



## Alpha 1A

Dual Band Wi-Fi and 5G/4G Adhesive T-bar Antenna



### Key Features

- Supports 5G NR / 4G LTE / 3G UMTS / 2G GSM
- Supports LTE Cat M, LTE Cat NB and NR Cat NB Bands
- Supports Dual-band Wi-Fi 2.4 GHz and 5 GHz
- Supports Bluetooth and BLE, Zigbee and ISM 2.4 GHz, ISM 5.8GHz and IEEE 802.15.4 Bands
- Adhesive Mount
- Low Profile
- Flexible Housing

### General Description

The Alpha 1A is a slim, low profile, T-Bar antenna measuring 104 x 10.8 x 4 mm, which will mount discreetly onto most surfaces using the adhesive base.

The Alpha 1A is tuned to GSM (2G), UMTS (3G), LTE (4G), NR (5G), Dual-band Wi-Fi (2.4 GHz and 5 GHz) & the 2.4 GHz ISM frequencies.

Typical applications are for smart energy meters, alarm panel equipment or on the side of telemetry equipment. However, this antenna will suit a wide variety of environments and applications.

### Additional Considerations

- High Grade integrated adhesive pad ensures long lasting bond to most surfaces, like windscreen / glass or dashboard material
- Flexible housing ensures ability for antenna to contour around different materials

A Adhesive	5G New Radio	4G LTE	3G UMTS	2G GSM
IEEE 802.15.4	BLE Bluetooth	ZB Zigbee	WLAN 2400	WLAN 5800
ISM 2450	ISM 5.8G	LTE Cat M	LTE NB IoT	WiFi 4 802.11n
WiFi 5 802.11ac	WiFi 6 802.11ax			



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### Electrical Specifications

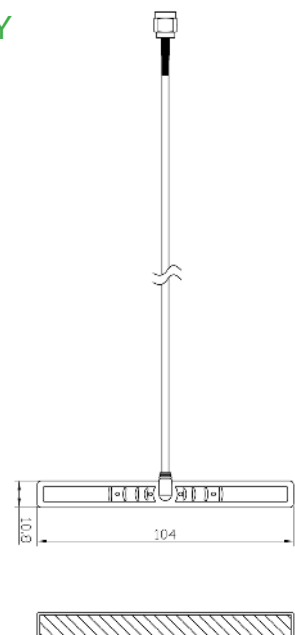
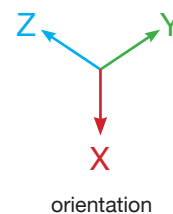
Impedance:	50 Ohm
Polarization:	Vertical
Max Input Power:	100 mW
Ground plane independent:	Yes

### Environmental Specifications

Operating Temperature range:	-20 to +80 °C
Storage Temperature range:	-10 to +60 °C

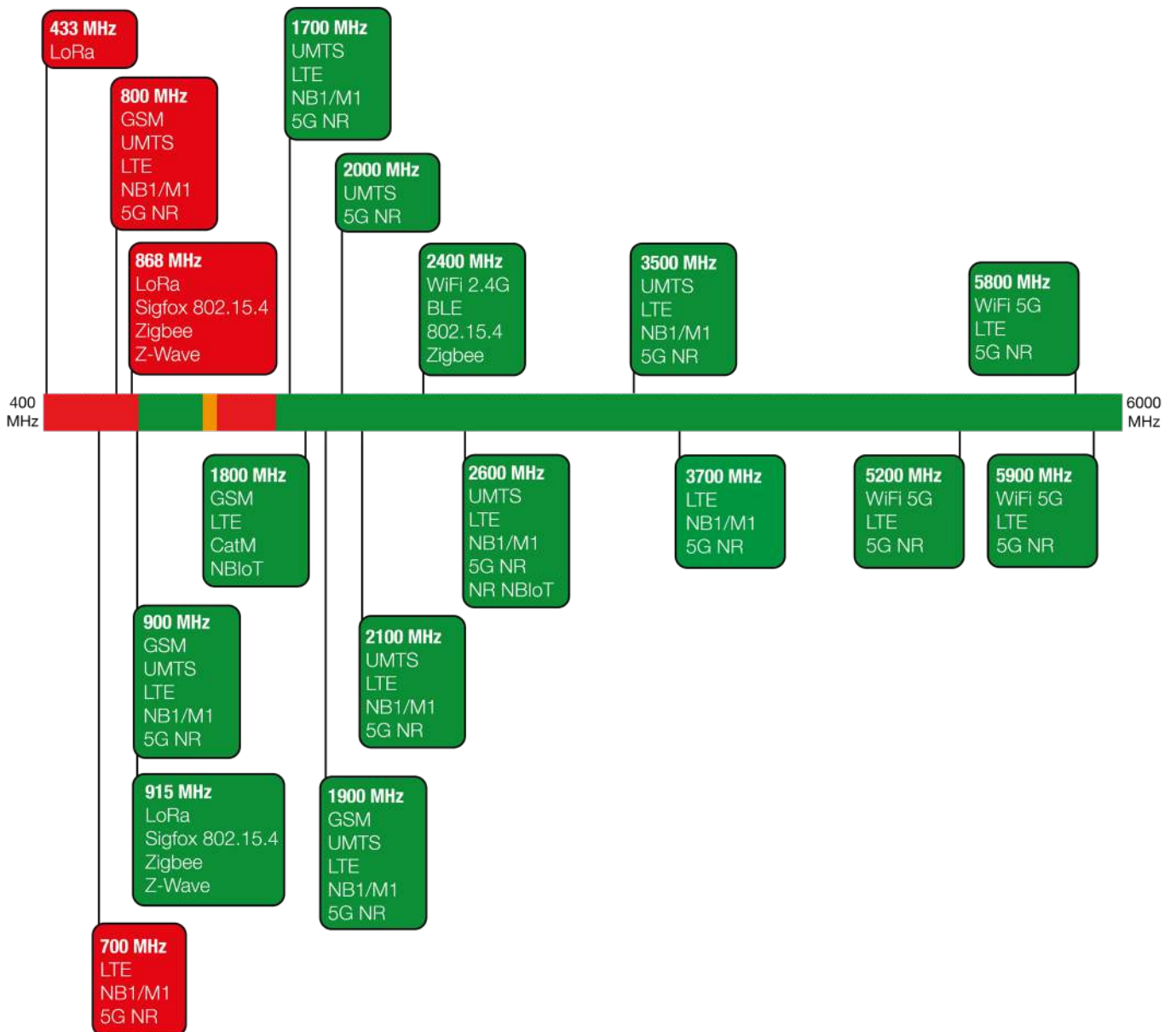
### Mechanical Specifications

Dimensions:	104 x 10.8 x 4 mm
Weight:	23.8 g
Connector:	SMA Male
Mounting method:	Adhesive Pad
Housing materials:	TPR





### Spectrum Coverage



● Suitable band      ● Adequate band in good signal conditions      ● Likely to be unsuitable



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### Usable Cellular Frequency Support (410 MHz – 1900 MHz)

	410	450	600	700	800	850	900	1500	1600	1700	1800	1900
GSM Bands:											●	●
UMTS Bands:										●	●	●
LTE Bands:										●	●	●
LTE Cat M Bands:										●	●	●
LTE Cat NB Bands:										●	●	●
5G NR Bands:										●	●	●
NR Cat NB Bands:										●	●	●

### Usable Cellular Frequency Support (2000 MHz – 5900 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 (433 MHz - 5800 MHz)

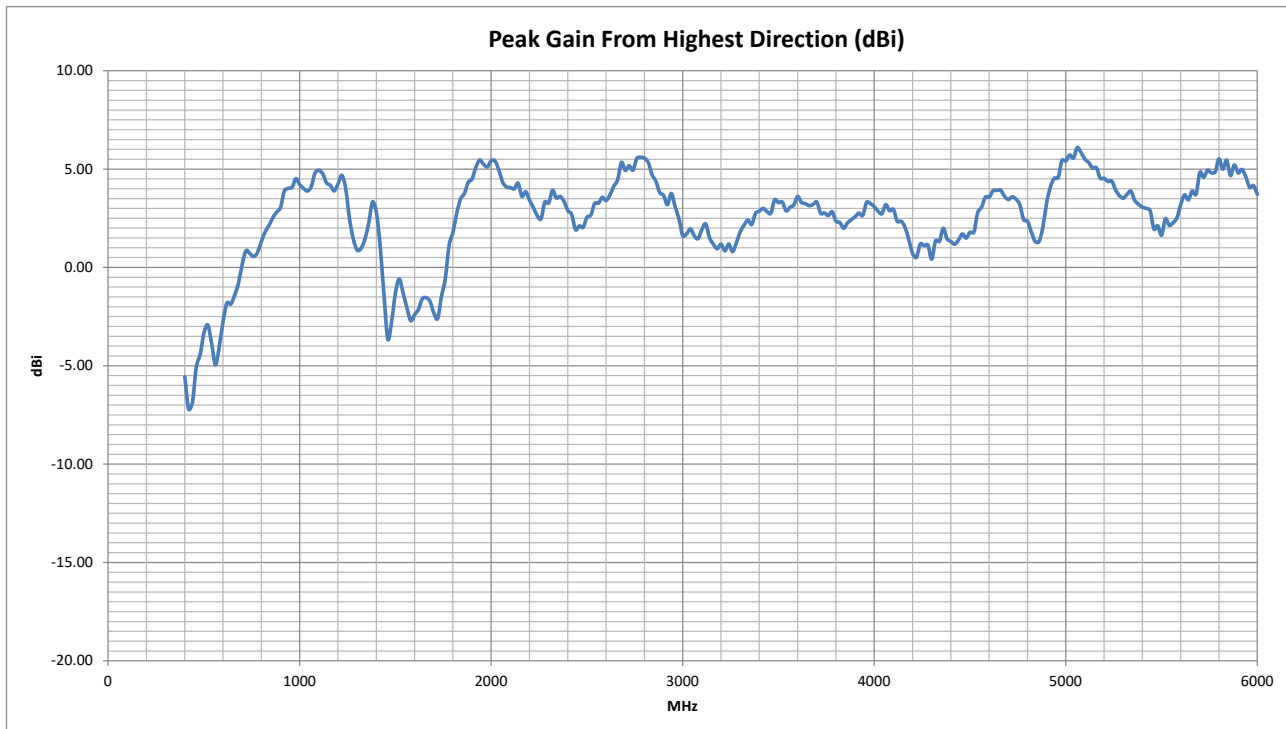
	433	868	915	2450	5800
Bluetooth				●	
IEEE 802.15.4				●	
LoRa					
Sigfox					
Wi-Fi 2.4G				●	
Wi-Fi 5G					●
Zigbee				●	
Z-Wave					



