

Delta 40

Helium, Weightless, LoRa, 5G/4G 161mm Direct Connect Antenna



Key Features

- Supports 5G NR / 4G LTE / 3G UMTS / 2G Quad-band GSM
- Supports LTE Cat M, LTE Cat NB and NR Cat NB Bands
- Supports LoRa, Sigfox, ISM 868 MHz & ISM 915 MHz Bands
- Flat Panel Swivel Knuckle Design

General Description

The Delta 40 direct connect antenna is tuned for wide band reception/transmission.

Suitable for a host of applications from cellular 2G/3G/4G/some 5G bands and LoRa/Sigfox bands, the Delta 40 achieves a high gain in the ISM and 4G/5G frequency ranges, despite its small size.

The swivel knuckle design is ideal for mounting on IoT equipment where the antenna can be positioned for best reception.

Additional Considerations

- Swivel knuckle allows positioning for best signal reception
- Ground plane independent

D Direct	5G New Radio	4G LTE	3G UMTS	2G GSM
LTE Cat M	LTE NB IoT	NR NB IoT	ISM 868	ISM 915
IEEE 802.15.4	LoRa Wireless	SF Sigfox	WiFi 2.4G	ZB Zigbee
Z Wave	HNT Helium	W Weightless		

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Electrical Specifications

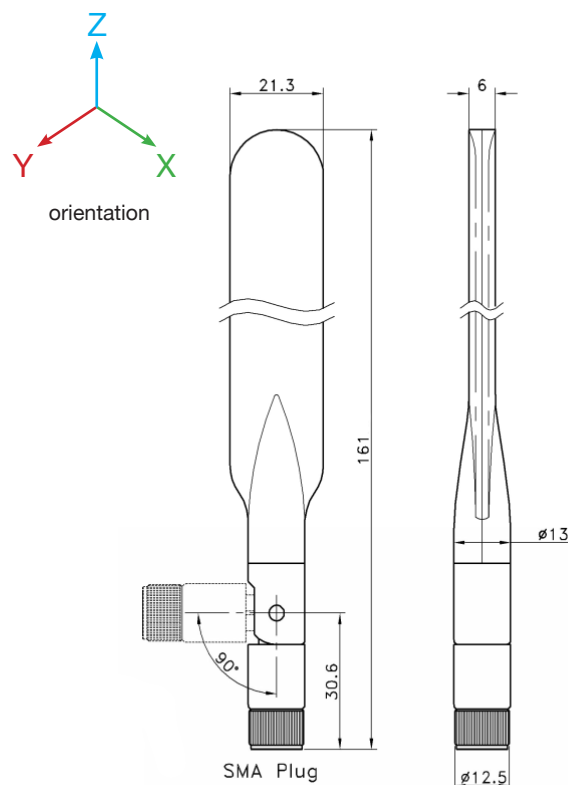
Impedance:	50 Ohm
Polarization:	Vertical
Max Input Power:	5 W
Ground plane independent:	Yes

Environmental Specifications

Operating Temperature range:	-20 to +65 °C
Storage Temperature range:	-20 to +65 °C

Mechanical Specifications

Dimensions:	161 x 21.3 mm
Weight:	29 g
Connector:	SMA Male
Mounting method:	Direct Connect
Housing materials:	Teflon (Cover), Brass (Body and Contact)

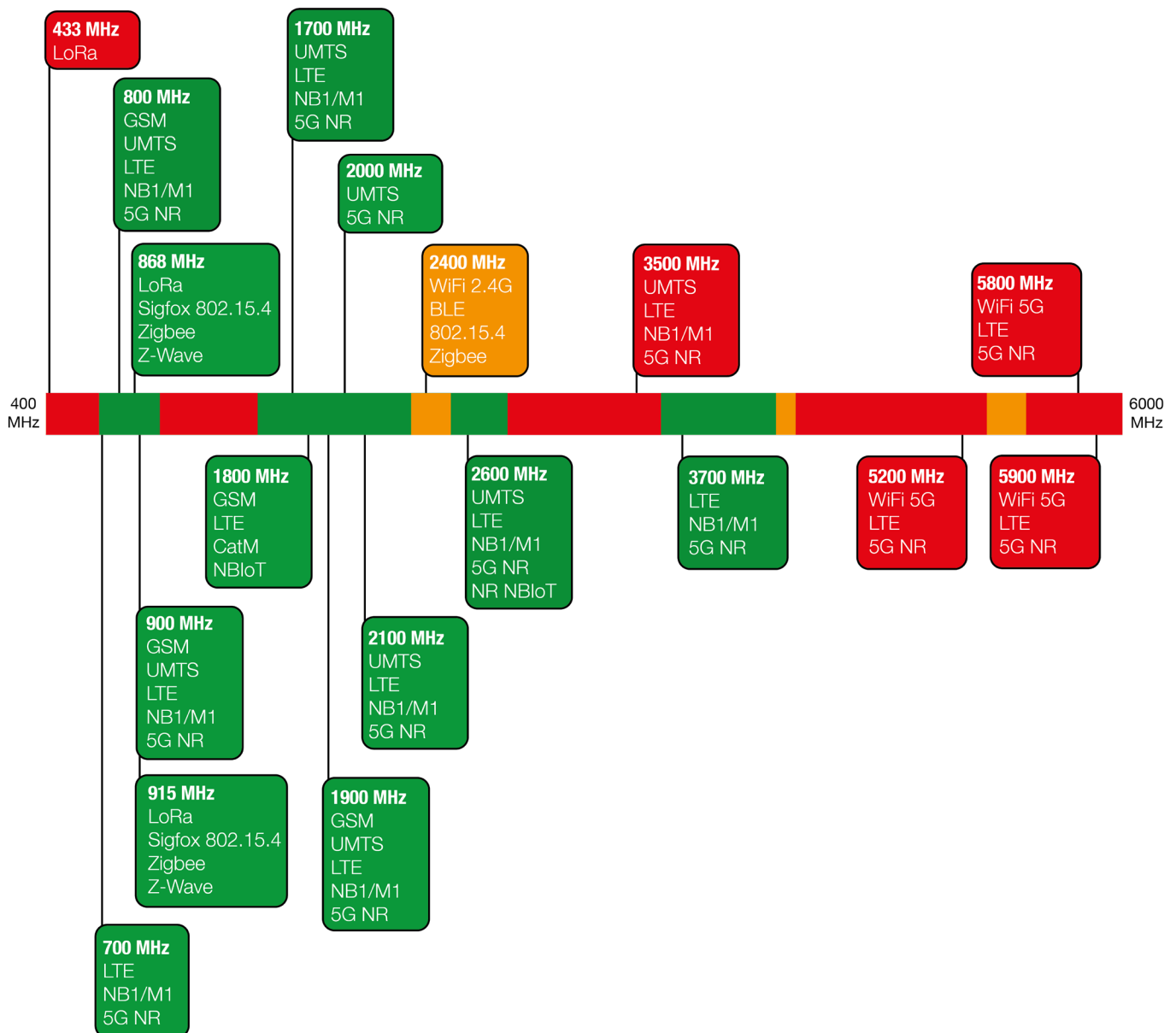




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Spectrum Coverage



● 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)

