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

ENAC ENSAYOS Nº 51/LE147

Test report No:
NIE: 61936REM.002A1

Test Report

FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-16 Edition) & ICES-003 (January 2016, Updated April 2017)

(*) Identification of item tested	BIONTECH THERMIC (HEATED INSOLE FOR FOOTWEAR)
(*) Trademark	BIONTECH
(*) Model and /or type reference tested	THERMIC
Other identification of the product	HW Version: 2.1.2 SW Version: 1.36.8 FCC ID: 2AUZK-THERMIC IC: 25556-THERMIC
(*) Features	Heated insole Bluetooth connected to an Android or IOS device
Manufacturer	ANTONIO MORÓN DE BLAS, S.L. Polígono Raposal. Parcela 38-45 C.P.: 26580. Arnedo. La Rioja. Spain.
Test method requested, standard	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition) & ICES-003 (January 2016, updated April 2017)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López EMC Lab Manager RAFAEL LÓPEZ MARTÍN 2020.02.20 16:37:45 +01'00'
Date of issue	2020-02-20
Report template No	FDT08_22 (*) "Data provided by the client"

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Competences and guarantees

DEKRA Testing and Certification 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 include testing performed in this test report, FCC designation number ES0004.

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

DEKRA Testing and Certification 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 at the time of performance of the test.

DEKRA Testing and Certification 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.
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 and the Accreditation Bodies.

Uncertainty

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

The total uncertainty of the measurement system for the measured conducted disturbance characteristics of EUT from 150kHz to 30 MHz is I = ± 3,9 dB for quasi-peak measurements, I = ± 3,2 dB for average 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 26 GHz is I = ± 2,6 dB for peaks and average measurements (k = 2)

Data provided by the client

The sample consists of a BIONTECH THERMIC, a heated insole for footwear with Bluetooth connection to an Android or IOS device.

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 under test have been selected by: The client.

Sample S/01 is composed by the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
61936/002	USB load cable	---	---	2019-08-08
61936/003	Insole	THERMIC	---	2019-08-08
61936/004	Insole	THERMIC	---	2019-08-08

Sample S/02 is composed by the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
61936/002	USB load cable	---	---	2019-08-08
61936/003	Insole	THERMIC	---	2019-08-08
61936/004	Insole	THERMIC	---	2019-08-08

Auxiliary equipment used with sample S/02:

Generic Certified AC/DC adapter. Model A1357. Manufacturer: Apple

Test sample description

		☐		
		Specified length [m]	Attached during test	Shielded
	Not provided data		☐	☐
			☐	☐

Supplymentary information to the ports…… :	Not provided data					
Rated power supply .....:	Voltage and Frequency		Reference poles			
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: 5Vdc. (USB port)					
	☐	DC:					
Rated Power .....:	Not provided data						
Clock frequencies.....:	Not provided data						
Other parameters .....:	FCC ID: 2AUZK-THERMIC IC: 25556-THERMIC						
Software version .....:	1.36.8						
Hardware version .....:	2.1.2						
Dimensions in mm (W x H x D)...:	Not provided data						
Mounting position .....:	☐	Table top equipment					
	☐	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☐	Hand-held equipment					
	☒	Other: Wearable device					

Modules/parts.....:	Module/parts of test item	Type	Manufacturer
	Not provided data		
Accessories (not part of the test item) .....:	Description	Type	Manufacturer
	Not provided data		
Documents as provided by the applicant.....:	Description	File name	Issue date
	Not provided data		

Identification of the client

ANTONIO MORÓN DE BLAS, S.L.
Polígono Raposal. Parcela 38-45
C.P.: 26580. Arnedo. La Rioja. Spain.

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2019-08-26
Date (finish)	2020-02-14

Document history

Report number	Date	Description
61936REM.002	2019-11-22	First release
61936REM.002A1	2020-02-20	Second release. It was added the sample 02 and operation mode 02. This modification test report cancels and replaces the test report 61936REM.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. = 860 mbar Max. = 1060 mbar

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. = 860 mbar Max. = 1060 mbar

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. = 860 mbar Max. = 1060 mbar

Remarks and comments

The test have been performed by the technical personnel: Alejandro Marín.

