

FCC Test Report for 47 CFR Part 15 subpart 15 C, sections 15.225 and 15.207; subpart 15B section 15.109

Product name : AltaTrack equipment – Table Side Launch Base
Applicant : Philips Medical Systems Nederland B.V.
FCC ID : 2AQ4B-432207025350

Test report No. : 180501367 04 Ver 1.00

Laboratory information

Accreditation

Telefication complies with the accreditation criteria for test laboratories as laid down in ISO/IEC 17025:2005. The accreditation covers the quality system of the laboratory as well as the specific activities as described in the authorized annex bearing the accreditation number L021 and is granted on 30 November 1990 by the Dutch Council For Accreditation (RvA: Raad voor Accreditatie).

Telefication is designated by the FCC as an Accredited Test Firm for compliance testing of equipment subject to Certification under Parts 15 & 18. The Designation number is: NL0001.

The Industry Canada registration number for the 3 meter test chamber of Telefication is: 4173A-1.

Documentation

The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 10 years at Telefication Netherlands.

Testing Location

Test Site	Telefication BV
Test Site location	Edisonstraat 12a 6902 PK Zevenaar The Netherlands Tel. +31889983600 Fax. +31316583189
Test Site FCC	NL0001

Revision History

Version	Date	Remarks	By
v0.50	14-08-2018	First draft	PS
v1.00	24-08-2018	Initial release	PS

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Summary of Test results

FCC	Description	Paragraph	Verdict
15.225(a),(b),(c)	Field strength of emissions	3.1	Pass
15.225(d)	Field strength of unwanted emissions	3.2	Pass
15.225(e)	Frequency Tolerance	3.3	Pass
15.109	Radiated Spurious Emissions	3.4	Pass
15.207	Conducted emissions	3.5	Pass

1 General Description

1.1 Applicant

Client name: Philips Medical Systems Nederland B.V.
Address: Veenpluis 4-6
Zip code: 5684 PC Best , The Netherlands
Telephone: + 31 (0)6 182 06 281
E-mail: Gert.de.vries@philips.com
Contact name: Mr. Gert de Vries

1.2 Manufacturer

Manufacturer name: Philips Medical Systems Nederland B.V.
Address: Veenpluis 4-6
Zip code: 5684 PC Best , The Netherlands
Telephone: + 31 (0)6 182 06 281
E-mail: Gert.de.vries@philips.com
Contact name: Mr. Gert de Vries

1.3 Tested Equipment Under Test (EUT)

Product name: AltaTrack equipment – Table Side Launch Base
Brand name: AltaTrack equipment
FCC ID:
Product type: Medical equipment
Model(s): --
Batch and/or serial No. 4322 070 2023
Software version: 1.0
Hardware version: 1.0
Date of receipt: 05-07-2018
Tests started: 09-07-2018
Testing ended: 20-07-2018

1.4 Product specifications of Equipment under test

TX Frequency:	13.56 MHz
RX frequency:	13.56 MHz
Antenna type	PCB loop Antenna
Type of modulation:	ASK
Emission designator	14K0K1D

1.5 Environmental conditions

Test date	9-07-2018	20-07-2018
Ambient temperature	26.7 °C	28.2 °C
Humidity	44.3 % RH	32.7 % RH

1.6 Measurement standards

- ANSI C63.4:2014
- ANSI C63.10:2013

1.7 Applicable standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.225
- FCC Part 15 Subpart B §15.109
- FCC Part 15 Subpart C §15.207

1.8 Observation and remarks

None.

1.9 Conclusions

The sample of the product showed NO NON-COMPLIANCES to the specifications stated in paragraph 1.7 of this report.

The results of the test as stated in this report, are exclusively applicable to the product items as identified in this report. Telefication accepts no responsibility for any properties of product items in this test report, which are not supported by the tests as specified in paragraph 1.7 "*Applicable standards*".