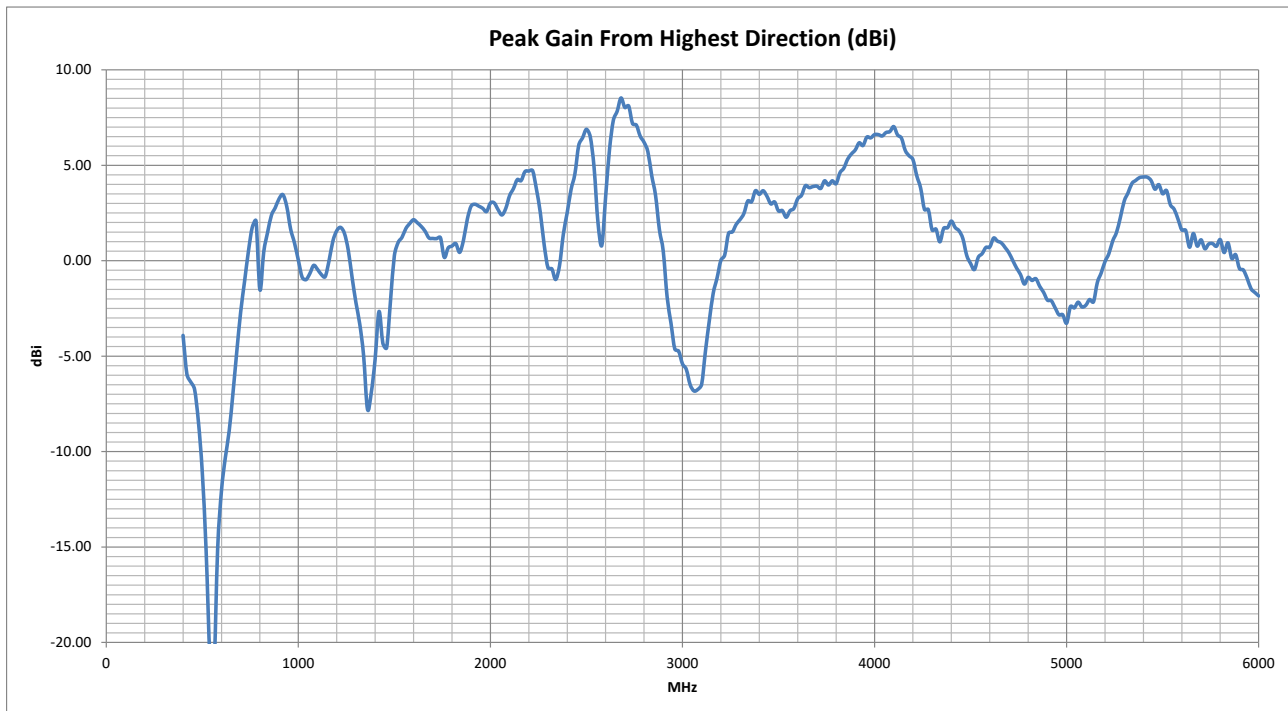
	433	868	915	2450	5800
Bluetooth					
IEEE 802.15.4		●	●		
LoRa		●	●		
Sigfox		●	●		
WiFi 2.4G					
WiFi 5G					
Zigbee		●	●		
Z-Wave		●	●		



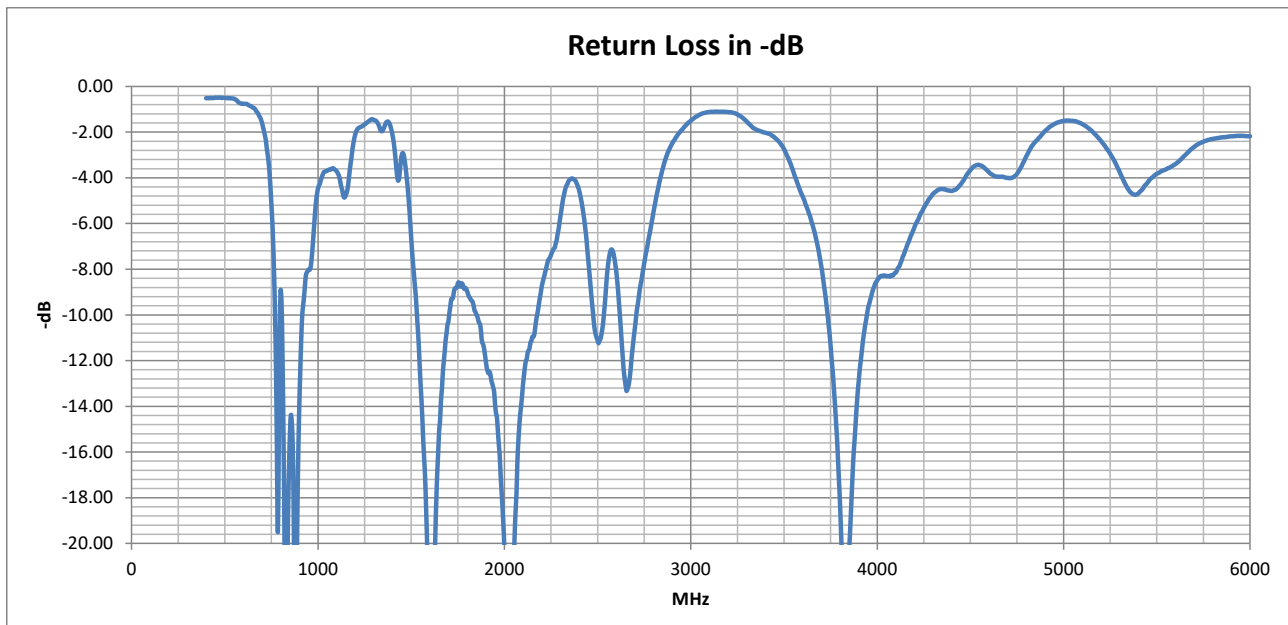
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Peak Gain vs. Frequency



