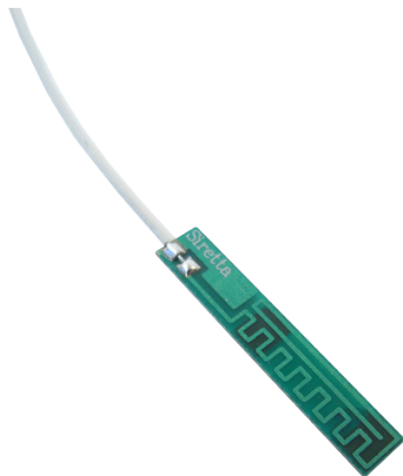




## Echo 1A

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

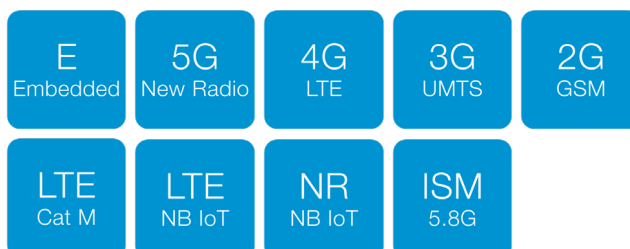
The Echo 1A is an efficiently tuned PCB antenna that is suited to a wide variety of RF & IoT modules operating on ISM 5.8 GHz, 2G/3G/4G and some 5G frequency bands.

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





## Echo 1A

5G/4G Compact PCB Embedded Antenna

### Electrical Specifications

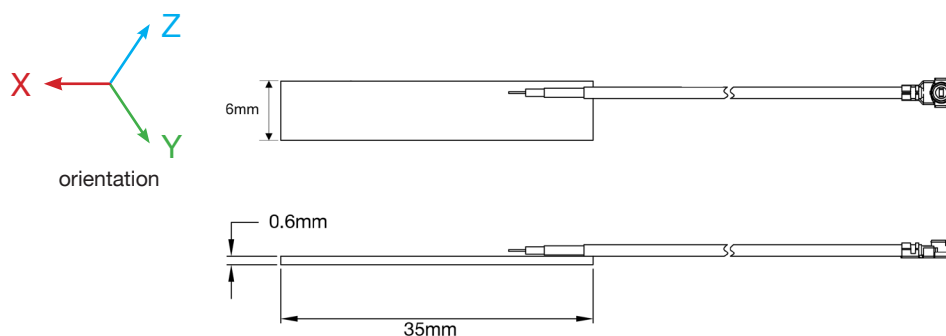
|                           |        |
|---------------------------|--------|
| Impedance:                | 50 Ohm |
| Polarization:             | Linear |
| Max Input Power:          | 3 W    |
| Ground plane independent: | Yes    |

