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Echo 1A

5G/4G Compact PCB Embedded 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 ISM 5.8 GHz
- Compact size

General Description

The Echo 1A is an efficiently tuned PCB antenna that is suited to a wide variety of RF & IoT modules operating on ISM 5.8 GHz, 2G/3G/4G and some 5G frequency bands.

Proven in many embedded applications, it is ground plane independent and compact making it a popular choice where a small size is important.

Alternative connectors and cable lengths may be specified for small volume orders.

Additional Considerations

- Good for small device integration
- Ground plane independent



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Electrical Specifications

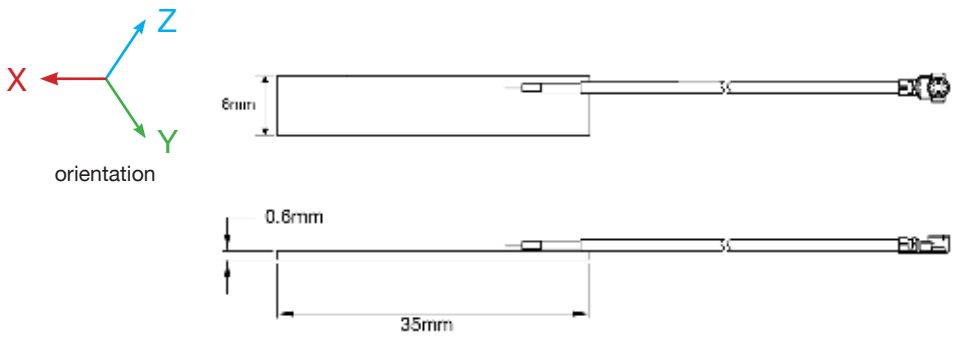
Impedance:	50 Ohm
Polarization:	Linear
Max Input Power:	3 W
Ground plane independent:	Yes

Environmental Specifications

Operating Temperature range:	-25°C to +60 °C
Storage Temperature range:	-25°C to +60 °C

Mechanical Specifications

Dimensions:	35 x 6 x 0.6 mm (without cable)
Weight:	0.65 g
Connector:	UFL/I-PEX
Antennna materials:	PCB



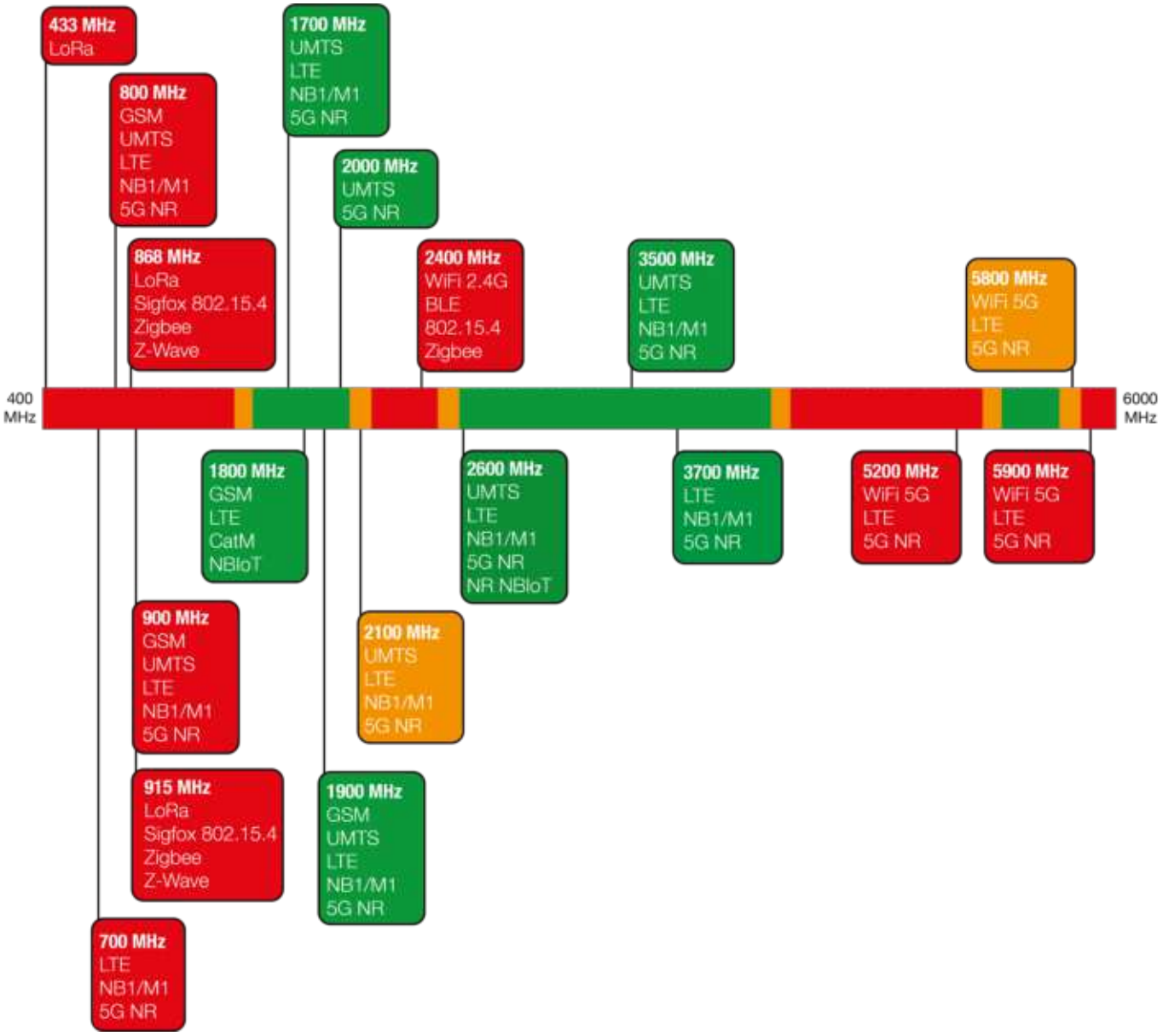
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Spectrum Coverage



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:										●	●	●

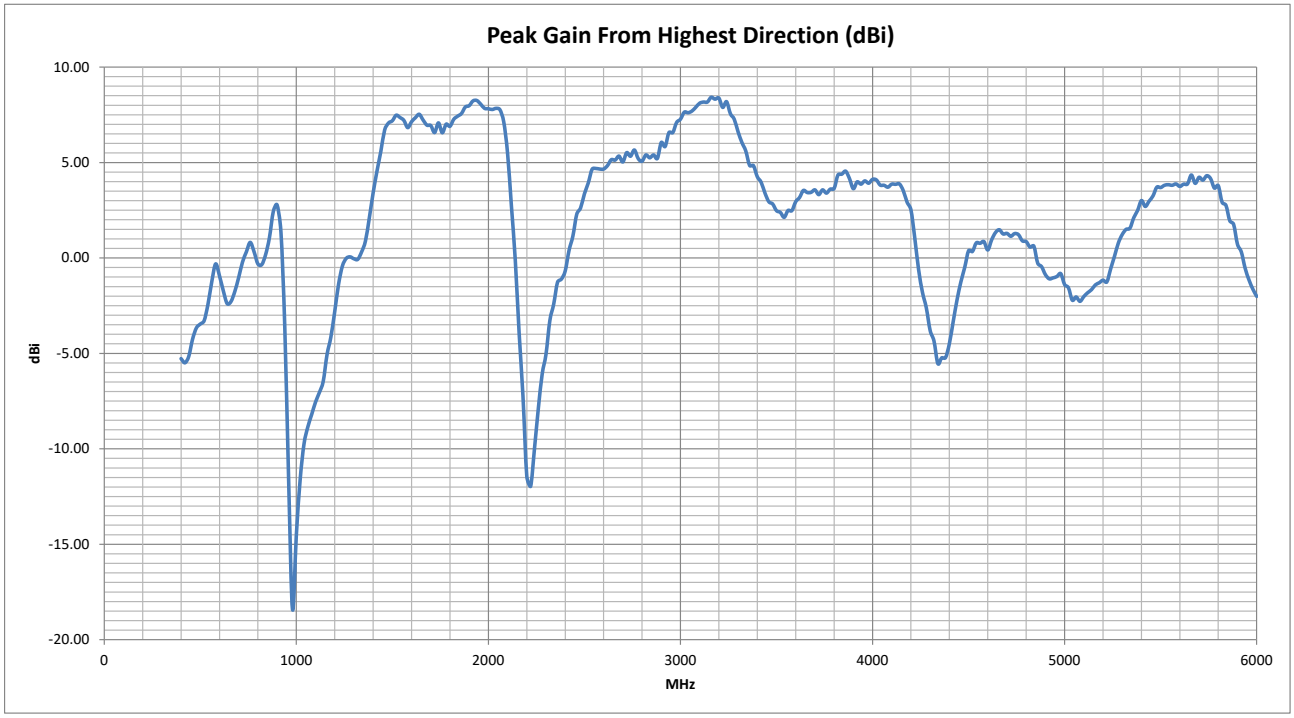
Usable Cellular Frequency Support (2000 MHz – 5900 MHz)

