DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29 507 456

Test report No:
NIE: 72548REM.002

Test report

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

(*) Identification of item tested	GPS fitness watch
(*) Trademark	Polar
(*) Model and /or type reference	5J
Other identification of the product	FCC ID: INW5J IC: 6248A-5J
(*) Features	Features: Bluetooth LE, GNSS: GPS, Galileo Glonass, SBAS HW version: 007106064 SW version: 0.6.0
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) & ICES-003 Issue 7 (October 2020)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López Martín EMC Consumer & RF Lab. Manager 2022.09.28 10:50:16 +02'00'
Date of issue	2022-09-28
Report template No	FDT08_24 (*) "Data provided by the client"

Index

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.

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 = ± 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 GPS fitness watch. GPS fitness watch with Bluetooth low-energy connectivity and wrist-based optical heart rate.

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	72548B_11.1	GPS fitness watch	5J	F2205J0400485	2022-07-12	Element Under Test
S/01	72548B_13.1	USB charging cable	--	--	2022-07-12	Element Under Test

Notes referenced to samples during the project: None.

Test sample description

<table>
<tr><td rowspan="2">Ports…… :</td><td rowspan="2">Port name and description</td><td colspan="4">Cable</td></tr>
<tr><td>Specified max length [m]</td><td>Attached during test</td><td>Shielded</td><td>Coupled to patient(3)</td></tr>
<tr><td></td><td>USB port</td><td>0.6</td><td>[X]</td><td>[ ]</td><td>[ ]</td></tr>
<tr><td>Supplementary information to the ports…… :</td><td colspan="5">.....</td></tr>
<tr><td rowspan="5">Rated power supply ..... :</td><td colspan="2" rowspan="2">Voltage and Frequency</td><td colspan="4">Reference poles</td></tr>
<tr><td>L1</td><td>L2</td><td>L3</td><td>N</td><td>PE</td></tr>
<tr><td>[ ]</td><td>AC: .....</td><td>[ ]</td><td>[ ]</td><td>[ ]</td><td>[ ]</td><td>[ ]</td></tr>
<tr><td>[X]</td><td colspan="5">DC: 3,87 Vdc</td></tr>
<tr><td>[ ]</td><td colspan="5">DC: .....</td></tr>
<tr><td>Rated Power ..... :</td><td colspan="6">0,9 W</td></tr>
<tr><td>Clock frequencies ..... :</td><td colspan="6">32 MHz, 26 MHz, 24 MHz, 32,768 kHz</td></tr>
<tr><td>Other parameters..... :</td><td colspan="6">.....</td></tr>
<tr><td>Software version ..... :</td><td colspan="6">0.6.0</td></tr>
<tr><td>Hardware version..... :</td><td colspan="6">007106064</td></tr>
<tr><td>Dimensions in cm (W x H x D) ..... :</td><td colspan="6">.....</td></tr>
<tr><td rowspan="5">Mounting position..... :</td><td>[ ]</td><td colspan="5">Table top equipment</td></tr>
<tr><td>[ ]</td><td colspan="5">Wall/Ceiling mounted equipment</td></tr>
<tr><td>[ ]</td><td colspan="5">Floor standing equipment</td></tr>
<tr><td>[X]</td><td colspan="5">Hand-held equipment</td></tr>
<tr><td>[ ]</td><td colspan="5">Other: .....</td></tr>
<tr><td rowspan="2">Modules/parts ..... :</td><td colspan="3">Module/parts of test item</td><td>Type</td><td>Manufacturer</td></tr>
<tr><td colspan="3">.....</td><td>.....</td><td>.....</td></tr>
<tr><td rowspan="2">Accessories (not part of the test item) ..... :</td><td colspan="3">Description</td><td>Type</td><td>Manufacturer</td></tr>
<tr><td colspan="3">.....</td><td>.....</td><td>.....</td></tr>
<tr><td rowspan="2">Documents as provided by the applicant ..... :</td><td colspan="3">Description</td><td>File name</td><td>Issue date</td></tr>
<tr><td colspan="3">.....</td><td>.....</td><td>.....</td></tr>
</table>

(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)	2021-10-13
Date (finish)	2022-07-21

Document history

Report number	Date	Description
72548REM.002	2022-09-02	First release

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: Antonio Ruiz Sánchez and Salvador Cuellar Guerrero.

