



Test report No:
 NIE: 54875REM.001A1

Test report (Modification 1)

FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-15 Edition)
 &
 ICES-003 ISSUE 6 (2016)

Identification of item tested	Electronic opener
Trademark	Hailo
Model and/or type reference.....	Libero 2.0 + Remote Control
Other identification of the product	S/N: 36972XX
Final HW version.....	1.0
Final SW version	1.0
FCC ID	2AN9TLibero20
IC	23468-LIBERO20
Features.....	Not provided data
Manufacturer.....	HS42 GMBH Steinkamp 22, 26125 Oldenburg. Germany.
Test method requested, standard	FCC CFR 47, Part 15, Subpart B (10-1-15 Edition) & ICES-003 Issue 6 (2016)
Summary.....	IN COMPLIANCE
Approved by (name / position & signature).....	Rafael López EMC Lab Manager
Date of issue	2018-05-24
Report template No.	FDT11_20

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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.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of AT4 wireless.
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.

Usage of samples

Samples under test have been selected by: the Client.

Sample S/01 is composed of the following elements:

Control N°	Description	Model	Serial number	Reception date
54875/015	AC/DC Adapter with cable	---	---	2017-09-12
54875/002	Remote control	---	---	2017-09-04
54875/001	Electronic Opener	Libero 2.0	---	2017-09-04

Test sample description

Device capable of opening garbage drawers used in kitchens. Triggered by sensor, remote, or app. It is also possible to change some values by app.

Identification of the client

HS42 GMBH
Steinkamp 22, 26125 Oldenburg. Germany.

Testing period

The performed test started on 2017-09-14 and finished on 2017-09-15.
The tests have been performed at DEKRA Testing and Certification, S.A.U.

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. = 860 mbar Max. = 1060 mbar

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. = 860 mbar Max. = 1060 mbar

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. = 860 mbar Max. = 1060 mbar

Modifications to the reference test report

It was introduced the following modifications in respect to the test report number 54875REM.001 related with the same samples, in the next clauses and sub-clauses:

It was modified a typo in the FCC ID and IC codes of the page 1.

This modification test report cancels and replaces the test report 54875REM.001.

Remarks and comments

The tests have been performed by the technical personnel: Pedro Manuel Valenzuela, Daniel López & Ismael Gamarro.

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 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 $I = \pm 4,9$ 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 26GHz is $I = \pm 2,6$ dB for peaks and average measurements ($k = 2$)

Testing verdicts (Legend)

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

List of equipment used during the test

CONTROL NUMBER	DESCRIPTION	MANUFACTURER	MODEL	LAST CALIBRATION	NEXT CALIBRATION
2942	EMI TEST Receiver	ROHDE & SCHWARZ	ESU40	2016-03-14	2017-03-14
4578	Bilog Antenna	ETS LINDGREN	3142E	2017-04-03	2020-04-03
4612	Horn Antenna	SCHWARZBECK	BBHA 9120 D	2016-12-19	2019-12-19
3783	Preamplifier	BONN ELEKTRONIK	BLMA 0118-3A	2017-05-03	2018-05-03
4656	Horn Antenna	SCHWARZBECK	BBHA 9170	2017-03-24	2020-03-24
4570	Thermohigrometer	HW GROUP	HWg-STE	2017-04-25	2018-04-25
4567	Thermohigrometer	HW GROUP	HWg-STE	2017-04-25	2018-04-25
4522	EMC measurement software	ROHDE & SCHWARZ	EMC32 V9.01	---	---
6120	Preamplifier	BONN ELEKTRONIK	BLNA 0360-D1N	2017-07-18	2018-07-18
4729	Preamplifier	BONN ELEKTRONIK	BLMA-1840-1M	2015-12-02	2017-12-02

Appendix A – Test result

APPENDIX A CONTENT

DESCRIPTION OF THE OPERATION MODES.....	9
RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE	10
CONTINUOUS CONDUCTED EMISSION.....	17

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:

OPERATION MODE	DESCRIPTION
OM#01	EUT ON. WiFi in ON mode. Power supply: 115Vac.
OM#02	EUT ON. WiFi session active. Power supply: 115Vac.

