EMC TEST REPORT

No. 2025115STO-106

Electromagnetic disturbances

EQUIPMENT UNDER TEST

Equipment:	Surface-mounted luminaire with LED
Type/Model:	T2030 Pilskott
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.

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

For details, see clause 2 – 4.

Date of issue: June 28, 2021

Tested by: Lovisa Gibson

Approved by: Per Granberg

Revision History

Test report no.	Release no.	Date of issue	Description
2025115STO-106	1	June 28, 2021	

Terms, definition and abbreviations

The following terms, definitions and abbreviations may be used throughout the report.

Term/definition/abbreviation	Meaning
AAN	Asymmetrical Artificial Network
AC	Alternating Current
AE	Associated Equipment
AM	Amplitude Modulation
AMN	Artificial Mains Network
AV	Average
BW	Bandwidth
CAV	CISPR Average
CDN	Coupling/Decoupling Network
CM	Common Mode
CMAD	Common Mode Absorption Device
DC	Direct Current
DM	Differential Mode
EM	Electromagnetic
EMC	Electromagnetic Compatibility
ESD	Electrostatic Discharge
EUT	Equipment Under Test
F	Fail
FM	Frequency Modulation
FAR	Fully Anechoic Room
F_X	Highest fundamental frequency generated or used within the EUT, or highest frequency at which it operates
H	Horizontal
HCP	Horizontal Coupling Plane
I_{ref}	Reference Current
ISN	Impedance Stabilizing Network
MU	Measurement Uncertainty
N/A	Not Applicable
P	Pass
PE	Protective Earth
PK	Peak
Pol.	Polarisation
PWHC	Partial Weighted Harmonic Current
QP / QPK	Quasi-Peak
RF	Radio Frequency
RGP	Reference Ground Plane
RH	Relative Humidity
RMS	Root Mean Square
Rx	Receiver / Receiving
SAC	Semi-Anechoic Chamber
THC	Total Harmonic Current
Tx	Transmitter / Transmitting
V	Vertical
VCP	Vertical Coupling Plane

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1. CLIENT INFORMATION

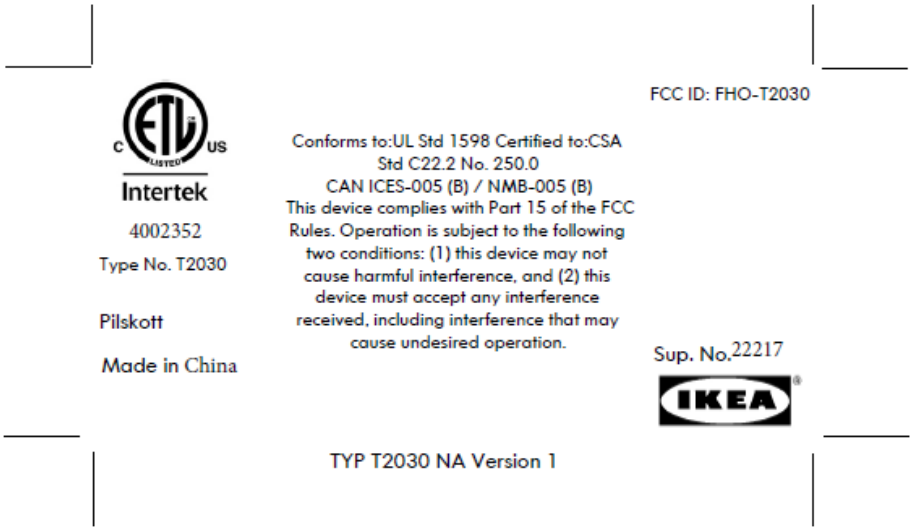
The EUT has been tested by request of

Company	IKEA of Sweden AB
Name of contact	Vivian Xu
Client observer	-

2. EQUIPMENT UNDER TEST (EUT)

2.1 Identification of the EUT

Equipment:	Surface-mounted luminaire with LED								
Type/Model:	T2030 Pilskott								
Brand name:	IKEA								
S/N:	-								
Manufacturer:	IKEA of Sweden AB								
Installation class:	☐ I ☒ II ☐ III ☐ N/A								
Highest clock frequency, F_X:	2.4 GHz								
Software version:	-								
Hardware version:	-								
Mounting position: (during normal use)	☐ Table-top ☐ Floor-standing ☒ Wall/ceiling ☐ Hand-held ☐ Other:								
Supplementary information:	FCC ID: FHO-T2030								
Input ratings	**Voltage [V]**	**Freq. [Hz]**	**Current [A]**	**Power [W]**	**Coupling**				
☒ AC	120	60	-	16.5	**L1** ☒	**L2** ☐	**L3** ☐	**N** ☒	**PE** ☐
☐ DC					**V+** ☐	**V-** ☐			**PE** ☐
☐ Battery					**V+** ☐	**V-** ☐			**PE** ☐
☐ Other:									



Photo/copy of marking/rating plate(s)

2.2 Test set up and EUT photos

Test set up and EUT photos are enclosed in Annex 1 to this test report.