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
2942	EMI TEST RECEIVER 20Hz-40GHz	ESU40	ROHDE AND SCHWARZ	2023-11-22
6129	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2023-04-28
6205	THREE-PHASE ARTIFICIAL NETWORK 32A	PMM L3-32	NARDA	2023-03-04
5152	TRANSIENT LIMITER 10DB N CONNECTOR	VTSD 9561-F	SCHWARZBECK	2022-10-20
4612	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK MESS-ELEKTRONIK	2024-07-13
4848	EMC/RF MEASUREMENT SOFTWARE	EMC32	ROHDE AND SCHWARZ	---
5641	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2024-09-15
6064	SEMIANECHOIC ABSORBER LINED CHAMBER III	SAC-3	FRANKONIA	---
6121	PRE-AMPLIFIER G>40dB 10MHz-6GHz	BLNA 0160-01N	BONN ELEKTRONIK	---

Control No.	Equipment	Model	Manufacturer	Next Calibration
6126	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2023-05-04
6132	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2023-05-09
6329	SHIELDED ROOM		FRANKONIA	---
8866	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2023-09-21
9360	PRE-AMPLIFIER G>40dB 1-18 GHz	BLMA 0118-1M	BONN ELEKTRONIK	2023-05-11

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	P	--
FCC CFR 47, Part 15, Subpart B (10-1-20 Edition) & ICES-003 Issue 7 (October 2020)	CE Continuous conducted emission	P	--
Supplementary information and remarks: None			

Appendix A: Test results

Appendix A content

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 in IDLE mode. GNSS in RX mode. Power supply: 5Vdc (Battery charging). Auxiliary PC for ANSI, setup powered 115 Vac 60 Hz.

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.
	ANSI C63.4 (2014)	CE Continuous conducted emission

Test Cases Details

FCC CFR 47, Part 15, Subpart B
(10-1-20 Edition), Secs. 15.109 & ICES-003 Issue 7 (October 2020)
RE Radiated emission. Electromagnetic field measure

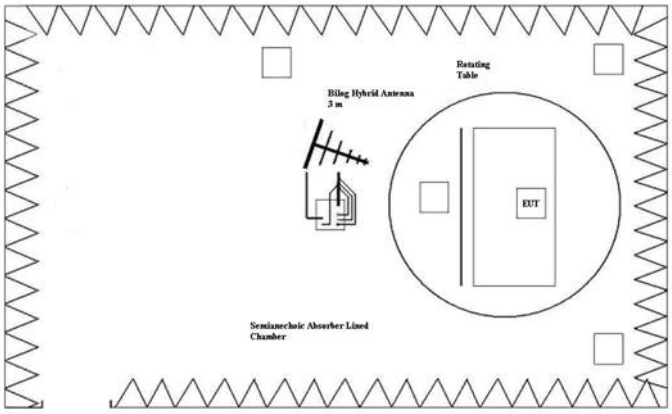
Limits

The applied limit for radiated emissions, 3 m distance, according to the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-19 Edition), Secs. 15.109 & ICES-003 Issue 7 (October 2020)

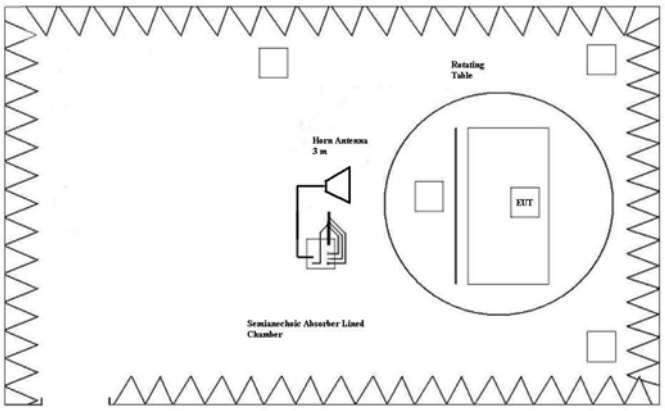
Frequency range (MHz)	FCC Part 15B		ICES-003 Issue 7		FCC Part 15B & ICES-003 Issue 7	
	QP Limit for 3 m		QP Limit for 3 m		PK Limit for 3 m	AVG Limit for 3 m
	(μV/m)	(dBμV/m)	(μV/m)	(dBμV/m)	(dBμV/m)	(dBμV/m)
30 to 88	100	40	100	40	---	---
88 to 216	150	43.5	150	43.5	---	---
216 to 230	200	46	200	46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

