

EMC TEST REPORT

FCC 47 CFR Part 15B
Industry Canada RSS-Gen

Electromagnetic compatibility - Unintentional radiators

Report Reference No. : G0M-1409-4154-EF0515B-V01

Testing Laboratory : Eurofins Product Service GmbH

Address : Storkower Str. 38c
15526 Reichenwalde
Germany

Accreditation :



A2LA Accredited Testing Laboratory, Certificate No.: 1983.01
FCC Filed Test Laboratory, Reg.-No.: 96970
IC OATS Filing assigned code: 3470A

Applicant's name : Amor Gummiwaren GmbH

Address : August-Rost-Straße 4
99310 Arnstadt
GERMANY

Test specification:

Standard..... : 47 CFR Part 15 Subpart B
RSS-Gen, Issue 3, 2010-12
ANSI C63.4:2009

Equipment under test (EUT):

Product description	electric device	
Model No.	Sette	
Additional Models	None	
Hardware version	V2.0	
Firmware / Software version	BLE-Stack SD110 V6.0.0	
	FCC-ID: 2ADAR504007	IC: 12372A-504007
Test result	Passed	

Test Report No.: G0M-1409-4154-EF0515B-V01

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

Possible test case verdicts:

- not applicable to test object: N/A
- test object does meet the requirement.....: P (Pass)
- test object does not meet the requirement.....: F (Fail)

Testing:

Date of receipt of test item: 2015-02-18

Date (s) of performance of tests: 2015-02-24

Compiled by: Steffen Zunke

Tested by (+ signature).....: Steffen Zunke

Approved by (+ signature): Marcus Klein

Date of issue.....: 2015-02-25

Total number of pages.....: 34



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:

Test Report No.: G0M-1409-4154-EF0515B-V01

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

Version History

Version	Issue Date	Remarks	Revised by
V01	2015-02-25	Initial Release	

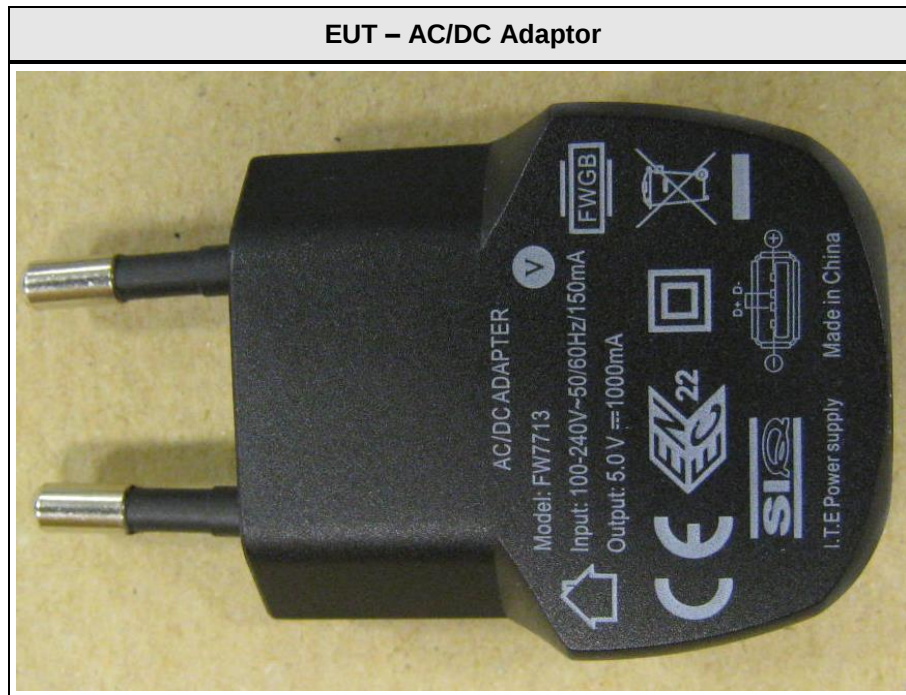
REPORT INDEX

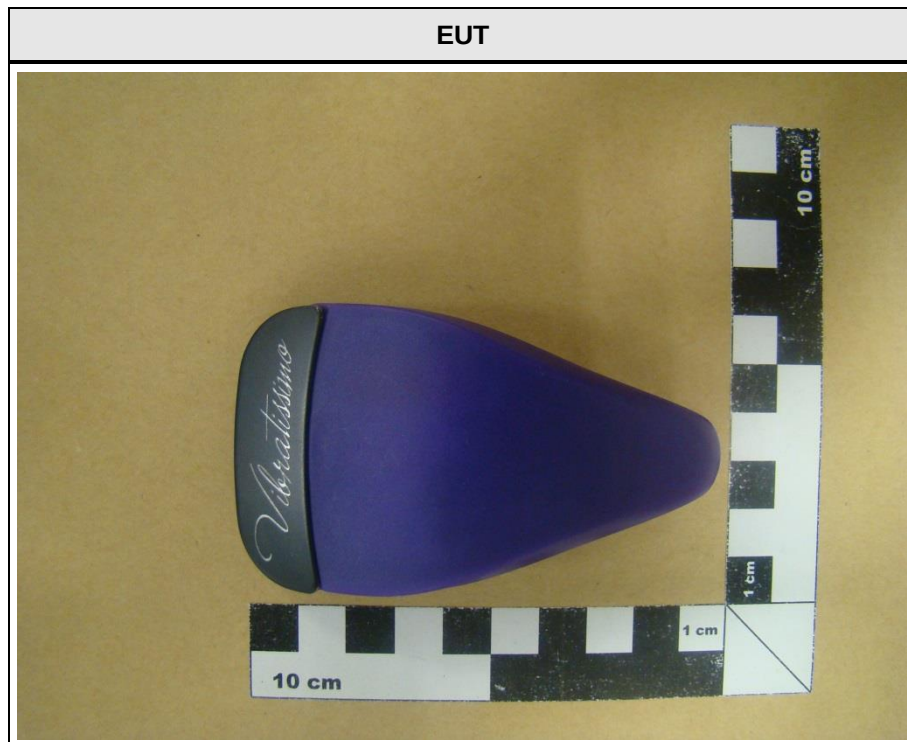
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1 Equipment (Test item) Description

Description	electric device
Model	Sette
Additional Models	None
Serial number	None
Hardware version	V2.0
Software / Firmware version	BLE-Stack SD110 V6.0.0
FCC-ID	2ADAR504007
IC-ID	12372A-504007
Power supply	3.7 VDC (accu)
AC/DC-Adaptor	Model : FW7713 Manufacturer : FRIWO Gerätebau GmbH Input : 100-240VAC / 50-60Hz Output : 5VDC / 1.0A
Manufacturer	Amor Gummiwaren GmbH August-Rost-Straße 4 99310 Arnstadt GERMANY
Highest emission frequency	Fmax [MHz] = 2540
Device classification	Class B
Equipment type	Tabletop
Number of tested samples	1

