DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
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C.I.F. A29 507 456

Test report No:
NIE: 67729REM.002A1

ISED CABid: ES1909

Test report

FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020)

(*) Identification of item tested	Sports watch with GPS and BLE connectivity
(*) Trademark	SUUNTO
(*) Model and /or type reference	Model number: OW202
Other identification of the product	FCC ID: RYP2652 IC: 5175A-2652 HW version: C4 SW version: 2.16
(*) Features	GNSS, BLE
Manufacturer	Suunto Oy Tammiston kauppatie 7A, 01510 Vantaa, Finland
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López Martín EMC Consumer & RF Lab. Manager 2021.07.15 12:46:26 +02'00'
Date of issue	2021-07-15
Report template No	FDT08_23 (*) “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
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.

DEKRA Testing and Certification is a FCC-recognized accredited testing laboratory with appropriate scope of accreditation that covers the performed tests in this report.

DEKRA Testing and Certification is an ISED-recognized accredited testing laboratory, CABid: ES1909, with the appropriate scope of accreditation that covers the performed tests in this report.

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.
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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 = ± 3,9 dB for quasi-peak measurements, I = ± 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 = ± 4,9 dB for quasi-peak measurements, I = ± 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 = ± 2,6 dB for peaks 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 sports watch with GPS for tracking outdoor trainings, optical heart rate measurement and BLE connectivity to connect with a smart phone and the Suunto App for recording training logs and analyze training and 24/7 data.

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 Nº	Date of Reception	Application
S/01	67729B_1.1	Smart watch (commercial)	RUFFE B2.5 C4A	021171200156	2021-05-19	Element Under Test
S/01	67729B_17.1	AC/DC adapter	PSAI05R-050Q	--	2021-05-19	Auxiliary Element

Notes referenced to samples during the project.

Test sample description

Test Sample description (compulsory information for EMC and RF testing services

Ports…… :	Port name and description	Cable			
		Specified max length [m]	Attached during test	Shielded	Coupled to patient(3)
	.....	.....	[ ]	[ ]	[ ]
	.....	.....	[ ]	[ ]	[ ]
	.....	.....	[ ]	[ ]	[ ]
	.....	.....	[ ]	[ ]	[ ]
	.....	.....	[ ]	[ ]	[ ]
	.....	.....	[ ]	[ ]	[ ]
Supplementary information to the ports…… :	.....				

Rated power supply .....:	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[ ]	AC:	[ ]	[ ]	[ ]	[ ]	[ ]
	[ ]	AC:	[ ]	[ ]	[ ]	[ ]	[ ]
	[X]	DC: 5Vdc (Internal Battery)					
	[ ]	DC:					
Rated Power .....:	.....						
Clock frequencies.....:	.....						
Other parameters .....:	.....						
Software version .....:	2.16						
Hardware version .....:	C4						
Dimensions in cm (W x H x D) ....:	.....						

Mounting position .....:	[ ]	Table top equipment		
	[ ]	Wall/Ceiling mounted equipment		
	[ ]	Floor standing equipment		
	[ ]	Hand-held equipment		
	[X]	Other: Wearable		
Modules/parts.....:	Module/parts of test item		Type	Manufacturer
	Sports watch		OW202	Suunto
	.....		.....	.....
	.....		.....	.....
	.....		.....	.....
Accessories (not part of the test item) .....:	Description		Type	Manufacturer
	Charging cable (USB)		.....	Suunto
	.....		.....	.....
	.....		.....	.....
	.....		.....	.....
	.....		.....	.....
	.....		.....	.....
Documents as provided by the applicant.....:	Description		File name	Issue date
	.....		.....	.....
	.....		.....	.....
	.....		.....	.....
	.....		.....	.....

(3) Only for Medical Equipment

Identification of the client

Suunto Oy
Tammiston kauppatie 7A,
01510 Vantaa,
Finland.

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2021-05-26
Date (finish)	2021-06-14

Document history

Report number	Date	Description
67729REM.002	2021-06-21	First release
67729REM.002A1	2021-07-15	Second release due to complete missing information. This modification test report cancels and replaces the test report 67729REM.002.

Environmental conditions

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

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

Remarks and comments

The tests have been performed by the technical personnel: Beatriz Cabello De Alba Bujalance and Raul Alfaya Ruiz.