	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:					●	●						

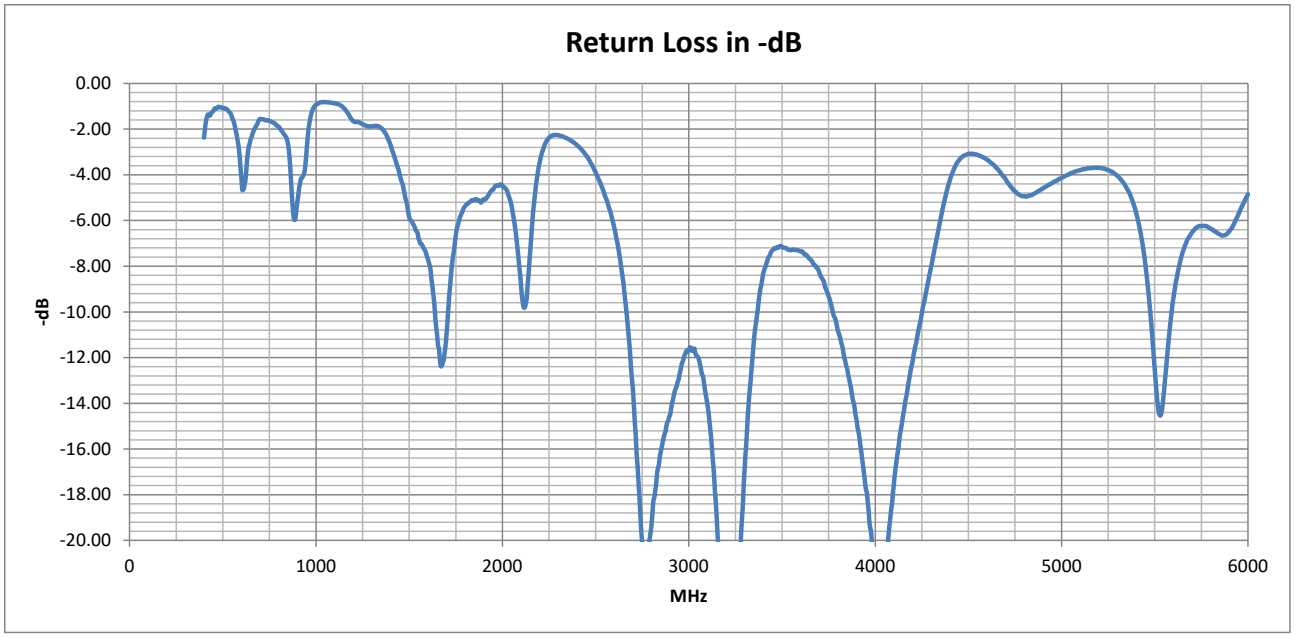
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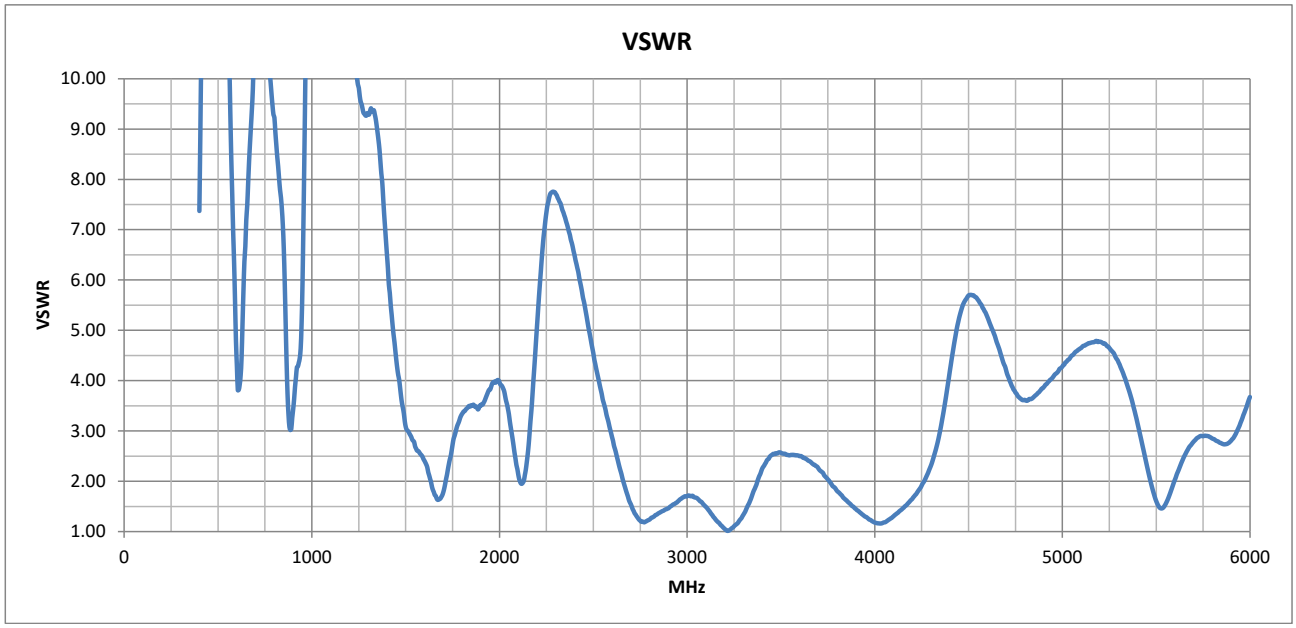
Peak Gain vs. Frequency



