

EMC TEST REPORT FCC 47 CFR Part 15B, ISED ICES-003 Issue 6	
Report Reference No	G0M-1905-8271-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 Geosystems AG
Address	Heinrich Wild Strasse 9435 Heerbrugg SWITZERLAND
Test Specification	
Standard	47 CFR Part 15 Subpart B ISED ICES-003 Issue 6 ANSI C63.4:2014
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Imaging Laser Scanner
Model(s)	BLK2GO
Additional Model(s)	None
Brand Name(s)	Leica
Hardware Version(s)	HW Rev. B
Software Version(s)	EDM FPGA SW V1.3; Main_FPGA SW V0.4; Alcapone SW V.0.4.8; Android V. 3.1
FCC-ID	RFD-BLK2GO
IC	3177A-BLK2GO
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	2019-07-15	
Report:		
Compiled by	Stephan Liebich	
Tested by (+ signature) (Responsible for Test)	Stephan Liebich	 
	Matthias Handrik	
Approved by (+ signature) (Deputy Head of Lab)	Jens Marquardt	
Date of Issue	2019-10-18	
Total number of pages	46	
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:		
1. EUT contains GNSS technology. According to customer requirements, this technology was not part of the EMC test.		

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	2019-10-18	Initial Release	

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1 Equipment (Test Item) Under Test

Description	Imaging Laser Scanner	
Model	BLK2GO	
Additional Model(s)	None	
Brand Name(s)	Leica	
Serial Number(s)	3630026	
Hardware Version(s)	HW Rev. B	
Software Version(s)	EDM FPGA SW V1.3; Main_FPGA SW V0.4; Alcapone SW V.0.4.8; Android V. 3.1	
FCC-ID	RFD-BLK2GO	
IC	3177A-BLK2GO	
Class	Class B	
Equipment type	Table top	
Highest internal frequency [MHz]	5000	
Radio Module 1	Type	WLAN and Bluetooth
	Model	NFA324A-12H32
	Manufacturer	Foxconn
	FCC-ID	PPD-QCNFA324
	IC	4104A-QCNFA324
Radio Module 2	Type	GNSS
	Model	WGR-7640-0-17WLNSP-TR-32-0
	Manufacturer	Qualcomm
	FCC-ID	None
	IC	None
Supply Voltage	V _{NOM}	7.2 VDC (internal battery) 5.0 VDC (via USB)
AC/DC-Adaptor	None	
Manufacturer	Leica Geosystems AG Heinrich Wild Strasse 9435 Heerbrugg SWITZERLAND	

1.1 Equipment Ports

Name	Type	Attributes	Comment
USB	DC;IO	Count: 1 Direction: IO Service only: No	-
Description:			
AC	AC mains power input/output port		
DC	DC power input/output port		
IO	Input/Output port		
TP	Telecommunication port		
NE	Non-electrical port		

1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Battery	Leica Geosystem AG	GEB821	-
CBL	USB	AUKEY	-	1.5 m
AE / MON	Laptop	Dell	Latitude E6440	-
AE	AC/DC-Adaptor	Dell	DA90SP1-00	-
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
MON	Monitoring Equipment			
CBL	Connecting Cable			
Comment:				

1.5 Operational Modes

Mode #	Description
1	WLAN 2.4 GHz Tx + BT classic Tx (EUT send via BT classic its status information to a receiver. EUT send via WLAN 2.4 GHz live stream data from the internal camera to a receiver)
2	WLAN 5 GHz Tx + BT classic Tx (EUT send via BT classic its status information to a receiver. EUT send via WLAN 5 GHz live stream data from the internal camera to a receiver)
3	USB data transfer (EUT send the captured data from the internal flash to a receiver via an USB link)
Comment:	

1.6 EUT Configuration

Configuration #	Description
1	EUT is powered up and powered via internal battery. The device captures in real time the room with a laser diode and stores the point cloud into its internal flash. WLAN is used to stream the user cam real time picture to the Laptop. A BLE link is used to send data form EUT to the Laptop.
2	EUT is powered up and powered via Laptop with USB link. Laptop is powered via AC/DC Adaptor with 120 V / 60 Hz. WLAN and BT classic are active.
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:

$$\text{Reading on Analyser (dB}\mu\text{V)} + \text{A.F. (dB/m)} = \text{Net field strength (dB}\mu\text{V/m)}$$

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:

$$\text{Limit (dB}\mu\text{V/m)} = 20 \cdot \log(\mu\text{V/m})$$

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 C63.4:2014	PASS	1
FCC 15.107 ICES-003, 8, 6.2	AC power line conducted emissions	ANSI C63.4:2014	PASS	1
Comment: 1 → The test data of the worst-case conditions were recorded and shown on the next pages.				

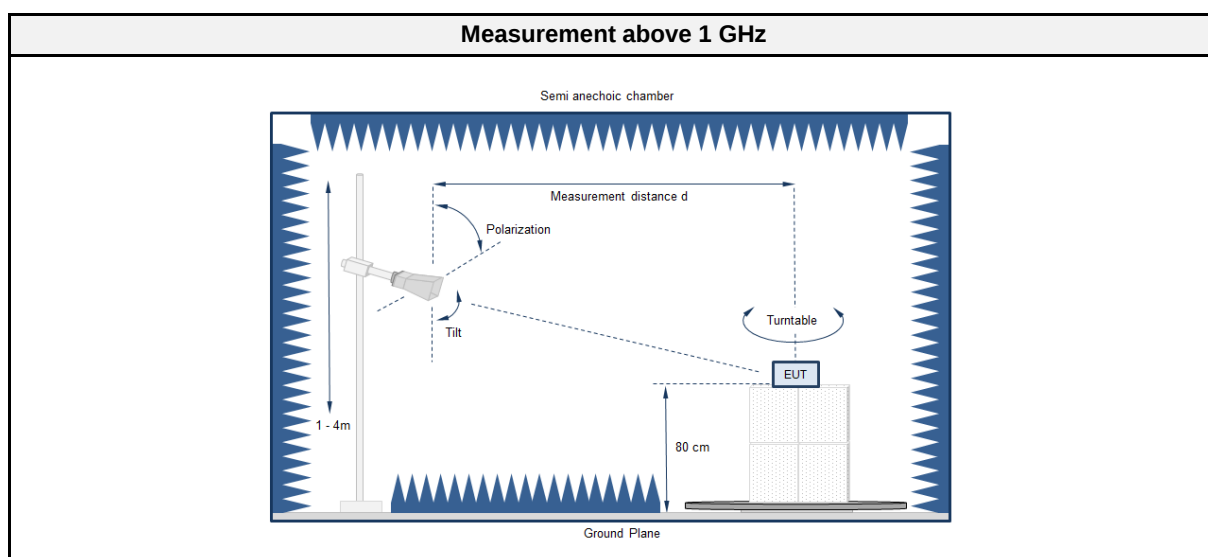
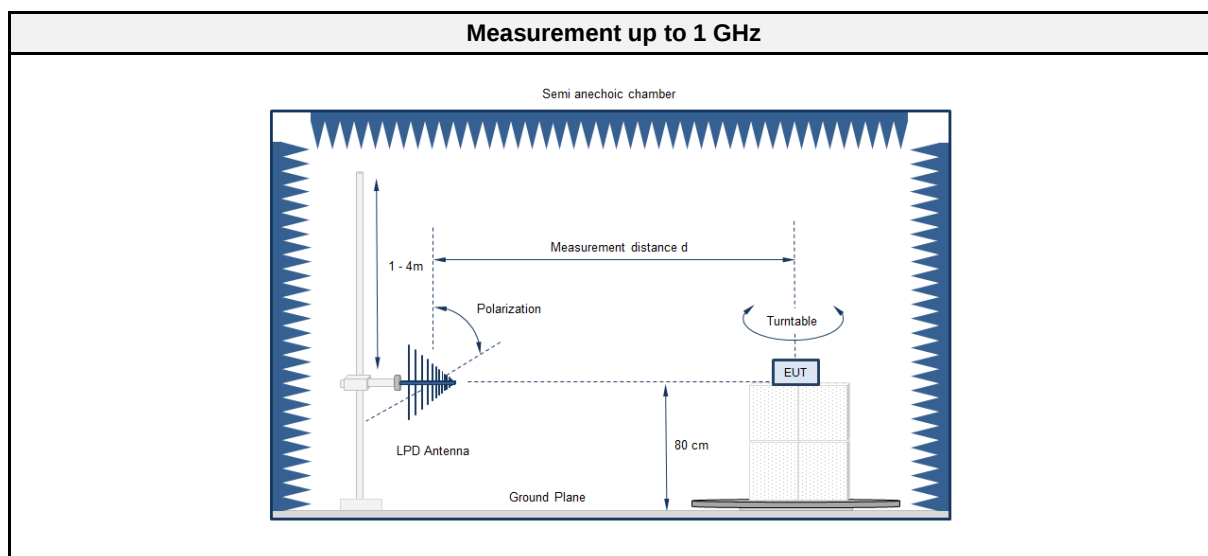
Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