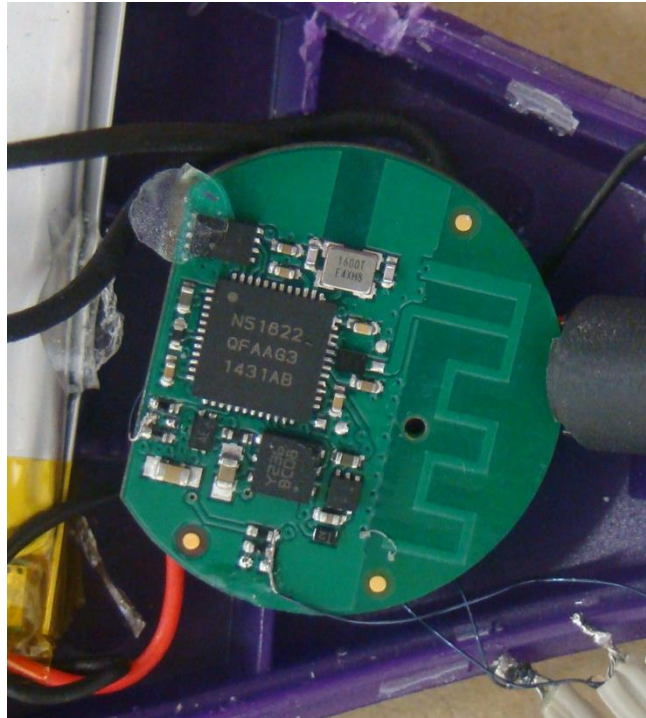
1.1 Photos – Equipment external



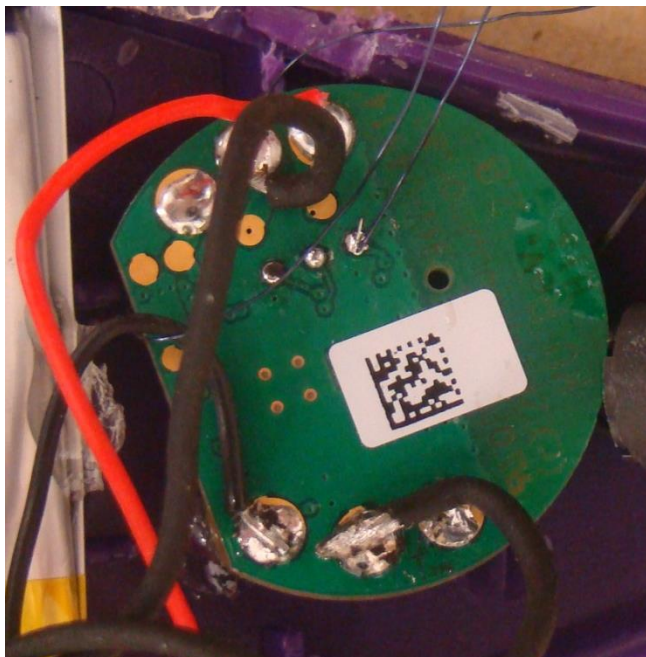


1.2 Photos – Equipment internal

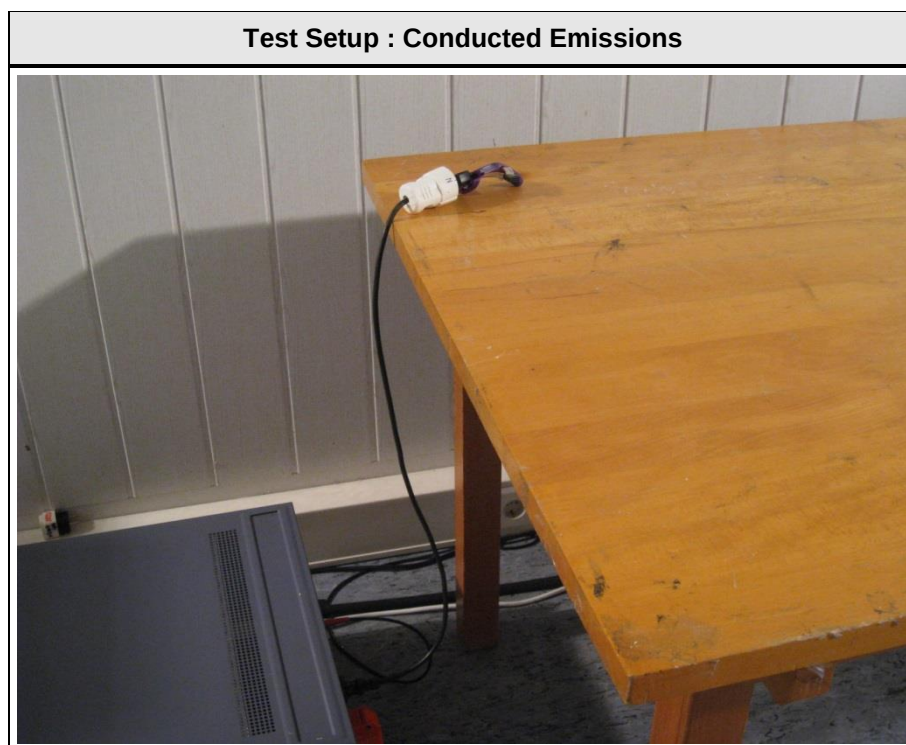
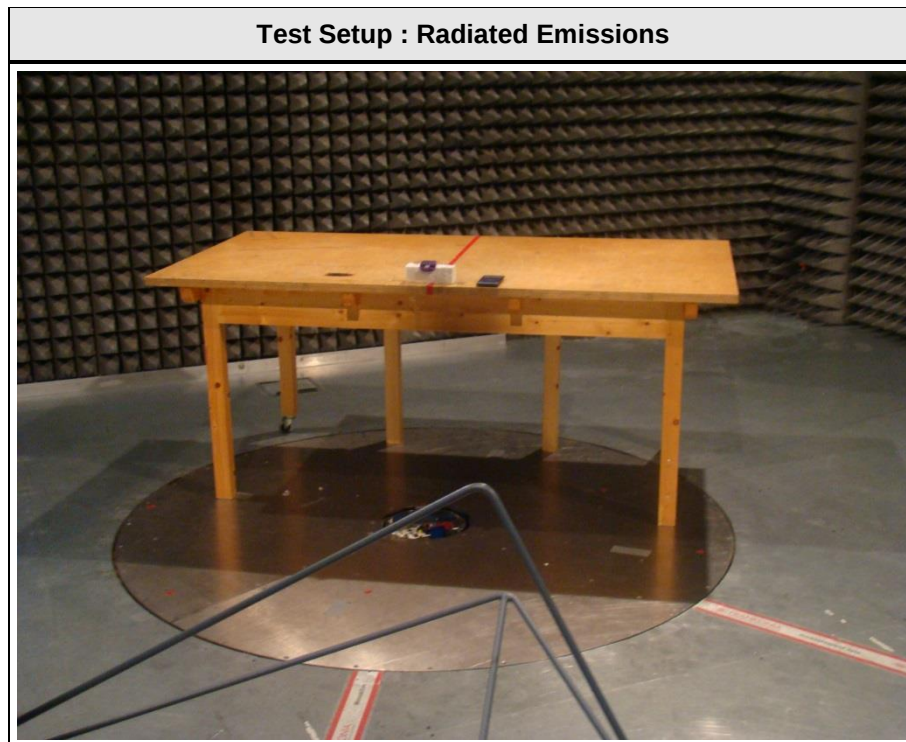
EUT PCB Top



EUT PCB Bottom



1.3 Photos – Test setup



1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
AE	smart phone	LG	G2	-
*Note: Use the following abbreviations: AE : Auxiliary/Associated Equipment, or SIM : Simulator (Not Subjected to Test) CABL : Connecting cables				

1.5 Input / Output Ports

No ports available

1.6 Operating Modes and Configurations

Mode #	Description
1	vibrating + Bluetooth communication to a smartphone
2	charging + Bluetooth communication to a smartphone

Configuration #	EUT Configuration
1	EUT in normal operation mode

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:

$$\text{Limit (dB}\mu\text{V/m)} = 20 * \log (\mu\text{V/m})$$

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 15B, Industry Canada RSS-Gen				
Product Specific Standard	Requirement – Test	Reference Method	Result	Remarks
47 CFR 15.109 RSS-Gen 4.9 & 4.10	Radiated emissions	ANSI C 63.4	PASS	-
47 CFR 15.107 RSS-Gen 7.2.4	AC power line conducted emissions	ANSI C63.4	PASS	-
Remarks:				

3 Test Conditions and Results

3.1 Test Conditions and Results – Radiated emissions

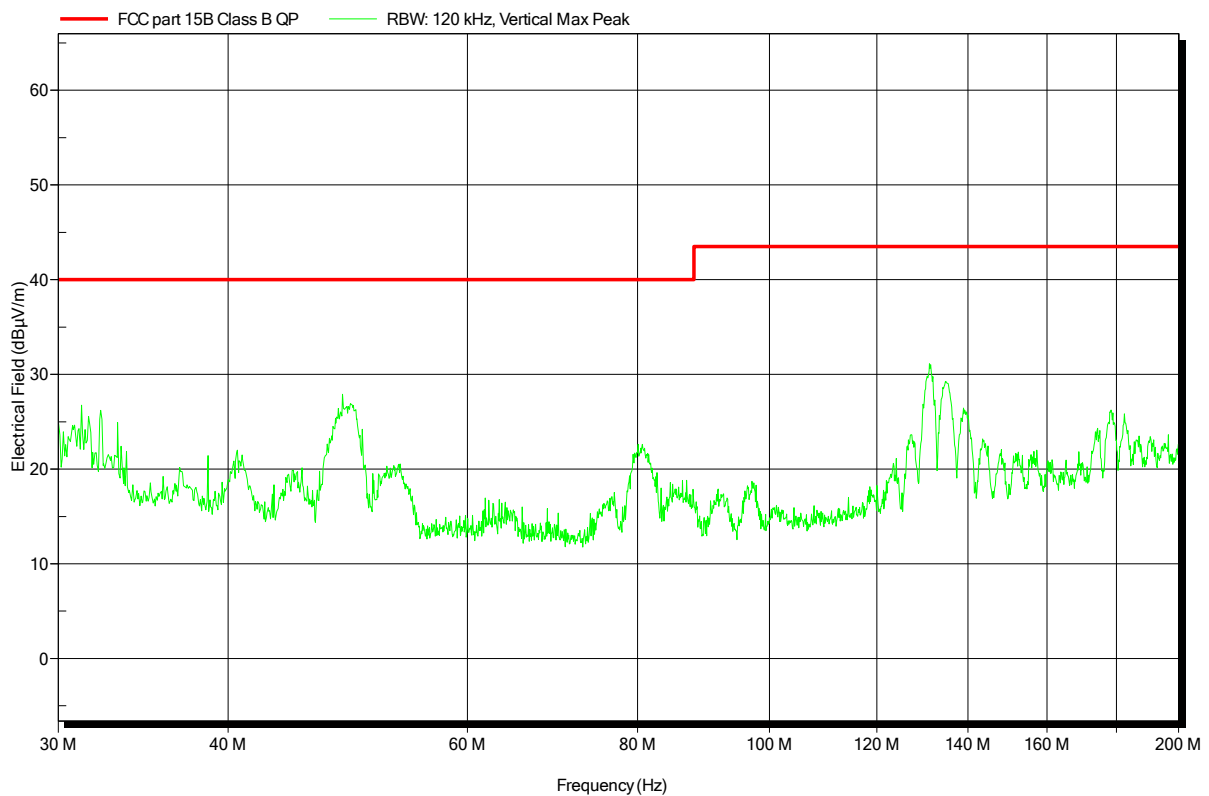
Radiated emissions acc. FCC 47 CFR 15.109 / IC RSS-Gen					Verdict: PASS		
Laboratory Parameters:		Required prior to the test			During the test		
Ambient Temperature		15 to 35 °C			21°C		
Relative Humidity		30 to 60 %			32%		
Test according referenced standards		Reference Method					
		ANSI C63.4					
Sample is tested with respect to the requirements of the equipment class		Equipment class					
		Class B					
Test frequency range determined from highest emission frequency		Highest emission frequency					
		Fmax [MHz] = 2540					
Fully configured sample scanned over the following frequency range		Frequency range					
		30 MHz to 13 GHz					
Operating mode and configuration		mode 1 / 2, configuration 1					
Limits and results Class B							
Frequency [MHz]	Quasi-Peak [dBµV/m]	Result	Average [dBµV/m]	Result	Peak [dBµV/m]	Result	
30 – 88	40	PASS	-		-	-	
88 – 216	43.5	PASS	-		-	-	
216 – 960	46	PASS	-		-	-	
960 – 1000	54	PASS	-		-	-	
> 1000	-	-	54	PASS	74	PASS	
Comments:							

Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4154

Manufacturer:	Amor Gummiwaren GmbH
EUT Name:	electric device
Model:	SETTE
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 3.7 VDC via AC/DC Adapter
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3m
Mode:	charging + BT link to a smartphone
Test Date:	2015-02-24
Note:	

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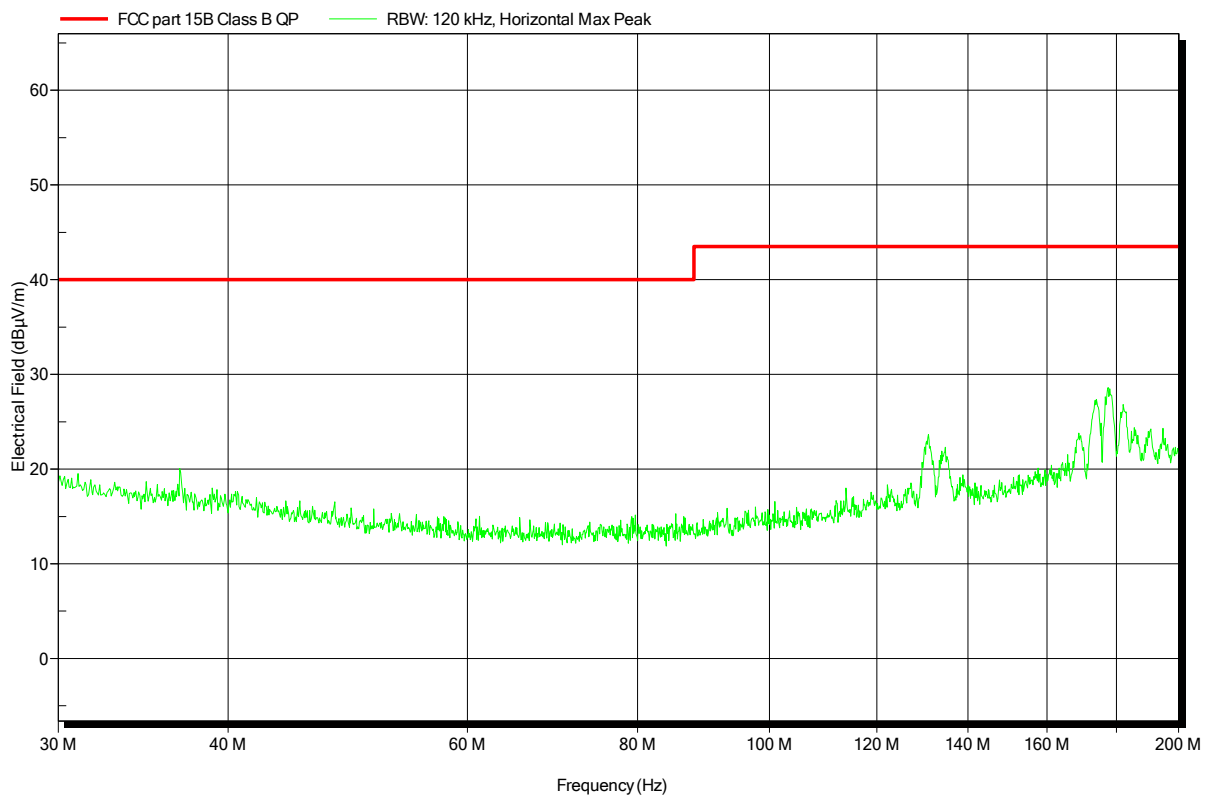


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Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m
Mode:	charging + BT link to a smartphone
Test Date:	2015-02-24
Note:	SETTE

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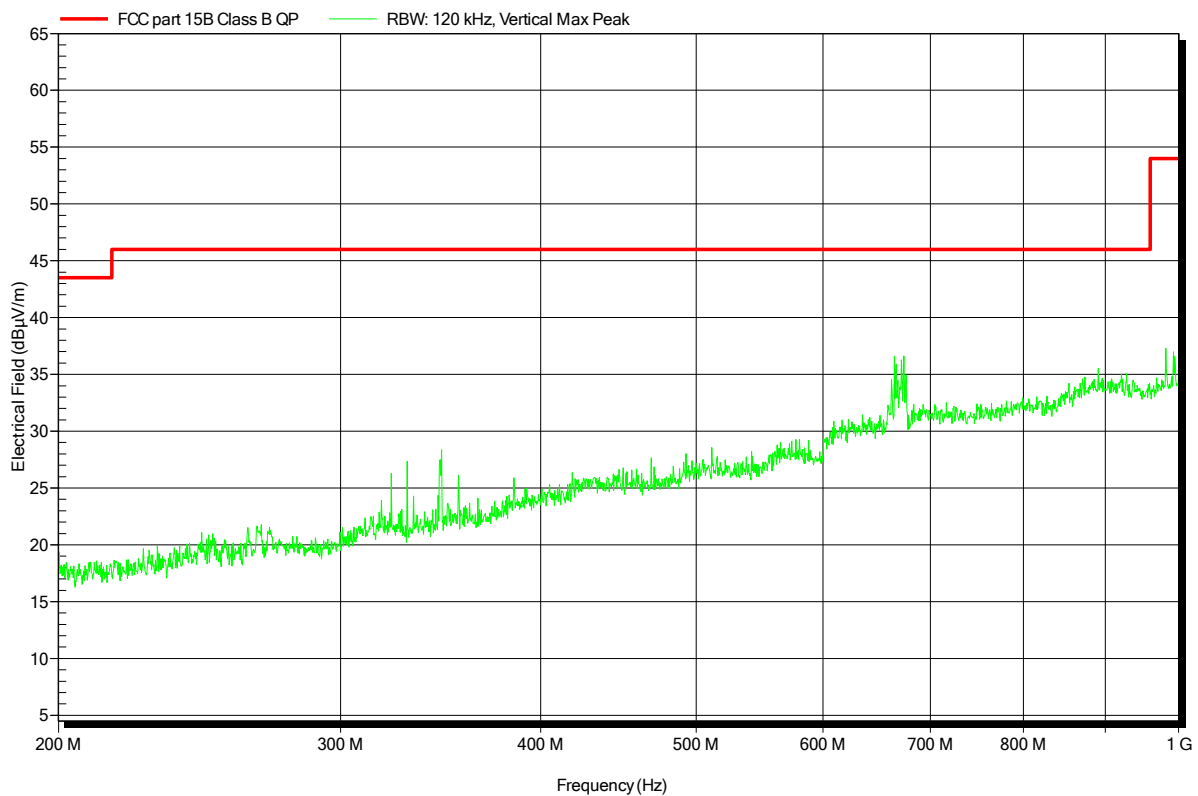


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Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3m
Mode:	charging + BT link to a smartphone
Test Date:	2015-02-24
Note:	SETTE

