

# EMC TEST REPORT

## No. 2103485STO-103

### Electromagnetic disturbances

#### EQUIPMENT UNDER TEST

Equipment: Work station luminaire for LED lamp  
Type/Model: A2001 Nymåne  
Manufacturer: IKEA of Sweden AB  
Tested by request of: IKEA of Sweden AB

#### SUMMARY

Referring to the emission limits, and the operating mode during the tests specified in this report, the equipment complies with the requirements according to the following standards:

FCC 47 CFR Part 15: Radio frequency devices, Subpart B: Unintentional radiators. Class B equipment and Subpart C: Intentional radiators. Section 15.209

ICES-005 Issue 5: Lighting Equipment, Class B. (2018)  
RSS-210 Issue 10: Licence exempt Radio Apparatus: Category I Equipment  
RSS-216 Issue 2: Wireless power transfer devices

For details, see clause 2 – 4.

Date of issue: May 06, 2021

Tested by:   
Madeleine Bengtsar

Approved by:   
Matti Virkki

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**Revision History**

<b>Test report number</b>	<b>Date</b>	<b>Description</b>	<b>Changes</b>
2010296STO-103	May 11, 2020	First release	
2103485STO-103	May 06, 2021	Second release	Chapter 2.1 is updated regarding power consumption. Chapter 2.5 is updated regarding bayonet.

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**1. CLIENT INFORMATION**

The EUT has been tested by request of

Company	IKEA of Sweden AB Box 702 SE-343 81 Älmhult Sweden
Name of contact	Markus Mauritzon

**2. EQUIPMENT UNDER TEST (EUT)**

**2.1 Identification of the EUT**

Equipment	Work station luminaire for LED lamp
Type/Model	A2001 Nymåne
Brand name	IKEA
Serial Number	-
Manufacturer	IKEA of Sweden AB
Rating	120 V, 60 Hz, 5.3 W
Class	II
Highest clock frequency	500 kHz (highest frequency used within EUT)
Induction charger frequency	112 – 148 kHz
Software/Firmware version	-
FCC ID	FHO-A2001


  
 Intertek
   
 xxxxxxxx
   
 Type No. A2001
   
 Nymåne
   
 Made in

Conforms to: UL Std 153 Certified to: CSA
   
 Std C22.2 No. 250.4
   
 CAN ICES-005 (B) / NMB-005 (B)
   
 This device complies with Part 15 of the FCC
   
 Rules. Operation is subject to the following
   
 two conditions: (1) this device may not
   
 cause harmful interference, and (2) this
   
 device must accept any interference
   
 received, including interference that may
   
 cause undesired operation.

FCC ID:FHO-A2001

Sup. No. xxxxxx
   


**Rating plate (draft)**

**2.2 Test set up and EUT photos**

Test set up and EUT photos are enclosed in photo annex no. 2103485STO-107 Annex 1.

### 2.3 Additional information about the EUT

The EUT is a table standing LED luminaire provided with a wireless cell phone charger plate and an USB-C charger outlet. The EUT is tested in a table-top standing configuration.

The EUT has the following noted components:

Built-in LED-driver, IKEA, type KMV-B-190-190-NA  
 Built-in Wireless charger, IKEA, type ICTD-5-BI-3  
 Built-in USB C outlet-unit, IKEA, type ICPSW5-18-BI-1

The EUT was equipped with the following cable:

Port	Type	Length [m]	Specifications
AC Mains	L, N	1.8	Two-core

### 2.4 Peripheral equipment

Peripheral equipment is equipment needed for correct operation of the EUT, but not included as part of the testing and evaluation of the EUT.

Equipment	Type / Model	Manufacturer	Serial no.
Self ballasted LED-lamp	GU-10	IKEA	LED1722R8 (7,5 W)
Cell phone dummy	-	IKEA	-
Resistive load	9 V, 2 A	IKEA	-
Resistive load	5 V, 3 A	IKEA	-
USB-C cable-electronic	CHO8280-PD Req V1.1	IKEA	-

### 2.5 Opinions and interpretations

The construction of the bayonet light source GU-10 is changed to Edison light source E12.  
 The rated power is changed from 7.5 W to 5.3 W

The difference is mechanical and is considered not to affect EMC-characteristics when compared to the tested type.

