

Test report No:
77595REM.001

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	CPAP Device
(*) Trademark	ResMed
(*) Model and /or type reference	28330
(*) Derived model not tested	28541, 28542, 28405
Other identification of the product	FCC ID: 2ACHL-AIR104GU IC: 9103A-AIR104GU
(*) Features	Features: 4G, 3G, 2G HW version: R379-7135 SW version: SX558
Manufacturer	ResMed Pty Ltd 1 Elizabeth Macarthur Drive 2153, Bella Vista, NSW
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 EMC Consumer & RF Lab. Manager
Date of issue	2024-02-21
Report template No	FDT08_24 (* "Data provided by the client")



Index

ACRONYMS	3
COMPETENCES AND GUARANTEES	3
GENERAL CONDITIONS	3
UNCERTAINTY	4
DATA PROVIDED BY THE CLIENT	4
USAGE OF SAMPLES	6
TEST SAMPLE DESCRIPTION	7
IDENTIFICATION OF THE CLIENT	8
TESTING PERIOD AND PLACE	8
DOCUMENT HISTORY	8
ENVIRONMENTAL CONDITIONS	9
REMARKS AND COMMENTS	10
TESTING VERDICTS	10
LIST OF EQUIPMENT USED DURING THE TEST	10
SUMMARY	11
APPENDIX A: TEST RESULTS	12

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
RE	Radiated Emission
LR	Low Range
HR	High Range
CE	Conducted Emission

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.

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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.
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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 1000 MHz is $I = \pm 4,9$ dB for quasi-peak measurements, $I = \pm 4,6$ 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 $I = \pm 2,6$ 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 a CPAP device with integrated cellular connectivity.
3. Derived model not tested. These models have been declared by the supplier of the sample as being the same as the model under test.



Date: 05-Feb-2024

DECLARATION OF EQUIVALENCE

This document declares that the following designated products are equivalent to the unit under test **28330**.

Model Name / Product Code	Marketing Name
28541	AirCurve 10 ST-A
28542	AirCurve 10 ST-A
28405	AirCurve 10 ST-A

All the above stated products have the same cellular hardware and firmware.

Applicant:

Company Name: ResMed Pty Ltd
Address: 1 Elizabeth Macarthur Drive,
Bella Vista NSW 2153
Australia

By,



Christopher Jenkins

Title: Manager – Systems Engineering
Company: ResMed Pty Ltd
Telephone: +61 2 8884 1517
e-mail: Christopher.jenkins@resmed.com.au

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	77595_13.1	CPAP device	28330		2023-12-13	Element Under Test
S/01	77595_14.1	Humidifier	--	--	2023-12-13	Element Under Test
S/01	77595_15.1	Climate tube	--	--	2023-12-13	Element Under Test
S/01	77595_16.1	AC/DC adapter	370006	--	2023-12-13	Element Under Test
S/01	77595_17.1	Power cable	--	--	2023-12-13	Element Under Test

Notes referenced to samples during the project:

Id	Note
S/01	Sample used for testing

Test sample description

Ports..... :	Port name and description		Cable				
			Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾	
	Power		[X]	[]	[]		
--		[]	[]	[]			
Supplementary information to the ports..... :							
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[X]	AC: 100–240V, 50–60Hz 1.0–1.5A	[X]	[]	[]	[X]	[]
	[X]	AC: 115V, 400Hz 1.5A, (aircraft)	[X]	[]	[]	[X]	[]
	[X]	DC: 24V, 90W (DC-DC Converter)					
[]	DC:						
Rated Power	53W (57VA) - Typical, 104W (108VA) - Peak						
Clock frequencies.....	N/A						
Other parameters							
Software version	SX558						
Hardware version	R379-7135						
Dimensions in cm (W x H x D)	255 mm X 116 mm X 150 mm						
Mounting position	[X]	Table top equipment					
	[]	Wall/Ceiling mounted equipment					
	[]	Floor standing equipment					
	[]	Hand-held equipment					
	[]	Other:					
Modules/parts.....	Module/parts of test item		Type		Manufacturer		
	Cellular Module (4G, 3G, 2G)		LARA-R6001		u-blox		
	--						
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

ResMed Pty Ltd
1 Elizabeth Macarthur Drive
2153, Bella Vista, NSW

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2023-12-18
Date (finish)	2023-12-26

Document history

Report number	Date	Description
77595REM.001	2024-02-21	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: Salvador Cuellar.