Return Loss

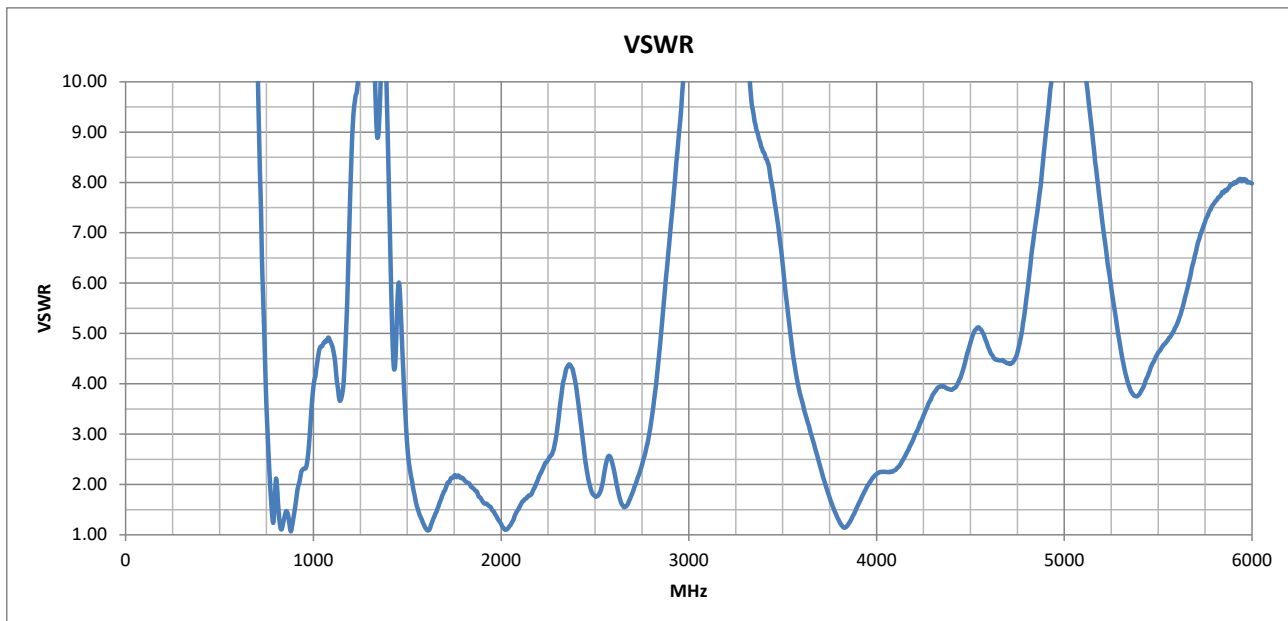




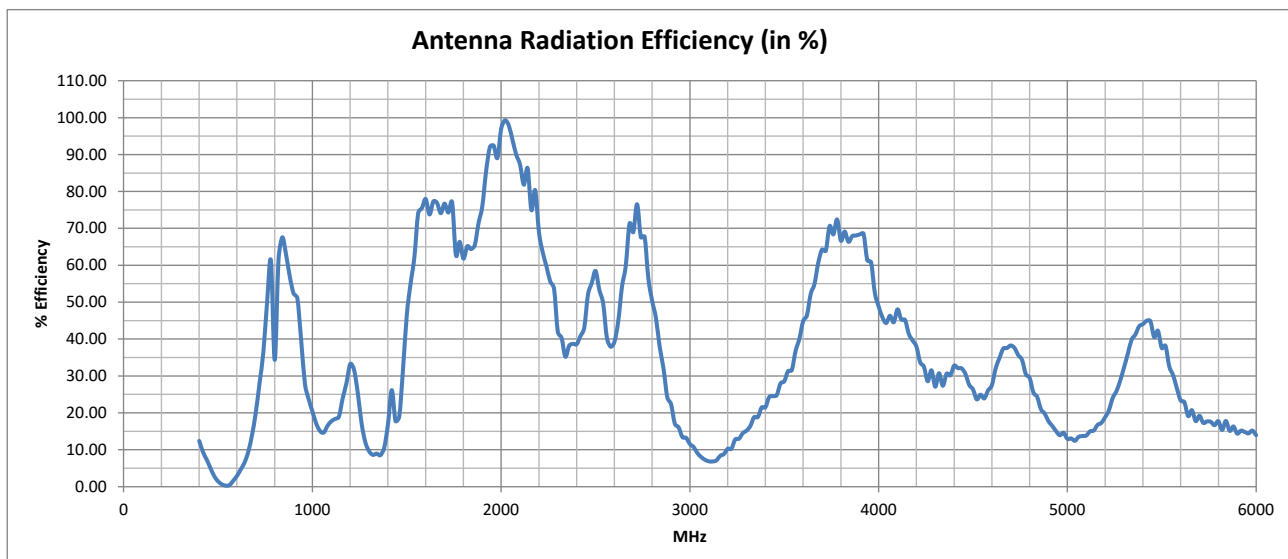
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VSWR



Radiation Efficiency





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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	90.60	81.49	1.62	1.88	●
PCS-1900	2	2	2	2	n2	n2	1850 - 1910 MHz	1930 - 1990 MHz	71.34	91.27	1.93	1.59	●
DCS-1800	3	3	3	3	n3	n3	1710 - 1785 MHz	1805 - 1880 MHz	70.44	65.63	2.19	2.08	●
	4	4	4	4			1710 - 1755 MHz	2110 - 2155 MHz	74.19	83.20	2.19	1.79	●
GSM-850	5	5	5	5	n5	n5	824 - 849 MHz	869 - 894 MHz	65.67	56.73	1.41	1.36	●
	6						830 - 840 MHz	875 - 885 MHz	66.09	56.98	1.27	1.16	●
	7	7	7	7	n7	n7	2500 - 2570 MHz	2620 - 2690 MHz	49.26	59.26	2.56	1.92	●
E-GSM-900	8	8	8	8	n8	n8	880 - 915 MHz	925 - 960 MHz	53.44	38.22	1.91	2.34	●
	9	9					1749.9 - 1784.9 MHz	1844.9 - 1879.9 MHz	65.29	66.99	2.19	1.95	●
	10	10					1710 - 1770 MHz	2110 - 2170 MHz	71.65	81.49	2.19	1.88	●
	11	11	11	11			1427.9 - 1447.9 MHz	1475.9 - 1495.9 MHz	19.42	36.36	5.68	4.45	●
	12	12	12	12	n12	n12	699 - 716 MHz	729 - 746 MHz	23.24	35.81	11.10	6.02	●
	13	13	13	13	n13	n13	777 - 787 MHz	746 - 756 MHz	57.68	44.14	1.53	3.93	●
	14	14	14	14	n14		788 - 798 MHz	758 - 768 MHz	43.76	51.95	1.99	2.81	●
		17		17			704 - 716 MHz	734 - 746 MHz	24.24	36.97	10.05	5.44	●
		18	18	18	n18	n18	815 - 830 MHz	860 - 875 MHz	61.39	60.68	1.43	1.45	●
	19	19	19	19			830 - 845 MHz	875 - 890 MHz	66.39	56.38	1.35	1.27	●
	20	20	20	20	n20	n20	832 - 862 MHz	791 - 821 MHz	65.39	46.16	1.47	2.11	●
	21	21	21	21			1447.9 - 1462.9 MHz	1495.9 - 1510.9 MHz	18.93	47.92	6.01	2.98	●
	22	22					3410 - 3490 MHz	3510 - 3590 MHz	25.35	35.03	8.47	6.00	●
		24	24	24	n24		1626.5 - 1660.5 MHz	1525 - 1559 MHz	76.69	64.21	1.52	2.07	●
	25	25	25	25	n25	n25	1850 - 1915 MHz	1930 - 1995 MHz	72.15	91.49	1.93	1.59	●
	26	26	26	26	n26		814 - 849 MHz	859 - 894 MHz	63.84	58.16	1.48	1.45	●
		27	27				807 - 824 MHz	852 - 869 MHz	54.90	62.67	1.88	1.47	●
		28	28	28	n28	n28	703 - 748 MHz	758 - 803 MHz	30.78	50.66	10.27	2.81	●

● Suitable band

● Adequate band in good signal conditions

● Likely to be unsuitable



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		28A					703 - 733 MHz	758 - 788 MHz	27.49	55.38	10.27	2.81	●
		29			n29		N/A	717 - 728 MHz	N/A	29.29	N/A	7.90	●
		30			n30		2305 - 2315 MHz	2350 - 2360 MHz	41.17	37.46	3.62	4.38	●
		31	31	31			452.5 - 457.5 MHz	462.5 - 467.5 MHz	5.57	4.45	35.04	34.85	●
	32	32					N/A	1452 - 1496 MHz	N/A	28.79	N/A	6.01	●
		33					1900 - 1920 MHz	1900 - 1920 MHz	80.77	80.77	1.67	1.67	●
		34			n34		2010 - 2025 MHz	2010 - 2025 MHz	98.88	98.88	1.15	1.15	●
		35					1850 - 1910 MHz	1850 - 1910 MHz	71.34	71.34	1.93	1.93	●
		36					1930 - 1990 MHz	1930 - 1990 MHz	91.27	91.27	1.59	1.59	●
		37					1910 - 1930 MHz	1910 - 1930 MHz	85.14	85.14	1.63	1.63	●
		38			n38		2570 - 2620 MHz	2570 - 2620 MHz	39.96	39.96	2.57	2.57	●
		39	39		n39		1880 - 1920 MHz	1880 - 1920 MHz	77.26	77.26	1.76	1.76	●
		40	40		n40		2300 - 2400 MHz	2300 - 2400 MHz	38.57	38.57	4.38	4.38	●
		41	41	41	n41	n41	2496 - 2690 MHz	2496 - 2690 MHz	50.66	50.66	2.57	2.57	●
		42	42	42			3400 - 3600 MHz	3400 - 3600 MHz	30.33	30.33	8.59	8.59	●
		43	43	43			3600 - 3800 MHz	3600 - 3800 MHz	60.98	60.98	3.70	3.70	●
		44					703 - 803 MHz	703 - 803 MHz	41.19	41.19	10.27	10.27	●
		45					1447 - 1467 MHz	1447 - 1467 MHz	19.58	19.58	6.01	6.01	●
		46			n46		5150 - 5925 MHz	5150 - 5925 MHz	26.52	26.52	8.95	8.95	●
		47			n47		5855 - 5925 MHz	5855 - 5925 MHz	15.30	15.30	8.04	8.04	●
		48			n48		3550 - 3700 MHz	3550 - 3700 MHz	49.01	49.01	4.72	4.72	●
		49					3550 - 3700 MHz	3550 - 3700 MHz	49.01	49.01	4.72	4.72	●
		50			n50		1432 - 1517 MHz	1432 - 1517 MHz	31.48	31.48	6.01	6.01	●
		51			n51		1427 - 1432 MHz	1427 - 1432 MHz	22.19	22.19	4.41	4.41	●
		52					3300 - 3400 MHz	3300 - 3400 MHz	18.80	18.80	11.29	11.29	●

