



## Delta 12A

ISM 433 & 458 MHz 130mm Flexy Rubber ¼ Wave Whip Antenna



### Key Features

- Dedicated ISM antenna for 433 MHz and 458 MHz bands
- 130mm whip antenna
- TETRA compatible

### General Description

The Delta 12A antenna range are ¼ wave ISM whip antennas. This style of antenna is offered in a number of different frequencies covering the popular ISM bands.

This antenna is perfect for high volume ISM applications within the mobile applications world including TETRA.

The Delta 12A is tuned to the ISM (Industrial, Scientific and Medical) radio frequency bands of 433 and 458 MHz.

### Additional Considerations

- ¼ wave radiating element
- Ideal for high volume ISM applications





## Delta 12A

ISM 433 & 458 MHz 130mm Flexy Rubber ¼ Wave Whip Antenna

### Electrical Specifications

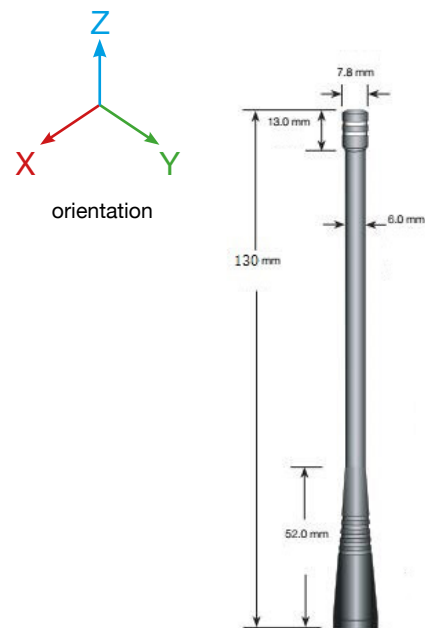
Impedance:	50 Ohm
Polarization:	Vertical
Max Input Power:	50 W
Ground plane independent:	No

### Environmental Specifications

Operating Temperature range:	-30 to +75°C
Storage Temperature range:	-30 to +75°C

### Mechanical Specifications

Dimensions:	L130 x 14.5 mm diameter base
Weight:	10 g
Connector:	SMA Male / BNC Male
Mounting method:	Direct Connect
Housing materials:	TPE

