



Antenna Datasheet

Product OC: YECT104WAAM

Version: 1.2

Date: 2025-01-20

Status: Released

Product Name: 5G Terminal Mount External Dipole Antenna

Key Features:

Frequency Band: 600–6000 MHz

Dimensions: Φ 20 mm $\times$ 145 mm

Efficiency: Up to 69.0 % (EVB)

RoHS and REACH Compliant

IP67

Overview

YECT104WAAM is a 5G external antenna measuring Φ 20 mm × 145 mm. This ultra-wide-band 5G antenna provides broad coverage from 600–6000 MHz whilst offering backward-compatibility to support 4G/3G and 2G networks as well as LTE Cat-M and narrowband IoT (NB-IoT). The antenna is terminated with SMA Male connector. Ideal for applications where the antenna is required to be discrete, this low profile, terminal mount omni-directional antenna is easy to install with maximum durability assured thanks to its IP67 rated, PC + ABS enclosure.

The antenna is designed as dipole type to work with various GND plane sizes or in free space for ease of integration with a hinged SMA Male connector to achieve the optimum position. Hinged structure helps to avoid other antennas or objects by rotating to different directions when mounted on terminals. This omni-directional antenna is ideally suited for Gateways & Routers, Smart Metering, Vending Machines, Industrial IoT, Smart Home, Connected Enterprise, offering great performance with its high gain and efficiency.

Typical applications include:

- Gateways & Routers
- Smart Metering
- Vending Machines
- Industrial IoT
- Smart Home
- Connected Enterprise

Quectel provides comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs. We have regional R & D centers to offer quick response to meet your requirements. Please contact our sales & FAEs if you have any requests.

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1 Specification

Test Condition: On 130 mm × 70 mm EVB

1.1. Electrical

Electrical	
Frequency Range	600–6000 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omni-directional

Electrical – Detail													
SPEC	Band	Band	B71	B12 /B13 /B28	B5 /B8 /B26	n74 /n75 /n76	B1 /B2 /B3	B40	Wi-Fi 2G	B38 /B41	B42 /B48 /n77	n79	Wi-Fi 5G
	Freq. (MHz)	600– 700	700– 810	820– 960	1420– 1520	1700– 2170	2300– 2400	2400– 2500	2500– 2690	3300– 4200	4400– 5000	5150– 5850	
Max. VSWR	Straight	3.5	5.6	5.9	3.2	4.1	2.3	3.3	3.3	1.9	2.1	1.9	
	Bent	3.0	5.0	6.1	4.5	2.6	2.4	3.3	3.3	1.9	1.8	1.8	
Max. Return Loss (dB)	Straight	-5.2	-3.2	-3.0	-5.5	-4.4	-7.9	-5.5	-5.5	-10.2	-9.1	-10.0	
	Bent	-6.0	-3.5	-2.9	-3.9	-6.9	-7.7	-5.4	-5.4	-10.2	-11.1	-11.0	
AVG Eff. (%)	Straight	45.8	34.8	26.6	54.4	51.3	54.2	41.6	52.6	51.8	43.8	25.9	
	Bent	49.9	40.0	27.5	40.6	60.4	51.5	41.4	56.2	60.5	39.9	28.7	
AVG AVG Gain (dB)	Straight	-3.4	-4.6	-5.7	-2.6	-2.9	-2.7	-3.8	-2.8	-2.9	-3.6	-5.9	
	Bent	-3.0	-4.0	-5.6	-3.9	-2.2	-2.9	-3.8	-2.5	-2.2	-4.0	-5.4	
Max. Peak	Straight	2.0	0.1	-0.3	3.4	4.3	5.0	4.9	4.9	5.0	3.9	2.5	

Gain (dBi)	Bent	1.8	-0.1	-0.2	0.0	2.9	1.9	1.9	4.7	5.6	4.1	4.6
VSWR	Straight	≤ 5.9										
	Bent	≤ 6.1										
Return Loss	Straight	≤ -3.0 dB										
	Bent	≤ -2.9 dB										
Peak Gain	Straight	≤ 5.0 dBi										
	Bent	≤ 5.6 dBi										

- Straight: The connector is vertical.
- Bent: The connector is bend.

1.2. Supported Bands

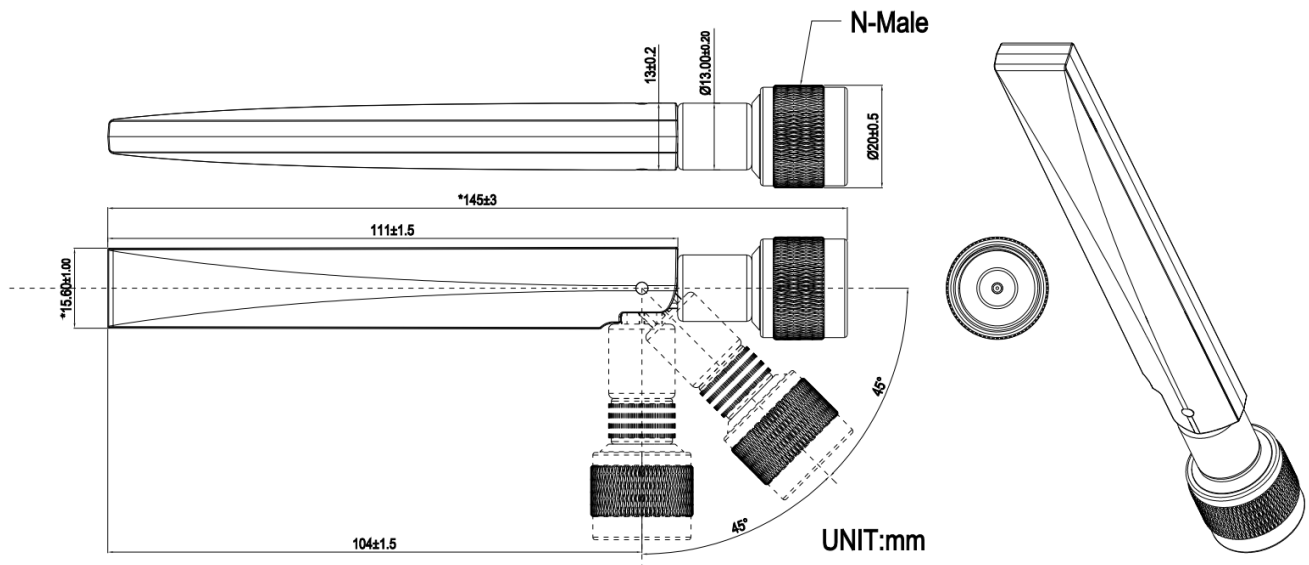
5G NR/ LTE/ LTE-Advanced/ WCDMA/ HSPA/ HSPA+/ GPRS/ GSM/ NB-IoT					
Band	Frequency (MHz)	Uplink (MHz)	Downlink (MHz)	Straight	Bent
1	2100	1920–1980	2110–2170	√	√
2	1900	1850–1910	1930–1990	√	√
3	1800	1710–1785	1805–1880	√	√
4	1700	1710–1755	2110–2155	√	√
5	850	824–849	869–894	√	√
7	2600	2500–2570	2620–2690	√	√
8	900	880–915	925–960	√	√
9	1800	1749.9–1784.9	1844.9–1879.9	√	√
11	1500	1427.9–1447.9	1475.9–1495.9	√	√
12	700	699–716	729–746	√	√
13	700	777–787	746–756	√	√
14	700	788–798	758–768	√	√
17	700	704–716	734–746	√	√
18	850	815–830	860–875	√	√
19	850	830–845	875–890	√	√
20	800	832–862	791–821	√	√
21	1500	1447.9–1462.9	1495.9–1510.9	√	√
22	3500	3410–3490	3510–3590	√	√
23	2100	2000–2020	2180–2200	√	√
24	1600	1626.5–1660.5	1525–1559	√	√
25	1900	1850–1915	1930–1995	√	√
26	850	814–849	859–894	√	√

5G NR/ LTE/ LTE-Advanced/ WCDMA/ HSPA/ HSPA+/ GPRS/ GSM/ NB-IoT					
Band	Frequency (MHz)	Uplink (MHz)	Downlink (MHz)	Straight	Bent
28	700	703–748	758–803	√	√
31	450	452.5–457.5	462.5–467.5	-	-
34	2100	2010–2025			√
38	2600	2570–2620			√
39	1900	1880–1920			√
40	2300	2300–2400			√
41	2500	2496–2690			√
42	3500	3400–3600			√
48	3500	3550–3700			√
66	1700	1710–1780	2110–2200	√	√
71	600	663–698	617–652	√	√
74	1500	1427–1470	1475–1518	√	√
77	3500	3300–4200			√
78	3500	3300–3800			√
79	4500	4400–5000			√

1.3. Mechanical & Environmental

Mechanical	
Antenna Dimensions	Φ 20 mm × 145 mm
Material & Color	PC + ABS & Black
Connector Type	N_Male
Mounting Type	Terminal
Weight	Typ. 40 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
Ingress Protection (IP) Rating	IP67 (After Installation)
RoHS and REACH Compliant	Yes

2 Drawing

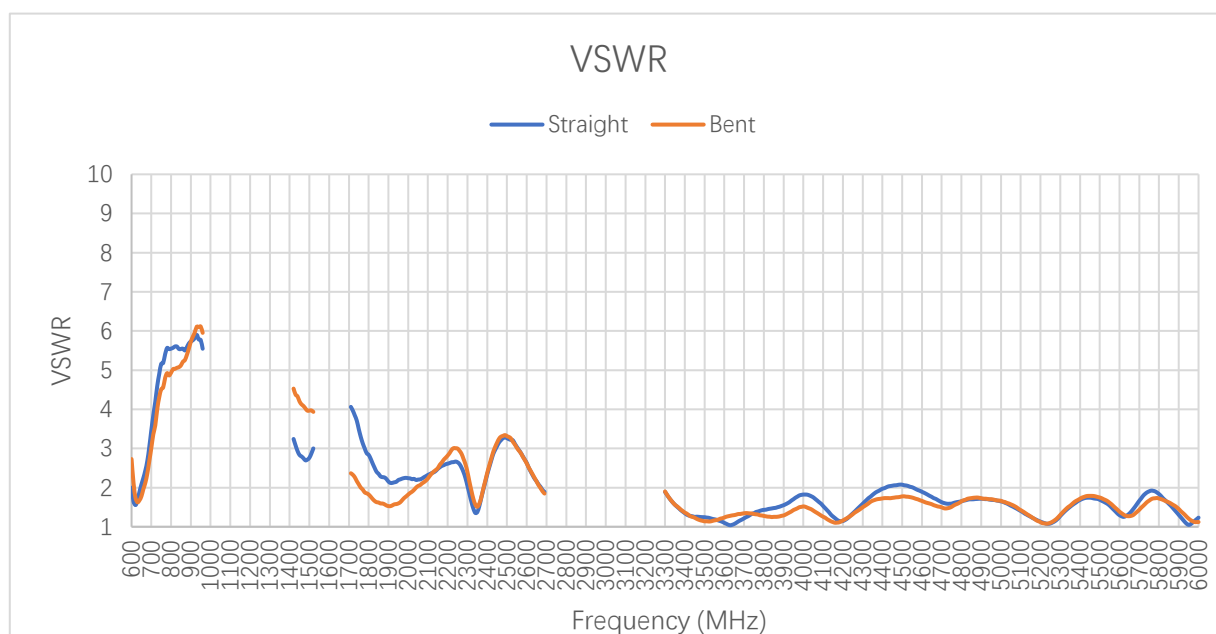


Note: If you use a torque wrench, the recommended force for mounting the antenna is 0.9Nm and the maximum torque to prevent antenna damage is 1.17Nm.