All conducted tests are performed by:

Name : ing P.A. Suringa

Review of test methods and report by:

Name : P. van Wanrooij, BASc

The above conclusions have been verified by the following signatory:

Date : 11-09-2018

Name : ing K.A. Roes

Function : Coordinator Radio Laboratory

Signature :



2 Test configuration of the Equipment Under Test

2.1 Test mode

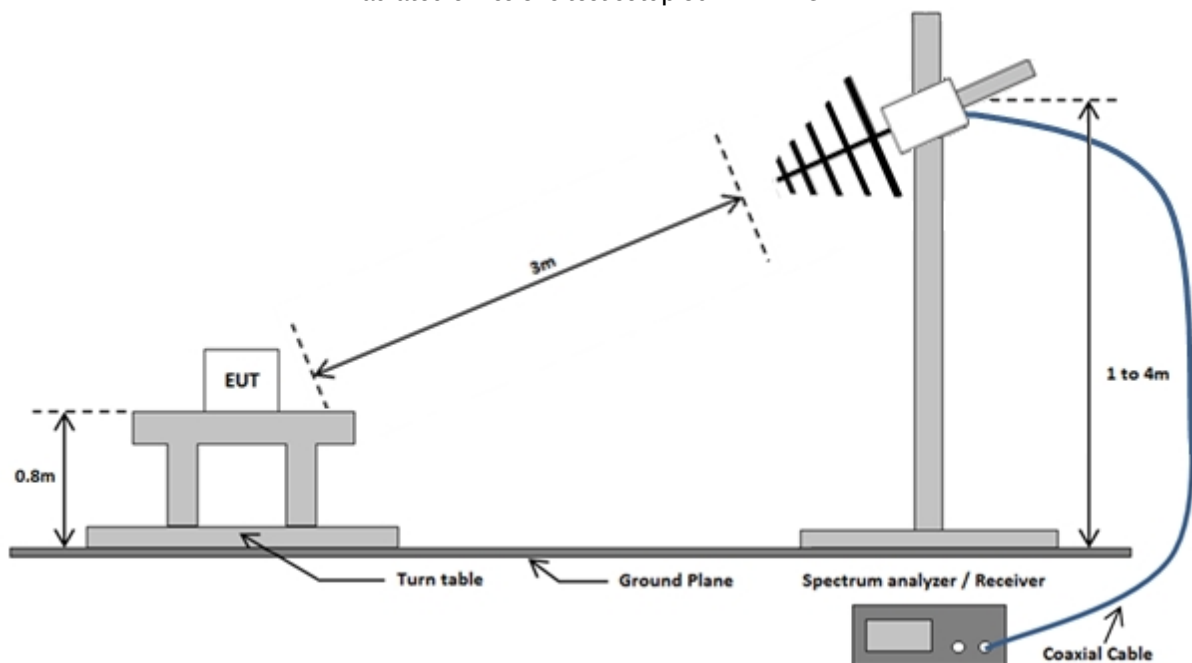
The applicant provided test mode firmware for the EUT, in which it was possible to configure the EUT to transmit continuously.