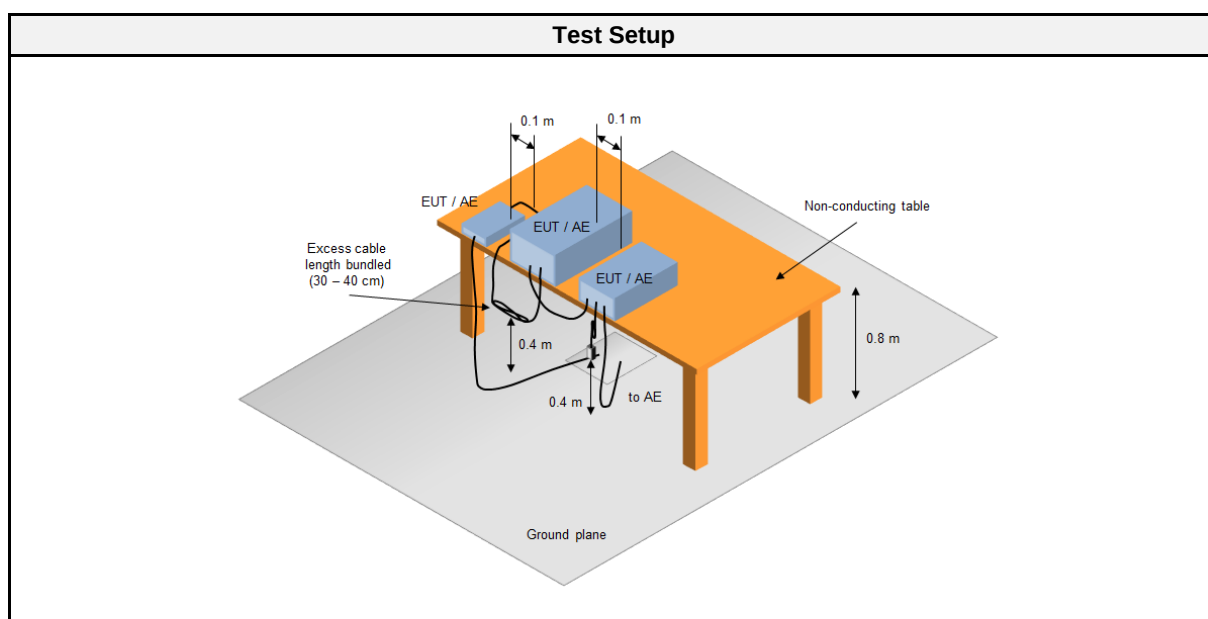
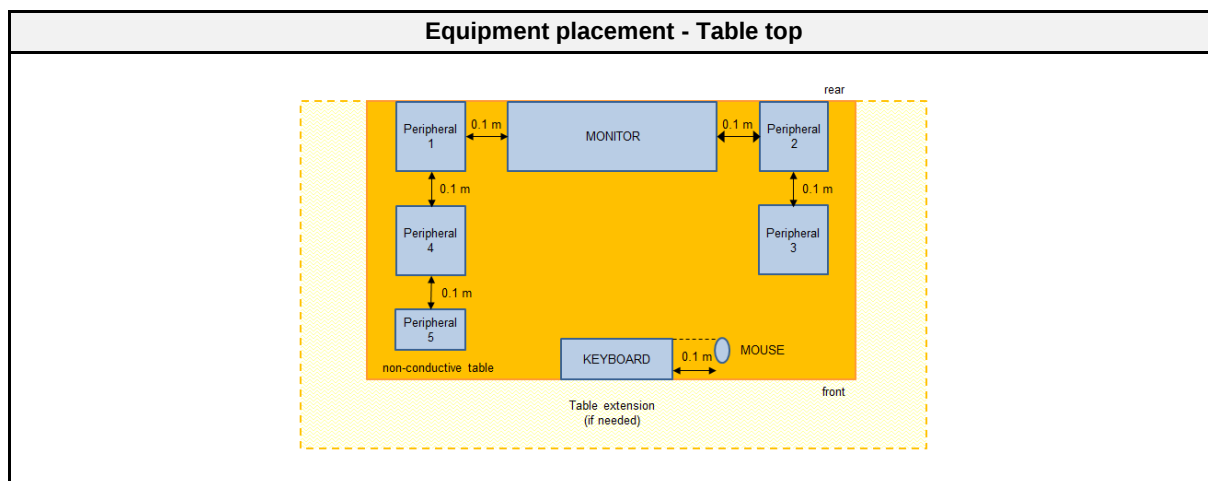
2.1 Test Conditions and Results - Radiated emissions acc. to ANSI C63.4

2.1.1 Information

Test Information	
Reference	FCC 15.109, ICES-003, 8, 6.1
Reference method	ANSI C63.4:2014 Section 8
Equipment class	Class B
Equipment type	Table top
Highest internal frequency [MHz]	6000
Measurement range	30 MHz to 30000 MHz
Temperature [°C]	21
Humidity [%]	52
Operator	Stephan Liebich
Date	2019-07-16

2.1.2 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	Rohde & Schwarz Vertriebs GmbH	ESU8	EF00379	2019-07	2020-07
40GHz Standard Gain Horn with Amplifier	Flann Microwave Ltd	22240-25 Amp. CBL26402075	EF00301	2016-11	2019-11
Spectrum analyzer	Rohde & Schwarz Vertriebs GmbH	FSW43	EF00896	2019-07	2020-07
40GHz High Gain Antenna	Amplifier Research	AT4560	EF00302	2019-05	2020-05
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	EF00018	2019-10	2021-10

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Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

		(1-18GHz)			
Climatic Sensor	Embedded Data Systems, LLC.	2800100000254 17E	EF01054	2019-05	2020-05
Anechoic chamber	Frankonia	AC1	EF00062	2018-07	2021-07

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 B @ 3 m		
Frequency [MHz]	Detector	Limit [dB μ V/m]
30 - 88	Quasi-peak	40
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46
960 - 1000	Quasi-peak	54
> 1000	Peak	74
	Average	54

Class A @ 10 m		
Frequency [MHz]	Detector	Limit [dB μ V/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	69.5
	Average	49.5

2.1.6 Results

Test Results			
Operational mode	EUT Configuration	Verdict	Remark
1	1	PASS	1
3	2	PASS	1
Comment: 1 → The test data of the worst-case conditions from 30 MHz to 26.5 GHz were recorded and shown on the next pages. No relevant peaks were detected above 26.5 GHz with Spectrum analyzer.			

Test Report No.: G0M-1905-8271-EF0115B-V01

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

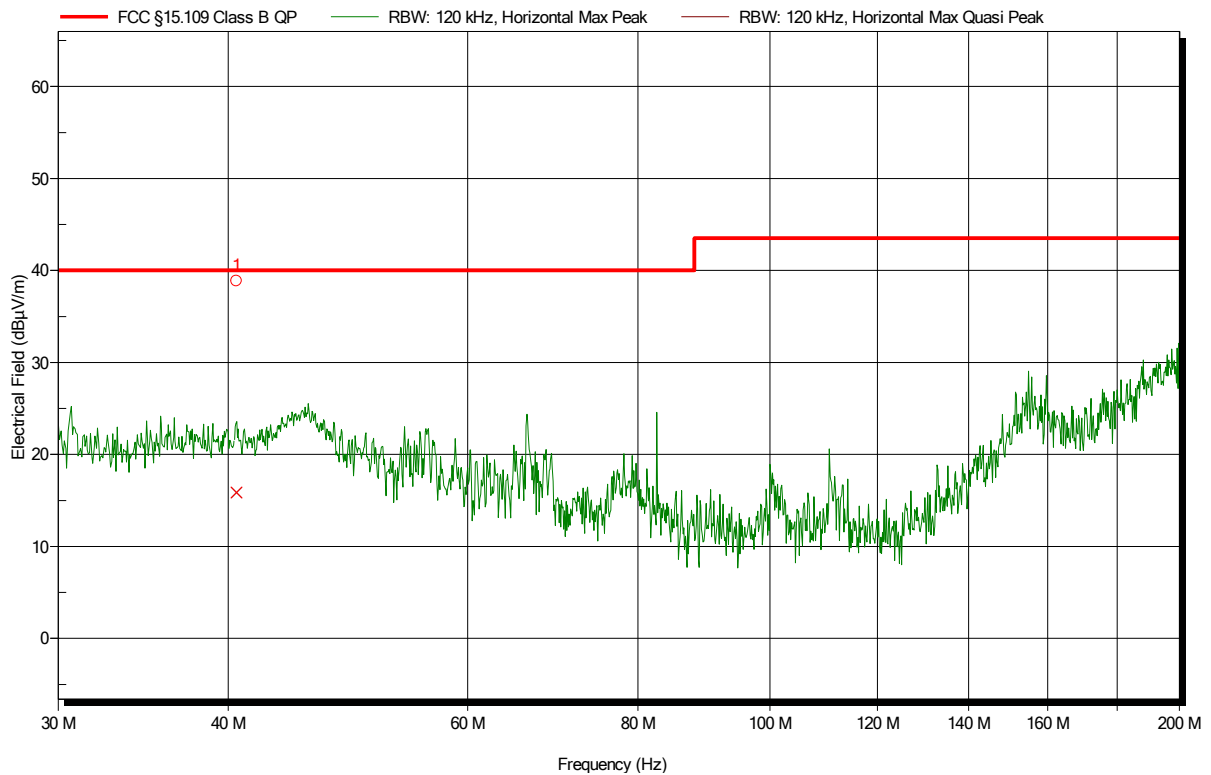
2.1.8 Records

Radiated emissions according to FCC Part 15b

Project number: G0M-1905-8271

Applicant: Leica Geosystems AG
 EUT Name: Imaging Laser Scanner
 Model: BLK2GO
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Conditions: Tnom: 21°C, Unom: 7.2 VDC (internal battery)
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: 1
 Test Date: 2019-07-16
 Note:

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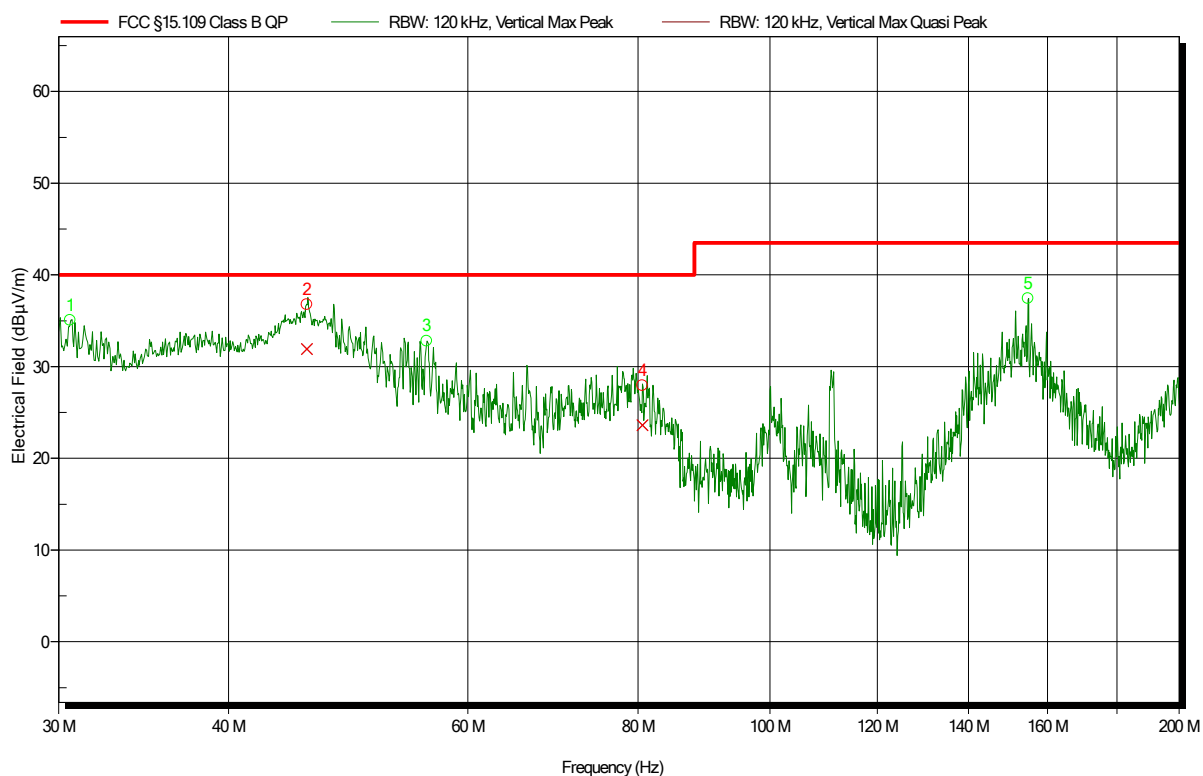
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	40.569 MHz	15.86 dBµV/m	40 dBµV/m	-24.14 dB	Pass	0 Degree	1 m