3 Detailed Performance

3.1. S-Parameter Test

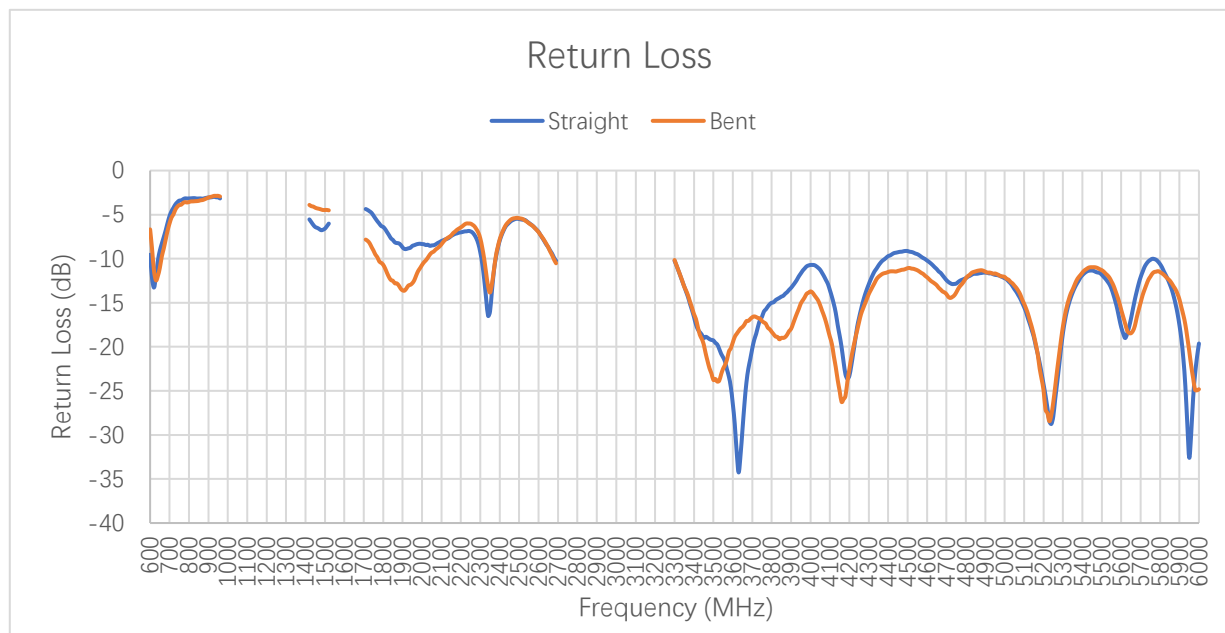
3.1.1. VSWR



VSWR

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Straight	2.0	1.7	3.8	5.6	5.7	5.5	2.9	4.1	3.7	2.3
Bent	2.7	1.6	3.4	5.1	5.7	6.0	4.3	2.4	2.2	1.6
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Straight	2.2	2.4	1.4	3.1	2.6	1.1	1.6	1.6	1.7	1.2
Bent	1.6	2.5	1.5	3.1	2.6	1.2	1.5	1.7	1.7	1.1

3.1.2. Return Loss

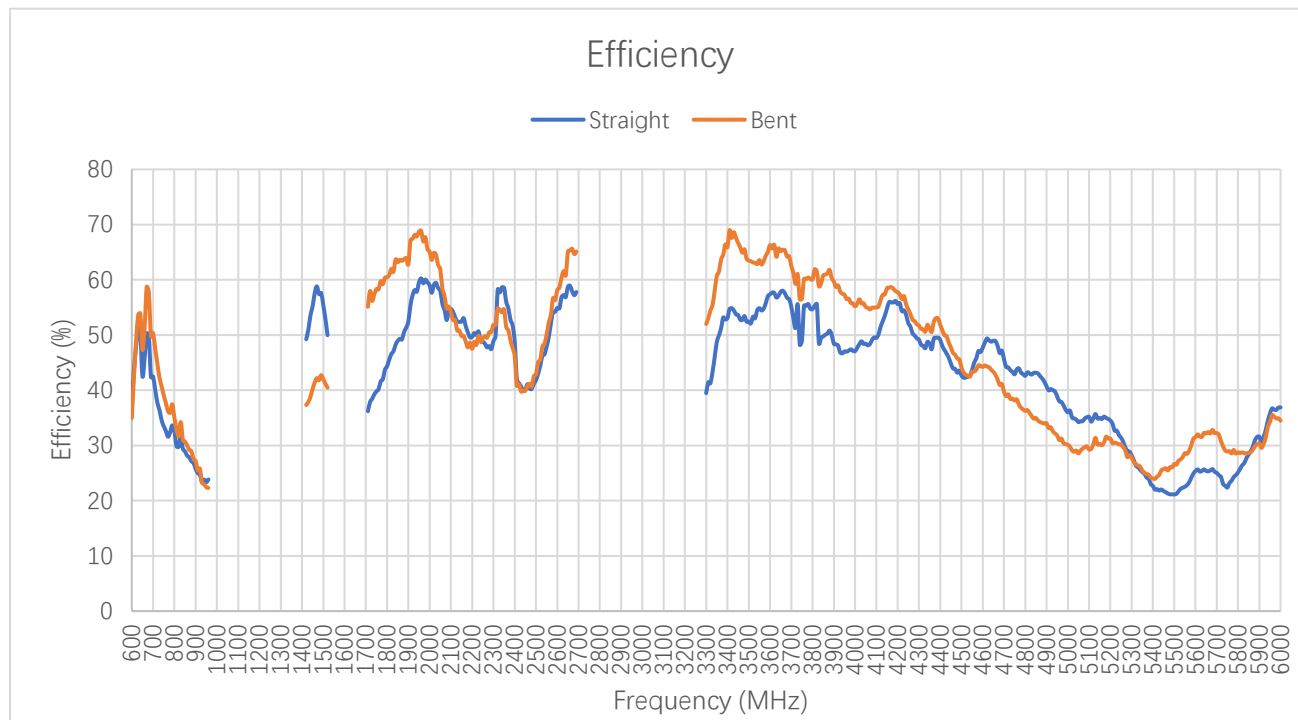


Return Loss (dB)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Straight	-9.6	-12.0	-4.6	-3.1	-3.1	-3.2	-6.2	-4.4	-4.8	-8.3
Bent	-6.7	-12.5	-5.3	-3.5	-3.1	-2.9	-4.1	-7.8	-8.7	-13.0
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Straight	-8.6	-7.6	-16.0	-5.9	-7.0	-26.5	-12.4	-12.2	-11.8	-19.6
Bent	-12.8	-7.5	-13.8	-5.7	-7.0	-19.5	-14.0	-12.1	-11.3	-24.8

3.2. Radiation Performance Test

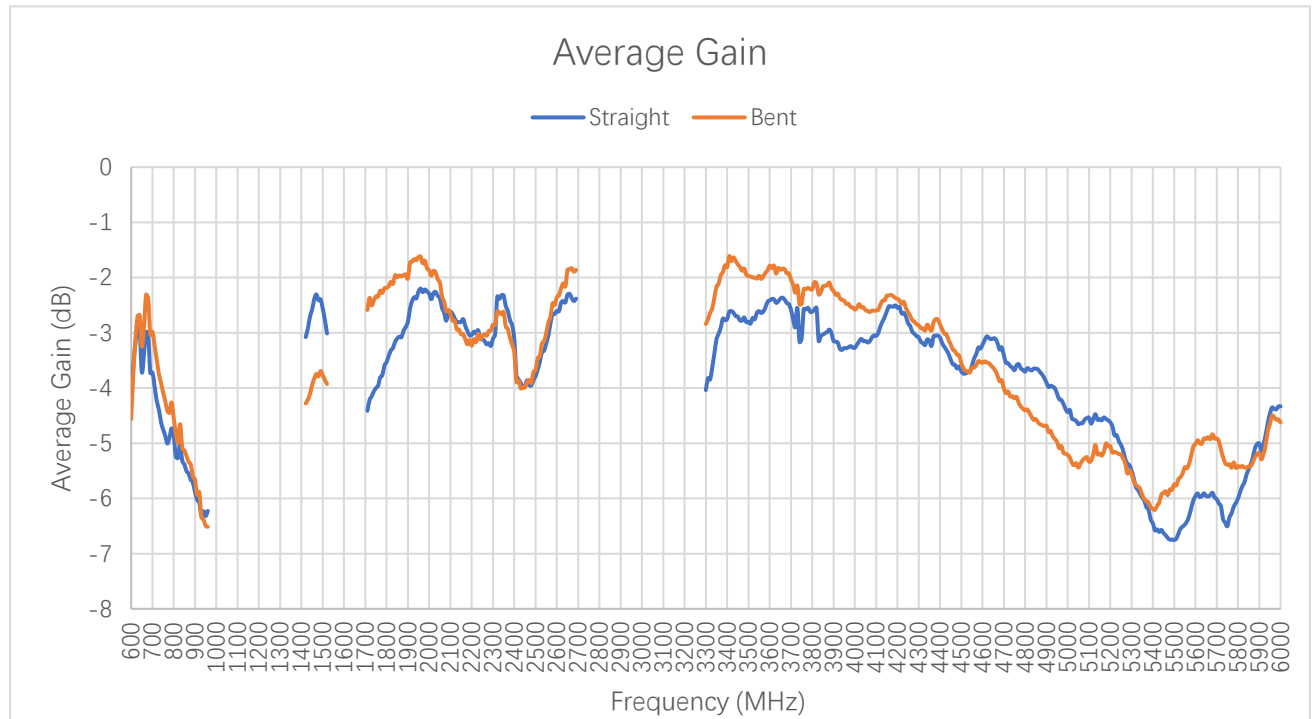
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Straight	37.3	51.2	40.1	31.6	25.8	23.8	55.2	36.2	39.3	50.6
Bent	35.0	53.7	47.5	34.2	27.2	22.3	40.3	55.1	57.4	63.7
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Straight	59.5	52.4	58.5	40.1	54.9	57.4	45.6	36.0	21.1	36.9
Bent	68.7	50.8	54.6	39.9	58.1	66.3	39.7	30.1	26.6	34.5

