



## Delta 45

IP67 Rated O-ring Sealed 2.4 GHz Bluetooth/Wi-Fi Stubby Antenna



### Key Features

- Supports 2.4 GHz Wi-Fi 4/5/6
- Supports Bluetooth / Zigbee / ISM 2450 / IEEE 802.15.4 Bands
- IP67 rated – No dust/water ingress (immersion in up to 1 meter of water for 30 minutes)
- High gain of 8.83 dBi at 2.4 GHz frequency
- Above 80% Radiation Efficiency and VSWR >2.5 at 2.4 GHz

### General Description

The Delta 45 is a compact, direct connect 2.4 GHz stubby antenna commonly used in Wi-Fi, Bluetooth and Zigbee applications.

Featuring a UV resistant TPE plastic radome and an O-ring seal to protect from water ingress, this antenna is IP67 rated and designed for outdoor use.

Ideally suited for covert situations where limiting antenna size is a critical consideration.

Despite its small size, the Delta 45 achieves a Peak Gain of 8.83 dBi, providing a stronger and more reliable Wi-Fi signal, particularly in areas with weaker signals.

The Delta 45 is supplied with a Reverse Polarity SMA Male Connector as standard, however other connector types can be specified for high volume orders.

### Additional Considerations

- Omnidirectional monopole
- Ground Plane independent
- 5/8 wave design

|                  |                  |             |             |              |
|------------------|------------------|-------------|-------------|--------------|
| D<br>Direct      | IEEE<br>802.15.4 | ISM<br>2.4G | ISM<br>5.8G | WLAN<br>2400 |
| BLE<br>Bluetooth | ZB<br>Zigbee     | IP<br>67    |             |              |

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### Electrical Specifications

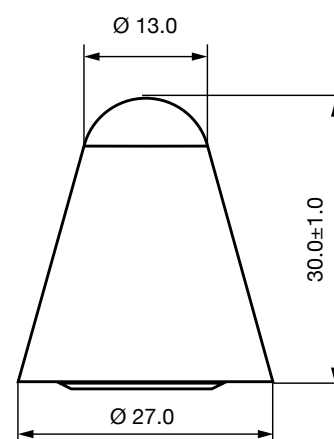
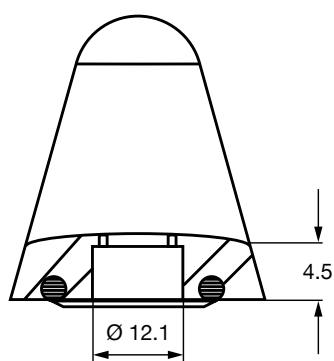
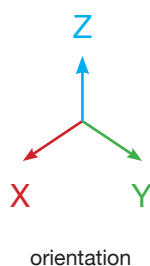
|                           |          |
|---------------------------|----------|
| Impedance:                | 50 Ohm   |
| Polarization:             | Vertical |
| Max input power:          | 10 W     |
| Ground plane independent: | Yes      |

### Environmental Specifications

|                              |                  |
|------------------------------|------------------|
| Operating temperature range: | -40 °C to +65 °C |
| Storage temperature range:   | -40 °C to +80 °C |

### Mechanical Specifications

|                    |                              |
|--------------------|------------------------------|
| Dimensions:        | 30 mm Length, 27 mm Diameter |
| Weight:            | 12 g                         |
| Connector:         | SMA Male / RP-SMA Male       |
| Mounting method:   | Direct Connect               |
| Housing materials: | ABS/TPEE Black               |

