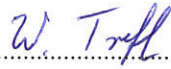


RADIO REPORT FCC 47 CFR Part 15C ISED Canada RSS-247 Digital transmission systems operating within the 2400 – 2483.5 MHz band	
Report Reference No	G0M-1611-6034-TFC247DT-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Applicant	Artis GmbH
Address	Buchenring 40 21272 Egestorf GERMANY
Test Specification	According to FCC/IC rules
Standard	47 CFR Part 15C RSS-247, Issue 1, 2015-05
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	4K-WISY-Antennenmodul
Model(s)	4K-WISY-Antennenmodul
Additional Model(s)	None
Brand Name(s)	None
Hardware Version(s)	A00447C
Software Version(s)	41.2.3.3
FCC-ID	2AKIJ-4KANTMOD
IC	22197-4KANTMOD
Test Result	PASSED

Possible test case verdicts:		
required by standard but not tested	N/T	
not required by standard	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	2017-02-02	
Date (s) of performance of tests	2017-02-02 – 2017-02-09	
Report:		
Compiled by	Wilfried Treffke	
Tested by (+ signature) (Responsible for Test)	Wilfried Treffke	
Approved by (+ signature) (Head of Lab)	Christian Weber	
Date of Issue	2017-02-17	
Total number of pages	104	
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:		
The EUT can operate with different power requirements. (5.0V DC powered by USB and 24V DC) Test mode selection is based on comparative tests. The 5.0V DC power port was selected for compliance tests.		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2017-02-17	Initial Release	

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
RBW	Resolution bandwidth
RMS	Root mean square
VBW	Video bandwidth
V _{NOM}	Nominal supply voltage

REPORT INDEX

1	Equipment (Test Item) Under Test.....	6
1.1	Photos – Equipment External	7
1.2	Photos – Equipment Internal	10
1.3	Photos – Test Setup.....	12
1.4	Support Equipment.....	13
1.5	Test mode duty cycle	14
1.6	Test Modes	16
1.7	Test Frequencies.....	17
1.8	Sample emission level calculation.....	18
2	Result Summary.....	19
3	Test Conditions and Results.....	20
3.1	Test Conditions and Results - Occupied bandwidth.....	20
3.2	Test Conditions and Results - 6 dB bandwidth.....	25
3.3	Test Conditions and Results - Maximum peak conducted output power	30
3.4	Test Conditions and Results - Power spectral density	35
3.5	Test Conditions and Results - AC powerline conducted emissions.....	40
3.6	Test Conditions and Results - Band-edge compliance.....	43
3.7	Test Conditions and Results - Conducted spurious emissions.....	46
3.8	Test Conditions and Results - Transmitter radiated emissions	50
3.9	Test Conditions and Results - Receiver radiated emissions	53
ANNEX A	Transmitter sprurious emissions	55
ANNEX B	Receiver sprurious emissions	95

1 Equipment (Test Item) Under Test

Description	4K-WISY-Antennenmodul	
Model	4K-WISY-Antennenmodul	
Additional Model(s)	None	
Brand Name(s)	None	
Serial Number(s)	11888	
Hardware Version(s)	A00447C	
Software Version(s)	41.2.3.3	
FCC-ID	2AKIJ-4KANTMOD	
IC	22197-4KANTMOD	
Equipment type	End Product	
Radio type	Transceiver	
Assigned frequency bands	2400 - 2483.5 MHz	
Radio technology	Digital Modulation	
Modulation	GFSK	
Number of antenna ports	1	
Antenna	Type	External dedicated
	Model	A24-HASM-450
	Manufacturer	Digi International
	Gain	2.1 dBi
Supply Voltage 1	V _{NOM}	5.0 VDC (USB)
Operating Temperature	T _{NOM}	25 °C
AC/DC-Adaptor	Model	none
	Vendor	none
	Input	none
	Output	none
Manufacturer	Artis GmbH Buchenring 40 ManufacturerPOCode Egestorf ManufacturerCountry	

1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
none				
Description:				
AE	Auxillary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
Comment:				

1.5 Test mode duty cycle

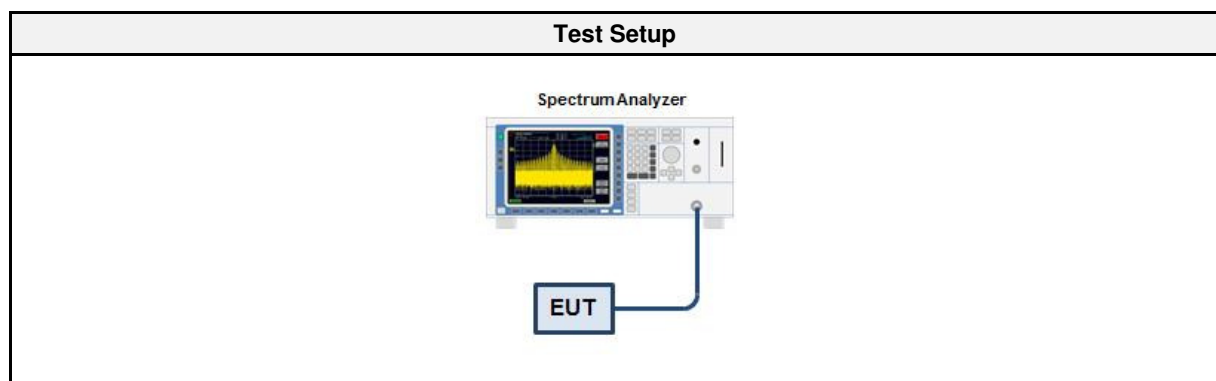
1.5.1 Information

Test Information	
Measurement Method	ANSI C63.10 11.6

1.5.2 Requirements

Requirements	
Duty cycle	Duty cycle correction
$\geq 98 \%$	No correction required
$< 98 \%$	Correction required ($10 \times \log_{10}(1/DC)$)

1.5.3 Setup



1.5.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 26	EF01003	2016-03	2017-03

1.5.5 Procedure

Test Procedure
1. EUT set to test mode 2. Span is set to zero span 3. Detector set to peak 4. Sweep time is set long enough to capture at least 5 bursts 5. Envelope peak value of emission spectrum is selected 6. The maximum burst duration T_{ON} is measured using two markers set to the start and the end of the longest burst 7. The minimum idle duration T_{OFF} is measured using two markers set to the start and the end of the shortest idle period 8. The duty cycle is calculated by $DC = T_{ON} / (T_{ON} + T_{OFF})$ 9. The duty cycle correction is calculated by $DC = 10 \times \log_{10}(T_{ON} / (T_{ON} + T_{OFF}))$

1.5.6 Results

Duty Cycle Results		
Mode	Duty Cycle	Correction Factor [dB]
Transmit-Bat / Transmit-PS	100	0

1.6 Test Modes

Mode	Description	
Transmit-PS	General Conditions:	EUT powered by laboratory power supply
	Radio Conditions:	Mode = Transmit Modulation = GFSK Duty cycle = 100 %
Transmit-Bat	General Conditions:	EUT powered by fully charged battery
	Radio Conditions:	Mode = Transmit Modulation = GFSK Duty cycle = 100 %
Receive-PS	General Conditions:	EUT powered by laboratory power supply
	Radio Conditions:	Mode = Receive Modulation = GFSK
Receive-Bat	General Conditions:	EUT powered by fully charged battery
	Radio Conditions:	Mode = Receive Modulation = GFSK
Comment:		

1.7 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx / Rx	1	2402
F2	Tx / Rx	2	2436
F3	Tx / Rx	3	2472

1.8 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-210				
Product Standard Reference	Requirement	Reference Method	Result	Remarks
RSS-Gen 6.6	Occupied Bandwidth	ANSI C63.10	N/R	Informational only
FCC § 15.247(a)(2) ISED RSS-247 § 5.2	6 dB Bandwidth	ANSI C63.10	PASS	
FCC § 15.247(b)(3) ISED RSS-247 § 5.4	Maximum peak conducted power	ANSI C63.10	PASS	
FCC § 15.247(e) ISED RSS-247 § 5.2	Power spectral density	ANSI C63.10	PASS	
FCC § 15.207 ISED RSS-247 § 3.1	AC power line conducted emissions	ANSI C63.10	PASS	
FCC § 15.247(d) ISED RSS-247 § 5.5	Band edge compliance	ANSI C63.10	PASS	
FCC § 15.247(d) ISED RSS-247 § 5.5	Conducted spurious emissions	ANSI C63.10	PASS	
FCC § 15.247(d) FCC § 15.209 ISED RSS-247 § 5.5	Transmitter radiated spurious emissions	ANSI C63.10	PASS	
ISED RSS-247 § 3.1	Receiver radiated spurious emissions	ANSI C63.10	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

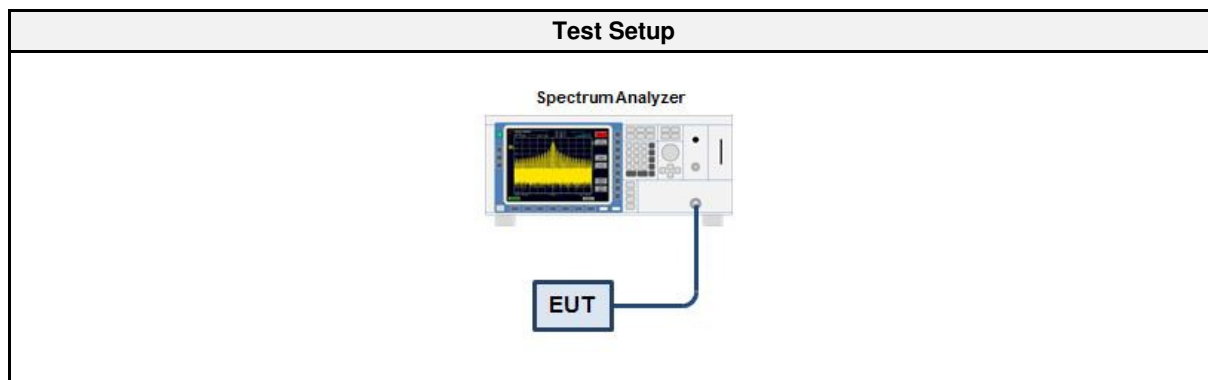
3.1.1 Information

Test Information	
Reference	ISED RSS-Gen 6.6
Measurement Method	ANSI C63.10 6.9.3

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	2016-03	2017-03

3.1.5 Procedure

Test Procedure
1. EUT transmitter is activated in test mode under normal conditions 2. The spectrum analyzer is set to peak detection and maximum hold with a span twice the emission spectrum 3. The resolution bandwidth is set to 1 % of the bandwidth 4. The occupied bandwidth is measured with the build-in analyzer function

3.1.6 Results

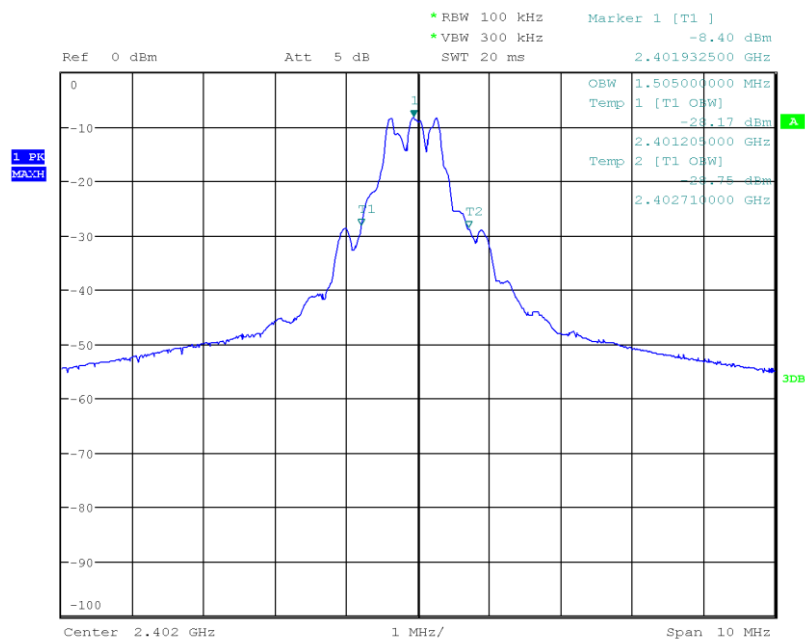
Test Results		
Mode	Frequency [MHz]	Bandwidth [MHz]
Transmit-PS	2402	1.505
Transmit-PS	2436	1.525
Transmit-PS	2472	1.705

Occupied bandwidth – 2402 MHz

Occupied Bandwidth

Project Number: G0M-1611-6034

Applicant	Artis GmbH
Model Description	4K-WISY-Antennenmodul
Model:	4K-WISY-Antennenmodul
Test Sample ID:	11888
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	GFSK, Channel: 2402.0 MHz
Operating Conditions:	Tnom/Vnom
Operator:	W. Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2017-02-06
Occupied Bandwidth [MHz]:	1.505



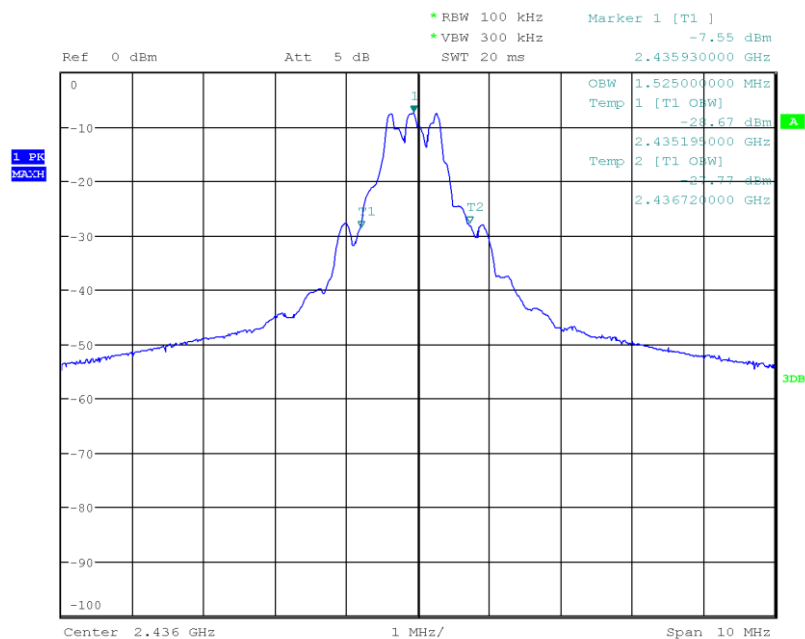
Date: 6.FEB.2017 10:04:35

Occupied bandwidth – 2436 MHz

Occupied Bandwidth

Project Number: G0M-1611-6034

Applicant: Artis GmbH
Model Description: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Sample ID: 11888
Reference Standards: FCC 15.247, RSS-247
Reference Method: ANSI C63.10:2013, Section 6.9.3
Operational Mode: GFSK, Channel: 2436.0 MHz
Operating Conditions: Tnom/Vnom
Operator: W. Treffke
Test Site: Eurofins Product Service GmbH
Test Date: 2017-02-06
Occupied Bandwidth [MHz]: 1.525



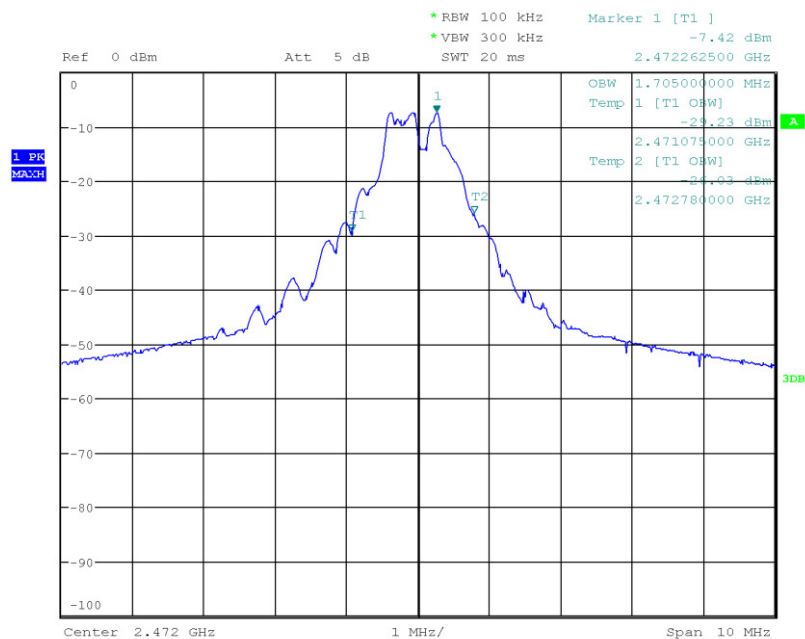
Date: 6.FEB.2017 10:11:04

Occupied bandwidth – 2472 MHz

Occupied Bandwidth

Project Number: G0M-1611-6034

Applicant: Artis GmbH
 Model Description: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Sample ID: 11888
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: GFSK, Channel: 2472.0 MHz
 Operating Conditions: Tnom/Vnom
 Operator: W. Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2017-02-06
 Occupied Bandwidth [MHz]: 1.705



Date: 6.FEB.2017 10:16:50

3.2 Test Conditions and Results - 6 dB bandwidth

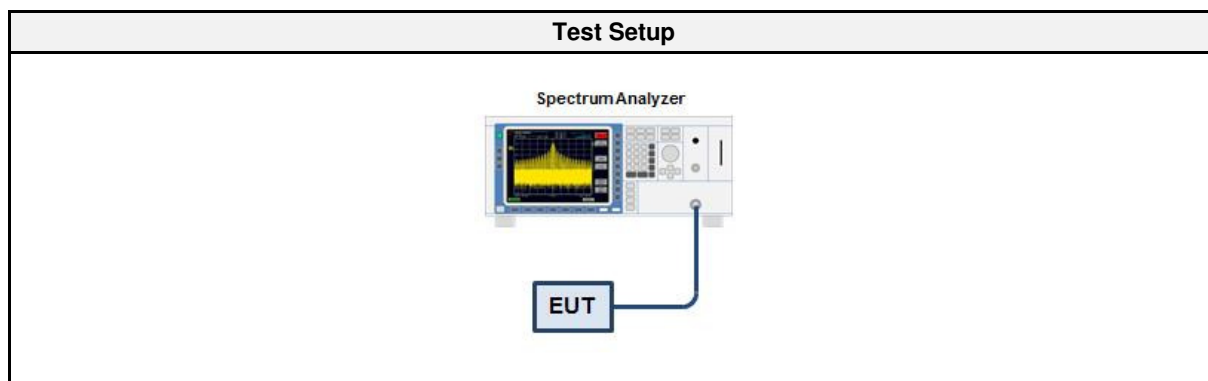
3.2.1 Information

Test Information	
Reference	FCC 15.247(a)(2) / ISED RSS-247 5.2
Measurement Method	ANSI C63.10 11.8

3.2.2 Limits

Limits
$\geq 500\text{kHz}$

3.2.3 Setup



3.2.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 26	EF01003	2016-03	2017-03

3.2.5 Procedure

Test Procedure
1. EUT set to test mode 2. Span set to at least twice the emission spectrum 3. Detector set to peak and max hold and RBW is set to 100 kHz 4. Envelope peak value of emission spectrum is selected 5. Marker on envelope of spectrum is set to level of -6 dB to the left of the peak 6. Marker on envelope of spectrum is set to level of -6 dB to the right of the peak 7. 6 dB Bandwidth is determined by marker frequency separation

3.2.6 Results

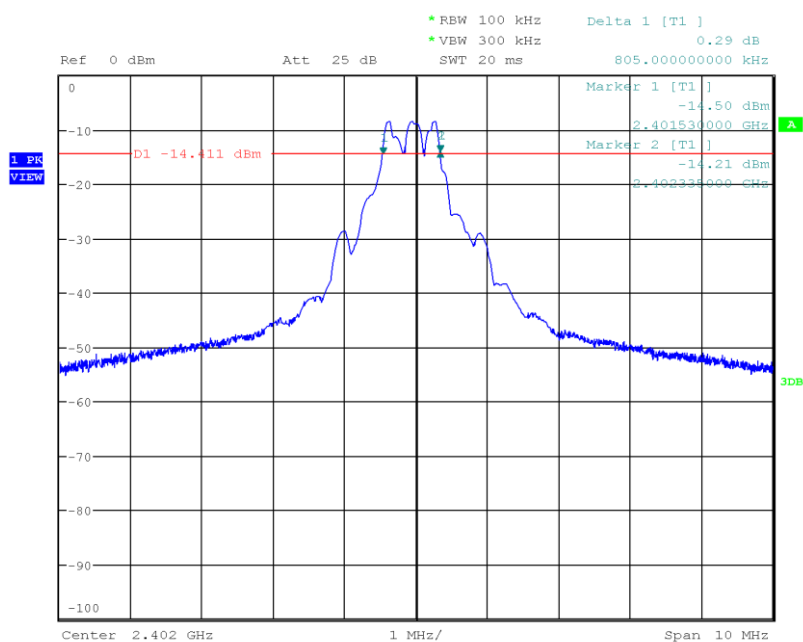
Test Results				
Mode	Frequency [MHz]	Bandwidth [kHz]	Limit [kHz]	Verdict
Transmit-PS	2402	805	500	PASS
Transmit-PS	2436	807	500	PASS
Transmit-PS	2472	850	500	PASS

6 dB bandwidth – 2402 MHz

DTS (6 dB) Bandwidth

Project Number: G0M-1611-6034

Applicant	Artis GmbH
Model Description	4K-WISY-Antennenmodul
Model:	4K-WISY-Antennenmodul
Test Sample ID:	11888
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	GFSK, Channel: 2402.0 MHz
Operating Conditions:	Tnom/Vnom
Operator:	W. Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2017-02-06
Lower Frequency [MHz]:	2401.530
Upper Frequency [MHz]:	2402.335
6 dB Bandwidth [kHz]:	805



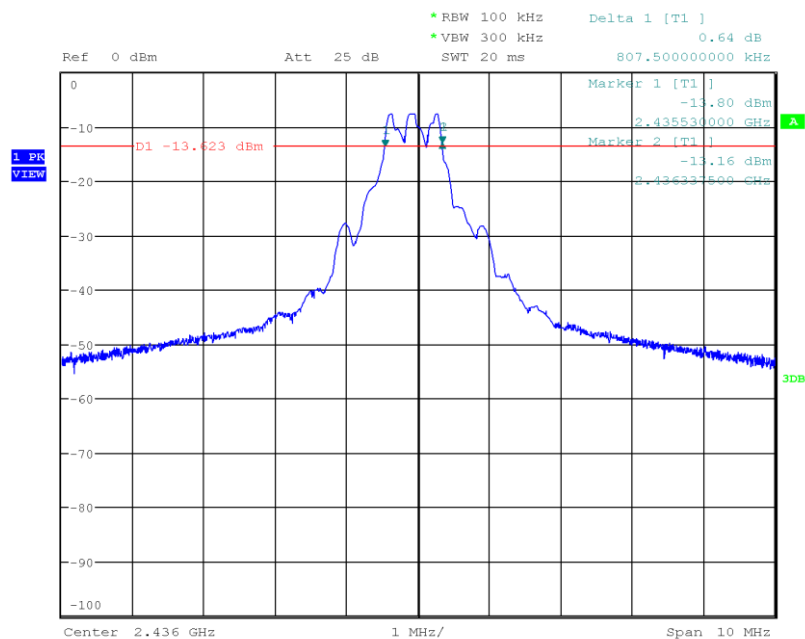
Date: 6.FEB.2017 10:42:39

6 dB bandwidth – 2436 MHz

DTS (6 dB) Bandwidth

Project Number: G0M-1611-6034

Applicant	Artis GmbH
Model Description	4K-WISY-Antennenmodul
Model:	4K-WISY-Antennenmodul
Test Sample ID:	11888
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.8.1 Option 1
Operational Mode:	GFSK, Channel: 2436.0 MHz
Operating Conditions:	Tnom/Vnom
Operator:	W. Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2017-02-06
Lower Frequency [MHz]:	2435.530
Upper Frequency [MHz]:	2436.338
6 dB Bandwidth [kHz]:	807



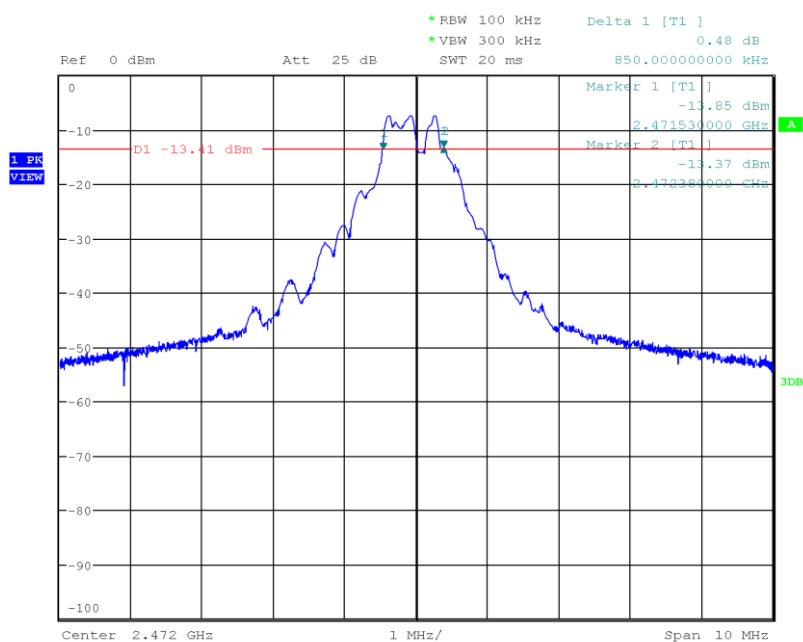
Date: 6.FEB.2017 10:34:33

6 dB bandwidth – 2472 MHz

DTS (6 dB) Bandwidth

Project Number: G0M-1611-6034

Applicant: Artis GmbH
 Model Description: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Sample ID: 11888
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1
 Operational Mode: GFSK, Channel: 2472.0 MHz
 Operating Conditions: Tnom/Vnom
 Operator: W. Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2017-02-06
 Lower Frequency [MHz]: 2471.530
 Upper Frequency [MHz]: 2472.380
 6 dB Bandwidth [kHz]: 850



Date: 6.FEB.2017 10:29:11

3.3 Test Conditions and Results - Maximum peak conducted output power

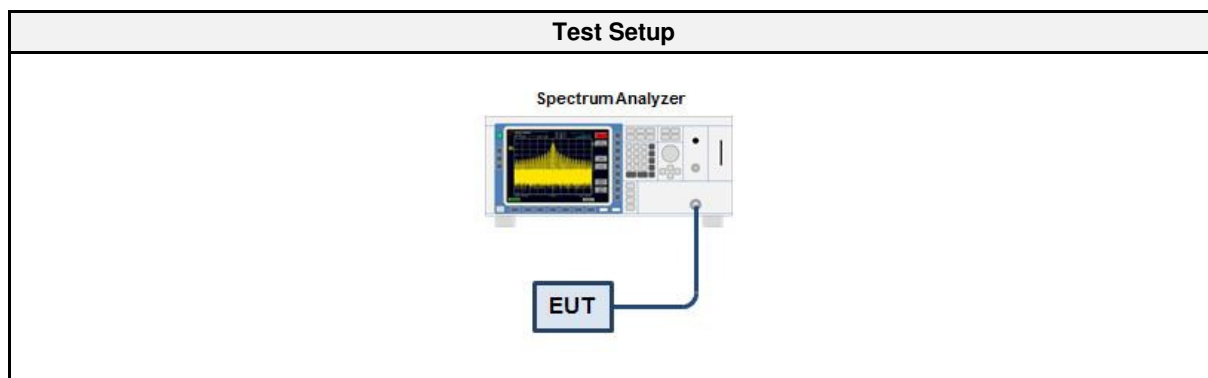
3.3.1 Information

Test Information	
Reference	FCC 15.247(b)(1) / ISED RSS-247 5.4
Measurement Method	ANSI C63.10 11.9.1

3.3.2 Limits

Limits
1 W (30 dBm)
The conducted output power limit specified above is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in the table, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.3 Setup



3.3.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 26	EF01003	2016-03	2017-03

3.3.5 Procedure

Test Procedure
1. EUT set to test hopping mode (Communication tester is used if needed) 2. Analyzer resolution bandwidth is set $\geq$ DTS bandwidth 3. Detector set to peak and max hold 4. Sweep time is set to auto 5. After the trace has stabilized a marker is set to peak of envelope

3.3.6 Results

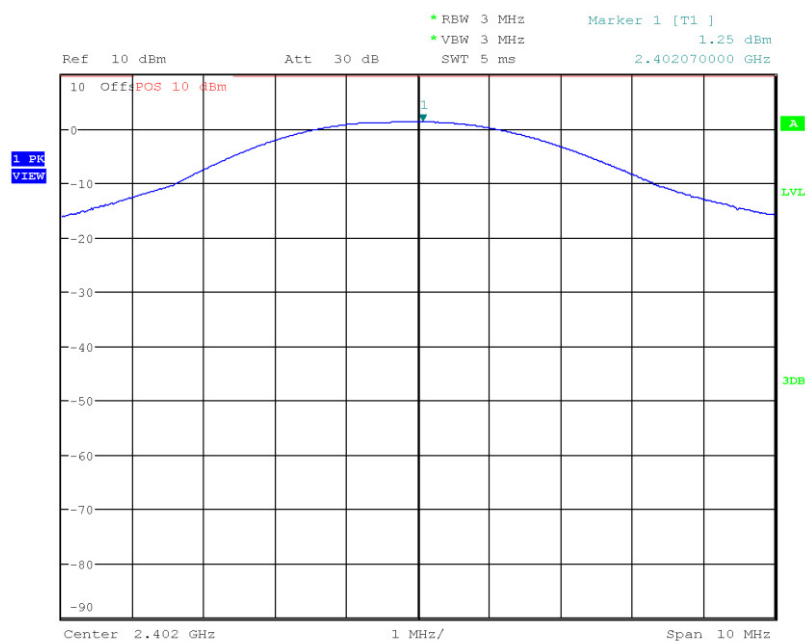
Test Results				
Channel [MHz]	Power [dBm]	Power [W]	Limit [W]	Verdict
2402	1.253	0.001334	1.0	PASS
2436	2.014	0.001590	1.0	PASS
2472	2.278	0.001690	1.0	PASS