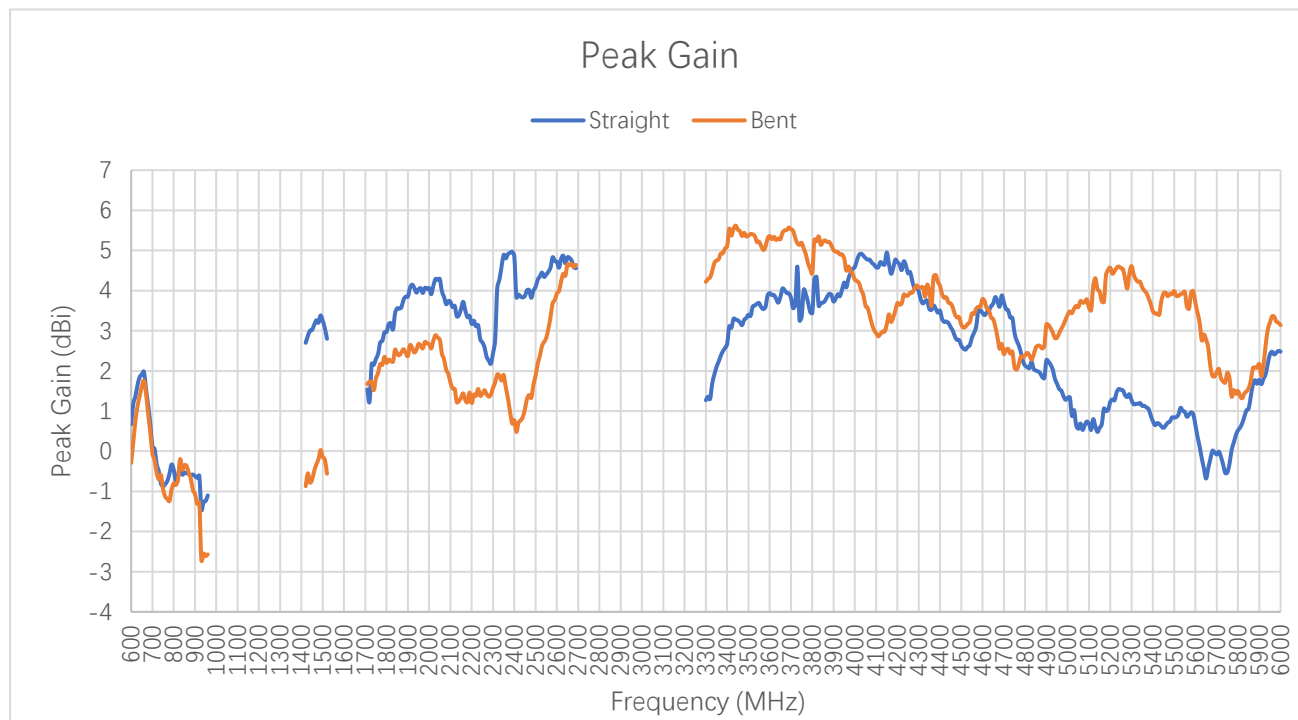
3.2.2. Average Gain



Average Gain (dB)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Straight	-4.3	-2.9	-4.0	-5.0	-5.9	-6.2	-2.6	-4.4	-4.1	-3.0
Bent	-4.6	-2.7	-3.2	-4.7	-5.7	-6.5	-4.0	-2.6	-2.4	-2.0
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Straight	-2.3	-2.8	-2.3	-4.0	-2.6	-2.4	-3.4	-4.4	-6.8	-4.3
Bent	-1.6	-2.9	-2.6	-4.0	-2.4	-1.8	-4.0	-5.2	-5.7	-4.6

3.2.3. Peak Gain



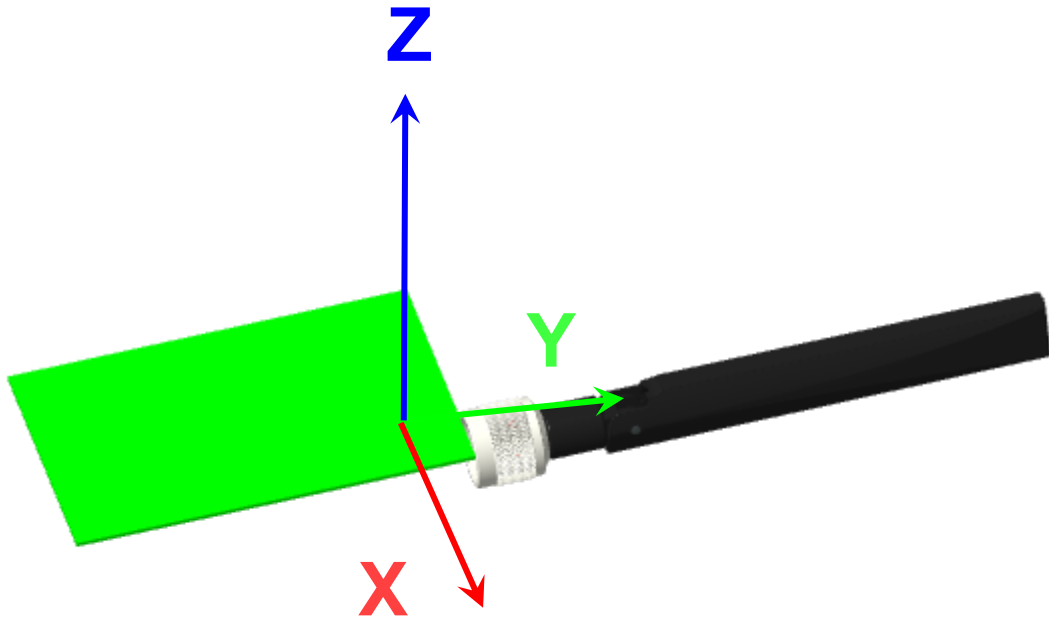
Peak Gain (dBi)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Straight	0.7	1.7	0.1	-0.3	-0.6	-1.1	3.0	1.5	2.2	3.8
Bent	-0.3	1.1	-0.2	-0.2	-1.1	-2.6	-0.7	1.7	1.5	2.5
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Straight	4.0	3.4	4.9	3.9	4.7	3.9	3.7	1.3	0.8	2.5
Bent	2.7	1.3	1.9	1.1	3.9	5.4	2.4	3.4	4.0	3.1

3.2.4. 3D & 2D Radiation Pattern

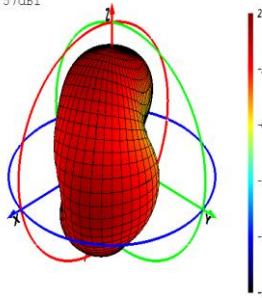
3.2.4.1. Test Condition: On 130 mm × 70 mm EVB and Straight

- Test Chamber: FS-S-1

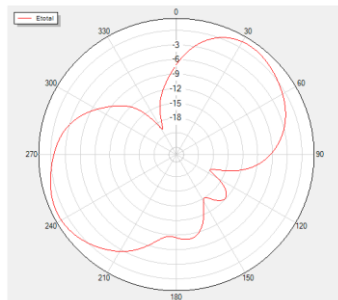


630 MHz

MAX:1.65dB1
MIN:-19.57dB1

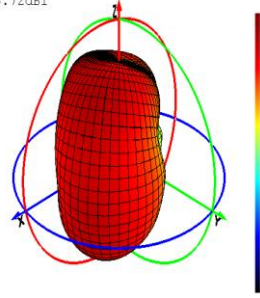


Theta=90 Freq=630MHz

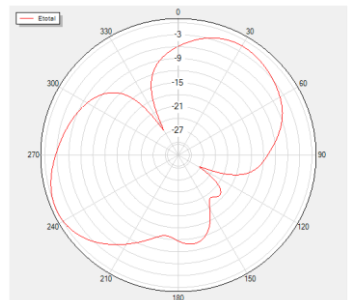


710 MHz

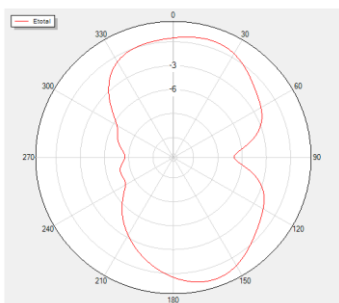
MAX:0.06dB1
MIN:-28.72dB1



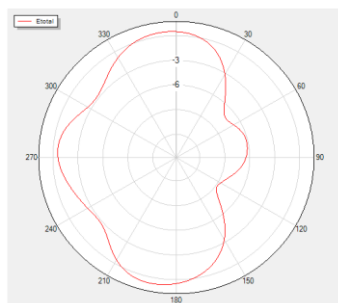
Theta=90 Freq=710MHz



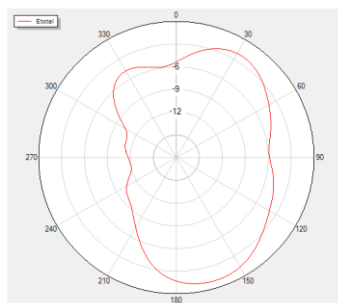
Phi=0 Freq=630MHz



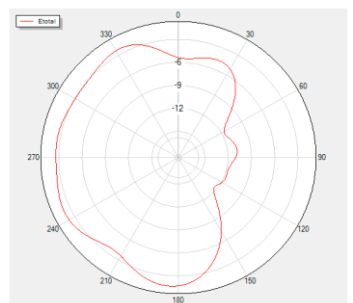
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Phi=0 Freq=710MHz

