

Radiation pattern and Antenna system description

Manufacturer: Suunto Oy
Product model: DW223

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Antenna system structure DW223

- Antenna system consists of a radiator, connection elements and a ground plane.
- Bezel is utilized as the radiating element for all protocols (Dualband GNSS&BLE/WLAN)
- Radiator is connected to GNSS receiver, WLAN&BLE transceivers and PCB ground using galvanically connected clips between bezel and corresponding PCB connections.
- Bezel diameter 49.5mm, height 3.7mm



Antenna main structure: bezel

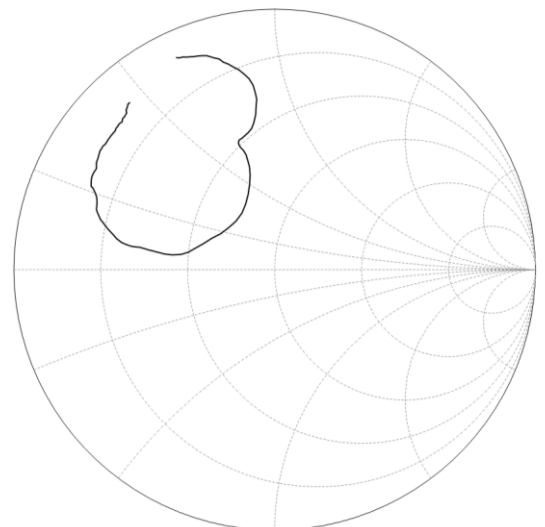
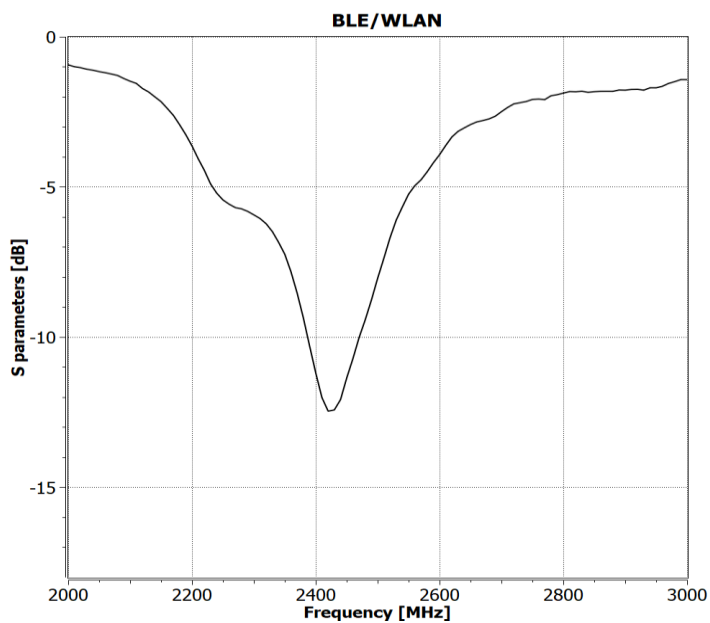
Radiation parameters

- BLE/WLAN 2.4 GHz antenna
 - Peak gain = -4.1 dBi
 - Efficiency = -9.2dB
 - Center frequency= 2442 MHz
 - Bandwidth = 85 MHz
- Dualband GNSS antenna L5-L1
 - L5 Center frequency = 1175 MHz
 - L1 Center frequency = 1575 MHz
 - L5 Bandwidth = 25 MHz
 - L1 Bandwidth = 55 MHz

