



Antenna Datasheet

Product OC: YECT005W1A

Version: 1.1

Date: 2024-07-16

Status: Preliminary

Product Name: 5G Terminal Mount External Dipole Antenna

Key Features:

Frequency Band: 600–6000 MHz

Dimensions: 135 × 15.6 × 13 mm

Efficiency: Up to 70.7 % (EVB)

RoHS

Overview

YECT005W1A is a 5G external antenna measuring 135 × 15.6 × 13 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 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 × 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	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	2.8	3.2	3.0	2.0	2.1	1.4	1.6	1.9	2.1	2.6	1.8
	Bent	4.1	2.8	3.2	2.5	1.7	1.5	2.1	2.1	2.3	2.4	2.2
Max. Return Loss (dB)	Straight	-6.5	-5.5	-6.0	-9.4	-9.1	-16.3	-12.8	-10.3	-8.8	-7.1	-10.6
	Bent	-4.4	-6.4	-5.6	-7.4	-11.9	-13.4	-9.2	-8.9	-7.9	-7.8	-8.5
AVG Eff. (%)	Straight	46.0	48.0	42.3	61.0	59.2	62.7	55.1	61.5	47.4	36.8	29.1
	Bent	55.5	59.9	50.4	57.5	62.9	63.9	56.9	59.1	56.4	39.4	20.2
AVG AVG Gain (dB)	Straight	-3.4	-3.2	-3.7	-2.1	-2.3	-2.0	-2.6	-2.1	-3.2	-4.3	-5.4
	Bent	-2.6	-2.2	-3.0	-2.4	-2.0	-1.9	-2.4	-2.3	-2.5	-4.0	-7.0

Max. Peak Gain (dBi)	Straight	1.4	1.7	1.5	2.5	4.6	4.1	3.8	3.6	4.5	3.3	3.3
	Bent	2.2	1.9	1.5	1.6	2.9	3.1	2.7	3.6	3.9	2.5	0.4
VSWR		Straight				≤ 3.2						
		Bent				≤ 4.1						
Return Loss		Straight				≤ -5.5 dB						
		Bent				≤ -4.4 dB						
Peak Gain		Straight				≤ 4.6 dBi						
		Bent				≤ 3.9 dBi						

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

1.2. Supported Bands

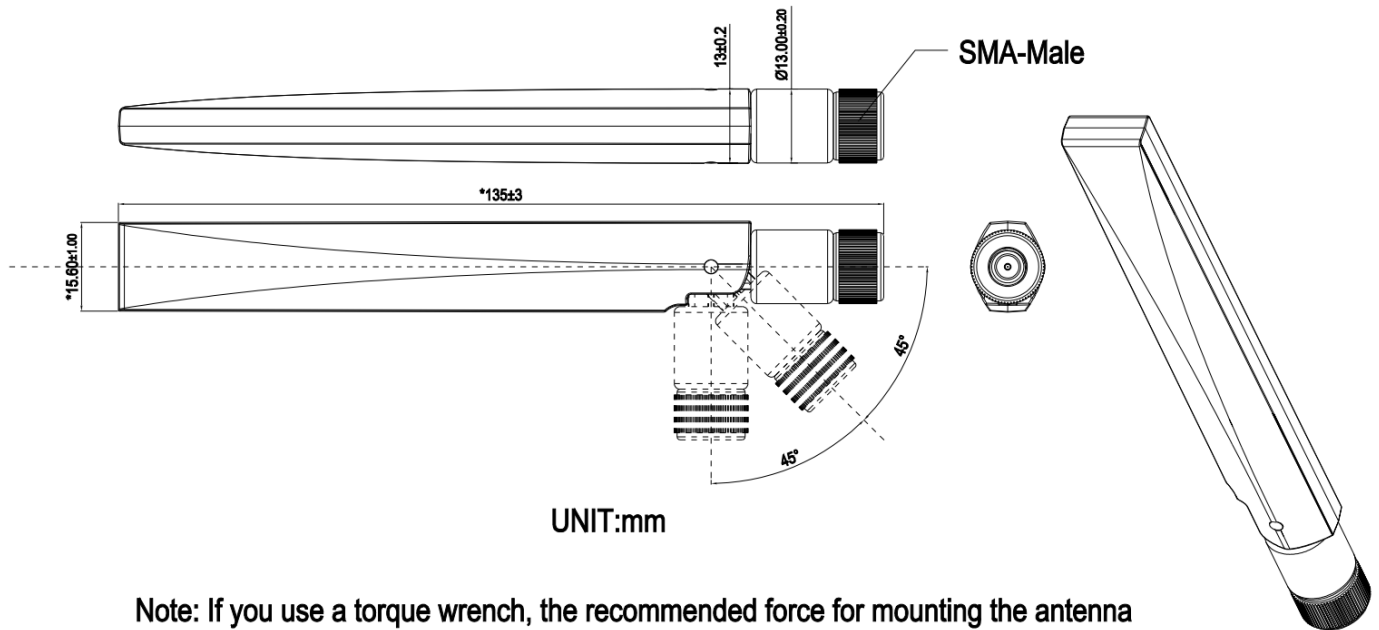
5G NR/ LTE/ LTE-Advanced/ WCDMA/ HSPA/ HSPA+/ GPRS/ GSM/ NB-IoT					
Band	Frequency (MHz)	Uplink (MHz)	Downlink (MHz)	Straight	Bent
1	2100	1920–1980	2110–2170	√	√
2	1900	1850–1910	1930–1990	√	√
3	1800	1710–1785	1805–1880	√	√
4	1700	1710–1755	2110–2155	√	√
5	850	824–849	869–894	√	√
7	2600	2500–2570	2620–2690	√	√
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		√	√
Note: Covered √ means efficiency > 20 %					

1.3. Mechanical & Environmental

Mechanical	
Antenna Dimensions	135 × 15.6 × 13 mm
Material & Color	PC+ABS & Black
Connector Type	SMA Male
Mounting Type	Terminal
Weight	Typ. 16 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS	Yes

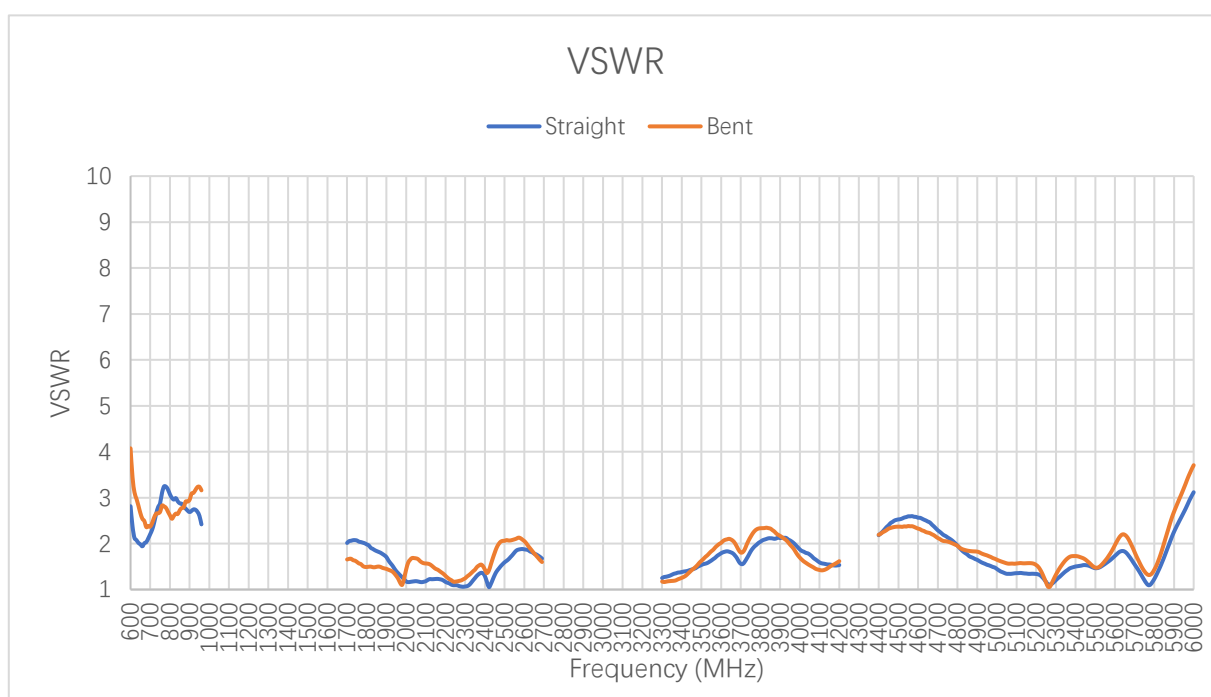
2 Drawing



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	2.8	2.1	2.3	3.0	2.7	2.4	1.8	2.1	2.1	1.8
Bent	4.1	3.0	2.5	2.7	3.0	3.2	2.3	1.7	1.6	1.5
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Straight	1.4	1.2	1.3	1.3	1.9	1.8	2.3	1.4	1.5	3.1
Bent	1.3	1.5	1.4	1.8	2.1	2.0	2.1	1.6	1.5	3.7

