



Alpha 8

4G LTE/LORA/BLUETOOTH FLAT BLADE ANTENNA



Key Features

- IP67 rated (no dust ingress and submersible in up to 1 meter of water for 30 minutes)
- Supports Key 4G LTE Frequencies
- Supports 2.4 GHz Wi-Fi / Bluetooth / Zigbee
- Supports LoRa / Sigfox / ISM 868 MHz
- Supports some 5G NR / 4G LTE / 3G UMTS Bands
- Supports Key Cat M / NB-IoT Bands
- Compact size and covert / anti-vandal design

General Description

The Alpha 8 has been tuned for 2.4 GHz with additional support for 868 MHz for Lora applications in Europe. It also covers the Key 4G LTE, NB-IoT and Cat M bands.

The dipole PCB is encased and heat sealed to protect against moisture ingress and is versatile enough to fit in many environments.

Supplied with various cable lengths and connector options, it is a reliable design which is already field proven making it ideal for today's telemetry applications which demand effective performance at a competitive price.

Alternative cable lengths and connector types can be specified for volume orders.

Additional Considerations

- Sealed housing protects against moisture ingress
- Low profile and ultra thin design allows installation into many applications

A Adhesive	IEEE 802.15.4	ISM 868	ISM 2.4G	WLAN 2400
BLE Bluetooth	ZB Zigbee	Z Wave	LoRa Wireless	SF Sigfox

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Electrical Specifications

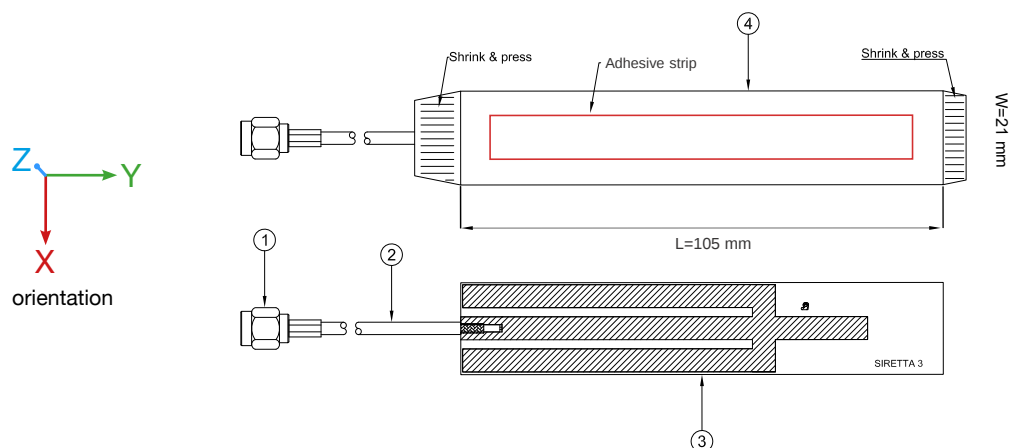
Impedance:	50 Ohm
Polarization:	Vertical
Max input power:	6 W
Ground plane independent:	No

Environmental Specifications

Operating temperature range:	-40 °C - +85 °C
Storage temperature range:	-40 °C - +85 °C

Mechanical Specifications

Dimensions:	113 x 21 x 3mm (without cable)
Weight:	5 g
Connector:	SMA Male / FME Female
Cable:	RG174
Mounting method:	Direct Connect
Housing materials:	NP-140TL-B



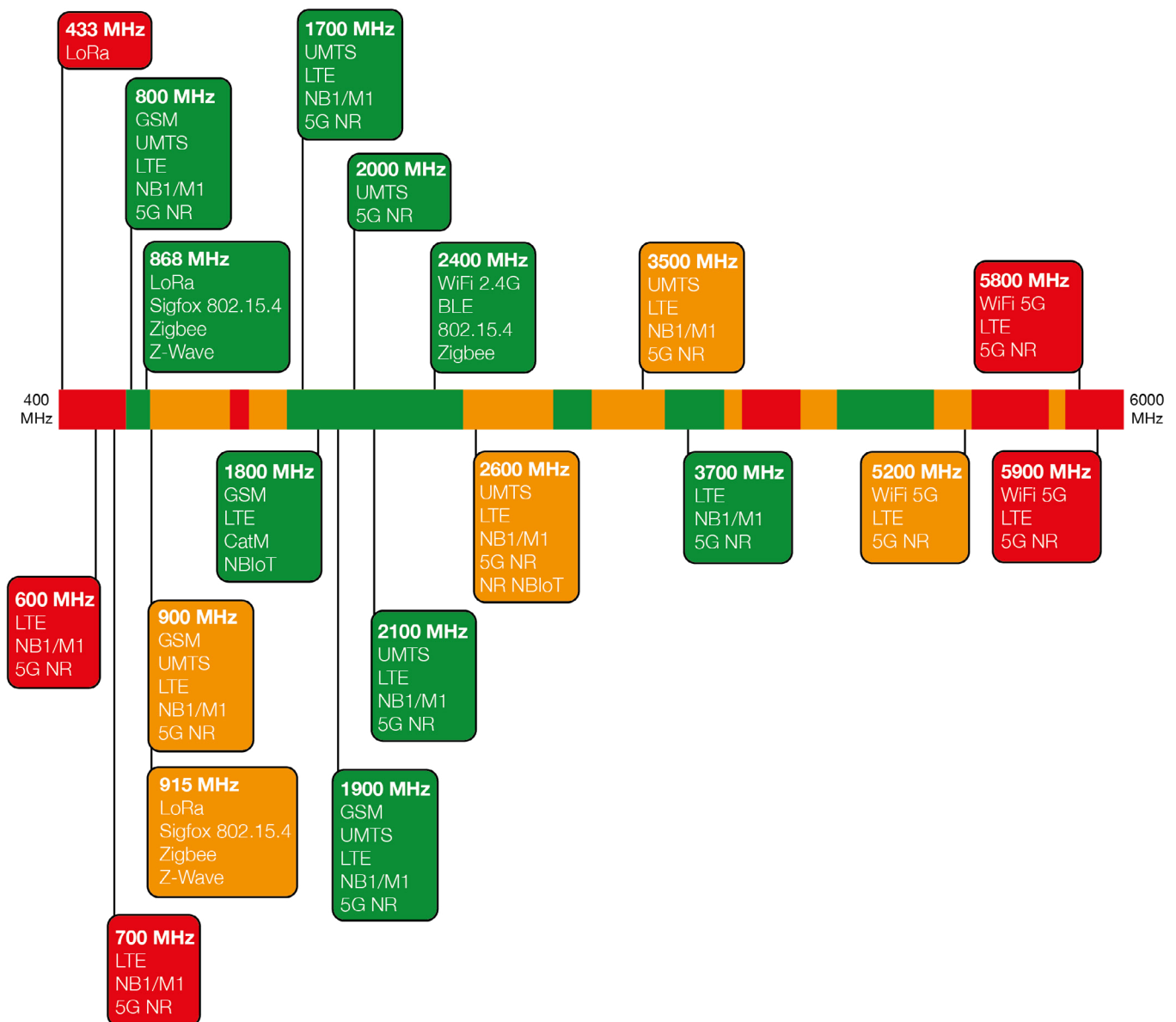
04	Heat shrink (Black, no mark)	1
03	PCB (105x20x1mm)	1
02	RG174-MIT coaxial cable (Black)	1
01	SMA Straight Plug (Nickel)	1
NO	DESCRIPTION	Q'TY