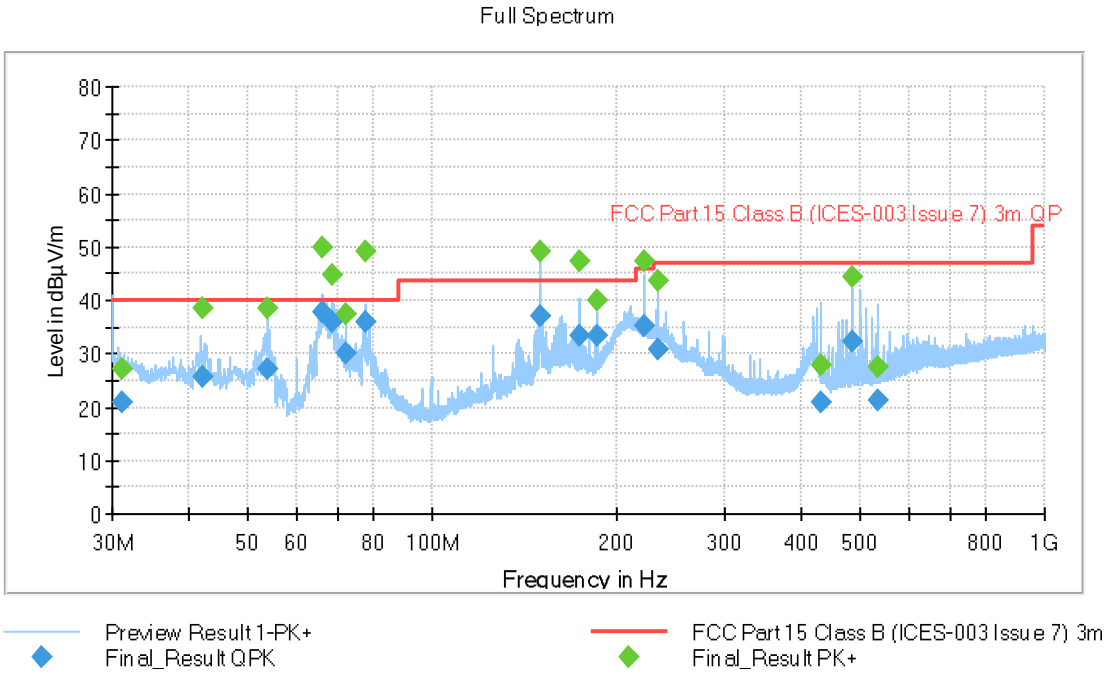
Pass

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

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Bluetooth low energy in IDLE mode.GNSS in RX mode. Power supply: 5Vdc (Battery charging). Auxiliary PC for ANSI, setup powered 115 Vac 60 Hz.

Images:



Tables:

Frequency(MHz)	QuasiPeak(dBµV/m)	MaxPeak(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	Pol	Azimuth(deg)
31.170000	---	27.21	---	---	384.0	V	69.0
31.170000	20.82	---	40.00	19.18	384.0	V	69.0
42.098000	25.87	---	40.00	14.13	122.0	V	37.0
42.098000	---	38.68	---	---	122.0	V	37.0
53.863000	---	38.43	---	---	132.0	V	69.0
53.863000	27.18	---	40.00	12.82	132.0	V	69.0
66.087000	---	50.03	---	---	360.0	H	8.0
66.087000	37.96	---	40.00	2.04	360.0	H	8.0
68.484000	---	44.69	---	---	320.0	H	-23.0
68.484000	35.88	---	40.00	4.12	320.0	H	-23.0
71.998000	30.15	---	---	---	198.0	H	-39.0
71.998000	---	37.40	40.00	30.85	198.0	H	-39.0
77.984000	35.89	---	40.00	4.11	150.0	V	-70.0
77.984000	---	49.34	---	---	150.0	V	-70.0
149.978000	---	49.17	---	---	204.0	H	65.0
149.978000	36.89	---	43.52	6.63	204.0	H	65.0
173.992000	33.30	---	43.52	10.22	132.0	H	65.0

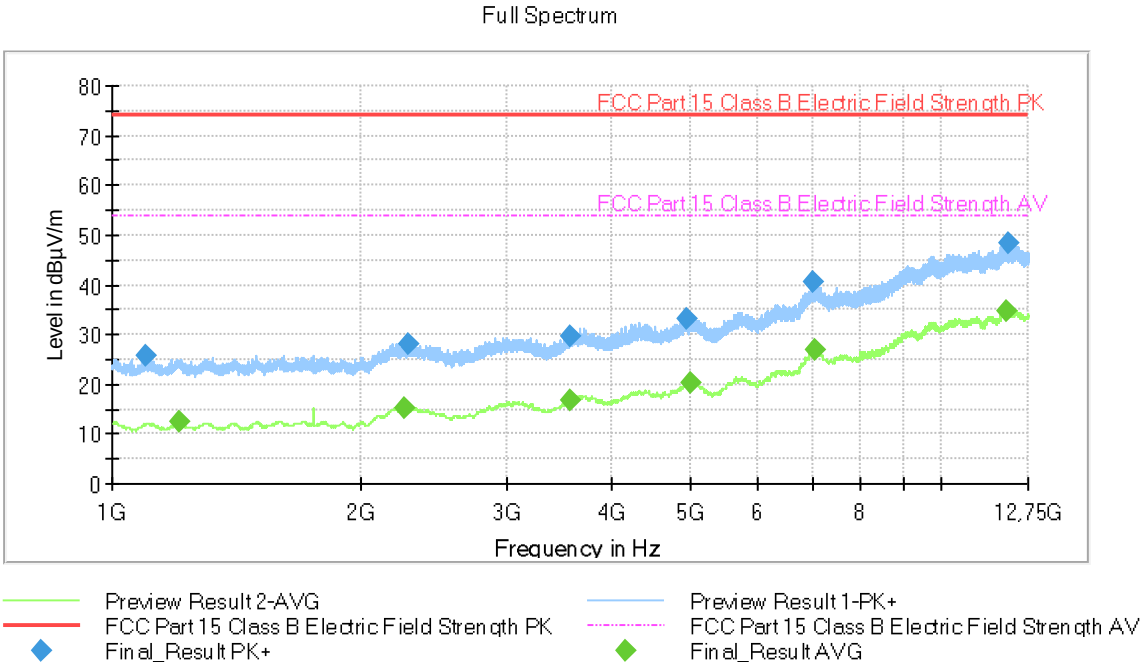
Frequency(MHz)	QuasiPeak(dBµV/m)	MaxPeak(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	Pol	Azimuth(deg)
173.992000	---	47.45	---	---	132.0	H	65.0
186.140000	33.40	---	43.52	30.12	272.0	H	76.0
186.140000	---	39.92	---	---	272.0	H	76.0
221.953000	35.10	---	46.00	10.90	118.0	H	-20.0
221.953000	---	47.50	---	---	118.0	H	-20.0
233.969000	---	43.72	---	---	118.0	H	180.0
233.969000	30.83	---	47.00	16.17	118.0	H	180.0
432.004000	---	27.95	---	---	156.0	V	-45.0
432.004000	21.06	---	47.00	25.94	156.0	V	-45.0
485.997000	---	44.51	---	---	184.0	H	117.0
485.997000	32.20	---	47.00	14.81	184.0	H	117.0
534.364000	---	27.51	---	---	115.0	V	-23.0
534.364000	21.32	---	47.00	25.68	115.0	V	-23.0

EMC Test Code = RE0101HR1, Frequency Range MHz = [1000, 12750]

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Bluetooth low energy in IDLE mode.GNSS in RX mode. Power supply: 5Vdc (Battery charging). Auxiliary PC for ANSI, setup powered 115 Vac 60 Hz.