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

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

List of equipment used during the test

Control Number	Description	Model	Manufacturer	Next Calibration
1935	EMI TEST RECEIVER 9kHz-3GHz	ESPI3	ROHDE AND SCHWARZ	2019-12-12
3548	USB TEMPERATURE AND HUMIDITY SENSOR	HUMIDIPROBE	PICO TECHNOLOGY	2020-04-02
4523	EMI TEST RECEIVER 20Hz-26.5GHz	ESU26	ROHDE AND SCHWARZ	2020-02-21
4570	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2020-04-05
4575	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	TR-702W	T&D	2020-04-04
4578	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2020-04-03
4612	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK MESS-ELEKTRONIK	2021-06-14
5705	PRE-AMPLIFIER G>40dB 1-18 GHz	BLMA 0118-1M	BONN ELEKTRONIK	2020-04-30
6205	THREE-PHASE ARTIFICIAL NETWORK 32A	Pmm L3 32	NARDA	2020-09-26
5152	TRANSIENT LIMITER 10 DB N CONNECTOR	VTSD 9561-F	SCHWARZBECK	2020-04-15

Summary

Emission Test		
Requirement – Test case	**Verdict**	**Remark**
Radiated emission. Electromagnetic field measure (30 MHz – 1000 MHz)	P	---
Radiated emission. Electromagnetic field measure (1 GHz – 18 GHz)	P	(1)
Continuous conducted emission (150 KHz – 30 MHz)	P	---

Supplymentary information and remarks:

(1) The upper frequency of measurement range is the 5th harmonic of the highest frequency generated or used in the device.

Appendix A: Test results

APPENDIX A CONTENT

DESCRIPTION OF THE OPERATION MODES 12
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DESCRIPTION OF THE OPERATION MODES

The operation modes used by the samples to which the present report refers, are shown in the following table:

OPERATION MODE	DESCRIPTION
OM#01	EUT ON. Stand-alone basis. Bluetooth not connected. Charging batteries. Power supply: 5Vdc. (USB port)
OM#02	EUT ON. Bluetooth not connected. Charging batteries. Power supply: 5Vdc(USB) via auxilliary AC/DC power supply powered at 115Vac.
OM#03	EUT ON. Bluetooth connected. Charging batteries. Power supply: 5Vdc(USB) via auxilliary AC/DC power supply powered at 115Vac.

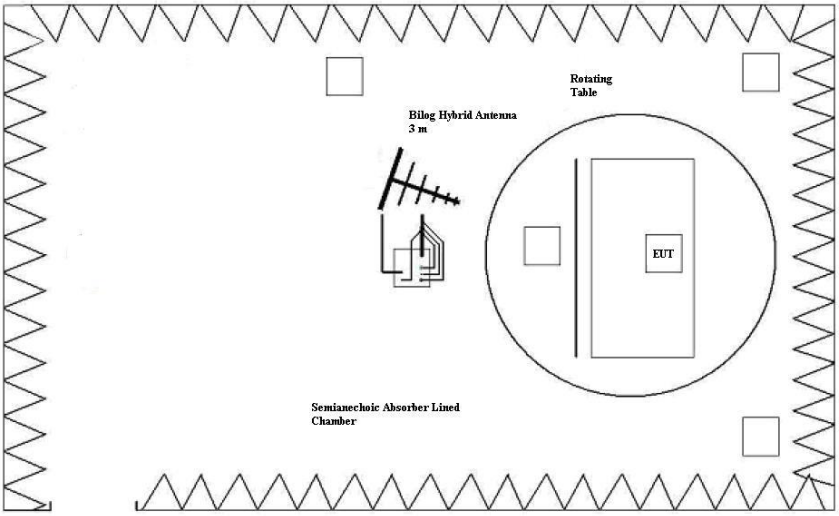
RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE

LIMITS:	Product standard:	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.109 & ICES-003 (January 2016, updated April 2017)
	Test standard:	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.109 & ICES-003 (January 2016, updated April 2017)

