EMC TEST REPORT

FCC 47 CFR Part 15B
Industry Canada RSS-Gen

Electromagnetic compatibility - Unintentional radiators

Report Reference No. ..... :	G0M-1409-4154-EF0415B-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.	Tre
Additional Models	None
Hardware version	V2.0
Firmware / Software version	BLE-Stack SD110 V6.0.0
	FCC-ID: 2ADAR504003 IC: 12372A-504003
Test result	**Passed**

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 ..... :	2014-12-05
Date (s) of performance of tests ..... :	2014-12-23
Compiled by..... :	Jens Marquardt
Tested by (+ signature)..... :	Jens Marquardt
Approved by (+ signature) ..... :	Marcus Klein
Date of issue..... :	2014-12-23
Total number of pages..... :	23
General remarks:	
The test results presented in this report relate only to the object tested.	
The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.	
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.	
Additional comments:	

Version History

Version	Issue Date	Remarks	Revised by
V01	2014-12-23	Initial Release	

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

REPORT INDEX

1 Equipment (Test item) Description

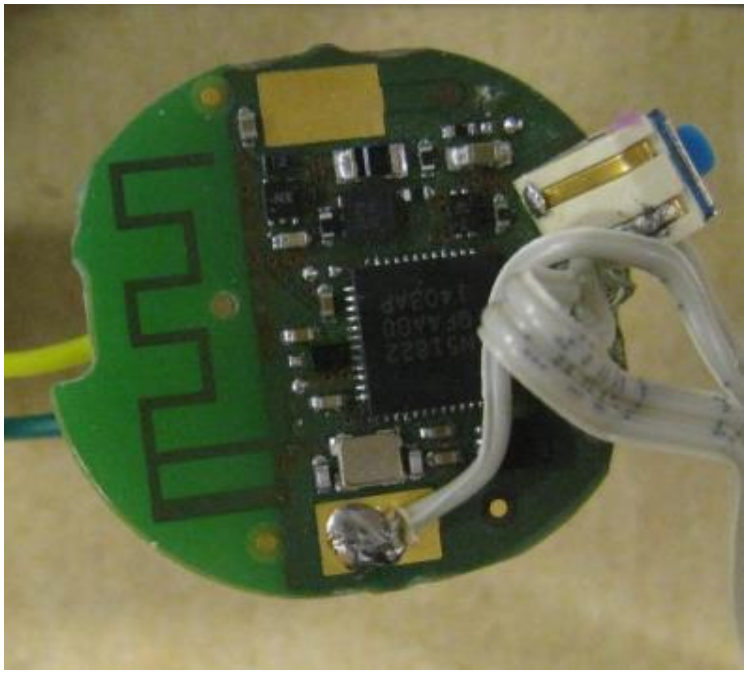
Description	electric device
Model	Tre
Additional Models	None
Serial number	None
Hardware version	V2.0
Software / Firmware version	BLE-Stack SD110 V6.0.0
FCC-ID	2ADAR504003
IC-ID	12372A-504003
Power supply	3 VDC battery
Manufacturer	Amor Gummiwaren GmbH August-Rost-Straße 4 99310 Arnstadt GERMANY
Highest emission frequency	Fmax [MHz] = 2540
Device classification	Class B
Equipment type	Tabletop
Number of tested samples	1

