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: 72575REM.002

Test report

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

(*) Identification of item tested	Connected watch
(*) Trademark	Tissot SA
(*) Model and /or type reference	T153420 A
Other identification of the product	FCC ID: 2AH93T153420A IC: 25567-T153420A
(*) Features	Features: Bluetooth Low Energy 5.0 HW version: T153420 A SW version: 1.0.0
Manufacturer	Tissot SA Chemin des Tourelles 17 CH-2400 Le Locle Switzerland
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 Galván EMC Consumer & RF Lab. Manager Firmado digitalmente por 53680346W JOSE MANUEL GOMEZ (C:A29507456)
Date of issue	2023-03-13
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.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Testing and Certification S.A.U.

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 an analog-digital connected watch with typical Swiss watchmaking design. The product is equipped with features such as notifications, pedometer, heart-rate monitoring, etc. The product can be recharged by light and/or with an USB cable.

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 & S/02	72575_8.1	Connected watch	Tissot SA	22MS0392084	2023-02-14	Element Under Test
S/01 & S/02	72575_17.1	Charging cable-USB	--	--	2023-02-14	Element Under Test

The sample S/02 is used with the following element, property of DEKRA TC:

Id	Description	Model	Serial Nº	Manufacturer	Application
S/02	AC/DC adapter	EP-TA50EWE	RT3J525XS/A-E	Samsung	Auxiliary device

Notes referenced to samples during the project:

Id	Type
S/01	Sample used for radiated emission test.
S/02	Sample used for conducted emission test.

Test sample description

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:	[ ]	[ ]	[ ]	[ ]	[ ]
	[X]	DC: 3.8 V (battery)					
Rated Power .....:	--						
Clock frequencies.....:	--						
Other parameters .....:	--						
Software version .....:	1.0.0						
Hardware version .....:	T1						
Dimensions in cm (W x H x D) ....:	T153420 A						
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	
	--						
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

ETA SA, Manufacture Horlogère Suisse
Schmelzistrasse 16
2540 Grenchen
Switzerland

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2023-02-20
Date (finish)	2023-02-23

Document history

Report number	Date	Description
72575REM.002	2023-03-13	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 and Iván 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
6064	SEMIANECHOIC ABSORBER LINED CHAMBER	SAC-3	FRANKONIA	N/A
6329	SHIELDED ROOM	---	FRANKONIA	N/A
6132	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2023-04-05
6126	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2023-04-05
8866	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2023-09-21
5641	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	EST LINDGREN	2024-09-15
4612	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK MESS-ELEKTRONIK	2024-07-13
9360	PRE-AMPLIFIER G>40dB 1-18 GHz	BLMA 0118-1M	BONN ELEKTRONIK	2023-05-11
4848	MEASUREMENT SOFTWARE EMC/RF	EMC32	ROHDE AND SCHWARZ	N/A
6129	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	--	--	2023-04-28

Control No.	Equipment	Model	Manufacturer	Next Calibration
4679	THREE-PHASE ARTIFICIAL NETWORK 32A	--	--	2023-01-11
5152	TRANSIENT LIMITER 10DB N CONNECTOR	VTSD 9561-F	SCHWARZBECK	2023-11-09
4523	EMI TEST RECEIVER 20Hz-26.5GHz	ESU26	ROHDE AND SCHWARZ	2023-11-05

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	Pass	---
FCC CFR 47, Part 15, Subpart B and Subpart C (10-1-21 Edition) & ICES-003 Issue 7 (October 2020)	CE Continuous conducted emission	Pass	---
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 disable. Charging batteries. Power supply: 5Vdc (through USB port)
OM/02	EUT ON. Bluetooth in advertising mode. Charging batteries. Power supply: 5Vdc (through AC/DC charger, powered at 115Vac, 60Hz)
OM/03	EUT ON. Bluetooth with communication established. Charging batteries. Power supply: 5Vdc (through AC/DC charger, powered at 115Vac, 60Hz)

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 B and 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