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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	56.72	56.72	1.84	1.84	●
		65		65	n65	n65	1920 - 2010 MHz	2110 - 2200 MHz	91.94	79.70	1.62	2.15	●
		66	66	66	n66	n66	1710 - 1780 MHz	2110 - 2200 MHz	70.77	79.70	2.19	2.15	●
		67			n67		N/A	738 - 758 MHz	N/A	42.10	N/A	4.95	●
		68					698 - 728 MHz	753 - 783 MHz	25.46	54.29	11.28	3.23	●
		69					N/A	2570 - 2620 MHz	N/A	39.96	N/A	2.57	●
		70		70	n70	n70	1695 - 1710 MHz	1995 - 2020 MHz	76.22	97.75	1.98	1.24	●
		71	71	71	n71		663 - 698 MHz	617 - 652 MHz	14.55	6.14	17.30	22.57	●
		72	72	72			451 - 456 MHz	461 - 466 MHz	5.74	4.61	35.04	34.79	●
		73	73	73			450 - 455 MHz	460 - 465 MHz	5.85	4.72	35.04	34.75	●
		74	74	74	n74		1427 - 1470 MHz	1475 - 1518 MHz	19.96	42.94	6.01	4.53	●
		75			n75		N/A	1432 - 1517 MHz	N/A	31.48	N/A	6.01	●
		76			n76		N/A	1427 - 1432 MHz	N/A	22.19	N/A	4.41	●
					n77		3300 - 4200 MHz	3300 - 4200 MHz	46.49	46.49	11.29	11.29	●
					n78		3300 - 3800 MHz	3300 - 3800 MHz	40.29	40.29	11.29	11.29	●
					n79		4400 - 5000 MHz	4400 - 5000 MHz	27.13	27.13	11.49	11.49	●
					n80		1710 - 1785 MHz	N/A	70.44	N/A	2.19	N/A	●
					n81		880 - 915 MHz	N/A	53.44	N/A	1.91	N/A	●
					n82		832 - 862 MHz	N/A	65.39	N/A	1.47	N/A	●
					n83		703 - 748 MHz	N/A	30.78	N/A	10.27	N/A	●
					n84		1920 - 1980 MHz	N/A	90.60	N/A	1.62	N/A	●
					n86		1710 - 1780 MHz	N/A	70.77	N/A	2.19	N/A	●
		87	87	87			410 - 415 MHz	420 - 425 MHz	10.52	9.12	33.38	34.00	●
		88	88	88			412 - 417 MHz	422 - 427 MHz	10.21	8.91	33.63	33.80	●
					n89		824 - 849 MHz	N/A	65.67	N/A	1.41	N/A	●

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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
					n90	n90	2496 - 2690 MHz	2496 - 2690 MHz	50.66	50.66	2.57	2.57	●
					n91		832 - 862 MHz	1427 - 1432 MHz	65.39	22.19	1.47	4.41	●
					n92		832 - 862 MHz	1432 - 1517 MHz	65.39	31.48	1.47	6.01	●
					n93		880 - 915 MHz	1427 - 1432 MHz	53.44	22.19	1.91	4.41	●
					n94		880 - 915 MHz	1432 - 1517 MHz	53.44	31.48	1.91	6.01	●
					n95		2010 - 2025 MHz	N/A	98.88	N/A	1.15	N/A	●
					n97		2300 - 2400 MHz	N/A	38.57	N/A	4.38	N/A	●
					n98		1880 - 1920 MHz	N/A	77.26	N/A	1.76	N/A	●
					n99		1626.5 - 1660.5 MHz	N/A	76.69	N/A	1.52	N/A	●
					n101		1900 - 1910 MHz	1900 - 1910 MHz	78.40	78.40	1.67	1.67	●
				103			787 - 788 MHz	757 - 758 MHz	51.16	48.63	1.33	2.90	●

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● 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.



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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	7.93	33.93	-6.2065	●
ISM 868 MHz	863 - 870 MHz	60.98	1.41	2.58	●
ISM 915 MHz	902 - 928 MHz	50.76	2.11	3.46	●
ISM 2.4 GHz	2400 - 2500 MHz	47.95	3.93	6.89	●
Wi-Fi 2.4G	2401 - 2483 MHz	46.17	3.90	6.5075	●
Wi-Fi 2.4G (USA)	2401 - 2473 MHz	44.96	3.90	6.3035	●
Wi-Fi 2.4G (Japan)	2401 - 2495 MHz	47.52	3.90	6.7775	●
Wi-Fi 5G (all channels)	5150 - 5990 MHz	25.61	8.95	4.39	●
Wi-Fi 5G (Ch 32-48)	5150 - 5250 MHz	19.54	8.95	1.265	●
Wi-Fi 5G (Ch 32-64)	5150 - 5330 MHz	24.54	8.95	3.805	●
Wi-Fi 5G (Ch 32-161)	5150 - 5815 MHz	28.30	8.95	4.39	●
Wi-Fi 5G (Ch 32-173)	5150 - 5875 MHz	27.30	8.95	4.39	●
ISM 5.8 GHz	5725 - 5875 MHz	16.87	7.88	1.11	●

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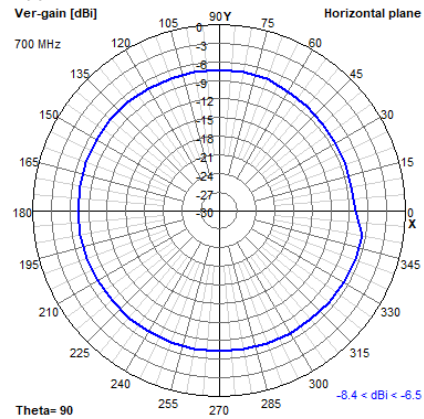


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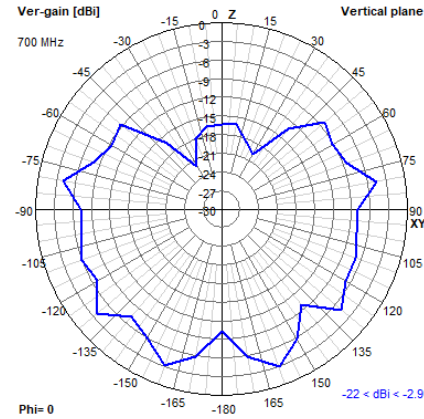
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2D Radiation Plots