2.3 Additional information about the EUT

The EUT has the following ports:

Port type	Port name	Shielded
AC I/O		
☒ AC power input	AC power input	☐
☐ AC power output		☐
DC I/O		
☐ DC power input		☐
☐ DC power output		☐
Signal/control I/O		
☐ Telecom/network		☐
☐ Signal/control		☐
Supplementary information:		

2.4 Decision rule

The statements of conformity are reported as:
Passed – When the measured values are within the specified limits.
Failed – When one or more measures values are outside the specified limits.

3. TEST SPECIFICATIONS

3.1 Additions, deviations and exclusions from standards and accreditation

The following editions of basic standards were applied instead of the standards referenced in FCC 47 CFR Part 15 and ICES-005:

Referenced	Applied
ANSI C63.4-2014	ANSI C63.4-2014
CISPR 15:2015	CISPR 15:2018

3.2 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
☐ BJÖRKHALLEN	Semi-anechoic 3 m	2042G-1
☐ 5 m CHAMBER	Semi-anechoic 5 m	2042G-3

3.3 Mode of operation during the test

Mode no.	Supply	Description
1	120 V AC, 60 Hz	Light on. Maximum light intensity.
2	120 V AC, 60 Hz	Light on. Minimum light intensity.

Test	Mode of operation
Conducted continuous emission	1, 2
Radiated emission of EM fields	1, 2

4. TEST SUMMARY

The test has been carried out at the Intertek Semko AB premises in Kista, Sweden.
The results in this report apply only to sample tested.
Result: P – F – N/A

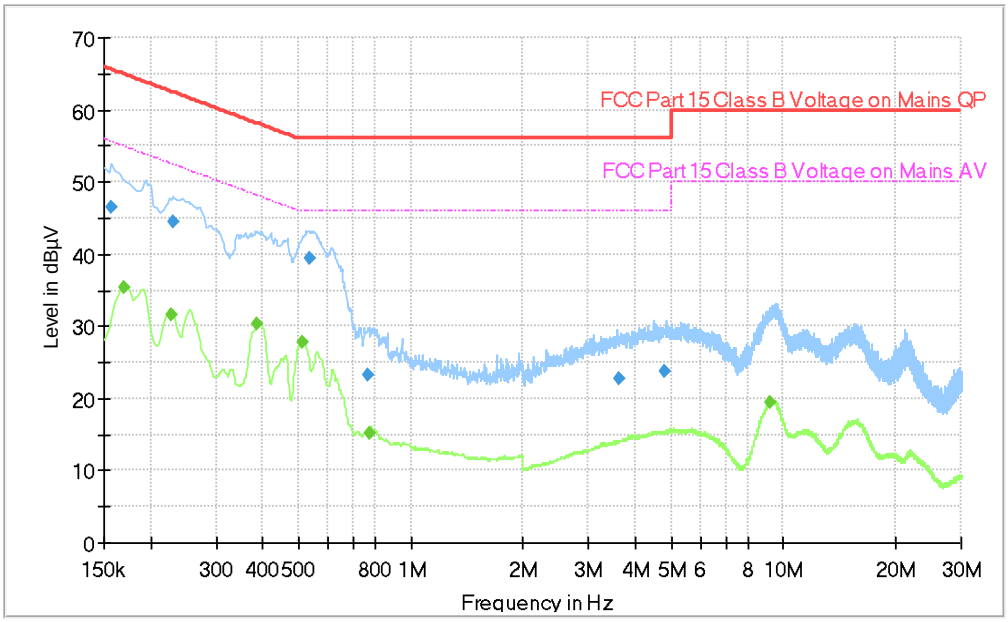
EMISSION TESTS					
Chapter	**Standard(s)**	**Description**	**Port type(s)**	**Note(s)**	**Verdict**
5	FCC Part 15 subpart B	Conducted continuous emission	AC input	-	P
5	ICES-005	Conducted continuous emission	AC input	-	P
6	FCC Part 15 subpart B	Radiated emission of EM fields	Enclosure	-	P
6	ICES-005	Radiated emission of EM fields	Enclosure	-	P
Supplementary information: --					

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

Date of test	Temp. [°C]	Humidity [%RH]	Tested by
May 20, 2021	23	31	Lovisa Gibson

Test setup and procedure:	EUT was placed 0.8 m from the AMN /ISN. Overview sweeps were performed for each lead of the cable(s). AE requiring mains power to operate was/were connected to AMN /ISN terminated with 50 Ω, when applicable.		
EUT position:	☒ Table-top (EUT 0.4 m from the RGP) ☐ Floor-standing (EUT 12 mm from the RGP) ☐ Other:		
Tested port type(s):	**Coupling device**	**Measurement uncertainty**	
		Frequency range	**Value**
☒ AC power	☒ AMN	0.15 – 30 MHz	± 3.3 dB
Supplementary information: Measurement uncertainty is calculated in accordance with CISPR 16-4-2:2011. The measurement uncertainty is given with a confidence of 95 %.			

