

EMC TEST REPORT

FCC 47 CFR Part 15B
Industry Canada RSS-Gen

Electromagnetic compatibility - Unintentional radiators

Report Reference No.: G0M-1302-2616-EF01-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: Agilion GmbH

Address: Blankenauer Str. 74
09113 Chemnitz
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	WIRELESS TAG DRIVE
Model No.	6021318
Additional Models	None
Hardware version	1.0
Firmware / Software version	2.0
	FCC-ID: SCF6021318

Test result: **Passed**

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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: 2013-02-21

Date (s) of performance of tests: 2013-02-22

Compiled by: Christian Weber

Tested by (+ signature).....: Marcus Klein



Approved by (+ signature): Toralf Jahn



Date of issue: 2013-04-09

Total number of pages: 19

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:

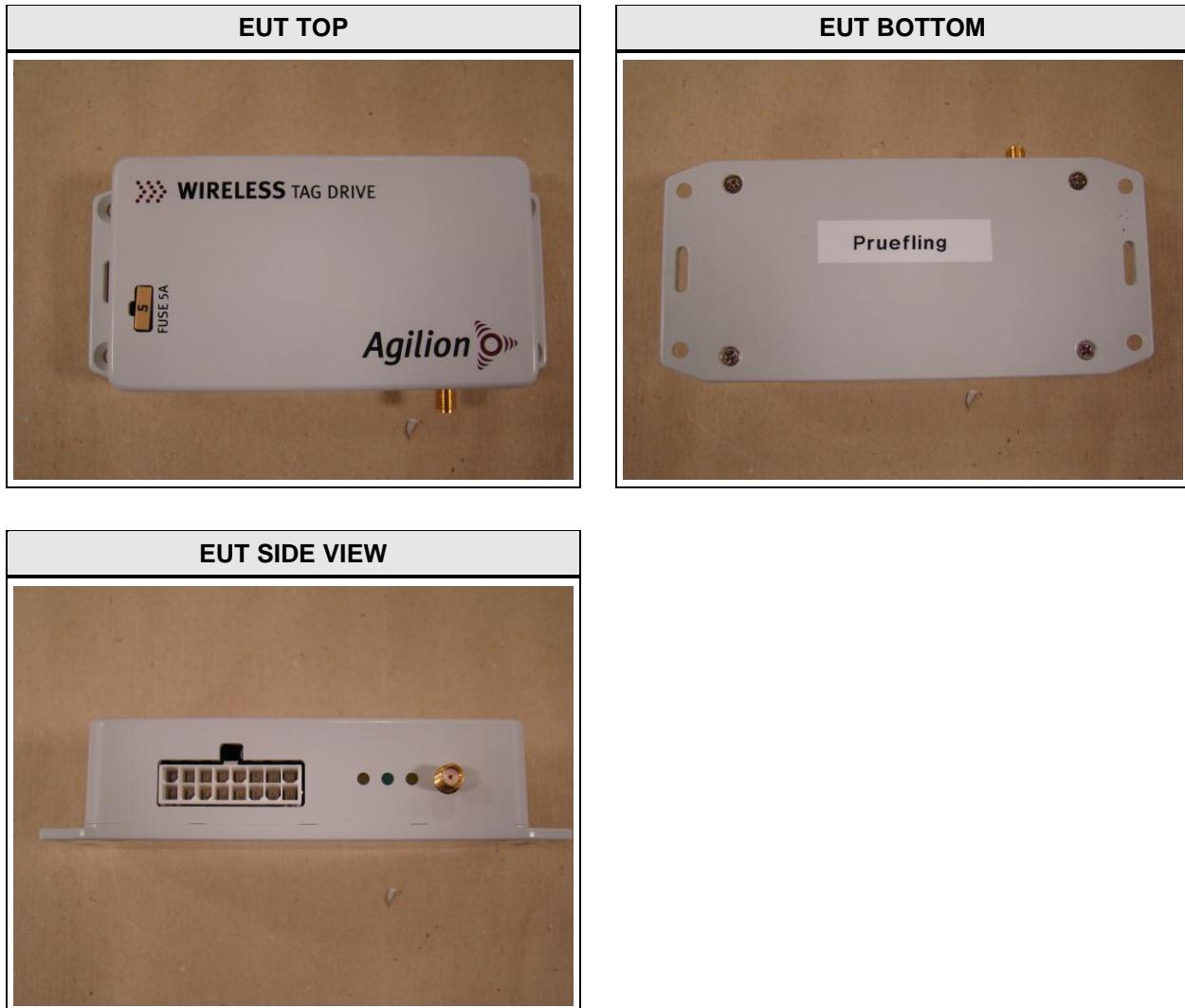
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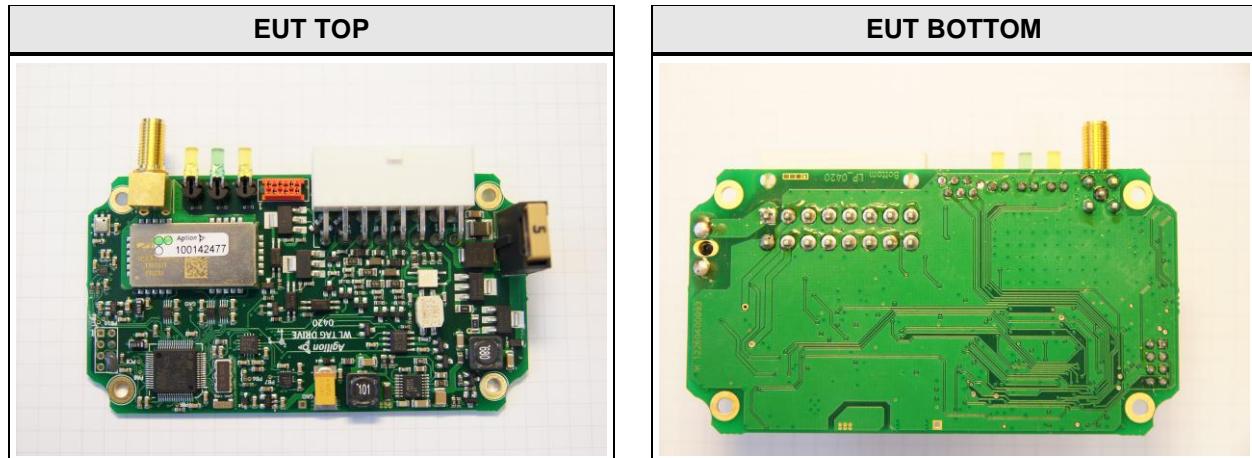
1 Equipment (Test item) Description