Testing verdicts

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

List of equipment used during the test

Control No.	Equipment	Model	Manufacturer	Next Calibration
6666	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2022-02-05
7743	HORN ANTENNA 0,75-18GHz	3115	ETS LINDGREN	2023-08-24
6815	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2022-02-01
6196	PRE-AMPLIFIER G>55dB 1-18GHz	AMF-7D-01001800-22-10P	NARDA	2022-02-25
6204	THREE-PHASE ARTIFICIAL NETWORK 32A	PMM L3-32	NARDA	2021-07-29
5151	TRANSIENT LIMITER	VTSD 9561-F	SCHWARZBECK	2021-10-02
1935	EMI TEST RECEIVER	ESPI3	ROHDE AND SCHWARZ	2022-02-05

Summary

Test Specification.	Requirement – Test case	Verdict	Remark
FCC 47 CFR Part 15B	CE Continuous conducted emission	Pass	---
FCC 47 CFR Part 15B	RE Radiated emission. Electromagnetic field measure	Pass	---
Supplementary information and remarks: None			

Appendix A: Test results

Appendix A context

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TEST CASES DETAILS 16

Description of the operation modes

The operation modes described in this paragraph constitute a functionality of the sample under test for itself. Every operation mode takes a failure criteria for the immunity test that they were applying to it and a monitoring to guarantee performance of the same ones.

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. Airplane mode activated. Charging battery via usb. Power supply: Internal battery 5 Vdc.
OM/02	EUT ON. Airplane mode activated. Charging battery & transferring data via USB. Power supply: 115Vac
OM/03	EUT ON. Bluetooth connected & GPS receiving valid positioning signal. Charging battery & transferring data via USB, USB. Power supply: 115Vac

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 (10-1-19 Edition) & ICES-003 Issue 7 (October 2020)	ANSI C63.4 (2014)	RE Radiated emission.
FCC CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020)	ANSI C63.4 (2014)	CE Continuous conducted emission

Test Cases Details

FCC 47 CFR Part 15B

CE Continuous conducted emission

Limits

Limits for antenna power conduction for receivers according to FCC Part 15 subpart 15.111:

Frequency range of emission (MHz)	Limit QuasiPeak (dBuV)
30-1000	50

Frequency range of emission (MHz)	Limit (dBuV) Average	Limit (dBuV) Peak
1000-10000	50	70

Limits for antenna power conduction for receivers according to ICES-003 Issue 7:

Frequency range of emission (MHz)	Limit (dBuV) QuasiPeak
30-1000	50

Frequency range of emission (MHz)	Limit (dBuV) Average	Limit (dBuV) Peak
1000-10000	54	74

Results

S/	OM	Code	Freq Rng (MHz)	Line	Comments	V
01	OM/02	CE0101L1	[0.15, 30]	L1	Ok, no fails detected.	P
01	OM/02	CE0101N	[0.15, 30]	N	Ok, no fails detected.	P
01	OM/03	CE0101L1	[0.15, 30]	L1	Ok, no fails detected.	P
01	OM/03	CE0101N	[0.15, 30]	N	Ok, no fails detected.	P

Verdict

Pass

Attachments

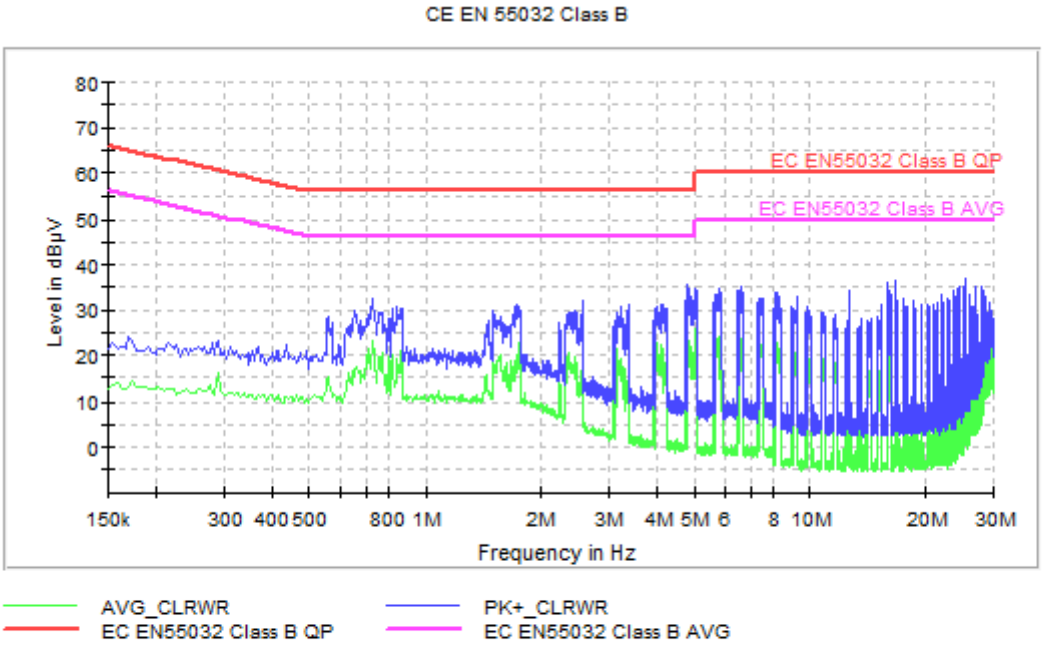
EMC Test Code = CE0102L1, Frequency Range MHz = [0.15, 30], Conducted Emissions - Tested Line = L1