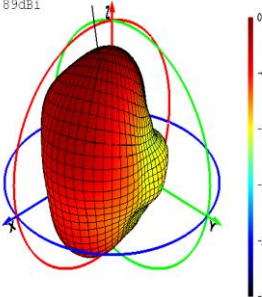


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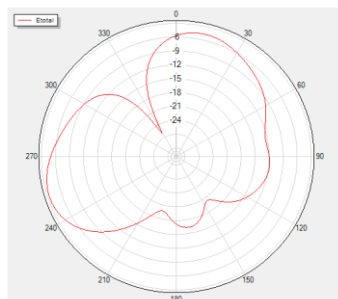


830 MHz

MAX:-0.33dB1
MIN:-32.89dB1

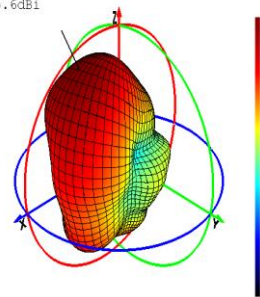


Theta=90 Freq=830MHz

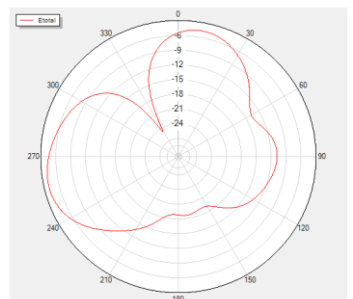


900 MHz

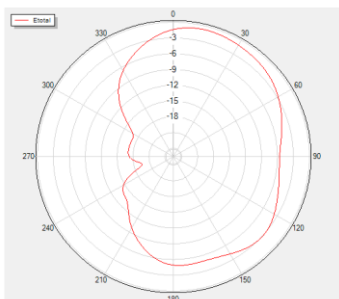
MAX:-0.62dB1
MIN:-25.6dB1



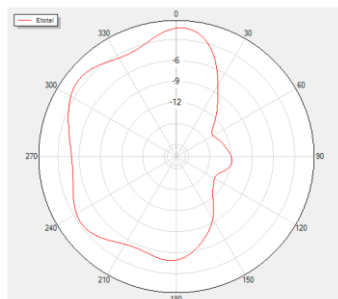
Theta=90 Freq=900MHz



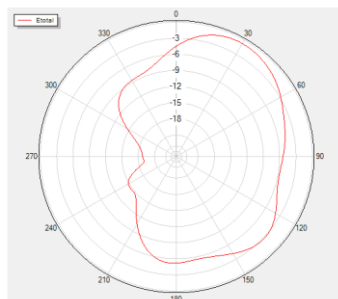
Phi=0 Freq=830MHz



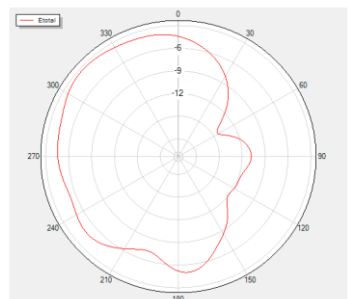
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Phi=0 Freq=900MHz