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
06064	SEMIANECHOIC ABSORBER LINED CHAMBER	SAC-3	FRANKONIA	N/A
06329	SHIELDED ROOM	--	FRANKONIA	N/A
06132	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2024-04-21
06126	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2024-04-21
05641	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2024-09-15
06666	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2024-03-04
04612	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK MESS-ELEKTRONIK	2024-07-13
09360	PRE-AMPLIFIER G>40dB 1-18 GHz	BLMA 0118-1M	BONN ELEKTRONIK	2024-07-25
04679	THREE-PHASE ARTIFICIAL V-NETWORK 32A	PMM L3-32	122WX30408	2024-02-06
07771	TRANSIENT LIMITER 10DB N CONNECTOR	VTSD 9561-F	SCHWARZBECK	2024-04-14
06138	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2024-04-25
04848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	N/A

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	P	(1)
FCC CFR 47, Part 15, Subpart B and C (10-1-21 Edition) & ICES-003 Issue 7 (October 2020)	CE Continuous conducted emission	P	--

Supplementary information and remarks:

(1) Test required only to the 5th harmonics of the maximum internal work frequency in the EUT.

Appendix A: Test results

Appendix A content

DESCRIPTION OF THE OPERATION MODES	14
TEST STANDARDS VERSION APPLIED	15
TEST CASES DETAILS	16
<i>RE Radiated emission. Electromagnetic field measure</i>	16
<i>CE Continuous conducted emission</i>	20

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. Cellular searching network. Active treatment, set to maximum power and applicator air tube at maximum tube temperature. Power supply: 115Vac, 60Hz
OM/02	EUT ON. MS in traffic mode. LTE Cat. M1 Band 12 (representative mode). Active treatment, set to maximum power and applicator air tube at maximum tube temperature. Power supply: 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

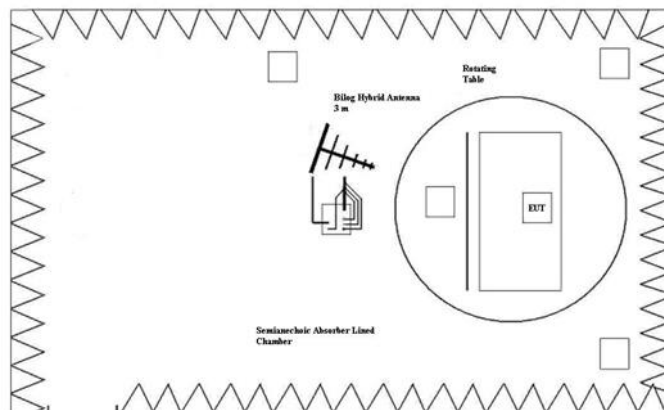
Limits of interference Class B

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)

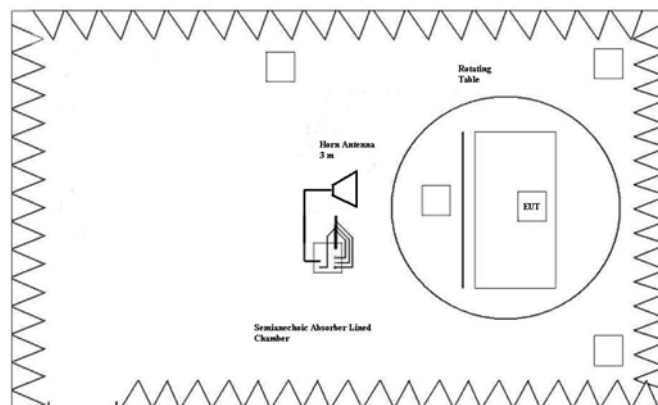
Frequency range (MHz)	FCC Part 15B		ICES-003 Issue 7		FCC Part 15B & ICES-003 Issue 7	
	QP Limit for 3 m		QP Limit for 3 m		PK Limit for 3 m	AVG Limit for 3 m
	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)
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