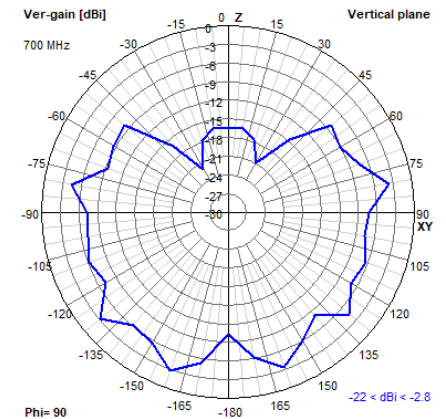
700 MHz XY



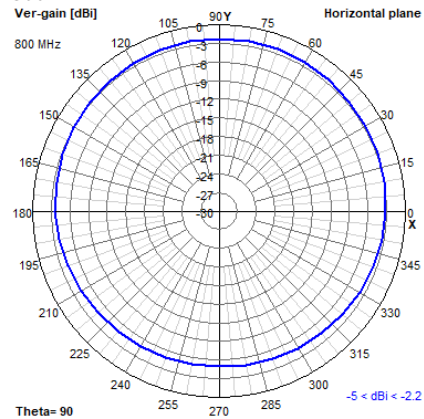
XZ



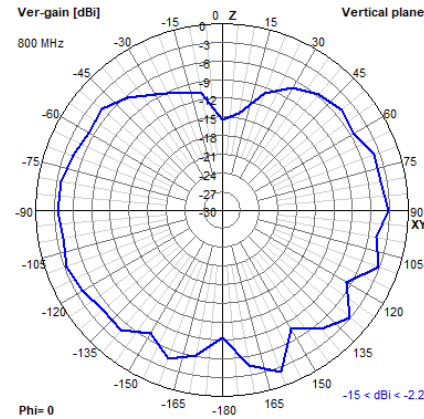
YZ



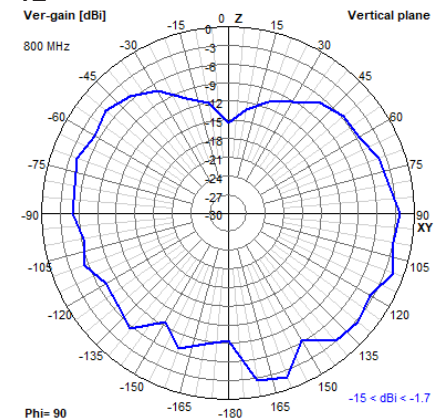
800 MHz XY



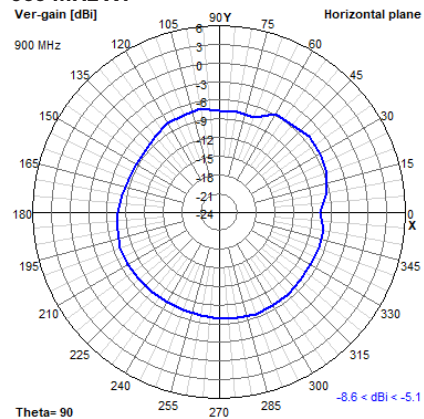
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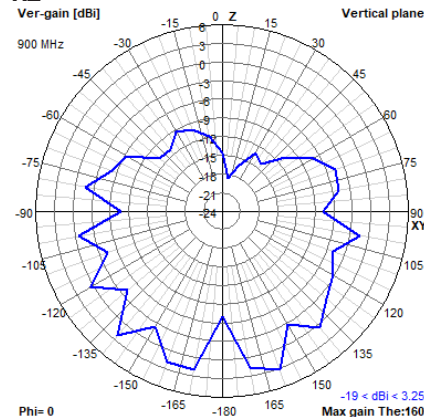
YZ



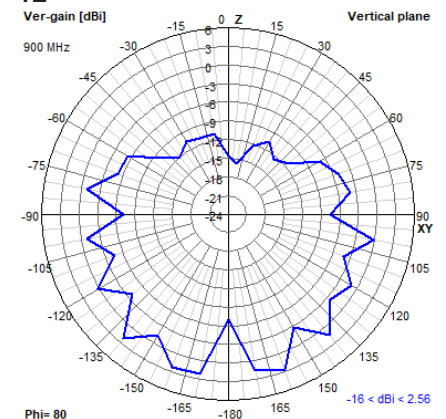
900 MHz XY



XZ



YZ



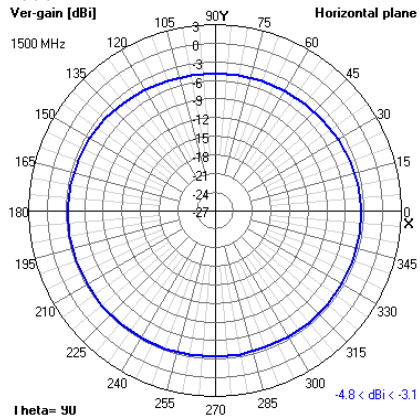


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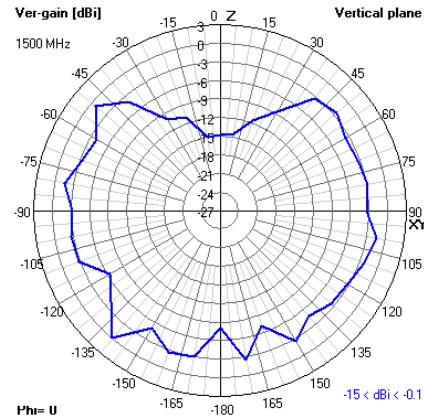
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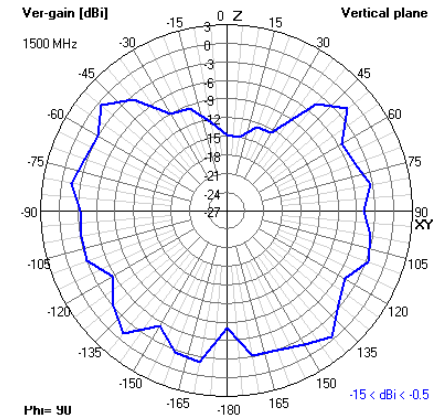
1500 MHz XY



