Measurements performed by

Name	Title/Role & Function	Signature	Date
Morten Thougaard	Senior Antenna Engineer		2023-08-22

Approved by:

Name	Title/Role & Function	Signature	Date
Peter Spragge	Senior Project Manager		2023-08-22

Manufacturer	SBO Hearing A/S
Test facility	SBO Hearing A/S
Antenna	VEIIFA24
Antenna type	2.4GHz Internal IFA antenna

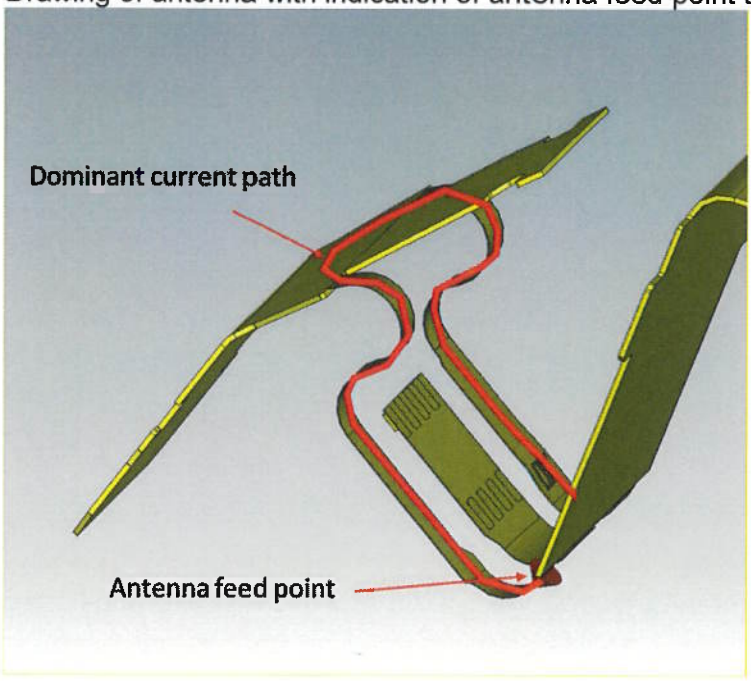
1 EUT Antenna specification and implementation

The radio system consists of the 2.4GHz transceiver VEAU5MNRR with the VEIIFA24 antenna.

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

Device serial number	B2ZH7L
Speaker unit	Minifit sense 100 R5
Antenna type	2.4GHz Internal IFA antenna
Operating frequency	2400MHz – 2483.5MHz
Interface impedance	50Ω

Drawing of antenna with indication of antenna feed point and dominant current path



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
Measurement Software	ETS-Lindgren EMQuest™ EMQ-100 Antenna Measurement Software

3 Gain and directivity

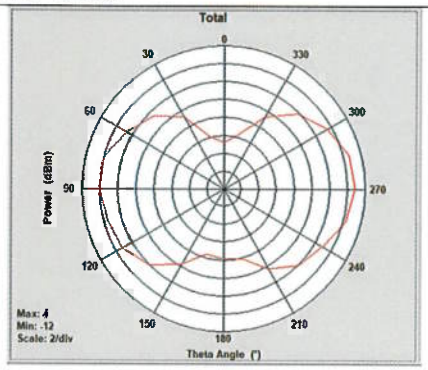
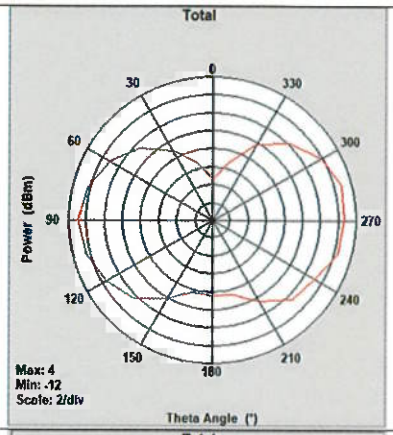
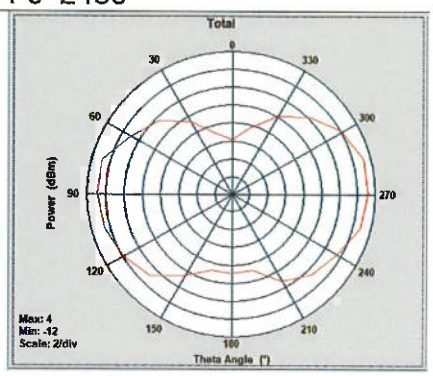
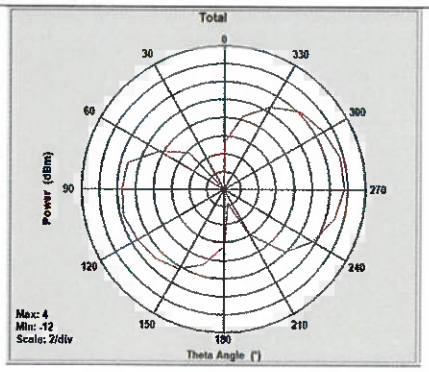
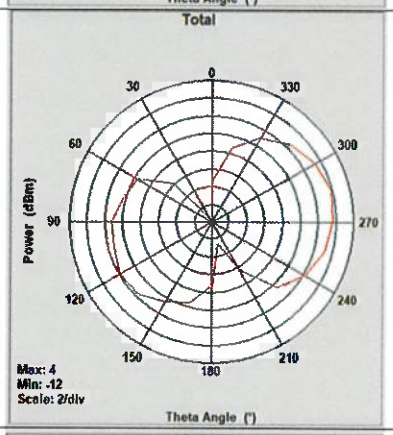
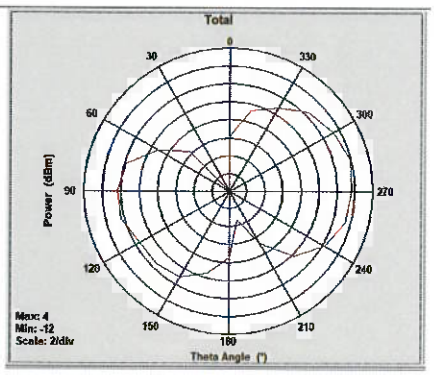
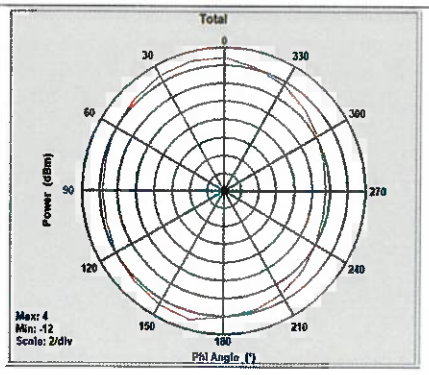
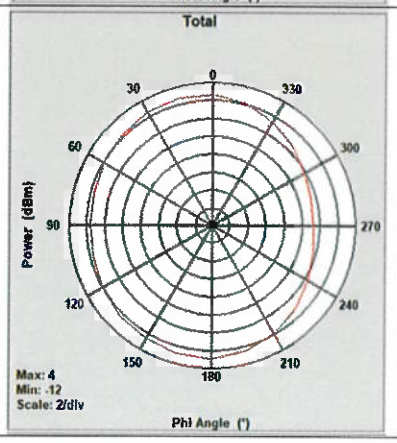
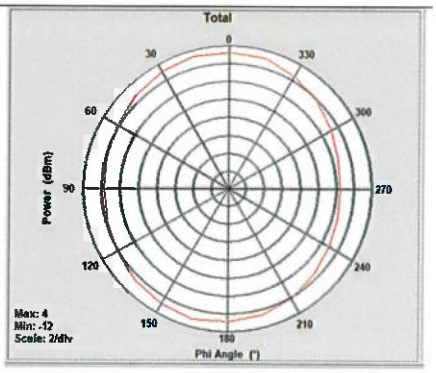
Antenna gain has been calculated as G = EIRP (dBm) – P_out (dBm), where G is antenna gain (dBi), EIRP is the Effective Isotropic Radiated Power and P_out is the measured conducted power at RF - antenna interface (50 Ohm). Gain numbers are listed for the worst-case speaker unit Length.

