

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-1803-7264-TFC247BL-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	 A2LA Accredited Testing Laboratory, Certificate No.: 1983.01 FCC Test Firm Designation Number: DE0008 IC Testing Laboratory site: 3470A-2
Applicant	Grässlin GmbH
Address	Bundesstraße 36 78112 St. Georgen GERMANY
Test Specification	According to FCC/ISED rules
Standard	47 CFR Part 15C RSS-247, Issue 2, 2017-02
Non-Standard Test Method	None
Test Scope	partial compliance test
Equipment under Test (EUT):	
Product Description	115 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model(s)	talento smart LAN
Additional Model(s)	None
Brand Name(s)	None
Hardware Version(s)	Rev_02
Software Version(s)	V.1.0
FCC-ID	2AHH7-DG
IC	21619-DG
Test Result	PASSED

Possible test case verdicts:		
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)	
Testing:		
Test Lab Temperature	20 - 23 °C	
Test Lab Humidity	32 – 38 %	
Date of receipt of test item	2018-07-26	
Report:		
Compiled by	Abdullah Al Jamal	
Tested by (+ signature) (Responsible for Test)	Abdullah Al Jamal	
Approved by (+ signature) (Deputy Head of Lab)	Toralf Jahn	
Date of Issue	2018-08-13	
Total number of pages	86	
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:		
None		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2018-08-13	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

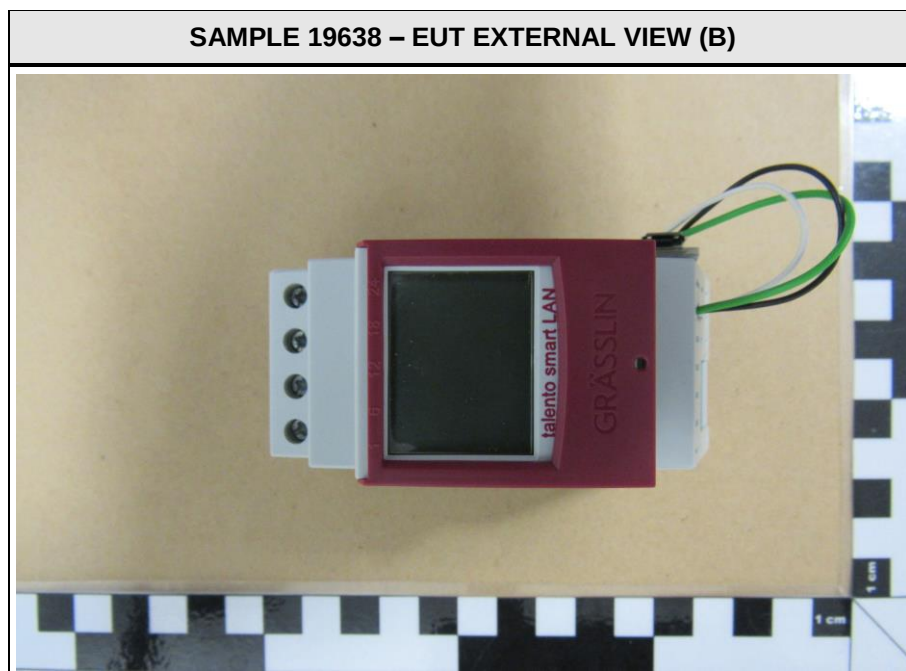
REPORT INDEX

1	Equipment (Test Item) Under Test.....	6
1.1	Photos – Equipment External	7
1.2	Photos – Equipment Internal	11
1.3	Photos – Test Setup.....	14
1.4	Support Equipment.....	15
1.5	Test Modes	16
1.6	Test Frequencies.....	17
1.7	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 - AC powerline conducted emissions.....	25
3.3	Test Conditions and Results - Transmitter radiated emissions	28
3.4	Test Conditions and Results - Receiver radiated emissions	31

1 Equipment (Test Item) Under Test

Description	115 VAC LAN-Gateway for Timer Switch with integrated BLE-Module	
Model	talento smart LAN	
Additional Model(s)	None	
Brand Name(s)	None	
Serial Number(s)	Not specified	
Hardware Version(s)	Rev_02	
Software Version(s)	V.1.0	
PMN	Carrier Board LCD-BLE	
HVIN	Carrier Board LCD-BLE	
FVIN	N/A	
HMN	talento smart LAN	
FCC-ID	2AHH7-DG	
IC	21619-DG	
Equipment type	End Product	
Radio type	Transceiver	
Assigned frequency bands	2400 - 2483.5 MHz	
Radio technology	Bluetooth LE	
Modulation	GFSK	
Number of antenna ports	1	
Radio Module	Type	Bluetooth Radio Module
	Model	Carrier Board V16 BLE
	Manufacturer	Grässlin GmbH
	HW Version	Rev_02
	SW Version	V.1.0
Antenna	Type	Integrated antenna
	Model	PCB Antenna
	Manufacturer	Grässlin GmbH
	Gain	4 dBi (declared by manufacturer)
Supply Voltage	V _{NOM}	115 VAC
Operating Temperature	T _{NOM}	25 °C
AC/DC-Adaptor	Model	N/A
	Vendor	N/A
	Input	N/A
	Output	N/A
Manufacturer	Grässlin GmbH Bundesstraße 36 78112 St. Georgen GERMANY	

1.1 Photos – Equipment External



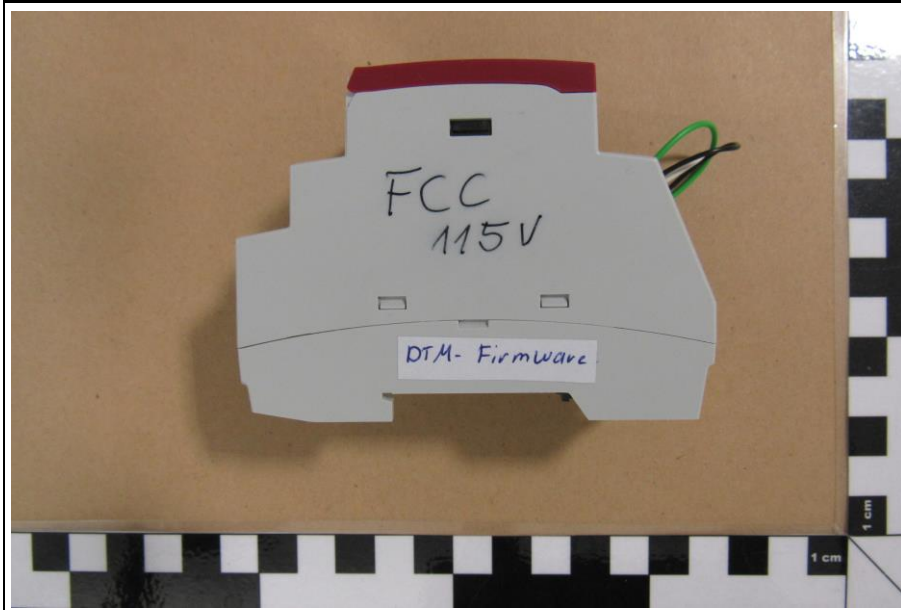
SAMPLE 19638 – EUT EXTERNAL VIEW (C)



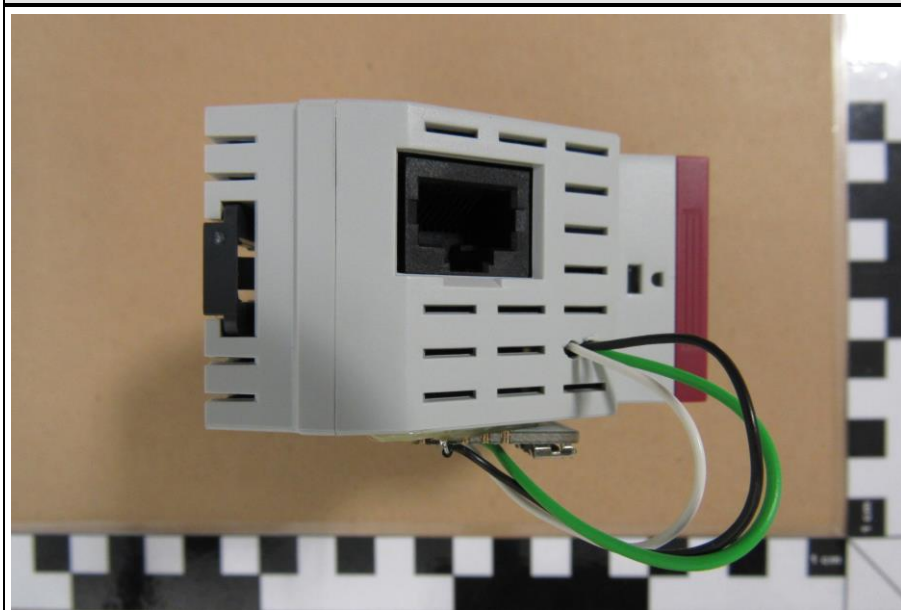
SAMPLE 19638 – EUT EXTERNAL VIEW (D)



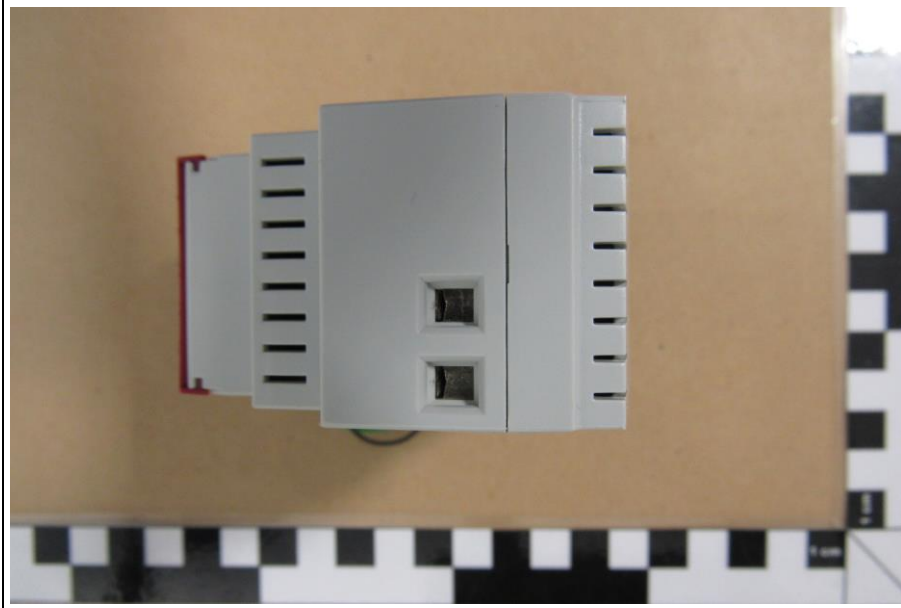
SAMPLE 19638 – EUT EXTERNAL VIEW (E)



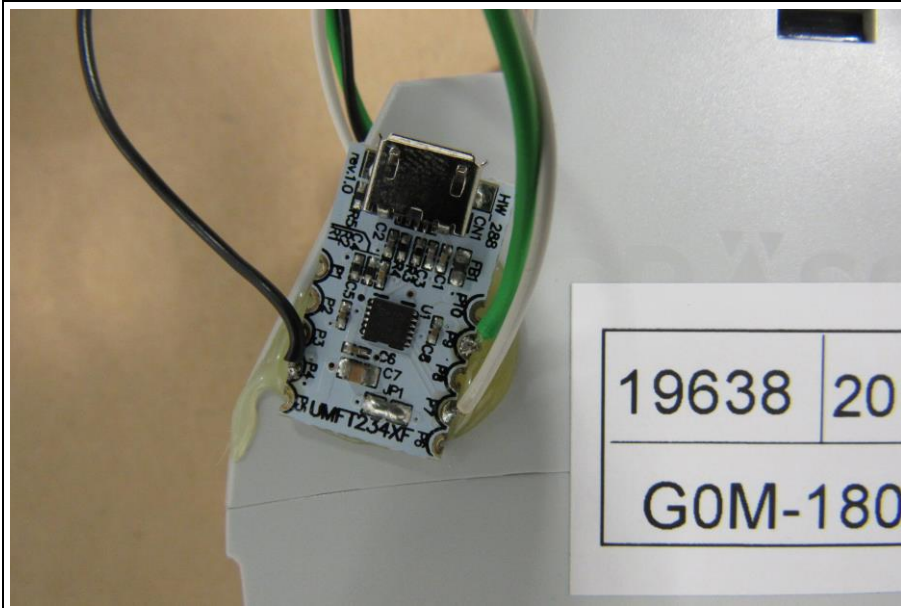
SAMPLE 19638 – EUT EXTERNAL VIEW (F)



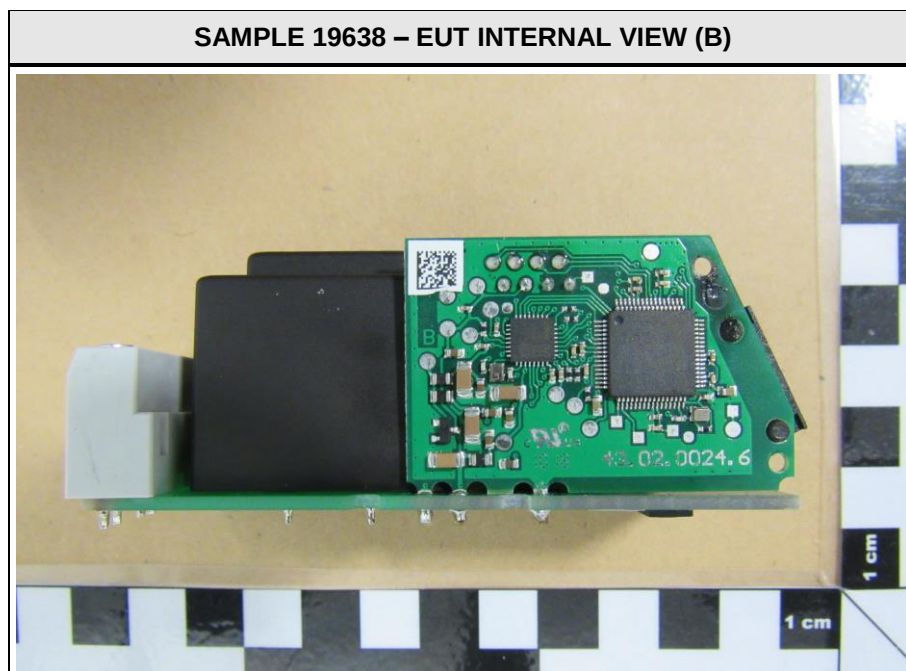
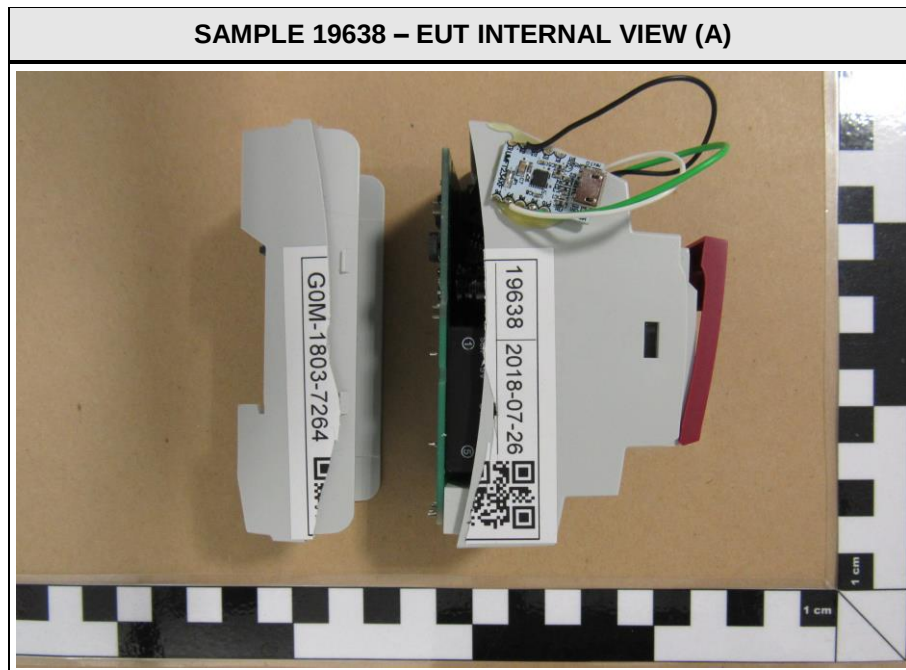
SAMPLE 19638 – EUT EXTERNAL VIEW (G)



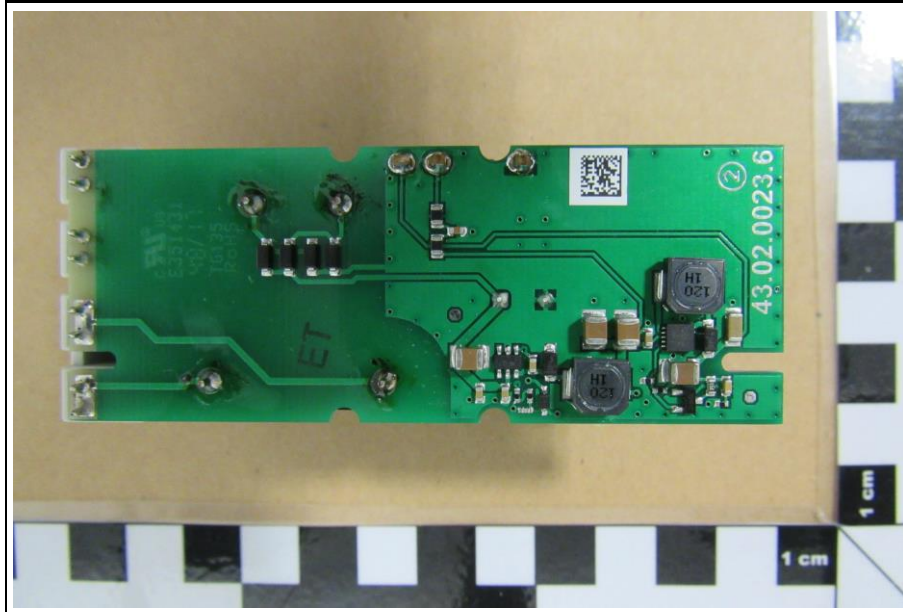
SAMPLE 19638 – EUT EXTERNAL VIEW (H)



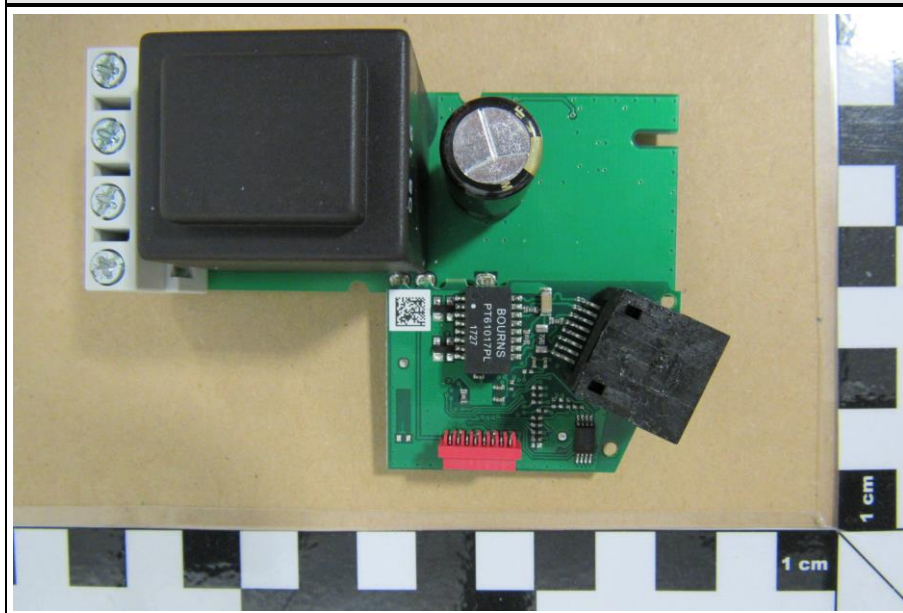
1.2 Photos – Equipment Internal



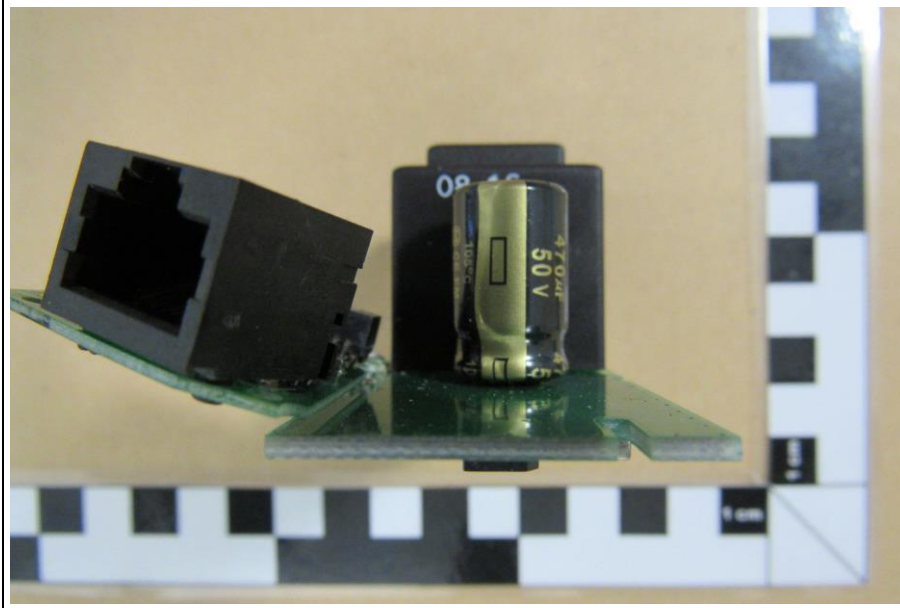
SAMPLE 19638 – EUT INTERNAL VIEW (C)



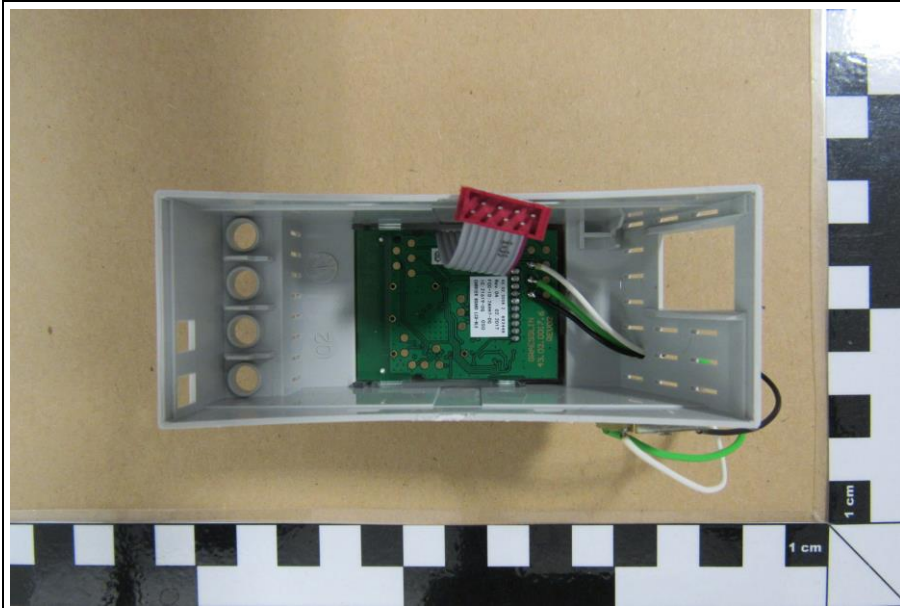
SAMPLE 19638 – EUT INTERNAL VIEW (D)



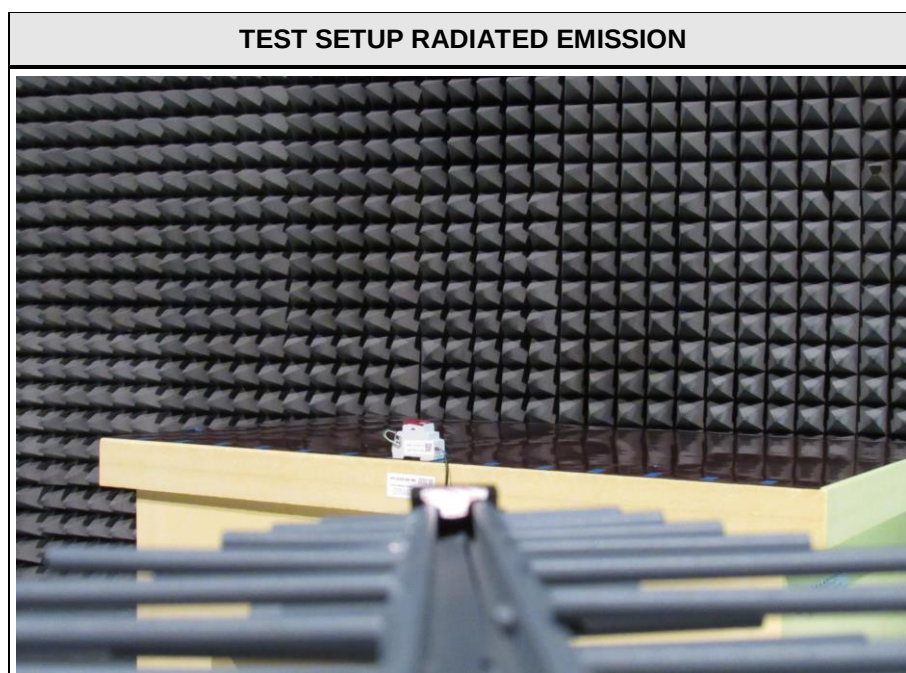
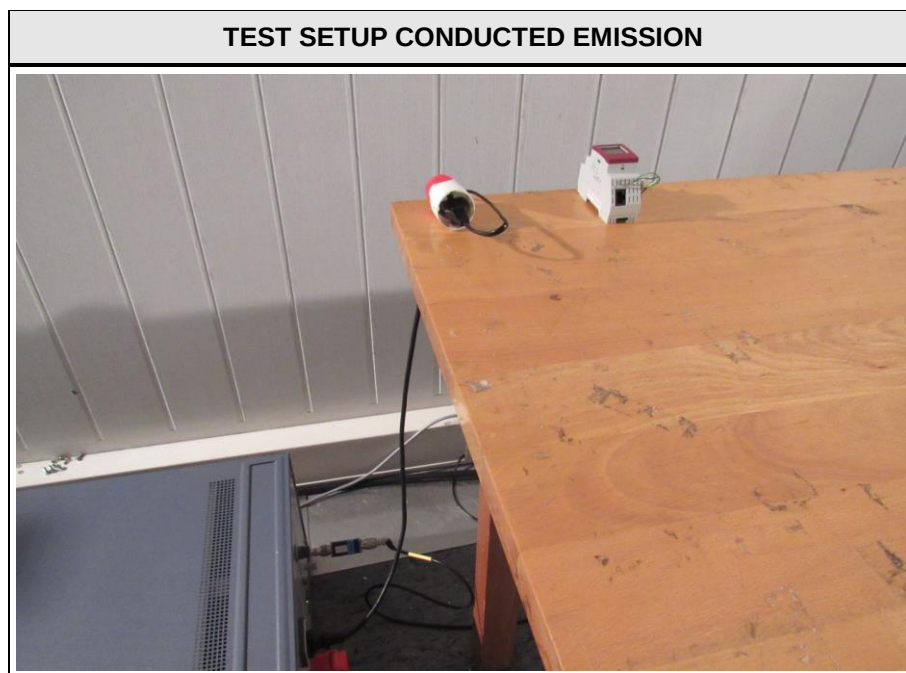
SAMPLE 19638 – EUT INTERNAL VIEW (E)



SAMPLE 19638 – EUT INTERNAL VIEW (F)



1.3 Photos – Test Setup



1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE1	Laptop	Dell	Latitude E6430	S/N 4MX5TY1
AE2	Power Supply	Dell	LA65NS2-01	S/N 6TM1C
Description:				
AE1 – AE2	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
Comment: None				

1.5 Test Modes

Mode	Description
GFSK	Mode = Transmit Modulation = GFSK Spreading = None Duty cycle = 64%
Receive	Mode = Receive
Comment: None	

1.6 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx / Rx	0	2402
F2	Tx / Rx	19	2440
F3	Tx / Rx	39	2480

1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum 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: None				