Description	WIRELESS TAG DRIVE	
Model	6021318	
Additional Models	None	
Serial number	None	
Hardware version	1.0	
Software / Firmware version	2.0	
FCC-ID	SCF6021318	
Power supply	24 VDC	
AC/DC-Adaptor	None	
Radio module	Type	CHIRP Spread Spectrum
	Model	nanoPAN 5375
	Manufacturer	Nanotron Technologies GmbH
	HW Version	unspecified
	SW Version	unspecified
	FCC-ID	SIFNANOPAN5375V1
Manufacturer	Agilion GmbH Blankenauer Str. 74 09113 Chemnitz GERMANY	
Highest emission frequency	Fmax [MHz] = 168	
Device classification	Class B	
Equipment type	Tabletop	
Number of tested samples	1	

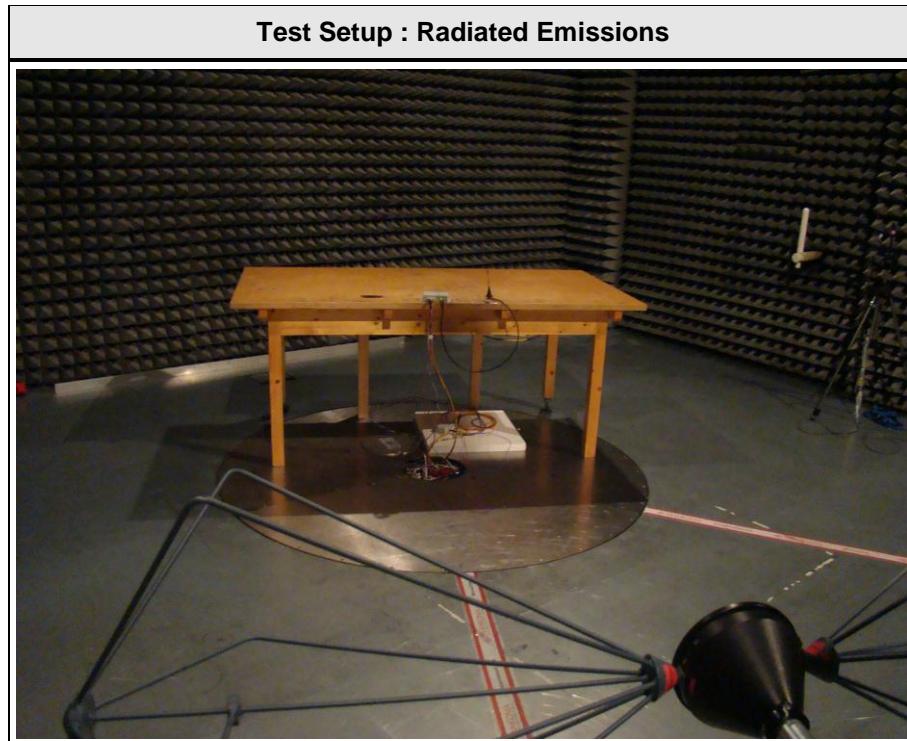
1.1 Photos – Equipment external



1.2 Photos – Equipment internal



1.3 Photos – Test setup



1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
AE	Companion Device	Agilion	Wireless Tag Drive	

***Note:** Use the following abbreviations:

AE : Auxiliary/Associated Equipment, or

SIM : Simulator (Not Subjected to Test)

CABL : Connecting cables

1.5 Operating Modes

Mode #	Description
1	Active Communication with companion device : 2.4 GHz Wireless Link & CAN-Bus & IBIS Bus Link

1.6 Test Equipment Used During Testing

Radiated emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Biconical Antenna	R&S	HK 116	EF00030	2011-02	2014-02
LPD-Antenne	R&S	HL 223	EF00187	2011-02	2014-02
LPD-Antenna	R&S	HL 025	EF00327	2013-02	2016-02
EMI Test Receiver	R&S	ESCS30	EF00295	2012-08	2013-08

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 dB μ V. 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 dB μ V/m). The FCC limits are given in units of μ V/m. The following formula is used to convert the units of μ V/m to dB μ V/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:

$$\begin{array}{lll} \text{Reading} + \text{AF} = & \text{Net Reading} : & \text{Net reading} - \text{FCC limit} = \text{Margin} \\ 21.5 \text{ dB}\mu\text{V} + 26 \text{ dB} = & 47.5 \text{ dB}\mu\text{V/m} : & 47.5 \text{ dB}\mu\text{V/m} - 57.0 \text{ dB}\mu\text{V/m} = -9.5 \text{ dB} \end{array}$$

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 C63.4	PASS	
47 CFR 15.107 RSS-Gen 7.2.4	AC power line conducted emissions	ANSI C63.4	N/A	EUT battery powered
Remarks:				