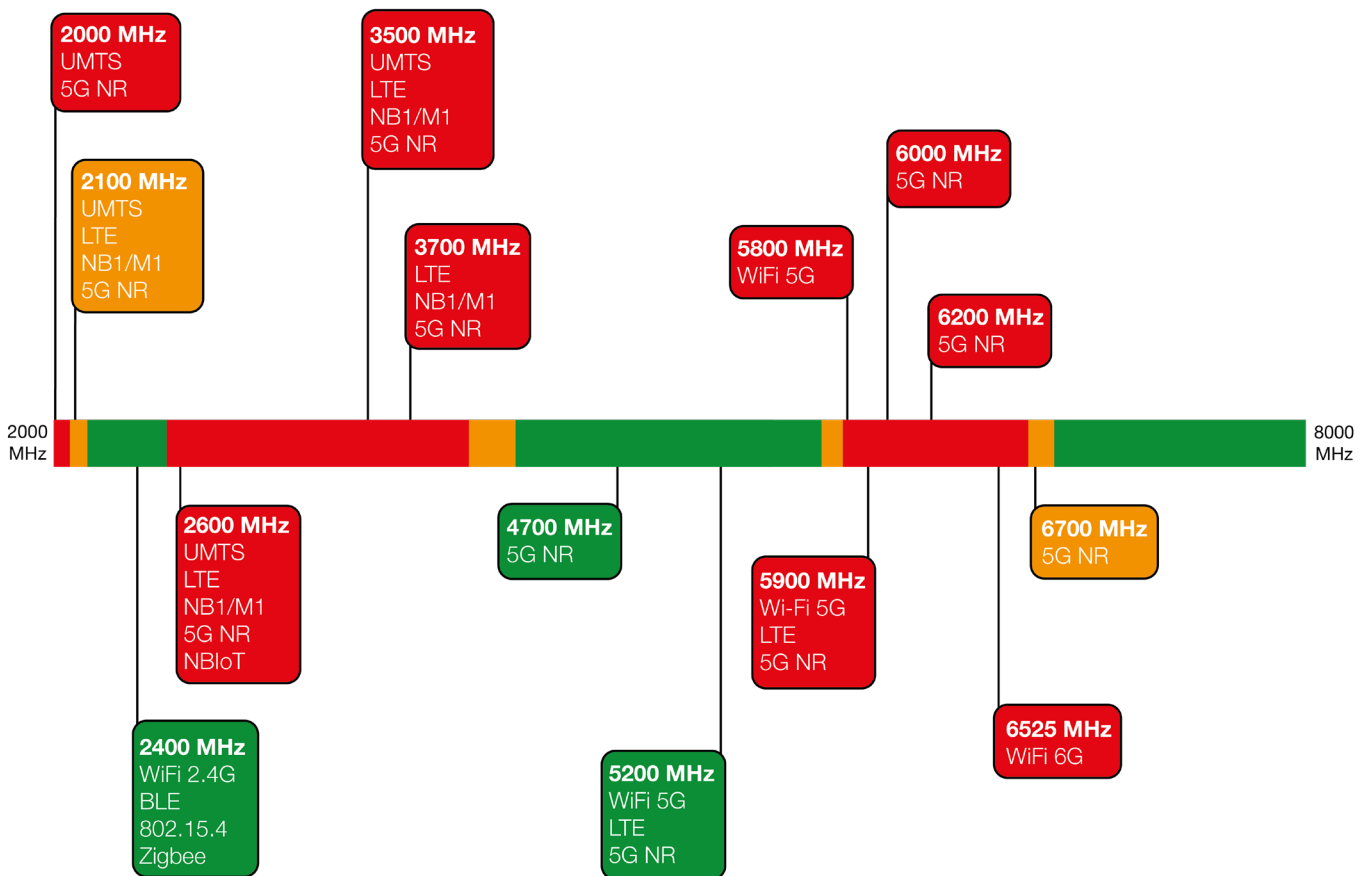




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### Spectrum Coverage



● Suitable band

● Adequate band in good signal conditions

● Likely to be unsuitable



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### Usable Cellular Frequency Support (2000 MHz – 5900 MHz)

|                   | 2000 | 2100 | 2300 | 2400 | 2500 | 2600 | 3300 | 3500 | 3700 | 4700 | 5200 | 5900 | 6000 | 6200 | 6700 |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| GSM Bands:        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| UMTS Bands:       |      |      |      |      |      | ●    |      |      |      |      |      |      |      |      |      |
| LTE Bands:        |      |      | ●    | ●    |      | ●    |      |      |      |      |      |      |      |      |      |
| LTE Cat M Bands:  |      |      | ●    |      |      | ●    |      |      |      |      |      |      |      |      |      |
| LTE Cat NB Bands: |      |      |      |      |      | ●    |      |      |      |      |      |      |      |      |      |
| 5G NR Bands:      |      |      | ●    | ●    |      | ●    |      |      |      |      |      |      |      |      |      |
| NR Cat NB Bands:  |      |      |      |      |      | ●    |      |      |      | ●    |      |      |      |      |      |

### Usable ISM Frequency Support (2450 MHz - 6525 MHz)

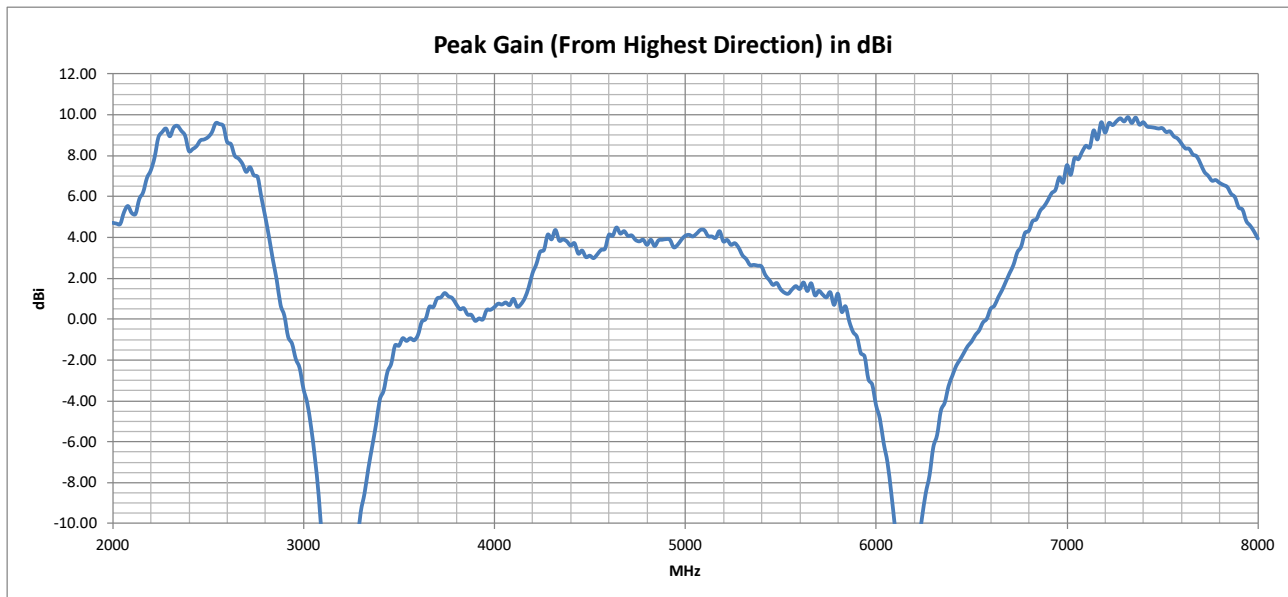
|               | 2450 | 5800 | 6525 |
|---------------|------|------|------|
| Bluetooth     | ●    |      |      |
| IEEE 802.15.4 | ●    |      |      |
| ISM 2.4G      | ●    |      |      |
| ISM 5.8G      | ●    |      |      |
| Wi-Fi 2.4G    | ●    |      |      |
| Wi-Fi 5G      |      |      |      |
| Wi-Fi 6E      |      | ●    |      |
| Zigbee        | ●    |      |      |