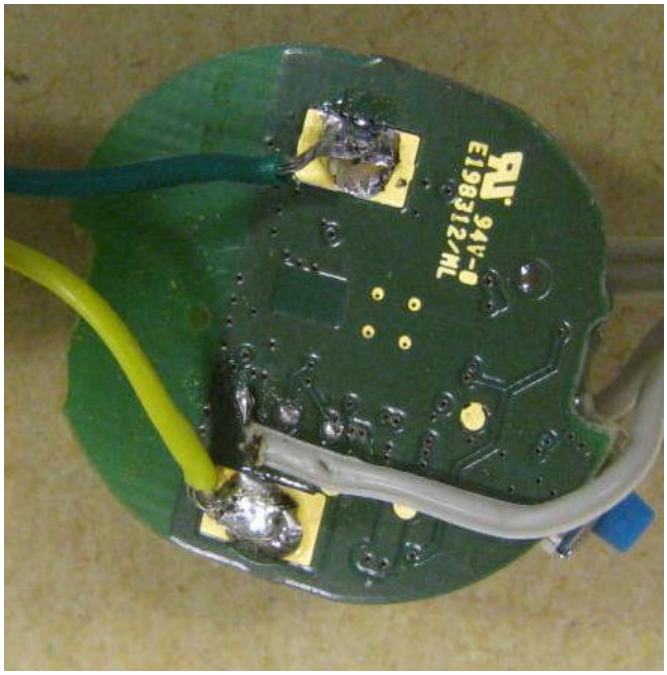
1.1 Photos – Equipment external

EUT


EUT


1.2 Photos – Equipment internal

EUT PCB Top


EUT PCB Bottom


1.3 Photos – Test setup

Test Setup : Radiated Emissions


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

Configuration #	EUT Configuration
1	EUT in normal operation mode

1.7 Test Equipment Used During Testing

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

Radiated emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Biconical Antenna	R&S	HK 116	EF00012	2013-02	2016-02
LPD-Antenne	R&S	HL 223	EF00187	2014-03	2017-03
Horn antenna	Schwarzbeck	BBHA 9120D	EF00018	2013-09	2016-09
EMI Test Receiver	R&S	ESU26	EF00887	2014-01	2015-01

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:

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

Net:

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

Limit:

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

Limit (dBµV/m) = 20*log (µV/m)

Margin:

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

Example only:

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

2 Result Summary

FCC 47 CFR Part 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	N/A	battery only
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	23°C
Relative Humidity	30 to 60 %	34%
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 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:

Test Procedure:

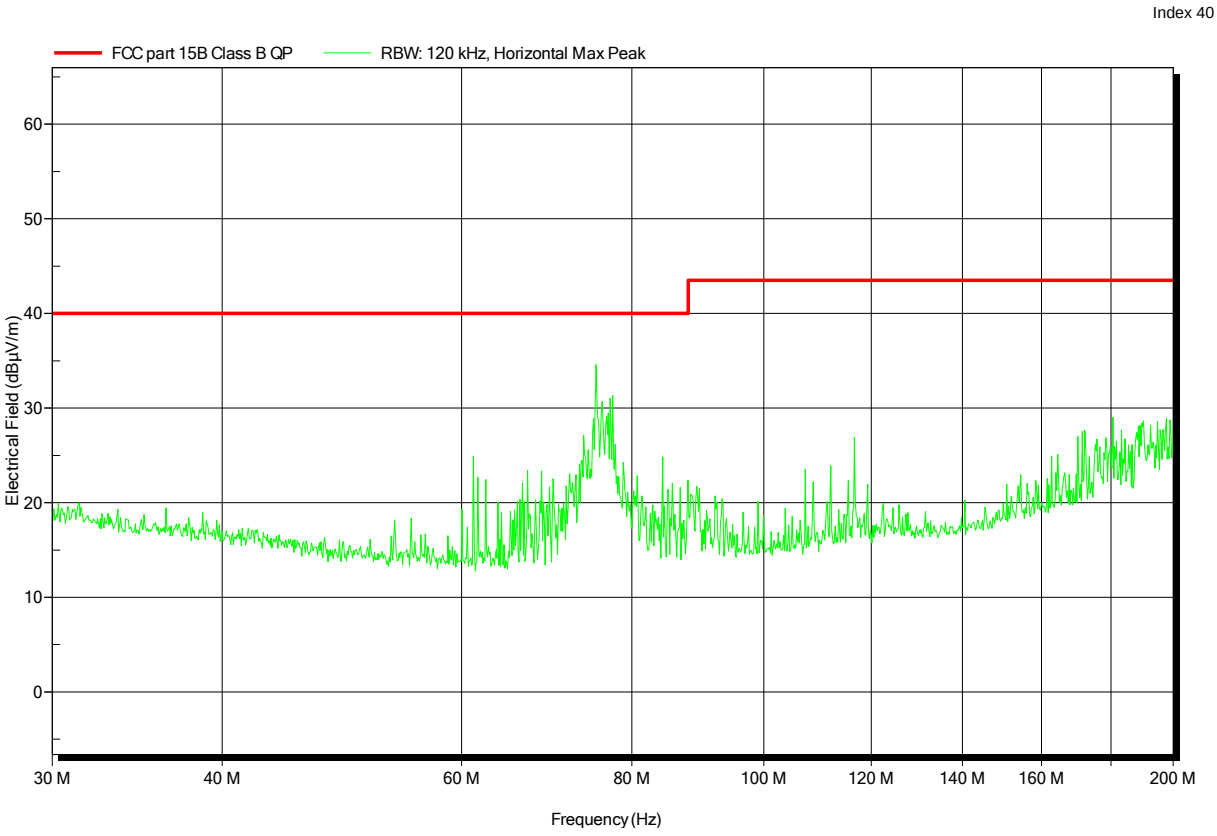
The test site is in accordance with ANSI C63-4:2009 requirements and is listed by FCC.
The measurement procedure is as follows:

1) The EUT was placed on a 0.8 m non conductive table at a 3 m distance from the receive antenna (ANSI C63.4: 2009 item 6.2)
2) The antenna output was connected to the measurement receiver
3) A biconical antenna was used for the frequency range 30 – 200 MHz, a logarithmic periodical antenna was used for the frequency range from 200 – 1000 MHz. Above one 1 GHz a Double Ridged Broadband Horn antenna was used. The antenna was placed on an adjustable height antenna mast
4) Emissions were maximized at each frequency by rotating the EUT and adjusting the receive antenna height and polarization. The maximum values were recorded.

Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1409-4154

Manufacturer:	Amor Gummiwaren GmbH
EUT Name:	electric device
Model:	Tre
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Marquardt
Test Conditions:	Tnom: 23°C, Unom: 3 VDC (battery)
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m
Mode:	vibrating + BT
Test Date:	2014-12-23
Note:	



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Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3m
Mode:	vibrating + BT
Test Date:	2014-12-23
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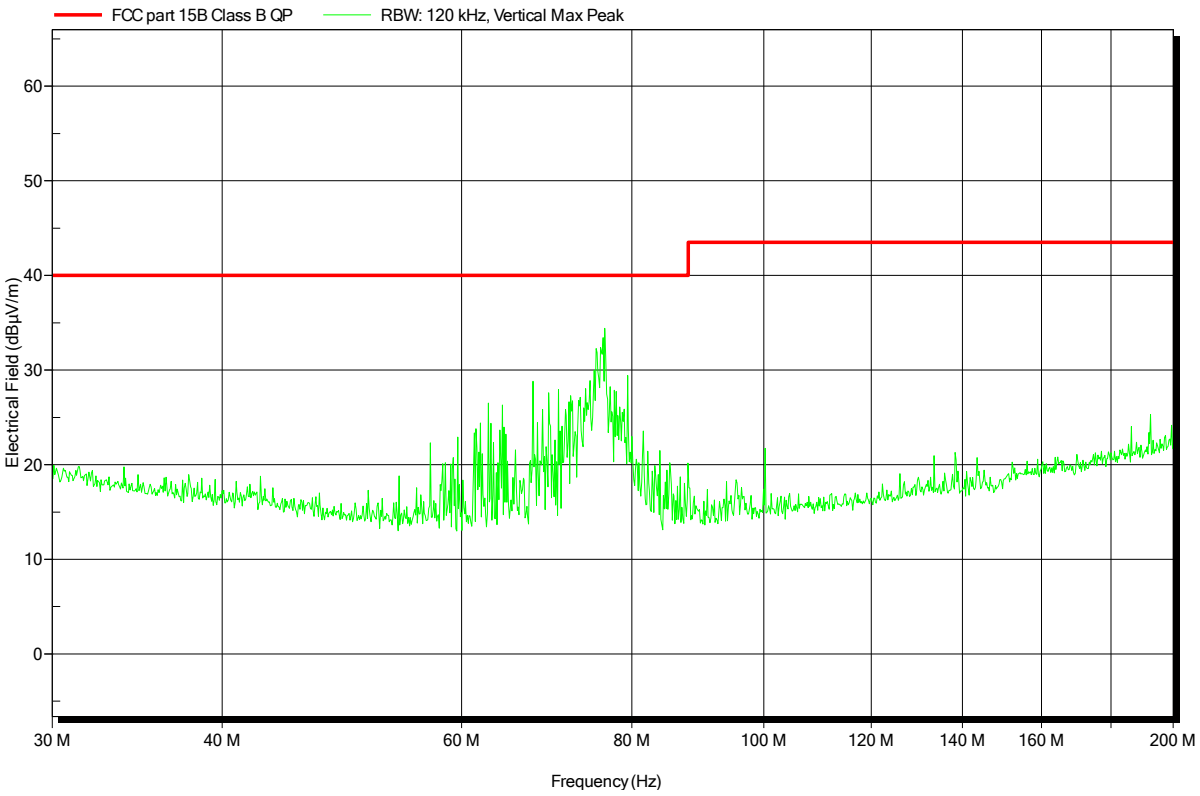

