

Test report No:
76170REM.002A1

Test report

**FCC Rules and Regulations CFR 47, Part 15, Subpart B and C(15.207)
(10-1-21 Edition) & ICES-003 Issue 7 (October 2020)**

(*) Identification of item tested	Noahlink Wireless 2, a hearing instrument programming interface.
(*) Trademark	Noahlink Wireless 2
(*) Model and /or type reference	CPD-2
Other identification of the product	FCC ID: 2AH4DCPD-2 IC: 21381-CPD2
(*) Features	Features: Bluetooth LE HW version: NLW2-PS SW version: Test FW w HCI
Manufacturer	HIMSA II K/S Lyngbyvej 28, 1. DK-2100 Copenhagen Ø, Denmark
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B and C (10-1-21 Edition) & ICES-003 Issue 7 (October 2020)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez EMC Consumer & RF Lab. Manager
Date of issue	2023-11-08
Report template No	FDT08_24 (*) "Data provided by the client"



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Acronyms

Acronym ID	Acronym Description
Code	EMC Test Code
Freq Rng	Frequency Range
Line	Conducted Emissions - Tested Line
MP	Measurement Point
OM	Operation Mode
S/	Sample
V	Verdict

Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory accredited by the National Accreditation Body (ENAC -Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification S.A.U. has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification S.A.U. at the time of performance of the test.

DEKRA Testing and Certification S.A.U. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification S.A.U.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

The total uncertainty of the measurement system for the measured conducted disturbance characteristics of EUT from 150 kHz to 30 MHz is $I = \pm 3,9$ dB for quasi-peak measurements, $I = \pm 3,2$ dB for peak measurements ($k = 2$).

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 30 MHz to 1000 MHz is $I = \pm 4,9$ dB for quasi-peak measurements, $I = \pm 4,6$ dB for peak measurements ($k = 2$).

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 1000 MHz to 12.75 GHz is $I = \pm 2,6$ dB for peak and average measurements ($k = 2$).

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample consists of a Noahlink Wireless 2, a hearing instrument programming interface. Noahlink Wireless 2 is a hearing instrument programming interface based on the Bluetooth Low Energy (BLE) standard.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial N°	Date of Reception	Application
S/01	76170B_1.1	Wireless	FW 3.5	2383000177	2023-07-03	Element Under Test
	76170B_2.1	USB Cable	--	--	2023-07-03	Element Under Test
S/02	76170B_1.1	Wireless	FW 3.5	2383000177	2023-07-03	Element Under Test
	76170B_2.1	USB Cable	--	--	2023-07-03	Element Under Test
	CTC-4667-U	Laptop	LATITUDE 5300	3510231410	N/A	Auxiliary Element
	CTC-4667-U	Power supply	LA65NM130	0G4X7T	N/A	Auxiliary Element
	MOU-7773-F	Mouse	MS116c	049PR0	N/A	Auxiliary Element

Notes referenced to samples during the project:

Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾		
	USB port		[X]	[]	[]		
			[]	[]	[]		
			[]	[]	[]		
			[]	[]	[]		
			[]	[]	[]		
Supplementary information to the ports..... :							
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[]	AC:	[]	[]	[]	[]	[]
	[]	AC:	[]	[]	[]	[]	[]
	[]	DC:					
	[X]	DC: 5 V					
Rated Power	USB powered max 100 mA						
Clock frequencies..... :							
Other parameters							
Software version	Test FW w HCI						
Hardware version	NLW2-PS						
Dimensions in cm (W x H x D)							
Mounting position	[X]	Table top equipment					
	[]	Wall/Ceiling mounted equipment					
	[]	Floor standing equipment					
	[]	Hand-held equipment					
	[]	Other:					

Modules/parts.....:	Module/parts of test item	Type	Manufacturer
	Noahlink Wireless	Test unit	HIMSA
			
			
			
Accessories (not part of the test item)	Description	Type	Manufacturer
	USB-C Cable	cable	(HIMSA)
			
			
			
			
			
Documents as provided by the applicant	Description	File name	Issue date
			
			
			
			

(3) Only for Medical Equipment

Identification of the client

HIMSA II K/S
Lyngbyvej 28, 1. DK-2100 Copenhagen Ø, Denmark

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2023-07-10
Date (finish)	2023-08-30

Document history

Report number	Date	Description
76170REM.002	2023-09-19	First release
76170REM.002A1	2023-11-08	Modification 1. The “FCC ID: 2AH4D-CPD2” is replaced by “FCC ID: 2AH4DCPD-2”. This report cancels and replaces report 76170REM.002.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860mbar Max. = 1060mbar

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860mbar Max. = 1060mbar

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 60 %
Air pressure	Min. = 860mbar Max. = 1060mbar

Remarks and comments

The tests have been performed by the technical personnel: Victoria Olmedo Villalba.

