



ECHO 1A

2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA



Key Features

- Compact size
- Quad band GSM/GPRS (2G), 3G and 4G
- Some 5G LTE Band Coverage
- ISM: 868 and 915MHz

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, 2G/3G/4G and some 5G frequency bands.

Proven in many embedded applications, it is groundplane 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
- Meets all EU compliance criteria for electronic goods.

E Embedded	2G GSM	3G UMTS	4G LTE
5G LTE	LTE Cat M	LTE NB IoT	ISM 868
ISM 915	SF Sigfox	LoRa Wireless	



ECHO 1A

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Electrical Specifications

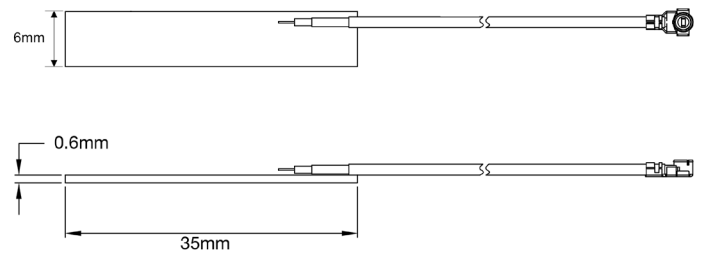
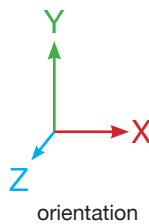
Impedance:	50 Ohm
Polarization:	Linear
Radiating element:	¼ wave dipole
Ground Plane Independent:	Yes
Max Input Power:	3 W

Mechanical Specifications

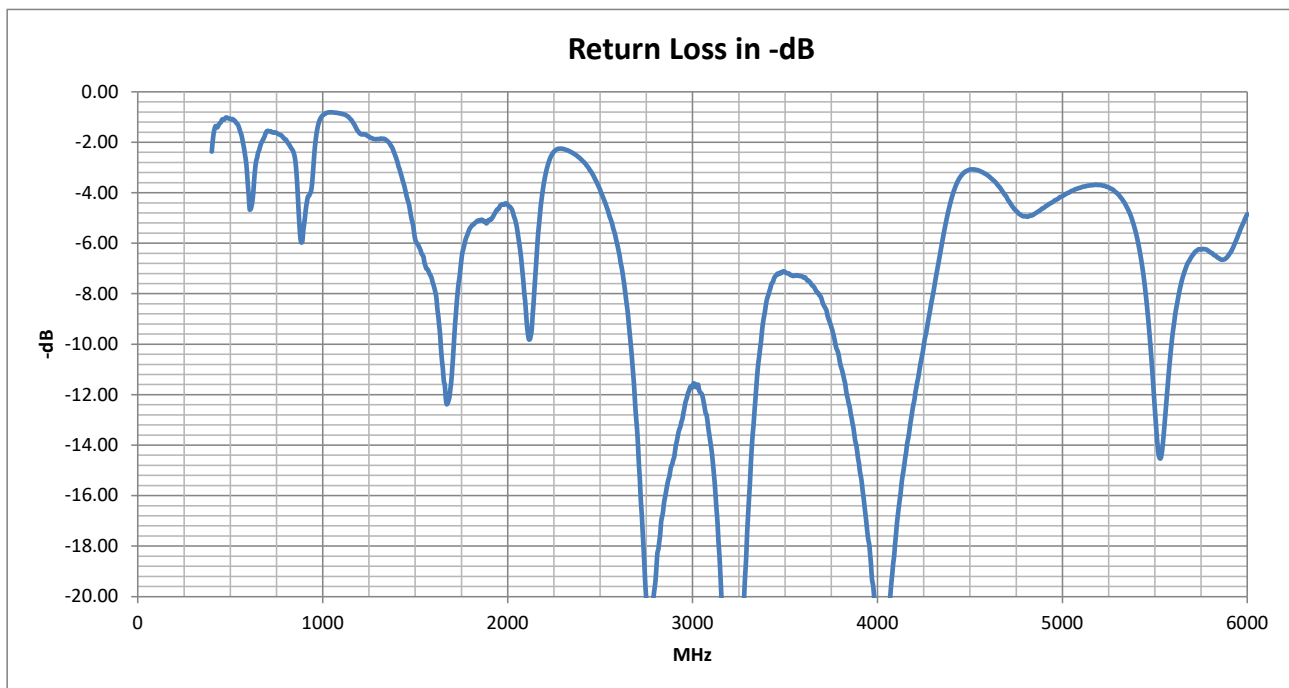
Dimensions:	35 x 6 x 0.6 mm (without cable)
Cable:	1.13 mm Coax
Connector:	UFL/IPEX

Environmental Specification

Operating Temperature Range:	-40 - +85 °C
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Return Loss tested with 100mm cable

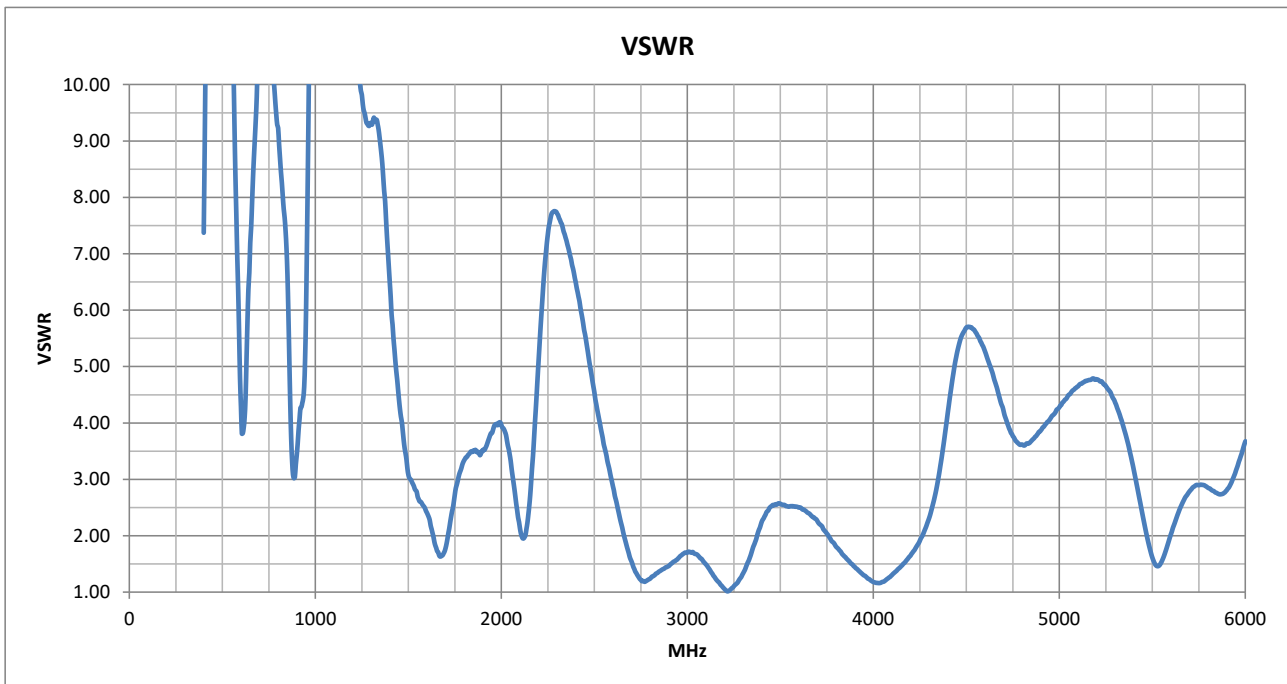




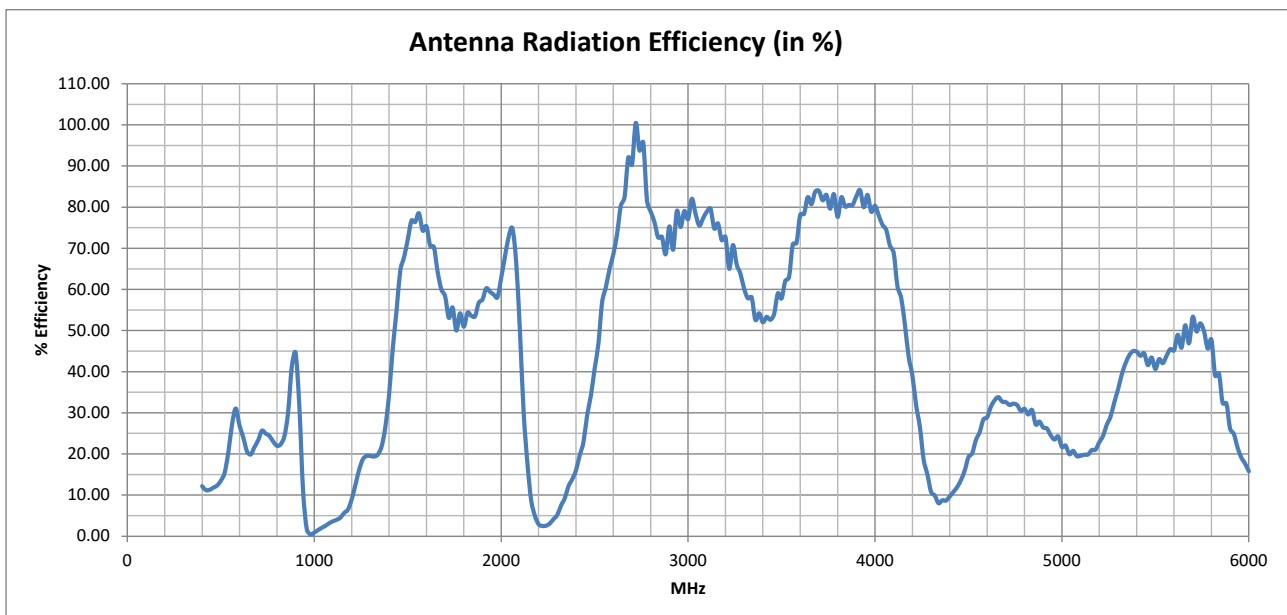
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VSWR tested with 100mm cable