**3. TEST SPECIFICATIONS**

**3.1 Standards**

Requirements:

FCC 47 CFR Part 15: Radio frequency devices, Subpart B: Unintentional radiators and Subpart C: Intentional radiators. Section 15.209

ICES-005 Issue 5: Lighting Equipment (2018).

RSS-210 Issue 10: Licence exempt Radio Apparatus: Category I Equipment

RSS-216 Issue 2: Wireless power transfer devices

Test methods:

ANSI C63.4: 2014: American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

Test methods:

ANSI C63.10-2013: American National Standard for testing Unlicensed Wireless Devices

**3.2 Additions, deviations and exclusions from standards and accreditation**

No additions, deviations or exclusions have been made from standards and accreditation.

**3.3 Test site**

Measurements were performed at:

Intertek Semko AB.  
Torshamnsgatan 43,  
P.O. Box 1103  
SE-164 22 Kista

Intertek Semko AB is a FCC listed test site with site registration number 90913

Intertek Semko AB is a FCC accredited conformity assessment body with designation number SE0002

Intertek Semko AB is an Industry Canada listed test facility with IC assigned code 2042G

Measurement chambers

Measurement Chamber	Type of chamber	IC Site filing #
STORA HALLEN	Semi-anechoic 10 m and 3 m	2042G-2

**3.4 Mode of operation during the test**

The EUT was tested with 120 V, 60 Hz.

Operating mode No.1 : tests were performed with the EUT light on (7,5 W LED-lamp, max rating), the USB-C outlet provided with a resistive load of 18 W (9 V, 2 A, max allowed) and a cell phone dummy placed on the induction charger plate. Regarding the radiated emission tests the USB-C port was loaded with a resistive load of 15 W (5 V, 3 A), since the peripheral electronic dongle necessary for 18 W, generated emission affecting the result for the EUT.

Operating mode No.2: additional measurements were performed with the EUT in standby.



### 3.5 Compliance

The EUT shall comply with the emission limits according to the standards as listed below

#### Conducted emission requirements:

The EUT shall meet the limits for the standards.

Reference: 47 CFR §15.107

ICES-005, section 5.5.2

#### Limits for conducted emission according to FCC and ICES-005

Class B

Frequency range [MHz]	Limits [dBµV]	
	Quasi-Peak	Average
0.15 – 0.50	66 – 56	56 – 46
0.50 – 5.00	56	46
5.00 – 30.0	60	50

#### Radiated Emission requirements:

The EUT shall meet the limits for the standards.

Reference: 47 CFR §15.109

ICES-005, section 5.5.3

#### Limits for radiated emission according to FCC

Class B

Frequency range [MHz]	Field strength at 3 m (dBµV/m)	Field strength at 10 m (dBµV/m)	Detector
30 – 88	40.0	29.5	Quasi Peak
88 – 216	43.5	33.1	Quasi Peak
216 – 960	46.0	35.6	Quasi Peak
960 – 1000	54.0	43.5	Quasi Peak
Above 1000	54.0 / 74.0	43.5 / 63.5	Average / Peak

The values for 10 m measuring distance are calculated by subtracting 10.5 dB from the 3 m limit. (i.e. an extrapolation factor of 20 dB/decade according to §15.31(f)(1))

Magnetic field radiated emissions: 47 CFR §15.209, RSS-210

(Test due to induction charger included in EUT.)

