

FCC TEST REPORT FCC 47 CFR Part 15E Industry Canada RSS-247 Digital transmission systems operating within the 5150 – 5350 and 5470 – 5850 MHz band	
Report Reference No.	G0M-1510-5172-TFC407WF-161-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	  A2LA Accredited Testing Laboratory, Certificate No.: 1983.01 FCC Filed Test Laboratory, Reg.-No.: 96970 IC OATS Filing assigned code: 3470A
Applicant's name	u-blox Berlin GmbH
Address	Rudower Chaussee 9 12489 Berlin GERMANY
Test specification:	
Standard	47 CFR Part 15E RSS-247, Issue 1, 2015-05 RSS-Gen, Issue 4, 2014-11 ANSI C63.10:2013 ANSI C63.4:2014
Test scope	partial radio compliance test according to customer request
Equipment under test (EUT):	
Product description	WLAN/Bluetooth multi-radio host-based module
Model No.	ELLA-W1
Additional Model(s)	None
Brand Name(s)	None
Hardware version	G8, mounted on eval board version 1.01
Firmware / Software version	MFG firmware
	FCC-ID: none IC: none
Test result	Passed

Possible test case verdicts:

- neither assessed nor tested : N/N
- required by standard but not appl. to test object : N/A
- required by standard but not tested : N/T
- not required by standard for the test object : N/R
- test object does meet the requirement : P (Pass)
- test object does not meet the requirement : F (Fail)

Testing:

Test Lab Temperature : 20 – 23 °C

Test Lab Humidity : 32 – 38 %

Date of receipt of test item : 2015-11-02

Date (s) of performance of tests : 2015-11-02 - 2015-11-16

Compiled by : Toralf Jahn

Tested by (+ signature) : Toralf Jahn 
 (Responsible for Test)

Approved by (+ signature) : Christian Weber 
 (Head of Lab)

Date of issue : 2015-12-23

Total number of pages : 128

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:

This test report is for the versions ELLA-W161-A and ELLA-W161.

Version History

Version	Issue Date	Remarks	Revised by
01	2015-12-23	Initial Release	

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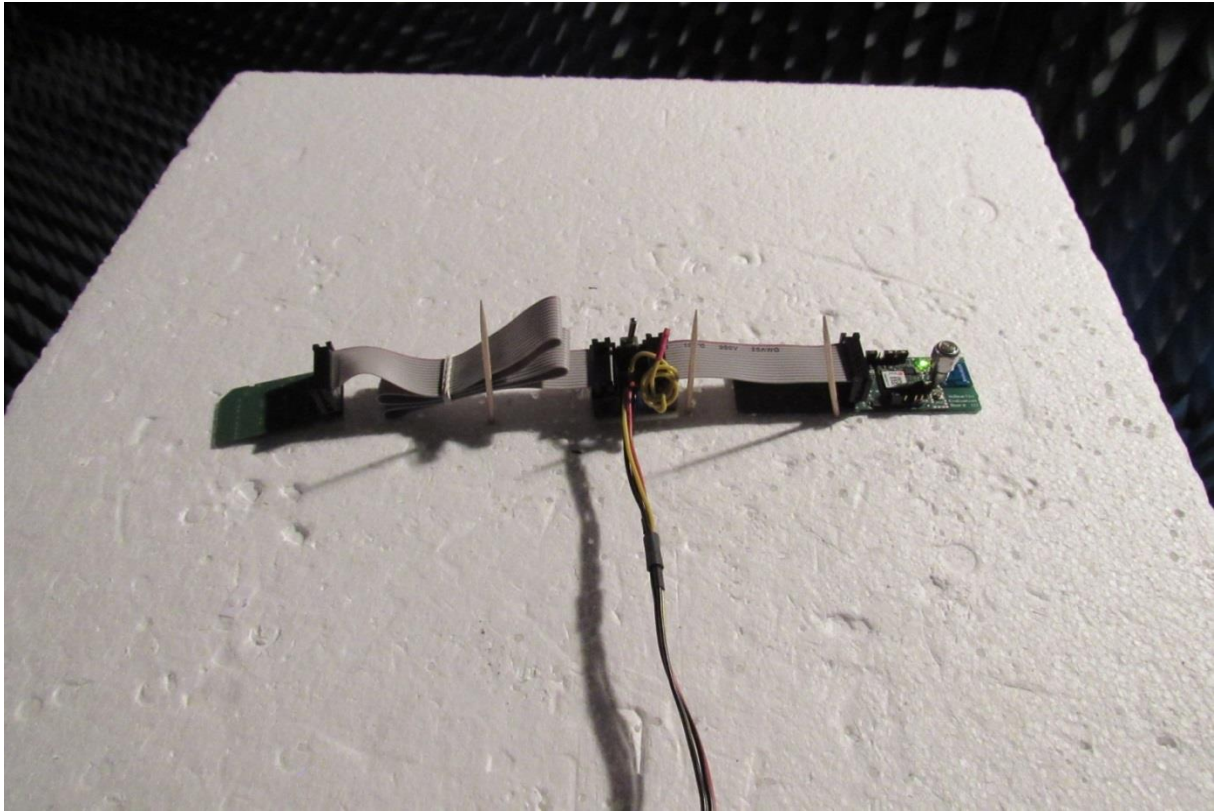
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1 Equipment (Test item) Description

Description	WLAN/Bluetooth multi-radio host-based module	
Model	ELLA-W1	
Additional Model(s)	None	
Brand Name(s)	None	
Serial number	None	
Hardware version	G8, mounted on eval board version 1.01	
Software / Firmware version	MFG firmware	
FCC-ID	none	
IC	none	
Equipment type	End product	
Radio type	Transceiver	
Radio technology	IEEE 802.11 a/n	
Master / Client capabilities	Client without radar detection	
Operating frequency range	5180 - 5700 MHz	
Assigned frequency band	5150 - 5725 MHz	
Main test frequencies	Channel 40	5200 MHz
	Channel 60	5300 MHz
	Channel 100	5500 MHz
	Channel 140	5700 MHz
Spreading	OFDM	
Modulations	BPSK, QPSK, 16-QAM, 64-QAM	
Channel spacing	20 / 40MHz	
Number of antennas	none	
Antenna	Type	N/A
	Model	N/A
	Manufacturer	N/A
	Gain	N/A
Manufacturer	u-blox Berlin GmbH Rudower Chaussee 9 12489 Berlin GERMANY	
Power supply	V _{NOM}	3.3 VDC
	V _{MIN}	3.0 VDC
	V _{MAX}	3.6 VDC
Temperature range	T _{NOM}	+25°C
	T _{MIN}	-40°C
	T _{MAX}	+85°C

AC/DC-Adaptor	Model	N/A
	Vendor	N/A
	Input	N/A
	Output	N/A

1.1 Photos – Test setup



1.2 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
AE	Development board	lesswire AG	WiBear11n-SF1-EK	Mounting of EUT
CABL	Flat ribbon cable	unspecific	unspecific	SDIO connection to control PC
AE	Interface card	DeLock	91481	SDIO interface on PC
AE	power supply	Statron	2224.7	
*Note: Use the following abbreviations: AE : Auxiliary/Associated Equipment, or SIM : Simulator (Not Subjected to Test) CABL : Connecting cables				

1.3 Test Modes

Mode #	Description	
OFDM	General conditions:	EUT powered by laboratory power supply.
	Radio conditions:	Mode = standalone transmit Spreading = OFDM Modulation = BPSK Data rate = 6 Mbps Bandwidth = 20 MHz Duty cycle = 100 % Power level = 15 dBm firmware setting
HT20	General conditions:	EUT powered by laboratory power supply.
	Radio conditions:	Mode = standalone transmit Spreading = OFDM Modulation = MCS0 (BPSK) Data rate = 6.5 Mbps Bandwidth = 20 MHz Duty cycle = 100 % Power level = 15 dBm firmware setting
HT40	General conditions:	EUT powered by laboratory power supply.
	Radio conditions:	Mode = standalone transmit Spreading = OFDM Modulation = MCS0 (BPSK) Data rate = 6.5 Mbps Bandwidth = 40 MHz Duty cycle = 100 % Power level = 15 dBm firmware setting

1.4 Test Equipment Used During Testing

Measurement Software			
Description	Manufacturer	Name	Version
EMC Test Software	Dare Instruments	Radimation	2014.1.15

Conducted spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum analyzer	R&S	FSW43	EF00896	2015-03	2016-03

Radiated spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-anechoic chamber	Frankonia	AC 1	EF00062	-	-
Spectrum Analyzer	R&S	FSIQ26	EF00242	2015-04	2016-04
Biconical Antenna	R&S	HK 116	EF00012	2013-02	2016-02
LPD Antenna	R&S	HL 223	EF00187	2014-03	2017-03
LPD Antenna	R&S	HL 025	EF00327	2015-10	2018-10

1.5 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 analyzer in dBμV. Any external preamplifiers used are taken into account through internal analyzer 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 analyzer. 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:

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

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	=	47.5 dBμV/m	:	47.5 dBμV/m - 57.0 dBμV/m	=	-9.5 dB

2 Result Summary

FCC 47 CFR Part 15E, IC RSS-247				
Product Specific Standard Section	Requirement – Test	Reference Method	Result	Remarks
IC RSS-247 § 3.1	Occupied Bandwidth	ANSI C63.10	N/R	Informational only
FCC § 15.407(a)(h)	26 dB emission bandwidth	ANSI C63.10	N/T	Customer specific test plan
FCC § 15.407(a) IC RSS-247 § 6.2	Maximum output power	ANSI C63.10	N/T	Customer specific test plan
FCC § 15.407(a) IC RSS-247 § 6.2	Maximum power spectral density	ANSI C63.10	N/T	Customer specific test plan
FCC § 15.407(b) IC RSS-247 § 6.2	Conducted spurious emissions at antenna port	ANSI C63.10	PASS	
FCC § 15.407(b) IC RSS-247 § 6.2	Band edge compliance	ANSI C63.10	N/T	Customer specific test plan
FCC § 15.407(g)	Frequency stability	ANSI C63.10	N/T	Customer specific test plan
FCC § 15.407(a)(e) IC RSS-247 § 6.2	Minimum 6 dB Bandwidth	ANSI C63.10	N/T	Customer specific test plan
FCC § 15.407(h) IC RSS-247 § 6.2	Transmit Power Control (TPC)	ANSI C63.10	N/T	Customer specific test plan
FCC § 15.407(h) IC RSS-247 § 6.3	Dynamic Frequency Selection (DFS)	FCC Order, ET Docket No.03-122 (FCC 06-96)	N/T	Customer specific test plan
FCC § 15.407(b) FCC § 15.207 IC RSS-247 § 3.1	AC power line conducted emissions	ANSI C63.10	N/T	Customer specific test plan
FCC § 15.407(b) FCC § 15.209 IC RSS-247 § 6.2	Transmitter radiated spurious emissions	ANSI C63.10	FAIL	Customer specific test plan. Measurements only above 1 GHz. Antenna ports terminated with 50 Ohms.
IC RSS-247 § 3.1	Receiver radiated spurious emissions	ANSI C63.10	N/T	Customer specific test plan
Remarks:				

3 Test Conditions and Results

3.1 Test Conditions and Results – Conducted spurious emissions

Conducted spurious emissions acc. to FCC 15.407 / IC RSS-247		Verdict: PASS
EUT requirement rule parts and clause	Reference	
	FCC 15.407(b) (1) – (4) / IC RSS-247 6.2	
Test according to measurement reference	Reference Method	
	ANSI C63.10	
Test frequency range	Tested frequencies	
	10 MHz – 10 th Harmonic	
Limits		
Frequency band [MHz]	Out of frequency band limit [e.i.r.p.]	
5150 - 5250	-27 dBm/MHz	
5250 – 5350	-27 dBm/MHz	
5470 - 5725	-27 dBm/MHz	
5725 – (5825) 5850	-17 dBm/MHz (within 10 MHz outside the band edges)	
5725 – (5825) 5850	-27 dBm/MHz	
Comments: Below 1 GHz peak detector is permitted as alternative to quasi-peak detector. Above 1 GHz peak detector is requested.		
Test setup		
Spectrum Analyzer EUT		
Test procedure		
1. Set EUT to test mode 2. Adjust reference level according to antenna gain 3. Set sweep time to auto 4. Set detector to peak and trace to max hold 5. Allow max hold to run until trace has stabilized 6. Set markers to emission peaks		

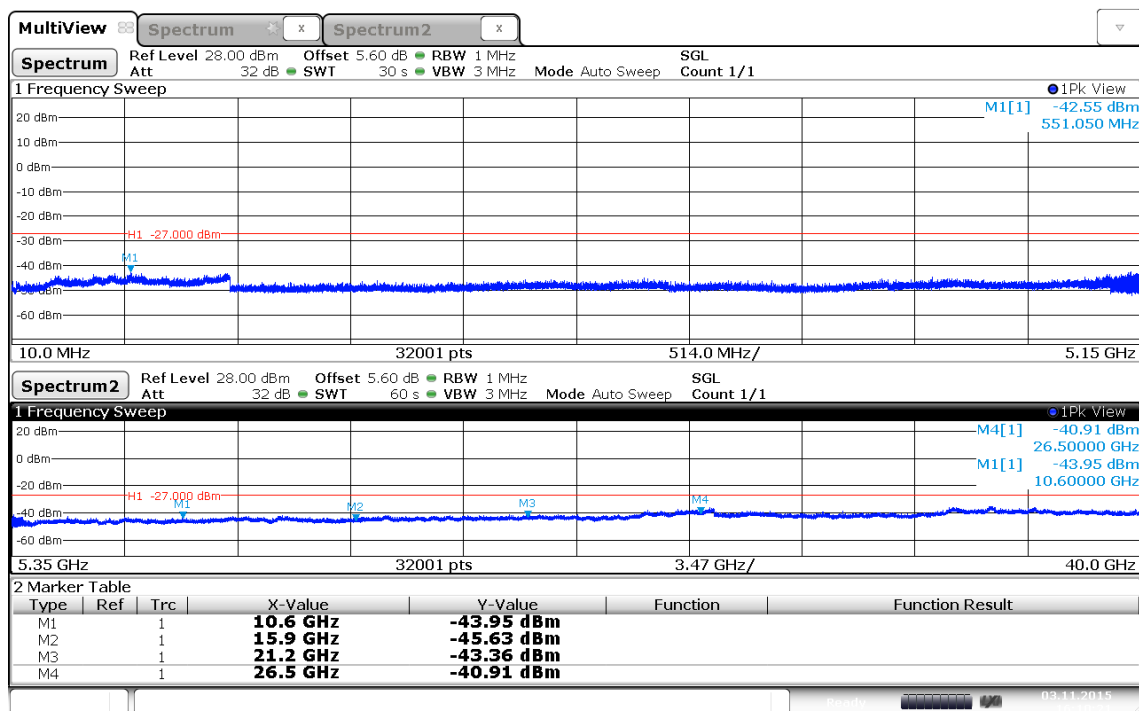
Test overview					
Channel	Frequency f_0 [MHz]	Mode	Model	Measurement Range	Result
60	5300	OFDM	ELLA-W161-A	1 – 12.5 GHz	Pass
60	5300	HT20	ELLA-W161-A	1 – 12.5 GHz	Pass
62	5310	HT40	ELLA-W161-A	1 – 12.5 GHz	Pass
40	5200	OFDM	ELLA-W161-A	1 – 12.5 GHz	Pass
100	5500	OFDM	ELLA-W161-A	1 – 12.5 GHz	Pass
140	5700	OFDM	ELLA-W161-A	1 – 12.5 GHz	Pass
40	5200	OFDM	ELLA-W161-A	$3 \times f_0, 4 \times f_0, 6 \times f_0$	Pass
60	5300	OFDM	ELLA-W161-A	$3 \times f_0, 4 \times f_0, 6 \times f_0$	Pass
100	5500	OFDM	ELLA-W161-A	$4 \times f_0$	Pass
140	5700	OFDM	ELLA-W161-A	$4 \times f_0$	Pass
40	5200	OFDM	ELLA-W161	1 – 12.5 GHz	Pass
60	5300	OFDM	ELLA-W161	1 – 12.5 GHz	Pass
100	5500	OFDM	ELLA-W161	1 – 12.5 GHz	Pass
140	5700	OFDM	ELLA-W161	1 – 12.5 GHz	Pass
40	5200	OFDM	ELLA-W161	$3 \times f_0, 4 \times f_0, 6 \times f_0$	Pass
60	5300	OFDM	ELLA-W161	$3 \times f_0, 4 \times f_0, 6 \times f_0$	Pass
100	5500	OFDM	ELLA-W161	$4 \times f_0$	Pass
140	5700	OFDM	ELLA-W161	$4 \times f_0$	Pass
Comments: The Channels 60/62 were measured for ELLA-W161-A with OFDM, HT20 and HT40. OFDM was determined as the worst case out of OFDM, HT20 and HT40. Subsequent measurements for ELLA-W161-A and for ELLA-W161 were only performed with OFDM.					

ELLA-W161-A Conducted spurious emissions – OFDM 5300 MHz

Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5300 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-03
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



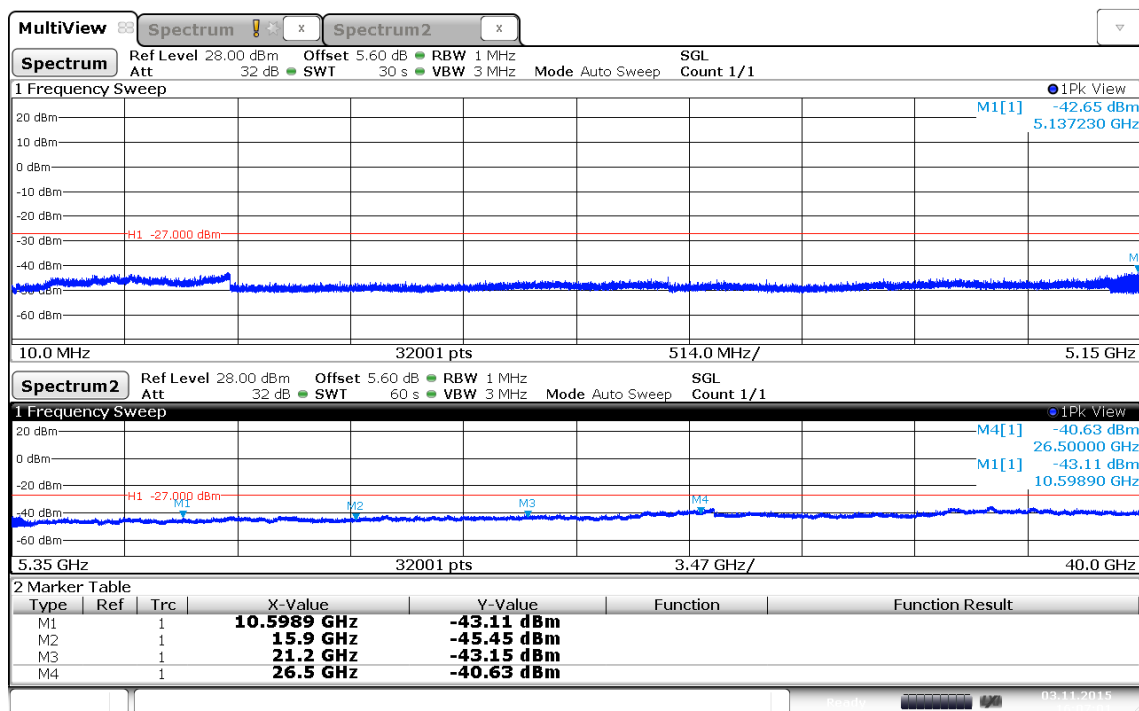
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ELLA-W161-A Conducted spurious emissions – HT20 5300 MHz

Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 n HT20, 5300 MHz, MCS0, Power 15 dBm
 Test Date: 2015-11-03
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



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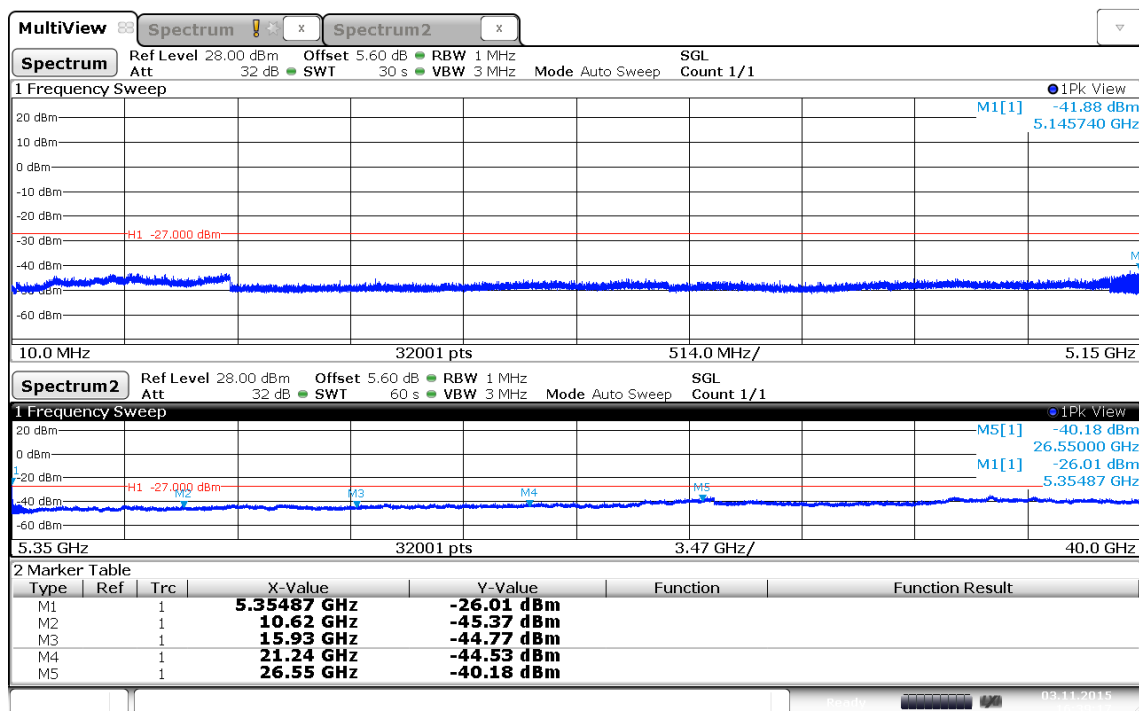
Test Report No.: GOM-1510-5172-TFC407WF-161-V01

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

ELLA-W161-A Conducted spurious emissions – HT40 5310 MHz
Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 n HT40, 5310 MHz, MCS0, Power 15 dBm
 Test Date: 2015-11-03
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



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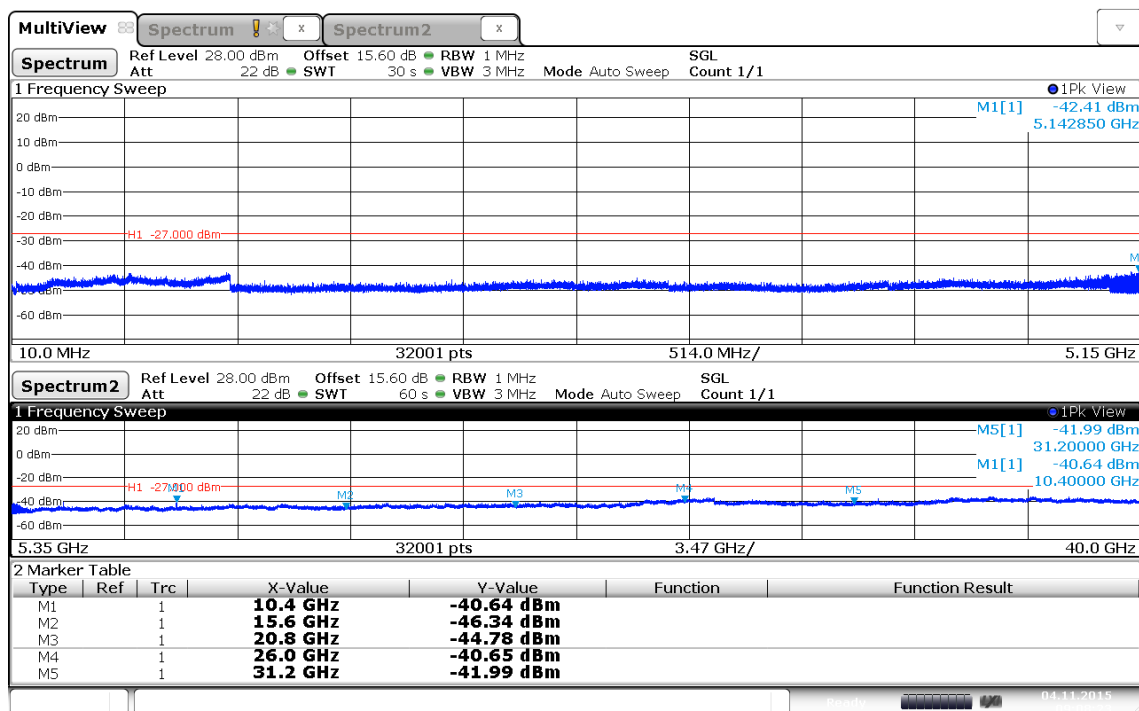
Test Report No.: GOM-1510-5172-TFC407WF-161-V01

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

ELLA-W161-A Conducted spurious emissions – OFDM 5200 MHz
Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5200 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



Date: 4.NOV.2015 09:08:23

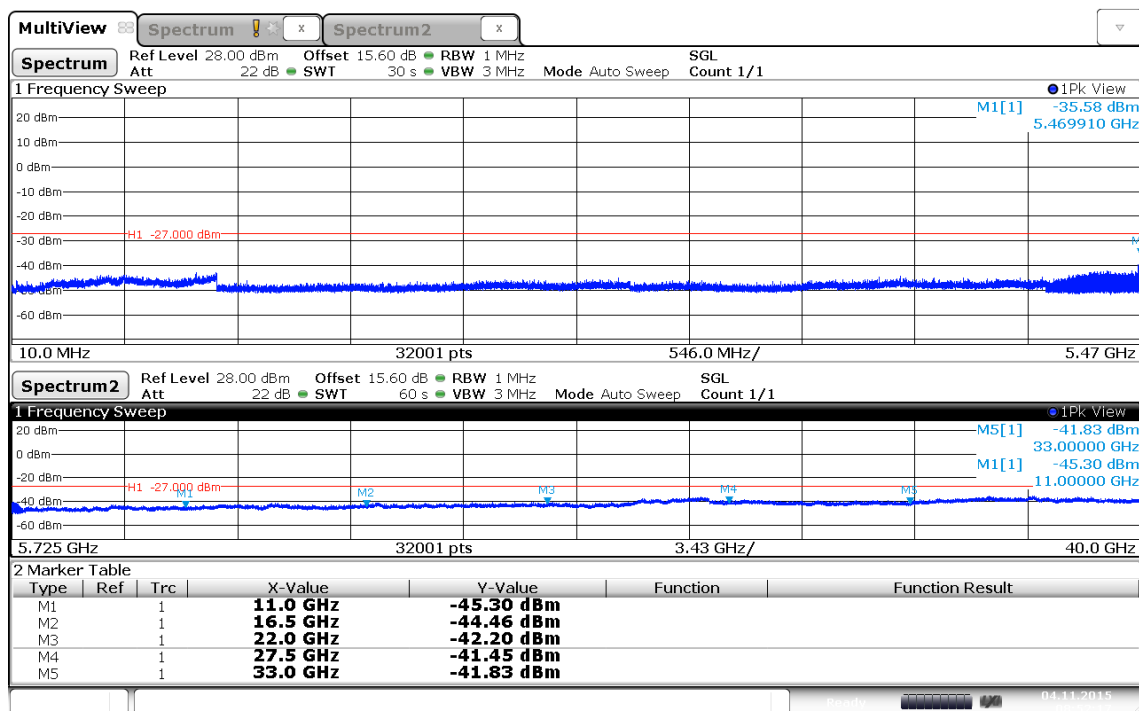
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Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

ELLA-W161-A Conducted spurious emissions – OFDM 5500 MHz
Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5500 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



Date: 4. NOV. 2015 08:52:17

Test Report No.: GOM-1510-5172-TFC407WF-161-V01

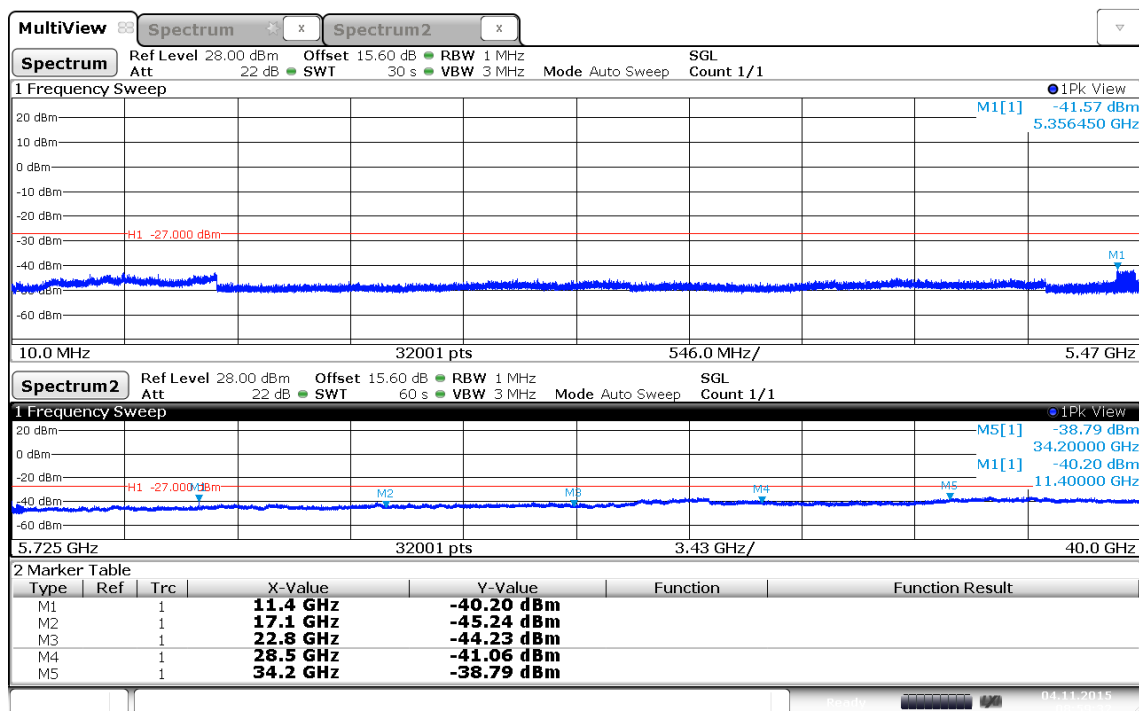
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

ELLA-W161-A Conducted spurious emissions – OFDM 5700 MHz

Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5700 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



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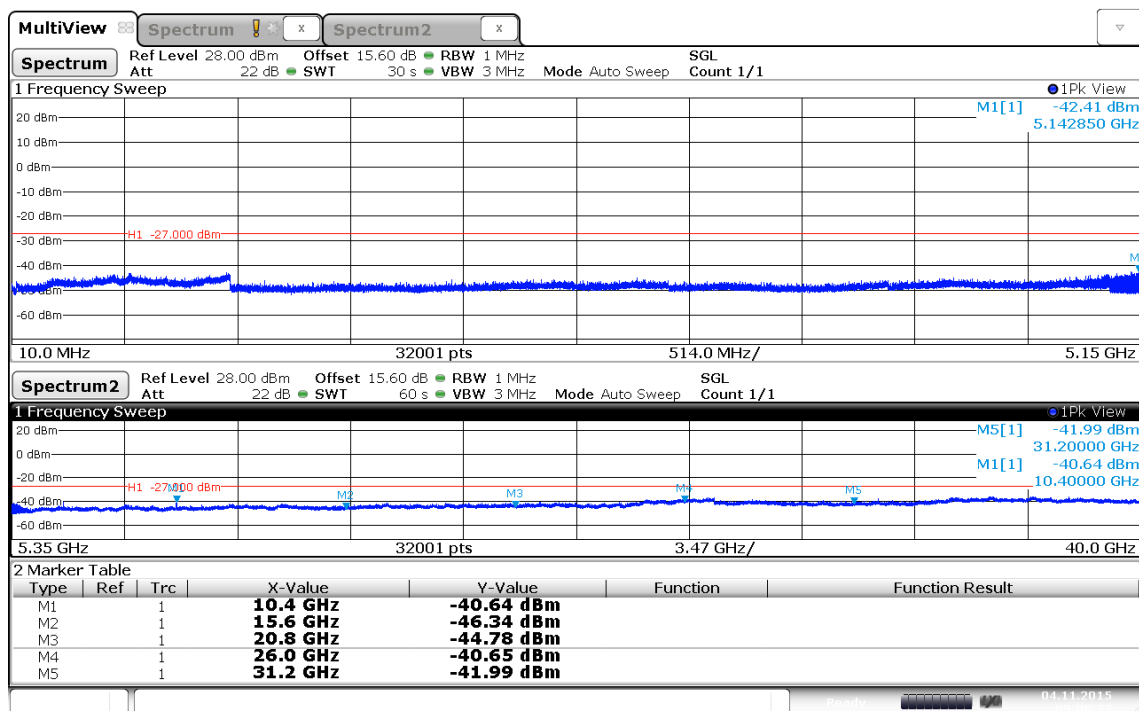
Test Report No.: GOM-1510-5172-TFC407WF-161-V01

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

ELLA-W161-A Conducted spurious emissions – OFDM 5200 MHz
Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5200 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



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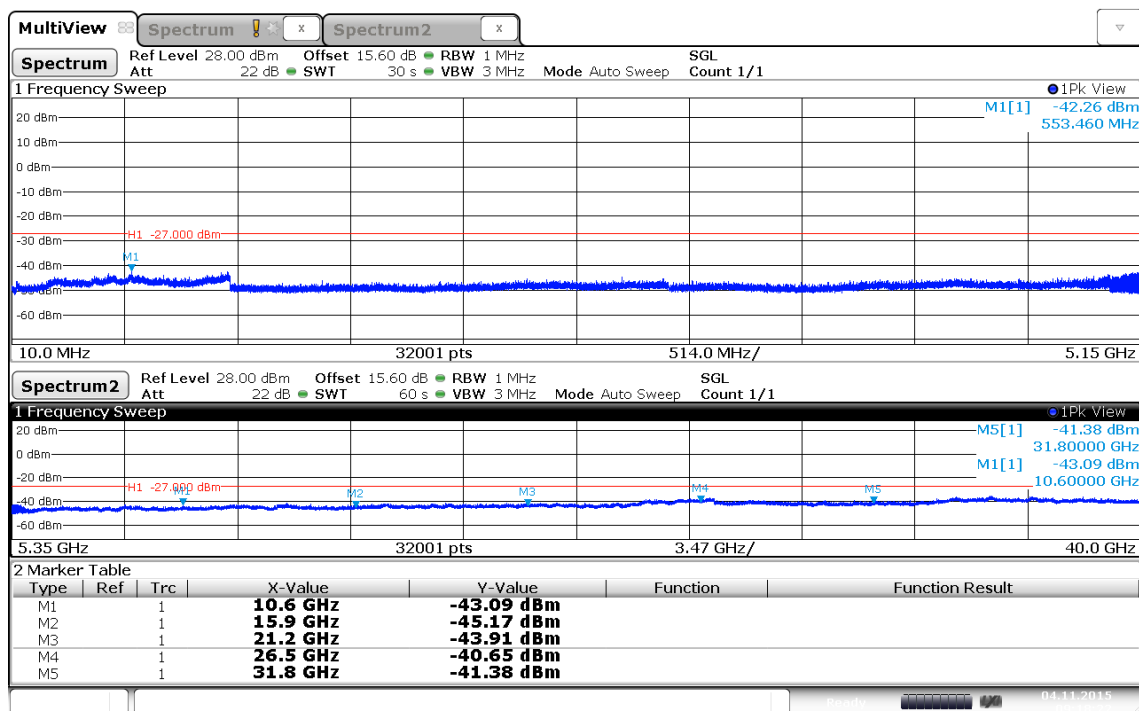
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 Storkower Str. 38c, D-15526 Reichenwalde, Germany

ELLA-W161-A Conducted spurious emissions – OFDM 5300 MHz
Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5300 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



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Test Report No.: GOM-1510-5172-TFC407WF-161-V01

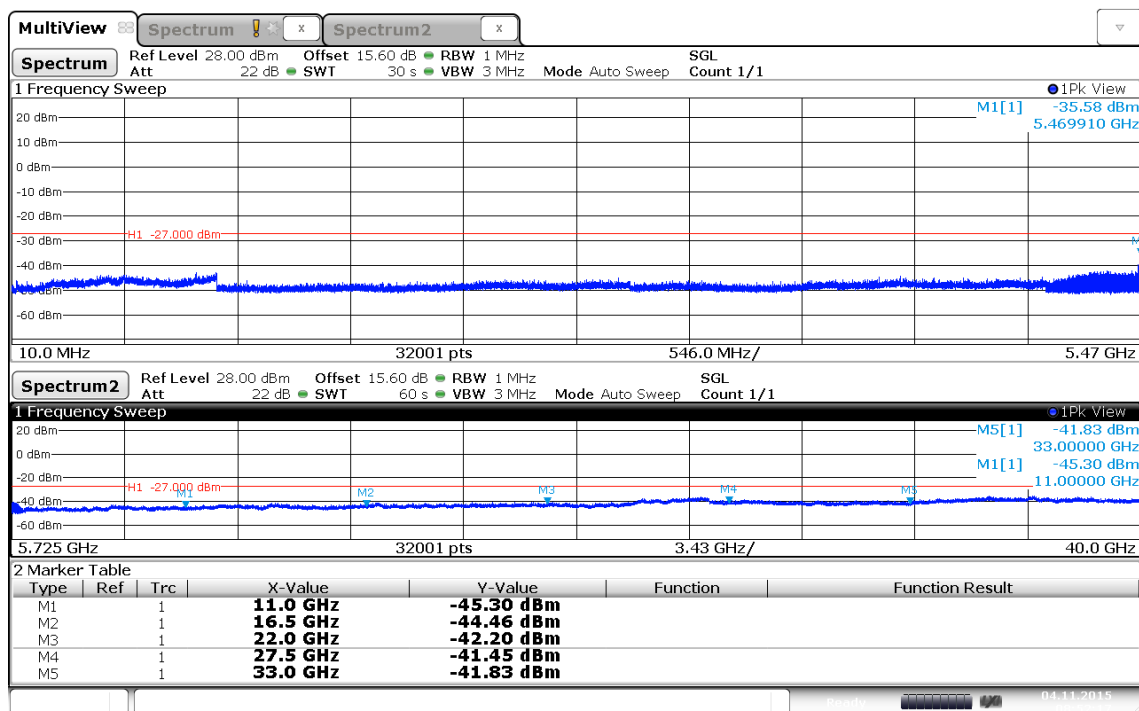
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ELLA-W161-A Conducted spurious emissions – OFDM 5500 MHz

Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5500 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



Date: 4.NOV.2015 08:52:17

Test Report No.: GOM-1510-5172-TFC407WF-161-V01

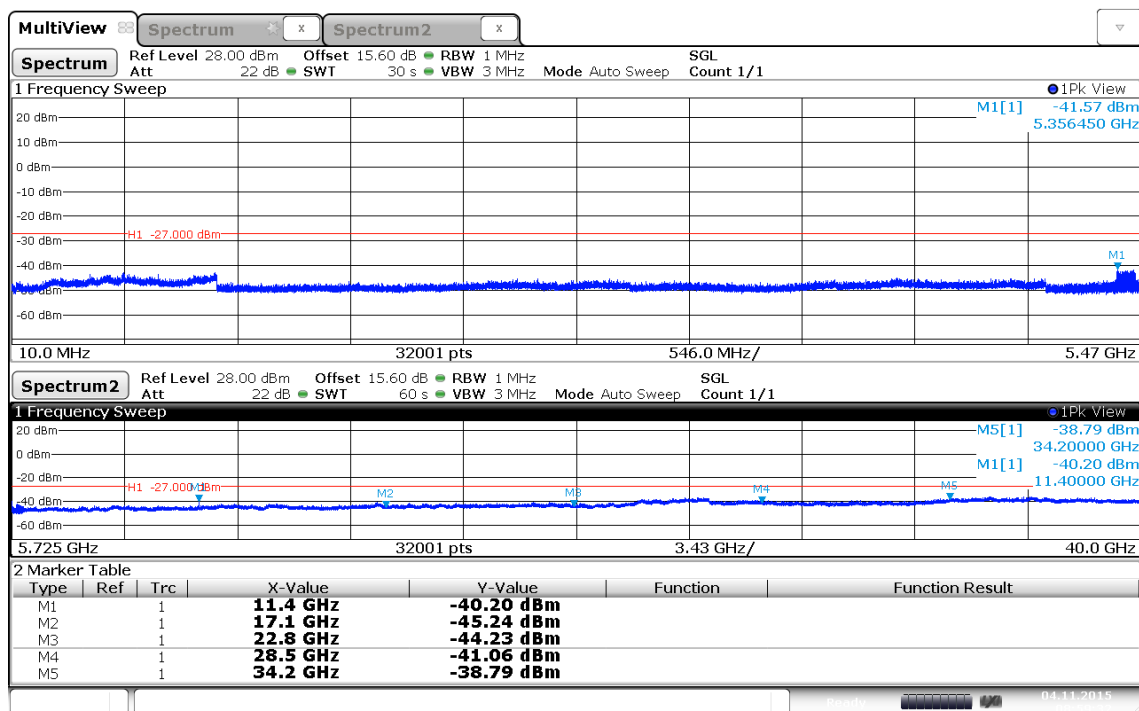
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ELLA-W161-A Conducted spurious emissions – OFDM 5700 MHz

Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5700 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



Date: 4.NOV.2015 08:59:31

Test Report No.: GOM-1510-5172-TFC407WF-161-V01

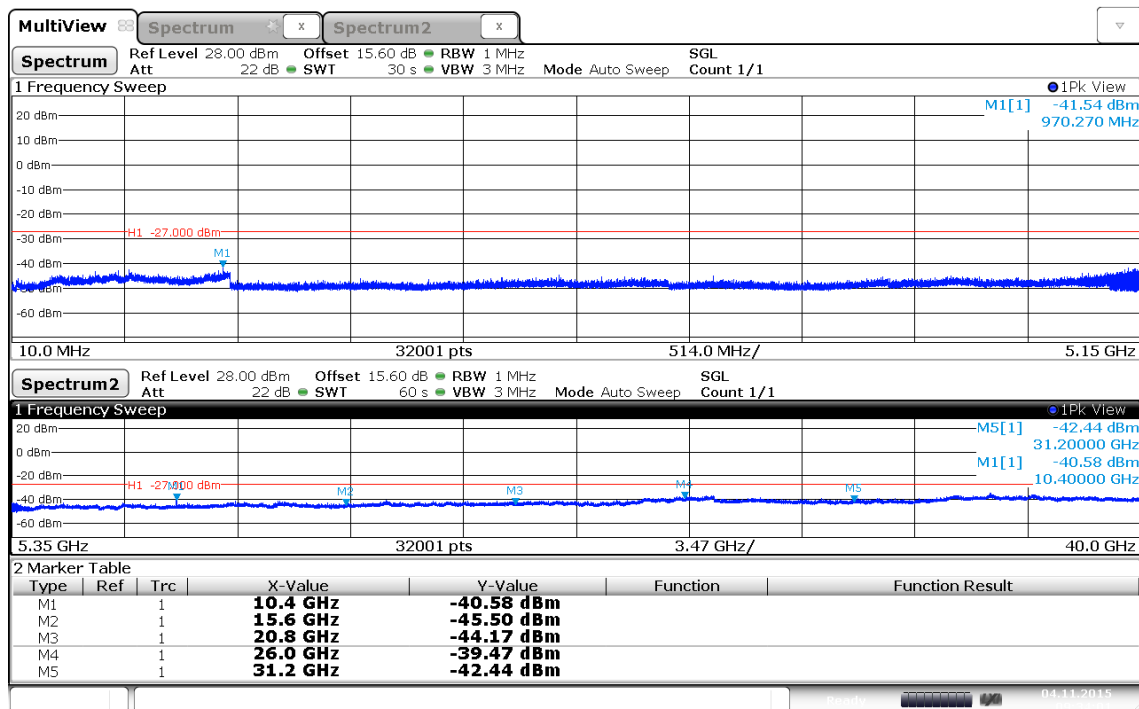
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

ELLA-W161 Conducted spurious emissions – OFDM 5200 MHz

Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5200 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement

