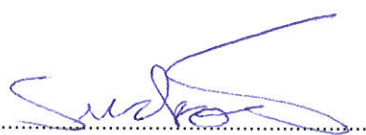
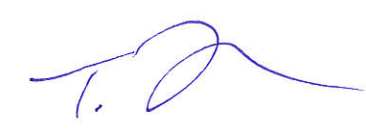


<b>RADIO REPORT</b> <b>FCC 47 CFR Part 15C</b> <b>ISED Canada RSS-247</b> <b>Digital transmission systems operating within the 2400 – 2483.5 MHz band</b>	
<b>Report Reference No</b>	G0M-1807-7540-TFC247WF-V01
<b>Testing Laboratory</b>	Eurofins Product Service GmbH
<b>Address</b>	Storkower Str. 38c 15526 Reichenwalde Germany
<b>Accreditation</b>	 <p>A2LA Accredited Testing Laboratory, Certificate No.: 1983.01 FCC Test Firm Designation Number: DE0008 IC Testing Laboratory site: 3470A-2</p>
<b>Applicant</b>	Leica Geosystems AG
<b>Address</b>	Heinrich Wild Strasse 9435 Heerbrugg SWITZERLAND
<b>Test Specification</b>	According to FCC/ISED rules
<b>Standard</b>	47 CFR Part 15C RSS-247, Issue 2, 2017-02
<b>Non-Standard Test Method</b>	None
<b>Test Scope</b>	partial compliance test
<b>Equipment under Test (EUT):</b>	
<b>Product Description</b>	Bluetooth, WLAN and BLE Modul
<b>Model(s)</b>	TiWi-BLE
<b>Additional Model(s)</b>	None
<b>Brand Name(s)</b>	None
<b>Hardware Version(s)</b>	1.0
<b>Software Version(s)</b>	4.0
<b>FCC-ID</b>	RFD-BTWCO
<b>IC</b>	3177A-BTWCO
<b>Test Result</b>	<b>PASSED</b>

<b>Possible test case verdicts:</b>		
required by standard but not tested	N/T	
not required by standard	N/R	
not applicable to EUT	N/A	
test object does meet the requirement	P(PASS)	
test object does not meet the requirement	F(FAIL)	
<b>Testing:</b>		
Test Lab Temperature	20 - 23 °C	
Test Lab Humidity	32 – 38 %	
Date of receipt of test item	2018-07-11	
<b>Report:</b>		
Compiled by	Sebastian Suckow	
Tested by (+ signature) (Responsible for Test)	Sebastian Suckow	
Approved by (+ signature) (Deputy Head of Lab)	Toralf Jahn	
Date of Issue	2018-08-14	
Total number of pages	86	
<b>General Remarks:</b>		
<p>The test results presented in this report relate only to the object tested.</p> <p>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.</p> <p>This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.</p>		
<b>Additional Comments:</b>		

**VERSION HISTORY**

Version History			
Version	Issue Date	Remarks	Revised By
01	2018-08-14	Initial Release	

**ABBREVIATIONS AND ACRONYMS**

Acronyms	
Acronym	Description
BPSK	Binary Phase Shift Keying
DSSS	Direct Sequence Spread Spectrum
EUT	Equipment Under Test
FCC	Federal Communications Commission
HT	High Throughput
IEEE 802.11	MAC and PHY Layer for WiFi
ISED	Innovation, Science and Economic Development Canada
OFDM	Orthogonal Frequency Division Multiplexing
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
RBW	Resolution bandwidth
RMS	Root mean square
VBW	Video bandwidth
V <sub>NOM</sub>	Nominal supply voltage

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## 1 Equipment (Test Item) Under Test

Description	Bluetooth, WLAN and BLE Modul	
Model	TiWi-BLE	
Additional Model(s)	None	
Brand Name(s)	None	
Serial Number(s)	None	
Hardware Version(s)	1.0	
Software Version(s)	4.0	
PMN	Leica Geosystems AG	
HVIN	TIWI	
FVIN	-/-	
HMN	-/-	
FCC-ID	RFD-BTWCO	
IC	3177A-BTWCO	
Equipment type	Radio Module	
Radio type	Transceiver	
Assigned frequency bands	2400 - 2483.5 MHz	
Radio technology	IEEE 802.11 b/g/n (HT20)	
Modulation	BPSK, QPSK, 16-QAM, 32-QAM	
Number of antenna ports	1	
Radio Module	Type	BT+EDR / BT LE / WLAN 2.4 GHz Module
	Model	TiWi-BLE
	Manufacturer	LS Research
	HW Version	1.0
	SW Version	4.0
Antenna	Type	External
	Model	853405
	Manufacturer	Leica Geosystems
	Gain	2.66 dBi
Supply Voltage	$V_{NOM}$	7.0 VDC
Operating Temperature	$T_{NOM}$	25 °C
Manufacturer	Leica Geosystems AG Heinrich Wild Strasse 9435 Heerbrugg SWITZERLAND	

### 1.3 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
CBL	USB Kabel	Leica	764700	USB Kabel
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
Comment:				

#### 1.4 Test Modes

Mode	Description
HT20 (IEEE 802.11n)	Mode = Transmit Modulation = BPSK Spreading = OFDM Bandwidth = 20 MHz Duty cycle = 100% Power setting (1 Simultaneous Tx) = 30 MCS (1 Simultaneous Tx) = 0
Receive	Mode = Receive
Comment: The above settings were found as worst case during pre-tests.	



### 1.5 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx / Rx	1	2412
F2	Tx / Rx	6	2437
F3	Tx / Rx	11	2462

### 1.6 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 15C, ISED RSS-247				
Product Standard Reference	Requirement	Reference Method	Result	Remarks
RSS-Gen 6.6 Issue 4	Occupied Bandwidth	ANSI C63.10-2013	N/R	Informational only
FCC § 15.247(a)(2) ISED RSS-247 § 5.2 Issue 2	6 dB Bandwidth	ANSI C63.10-2013	N/T	
FCC § 15.247(b)(3) ISED RSS-247 § 5.4 Issue 2	Maximum peak conducted power	ANSI C63.10-2013	N/T	
FCC § 15.247(e) ISED RSS-247 § 5.2 Issue 2	Power spectral density	ANSI C63.10-2013	N/T	
FCC § 15.207 ISED RSS-247 § 3.1 Issue 2	AC power line conducted emissions	ANSI C63.10-2013	PASS	
FCC § 15.247(d) ISED RSS-247 § 5.5 Issue 2	Band edge compliance	ANSI C63.10-2013	N/T	
FCC § 15.247(d) ISED RSS-247 § 5.5 Issue 2	Conducted spurious emissions	ANSI C63.10-2013	N/T	
FCC § 15.247(d) FCC § 15.209 ISED RSS-GEN § 8.9 Issue 4	Transmitter radiated spurious emissions	ANSI C63.10-2013	PASS	
ISED RSS-247 § 3.1 Issue 2	Receiver radiated spurious emissions	ANSI C63.10-2013	PASS	
Comment:				

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

### 3 Test Conditions and Results

#### 3.1 Test Conditions and Results - Occupied bandwidth

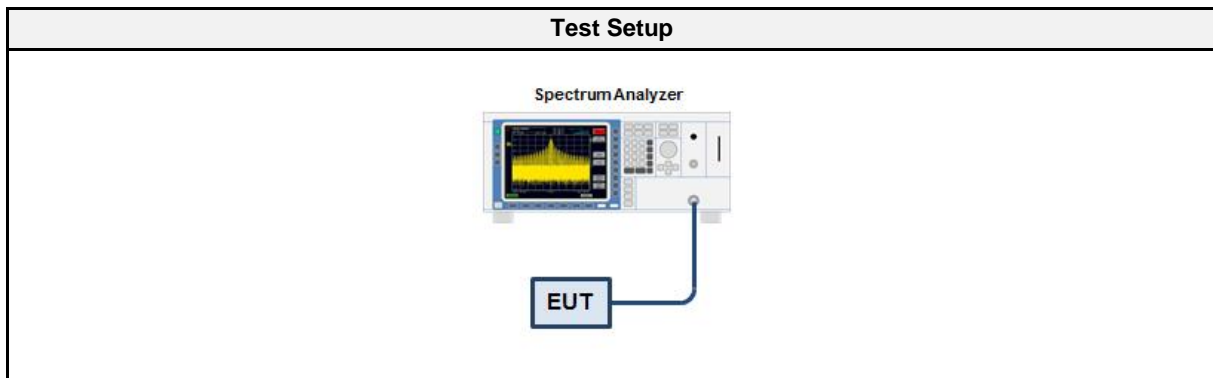
##### 3.1.1 Information

Test Information	
Reference	ISED RSS-Gen 6.6
Measurement Method	ANSI C63.10 6.9.3
Operator	Sebastian Suckow
Date	2018-07-20

##### 3.1.2 Limits

Limits
None (Informational only)

##### 3.1.3 Setup



##### 3.1.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 26	EF01003	2017-07	2018-07

##### 3.1.5 Procedure

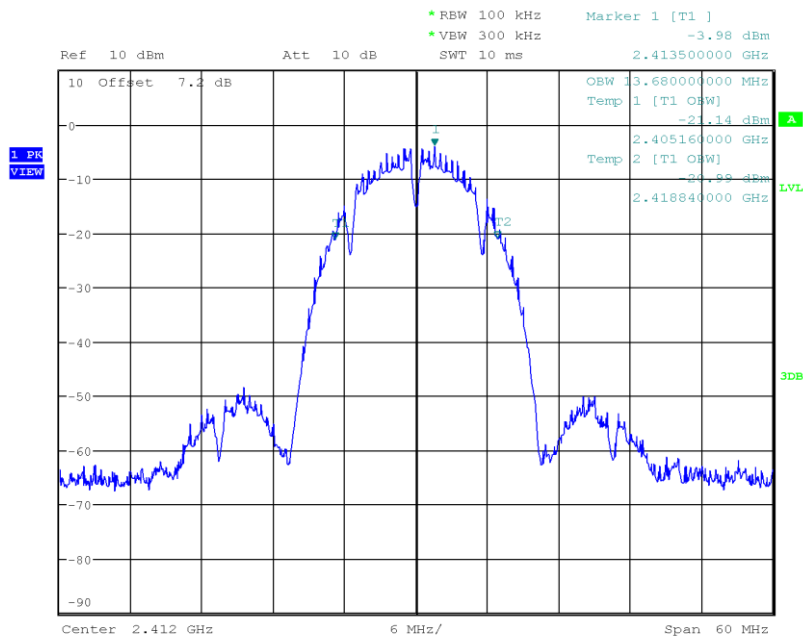
Test Procedure
<ol style="list-style-type: none"> <li>1. EUT transmitter is activated in test mode under normal conditions</li> <li>2. The spectrum analyzer is set to peak detection and maximum hold with a span twice the emission spectrum</li> <li>3. The resolution bandwidth is set to 1 % of the bandwidth</li> <li>4. The occupied bandwidth is measured with the build-in analyzer function</li> </ol>

## 3.1.6 Results

Test Results		
Mode	Frequency [MHz]	Bandwidth [MHz]
DSSS	2412	13.680
DSSS	2437	13.740
DSSS	2462	13.800
OFDM	2412	16.440
OFDM	2437	16.440
OFDM	2462	16.440
HT20	2412	17.640
HT20	2437	17.580
HT20	2462	17.640

### Occupied Bandwidth

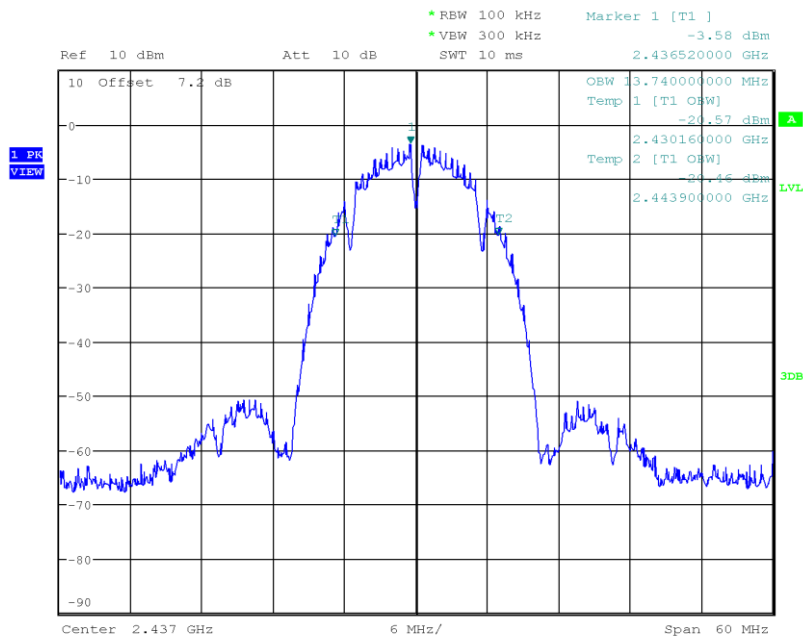
Project Number: G0M-1807-7540  
 Applicant: Leica Geosystems AG  
 Model Description: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Sample ID: 19294  
 Reference Method: ANSI C63.10:2013, Section 6.9.3  
 Operational Mode: IEEE 802.11 b, Channel: 1, 2412  
 Operating Conditions: Tnom/Vnom  
 Operator: S. Suckow  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2018-07-20  
 Occupied Bandwidth [MHz]: 13.680



Date: 20.JUL.2018 13:17:18

### Occupied Bandwidth

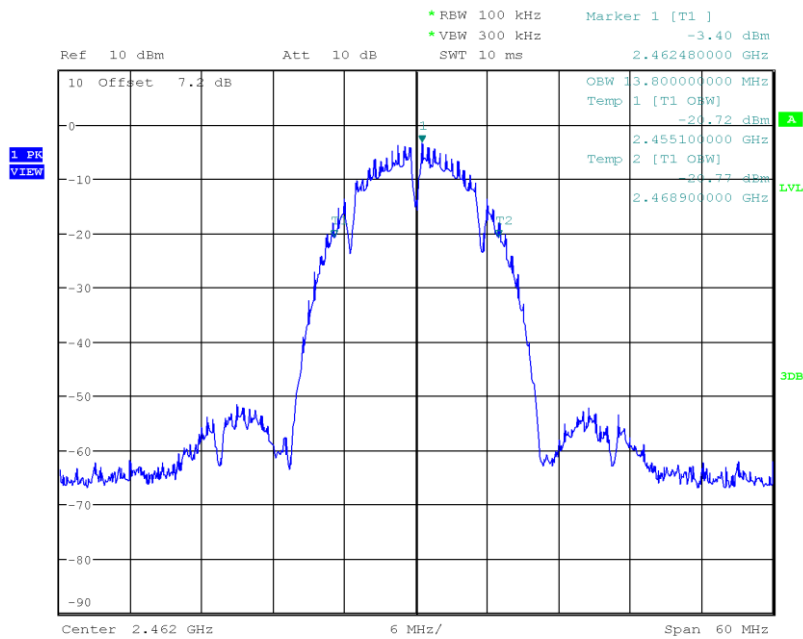
Project Number: G0M-1807-7540  
 Applicant: Leica Geosystems AG  
 Model Description: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Sample ID: 19294  
 Reference Method: ANSI C63.10:2013, Section 6.9.3  
 Operational Mode: IEEE 802.11 b, Channel: 6, 2437  
 Operating Conditions: Tnom/Vnom  
 Operator: S. Suckow  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2018-07-20  
 Occupied Bandwidth [MHz]: 13.740



Date: 20.JUL.2018 13:17:56

### Occupied Bandwidth

Project Number: G0M-1807-7540  
 Applicant: Leica Geosystems AG  
 Model Description: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Sample ID: 19294  
 Reference Method: ANSI C63.10:2013, Section 6.9.3  
 Operational Mode: IEEE 802.11 b, Channel: 11, 2462  
 Operating Conditions: Tnom/Vnom  
 Operator: S. Suckow  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2018-07-20  
 Occupied Bandwidth [MHz]: 13.800

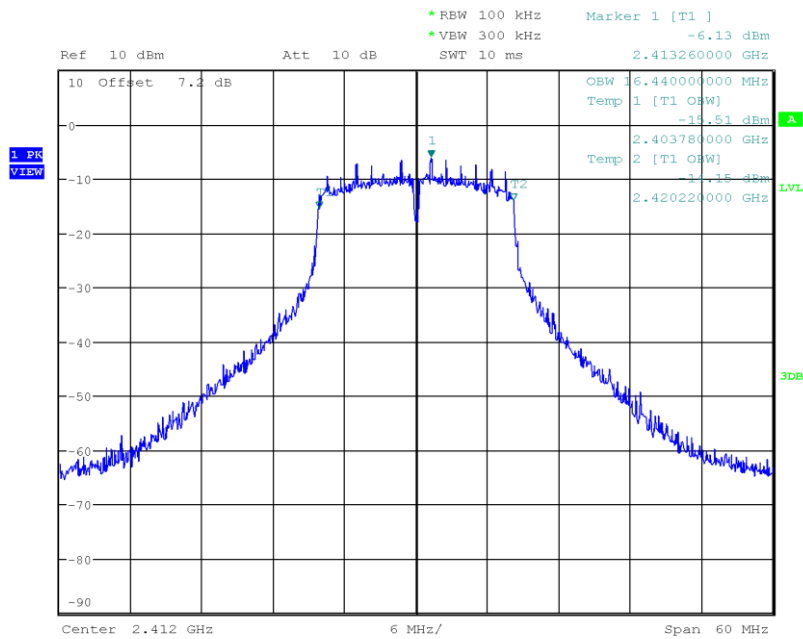


Date: 20.JUL.2018 13:18:39



### Occupied Bandwidth

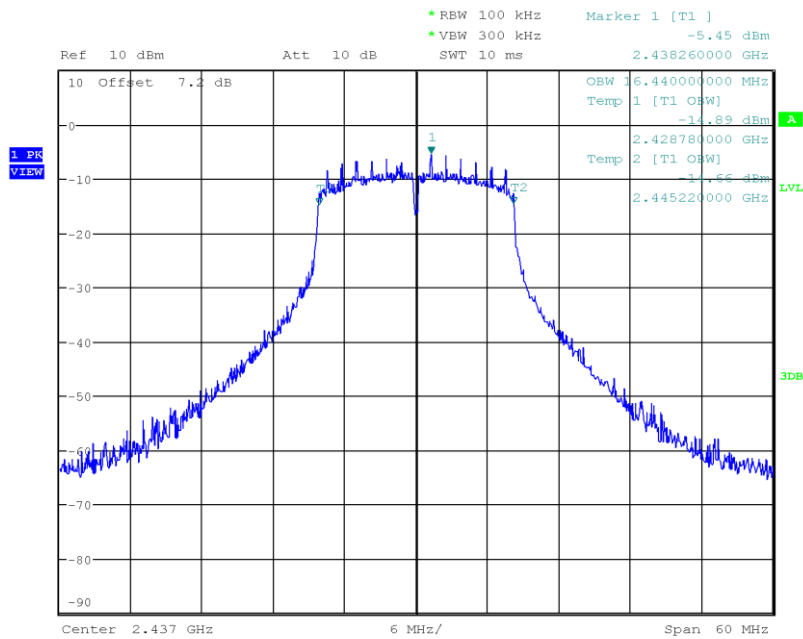
Project Number: G0M-1807-7540  
 Applicant: Leica Geosystems AG  
 Model Description: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Sample ID: 19294  
 Reference Method: ANSI C63.10:2013, Section 6.9.3  
 Operational Mode: IEEE 802.11 g, Channel: 1, 2412  
 Operating Conditions: Tnom/Vnom  
 Operator: S. Suckow  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2018-07-20  
 Occupied Bandwidth [MHz]: 16.440



Date: 20.JUL.2018 13:19:35

### Occupied Bandwidth

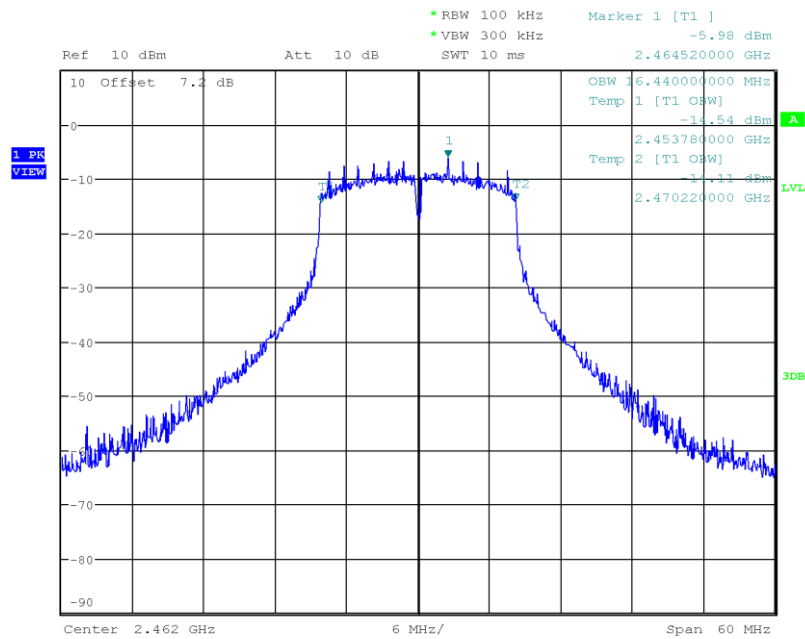
Project Number: G0M-1807-7540  
 Applicant: Leica Geosystems AG  
 Model Description: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Sample ID: 19294  
 Reference Method: ANSI C63.10:2013, Section 6.9.3  
 Operational Mode: IEEE 802.11 g, Channel: 6, 2437  
 Operating Conditions: Tnom/Vnom  
 Operator: S. Suckow  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2018-07-20  
 Occupied Bandwidth [MHz]: 16.440



Date: 20.JUL.2018 13:20:18

## Occupied Bandwidth

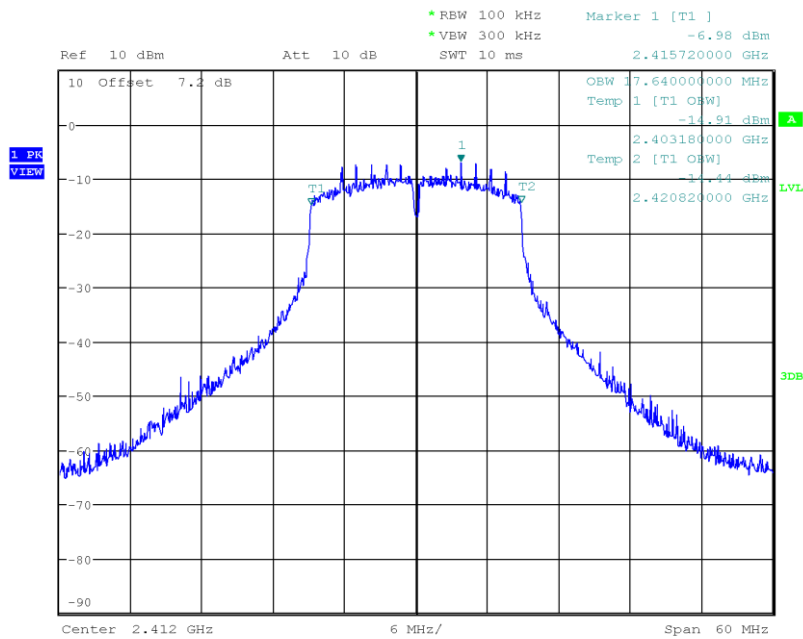
Project Number: G0M-1807-7540  
 Applicant: Leica Geosystems AG  
 Model Description: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Sample ID: 19294  
 Reference Method: ANSI C63.10:2013, Section 6.9.3  
 Operational Mode: IEEE 802.11 g, Channel: 11, 2462  
 Operating Conditions: Tnom/Vnom  
 Operator: S. Suckow  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2018-07-20  
 Occupied Bandwidth [MHz]: 16.440



Date: 20.JUL.2018 13:20:58

### Occupied Bandwidth

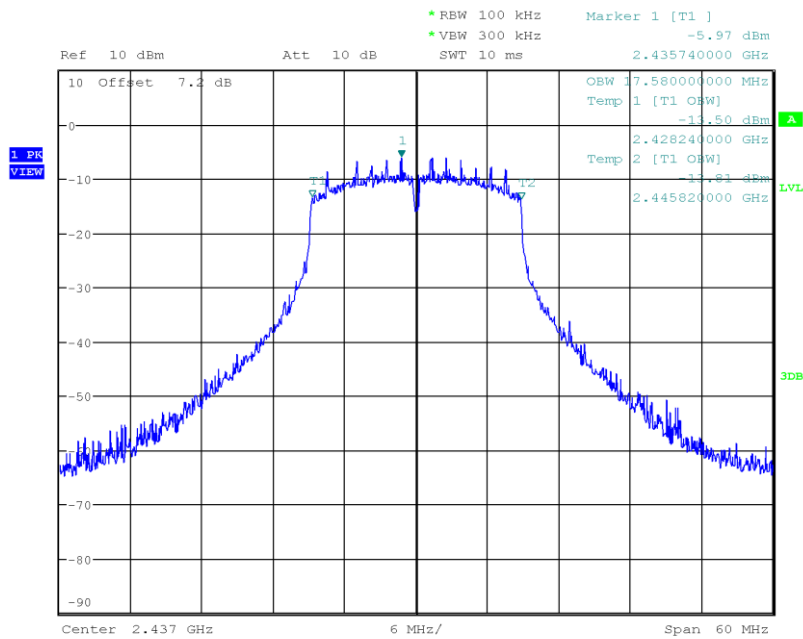
Project Number: G0M-1807-7540  
 Applicant: Leica Geosystems AG  
 Model Description: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Sample ID: 19294  
 Reference Method: ANSI C63.10:2013, Section 6.9.3  
 Operational Mode: IEEE 802.11 n HT20, Channel: 1, 2412  
 Operating Conditions: Tnom/Vnom  
 Operator: S. Suckow  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2018-07-20  
 Occupied Bandwidth [MHz]: 17.640