Radiated emissions according to FCC Part 15b

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Applicant: Leica Geosystems AG
 EUT Name: Imaging Laser Scanner
 Model: BLK2GO
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Conditions: Tnom: 21°C, Unom: 7.2 VDC (internal battery)
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: 1
 Test Date: 2019-07-16
 Note:

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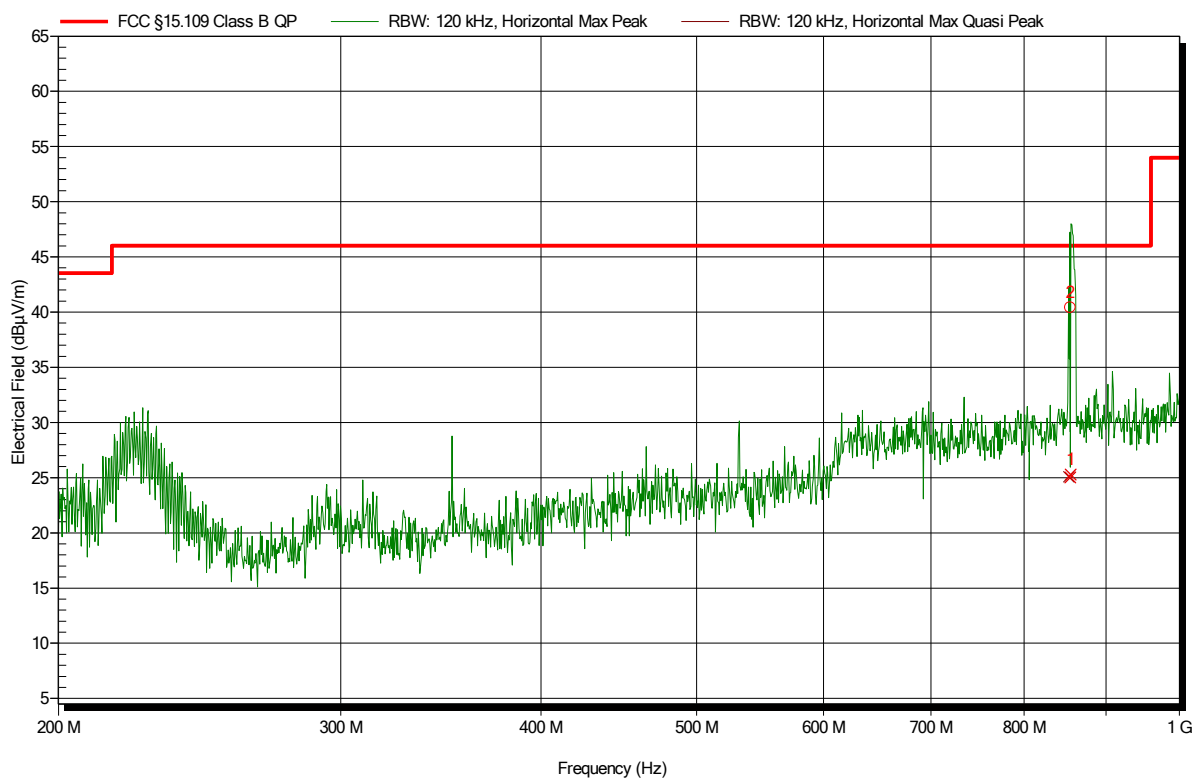
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	30.6 MHz					0 Degree	1 m
2	45.673 MHz	31.92 dBμV/m	40 dBμV/m	-8.08 dB	Pass	0 Degree	1 m
3	55.941 MHz					0 Degree	1 m
4	80.61 MHz	23.6 dBμV/m	40 dBμV/m	-16.4 dB	Pass	0 Degree	1 m
5	154.843 MHz					0 Degree	1 m

Radiated emissions according to FCC Part 15b

Project number: G0M-1905-8271

Applicant: Leica Geosystems AG
 EUT Name: Imaging Laser Scanner
 Model: BLK2GO
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Conditions: Tnom: 21°C, Unom: 7.2 VDC (internal battery)
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: 1
 Test Date: 2019-07-16

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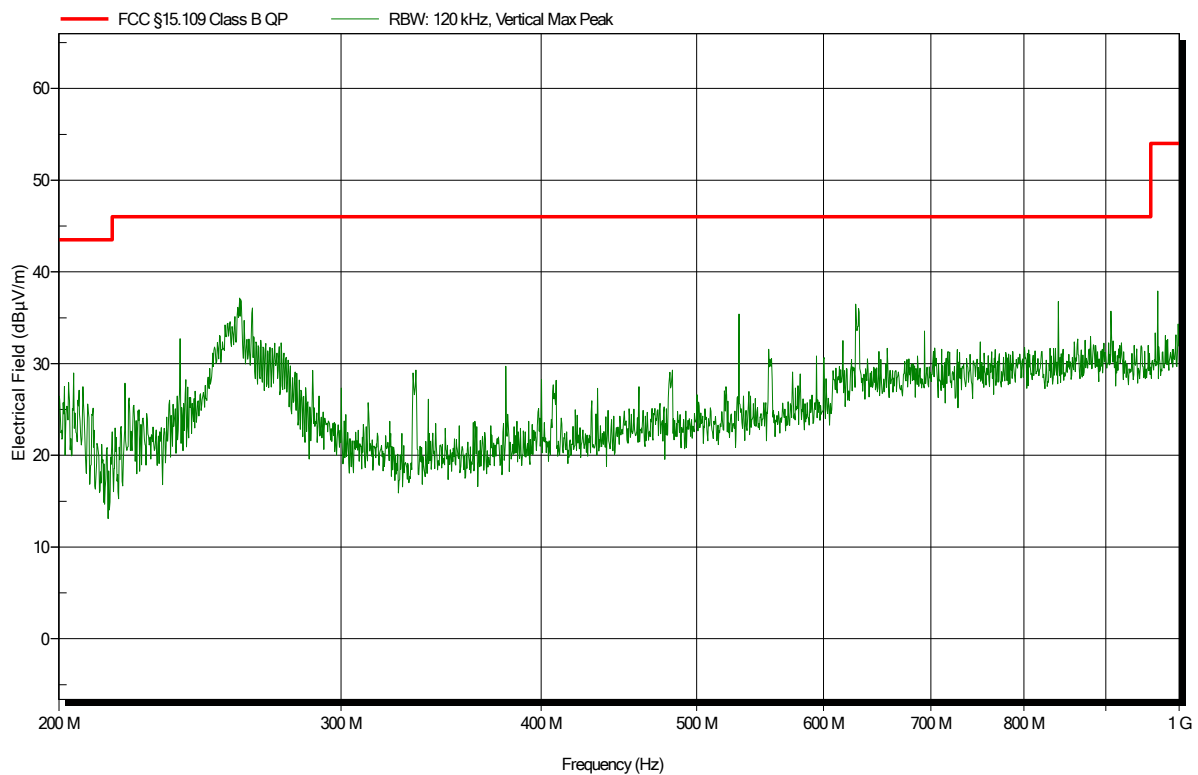
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	855.436 MHz	25.29 dBμV/m	46.02 dBμV/m	-20.73 dB	Pass	71 Degree	1 m
2	854.955 MHz	25.02 dBμV/m	46.02 dBμV/m	-21 dB	Pass	71 Degree	1 m

Radiated emissions according to FCC Part 15b

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Applicant:	Leica Geosystems AG
EUT Name:	Imaging Laser Scanner
Model:	BLK2GO
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Liebich
Test Conditions:	Tnom: 21°C, Unom: 7.2 VDC (internal battery)
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	1
Test Date:	2019-07-16
Note:	Angle: 0°; Height: 187 cm

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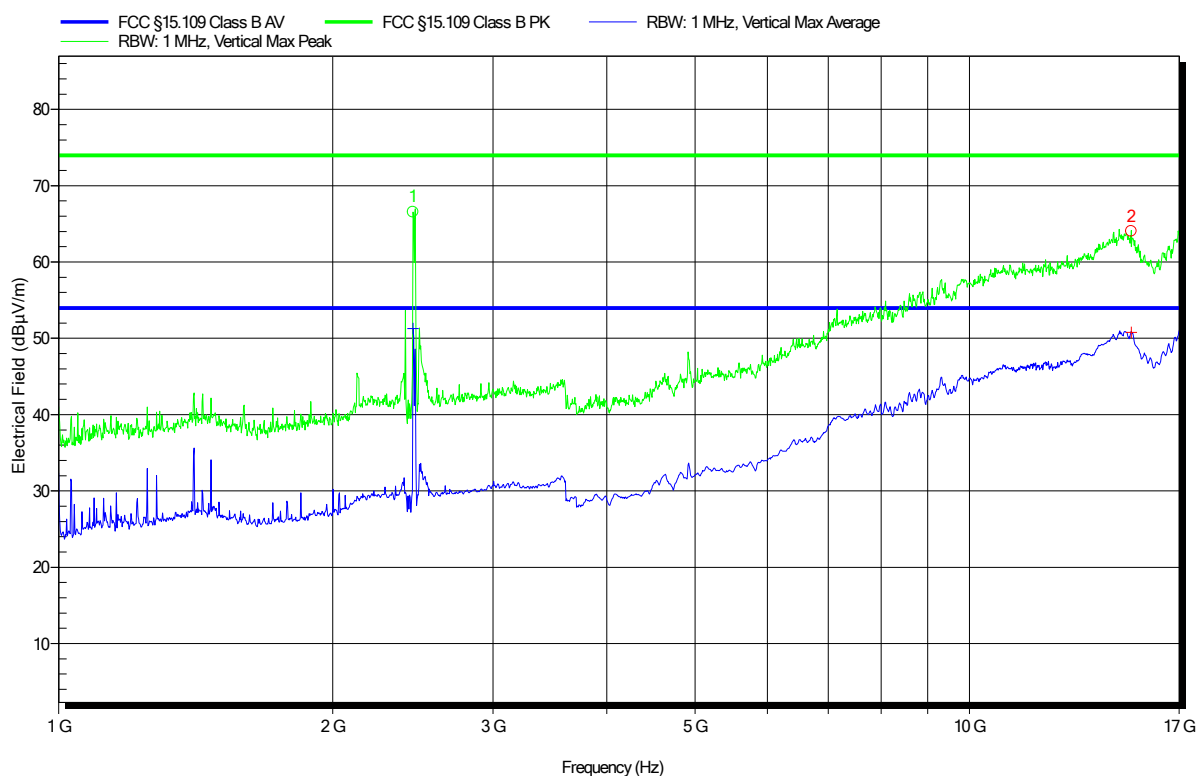