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Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3m
Mode:	vibrating + BT
Test Date:	2014-12-23
Note:	

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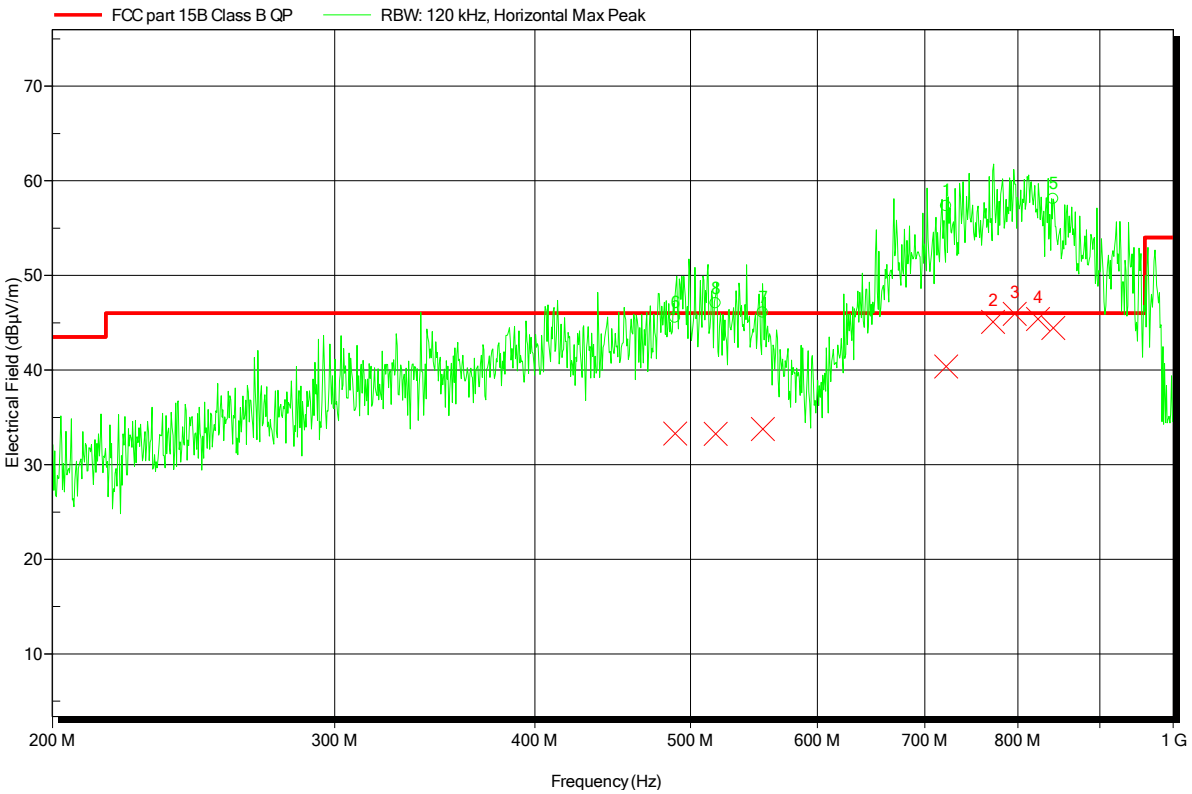

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
489.15 MHz	33.28 dBµV/m	46 dBµV/m	-12.72 dB	Pass
518.385 MHz	33.27 dBµV/m	46 dBµV/m	-12.73 dB	Pass
554.873 MHz	33.75 dBµV/m	46 dBµV/m	-12.25 dB	Pass
721.606 MHz	40.39 dBµV/m	46 dBµV/m	-5.61 dB	Pass
771.926 MHz	45.09 dBµV/m	46 dBµV/m	-0.91 dB	Pass
796.291 MHz	45.94 dBµV/m	46 dBµV/m	-0.06 dB	Pass
823.411 MHz	45.39 dBµV/m	46 dBµV/m	-0.61 dB	Pass
841.576 MHz	44.46 dBµV/m	46 dBµV/m	-1.54 dB	Pass