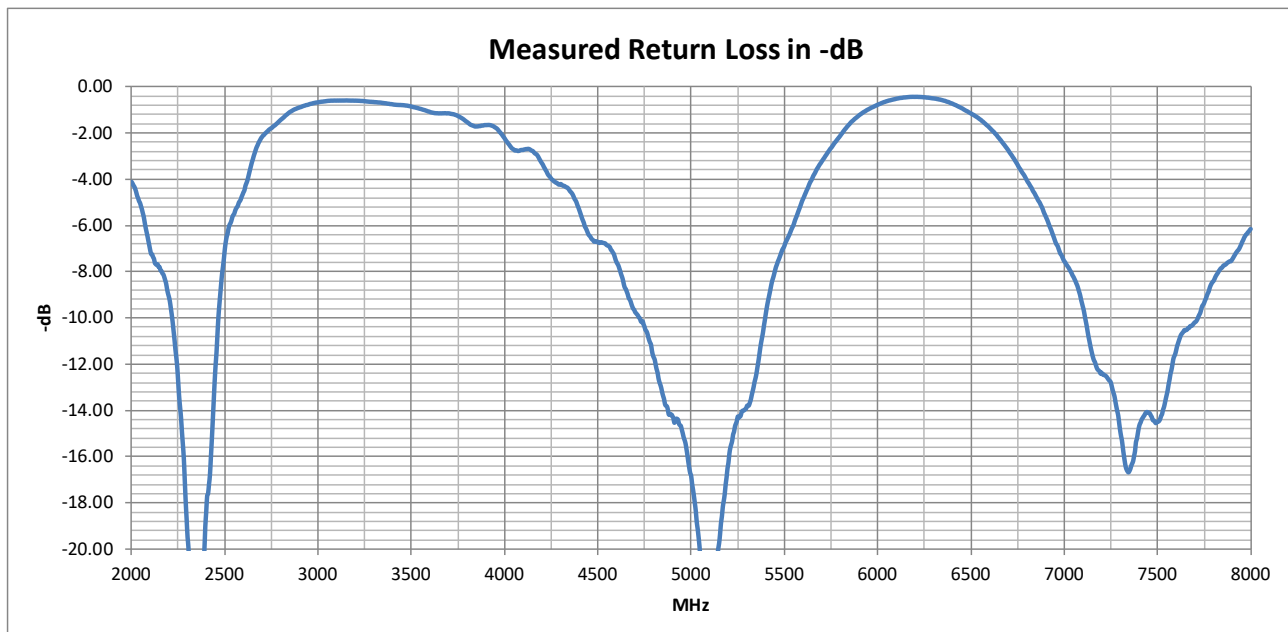
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### Peak Gain vs. Frequency