Radiated emissions according to FCC Part 15b

Project number: G0M-1905-8271

Applicant: Leica Geosystems AG
 EUT Name: Imaging Laser Scanner
 Model: BLK2GO
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Conditions: Tnom: 21°C, Unom: 7.2 VDC (internal battery)
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: 1
 Test Date: 2019-07-16
 Note:

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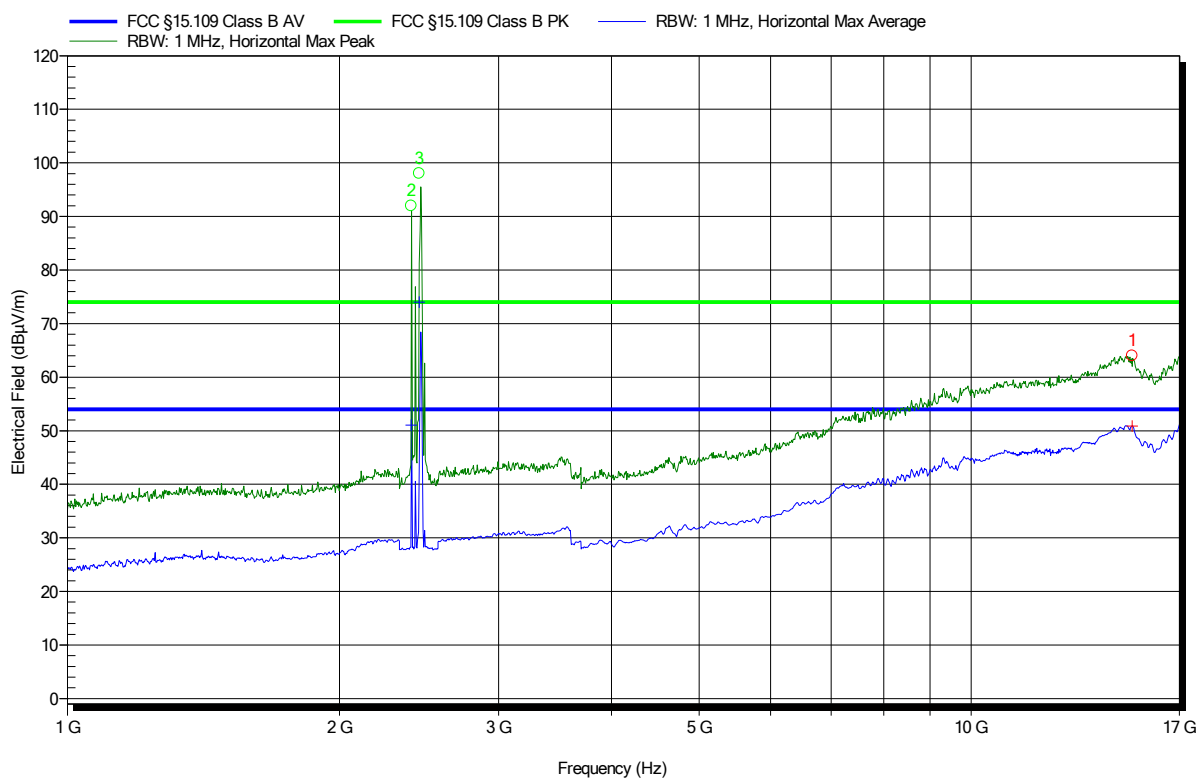
Peak Number 1	Frequency 2.45 GHz	WLAN Carrier				Angle 0 Degree	Height 1 m
Peak Number 2	Frequency 15.063 GHz	Peak 64.03 dBμV/m	Peak Limit 73.98 dBμV/m	Peak Difference -9.95 dB	Peak Status Pass	Angle 0 Degree	Height 1 m
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
2	15.063 GHz	50.78 dBμV/m	53.98 dBμV/m	-3.2 dB	Pass	0 Degree	1 m

Radiated emissions according to FCC Part 15b

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 EUT Name: Imaging Laser Scanner
 Model: BLK2GO
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Conditions: Tnom: 21°C, Unom: 7.2 VDC (internal battery)
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: 1
 Test Date: 2019-07-16
 Note:

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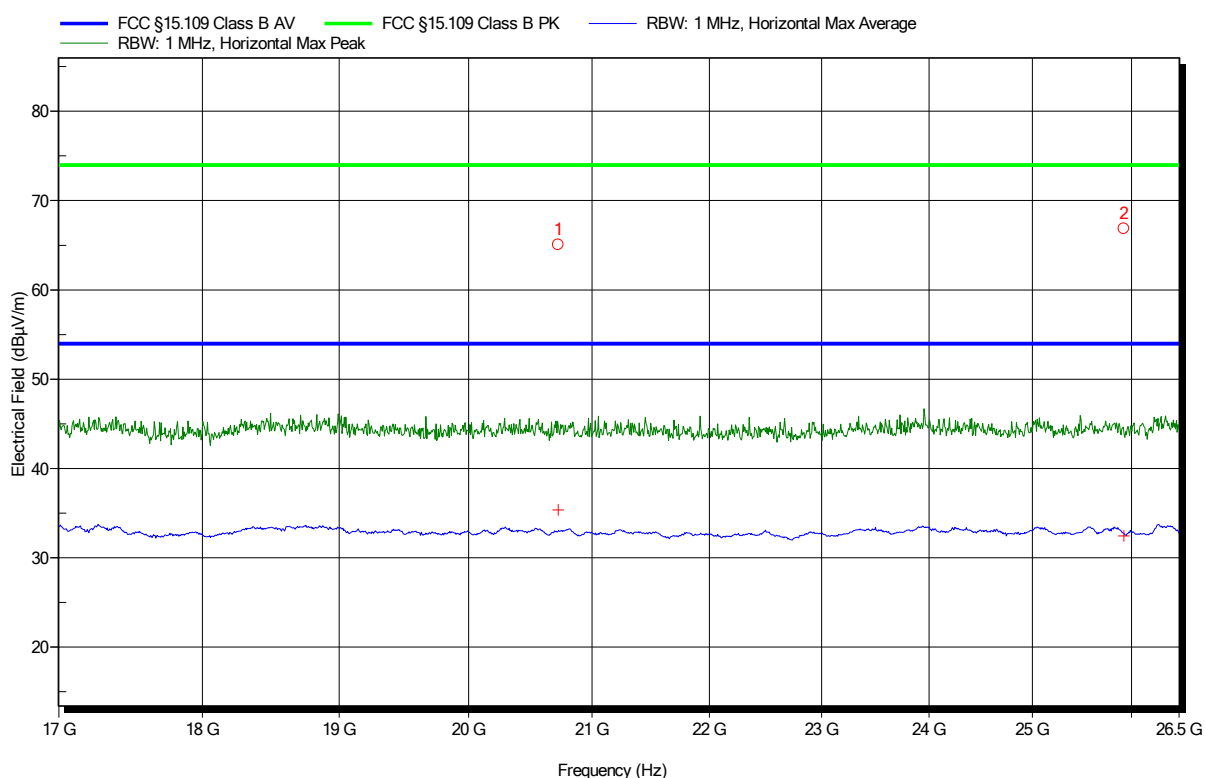
Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	15.07 GHz	64.01 dBµV/m	73.98 dBµV/m	-9.97 dB	Pass	0 Degree	1 m
Peak Number	Frequency						Height
2	2.402 GHz	WLAN Carrier					1 m
3	2.451 GHz						1 m
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	15.07 GHz	50.88 dBµV/m	53.98 dBµV/m	-3.1 dB	Pass	0 Degree	1 m

Radiated emissions according to FCC Part 15b

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 EUT Name: Imaging Laser Scanner
 Model: BLK2GO
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Conditions: Tnom: 21°C, Unom: 7.2 VDC (internal battery)
 Antenna: AT4560, Horizontal
 Measurement distance: 3 m
 Mode: 1
 Test Date: 2019-07-16
 Note:

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Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	20.723 GHz	65.06 dBµV/m	73.98 dBµV/m	-8.92 dB	Pass	0 Degree	1 m
2	25.922 GHz	66.86 dBµV/m	73.98 dBµV/m	-7.12 dB	Pass	0 Degree	1 m

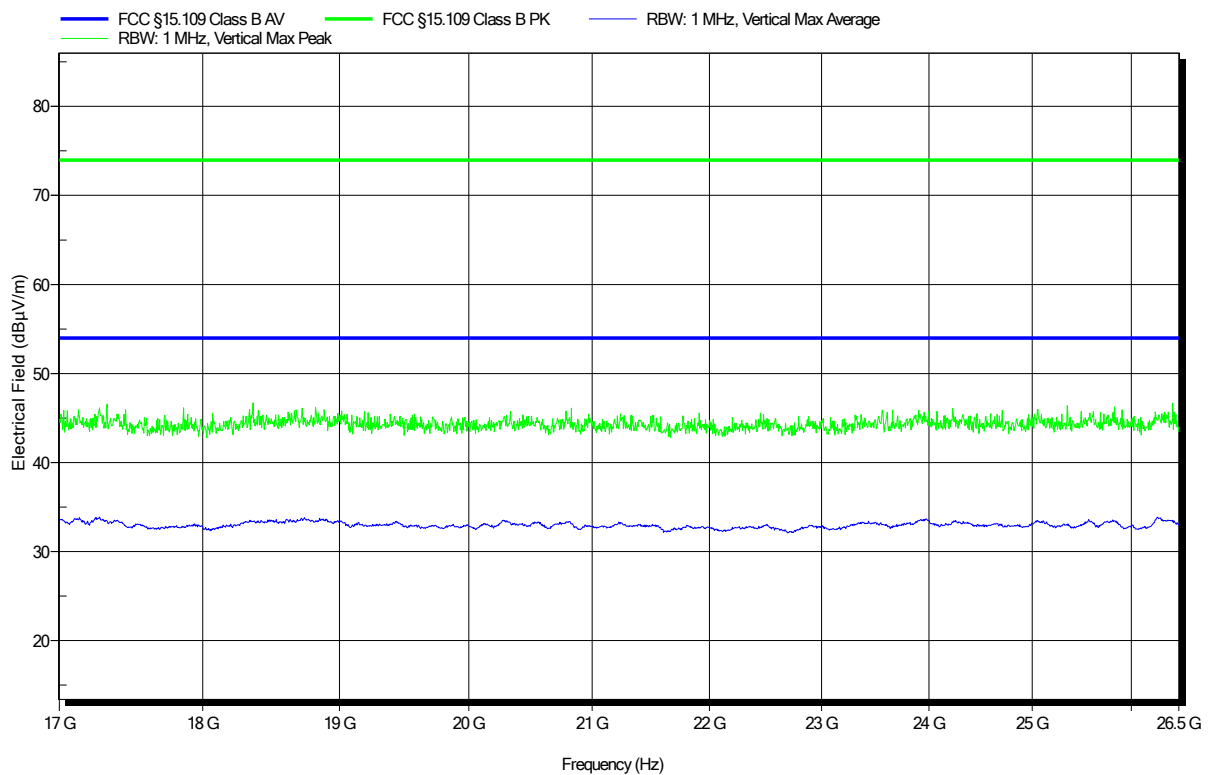
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	20.723 GHz	35.35 dBµV/m	53.98 dBµV/m	-18.63 dB	Pass	0 Degree	1 m
2	25.922 GHz	32.44 dBµV/m	53.98 dBµV/m	-21.54 dB	Pass	0 Degree	1 m

