

# 加利电子（无锡）有限公司

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## 零件承认书

### SPECIFICATION FOR APPROVAL

**Antenna Type: PIFA Antenna**

**P/N of Galtronics**

**P/N of Sercomm**

02102140-04643-1

6172105MGN

02102140-04643-2

6172105NGN

02102140-04643-3

6172105RGN

<u>APPROVED BY</u>	<u>SIGNATURE</u>	<u>DATE</u>
Engineering Department Manager		2011.6.1
Mechanical Engineer	Joyce	2011.6.1
RF Engineer	Jessie	2011.6.1
Customer Approval		

## **Preliminary Design Specification**

### **Dual-Band Compact Balanced Antennas**

**For**

**Cisco WAP321 Access Point**

**Galtronics P/Ns:**

**021020140-04643-1**

**021020140-04643-2**

**021020140-04643-3**

**Sercomm P/Ns:**

**6172105MGN**

**6172105NGN**

**6172105RGN**

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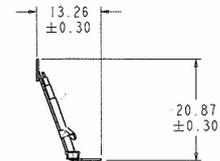
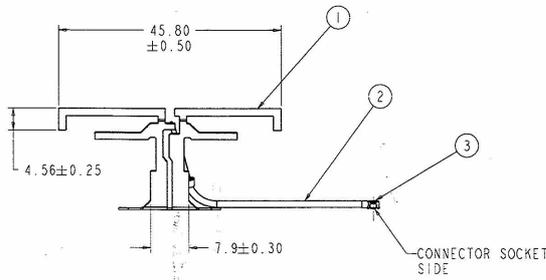
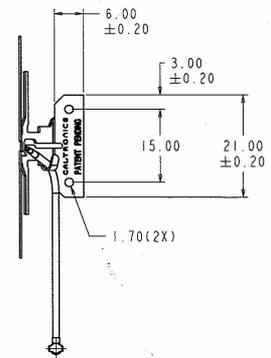
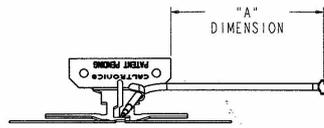
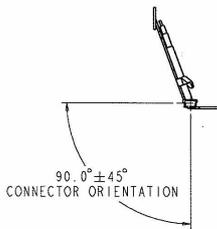
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02102140-04643-X

ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED. DO NOT SCALE - IF IN DOUBT, ASK

THIRD ANGLE PROJECTION

PART NUMBER	"A" DIMENSION	TOLERANCE	CAL. CABLE LENGTH
02102140-04643-1	227	±4	250 (REF)
02102140-04643-2	87	±3	110 (REF)
02102140-04643-3	52	±3	75 (REF)



3	CONNECTOR, COAX	UFL CONNECTOR	
2	CABLE, COAX	Ø 1.37 O.D., COLOR BLACK	
1	ELECTRICAL ELEMENT	STAINLESS STEEL THICKNESS 0.4 mm	NICKEL PLATING
NO	DESCRIPTION	MATERIAL	FIN. SH.



CALTRONICS

ENGINEER GAW  
DRAWN Joyce  
DATE 1-05-3

CHECKED

APPROVED

ANTENNA, 2.4 GHz/5 GHz

DWG. NO. 1

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## Cisco WAP321 Dual-Band Access Point Antenna Performance Report

- WAP321 Access Point requires 3 dual-band antennas that operate on unlicensed 2.45 GHz and 5 GHz bands for 3x3 MIMO antenna configuration.
- Install prototype antennas in test fixture consisting of production enclosure and unpopulated PCB. One antenna is installed in front of PCB, second antenna is installed on right side of enclosure, and third antenna is installed on left side of enclosure.
- Measure antenna performance and report results.

