



<b>EMC TEST REPORT</b> <b>FCC 47 CFR Part 15B</b> <b>Industry Canada RSS-Gen</b> <b>Electromagnetic compatibility - Unintentional radiators</b>	
<b>Report Reference No.</b> .....	G0M-1407-4031-EC0115B-V01
<b>Testing Laboratory</b> .....	Eurofins Product Service GmbH
Address .....	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation .....	<div style="text-align: center;">   </div> <p>A2LA Accredited Testing Laboratory, Certificate No.: 1983.01            FCC Filed Test Laboratory, Reg.-No.: 96970            IC OATS Filing assigned code: 3470A</p>
<b>Applicant's name</b> .....	GN Netcom A/S
Address .....	Lautrupbjerg 7 2750 Ballerup DENMARK
<b>Test specification:</b>	
Standard.....	47 CFR Part 15 Subpart B RSS-Gen, Issue 3, 2010-12 ANSI C63.4:2009
<b>Equipment under test (EUT):</b>	
Product description	Bluetooth Speakerphone
Model No.	HFS210
Additional Models	None
Hardware version	V25
Firmware / Software version	V3.3.0
Contains	FCC-ID: BCE-HFS210A                      IC: 2386C-HFS210
<b>Test result</b>	<b>Passed</b>

**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 .....: 2014-07-31

Date (s) of performance of tests .....: 2014-08-22 - 2014-08-22

Compiled by .....: Steffen Zunke

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

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

Date of issue .....: 2014-08-26

Total number of pages .....: 31

**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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## Version History

Version	Issue Date	Remarks	Revised by
V01	2014-08-26	Initial Release	

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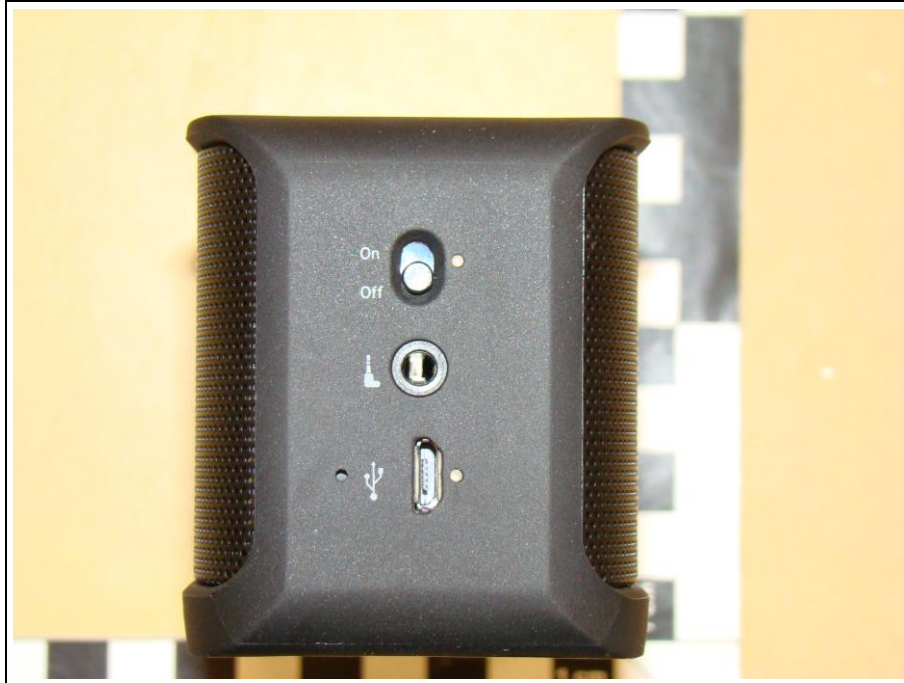
## 1 Equipment (Test item) Description

<b>Description</b>	Bluetooth Speakerphone	
<b>Model</b>	HFS210	
<b>Additional Models</b>	None	
<b>Serial number</b>	None	
<b>Hardware version</b>	V25	
<b>Software / Firmware version</b>	V3.3.0	
<b>Contains FCC-ID</b>	N/A	
<b>Contains IC</b>	N/A	
<b>Power supply</b>	5VDC via USB	
<b>Radio module</b>	Type	Bluetooth module
	Model	CSR 8635
	Manufacturer	CSR
	HW Version	V25
	SW Version	V3.3.0
	FCC-ID	BCE-HFS210A
	IC	2386C-HF210
<b>Manufacturer</b>	GN Netcom A/S Lautrupbjerg 7 2750 Ballerup DENMARK	
<b>Highest emission frequency</b>	500 MHz - 1000 MHz (up to 5 GHz)	
<b>Device classification</b>	Class B	
<b>Equipment type</b>	Tabletop	
<b>Number of tested samples</b>	1	

1.1 Photos – Equipment external

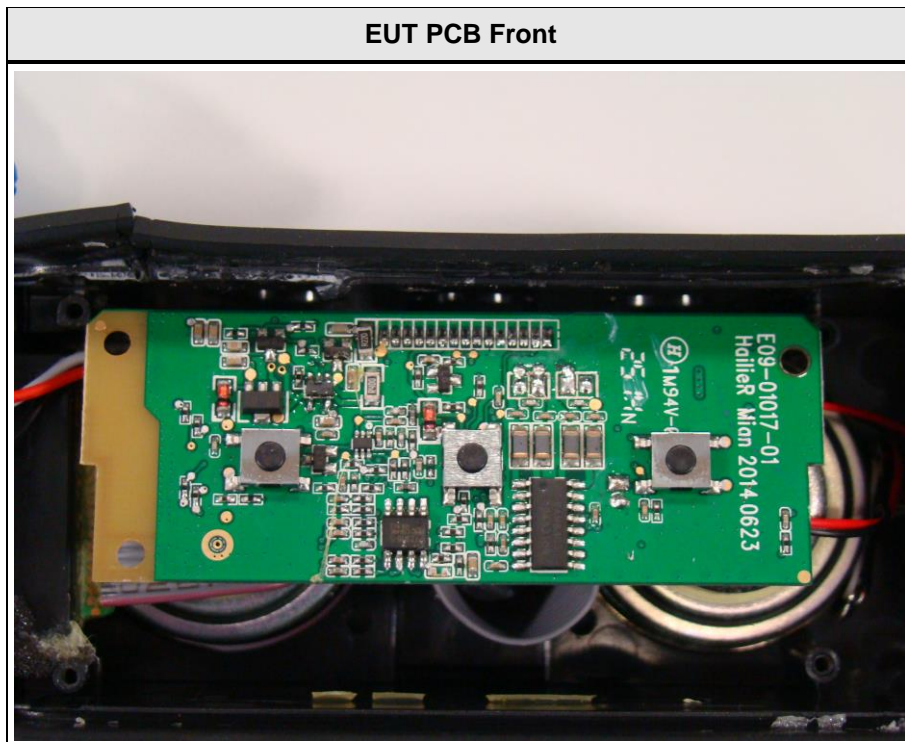
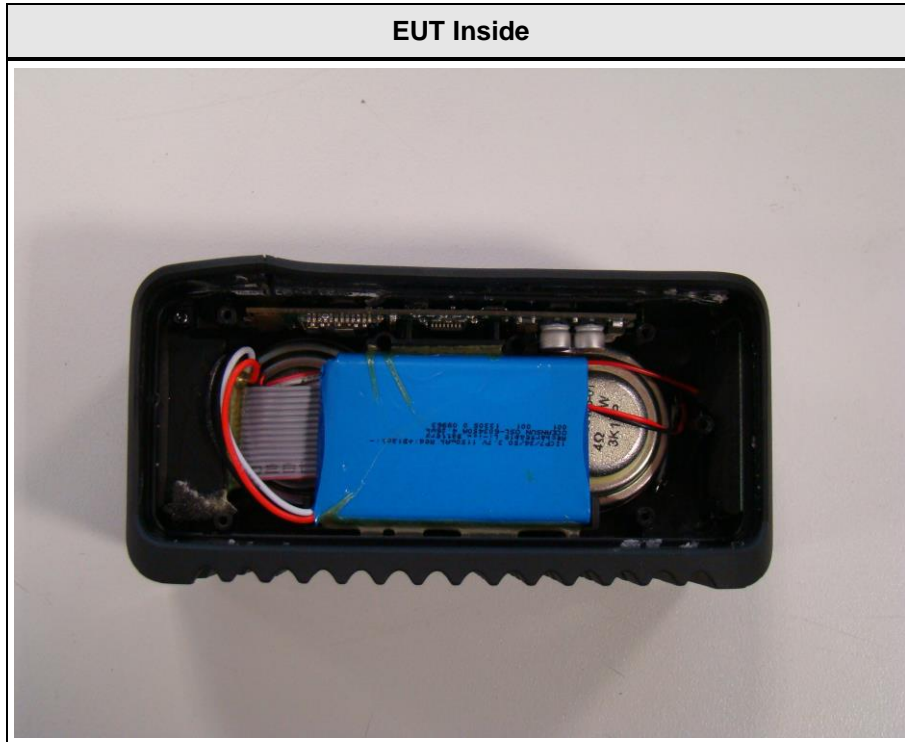