Testing verdicts

Fail	F
Inconclusive	I
Not applicable	N/A
Not measured	N/M
Pass	P
Partial Passed	P*

List of equipment used during the test

Control No.	Equipment	Model	Manufacturer	Next Calibration
7822	EMC SOFTWARE	RADIMATION	DARE INSTRUMENTS	--
7853	EMI RECEIVER 10Hz-30MHz	PMM 9010F	NARDA	2023-12-03
4523	EMI TEST RECEIVER 20Hz-26.5GHz	ESU26	ROHDE AND SCHWARZ	2023-11-05
5862	EMI TEST RECEIVER 9kHz-7GHz	ESR7	ROHDE AND SCHWARZ	2025-02-15
8165	GROUNDING PLANE LAB-3	-	--	--
7763	HORN ANTENNA 1-18GHz	BBHA 9120D	SCHWARZBECK MESS-ELEKTRONIK	2026-01-16
2932	HYBRID BILOG ANTENNA 30MHz-6GHz	JB6	SUNOL SCIENCES CORPORATION	2023-10-29
7769	PREAMPLIFIER 30dB 500MHz-18GHz	BBV 9718 C	SCHWARZBECK	2024-02-15
8130	SEMIANECHOIC ABSORBER LINED CHAMBER	P29419	ALBATROSS	--
8134	SHIELDED ROOM	P29419	ALBATROSS PROJECTS GMBH	--
4848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	--
7549	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2024-05-02
7550	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2024-05-02

Control No.	Equipment	Model	Manufacturer	Next Calibration
7551	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2024-05-02
7859	THREE-PHASE ARTIFICIAL NETWORK 32A	PMM L3-32	NARDA	2024-02-01

Summary

Test Specification	Requirement – Test case	Verdict	Remark
FCC CFR 47, Part 15, Subpart B (10-1-21 Edition) & ICES-003 Issue 7 (October 2020)	RE Radiated emission. Electromagnetic field measure	P	(1)
FCC CFR 47, Part 15, Subpart C (15.207) (10-1-21 Edition)	CE Continuous conducted emission	P	(2)
<u>Supplementary information and remarks:</u> (1) Range: $f > 12.75$ GHz. Test required only to the 5th harmonics of the maximum internal work frequency in the EUT. (2) According to Subpart C (15.207), this test is applicable for an intentional radiator that is designed to be connected to the public utility (AC) power line.			

Appendix A: Test results

Appendix A content

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Description of the operation modes

The operation modes described in this paragraph constitute a functionality of the sample under test for itself.
The operation modes used by the samples to which the present report refers, are shown in the following table:

Id	Description
OM/01	EUT ON. Bluetooth Low Energy OFF. Power supply: 5 Vdc.
OM/02	EUT ON. Bluetooth Low Energy OFF. Device in communication mode via USB. Power supply: 115 Vac.
OM/03	EUT ON. Bluetooth Low Energy ON without communications established. Device in communication mode via USB. Power supply: 115 Vac.
OM/04	EUT ON. Bluetooth Low Energy ON with communications established. Device in communication mode via USB. Power supply: 115 Vac.

Test standards version applied

The product standards and test standards applied for each test cases are shown in the following table:

Product Test Standard	Test standard	Requirement – Test case
FCC CFR 47, Part 15, Subpart B (10-1-21 Edition) & ICES-003 Issue 7 (October 2020)	ANSI C63.4 (2014)	RE Radiated emission.
FCC CFR 47, Part 15, Subpart C (15.207) (10-1-21 Edition)	ANSI C63.4 (2014)	CE Continuous conducted emission

Test Cases Details

CE Continuous conducted emission

Limits

Limits of interference Class B

The applied limit for continuous conducted emissions in power leads, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B and C (10-1-21 Edition), Secs. 15.107 and 15.207 & ICES-003 Issue 7 (October 2020), in the frequency range 0,15 to 30 MHz, for Class B equipment was:

Frequency range (MHz)	Limit (dBμV)	
	Quasi-Peak	Average
0,15 to 0,5	66 – 56*	56 – 46*
0,5 to 5	56	46
5 to 30	60	50

*Decreases with the logarithm of the frequency.

Results

S/	OM	Code	Freq Rng (MHz)	Line	V
02	OM/03	CE02030N	[0.15, 30]	N	P
02	OM/03	CE0203L1	[0.15, 30]	L1	P
02	OM/04	CE02040N	[0.15, 30]	N	P
02	OM/04	CE0204L1	[0.15, 30]	L1	P

