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: 68832REM.002A1

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	Airzone Main Control Board
(*) Trademark	AIRZONE
(*) Model and /or type reference	AZxxxCBxANT
Other identification of the product	FCC ID: SVS-CB-ANT IC: 24685-CB-ANT HW version:1.3 SW version: 3.3.0
(*) Features	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 Firmado digitalmente por 53680346W JOSE MANUEL GOMEZ (C:A29507456) Fecha: 2022.06.20 13:32:08 +02'00'
Date of issue	2022-06-16
Report template No	FDT08_23 (*) "Data provided by the client"

Index

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.

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 Airzone Main Control Board, model AZxxxCBxANT. Electronic board that controls the system through wired and wireless devices. Externally powered at 230 Vac. Wall mounted.

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	68832B_27.1	Communication box	AZPV6IBPRO6ANT	000C1DLC	2021-06-17	Element Under Test
S/01	68832B_28.1	Touch Display	AZCE6THINKRB	F00V9YI	2021-06-17	Auxiliary Element
S/01	68832B_29.1	Duct Door	CC100	000C1AAV	2021-06-17	Auxiliary Element

Notes referenced to samples during the project.

Id	Description
S/01	Original sample

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	
	Indoor unit bus	2			
	Motor output	15			
	Analog input: Alarm input	3		X	
	Anolog input: Temperature probe	3		X	
	Relay output: VMC/Boiler	-			
	Relay Output: ON/OFF machine	-			
	Power	-	X		
Supplementary information to the ports…… :					

Rated power supply .....:		Voltage and Frequency	Reference poles				
			L1	L2	L3	N	PE
		AC:					
	X	AC: 115Vac	X			X	X
		DC:					
		DC:					

Rated Power .....:	0.4W			
Clock frequencies.....:	6MHz			
Other parameters.....:	--			
Software version .....:	3.3.0			
Hardware version.....:	1.3			
Dimensions in mm (W x H x D) :	195 × 180 × 55.5			
Mounting position.....:		Table top equipment		
	X	Wall/Ceiling mounted equipment		
		Floor standing equipment		
		Hand-held equipment		
		Other:		
Modules/parts.....:	Module/parts of test item		Type	Manufacturer
	Main control board		AZxxxCBxANT	AIRZONE
Accessories (not part of the test item) .....:	Description		Type	Manufacturer
	Thermostat and user interface Think wireless		AZCE6THINKRB	AIRZONE
	Thermostat and user interface Think wire		AZCE6THINKCB	AIRZONE
	Circular damper with actuator		CPCCXXXXMTE	AIRZONE
	Webserver		AZX6WEBSCLOUDC	AIRZONE
	Gateway		AZX6GTCDA1	AIRZONE
Documents as provided by the applicant.....:	Description		File name	Issue date
	Technical datasheet Main Control Board		FTAZxxxCBxANT_A4	--

(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)	2021-06-25
Date (finish)	2021-09-21

Document history

Report number	Date	Description
68832REM.002	2021-09-21	First release
68832REM.002A1	2021-06-16	Second reléase: Including references to standards Part 15.207 and RSS-Gen. This test report cancels and replaces the report: 68832REM.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. = 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: Miguel Quesada Dueñas.

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
7743	HORN ANTENNA 0,75-18GHz	3115	ETS LINDGREN	2023-08-24
7746	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2023-07-23
6142	PRE-AMPLIFIER G>38dB 30MHz-6GHz	BLNA 0360-01N	BONN ELEKTRONIK	2022-03-08
6196	PRE-AMPLIFIER G>55dB 1-18GHz	AMF-7D-01001800-22-10P	NARDA	2022-02-25
6204	THREE-PHASE ARTIFICIAL NETWORK 32A	PMM L3-32	NARDA	2022-07-29
8130	SEMIANECHOIC ABSORBER LINED CHAMBER VI	P29419	ALBATROSS	---
4575	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	TR-702W	T&D	2022-04-07
7817	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2021-10-29

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	--

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. 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. ISM band 915MHz-917MHz in RX mode. Power supply: 115V ac.
OM/02	EUT ON. ISM band 915MHz-917MHz in TX mode. Power supply: 115V ac.