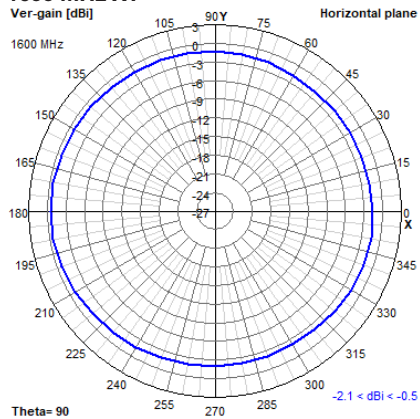
XZ



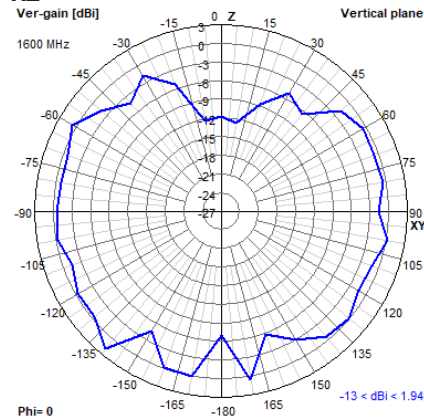
YZ



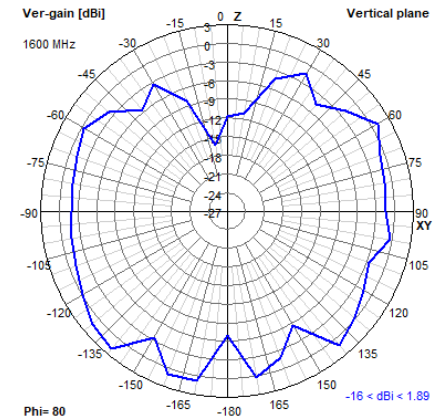
1600 MHz XY



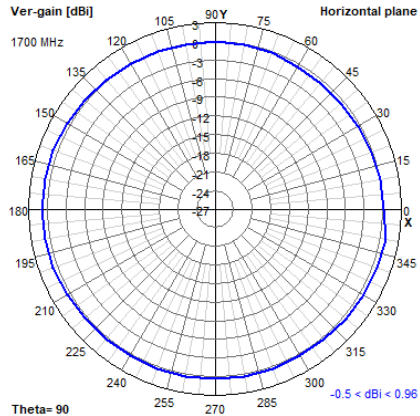
XZ



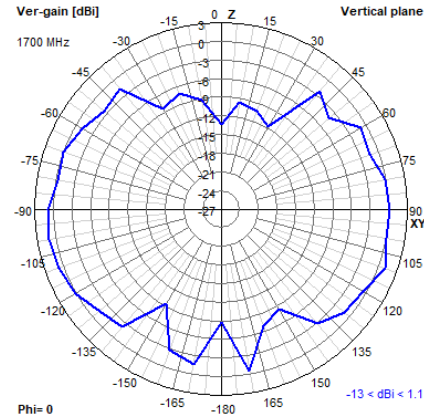
YZ



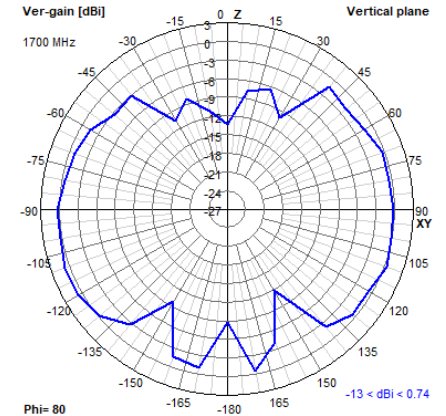
1700 MHz XY



XZ



YZ

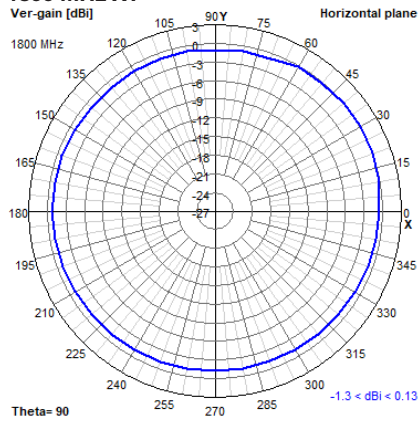


Delta 40

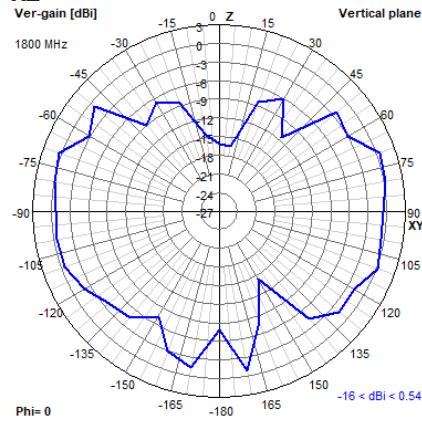
Helium, Weightless, LoRa, 5G/4G 161mm Direct Connect Antenna

2D Radiation Plots

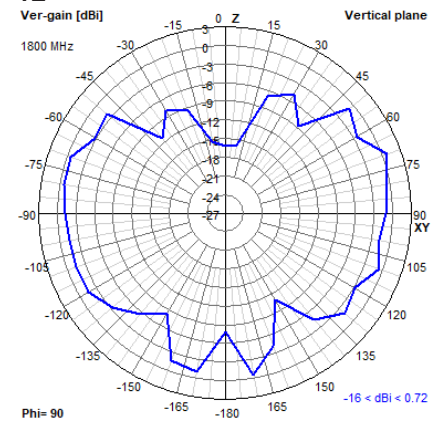
1800 MHz XY



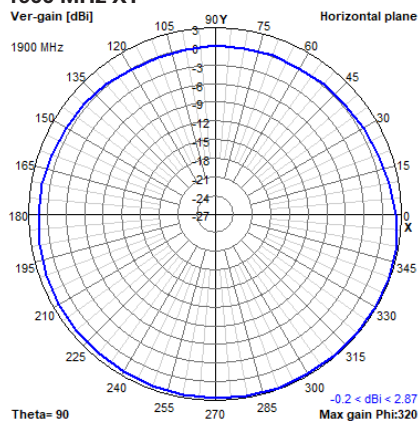
XZ



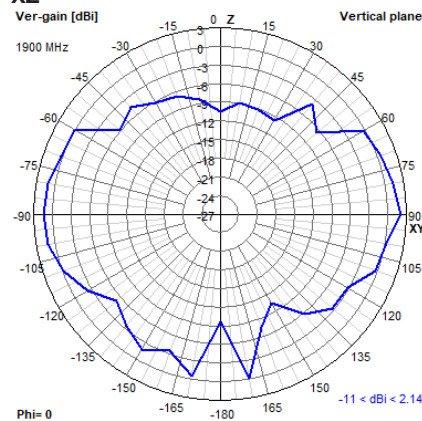
YZ



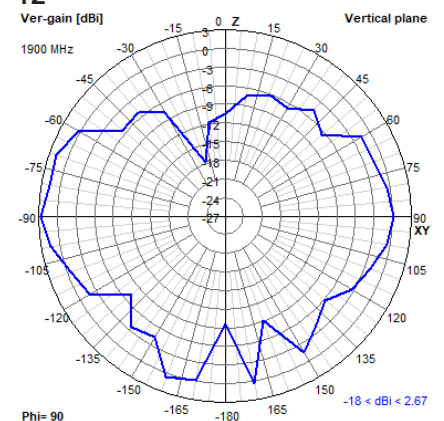
1900 MHz XY



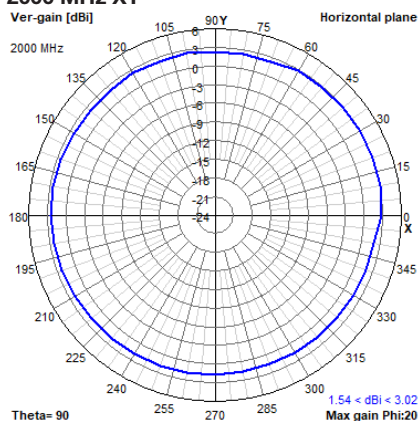
XZ



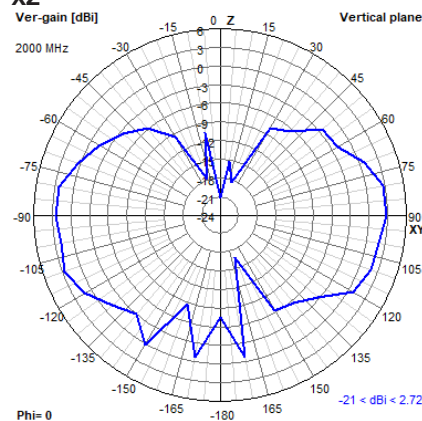
YZ



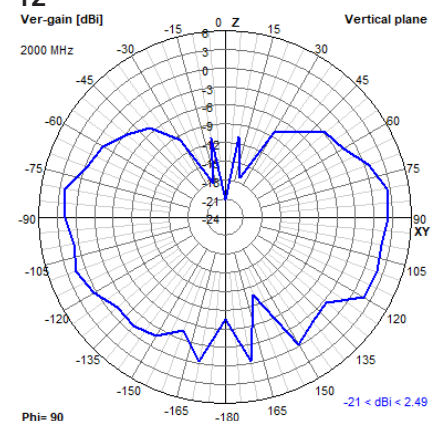
2000 MHz XY



XZ



YZ



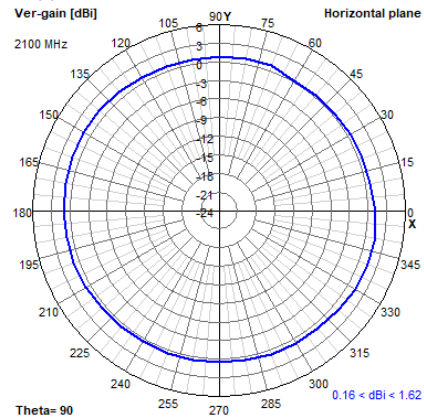


Delta 40

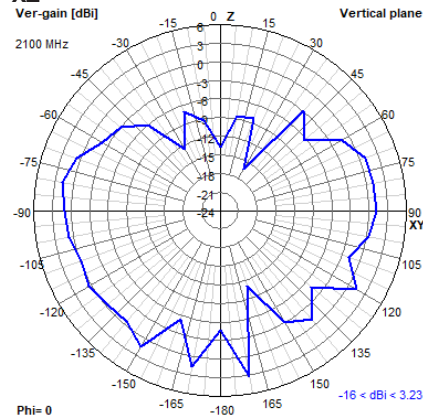
Helium, Weightless, LoRa, 5G/4G 161mm Direct Connect Antenna

