eurofins | Product Service

FCC TEST REPORT

FCC 47 CFR Part 15C
Industry Canada RSS-247
Digital transmission systems operating within the 2400 – 2483.5 MHz band

Report Reference No. ..... :	G0M-1507-4921-TFC247WF-V02
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 ..... :	Panono GmbH
Address ..... :	Französische Straße 9-12 10117 Berlin GERMANY
Test specification:	
Standard..... :	47 CFR Part 15C 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
Equipment under test (EUT):	
Product description	Panono Camera
Model No.	MVP15
Additional Model(s)	None
Brand Name(s)	None
Hardware version	1
Firmware / Software version	1.1.0
	FCC-ID: 2AFGVMVP15 IC: 20441-MVP15
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 ..... :	2015-07-20	
Date (s) of performance of tests ..... :	2015-07-22 - 2015-07-23	
Compiled by ..... :	Wilfried Treffke	
Tested by (+ signature) ..... : (Responsible for Test)	Matthias Handrik	.....
Approved by (+ signature) ..... : (Head of Lab)	Christian Weber	.....
Date of issue ..... :	2015-10-16	
Total number of pages ..... :	100	

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:

Version History

Version	Issue Date	Remarks	Revised by
01	2015-09-10	Initial Release	
02	2015-10-15	Antenna gain corrected	C. Weber

REPORT INDEX

1 EQUIPMENT (TEST ITEM) DESCRIPTION 5

1.1 Photos – Equipment External 7
1.2 Photos – Equipment internal 9
1.1 Photos – Test setup 18
1.2 Supporting Equipment Used During Testing 19
1.3 Test Modes 20
1.4 Test Equipment Used During Testing 21
1.5 Sample emission level calculation 22

2 RESULT SUMMARY 23

3 TEST CONDITIONS AND RESULTS 24

3.1 Test Conditions and Results – Occupied Bandwidth 24
3.2 Test Conditions and Results – AC power line conducted emissions 34
3.3 Test Conditions and Results – Transmitter radiated emissions 37
3.4 Test Conditions and Results – Receiver radiated emissions 40

ANNEX A Transmitter radiated spurious emissions 42
ANNEX B Receiver radiated spurious emissions 91

1 Equipment (Test item) Description

Description	Panono Camera			
Model	MVP15			
Additional Model(s)	None			
Brand Name(s)	None			
Serial number	None			
Hardware version	1			
Software / Firmware version	1.1.0			
FCC-ID	2AFGVMVP15			
IC	20441-MVP15			
Equipment type	End product			
Radio type	Transceiver			
Radio technology	IEEE 802.11 b/g/n			
Operating frequency range	2412 - 2462 MHz			
Assigned frequency band	2400 - 2483.5 MHz			
Main test frequencies	F_{LOW20}	2412 MHz	F_{LOW40}	2422 MHz
	F_{MID20}	2437 MHz	F_{MID40}	2437 MHz
	F_{HIGH20}	2462 MHz	F_{HIGH40}	2452 MHz
Spreading	CCK, DSSS, OFDM			
Modulations	BPSK, QPSK, 16-QAM, 64-QAM			
Number of channels	11			
Channel spacing	5 MHz			
Number of antennas	2			
Radio module	Type	WiFi and Bluetooth Module		
	Model	WL1805MODGBMOC		
	Manufacturer	Texas Instruments Incorporated		
	HW Version	1st revision (ROM 0x11)		
	SW Version	ol_r8.a8.10		
	FCC-ID	Z64-WL18SBMOD		
	IC	451I-WL18SBMOD		
Antenna	Type	integrated		
	Model	ANT016008LCD2 442MA1		
	Manufacturer	TDK		
	Gain	2.27 dBi (from declaration)		
Manufacturer	Panono GmbH Französische Straße 9-12 10117 Berlin GERMANY			

Power supply	V_{NOM}	3.7 VDC lithium battery
	V_{MIN}	N/A
	V_{MAX}	N/A
AC/DC-Adaptor	Model	N/A
	Vendor	N/A
	Input	N/A
	Output	N/A

1.2 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
none				

***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	
DSSS	General conditions:	EUT powered by fully charged battery
	Radio conditions:	Mode = standalone transmit Spreading = DSSS Modulation = BPSK Data rate = 1 Mbps Bandwidth = 20 MHz Duty cycle = 100 % Power level = 20 (Test mode setting)
HT20	General conditions:	EUT powered by fully charged battery
	Radio conditions:	Mode = standalone transmit Spreading = OFDM Modulation = 64-QAM MCS index = 13 Guard Interval = long Bandwidth = 20 MHz Data rate = 115.6 Mbps Duty cycle = 100 % Power level = 20 (Test mode setting)
HT40	General conditions:	EUT powered by fully charged battery
	Radio conditions:	Mode = standalone transmit Spreading = OFDM Modulation = BPSK MCS index = 13 Guard Interval = long Bandwidth = 20 MHz Data rate = 240.0 Mbps Duty cycle = 100 % Power level = 20 (Test mode setting)
Receive	General conditions:	EUT powered by fully charged battery
	Radio conditions:	Mode = standalone receive
AC-Powerline	General conditions:	EUT powered by commercial AC/DC-Adapter
	Radio conditions:	Mode = charging mode, no radio activity

1.4 Test Equipment Used During Testing

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

Occupied Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2015-02	2016-02

Radiated spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-anechoic chamber	Frankonia	AC 1	EF00062	-	-
Spectrum Analyzer	R&S	FSEK30	EF00168	2015-01	2016-01
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	2013-02	2016-02

AC powerline conducted emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
AMN	R&S	ESH2-Z5	EF00182	2014-11	2016-11
EMI Test Receiver	R&S	ESCS 30	EF00295	2014-10	2015-10

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:

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

Net:

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

Limit:

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

Limit (dBµV/m) = 20*log (µV/m)

Margin:

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

Example only:

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

2 Result Summary

FCC 47 CFR Part 15C, IC RSS-247				
Product Specific Standard Section	**Requirement – Test**	**Reference Method**	**Result**	**Remarks**
RSS-Gen 6.6	Occupied Bandwidth	ANSI C63.10	N/R	Informational only
FCC § 15.247(a)(2) IC RSS-247 § 5.2	6dB Bandwidth	ANSI C63.10	N/R	integration of certified module
FCC § 15.247(b)(3) IC RSS-247 § 5.4	Maximum peak conducted power	ANSI C63.10	N/R	integration of certified module
FCC § 15.247(e) IC RSS-247 § 5.2	Power spectral density	ANSI C63.10	N/R	integration of certified module
47 CFR 15.207 IC RSS-247 § 3.1	AC power line conducted emissions	ANSI C63.4	PASS	
FCC § 15.247(d) IC RSS-247 § 5.5	Band edge compliance	ANSI C63.10	N/R	integration of certified module
FCC § 15.247(d) IC RSS-247 § 5.5	Conducted spurious emissions	ANSI C63.10	N/R	integration of certified module
FCC § 15.247(d) FCC § 15.209 IC RSS-247 § 5.5	Transmitter radiated spurious emissions	ANSI C63.10	PASS	
IC RSS-247 § 3.1	Receiver radiated spurious emissions	ANSI C63.10	PASS	
Remarks:				

3 Test Conditions and Results

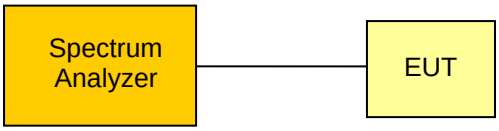
3.1 Test Conditions and Results – Occupied Bandwidth

Occupied Bandwidth acc. to IC RSS-Gen	**Verdict: N/R**
Test according to measurement reference	Reference Method
	ANSI C63.10
Test frequency range	Tested frequencies
	F_{LOW} / F_{MID} / F_{HIGH}

Limits

None (Informational only)

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Span set to at least twice the emission spectrum
3. Resolution bandwidth set to 1 % of span
4. Occupied Bandwidth (99 %) measurement with spectrum analyzer built in measurement function

Test results

Channel	Frequency [MHz]	Mode	Occupied Bandwidth [kHz]
F_{LOW20}	2412	DSSS	15.43
F_{MID20}	2437	DSSS	15.03
F_{HIGH20}	2462	DSSS	10.92
F_{LOW20}	2412	HT20	18.84
F_{MID20}	2437	HT20	18.84
F_{HIGH20}	2462	HT20	19.54
F_{LOW40}	2422	HT40	36.87
F_{MID40}	2437	HT40	36.67
F_{HIGH40}	2452	HT40	37.07

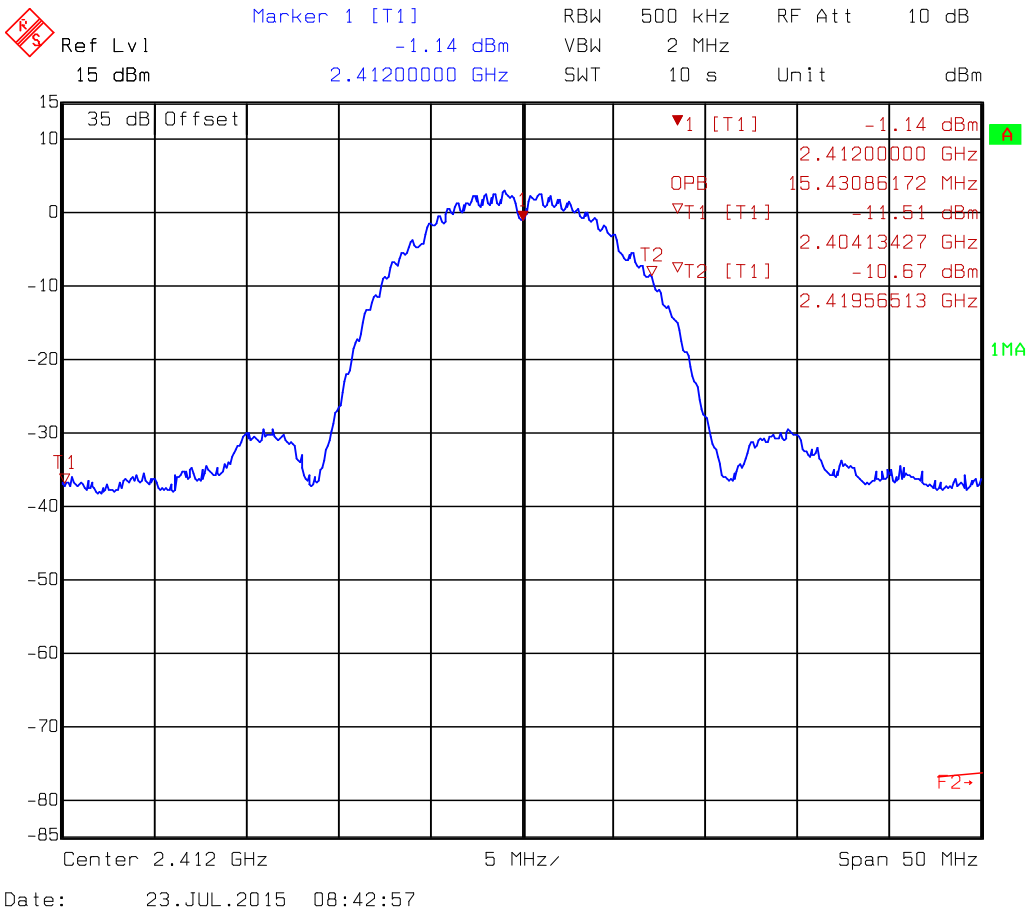
Comments:

Occupied Bandwidth – DSSS F_{LOW}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Wilfried Treffke
Test Conditions:	Tnom / Vnom
Mode:	Tx, IEEE 802.11b, 1 Mbps, 2412 MHz
Test Date:	2015-07-23
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	radiated measurement

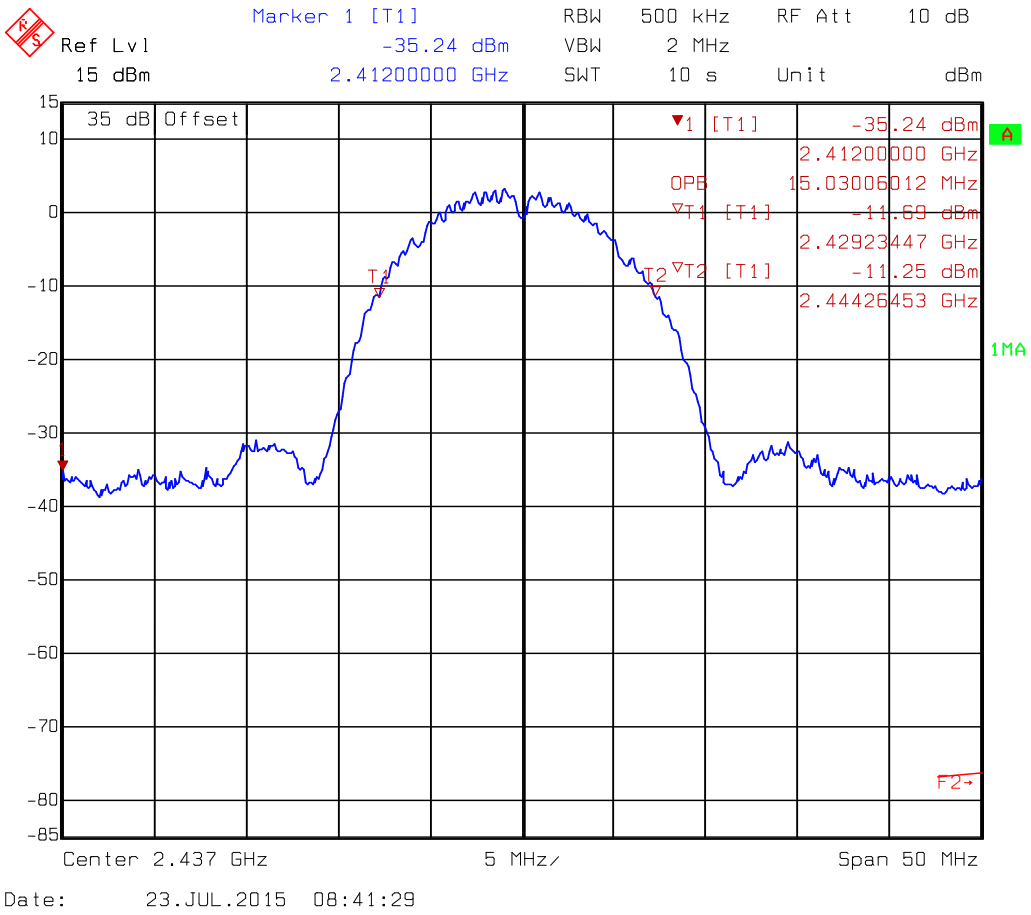


Occupied Bandwidth – DSSS F_{MID}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Wilfried Treffke
Test Conditions:	Tnom / Vnom
Mode:	Tx, IEEE 802.11b, 1 Mbps, 2437 MHz
Test Date:	2015-07-23
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	radiated measurement

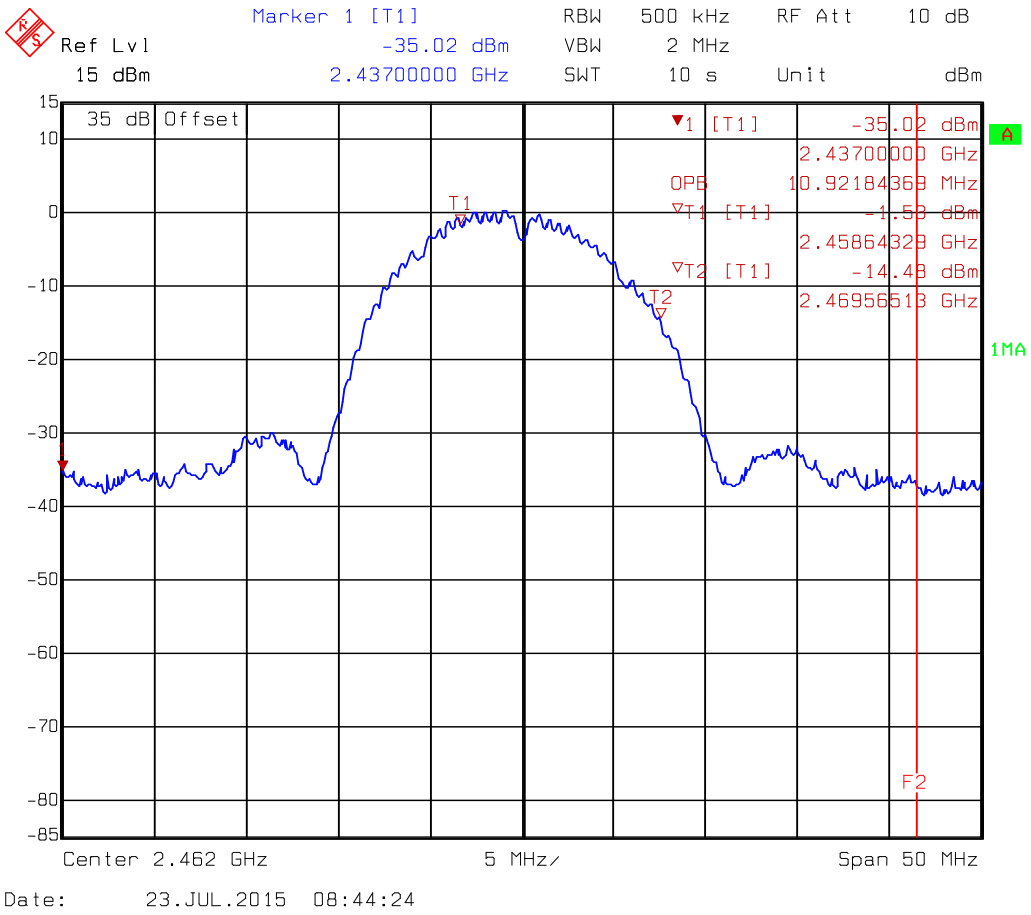


Occupied Bandwidth – DSSS F_{HIGH}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Wilfried Treffke
Test Conditions:	Tnom / Vnom
Mode:	Tx, IEEE 802.11b, 1 Mbps, 2462 MHz
Test Date:	2015-07-23
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	radiated measurement

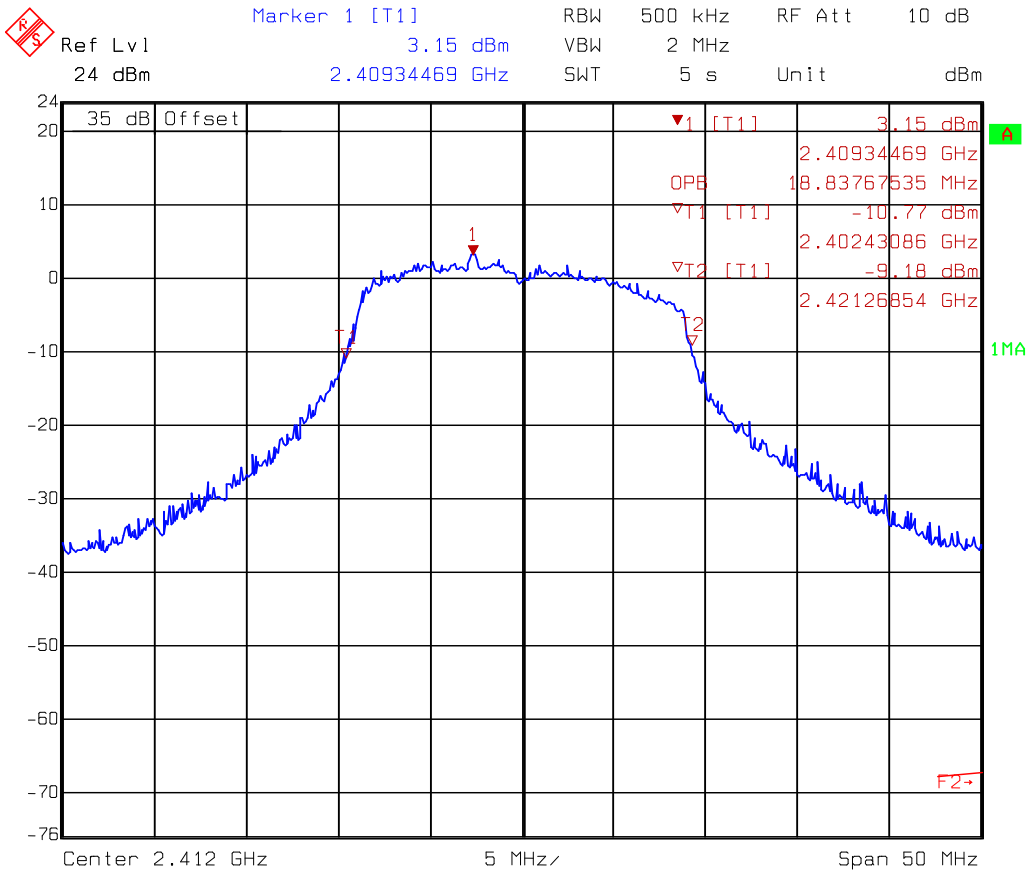


Occupied Bandwidth – HT20 F_{LOW}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Wilfried Treffke
Test Conditions:	Tnom / Vnom
Mode:	Tx, IEEE 802.11n, HT20 MSC13, 2412 MHz
Test Date:	2015-07-23
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	radiated measurement

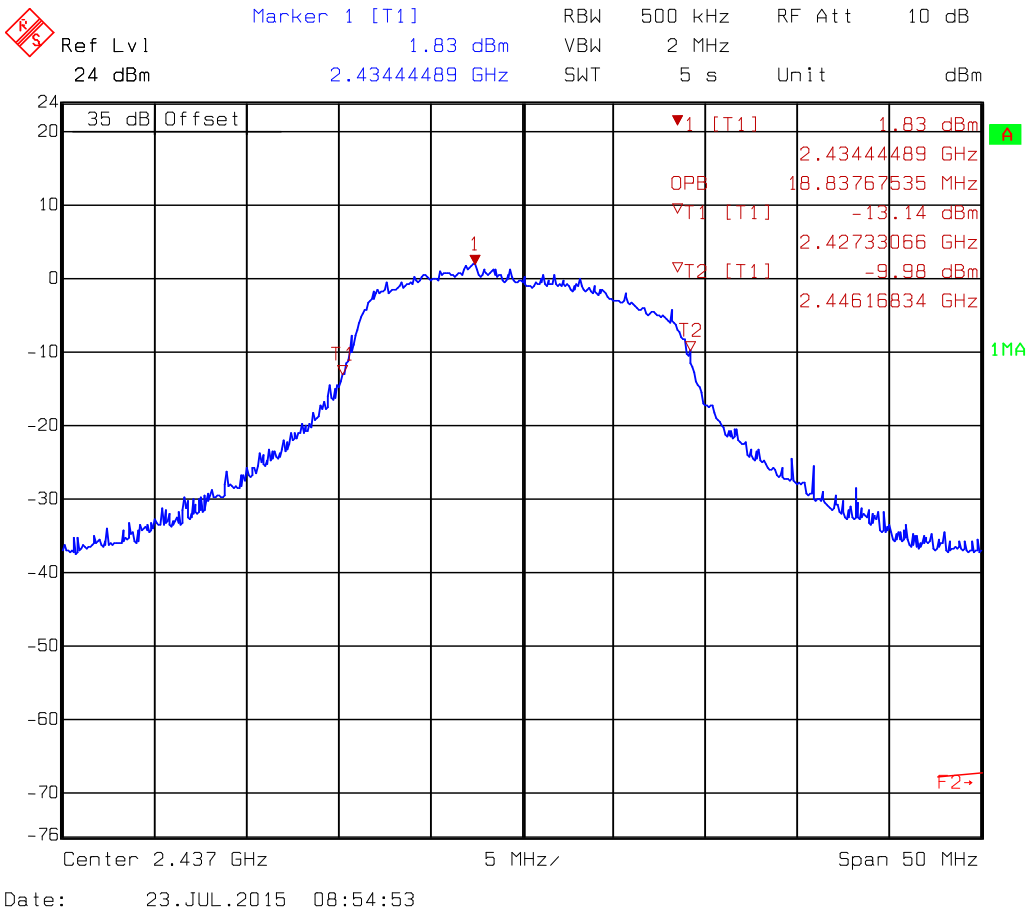


Occupied Bandwidth – HT20 F_{MID}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Wilfried Treffke
Test Conditions:	Tnom / Vnom
Mode:	Tx, IEEE 802.11n, HT20 MSC13, 2437 MHz
Test Date:	2015-07-23
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	radiated measurement

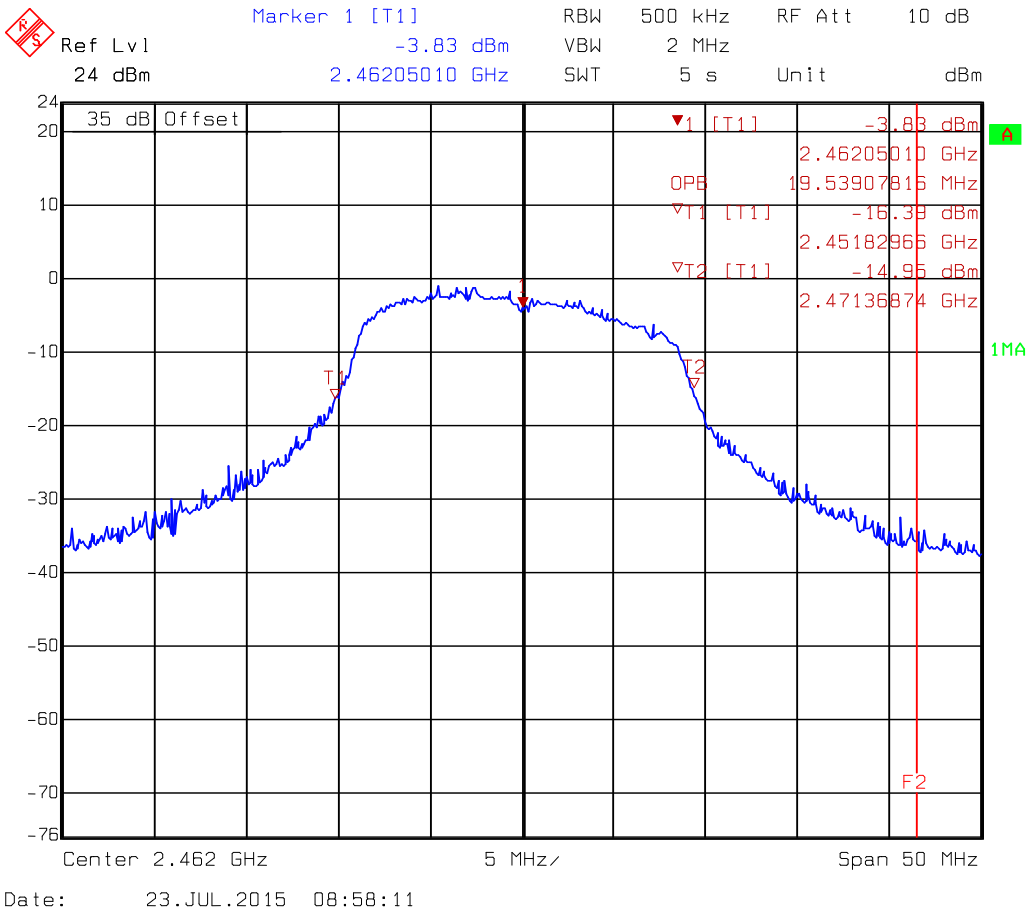


Occupied Bandwidth – HT20 F_{HIGH}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Wilfried Treffke
Test Conditions:	Tnom / Vnom
Mode:	Tx, IEEE 802.11n, HT20 MSC13, 2462 MHz
Test Date:	2015-07-23
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	radiated measurement

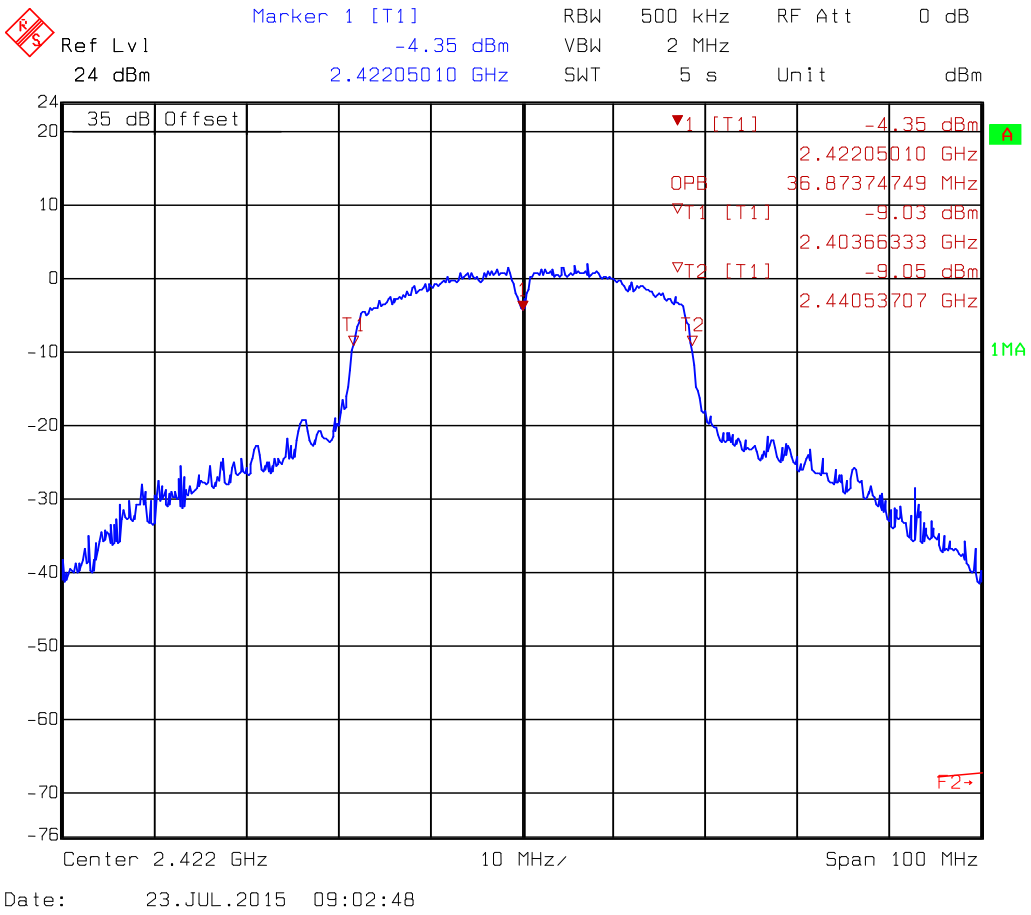


Occupied Bandwidth – HT40 F_{LOW}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Wilfried Treffke
Test Conditions:	Tnom / Vnom
Mode:	Tx, IEEE 802.11n, HT40 MSC0, 2422 MHz
Test Date:	2015-07-23
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	radiated measurement

