

Test report No:
NIE: 70388REM.002A1

Test report

FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-20 Edition), Subpart C (10-1-21 Edition) & ICES-003 Issue 7 (October 2020)

(*) Identification of item tested	GPS multisport watch
(*) Trademark	Polar
(*) Model and /or type reference	5A
Other identification of the product	HW version: 007101307 SW version: 0.11.0 FCC ID: INW5A IC: 6248A-5A
(*) Features	Bluetooth LE, GNSS: GPS, Galileo, Glonass, SBAS
Manufacturer	Polar Electro Oy Professorintie 5 90440 Kempele, FINLAND
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-20 Edition), Subpart C (10-1-21 Edition) & ICES-003 Issue 7 (October 2020)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López Martín EMC Consumer & RF Lab. Manager  2022.04.13 08:49:42 +02'00'
Date of issue	2022-04-12
Report template No	FDT08_24 (*) "Data provided by the client"



Index

ACRONYMS3

COMPETENCES AND GUARANTEES3

GENERAL CONDITIONS4

UNCERTAINTY4

DATA PROVIDED BY THE CLIENT4

USAGE OF SAMPLES5

TEST SAMPLE DESCRIPTION6

IDENTIFICATION OF THE CLIENT7

TESTING PERIOD AND PLACE7

DOCUMENT HISTORY7

ENVIRONMENTAL CONDITIONS8

REMARKS AND COMMENTS9

TESTING VERDICTS9

LIST OF EQUIPMENT USED DURING THE TEST9

SUMMARY10

APPENDIX A: TEST RESULTS11

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.

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 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 GPS multi-sports watch with Bluetooth low-energy connectivity and wrist-based optical heart rate, model 5A.

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	70388_7.1	Smart watch 5A (commercial sample)	5A	F1475E1400252	2021-11-29	Element Under Test
S/01	70388_1.1	USB Cable charger (5A)	---	CFE2143A0	2021-11-29	Auxiliary Element

Notes referenced to samples during the project:

None.

Test sample description

Ports..... :	Port name and description		Cable				
			Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾	
	USB port	0.6	[X]	[]	[]		
			[]	[]	[]		
Supplementary information to the ports..... :							
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[]	AC:	[]	[]	[]	[]	[]
	[X]	DC: 3.85 Vdc					
Rated Power	1.02 W						
Clock frequencies..... :	32.768 kHz, 24 MHz, 26 MHz, 32 MHz						
Other parameters							
Software version	0.11.0						
Hardware version	007101307						
Dimensions in cm (W x H x D)							
Mounting position	[]	Table top equipment					
	[]	Wall/Ceiling mounted equipment					
	[]	Floor standing equipment					
	[X]	Hand-held equipment					
	[]	Other:					
Modules/parts..... :	Module/parts of test item		Type		Manufacturer		
							
Accessories (not part of the test item)	Description		Type		Manufacturer		
							
Documents as provided by the applicant..... :	Description		File name		Issue date		
							

⁽³⁾ Only for Medical Equipment

Identification of the client

Polar Electro Oy
Professorintie 5
90440 Kempele, FINLAND

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2021-11-29
Date (finish)	2021-12-16

Document history

Report number	Date	Description
70388REM.002A1	2022-04-12	It is added mode operation OM/02 and tests for OM/02. It is modified some typos in the test report. This modification test report cancels and replaces the test report 70388REM.002.
70388REM.002	2022-02-11	First release

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: Abel Gil Pensado, Beatriz Cabello De Alba Bujalance and Julio Bautista Martín.

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	--	SCHWARZBECK	2022-07-09
7553	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2022-04-12
6204	THREE-PHASE ARTIFICIAL NETWORK 32A	PMM L3-32	NARDA	2023-09-27
1936	PRESELECTOR	ESPI-B2	ROHDE AND SCHWARZ	--

Summary

Test Specification	Requirement – Test case	Verdict	Remark
FCC CFR 47, Part 15, Subpart B (10-1-20 Edition) & ICES-003 Issue 7 (October 2020)	RE Radiated emission. Electromagnetic field measure	Pass	--
FCC CFR 47, Part 15, Subpart B (10-1-20 Edition), Subpart C (10-1-21 Edition) & ICES-003 Issue 7 (October 2020)	CE Continuous conducted emission	Pass	--
<u>Supplementary information and remarks:</u> None			