Frequency range [MHz]	Field strength at 3 m (dBµV/m)	Field strength at 10 m (dBµV/m)	Detector (dBµV/m)
0.009 – 0.09	128.5 – 108.5	107.6 – 87.6	Average
0.09 – 0.110	108.5 – 106.8	87.6 – 85.9	Quasi Peak
0.110 – 0.490	106.8 – 93.8	85.9 - 72.9	Average
0.490 – 1.705	73.8 – 62.9	68.1 – 42.1	Quasi Peak
1.705 – 30	69,5	49.1	Quasi Peak

#### Limits for radiated emission according to ICES-005

Class B

Frequency range [MHz]	Field strength at 3 m (dBµV/m)	Field strength at 10 m (dBµV/m)	Detector
30 – 88	40.0	29.5	Quasi Peak
88 – 216	43.5	33.1	Quasi Peak
216 – 1000	46.0	35.6	Quasi Peak



#### 4. TEST SUMMARY

The results in this report apply only to sample tested:

Standard	Description	Result
	<b>Emission</b>	
<b>FCC Part 15 subpart B</b>  <b>ICES-005</b>	<b>Conducted continuous emission in the frequency range 0.150 – 30 MHz, AC Power input port</b>  The EUT complies with the Class B limits. The margin to the limit was at least 8.3 dB at 1.858 MHz See clause 5.4 – 5.5.	<b>PASS</b>
<b>FCC Part 15 subpart B</b>  <b>ICES-005</b>	<b>Radiated emission of electromagnetic fields in the frequency range 30 – 1000 MHz</b>  The EUT complies with the Class B limits. The margin to the limit was at least 4.6 dB at 69.450 MHz See clause 6.5.	<b>PASS</b>
<b>FCC Part 15 subpart C</b>  <b>RSS-210</b>	<b>Radiated emission of electromagnetic fields in the frequency range 9 kHz - 30 MHz</b>  Test due to induction charger included in EUT  The EUT complies with the limits. The margin to the limit was at least 29.3 dB at 0.728 MHz See clause 6.4.	<b>PASS</b>
<b>FCC Part 15 subpart B</b>  <b>ICES-005</b>	<b>Radiated emission of electromagnetic fields in the frequency range 1 – 40 GHz</b>  Not applicable (N/A), no clock frequency above 108 MHz	<b>N/A</b>

**5. CONDUCTED CONTINUOUS DISTURBANCES  
in the frequency-range 0.15 – 30 MHz**

**5.1 Operating environment**

Date of test:	Temperature:	Relative Humidity:
April 2, 2020	22 [°C]	22 [%]

**5.2 Test setup and test procedure**

The test method is in accordance with ANSI C63.4.

The EUT was connected to the power via Artificial Mains Networks AMN.

The EUT was placed on an insulating support 0.8 m above the floor, 0.4 m from the vertical reference ground plane (RGP) and 0.8 m from the AMN/ISN.

Overview sweeps were performed for each lead.

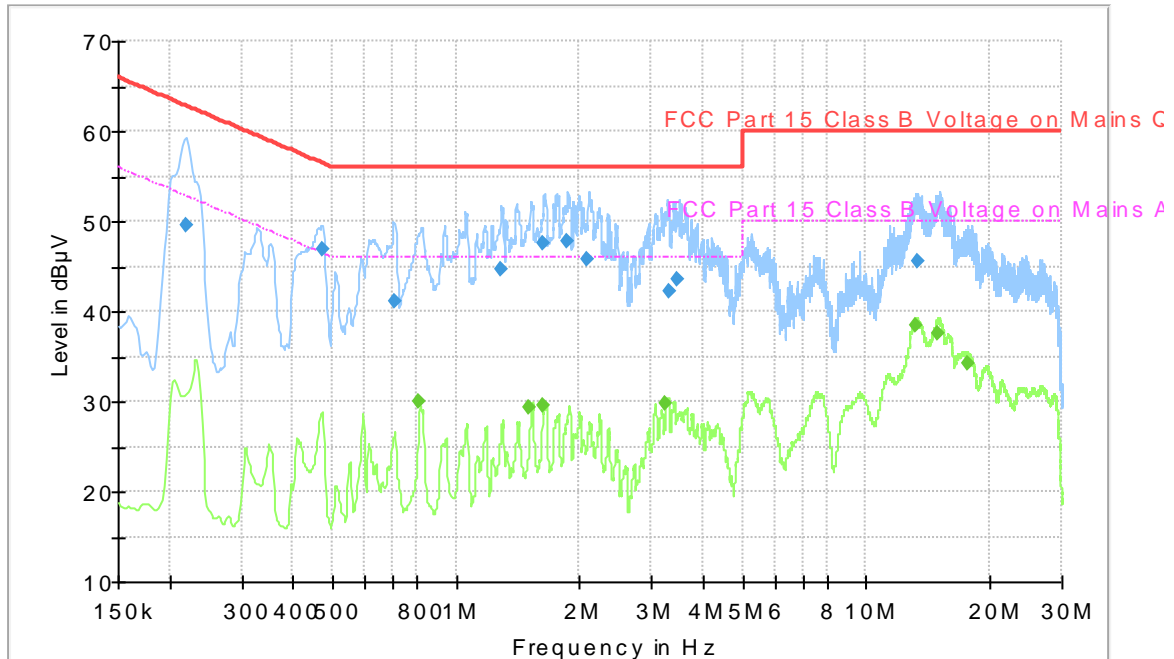
During the tests the EUT was operated according to the mode of operation mentioned in clause 3.4.