Verdict

Pass

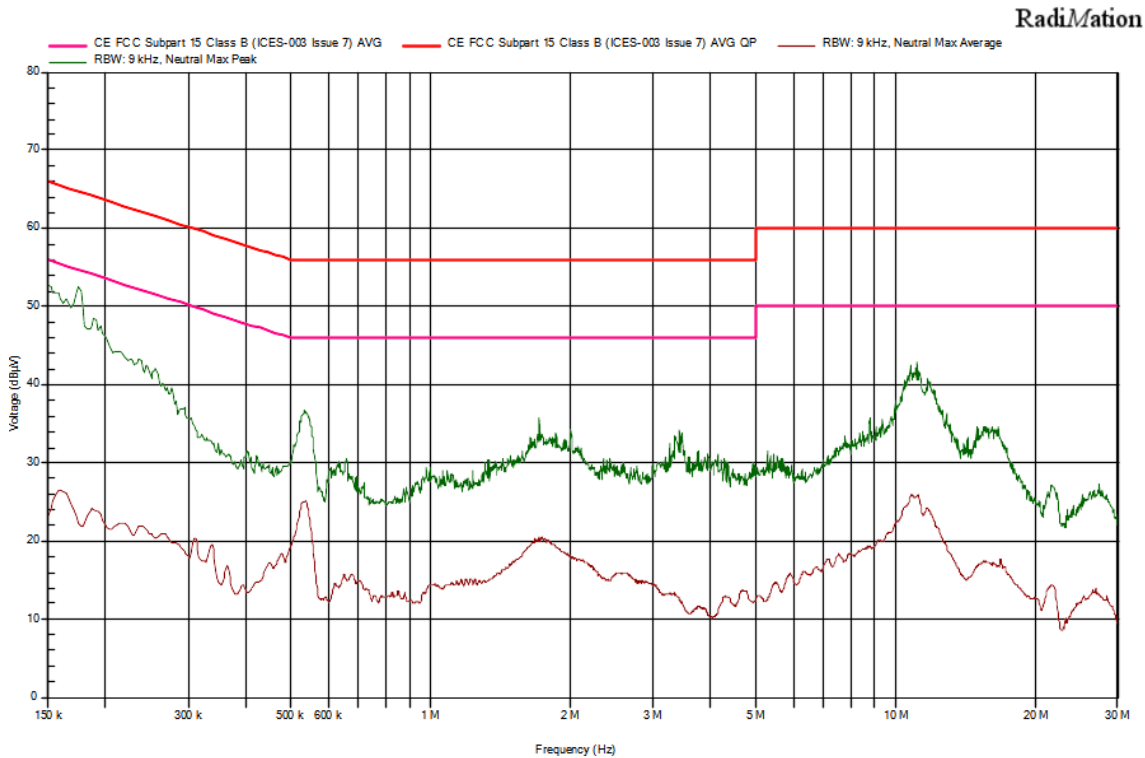
Attachments

EMC Test Code = CE02030N Frequency Range MHz = [0.15, 30]
Conducted Emissions - Tested Line = N

Sample ID: S/02

Operation Mode: OM/03. EUT ON. Bluetooth Low Energy ON without communications established. Device in communication mode via USB. Power supply: 115 Vac.

Images:



Tables:

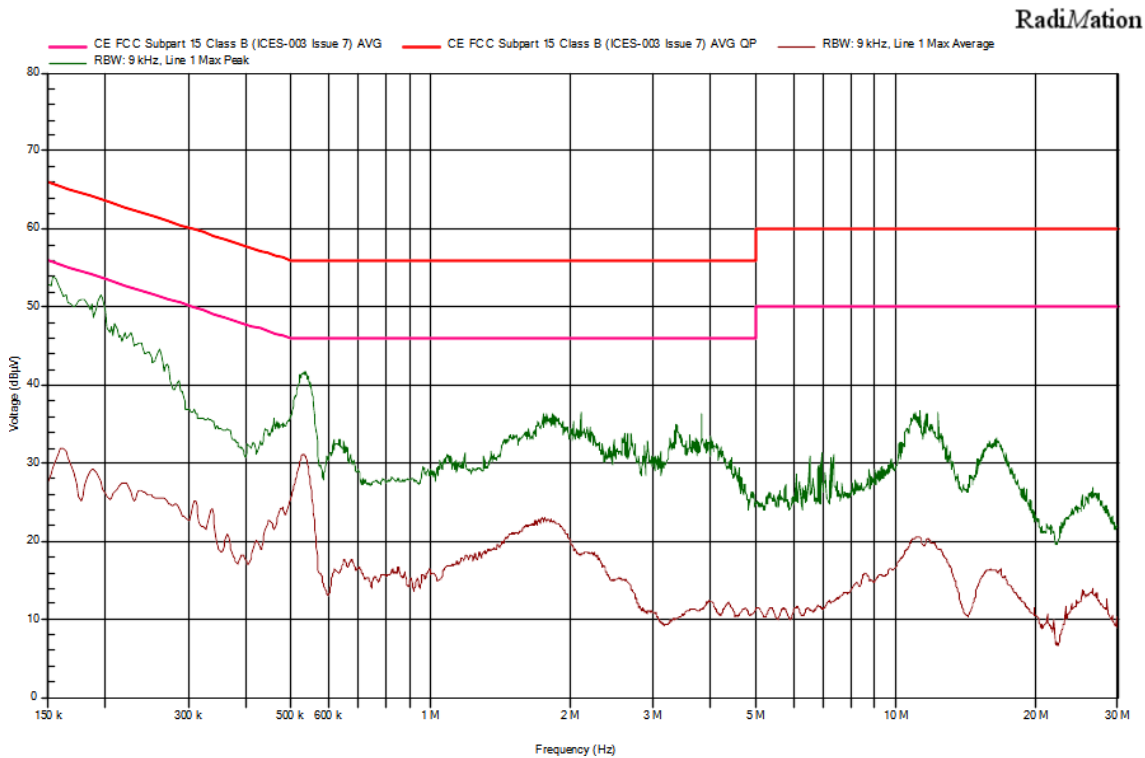
Frequency(MHz)	Average(dBµV)	Peak(dBµV)	Line
0,15 MHz	23,1 dBµV	52,7 dBµV	N
0,534 MHz	25,1 dBµV	36,8 dBµV	N
1,71 MHz	19,9 dBµV	35,8 dBµV	N
1,731 MHz	20,4 dBµV	33,7 dBµV	N
3,417 MHz	12,3 dBµV	34,1 dBµV	N
3,751 MHz	11,4 dBµV	31,5 dBµV	N
8,779 MHz	18,9 dBµV	35,8 dBµV	N
11,081 MHz	25,6 dBµV	42,8 dBµV	N
11,69 MHz	24 dBµV	39,9 dBµV	N
14,919 MHz	16,3 dBµV	34,6 dBµV	N