Sample ID: S/01

Operation Mode: OM/02. EUT ON. Airplane mode activated. Charging battery & transferring data via USB.

Power supply: 115Vac

Images:



Documents:

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)
0.170000	24.1	13.0
0.290000	23.3	15.9
0.730000	32.4	22.6
0.838000	31.1	18.8
1.722000	31.2	20.0
2.554000	32.1	19.9
4.810000	35.3	22.8
6.618000	35.1	22.5
16.654000	36.6	23.6
25.422000	37.2	20.6

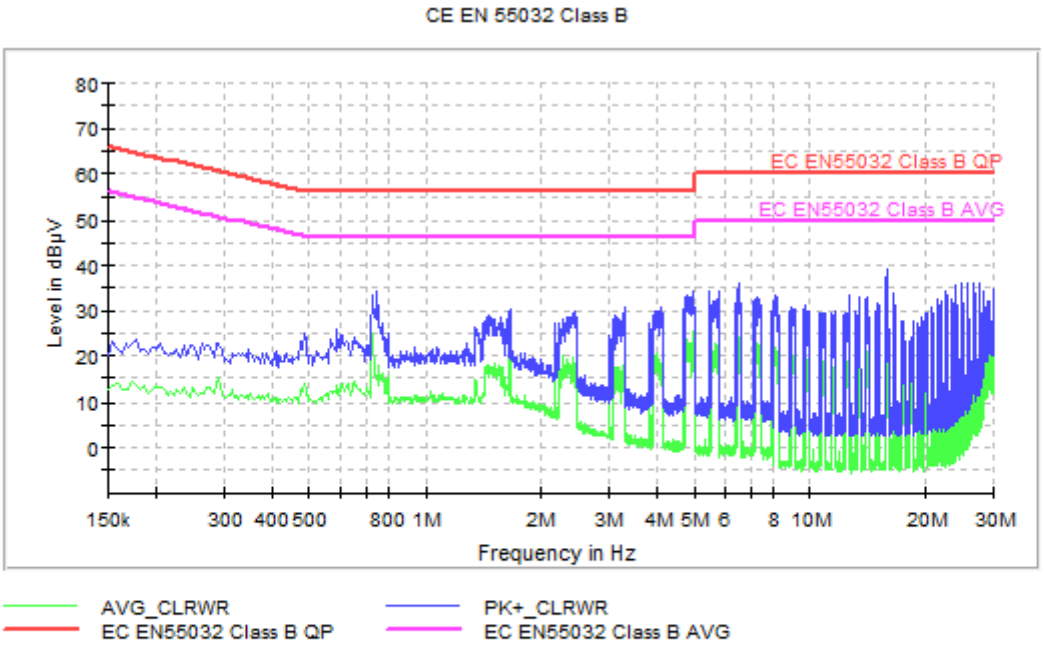
EMC Test Code = CE0102N, Frequency Range MHz = [0.15, 30], Conducted Emissions - Tested Line = N

Sample ID: S/01

Operation Mode: OM/02. EUT ON. Airplane mode activated. Charging battery & transferring data via USB.