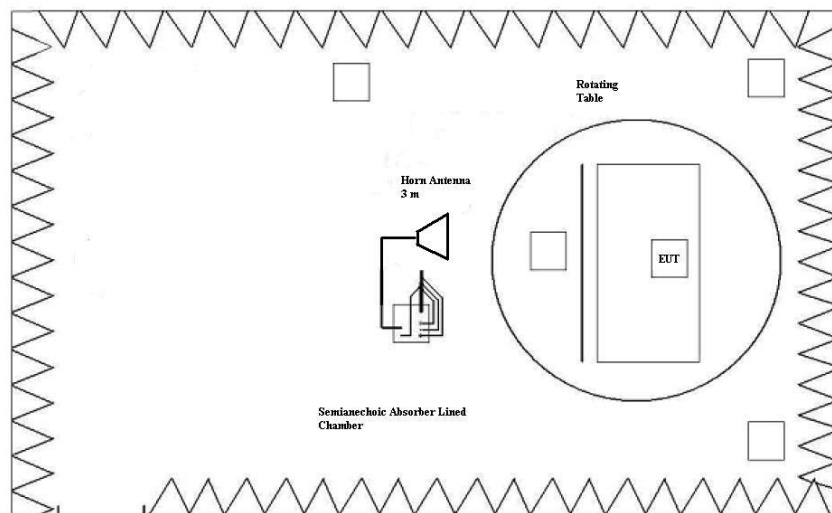
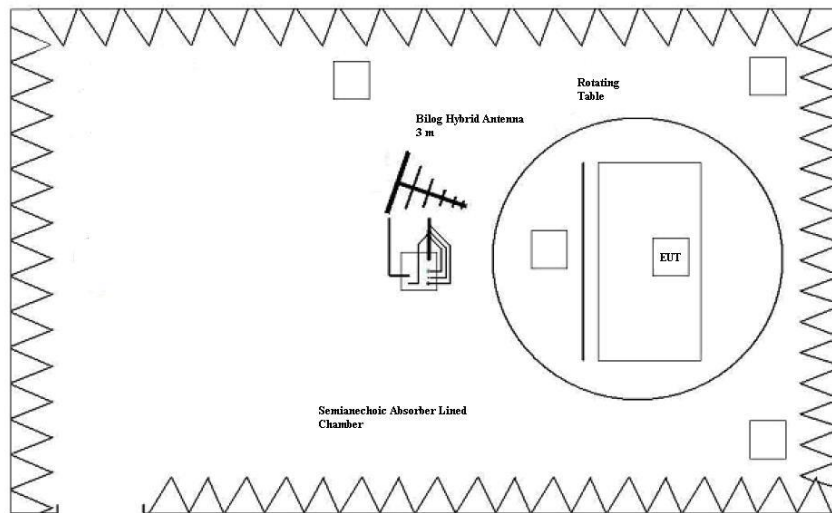
RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE

LIMITS:	Product standard:	FCC CFR 47, Part 15, Subpart B (10-1-15 Edition), Secs. 15.207 & ICES-003 Issue 6 (2016)
	Test standard:	FCC CFR 47, Part 15, Subpart B (10-1-15 Edition), Secs. 15.207 & ICES-003 Issue 6 (2016)

Limits of interference Class B

The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-01-15 Edition), Secs. 15.207 & ICES-003 Issue 6 (2016) in the frequency range 30 MHz to 26 GHz for class B equipments.