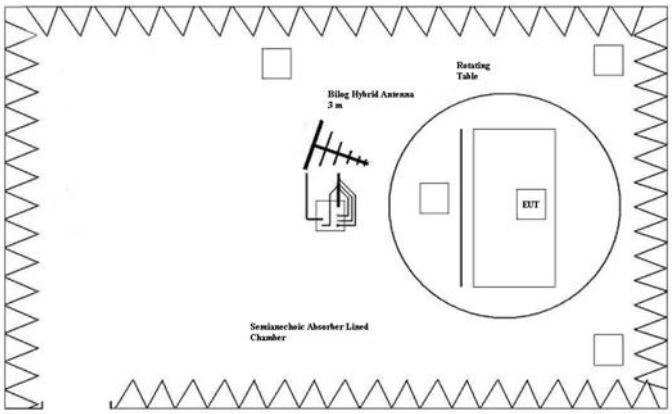
Limits of interference Class B

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)

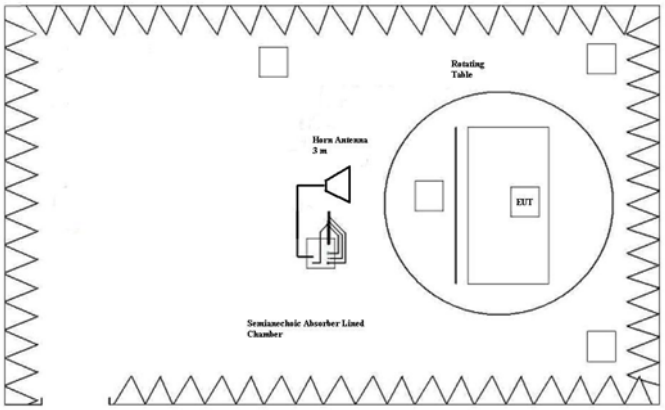
Frequency range (MHz)	FCC Part 15B		ICES-003 Issue 7		FCC Part 15B & ICES-003 Issue 7	
	QP Limit for 3 m		QP Limit for 3 m		PK Limit for 3 m	AVG Limit for 3 m
	(μV/m)	(dBμV/m)	(μV/m)	(dBμV/m)	(dBμV/m)	(dBμV/m)
30 to 88	100	40	100	40	---	---
88 to 216	150	43.5	150	43.5	---	---
216 to 230	200	46	200	46	---	---
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	RE0101HR1	[1000, 12750]	P

Note: Range: f>12.75 GHz. Test required only to the 5th harmonics of the maximum internal work frequency in the EUT.

