

Echo 44

5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

Key Features

- 2.4 GHz, 5 GHz and 6 GHz support
- Supports Wi-Fi 7 (802.11be), Wi-Fi 6e (802.11ax), Wi-Fi 6 (802.11ax), Wi-Fi 5 (802.11ac)
- Support 5G C-band n48, n77, n78
- Supports Bluetooth / Zigbee / IEEE 802.15.4 / ISM 2.4 GHz / ISM 5.8 GHz
- Compact size
- Adhesive mount

Additional Considerations

- Omnidirectional
- Ground Plane independent
- Can be mounted on curved surfaces (inside radius of 100 mm)
- Covers UWB and 5G bands in the 2-8 GHz range

General Description

The Echo 44 is a flexible printed circuit antenna designed for Wi-Fi 6E and Wi-Fi 7 technologies, operating efficiently across the 2.4 GHz, 5 GHz, and 6 GHz Wi-Fi bands. With an exceptional radiation efficiency of up to 90%, a low VSWR, and a gain of 3-5 dBi, this omnidirectional antenna ensures robust coverage across the Wi-Fi spectrum.

The Echo 44 also supports the 5G C-bands n48, n77, and n78, enhancing its versatility in modern communication applications.

Constructed with a flexible polyimide (PI) substrate, etched with precision copper tracks for radiating elements, and backed with an adhesive layer for easy mounting, this ground plane independent antenna can be positioned on both flat and curved surfaces without compromising RF performance. This capability allows for versatile placements in applications where mounting flexibility and space optimisation are paramount.

Terminated with 100 mm of 1.13 mm coaxial cable, with I-PEX MHF1 (uFL) or I-PEX MHF4 connectors as standard, the Echo 44 can be customised with other cable lengths and connector types for high volume projects.

A Adhesive	E Embedded	WiFi 7 802.11be	WiFi 6e 802.11ax	WiFi 6 802.11ax
WiFi 5 802.11ac	WiFi 4 802.11n	WLAN 2400	WLAN 5800	WiFi 2.4G & 5G
IEEE 802.15.4	ISM 2.4G	ISM 5.8G	BLE Bluetooth	ZB Zigbee
Z Wave	UWB Ultra-Wideband	5G New Radio	4G LTE	

Echo 44

5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

Electrical Specifications

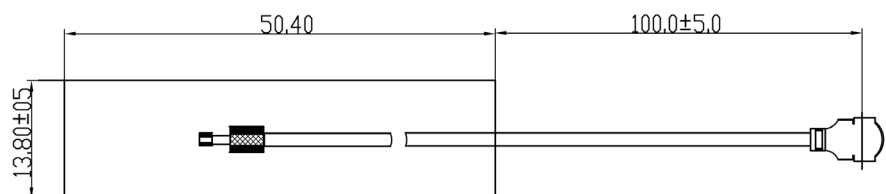
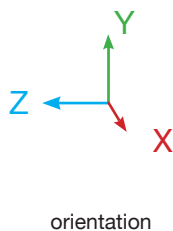
Impedance:	50 Ohm
Polarization:	Vertical
Max input power:	50 W
Ground plane independent:	Yes

Environmental Specifications

Operating temperature range:	-40 to +75 °C
Storage temperature range:	-40 to +80 °C

Mechanical Specifications

Dimensions:	50.40 mm Length, 13.80 mm Width, 0.22 mm Height
Weight:	1g
Connector:	I-PEX MHF1 (UFL), I-PEX MHF4
Mounting method:	Adhesive
Housing materials:	Halogen-free epoxy resin adhesive/ Polyimide film / Copper foil