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

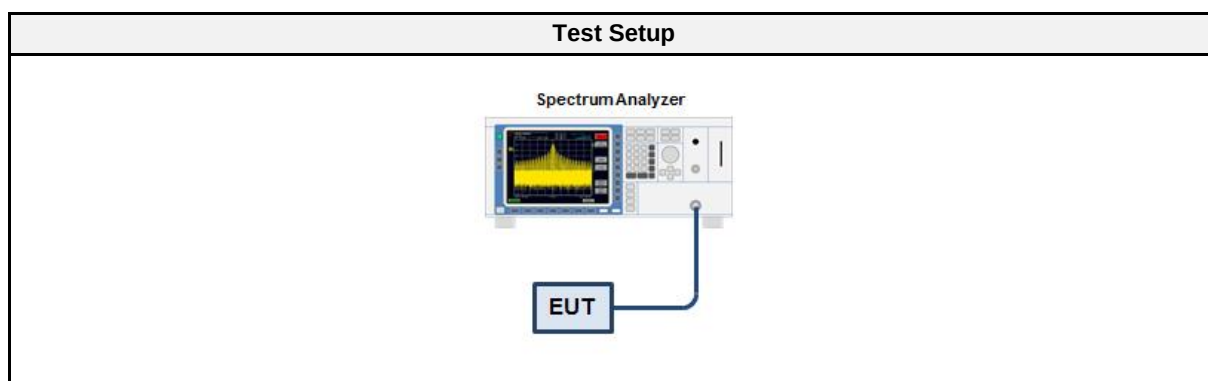
3.1.1 Information

Test Information	
Reference	ISED RSS-Gen 6.6
Measurement Method	ANSI C63.10 6.9.3
Operator	Abdullah Al Jamal
Date	2018-08-01

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	FSW 43	EF00896	2018-07	2019-07

3.1.5 Procedure

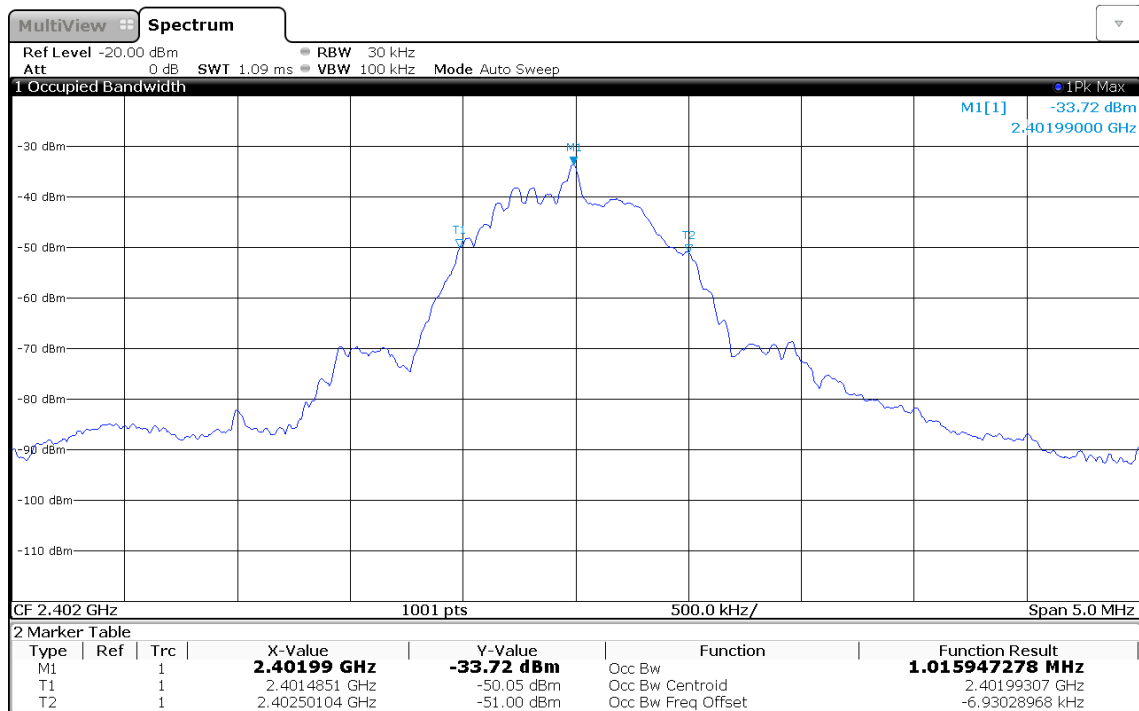
Test Procedure
1. EUT transmitter is activated in test mode under normal conditions 2. The spectrum analyzer is set to peak detection and maximum hold with a span twice the emission spectrum 3. The resolution bandwidth is set to the range of 1 % to 5 % of the occupied bandwidth 4. The occupied bandwidth is measured with the build-in analyzer function

3.1.6 Results

Test Results		
Mode	Frequency [MHz]	Bandwidth [MHz]
GFSK	2402	1.016
GFSK	2440	1.017
GFSK	2480	1.016

Occupied Bandwidth

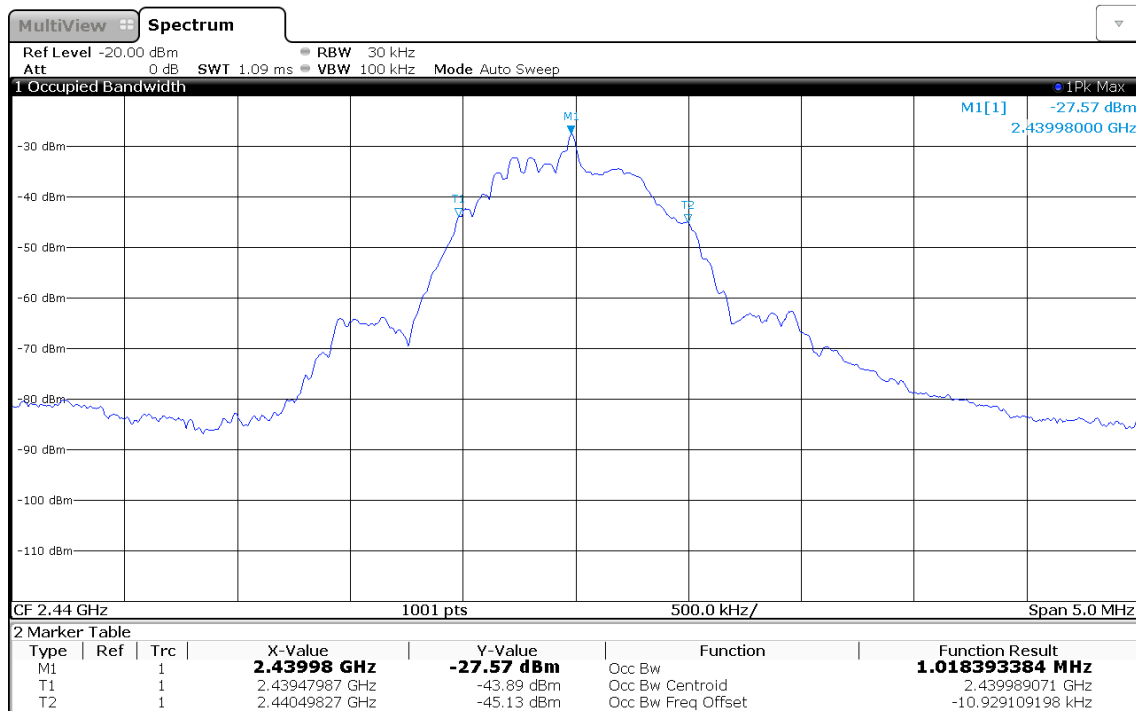
Project Number: G0M-1803-7264
 Applicant: Grässlin GmbH
 Model Description: 115 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Sample ID: 19638
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: GFSK, Channel: 0, 2402 MHz
 Operating Conditions: Tnom/Vnom
 Operator: A. Al Jamal
 Test Site: Eurofins Product Service GmbH
 Test Date: 2018-08-01
 Occupied Bandwidth [MHz]: 1.016



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Occupied Bandwidth

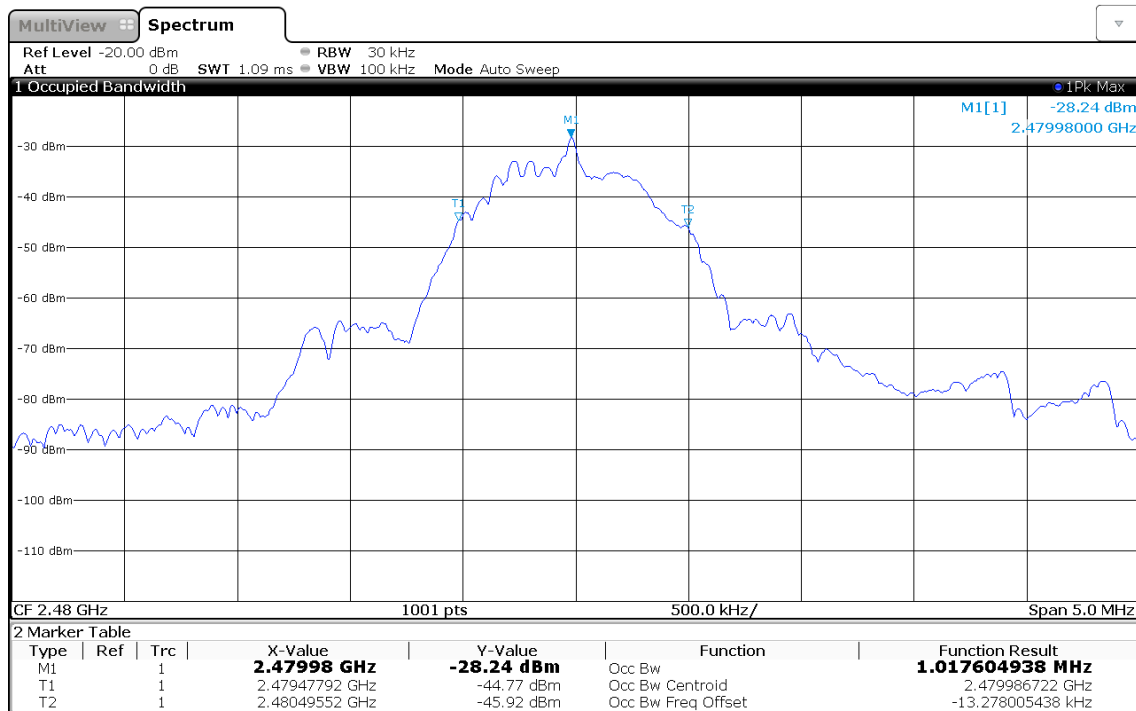
Project Number: G0M-1803-7264
 Applicant: Grässlin GmbH
 Model Description: 115 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Sample ID: 19638
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: GFSK, Channel: 19, 2440 MHz
 Operating Conditions: Tnom/Vnom
 Operator: A. Al Jamal
 Test Site: Eurofins Product Service GmbH
 Test Date: 2018-08-01
 Occupied Bandwidth [MHz]: 1.017



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Occupied Bandwidth

Project Number: G0M-1803-7264
 Applicant: Grässlin GmbH
 Model Description: 115 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Sample ID: 19638
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: GFSK, Channel: 39, 2480 MHz
 Operating Conditions: Tnom/Vnom
 Operator: A. Al Jamal
 Test Site: Eurofins Product Service GmbH
 Test Date: 2018-08-01
 Occupied Bandwidth [MHz]: 1.016



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3.2 Test Conditions and Results - AC powerline conducted emissions

3.2.1 Information

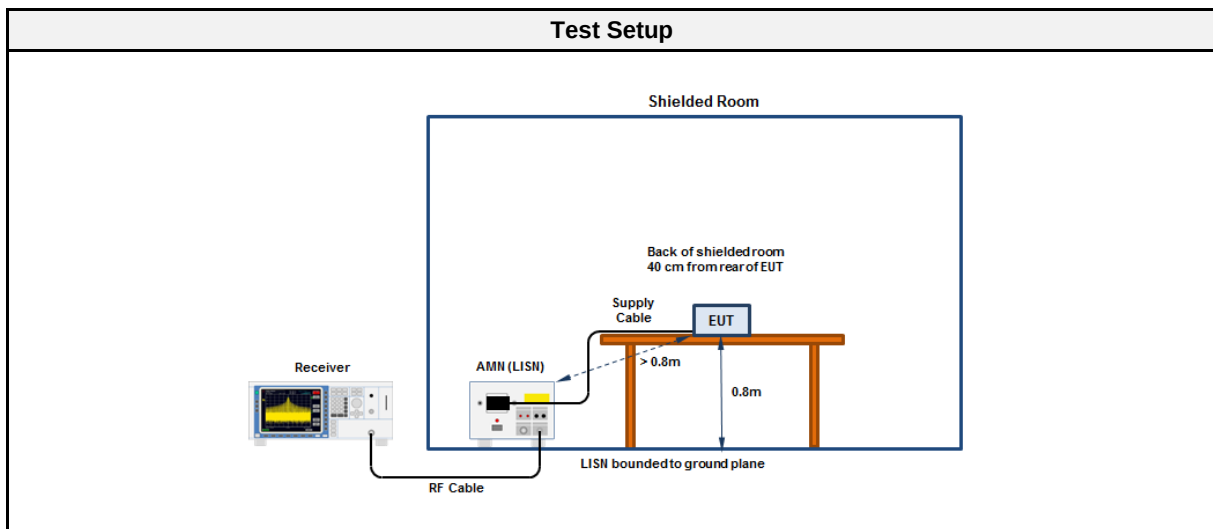
Test Information	
Reference	FCC 15.207
Measurement Method	ANSI C63.10 6.2
Operator	Abdullah Al Jamal
Date	2018-08-01

3.2.2 Limits

Limits		
Frequency [MHz]	Quasi-Peak [dB μ V]	Average [dB μ 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

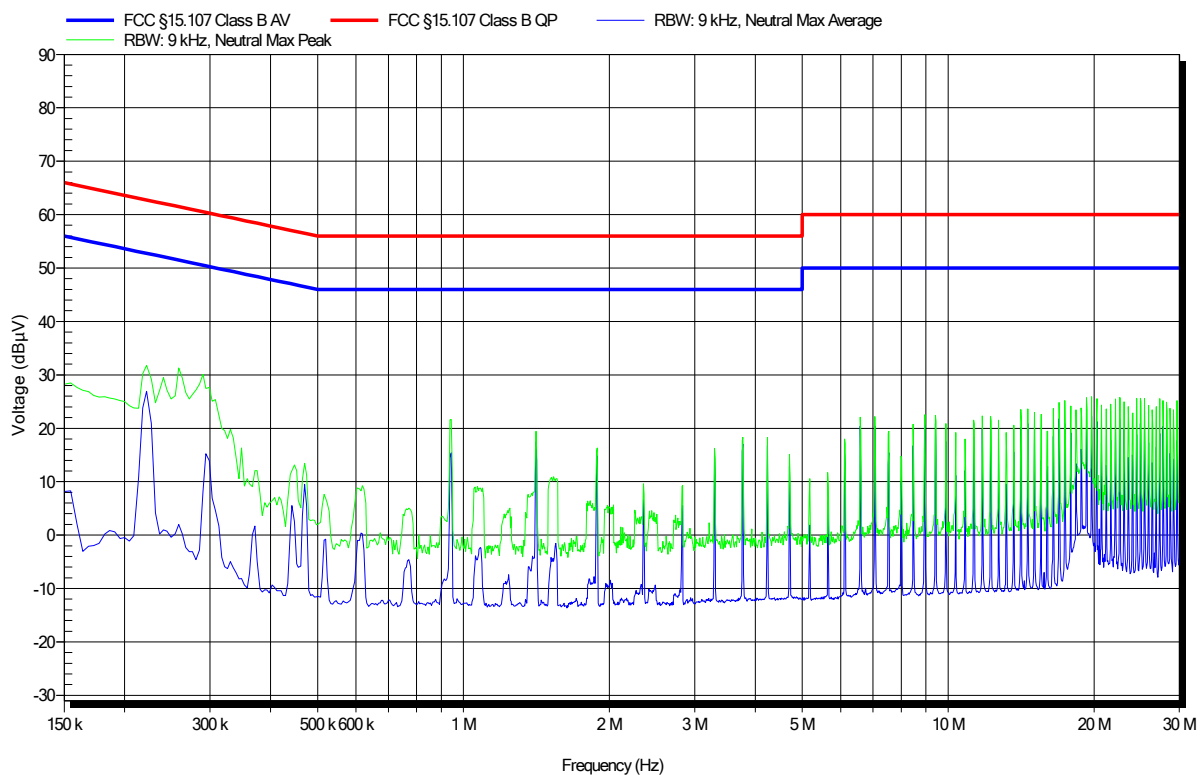
Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	R&S	ESU 26	EF00241	2017-07	2019-07
LISN	R&S	ESH2-Z5	EF00182	2017-01	2019-01

EMI voltage test in the ac-mains according to FCC Part C 15.207

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 115 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 24.4°C, Vnom: 115 VAC
LISN: ESH2-Z5 N
Mode: LE
Test Date: 2018-08-01
Note:

Index 2

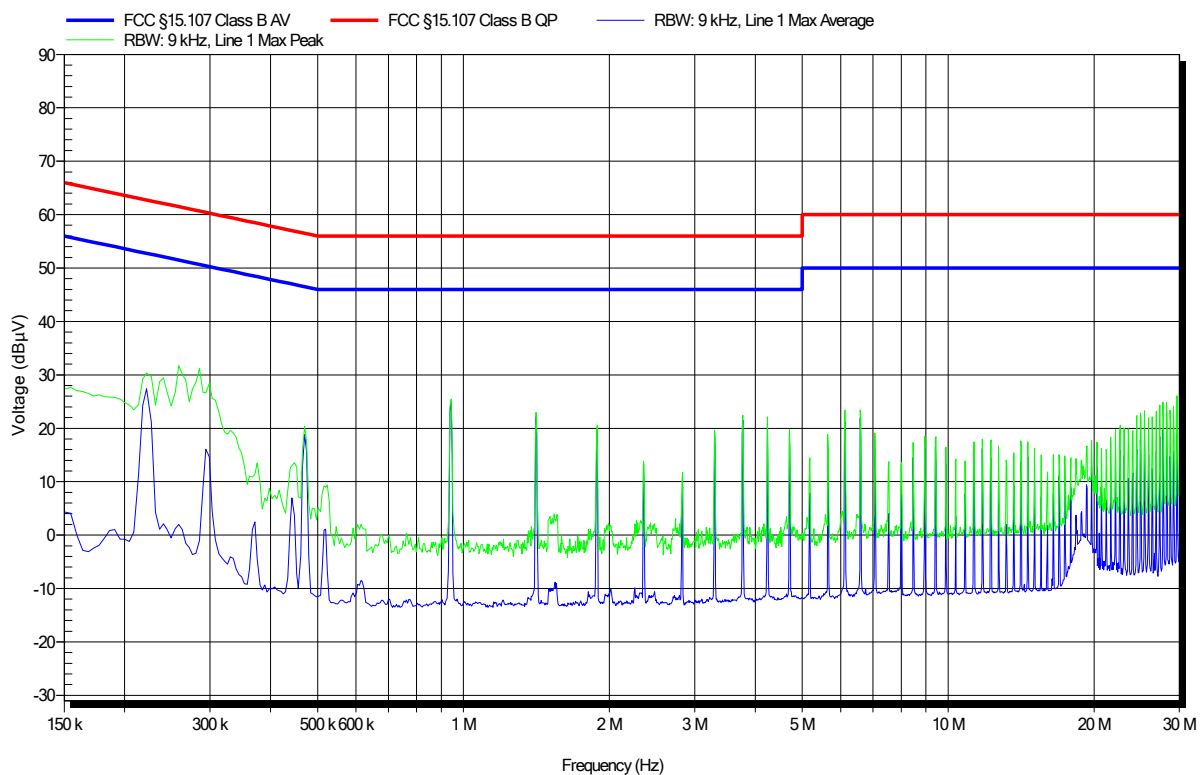


EMI voltage test in the ac-mains according to FCC Part C 15.207

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 115 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 24.4°C, Vnom: 115 VAC
LISN: ESH2-Z5 L
Mode: LE
Test Date: 2018-08-01
Note:

Index 3



3.3 Test Conditions and Results - Transmitter radiated emissions

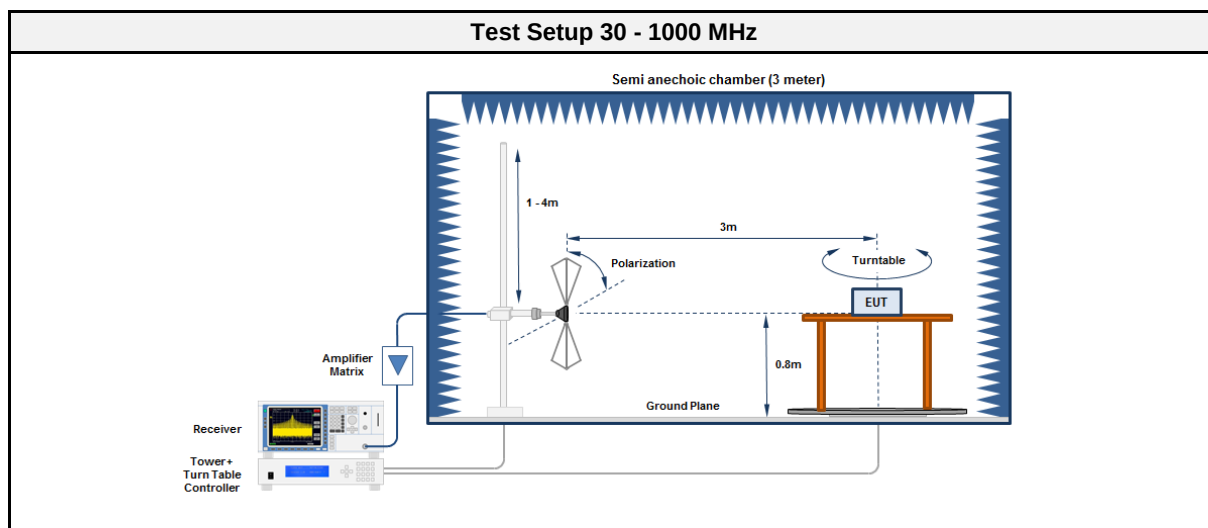
3.3.1 Information

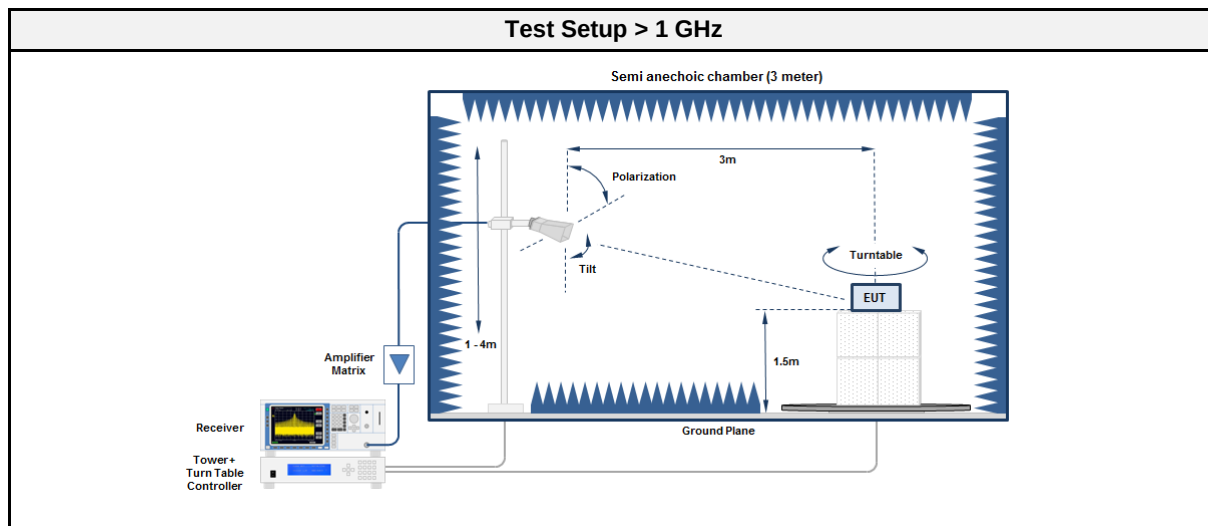
Test Information	
Reference	FCC 15.247(d) / ISSED RSS-GEN 8.9
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6, 11.12
Operator	Abdullah Al Jamal
Date	2018-07-31

3.3.2 Limits

Limits			
Frequency [MHz]	Detector	Field strength [$\mu\text{V/m}$]	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	2017-02	2020-02
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2017-08	2018-08
Antenna	R&S	HK 116	EF00013	2018-06	2020-06
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	2017-02	2020-02
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2017-08	2018-08
Antenna	R&S	BBHA 9120D	EF00019	2016-09	2018-09
Antenna	Amplifier Research	AT4560	EF01152	2017-10	2018-10

3.3.5 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

3.3.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
2402	166.776	38.78	pk	hor	43.52	-04.74
2402	166.776	25.78	qpk	hor	43.52	-17.74
2402	168.782	37.38	pk	ver	43.52	-06.14
2402	4804	55.02	pk	hor	74.00	-18.98
2402	4804	53.01	RMS	hor	54.00	-00.99
2402	4804	55.00	pk	ver	74.00	-19.00
2402	4804	53.72	RMS	ver	54.00	-00.28
2440	171.497	38.06	pk	ver	43.52	-05.46
2440	171.497	26.00	qpk	ver	43.52	-17.52
2440	4879	54.34	pk	hor	74.00	-19.66
2440	4879	53.00	RMS	hor	54.00	-01.00
2440	4880	51.75	RMS	ver	54.00	-02.25
2480	170.591	38.71	pk	hor	43.52	-04.81
2480	170.591	25.90	qpk	hor	43.52	-17.62
2480	170.616	38.29	pk	ver	43.52	-05.23
2480	170.616	26.01	qpk	ver	43.52	-17.51
2480	4879	54.02	pk	ver	74.00	-19.98
2480	4879	52.49	RMS	ver	54.00	-01.51

3.4 Test Conditions and Results - Receiver radiated emissions

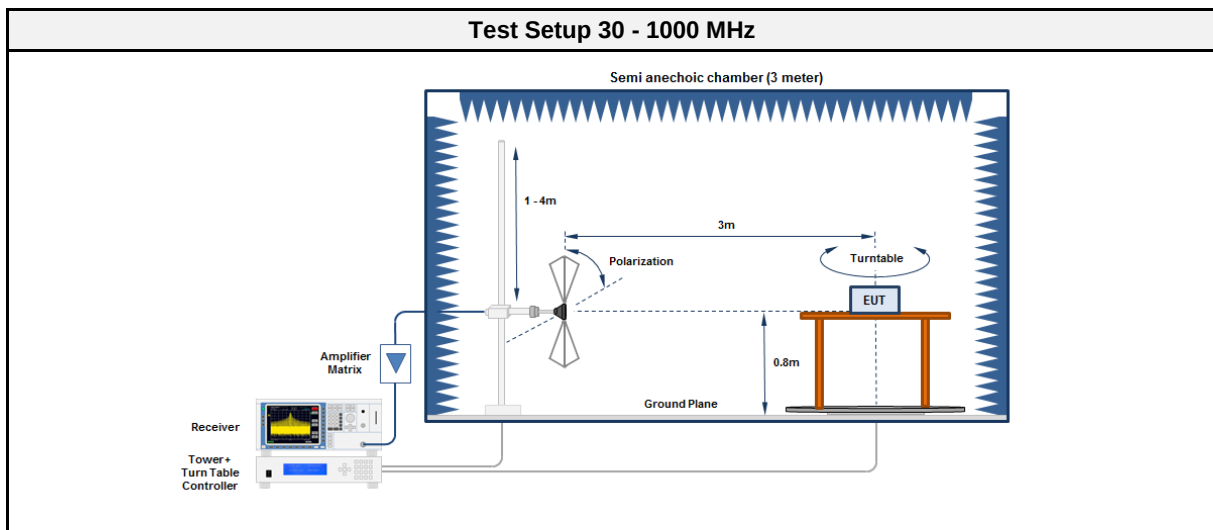
3.4.1 Information

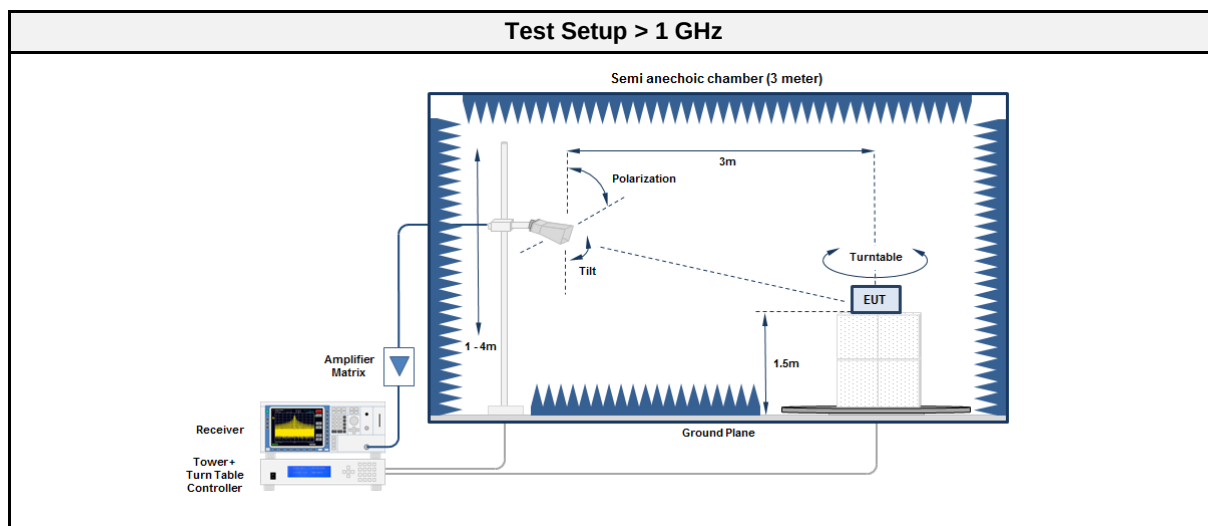
Test Information	
Reference	ISED RSS-247 3.1
Measurement Method	ANSI C63.10 6.5, 6.6, 11.12
Operator	Abdullah Al Jamal
Date	2018-07-31