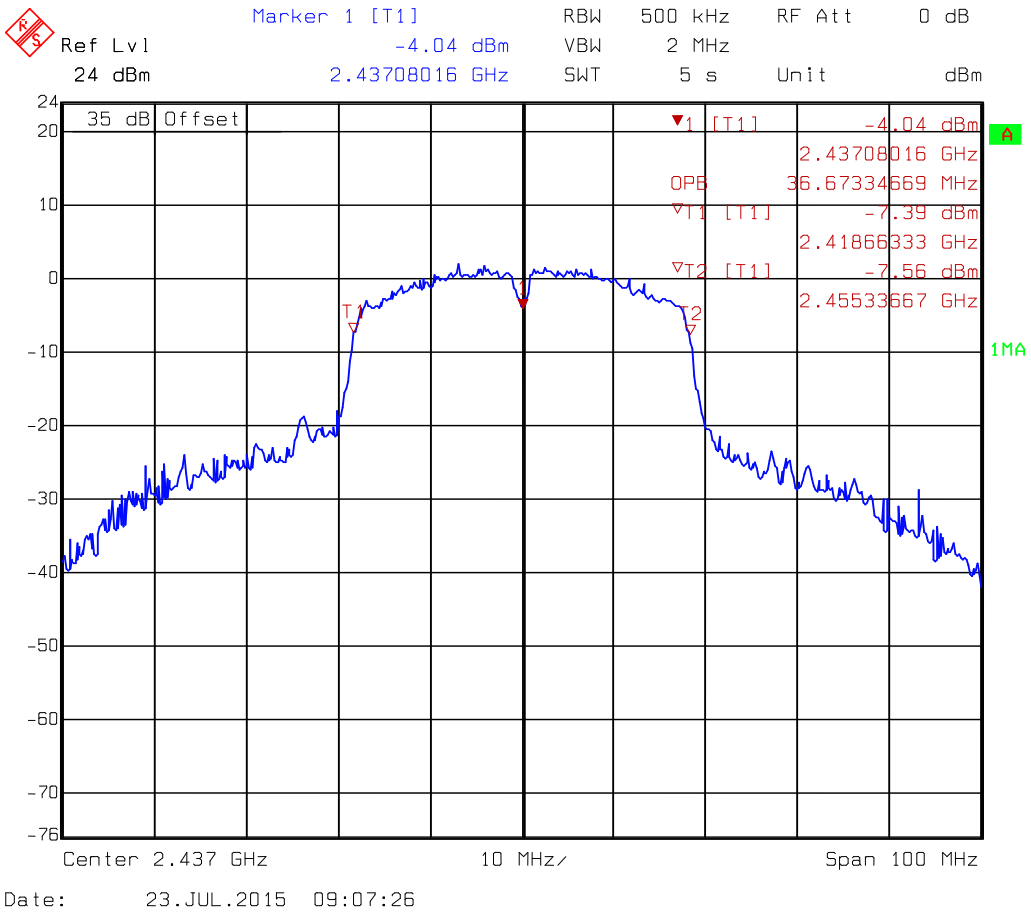


Occupied Bandwidth – HT40 F_{MID}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Wilfried Treffke
Test Conditions:	Tnom / Vnom
Mode:	Tx, IEEE 802.11n, HT40 MSC0, 2437 MHz
Test Date:	2015-07-23
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	radiated measurement

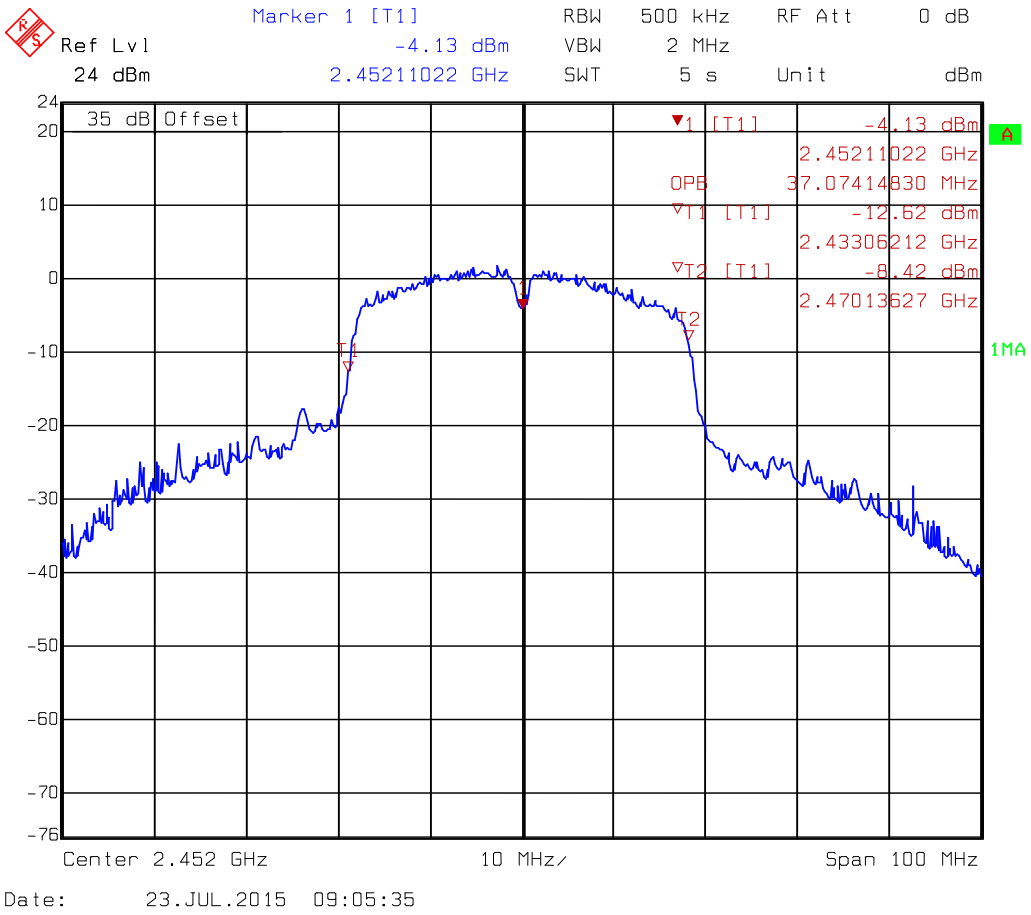


Occupied Bandwidth – HT40 F_{HIGH}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Wilfried Treffke
Test Conditions:	Tnom / Vnom
Mode:	Tx, IEEE 802.11n, HT40 MSC0, 2452 MHz
Test Date:	2015-07-23
Verdict:	NONE (INFORMATION ONLY)
Note 1:	A spectrum analyzer with an integrated 99% power bandwidth function is used
Note 2:	radiated measurement



3.2 Test Conditions and Results – AC power line conducted emissions

Power line conducted emissions acc. to FCC 47 CFR 15.207 / IC RSS-Gen				**Verdict: PASS**
Test according referenced standards	Reference Method			
	ANSI C63.4			
Fully configured sample scanned over the following frequency range	Frequency range			
	0.15 MHz to 30 MHz			
Points of Application	Application Interface			
AC Mains	LISN			
EUT test mode	AC-Powerline			
Limits and results				
Frequency [MHz]	Quasi-Peak [dBµV]	Result	Average [dBµV]	Result
0.15 to 5	66 to 56*	PASS	56 to 46*	PASS
0.5 to 5	56	PASS	46	PASS
5 to 30	60	PASS	50	PASS
Comments: * Limit decreases linearly with the logarithm of the frequency.				

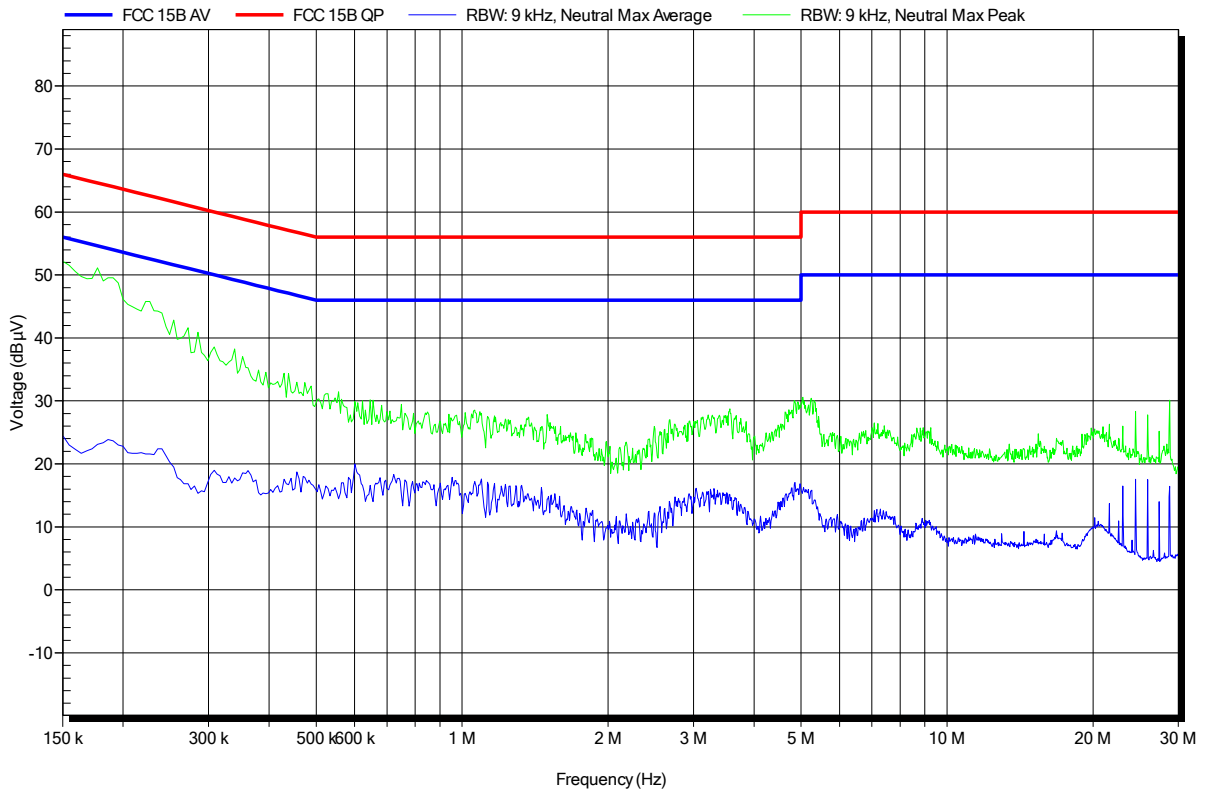
Conducted Emissions 1

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

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via AC/DC Adapter
LISN:	ESH2-Z5 N
Mode:	EUT in charging mode
Test Date:	2015-08-04
Note:	

Index 41



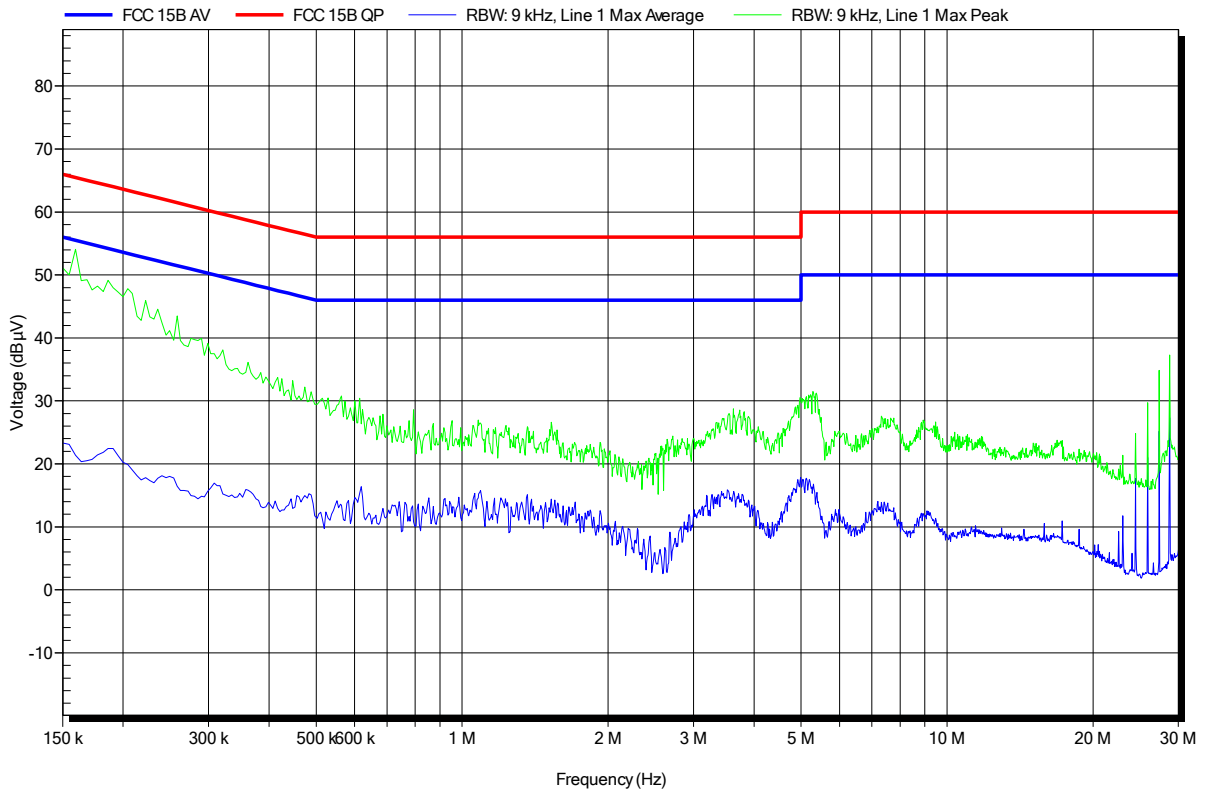
Conducted Emissions 2

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

Project number: G0M-1507-4921

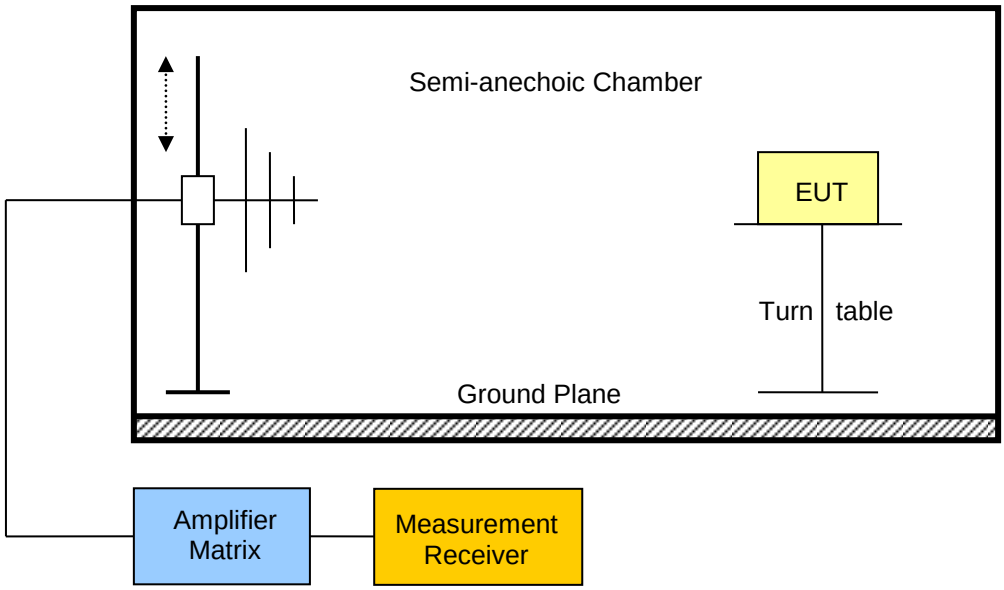
Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via AC/DC Adapter
LISN:	ESH2-Z5 L
Mode:	EUT in charging mode
Test Date:	2015-08-04
Note:	

Index 42



3.3 Test Conditions and Results – Transmitter radiated emissions

Transmitter radiated emissions acc. to FCC 47 CFR 15.247 / IC RSS-247				**Verdict: PASS**
Test according referenced standards		Reference Method		
		FCC 15.247(d) / IC RSS-247 5.5		
Test according to measurement reference		Reference Method		
		ANSI C63.10		
Test frequency range		Tested frequencies		
		30 MHz – 10th 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)). When average radiated emission measurements are specified, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.				
Test setup				



Test procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Span it set according to measurement range 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz 4. Markers are set to peak emission levels within restricted bands

Test results DSSS

Channel	Frequency [MHz]	Mode	Emission [MHz]	Level [dbµV/m]	Det.	Pol.	Limit [dbµV/m]	Limit dist. [m]*	Margin [dB]
F_{LOW}	2412	DSSS	240.124	27.40	pk	hor	46.00	3	-18.60
F_{LOW}	2412	DSSS	2386	55.63	pk	hor	74.00	3	-18.37
F_{LOW}	2412	DSSS	2386	48.78	RMS	hor	54.00	3	-05.22
F_{LOW}	2412	DSSS	2386	52.39	pk	ver	74.00	3	-21.61
F_{LOW}	2412	DSSS	2386	44.75	RMS	ver	54.00	3	-09.25
F_{LOW}	2412	DSSS	4816	38.50	pk	ver	74.00	3	-35.50
F_{LOW}	2412	DSSS	4824	39.48	pk	hor	74.00	3	-34.52
F_{MID}	2437	DSSS	4872	39.16	pk	hor	74.00	3	-34.84
F_{MID}	2437	DSSS	4872	39.31	pk	ver	74.00	3	-34.69
F_{HIGH}	2462	DSSS	2483.6	54.99	pk	hor	74.00	3	-19.01
F_{HIGH}	2462	DSSS	2483.6	48.34	RMS	hor	54.00	3	-05.66
F_{HIGH}	2462	DSSS	2487.4	57.45	pk	hor	74.00	3	-16.55
F_{HIGH}	2462	DSSS	2487.4	50.46	RMS	hor	54.00	3	-03.54
F_{HIGH}	2462	DSSS	2487.6	55.39	pk	ver	74.00	3	-18.61
F_{HIGH}	2462	DSSS	2487.6	47.67	RMS	ver	54.00	3	-06.33
F_{HIGH}	2462	DSSS	4920	39.55	pk	hor	74.00	3	-34.45
F_{HIGH}	2462	DSSS	4920	38.64	pk	ver	74.00	3	-35.36
F_{HIGH}	2462	DSSS	7384	43.12	pk	hor	74.00	1	-30.88

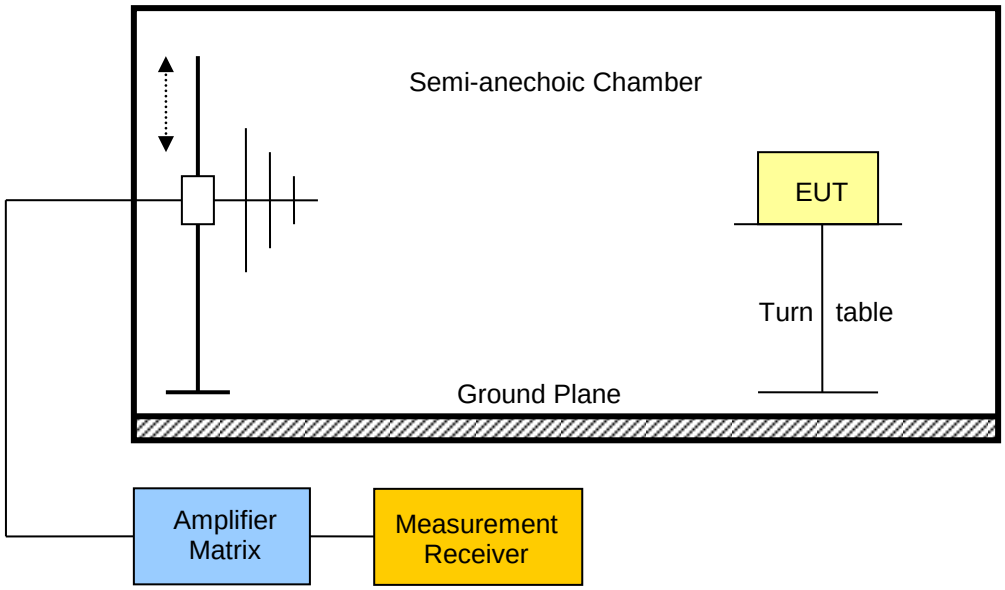
Comments: * Physical distance between EUT and measurement antenna.

Test results HT20									
Channel	Frequency [MHz]	Mode	Emission [MHz]	Level [dbµV/m]	Det.	Pol.	Limit [dbµV/m]	Limit dist. [m]*	Margin [dB]
F_{LOW}	2412	HT20	2390	62.79	pk	hor	74.00	3	-11.21
F_{LOW}	2412	HT20	2390	42.54	RMS	hor	54.00	3	-11.46
F_{LOW}	2412	HT20	2390	58.35	pk	ver	74.00	3	-15.65
F_{LOW}	2412	HT20	2390	40.85	RMS	ver	54.00	3	-13.15
F_{LOW}	2412	HT20	4824	34.17	pk	hor	74.00	3	-39.83
F_{MID}	2437	HT20	4872	40.46	pk	hor	74.00	3	-33.54
F_{MID}	2437	HT20	4872	38.80	pk	ver	74.00	3	-35.20
F_{HIGH}	2462	HT20	2483.5	68.10	pk	hor	74.00	3	-05.90
F_{HIGH}	2462	HT20	2483.5	46.13	RMS	hor	54.00	3	-07.87
F_{HIGH}	2462	HT20	2483.5	64.36	pk	ver	74.00	3	-09.64
F_{HIGH}	2462	HT20	2483.5	43.15	RMS	ver	54.00	3	-10.85
F_{HIGH}	2462	HT20	4920	38.92	pk	hor	74.00	3	-35.08
F_{HIGH}	2462	HT20	4928	40.29	pk	ver	74.00	3	-33.71
Comments: * Physical distance between EUT and measurement antenna.									

Test results HT40									
Channel	Frequency [MHz]	Mode	Emission [MHz]	Level [dbµV/m]	Det.	Pol.	Limit [dbµV/m]	Limit dist. [m]*	Margin [dB]
F_{LOW}	2422	DSSS	2390	67.36	pk	hor	74.00	3	-06.64
F_{LOW}	2422	DSSS	2390	50.60	RMS	hor	54.00	3	-03.40
F_{LOW}	2422	DSSS	2390	70.14	pk	ver	74.00	3	-03.86
F_{LOW}	2422	DSSS	2390	50.99	RMS	ver	54.00	3	-03.01
F_{HIGH}	2452	DSSS	2483.6	69.87	pk	hor	74.00	3	-04.13
F_{HIGH}	2452	DSSS	2483.6	52.82	RMS	hor	54.00	3	-01.18
F_{HIGH}	2452	DSSS	2483.7	70.12	pk	ver	74.00	3	-03.88
F_{HIGH}	2452	DSSS	2483.7	52.15	RMS	ver	54.00	3	-01.85
Comments: * Physical distance between EUT and measurement antenna.									

3.4 Test Conditions and Results – Receiver radiated emissions

Receiver radiated emissions acc. to IC RSS-247				**Verdict: PASS**
Test according referenced standards	Reference Method			
	IC RSS-247 3.1			
Test according to measurement reference	Reference Method			
	ANSI C63.10			
Test frequency range	Tested frequencies			
	30 MHz – 5th Harmonic			
EUT test mode	Receive			
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
Test setup				



Test procedure
1. EUT set to receive mode (Communication tester is used if needed) 2. Span it set according to measurement range 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz 4. Markers are set to peak emission levels

Test results

Channel	Frequency [MHz]	Emission [MHz]	Emission Level [dbµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dBµV/m]
F_{MID}	2437	398.4	20.44	pk	ver	46.00	-25.56 dB
F_{MID}	2437	905.6	30.29	pk	hor	46.00	-15.71 dB
F_{MID}	2437	960	27.33	pk	hor	46.00	-18.67 dB
F_{MID}	2437	960	23.87	pk	ver	46.00	-22.13 dB
F_{MID}	2437	1198	40.79	pk	ver	53.98	-13.19 dB
F_{MID}	2437	7824	49.11	pk	hor	53.98	-4.87 dB
F_{MID}	2437	1198	41.57	pk	hor	53.98	-12.41 dB
F_{MID}	2437	1876	38.41	pk	hor	53.98	-15.57 dB

Comments:

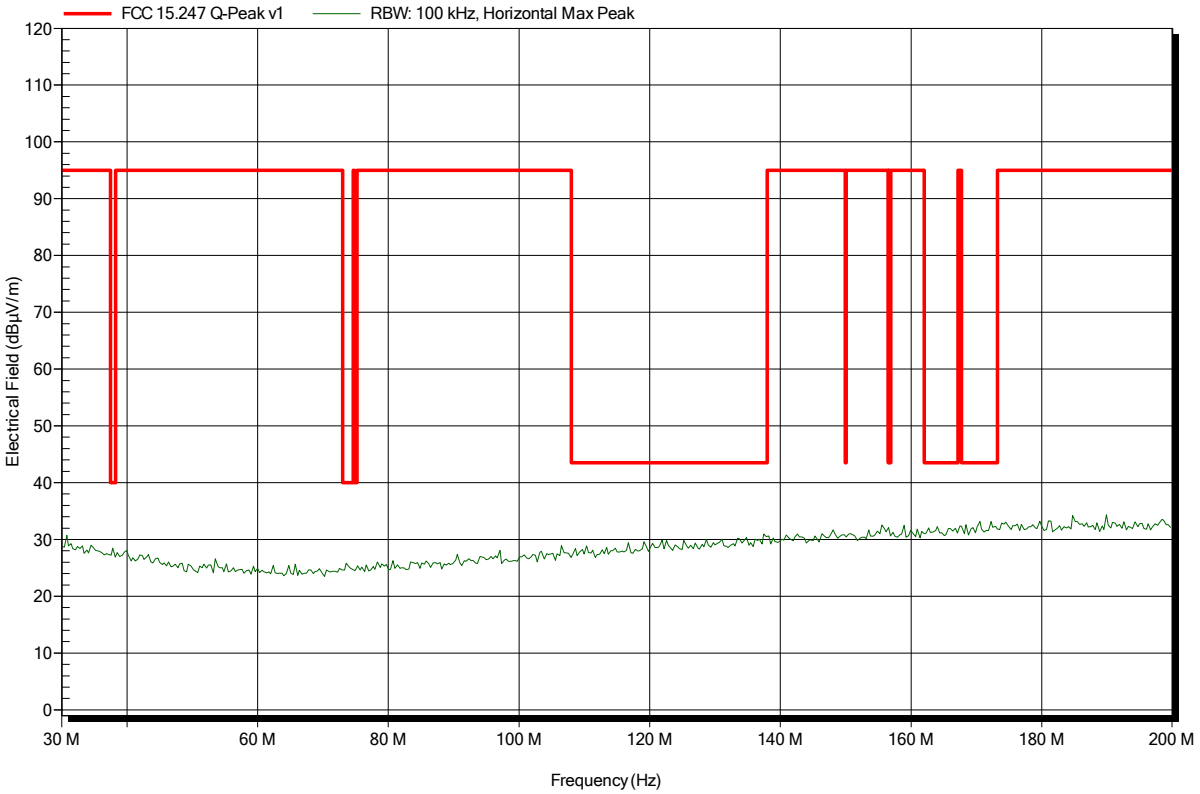
ANNEX A Transmitter radiated spurious emissions

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2412MHz
Test Date:	2015-07-23
Note:	

Index 95

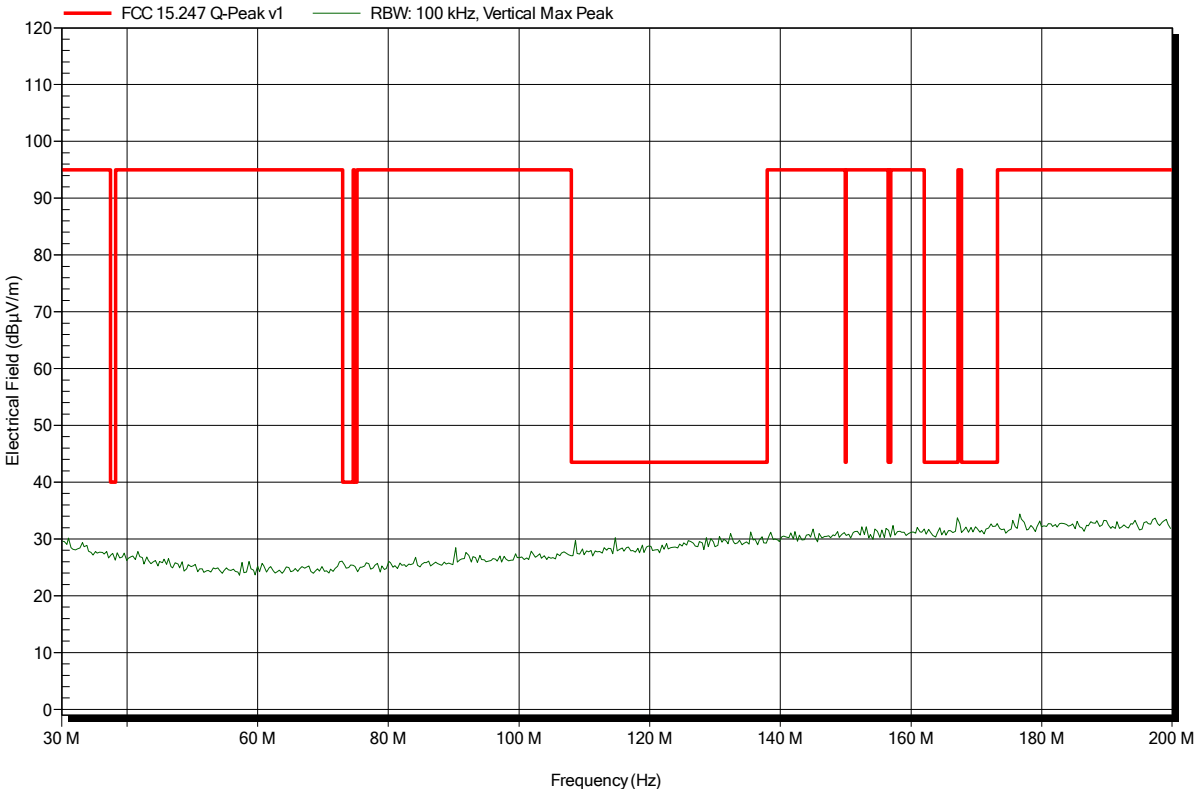


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2412MHz
Test Date:	2015-07-23
Note:	