3.1.2. Return Loss

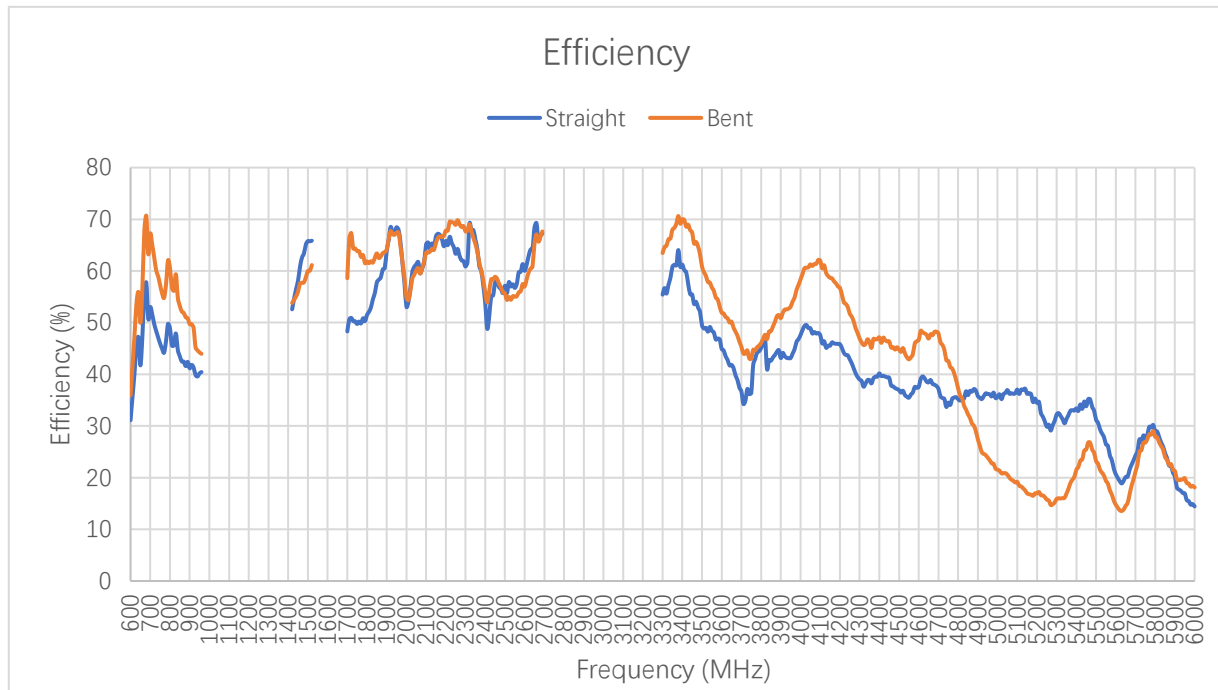


Return Loss (dB)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Straight	-6.5	-9.1	-8.1	-6.0	-6.8	-7.6	-10.9	-9.2	-9.1	-11.1
Bent	-4.4	-6.1	-7.5	-6.9	-6.1	-5.7	-7.9	-12.0	-12.4	-14.4
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Straight	-15.6	-19.8	-19.1	-17.2	-10.3	-11.0	-8.1	-14.7	-14.5	-5.8
Bent	-17.8	-14.2	-15.0	-10.9	-9.2	-9.4	-8.9	-12.2	-14.3	-4.8

3.2. Radiation Performance Test

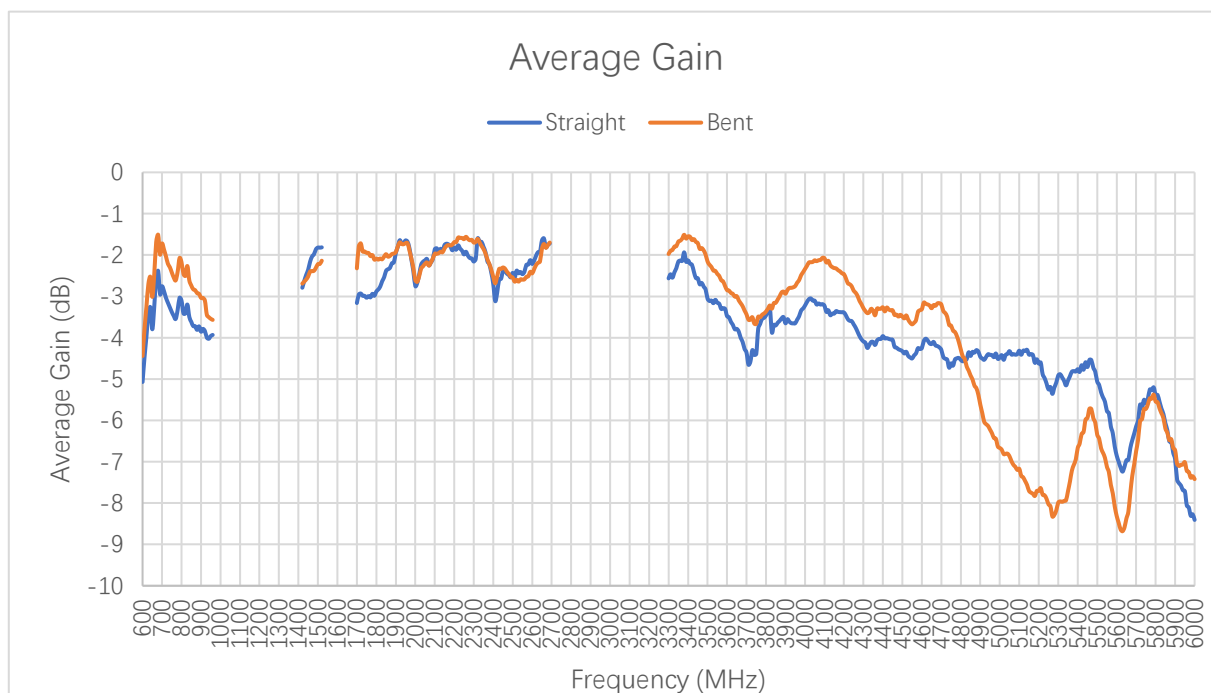
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Straight	31.1	45.6	51.6	47.9	41.2	40.4	58.1	50.6	50.3	60.3
Bent	36.0	53.7	65.1	59.4	49.7	44.0	56.0	66.2	64.4	63.5
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Straight	68.5	64.5	66.1	57.8	60.0	44.9	37.2	35.6	31.2	14.4
Bent	67.4	64.1	65.2	58.9	57.0	51.9	47.9	21.5	23.2	18.1

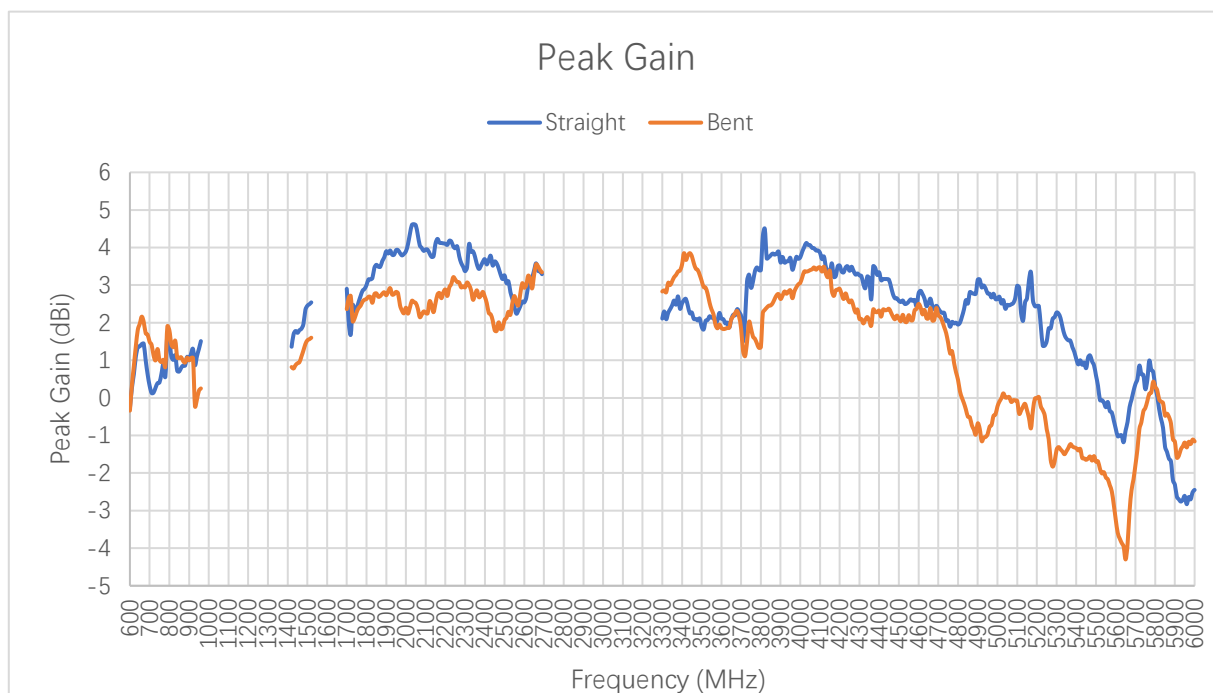
3.2.2. Average Gain



Average Gain (dB)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Straight	-5.1	-3.4	-2.9	-3.2	-3.9	-3.9	-2.4	-3.0	-3.0	-2.2
Bent	-4.4	-2.7	-1.9	-2.3	-3.0	-3.6	-2.5	-1.8	-1.9	-2.0
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Straight	-1.6	-1.9	-1.8	-2.4	-2.2	-3.5	-4.3	-4.5	-5.1	-8.4
Bent	-1.7	-1.9	-1.9	-2.3	-2.4	-2.8	-3.2	-6.7	-6.3	-7.4