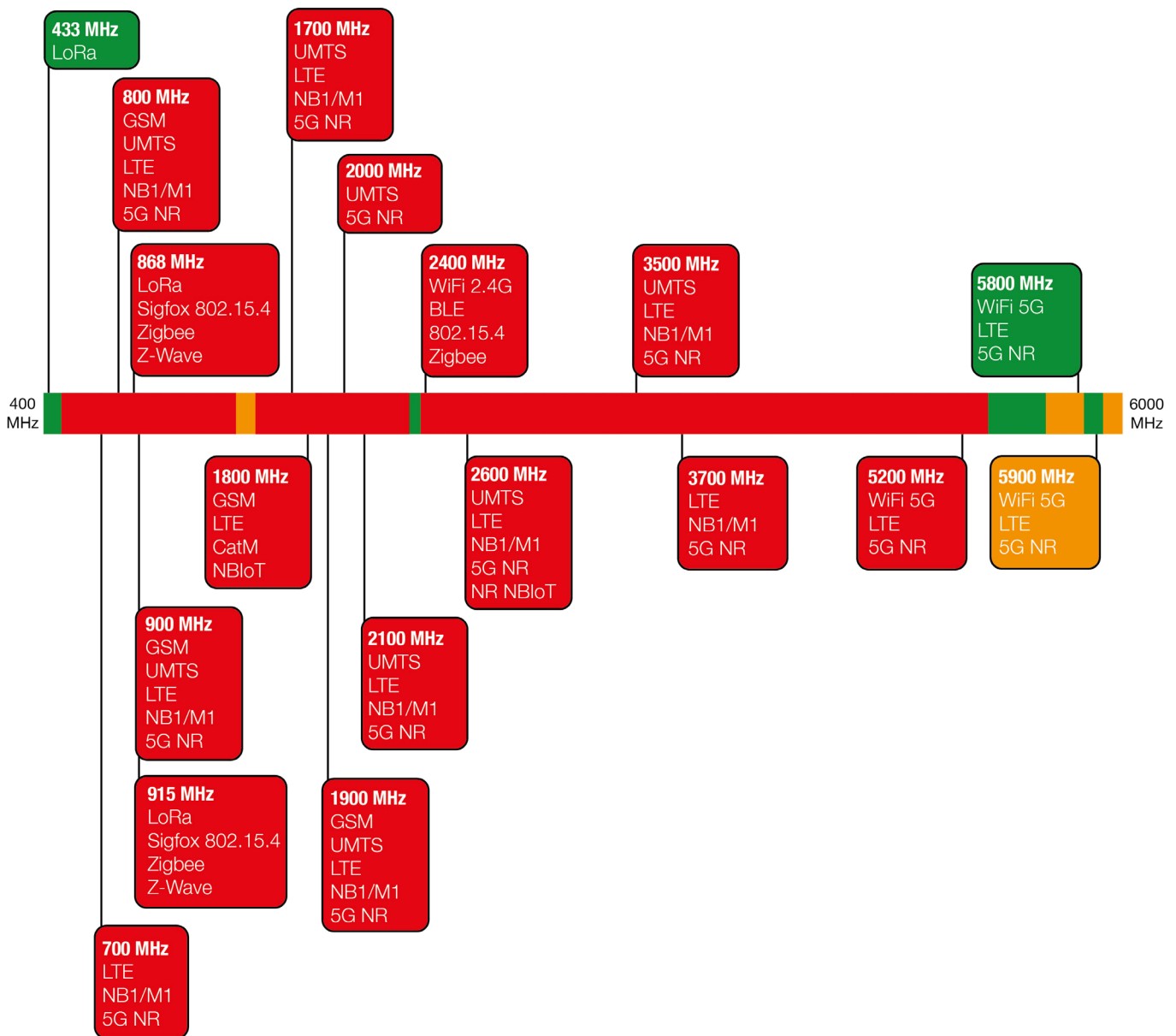




## Delta 12A

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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)

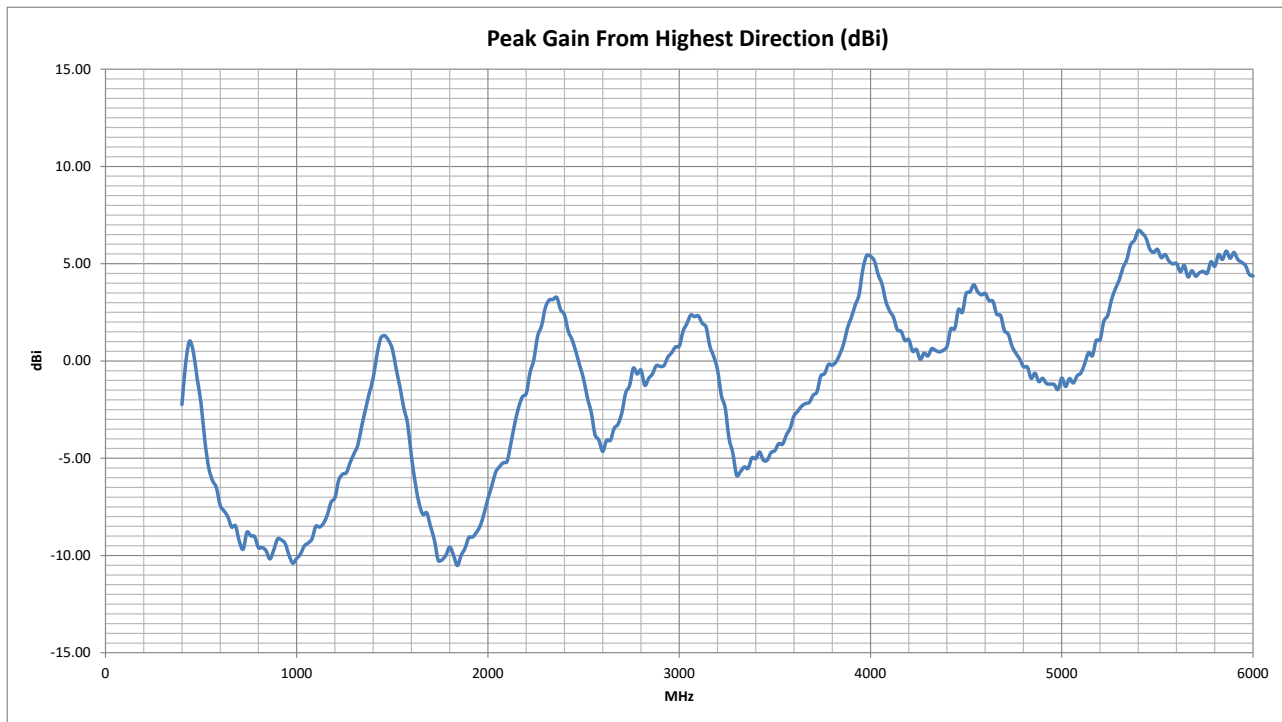
	433	868	915	2450	5800
Bluetooth					
IEEE 802.15.4					
LoRa	●				
Sigfox					
WiFi 2.4G					
WiFi 5G					
Zigbee					
Z-Wave					