Index 96

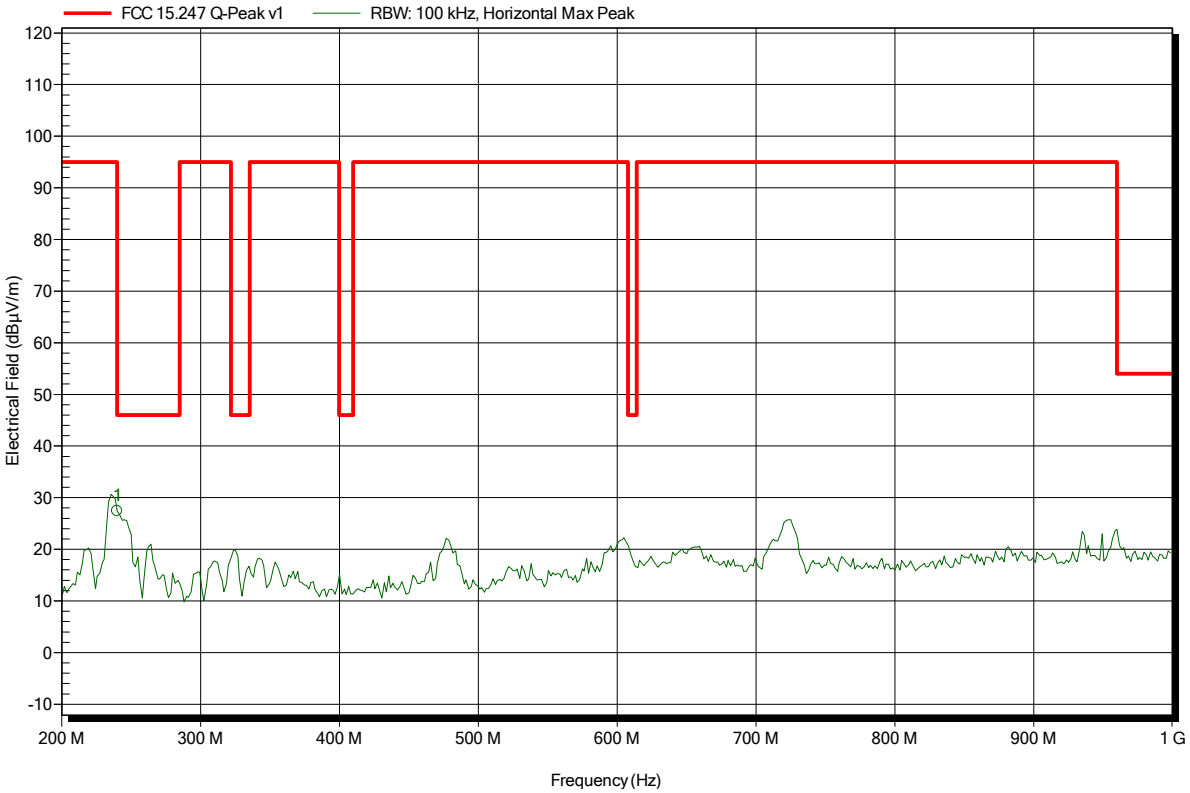


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2412MHz
Test Date:	2015-07-23
Note:	

Index 97



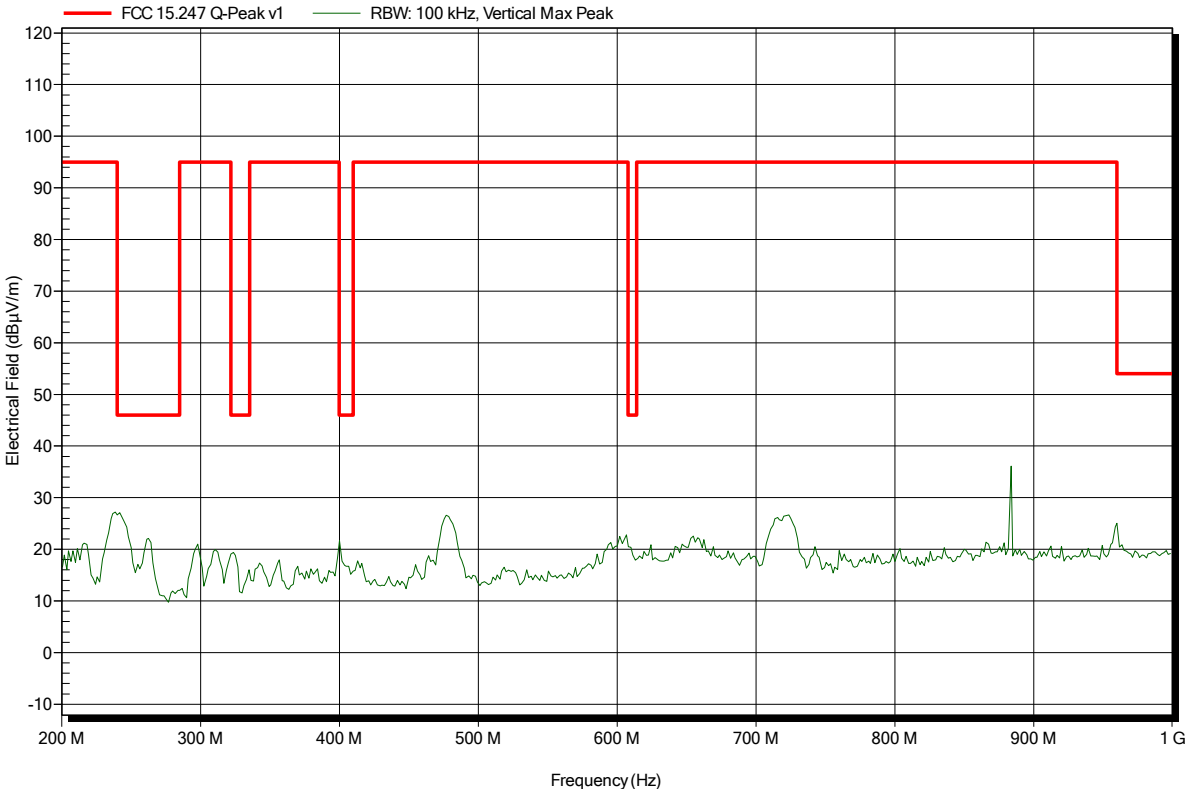
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
240.124 MHz	27.4 dBµV/m	46 dBµV/m	-18.6 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2412MHz
Test Date:	2015-07-23
Note:	

Index 98

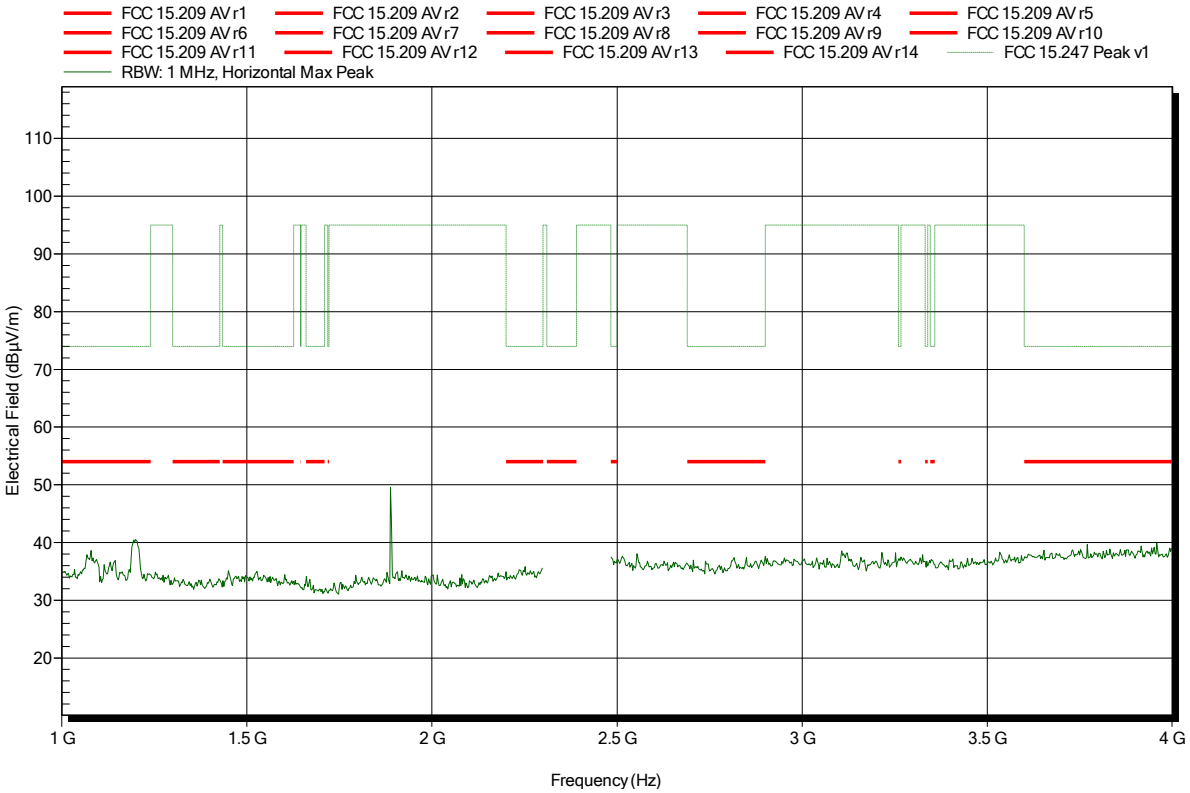


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2412MHz
Test Date:	2015-07-22
Note:	

Index 43

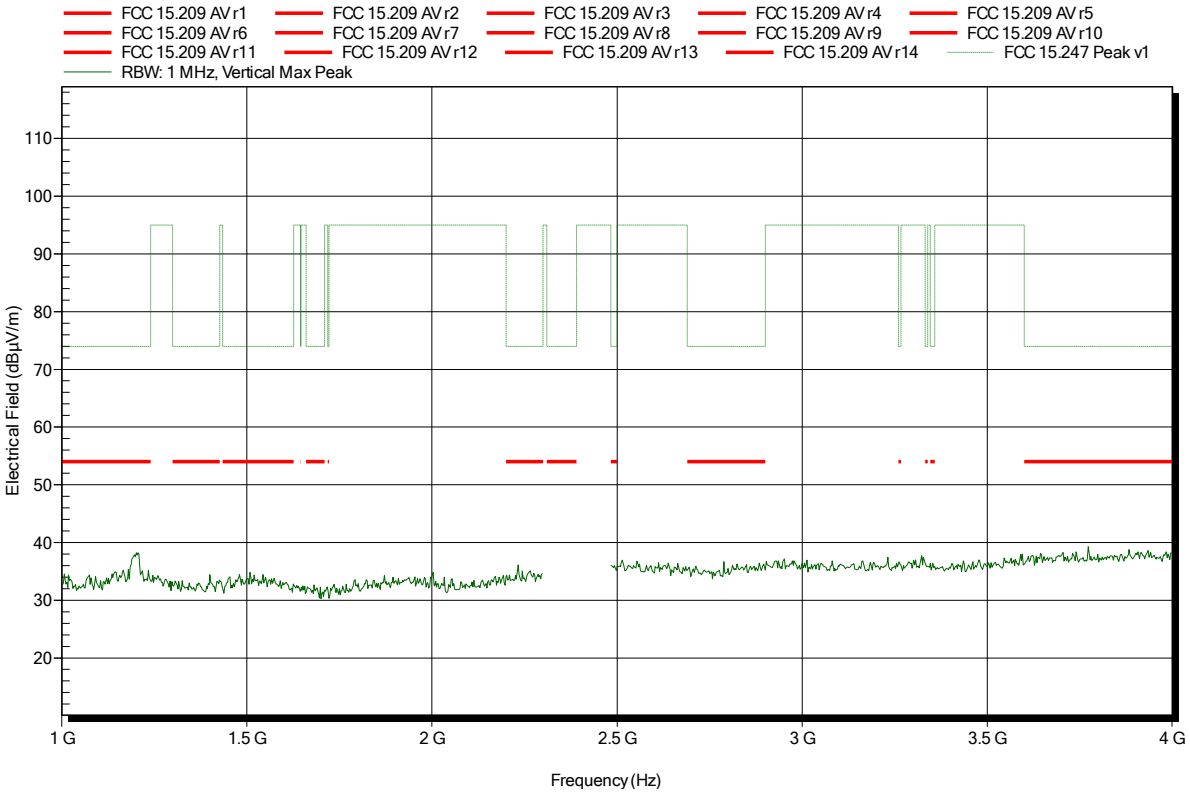


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2412MHz
Test Date:	2015-07-22
Note:	

Index 44

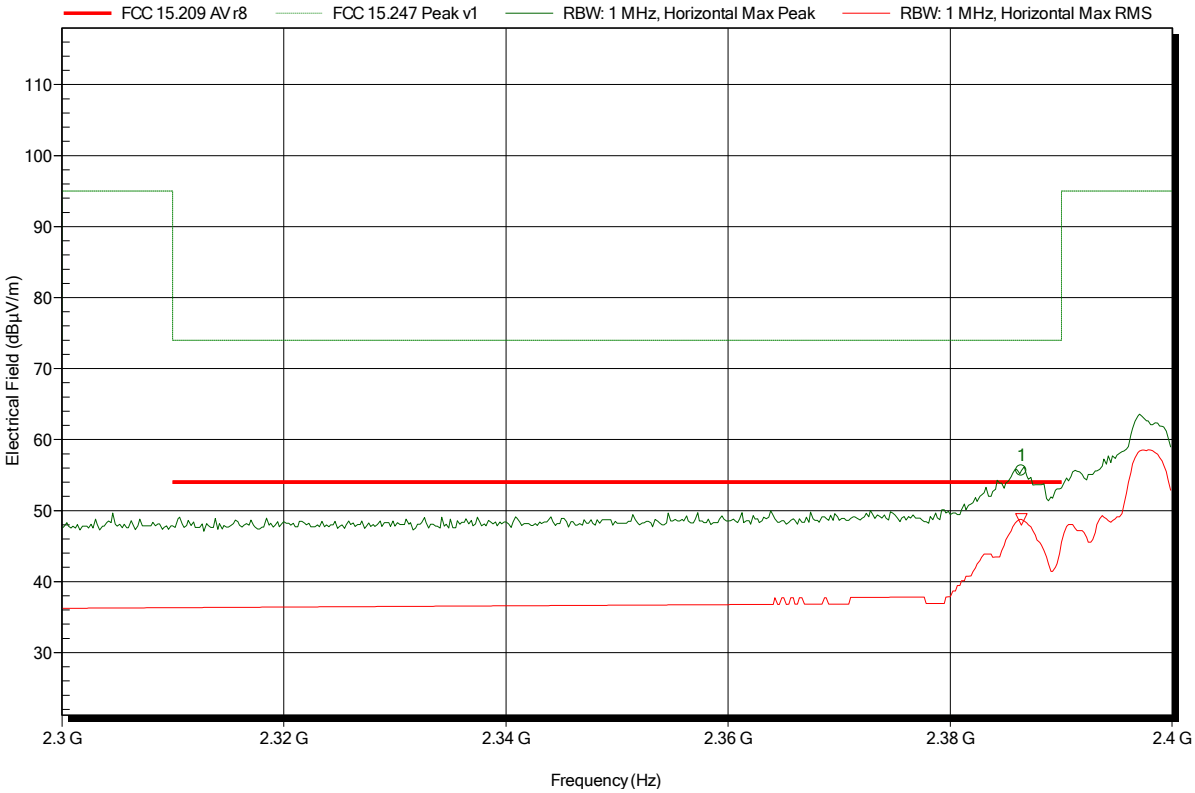


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2412MHz
Test Date:	2015-07-22
Note:	lower bandedge

Index 50



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.386 GHz	55.63 dBµV/m	74 dBµV/m	-18.37 dB	Pass

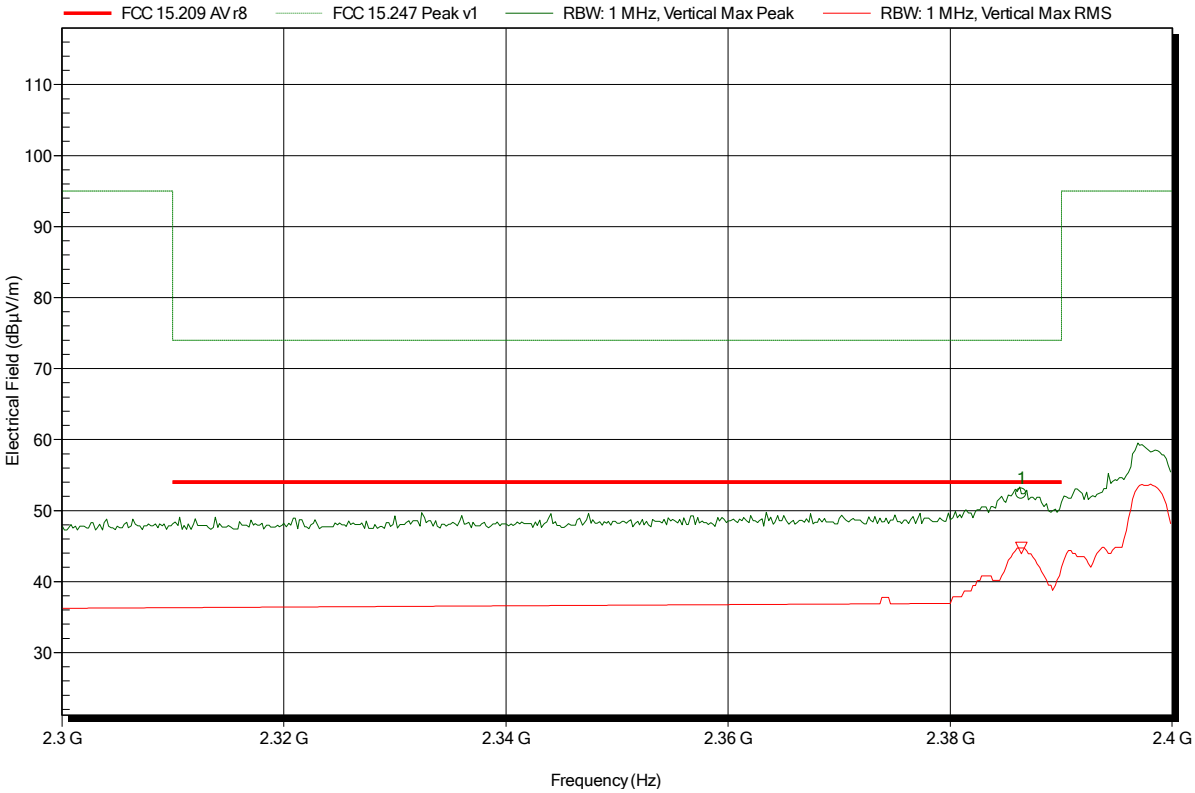
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.386 GHz	48.78 dBµV/m	54 dBµV/m	-5.22 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2412MHz
Test Date:	2015-07-22
Note:	lower bandedge

Index 54



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.386 GHz	52.39 dBµV/m	74 dBµV/m	-21.61 dB	Pass

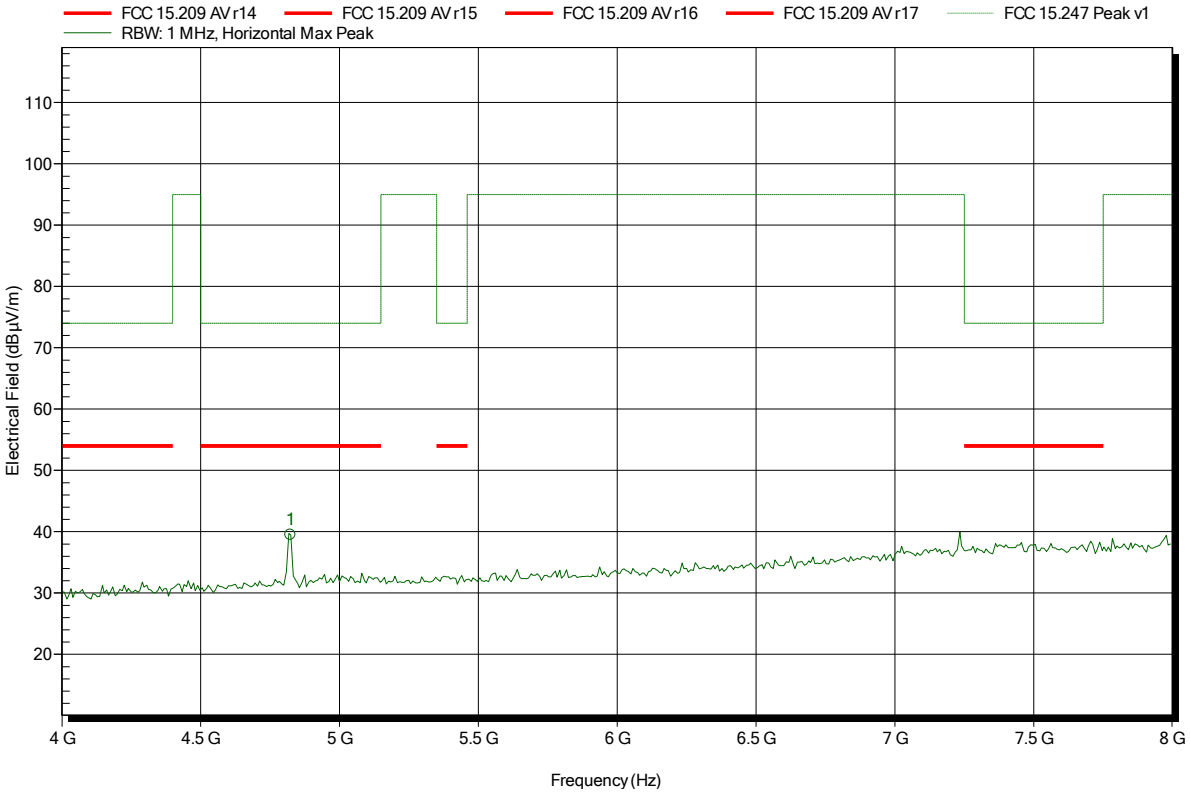
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.386 GHz	44.75 dBµV/m	54 dBµV/m	-9.25 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2412MHz
Test Date:	2015-07-22
Note:	

Index 51



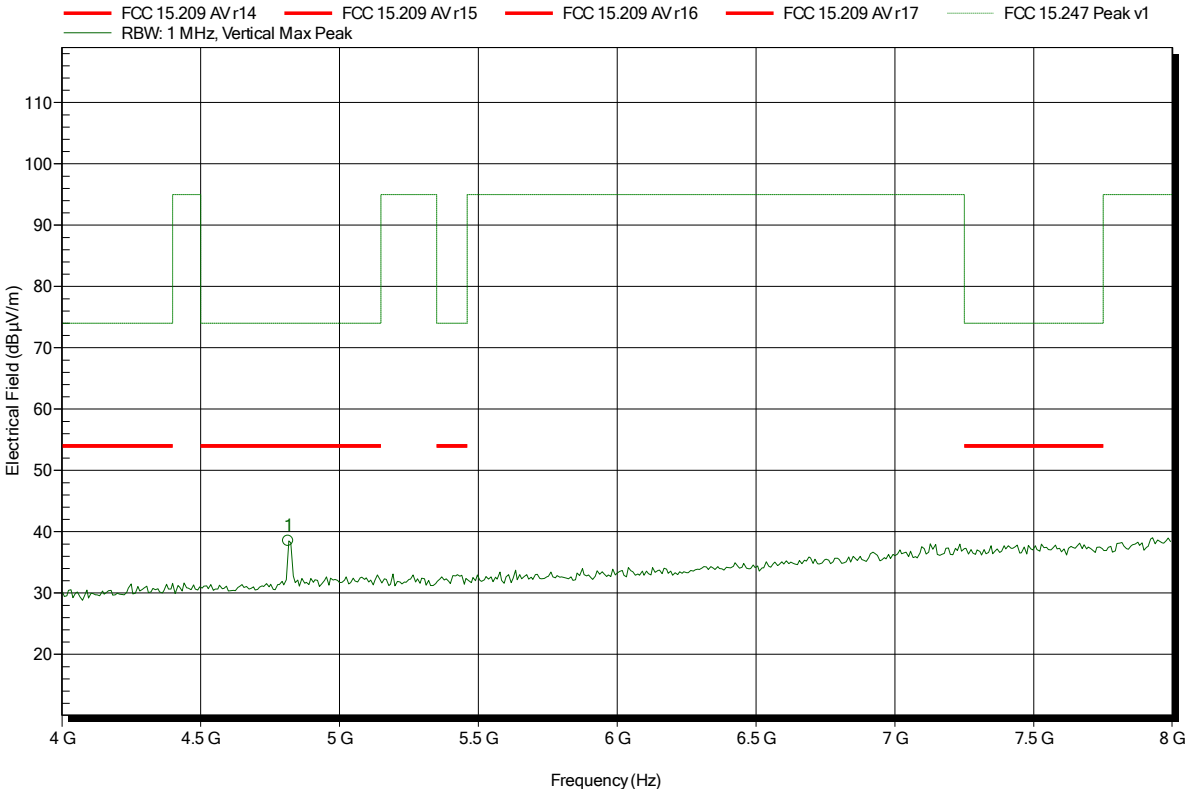
Frequency	Peak	Peak Limit	Peak Difference	Status
4.824 GHz	39.48 dBµV/m	74 dBµV/m	-34.52 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2412MHz
Test Date:	2015-07-22
Note:	

Index 55

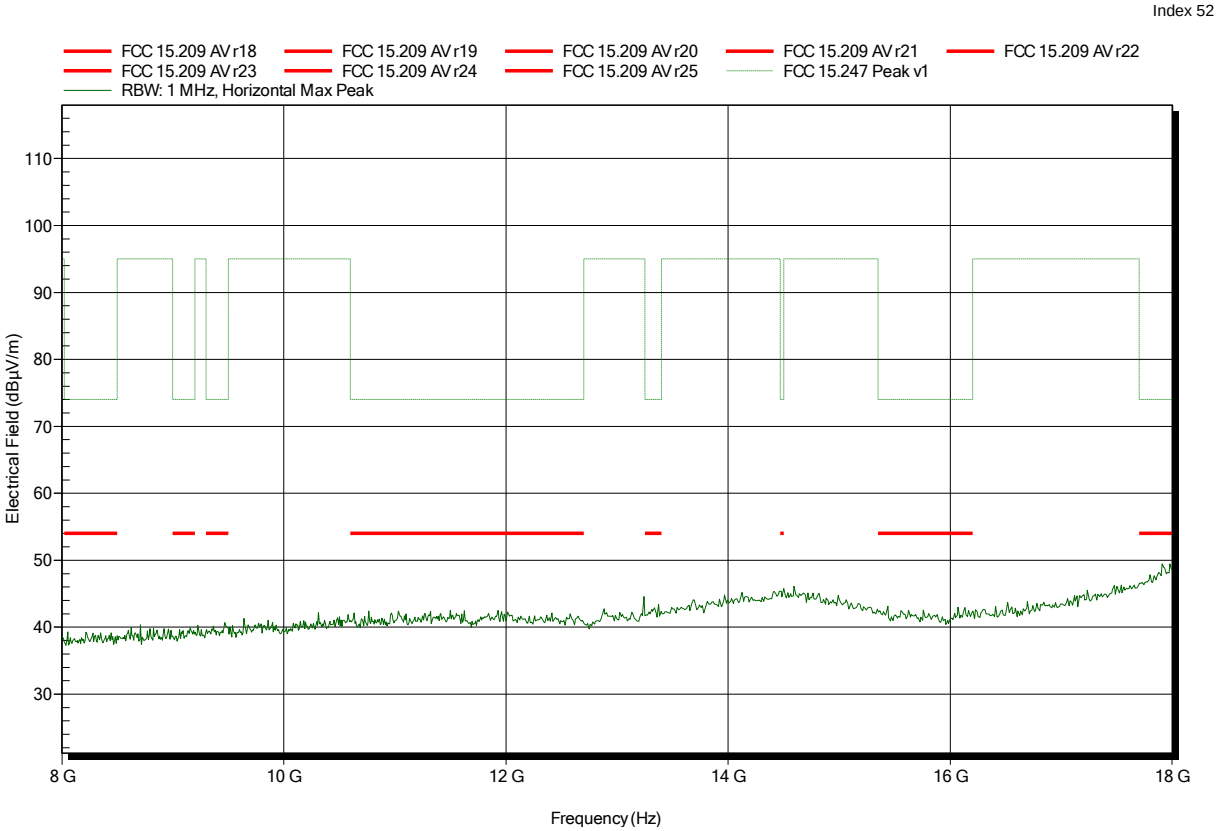


Frequency	Peak	Peak Limit	Peak Difference	Status
4.816 GHz	38.5 dBµV/m	74 dBµV/m	-35.5 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2412MHz
Test Date:	2015-07-22
Note:	

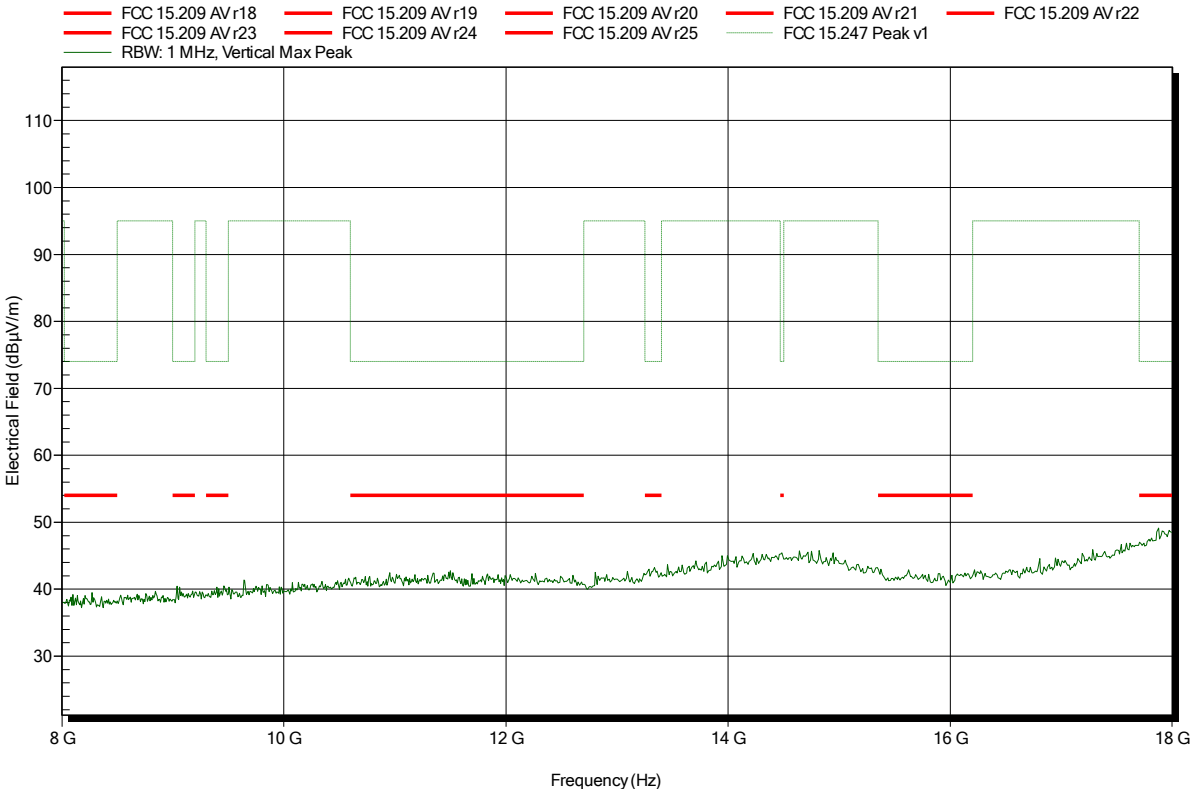


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2412MHz
Test Date:	2015-07-22
Note:	