5.1 Test results, AC Power input port, Class B, Test Mode No. 1



Diagram, Peak and AV overview sweep

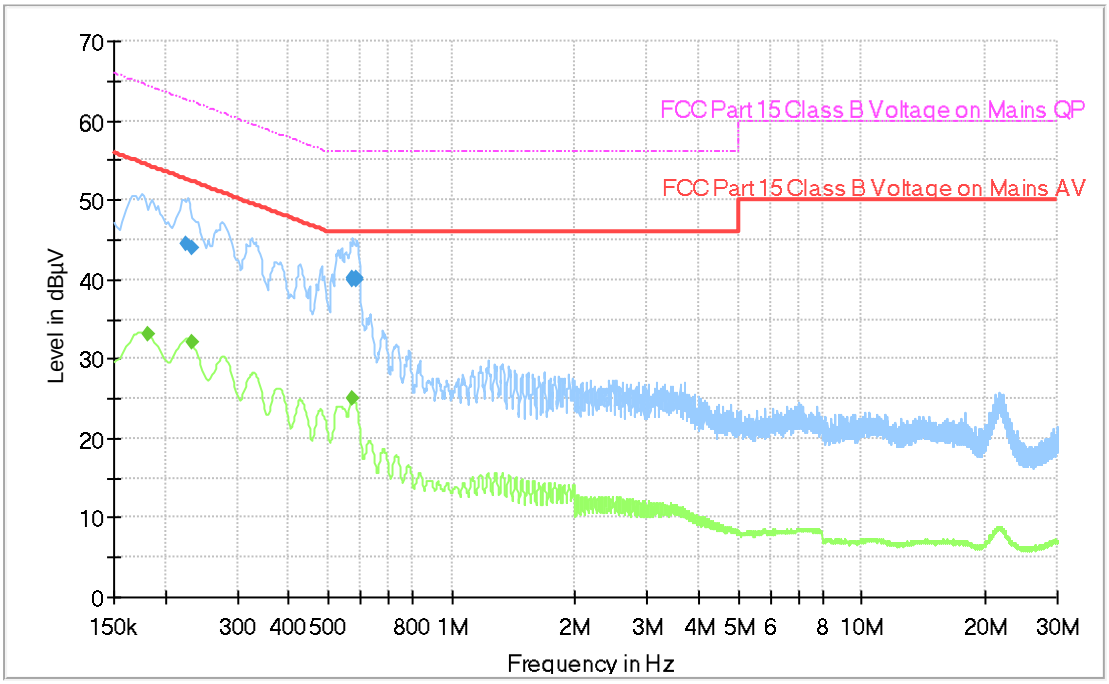
Measurement results, Quasi-peak

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE
0.156750	46.61	---	65.63	19.02	1000.0	9.000	L1	GND
0.228750	44.50	---	62.50	18.00	1000.0	9.000	N	GND
0.534750	39.53	---	56.00	16.47	1000.0	9.000	N	GND
0.768750	23.35	---	56.00	32.65	1000.0	9.000	N	GND
3.617250	22.77	---	56.00	33.23	1000.0	9.000	N	GND
4.794000	23.65	---	56.00	32.35	1000.0	9.000	N	GND

Measurement results, Average

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE
0.170250	---	35.44	54.95	19.51	1000.0	9.000	N	GND
0.226500	---	31.64	52.58	20.94	1000.0	9.000	N	GND
0.384000	---	30.33	48.19	17.86	1000.0	9.000	N	GND
0.512250	---	27.88	46.00	18.12	1000.0	9.000	N	GND
0.773250	---	15.13	46.00	30.87	1000.0	9.000	N	GND
9.237750	---	19.56	50.00	30.44	1000.0	9.000	N	GND

5.2 Test results, AC Power input port, Class B, Test Mode No. 2



Diagram, Peak and AV overview sweep

Measurement results, Quasi-peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE
0.224250	44.55	62.66	18.11	1000.0	9.000	N	GND
0.233250	43.90	62.33	18.43	1000.0	9.000	N	GND
0.573000	39.85	56.00	16.15	1000.0	9.000	N	GND
0.575250	40.19	56.00	15.81	1000.0	9.000	N	GND
0.582000	40.17	56.00	15.83	1000.0	9.000	N	GND
0.584250	39.86	56.00	16.14	1000.0	9.000	N	GND

