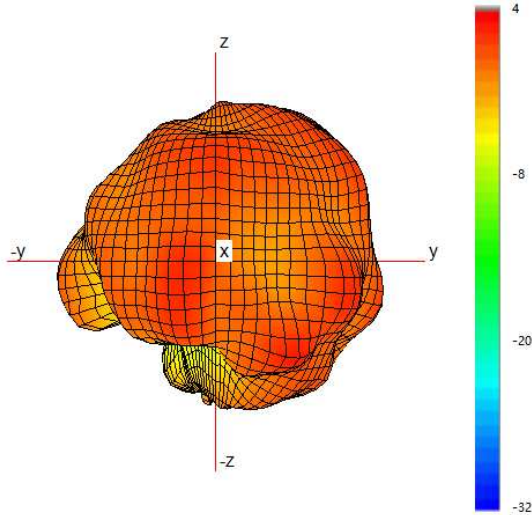
4X4 MiMo 4G/5G Reef Sharkee® Antenna

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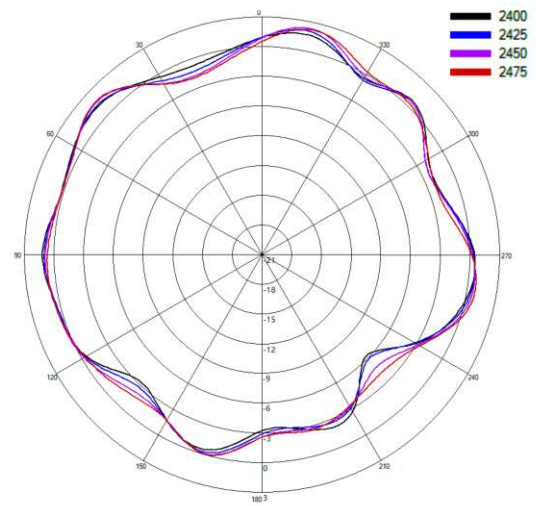
GPSD[X]4-7-49[X]

WiFi Pattern-Data in
Free Space -WiFi -1

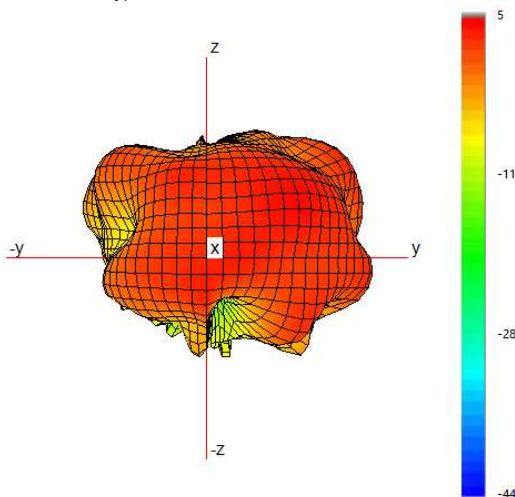
Typical 3D Pattern- WiFi - 1 - 2450 MHz



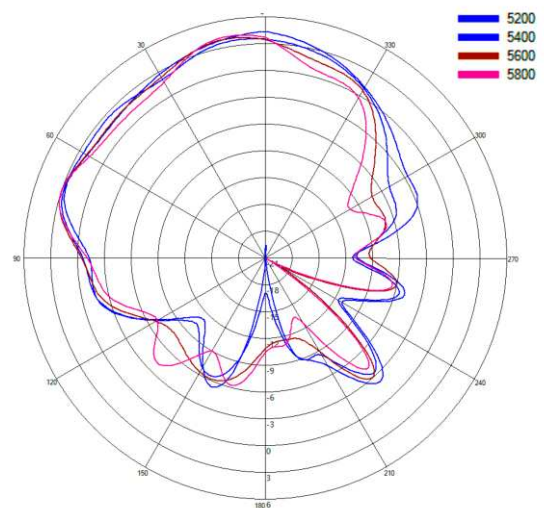
Typical H Plane- WiFi - 1 - Patterns- 2400-2475MHz