2.2 Test setups

Radiated emissions test setup below 30 MHz

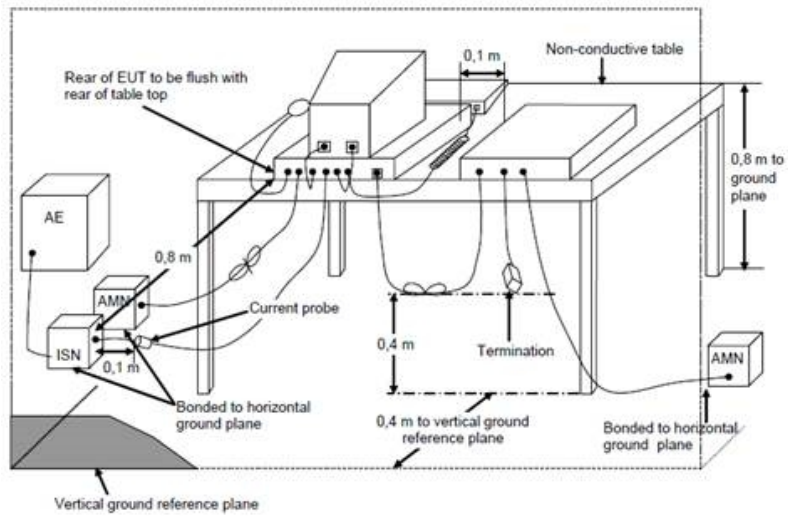


Radiated emissions test setup 30 MHz - 1 GHz



Conducted emissions test setup

Emissions test at AC mains



2.3 Equipment used in the test configuration

Description	Manufacturer	Model	ID	Used at Par.
Spectrum Analyzer	Rohde & Schwarz	ESR7	TE01220	3.1 to 3.5
Climate Chamber	TE 00741	CTS	-40/350	3.3
Biconilog Antenna	Chase	CBL6112a	TE00967	3.2, 3.4
SAC Chamber	Comtest Engineering BV	-	TE00861	3.2, 3.4
Active loop antenna	Rohde & Schwarz	HFH2-Z2	TE00746	3.1
Artificial Mains network (AMN)	Rohde & Schwarz	ESH3-Z5	TE00208	3.5
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	TE00756	3.5
Measurement software	Dare	Radimation	Version 2016.2.8	3.2, 3.4
Measurement software	Dare	Radimation	Version 2018.1.3	3.5
AC power supply	Chroma	61601	TE 02001	3.5

2.4 Sample calculations

Field Strength Measurement example(see chapter 3.3):

Frequency (MHz)	Polarization	Height(m)	Quasi-Peak (dBμV/m)
135,6	Horizontal	1	40,4

The following relation applies:

$$E \text{ (dB}\mu\text{V/m)} = U \text{ (dB}\mu\text{V)} + AF \text{ (dB/m)} + CL \text{ (dB)}$$

Where:

E = Electric field strength

U = Measuring receiver voltage

AF = Antenna factor

CL = Cable loss

$$(40.4 = 27.23 + 11.8 + 1.37)$$

3 Test results

3.1 Field strength of emissions

3.1.1 Limit

15.225 (a) (b) (c)

Frequency (MHz)	$\mu\text{V/m}$ at 30 meter	$\text{dB}\mu\text{V/m}$ at 30 meter
13.553 – 13.567	15848	84
13.410 – 13.553 and 13.567 – 13.710	334	50.5
13.110 – 13.410 and 13.710 - 14.010	106	40.5

15.225(d)

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Field strength ($\text{dB}\mu\text{V/m}$)	Measurement distance(m)
0.009 - 0.490	$2400/F(\text{kHz})$	$67.6-20 \log(F(\text{kHz}))$	300
0.490 – 1.705	$24000/F(\text{kHz})$	$87.6-20 \log(F(\text{kHz}))$	30
14.010 - 30	30	29.5	30

3.1.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.1.3 Test setup

The test setup is as shown in chapter 2.2 of this report.

3.1.4 Test procedure

According to ANSI C63.10-2013, section 6.4.4.2.

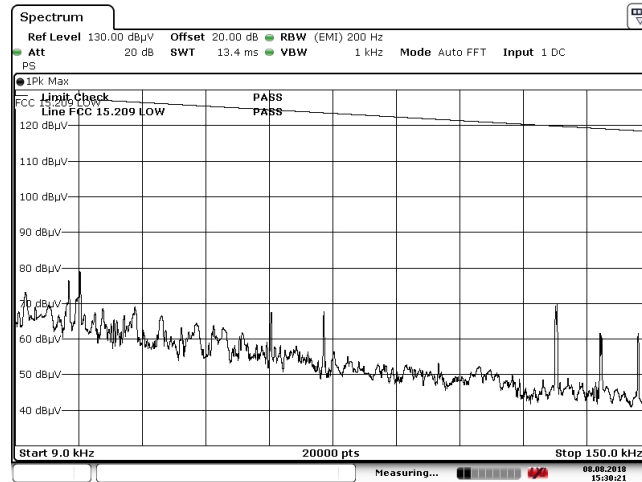
3.1.5 Test results of Field strength of emissions

Frequency (MHz)	Max Field strength at 3m ($\text{dB}\mu\text{V/m}$) (Perpendicular to site axis)	Max Field strength at 3m ($\text{dB}\mu\text{V/m}$) (Parallel to site axis)
13.56	39.44	49.53
Uncertainty	+3.0 / -2.5 dB	