Index 56

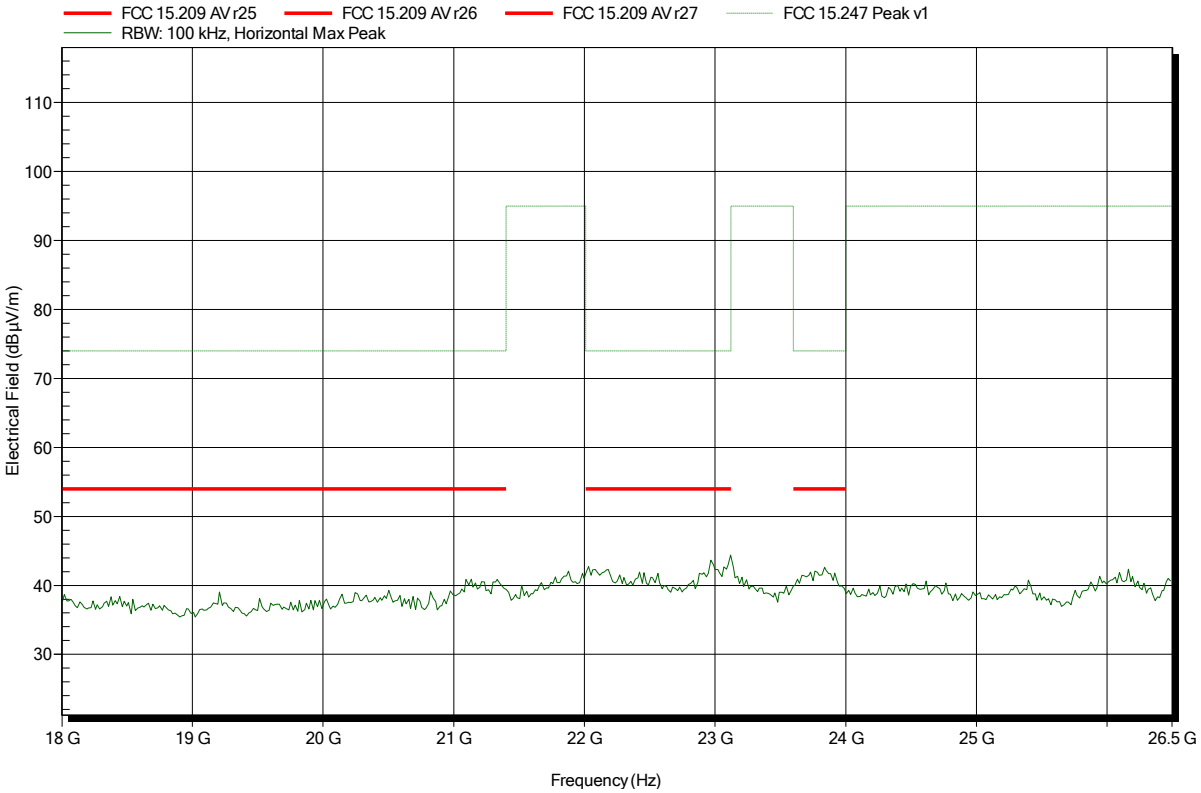


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2412MHz
Test Date:	2015-07-22
Note:	

Index 53

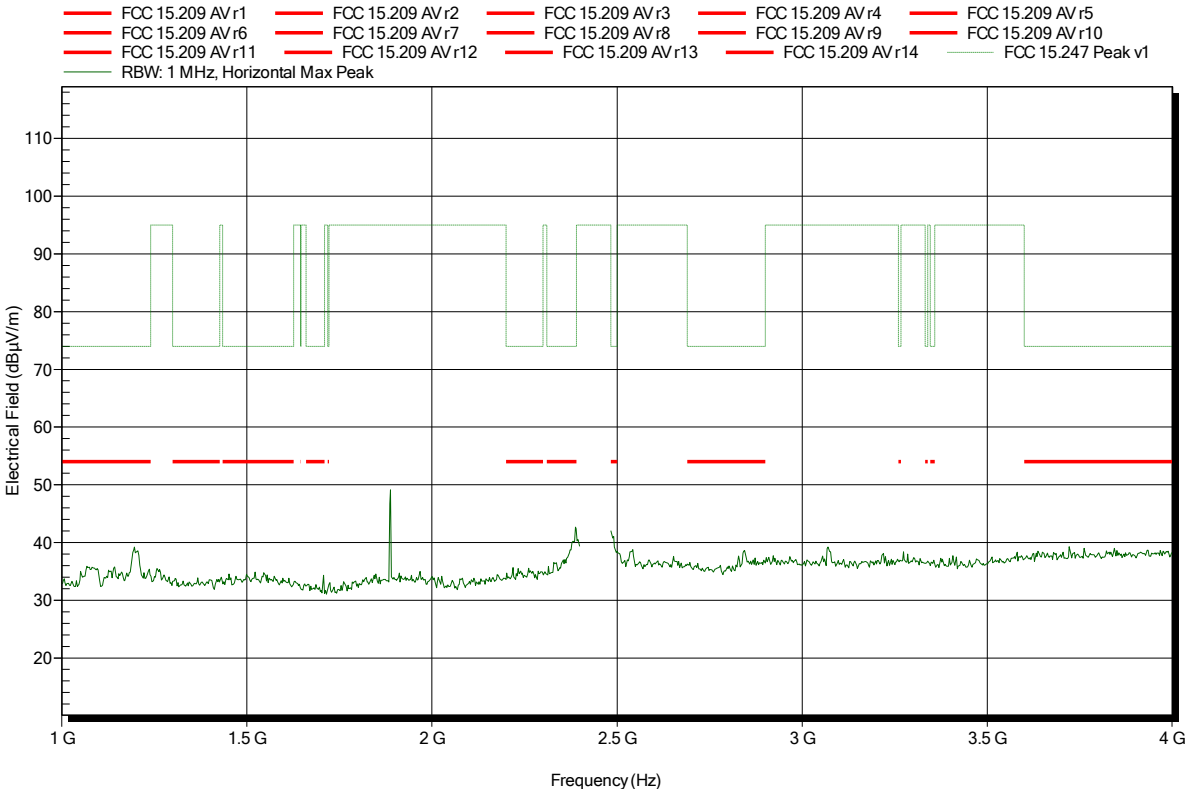


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2437MHz
Test Date:	2015-07-22
Note:	

Index 46

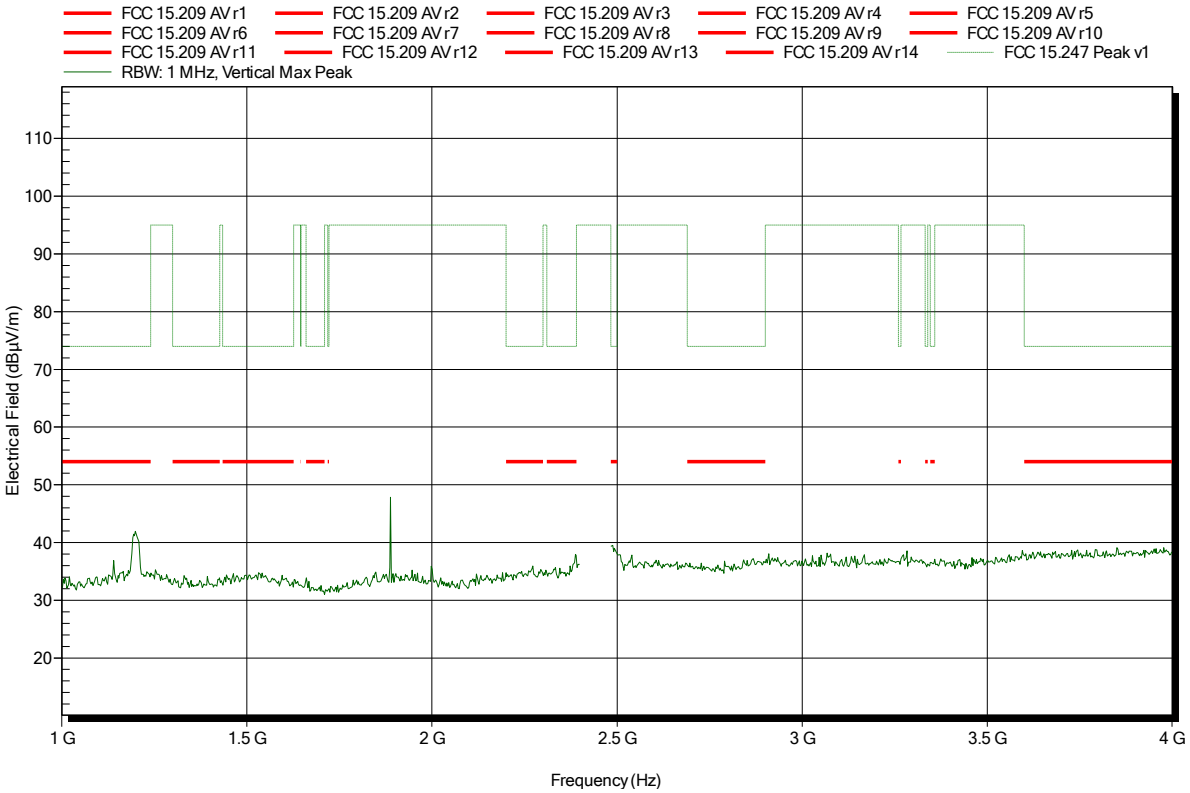


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2437MHz
Test Date:	2015-07-22
Note:	

Index 45

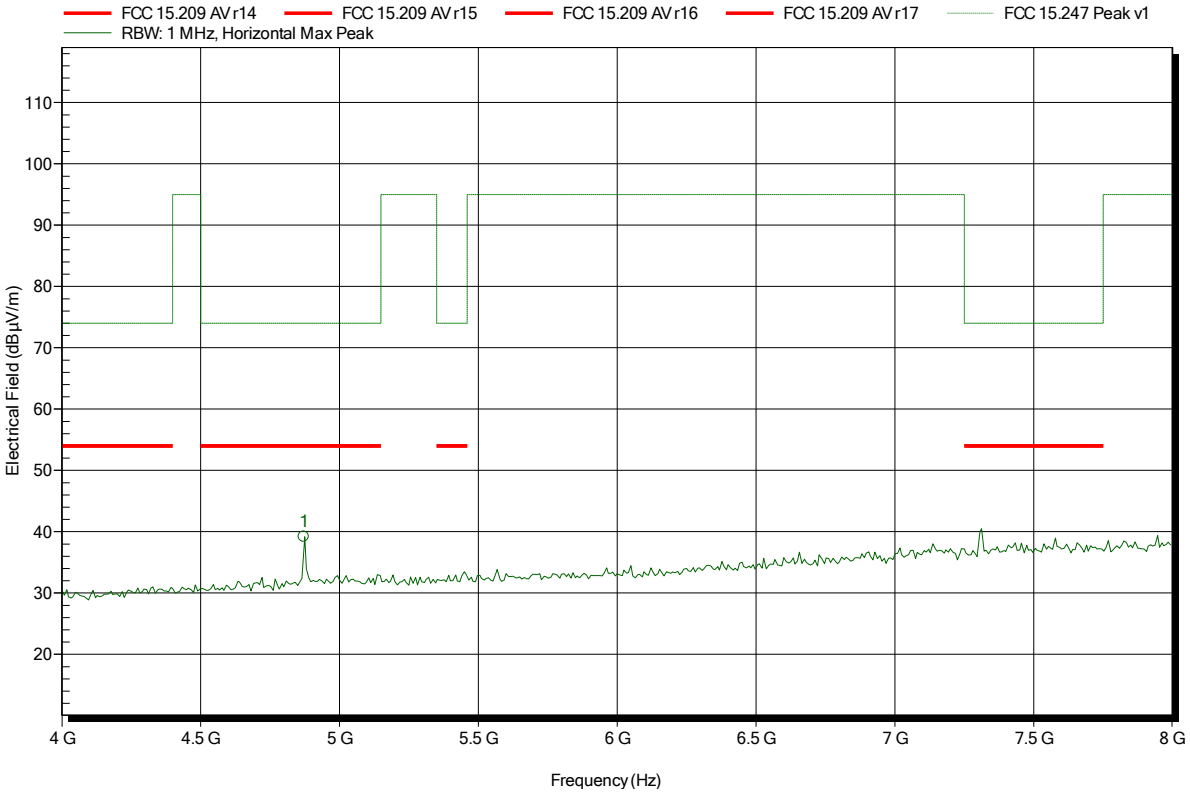


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2437MHz
Test Date:	2015-07-22
Note:	

Index 62



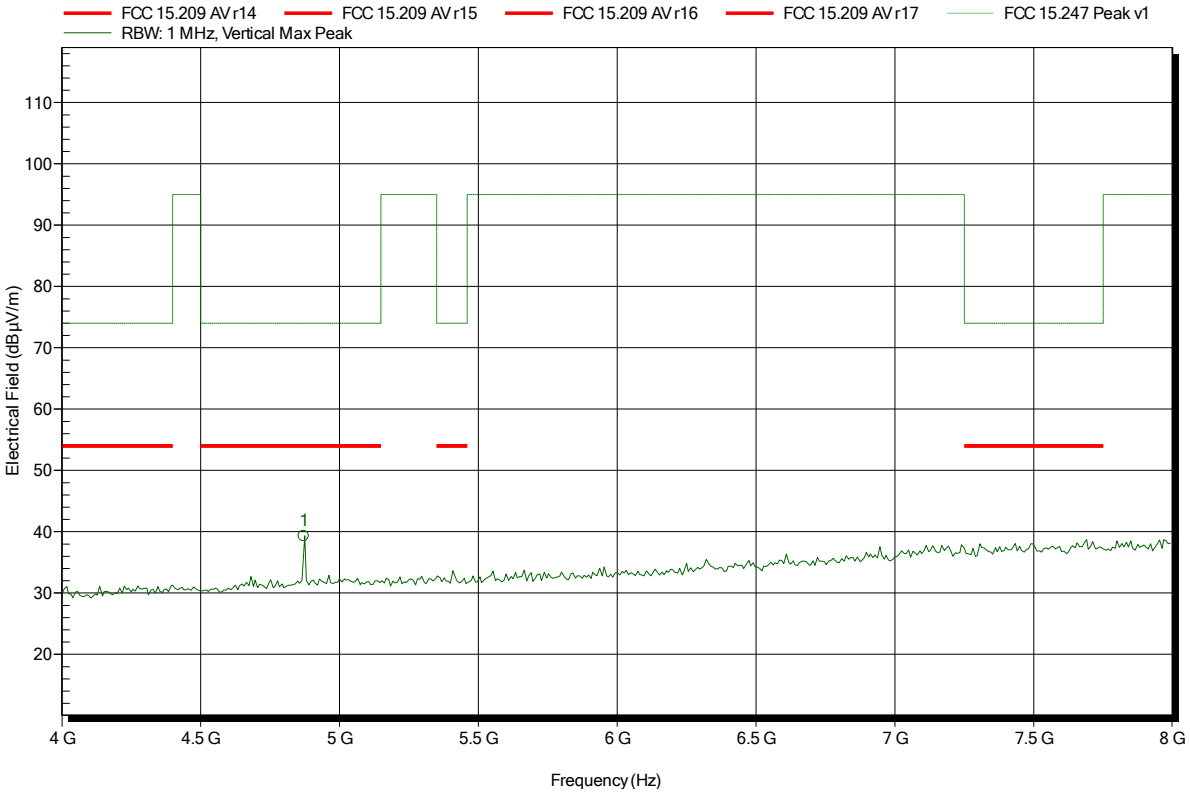
Frequency	Peak	Peak Limit	Peak Difference	Status
4.872 GHz	39.16 dBµV/m	74 dBµV/m	-34.84 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2437MHz
Test Date:	2015-07-22
Note:	

Index 57



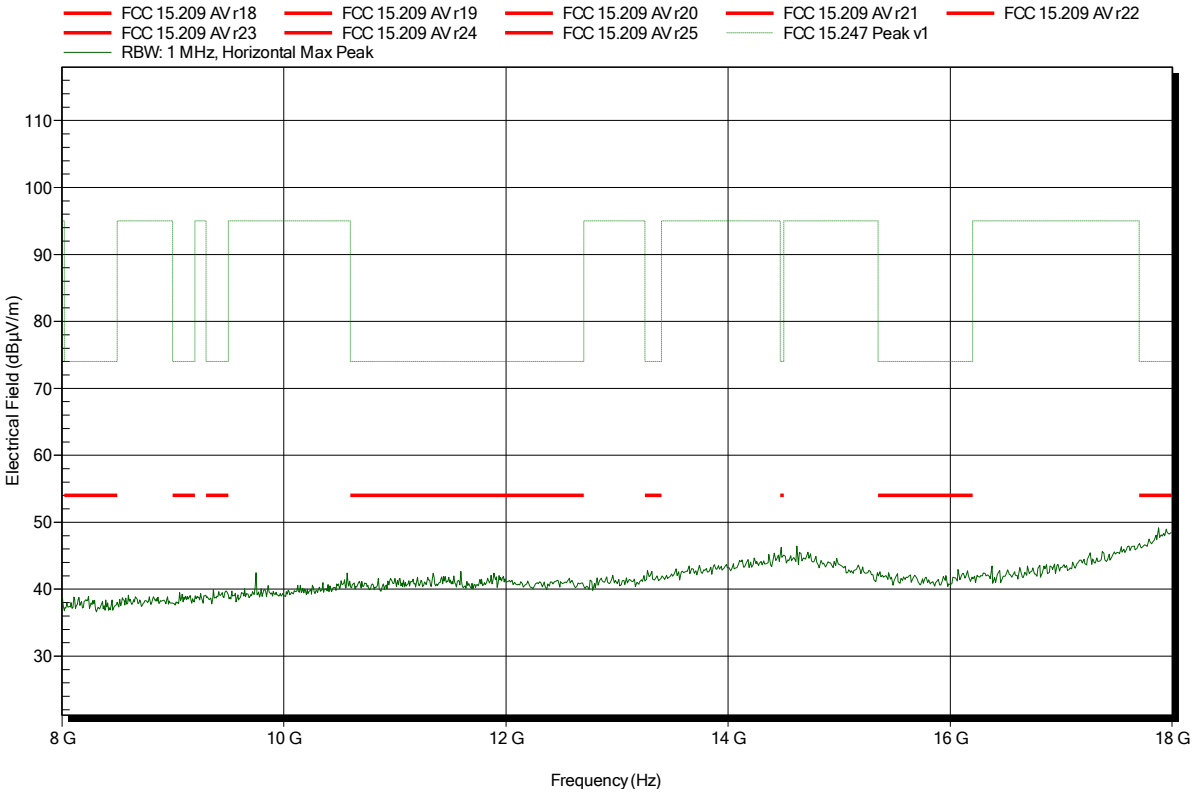
Frequency	Peak	Peak Limit	Peak Difference	Status
4.872 GHz	39.31 dBµV/m	74 dBµV/m	-34.69 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2437MHz
Test Date:	2015-07-22
Note:	

Index 64

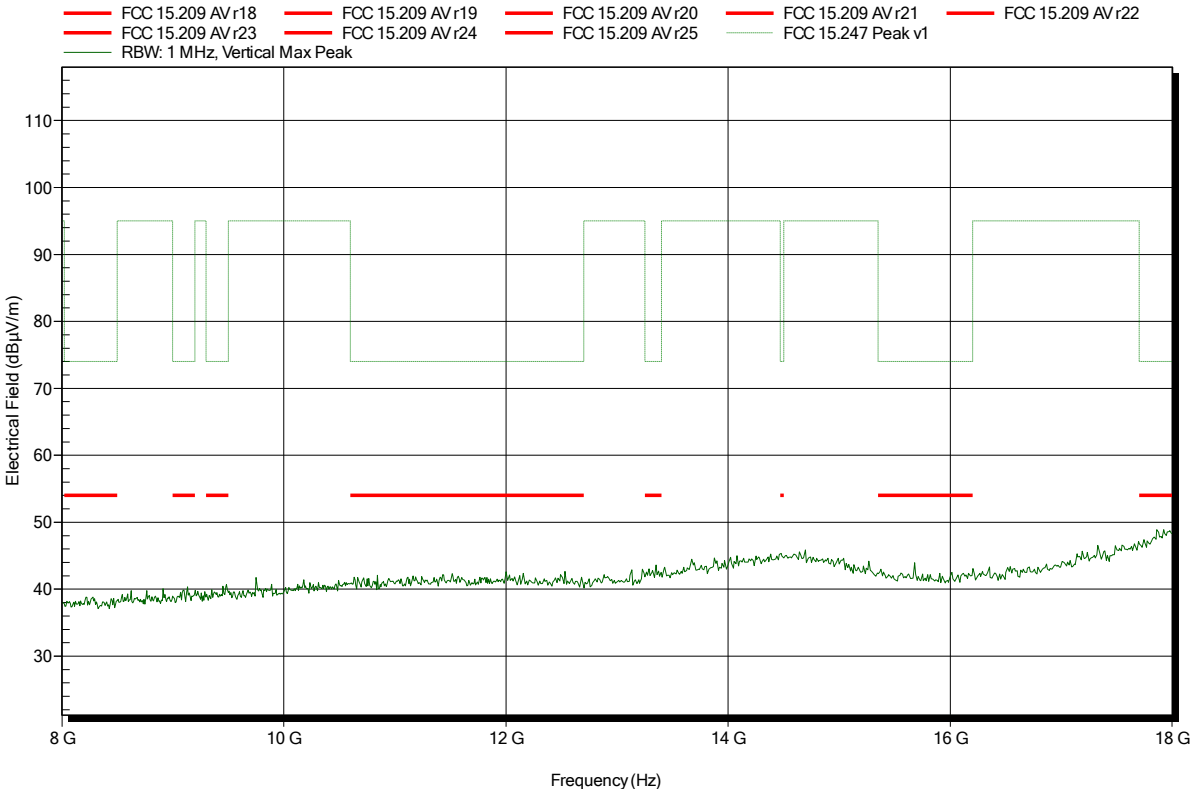


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2437MHz
Test Date:	2015-07-22
Note:	

Index 58

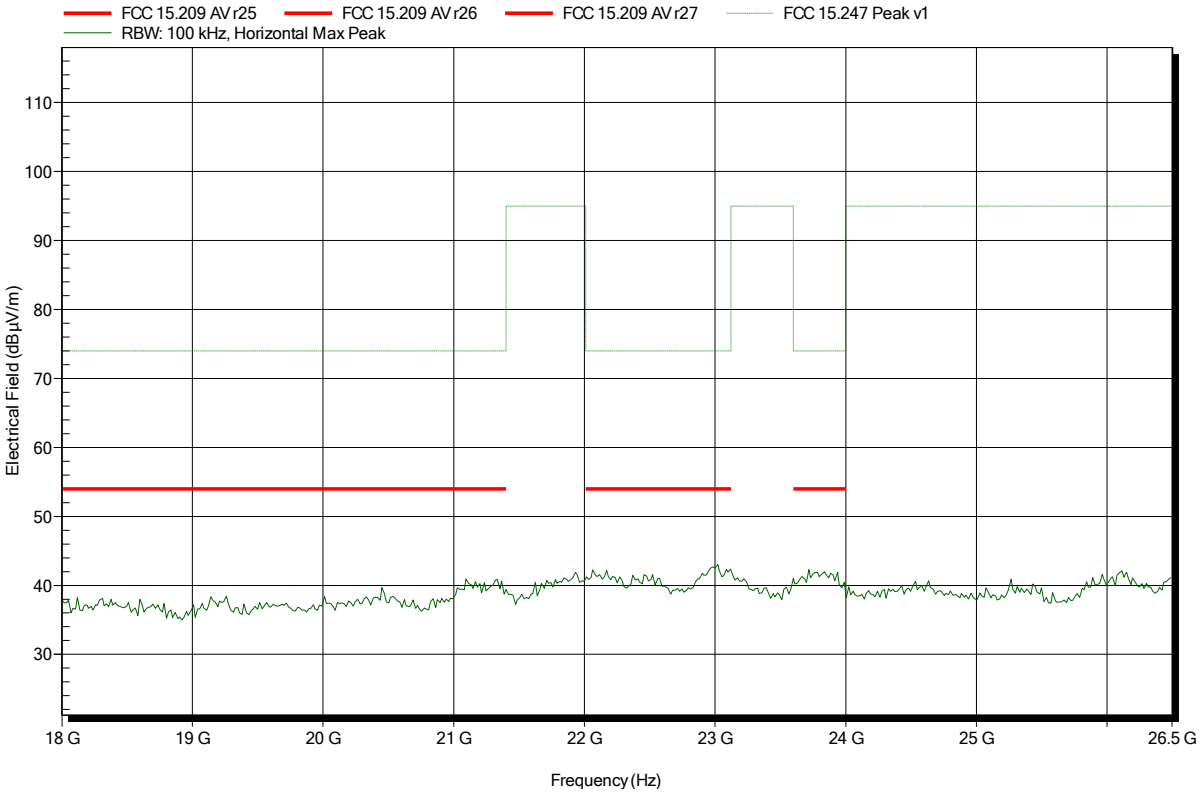


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2437MHz
Test Date:	2015-07-22
Note:	

Index 63

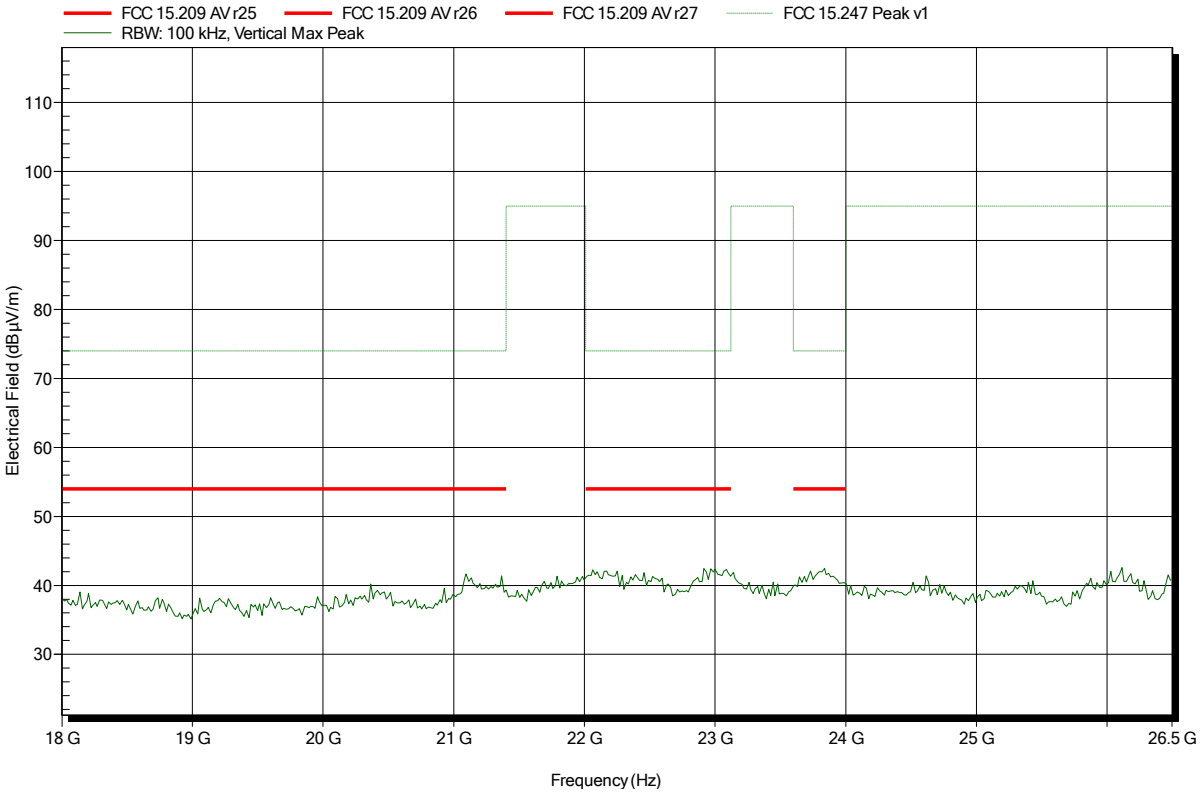


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2437MHz
Test Date:	2015-07-22
Note:	