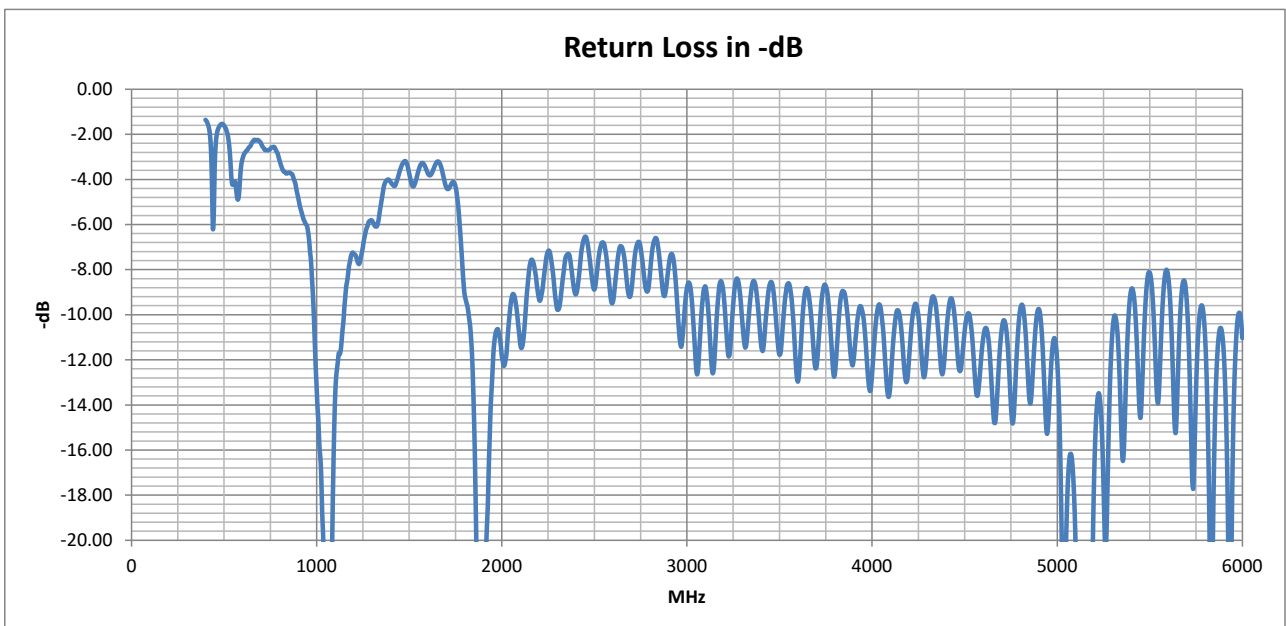
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### Peak Gain vs. Frequency



### Return Loss

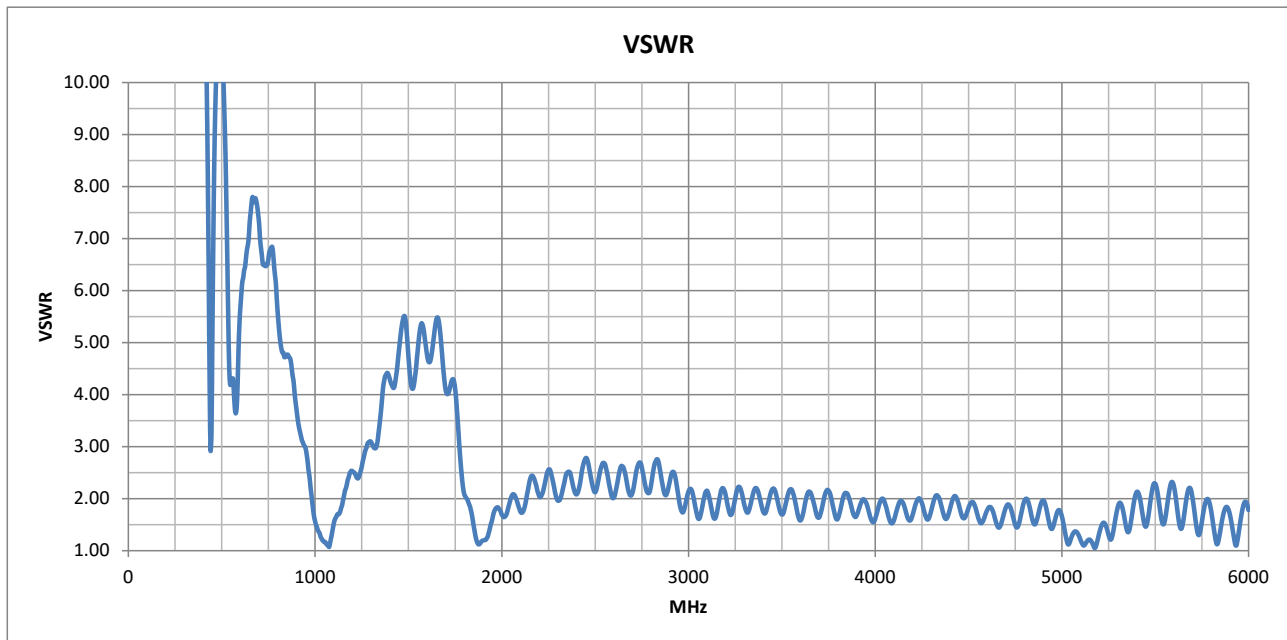




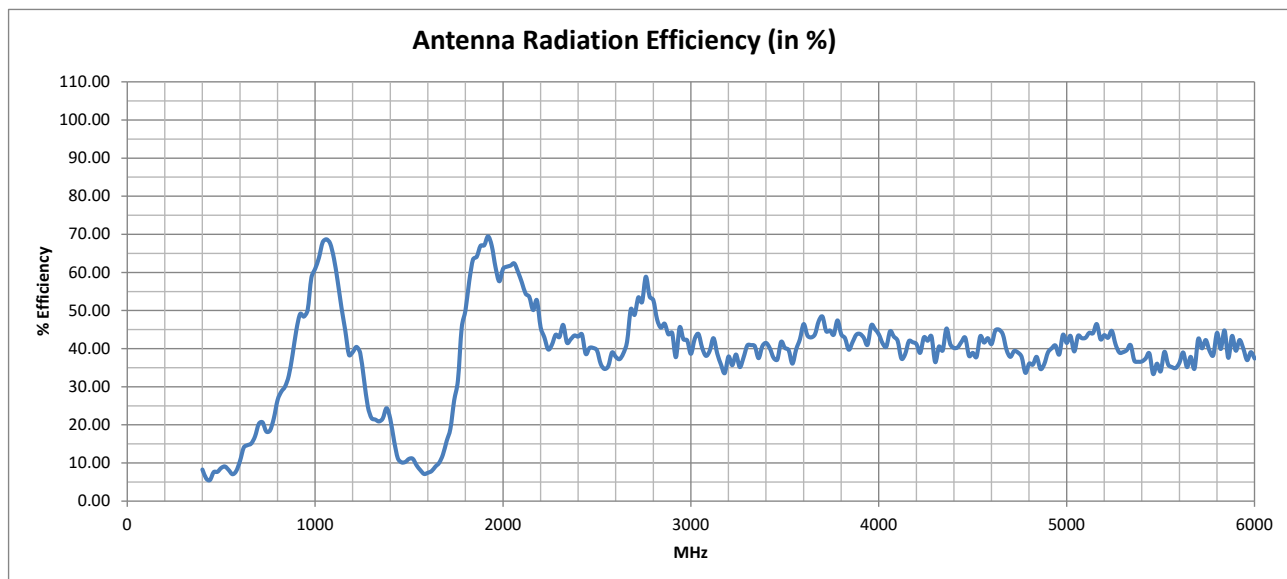
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### VSWR