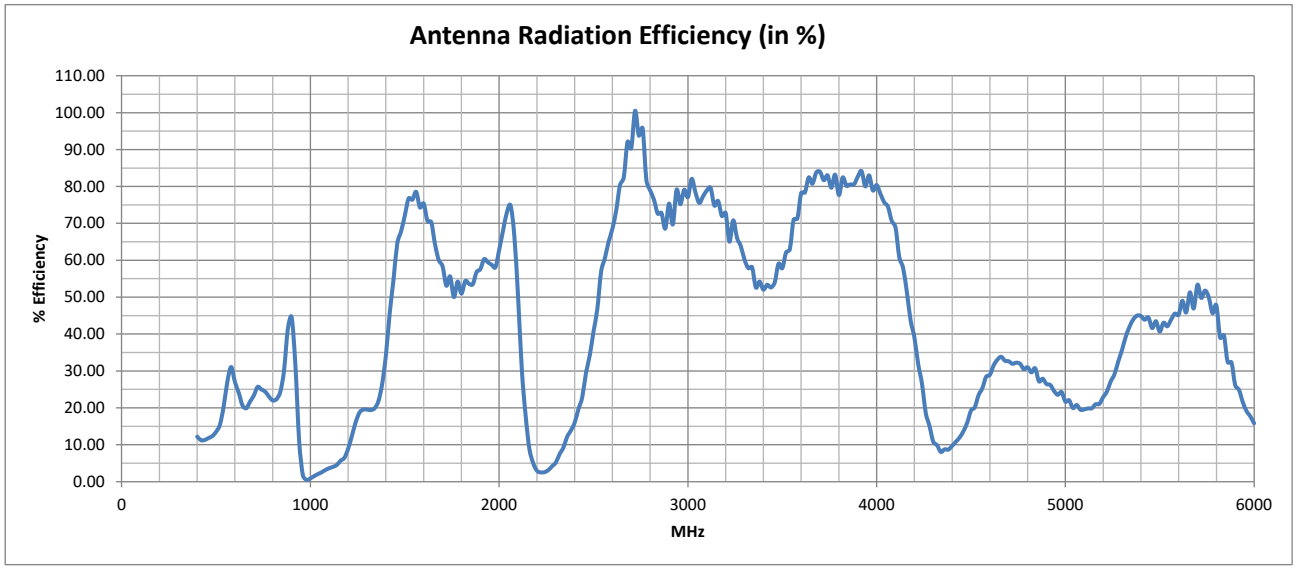
Return Loss



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	59.11	19.68	3.99	3.41	🟠
PCS-1900	2	2	2	2	n2	n2	1850 - 1910 MHz	1930 - 1990 MHz	56.04	58.98	3.53	4.01	🟢
DCS-1800	3	3	3	3	n3	n3	1710 - 1785 MHz	1805 - 1880 MHz	53.30	53.96	3.20	3.53	🟢
	4	4	4	4			1710 - 1755 MHz	2110 - 2155 MHz	54.07	23.38	2.84	2.72	🟢
GSM-850	5	5	5	5	n5	n5	824 - 849 MHz	869 - 894 MHz	24.25	40.59	8.06	3.86	🔴
	6						830 - 840 MHz	875 - 885 MHz	23.78	40.81	7.79	3.33	🔴
	7	7	7	7	n7	n7	2500 - 2570 MHz	2620 - 2690 MHz	52.89	83.24	4.55	2.58	🟢
E-GSM-900	8	8	8	8	n8	n8	880 - 915 MHz	925 - 960 MHz	41.54	11.69	4.07	8.56	🔴
	9	9					1749.9 - 1784.9 MHz	1844.9 - 1879.9 MHz	52.14	54.41	3.20	3.53	🟢
	10	10					1710 - 1770 MHz	2110 - 2170 MHz	53.29	19.68	3.04	3.41	🟠
	11	11	11	11			1427.9 - 1447.9 MHz	1475.9 - 1495.9 MHz	53.83	69.07	5.19	3.67	🟢
	12	12	12	12	n12	n12	699 - 716 MHz	729 - 746 MHz	24.20	25.04	11.22	10.84	🔴
	13	13	13	13	n13	n13	777 - 787 MHz	746 - 756 MHz	22.92	24.63	10.03	10.75	🔴
	14	14	14	14	n14		788 - 798 MHz	758 - 768 MHz	22.34	24.17	9.55	10.44	🔴
		17		17			704 - 716 MHz	734 - 746 MHz	24.49	24.96	11.22	10.82	🔴
		18	18	18	n18	n18	815 - 830 MHz	860 - 875 MHz	22.64	34.32	8.45	5.14	🔴
	19	19	19	19			830 - 845 MHz	875 - 890 MHz	24.19	41.38	7.79	3.33	🔴
	20	20	20	20	n20	n20	832 - 862 MHz	791 - 821 MHz	26.55	22.18	7.73	9.43	🔴
	21	21	21	21			1447.9 - 1462.9 MHz	1495.9 - 1510.9 MHz	62.20	72.91	4.48	3.17	🟢
	22	22					3410 - 3490 MHz	3510 - 3590 MHz	54.65	66.90	2.58	2.55	🟢
		24	24	24	n24		1626.5 - 1660.5 MHz	1525 - 1559 MHz	68.48	77.01	2.10	2.92	🟢
	25	25	25	25	n25	n25	1850 - 1915 MHz	1930 - 1995 MHz	56.28	59.14	3.56	4.01	🟢
	26	26	26	26	n26		814 - 849 MHz	859 - 894 MHz	23.72	38.24	8.50	5.30	🔴
		27	27				807 - 824 MHz	852 - 869 MHz	22.29	30.91	8.84	6.36	🔴
		28	28	28	n28	n28	703 - 748 MHz	758 - 803 MHz	24.97	23.08	11.22	10.44	🔴

🟢 Suitable band 🟠 Adequate band in good signal conditions 🔴 Likely to be unsuitable

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		28A					703 - 733 MHz	758 - 788 MHz	24.99	23.51	11.22	10.44	🔴
		29			n29		N/A	717 - 728 MHz	N/A	25.49	N/A	11.11	🔴
		30			n30		2305 - 2315 MHz	2350 - 2360 MHz	6.29	11.40	7.68	7.23	🔴
		31	31	31			452.5 - 457.5 MHz	462.5 - 467.5 MHz	11.67	11.93	15.80	15.93	🔴
	32	32					N/A	1452 - 1496 MHz	N/A	66.73	N/A	4.34	🟢
		33					1900 - 1920 MHz	1900 - 1920 MHz	58.90	58.90	3.60	3.60	🟢
		34			n34		2010 - 2025 MHz	2010 - 2025 MHz	67.27	67.27	3.91	3.91	🟢
		35					1850 - 1910 MHz	1850 - 1910 MHz	56.04	56.04	3.53	3.53	🟢
		36					1930 - 1990 MHz	1930 - 1990 MHz	58.98	58.98	4.01	4.01	🟢
		37					1910 - 1930 MHz	1910 - 1930 MHz	59.81	59.81	3.69	3.69	🟢
		38			n38		2570 - 2620 MHz	2570 - 2620 MHz	67.89	67.89	3.33	3.33	🟢
		39	39		n39		1880 - 1920 MHz	1880 - 1920 MHz	58.03	58.03	3.60	3.60	🟢
		40	40		n40		2300 - 2400 MHz	2300 - 2400 MHz	10.63	10.63	7.71	7.71	🔴
		41	41	41	n41	n41	2496 - 2690 MHz	2496 - 2690 MHz	67.44	67.44	4.62	4.62	🟢
		42	42	42			3400 - 3600 MHz	3400 - 3600 MHz	60.91	60.91	2.58	2.58	🟢
		43	43	43			3600 - 3800 MHz	3600 - 3800 MHz	81.45	81.45	2.50	2.50	🟢
		44					703 - 803 MHz	703 - 803 MHz	24.08	24.08	11.22	11.22	🔴
		45					1447 - 1467 MHz	1447 - 1467 MHz	62.67	62.67	4.51	4.51	🟢
		46			n46		5150 - 5925 MHz	5150 - 5925 MHz	39.77	39.77	4.79	4.79	🟠
		47			n47		5855 - 5925 MHz	5855 - 5925 MHz	28.98	28.98	2.95	2.95	🟠
		48			n48		3550 - 3700 MHz	3550 - 3700 MHz	78.21	78.21	2.53	2.53	🟢
		49					3550 - 3700 MHz	3550 - 3700 MHz	78.21	78.21	2.53	2.53	🟢
		50			n50		1432 - 1517 MHz	1432 - 1517 MHz	65.85	65.85	5.03	5.03	🟠
		51			n51		1427 - 1432 MHz	1427 - 1432 MHz	49.98	49.98	5.23	5.23	🟠
		52					3300 - 3400 MHz	3300 - 3400 MHz	55.75	55.75	2.25	2.25	🟢