EUT Connector Side



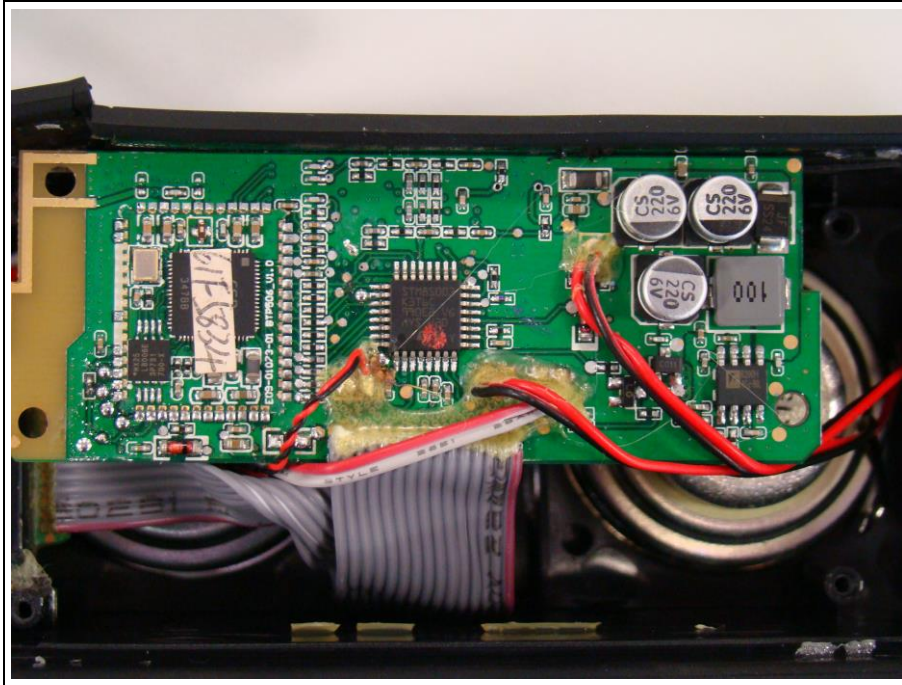


1.2 Photos – Equipment internal

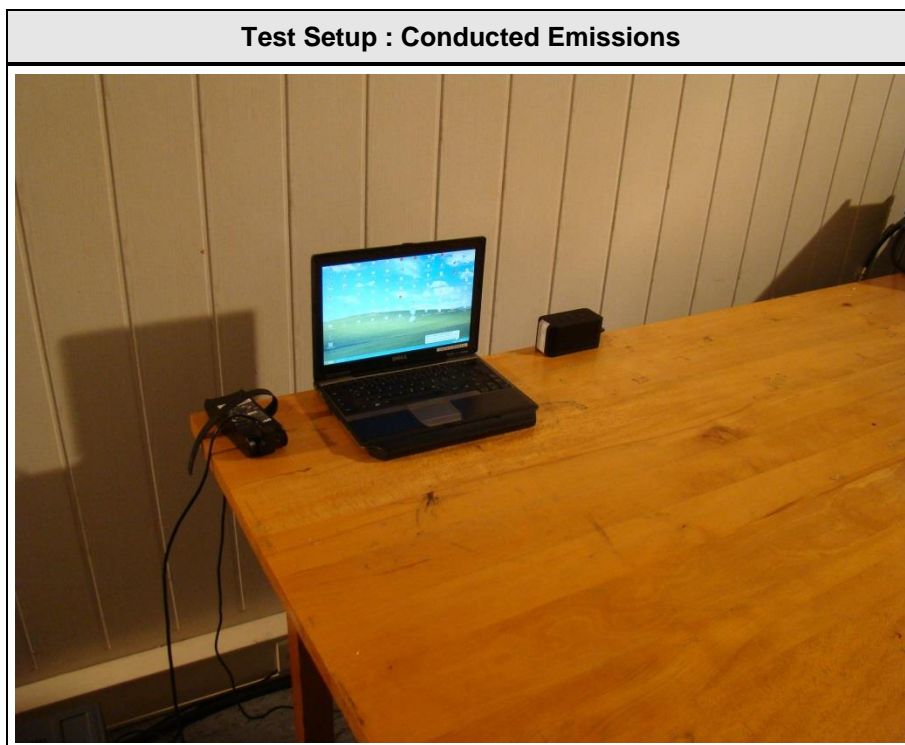
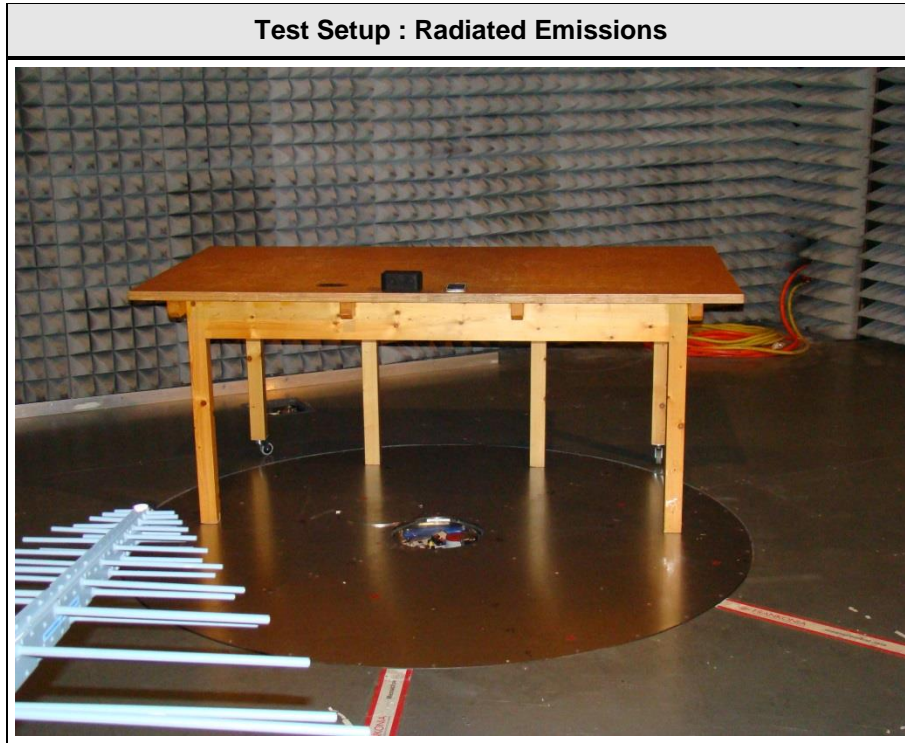