EMC Test Code = CE0203L1 Frequency Range MHz = [0.15, 30]
Conducted Emissions - Tested Line = L1

Sample ID: S/02

Operation Mode: OM/03. EUT ON. Bluetooth Low Energy ON without communications established. Device in communication mode via USB. Power supply: 115 Vac.

Images:



Tables:

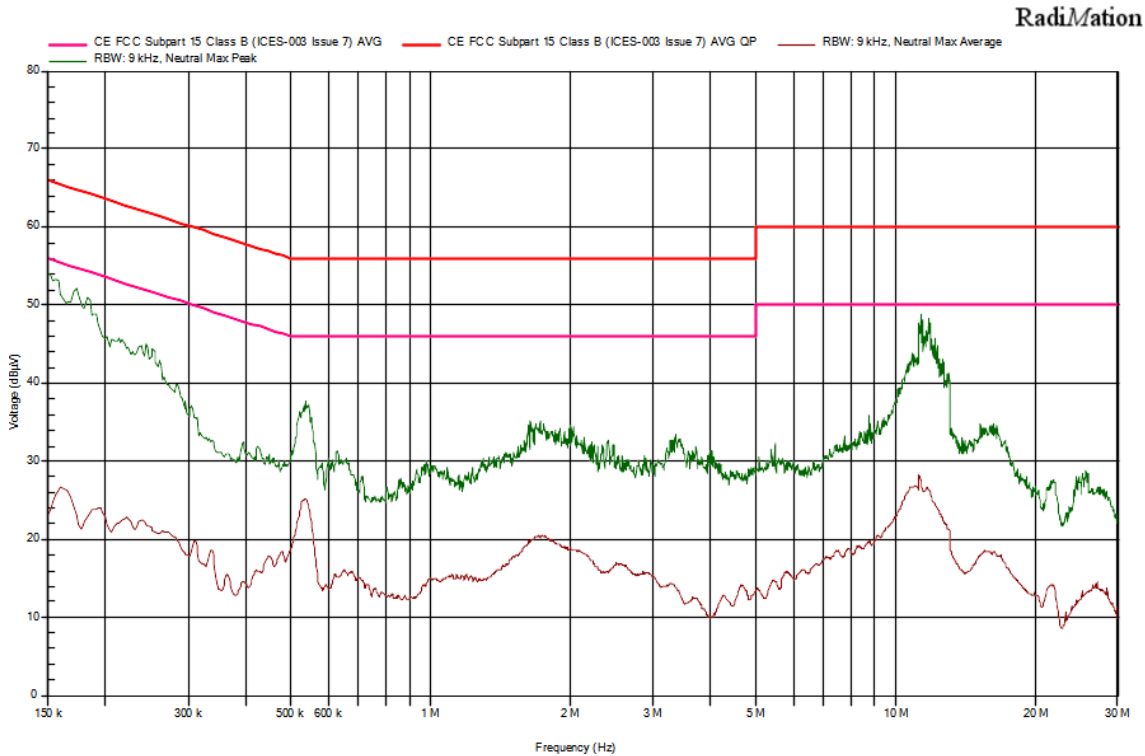
Frequency(MHz)	Average(dBµV)	Peak(dBµV)	Line
0,154 MHz	29,5 dBµV	53,9 dBµV	L1
0,534 MHz	31 dBµV	41,7 dBµV	L1
0,635 MHz	15,9 dBµV	33,1 dBµV	L1
1,823 MHz	22,2 dBµV	36,4 dBµV	L1
2,097 MHz	18,1 dBµV	36,5 dBµV	L1
2,604 MHz	14,9 dBµV	33,8 dBµV	L1
2,698 MHz	13,7 dBµV	33,4 dBµV	L1
2,923 MHz	10,7 dBµV	32,9 dBµV	L1
3,379 MHz	10,1 dBµV	35 dBµV	L1
3,812 MHz	11,1 dBµV	36,4 dBµV	L1

EMC Test Code = CE02040N Frequency Range MHz = [0.15, 30]
Conducted Emissions - Tested Line = N

Sample ID: S/02

Operation Mode: OM/04. EUT ON. Bluetooth Low Energy ON with communications established. Device in communication mode via USB. Power supply: 115 Vac.