Power supply: 115Vac

Images:



Documents:

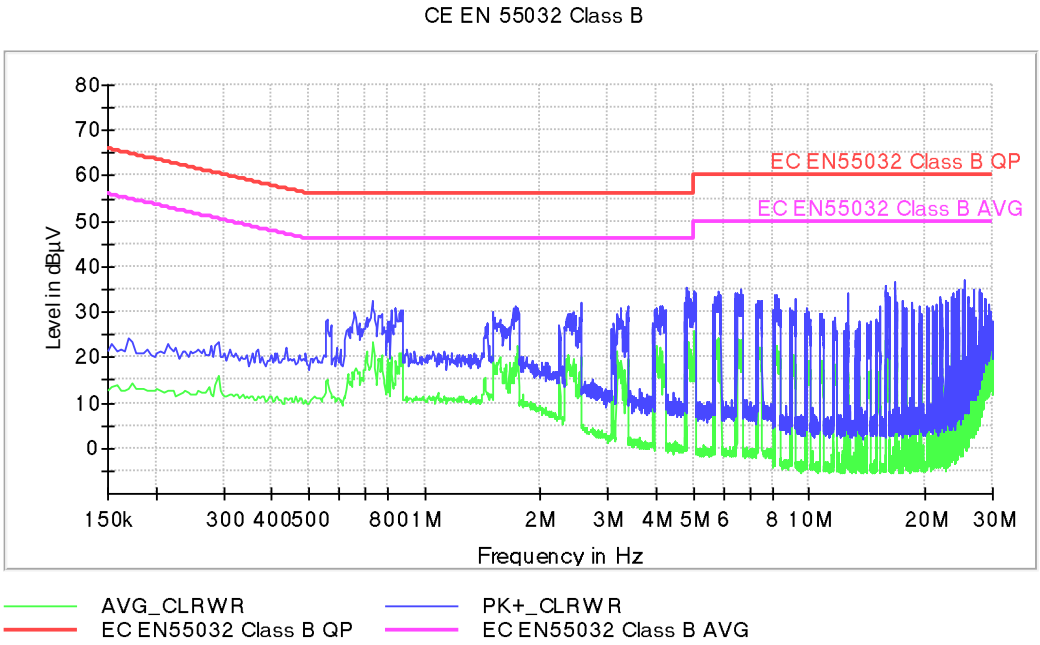
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)
0.178000	23.8	13.7
0.290000	22.7	15.2
0.730000	33.2	25.2
0.750000	34.3	15.8
1.658000	30.6	21.1
3.298000	30.7	18.8
5.498000	34.4	20.8
6.566000	36.1	21.6
15.718000	39.2	25.9
27.310000	36.4	21.2

EMC Test Code = CE0103L1, Frequency Range MHz = [0.15, 30], Conducted Emissions - Tested Line = L1

Sample ID: S/01

Operation Mode: OM/03. EUT ON. Bluetooth connected & GPS receiving valid positioning signal. Charging battery & transferring data via USB, USB. Power supply: 115Vac.

Images:



Documents:

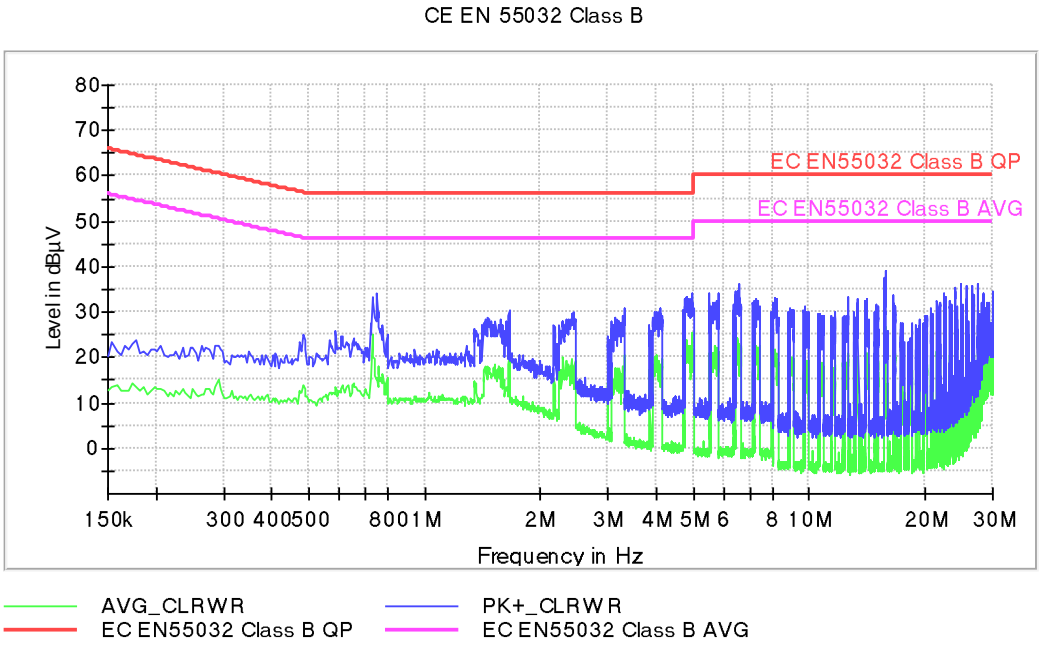
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)
0.170000	26.3	12.7
0.290000	24.1	16.1
0.730000	31.9	22.4
0.843000	30.9	19.1
1.725000	31.6	19.7
2.561000	31.8	19.8
4.812000	35.0	22.0
6.621000	34.8	21.9
16.654000	36.0	23.0
25.426000	37.5	21.2

