FCC Antenna OTA test report, EPOS DSBT4

Measurements performed by

Name	Title/Role & Function	Signature	Date
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Approved by:

Name	Title/Role & Function	Signature	Date
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Manufacturer	DSEA A/S, Kongebakken 9, DK-2765 Smørum, Denmark
Test facility	Oticon RF Test Lab, Kongebakken 9, DK-2765 Smørum, Denmark
Test date	2025-03-27
Antenna	Mini_Speed
Antenna type	2.4GHz Internal Monopole antenna

1. EUT Antenna specification and implementation

The radio system consists of the 2.4GHz transceiver Airoha AB1585D with the Mini_Speed monopole antenna.

Figure below shows the antenna implementation with feed point and dominant current path indicated.

Device serial number	A004431245000001
Device Model	EPOS DSBT4 (BTD900c Bluetooth Dongle USB Type-C)
Device SW version	1.2.13
Antenna type	2.4GHz Internal Monopole Antenna
Operating frequency	2400MHz – 2480MHz
Interface impedance	50Ω

Drawing of antenna with indication of antenna feed point and dominant current path.
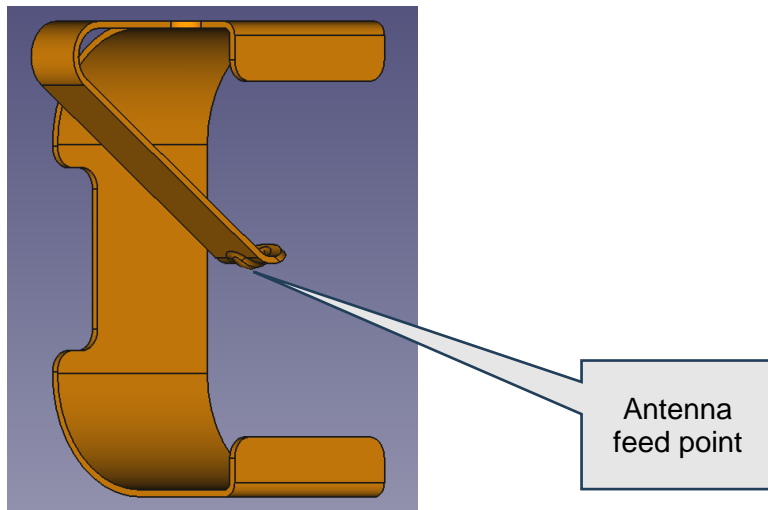If separate antenna part is used, insert a technical drawing of the antenna part only.

Antenna feed point

Figure 1 Mini_Speed monopole antenna part
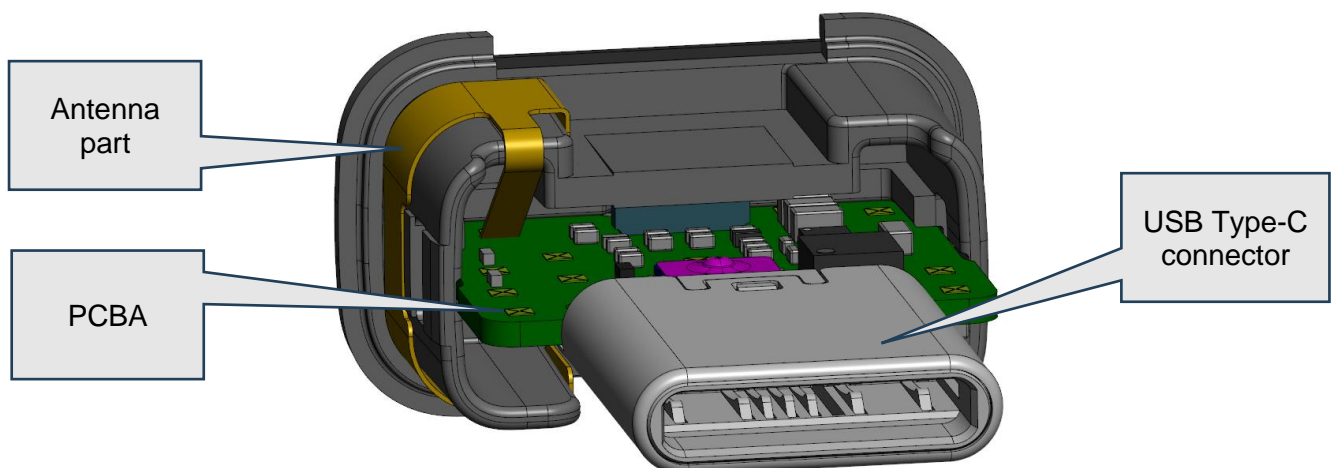

Antenna part

USB Type-C connector

PCBA

Figure 2 Integration of antenna part in DSBT4 device (outer plastic shell not shown)

2. Measurement setup

The OTA measurements are performed in a 3D capable shielded anechoic chamber. Measurements are performed using a spectrum analyzer and the ETS-Lindgren's EMQuest™ EMQ-100 Antenna Measurement Software. Measurements are done under standard operating conditions at room temperature.