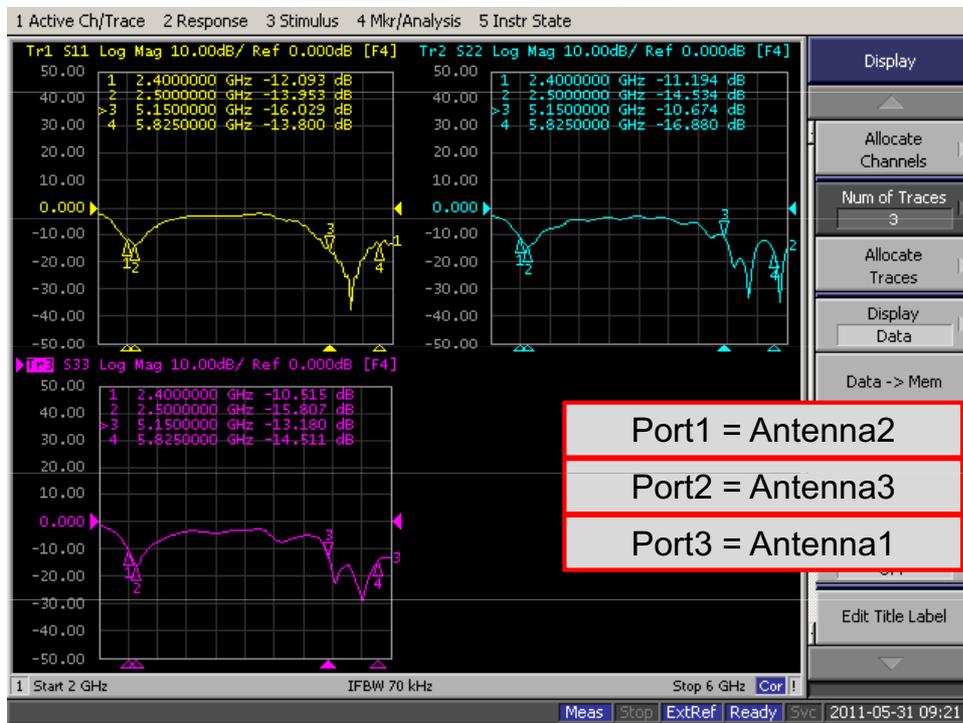


# Cisco WAP321 Dual-Band Access Point

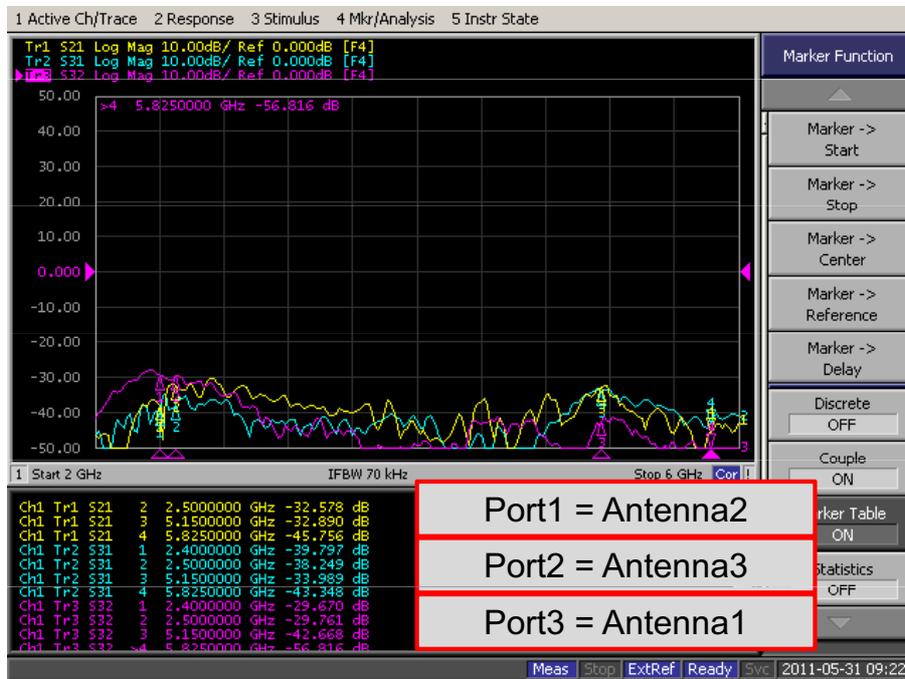


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# Antenna Return Loss



# Antenna Isolation



## Antenna Efficiency and Peak Gain

		Low Band				High Band					
		Frequency (GHz)	Directivity	Peak Gain	S11	Terminal Efficiency	Frequency (GHz)	Directivity	Peak Gain	S11	Terminal Efficiency
<b>Antenna1</b>		2.400	5.30	4.10	-12.20	75.88%	5.150	4.92	3.86	-20.46	78.35%
		2.450	5.27	4.31	-14.40	80.34%	5.250	4.88	3.99	-21.71	81.52%
		2.500	5.23	4.32	-14.64	81.09%	5.350	4.84	3.98	-17.44	81.94%
		<b>AVERAGE</b>				<b>79.10%</b>	5.725	5.20	4.29	-17.21	81.06%
							5.825	5.07	4.88	-13.68	83.89%
						<b>AVERAGE</b>					<b>81.35%</b>
<b>Antenna2</b>		2.400	4.97	3.86	-12.35	77.41%	5.150	6.12	4.97	-13.22	76.69%
		2.450	5.09	4.26	-13.73	82.65%	5.250	5.38	4.38	-14.11	79.52%
		2.500	5.36	4.67	-14.63	82.44%	5.350	5.34	4.59	-17.47	84.09%
		<b>AVERAGE</b>				<b>80.83%</b>	5.725	4.86	4.04	-13.56	82.77%
							5.825	5.23	4.50	-11.50	86.22%
						<b>AVERAGE</b>					<b>81.88%</b>
<b>Antenna3</b>		2.400	5.73	3.96	-14.57	66.54%	5.150	6.03	3.96	-10.23	62.08%
		2.450	5.30	3.75	-15.30	69.88%	5.250	6.38	4.74	-14.72	68.70%
		2.500	5.32	3.85	-15.27	71.36%	5.350	5.87	4.43	-17.14	71.81%
		<b>AVERAGE</b>				<b>69.26%</b>	5.725	4.67	2.88	-10.84	66.22%
							5.825	4.94	3.70	-16.26	75.27%
						<b>AVERAGE</b>					<b>68.82%</b>



# Azimuth Cut – Power Sum Antenna 1

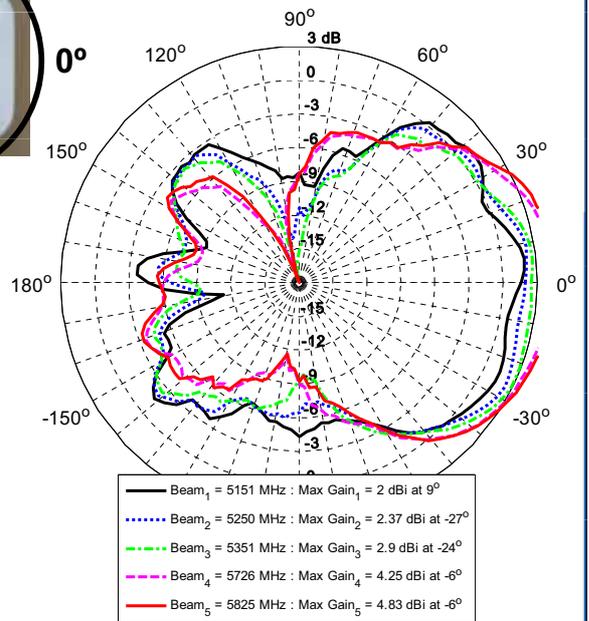
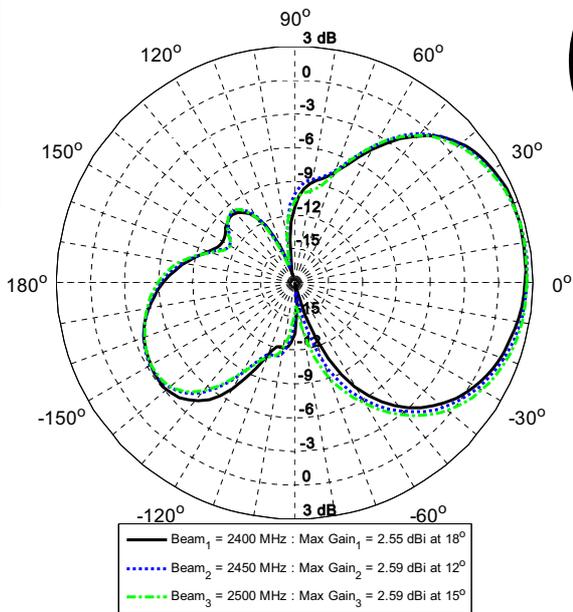
**Low Band**