Maximum peak conducted output power - 2472 MHz

Peak Conducted Output Power

Project Number: G0M-1611-6034

Applicant: Artis GmbH
 Model Description: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Sample ID: 11888
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.9.1.1
 Operational Mode: GFSK, Channel: 2402.0 MHz
 Operating Conditions: Tnom/Vnom
 Operator: W. Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2017-02-06
 Peak Power [dBm]: 1.253



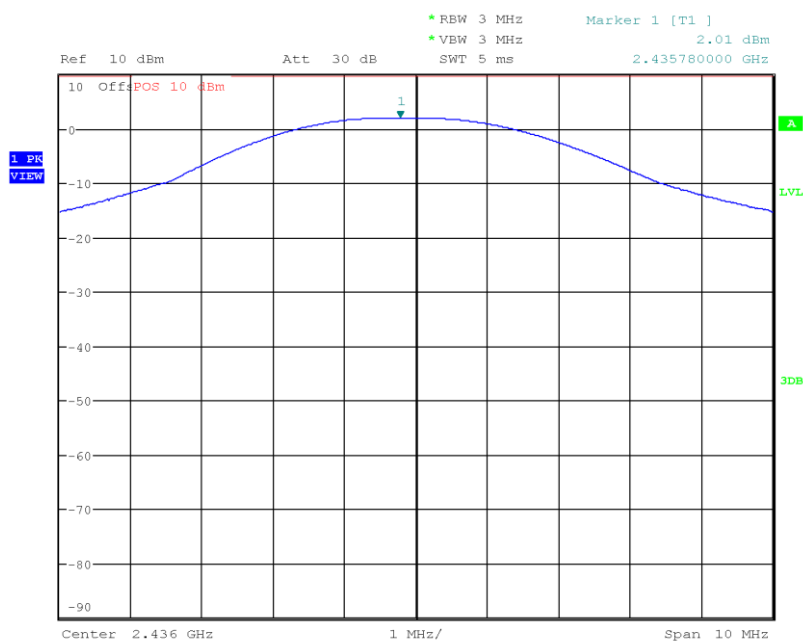
Date: 6.FEB.2017 11:10:50

Maximum peak conducted output power - 2472 MHz

Peak Conducted Output Power

Project Number: G0M-1611-6034

Applicant	Artis GmbH
Model Description	4K-WISY-Antennenmodul
Model:	4K-WISY-Antennenmodul
Test Sample ID:	11888
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.9.1.1
Operational Mode:	GFSK, Channel: 2436.0 MHz
Operating Conditions:	Tnom/Vnom
Operator:	W. Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2017-02-06
Peak Power [dBm]:	2.014



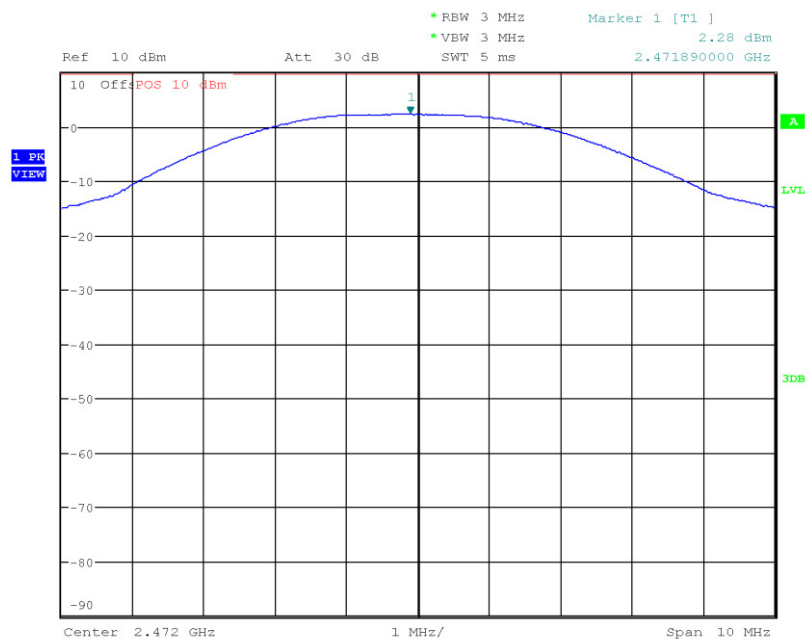
Date: 6.FEB.2017 11:14:56

Maximum peak conducted output power - 2472 MHz

Peak Conducted Output Power

Project Number: G0M-1611-6034

Applicant	Artis GmbH
Model Description	4K-WISY-Antennenmodul
Model:	4K-WISY-Antennenmodul
Test Sample ID:	11888
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.9.1.1
Operational Mode:	GFSK, Channel: 2472.0 MHz
Operating Conditions:	Tnom/Vnom
Operator:	W. Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2017-02-06
Peak Power [dBm]:	2.278



Date: 6.FEB.2017 11:21:21

3.4 Test Conditions and Results - Power spectral density

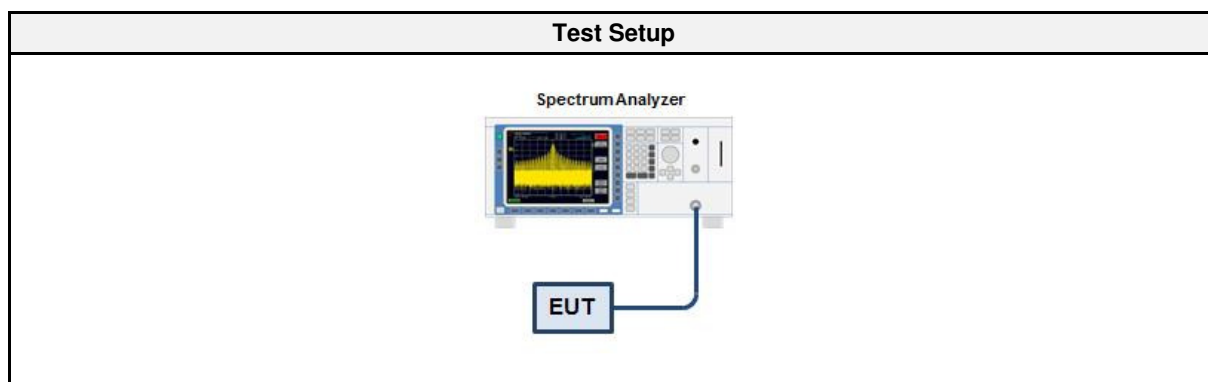
3.4.1 Information

Test Information	
Reference	FCC 15.247(e) / ISED RSS-247 5.2
Measurement Method	ANSI C63.10 11.10.2, 14.3.2

3.4.2 Limits

Limits
8 dBm / 3 kHz

3.4.3 Setup



3.4.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 26	EF01003	2016-03	2017-03

3.4.5 Procedure

Test Procedure
1. EUT set to test mode 2. The analyzer is set to DTS channel center frequency with a span of 1.5 times the DTS bandwidth 3. The RBW is set to 100 kHz with VBW $\geq$ RBW and the detector is set to peak with max hold 4. After the trace has stabilized a marker is set to the envelope maximum 5. If the power spectral density is above the limit the RBW is reduced (not lower than 3 kHz) and the measurement is repeated 6. If the EUT has more than one transmit chain the procedure is repeated for each transmit chain

3.4.6 Results

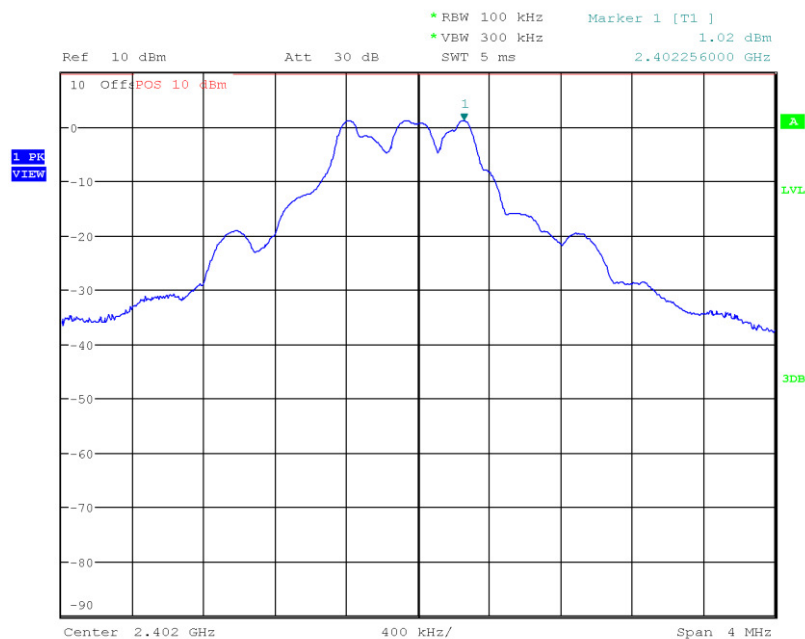
Test Results			
Channel [MHz]	PSD [dBm/RBW]	Limit [dBm/3kHz]	Verdict
2402	1.021	8.0	PASS
2436	1.758	8.0	PASS
2472	2.026	8.0	PASS
RBW = 100 kHz			

Power spectral density - 2402 MHz

Peak Power Spectral Density

Project Number: G0M-1611-6034

Applicant	Artis GmbH
Model Description	4K-WISY-Antennenmodul
Model:	4K-WISY-Antennenmodul
Test Sample ID:	11888
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	GFSK, Channel: 2402.0 MHz
Operating Conditions:	Tnom/Vnom
Operator:	W. Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2017-02-06
Peak Frequency [MHz]:	2402.256
Spectral Density [dBm/RBW]:	1.021
Resolution Bandwidth [kHz]:	100 kHz



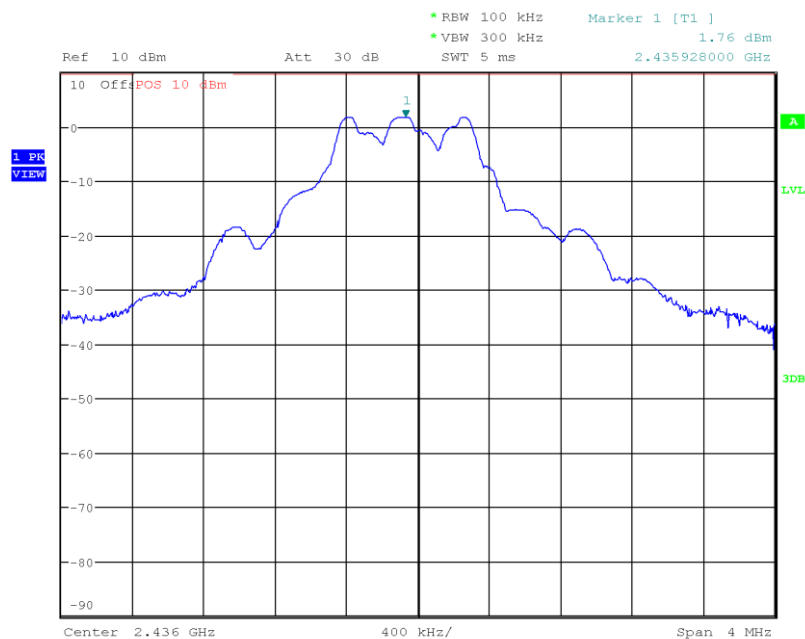
Date: 6.FEB.2017 11:53:10

Power spectral density - 2402 MHz

Peak Power Spectral Density

Project Number: G0M-1611-6034

Applicant	Artis GmbH
Model Description	4K-WISY-Antennenmodul
Model:	4K-WISY-Antennenmodul
Test Sample ID:	11888
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	GFSK, Channel: 2436.0 MHz
Operating Conditions:	Tnom/Vnom
Operator:	W. Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2017-02-06
Peak Frequency [MHz]:	2435.928
Spectral Density [dBm/RBW]:	1.758
Resolution Bandwidth [kHz]:	100 kHz



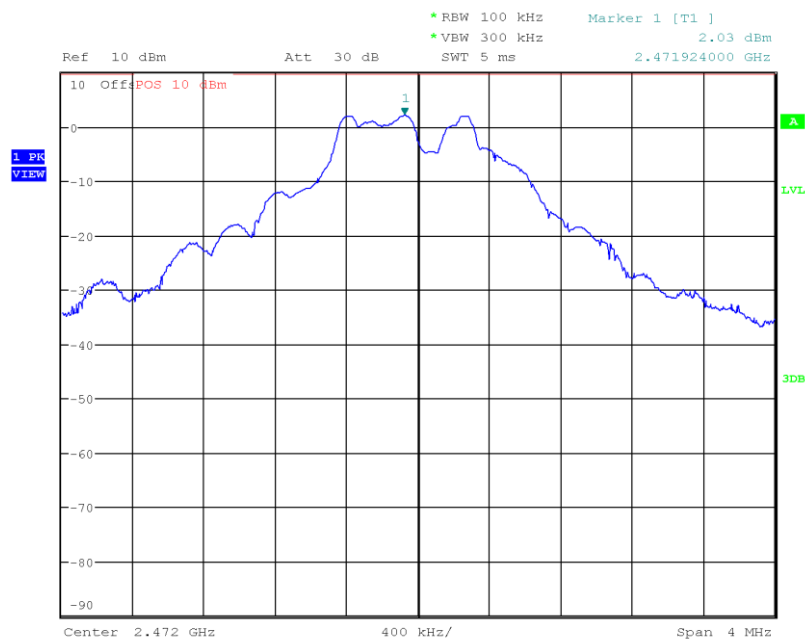
Date: 6.FEB.2017 11:56:15

Power spectral density - 2402 MHz

Peak Power Spectral Density

Project Number: G0M-1611-6034

Applicant	Artis GmbH
Model Description	4K-WISY-Antennenmodul
Model:	4K-WISY-Antennenmodul
Test Sample ID:	11888
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.10.2
Operational Mode:	GFSK, Channel: 2472.0 MHz
Operating Conditions:	Tnom/Vnom
Operator:	W. Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2017-02-06
Peak Frequency [MHz]:	2471.924
Spectral Density [dBm/RBW]:	2.026
Resolution Bandwidth [kHz]:	100 kHz



Date: 6.FEB.2017 12:02:14

3.5 Test Conditions and Results - AC powerline conducted emissions

3.5.1 Information

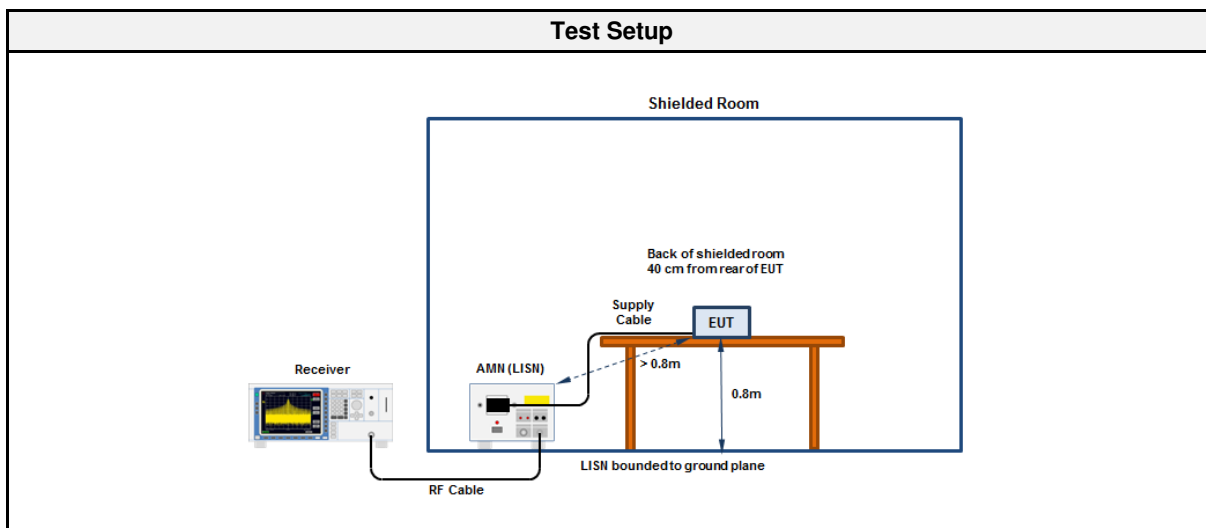
Test Information	
Reference	FCC 15.207
Measurement Method	ANSI C63.10 6.2

3.5.2 Limits

Limits		
Frequency [MHz]	Quasi-Peak [dBμV]	Average [dBμV]
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

3.5.3 Setup



3.5.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	R&S	ESU 26	EF00241	2016-04	2018-04
LISN	R&S	ESH2-Z5	EF00182	2017-01	2019-01

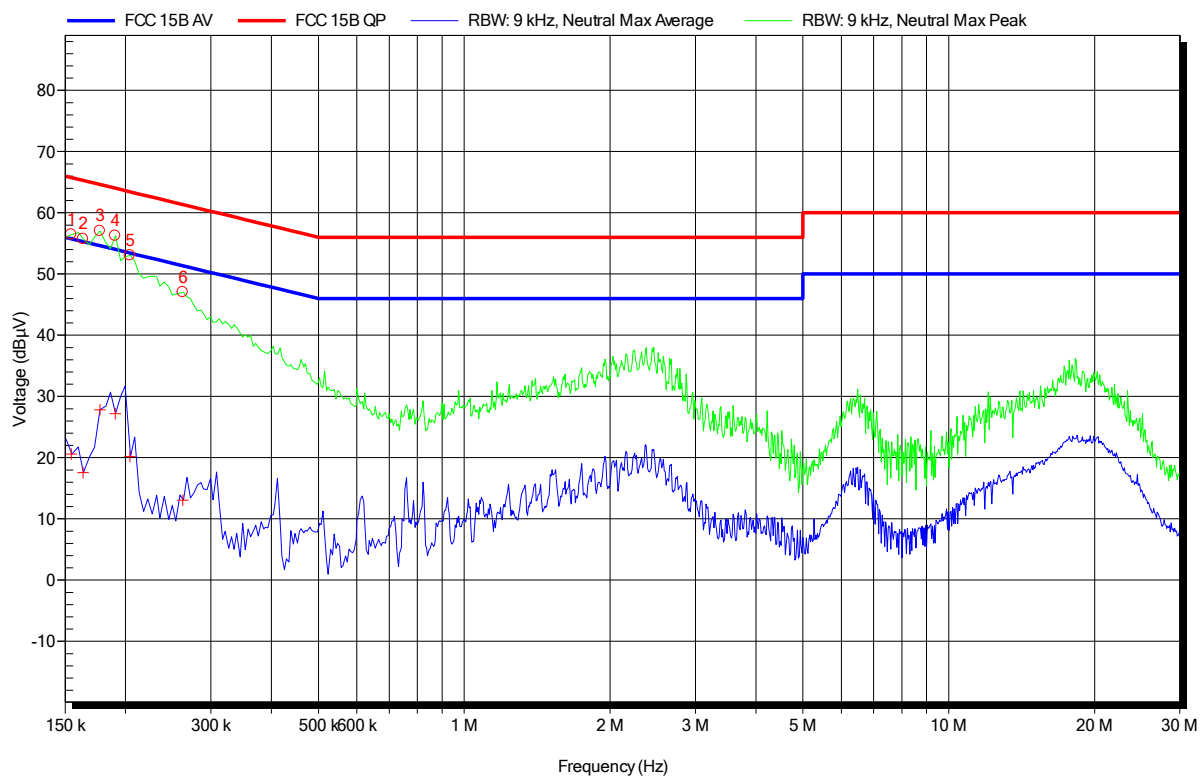
Conducted Emissions N

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

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Handrik
 Test Conditions: Tnom: 24°C, Unom: 3.7 V DC
 LISN: ESH2-Z5 N
 Mode: XBee; Ch: 2436 MHz; GFSK; Pmax
 Test Date: 2017-09-02
 Note:

Index 43



Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status
1	154.5 kHz	20.59 dBμV	55.75 dBμV	-35.17 dB	Pass
2	163.5 kHz	17.57 dBμV	55.28 dBμV	-37.72 dB	Pass
3	177 kHz	27.8 dBμV	54.63 dBμV	-26.83 dB	Pass
4	190.5 kHz	27.2 dBμV	54.01 dBμV	-26.82 dB	Pass
5	204 kHz	20.17 dBμV	53.45 dBμV	-33.28 dB	Pass
6	262.5 kHz	13.04 dBμV	51.35 dBμV	-38.31 dB	Pass

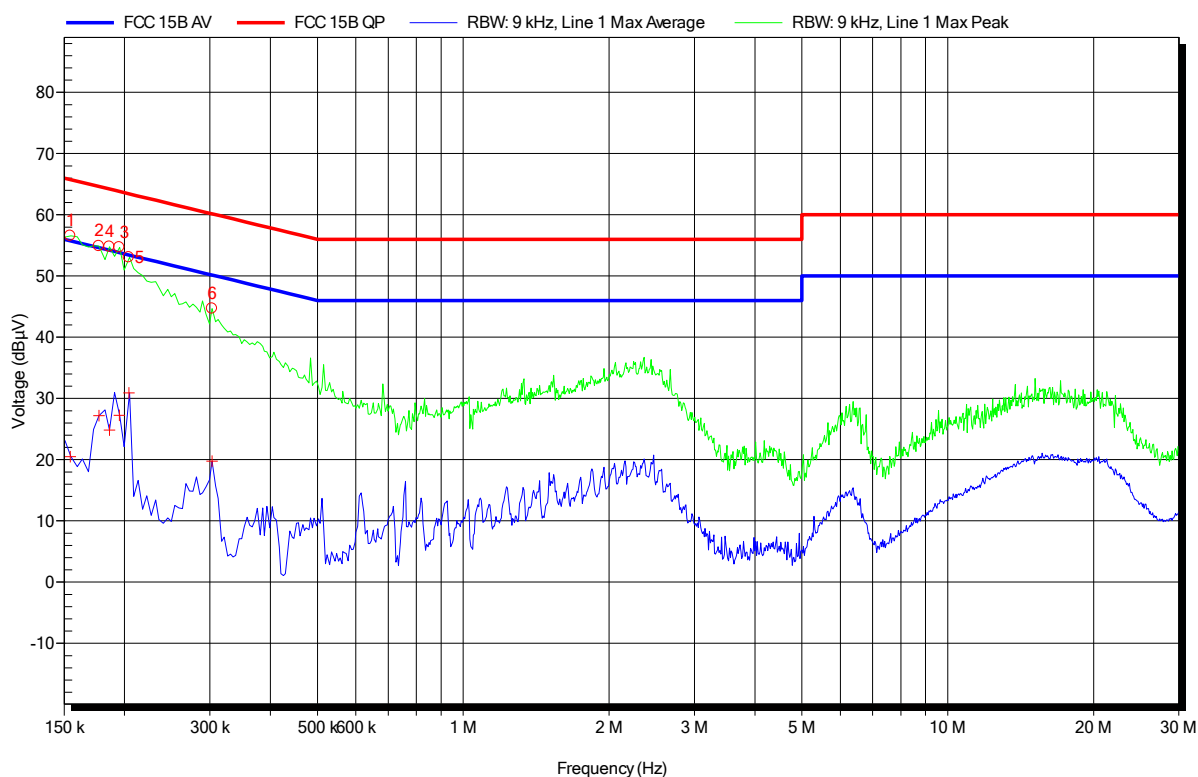
Conducted Emissions L

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

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Handrik
Test Conditions: Tnom: 24°C, Unom: 3.7 V DC
LISN: ESH2-Z5 L
Mode: XBee; Ch: 2436 MHz; GFSK; Pmax
Test Date: 2017-09-02
Note:

Index 44



Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status
1	154.5 kHz	20.51 dBμV	55.75 dBμV	-35.25 dB	Pass
2	177 kHz	27.21 dBμV	54.63 dBμV	-27.42 dB	Pass
3	195 kHz	27.23 dBμV	53.82 dBμV	-26.59 dB	Pass
4	186 kHz	24.86 dBμV	54.21 dBμV	-29.35 dB	Pass
5	204 kHz	30.93 dBμV	53.45 dBμV	-22.52 dB	Pass
6	303 kHz	19.75 dBμV	50.16 dBμV	-30.41 dB	Pass

3.6 Test Conditions and Results - Band-edge compliance

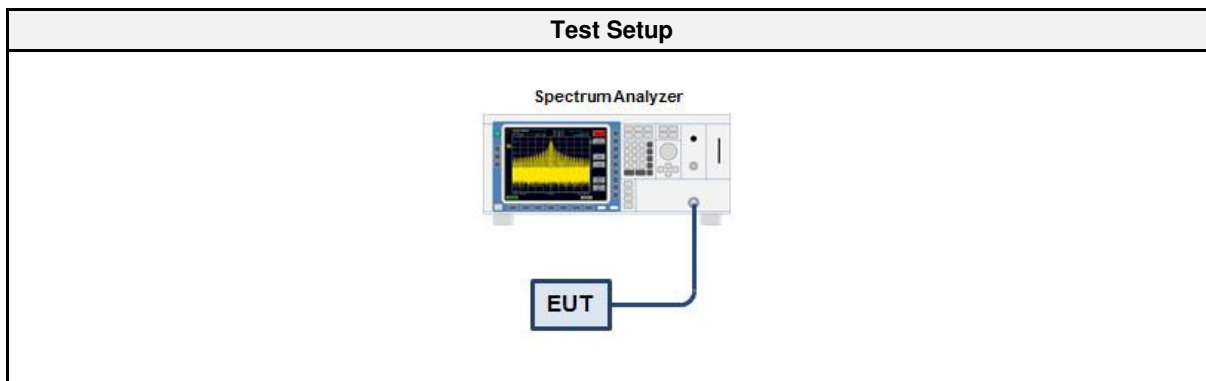
3.6.1 Information

Test Information	
Reference	FCC 15.247(d) / ISSED RSS-247 5.5
Measurement Method	ANSI C63.10 11.11

3.6.2 Limits

Limits	
Power Measurement	Out-of-band attenuation [dB]
Peak	20
Average	30

3.6.3 Setup



3.6.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 26	EF01003	2016-03	2017-03

3.6.5 Procedure

Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Span set around lower band edge and detector is set to peak and max hold 3. Resolution bandwidth is set to 100 kHz 4. Markers are set to peak emission levels within frequency band and outside frequency band 5. Band edge attenuation is determined from level difference

3.6.6 Results

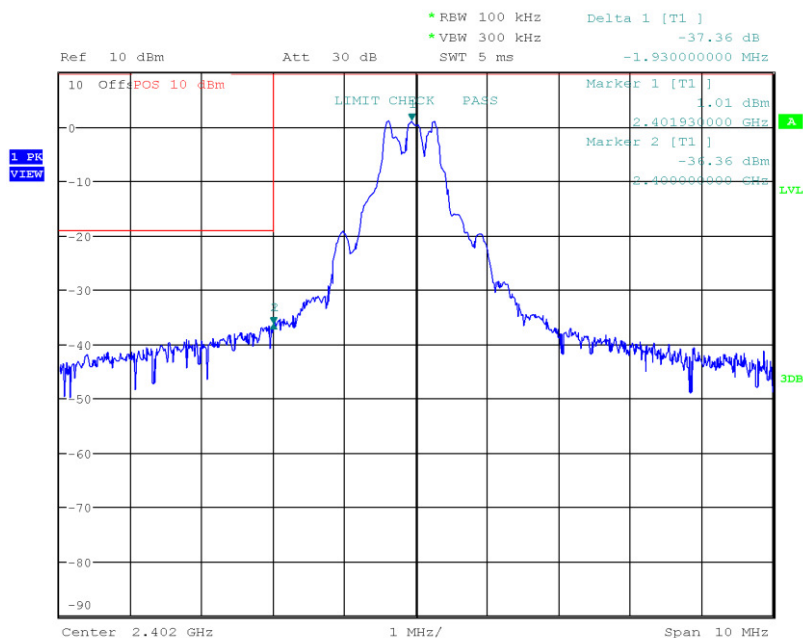
Test Results				
Mode	Channel [MHz]	Out-of-band Attenuation [dB]	Limit [dB]	Verdict
Transmit-PS	2402	-37.36	-20	PASS
Transmit-PS	2472	-46.63	-20	PASS

Band-edge compliance - 2402 MHz

Band-edge Compliance

Project Number: G0M-1611-6034

Applicant	Artis GmbH
Model Description	4K-WISY-Antennenmodul
Model:	4K-WISY-Antennenmodul
Test Sample ID:	11888
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	GFSK, Channel: 2402.0 MHz
Operating Conditions:	Tnom/Vnom
Operator:	W. Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2017-02-06
Band-edge	Lower
In-band Frequency [MHz]:	2401.93
Max. in-band Level [dBm/100 kHz]:	1.006
Out-of-band Frequency [MHz]:	2400.0
Max. out-of-band Level [dBm/100 kHz]:	-36.357
Attenuation [dB]:	-37.36