Date: 20.JUL.2018 13:21:55

### Occupied Bandwidth

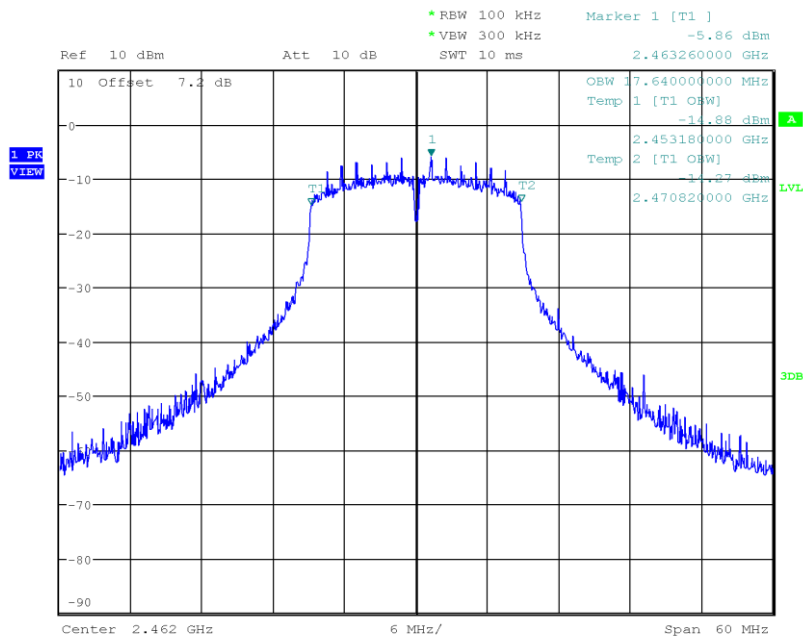
Project Number: G0M-1807-7540  
 Applicant: Leica Geosystems AG  
 Model Description: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Sample ID: 19294  
 Reference Method: ANSI C63.10:2013, Section 6.9.3  
 Operational Mode: IEEE 802.11 n HT20, Channel: 6, 2437  
 Operating Conditions: Tnom/Vnom  
 Operator: S. Suckow  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2018-07-20  
 Occupied Bandwidth [MHz]: 17.580



Date: 20.JUL.2018 13:22:52

### Occupied Bandwidth

Project Number: G0M-1807-7540  
 Applicant: Leica Geosystems AG  
 Model Description: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Sample ID: 19294  
 Reference Method: ANSI C63.10:2013, Section 6.9.3  
 Operational Mode: IEEE 802.11 n HT20, Channel: 11, 2462  
 Operating Conditions: Tnom/Vnom  
 Operator: S. Suckow  
 Test Site: Eurofins Product Service GmbH  
 Test Date: 2018-07-20  
 Occupied Bandwidth [MHz]: 17.640



Date: 20.JUL.2018 13:23:39

### 3.2 Test Conditions and Results - AC powerline conducted emissions

#### 3.2.1 Information

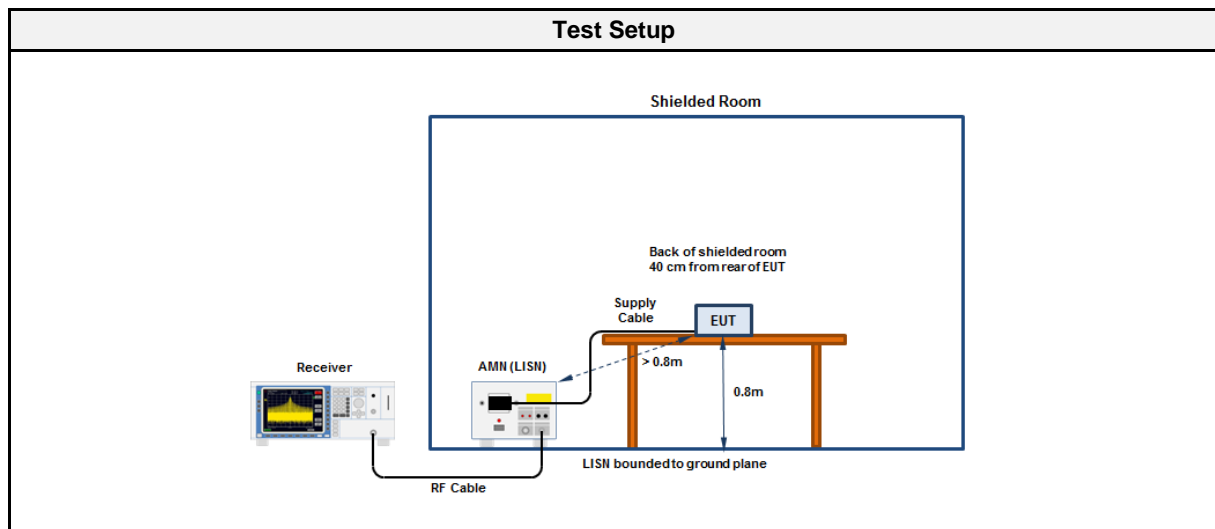
Test Information	
Reference	FCC 15.207
Measurement Method	ANSI C63.10 6.2
Operator	Sebastian Suckow
Date	2018-07-19

#### 3.2.2 Limits

Limits		
Frequency [MHz]	Quasi-Peak [dB $\mu$ V]	Average [dB $\mu$ V]
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5	56	46
5 - 30	60	50

\* Limit decreases linearly with the logarithm of the frequency

#### 3.2.3 Setup



#### 3.2.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	R&S	ESU 26	EF00241	2017-07	2019-07
LISN	R&S	ESH2-Z5	EF00182	2017-01	2019-01

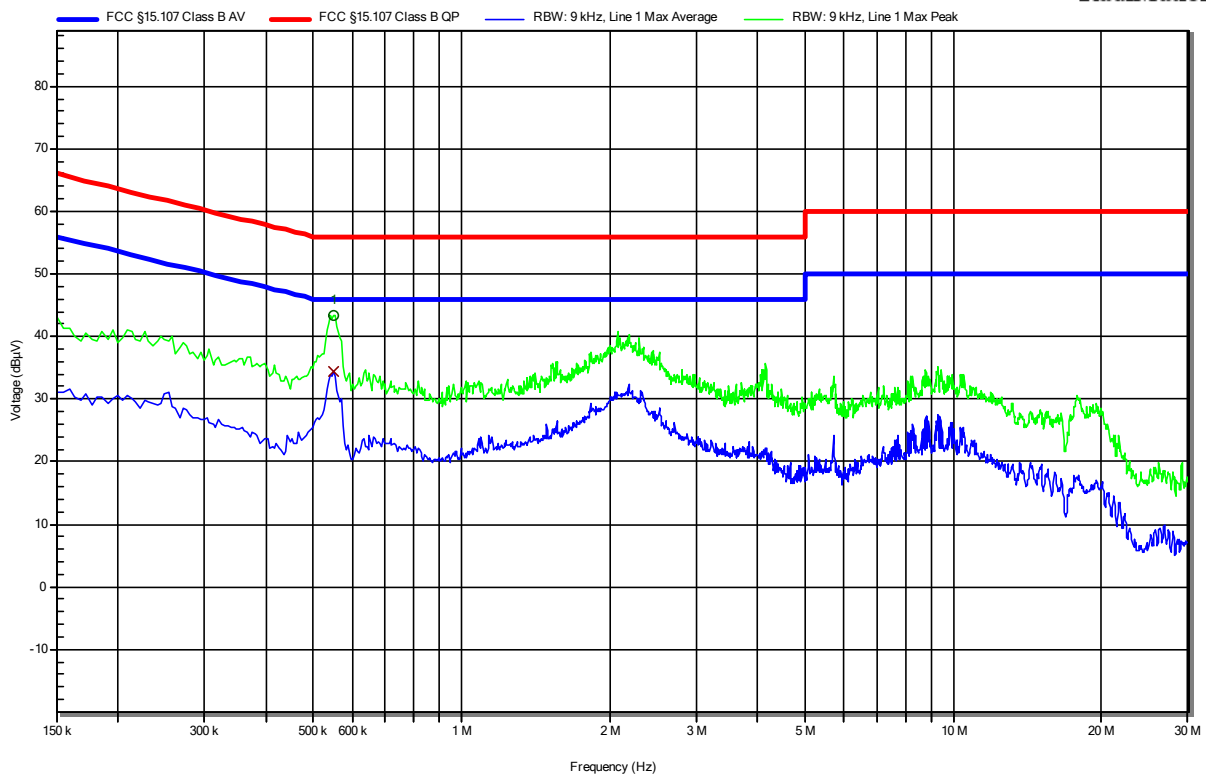
**EMI voltage test in the ac-mains according to FCC part 15B**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Suckow  
 Test Conditions: Tnom: 24°C, Unom: 7.0 VDC  
 LISN: ESH2-Z5 L  
 Mode: IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-19  
 Note: Plus

Index 2

**RadiMation**



Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status
1	550.5 kHz	34.44 dBµV	46 dBµV	-11.56 dB	Pass

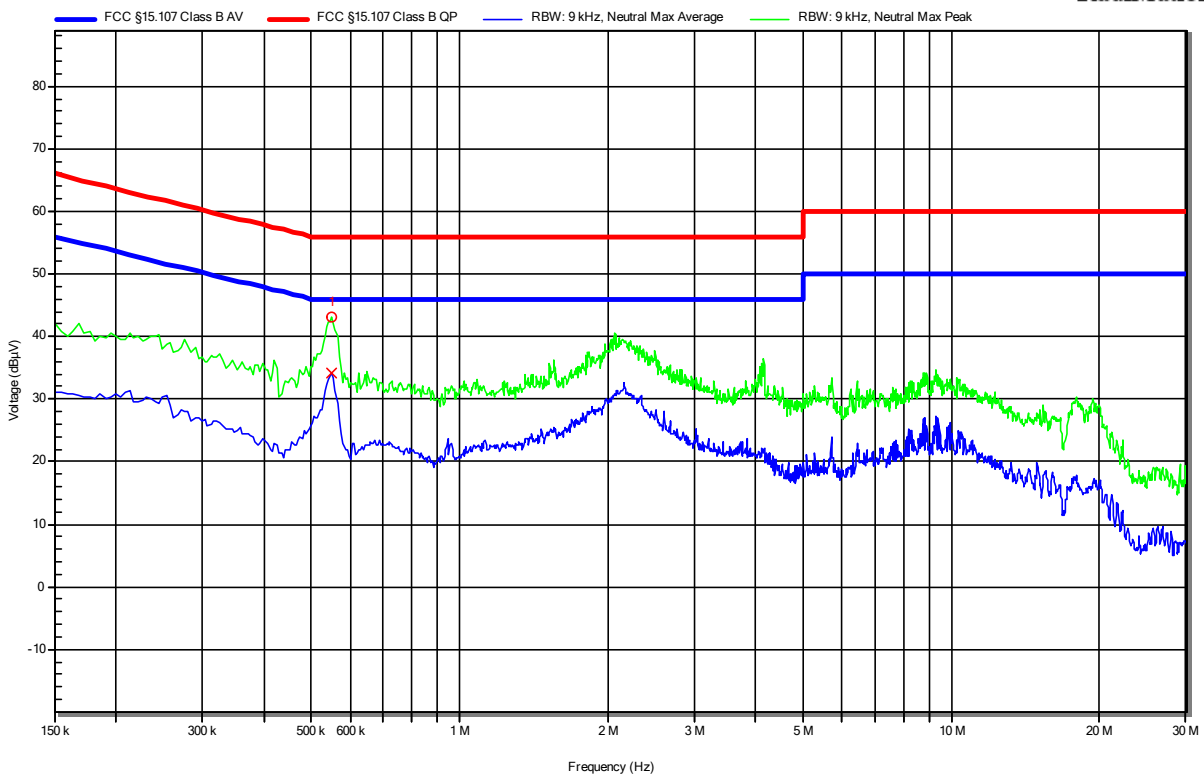


### EMI voltage test in the ac-mains according to FCC part 15B

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Suckow  
 Test Conditions: Tnom: 24°C, Unom: 7.0 VDC  
 LISN: ESH2-Z5 N  
 Mode: IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-19  
 Note: Minus

Index 1  
**RadiMation**



Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status
1	550.5 kHz	34.25 dBµV	46 dBµV	-11.75 dB	Pass

### 3.3 Test Conditions and Results - Transmitter radiated emissions

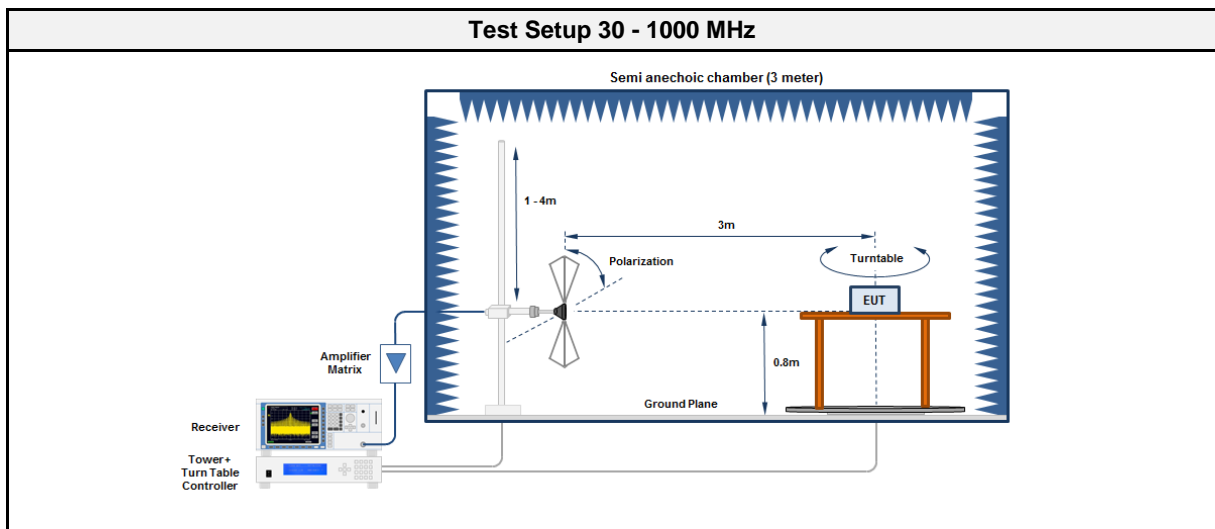
#### 3.3.1 Information

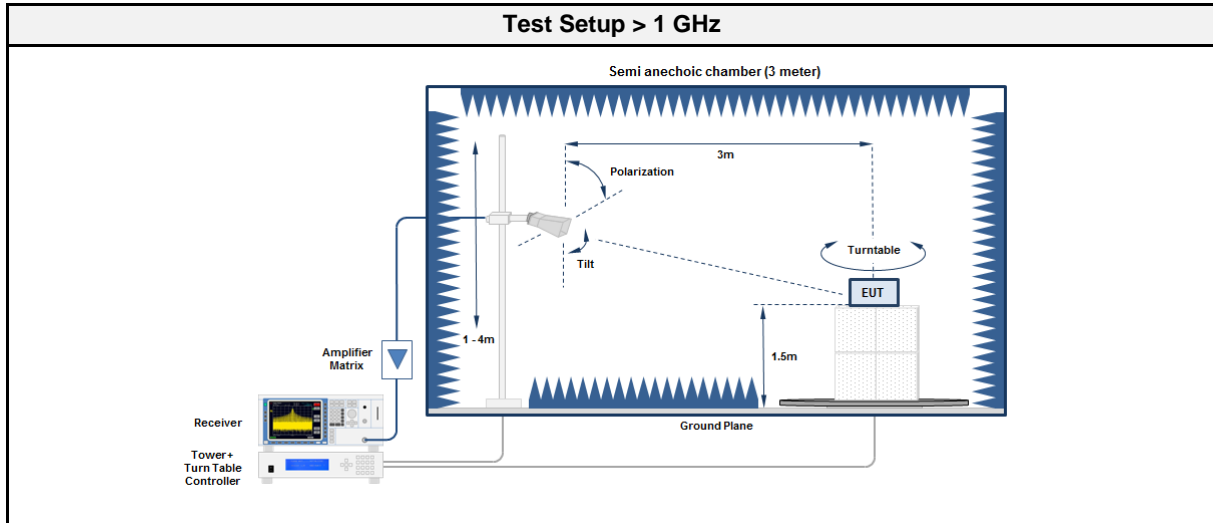
Test Information	
Reference	FCC 15.247(d) / ISED RSS-GEN 8.9
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6, 11.12
Operator	Sebastian Suckow
Date	2018-07-18 – 2018-07-20

#### 3.3.2 Limits

Limits			
Frequency [MHz]	Detector	Field strength [ $\mu\text{V}/\text{m}$ ]	Measurement distance [m]
0.009 - 0.09	Average	2400/F[kHz]	300
0.09 - 0.110	Quasi-Peak	2400/F[kHz]	300
0.110 - 0.490	Average	2400/F[kHz]	300
0.490 - 1.705	Quasi-Peak	24000/F[kHz]	30
1.705 - 30.0	Quasi-Peak	30	30
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

#### 3.3.3 Setup





### 3.3.4 Equipment

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	-	-
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2017-08	2018-08
Antenna	R&S	HK 116	EF00203	2018-06	2020-06
Antenna	R&S	HL 223	EF00212	2016-04	2019-04

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	-	-
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2017-08	2018-08
Antenna	R&S	BBHA 9120D	EF01153	2017-08	2018-08
Antenna	Amplifier Research	AT4560	EF01152	2017-10	2018-10

### 3.3.5 Procedure

Test Procedure 30 - 1000 MHz
<ol style="list-style-type: none"> <li>EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground</li> <li>EUT set to test mode</li> <li>The receiver is set to peak detection with max hold</li> <li>The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m</li> <li>All significant emissions are measured again using the corresponding final detector</li> </ol>

Test Procedure > 1 GHz
<ol style="list-style-type: none"> <li>EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground</li> <li>EUT set to test mode</li> <li>The receiver is set to peak detection with max hold</li> <li>The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m</li> <li>All significant emissions are measured again using the corresponding final detector</li> </ol>

## 3.3.6 Results

Test Results - HT20						
Channel [MHz]	Emission [MHz]	Level [dB $\mu$ V/m]	Det.	Pol.	Limit [dB $\mu$ V/m]	Margin [dB]
2412	109.685	38.10	pk	hor	43.50	-05.45
2412	2399.9	78.69	pk	hor	95.00	-16.31
2412	2399.9	67.79	pk	ver	95.00	-27.21
2412	2490.8	53.17	pk	hor	74.00	-20.83
2412	2499.8	51.47	pk	ver	74.00	-22.53
2412	4827	60.09	pk	hor	74.00	-13.91
2437	108.905	37.80	pk	hor	43.50	-05.68
2437	4873	53.23	pk	hor	74.00	-20.77
2462	110.7059	37.80	pk	hor	43.50	-05.69
2462	2483.7	58.35	pk	hor	74.00	-15.65
2462	4923	45.31	pk	hor	74.00	-28.69

### 3.4 Test Conditions and Results - Receiver radiated emissions

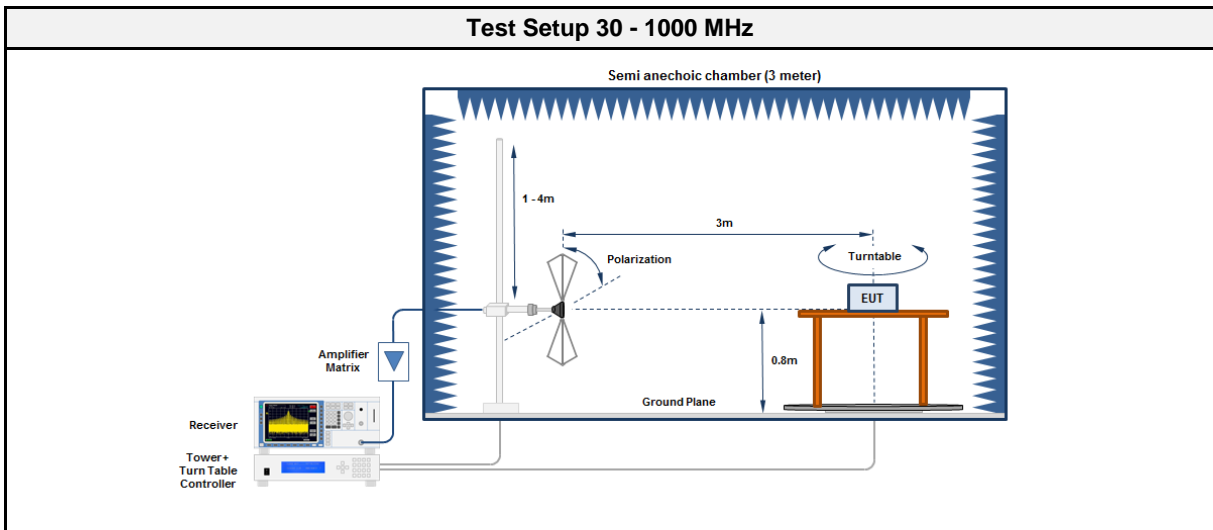
#### 3.4.1 Information

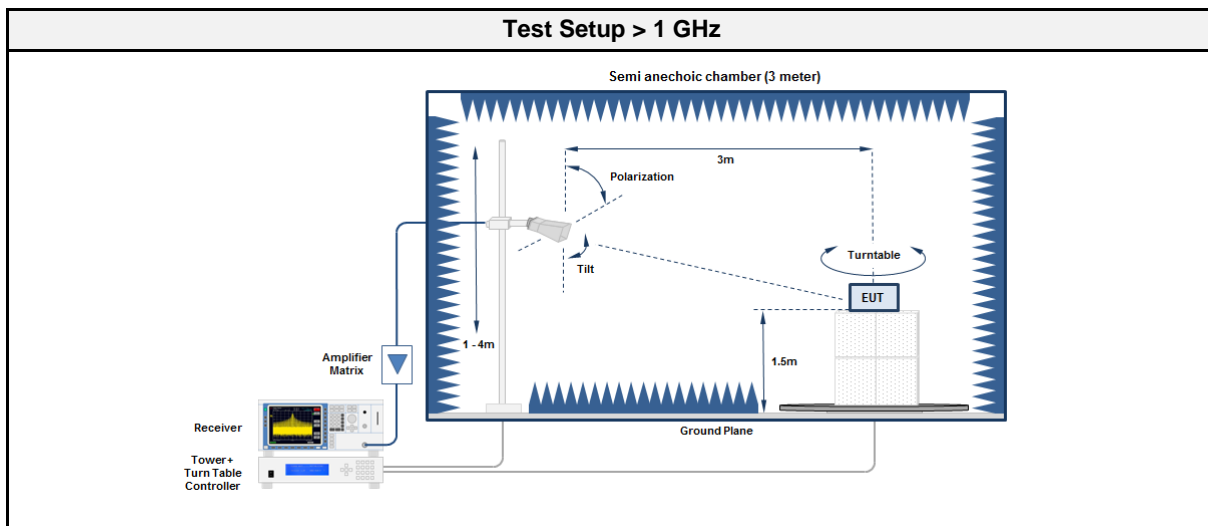
Test Information	
Reference	ISED RSS-247 3.1
Measurement Method	ANSI C63.10 6.5, 6.6, 11.12
Operator	Sebastian Suckow
Date	2018-07-18 – 2018-07-20

#### 3.4.2 Limits

Limits			
Frequency [MHz]	Detector	Field strength [dB $\mu$ V/m]	Measurement distance [m]
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

#### 3.4.3 Setup





### 3.4.4 Equipment

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	-	-
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2017-08	2018-08
Antenna	R&S	HK 116	EF00203	2018-06	2020-06
Antenna	R&S	HL 223	EF00212	2016-04	2019-04

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	-	-
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2017-08	2018-08
Antenna	R&S	BBHA 9120D	EF01153	2017-08	2018-08

### 3.4.5 Procedure

Test Procedure 30 - 1000 MHz	
1.	EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground
2.	EUT set to test mode
3.	The receiver is set to peak detection with max hold
4.	The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m
5.	All significant emissions are measured again using the corresponding final detector

Test Procedure > 1 GHz	
1.	EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground
2.	EUT set to test mode
3.	The receiver is set to peak detection with max hold
4.	The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m
5.	All significant emissions are measured again using the corresponding final detector

## 3.4.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dB $\mu$ V/m]	Det.	Pol.	Limit [dB $\mu$ V/m]	Margin [dB]
2437	110.6458	38.30	pk	hor	43.50	-05.25
2437	1195	49.50	pk	hor	53.98	-04.48