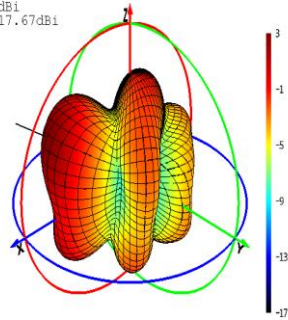


Phi=90 Freq=900MHz

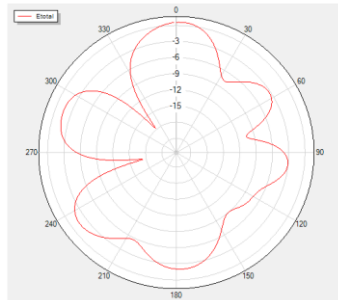


1440 MHz

MAX: 3dB_i
MIN: -17.67dB_i

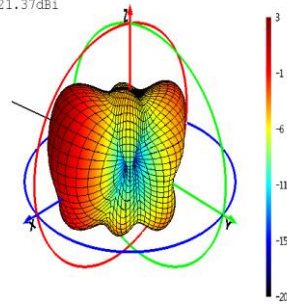


Theta=90 Freq=1440MHz

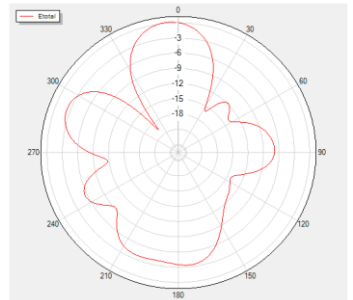


1740 MHz

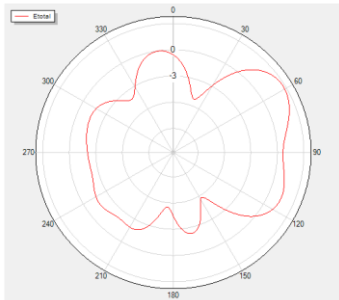
MAX: 2.15dB_i
MIN: -21.37dB_i



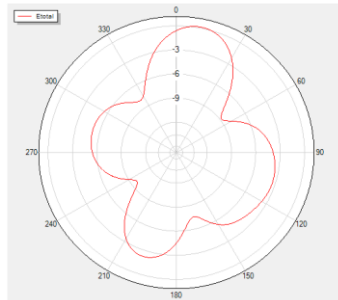
Theta=90 Freq=1740MHz



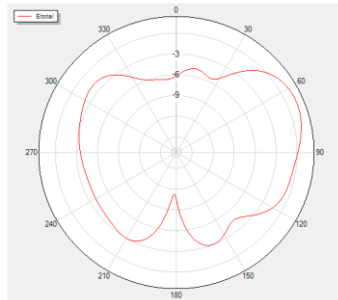
Phi=0 Freq=1440MHz



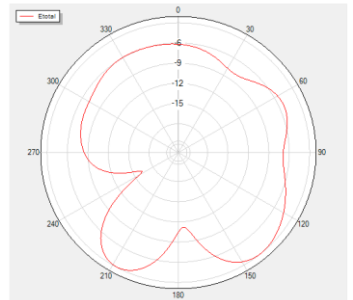
Phi=90 Freq=1440MHz



Phi=0 Freq=1740MHz

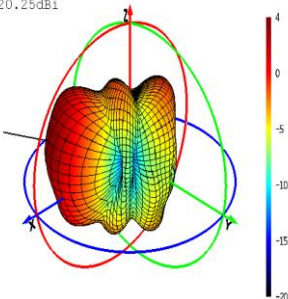


Phi=90 Freq=1740MHz

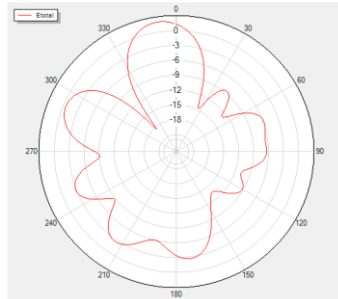


1880 MHz

MAX: 3.78dB_i
MIN: -20.25dB_i

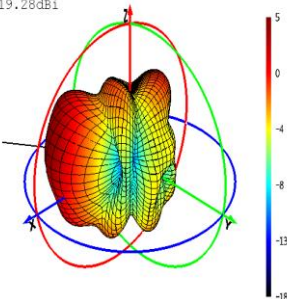


Theta=90 Freq=1880MHz

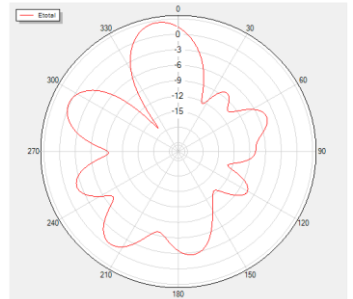


1950 MHz

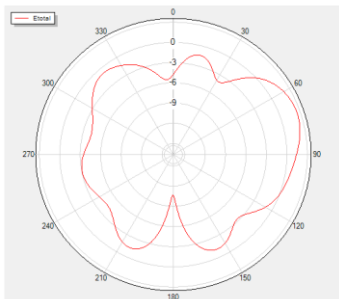
MAX: 4.03dB_i
MIN: -19.28dB_i



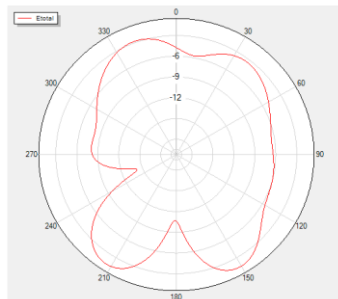
Theta=90 Freq=1950MHz



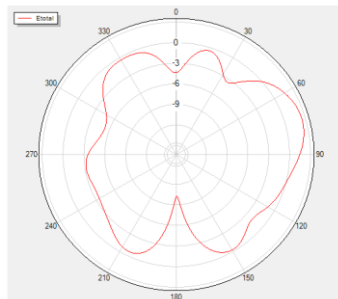
Phi=0 Freq=1880MHz



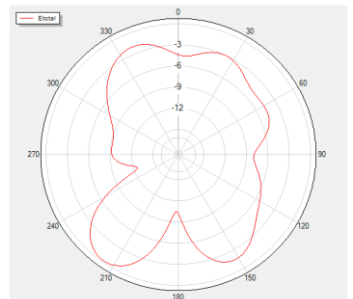
Phi=90 Freq=1880MHz



Phi=0 Freq=1950MHz

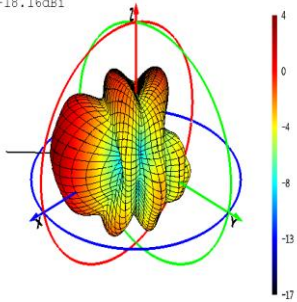


Phi=90 Freq=1950MHz

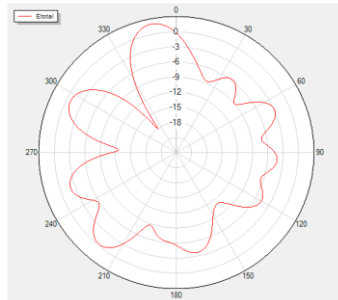


2140 MHz

MAX:3.39dBi
MIN:-18.16dBi

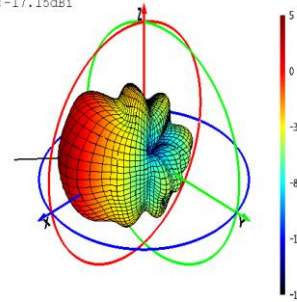


Theta=90 Freq=2140MHz

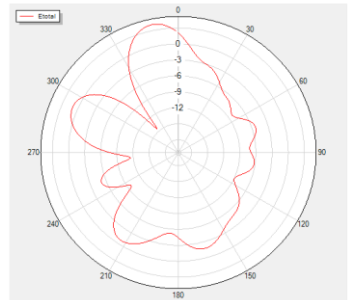


2350 MHz

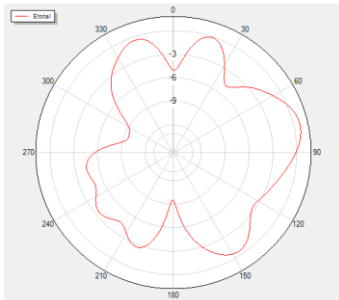
MAX:4.89dBi
MIN:-17.15dBi



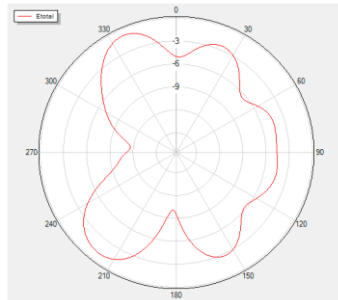
Theta=90 Freq=2350MHz



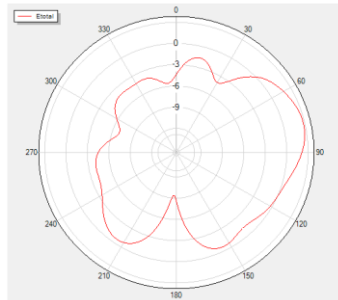
Phi=0 Freq=2140MHz



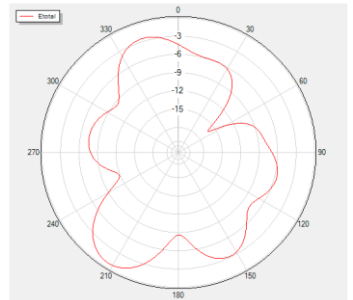
Phi=90 Freq=2140MHz



Phi=0 Freq=2350MHz

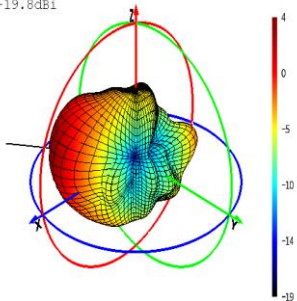


Phi=90 Freq=2350MHz