Index 59

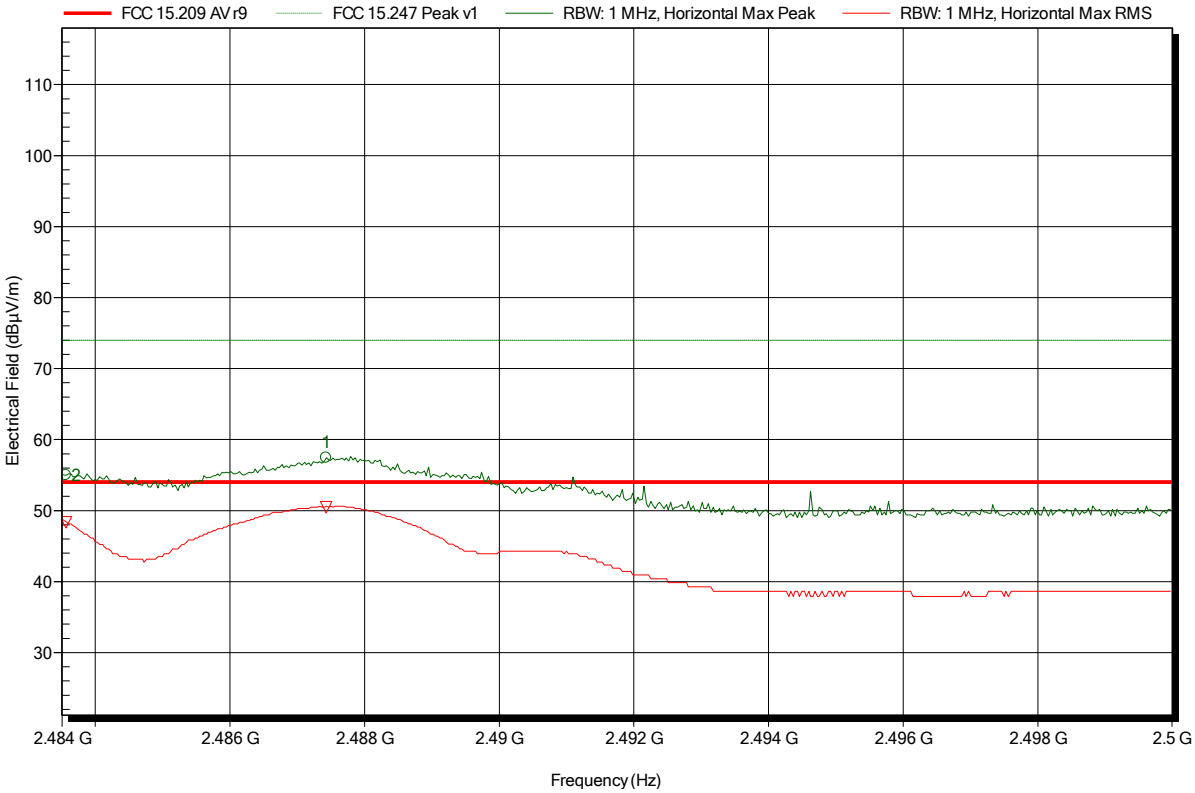


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2462MHz
Test Date:	2015-07-22
Note:	upper bandedge

Index 65



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4836 GHz	54.99 dBµV/m	74 dBµV/m	-19.01 dB	Pass
2.4874 GHz	57.45 dBµV/m	74 dBµV/m	-16.55 dB	Pass

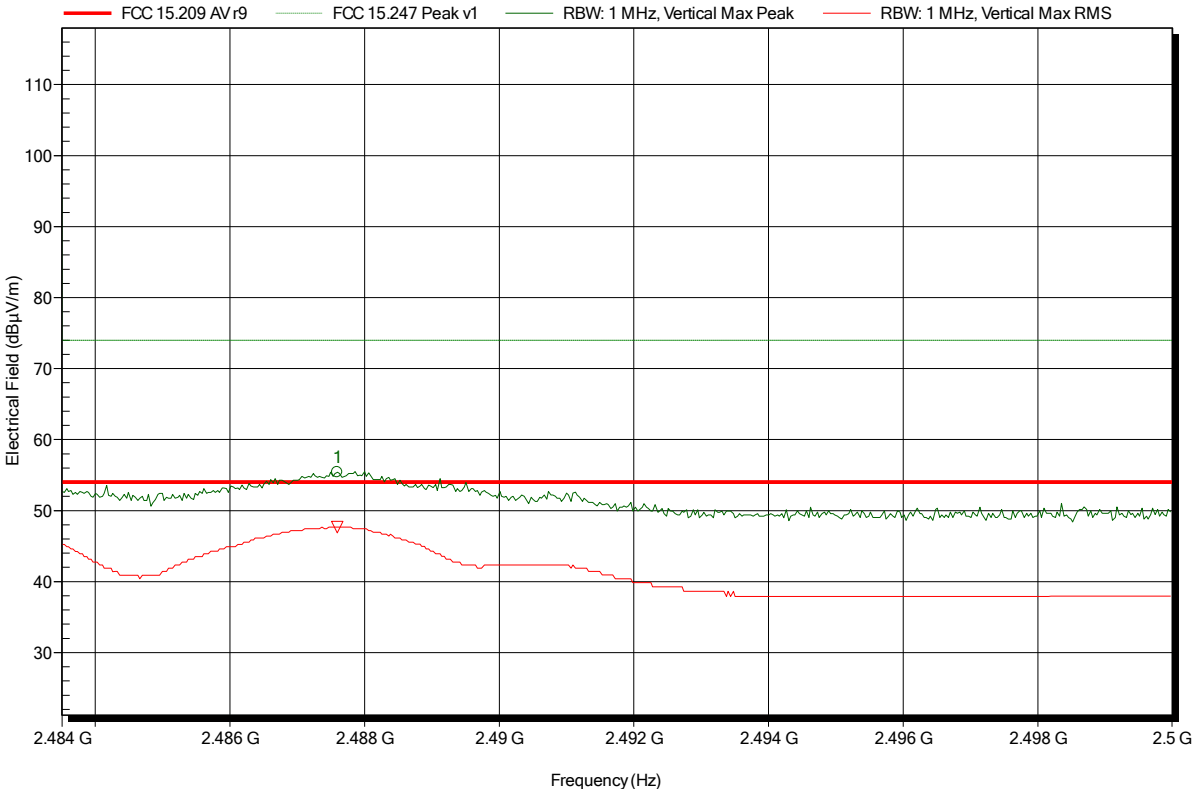
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4836 GHz	48.34 dBµV/m	54 dBµV/m	-5.66 dB	Pass
2.4874 GHz	50.46 dBµV/m	54 dBµV/m	-3.54 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2462MHz
Test Date:	2015-07-22
Note:	upper bandedge

Index 69



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4876 GHz	55.39 dBµV/m	74 dBµV/m	-18.61 dB	Pass

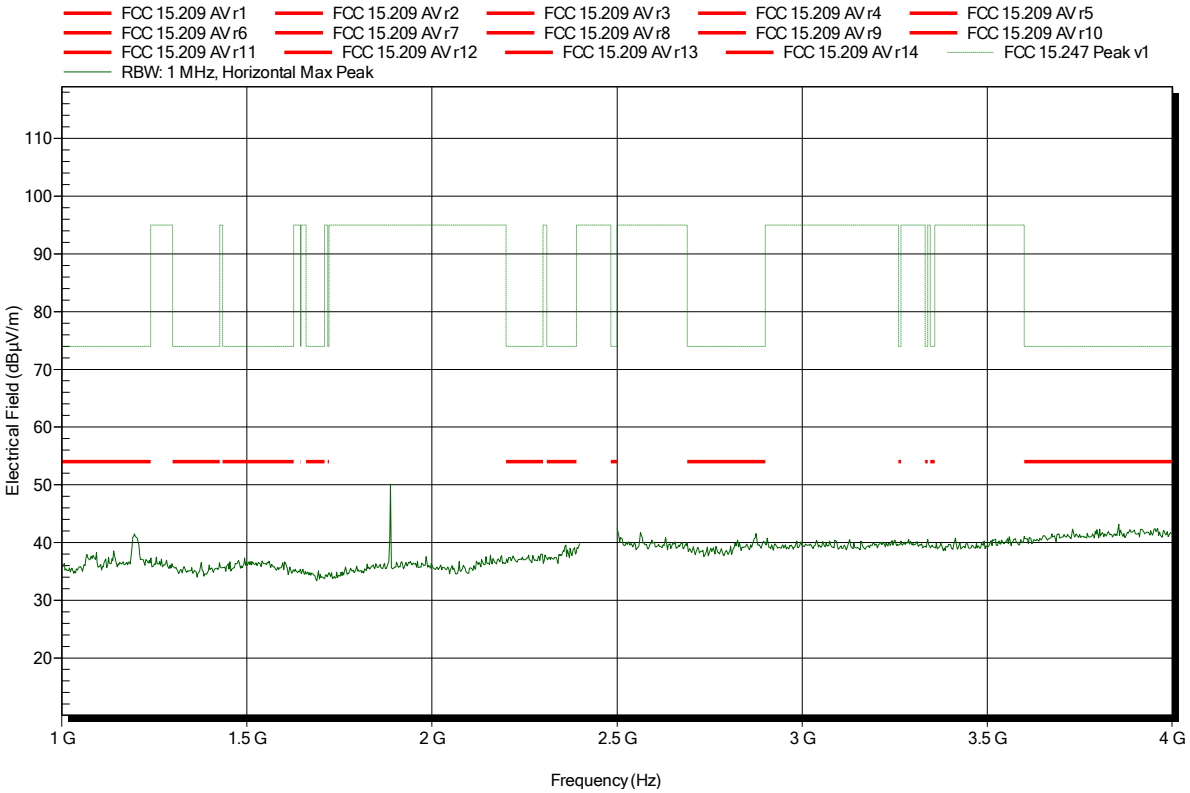
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4876 GHz	47.67 dBµV/m	54 dBµV/m	-6.33 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2462MHz
Test Date:	2015-07-22
Note:	

Index 47

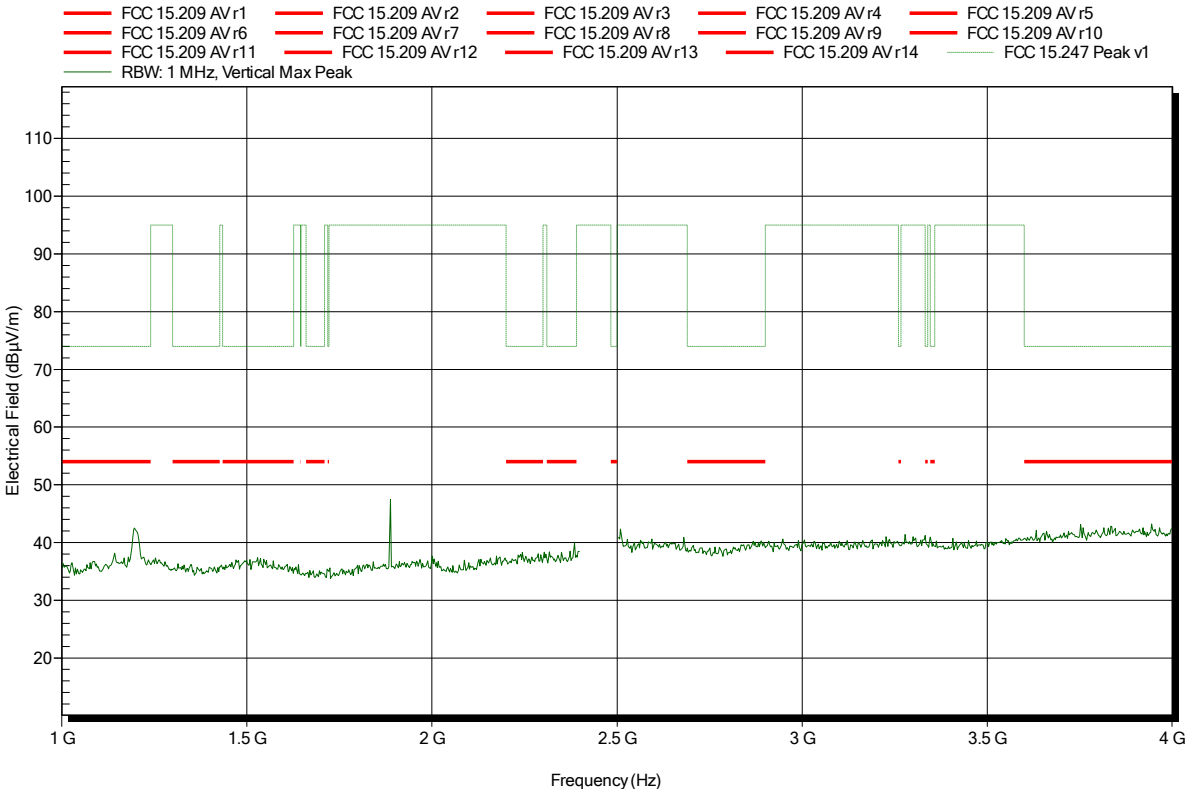


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2462MHz
Test Date:	2015-07-22
Note:	

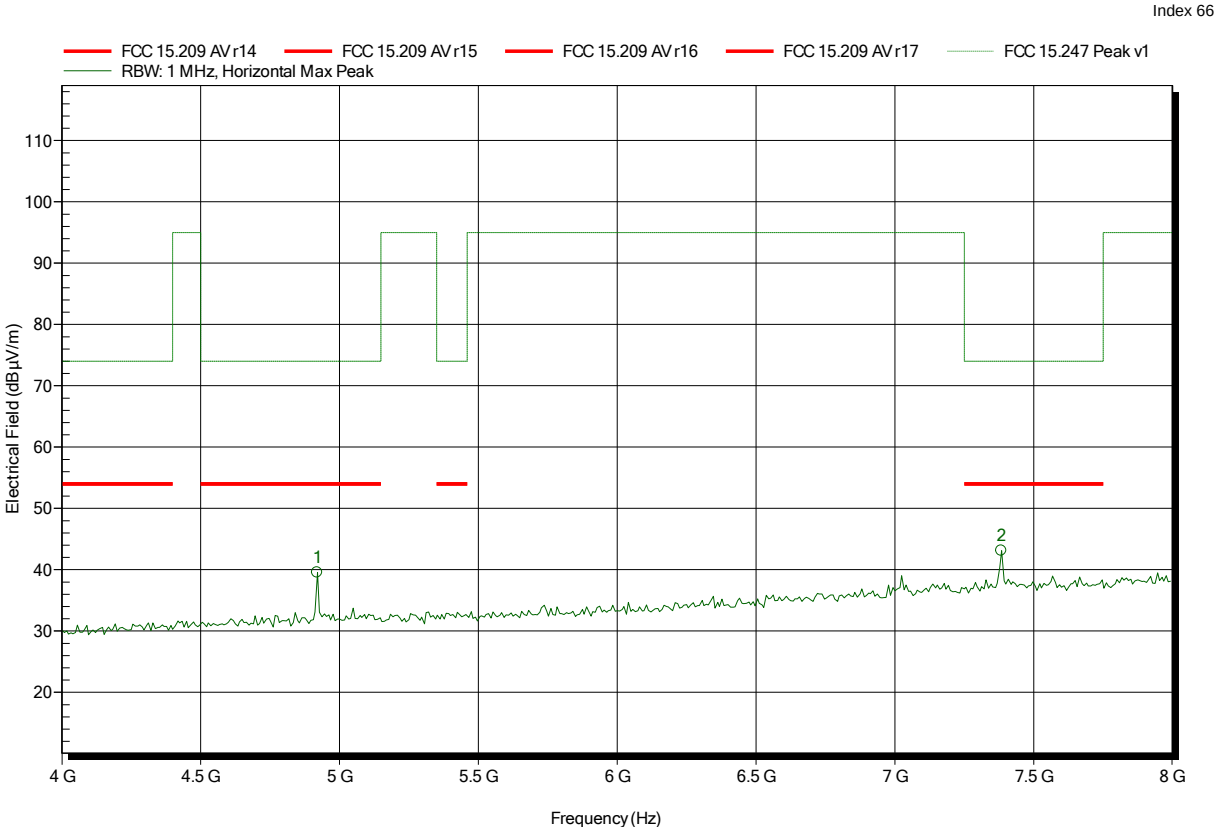
Index 48



Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2462MHz
Test Date:	2015-07-22
Note:	



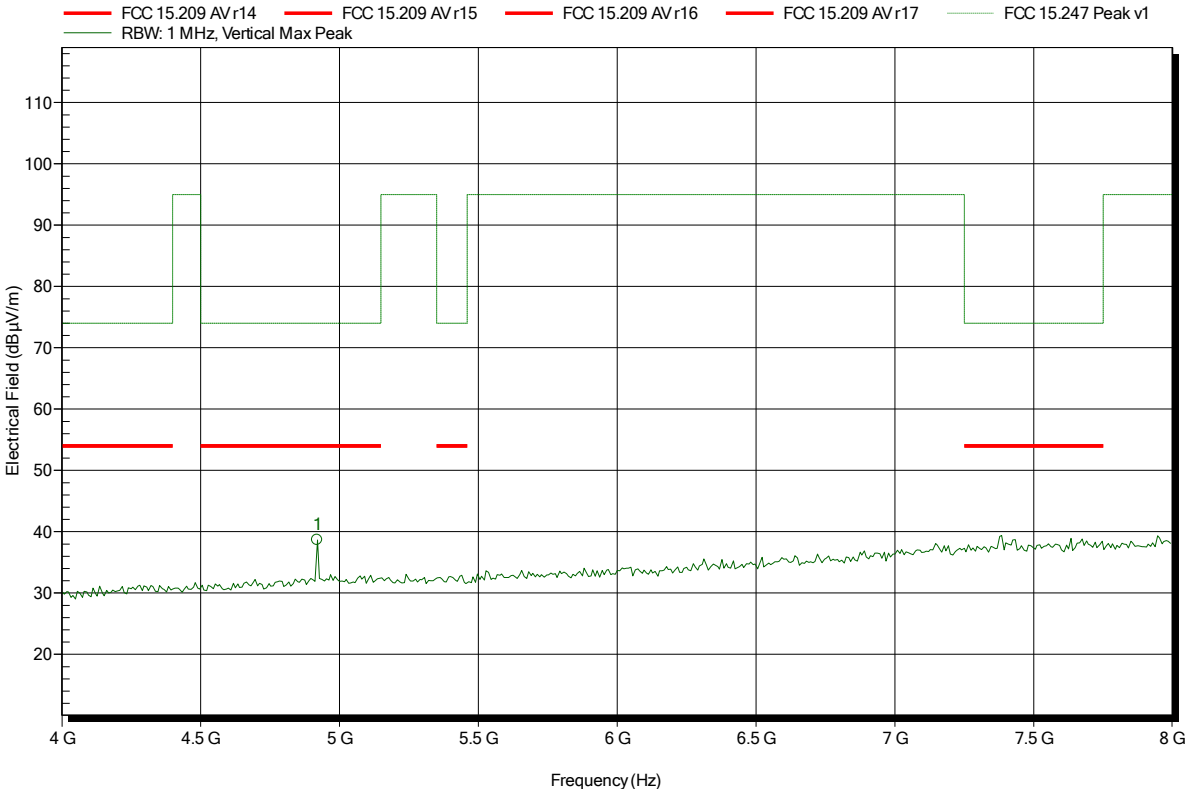
Frequency	Peak	Peak Limit	Peak Difference	Status
4.92 GHz	39.55 dBµV/m	74 dBµV/m	-34.45 dB	Pass
7.384 GHz	43.12 dBµV/m	74 dBµV/m	-30.88 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2462MHz
Test Date:	2015-07-22
Note:	

Index 73



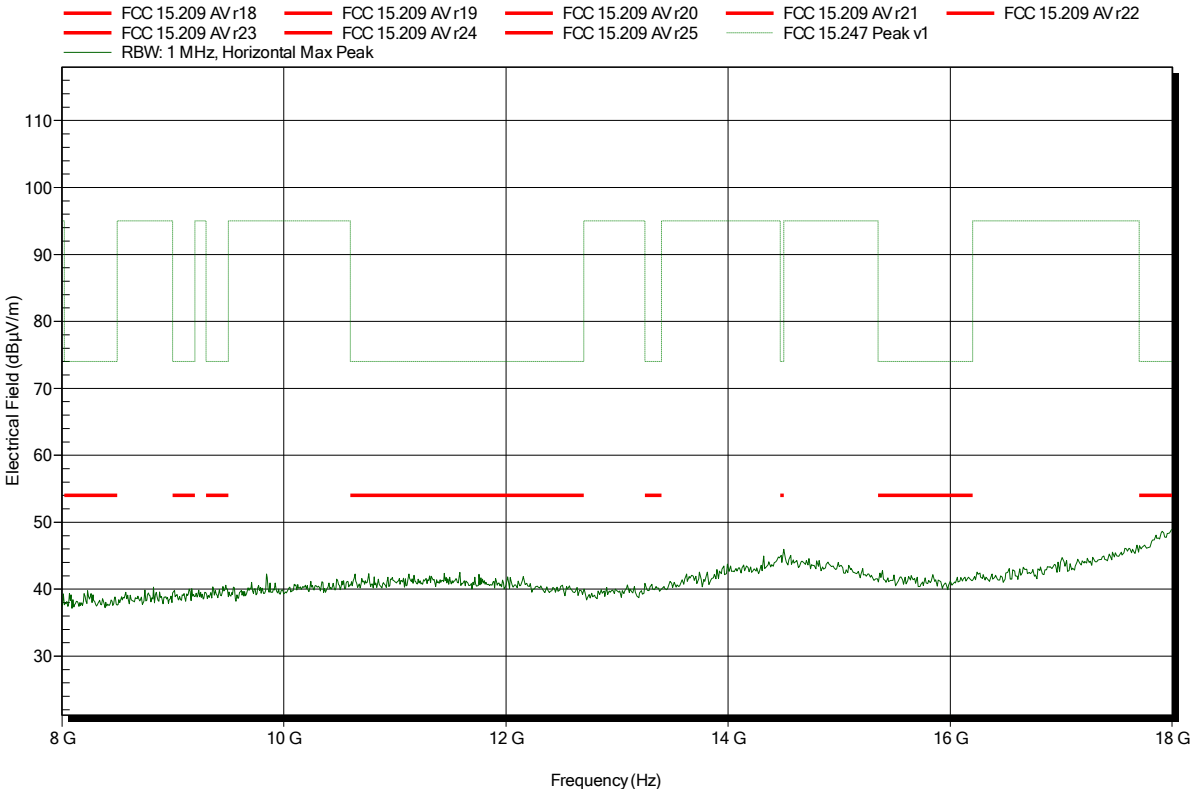
Frequency	Peak	Peak Limit	Peak Difference	Status
4.92 GHz	38.64 dBµV/m	74 dBµV/m	-35.36 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2462MHz
Test Date:	2015-07-22
Note:	

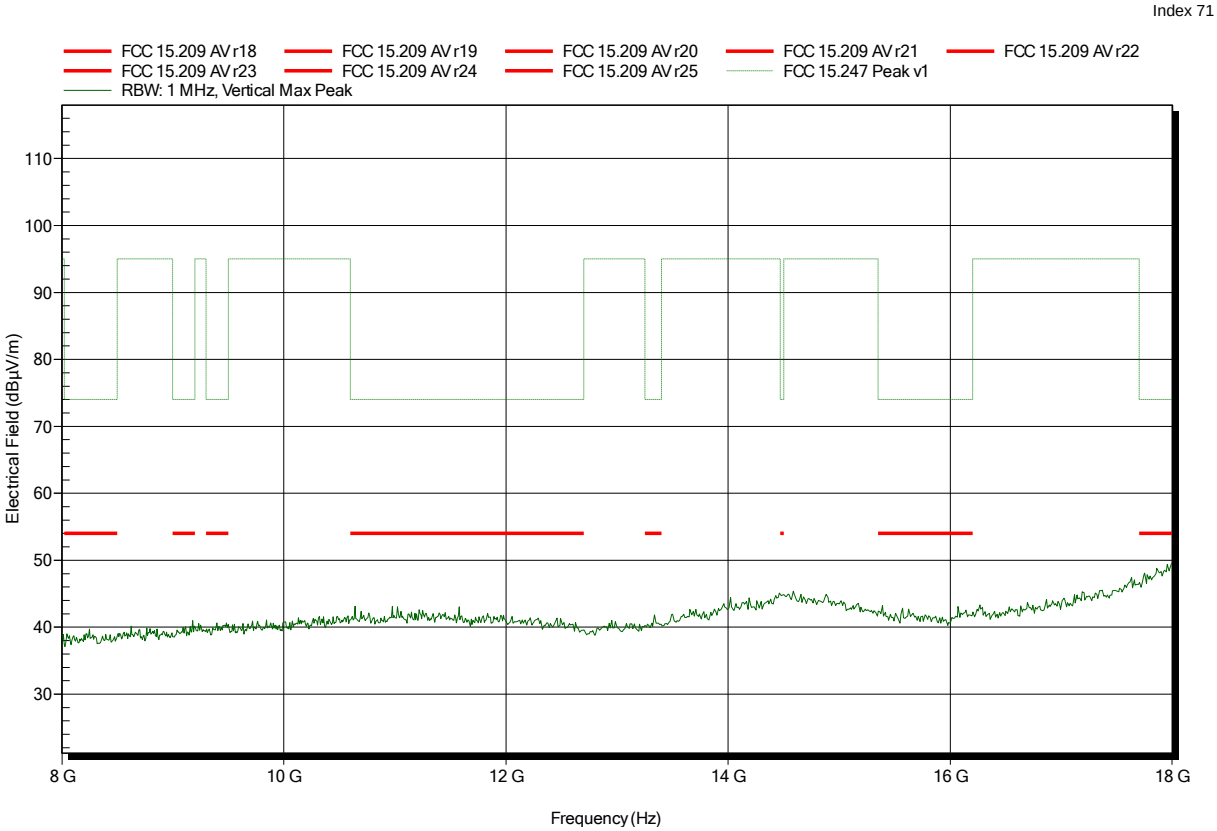
Index 67



Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2462MHz
Test Date:	2015-07-22
Note:	

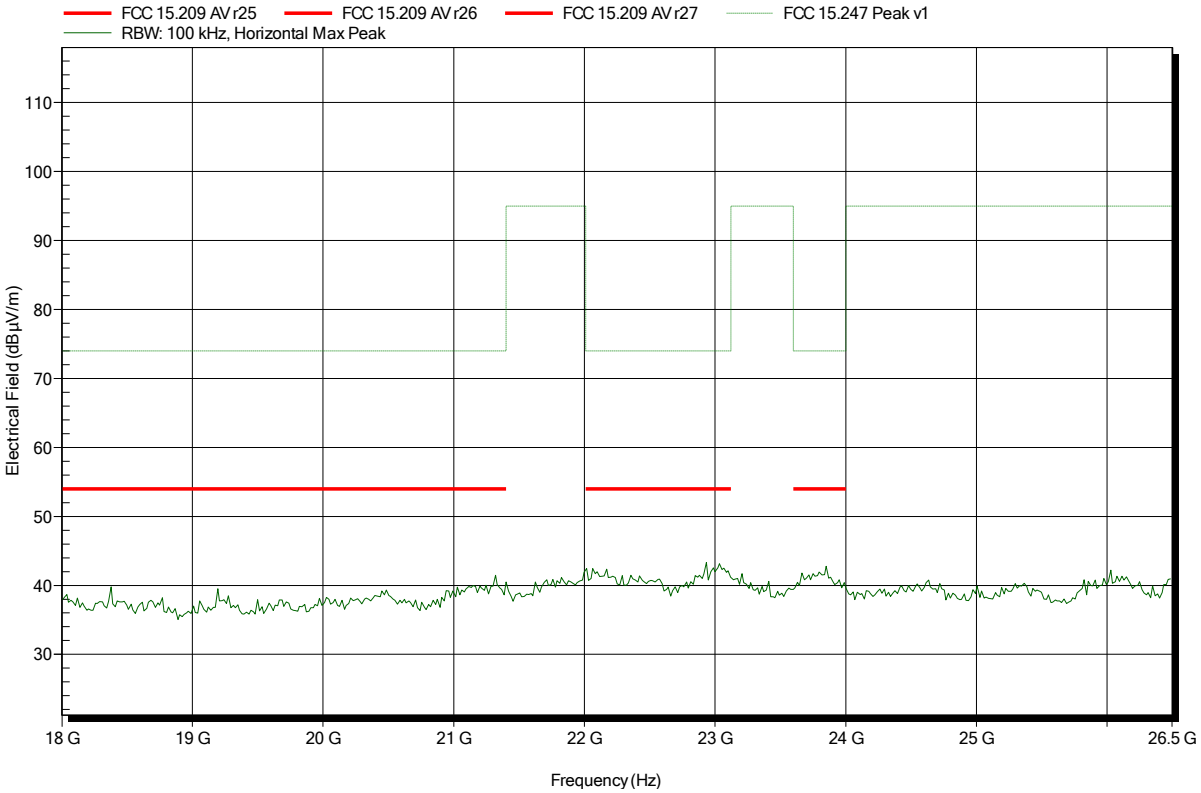


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2462MHz
Test Date:	2015-07-22
Note:	

Index 68

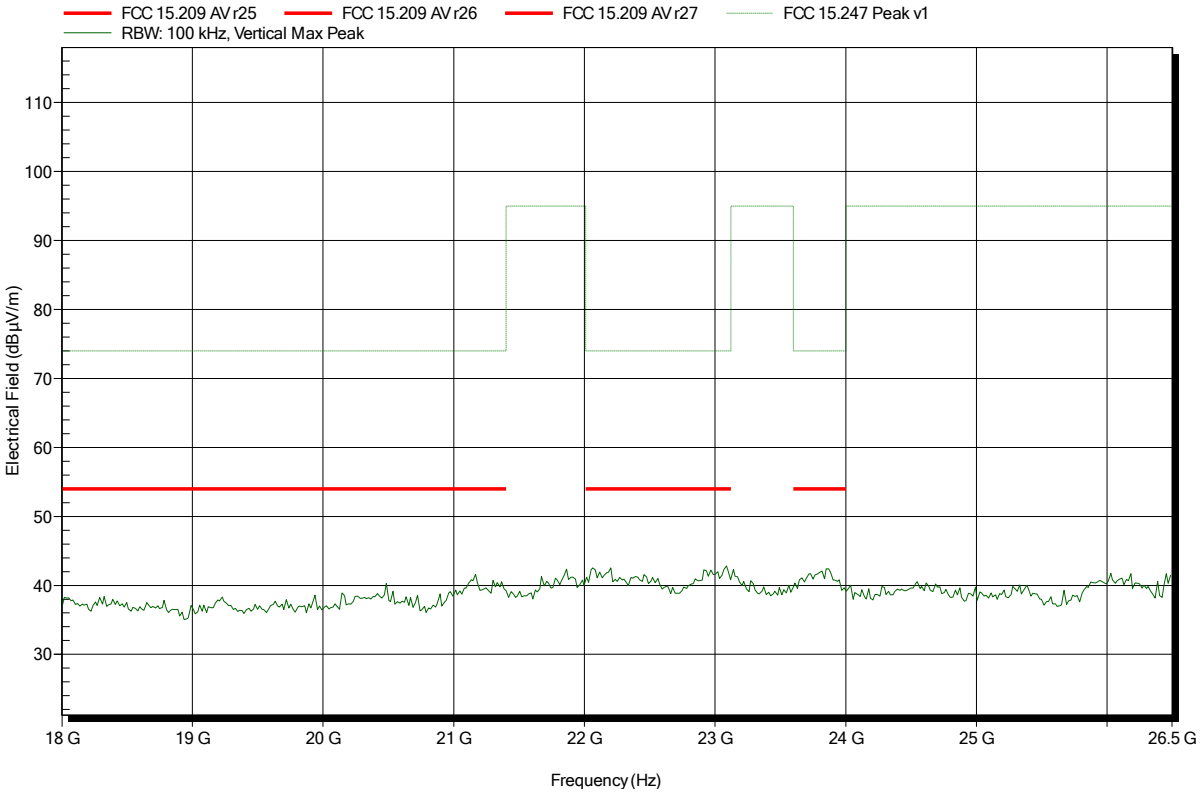


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11b; DSSS; 1Mbps; 2462MHz
Test Date:	2015-07-22
Note:	

