

ISED CABid: ES1909
 Lab Company Number: 4621A

Test report No:
 NIE: 72232REM.002

Test report

FCC Rules and Regulations CFR 47, Part 15, Subpart B & Subpart C (10-1-20 Edition)
ICES-003 Issue 7 (October 2020)
RSS-Gen Issue 5 (April 2018)

(*) Identification of item tested	EASYZONE EZ8
(*) Trademark	AIRZONE
(*) Model and /or type reference	AZPV8CB2IAQ (USA)
(*) Derived model not tested	AZPV8CB1IAQ (EU)
Other identification of the product	Not provided data
(*) Features	FCC ID: SVS-CB-IAQ IC: 24685-CBIAQ HW version: V1.0 SW version: Not provided data Features: SRD, Bluetooth (See data sheet)
Manufacturer	CORPORACIÓN EMPRESARIAL ALTRA S.L. C/ MARIE CURIE 21, MÁLAGA (29590), SPAIN
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B & Subpart C (10-1-20 Edition) ICES-003 Issue 7 (October 2020) & RSS-Gen Issue 5 (April 2018)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez Industrial & Automotive EMC Lab. Manager
Date of issue	2023-01-16
Report template No	FDT08_24 (*) "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
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.

DEKRA Testing and Certification S.A.U. is an FCC-recognized accredited testing laboratory with the appropriate scope of accreditation that covers the performed tests in this report, FCC designation number ES0004.

DEKRA Testing and Certification S.A.U. is an ISED recognized accredited testing laboratory, CABid: ES1909, Company Number: 4621A, 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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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 6000 MHz is $I = \pm 4,7$ dB for quasi-peak measurements, $I = \pm 4,3$ dB for peak 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 Airzone motorized plenum with neck that mechanically adapts to the main ducted AC units. Communications via radio at 868/915 MHz. Powered at 110/230 Vac.

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	72232_9.1	Communication box	AZPV8CB1IAQ	0ACML3	2022-11-03	Element Under Test
S/01	72232_4.1	Temperature probe	--	--	2022-06-13	Auxiliary Element
S/01	72232_5.1	Module (Auxiliar)	AZxxxZMOION	--	2022-06-13	Auxiliary Element
S/01	72232_6.1	Module	--	--	2022-06-13	Auxiliary Element
S/01	72232_3.1	Touch pad (Auxiliar)	AZCE6THINKCB	F00C436	2022-06-13	Auxiliary Element
S/01	73542_5.1	Communication box	--	--	2022-10-20	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⁾		
	Airzone connection bus	100	[X]	[X]	[]		
	Automation bus	100	[X]	[X]	[]		
	CAN connection bus	-	[]	[X]	[]		
	AC unit bus	2	[]	[]	[]		
	Actuator outputs	15	[X]	[]	[]		
	Relay outputs	-	[]	[]	[]		
Supplementary information to the ports..... :	Complete description of the ports in the file "List of devices and Manual test"						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
[]	AC:		[]	[]	[]	[]	[]
[X]	AC: 110 (USA)		[X]	[]	[]	[X]	[X]
[]	DC:						
[]	DC:						
Rated Power	4.1 W						
Clock frequencies.....	Not provided data						
Other parameters	Not provided data						
Software version	Not provided data						
Hardware version	V1.0						
Dimensions in cm (W x H x D)	195 x 180 x 55,5 mm						

Mounting position	<input type="checkbox"/>	Table top equipment		
	<input checked="" type="checkbox"/>	Wall/Ceiling mounted equipment		
	<input type="checkbox"/>	Floor standing equipment		
	<input type="checkbox"/>	Hand-held equipment		
	<input type="checkbox"/>	Other:		
Modules/parts.....	Module/parts of test item		Type	Manufacturer
	Central Easyzone EZ8		AZPV8CB1IAQ	AIRZONE