**High Band**

90°

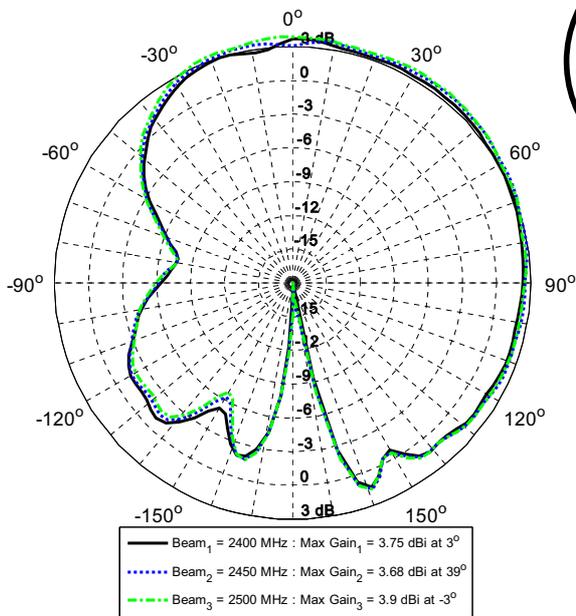


Front →



# Elevation (Front to Back) Cut – Power Sum Antenna1

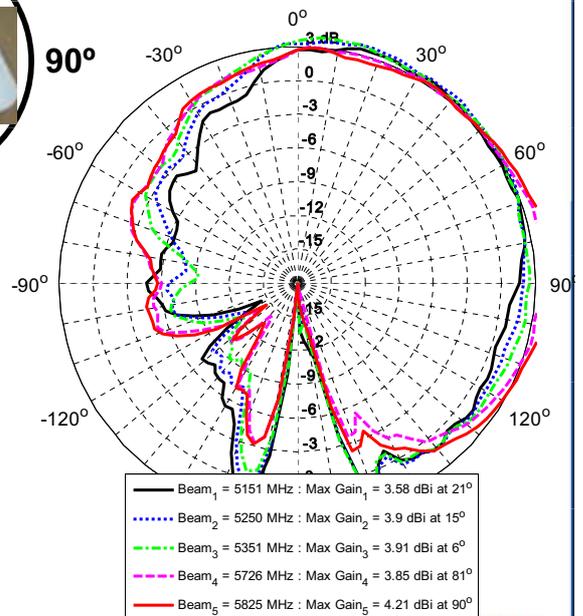
**Low Band**



0°



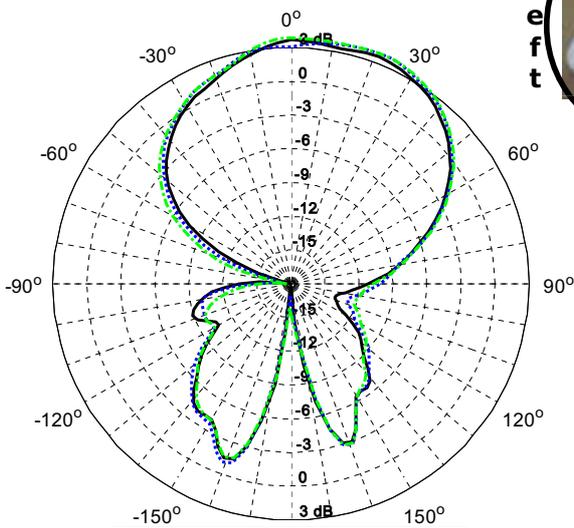
**High Band**



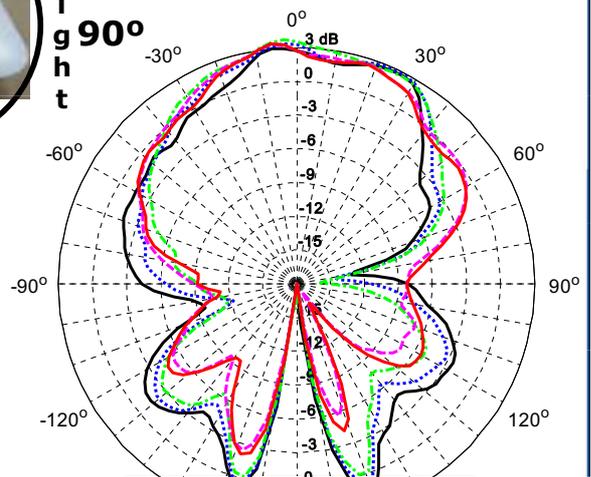
# Elevation (Side to Side) Cut – Power Sum Antenna1