Measurement results, Average

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

5.3 Test equipment

Equipment type	Manufacturer	Model	Inv. No.	Last Cal. date	Cal. interval
Measurement software	Rohde & Schwarz	EMC32 - Version	--	--	--
Receiver	Rohde & Schwarz	ESU	12866	27-07-2020	31-07-2021
Pulse limiter	Rohde & Schwarz	ESH3-Z2	4623	13-05-2020	31-07-2021
AMN / LISN	Rohde & Schwarz	ESH3-Z5	2728	08-07-2020	31-07-2021
Cable	Huber + Suhner	RG 223/U	9815	07-06-2021	30-06-2022
Cable	Suhner	G03232 D-01	9701	07-06-2021	30-06-2022
Multimeter	Gossen Metrawatt	Metra Hit 16S	8141	23-06-2021	30-06-2021
Temp/Hygro	Vaisala	HMI41	8335	06-11-2020	30-11-2021

6. RADIATED RF EMISSION IN THE FREQUENCY-RANGE 30 MHZ – 13 GHZ

Date of test	Temp. [°C]	Humidity [%RH]	Tested by
May 26, 2021, June 29, 2021	21, 22	51, 63	Lovisa Gibson

Test setup and procedure:	The EUT was placed on a non-conductive support on the RGP. Overview sweeps were performed with the measurement receiver in max hold mode and the peak detector activated in the frequency range 30 – 1000 MHz. Above 1 GHz, both the peak and average detectors were activated, when applicable. During height scan above 1 GHz the EUT was kept in antennas cone of radiation.	
EUT position:	☒ Table-top (EUT 0.8 m from the RGP) ☐ Floor-standing (EUT 12 mm from the RGP) ☐ Other:	
Highest measured frequency:	☐ F_X 108 MHz: 1 GHz ☐ 108 MHz < F_X ≤ 500 MHz: 2 GHz ☐ 500 Mhz < F_X ≤ 1 GHz: 5 GHz ☒ F_X > 1 GHz: 5 x F_X up to a max. of 40 GHz ☐ F_X is unknown: 40 GHz	

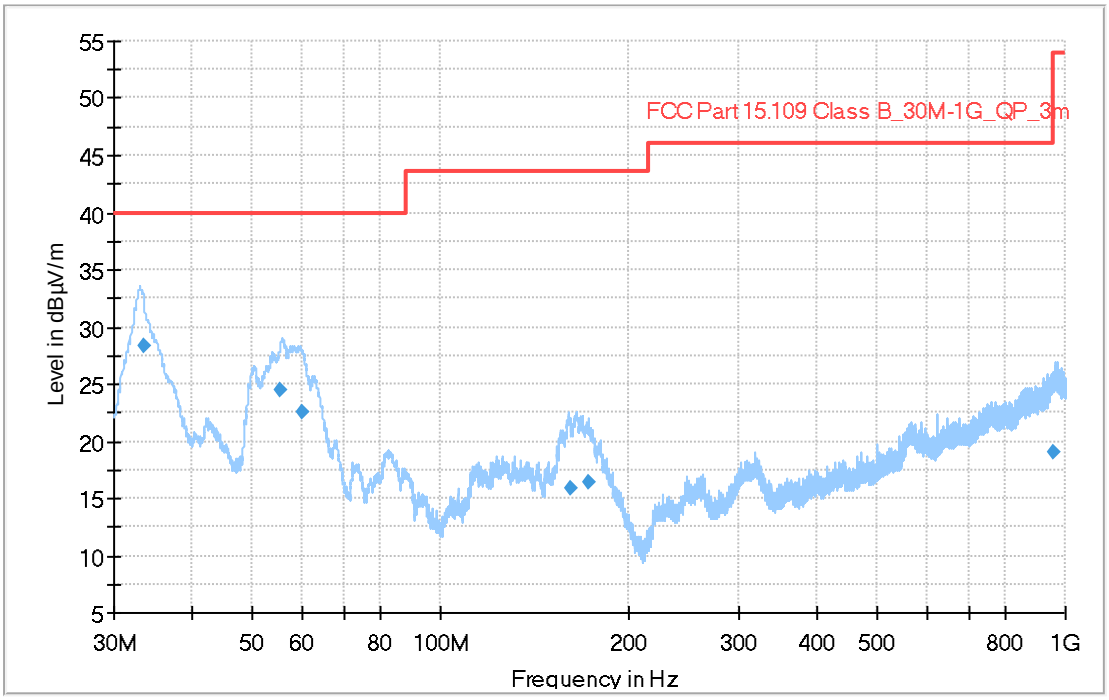
Frequency range:	**Measuring distance**	**Measurement uncertainty**
☒ 30 to 1000 MHz	3 m	± 5.1 dB
☐ 30 to 1000 MHz	10 m	± 5.0 dB
☒ 1.0 to 18 GHz	3 m	± 4.5 dB
☐ 18 to 26 GHz	3 m	± 4.8 dB
☐ 26 to 40 GHz	3 m	± 5.7 dB

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

Test	**Freq. [MHz]**	**Meas. angle [°]**	**Antenna**			**RBW [kHz]**			**VBW [kHz]**
			Type	**Height**	**Pol.**	**QP**	**PK**	**AV**	**PK**
Preview	30 – 1000	0 – 359	Bilog	1 – 4 m	V and H	-	120	-	1000
Final						120	-	-	-
Preview	1000 – 40000	0 – 359	Horn	1 – 4 m		-	1000	-	3000
Final						-	1000	1000	-