### Radiation Efficiency





### 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
	1	1	1	1	n1	n1	1920 - 1980 MHz	2110 - 2170 MHz	63.98	52.95	1.83	2.44	●
PCS-1900	2	2	2	2	n2	n2	1850 - 1910 MHz	1930 - 1990 MHz	66.15	62.26	1.47	1.83	●
DCS-1800	3	3	3	3	n3	n3	1710 - 1785 MHz	1805 - 1880 MHz	29.60	61.58	4.29	2.04	●
	4	4	4	4			1710 - 1755 MHz	2110 - 2155 MHz	23.61	53.70	4.29	2.41	●
GSM-850	5	5	5	5	n5	n5	824 - 849 MHz	869 - 894 MHz	29.95	39.05	4.82	4.65	●
	6						830 - 840 MHz	875 - 885 MHz	29.72	38.52	4.81	4.50	●
	7	7	7	7	n7	n7	2500 - 2570 MHz	2620 - 2690 MHz	36.08	42.66	2.69	2.63	●
E-GSM-900	8	8	8	8	n8	n8	880 - 915 MHz	925 - 960 MHz	43.72	49.01	4.35	3.19	●
	9	9					1749.9 - 1784.9 MHz	1844.9 - 1879.9 MHz	37.27	64.81	4.12	1.58	●
	10	10					1710 - 1770 MHz	2110 - 2170 MHz	26.15	52.95	4.29	2.44	●
	11	11	11	11			1427.9 - 1447.9 MHz	1475.9 - 1495.9 MHz	11.98	10.51	4.80	5.51	●
	12	12	12	12	n12	n12	699 - 716 MHz	729 - 746 MHz	20.38	18.69	7.33	6.53	●
	13	13	13	13	n13	n13	777 - 787 MHz	746 - 756 MHz	22.20	18.40	6.63	6.75	●
	14	14	14	14	n14		788 - 798 MHz	758 - 768 MHz	24.80	19.04	6.20	6.84	●
		17		17			704 - 716 MHz	734 - 746 MHz	20.44	18.44	7.06	6.53	●
		18	18	18	n18	n18	815 - 830 MHz	860 - 875 MHz	28.84	35.02	4.98	4.72	●
	19	19	19	19			830 - 845 MHz	875 - 890 MHz	29.96	39.30	4.81	4.50	●
	20	20	20	20	n20	n20	832 - 862 MHz	791 - 821 MHz	31.17	26.98	4.77	6.08	●
	21	21	21	21			1447.9 - 1462.9 MHz	1495.9 - 1510.9 MHz	10.41	11.04	5.28	4.94	●
	22	22					3410 - 3490 MHz	3510 - 3590 MHz	39.15	39.63	2.19	2.18	●
		24	24	24	n24		1626.5 - 1660.5 MHz	1525 - 1559 MHz	9.18	9.30	5.49	5.17	●
	25	25	25	25	n25	n25	1850 - 1915 MHz	1930 - 1995 MHz	66.34	62.06	1.47	1.83	●
	26	26	26	26	n26		814 - 849 MHz	859 - 894 MHz	29.55	37.63	5.01	4.73	●
		27	27				807 - 824 MHz	852 - 869 MHz	28.19	33.34	5.26	4.77	●
		28	28	28	n28	n28	703 - 748 MHz	758 - 803 MHz	19.63	22.24	7.12	6.84	●

● Suitable band

● Adequate band in good signal conditions

● Likely to be unsuitable



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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
		28A					703 - 733 MHz	758 - 788 MHz	20.21	20.68	7.12	6.84	●
		29			n29		N/A	717 - 728 MHz	N/A	20.29	N/A	6.61	●
		30			n30		2305 - 2315 MHz	2350 - 2360 MHz	44.65	42.24	2.01	2.52	●
		31	31	31			452.5 - 457.5 MHz	462.5 - 467.5 MHz	7.05	7.59	7.75	9.77	●
	32	32					N/A	1452 - 1496 MHz	N/A	10.37	N/A	5.51	●
		33					1900 - 1920 MHz	1900 - 1920 MHz	68.32	68.32	1.24	1.24	●
		34			n34		2010 - 2025 MHz	2010 - 2025 MHz	61.44	61.44	1.69	1.69	●
		35					1850 - 1910 MHz	1850 - 1910 MHz	66.15	66.15	1.47	1.47	●
		36					1930 - 1990 MHz	1930 - 1990 MHz	62.26	62.26	1.83	1.83	●
		37					1910 - 1930 MHz	1910 - 1930 MHz	68.89	68.89	1.34	1.34	●
		38			n38		2570 - 2620 MHz	2570 - 2620 MHz	38.00	38.00	2.38	2.38	●
		39	39		n39		1880 - 1920 MHz	1880 - 1920 MHz	67.70	67.70	1.24	1.24	●
		40	40		n40		2300 - 2400 MHz	2300 - 2400 MHz	43.37	43.37	2.52	2.52	●
		41	41	41	n41	n41	2496 - 2690 MHz	2496 - 2690 MHz	39.02	39.02	2.69	2.69	●
		42	42	42			3400 - 3600 MHz	3400 - 3600 MHz	39.87	39.87	2.19	2.19	●
		43	43	43			3600 - 3800 MHz	3600 - 3800 MHz	45.13	45.13	2.17	2.17	●
		44					703 - 803 MHz	703 - 803 MHz	20.69	20.69	7.12	7.12	●
		45					1447 - 1467 MHz	1447 - 1467 MHz	10.38	10.38	5.37	5.37	●
		46			n46		5150 - 5925 MHz	5150 - 5925 MHz	39.24	39.24	2.32	2.32	●
		47			n47		5855 - 5925 MHz	5855 - 5925 MHz	40.81	40.81	1.84	1.84	●
		48			n48		3550 - 3700 MHz	3550 - 3700 MHz	43.98	43.98	2.18	2.18	●
		49					3550 - 3700 MHz	3550 - 3700 MHz	43.98	43.98	2.18	2.18	●
		50			n50		1432 - 1517 MHz	1432 - 1517 MHz	10.78	10.78	5.51	5.51	●
		51			n51		1427 - 1432 MHz	1427 - 1432 MHz	13.63	13.63	4.31	4.31	●
		52					3300 - 3400 MHz	3300 - 3400 MHz	40.18	40.18	2.20	2.20	●

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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
		53			n53		2483.5 - 2495 MHz	2483.5 - 2495 MHz	39.88	39.88	2.29	2.29	●
		65		65	n65	n65	1920 - 2010 MHz	2110 - 2200 MHz	62.63	52.01	1.83	2.44	●
		66	66	66	n66	n66	1710 - 1780 MHz	2110 - 2200 MHz	28.42	52.01	4.29	2.44	●
		67			n67		N/A	738 - 758 MHz	N/A	18.37	N/A	6.77	●
		68					698 - 728 MHz	753 - 783 MHz	20.34	19.92	7.36	6.84	●
		69					N/A	2570 - 2620 MHz	N/A	38.00	N/A	2.38	●
		70		70	n70	n70	1695 - 1710 MHz	1995 - 2020 MHz	16.14	61.10	4.20	1.74	●
		71	71	71	n71		663 - 698 MHz	617 - 652 MHz	17.32	14.44	7.80	7.40	●
		72	72	72			451 - 456 MHz	461 - 466 MHz	6.89	7.58	7.31	9.57	●
		73	73	73			450 - 455 MHz	460 - 465 MHz	6.79	7.58	7.02	9.44	●
		74	74	74	n74		1427 - 1470 MHz	1475 - 1518 MHz	11.18	10.78	5.43	5.51	●
		75			n75		N/A	1432 - 1517 MHz	N/A	10.78	N/A	5.51	●
		76			n76		N/A	1427 - 1432 MHz	N/A	13.63	N/A	4.31	●
					n77		3300 - 4200 MHz	3300 - 4200 MHz	42.12	42.12	2.20	2.20	●
					n78		3300 - 3800 MHz	3300 - 3800 MHz	42.04	42.04	2.20	2.20	●
					n79		4400 - 5000 MHz	4400 - 5000 MHz	39.75	39.75	2.05	2.05	●
					n80		1710 - 1785 MHz	N/A	29.60	N/A	4.29	N/A	●
					n81		880 - 915 MHz	N/A	43.72	N/A	4.35	N/A	●
					n82		832 - 862 MHz	N/A	31.17	N/A	4.77	N/A	●
					n83		703 - 748 MHz	N/A	19.63	N/A	7.12	N/A	●
					n84		1920 - 1980 MHz	N/A	63.98	N/A	1.83	N/A	●
		85	85	85	n85		698 - 716 MHz	728 - 746 MHz	20.36	18.74	7.36	6.53	●
					n86		1710 - 1780 MHz	N/A	28.42	N/A	4.29	N/A	●
		87	87	87			410 - 415 MHz	420 - 425 MHz	6.80	5.88	11.66	9.82	●
		88	88	88			412 - 417 MHz	422 - 427 MHz	6.57	5.83	11.33	9.22	●