2D Radiation Plots

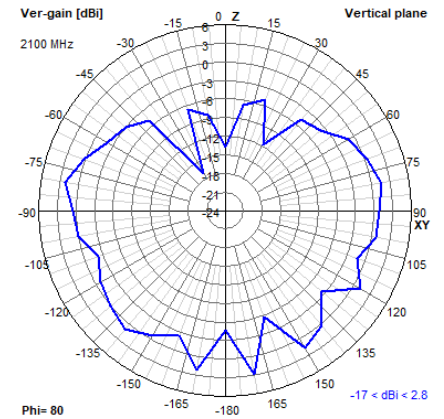
2100 MHz XY



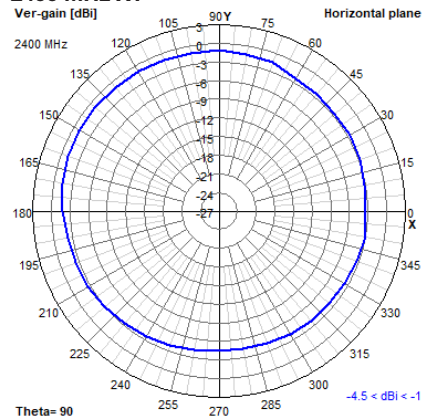
XZ



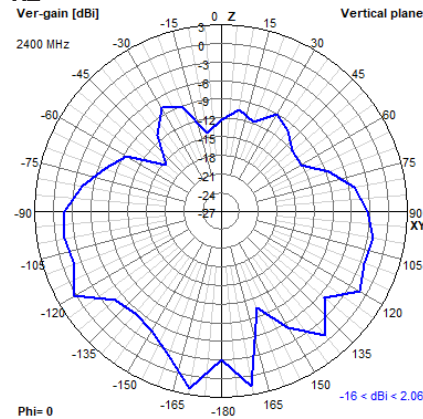
YZ



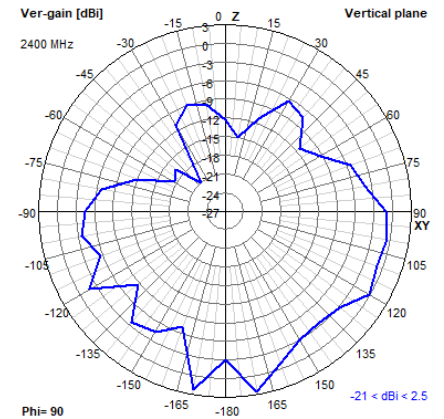
2400 MHz XY



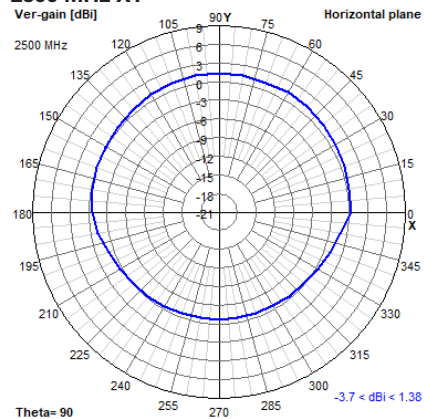
XZ



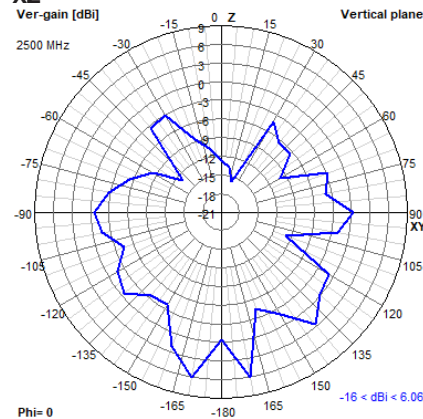
YZ



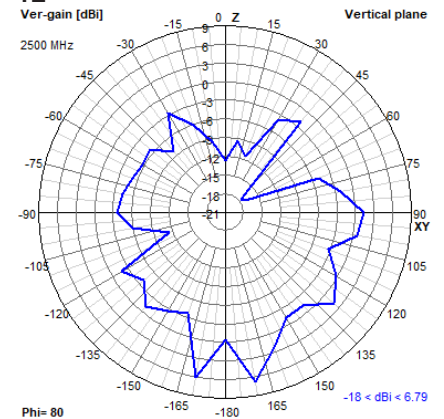
2500 MHz XY



XZ



YZ



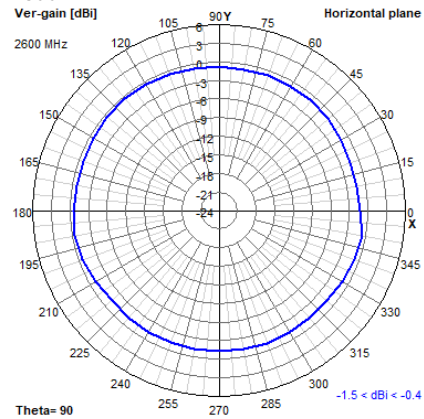


Delta 40

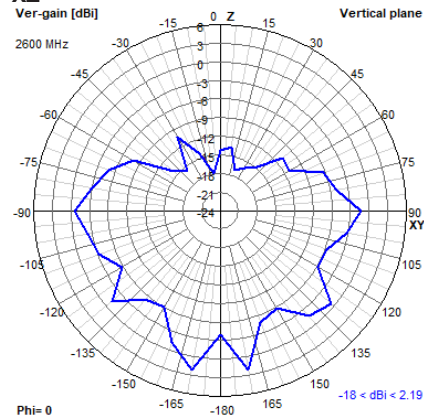
Helium, Weightless, LoRa, 5G/4G 161mm Direct Connect Antenna

2D Radiation Plots

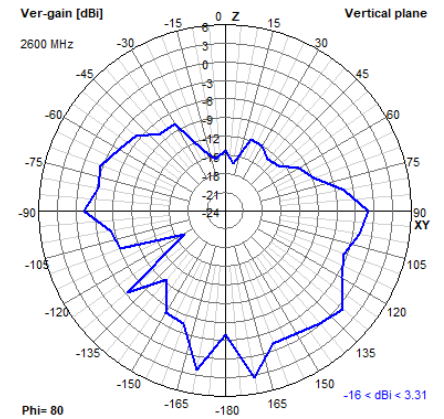
2600 MHz XY



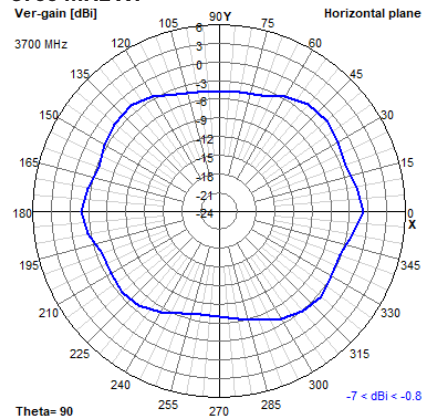
XZ



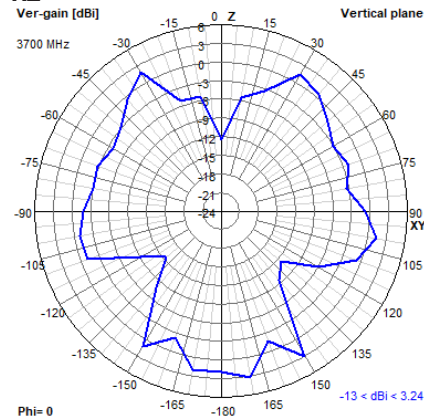
YZ



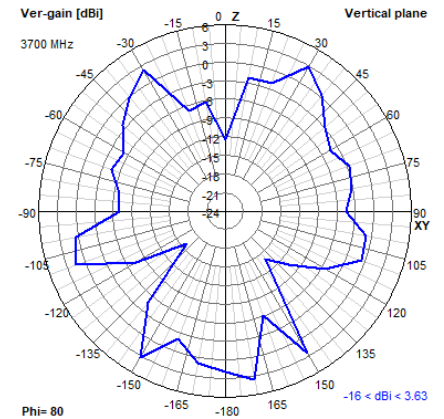
3700 MHz XY



XZ



YZ



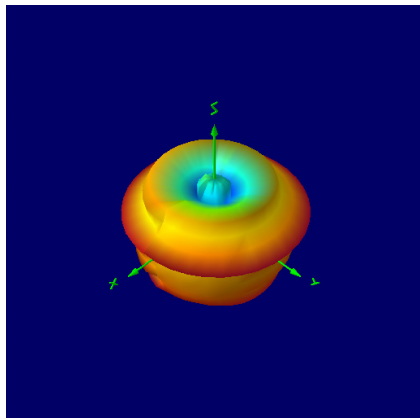


Delta 40

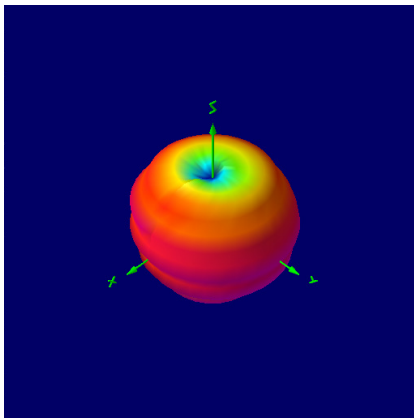
Helium, Weightless, LoRa, 5G/4G 161mm Direct Connect Antenna