EMC Test Code = CE0103N, Frequency Range MHz = [0.15, 30], Conducted Emissions - Tested Line = N

Sample ID: S/01

Operation Mode: OM/03. EUT ON. Bluetooth connected & GPS receiving valid positioning signal. Charging battery & transferring data via USB, USB. Power supply: 115Vac

Images:



Documents:

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)
0.181000	24.1	14.0
0.293000	22.9	14.9
0.729000	33.0	25.0
0.750000	33.9	15.6
1.662000	30.2	20.7
3.300000	31.1	19.2
5.499000	34.8	21.1
6.568000	35.7	21.9
15.722000	39.0	26.3
27.315000	36.7	20.9

RE Radiated emission. Electromagnetic field measure

Limits

The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-19 Edition), Secs. 15.109.

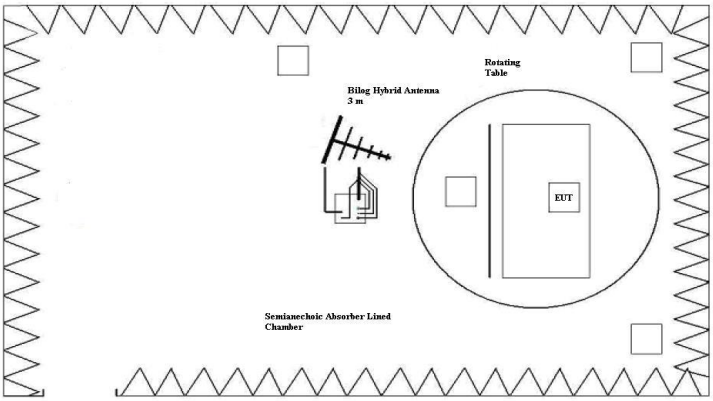
Frequency of emission (MHz)	Field strength (dBuV/m) QuasiPeak
30-88	40
88-216	43.5
216-960	46
Above 960	54
*Above 1GHz, the limit is defined for an AVG detector.	

The applied limit for radiated emissions, 3 m distance, according with the requirements of ICES-003 Issue 7 (October 2020)

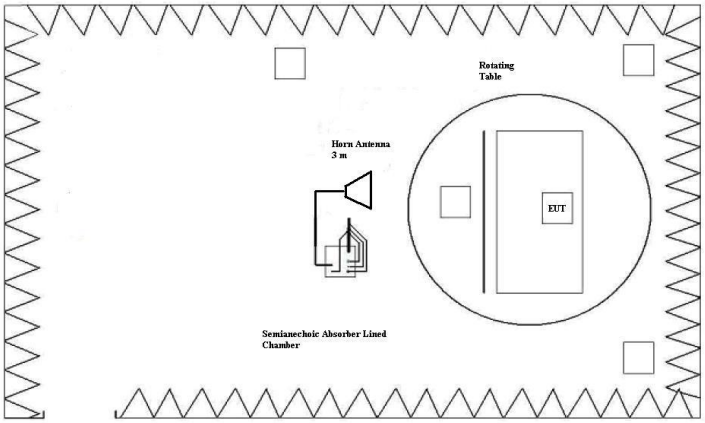
Frequency of emission (MHz)	Field strength (dBuV/m) QuasiPeak
30-88	40
88-216	43.5
216- 230	46
230-960	47
960 - 1000	54