### 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                             |

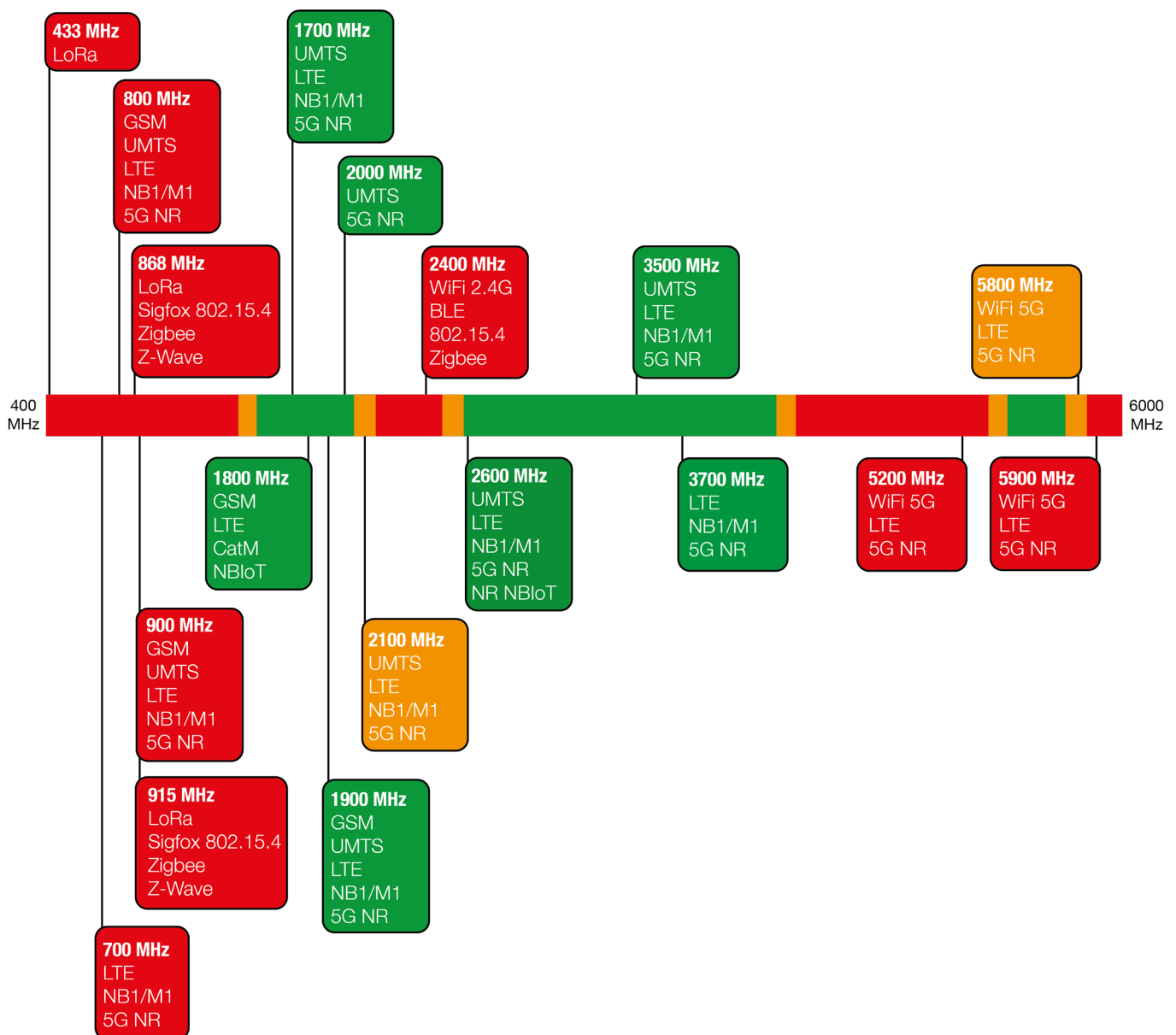




## Echo 1A

5G/4G Compact PCB Embedded Antenna

### Spectrum Coverage



● Suitable band

● Adequate band in good signal conditions

● Likely to be unsuitable



## Echo 1A

5G/4G Compact PCB Embedded Antenna

### 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)

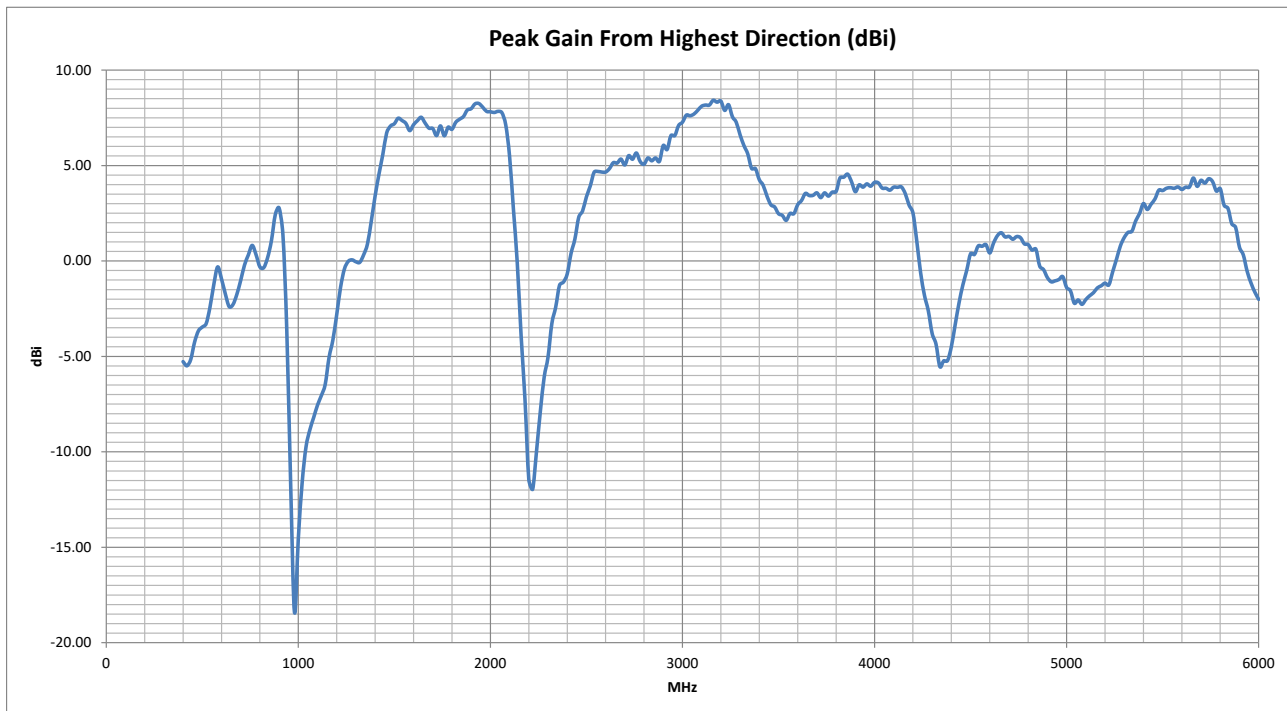
|                   | 2000 | 2100 | 2300 | 2400 | 2500 | 2600 | 3300 | 3500 | 3700 | 4700 | 5200 | 5900 |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| GSM Bands:        |      |      |      |      |      |      |      |      |      |      |      |      |
| UMTS Bands:       |      |      |      |      |      | ●    |      | ●    |      |      |      |      |
| LTE Bands:        | ●    |      |      |      | ●    | ●    | ●    | ●    | ●    |      |      |      |
| LTE Cat M Bands:  |      |      |      |      | ●    | ●    |      | ●    | ●    |      |      |      |
| LTE Cat NB Bands: |      |      |      |      | ●    | ●    |      | ●    | ●    |      |      |      |
| 5G NR Bands:      | ●    | ●    |      |      | ●    | ●    |      | ●    | ●    |      |      |      |
| NR Cat NB Bands:  |      |      |      |      | ●    | ●    |      |      |      |      |      |      |