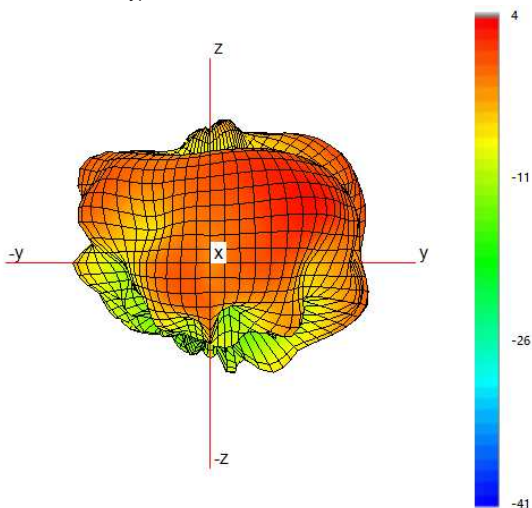
Typical 3D Pattern- WiFi - 1 - 5500 MHz



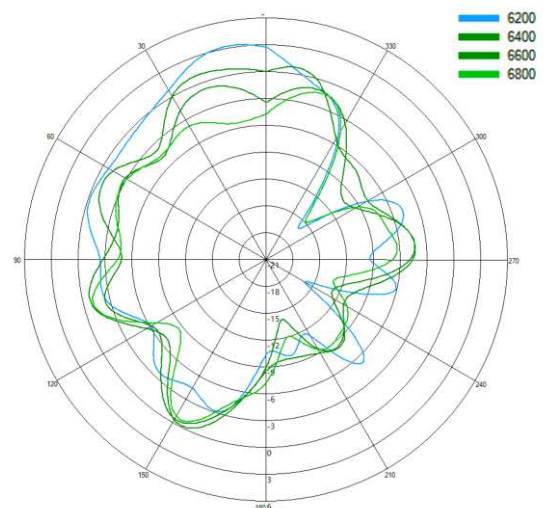
Typical H Plane- WiFi - 1 - Patterns- 5200-5800MHz



Typical 3D Pattern- WiFi - 1 - 6500 MHz



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



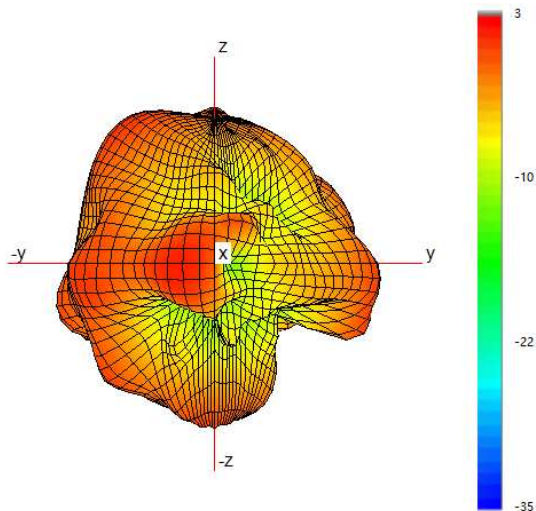
4X4 MiMo 4G/5G Reef Sharkee® Antenna

GPSP[X]4-7-49[X]

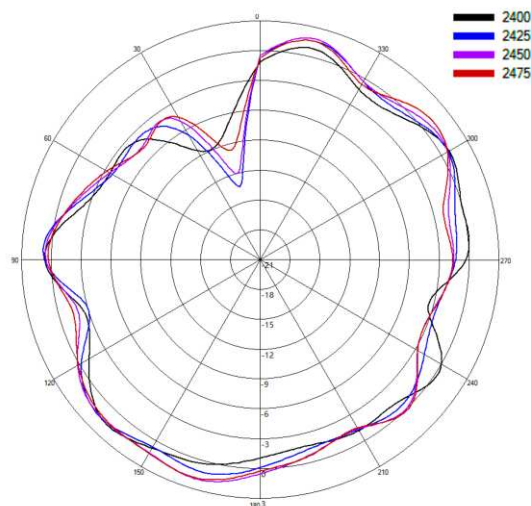
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WiFi Pattern-Data in
Free Space -WiFi -2