Measurement setup	Model
OTA chamber	ETS 8923
Spectrum analyzer	Agillent EXA Signal analyzer N9010A, S/N MY52221039, Calibration date 2024-11-22, Calibration Due 2026-01-22
Measurement Software	ETS-Lindgren EMQuest™ EMQ-100 Antenna Measurement Software

The EUT can only be activated and controlled while connected to a PC. For this test a Lenovo Thinkpad L14 Gen 1 PC with Windows 11 was used. The EUT was connected to a USB Type-C port on the left side of the PC. The PC was not connected to an AC adapter during the test.

In order to set the EUT to test mode and to set the correct RF transmit power and frequency of the EUT, the Airoha AB1585/88 Lab Test Tool PC application was used. DC tone modulation was used.
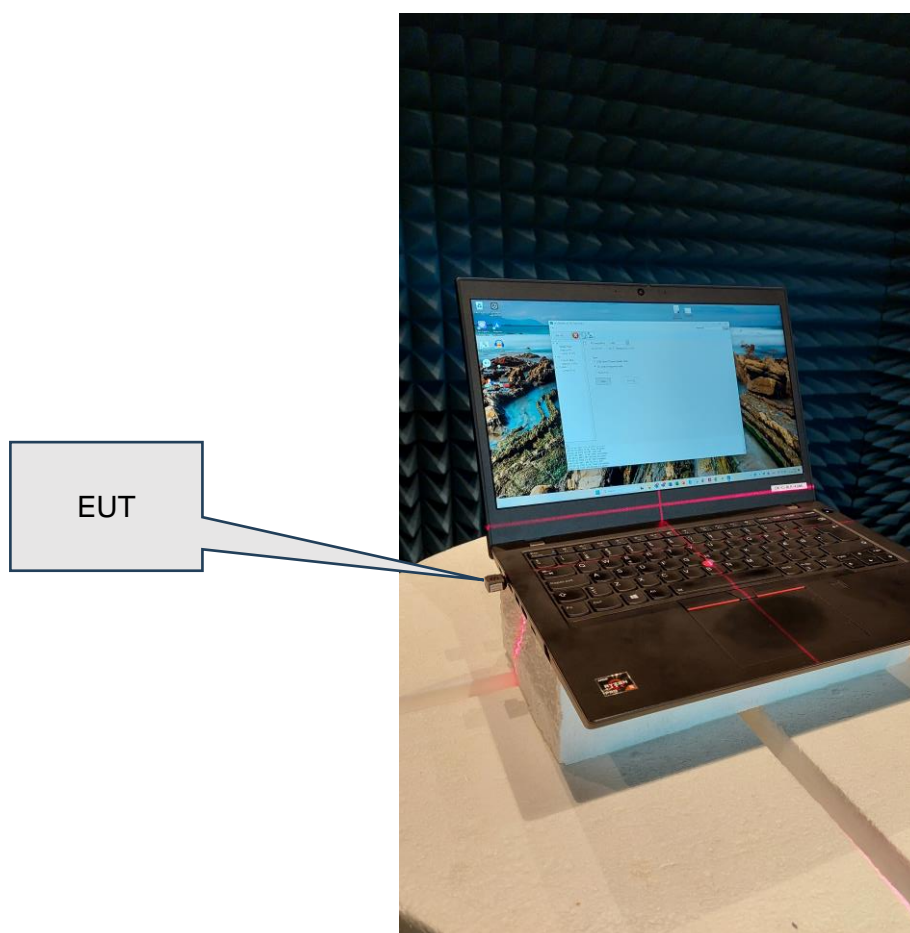