Attachments

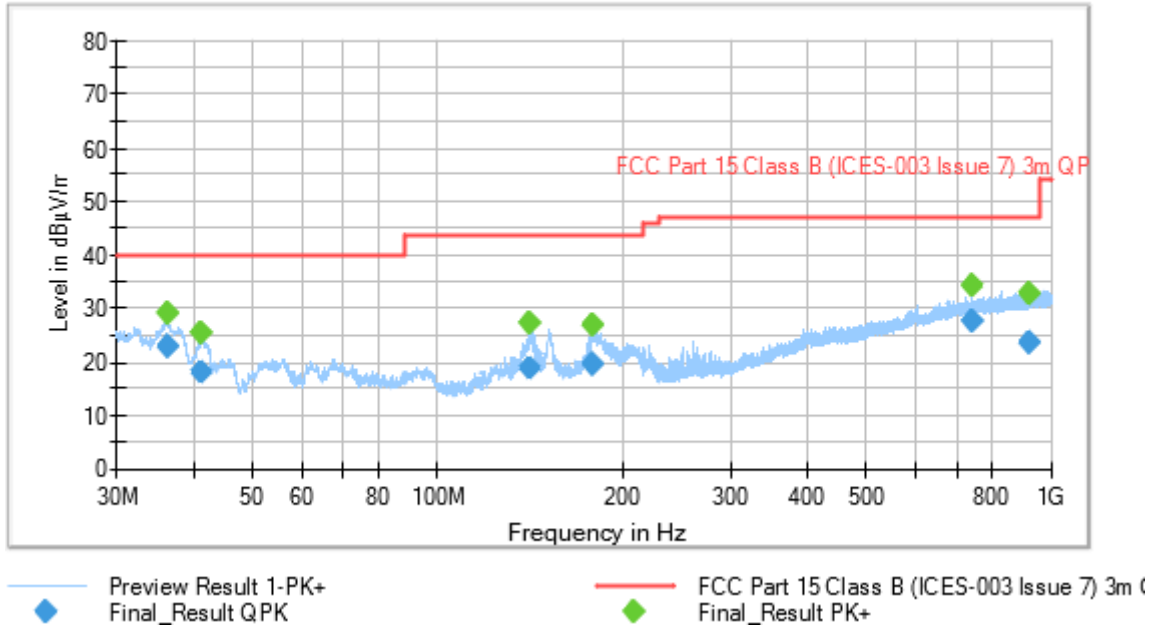
EMC Test Code = RE0101LR Frequency Range MHz = [30, 1000]

Sample ID: S/01

Operation Mode: OM/01

Images:

Full Spectrum



Tables:

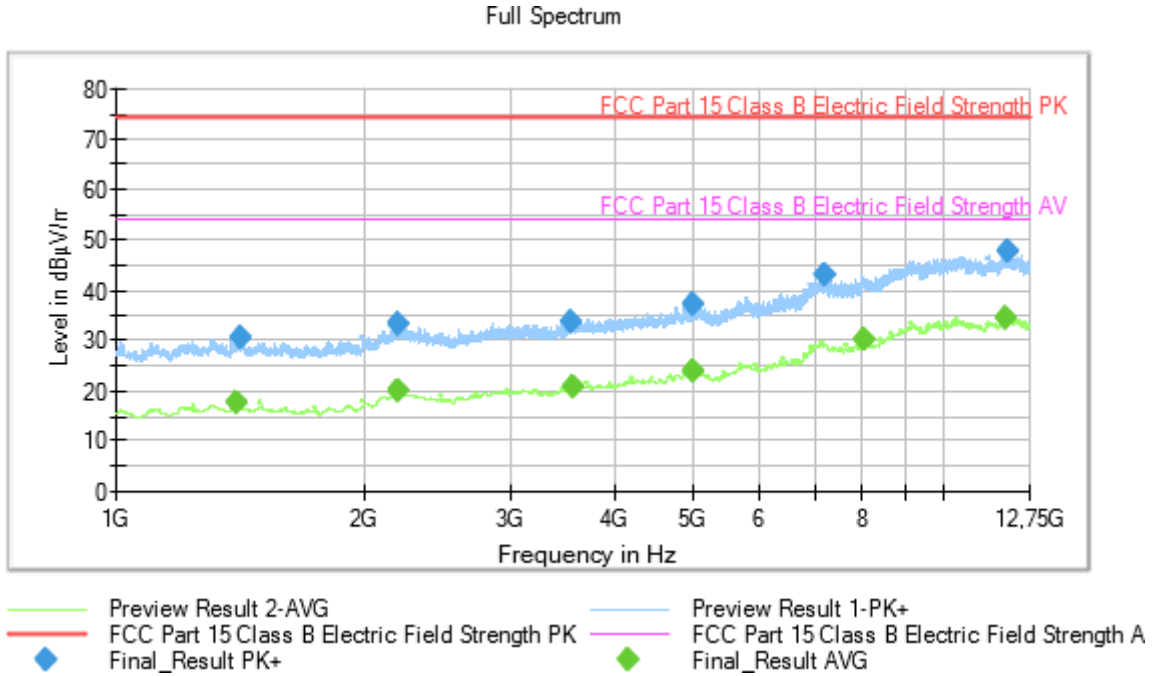
Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
36.229000	---	29.13	---	---	139.0	V	-12.0
36.229000	22.77	---	40.00	17.23	139.0	V	-12.0
41.235000	---	25.39	---	---	118.0	V	62.0
41.235000	17.87	---	40.00	22.13	118.0	V	62.0
141.340000	---	27.27	---	---	232.0	H	-3.0
141.340000	18.83	---	43.52	24.69	232.0	H	-3.0
178.643000	19.34	---	43.52	24.18	194.0	H	-87.0
178.643000	---	26.82	---	---	194.0	H	-87.0
742.591000	27.56	---	47.00	19.44	237.0	V	-51.0
742.591000	---	34.21	---	---	237.0	V	-51.0
919.185000	---	32.73	---	---	336.0	V	99.0
919.185000	23.66	---	47.00	23.34	336.0	V	99.0

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

Sample ID: S/01

Operation Mode: OM/01

Images:



Tables:

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1401.000000	---	17.41	53.97	36.56
1410.000000	30.39	---	73.97	43.58
2191.750000	---	19.84	53.97	34.13
2191.750000	33.00	---	73.97	40.97
3541.750000	33.52	---	73.97	40.45
3565.750000	---	20.72	53.97	33.25
4991.250000	36.96	---	73.97	37.01
4996.250000	---	23.91	53.97	30.06
7210.750000	43.01	---	73.97	30.96
8022.750000	---	30.04	53.97	23.93
11940.000000	---	34.22	53.97	19.75
11979.750000	47.44	---	73.97	26.53

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 (MHz)	Limit (dBµV)	
	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/01	CE01010N	[0.15, 30]	N	P
01	OM/01	CE0101L1	[0.15, 30]	L1	P
01	OM/02	CE01020N	[0.15, 30]	N	P
01	OM/02	CE0102L1	[0.15, 30]	L1	P

