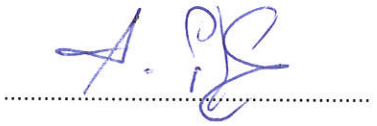
EMC TEST REPORT

FCC 47 CFR Part 15B, ISED ICES-003 Issue 6

Report Reference No	G0M-1906-8288-EF0115B-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	DAkkS - Registration number : D-PL-12092-01-03 (ISED) ISED Testing Laboratory site: 3470A-2 DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	Leica Microsystems (Schweiz) AG
Address	Max Schmidheiny-Strasse 201 9435 Heerbrugg SWITZERLAND
Test Specification	
Standard	47 CFR Part 15 Subpart B ISED ICES-003 Issue 6 ANSI C63.4:2014 ANSI C63.4a-2017
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Stereo Microscope with integrated camera
Model(s)	EZ4 W
Additional Model(s)	None
Brand Name(s)	Leica
Hardware Version(s)	20190411
Software Version(s)	20190411
FCC-ID	2AEJM-EZ4W
IC	20232-EZ4W
Test Result	**PASSED**

Possible test case verdicts:		
required by standard but not tested	N/T	
not required by standard	N/R	
required by standard but not appl. to test object	N/A	
test object does meet the requirement	P(PASS)	
test object does not meet the requirement	F(FAIL)	
Testing:		
Date of receipt of test item	2019-09-30	
Report:		
Compiled by	Matthias Handrik	
Tested by (+ signature) (Responsible for Test)	Matthias Handrik	
Approved by (+ signature) (Test Lab Engineer)	Andreas Pflug	
Date of Issue	2020-02-26	
Total number of pages	49	
General Remarks:		
The test results presented in this report relate only to the object tested. **The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.** This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		
Additional Comments:		

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
T_{NOM}	Nominal operating temperature
V_{NOM}	Nominal supply voltage

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2020-02-26	Initial Release	

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1 Equipment (Test Item) Under Test

Description	Stereo Microscope with integrated camera	
Model	EZ4 W	
Additional Model(s)	None	
Brand Name(s)	Leica	
Serial Number(s)	1619093579	
Hardware Version(s)	20190411	
Software Version(s)	20190411	
Dimension	37.2cm x 25.5cm x 18.1cm	
FCC-ID	2AEJM-EZ4W	
IC	20232-EZ4W	
Class	Class A	
Equipment type	Table top	
Highest internal frequency [MHz]	339 / 2480 WLAN	
Radio Module	Type	WLAN module
	Model	HF-A11-1
	Manufacturer	High Flying Electronics
	FCC-ID	AZYHF-A11XX
	IC	12243A-HFA11
Supply Voltage	V_{NOM}	120V AC / 60Hz
AC/DC-Adaptor	None	
Manufacturer	Leica Microsystems (Schweiz) AG Max Schmidheiny-Strasse 201 9435 Heerbrugg SWITZERLAND	

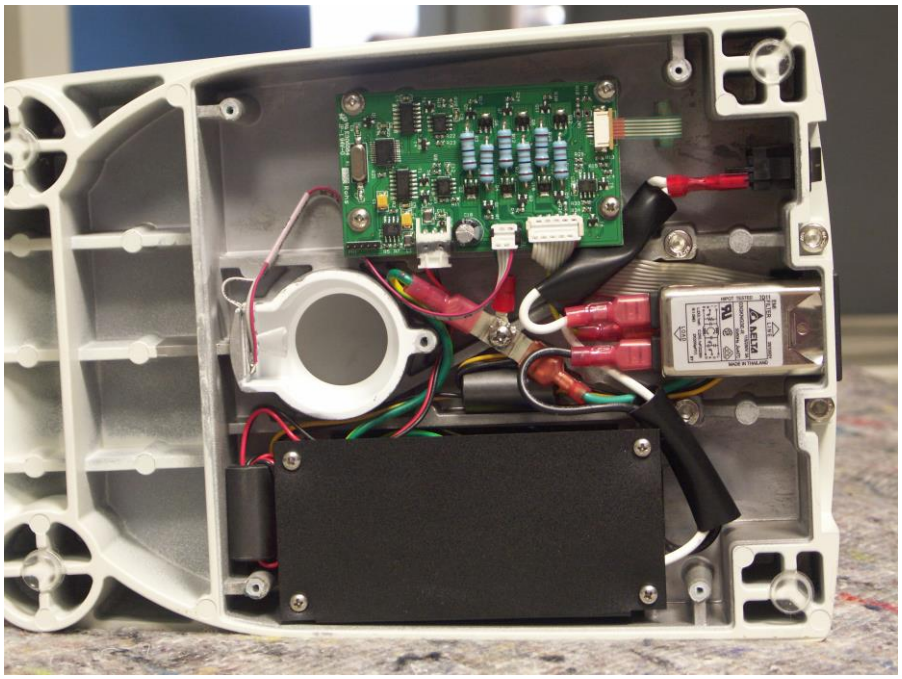
1.1 Equipment Ports

Name	Type	Attributes		Comment
Power	AC	Count: Direction: Max. cable length [m]: Shielded: Service only:	1 In 1.90 No No	N; L1; PE
USB Typ B	IO	Count: Direction: Max. cable length [m]: Shielded: Service only:	1 IO 2 Yes No	Shield connected during test on both sides. (AZCBL-USB-14011)
HDMI A	IO	Count: Direction: Max. cable length [m]: Shielded: Service only:	1 IO 2 Yes No	Shield connected during test on both sides. (AZCBL-HDMI-13003)
Ethernet	IO	Count: Direction: Max. cable length [m]: Shielded: Service only:	1 IO 2 Yes No	Shield connected during test on both sides. CAT 6 S/FTP 4x2xAWG 27/7

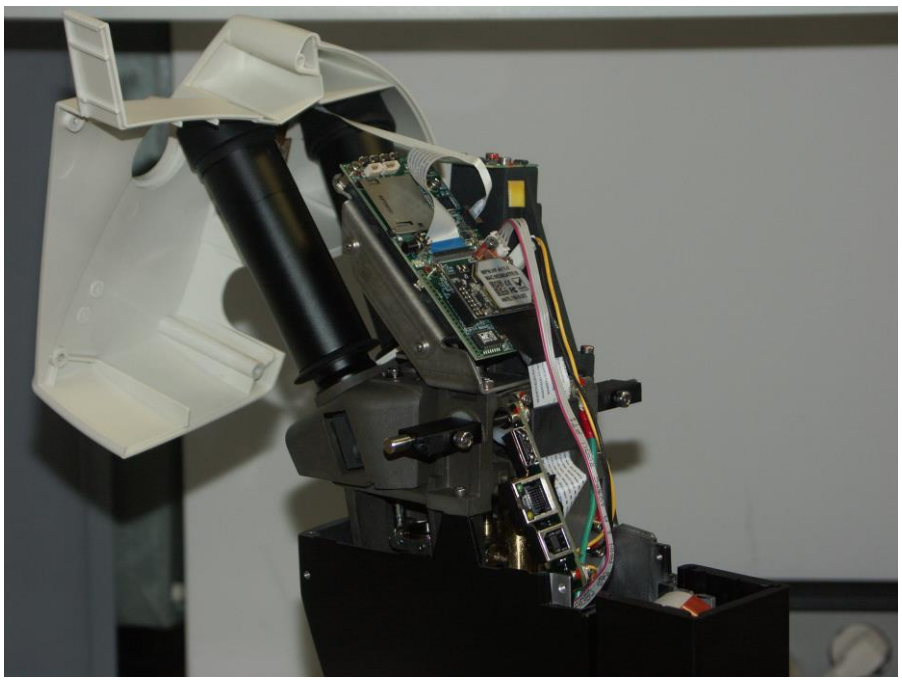
Description:	
AC	AC mains power input/output port
DC	DC power input/output port
BAT	DC power input port connected to external battery
IO	Input/Output port
TP	Telecommunication port
NE	Non-electrical port