Accessories (not part of the test item)	Description		Type	Manufacturer
	Particle sensor		SN-GCJA5L	Panasonic
	Thermostat		Think	Airzone
	Ionizer		MHM314-02A	Murata
	Webserver		AZX6WSC5GE	Airzone
	Gateway		AZX6GTCD1	Airzone

Documents as provided by the applicant	Description		File name	Issue date
	Data sheet		FTAZEZ8_PLE

⁽³⁾ Only for Medical Equipment

Identification of the client

CORPORACIÓN EMPRESARIAL ALTRA S.L.
C/ MARIE CURIE 21, MÁLAGA (29590), SPAIN

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2022-12-01
Date (finish)	2022-12-12

Document history

Report number	Date	Description
72232REM.002	2023-01-16	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: Armando Moles Tejedor and Julio Bautista Martin.

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
2853	CURRENT PROBE 10kHz-150MHz	9206-1	SOLAR ELECTRONICS	2023-10-06
7816	EMI TEST RECEIVER 1Hz-26.5GHz	ESW26	ROHDE AND SCHWARZ	2023-11-04
6666	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2024-03-04
5779	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2023-04-28
7743	HORN ANTENNA 0,75-18GHz	3115	ETS LINDGREN	2023-08-24
6815	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2025-03-04
9360	PRE-AMPLIFIER G>40dB 1-18 GHz	BLMA 0118-1M	BONN ELEKTRONIK	2023-05-11
7614	SEMIANECHOIC ABSORBER LINED CHAMBER V	FACT 3 200 STP	ETS LINDGREN	--
4848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	--
4636	CURRENT PROBE, 10kHz – 500MHz	F55	FCC	2023-09-30
1650	THREE-PHASE ARTIFICIAL V-NETWORK 100A	NNLK8121	SCHWARZBECK	2023-02-08

Summary

Test Specification.	Requirement – Test case	Verdict	Remark
FCC 47 CFR Part 15B	RE Radiated emission. Electromagnetic field measure	Pass	--
FCC 47 CFR Part 15B FCC 47 CFR Part 15C ICES-003 RSS-Gen	CE Continuous conducted emission	Pass	--
<u>Supplementary information and remarks:</u> None			

Appendix A: Test results

Appendix A content

DESCRIPTION OF THE OPERATION MODES	15
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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. SRD without transmission mode. BLE active and without transmission. Managing work by zones. Heating mode. Power supply: 115 Vac.
OM/02	EUT ON. SRD in transmission mode. BLE ON with communication established with auxiliary device. Managing work by zones. Heating mode. Power supply: 115 Vac.

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 and Subpart C (10-1-20 Edition) & ICES-003 Issue 7 (October 2020) RSS-Gen Issue 5 (April 2018)	ANSI C63.4 (2014)	CE Continuous conducted emission

Test Cases Details

FCC 47 CFR Part 15B

RE Radiated emission. Electromagnetic field measure

Limits

Limits of interference Class B

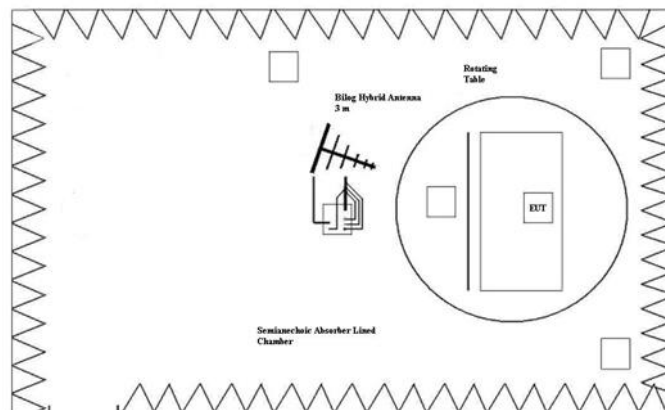
The applied limit for radiated emissions, 3 m distance, according to the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-19 Edition), Secs. 15.109 & ICES-003 Issue 7 (October 2020)