**5.3 Measurement uncertainty**

Continuous conducted disturbances with AMN  
in the frequency range 150 kHz to 30 MHz ± 3.3 dB

Measurement uncertainty is calculated in accordance with CISPR 16-4-2:2011.  
The measurement uncertainty is given with a confidence of 95 %.

5.4 Test results, AC Power input port, Class B



Diagram, Peak and Average overview sweep

Measurement results, Quasi-peak, Class B

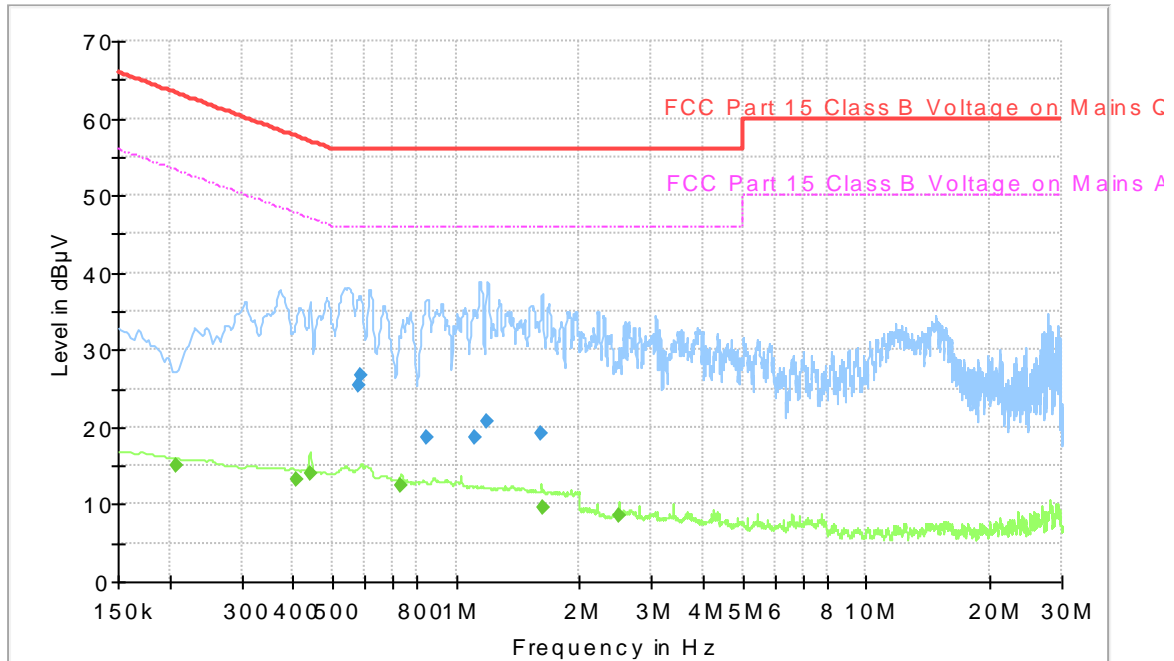
Frequency [MHz]	Result [dBµV]	Limit [dBµV]	Line L/N	Margin [dB]
0.220	49.5	62.8	N	13.3
0.472	46.9	56.5	L1	9.6
0.708	41.1	56.0	N	14.9
1.286	44.6	56.0	N	11.4
1.628	47.5	56.0	N	8.5
1.858	47.7	56.0	N	8.3
2.090	45.7	56.0	N	10.3
3.307	42.1	56.0	L1	13.9
3.476	43.6	56.0	N	12.4
13.319	45.7	60.0	L1	14.3