3.2.3. Peak Gain



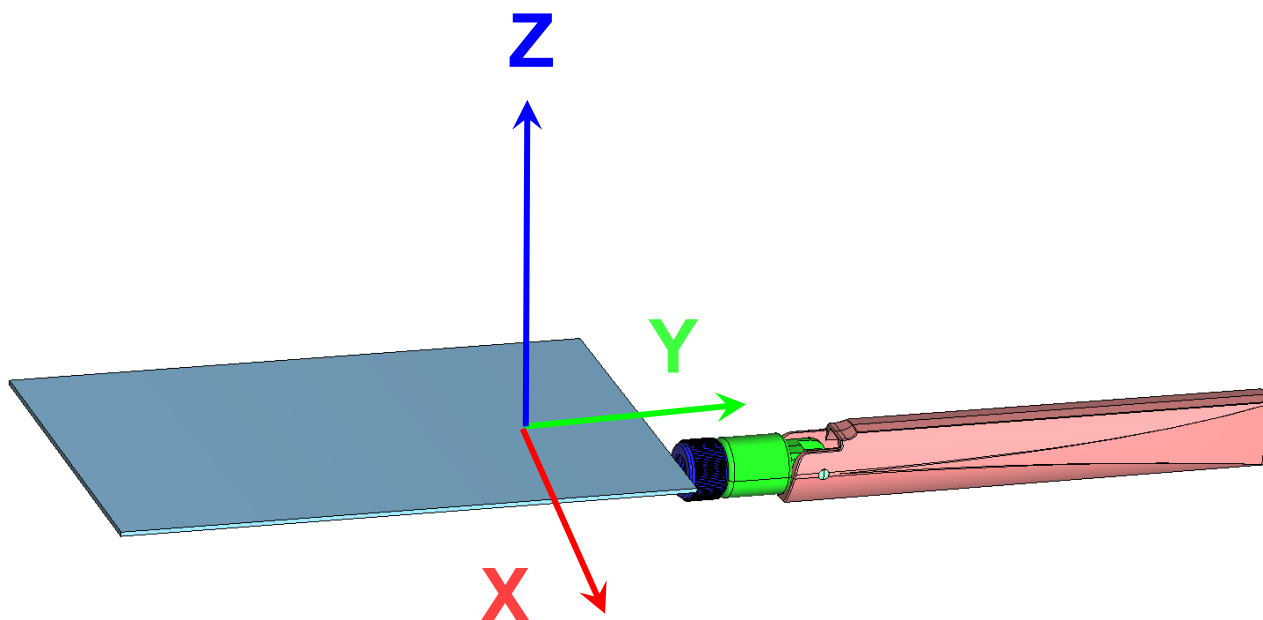
Peak Gain (dBi)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Straight	-0.3	1.1	0.1	1.1	1.0	1.5	1.7	2.0	2.3	3.6
Bent	-0.3	1.4	1.4	1.5	1.0	0.3	0.9	2.7	2.1	2.8
Frequency (MHz)	1950	2140	2350	2450	2600	3600	4700	5000	5500	6000
Straight	3.9	3.8	3.8	3.6	2.5	2.1	2.4	2.6	0.6	-2.5
Bent	2.8	2.3	2.7	1.8	2.9	1.9	2.2	-0.2	-1.7	-1.2

3.2.4. 3D & 2D Radiation Pattern

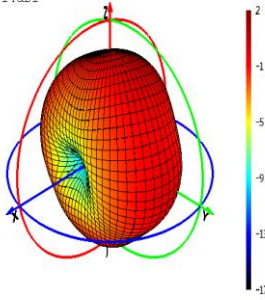
3.2.4.1. Test Condition: On 130 × 70 mm EVB and Straight

- Test Chamber: FS-S-1

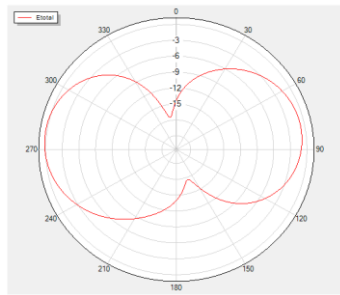


630 MHz

MAX:1.09dBi
MIN:-18.14dBi

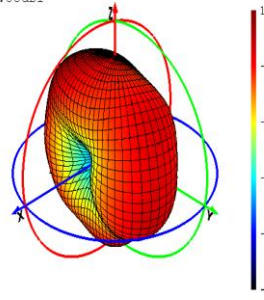


Theta=90 Freq=630MHz

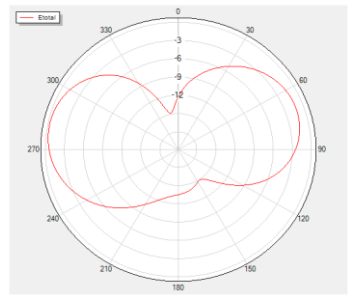


710 MHz

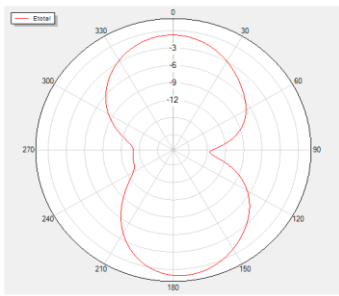
MAX:0.13dBi
MIN:-16.58dBi



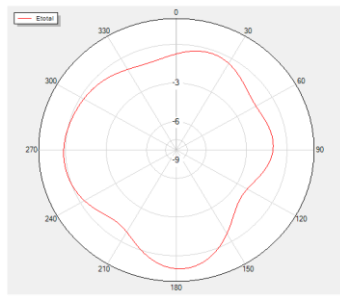
Theta=90 Freq=710MHz



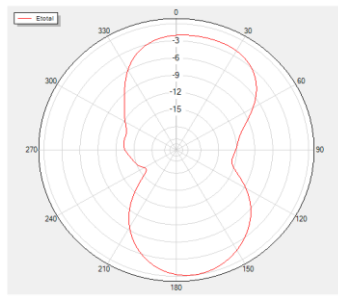
Phi=0 Freq=630MHz



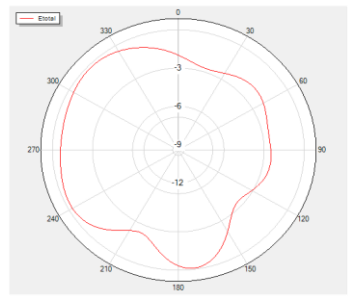
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Phi=0 Freq=710MHz

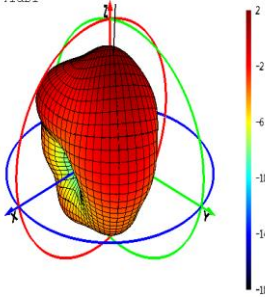


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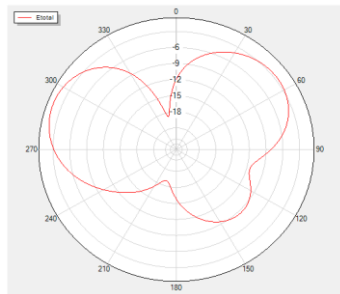


830 MHz

MAX:1.13dBi
MIN:-19.41dBi

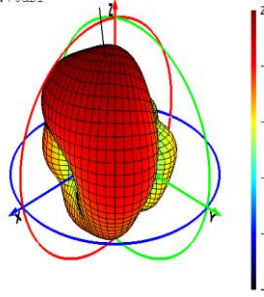


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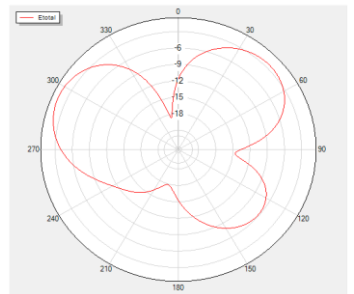


900 MHz

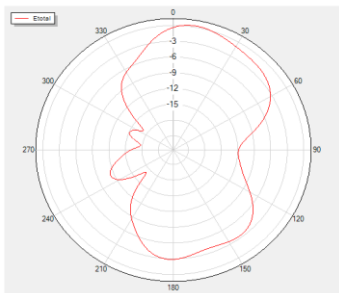
MAX:1dBi
MIN:-22.76dBi



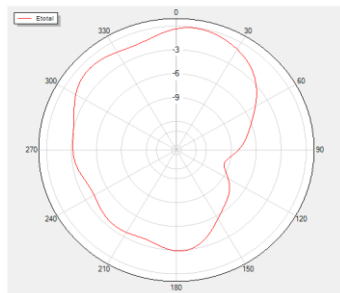
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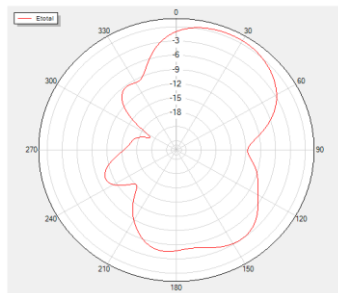
Phi=0 Freq=830MHz



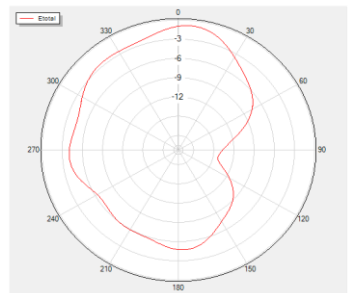
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Phi=0 Freq=900MHz