**Low Band**

**High Band**

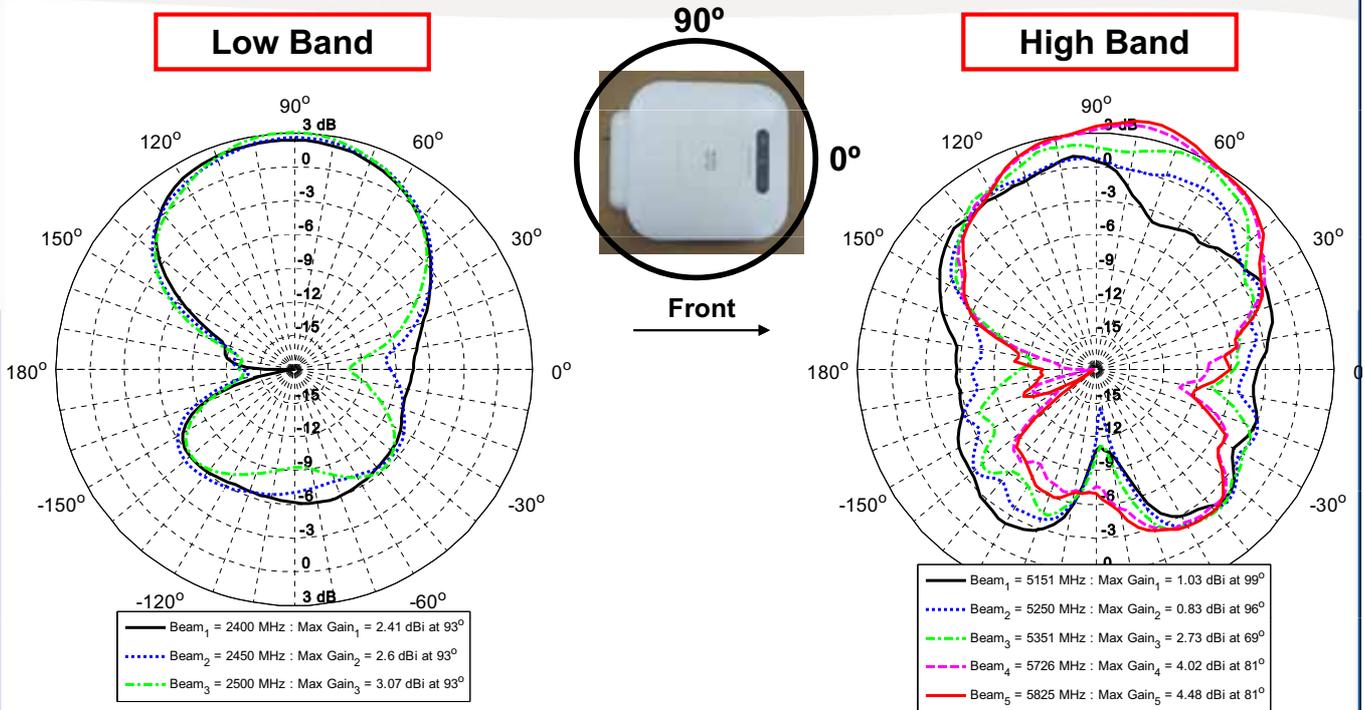


— Beam<sub>1</sub> = 2400 MHz : Max Gain<sub>1</sub> = 3.67 dBi at 0°  
 ..... Beam<sub>2</sub> = 2450 MHz : Max Gain<sub>2</sub> = 3.9 dBi at 21°  
 - - - - - Beam<sub>3</sub> = 2500 MHz : Max Gain<sub>3</sub> = 3.96 dBi at 21°