Measurement results, Average, Class B

Frequency [MHz]	Result [dBµV]	Limit [dBµV]	Line L/N	Margin [dB]
0.809	30.1	46.0	N	15.9
1.509	29.4	46.0	L1	16.6
1.622	29.5	46.0	N	16.5
3.246	29.8	46.0	N	16.2
13.124	38.5	50.0	L1	11.5
14.937	37.5	50.0	L1	12.5
17.732	34.2	50.0	L1	15.8

Result [dBµV] = Analyser reading [dBµV] + cable loss [dB] + LISN insertion loss [dB]

5.5 Test results, AC Power input port, Class B, Operating mode No.2



Diagram, Peak and Average overview sweep

Measurement results, Quasi-peak, Class B

All measured disturbances have a margin of more than 20 dB to the limits.

Measurement results, Average, Class B

All measured disturbances have a margin of more than 20 dB to the limits.

$$\text{Result [dB}\mu\text{V]} = \text{Analyser reading [dB}\mu\text{V]} + \text{cable loss [dB]} + \text{LISN insertion loss [dB]}$$

5.6 Test equipment

Equipment type	Manufacturer	Model	Inv. No.	Last Cal. date	Cal. interval
Measurement software	Rohde & Schwarz	EMC32 - V10.50.40	--	--	--
Measurement Receiver	Rohde & Schwarz	ESU 8	12866	06-2019	1 year
Pulse limiter	Rohde & Schwarz	ESH3-Z2	4623	30-04-2019	1 year
Artificial mains network	Rohde & Schwarz	ESH3-Z5	2728	06-2019	1 year
Measurement cable	Suhner	RG 223/U	9815	06-2019	1 year
Measurement cable	Suhner	G03232D-01	9701	06-2019	1 year

**6. RADIATED RF EMISSION IN THE FREQUENCY-RANGE 0.009 MHz TO 1 GHz**

Date of test:	Temperature:	Relative Humidity:
April 15, 2020	21 [°C]	24 [%]
May 6, 2020	21 [°C]	27 [%]

**6.1 Test set-up and test procedure.**

The test method is in accordance with ANSI C63.10 and ANSI C63.4.

The EUT was set up according to the standard

The EUT was placed on an insulating support 0.8 m above the turntable which is part of the reference ground plane.

Overview sweeps were performed with the measurement receiver in max-hold mode and the peak detector activated.

**6.2 Test conditions**

**Test set-up:**

**9 kHz to 30 MHz**

Test receiver set-up:

Preview/Final test:

Quasi-Peak, RBW 200 Hz / 9 kHz  
Average RBW 200 Hz / 9 kHz

Measuring distance:

3 m

Measuring angle:

0 – 359°

Antenna

Height above ground plane:

1 m

orientation:

2 orthogonal axis

Type:

Loop

**Test set-up:**

**30 MHz to 1000 MHz**

Test receiver set-up:

Preview test:

Peak, RBW 120 kHz. VBW 1 MHz

Final test:

Quasi-Peak, RBW 120 kHz

Measuring distance:

3 m

Measuring angle:

0 – 359°

Antenna

Height above ground plane:

1 – 4 m

Polarisation:

Vertical and Horizontal

Type:

Bilog

**6.3 Measurement uncertainty**

Measurement uncertainty for radiated disturbance

Uncertainty for the frequency range 0.09 to 30 MHz at 3 m ± 3.2 dB

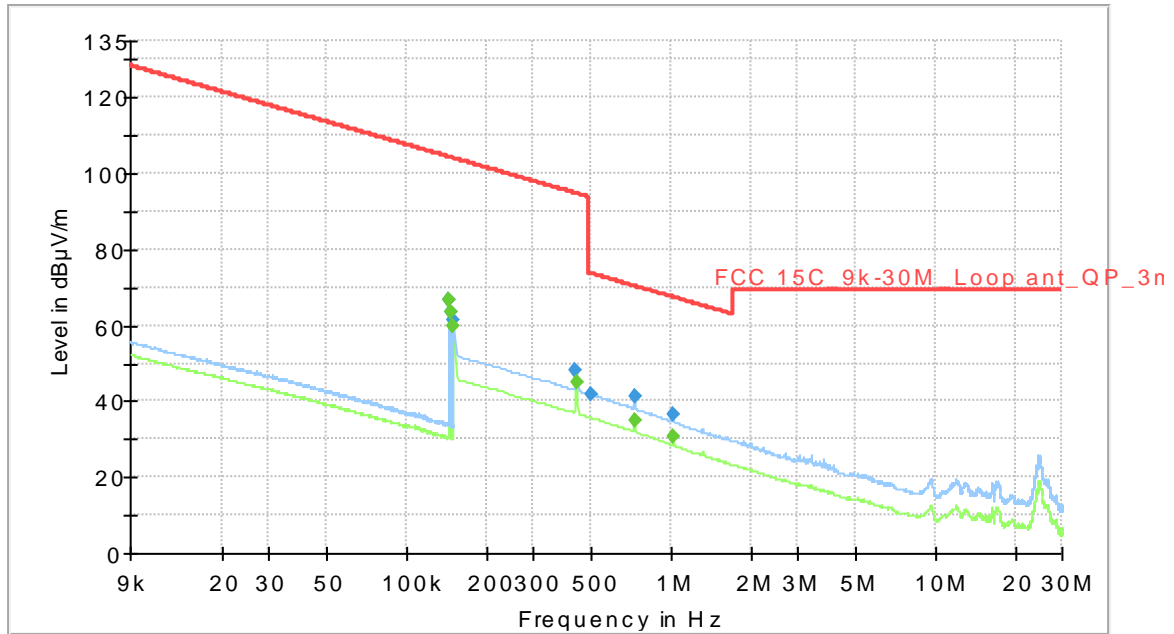
Uncertainty for the frequency range 30 to 1000 MHz at 3 m ± 5.1 dB

Measurement uncertainty is calculated in accordance with CISPR 16-4-2:2011.

The measurement uncertainty is given with a confidence of 95 %.

6.4 Test results, 0.009 – 30 MHz

Full Spectrum



Diagram, Quasi Peak and average overview sweep, 0.009 – 30 MHz at 3 m distance.