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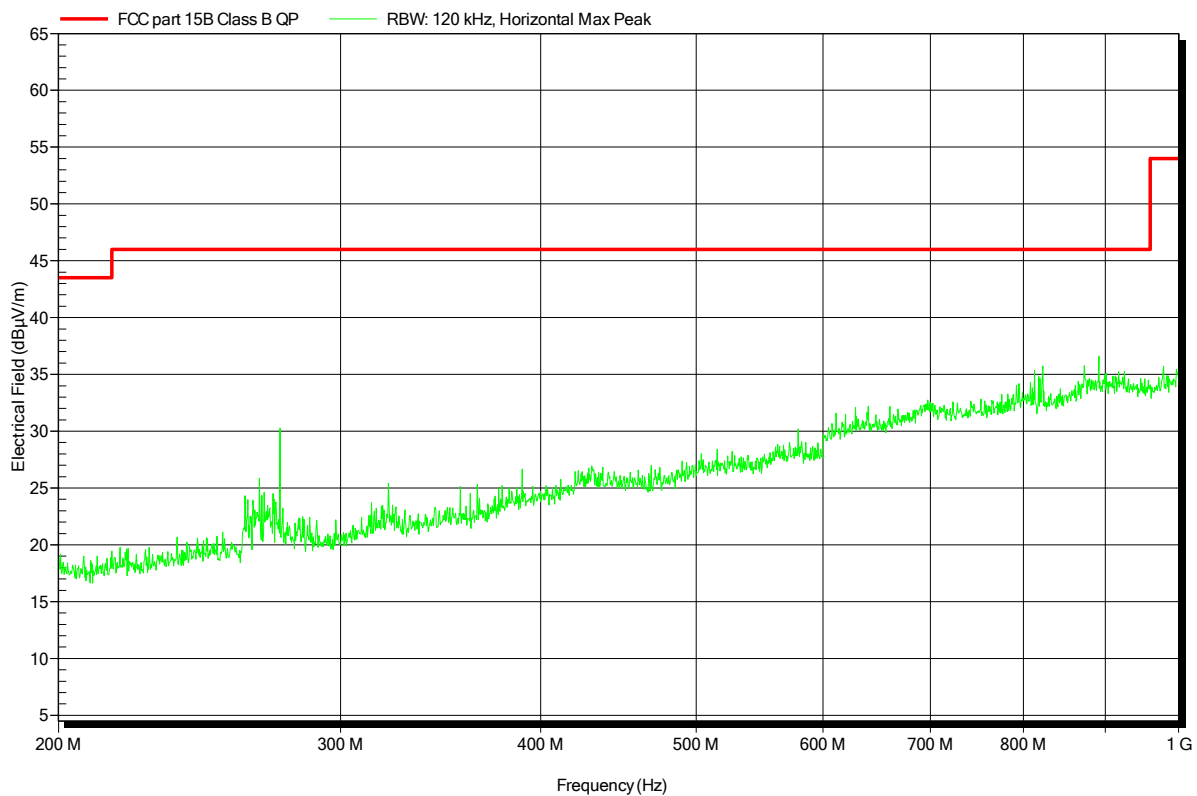


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 Operator: Mr. Zunke
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 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3m
 Mode: charging + BT link to a smartphone
 Test Date: 2015-02-24
 Note: SETTE

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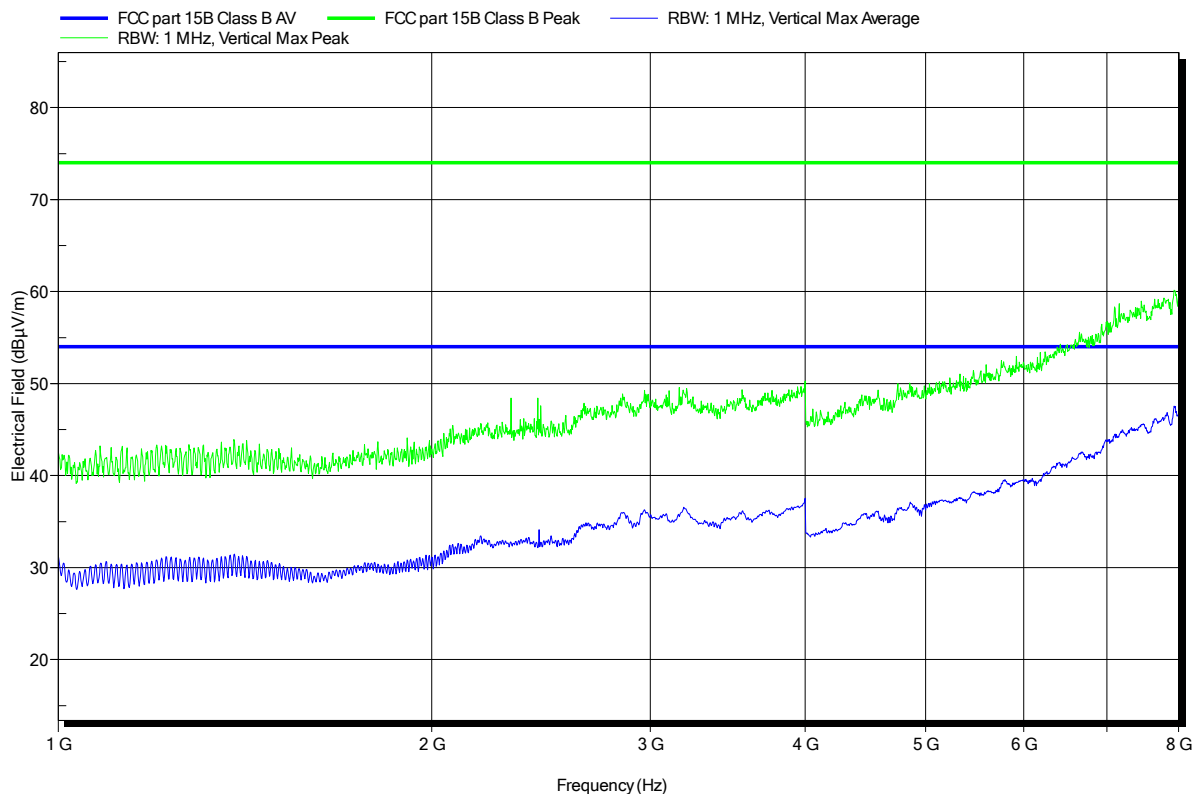


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 Model: SETTE
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Zunke
 Test Conditions: Tnom: 23°C, Unom: 3.7 VDC via AC/DC Adapter
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3m
 Mode: charging + BT link to a smartphone
 Test Date: 2015-02-24
 Note: SETTE

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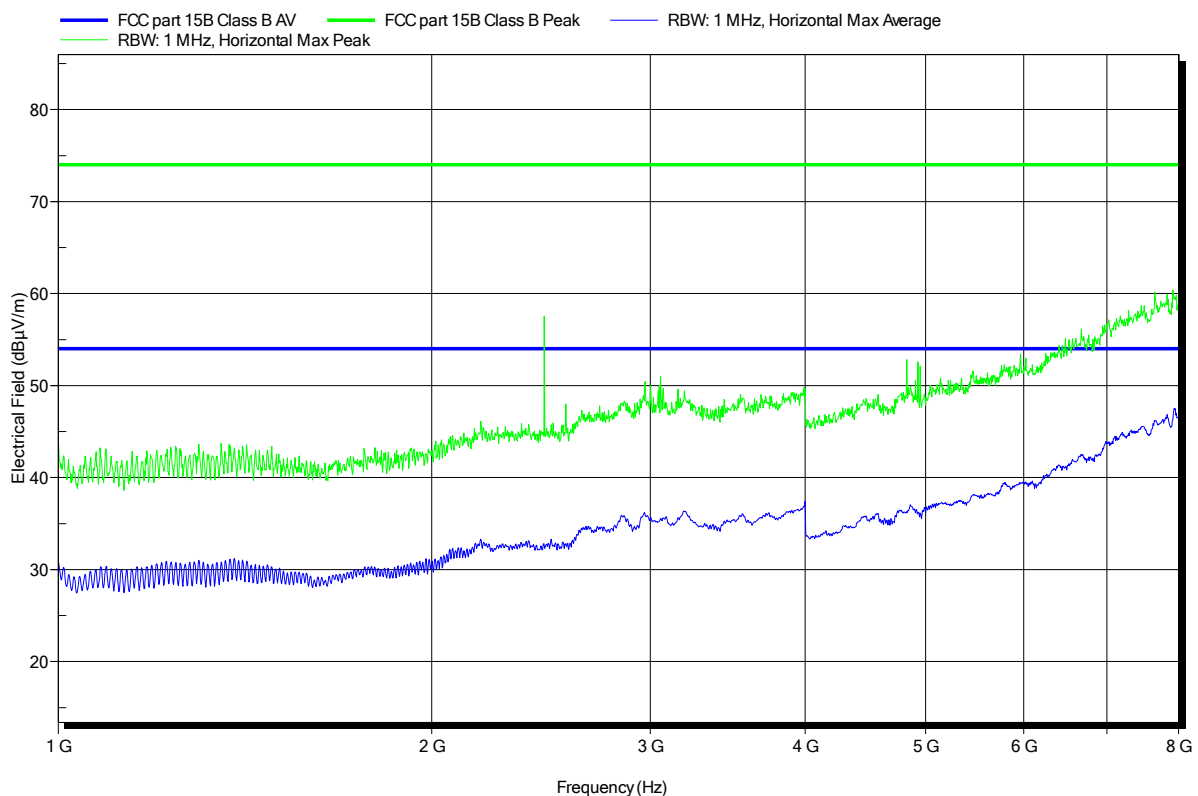


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 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3m
 Mode: charging + BT link to a smartphone
 Test Date: 2015-02-24
 Note: SETTE