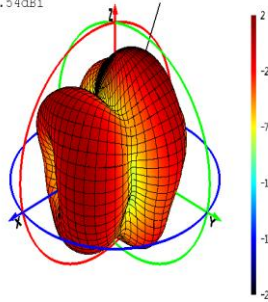


Phi=90 Freq=900MHz

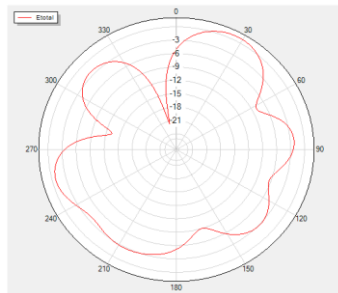


1440 MHz

MAX:1.78dBi
MIN:-21.54dBi

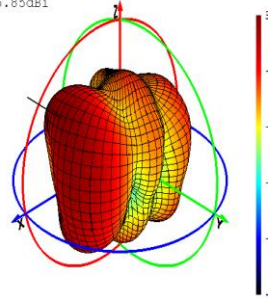


Theta=90 Freq=1440MHz

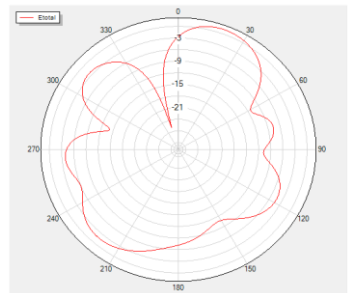


1740 MHz

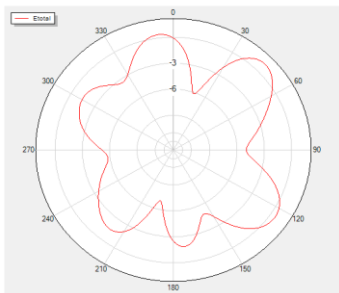
MAX:2.3dBi
MIN:-25.85dBi



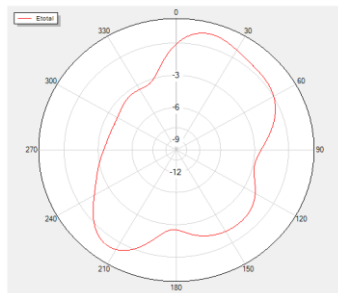
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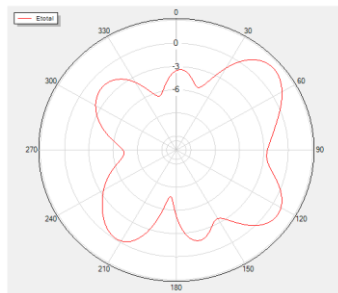
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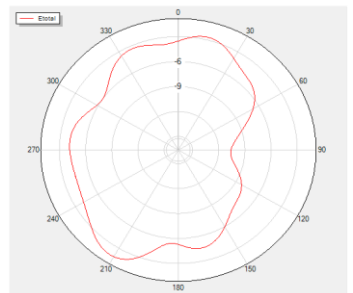
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Phi=0 Freq=1740MHz