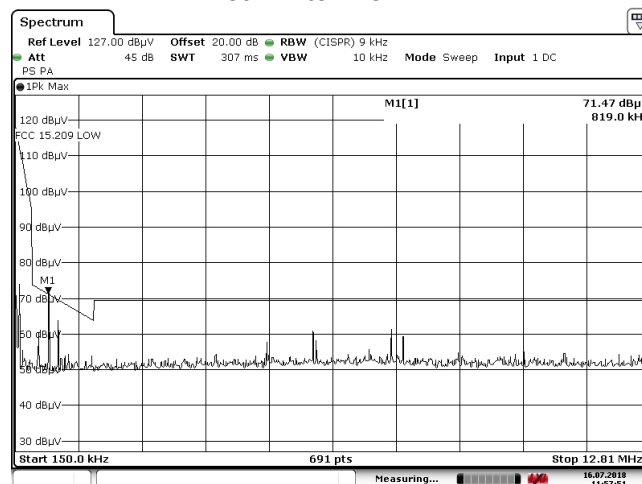
3.1.6 Plots of Field strength of emissions Measurement

Loop antenna perpendicular to site axis

9 kHz – 150 kHz

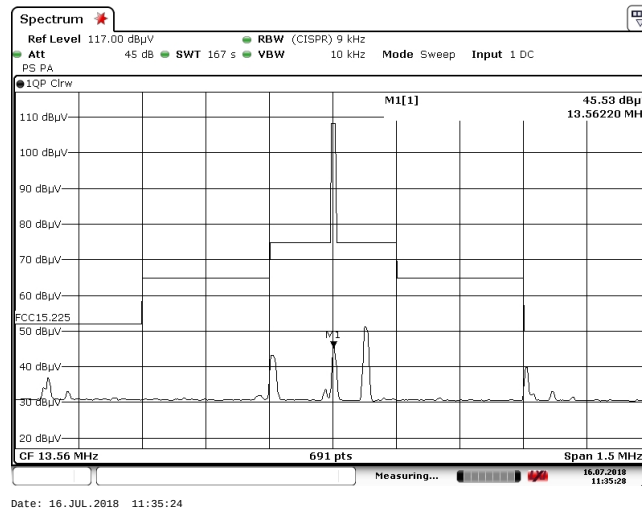


150 kHz to 12.81 MHz



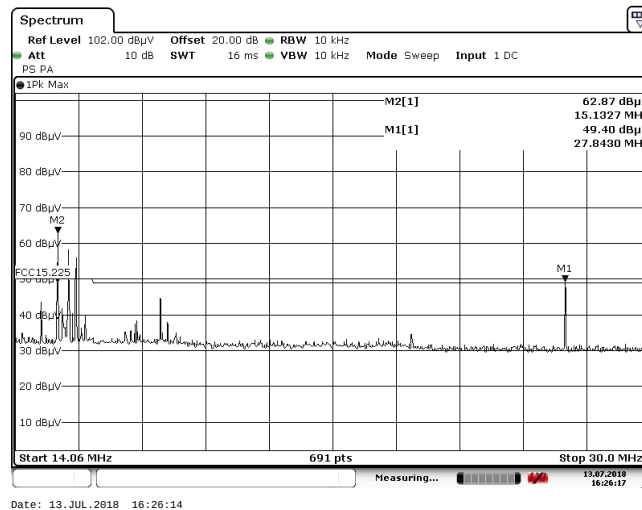
Note: in the plots above a distance factor of - 40 dB/decade to convert to 3 m distance has been used (ref. 47 CFR part 15B, §15.31 f (2)).

12.81 MHz to 14.31 MHz



Note: the limit has been converted to 3 m distance according to the procedure as given in ANSI C63.10; 2013, §6.4.4.2.