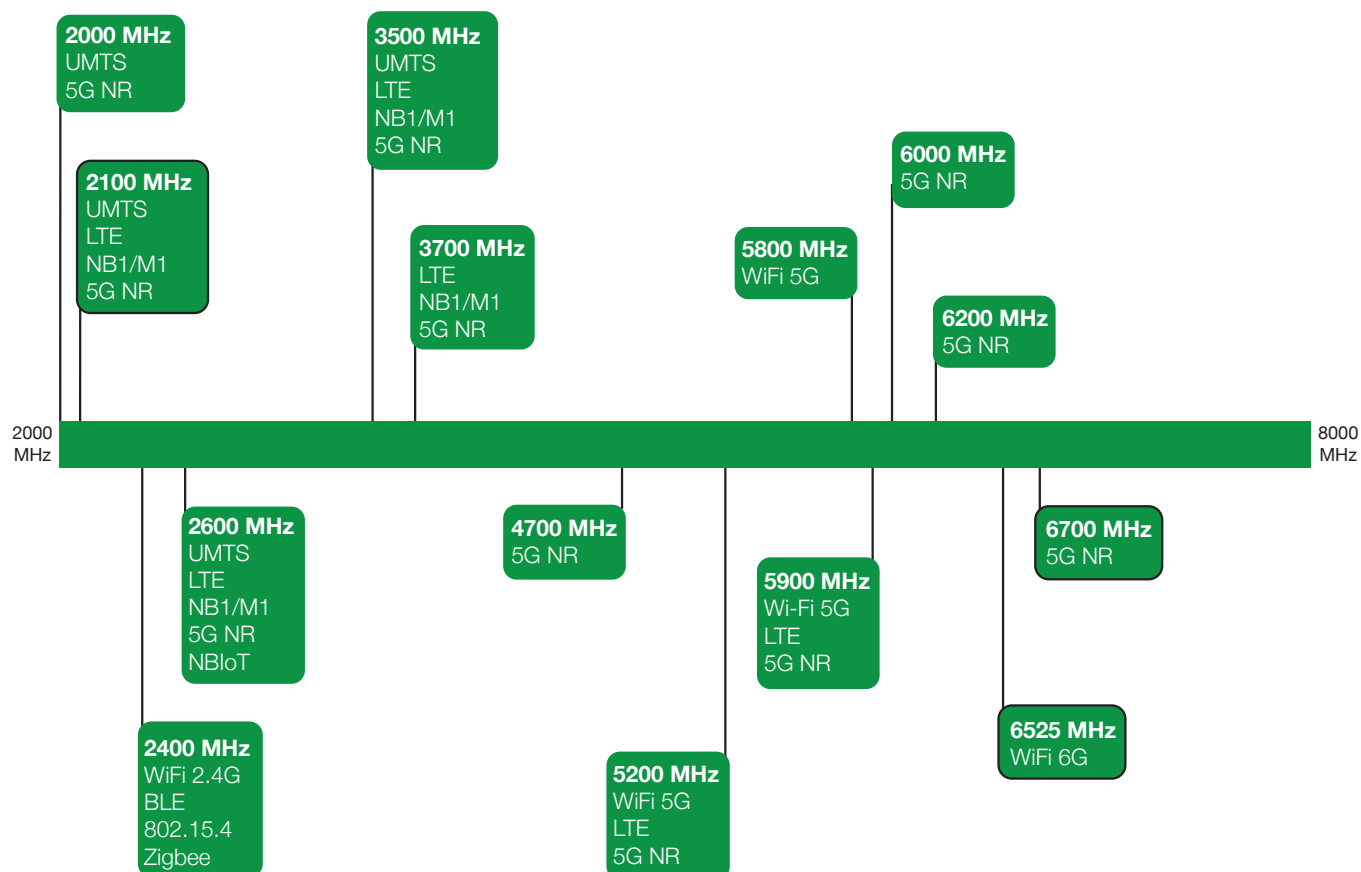




Echo 44

5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

Spectrum Coverage



● Suitable band

● Adequate band in good signal conditions

● Likely to be unsuitable

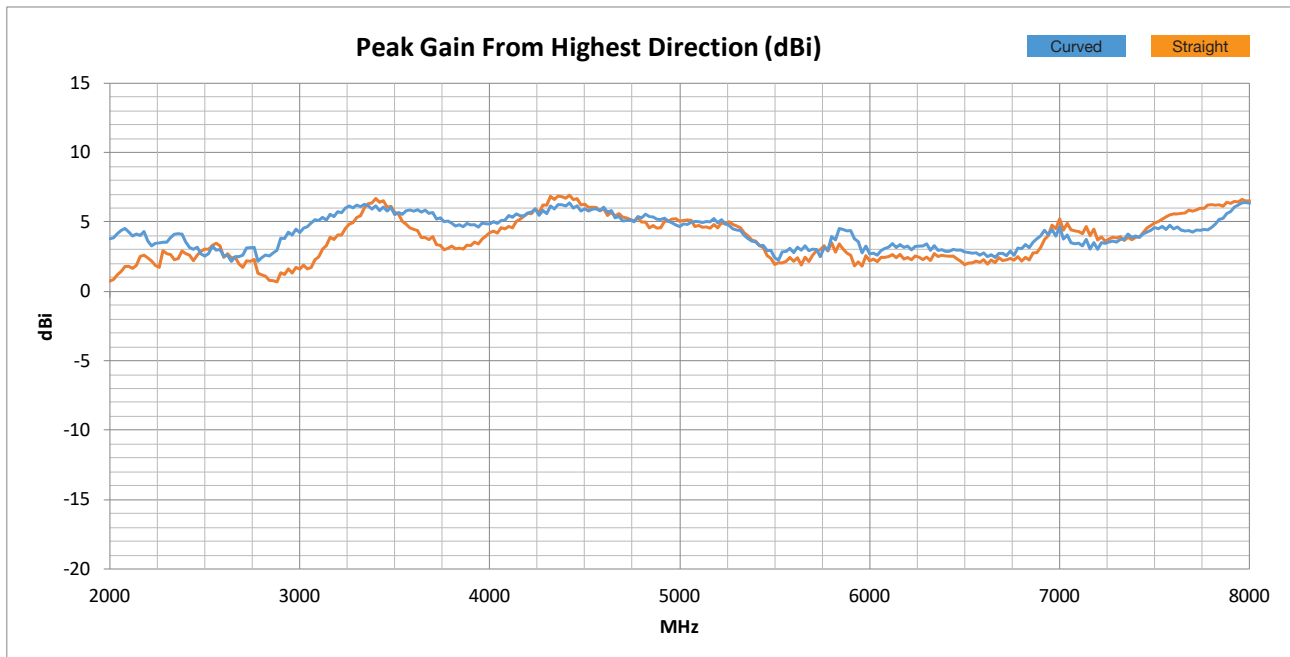




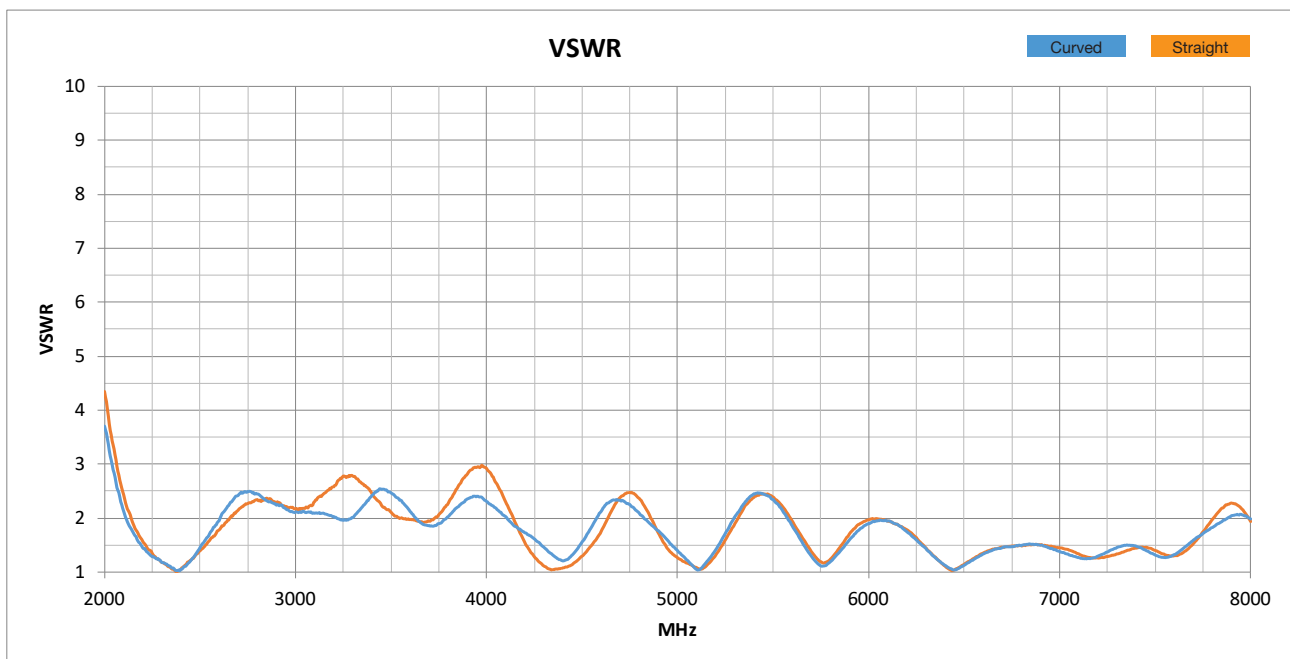
Echo 44

5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

Peak Gain vs. Frequency



VSWR

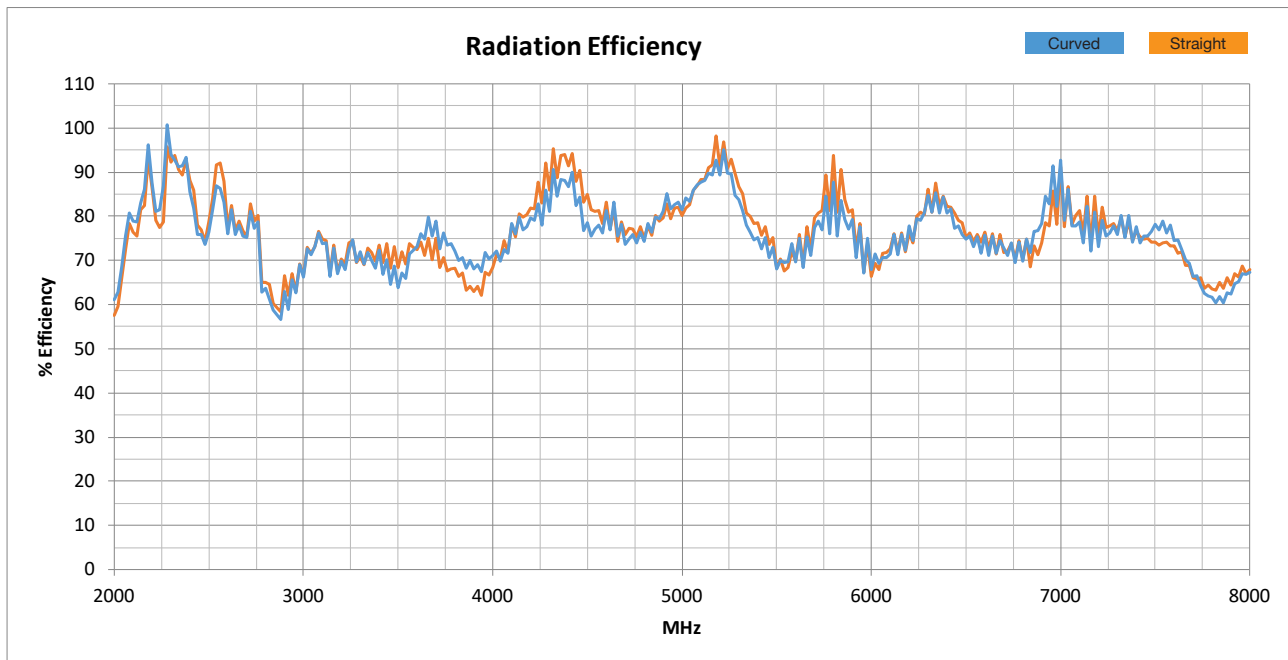




Echo 44

5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

Radiation Efficiency





Echo 44

5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

Usable Cellular Frequency Support (2000 MHz – 6700 MHz)

	2000	2100	2300	2400	2500	2600	3300	3500	3700	4700	5200	5900			
GSM Bands:	●	●	●	●	●	●	●	●	●	●	●	●			
UMTS Bands:	●	●	●	●	●	●	●	●	●	●	●	●			
LTE Bands:	●	●	●	●	●	●	●	●	●	●	●	●			
LTE Cat M Bands:	●	●	●	●	●	●	●	●	●	●	●	●			
LTE Cat NB Bands:	●	●	●	●	●	●	●	●	●	●	●	●			
5G NR Bands:	●	●	●	●	●	●	●	●	●	●	●	●			
NR Cat NB Bands:	●	●	●	●	●	●	●	●	●	●	●	●			