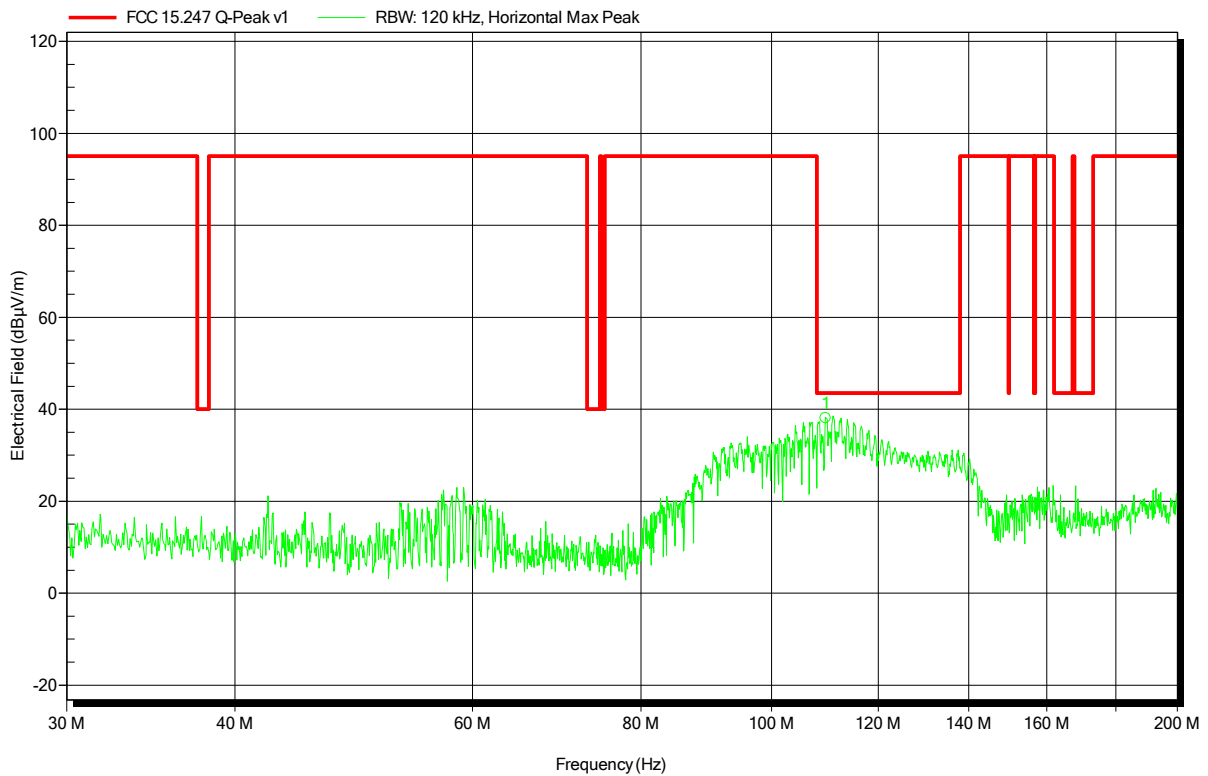
## ANNEX A Transmitter spurious emissions

### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Suckow  
 Test Conditions: Tnom: 22°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HK 116, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-20  
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
109.685 MHz	38.1 dBµV/m	43.5 dBµV/m	-5.45 dB	Pass

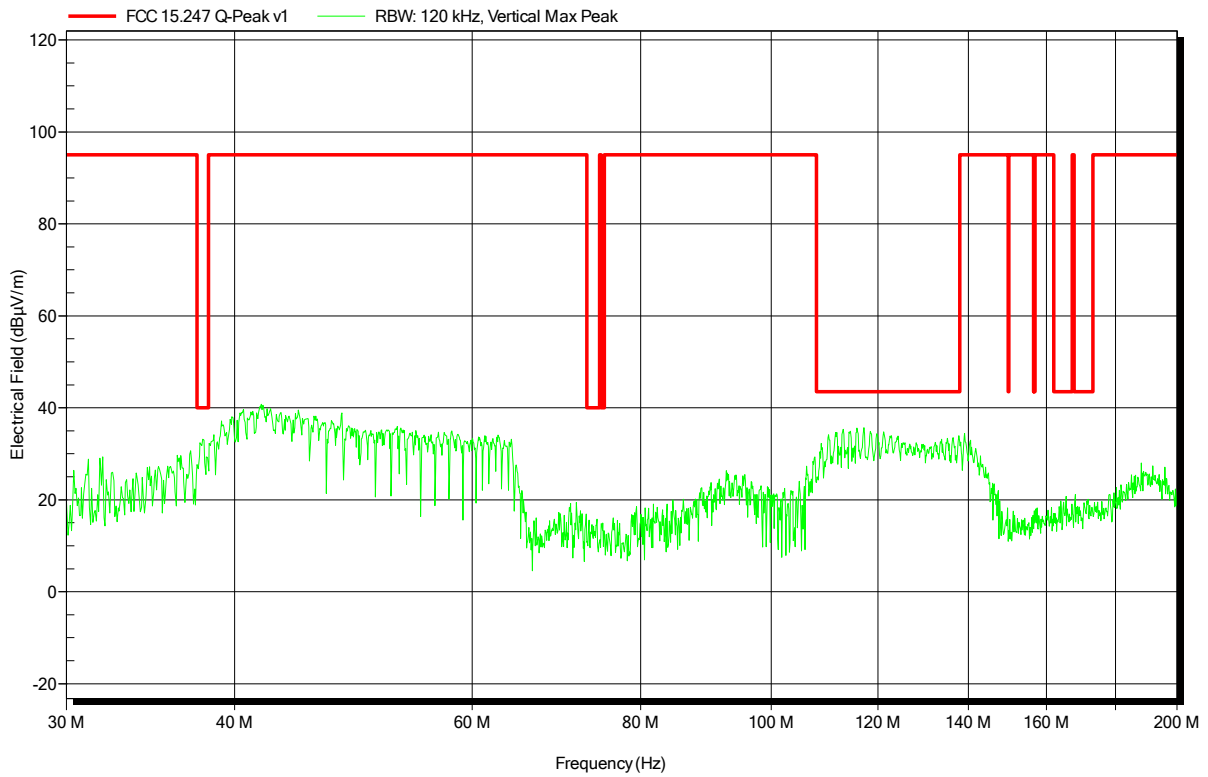


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Suckow  
 Test Conditions: Tnom: 22°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HK 116, Vertical  
 Measurement distance: 3 m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-20  
 Note:

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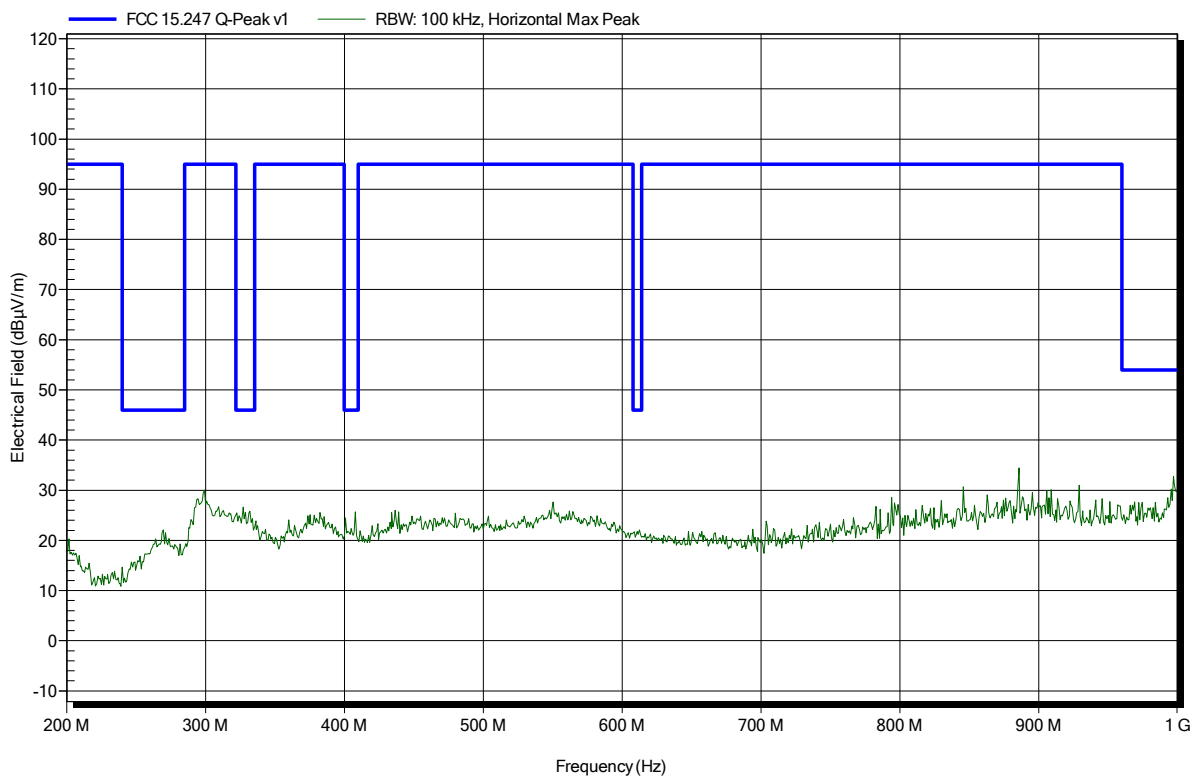


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HL 223, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note:

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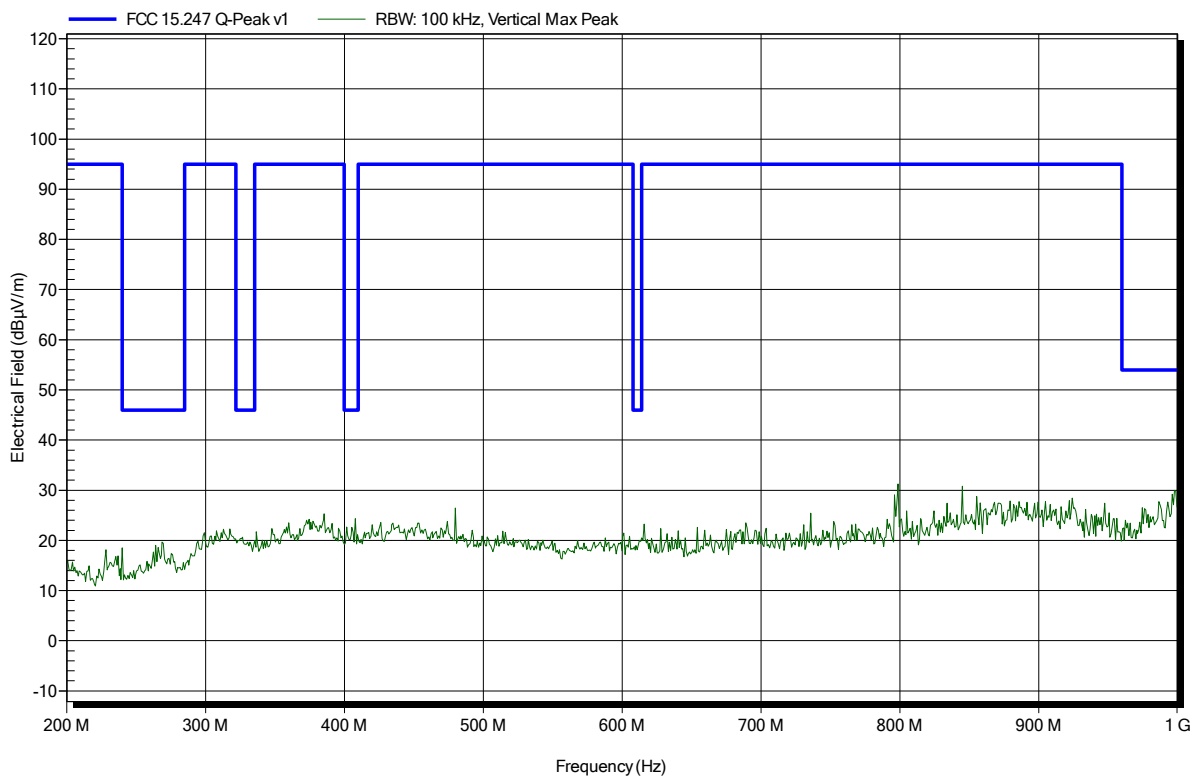


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HL 223, Vertical  
 Measurement distance: 3 m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note:

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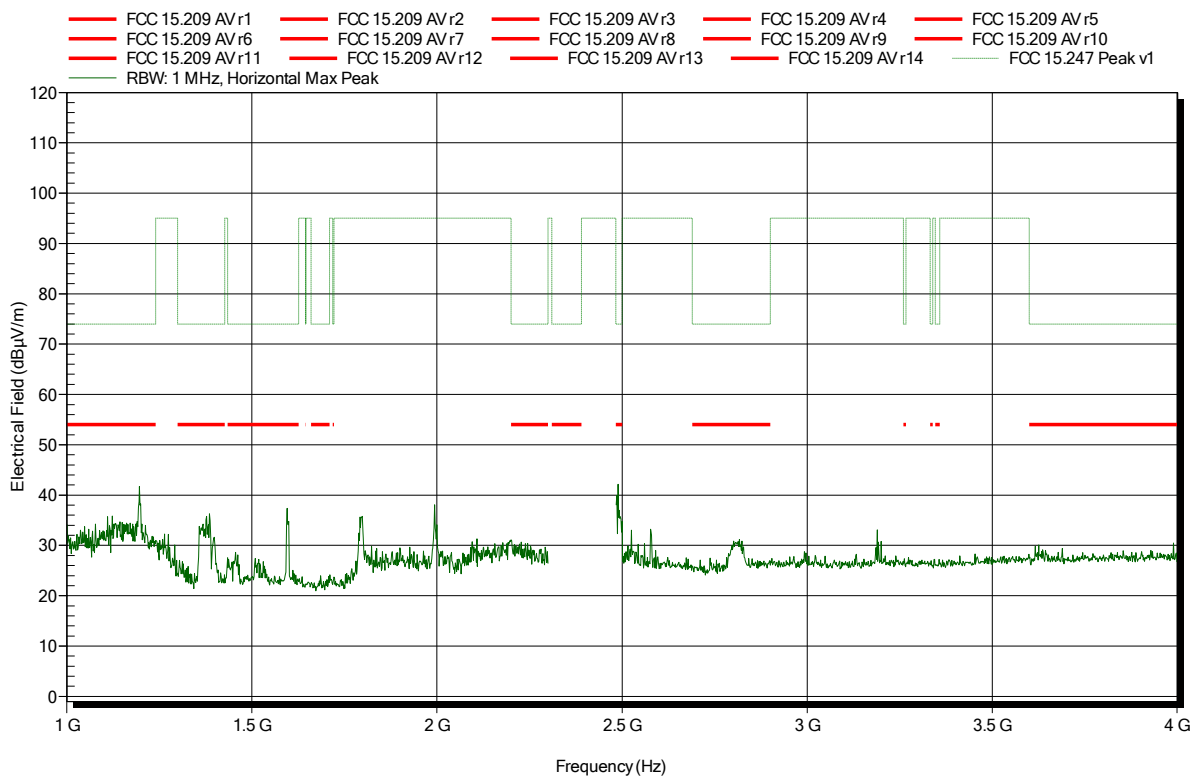


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note:

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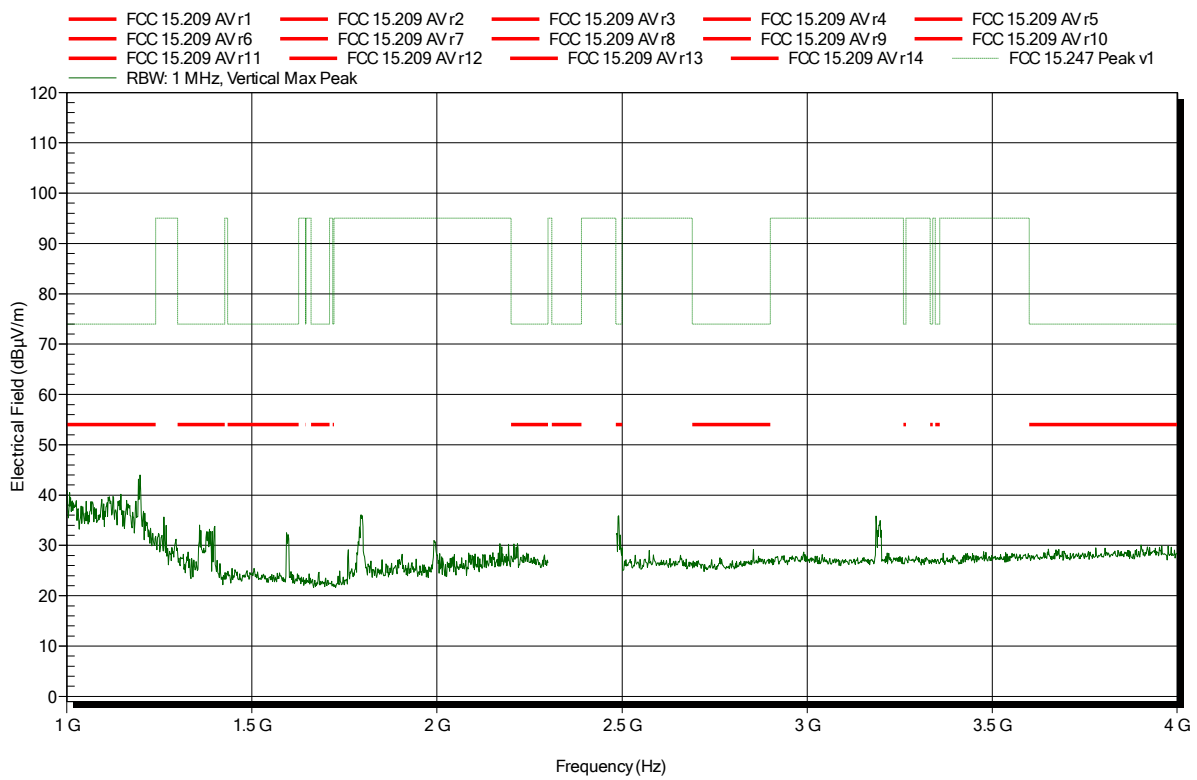


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note:

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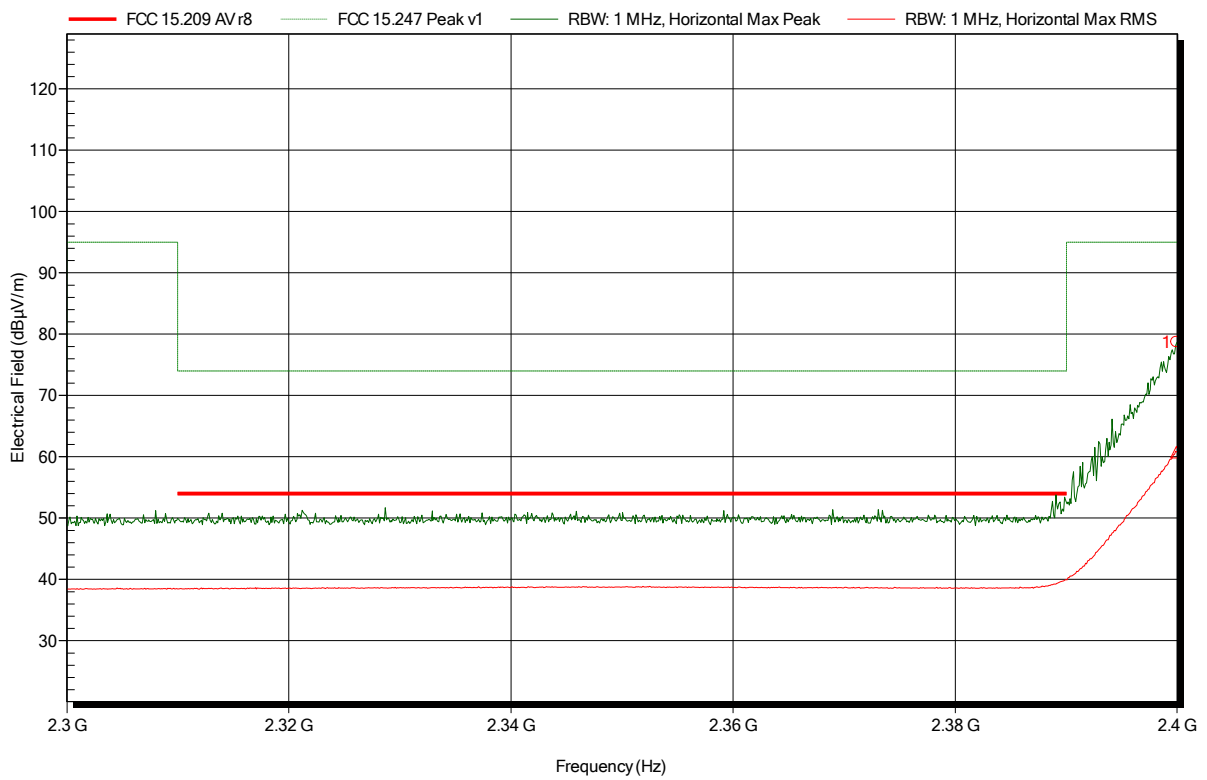


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note: lower bandedge

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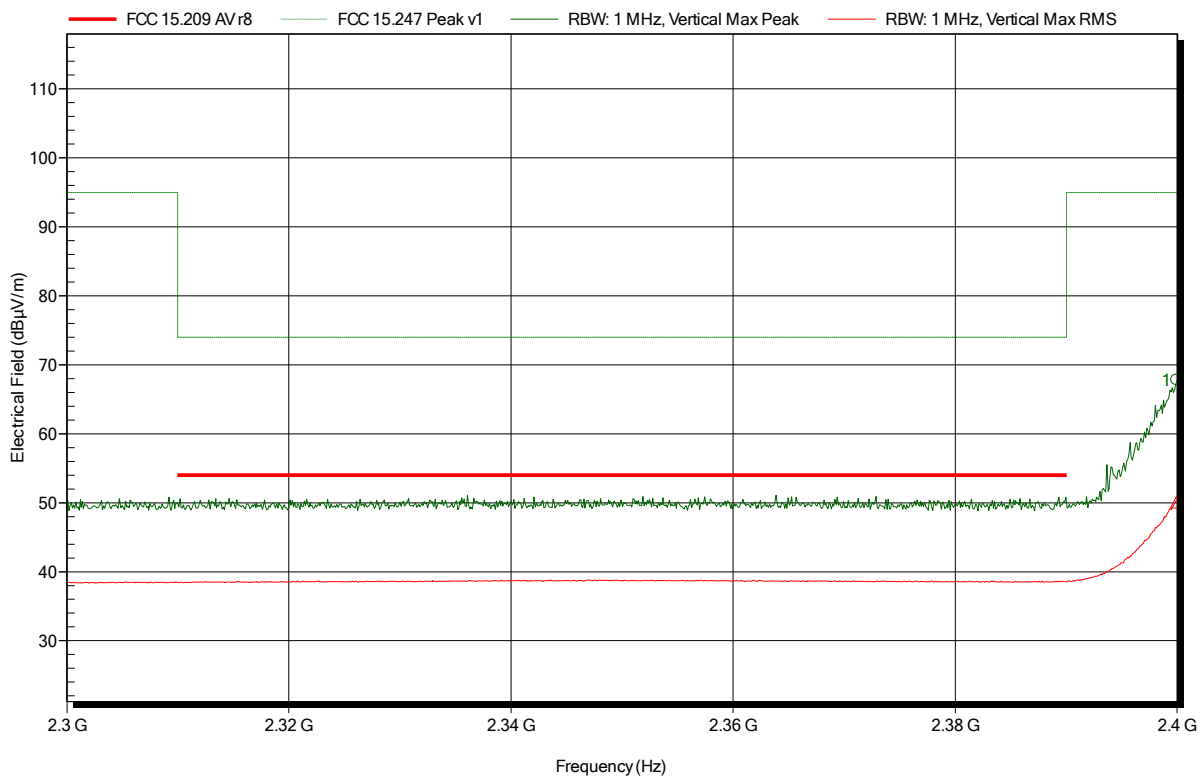
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.3999 GHz	78.69 dBµV/m	95 dBµV/m	-16.31 dB	Pass
Frequency	RMS			
2.3999 GHz	60.77 dBµV/m			

### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note: lower bandedge

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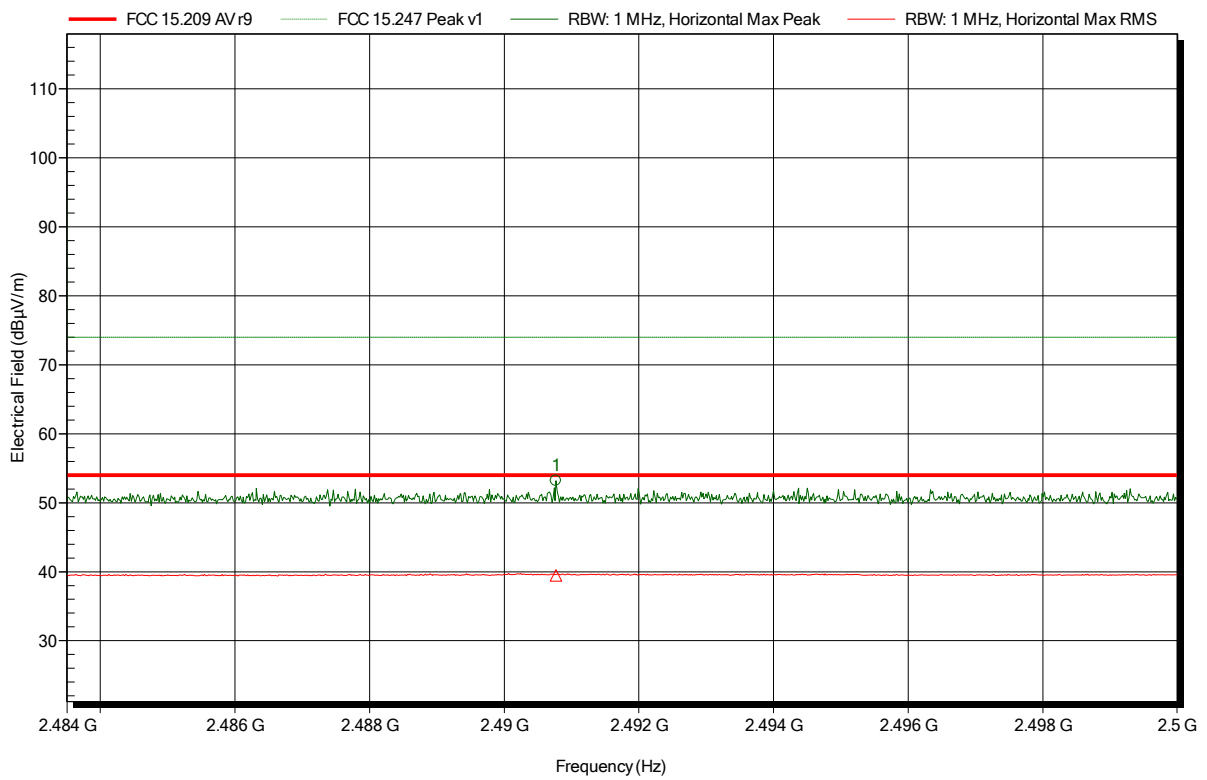
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.3999 GHz	67.79 dBµV/m	95 dBµV/m	-27.21 dB	Pass
Frequency			RMS	
2.3999 GHz			50.06 dBµV/m	