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
	($\mu\text{V}/\text{m}$)	($\text{dB}\mu\text{V}/\text{m}$)	($\mu\text{V}/\text{m}$)	($\text{dB}\mu\text{V}/\text{m}$)	($\text{dB}\mu\text{V}/\text{m}$)	($\text{dB}\mu\text{V}/\text{m}$)
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

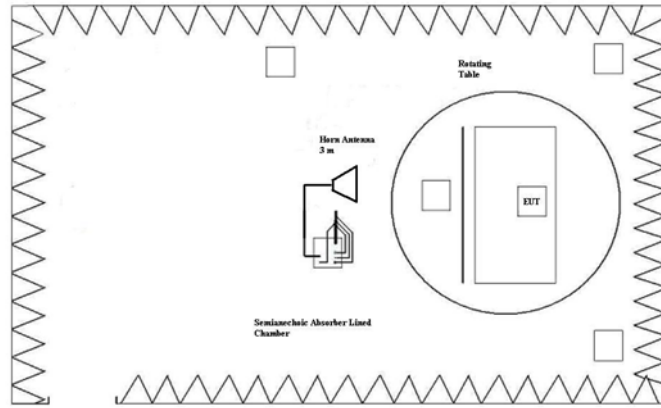
NOTE: FCC QP and AVG limits are in concordance with RSS-Gen Issue 5 (March 2019), Secs. 7.1 and 7.3.

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

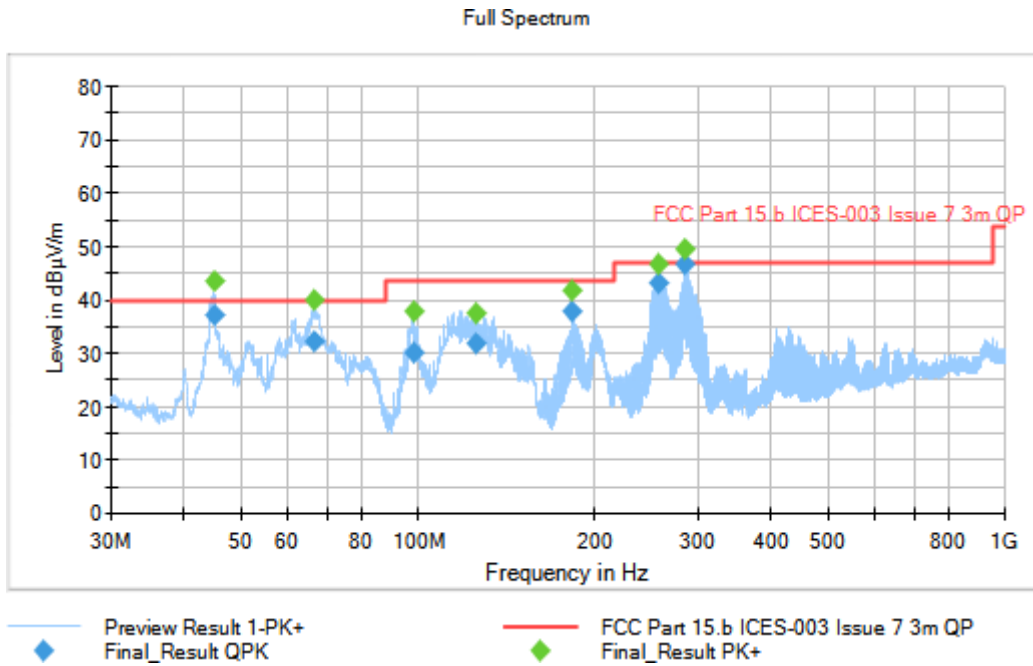
Attachments

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

Sample ID: S/01

Operation Mode: OM/01. EUT ON. SRD without transmission mode. BLE active and without transmission. Managing work by zones. Heating mode. Power Supply 115Vac.