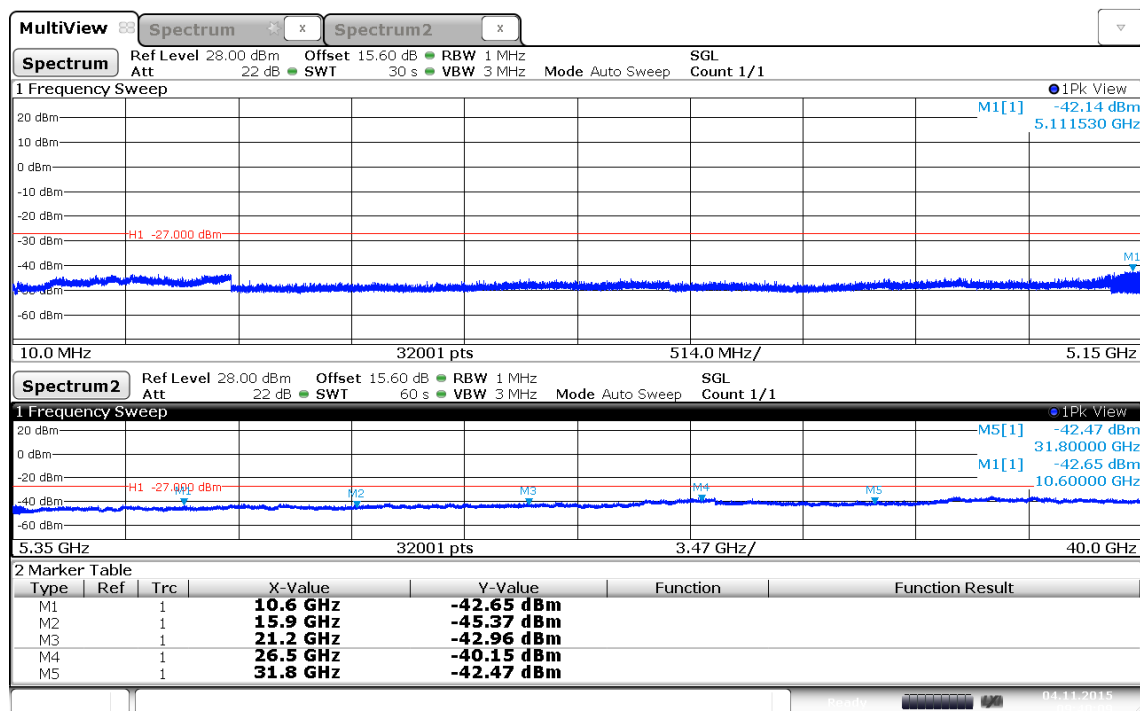


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ELLA-W161 Conducted spurious emissions – OFDM 5300 MHz
Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5300 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



Date: 4. NOV. 2015 09:40:09

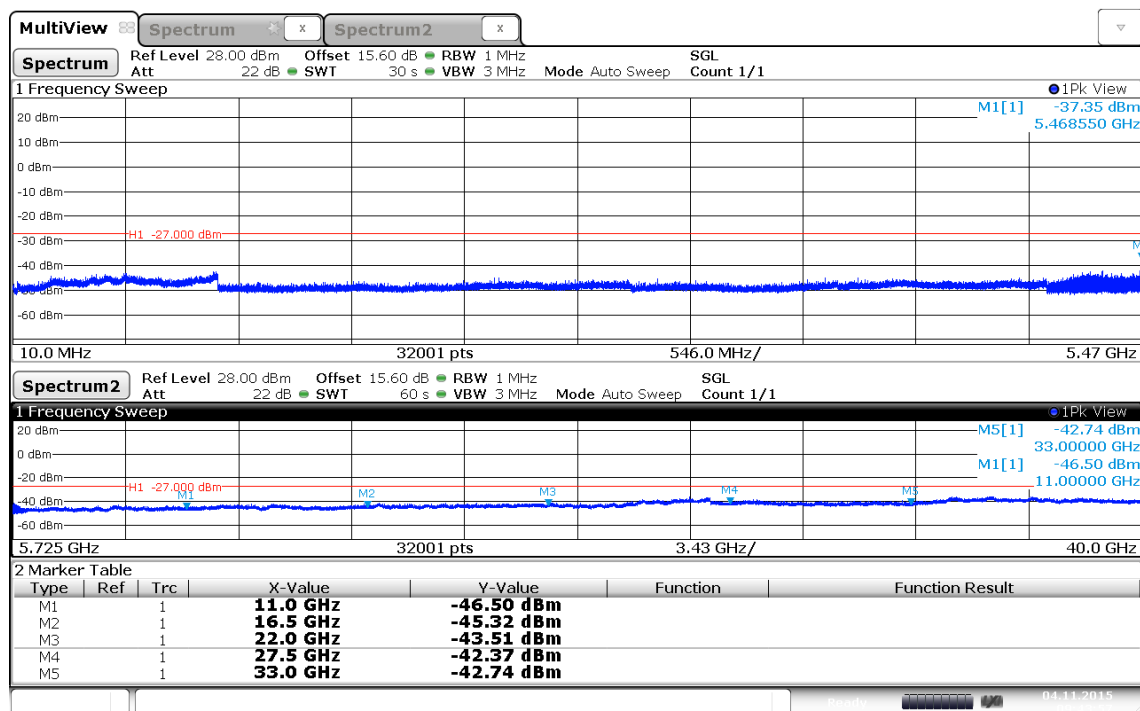
Test Report No.: GOM-1510-5172-TFC407WF-161-V01

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

ELLA-W161 Conducted spurious emissions – OFDM 5500 MHz
Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5500 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



Date: 4. NOV. 2015 09:43:57

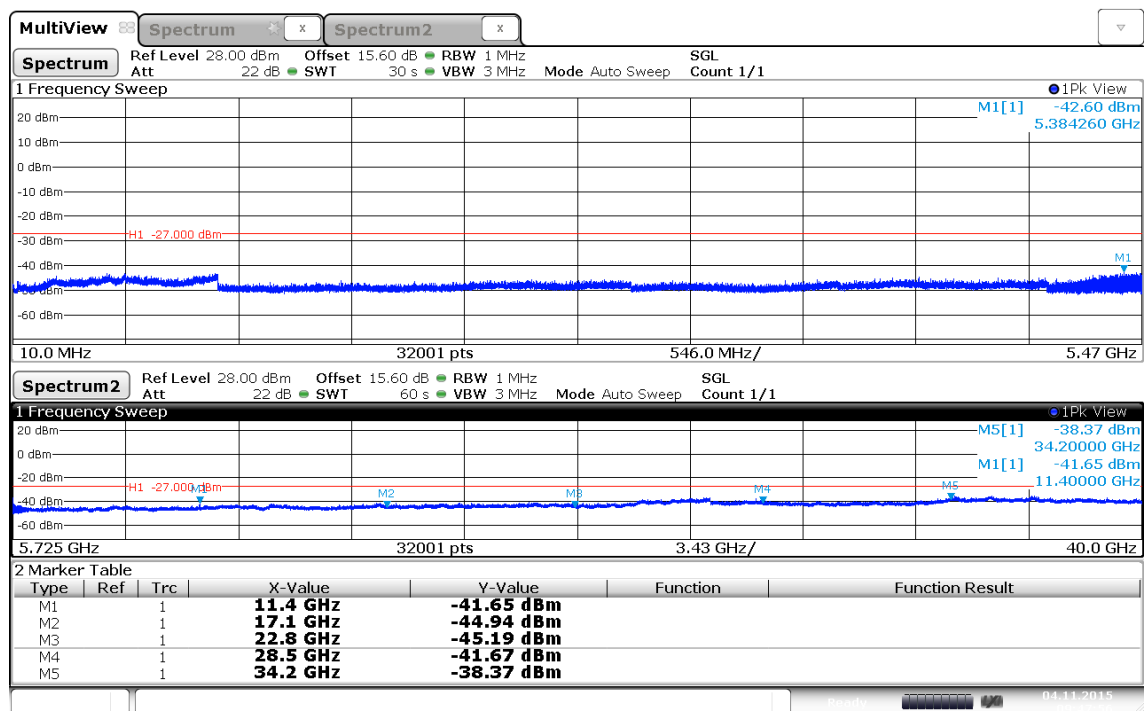
Test Report No.: GOM-1510-5172-TFC407WF-161-V01

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

ELLA-W161 Conducted spurious emissions – OFDM 5700 MHz
Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5700 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



Date: 4. NOV. 2015 09:47:56

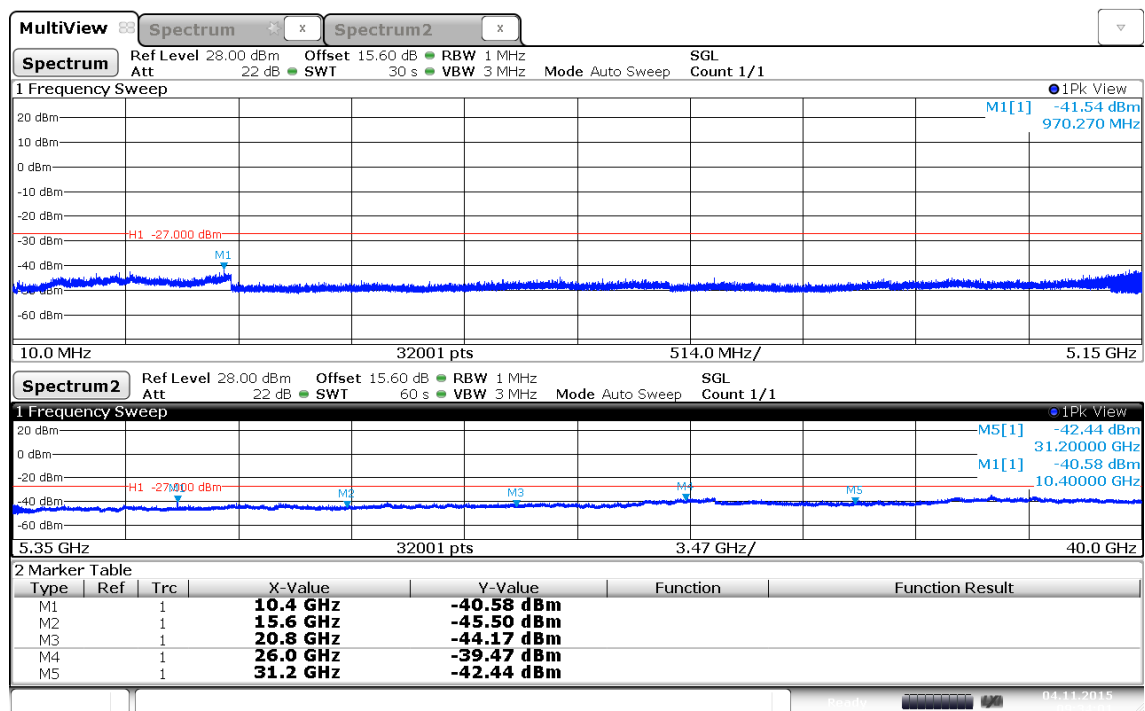
Test Report No.: GOM-1510-5172-TFC407WF-161-V01

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

ELLA-W161 Conducted spurious emissions – OFDM 5200 MHz
Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5200 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



Date: 4.NOV.2015 09:34:01

Test Report No.: GOM-1510-5172-TFC407WF-161-V01

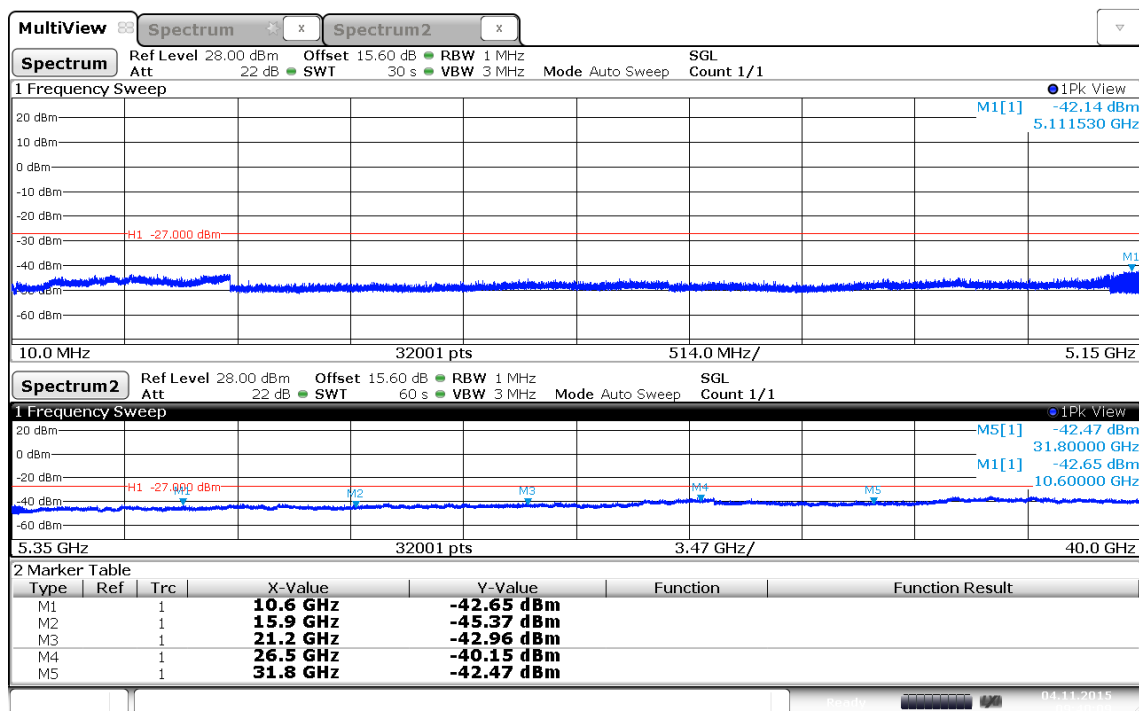
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

ELLA-W161 Conducted spurious emissions – OFDM 5300 MHz

Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5300 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



Date: 4.NOV.2015 09:40:09

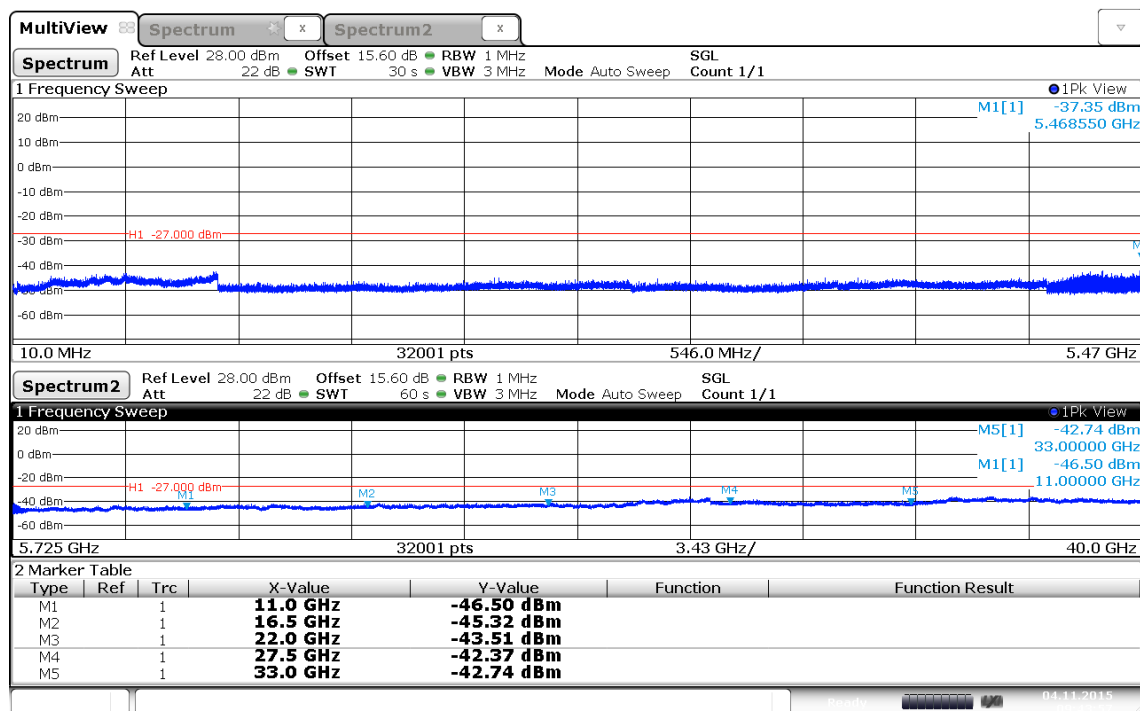
Test Report No.: GOM-1510-5172-TFC407WF-161-V01

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

ELLA-W161 Conducted spurious emissions – OFDM 5500 MHz
Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5500 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement



Date: 4.NOV.2015 09:43:57

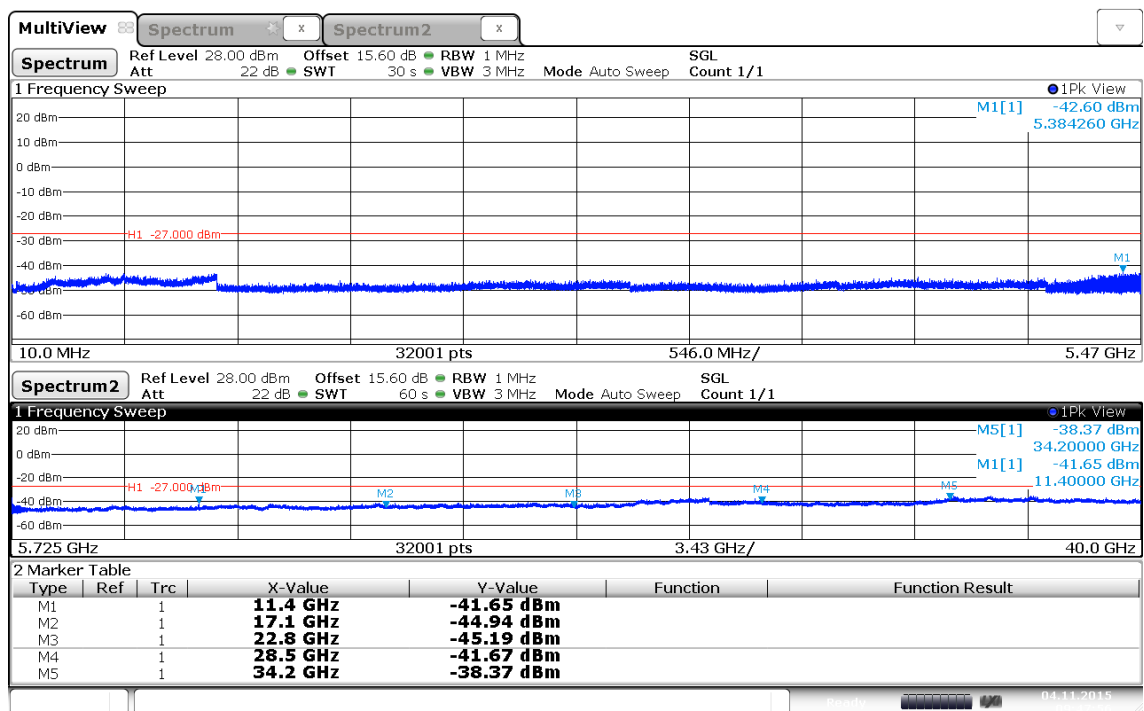
Test Report No.: GOM-1510-5172-TFC407WF-161-V01

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

ELLA-W161 Conducted spurious emissions – OFDM 5700 MHz
Spurious Emissions in the non-restricted frequency bands acc. to FCC 15.407

Project Number: GOM-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Christian Weber
 Test Conditions: Tnom / Vnom
 Mode: Tx, IEEE 802.11 a, 5700 MHz, 6 Mbps, Power 15 dBm
 Test Date: 2015-11-04
 Verdict: PASS
 Note 1: Antenna Gain 4.6 dBi
 Note 2: conducted measurement

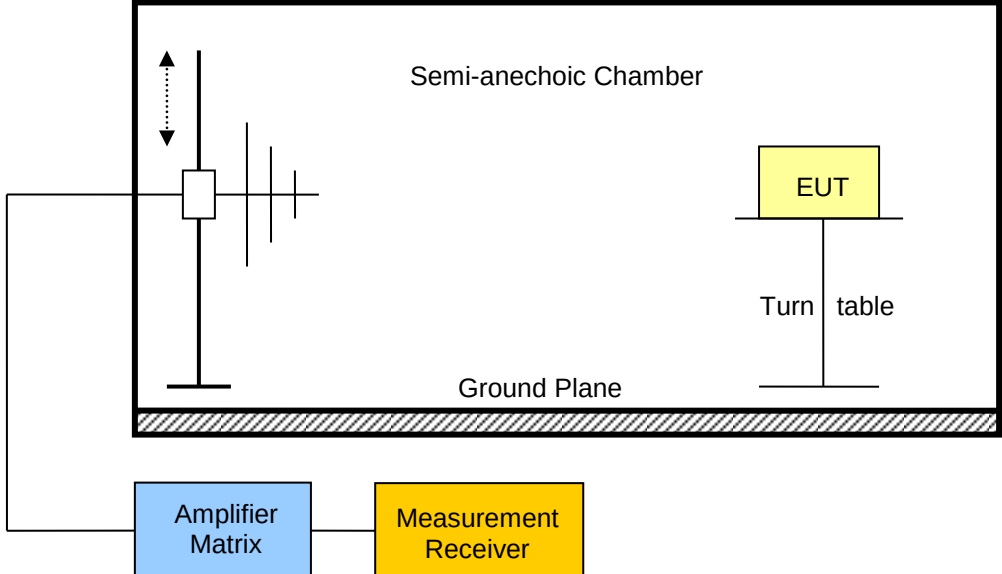


Date: 4. NOV. 2015 09:47:56

Test Report No.: GOM-1510-5172-TFC407WF-161-V01

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

3.2 Test Conditions and Results – Transmitter radiated emissions in the restricted bands

Transmitter radiated emissions acc. to FCC 47 CFR 15.407 / IC RSS-247				Verdict: FAIL
Test according referenced standards	Reference Method			
	FCC 15.407(b) (7) / IC RSS-247 6.2			
Test according to measurement reference	Reference Method			
	ANSI C63.10			
Test frequency range	Tested frequencies			
	30 MHz – 10 th Harmonic			
Limits				
Frequency range [MHz]	Detector	Limit [µV/m]	Limit [dBµV/m]	Limit Distance [m]
30 – 88	Quasi-Peak	100	40	3
88 – 216	Quasi-Peak	150	43.5	3
216 – 960	Quasi-Peak	200	46	3
960 – 1000	Quasi-Peak	500	54	3
> 1000	Average	500	54	3
Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)). Below 1000 MHz peak detector is allowed as an alternative to quasi-peak detector. Above 1000 MHz is an additional peak limit 20 dB above the average limit. If all peak measurements satisfy the average limit, then average measurements are not required.				
Test setup				
				

Test procedure									
1. Set EUT to test mode 2. Set span according to measurement range 3. Set resolution bandwidth below 1 GHz according to CISPR 16 with peak/quasi-peak detector and to 1 MHz with peak/average detector above 1 GHz 4. Set markers to peak emission levels within restricted bands									
Test results ELLA-W161-A									
Channel	Channel Frequency [MHz]	Test Mode	Emission Frequency [MHz]	Emission Level [db μ V/m]	Det.	Pol.	Limit [db μ V/m]	Limit dist. [m]*	Margin [dB]
60	5300	OFDM	10592	44.29	pk	ver	68.00	3	-23.71
60	5300	HT20	10600	43.48	pk	ver	68.00	3	-24.52
100	5500	OFDM	10992	45.52	pk	ver	74.00	3	-28.48
140	5700	OFDM	11400	44.13	pk	ver	74.00	3	-29.87
40	5200	OFDM	15600	38.97	pk	hor	74.00	3	-35.03
40	5200	OFDM	15600	39.89	pk	ver	74.00	3	-34.11
40	5200	OFDM	20805	47.48	pk	hor	74.00	3	-26.52
40	5200	OFDM	20805	46.75	pk	ver	74.00	3	-27.25
40	5200	OFDM	31206	45.51	pk	hor	74.00	3	-28.49
40	5200	OFDM	31206	46.12	pk	ver	74.00	3	-27.88
60	5300	OFDM	10592	44.00	pk	ver	68.00	3	-24.00
60	5300	OFDM	15900	37.59	pk	hor	74.00	3	-36.41
60	5300	OFDM	15900	37.35	pk	ver	74.00	3	-36.65
60	5300	OFDM	21196	46.37	pk	hor	74.00	3	-27.63
60	5300	OFDM	21196	46.46	pk	ver	74.00	3	-27.54
60	5300	OFDM	31804	45.79	pk	ver	68.00	3	-22.21
60	5300	OFDM	31804	45.22	pk	hor	68.00	3	-22.78
100	5500	OFDM	21995	49.25	pk	hor	68.00	3	-18.75
100	5500	OFDM	21995	54.32	pk	ver	68.00	3	-13.68
140	5700	OFDM	22794	48.15	pk	hor	74.00	3	-25.85
140	5700	OFDM	22794	52.51	pk	ver	74.00	3	-21.49

Test results ELLA-W161									
Channel	Channel Frequency [MHz]	Test Mode	Emission Frequency [MHz]	Emission Level [dbμV/m]	Det.	Pol.	Limit [dbμV/m]	Limit dist. [m]*	Margin [dB]
40	5200	OFDM	10392	45.17	pk	hor	68.00	3	-22.83
40	5200	OFDM	10400	46.53	pk	ver	68.00	3	-21.47
40	5200	OFDM	15600	39.18	pk	hor	74.00	3	-34.82
40	5200	OFDM	15600	39.78	pk	ver	74.00	3	-34.22
60	5300	OFDM	10600	47.51	pk	hor	68.00	3	-20.49
60	5300	OFDM	10600	50.44	pk	ver	68.00	3	-17.56
60	5300	OFDM	15900	36.73	pk	hor	74.00	3	-37.27
60	5300	OFDM	15900	36.98	pk	ver	74.00	3	-37.02
100	5500	OFDM	10992	46.73	pk	hor	74.00	3	-27.27
100	5500	OFDM	10992	52.23	pk	ver	74.00	3	-21.77
140	5700	OFDM	11400	47.26	pk	hor	74.00	3	-26.74
140	5700	OFDM	11400	53.14	pk	ver	74.00	3	-20.86
40	5200	OFDM	10392	45.17	pk	hor	68.00	3	-22.83
40	5200	OFDM	10400	46.53	pk	ver	68.00	3	-21.47
40	5200	OFDM	15600	39.18	pk	hor	74.00	3	-34.82
40	5200	OFDM	15600	39.78	pk	ver	74.00	3	-34.22
40	5200	OFDM	20805	47.21	pk	hor	74.00	3	-26.79
40	5200	OFDM	20805	47.57	pk	ver	74.00	3	-26.43
40	5200	OFDM	26007	49.41	pk	hor	68.00	3	-18.59
40	5200	OFDM	26007	49.49	pk	ver	68.00	3	-18.51
40	5200	OFDM	31206	46.25	pk	hor	74.00	3	-27.75
40	5200	OFDM	31206	45.70	pk	ver	74.00	3	-28.30
60	5300	OFDM	10600	47.51	pk	hor	68.00	3	-20.49
60	5300	OFDM	10600	50.44	pk	ver	68.00	3	-17.56
60	5300	OFDM	15900	36.73	pk	hor	74.00	3	-37.27
60	5300	OFDM	15900	36.98	pk	ver	74.00	3	-37.02
60	5300	OFDM	21196	47.10	pk	hor	74.00	3	-26.90
60	5300	OFDM	21196	47.08	pk	ver	74.00	3	-26.92
60	5300	OFDM	26526	42.92	pk	hor	68.00	3	-25.08
60	5300	OFDM	26526	43.81	pk	ver	68.00	3	-24.19
60	5300	OFDM	31804	45.21	pk	hor	68.00	3	-22.79
60	5300	OFDM	31804	44.72	pk	ver	68.00	3	-23.28
100	5500	OFDM	21995	48.46	pk	hor	68.00	3	-19.54

100	5500	OFDM	21995	58.75	pk	ver	68.00	3	-09.25
140	5700	OFDM	22794	49.69	pk	hor	74.00	3	-24.31
140	5700	OFDM	22794	57.51	pk	ver	74.00	3	-16.49
140	5700	OFDM	22794	57.50	avg	ver	54.00	3	3.50

Comments:

- * Physical distance between EUT and measurement antenna.
- Customer specific test plan. Measurements only above 1. Antenna ports terminated with 50 Ohms. The Low Channel was measured for ELLA-W136-A with OFDM, HT20 and HT40. OFDM was determined as the worst case out of OFDM, HT20 and HT40. Subsequent measurements were only performed with OFDM.

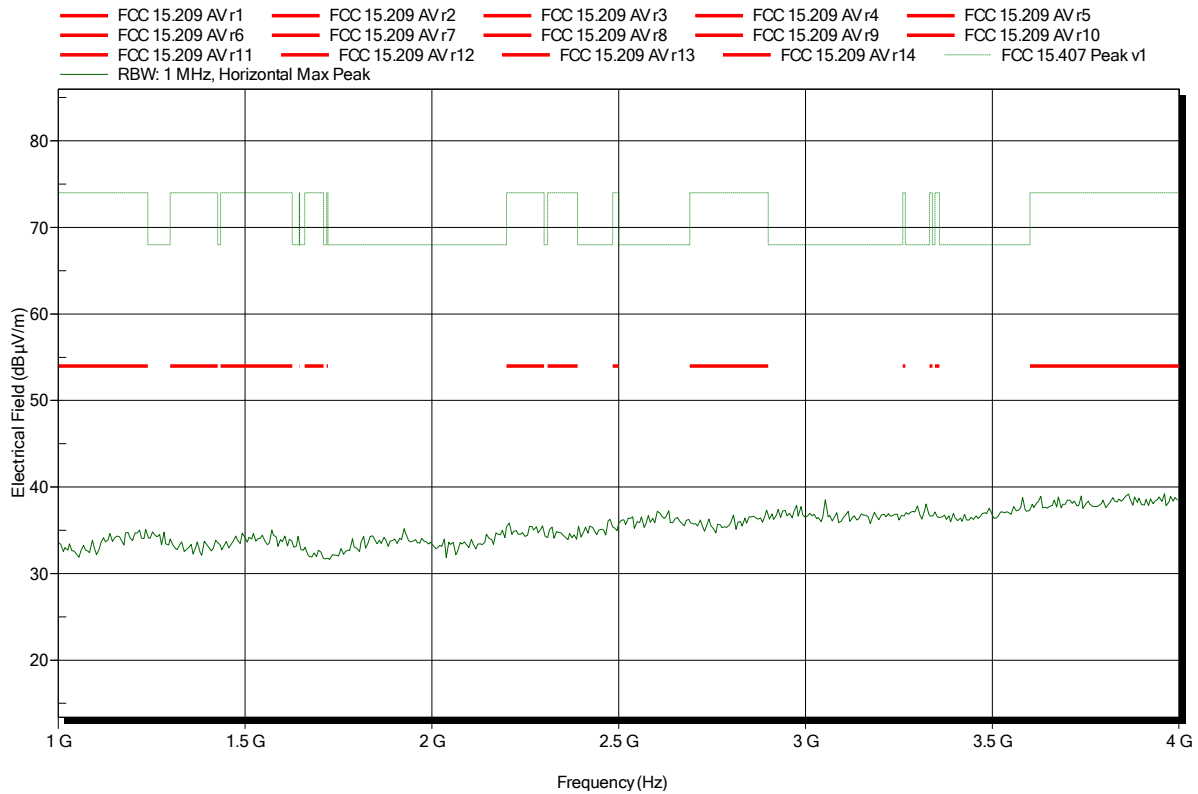
ANNEX A Transmitter radiated spurious emissions

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-11
 Note:

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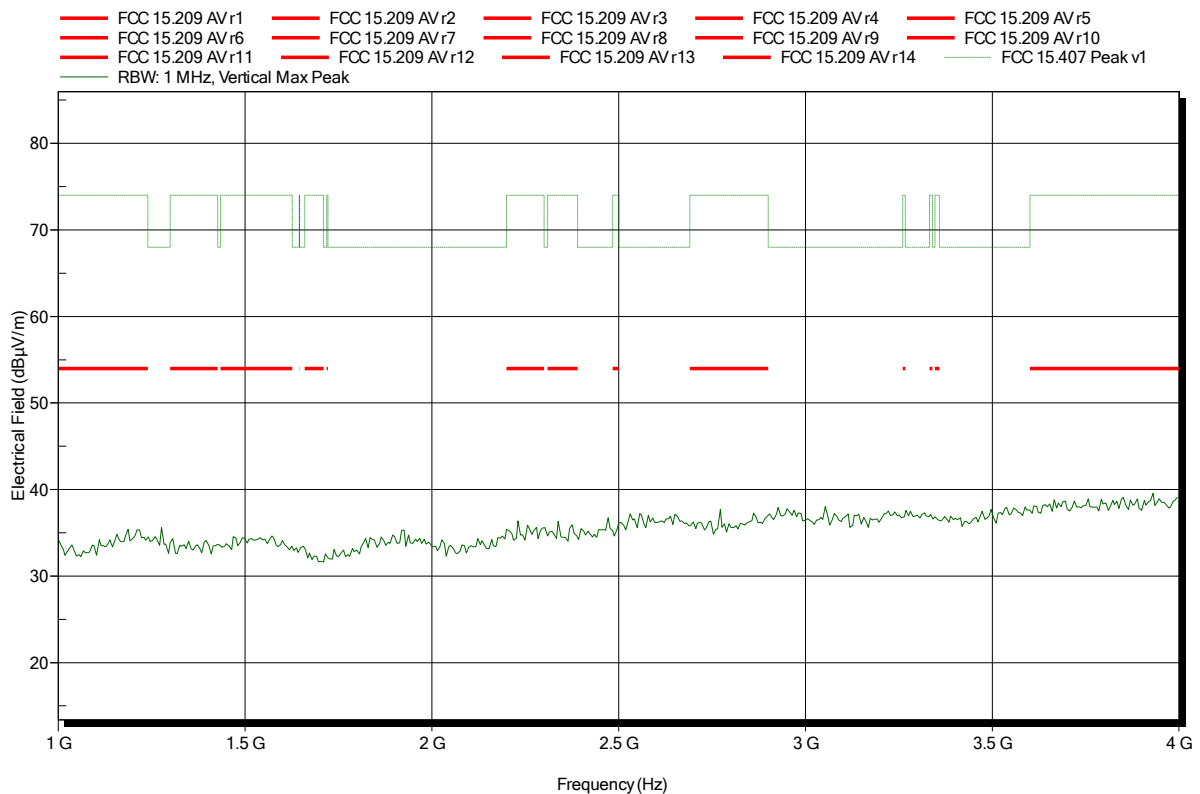


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-11
 Note:

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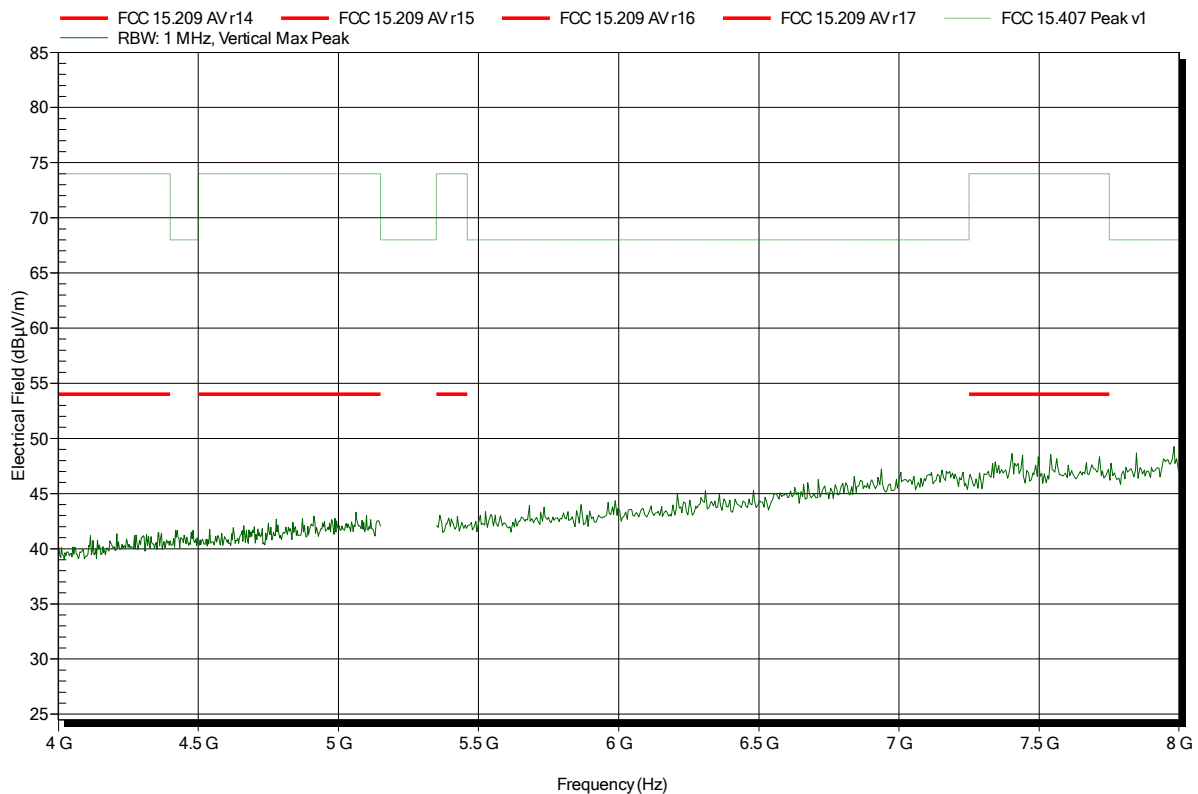


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-11
 Note:

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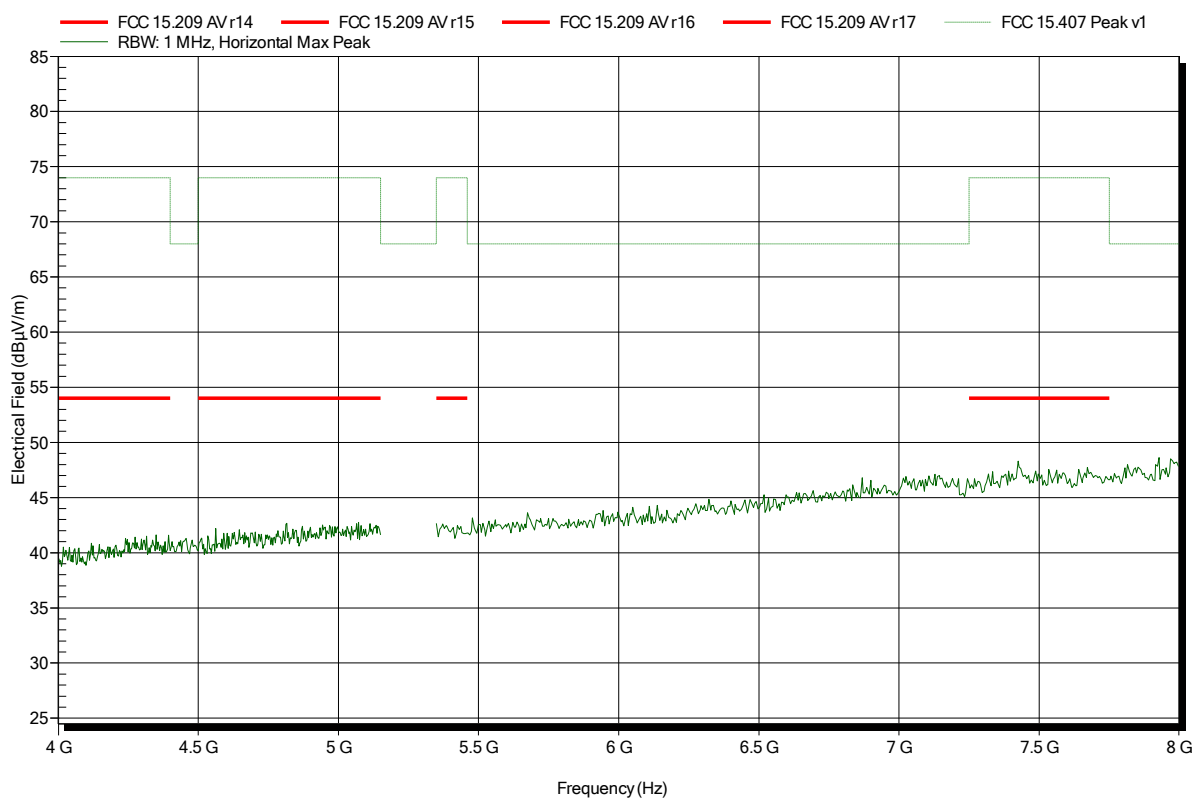


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-11
 Note:

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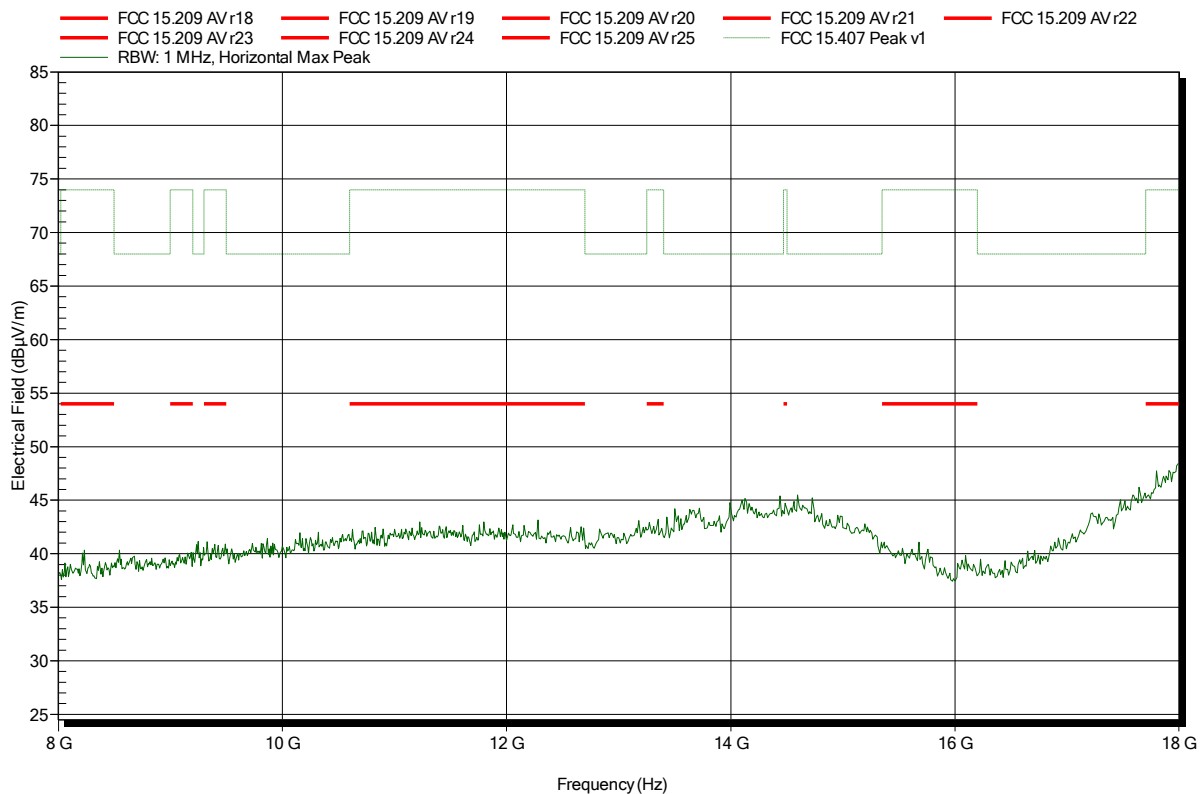


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-11
 Note:

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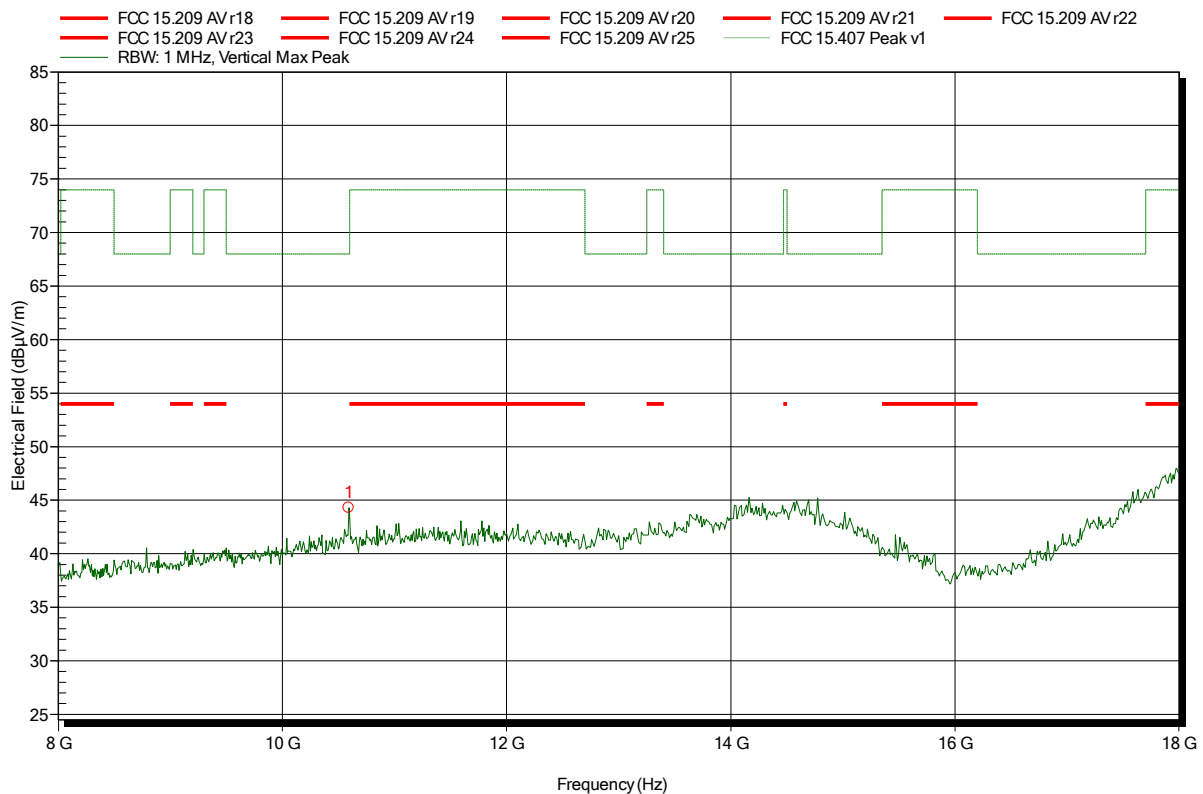