Usable ISM Frequency Support (2450 MHz - 6525 MHz)

	2450	5800	6525
Bluetooth	●		
IEEE 802.15.4	●		
ISM 2.4G	●		
ISM 5.8G		●	
Wi-Fi 2.4G	●		
Wi-Fi 5G		●	
Wi-Fi 6E			●
Zigbee	●		



Echo 44

5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

Cellular Standards Band Support

GSM (2G) Band	UMTS (3G) Band	E-UTRA (4G) Band	Cat M E-UTRA Band	Cat NB E-UTRA Band	NR (5G) Band	Cat NB NR (5G) Band	Uplink	Downlink	Average Upload Efficiency (%)	Average Download Efficiency (%)	Maximum Upload VSWR	Maximum Download VSWR	Use Indicator
	7	7	7	7	n7	n7	2500 - 2570 MHz	2620 - 2690 MHz	87.55	78.11	1.66	2.12	●
	22	22					3410 - 3490 MHz	3510 - 3590 MHz	71.14	71.84	2.40	2.07	●
		30			n30		2305 - 2315 MHz	2350 - 2360 MHz	93.01	89.64	1.18	1.06	●
		34			n34		2010 - 2025 MHz	2010 - 2025 MHz	59.50	59.50	4.16	4.16	●
		38			n38		2570 - 2620 MHz	2570 - 2620 MHz	82.84	82.84	1.86	1.86	●
		40	40		n40		2300 - 2400 MHz	2300 - 2400 MHz	91.30	91.30	1.18	1.18	●
		41	41	41	n41	n41	2496 - 2690 MHz	2496 - 2690 MHz	82.74	82.74	2.12	2.12	●
		42	42	42			3400 - 3600 MHz	3400 - 3600 MHz	71.39	71.39	2.45	2.45	●
		43	43	43			3600 - 3800 MHz	3600 - 3800 MHz	71.04	71.04	2.28	2.28	●
		46			n46		5150 - 5925 MHz	5150 - 5925 MHz	80.83	80.83	2.45	2.45	●
		47			n47		5855 - 5925 MHz	5855 - 5925 MHz	79.98	79.98	1.81	1.81	●
		48	48	48	n48		3550 - 3700 MHz	3550 - 3700 MHz	72.87	72.87	2.01	2.01	●
		49					3550 - 3700 MHz	3550 - 3700 MHz	72.87	72.87	2.01	2.01	●
		52					3300 - 3400 MHz	3300 - 3400 MHz	71.11	71.11	2.78	2.78	●
		53			n53		2483.5 - 2495 MHz	2483.5 - 2495 MHz	76.34	76.34	1.38	1.38	●
		69					N/A	2570 - 2620 MHz	N/A	82.84	N/A	1.86	●
					n77		3300 - 4200 MHz	3300 - 4200 MHz	70.88	70.88	2.98	2.98	●
					n78		3300 - 3800 MHz	3300 - 3800 MHz	71.19	71.19	2.78	2.78	●
					n79		4400 - 5000 MHz	4400 - 5000 MHz	80.66	80.66	2.48	2.48	●
					n90	n90	2496 - 2690 MHz	2496 - 2690 MHz	82.74	82.74	2.12	2.12	●
					n95		2010 - 2025 MHz	N/A	59.50	N/A	4.16	N/A	●
					n96		5925 - 7125 MHz	5925 - 7125 MHz	76.39	76.39	1.99	1.99	●
					n97		2300 - 2400 MHz	N/A	91.30	N/A	1.18	N/A	●
					n102		5925 - 6425 MHz	5925 - 6425 MHz	76.39	76.39	1.99	1.99	●
					n104		6425 - 7125 MHz	6425 - 7125 MHz	76.40	76.40	1.52	1.52	●

● Suitable band

● Adequate band in good signal conditions

● Likely to be unsuitable

ISM Standards Frequency Support

Application	Frequency Range	Efficiency (%)	Maximum VSWR	Peak Gain from highest direction (dBi)	Use Indicator
ISM 2.4 GHz	2400 - 2500 MHz	79.70	1.40	3.05	●
Wi-Fi 2.4G	2401 - 2483 MHz	80.20	1.33	2.91	●
Wi-Fi 2.4G (USA)	2401 - 2473 MHz	80.95	1.30	2.79	●
Wi-Fi 2.4G (Japan)	2401 - 2495 MHz	79.70	1.38	3.01	●
Wi-Fi 5G (all channels)	5150 - 5990 MHz	80.21	2.45	5.02	●
Wi-Fi 5G (Ch 32-48)	5150 - 5250 MHz	93.76	1.60	4.95	●
Wi-Fi 5G (Ch 32-64)	5150 - 5330 MHz	91.38	2.08	5.02	●
Wi-Fi 5G (Ch 32-161)	5150 - 5815 MHz	80.60	2.45	5.02	●
Wi-Fi 5G (Ch 32-173)	5150 - 5875 MHz	80.98	2.45	5.02	●
Wi-Fi 6E (Ch 1-93)	5925 - 6425 MHz	76.39	1.99	2.72	●
Wi-Fi 6E (all channels)	5925 - 7125 MHz	76.39	1.99	5.22	●
ISM 5.8 GHz	5725 - 5875 MHz	85.49	1.58	3.50	●
UWB band 1	3168 - 3696 MHz	71.47	2.79	6.69	●
UWB band 2	3696 - 4224 MHz	70.80	2.98	5.67	●
UWB band 3	4224 - 4752 MHz	84.52	2.48	6.93	●
UWB band 4	4752 - 5280 MHz	84.48	2.47	5.29	●
UWB band 5	5280 - 5808 MHz	77.40	2.45	4.82	●
UWB band 6	5808 - 6336 MHz	76.54	1.99	3.42	●
UWB band 7	6336 - 6864 MHz	75.98	1.51	2.77	●
UWB band 8	6864 - 7392 MHz	78.99	1.52	5.22	●
UWB band 9	7392 - 7920 MHz	69.58	2.28	6.48	●

● Suitable band

● Adequate band in good signal conditions

● Likely to be unsuitable

NOTE: For each frequency band, Siretta provides a traffic light indication to show the suitability of the antenna for use at that frequency band. Determination of exactly what makes an antenna good or bad at any frequency is subjective.

The view presented is that of Siretta's engineering team having taken into account the efficiency and VSWR measurements. The end user is advised to use their own criteria and/or testing to confirm suitability.

Echo 44

5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

Test Setup (Curved)