3D Radiation Plots

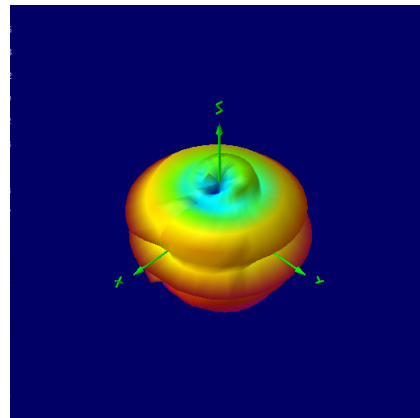
700 MHz



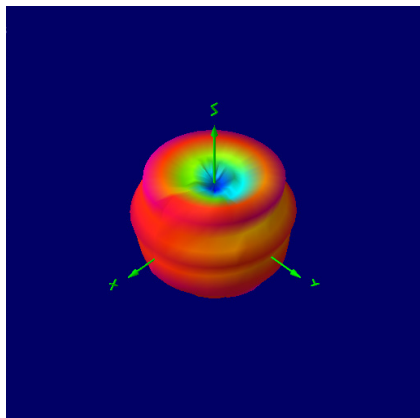
800 MHz



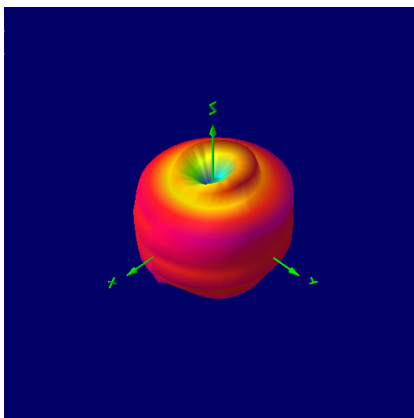
900 MHz



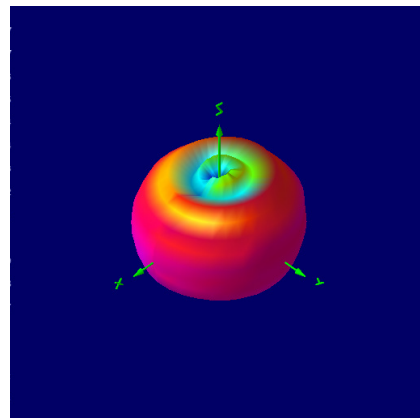
1500 MHz



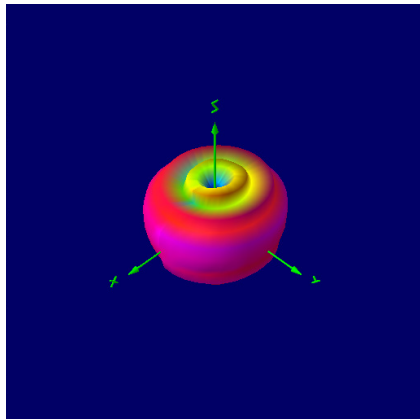
1600 MHz



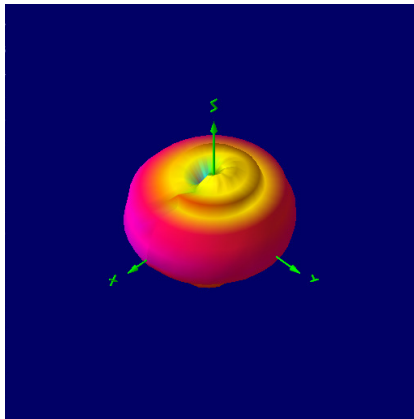
1700 MHz



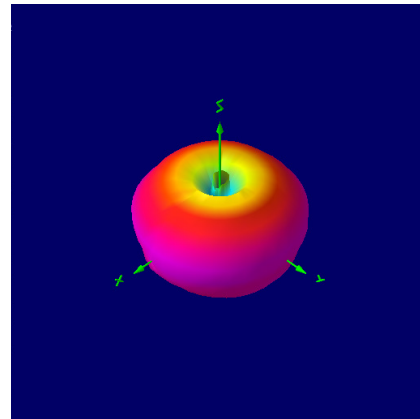
1800 MHz



1900 MHz



2000 MHz



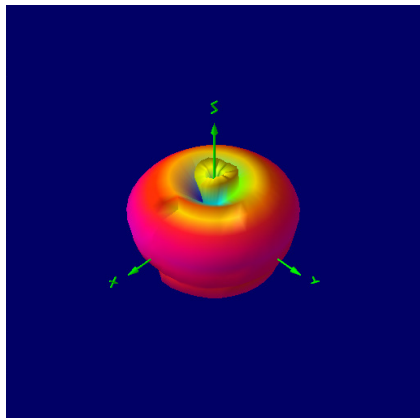


Delta 40

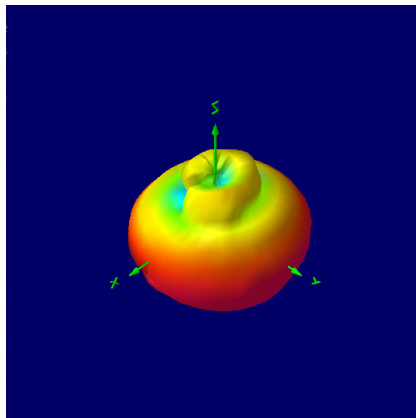
Helium, Weightless, LoRa, 5G/4G 161mm Direct Connect Antenna

3D Radiation Plots

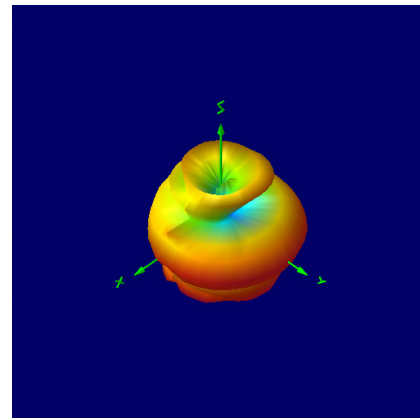
2100 MHz



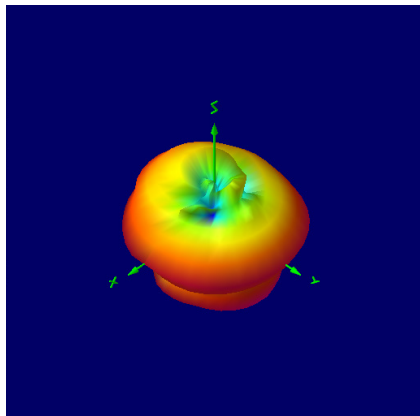
2400 MHz



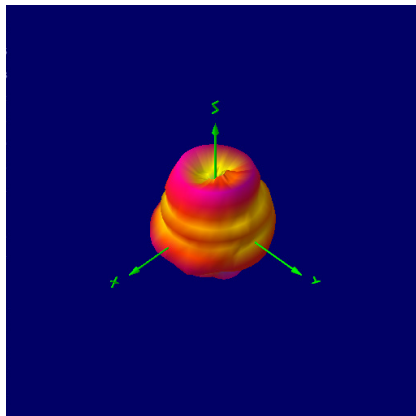
2500 MHz



2600 MHz



3700 MHz



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

Ordering Details:

Part Number	Description
DELTA40/X/SMAM/S/S/32	Helium, Weightless, LoRa, 5G/4G 161mm Direct Connect Antenna SMA Male Connector



Mouser Electronics

Authorized Distributor

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