3.4.2 Limits

Limits			
Frequency [MHz]	Detector	Field strength [dB μ 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	2017-02	2020-02
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2017-08	2018-08
Antenna	R&S	HK 116	EF00013	2018-06	2020-06
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	2017-02	2020-02
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2017-08	2018-08
Antenna	R&S	BBHA 9120D	EF00019	2016-09	2018-09
Antenna	Amplifier Research	AT4560	EF01152	2017-10	2018-10

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 [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
2440	31.332	36.68	pk	ver	40.00	-03.32
2440	31.332	28.04	qpk	ver	40.00	-11.96
2440	35.357	34.50	pk	hor	40.00	-05.50
2440	35.357	23.74	qpk	hor	40.00	-16.26
2440	190.499	38.07	pk	hor	43.50	-05.43
2440	190.499	26.69	qpk	hor	43.50	-16.81
2440	190.838	37.24	pk	ver	43.50	-06.26
2440	190.838	26.76	qpk	ver	43.50	-16.74
2440	2790	41.87	pk	ver	53.98	-12.11
2440	6659	47.86	pk	ver	53.98	-06.12
2440	6659	35.02	avg	ver	53.98	-18.96
2440	7521	49.89	pk	hor	53.98	-04.09
2440	7521	37.13	avg	hor	53.98	-16.85
2440	7920	51.29	pk	ver	53.98	-02.69
2440	7920	38.44	avg	ver	53.98	-15.54
2440	14593	49.63	pk	hor	53.98	-04.35
2440	14593	37.79	avg	hor	53.98	-16.19
2440	14593	49.82	pk	ver	53.98	-04.16
2440	14593	37.62	avg	ver	53.98	-16.36

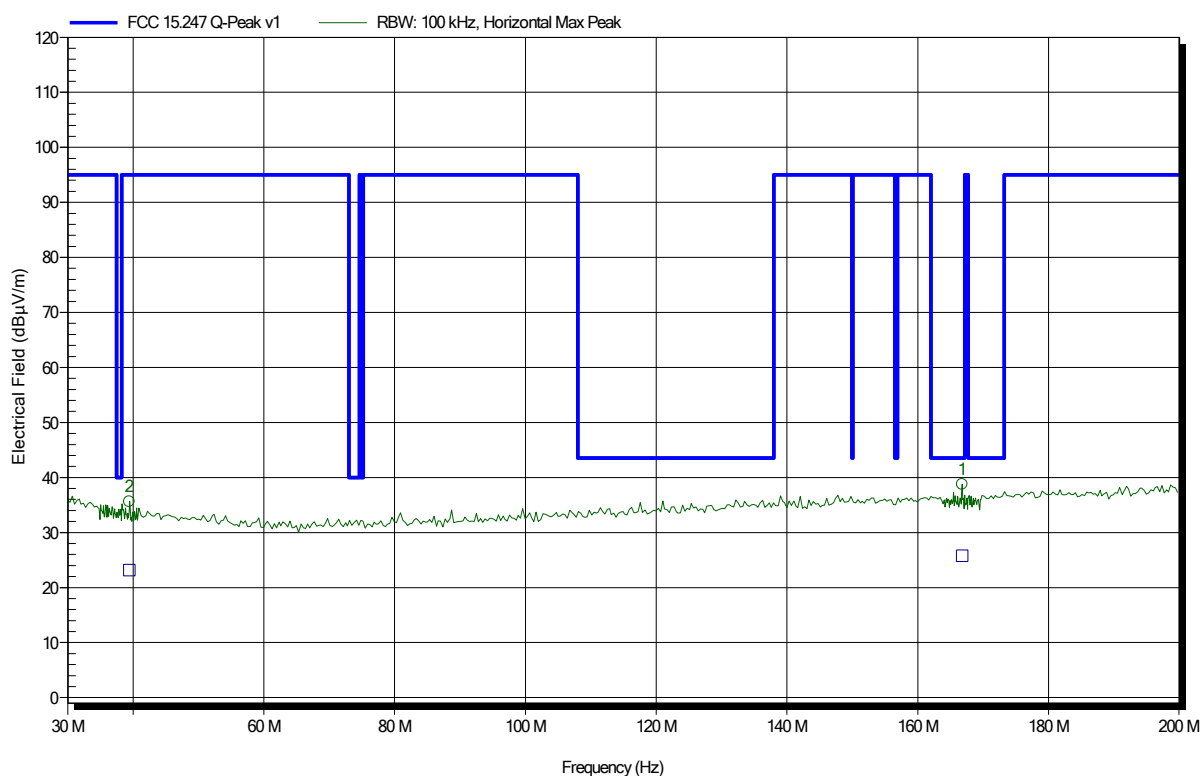
ANNEX A Transmitter spurious emissions

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: TX; LE; 2402 MHz
 Test Date: 2018-07-31
 Note:

Index 32



Frequency	Peak	Peak Limit	Peak Difference	Status
166.776 MHz	38.78 dBµV/m	43.52 dBµV/m	-4.74 dB	Pass
39.449 MHz	35.61 dBµV/m	95 dBµV/m	-59.39 dB	Pass

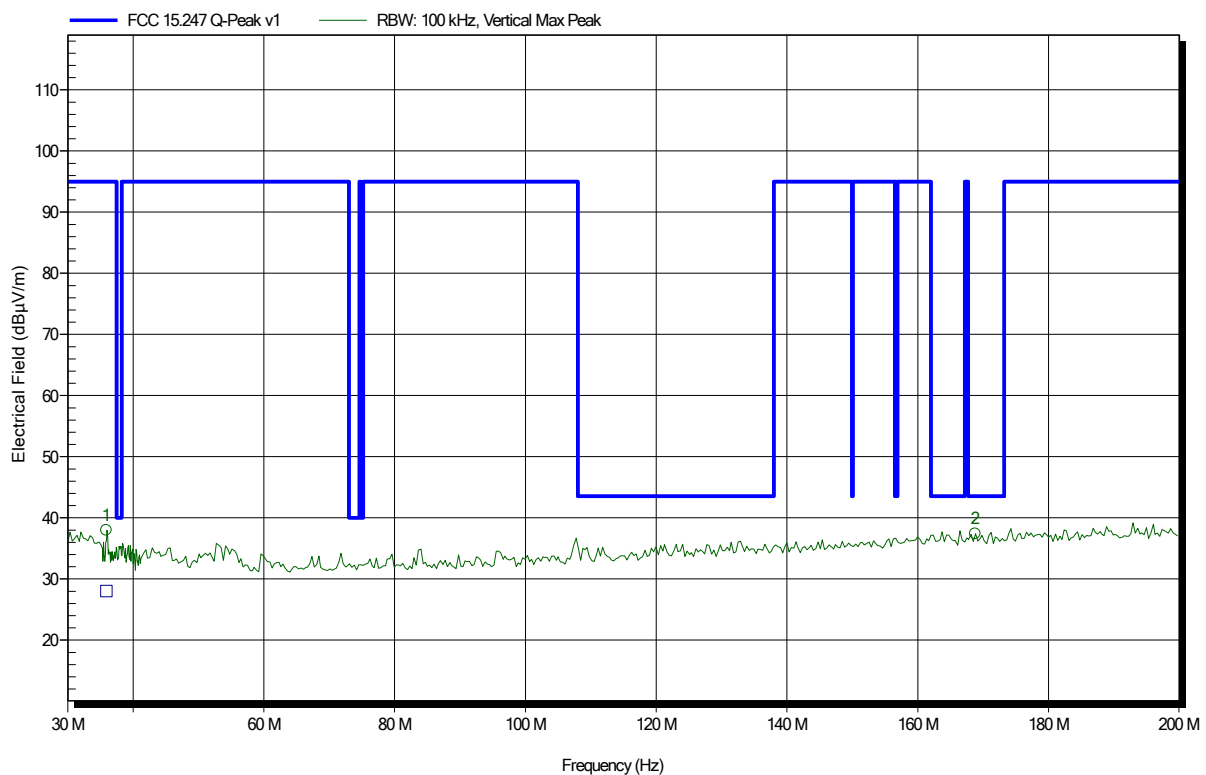
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
166.776 MHz	25.78 dBµV/m	43.52 dBµV/m	-17.74 dB	Pass
39.449 MHz	23.19 dBµV/m	95 dBµV/m	-71.81 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Rohde & Schwarz HK 116, Vertical
Measurement distance: 3 m
Mode: TX; LE; 2402 MHz
Test Date: 2018-07-31
Note:

Index 27



Frequency	Peak	Peak Limit	Peak Difference	Status
168.782 MHz	37.38 dBµV/m	43.52 dBµV/m	-6.14 dB	Pass
35.942 MHz	38 dBµV/m	95 dBµV/m	-57 dB	Pass

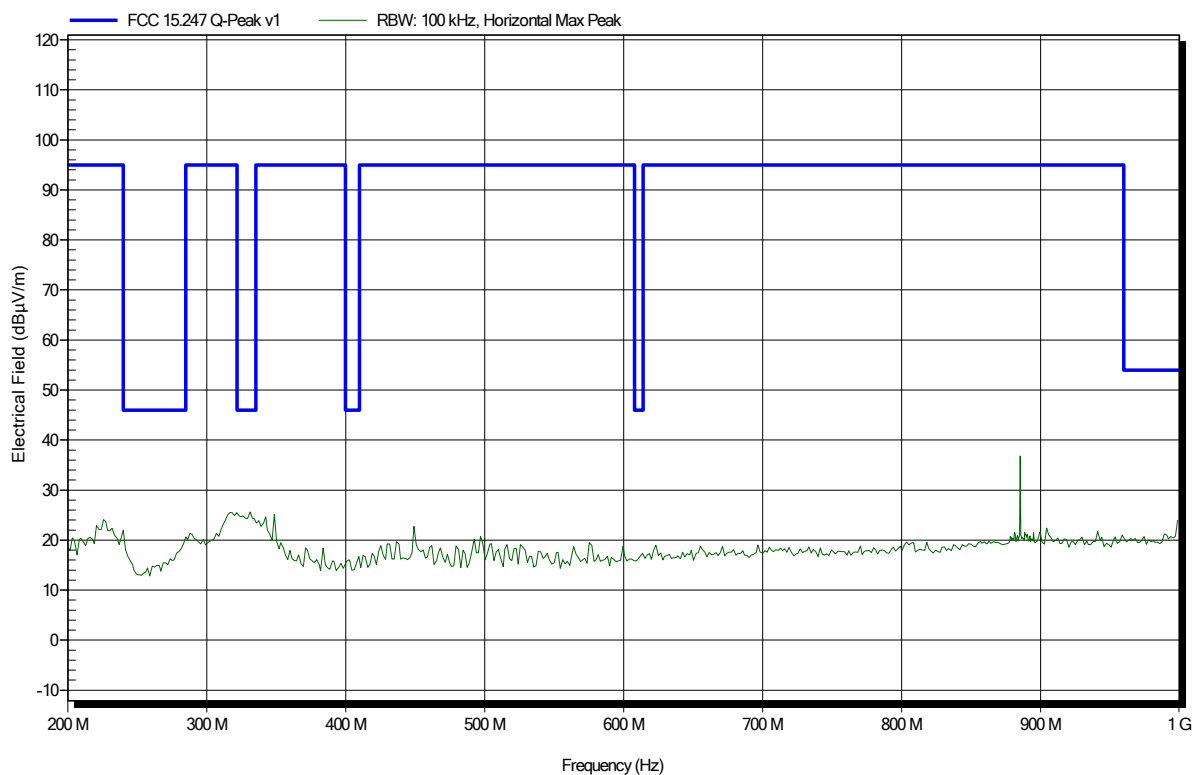
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
35.942 MHz	28.03 dBµV/m	95 dBµV/m	-66.97 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Rohde & Schwarz HL 223, Horizontal
Measurement distance: 3 m
Mode: TX; LE; 2402 MHz
Test Date: 2018-07-31
Note:

Index 34

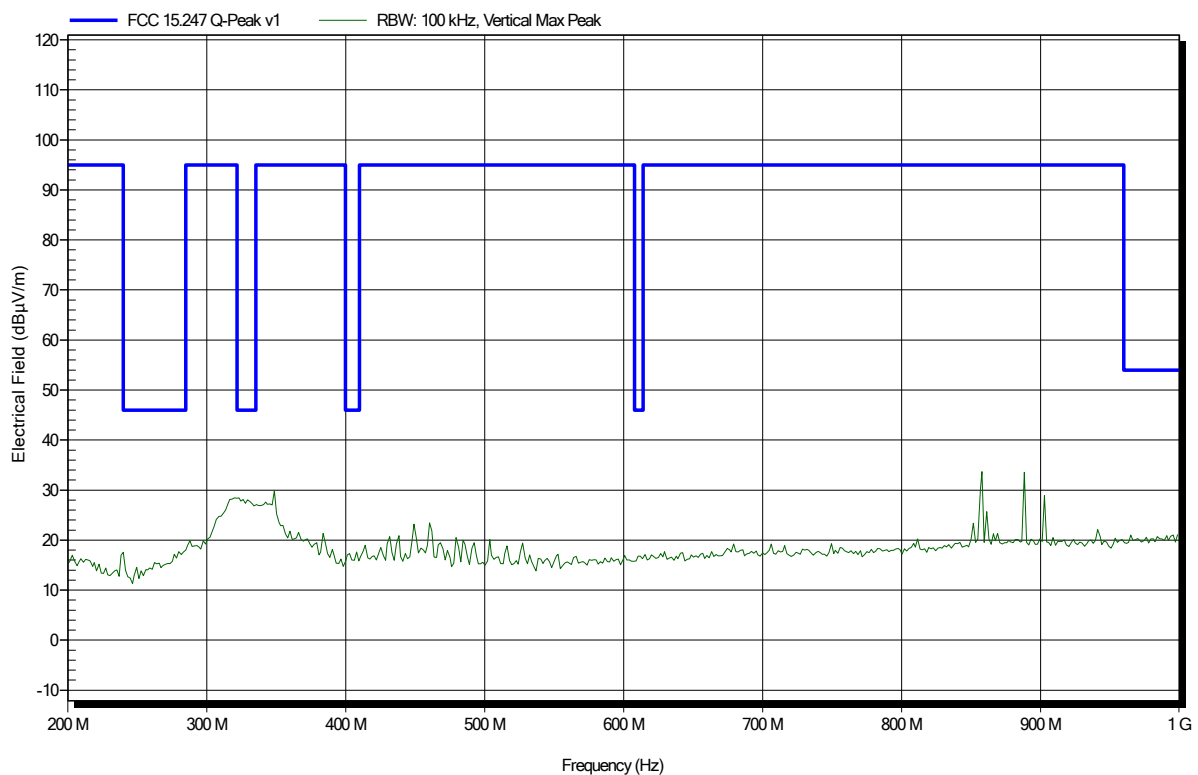


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Rohde & Schwarz HL 223, Vertical
Measurement distance: 3 m
Mode: TX; LE; 2402 MHz
Test Date: 2018-07-31
Note:

Index 42

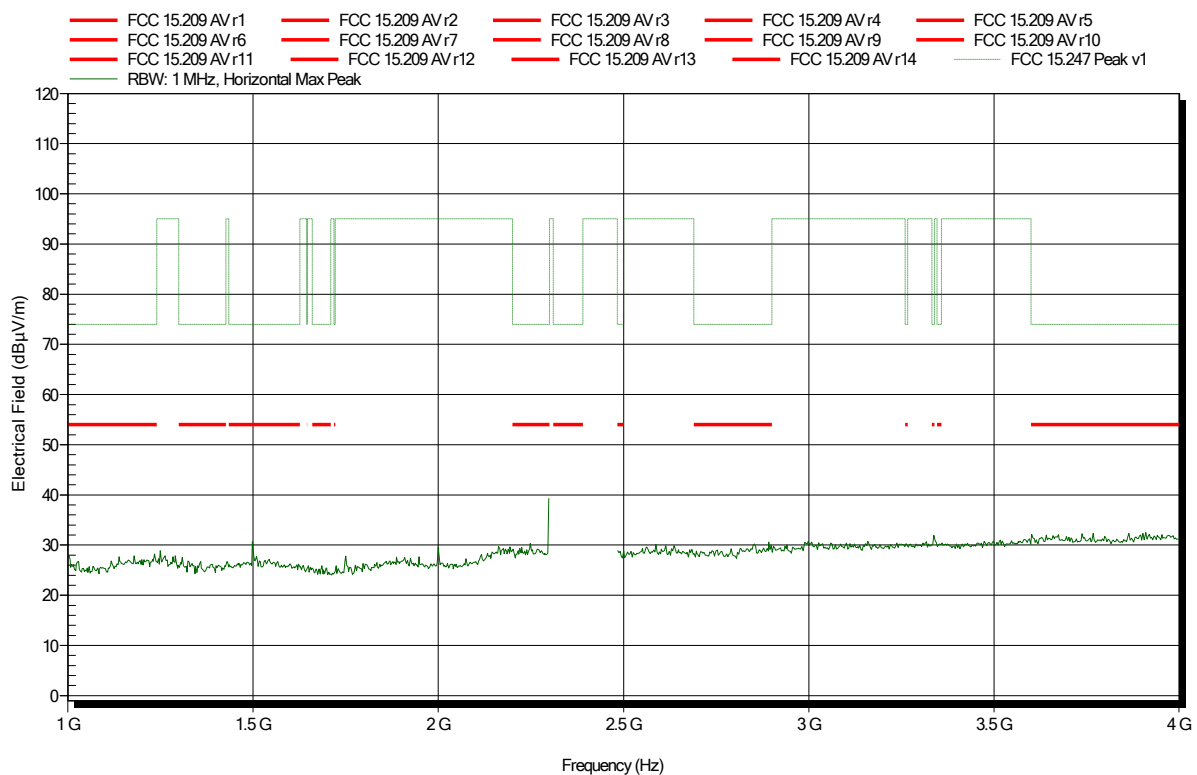


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 24.8°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2402 MHz
Test Date: 2018-07-31
Note:

Index 1

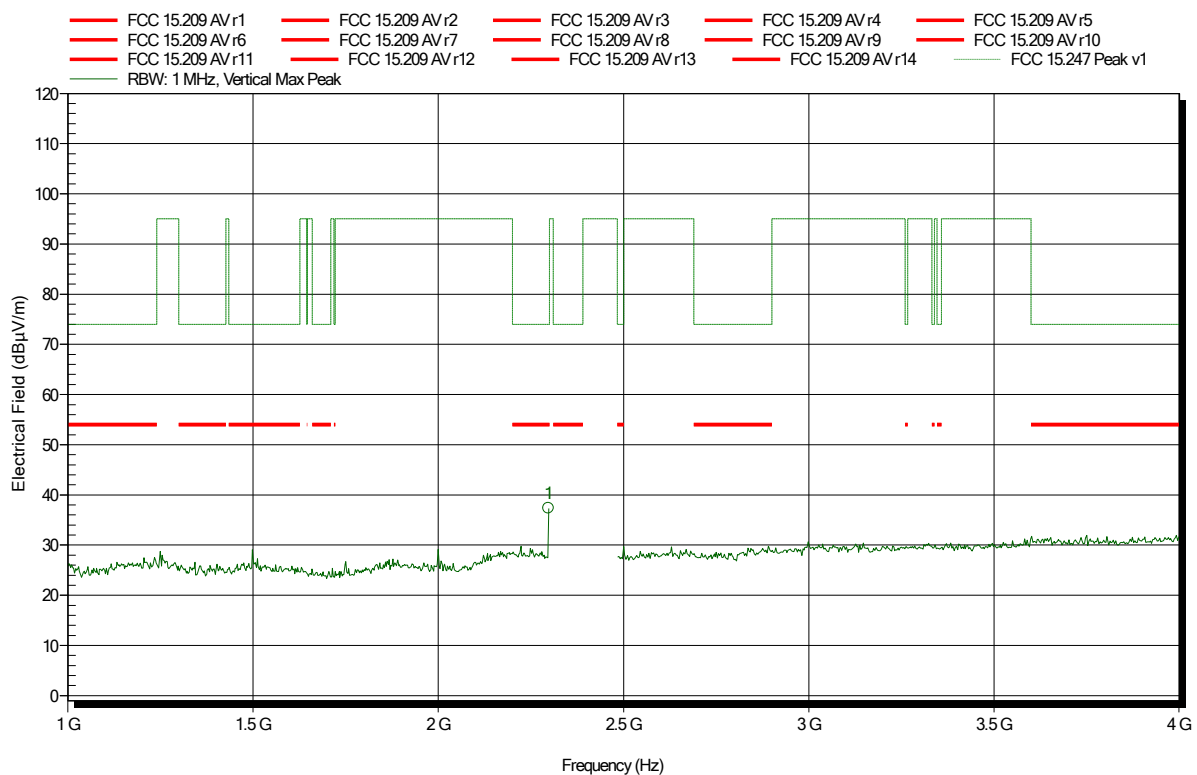


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25°C, Vnom: 115 VAC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; LE; 2402 MHz
 Test Date: 2018-07-31
 Note:

Index 17



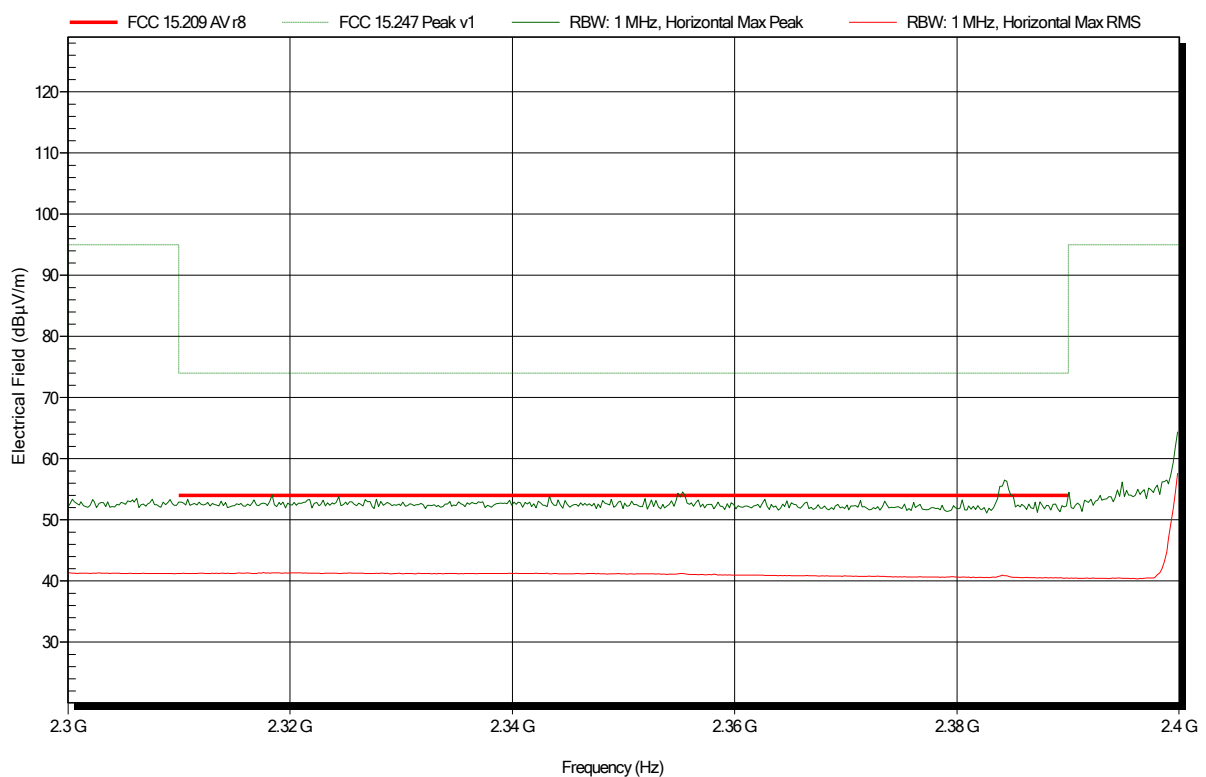
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.2974 GHz	37.34 dBµV/m	74 dBµV/m	-36.66 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 24.8°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2402 MHz
Test Date: 2018-07-31
Note: lower bandedge

Index 4

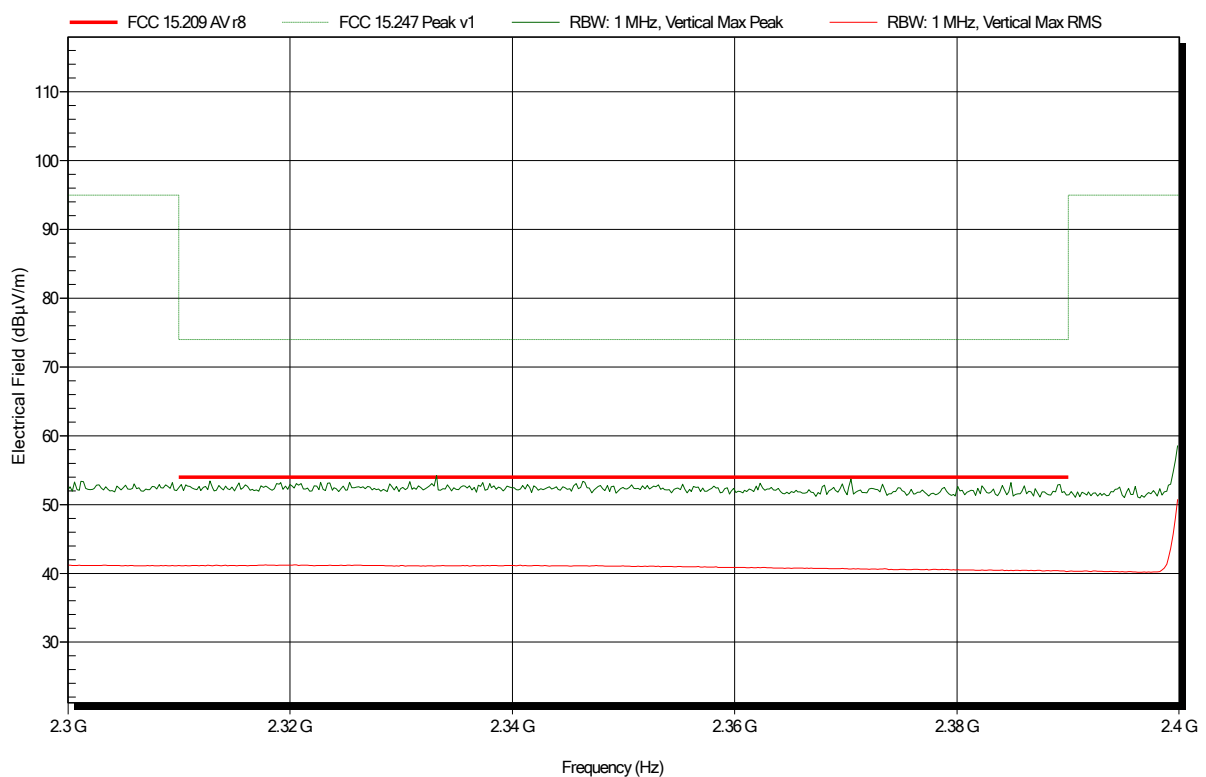


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25°C, Vnom: 115 VAC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; LE; 2402 MHz
 Test Date: 2018-07-31
 Note: lower bandedge