3 Test Conditions and Results

3.1 Test Conditions and Results – Radiated emissions

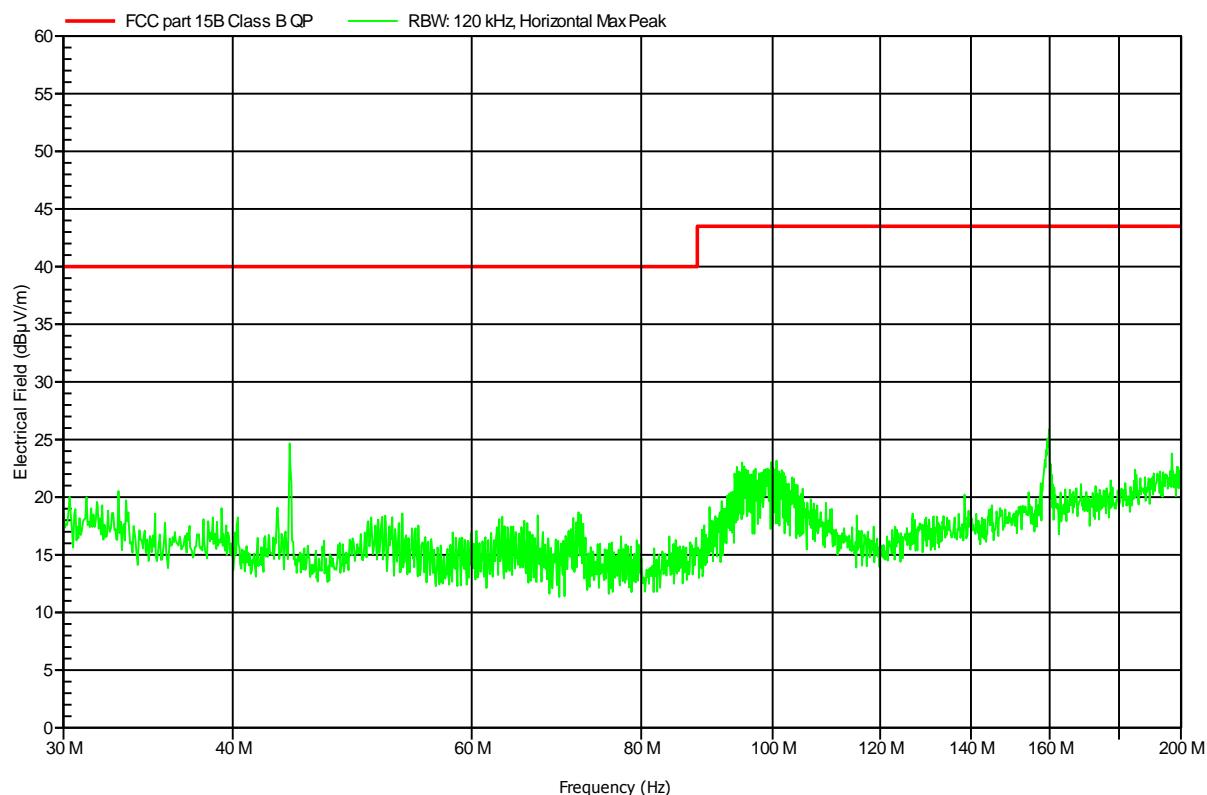
Radiated emissions acc. FCC 47 CFR 15.109 / IC RSS-Gen			Verdict: PASS			
Laboratory Parameters:	Required prior to the test		During the test			
Ambient Temperature	15 to 35 °C		23 °C			
Relative Humidity	30 to 60 %		35 %			
Test according referenced standards	Reference Method					
	ANSI C63.4					
Sample 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] = 168					
Fully configured sample scanned over the following frequency range	Frequency range					
	30 MHz to 2 GHz					
Operating mode	1					
Limits and results Class B						
Frequency [MHz]	Quasi-Peak [dB μ V/m]	Result	Average [dB μ V/m]	Result	Peak [dB μ V/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 Part 15B

Project number: G0M-1302-2616

Manufacturer: Agilion GmbH
EUT Name: Wireless Tag Drive
Model: 021317
Test Site: Eurofins Product Service GmbH
Operator: Mr. Klein
Test Conditions: $T_{nom}: 23^{\circ}\text{C}$, $U_{nom}: 24 \text{ VDC}$
Antenna: Rohde & Schwarz HK 116, Horizontal
Measurement distance: 3m
Mode: communication with companion device
Test Date: 2013-02-22
Note:

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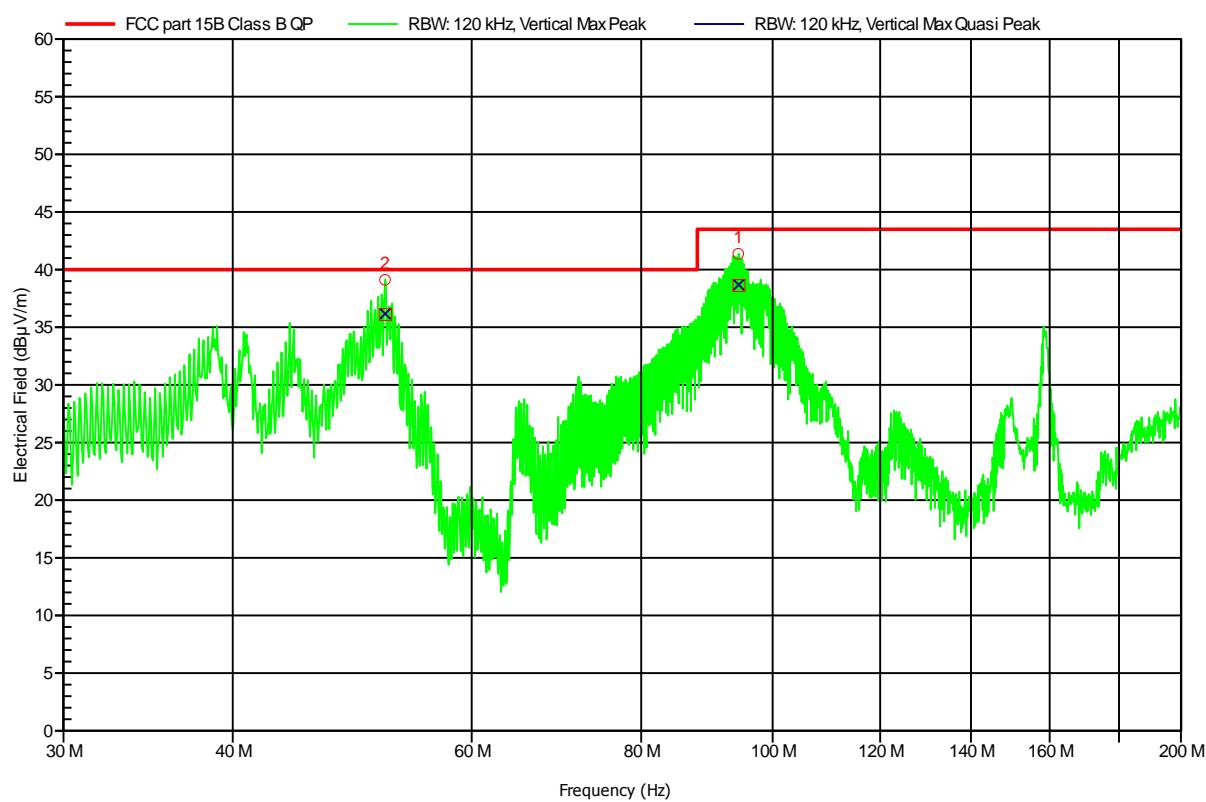
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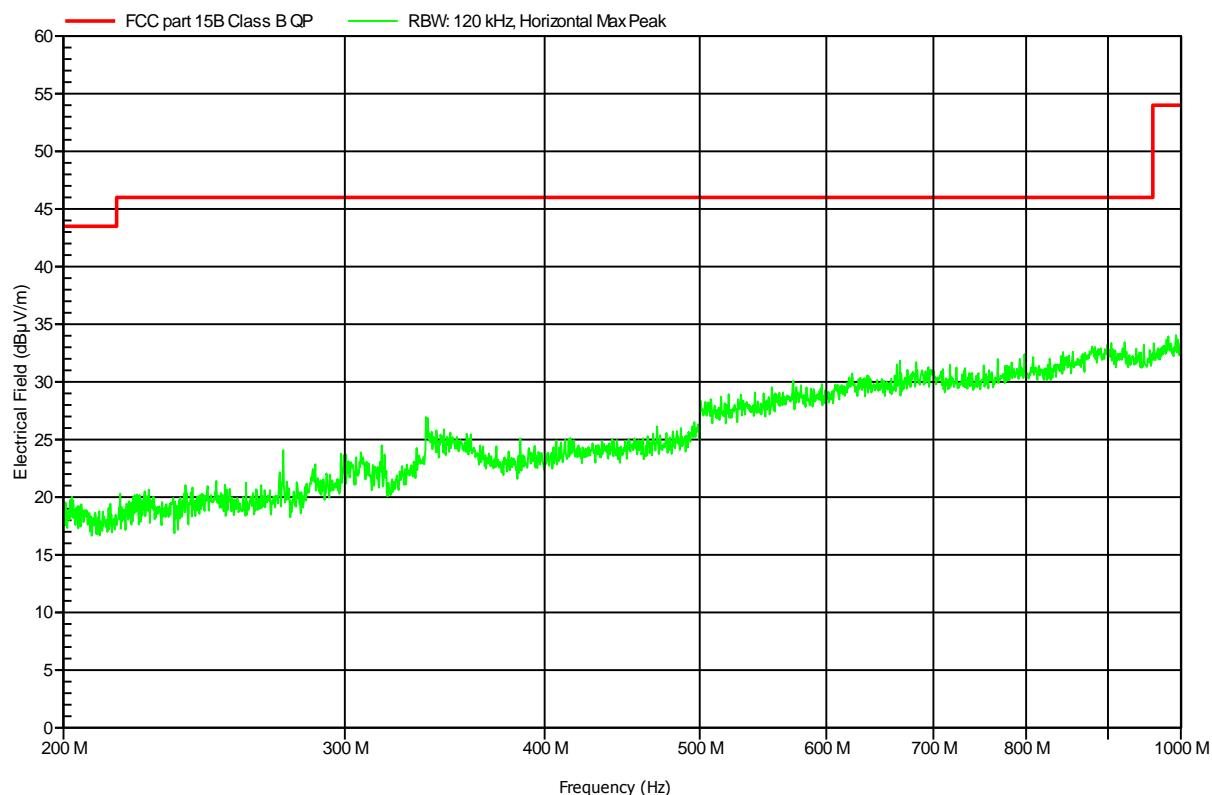
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
51.798 MHz	36.17 dBμV/m	40 dBμV/m	-3.83 dB	Pass
94.338 MHz	38.68 dBμV/m	43.5 dBμV/m	-4.82 dB	Pass