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

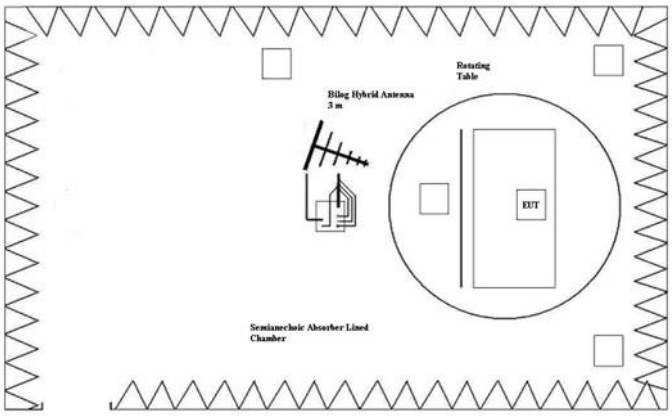
Limits of interference Class B.
The applied limit for radiated emissions, 3 m distance, according to the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-20 Edition), Secs. 15.109 & ICES-003 Issue 7 (October 2020)

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

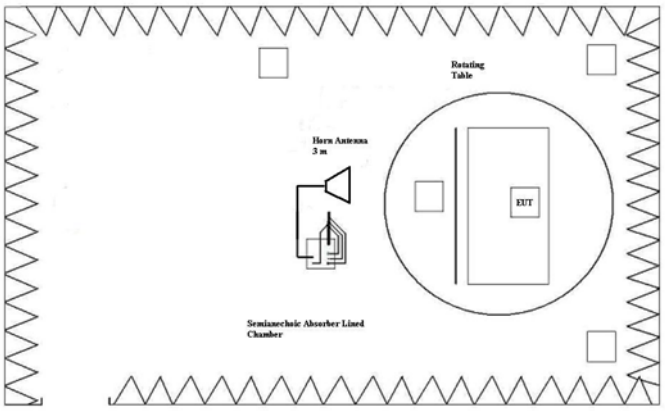
NOTE: FCC QP and AVG limits are in concordance with RSS-Gen Issue 5 (March 2019), Secs. 7.1 and 7.3.

Limits according to FCC Part 15B, equal to o 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