Index 16

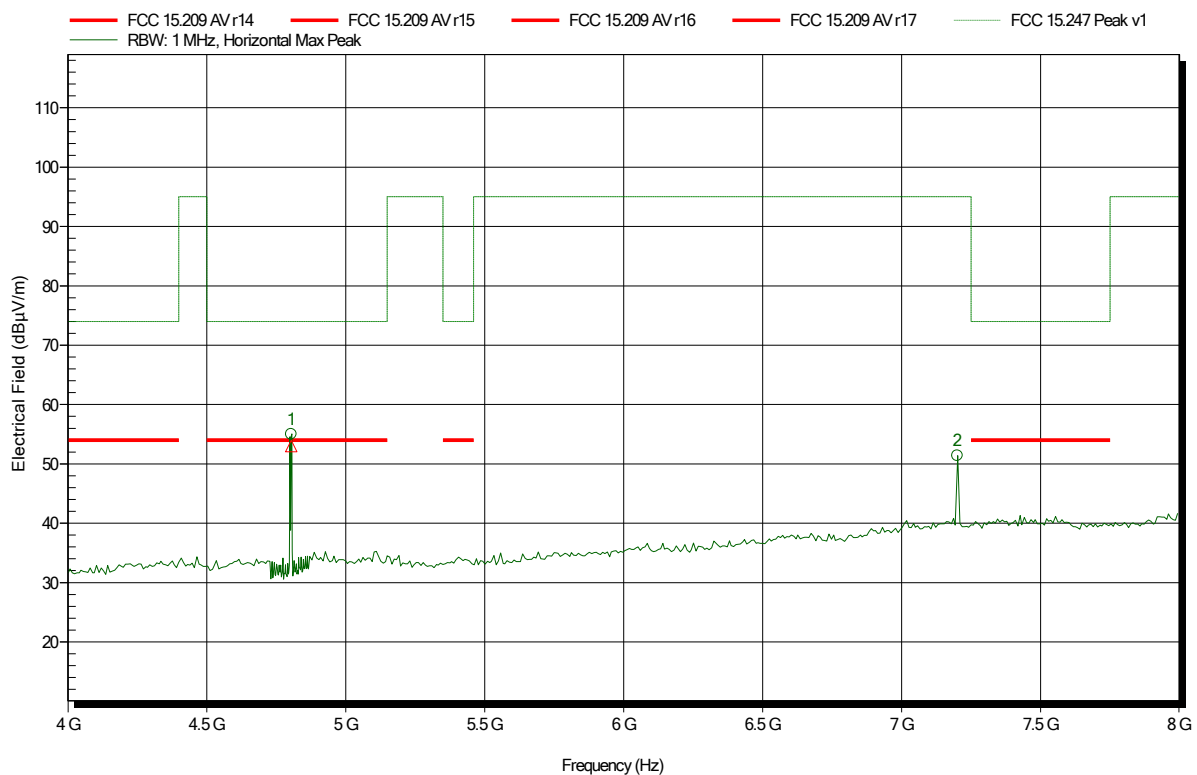


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 24.8°C, Vnom: 115 VAC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; LE; 2402 MHz
 Test Date: 2018-07-31
 Note:

Index 2



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.804 GHz	55.02 dBµV/m	74 dBµV/m	-18.98 dB	Pass
7.202 GHz	51.4 dBµV/m	95 dBµV/m	-43.6 dB	Pass

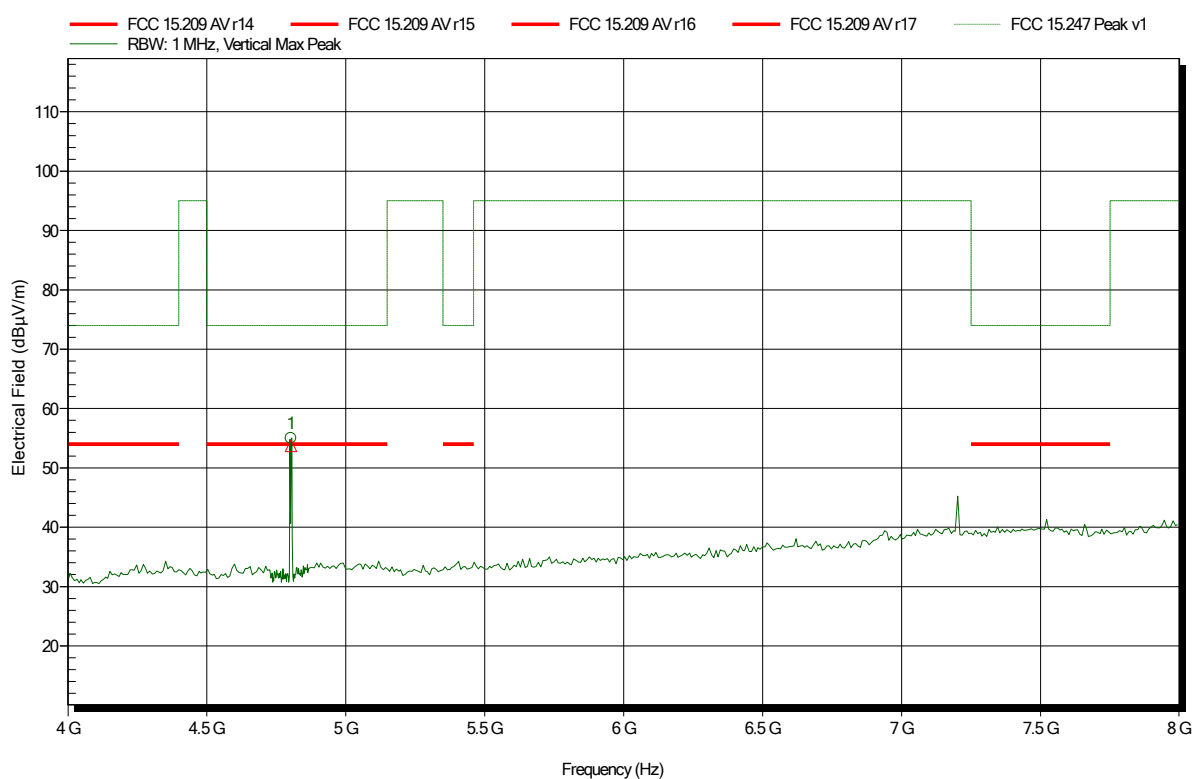
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.804 GHz	53.01 dBµV/m	54 dBµV/m	-0.99 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2402 MHz
Test Date: 2018-07-31
Note:

Index 18



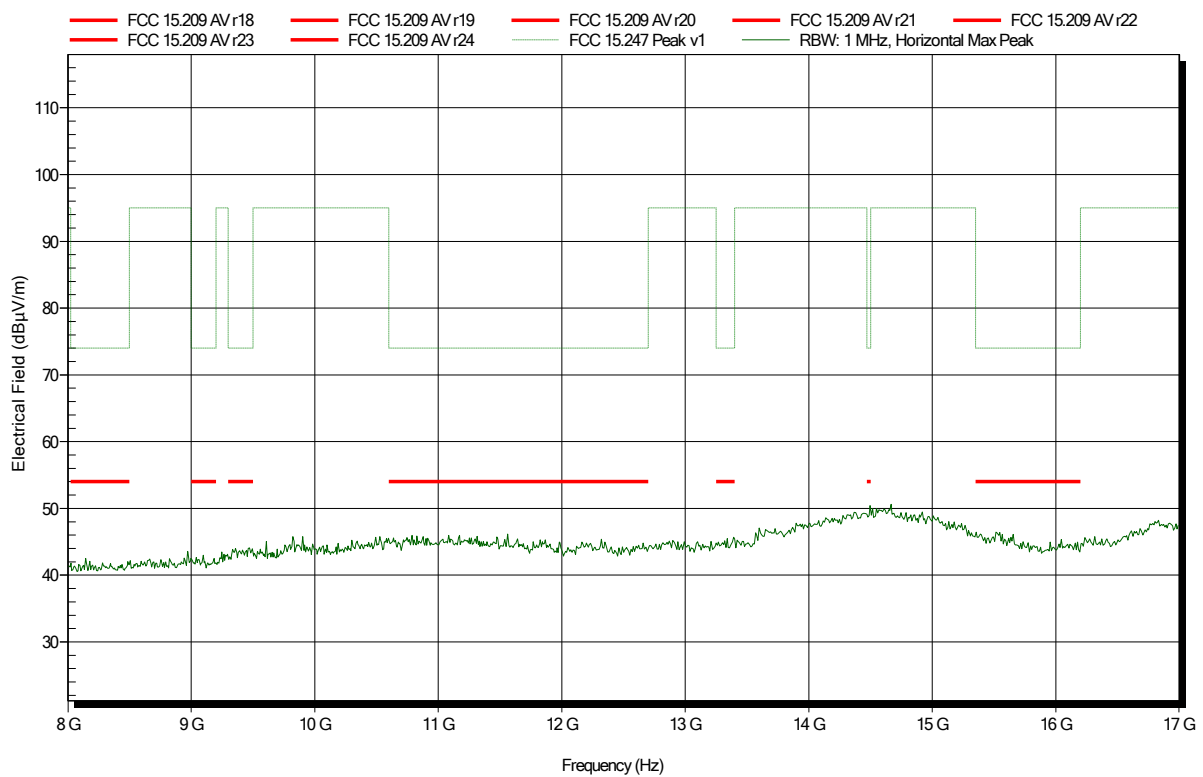
Frequency 4.804 GHz	Peak 55 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -19 dB	Peak Status Pass
Frequency 4.804 GHz	RMS 53.72 dBµV/m	RMS Limit 54 dBµV/m	RMS Difference -0.28 dB	RMS Status Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 24.8°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2402 MHz
Test Date: 2018-07-31
Note:

Index 3

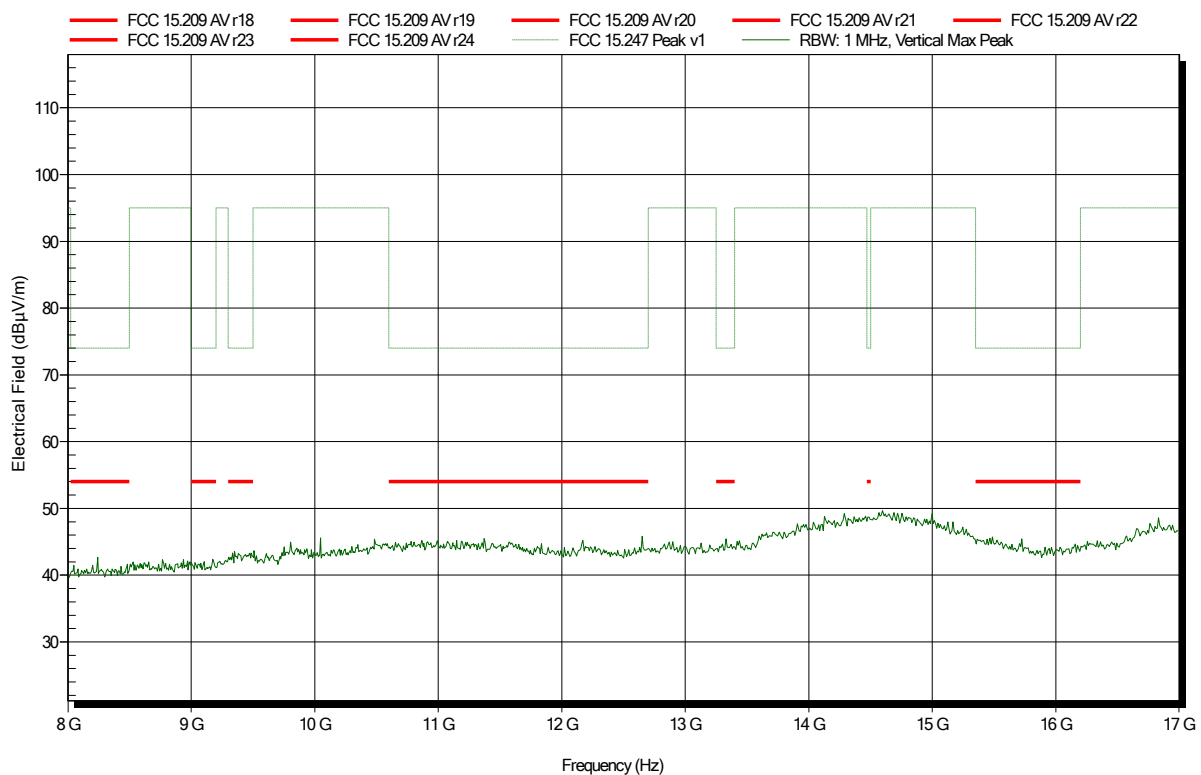


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2402 MHz
Test Date: 2018-07-31
Note:

Index 19

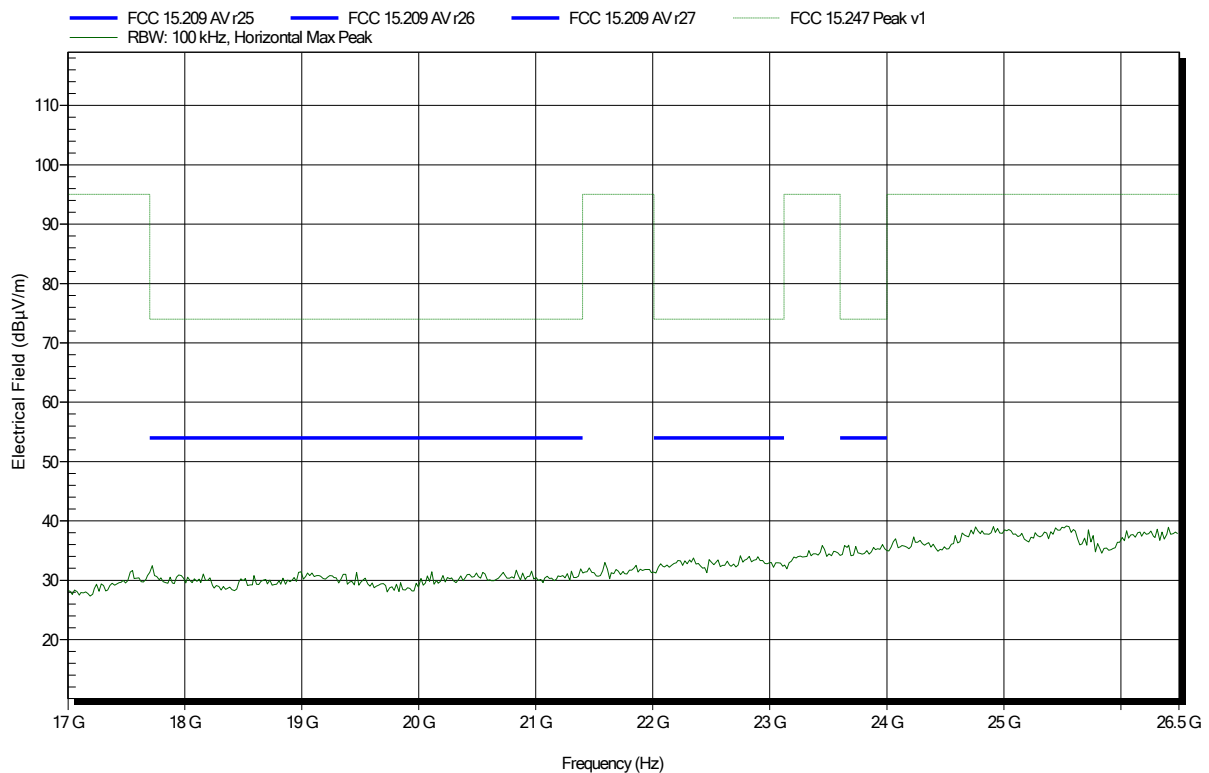


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),
Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2402 MHz
Test Date: 2018-07-31
Note:

Index 43

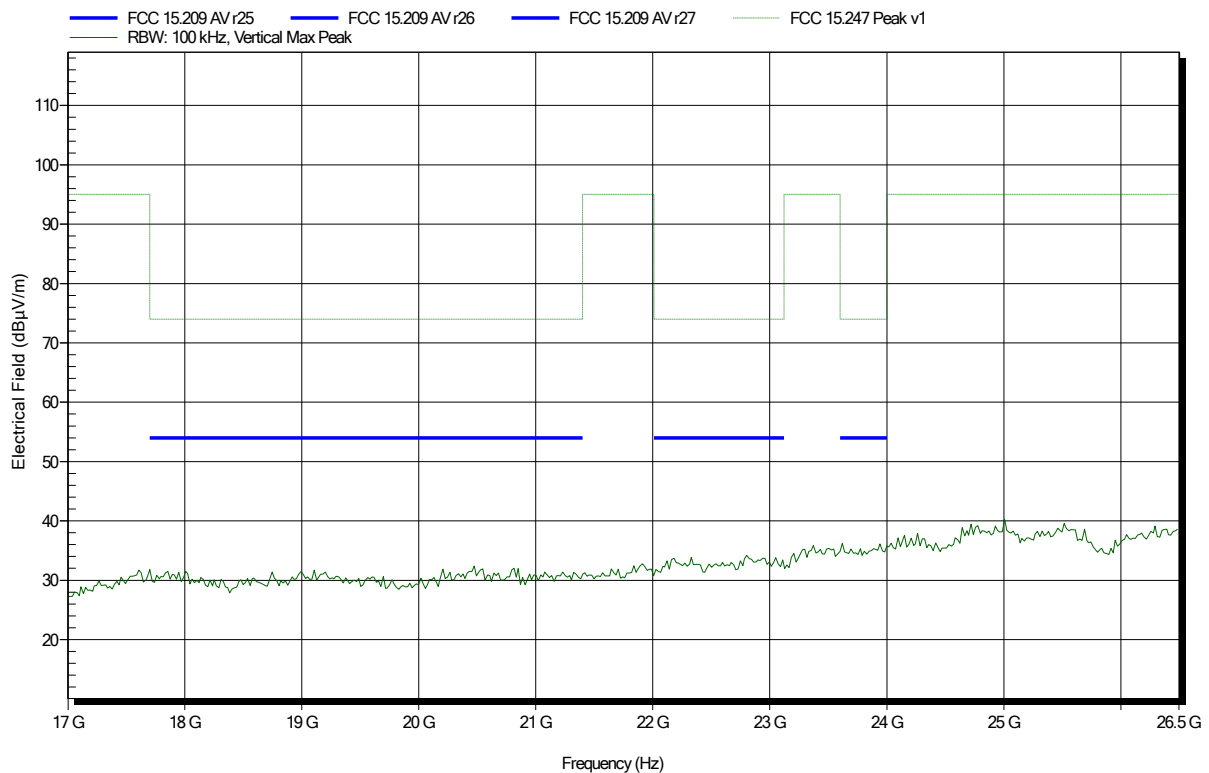


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
 Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),
 Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; LE; 2402 MHz
 Test Date: 2018-07-31
 Note:

Index 48

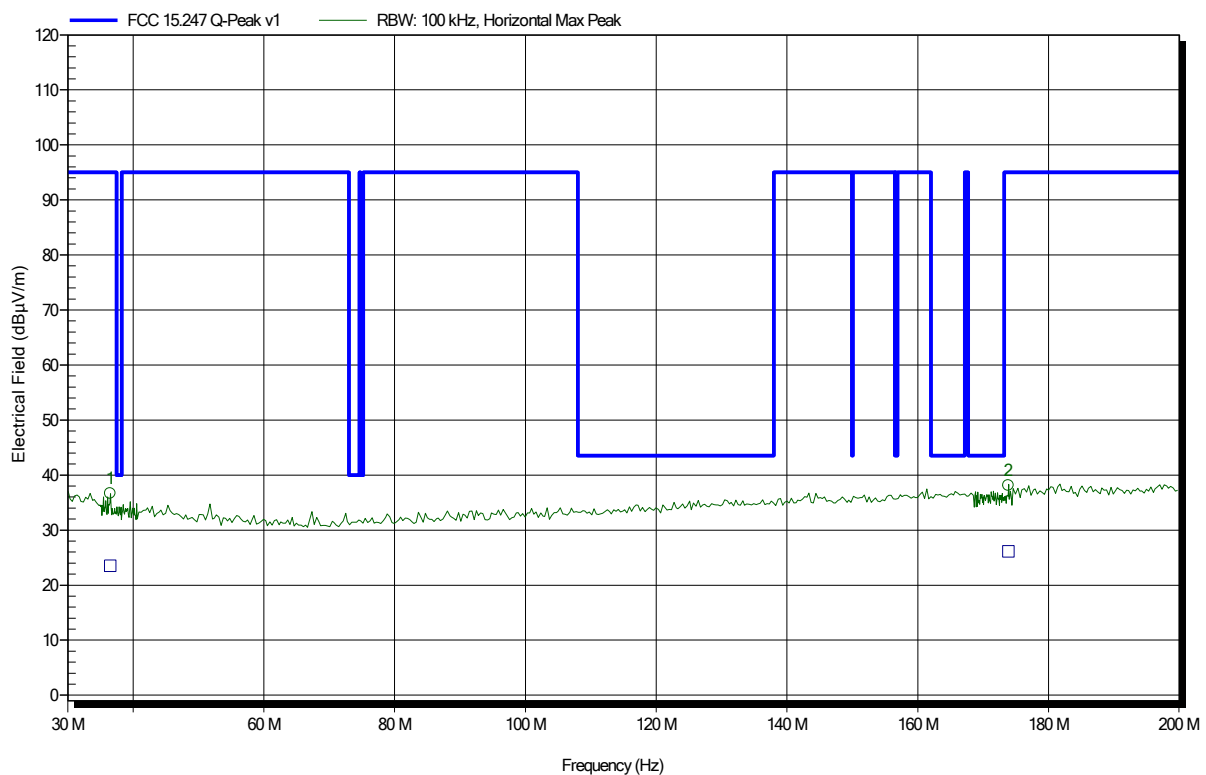


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: TX; LE; 2440 MHz
 Test Date: 2018-07-31
 Note:

Index 31



Frequency	Peak	Peak Limit	Peak Difference	Status
173.855 MHz	38.11 dBµV/m	95 dBµV/m	-56.89 dB	Pass
36.507 MHz	36.64 dBµV/m	95 dBµV/m	-58.36 dB	Pass

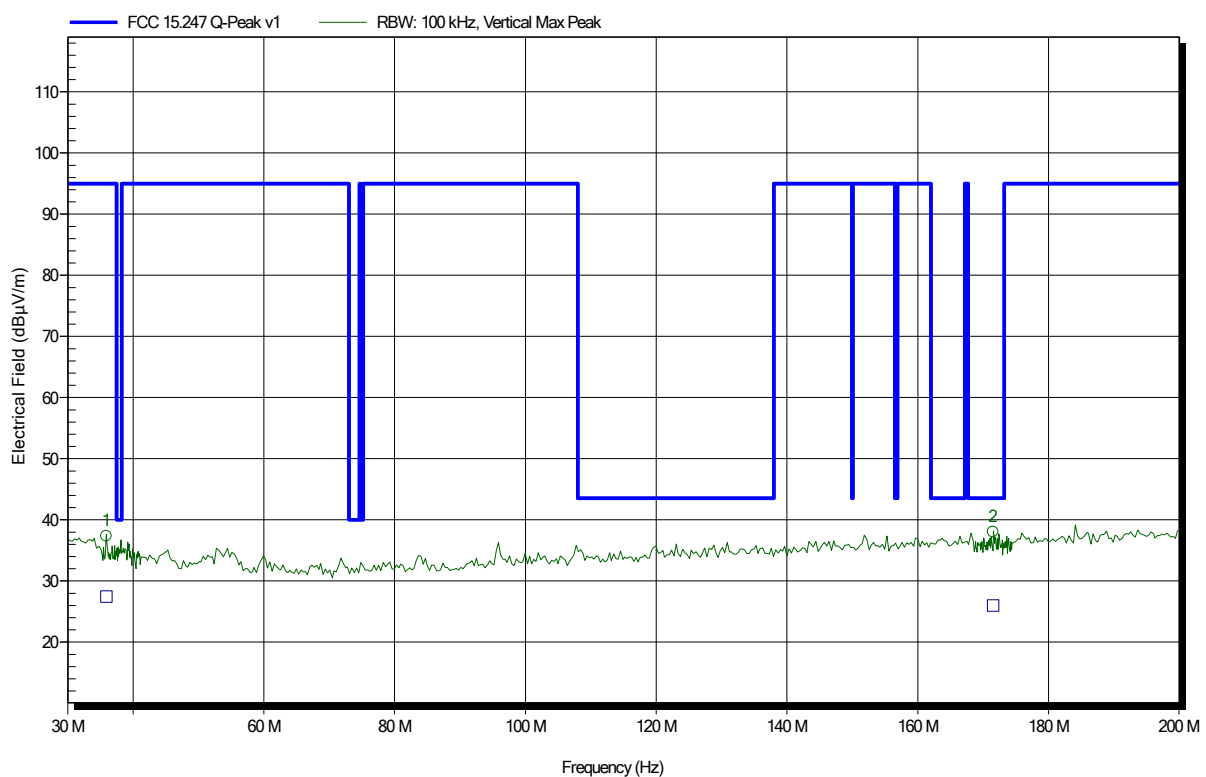
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
173.855 MHz	26.11 dBµV/m	95 dBµV/m	-68.89 dB	Pass
36.507 MHz	23.5 dBµV/m	95 dBµV/m	-71.5 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Rohde & Schwarz HK 116, Vertical
Measurement distance: 3 m
Mode: TX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 28



Frequency	Peak	Peak Limit	Peak Difference	Status
171.497 MHz	38.06 dBµV/m	43.52 dBµV/m	-5.46 dB	Pass
35.93 MHz	37.35 dBµV/m	95 dBµV/m	-57.65 dB	Pass

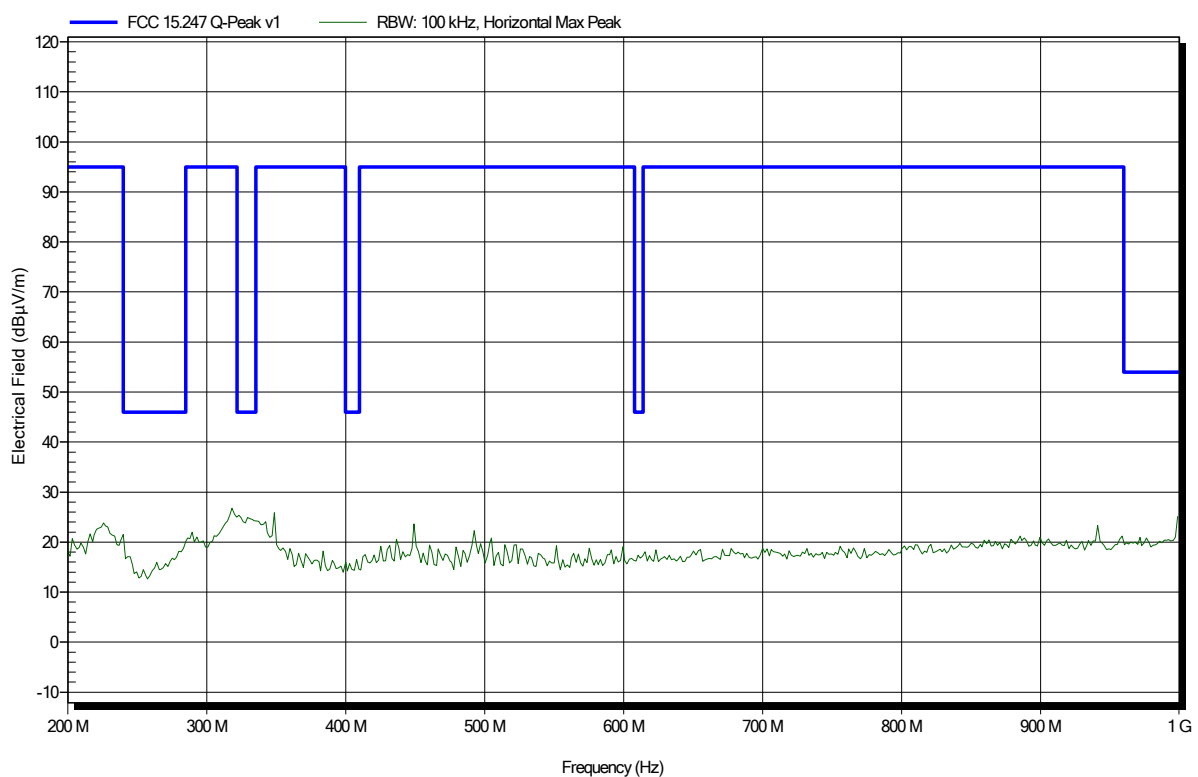
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
171.497 MHz	26 dBµV/m	43.52 dBµV/m	-17.52 dB	Pass
35.93 MHz	27.47 dBµV/m	95 dBµV/m	-67.53 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Rohde & Schwarz HL 223, Horizontal
Measurement distance: 3 m
Mode: TX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 35