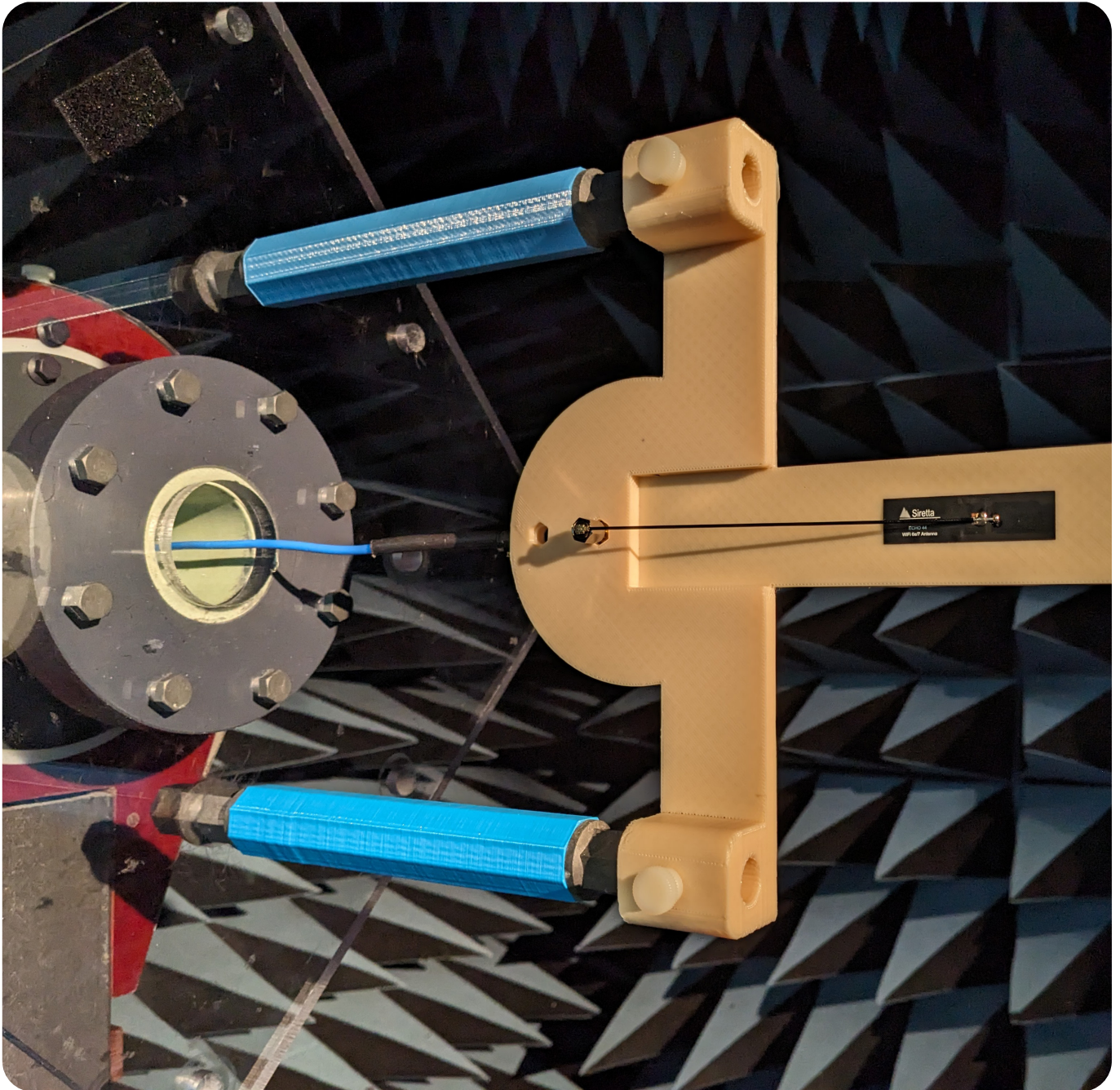




Echo 44

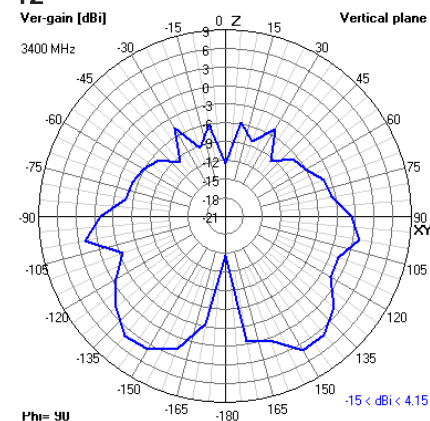
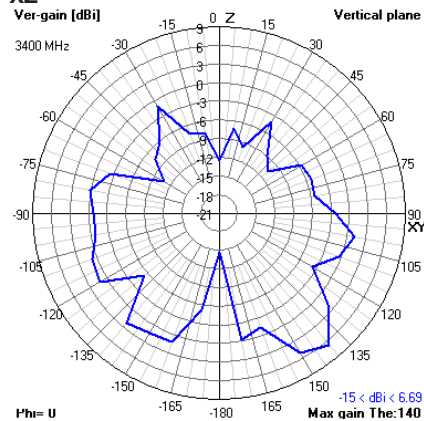
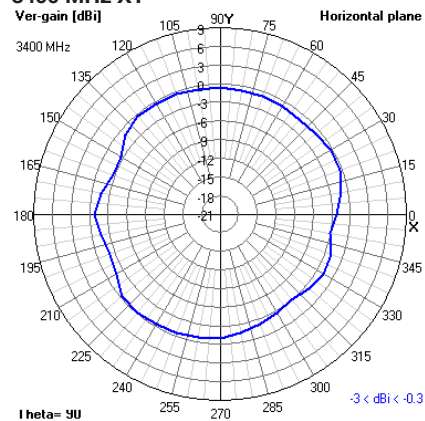
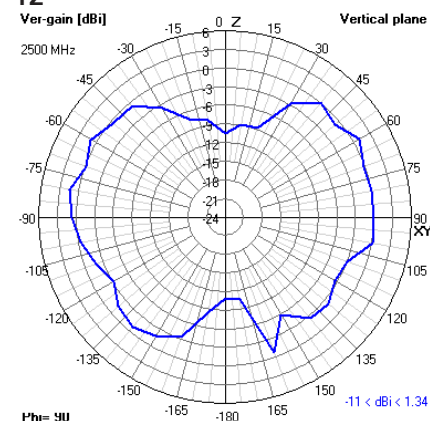
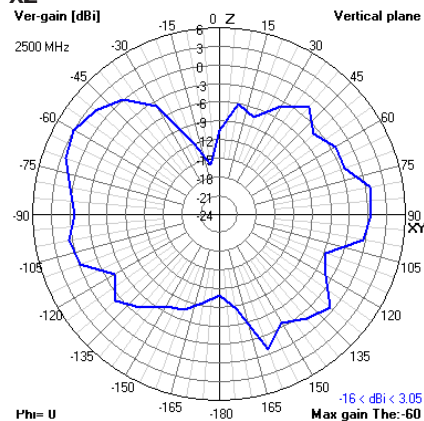
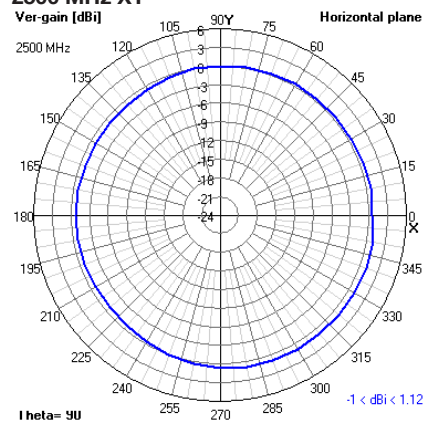
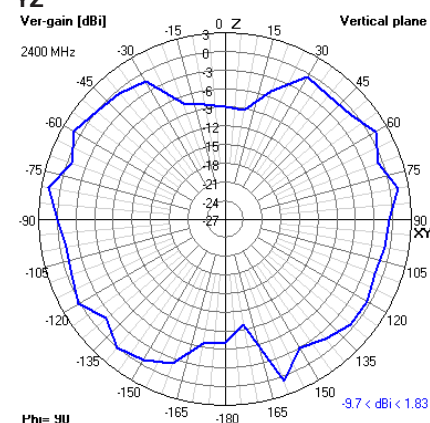
5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

Test Setup (Straight)



5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

2400 MHz XY



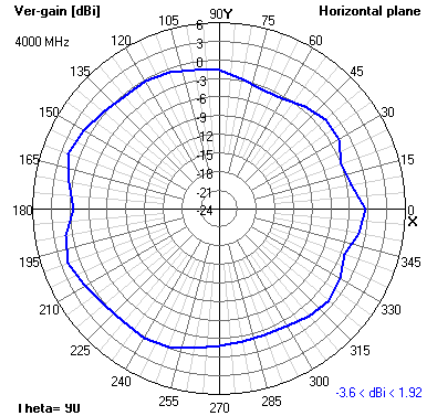


Echo 44

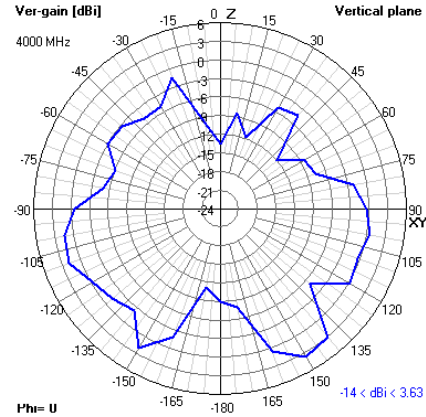
5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

2D Radiation Plots (tested on flat surface)