EUT PCB Back



1.3 Photos – Test setup



**1.4 Supporting Equipment Used During Testing**

Product Type*	Device	Manufacturer	Model No.	Comments
AE	Smartphone	Samsung	S3 mini	-
AE	Laptop	DELL	D430	-

**\*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	Bluetooth connection to a smartphone
2	Charging

**1.6 Test Equipment Used During Testing**

<b>Radiated emissions</b>					
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
LPD-Antenna	R&S	HL 025	EF00327	2013-02	2016-02
EMI Test Receiver	R&S	ESU8	EF00379	2014-03	2015-03
EMI Test Receiver	R&S	ESCS30	EF00295	2013-10	2014-10

<b>Conducted emissions</b>					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
AMN	R&S	ESH2-Z5	EF00182	2012-10	2014-10
AMN	R&S	ESH3-Z5	EF00036	2012-11	2014-11
EMI Test Receiver	R&S	ESCS 30	EF00295	2013-10	2014-10

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

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

## 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 C 63.4	PASS	-
47 CFR 15.107 RSS-Gen 7.2.4	AC power line conducted emissions	ANSI C63.4	PASS	-
<b>Remarks:</b>				



### 3 Test Conditions and Results

#### 3.1 Test Conditions and Results – Radiated emissions

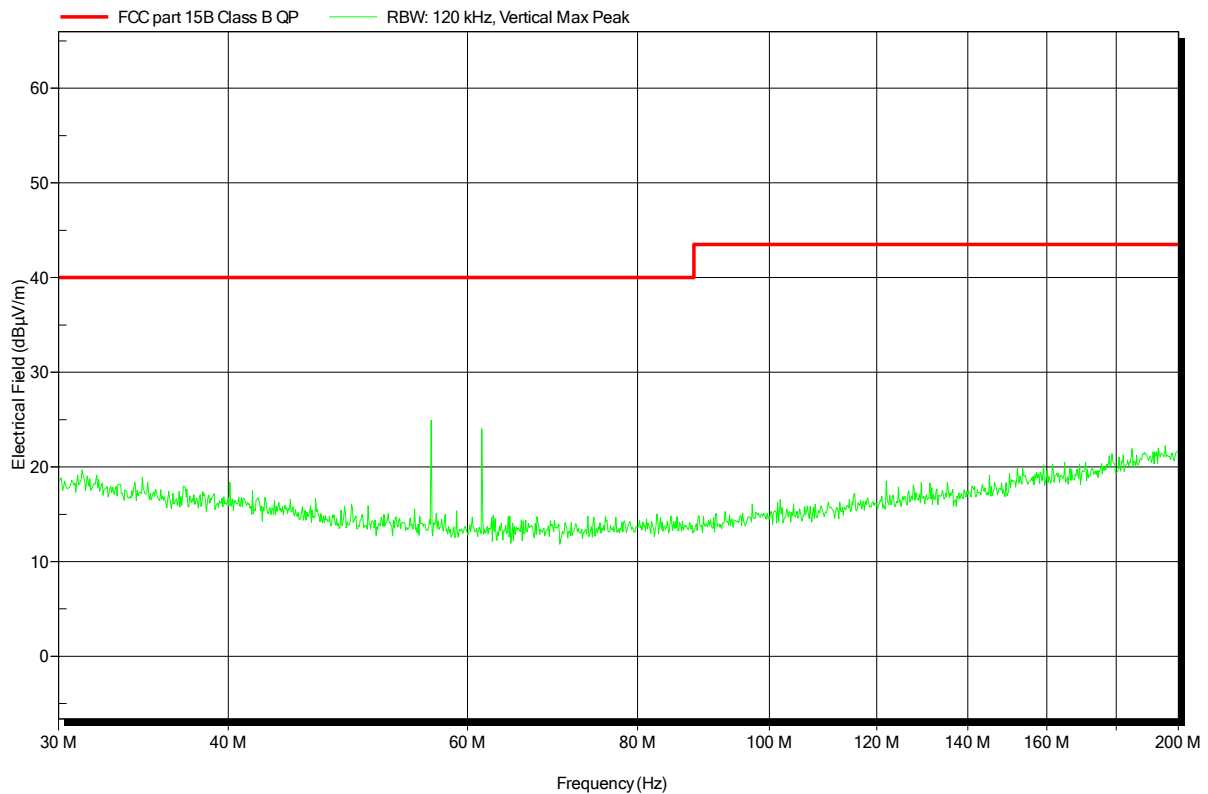
Radiated emissions acc. FCC 47 CFR 15.109 / IC RSS-Gen		Verdict: PASS				
Laboratory Parameters:	Required prior to the test	During the test				
Ambient Temperature	15 to 35 °C	23 °C				
Relative Humidity	30 to 60 %	35 %				
Test according referenced standards	Reference Method					
	ANSI C63.4					
Sample 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					
	500 MHz - 1000 MHz (up to 5 GHz)					
Fully configured sample scanned over the following frequency range	Frequency range					
	30 MHz to 5 GHz					
Operating mode	1 / 2					
<b>Limits and results Class B</b>						
Frequency [MHz]	Quasi-Peak [dB $\mu$ V/m]	Result	Average [dB $\mu$ V/m]	Result	Peak [dB $\mu$ 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-1407-4031

Manufacturer:	GN Netcom A/S
EUT Name:	Bluetooth Speakerphone
Model:	HFS210
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via USB
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3m
Mode:	Bluetooth link to Smartphone
Test Date:	2014-08-22
Note:	

Index 1

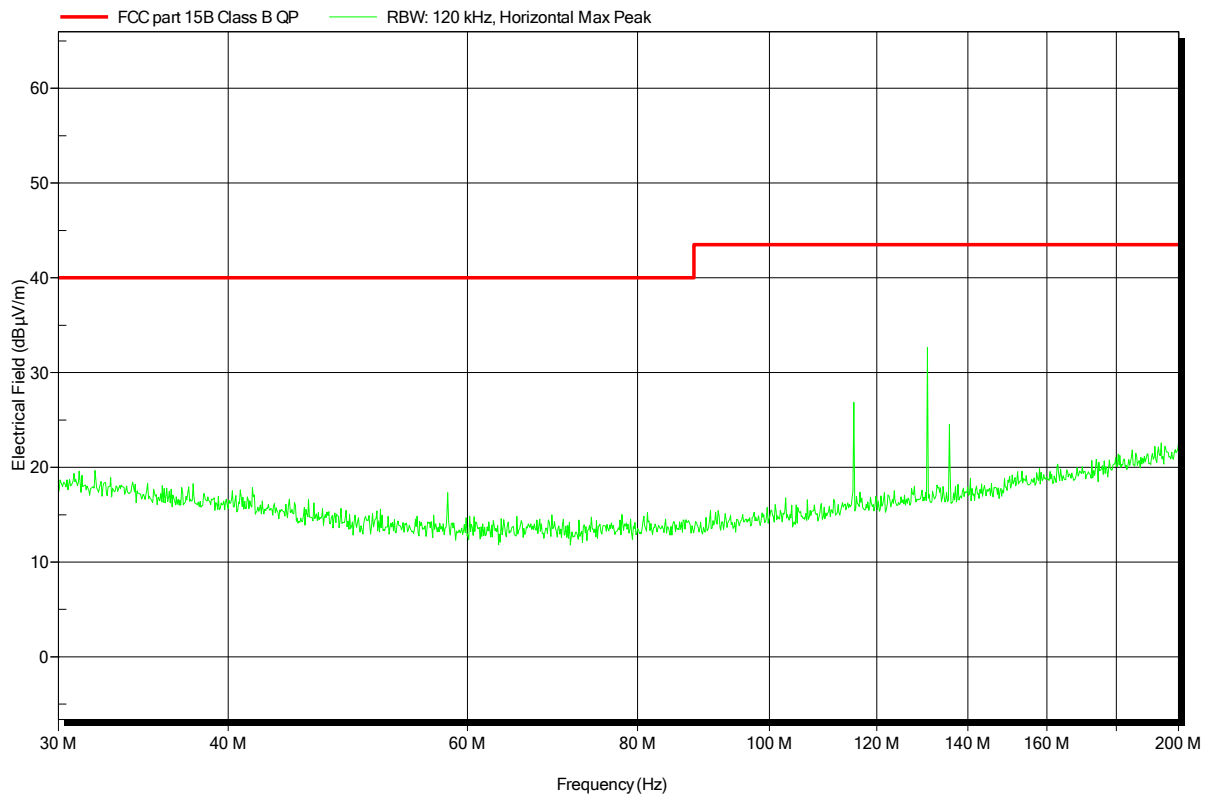


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Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m
Mode:	Bluetooth link to Smartphone
Test Date:	2014-08-22
Note:	