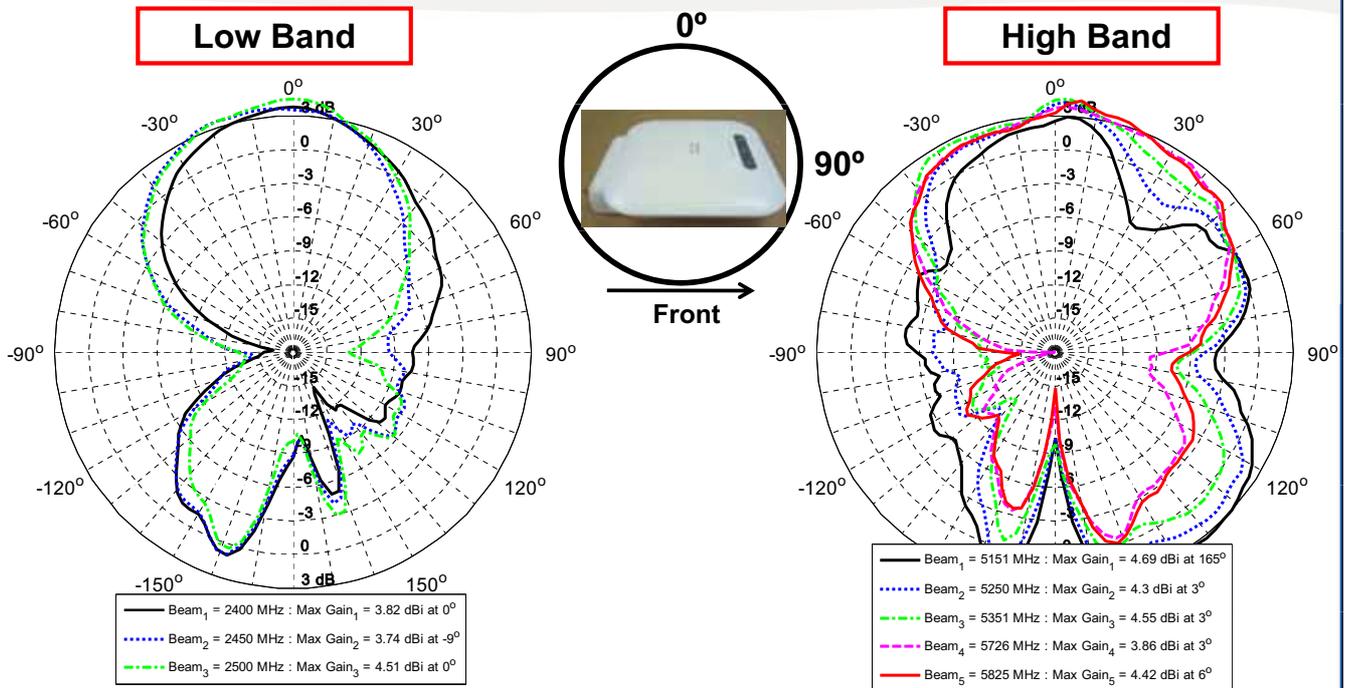


— Beam<sub>1</sub> = 5151 MHz : Max Gain<sub>1</sub> = 3.02 dBi at -6°  
 ..... Beam<sub>2</sub> = 5250 MHz : Max Gain<sub>2</sub> = 3.4 dBi at -3°  
 - - - - - Beam<sub>3</sub> = 5351 MHz : Max Gain<sub>3</sub> = 3.69 dBi at -3°  
 - · - · - Beam<sub>4</sub> = 5726 MHz : Max Gain<sub>4</sub> = 3.4 dBi at -6°  
 — Beam<sub>5</sub> = 5825 MHz : Max Gain<sub>5</sub> = 3.43 dBi at -6°