Images:



Tables:

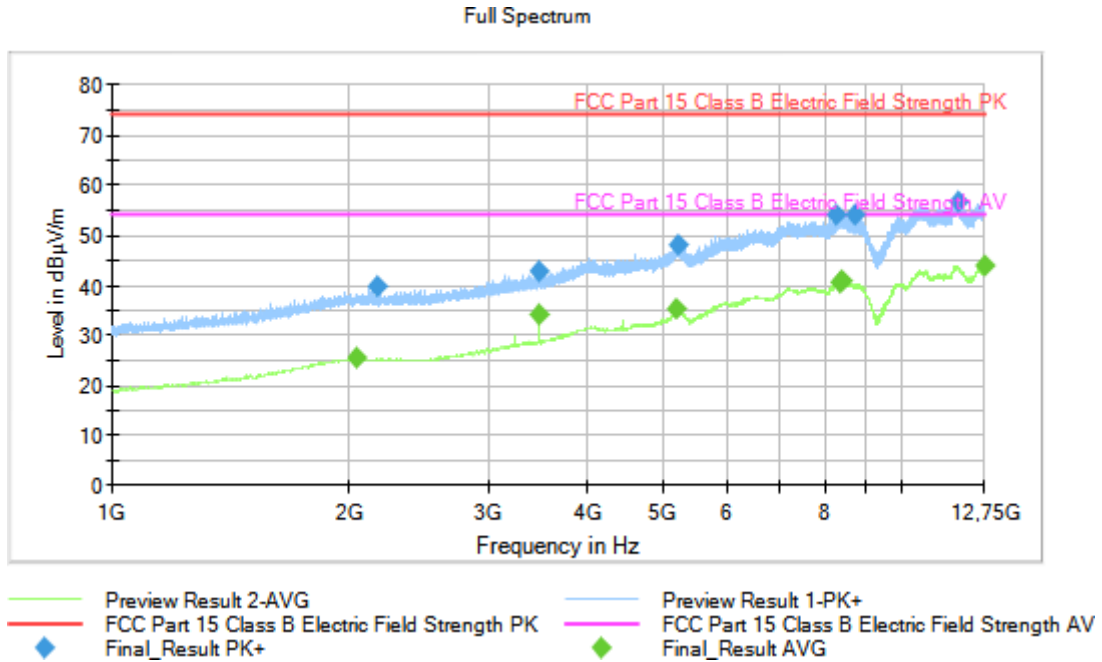
Frequency(MHz)	QuasiPeak(dBµV/m)	MaxPeak(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	Po l	Azimuth(deg)
45.154000	---	43.67	---	---	100.0	V	54.0
45.154000	37.27	---	40.00	2.73	100.0	V	54.0
66.829000	---	40.00	---	---	190.0	V	145.0
66.829000	32.12	---	40.00	7.88	190.0	V	145.0
98.157000	---	38.04	---	---	157.0	V	115.0
98.157000	30.15	---	43.52	13.37	157.0	V	115.0
125.171000	31.70	---	43.52	11.82	136.0	V	34.0
125.171000	---	37.67	---	---	136.0	V	34.0
183.291000	---	41.70	---	---	107.0	V	49.0
183.291000	37.81	---	43.52	5.71	107.0	V	49.0
257.159000	43.32	---	47.00	3.68	195.0	V	92.0
257.159000	---	46.90	---	---	195.0	V	92.0
285.676000	---	49.40	---	---	121.0	H	128.0
285.676000	46.77	---	47.00	0.23	121.0	H	128.0

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

Sample ID: S/01

Operation Mode: OM/01. EUT ON. SRD without transmission mode. BLE active and without transmission.
 Managing work by zones. Heating mode. Power Supply 115Vac

Images:



Tables:

Frequency(MHz)	MaxPeak(dBµV/m)	Average(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	Po l	Azimuth(deg)
2038.400000	---	25.48	53.97	28.49	80.0	H	0.0
2163.600000	39.68	---	73.97	34.29	80.0	H	0.0
3476.800000	---	34.01	53.97	19.96	80.0	H	0.0
3476.800000	42.79	---	73.97	31.18	80.0	H	0.0
5198.000000	---	35.20	53.97	18.77	80.0	V	0.0
5206.800000	48.03	---	73.97	25.94	80.0	V	0.0
8272.400000	53.93	---	73.97	20.04	80.0	V	0.0
8341.600000	---	40.69	53.97	13.28	80.0	V	0.0
8384.800000	---	40.90	53.97	13.07	80.0	V	0.0
8740.800000	54.07	---	73.97	19.90	80.0	H	0.0
11783.600000	56.73	---	73.97	17.24	80.0	H	0.0
12719.600000	---	43.84	53.97	10.13	80.0	H	0.0

CE Continuous conducted emission

Limits

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 (10-1-19 Edition), Secs. 15.107 & ICES-003 Issue 6 (April 2019), 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

Results

S/	OM	Code	Freq Rng (MHz)	Line	V
01	OM/01	CE01020N	[0.15, 30]	N	P
01	OM/01	CE0102L1	[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

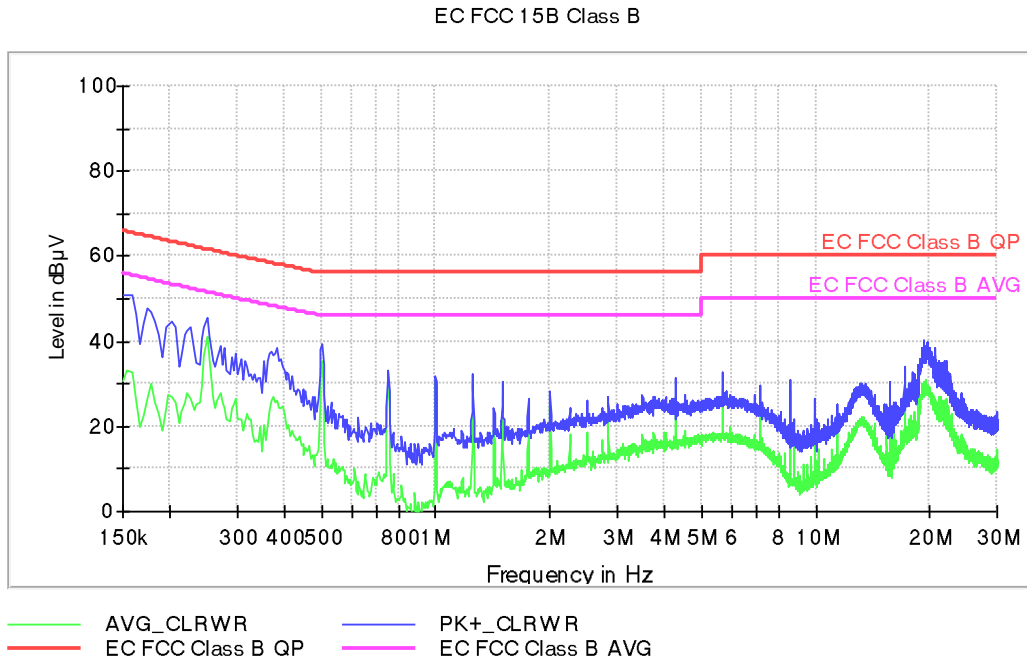
Attachments

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. SRD without transmission mode. BLE active and without transmission. Managing work by zones. Heating mode Power supply: 115 Vac

Images:



Tables:

Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.158000	51.1	32.7	N
0.270000	38.9	28.1	N
0.502000	39.4	35.4	N
0.750000	33.3	32.1	N
1.250000	32.3	30.3	N
3.502000	27.4	18.2	N
5.690000	32.8	28.8	N
8.538000	31.1	28.4	N
17.078000	34.0	31.1	N
19.262000	40.1	30.2	N