Index 2

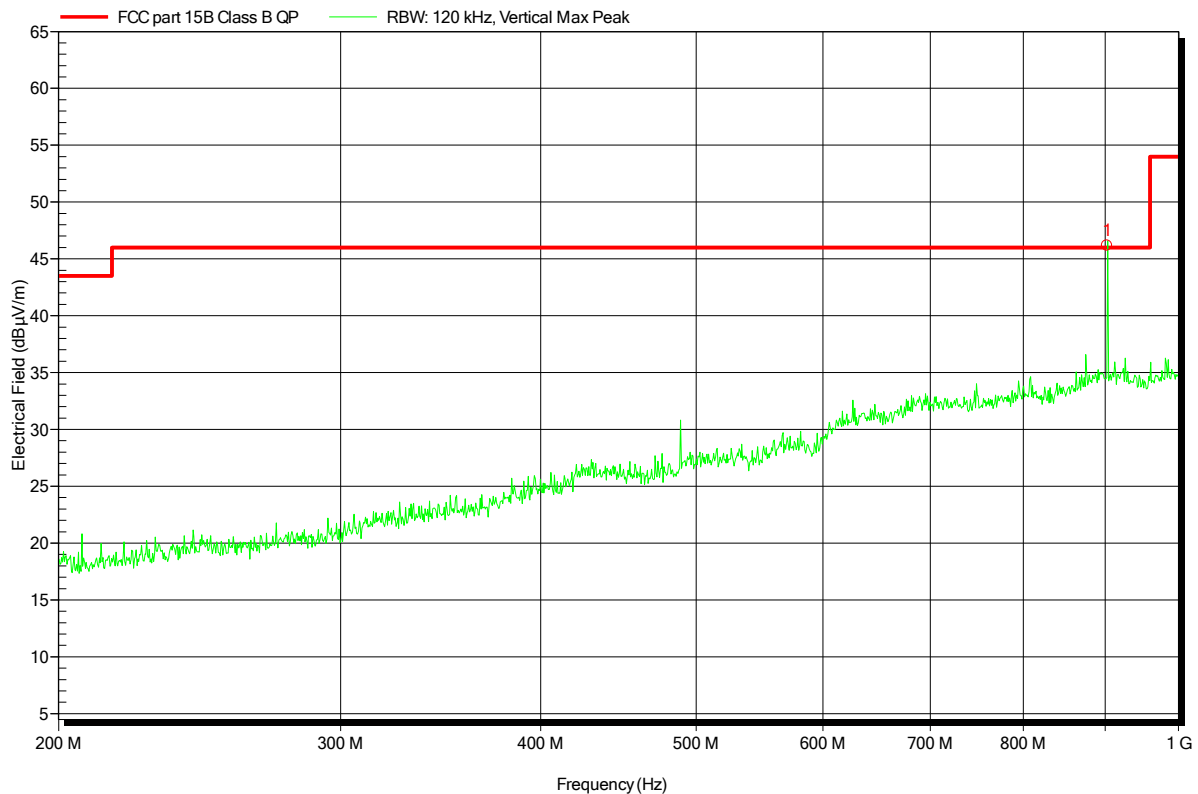


**Spurious emissions under normal conditions according to FCC Part 15b**

Project number: G0M-1407-4031

Manufacturer:	GN Netcom A/S
EUT Name:	Bluetooth Speakerphone
Model:	HFS210
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via USB
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3m
Mode:	Bluetooth link to Smartphone
Test Date:	2014-08-22
Note:	

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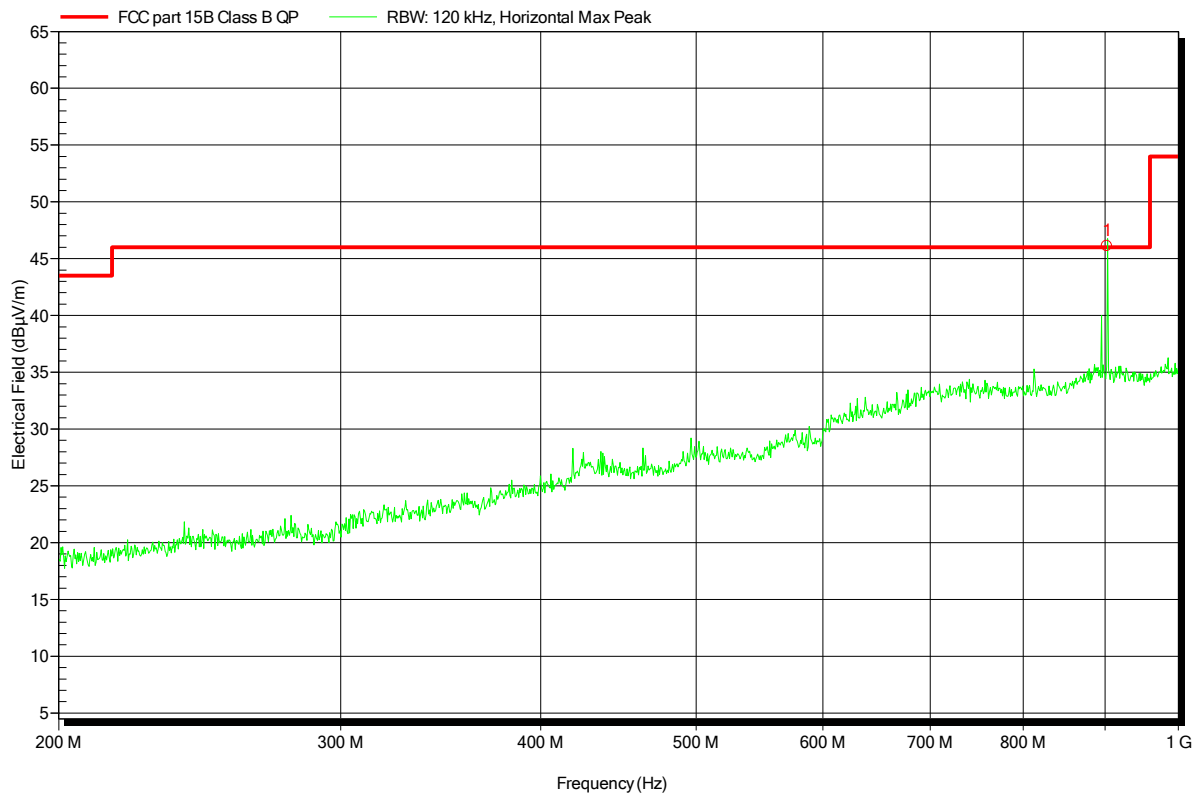
Frequency  
902.42 MHz GSM carrier smartphone

**Spurious emissions under normal conditions according to FCC Part 15b**

Project number: G0M-1407-4031

Manufacturer:	GN Netcom A/S
EUT Name:	Bluetooth Speakerphone
Model:	HFS210
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via USB
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3m
Mode:	Bluetooth link to Smartphone
Test Date:	2014-08-22
Note:	