**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note: upper bandedge

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Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4908 GHz	53.17 dBµV/m	74 dBµV/m	-20.83 dB	Pass
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4908 GHz	39.48 dBµV/m	54 dBµV/m	-14.52 dB	Pass

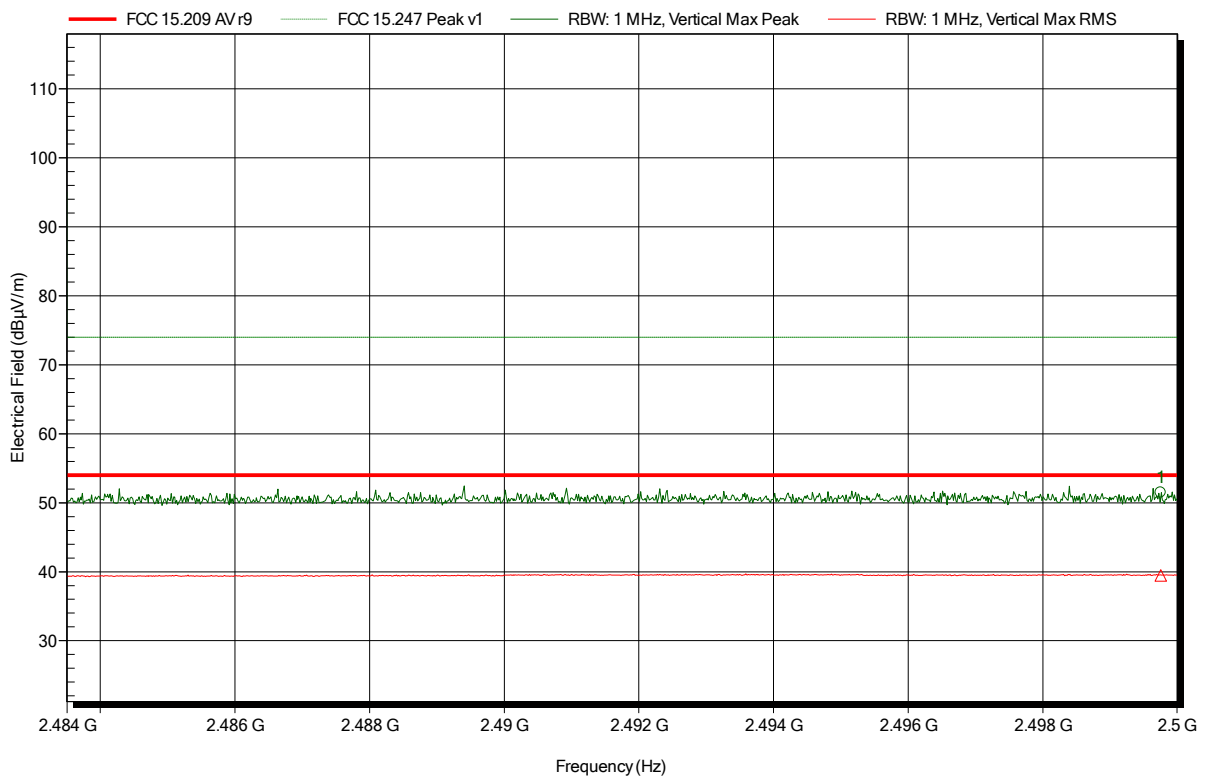


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note: upper bandedge

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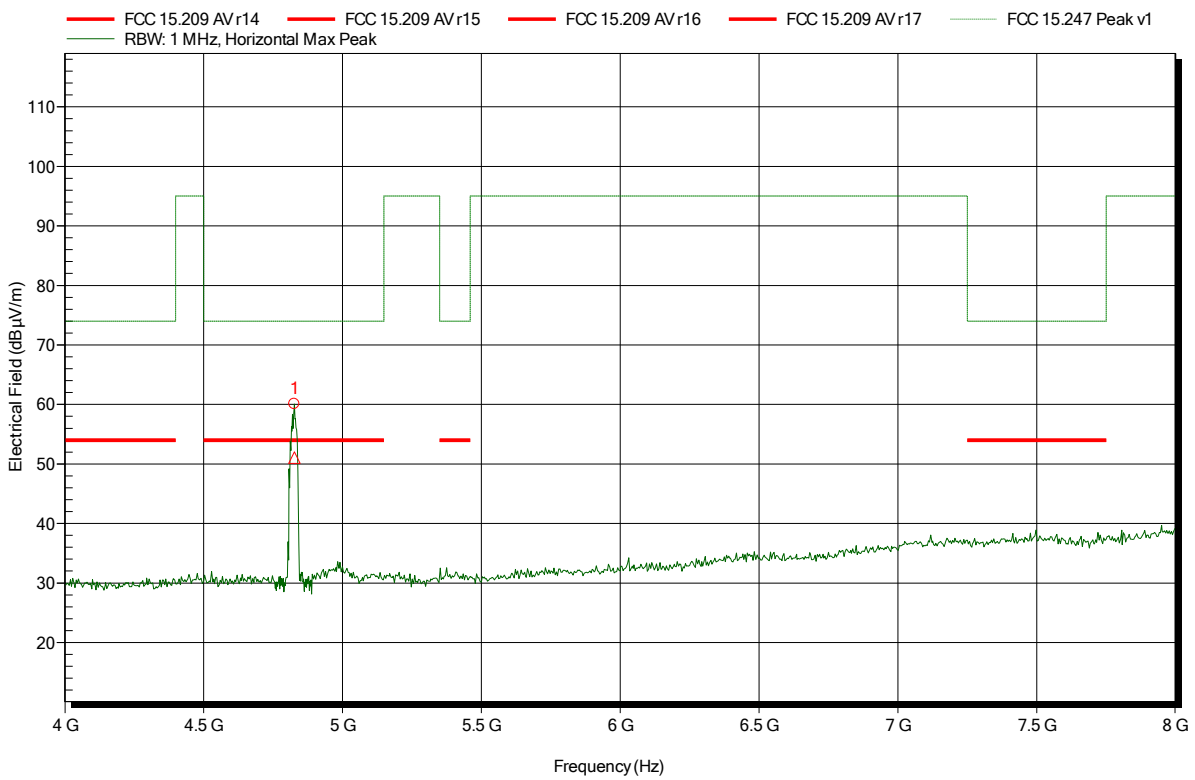
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4998 GHz	51.47 dBµV/m	74 dBµV/m	-22.53 dB	Pass
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4998 GHz	39.45 dBµV/m	54 dBµV/m	-14.55 dB	Pass

**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note:

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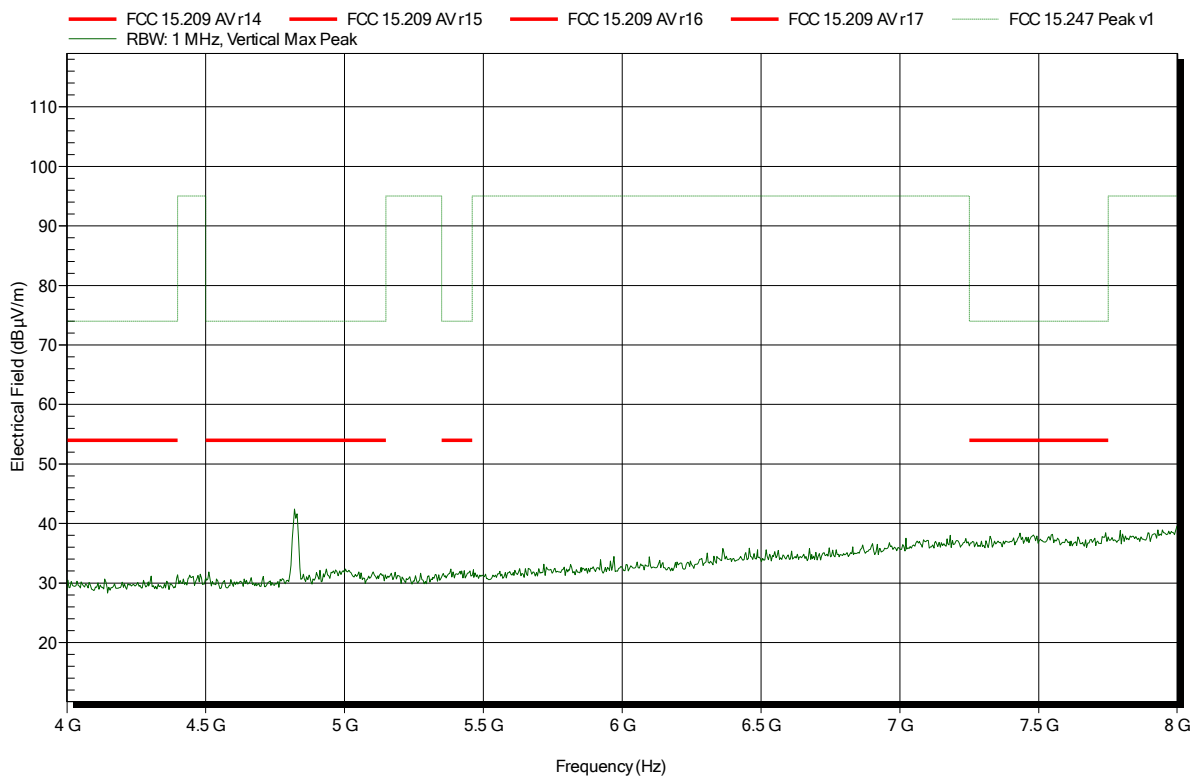
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.827 GHz	60.09 dBµV/m	74 dBµV/m	-13.91 dB	Pass
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.827 GHz	51.09 dBµV/m	54 dBµV/m	-2.91 dB	Pass

### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note:

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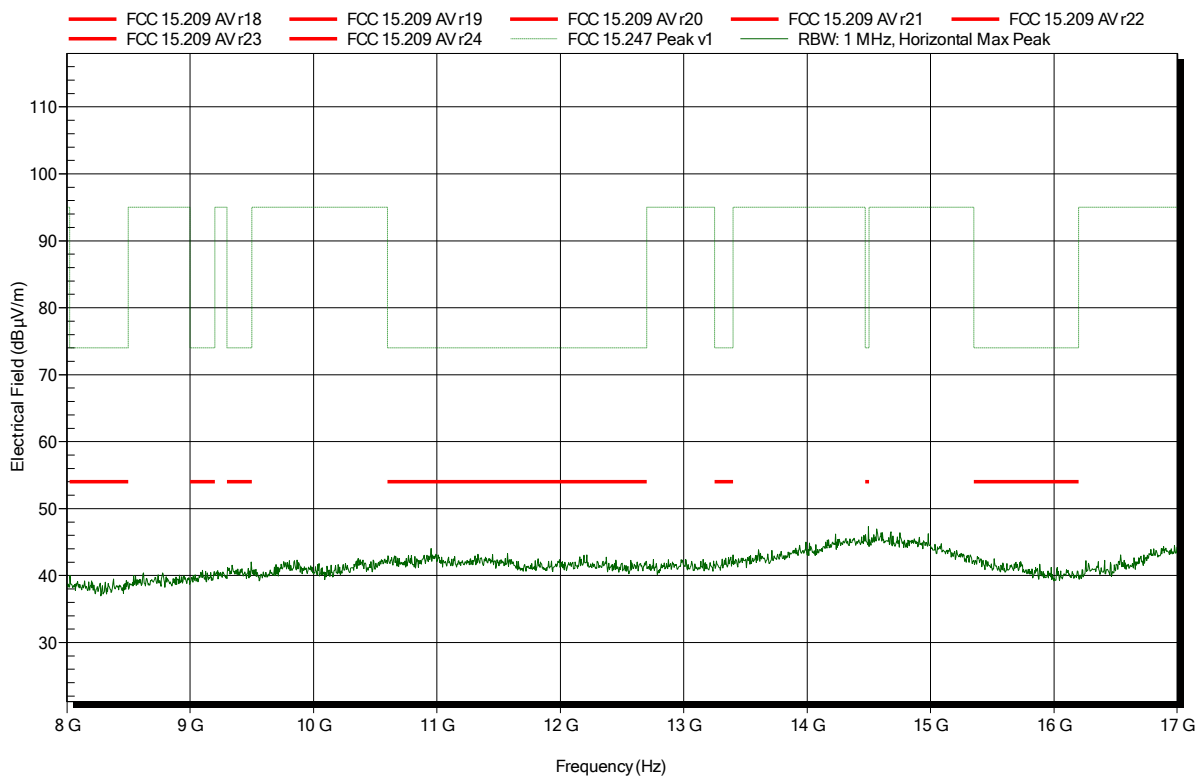


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note:

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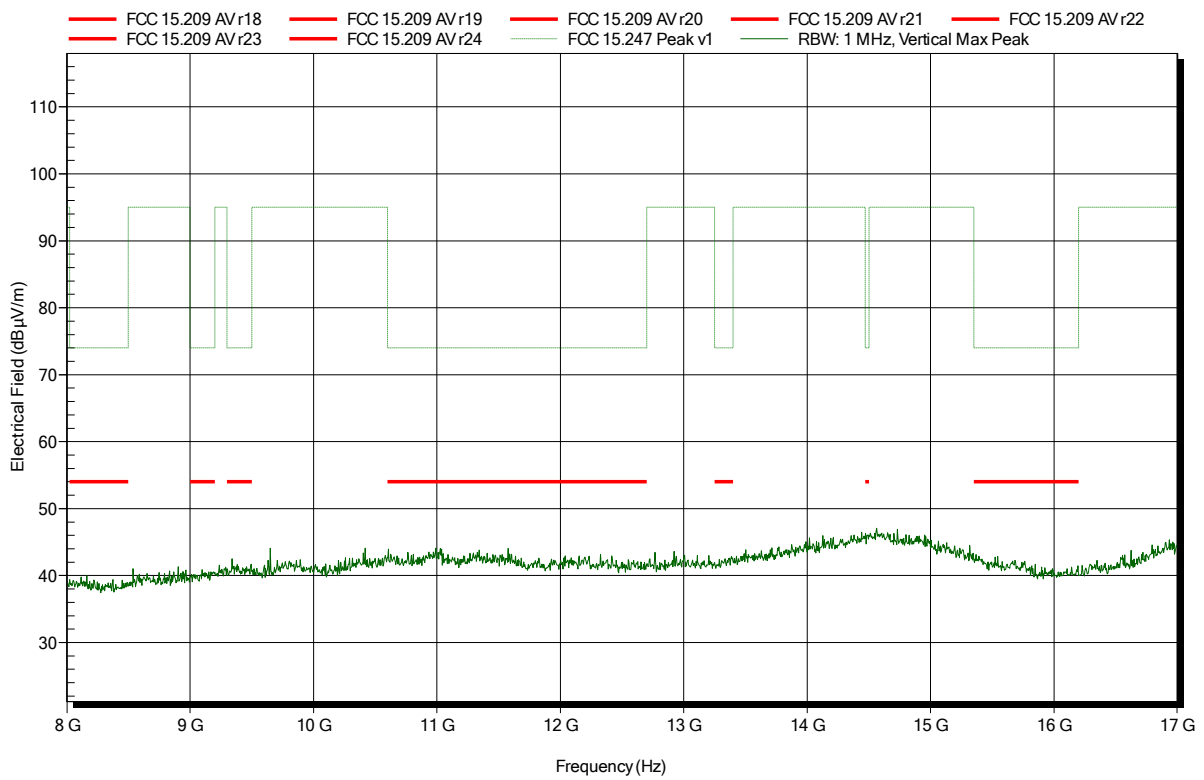


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note:

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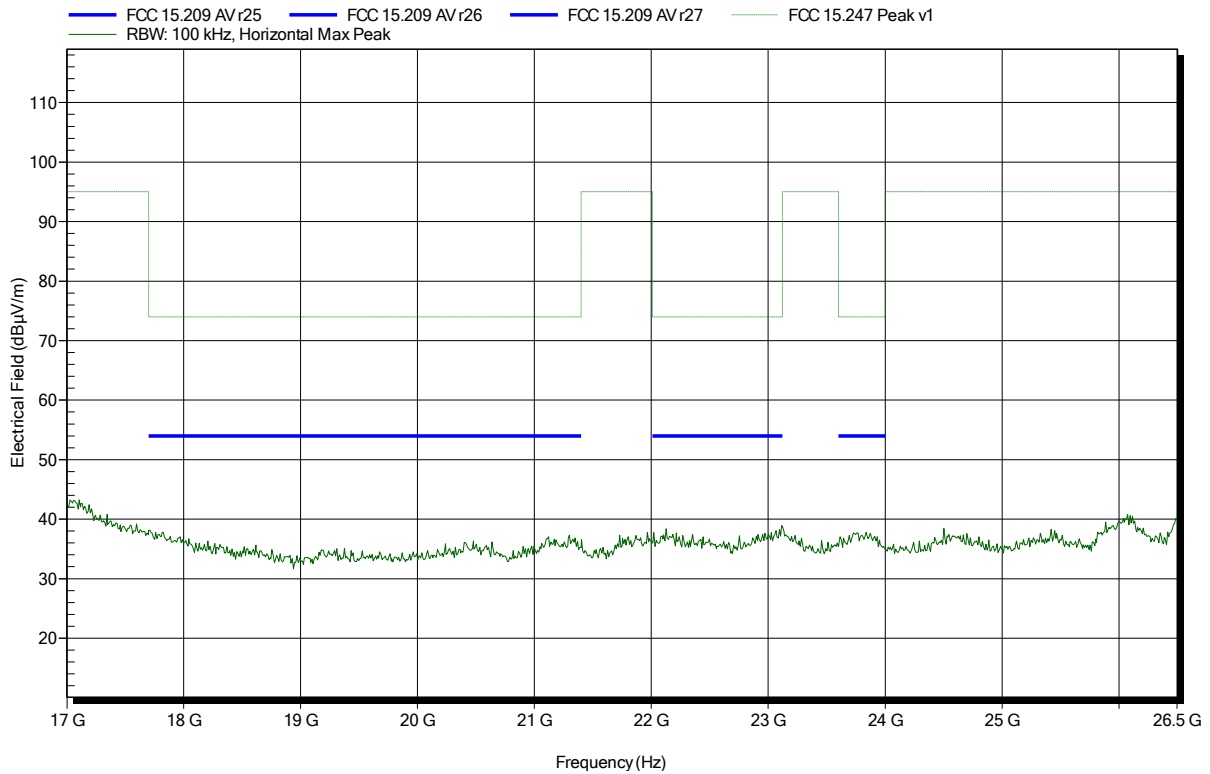


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),  
 Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note:

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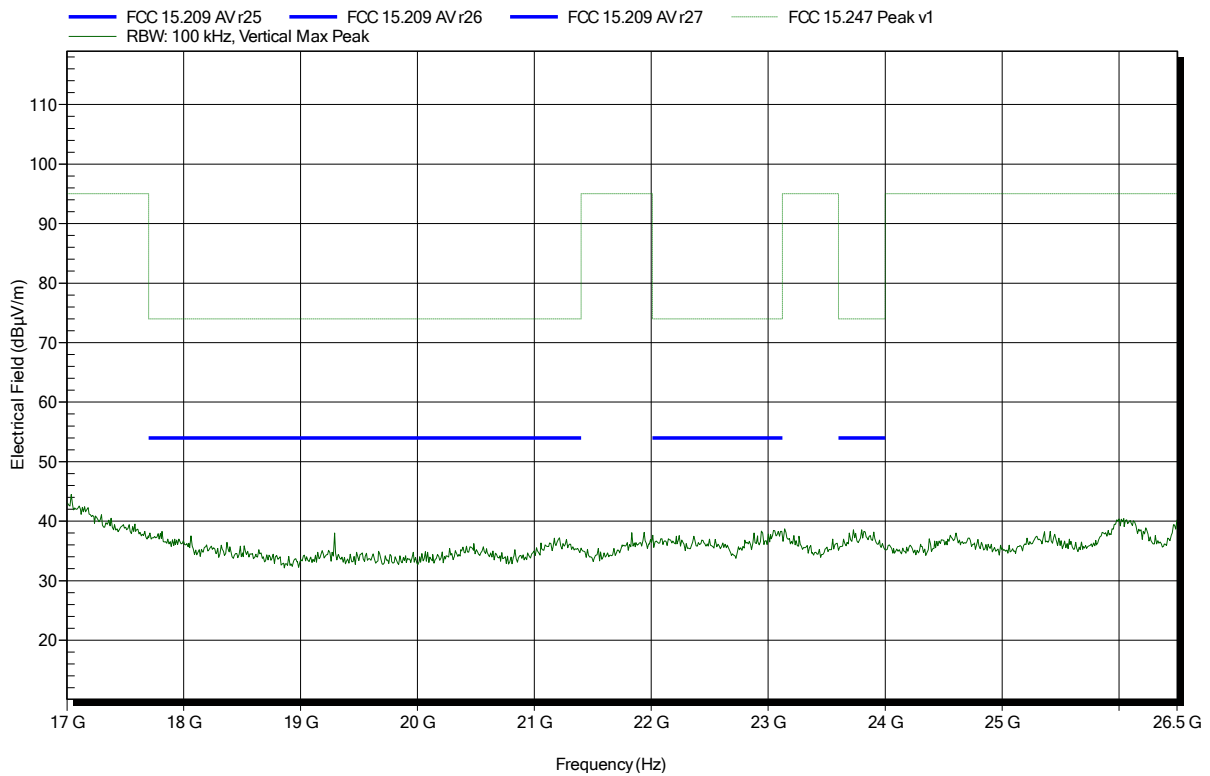


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name), Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2412 MHz  
 Test Date: 2018-07-18  
 Note:

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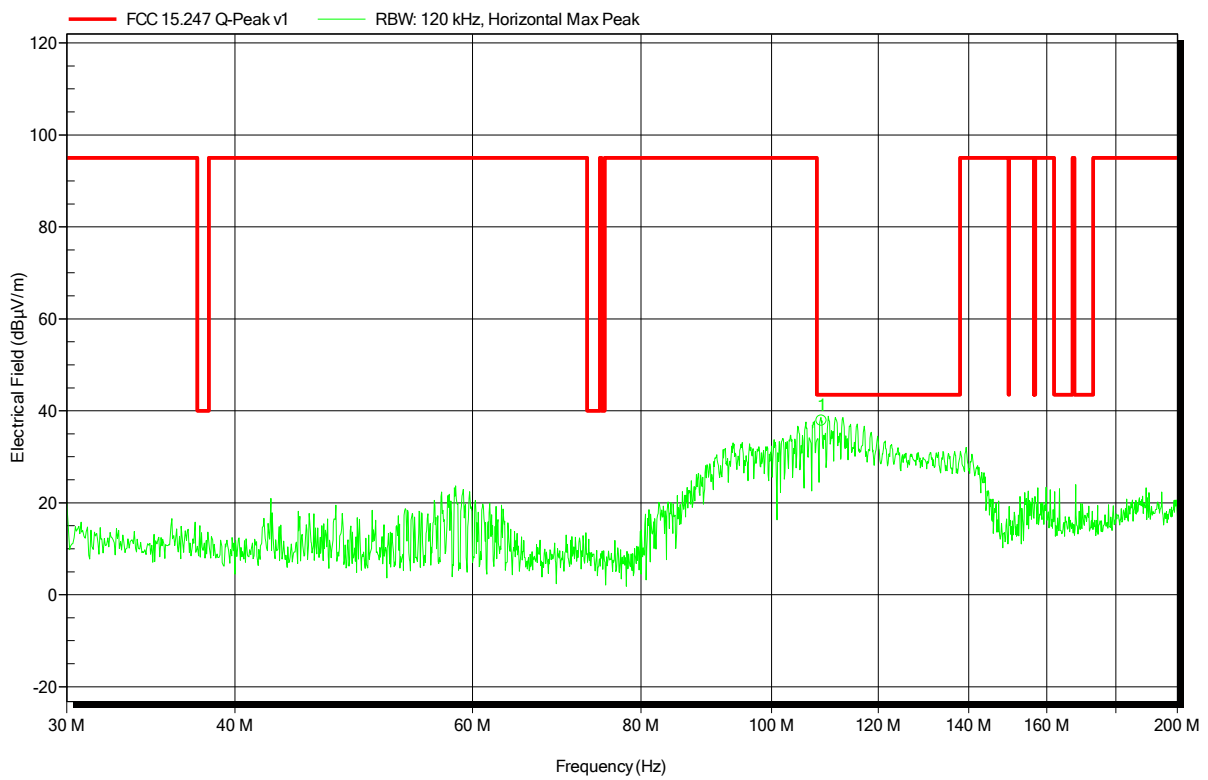


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Suckow  
 Test Conditions: Tnom: 22°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HK 116, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-20  
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status
108.905 MHz	37.8 dBµV/m	43.5 dBµV/m	-5.68 dB	Pass