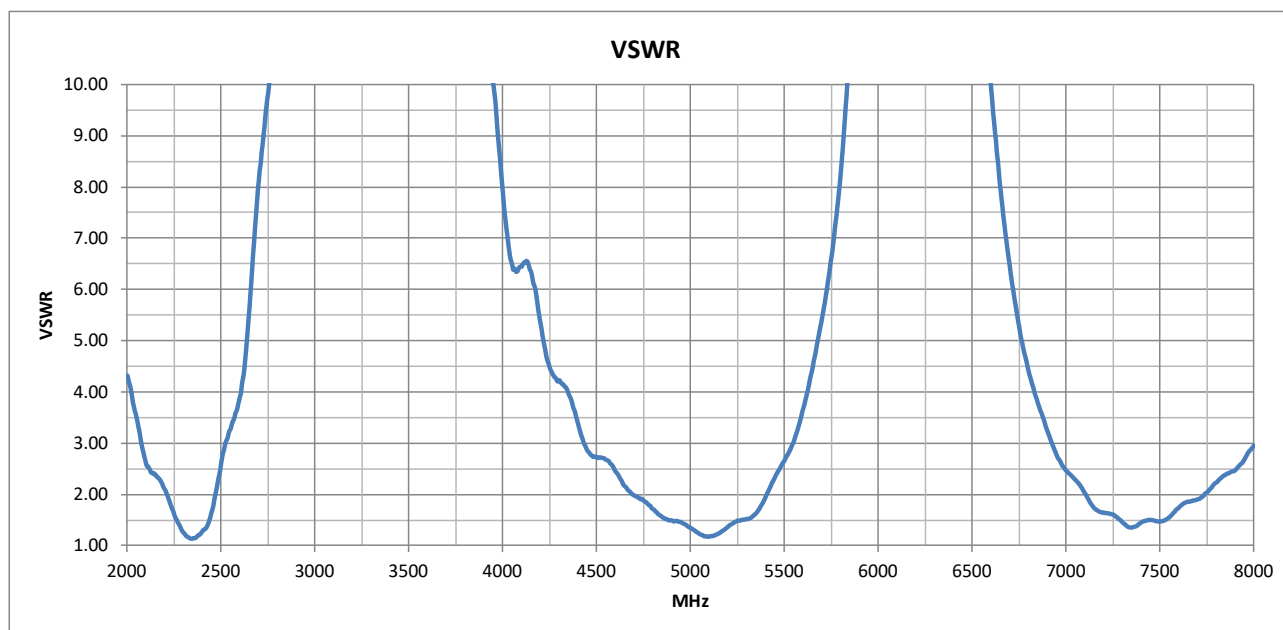
### Return Loss



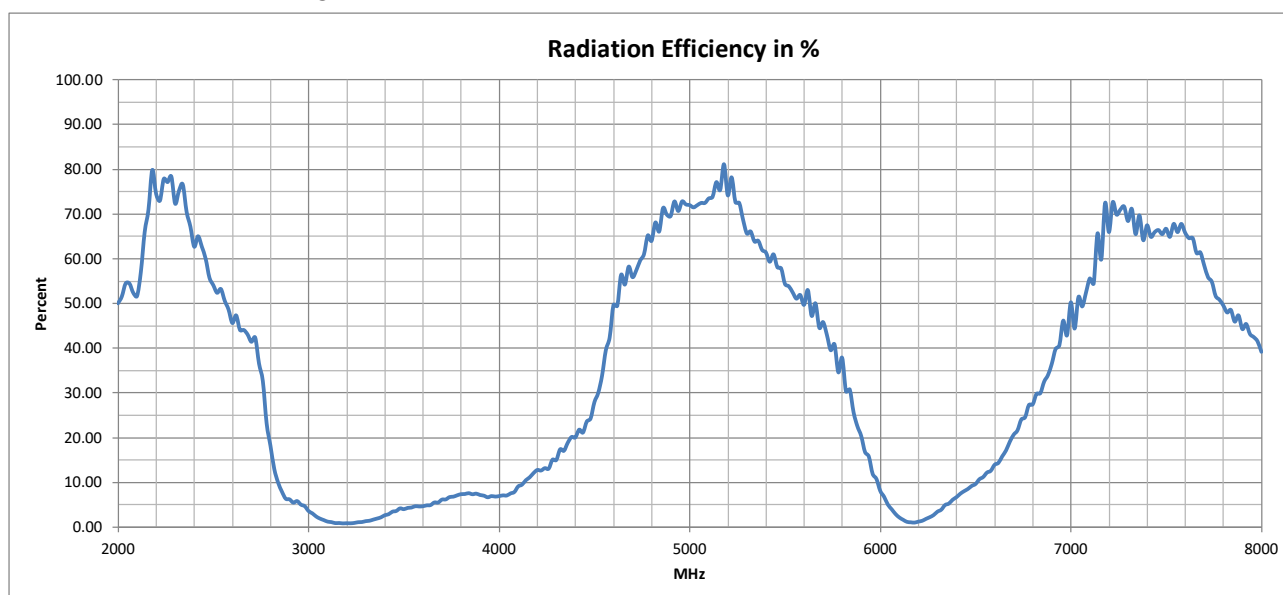
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### VSWR



### Radiation Efficiency





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### Cellular Standards Band Support

| GSM (2G) Band | UMTS (3G) Band | E-UTRA (4G) Band | Cat M E-UTRA Band | Cat NB E-UTRA Band | NR (5G) Band | Cat NB NR (5G) Band | Uplink            | Downlink          | Average Upload Efficiency (%) | Average Download Efficiency (%) | Maximum Upload VSWR | Maximum Download VSWR | Use Indicator |
|---------------|----------------|------------------|-------------------|--------------------|--------------|---------------------|-------------------|-------------------|-------------------------------|---------------------------------|---------------------|-----------------------|---------------|
|               | 7              | 7                | 7                 | 7                  | n7           | n7                  | 2500 - 2570 MHz   | 2620 - 2690 MHz   | 92.06                         | 61.32                           | 3.49                | 7.68                  | ●             |
|               | 22             | 22               |                   |                    |              |                     | 3410 - 3490 MHz   | 3510 - 3590 MHz   | 48.07                         | 80.94                           | 22.86               | 20.13                 | ●             |
|               |                | 30               |                   |                    | n30          |                     | 2305 - 2315 MHz   | 2350 - 2360 MHz   | 68.84                         | 74.47                           | 1.22                | 1.14                  | ●             |
|               |                | 34               |                   |                    | n34          |                     | 2010 - 2025 MHz   | 2010 - 2025 MHz   | 17.72                         | 17.72                           | 4.16                | 4.16                  | ●             |
|               |                | 38               |                   |                    | n38          |                     | 2570 - 2620 MHz   | 2570 - 2620 MHz   | 66.31                         | 66.31                           | 4.35                | 4.35                  | ●             |
|               |                | 40               | 40                |                    | n40          |                     | 2300 - 2400 MHz   | 2300 - 2400 MHz   | 75.57                         | 75.57                           | 1.27                | 1.27                  | ●             |
|               |                | 41               | 41                | 41                 | n41          | n41                 | 2496 - 2690 MHz   | 2496 - 2690 MHz   | 74.38                         | 74.38                           | 7.68                | 7.68                  | ●             |
|               |                | 42               | 42                | 42                 |              |                     | 3400 - 3600 MHz   | 3400 - 3600 MHz   | 64.18                         | 64.18                           | 23.27               | 23.27                 | ●             |
|               |                | 43               | 43                | 43                 |              |                     | 3600 - 3800 MHz   | 3600 - 3800 MHz   | 96.14                         | 96.14                           | 16.13               | 16.13                 | ●             |
|               |                | 46               |                   |                    | n46          |                     | 5150 - 5925 MHz   | 5150 - 5925 MHz   | 87.92                         | 87.92                           | 16.09               | 16.09                 | ●             |
|               |                | 47               |                   |                    | n47          |                     | 5855 - 5925 MHz   | 5855 - 5925 MHz   | 81.89                         | 81.89                           | 16.09               | 16.09                 | ●             |
|               |                | 48               | 48                | 48                 | n48          |                     | 3550 - 3700 MHz   | 3550 - 3700 MHz   | 95.78                         | 95.78                           | 18.40               | 18.40                 | ●             |
|               |                | 49               |                   |                    |              |                     | 3550 - 3700 MHz   | 3550 - 3700 MHz   | 95.78                         | 95.78                           | 18.40               | 18.40                 | ●             |
|               |                | 52               |                   |                    |              |                     | 3300 - 3400 MHz   | 3300 - 3400 MHz   | 51.53                         | 51.53                           | 26.77               | 26.77                 | ●             |
|               |                | 53               |                   |                    | n53          |                     | 2483.5 - 2495 MHz | 2483.5 - 2495 MHz | 88.26                         | 88.26                           | 2.48                | 2.48                  | ●             |
|               |                | 69               |                   |                    |              |                     | N/A               | 2570 - 2620 MHz   | N/A                           | 66.31                           | N/A                 | 4.35                  | ●             |
|               |                |                  |                   |                    | n77          |                     | 3300 - 4200 MHz   | 3300 - 4200 MHz   | 78.42                         | 78.42                           | 26.77               | 26.77                 | ●             |
|               |                |                  |                   |                    | n78          |                     | 3300 - 3800 MHz   | 3300 - 3800 MHz   | 74.43                         | 74.43                           | 26.77               | 26.77                 | ●             |
|               |                |                  |                   |                    | n79          |                     | 4400 - 5000 MHz   | 4400 - 5000 MHz   | 91.36                         | 91.36                           | 3.37                | 3.37                  | ●             |
|               |                |                  |                   |                    | n90          | n90                 | 2496 - 2690 MHz   | 2496 - 2690 MHz   | 74.38                         | 74.38                           | 7.68                | 7.68                  | ●             |
|               |                |                  |                   |                    | n95          |                     | 2010 - 2025 MHz   | N/A               | 17.72                         | N/A                             | 4.16                | N/A                   | ●             |
|               |                |                  |                   |                    | n96          |                     | 5925 - 7125 MHz   | 5925 - 7125 MHz   | 81.99                         | 81.99                           | 41.28               | 41.28                 | ●             |
|               |                |                  |                   |                    | n97          |                     | 2300 - 2400 MHz   | N/A               | 75.57                         | N/A                             | 1.27                | N/A                   | ●             |
|               |                |                  |                   |                    | n102         |                     | 5925 - 6425 MHz   | 5925 - 6425 MHz   | 83.69                         | 83.69                           | 41.28               | 41.28                 | ●             |
|               |                |                  |                   |                    | n104         |                     | 6425 - 7125 MHz   | 6425 - 7125 MHz   | 80.77                         | 80.77                           | 21.49               | 21.49                 | ●             |