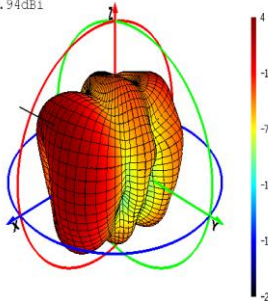


Phi=90 Freq=1740MHz

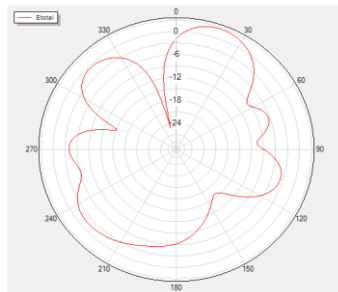


1880 MHz

MAX:3.64dBi
MIN:-24.94dBi

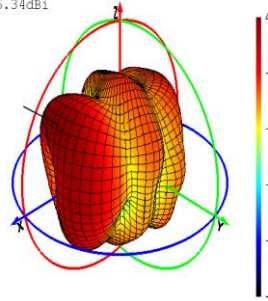


Theta=90 Freq=1880MHz

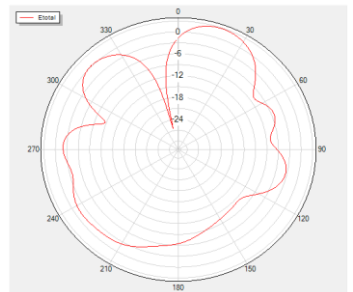


1950 MHz

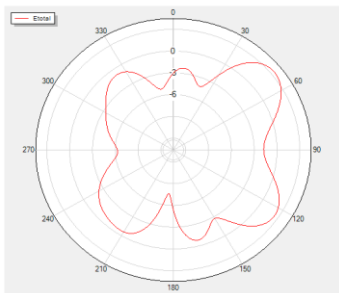
MAX:3.93dBi
MIN:-26.34dBi



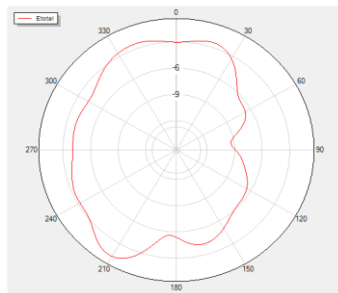
Theta=90 Freq=1950MHz



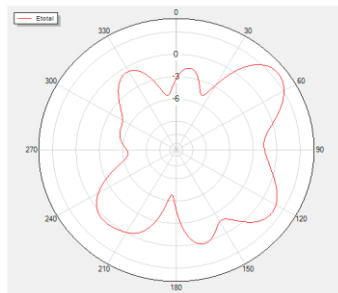
Phi=0 Freq=1880MHz



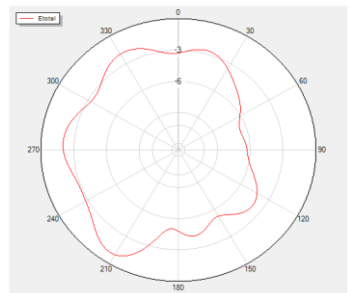
Phi=90 Freq=1880MHz



Phi=0 Freq=1950MHz

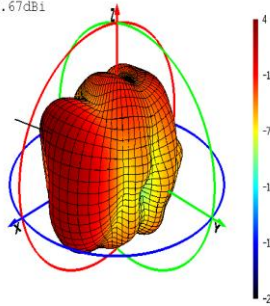


Phi=90 Freq=1950MHz

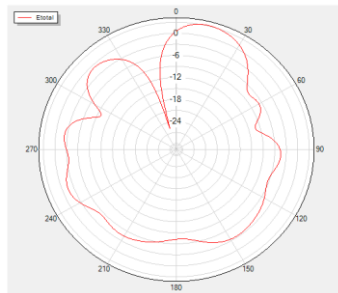


2140 MHz

MAX:3.77dBi
MIN:-25.67dBi

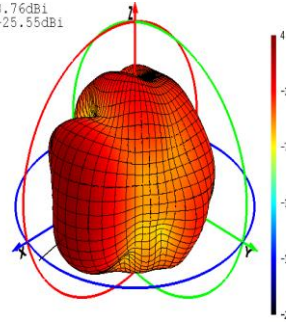


Theta=90 Freq=2140MHz

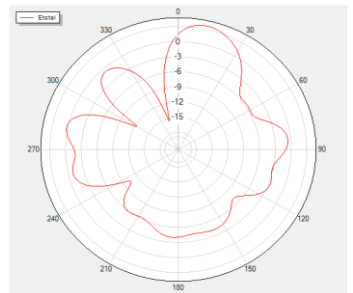


2350 MHz

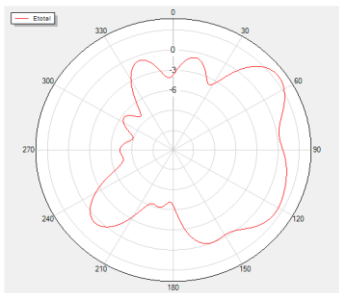
MAX:3.76dBi
MIN:-25.55dBi



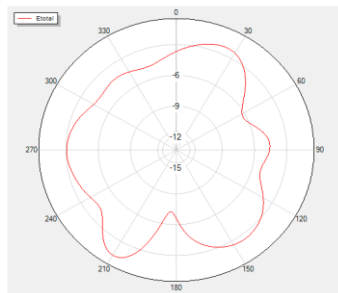
Theta=90 Freq=2350MHz



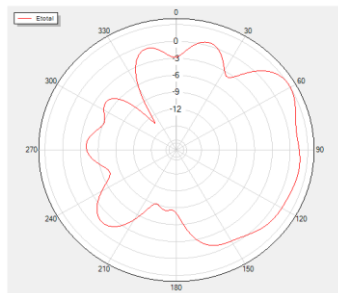
Phi=0 Freq=2140MHz



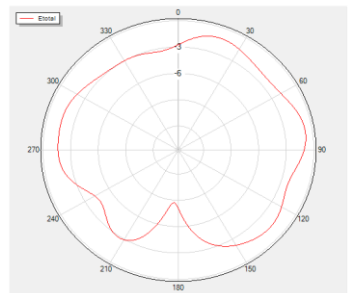
Phi=90 Freq=2140MHz



Phi=0 Freq=2350MHz

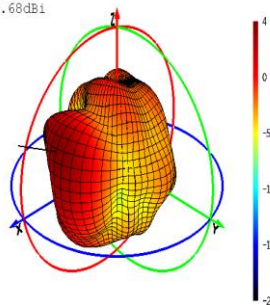


Phi=90 Freq=2350MHz

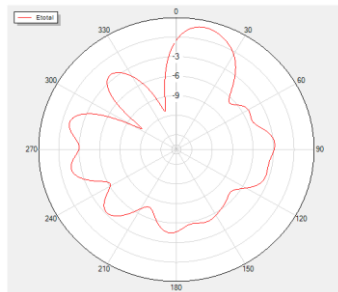


2450 MHz

MAX:3.63dBi
MIN:-20.68dBi

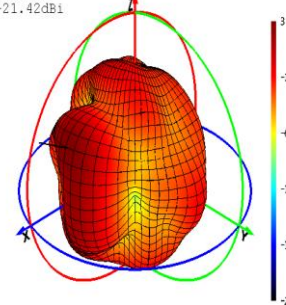


Theta=90 Freq=2450MHz

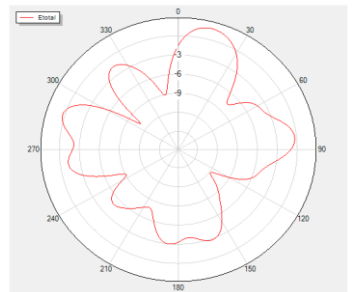


2600 MHz

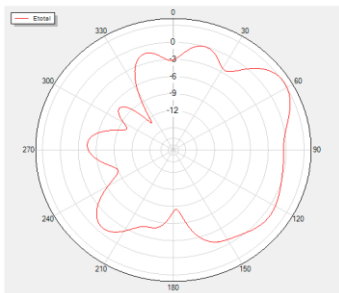
MAX:2.54dBi
MIN:-21.42dBi