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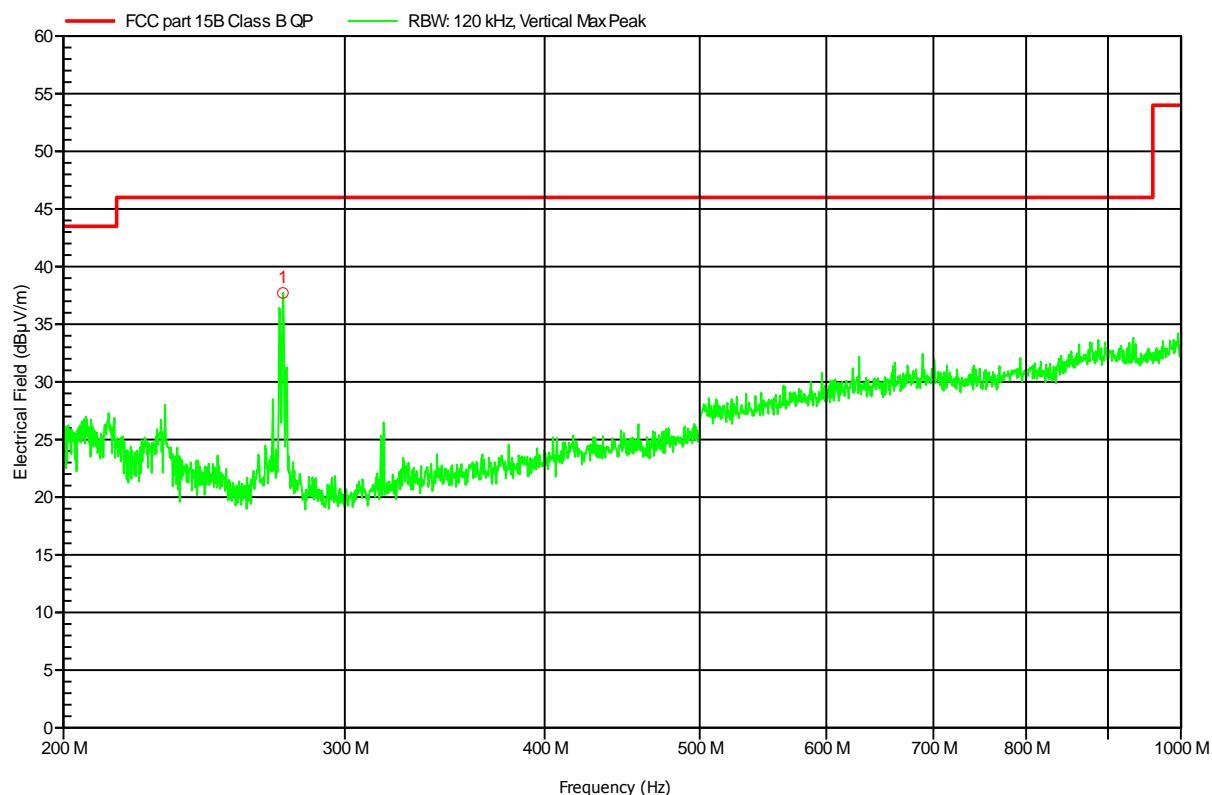
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Frequency
274.4 MHz