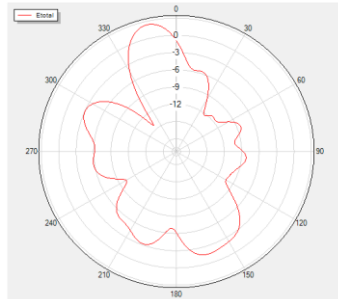


2450 MHz

MAX:3.87dBi
MIN:-19.8dBi

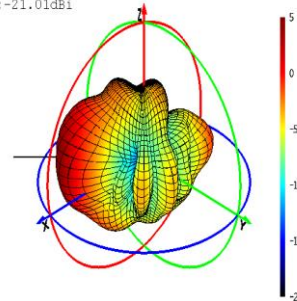


Theta=90 Freq=2450MHz

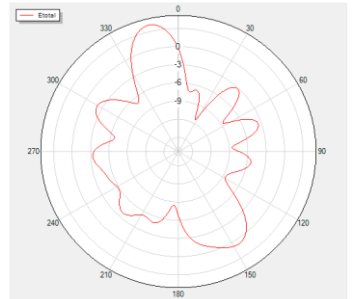


2600 MHz

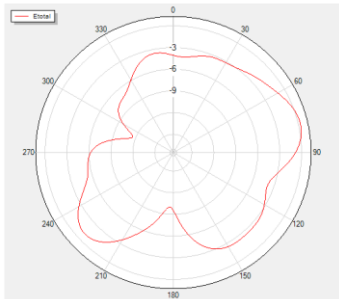
MAX:4.72dBi
MIN:-21.01dBi



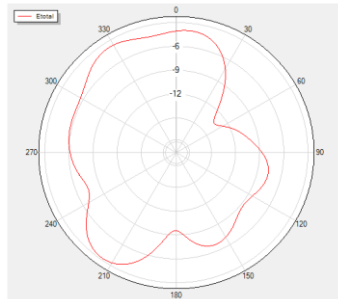
Theta=90 Freq=2600MHz



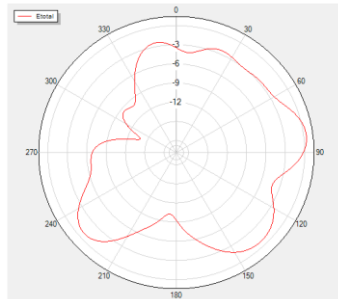
Phi=0 Freq=2450MHz



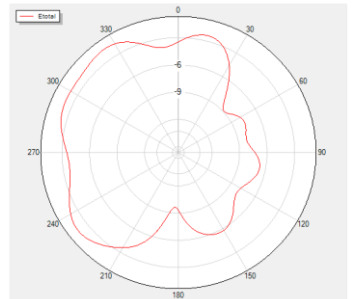
Phi=90 Freq=2450MHz



Phi=0 Freq=2600MHz

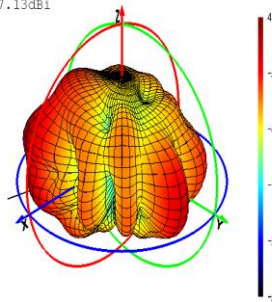


Phi=90 Freq=2600MHz

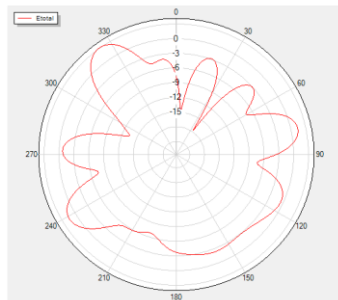


3600 MHz

MAX:3.94dBi
MIN:-27.13dBi

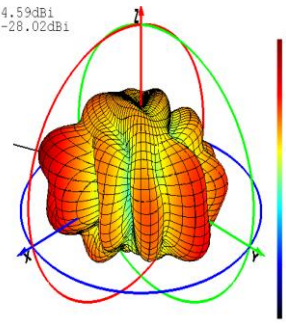


Theta=90 Freq=3600MHz

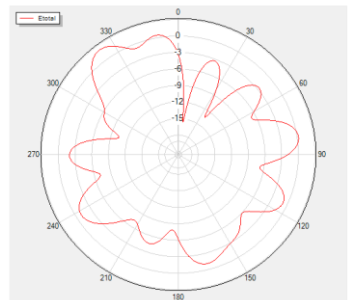


4000 MHz

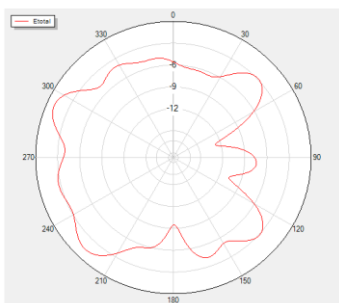
MAX:4.59dBi
MIN:-28.02dBi



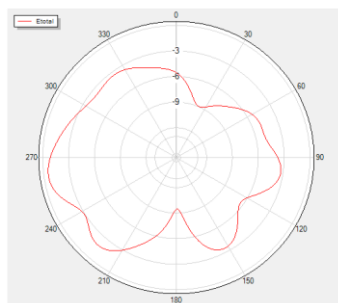
Theta=90 Freq=4000MHz



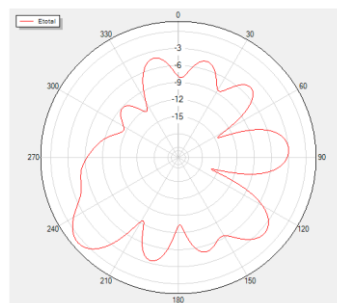
Phi=0 Freq=3600MHz



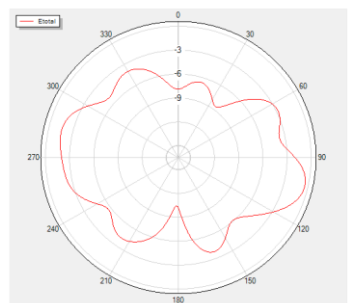
Phi=90 Freq=3600MHz



Phi=0 Freq=4000MHz

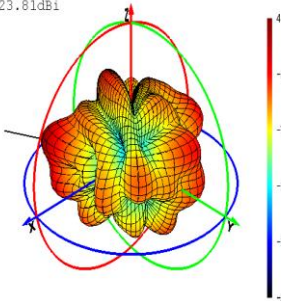


Phi=90 Freq=4000MHz

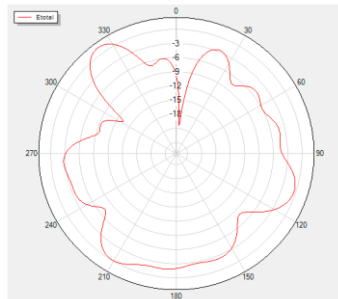


4700 MHz

MAX:3.71dBi
MIN:-23.81dBi

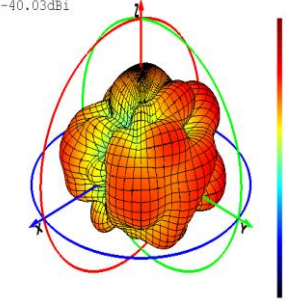


Theta=90 Freq=4700MHz

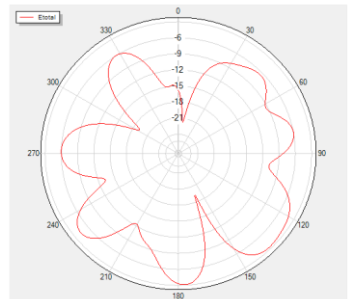


5500 MHz

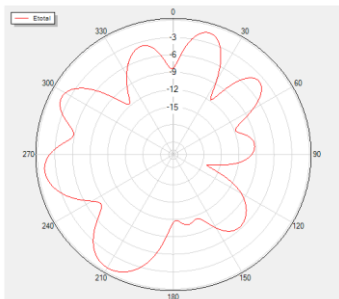
MAX:0.84dBi
MIN:-40.03dBi



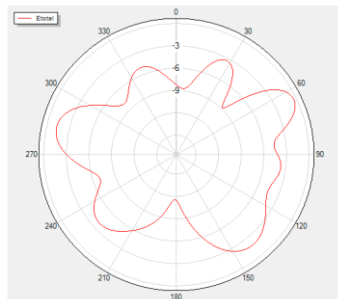
Theta=90 Freq=5500MHz



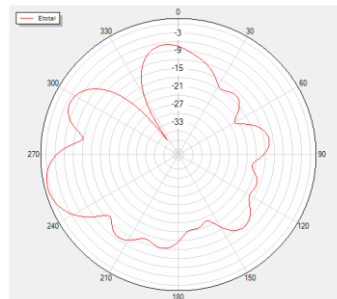
Phi=0 Freq=4700MHz



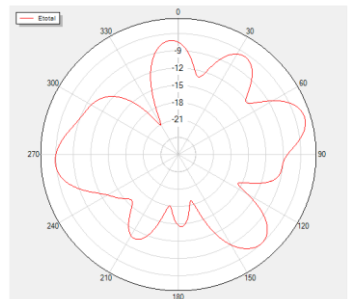
Phi=90 Freq=4700MHz



Phi=0 Freq=5500MHz

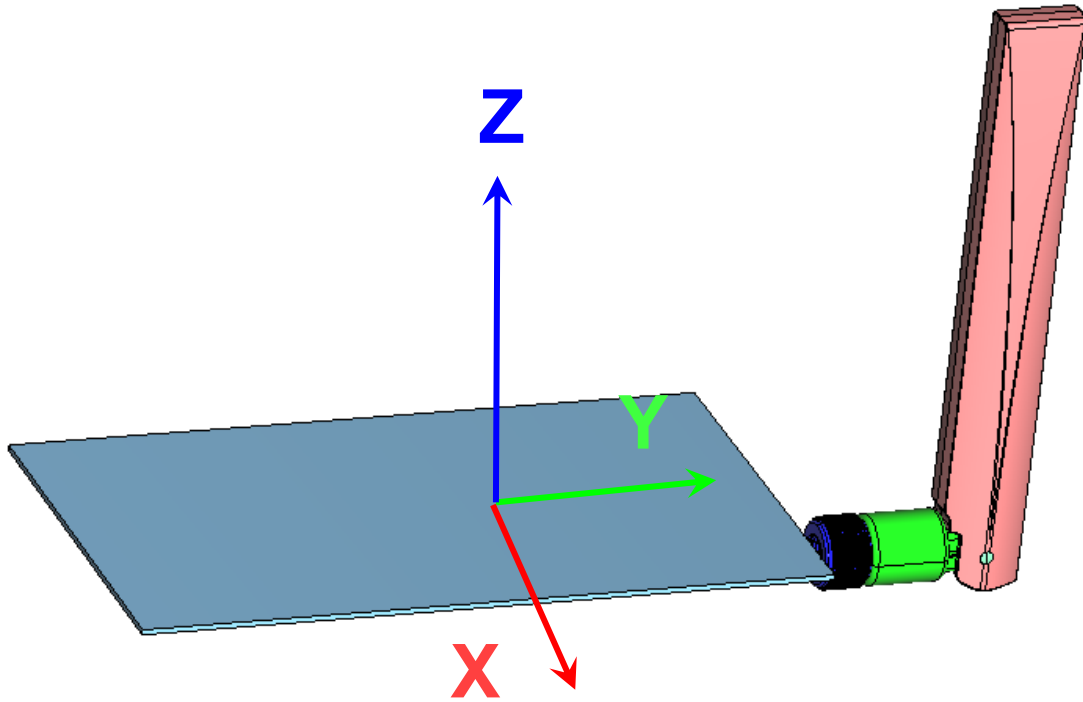


Phi=90 Freq=5500MHz



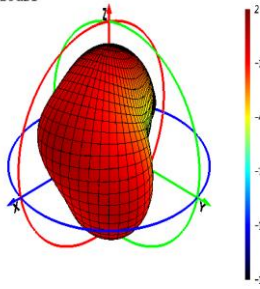
3.2.4.2. Test Condition: On 130 mm × 70 mm EVB and Bent