Images:



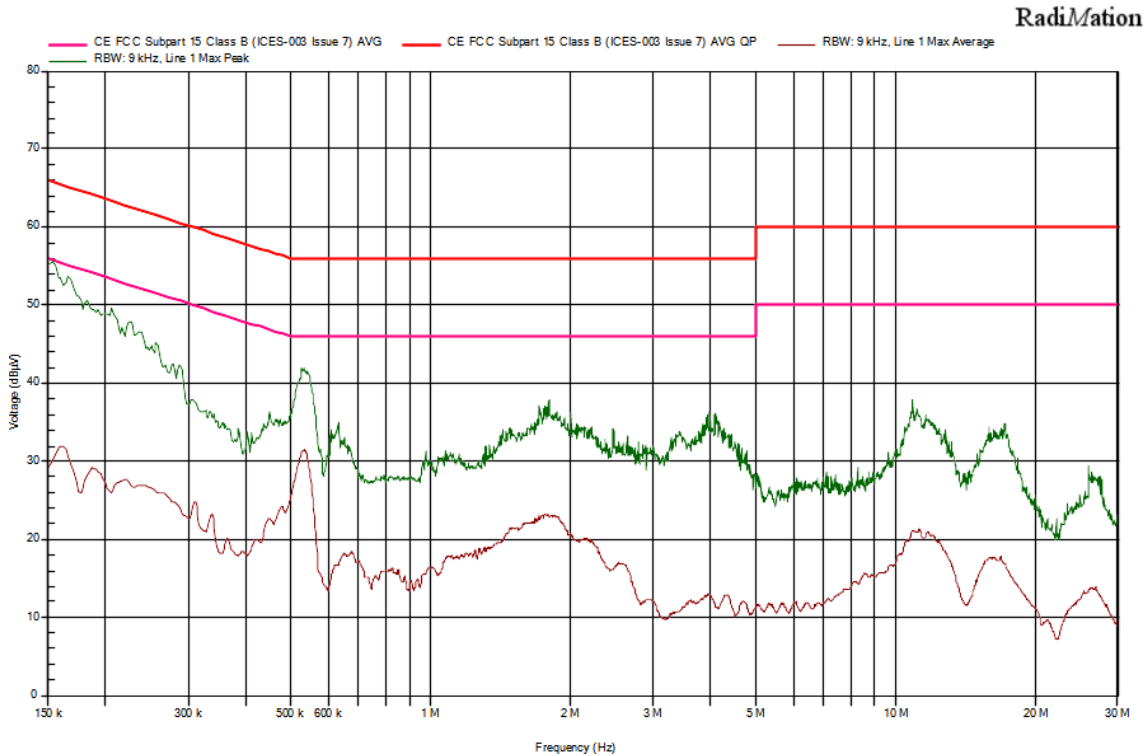
Tables:

Frequency(MHz)	Average(dBµV)	Peak(dBµV)	Line
0,15 MHz	23,3 dBµV	54,1 dBµV	N
0,536 MHz	25,1 dBµV	37,7 dBµV	N
1,716 MHz	20,1 dBµV	35,2 dBµV	N
2,342 MHz	15,6 dBµV	32,2 dBµV	N
2,401 MHz	15,7 dBµV	32,6 dBµV	N
3,348 MHz	13,7 dBµV	33,1 dBµV	N
8,746 MHz	19,4 dBµV	36 dBµV	N
11,296 MHz	27,1 dBµV	48,8 dBµV	N
11,719 MHz	26,1 dBµV	48 dBµV	N
12,984 MHz	20,7 dBµV	41,3 dBµV	N

EMC Test Code = CE0204L1 Frequency Range MHz = [0.15, 30]
Conducted Emissions - Tested Line = L1

Sample ID: S/02
Operation Mode: OM/04. EUT ON. Bluetooth Low Energy ON with communications established. Device in communication mode via USB. Power supply: 115 Vac.

Images:



Tables:

Frequency(MHz)	Average(dBµV)	Peak(dBµV)	Line
0,15 MHz	29,2 dBµV	55,2 dBµV	L1
0,532 MHz	31,4 dBµV	41,9 dBµV	L1
0,63 MHz	16,7 dBµV	35 dBµV	L1
1,792 MHz	22,9 dBµV	37,9 dBµV	L1
2,465 MHz	16 dBµV	33,8 dBµV	L1
3,413 MHz	10,5 dBµV	33,9 dBµV	L1
3,974 MHz	12,6 dBµV	35,2 dBµV	L1
4,094 MHz	11 dBµV	36,1 dBµV	L1
4,567 MHz	10,4 dBµV	32,4 dBµV	L1
10,84 MHz	20,8 dBµV	37,9 dBµV	L1

RE Radiated emission. Electromagnetic field measure

Limits

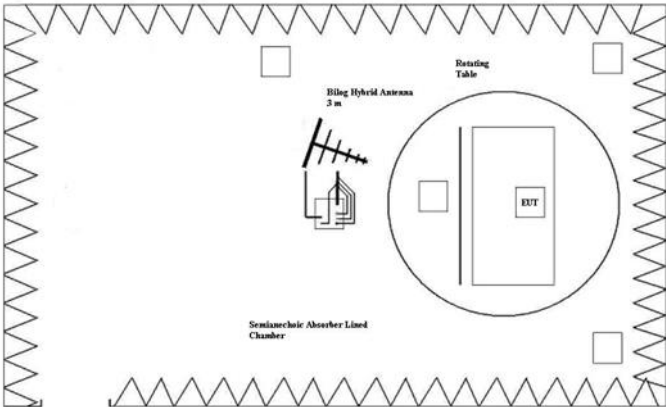
Limits of interference Class B

The applied limit for radiated emissions, 3 m distance, according to the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-21 Edition), Secs. 15.109 & ICES-003 Issue 7 (October 2020)