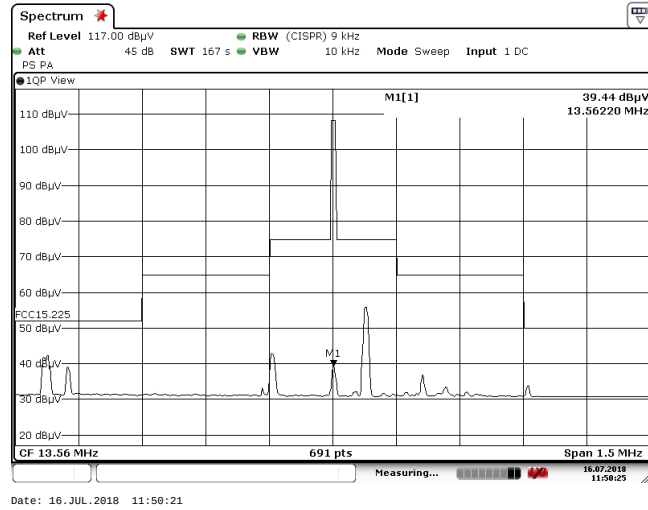
14.06 MHz to 30 MHz



Note: the limit has been converted to 3 m distance according to the procedure as given in ANSI C63.10; 2013, §6.4.4.2.

Loop antenna parallel to site axis

Field strength of emission (12.81 MHz to 14.31 MHz)



3.2 Field Strength of Unwanted Emissions

3.2.1 Limit

15.225(d)

The field strength of any emissions appearing outside of the 13.110 -14.010 MHz band shall not exceed the general radiated emission limits in part 15.209.

Frequency (MHz)	Field strength ($\mu\text{V}/\text{m}$)	Field strength ($\text{dB}\mu\text{V}/\text{m}$)	Measurement distance(m)
1.705 - 30	30	69.5	3
30 -88	100	40	3
88 - 216	150	43,5	3
216-960	200	46	3
Above 960	500	54	3

3.2.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.2.3 Test setup

The test setup is as shown in chapter 2.2 of this report.

3.2.4 Test procedure

According to ANSI C63.4-2014, section 5.4.2 and 8.2.3.

3.2.5 Measurement Uncertainty

Horizontal polarization	
30 – 200 MHz	4.5 dB
Vertical polarization	
30 – 200 MHz	5.4 dB

3.2.6 Results of the Field strength of unwanted emissions measurement

Frequency (MHz)	Level ($\text{dB}\mu\text{V}/\text{m}$)	Polarization	Limit ($\text{dB}\mu\text{V}/\text{m}$)
40.68	--	--	--
54.24	30	Vertical	40
67.8	22.8	Vertical	40
72	39.1	Horizontal	40
81.36	--	--	--

3.3 Frequency Tolerance

3.3.1 Limit

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

3.3.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.3.3 Test setup

The test has been performed in a climatic chamber using a test fixture.

3.3.4 Test procedure

According to ANSI C63.10-2013, section 6.8.

3.3.5 Test results of Frequency Tolerance Measurements

Temperature variation:

Temp. (°C)	-20	-10	0	10	20	30	40	50
Frequency (MHz) At start-up	13.56008	13.56008	13.56008	13.56006	13.56003	13.55997	13.55996	13.55993
After 2 min	13.56008	13.56008	13.56008	13.56006	13.56003	13.55997	13.55995	13.55993
After 5 min	13.56008	13.56008	13.56008	13.56006	13.56003	13.55997	13.55995	13.55993
After 10 min	13.56008	13.56008	13.56008	13.56005	13.56002	13.55997	13.55995	13.55993
Deviation (%)*)	+ 0.0006	+ 0.0006	+ 0.0006	+ 0.0004	+ 0.0002	- 0.0002	- 0.0004	- 0.0005
Limit (%)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

*) w.r.t. nominal frequency of 13.56 MHz

Voltage variation:

Voltage	Frequency (MHz)	Deviation (%)*)	Limit (%)
4.25 V	13.55999	- 0.00007	0.01
5 V	13.56000	0	0.01
5.75 V	13.55999	- 0.00007	0.01

*) w.r.t. nominal frequency of 13.56 MHz

3.3.6 Measurement Uncertainty

Measurement uncertainty = ± 10 Hz.

3.4 Radiated Spurious Emissions

3.4.1 Limit

15.109(b)

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Field strength ($\text{dB}\mu\text{V/m}$)	Measurement distance(m)
30 -88	90	39	10
88 - 216	150	43.5	10
216-960	210	46	10
Above 960	300	49.5	10

3.4.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.4.3 Test setup

The test setup is as shown in chapter 2.2 of this report.