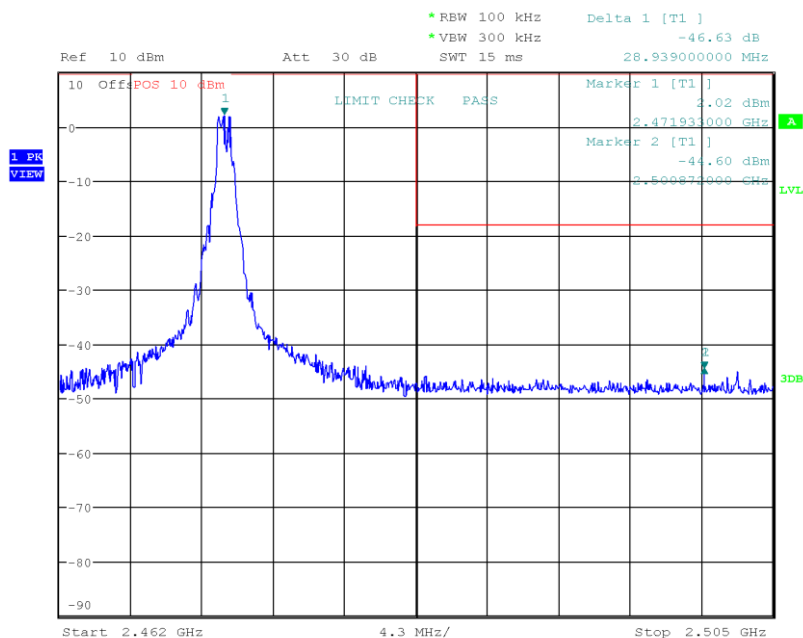
Date: 6.FEB.2017 13:06:50

Band-edge compliance - 2472 MHz

Band-edge Compliance

Project Number: G0M-1611-6034

Applicant	Artis GmbH
Model Description	4K-WISY-Antennenmodul
Model:	4K-WISY-Antennenmodul
Test Sample ID:	11888
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.11
Operational Mode:	GFSK, Channel: 2472.0 MHz
Operating Conditions:	Tnom/Vnom
Operator:	W. Treffke
Test Site:	Eurofins Product Service GmbH
Test Date:	2017-02-06
Band-edge	Upper
In-band Frequency [MHz]:	2471.933
Max. in-band Level [dBm/100 kHz]:	2.024
Out-of-band Frequency [MHz]:	2500.872
Max. out-of-band Level [dBm/100 kHz]:	-44.604
Attenuation [dB]:	-46.63



Date: 6.FEB.2017 13:04:34

3.7 Test Conditions and Results - Conducted spurious emissions

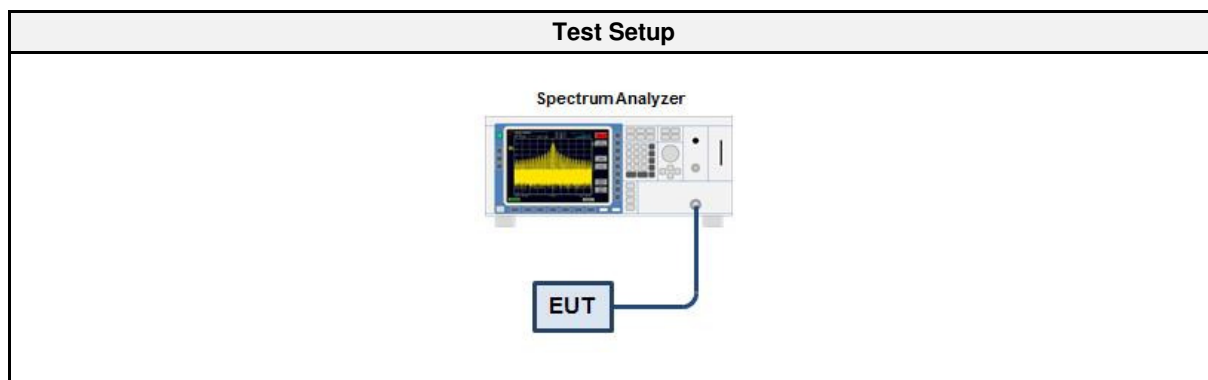
3.7.1 Information

Test Information	
Reference	FCC 15.247(d) / ISSED RSS-247 5.5
Measurement Method	ANSI C63.10 11.11

3.7.2 Limits

Limits	
Power Measurement	Out-of-band attenuation [dB]
Peak	20
Average	30

3.7.3 Setup



3.7.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSU 26	EF01003	2016-03	2017-03

3.7.5 Procedure

Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Span set around lower band edge and detector is set to peak and max hold 3. Resolution bandwidth is set to 100 kHz 4. Markers are set to peak emission levels within frequency band and outside frequency band 5. Band edge attenuation is determined from level difference

3.7.6 Results

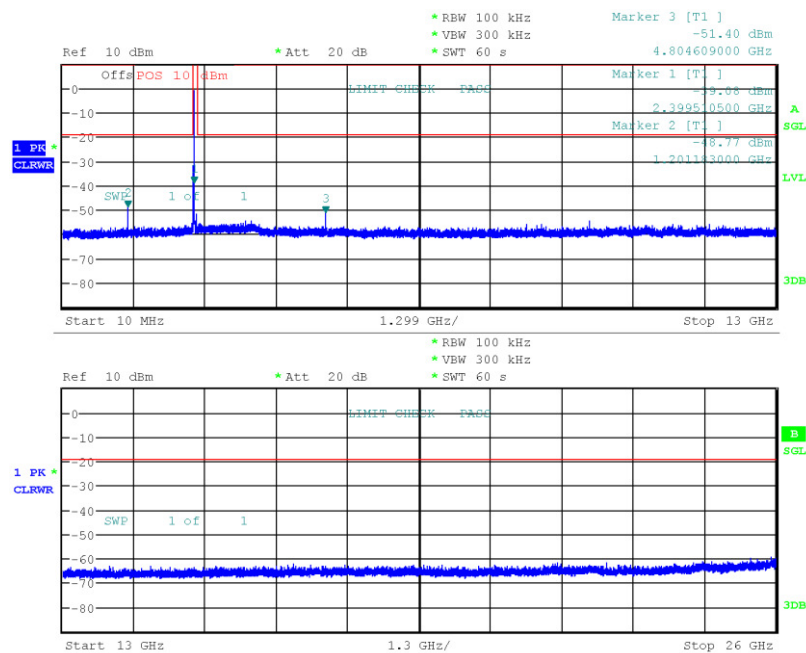
Test Results		
Mode	Channel [MHz]	Verdict
Transmit-PS	2402	PASS
Transmit-PS	2436	PASS
Transmit-PS	2472	PASS

CSE - 2402 MHz

Conducted Spurious Emissions

Project Number: G0M-1611-6034

Applicant: Artis GmbH
 Model Description: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Sample ID: 11888
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: GFSK, Channel: 2402.0 MHz
 Operating Conditions: Tnom/Vnom
 Operator: W. Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2017-02-06
 Max. in-band Frequency [MHz]: 2402.2
 Max. in-band Level [dBm/100 kHz]: 1.0
 Out-of-band Limit [dBm/100 kHz]: -19.0



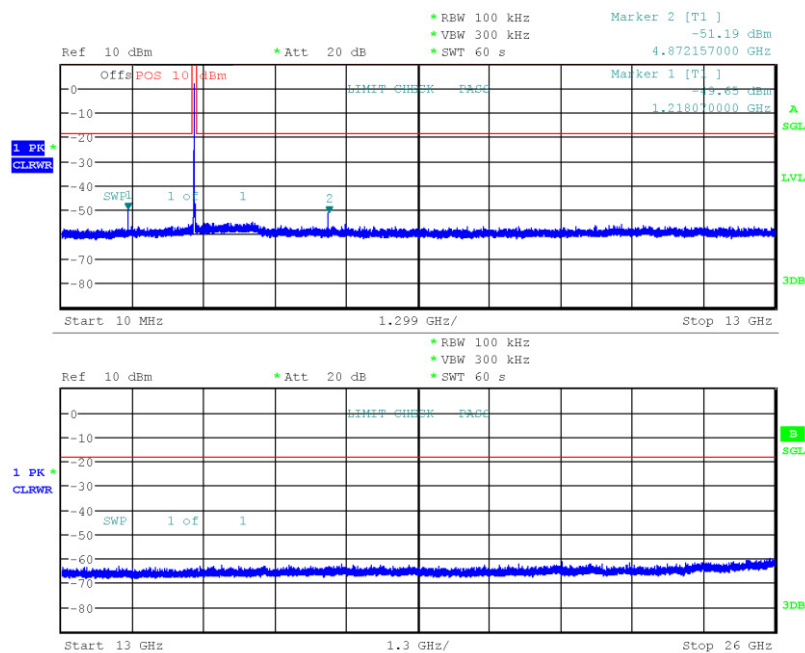
Date: 6.FEB.2017 13:20:25

CSE - 2436 MHz

Conducted Spurious Emissions

Project Number: G0M-1611-6034

Applicant: Artis GmbH
 Model Description: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Sample ID: 11888
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: GFSK, Channel: 2436.0 MHz
 Operating Conditions: Tnom/Vnom
 Operator: W. Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2017-02-06
 Max. in-band Frequency [MHz]: 2435.9
 Max. in-band Level [dBm/100 kHz]: 1.8
 Out-of-band Limit [dBm/100 kHz]: -18.2



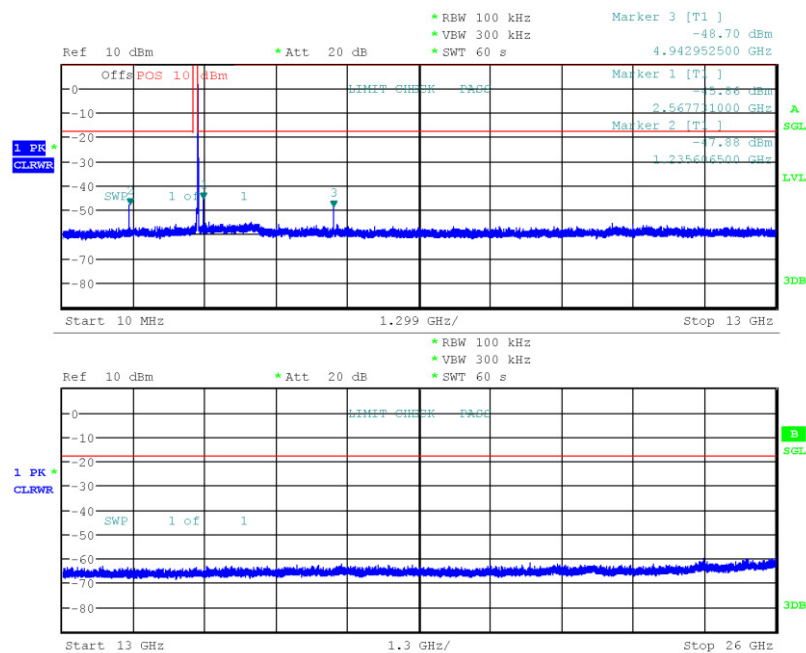
Date: 6.FEB.2017 13:25:34

CSE - 2472 MHz

Conducted Spurious Emissions

Project Number: G0M-1611-6034

Applicant: Artis GmbH
 Model Description: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Sample ID: 11888
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: GFSK, Channel: 2472.0 MHz
 Operating Conditions: Tnom/Vnom
 Operator: W. Treffke
 Test Site: Eurofins Product Service GmbH
 Test Date: 2017-02-06
 Max. in-band Frequency [MHz]: 2471.9
 Max. in-band Level [dBm/100 kHz]: 2.0
 Out-of-band Limit [dBm/100 kHz]: -18.0



3.8 Test Conditions and Results - Transmitter radiated emissions

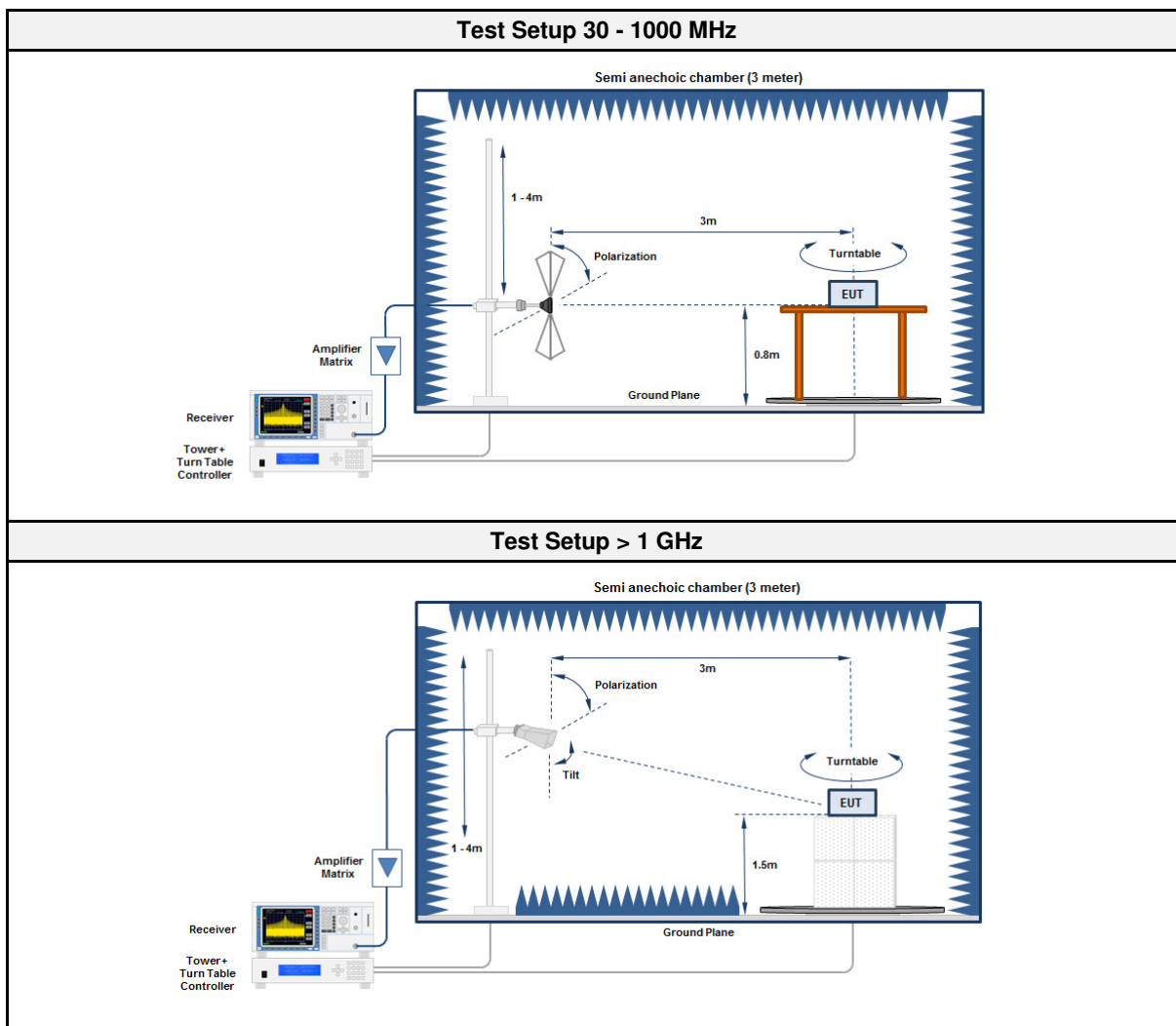
3.8.1 Information

Test Information	
Reference	FCC 15.247(d) / ISED RSS-247 5.5
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6, 11.12

3.8.2 Limits

Limits		
Frequency [MHz]	Field strength [dB μ V/m]	Measurement distance [m]
0.009 - 0.490	2400/F[kHz]	300
0.490 - 1.705	24000/F[kHz]	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
> 960	500	3

3.8.3 Setup



3.8.4 Equipment

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	--	--
Measurement Receiver	R&S	N9038A-526/WXP	EF01070	2016-08	2017-08
Biconical Antenna	R&S	HK 116	EF00012	2016-05	2019-05
LPD Antenna	R&S	HL 223	EF00187	2016-05	2019-05
Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	--	--
Measurement Receiver	R&S	N9038A-526/WXP	EF01070	2016-08	2017-08
Horn antenna	Schwarzbeck	BBHA 9120D (1-18GHz)	EF00018	2016-09	2019-09
Horn antenna	Amplifier Research	ATH18G40 (18-40GHz)	EF01152	2016-09	2017-09

3.8.5 Procedure

Test Procedure < 30 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 EUT is rotated through 360°
4.	The emissions are measured with peak detector and max hold
5.	All significant emissions are measured again using the corresponding final detector
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

3.8.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
2402	74.22	35.60	pk	ver	40.00	-04.41
2402	74.22	27.20	qpk	ver	40.00	-12.84
2402	74.88	35.40	pk	ver	40.00	-04.59
2402	74.88	27.40	qpk	ver	40.00	-12.59
2402	2390	65.56	pk	ver	74.00	-08.44
2402	2390	37.92	RMS	ver	54.00	-16.08
2436	73.44	35.80	pk	ver	40.00	-04.24
2436	73.44	26.50	qpk	ver	40.00	-13.46
2436	74.16	35.90	pk	ver	40.00	-04.08
2436	74.16	27.00	qpk	ver	40.00	-12.98
2436	75.06	36.30	pk	ver	40.00	-03.70
2436	75.06	27.40	qpk	ver	40.00	-12.59
2472	37.62	31.60	pk	ver	40.00	-08.36
2472	73.32	36.40	pk	ver	40.00	-03.63
2472	73.32	26.40	qpk	ver	40.00	-13.64
2472	74.28	35.90	pk	ver	40.00	-04.13
2472	74.28	27.20	qpk	ver	40.00	-12.77
2472	74.94	36.70	pk	ver	40.00	-03.34
2472	74.94	27.70	qpk	ver	40.00	-12.30
2472	2484	66.77	pk	ver	74.00	-07.23
2472	2484	39.40	RMS	ver	54.00	-14.60
2472	2499	60.16	pk	ver	74.00	-13.84
2472	2499	39.30	RMS	ver	54.00	-14.70
2472	2500	57.59	pk	ver	74.00	-16.41

3.9 Test Conditions and Results - Receiver radiated emissions

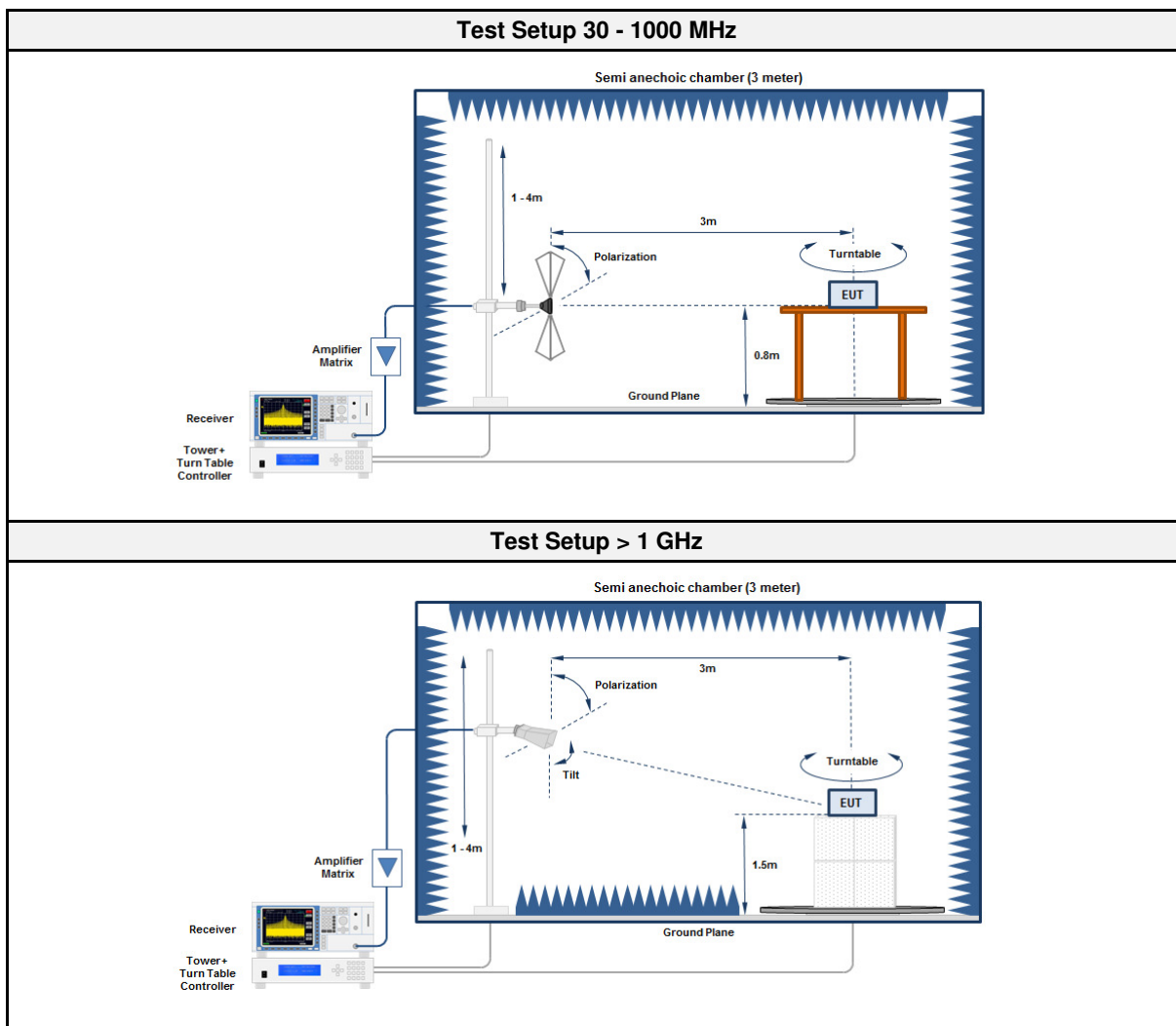
3.9.1 Information

Test Information	
Reference	ISED RSS-247 3.1
Measurement Method	ANSI C63.10 6.5, 6.6, 11.12

3.9.2 Limits

Limits		
Frequency [MHz]	Field strength [dB μ V/m]	Measurement distance [m]
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
> 960	500	3

3.9.3 Setup



3.9.4 Equipment

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	--	--
Measurement Receiver	R&S	N9038A-526/WXP	EF01070	2016-08	2017-08
Biconical Antenna	R&S	HK 116	EF00012	2016-05	2019-05
LPD Antenna	R&S	HL 223	EF00187	2016-05	2019-05
Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	--	--
Measurement Receiver	R&S	N9038A-526/WXP	EF01070	2016-08	2017-08
Horn antenna	Schwarzbeck	BBHA 9120D (1-18GHz)	EF00018	2016-09	2019-09

3.9.5 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	

3.9.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
2436	30	37.90	pk	ver	40.00	-02.15
2436	30	31.60	qpk	ver	40.00	-08.35
2436	33.3	38.00	pk	ver	40.00	-01.97
2436	33.3	30.30	qpk	ver	40.00	-09.71
2436	63.66	39.30	pk	ver	40.00	-00.68
2436	63.66	32.90	qpk	ver	40.00	-07.12
2436	86.7	38.50	pk	ver	40.00	-01.48
2436	86.7	32.20	qpk	ver	40.00	-07.82
2436	2747	50.87	pk	ver	53.98	-03.11
2436	2747	47.74	avg	ver	53.98	-06.24

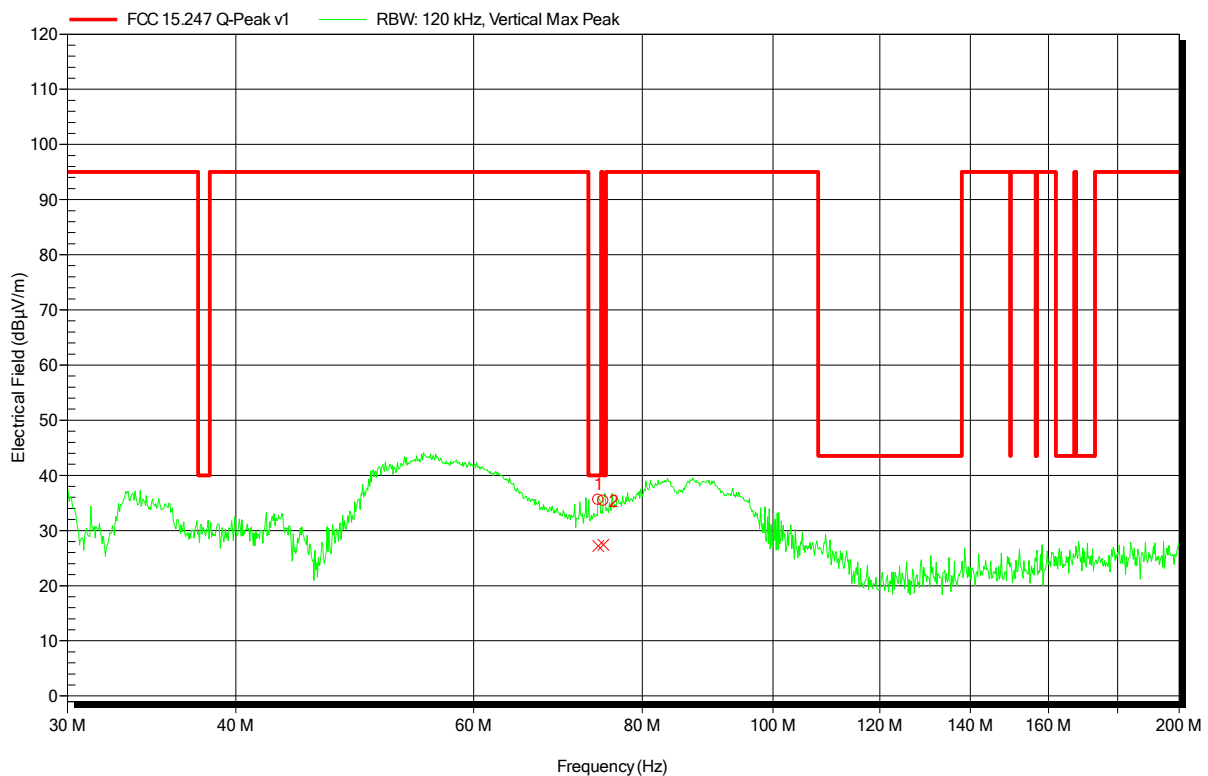
ANNEX A Transmitter spurious emissions

Spurious emissions according to FCC part 15 Subpart C § 15.247, ISD RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
 Test Date: 2017-02-07
 Note: ANT extern vertical

Index 86



Frequency	Peak	Peak Limit	Peak Difference	Status
74.22 MHz	35.6 dBµV/m	40 dBµV/m	-4.41 dB	Pass
74.88 MHz	35.4 dBµV/m	40 dBµV/m	-4.59 dB	Pass

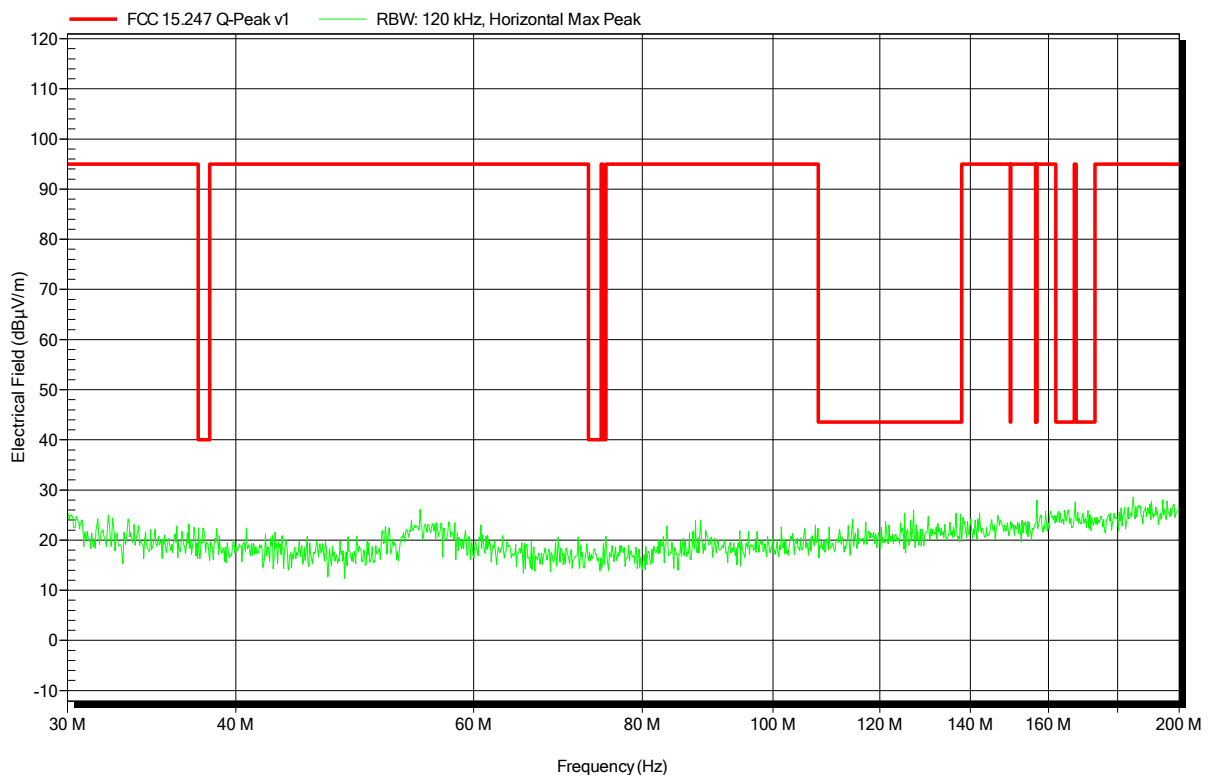
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
74.22 MHz	27.2 dBµV/m	40 dBµV/m	-12.84 dB	Pass
74.88 MHz	27.4 dBµV/m	40 dBµV/m	-12.59 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
 Test Date: 2017-02-07
 Note: ANT extern vertical