Radiation Efficiency tested with 100mm cable





LTE/5G Band Coverage

LTE, CAT-M/5G Bands	NB-IoT Band	Regional Coverage	Uplink	Downlink	Avg Efficiency % over band	Max VSWR over Band
1/n1	B1	Europe / Asia	1920-1980 MHz	2110-2170 MHz	59.13 / 22.43	3.99 / 3.41
2/n2	B2	North America/Latin America/Caribbean	1850-1910 MHz	1930-1990 MHz	56.32 / 59.86	3.53 / 4.01
3/n3	B3	Europe/Africa/Asia/Oceania	1710-1785 MHz	1805-1880 MHz	53.69 / 53.81	3.20 / 3.53
4	B4	North America/Latin America/Caribbean	1710-1755 MHz	2110-2155 MHz	54.26 / 26.79	2.84 / 2.72
5/n5	B5	Country Specific	824-849 MHz	869-894 MHz	25.58 / 38.67	8.26 / 4.36
7/n7		Latin America/Europe/Asia +	2500-2570 MHz	2620-2690 MHz	53.99 / 83.73	4.55 / 2.58
8/n8	B8	Europe / Asia +	880-915 MHz	925-960 MHz	39.16 / 14.78	4.07 / 8.56
11	B11	Country Specific	1427.9-1447.9 MHz	1475.9-1495.9 MHz	54.99 / 68.15	5.31 / 3.69
12/n12	B12	North America/Caribbean +	699-716 MHz	729-746 MHz	23.55 / 24.99	11.22 / 10.8
13/n13	B13	North America/Caribbean +	777-787 MHz	746-756 MHz	23.12 / 24.66	10.1 / 10.77
14/n14	B14	Country Specific	788-798 MHz	758-768 MHz	22.50 / 24.11	9.68 / 10.53
17	B17	North America/Caribbean +	704-716 MHz	734.746 MHz	24.49 / 24.99	11.22 / 10.8
18/n18	B18	Country Specific	815-830 MHz	860-875 MHz	22.86 / 35.72	8.45 / 5.14
19	B19	Country Specific	830-845 MHz	875-890 MHz	25.58 / 38.67	7.79 / 3.33
20/n20	B20	Europe/Africa +	832-862 MHz	791-821 MHz	29.51 / 22.90	7.79 / 9.46
21		Country Specific	1447.9-1462.9 MHz	1495.9-1510.9 MHz	62.34 / 72.20	4.58 / 3.19
25/n25	B25	Country Specific	1850-1915 MHz	1525-1559 MHz	56.32 / 77.21	3.56 / 2.92
26/n26	B26	Country Specific	814-849 MHz	859-894 MHz	24.68 / 35.07	8.70 / 5.95
28/n28	B28	Latin America/Europe/Asia +	703-748 MHz	758-803 MHz	24.99 / 23.33	11.22 / 10.5
29/n29		Country Specific	-	717-728 MHz	24.64	11.11
30/n30		Country Specific	2305-2315 MHz	2350-2360 MHz	6.29 / 10.66	7.68 / 7.23
31	B31	Country Specific	452.5-457.5 MHz	462.5-467.5 MHz	11.54 / 12.05	15.99 / 16.1
32		Country Specific	-	1452-1496 MHz	64.79	4.40
38/n38		Europe +	2570-2620 MHz		66.89	3.33
39/n39		Country Specific	1880-1920 MHz		58.18	3.60
40/n40		Asia +	2300-2400 MHz		10.62	7.71
41/n41		Country Specific	2496-2690 MHz		65.94	4.64
42		Country Specific	3400-3600 MHz		61.29	2.58
43		Country Specific	3600-3800 MHz		81.13	2.50
46/n46		Country Specific	5150-5925 MHz		38.75	4.79
48/n48		Country Specific	3550-3700 MHz		76.95	2.53
65/n65		Country Specific	1920-2010 MHz	2110-2200 MHz	61.21 / 19.18	4.01 / 5.10
66/n66	B66	Country Specific	1710-1780 MHz	2110-2200 MHz	54.25 / 19.18	3.15 / 5.10
71/n71	B71	Country Specific	663-698 MHz	617-652 MHz	21.62 / 22.86	11.21 / 7.47

Table data for bands as detailed in 3GPP TS 36.101 & 38.101

● Usable Band

○ Adequate in good signal area

✘ Not Usable



5G Extended Table for Band Coverage

LTE/5G Band	NB-IoT Band	Uplink	Downlink	Avg Efficiency % over band	Max VSWR over Band
n24		1626.5 – 1660.5 MHz	1525 – 1559 MHz	68.40 / 77.21	● 2.12 / 2.92
n34		2010 – 2025 MHz		67.83	● 3.91
n47		5855 – 5925 MHz		29.46	● 2.95
n50		1432 – 1517 MHz		63.60	● 5.10
n51		1427 – 1432 MHz		50.21	● 5.31
n53		2483.5 – 2495 MHz		37.47	● 4.95
n67		738 – 758 MHz		24.99	✘ 10.82
n70	B70	1695 – 1710 MHz	1995 – 2020 MHz	57.14 / 62.93	● 1.94 / 4.01
n74		1427 – 1470 MHz	1475 – 1518 MHz	58.18 / 70.29	● 5.31 / 3.69
n75		1432 – 1517 MHz		63.60	● 5.10
n76		1427 – 1432 MHz		50.21	● 5.31
n77		3300 – 4200 MHz		69.66	● 2.58
n78		3300 – 3800 MHz		68.12	● 2.58
n79		4400 – 5000 MHz		25.50	⊖ 5.71
n80		1710 – 1785 MHz		53.69	● 3.20
n81		880 – 915 MHz		39.16	● 4.07
n82		832 – 862 MHz		29.51	✘ 7.79
n83		703 – 748 MHz		24.58	✘ 11.22
n84		1920 – 1980 MHz		59.13	● 3.99
n85	B85	698 – 716 MHz	728 – 746 MHz	23.55 / 24.99	✘ 11.22 / 10.8
n86		1710 – 1780 MHz		54.25	● 3.15
n89		824 – 849 MHz		25.58	✘ 8.26
n90		2496 – 2690 MHz		65.94	● 4.64
n91		832 – 862 MHz	1427 – 1432 MHz	29.51 / 50.21	✘ 7.79 / 5.31
n92		832 – 862 MHz	1432 – 1517 MHz	29.51 / 63.60	✘ 7.79 / 5.10
n93		880 – 915 MHz	1427 – 1432 MHz	39.16 / 50.21	● 4.07 / 5.31
n94		880 – 915 MHz	1432 – 1517 MHz	39.16 / 63.60	● 4.07 / 5.10
n95		2010 – 2025 MHz		67.83	● 3.91
n96		5925 – 7125 MHz		unmeasured	
n97		2300 – 2400 MHz		10.62	✘ 7.71
n98		1880 – 1920 MHz		58.18	● 3.60
n99		1626.5 – 1660.5 MHz		68.40	● 2.12

Table data for bands as detailed in 3GPP TS 38.101

● Usable Band ⊖ Adequate in good signal area ✘ Not Usable

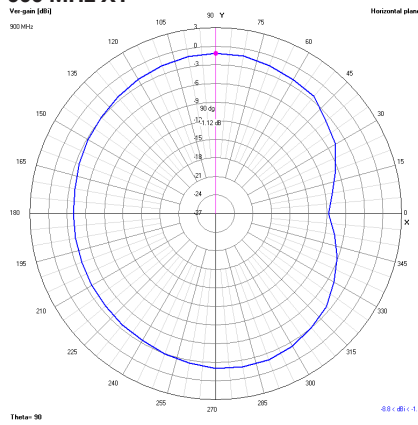


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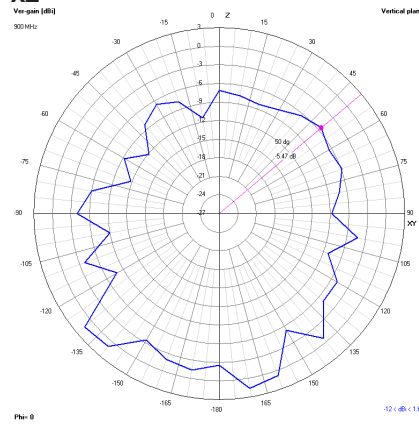
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Radiation Plots tested with 100mm cable

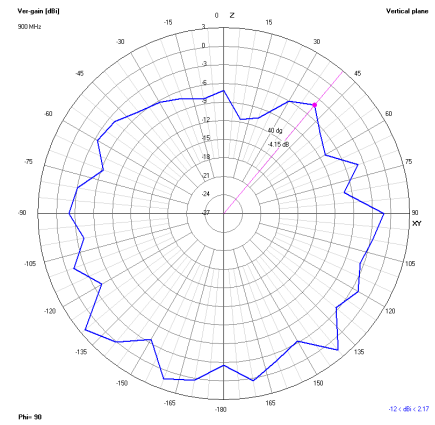
900 MHz XY



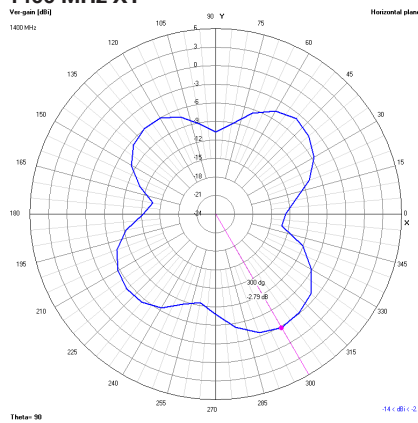
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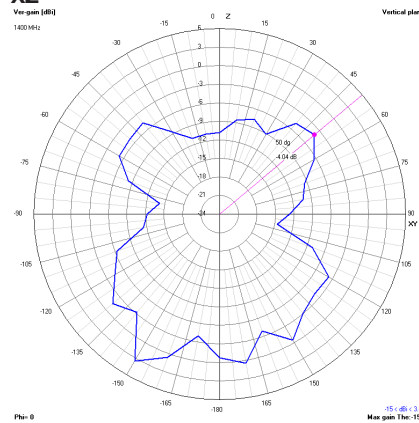
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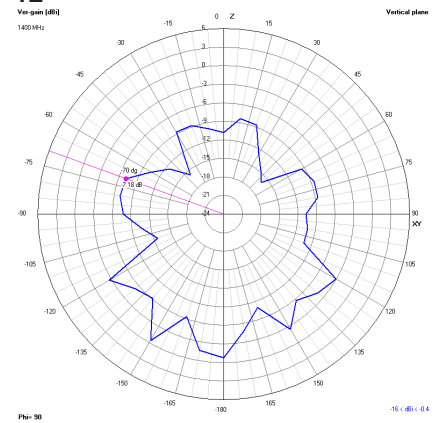
1400 MHz XY



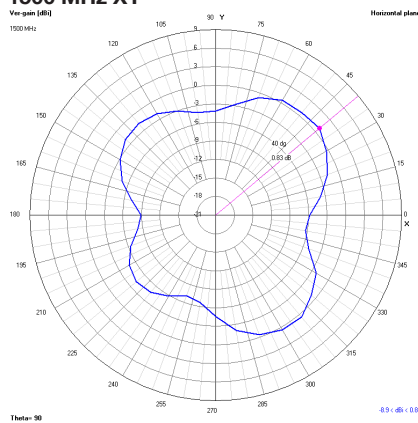
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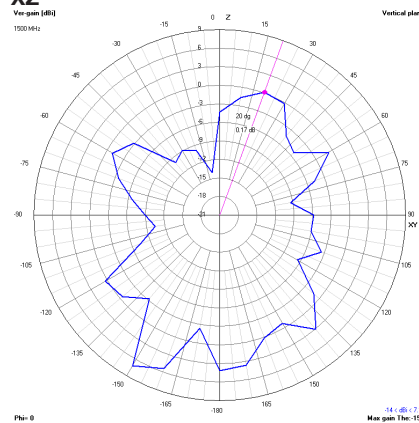
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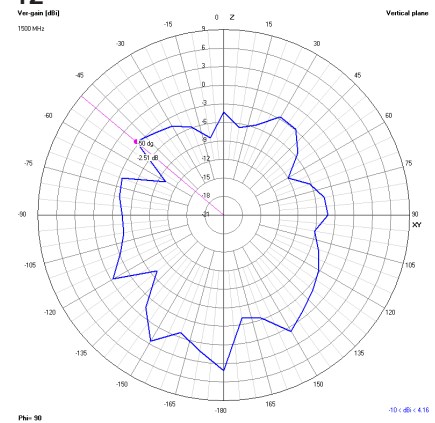
1500 MHz XY