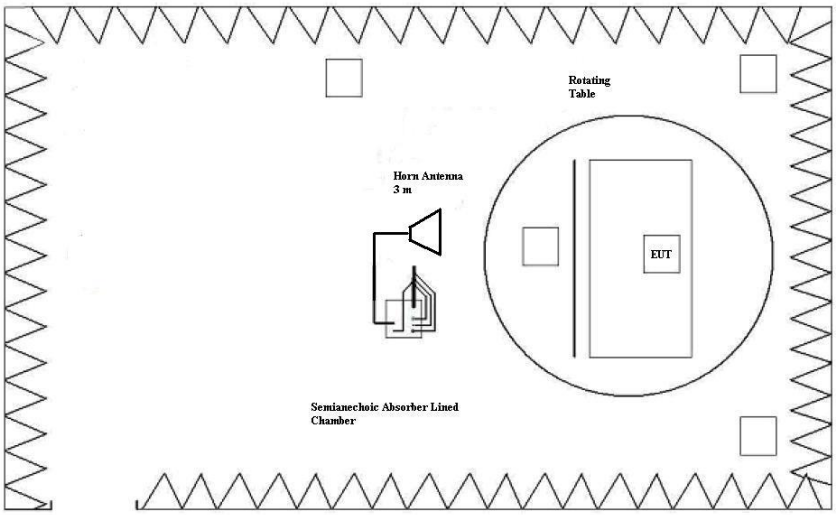
Limits of interference Class A

The applied limit for radiated emissions, 10 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-16 Edition), Secs. 15.109 & ICES-003 (January 2016, updated April 2017) in the frequency range 30 MHz to 26 GHz for class A equipments.

Frequency of emission (MHz)	Field strength (microvolts/meter)
30-88	90
88-216	150
216-960	210
Above 960	300



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

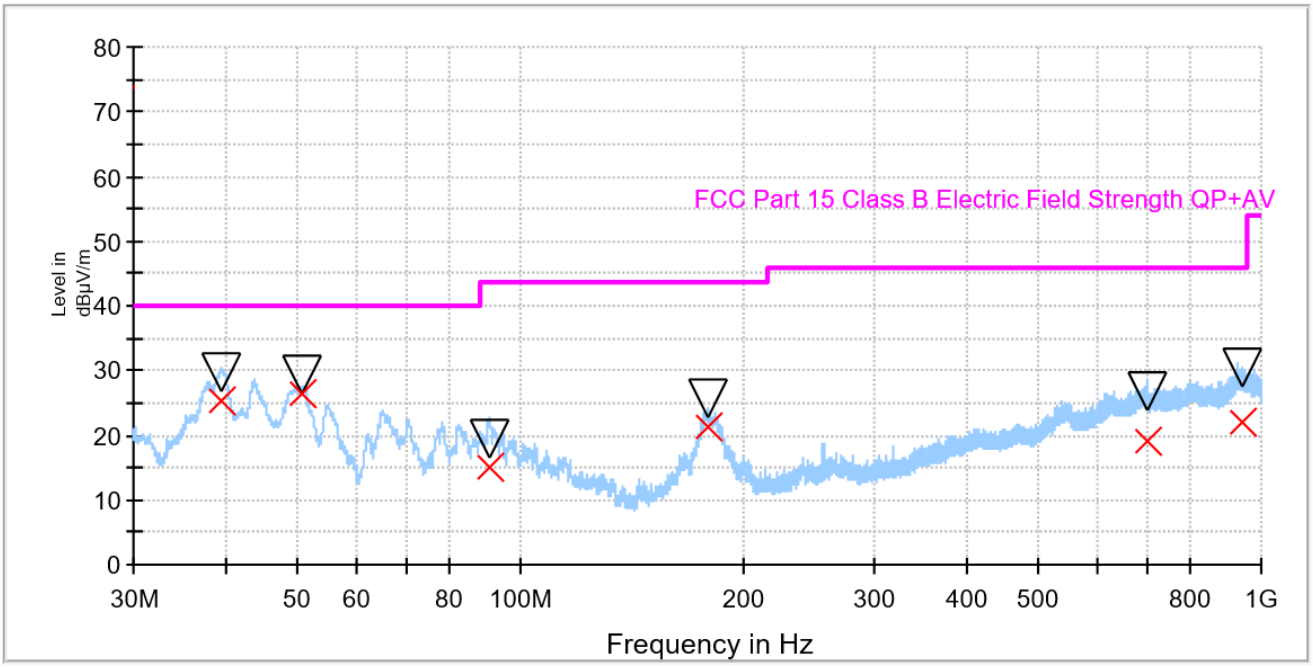
TESTED SAMPLE:	S/01
TESTED OPERATION MODES:	OM#01
TEST RESULTS:	CRmmnnRRPP: CR, Radiated Condition; mm: Sample number; nn: Operation mode; RR: Range; PP: Polarization.