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EUT Name:	Imaging Laser Scanner
Model:	BLK2GO
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Liebich
Test Conditions:	Tnom: 21°C, Unom: 7.2 VDC (internal battery)
Antenna:	AT4560, Vertical
Measurement distance:	3 m
Mode:	1
Test Date:	2019-07-16
Note:	Angle: 0°; Height: 100 cm

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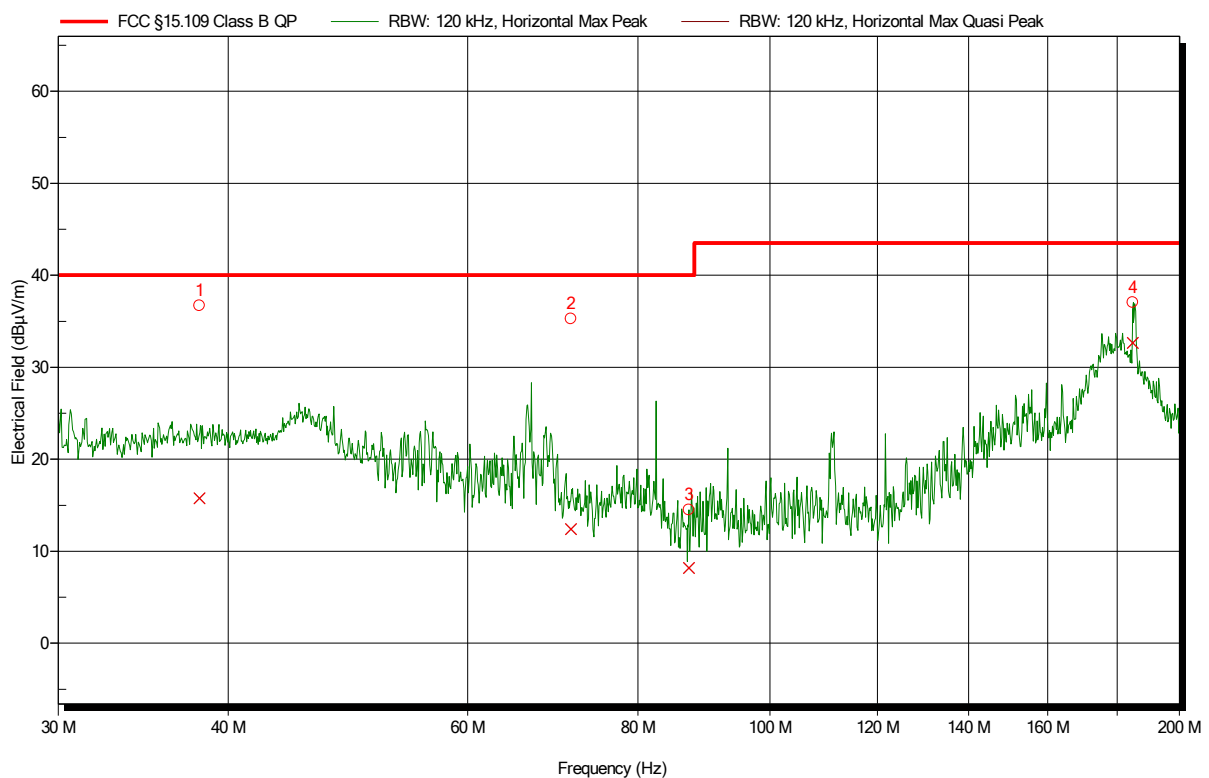


Radiated emissions according to FCC Part 15b

Project number: G0M-1905-8271

Applicant: Leica Geosystems AG
EUT Name: Imaging Laser Scanner
Model: BLK2GO
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Conditions: Tnom: 21°C, Unom: 120 V / 60 Hz (external power supply)
Antenna: Rohde & Schwarz HK 116, Horizontal
Measurement distance: 3 m
Mode: 3
Test Date: 2019-07-16
Note: Angle: 150°; Height: 100 cm

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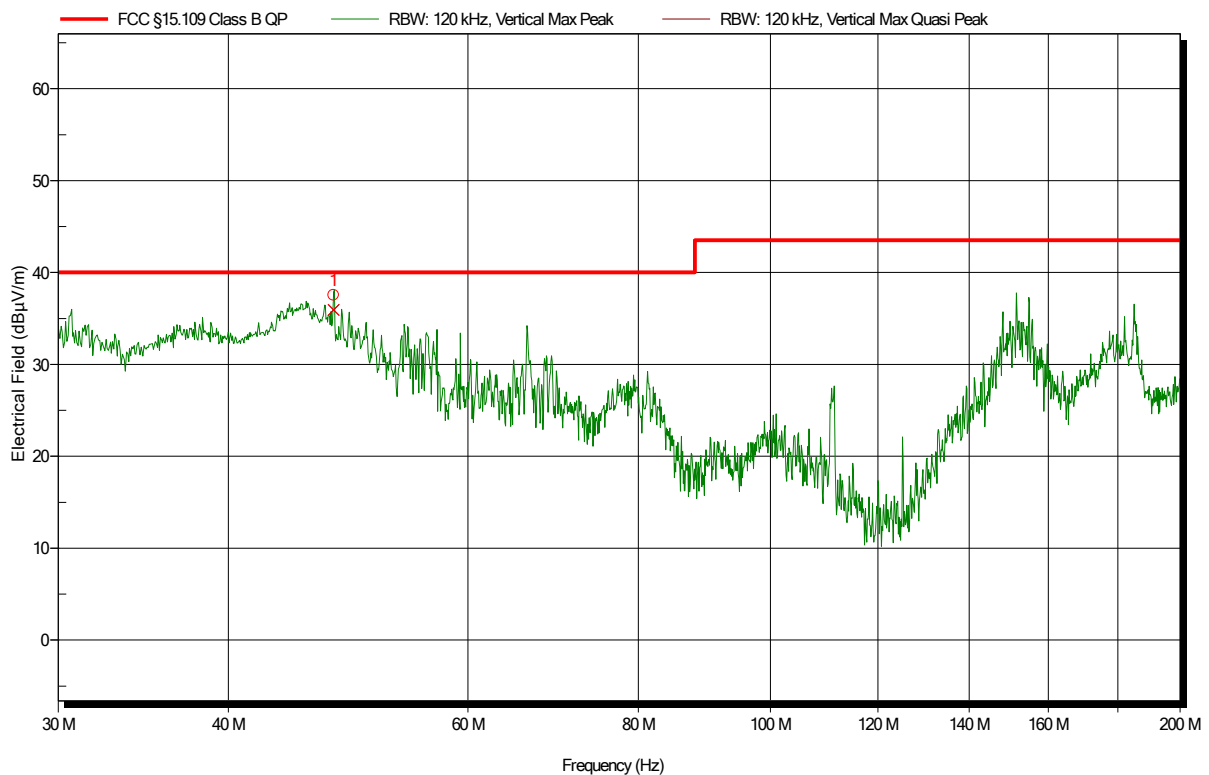
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	38.107 MHz	15.77 dBμV/m	40 dBμV/m	-24.23 dB	Pass	150 Degree	1 m
2	71.434 MHz	12.4 dBμV/m	40 dBμV/m	-27.6 dB	Pass	150 Degree	1 m
3	87.203 MHz	8.19 dBμV/m	40 dBμV/m	-31.81 dB	Pass	150 Degree	1 m
4	184.8 MHz	32.64 dBμV/m	43.52 dBμV/m	-10.88 dB	Pass	150 Degree	1 m

Radiated emissions according to FCC Part 15b

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 Operator: Mr. Liebich
 Test Conditions: Tnom: 21°C, Unom: 120 V / 60 Hz (external power supply)
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: 3
 Test Date: 2019-07-16
 Note:

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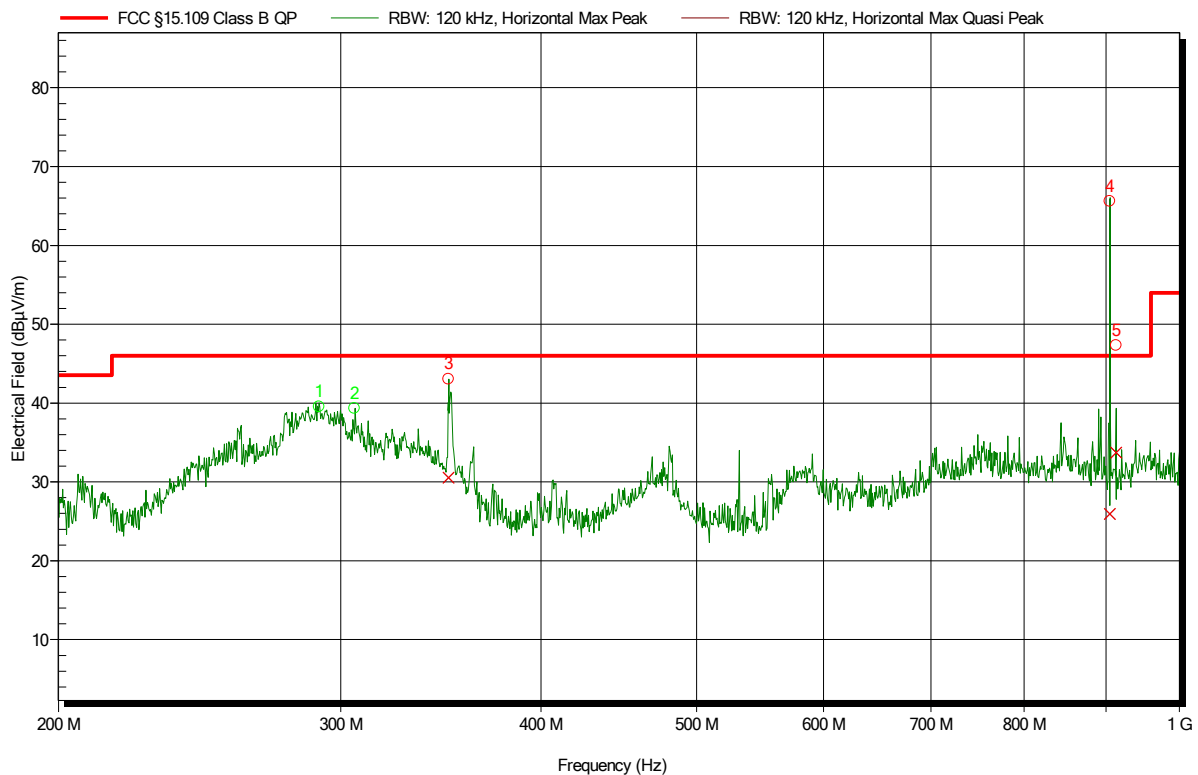
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	47.799 MHz	35.93 dBµV/m	40 dBµV/m	-4.07 dB	Pass	0 Degree	1 m

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 Model: BLK2GO
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Conditions: Tnom: 21°C, Unom: 120 V / 60 Hz (external power supply)
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: 3
 Test Date: 2019-07-16

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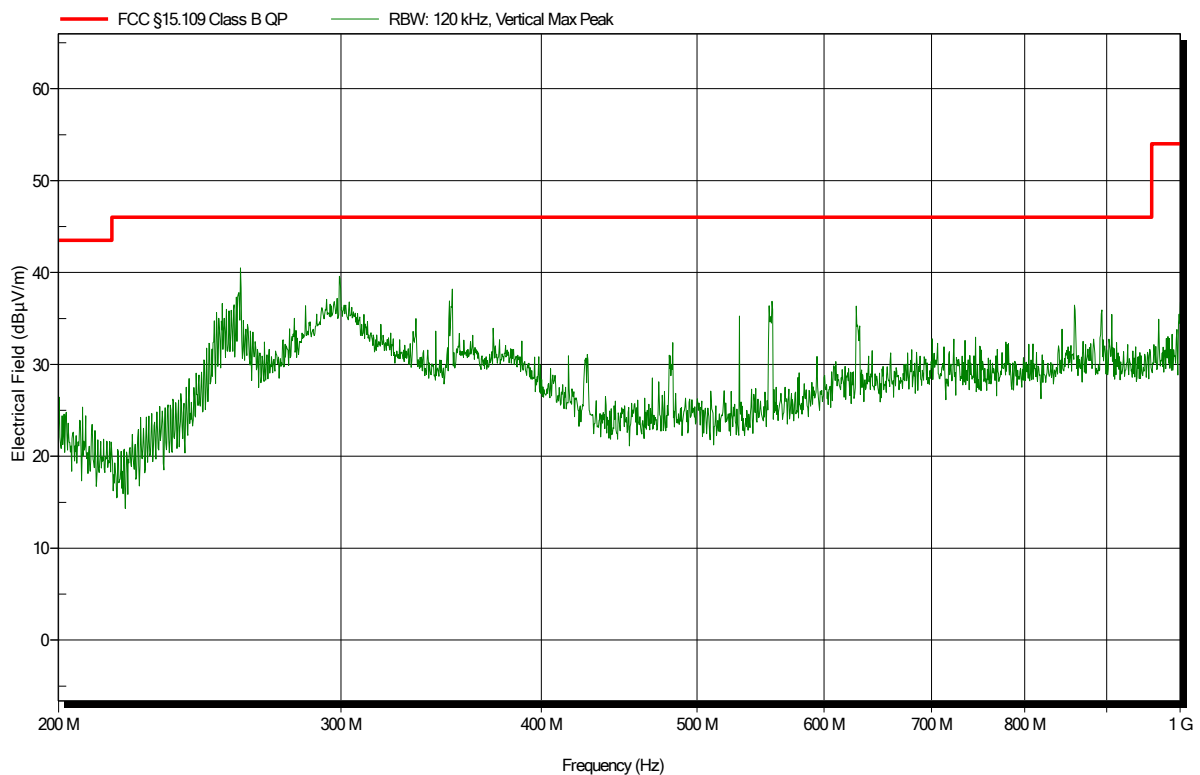
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	290.904 MHz					91 Degree	1 m
2	306.094 MHz					91 Degree	1 m
3	350.327 MHz	30.55 dBμV/m	46.02 dBμV/m	-15.47 dB	Pass	91 Degree	1 m
4	904.893 MHz	25.94 dBμV/m	46.02 dBμV/m	-20.09 dB	Pass	91 Degree	1 m
5	913.239 MHz	33.73 dBμV/m	46.02 dBμV/m	-12.29 dB	Pass	91 Degree	1 m

Radiated emissions according to FCC Part 15b

Project number: G0M-1905-8271

Applicant:	Leica Geosystems AG
EUT Name:	Imaging Laser Scanner
Model:	BLK2GO
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Liebich
Test Conditions:	Tnom: 21°C, Unom: 120 V / 60 Hz (external power supply)
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	3
Test Date:	2019-07-16
Note:	Angle: 55°; Height: 172 cm

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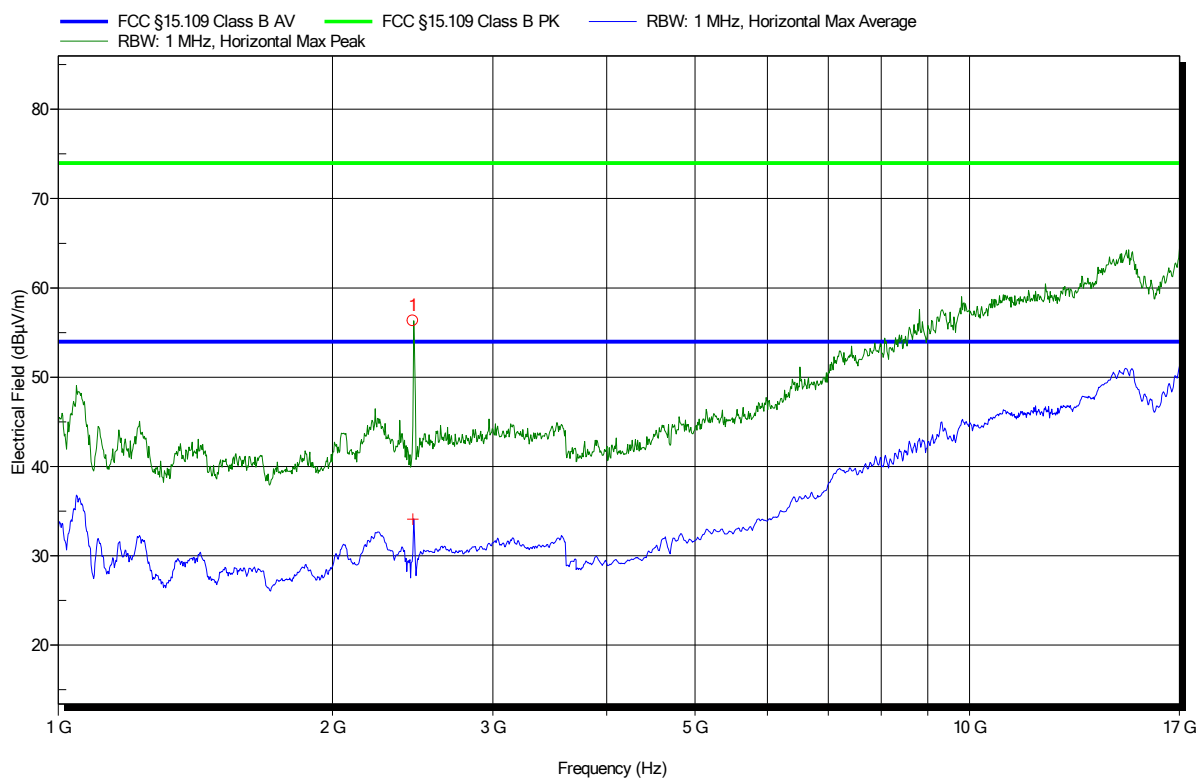


Radiated emissions according to FCC Part 15b

Project number: G0M-1905-8271

Applicant: Leica Geosystems AG
EUT Name: Imaging Laser Scanner
Model: BLK2GO
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Conditions: Tnom: 21°C, Unom: 120 V / 60 Hz (external power supply)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 3 m
Mode: 3
Test Date: 2019-07-16
Note:

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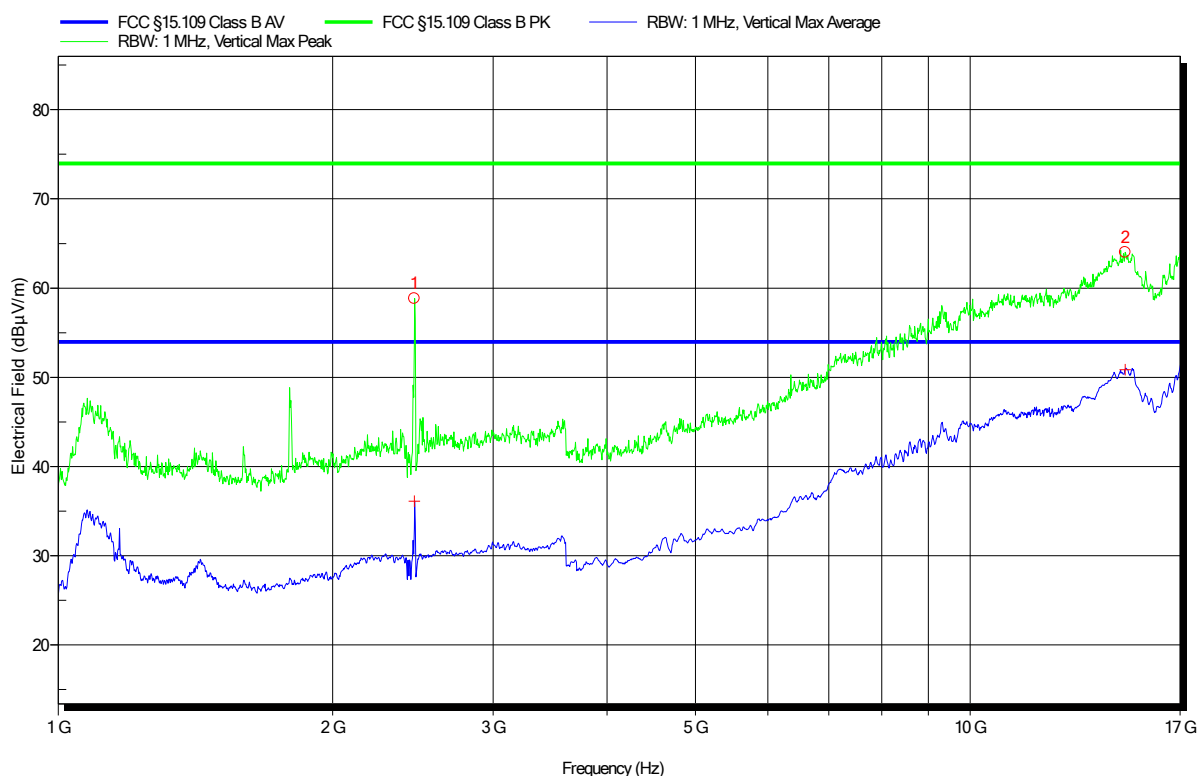
Peak Number	Frequency	WLAN Carrier	Angle	Height
1	2.451 GHz	WLAN Carrier	0 Degree	1 m

Radiated emissions according to FCC Part 15b

Project number: G0M-1905-8271

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 EUT Name: Imaging Laser Scanner
 Model: BLK2GO
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Liebich
 Test Conditions: Tnom: 21°C, Unom: 120 V / 60 Hz (external power supply)
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: 3
 Test Date: 2019-07-16
 Note:

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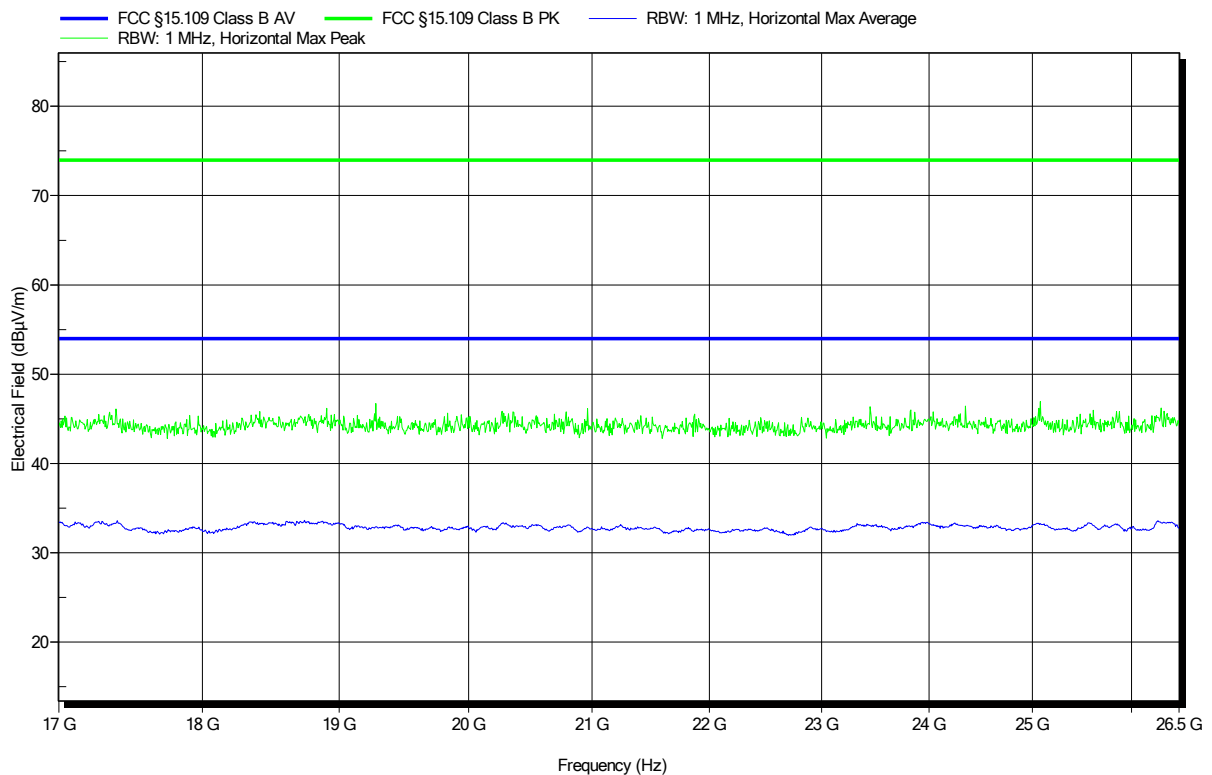
Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
2	14.79 GHz	64.02 dBµV/m	73.98 dBµV/m	-9.96 dB	Pass	0 Degree	1 m
Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.459 GHz	WLAN Carrier				0 Degree	1 m
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
2	14.79 GHz	50.84 dBµV/m	53.98 dBµV/m	-3.13 dB	Pass	0 Degree	1 m

Radiated emissions according to FCC Part 15b

Project number: G0M-1905-8271

Applicant:	Leica Geosystems AG
EUT Name:	Imaging Laser Scanner
Model:	BLK2GO
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Liebich
Test Conditions:	Tnom: 21°C, Unom: 120 V / 60 Hz (external power supply)
Antenna:	AT4560, Horizontal
Measurement distance:	3 m
Mode:	3
Test Date:	2019-07-16
Note:	Angle: 0°; Height: 100 cm

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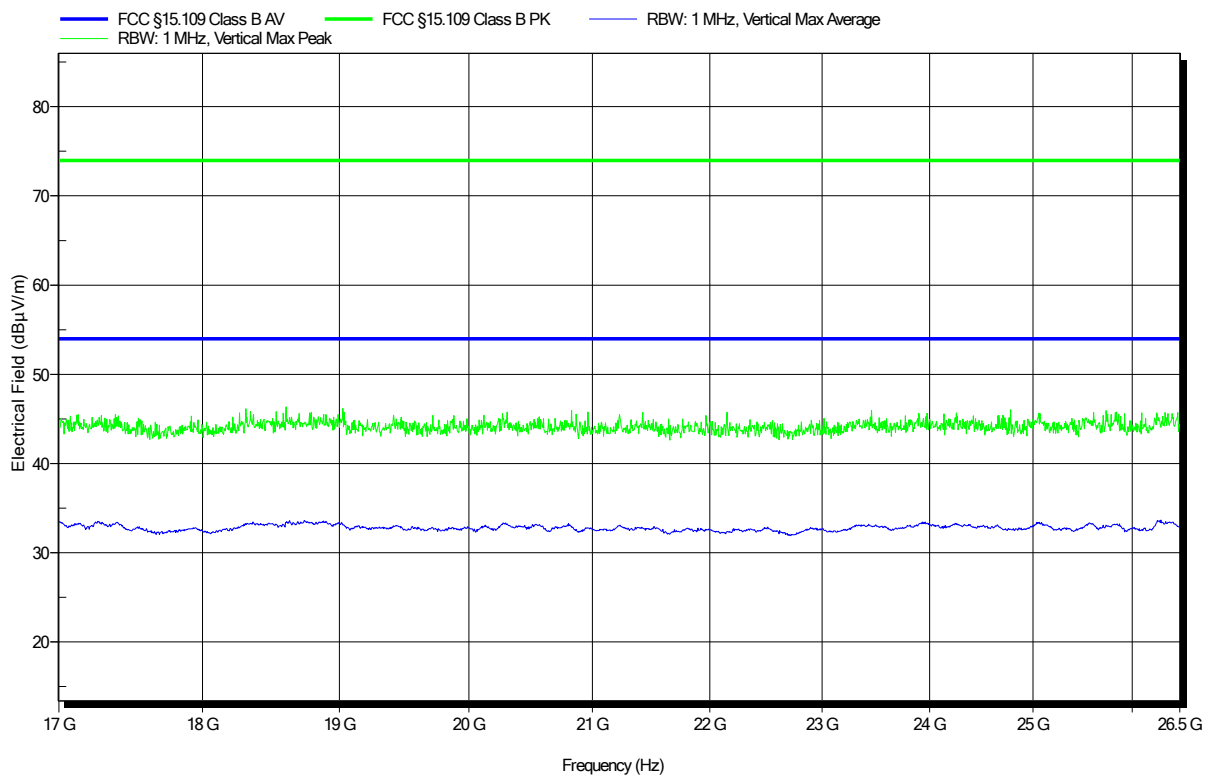


Radiated emissions according to FCC Part 15b

Project number: G0M-1905-8271

Applicant:	Leica Geosystems AG
EUT Name:	Imaging Laser Scanner
Model:	BLK2GO
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Liebich
Test Conditions:	Tnom: 21°C, Unom: 120 V / 60 Hz (external power supply)
Antenna:	AT4560, Vertical
Measurement distance:	3 m
Mode:	3
Test Date:	2019-07-16
Note:	Angle: 0°; Height: 100 cm