XZ



YZ



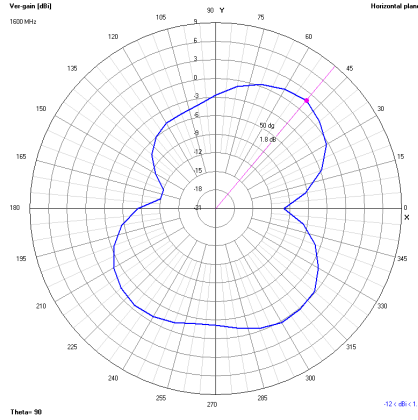


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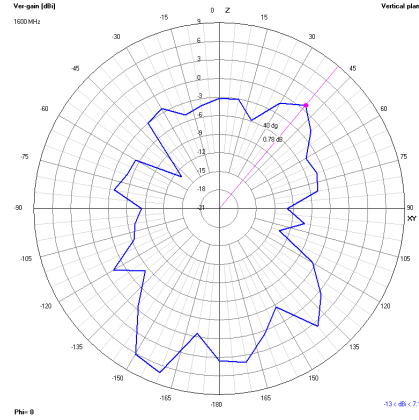
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Radiation Plots tested with 100mm cable

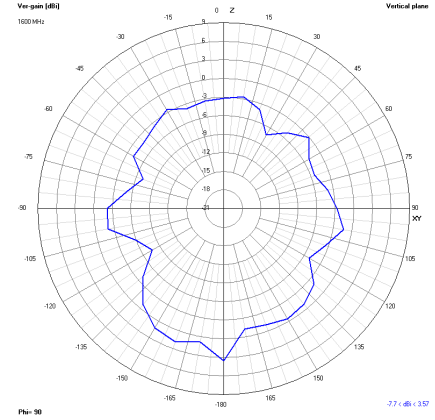
1600 MHz XY



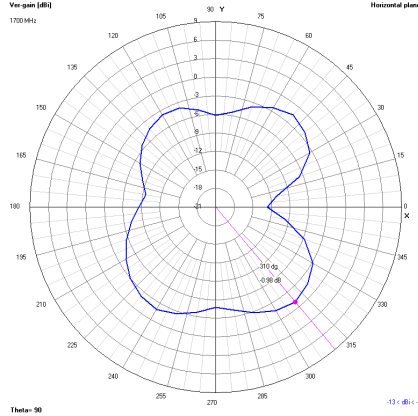
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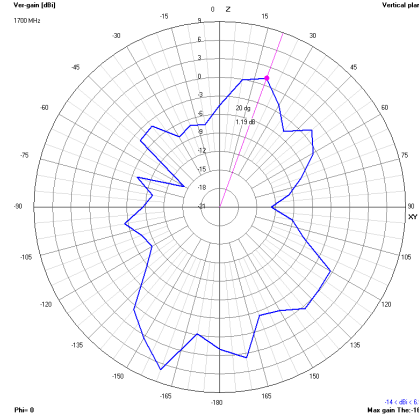
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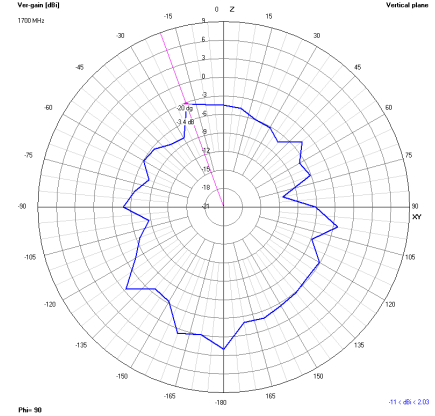
1700 MHz XY



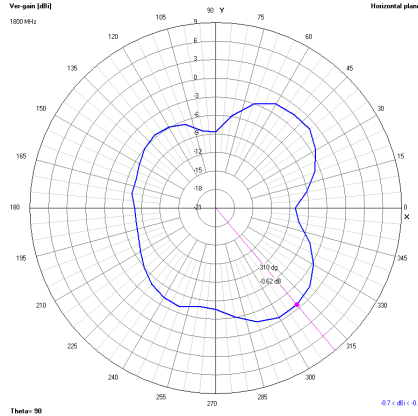
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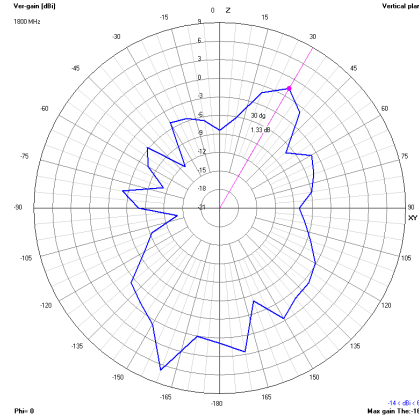
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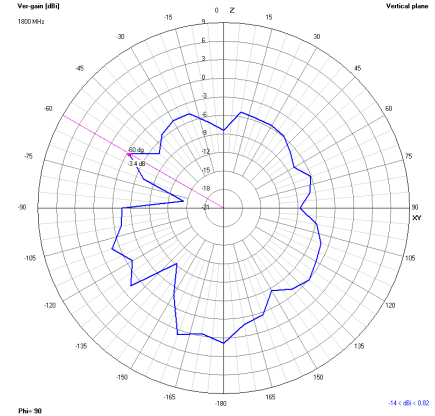
1800 MHz XY



XZ



YZ



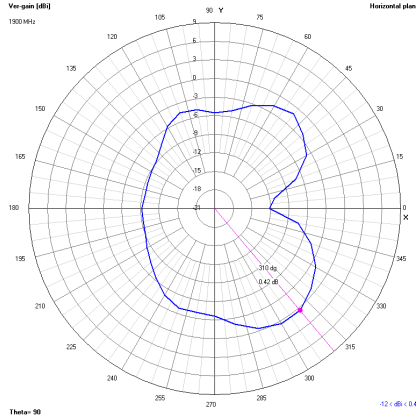


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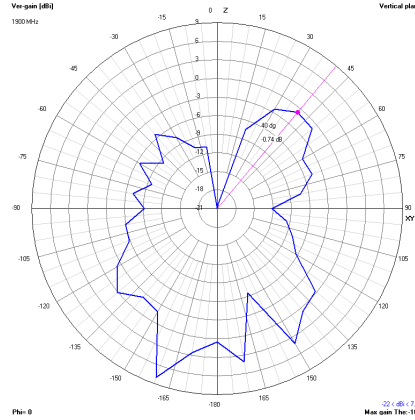
2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA

Radiation Plots tested with 100mm cable

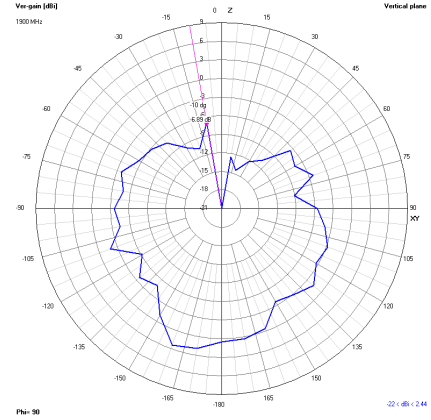
1900 MHz XY



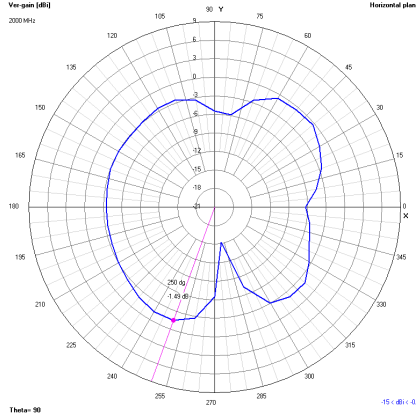
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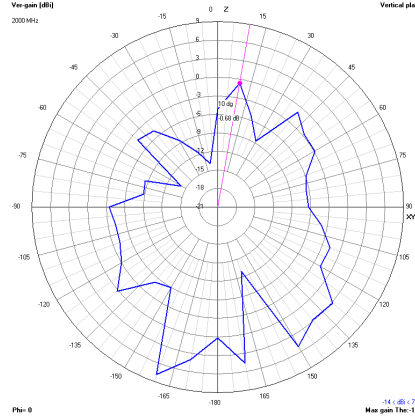
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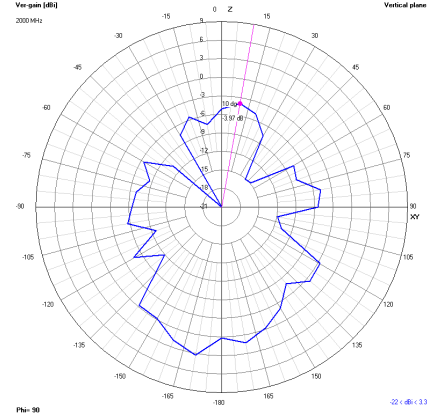
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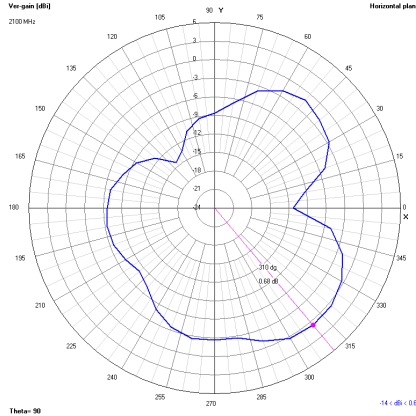
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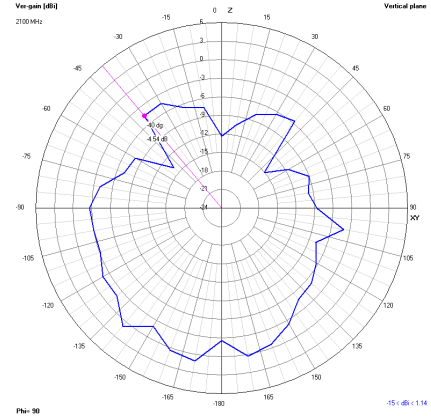
2100 MHz XY



XZ



YZ



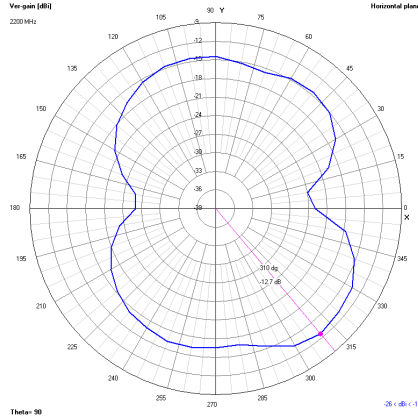


ECHO 1A

2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA

Radiation Plots tested with 100mm cable

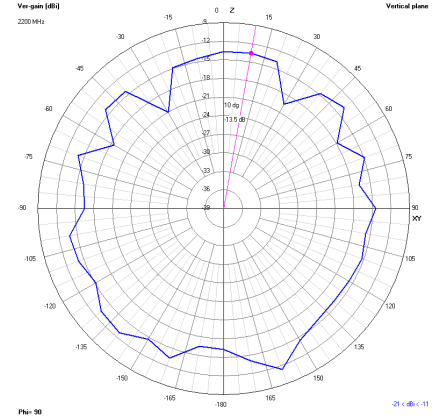
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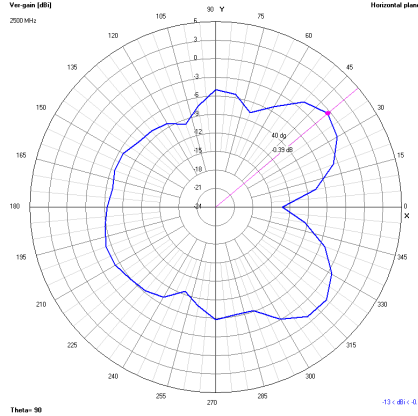
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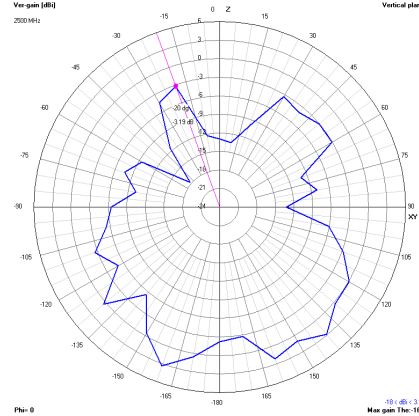
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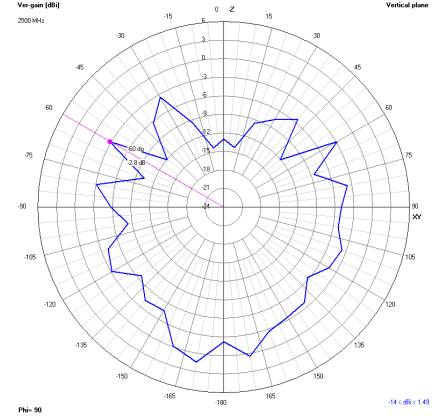
2500 MHz XY