CRmmnnRRPP	Description	Result
CR0101HR1_H	Range: 1 GHz – 18 GHz. Horizontal polarization.	P
CR0101HR1_V	Range: 1 GHz – 18 GHz. Vertical polarization.	P

Radiated Emission. CR0101LR

Project:	61936REM.002
Operating Conditions:	GRUPO MORON
Operator Name:	S/01
Comment:	EUT ON. Stand alone basis. Charging batteries. Power supply: 5Vdc (via USB).

Full Spectrum



Peak Preview
MaxPeak
QuasiPeak
FCC Part 15 Class B Electric Field Strength QP+AV

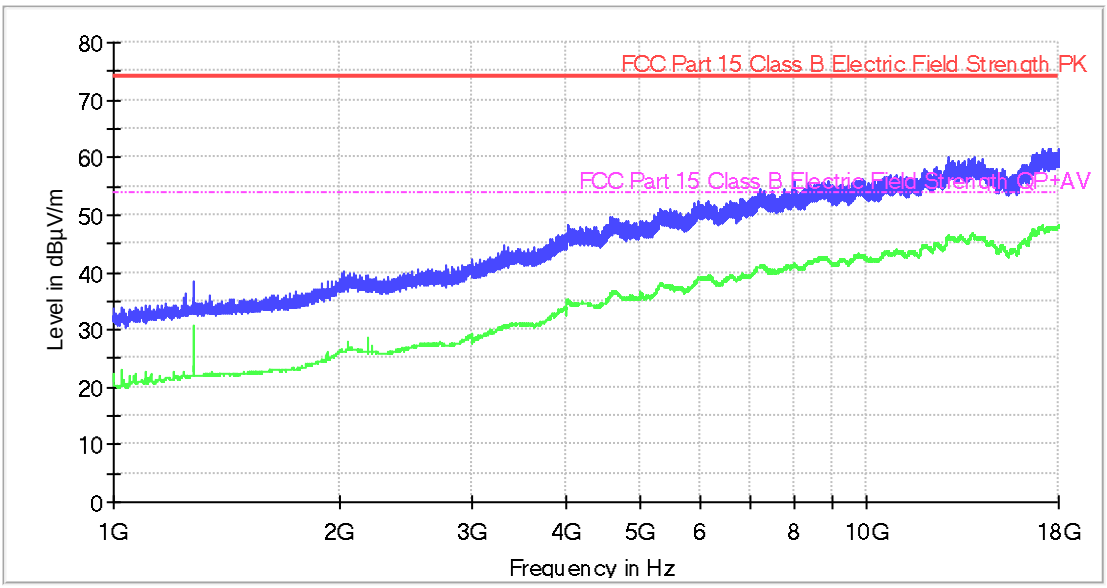
Maximizations

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
39.401250	29.87	25.14	40.00	10.13	104.0	V	350.0
50.586250	29.37	26.37	40.00	10.63	104.0	V	62.0
90.588750	19.36	14.93	40.00	20.64	106.0	V	136.0
179.096250	25.84	21.29	40.00	14.16	104.0	V	257.0
702.320000	26.89	19.16	47.00	20.11	116.0	H	258.0
940.822500	30.29	22.06	47.00	16.71	225.0	V	155.0

Radiated Emission. CR0101HR1_H

Project:	61936REM.002
Operating Conditions:	GRUPO MORON
Operator Name:	S/01
Comment:	EUT ON. Stand alone basis. Charging batteries. Bluetooth OFF. Power supply: 5Vdc (via USB). Horizontal Polarization.