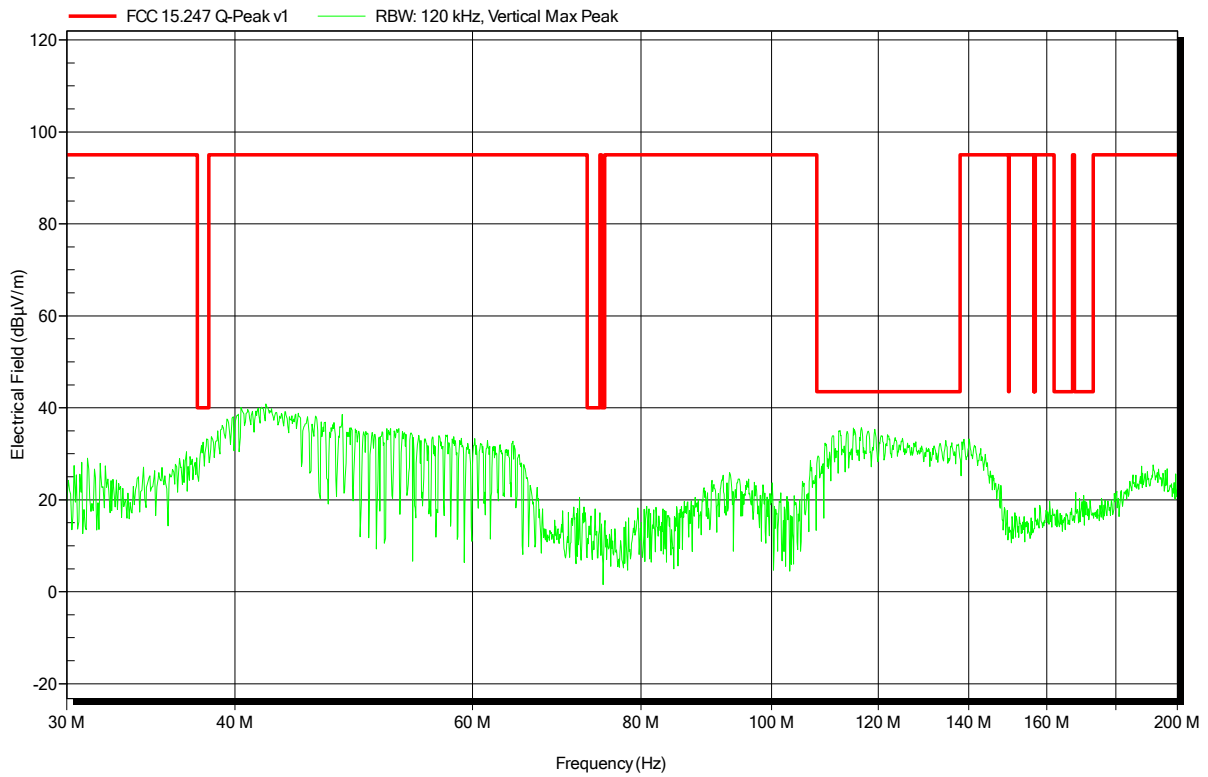


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Suckow  
 Test Conditions: Tnom: 22°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HK 116, Vertical  
 Measurement distance: 3 m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-20  
 Note:

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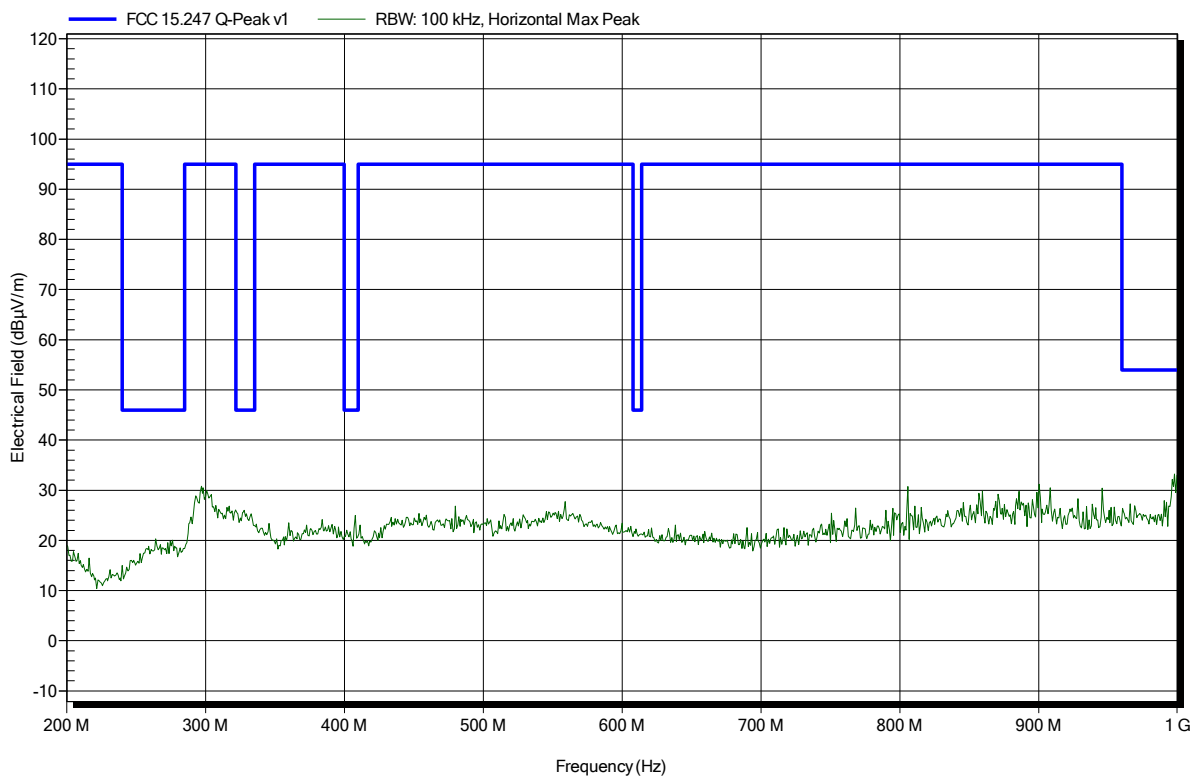


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HL 223, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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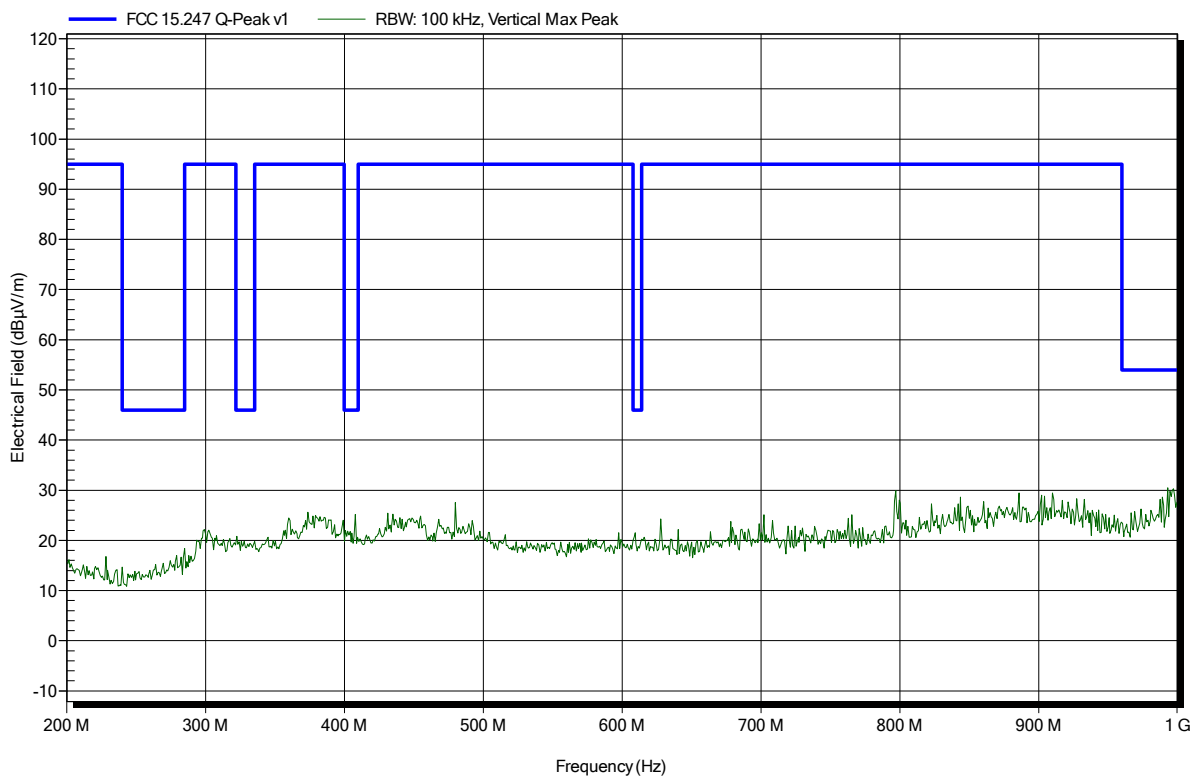


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HL 223, Vertical  
 Measurement distance: 3 m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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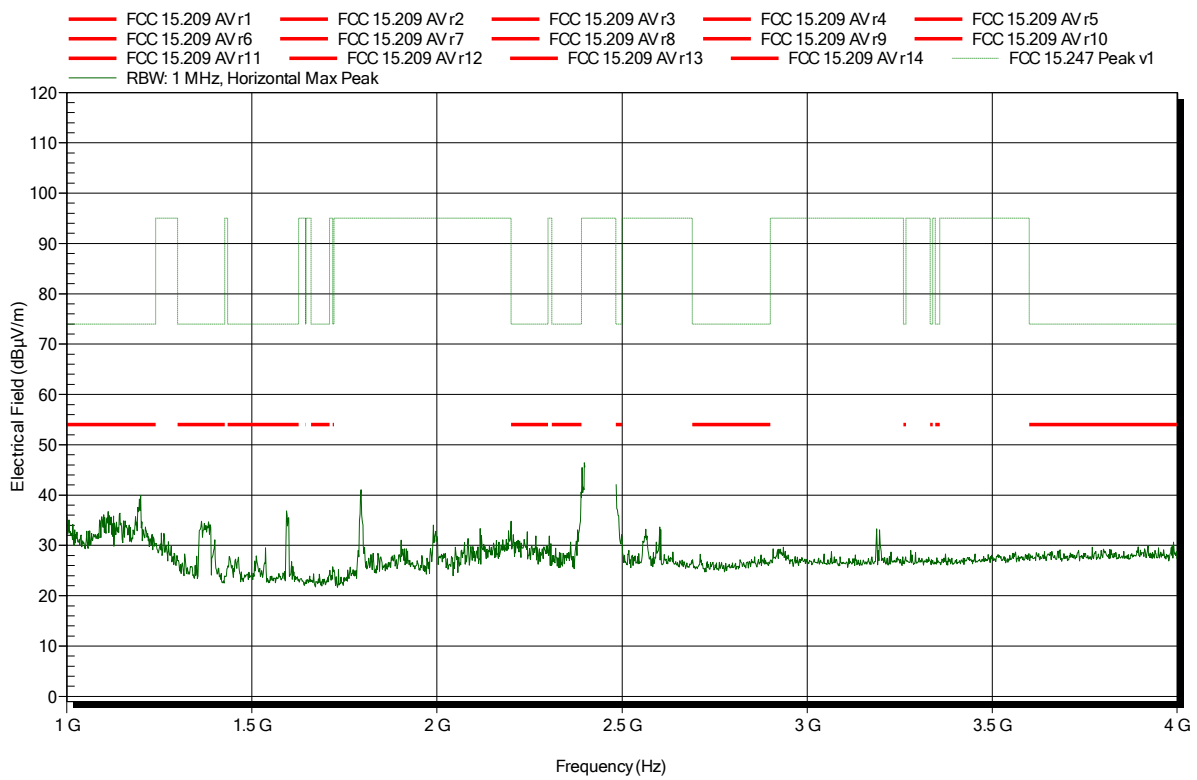


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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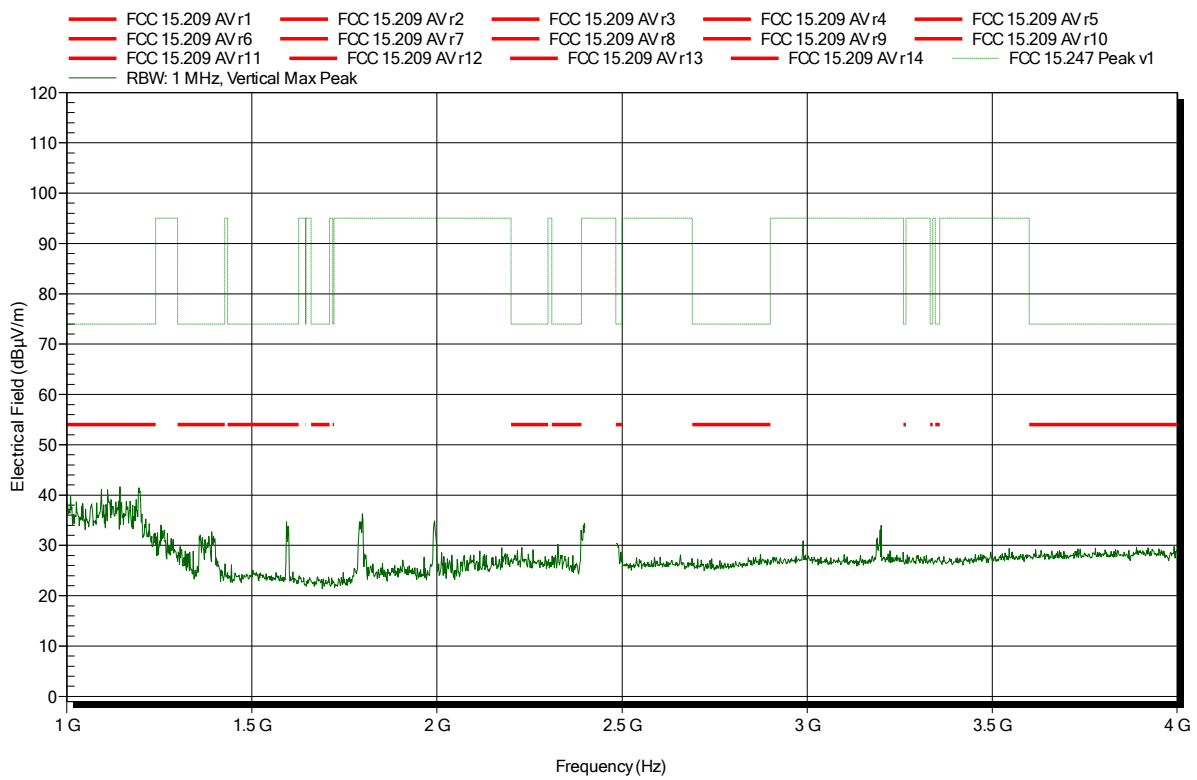


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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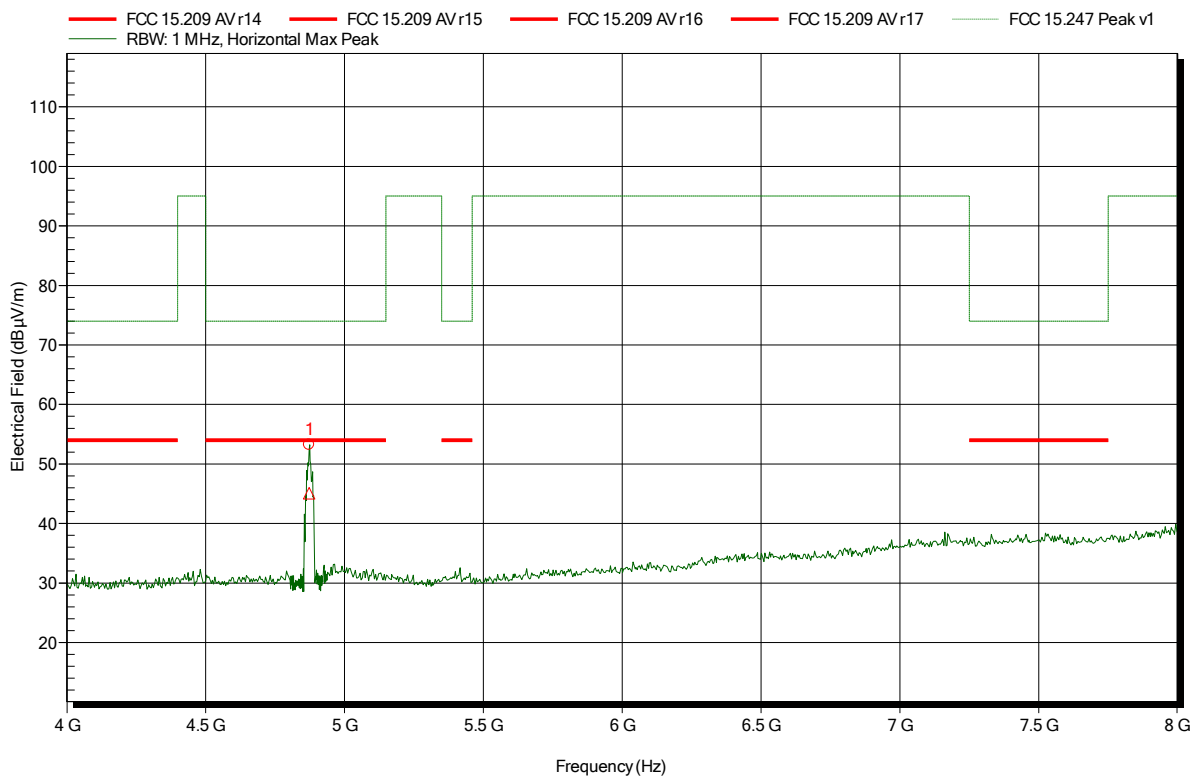


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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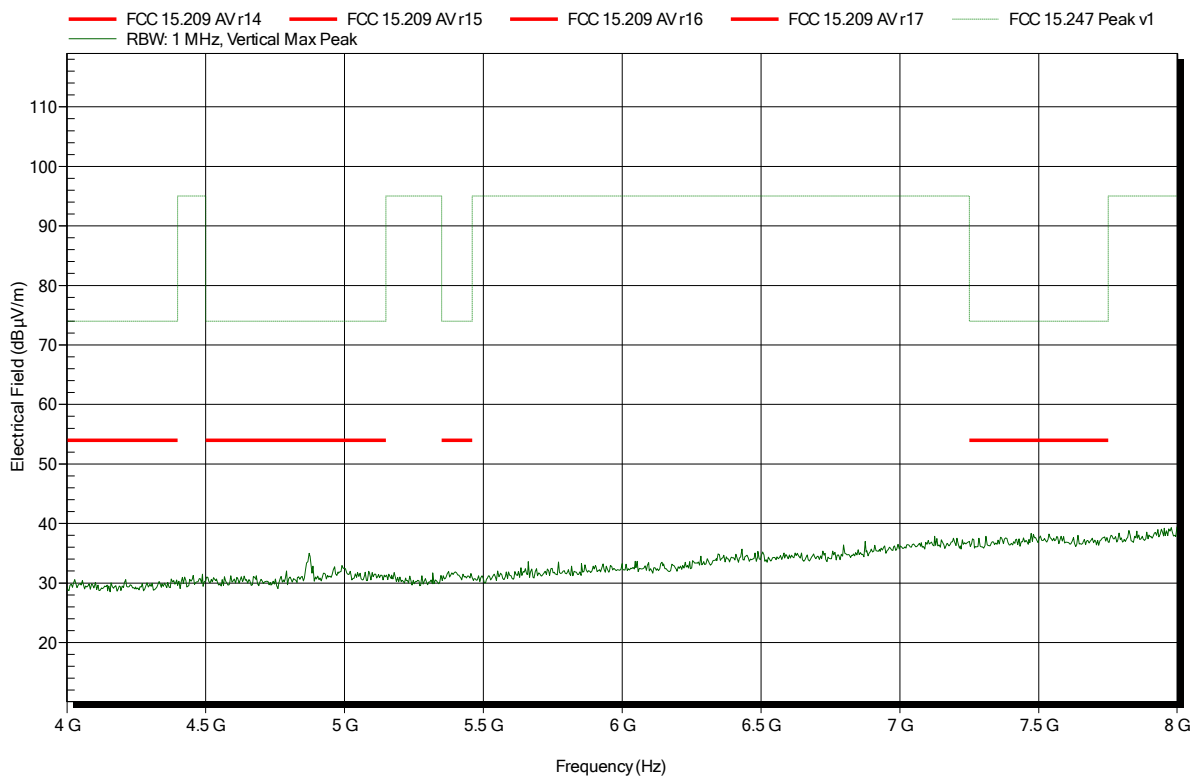
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.873 GHz	53.23 dBµV/m	74 dBµV/m	-20.77 dB	Pass
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.873 GHz	45.1 dBµV/m	54 dBµV/m	-8.9 dB	Pass

**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-18  
 Note:

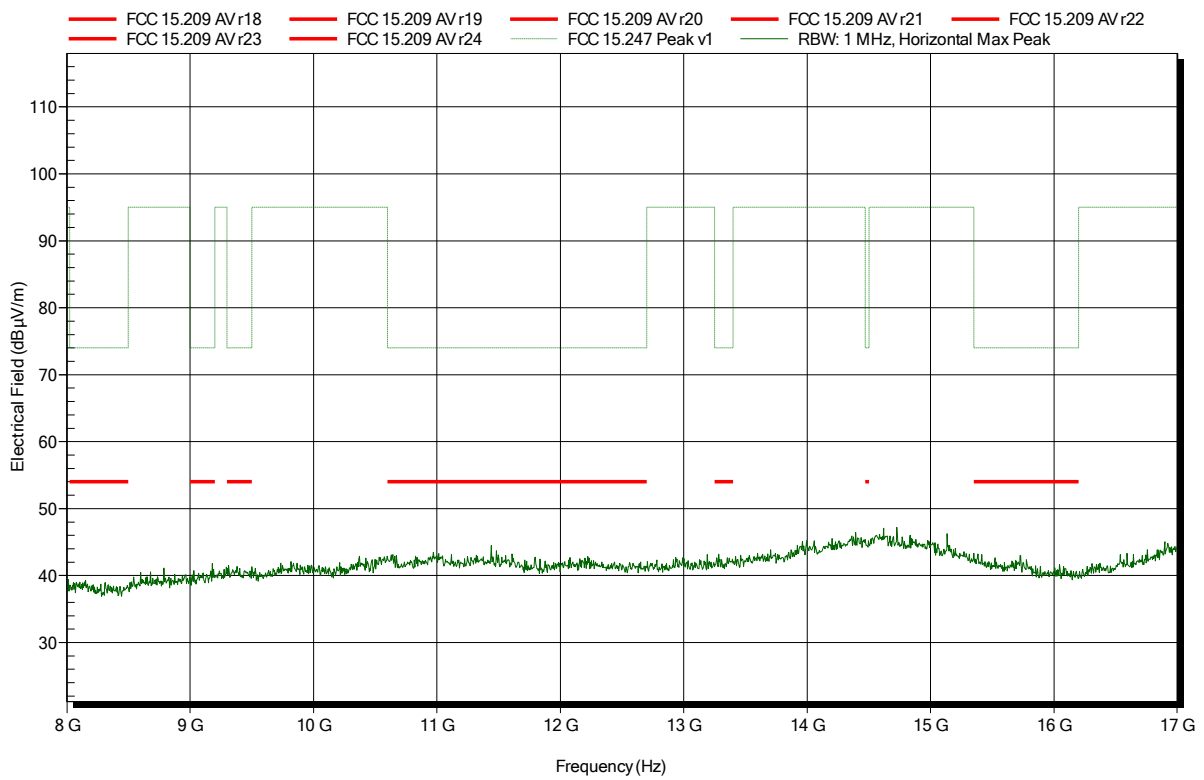
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**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540  
 Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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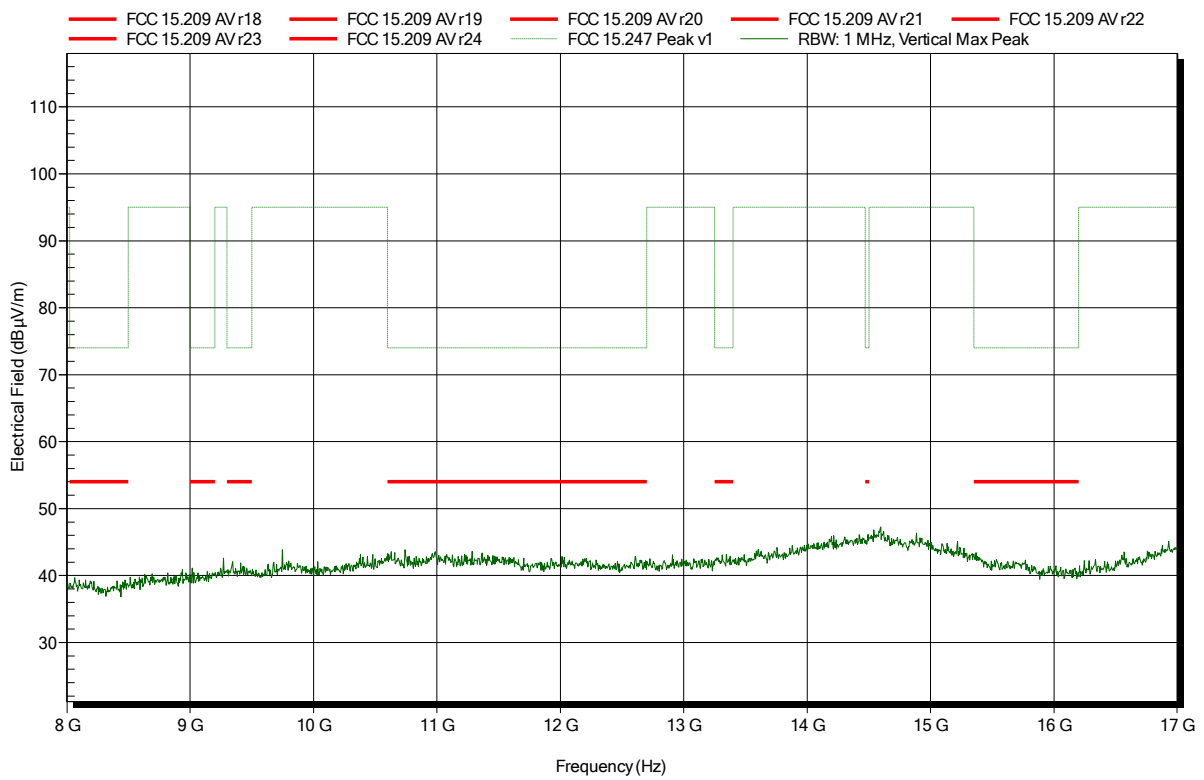