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Spectrum Coverage



● Suitable band

● Adequate band in good signal conditions

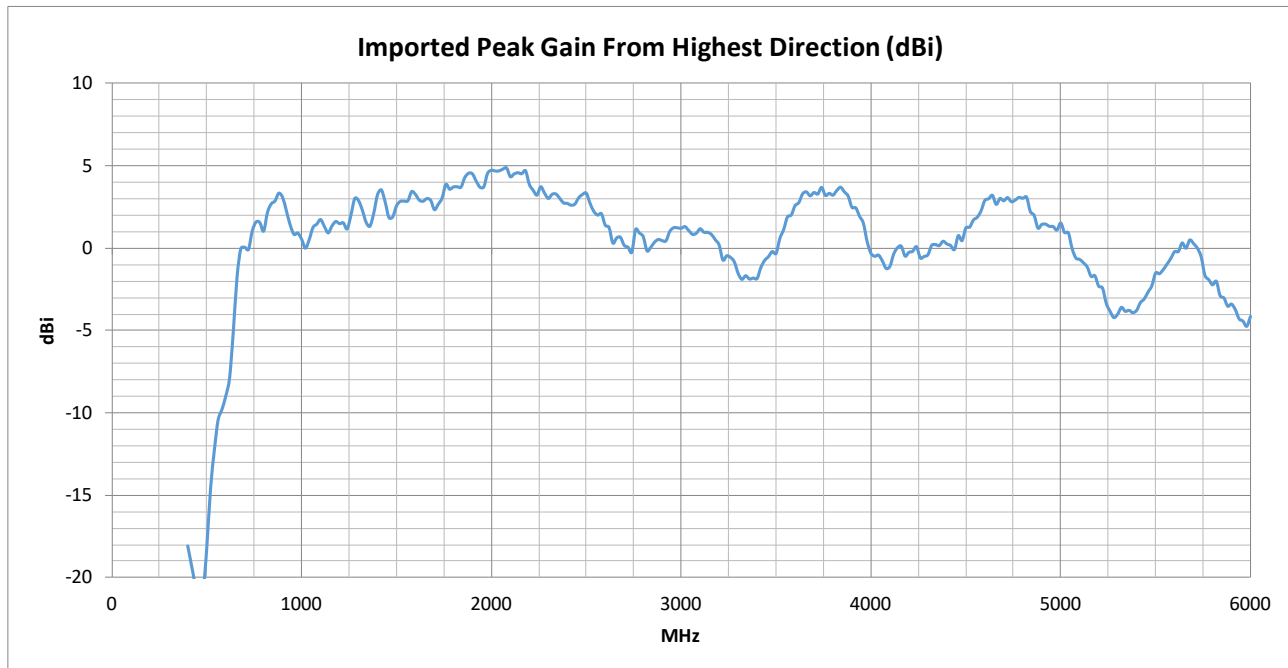
● Likely to be unsuitable



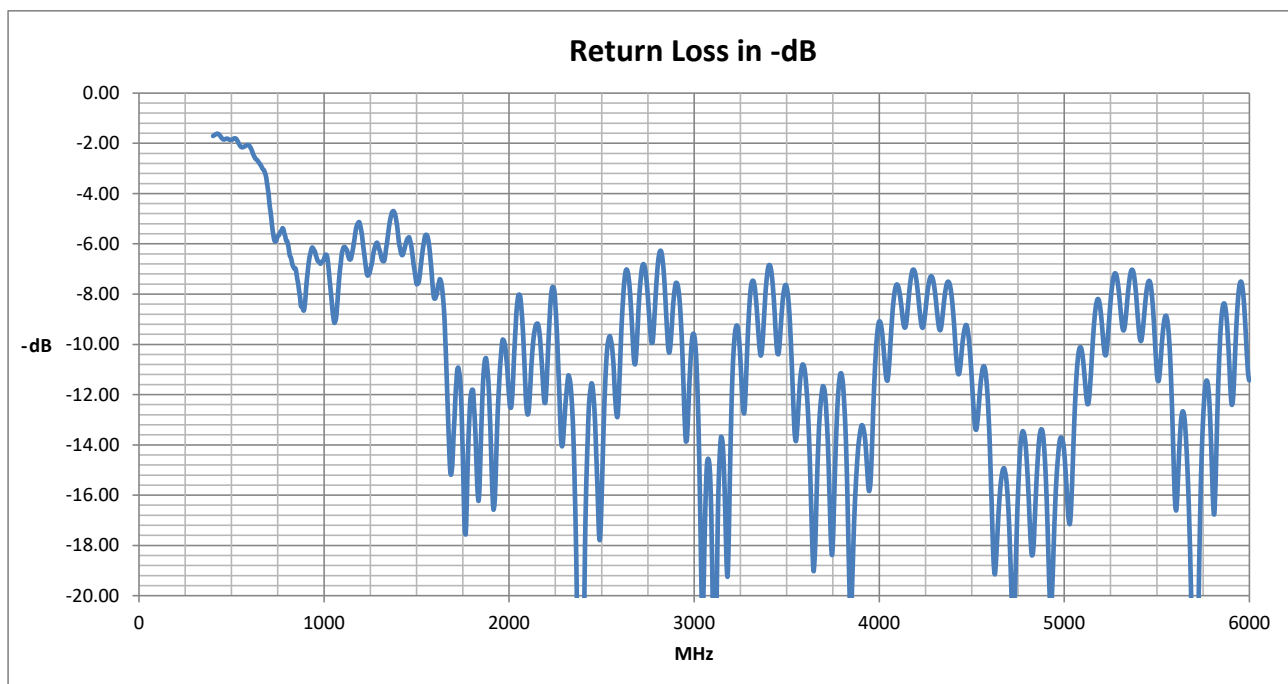
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Peak Gain vs. Frequency



Return Loss

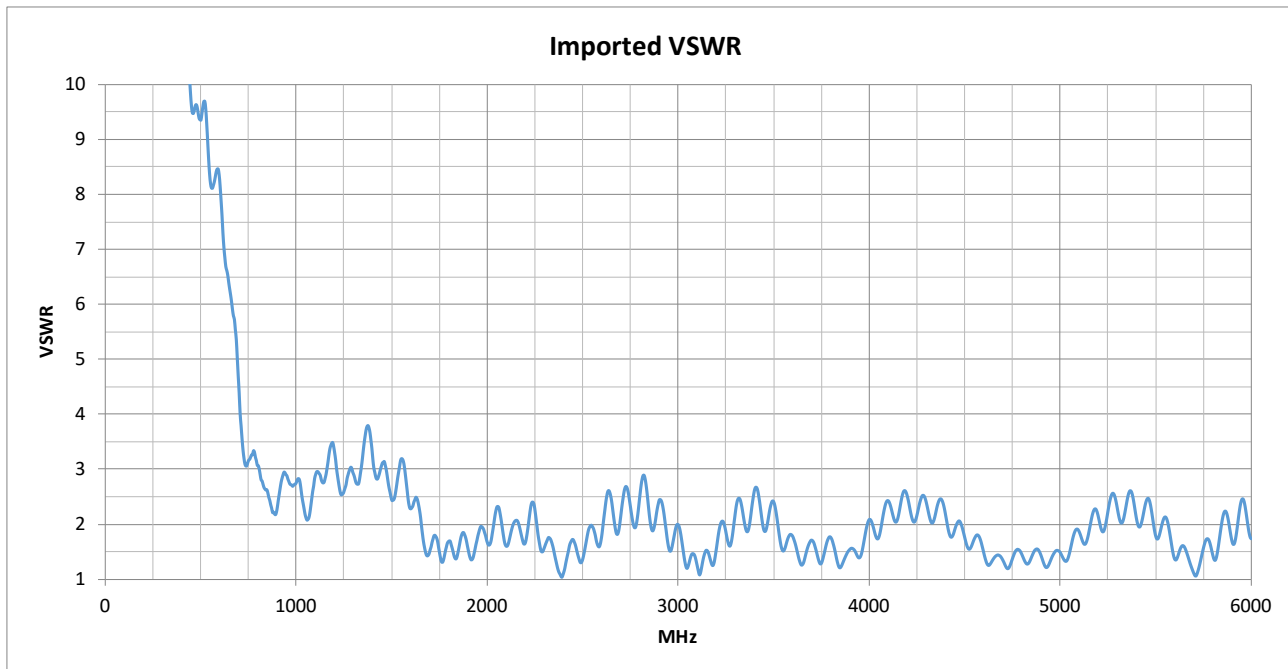




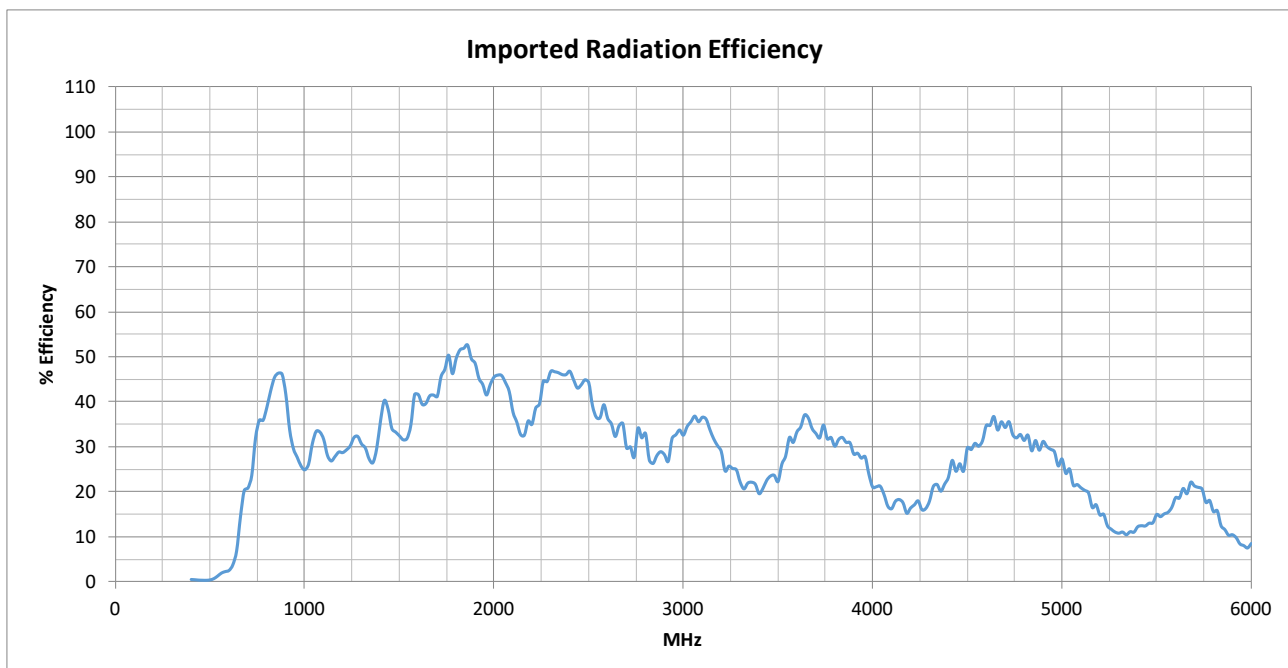
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VSWR