FCC 1-18GHz class B



Average Scan
Peak Scan
FCC Part 15 Class B Electric Field Strength PK
FCC Part 15 Class B Electric Field Strength QP+AV

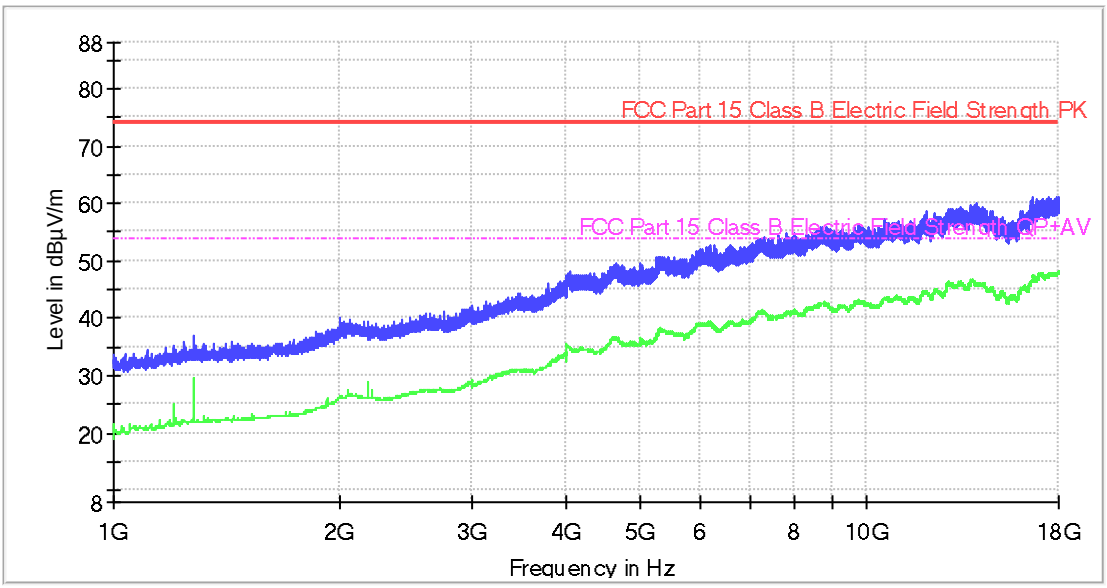
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)	Height (cm)	Pol
1000.000000	33.9	20.9	155.0	H

Radiated Emission. CR0101HR1_V

Project:	61936BREM.002
Operating Conditions:	GRUPO MORON
Operator Name:	S/01
Comment:	EUT ON. Stand alone basis. Charging batteries. Bluetooth OFF. Power supply: 5Vdc (via USB). Vertical Polarization.

FCC 1-18GHz class B



Average Scan
Peak Scan
FCC Part 15 Class B Electric Field Strength PK
FCC Part 15 Class B Electric Field Strength QP+AV

Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)	Pol
1000.000000	33.8	18.7	V

CONTINUOUS CONDUCTED EMISSION

LIMITS:	Product standard :	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.107; ICES-003 Issue 6 (January 2016); Subpart C (10-1-16 Edition). Sec. 15.207
	Test standard :	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.107; ICES-003 Issue 6 (January 2016); Subpart C (10-1-16 Edition). Sec. 15.207

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 (10-1-16 Edition), Secs. 15.107 & ICES-003 Issue 6 (January 2016) & Subpart C (10-1-16 Edition). Sec. 15.207, 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.