Frequency of emission (MHz)	Field strength (dBuV/m) Peak	Field strength (dBuV/m) Average
Above 1000	74	54

Setup for measurements



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

Results

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

Verdict

Pass

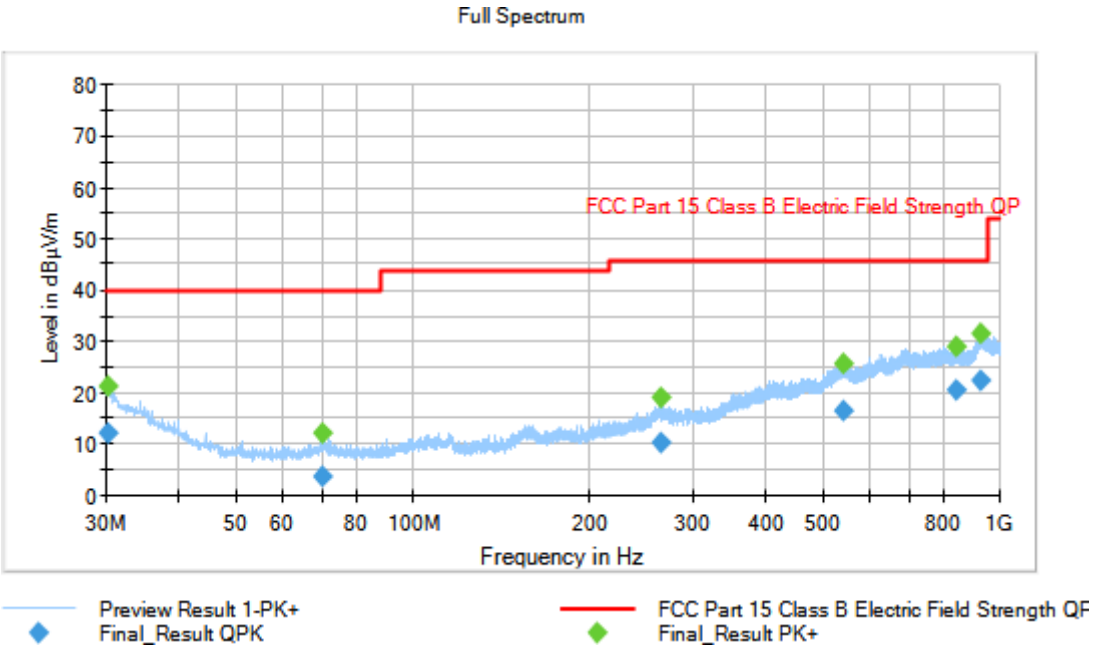
Attachments

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

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Airplane mode activated. Charging battery via usb. Power supply: Internal battery 5 Vdc..

Images:



Documents:

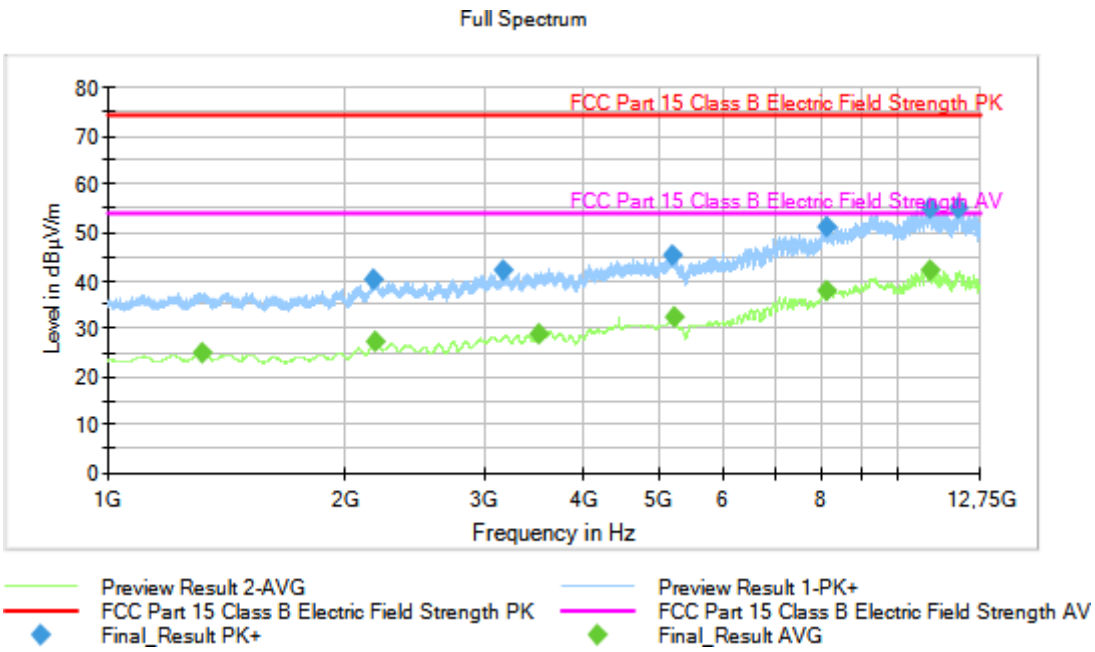
Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
30.150040	---	21.24	---	---	337.0	H	96.0
30.150040	12.20	---	40.00	27.80	337.0	H	96.0
69.973000	3.50	---	40.00	36.50	136.0	V	317.0
69.973000	---	12.27	---	---	136.0	V	317.0
264.732000	10.19	---	46.00	35.81	109.0	V	23.0
264.732000	---	18.91	---	---	109.0	V	23.0
543.215000	16.44	---	46.00	29.56	291.0	V	326.0
543.215000	---	25.73	---	---	291.0	V	326.0
843.094000	---	28.94	---	---	326.0	V	219.0
843.094000	20.52	---	46.00	25.48	326.0	V	219.0
927.745000	22.31	---	46.00	23.69	282.0	H	302.0
927.745000	---	31.58	---	---	282.0	H	302.0