Radiation Efficiency



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:	●	●			●	●						



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Usable ISM Frequency Support (433 MHz - 5800 MHz)

	433	868	915	2450	5800
Bluetooth				●	
Helium		●			
IEEE 802.15.4		●		●	
ISM 433					
ISM 868		●			
ISM 915					
ISM 2.4G				●	
ISM 5.8G					
LoRa		●			
SigFox		●			
Weightless		●			
Wi-Fi 2.4G				●	
Wi-Fi 5G					
Wi-Fi 6E					
Zigbee		●		●	
Z-Wave		●			



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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	43.29	33.82	1.95	2.07	●
PCS-1900	2	2	2	2	n2	n2	1850 - 1910 MHz	1930 - 1990 MHz	50.05	43.19	1.84	1.95	●
DCS-1800	3	3	3	3	n3	n3	1710 - 1785 MHz	1805 - 1880 MHz	47.30	51.50	1.80	1.84	●
	4	4	4	4			1710 - 1755 MHz	2110 - 2155 MHz	46.64	34.06	1.80	2.07	●
GSM-850	5	5	5	5	n5	n5	824 - 849 MHz	869 - 894 MHz	44.72	45.26	2.73	2.30	●
	6						830 - 840 MHz	875 - 885 MHz	44.66	45.86	2.67	2.22	●
	7	7	7	7	n7	n7	2500 - 2570 MHz	2620 - 2690 MHz	38.46	33.99	1.98	2.61	●
E-GSM-900	8	8	8	8	n8	n8	880 - 915 MHz	925 - 960 MHz	41.64	29.71	2.66	2.94	●
	9	9					1749.9 - 1784.9 MHz	1844.9 - 1879.9 MHz	48.43	51.62	1.58	1.84	●
	10	10					1710 - 1770 MHz	2110 - 2170 MHz	47.36	33.82	1.80	2.07	●
	11	11	11	11			1427.9 - 1447.9 MHz	1475.9 - 1495.9 MHz	38.38	33.02	3.09	2.86	●
	12	12	12	12	n12	n12	699 - 716 MHz	729 - 746 MHz	21.90	30.71	4.45	3.13	●
	13	13	13	13	n13		777 - 787 MHz	746 - 756 MHz	36.25	34.14	3.32	3.19	●
	14	14	14	14	n14	n14	788 - 798 MHz	758 - 768 MHz	37.79	35.85	3.18	3.26	●
		17		17			704 - 716 MHz	734 - 746 MHz	22.25	31.65	4.08	3.13	●
		18	18	18	n18	n18	815 - 830 MHz	860 - 875 MHz	42.80	46.26	2.80	2.43	●
	19	19	19	19			830 - 845 MHz	875 - 890 MHz	44.94	45.38	2.67	2.22	●
	20	20	20	20	n20	n20	832 - 862 MHz	791 - 821 MHz	45.62	39.96	2.65	3.14	●
	21	21	21	21			1447.9 - 1462.9 MHz	1495.9 - 1510.9 MHz	35.09	32.28	3.14	2.48	●
	22	22					3410 - 3490 MHz	3510 - 3590 MHz	22.53	29.22	2.66	2.24	●
		24	24	24	n24	n24	1626.5 - 1660.5 MHz	1525 - 1559 MHz	40.12	32.57	2.48	3.19	●
	25	25	25	25	n25	n25	1850 - 1915 MHz	1930 - 1995 MHz	49.78	43.32	1.84	1.95	●
	26	26	26	26	n26	n26	814 - 849 MHz	859 - 894 MHz	44.01	45.56	2.82	2.44	●
		27	27				807 - 824 MHz	852 - 869 MHz	41.62	46.23	2.96	2.54	●
		28	28	28	n28	n28	703 - 748 MHz	758 - 803 MHz	26.68	36.75	4.16	3.33	●

● 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	24.16	36.04	4.16	3.33	●
		29			n29		N/A	717 - 728 MHz	N/A	24.82	N/A	3.47	●
		30			n30		2305 - 2315 MHz	2350 - 2360 MHz	46.72	46.13	1.72	1.47	●
		31	31	31			452.5 - 457.5 MHz	462.5 - 467.5 MHz	0.37	0.36	9.54	9.57	●
	32	32					N/A	1452 - 1496 MHz	N/A	33.62	N/A	3.14	●
		33					1900 - 1920 MHz	1900 - 1920 MHz	46.86	46.86	1.52	1.52	●
		34			n34		2010 - 2025 MHz	2010 - 2025 MHz	45.84	45.84	1.82	1.82	●
		35					1850 - 1910 MHz	1850 - 1910 MHz	50.05	50.05	1.84	1.84	●
		36					1930 - 1990 MHz	1930 - 1990 MHz	43.19	43.19	1.95	1.95	●
		37					1910 - 1930 MHz	1910 - 1930 MHz	45.44	45.44	1.46	1.46	●
		38			n38		2570 - 2620 MHz	2570 - 2620 MHz	37.13	37.13	2.40	2.40	●
		39	39		n39		1880 - 1920 MHz	1880 - 1920 MHz	47.95	47.95	1.81	1.81	●
		40	40		n40		2300 - 2400 MHz	2300 - 2400 MHz	46.39	46.39	1.76	1.76	●
		41	41	41	n41	n41	2496 - 2690 MHz	2496 - 2690 MHz	36.63	36.63	2.61	2.61	●
		42	42	42			3400 - 3600 MHz	3400 - 3600 MHz	25.63	25.63	2.67	2.67	●
		43	43	43			3600 - 3800 MHz	3600 - 3800 MHz	33.73	33.73	1.77	1.77	●
		44					703 - 803 MHz	703 - 803 MHz	31.99	31.99	4.16	4.16	●
		45					1447 - 1467 MHz	1447 - 1467 MHz	34.91	34.91	3.14	3.14	●
		46			n46		5150 - 5925 MHz	5150 - 5925 MHz	14.85	14.85	2.61	2.61	●
		47			n47		5855 - 5925 MHz	5855 - 5925 MHz	10.54	10.54	2.23	2.23	●
		48	48	48	n48		3550 - 3700 MHz	3550 - 3700 MHz	33.90	33.90	1.81	1.81	●
		49					3550 - 3700 MHz	3550 - 3700 MHz	33.90	33.90	1.81	1.81	●
		50			n50		1432 - 1517 MHz	1432 - 1517 MHz	34.23	34.23	3.14	3.14	●
		51			n51		1427 - 1432 MHz	1427 - 1432 MHz	39.37	39.37	2.89	2.89	●
		52					3300 - 3400 MHz	3300 - 3400 MHz	21.45	21.45	2.64	2.64	●

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		53			n53		2483.5 - 2495 MHz	2483.5 - 2495 MHz	44.59	44.59	1.32	1.32	●
		54	54	54	n54	n54	1670 - 1675 MHz	1670 - 1675 MHz	41.42	41.42	1.58	1.58	●
		65		65	n65	n65	1920 - 2010 MHz	2110 - 2200 MHz	43.86	34.29	1.95	2.07	●
		66	66	66	n66	n66	1710 - 1780 MHz	2110 - 2200 MHz	47.35	34.29	1.80	2.07	●
		67			n67		N/A	738 - 758 MHz	N/A	33.53	N/A	3.20	●
		68					698 - 728 MHz	753 - 783 MHz	22.98	35.75	4.51	3.33	●
		69					N/A	2570 - 2620 MHz	N/A	37.13	N/A	2.40	●
		70		70	n70	n70	1695 - 1710 MHz	1995 - 2020 MHz	41.96	45.63	1.67	1.72	●
		71	71	71	n71	n71	663 - 698 MHz	617 - 652 MHz	19.19	6.51	5.96	7.19	●
		72	72	72			451 - 456 MHz	461 - 466 MHz	0.37	0.36	9.58	9.54	●
		73	73	73			450 - 455 MHz	460 - 465 MHz	0.37	0.36	9.61	9.53	●
		74	74	74	n74	n74	1427 - 1470 MHz	1475 - 1518 MHz	36.50	32.57	3.14	2.88	●
		75			n75		N/A	1432 - 1517 MHz	N/A	34.23	N/A	3.14	●
		76			n76		N/A	1427 - 1432 MHz	N/A	39.37	N/A	2.89	●
					n77		3300 - 4200 MHz	3300 - 4200 MHz	26.01	26.01	2.67	2.67	●
					n78		3300 - 3800 MHz	3300 - 3800 MHz	28.03	28.03	2.67	2.67	●
					n79		4400 - 5000 MHz	4400 - 5000 MHz	30.69	30.69	2.15	2.15	●
					n80		1710 - 1785 MHz	N/A	47.30	N/A	1.80	N/A	●
					n81		880 - 915 MHz	N/A	41.64	N/A	2.66	N/A	●
					n82		832 - 862 MHz	N/A	45.62	N/A	2.65	N/A	●
					n83		703 - 748 MHz	N/A	26.68	N/A	4.16	N/A	●
					n84		1920 - 1980 MHz	N/A	43.29	N/A	1.95	N/A	●
		85	85	85	n85		698 - 716 MHz	728 - 746 MHz	21.84	30.52	4.51	3.14	●
					n86		1710 - 1780 MHz	N/A	47.35	N/A	1.80	N/A	●
		87	87	87			410 - 415 MHz	420 - 425 MHz	0.49	0.46	10.66	10.79	●