Verdict

Pass

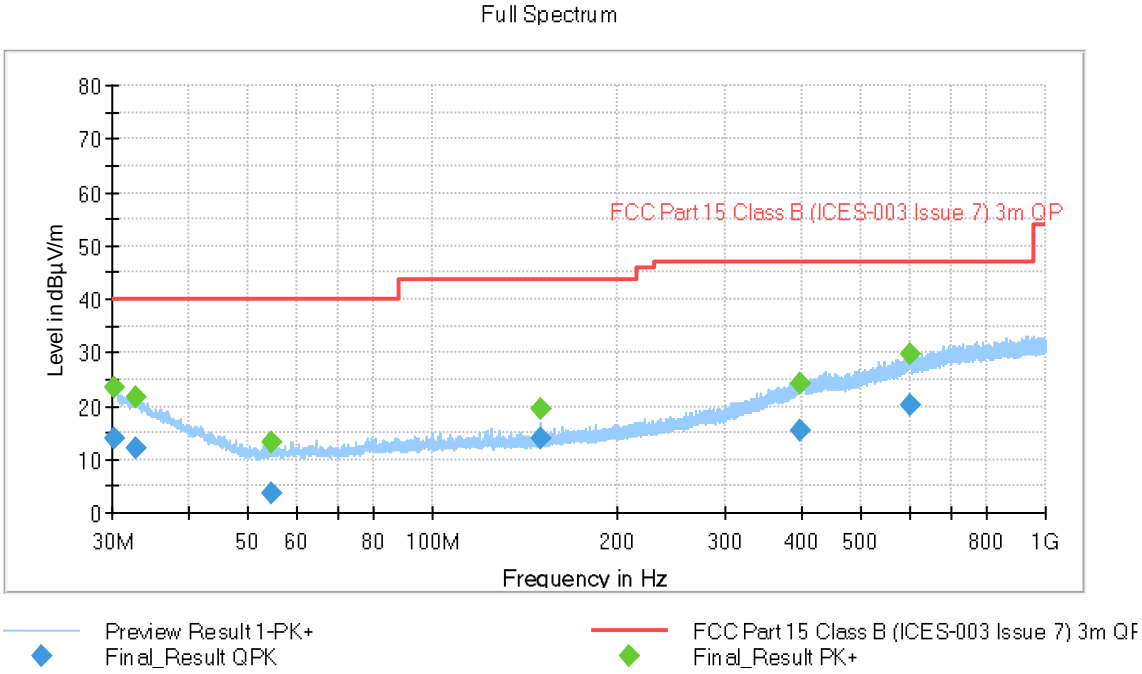
Attachments

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

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Bluetooth disable. Charging batteries. Power supply: 5Vdc (through USB port)

Images:



Tables:

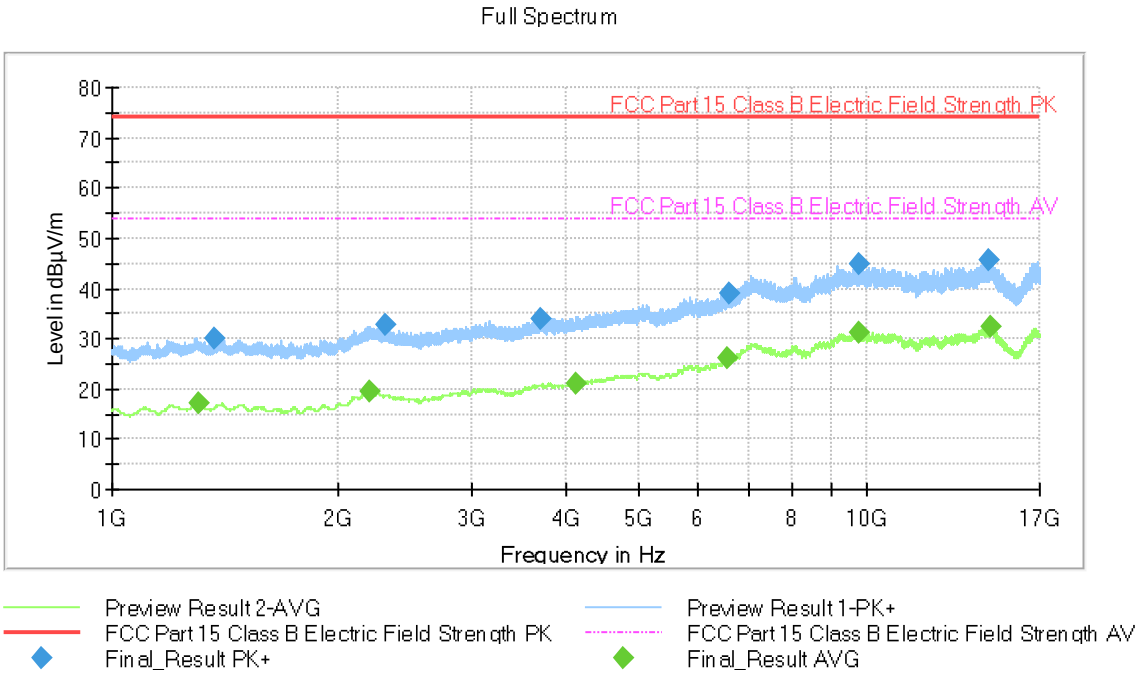
Frequency(MHz)	QuasiPeak(dBµV/m)	MaxPeak(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	Pol	Azimuth(deg)
30.256320	---	23.31	---	---	262.0	V	60.0
30.256320	14.07	---	40.00	25.93	262.0	V	60.0
32.739000	---	21.64	---	---	224.0	H	-101.0
32.739000	12.09	---	40.00	27.91	224.0	H	-101.0
54.561000	3.68	---	40.00	36.32	339.0	V	-169.0
54.561000	---	13.31	---	---	339.0	V	-169.0
149.971000	13.78	---	43.52	29.74	100.0	V	132.0
149.971000	---	19.28	---	---	100.0	V	132.0
397.786000	15.48	---	47.00	31.52	171.0	H	-105.0
397.786000	---	24.28	---	---	171.0	H	-105.0
599.558000	20.23	---	47.00	26.77	339.0	H	-53.0
599.558000	---	29.74	---	---	339.0	H	-53.0