● Suitable band

● Adequate band in good signal conditions

● Likely to be unsuitable

**NOTE:** For each frequency band, Siretta provides a traffic light indication to show the suitability of the antenna for use at that frequency band. Determination of exactly what makes an antenna good or bad at any frequency is subjective.

The view presented is that of Siretta's engineering team having taken into account the efficiency and VSWR measurements. The end user is advised to use their own criteria and/or testing to confirm suitability.



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### ISM Standards Frequency Support

| Application             | Frequency Range | Efficiency (%) | Maximum VSWR | Peak Gain from highest direction (dBi) | Use Indicator |
|-------------------------|-----------------|----------------|--------------|----------------------------------------|---------------|
| ISM 2.4 GHz             | 2400 - 2500 MHz | 84.38          | 2.61         | 8.92                                   | ●             |
| Wi-Fi 2.4G              | 2401 - 2483 MHz | 83.21          | 2.26         | 8.83                                   | ●             |
| Wi-Fi 2.4G (USA)        | 2401 - 2473 MHz | 83.38          | 2.06         | 8.79                                   | ●             |
| Wi-Fi 2.4G (Japan)      | 2401 - 2495 MHz | 83.83          | 2.48         | 8.89                                   | ●             |
| Wi-Fi 5G (all channels) | 5150 - 5990 MHz | 87.26          | 21.64        | 4.32                                   | ●             |
| Wi-Fi 5G (Ch 32-48)     | 5150 - 5250 MHz | 92.36          | 1.48         | 4.32                                   | ●             |
| Wi-Fi 5G (Ch 32-64)     | 5150 - 5330 MHz | 91.95          | 1.56         | 4.32                                   | ●             |
| Wi-Fi 5G (Ch 32-161)    | 5150 - 5815 MHz | 88.74          | 9.03         | 4.32                                   | ●             |
| Wi-Fi 5G (Ch 32-173)    | 5150 - 5875 MHz | 88.33          | 12.51        | 4.32                                   | ●             |
| Wi-Fi 6E (Ch 1-93)      | 5925 - 6425 MHz | 83.69          | 41.28        | -1.69                                  | ●             |
| Wi-Fi 6E (all channels) | 5925 - 7125 MHz | 81.99          | 41.28        | 8.63                                   | ●             |
| ISM 5.8 GHz             | 5725 - 5875 MHz | 84.61          | 12.51        | 1.33                                   | ●             |
| UWB band 1              | 3168 - 3696 MHz | 66.99          | 29.82        | 0.94                                   | ●             |
| UWB band 2              | 3696 - 4224 MHz | 85.76          | 15.34        | 2.82                                   | ●             |
| UWB band 3              | 4224 - 4752 MHz | 88.89          | 4.84         | 4.50                                   | ●             |
| UWB band 4              | 4752 - 5280 MHz | 90.41          | 1.86         | 4.38                                   | ●             |
| UWB band 5              | 5280 - 5808 MHz | 87.90          | 8.68         | 3.51                                   | ●             |
| UWB band 6              | 5808 - 6336 MHz | 82.31          | 41.28        | 0.90                                   | ●             |
| UWB band 7              | 6336 - 6864 MHz | 80.58          | 32.01        | 5.36                                   | ●             |
| UWB band 8              | 6864 - 7392 MHz | 86.58          | 3.61         | 9.90                                   | ●             |
| UWB band 9              | 7392 - 7920 MHz | 61.23          | 2.55         | 9.65                                   | ●             |