Index 81

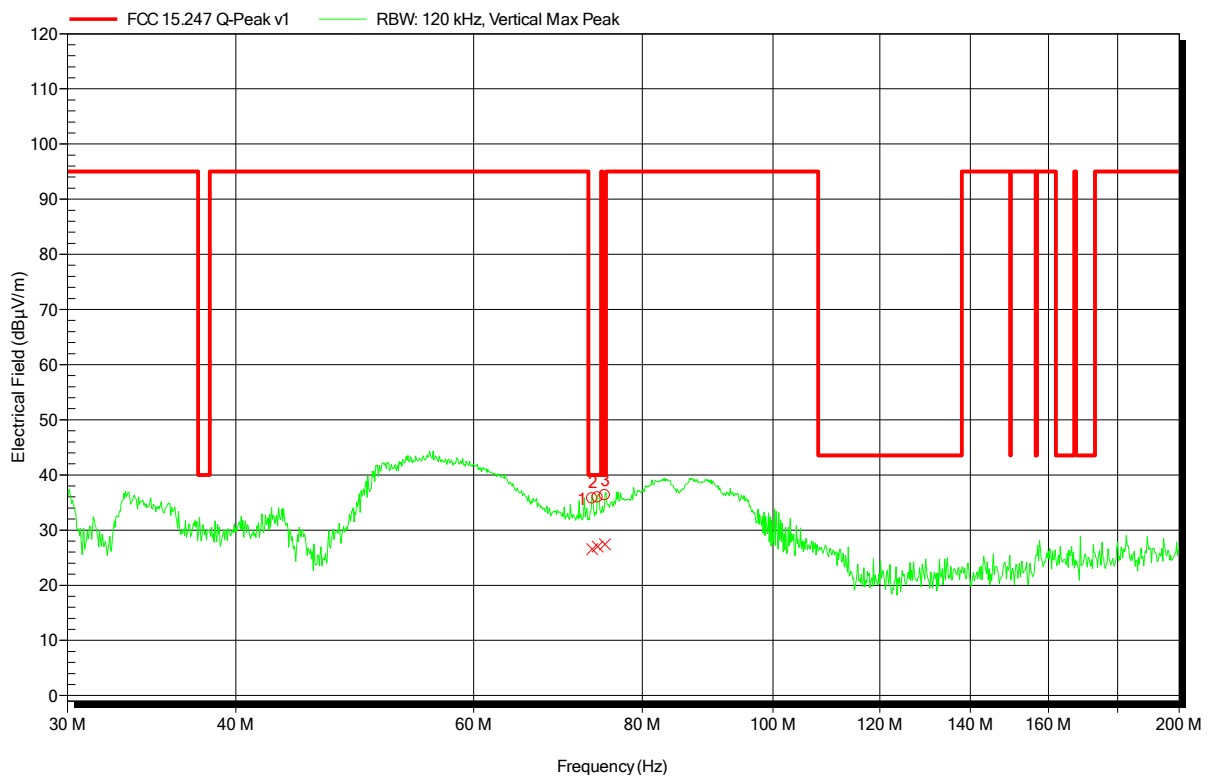


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISSED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: TX; XBee; Ch: 2436 MHz; GFSK; Pmax
 Test Date: 2017-02-07
 Note: ANT extern vertical

Index 85



Frequency	Peak	Peak Limit	Peak Difference	Status
73.44 MHz	35.8 dBµV/m	40 dBµV/m	-4.24 dB	Pass
74.16 MHz	35.9 dBµV/m	40 dBµV/m	-4.08 dB	Pass
75.06 MHz	36.3 dBµV/m	40 dBµV/m	-3.7 dB	Pass

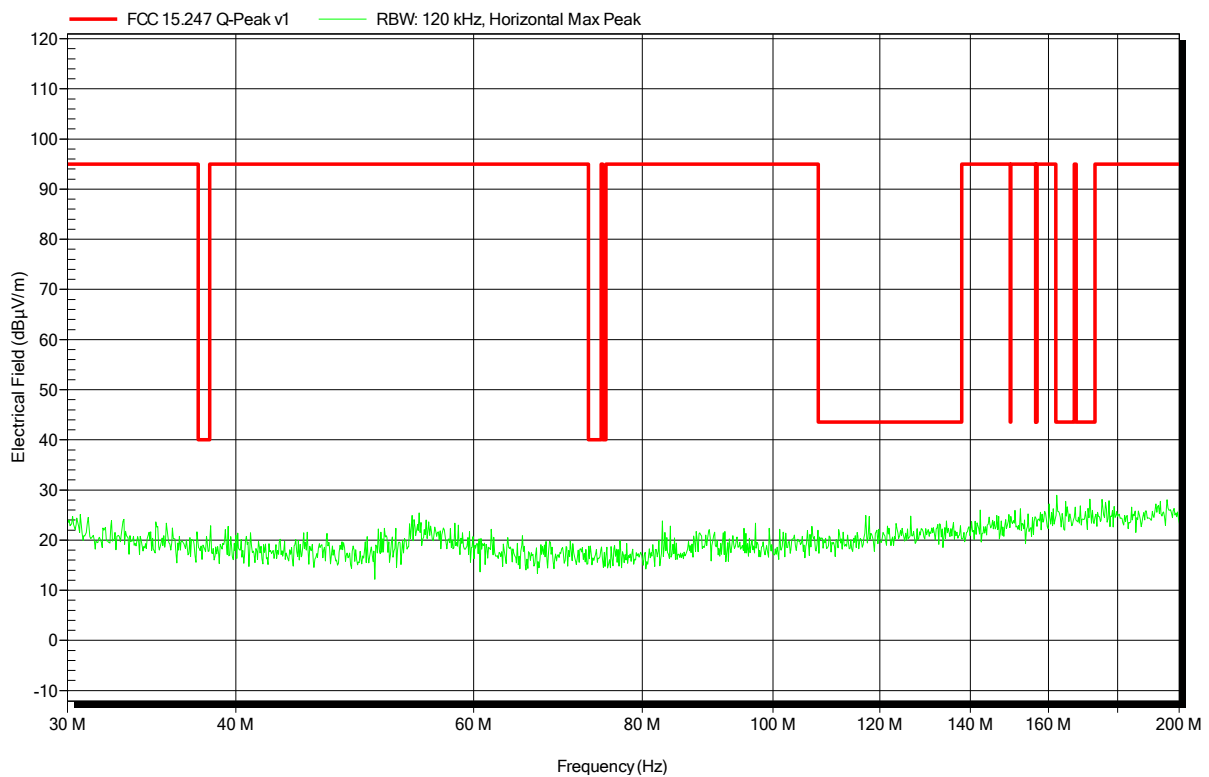
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
73.44 MHz	26.5 dBµV/m	40 dBµV/m	-13.46 dB	Pass
74.16 MHz	27 dBµV/m	40 dBµV/m	-12.98 dB	Pass
75.06 MHz	27.4 dBµV/m	40 dBµV/m	-12.59 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: TX; XBee; Ch: 2436 MHz; GFSK; Pmax
 Test Date: 2017-02-07
 Note: ANT extern vertical

Index 82

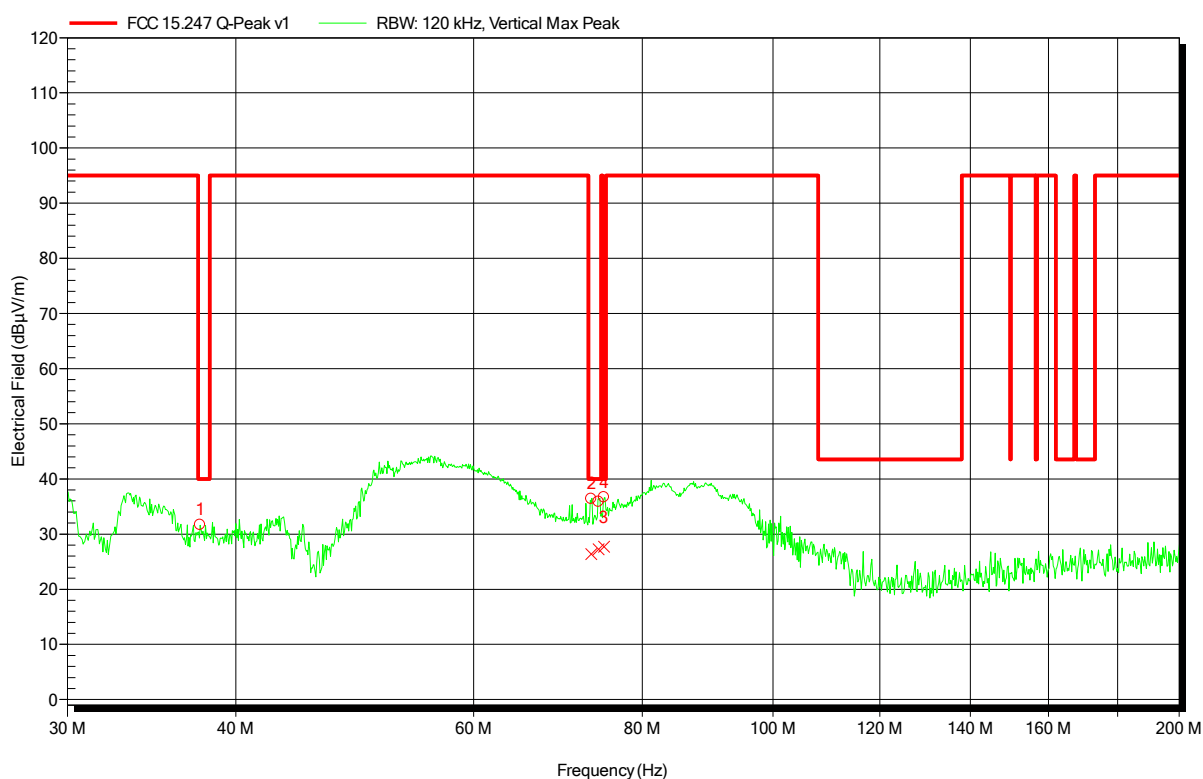


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISSED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
 Test Date: 2017-02-07
 Note: ANT extern vertical

Index 84



Frequency	Peak	Peak Limit	Peak Difference	Status
37.62 MHz	31.6 dBμV/m	40 dBμV/m	-8.36 dB	Pass
73.32 MHz	36.4 dBμV/m	40 dBμV/m	-3.63 dB	Pass
74.28 MHz	35.9 dBμV/m	40 dBμV/m	-4.13 dB	Pass
74.94 MHz	36.7 dBμV/m	40 dBμV/m	-3.34 dB	Pass

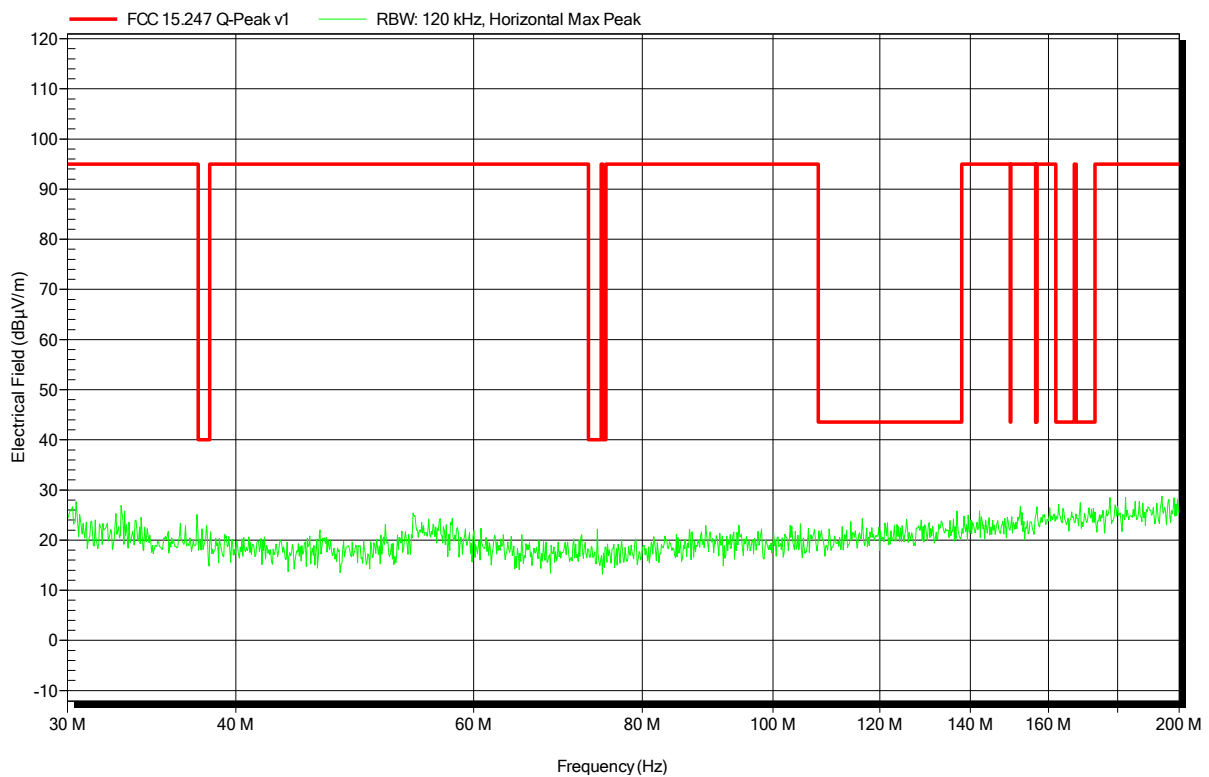
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
37.62 MHz	26.4 dBμV/m	40 dBμV/m	-13.64 dB	Pass
73.32 MHz	27.2 dBμV/m	40 dBμV/m	-12.77 dB	Pass
74.94 MHz	27.7 dBμV/m	40 dBμV/m	-12.3 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
 Test Date: 2017-02-07
 Note: ANT extern vertical

Index 83

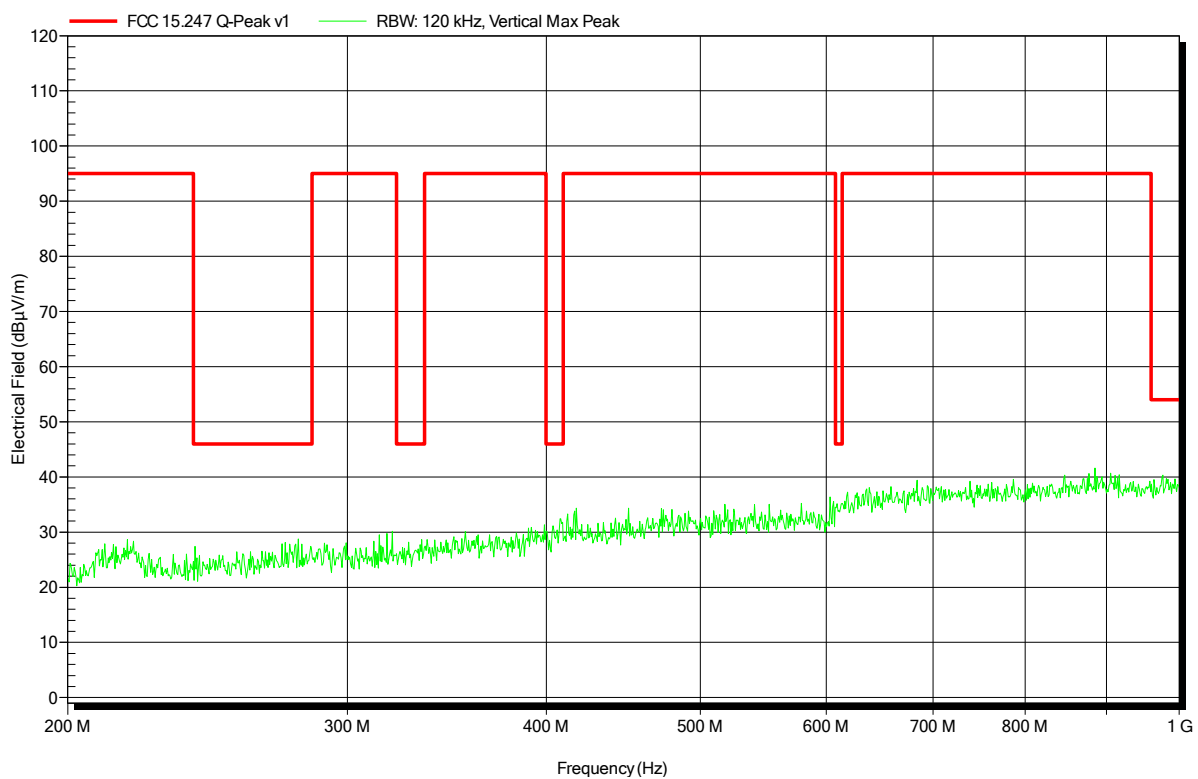


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Rohde & Schwarz HL 223, Vertical
Measurement distance: 3 m
Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
Test Date: 2017-02-07
Note: ANT extern vertical

Index 68

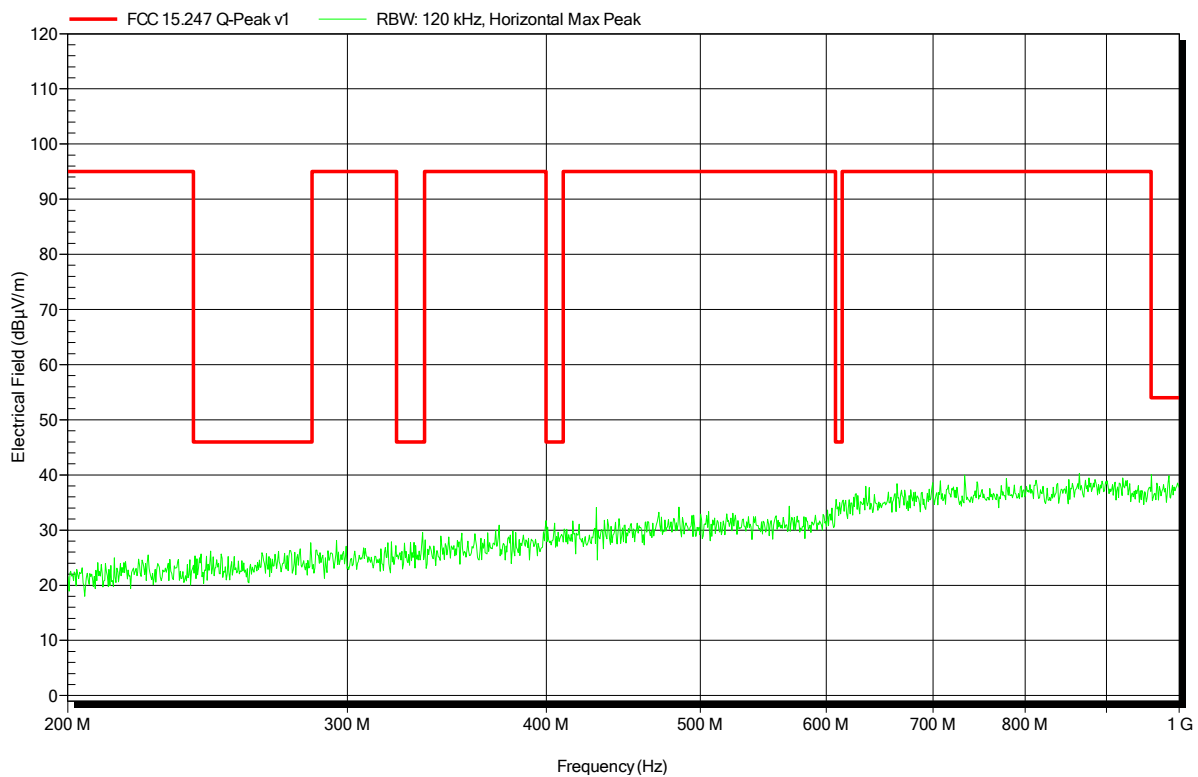


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Rohde & Schwarz HL 223, Horizontal
Measurement distance: 3 m
Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
Test Date: 2017-02-07
Note: ANT extern vertical

Index 73

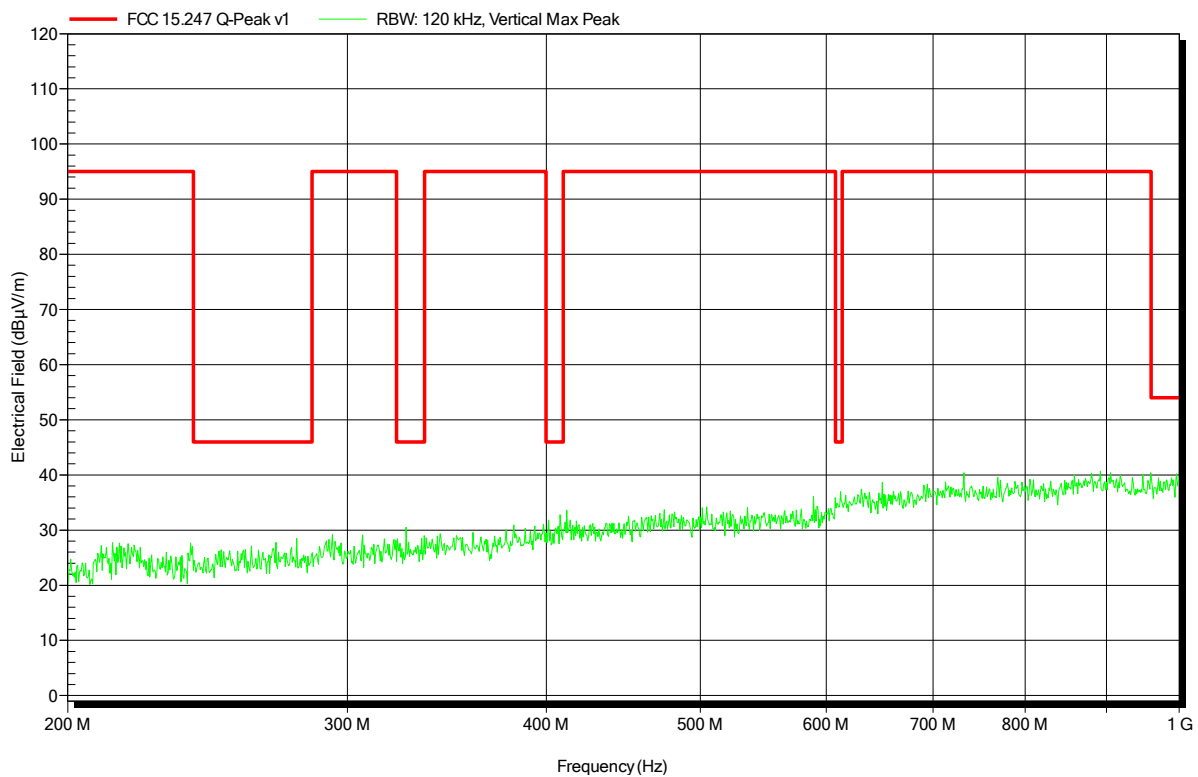


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: TX; XBee; Ch: 2436 MHz; GFSK; Pmax
 Test Date: 2017-02-07
 Note: ANT extern vertical

Index 69

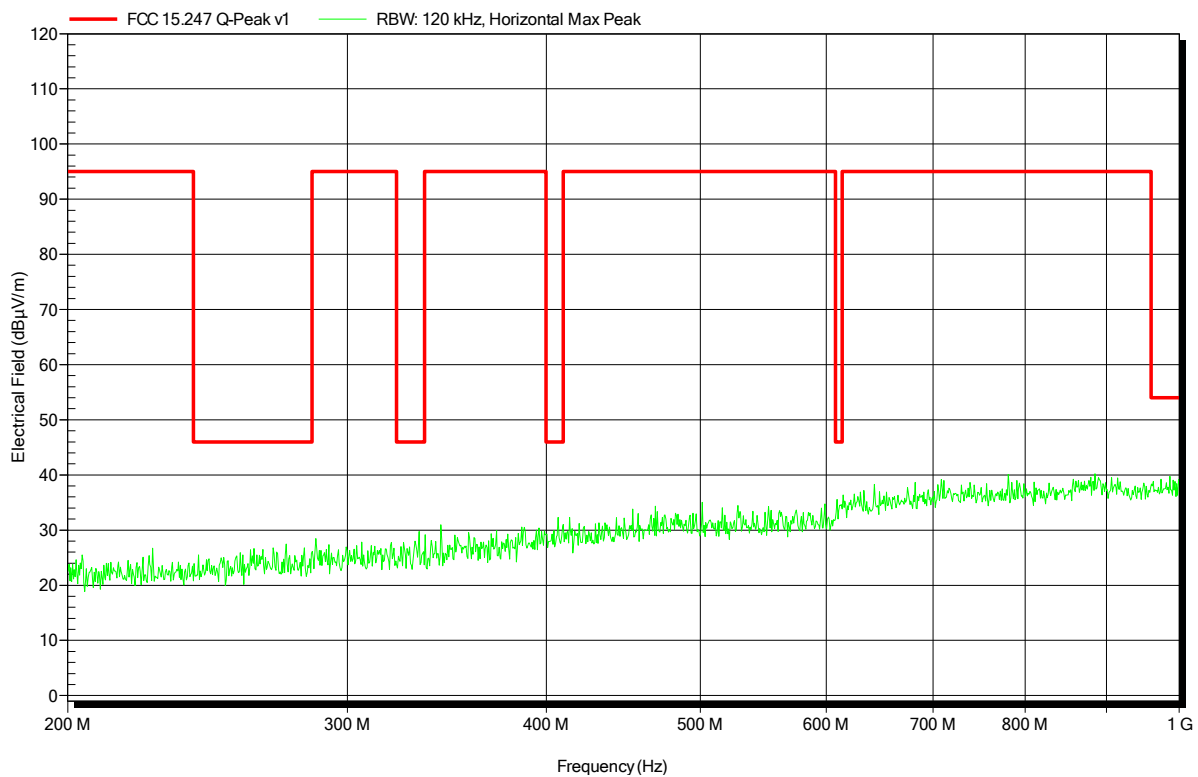


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Rohde & Schwarz HL 223, Horizontal
Measurement distance: 3 m
Mode: TX; XBee; Ch: 2436 MHz; GFSK; Pmax
Test Date: 2017-02-07
Note: ANT extern vertical

Index 72

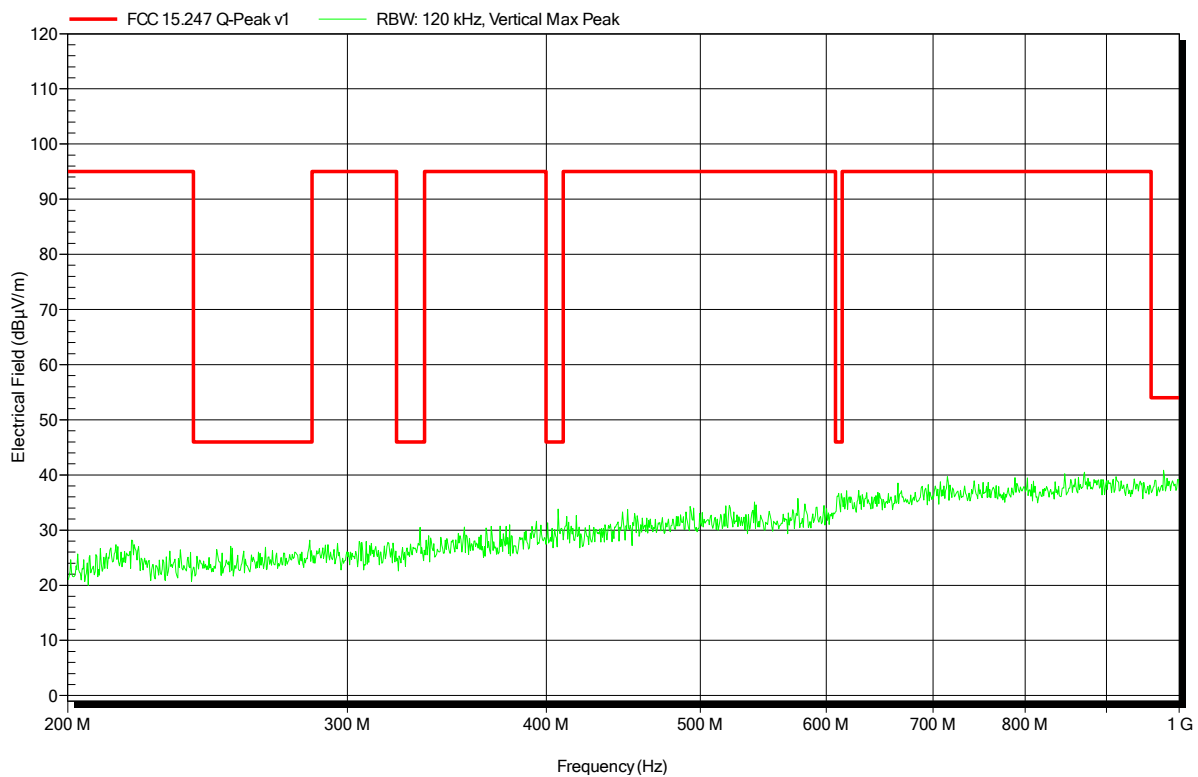


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Rohde & Schwarz HL 223, Vertical
Measurement distance: 3 m
Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
Test Date: 2017-02-07
Note: ANT extern vertical