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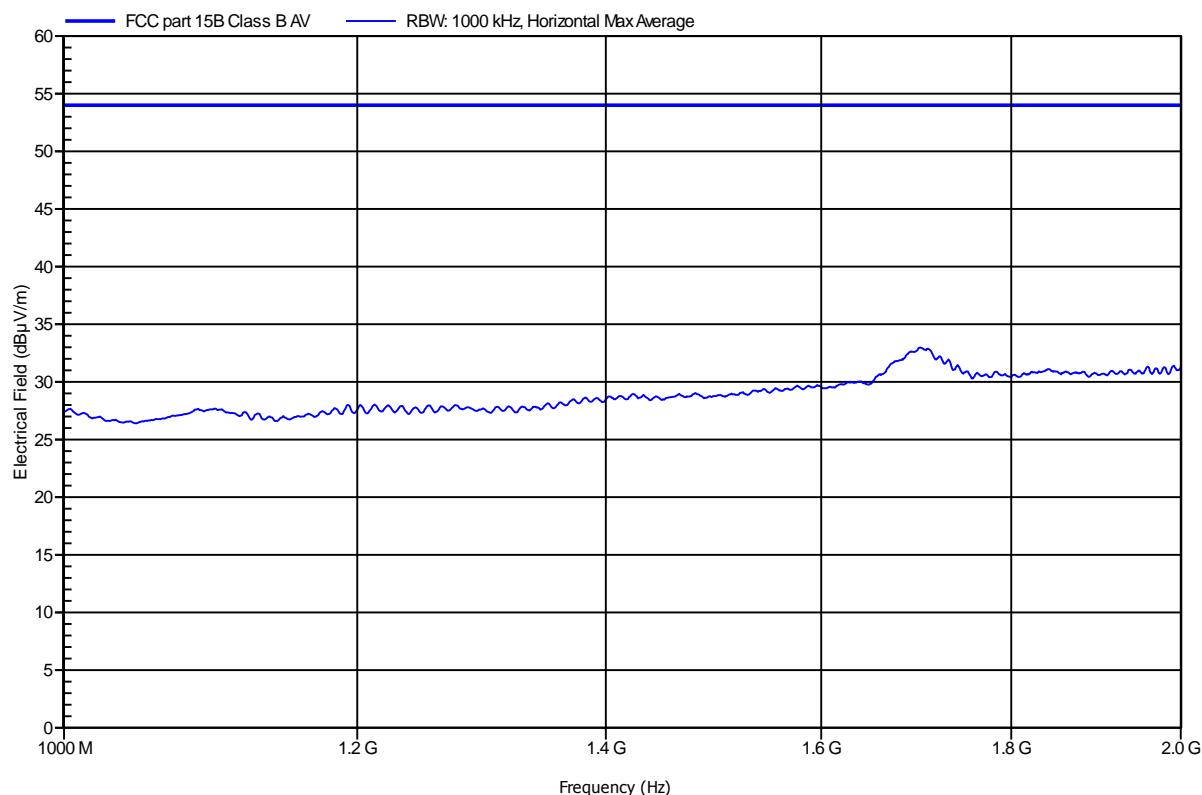
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Operator: Mr. Klein
Test Conditions: T_{nom} : 23°C, U_{nom} : 24 VDC
Antenna: Rohde & Schwarz HL 025, Horizontal
Measurement distance: 3m
Mode: communication with companion device
Test Date: 2013-02-22
Note:

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Note:

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