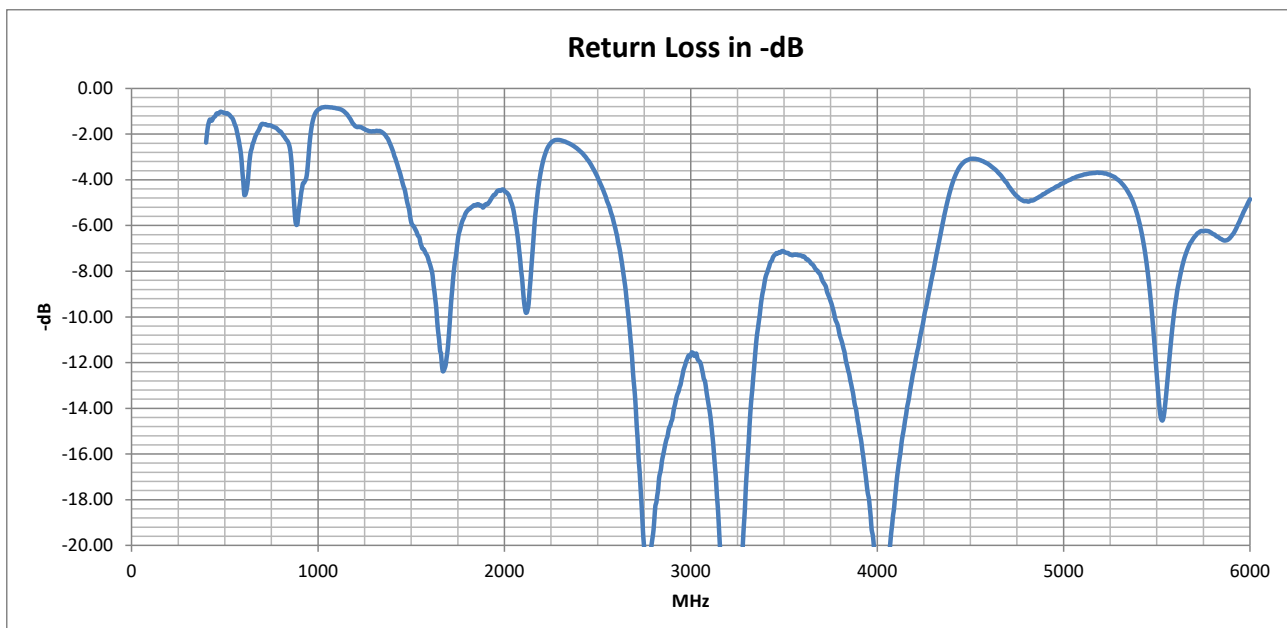
## Echo 1A

5G/4G Compact PCB Embedded Antenna

### Peak Gain vs. Frequency



### Return Loss

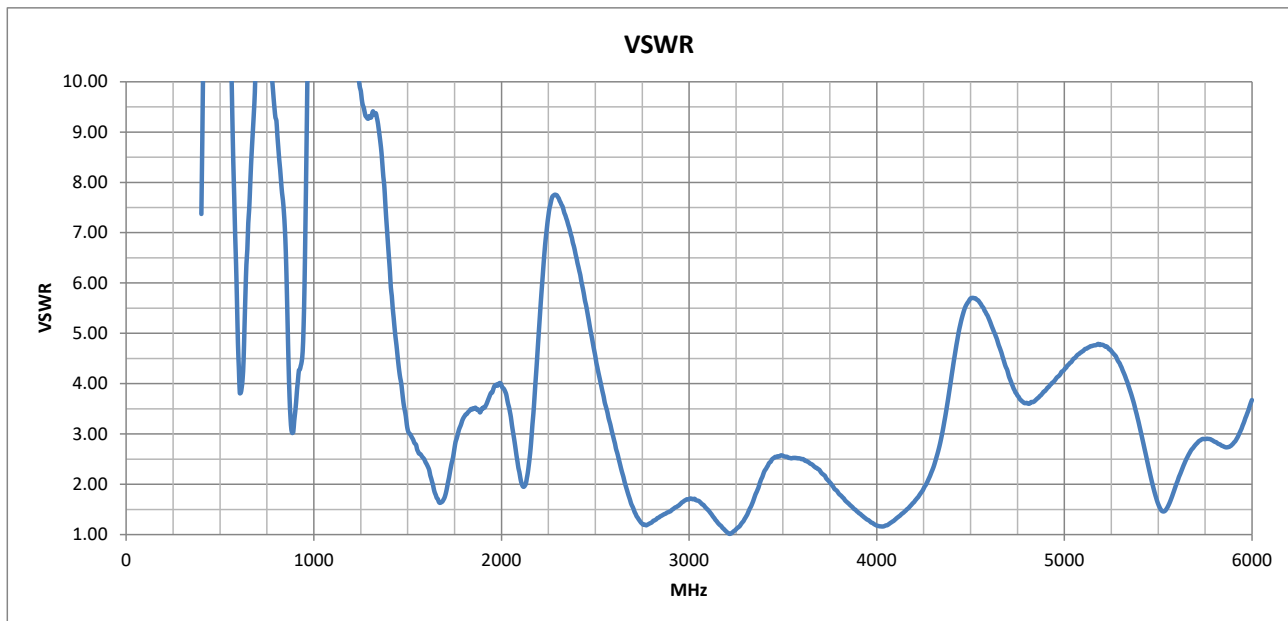




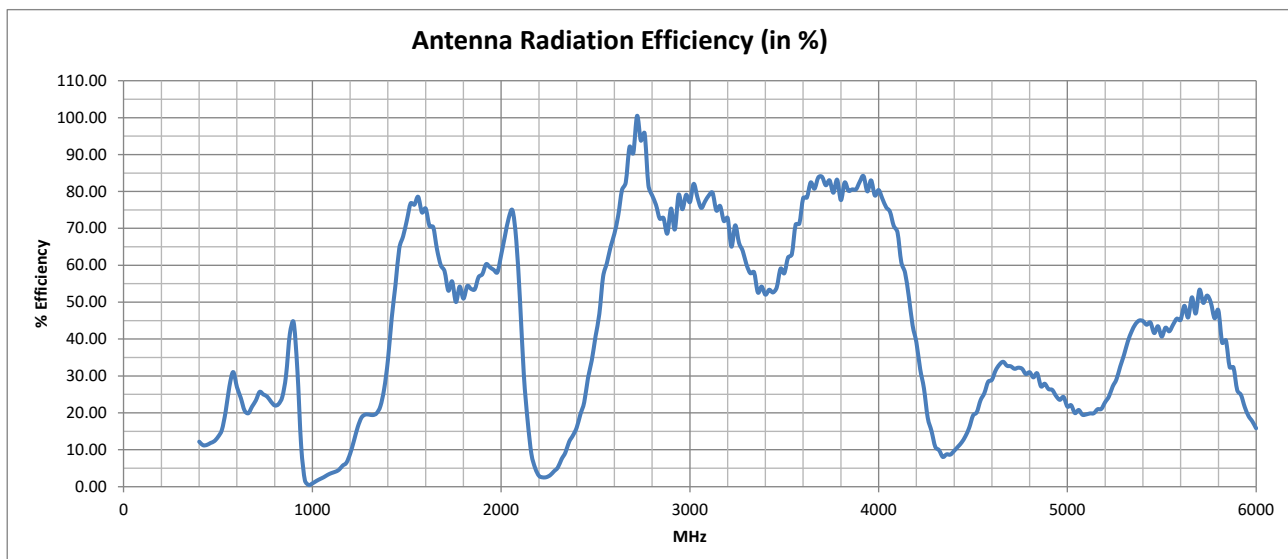
## Echo 1A

5G/4G Compact PCB Embedded Antenna

### VSWR



### Radiation Efficiency





## Echo 1A

5G/4G Compact PCB Embedded Antenna

### 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



## Echo 1A

5G/4G Compact PCB Embedded Antenna

### 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 |
|---------------|----------------|------------------|-------------------|--------------------|--------------|---------------------|-------------------|-------------------|-------------------------------|---------------------------------|---------------------|-----------------------|---------------|
|               |                | 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                  | ●             |

● Suitable band

● Adequate band in good signal conditions

● Likely to be unsuitable



## Echo 1A

5G/4G Compact PCB Embedded Antenna

### 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 |
|---------------|----------------|------------------|-------------------|--------------------|--------------|---------------------|-------------------|-------------------|-------------------------------|---------------------------------|---------------------|-----------------------|---------------|
|               |                | 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                 | ●             |

● Suitable band

● Adequate band in good signal conditions

● Likely to be unsuitable



## Echo 1A

5G/4G Compact PCB Embedded Antenna

### 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             | 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                 | ●             |

● 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.