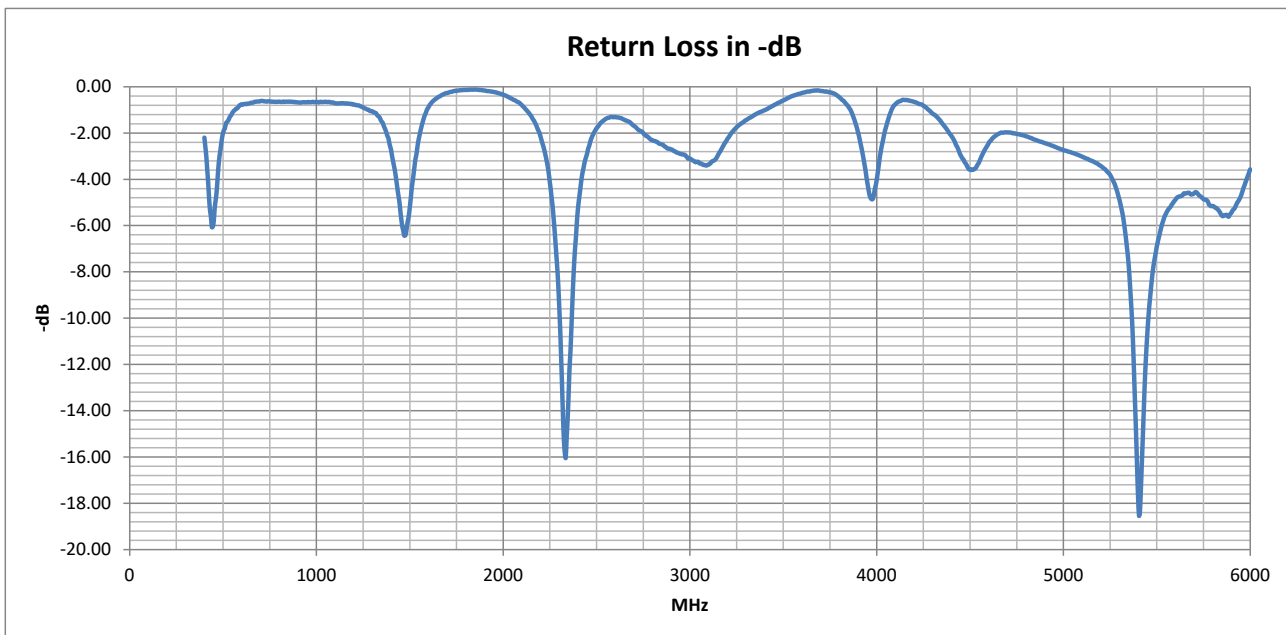
## Delta 12A

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### Peak Gain vs. Frequency



### Return Loss

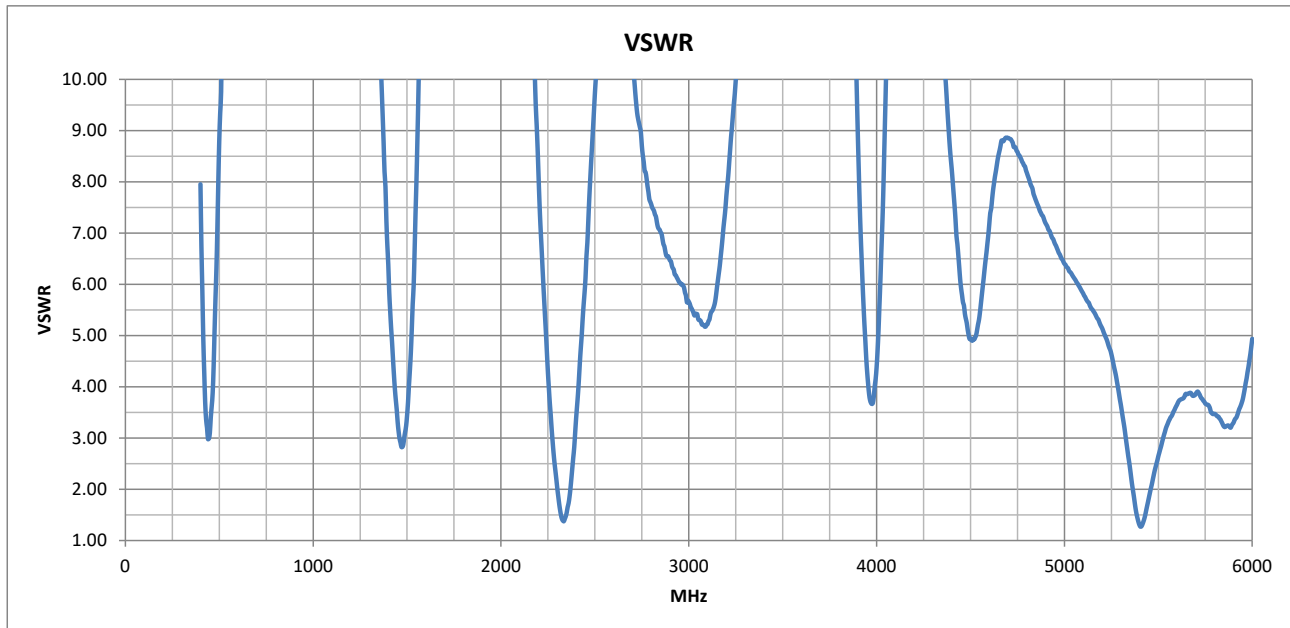




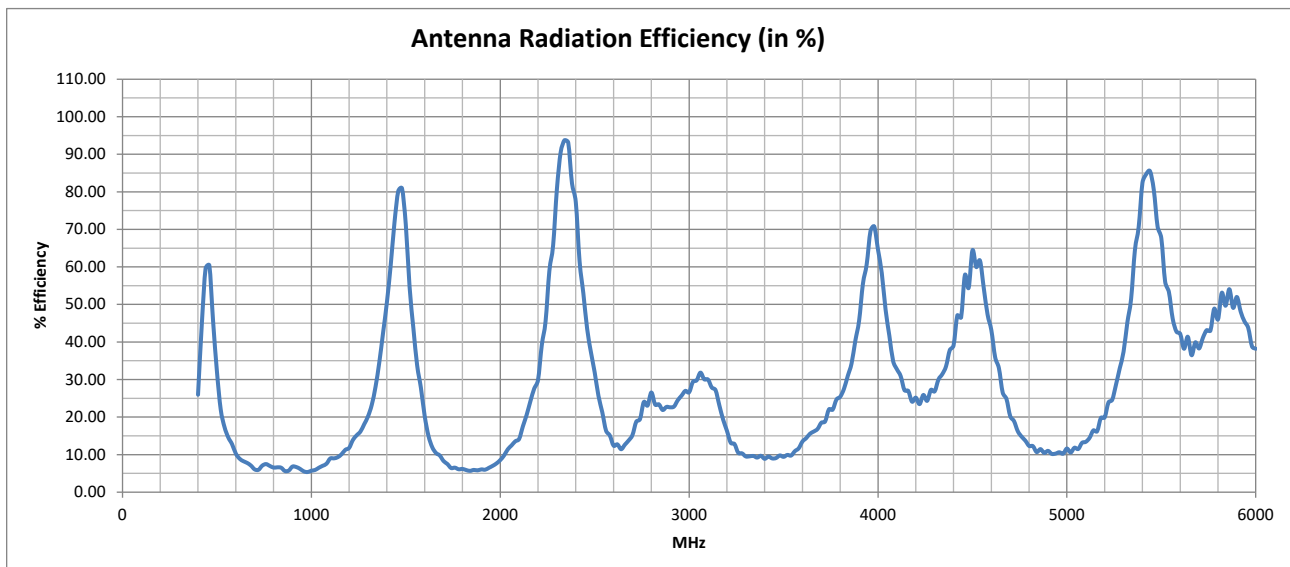
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### VSWR



### Radiation Efficiency





## Delta 12A

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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	6.76	20.80	93.28	19.74	●
PCS-1900	2	2	2	2	n2	n2	1850 - 1910 MHz	1930 - 1990 MHz	5.91	7.05	144.35	88.37	●
DCS-1800	3	3	3	3	n3	n3	1710 - 1785 MHz	1805 - 1880 MHz	6.69	5.84	123.71	146.53	●
	4	4	4	4			1710 - 1755 MHz	2110 - 2155 MHz	6.95	19.51	103.82	19.74	●
GSM-850	5	5	5	5	n5	n5	824 - 849 MHz	869 - 894 MHz	6.46	5.93	27.23	26.93	●
	6						830 - 840 MHz	875 - 885 MHz	6.53	5.79	27.06	26.62	●
	7	7	7	7	n7	n7	2500 - 2570 MHz	2620 - 2690 MHz	22.62	12.69	13.16	13.07	●
E-GSM-900	8	8	8	8	n8	n8	880 - 915 MHz	925 - 960 MHz	6.48	6.08	26.47	26.40	●
	9	9					1749.9 - 1784.9 MHz	1844.9 - 1879.9 MHz	6.33	5.84	123.66	146.53	●
	10	10					1710 - 1770 MHz	2110 - 2170 MHz	6.82	20.80	117.22	19.74	●