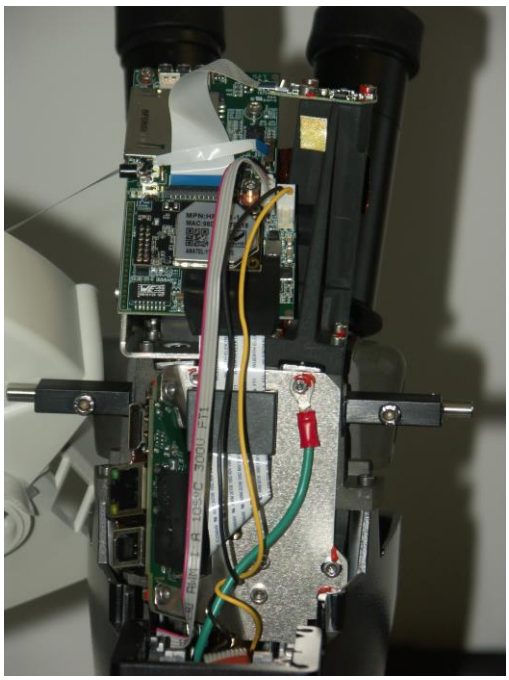
1.2 Equipment Photos – Internal

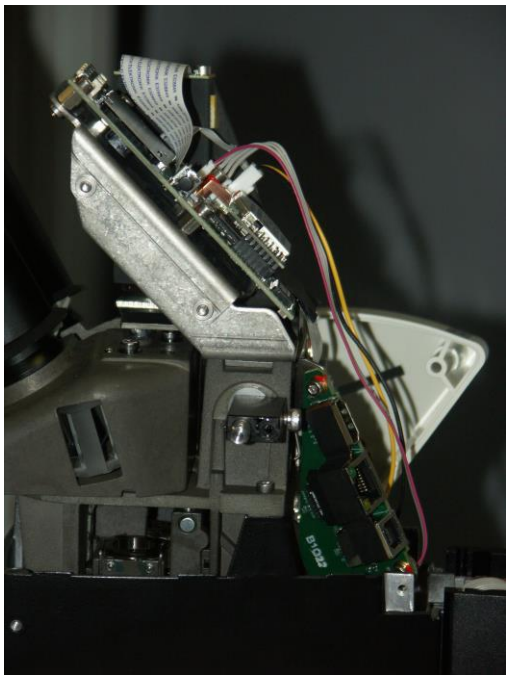
EUT Bottom PCB I



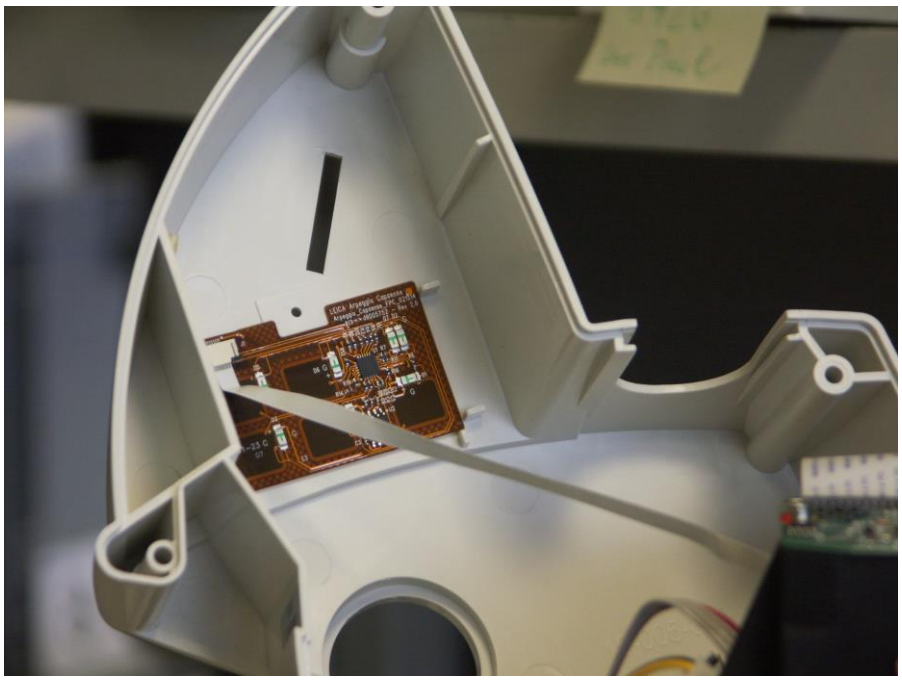
EUT inside PCB II/I



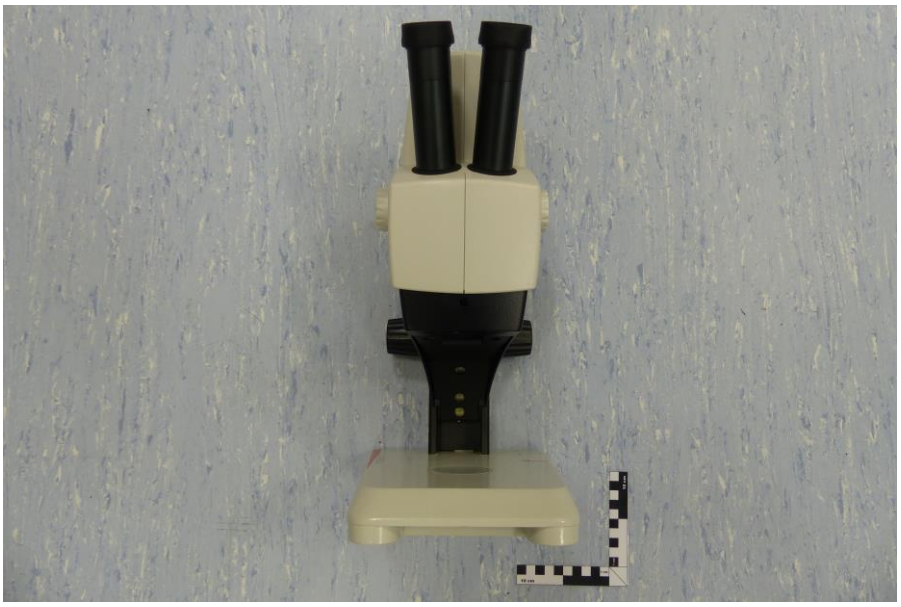
EUT inside PCB II/II


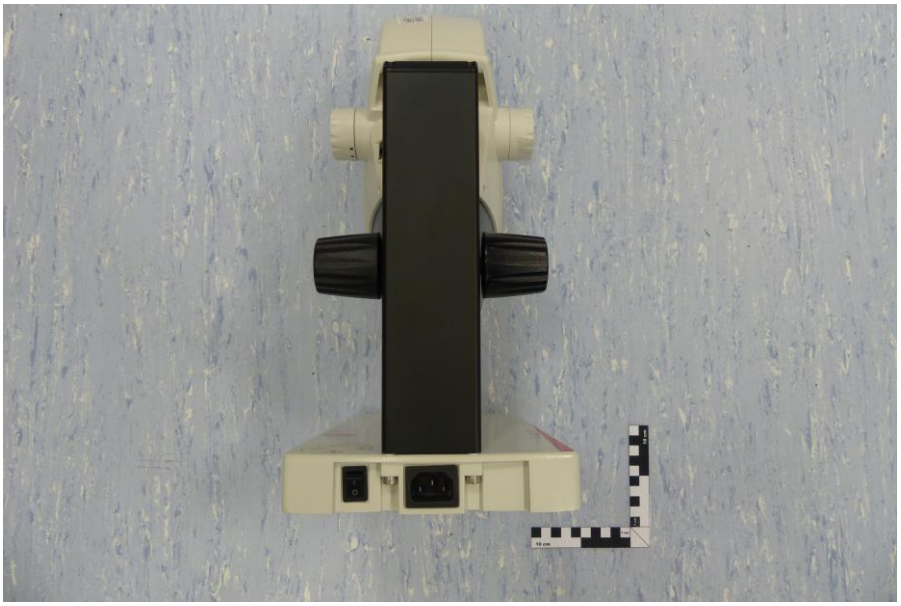
EUT inside PCB II/III


EUT PCB III



1.3 Equipment Photos - External

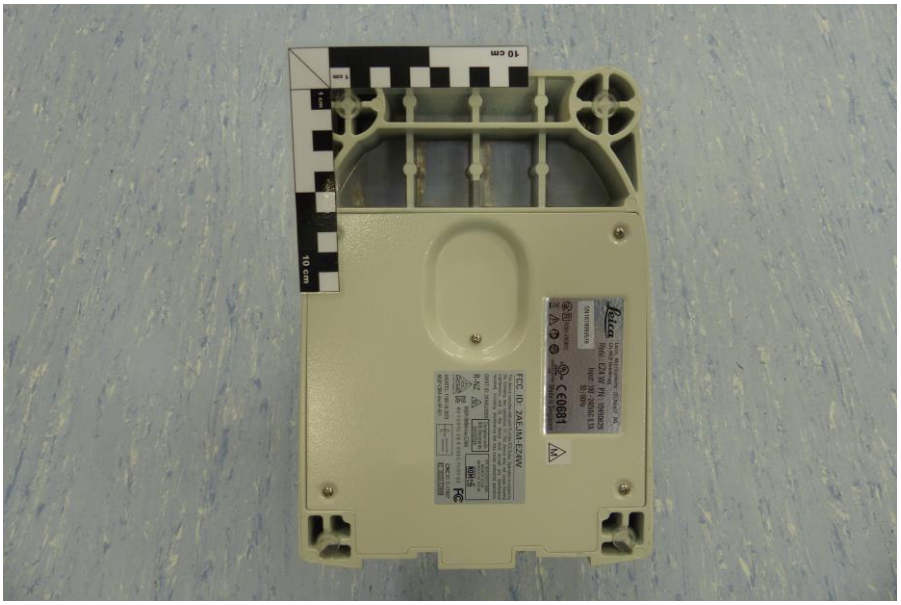
EUT FRONT


EUT BACK


EUT TOP

EUT RIGHT

EUT LEFT


EUT BOTTOM


EUT label


Leica Microsystems (Schweiz) AG
CH-9435 Heerbrugg
Model : EZ4 W PN : 10450629
SN1619093579
Input : 100 - 240VAC 0.7A
50 / 60Hz
R203-JN3031
CE0681
Made in Singapore
FCC ID: 2AEJM-EZ4W
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.
CMIIT ID: 2016DJ0269
Complies with IDA Standards DA107224
IFT: RCPLEEZ17-0585
MARCA: LEICA
MODELO (S): EZ4 W
R-NZ
MSIP-RMM-lms-EZ4W
ANATEL: 1160-16-2673
MSIP-CRM-lms-HF-A11
CNC ID: C-17607
IC: 20232-EZ4W

1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Laptop	Lenovo	X250	
AE	Monitor	Lenovo	A16240WT0	1920x1080; 28.1KHz/50.0Hz
AE	Wireless router	ZyXEL	NBG6503	
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
MON	Monitoring Equipment			
CBL	Connecting Cable			
Comment:				

1.5 Operational Modes

Mode #	Description
1	Video stream via WLAN mode / HDMI data connection to external monitor
2	Video stream via USB mode / HDMI data connection to external monitor
3	Video stream via Ethernet mode / HDMI data connection to external monitor
Comment:	

1.6 EUT Configuration

Configuration #	Description
1	EUT powered via laboratory power supply. EUT fully cable assembled. Each operating mode is choosing by pressing button on EUT.
Comment:	

1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyser in dBµV. Any external preamplifiers used are taken into account through internal analyser settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyser. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

Reading on Analyser (dBµV) + A.F. (dB/m) = Net field strength (dBµV/m)

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dBµV/m). The FCC limits are given in units of µV/m. The following formula is used to convert the units of µV/m to dBµV/m:

Limit (dBµV/m) = 20*log (µV/m)

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

Reading + AF	= Net Reading	:	Net reading - FCC limit	= Margin
+21.5 dBµV + 26 dB/m	= 47.5 dBµV/m	:	47.5 dBµV/m - 57.0 dBµV/m	= -9.5 dB

2 Result Summary

FCC 47 CFR Part 15B, ISED ICES-003 Issue 6				
Reference	**Requirement**	**Reference Method**	**Result**	**Remarks**
Emission				
FCC 15.109 ICES-003, 8, 6.1	Radiated emissions	ANSI C63.4	PASS	
FCC 15.107 ICES-003, 8, 6.2	AC power line conducted emissions	ANSI C63.4	PASS	
Comment:				

Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

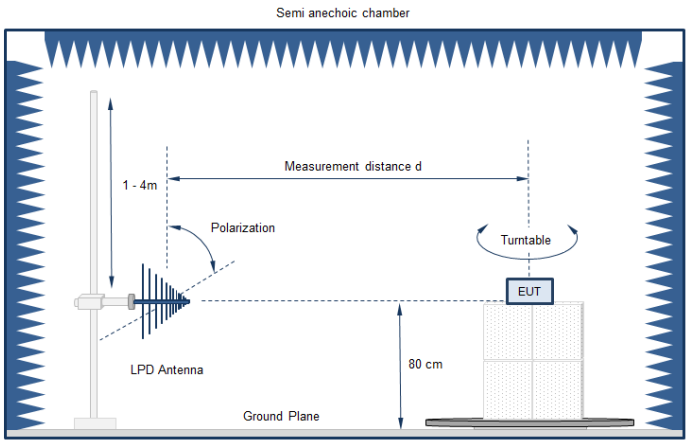
2.1 Test Conditions and Results - Radiated emissions acc. to ANSI C63.4

2.1.1 Information

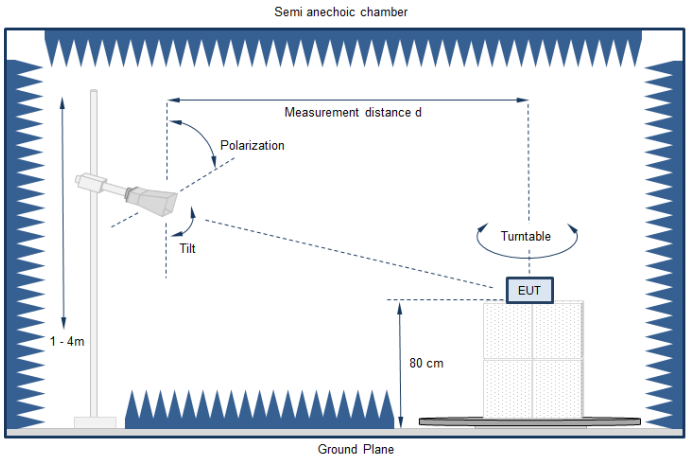
Test Information	
Reference	FCC 15.109, ICES-003, 8, 6.1
Reference method	ANSI C63.4
Equipment class	Class A
Equipment type	Table top
Highest internal frequency [MHz]	2480
Measurement range	30 MHz to 13 GHz
Temperature [°C]	20
Humidity [%]	31
Operator	Matthias Handrik
Date	2019-10-30

2.1.2 Setup

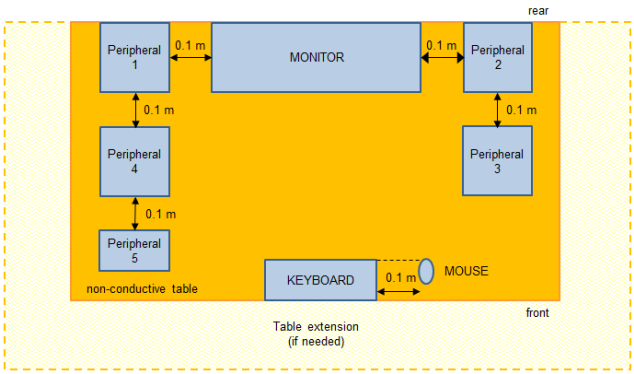
Measurement up to 1 GHz



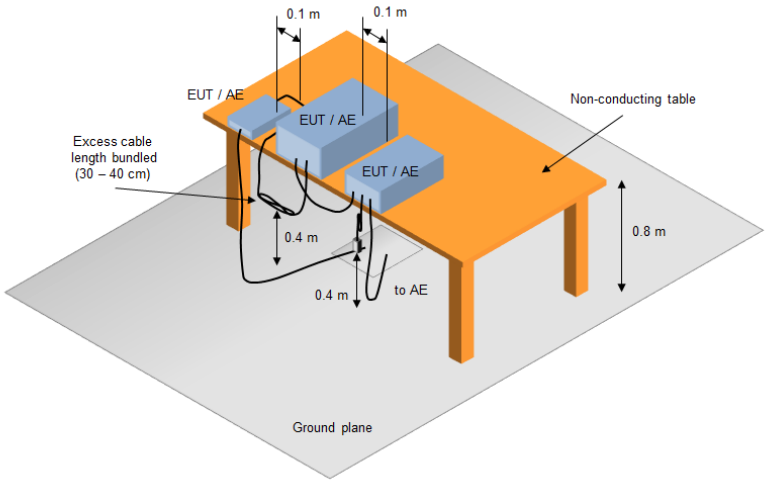
Measurement above 1 GHz



Equipment placement - Table top



Test Setup



2.1.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	Radimation	2016.1.10

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic chamber	Frankonia	AC1	EF00062	2018-07	2021-07
EMI Test Receiver	Keysight	N9038A-526/WXP	EF01070	2019-09	2020-09
Biconical Antenna	R&S	HK 116	EF00030	2019-04	2022-04
LPD Antenna	R&S	HL 223	EF00187	2019-05	2022-05
Horn antenna	Schwarzbeck	BBHA 9120D (1-18GHz)	EF00018	2019-10	2022-10
Climatic Sensor	Embedded Data Systems, LLC.	2800100000254 17E	EF01054	2019-05	2020-05

2.1.4 Procedure

Exploratory measurement
1. The EUT was placed on a non-conductive table at a height of 0.8m. 2. The EUT and support equipment, if needed, were set up to simulate typical usage. 3. Cables, of type and length specified by the manufacturer, were connected to at least one port of each type and were terminated by a device or simulating load of actual usage. 4. The antenna was placed at a distance of 3 or 10 m. 5. The received signal was monitored at the measurement receiver. 6. This procedure has to be performed in both antenna polarizations, horizontal and vertical. 7. The arrangement of the equipment with the maximum emission level is shown on the setup picture at item 1.3

Final measurement
1. The EUT was placed on a 0.8 m non-conductive table at a 3 m distance from the receive antenna. The antenna output was connected to the measurement receiver. 2. A biconical antenna was used for the frequency range 30 – 200 MHz, a logarithmic periodical antenna was used for the frequency range from 200 – 1000 MHz. Above one 1 GHz a Double Ridged Broadband Horn antenna was used. The antenna was placed on an adjustable height antenna mast. 3. The EUT and cable arrangement were based on the exploratory measurement results. 4. Emissions were maximized at each frequency by rotating the EUT and adjusting the receive antenna height and polarization. The maximum values were recorded. 5. The test data of the worst-case conditions were recorded and shown on the next pages.