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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
		88	88	88			412 - 417 MHz	422 - 427 MHz	0.49	0.45	10.71	10.79	●
					n89		824 - 849 MHz	N/A	44.72	N/A	2.73	N/A	●
					n90	n90	2496 - 2690 MHz	2496 - 2690 MHz	36.63	36.63	2.61	2.61	●
					n91		832 - 862 MHz	1427 - 1432 MHz	45.62	39.37	2.65	2.89	●
					n92		832 - 862 MHz	1432 - 1517 MHz	45.62	34.23	2.65	3.14	●
					n93		880 - 915 MHz	1427 - 1432 MHz	41.64	39.37	2.66	2.89	●
					n94		880 - 915 MHz	1432 - 1517 MHz	41.64	34.23	2.66	3.14	●
					n95		2010 - 2025 MHz	N/A	45.84	N/A	1.82	N/A	●
					n97		2300 - 2400 MHz	N/A	46.39	N/A	1.76	N/A	●
					n98		1880 - 1920 MHz	N/A	47.95	N/A	1.81	N/A	●
					n99		1626.5 - 1660.5 MHz	N/A	40.12	N/A	2.48	N/A	●
1900					n101		1900 - 1910 MHz	1900 - 1910 MHz	47.69	47.69	1.52	1.52	●
				103			787 - 788 MHz	757 - 758 MHz	36.99	35.40	3.19	3.20	●
					n105		663 - 703 MHz	612 - 652 MHz	19.41	6.13	5.96	7.49	●

● 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	0.41	10.54	-20.08	●
ISM 868 MHz	863 - 870 MHz	46.28	2.38	3.10	●
ISM 915 MHz	902 - 928 MHz	35.97	2.87	2.99	●
ISM 2.4 GHz	2400 - 2500 MHz	44.42	1.72	3.33	●
Wi-Fi 2.4G	2401 - 2483 MHz	44.37	1.72	3.26	●
Wi-Fi 2.4G (USA)	2401 - 2473 MHz	44.32	1.72	3.18	●
Wi-Fi 2.4G (Japan)	2401 - 2495 MHz	44.39	1.72	3.31	●
Wi-Fi 5G (all channels)	5150 - 5990 MHz	14.34	2.61	0.49	●
Wi-Fi 5G (Ch 32-48)	5150 - 5250 MHz	15.25	2.27	-1.44	●
Wi-Fi 5G (Ch 32-64)	5150 - 5330 MHz	13.44	2.56	-1.44	●
Wi-Fi 5G (Ch 32-161)	5150 - 5815 MHz	15.38	2.61	0.49	●
Wi-Fi 5G (Ch 32-173)	5150 - 5875 MHz	15.17	2.61	0.49	●
ISM 5.8 GHz	5725 - 5875 MHz	15.95	2.23	-0.14	●
UWB band 1	3168 - 3696 MHz	26.74	2.67	3.41	●
UWB band 2	3696 - 4224 MHz	24.95	2.61	3.69	●
UWB band 3	4224 - 4752 MHz	27.13	2.52	3.20	●
UWB band 4	4752 - 5280 MHz	24.03	2.56	3.09	●
UWB band 5	5280 - 5808 MHz	15.62	2.61	0.49	●

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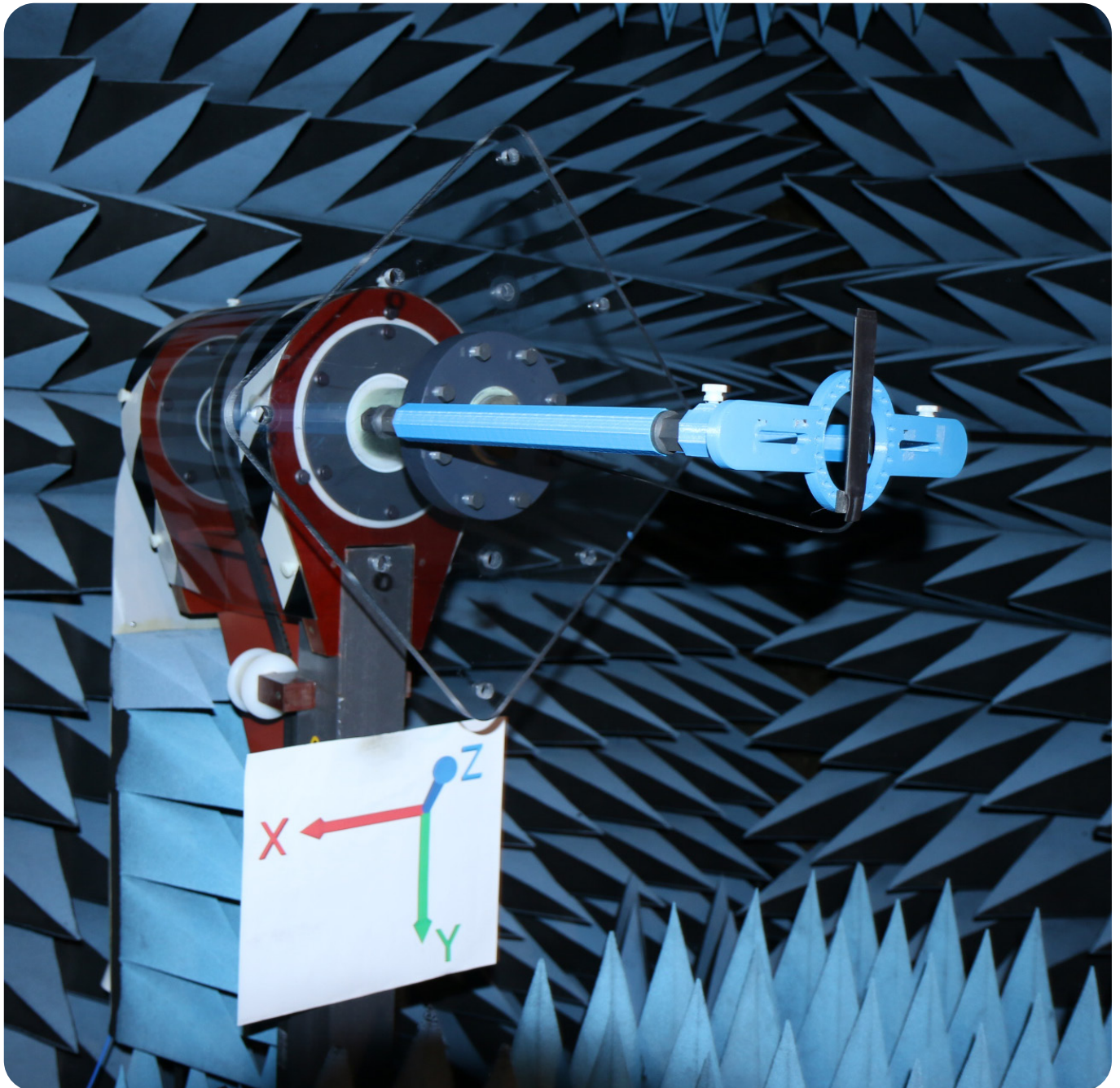
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Test Setup (in Free Space)



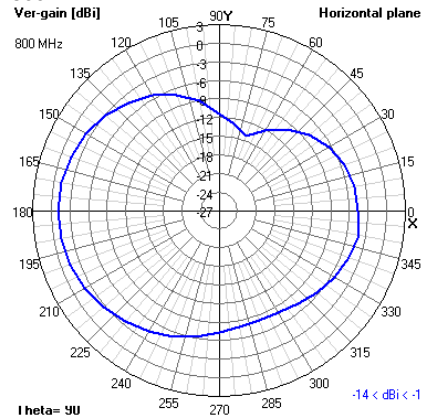


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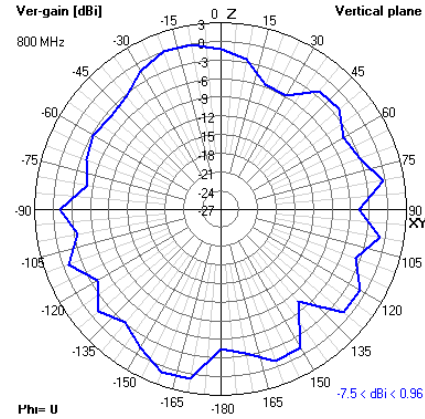
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2D Radiation Plots