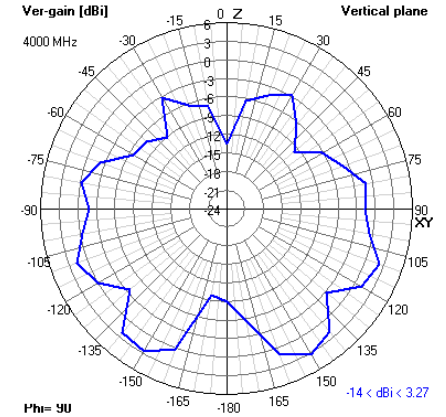
4000 MHz XY



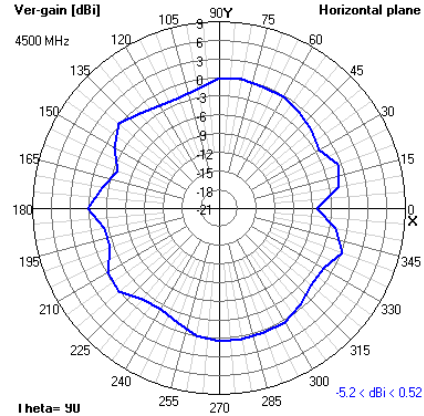
XZ



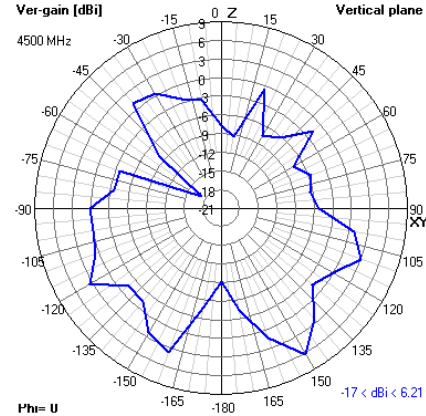
YZ



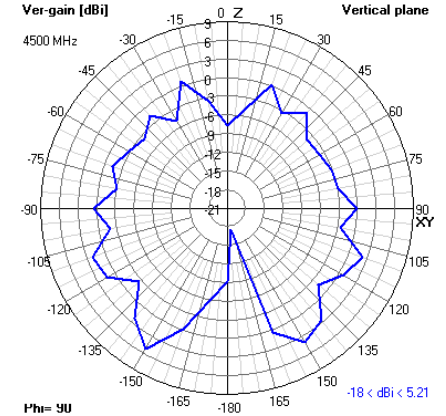
4500 MHz XY



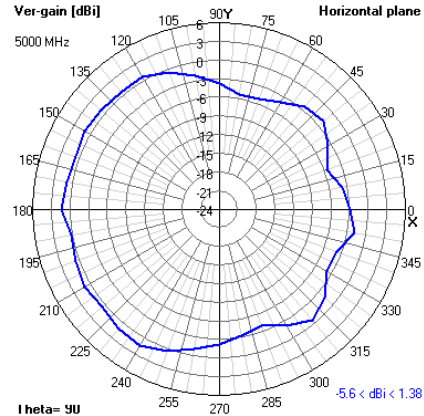
XZ



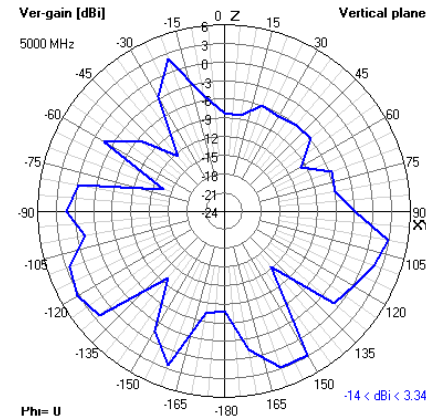
YZ



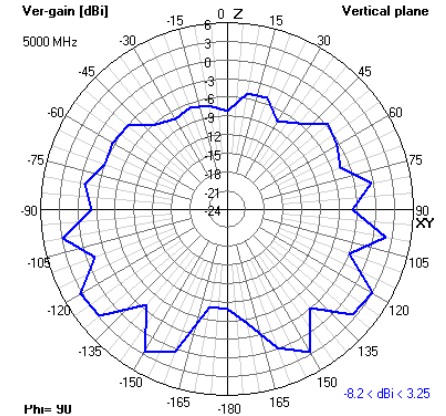
5000 MHz XY



XZ



YZ





Echo 44

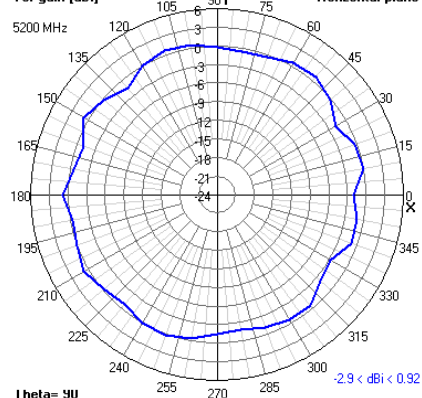
5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

2D Radiation Plots (tested on flat surface)

5200 MHz XY

Ver-gain [dBi]

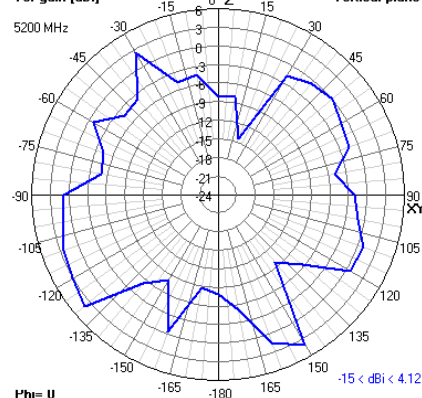
Horizontal plane



XZ

Ver-gain [dBi]

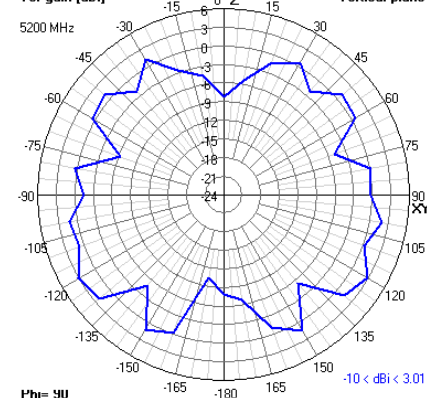
Vertical plane



YZ

Ver-gain [dBi]

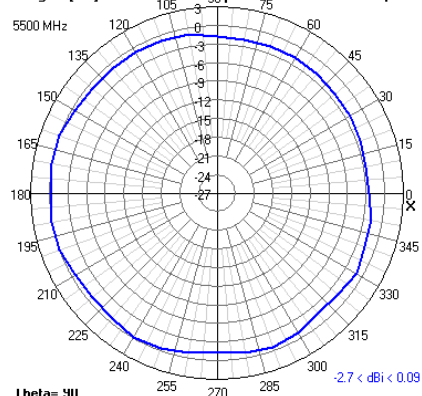
Vertical plane



5500 MHz XY

Ver-gain [dBi]

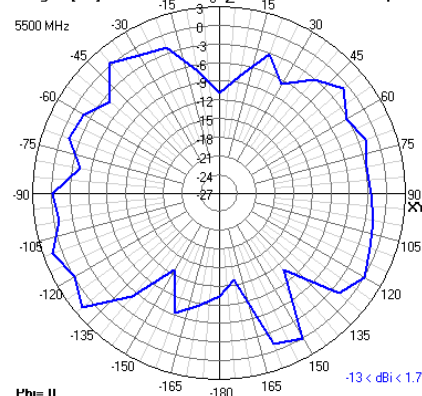
Horizontal plane



XZ

Ver-gain [dBi]

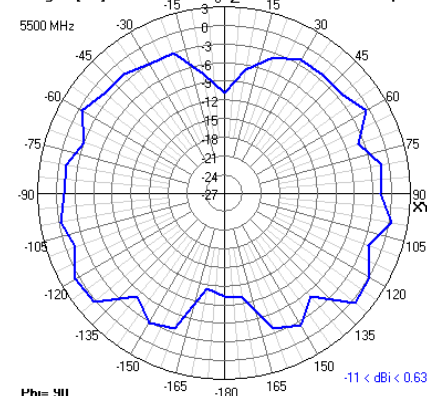
Vertical plane



YZ

Ver-gain [dBi]

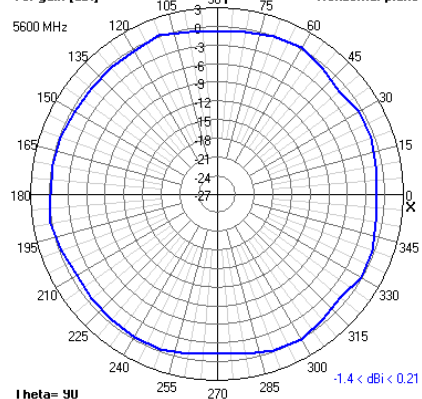
Vertical plane



5600 MHz XY

Ver-gain [dBi]