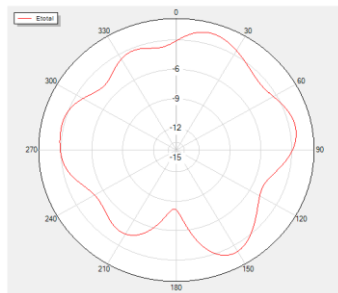
Theta=90 Freq=2600MHz



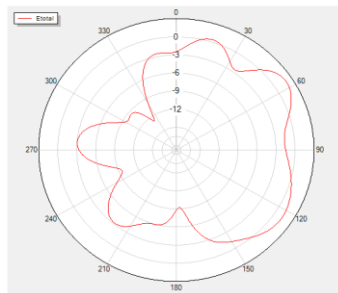
Phi=0 Freq=2450MHz



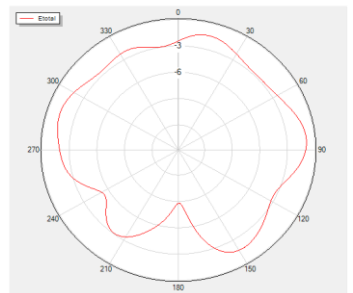
Phi=90 Freq=2450MHz



Phi=0 Freq=2600MHz

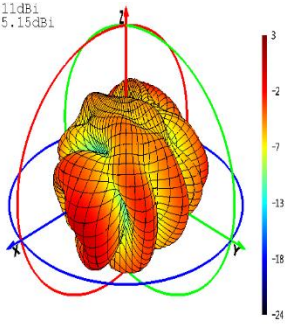


Phi=90 Freq=2600MHz

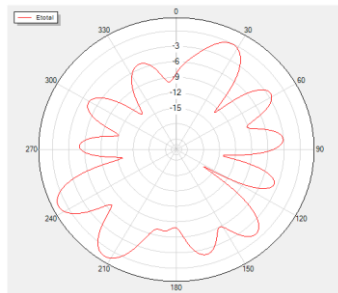


3600 MHz

MAX:2.11dBi
MIN:-25.15dBi

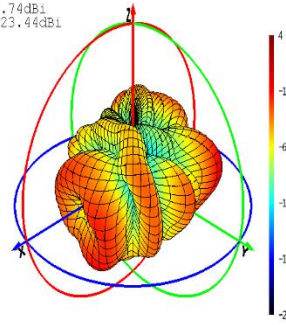


Theta=90 Freq=3600MHz

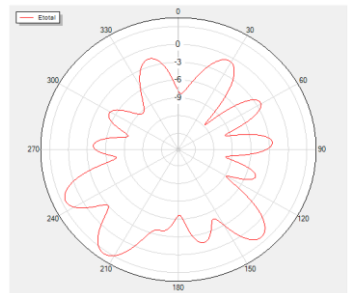


4000 MHz

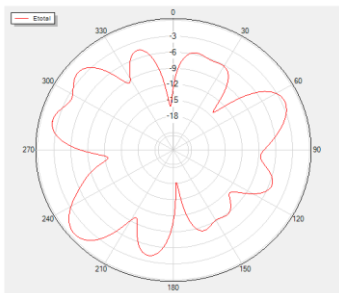
MAX:3.74dBi
MIN:-23.44dBi



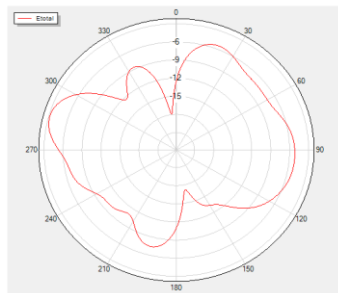
Theta=90 Freq=4000MHz



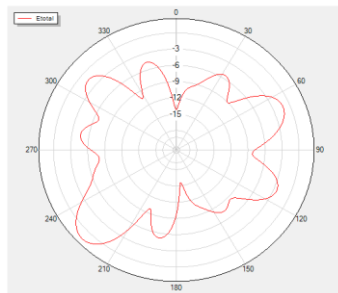
Phi=0 Freq=3600MHz



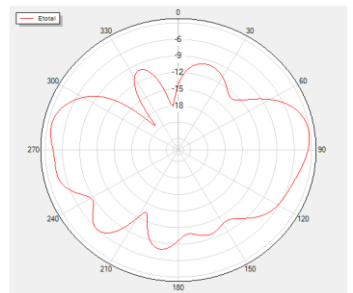
Phi=90 Freq=3600MHz



Phi=0 Freq=4000MHz

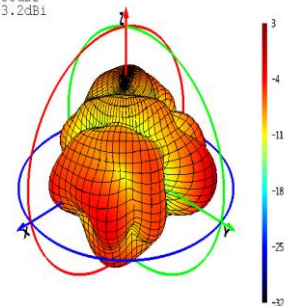


Phi=90 Freq=4000MHz

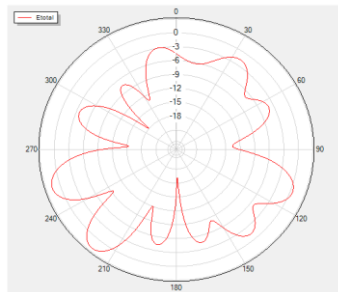


4700 MHz

MAX:2.38dBi
MIN:-33.2dBi

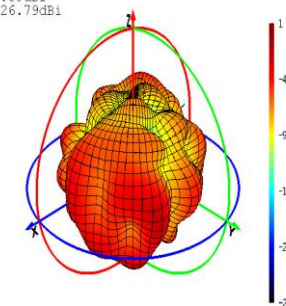


Theta=90 Freq=4700MHz

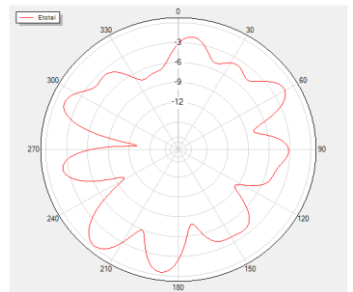


5500 MHz

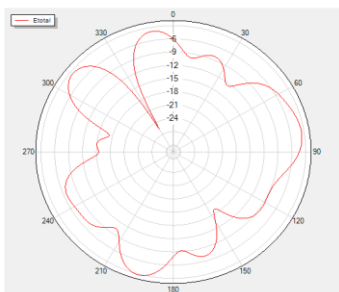
MAX:0.59dBi
MIN:-26.79dBi



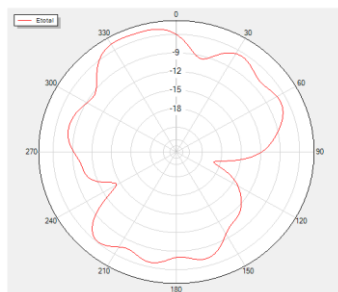
Theta=90 Freq=5500MHz



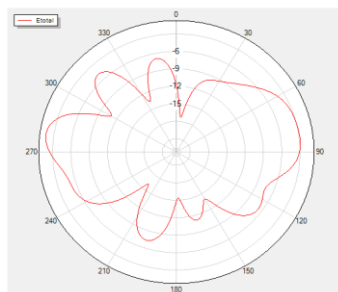
Phi=0 Freq=4700MHz



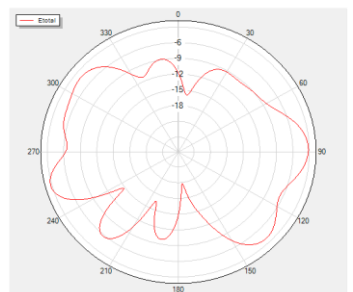
Phi=90 Freq=4700MHz



Phi=0 Freq=5500MHz

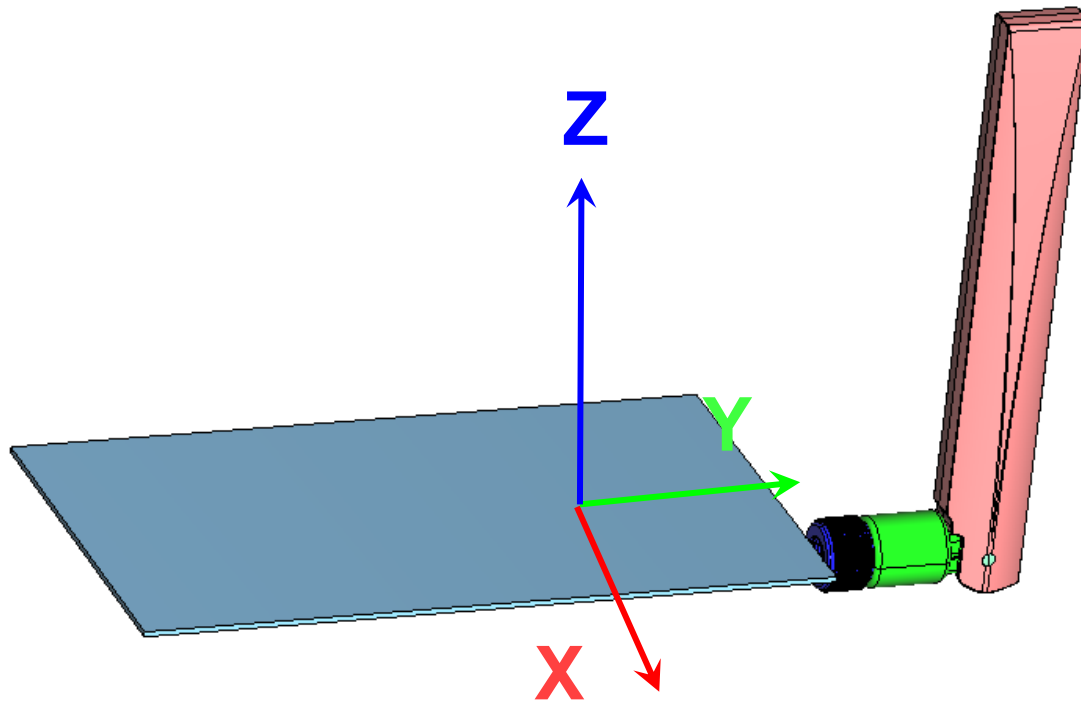


Phi=90 Freq=5500MHz



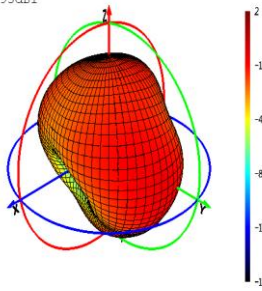
3.2.4.2. Test Condition: On 130 × 70 mm EVB and Bent