Frequency range (MHz)	QP Limit at 3 m		PK Limit at 3 m
	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)
30 to 88	100	40	---
88 to 216	150	43.5	---
216 to 960	200	46	---
Above 960	500	54	74

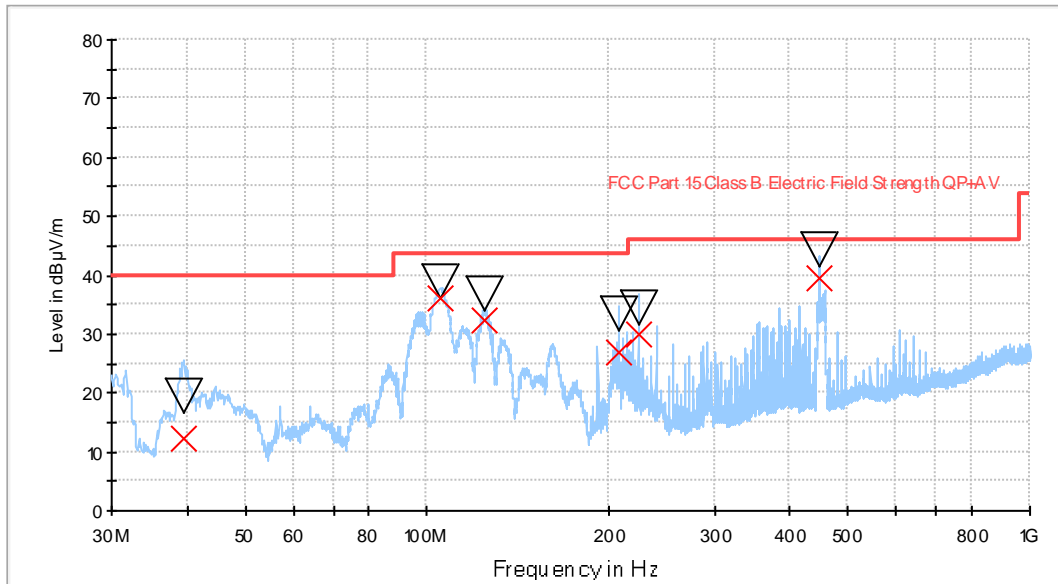


TESTED SAMPLE:	S#01																			
TESTED OPERATION MODES:	OM#01																			
TEST RESULTS:	CRmmnnRRPP: CR, Radiated Condition; mm: Sample number; nn: Operation mode; RR: Range; PP: Polarization.																			
<table border="1"> <thead> <tr> <th>CRmmnnRRPP</th> <th>Description</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>CR0101LR</td> <td>Range: 30 MHz - 1000 MHz.</td> <td>P</td> </tr> <tr> <td>CR0101HR1_PH</td> <td>Range: 1 GHz - 18 GHz. Horizontal Polarization.</td> <td>P</td> </tr> <tr> <td>CR0101HR1_PV</td> <td>Range: 1 GHz - 18 GHz. Vertical Polarization.</td> <td>P</td> </tr> <tr> <td>CR0101HR2_PH</td> <td>Range: 18 GHz - 26 GHz. Horizontal Polarization.</td> <td>P</td> </tr> <tr> <td>CR0101HR2_PV</td> <td>Range: 18 GHz - 26 GHz. Vertical Polarization.</td> <td>P</td> </tr> </tbody> </table>			CRmmnnRRPP	Description	Result	CR0101LR	Range: 30 MHz - 1000 MHz.	P	CR0101HR1_PH	Range: 1 GHz - 18 GHz. Horizontal Polarization.	P	CR0101HR1_PV	Range: 1 GHz - 18 GHz. Vertical Polarization.	P	CR0101HR2_PH	Range: 18 GHz - 26 GHz. Horizontal Polarization.	P	CR0101HR2_PV	Range: 18 GHz - 26 GHz. Vertical Polarization.	P
CRmmnnRRPP	Description	Result																		
CR0101LR	Range: 30 MHz - 1000 MHz.	P																		
CR0101HR1_PH	Range: 1 GHz - 18 GHz. Horizontal Polarization.	P																		
CR0101HR1_PV	Range: 1 GHz - 18 GHz. Vertical Polarization.	P																		
CR0101HR2_PH	Range: 18 GHz - 26 GHz. Horizontal Polarization.	P																		
CR0101HR2_PV	Range: 18 GHz - 26 GHz. Vertical Polarization.	P																		

Radiated Emission. CR0101LR

Project: 54875REM.001
 Company: DEKRA TESTING AND CERTIFICATION GMBH
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. WiFi ON. Power supply:115 Vac.