● Suitable band

● Adequate band in good signal conditions

● Likely to be unsuitable



### 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
					n89		824 - 849 MHz	N/A	29.95	N/A	4.82	N/A	●
					n90	n90	2496 - 2690 MHz	2496 - 2690 MHz	39.02	39.02	2.69	2.69	●
					n91		832 - 862 MHz	1427 - 1432 MHz	31.17	13.63	4.77	4.31	●
					n92		832 - 862 MHz	1432 - 1517 MHz	31.17	10.78	4.77	5.51	●
					n93		880 - 915 MHz	1427 - 1432 MHz	43.72	13.63	4.35	4.31	●
					n94		880 - 915 MHz	1432 - 1517 MHz	43.72	10.78	4.35	5.51	●
					n95		2010 - 2025 MHz	N/A	61.44	N/A	1.69	N/A	●
					n97		2300 - 2400 MHz	N/A	43.37	N/A	2.52	N/A	●
					n98		1880 - 1920 MHz	N/A	67.70	N/A	1.24	N/A	●
					n99		1626.5 - 1660.5 MHz	N/A	9.18	N/A	5.49	N/A	●
					n101		1900 - 1910 MHz	1900 - 1910 MHz	67.73	67.73	1.20	1.20	●
				103			787 - 788 MHz	757 - 758 MHz	23.48	18.50	6.24	6.77	●

● 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.



### ISM Standards Frequency Support

Application	Frequency Range	Efficiency (%)	Maximum VSWR	Peak Gain from highest direction (dBi)	Use Indicator
ISM 433 MHz	433.05 - 434.79 MHz	5.63	5.11	-6.951	●
ISM 868 MHz	863 - 870 MHz	34.75	4.71	2.675	●
ISM 915 MHz	902 - 928 MHz	47.73	3.67	3.942	●
ISM 2.4 GHz	2400 - 2500 MHz	40.82	2.78	2.89	●
Wi-Fi 2.4G	2401 - 2483 MHz	41.00	2.78	2.88	●
Wi-Fi 2.4G (USA)	2401 - 2473 MHz	41.12	2.78	2.88	●
Wi-Fi 2.4G (Japan)	2401 - 2495 MHz	40.86	2.78	2.88	●
Wi-Fi 5G (all channels)	5150 - 5990 MHz	39.22	2.32	5.52	●
Wi-Fi 5G (Ch 32-48)	5150 - 5250 MHz	43.85	1.54	5.07	●
Wi-Fi 5G (Ch 32-64)	5150 - 5330 MHz	42.08	1.92	5.07	●
Wi-Fi 5G (Ch 32-161)	5150 - 5815 MHz	38.91	2.32	5.52	●
Wi-Fi 5G (Ch 32-173)	5150 - 5875 MHz	39.10	2.32	5.52	●
ISM 5.8 GHz	5725 - 5875 MHz	40.98	1.99	5.52	●

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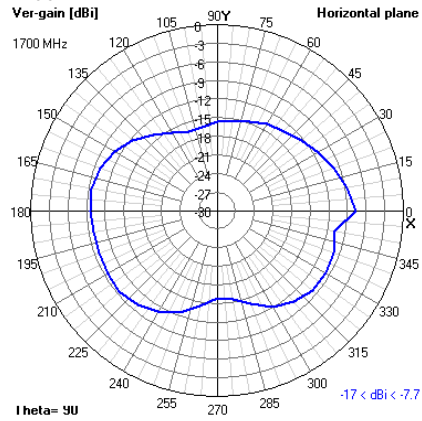


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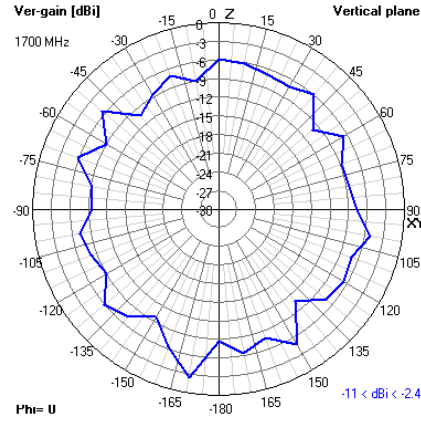
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### 2D Radiation Plots

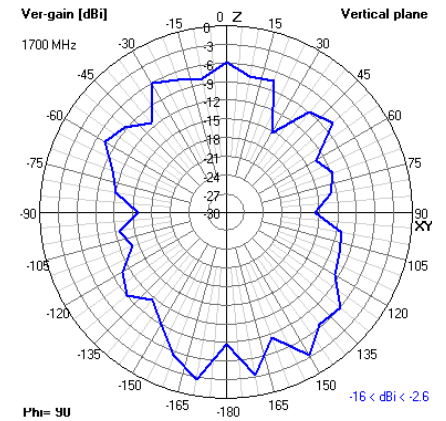
#### 1700 MHz XY



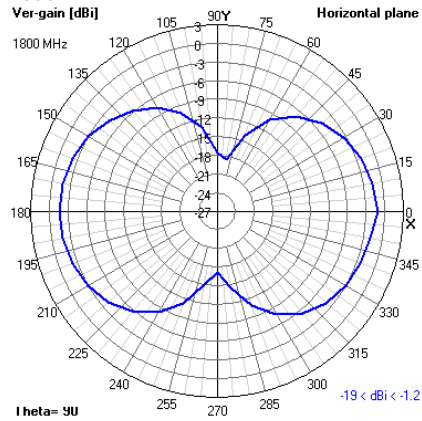
#### XZ



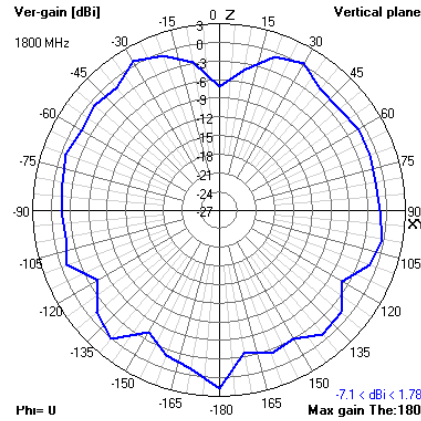
#### YZ



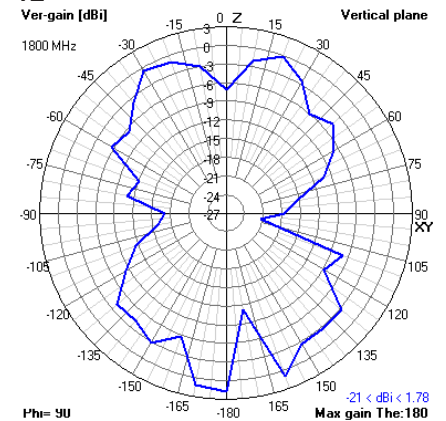
#### 1800 MHz XY



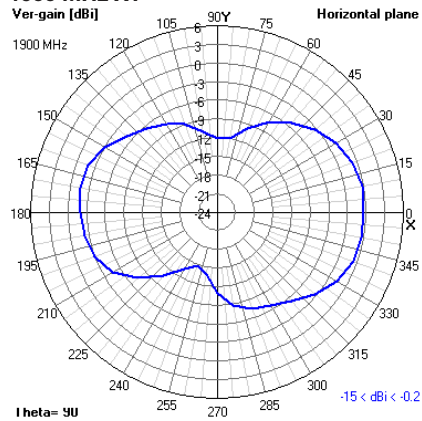
#### XZ



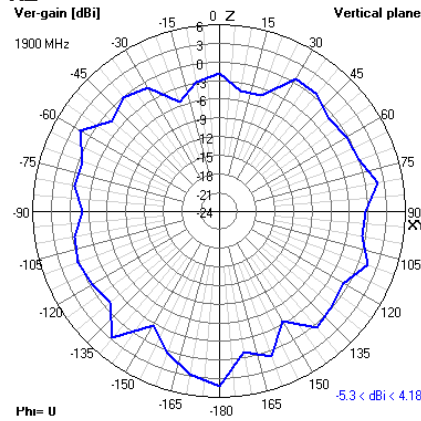
#### YZ



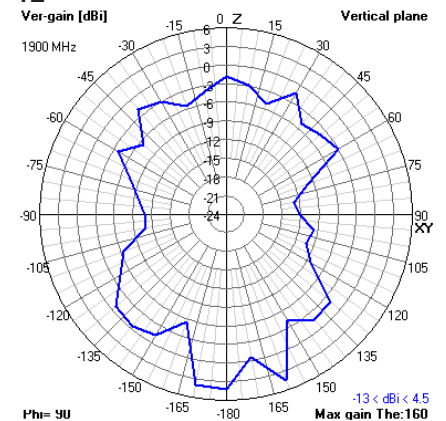
#### 1900 MHz XY



#### XZ



#### YZ



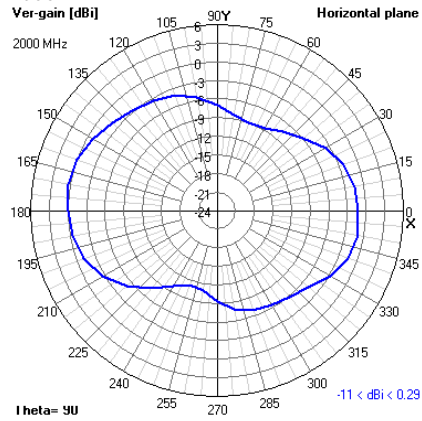


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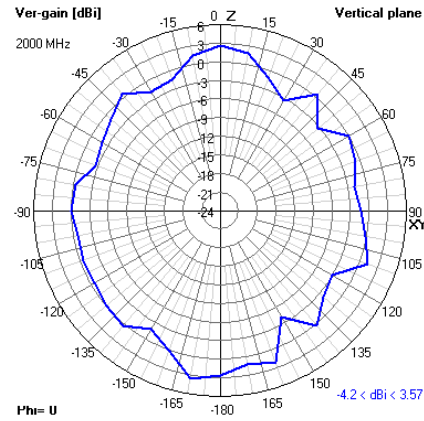
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### 2D Radiation Plots