Appendix A: Test results

Appendix A content

DESCRIPTION OF THE OPERATION MODES 13

TEST STANDARDS VERSION APPLIED 14

TEST CASES DETAILS 15

RE Radiated emission. Electromagnetic field measure 15

CE Continuous conducted emission 19

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. Charging and transferring data from an auxiliary device. Bluetooth in IDLE mode. ANSI Setup. Power Supply: 5Vdc (By USB port). Auxiliary PC for ANSI Setup powered 115Vac.
OM/02	EUT ON. Charging battery from an auxiliary device. ANSI Setup. Bluetooth active and paired with auxiliary device. Power supply: 5Vdc (By USB port). Auxiliary PC for ANSI Setup powered 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 (10-1-20 Edition) & ICES-003 Issue 7 (October 2020)	ANSI C63.4 (2014)	RE Radiated emission.
FCC CFR 47, Part 15, Subpart B (10-1-20 Edition), Subpart C (10-1-21 Edition) & ICES-003 Issue 7 (October 2020)	ANSI C63.4 (2014)	CE Continuous conducted emission

Test Cases Details

RE Radiated emission. Electromagnetic field measure

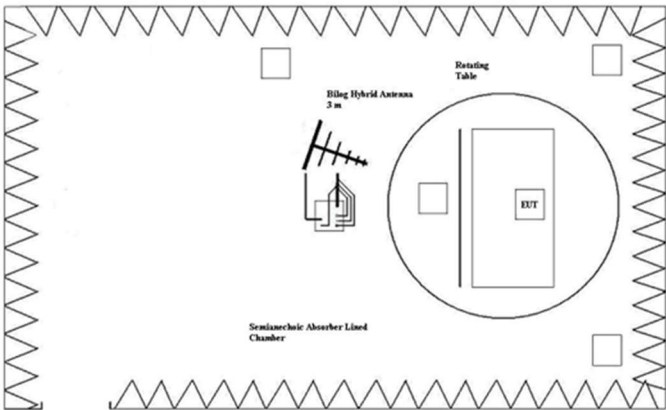
Limits

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 (01-10-20 Edition), Secs.15.109 & ICES-003 Issue 7 (October 2020)

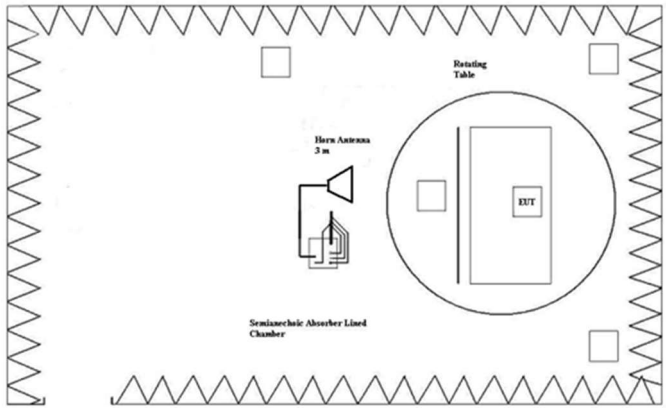
Frequency range (MHz)	FCC Part 15B		ICES-003 Issue 7		FCC Part 15B & ICES-003 Issue 7	
	QP Limit for 3 m		QP Limit for 3 m		PK Limit for 3 m	AVG Limit for 3 m
	(µV/m)	(dBµV/m)	(µV/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)
30 to 88	100	40	100	40	---	---
88 to 216	150	43.5	150	43.5	---	---
216 to 230	200	46	200	46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