EUT #	Test state	Frequency (MHz)	Antenna gain (dB)	Directivity (dB)
1	Free space	2402	-4,14	2,88
1	Free space	2442	-4,92	2,55
1	Free space	2480	-3,93	2,64

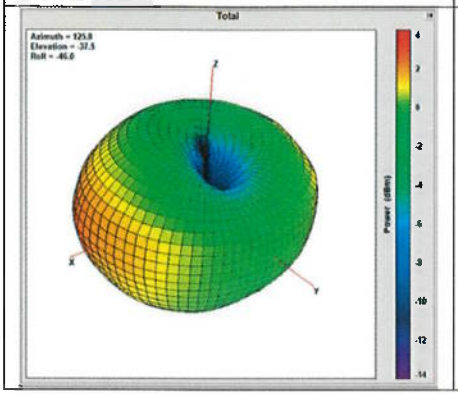
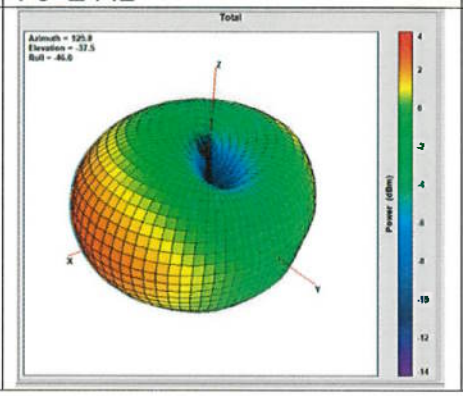
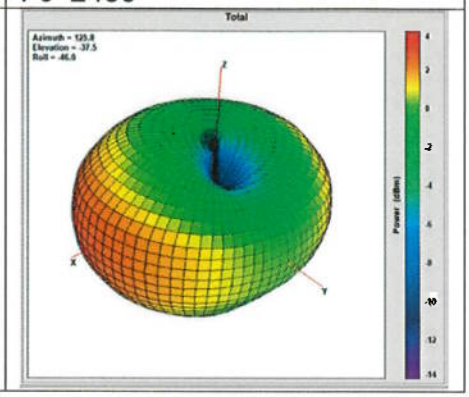
4 Radiation pattern 2D and 3D

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

4.1 2D patterns

	Fc=2402	Fc=2442	Fc=2480
Φ=0°			
Φ=90°			
Θ=90°			

4.2 3D pattern

Fc=2402	Fc=2442	Fc=2480
		

5 Appendix – Gain figures for shorter speaker unit

Gain numbers in this report are listed for the worst-case speaker unit. Speaker units come in different lengths, and while not a part of the antenna system, the speaker length does have a minor effect on the antenna gain. For this reason, gain figures are included here for the lowest gain speaker unit.

EUT #	Test state	Frequency (MHz)	Antenna gain (dB)	Directivity (dB)
1	Free space	2402	-4,3	2,9
1	Free space	2442	-5,7	2,5
1	Free space	2480	-4,9	2,4

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