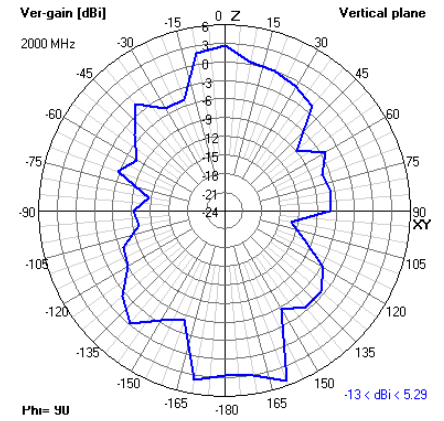
#### 2000 MHz XY



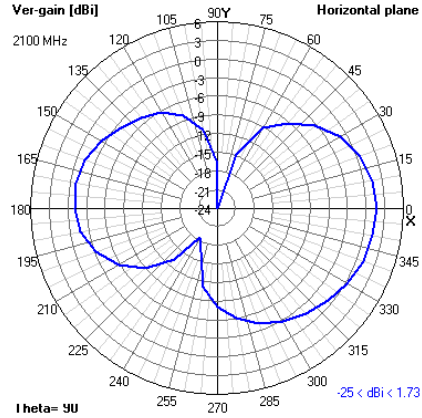
#### XZ



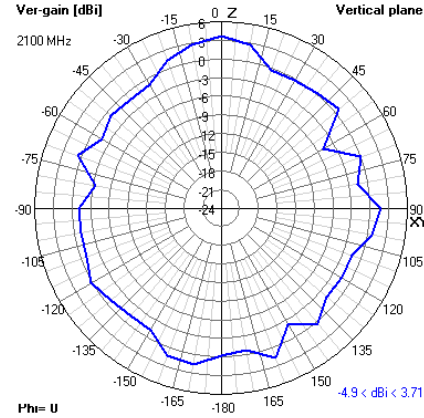
#### YZ



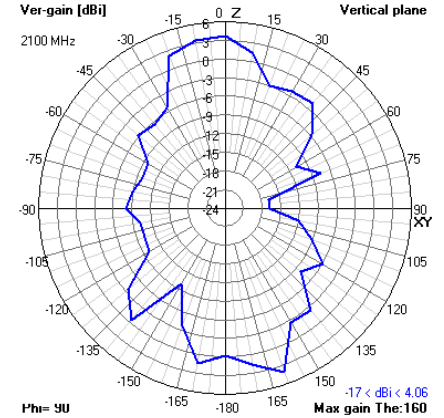
#### 2100 MHz XY



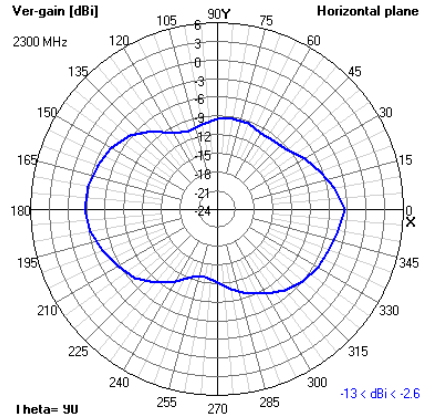
#### XZ



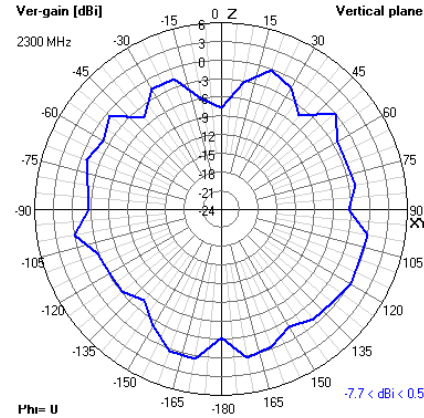
#### YZ



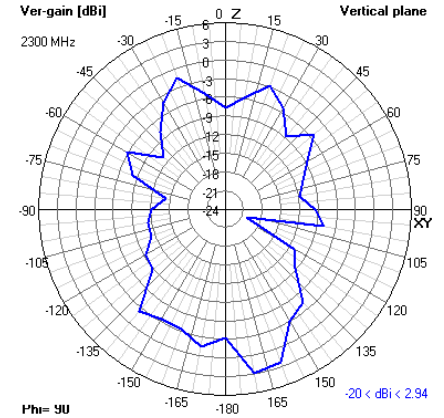
#### 2300 MHz XY



#### XZ



#### YZ



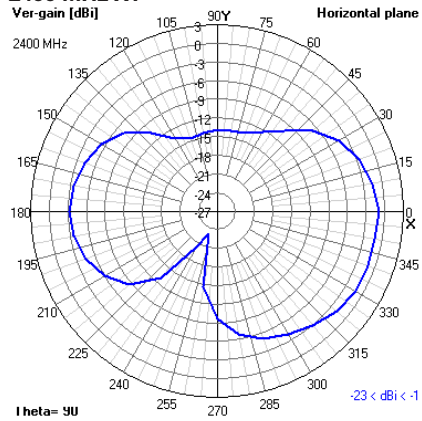


## Alpha 1A

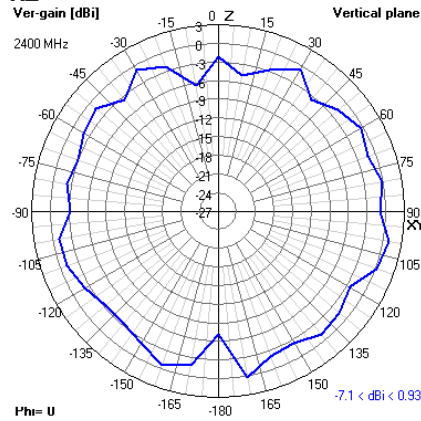
Dual Band Wi-Fi and 5G/4G Adhesive T-bar Antenna