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

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Airplane mode activated. Charging battery via usb. Power supply: Internal battery 5 Vdc..

Images:



Documents:

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1313.200000	---	24.81	53.97	29.16
2173.200000	40.04	---	73.97	33.93
2183.200000	---	27.22	53.97	26.75
3171.600000	42.29	---	73.97	31.69
3518.000000	---	28.84	53.97	25.13
5196.800000	45.13	---	73.97	28.84
5201.200000	---	32.32	53.97	21.65
8114.800000	50.95	---	73.97	23.02
8117.200000	---	37.94	53.97	16.03
10977.600000	---	42.32	53.97	11.65
10980.000000	55.16	---	73.97	18.81
11905.600000	54.96	---	73.97	19.01

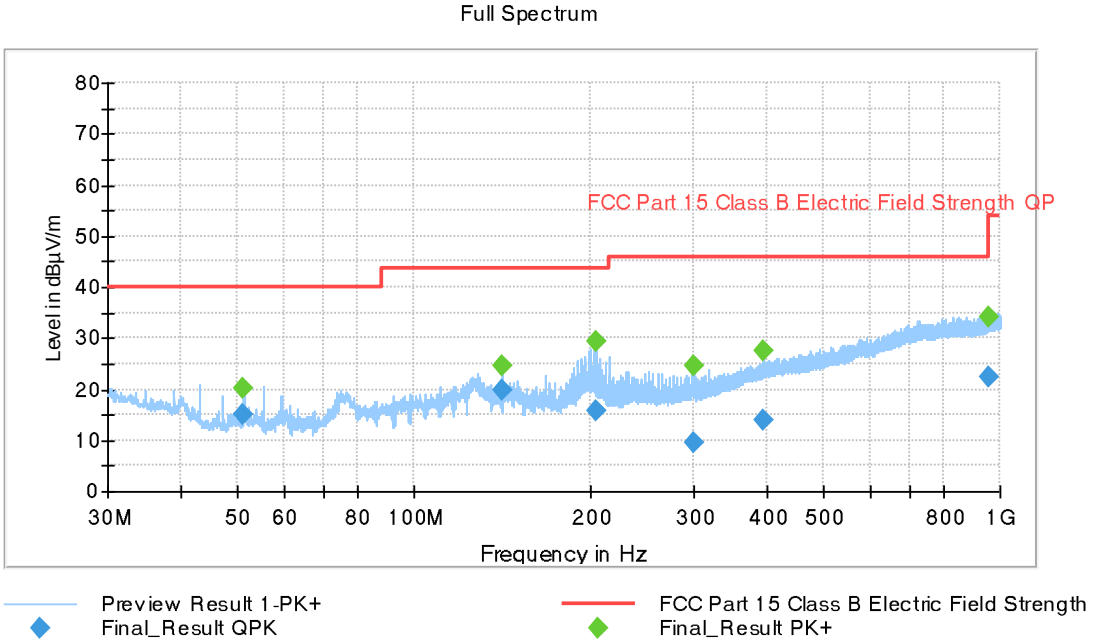
EMC Test Code = RE0102LR, Frequency Range MHz = [30, 1000]

Sample ID: S/01

Operation Mode: OM/02. EUT ON. Airplane mode activated. Charging battery & transferring data via USB.