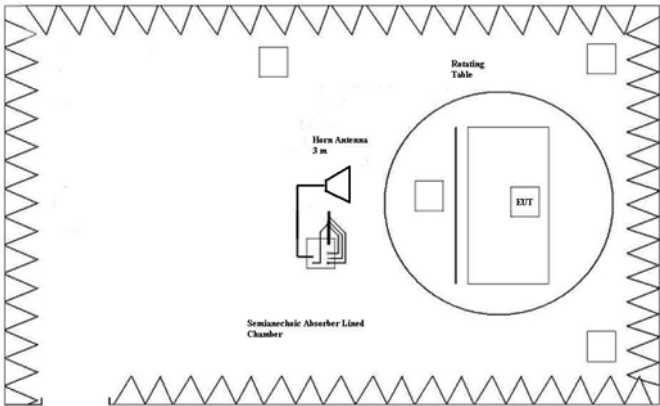
Frequency range (MHz)	FCC Part 15B		ICES-003 Issue 7		FCC Part 15B & ICES-003 Issue 7	
	QP Limit for 3 m		QP Limit for 3 m		PK Limit for 3 m	AVG Limit for 3 m
	(µV/m)	(dBµV/m)	(µV/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)
30 to 88	100	40	100	40	---	---
88 to 216	150	43.5	150	43.5	---	---
216 to 230	200	46	200	46	---	---
230 to 960	200	46	224	47		
960 to 1000	500	54	500	54	---	---
Above 1000	---	---	---	---	74	54

Limits according to FCC Part 15B, are equal or more stringent than those of ICES-003 Issue 7.

Setup for measurements



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

Results

S/	OM	Code	Freq Rng (MHz)	V
01	OM/01	RE0101LR	[30, 1000]	P
01	OM/01	RE0101HR	[1000, 12750]	P
02	OM/02	RE0202LR	[30, 1000]	P
02	OM/02	RE0202HR	[1000, 12750]	P

Verdict

Pass

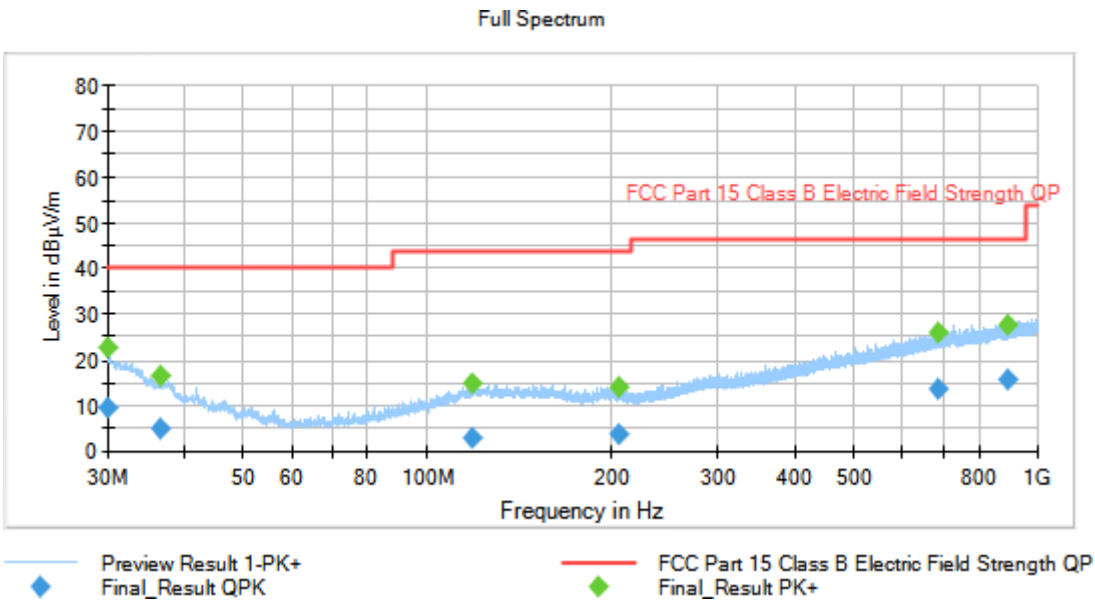
Attachments

EMC Test Code = RE0101LR Frequency Range MHz = [30, 1000]

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Bluetooth Low Energy OFF. Power supply: 5 Vdc.