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		53			n53		2483.5 - 2495 MHz	2483.5 - 2495 MHz	37.22	37.22	4.88	4.88	🔴
		65		65	n65	n65	1920 - 2010 MHz	2110 - 2200 MHz	59.96	14.67	4.01	5.10	🟠
		66	66	66	n66	n66	1710 - 1780 MHz	2110 - 2200 MHz	53.27	14.67	3.15	5.10	🟠
		67			n67		N/A	738 - 758 MHz	N/A	24.72	N/A	10.82	🔴
		68					698 - 728 MHz	753 - 783 MHz	24.68	23.80	11.22	10.59	🔴
		69					N/A	2570 - 2620 MHz	N/A	67.89	N/A	3.33	🟢
		70		70	n70	n70	1695 - 1710 MHz	1995 - 2020 MHz	57.53	64.73	1.94	4.01	🟢
		71	71	71	n71		663 - 698 MHz	617 - 652 MHz	21.69	21.83	11.10	7.31	🔴
		72	72	72			451 - 456 MHz	461 - 466 MHz	11.63	11.89	15.69	15.93	🔴
		73	73	73			450 - 455 MHz	460 - 465 MHz	11.60	11.87	15.62	15.99	🔴
		74	74	74	n74		1427 - 1470 MHz	1475 - 1518 MHz	58.59	71.42	5.23	3.69	🟢
		75			n75		N/A	1432 - 1517 MHz	N/A	65.85	N/A	5.03	🟠
		76			n76		N/A	1427 - 1432 MHz	N/A	49.98	N/A	5.23	🟠
					n77		3300 - 4200 MHz	3300 - 4200 MHz	70.10	70.10	2.58	2.58	🟢
					n78		3300 - 3800 MHz	3300 - 3800 MHz	68.09	68.09	2.58	2.58	🟢
					n79		4400 - 5000 MHz	4400 - 5000 MHz	25.82	25.82	5.71	5.71	🔴
					n80		1710 - 1785 MHz	N/A	53.30	N/A	3.20	N/A	🟢
					n81		880 - 915 MHz	N/A	41.54	N/A	4.07	N/A	🟠
					n82		832 - 862 MHz	N/A	26.55	N/A	7.73	N/A	🔴
					n83		703 - 748 MHz	N/A	24.97	N/A	11.22	N/A	🔴
					n84		1920 - 1980 MHz	N/A	59.11	N/A	3.99	N/A	🟢
		85	85	85	n85		698 - 716 MHz	728 - 746 MHz	24.15	25.06	11.22	10.85	🔴
					n86		1710 - 1780 MHz	N/A	53.27	N/A	3.15	N/A	🟢
		87	87	87			410 - 415 MHz	420 - 425 MHz	11.56	11.20	11.75	12.73	🔴
		88	88	88			412 - 417 MHz	422 - 427 MHz	11.46	11.21	12.14	12.73	🔴

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					n89		824 - 849 MHz	N/A	24.25	N/A	8.06	N/A	🔴
					n90	n90	2496 - 2690 MHz	2496 - 2690 MHz	67.44	67.44	4.62	4.62	🟢
					n91		832 - 862 MHz	1427 - 1432 MHz	26.55	49.98	7.73	5.23	🔴
					n92		832 - 862 MHz	1432 - 1517 MHz	26.55	65.85	7.73	5.03	🟠
					n93		880 - 915 MHz	1427 - 1432 MHz	41.54	49.98	4.07	5.23	🟠
					n94		880 - 915 MHz	1432 - 1517 MHz	41.54	65.85	4.07	5.03	🟠
					n95		2010 - 2025 MHz	N/A	67.27	N/A	3.91	N/A	🟢
					n97		2300 - 2400 MHz	N/A	10.63	N/A	7.71	N/A	🔴
					n98		1880 - 1920 MHz	N/A	58.03	N/A	3.60	N/A	🟢
					n99		1626.5 - 1660.5 MHz	N/A	68.48	N/A	2.10	N/A	🟢
					n101		1900 - 1910 MHz	1900 - 1910 MHz	58.22	58.22	3.53	3.53	🟢
				103			787 - 788 MHz	757 - 758 MHz	22.63	24.45	9.59	10.47	🔴

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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	11.25	12.88	-5.2458	🔴
ISM 868 MHz	863 - 870 MHz	33.76	4.67	1.74	🔴
ISM 915 MHz	902 - 928 MHz	34.39	4.33	2.638	🔴
ISM 2.4 GHz	2400 - 2500 MHz	26.90	6.49	3.36	🔴
Wi-Fi 2.4G	2401 - 2483 MHz	24.74	6.47	2.731	🔴
Wi-Fi 2.4G (USA)	2401 - 2473 MHz	23.48	6.47	2.5045	🔴
Wi-Fi 2.4G (Japan)	2401 - 2495 MHz	26.32	6.47	3.175	🔴
Wi-Fi 5G (all channels)	5150 - 5990 MHz	38.22	4.79	4.35	🔴
Wi-Fi 5G (Ch 32-48)	5150 - 5250 MHz	23.29	4.79	-0.23	🔴
Wi-Fi 5G (Ch 32-64)	5150 - 5330 MHz	28.11	4.79	1.53	🔴
Wi-Fi 5G (Ch 32-161)	5150 - 5815 MHz	40.98	4.79	4.35	🟠
Wi-Fi 5G (Ch 32-173)	5150 - 5875 MHz	40.61	4.79	4.35	🟠
ISM 5.8 GHz	5725 - 5875 MHz	43.52	2.91	4.31	🟢

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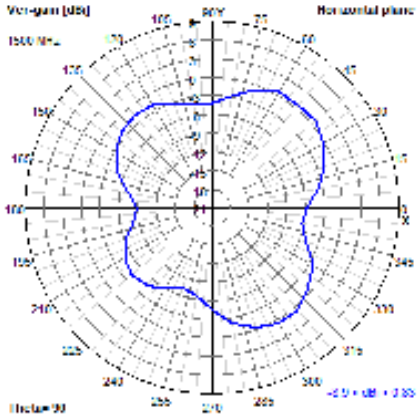
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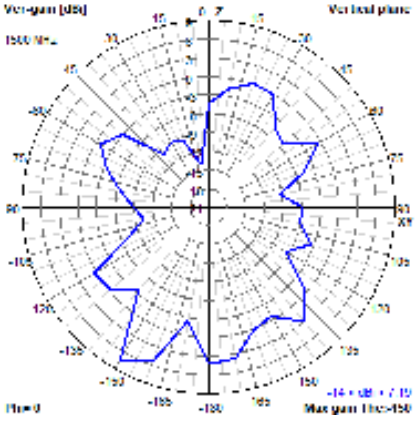
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2D Radiation Plots