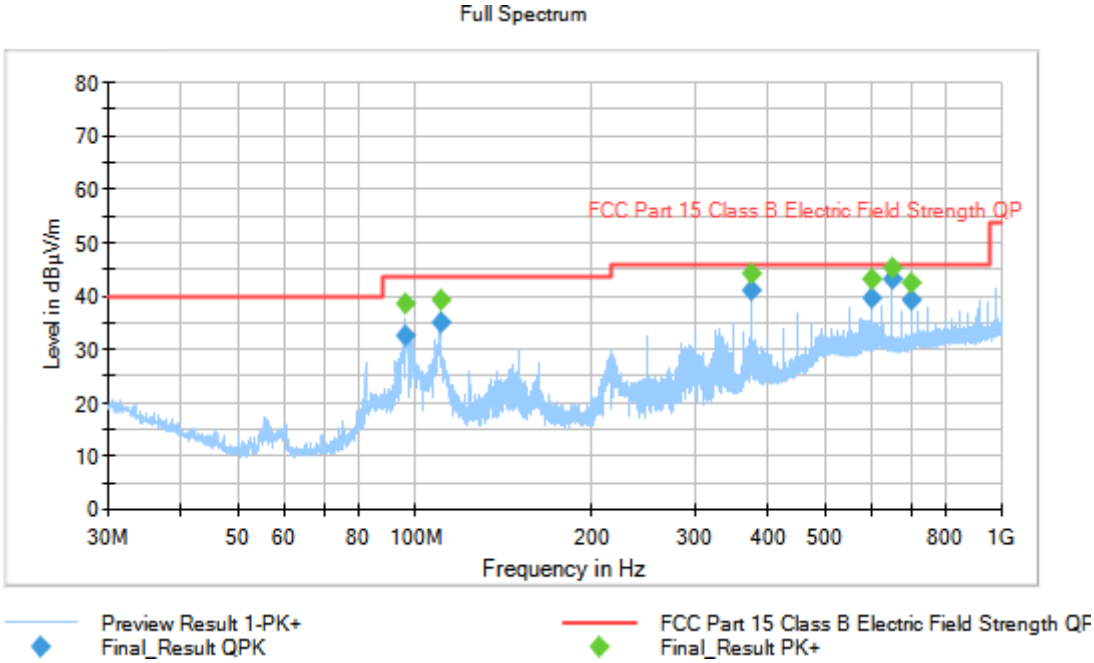
Attachments

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

Sample ID: S/01

Operation Mode: OM/01. EUT ON. ISM band 915MHz-917MHz in RX mode. Power supply: 115V ac.

Images:



Documents:

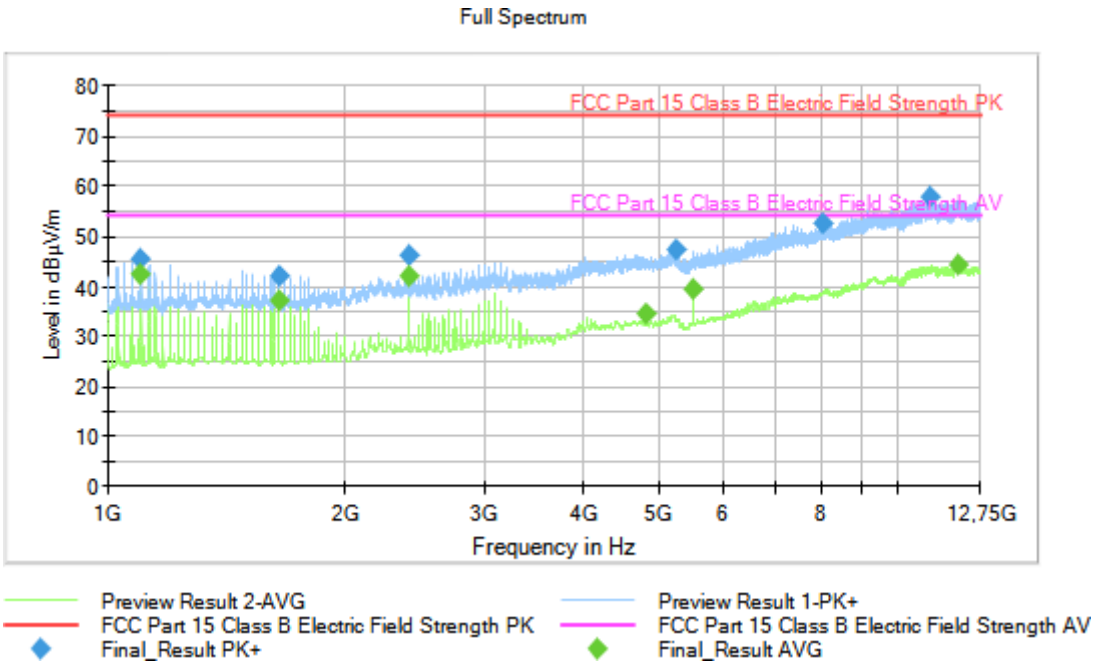
Frequency(MHz)	QuasiPeak(dBµV/m)	MaxPeak(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	Pol	Azimuth(deg)
96.613000	32.44	---	43.52	11.08	124.0	V	146.0
96.613000	---	38.43	---	---	124.0	V	146.0
110.470000	34.92	---	43.52	8.60	144.0	H	10.0
110.470000	---	39.24	---	---	144.0	H	10.0
375.005000	41.15	---	46.00	4.85	100.0	H	14.0
375.005000	---	44.40	---	---	100.0	H	14.0
600.010000	39.62	---	46.00	6.38	129.0	H	55.0
600.010000	---	43.01	---	---	129.0	H	55.0
649.997000	43.03	---	46.00	2.97	144.0	H	343.0
649.997000	---	45.14	---	---	144.0	H	343.0
699.975000	39.14	---	46.00	6.86	126.0	H	191.0
699.975000	---	42.44	---	---	126.0	H	191.0