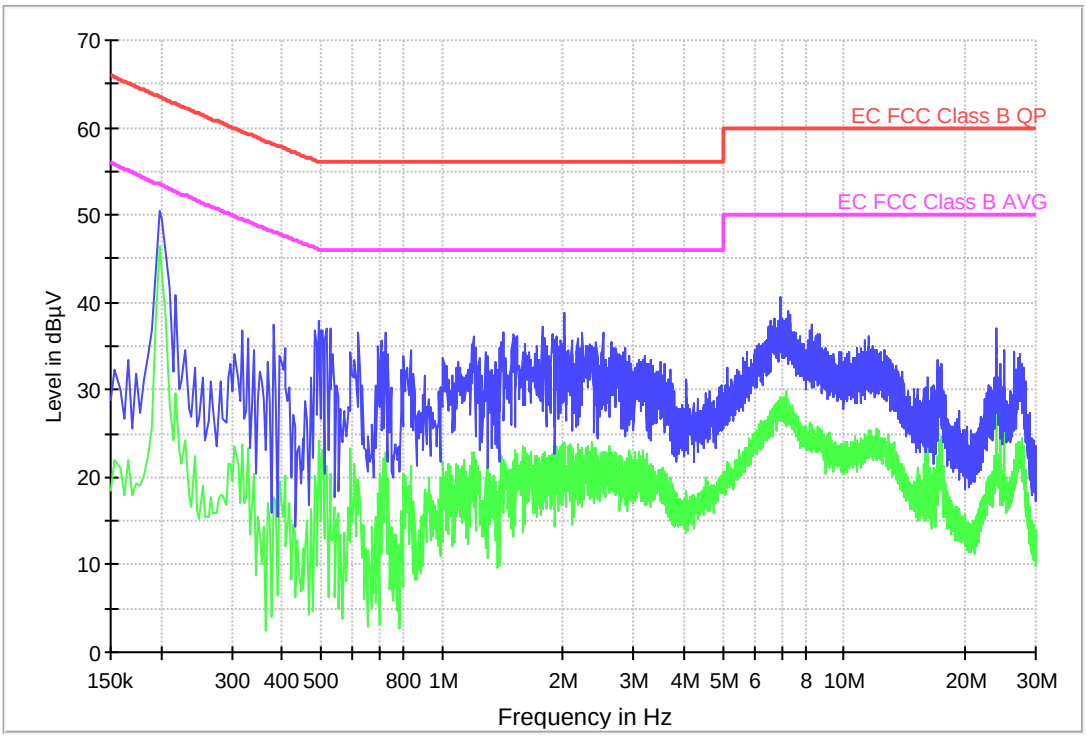
TESTED SAMPLES:	S02
TESTED OPERATION MODES:	OM#02 & OM#03
TEST RESULTS:	CCmmnnhh: CC, Conducted Condition; mm: Sample number; nn: Operation mode; hh: wire

CCmmnnhh	**DESCRIPTION**	**RESULT**
CC02020N	Range: 150kHz – 30MHz. Neutral wire noise.	P
CC0202L1	Range: 150kHz – 30MHz. Phase wire noise.	P
CC02030N	Range: 150kHz – 30MHz. Neutral wire noise.	P
CC0203L1	Range: 150kHz – 30MHz. Phase wire noise.	P

Conducted Emission. CC02020L1

Project:	61936BREM.002
Company:	GRUPO MORON
Sample:	S/02
Operation mode:	OM#02
Description:	EUT ON. Bluetooth not connected. Charging batteries. Power supply: 5Vdc(USB) via auxilliary AC/DC power supply powered at 115Vac. L1 wire noise.

EC FCC Class B ESPI CC



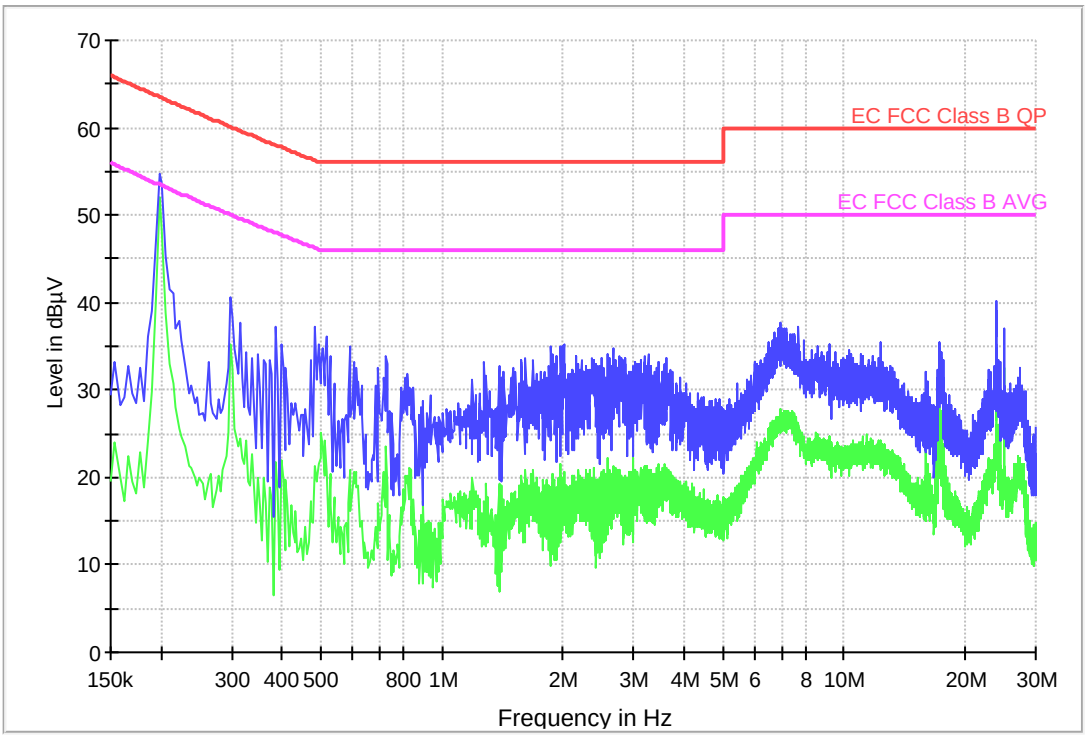
Average Scan
EC FCC Class B QP
Peak Scan
EC FCC Class B AVG

Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)
0.198000	50.4	46.4
0.494000	38.0	24.3
2.022000	38.9	20.7
6.114000	35.2	24.5
6.982000	40.7	27.0
24.002000	37.0	29.4

Conducted Emission. CC0202N

Project:	61936BREM.002
Company:	GRUPO MORON
Sample:	S/02
Operation mode:	OM#02
Description:	EUT ON. Bluetooth not connected. Charging batteries. Power supply: 5Vdc (USB) via auxilliary AC/DC power supply powered at 115Vac. Neutral wire noise.



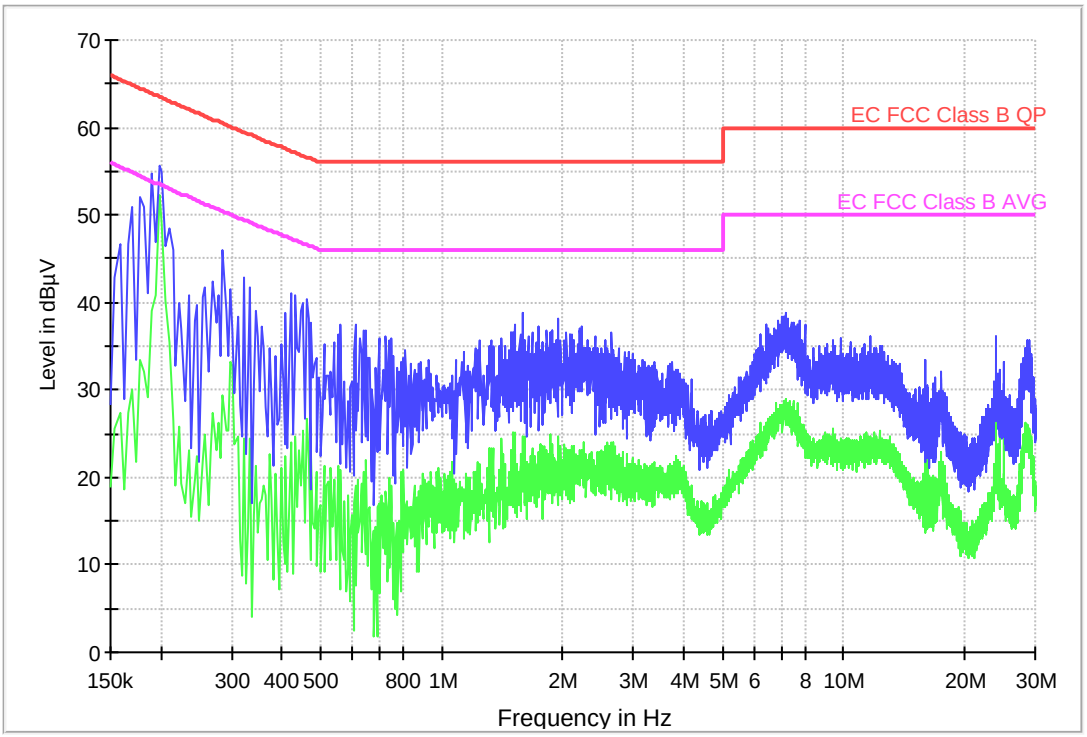
Average Scan — Peak Scan
EC FCC Class B QP — EC FCC Class B AVG

Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)
0.198000	54.7	52.1
0.482000	37.2	21.4
2.006000	35.2	17.3
6.942000	37.6	25.8
12.278000	35.4	24.2
24.002000	40.1	31.4

Conducted Emission. CC02030L1

Project:	61936BREM.002
Company:	GRUPO MORON
Sample:	S/02
Operation mode:	OM#03
Description:	EUT ON. Bluetooth connected. Charging batteries. Power supply: 5Vdc (USB) via auxilliary AC/DC power supply powered at 115Vac. L1 wire noise.

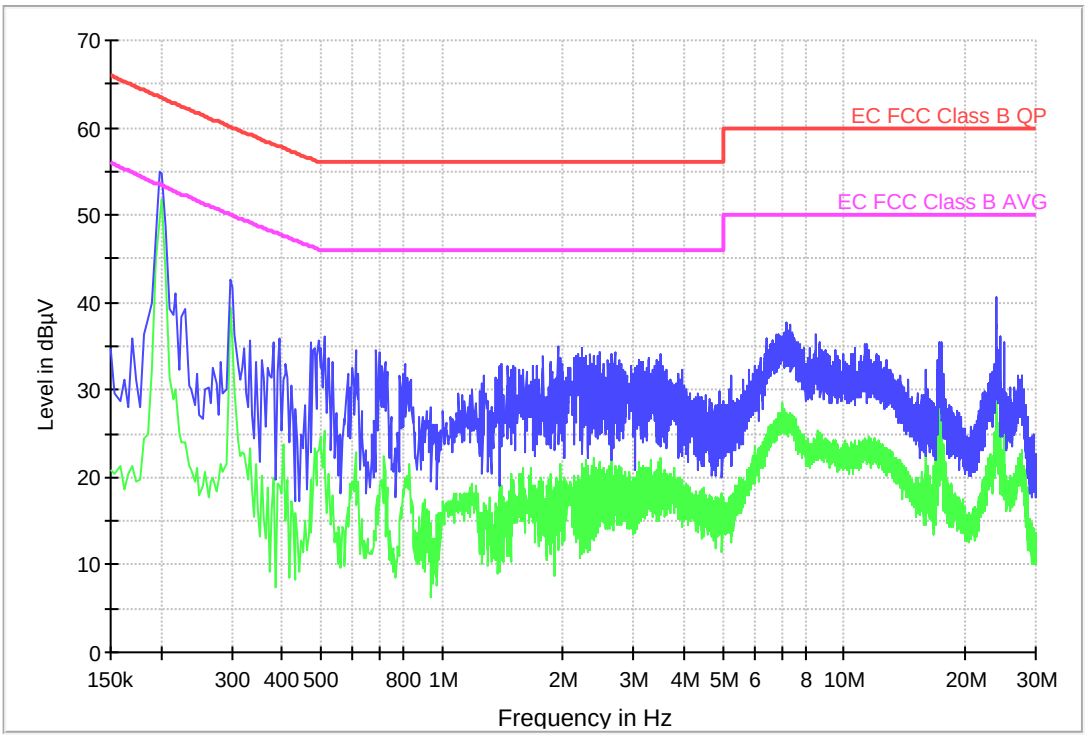


Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)
0.198000	55.6	52.2
0.286000	46.0	29.3
1.590000	38.9	24.8
6.090000	34.5	23.4
7.202000	38.7	28.9
24.002000	36.1	27.5

Conducted Emission. CC0203N

Project:	61936BREM.002
Company:	GRUPO MORON
Sample:	S/02
Operation mode:	OM#02
Description:	EUT ON. Bluetooth connected. Charging batteries. Power supply: 5Vdc (USB)via auxilliary AC/DC power supply powered at 115Vac. Neutral wire noise.



Average Scan
EC FCC Class B QP
Peak Scan
EC FCC Class B AVG

Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)
0.198000	55.0	49.5
0.510000	36.0	25.4
2.234000	34.8	21.5
7.202000	37.6	27.0
17.482000	35.4	27.4
24.002000	40.6	34.6