EMC Test Code = RE0101HR1 Frequency Range MHz = [1000, 17000]

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Bluetooth disable. Charging batteries. Power supply: 5Vdc (USB)

Images:



Tables:

Frequency(MHz)	MaxPeak(dBµV/m)	Average(dBµV/m)	Limit(dBµV/m)	Margin(dB)
1298.500000	---	17.04	53.97	36.93
1365.750000	30.10	---	73.97	43.87
2191.000000	---	19.37	53.97	34.60
2305.500000	32.89	---	73.97	41.08
3711.500000	34.00	---	73.97	39.97
4122.500000	---	21.12	53.97	32.85
6556.500000	---	26.05	53.97	27.92
6601.750000	38.89	---	73.97	35.08
9800.750000	---	31.36	53.97	22.61
9809.250000	44.83	---	73.97	29.14
14564.500000	45.73	---	73.97	28.24
14636.000000	---	32.30	53.97	21.67

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 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	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

*Decreases with the logarithm of the frequency.

Results

S/	OM	Code	Freq Rng (MHz)	Line	V
01	OM/02	CE0102N	[0.15, 30]	N	P
01	OM/02	CE0102L1	[0.15, 30]	L1	P
01	OM/03	CE0103N	[0.15, 30]	N	P
01	OM/03	CE0103L1	[0.15, 30]	L1	P

Verdict

Pass

Attachments

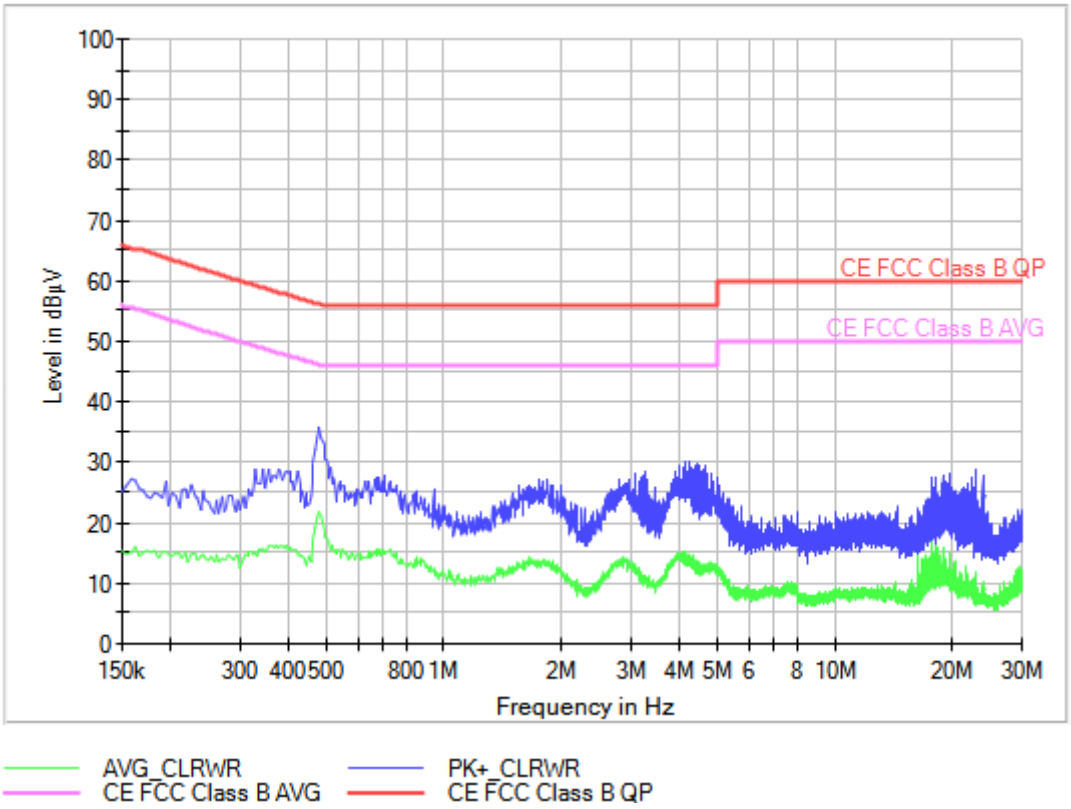
EMC Test Code = CE01020N Frequency Range MHz = [0.15, 30]