Images:



Tables:

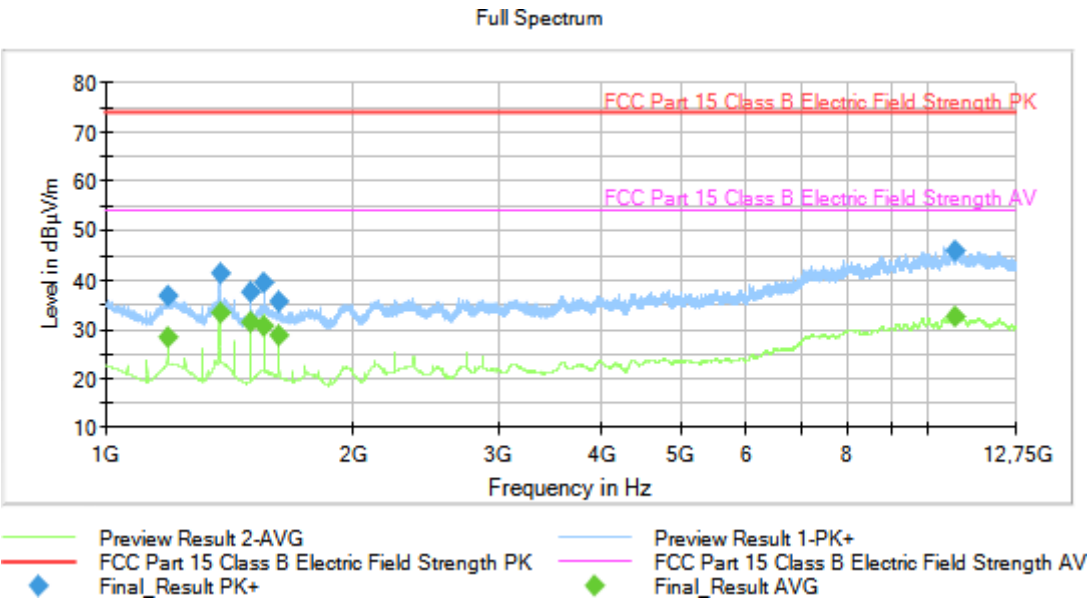
Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	Pol	Azimuth(deg)
30.053040	---	22.59	---	---	337.0	V	62.0
30.053040	9.53	---	40.00	30.47	337.0	V	62.0
36.578000	---	16.54	---	---	262.0	H	106.0
36.578000	4.75	---	40.00	35.25	262.0	H	106.0
118.518000	---	14.95	---	---	173.0	H	213.0
118.518000	2.70	---	43.52	40.82	173.0	H	213.0
206.317000	3.62	---	43.52	39.90	182.0	V	197.0
206.317000	---	14.21	---	---	182.0	V	197.0
686.185000	13.48	---	46.00	32.52	182.0	H	238.0
686.185000	---	25.78	---	---	182.0	H	238.0
895.176000	---	27.60	---	---	156.0	H	323.0
895.176000	15.52	---	46.00	30.48	156.0	H	323.0

EMC Test Code = RE0101HR Frequency Range MHz = [1000, 12750]

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Bluetooth Low Energy OFF. Power supply: 5 Vdc.

Images:



Tables:

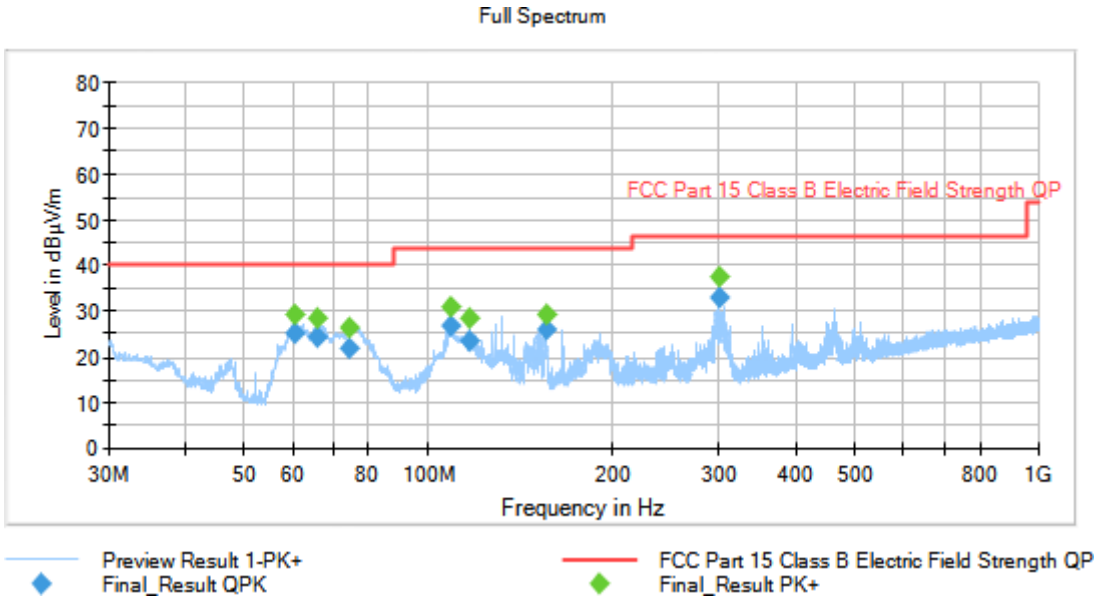
Frequency (MHz)	MaxPeak (dBµV/m)	Average(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	Pol	Azimuth(deg)
1187.760000	---	28.49	53.97	26.48	176.0	H	333.0
1187.760000	36.90	---	73.97	37.07	176.0	H	333.0
1375.440000	41.25	---	73.97	34.72	226.0	H	152.0
1375.440000	---	33.23	53.97	24.74	226.0	H	152.0
1500.220000	37.53	---	73.97	36.44	237.0	H	104.0
1500.220000	---	31.51	53.97	22.46	237.0	H	104.0
1559.420000	39.32	---	73.97	40.65	120.0	H	148.0
1559.420000	---	30.72	53.97	34.25	120.0	H	148.0
1625.460000	35.73	---	73.97	39.24	309.0	H	24.0
1625.460000	---	28.87	53.97	29.10	309.0	H	24.0
10760.400000	---	32.56	53.97	21.41	100.0	V	331.0
10760.400000	46.03	---	73.97	27.94	100.0	V	331.0

EMC Test Code = RE0202LR Frequency Range MHz = [30, 1000]

Sample ID: S/02

Operation Mode: OM/02. EUT ON. Bluetooth Low Energy OFF. Device in communication mode via USB. Power supply: 115 Vac.