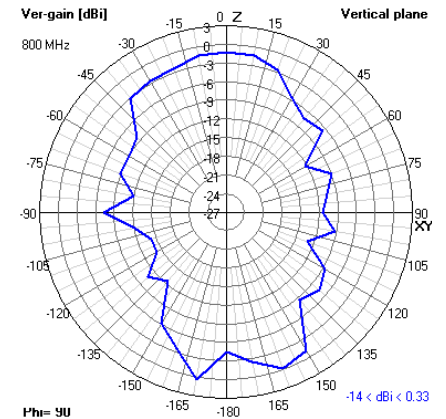
800 MHz XY



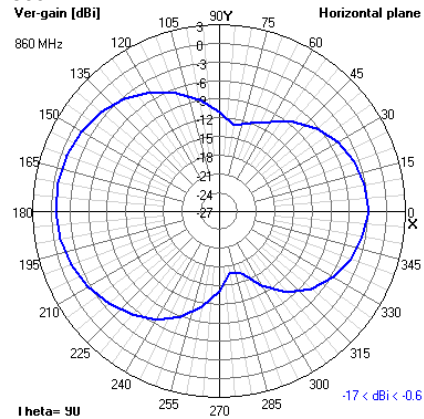
XZ



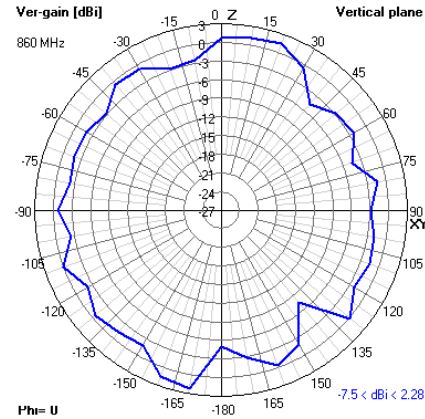
YZ



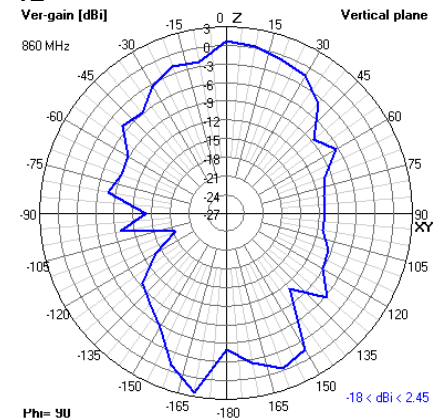
860 MHz XY



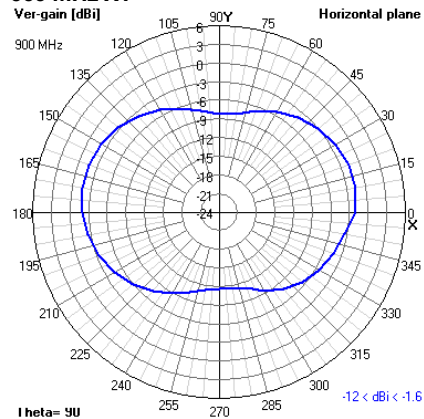
XZ



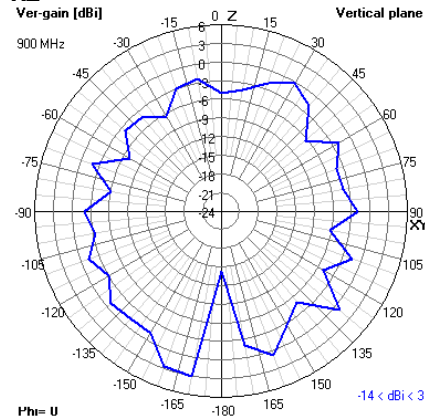
YZ



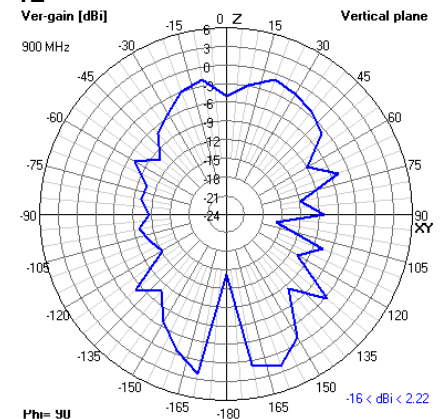
900 MHz XY



XZ



YZ



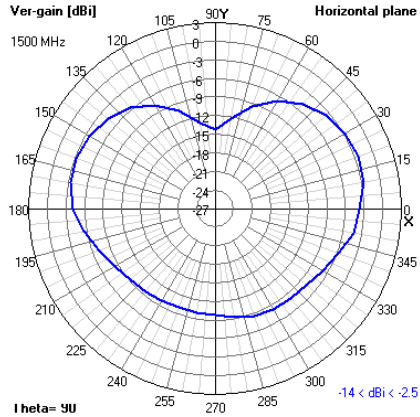


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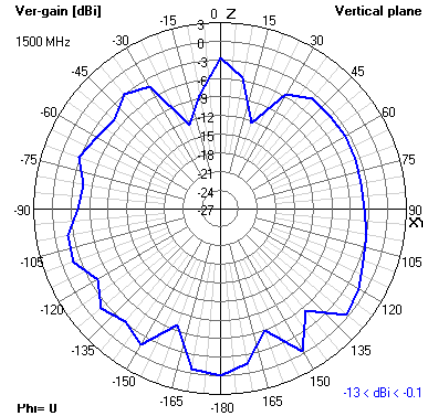
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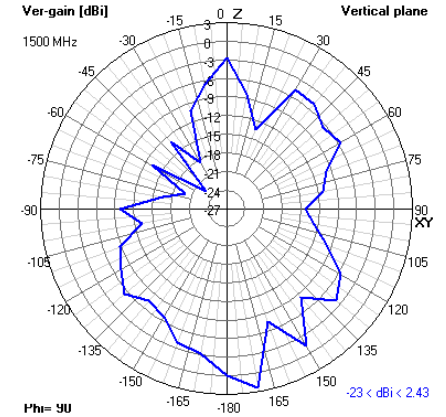
1500 MHz XY