● Suitable band

● Adequate band in good signal conditions

● Likely to be unsuitable

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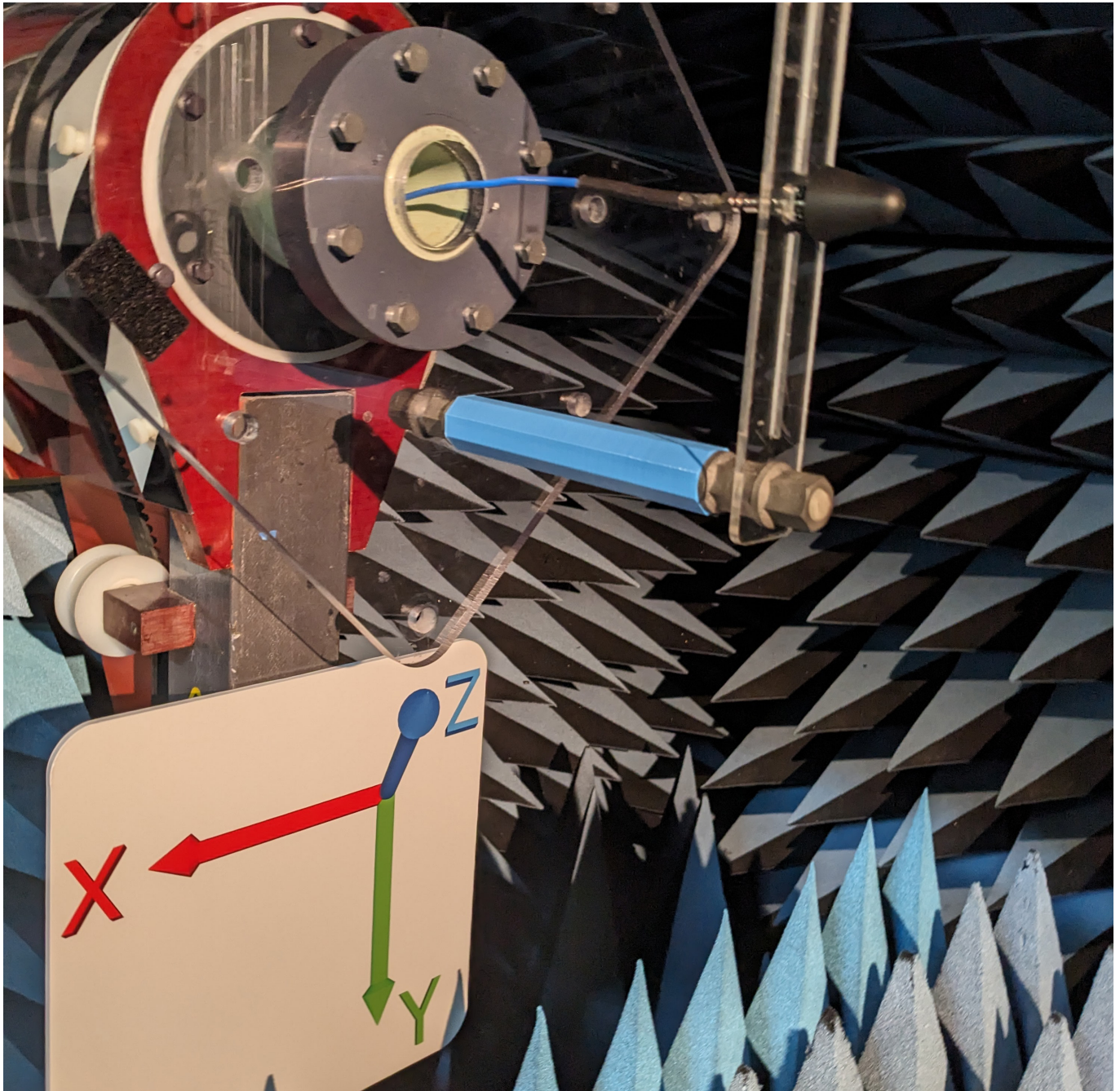




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### Test Setup (in Free Space)



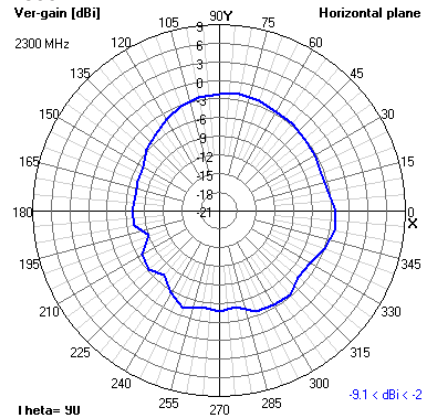


## Delta 45

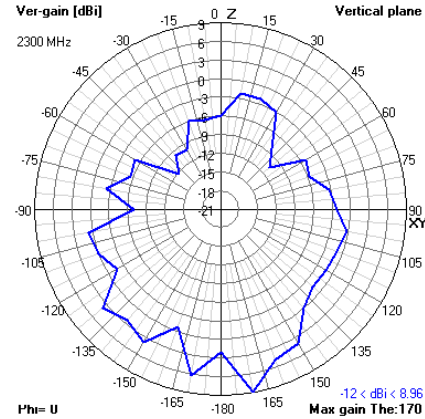
IP67 Rated O-ring Sealed 2.4 GHz Bluetooth/Wi-Fi Stubby Antenna