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-11
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
10.592 GHz	44.29 dBµV/m	68 dBµV/m	-23.71 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

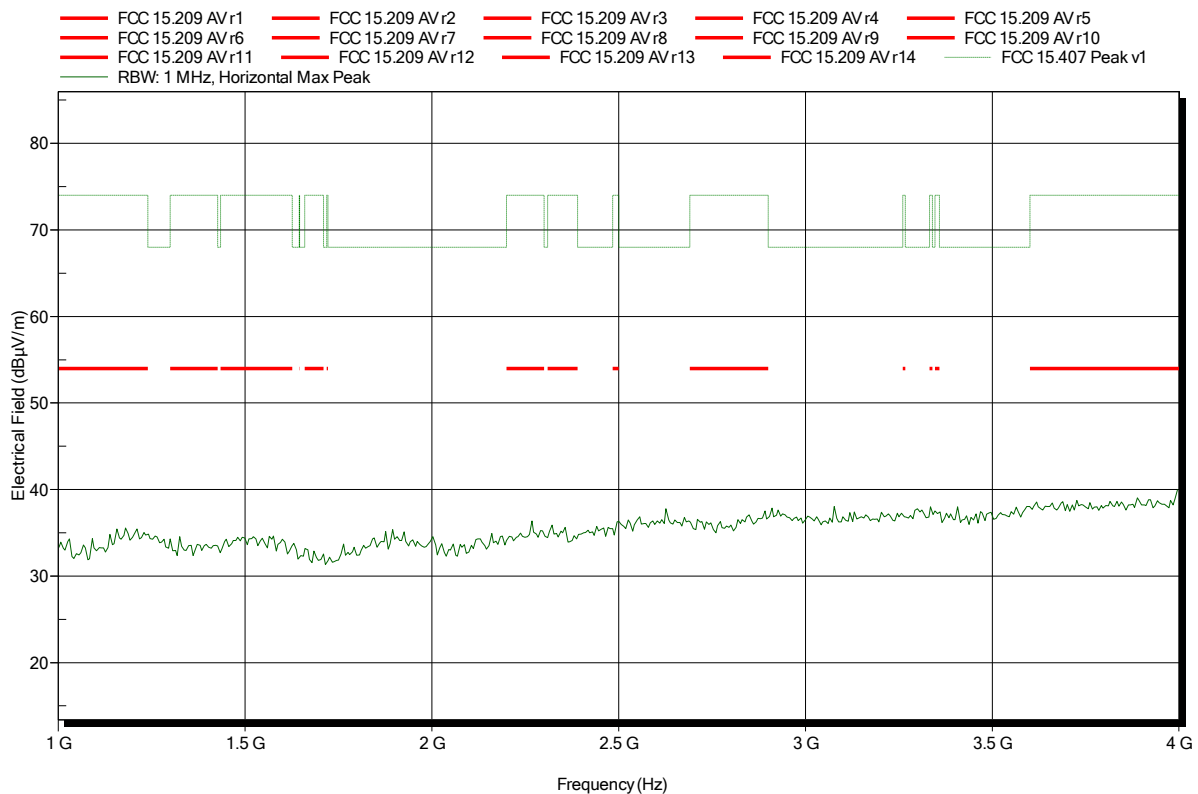
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch60, 802.11n HT20, MCS0, 15dBm
 Test Date: 2015-11-12
 Note:

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Test Report No.: G0M-1510-5172-TFC407WF-161-V01

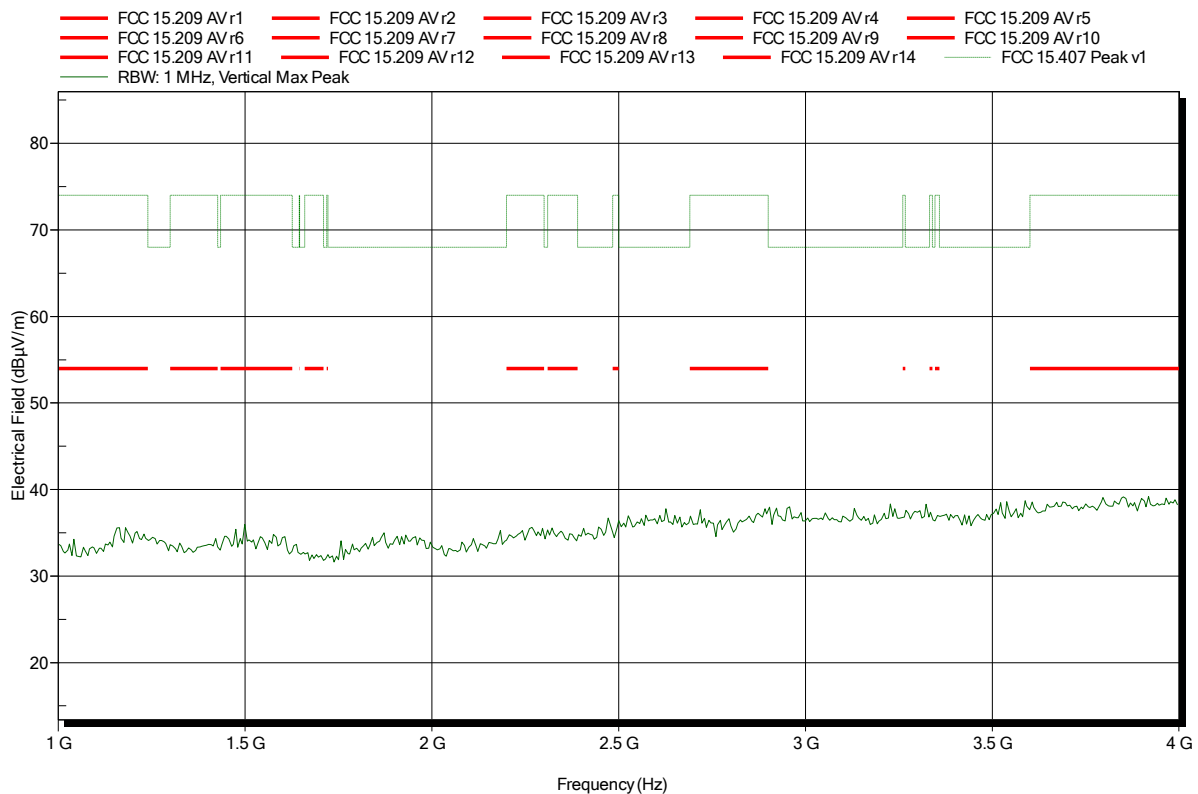
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch60, 802.11n HT20, MCS0, 15dBm
 Test Date: 2015-11-12
 Note:

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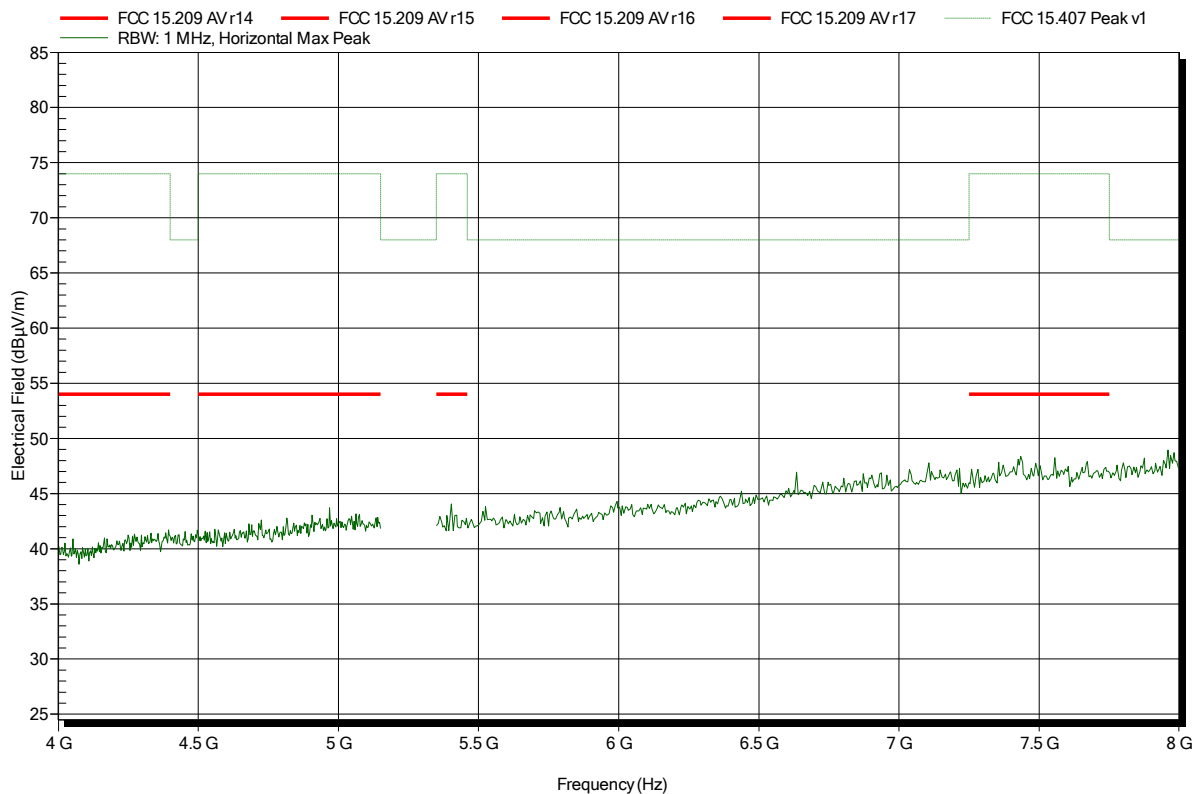


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch60, 802.11n HT20, MCS0, 15dBm
 Test Date: 2015-11-12
 Note:

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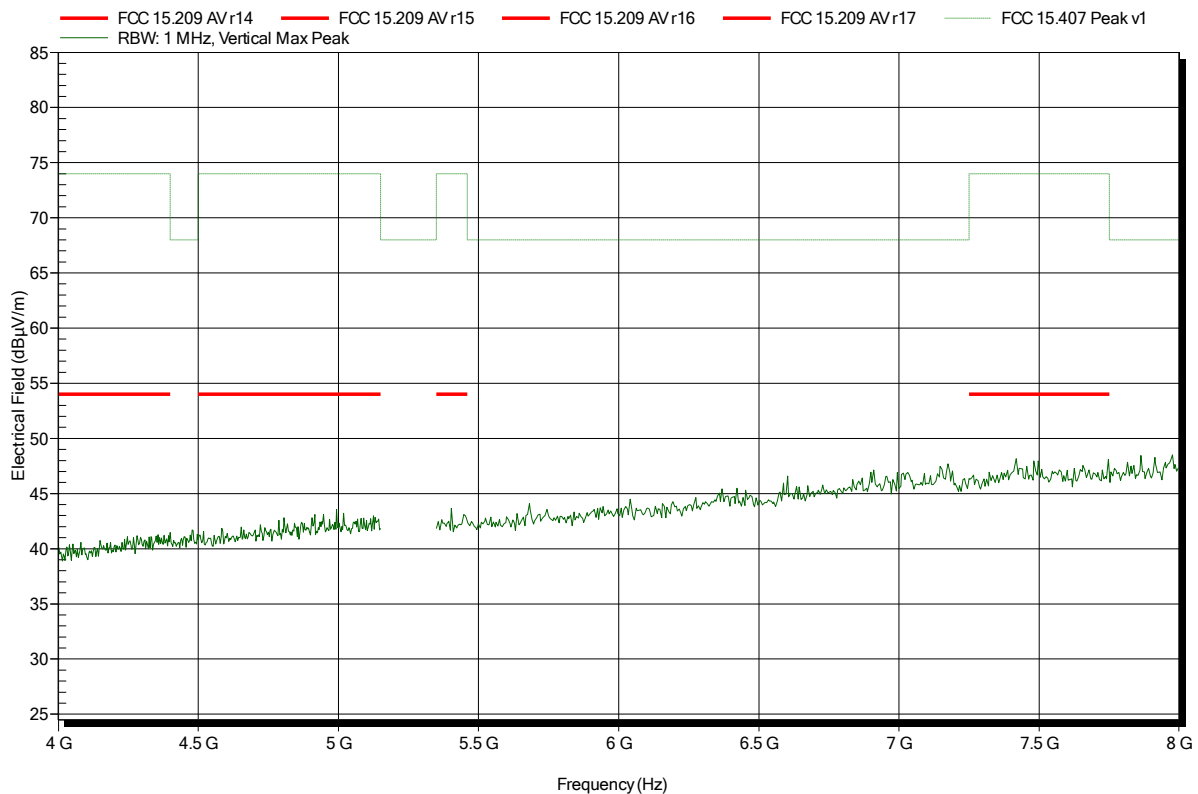


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch60, 802.11n HT20, MCS0, 15dBm
 Test Date: 2015-11-12
 Note:

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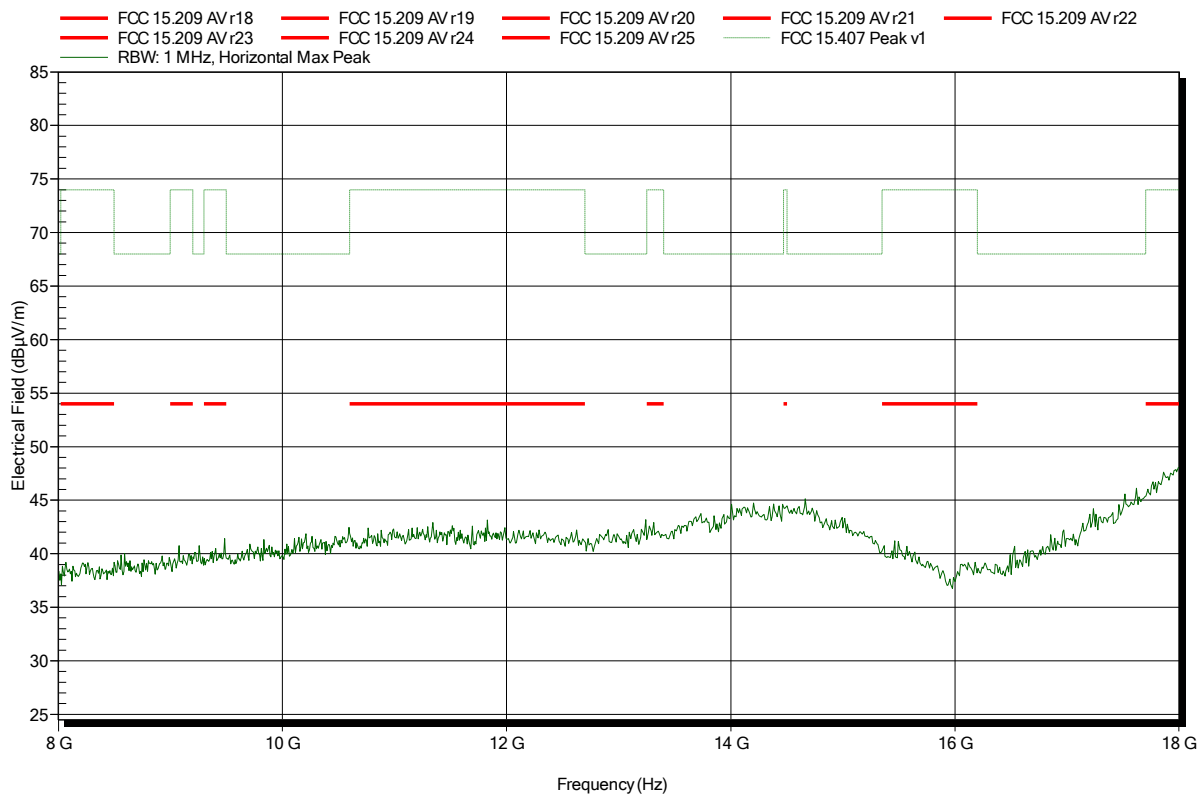


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11n HT20, MCS0, 15dBm
 Test Date: 2015-11-12
 Note:

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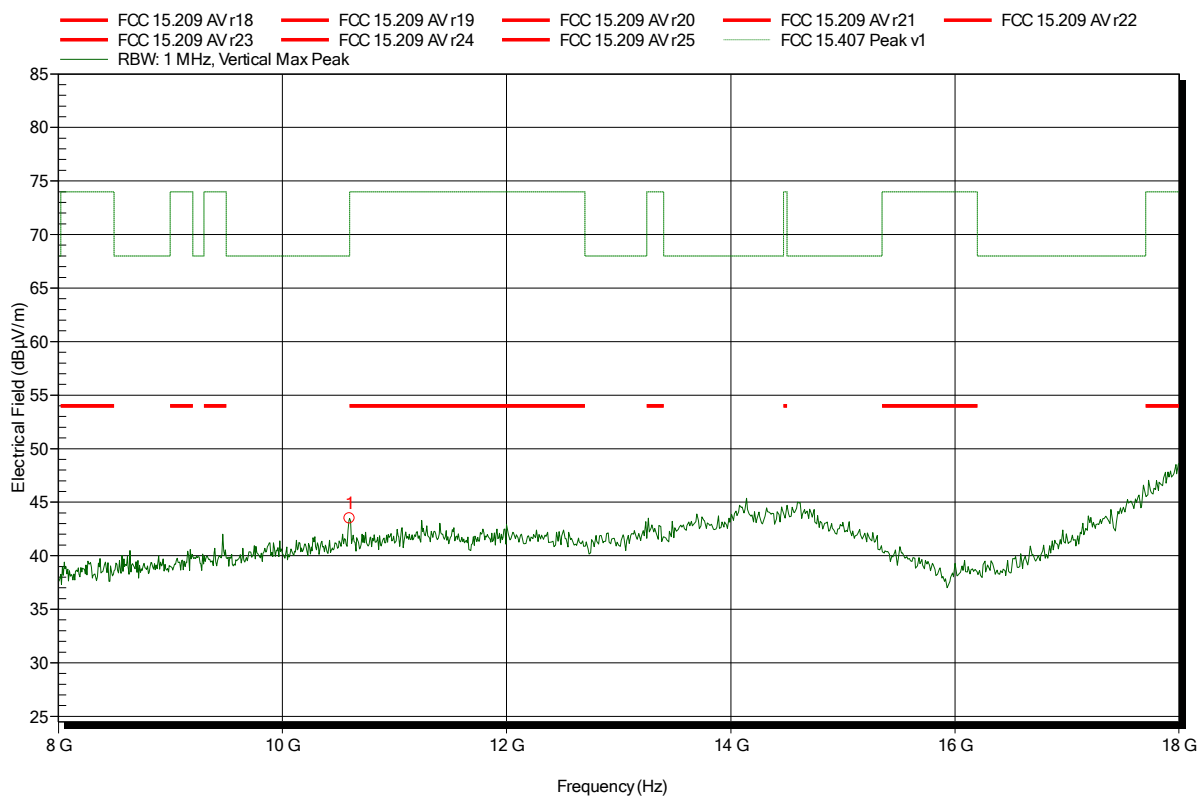


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11n HT20, MCS0, 15dBm
 Test Date: 2015-11-12
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
10.6 GHz	43.48 dBµV/m	68 dBµV/m	-24.52 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

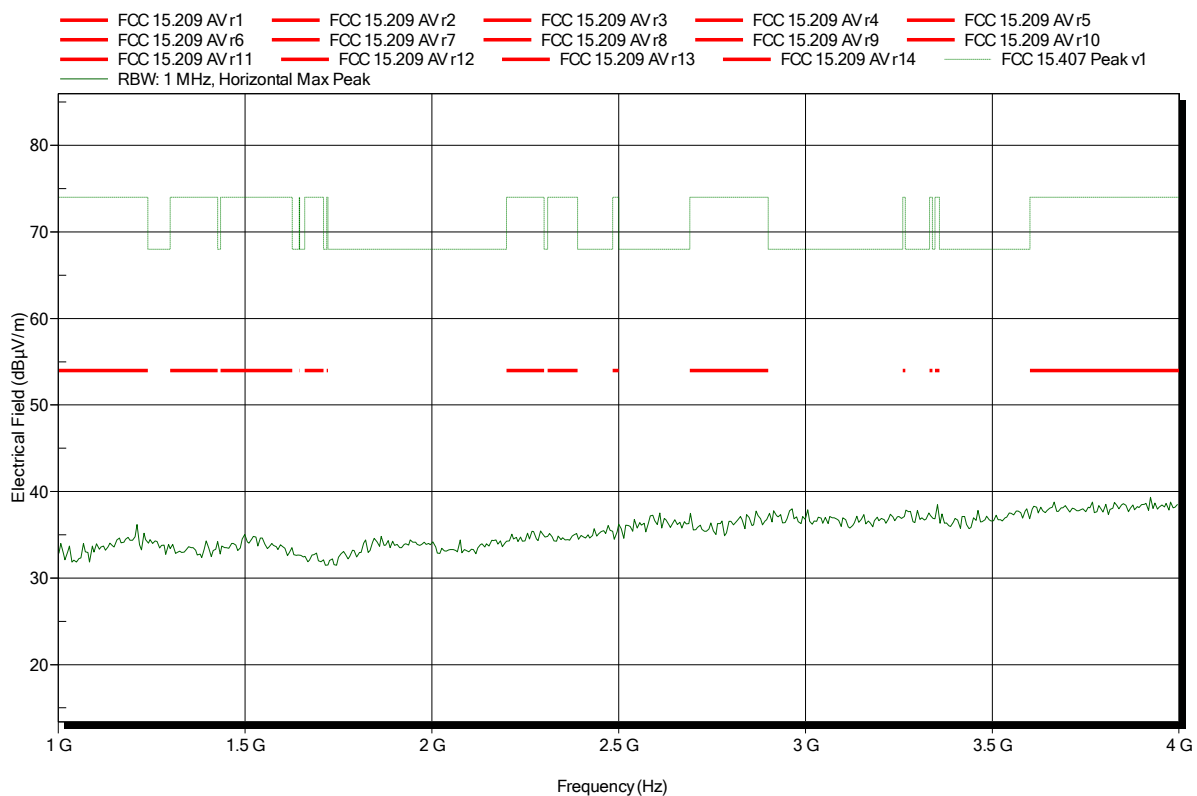
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch62, 802.11n HT40, MCS0, 15dBm
 Test Date: 2015-11-12
 Note:

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Test Report No.: G0M-1510-5172-TFC407WF-161-V01

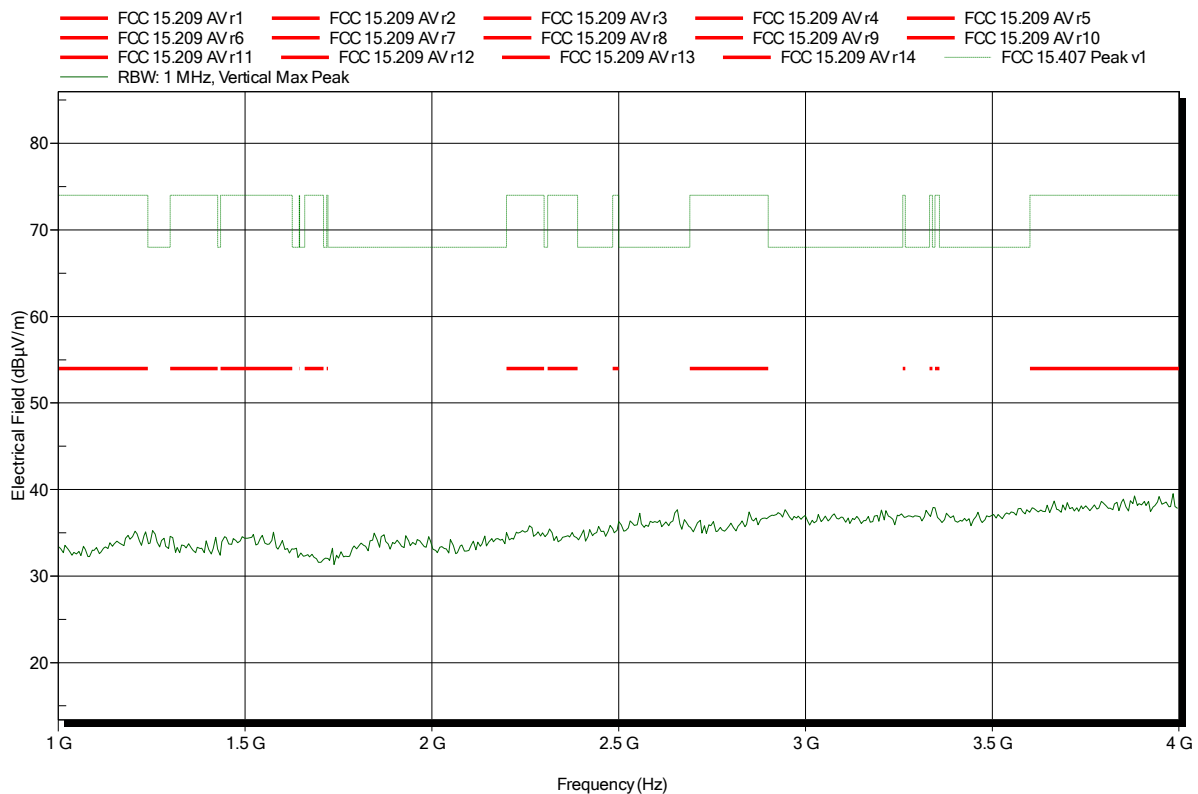
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch62, 802.11n HT40, MCS0, 15dBm
 Test Date: 2015-11-12
 Note:

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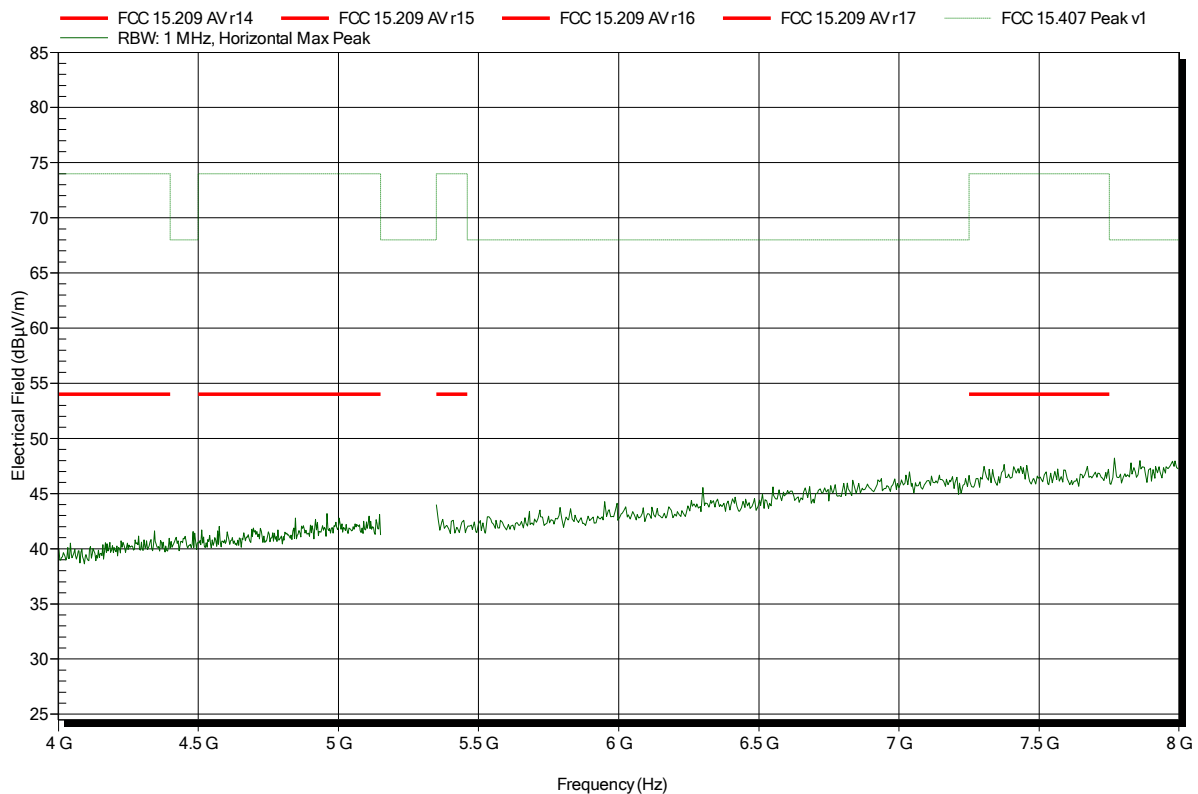


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch62, 802.11n HT40, MCS0, 15dBm
 Test Date: 2015-11-12
 Note:

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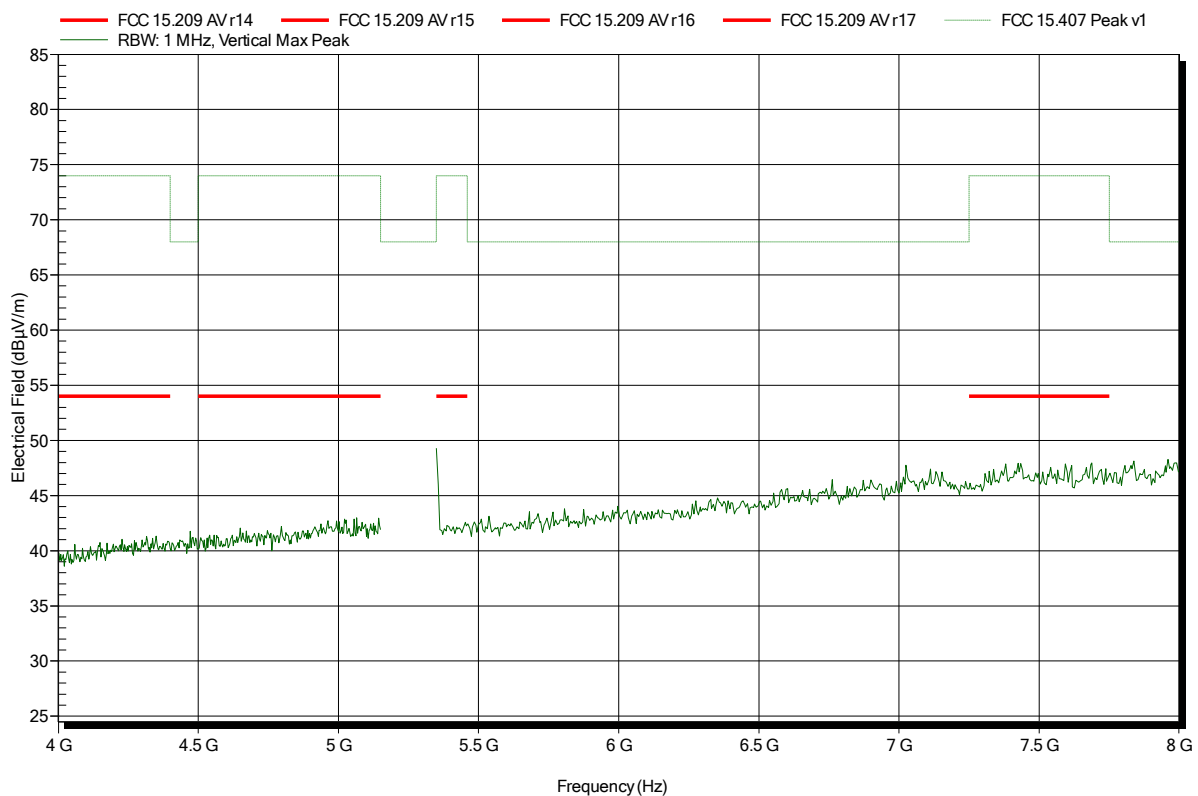


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch62, 802.11n HT40, MCS0, 15dBm
 Test Date: 2015-11-12
 Note:

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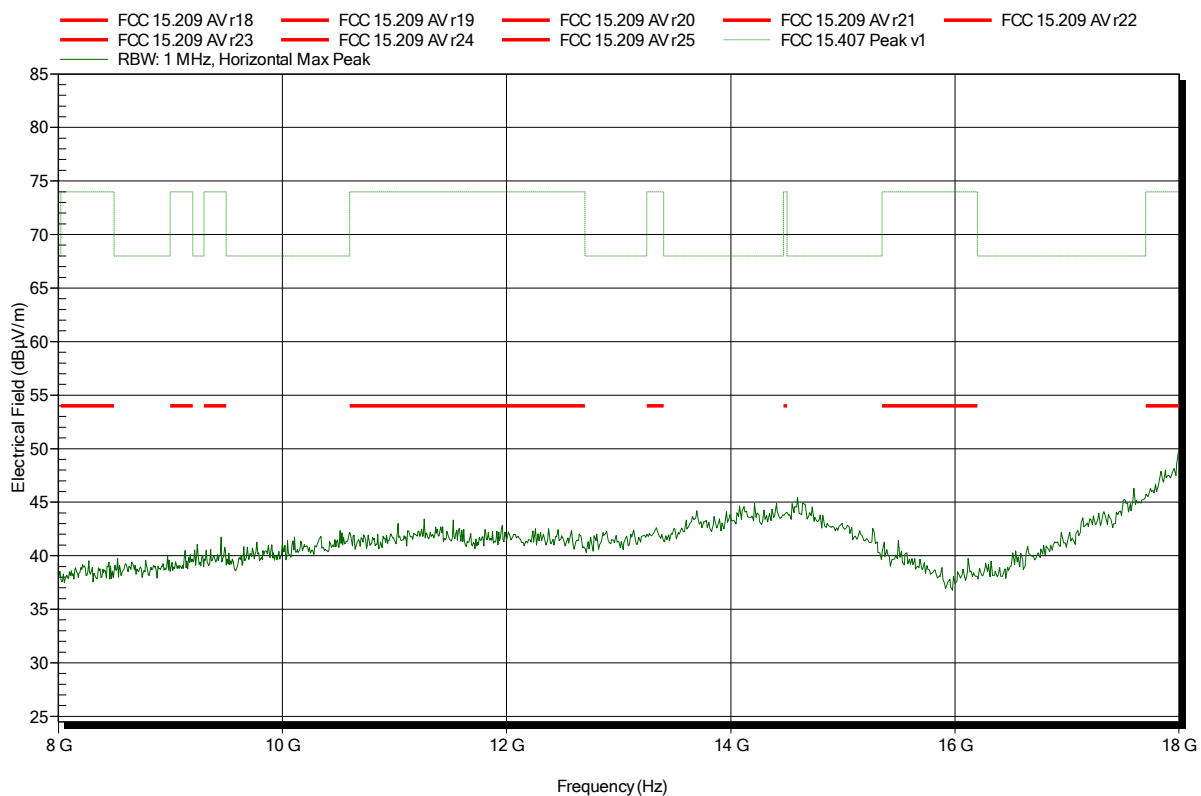


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch62, 802.11n HT40, MCS0, 15dBm
 Test Date: 2015-11-12
 Note:

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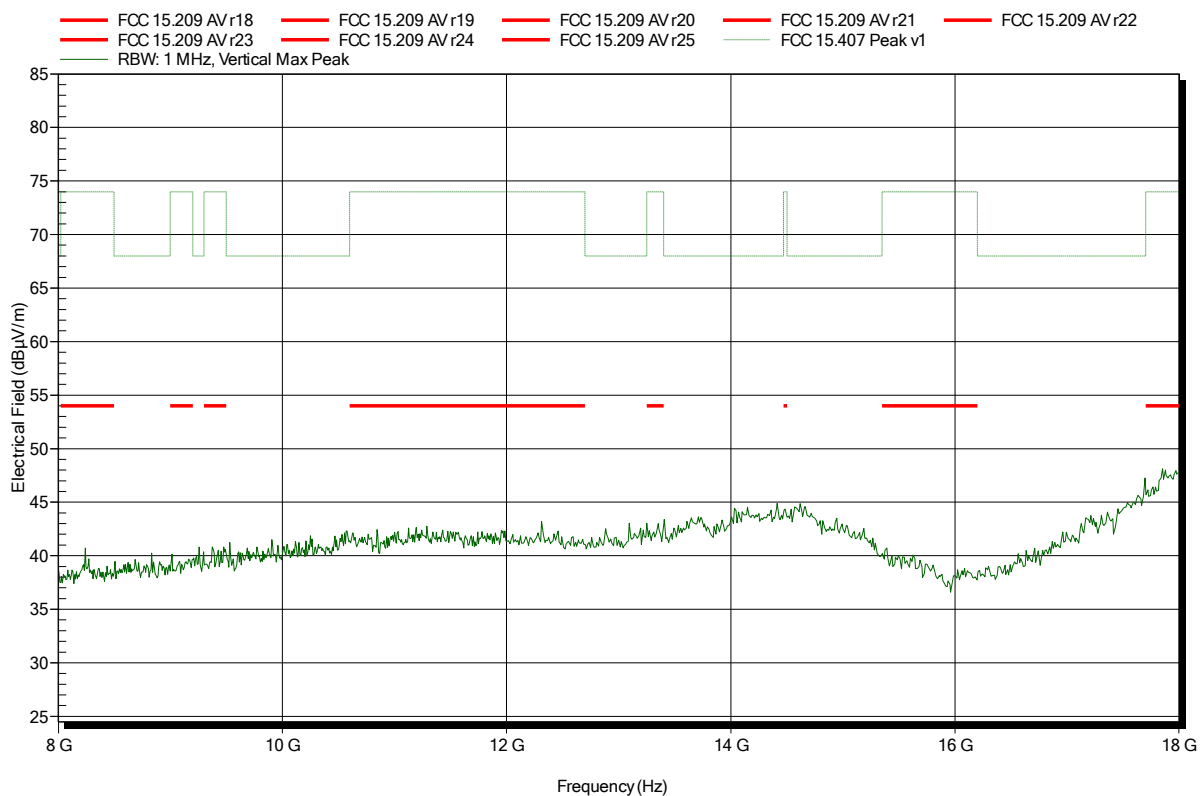


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch62, 802.11n HT40, MCS0, 15dBm
 Test Date: 2015-11-12
 Note:

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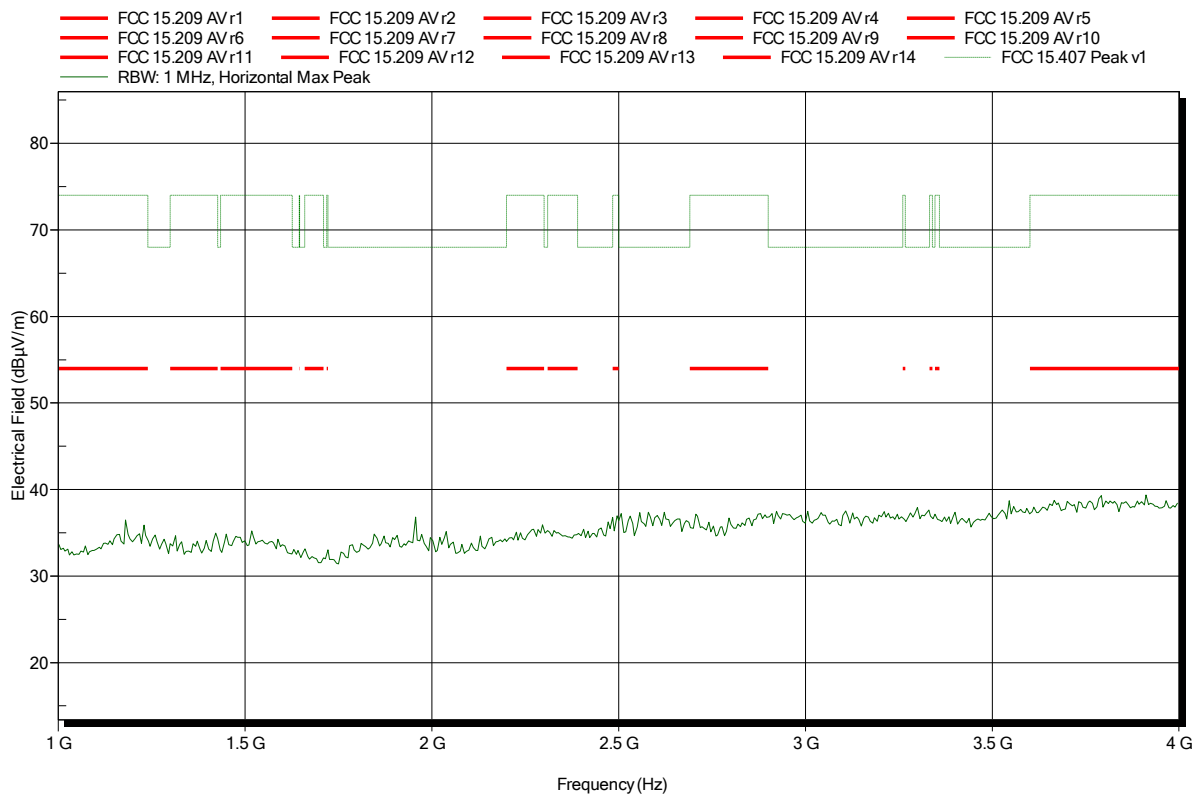


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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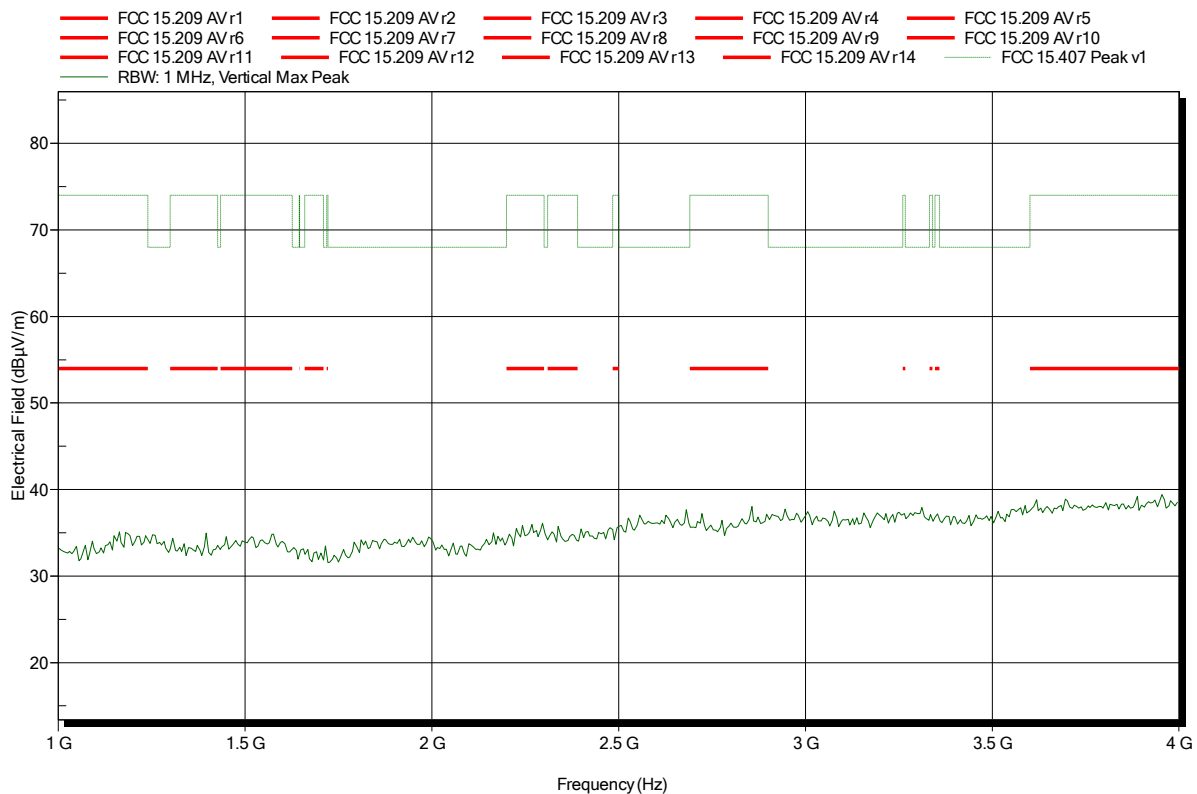