- Test Chamber: FS-S-1

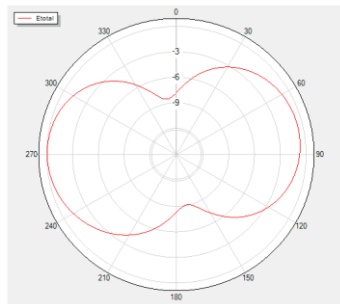


630 MHz

MAX:1.37dBi
MIN:-15.93dBi

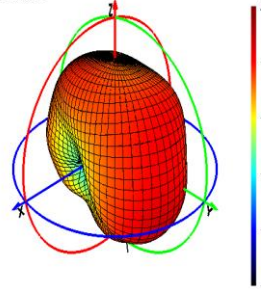


Theta=90 Freq=630MHz

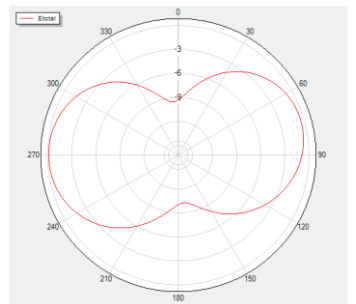


710 MHz

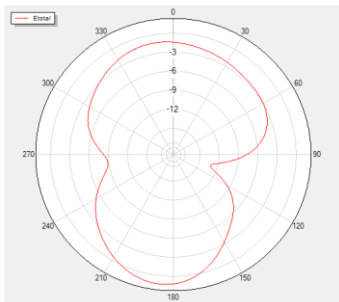
MAX:1.41dBi
MIN:-17.61dBi



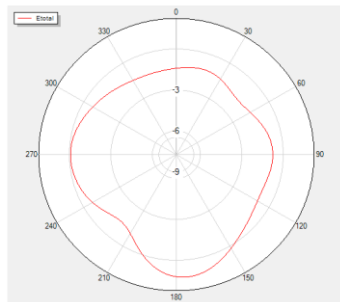
Theta=90 Freq=710MHz



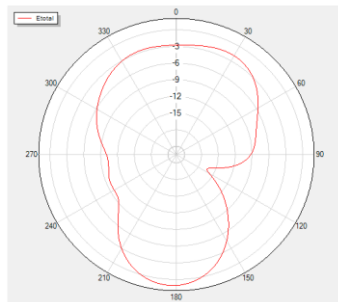
Phi=0 Freq=630MHz



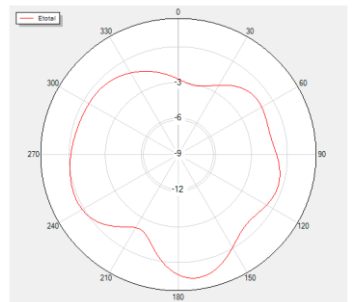
Phi=90 Freq=630MHz



Phi=0 Freq=710MHz

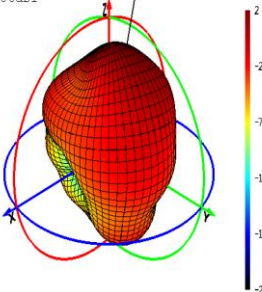


Phi=90 Freq=710MHz

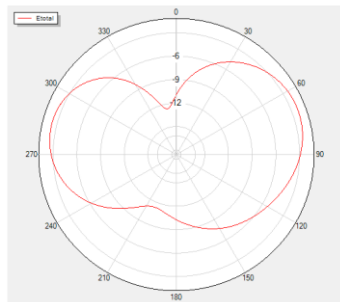


830 MHz

MAX:1.52dBi
MIN:-21.06dBi

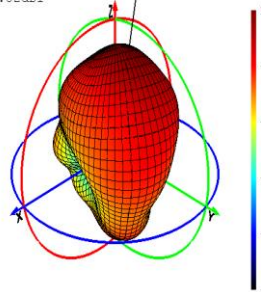


Theta=90 Freq=830MHz

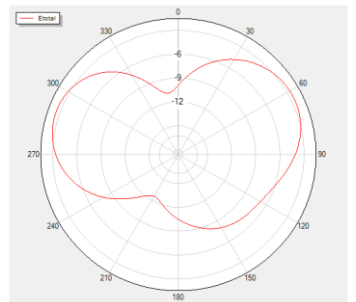


900 MHz

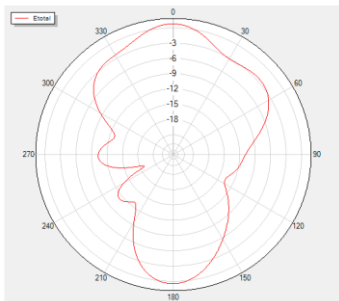
MAX:1dBi
MIN:-17.52dBi



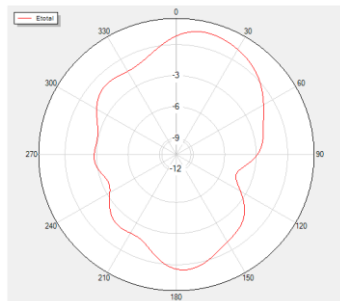
Theta=90 Freq=900MHz



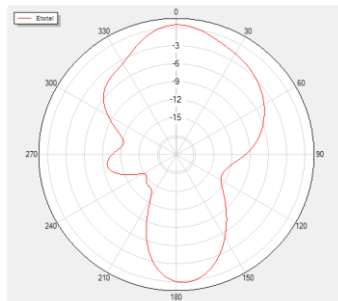
Phi=0 Freq=830MHz



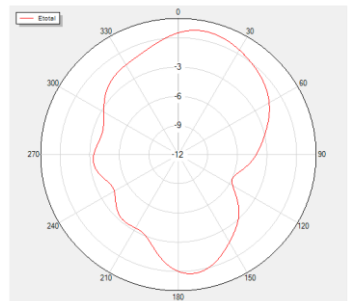
Phi=90 Freq=830MHz



Phi=0 Freq=900MHz

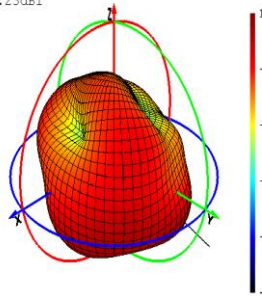


Phi=90 Freq=900MHz

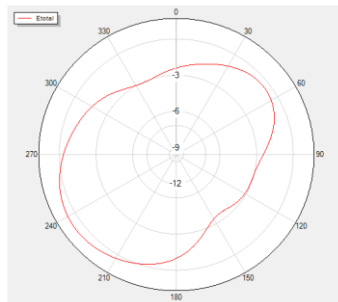


1440 MHz

MAX:0.87dBi
MIN:-20.23dBi

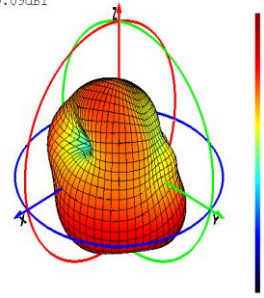


Theta=90 Freq=1440MHz

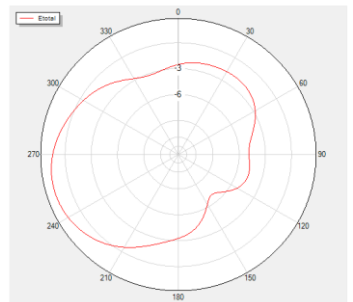


1740 MHz

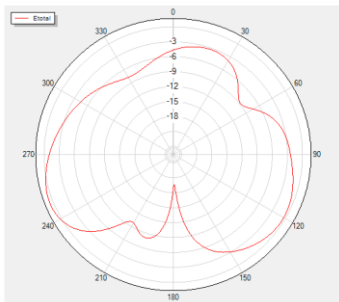
MAX:2.12dBi
MIN:-19.09dBi



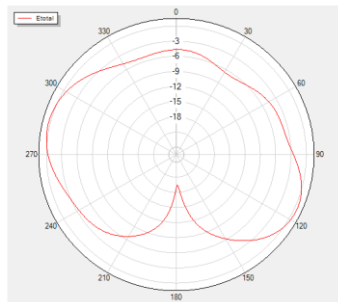
Theta=90 Freq=1740MHz



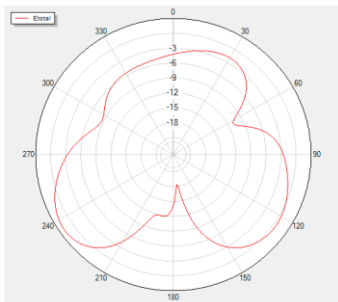
Phi=0 Freq=1440MHz



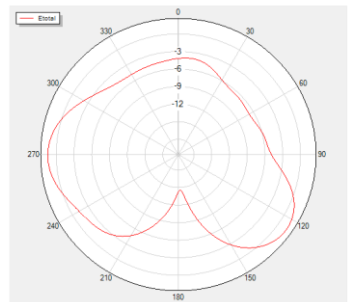
Phi=90 Freq=1440MHz



Phi=0 Freq=1740MHz

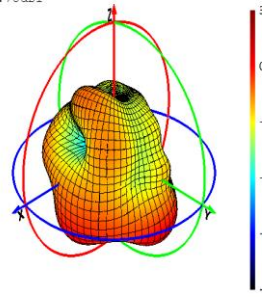


Phi=90 Freq=1740MHz

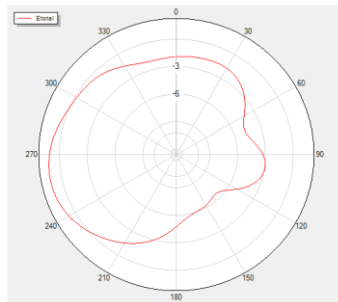


1880 MHz

MAX:2.77dBi
MIN:-14.78dBi

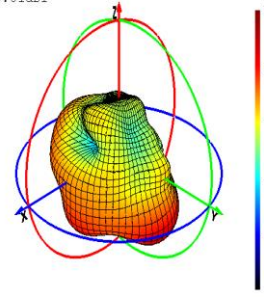


Theta=90 Freq=1880MHz

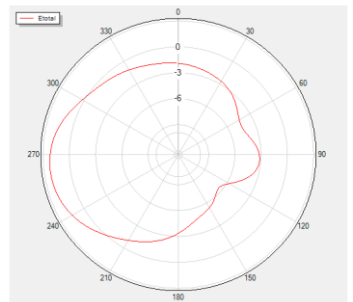


1950 MHz

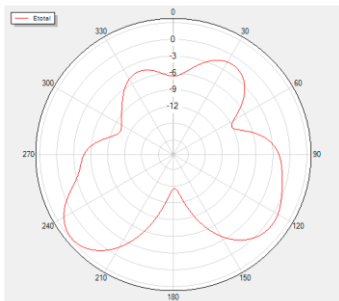
MAX:2.82dBi
MIN:-15.01dBi



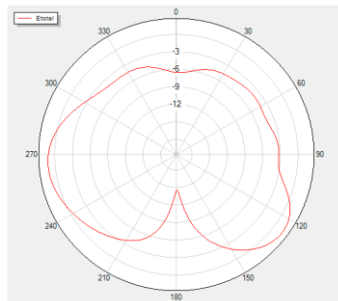
Theta=90 Freq=1950MHz



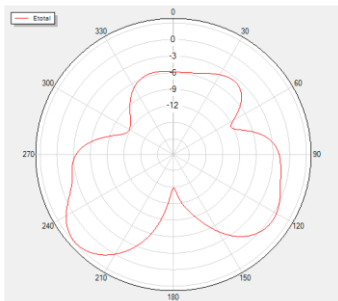
Phi=0 Freq=1880MHz



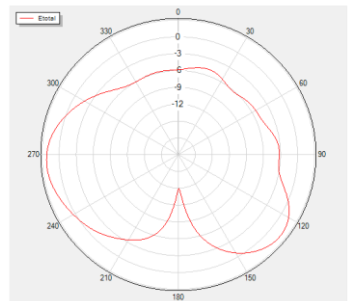
Phi=90 Freq=1880MHz



Phi=0 Freq=1950MHz

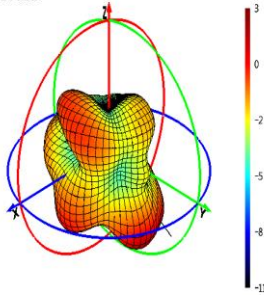


Phi=90 Freq=1950MHz

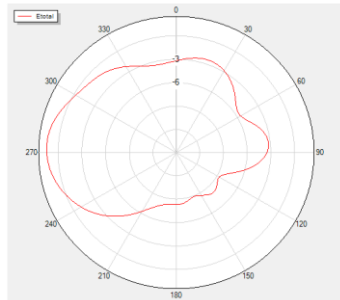


2140 MHz

MAX:2.28dB1
MIN:-12.16dB1

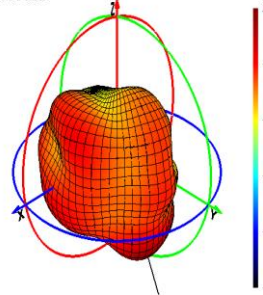


Theta=90 Freq=2140MHz

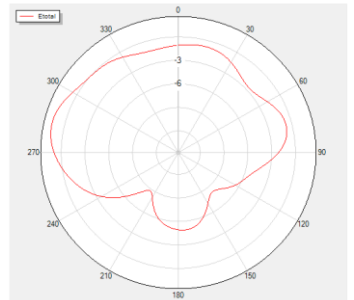


2350 MHz

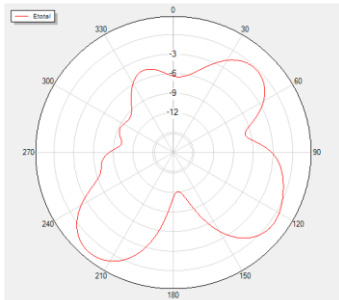
MAX:2.74dB1
MIN:-20.33dB1



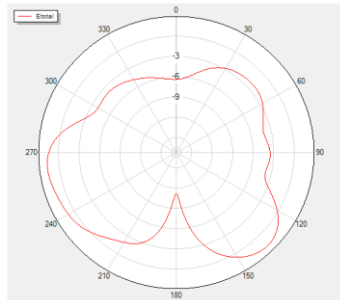
Theta=90 Freq=2350MHz



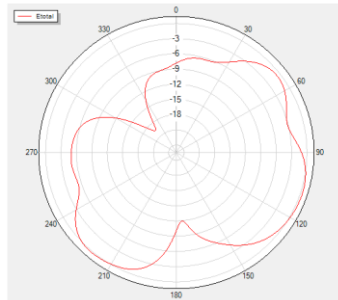
Phi=0 Freq=2140MHz



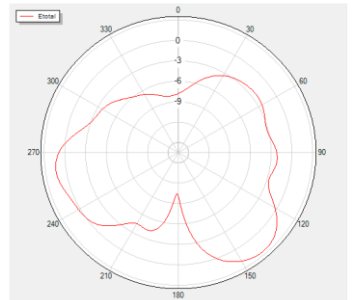
Phi=90 Freq=2140MHz



Phi=0 Freq=2350MHz

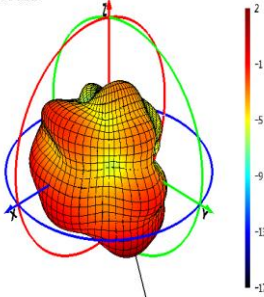