Figure 3 EUT is connected to a laptop PC and placed in the anechoic antenna radiation pattern test chamber.
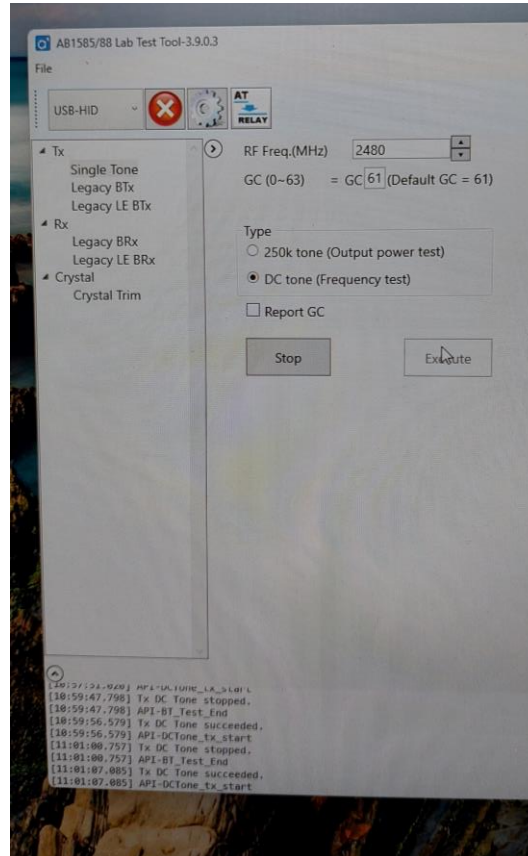
Figure 4 Screendump of Airoha Lab Test Tool used for setting the EUT to test mode

3. Gain and directivity

Antenna gain has been calculated as G = EIRP (dBm) – P_out (dBm), where G is antenna gain (dBi), EIRP is the Effective Isotropic Radiated Power and P_out is the measured conducted power at RF - antenna interface (50 Ohm). Gain numbers are listed for the worst-case speaker unit Length.

EUT #	Test state	Frequency (MHz)	Antenna gain (dBi)	Directivity (dBi)
1	Free space	2402	-6,95	5,06
1	Free space	2442	-3,89	5,14
1	Free space	2480	-4,98	5,32

4. Radiation pattern 2D and 3D

Patterns are radiation patterns – Not Gain – Values are not normalized with output power.