Index 70

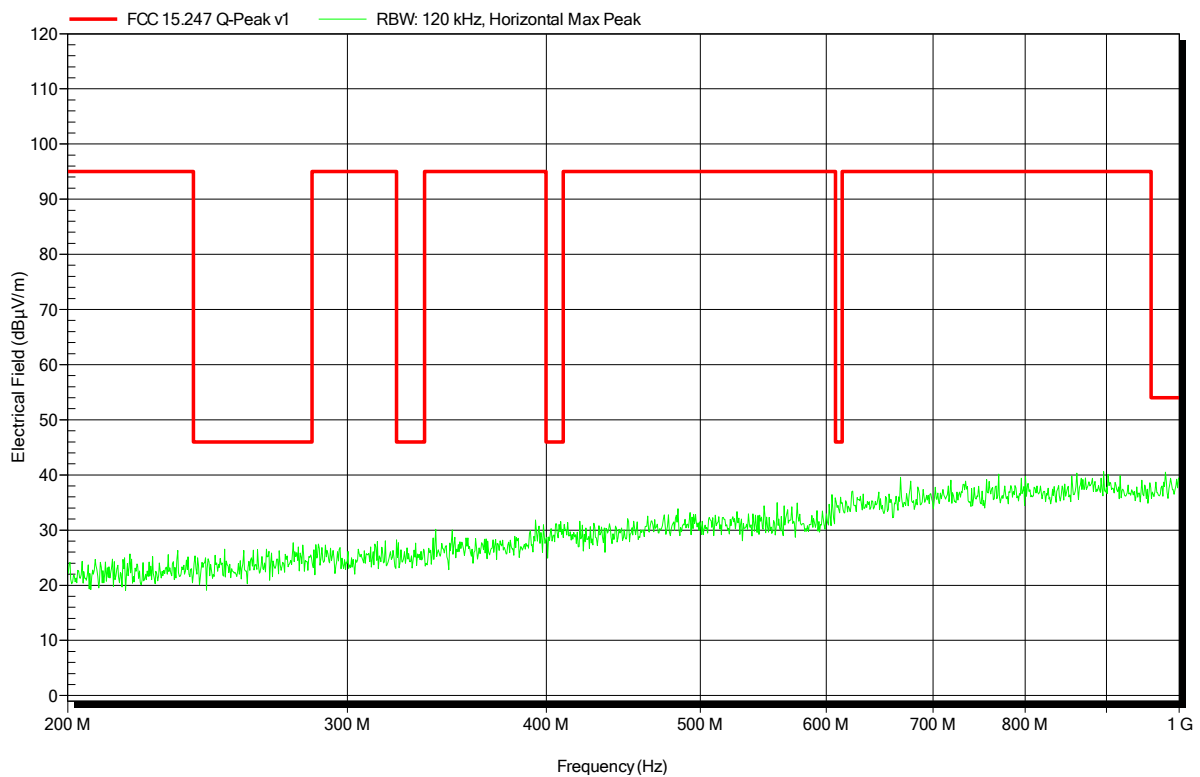


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3 m
 Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
 Test Date: 2017-02-07
 Note: ANT extern vertical

Index 71

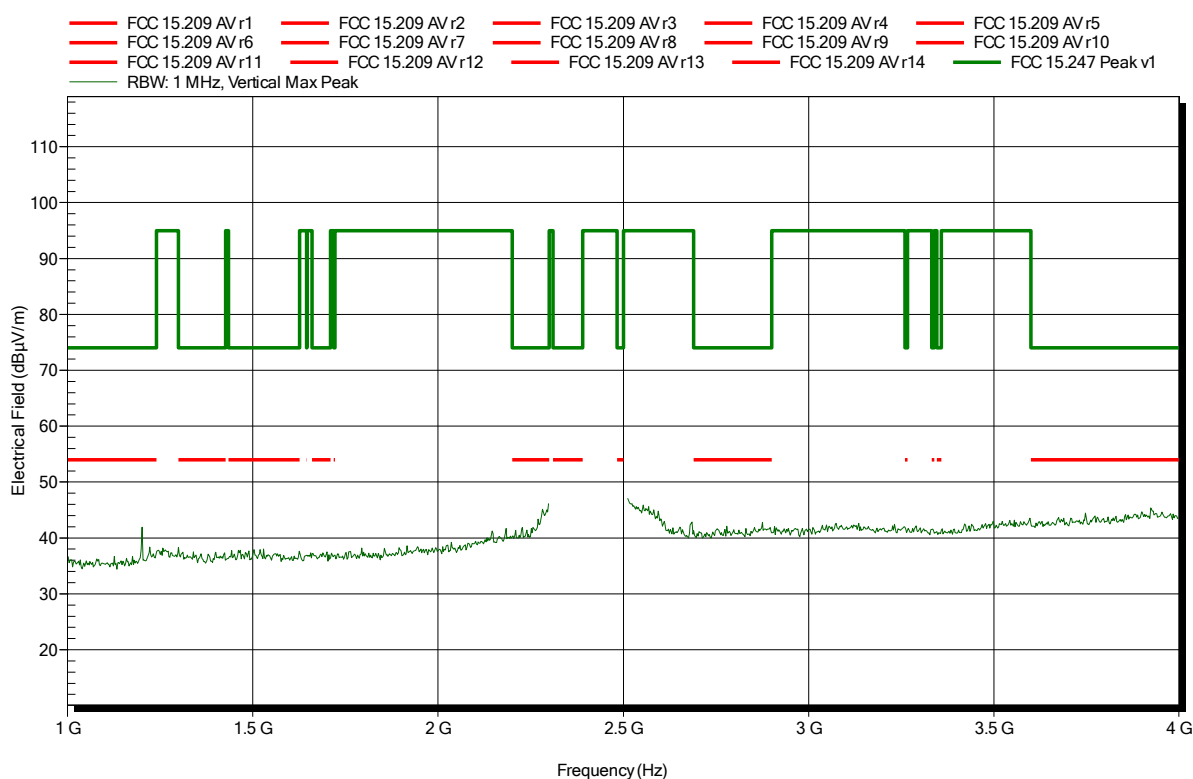


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 3 m
Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 37

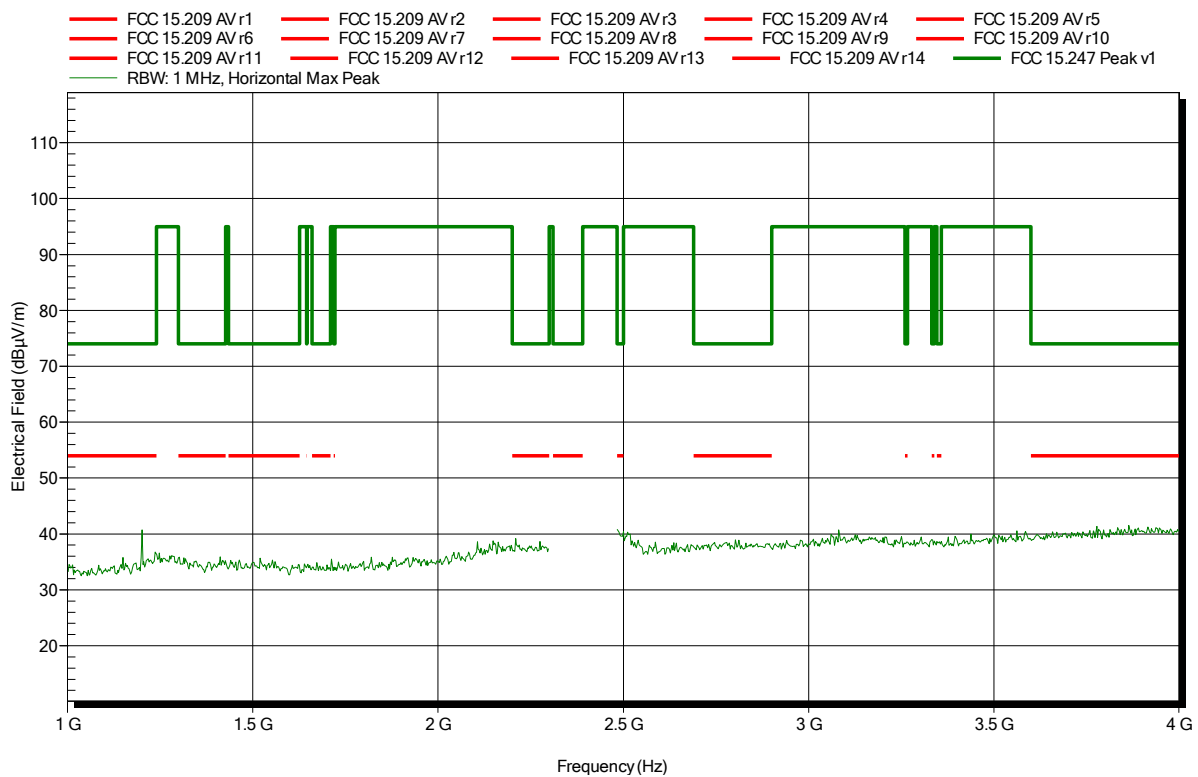


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 3 m
Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 39

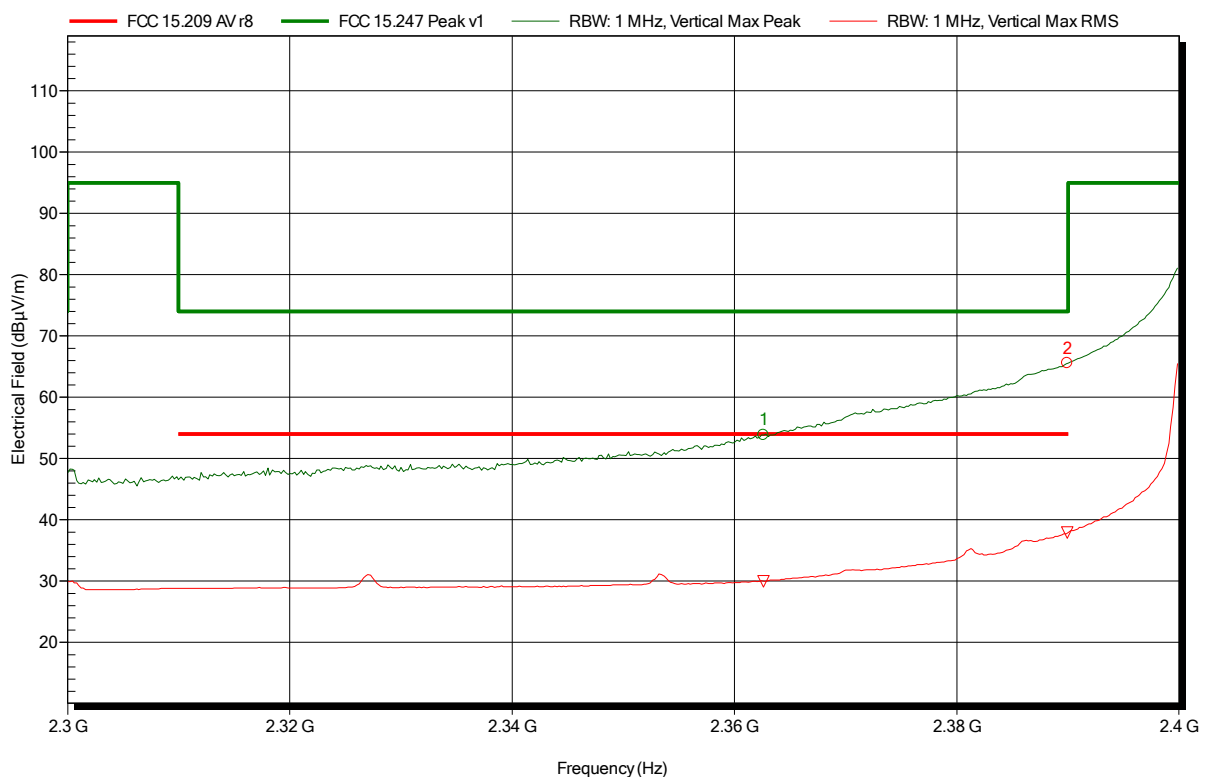


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISSED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 3 m
Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT vertical; lower bandedge

Index 38



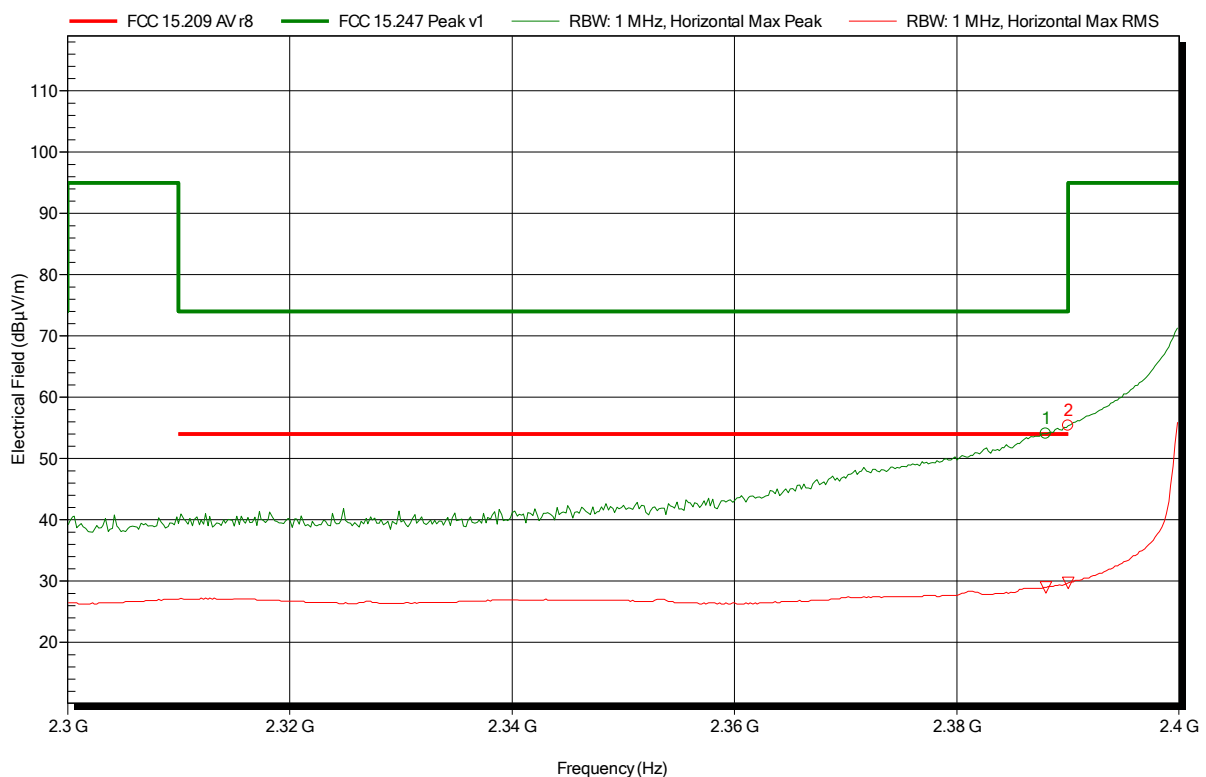
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.363 GHz	53.83 dBµV/m	74 dBµV/m	-20.17 dB	Pass
2.39 GHz	65.56 dBµV/m	74 dBµV/m	-8.44 dB	Pass
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.363 GHz	29.99 dBµV/m	54 dBµV/m	-24.01 dB	Pass
2.39 GHz	37.92 dBµV/m	54 dBµV/m	-16.08 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 3 m
Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT vertical; lower bandedge

Index 40



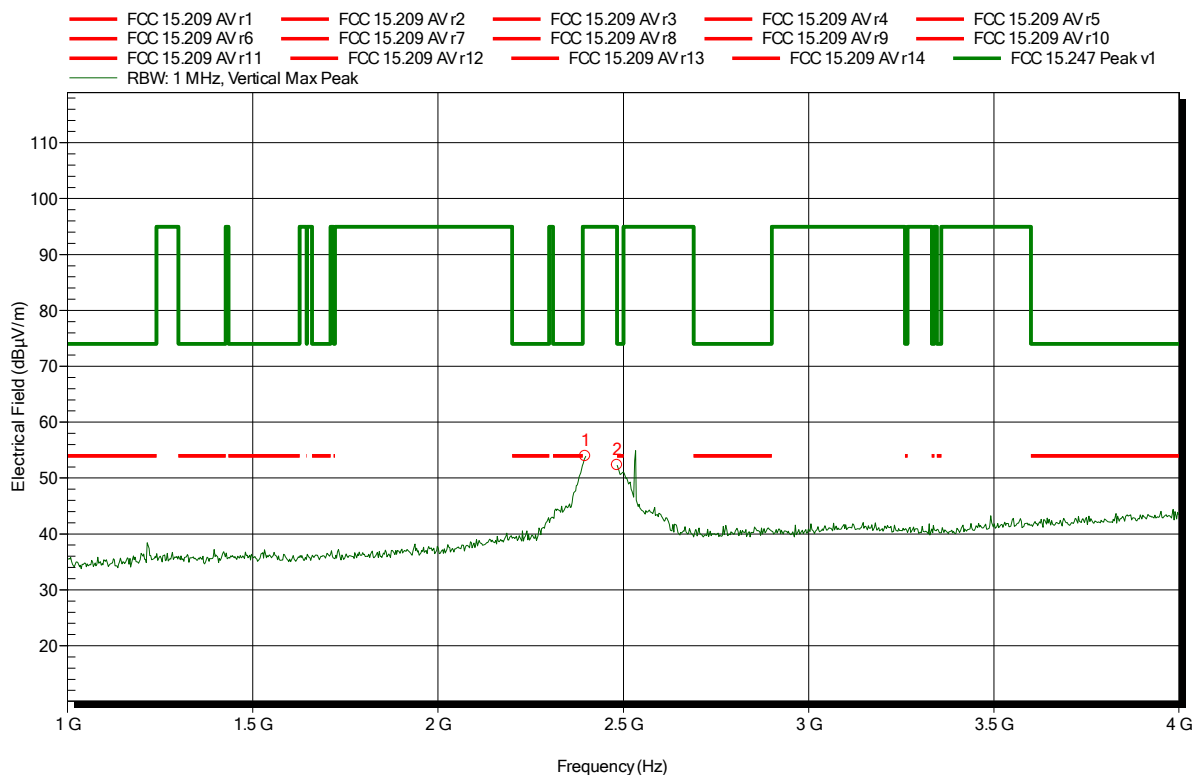
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.388 GHz	54.05 dBµV/m	74 dBµV/m	-19.95 dB	Pass
2.39 GHz	55.36 dBµV/m	74 dBµV/m	-18.64 dB	Pass
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.388 GHz	28.96 dBµV/m	54 dBµV/m	-25.04 dB	Pass
2.39 GHz	29.7 dBµV/m	54 dBµV/m	-24.3 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 3 m
Mode: TX; XBee; Ch: 2436 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 42



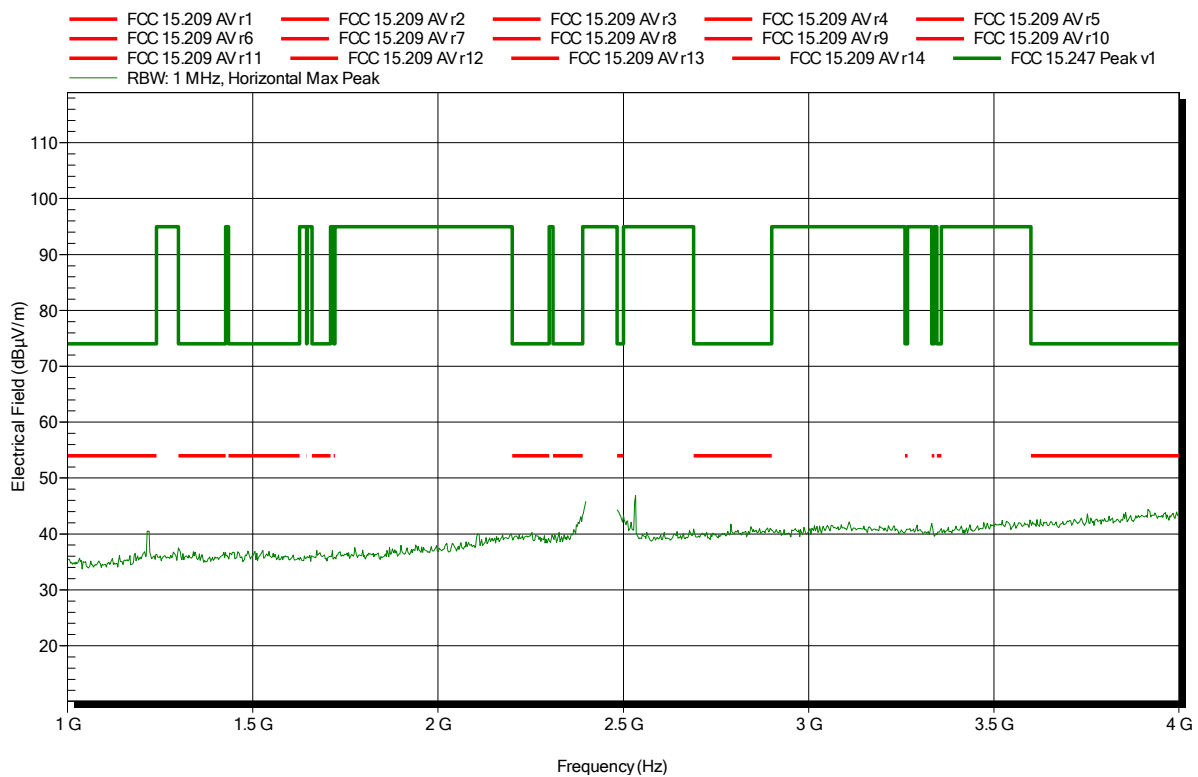
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.397 GHz	53.92 dBµV/m	95 dBµV/m	-41.08 dB	Pass
2.484 GHz	52.3 dBµV/m	74 dBµV/m	-21.7 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 3 m
Mode: TX; XBee; Ch: 2436 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 41

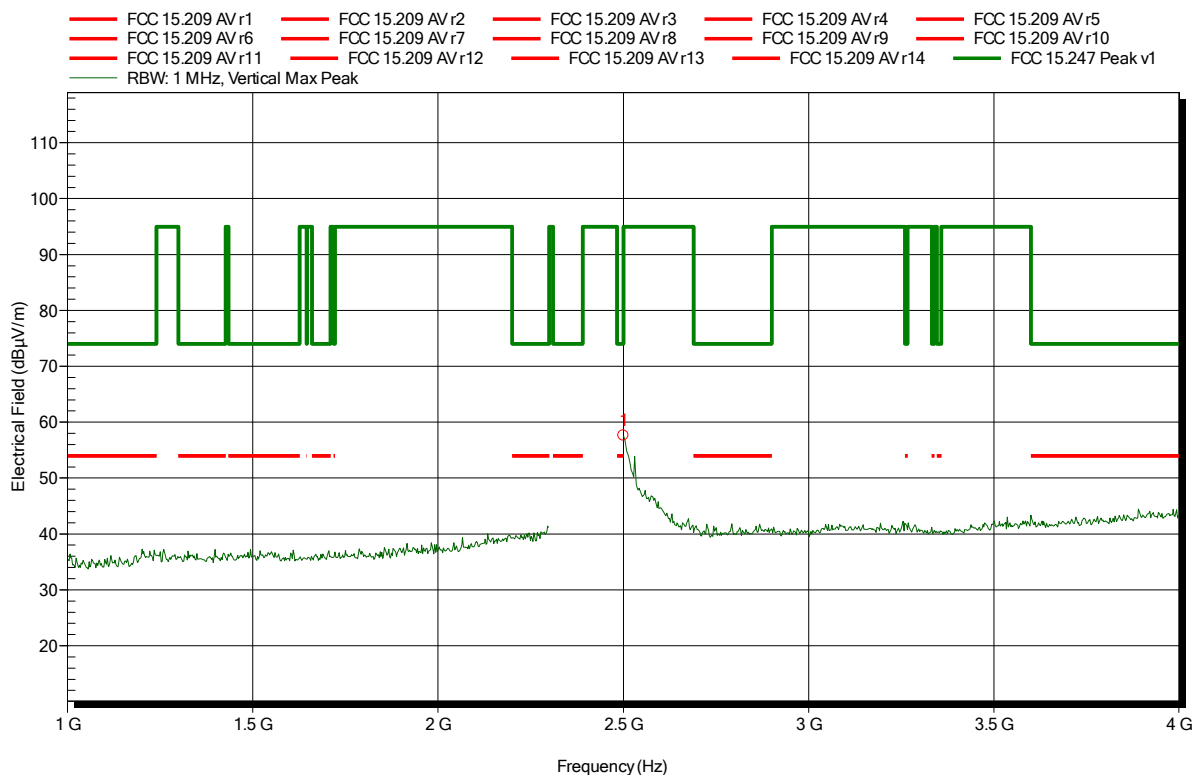


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 3 m
Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 43



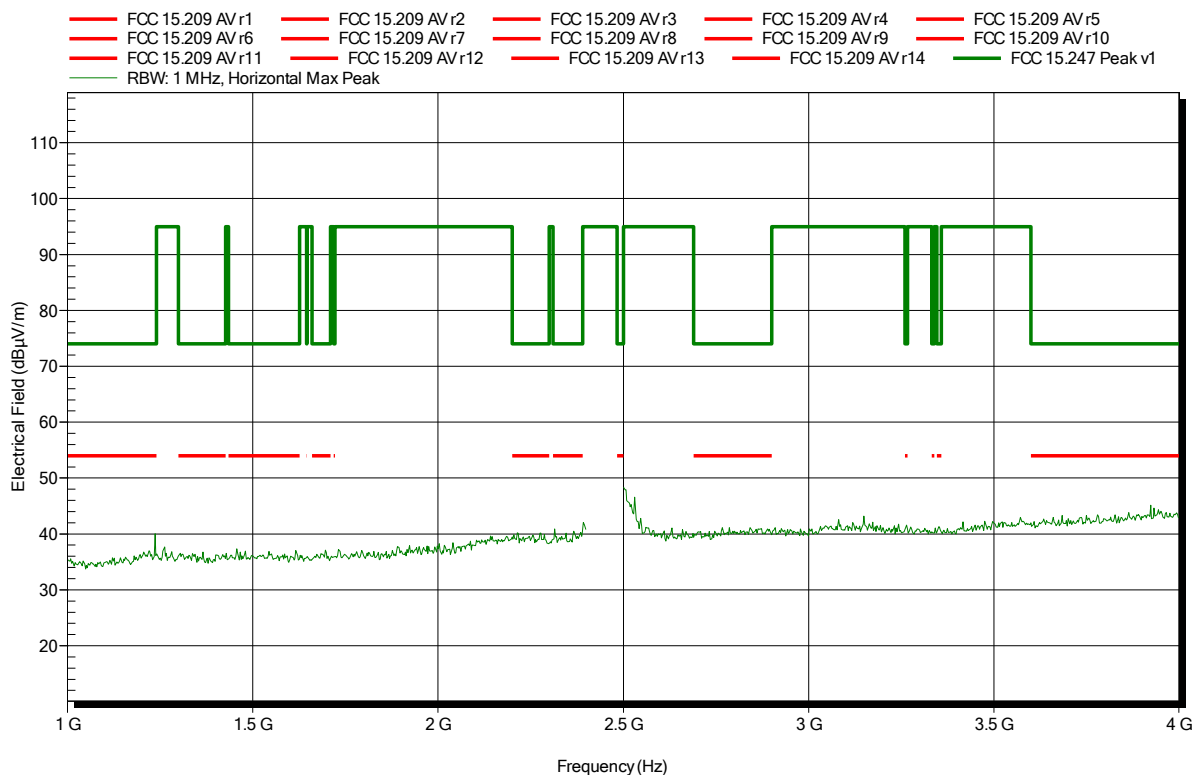
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.5 GHz	57.59 dBµV/m	74 dBµV/m	-16.41 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 3 m
Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 45

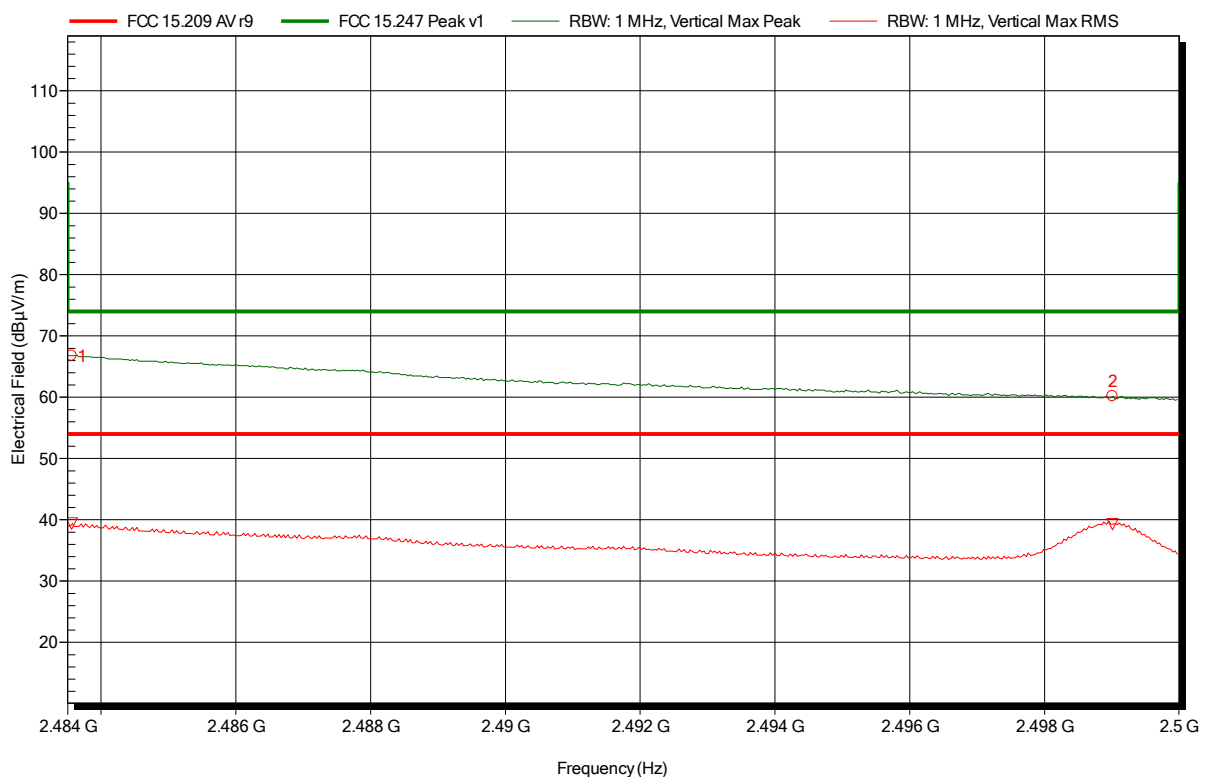


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
 Test Date: 2017-02-03
 Note: ANT vertical; higher bandedge