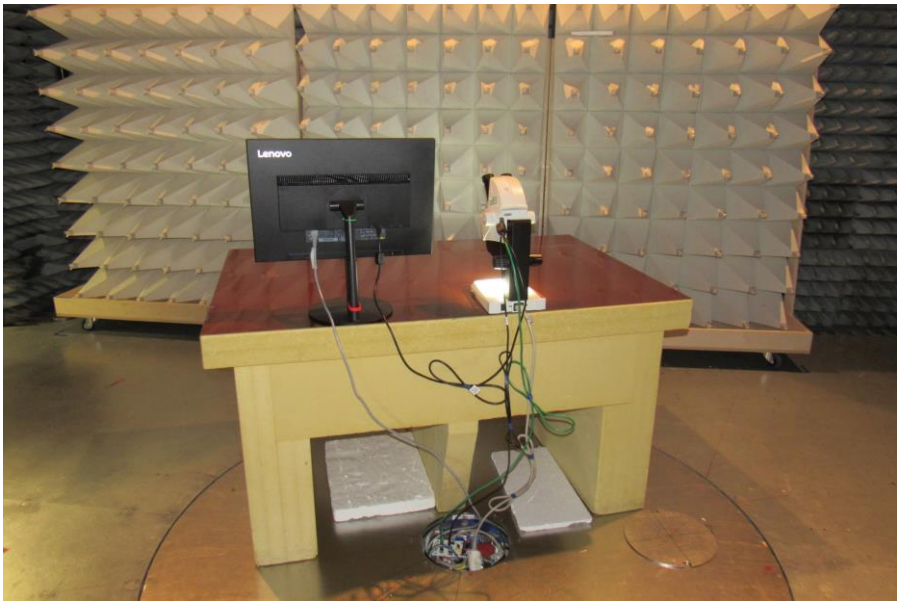
2.1.5 Limits

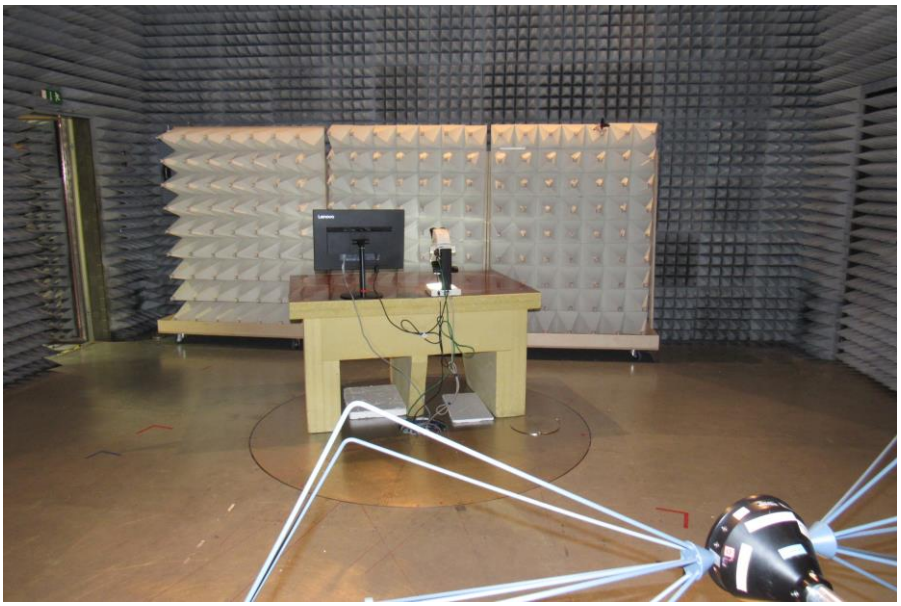
Class A @ 10 m		
Frequency [MHz]	Detector	Limit [dBµV/m]
30 - 88	Quasi-peak	39
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46.5
960 - 1000	Quasi-peak	49.5
> 1000	Peak Average	69.5 49.5

2.1.6 Results

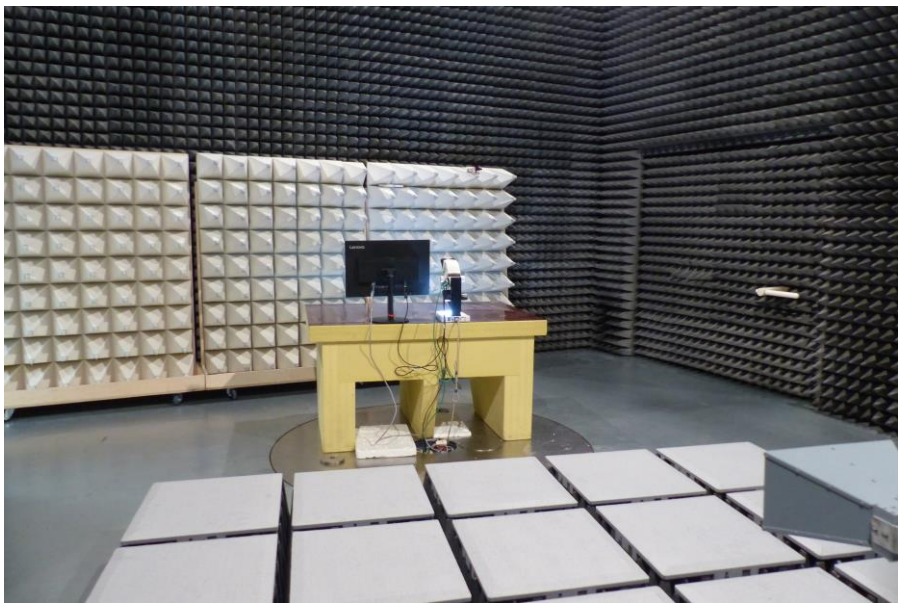
Test Results			
Operational mode	EUT Configuration	Verdict	Remark
1/2/3	1	PASS	

2.1.7 Setup Photos

Test setup


Test setup 30-200MHz


Test setup 200-1000MHz


Test setup 1-13GHz


2.1.8 Records

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 20°C, Unom: 120V AC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3m, converted to 10m
Mode:	mode# 2
Test Date:	2019-10-30
Note:	

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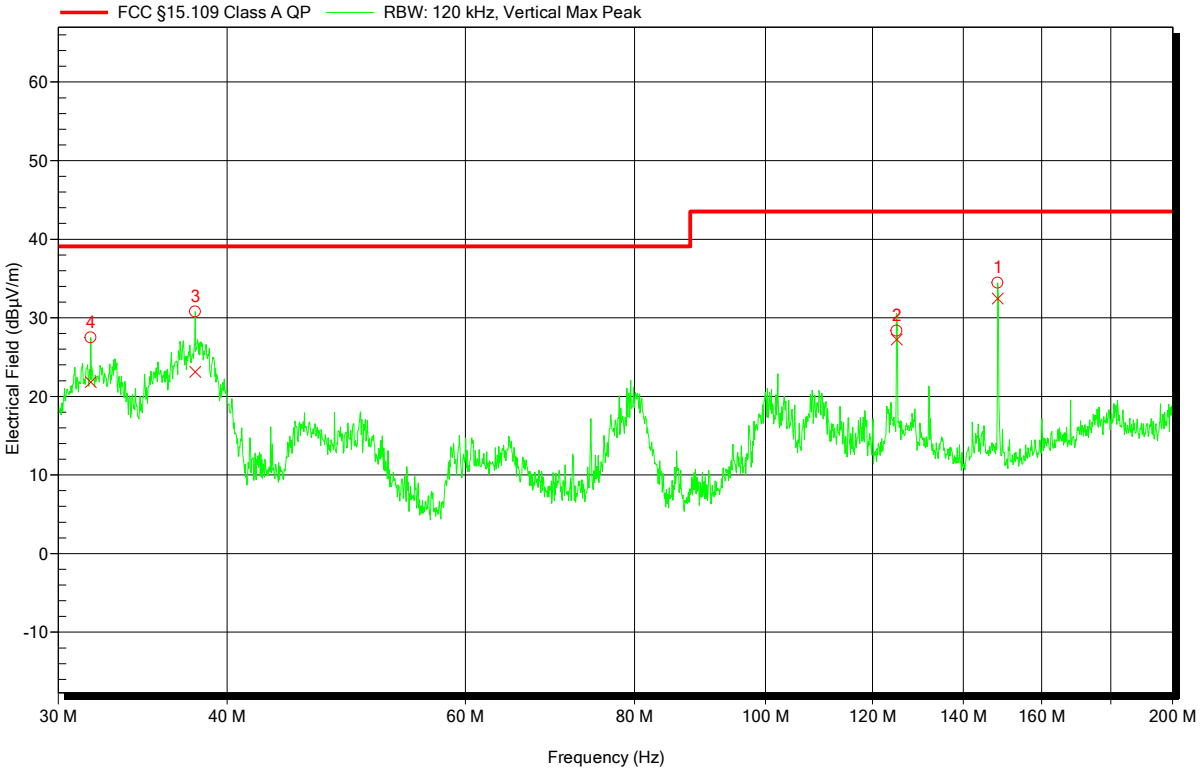

Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	148.508 MHz	32.44 dBµV/m	43.52 dBµV/m	-11.08 dB	Pass	162 Degree	1 m
2	124.994 MHz	27.22 dBµV/m	43.52 dBµV/m	-16.31 dB	Pass	162 Degree	1 m
3	37.879 MHz	23.12 dBµV/m	39.08 dBµV/m	-15.96 dB	Pass	-45 Degree	1 m
4	31.721 MHz	21.84 dBµV/m	39.08 dBµV/m	-17.25 dB	Pass	-162 Degree	1.1 m

Radiated emissions according to FCC Part 15b

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EUT Name:	Stereo Microscope with integrated camera
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Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 20°C, Unom: 120V AC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m, converted to 10m
Mode:	mode# 2
Test Date:	2019-10-30
Note:	

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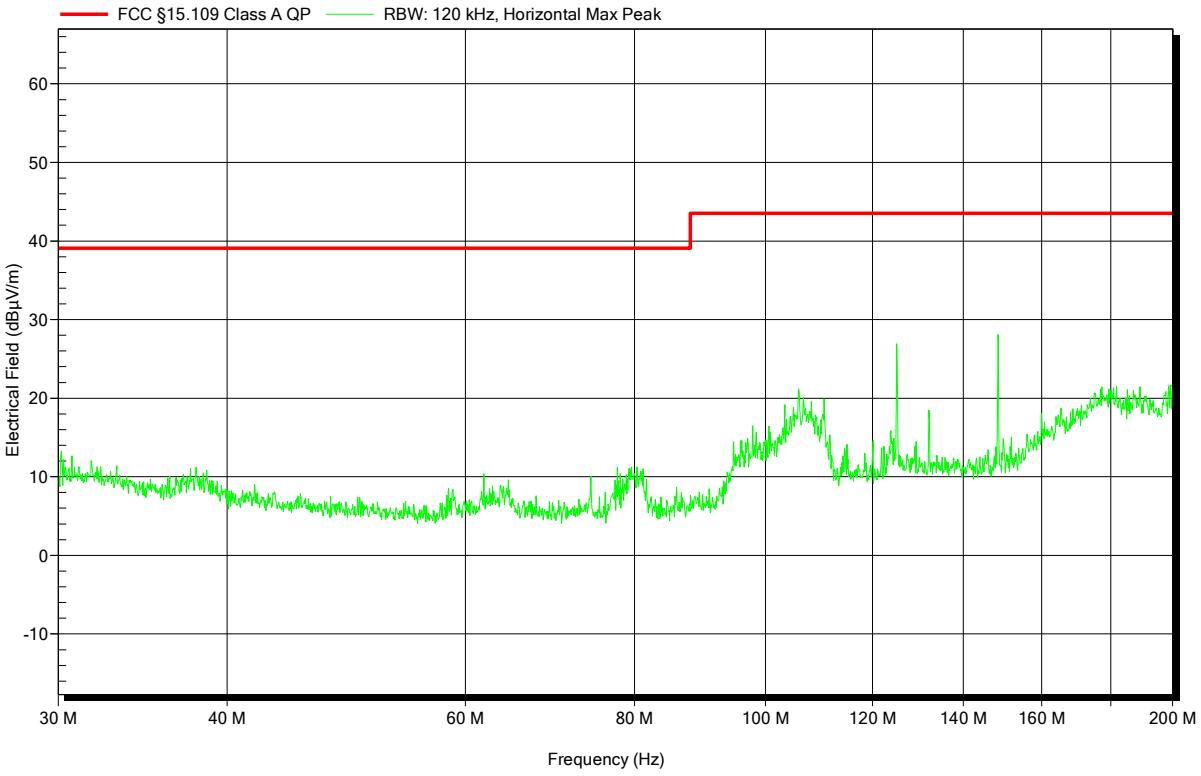

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 20°C, Unom: 120V AC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3m, converted to 10m
Mode:	mode# 2
Test Date:	2019-10-28
Note:	

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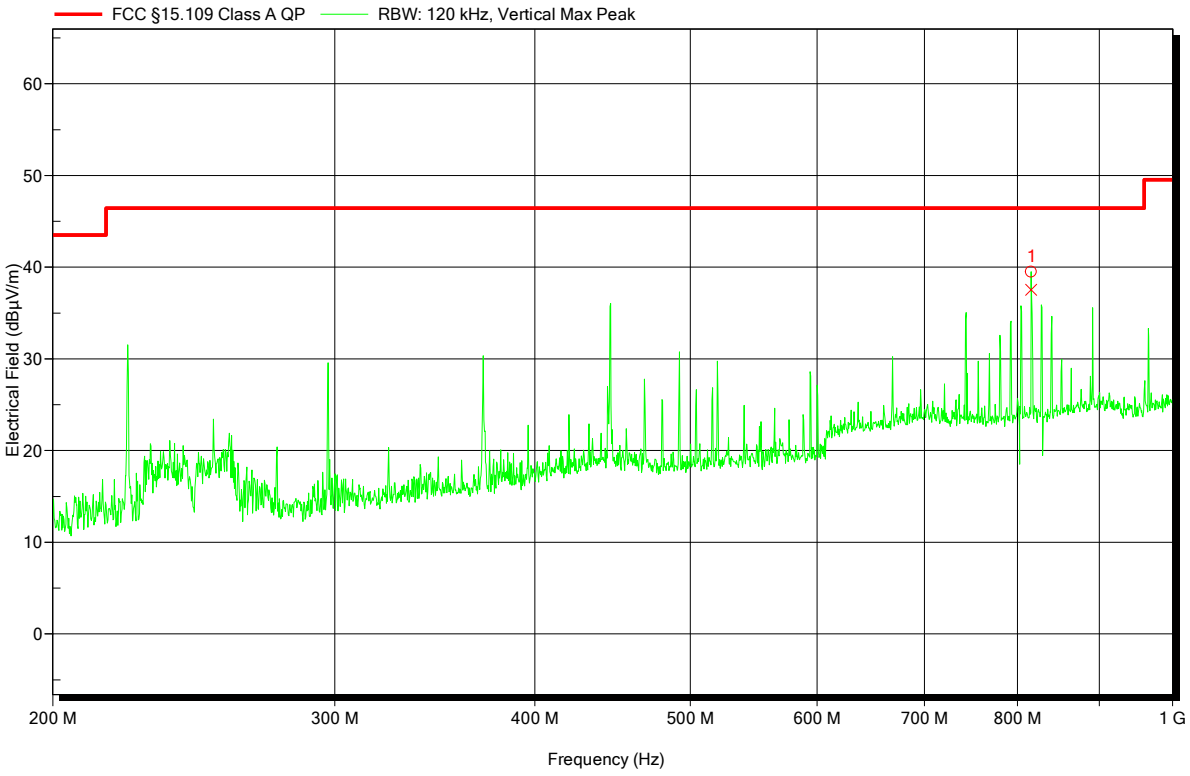

Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	816.044 MHz	37.52 dBµV/m	46.44 dBµV/m	-8.92 dB	Pass	-45 Degree	1.1 m

Radiated emissions according to FCC Part 15b

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Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 20°C, Unom: 120V AC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3m, converted to 10m
Mode:	mode# 2
Test Date:	2019-10-28
Note:	

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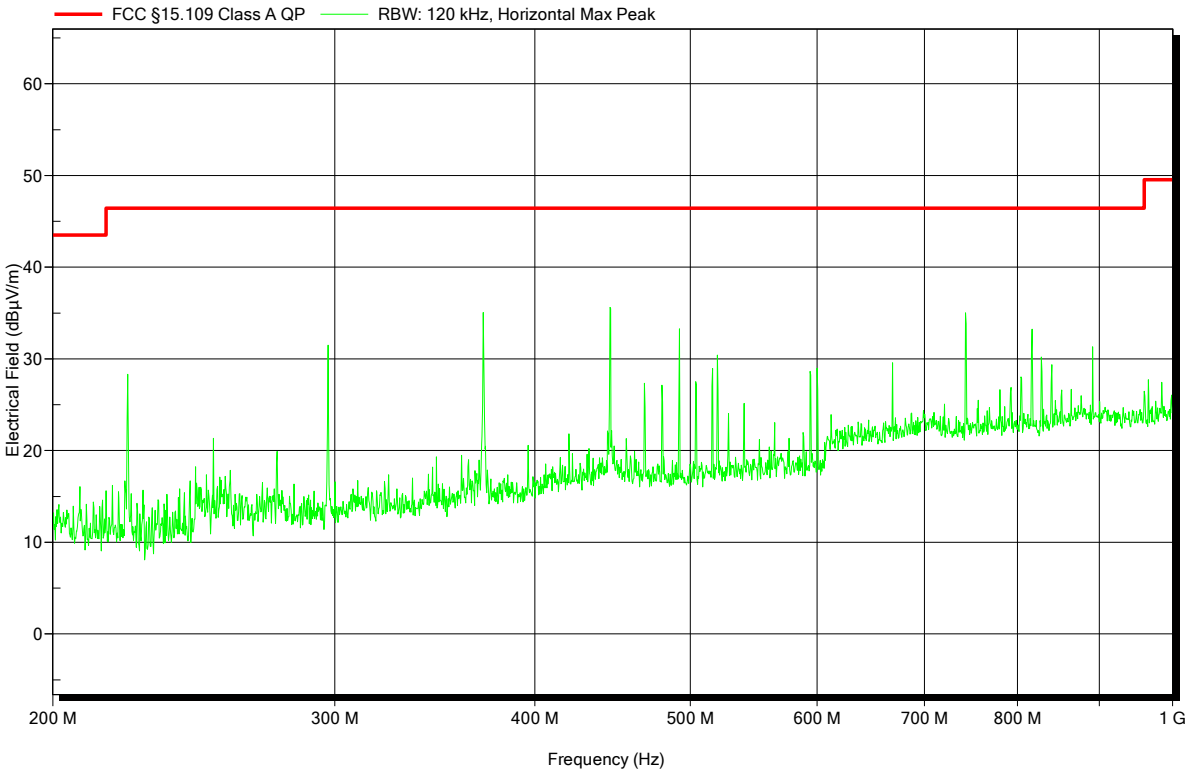

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 21°C, Unom: 120V AC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3m, converted to 10m
Mode:	mode# 2
Test Date:	2019-11-11
Note:	

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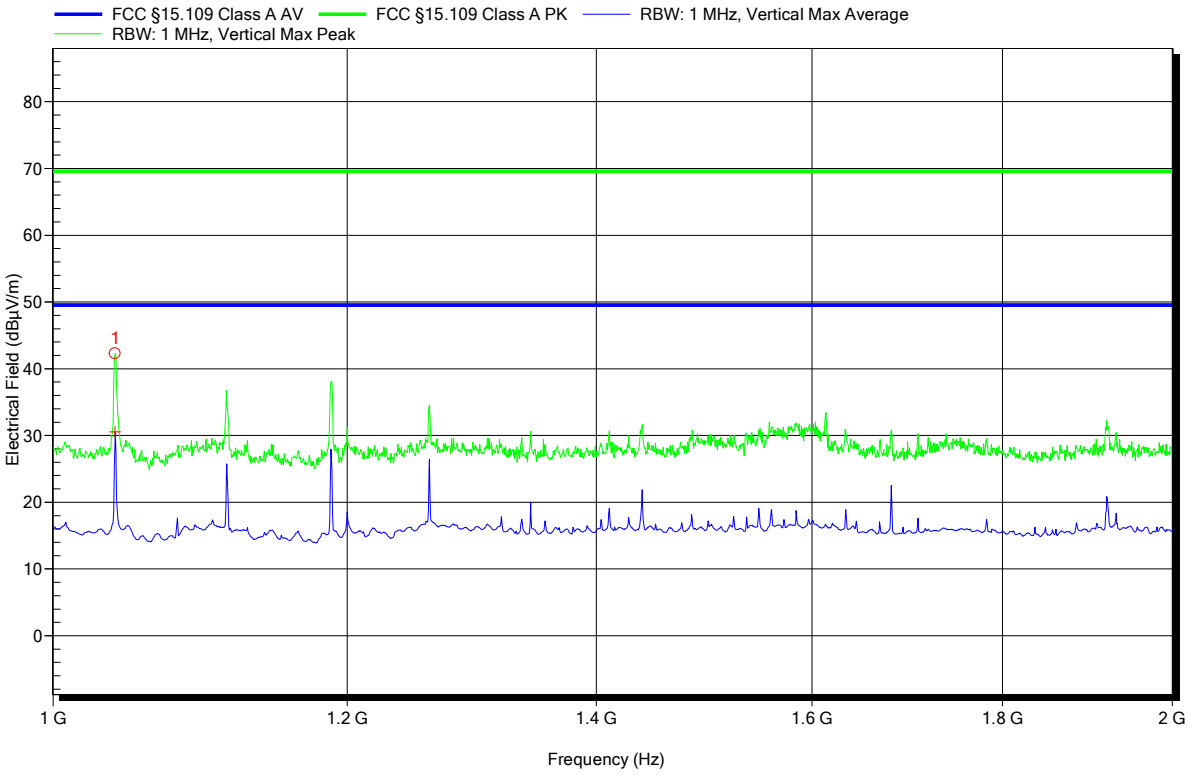

Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.04 GHz	42.3 dBµV/m	69.54 dBµV/m	-27.24 dB	Pass	47 Degree	2.27 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.04 GHz	30.56 dBµV/m	49.54 dBµV/m	-18.98 dB	Pass	47 Degree	2.27 m

Radiated emissions according to FCC Part 15b

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Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 21°C, Unom: 120V AC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3m, converted to 10m
Mode:	mode# 2
Test Date:	2019-11-11
Note:	

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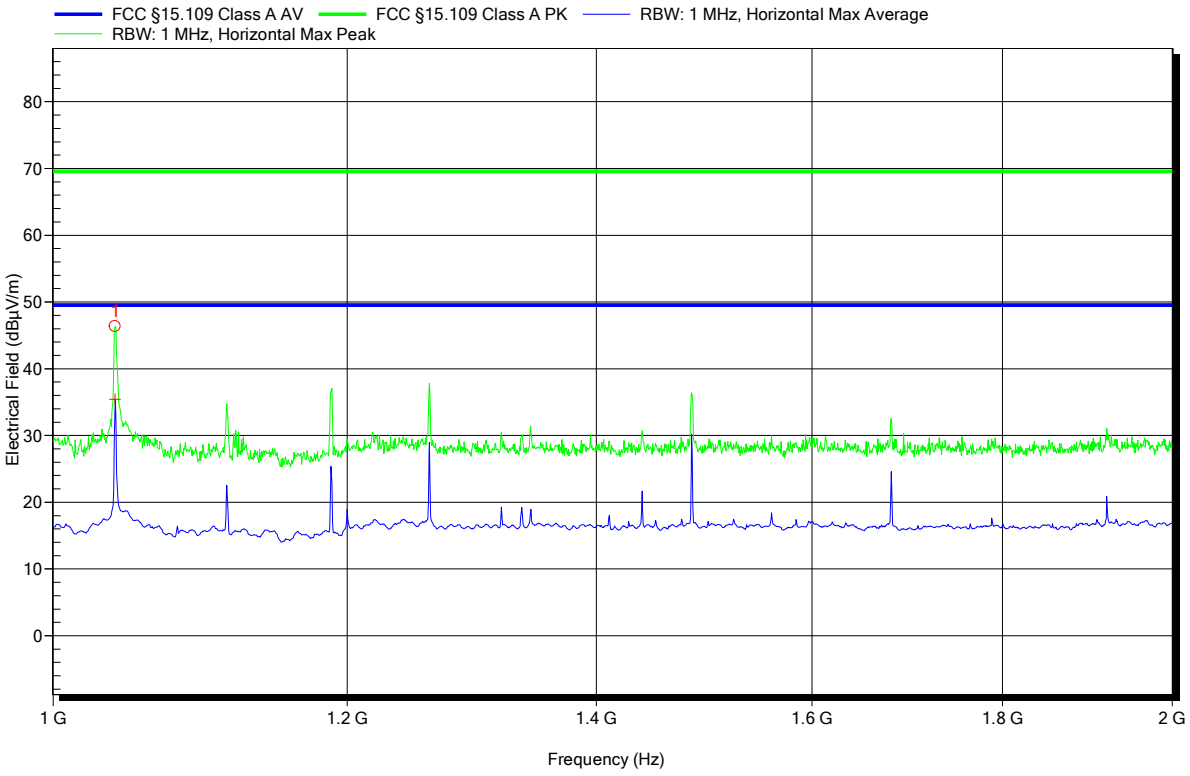

Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.04 GHz	46.36 dBµV/m	69.54 dBµV/m	-23.18 dB	Pass	-35 Degree	2.81 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.04 GHz	35.44 dBµV/m	49.54 dBµV/m	-14.1 dB	Pass	-35 Degree	2.81 m

Radiated emissions according to FCC Part 15b

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Mode:	mode# 3
Test Date:	2019-10-30
Note:	

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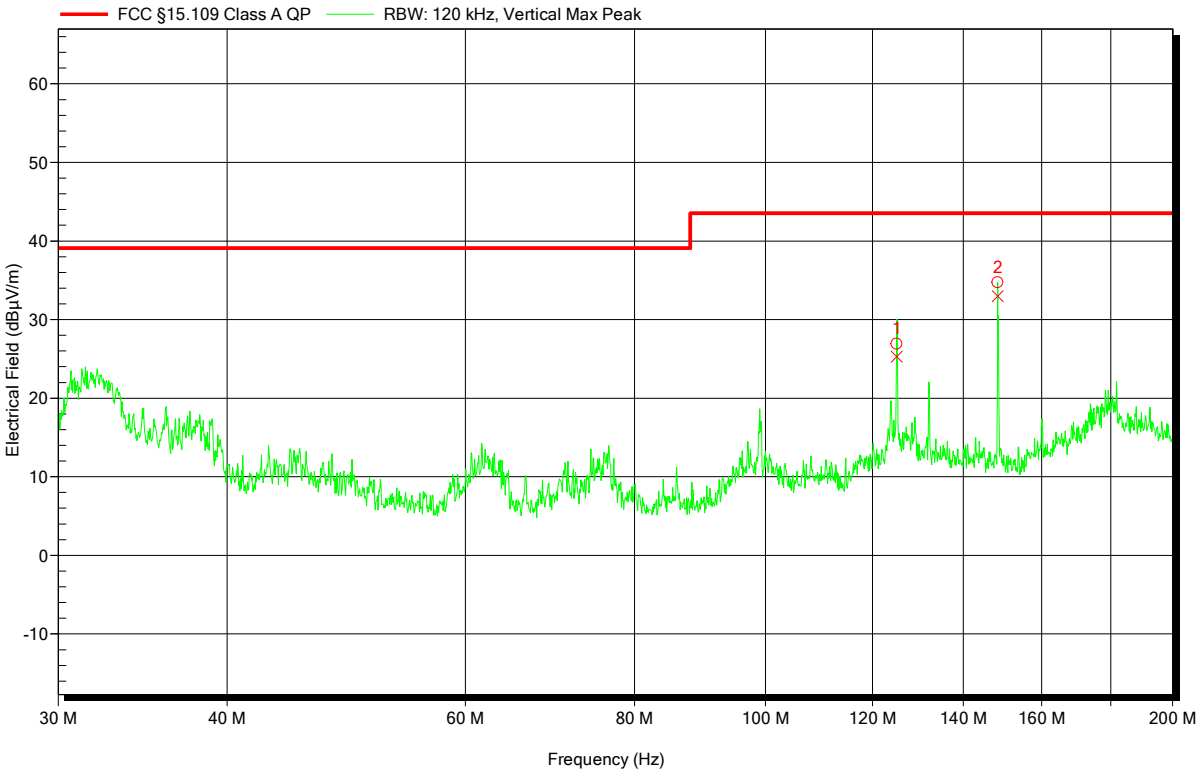

Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	125.002 MHz	25.3 dBµV/m	43.52 dBµV/m	-18.23 dB	Pass	171 Degree	1 m
2	148.504 MHz	32.98 dBµV/m	43.52 dBµV/m	-10.54 dB	Pass	126 Degree	1 m

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 20°C, Unom: 120V AC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m, converted to 10m
Mode:	mode# 3
Test Date:	2019-10-30
Note:	

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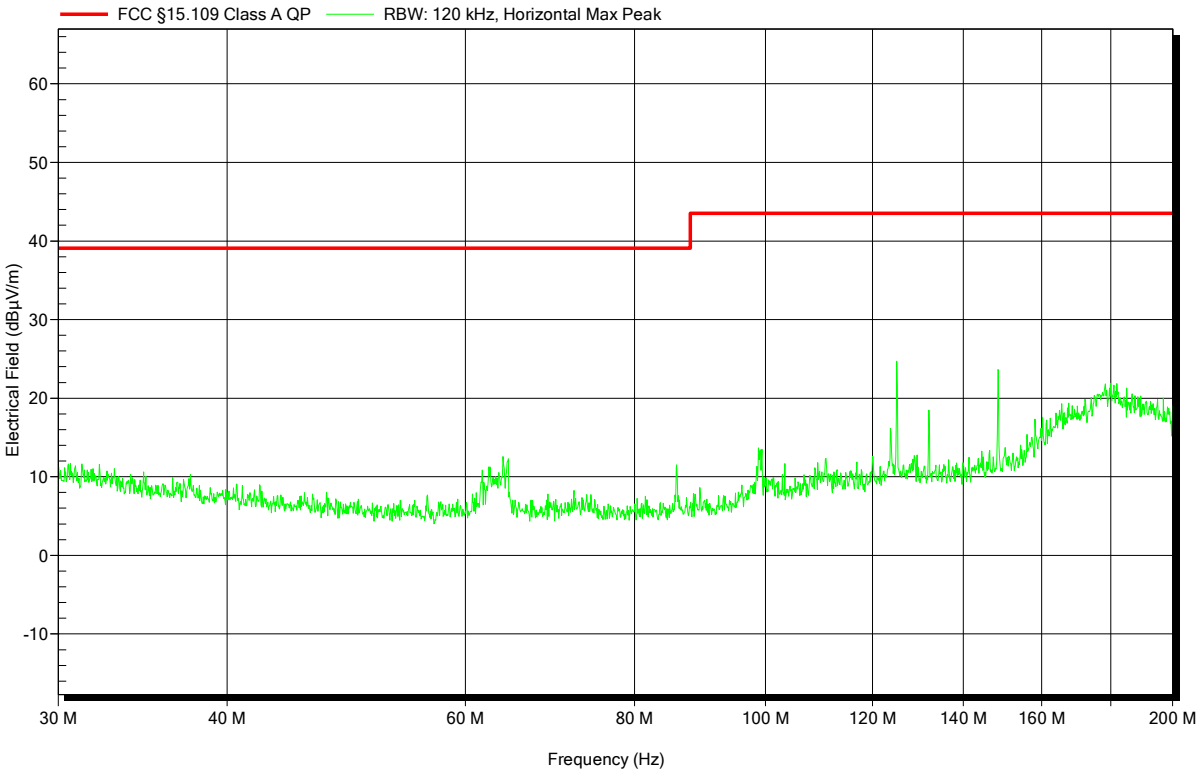

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 20°C, Unom: 120V AC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3m, converted to 10m
Mode:	mode# 3
Test Date:	2019-10-28
Note:	

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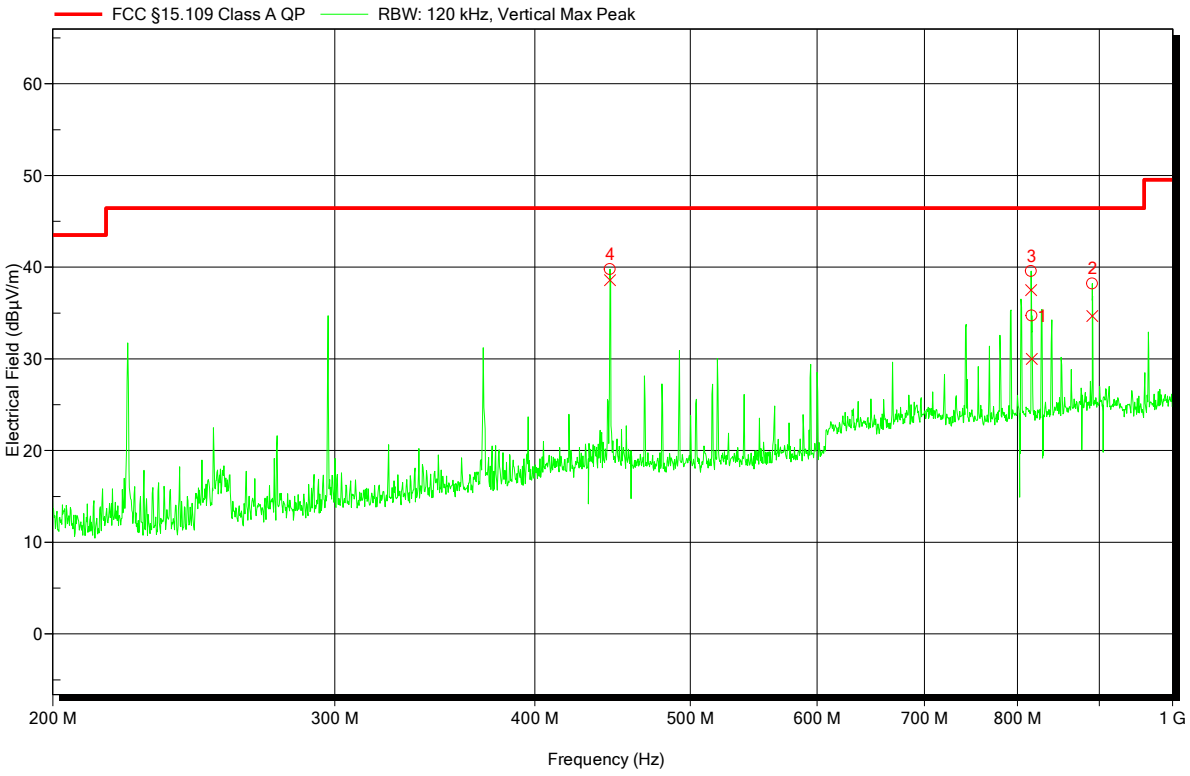

Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	816.755 MHz	30 dBµV/m	46.44 dBµV/m	-16.44 dB	Pass	180 Degree	1 m
2	891.026 MHz	34.68 dBµV/m	46.44 dBµV/m	-11.77 dB	Pass	-108 Degree	1 m
3	816.023 MHz	37.49 dBµV/m	46.44 dBµV/m	-8.95 dB	Pass	-45 Degree	1.1 m
4	445.514 MHz	38.58 dBµV/m	46.44 dBµV/m	-7.86 dB	Pass	144 Degree	2 m

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 20°C, Unom: 120V AC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3m, converted to 10m
Mode:	mode# 3
Test Date:	2019-10-28
Note:	

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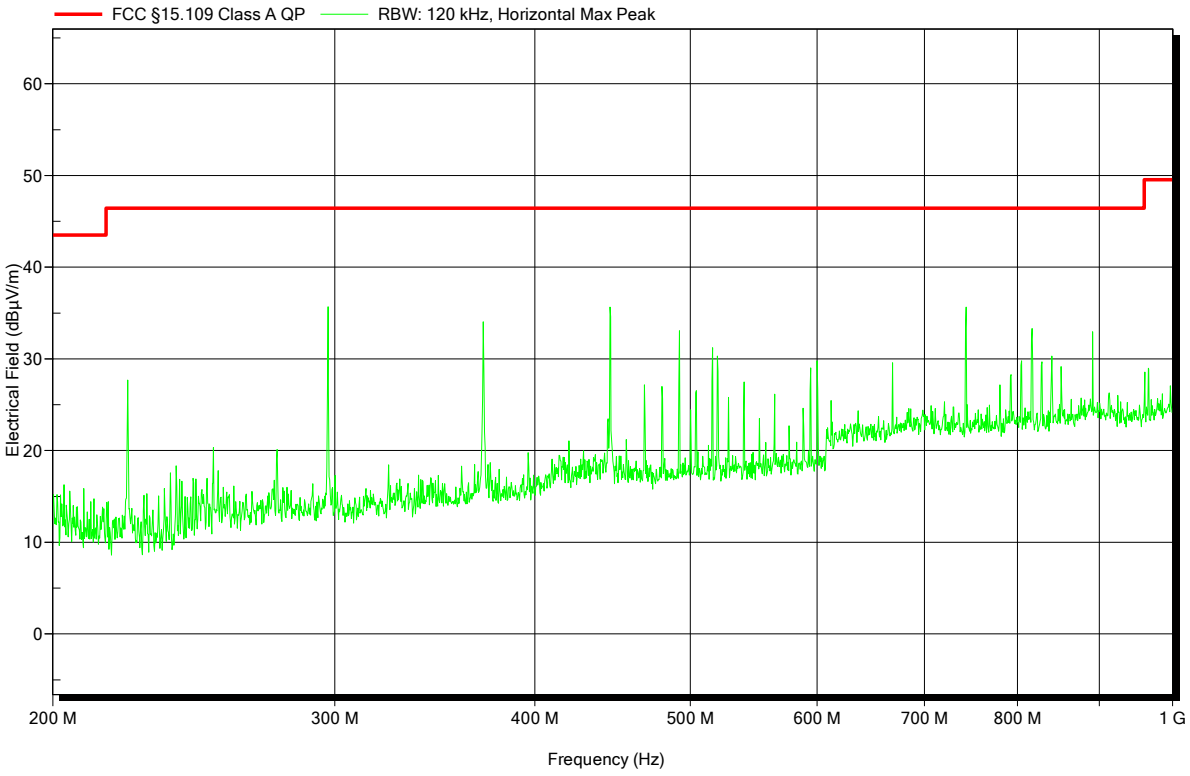

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 21°C, Unom: 120V AC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3m, converted to 10m
Mode:	mode# 3
Test Date:	2019-11-11
Note:	

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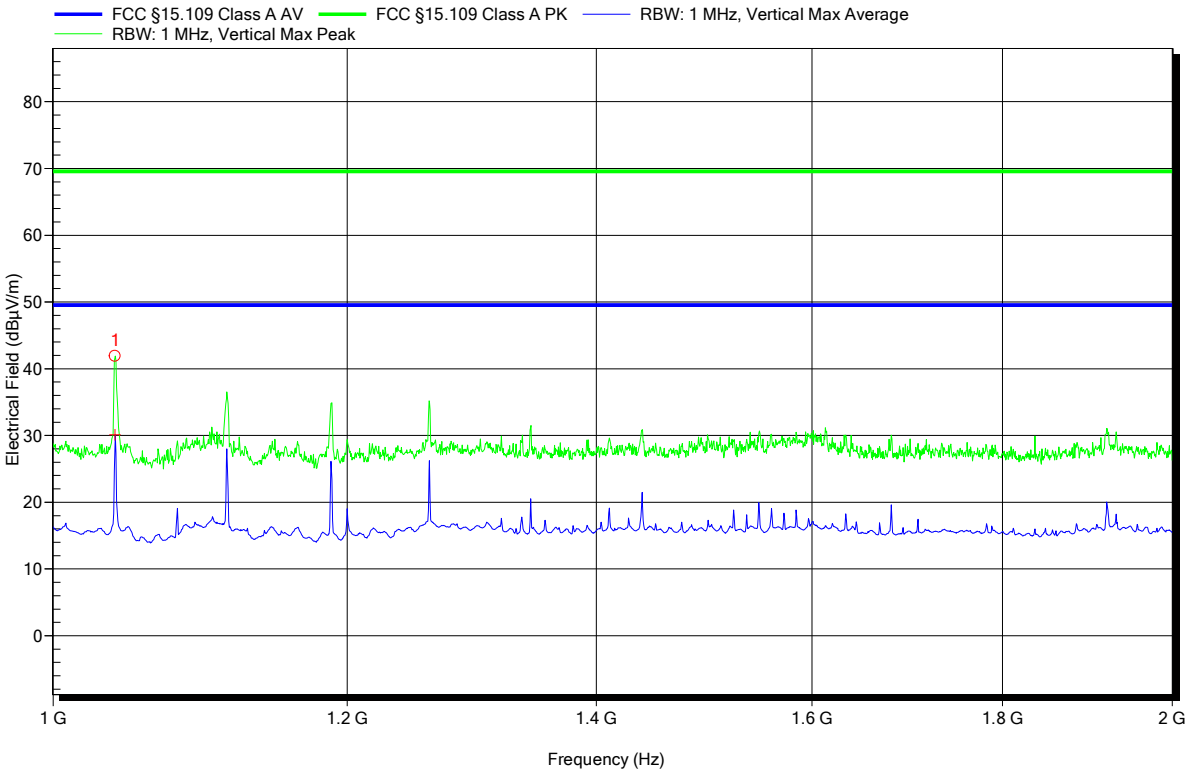

Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.04 GHz	41.9 dBµV/m	69.54 dBµV/m	-27.64 dB	Pass	60 Degree	2.34 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.04 GHz	30.11 dBµV/m	49.54 dBµV/m	-19.43 dB	Pass	60 Degree	2.34 m

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 21°C, Unom: 120V AC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3m, converted to 10m
Mode:	mode# 3
Test Date:	2019-11-11
Note:	