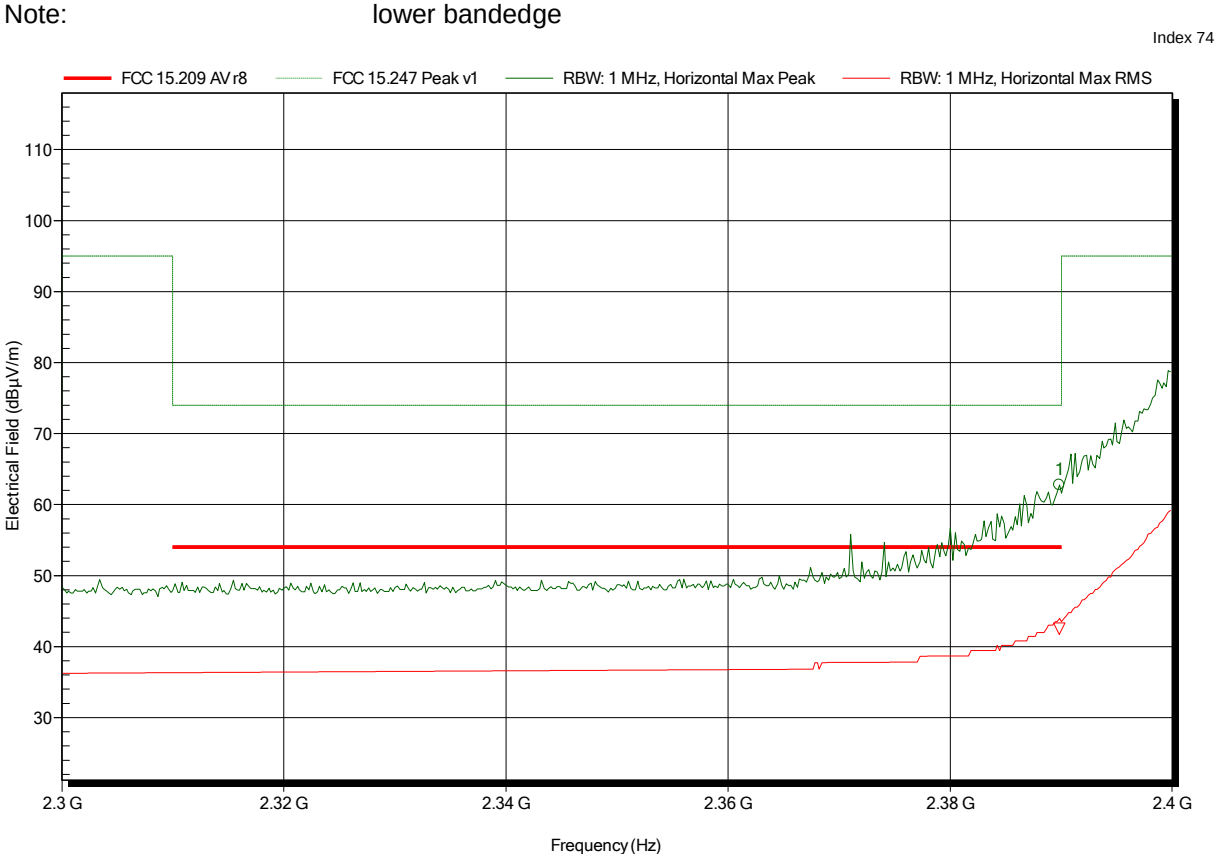
Index 72



Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT20; MCS13; 2412MHz; ant.1+2
Test Date:	2015-07-22
Note:	lower bandedge



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.39 GHz	62.79 dBµV/m	74 dBµV/m	-11.21 dB	Pass

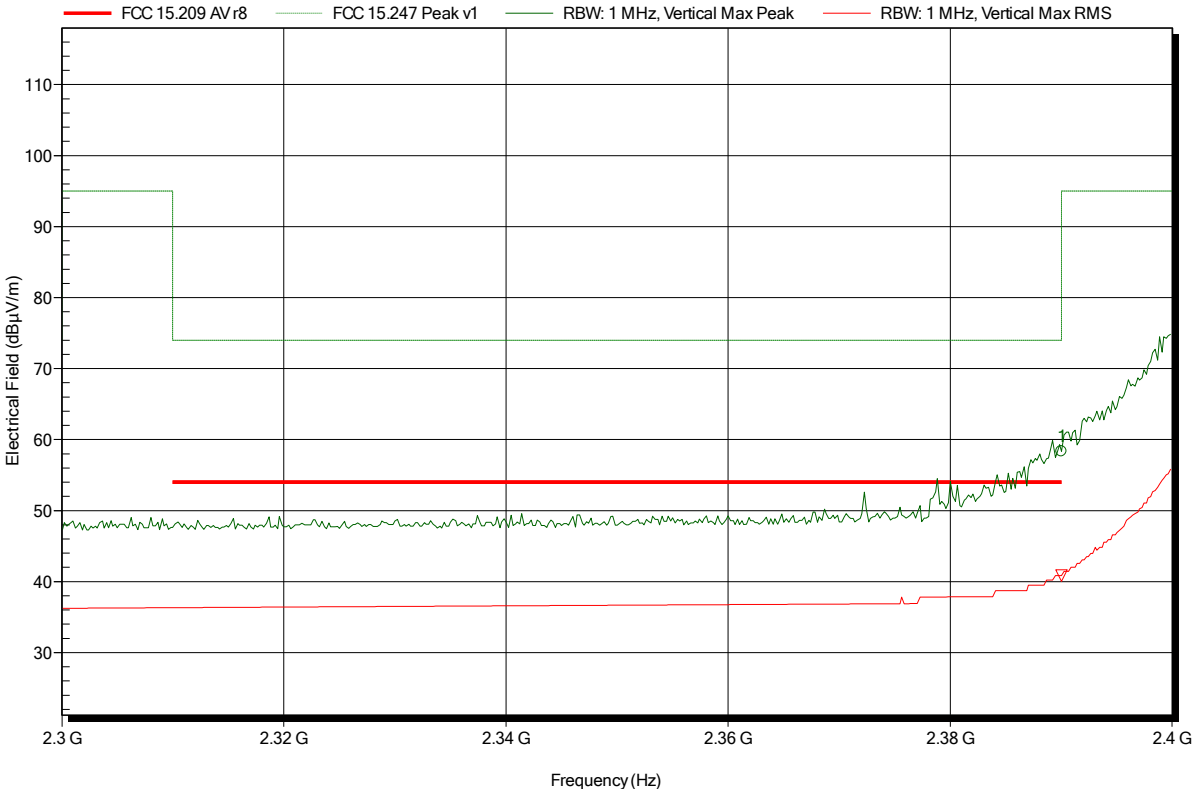
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.39 GHz	42.54 dBµV/m	54 dBµV/m	-11.46 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT20; MCS13; 2412MHz; ant.1+2
Test Date:	2015-07-22
Note:	lower bandedge

Index 76



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.39 GHz	58.35 dBµV/m	74 dBµV/m	-15.65 dB	Pass

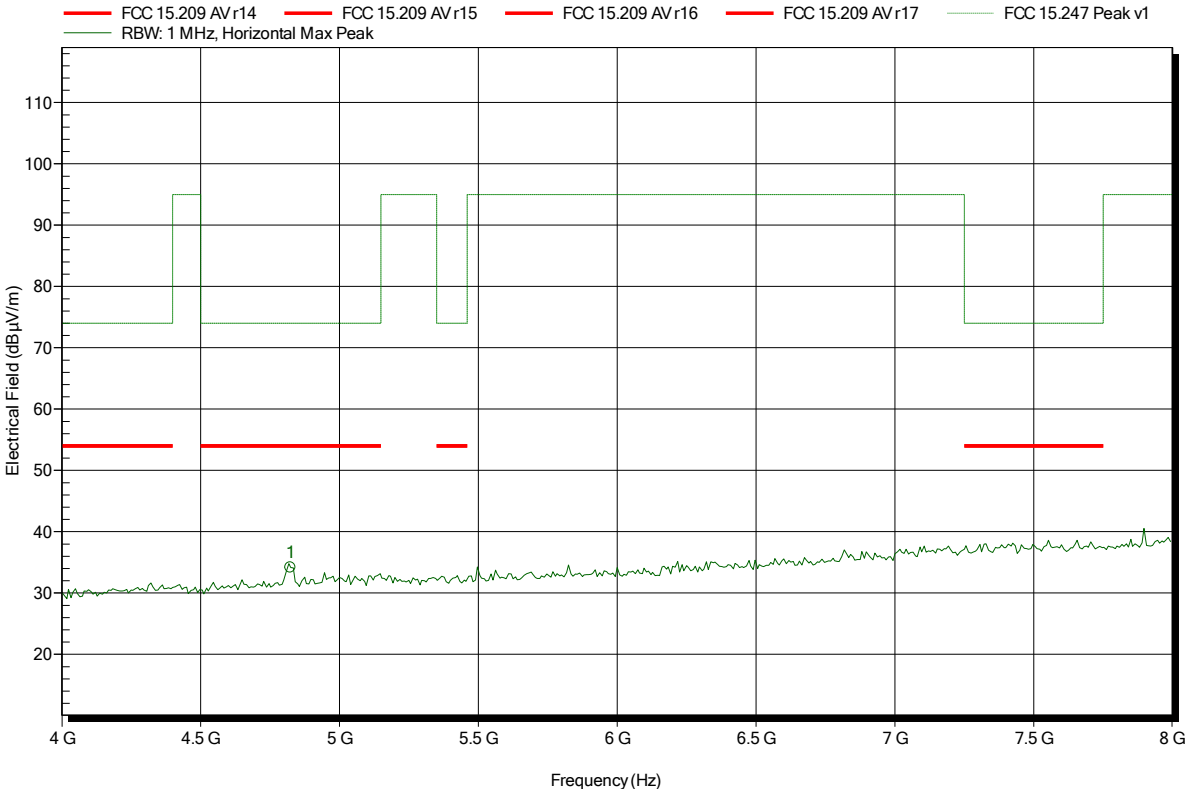
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.39 GHz	40.85 dBµV/m	54 dBµV/m	-13.15 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT20; MCS13; 2412MHz; ant.1+2
Test Date:	2015-07-22
Note:	

Index 75



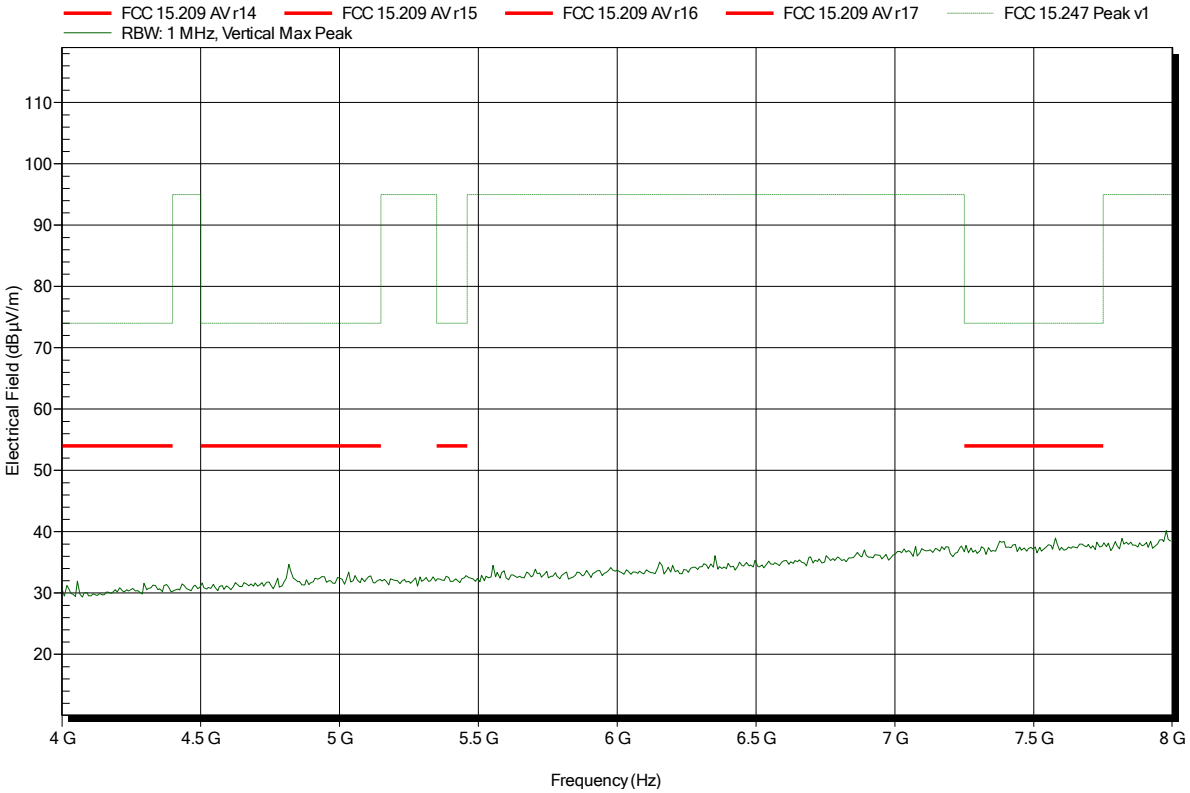
Frequency	Peak	Peak Limit	Peak Difference	Status
4.824 GHz	34.17 dBµV/m	74 dBµV/m	-39.83 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT20; MCS13; 2412MHz; ant.1+2
Test Date:	2015-07-22
Note:	

Index 81

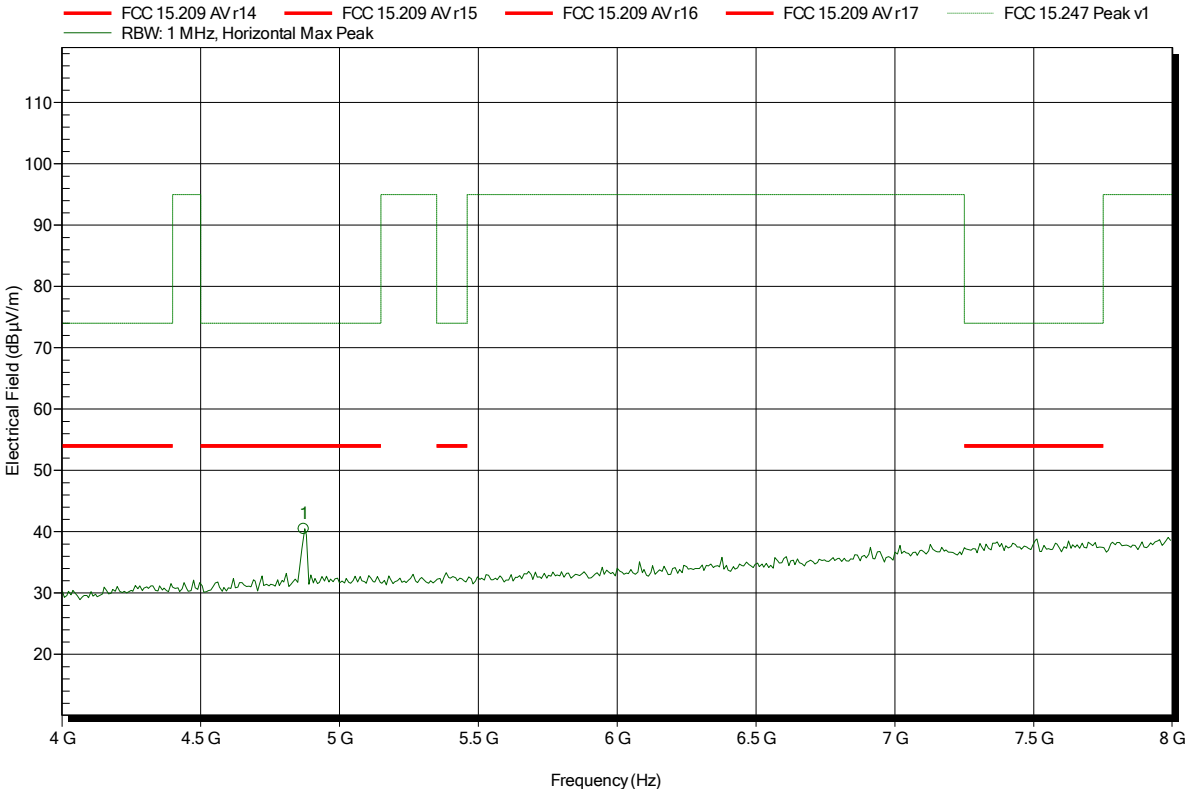


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT20; MCS13; 2437MHz; ant.1+2
Test Date:	2015-07-22
Note:	

Index 79



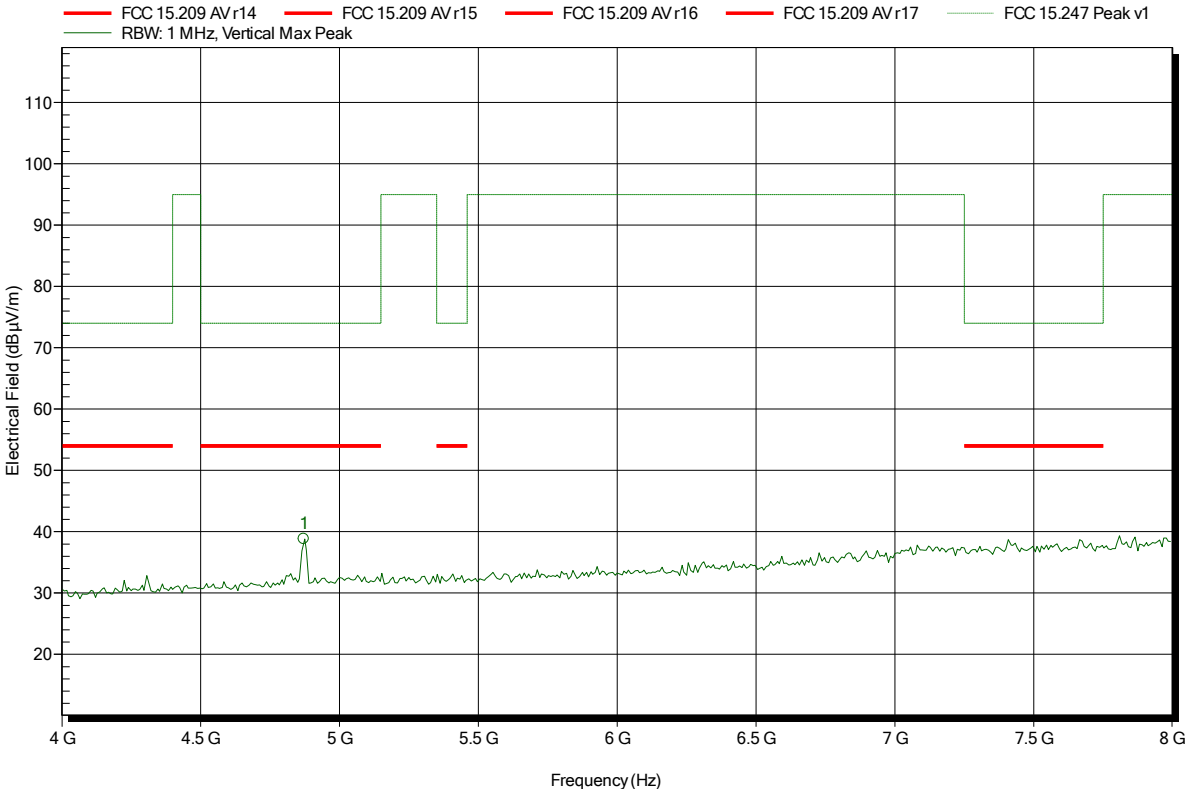
Frequency	Peak	Peak Limit	Peak Difference	Status
4.872 GHz	40.46 dBµV/m	74 dBµV/m	-33.54 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT20; MCS13; 2437MHz; ant.1+2
Test Date:	2015-07-22
Note:	

Index 78



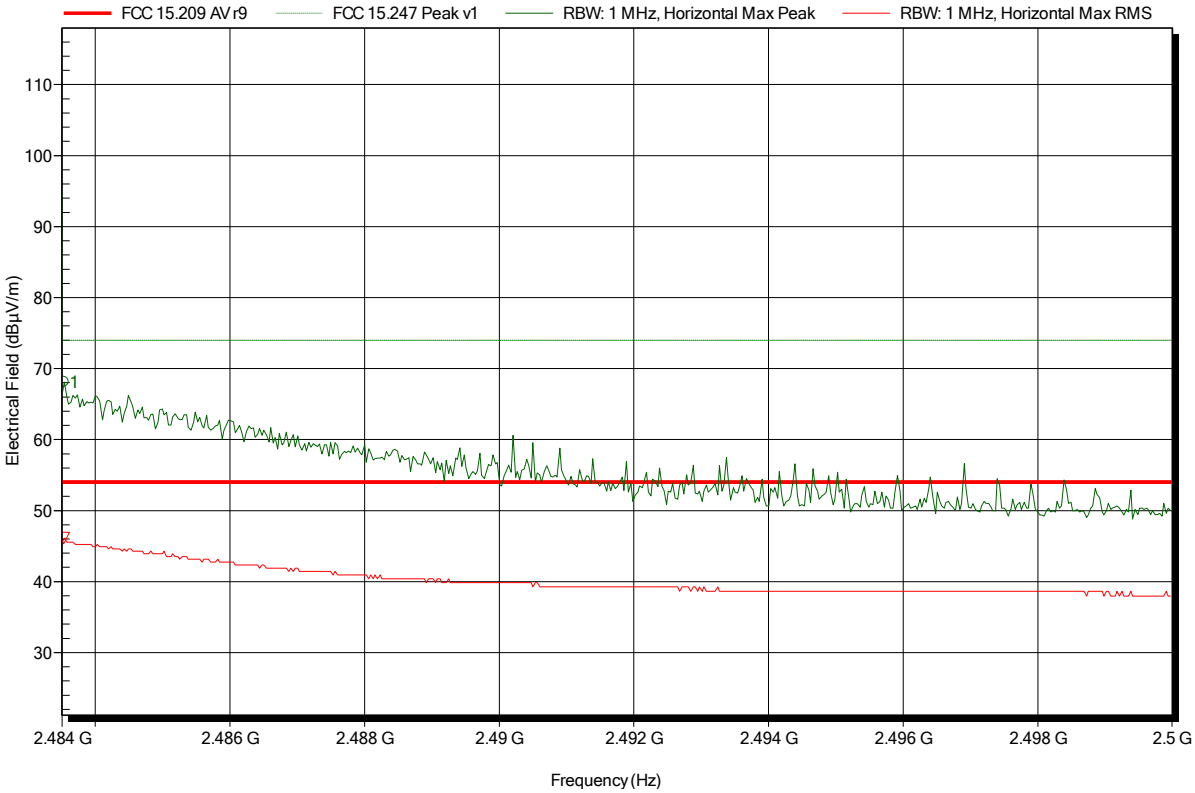
Frequency	Peak	Peak Limit	Peak Difference	Status
4.872 GHz	38.8 dBµV/m	74 dBµV/m	-35.2 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT20; MCS13; 2462MHz; ant.1+2
Test Date:	2015-07-22
Note:	upper bandedge

Index 84



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4835 GHz	68.1 dBµV/m	74 dBµV/m	-5.9 dB	Pass

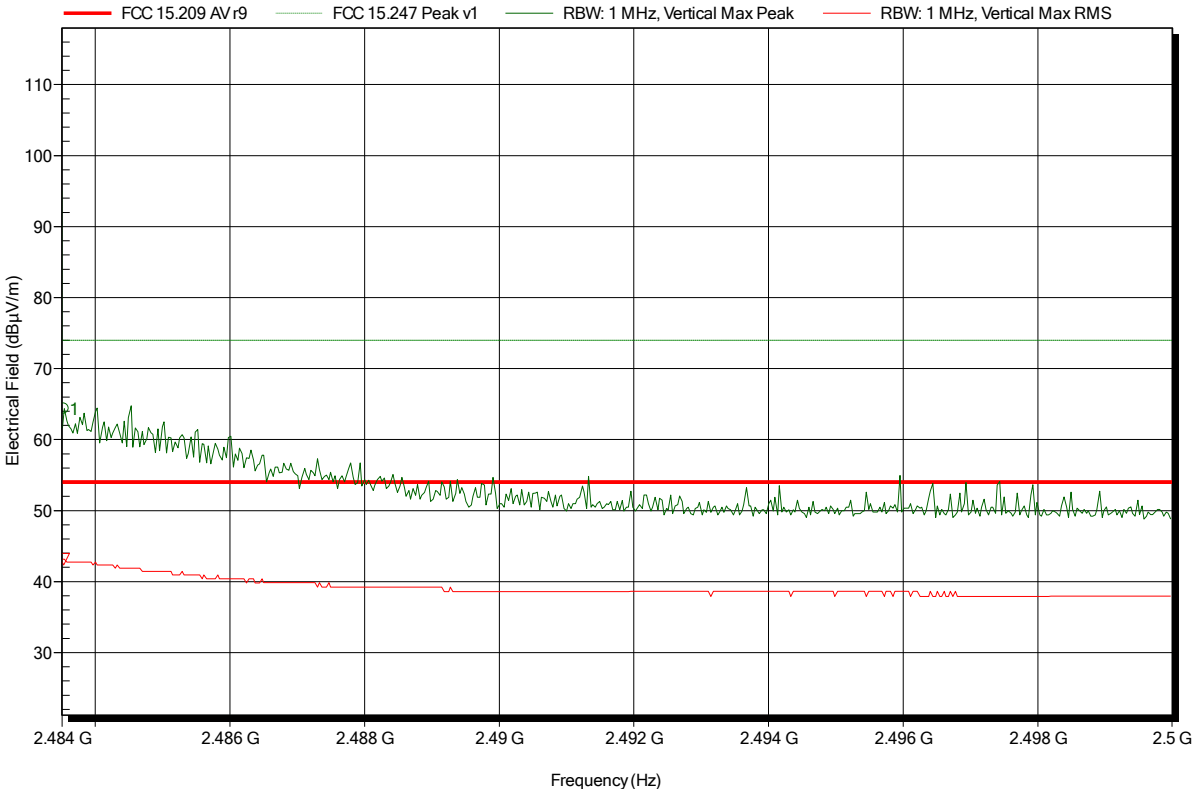
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4835 GHz	46.13 dBµV/m	54 dBµV/m	-7.87 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT20; MCS13; 2462MHz; ant.1+2
Test Date:	2015-07-22
Note:	upper bandedge

Index 82



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4835 GHz	64.36 dBµV/m	74 dBµV/m	-9.64 dB	Pass

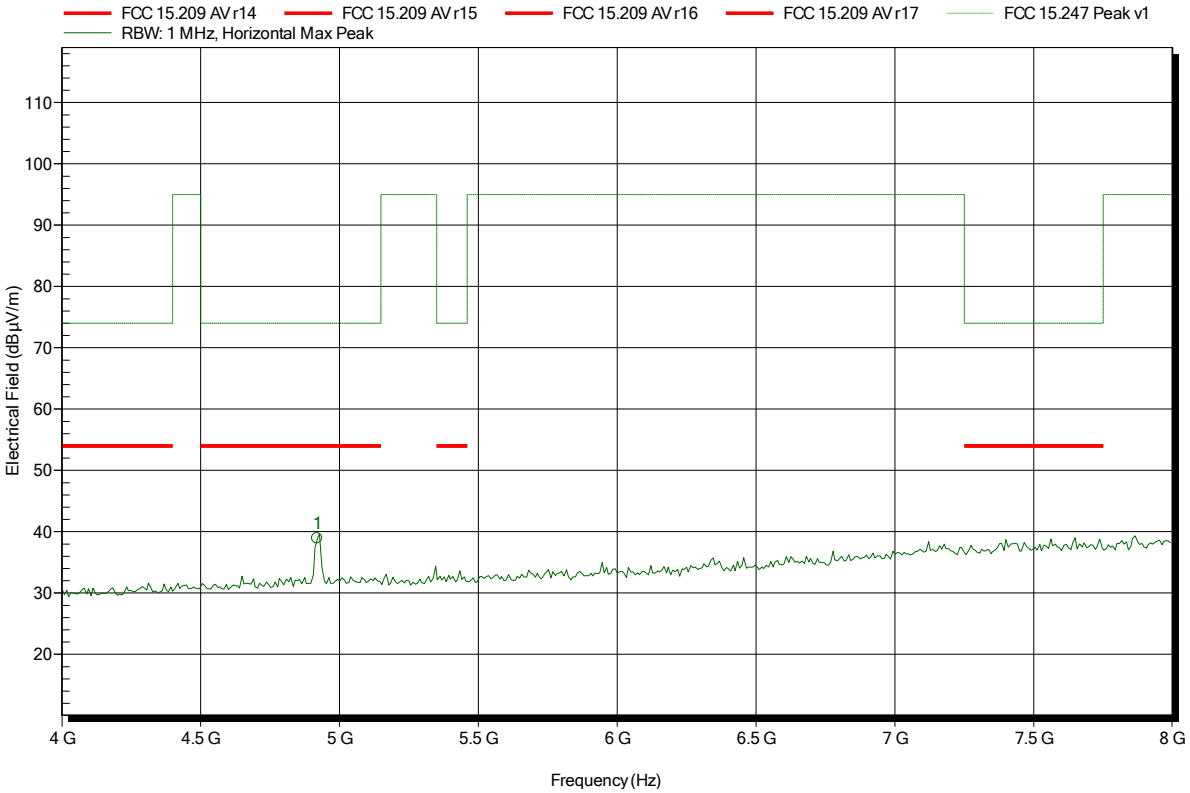
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4835 GHz	43.15 dBµV/m	54 dBµV/m	-10.85 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT20; MCS13; 2462MHz; ant.1+2
Test Date:	2015-07-22
Note:	