### 2D Radiation Plots

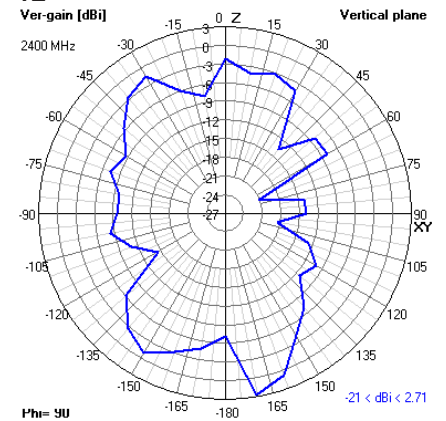
#### 2400 MHz XY



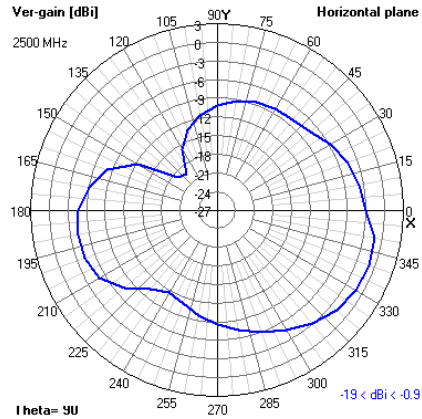
#### XZ



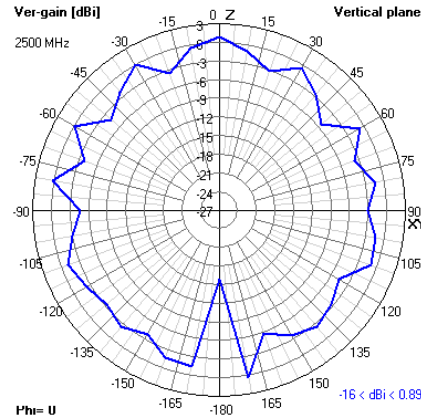
#### YZ



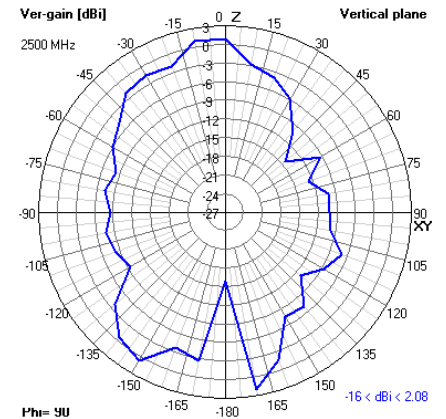
#### 2500 MHz XY



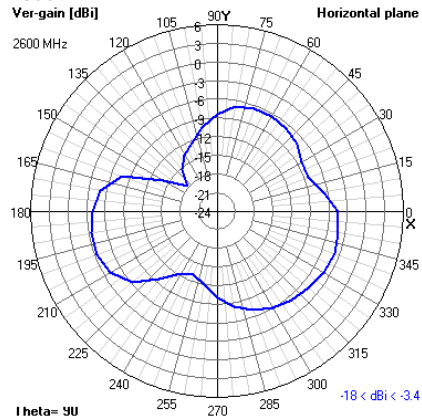
#### XZ



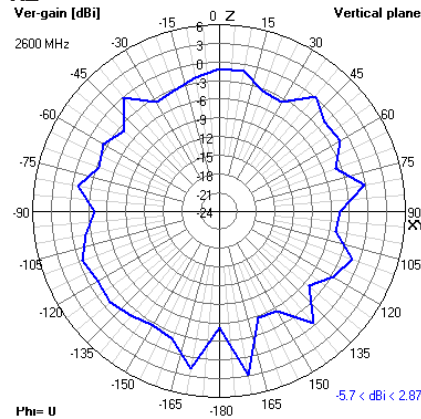
#### YZ



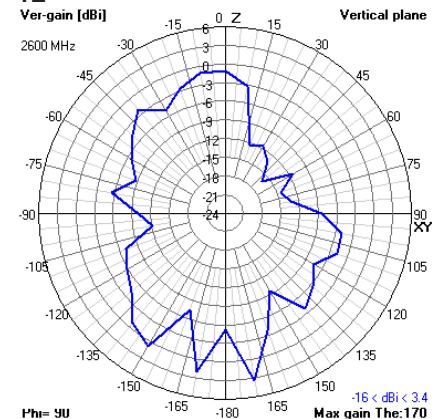
#### 2600 MHz XY



#### XZ



#### YZ





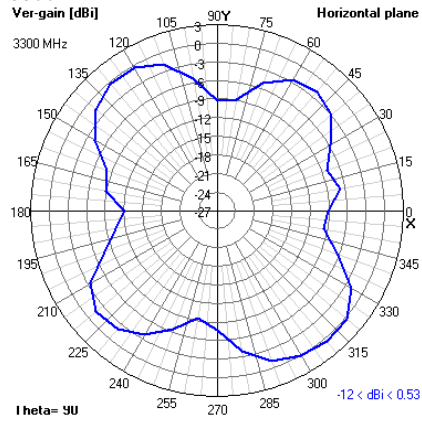


## Alpha 1A

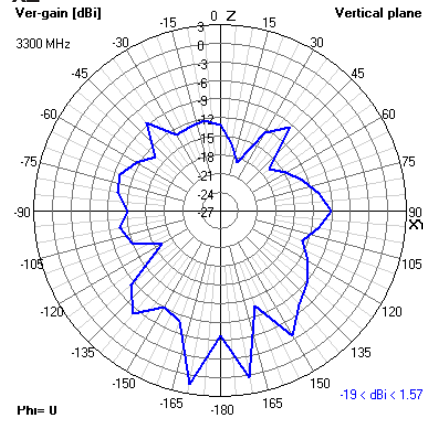
Dual Band Wi-Fi and 5G/4G Adhesive T-bar Antenna

### 2D Radiation Plots

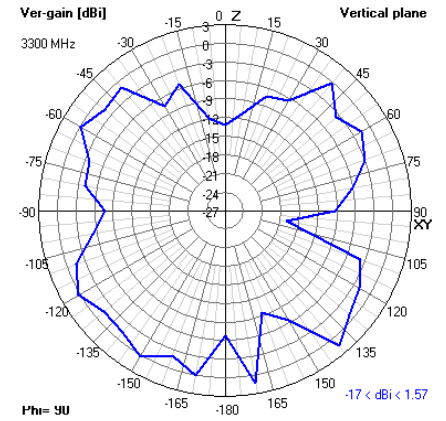
#### 3300 MHz XY



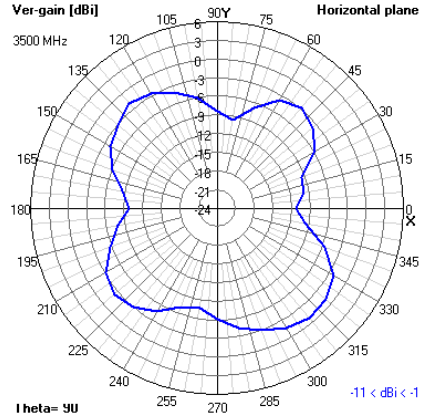
#### XZ



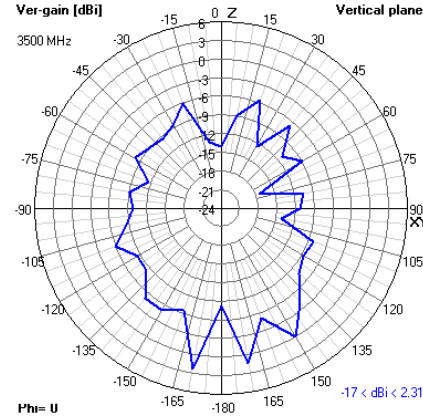
#### YZ



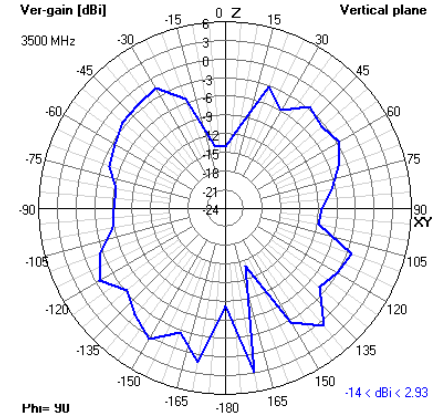
#### 3500 MHz XY



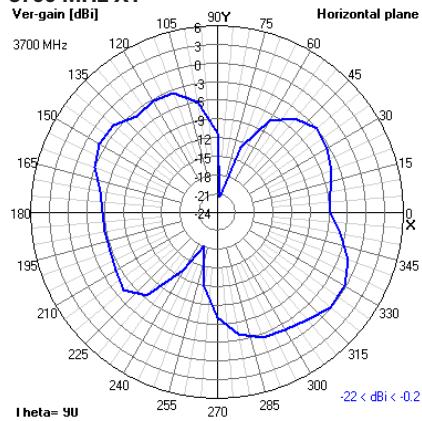
#### XZ



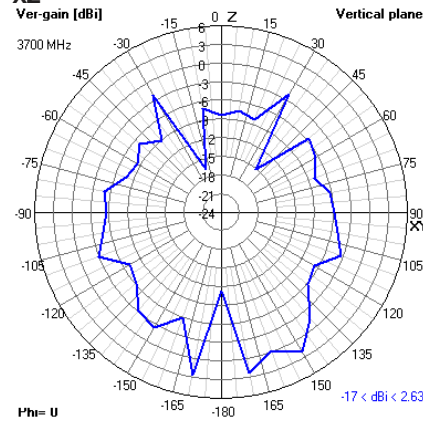
#### YZ



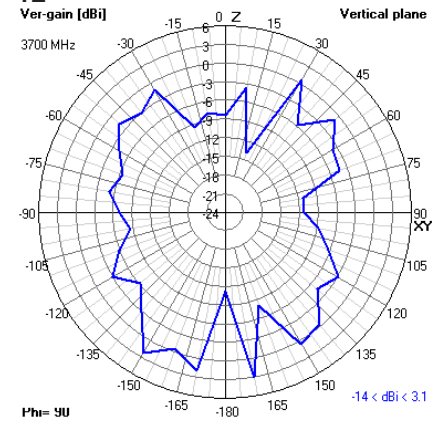
#### 3700 MHz XY



#### XZ



#### YZ



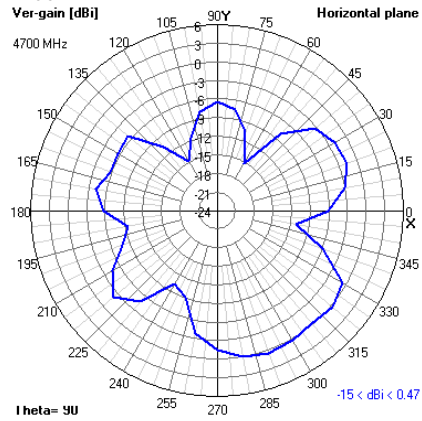


## Alpha 1A

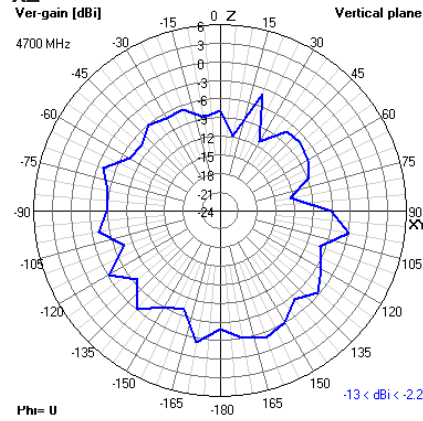
Dual Band Wi-Fi and 5G/4G Adhesive T-bar Antenna