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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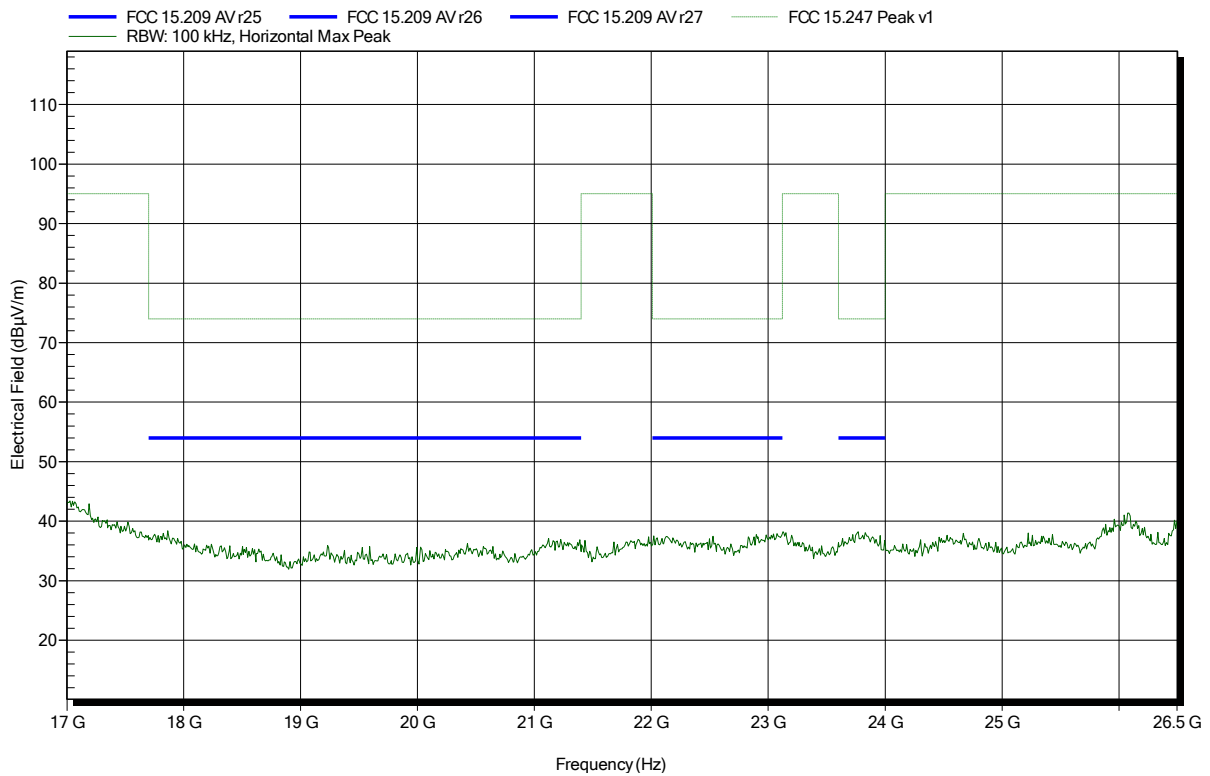


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),  
 Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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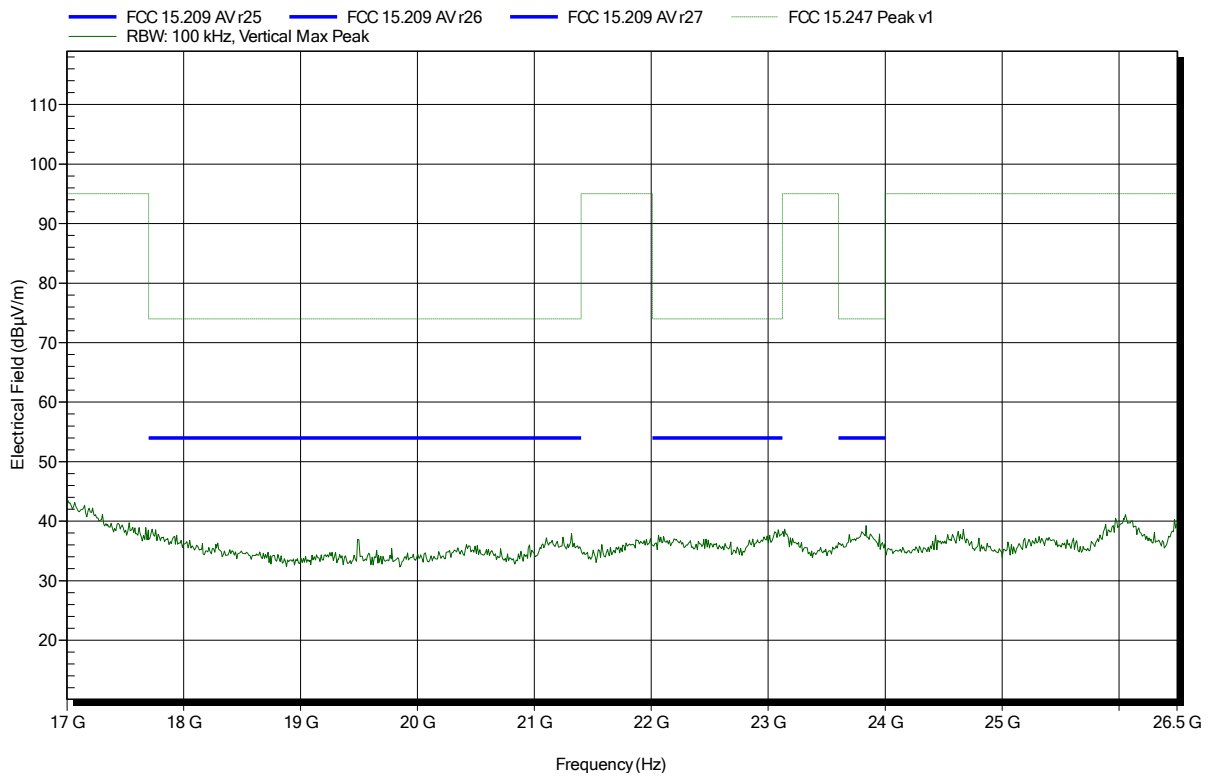


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name), Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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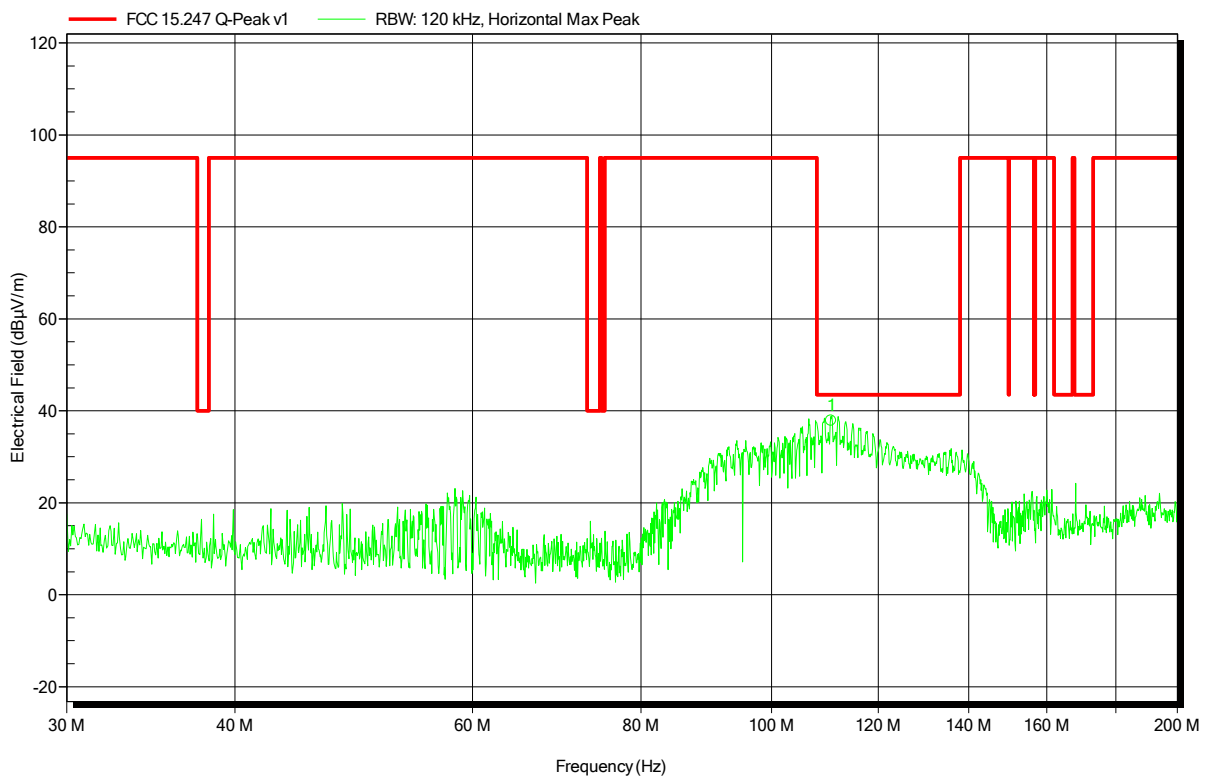


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Suckow  
 Test Conditions: Tnom: 22°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HK 116, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-20  
 Note:

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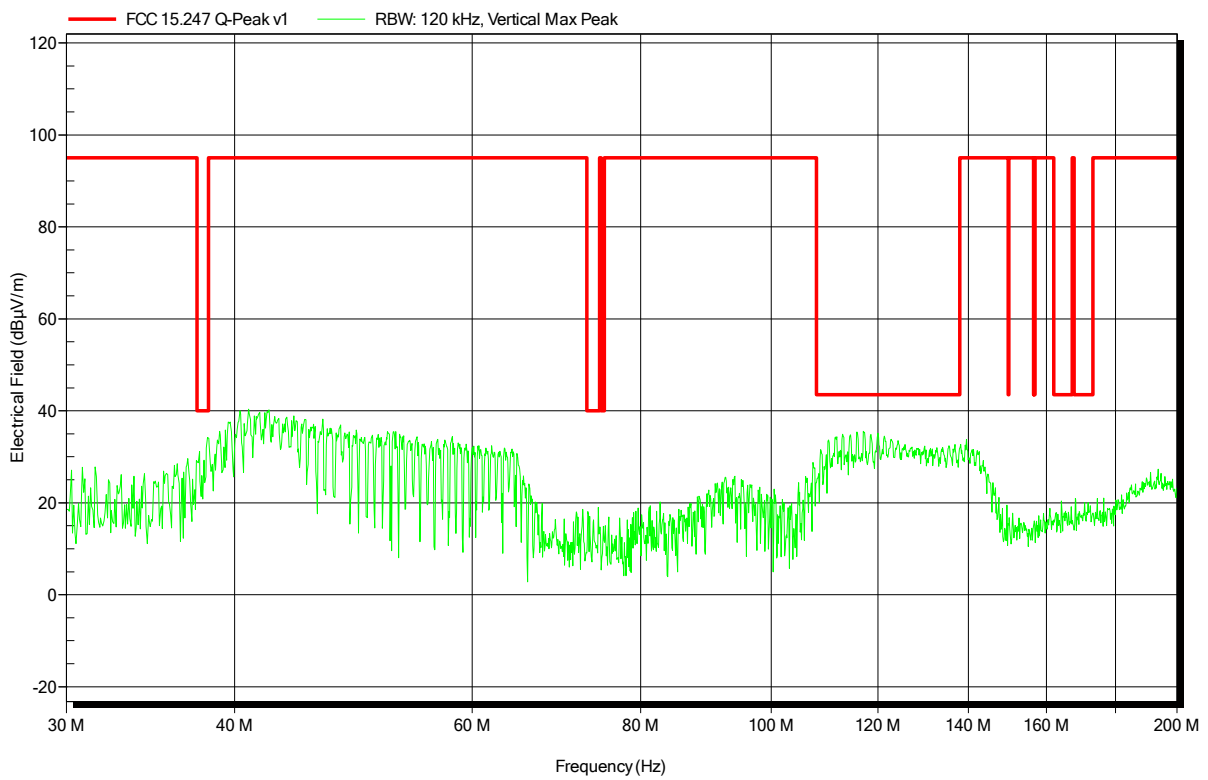
Frequency	Peak	Peak Limit	Peak Difference	Status
110.7059 MHz	37.8 dBµV/m	43.5 dBµV/m	-5.69 dB	Pass

**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Suckow  
 Test Conditions: Tnom: 22°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HK 116, Vertical  
 Measurement distance: 3 m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-20  
 Note:

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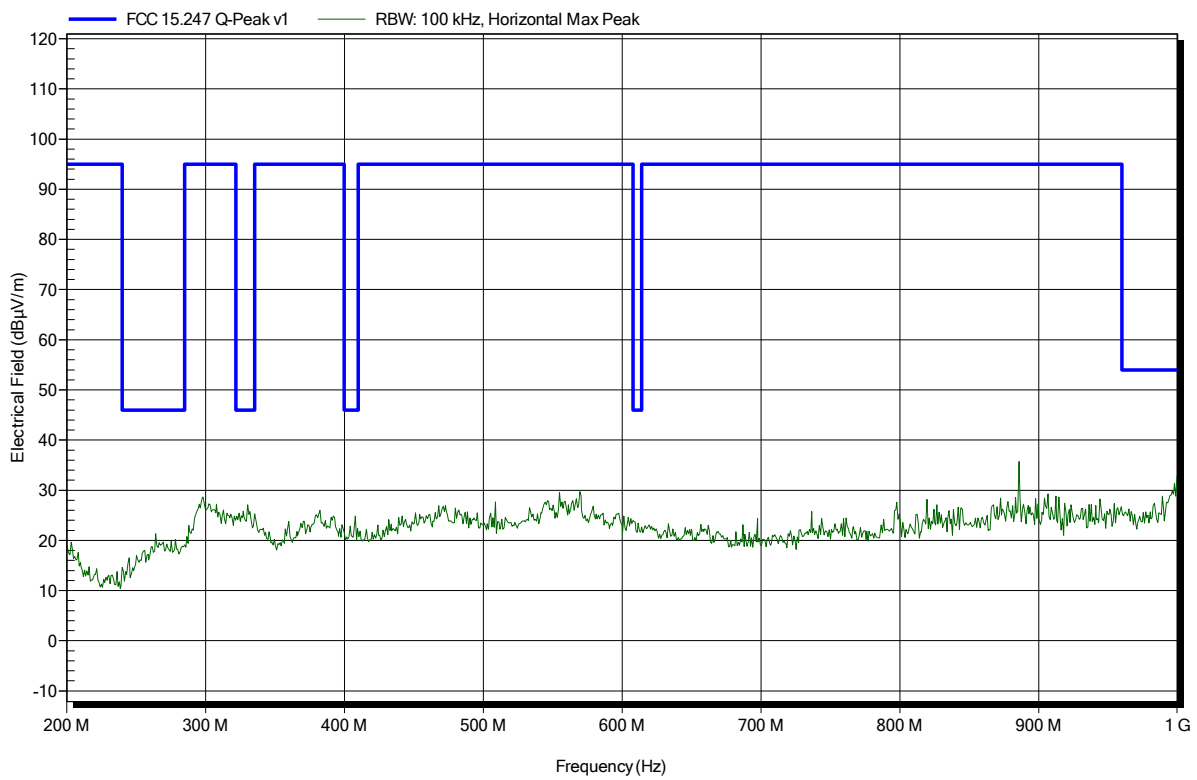


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HL 223, Horizontal  
 Measurement distance: 3 m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-18  
 Note:

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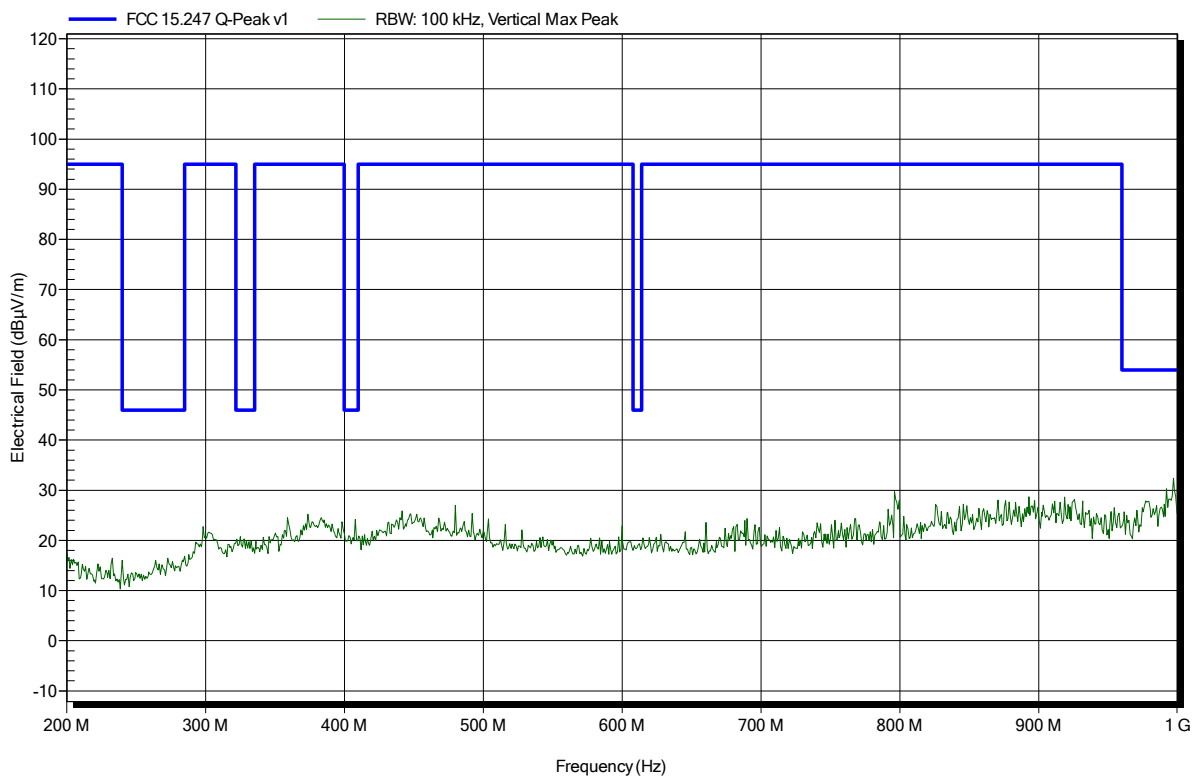


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HL 223, Vertical  
 Measurement distance: 3 m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-18  
 Note:

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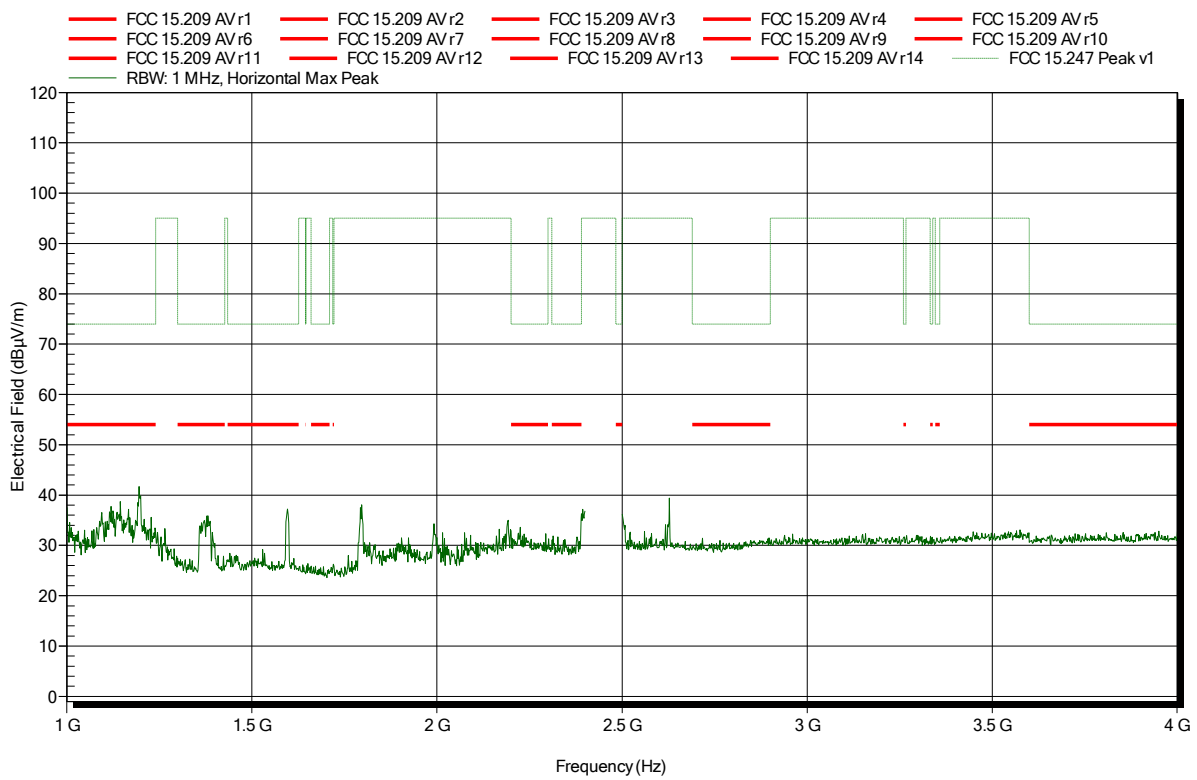


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-18  
 Note:

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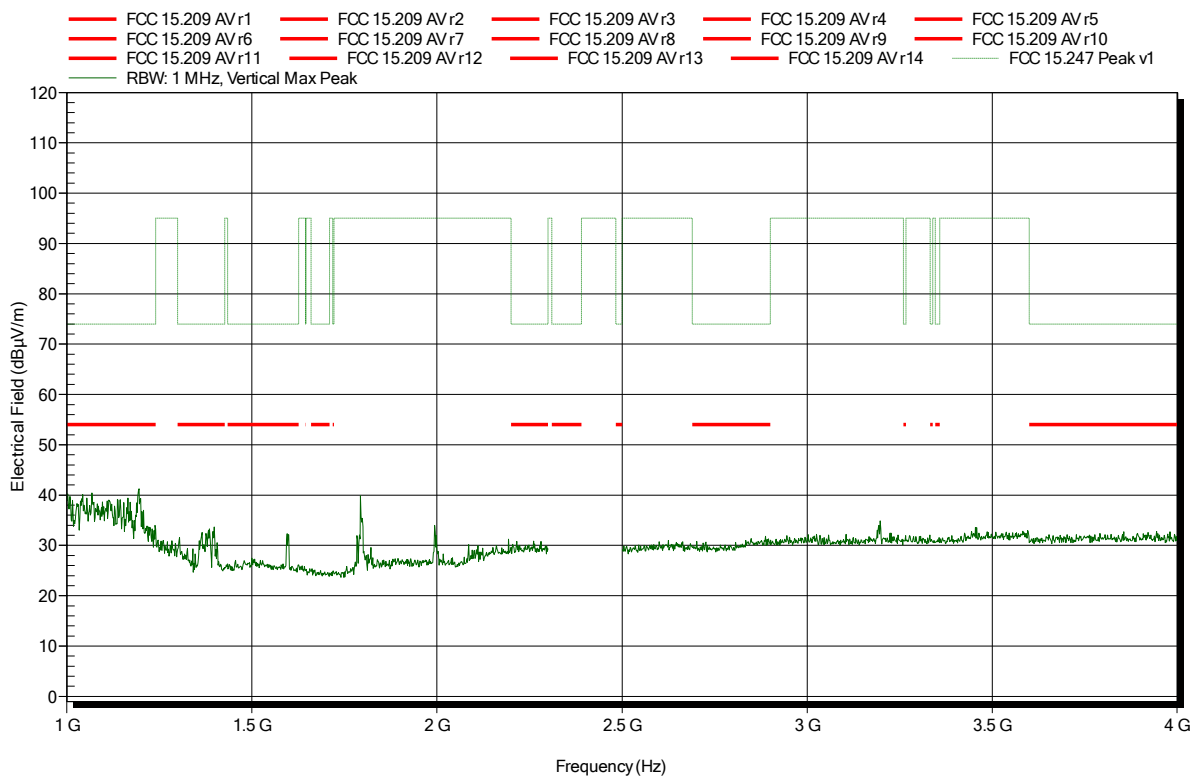


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-18  
 Note:

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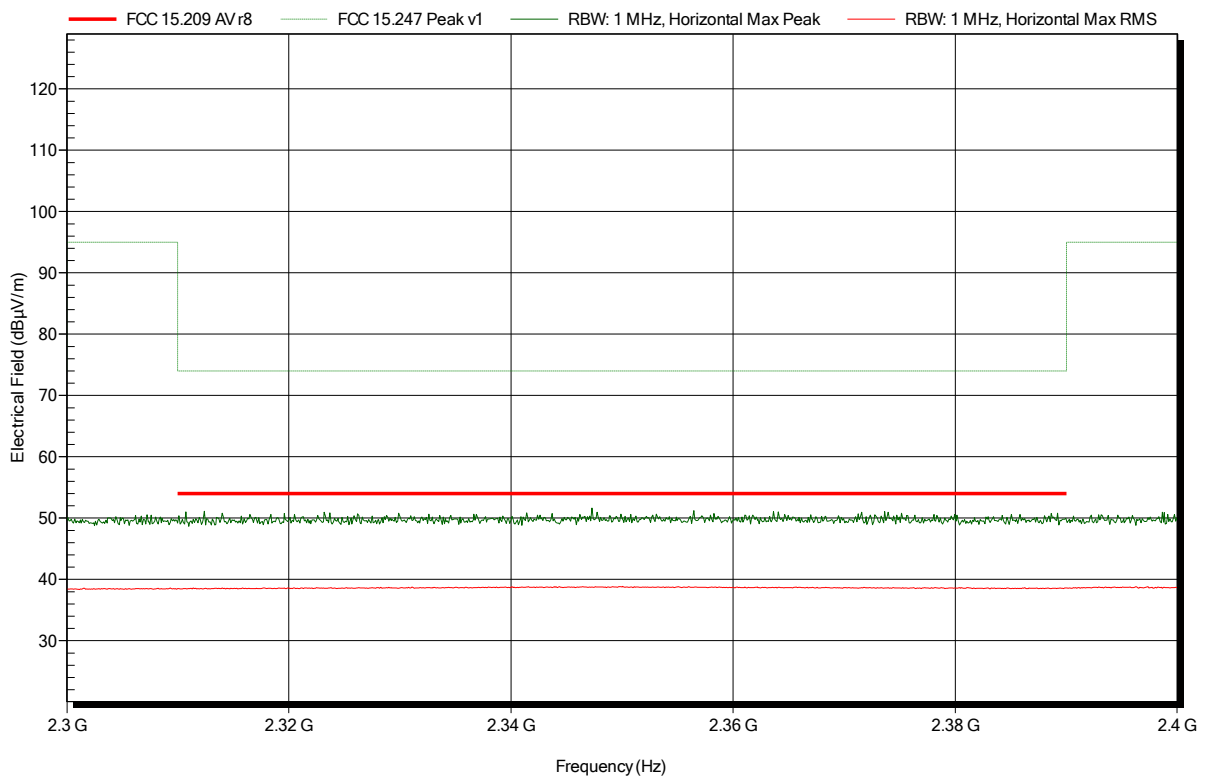