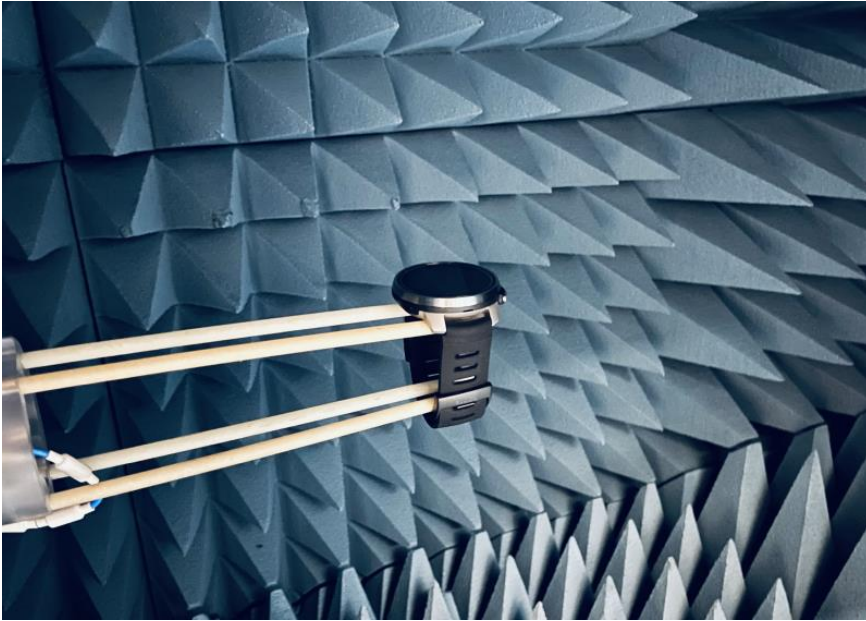
 - L5 Peak gain = -6.8 dBi
 - L1 Peak gain = -7 dBi