Measurement distance [m]	Frequency [MHz]	Limits [dBµV/m]		
		QP	PK	AV
Limits, FCC, Class A				
☐ 3 / ☐ 10	30 – 88	49.6 / 39.1	-	-
	88 – 216	54.0 / 43.5	-	-
	216 – 960	56.9 / 46.4	-	-
	960 – 1000	60.0 / 49.5	-	-
☐ 3 / ☐ 10	Above 1000	-	80.0 / 69.5	60.0 / 49.5
Limits, FCC, Class B				
☒ 3 / ☐ 10	30 – 88	40.0 / 29.5	-	-
	88 – 216	43.5 / 33.1	-	-
	216 – 960	46.0 / 35.6	-	-
	960 – 1000	54.0 / 43.5	-	-
☒ 3 / ☐ 10	Above 1000	-	74.0 / 63.5	54.0 / 43.5
Limits, ICES-005 Class A				
☐ 3 / ☐ 10	30 – 88	49.5 / 39.1	-	-
	88 – 216	54.0 / 43.5		
	230 – 1000	56.9 / 46.4	-	-
Limits, ICES-005, Class B				
☒ 3 / ☐ 10	30 – 88	40.0 / 29.5	-	-
	88 – 216	43.5 / 33.1	-	-
	230 – 1000	46.0 / 35.6	-	-

6.1 Test results, 30 – 1000 MHz, FCC, Class B, Test Mode No. 1

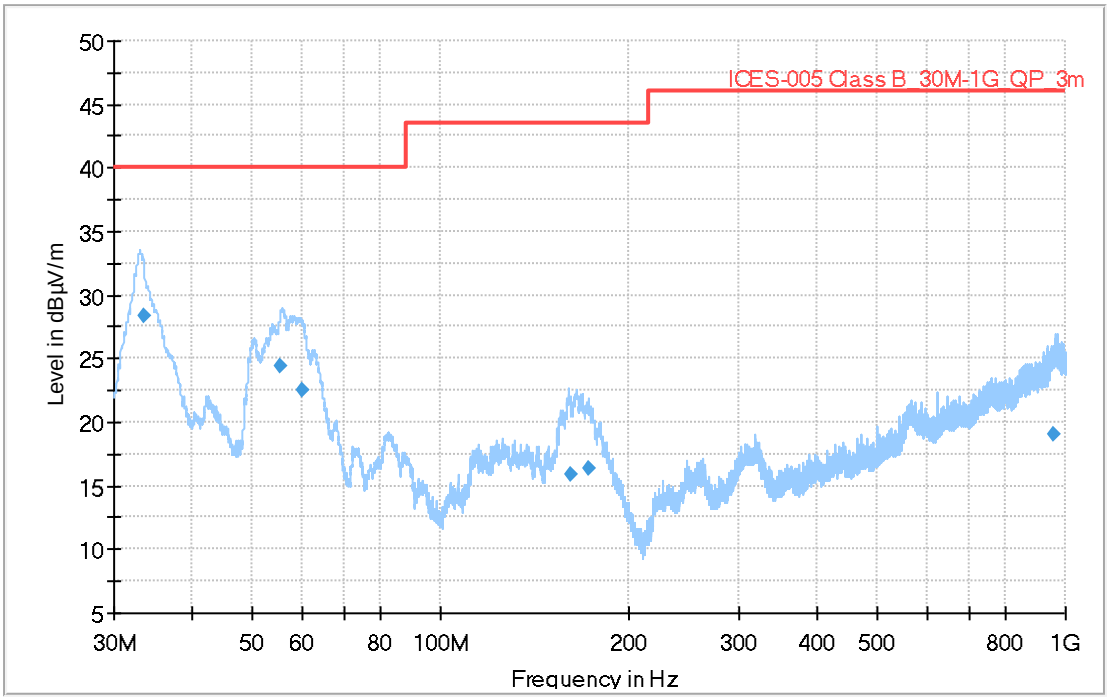


Diagram, Peak and Average overview sweep

Measurement results, Quasi-peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
33.390	28.29	40.00	11.71	1000.0	120.0	109.0	V	123.0
55.230	24.39	40.00	15.61	1000.0	120.0	100.0	V	95.0
59.970	22.50	40.00	17.50	1000.0	120.0	133.0	V	300.0
161.370	15.82	43.52	27.70	1000.0	120.0	141.0	H	11.0
172.980	16.39	43.52	27.13	1000.0	120.0	143.0	H	-3.0
959.910	19.12	46.02	26.90	1000.0	120.0	200.0	H	290.0