Conducted Emissions - Tested Line = N

Sample ID: S/01

Operation Mode: OM/02. EUT ON. Bluetooth in advertising mode. Charging batteries. Power supply: 5Vdc (through AC/DC charger, powered at 115Vac, 60Hz)

Images:



Tables:

Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.330000	28.9	15.1	N
0.482000	35.8	21.8	N
1.850000	27.3	13.3	N
4.226000	30.2	14.3	N
5.162000	25.0	11.7	N
23.130000	28.9	12.0	N

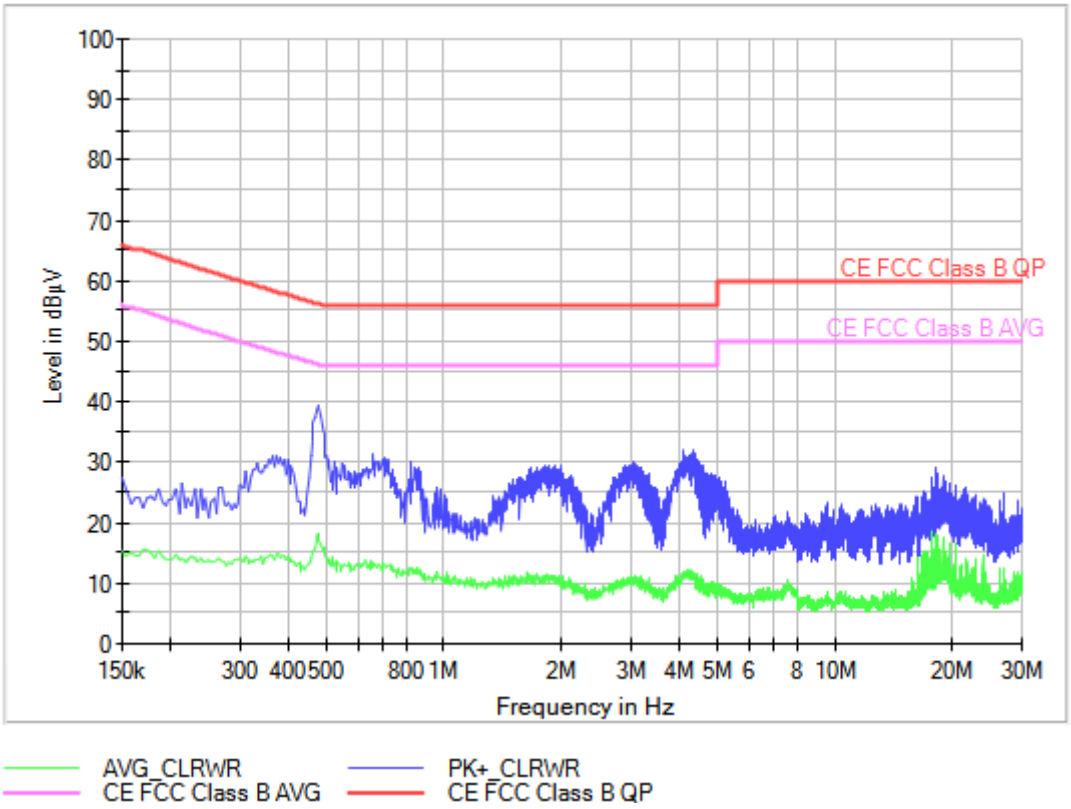
EMC Test Code = CE0102L1 Frequency Range MHz = [0.15, 30]