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

Sample ID: S/01

Operation Mode: OM/01. EUT ON. ISM band 915MHz-917MHz in RX mode. Power supply: 115V ac.

Images:



Documents:

Frequency(MHz)	MaxPeak(dBµV/m)	Average(dBµV/m)	Limit(dBµV/m)	Margin(dB)
1100.000000	---	42.27	53.97	11.70
1100.000000	45.61	---	73.97	28.36
1650.000000	---	37.15	53.97	16.82
1650.000000	42.17	---	73.97	31.80
2400.000000	---	42.03	53.97	11.94
2400.000000	46.28	---	73.97	27.69
4800.000000	---	34.72	53.97	19.25
5229.200000	47.41	---	73.97	26.56
5496.400000	---	39.54	53.97	14.43
8060.000000	52.72	---	73.97	21.25
11010.000000	57.65	---	73.97	16.32
11936.800000	---	44.43	53.97	9.55

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 (10-1-20 Edition) Secs. 15.107 and Subpart C (10-1-20 Edition) Secs. 15.207 & ICES-003 Issue 7 (April 2020) & RSS-Gen Issue 5 (April 2018) 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	CE0101L1	[0.15, 30]	L1	P
01	OM/01	CE01010N	[0.15, 30]	N	P
01	OM/02	CE0102L1	[0.15, 30]	L1	P
01	OM/02	CE01020N	[0.15, 30]	N	P

Verdict

Pass

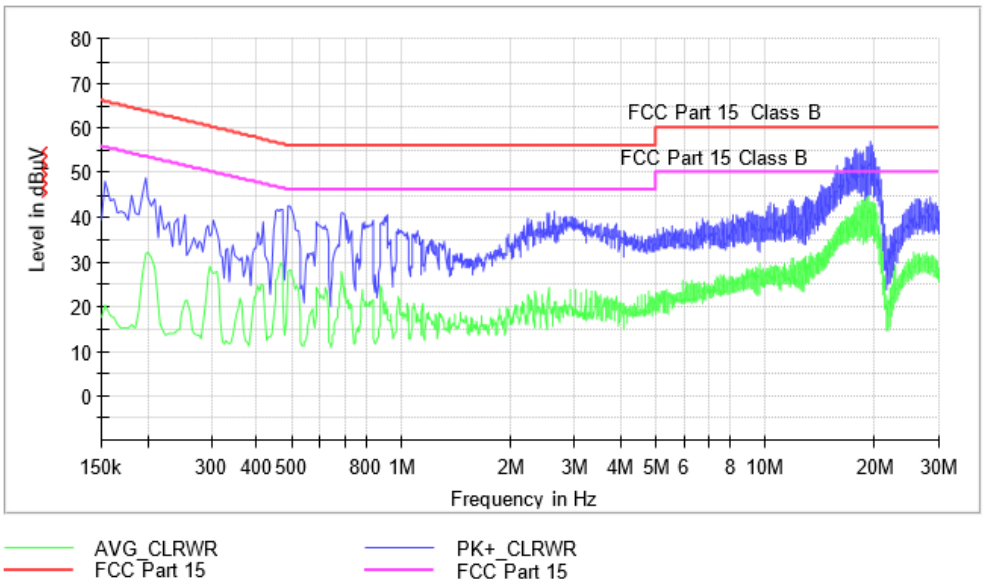
Attachments

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. ISM band 915MHz-917MHz in RX mode. Power supply: 115V ac.