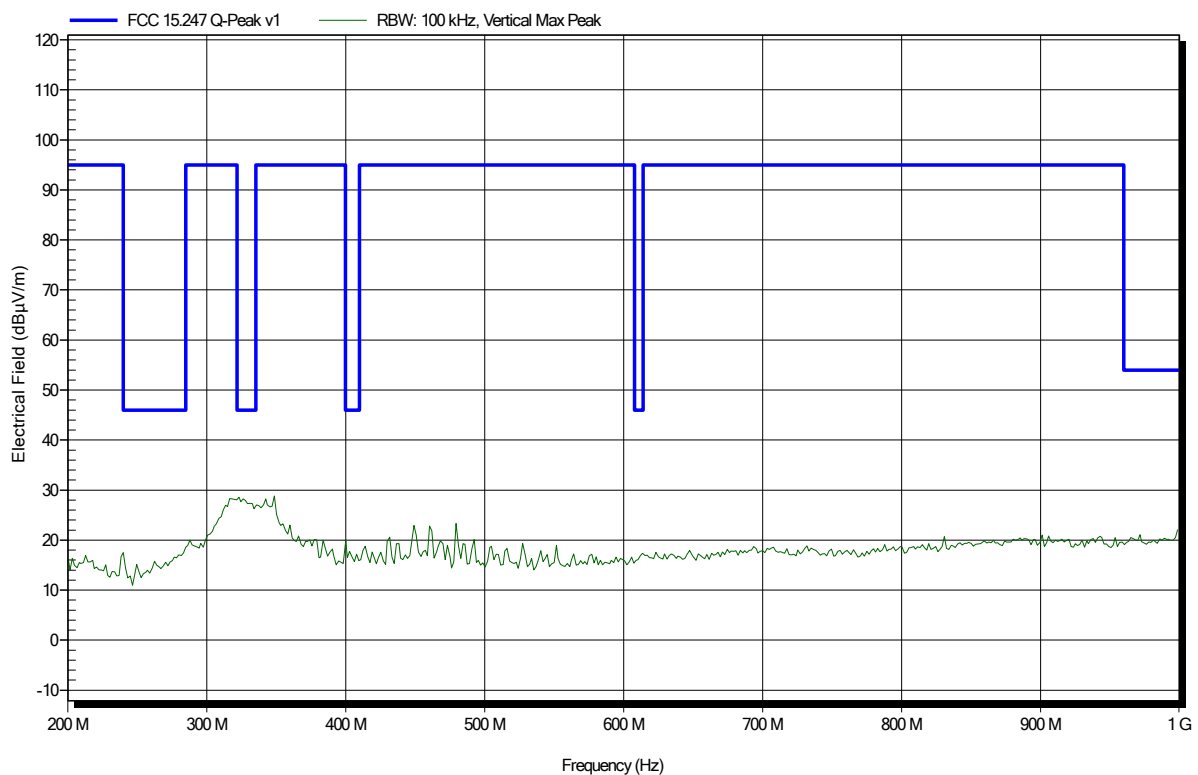


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
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Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Rohde & Schwarz HL 223, Vertical
Measurement distance: 3 m
Mode: TX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 40

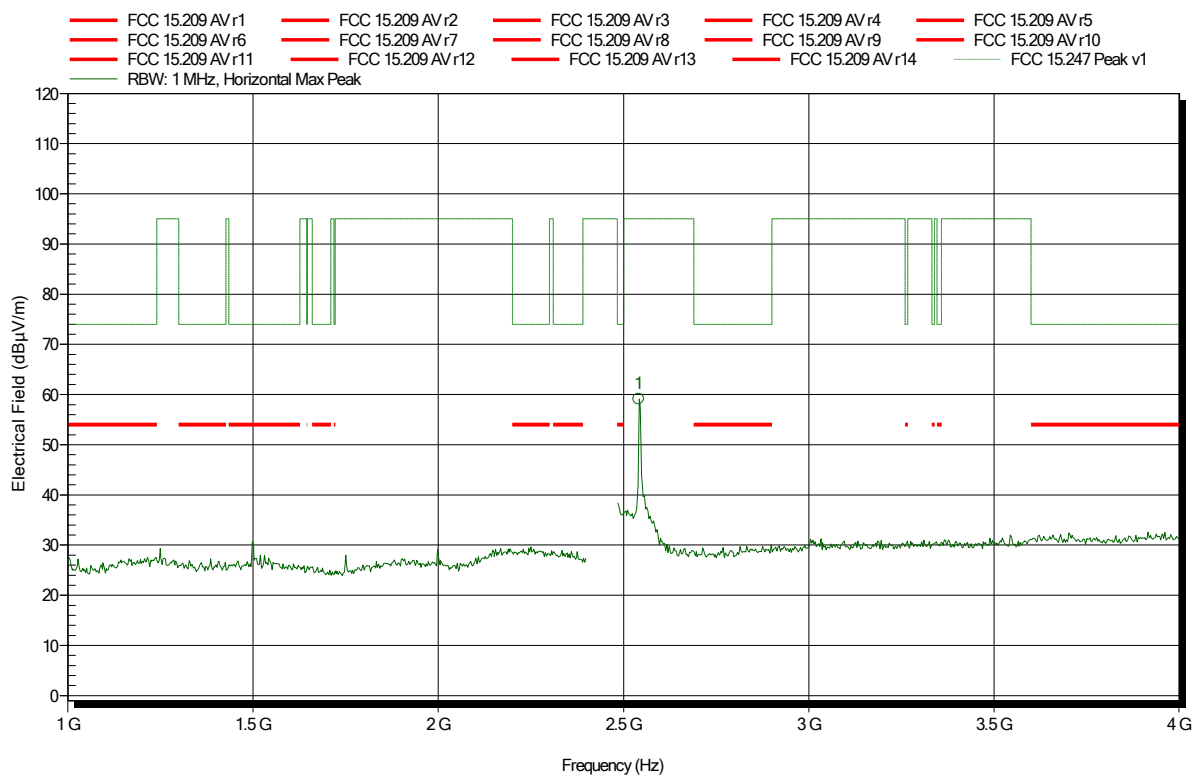


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 24.8°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 5



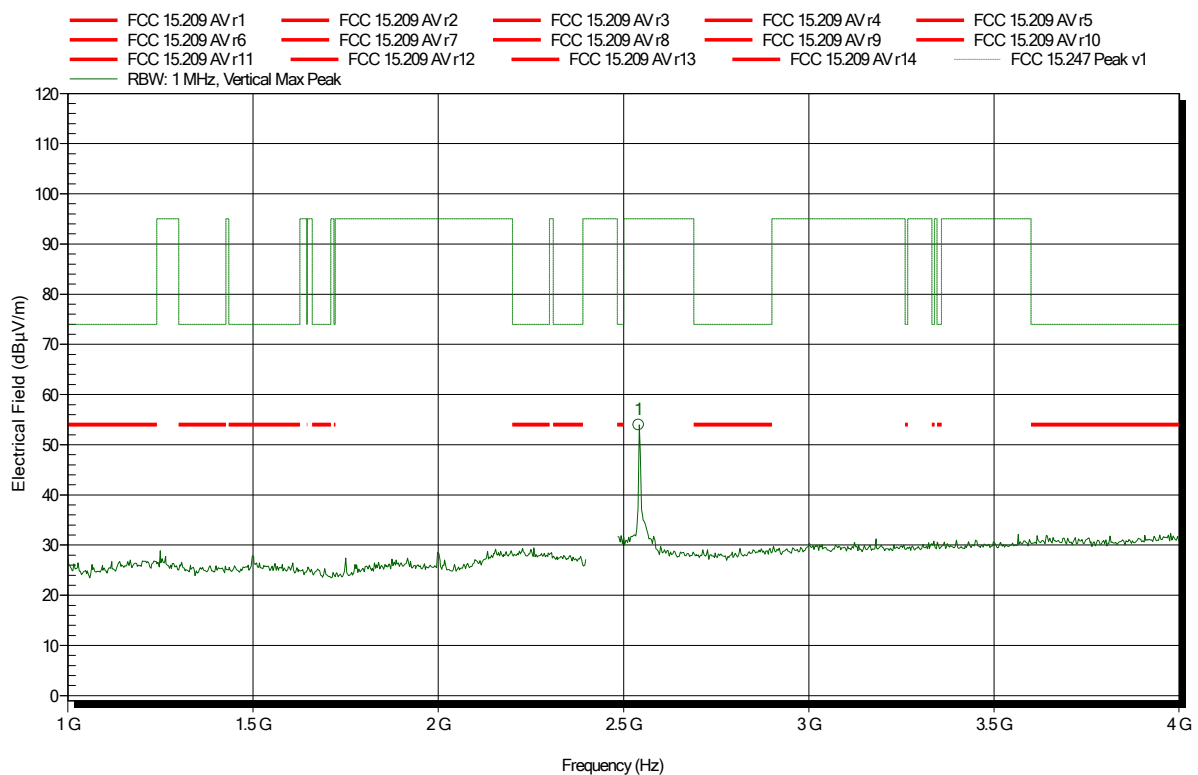
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.541 GHz	59.12 dBµV/m	95 dBµV/m	-35.88 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

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EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
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Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 22



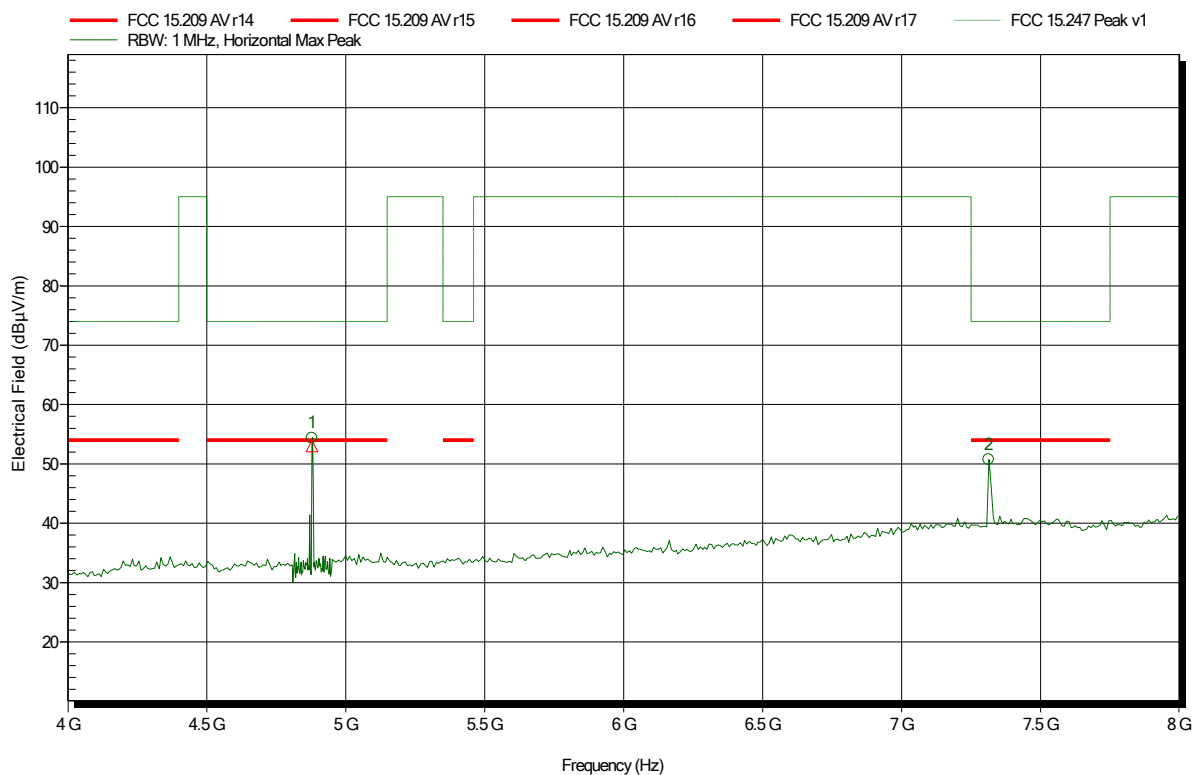
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.541 GHz	53.96 dBµV/m	95 dBµV/m	-41.04 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
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 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 24.8°C, Vnom: 115 VAC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; LE; 2440 MHz
 Test Date: 2018-07-31
 Note:

Index 8



Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.879 GHz	54.34 dBµV/m	74 dBµV/m	-19.66 dB	Pass
7.313 GHz	50.76 dBµV/m	74 dBµV/m	-23.24 dB	Pass

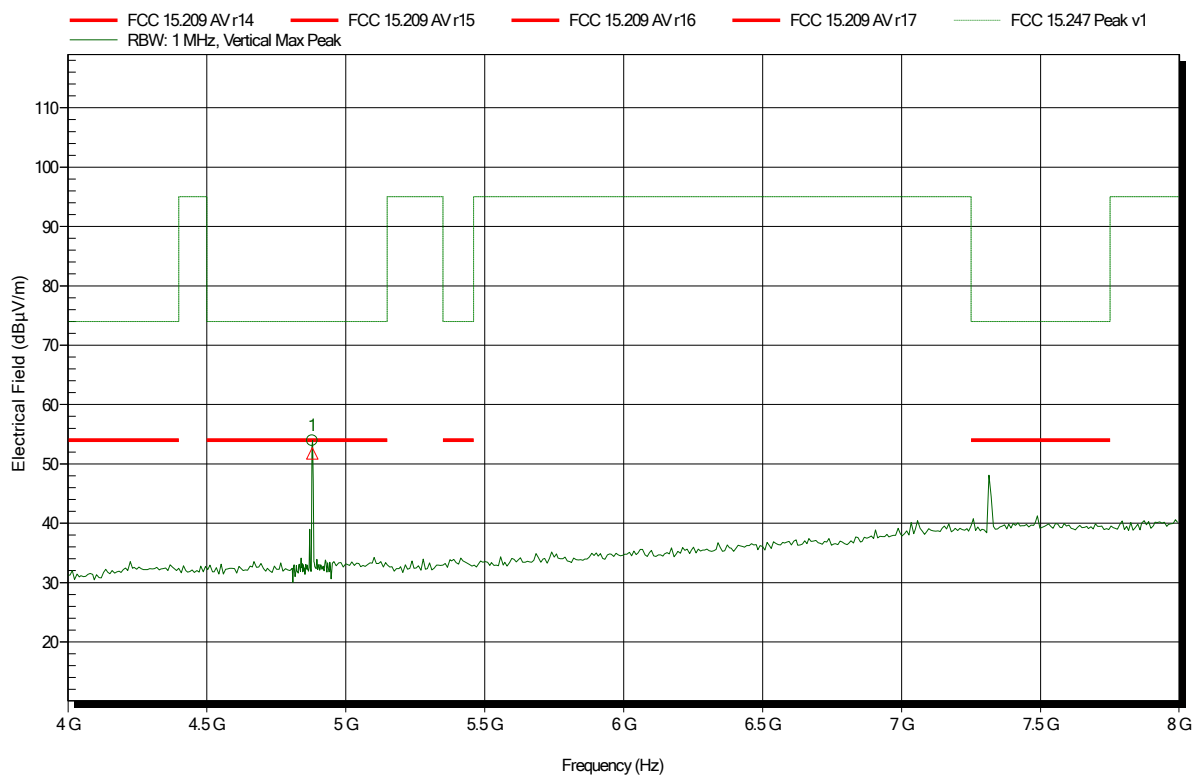
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.879 GHz	53 dBµV/m	54 dBµV/m	-1 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25°C, Vnom: 115 VAC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; LE; 2440 MHz
 Test Date: 2018-07-31
 Note:

Index 21



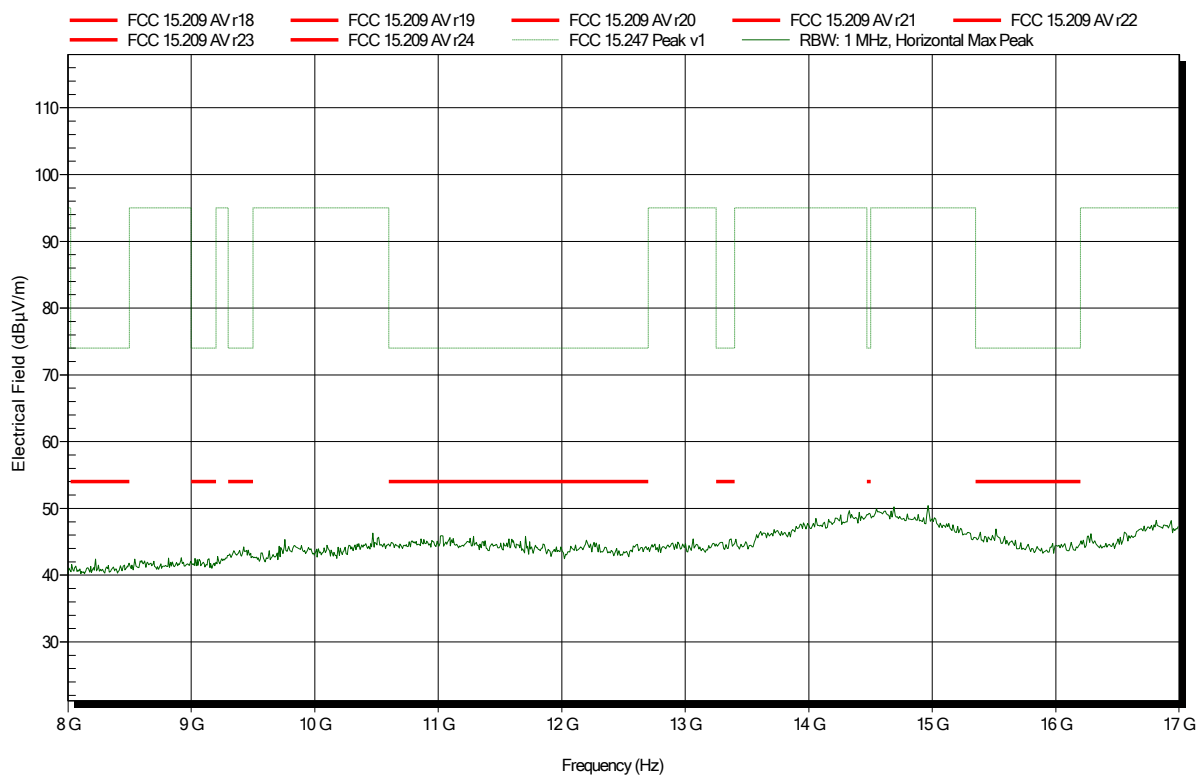
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.88 GHz	53.95 dBµV/m	74 dBµV/m	-20.05 dB	Pass
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.88 GHz	51.75 dBµV/m	54 dBµV/m	-2.25 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 24.8°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 9

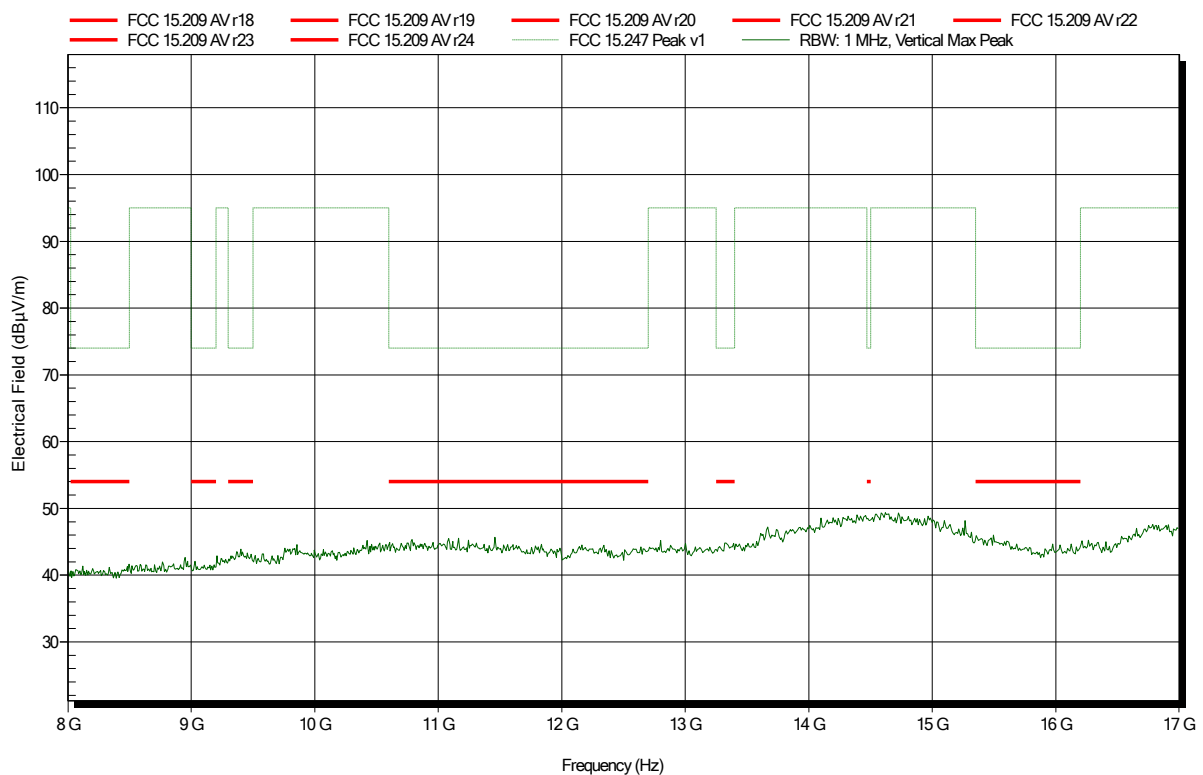


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
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Test Conditions: Tnom: 25°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 20

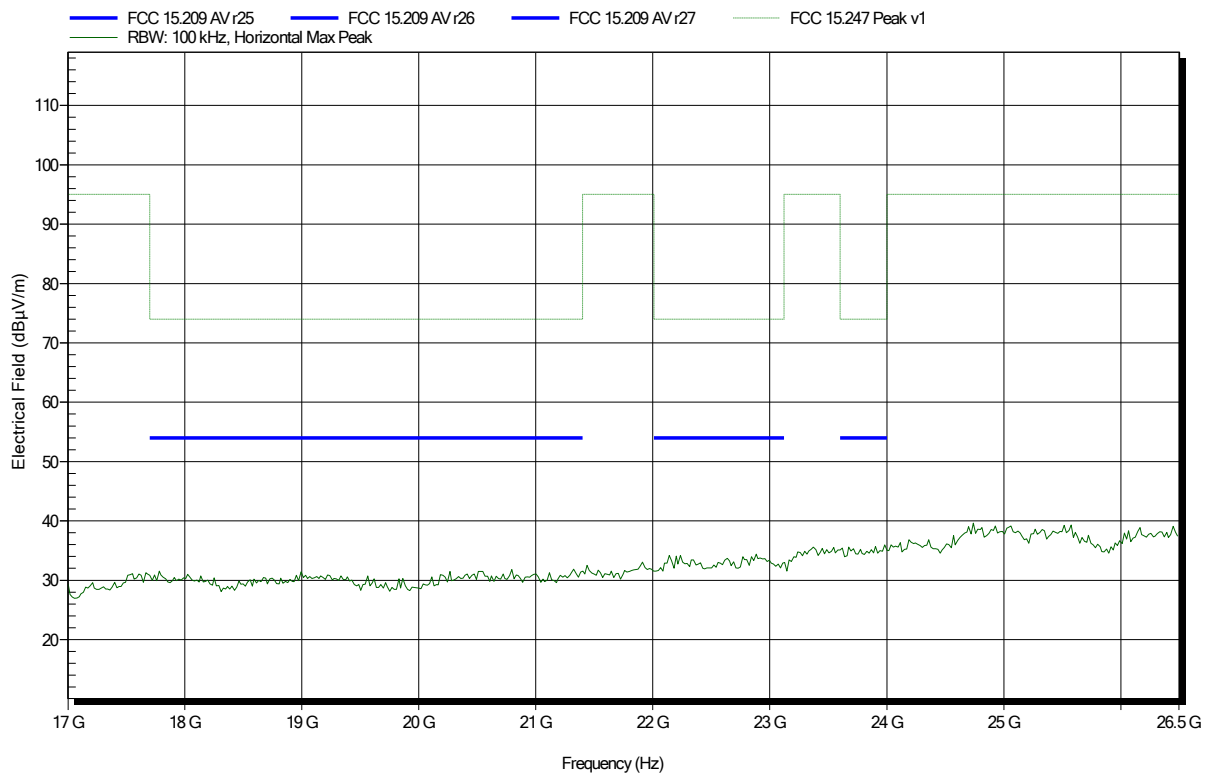


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),
Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 44

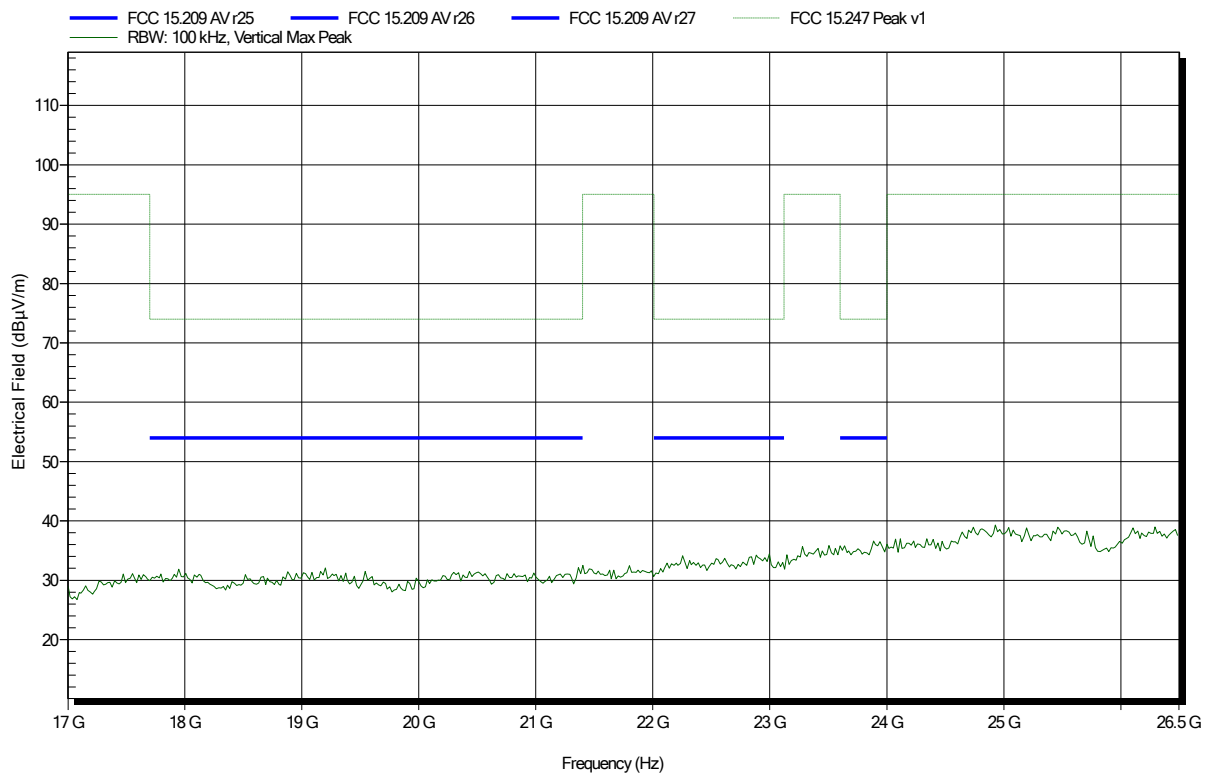


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
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Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),
Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 47