 - L5 Efficiency = -10.2 dB
 - L1 Efficiency = -9.5 dB

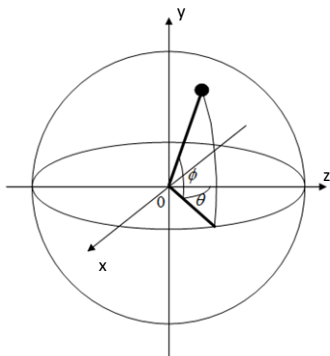
Impedance



Measurement



Measurement setup

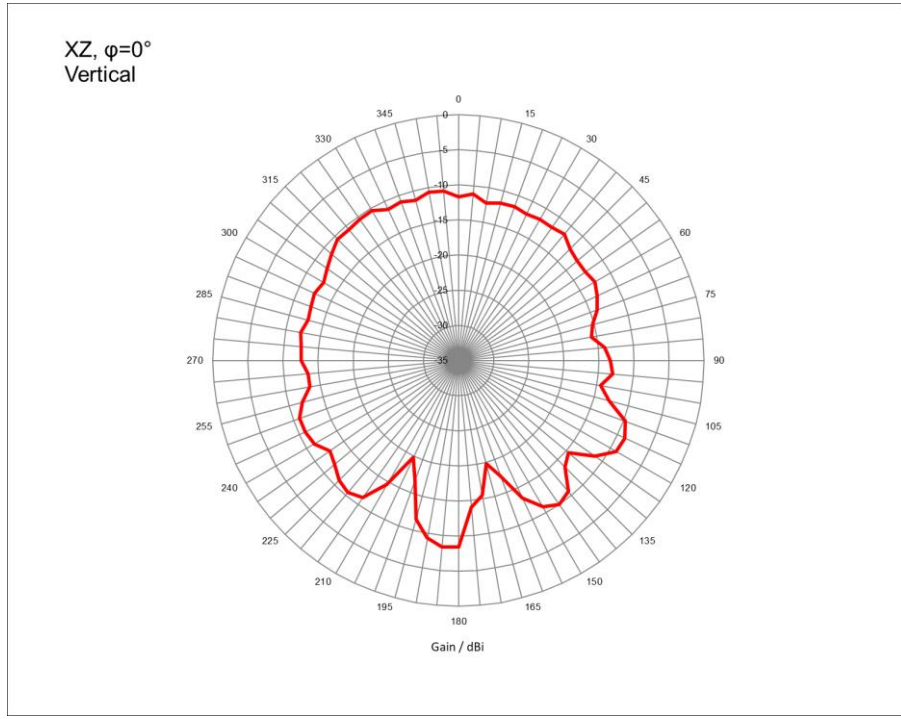
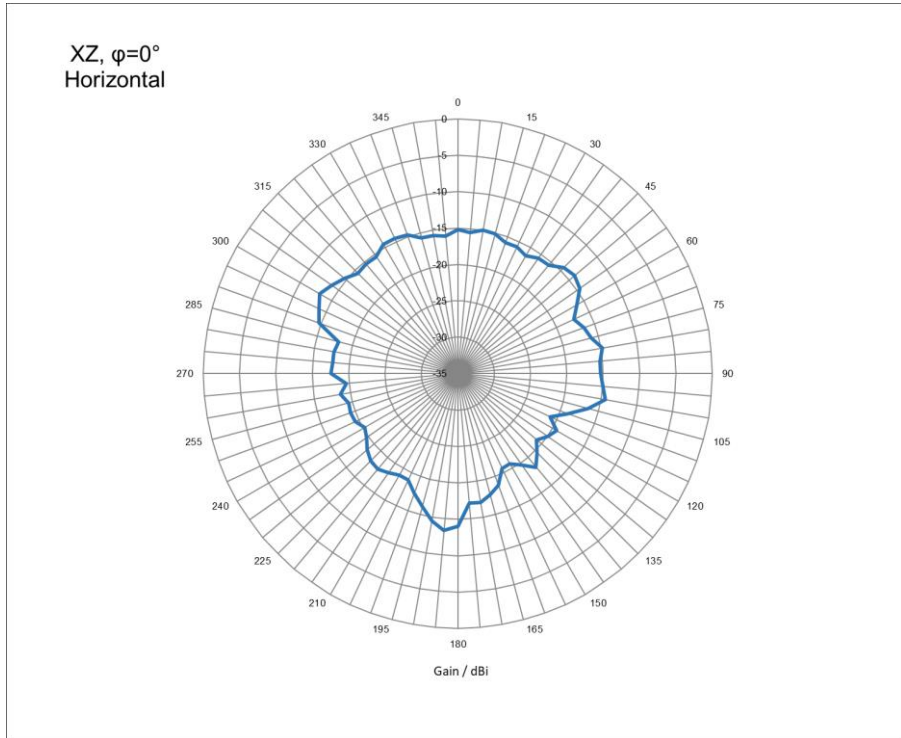
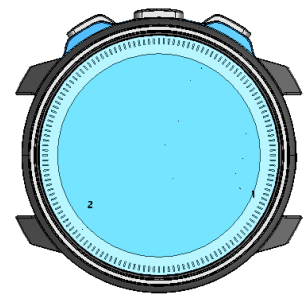


Spherical polar coordinate system used. Measuring antenna is located along z-axis