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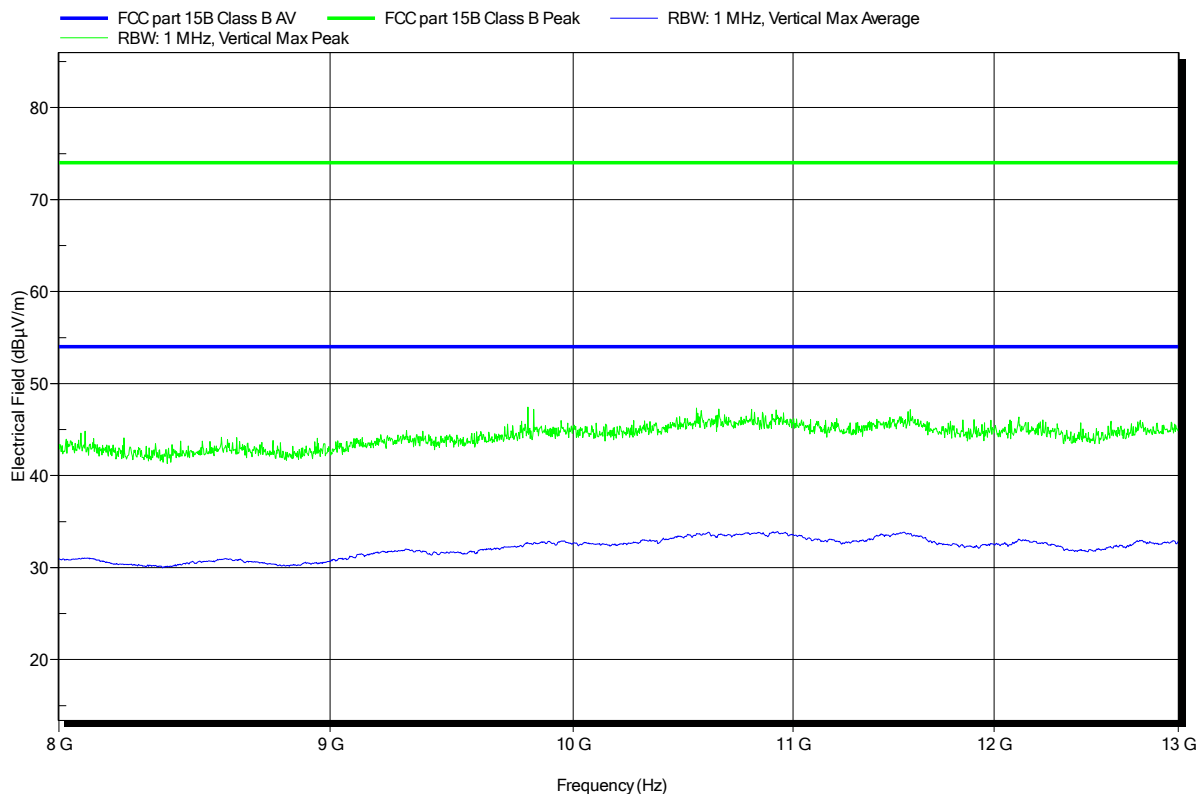


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 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement distance: 3m
 Mode: charging + BT link to a smartphone
 Test Date: 2015-02-24
 Note: SETTE

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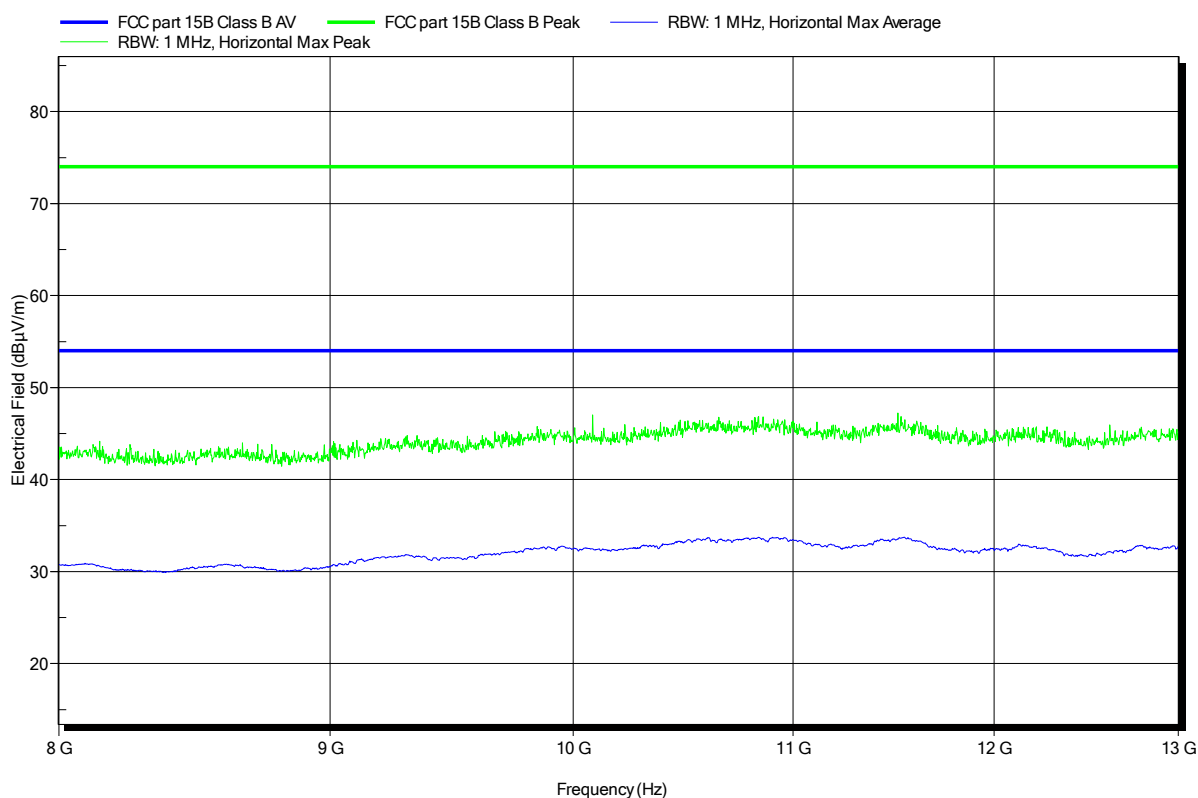


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 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3m
 Mode: charging + BT link to a smartphone
 Test Date: 2015-02-24
 Note: SETTE

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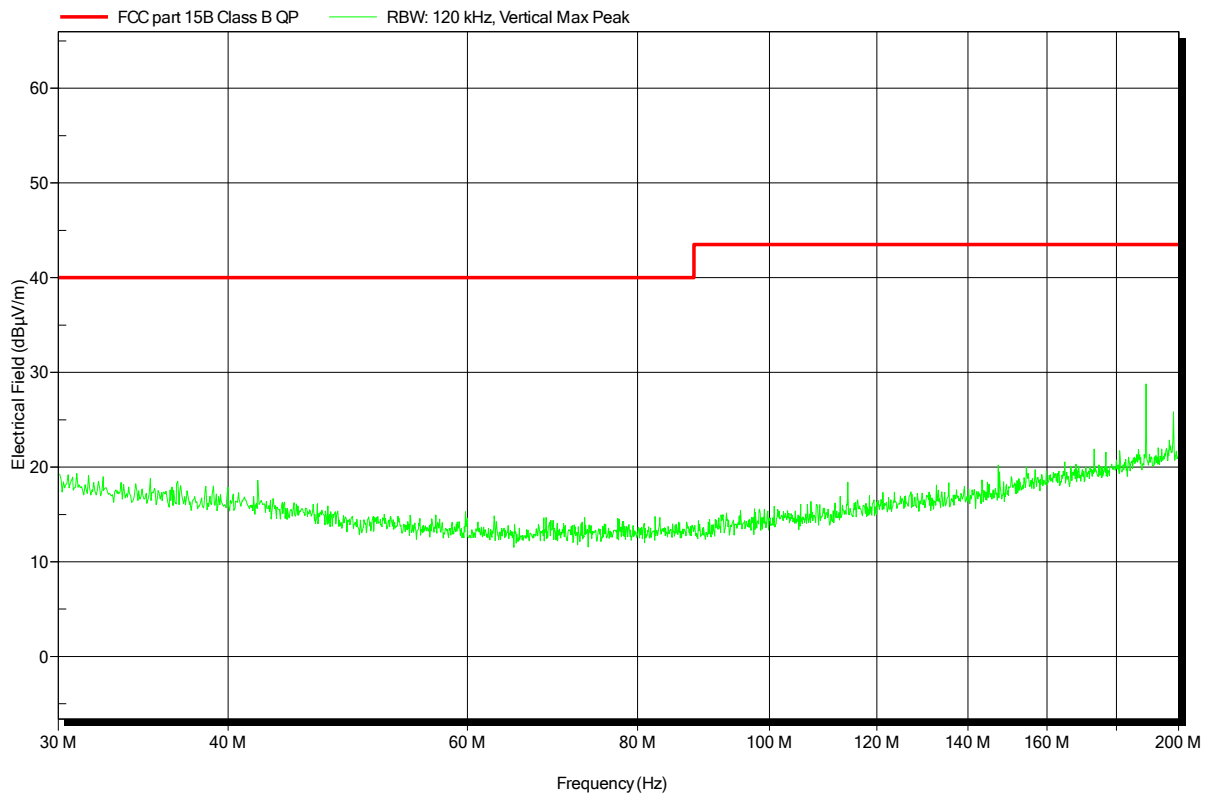