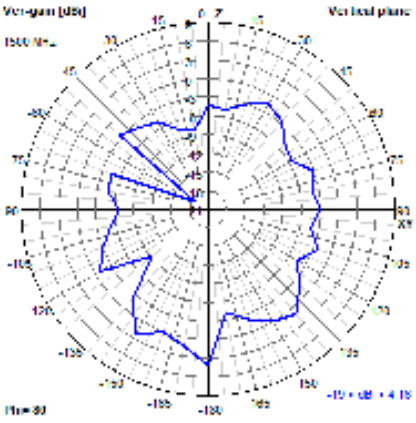
1500 MHz XY



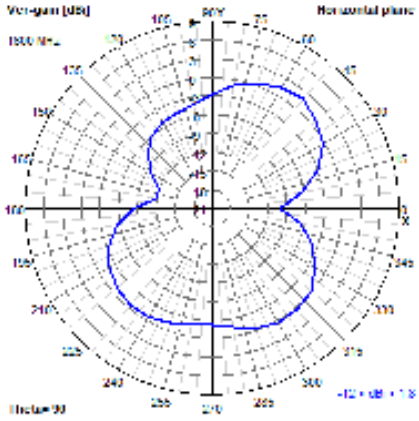
XZ



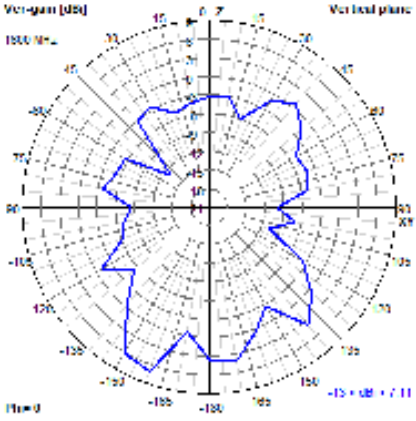
YZ



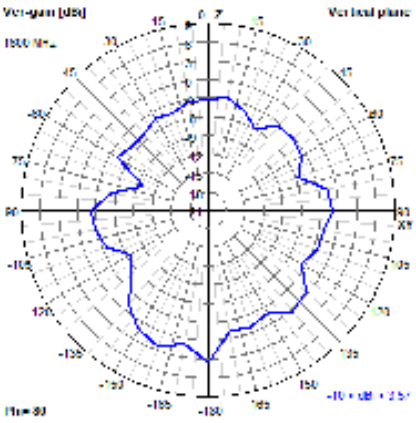
1600 MHz XY



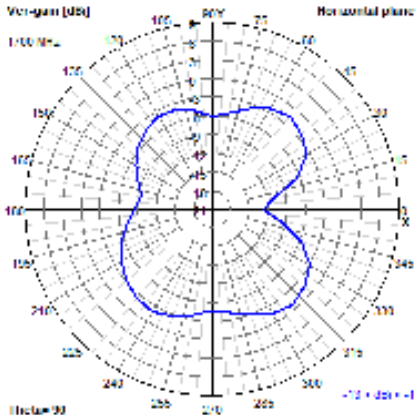
XZ



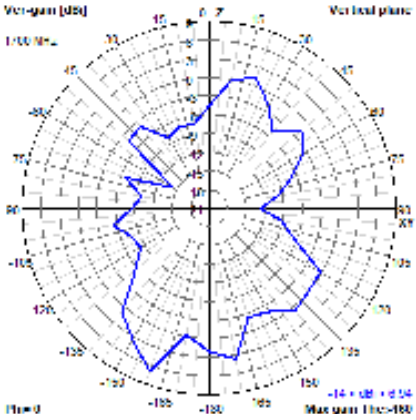
YZ



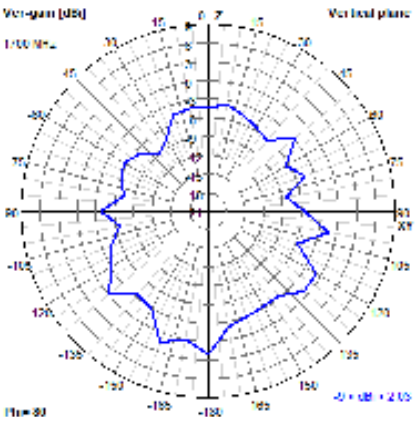
1700 MHz XY



XZ



YZ



Siretta

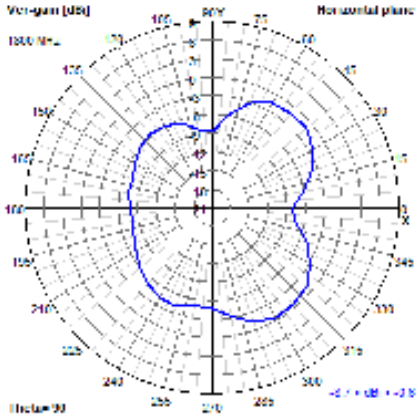
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Echo 1A