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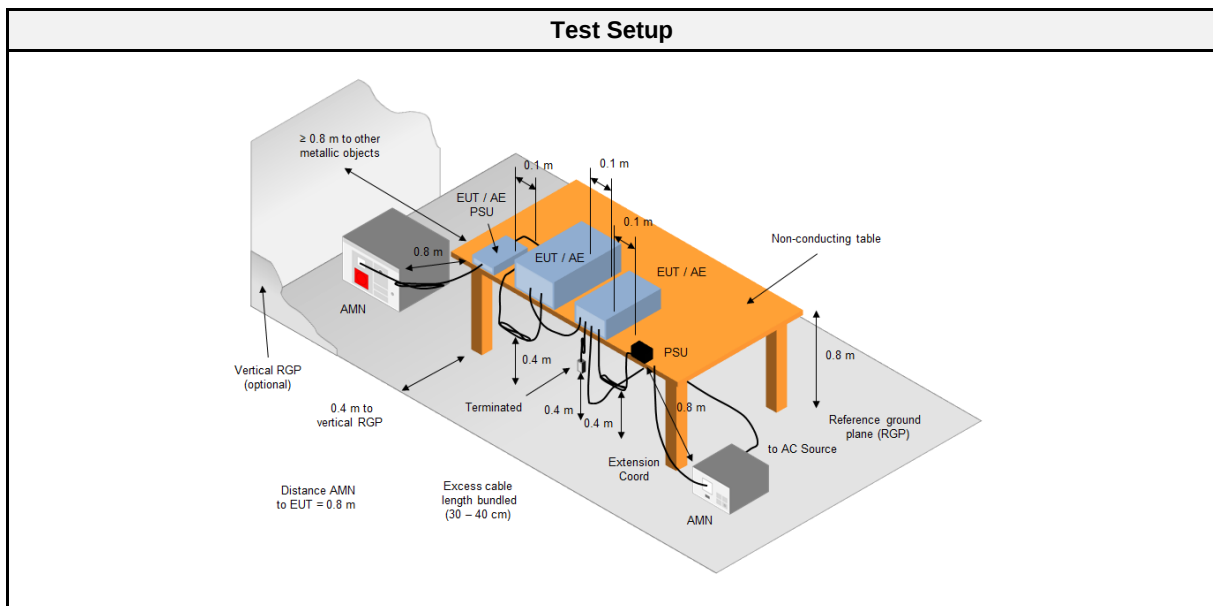
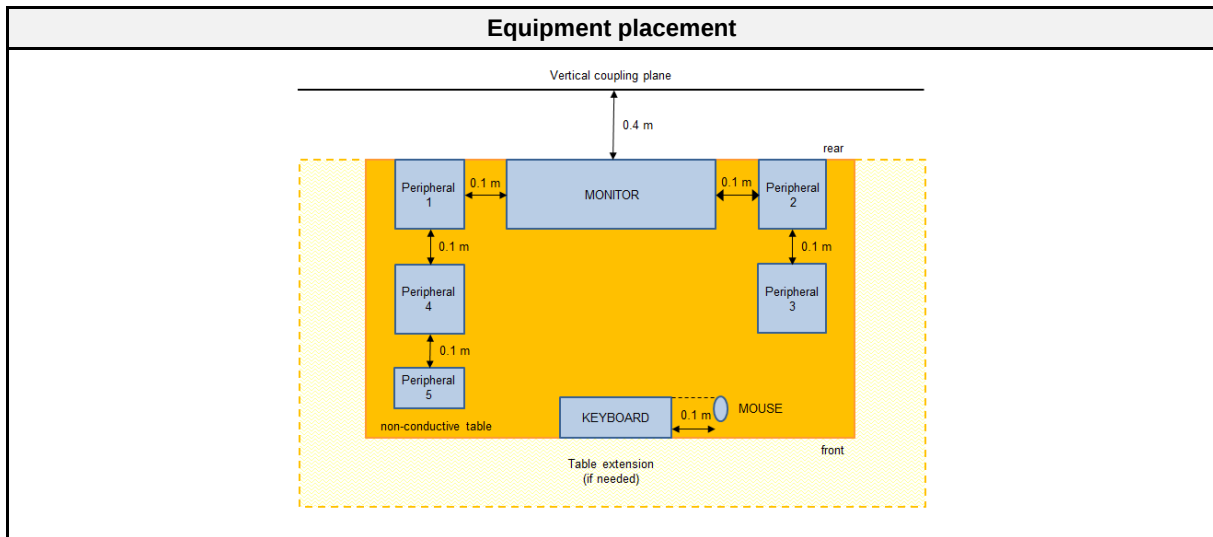


2.2 Test Conditions and Results - Conducted emissions acc. to ANSI C63.4

2.2.1 Information

Test Information	
Reference	FCC 15.107, ICES-003, 8, 6.2
Reference method	ANSI C63.4:2014 Section 12
Measurement range	150 kHz to 30 MHz
Equipment class	Class B
Equipment type	Table top
Temperature [°C]	21
Humidity [%]	52
Operator	Stephan Liebich
Date	2019-07-17

2.2.2 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	ESH3-Z5	EF00036	2017-01	2019-07
Pulse Limiter	R&S	ESH3-Z2	EF01063	2018-07	2019-07
EMI Test Receiver	R&S	ESR 7	EF00943	2018-07	2019-07

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

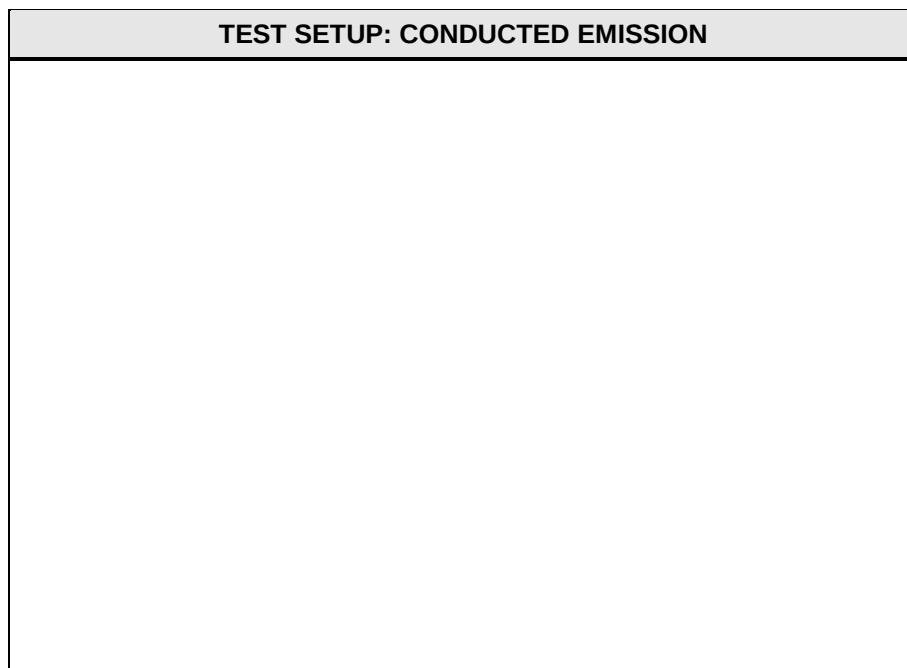
2.2.5 Limits

Class B		
Frequency [MHz]	Quasi-peak Limit [dBμV]	Average Limit [dBμV]
0.15 - 0.5	66 - 56 *	56 - 46 *
0.5 - 5	56	46
5 - 30	60	50
* Decreases with the logarithm of the frequency		

2.2.6 Results

AC power line conducted emissions					
Port	Coupling	Operational mode	EUT Configuration	Verdict	Remark
USB	AMN	3	2	PASS	1
Comment: 1 → The test data of the worst-case conditions were recorded and shown on the next pages.					

2.2.7 Setup Photos



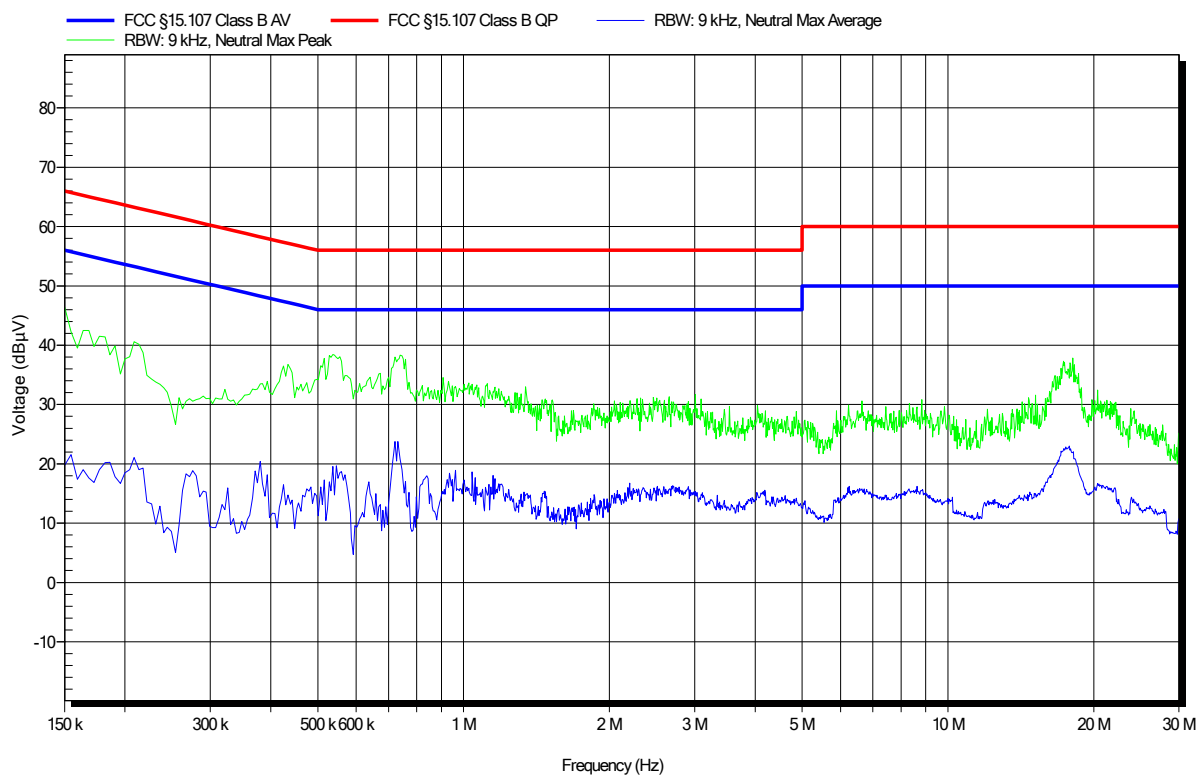
2.2.8 Records

EMI voltage test in the ac-mains according to ICES-003, FCC Part 15b

Project number: G0M-1905-8271

Applicant:	Leica Geosystems AG
EUT Name:	Imaging Laser Scanner
Model:	BLK2GO
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Liebich
Test Conditions:	Tnom: 21°C, Unom: 120 V / 60 Hz (external power supply)
LISN:	ESH3-Z5 (N)
Mode:	3
Test Date:	2019-07-17
Note:	

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EMI voltage test in the ac-mains according to ICES-003, FCC Part 15b

Project number: G0M-1905-8271

Applicant: Leica Geosystems AG
EUT Name: Imaging Laser Scanner
Model: BLK2GO
Test Site: Eurofins Product Service GmbH
Operator: Mr. Liebich
Test Conditions: Tnom: 21°C, Unom: 120 V / 60 Hz (external power supply)
LISN: ESH3-Z5 (L)
Mode: 3
Test Date: 2019-07-17
Note:

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