Verdict

Pass

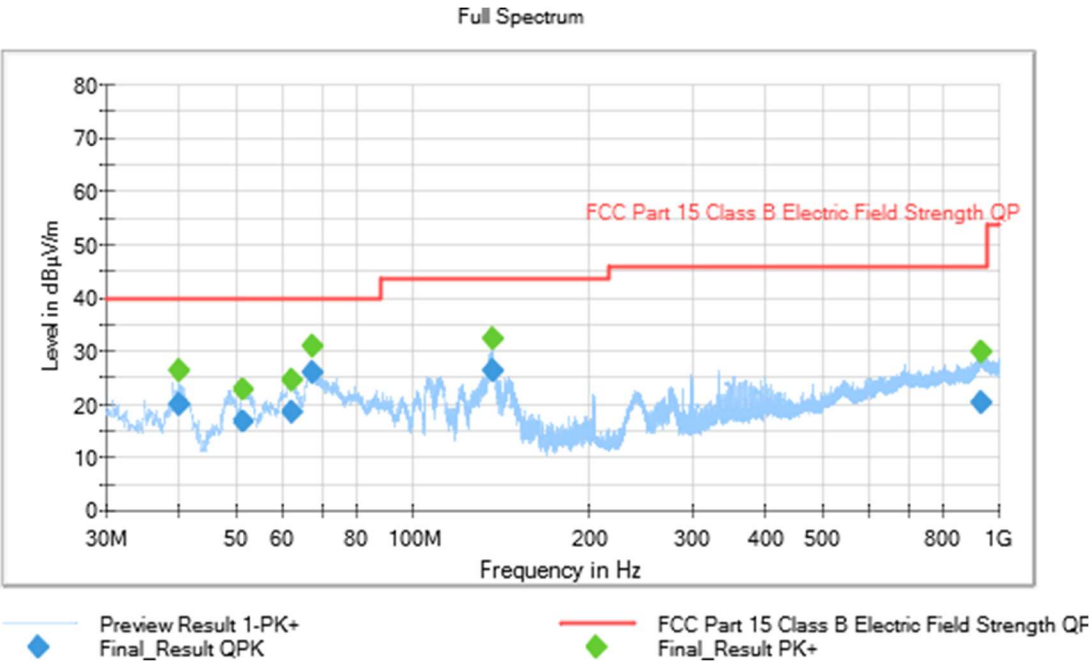
Attachments

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

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Charging and transferring data from an auxiliary device. Bluetooth in IDLE mode. ANSI Setup. Power supply: 5Vdc (By USB port). Auxiliary PC for ANSI Setup powered 115Vac.

Images:



Documents:

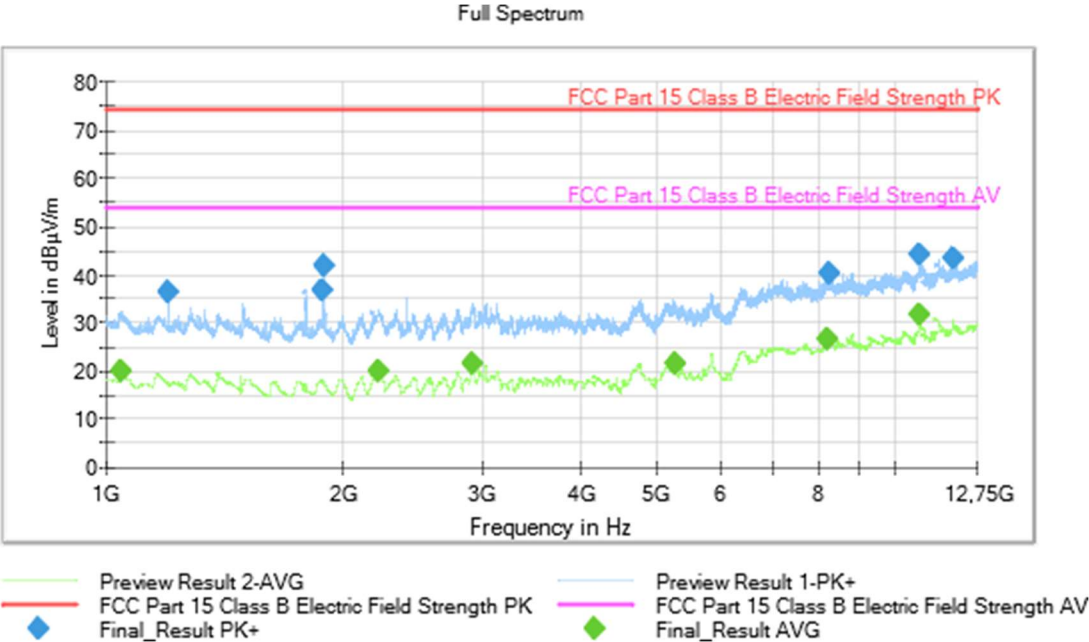
Frequency(MHz)	QuasiPeak(dBµV/m)	MaxPeak(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	Pol	Azimuth(deg)
40.072000	19.83	---	40.00	20.17	105.0	V	80.0
40.072000	---	26.14	---	---	105.0	V	80.0
51.407000	16.78	---	40.00	23.22	168.0	V	63.0
51.407000	---	22.60	---	---	168.0	V	63.0
62.244000	18.36	---	40.00	21.64	168.0	V	103.0
62.244000	---	24.38	---	---	168.0	V	103.0
67.557000	25.68	---	40.00	14.32	112.0	V	123.0
67.557000	---	30.94	---	---	112.0	V	123.0
136.993000	---	32.36	---	---	268.0	H	182.0
136.993000	26.15	---	43.52	17.37	268.0	H	182.0
936.990000	---	29.81	---	---	252.0	H	196.0
936.990000	20.33	---	46.00	25.67	252.0	H	196.0

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

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Charging and transferring data from an auxiliary device. Bluetooth in IDLE mode. ANSI Setup. Power supply: 5Vdc (By USB port). Auxiliary PC for ANSI Setup powered 115Vac.