FCC class B



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

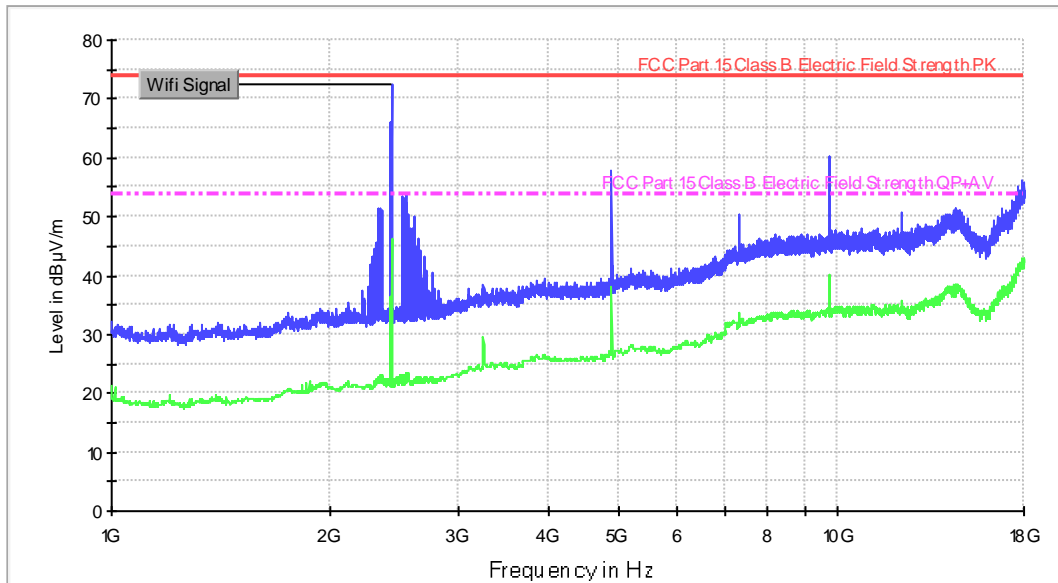
Maximizations

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)
39.400802	19.5	12.2	98.0	H	65.0
105.172545	39.0	36.2	98.0	V	310.0
124.450301	36.7	32.2	98.0	V	313.0
208.051102	33.3	26.9	108.0	H	343.0
223.950902	34.4	29.9	118.0	H	1.0
447.998998	44.3	39.4	151.0	V	0.0

Radiated Emission. CR0101HR1_PH

Project: 54875REM.001
 Company: DEKRA TESTING AND CERTIFICATION GMBH
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. Wifi ON. Power supply:115 Vac. Horizontal polarization.

FCC 1-18GHz class B



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

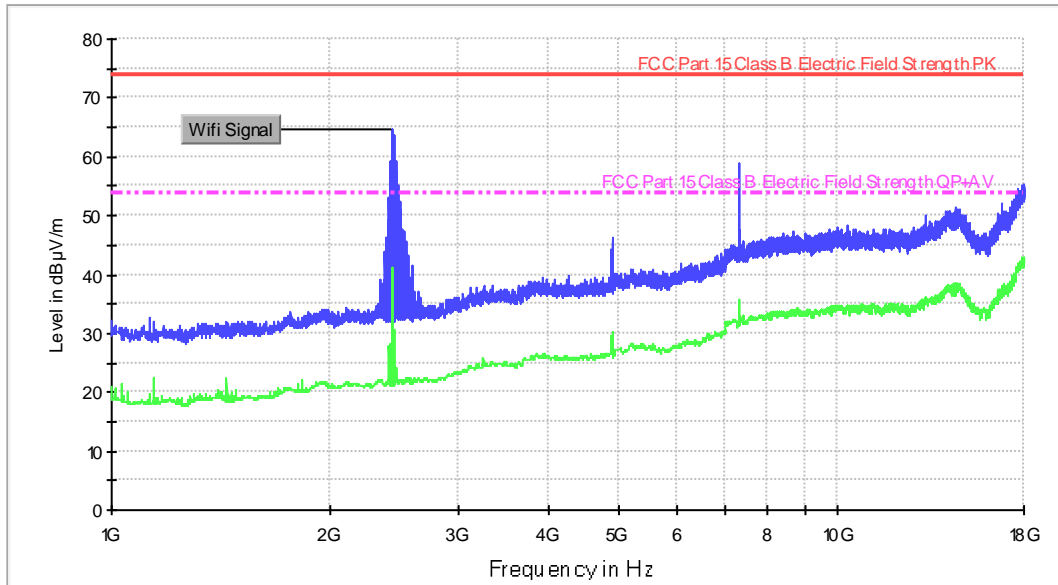
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)	Average-ClearWrite (dBµV/m)
1000.000000	32.3	21.5
2426.000000	72.6	46.4
2638.000000	46.3	22.8
4878.000000	57.8	38.0
9749.000000	60.2	40.1
17887.000000	56.2	42.9