# Azimuth Cut – Power Sum Antenna2

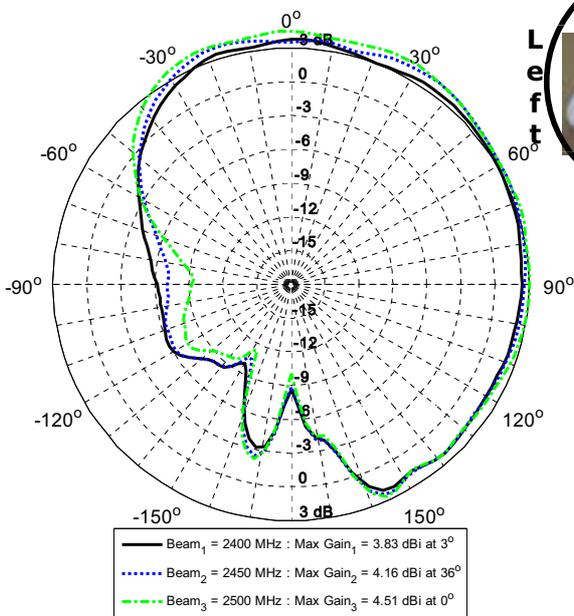


# Elevation (Front to Back) Cut – Power Sum Antenna2



# Elevation (Side to Side) Cut – Power Sum Antenna2

**Low Band**



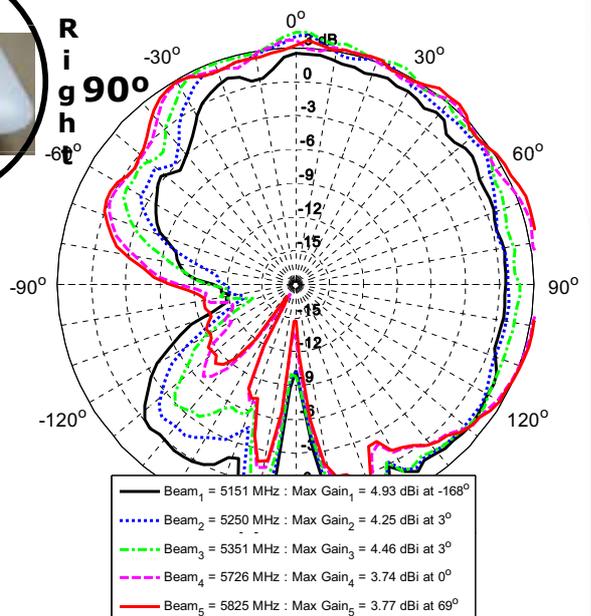
0°



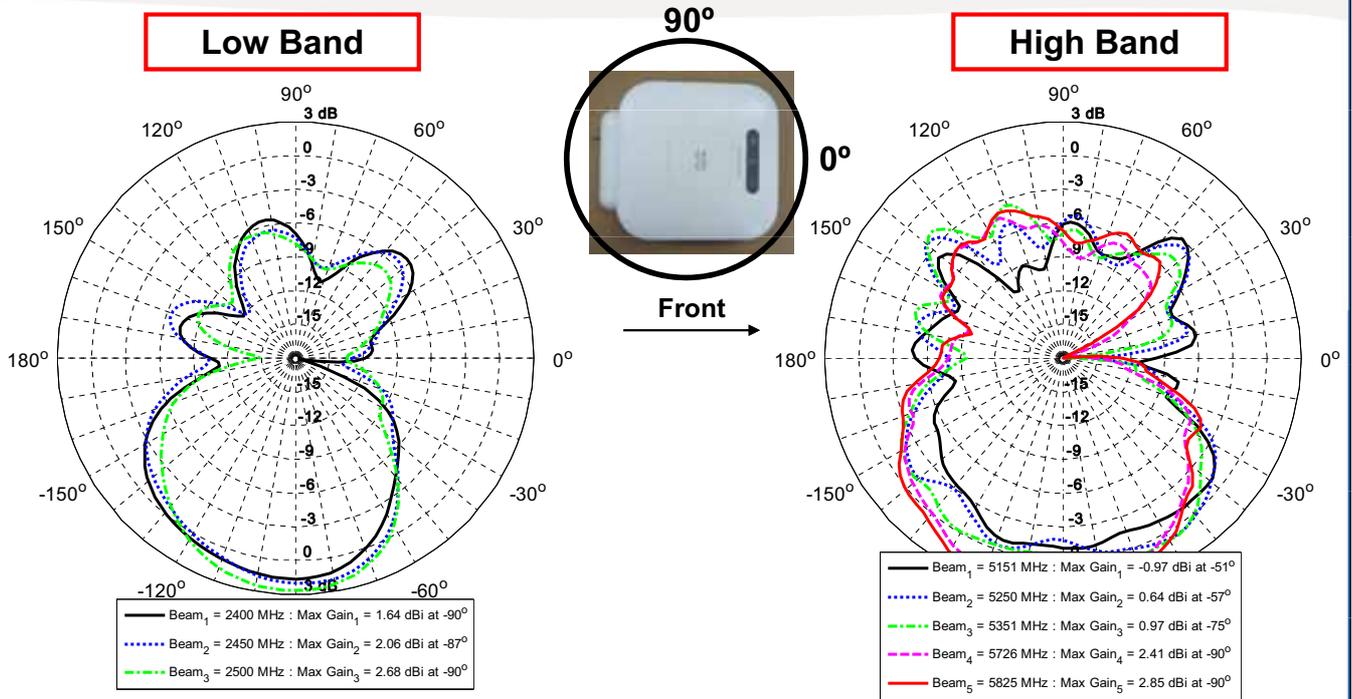
Left

Right

**High Band**

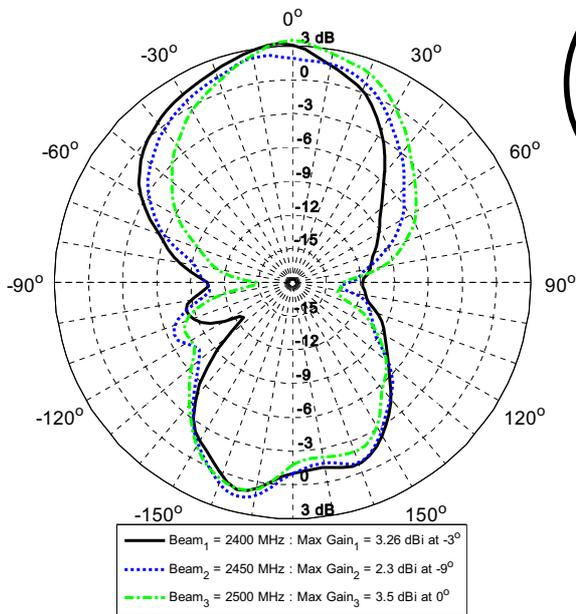


# Azimuth Cut – Power Sum Antenna3



# Elevation (Front to Back) Cut – Power Sum Antenna3

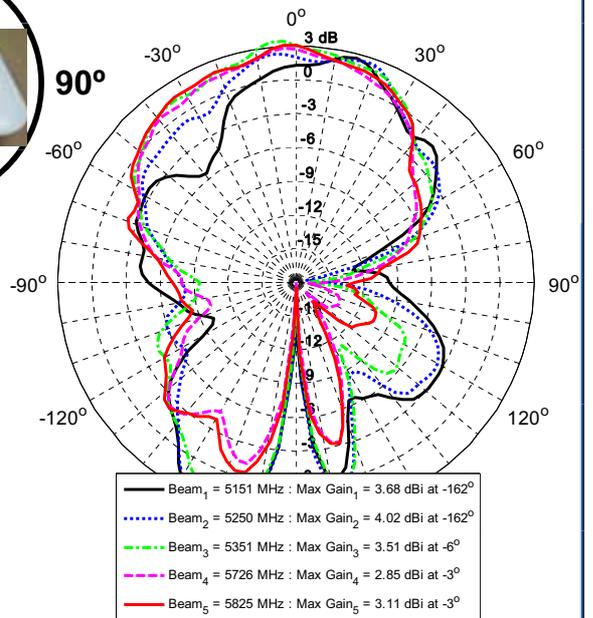
**Low Band**



0°

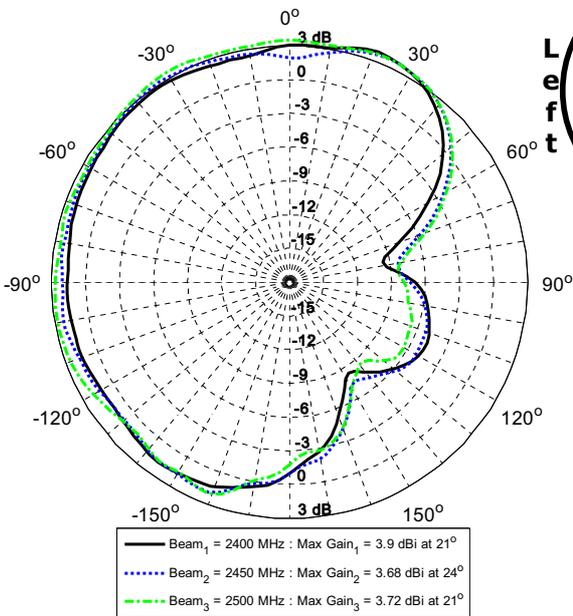


**High Band**

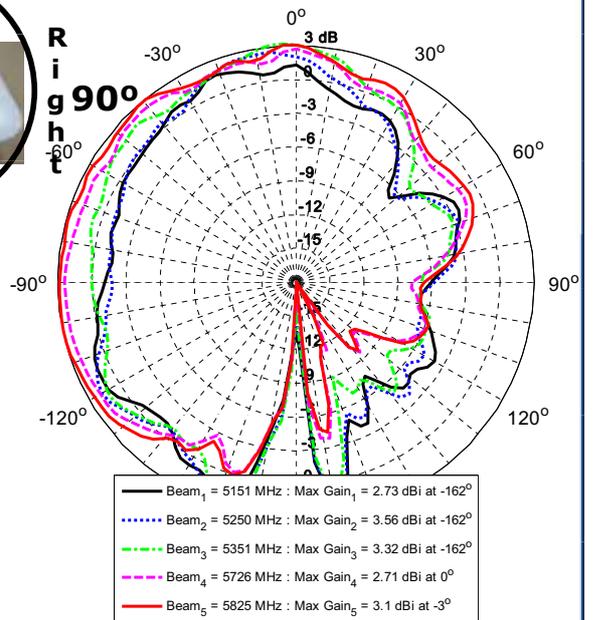