Images:



Documents:

Subrange Maxima

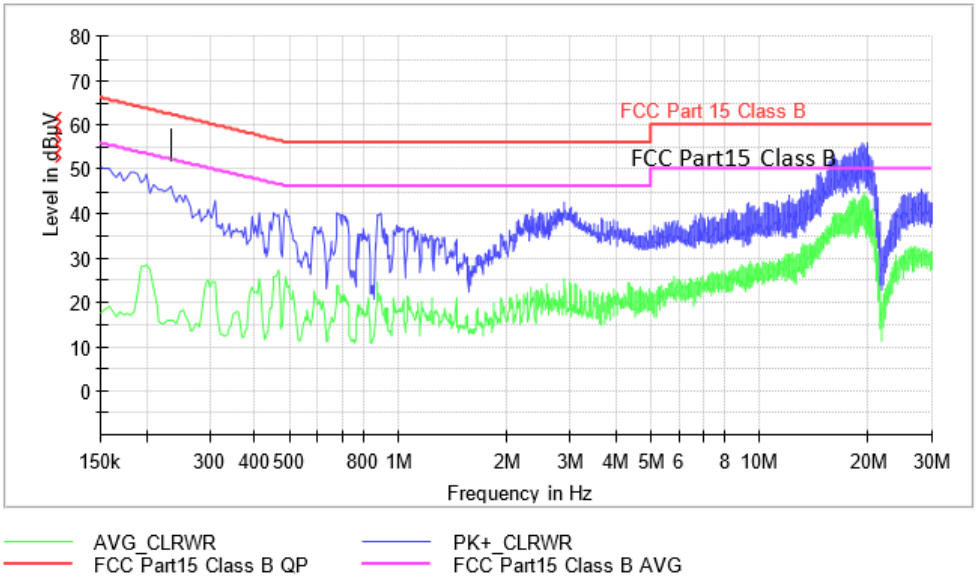
Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)	Line
0.198000	48.8	31.9	L1
0.306000	39.3	27.3	L1
0.490000	42.6	27.9	L1
0.914000	40.6	19.6	L1
2.054000	36.3	20.3	L1
2.634000	41.5	20.3	L1
3.714000	38.7	21.7	L1
10.310000	43.3	29.4	L1
17.590000	53.5	41.8	L1
19.466000	56.9	43.4	L1

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. ISM band 915MHz-917MHz in RX mode. Power supply: 115V ac.

Images:



Documents:

Subrange Maxima

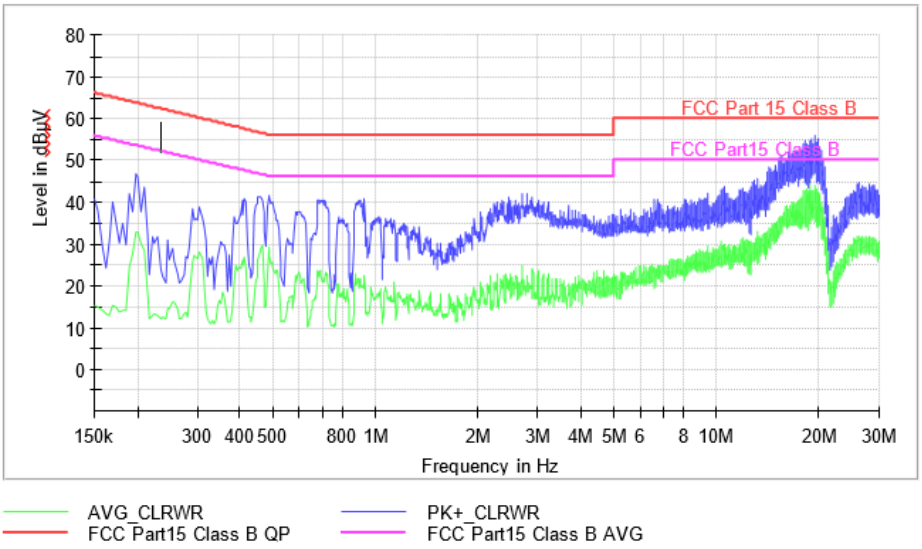
Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)	Line
0.150000	50.6	17.4	N
0.258000	44.2	17.3	N
0.490000	41.1	25.9	N
0.902000	40.3	20.2	N
2.034000	36.1	20.5	N
2.902000	42.4	25.5	N
3.678000	39.1	20.9	N
10.358000	42.6	29.1	N
16.166000	53.4	40.2	N
19.290000	56.2	43.5	N