### 2D Radiation Plots

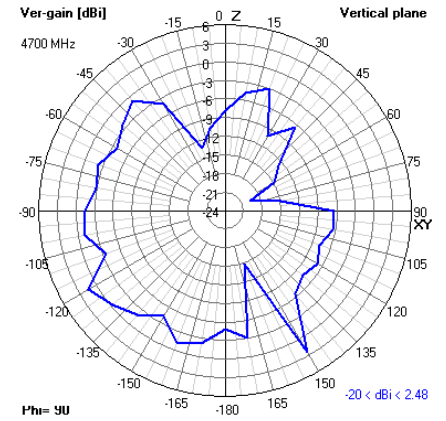
#### 4700 MHz XY



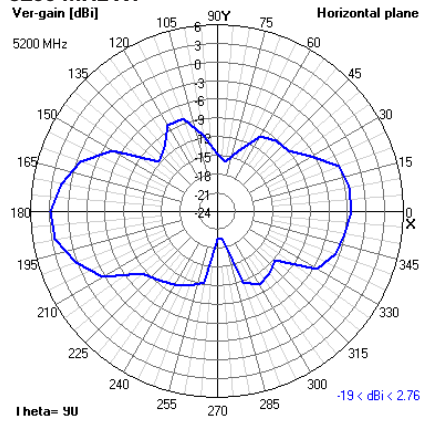
#### XZ



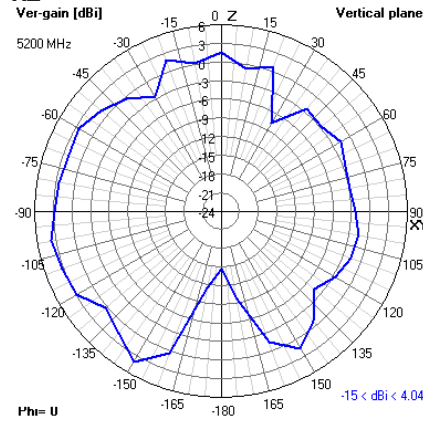
#### YZ



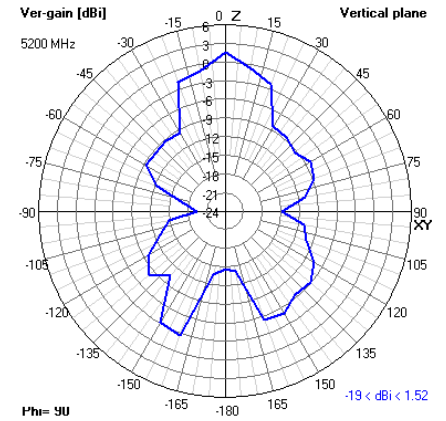
#### 5200 MHz XY



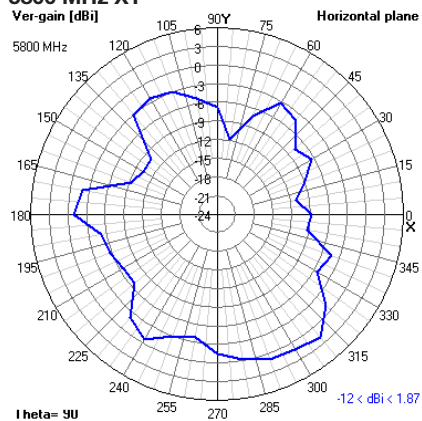
#### XZ



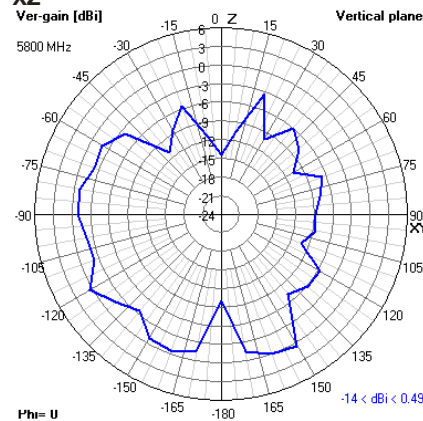
#### YZ



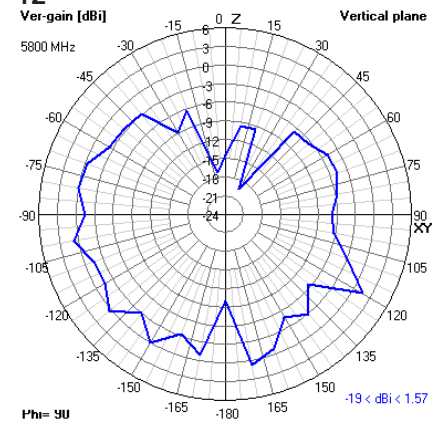
#### 5800 MHz XY



#### XZ



#### YZ





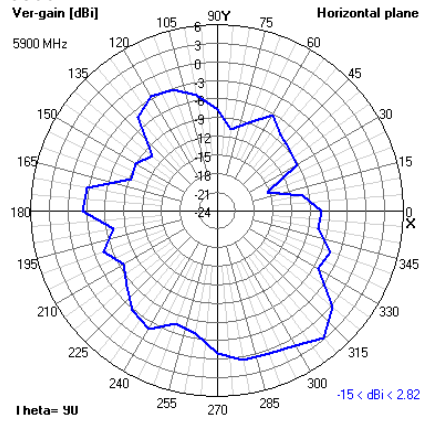


## Alpha 1A

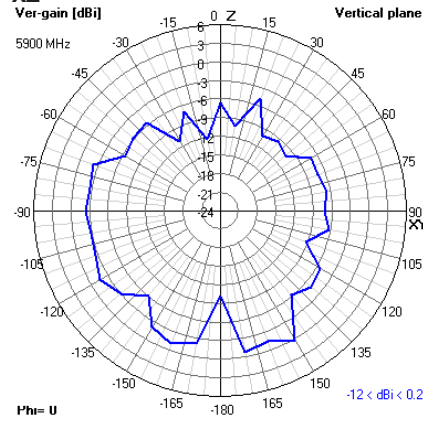
Dual Band Wi-Fi and 5G/4G Adhesive T-bar Antenna

### 2D Radiation Plots

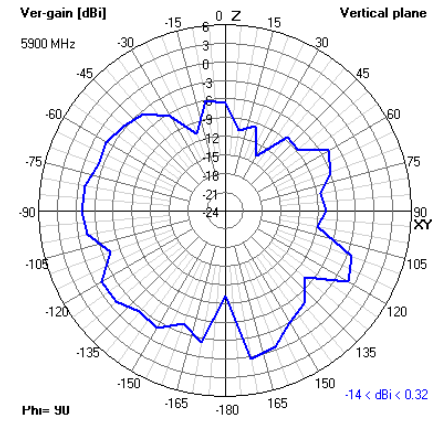
#### 5900 MHz XY



#### XZ



#### YZ



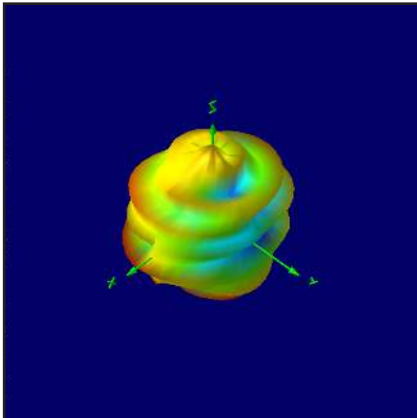


## Alpha 1A

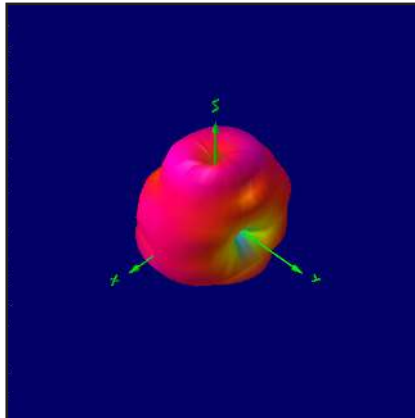
Dual Band Wi-Fi and 5G/4G Adhesive T-bar Antenna