3.4.4 Test procedure

According to ANSI C63.4-2014, section 8.3.

3.4.5 Measurement Uncertainty

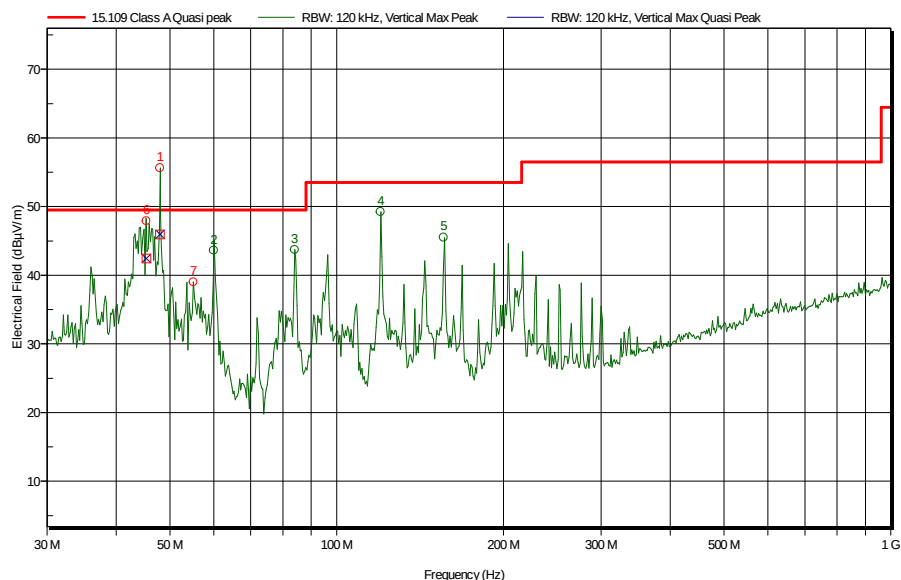
Measurement uncertainty Radiated emissions below 1 GHz

Horizontal polarization	
30 – 200 MHz	4.5 dB
200 – 1000 MHz	3.6 dB
Vertical polarization	
30 – 200 MHz	5.4 dB
200 – 1000 MHz	4.6 dB

3.4.6 Plots of the Radiated Spurious Emissions Measurement

30 - 1000 MHz

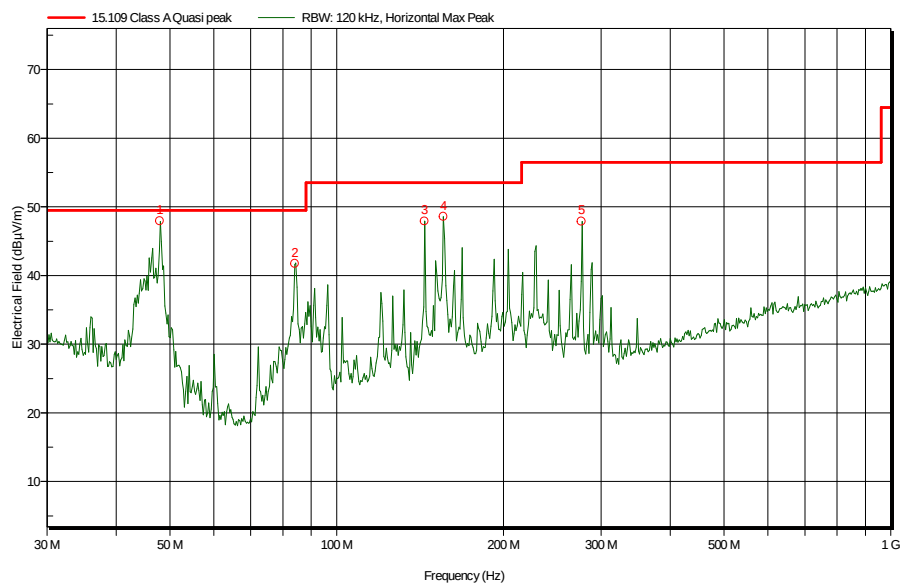
Vertical polarization



Measured peaks Vertical 30 – 1000 MHz

No.	Frequency	Polarization	Height	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference
1	47,988 MHz	Vertical	1 m	46 dBμV/m	49,5 dBμV/m	-3,5 dB
2	60 MHz	Vertical	1 m	--	--	--
3	84 MHz	Vertical	2 m	--	--	--
4	120 MHz	Vertical	2,5 m	--	--	--
5	156 MHz	Vertical	2 m	--	--	--
6	45,342 MHz	Vertical	1 m	42,4 dBμV/m	49,5 dBμV/m	-7,1 dB
7	55,14 MHz	Vertical	1,5 m	--	--	--