6.2 Test results, 30 – 1000 MHz, ICES-005, Class B, Test Mode No. 1

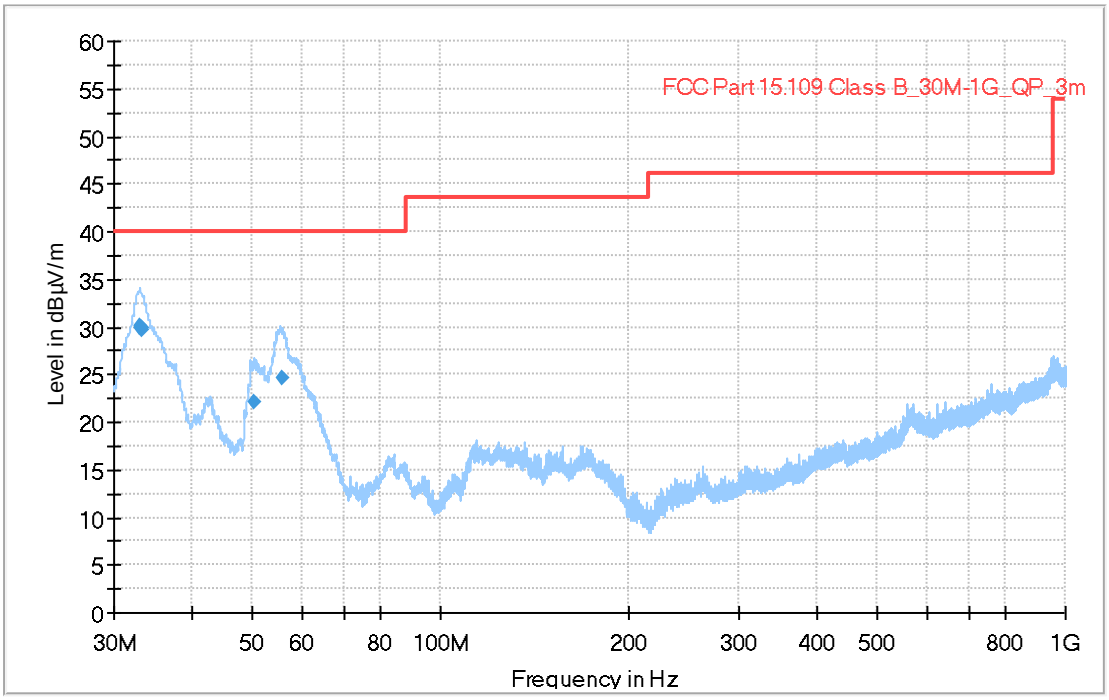


Diagram, Peak and Average overview sweep

Measurement results, Quasi-peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
33.390	28.29	40.00	11.71	1000.0	120.0	109.0	V	123.0
55.230	24.39	40.00	15.61	1000.0	120.0	100.0	V	95.0
59.970	22.50	40.00	17.50	1000.0	120.0	133.0	V	300.0
161.370	15.82	43.52	27.70	1000.0	120.0	141.0	H	11.0
172.980	16.39	43.52	27.13	1000.0	120.0	143.0	H	-3.0
959.910	19.12	46.02	26.90	1000.0	120.0	200.0	H	290.0