Verdict

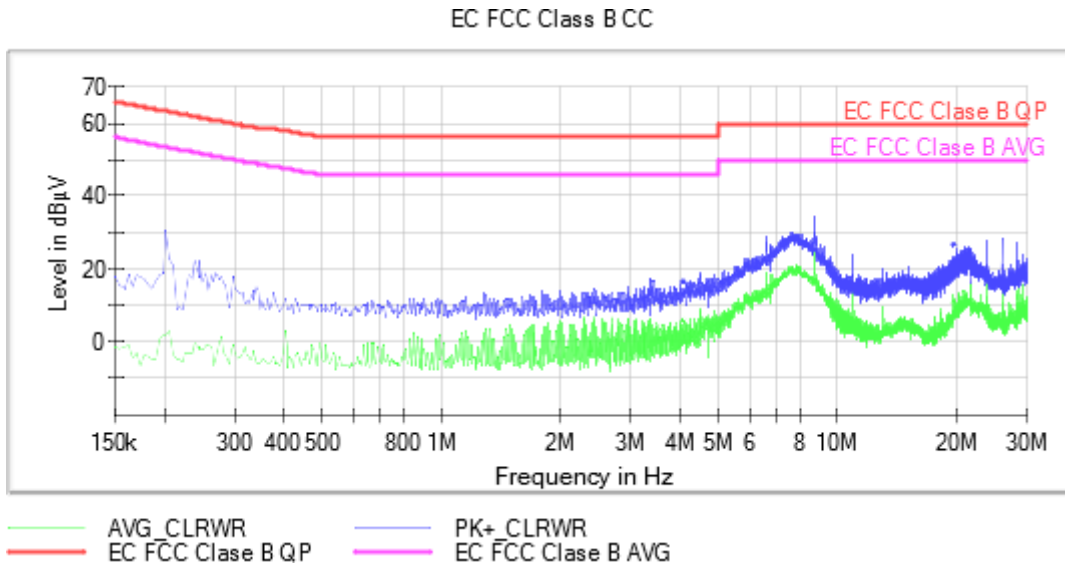
Pass

Attachments

EMC Test Code = CE01010N Frequency Range MHz = [0.15, 30]
 Conducted Emissions - Tested Line = N

Sample ID: S/01
 Operation Mode: OM/01

Images:



Tables:

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)
0.202000	30.7	2.1
0.378000	13.6	-3.9
1.998000	14.3	6.3
4.490000	19.1	9.1
8.782000	34.9	25.7
26.066000	28.6	11.4

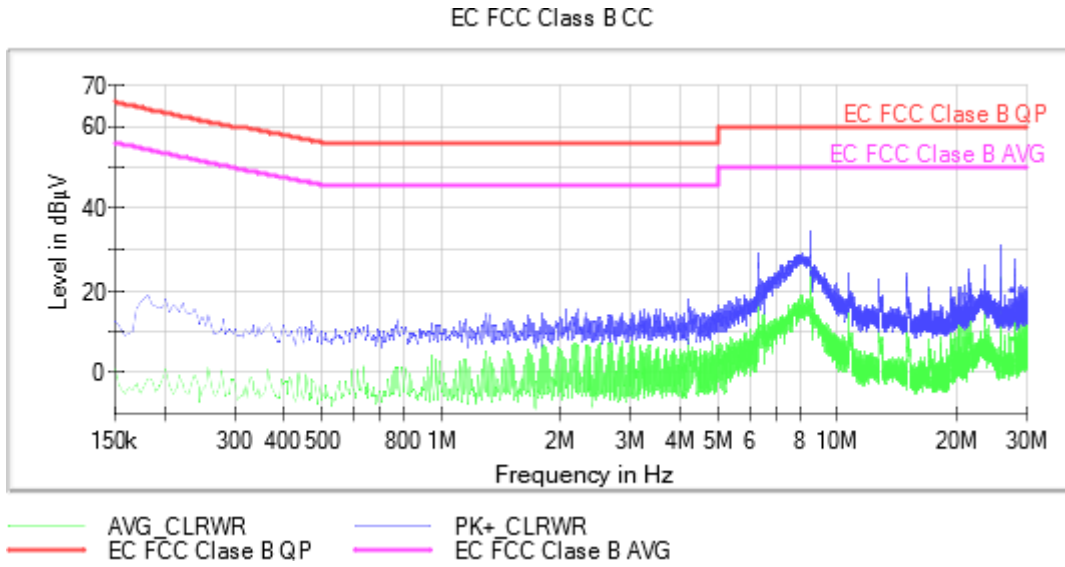
EMC Test Code = CE0101L1 Frequency Range MHz = [0.15, 30]

Conducted Emissions - Tested Line = L1

Sample ID: S/01

Operation Mode: OM/01

Images:



Tables:

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)
0.182000	19.1	-1.4
0.774000	12.6	0.9
2.058000	15.6	3.3
4.198000	17.8	8.1
8.502000	35.1	26.5
25.794000	31.2	23.8