Index 44



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.484 GHz	66.77 dBµV/m	74 dBµV/m	-7.23 dB	Pass
2.499 GHz	60.16 dBµV/m	74 dBµV/m	-13.84 dB	Pass

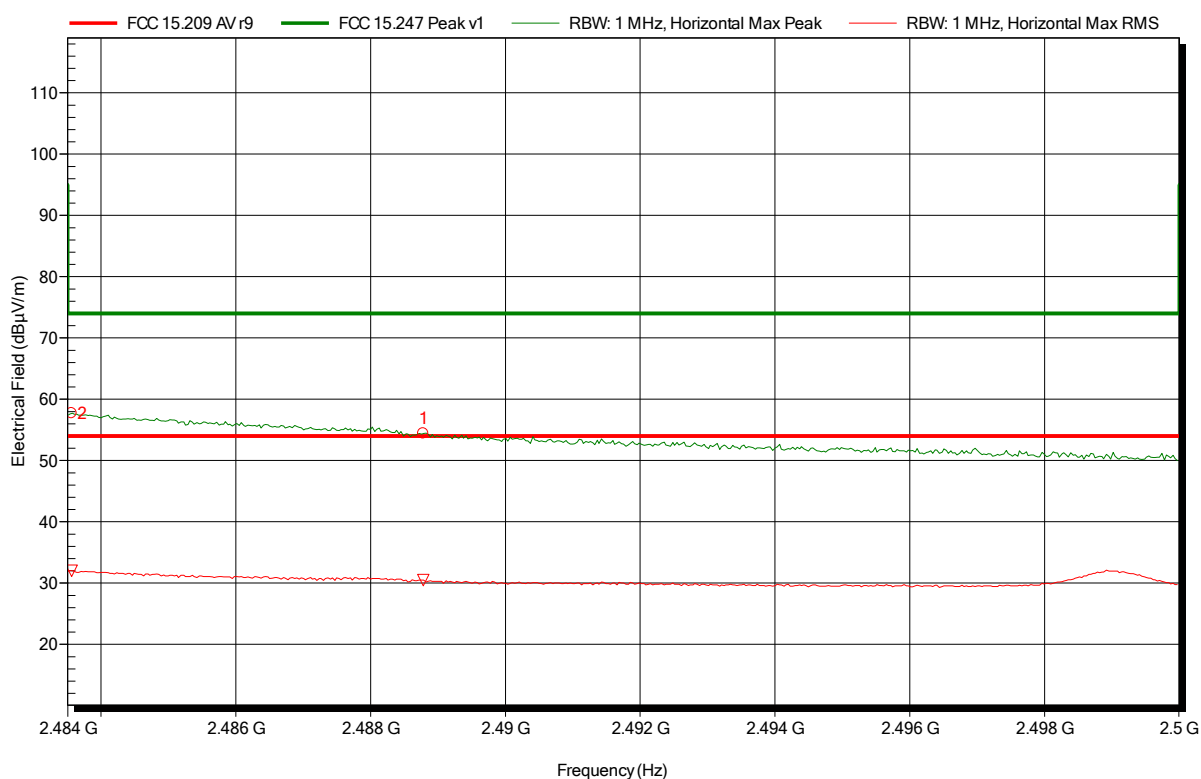
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.484 GHz	39.4 dBµV/m	54 dBµV/m	-14.6 dB	Pass
2.499 GHz	39.3 dBµV/m	54 dBµV/m	-14.7 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
 Test Date: 2017-02-03
 Note: ANT vertical; higher bandedge

Index 46



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.484 GHz	57.71 dBµV/m	74 dBµV/m	-16.29 dB	Pass
2.489 GHz	54.44 dBµV/m	74 dBµV/m	-19.56 dB	Pass

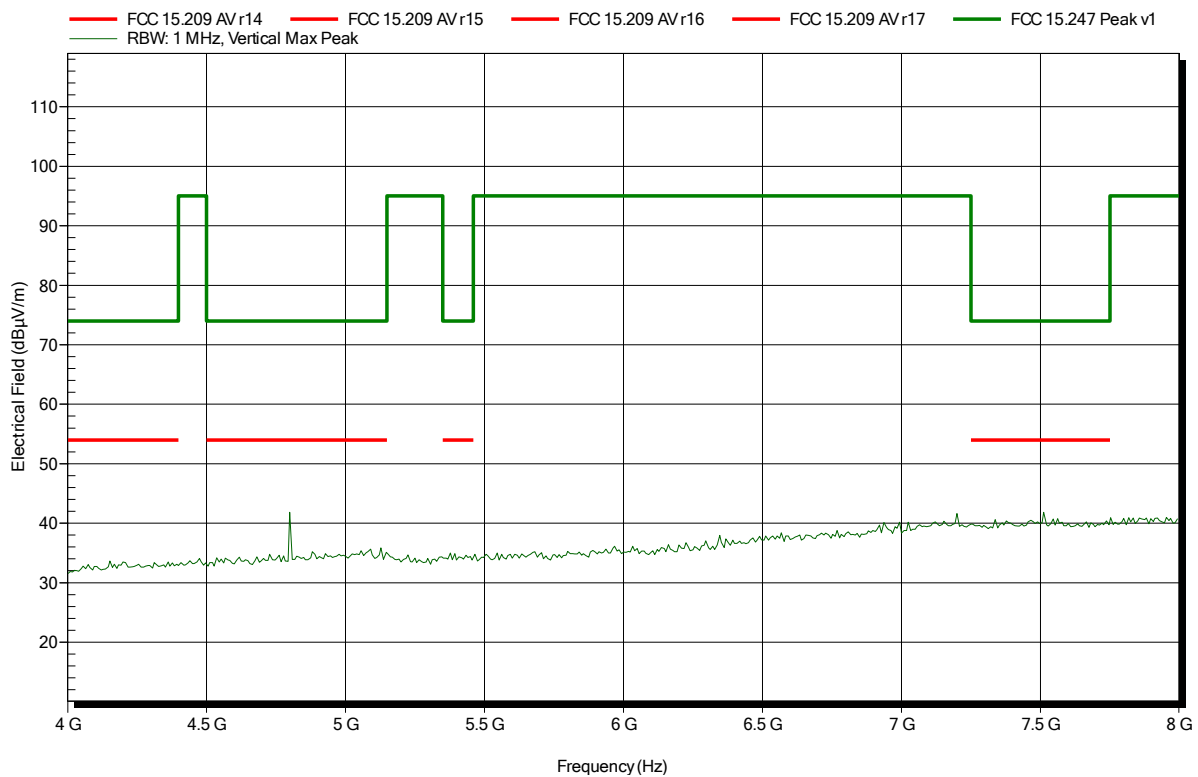
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
2.484 GHz	32 dBµV/m	54 dBµV/m	-22 dB	Pass
2.489 GHz	30.47 dBµV/m	54 dBµV/m	-23.53 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 35

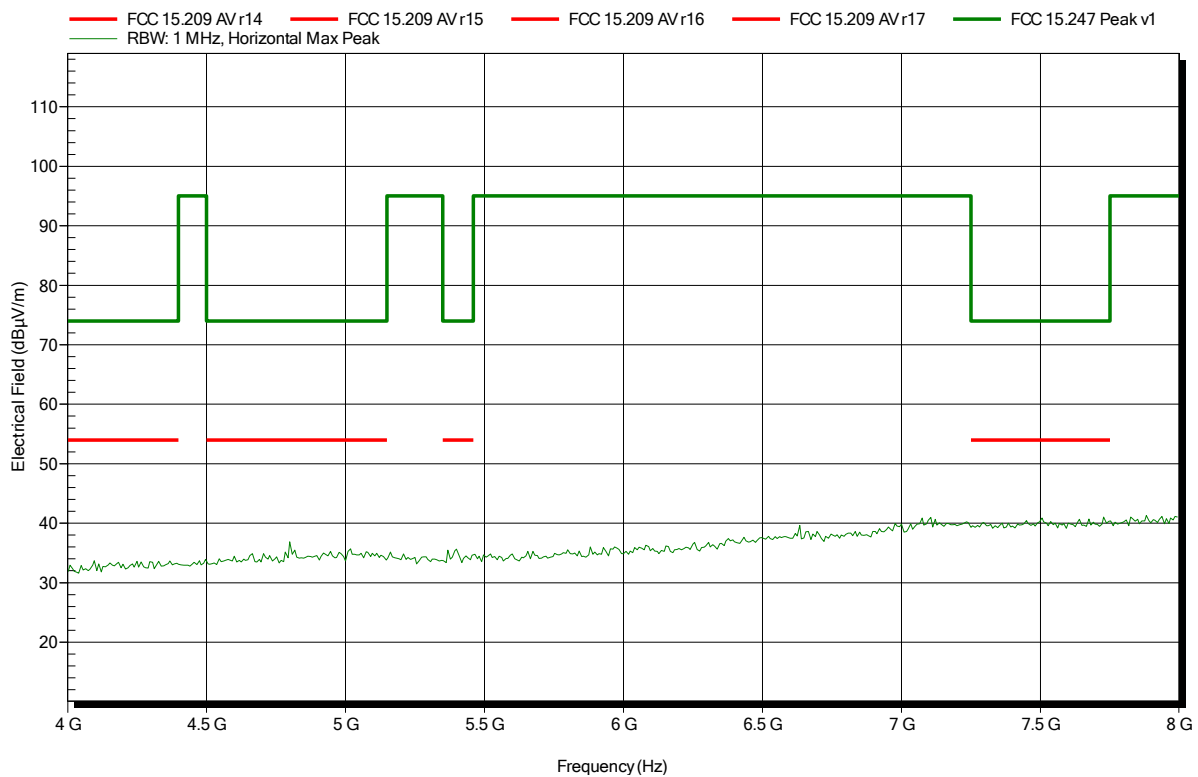


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 47

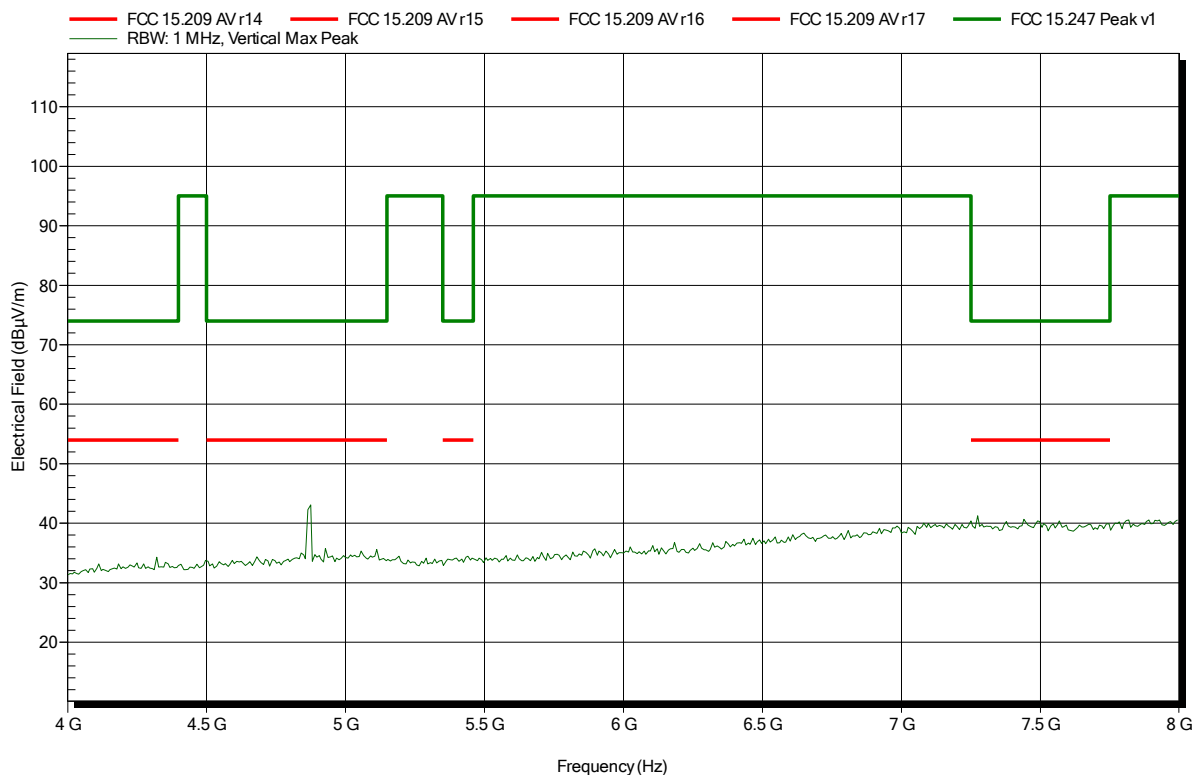


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2436 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 52

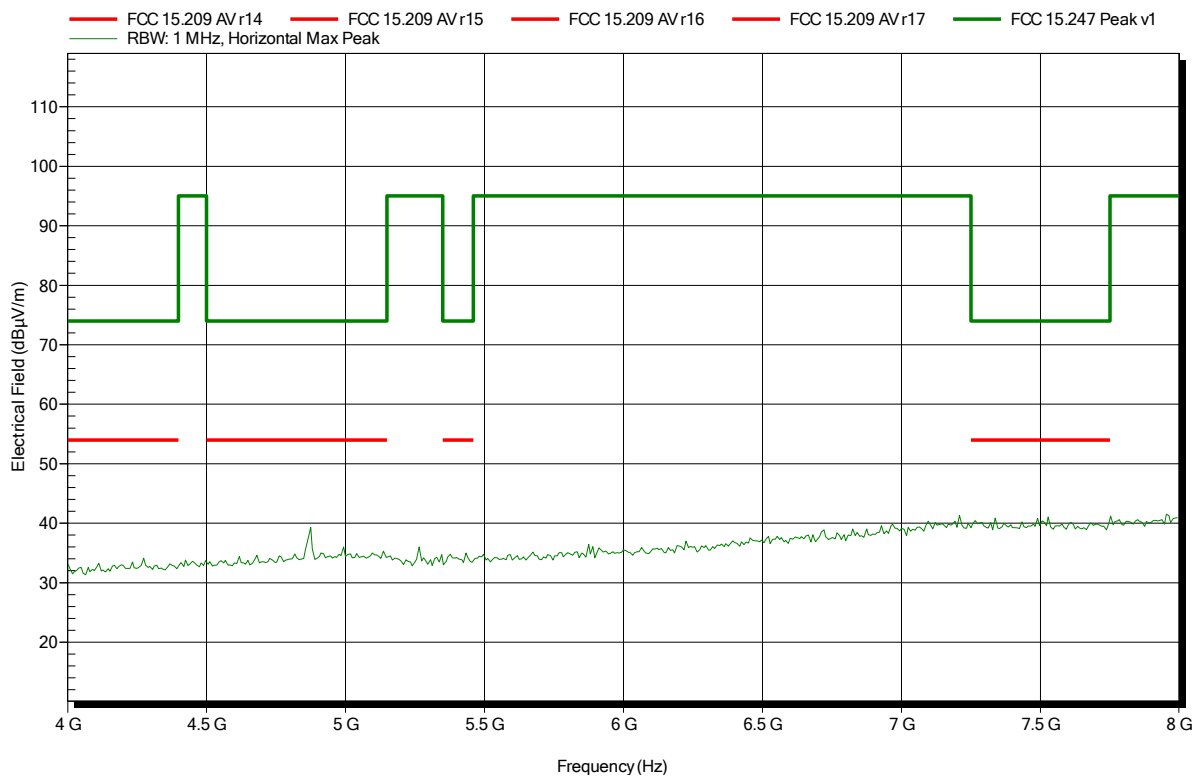


Spurious emissions according to FCC part 15 Subpart C § 15.247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2436 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 58

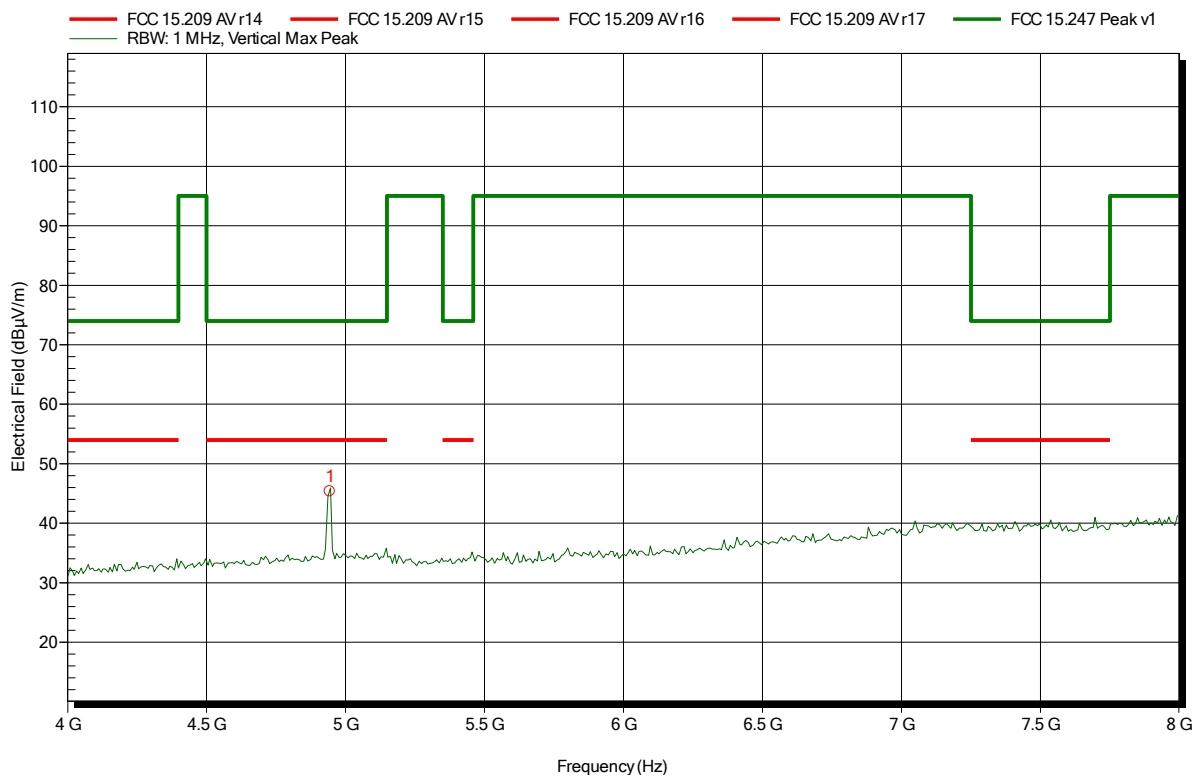


Spurious emissions according to FCC part 15 Subpart C § 15.247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
Test Date: 2017-02-06
Note: ANT extern vertical

Index 67



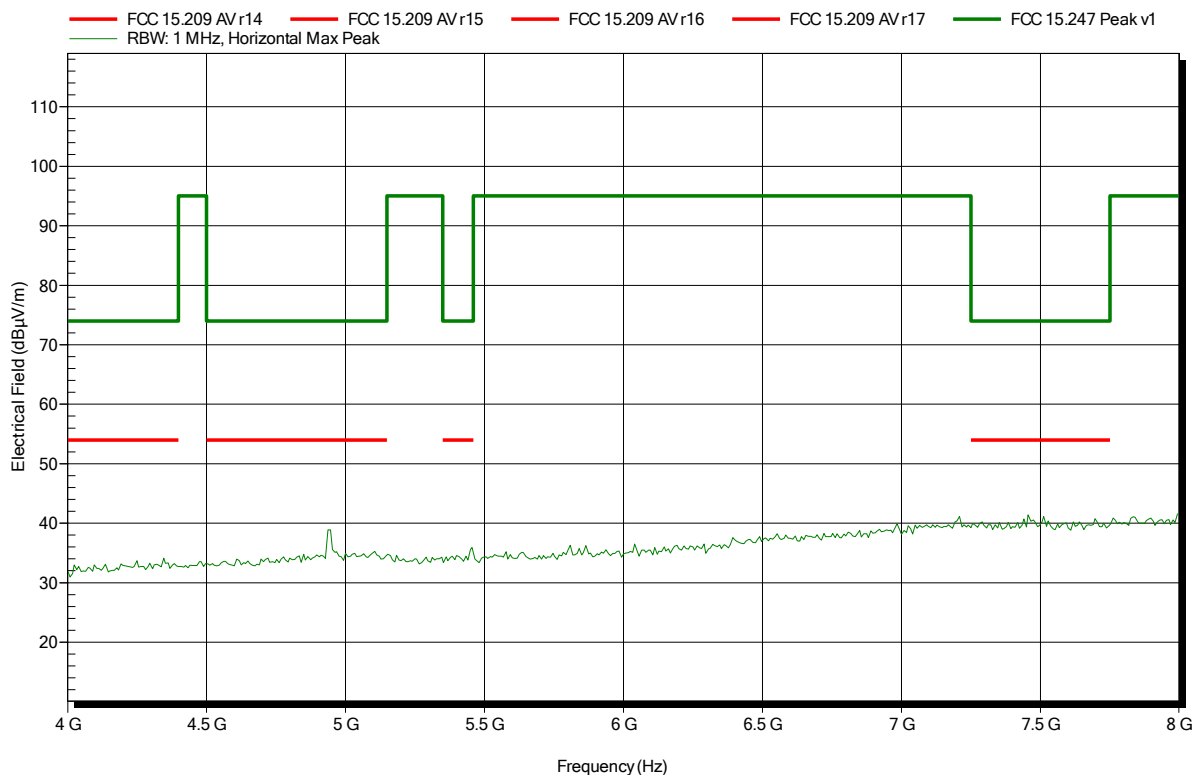
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.944 GHz	45.33 dBµV/m	74 dBµV/m	-28.67 dB	Pass

Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 61

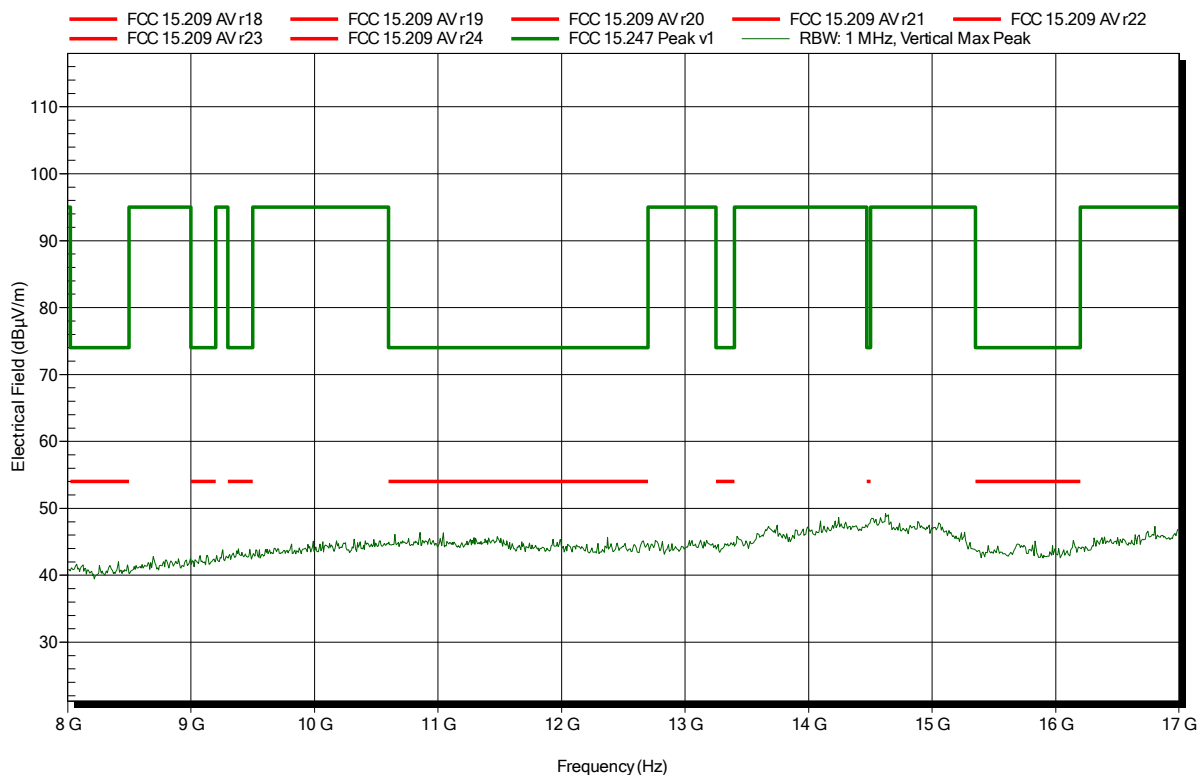


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISD RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 36

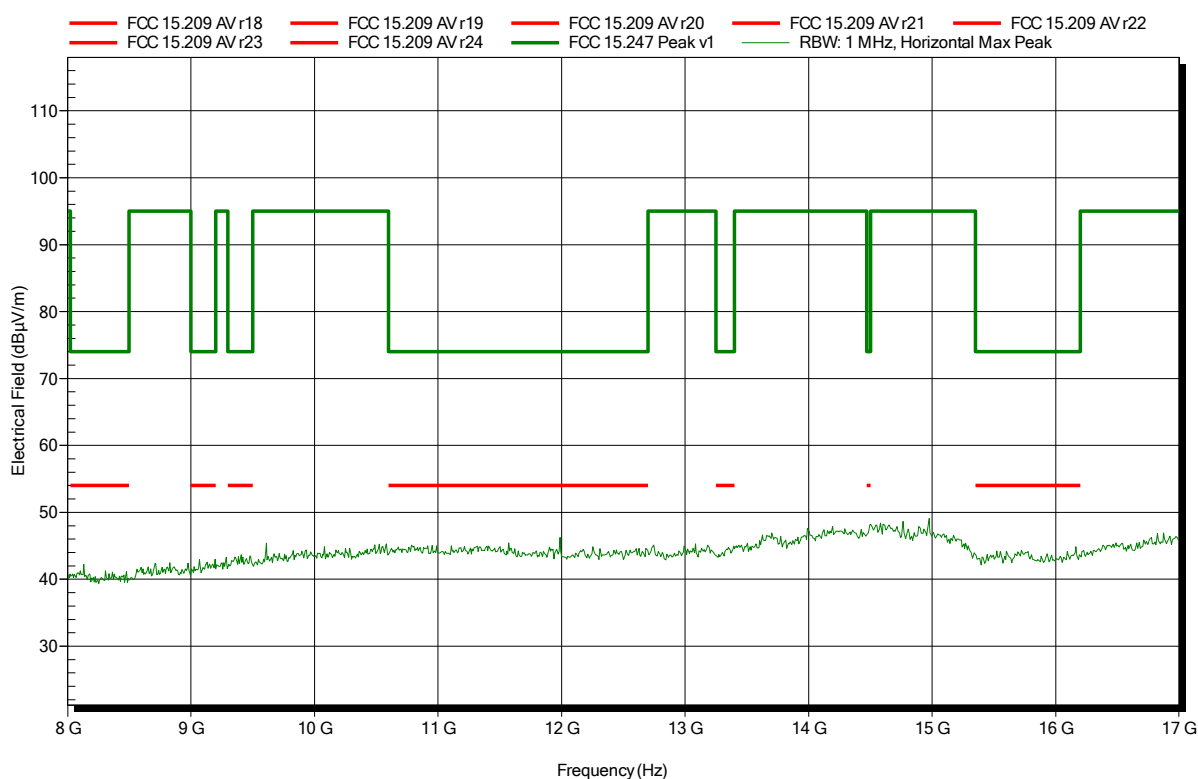


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISSED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
 Test Date: 2017-02-03
 Note: ANT extern vertical