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 EUT Name: electric device
 Model: SETTE
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Zunke
 Test Conditions: Tnom: 23°C, Unom: 3.7 VDC (accu)
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3m
 Mode: vibrating + BT link to a smartphone
 Test Date: 2015-02-24
 Note:

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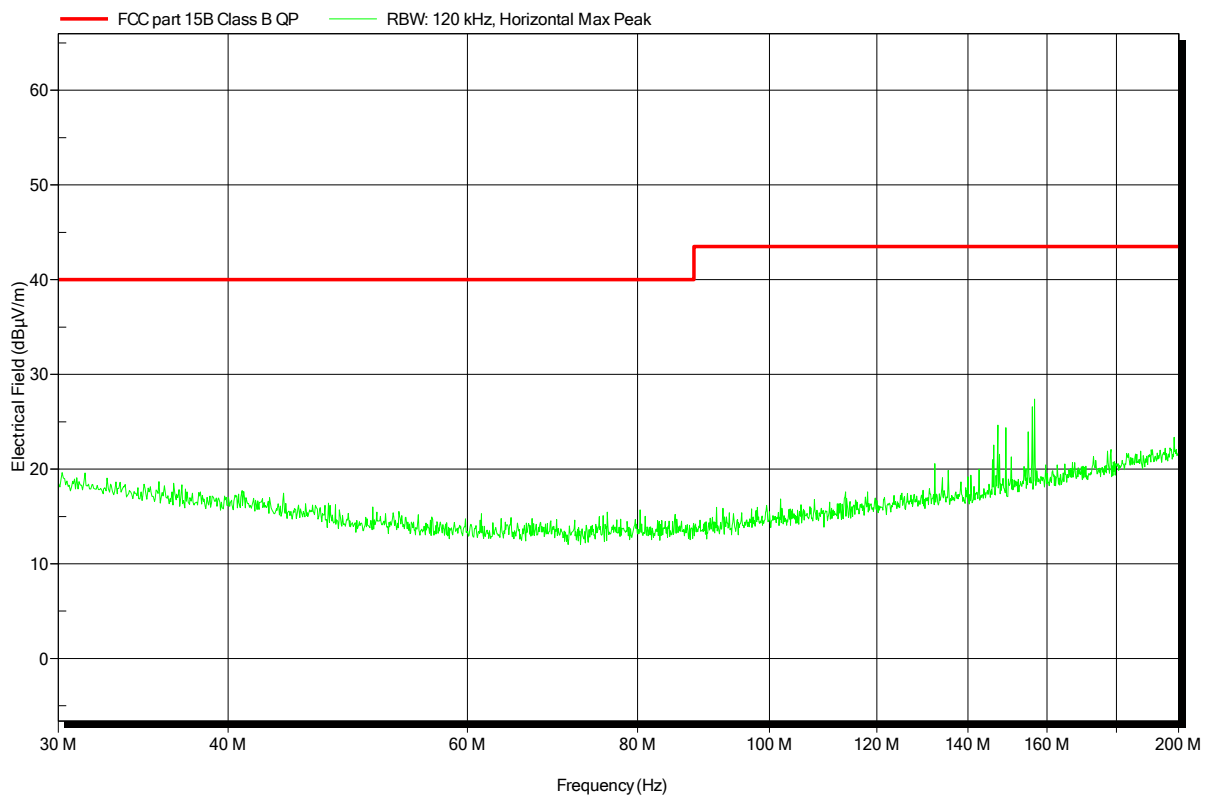


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 Measurement distance: 3m
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Test Report No.: G0M-1409-4154-EF0515B-V01

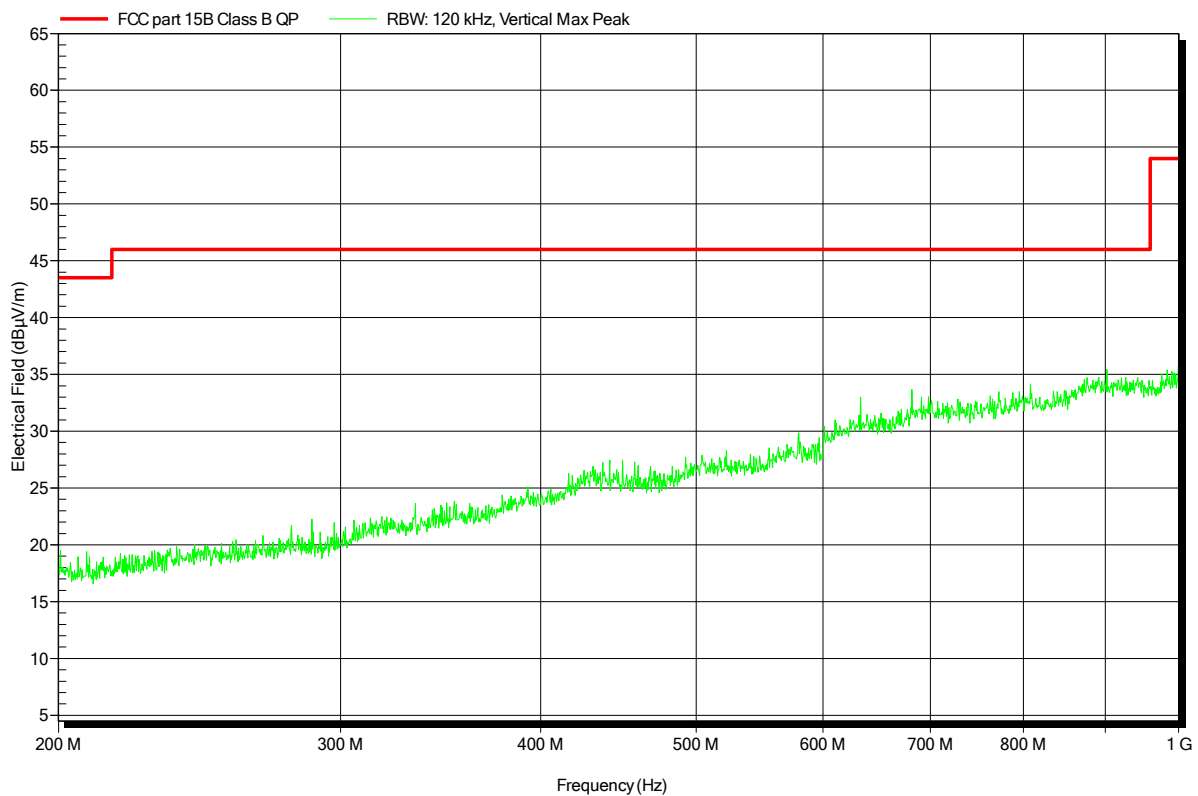
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions under normal conditions according to FCC 15B

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 Note:

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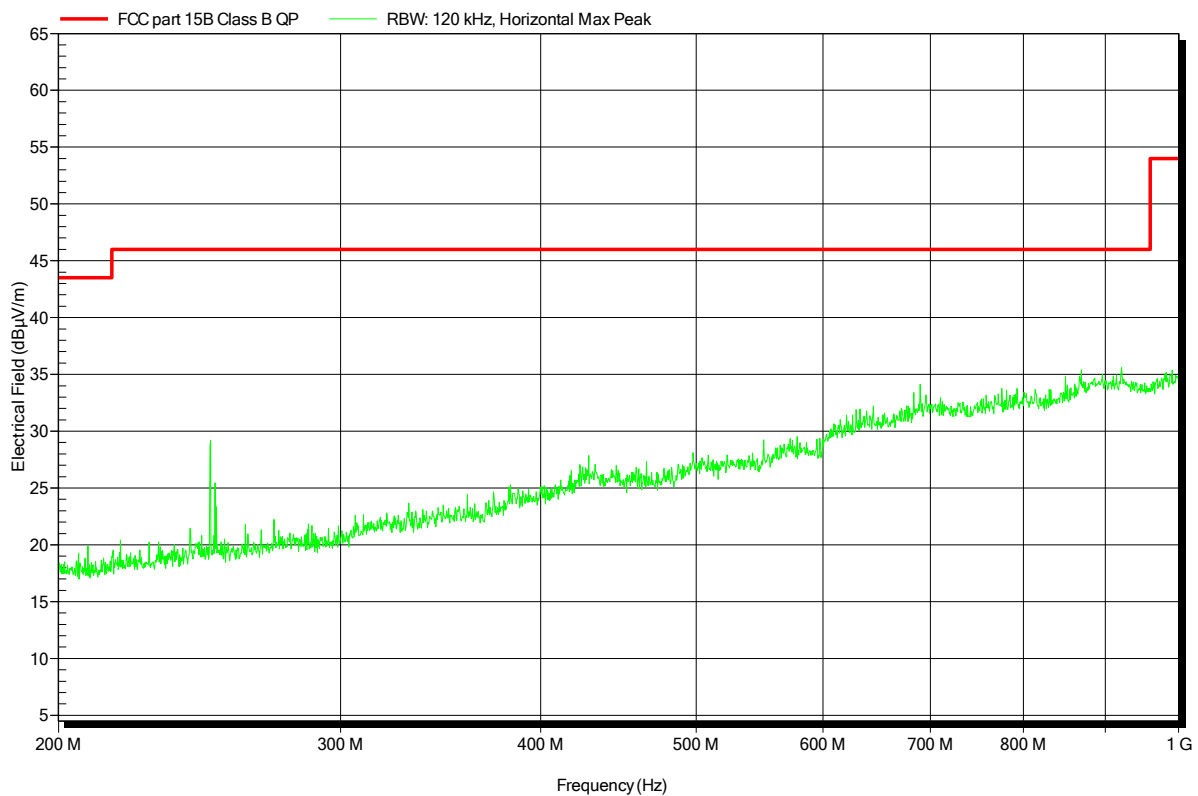