## Echo 1A

5G/4G Compact PCB Embedded Antenna

### 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                                   | ●             |

● 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.

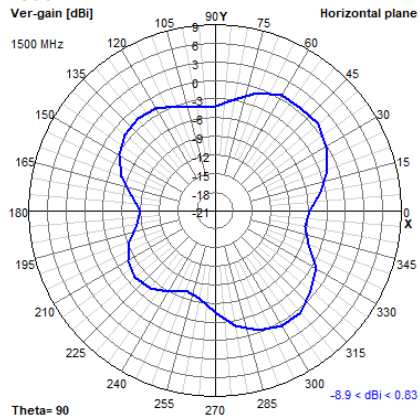


## Echo 1A

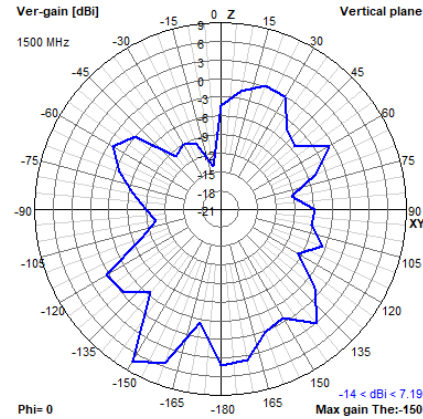
5G/4G Compact PCB Embedded Antenna

### 2D Radiation Plots

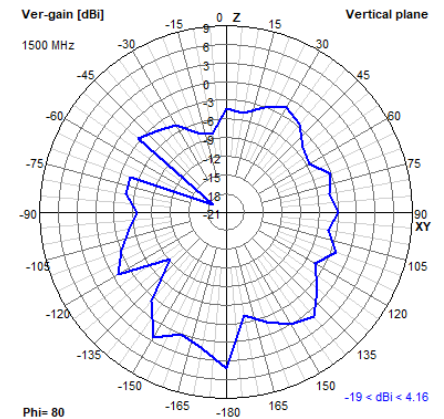
#### 1500 MHz XY



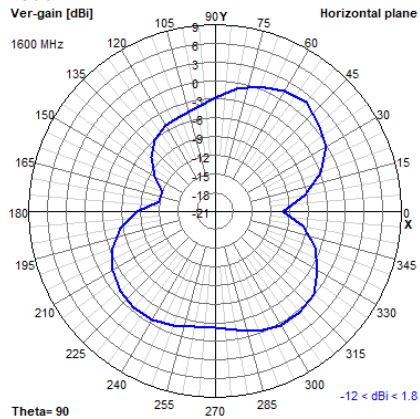
#### XZ



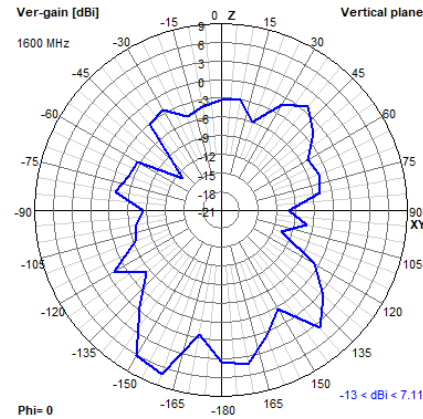
#### YZ



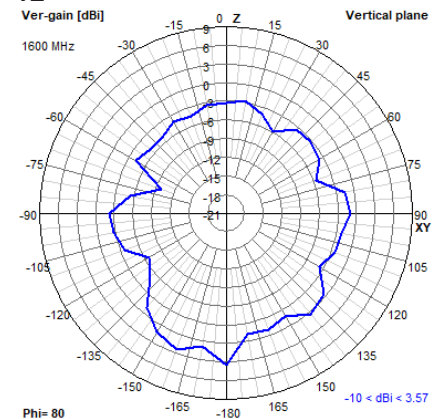
#### 1600 MHz XY



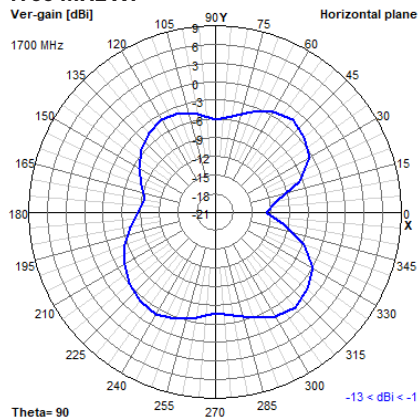
#### XZ



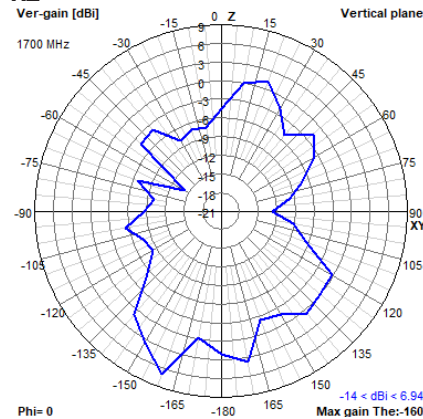
#### YZ



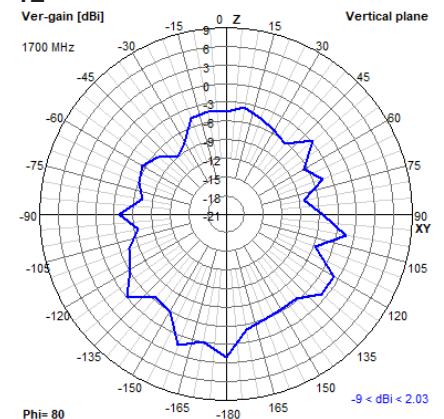