Images:



Documents:

Frequency(MHz)	MaxPeak(dBµV/m)	Average(dBµV/m)	Limit(dBµV/m)	Margin(dB)
1045.200000	---	19.95	53.97	34.02
1196.400000	36.46	---	73.97	37.51
1881.600000	36.84	---	73.97	37.13
1885.200000	41.65	---	73.97	32.32
2221.200000	---	20.02	53.97	33.95
2915.200000	---	21.47	53.97	32.50
5264.000000	---	21.42	53.97	32.55
8224.400000	---	26.59	53.97	27.38
8265.600000	40.11	---	73.97	33.87
10769.200000	44.03	---	73.97	29.94
10775.600000	---	31.55	53.97	22.42
11867.200000	43.42	---	73.97	30.55

CE Continuous conducted emission

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 (10-1-20 Edition), Secs. 15.107, Subpart C (10-1-21 Edition), Secs. 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 (dB μ V)	
	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
01	OM/01	CE01010N	[0.15, 30]	N	P
01	OM/01	CE0101L1	[0.15, 30]	L1	P
01	OM/02	CE01020N	[0.15, 30]	N	P
01	OM/02	CE0102L1	[0.15, 30]	L1	P

Verdict

Pass

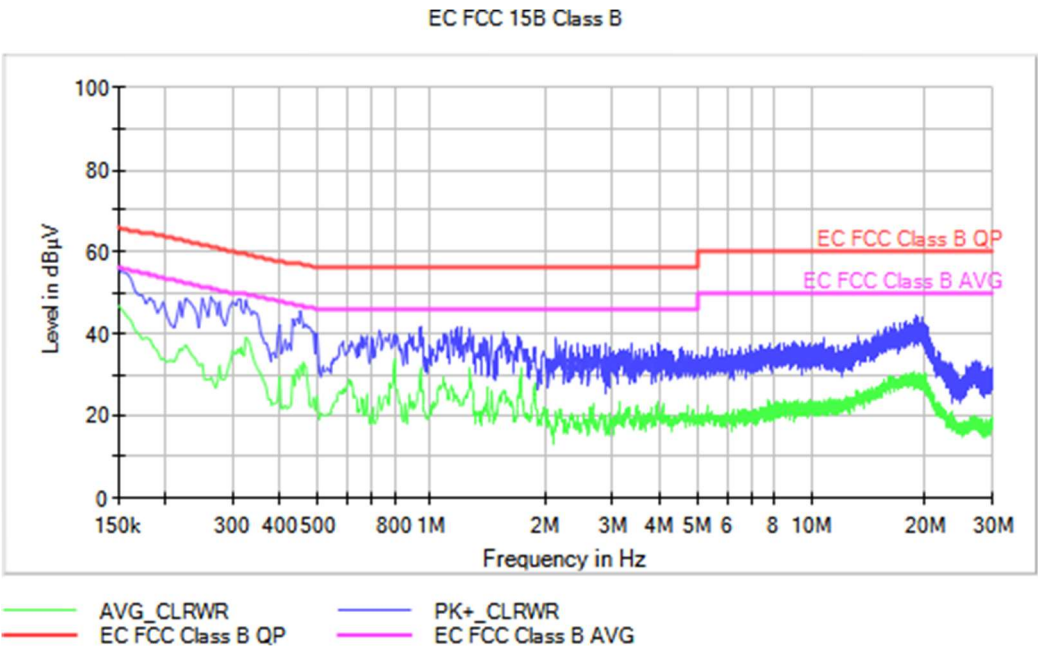
Attachments

EMC Test Code = CE01010N, Frequency Range MHz = [0.15, 30], Conducted Emissions - Tested Line = N

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Charging and transferring data from an auxiliary device. Bluetooth in IDLE mode. ANSI Setup. Power supply: 5Vdc (By USB port). Auxiliary PC for ANSI Setup powered 115Vac.