Radiated Emission. CR0101HR1_PV

Project: 54875REM.001
 Company: DEKRA TESTING AND CERTIFICATION GMBH
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. Wifi ON. Power supply: 115 Vac.

FCC 1-18GHz class B



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

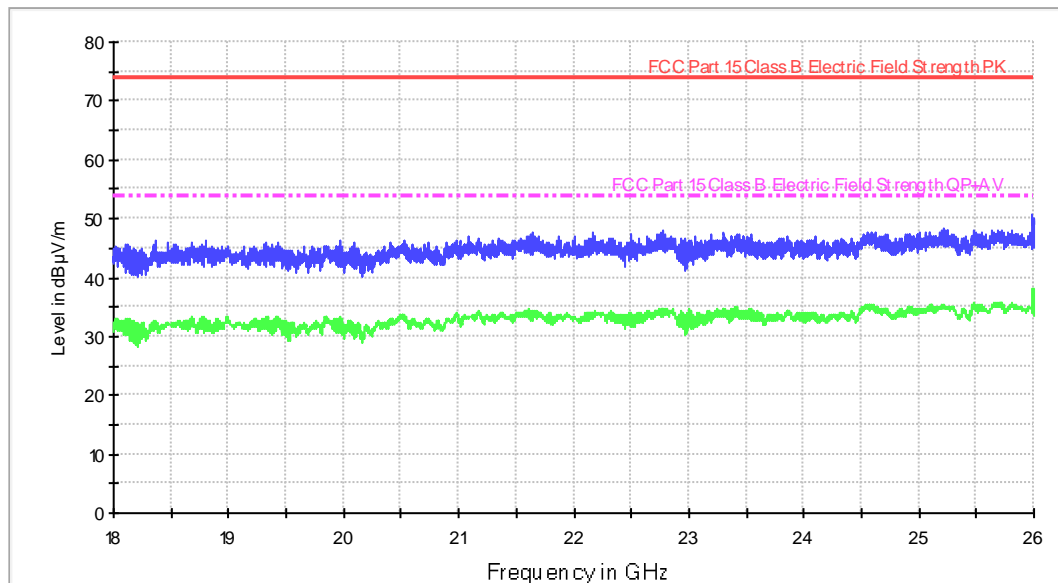
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)	Average-ClearWrite (dBµV/m)
1130.000000	32.5	19.7
2430.000000	64.8	41.3
3924.000000	39.4	26.3
4879.000000	46.4	30.3
7310.000000	59.0	33.2
18000.000000	55.4	42.2

Radiated Emission. CR0101HR2_PH

Project: 54875REM.001
Company: DEKRA TESTING AND CERTIFICATION GMBH
Sample: S/01
Operation mode: OM#01
Description: EUT ON. Wifi ON. Power supply: 115 Vac. Horizontal polarization.