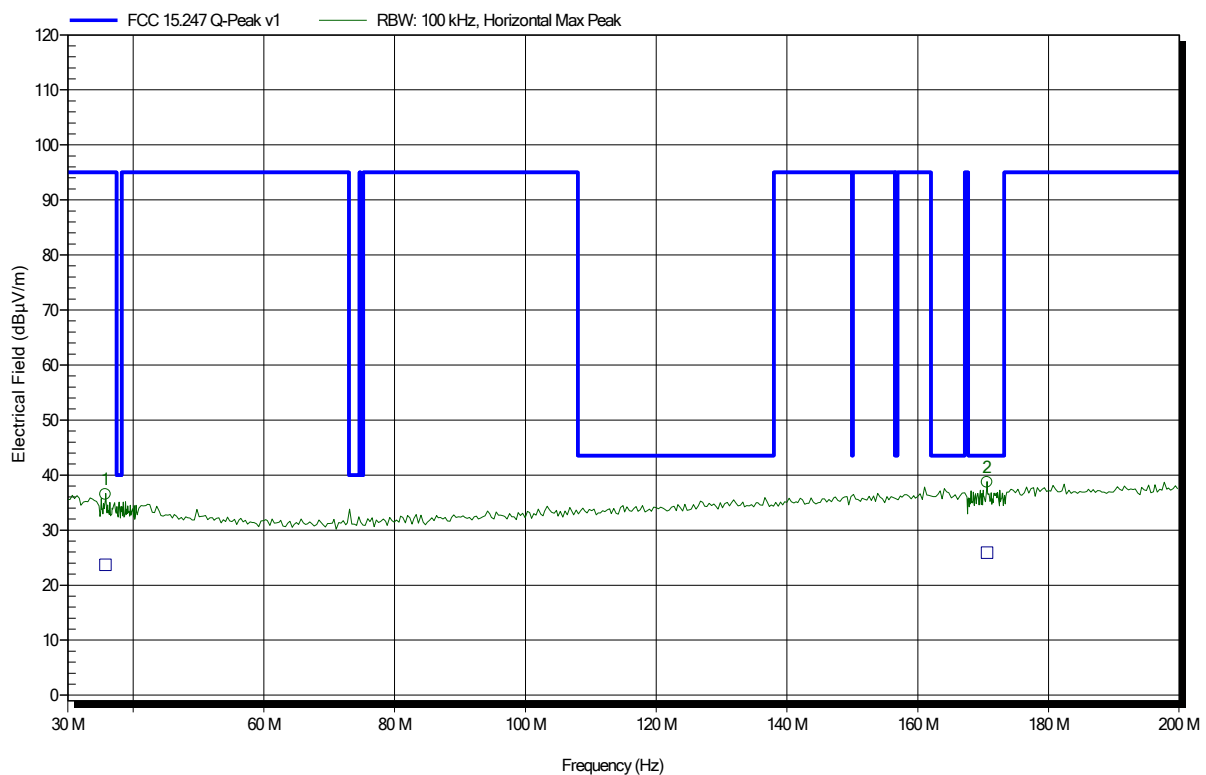


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: TX; LE; 2480 MHz
 Test Date: 2018-07-31
 Note:

Index 30



Frequency	Peak	Peak Limit	Peak Difference	Status
170.591 MHz	38.71 dBµV/m	43.52 dBµV/m	-4.81 dB	Pass
35.772 MHz	36.52 dBµV/m	95 dBµV/m	-58.48 dB	Pass

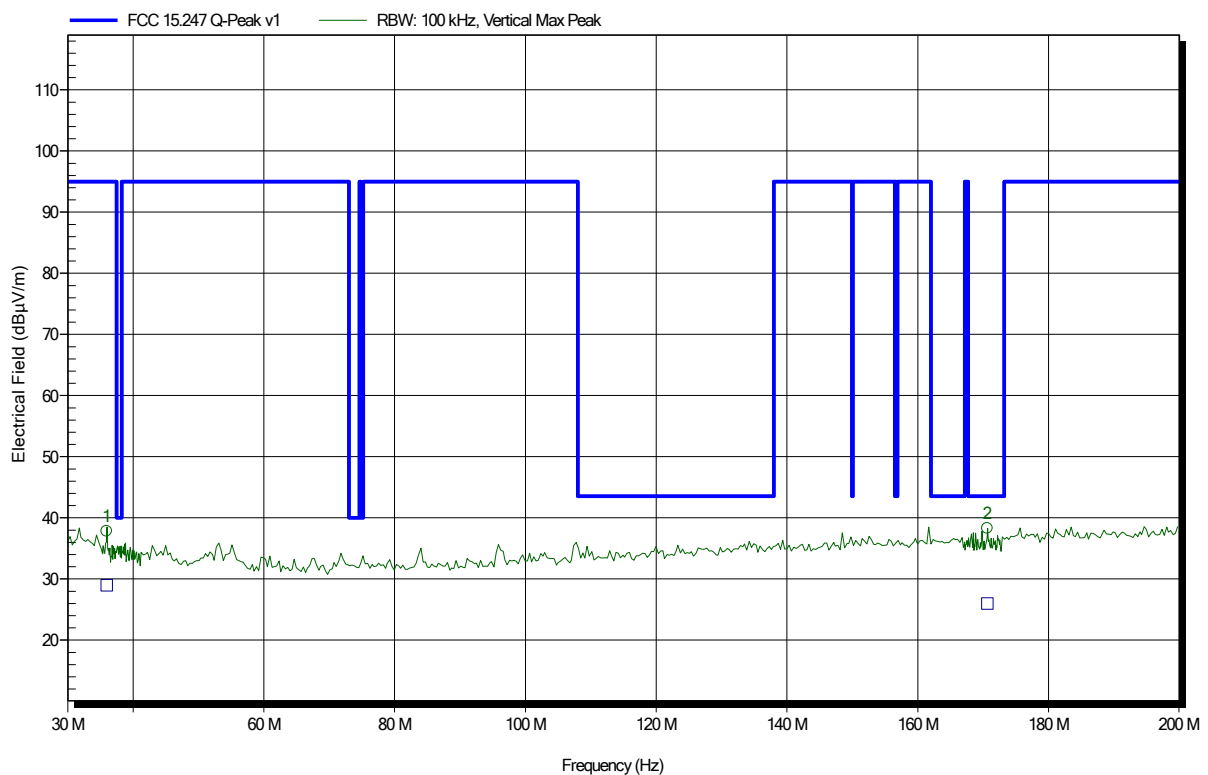
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
170.591 MHz	25.9 dBµV/m	43.52 dBµV/m	-17.62 dB	Pass
35.772 MHz	23.69 dBµV/m	95 dBµV/m	-71.31 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Rohde & Schwarz HK 116, Vertical
Measurement distance: 3 m
Mode: TX; LE; 2480 MHz
Test Date: 2018-07-31
Note:

Index 29



Frequency	Peak	Peak Limit	Peak Difference	Status
170.616 MHz	38.29 dBµV/m	43.52 dBµV/m	-5.23 dB	Pass
35.971 MHz	37.84 dBµV/m	95 dBµV/m	-57.16 dB	Pass

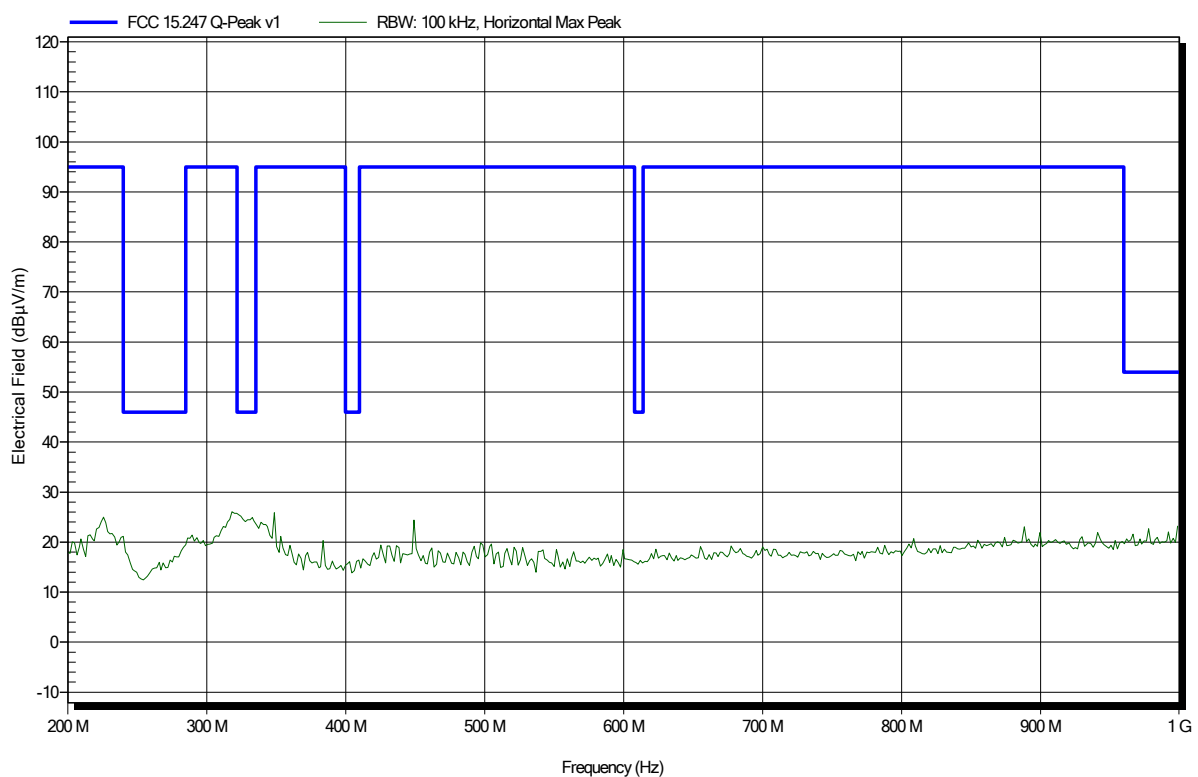
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
170.616 MHz	26.01 dBµV/m	43.52 dBµV/m	-17.51 dB	Pass
35.971 MHz	28.99 dBµV/m	95 dBµV/m	-66.01 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Rohde & Schwarz HL 223, Horizontal
Measurement distance: 3 m
Mode: TX; LE; 2480 MHz
Test Date: 2018-07-31
Note:

Index 36

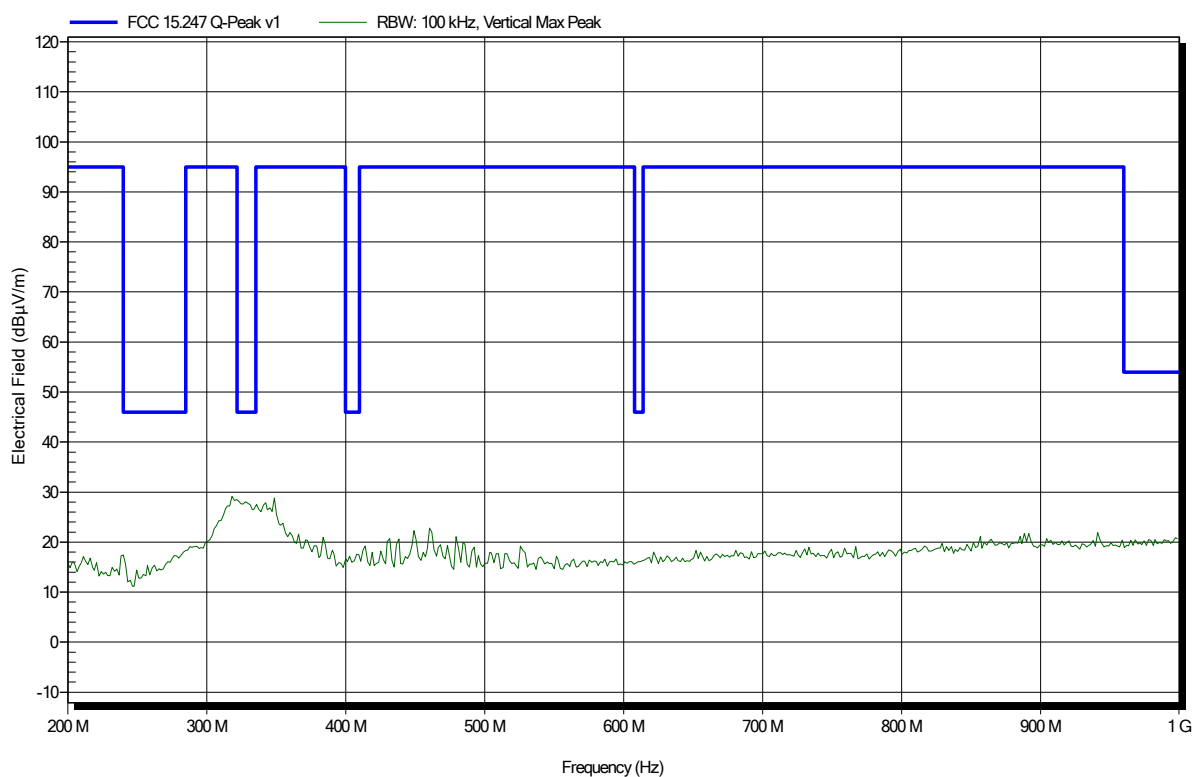


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Rohde & Schwarz HL 223, Vertical
Measurement distance: 3 m
Mode: TX; LE; 2480 MHz
Test Date: 2018-07-31
Note:

Index 39

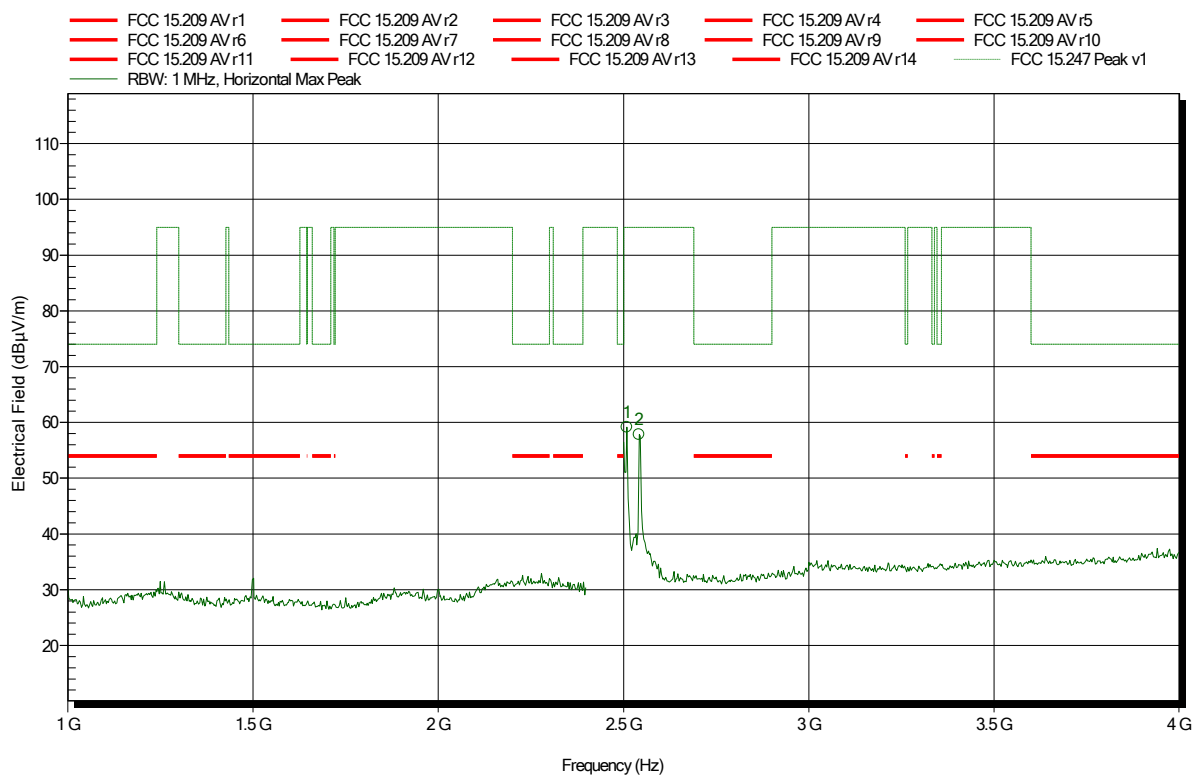


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 23.3°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2480 MHz
Test Date: 2018-08-01
Note:

Index 53



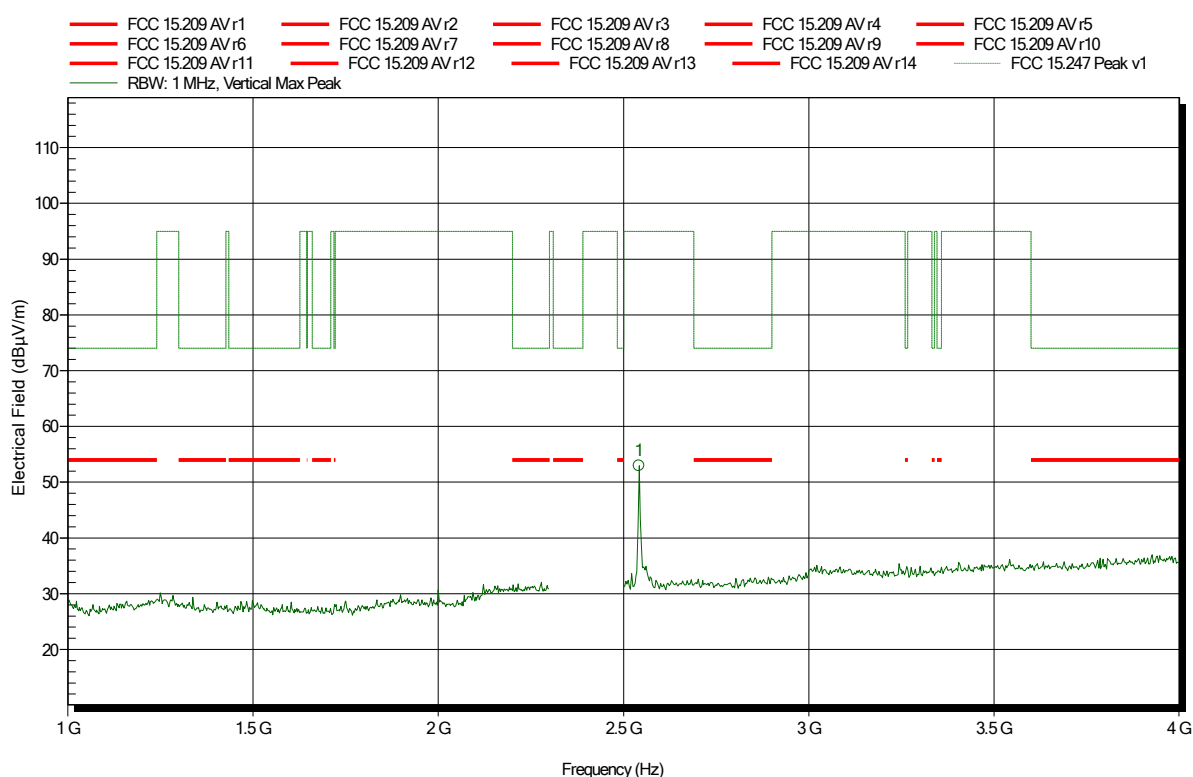
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.509 GHz	59.15 dBµV/m	95 dBµV/m	-35.85 dB	Pass
2.542 GHz	57.83 dBµV/m	95 dBµV/m	-37.17 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25°C, Vnom: 115 VAC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; LE; 2480 MHz
 Test Date: 2018-07-31
 Note:

Index 24



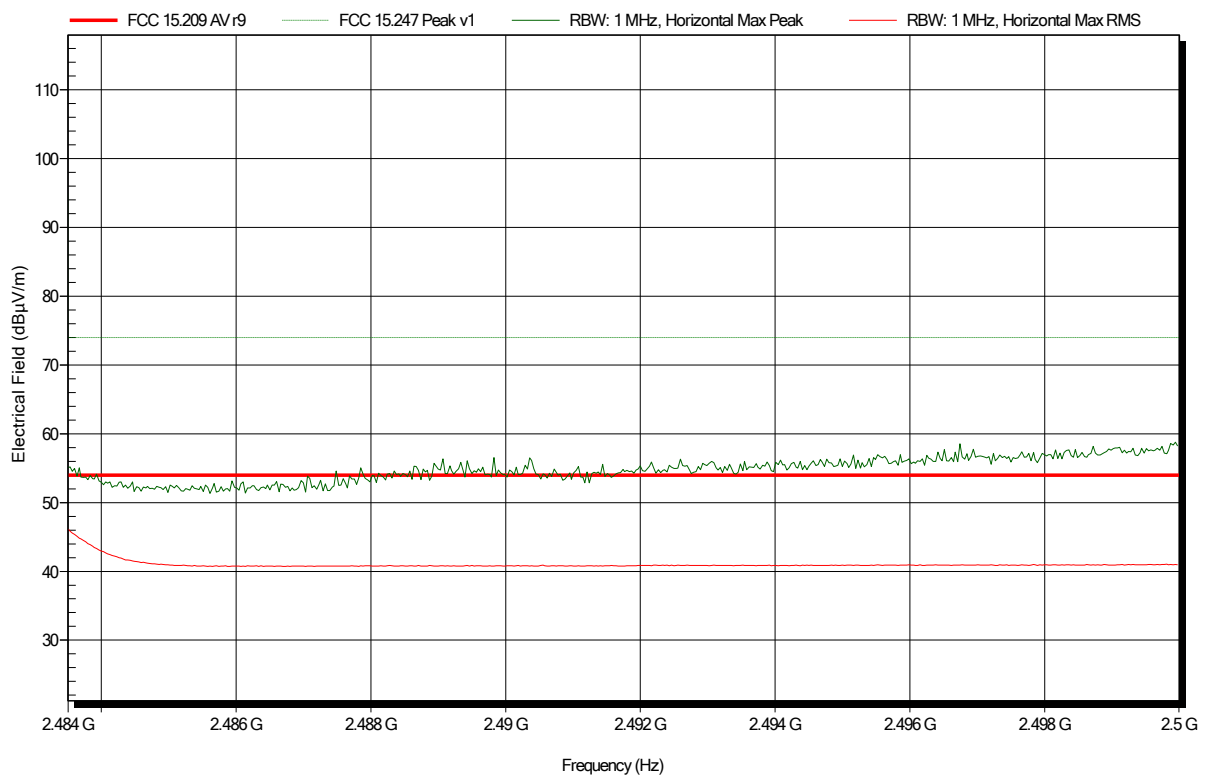
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.542 GHz	52.98 dBµV/m	95 dBµV/m	-42.02 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 24.8°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2480 MHz
Test Date: 2018-07-31
Note: upper bandedge

Index 10

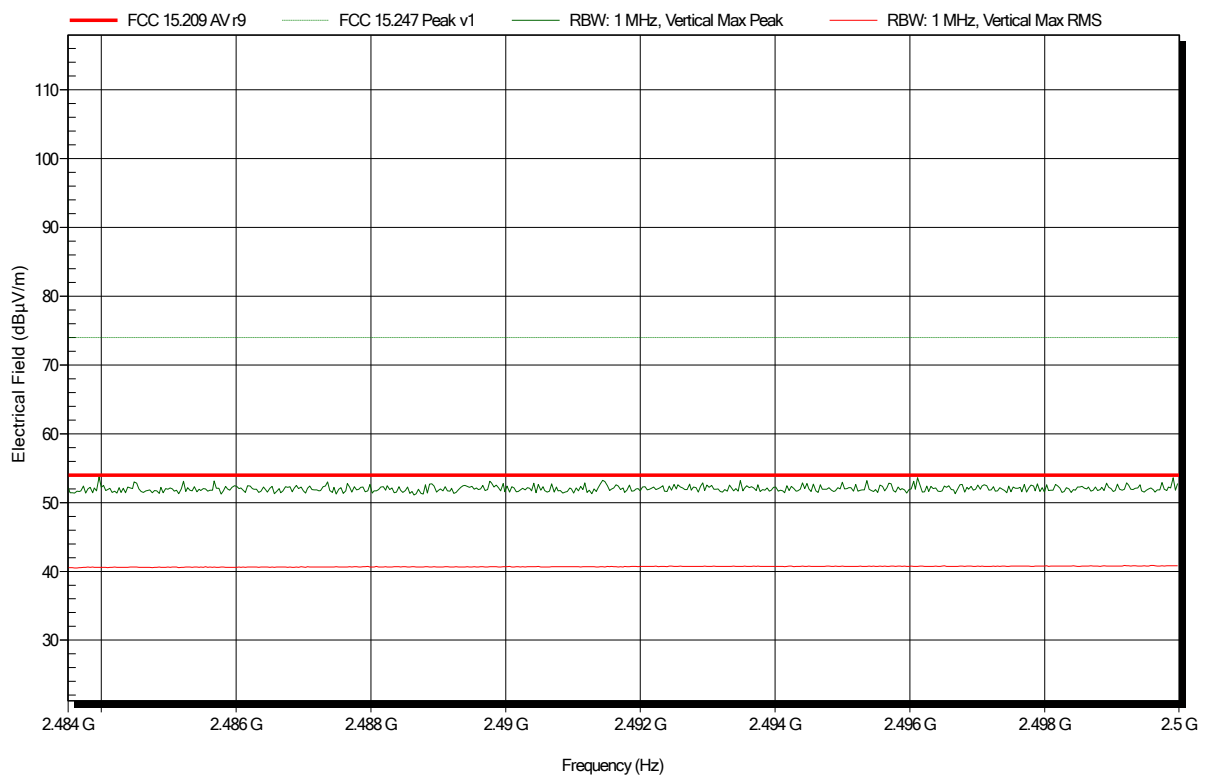


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25°C, Vnom: 115 VAC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: TX; LE; 2480 MHz
 Test Date: 2018-07-31
 Note: upper bandedge

Index 23

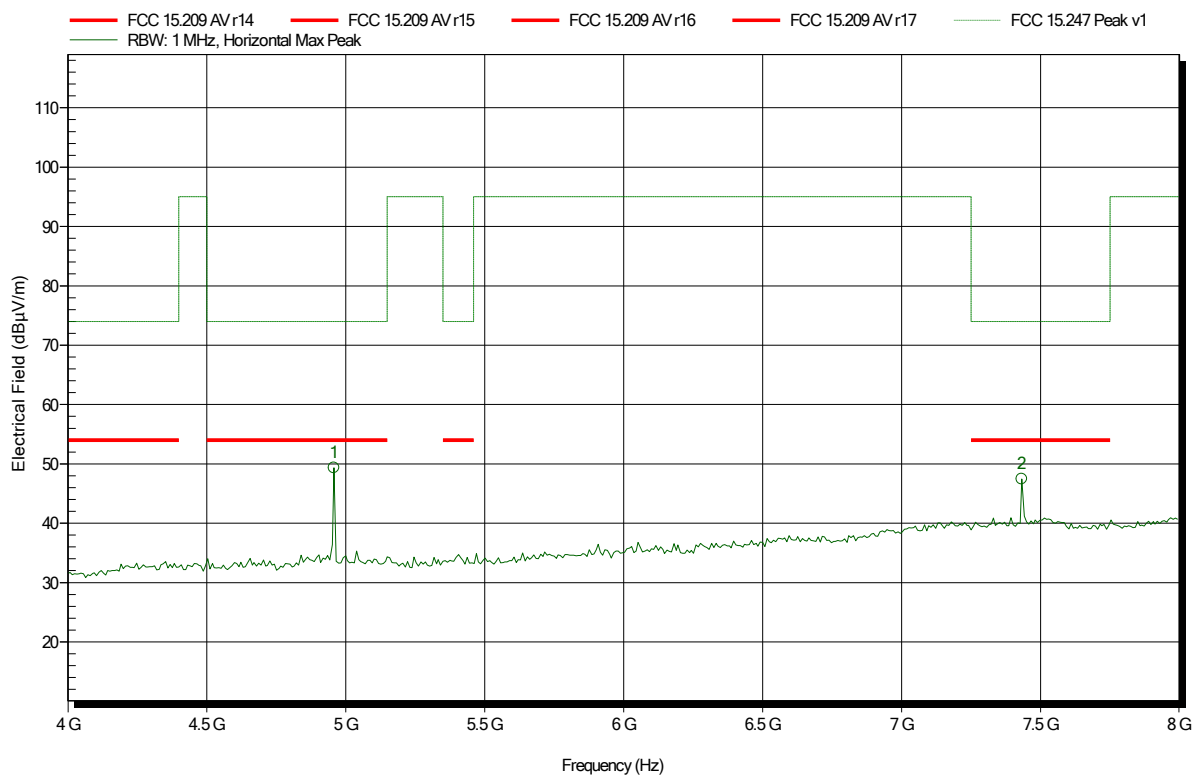


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 24.8°C, Vnom: 115 VAC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 1 m converted to 3m
 Mode: TX; LE; 2480 MHz
 Test Date: 2018-07-31
 Note:

Index 13



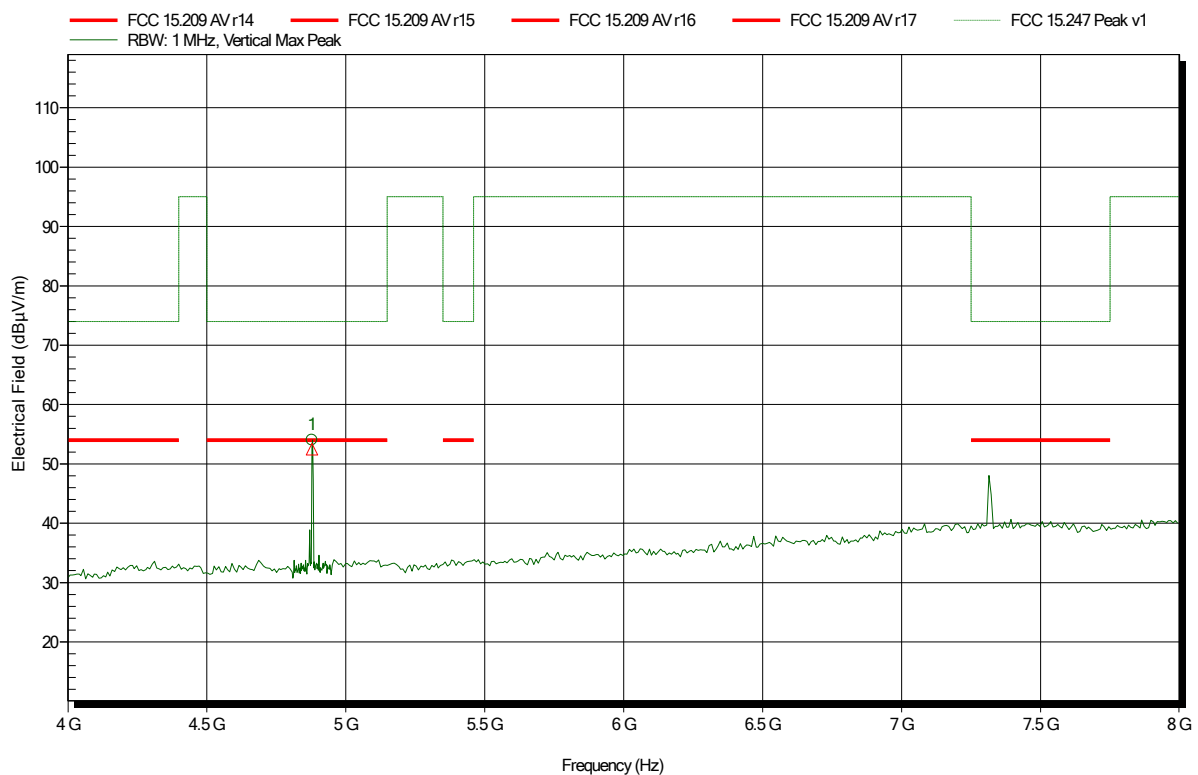
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.958 GHz	49.36 dBµV/m	74 dBµV/m	-24.64 dB	Pass
7.433 GHz	47.45 dBµV/m	74 dBµV/m	-26.55 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2480 MHz
Test Date: 2018-07-31
Note:

Index 25



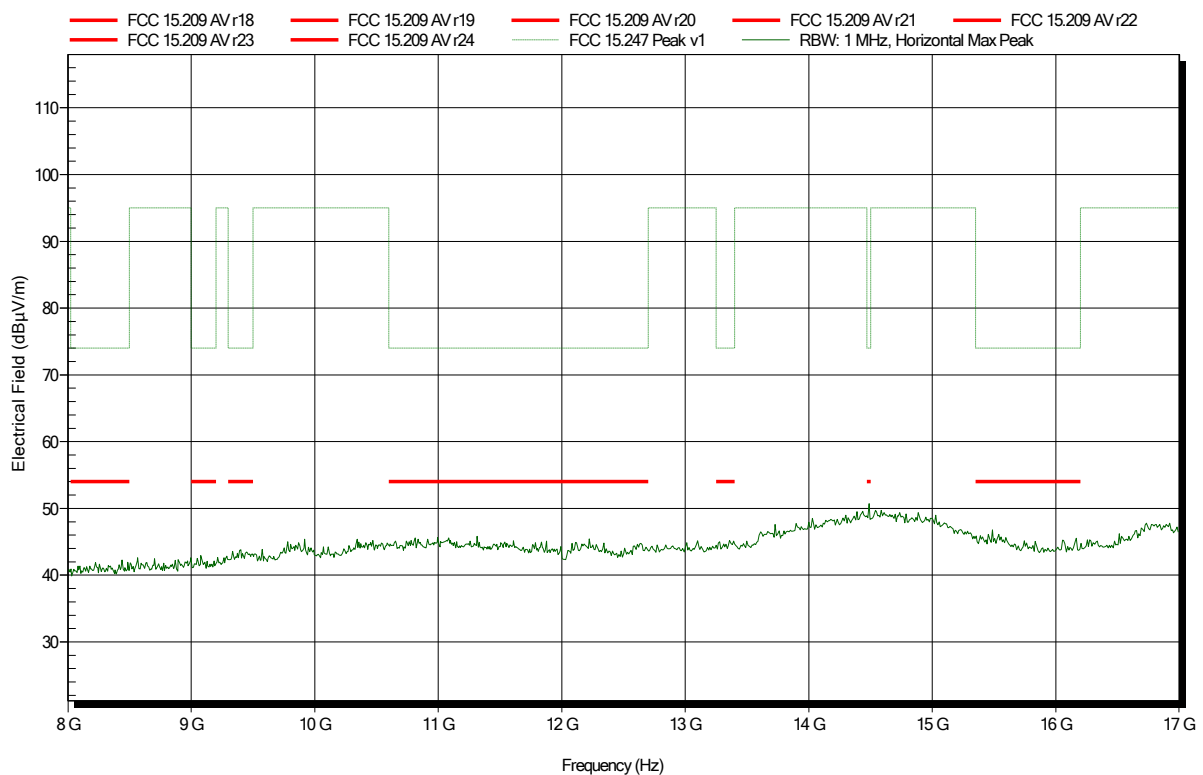
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
4.879 GHz	54.02 dBµV/m	74 dBµV/m	-19.98 dB	Pass
Frequency	RMS	RMS Limit	RMS Difference	RMS Status
4.879 GHz	52.49 dBµV/m	54 dBµV/m	-1.51 dB	Pass

Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 24.8°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2480 MHz
Test Date: 2018-07-31
Note:

Index 15

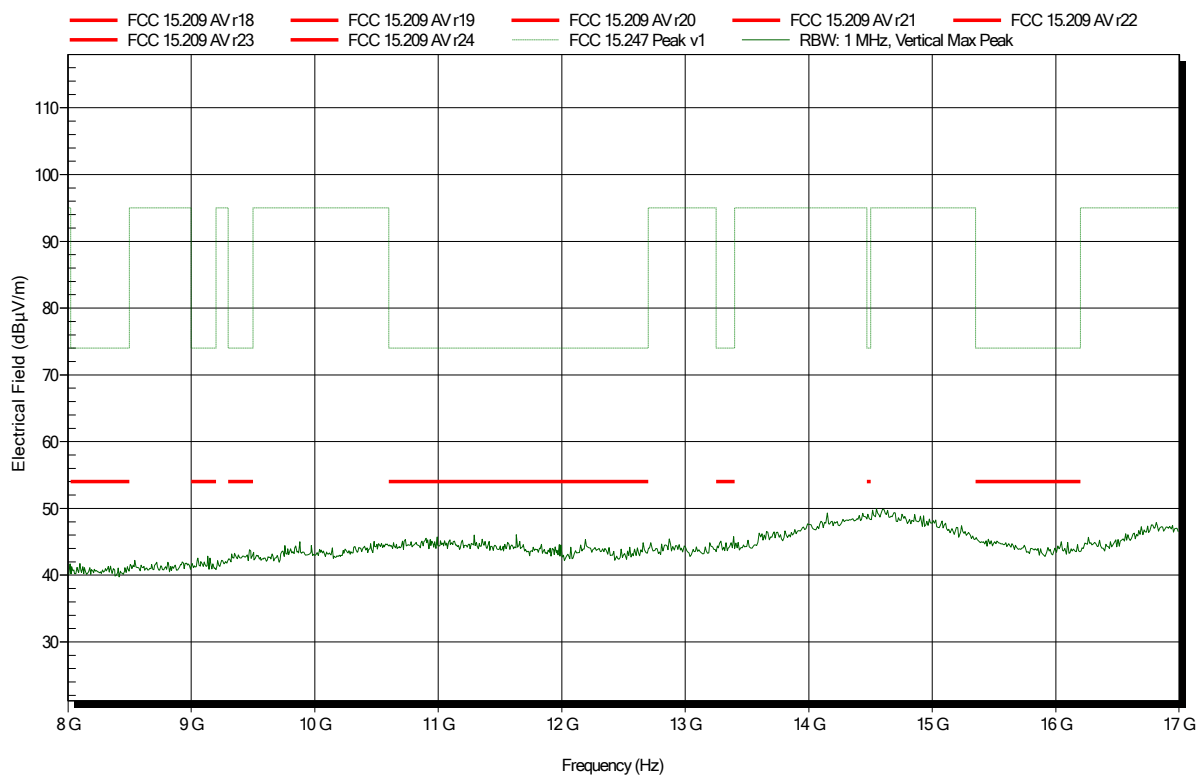


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2480 MHz
Test Date: 2018-07-31
Note:

Index 26

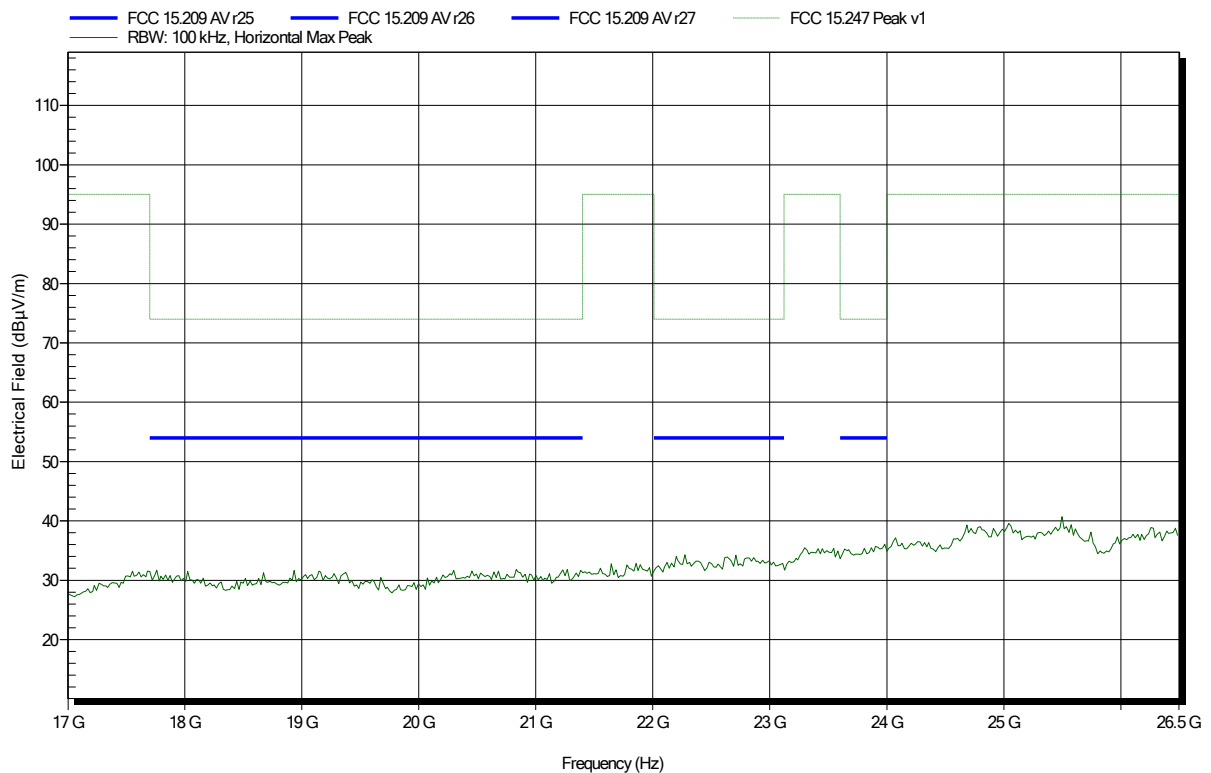


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),
Horizontal
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2480 MHz
Test Date: 2018-07-31
Note:

Index 45

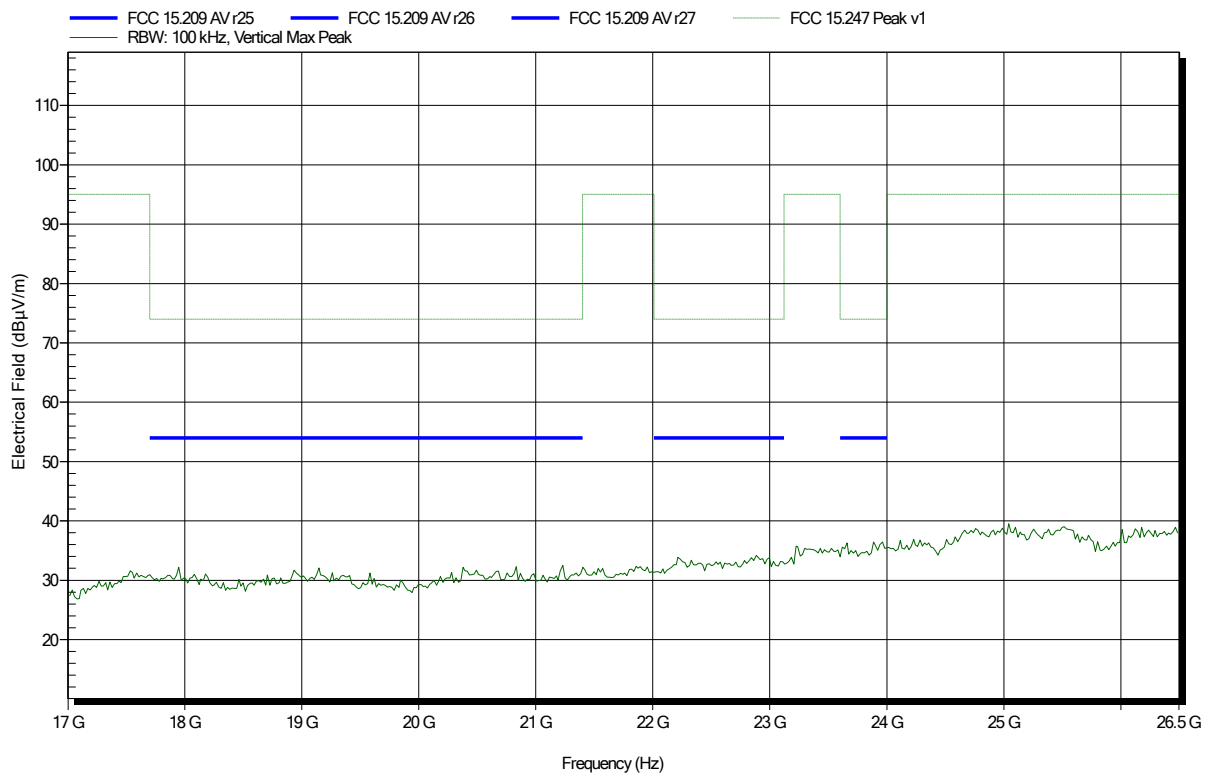


Spurious emissions according to FCC 47 e-CFR §15.247

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.3°C, Vnom: 115 VAC
Antenna: Amplifier Research AT 4560 (old name) / ATH18G40 (new name),
Vertical
Measurement distance: 1 m converted to 3m
Mode: TX; LE; 2480 MHz
Test Date: 2018-07-31
Note:

Index 46



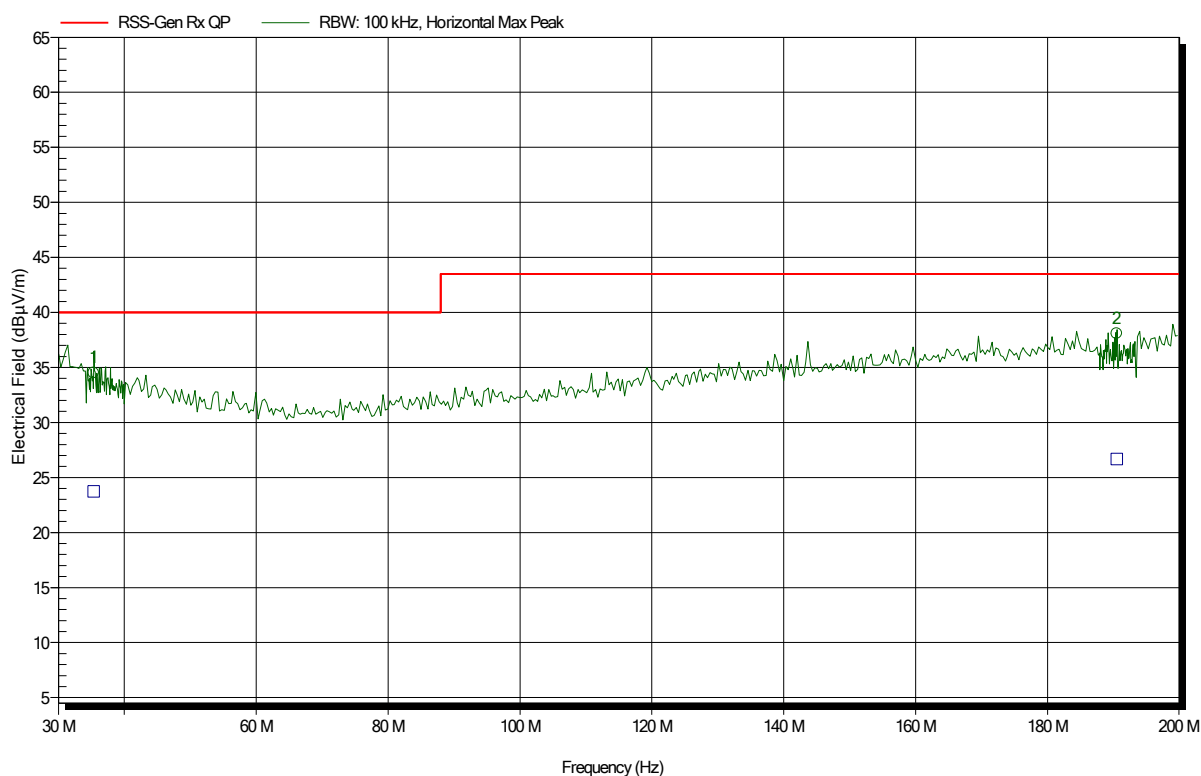
ANNEX B Receiver spurious emissions

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25.1°C, Vnom: 115 VAC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3 m
 Mode: RX; LE; 2440 MHz
 Test Date: 2018-07-31
 Note:

Index 10



Frequency	Peak	Peak Limit	Peak Difference	Status	Angle	Height
190.499 MHz	38.07 dBµV/m	43.5 dBµV/m	-5.43 dB	Pass	67 Degree	1.2 m
35.357 MHz	34.5 dBµV/m	40 dBµV/m	-5.5 dB	Pass	266 Degree	1.2 m

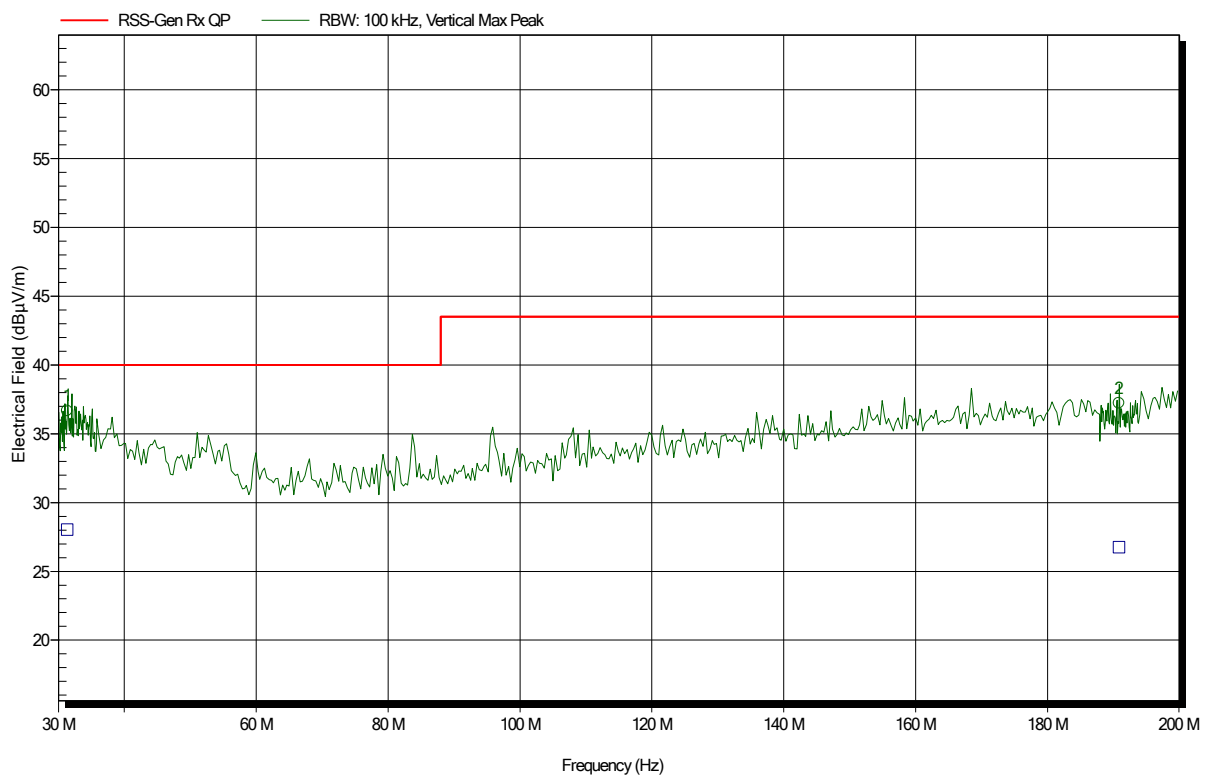
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
190.499 MHz	26.69 dBµV/m	43.5 dBµV/m	-16.81 dB	Pass	67 Degree	1.2 m
35.357 MHz	23.74 dBµV/m	40 dBµV/m	-16.26 dB	Pass	266 Degree	1.2 m

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25.1°C, Vnom: 115 VAC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3 m
 Mode: RX; LE; 2440 MHz
 Test Date: 2018-07-31
 Note:

Index 11



Frequency	Peak	Peak Limit	Peak Difference	Status	Angle	Height
190.838 MHz	37.24 dBµV/m	43.5 dBµV/m	-6.26 dB	Pass	147 Degree	1.2 m
31.332 MHz	36.68 dBµV/m	40 dBµV/m	-3.32 dB	Pass	132 Degree	1.2 m

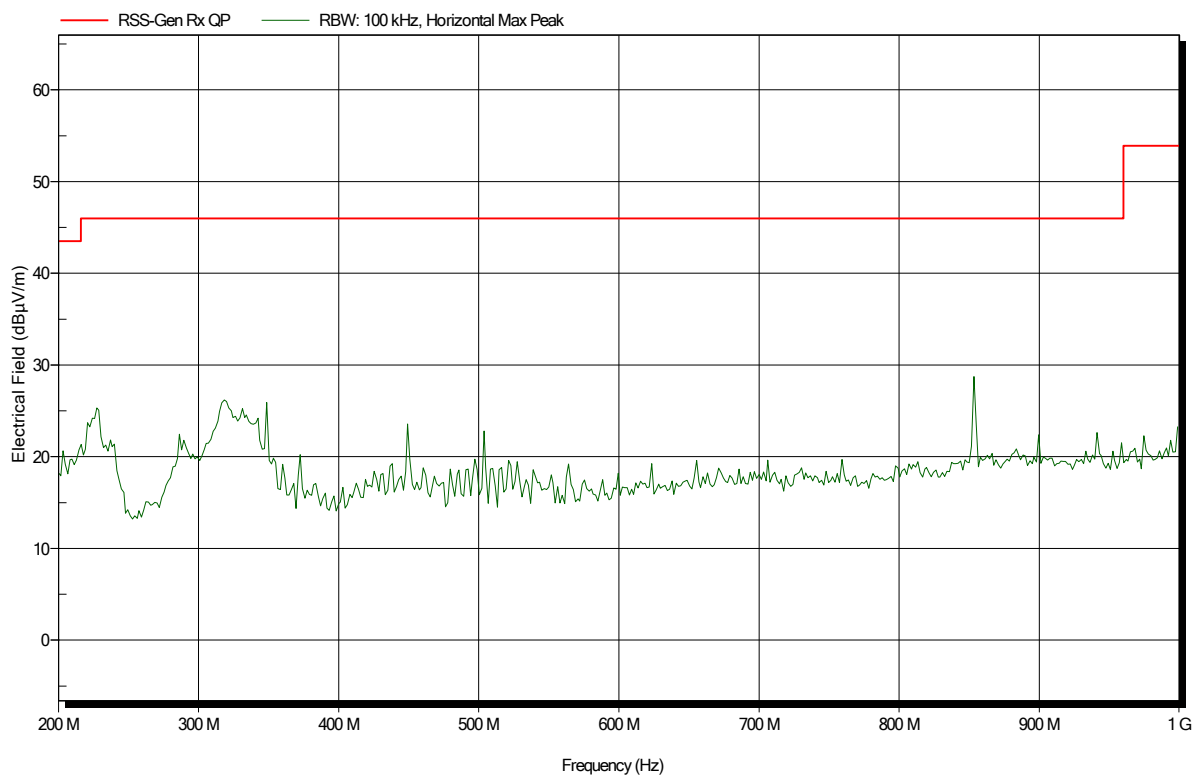
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
190.838 MHz	26.76 dBµV/m	43.5 dBµV/m	-16.74 dB	Pass	147 Degree	1.2 m
31.332 MHz	28.04 dBµV/m	40 dBµV/m	-11.96 dB	Pass	132 Degree	1.2 m

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.1°C, Vnom: 115 VAC
Antenna: Rohde & Schwarz HL 223, Horizontal
Measurement distance: 3 m
Mode: RX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 12

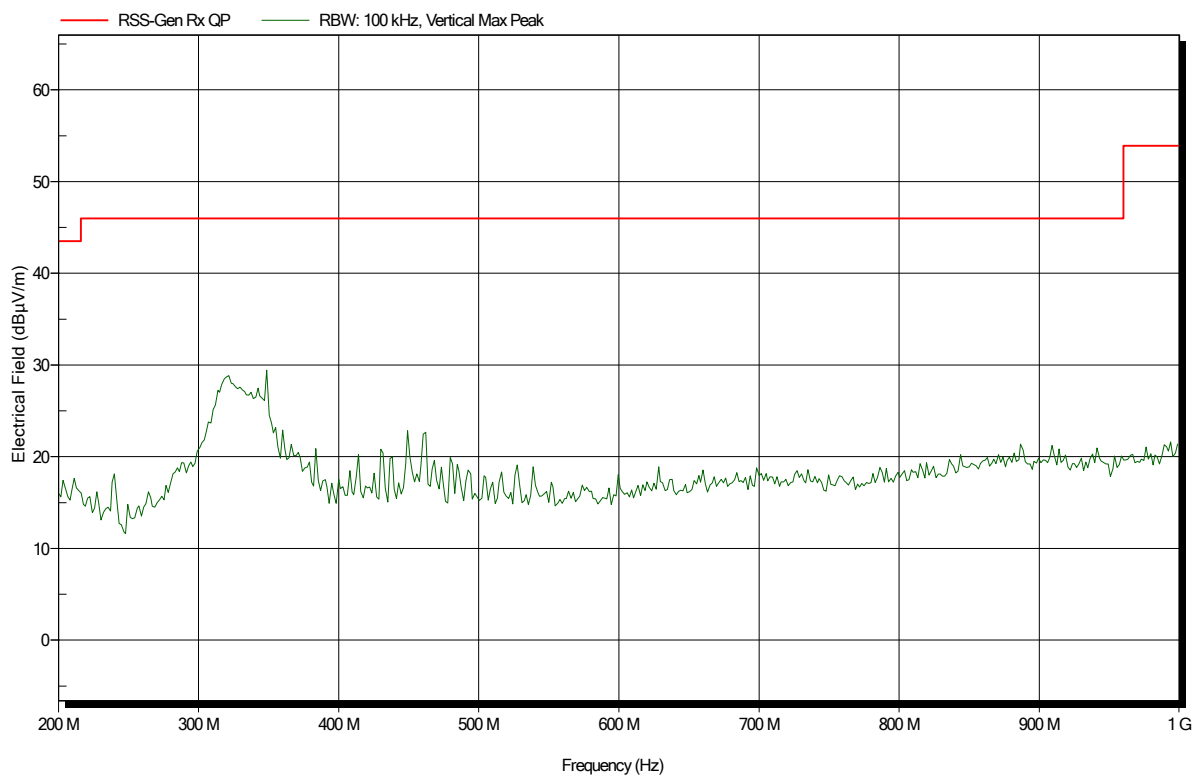


Spurious emissions according to ISCED RSS-247 Issue 2 (February 2017)