Images:



Tables:

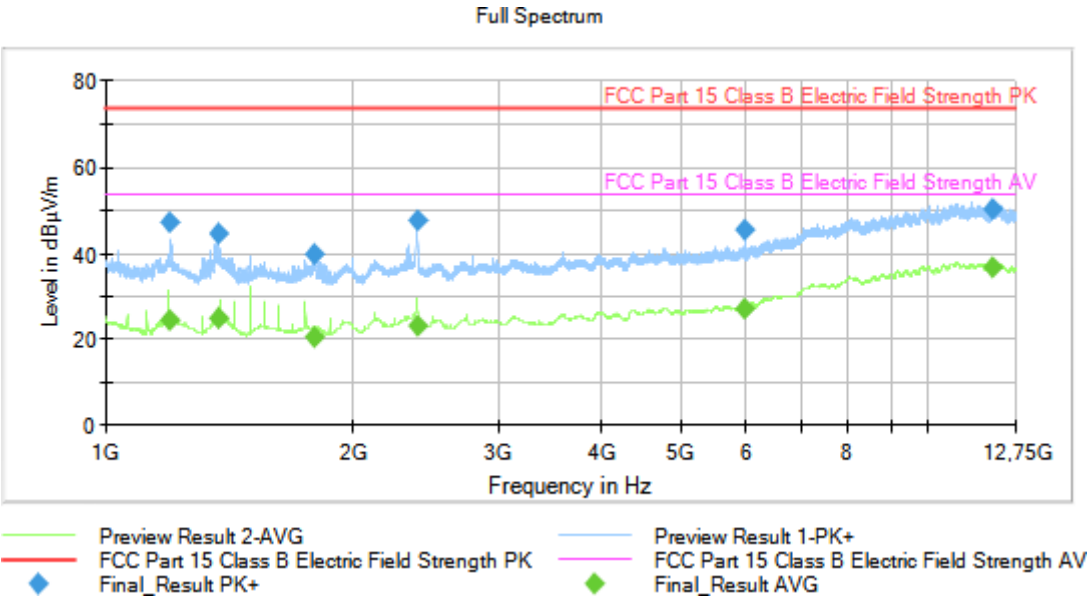
Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	Pol	Azimuth(deg)
60.394000	25.27	---	40.00	14.73	120.0	V	314.0
60.394000	---	29.18	---	---	120.0	V	314.0
66.001000	24.22	---	40.00	15.78	136.0	V	259.0
66.001000	---	28.48	---	---	136.0	V	259.0
74.331000	---	26.58	---	---	122.0	V	22.0
74.331000	22.04	---	40.00	17.96	122.0	V	22.0
108.877000	26.63	---	43.52	16.89	284.0	H	165.0
108.877000	---	31.05	---	---	284.0	H	165.0
116.934000	23.48	---	43.52	20.04	252.0	H	286.0
116.934000	---	28.35	---	---	252.0	H	286.0
156.011000	25.93	---	43.52	17.59	241.0	H	102.0
156.011000	---	29.37	---	---	241.0	H	102.0
300.119000	33.10	---	46.00	12.90	100.0	H	94.0
300.119000	---	37.53	---	---	100.0	H	94.0

EMC Test Code = RE0202HR Frequency Range MHz = [1000, 12750]

Sample ID: S/02

Operation Mode: OM/02. EUT ON. Bluetooth Low Energy OFF. Device in communication mode via USB. Power supply: 115 Vac.

Images:



Tables:

Frequency (MHz)	MaxPeak (dBµV/m)	Average(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	Pol	Azimuth(deg)
1194.400000	47.32	---	73.97	26.65	248.0	V	41.0
1194.400000	---	24.42	53.97	29.55	248.0	V	41.0
1367.940000	44.52	---	73.97	29.45	104.0	H	191.0
1367.940000	---	24.99	53.97	28.98	104.0	H	191.0
1793.260000	---	20.75	53.97	33.22	109.0	V	4.0
1793.260000	39.92	---	73.97	34.05	109.0	V	4.0
2395.260000	---	23.20	53.97	30.77	108.0	V	184.0
2395.260000	47.60	---	73.97	26.37	108.0	V	184.0
5978.020000	---	27.17	53.97	26.80	138.0	V	344.0
5978.020000	45.50	---	73.97	28.47	138.0	V	344.0
11963.040000	---	36.92	53.97	17.05	138.0	V	76.0
11963.040000	50.39	---	73.97	23.58	138.0	V	76.0