6.3 Test results, 30 – 1000 MHz, FCC, Class B, Test Mode No. 2

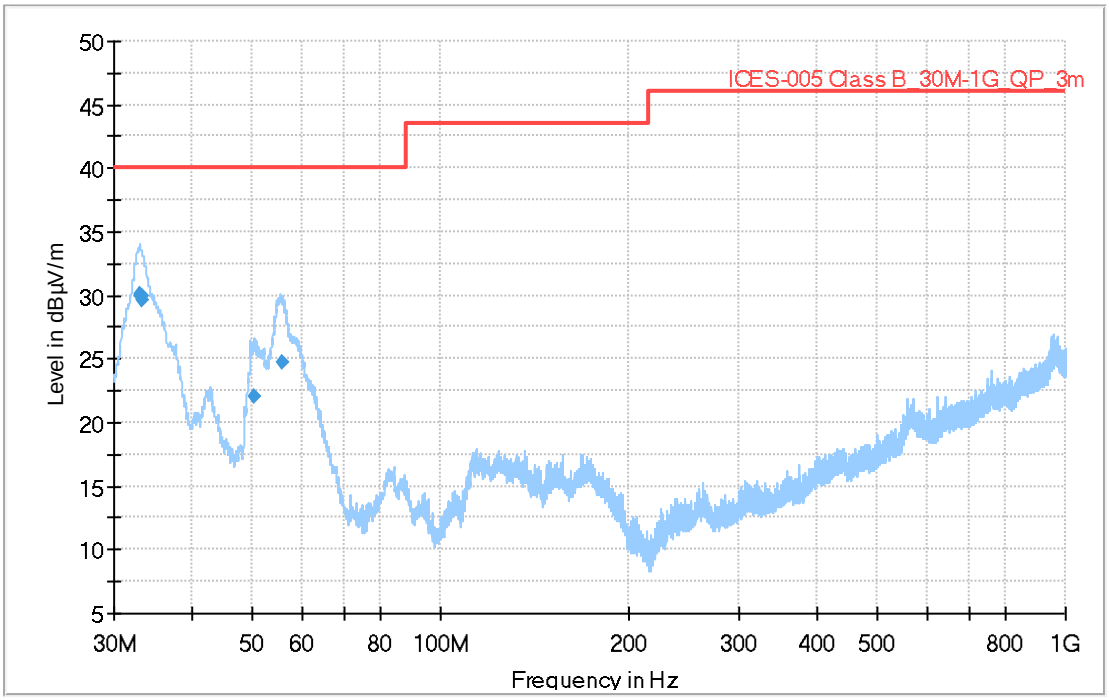


Diagram, Peak and Average overview sweep

Measurement results, Quasi-peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
32.970	30.08	40.00	9.92	1000.0	120.0	100.0	V	113.0
33.090	29.91	40.00	10.09	1000.0	120.0	104.0	V	124.0
33.150	29.96	40.00	10.04	1000.0	120.0	105.0	V	123.0
33.180	29.66	40.00	10.34	1000.0	120.0	105.0	V	112.0
50.220	22.09	40.00	17.91	1000.0	120.0	100.0	V	302.0
55.800	24.71	40.00	15.29	1000.0	120.0	109.0	V	319.0

6.4 Test results, 30 – 1000 MHz, ICES-005, Class B, Test Mode No. 2

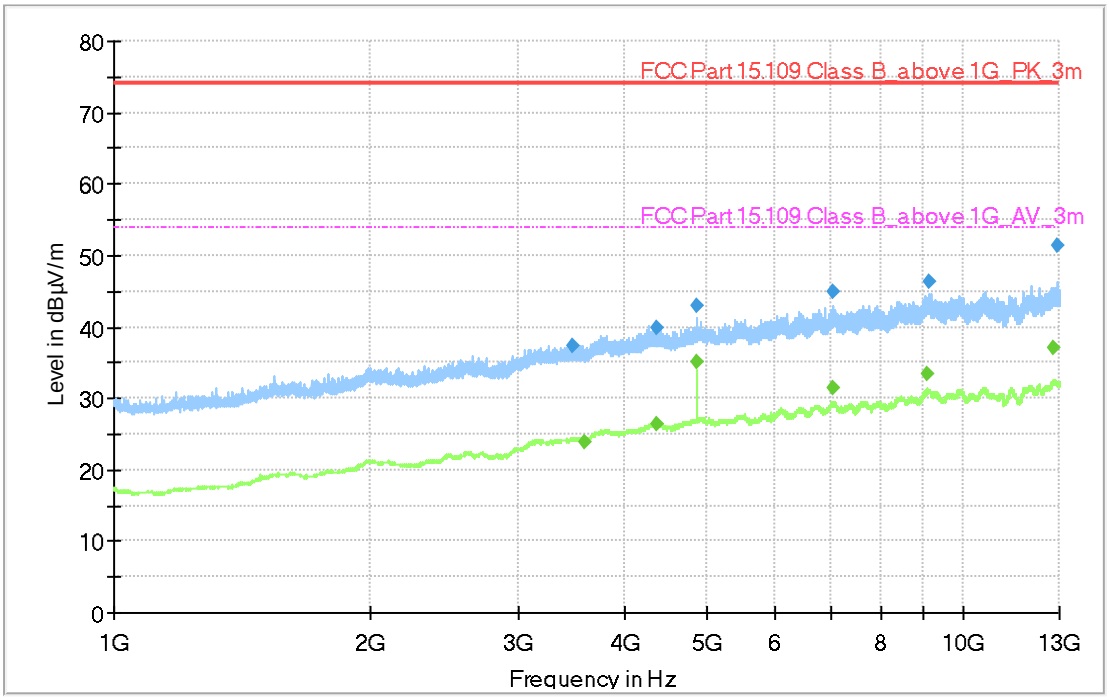


Diagram, Peak and Average overview sweep

Measurement results, Quasi-peak

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
32.970	30.08	40.00	9.92	1000.0	120.0	100.0	V	113.0
33.090	29.91	40.00	10.09	1000.0	120.0	104.0	V	124.0
33.150	29.96	40.00	10.04	1000.0	120.0	105.0	V	123.0
33.180	29.66	40.00	10.34	1000.0	120.0	105.0	V	112.0
50.220	22.09	40.00	17.91	1000.0	120.0	100.0	V	302.0
55.800	24.71	40.00	15.29	1000.0	120.0	109.0	V	319.0