- Test Chamber: FS-S-1

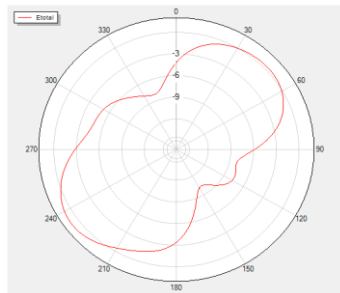


630 MHz

MAX:1.12dBi
MIN:-14.25dBi

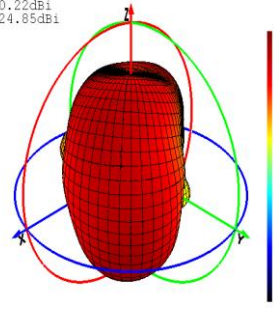


Theta=90 Freq=630MHz

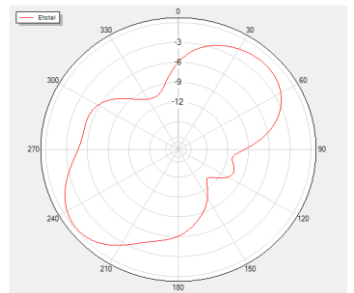


710 MHz

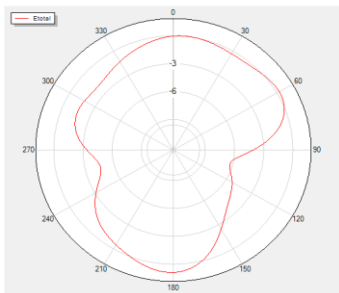
MAX:-0.22dBi
MIN:-24.85dBi



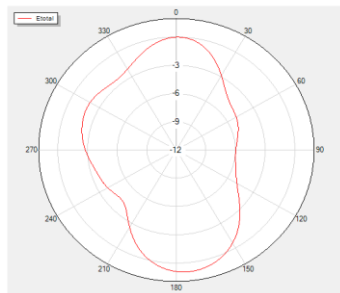
Theta=90 Freq=710MHz



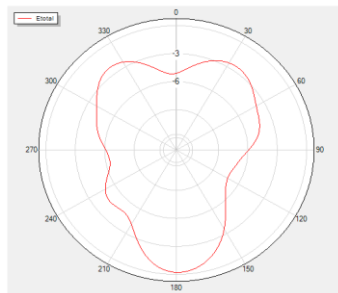
Phi=0 Freq=630MHz



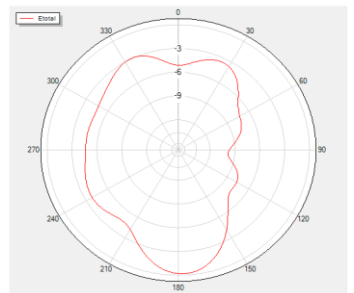
Phi=90 Freq=630MHz



Phi=0 Freq=710MHz

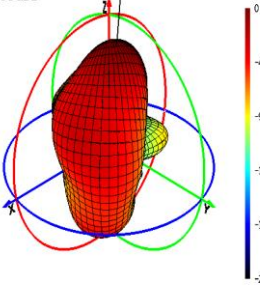


Phi=90 Freq=710MHz

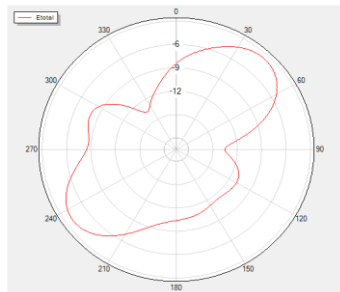


830 MHz

MAX:-0.2dBi
MIN:-23.83dBi

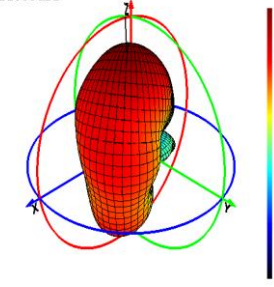


Theta=90 Freq=830MHz

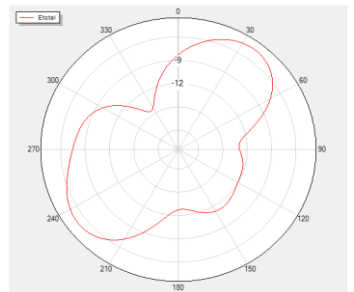


900 MHz

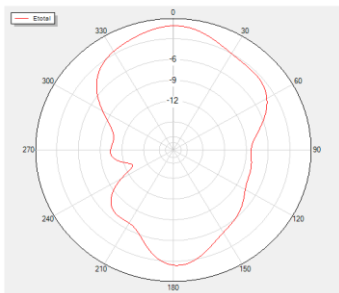
MAX:-1.07dBi
MIN:-21.99dBi



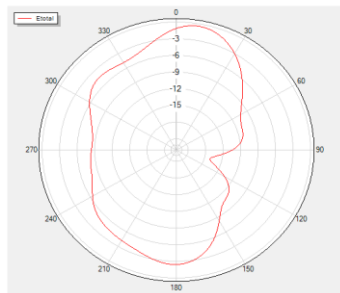
Theta=90 Freq=900MHz



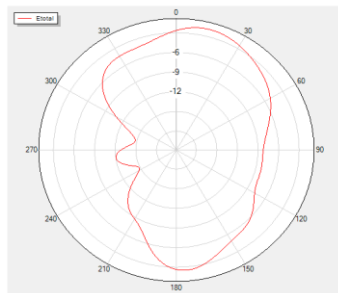
Phi=0 Freq=830MHz



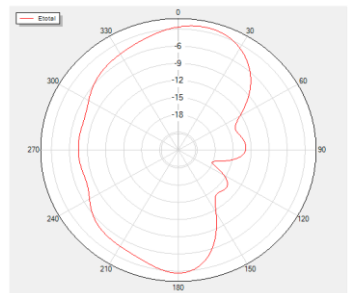
Phi=90 Freq=830MHz



Phi=0 Freq=900MHz

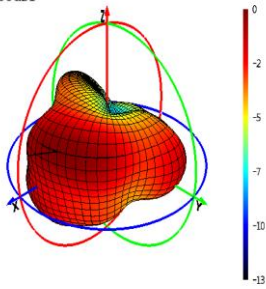


Phi=90 Freq=900MHz

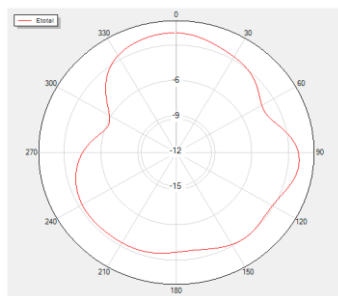


1440 MHz

MAX:-0.78dBi
MIN:-13.85dBi

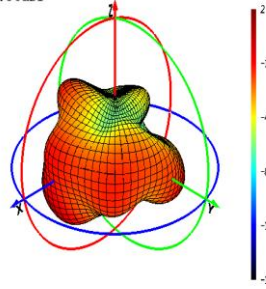


Theta=90 Freq=1440MHz

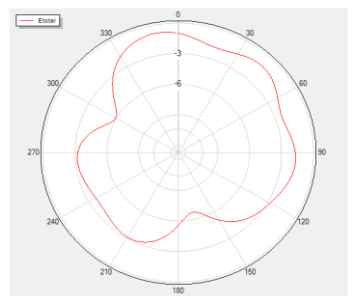


1740 MHz

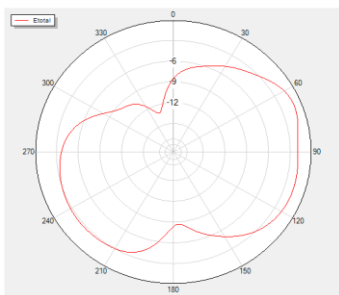
MAX:1.52dBi
MIN:-15.56dBi



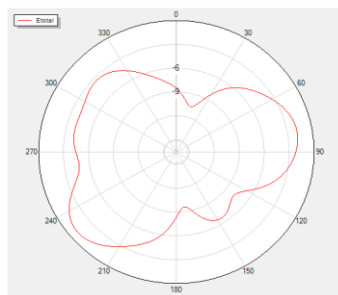
Theta=90 Freq=1740MHz



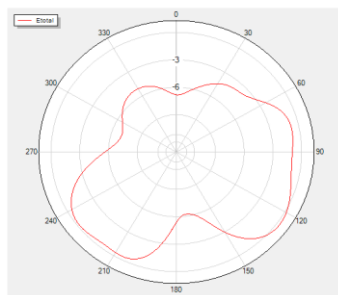
Phi=0 Freq=1440MHz



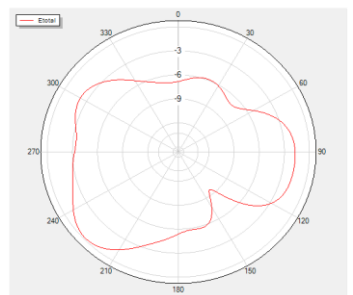
Phi=90 Freq=1440MHz



Phi=0 Freq=1740MHz

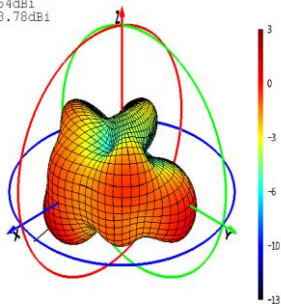


Phi=90 Freq=1740MHz

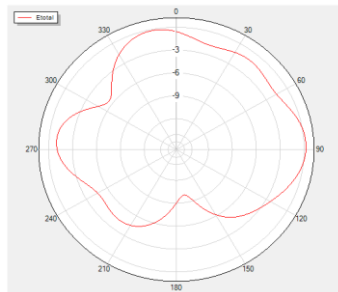


1880 MHz

MAX:2.54dBi
MIN:-13.78dBi

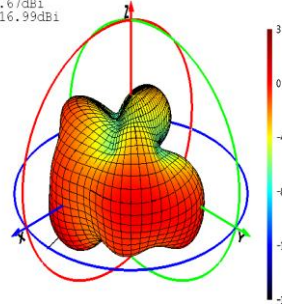


Theta=90 Freq=1880MHz

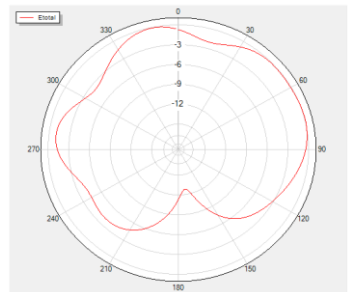


1950 MHz

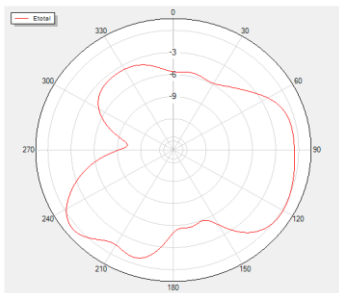
MAX:2.67dBi
MIN:-16.99dBi



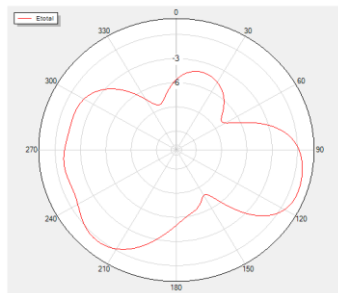
Theta=90 Freq=1950MHz



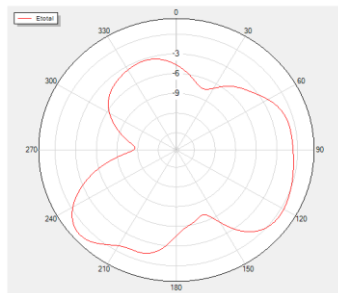
Phi=0 Freq=1880MHz



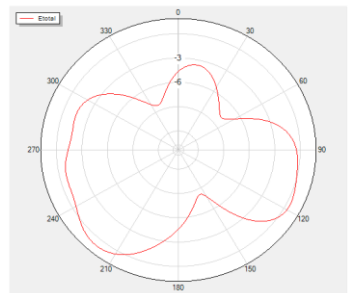
Phi=90 Freq=1880MHz



Phi=0 Freq=1950MHz

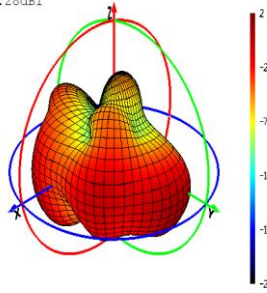


Phi=90 Freq=1950MHz

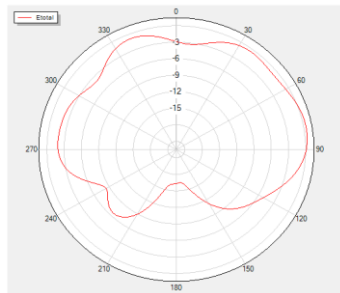


2140 MHz

MAX:1.25dBi
MIN:-22.28dBi

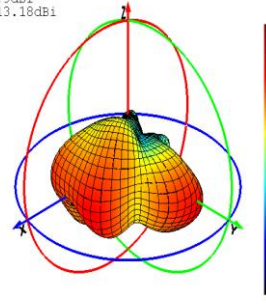


Theta=90 Freq=2140MHz

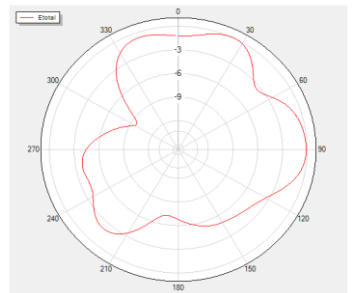


2350 MHz

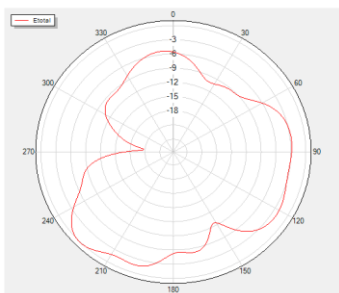
MAX:1.9dBi
MIN:-13.18dBi



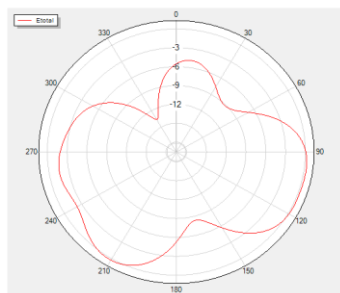
Theta=90 Freq=2350MHz



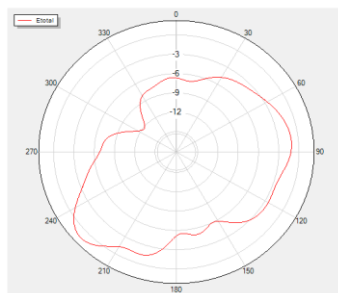
Phi=0 Freq=2140MHz



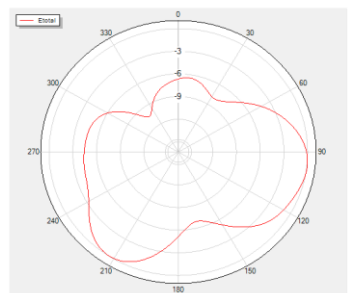
Phi=90 Freq=2140MHz



Phi=0 Freq=2350MHz

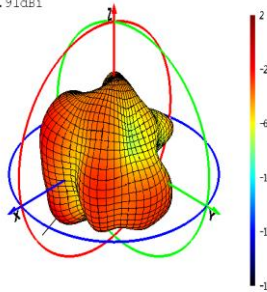


Phi=90 Freq=2350MHz

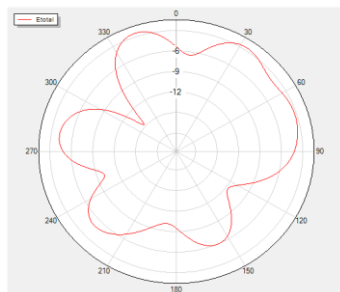


2450 MHz

MAX:1.05dBi
MIN:-20.91dBi

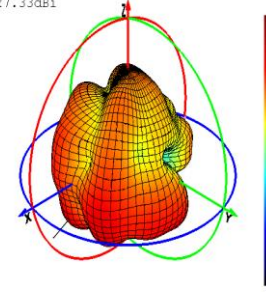


Theta=90 Freq=2450MHz