#### 1700 MHz XY



#### XZ



#### YZ



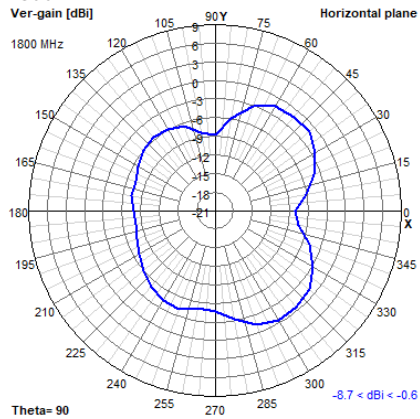


## Echo 1A

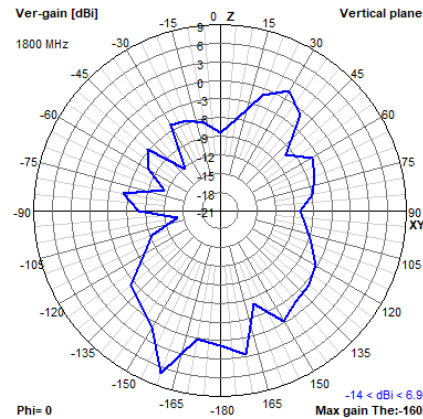
5G/4G Compact PCB Embedded Antenna

### 2D Radiation Plots

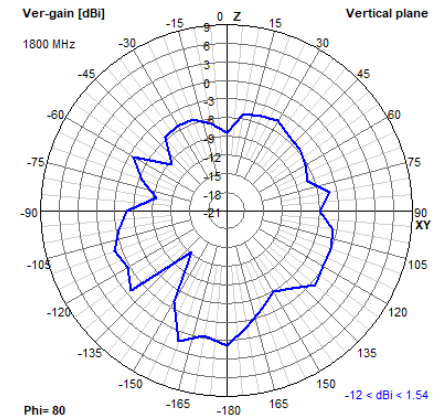
#### 1800 MHz XY



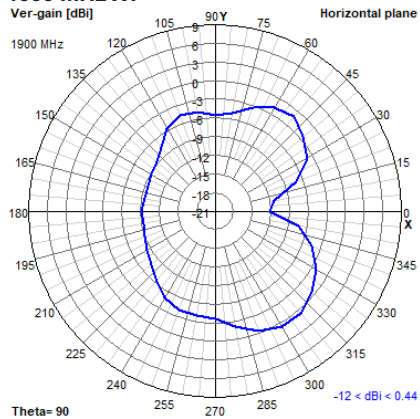
#### XZ



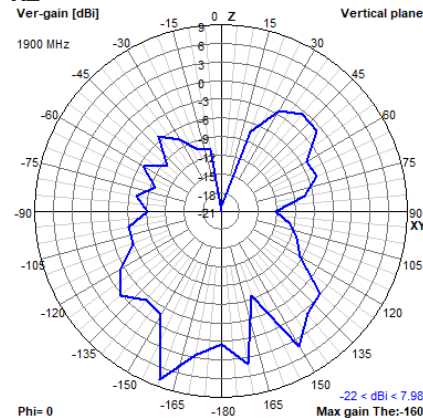
#### YZ



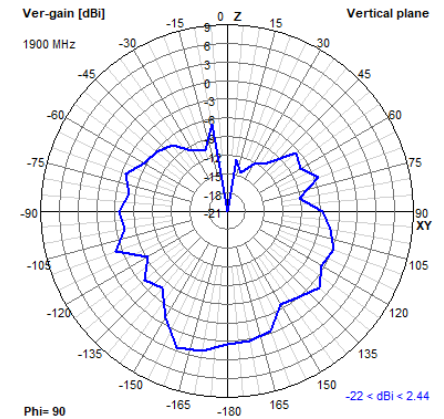
#### 1900 MHz XY



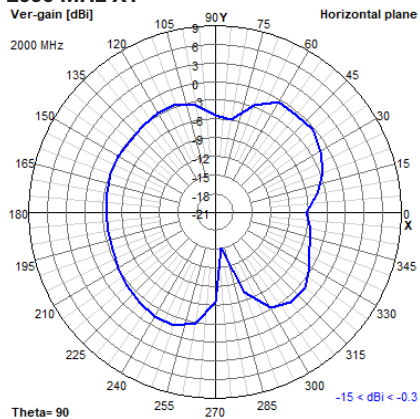
#### XZ



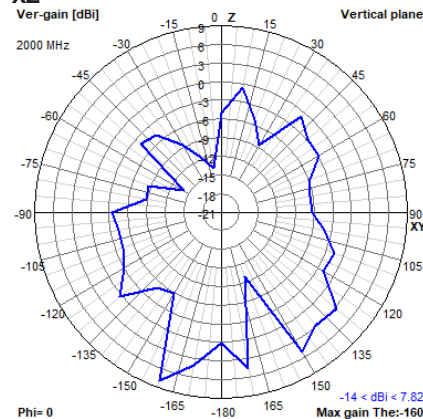
#### YZ



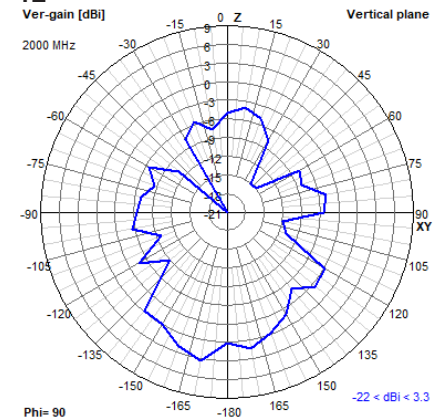
#### 2000 MHz XY



#### XZ



#### YZ



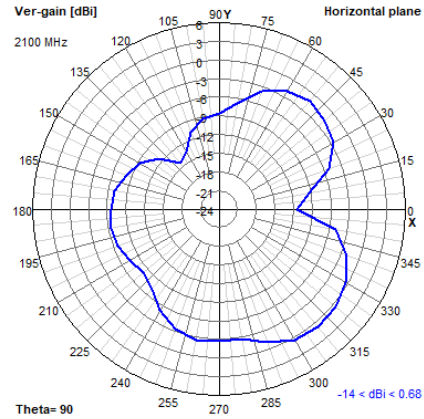


## Echo 1A

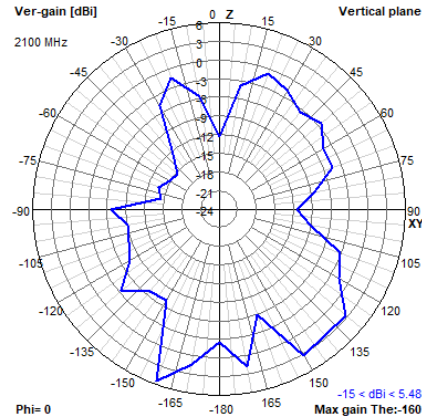
5G/4G Compact PCB Embedded Antenna