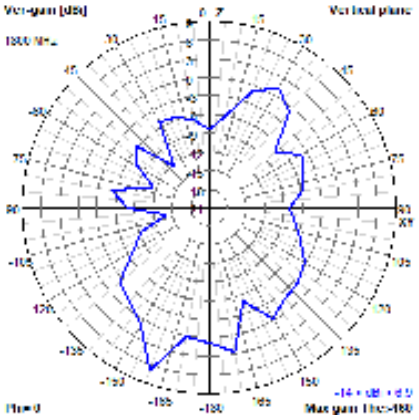
5G/4G Compact PCB Embedded Antenna

2D Radiation Plots

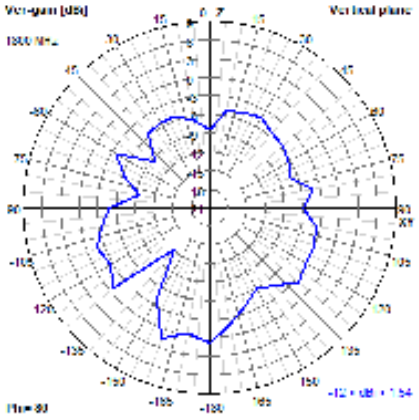
1800 MHz XY



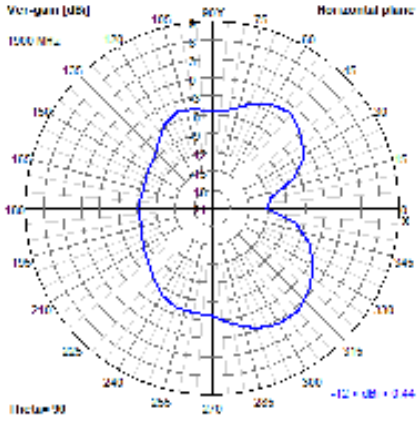
XZ



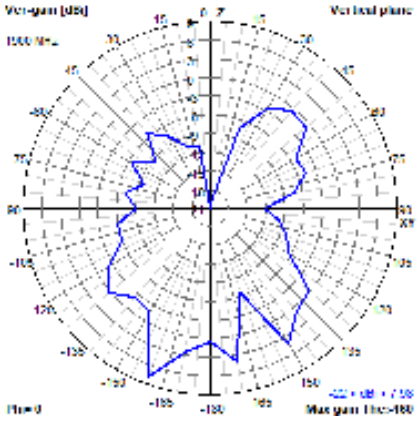
YZ



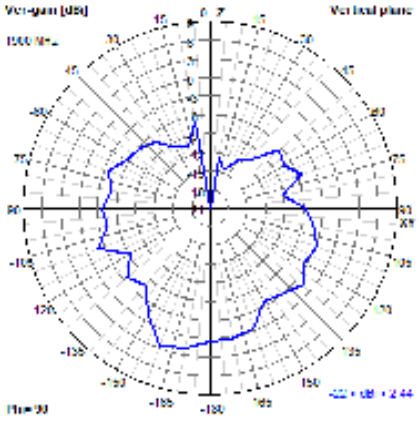
1900 MHz XY



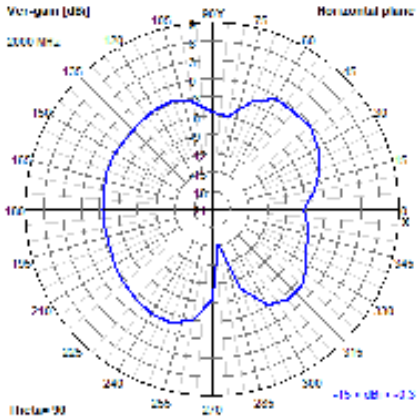
XZ



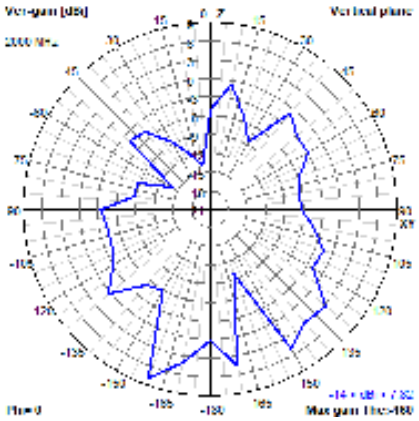
YZ



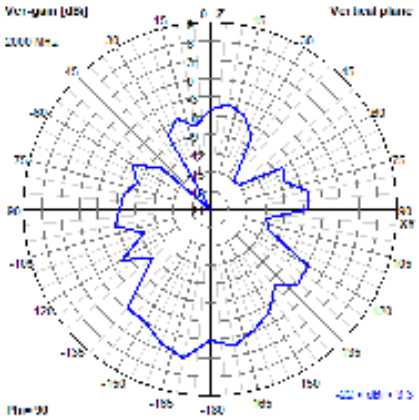
2000 MHz XY



XZ



YZ



Siretta

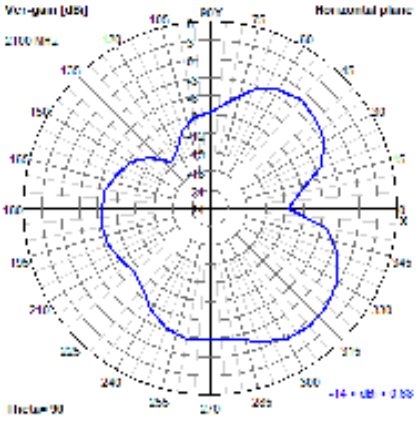
Enabling Industrial IoT

Echo 1A

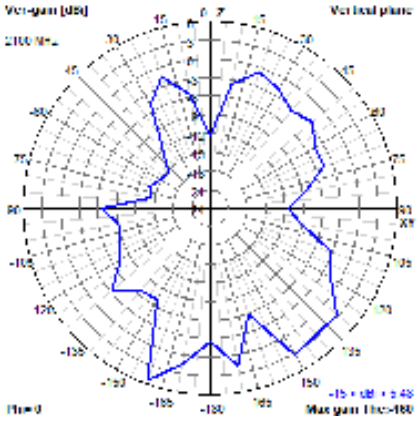
5G/4G Compact PCB Embedded Antenna

2D Radiation Plots

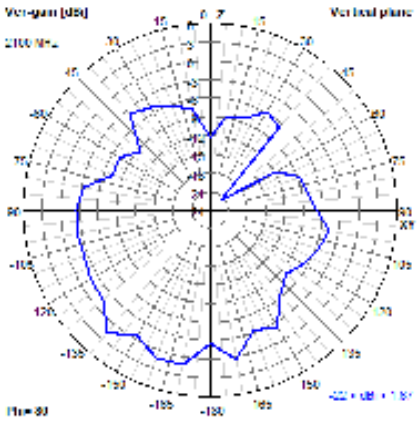
2100 MHz XY



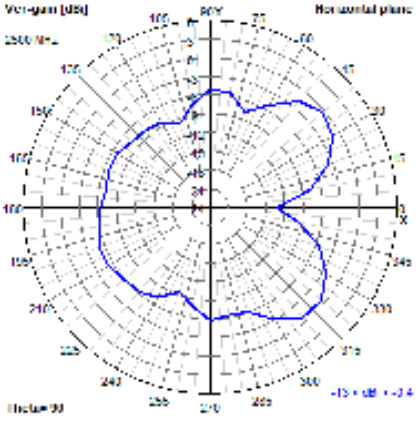
XZ



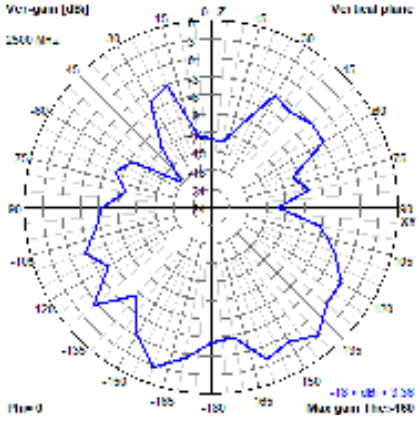
YZ



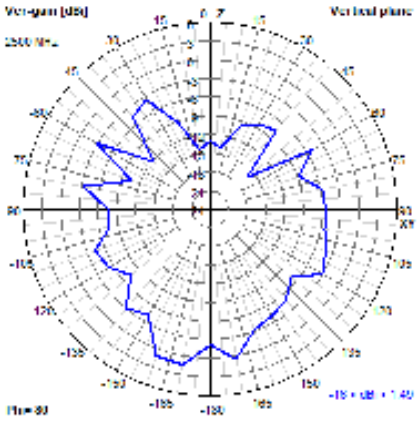
2500 MHz XY



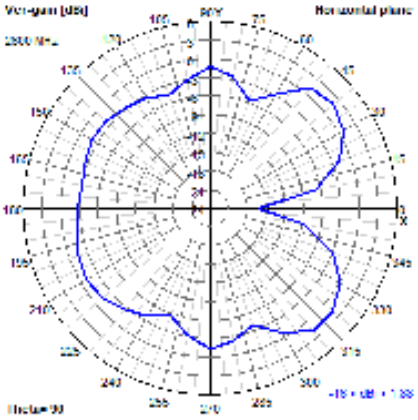
XZ



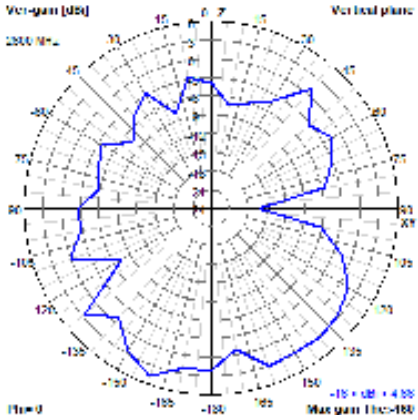
YZ



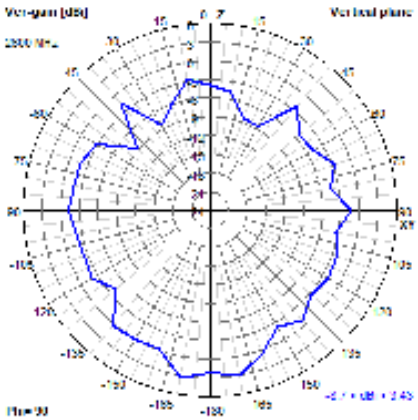
2600 MHz XY



XZ



YZ



Siretta

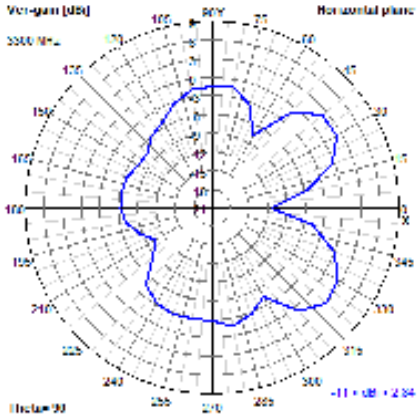
Enabling Industrial IoT