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 Note:

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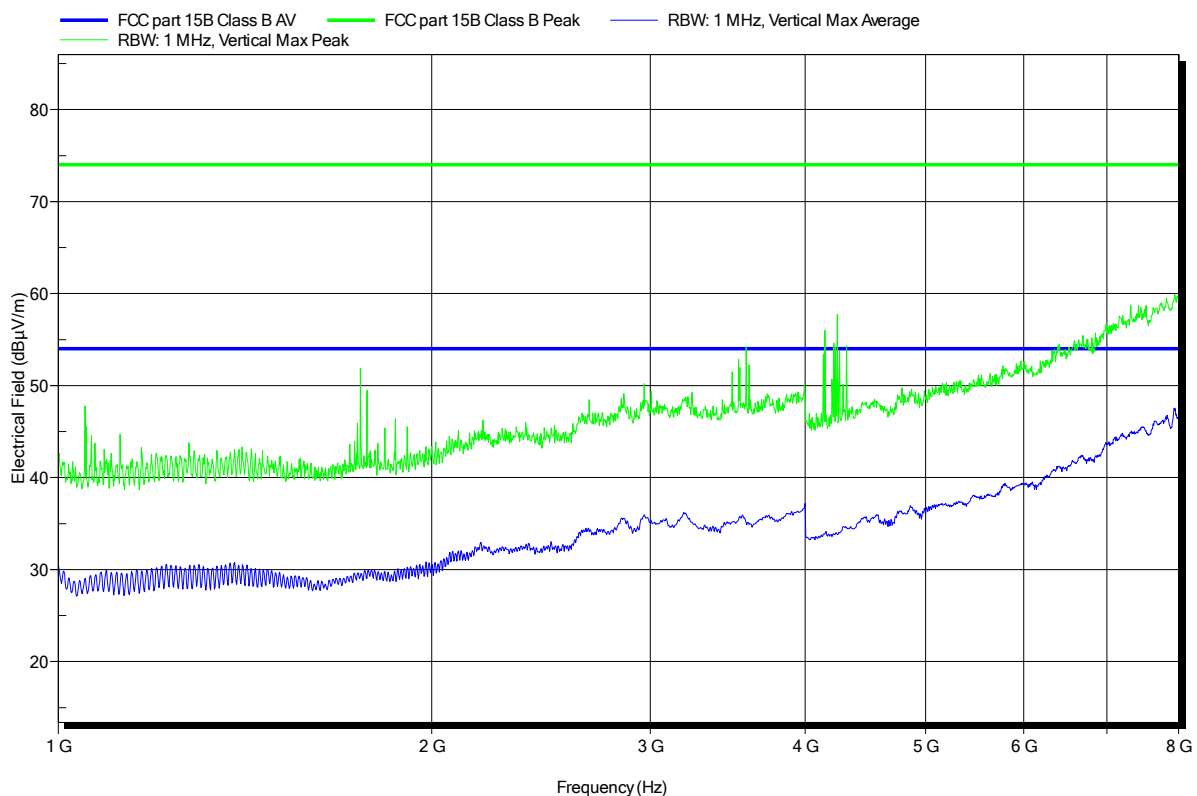


Spurious emissions under normal conditions according to FCC 15B

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 Note:

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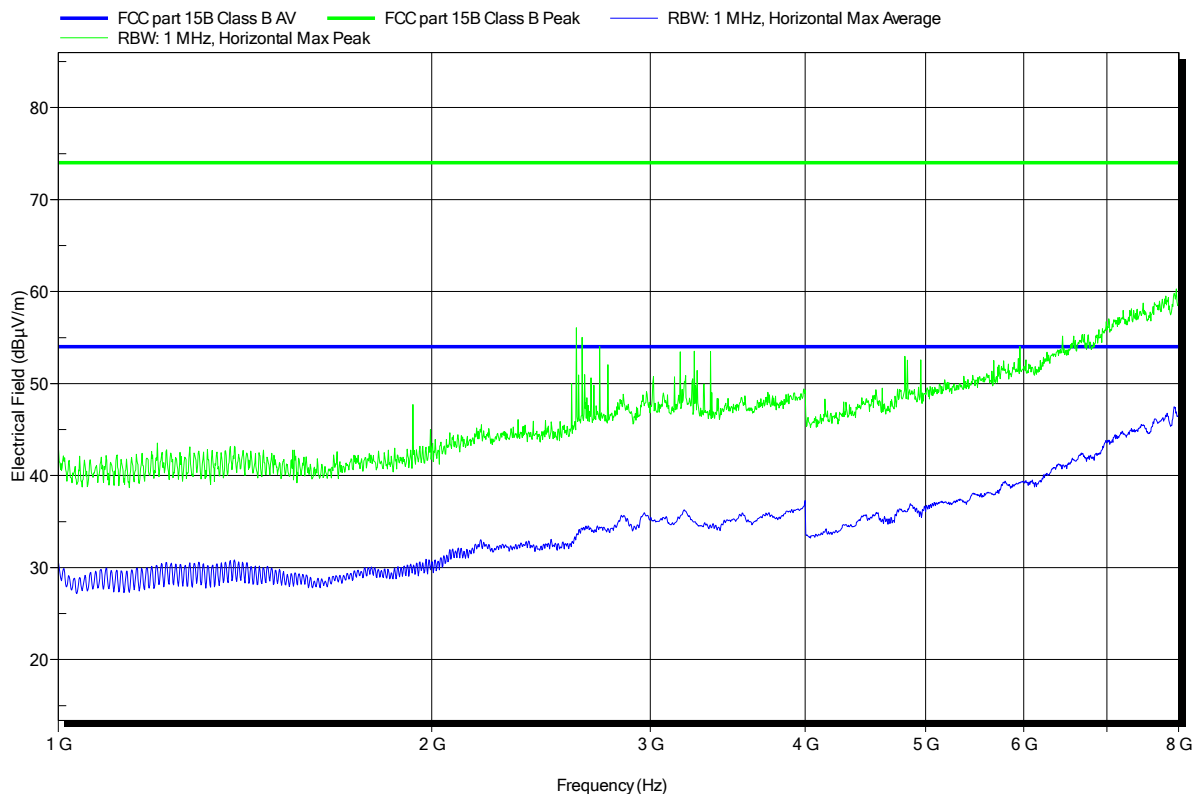


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 Measurement distance: 3m
 Mode: vibrating + BT link to a smartphone
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 Note:

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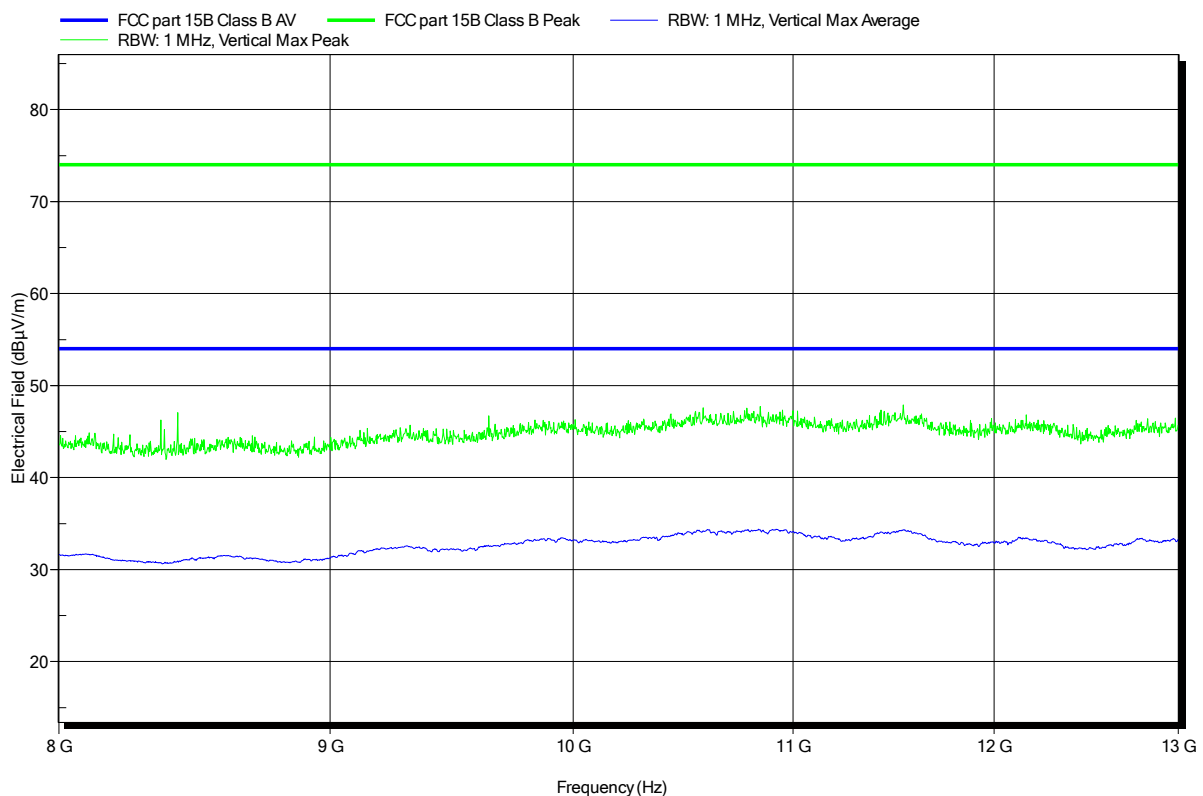