### 3D Radiation Plots

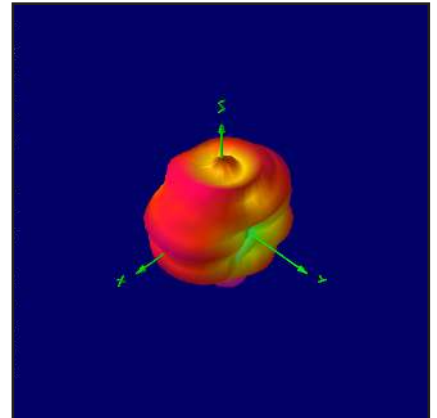
1700 MHz



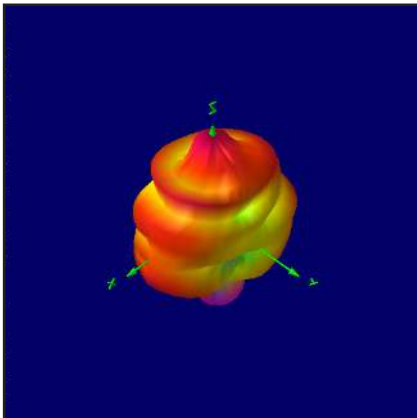
1800 MHz



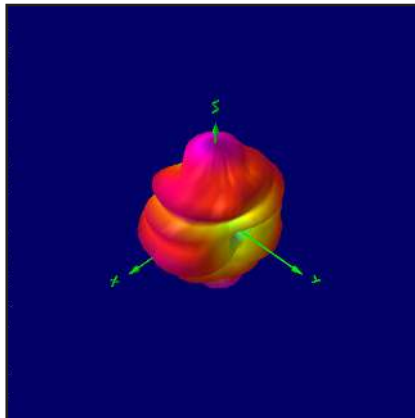
1900 MHz



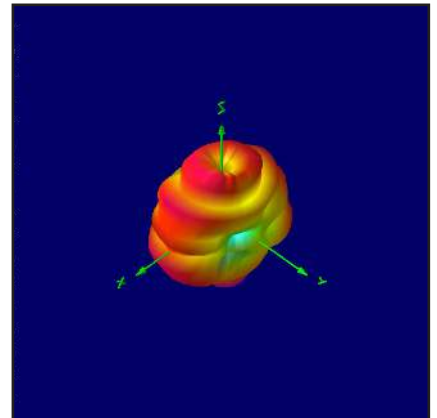
2000 MHz



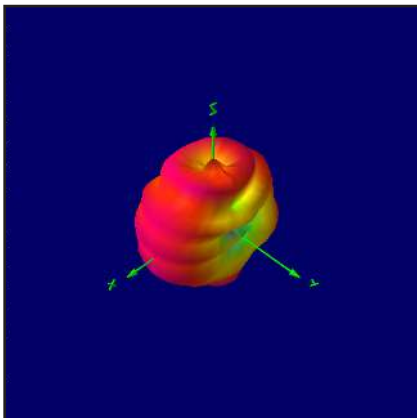
2100 MHz



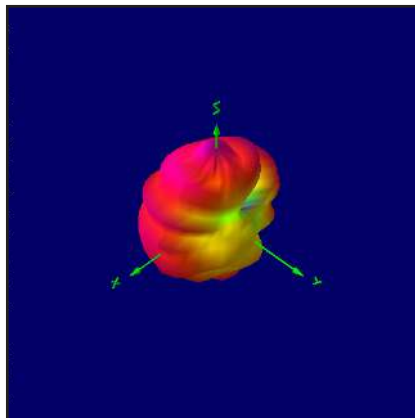
2300 MHz



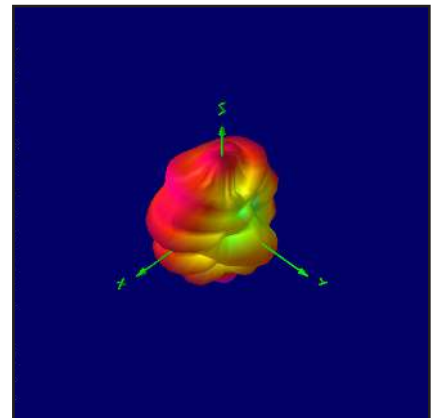
2400 MHz



2500 MHz



2600 MHz



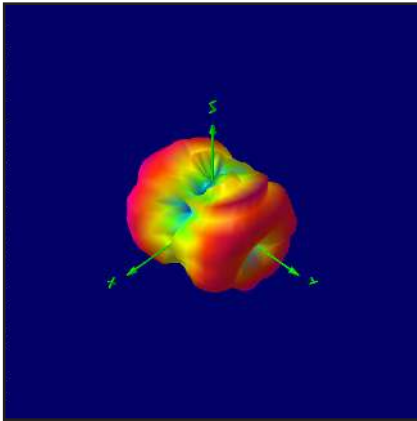


## Alpha 1A

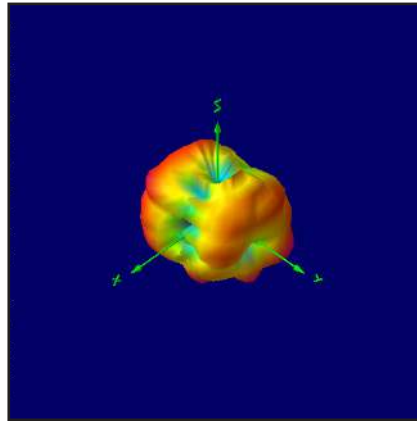
Dual Band Wi-Fi and 5G/4G Adhesive T-bar Antenna

### 3D Radiation Plots

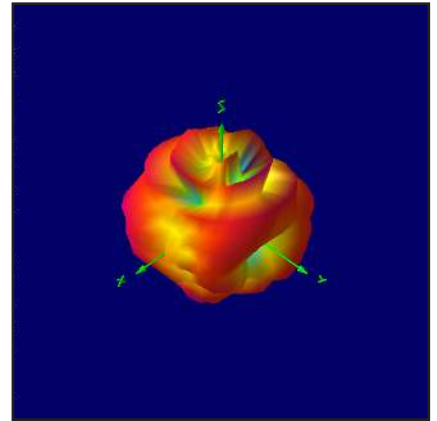
3300 MHz



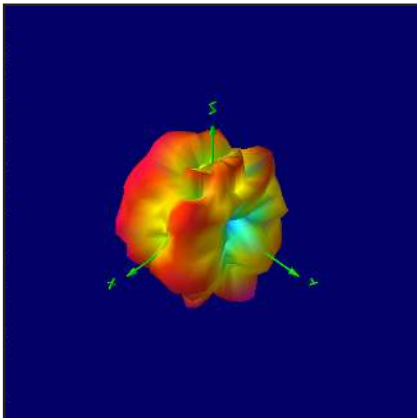
3500 MHz



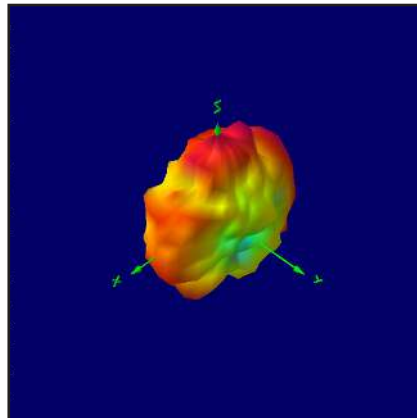
3700 MHz



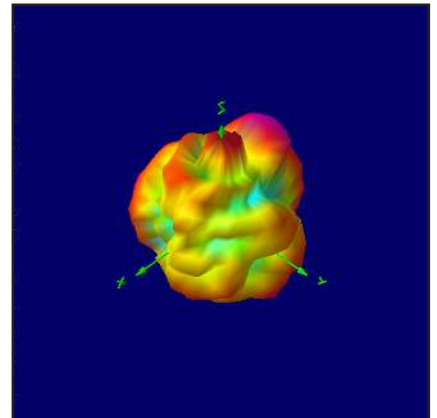
4700 MHz



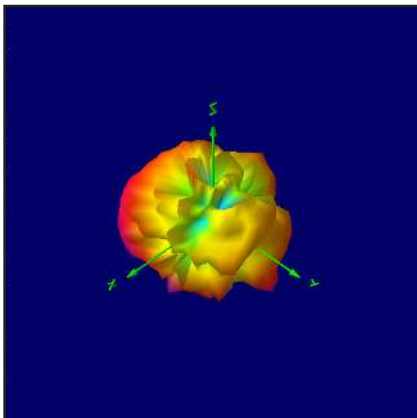
5200 MHz



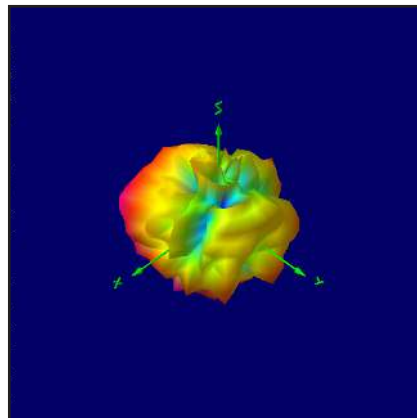
5500 MHz



5800 MHz



5900 MHz



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





Enabling Industrial IoT



## Alpha 1A

Dual Band Wi-Fi and 5G/4G Adhesive T-bar Antenna

### Ordering Details:

Part Number	Description
ALPHA1A/1M/SMAM/S/S/11	Dual Band Wi-Fi and 5G/4G Adhesive T-bar Antenna 1 Meter Cable SMA Male
ALPHA1A/2.5M/SMAM/S/S/11	Dual Band Wi-Fi and 5G/4G Adhesive T-bar Antenna 2.5 Meter Cable SMA Male
ALPHA1A/3M/BNCM/S/S/11	Dual Band Wi-Fi and 5G/4G Adhesive T-bar Antenna 3 Meter Cable BNC Male

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