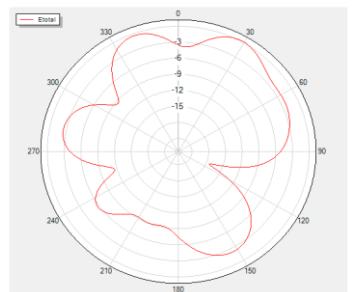


2600 MHz

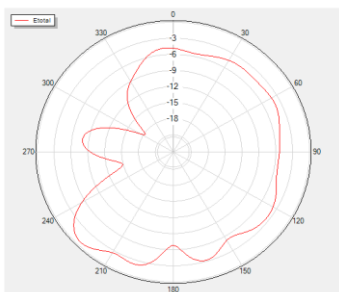
MAX:3.93dBi
MIN:-27.33dBi



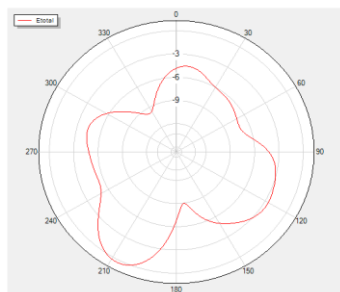
Theta=90 Freq=2600MHz



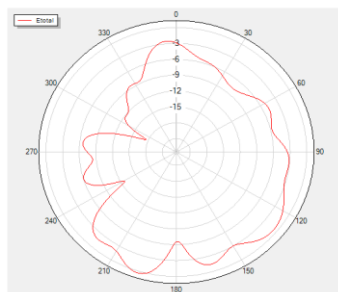
Phi=0 Freq=2450MHz



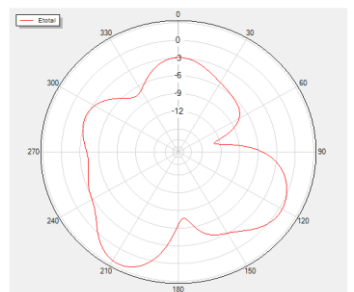
Phi=90 Freq=2450MHz



Phi=0 Freq=2600MHz

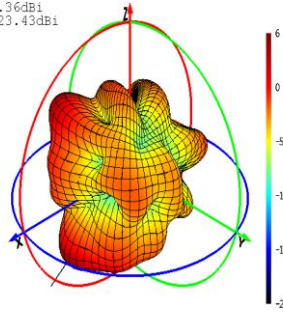


Phi=90 Freq=2600MHz

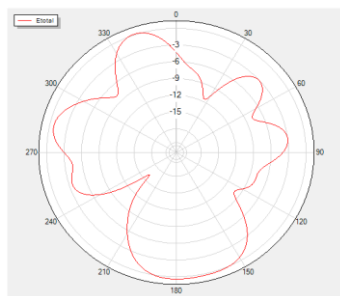


3600 MHz

MAX: 5.36dBi
MIN: -23.43dBi

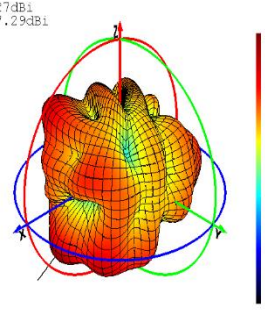


Theta=90 Freq=3600MHz

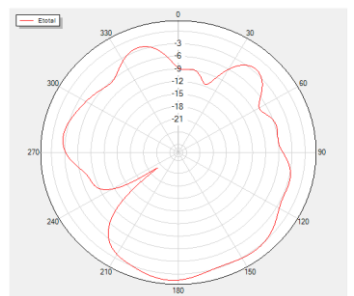


4000 MHz

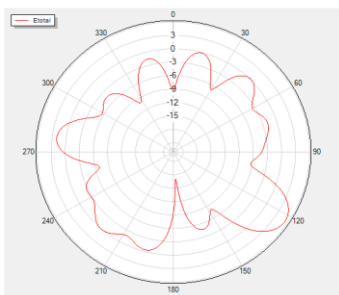
MAX: 4.27dBi
MIN: -27.29dBi



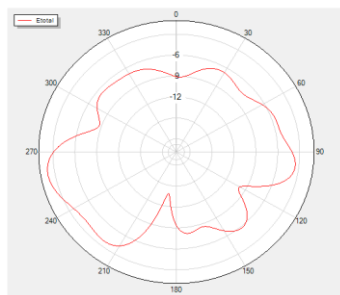
Theta=90 Freq=4000MHz



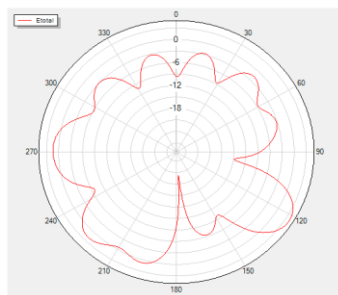
Phi=0 Freq=3600MHz



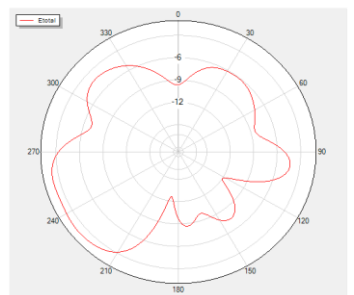
Phi=90 Freq=3600MHz



Phi=0 Freq=4000MHz

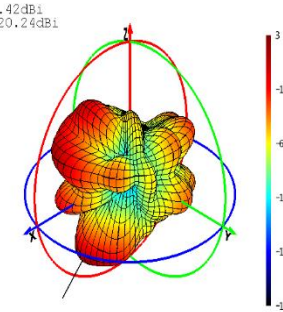


Phi=90 Freq=4000MHz

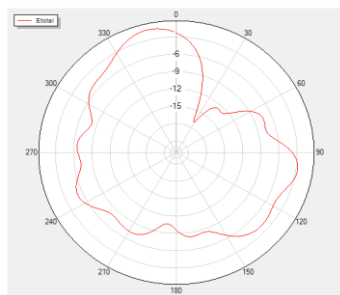


4700 MHz

MAX: 2.42dBi
MIN: -20.24dBi

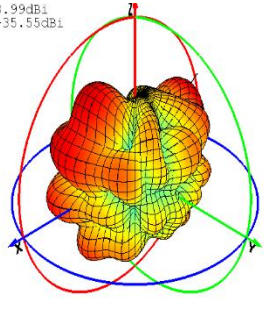


Theta=90 Freq=4700MHz

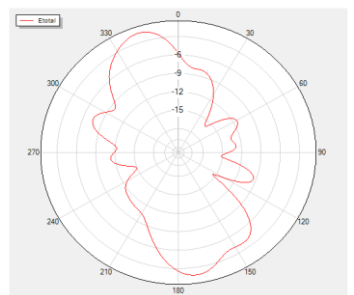


5500 MHz

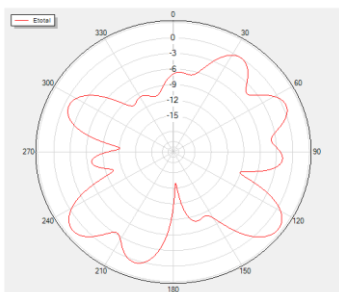
MAX: 3.99dBi
MIN: -35.55dBi



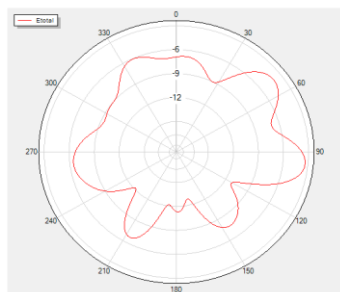
Theta=90 Freq=5500MHz



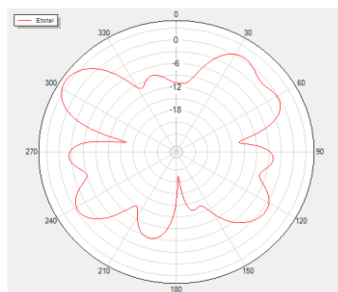
Phi=0 Freq=4700MHz



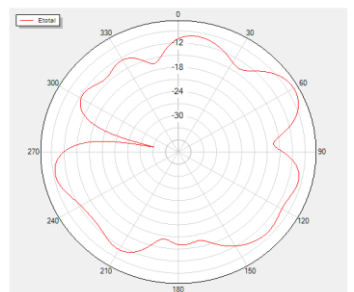
Phi=90 Freq=4700MHz



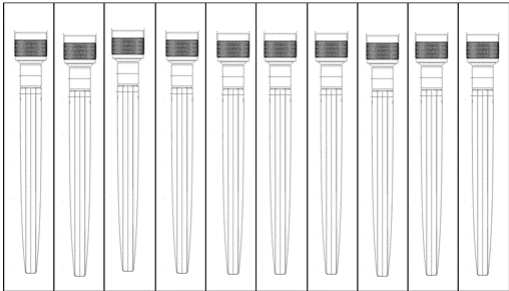
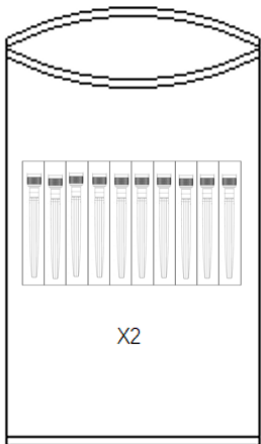
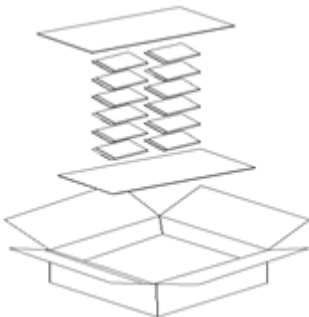
Phi=0 Freq=5500MHz

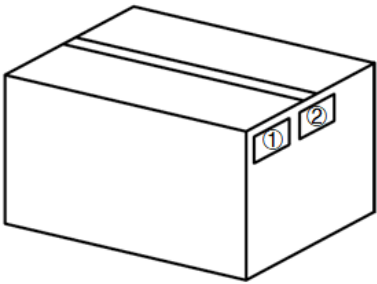
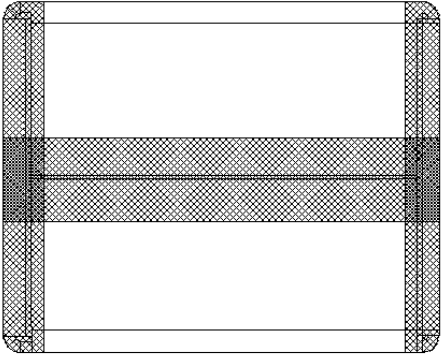


Phi=90 Freq=5500MHz



4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		(10 PCS Antennas / Conjoined Plastic Bag)
2		Put the conjoined plastic bag containing the product into a PE bag. (20 PCS Antennas / PE Bag)
3		(12 PE Bags / Carton Box) (240 PCS Antennas / Carton Box) Estimated quantity Products that cannot fill the entire carton box are packed in a suitable size carton box. <u>Carton Size:</u> <u>L × W × H = 325 × 325 × 200 mm</u>

4		Position for Attaching Labels ① Carton Label ② Quality Label
5		Sealing Cartons H-shaped sealing cartons
Note	The initial packaging method described above is for reference only, and the final actual packaging method shall be subject to the actual shipping packaging.	

Contact Us

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Or our local offices. For more information, please visit:

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Revision History

Version	Date	Author	Note
-	2024-05-12	Mordecai LIU/ Lance SUN/ David LIU/ Rainey LIAO	Creation of the document
1.0	2024-06-05	Mordecai LIU/ Lance SUN/ David LIU/ Rainey LIAO	First official release
1.1	2024-11-07	Lance SUN	Updated the drawing (Chapter 2).
1.2	2025-01-20	Allow XU	Updated the packaging (Chapter 4).



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