### 2D Radiation Plots

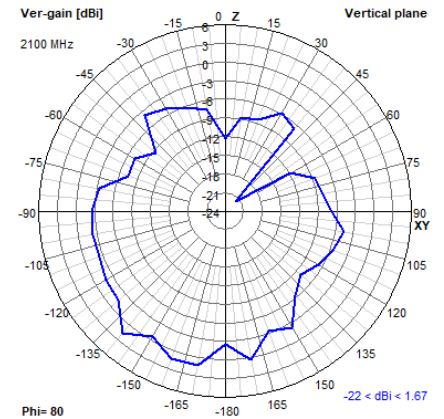
#### 2100 MHz XY



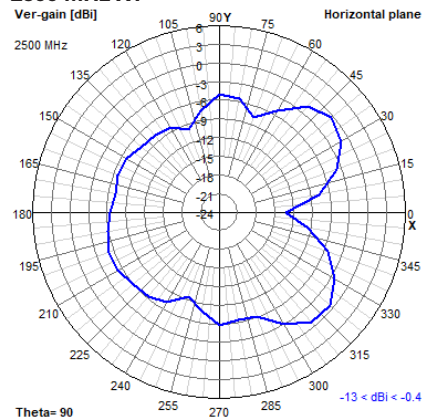
#### XZ



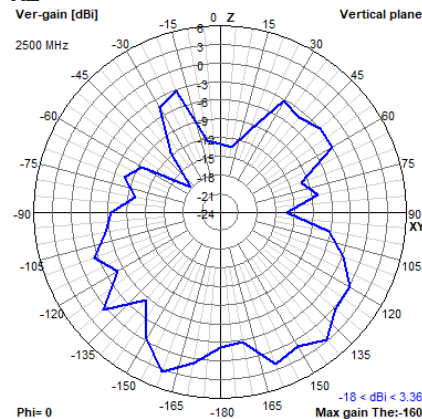
#### YZ



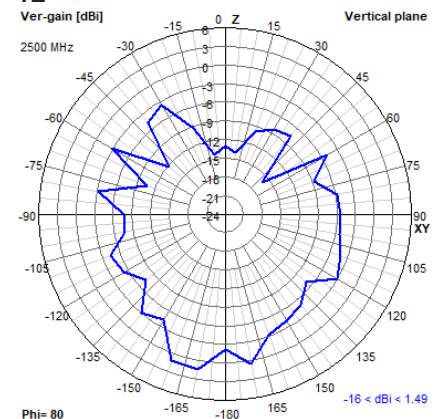
#### 2500 MHz XY



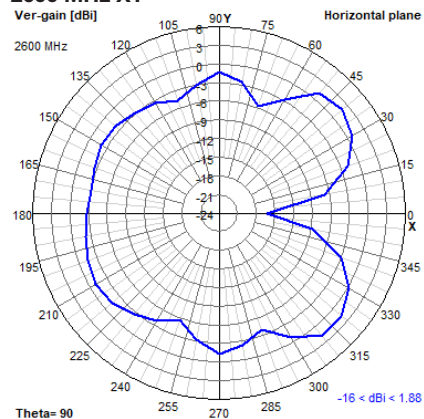
#### XZ



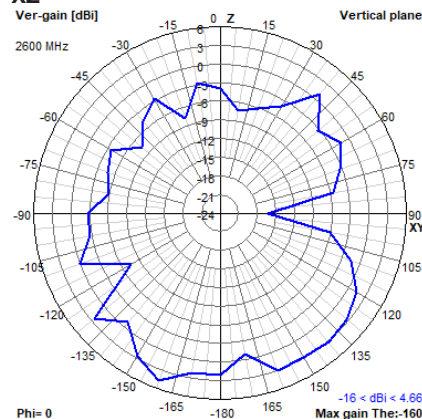
#### YZ



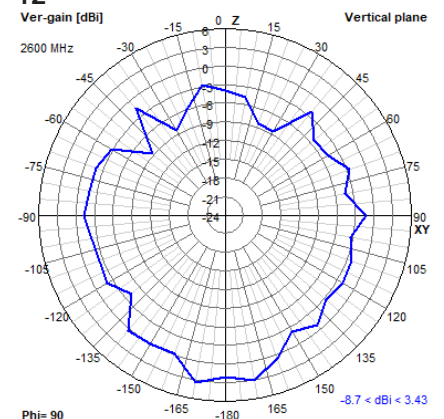
#### 2600 MHz XY



#### XZ



#### YZ



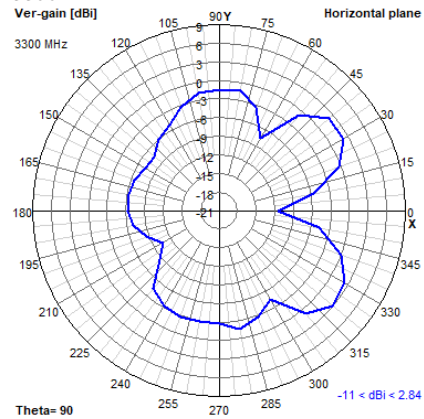


## Echo 1A

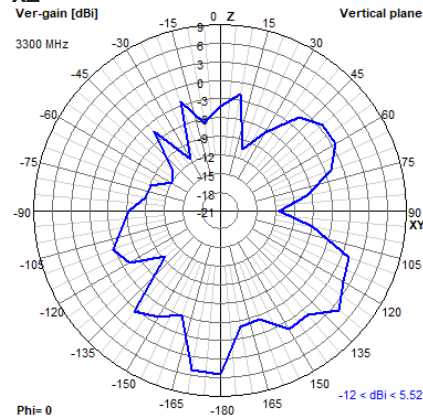
5G/4G Compact PCB Embedded Antenna

### 2D Radiation Plots

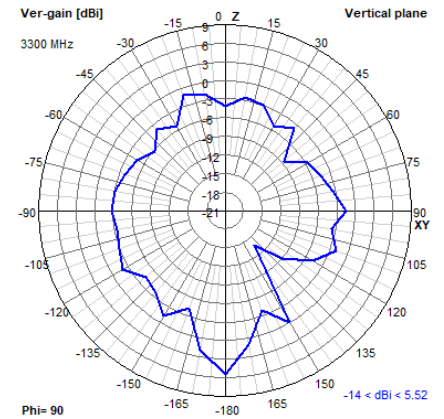
#### 3300 MHz XY



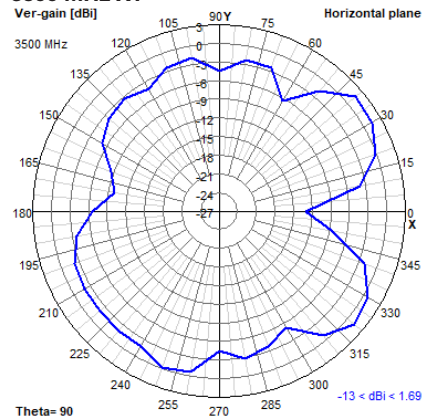
#### XZ



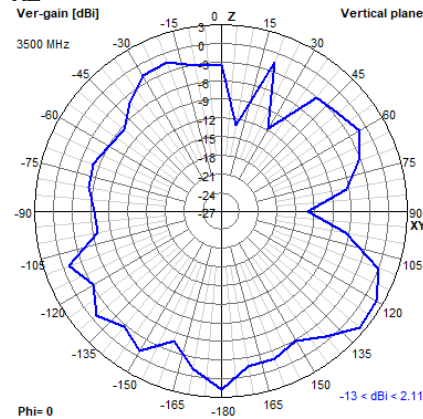