	11	11	11	11			1427.9 - 1447.9 MHz	1475.9 - 1495.9 MHz	70.35	77.85	4.37	3.27	●
	12	12	12	12	n12	n12	699 - 716 MHz	729 - 746 MHz	6.01	6.87	28.56	27.72	●
	13	13	13	13	n13	n13	777 - 787 MHz	746 - 756 MHz	6.94	7.28	26.75	27.67	●
	14	14	14	14	n14		788 - 798 MHz	758 - 768 MHz	6.69	7.38	26.99	27.23	●
		17		17			704 - 716 MHz	734 - 746 MHz	6.00	7.00	28.56	27.72	●
		18	18	18	n18	n18	815 - 830 MHz	860 - 875 MHz	6.59	5.66	27.23	26.99	●
	19	19	19	19			830 - 845 MHz	875 - 890 MHz	6.48	5.90	27.06	26.62	●
	20	20	20	20	n20	n20	832 - 862 MHz	791 - 821 MHz	6.16	6.59	27.18	27.00	●
	21	21	21	21			1447.9 - 1462.9 MHz	1495.9 - 1510.9 MHz	78.13	68.27	3.41	4.08	●
	22	22					3410 - 3490 MHz	3510 - 3590 MHz	9.30	10.60	27.79	58.54	●
		24	24	24	n24		1626.5 - 1660.5 MHz	1525 - 1559 MHz	11.90	42.92	42.28	9.49	●
	25	25	25	25	n25	n25	1850 - 1915 MHz	1930 - 1995 MHz	5.91	7.14	144.35	88.37	●
	26	26	26	26	n26		814 - 849 MHz	859 - 894 MHz	6.50	5.85	27.23	26.99	●
		27	27				807 - 824 MHz	852 - 869 MHz	6.59	5.72	27.17	27.18	●
		28	28	28	n28	n28	703 - 748 MHz	758 - 803 MHz	6.42	6.98	28.56	27.23	●