Images:



Tables:

Frequency(MHz)	MaxPeak(dBµV/m)	Average(dBµV/m)	Limit(dBµV/m)	Margin(dB)
1096.500000	25.61	---	73.97	48.36
1204.250000	---	12.52	53.97	41.45
2250.000000	---	15.28	53.97	38.69
2279.500000	28.29	---	73.97	45.68
3568.250000	29.75	---	73.97	44.22
3570.500000	---	16.81	53.97	37.16
4944.000000	33.18	---	73.97	40.79
4997.500000	---	20.37	53.97	33.60
7004.250000	40.45	---	73.97	33.52
7063.250000	---	26.80	53.97	27.17
12026.750000	---	34.87	53.97	19.10
12043.250000	48.24	---	73.97	25.73

FCC CFR 47, Part 15, Subpart B
(10-1-20 Edition), Secs. 15.107 & ICES-003 Issue 7 (October 2020)
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 & ICES-003 Issue 7 (October 2020), in the frequency range 0,15 to 30 MHz, for Class B equipment was:

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

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

Verdict

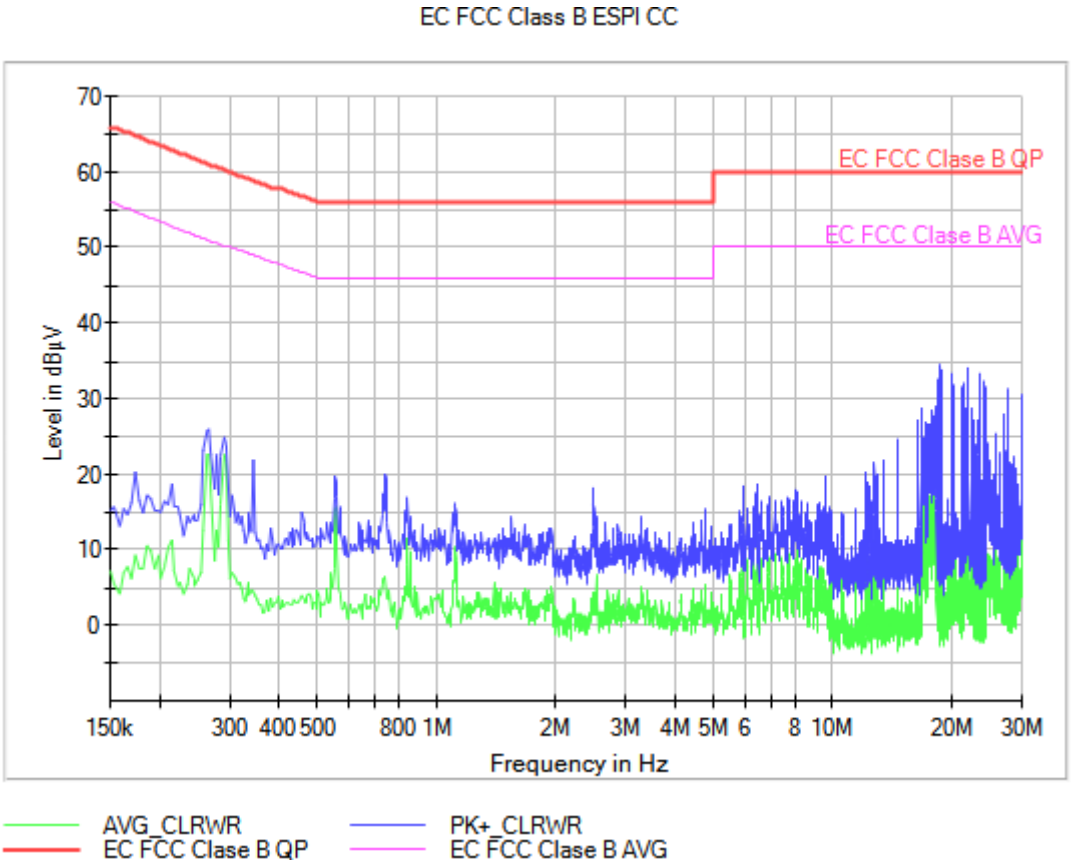
Pass

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. Bluetooth low energy in IDLE mode.GNSS in RX mode. Power supply: 5Vdc (Battery charging). Auxiliary PC for ANSI, setup powered 115 Vac 60 Hz.