FCC 18-26GHz class B



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

Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)	Average-ClearWrite (dBµV/m)
18365.000000	46.3	32.7
19964.000000	46.4	33.1
21625.000000	47.3	34.3
22780.000000	47.9	34.7
23307.000000	47.6	34.5
25988.000000	50.6	38.2

CONTINUOUS CONDUCTED EMISSION

LIMITS:	Product standard :	FCC CFR 47, Subpart C (10-1-15 Edition) Secs. 15.207 & ICES-003 Issue 6 (2016)
	Test standard :	FCC CFR 47, Part 15, Subpart C (10-1-15 Edition) Secs. 15.207 & ICES-003 Issue 6 (2016)

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 C (10-1-15 Edition) Secs. 15.207 & ICES-003 Issue 6 (2016), 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

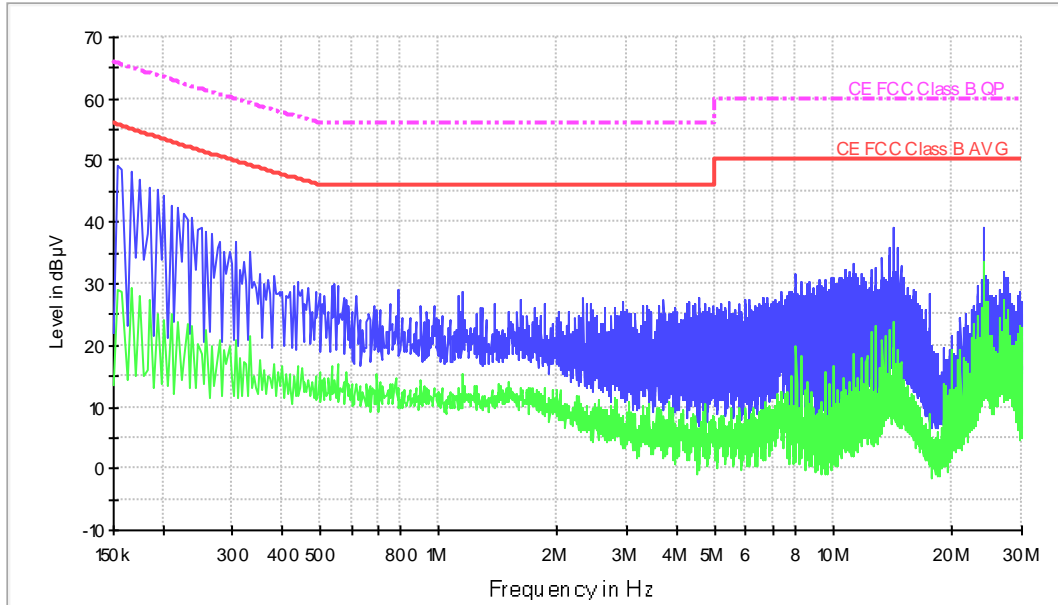
TESTED SAMPLES:	S/01
TESTED OPERATION MODES:	OM#01 & OM#02
TEST RESULTS:	CCmmnnhh: CC, Conducted Condition; mm: Sample number; nn: Operation mode; hh: wire

CCmmnnhh	Description	Result
CC01010N	Neutral wire noise.	P
CC0101L1	Phase wire noise.	P
CC01020N	Neutral wire noise.	P
CC0102L1	Phase wire noise.	P

Conducted Emission. CC01010N

Project: 54875REM.001
 Company: DEKRA TESTING AND CERTIFICATION GMBH (HS42)
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. Wifi ON. Power supply: 115 Vac. Neutral wire noise.