● 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	6.13	7.15	28.56	27.23	●
		29			n29		N/A	717 - 728 MHz	N/A	6.11	N/A	27.93	●
		30			n30		2305 - 2315 MHz	2350 - 2360 MHz	85.65	93.27	1.86	1.73	●
		31	31	31			452.5 - 457.5 MHz	462.5 - 467.5 MHz	60.19	56.64	3.51	4.13	●
	32	32					N/A	1452 - 1496 MHz	N/A	78.89	N/A	3.28	●
		33					1900 - 1920 MHz	1900 - 1920 MHz	6.01	6.01	109.11	109.11	●
		34			n34		2010 - 2025 MHz	2010 - 2025 MHz	9.62	9.62	46.52	46.52	●
		35					1850 - 1910 MHz	1850 - 1910 MHz	5.91	5.91	144.35	144.35	●
		36					1930 - 1990 MHz	1930 - 1990 MHz	7.05	7.05	88.37	88.37	●
		37					1910 - 1930 MHz	1910 - 1930 MHz	6.04	6.04	97.95	97.95	●
		38			n38		2570 - 2620 MHz	2570 - 2620 MHz	13.61	13.61	13.39	13.39	●
		39	39		n39		1880 - 1920 MHz	1880 - 1920 MHz	5.97	5.97	125.27	125.27	●
		40	40		n40		2300 - 2400 MHz	2300 - 2400 MHz	87.72	87.72	3.38	3.38	●
		41	41	41	n41	n41	2496 - 2690 MHz	2496 - 2690 MHz	16.92	16.92	13.39	13.39	●
		42	42	42			3400 - 3600 MHz	3400 - 3600 MHz	10.01	10.01	65.28	65.28	●
		43	43	43			3600 - 3800 MHz	3600 - 3800 MHz	18.84	18.84	112.16	112.16	●
		44					703 - 803 MHz	703 - 803 MHz	6.76	6.76	28.56	28.56	●
		45					1447 - 1467 MHz	1447 - 1467 MHz	78.44	78.44	3.45	3.45	●
		46			n46		5150 - 5925 MHz	5150 - 5925 MHz	47.94	47.94	5.50	5.50	●
		47			n47		5855 - 5925 MHz	5855 - 5925 MHz	50.71	50.71	3.50	3.50	●
		48			n48		3550 - 3700 MHz	3550 - 3700 MHz	14.41	14.41	112.16	112.16	●
		49					3550 - 3700 MHz	3550 - 3700 MHz	14.41	14.41	112.16	112.16	●
		50			n50		1432 - 1517 MHz	1432 - 1517 MHz	74.11	74.11	4.46	4.46	●
		51			n51		1427 - 1432 MHz	1427 - 1432 MHz	65.80	65.80	4.43	4.43	●
		52					3300 - 3400 MHz	3300 - 3400 MHz	9.45	9.45	17.20	17.20	●

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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	34.82	34.82	9.37	9.37	●
		65		65	n65	n65	1920 - 2010 MHz	2110 - 2200 MHz	7.28	23.23	93.28	19.74	●
		66	66	66	n66	n66	1710 - 1780 MHz	2110 - 2200 MHz	6.73	23.23	121.46	19.74	●
		67			n67		N/A	738 - 758 MHz	N/A	7.21	N/A	27.72	●
		68					698 - 728 MHz	753 - 783 MHz	6.05	7.23	28.56	27.23	●
		69					N/A	2570 - 2620 MHz	N/A	13.61	N/A	13.39	●
		70		70	n70	n70	1695 - 1710 MHz	1995 - 2020 MHz	8.21	9.00	72.31	53.46	●
		71	71	71	n71		663 - 698 MHz	617 - 652 MHz	6.99	8.45	27.83	25.25	●
		72	72	72			451 - 456 MHz	461 - 466 MHz	60.13	57.77	3.45	3.98	●
		73	73	73			450 - 455 MHz	460 - 465 MHz	60.08	58.52	3.40	3.88	●
		74	74	74	n74		1427 - 1470 MHz	1475 - 1518 MHz	74.60	71.50	4.43	4.52	●
		75			n75		N/A	1432 - 1517 MHz	N/A	74.11	N/A	4.46	●
		76			n76		N/A	1427 - 1432 MHz	N/A	65.80	N/A	4.43	●
					n77		3300 - 4200 MHz	3300 - 4200 MHz	26.36	26.36	112.16	112.16	●
					n78		3300 - 3800 MHz	3300 - 3800 MHz	13.43	13.43	112.16	112.16	●
					n79		4400 - 5000 MHz	4400 - 5000 MHz	29.19	29.19	8.86	8.86	●
					n80		1710 - 1785 MHz	N/A	6.69	N/A	123.71	N/A	●
					n81		880 - 915 MHz	N/A	6.48	N/A	26.47	N/A	●
					n82		832 - 862 MHz	N/A	6.16	N/A	27.18	N/A	●
					n83		703 - 748 MHz	N/A	6.42	N/A	28.56	N/A	●
					n84		1920 - 1980 MHz	N/A	6.76	N/A	93.28	N/A	●
		85	85	85	n85		698 - 716 MHz	728 - 746 MHz	6.02	6.85	28.56	27.72	●
					n86		1710 - 1780 MHz	N/A	6.73	N/A	121.46	N/A	●
		87	87	87			410 - 415 MHz	420 - 425 MHz	37.65	46.53	5.87	4.29	●
		88	88	88			412 - 417 MHz	422 - 427 MHz	39.52	48.02	5.50	4.05	●

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● Adequate band in good signal conditions