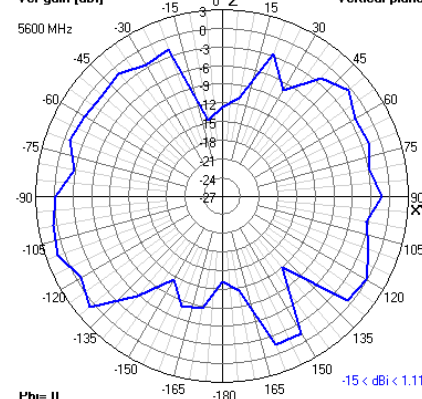
Horizontal plane



XZ

Ver-gain [dBi]

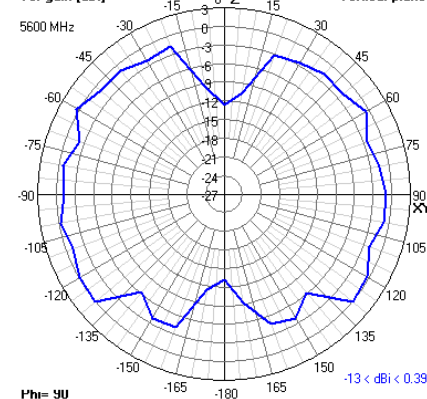
Vertical plane



YZ

Ver-gain [dBi]

Vertical plane



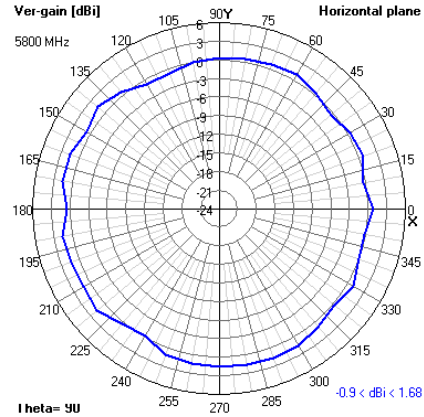


Echo 44

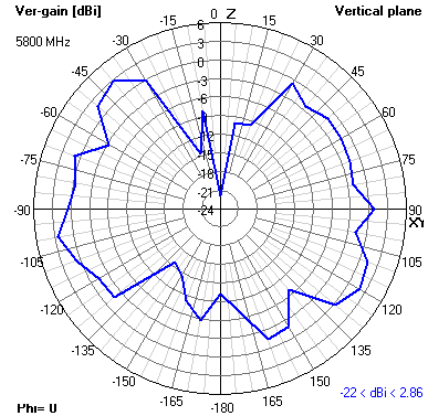
5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

2D Radiation Plots (tested on flat surface)

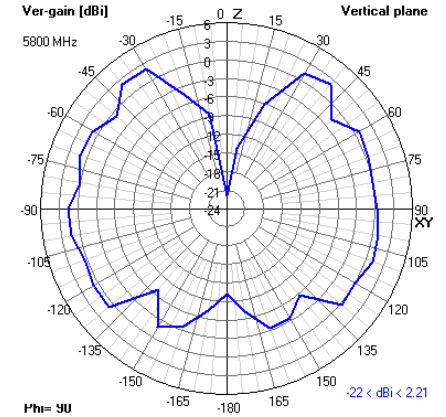
5800 MHz XY



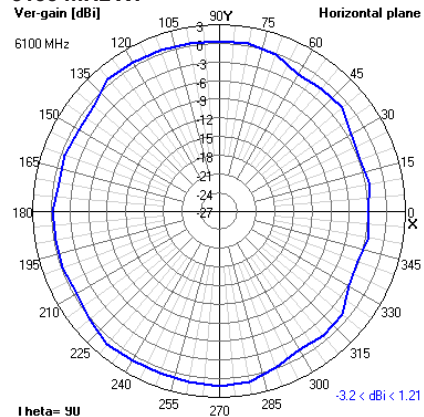
XZ



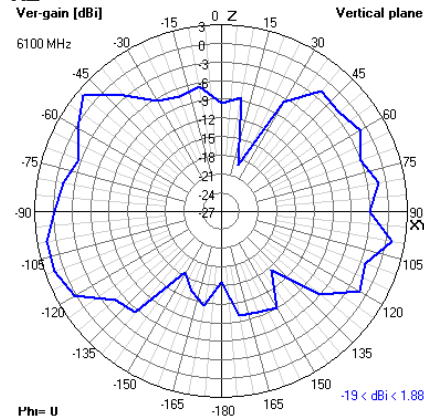
YZ



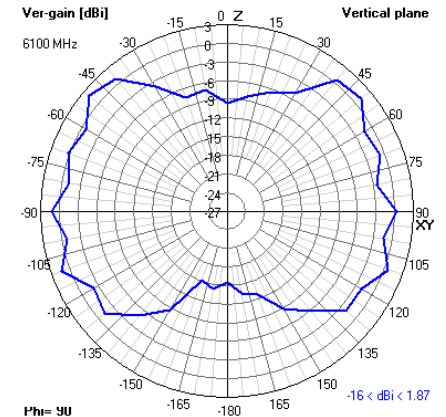
6100 MHz XY



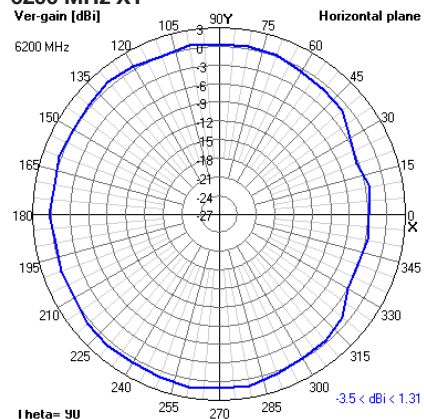
XZ



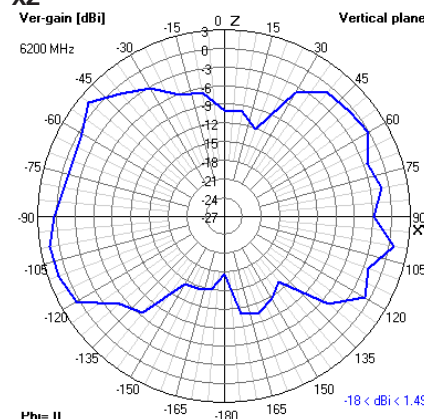
YZ



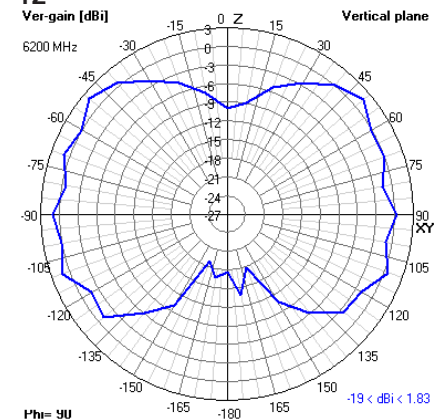
6200 MHz XY



XZ



YZ



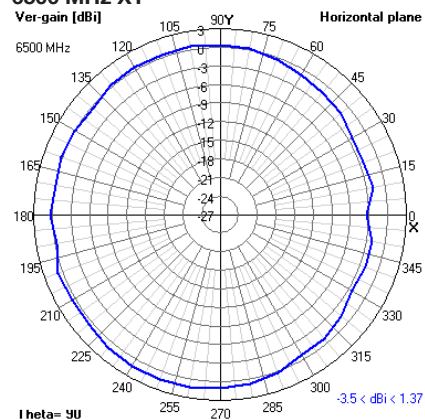


Echo 44

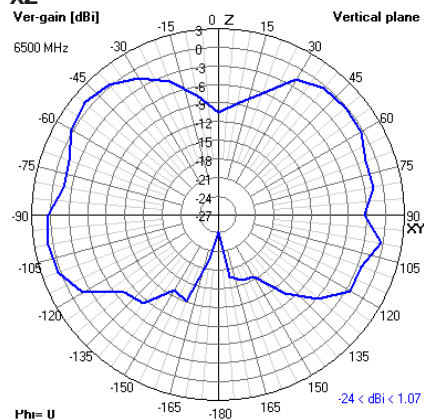
5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