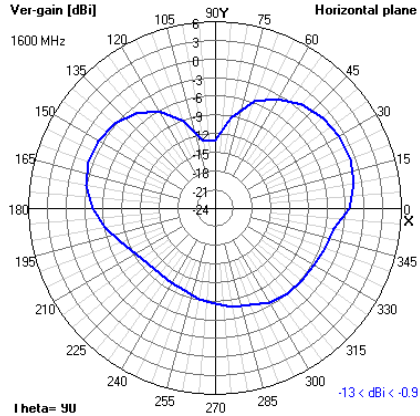
XZ



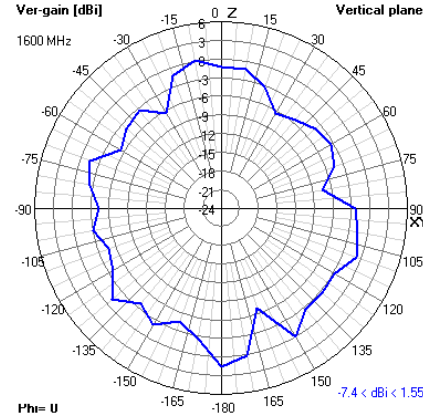
YZ



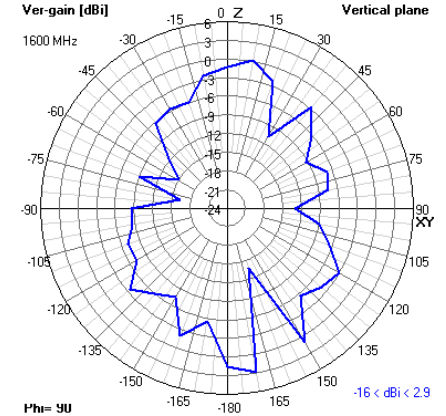
1600 MHz XY



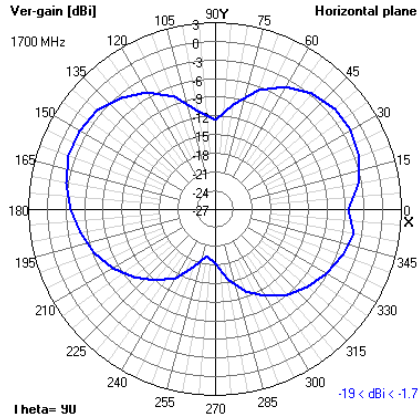
XZ



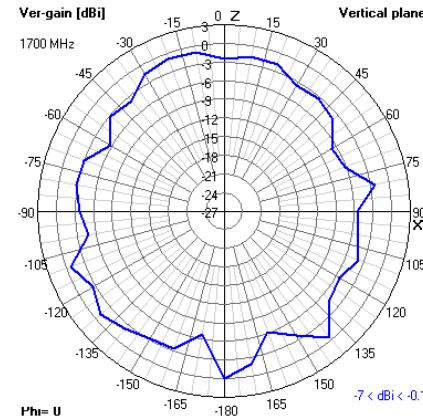
YZ



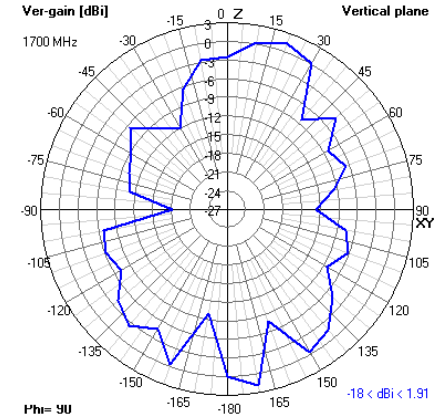
1700 MHz XY



XZ



YZ





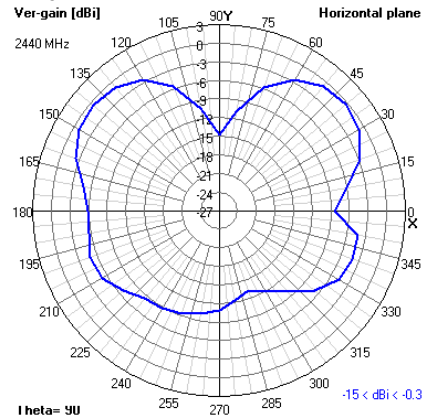
4G LTE/LORA/BLUETOOTH FLAT BLADE ANTENNA

Alpha 8

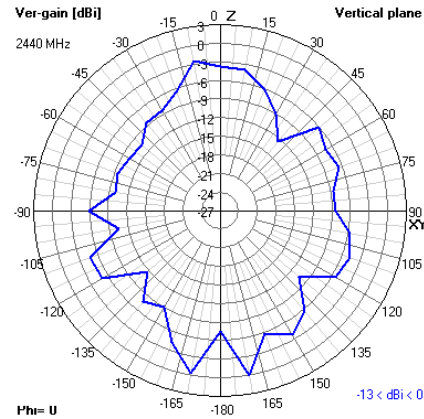
4G LTE/LORA/BLUETOOTH FLAT BLADE ANTENNA

2D Radiation Plots

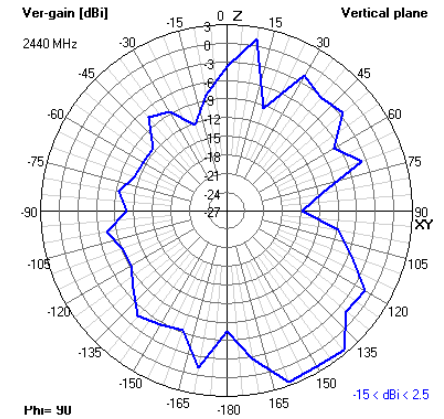
2440 MHz XY



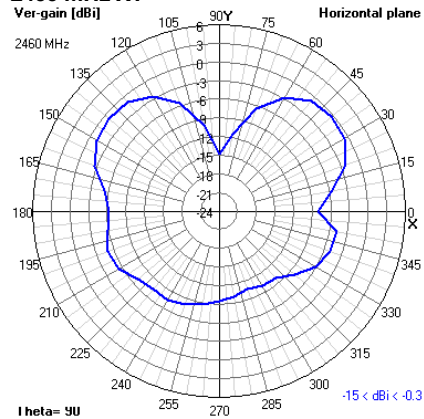
XZ



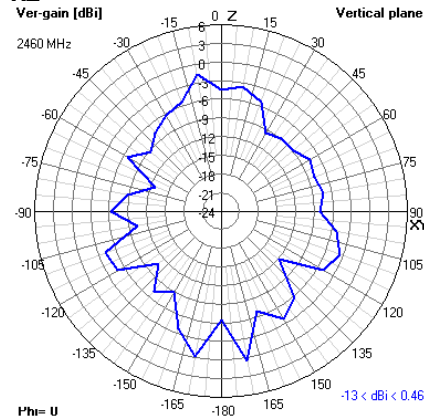
YZ



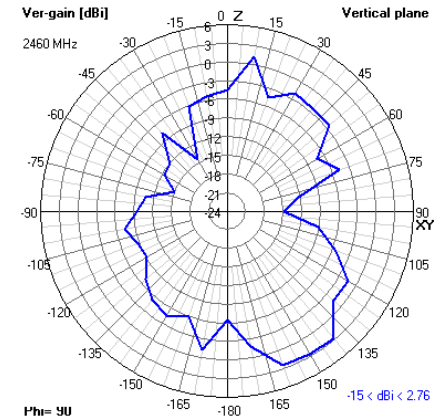
2460 MHz XY



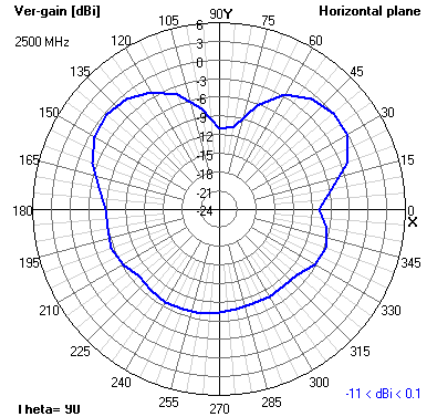
XZ



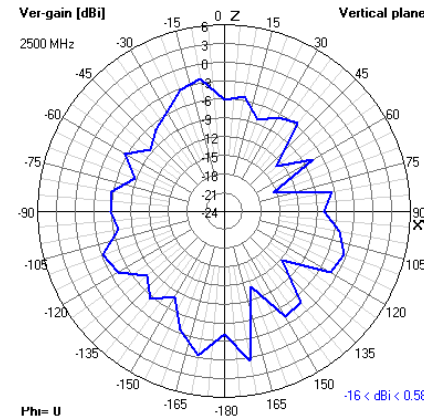
YZ



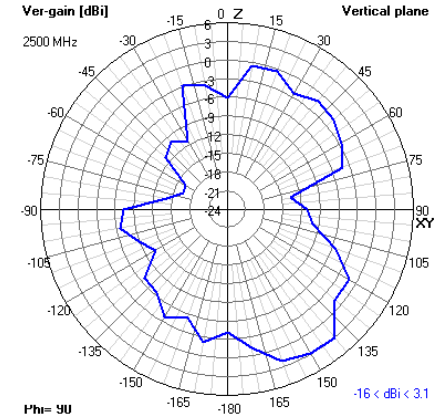
2500 MHz XY



XZ



YZ

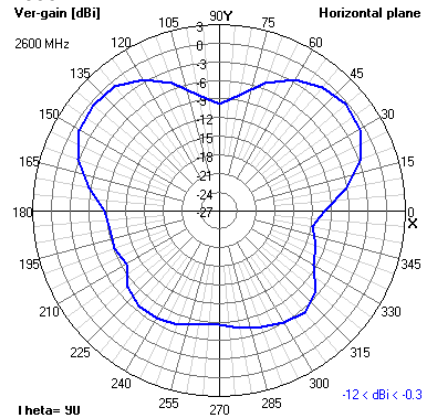


Alpha 8

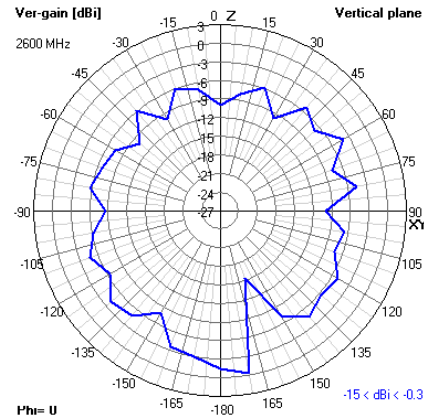
4G LTE/LORA/BLUETOOTH FLAT BLADE ANTENNA