### 2D Radiation Plots

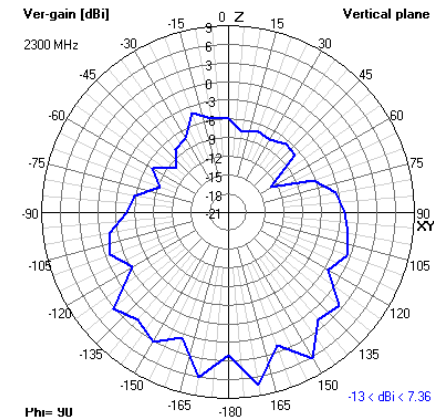
#### 2300 MHz XY



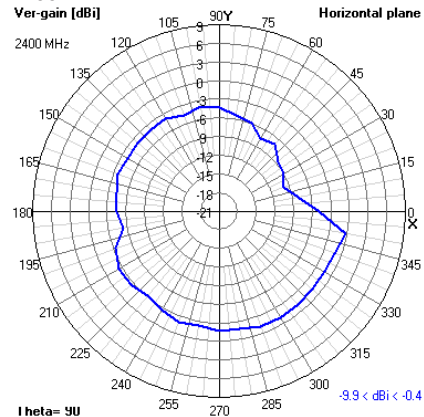
#### XZ



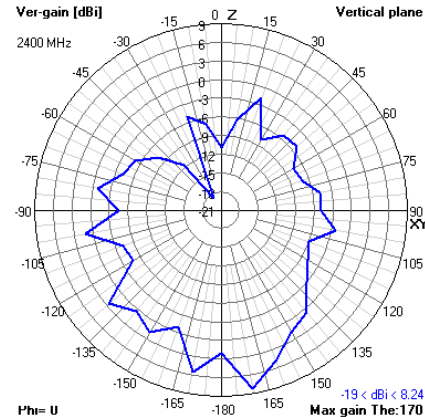
#### YZ



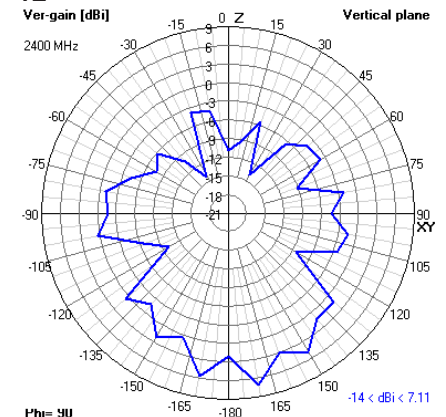
#### 2400 MHz XY



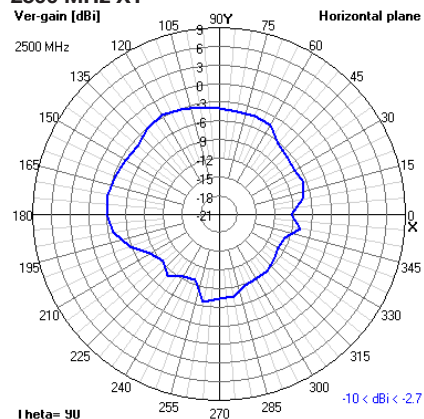
#### XZ



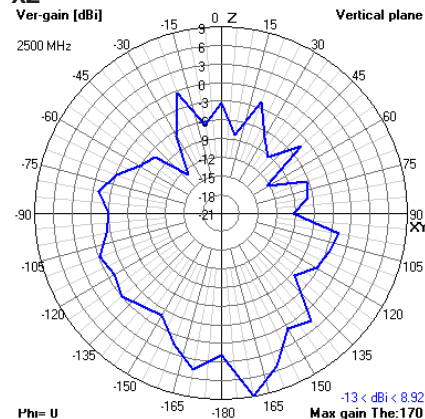
#### YZ



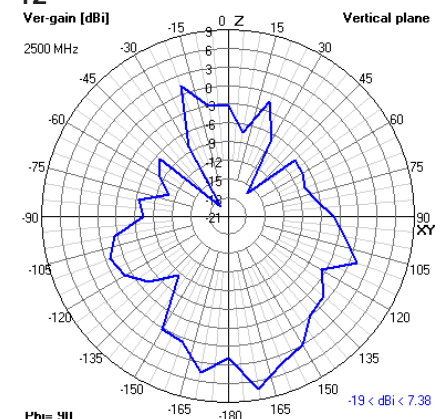
#### 2500 MHz XY



#### XZ



#### YZ





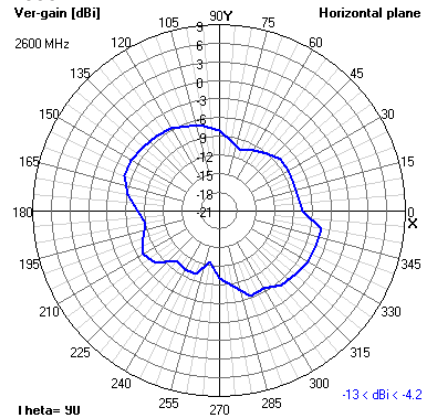


## Delta 45

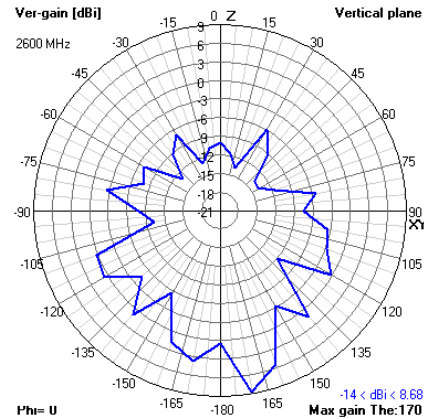
IP67 Rated O-ring Sealed 2.4 GHz Bluetooth/Wi-Fi Stubby Antenna