Index 48

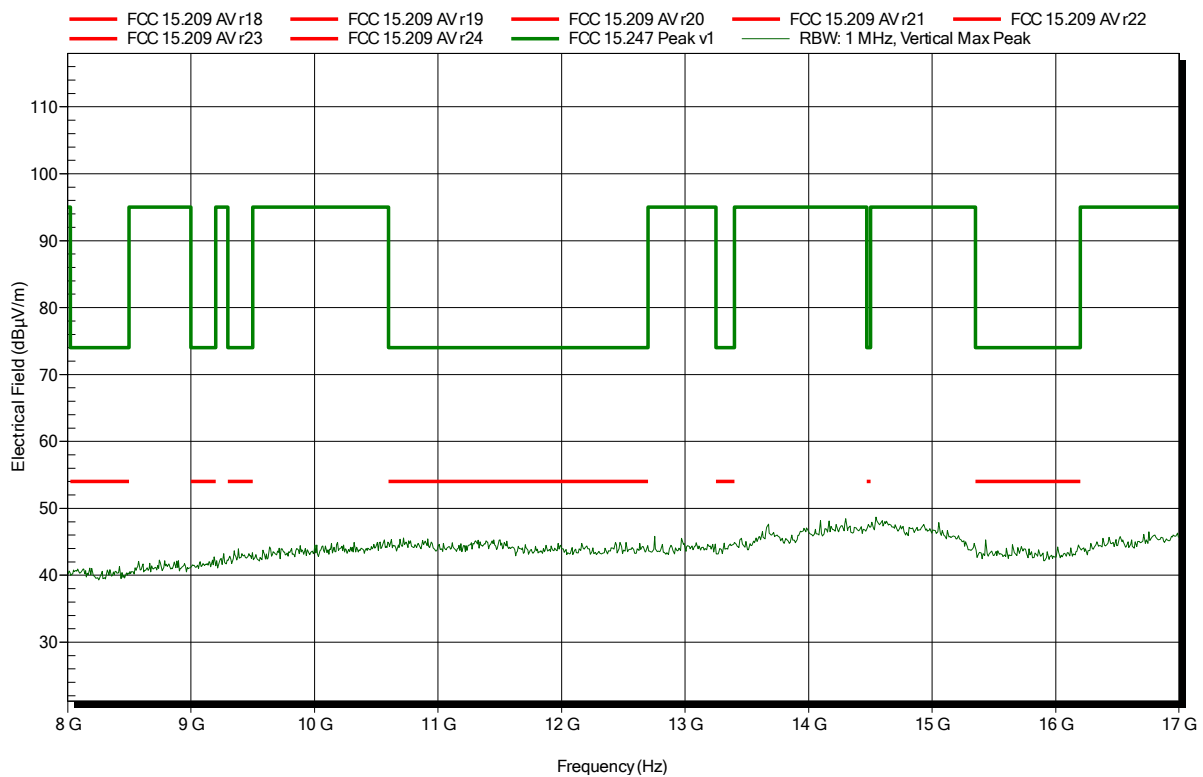


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2436 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 53

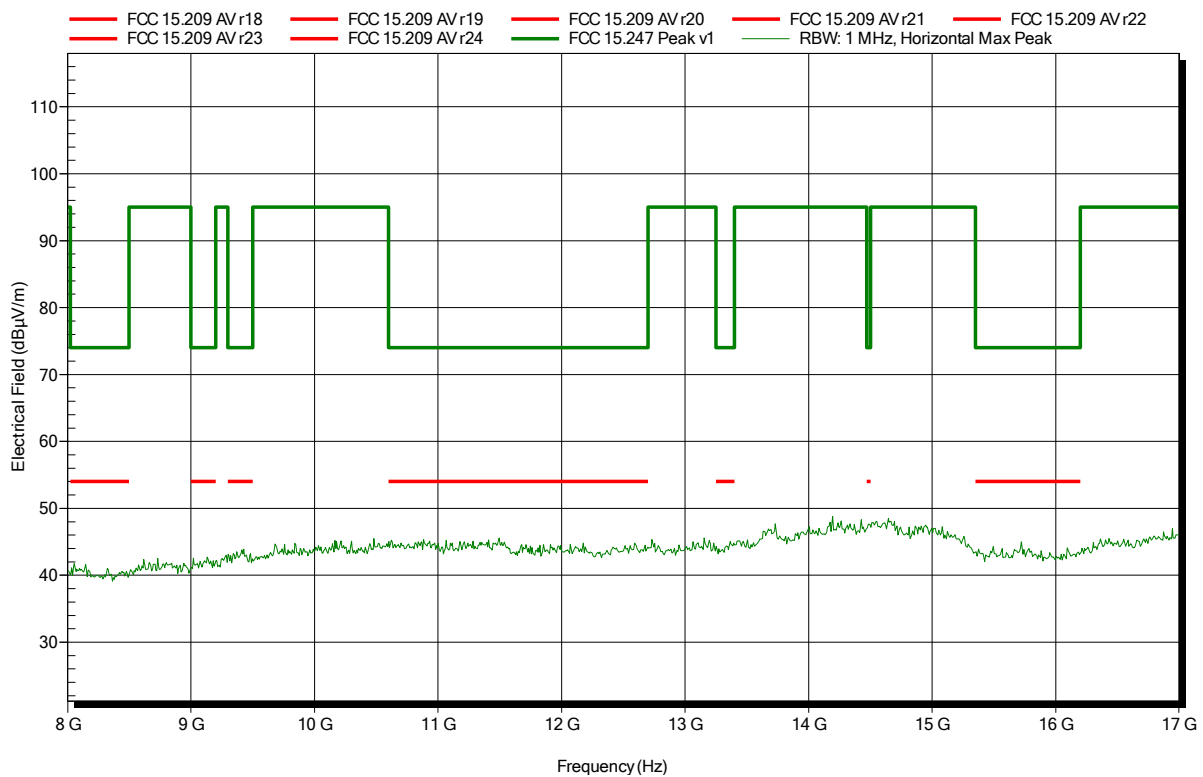


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2436 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 56

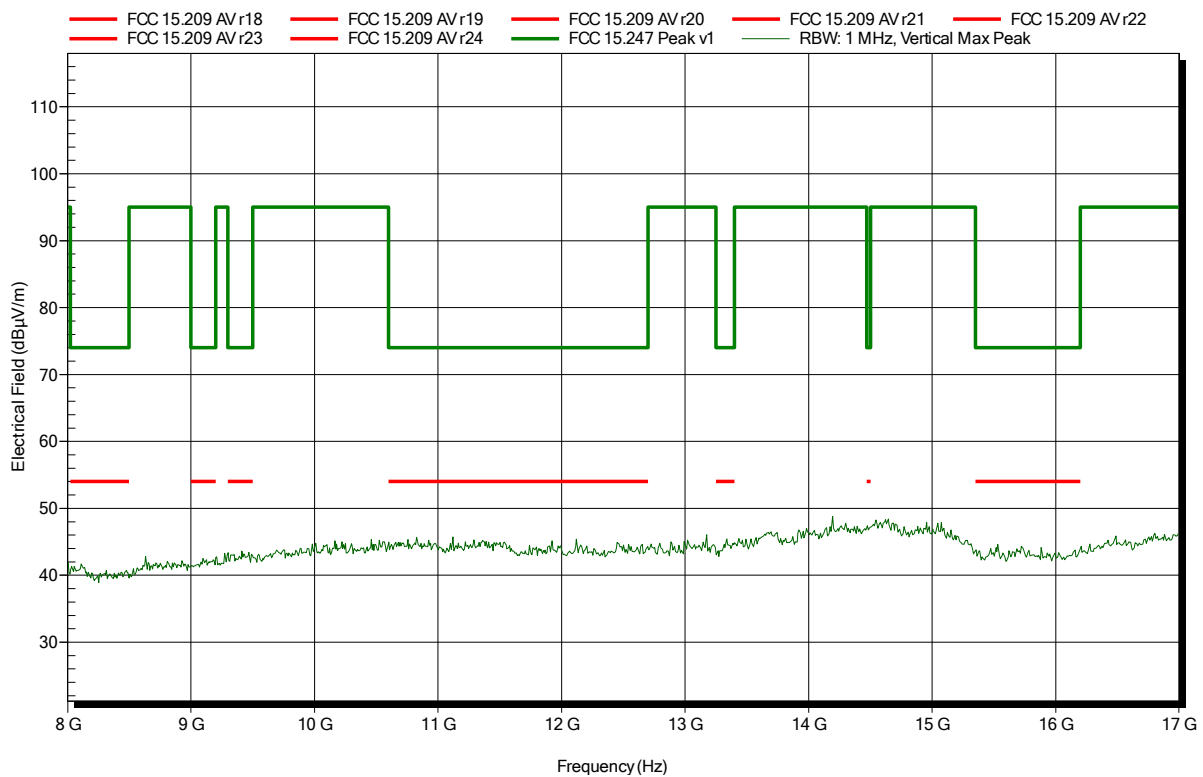


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
Test Date: 2017-02-06
Note: ANT extern vertical

Index 66

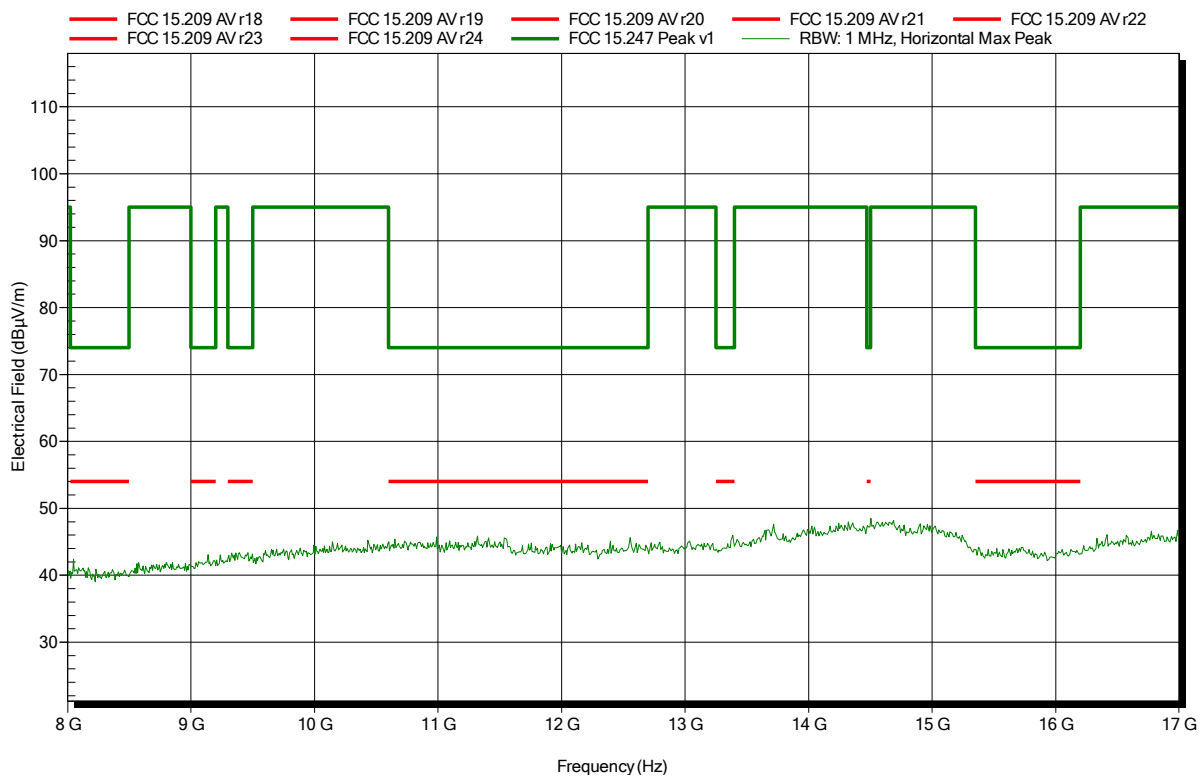


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISD RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 63

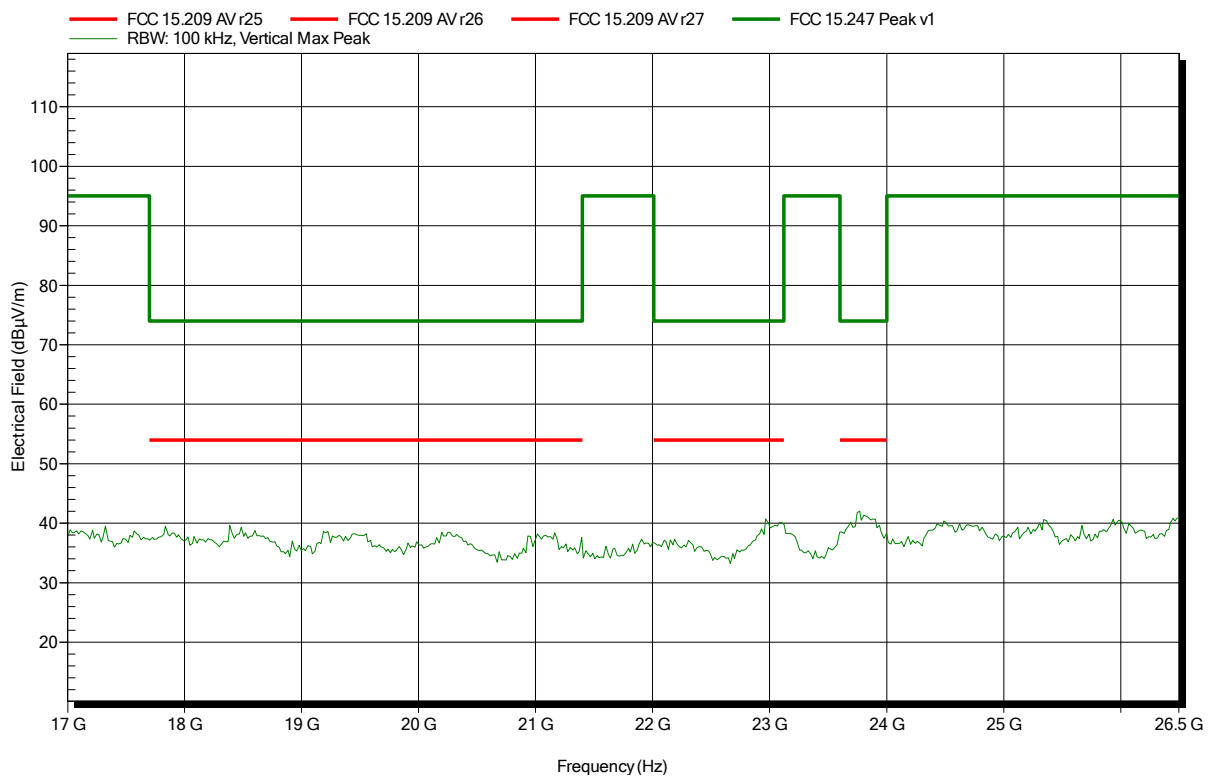


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: ATH18G40, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 50

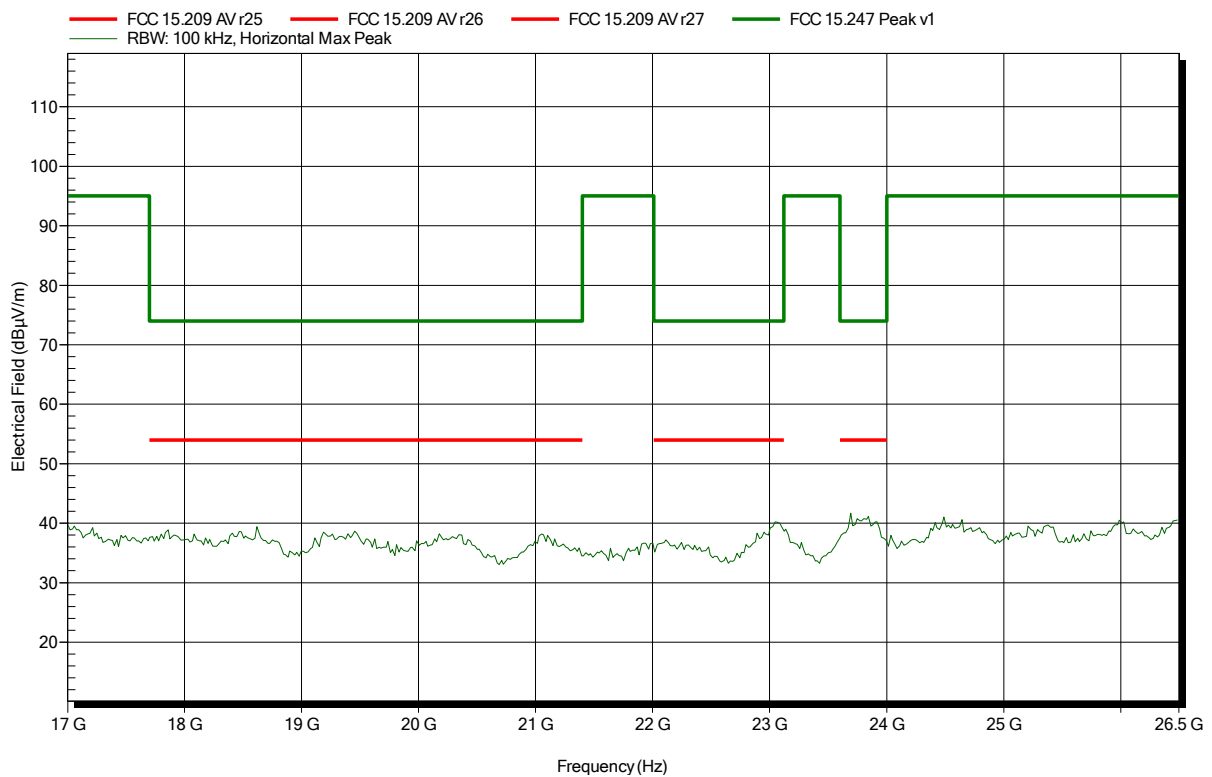


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: ATH18G40, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2402 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 49

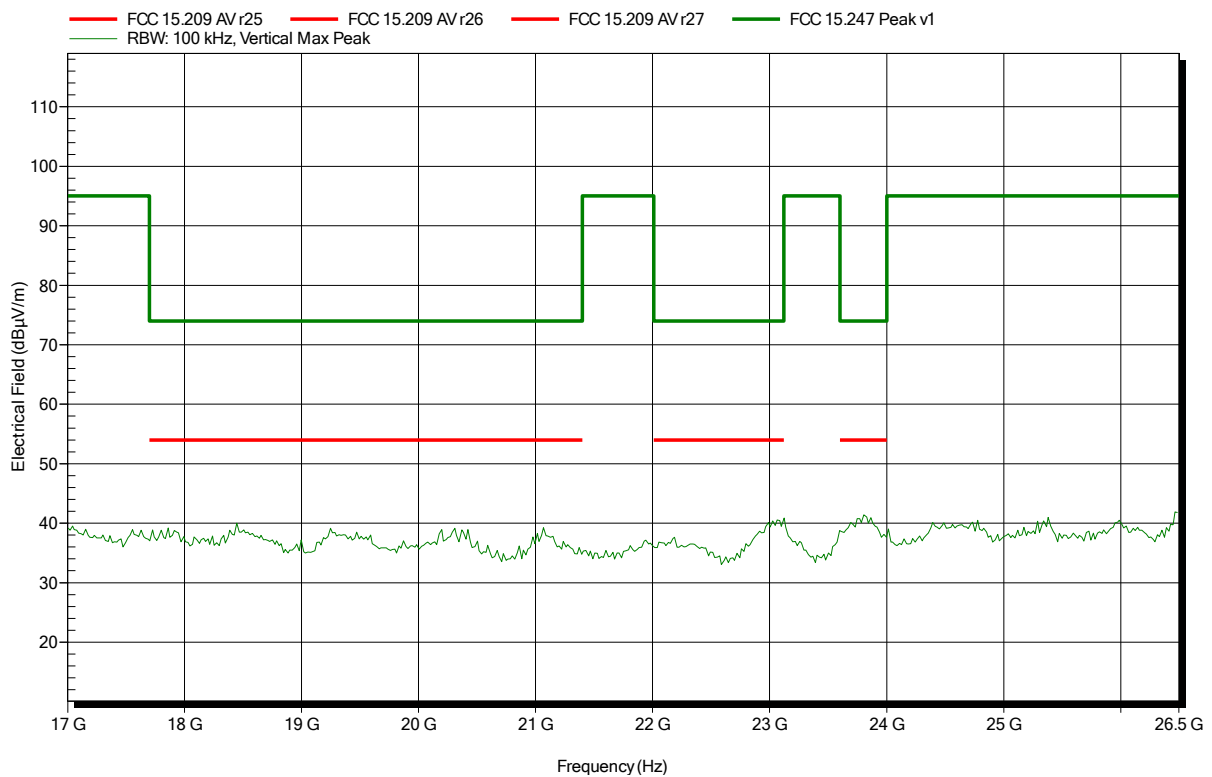


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: ATH18G40, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2436 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 54

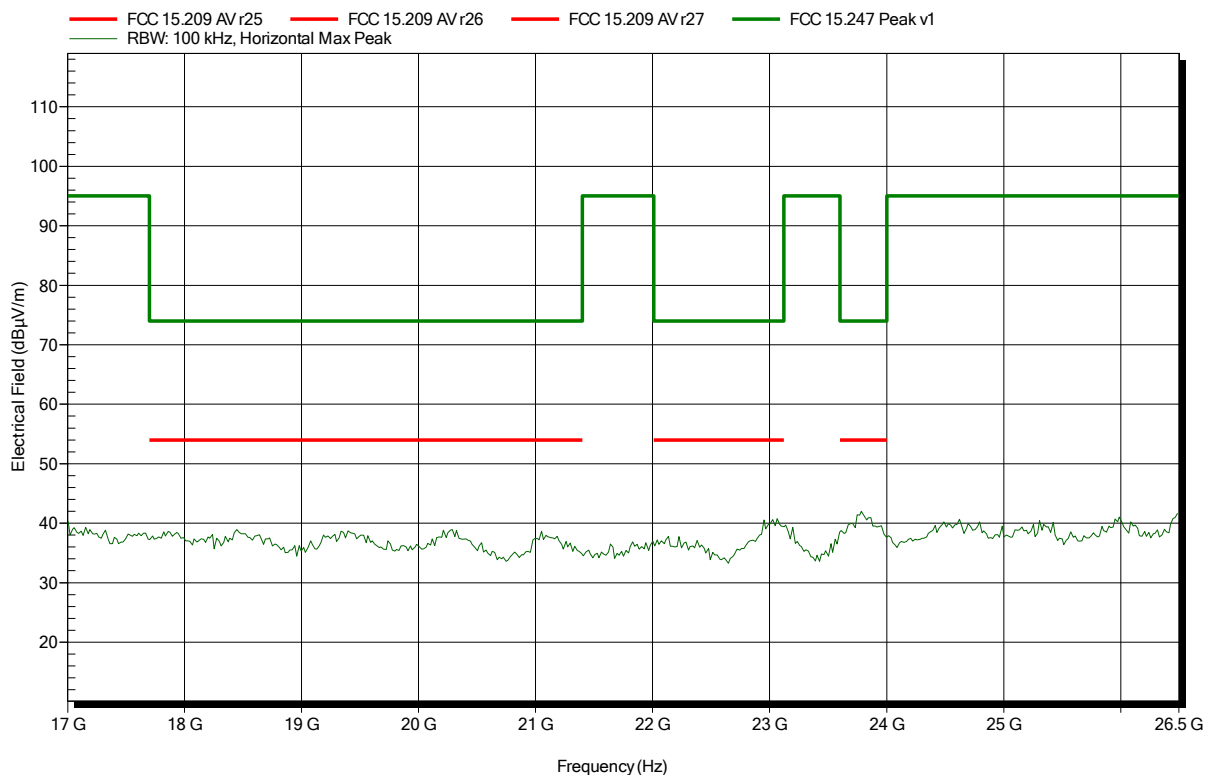


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: ATH18G40, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2436 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 55

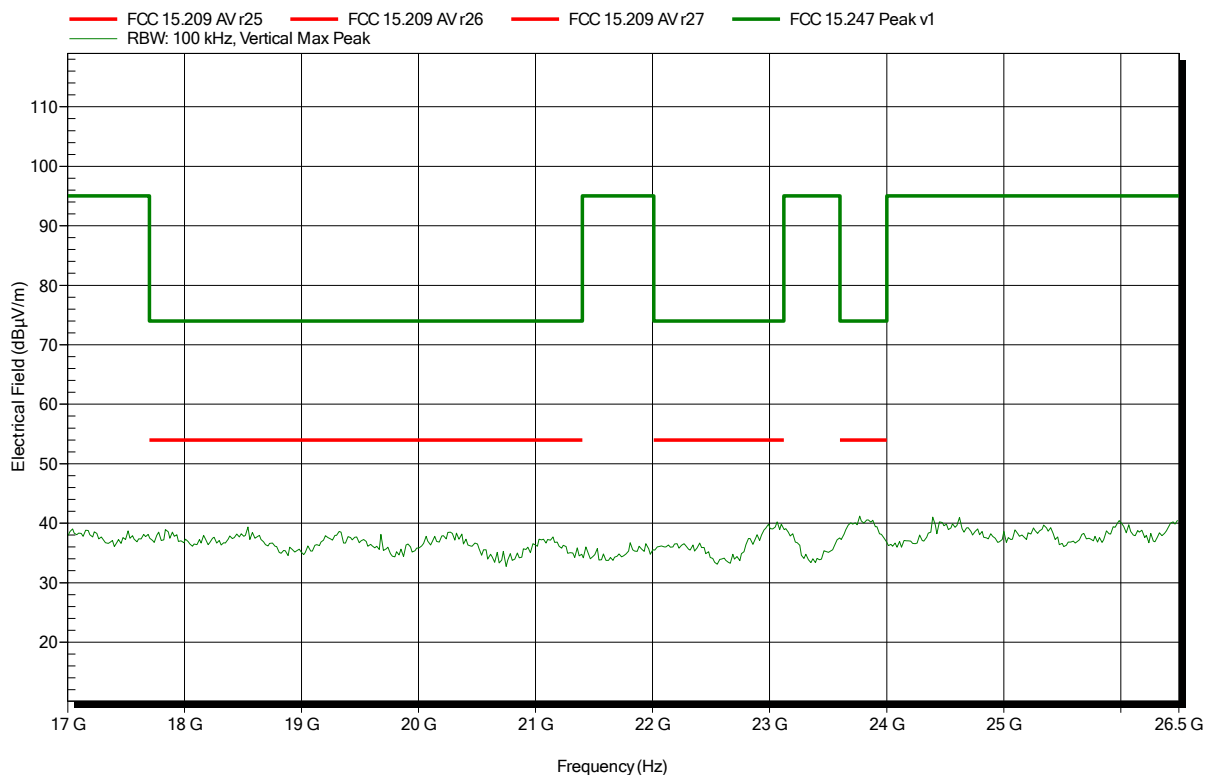


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: ATH18G40, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
Test Date: 2017-02-06
Note: ANT extern vertical

Index 65

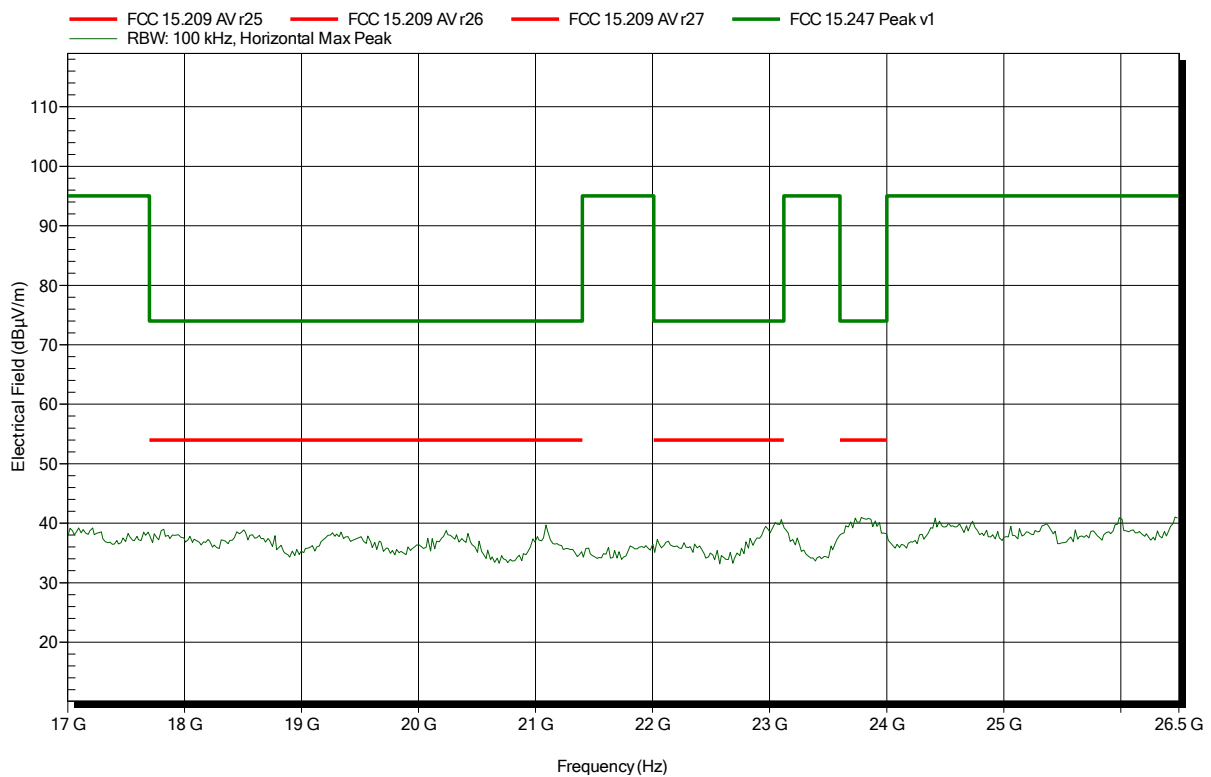


Spurious emissions according to FCC part 15 Subpart C § 15.247, ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: ATH18G40, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; XBee; Ch: 2472 MHz; GFSK; Pmax
Test Date: 2017-02-03
Note: ANT extern vertical