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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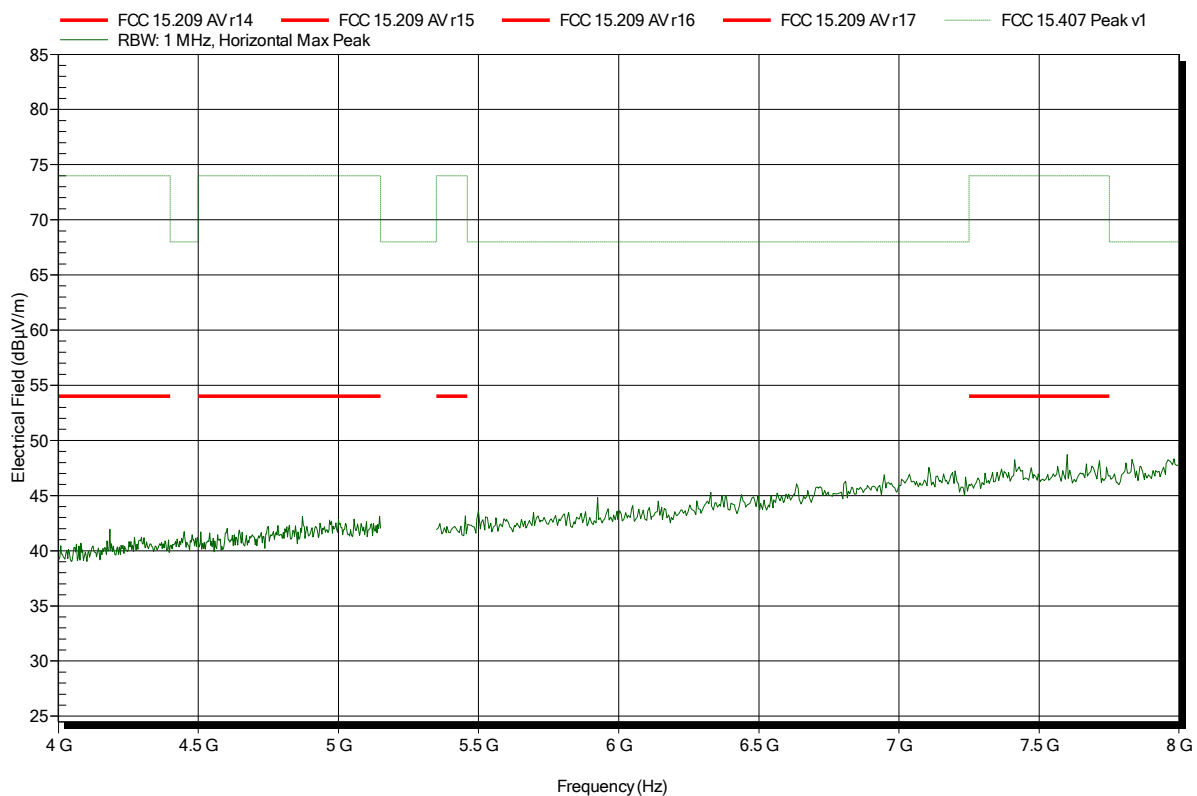


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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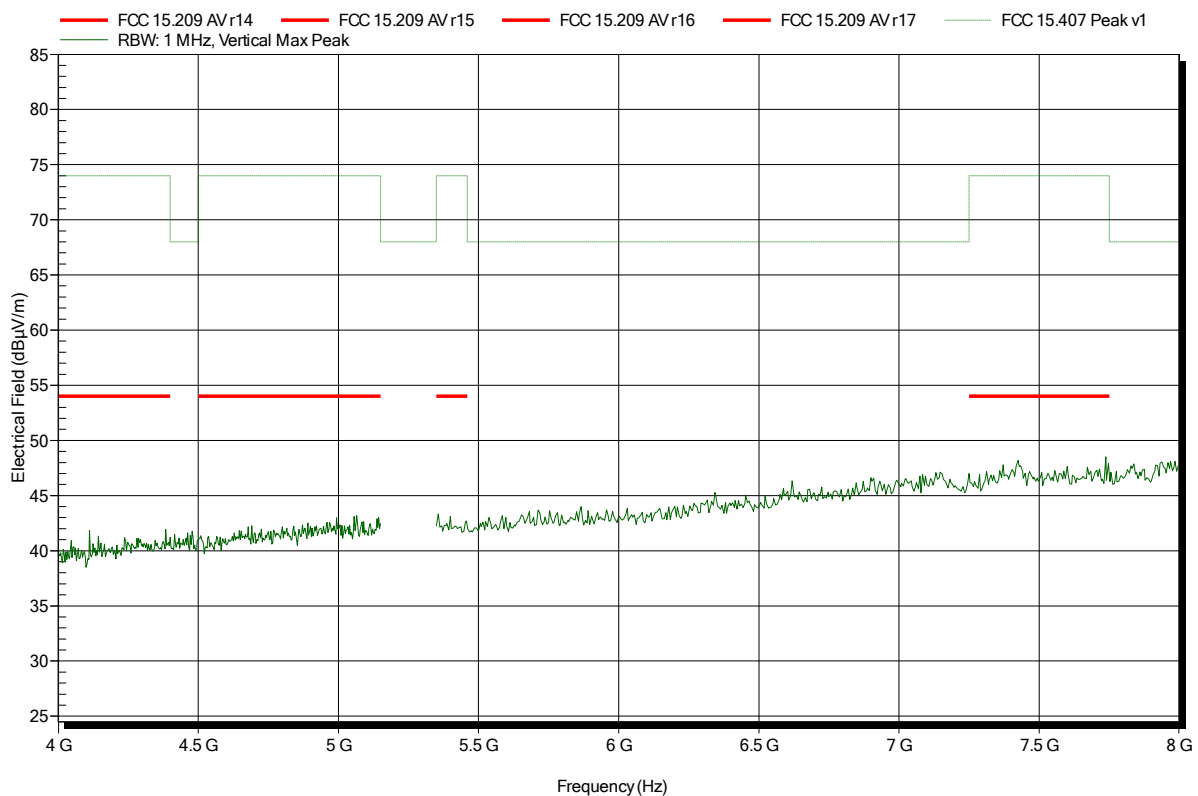


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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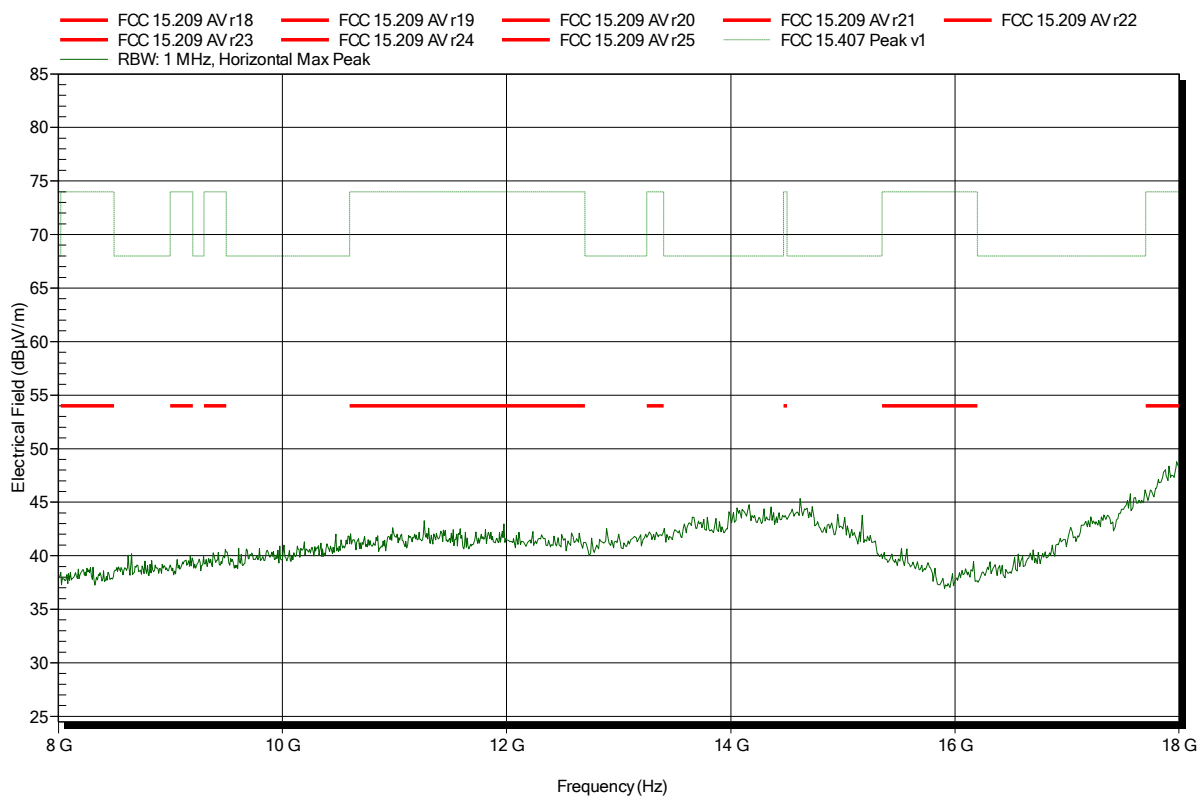


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Test Report No.: G0M-1510-5172-TFC407WF-161-V01

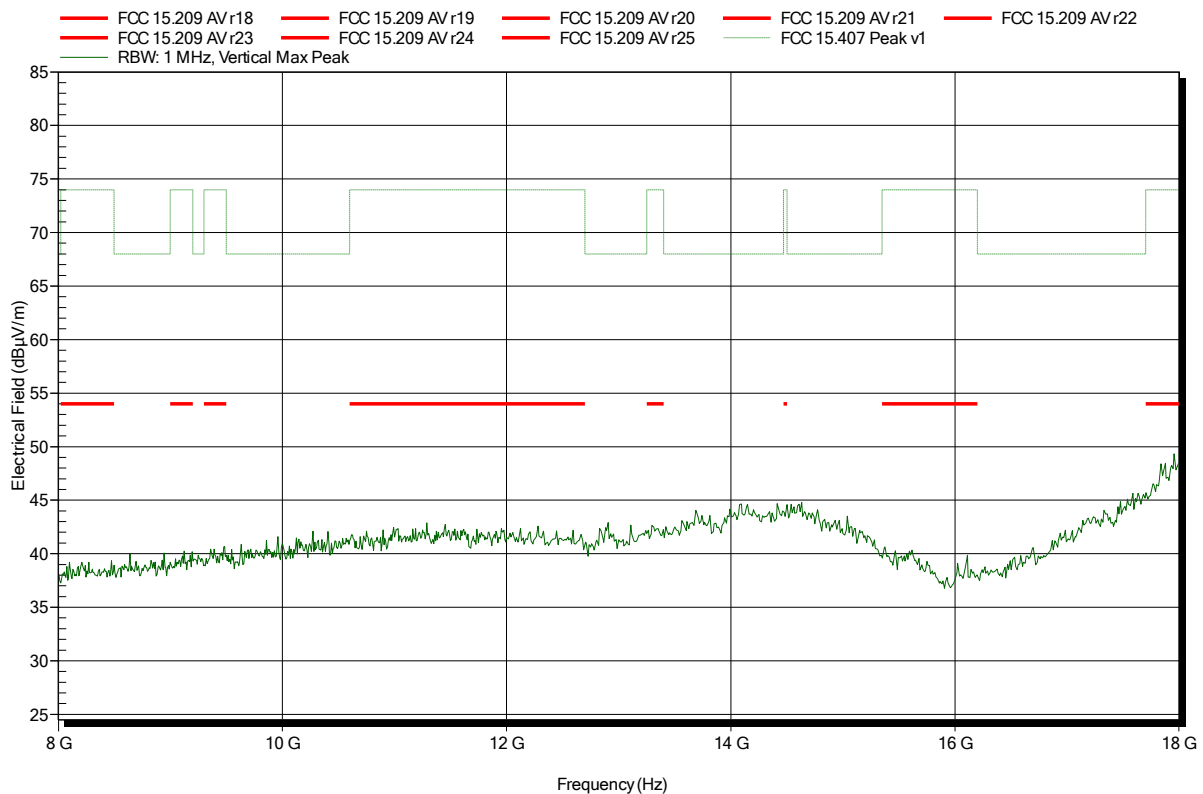
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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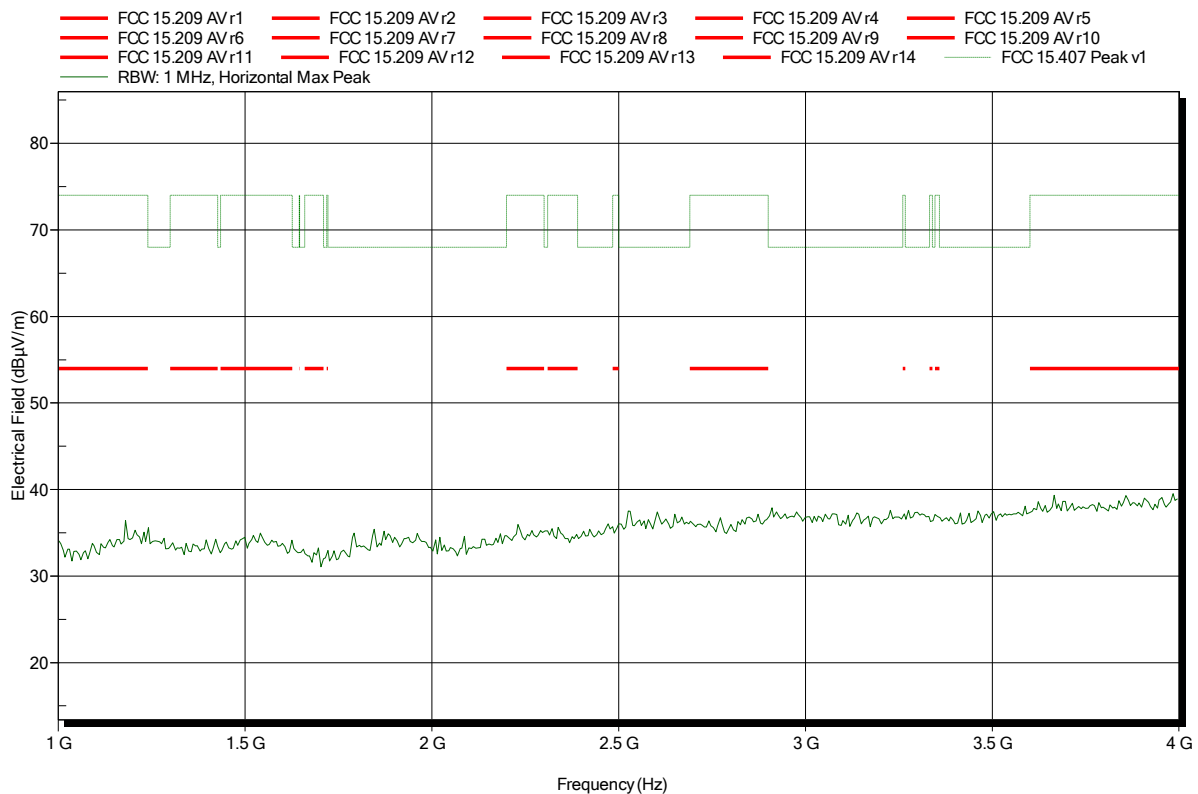


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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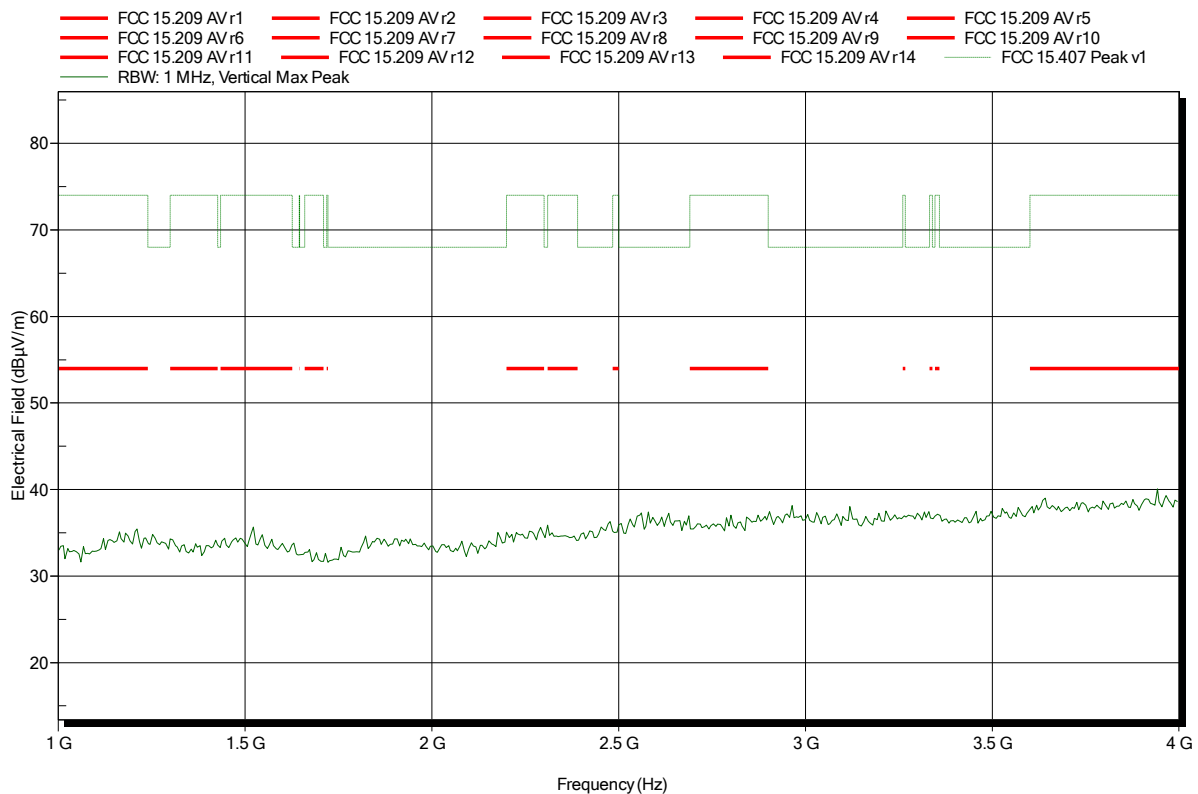


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Test Report No.: G0M-1510-5172-TFC407WF-161-V01

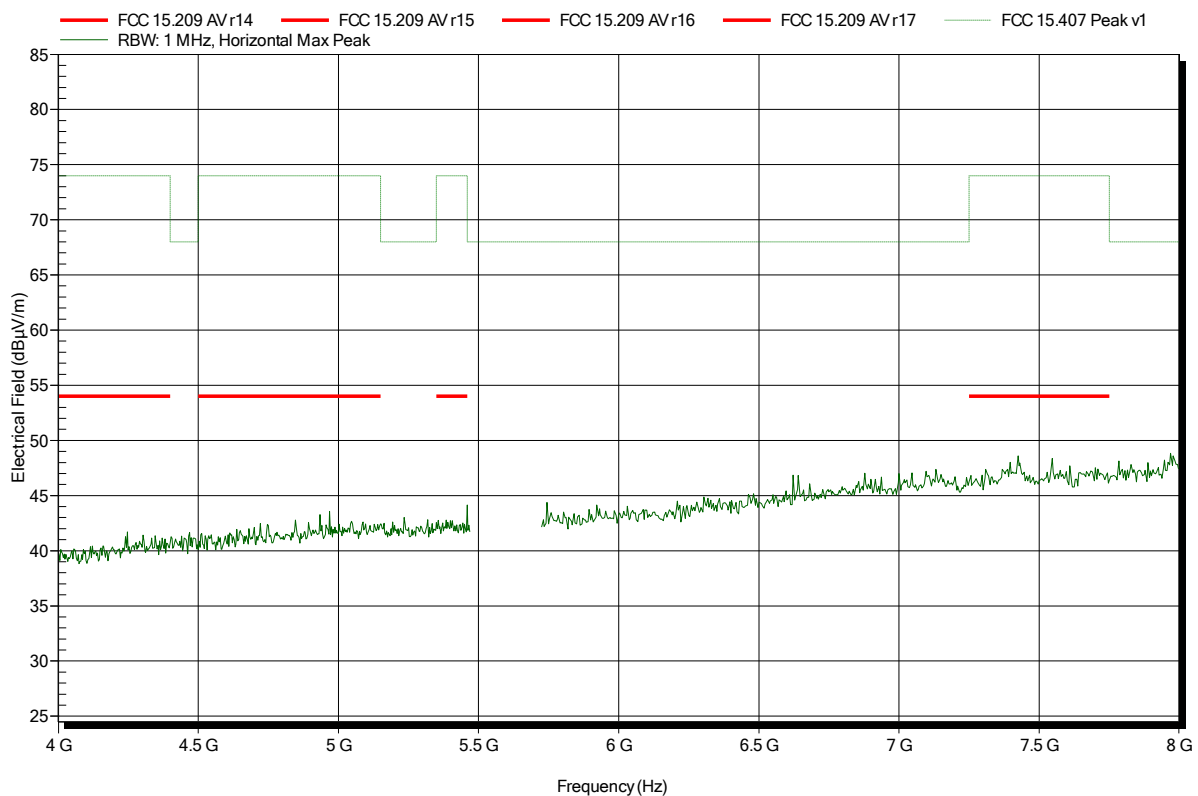
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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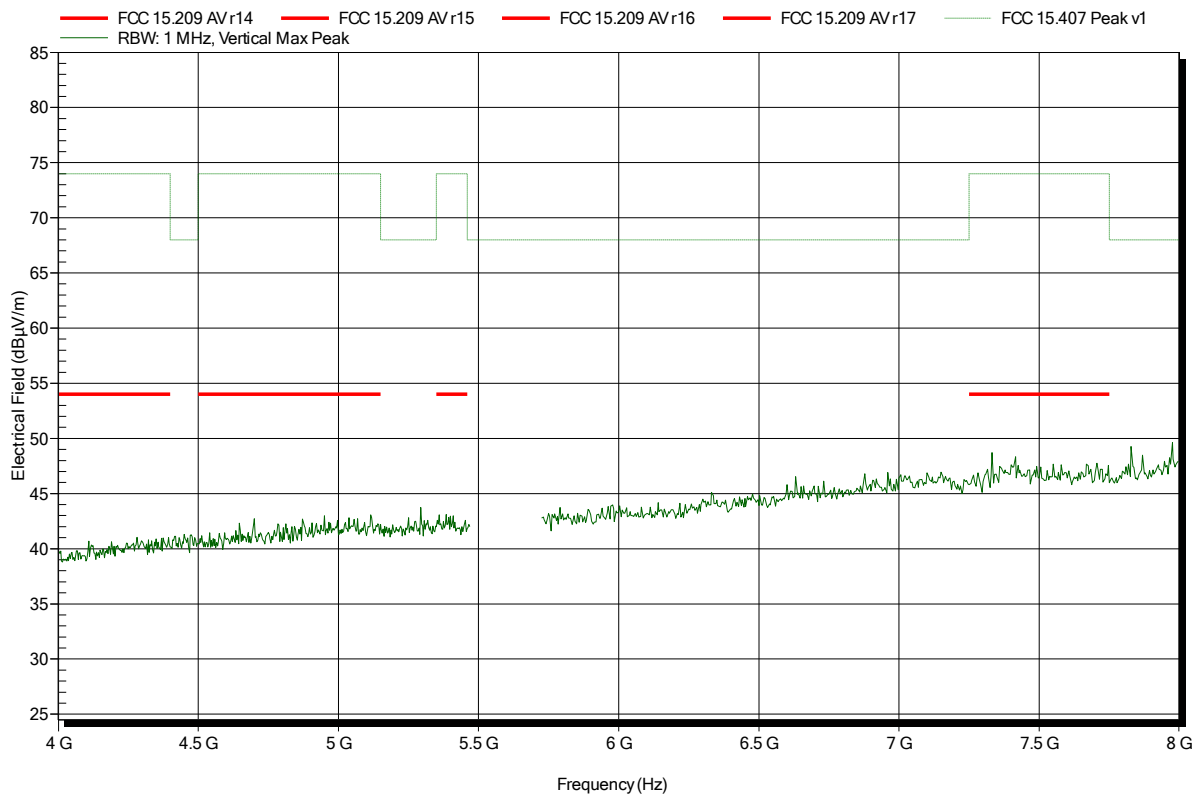


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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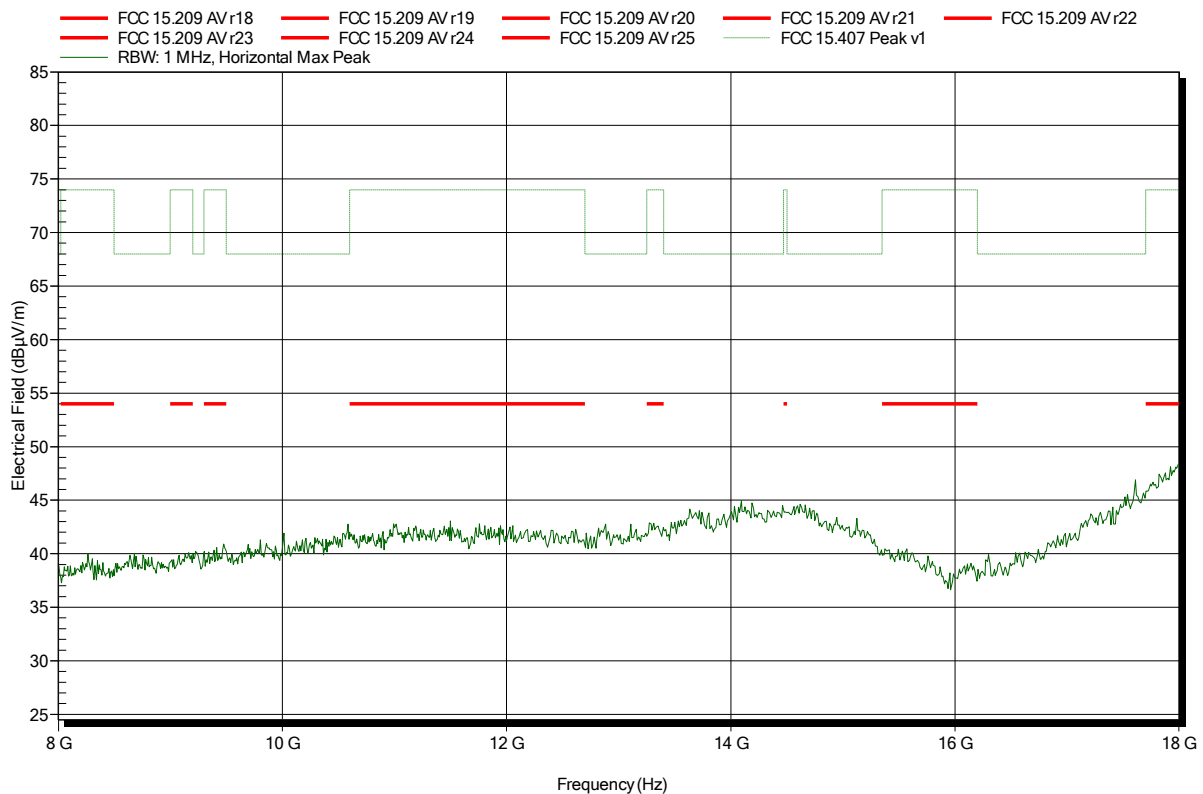


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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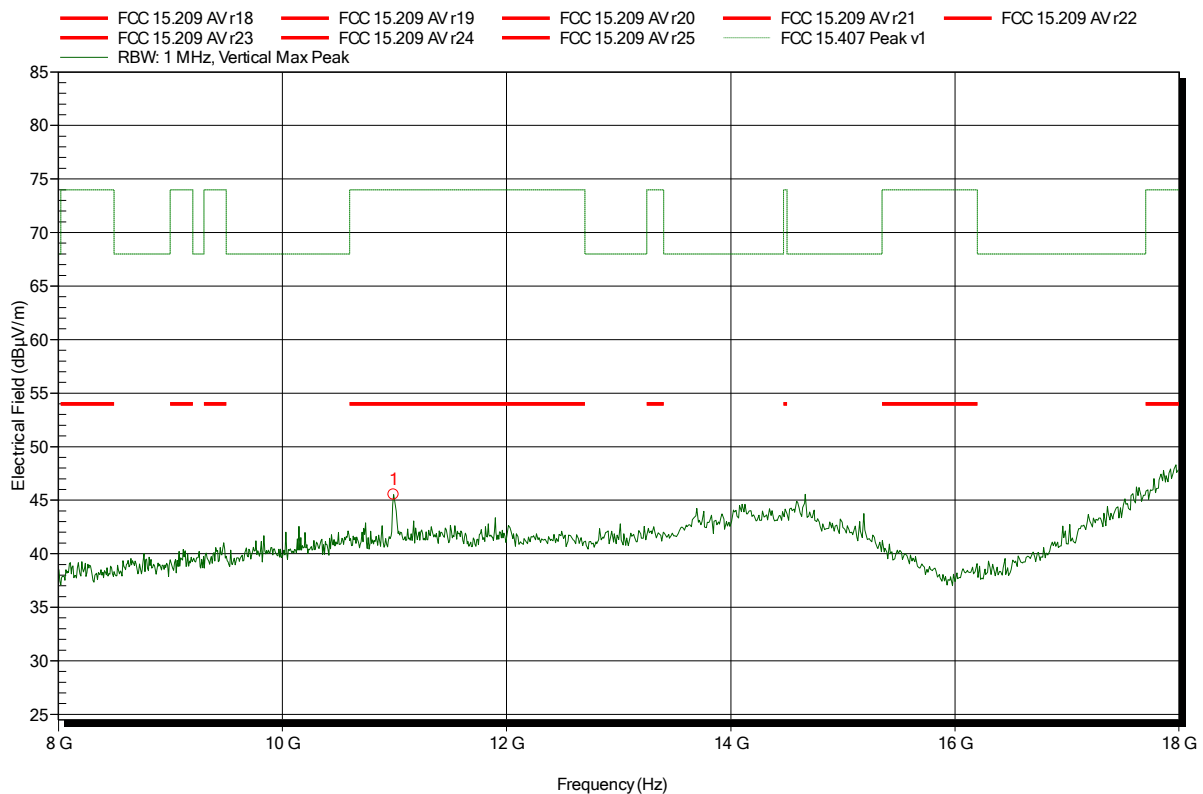


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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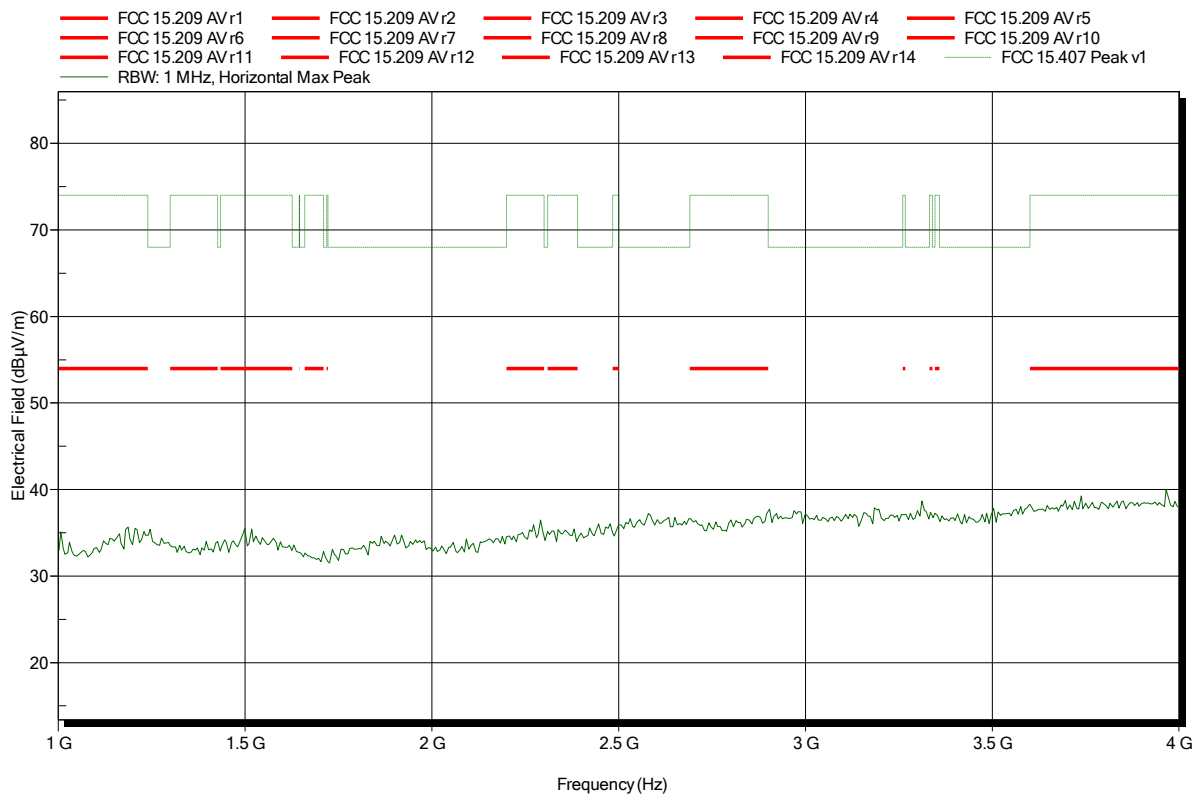
Frequency	Peak	Peak Limit	Peak Difference	Status
10.992 GHz	45.52 dBµV/m	74 dBµV/m	-28.48 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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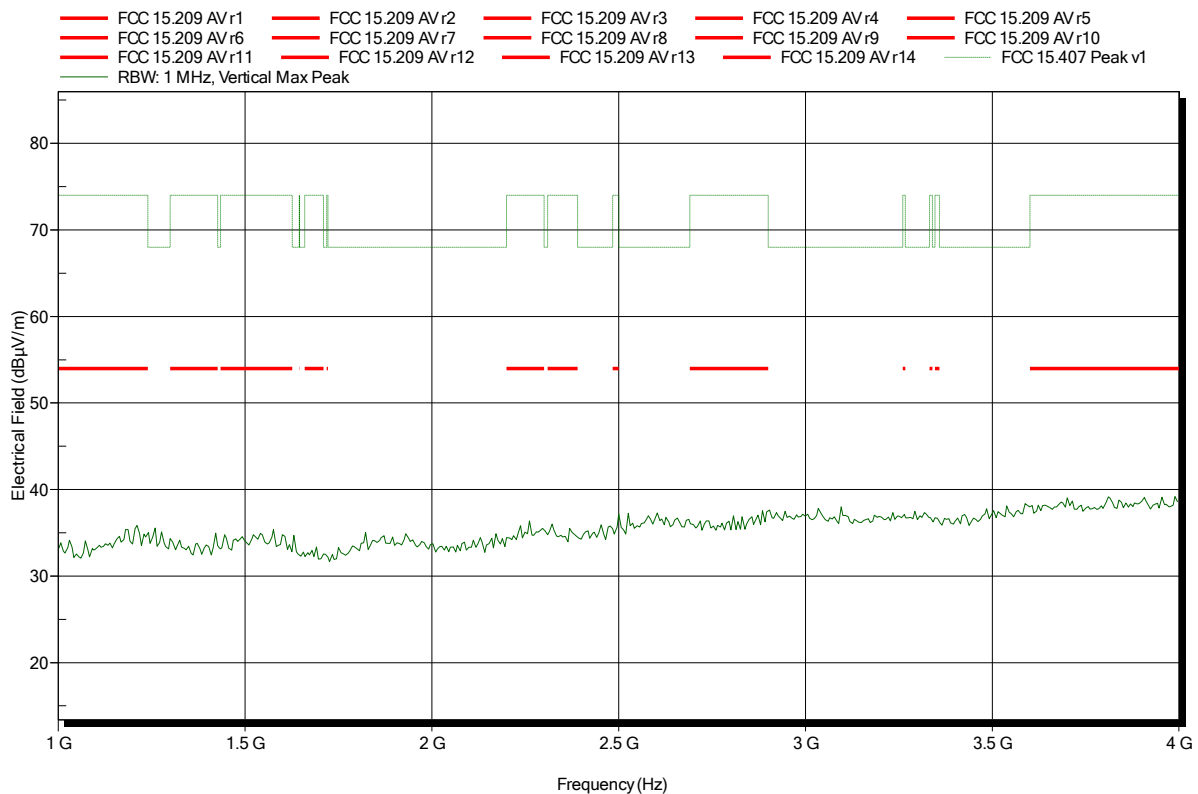


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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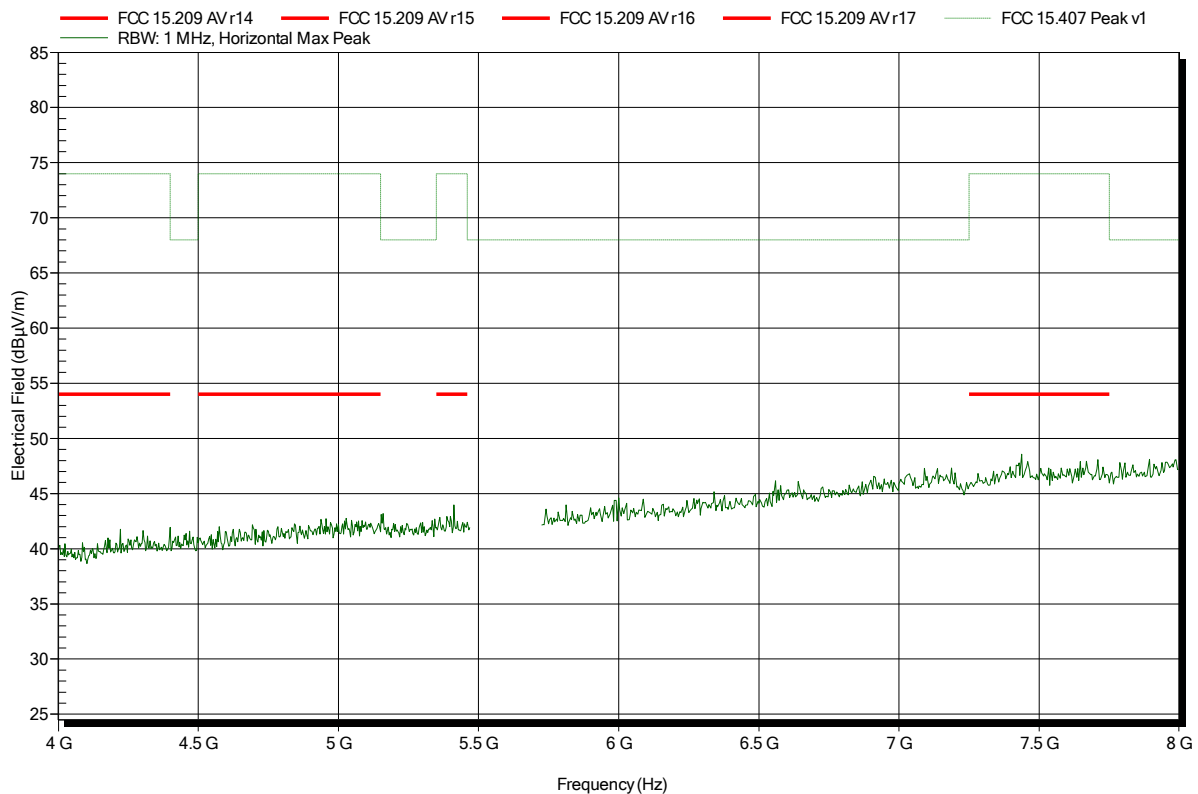


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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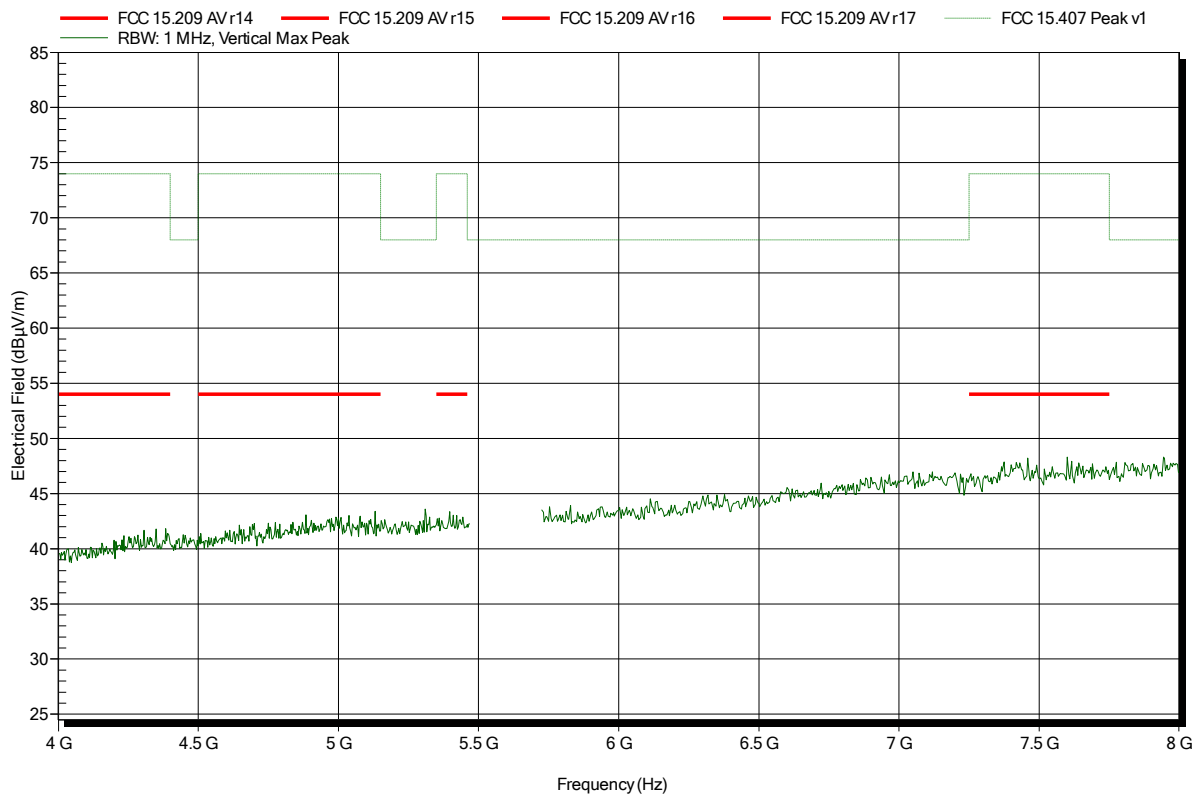


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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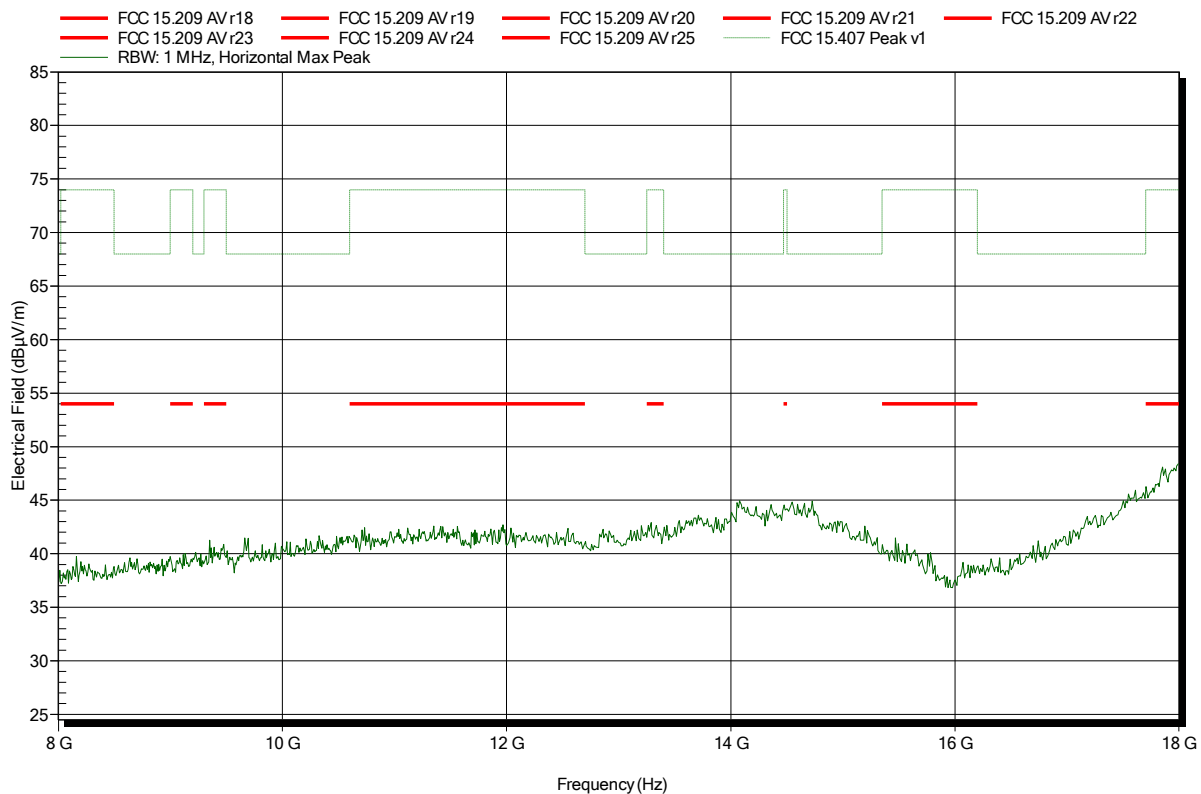