● Likely to be unsuitable



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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
					n89		824 - 849 MHz	N/A	6.46	N/A	27.23	N/A	●
					n90	n90	2496 - 2690 MHz	2496 - 2690 MHz	16.92	16.92	13.39	13.39	●
					n91		832 - 862 MHz	1427 - 1432 MHz	6.16	65.80	27.18	4.43	●
					n92		832 - 862 MHz	1432 - 1517 MHz	6.16	74.11	27.18	4.46	●
					n93		880 - 915 MHz	1427 - 1432 MHz	6.48	65.80	26.47	4.43	●
					n94		880 - 915 MHz	1432 - 1517 MHz	6.48	74.11	26.47	4.46	●
					n95		2010 - 2025 MHz	N/A	9.62	N/A	46.52	N/A	●
					n97		2300 - 2400 MHz	N/A	87.72	N/A	3.38	N/A	●
					n98		1880 - 1920 MHz	N/A	5.97	N/A	125.27	N/A	●
					n99		1626.5 - 1660.5 MHz	N/A	11.90	N/A	42.28	N/A	●
					n101		1900 - 1910 MHz	1900 - 1910 MHz	6.03	6.03	109.11	109.11	●
				103			787 - 788 MHz	757 - 758 MHz	6.81	7.41	26.80	27.16	●

● 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.



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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	55.02	3.26	0.7314	●
ISM 868 MHz	863 - 870 MHz	5.66	26.99	-9.95	●
ISM 915 MHz	902 - 928 MHz	6.69	26.09	-9.155	●
ISM 2.4 GHz	2400 - 2500 MHz	49.99	9.72	2.37	●
Wi-Fi 2.4G	2401 - 2483 MHz	52.94	8.57	2.3275	●
Wi-Fi 2.4G (USA)	2401 - 2473 MHz	55.02	7.88	2.3275	●
Wi-Fi 2.4G (Japan)	2401 - 2495 MHz	50.63	9.37	2.3275	●
Wi-Fi 5G (all channels)	5150 - 5990 MHz	47.57	5.50	6.7	●
Wi-Fi 5G (Ch 32-48)	5150 - 5250 MHz	20.98	5.50	2.745	●
Wi-Fi 5G (Ch 32-64)	5150 - 5330 MHz	27.72	5.50	5.01	●
Wi-Fi 5G (Ch 32-161)	5150 - 5815 MHz	47.44	5.50	6.7	●
Wi-Fi 5G (Ch 32-173)	5150 - 5875 MHz	47.80	5.50	6.7	●
ISM 5.8 GHz	5725 - 5875 MHz	48.03	3.80	5.65	●

● Suitable band

● Adequate band in good signal conditions

● Likely to be unsuitable

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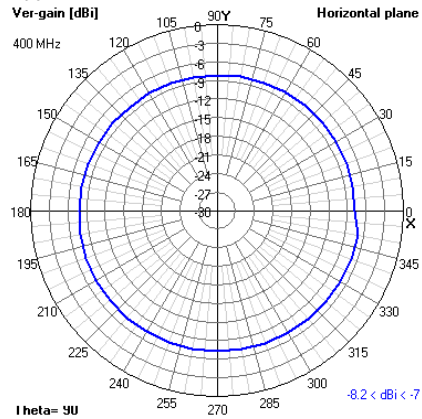


## Delta 12A

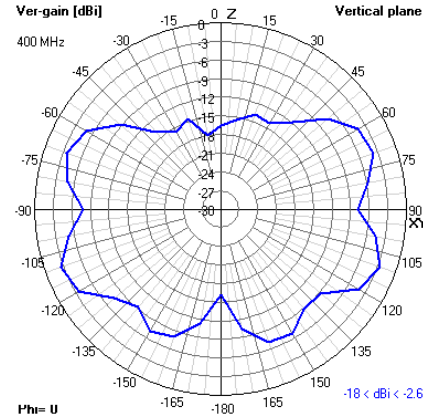
ISM 433 & 458 MHz 130mm Flexy Rubber ¼ Wave Whip Antenna