Images:



Documents:

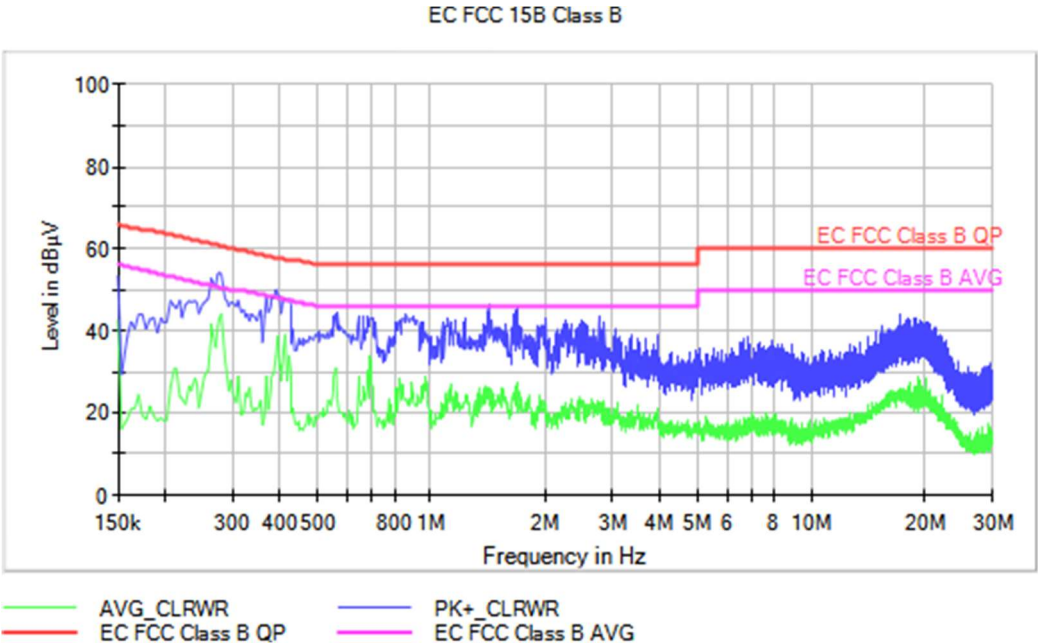
Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.150000	55.9	46.7	N
0.262000	49.1	29.0	N
0.454000	45.3	32.3	N
1.202000	41.6	22.3	N
1.270000	41.4	31.0	N
2.142000	38.8	20.9	N
3.930000	37.8	21.9	N
9.510000	38.0	21.9	N
17.618000	42.7	29.4	N
18.994000	44.5	28.5	N

EMC Test Code = CE0101L1, Frequency Range MHz = [0.15, 30], Conducted Emissions - Tested Line = L1

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Charging and transferring data from an auxiliary device. Bluetooth in IDLE mode. ANSI Setup. Power supply: 5Vdc (By USB port). Auxiliary PC for ANSI Setup powered 115Vac.

Images:



Documents:

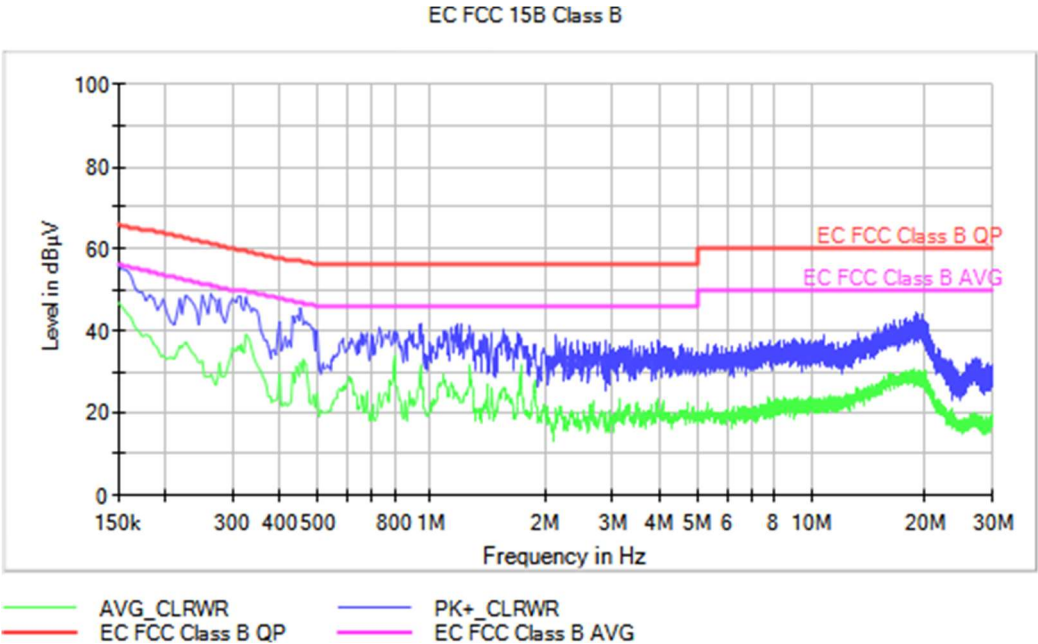
Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.150000	53.2	42.6	L1
0.278000	54.0	43.3	L1
0.570000	44.4	23.4	L1
0.862000	44.1	23.4	L1
1.426000	46.2	24.1	L1
2.758000	43.5	22.7	L1
3.942000	38.8	21.1	L1
6.786000	38.3	18.8	L1
17.242000	44.1	24.6	L1
19.026000	43.0	25.4	L1