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-18  
 Note: lower bandedge

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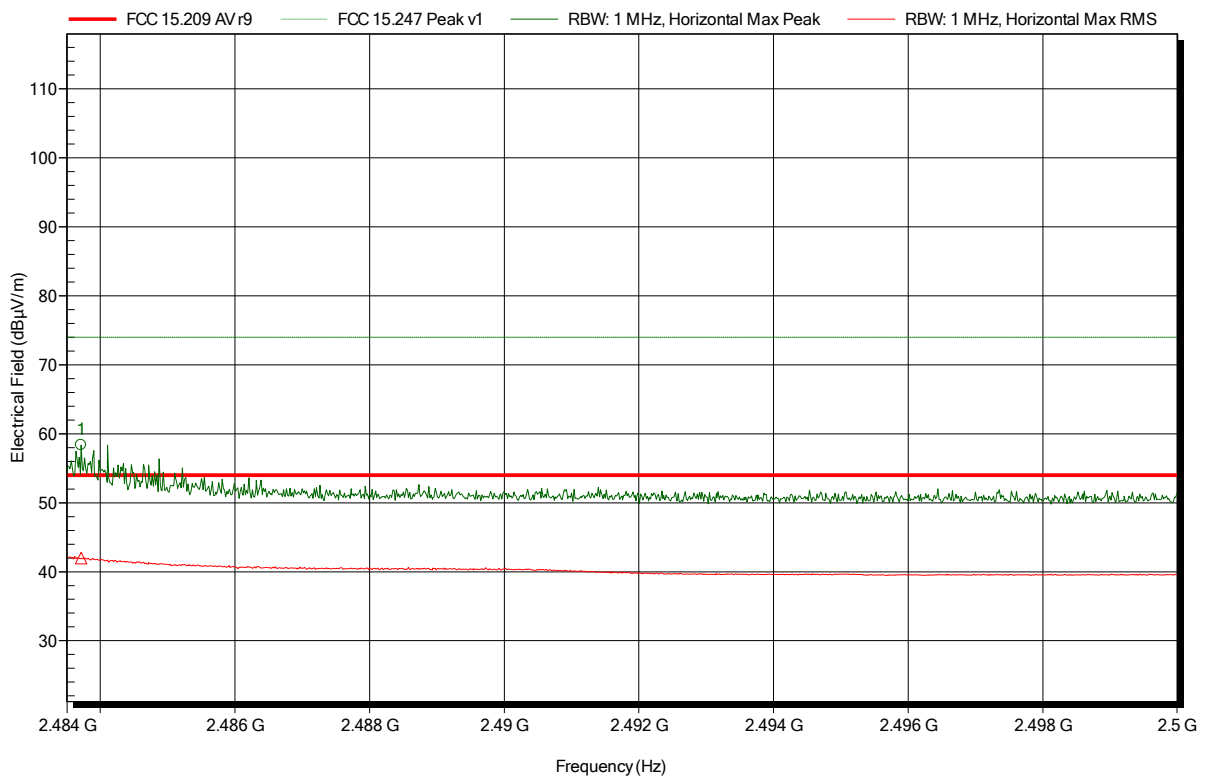


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-18  
 Note: upper bandedge

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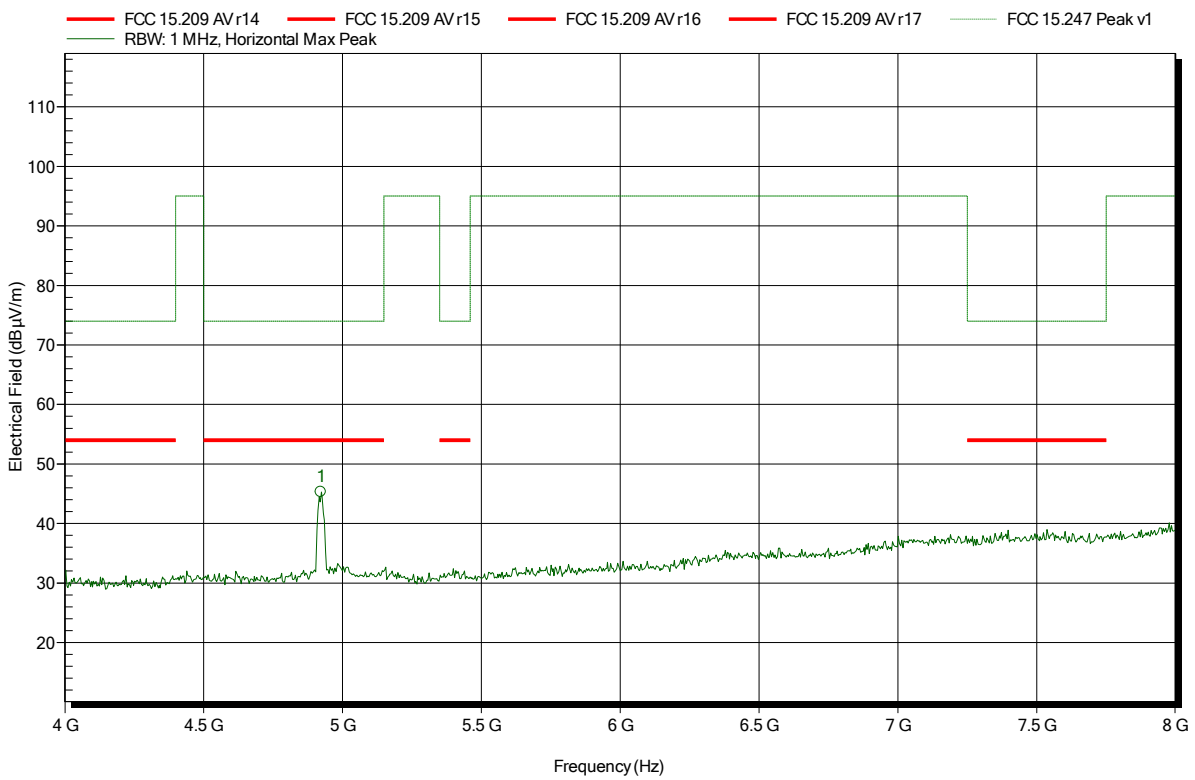
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.4837 GHz	58.35 dBµV/m	74 dBµV/m	-15.65 dB	Pass
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.4837 GHz	41.97 dBµV/m	54 dBµV/m	-12.03 dB	Pass

**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-18  
 Note:

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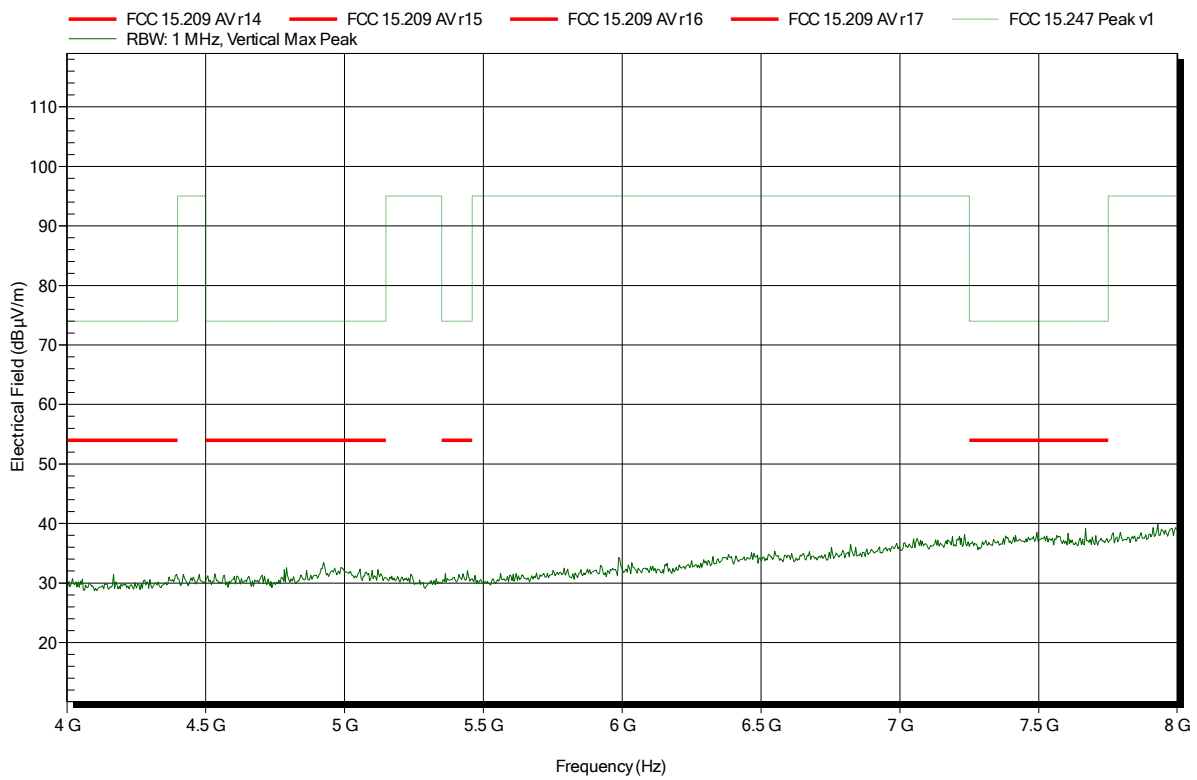
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.923 GHz	45.31 dBµV/m	74 dBµV/m	-28.69 dB	Pass

### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-18  
 Note:

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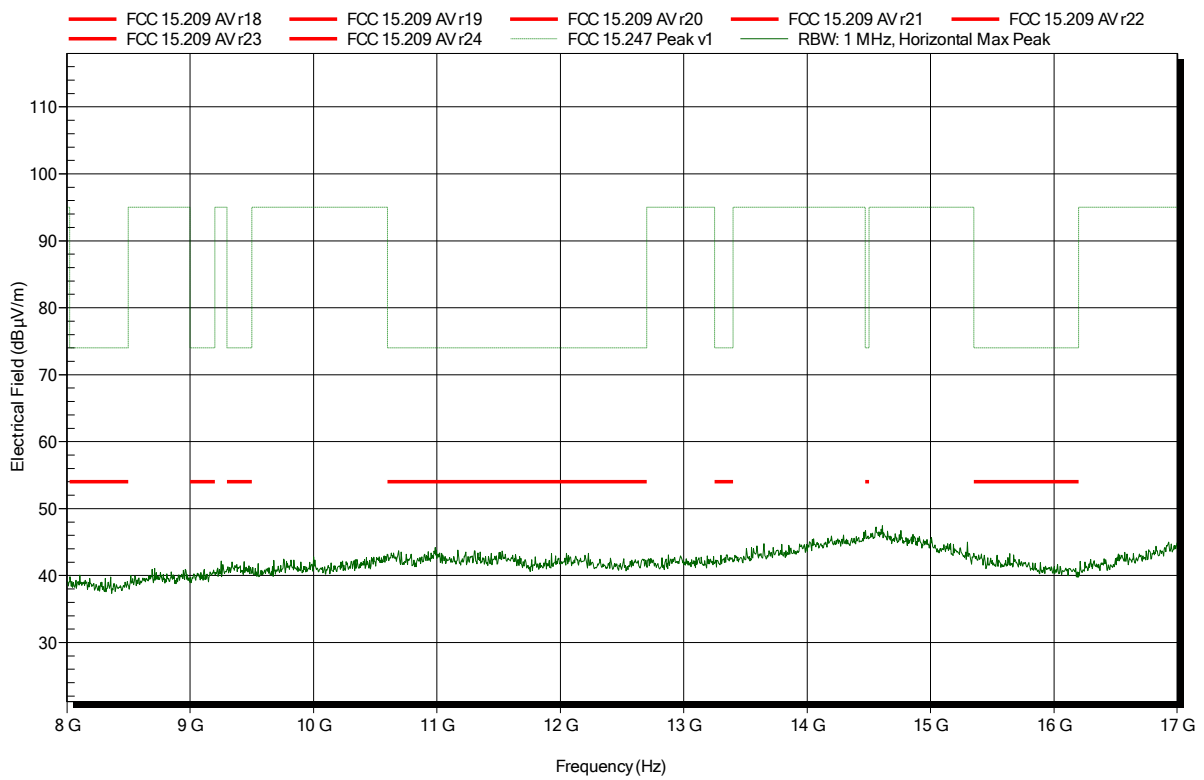


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-18  
 Note:

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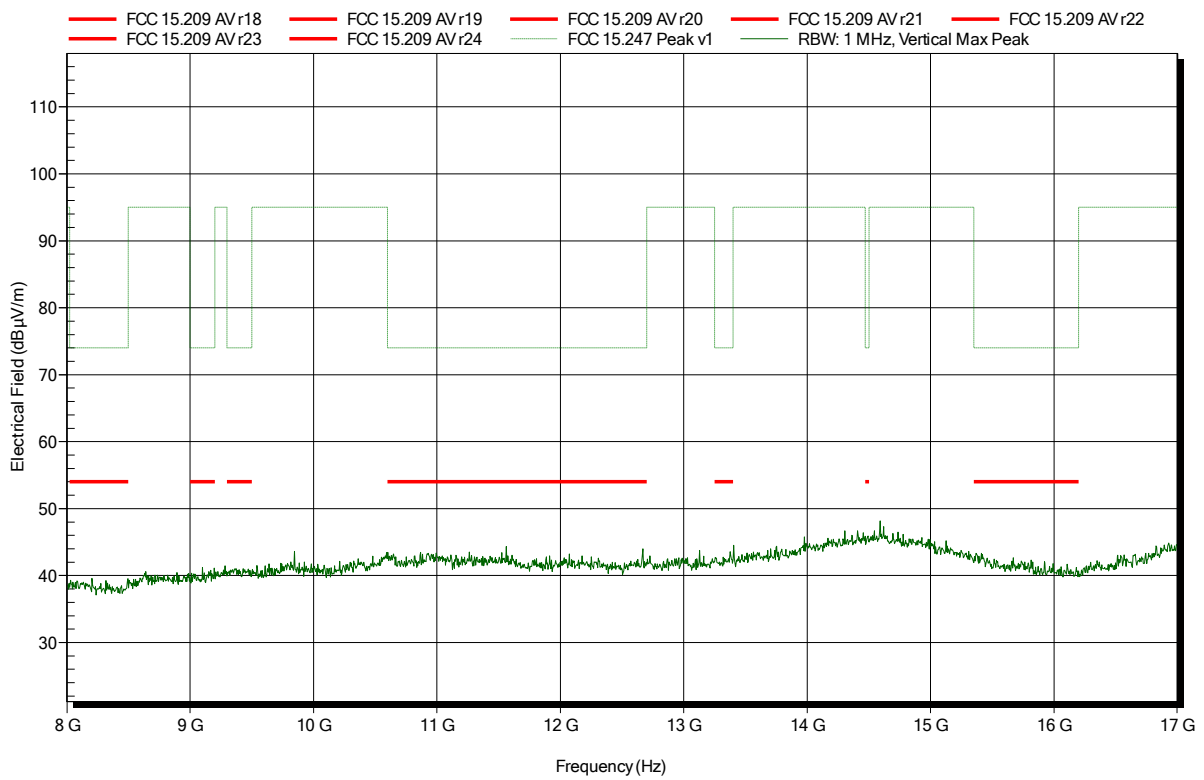


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-18  
 Note:

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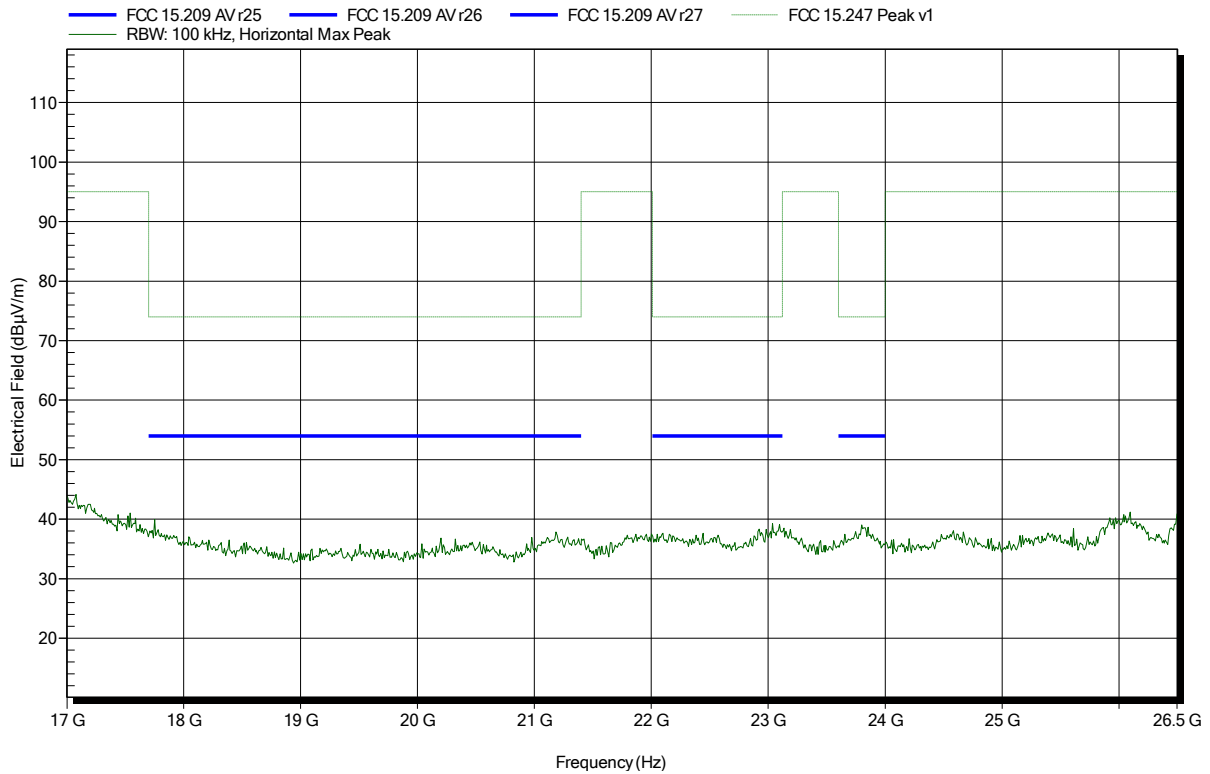


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),  
 Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-18  
 Note:

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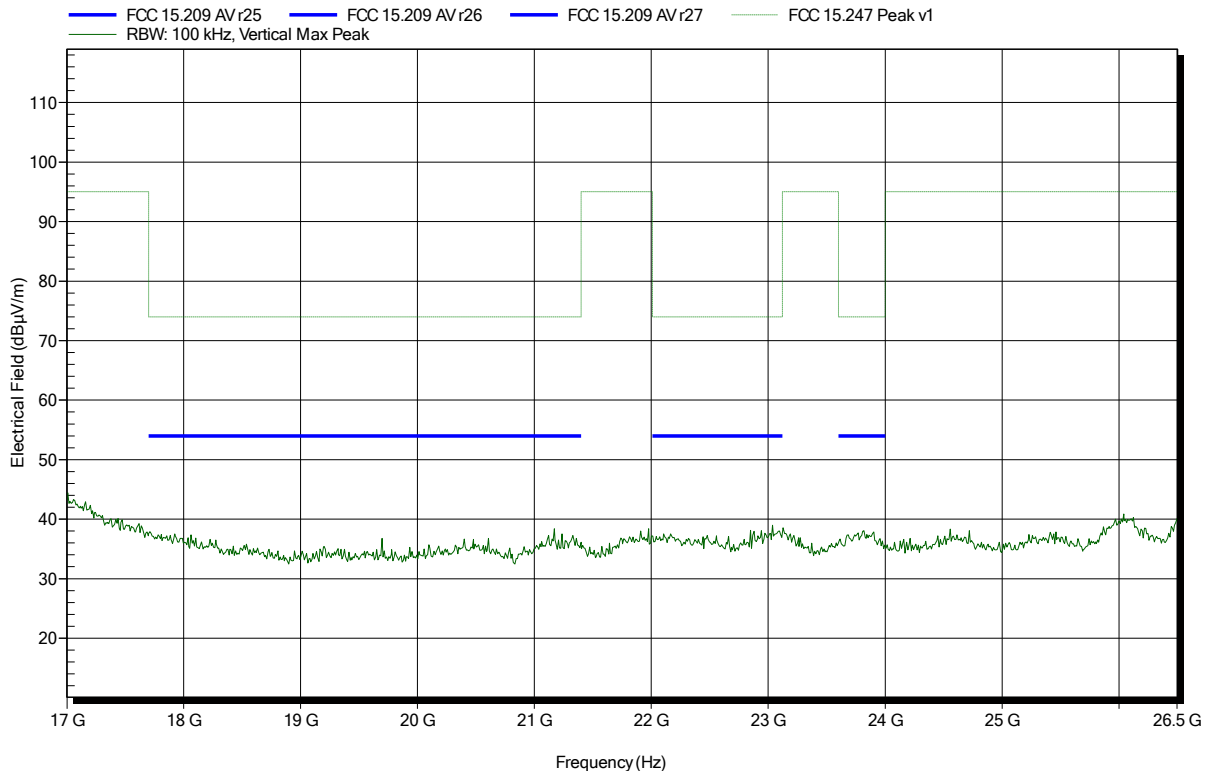


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name), Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: TX; IEEE 802.11n HT20 WLAN MCS0 2462 MHz  
 Test Date: 2018-07-18  
 Note:

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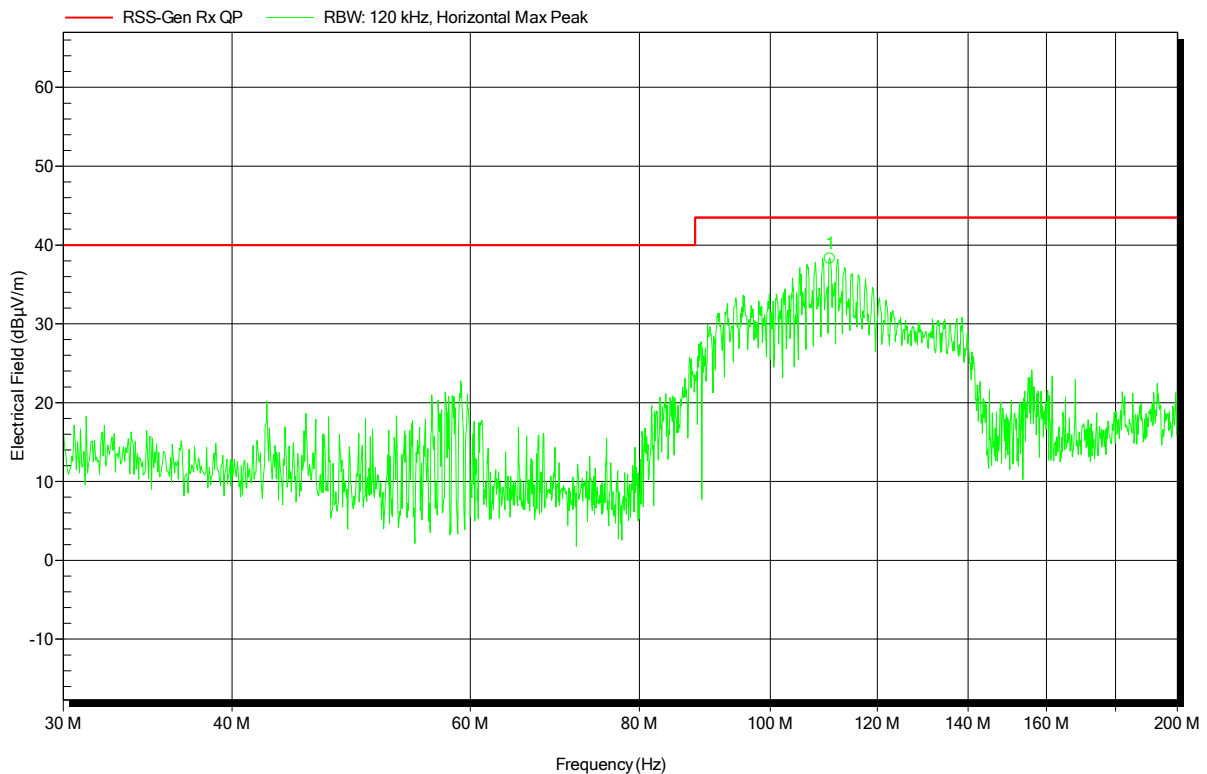
## ANNEX B Receiver spurious emissions

### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Suckow  
 Test Conditions: Tnom: 22°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HK 116, Horizontal  
 Measurement distance: 3 m  
 Mode: RX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-20  
 Note:

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Frequency	Peak	Peak Limit	Peak Difference	Status	Angle	Height
110.6458 MHz	38.3 dBµV/m	43.5 dBµV/m	-5.25 dB	Pass	0 Degree	1 m