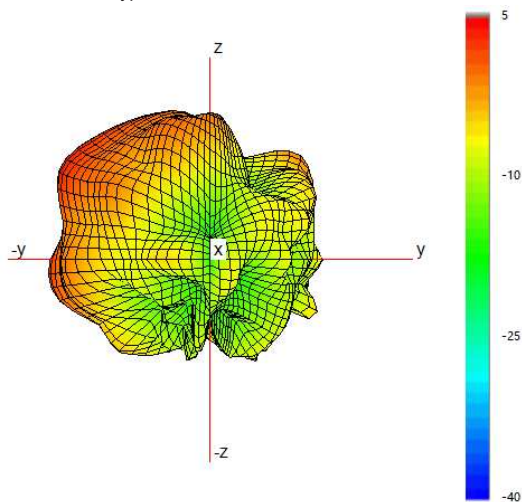
Typical 3D Pattern- WiFi - 2 - 2450 MHz



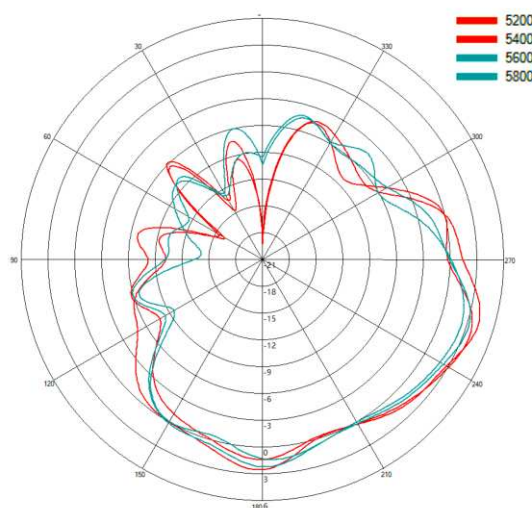
Typical H Plane- WiFi - 2 - Patterns- 2400-2475MHz



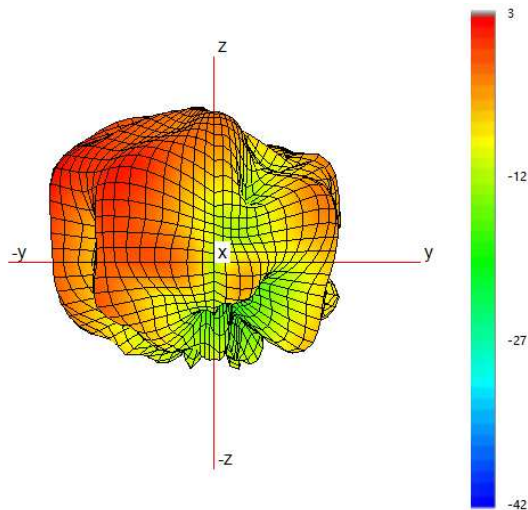
Typical 3D Pattern- WiFi - 2 - 5500 MHz



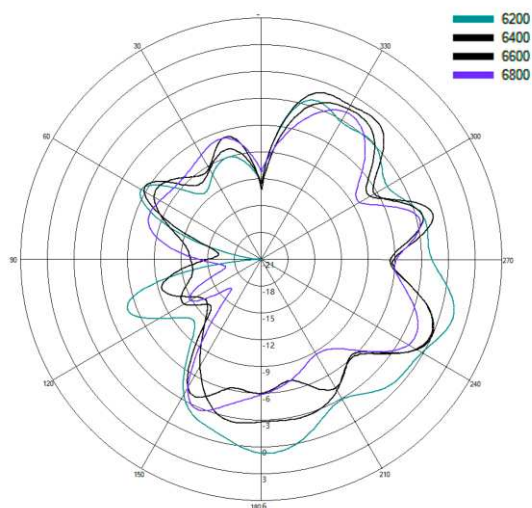
Typical H Plane- WiFi - 2 - Patterns- 5200-5800MHz