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Test Report No.: G0M-1510-5172-TFC407WF-161-V01

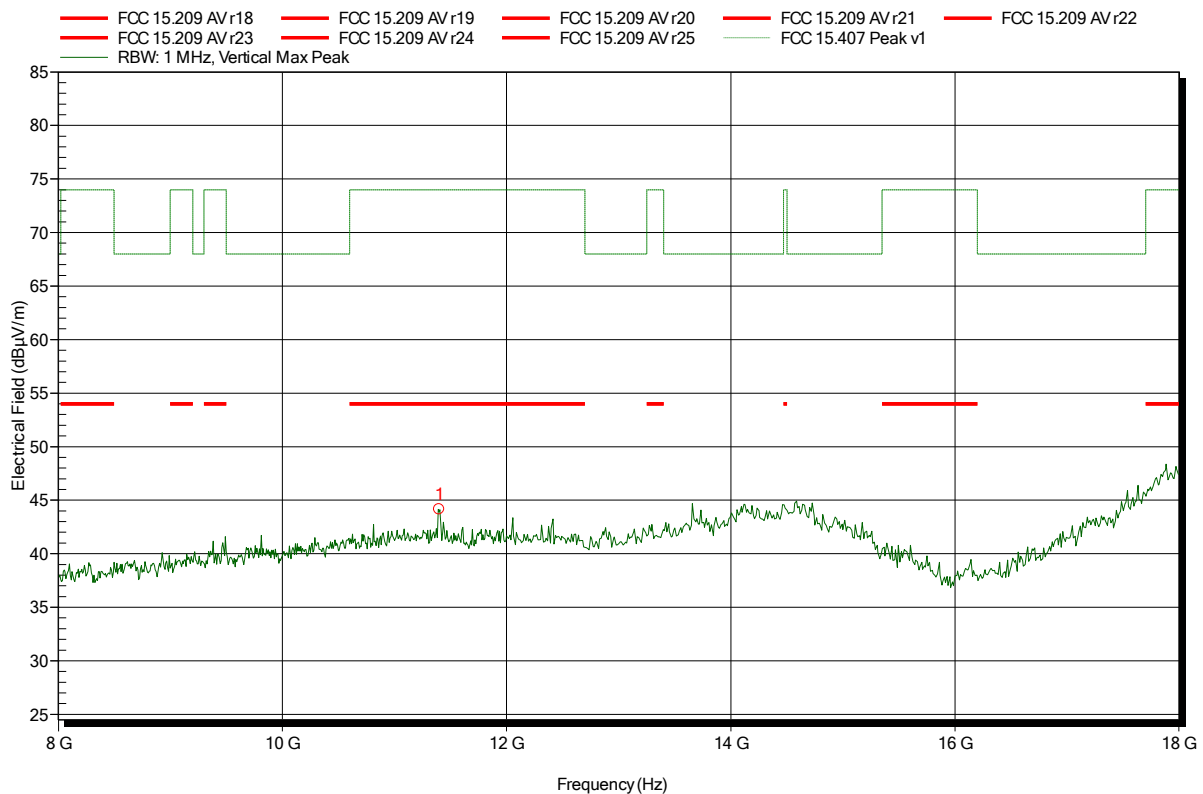
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
11.4 GHz	44.13 dBµV/m	74 dBµV/m	-29.87 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

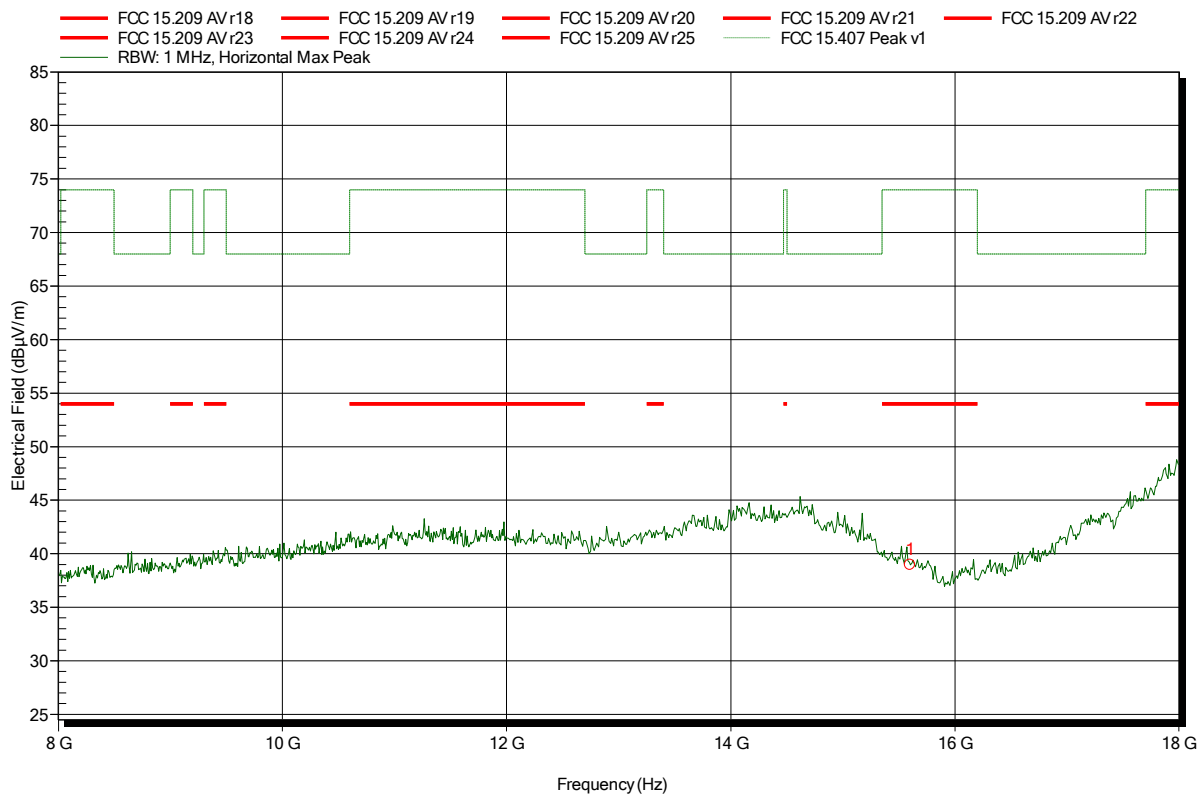
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
15.6 GHz	38.97 dBµV/m	74 dBµV/m	-35.03 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

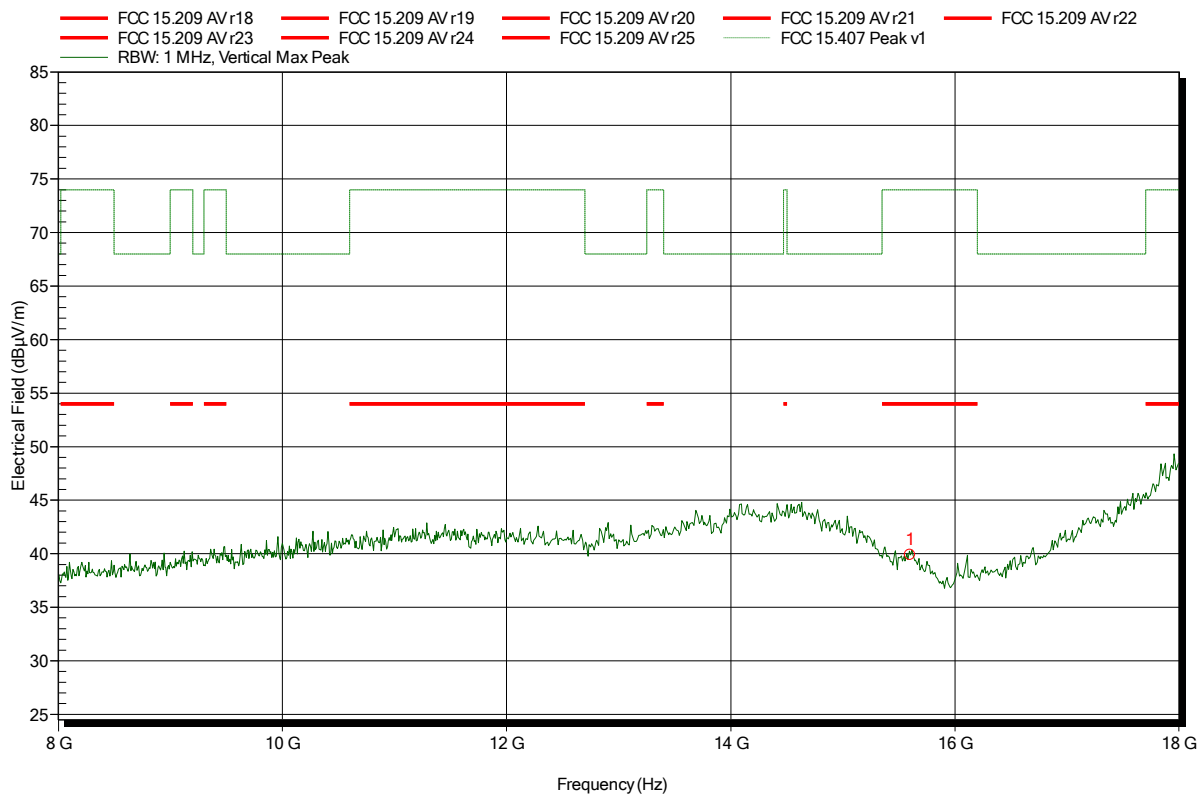
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
15.6 GHz	39.89 dBµV/m	74 dBµV/m	-34.11 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

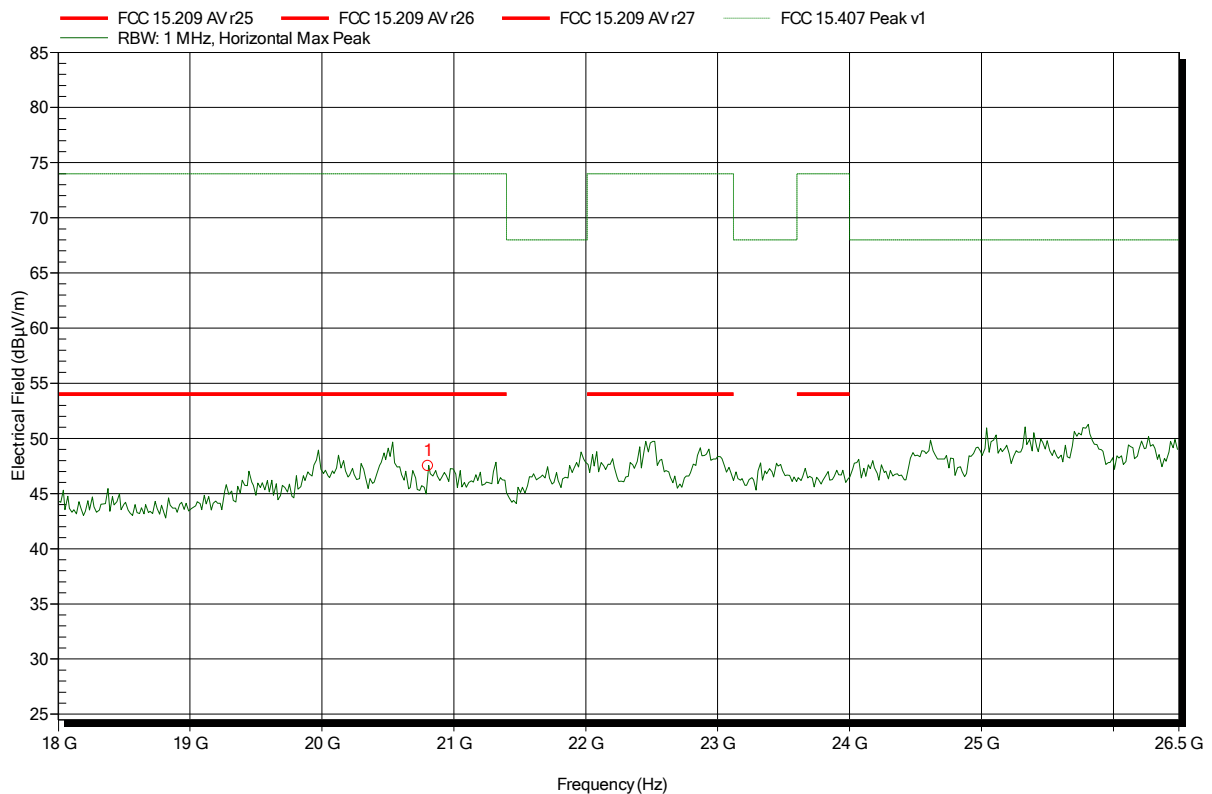
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Weber
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
20.805 GHz	47.48 dBµV/m	74 dBµV/m	-26.52 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

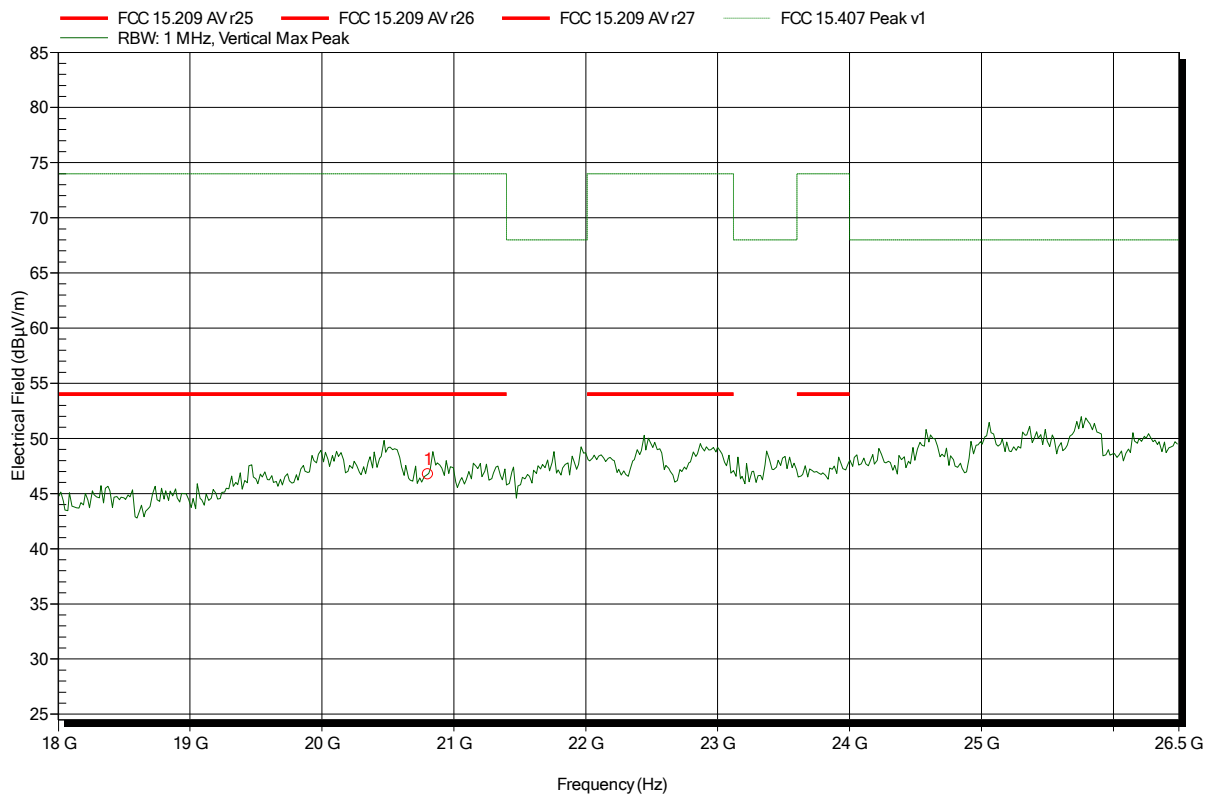
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Weber
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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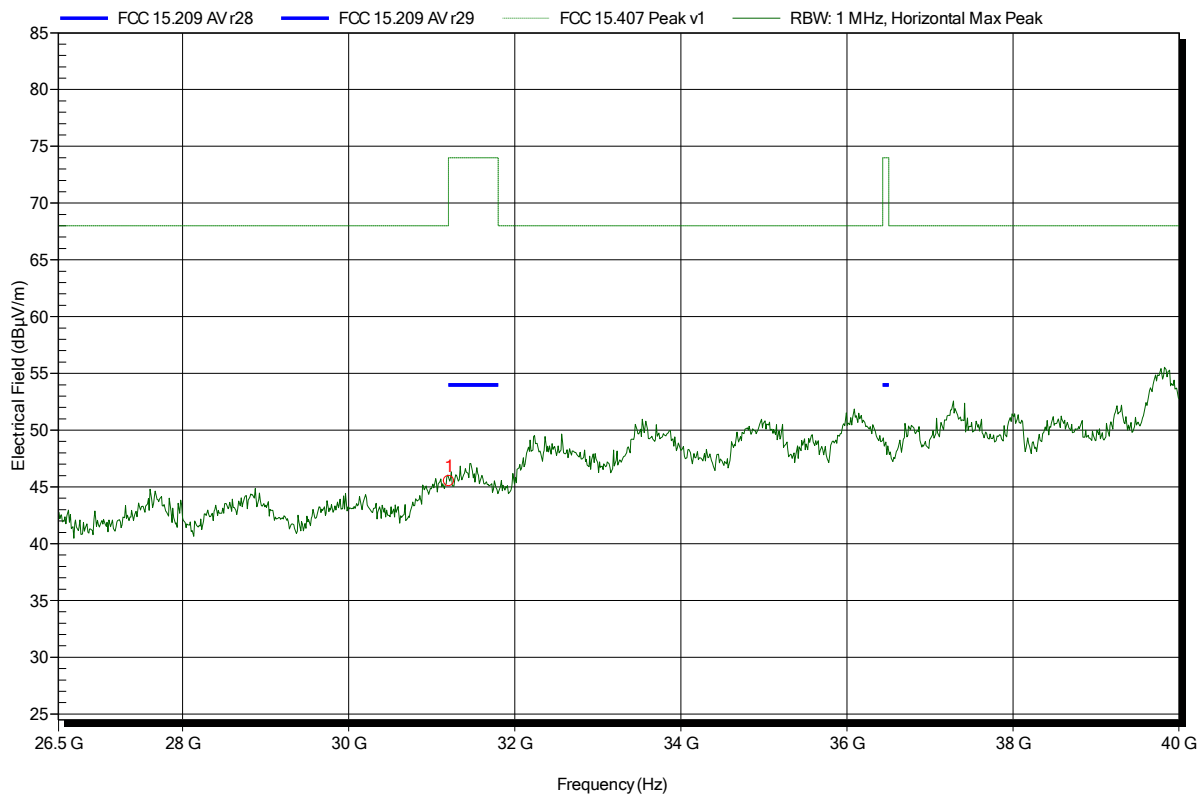
Frequency	Peak	Peak Limit	Peak Difference	Status
20.805 GHz	46.75 dBµV/m	74 dBµV/m	-27.25 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: 22240-25, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-16
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
31.206 GHz	45.51 dBµV/m	74 dBµV/m	-28.49 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

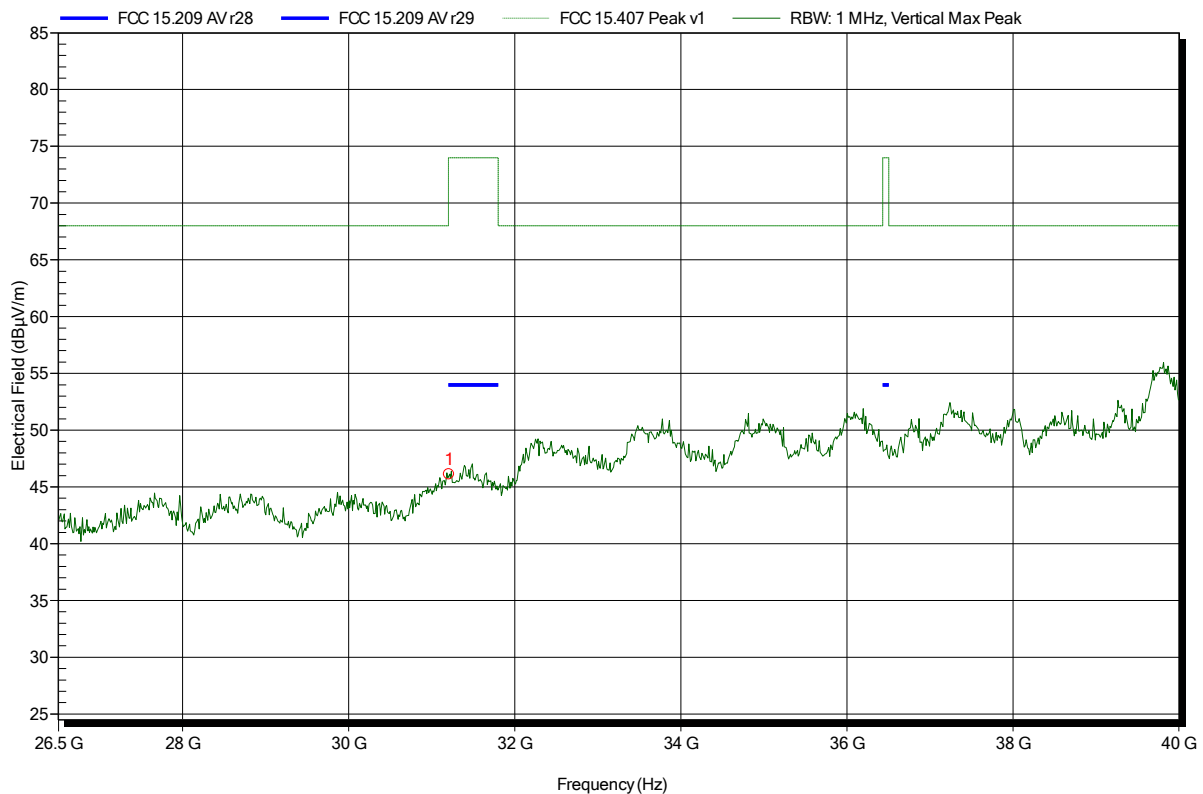
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: 22240-25, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-16
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
31.206 GHz	46.12 dBµV/m	74 dBµV/m	-27.88 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

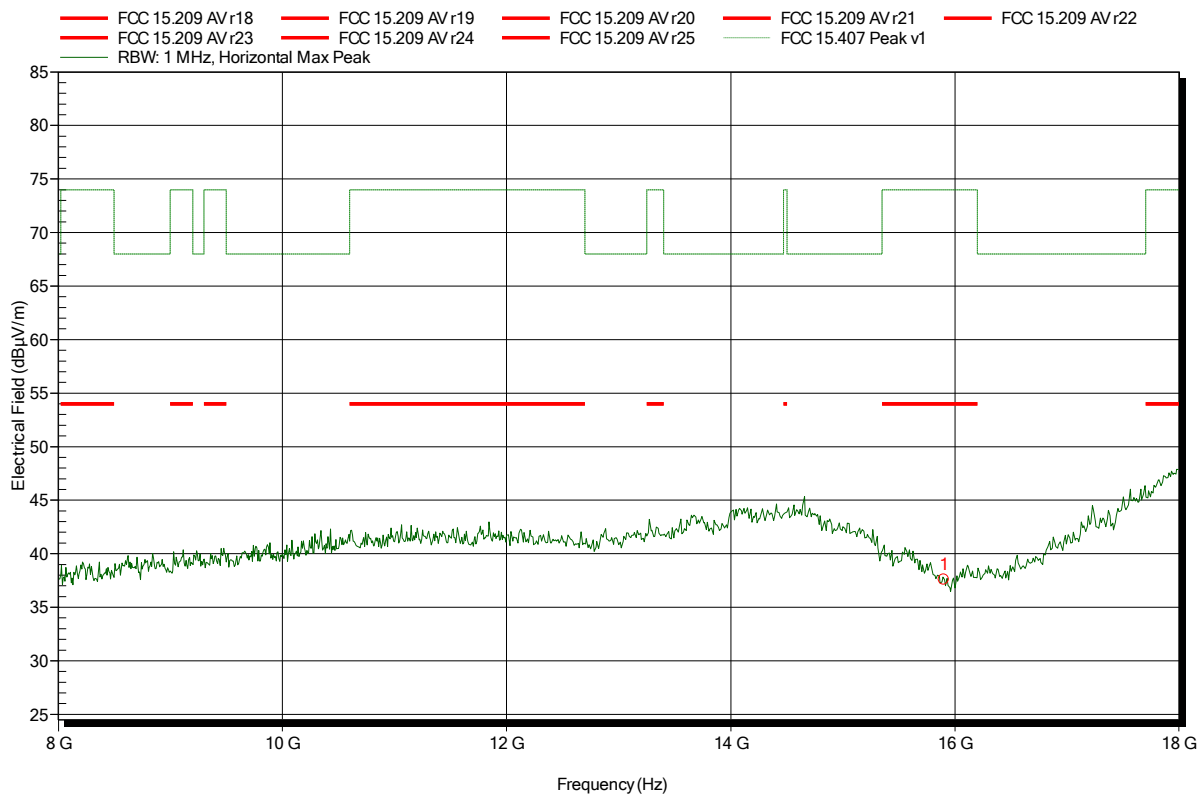
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
15.9 GHz	37.59 dBµV/m	74 dBµV/m	-36.41 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

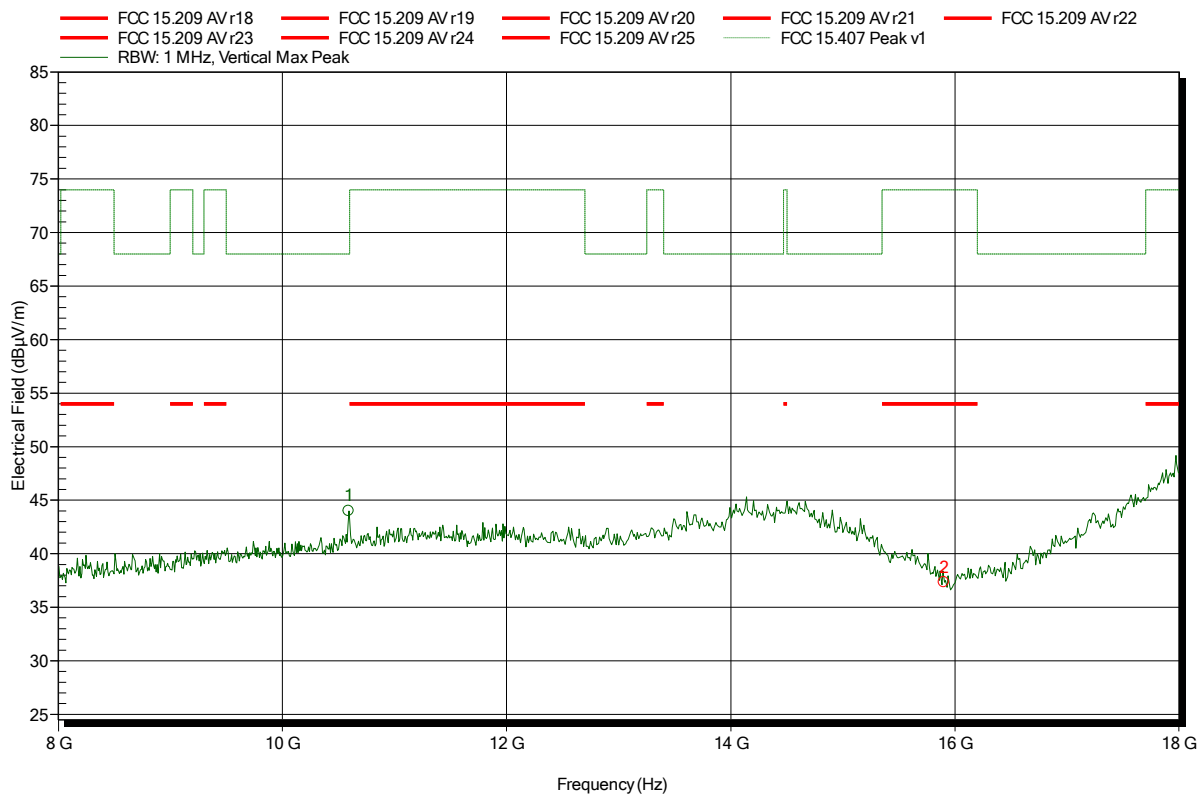
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
10.592 GHz	44 dBμV/m	68 dBμV/m	-24 dB	Pass
15.9 GHz	37.35 dBμV/m	74 dBμV/m	-36.65 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

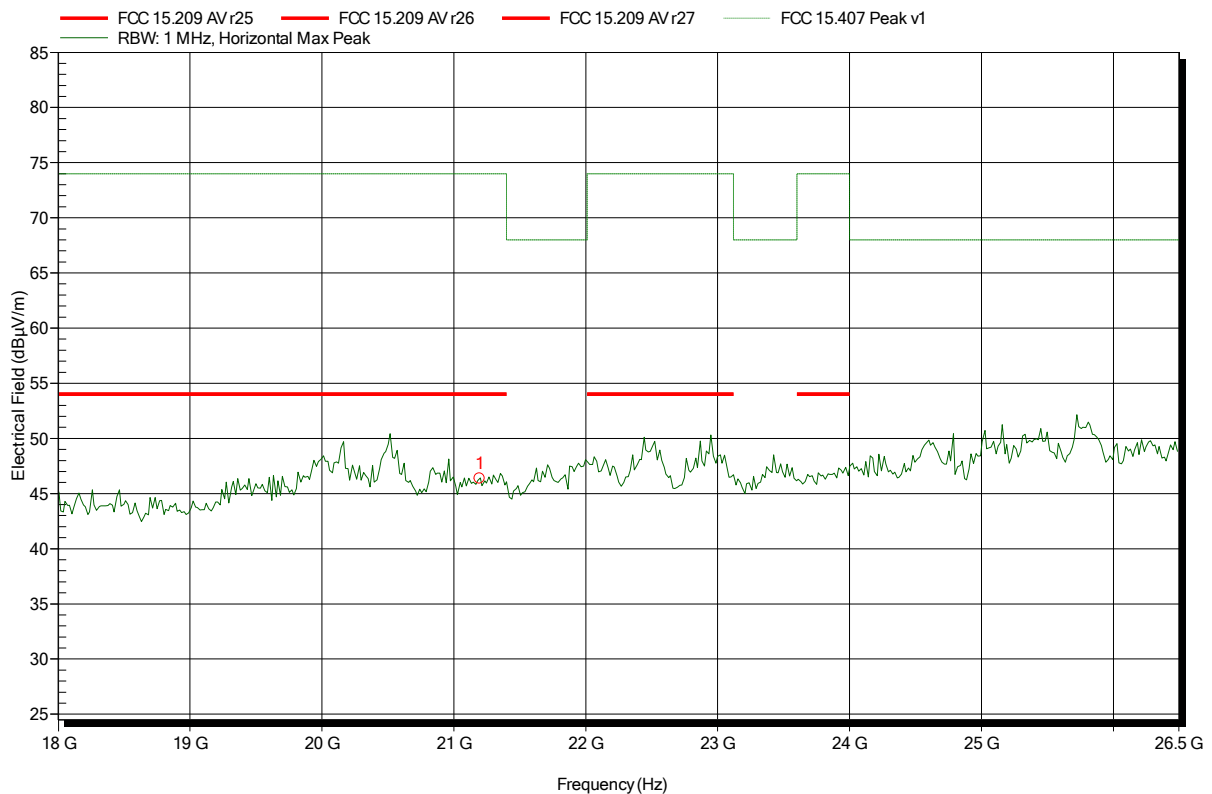
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
21.196 GHz	46.37 dBµV/m	74 dBµV/m	-27.63 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

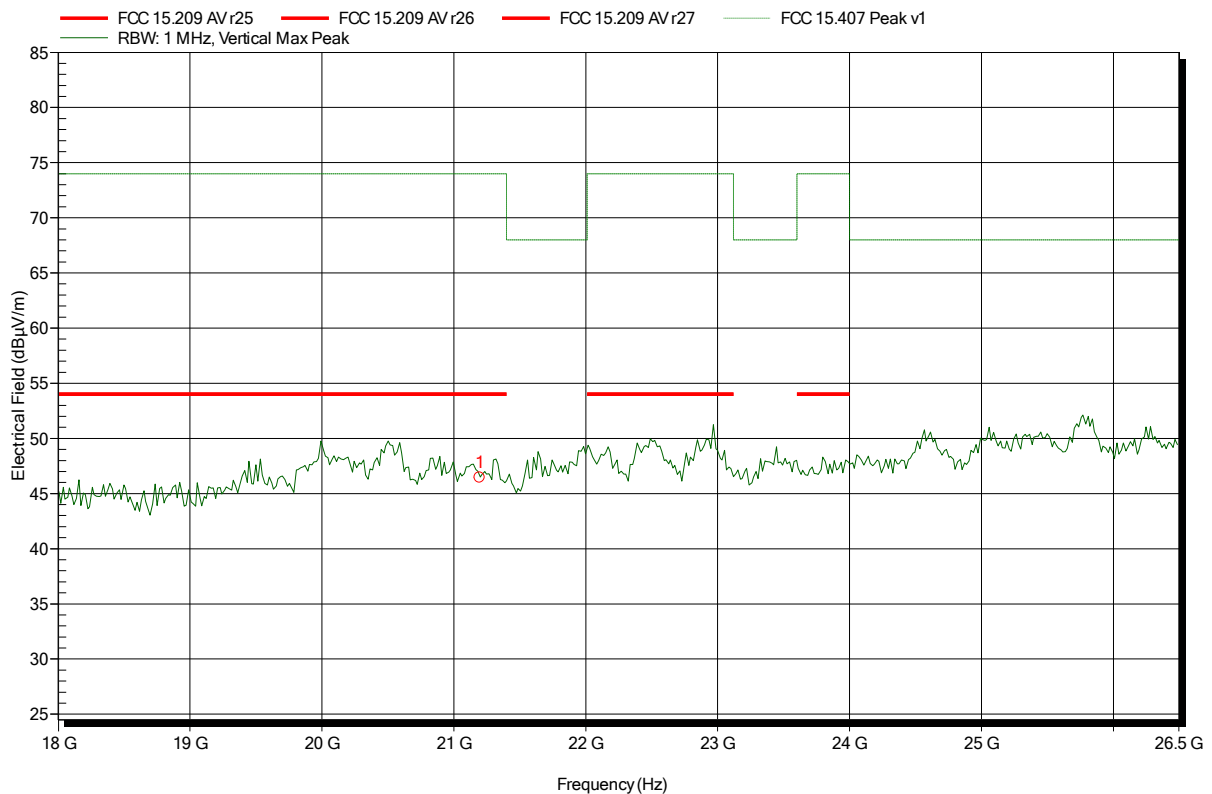
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
21.196 GHz	46.46 dBµV/m	74 dBµV/m	-27.54 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

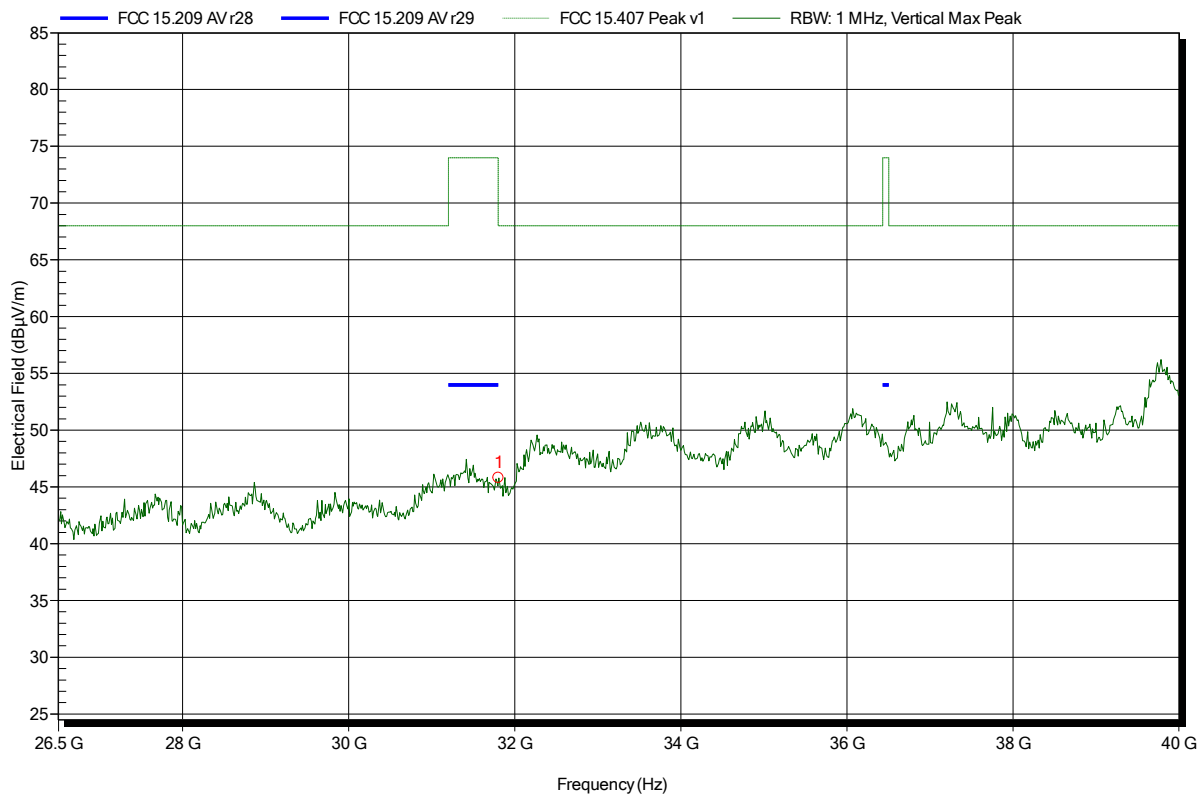
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: 22240-25, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-16
 Note:

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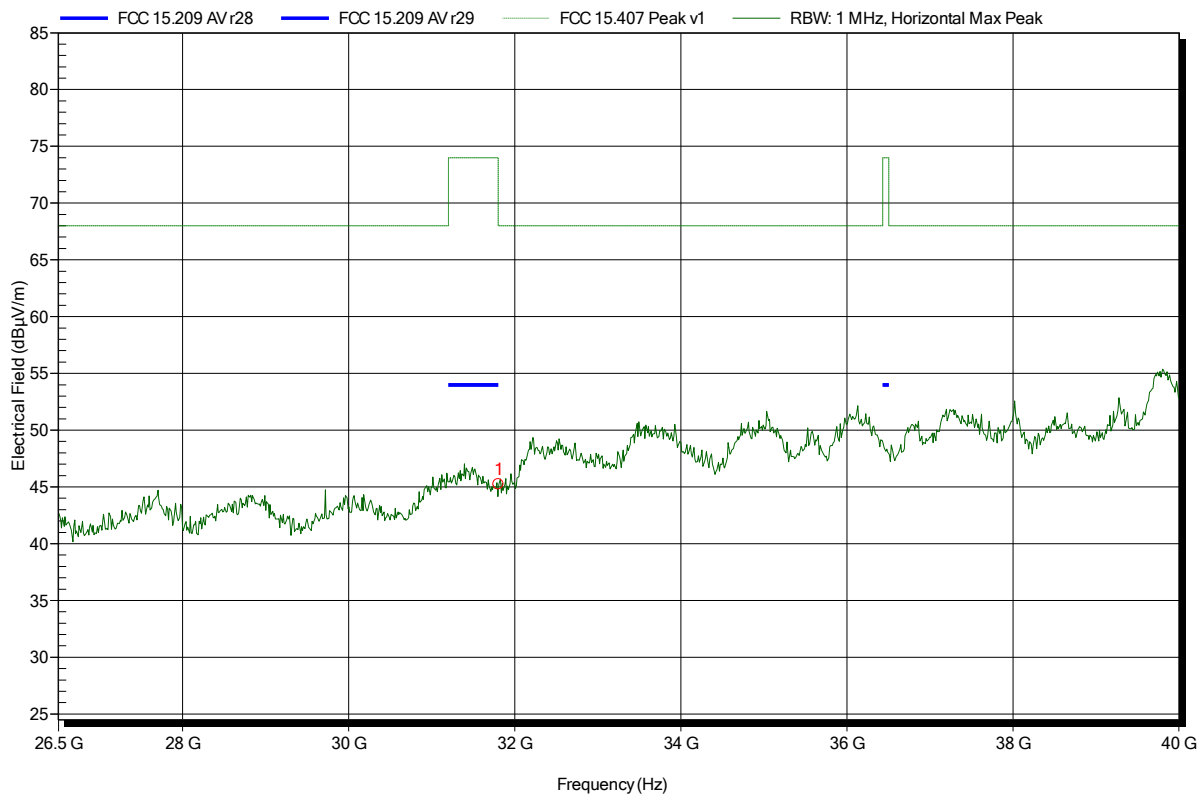


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: 22240-25, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-16
 Note:

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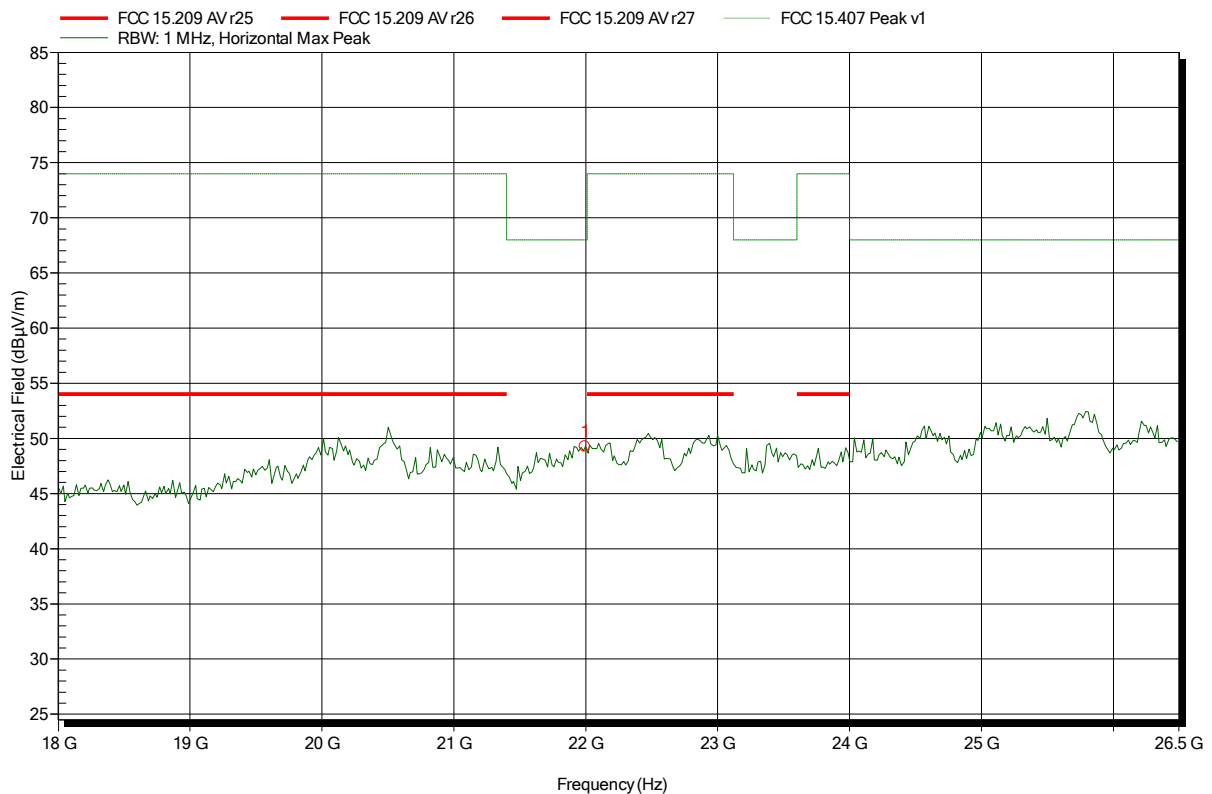
Frequency	Peak	Peak Limit	Peak Difference	Status
31.804 GHz	45.22 dBμV/m	68 dBμV/m	-22.78 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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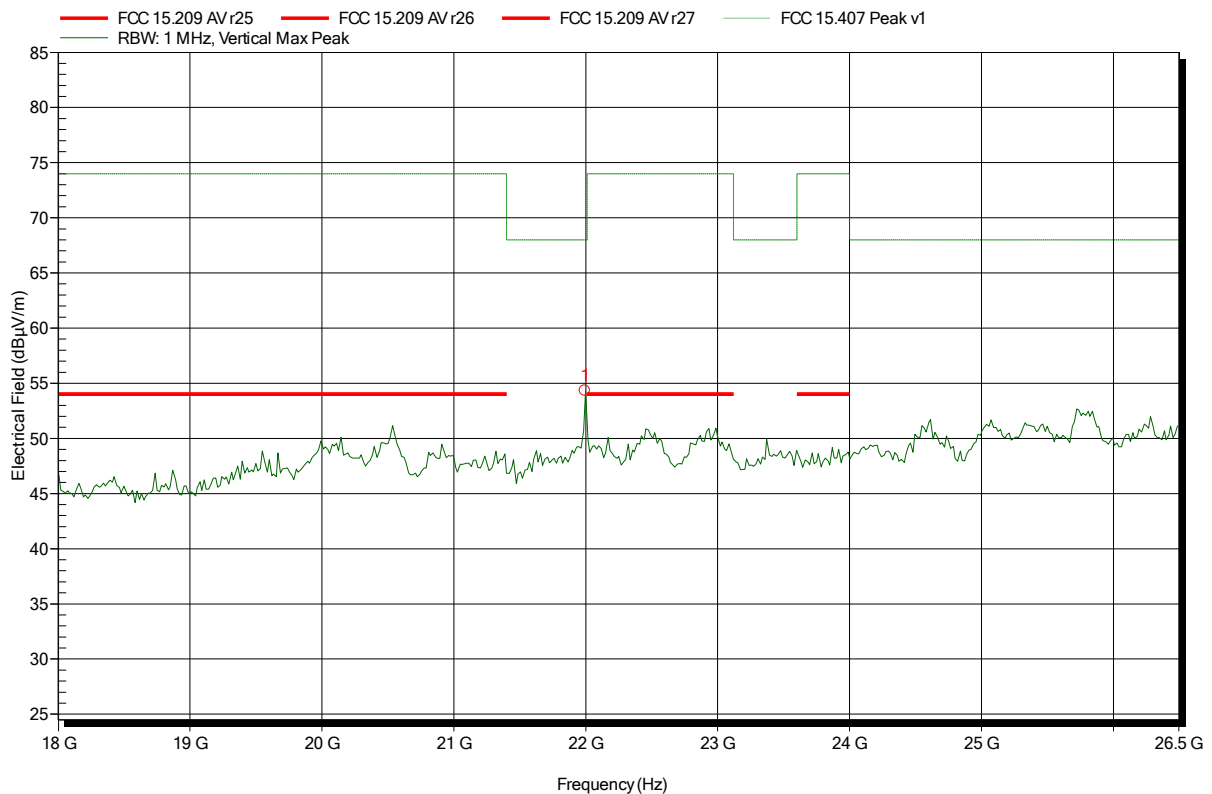
Frequency	Peak	Peak Limit	Peak Difference	Status
21.995 GHz	49.25 dBµV/m	68 dBµV/m	-18.75 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
21.995 GHz	54.32 dBµV/m	68 dBµV/m	-13.68 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