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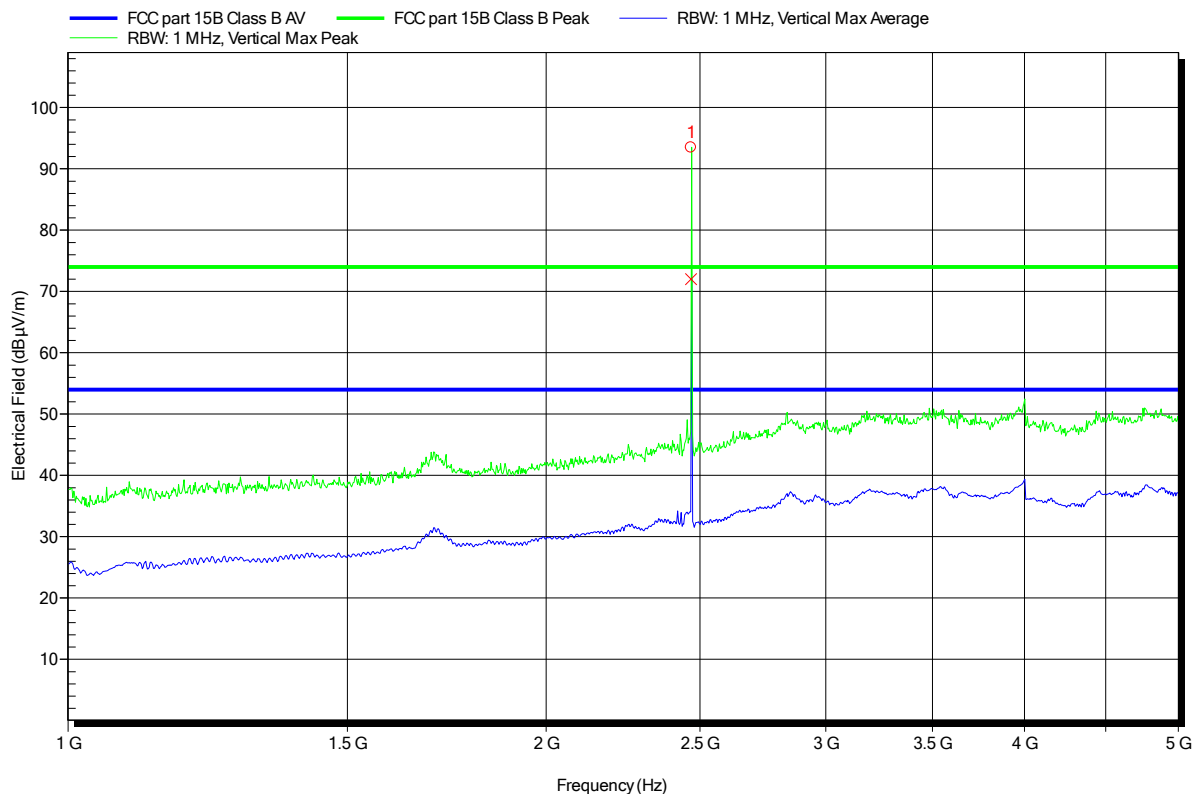
Frequency  
902.42 MHz GSM carrier smartphone

**Spurious emissions under normal conditions according to FCC Part 15b**

Project number: G0M-1407-4031

Manufacturer:	GN Netcom A/S
EUT Name:	Bluetooth Speakerphone
Model:	HFS210
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via USB
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3m
Mode:	Bluetooth link to Smartphone
Test Date:	2014-08-26
Note:	

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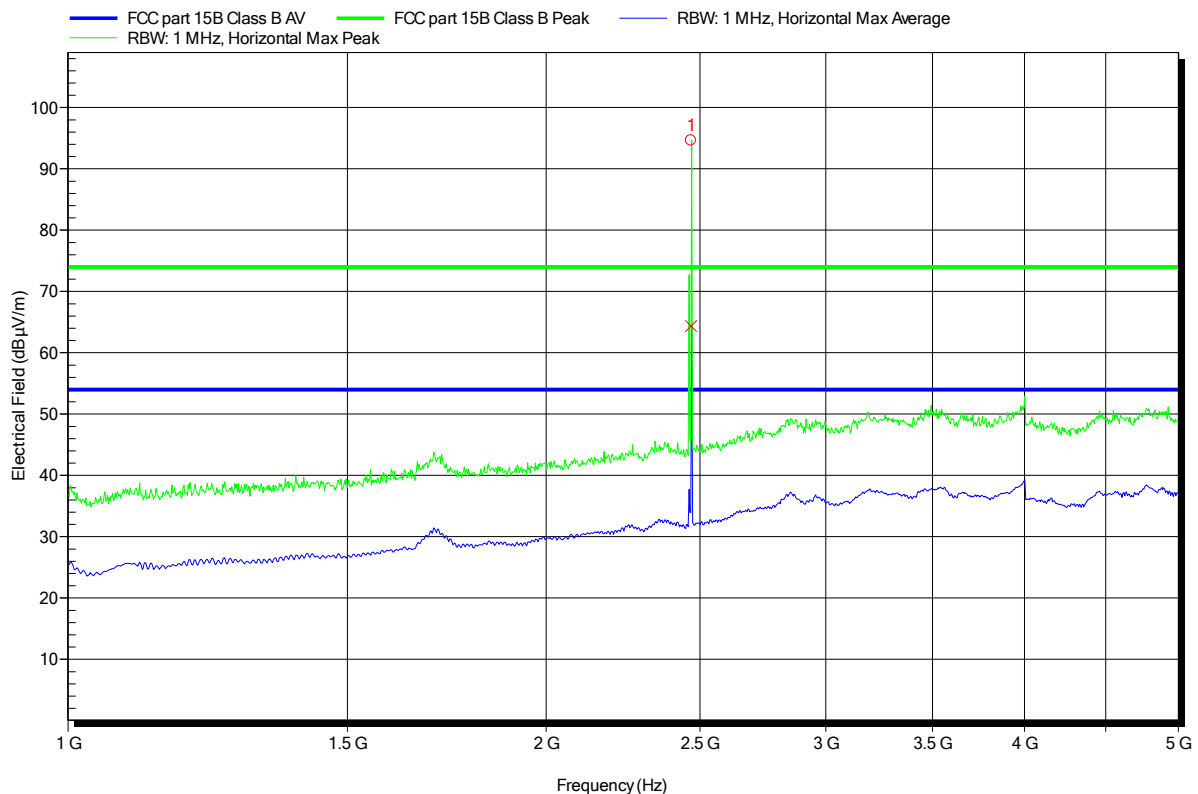
Frequency  
 2.468 GHz Bluetooth carrier

**Spurious emissions under normal conditions according to FCC Part 15b**

Project number: G0M-1407-4031

Manufacturer:	GN Netcom A/S
EUT Name:	Bluetooth Speakerphone
Model:	HFS210
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via USB
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3m
Mode:	Bluetooth link to Smartphone
Test Date:	2014-08-26
Note:	

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Frequency  
2.468 GHz Bluetooth carrier