4.1 2D patterns

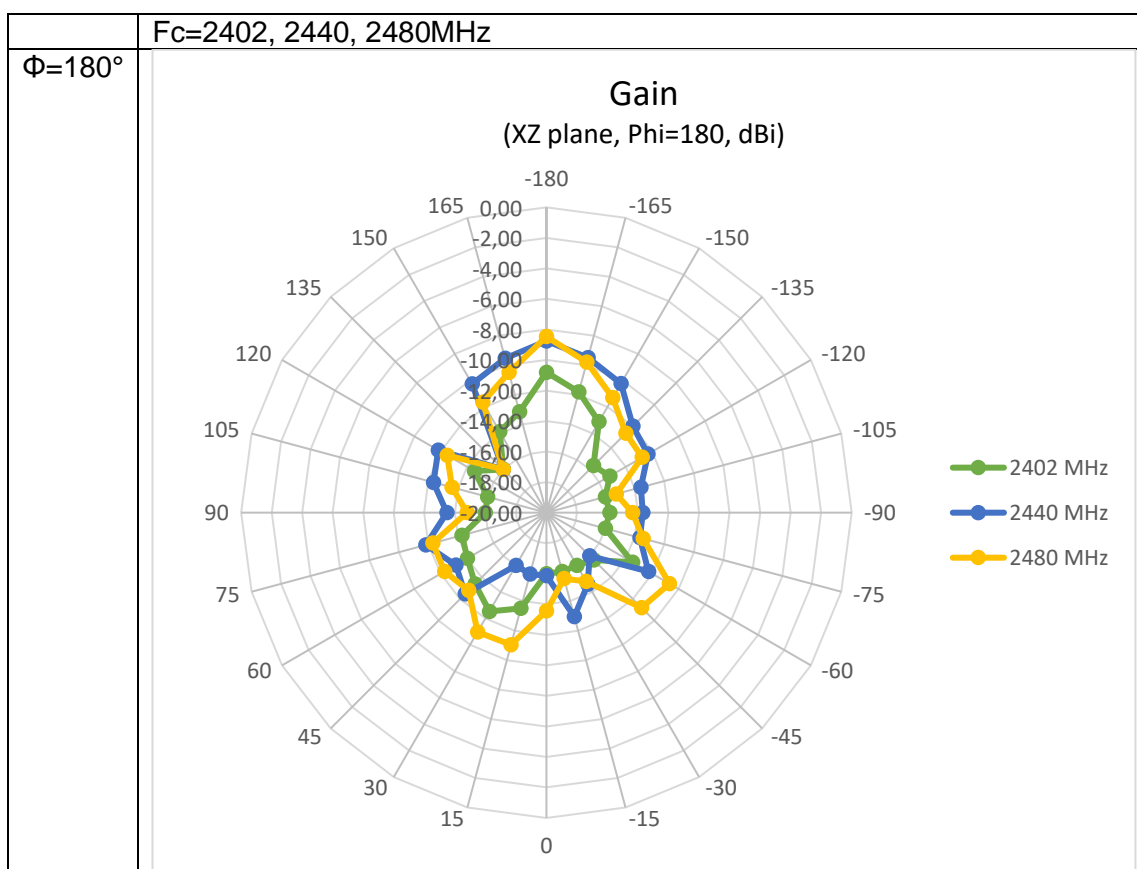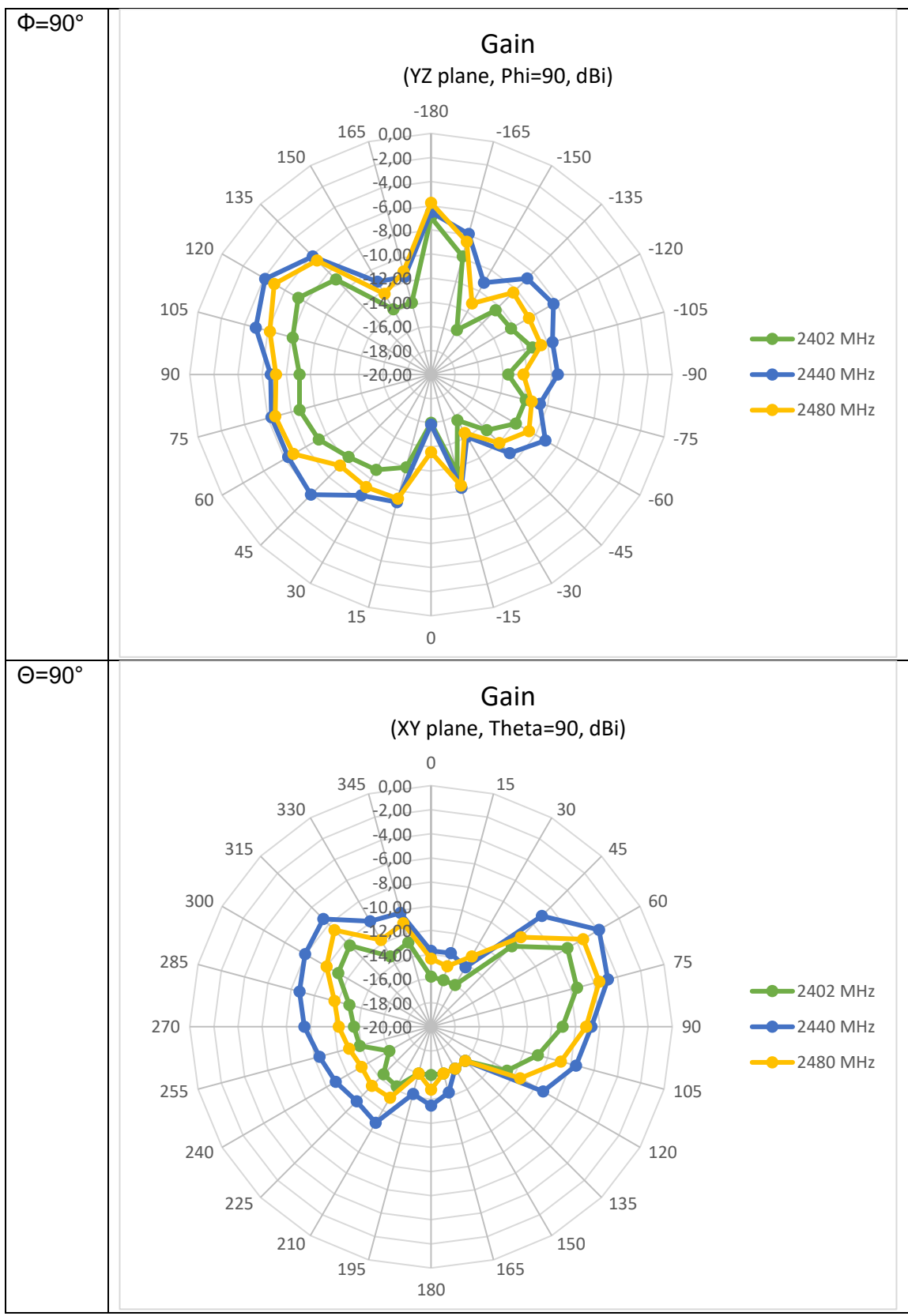Coordinate system in the ETS chamber:
Phi angle: Tower
Theta: Probe ring

x-axis points from the DUT towards the theta 90 probe. (left, when looking into the chamber)
y-axis points from the DUT to the door.
z-axis points upwards.

	Fc=2402, 2440, 2480MHz
Φ=180°	

Gain
(XZ plane, Phi=180, dBi)

- 2402 MHz
- 2440 MHz
- 2480 MHz

Φ=90°

Gain
(YZ plane, Phi=90, dBi)

Legend: 2402 MHz, 2440 MHz, 2480 MHz

Θ=90°

Gain
(XY plane, Theta=90, dBi)

Legend: 2402 MHz, 2440 MHz, 2480 MHz

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