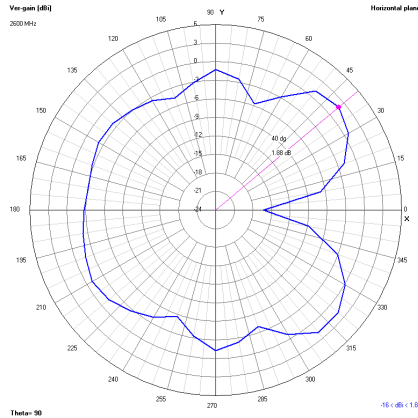
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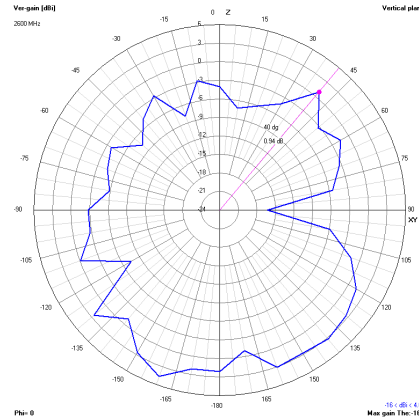
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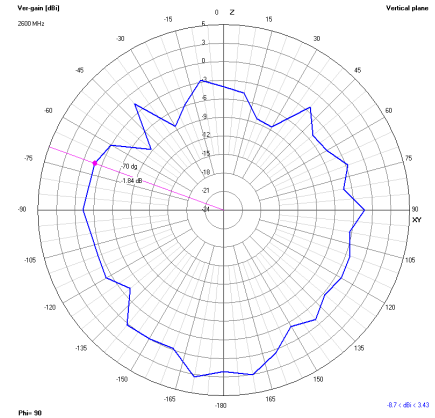
2600 MHz XY



XZ



YZ



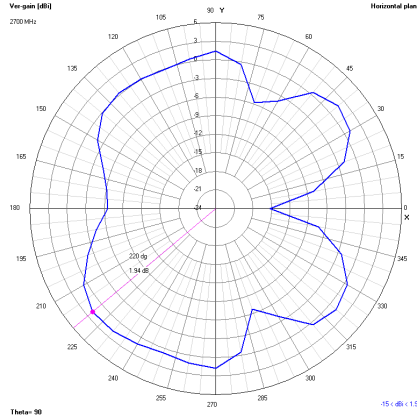


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Radiation Plots tested with 100mm cable

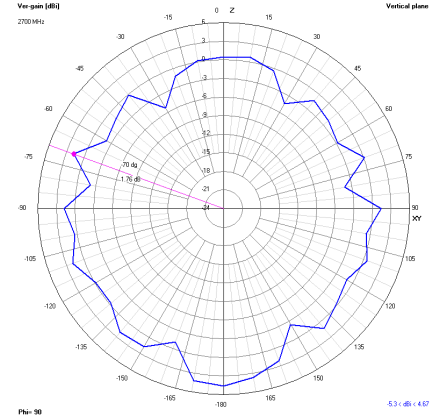
2700 MHz XY



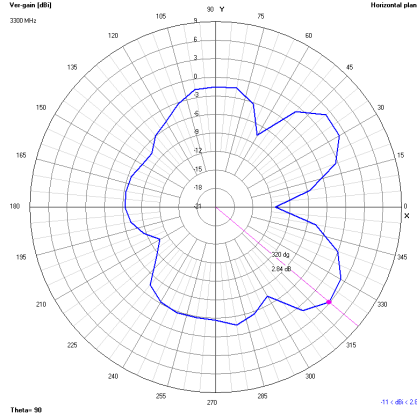
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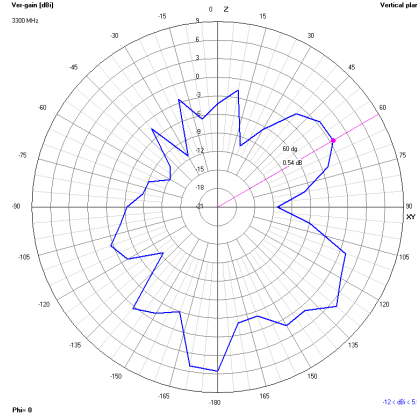
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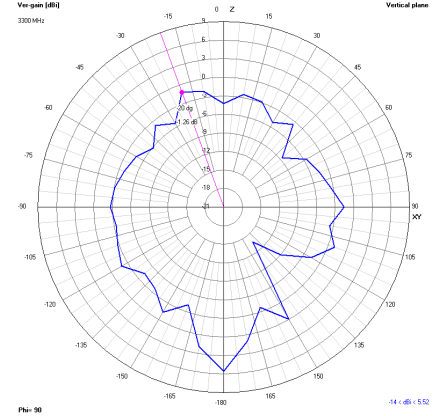
3300 MHz XY



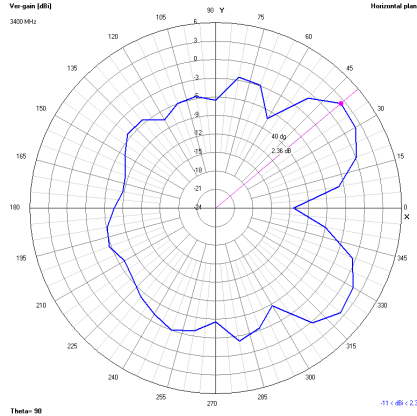
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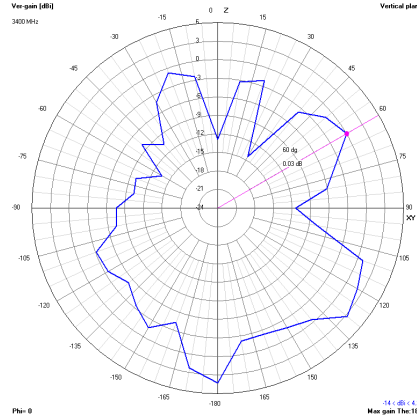
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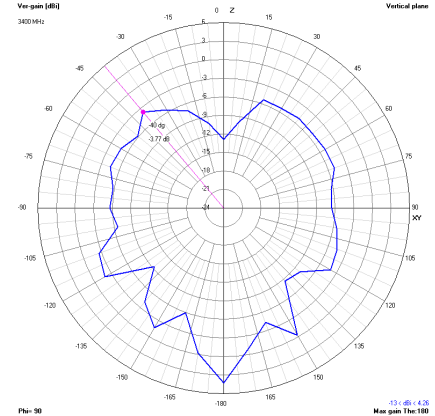
3400 MHz XY



XZ



YZ



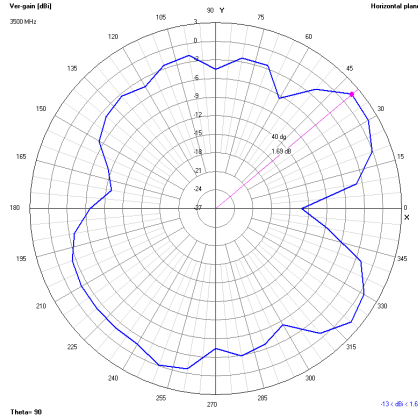


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Radiation Plots tested with 100mm cable

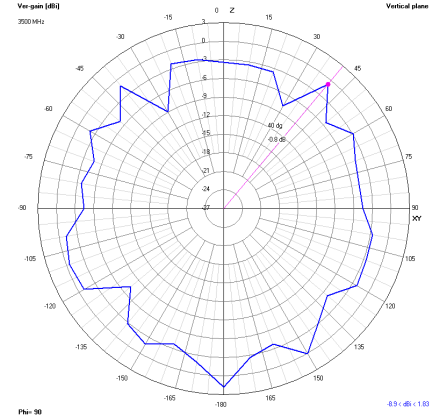
3500 MHz XY



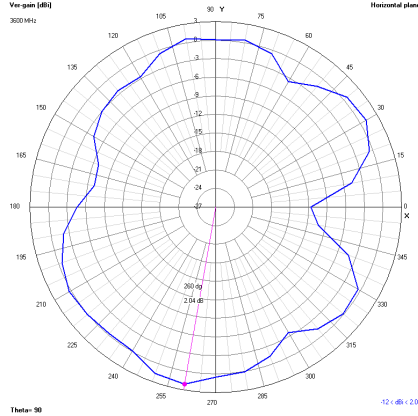
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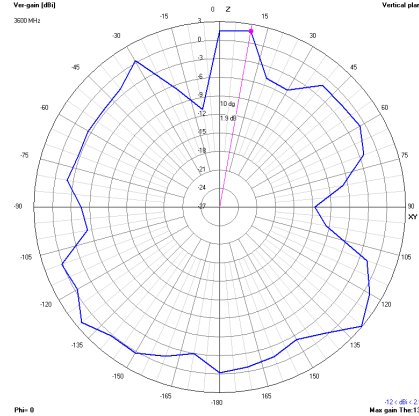
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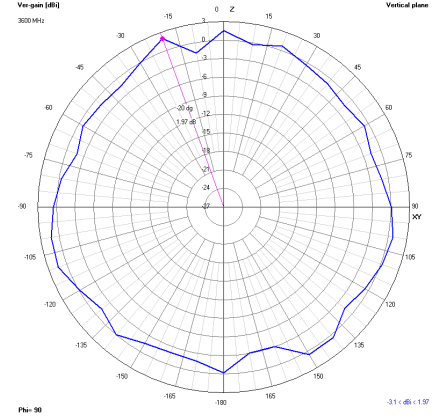
3600 MHz XY