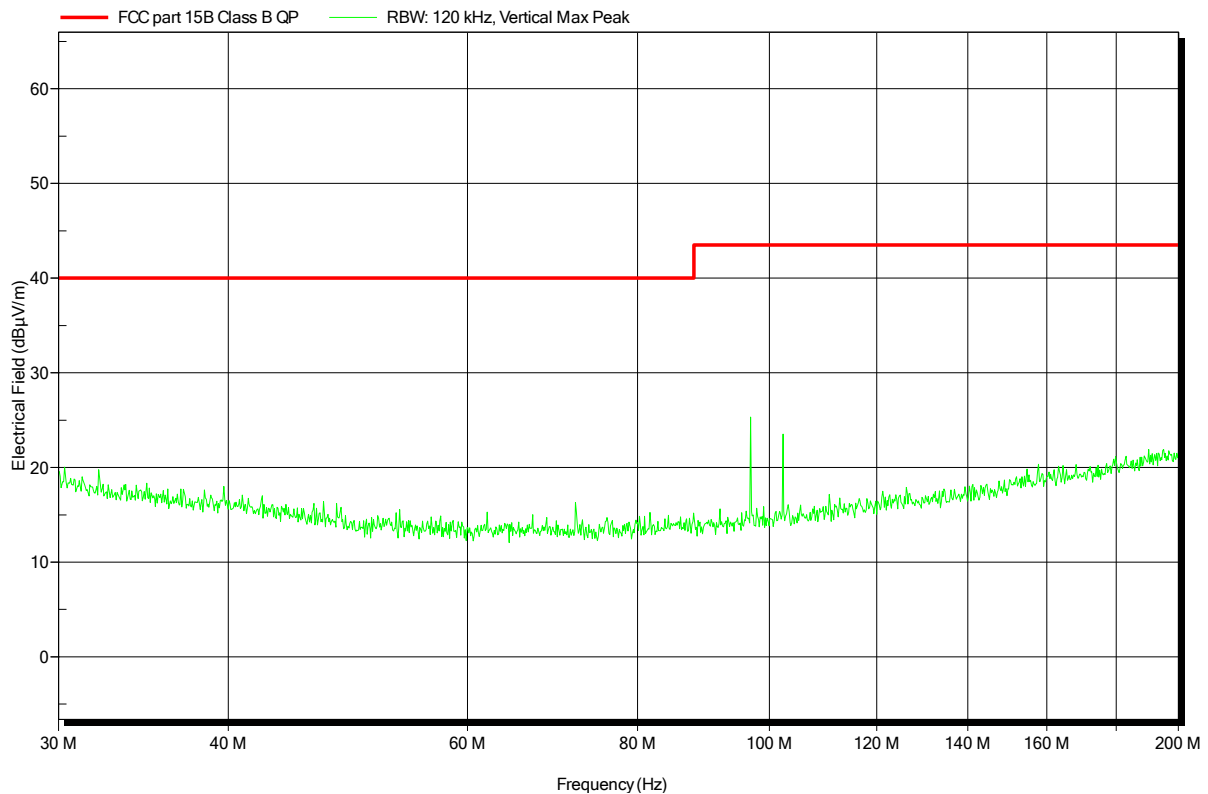


**Spurious emissions under normal conditions according to FCC Part 15b**

Project number: G0M-1407-4031

Manufacturer:	GN Netcom A/S
EUT Name:	Bluetooth Speakerphone
Model:	HFS210
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via USB
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3m
Mode:	charging
Test Date:	2014-08-26
Note:	

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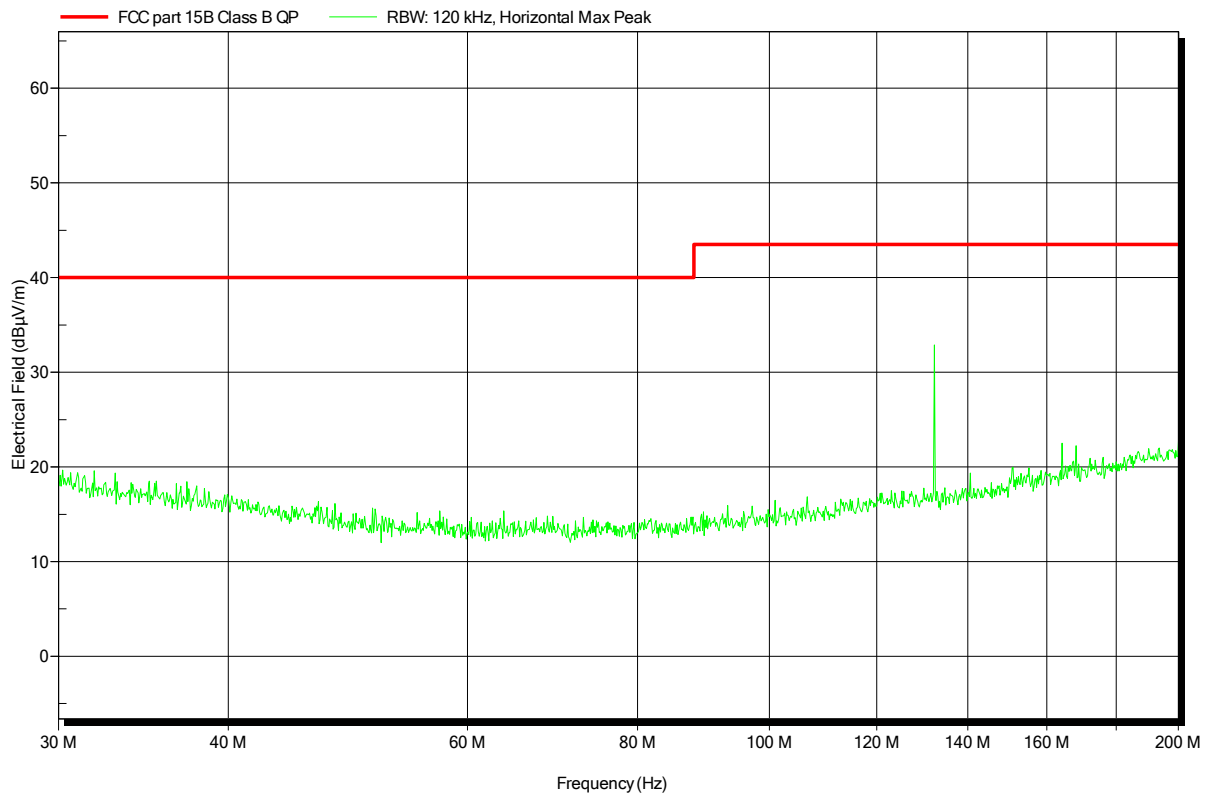


**Spurious emissions under normal conditions according to FCC Part 15b**

Project number: G0M-1407-4031

Manufacturer:	GN Netcom A/S
EUT Name:	Bluetooth Speakerphone
Model:	HFS210
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via USB
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m
Mode:	charging
Test Date:	2014-08-26
Note:	

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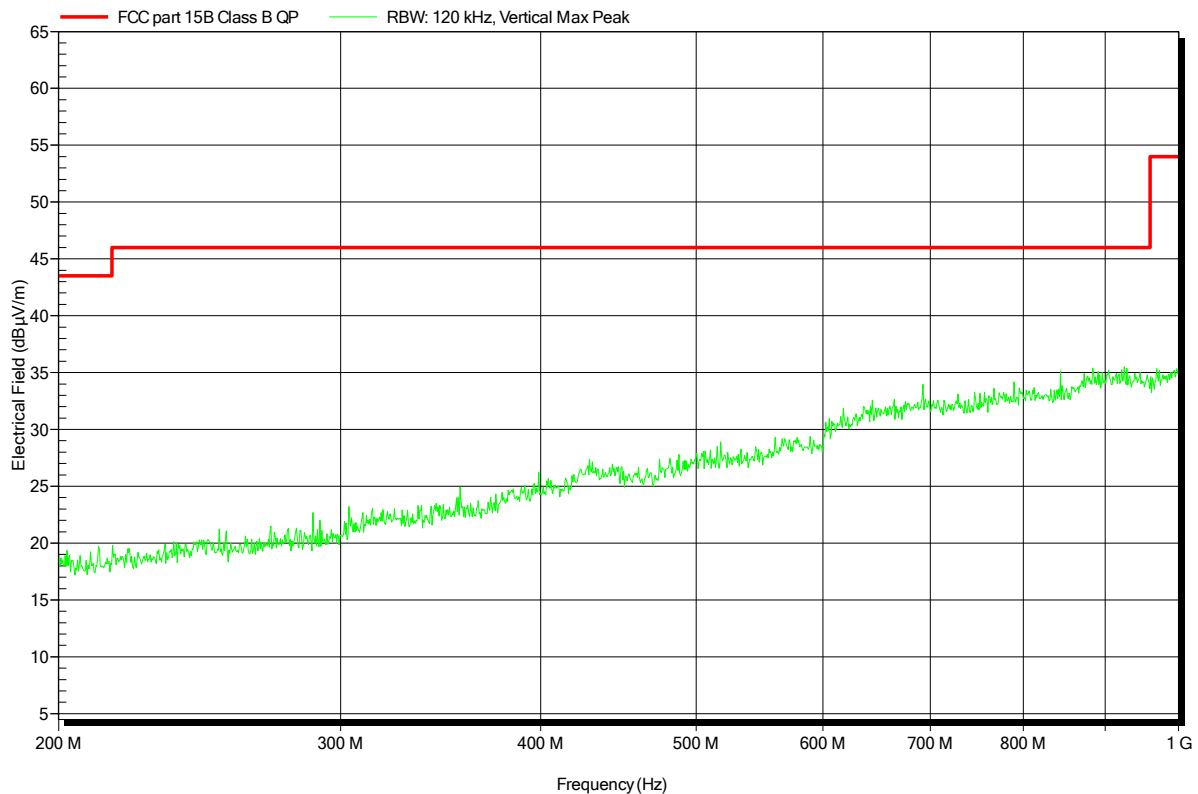