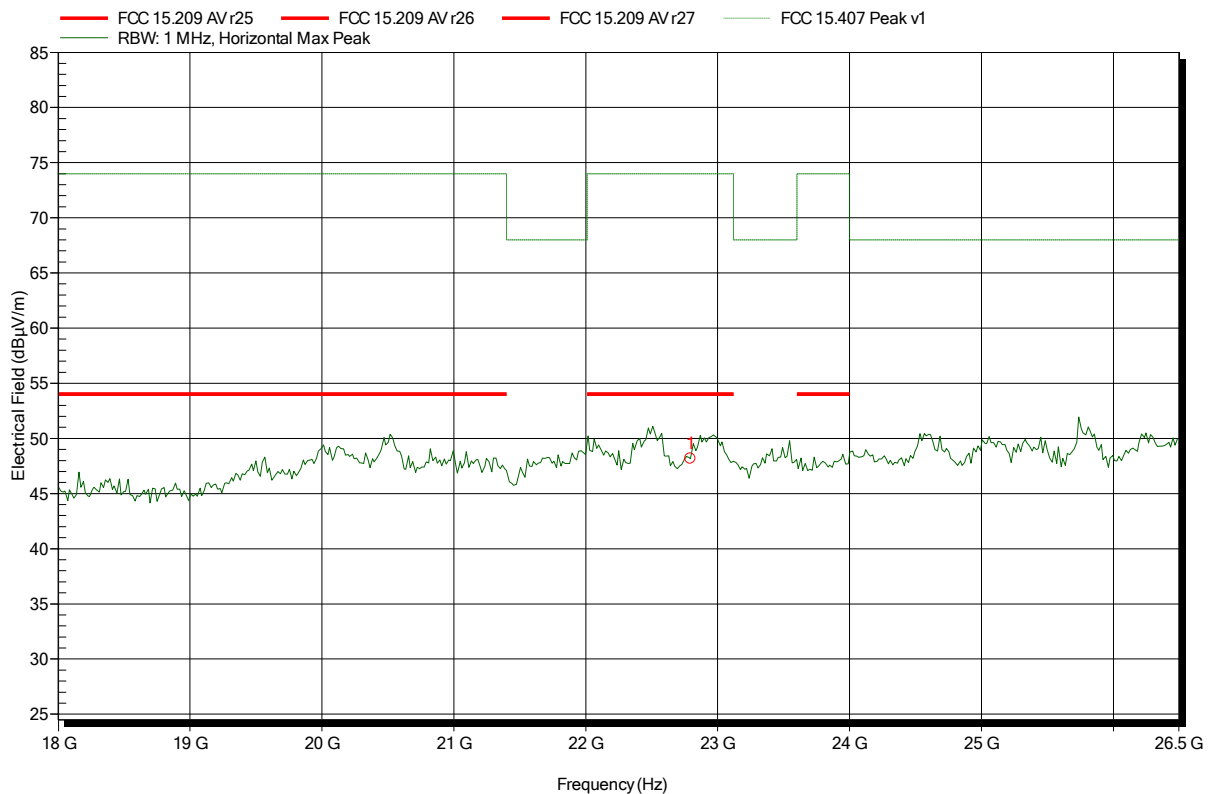
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-16
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
22.794 GHz	48.15 dBµV/m	74 dBµV/m	-25.85 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

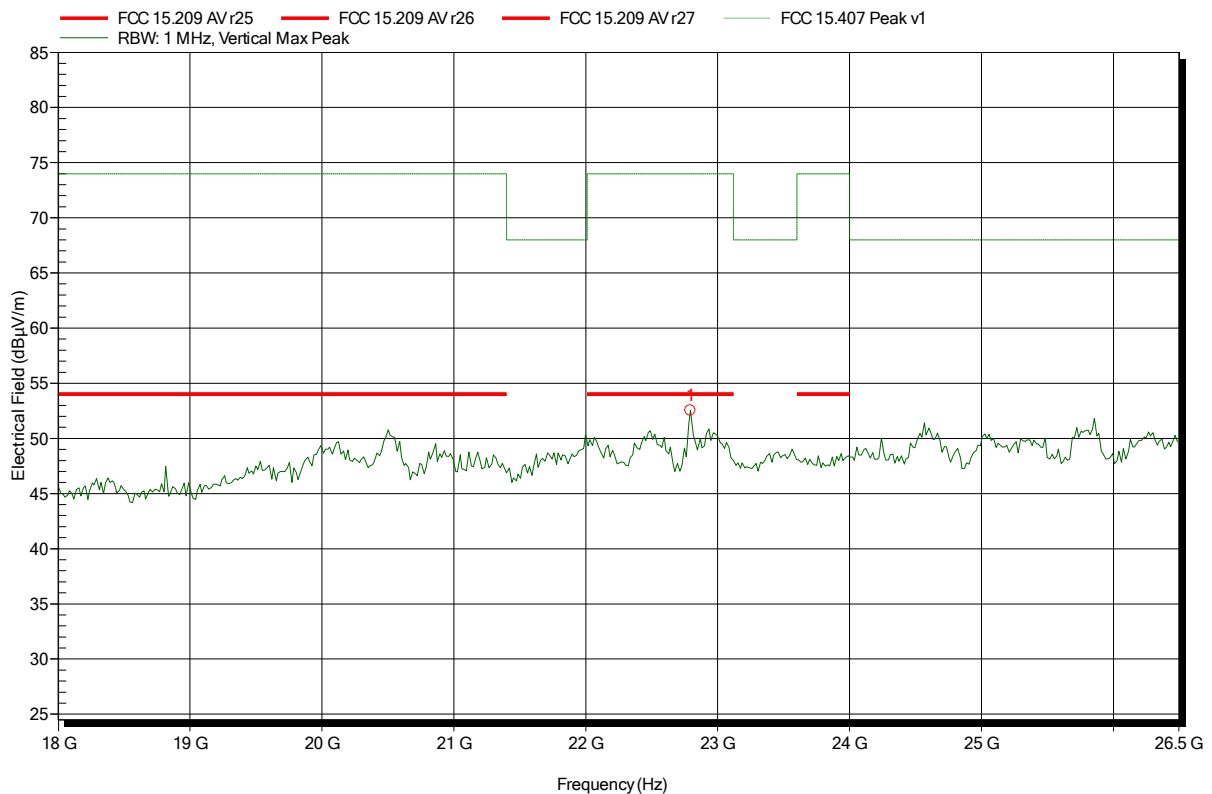
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161-A
 Model: Test Sample #5
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-16
 Note:

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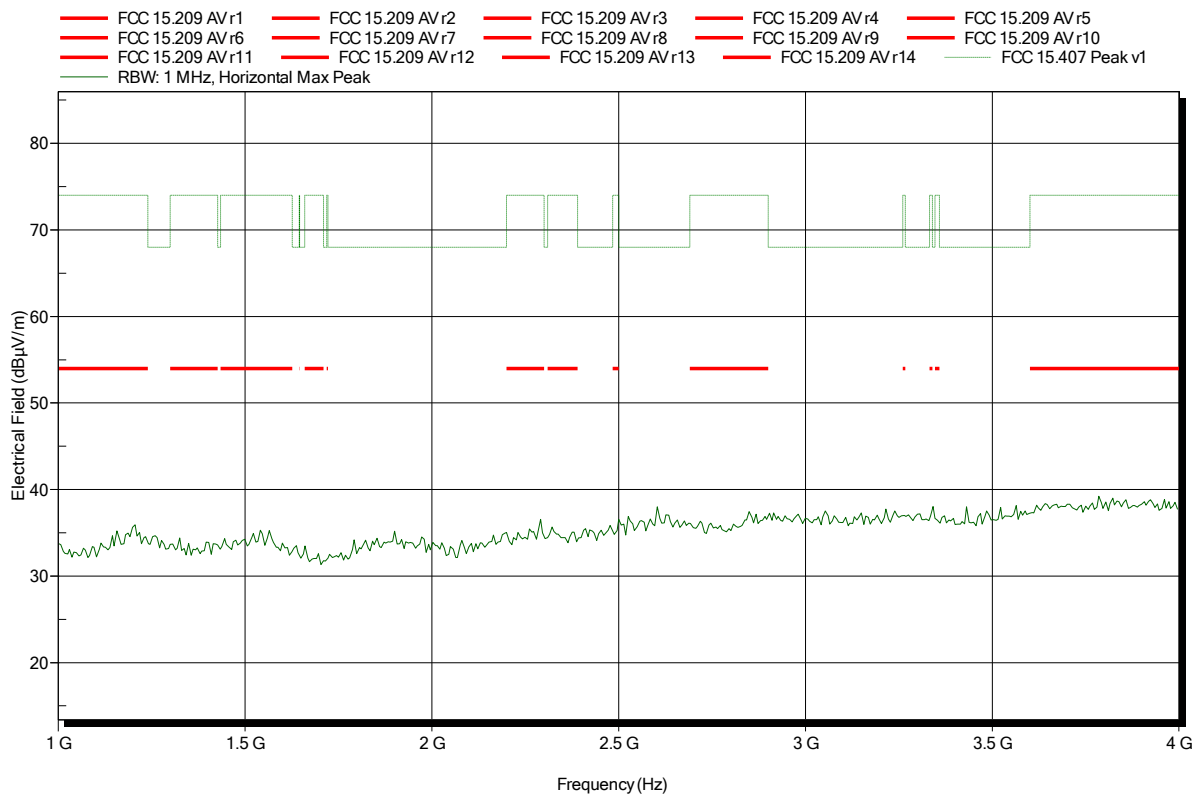
Frequency	Peak	Peak Limit	Peak Difference	Status
22.794 GHz	52.51 dBµV/m	74 dBµV/m	-21.49 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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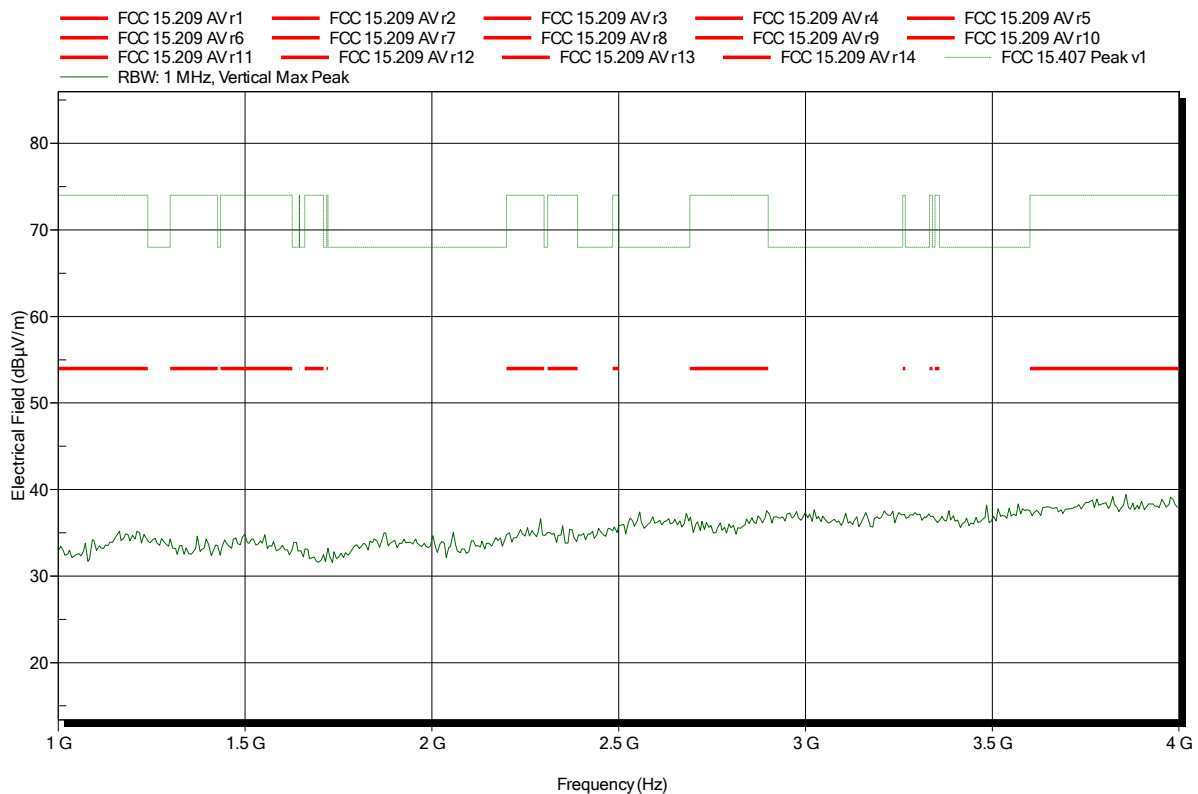


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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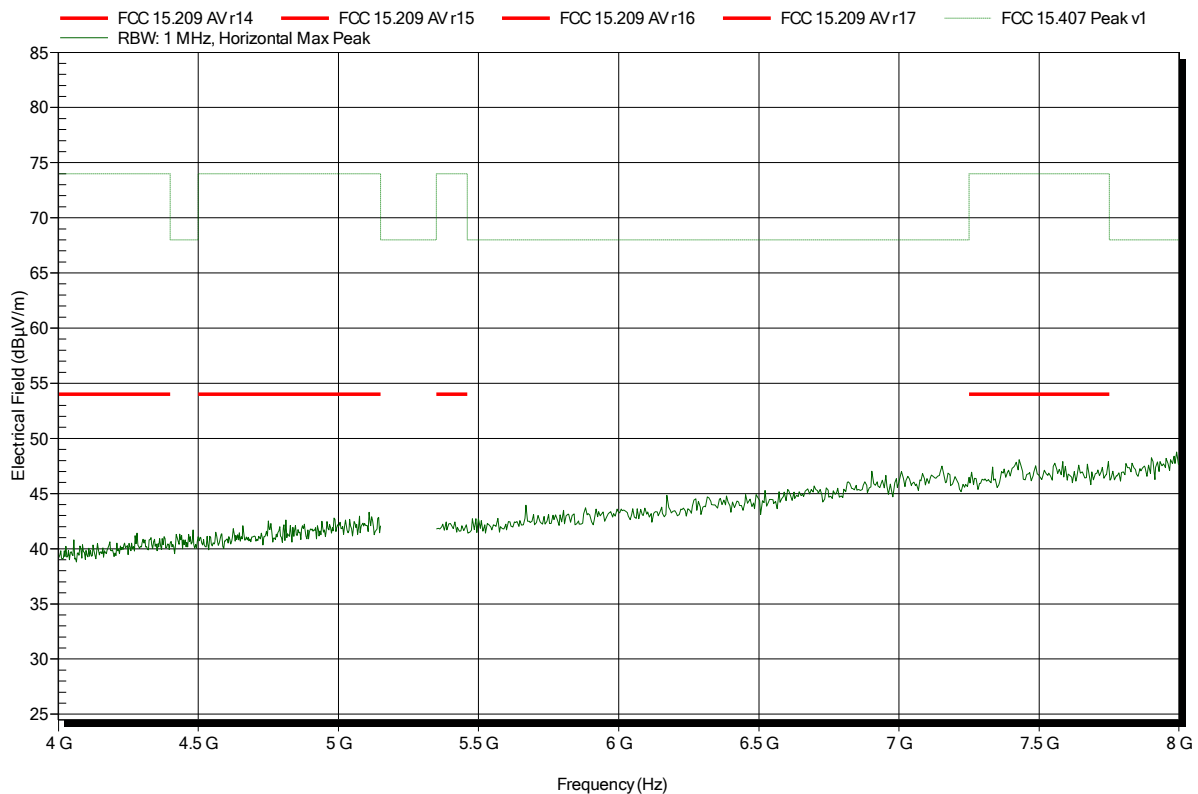


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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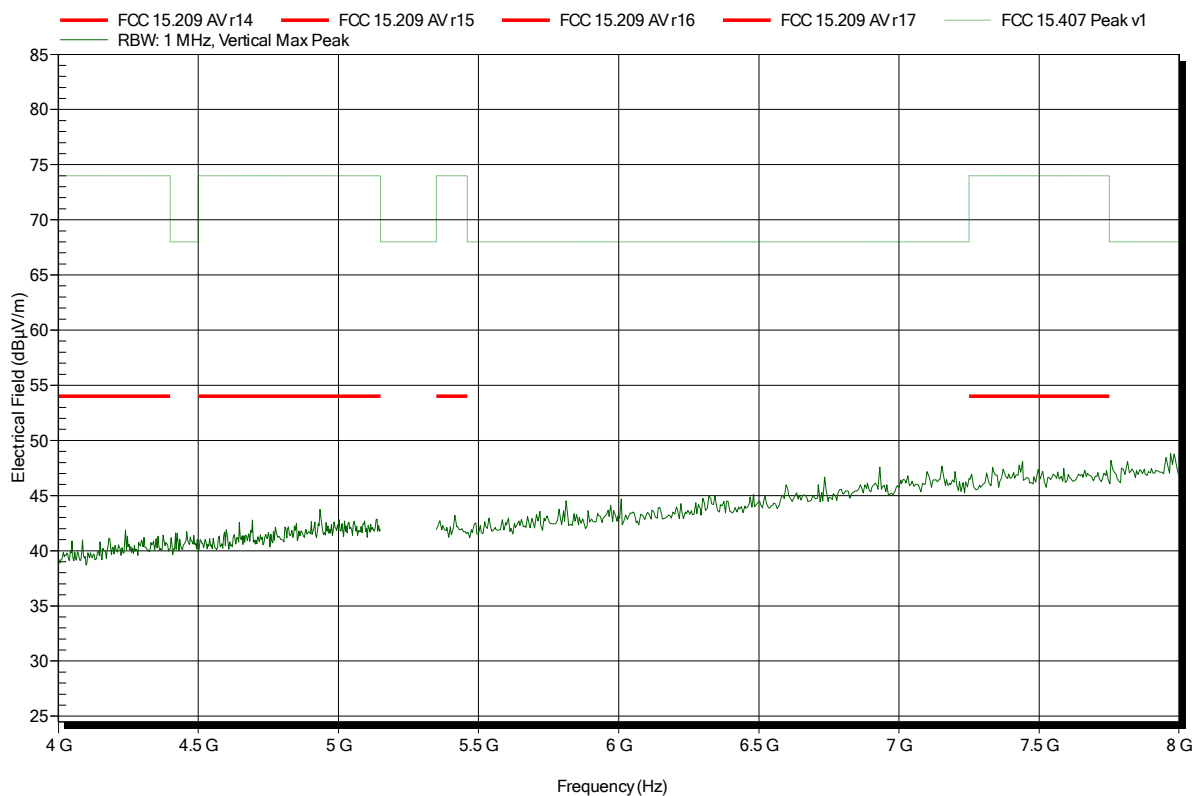


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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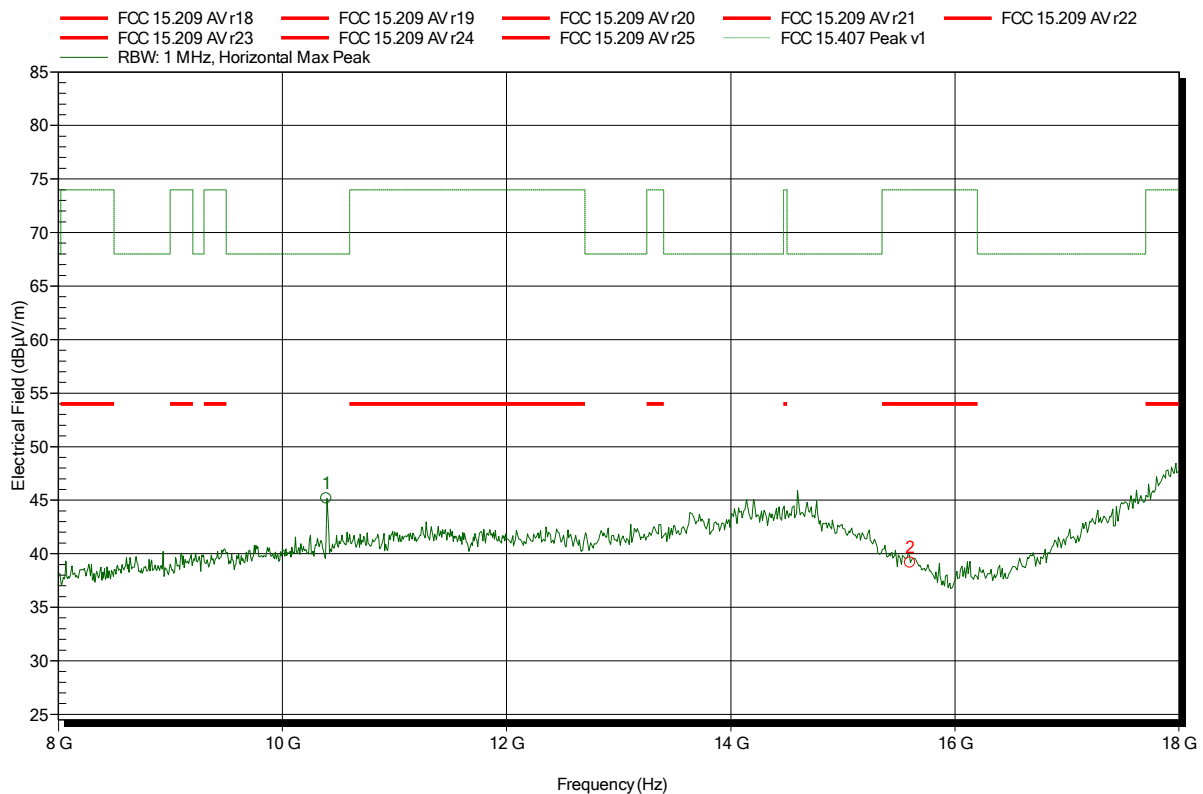


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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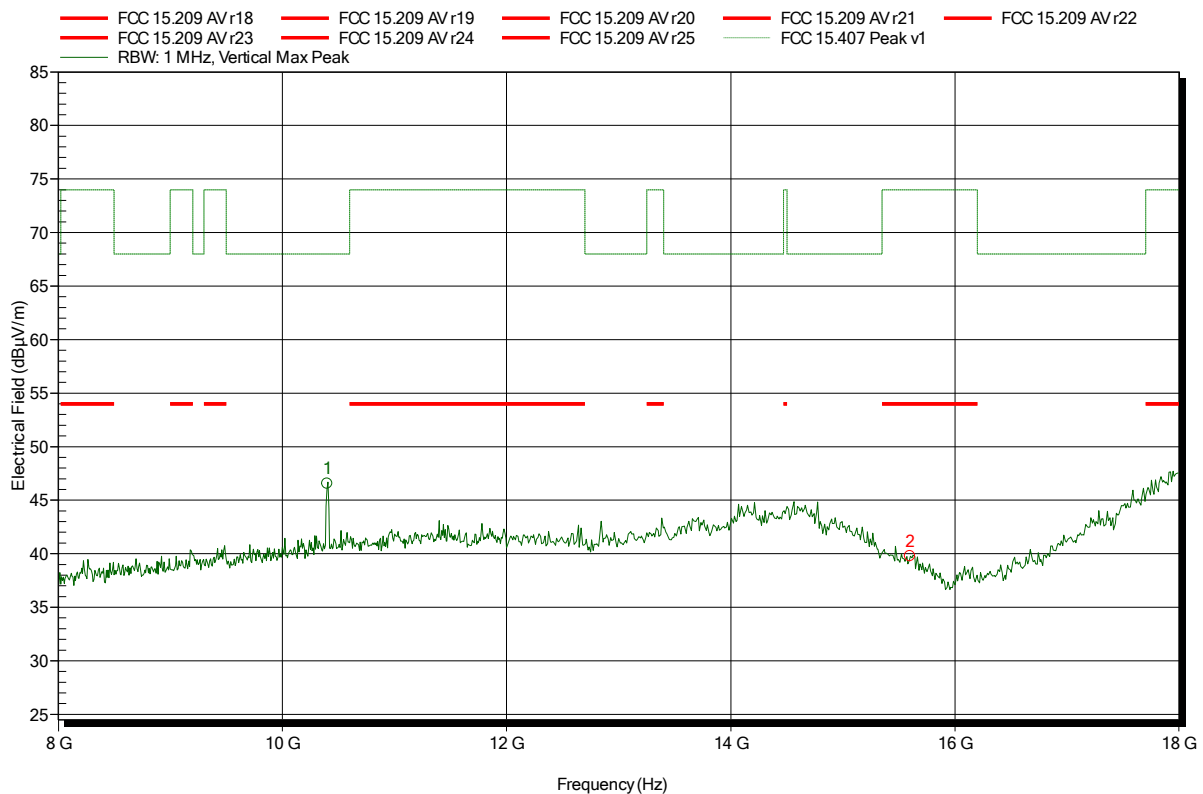
Frequency	Peak	Peak Limit	Peak Difference	Status
10.392 GHz	45.17 dBμV/m	68 dBμV/m	-22.83 dB	Pass
15.6 GHz	39.18 dBμV/m	74 dBμV/m	-34.82 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
10.4 GHz	46.53 dBμV/m	68 dBμV/m	-21.47 dB	Pass
15.6 GHz	39.78 dBμV/m	74 dBμV/m	-34.22 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

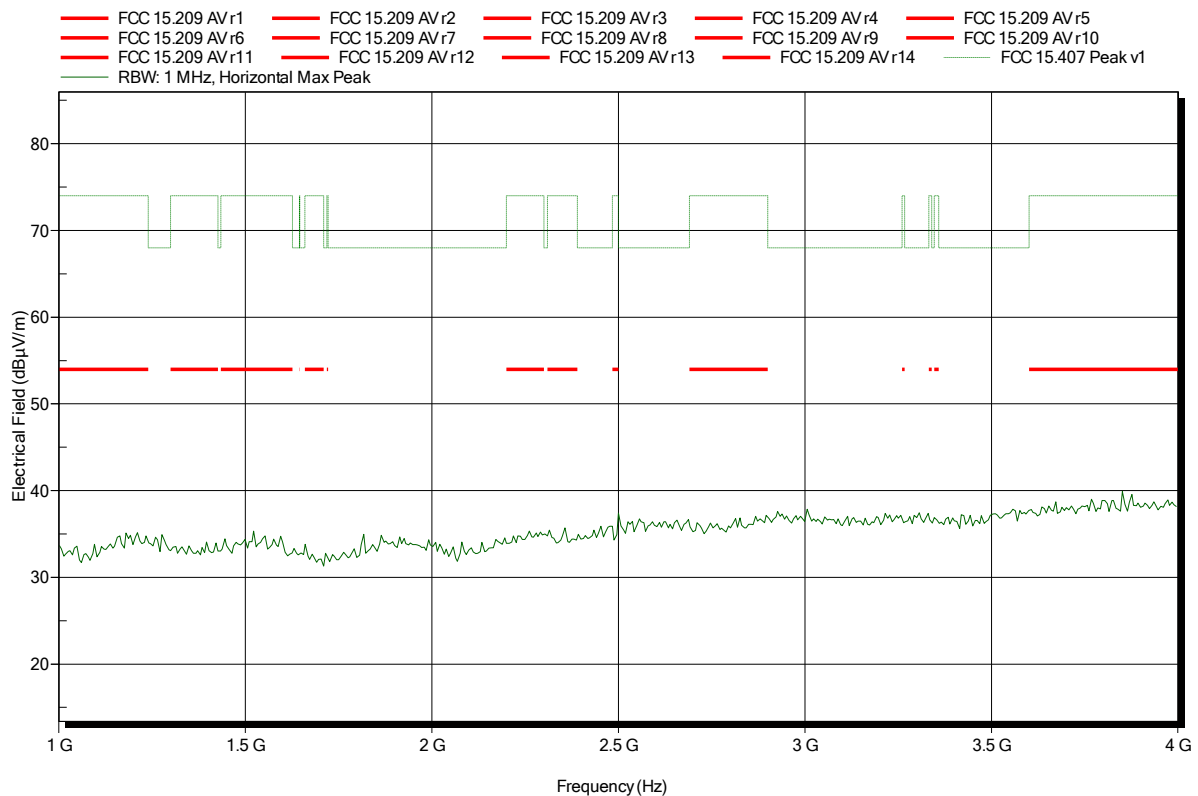
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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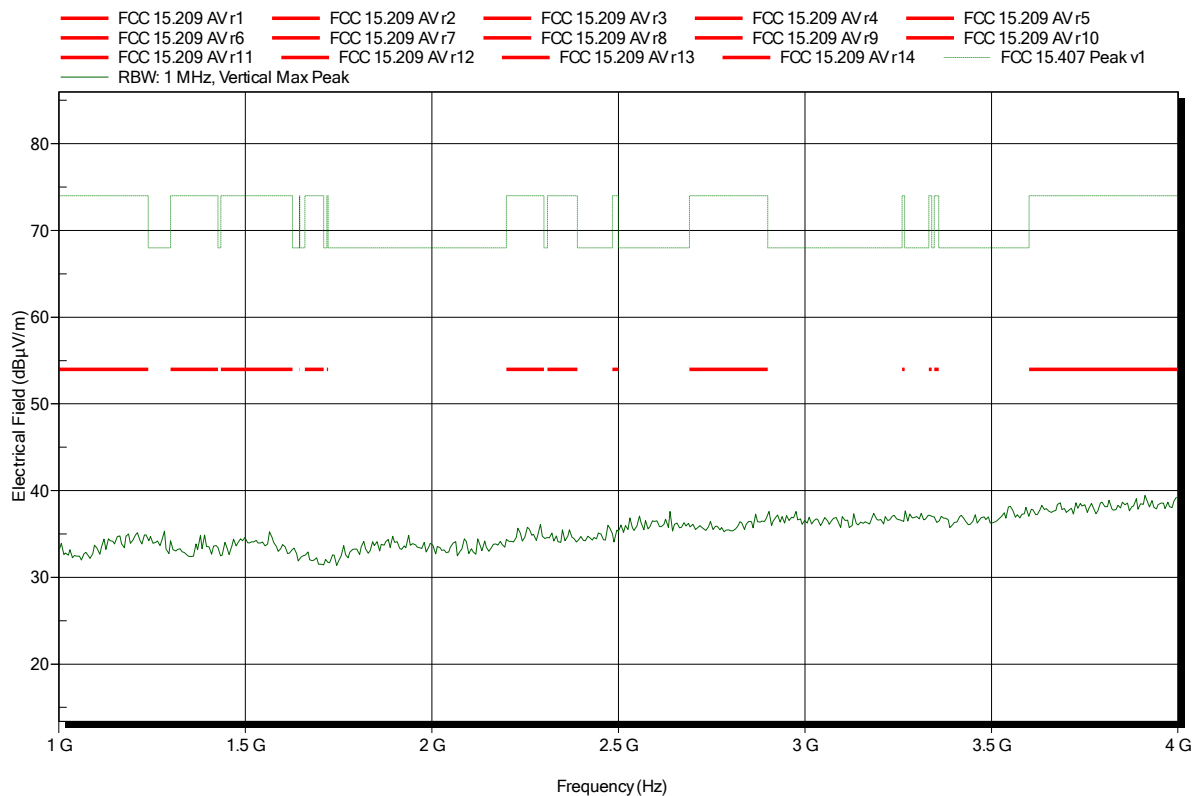


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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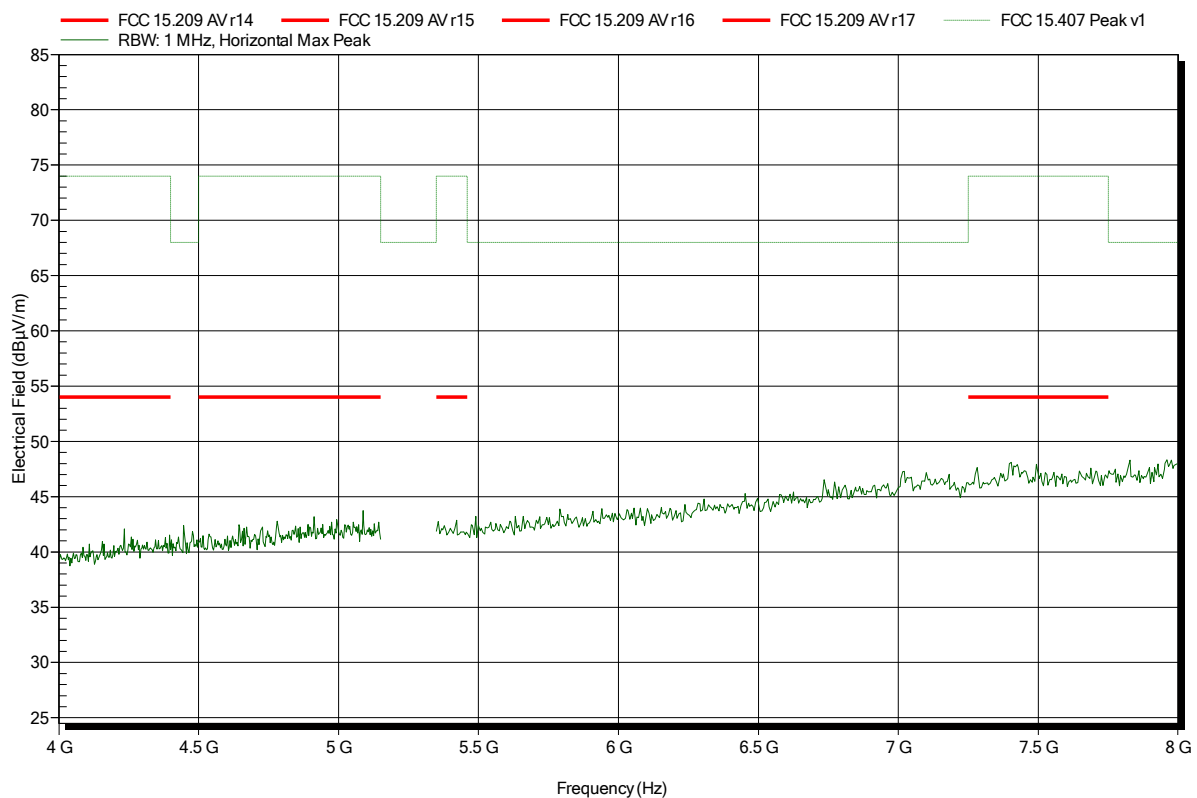


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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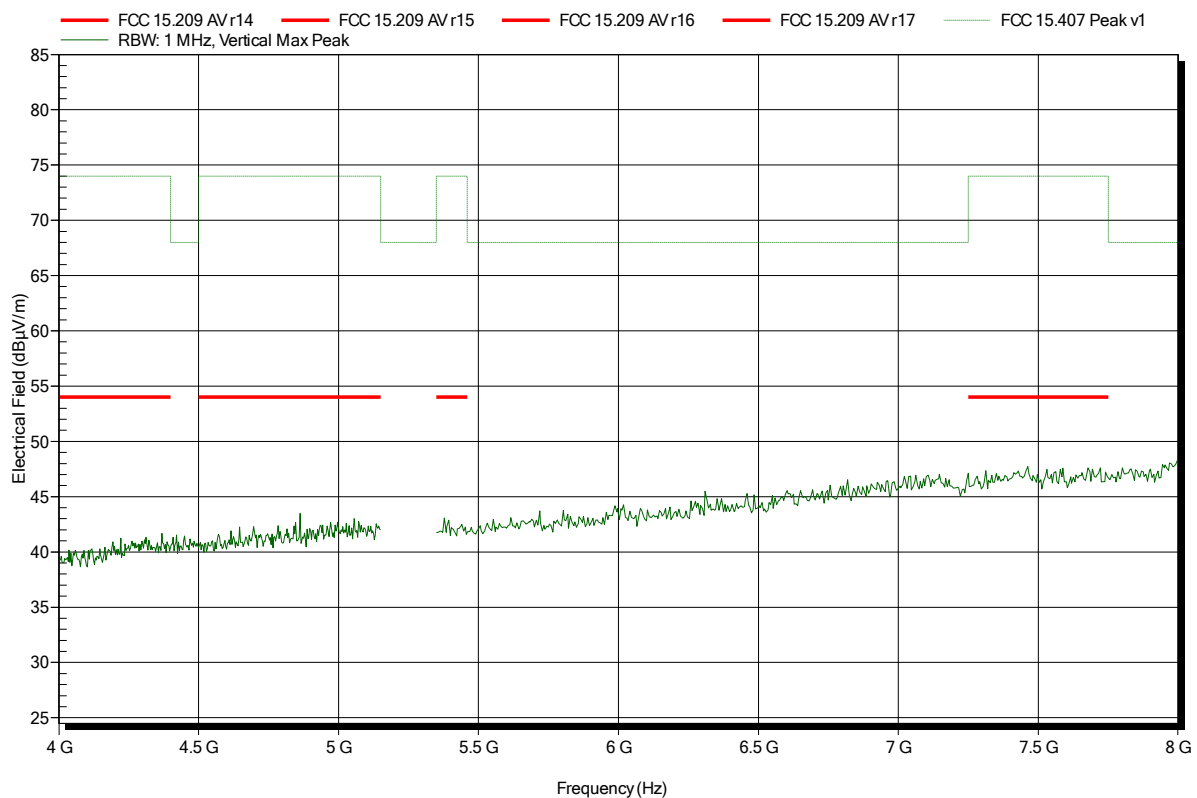


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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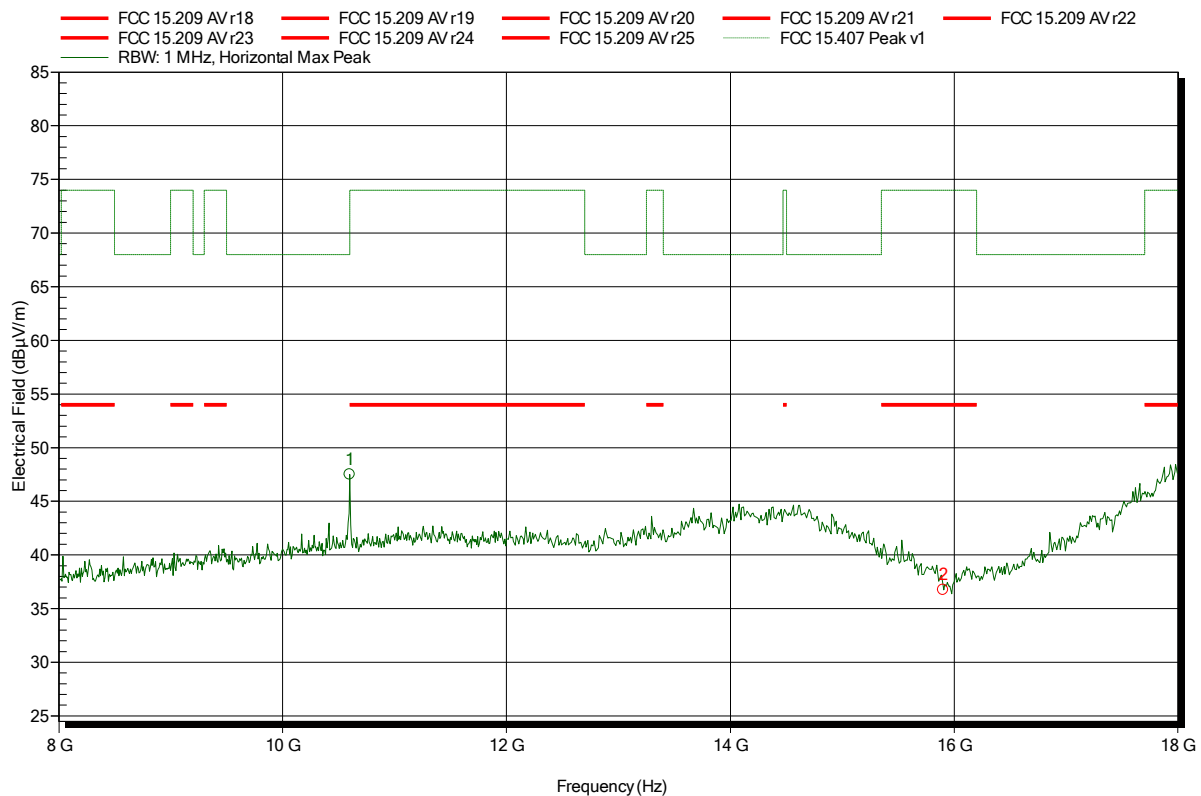


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
10.6 GHz	47.51 dBμV/m	68 dBμV/m	-20.49 dB	Pass
15.9 GHz	36.73 dBμV/m	74 dBμV/m	-37.27 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