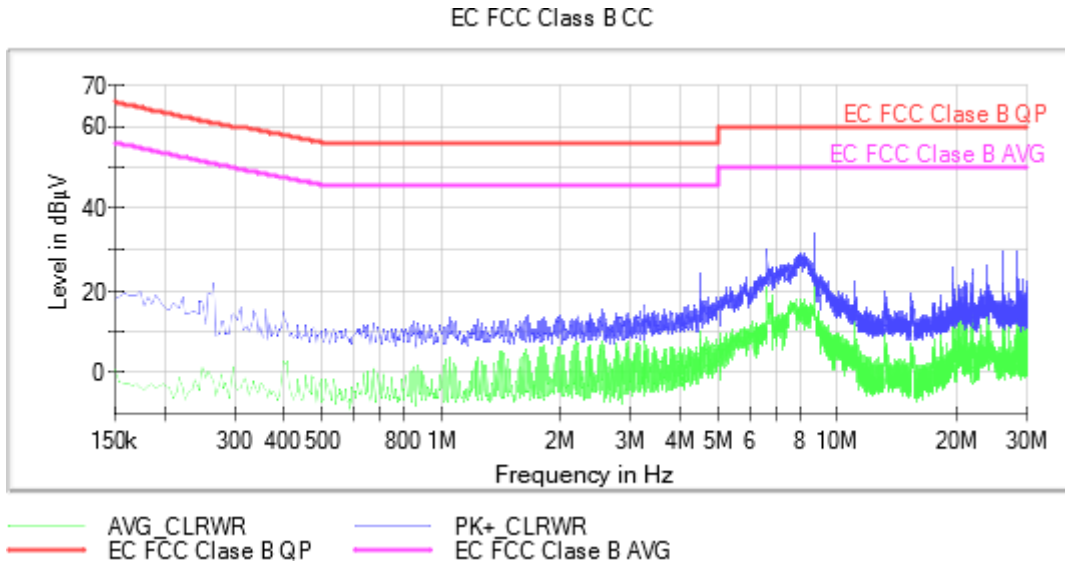
EMC Test Code = CE01020N Frequency Range MHz = [0.15, 30]

Conducted Emissions - Tested Line = N

Sample ID: S/01

Operation Mode: OM/02

Images:



Tables:

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)
0.162000	18.7	-5.2
0.498000	12.9	-1.3
1.546000	15.0	4.7
5.014000	21.3	12.4
7.174000	30.9	18.3
26.610000	30.3	15.3

EMC Test Code = CE0102L1

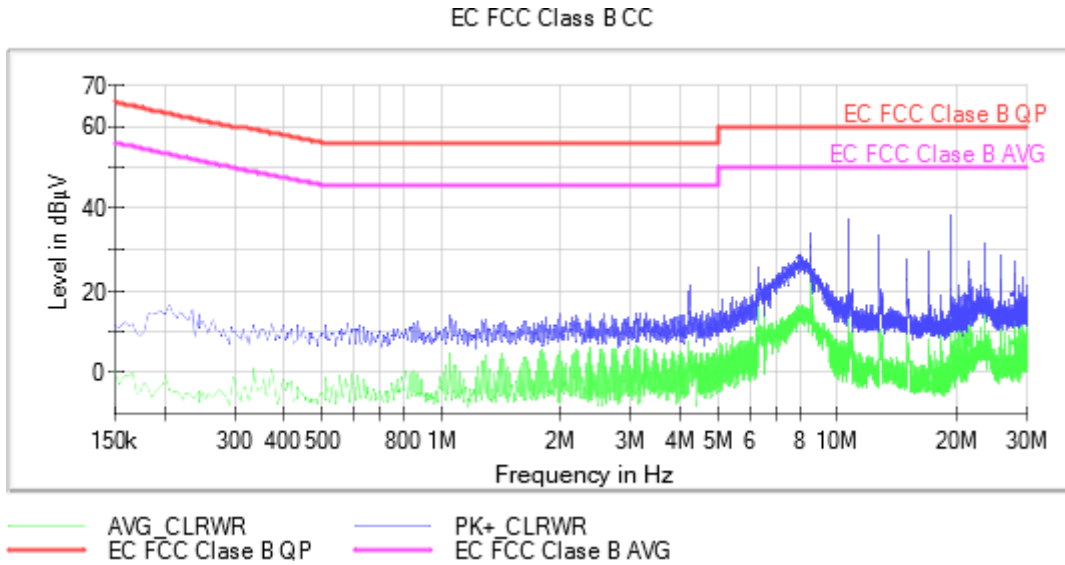
Frequency Range MHz = [0.15, 30]

Conducted Emissions - Tested Line = L1

Sample ID: S/01

Operation Mode: OM/02

Images:



Tables:

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)
0.150000	21.0	-0.5
0.530000	14.6	-3.2
1.210000	14.2	2.8
4.806000	19.0	9.7
9.110000	32.6	24.3
24.242000	32.1	22.9