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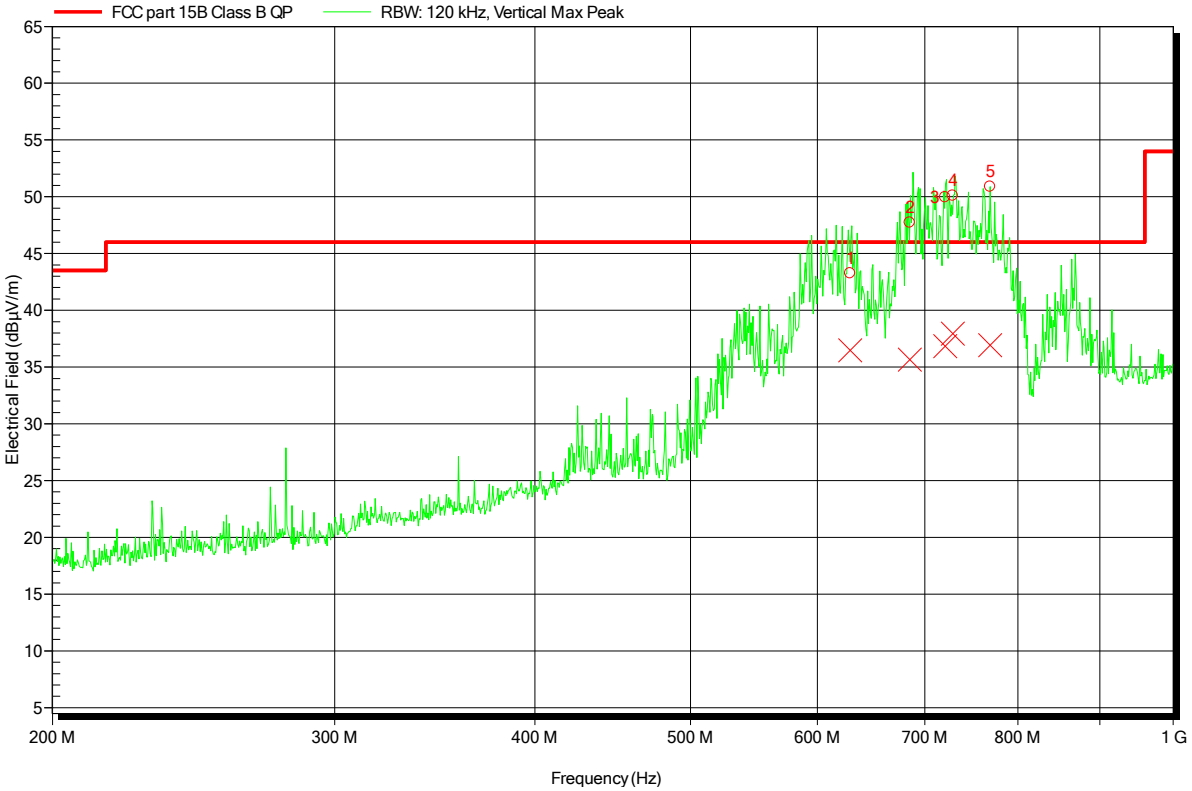

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
629.03 MHz	36.48 dBµV/m	46 dBµV/m	-9.52 dB	Pass
685.04 MHz	35.64 dBµV/m	46 dBµV/m	-10.36 dB	Pass
720.86 MHz	36.84 dBµV/m	46 dBµV/m	-9.16 dB	Pass
728.72 MHz	37.93 dBµV/m	46 dBµV/m	-8.07 dB	Pass
768.662 MHz	36.93 dBµV/m	46 dBµV/m	-9.07 dB	Pass

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Operator:	Mr. Marquardt
Test Conditions:	Tnom: 23°C, Unom: 3 VDC (battery)
Antenna:	Schwarzbeck BBHA 9120D, horizontal
Measurement distance:	3m
Mode:	vibrating + BT
Test Date:	2014-12-23
Note:	