Echo 1A

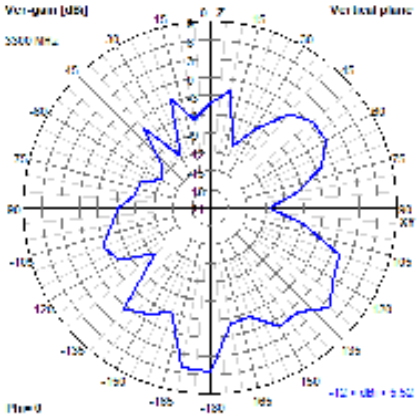
5G/4G Compact PCB Embedded Antenna

2D Radiation Plots

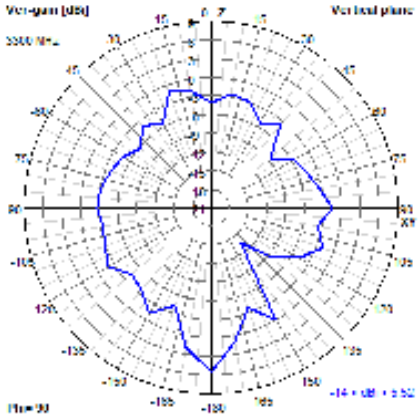
3300 MHz XY



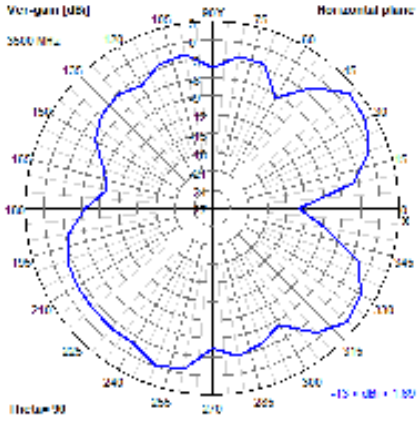
XZ



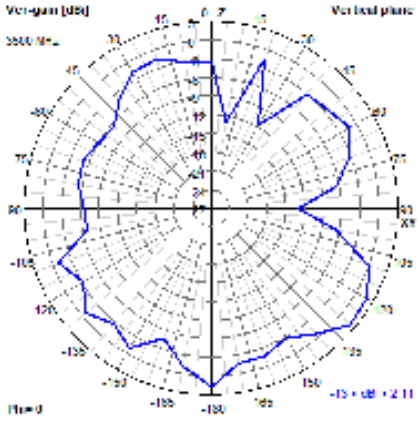
YZ



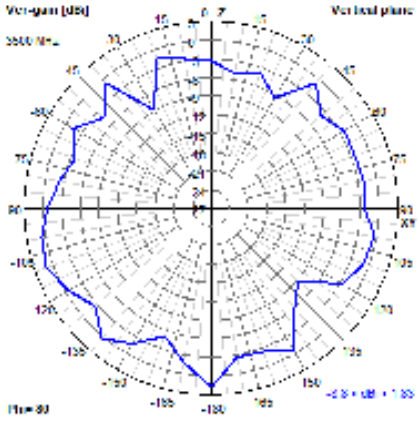
3500 MHz XY



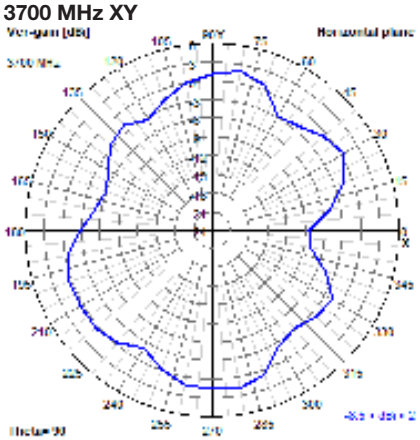
XZ



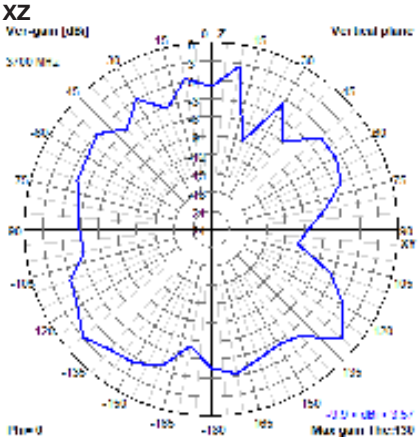
YZ



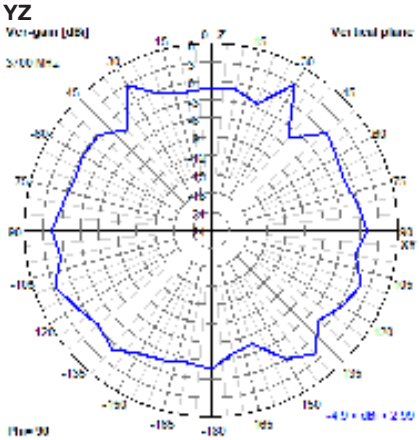
3700 MHz XY



XZ



YZ



Siretta

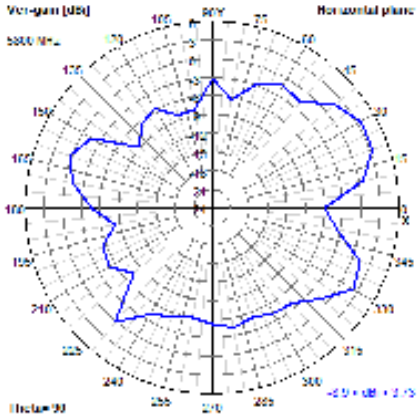
Enabling Industrial IoT

Echo 1A

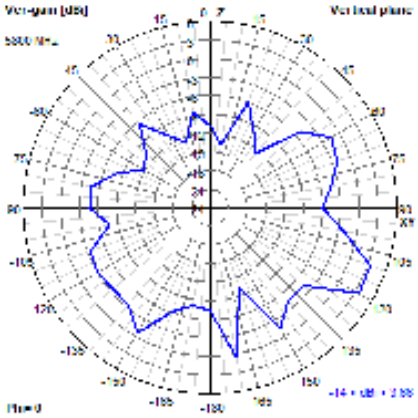
5G/4G Compact PCB Embedded Antenna

2D Radiation Plots

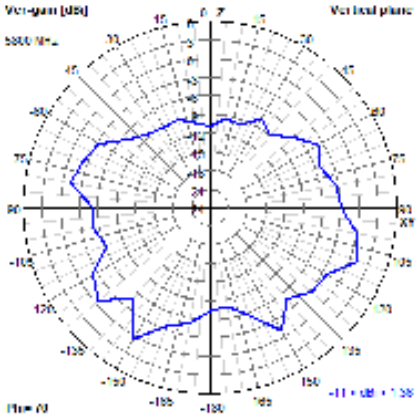
5800 MHz XY



XZ



YZ

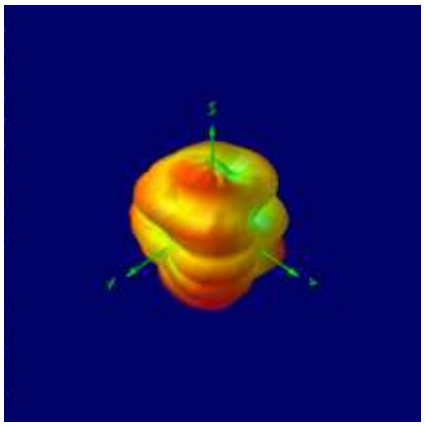


Echo 1A

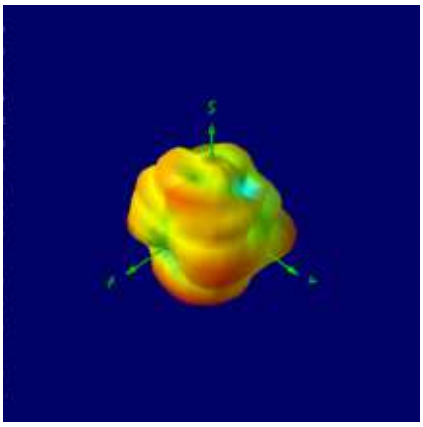
5G/4G Compact PCB Embedded Antenna

3D Radiation Plots

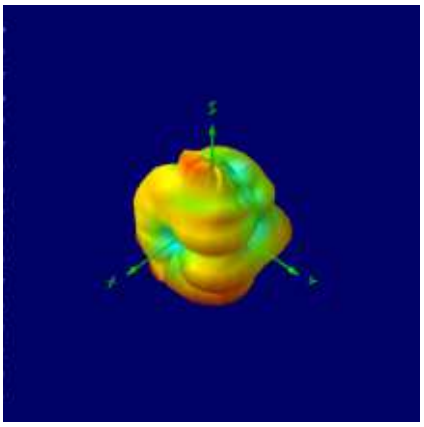
1500 MHz



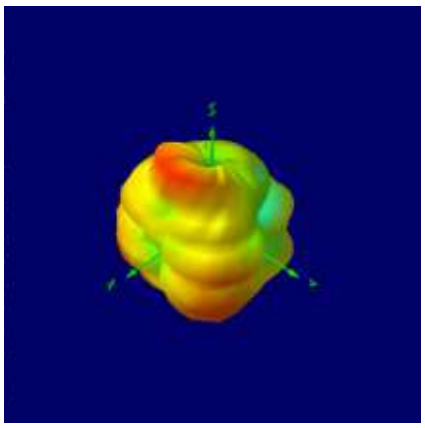
1600 MHz



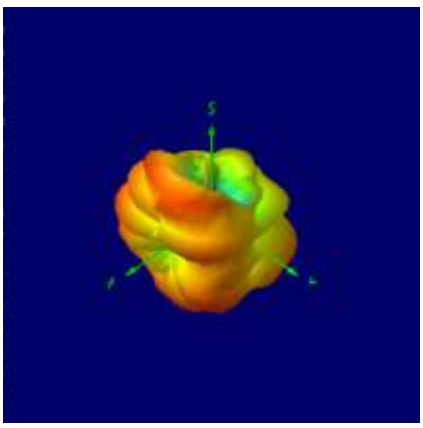
1700 MHz



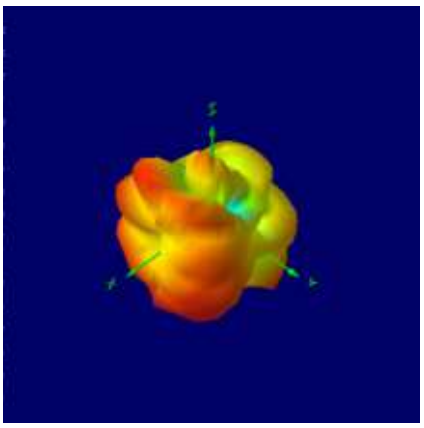