2D Radiation Plots

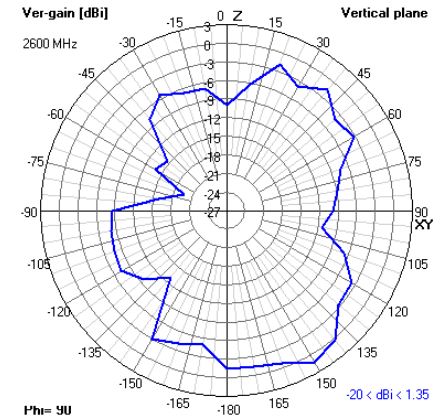
2600 MHz XY



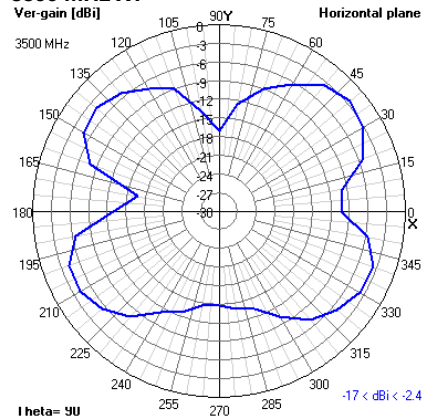
XZ



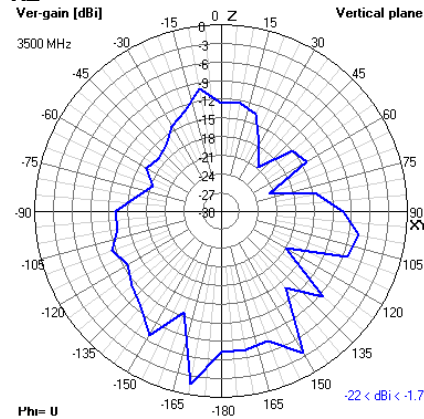
YZ



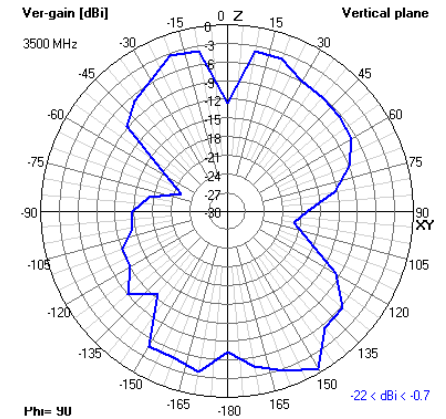
3500 MHz XY



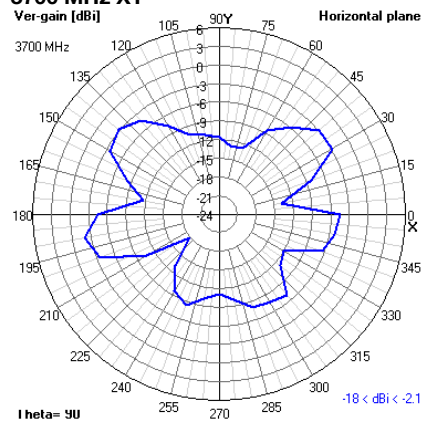
XZ



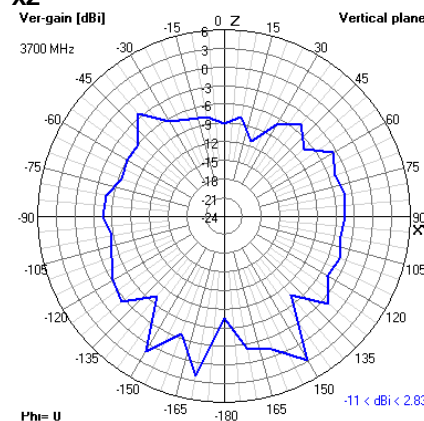
YZ



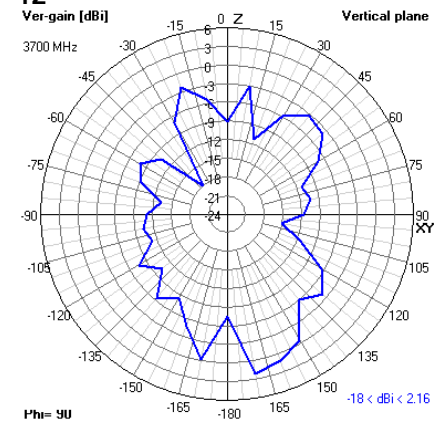
3700 MHz XY



XZ



YZ



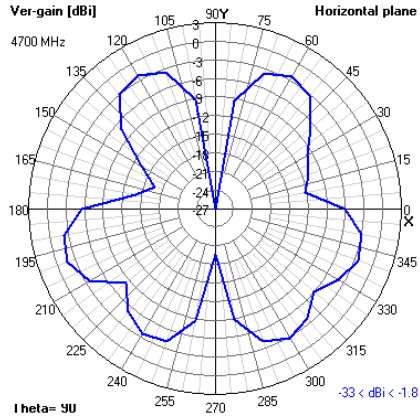


Alpha 8

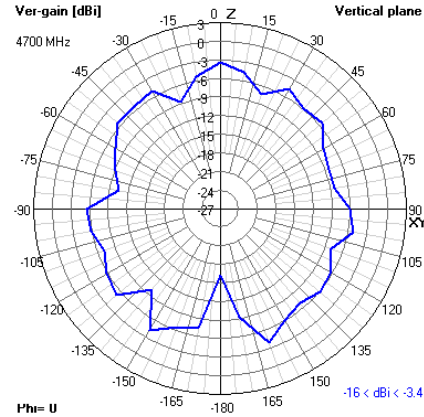
4G LTE/LORA/BLUETOOTH FLAT BLADE ANTENNA

2D Radiation Plots

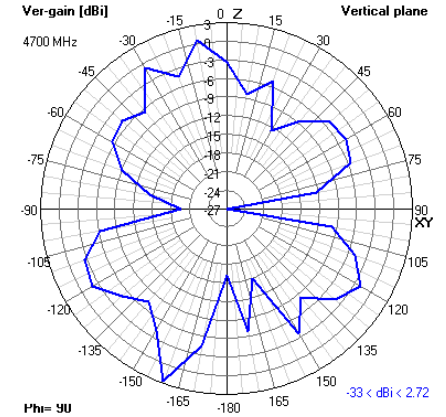
4700 MHz XY



XZ



YZ



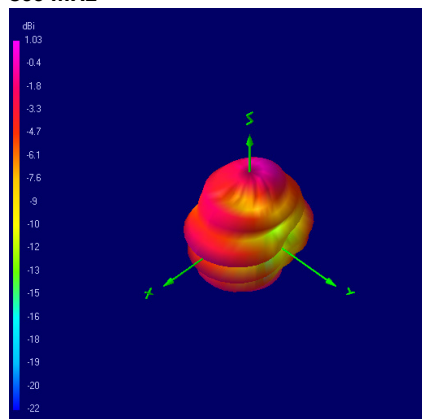


Alpha 8

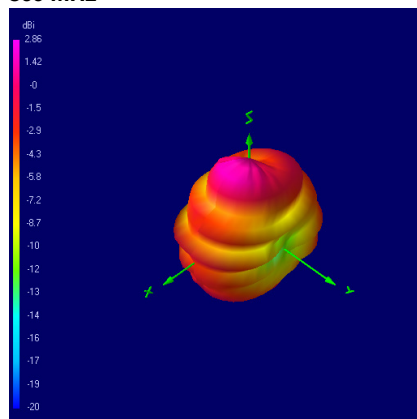
4G LTE/LORA/BLUETOOTH FLAT BLADE ANTENNA