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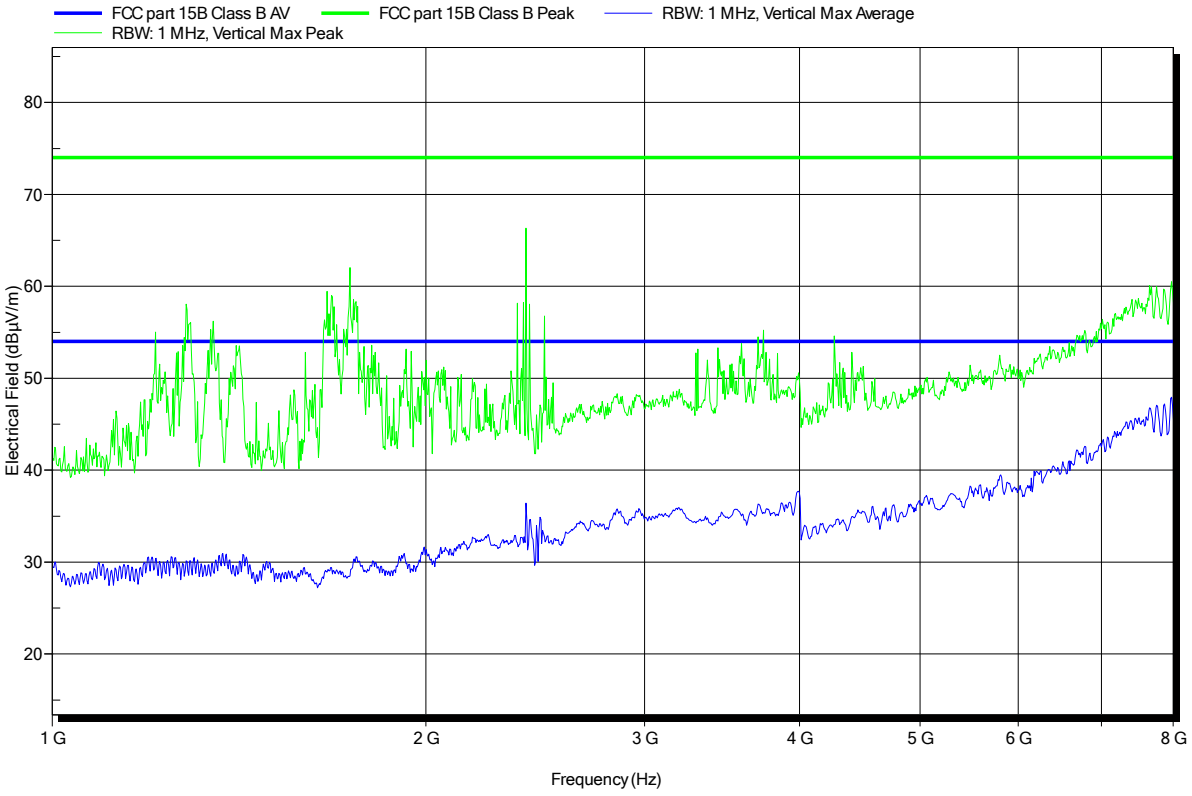

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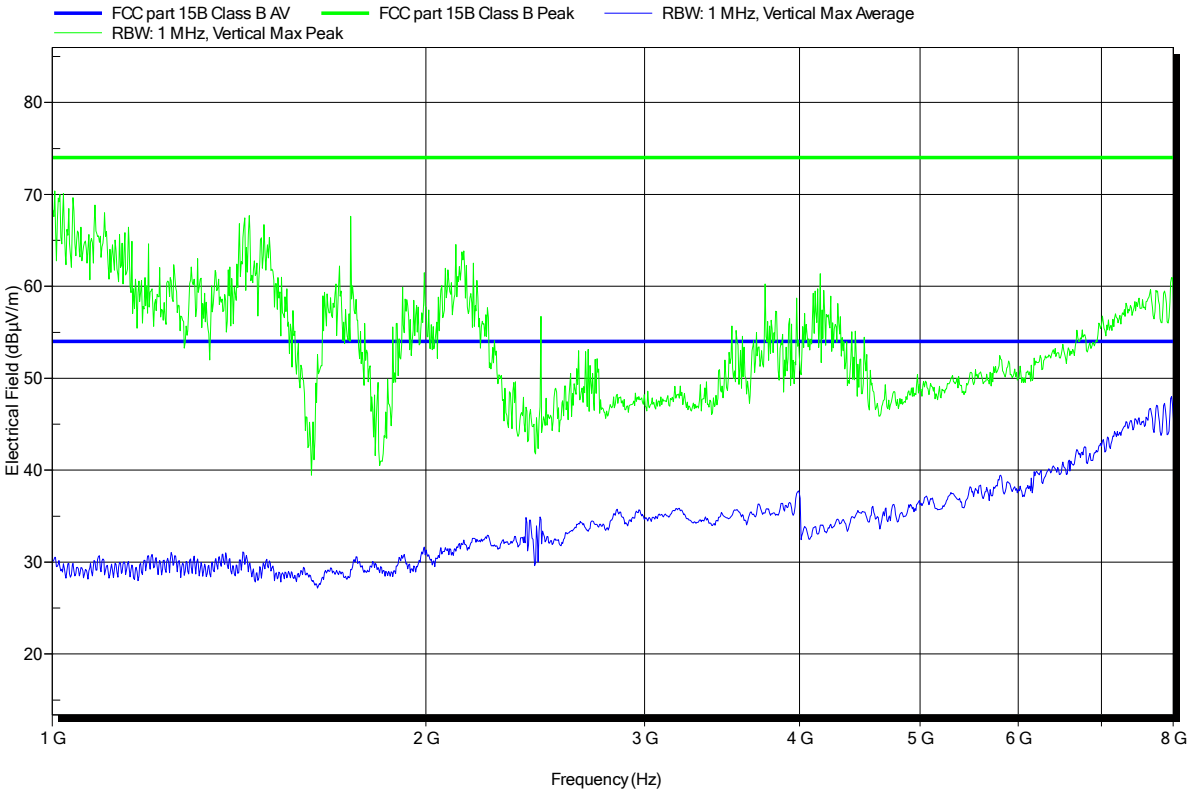