Conducted Emissions - Tested Line = L1

Sample ID: S/01

Operation Mode: OM/02. EUT ON. BLE with comunication established. Power supply: 115Vac / 60Hz (USB charger)

Images:



Tables:

Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.358000	30.5	14.3	L1
0.478000	39.4	18.2	L1
1.866000	29.6	11.1	L1
4.094000	32.0	11.3	L1
5.262000	26.8	8.4	L1
18.246000	29.0	19.0	L1

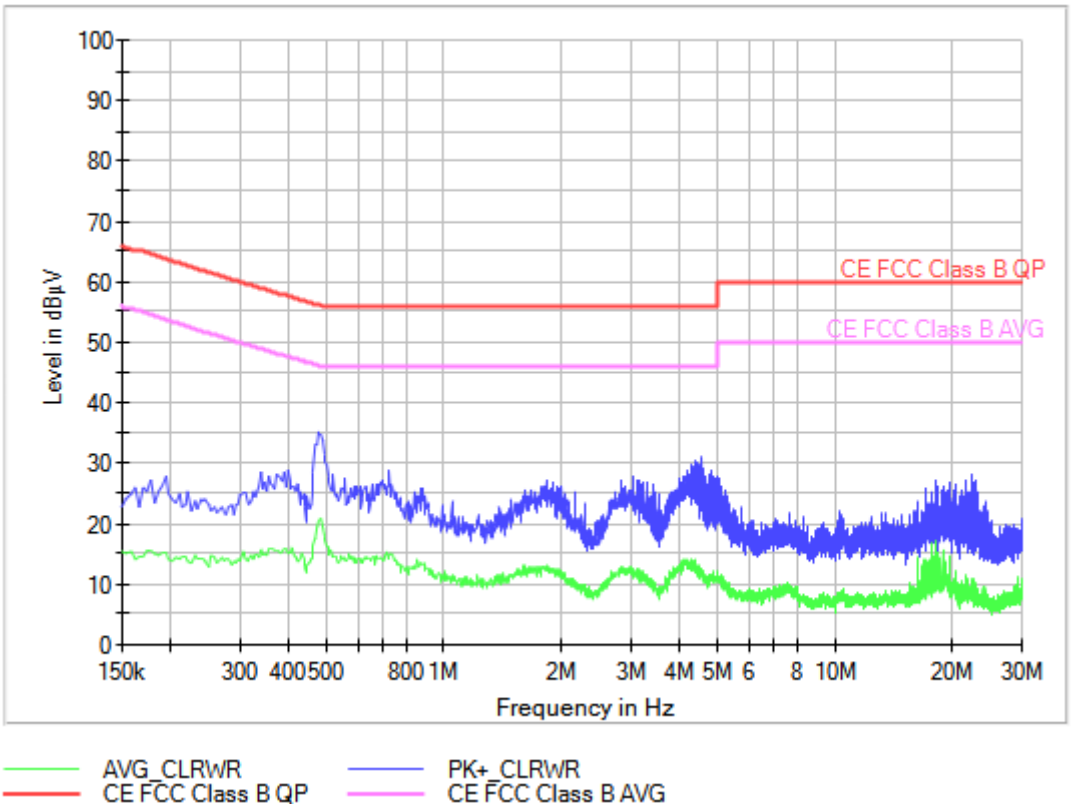
EMC Test Code = CE01030N Frequency Range MHz = [0.15, 30]