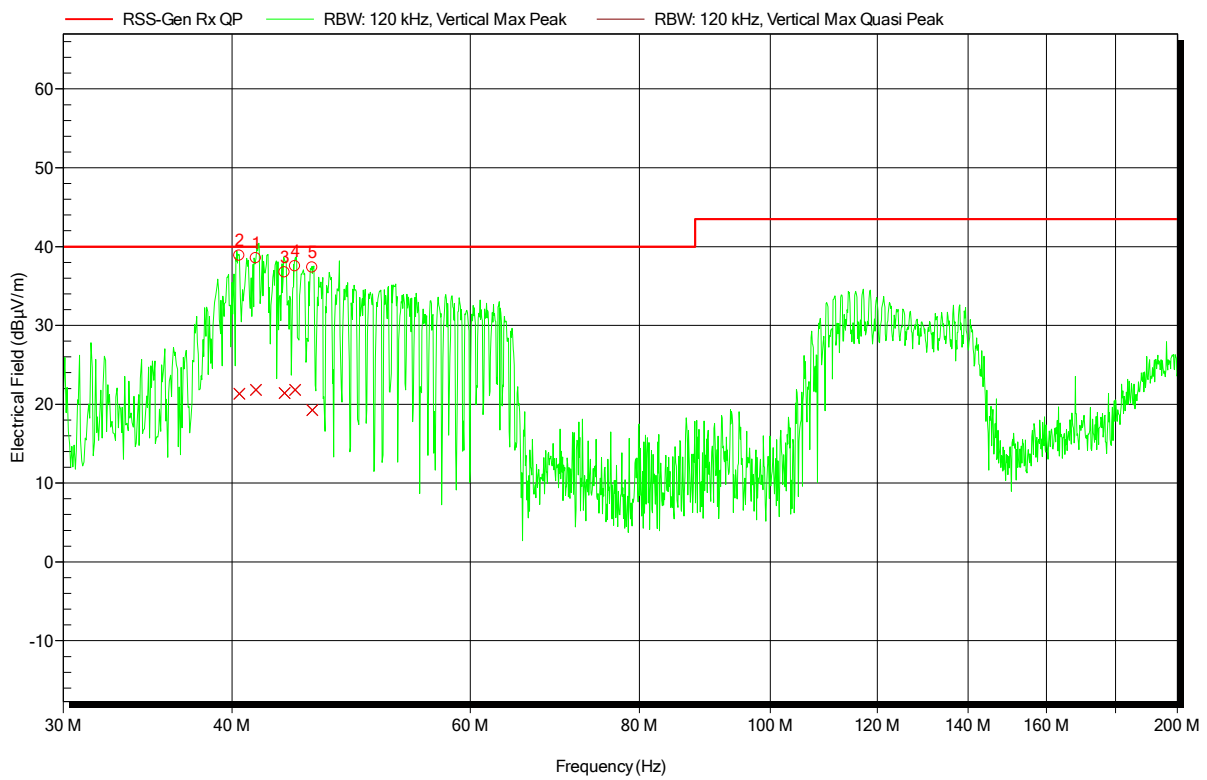
Frequency	Angle	Height
110.6458 MHz	0 Degree	1 m

### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Suckow  
 Test Conditions: Tnom: 22°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HK 116, Vertical  
 Measurement distance: 3 m  
 Mode: RX; IEEE 802.11n HT20 WLAN MCS0 2437 MHz  
 Test Date: 2018-07-20  
 Note:

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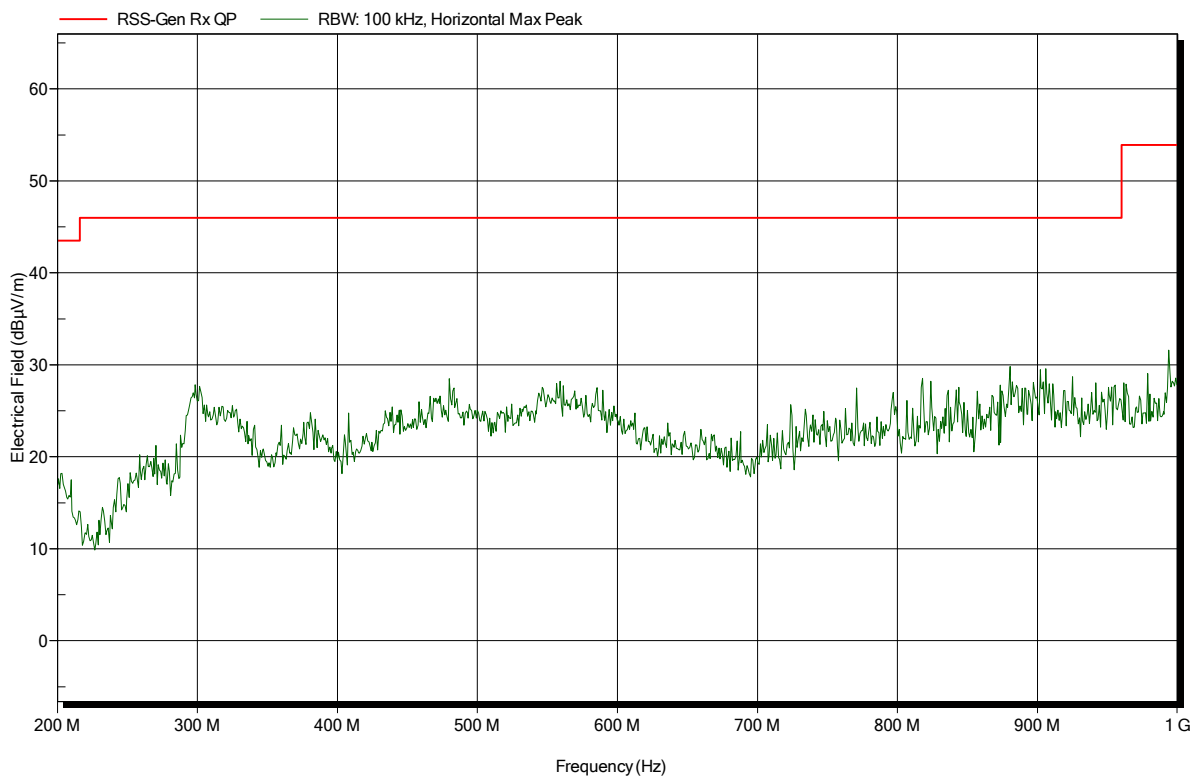
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
40.5086 MHz	21.3 dBµV/m	40 dBµV/m	-18.68 dB	Pass	0 Degree	1 m
41.6495 MHz	21.8 dBµV/m	40 dBµV/m	-18.19 dB	Pass	0 Degree	1 m
43.7512 MHz	21.4 dBµV/m	40 dBµV/m	-18.6 dB	Pass	0 Degree	1 m
44.5319 MHz	21.8 dBµV/m	40 dBµV/m	-18.18 dB	Pass	0 Degree	1 m
45.8529 MHz	19.3 dBµV/m	40 dBµV/m	-20.74 dB	Pass	0 Degree	1 m

**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HL 223, Horizontal  
 Measurement distance: 3 m  
 Mode: RX; WLAN 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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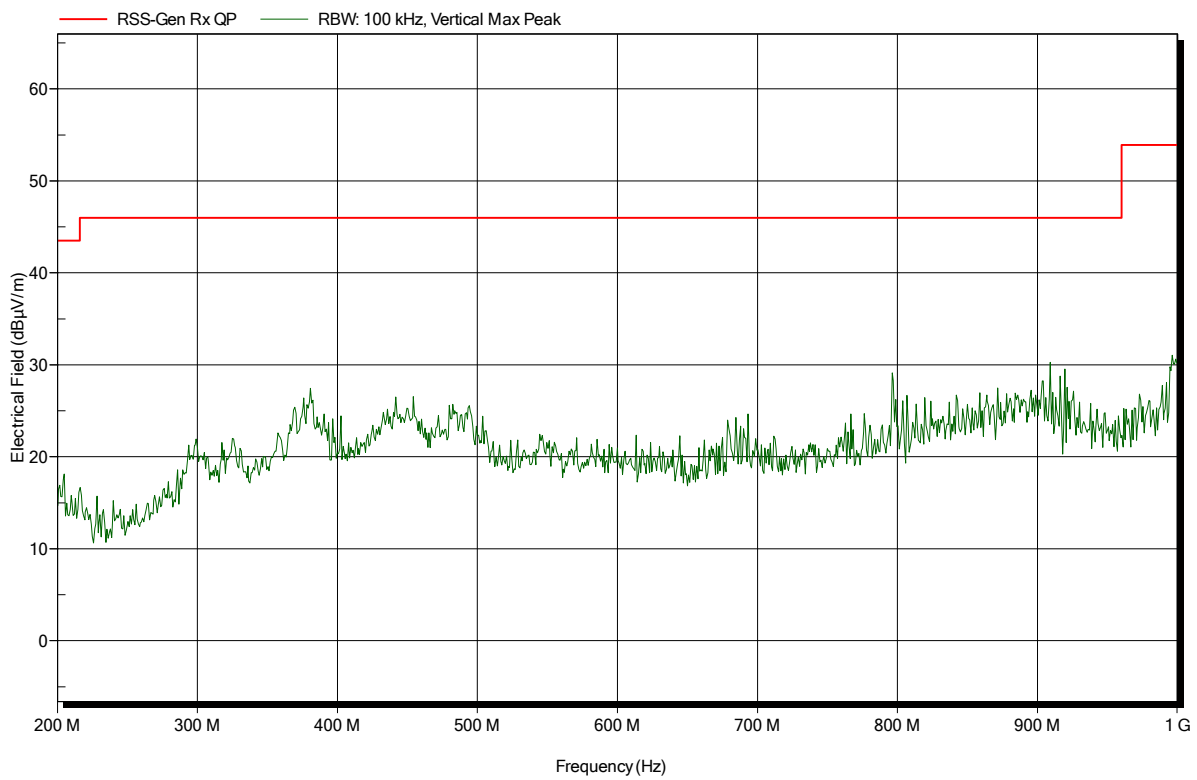


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Rohde & Schwarz HL 223, Vertical  
 Measurement distance: 3 m  
 Mode: RX; WLAN 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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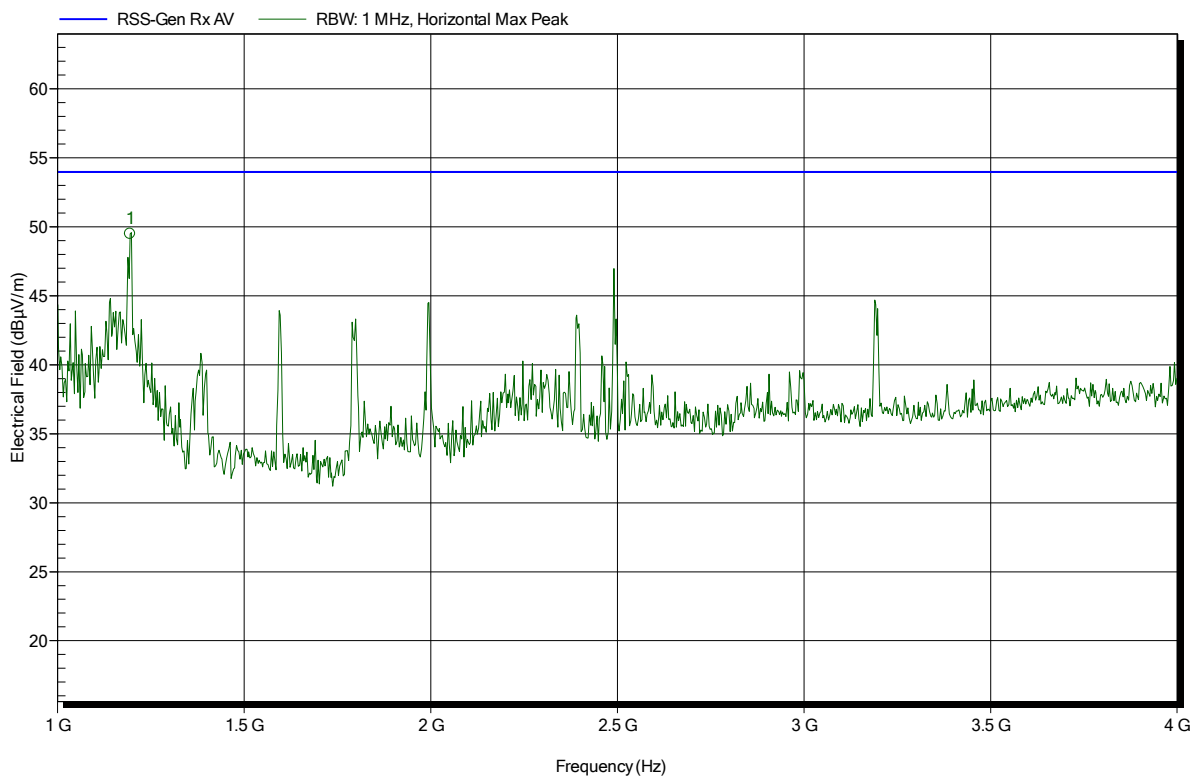


**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 3 m  
 Mode: RX; WLAN 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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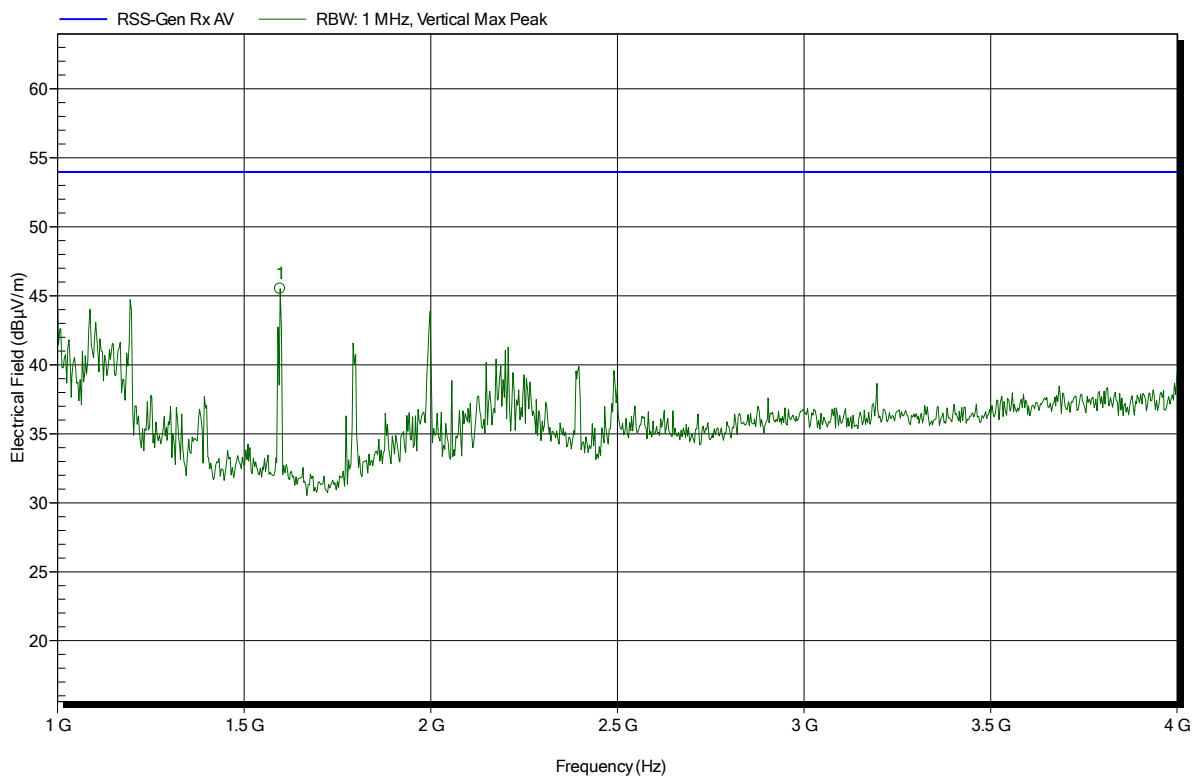
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
1.195 GHz	49.5 dBµV/m	53.98 dBµV/m	-4.48 dB	Pass

**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 3 m  
 Mode: RX; WLAN 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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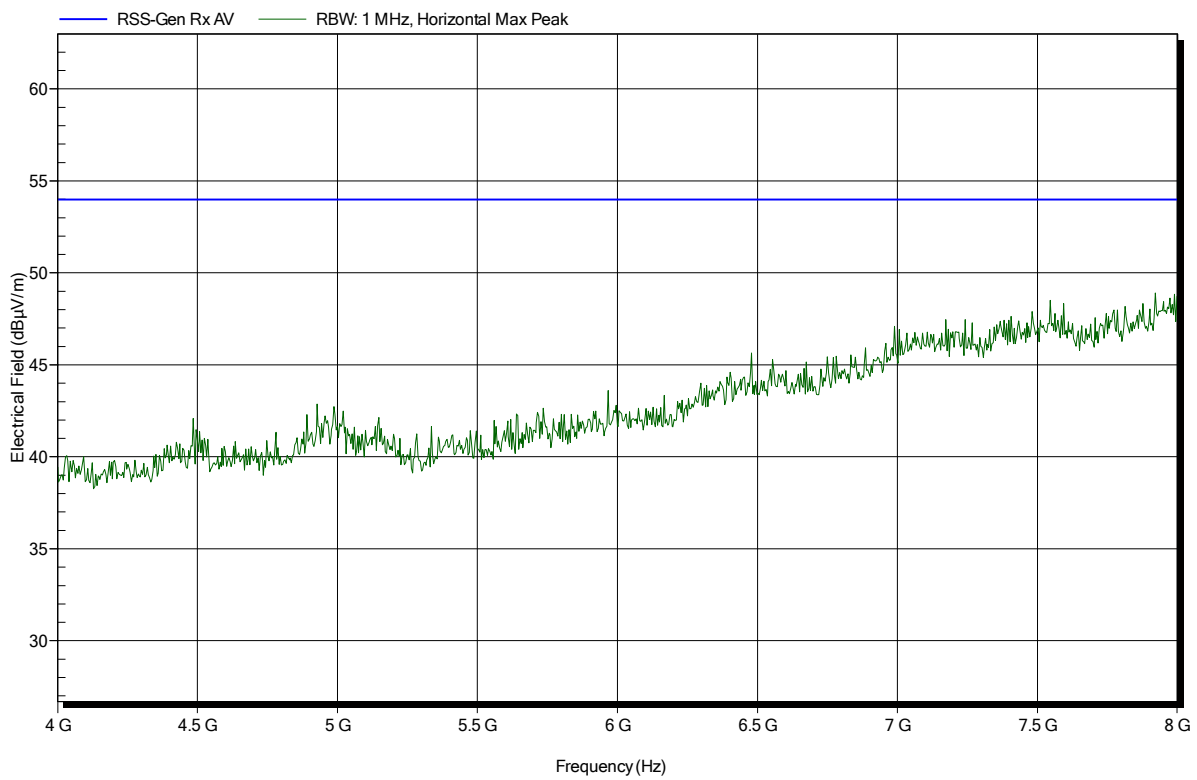
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
1.596 GHz	45.51 dBµV/m	53.98 dBµV/m	-8.47 dB	Pass

**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 3 m  
 Mode: RX; WLAN 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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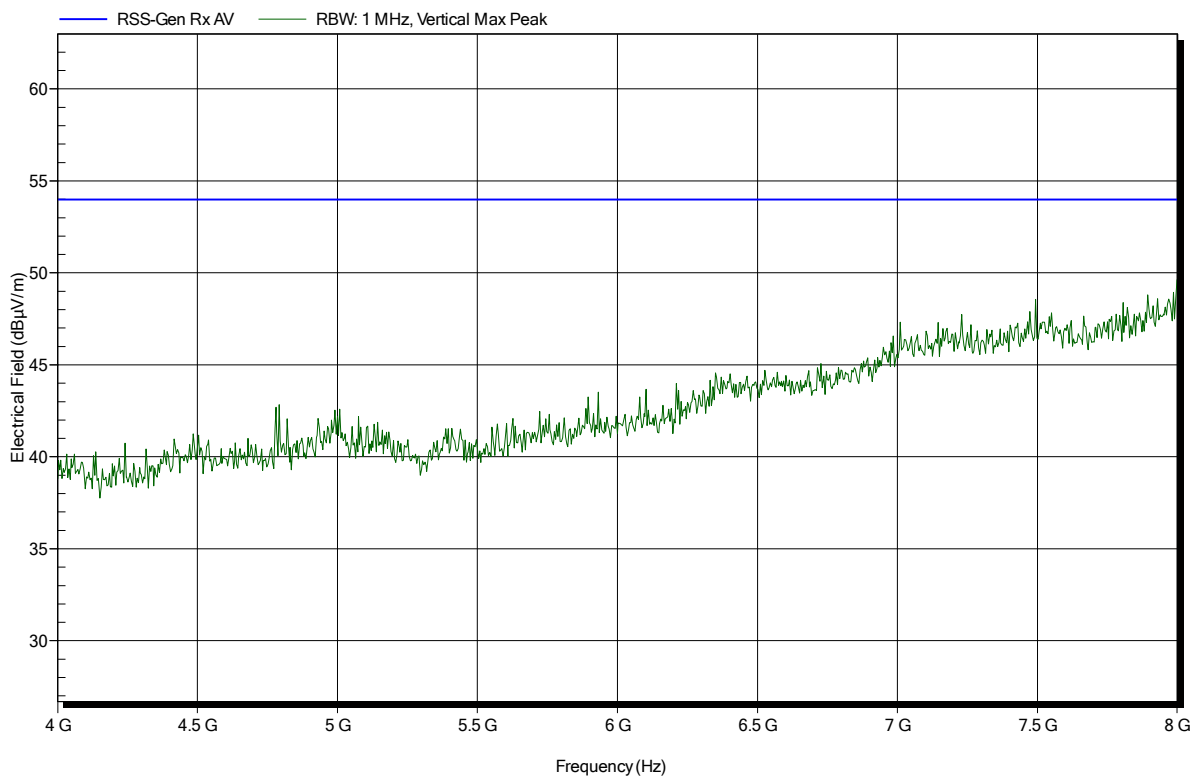


### Spurious emissions according to FCC 15.247

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 3 m  
 Mode: RX; WLAN 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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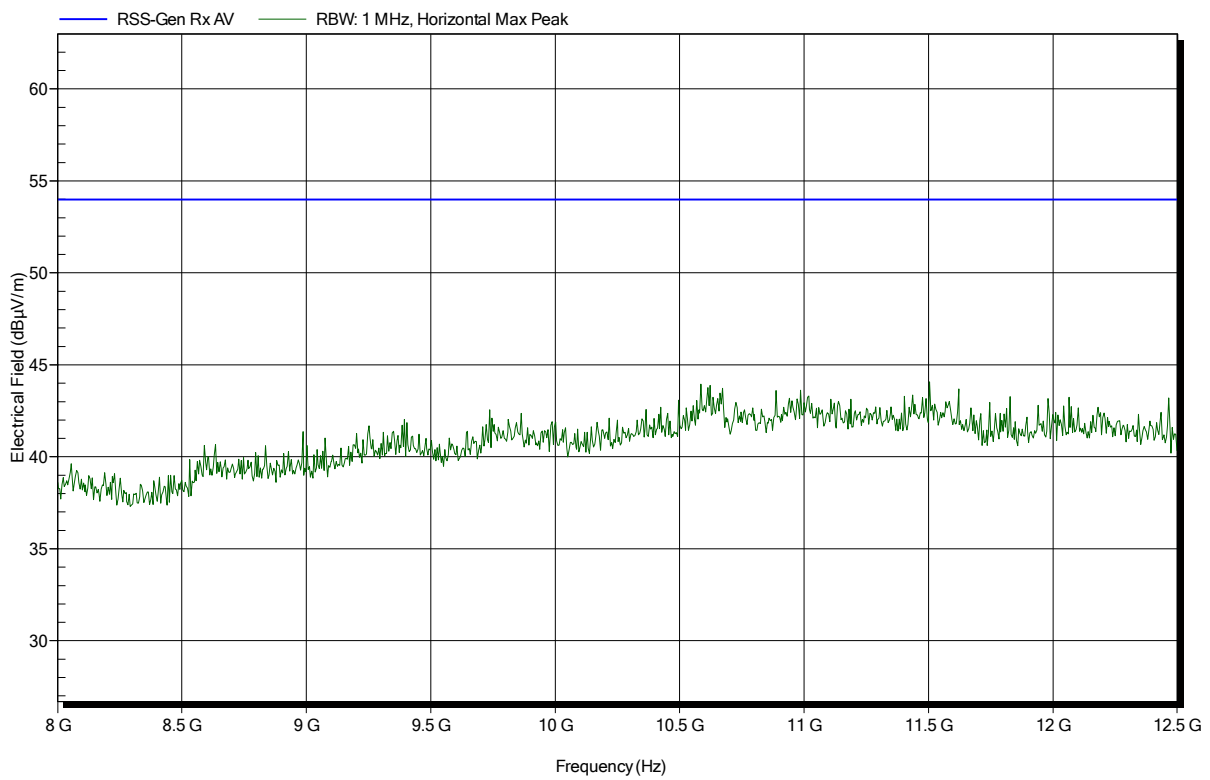


**Spurious emissions according to FCC 15.247**

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Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Horizontal  
 Measurement distance: 1 m converted to 3m  
 Mode: RX; WLAN 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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**Spurious emissions according to FCC 15.247**

Project number: G0M-1807-7540

Applicant: Leica Geosystems AG  
 EUT Name: TiWi BT/WLAN Evaluation Board  
 Model: TiWi BT/WLAN Evaluation Board  
 Test Site: Eurofins Product Service GmbH  
 Operator: Sebastian Suckow  
 Test Conditions: Tnom: 24°C, Vnom: 7.0 VDC  
 Antenna: Schwarzbeck BBHA 9120D, Vertical  
 Measurement distance: 1 m converted to 3m  
 Mode: RX; WLAN 2437 MHz  
 Test Date: 2018-07-18  
 Note:

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