### 2D Radiation Plots

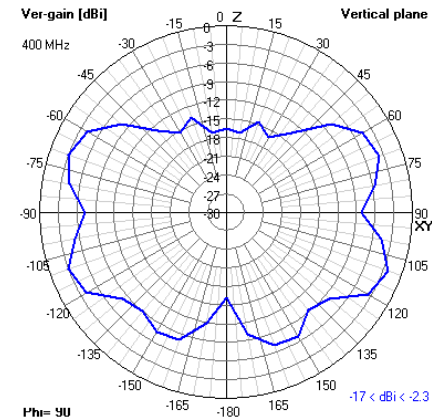
#### 400 MHz XY



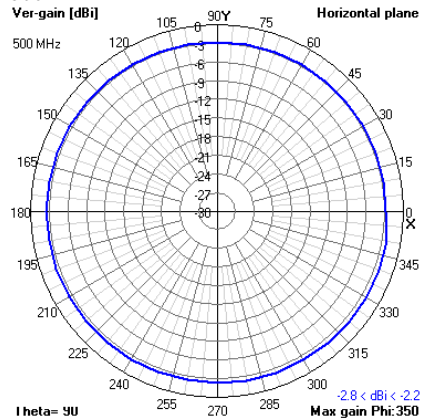
#### XZ



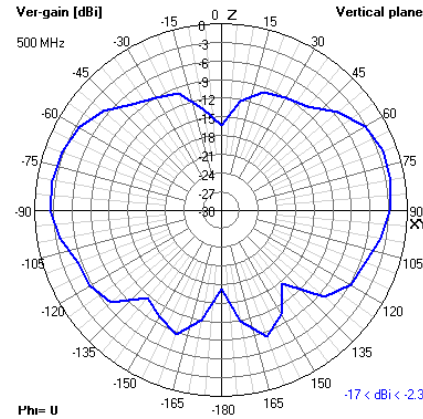
#### YZ



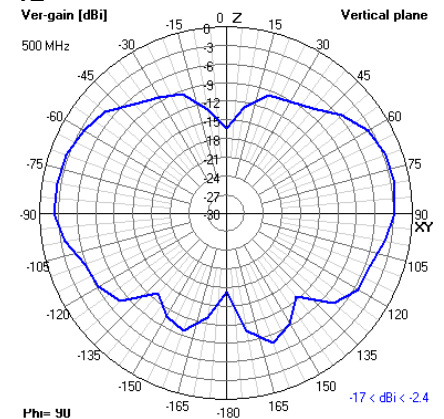
#### 500 MHz XY



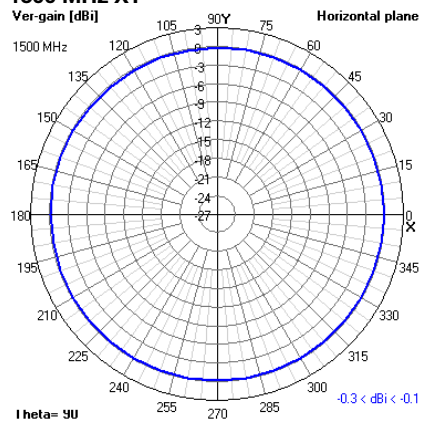
#### XZ



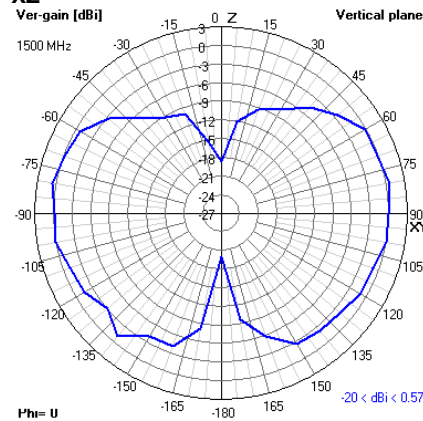
#### YZ



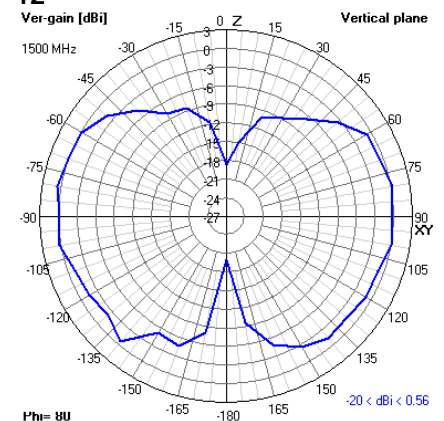
#### 1500 MHz XY



#### XZ



#### YZ



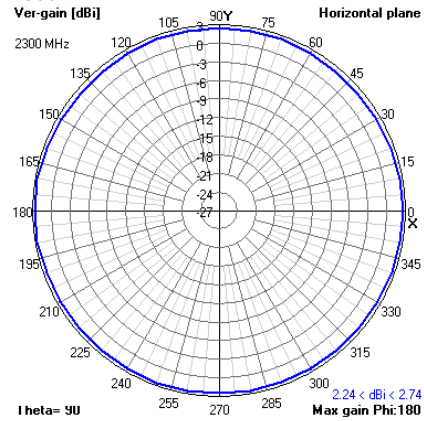


## Delta 12A

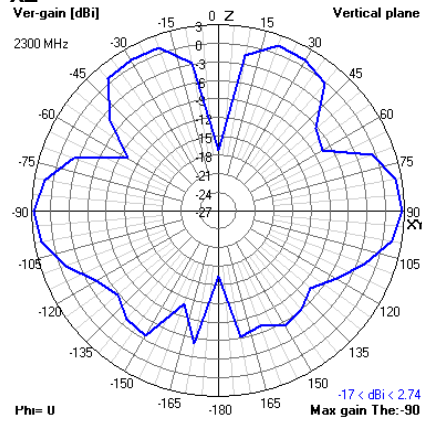
ISM 433 & 458 MHz 130mm Flexy Rubber ¼ Wave Whip Antenna