EMC Test Code = CE01020N, Frequency Range MHz = [0.15, 30], Conducted Emissions - Tested Line = N

Sample ID: S/01

Operation Mode: OM/02. EUT ON. Charging battery from an auxiliary device. Bluetooth active and paired with auxiliary device. ANSI Setup. Power supply: 5Vdc (By USB port). Auxiliary PC for ANSI Setup powered 115Vac.

Images:



Documents:

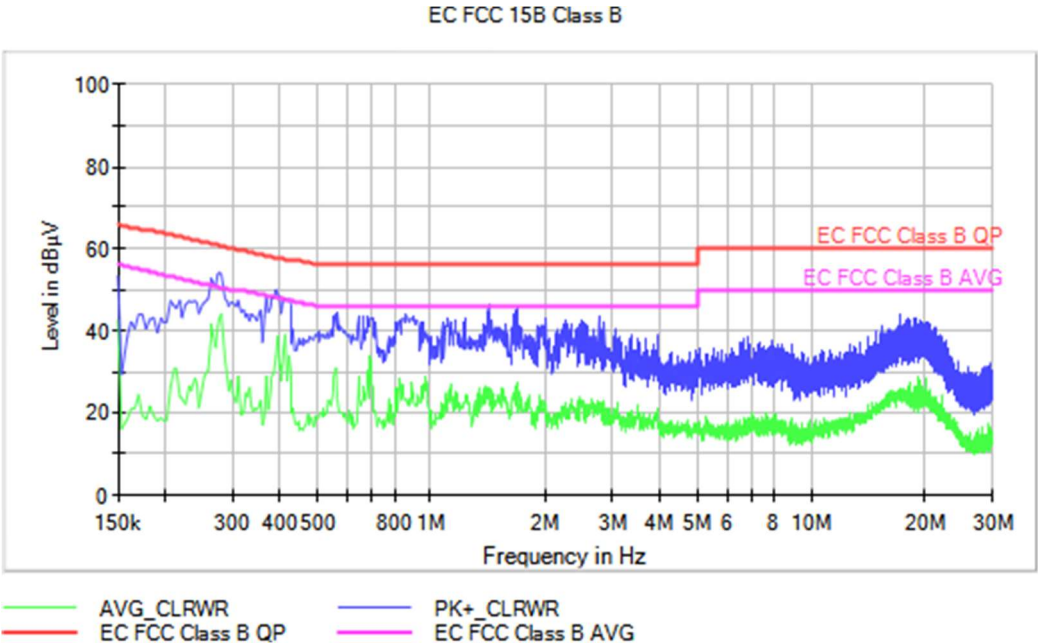
Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.160000	56.0	46.7	N
0.272000	49.0	29.1	N
0.484000	45.5	32.3	N
1.202000	41.6	22.5	N
1.270000	41.4	31.0	N
2.162000	38.9	20.8	N
3.830000	37.8	21.9	N
9.570000	37.9	22.0	N
17.618000	42.8	29.4	N
18.984000	44.5	28.7	N

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. Charging battery from an auxiliary device. Bluetooth active and paired with auxiliary device. ANSI Setup. Power supply: 5Vdc (By USB port). Auxiliary PC for ANSI Setup powered 115Vac.

Images:



Documents:

Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.150000	53.3	42.7	L1
0.288000	54.5	43.5	L1
0.570000	44.4	22.9	L1
0.882000	44.0	23.4	L1
1.426000	46.2	23.9	L1
2.788000	43.8	22.7	L1
3.942000	39.1	21.2	L1
6.886000	38.1	18.8	L1
17.256000	44.1	24.7	L1
19.026000	43.2	25.1	L1