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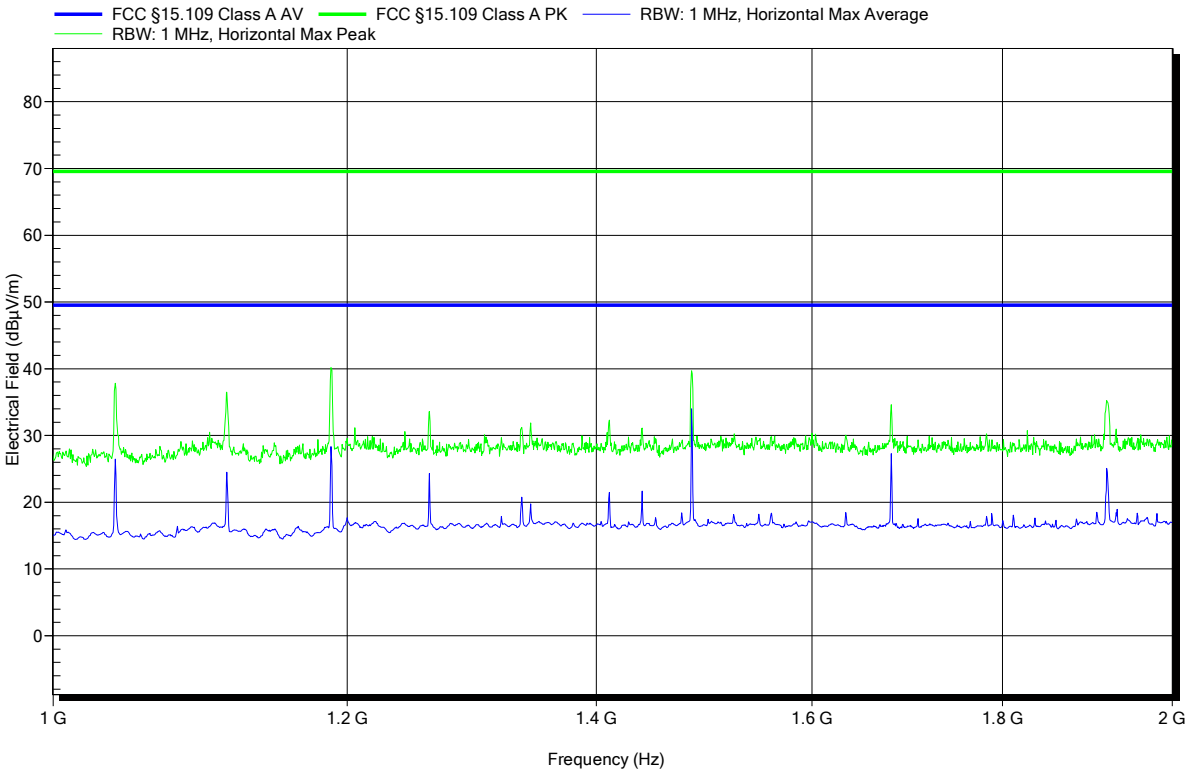

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 20°C, Unom: 120V AC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3m, converted to 10m
Mode:	mode# 1
Test Date:	2019-10-30
Note:	

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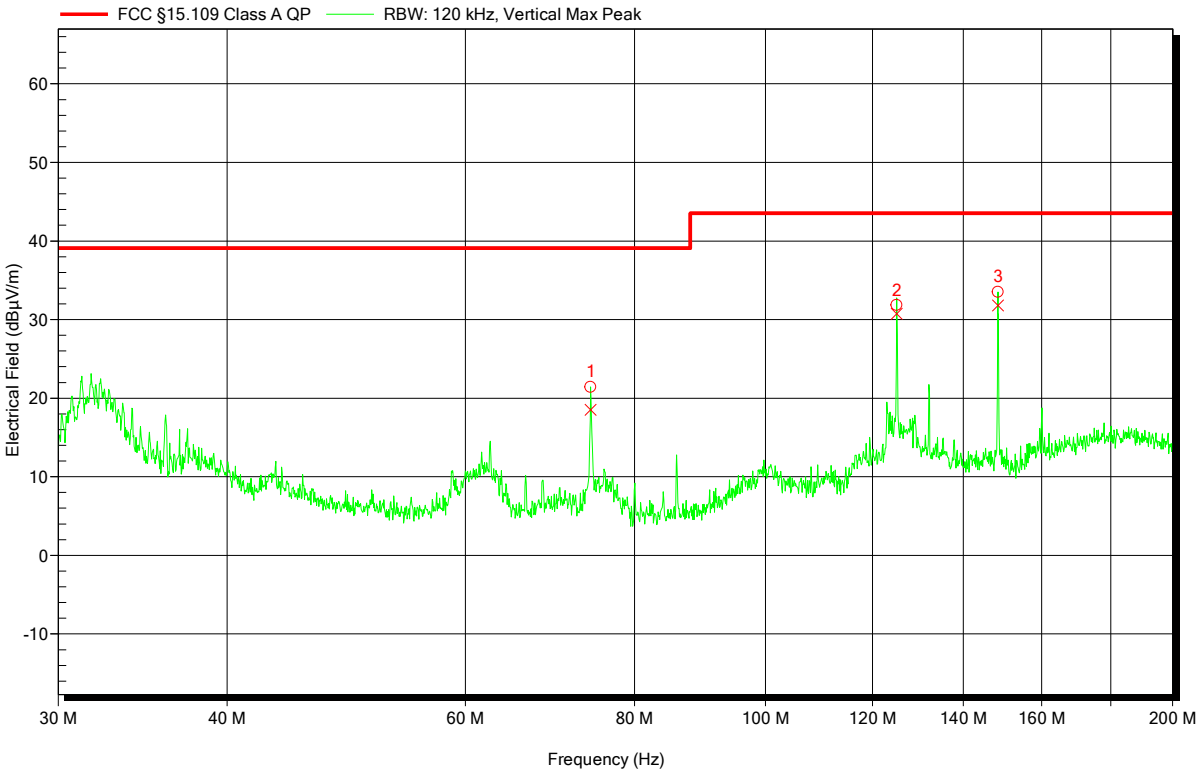

Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	74.25 MHz	18.52 dBµV/m	39.08 dBµV/m	-20.56 dB	Pass	-90 Degree	1.1 m
2	124.998 MHz	30.76 dBµV/m	43.52 dBµV/m	-12.77 dB	Pass	-198 Degree	1 m
3	148.513 MHz	31.81 dBµV/m	43.52 dBµV/m	-11.71 dB	Pass	162 Degree	1 m

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 20°C, Unom: 120V AC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m, converted to 10m
Mode:	mode# 1
Test Date:	2019-10-30
Note:	

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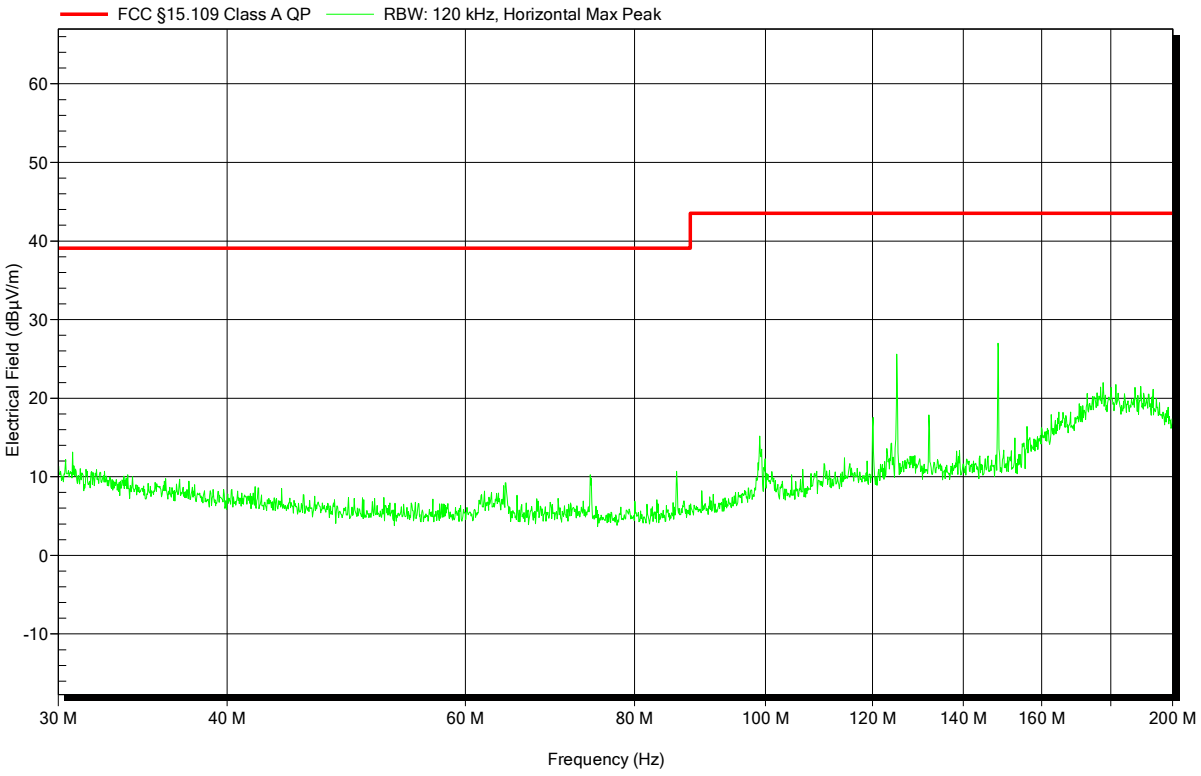

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 20°C, Unom: 120V AC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3m, converted to 10m
Mode:	mode# 1
Test Date:	2019-10-28
Note:	

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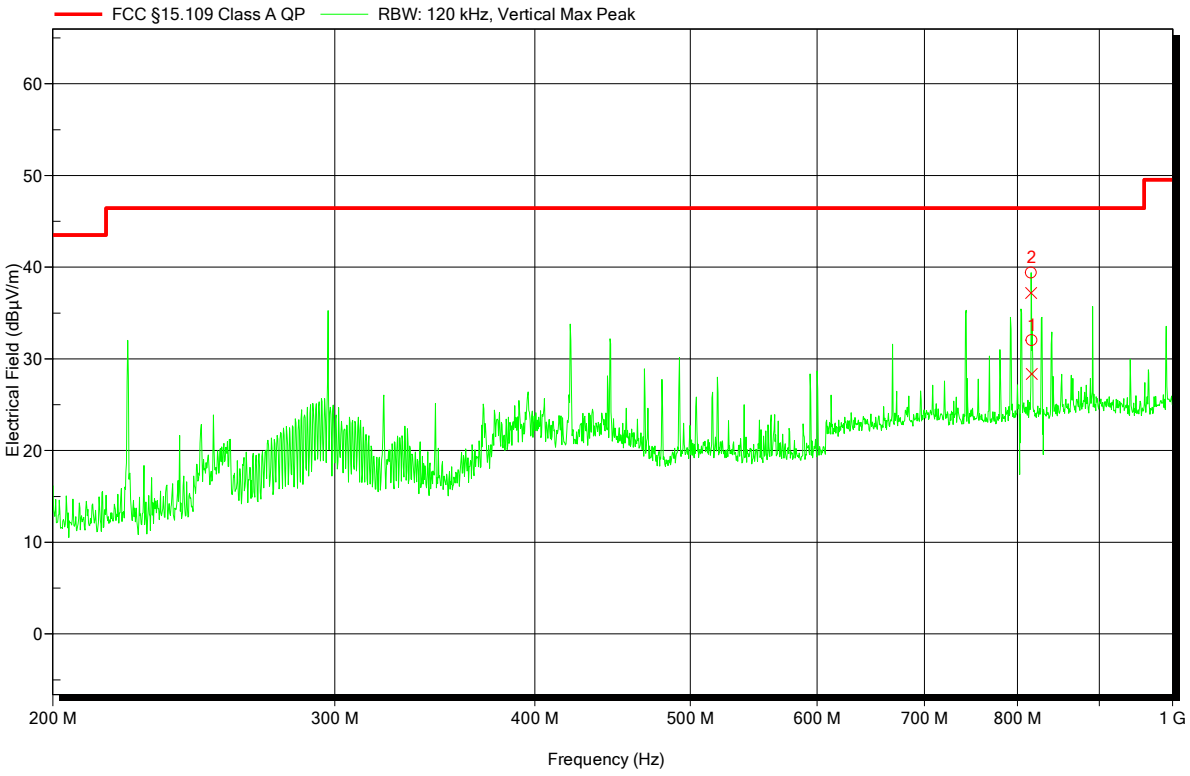

Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	816.784 MHz	28.35 dBµV/m	46.44 dBµV/m	-18.09 dB	Pass	180 Degree	1.1 m
2	816.015 MHz	37.18 dBµV/m	46.44 dBµV/m	-9.26 dB	Pass	-45 Degree	1.1 m

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 20°C, Unom: 120V AC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3m, converted to 10m
Mode:	mode# 1
Test Date:	2019-10-28
Note:	