### 2D Radiation Plots

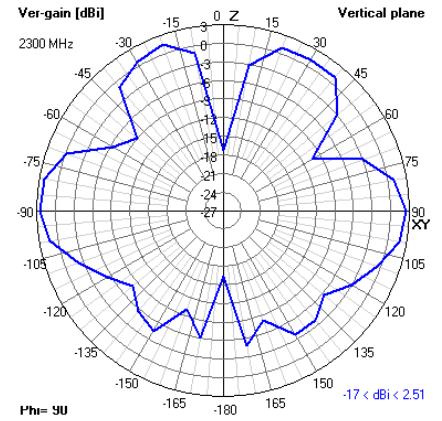
#### 2300 MHz XY



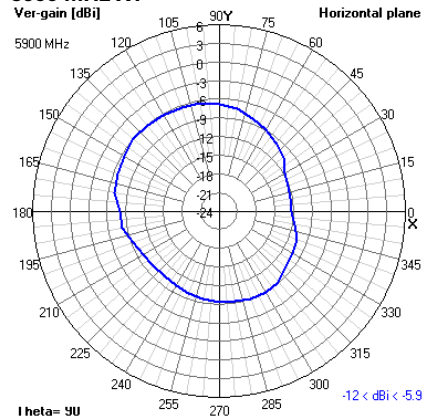
#### XZ



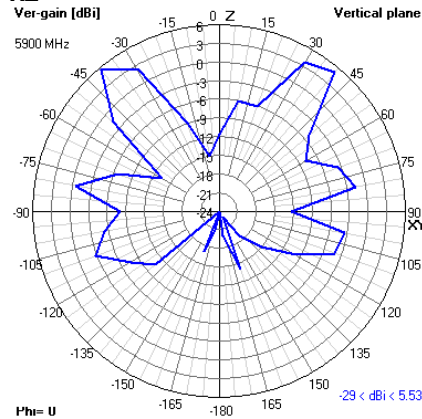
#### YZ



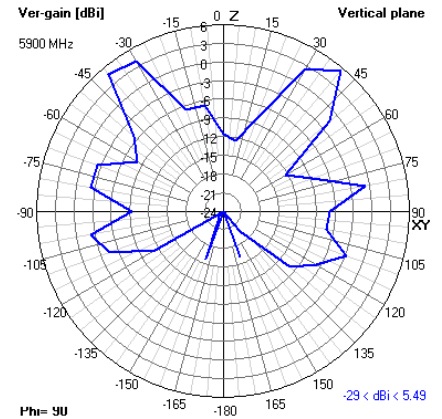
#### 5900 MHz XY



#### XZ



#### YZ



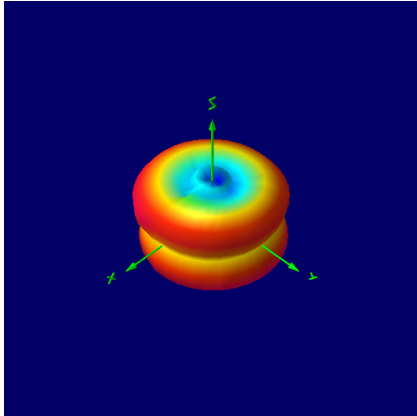


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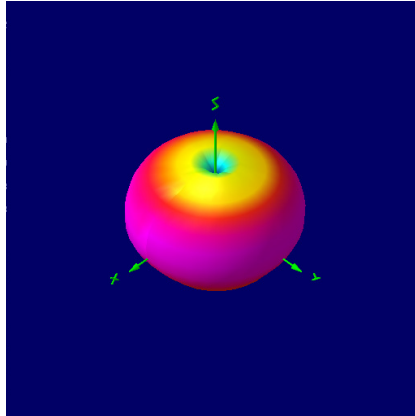
ISM 433 & 458 MHz 130mm Flexy Rubber ¼ Wave Whip Antenna

### 3D Radiation Plots

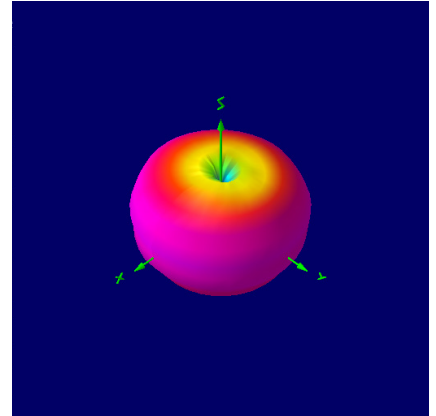
400 MHz



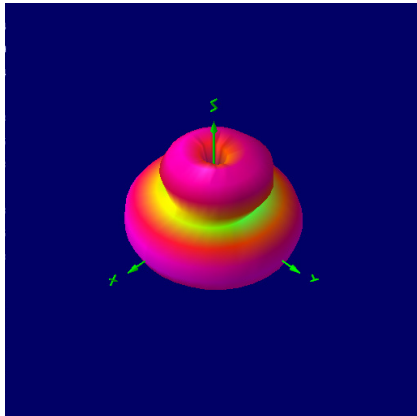
500 MHz



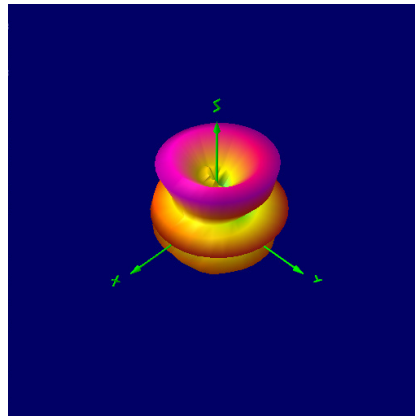
1500 MHz



2300 MHz



5900 MHz



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

### Ordering Details:

Part Number	Description
DELTA12A/X/SMAM/S/S/17	ISM 433 & 458 MHz 130mm Flexy Rubber ¼ Wave Whip Antenna SMA Male Connector
DELTA12A/X/BNCM/S/S/17	ISM 433 & 458 MHz 130mm Flexy Rubber ¼ Wave Whip Antenna BNC Male Connector