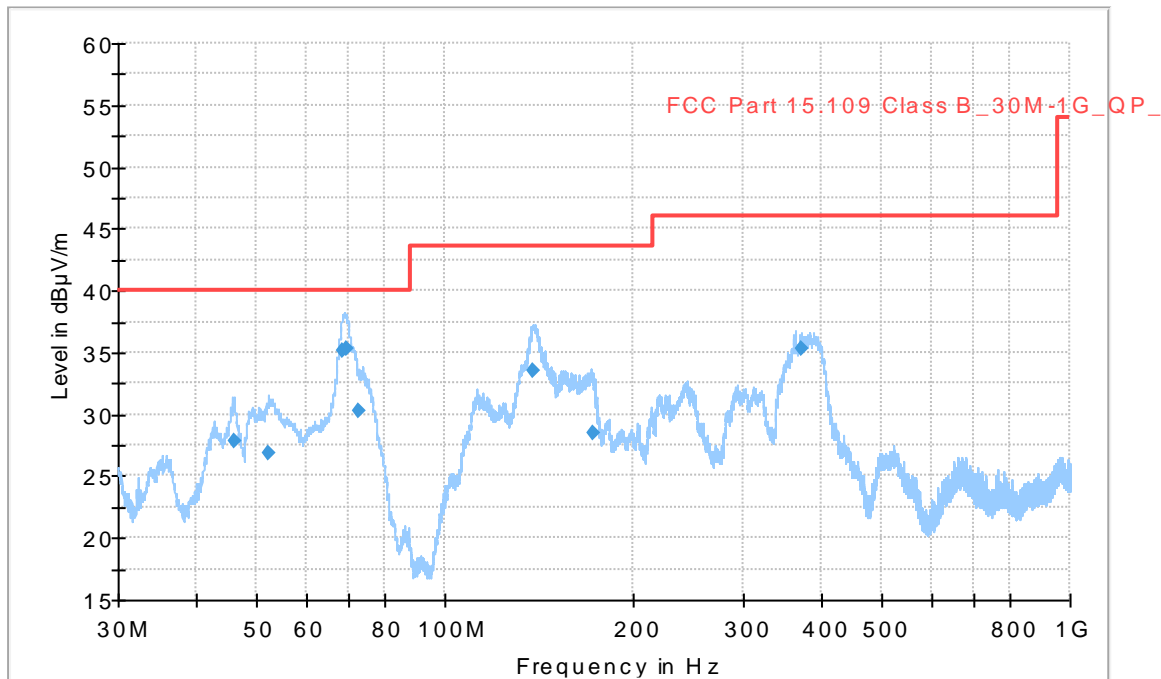
Measurement results, Quasi Peak

Frequency [MHz]	Result [dBµV/m]	Limit [dBµV/m]	Polarization H/V	Margin [dB]
0,499	41.9	73.7	V	31.8
0.728	41.1	70.4	V	29.3
1.021	36.3	67.4	V	31.1

Measurement results, Average

Frequency [MHz]	Result [dBµV/m]	Limit [dBµV/m]	Polarization H/V	Margin [dB]
0.146	63.4	104.3	V	40.9
0.150	59.9	104.1	V	44.2
0.438	44.8	94.8	V	50.0

6.5 Test results, 30 – 1000 MHz, FCC, Class B



Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance.

Measurement results, Quasi Peak, Class B

Frequency [MHz]	Result [dBµV/m]	Limit [dBµV/m]	Polarization H/V	Margin [dB]
45.960	27.8	40.0	V	12.2
52.230	26.8	40.0	V	13.2
68.580	35.2	40.0	V	4.8*
69.450	35.4	40.0	V	4.6*
72.810	30.3	40.0	V	9.7
138.450	33.5	43.5	V	10.0
172.980	28.4	43.5	H	15.1
372.330	35.4	46.0	H	10.6

\*The measured result is below the limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95 % level of confidence. However, the result indicates that compliance is more probable than non-compliance with the specification limit.

The EUT also fulfil the limit for ICES-005, see limit table clause 3.5 in this test report.

Result [dBµV/m] = Analyser reading [dBµV] + Antenna factor [1/m] - Amplifier gain [dB] + Cable loss [dB]

**6.6 Test equipment**

Equipment type	Manufacturer	Model	Inv. No.	Last Cal. date	Cal. interval
Measurement software	Rohde & Schwarz	EMC32 - V10.50.40	--	--	--
Measurement Receiver	Rohde & Schwarz	ESW44	33890	06-2019	1 year
Antenna	Chase	CBL 6111D	34200	03-2020	3 years
Pre-amplifier	SEMKO	AM1331	7992	30-04-2019	1 year
Measurement cable	Huber & Suhner	Sucoflex 106	39122	30-04-2019	1 year
Measurement cable	Rosenberger	LA5-S003-8500	39148	01-04-2020	1 year
Measurement cable	Rosenberger	LA5-S003-7000	39163	30-04-2019	1 year
Loop antenna	EMCO	6502	8853	01-2019	3 years
Measurement cable	Suhner	RG 214/U	9798	01-2020	1 year
Measurement cable	Suhner	RG 214/U	8911	30-04-2019	1 year
Measurement cable	Rohde & Schwarz	-	9206	01-2020	1 year
Pulse limiter	Rohde & Schwarz	ESH3-Z2	32457	06-2019	1 year