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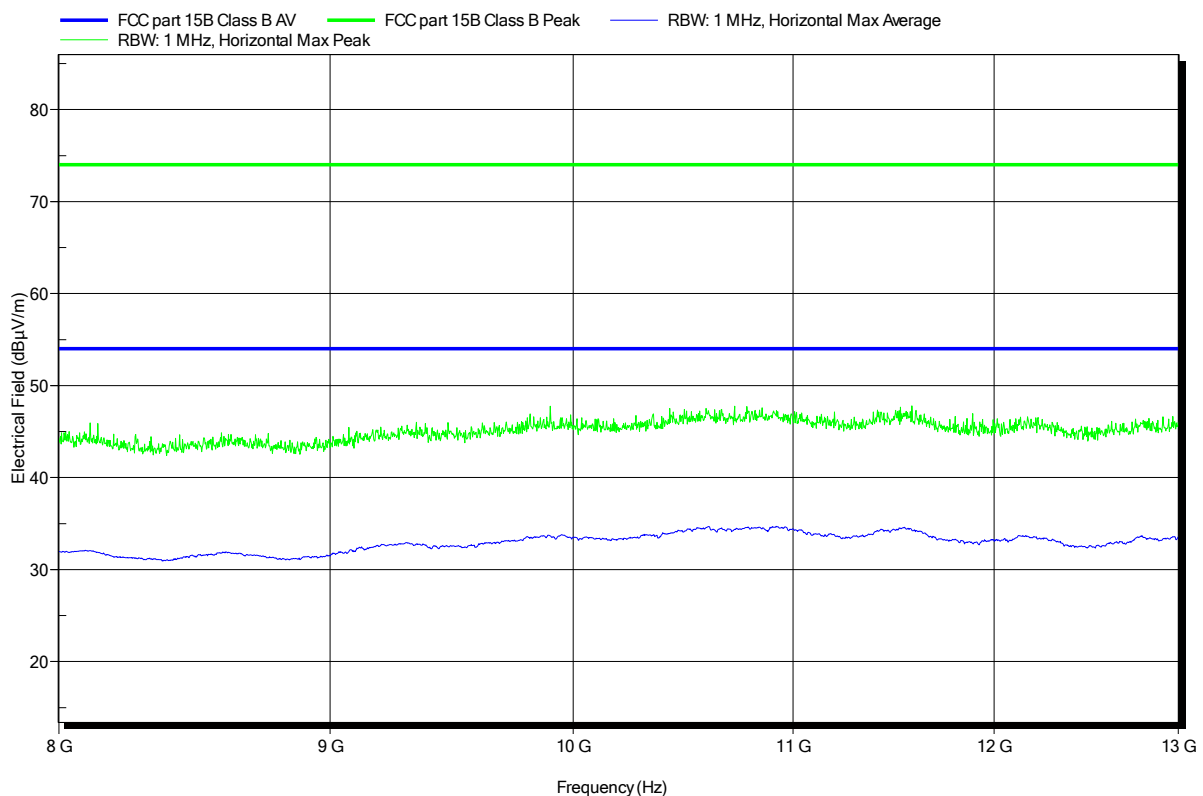


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 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement distance: 3m
 Mode: vibrating + BT link to a smartphone
 Test Date: 2015-02-24
 Note:

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3.2 Test Conditions and Results – AC power line conducted emissions

Conducted emissions acc. FCC 47 CFR 15.107 / IC RSS-Gen			Verdict: PASS	
Laboratory Parameters:		Required prior to the test	During the test	
Ambient Temperature		15 to 35 °C	21°C	
Relative Humidity		30 to 60 %	32%	
Test according referenced standards		Reference Method		
		ANSI C63.4		
Fully configured sample scanned over the following frequency range		Frequency range		
		0.15 MHz to 30 MHz		
Sample is tested with respect to the requirements of the equipment class		Equipment class		
		Class B		
Points of Application		Application Interface		
AC Mains		LISN		
Operating mode and configuration		mode 2, configuration 1		
Limits and results Class B				
Frequency [MHz]	Quasi-Peak [dBµV]	Result	Average [dBµV]	Result
0.15 to 5	66 to 56*	PASS	56 to 46*	PASS
0.5 to 5	56	PASS	46	PASS
5 to 30	60	PASS	50	PASS
Comments:				
* Limit decreases linearly with the logarithm of the frequency.				

Test Procedure:

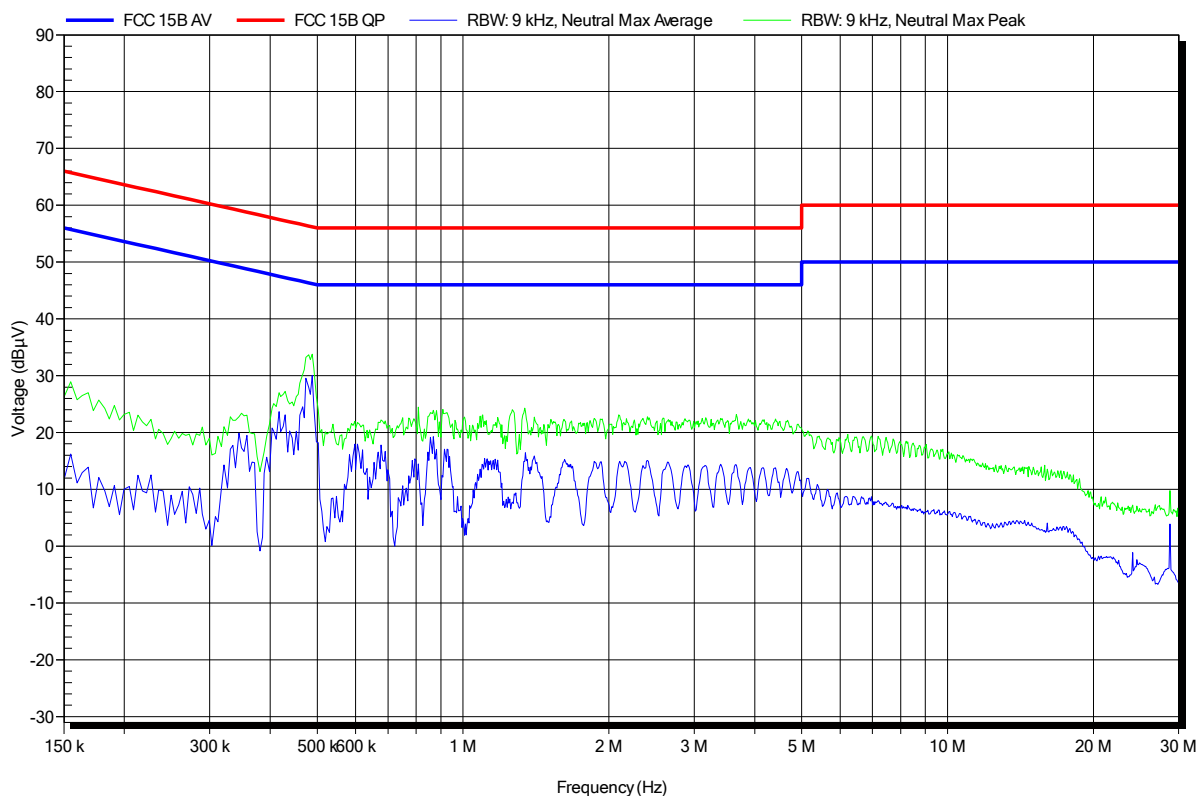
- 1) The EUT was placed on a non conductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2009 item 7.3.1)
- 2) The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN.
- 3) The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length).
- 4) The LISN measurement port was connected to a measurement receiver
- 5) I/O cables were bundled not longer than 0.4 m
- 6) Measurement was performed in the frequency range 0.15 – 30MHz on each current-carrying conductor

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

Project number: G0M-1409-4154

Manufacturer: Amor Gummiwaren GmbH
 EUT Name: electric device
 Model: Sette
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 24°C, Unom: 3.0VDC (accu)
 LISN: ESH2-Z5 N
 Mode: charging
 Test Date: 2015-02-24
 Note:

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Test Report No.: G0M-1409-4154-EF0515B-V01

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 Operator: Mr. Pflug
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 LISN: ESH2-Z5 L
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