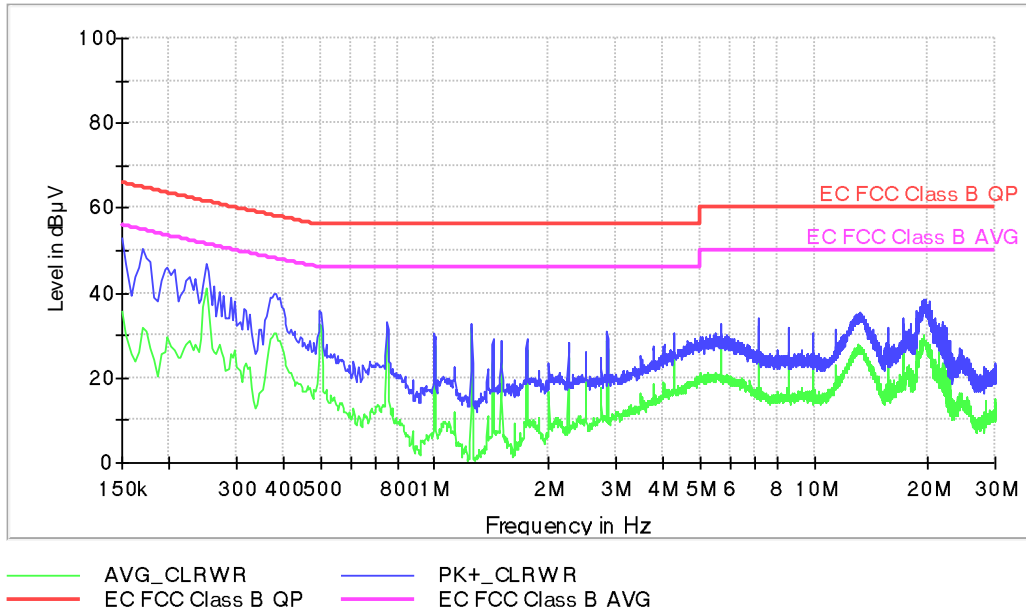
EMC Test Code = CE0101L1, Frequency Range MHz = [0.15, 30], Conducted Emissions - Tested Line = L1

Sample ID: S/01

Operation Mode: OM/01. EUT ON. SRD without transmission mode. BLE active and without transmission.
 Managing work by zones. Heating mode. Power supply: 115 Vac

Images:

EC FCC 15B Class B



Tables:

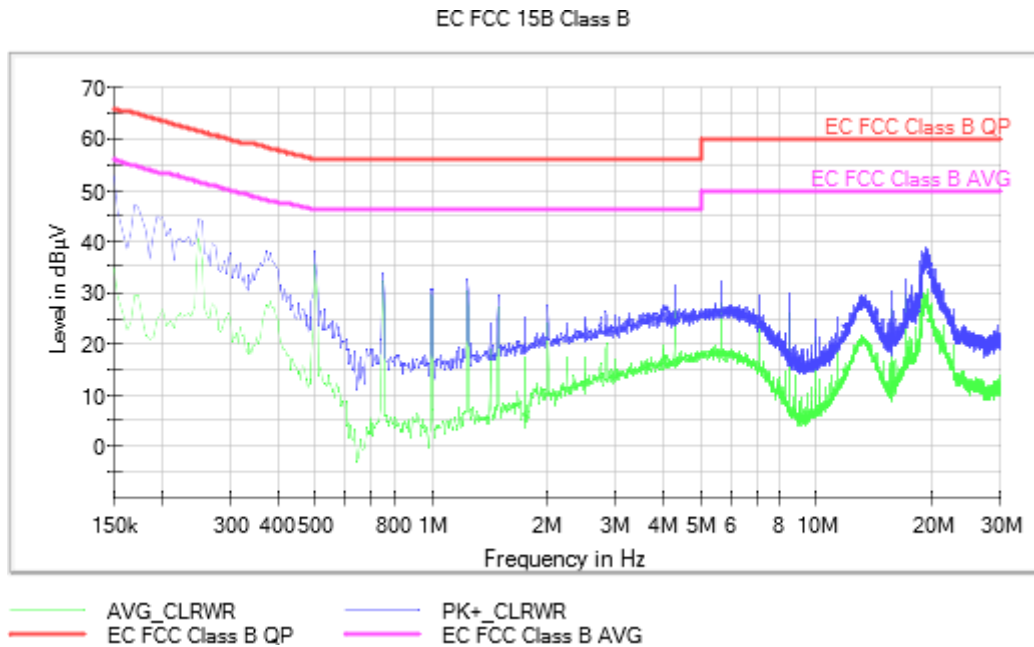
Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line