Index 85



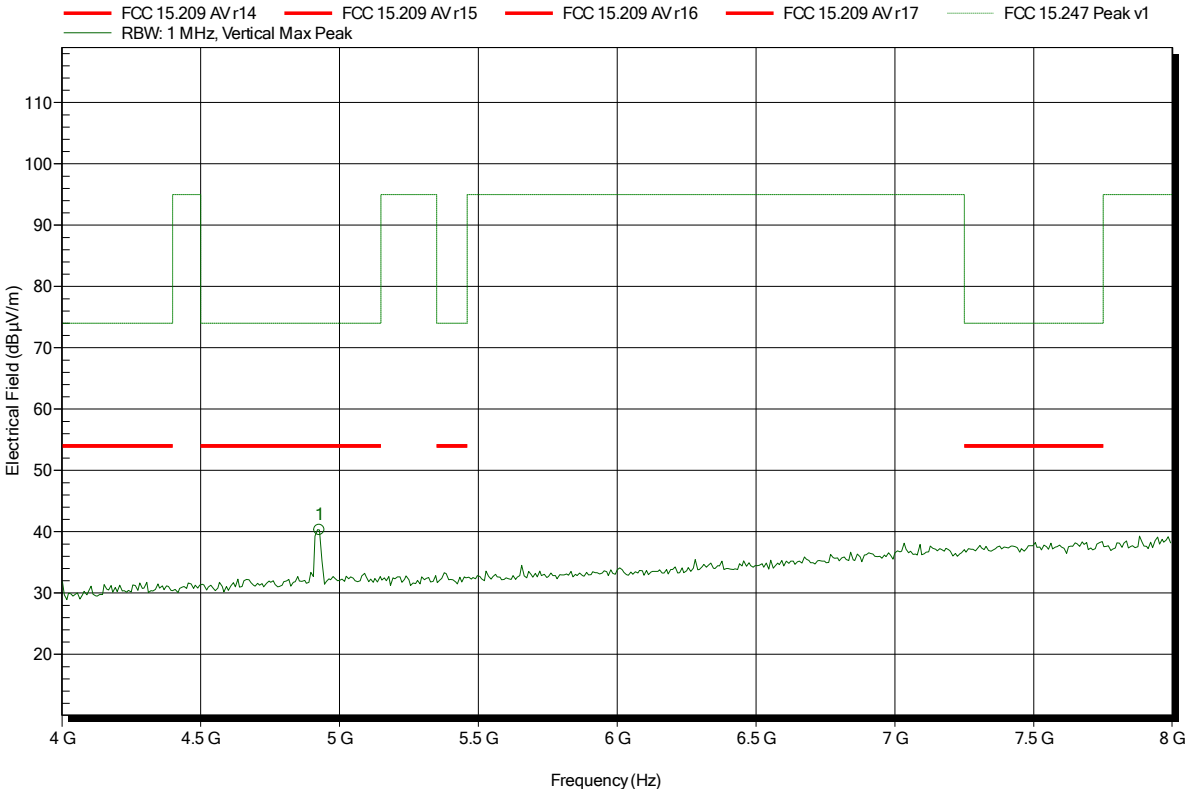
Frequency	Peak	Peak Limit	Peak Difference	Status
4.92 GHz	38.92 dBµV/m	74 dBµV/m	-35.08 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT20; MCS13; 2462MHz; ant.1+2
Test Date:	2015-07-22
Note:	

Index 83



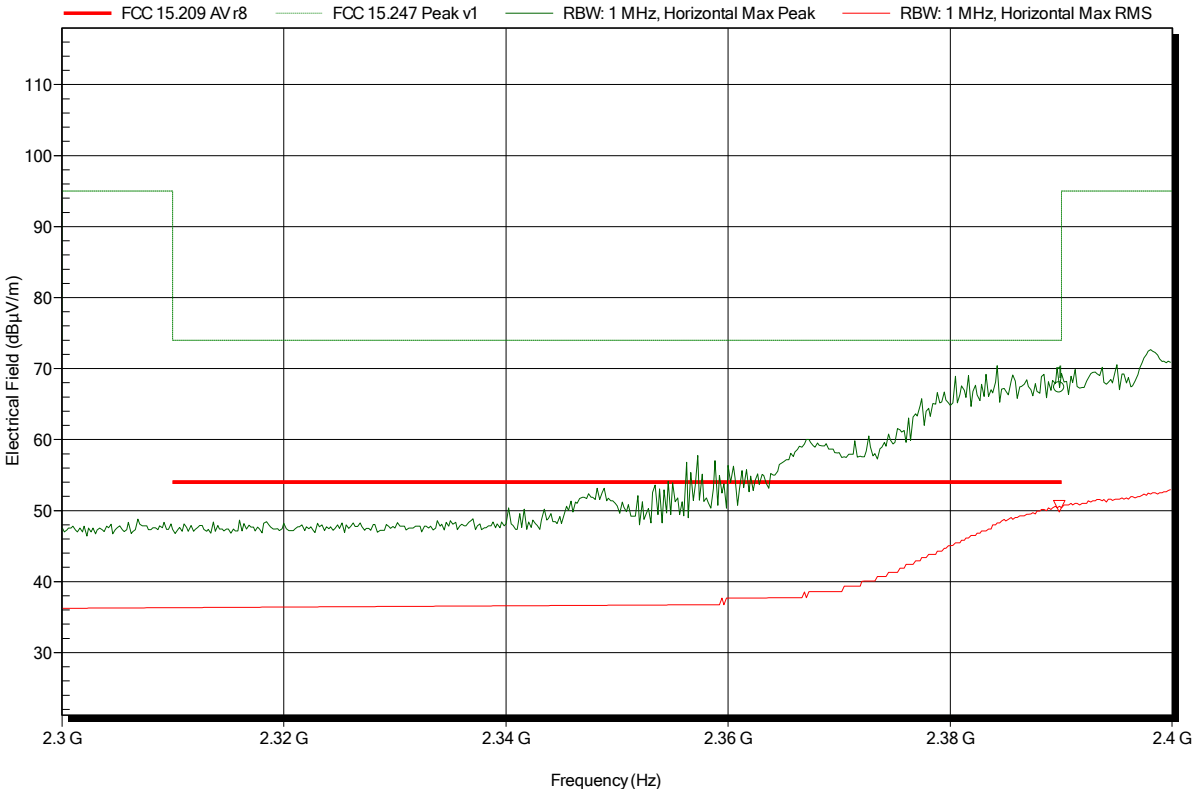
Frequency	Peak	Peak Limit	Peak Difference	Status
4.928 GHz	40.29 dBµV/m	74 dBµV/m	-33.71 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT40; MCS0; 2422MHz; ant.1
Test Date:	2015-07-22
Note:	lower bandedge

Index 87



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.39 GHz	67.36 dBµV/m	74 dBµV/m	-6.64 dB	Pass

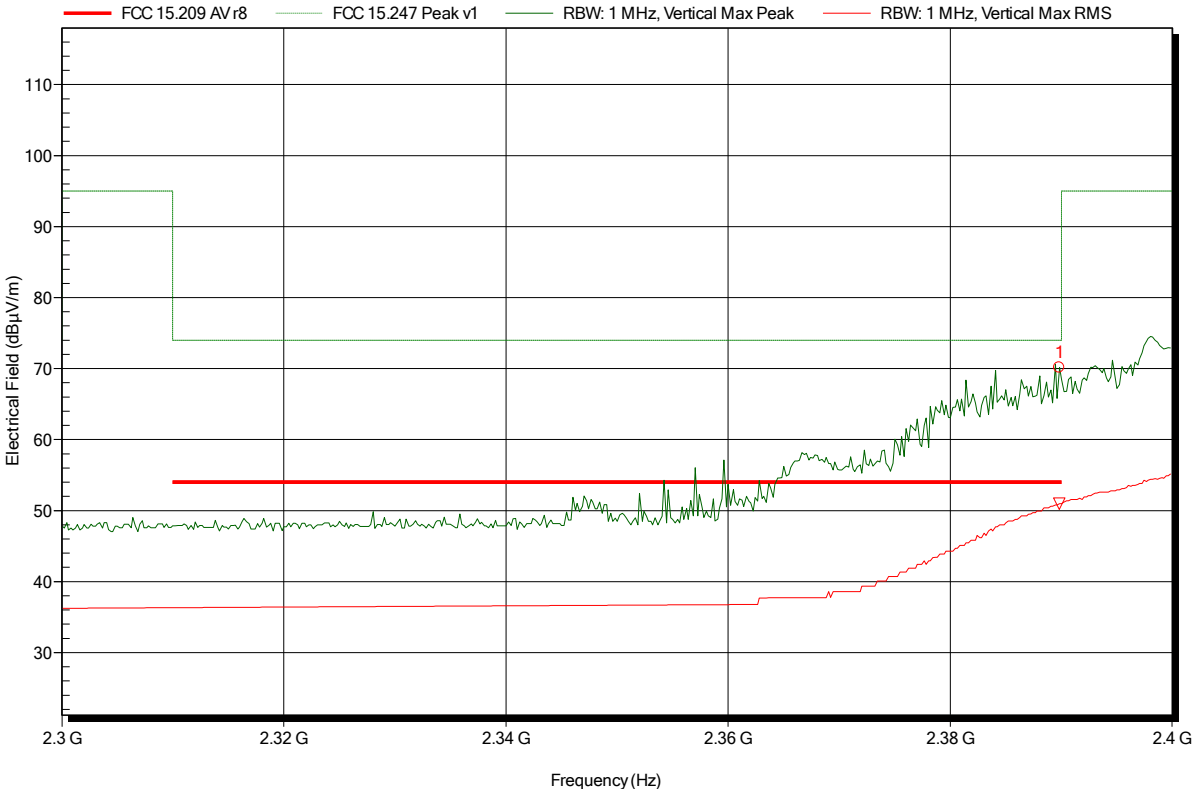
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.39 GHz	50.6 dBµV/m	54 dBµV/m	-3.4 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT40; MCS0; 2422MHz; ant.1
Test Date:	2015-07-22
Note:	lower bandedge

Index 89



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.39 GHz	70.14 dBµV/m	74 dBµV/m	-3.86 dB	Pass

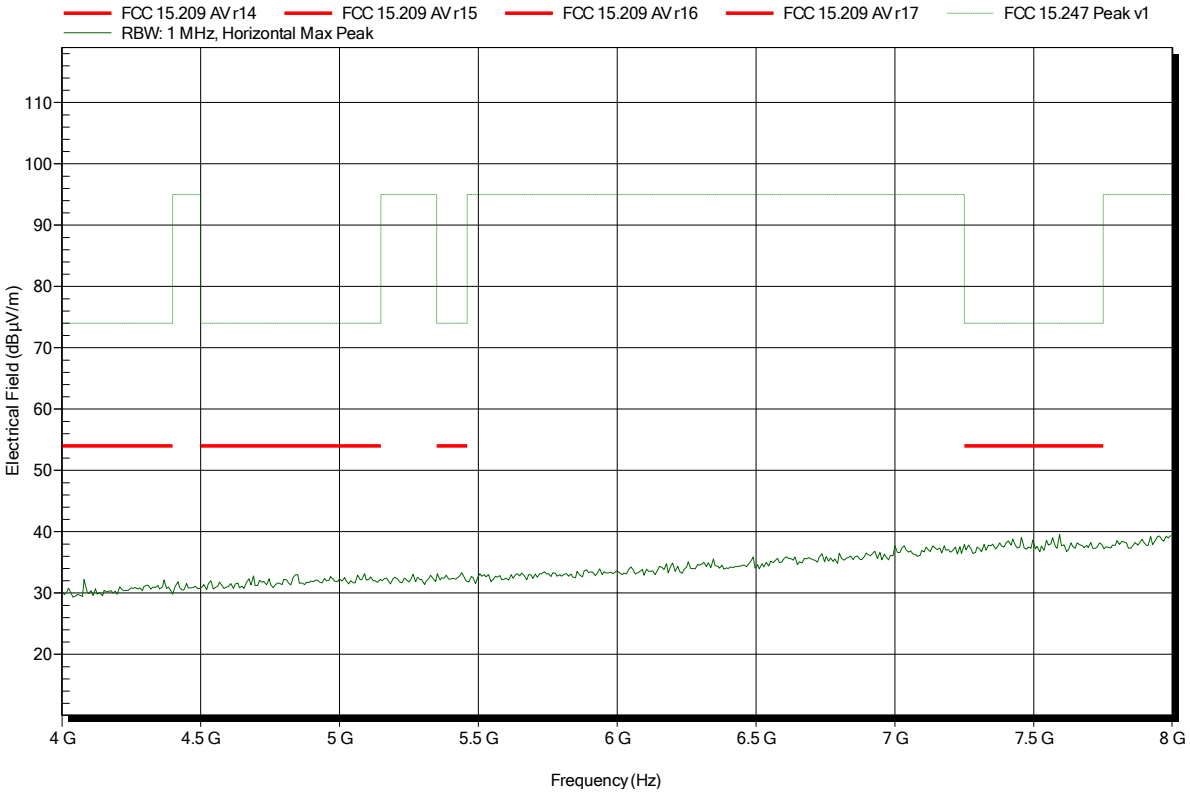
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.39 GHz	50.99 dBµV/m	54 dBµV/m	-3.01 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT40; MCS0; 2422MHz; ant.1
Test Date:	2015-07-22
Note:	

Index 88

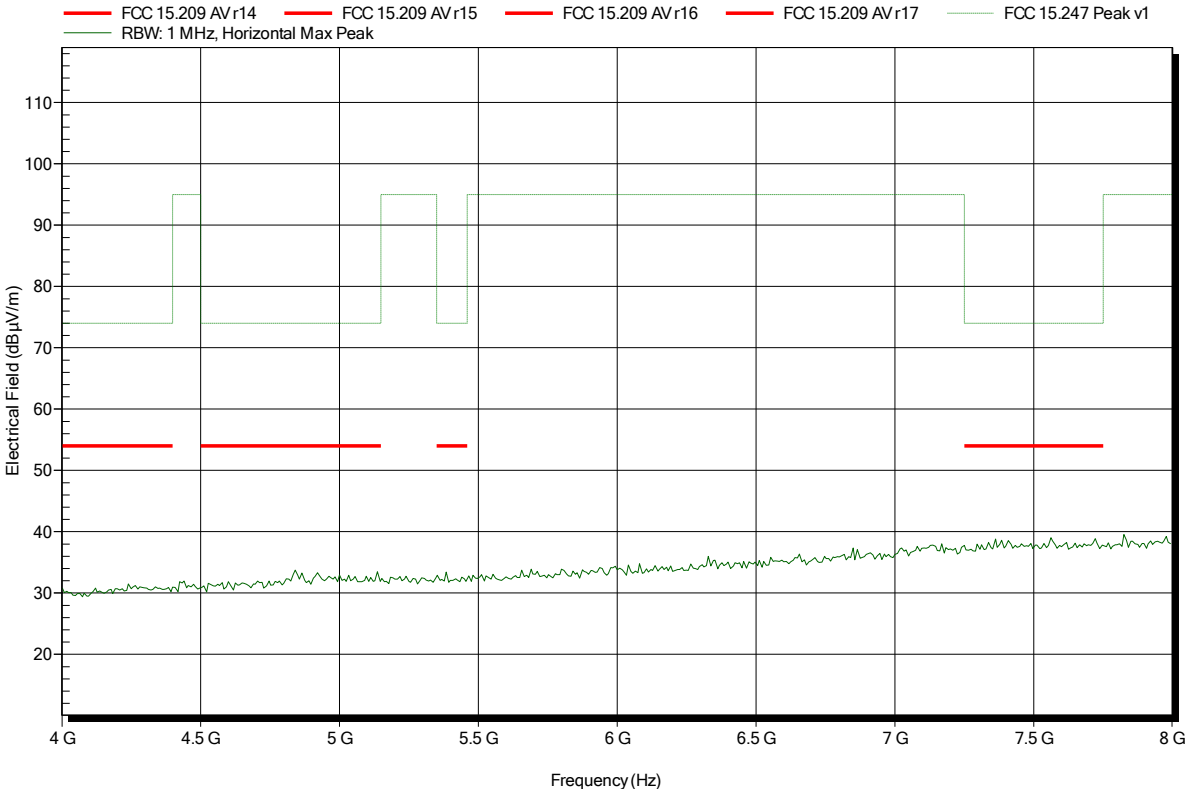


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT40; MCS0; 2422MHz; ant.1
Test Date:	2015-07-22
Note:	

Index 90

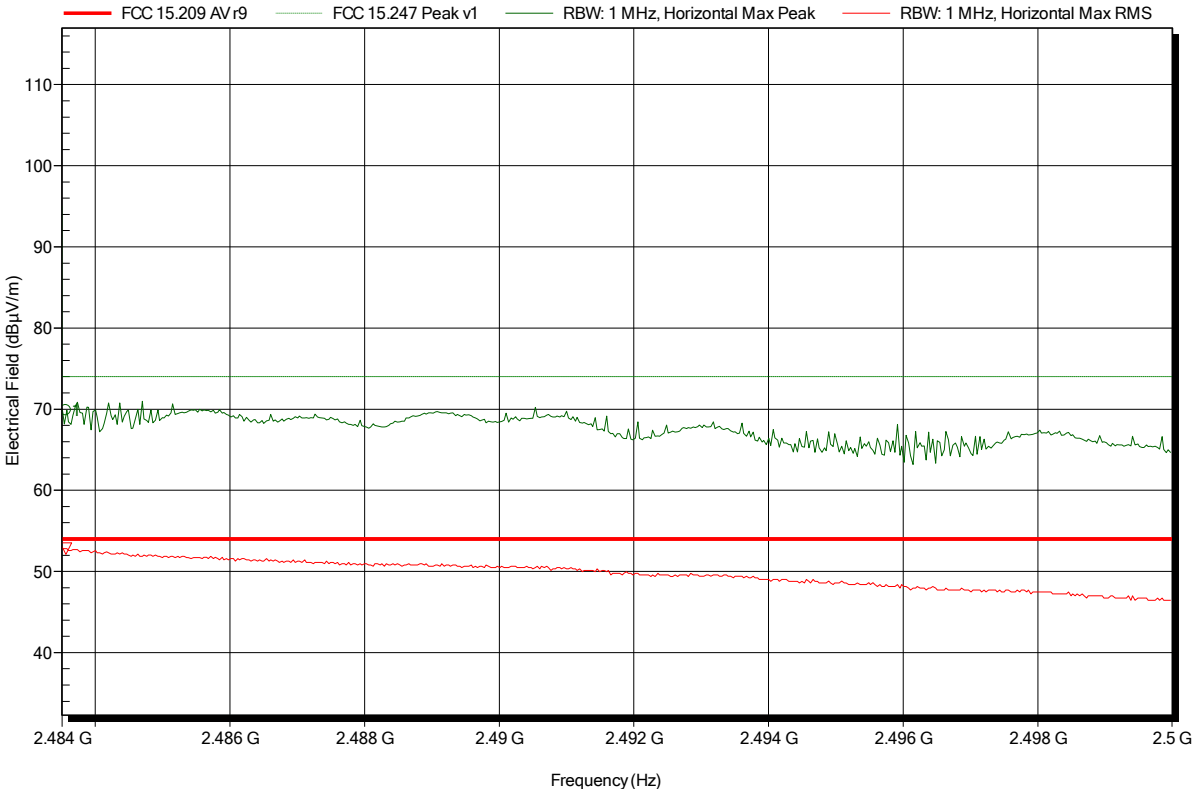


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT40; MCS0; 2452MHz; ant.1
Test Date:	2015-07-22
Note:	upper bandedge

Index 93



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4836 GHz	69.87 dBµV/m	74 dBµV/m	-4.13 dB	Pass

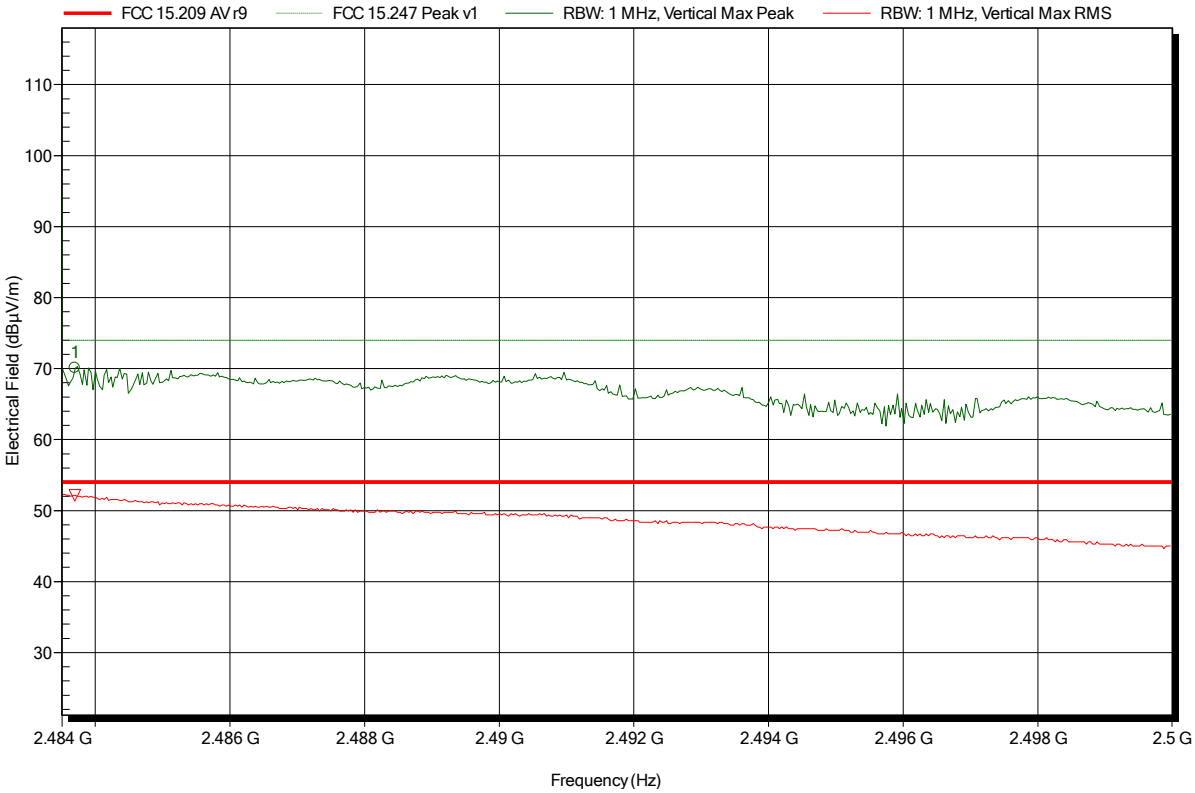
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4836 GHz	52.82 dBµV/m	54 dBµV/m	-1.18 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT40; MCS0; 2452MHz; ant.1
Test Date:	2015-07-22
Note:	upper bandedge

Index 91



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4837 GHz	70.12 dBµV/m	74 dBµV/m	-3.88 dB	Pass

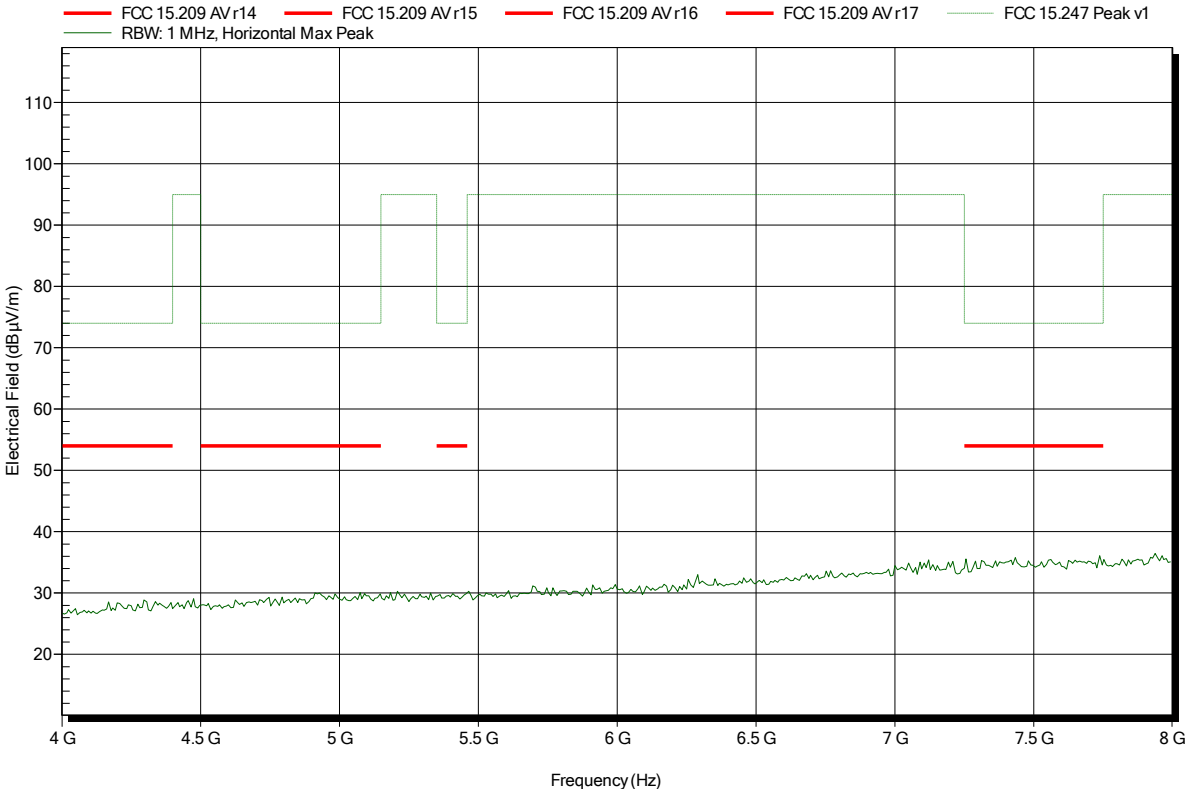
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4837 GHz	52.15 dBµV/m	54 dBµV/m	-1.85 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT40; MCS0; 2452MHz; ant.1
Test Date:	2015-07-22
Note:	

Index 94

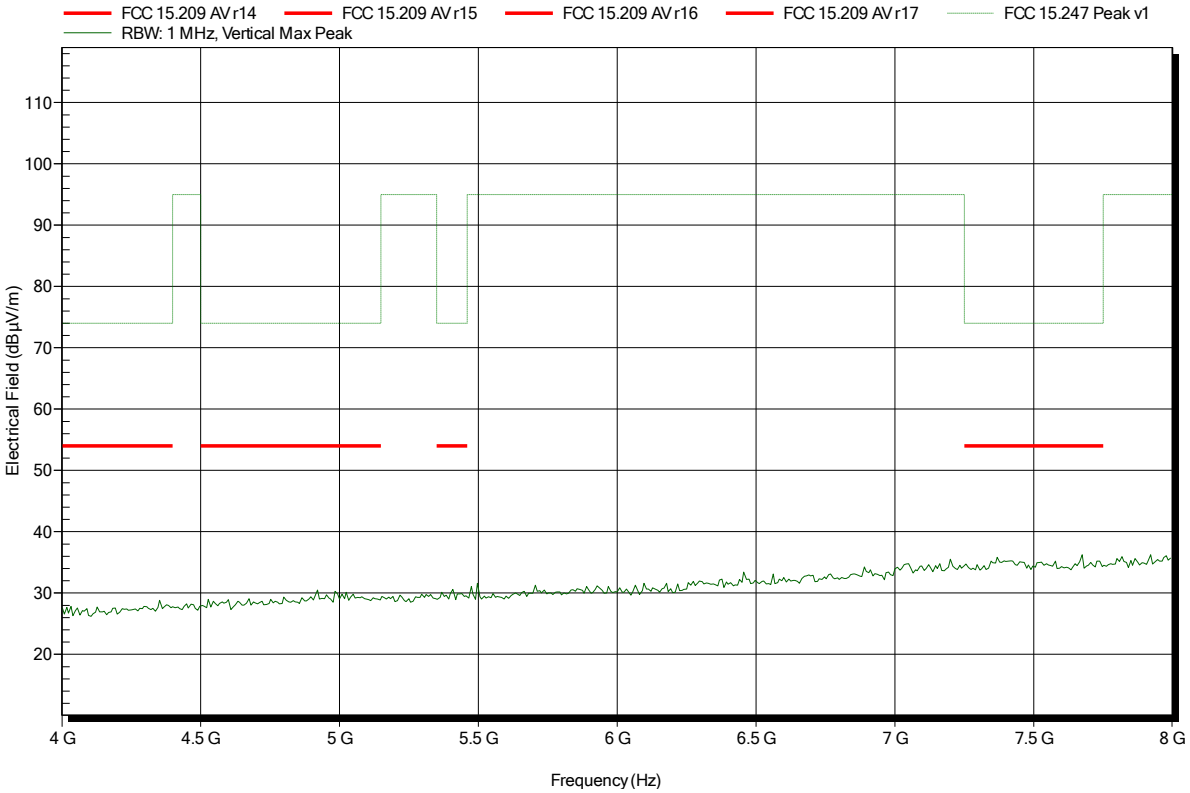


Spurious emissions according to FCC 15.247

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	TX; 802.11n; HT40; MCS0; 2452MHz; ant.1
Test Date:	2015-07-22
Note:	

Index 92



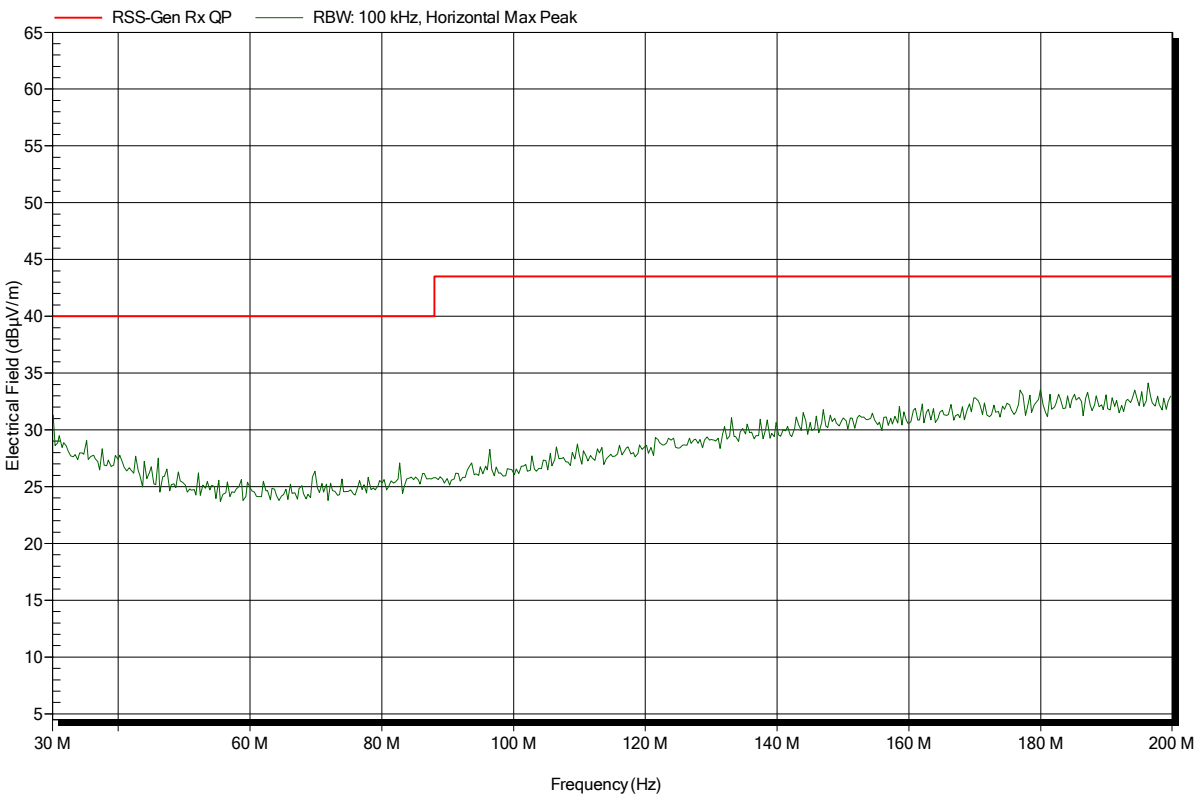
ANNEX B Receiver radiated spurious emissions