6.5 Test results, 1 – 13 GHz, FCC, Class B, Test Mode No. 1



Diagram, Peak and Average overview sweep

Measurement results, Peak

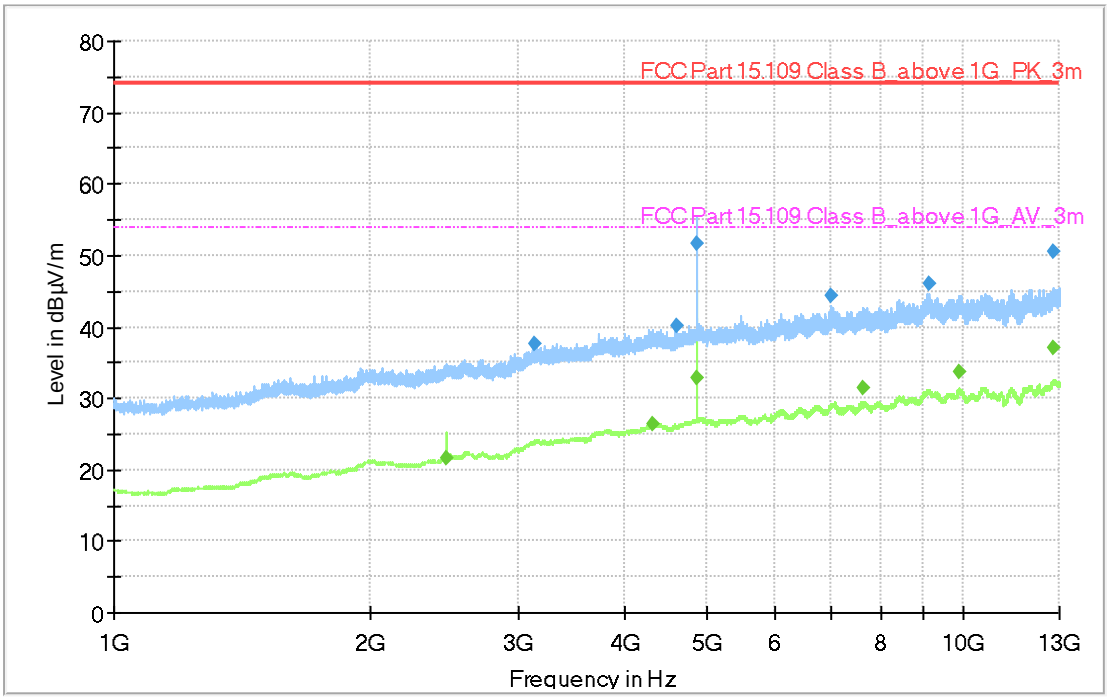
All measured disturbances have a margin of more than 20 dB to the limits.

Measurement results, Average

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
3584.750	---	23.99	54.00	30.01	1000.0	1000.0	325.0	H
4360.250	---	26.47	54.00	27.53	1000.0	1000.0	322.0	H
4852.750	---	35.01	54.00	18.99	1000.0	1000.0	286.0	H
7016.417	---	31.34	54.00	22.66	1000.0	1000.0	105.0	H
9089.375	---	33.38	54.00	20.62	1000.0	1000.0	301.0	V
12793.833	---	36.92	54.00	17.08	1000.0	1000.0	115.0	H

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

6.6 Test results, 1 – 13 GHz, FCC, Class B, Test Mode No. 2



Diagram, Peak and Average overview sweep

Measurement results, Peak

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

Measurement results, Average

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
2468.500	---	21.62	54.00	32.38	1000.0	1000.0	316.0	H
4314.750	---	26.51	54.00	27.49	1000.0	1000.0	227.0	V
4852.750	---	32.79	54.00	21.21	1000.0	1000.0	325.0	H
7632.542	---	31.39	54.00	22.61	1000.0	1000.0	105.0	H
9905.167	---	33.81	54.00	20.19	1000.0	1000.0	297.0	V
12792.375	---	36.96	54.00	17.04	1000.0	1000.0	104.0	H

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

6.7 Test equipment

Equipment type	Manufacturer	Model	Inv. No.	Last Cal. date	Cal. interval
Measurement software	Rohde & Schwarz	EMC32 - Version	--	--	--
Antenna	Teseq	CBL 6111D	34200	18-03-2020	31-03-2023
Preamplifier	Semko	AM1331	S7992	15-06-2020	30-06-2021
Multimeter	Fluke	287	31781	26-11-2020	30-11-2021
Termo/hygro	Vaisala	HMI41	31215	25-06-2020	30-06-2021
Measurement cable	Rosenberger	LA5-S003-8500	39148	06-05-2021	31-05-2022
Measurement cable	Rosenberger	LA5-S003-10000 (UFB293C)	39163	04-02-2021	28-02-2022
Measurement cable	Huber + Suhner	Sucoflex 106	39122	06-05-2021	31-05-2022
Measurement Receiver	Rohde & Schwarz	ESW 44	33890	08-07-2020	31-07-2021
Antenna	Rohde & Schwarz	HF907	31245	17-01-2020	31-01-2023
Preamplifier	Bonn	BLMA0118-M	31246	17-06-2020	30-06-2021