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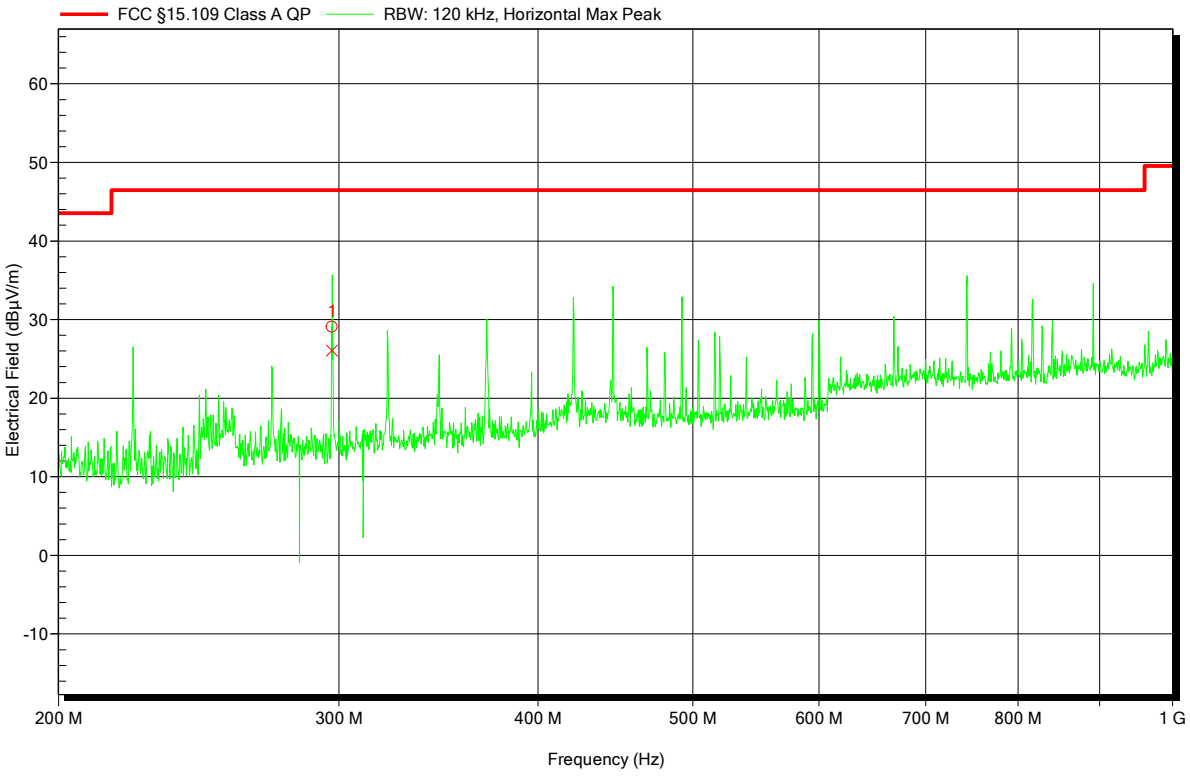

Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	296.998 MHz	26.05 dBµV/m	46.44 dBµV/m	-20.4 dB	Pass	45 Degree	4 m

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 21°C, Unom: 120V AC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3m, converted to 10m
Mode:	mode# 1
Test Date:	2019-11-11
Note:	

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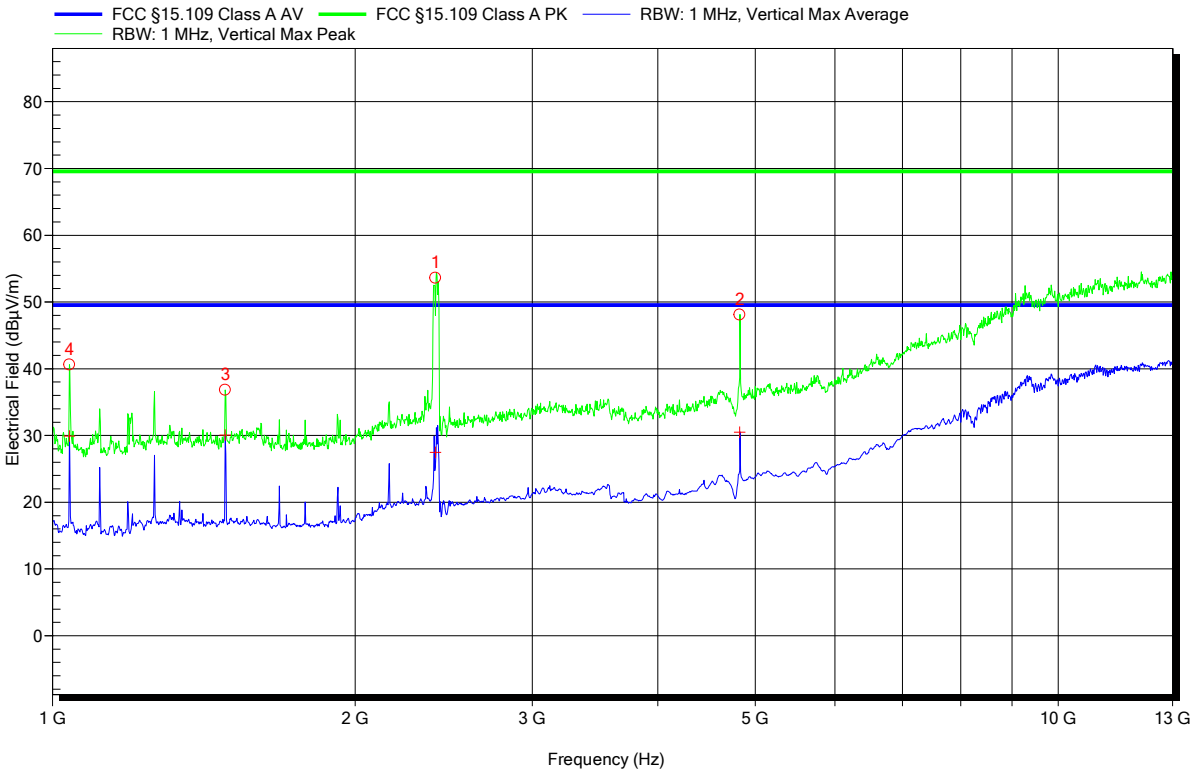

Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.404 GHz	WLAN 1st harmonic				-232 Degree	2.86 m
2	4.824 GHz	WLAN 2nd harmonic				-232 Degree	2.86 m
3	1.485 GHz	36.8 dBµV/m	69.54 dBµV/m	-32.75 dB	Pass	-232 Degree	2.86 m
4	1.04 GHz	40.63 dBµV/m	69.54 dBµV/m	-28.91 dB	Pass	-232 Degree	2.86 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	2.404 GHz	WLAN 1st harmonic		-22.05 dB	Pass	-232 Degree	2.86 m
2	4.824 GHz	WLAN 2nd harmonic		-19.04 dB	Pass	-232 Degree	2.86 m
3	1.485 GHz	30.08 dBµV/m	49.54 dBµV/m	-19.47 dB	Pass	-232 Degree	2.86 m
4	1.04 GHz	29.9 dBµV/m	49.54 dBµV/m	-19.64 dB	Pass	-232 Degree	2.86 m

Radiated emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 21°C, Unom: 120V AC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3m, converted to 10m
Mode:	mode# 1
Test Date:	2019-11-11
Note:	

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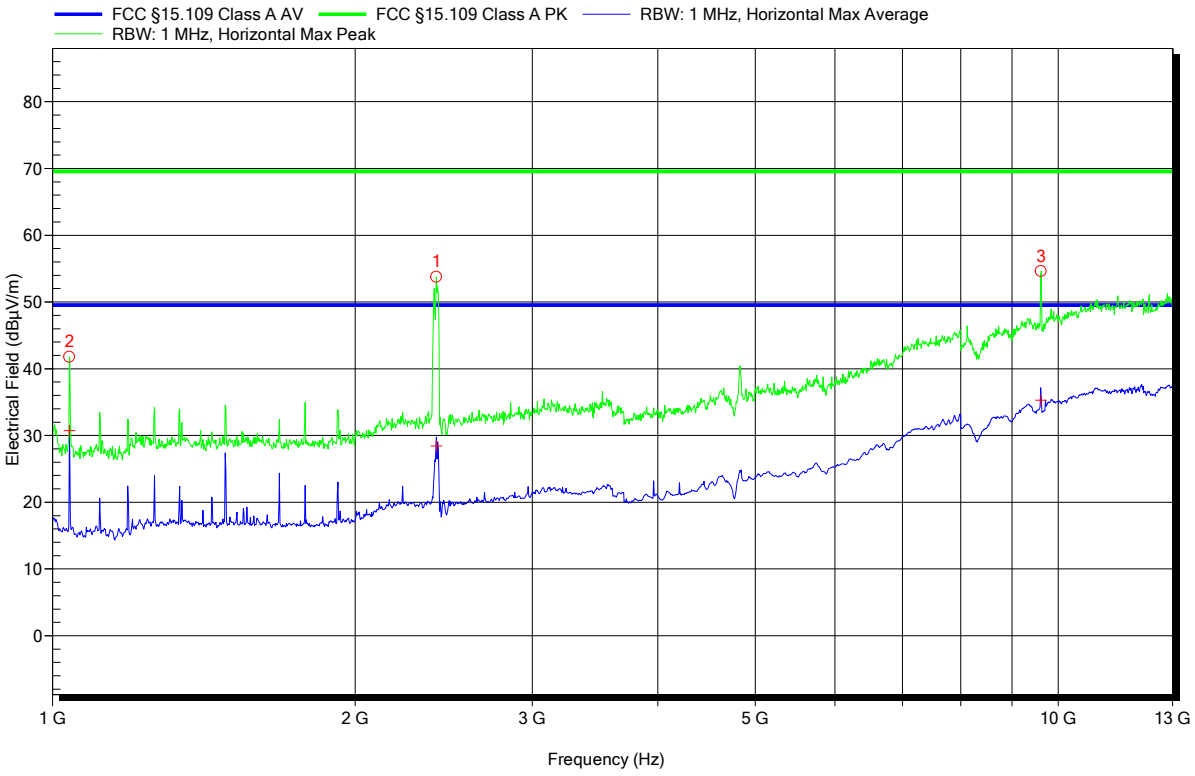


Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.409 GHz	WLAN 1st harmonic		-15.79 dB	Pass	-10 Degree	2.10 m
2	1.04 GHz	41.74 dBµV/m	69.54 dBµV/m	-27.8 dB	Pass	-10 Degree	2.10 m
3	9.616 GHz	54.63 dBµV/m	69.54 dBµV/m	-14.91 dB	Pass	-10 Degree	2.10 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	2.409 GHz	WLAN 1st harmonic		-21.1 dB	Pass	-10 Degree	2.10 m
2	1.04 GHz	30.72 dBµV/m	49.54 dBµV/m	-18.82 dB	Pass	-10 Degree	2.10 m
3	9.616 GHz	35.28 dBµV/m	49.54 dBµV/m	-14.26 dB	Pass	-10 Degree	2.10 m

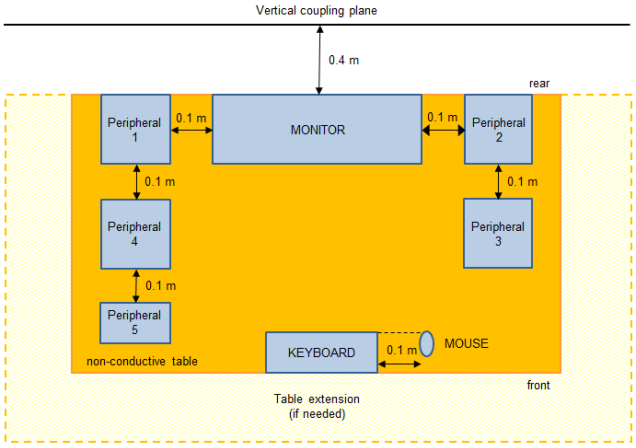
2.2 Test Conditions and Results - Conducted emissions acc. to ANSI C63.4

2.2.1 Information

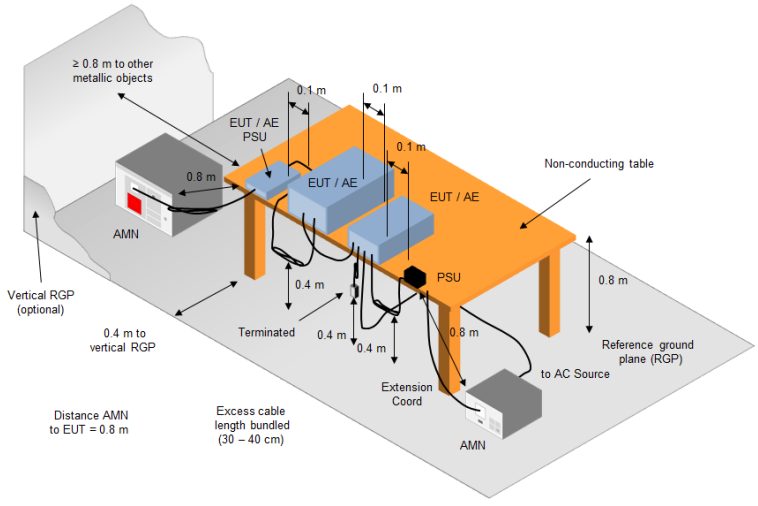
Test Information	
Reference	FCC 15.107, ICES-003, 8, 6.2
Reference method	ANSI C63.4
Measurement range	150 kHz to 30 MHz
Equipment class	Class A
Equipment type	Table top
Temperature [°C]	23
Humidity [%]	39
Operator	Matthias Handrik
Date	2019-11-05

2.2.2 Setup

Equipment placement



Test Setup



2.2.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	Radimation	2016.1.10

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
AMN	R&S	ESH2-Z5	EF00182	2019-02	2021-02
AMN	R&S	ESH3-Z5	EF00036	2019-07	2021-07
Pulse Limiter	R&S	ESH3-Z2	EF01063	2019-07	2020-07
EMI Test Receiver	R&S	ESR 7	EF00943	2019-10	2020-10
Climatic Sensor	Embedded Data Systems, LLC.	2800100000254 17E	EF01054	2019-05	2020-05

2.2.4 Procedure

Exploratory measurement
1. The EUT was placed on a non conductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2014 item 7.3.1)
2. The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN.
3. The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length).
4. The LISN measurement port was connected to a measurement receiver
5. I/O cables were bundled not longer than 0.4 m
6. Measurement was performed in the frequency range 0.15 – 30MHz on each current-carrying conductor
7. To maximize the emissions the cable positions were manipulated
8. The worst configuration of EUT and cables is shown on a test setup picture at item 1.3