Phi=90 Freq=2350MHz

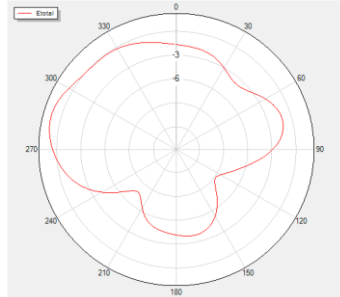


2450 MHz

MAX:1.8dB1
MIN:-17.53dB1

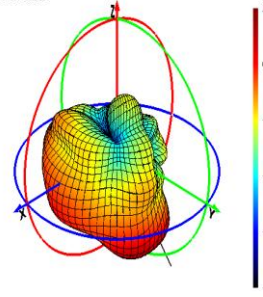


Theta=90 Freq=2450MHz

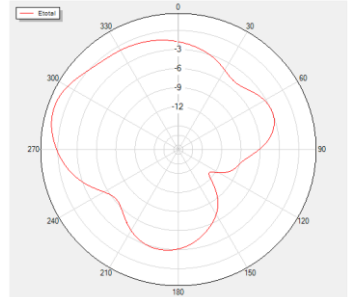


2600 MHz

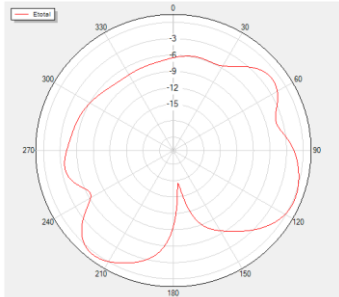
MAX:2.93dB1
MIN:-16.67dB1



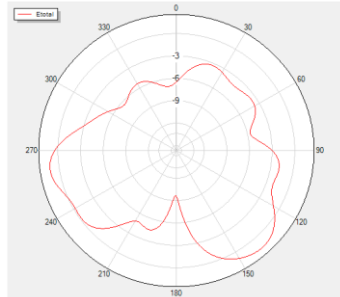
Theta=90 Freq=2600MHz



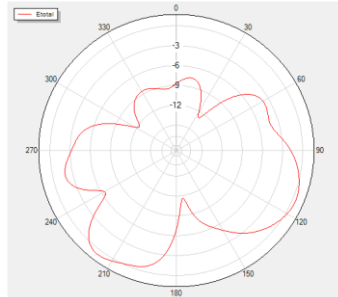
Phi=0 Freq=2450MHz



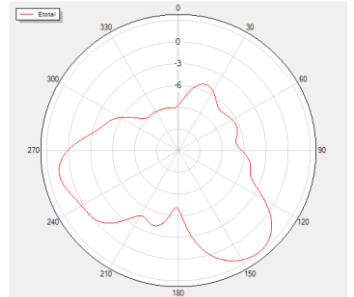
Phi=90 Freq=2450MHz



Phi=0 Freq=2600MHz

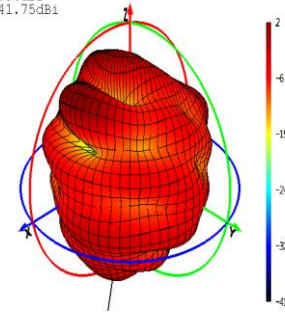


Phi=90 Freq=2600MHz

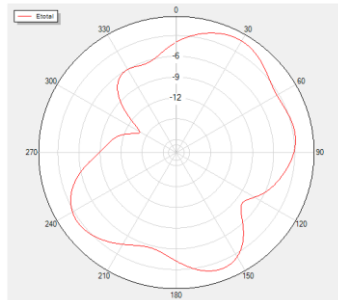


3600 MHz

MAX:1.86dBi
MIN:-41.75dBi

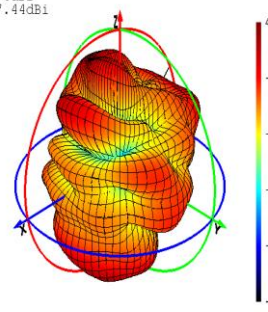


Theta=90 Freq=3600MHz

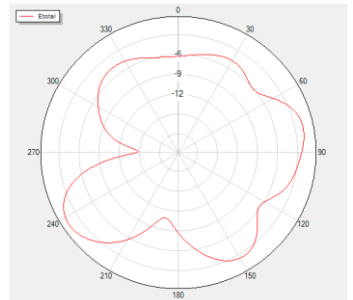


4000 MHz

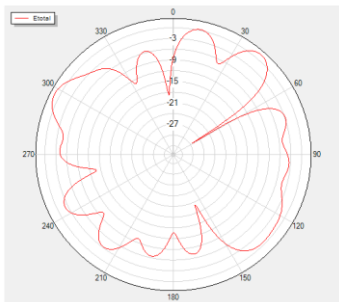
MAX:3.06dBi
MIN:-27.44dBi



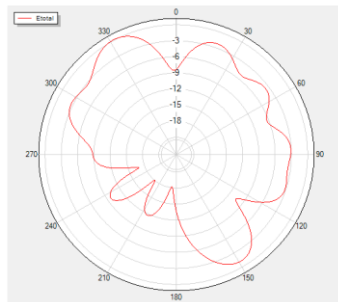
Theta=90 Freq=4000MHz



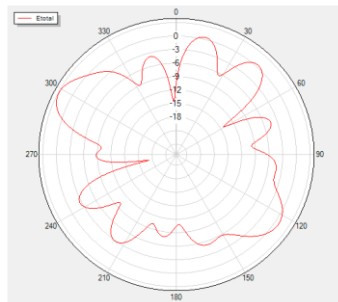
Phi=0 Freq=3600MHz



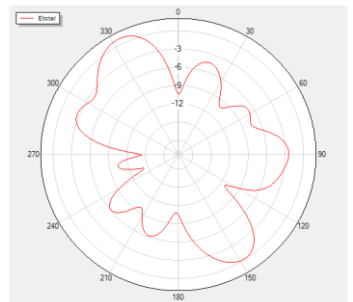
Phi=90 Freq=3600MHz



Phi=0 Freq=4000MHz

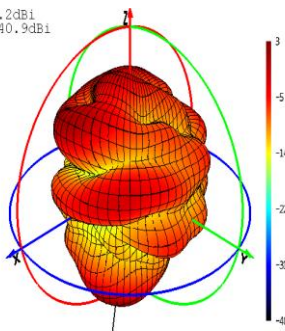


Phi=90 Freq=4000MHz

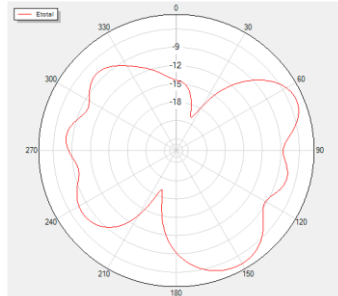


4700 MHz

MAX:2.2dBi
MIN:-40.9dBi

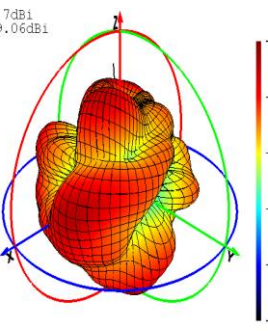


Theta=90 Freq=4700MHz

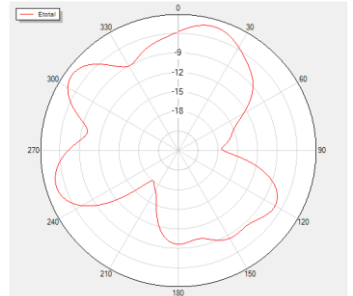


5500 MHz

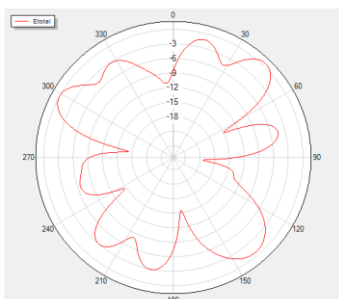
MAX:-1.7dBi
MIN:-29.06dBi



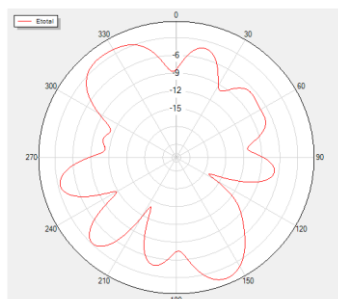
Theta=90 Freq=5500MHz



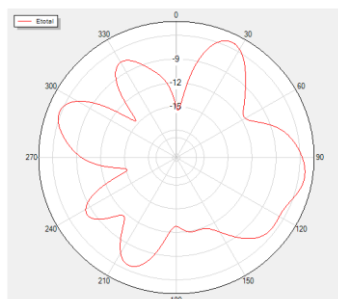
Phi=0 Freq=4700MHz



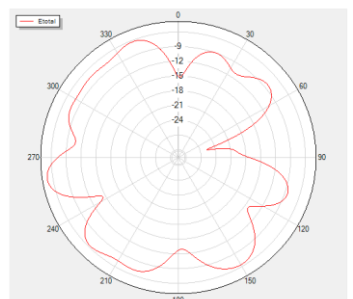
Phi=90 Freq=4700MHz



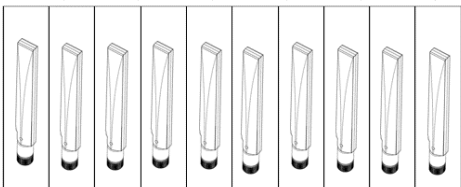
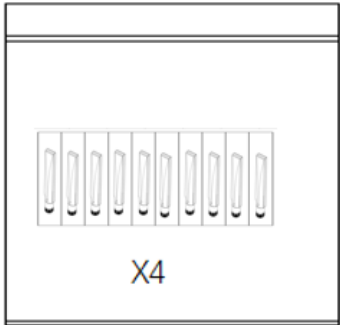
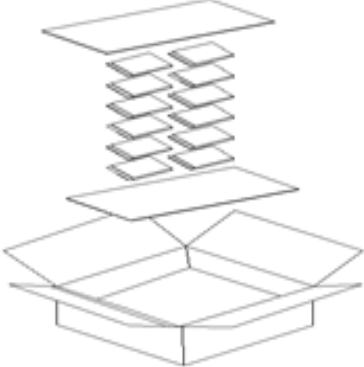
Phi=0 Freq=5500MHz

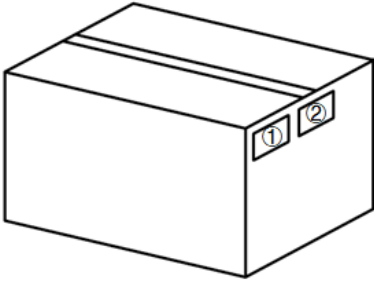
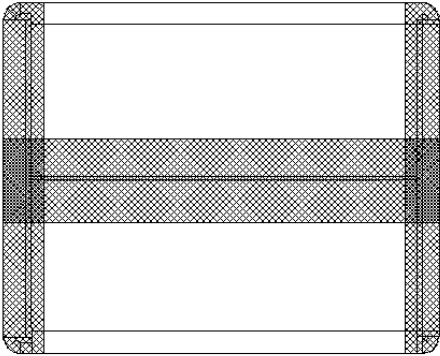


Phi=90 Freq=5500MHz



4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		10 pcs antenna products in a one-piece bag. (10 PCS / One-piece Bag)
2		40 pcs antenna products in a PE bag. (40 PCS / PE Bag)
3		(16 PE Bags / Carton Box) (640 PCS Antenna / 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 “I” type 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

At Quectel, our aim is to provide timely and comprehensive services to our customers. If you require any assistance, please contact our headquarters:

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

<http://www.quectel.com/support/sales.htm>.

For technical support, or to report documentation errors, 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	2024-05-12	Mordecai LIU/ Lance SUN/ David LIU/ Rainey LIAO	First official release
1.1	2024-07-16	Mordecai LIU	Updated all the test data



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