#### YZ



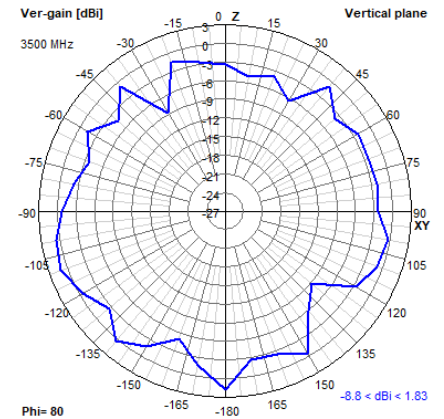
#### 3500 MHz XY



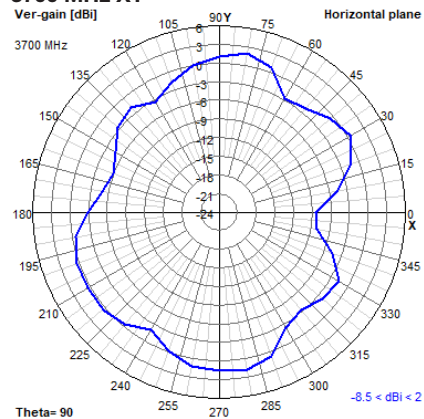
#### XZ



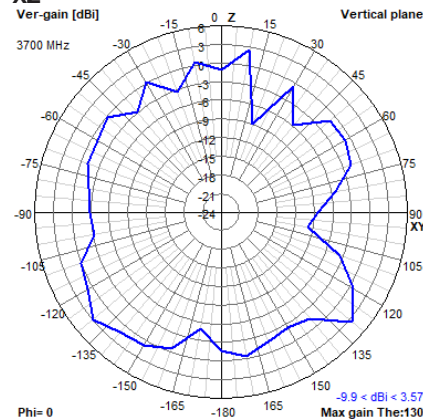
#### YZ



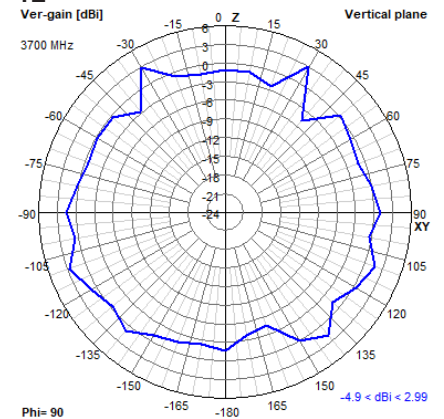
#### 3700 MHz XY



#### XZ



#### YZ

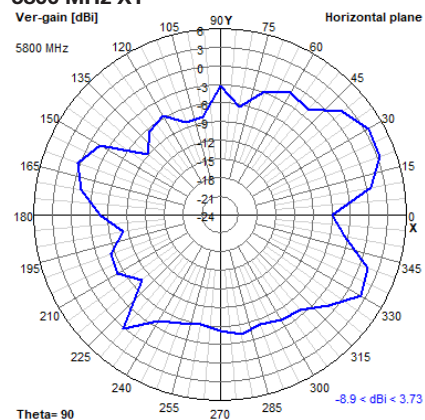


## Echo 1A

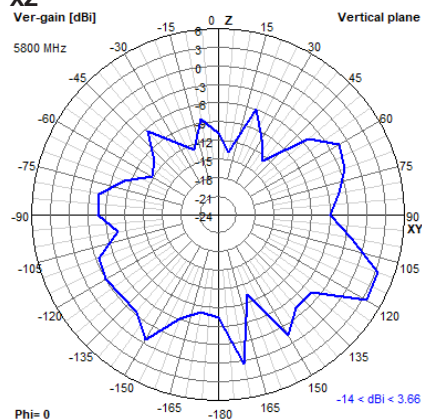
5G/4G Compact PCB Embedded Antenna

### 2D Radiation Plots

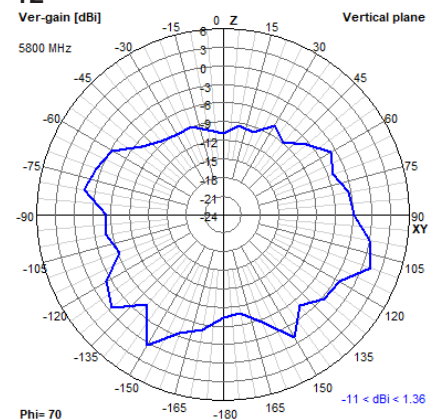
#### 5800 MHz XY



#### XZ



#### YZ



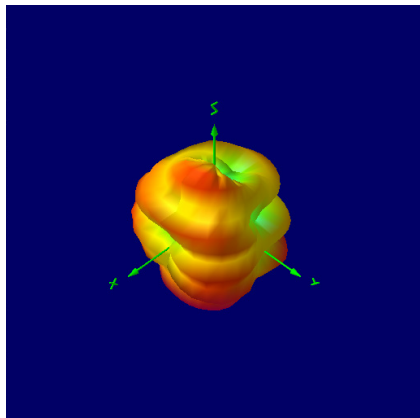


## Echo 1A

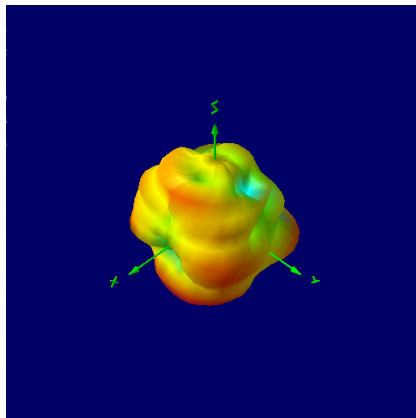
5G/4G Compact PCB Embedded Antenna

### 3D Radiation Plots

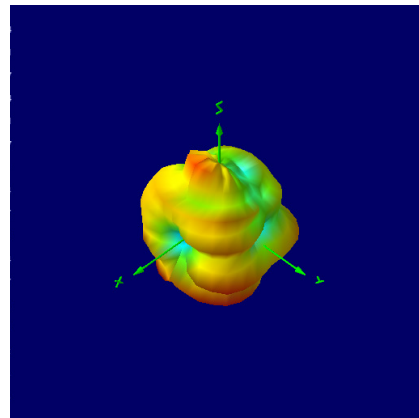
1500 MHz



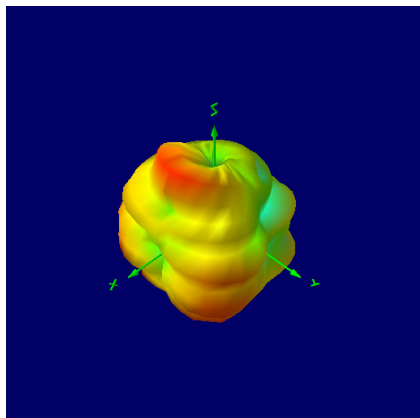
1600 MHz