Index 64



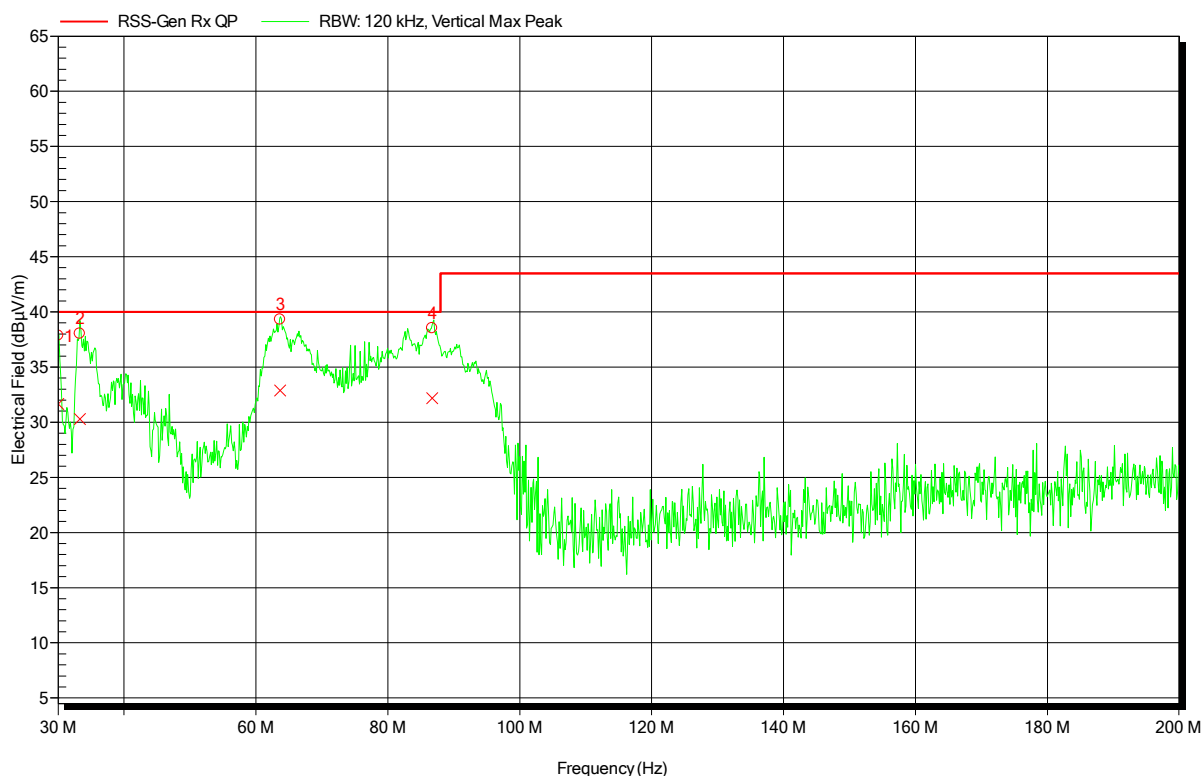
ANNEX B Receiver spurious emissions

Spurious emissions according to ISCED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: RX; XBee; Ch: 2436 MHz; GFSK
 Test Date: 2017-02-07
 Note: ANT extern vertical

Index 37



Frequency	Peak	Peak Limit	Peak Difference	Status
30 MHz	37.9 dBµV/m	40 dBµV/m	-2.15 dB	Pass
33.3 MHz	38 dBµV/m	40 dBµV/m	-1.97 dB	Pass
63.66 MHz	39.3 dBµV/m	40 dBµV/m	-0.68 dB	Pass
86.7 MHz	38.5 dBµV/m	40 dBµV/m	-1.48 dB	Pass

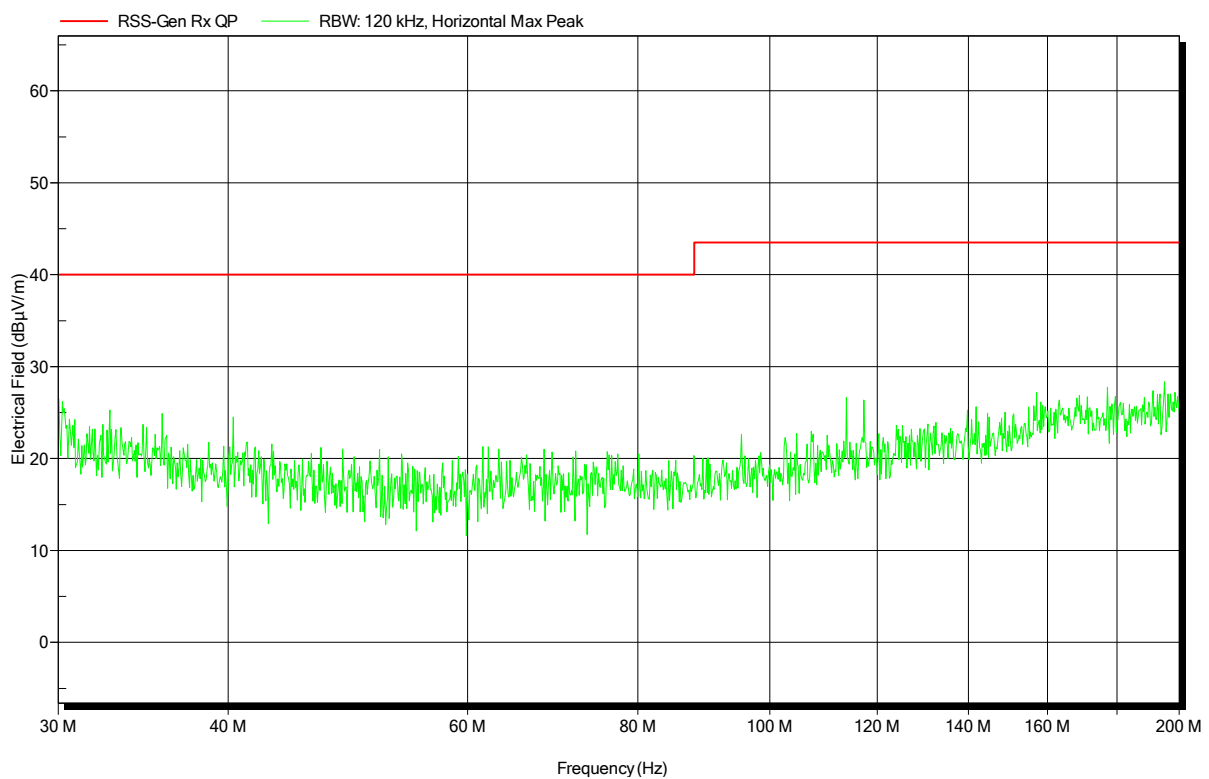
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
30 MHz	31.6 dBµV/m	40 dBµV/m	-8.35 dB	Pass
33.3 MHz	30.3 dBµV/m	40 dBµV/m	-9.71 dB	Pass
63.66 MHz	32.9 dBµV/m	40 dBµV/m	-7.12 dB	Pass
86.7 MHz	32.2 dBµV/m	40 dBµV/m	-7.82 dB	Pass

Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Rohde & Schwarz HK 116, Horizontal
Measurement distance: 3 m
Mode: RX; XBee; Ch: 2436 MHz; GFSK
Test Date: 2017-02-07
Note: ANT extern vertical

Index 38

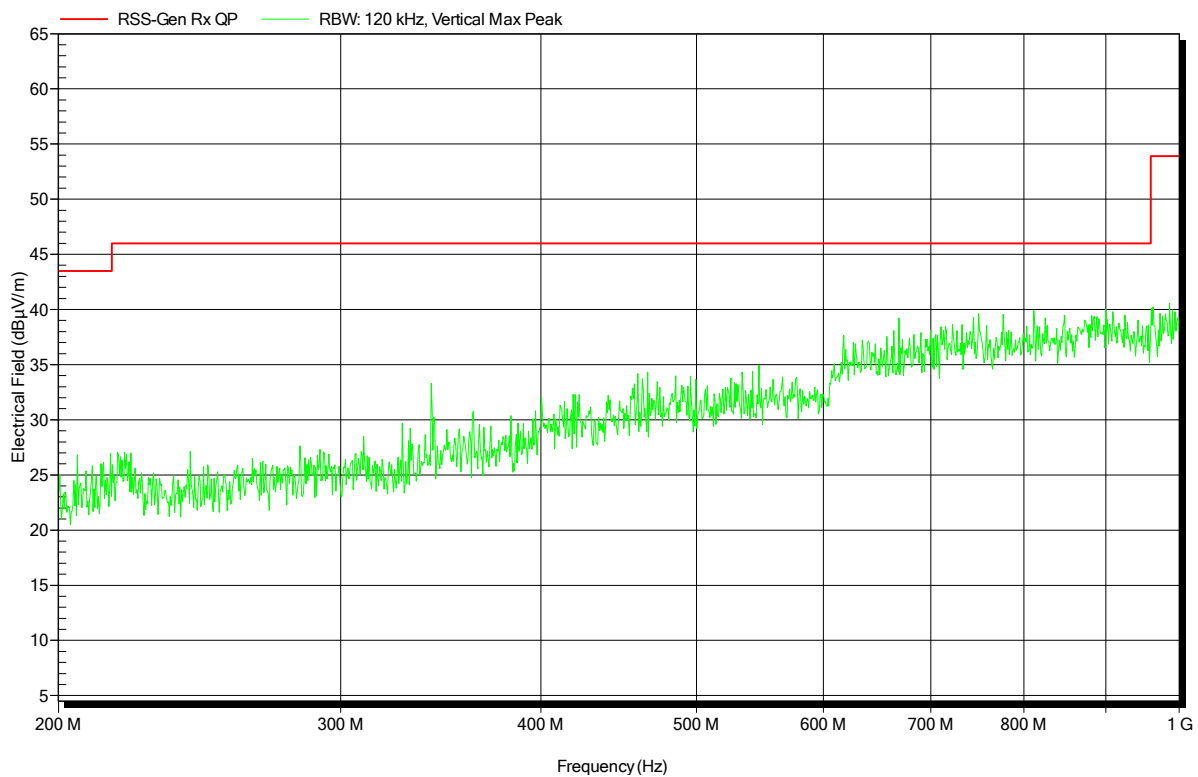


Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3 m
 Mode: RX; XBee; Ch: 2436 MHz; GFSK
 Test Date: 2017-02-07
 Note: ANT extern vertical

Index 35

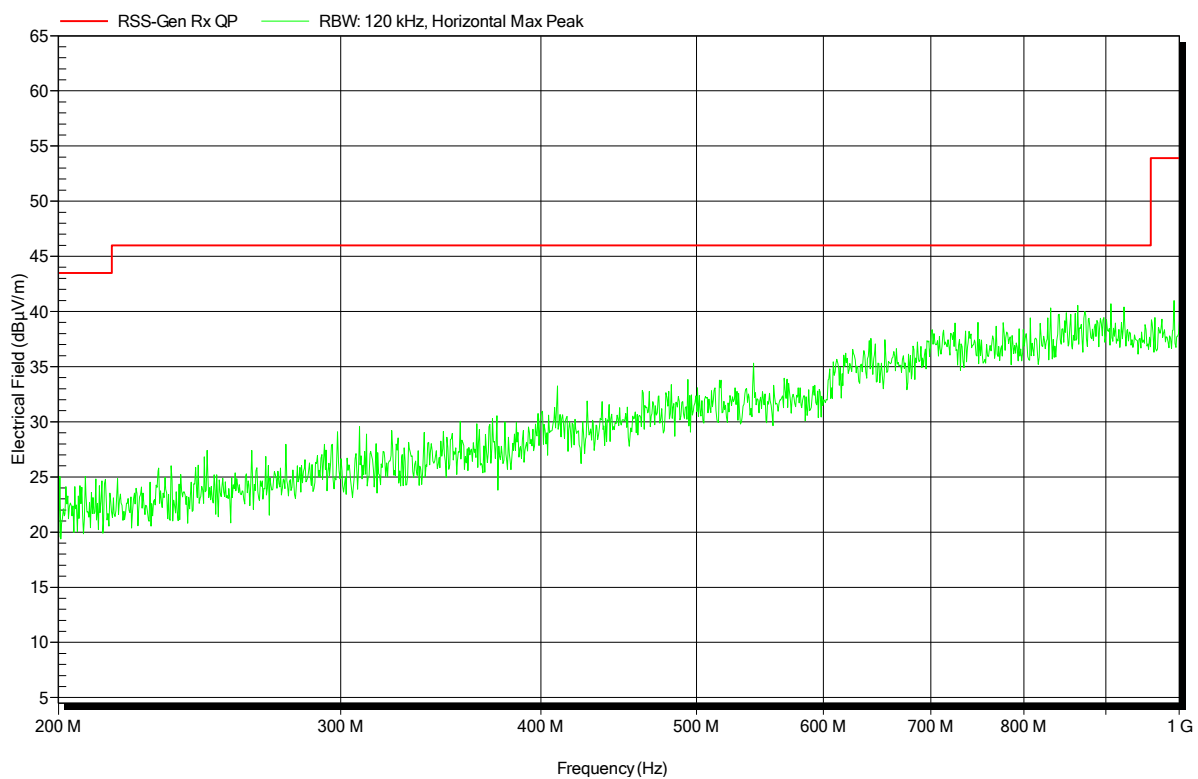


Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Rohde & Schwarz HL 223, Horizontal
Measurement distance: 3 m
Mode: RX; XBee; Ch: 2436 MHz; GFSK
Test Date: 2017-02-07
Note: ANT extern vertical

Index 36

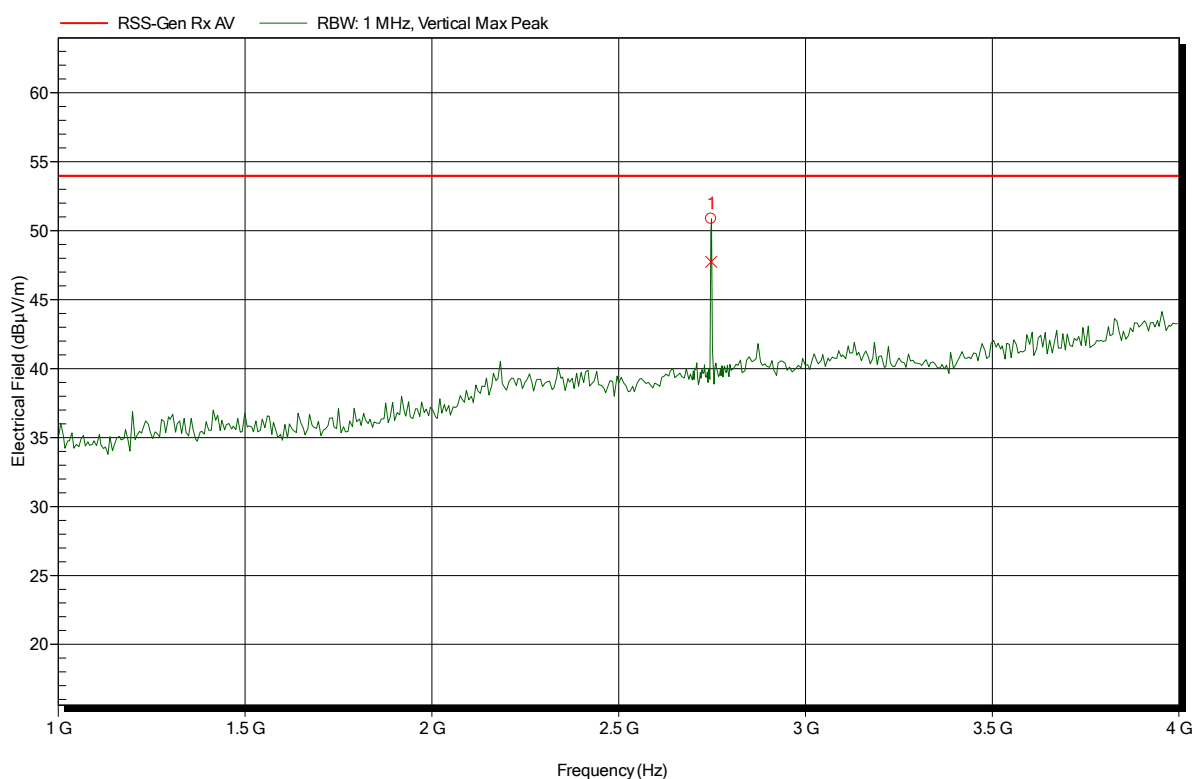


Spurious emissions according to ISSED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 3 m
Mode: RX; XBee; Ch: 2436 MHz; GFSK
Test Date: 2017-02-09
Note: ANT extern vertical

Index 39



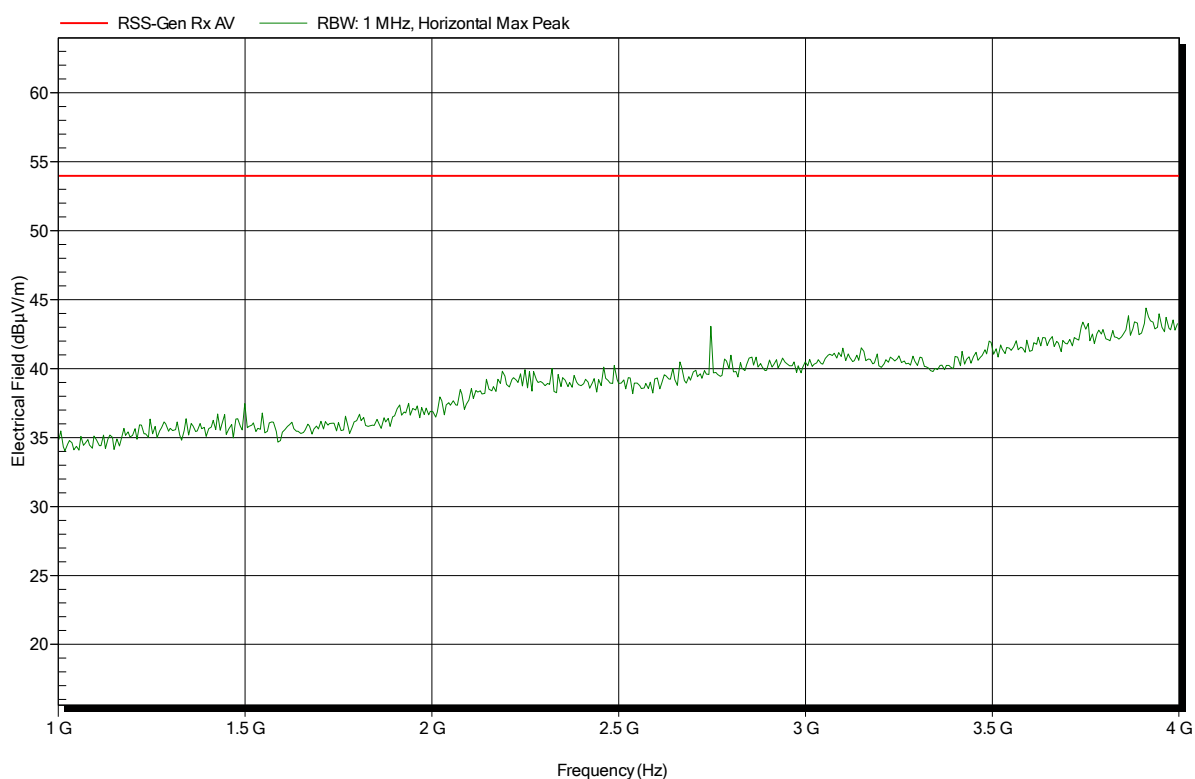
Frequency 2.747 GHz	Peak 50.87 dBμV/m	Peak Limit 53.98 dBμV/m	Peak Difference -3.11 dB	Peak Status Pass
Frequency 2.747 GHz	Average 47.74 dBμV/m	Average Limit 53.98 dBμV/m	Average Difference -6.24 dB	Average Status Pass

Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 3 m
Mode: RX; XBee; Ch: 2436 MHz; GFSK
Test Date: 2017-02-09
Note: ANT extern vertical

Index 43

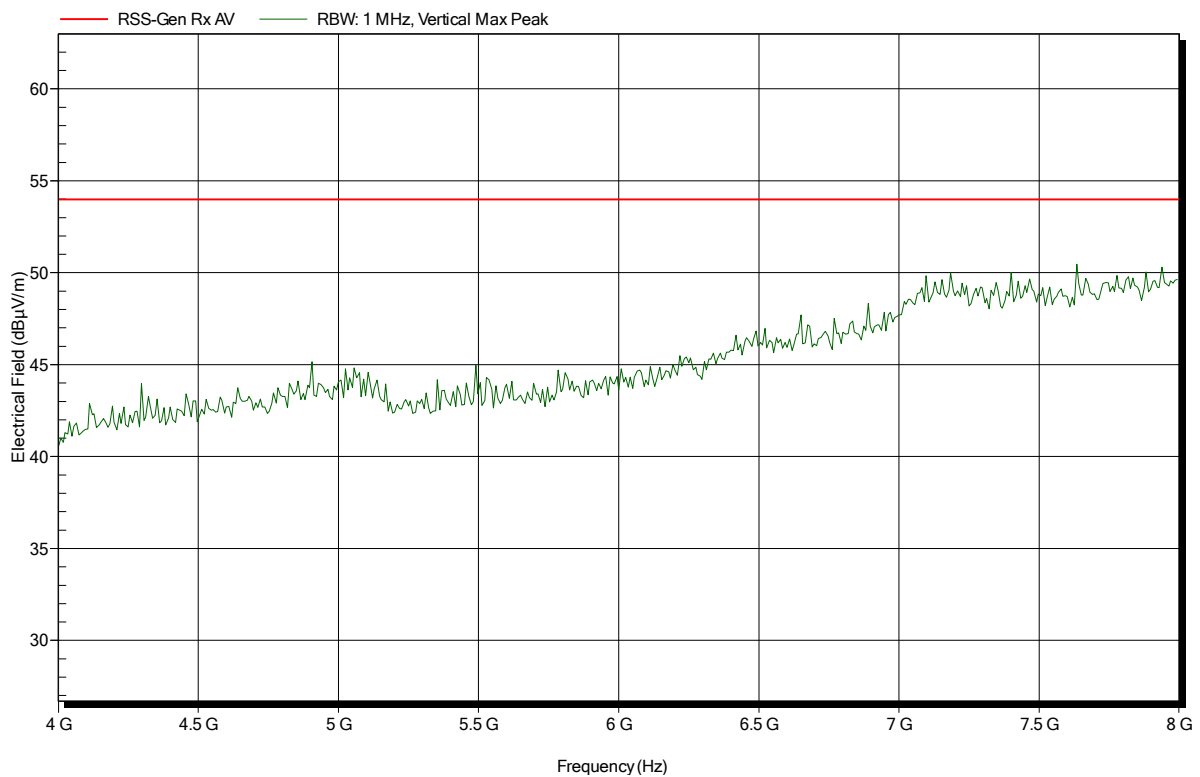


Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: RX; XBee; Ch: 2436 MHz; GFSK
 Test Date: 2017-02-09
 Note: ANT extern vertical

Index 40

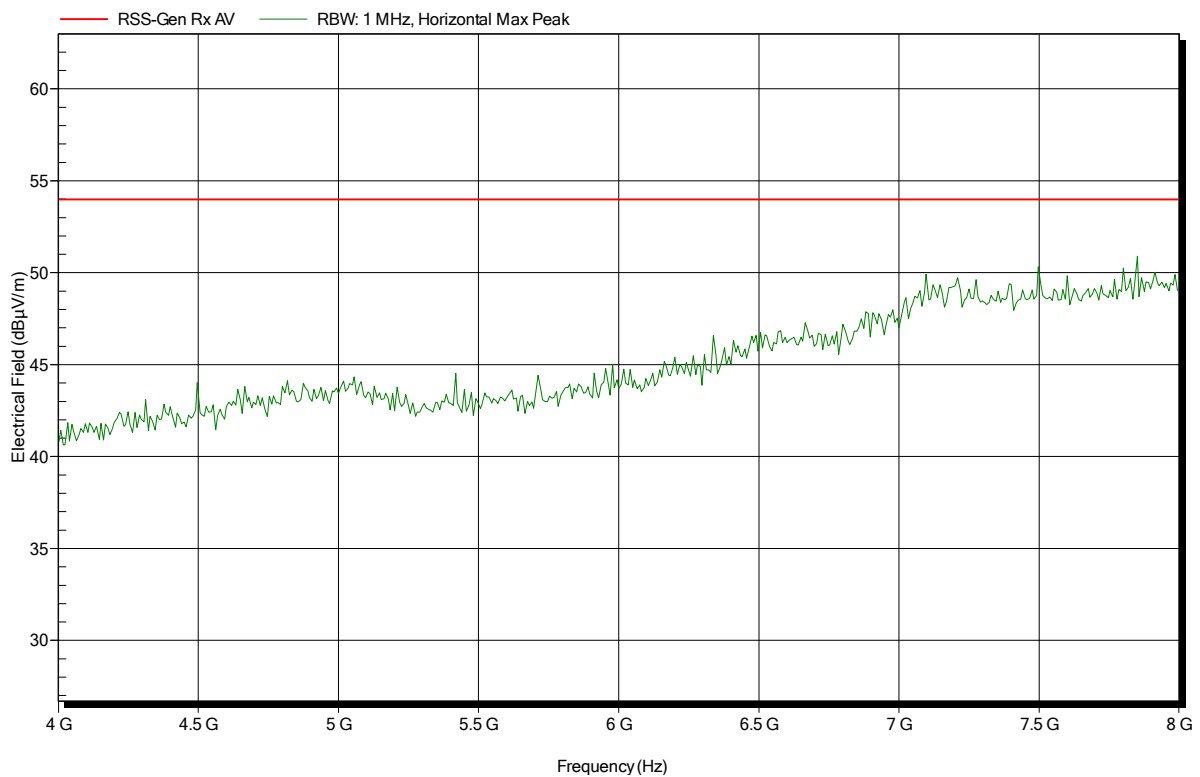


Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 3 m
Mode: RX; XBee; Ch: 2436 MHz; GFSK
Test Date: 2017-02-09
Note: ANT extern vertical

Index 44

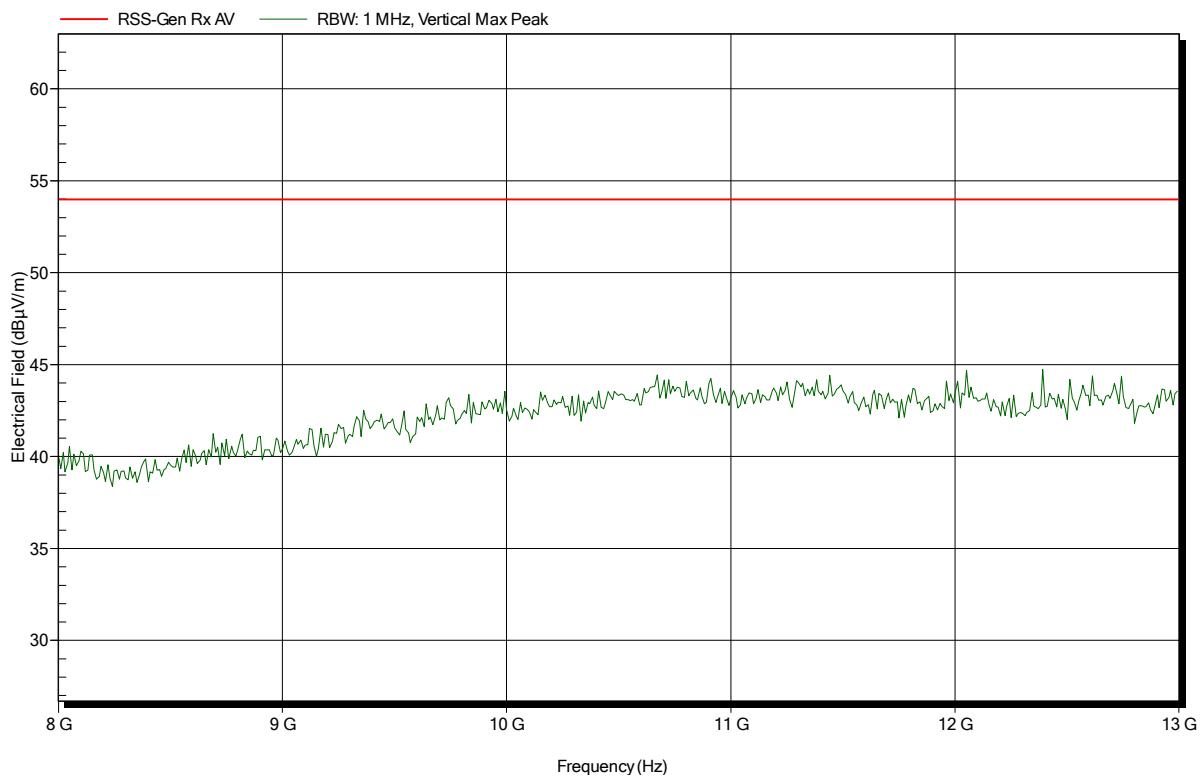


Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
EUT Name: 4K-WISY-Antennenmodul
Model: 4K-WISY-Antennenmodul
Test Site: Eurofins Product Service GmbH
Operator: Mr. Pudell
Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: RX; XBee; Ch: 2436 MHz; GFSK
Test Date: 2017-02-09
Note: ANT extern vertical

Index 42



Spurious emissions according to ISED RSS-247, I1

Project number: G0M-1611-6034

Applicant: Artis GmbH
 EUT Name: 4K-WISY-Antennenmodul
 Model: 4K-WISY-Antennenmodul
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pudell
 Test Conditions: Tnom: 24°C, Vnom: 5.0 V DC (USB)
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: RX; XBee; Ch: 2436 MHz; GFSK
 Test Date: 2017-02-09
 Note: ANT extern vertical

Index 45