1800 MHz



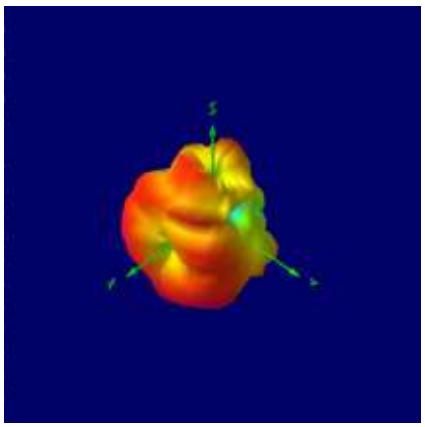
1900 MHz



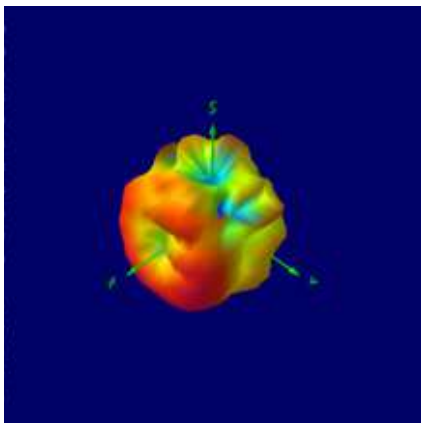
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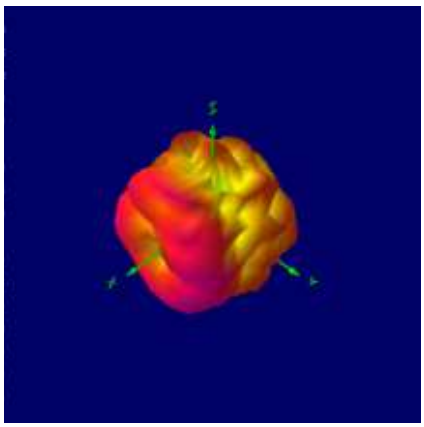
2100 MHz



2500 MHz



2600 MHz



Siretta

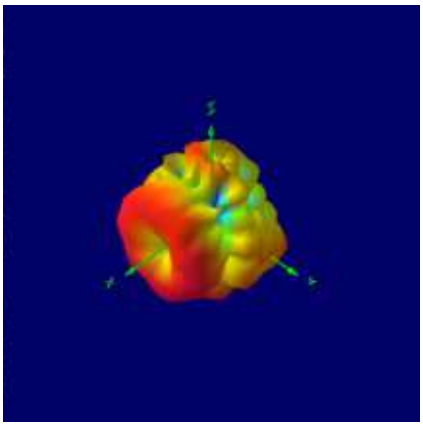
Enabling Industrial IoT

Echo 1A

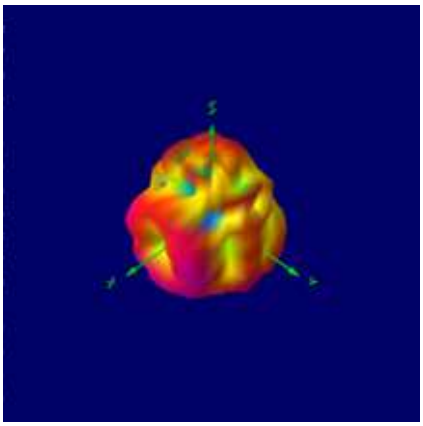
5G/4G Compact PCB Embedded Antenna

3D Radiation Plots

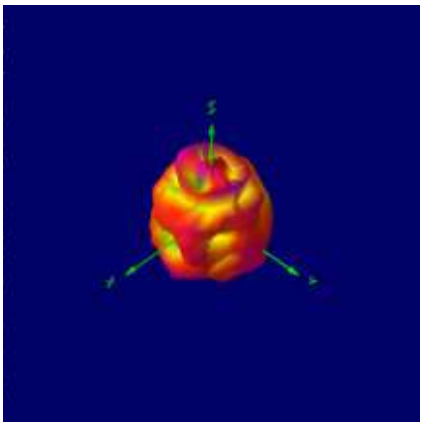
3300 MHz



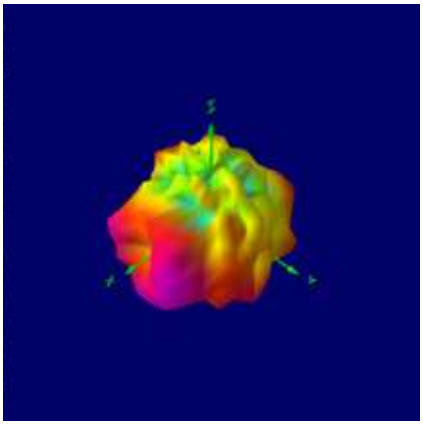
3500 MHz



3700 MHz



5800 MHz



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

Ordering Details:

Part Number	Description
ECHO1A/0.15M/IPEX/S/S/11	5G/4G Compact PCB Embedded Antenna I-PEX Connector 150mm Cable
ECHO1A/0.15M/SMAM/S/S/11	5G/4G Compact PCB Embedded Antenna SMA Male Connector 150mm Cable
ECHO1A/0.1M/IPEX/S/S/11	5G/4G Compact PCB Embedded Antenna I-PEX Connector 100mm Cable
ECHO1A/0.1M/SMAM/S/S/11	5G/4G Compact PCB Embedded Antenna SMA Male Connector 100mm Cable
ECHO1A/0.2M/IPEX/S/S/11	5G/4G Compact PCB Embedded Antenna I-PEX Connector 200mm Cable