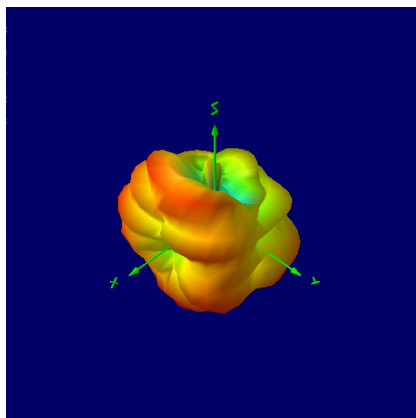
1700 MHz



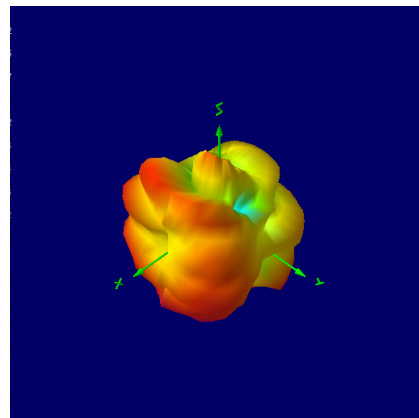
1800 MHz



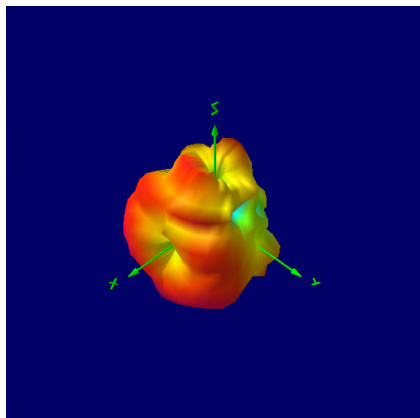
1900 MHz



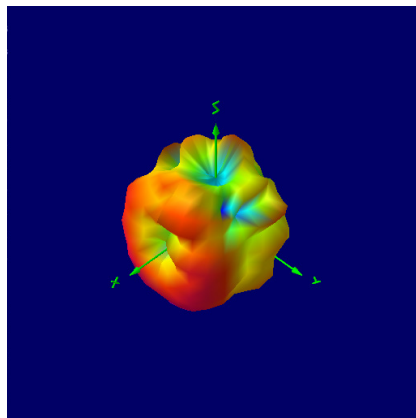
2000 MHz



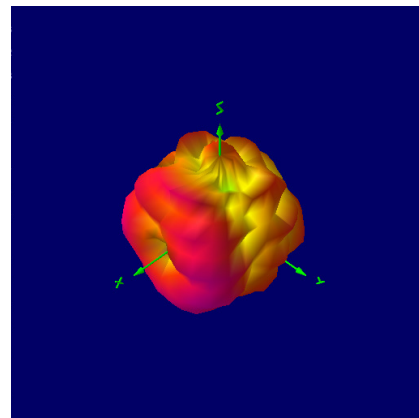
2100 MHz



2500 MHz



2600 MHz



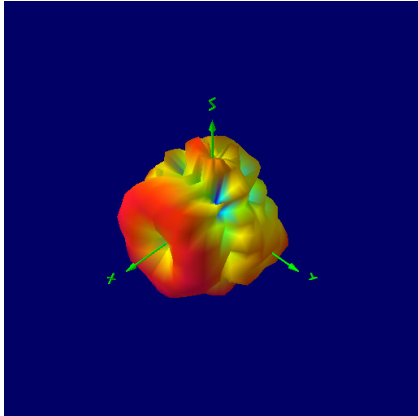


## Echo 1A

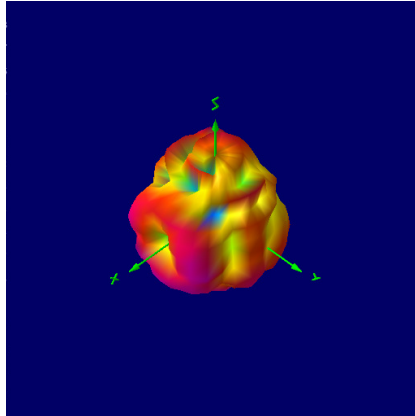
5G/4G Compact PCB Embedded Antenna

### 3D Radiation Plots

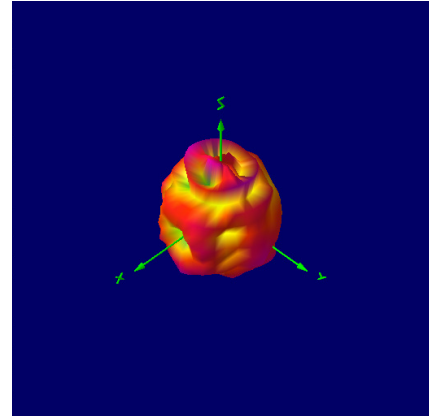
3300 MHz



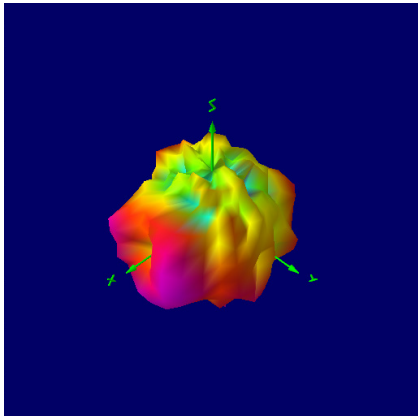
3500 MHz



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



# Mouser Electronics

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Siretta:

[ECHO1A/0.1M/IPEX/S/S/11](#) [ECHO1A/0.2M/IPEX/S/S/11](#)