### 2D Radiation Plots

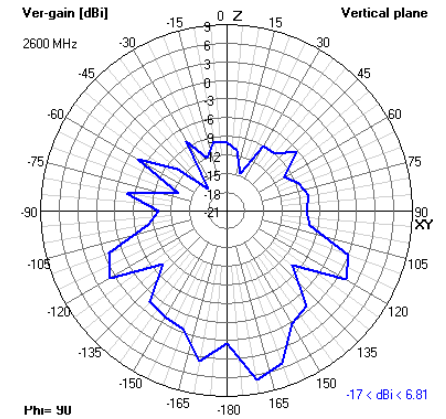
#### 2600 MHz XY



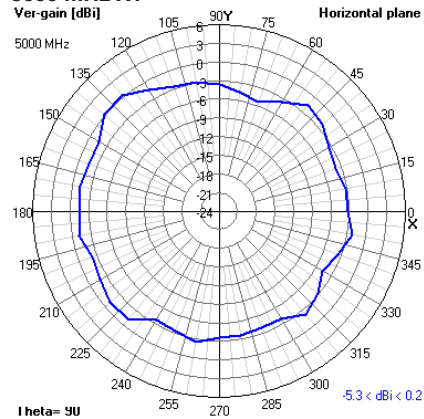
#### XZ



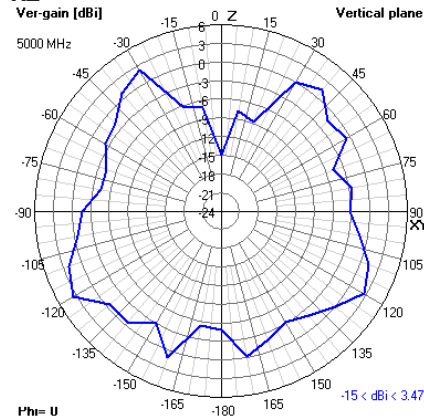
#### YZ



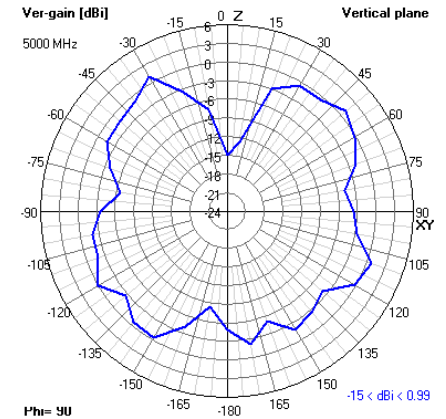
#### 5000 MHz XY



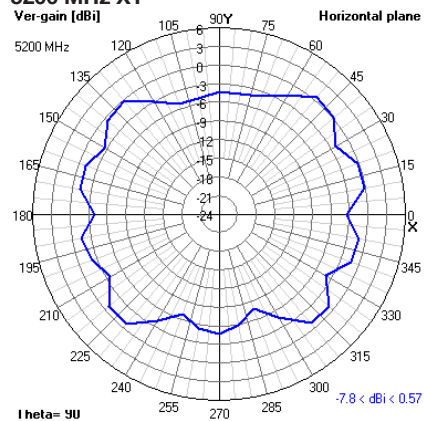
#### XZ



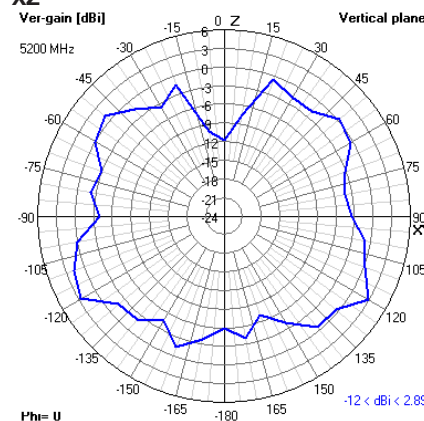
#### YZ



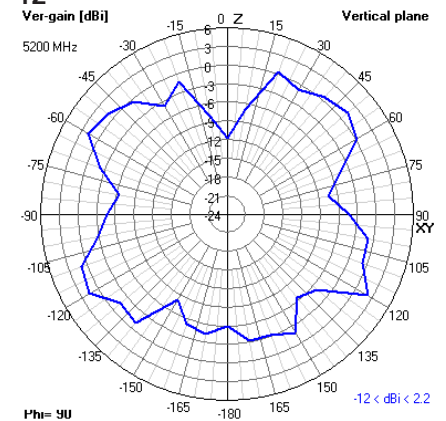
#### 5200 MHz XY



#### XZ



#### YZ



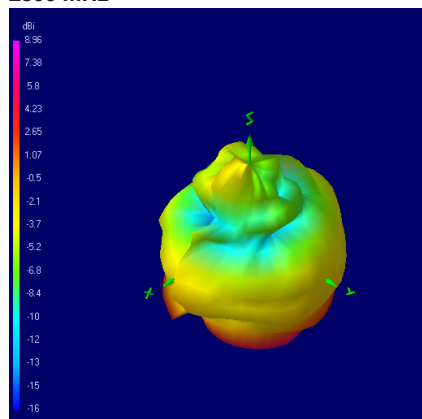


## Delta 45

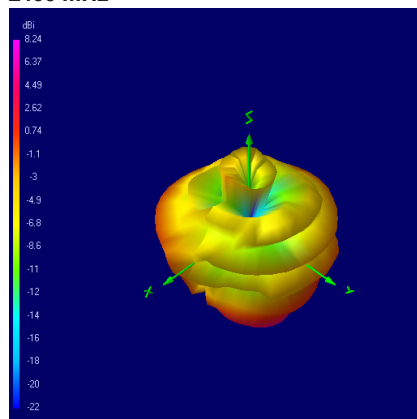
IP67 Rated O-ring Sealed 2.4 GHz Bluetooth/Wi-Fi Stubby Antenna

### 3D Radiation Plots

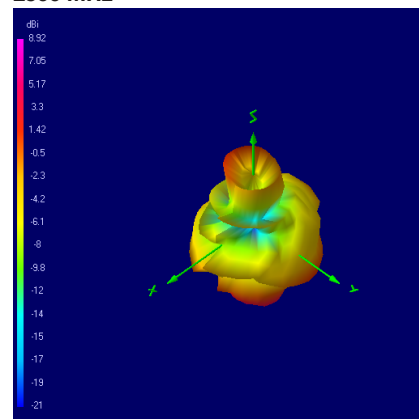
2300 MHz



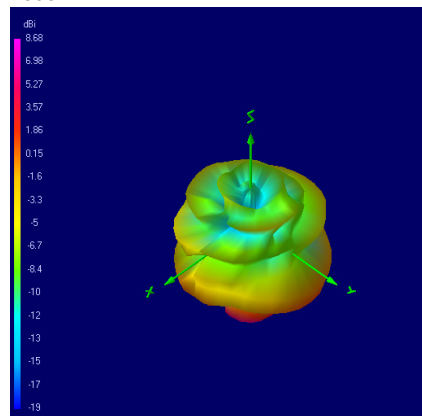
2400 MHz



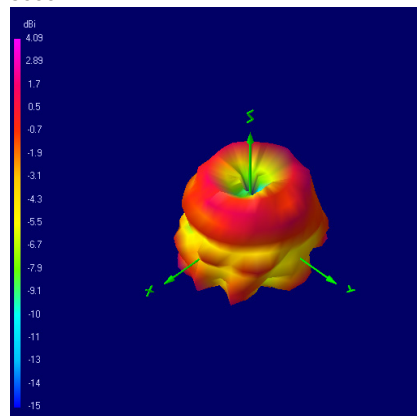
2500 MHz



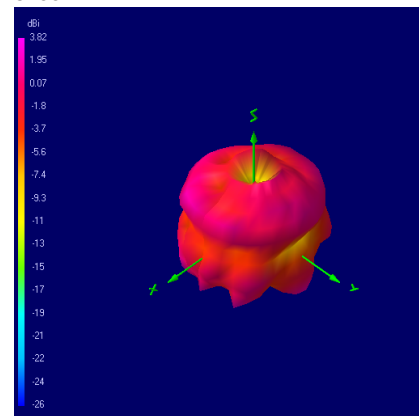
2600 MHz



5000 MHz



5200 MHz



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

### Ordering Details:

| Part Number            | Description                                                                       |
|------------------------|-----------------------------------------------------------------------------------|
| DELTA45/X/SMAM/RP/S/35 | IP67 Rated O-ring Sealed 2.4 GHz Bluetooth/Wi-Fi Stubby Antenna RP-SMAM Connector |

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VAT Registration No. GB163 04 0349



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