EC FCC Class B



— Peak Scan — Average Scan — CE FCC Class B AVG - - - - CE FCC Class B QP

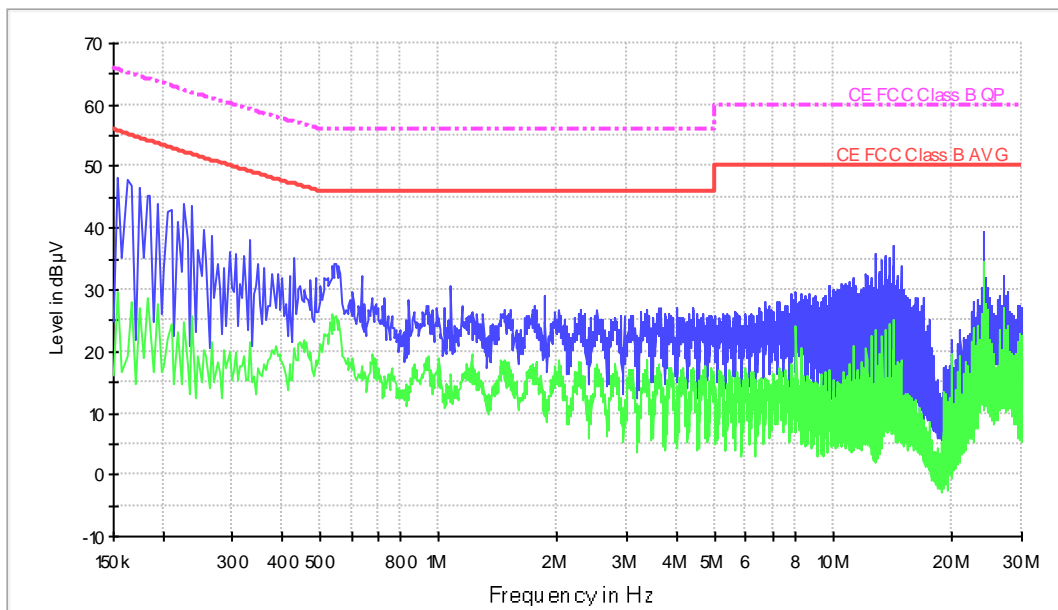
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.154000	49.3	28.9
0.258000	38.4	22.5
0.438000	30.2	16.6
0.790000	28.9	13.1
1.610000	27.5	12.9
2.326000	27.7	9.8
4.550000	27.8	6.1
8.046000	31.7	20.1
14.194000	39.0	23.9
24.002000	39.0	33.6

Conducted Emission. CC0101L1

Project: 54875REM.001
 Company: DEKRA TESTING AND CERTIFICATION GMBH (HS42)
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. Wifi ON. Power supply: 115Vac. L1 wire noise.

EC FCC Class B



— Peak Scan — Average Scan — CE FCC Class B AVG - - - CE FCC Class B QP

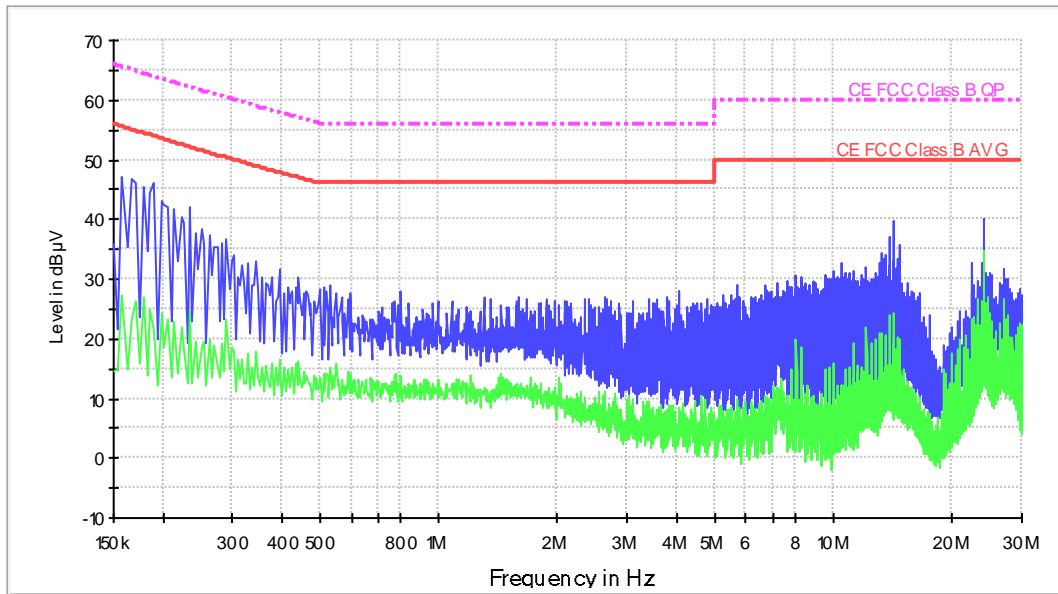
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.154000	48.3	29.8
0.266000	38.7	21.5
0.550000	34.1	25.7
1.074000	30.8	16.5
1.850000	28.9	13.4
3.594000	27.0	18.0
4.026000	27.1	9.2
9.758000	30.8	15.9
14.190000	37.1	23.4
24.002000	39.5	34.4