Horizontal polarization



Measured peaks Horizontal 30 – 1000 MHz

No.	Frequency	Polarization	Height
1	47,94 MHz	Horizontal	2,5 m
2	84,06 MHz	Horizontal	2 m
3	144 MHz	Horizontal	3,5 m
4	155,88 MHz	Horizontal	2,5 m
5	276,48 MHz	Horizontal	1,5 m

Note: in the plots above a factor of -20 dB/decade has been used to convert the limit to 3 m distance.

3.5 Conducted emissions

3.5.1 Limit

According to 15.207 (c).

Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.

3.5.2 Measurement instruments

The measurement instruments are listed in chapter 2.3 of this report.

3.5.3 Test setup

The test setup is as shown in chapter 2.2 of this report.

3.5.4 Test procedure

According to ANSI C63.4: 2014, section 13.3.

3.5.5 Test results and plots of the AC mains conducted measurement

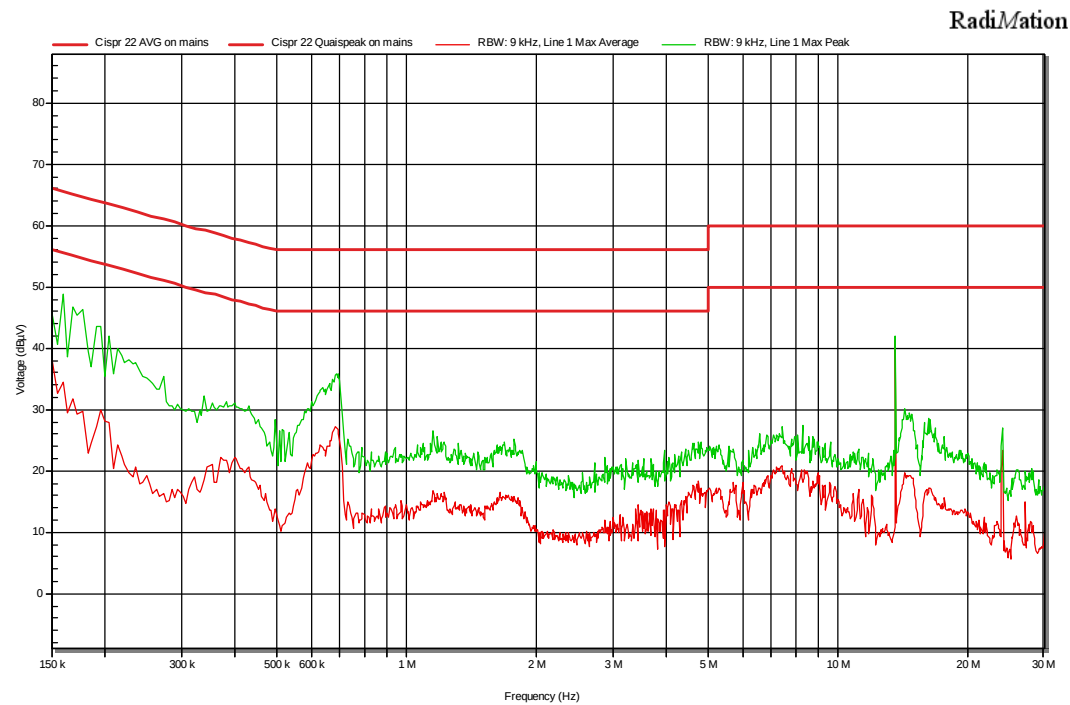
See next page.

3.5.6 Measurement uncertainty

+/- 3.6 dB.

3.5.7 Plots of the AC mains conducted spurious measurement

Phase



Neutral