2D Radiation Plots (tested on flat surface)

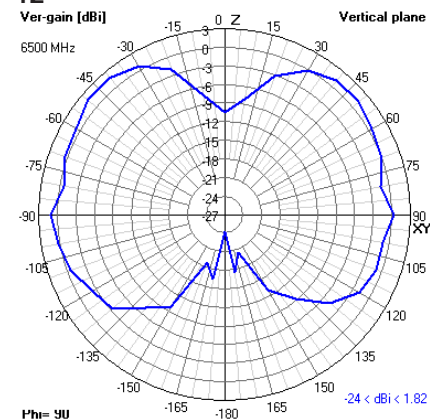
6500 MHz XY



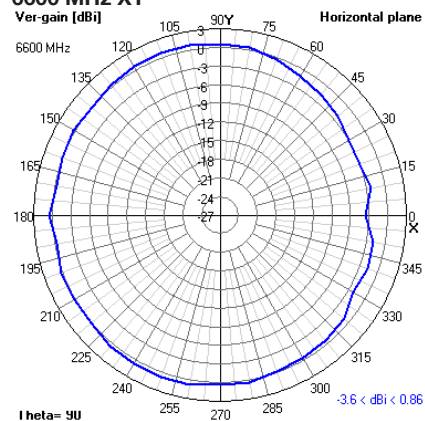
XZ



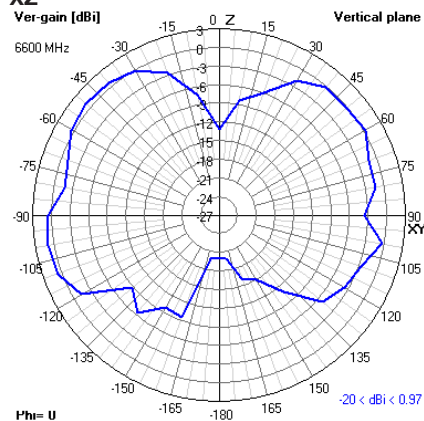
YZ



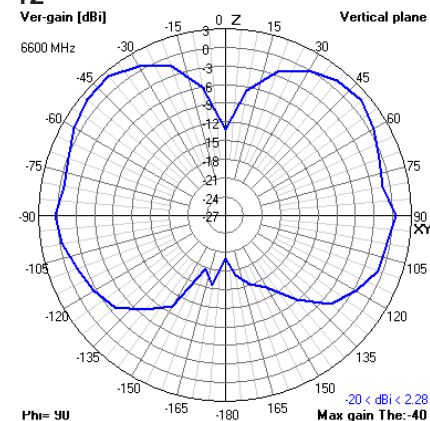
6600 MHz XY



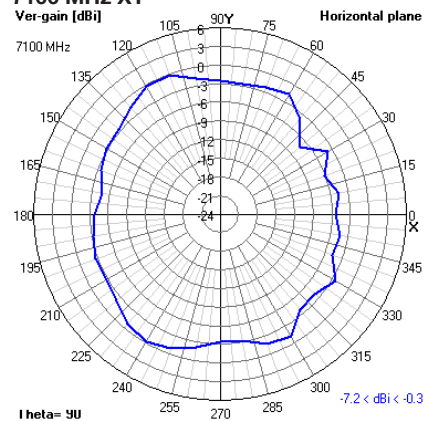
XZ



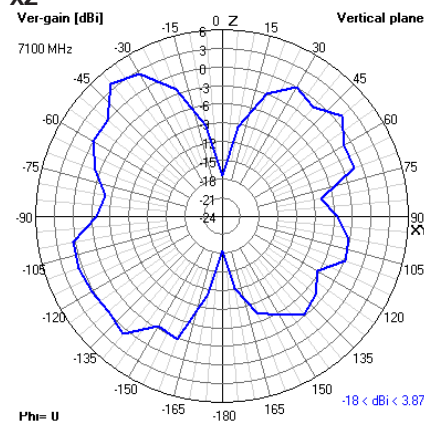
YZ



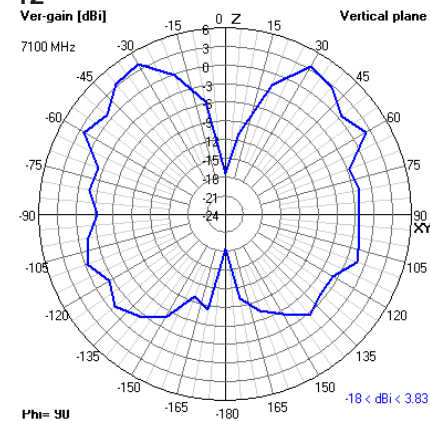
7100 MHz XY



XZ



YZ

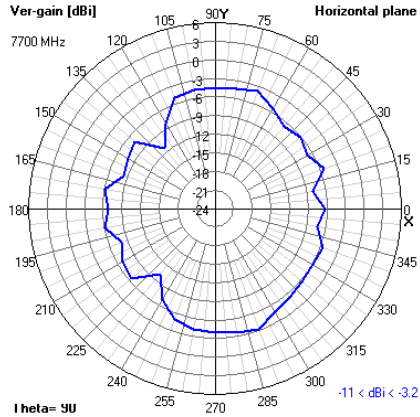


Echo 44

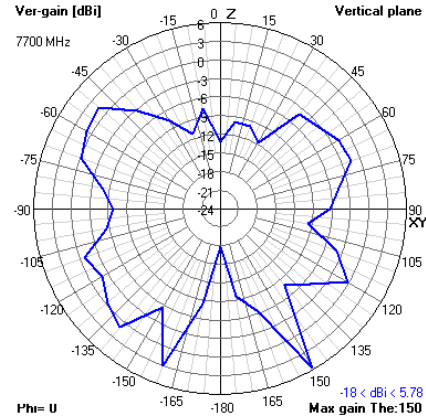
5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

2D Radiation Plots (tested on flat surface)

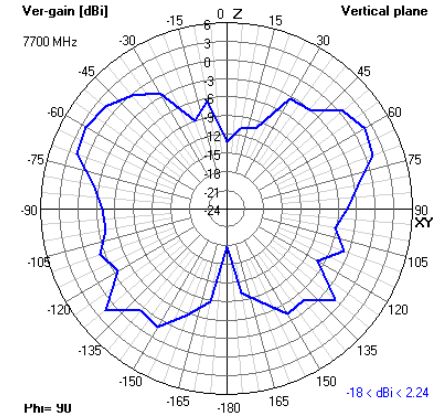
7700 MHz XY



XZ



YZ



NOTE: To view the radiation plots from our tests carried out on a curved surface, please contact support@siretta.com.

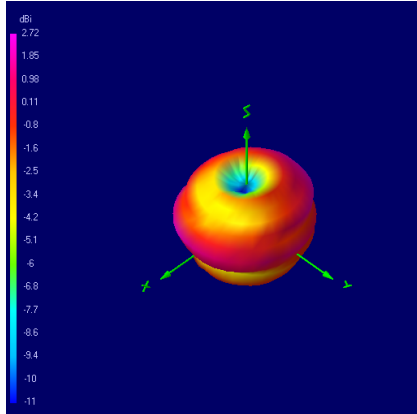


Echo 44

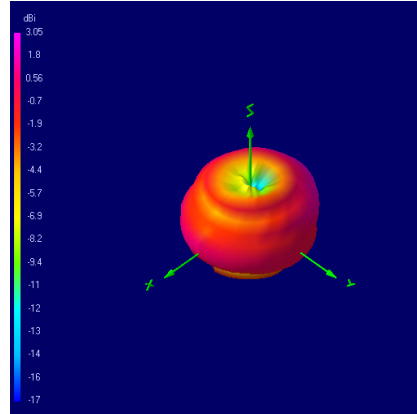
5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