Conducted Emissions - Tested Line = N

Sample ID: S/01

Operation Mode: OM/03. EUT ON. Bluetooth with communication established. Charging batteries. Power supply: 5Vdc (through AC/DC charger, powered at 115Vac, 60Hz)

Images:



Tables:

Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.342000	28.5	15.8	N
0.478000	35.1	20.4	N
1.830000	27.4	13.1	N
4.602000	31.0	12.3	N
5.230000	25.6	9.8	N
22.198000	28.1	8.8	N

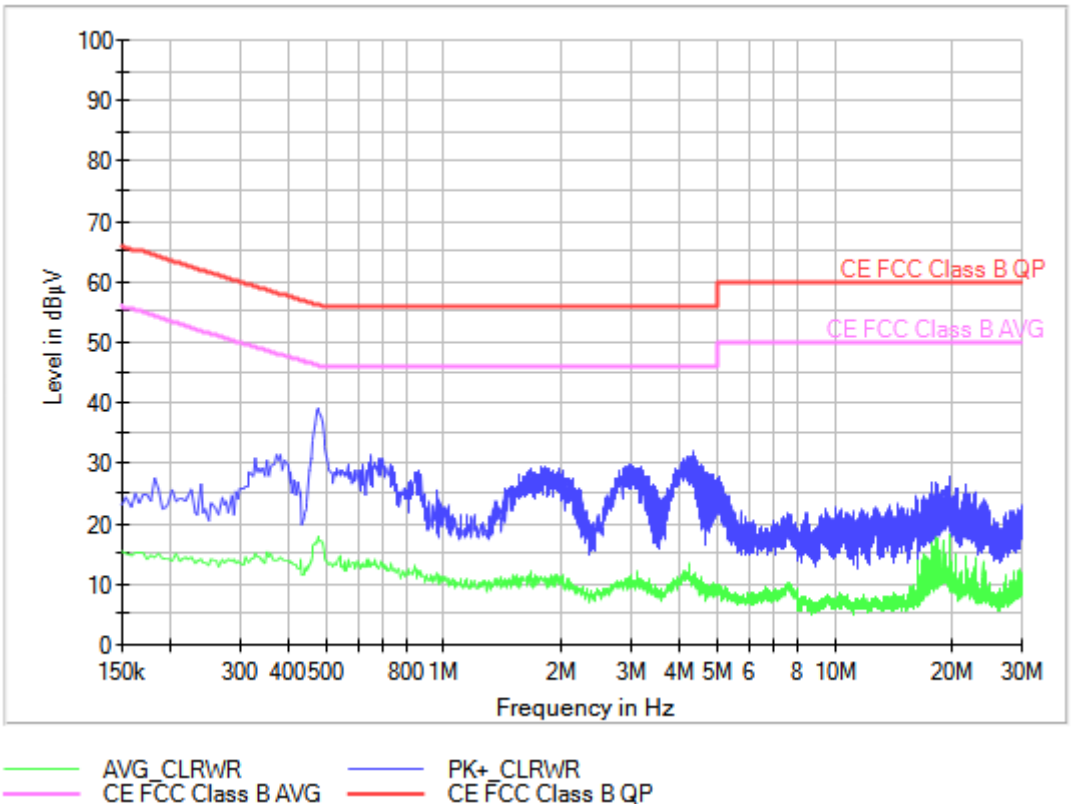
EMC Test Code = CE0103L1 Frequency Range MHz = [0.15, 30]

Conducted Emissions - Tested Line = L1

Sample ID: S/01

Operation Mode: OM/03. EUT ON. Bluetooth with communication established. Charging batteries. Power supply: 5Vdc (through AC/DC charger, powered at 115Vac, 60Hz)

Images:



Tables:

Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.330000	30.8	15.0	L1
0.478000	39.2	17.8	L1
1.782000	29.4	11.4	L1
4.314000	32.0	11.2	L1
5.158000	26.8	8.9	L1
19.710000	27.8	18.3	L1