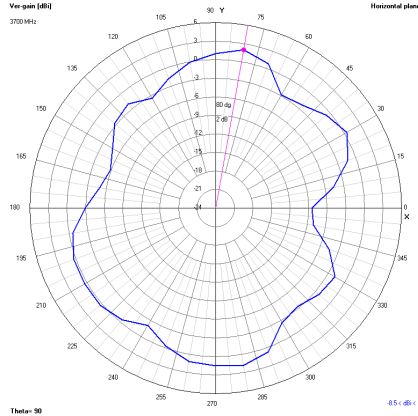
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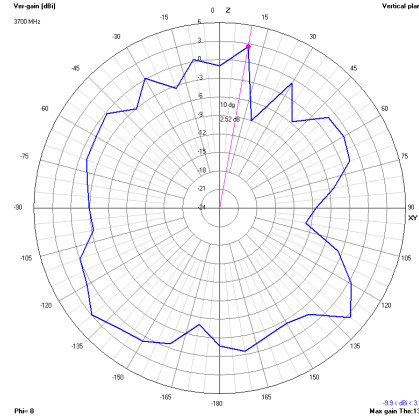
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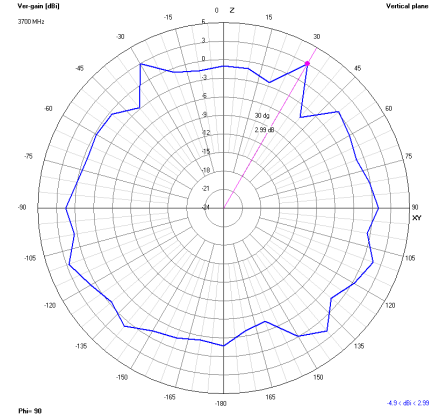
3700 MHz XY



XZ



YZ



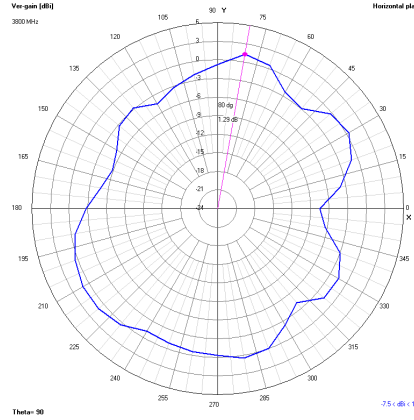


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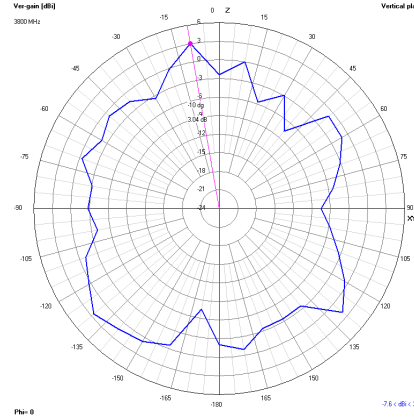
2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA

Radiation Plots tested with 100mm cable

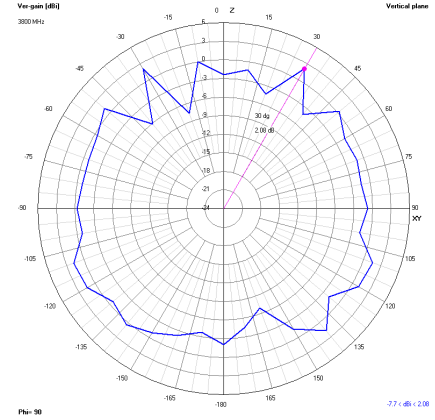
3800 MHz XY



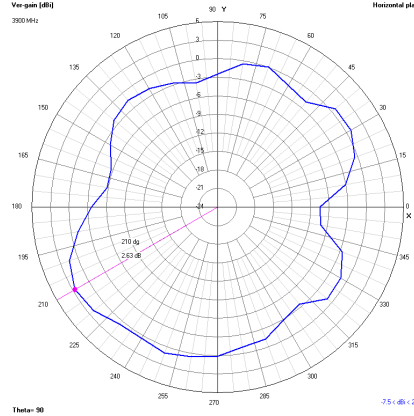
XZ



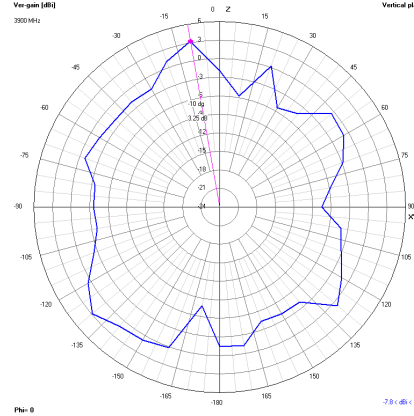
YZ



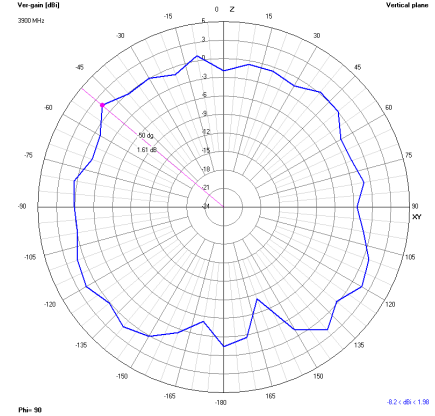
3900 MHz XY



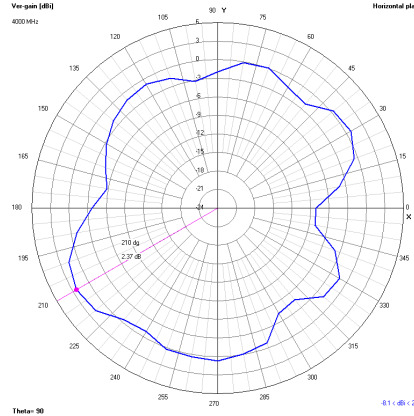
XZ



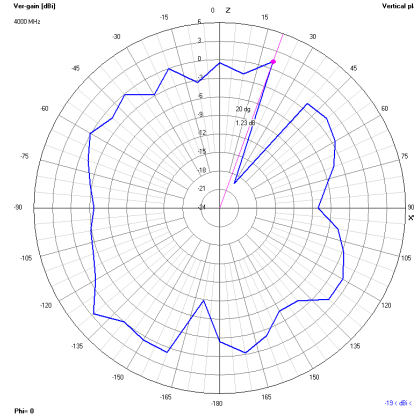
YZ



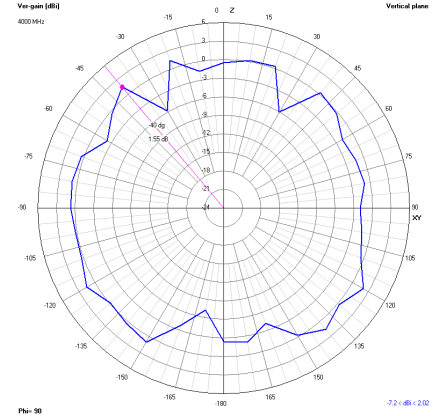
4000 MHz XY



XZ



YZ



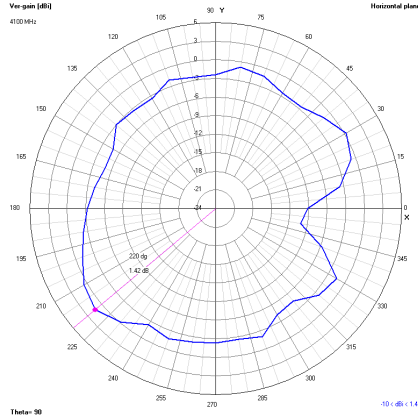


ECHO 1A

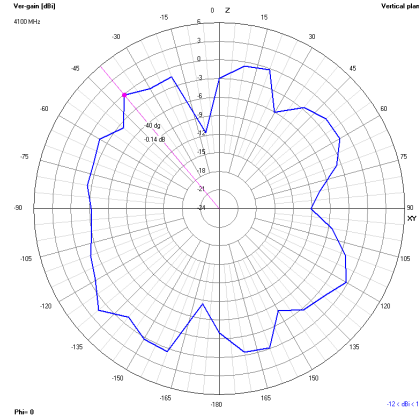
2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA

Radiation Plots tested with 100mm cable

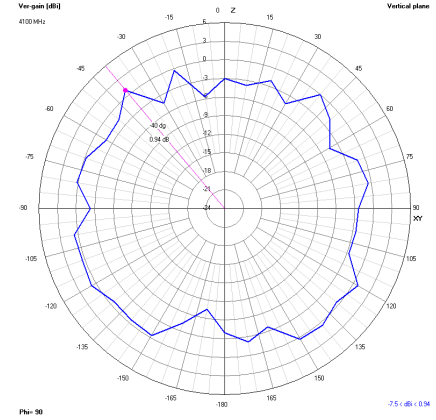
4100 MHz XY



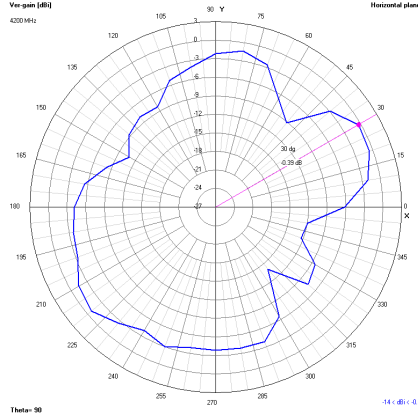
XZ



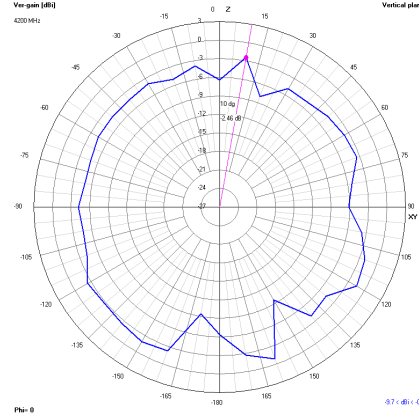
YZ



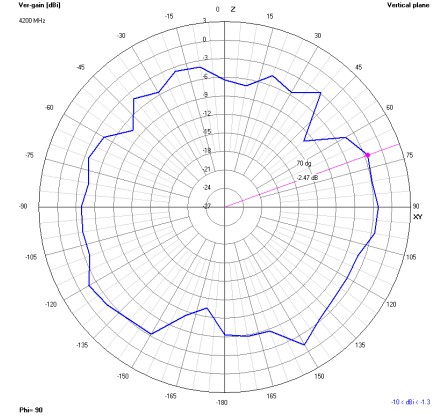
4200 MHz XY



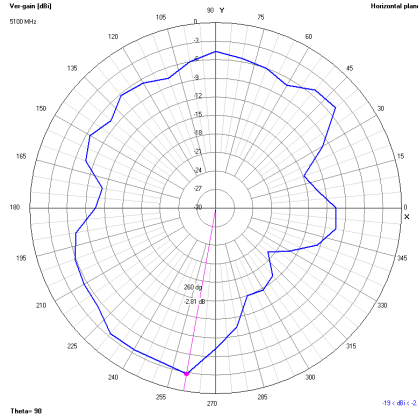
XZ



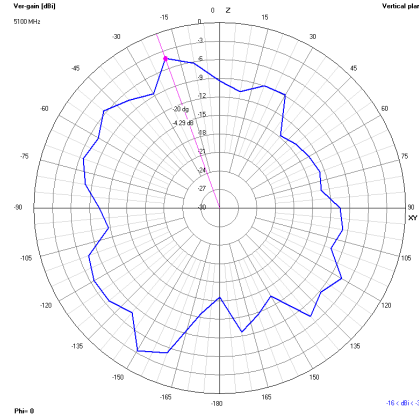
YZ



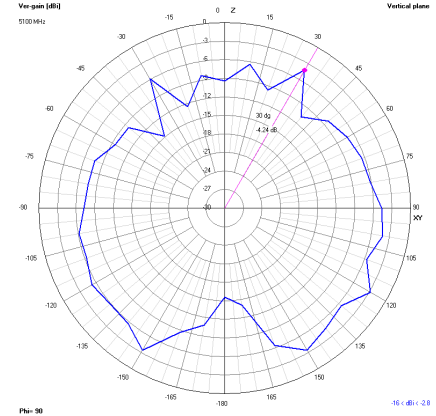
5100 MHz XY



XZ



YZ



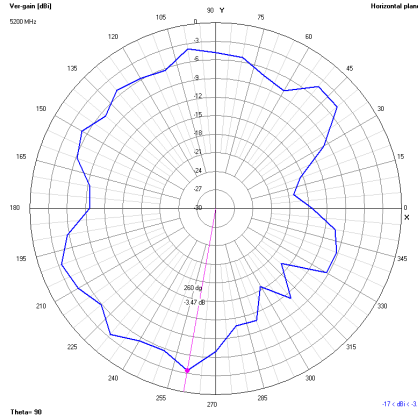


ECHO 1A

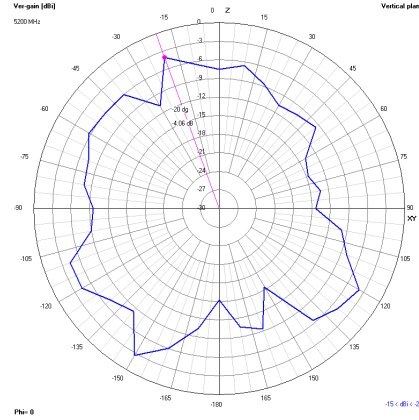
2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA

Radiation Plots tested with 100mm cable

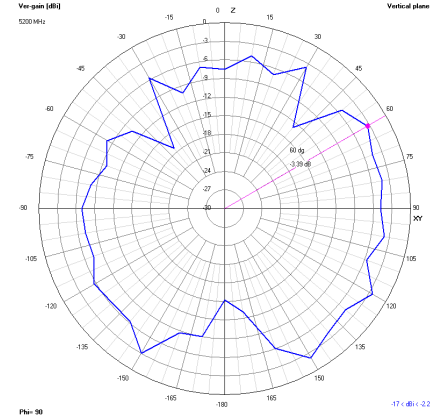
5200 MHz XY



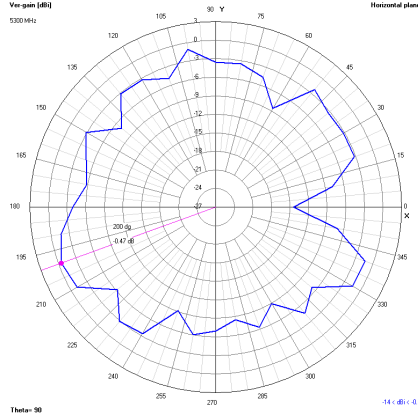
XZ



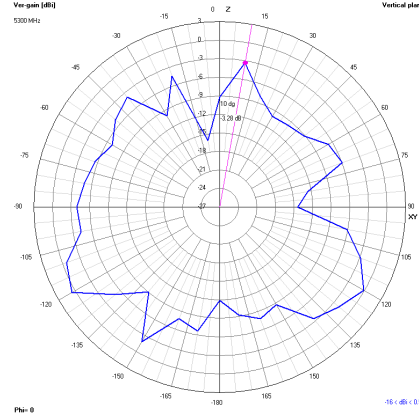
YZ



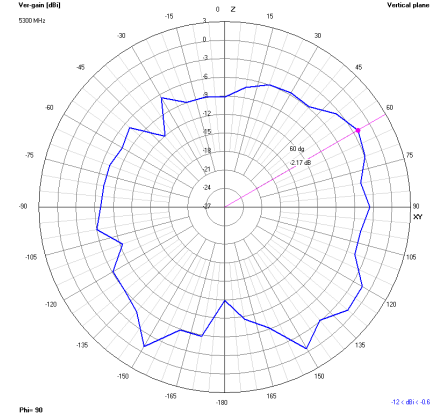
5300 MHz XY



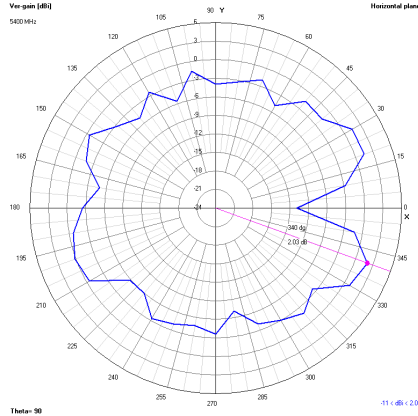
XZ



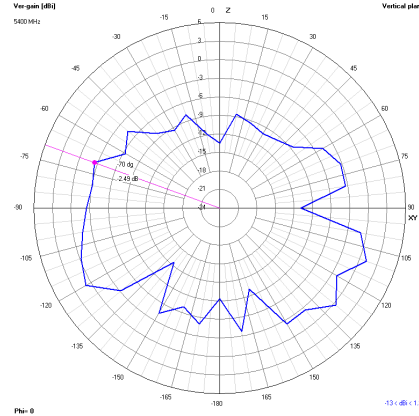
YZ



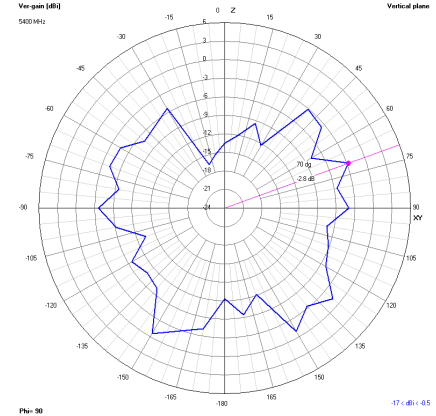
5400 MHz XY



XZ



YZ



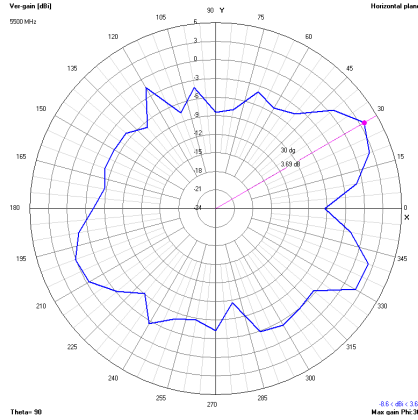


ECHO 1A

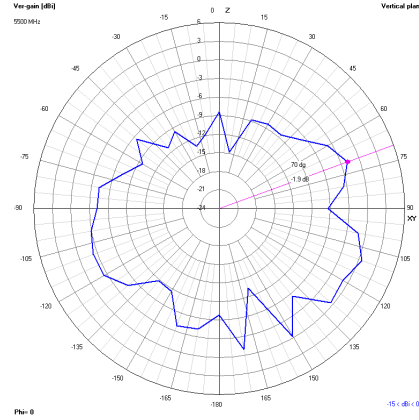
2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA

Radiation Plots tested with 100mm cable

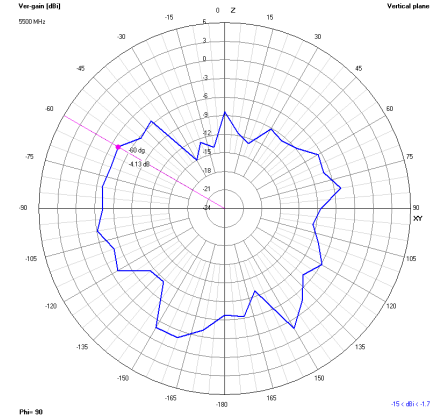
5500 MHz XY



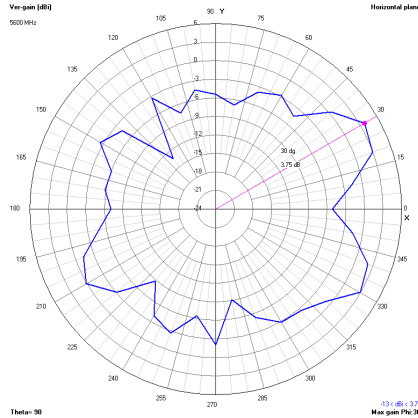
XZ



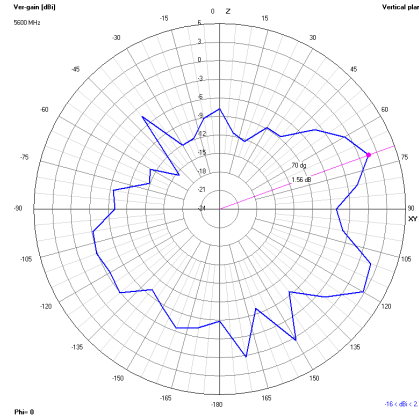
YZ



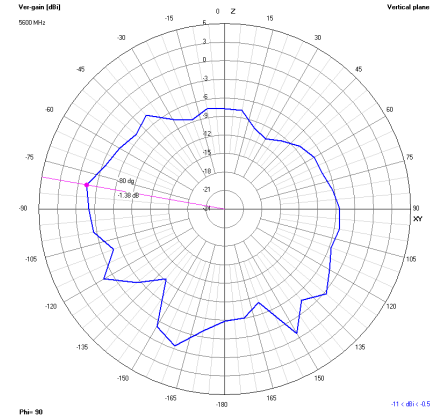
5600 MHz XY



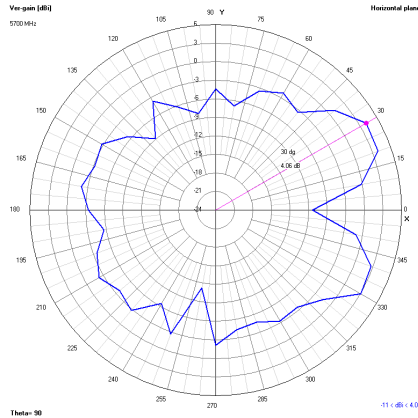
XZ



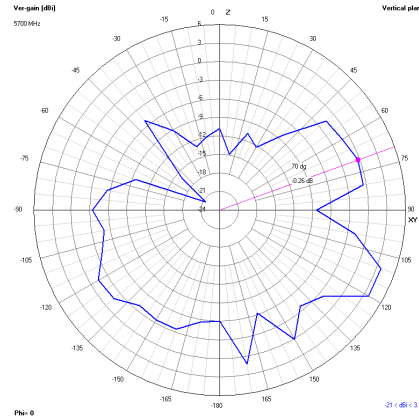
YZ



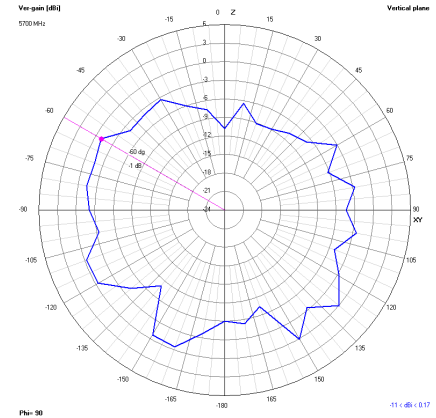
5700 MHz XY



XZ



YZ



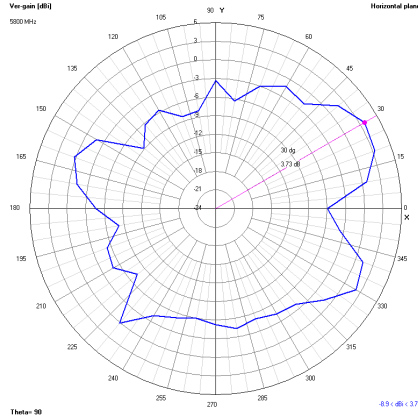


ECHO 1A

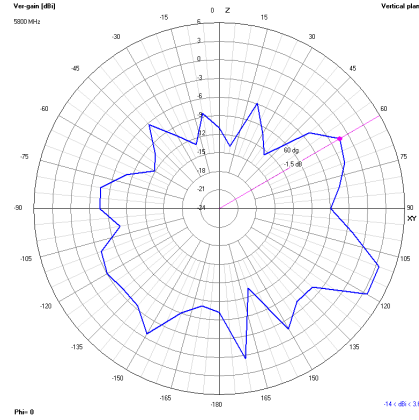
2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA

Radiation Plots tested with 100mm cable

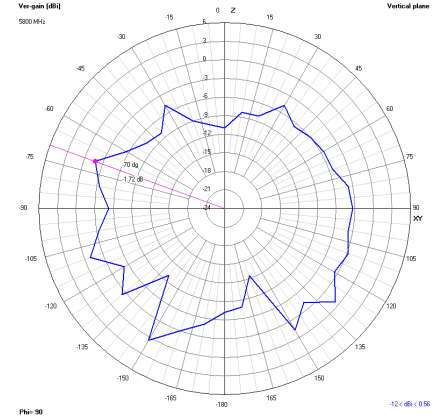
5800 MHz XY



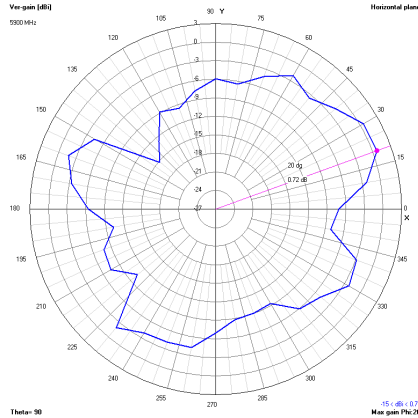
XZ



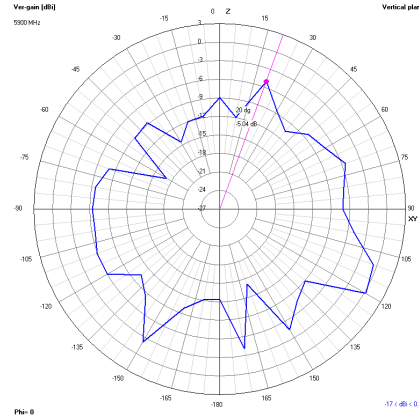
YZ



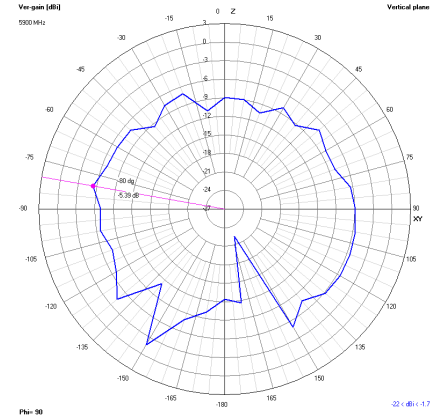
5900 MHz XY



XZ



YZ



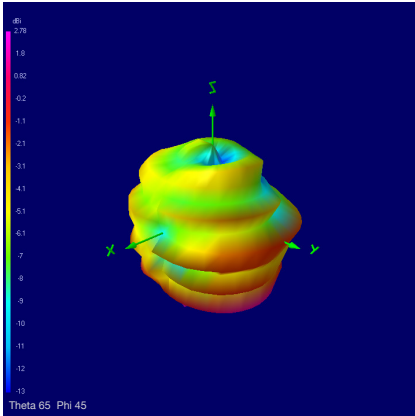


ECHO 1A

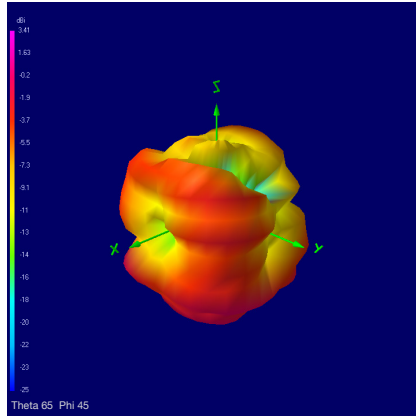
2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA

3D Radiation Plots tested with 100mm cable

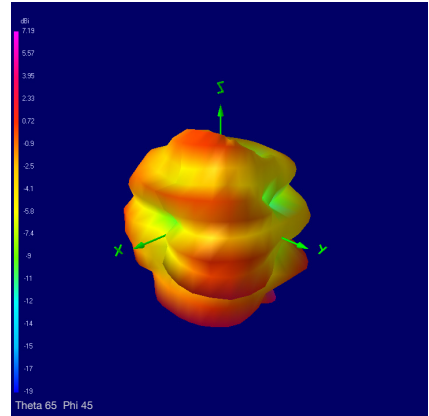
900 MHz



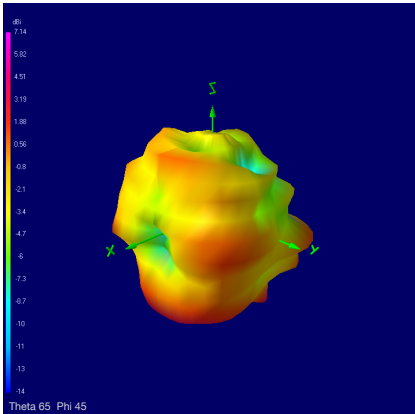
1400 MHz



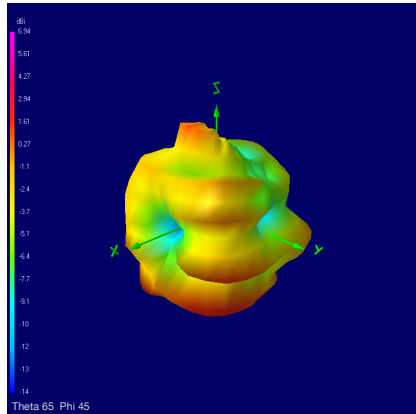
1500 MHz



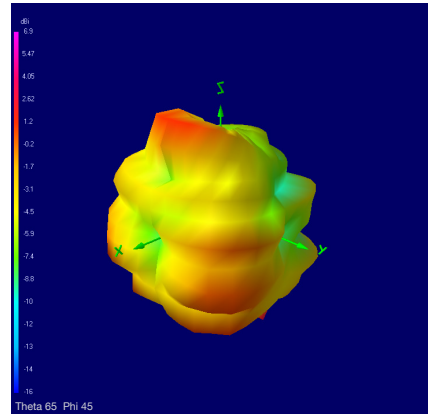
1600 MHz



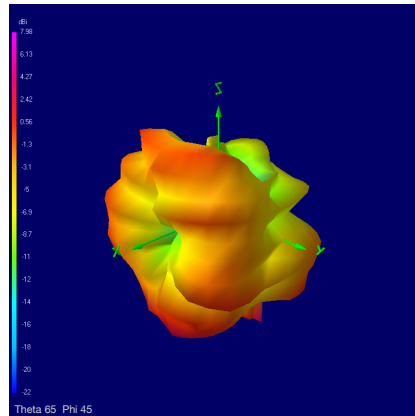
1700 MHz



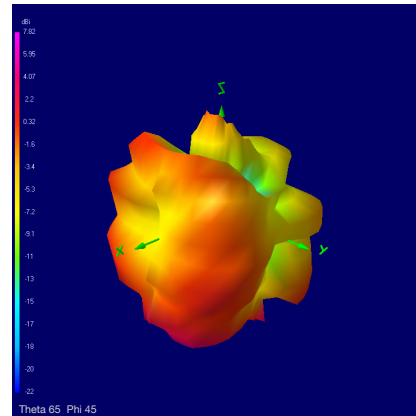
1800 MHz



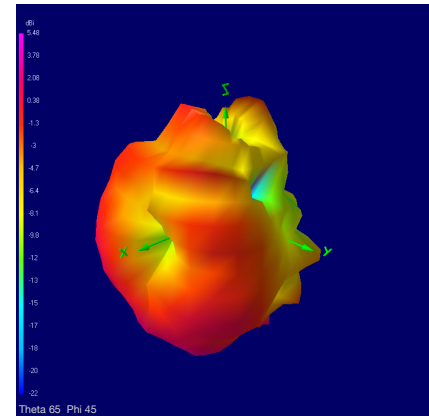
1900 MHz



2000 MHz



2100 MHz



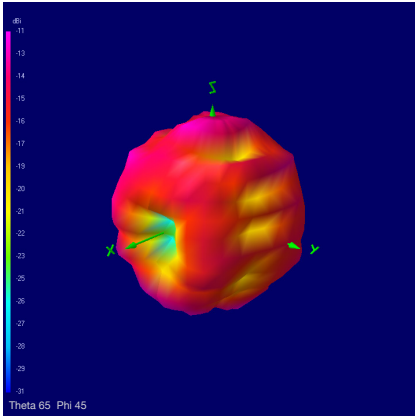


ECHO 1A

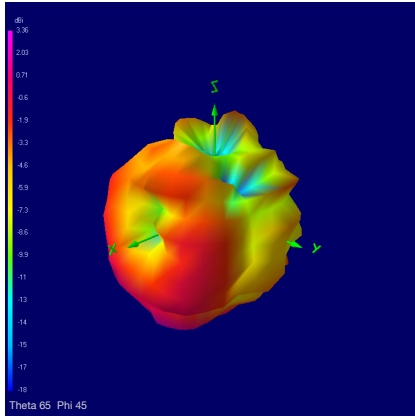
2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA

3D Radiation Plots tested with 100mm cable

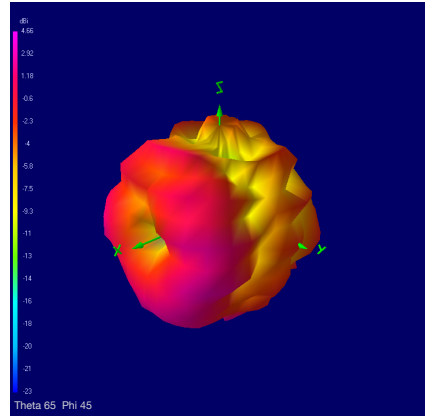
2200 MHz



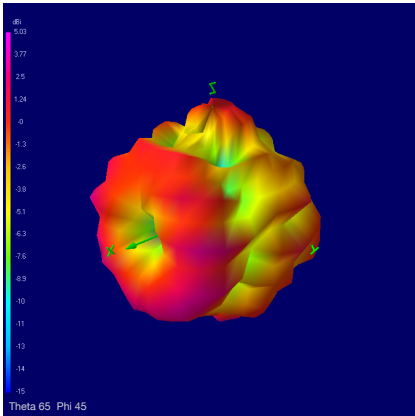
2500 MHz



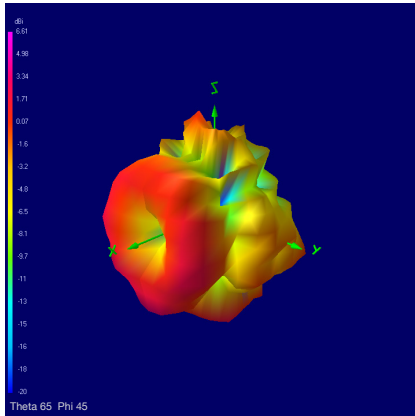
2600 MHz



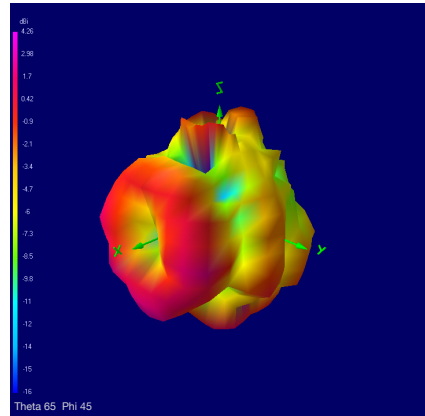
2700 MHz



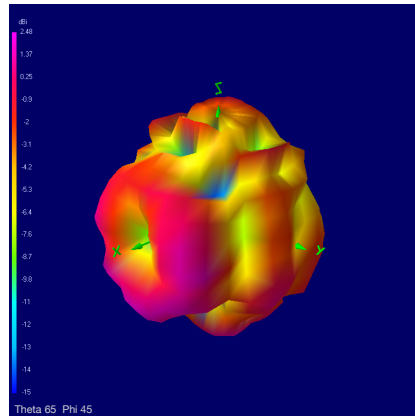
3300 MHz



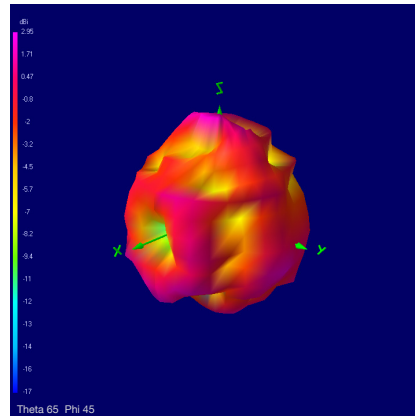
3400 MHz



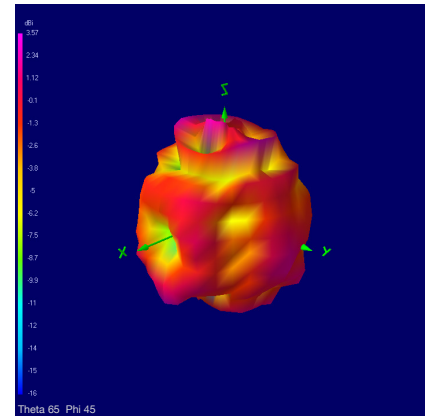
3500 MHz



3600 MHz



3700 MHz



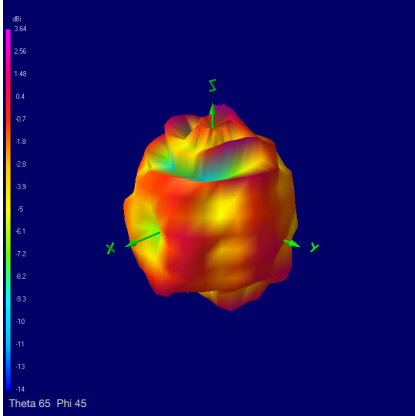


ECHO 1A

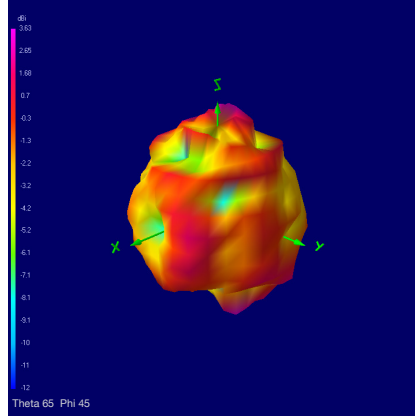
2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA

3D Radiation Plots tested with 100mm cable

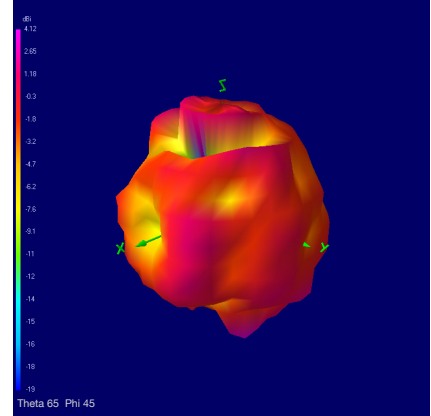
3800 MHz



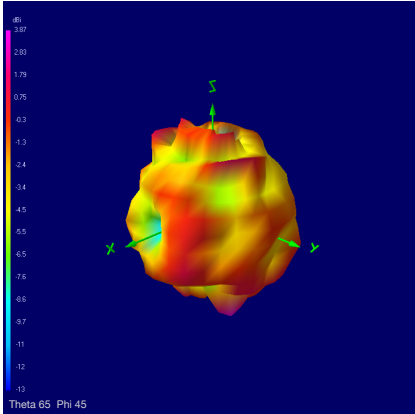
3900 MHz



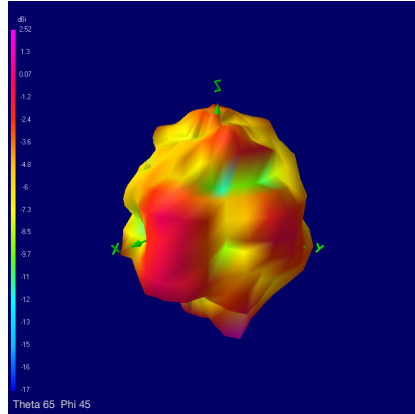
4000 MHz



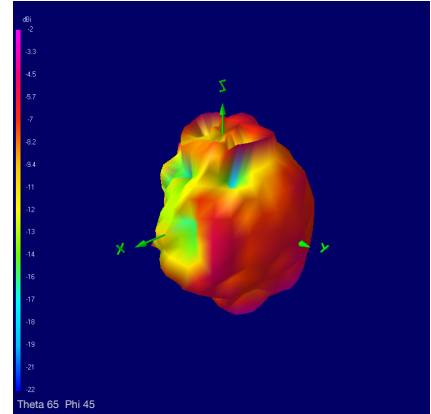
4100 MHz



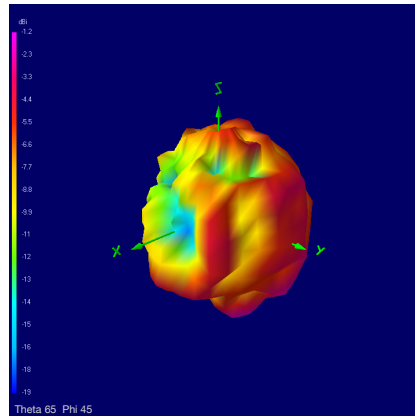
4200 MHz



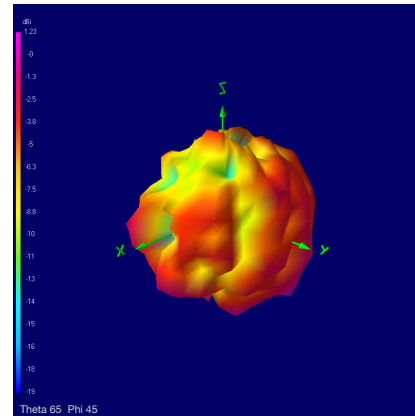
5100 MHz



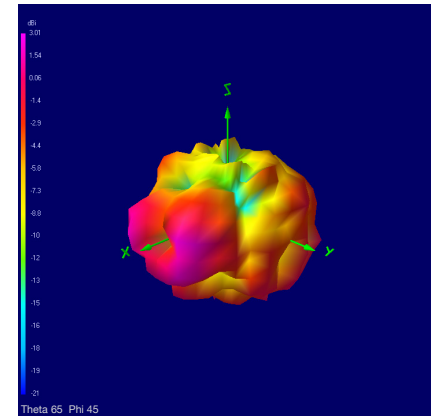
5200 MHz



5300 MHz



5400 MHz



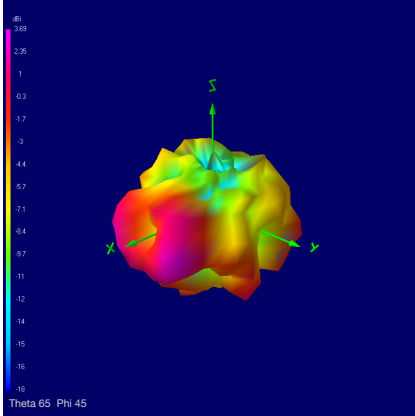


ECHO 1A

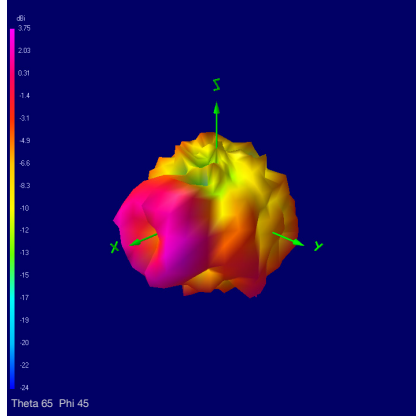
2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA

3D Radiation Plots tested with 100mm cable

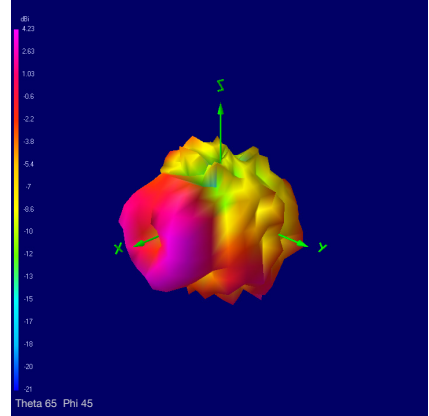
5500 MHz



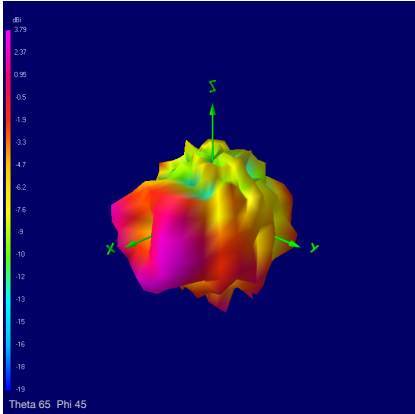
5600 MHz



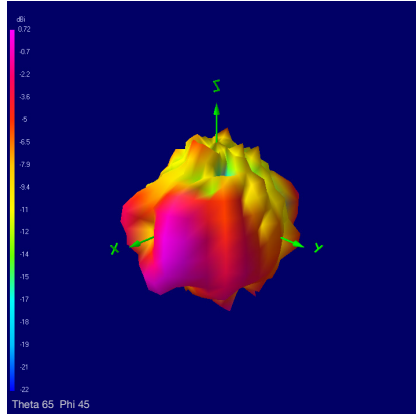
5700 MHz



5800 MHz



5900 MHz



Ordering Details

Part Number	Description
ECHO1A/0.1M/IPEX/S/S/11	2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA IPEX CONNECTOR 100MM x 0.81mm CABLE
ECHO1A/0.2M/IPEX/S/S/11	2G/3G/4G/(5G) COMPACT PCB EMBEDDED ANTENNA IPEX CONNECTOR 200MM x 0.81mm CABLE

Registered in England No. 08405712
VAT Registration No. GB163 04 0349



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