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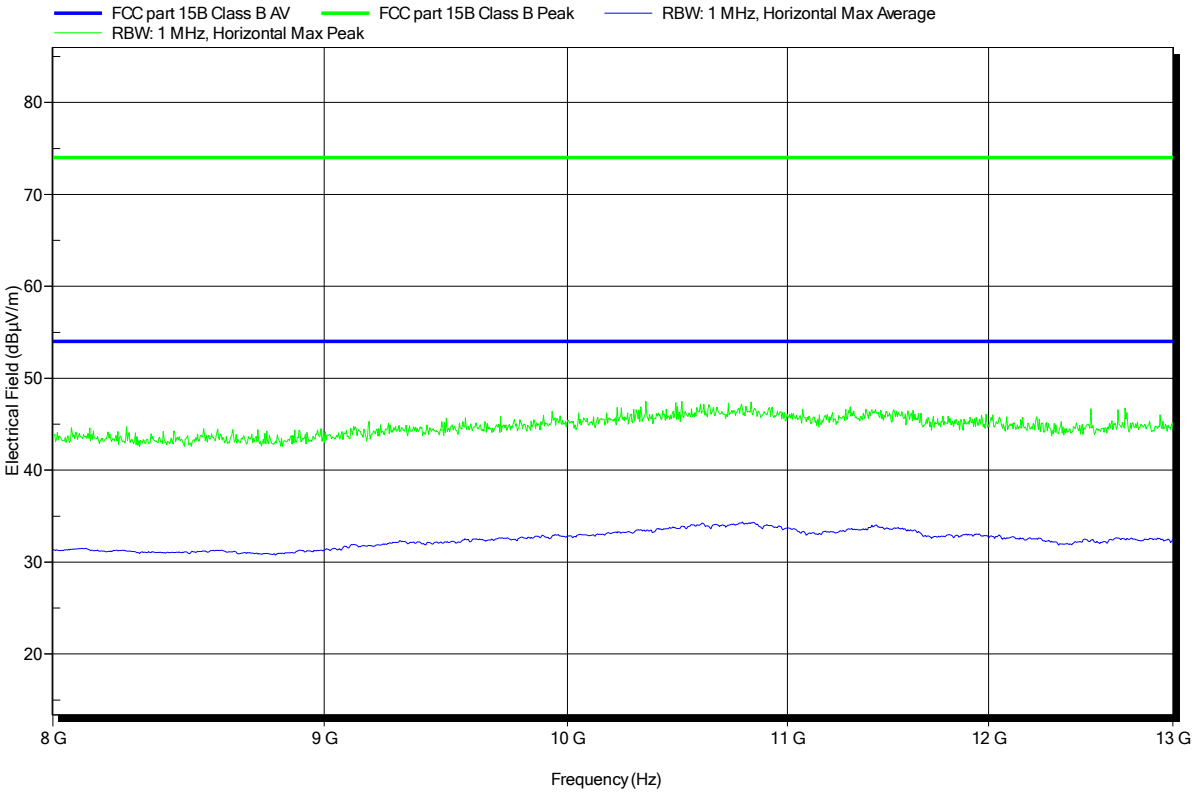

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