Typical 3D Pattern- WiFi - 2 - 6500 MHz



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



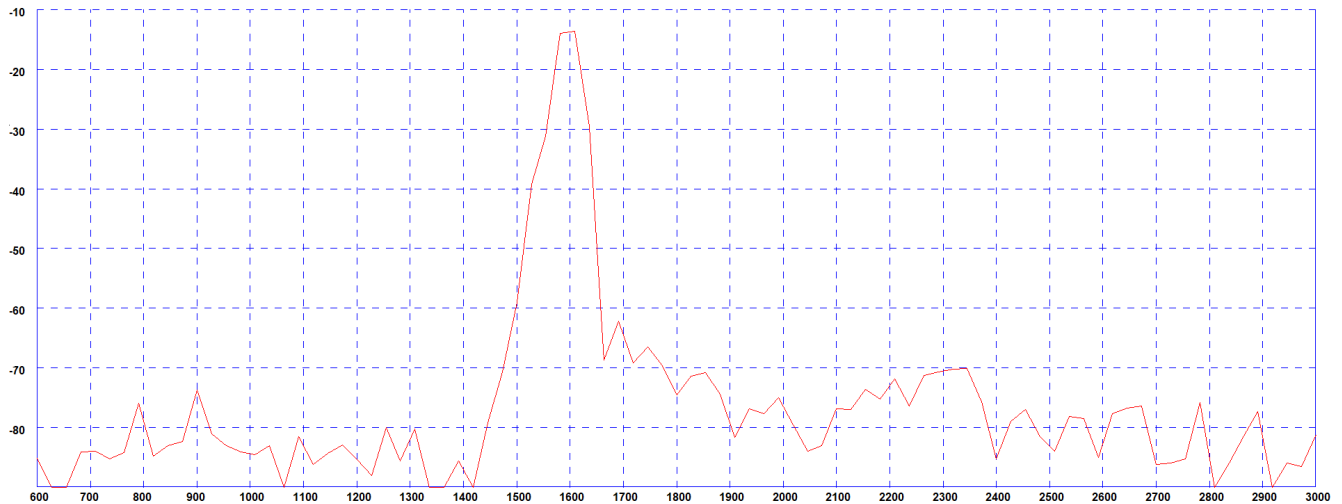
4X4 MiMo 4G/5G Reef Sharkee® Antenna

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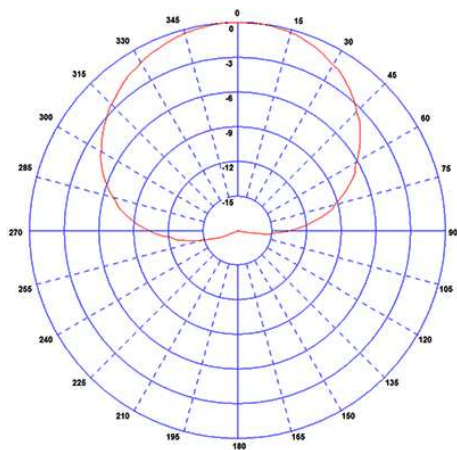
GPSD[X]4-7-49[X]