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 25.1°C, Vnom: 115 VAC
Antenna: Rohde & Schwarz HL 223, Vertical
Measurement distance: 3 m
Mode: RX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 13

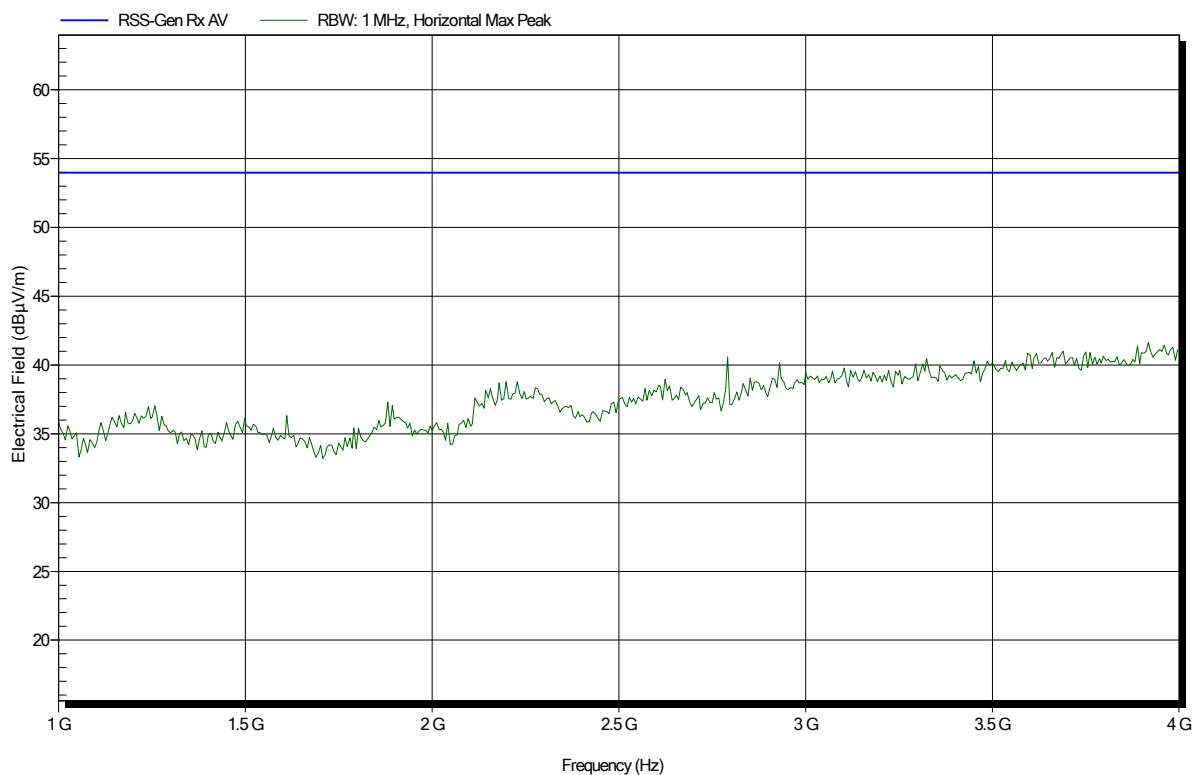


Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25.1°C, Vnom: 115 VAC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: RX; LE; 2440 MHz
 Test Date: 2018-07-31
 Note:

Index 8

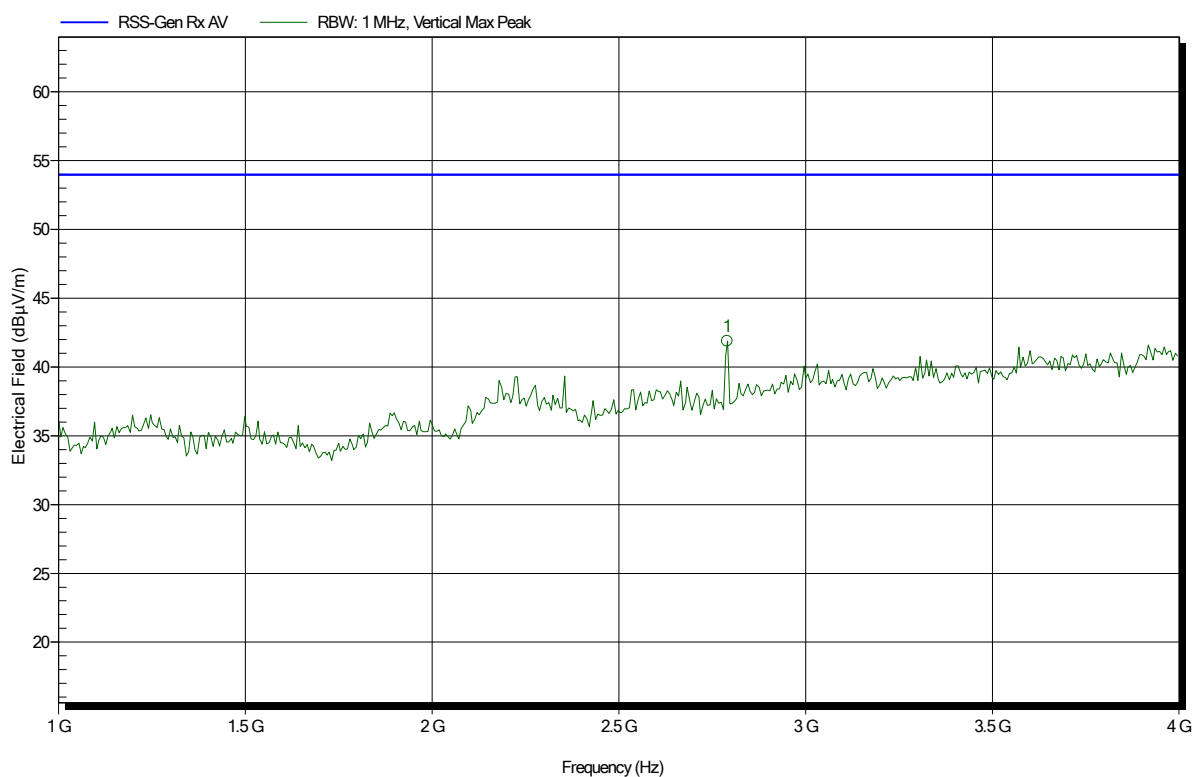


Spurious emissions according to ISCED RSS-247 Issue 2 (February 2017)

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25.1°C, Vnom: 115 VAC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: RX; LE; 2440 MHz
 Test Date: 2018-07-31
 Note:

Index 7



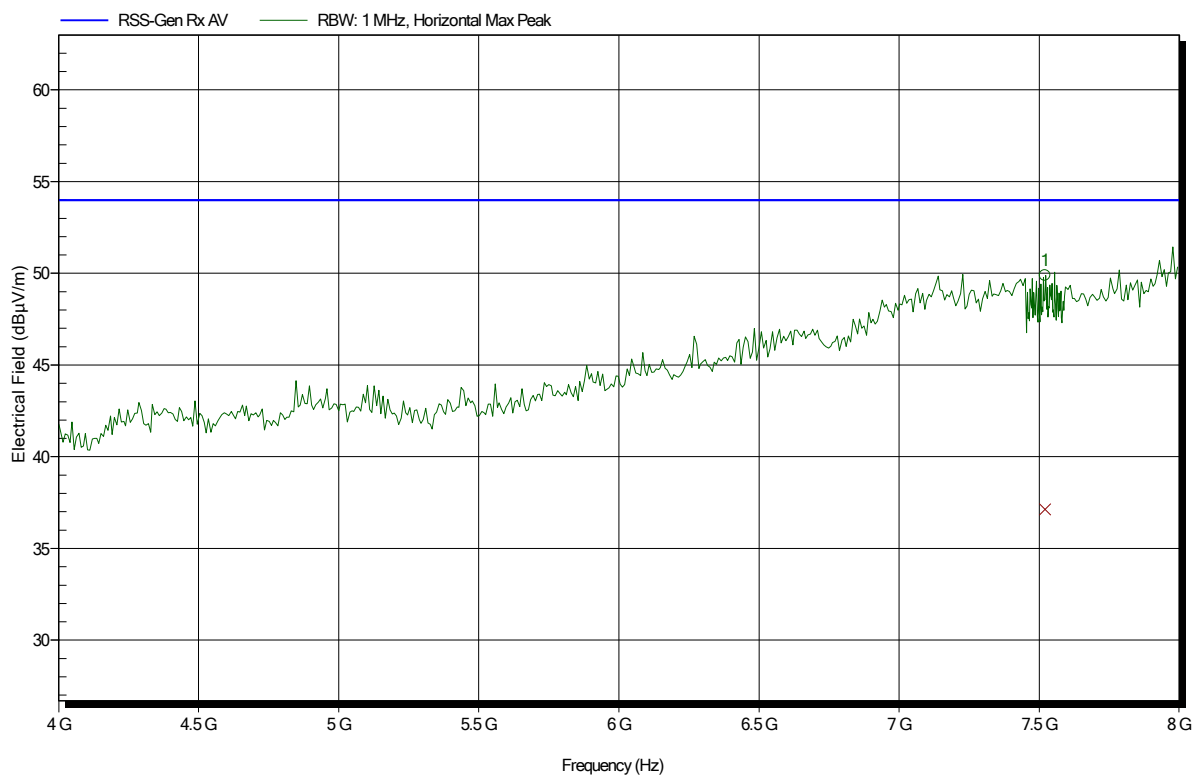
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.79 GHz	41.87 dBµV/m	53.98 dBµV/m	-12.11 dB	Pass

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25.1°C, Vnom: 115 VAC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3 m
 Mode: RX; LE; 2440 MHz
 Test Date: 2018-07-31
 Note:

Index 9



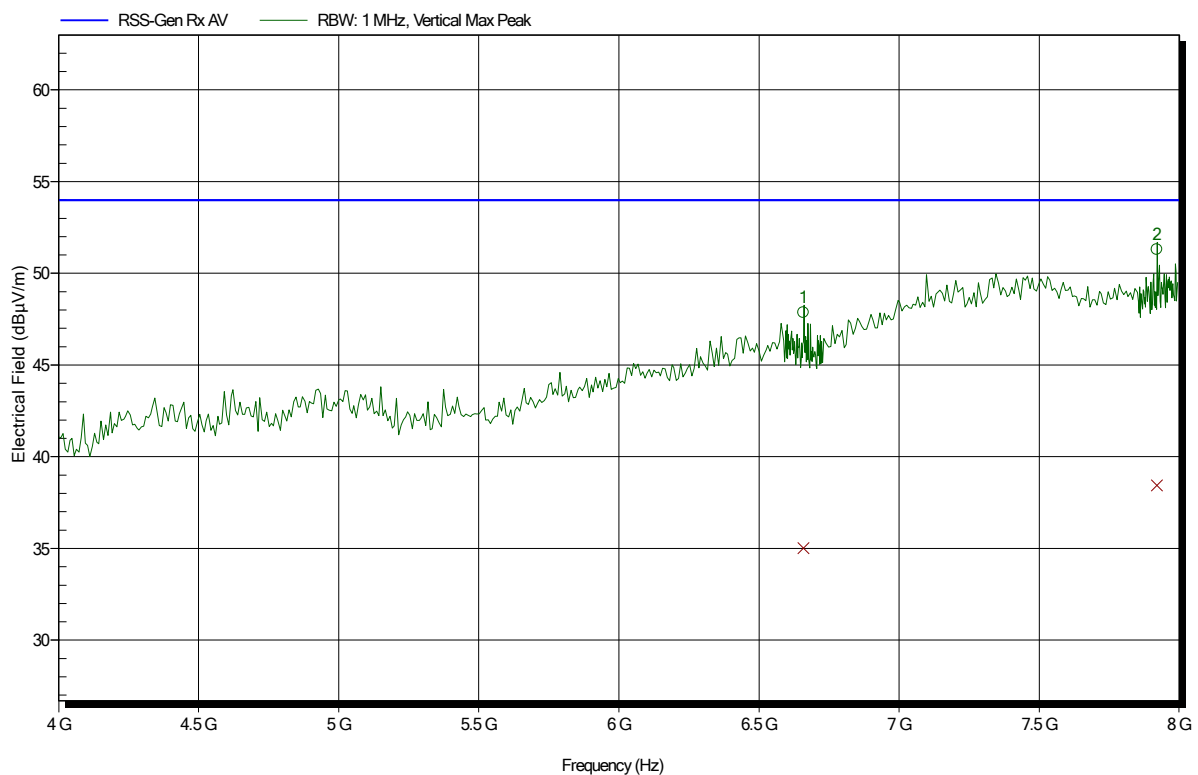
Frequency 7.521 GHz	Peak 49.89 dBµV/m	Peak Limit 53.98 dBµV/m	Peak Difference -4.09 dB	Peak Status Pass
Frequency 7.521 GHz	Average 37.13 dBµV/m	Average Limit 53.98 dBµV/m	Average Difference -16.85 dB	Average Status Pass

Spurious emissions according to ISCED RSS-247 Issue 2 (February 2017)

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 25.1°C, Vnom: 115 VAC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3 m
 Mode: RX; LE; 2440 MHz
 Test Date: 2018-07-31
 Note:

Index 6



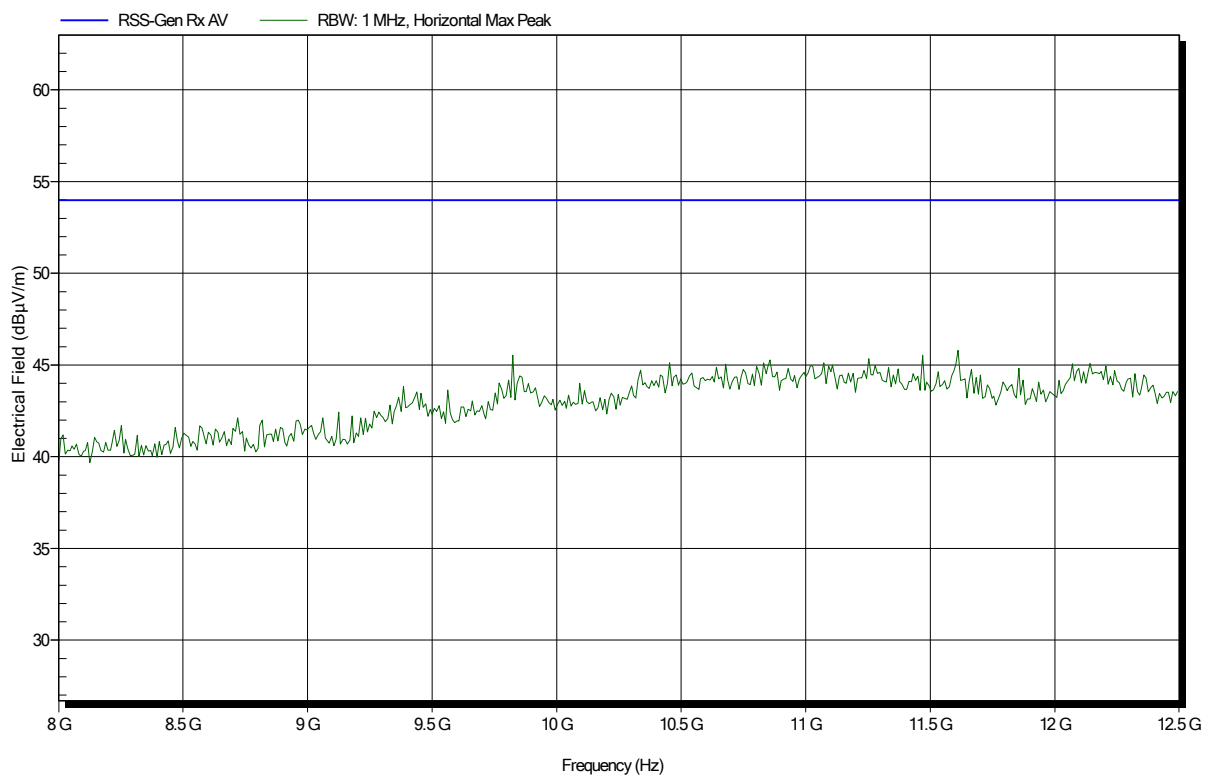
Frequency	Peak	Peak Limit	Peak Difference	Peak Status
6.659 GHz	47.86 dBµV/m	53.98 dBµV/m	-6.12 dB	Pass
7.92 GHz	51.29 dBµV/m	53.98 dBµV/m	-2.69 dB	Pass
Frequency	Average	Average Limit	Average Difference	Average Status
6.659 GHz	35.02 dBµV/m	53.98 dBµV/m	-18.96 dB	Pass
7.92 GHz	38.44 dBµV/m	53.98 dBµV/m	-15.54 dB	Pass

Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 24.7°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: RX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 2

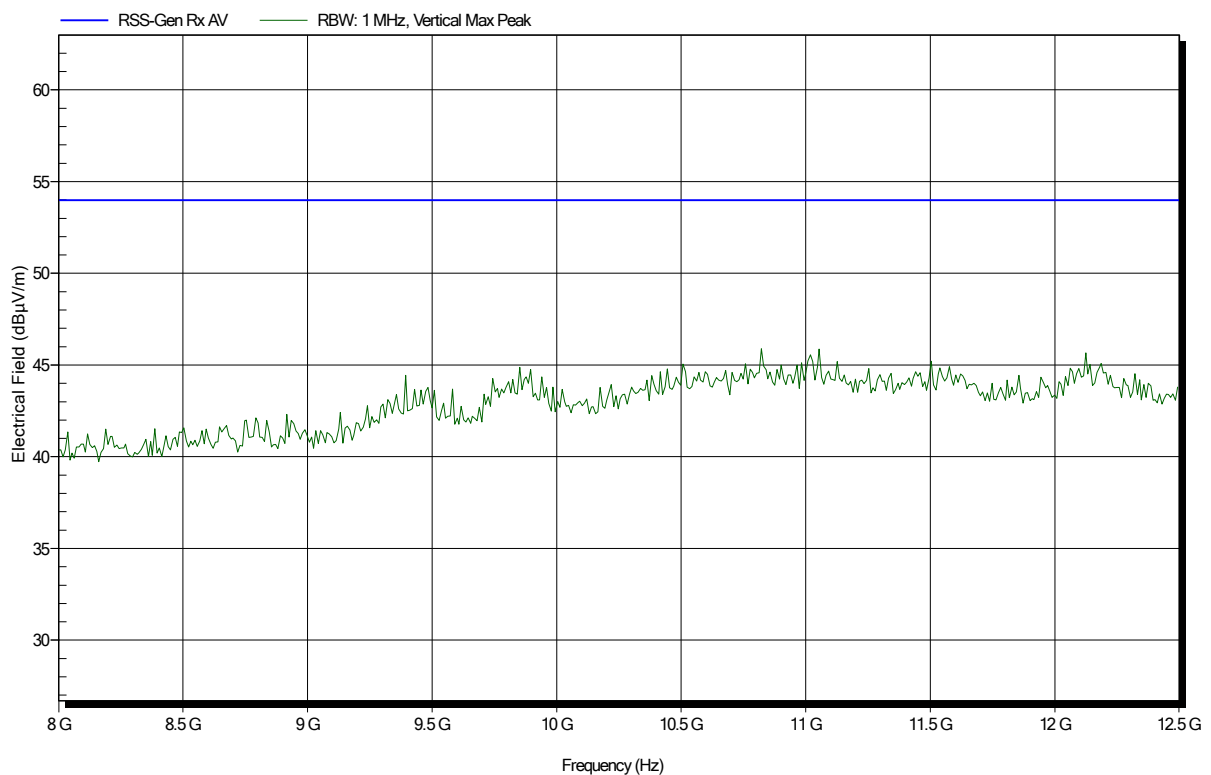


Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 24.7°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement distance: 1 m converted to 3m
Mode: RX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 4

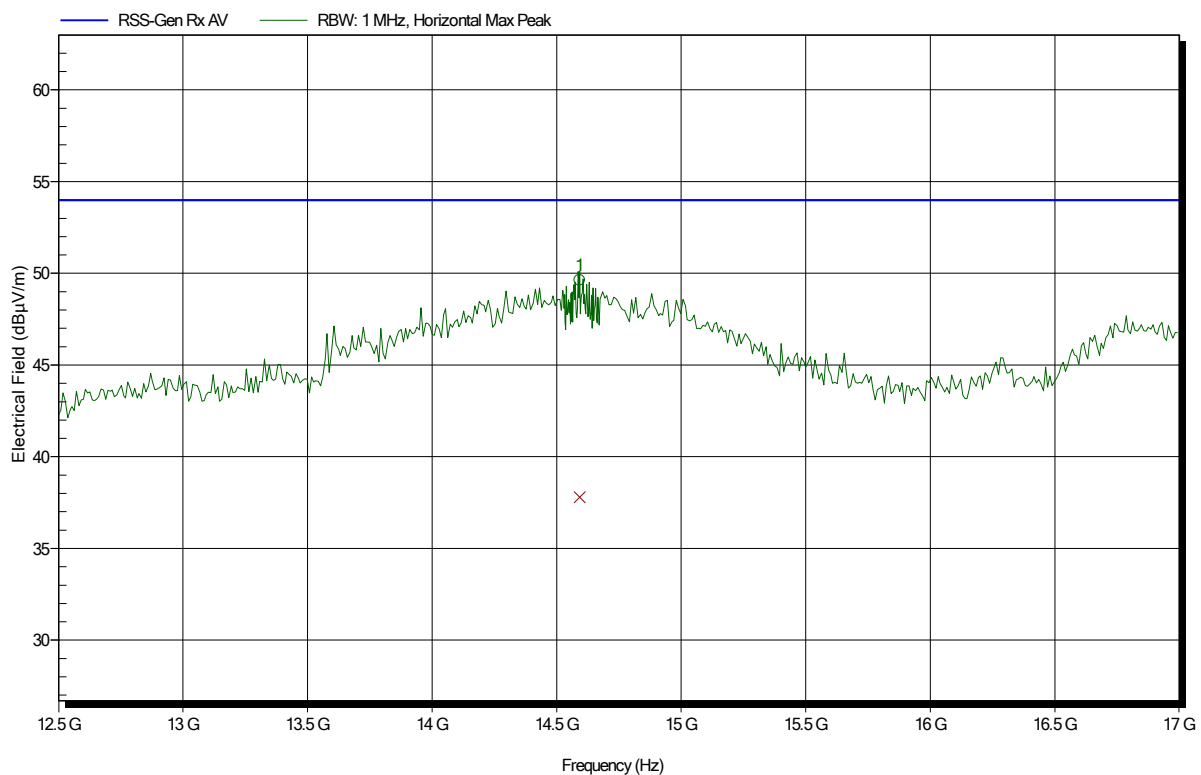


Spurious emissions according to ISED RSS-247 Issue 2 (February 2017)

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
Model: talento smart LAN
Test Site: Eurofins Product Service GmbH
Operator: Abdullah Al Jamal
Test Conditions: Tnom: 24.7°C, Vnom: 115 VAC
Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement distance: 1 m converted to 3m
Mode: RX; LE; 2440 MHz
Test Date: 2018-07-31
Note:

Index 1



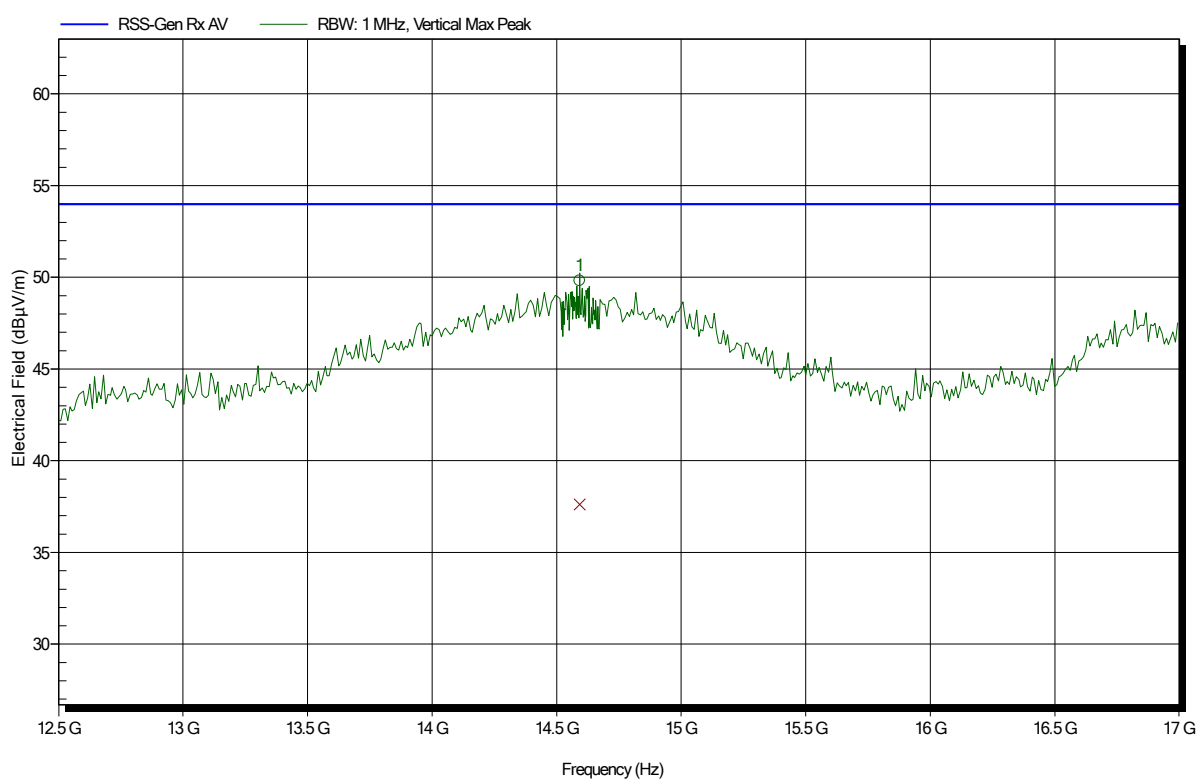
Frequency	Peak	Peak Limit	Peak Difference	Status
14.593 GHz	49.63 dBµV/m	53.98 dBµV/m	-4.35 dB	Pass
Frequency	Average	Average Limit	Average Difference	Average Status
14.593 GHz	37.79 dBµV/m	53.98 dBµV/m	-16.19 dB	Pass

Spurious emissions according to ISCED RSS-247 Issue 2 (February 2017)

Project number: G0M-1803-7264

Applicant: Grässlin GmbH
 EUT Name: 230 VAC LAN-Gateway for Timer Switch with integrated BLE-Module
 Model: talento smart LAN
 Test Site: Eurofins Product Service GmbH
 Operator: Abdullah Al Jamal
 Test Conditions: Tnom: 24.7°C, Vnom: 115 VAC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 1 m converted to 3m
 Mode: RX; LE; 2440 MHz
 Test Date: 2018-07-31
 Note:

Index 3



Frequency	Peak	Peak Limit	Peak Difference	Status
14.593 GHz	49.82 dBµV/m	53.98 dBµV/m	-4.16 dB	Pass
Frequency	Average	Average Limit	Average Difference	Average Status
14.593 GHz	37.62 dBµV/m	53.98 dBµV/m	-16.36 dB	Pass