3D Radiation Plots

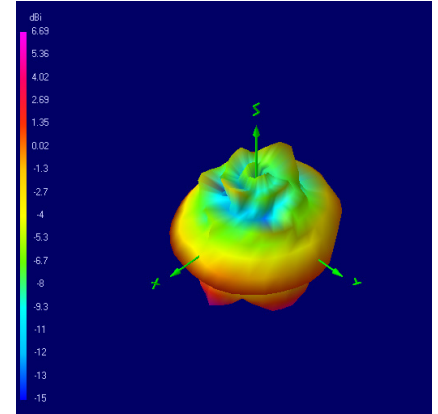
2400 MHz



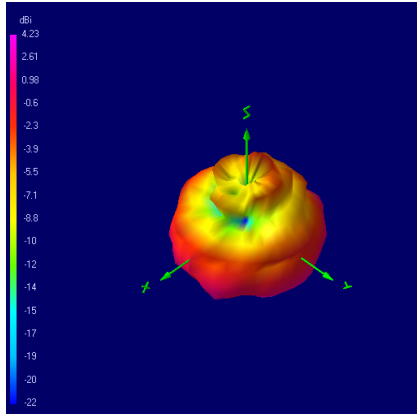
2500 MHz



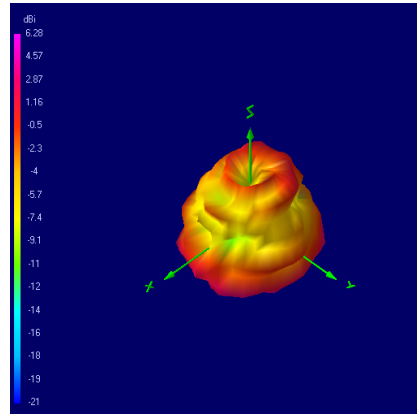
3400 MHz



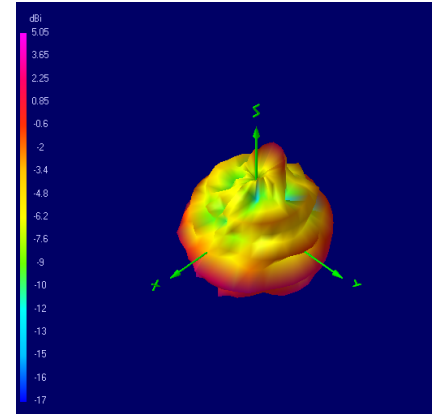
4000 MHz



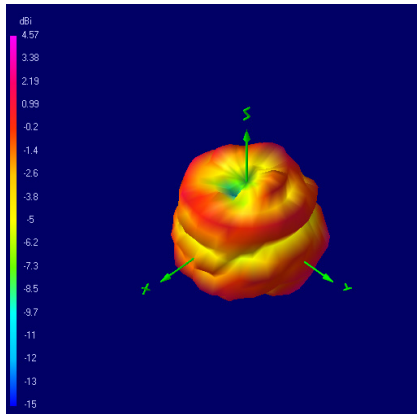
4500 MHz



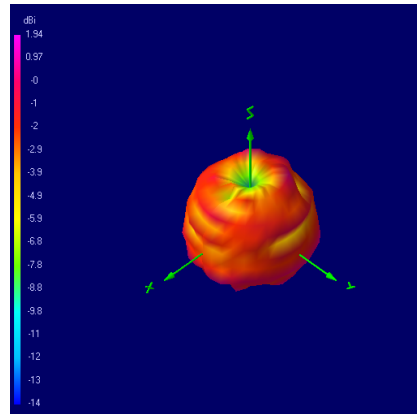
5000 MHz



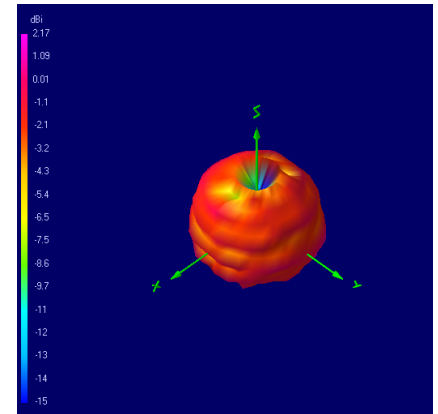
5200 MHz



5500 MHz



5600 MHz



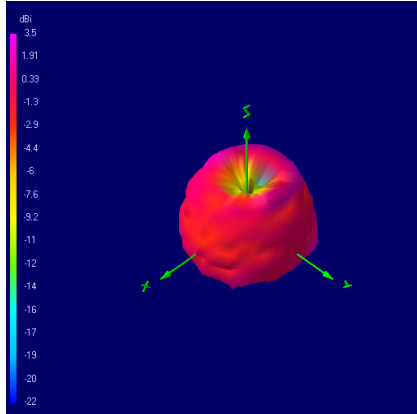


Echo 44

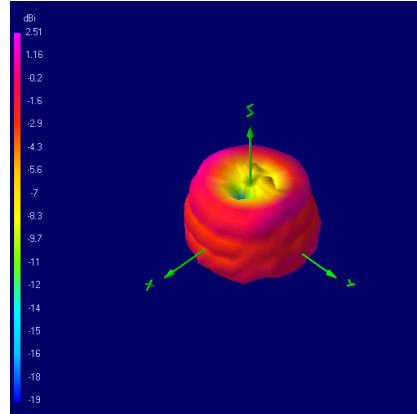
5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

3D Radiation Plots

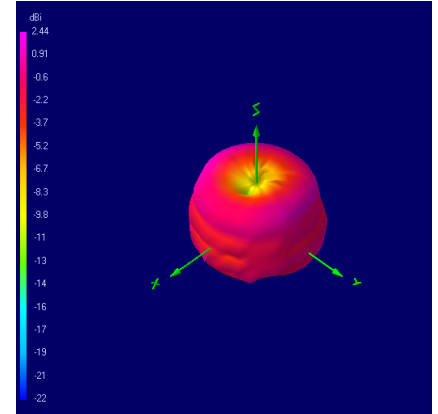
5800 MHz



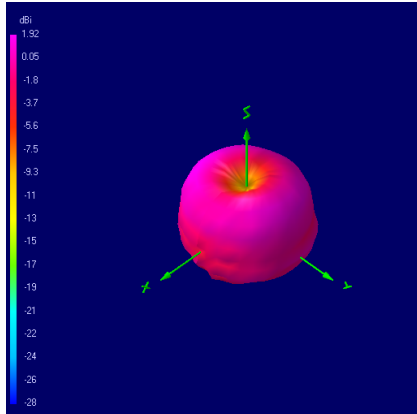
6100 MHz



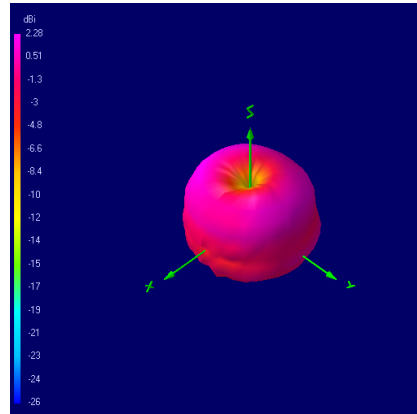
6200 MHz



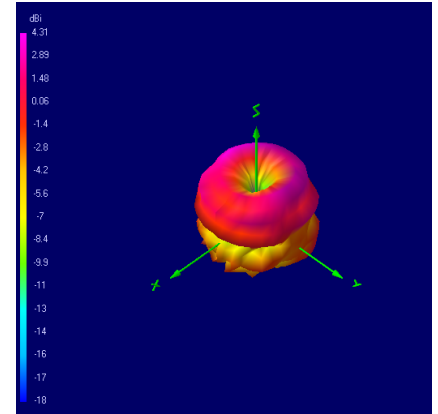
6500 MHz



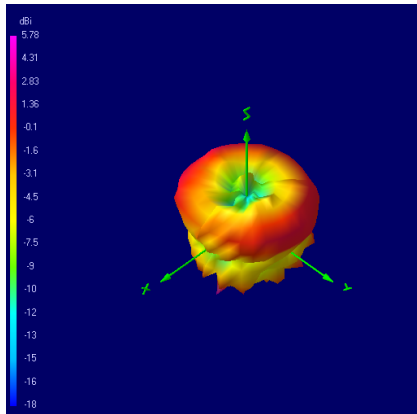
6600 MHz



7100 MHz



7700 MHz



NOTE: All 3D radiation plots are shown with Theta = 45 and Phi = 45.





Echo 44

5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna

Ordering Details:

Part Number	Description
ECHO44/0.1M/UFL/36	5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna 0.1 M Cable 1.13 UFL/MHF1 Connector
ECHO44/0.1M/MHF4/36	5G C-Band and Wi-Fi 7 Flexible Printed Circuit Antenna 0.1 M Cable 1.13 I-PEX MHF4 Connector