3D Radiation Plots

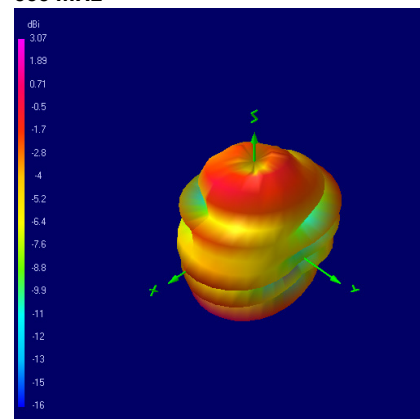
800 MHz



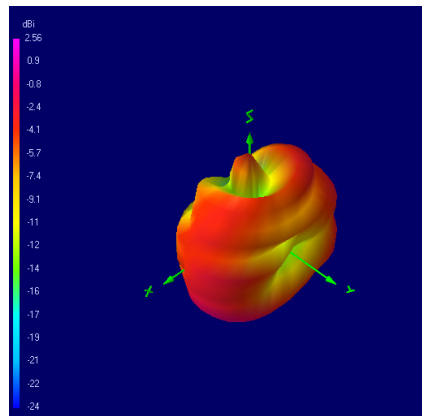
860 MHz



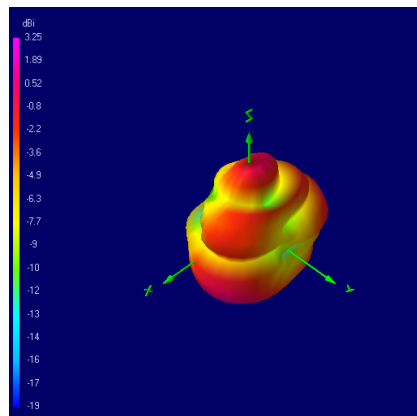
900 MHz



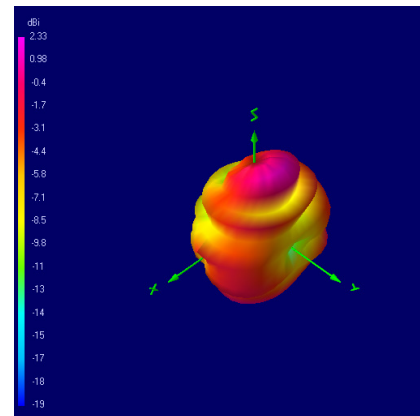
1500 MHz



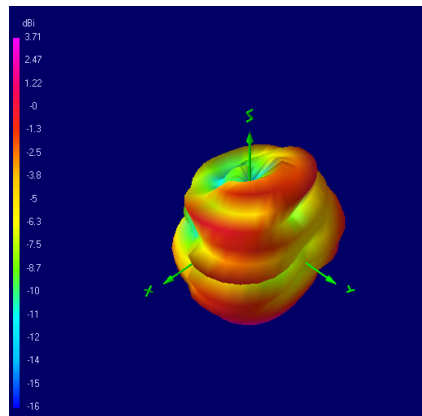
1600 MHz



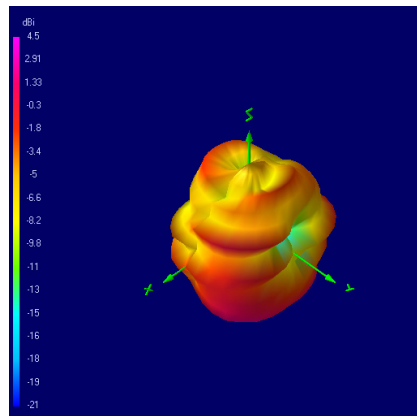
1700 MHz



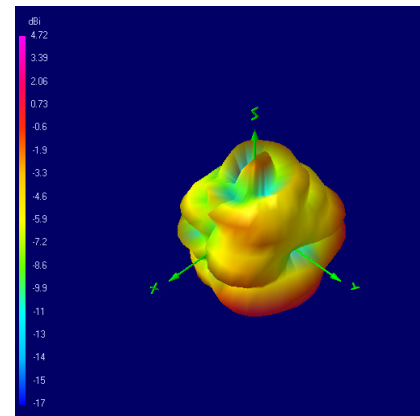
1800 MHz



1900 MHz



2000 MHz



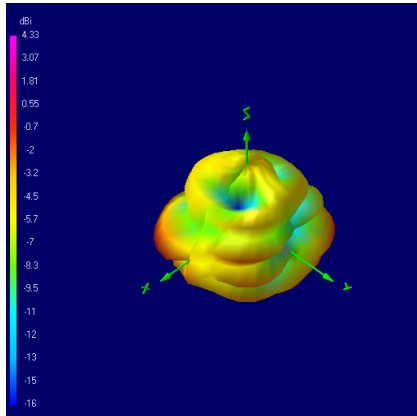


Alpha 8

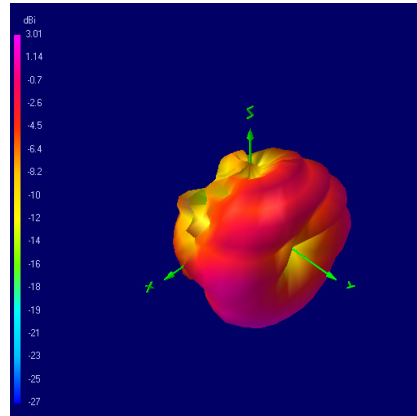
4G LTE/LORA/BLUETOOTH FLAT BLADE ANTENNA

3D Radiation Plots

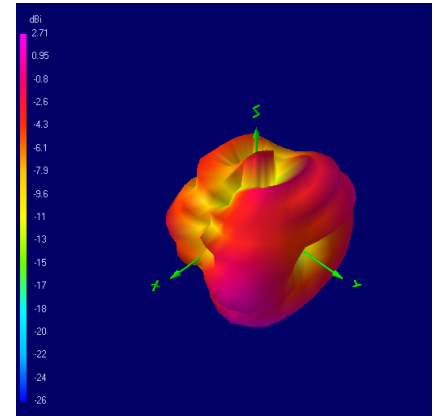
2100 MHz



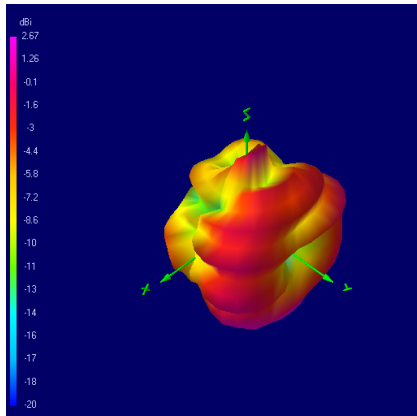
2300 MHz



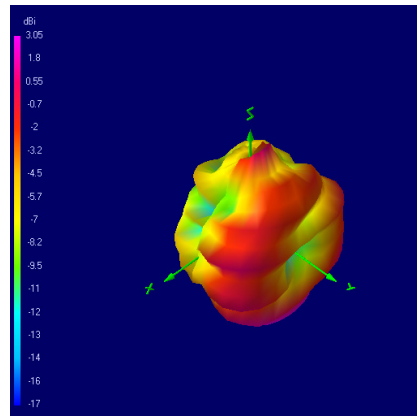
2400 MHz



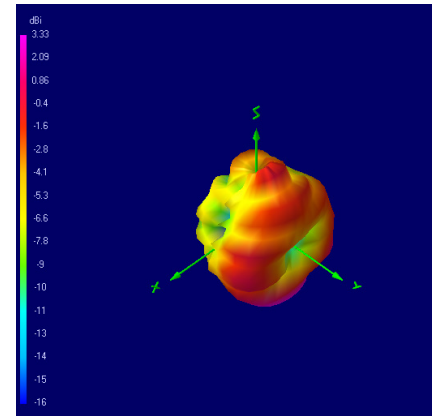
2440 MHz



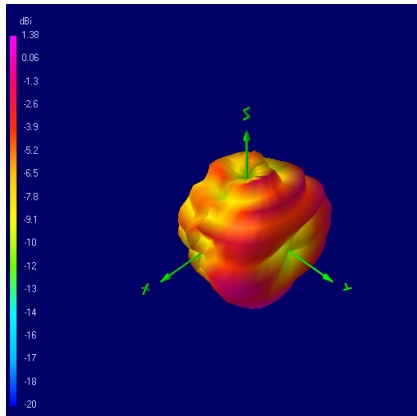
2460 MHz



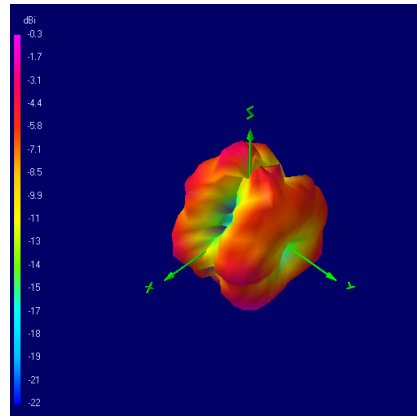
2500 MHz



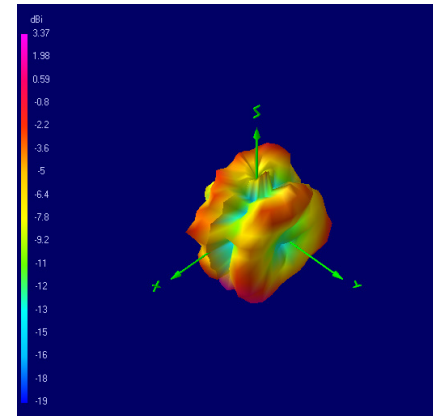
2600 MHz



3500 MHz



3700 MHz



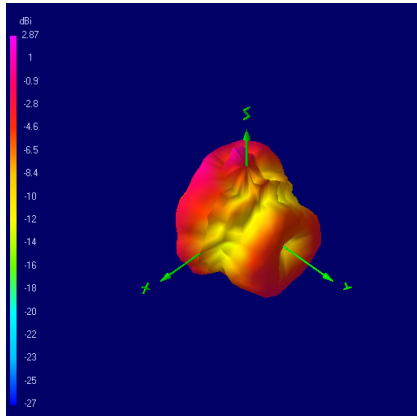


Alpha 8

4G LTE/LORA/BLUETOOTH FLAT BLADE ANTENNA

3D Radiation Plots

4700 MHz



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

Ordering Details:

Part Number	Description
ALPHA8/1M/SMAM/S/S/11	4G LTE/LoRa/Bluetooth Flat Blade Antenna 1M Cable SMA Male Connector
ALPHA8/3M/SMAM/S/S/11	4G LTE/LoRa/Bluetooth Flat Blade Antenna 3M Cable SMA Male Connector

Mouser Electronics

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