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. SRD in transmission mode. BLE ON with communication established with auxiliary device. Managing work by zones. Heating mode. Power supply: 115 Vac.

Images:



Tables:

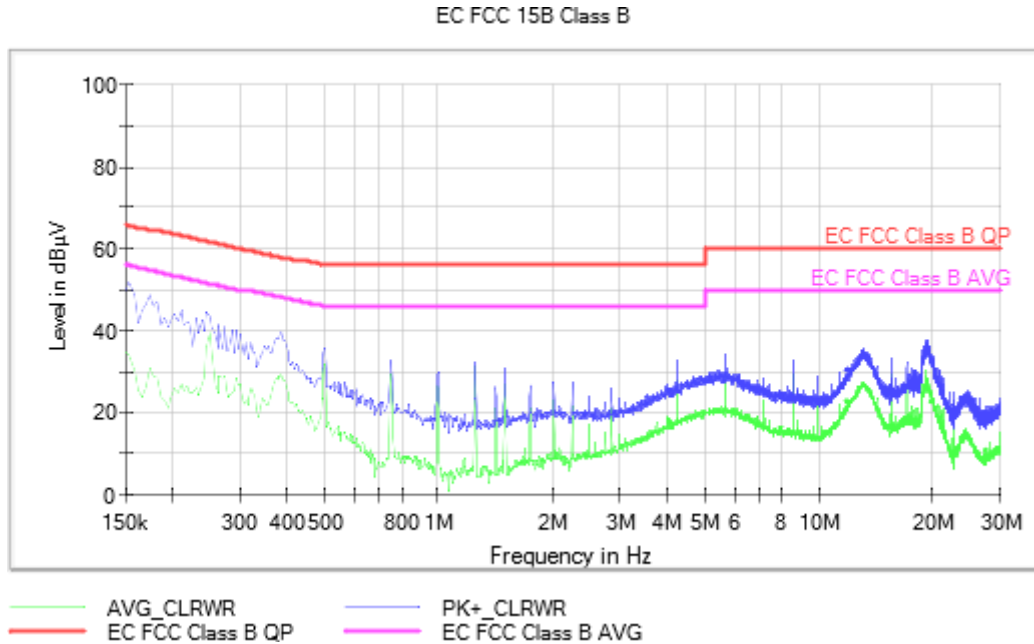
Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.150000	52.7	34.9	N
0.270000	39.7	27.8	N
0.502000	37.9	35.5	N
0.750000	33.7	32.2	N
1.250000	32.6	30.5	N
2.842000	26.2	19.0	N
5.690000	32.2	28.0	N
8.538000	30.1	25.3	N
17.070000	33.1	29.6	N
19.250000	39.0	30.0	N

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. SRD in transmission mode. BLE ON with communication established with auxiliary device. Managing work by zones. Heating mode. Power supply: 115 Vac.

Images:



Tables:

Frequency(MHz)	PK+_CLRWR(dBµV)	AVG_CLRWR(dBµV)	Line
0.154000	51.7	33.9	L1
0.266000	41.1	28.8	L1
0.502000	35.9	31.8	L1
0.750000	32.4	29.4	L1
1.250000	32.7	31.6	L1
2.250000	27.4	21.3	L1
5.694000	34.8	29.1	L1
8.538000	33.1	29.3	L1
13.234000	35.7	26.5	L1
19.510000	37.8	27.3	L1