Spurious emissions according to RSS-GEN

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	RX; 2437 MHz
Test Date:	2015-07-23
Note:	

Index 47

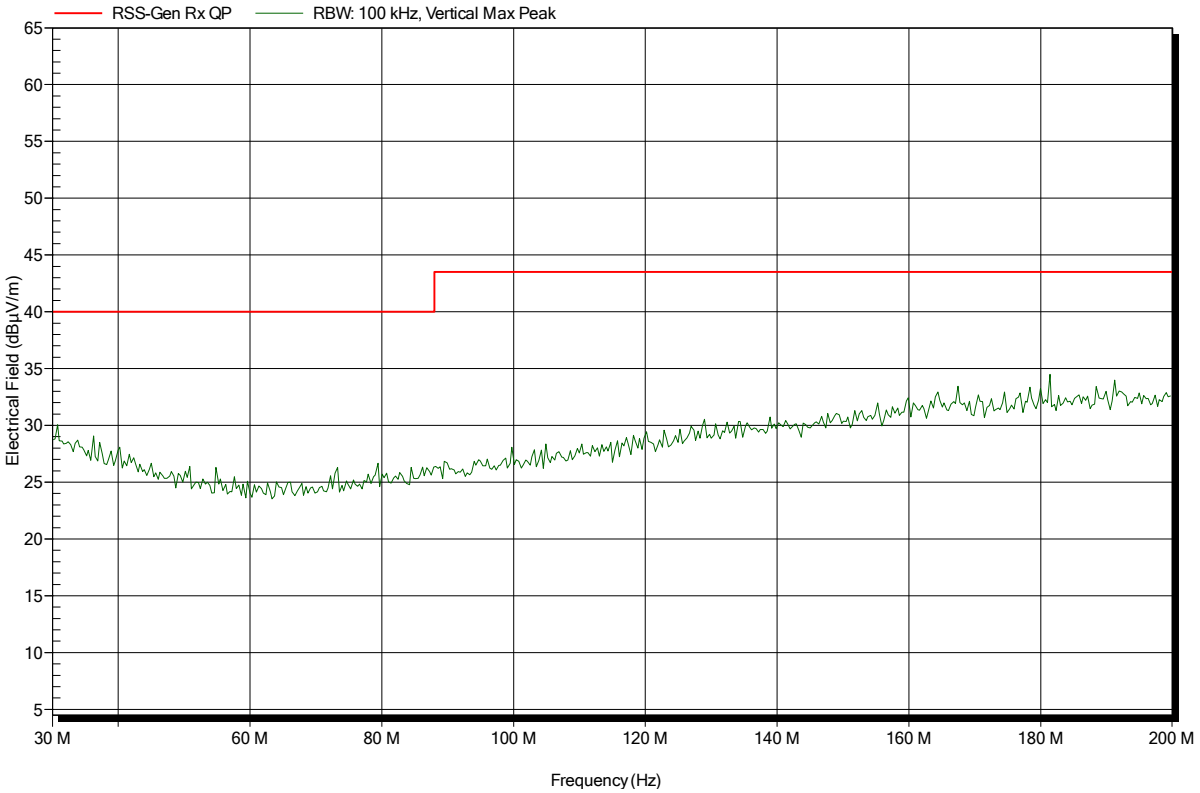


Spurious emissions according to RSS-GEN

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	RX; 2437 MHz
Test Date:	2015-07-23
Note:	

Index 48

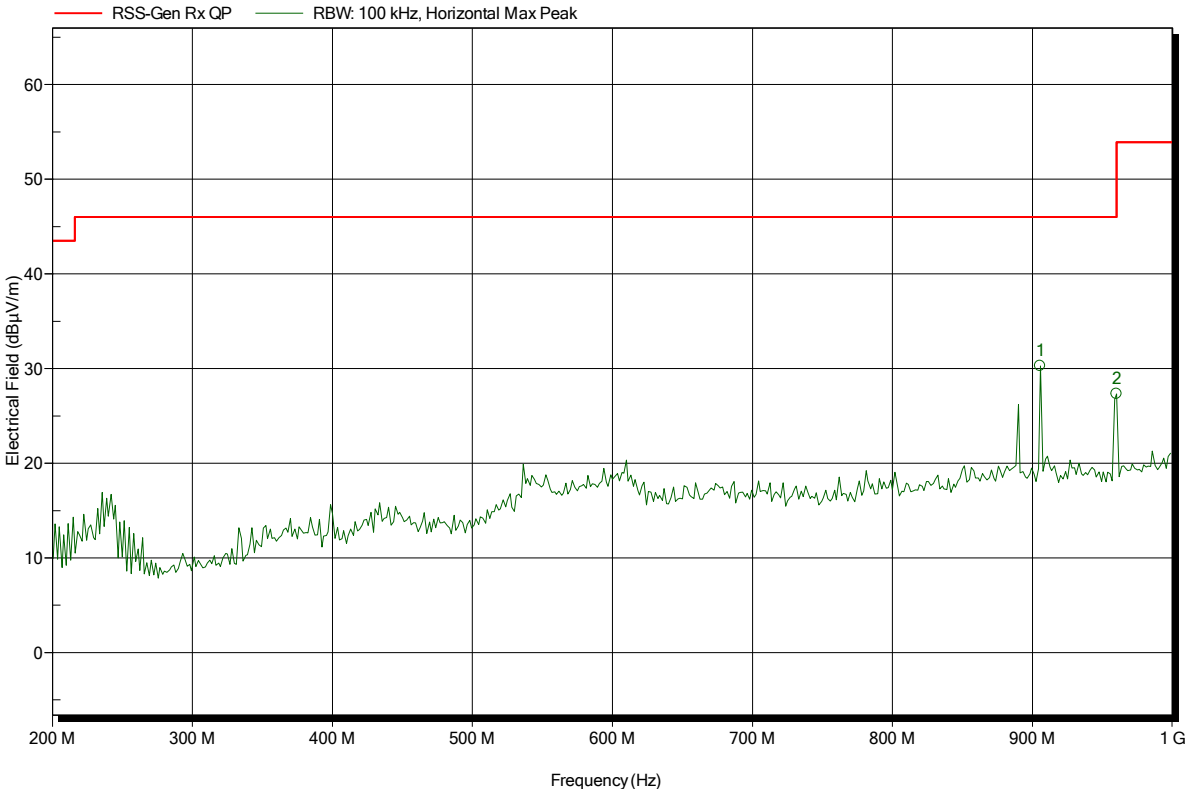


Spurious emissions according to RSS-GEN

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	RX; 2437 MHz
Test Date:	2015-07-23
Note:	

Index 49



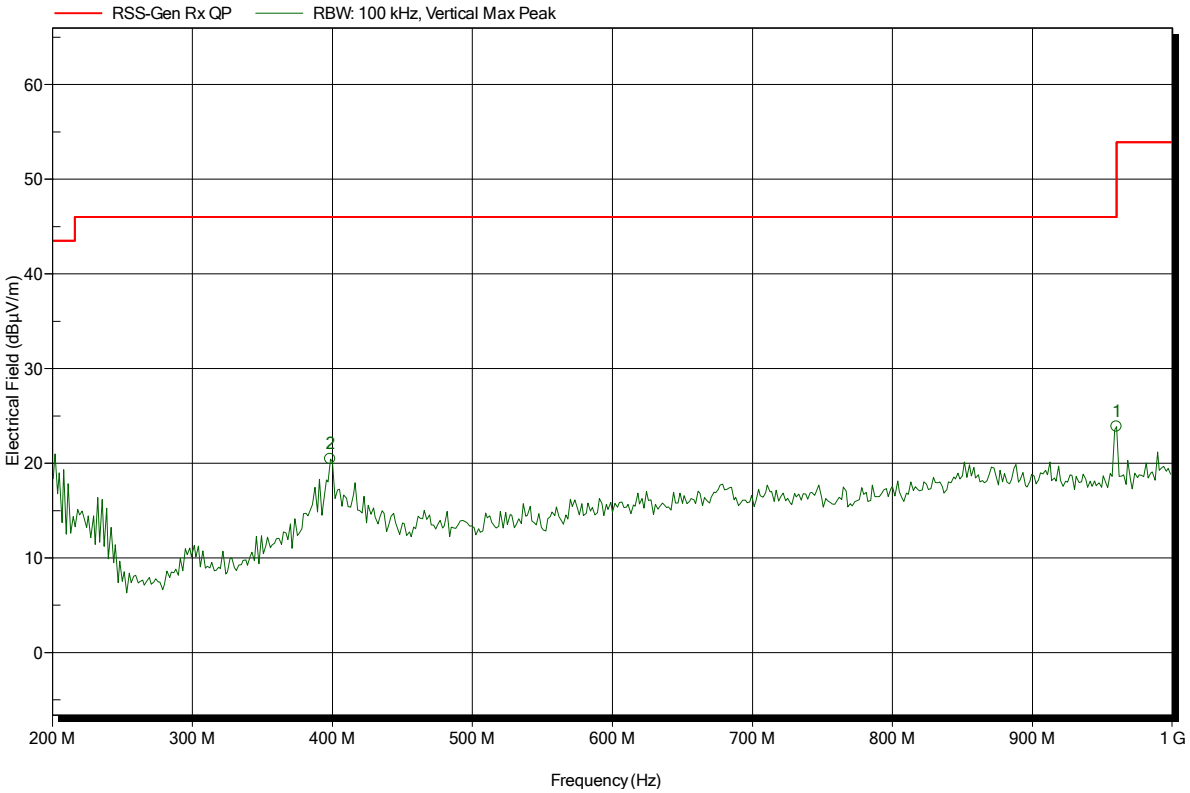
Frequency	Peak	Peak Limit	Peak Difference	Status
905.6 MHz	30.29 dBµV/m	46 dBµV/m	-15.71 dB	Pass
960 MHz	27.33 dBµV/m	46 dBµV/m	-18.67 dB	Pass

Spurious emissions according to RSS-GEN

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	RX; 2437 MHz
Test Date:	2015-07-23
Note:	

Index 50



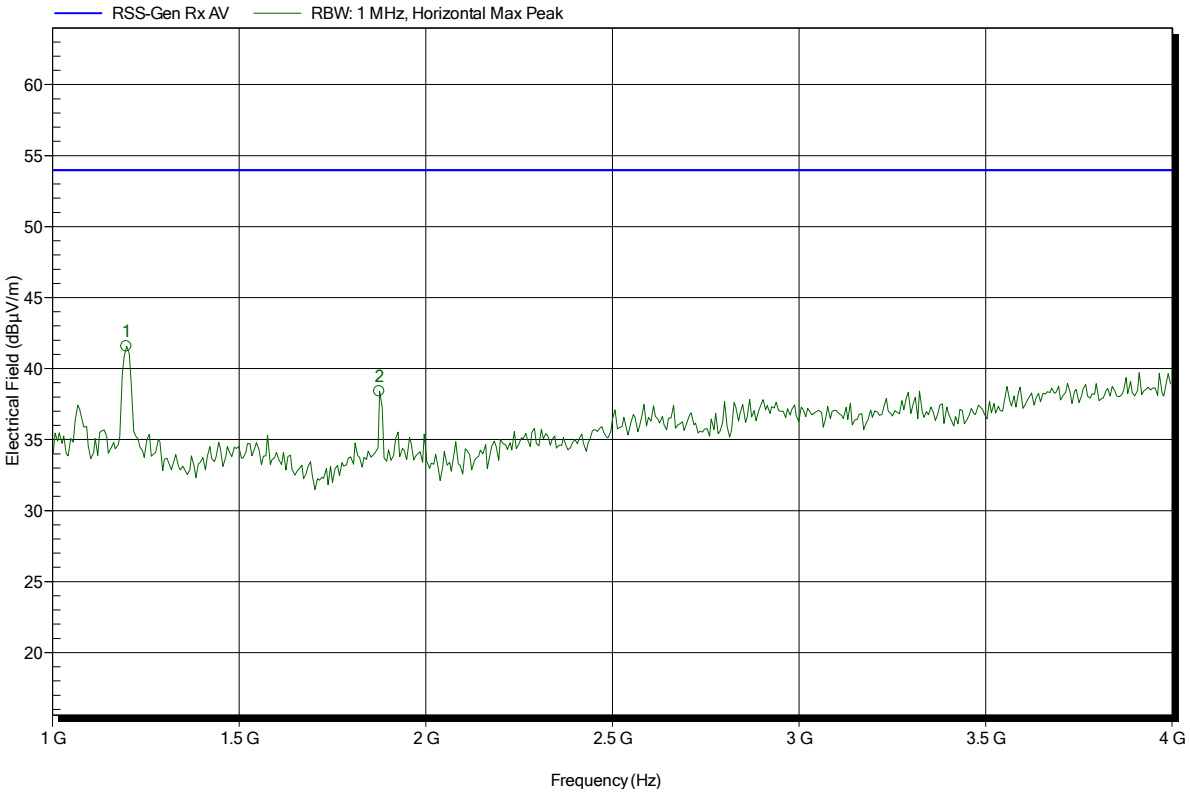
Frequency	Peak	Peak Limit	Peak Difference	Status
398.4 MHz	20.44 dBµV/m	46 dBµV/m	-25.56 dB	Pass
960 MHz	23.87 dBµV/m	46 dBµV/m	-22.13 dB	Pass

Spurious emissions according to RSS-GEN

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	RX; 2037 MHz
Test Date:	2015-07-23
Note:	

Index 43



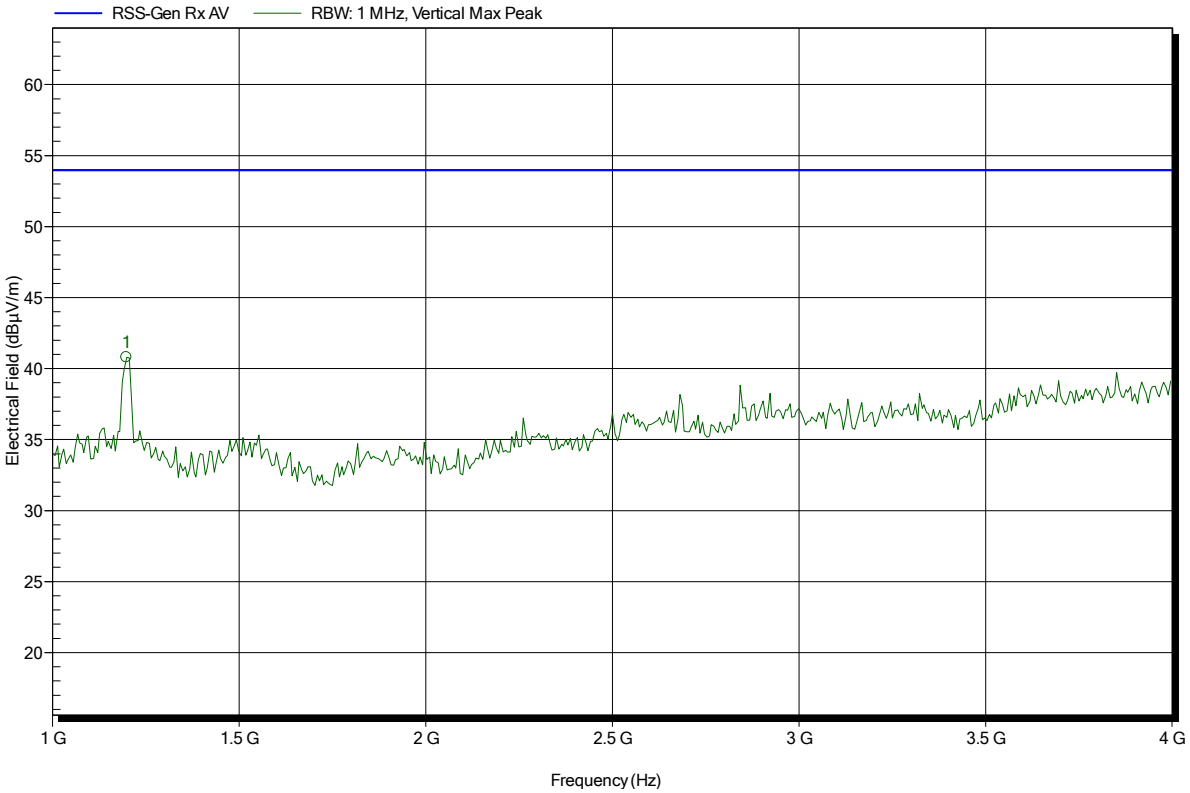
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
1.198 GHz	41.57 dBµV/m	53.98 dBµV/m	-12.41 dB	Pass
1.876 GHz	38.41 dBµV/m	53.98 dBµV/m	-15.57 dB	Pass

Spurious emissions according to RSS-GEN

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	RX; 2437 MHz
Test Date:	2015-07-23
Note:	

Index 45



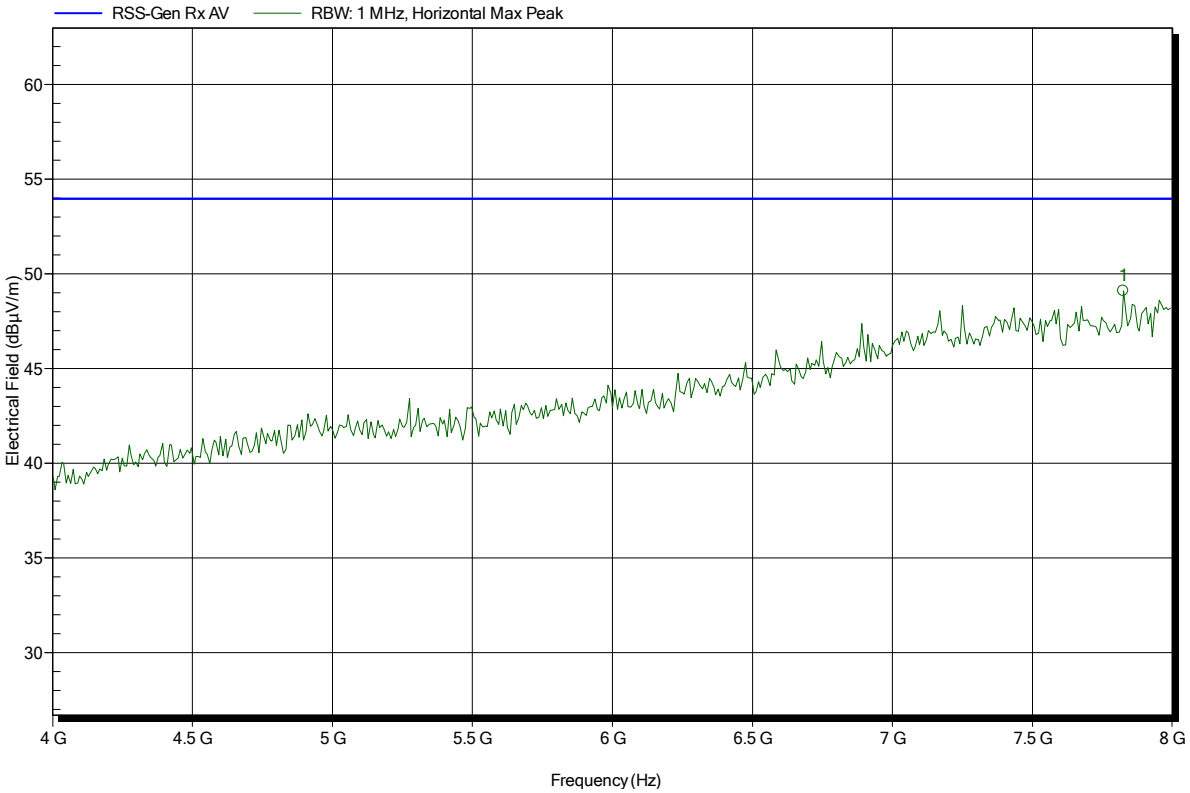
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
1.198 GHz	40.79 dBµV/m	53.98 dBµV/m	-13.19 dB	Pass

Spurious emissions according to RSS-GEN

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	RX; 2437 MHz
Test Date:	2015-07-23
Note:	

Index 44



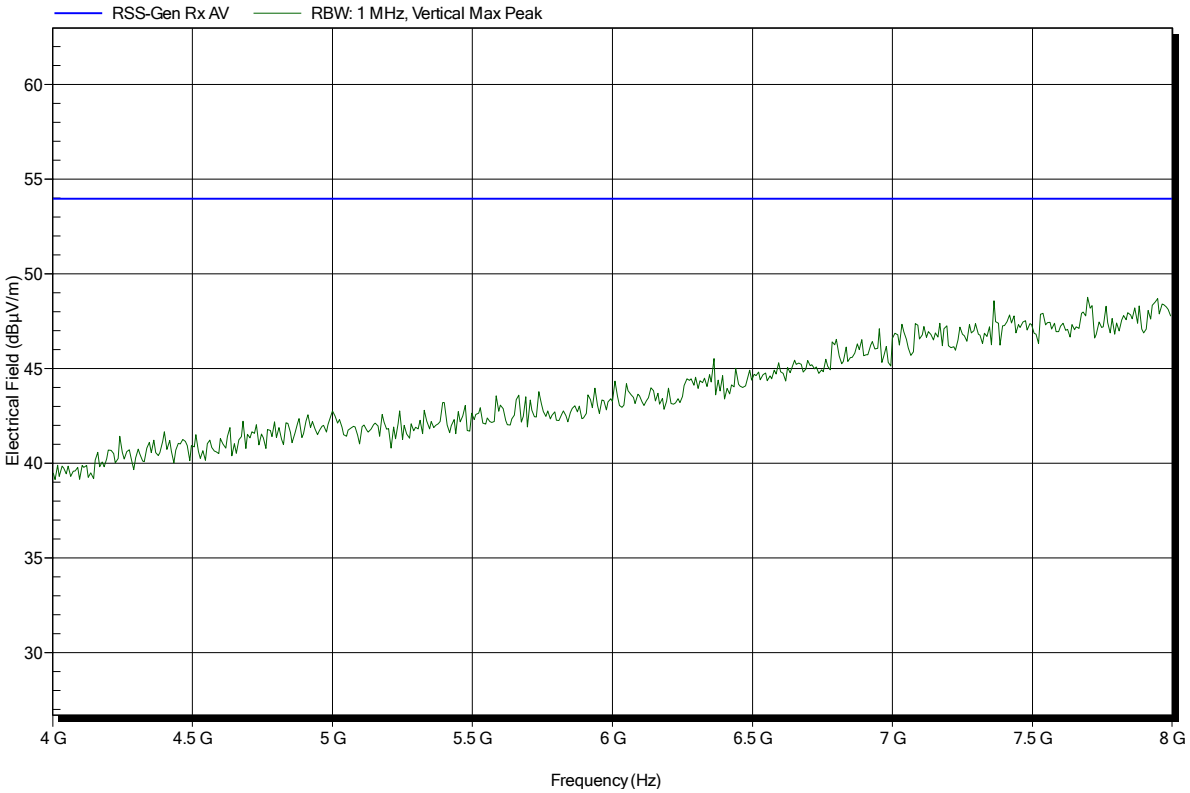
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
7.824 GHz	49.11 dBµV/m	53.98 dBµV/m	-4.87 dB	Pass

Spurious emissions according to RSS-GEN

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	RX; 2437 MHz
Test Date:	2015-07-23
Note:	

Index 46

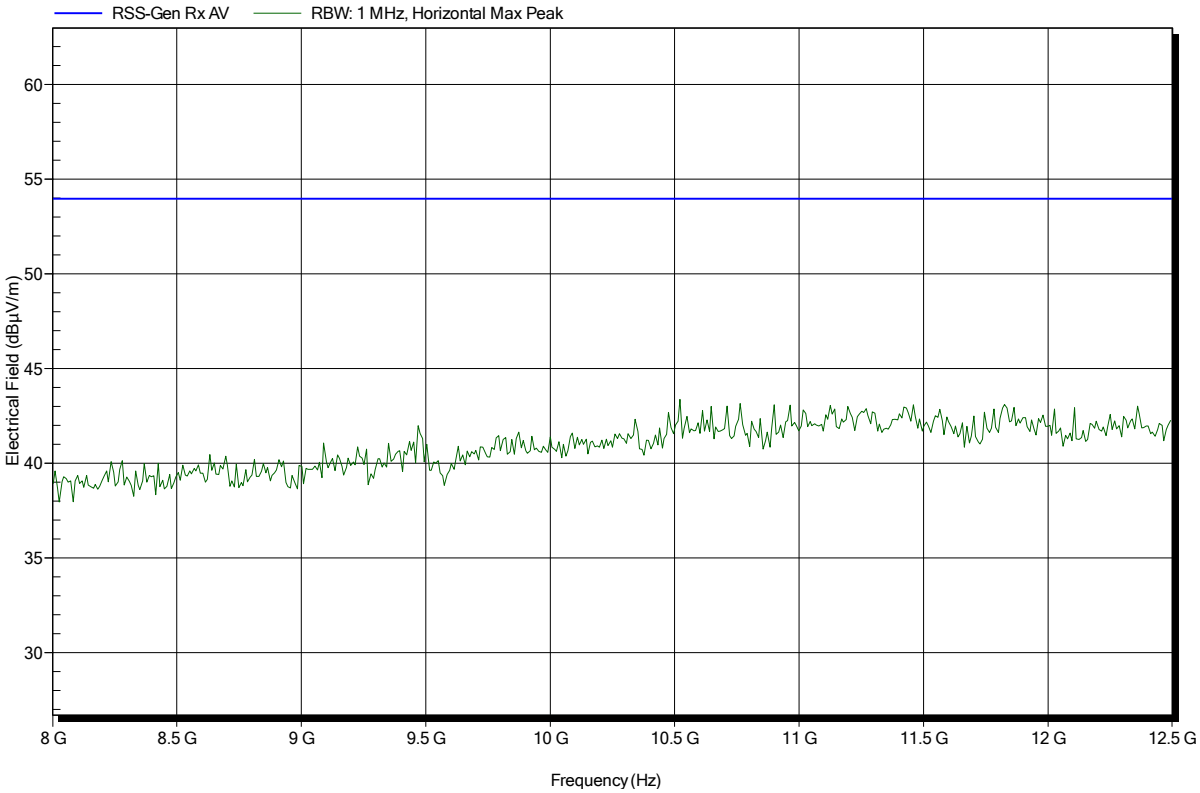


Spurious emissions according to RSS-GEN

Project number: G0M-1507-4921

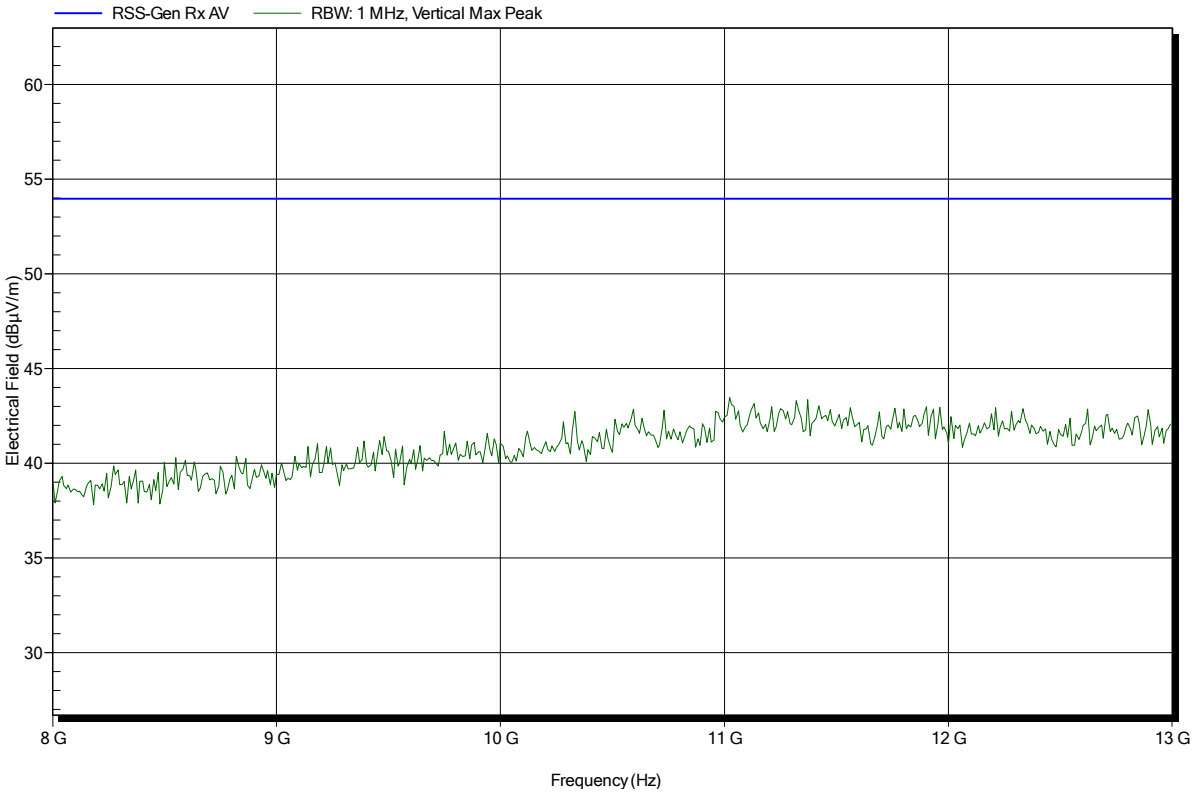
Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	1 m converted to 3m
Mode:	RX; 2037 MHz
Test Date:	2015-07-23
Note:	

Index 41



Spurious emissions according to RSS-GEN

Project number: G0M-1507-4921

Applicant:	Panono GmbH
EUT Name:	Panono Camera
Model:	MVP15
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 3.7 VDC lithium battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	1 m converted to 3m
Mode:	RX; 2037 MHz
Test Date:	2015-07-23
Note:	

Index 42