Power supply: 115Vac

Images:



Documents:

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
51.183000	15.01	---	40.00	24.99	118.0	V	351.0
51.183000	---	20.34	---	---	118.0	V	351.0
141.316000	19.72	---	43.52	23.80	212.0	H	19.0
141.316000	---	24.61	---	---	212.0	H	19.0
204.173000	15.66	---	43.52	27.86	127.0	H	28.0
204.173000	---	29.19	---	---	127.0	H	28.0
299.410000	---	24.75	---	---	225.0	V	186.0
299.410000	9.56	---	46.00	36.44	225.0	V	186.0
394.021000	13.83	---	46.00	32.17	133.0	V	68.0
394.021000	---	27.60	---	---	133.0	V	68.0
956.275000	---	34.03	---	---	400.0	V	216.0
956.275000	22.26	---	46.00	23.74	400.0	V	216.0

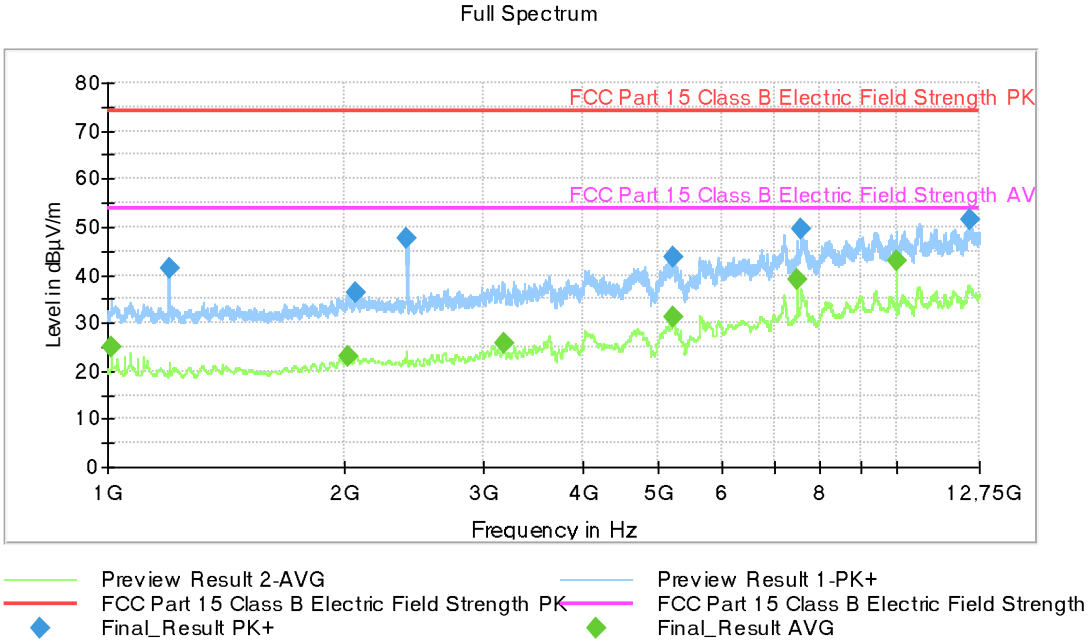
EMC Test Code = RE0102HR, Frequency Range MHz = [1000, 12750]

Sample ID: S/01

Operation Mode: OM/02. EUT ON. Airplane mode activated. Charging battery & transferring data via USB.

Power supply: 115Vac

Images:



Documents:

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1010.000000	---	25.10	53.97	28.87
1195.200000	41.39	---	73.97	32.58
2016.400000	---	23.03	53.97	30.94
2065.200000	36.42	---	73.97	37.55
2393.200000	47.54	---	73.97	26.43
3175.600000	---	25.57	53.97	28.40
5216.000000	43.69	---	73.97	30.28
5216.400000	---	31.36	53.97	22.61
7500.000000	---	39.11	53.97	14.86
7581.200000	49.52	---	73.97	24.45
10000.400000	---	43.07	53.97	10.90
12380.000000	51.65	---	73.97	22.32