Final measurement
1. The EUT was placed on a non conductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2014 item 7.3.1)
2. The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN.
3. The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length).
4. The LISN measurement port was connected to a measurement receiver
5. The EUT and cable arrangement were based on the exploratory measurement results
6. The test data of the worst-case conditions were recorded and shown on the next pages

2.2.5 Limits

Class A		
Frequency [MHz]	Quasi-peak Limit [dBµV]	Average Limit [dBµV]
0.15 - 0.5	79	66
0.5 - 30	73	60

2.2.6 Results

AC power line conducted emissions					
Port	Coupling	Operational mode	EUT Configuration	Verdict	Remark
Power	AMN	1/2/3	1	PASS	

2.2.7 Setup Photos

Test setup


2.2.8 Records

Conducted emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 23°C, Unom: 120V AC
LISN:	Rohde & Schwarz ESH3-Z5
Mode:	mode# 1
Test Date:	2019-11-05
Note:	

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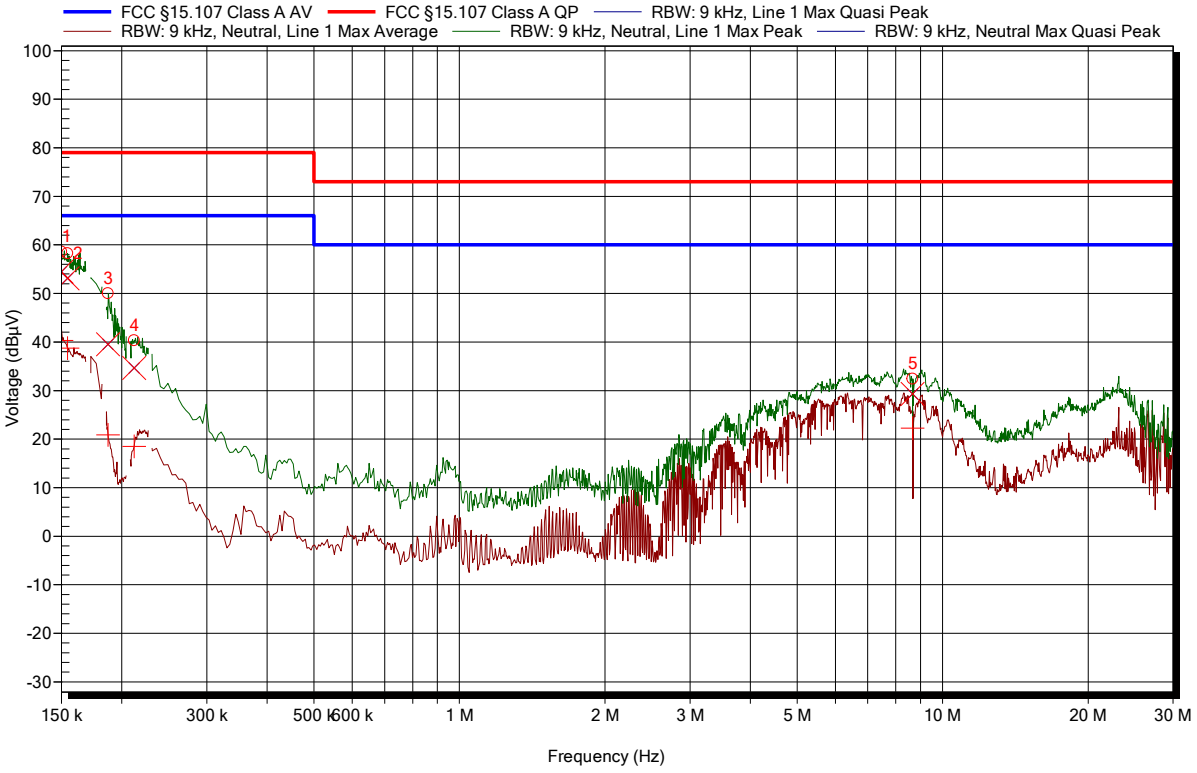

Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	150 kHz	54.5 dBµV	79 dBµV	-24.5 dB	Pass	Neutral
2	154.5 kHz	53.12 dBµV	79 dBµV	-25.88 dB	Pass	Neutral
3	187.35 kHz	39.52 dBµV	79 dBµV	-39.48 dB	Pass	Neutral
4	212.1 kHz	34.65 dBµV	79 dBµV	-44.35 dB	Pass	Neutral
5	8.669 MHz	29.3 dBµV	73 dBµV	-43.7 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	150 kHz	40.3 dBµV	66 dBµV	-25.7 dB	Pass	Neutral
2	154.5 kHz	38.77 dBµV	66 dBµV	-27.23 dB	Pass	Neutral
3	187.35 kHz	20.84 dBµV	66 dBµV	-45.16 dB	Pass	Neutral
4	212.1 kHz	18.5 dBµV	66 dBµV	-47.5 dB	Pass	Neutral
5	8.669 MHz	22.26 dBµV	60 dBµV	-37.74 dB	Pass	Line 1

Conducted emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 23°C, Unom: 120V AC
LISN:	Rohde & Schwarz ESH3-Z5
Mode:	mode# 2
Test Date:	2019-11-05
Note:	

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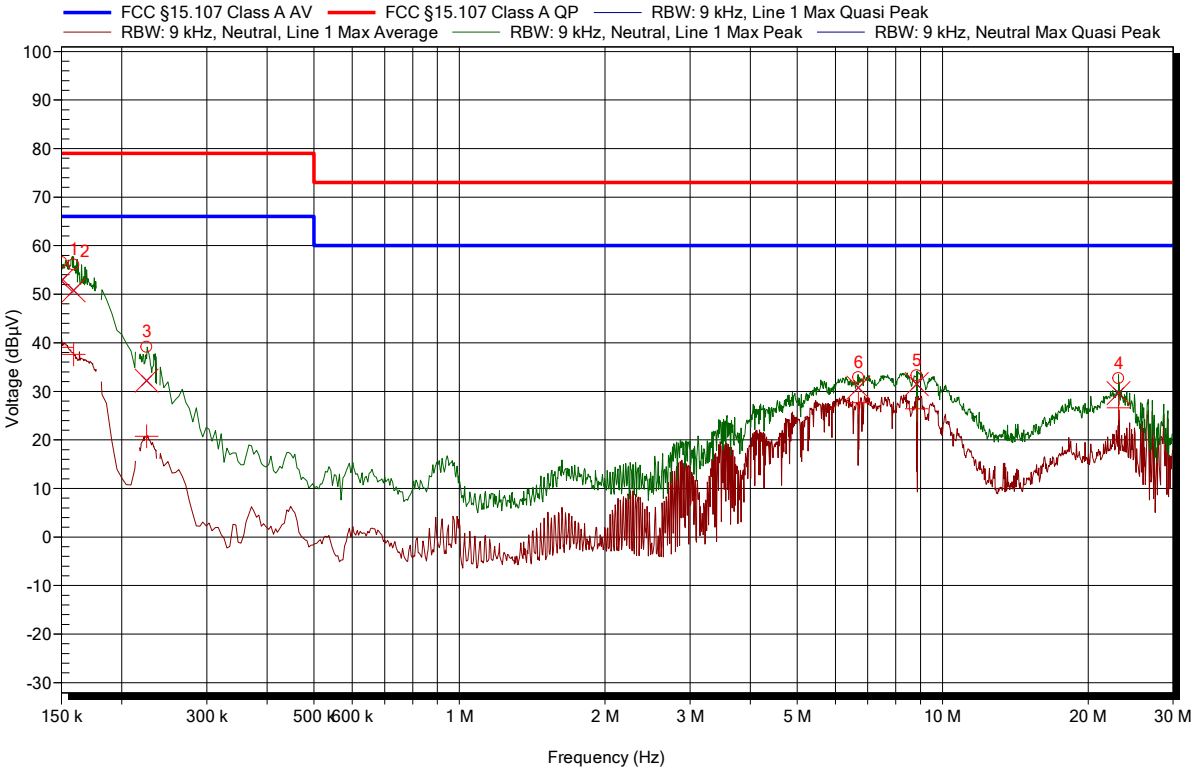

Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	159 kHz	50.79 dBµV	79 dBµV	-28.21 dB	Pass	Line 1
2	150 kHz	52.77 dBµV	79 dBµV	-26.23 dB	Pass	Neutral
3	225.15 kHz	32.2 dBµV	79 dBµV	-46.8 dB	Pass	Line 1
4	23.127 MHz	29.61 dBµV	73 dBµV	-43.39 dB	Pass	Neutral
5	8.84 MHz	31.51 dBµV	73 dBµV	-41.49 dB	Pass	Neutral
6	6.694 MHz	30.76 dBµV	73 dBµV	-42.24 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	159 kHz	37.59 dBµV	66 dBµV	-28.41 dB	Pass	Line 1
2	150 kHz	39.06 dBµV	66 dBµV	-26.94 dB	Pass	Neutral
3	225.15 kHz	20.75 dBµV	66 dBµV	-45.25 dB	Pass	Line 1
4	23.127 MHz	26.62 dBµV	60 dBµV	-33.38 dB	Pass	Neutral
5	8.84 MHz	26.39 dBµV	60 dBµV	-33.61 dB	Pass	Neutral
6	6.694 MHz	27.66 dBµV	60 dBµV	-32.34 dB	Pass	Line 1

Conducted emissions according to FCC Part 15b

Project number: G0M-1906-8288

Applicant:	Leica Microsystems (Schweiz) AG
EUT Name:	Stereo Microscope with integrated camera
Model:	EZ4 W
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 23°C, Unom: 120V AC
LISN:	Rohde & Schwarz ESH3-Z5
Mode:	mode# 3
Test Date:	2019-11-05
Note:	

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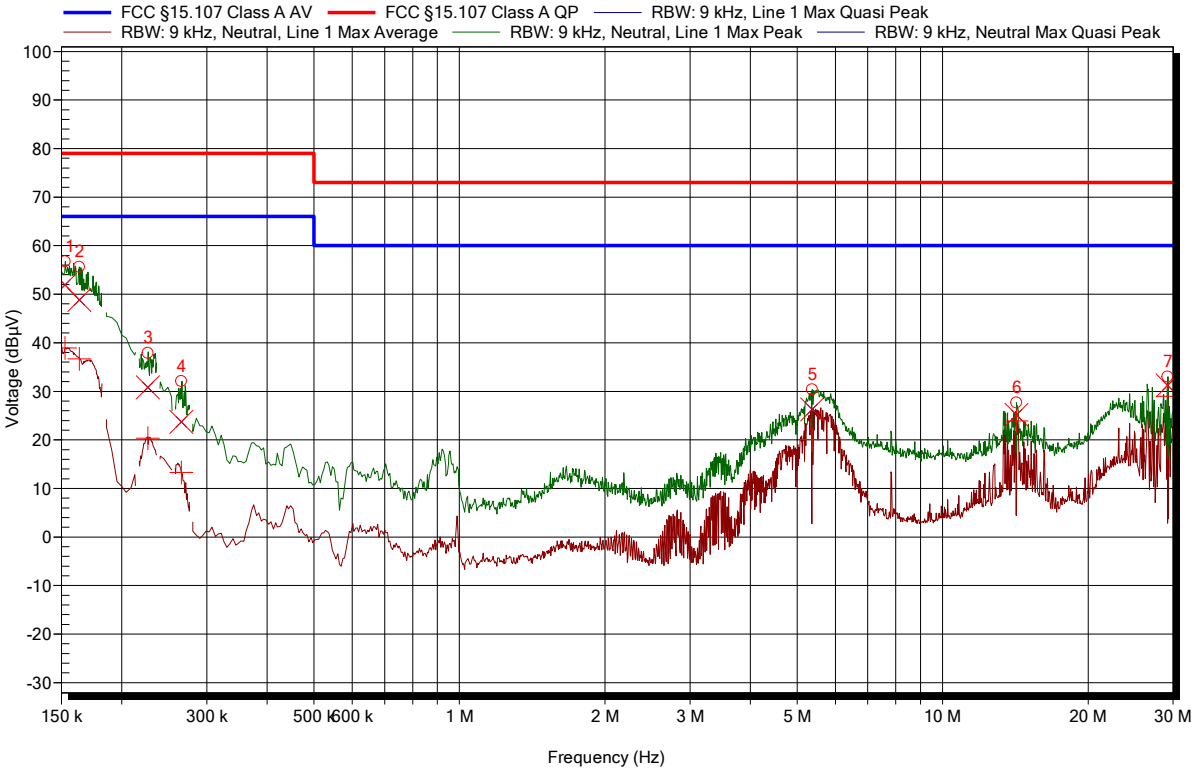

Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	152.7 kHz	51.91 dBµV	79 dBµV	-27.09 dB	Pass	Line 1
2	163.5 kHz	48.85 dBµV	79 dBµV	-30.15 dB	Pass	Line 1
3	226.5 kHz	30.83 dBµV	79 dBµV	-48.17 dB	Pass	Line 1
4	265.65 kHz	23.73 dBµV	79 dBµV	-55.27 dB	Pass	Line 1
5	5.368 MHz	26.29 dBµV	73 dBµV	-46.71 dB	Pass	Neutral
6	14.213 MHz	25.18 dBµV	73 dBµV	-47.82 dB	Pass	Line 1
7	29.235 MHz	31.2 dBµV	73 dBµV	-41.8 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	152.7 kHz	38.92 dBµV	66 dBµV	-27.08 dB	Pass	Line 1
2	163.5 kHz	36.68 dBµV	66 dBµV	-29.32 dB	Pass	Line 1
3	226.5 kHz	20.32 dBµV	66 dBµV	-45.68 dB	Pass	Line 1
4	265.65 kHz	13.27 dBµV	66 dBµV	-52.73 dB	Pass	Line 1
5	5.368 MHz	20.08 dBµV	60 dBµV	-39.92 dB	Pass	Neutral
6	14.213 MHz	23.88 dBµV	60 dBµV	-36.12 dB	Pass	Line 1
7	29.235 MHz	28.99 dBµV	60 dBµV	-31.01 dB	Pass	Line 1