Electrical Data- L1
GPS/GNSS

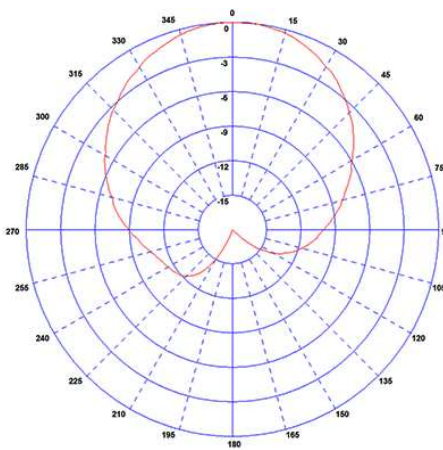
Swept Gain GPS/GNSS



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

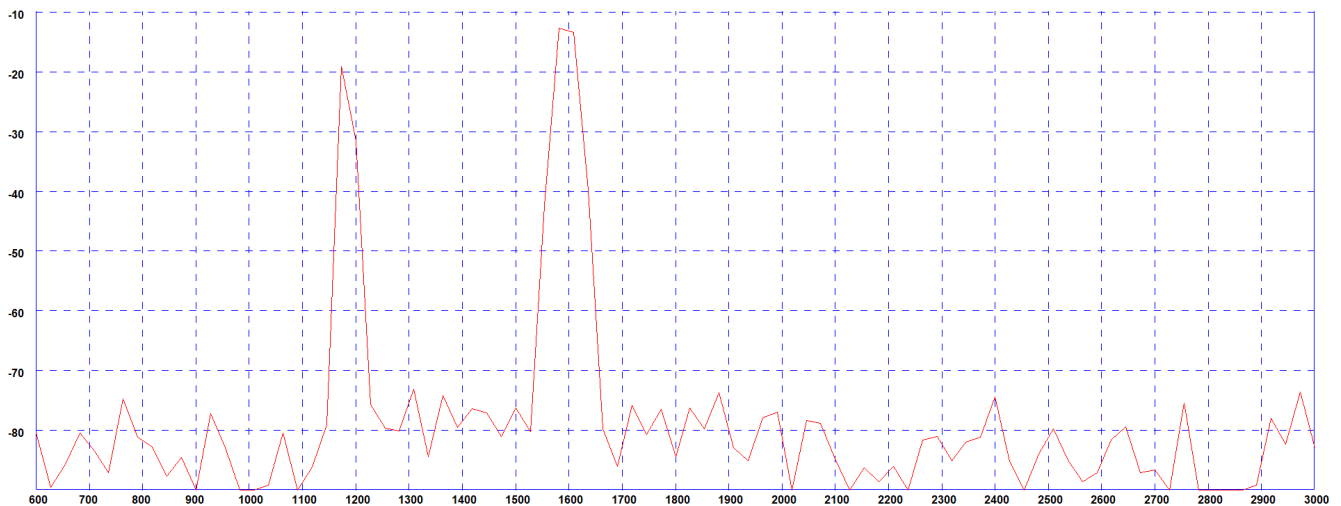
4X4 MiMo 4G/5G Reef Sharkee® Antenna

GPSP[X]4-7-49[X]

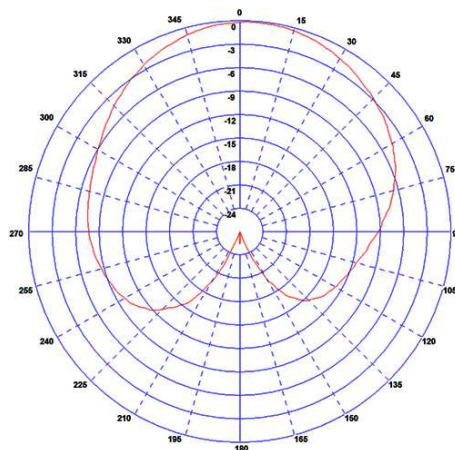
PANORAMA ANTENNAS

Electrical Data- L1/L5
GPS/GNSS

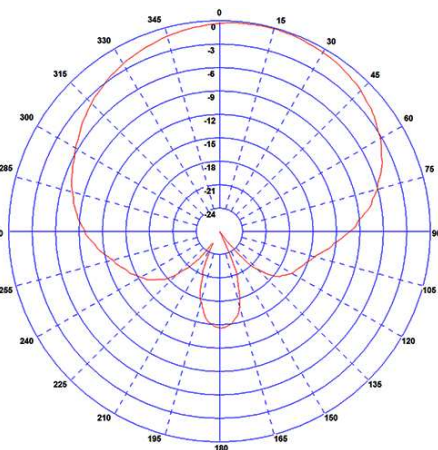
Swept Gain GPS/GNSS



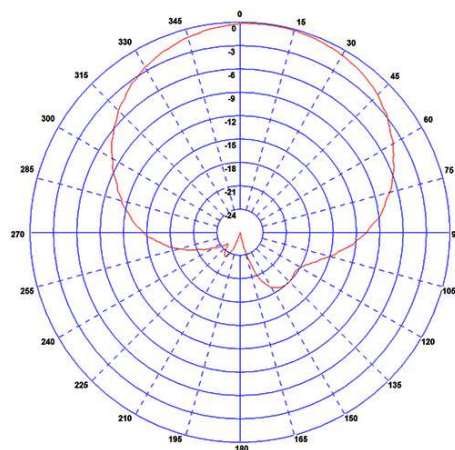
Typical E Plane Pattern - GPS/GNSS 1575 MHz



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