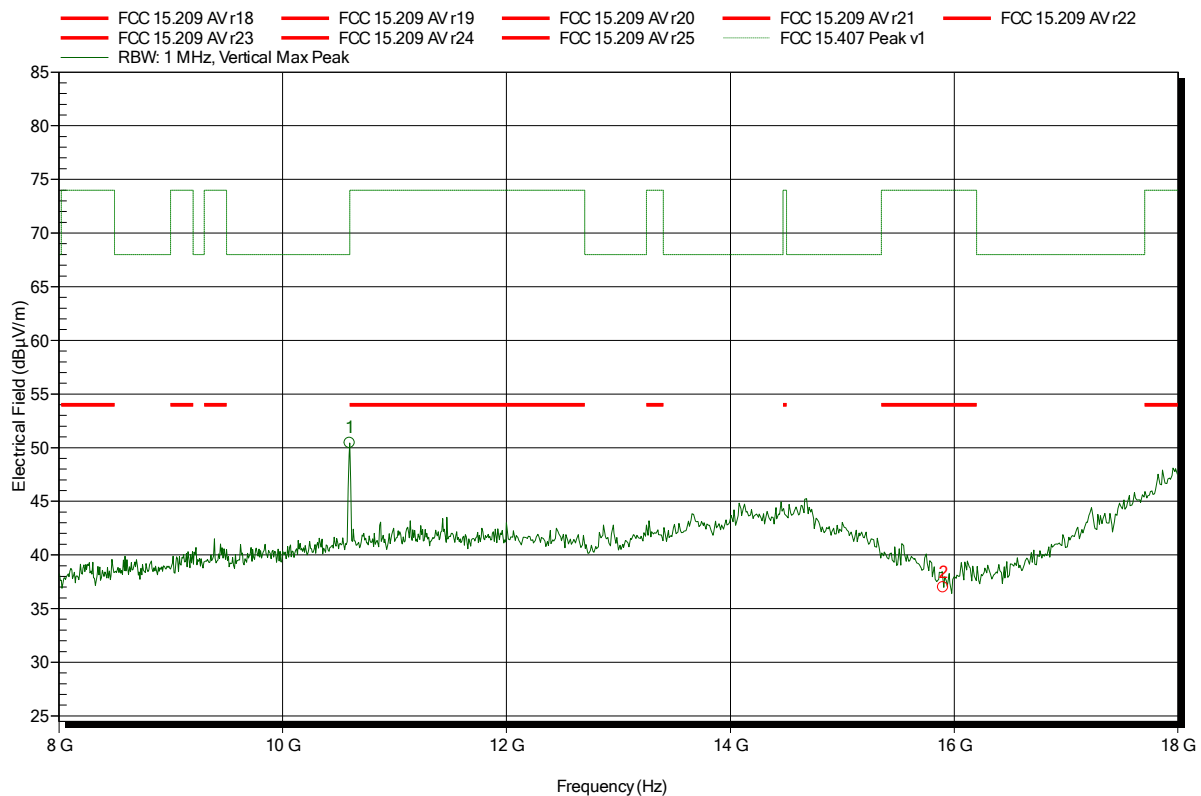
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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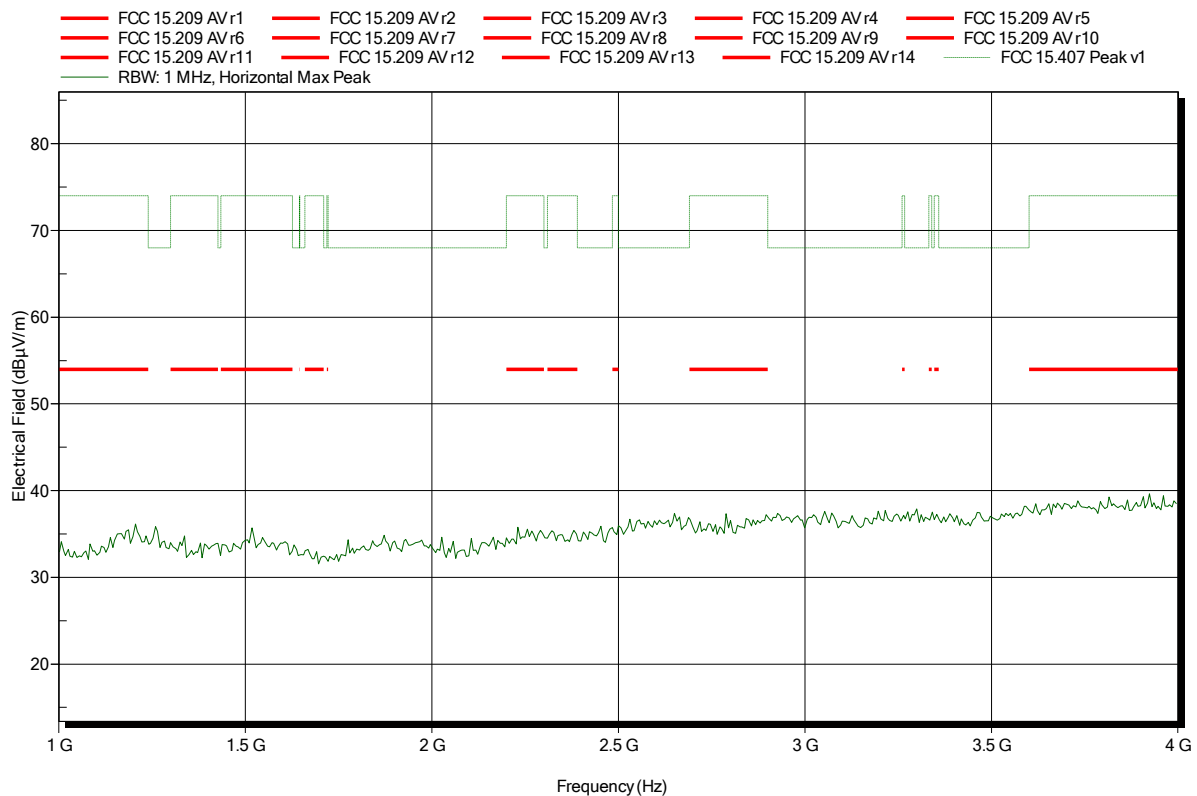
Frequency	Peak	Peak Limit	Peak Difference	Status
10.6 GHz	50.44 dBµV/m	68 dBµV/m	-17.56 dB	Pass
15.9 GHz	36.98 dBµV/m	74 dBµV/m	-37.02 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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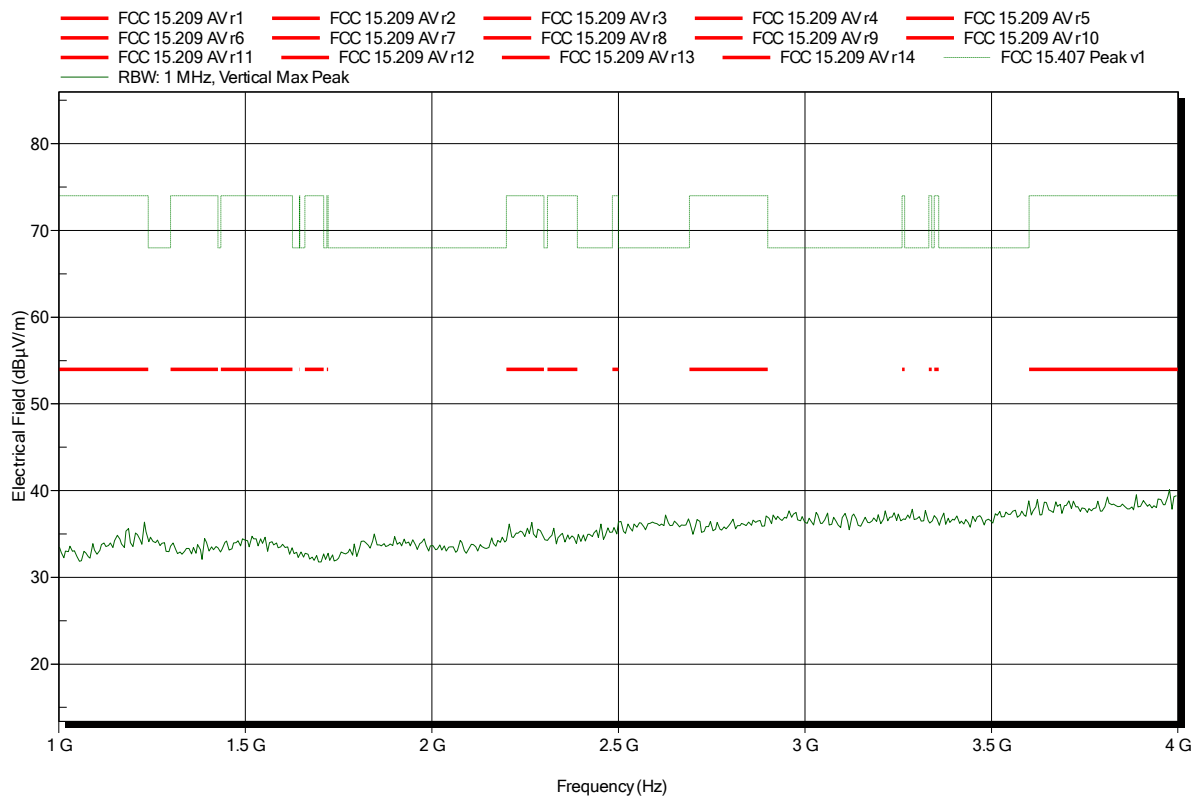


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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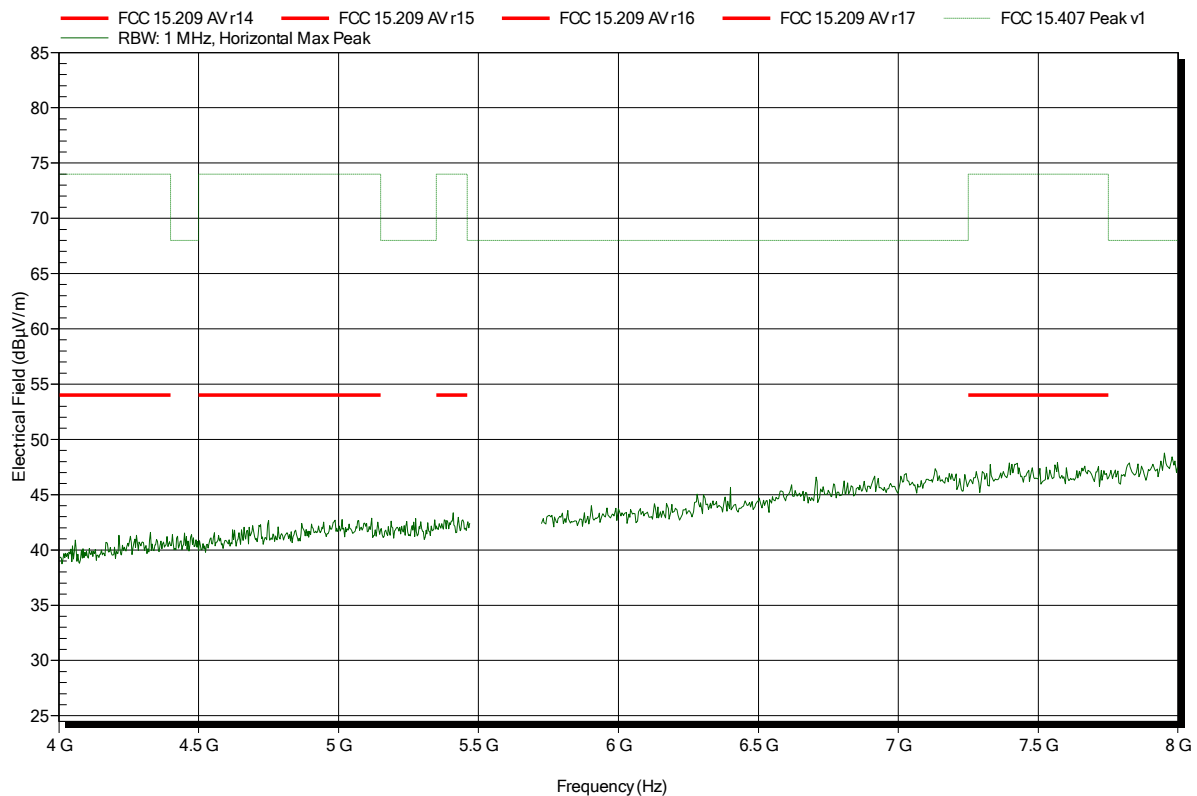


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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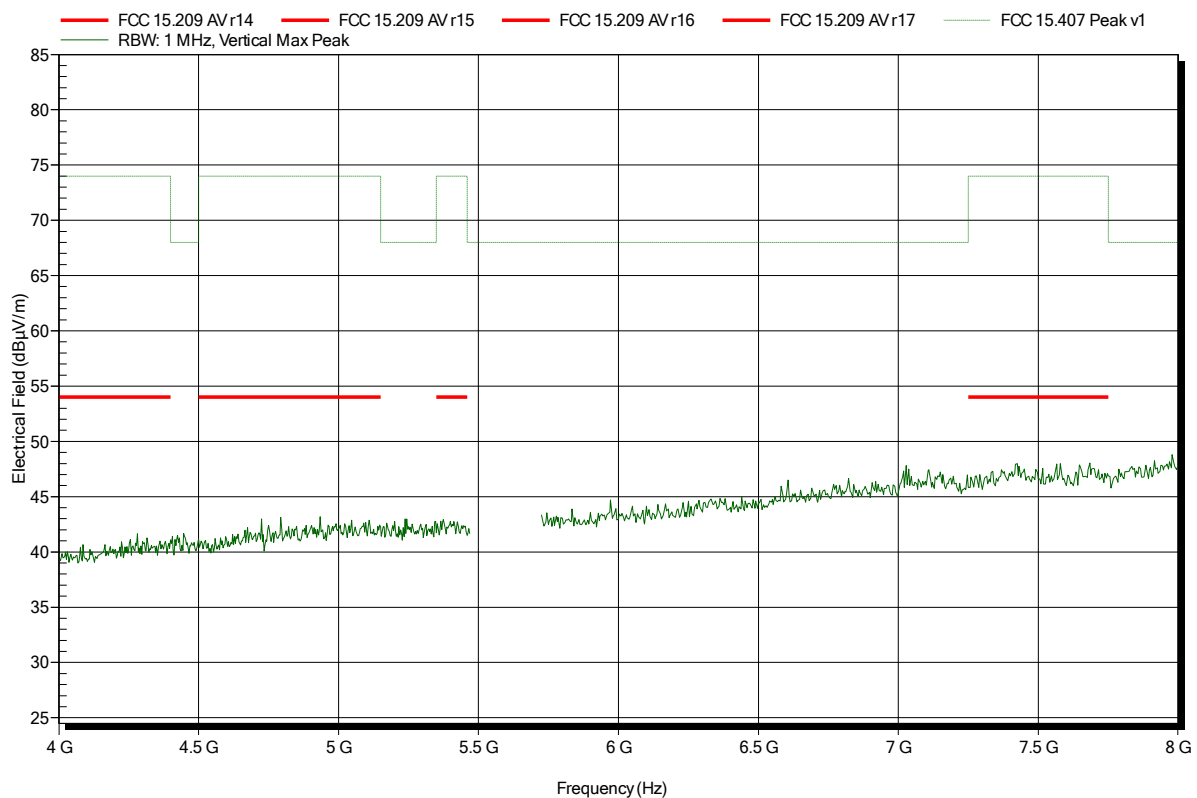


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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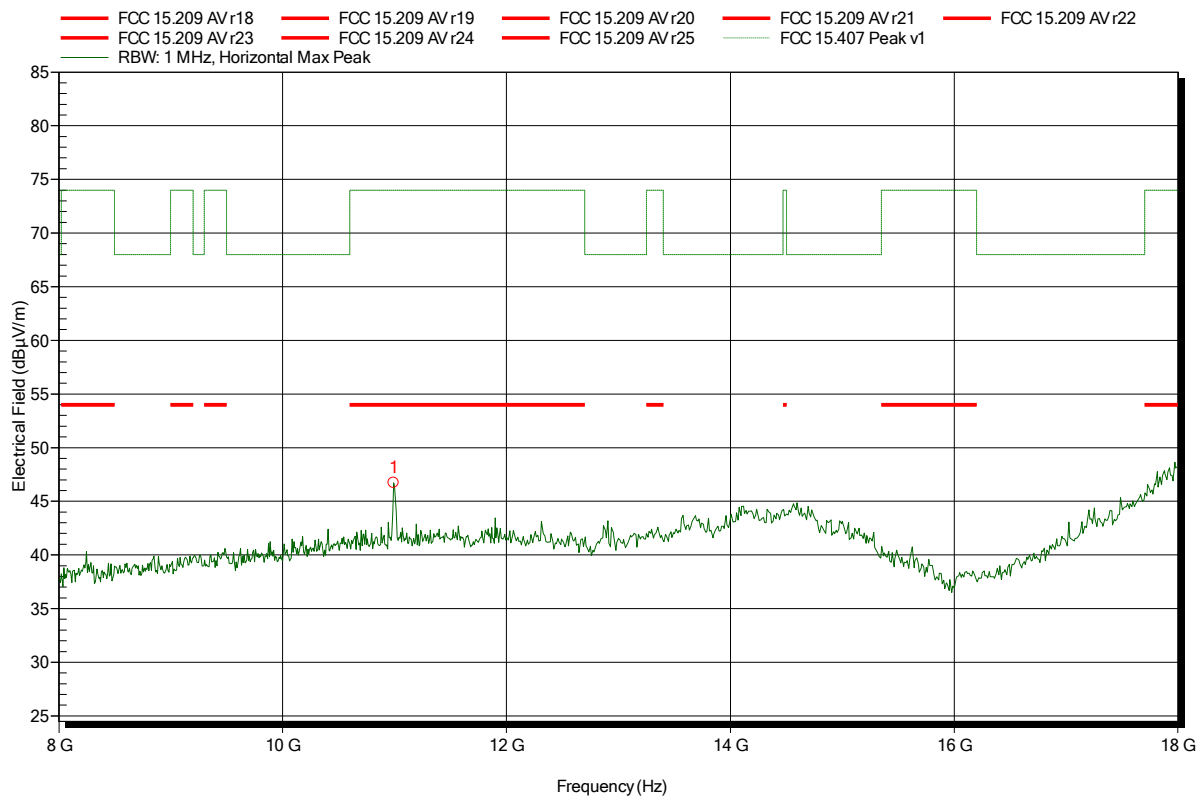


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
10.992 GHz	46.73 dBμV/m	74 dBμV/m	-27.27 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

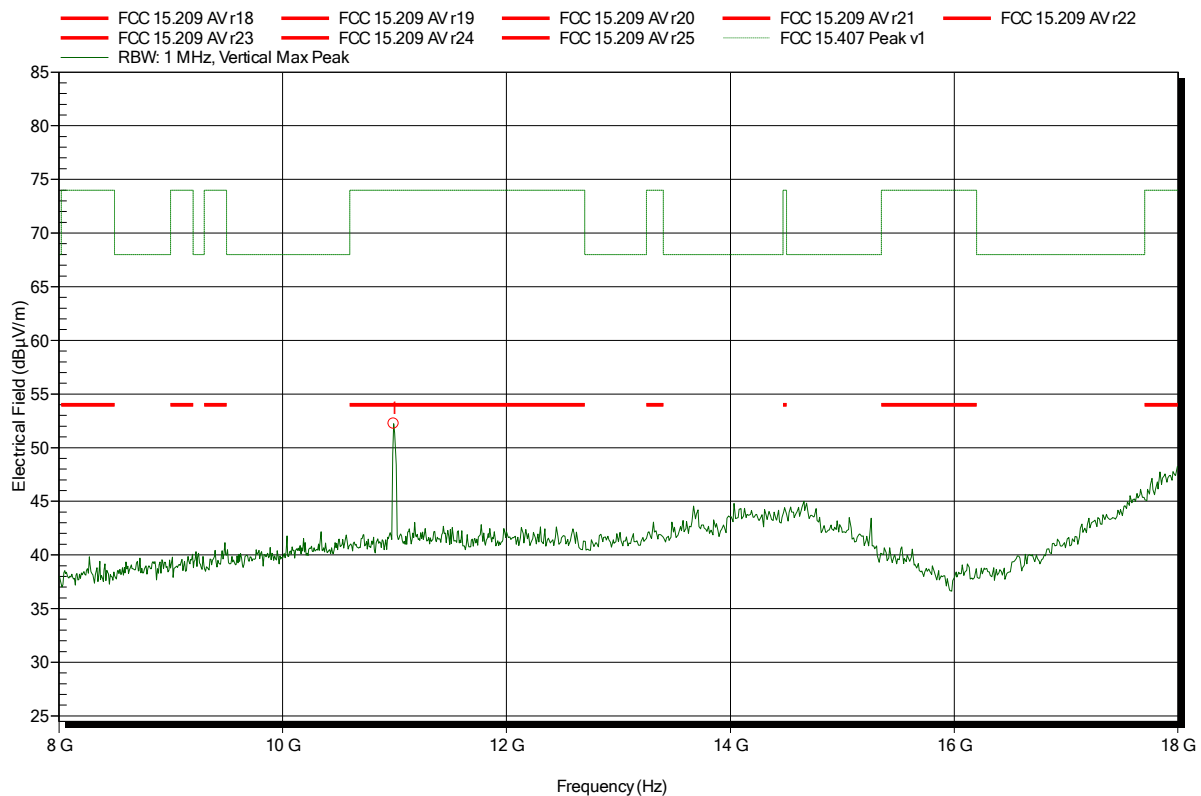
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
10.992 GHz	52.23 dBµV/m	74 dBµV/m	-21.77 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

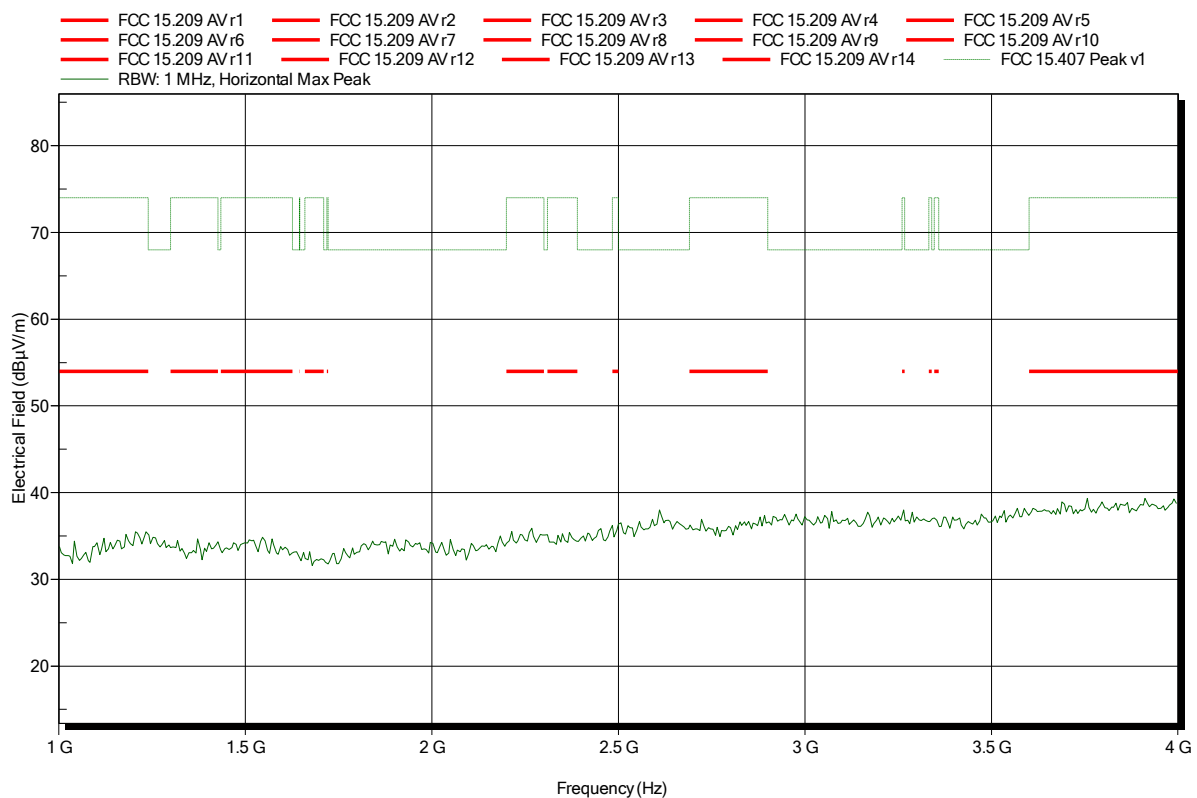
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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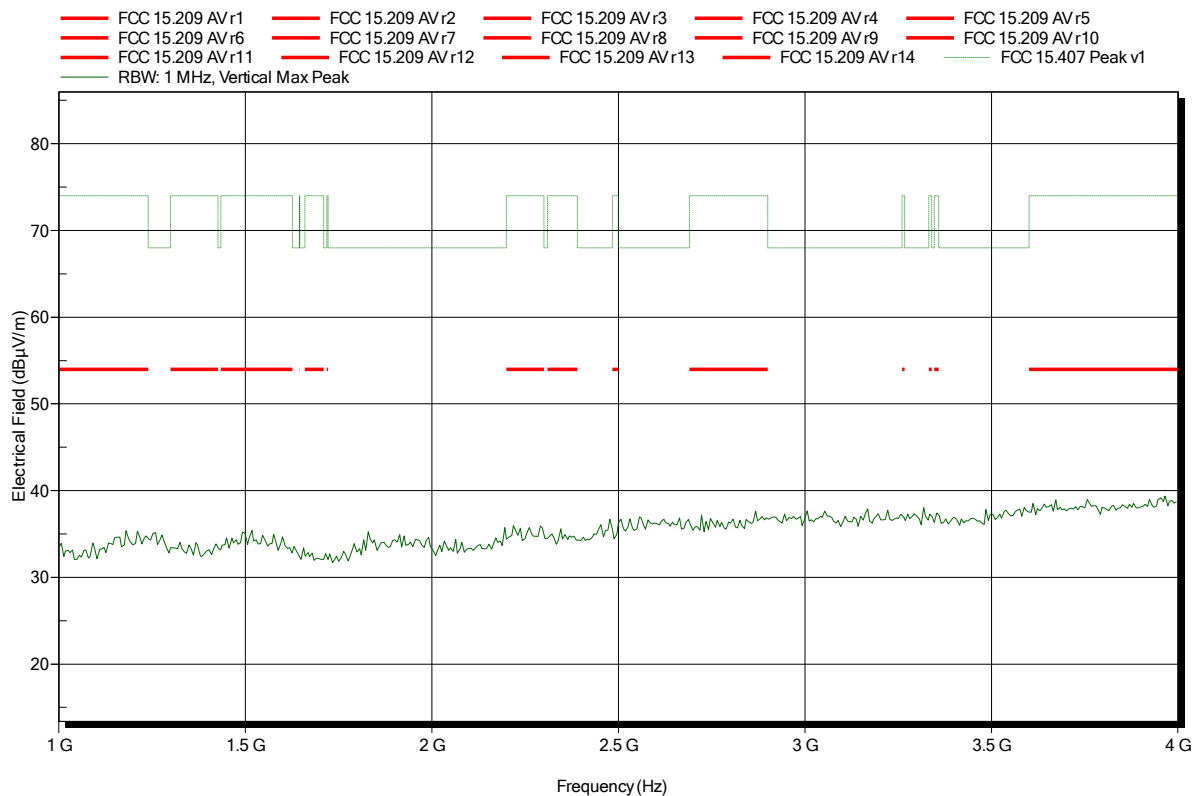


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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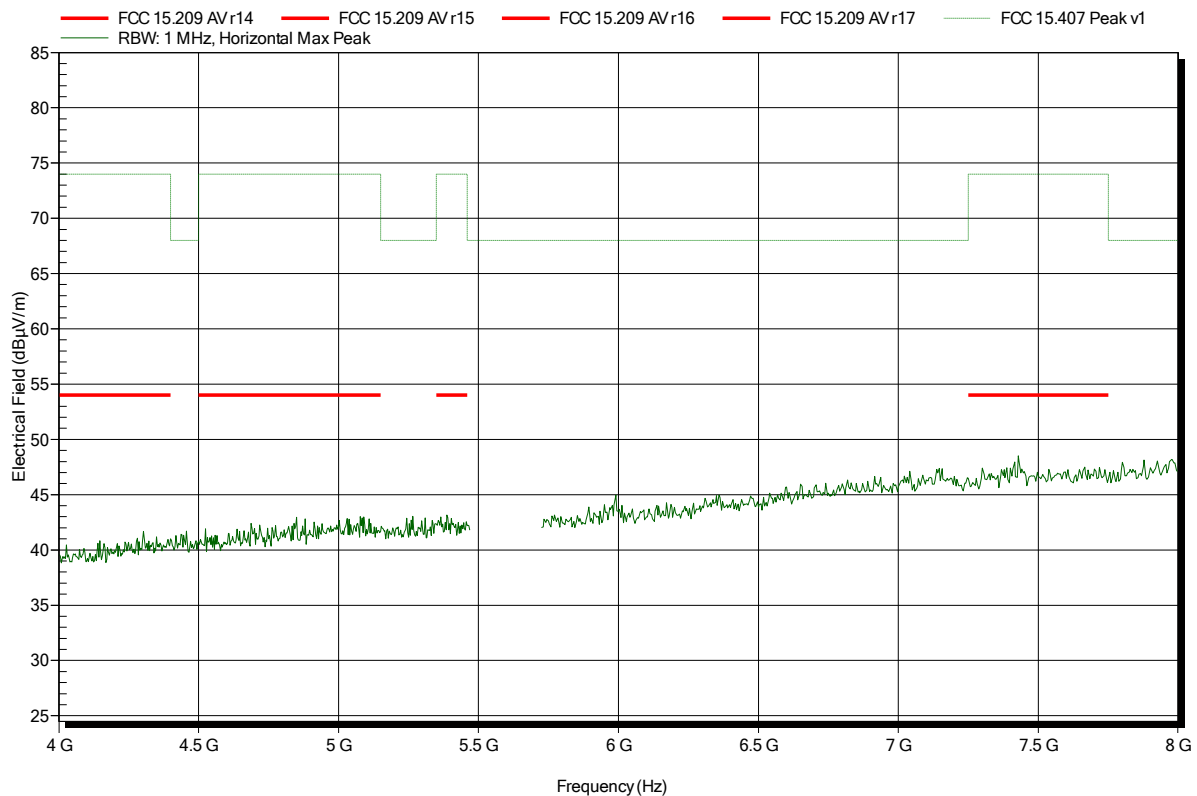


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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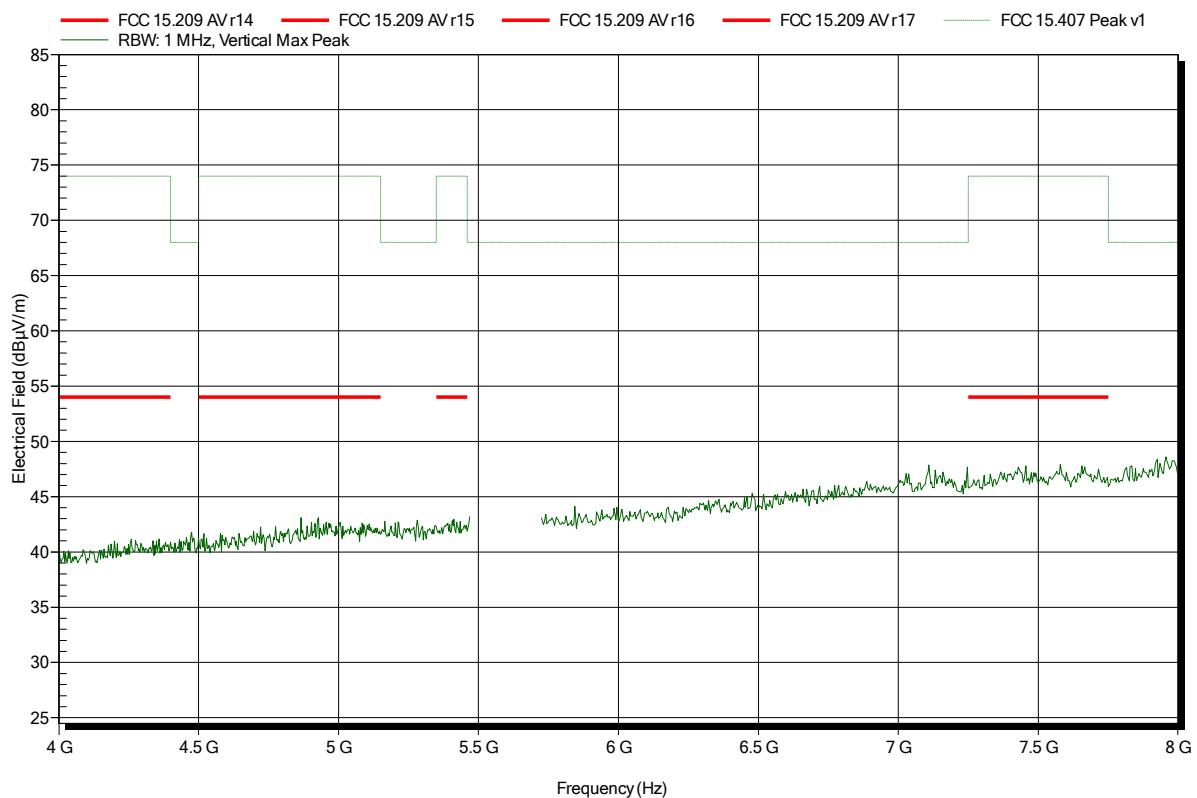


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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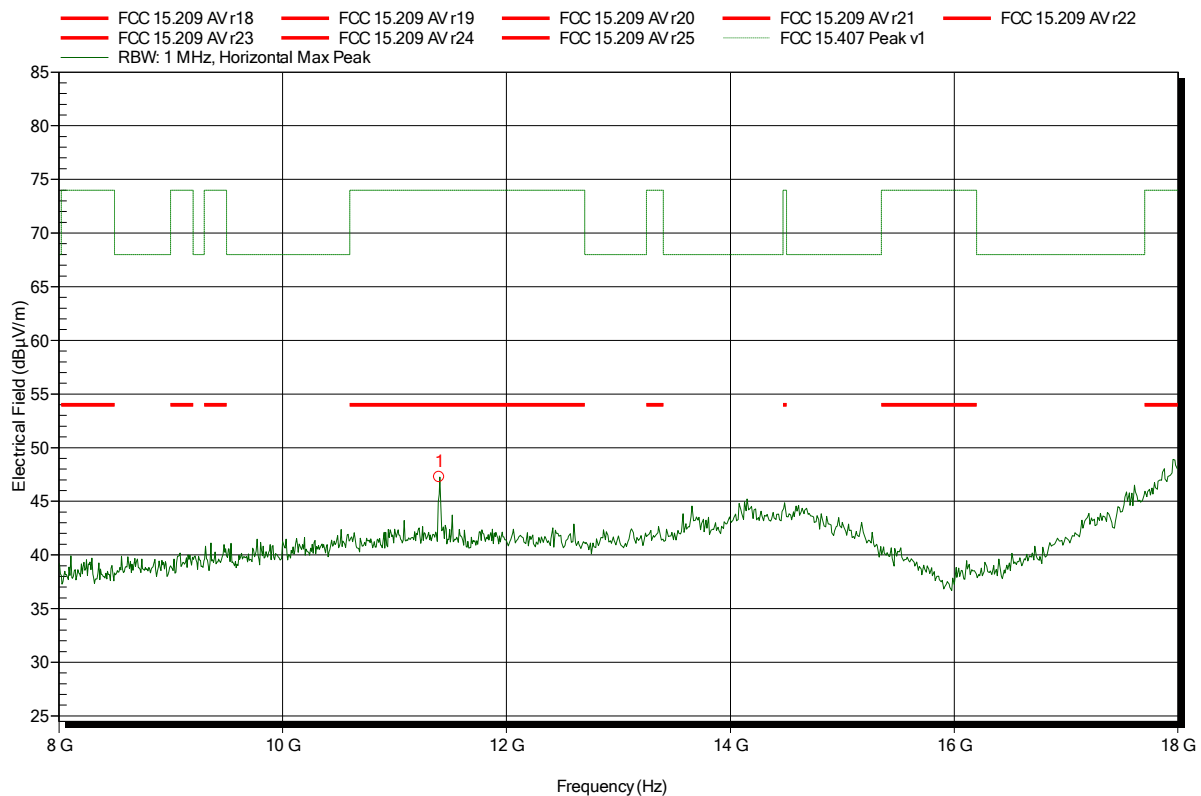


Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
11.4 GHz	47.26 dBµV/m	74 dBµV/m	-26.74 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

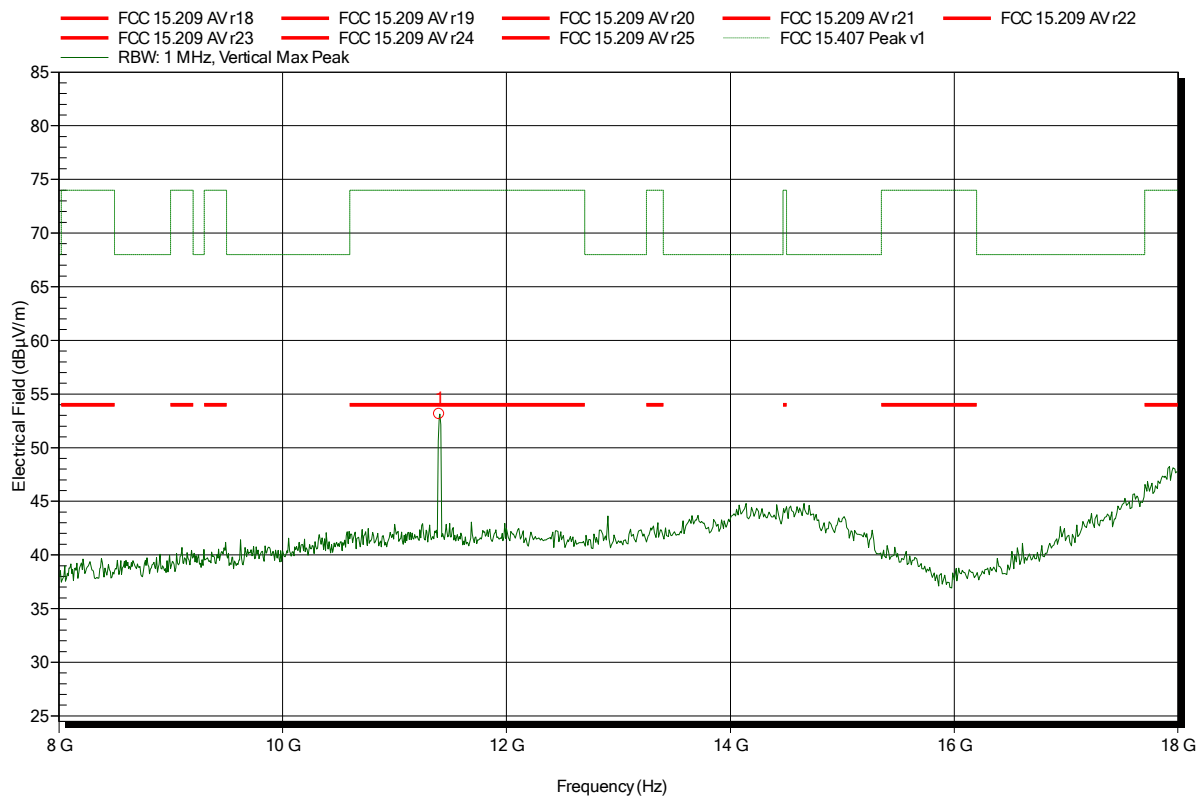
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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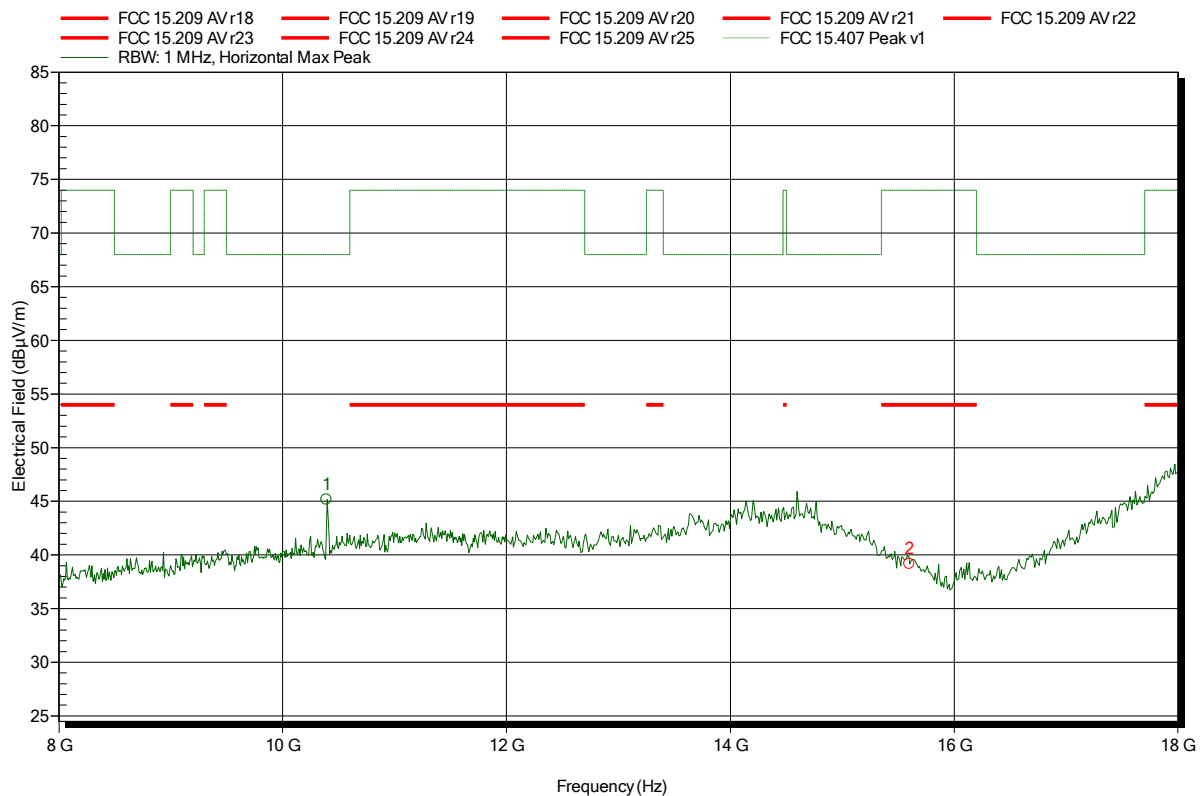
Frequency	Peak	Peak Limit	Peak Difference	Status
11.4 GHz	53.14 dBμV/m	74 dBμV/m	-20.86 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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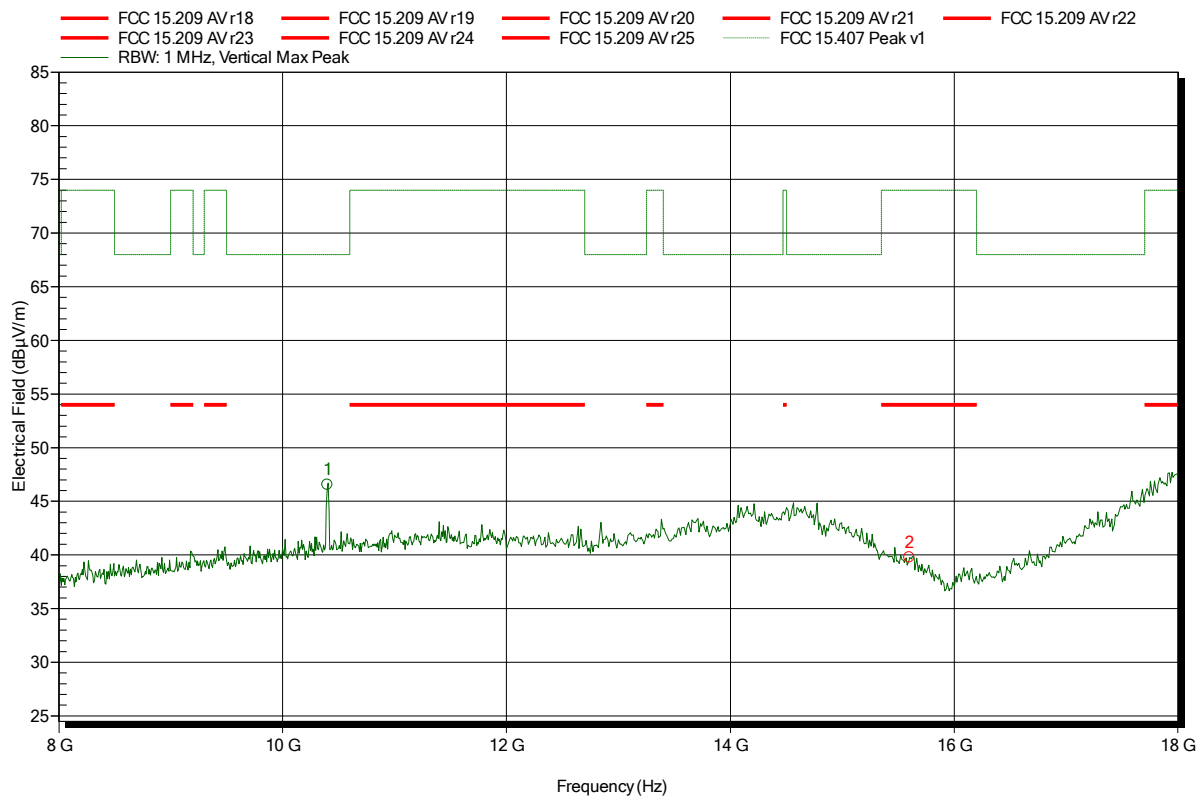
Frequency	Peak	Peak Limit	Peak Difference	Status
10.392 GHz	45.17 dBμV/m	68 dBμV/m	-22.83 dB	Pass
15.6 GHz	39.18 dBμV/m	74 dBμV/m	-34.82 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
10.4 GHz	46.53 dBμV/m	68 dBμV/m	-21.47 dB	Pass
15.6 GHz	39.78 dBμV/m	74 dBμV/m	-34.22 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