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. ISM band 915MHz-917MHz in TX mode. Power supply: 115V ac.

Images:



Subrange Maxima

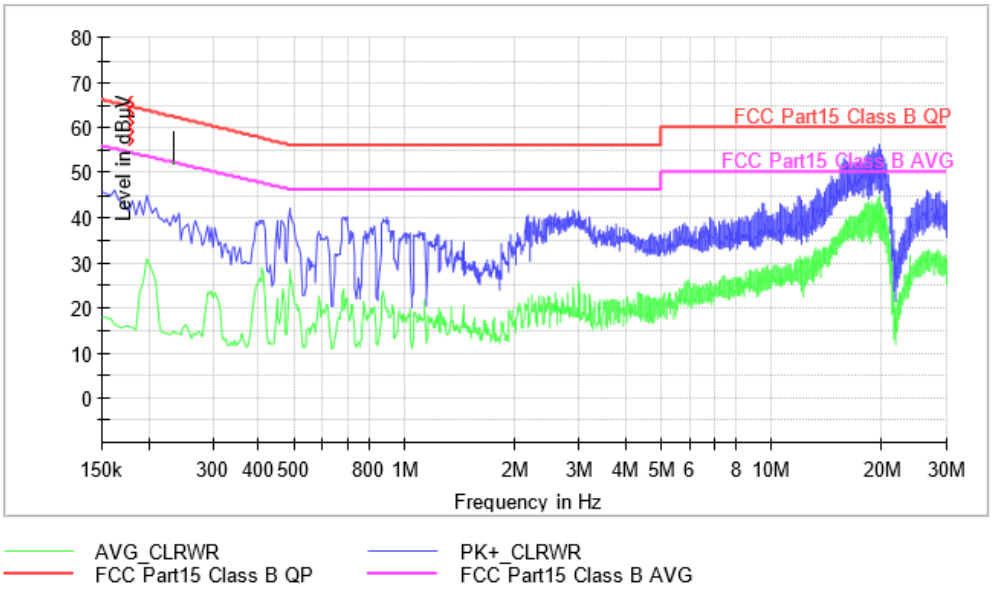
Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)	Line
0.198000	46.9	33.1	L1
0.414000	40.8	26.9	L1
0.486000	41.7	29.4	L1
0.930000	41.2	22.8	L1
2.038000	37.8	21.0	L1
2.698000	42.2	24.9	L1
3.682000	39.3	18.7	L1
10.370000	43.5	29.6	L1
17.650000	53.3	40.6	L1
19.618000	56.2	44.0	L1

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. ISM band 915MHz-917MHz in TX mode. Power supply: 115V ac.

Images:



Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)	Line
0.162000	46.1	16.3	N
0.402000	39.6	26.5	N
0.486000	42.0	28.5	N
0.898000	40.2	19.0	N
2.038000	36.5	19.3	N
2.906000	41.8	24.5	N
5.806000	38.9	26.0	N
9.386000	43.3	28.6	N
15.774000	53.3	37.5	N
19.698000	56.4	44.9	N