Conducted Emission. CC01020N

Project: 54875REM.001
 Company: DEKRA TESTING AND CERTIFICATION GMBH (HS42)
 Sample: S/01
 Operation mode: OM#02
 Description: EUT ON. WiFi session active. Power supply: 115Vac. Neutral wire noise.

EC FCC Class B



— Peak Scan — Average Scan — CE FCC Class B AVG - - - - CE FCC Class B QP

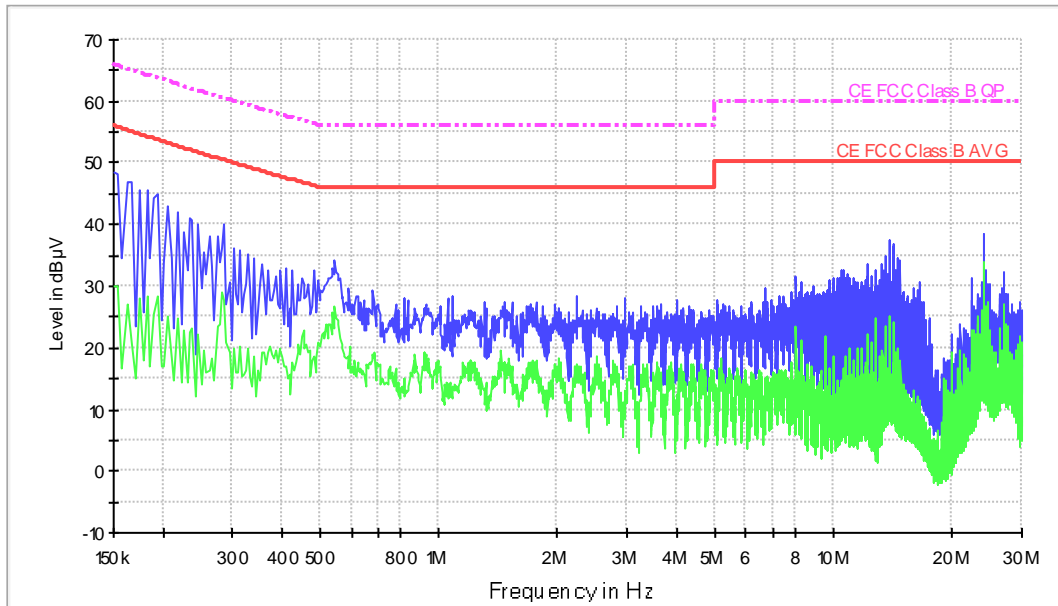
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.158000	47.2	27.2
0.262000	37.6	19.9
0.442000	30.3	16.4
0.802000	28.0	13.8
1.594000	27.0	11.6
2.626000	26.9	11.2
5.682000	28.9	8.0
10.006000	31.2	6.9
14.190000	39.6	24.4
24.002000	40.1	34.7

Conducted Emission. CC0102L1

Project: 54875REM.001
 Company: DEKRA TESTING AND CERTIFICATION GMBH (HS42)
 Sample: S/01
 Operation mode: OM#02
 Description: EUT ON. WiFi session active. Power supply: 115Vac. L1 wire noise.

EC FCC Class B



— Peak Scan — Average Scan — CE FCC Class B AVG - - - CE FCC Class B QP

Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	48.6	29.9
0.286000	40.1	27.6
0.546000	34.2	26.9
1.082000	28.3	12.3
1.530000	27.5	16.9
2.238000	28.3	17.3
5.058000	27.8	9.9
8.046000	31.6	23.6
13.898000	37.6	25.0
24.002000	38.4	34.0