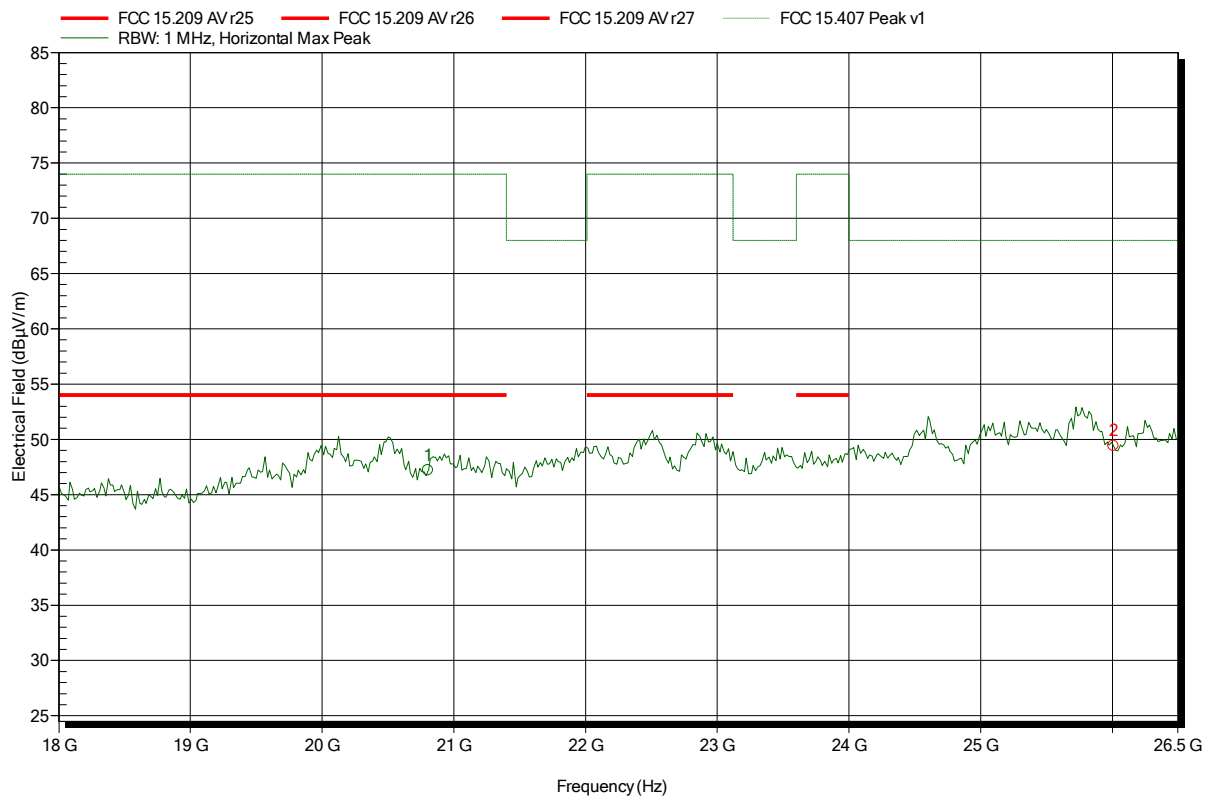
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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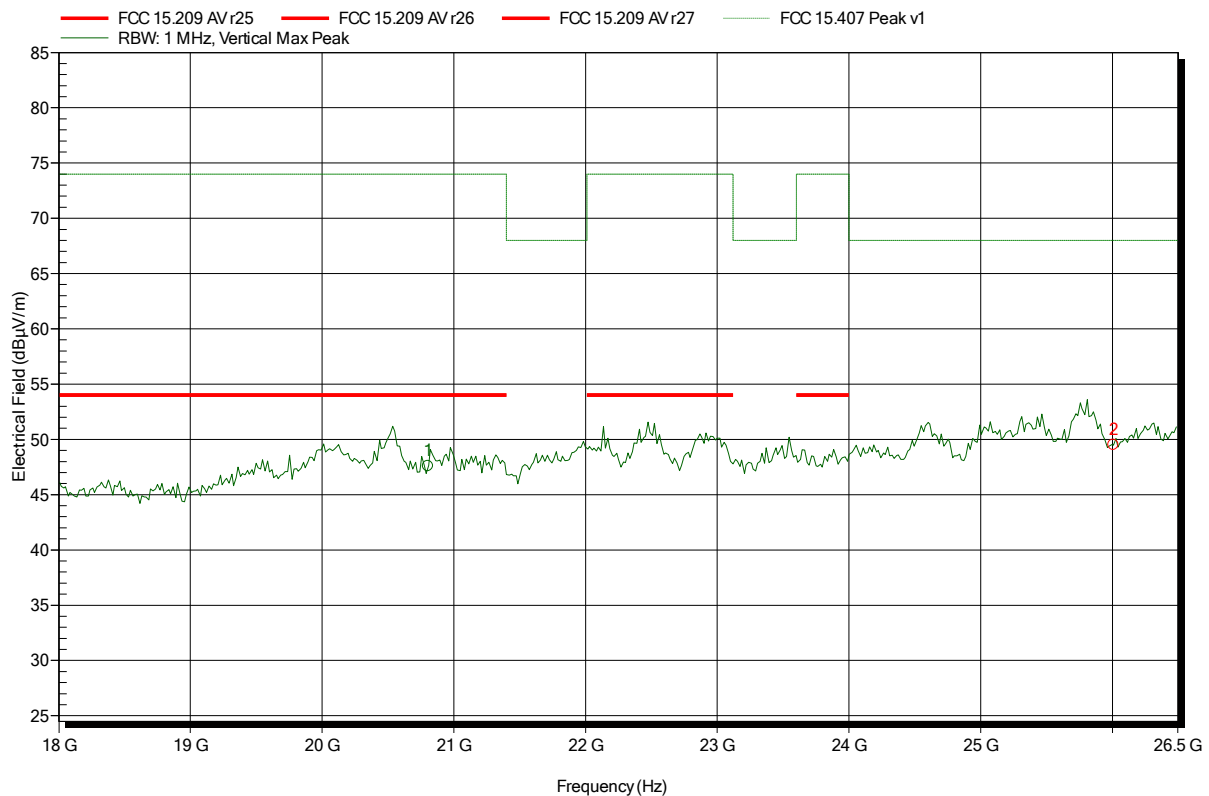
Frequency	Peak	Peak Limit	Peak Difference	Status
20.805 GHz	47.21 dBμV/m	74 dBμV/m	-26.79 dB	Pass
26.007 GHz	49.41 dBμV/m	68 dBμV/m	-18.59 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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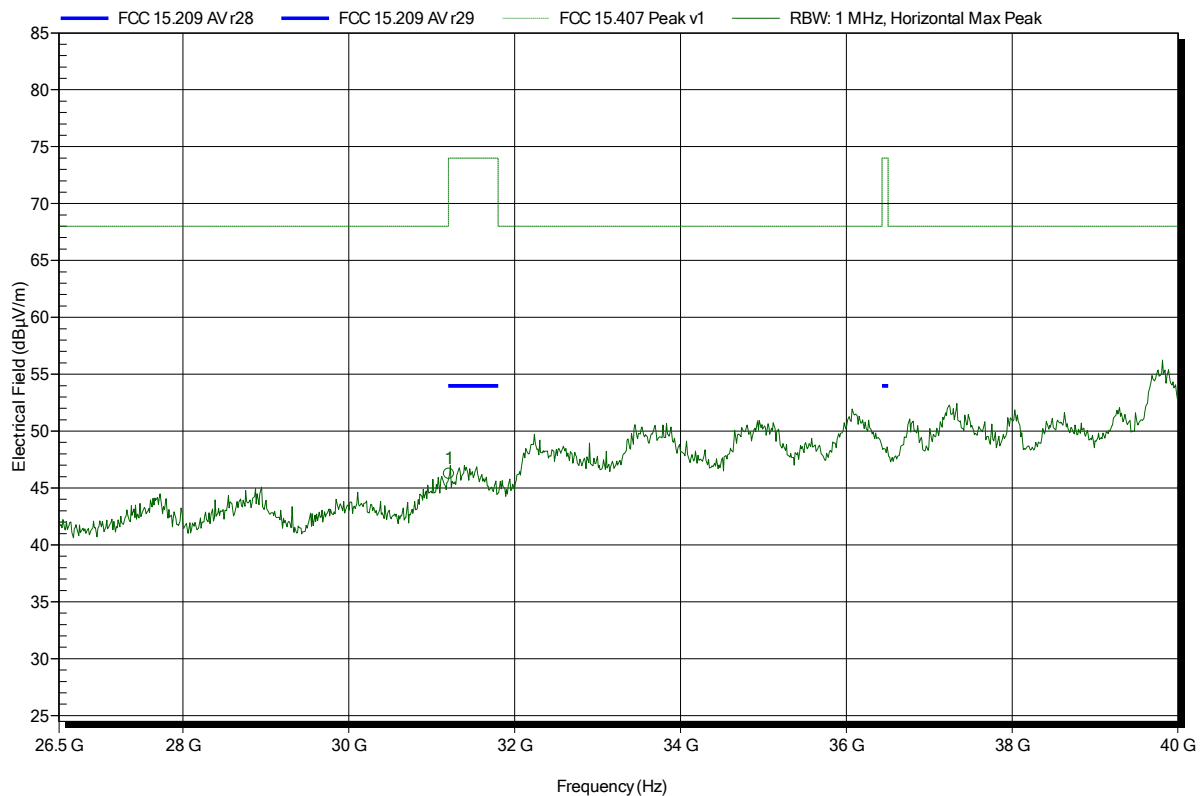
Frequency	Peak	Peak Limit	Peak Difference	Status
20.805 GHz	47.57 dBµV/m	74 dBµV/m	-26.43 dB	Pass
26.007 GHz	49.49 dBµV/m	68 dBµV/m	-18.51 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: 22240-25, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-16
 Note:

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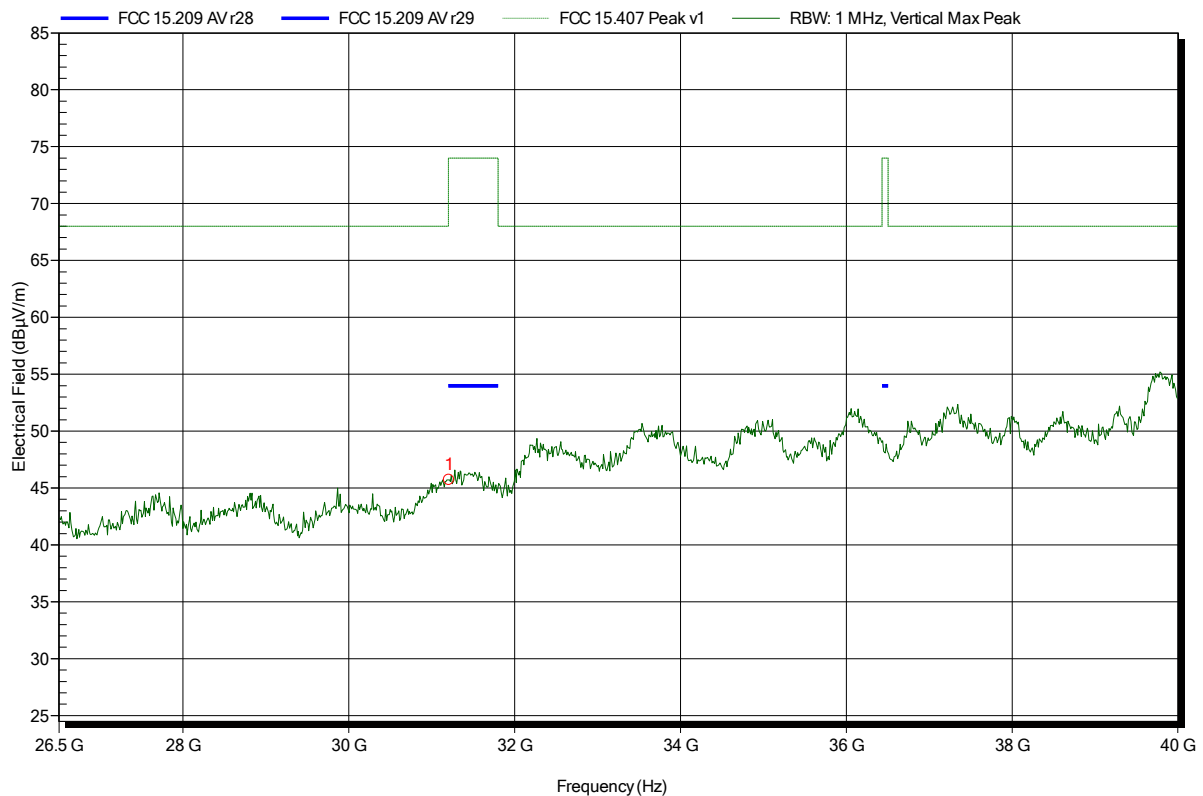
Frequency	Peak	Peak Limit	Peak Difference	Status
31.206 GHz	46.25 dBµV/m	74 dBµV/m	-27.75 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: 22240-25, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch40, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-16
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
31.206 GHz	45.7 dBµV/m	74 dBµV/m	-28.3 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

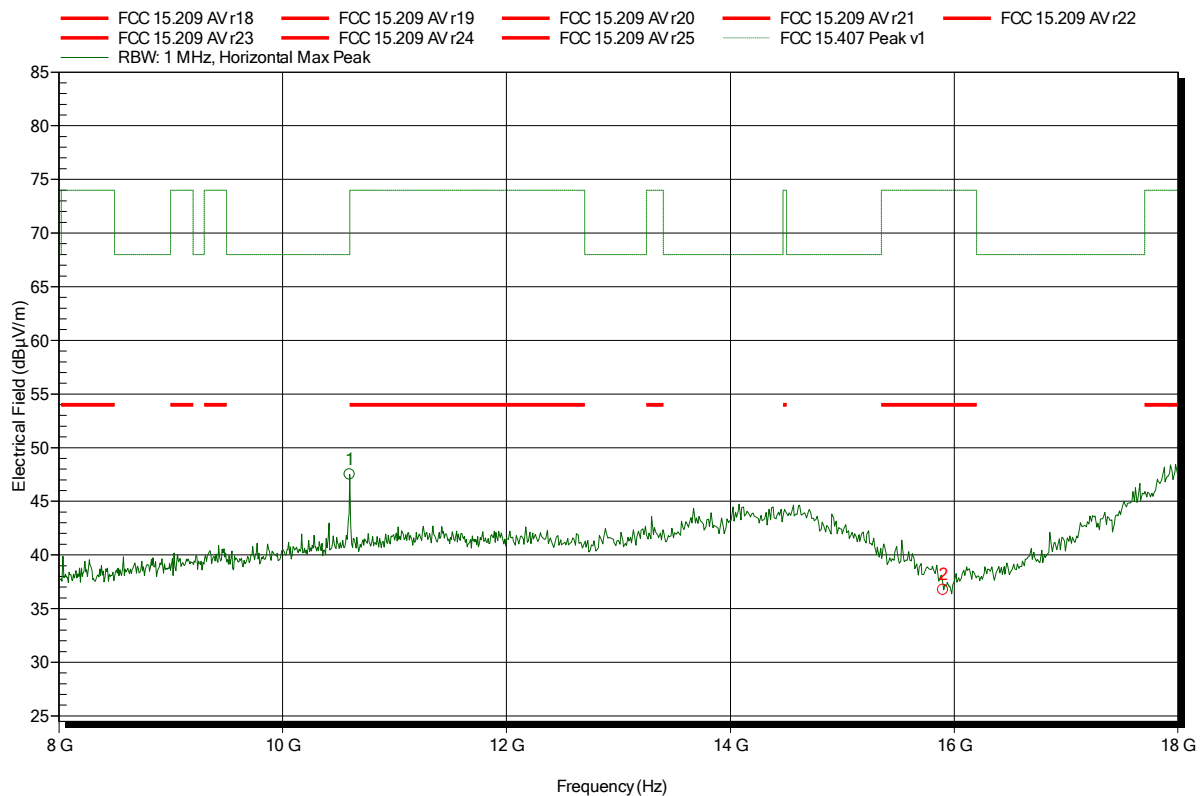
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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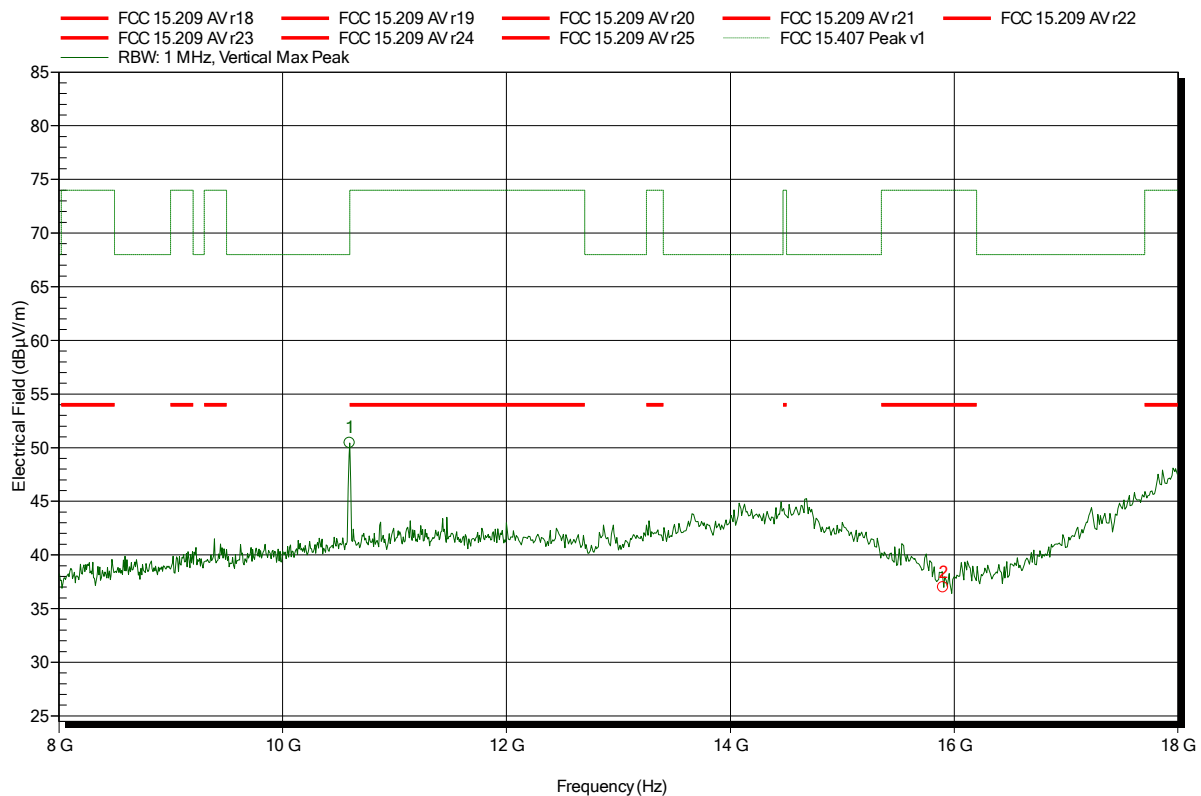
Frequency	Peak	Peak Limit	Peak Difference	Status
10.6 GHz	47.51 dBμV/m	68 dBμV/m	-20.49 dB	Pass
15.9 GHz	36.73 dBμV/m	74 dBμV/m	-37.27 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-12
 Note:

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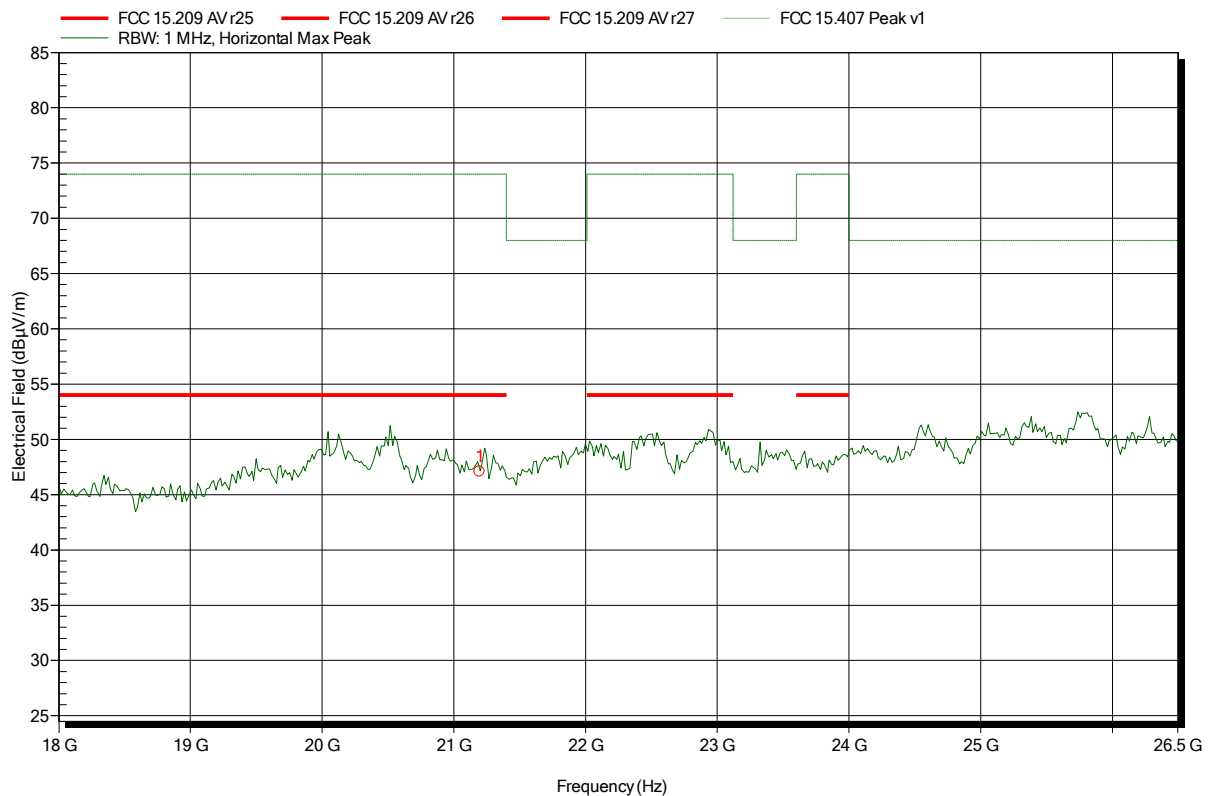
Frequency	Peak	Peak Limit	Peak Difference	Status
10.6 GHz	50.44 dBμV/m	68 dBμV/m	-17.56 dB	Pass
15.9 GHz	36.98 dBμV/m	74 dBμV/m	-37.02 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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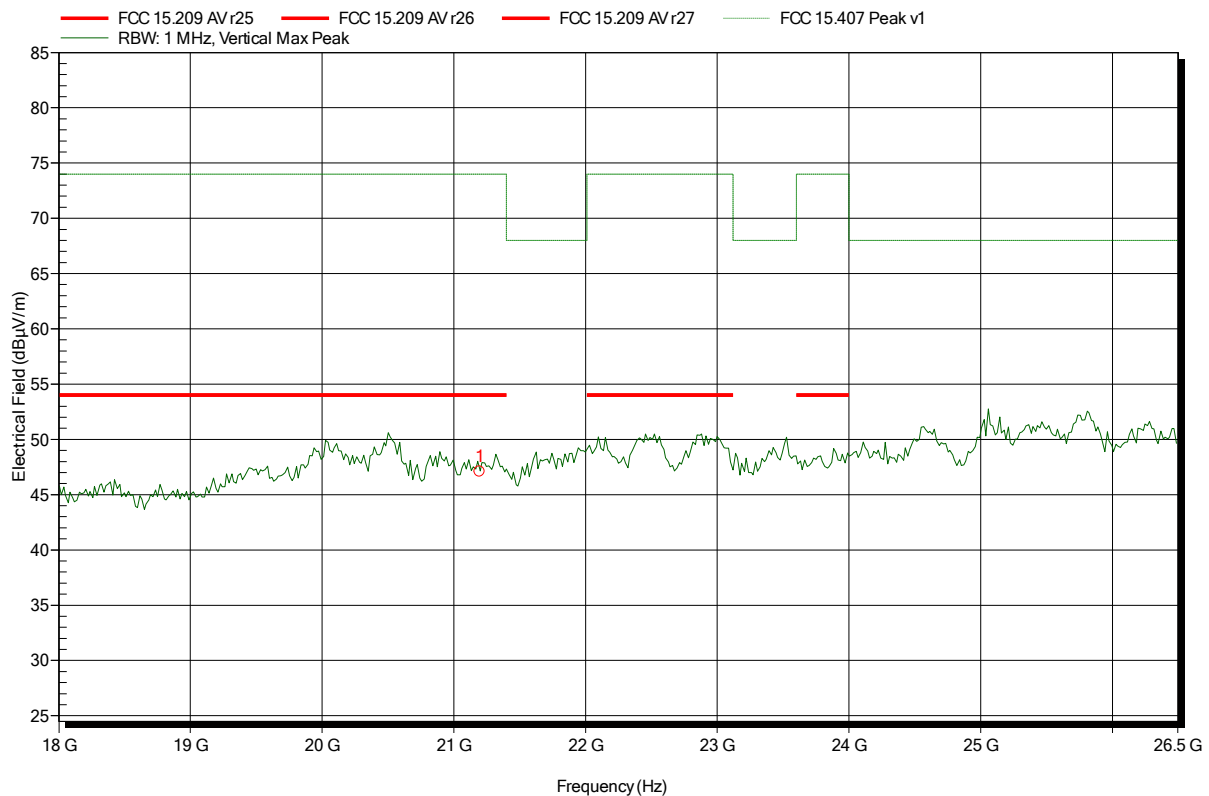
Frequency	Peak	Peak Limit	Peak Difference	Status
21.196 GHz	47.1 dBµV/m	74 dBµV/m	-26.9 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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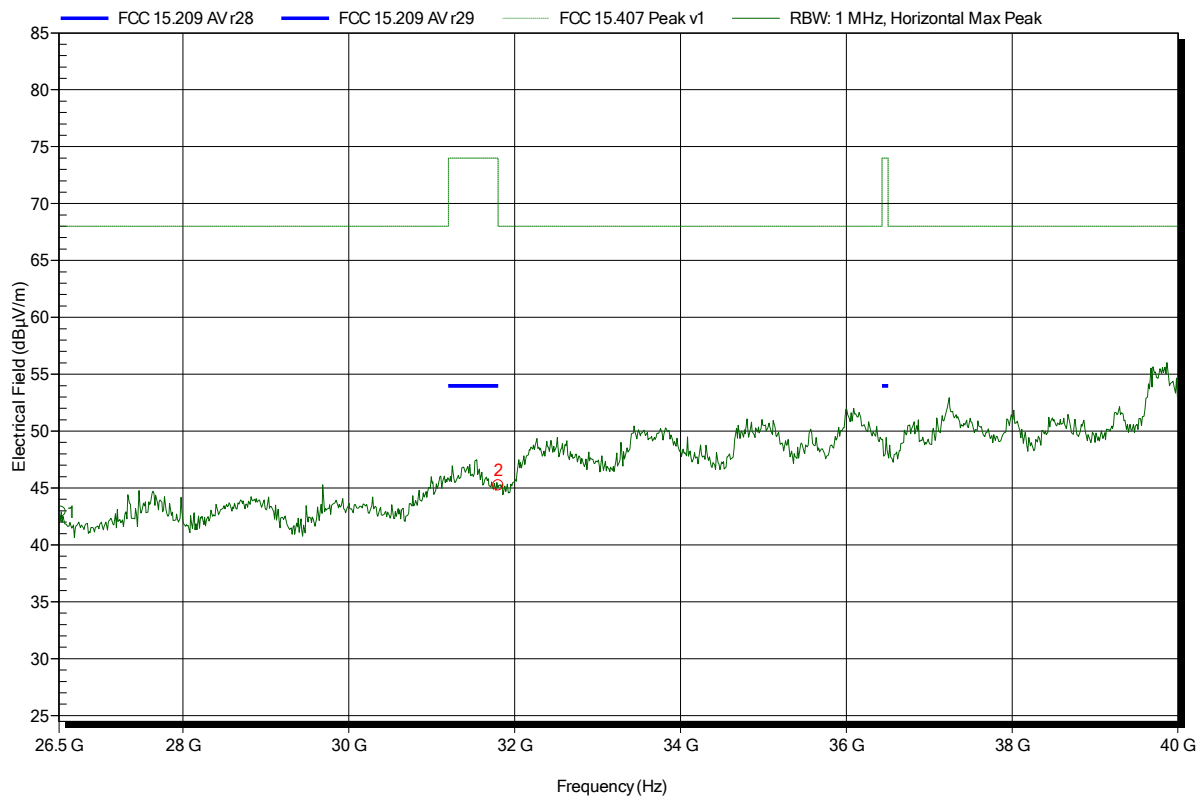
Frequency	Peak	Peak Limit	Peak Difference	Status
21.196 GHz	47.08 dBµV/m	74 dBµV/m	-26.92 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: 22240-25, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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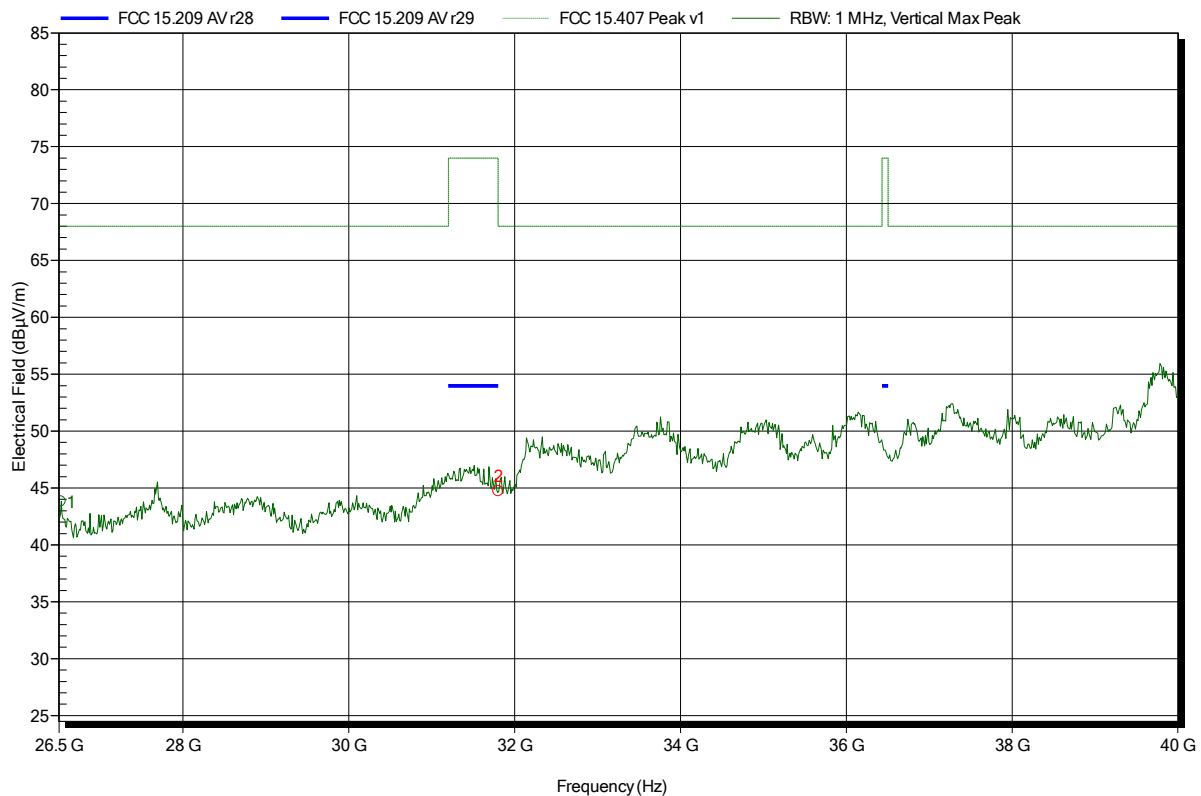
Frequency	Peak	Peak Limit	Peak Difference	Status
26.526 GHz	42.92 dBµV/m	68 dBµV/m	-25.08 dB	Pass
31.804 GHz	45.21 dBµV/m	68 dBµV/m	-22.79 dB	Pass

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: 22240-25, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch60, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
26.526 GHz	43.81 dBµV/m	68 dBµV/m	-24.19 dB	Pass
31.804 GHz	44.72 dBµV/m	68 dBµV/m	-23.28 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

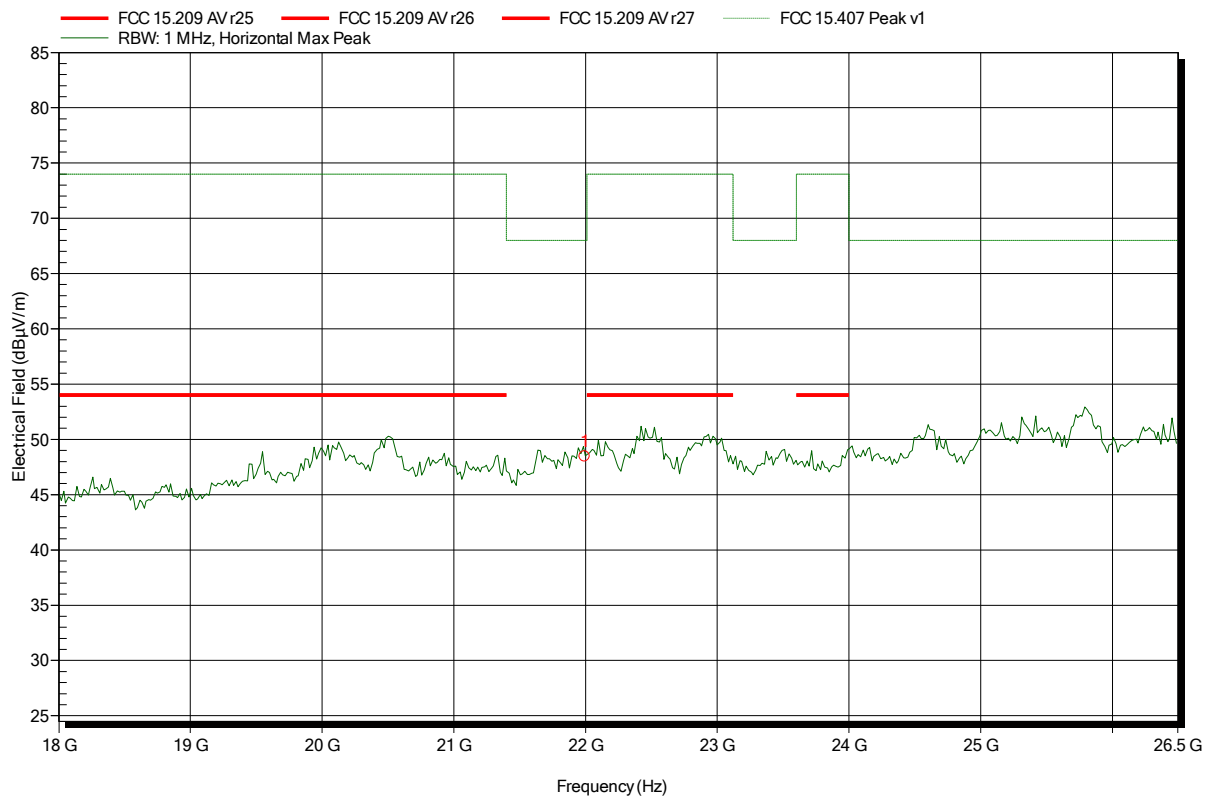
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
21.995 GHz	48.46 dBμV/m	68 dBμV/m	-19.54 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

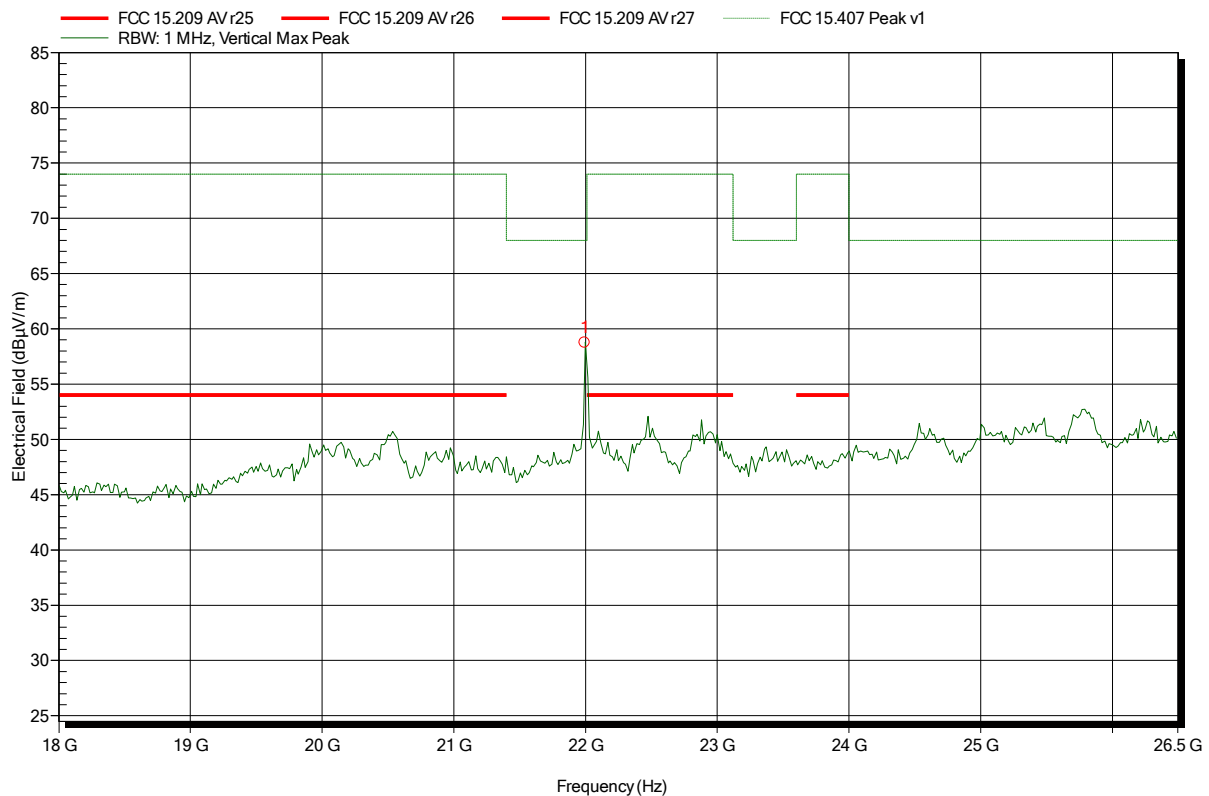
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch100, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
21.995 GHz	58.75 dBµV/m	68 dBµV/m	-9.25 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

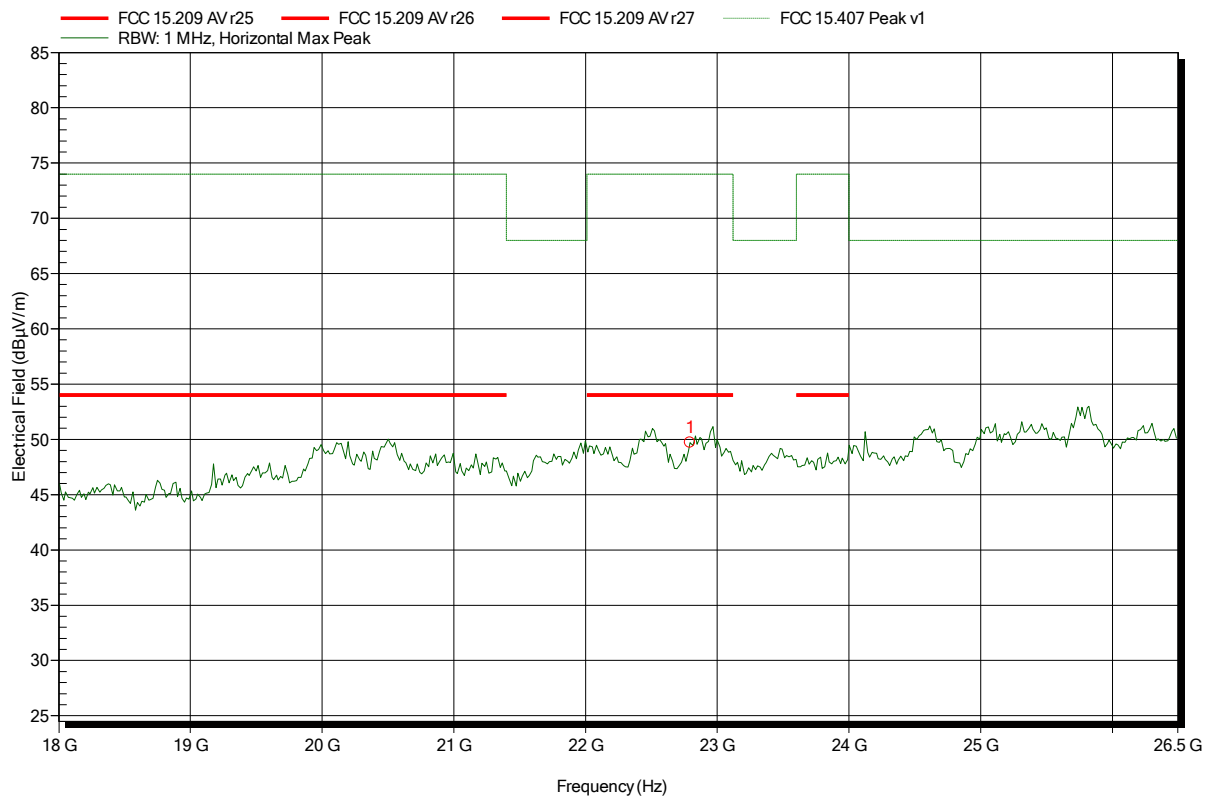
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
22.794 GHz	49.69 dBμV/m	74 dBμV/m	-24.31 dB	Pass

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

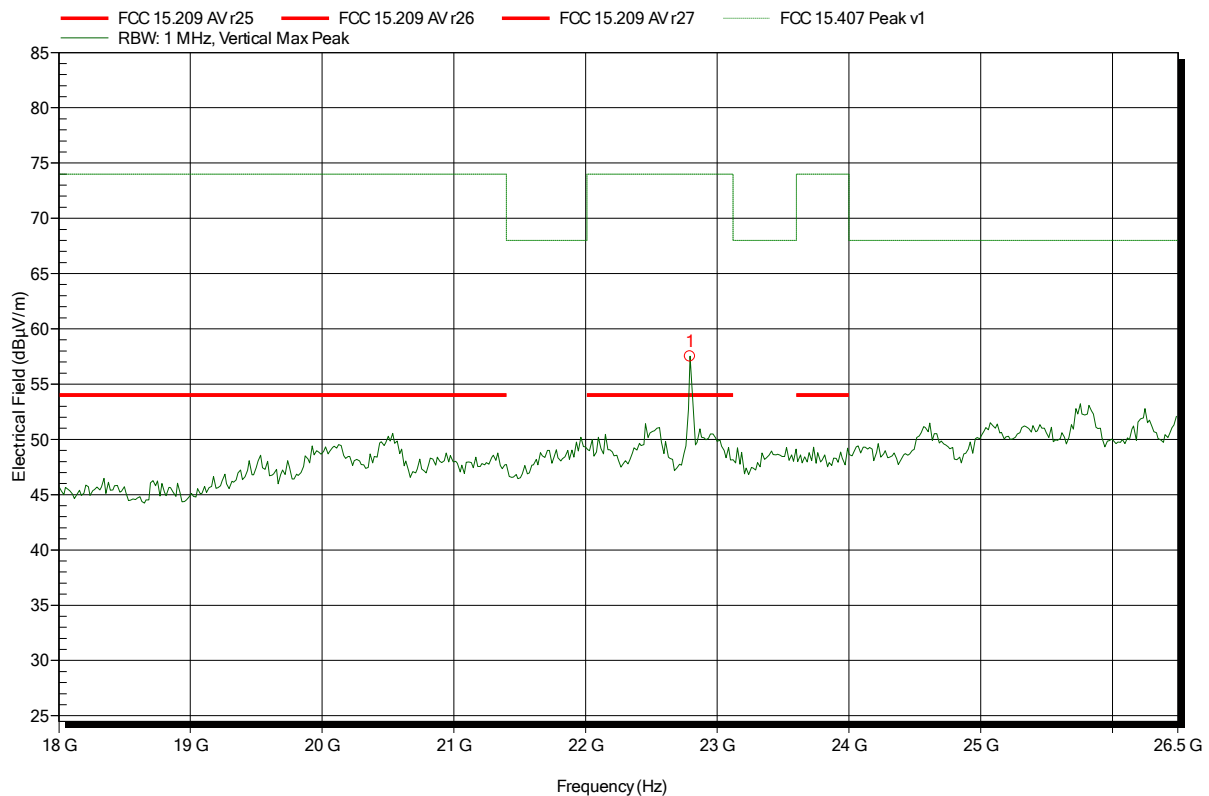
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions according to FCC 15.407

Project number: G0M-1510-5172

Applicant: u-blox Berlin GmbH
 EUT Name: ELLA-W161
 Model: Test Sample #6
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Jahn
 Test Conditions: Tnom: 25°C, Vnom: 3.3 V DC
 Antenna: Rohde & Schwarz HL 025, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; TX; 5GHz, Ch140, 802.11a, 6Mbps, 15dBm
 Test Date: 2015-11-13
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
22.794 GHz	57.51 dBμV/m	74 dBμV/m	-16.49 dB	Pass
Frequency	Average	Average Limit	Average Difference	Status
22.794 GHz	57.50 dBμV/m	54 dBμV/m	3.50 dB	Fail

Test Report No.: G0M-1510-5172-TFC407WF-161-V01

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