# Elevation (Side to Side) Cut – Power Sum Antenna3

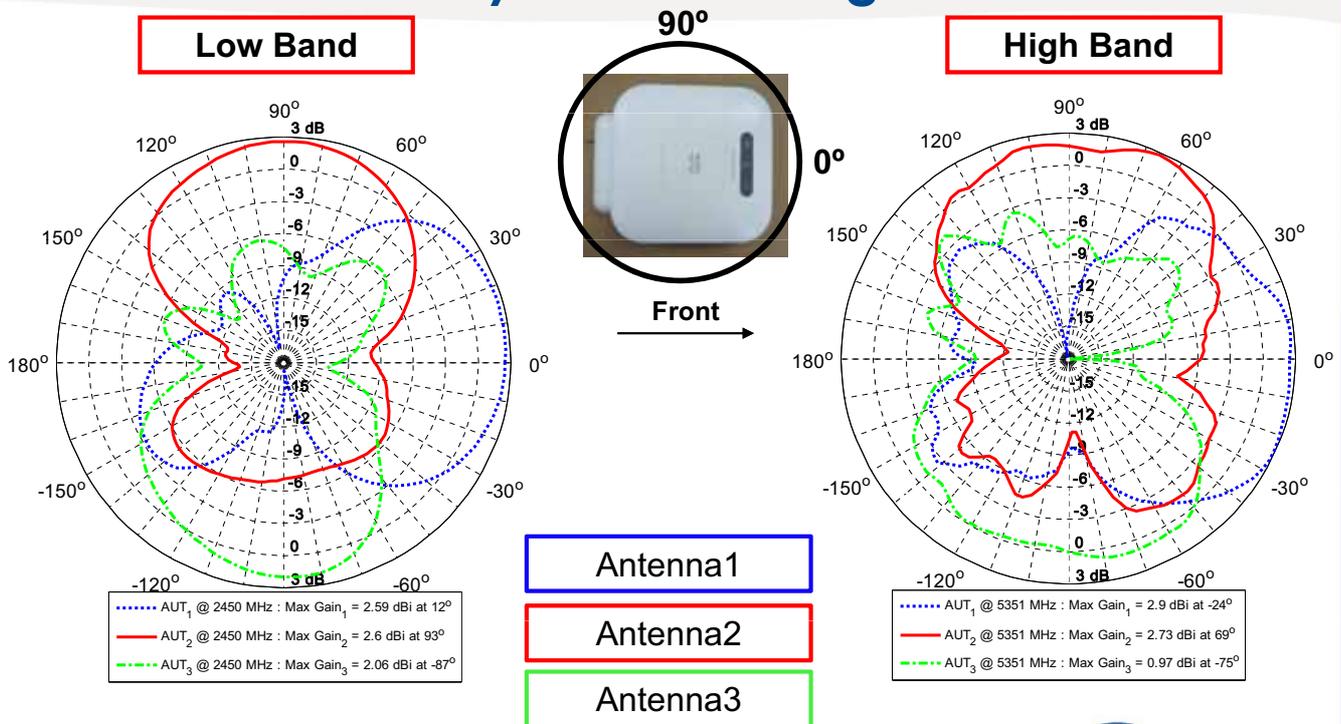
**Low Band**



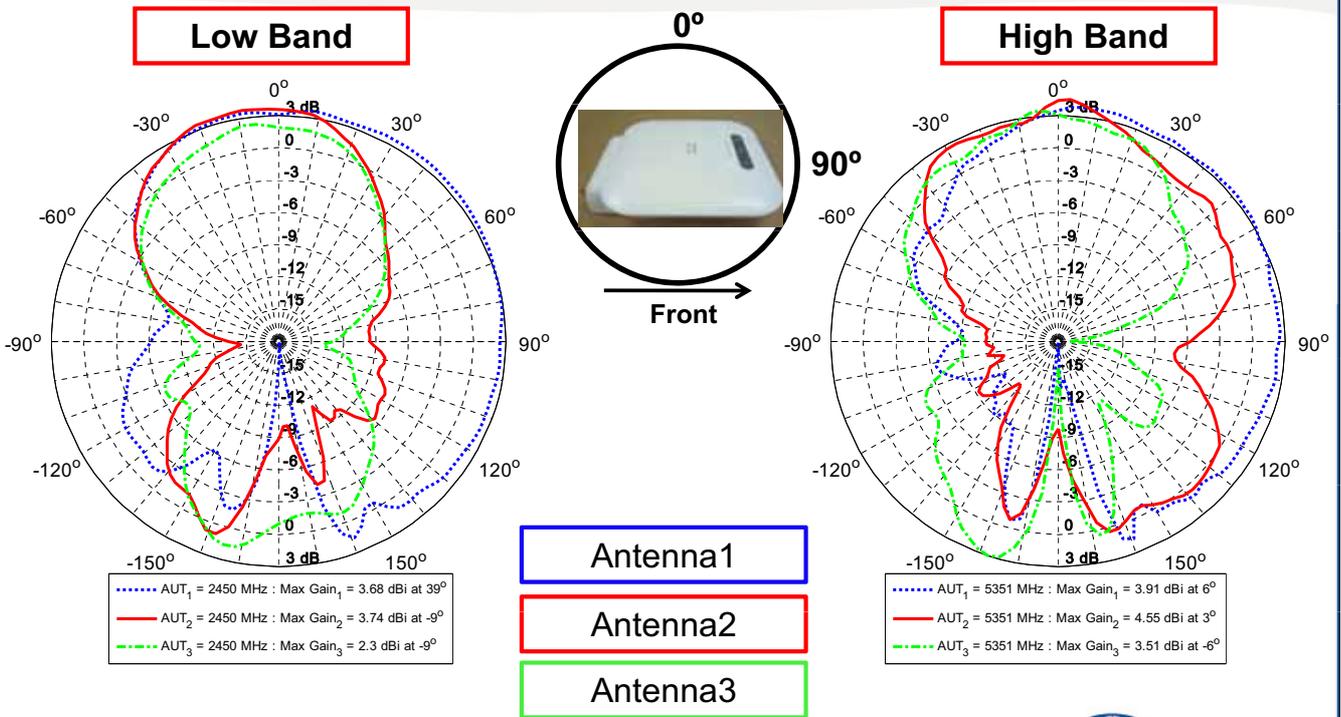
**High Band**



# Azimuth Cut – Power Sum System Coverage



# Elevation (Front to Back) Cut – Power Sum System Coverage

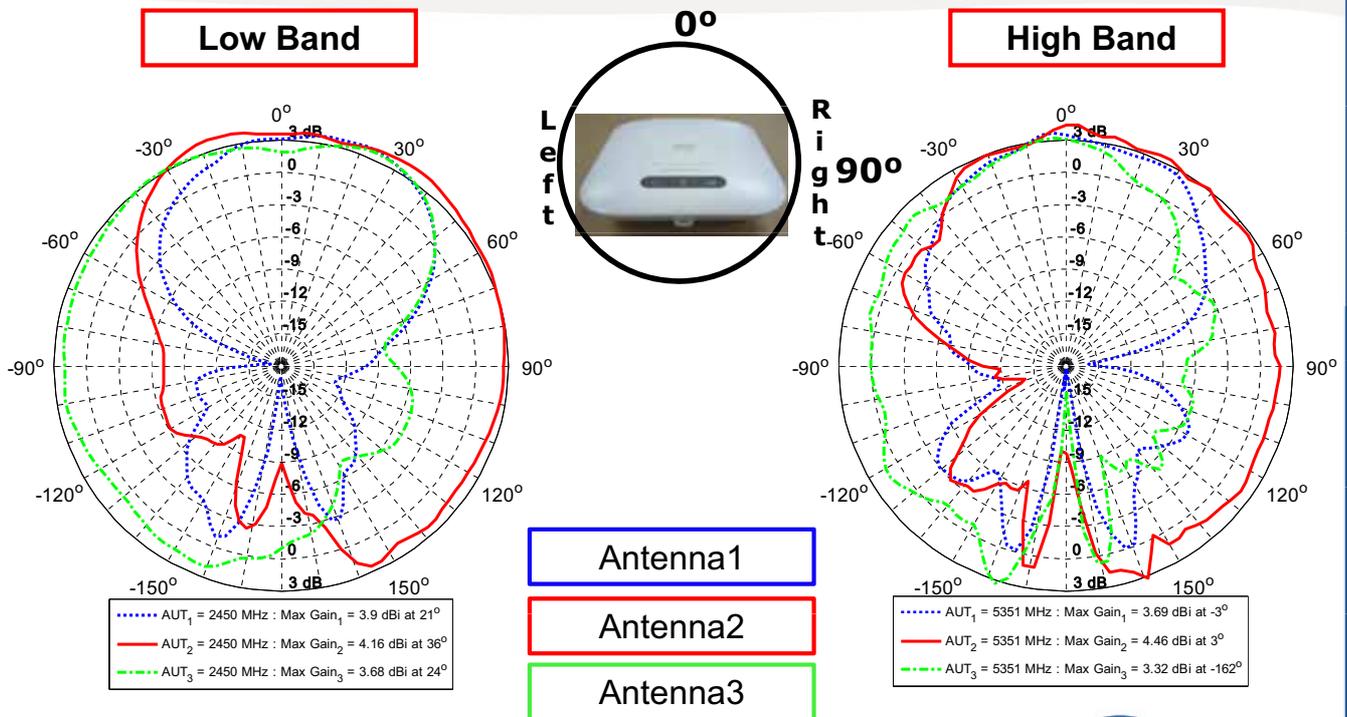


..... AUT<sub>1</sub> = 2450 MHz : Max Gain<sub>1</sub> = 3.68 dBi at 39°  
 ——— AUT<sub>2</sub> = 2450 MHz : Max Gain<sub>2</sub> = 3.74 dBi at -9°  
 - - - AUT<sub>3</sub> = 2450 MHz : Max Gain<sub>3</sub> = 2.3 dBi at -9°

..... AUT<sub>1</sub> = 5351 MHz : Max Gain<sub>1</sub> = 3.91 dBi at 6°  
 ——— AUT<sub>2</sub> = 5351 MHz : Max Gain<sub>2</sub> = 4.55 dBi at 3°  
 - - - AUT<sub>3</sub> = 5351 MHz : Max Gain<sub>3</sub> = 3.51 dBi at -6°



# Elevation (Side to Side) Cut – Power Sum System Coverage



..... AUT<sub>1</sub> = 2450 MHz : Max Gain<sub>1</sub> = 3.9 dBi at 21°  
——— AUT<sub>2</sub> = 2450 MHz : Max Gain<sub>2</sub> = 4.16 dBi at 36°  
- - - - AUT<sub>3</sub> = 2450 MHz : Max Gain<sub>3</sub> = 3.68 dBi at 24°

..... AUT<sub>1</sub> = 5351 MHz : Max Gain<sub>1</sub> = 3.69 dBi at -3°  
——— AUT<sub>2</sub> = 5351 MHz : Max Gain<sub>2</sub> = 4.46 dBi at 3°  
- - - - AUT<sub>3</sub> = 5351 MHz : Max Gain<sub>3</sub> = 3.32 dBi at -162°