**Spurious emissions under normal conditions according to FCC Part 15b**

Project number: G0M-1407-4031

Manufacturer:	GN Netcom A/S
EUT Name:	Bluetooth Speakerphone
Model:	HFS210
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via USB
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3m
Mode:	charging
Test Date:	2014-08-26
Note:	

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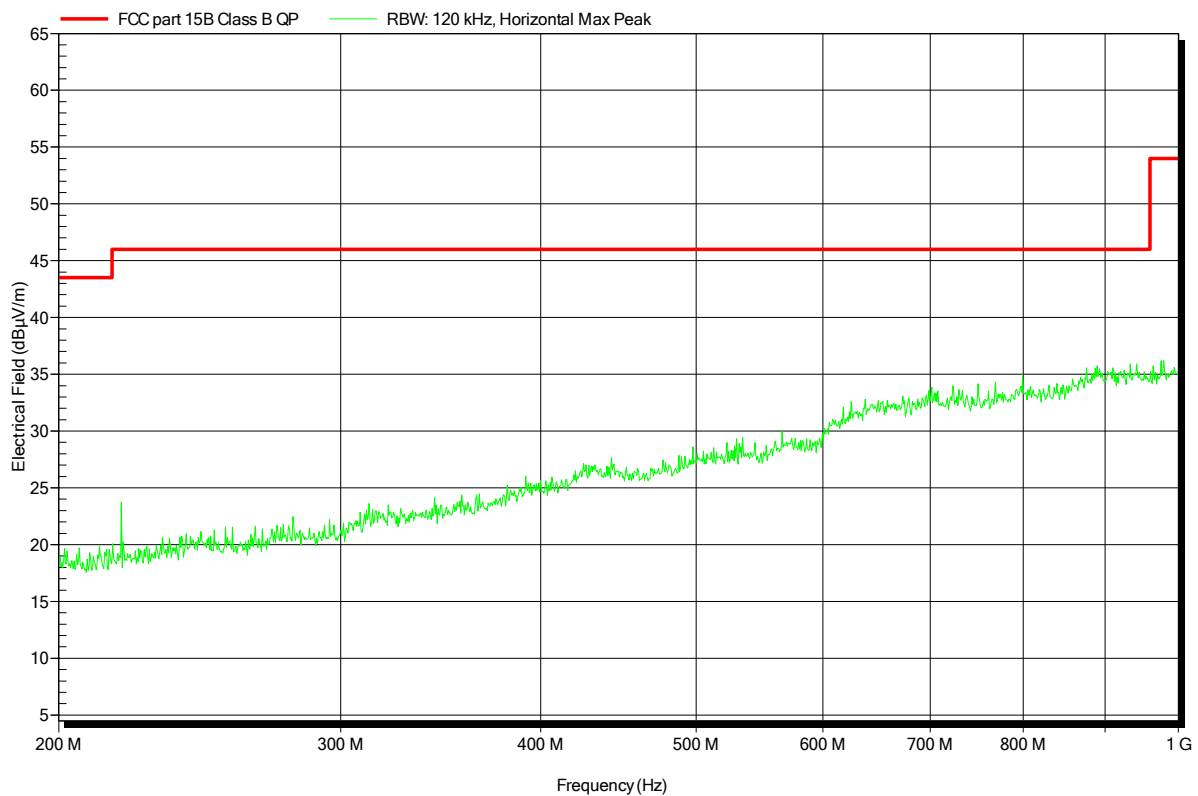


**Spurious emissions under normal conditions according to FCC Part 15b**

Project number: G0M-1407-4031

Manufacturer:	GN Netcom A/S
EUT Name:	Bluetooth Speakerphone
Model:	HFS210
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via USB
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3m
Mode:	charging
Test Date:	2014-08-26
Note:	

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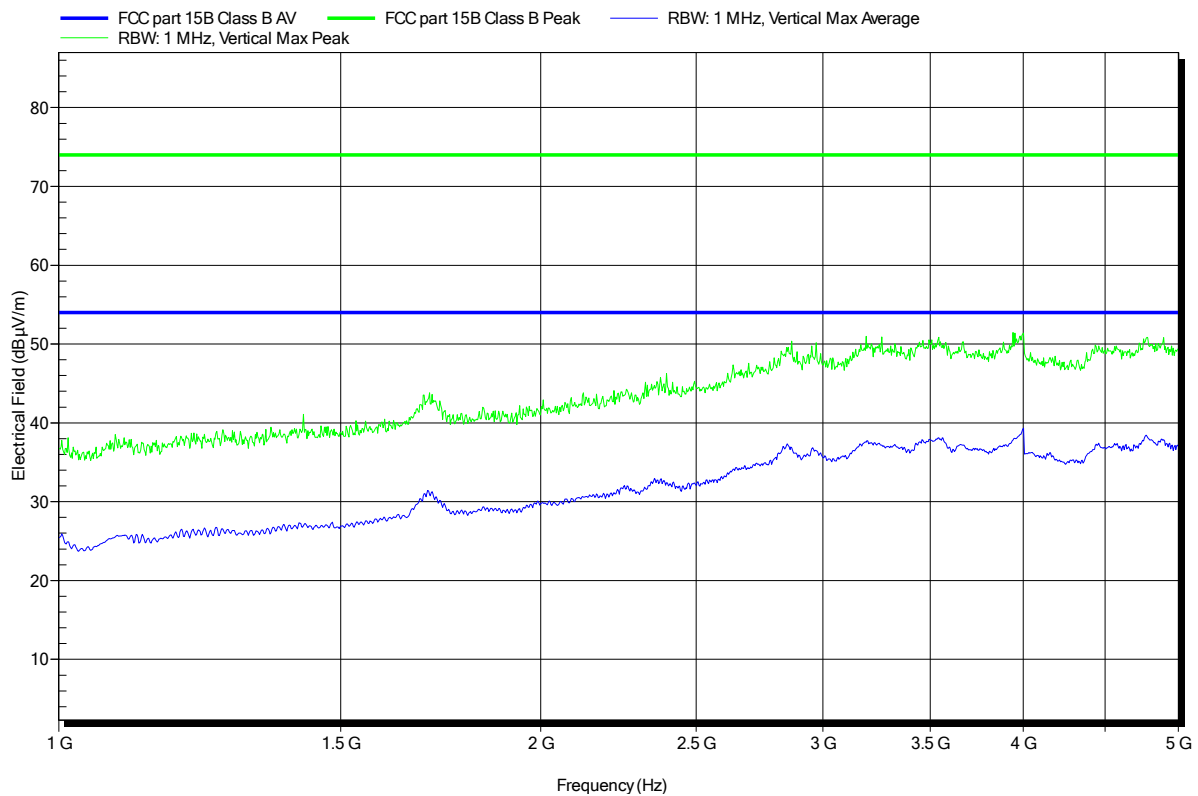