Images:



Tables:

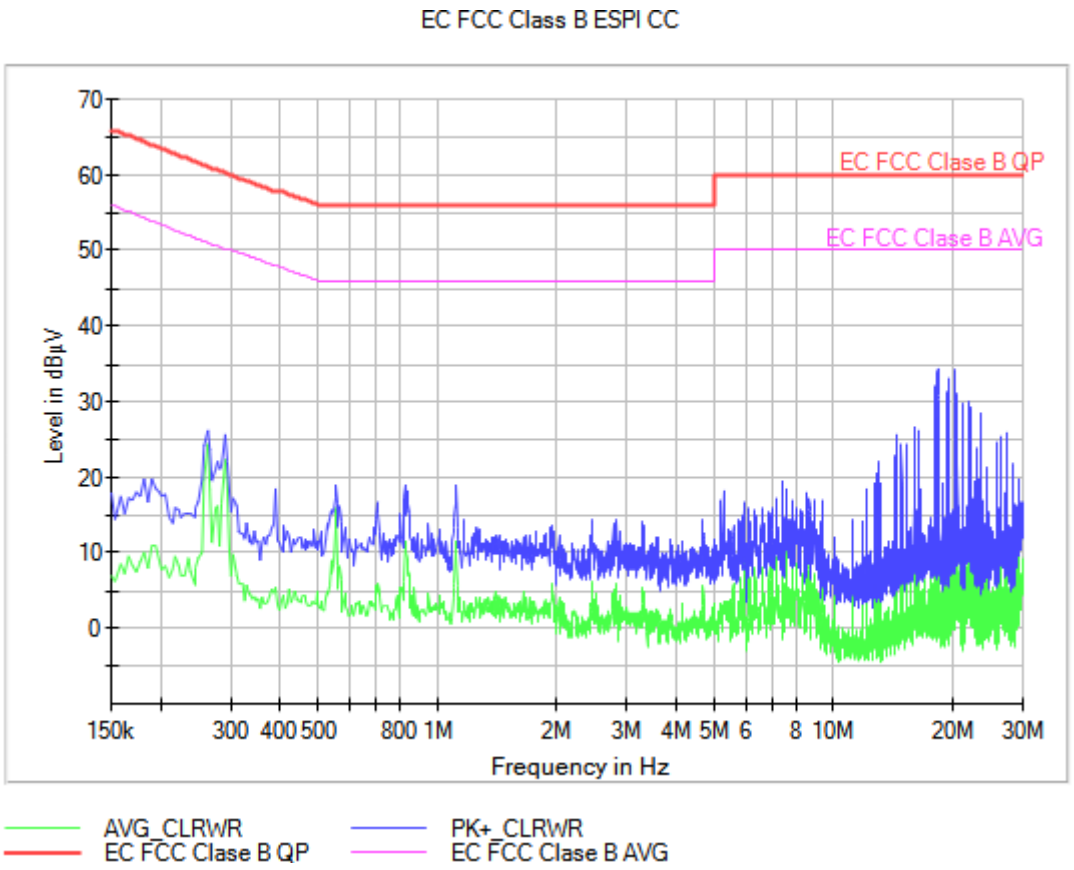
Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.174000	20.2	9.2	N

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. Bluetooth low energy in IDLE mode.GNSS in RX mode. Power supply: 5Vdc (Battery charging). Auxiliary PC for ANSI, setup powered 115 Vac 60 Hz.

Images:



Tables:

Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.190000	19.8	11.1	L1