Coordinate system

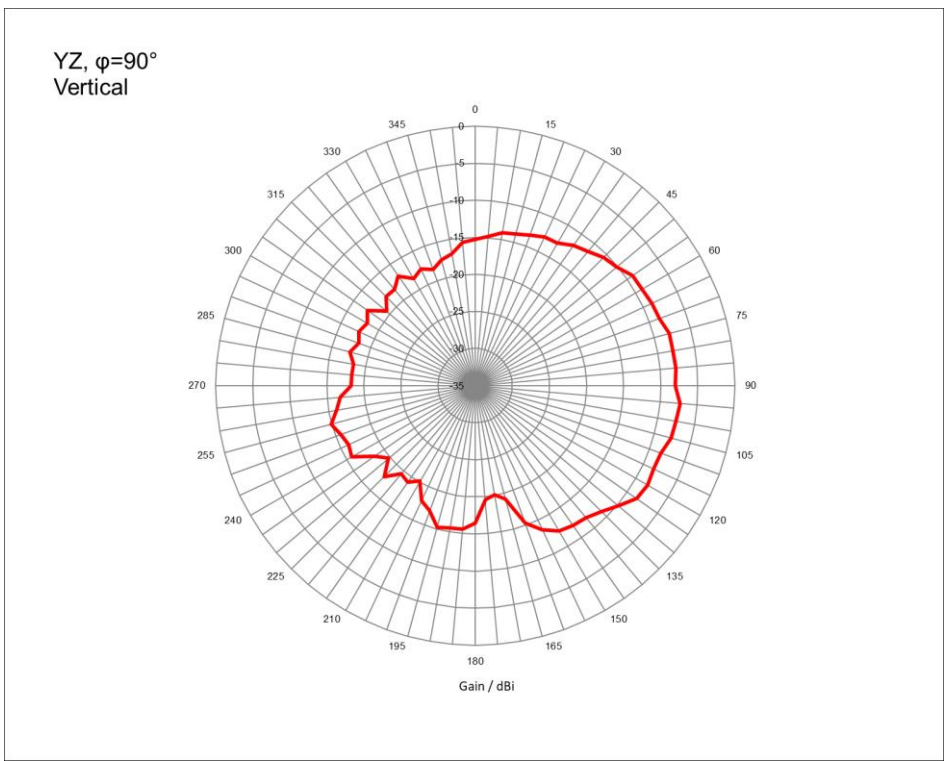
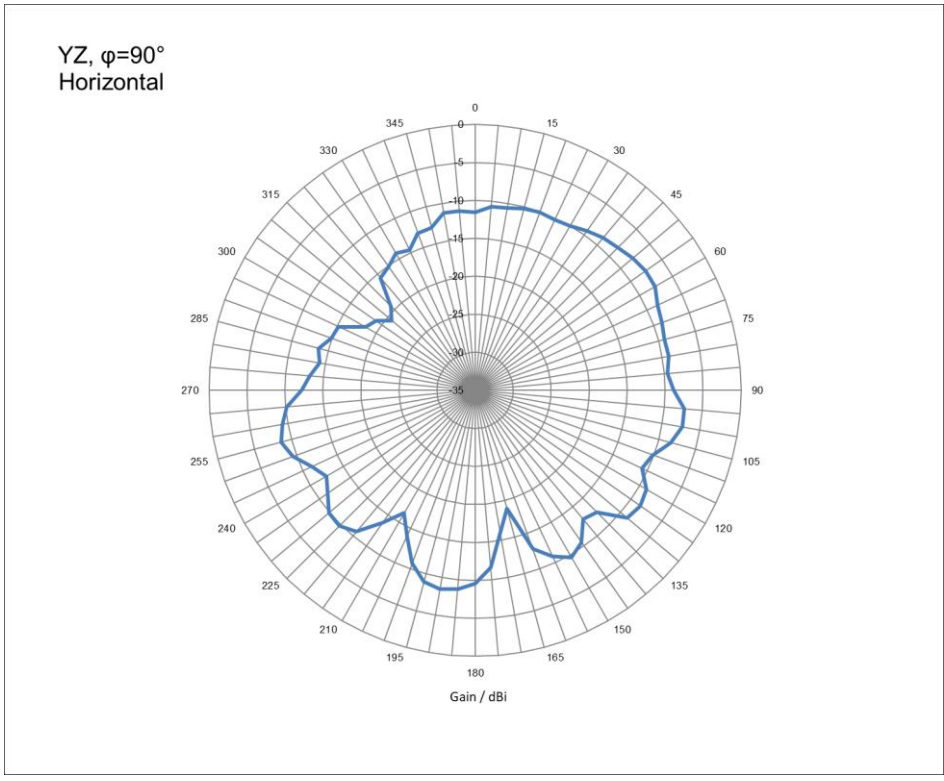
Radiation pattern, XY-plane, $f_c=2442\text{MHz}$

- 3 o'clock towards 0°



Radiation pattern, YZ-plane, $f_c=2442\text{MHz}$

- 3 o'clock towards 0°



Radiation pattern, XY-plane, $f_c=2442\text{MHz}$

- 12 o'clock towards 0°