**Spurious emissions under normal conditions according to FCC Part 15b**

Project number: G0M-1407-4031

Manufacturer:	GN Netcom A/S
EUT Name:	Bluetooth Speakerphone
Model:	HFS210
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via USB
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3m
Mode:	charging
Test Date:	2014-08-26
Note:	

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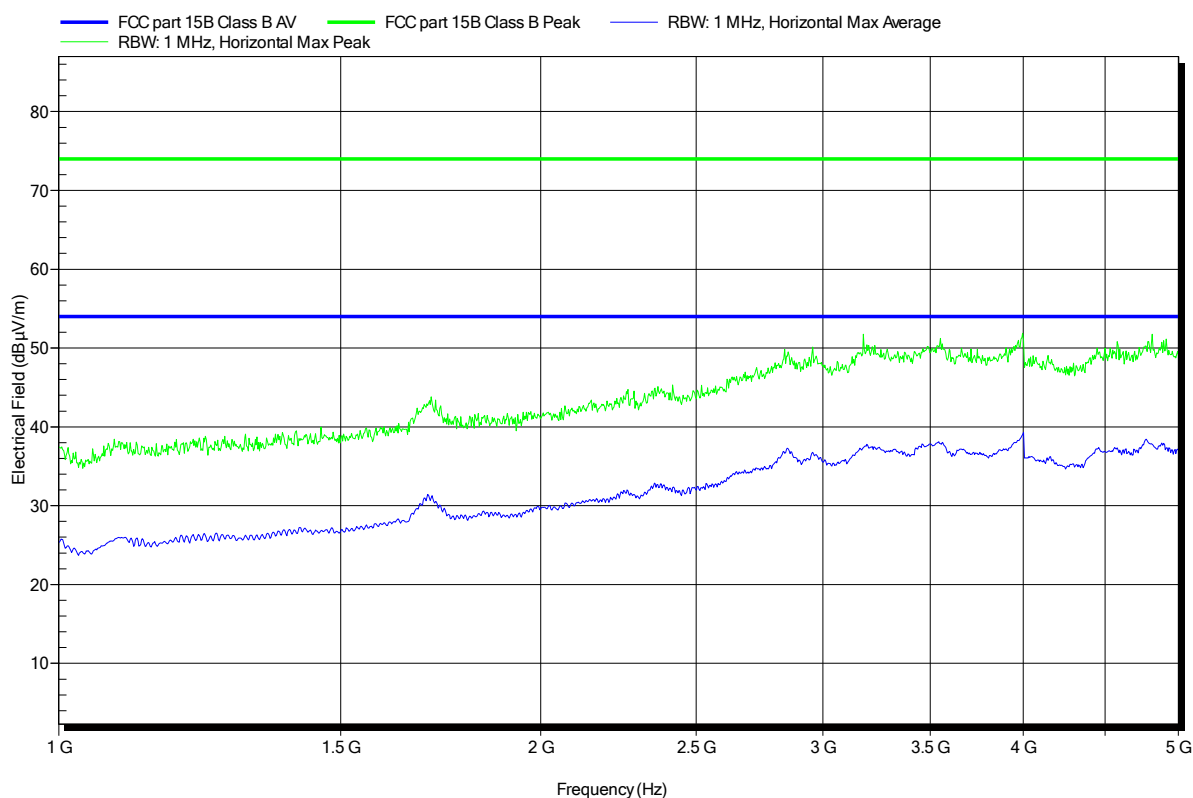


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Project number: G0M-1407-4031

Manufacturer:	GN Netcom A/S
EUT Name:	Bluetooth Speakerphone
Model:	HFS210
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via USB
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3m
Mode:	charging
Test Date:	2014-08-26
Note:	

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**3.2 Test Conditions and Results – AC power line conducted emissions**

<b>Conducted emissions acc. FCC 47 CFR 15.107 / IC RSS-Gen</b>		<b>Verdict: PASS</b>		
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			
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	2			
<b>Limits and results Class B</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.				

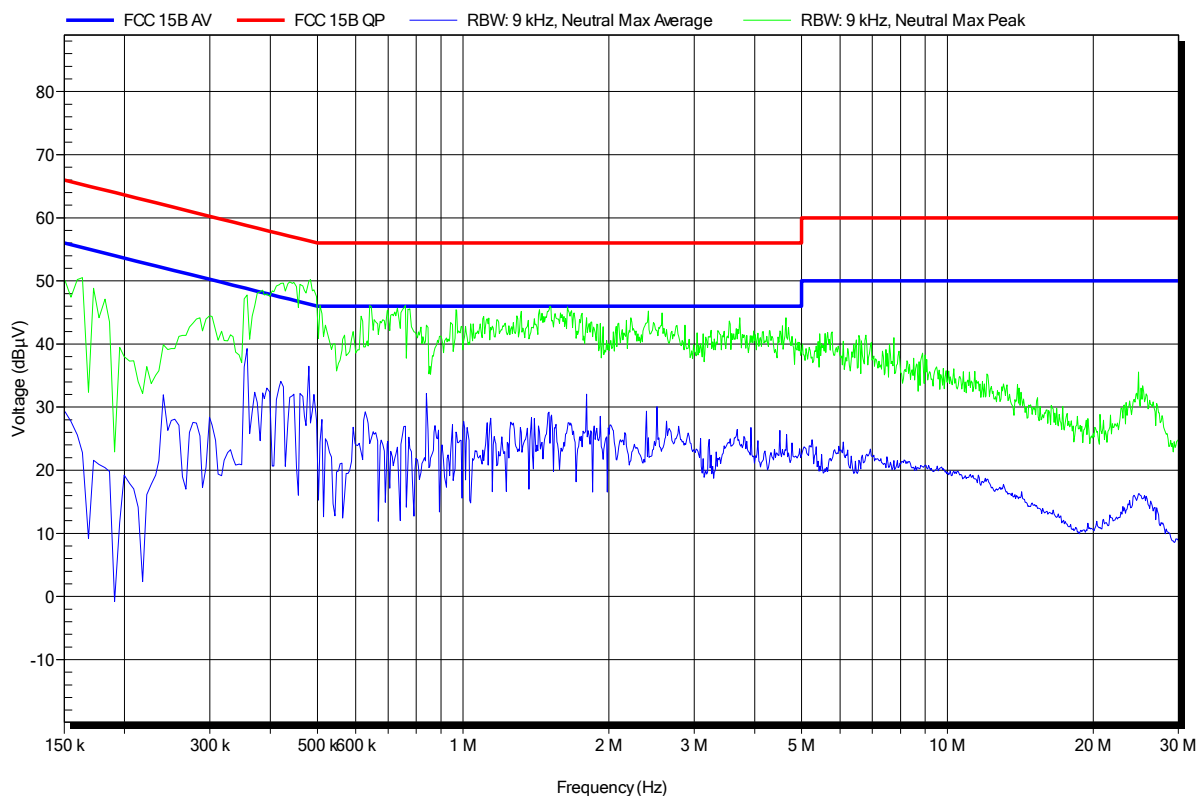


**EMI voltage test in the ac-mains according to FCC Part 15b**

Project number: G0M-1407-4031

Manufacturer: GN Netcom A/S  
 EUT Name: Bluetooth Speakerphone  
 Model: HFS210  
 Test Site: Eurofins Product Service GmbH  
 Operator: Mr. Zunke  
 Test Conditions: Tnom: 23°C, Unom: 5VDC via USB  
 LISN: ESH2-Z5 N  
 Mode: charging  
 Test Date: 2014-08-26  
 Note:

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**EMI voltage test in the ac-mains according to FCC Part 15b**

Project number: G0M-1407-4031

Manufacturer:	GN Netcom A/S
EUT Name:	Bluetooth Speakerphone
Model:	HFS210
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 5VDC via USB
LISN:	ESH2-Z5 L
Mode:	charging
Test Date:	2014-08-26
Note:	

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