

EMC TEST REPORT

FCC 47 CFR Part 15B
Industry Canada RSS-Gen

Electromagnetic compatibility - Unintentional radiators

Report Reference No. : G0M-1407-3973-EF0115B-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 : BARTEC PIXAVI AS

Address : Domkirkeplassen 2
4006 Stavanger
NORWAY

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	Smartphone	
Model No.	ImpactX	
Additional Models	None	
Hardware version	rev B0	
Firmware / Software version	Android 4.2.2	
Contains	FCC-ID: YML-X7SERIES	IC: 9249A-X7SERIES
Test result	Passed	

Test Report No.: G0M-1407-3973-EF0115B-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: 2014-07-23

Date (s) of performance of tests: 2014-08-29 - 2014-09-17

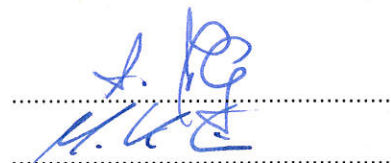
Compiled by: Steffen Zunke

Tested by (+ signature).....: Andreas Pflug

Approved by (+ signature): Marcus Klein

Date of issue: 2014-10-28

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:

Version History

Version	Issue Date	Remarks	Revised by
V01	2014-10-28	Initial Release	

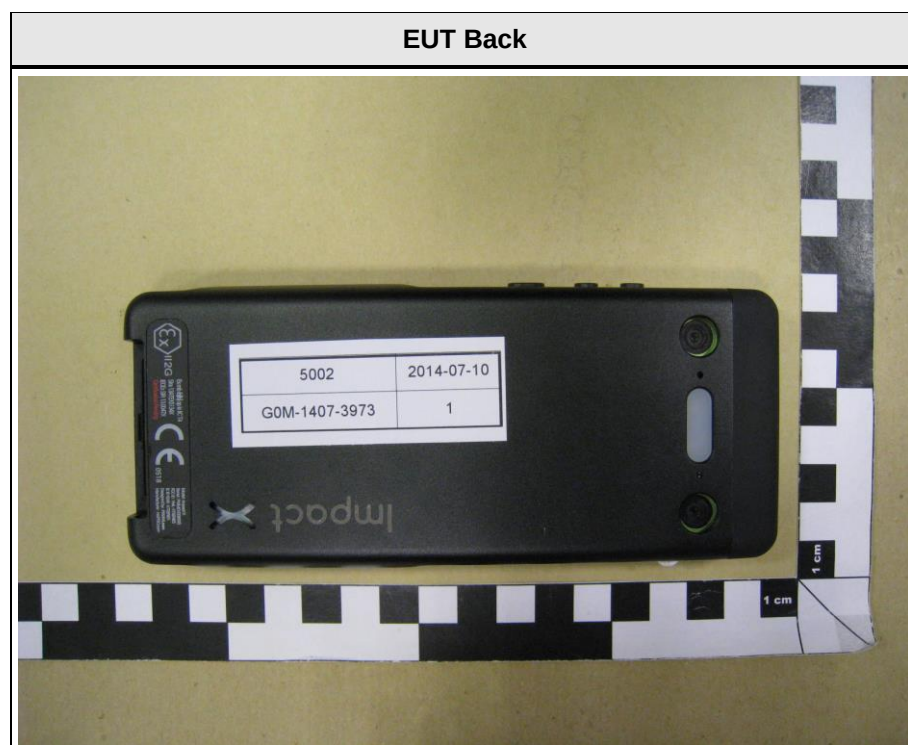
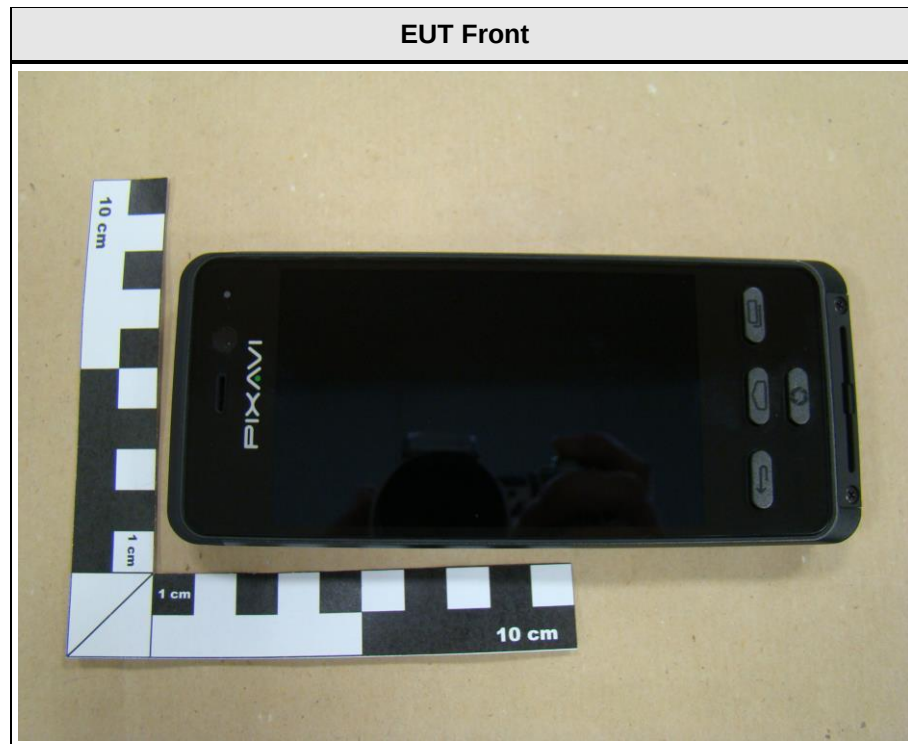
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1 Equipment (Test item) Description

Description	Smartphone	
Model	ImpactX	
Additional Models	None	
Serial number	None	
Hardware version	rev B0	
Software / Firmware version	Android 4.2.2	
Contains FCC-ID	N/A	
Contains IC	N/A	
Power supply	3.7 VDC via rechargeable Battery	
AC/DC-Adaptor	Model : AN4111 Manufacturer : ANSMANN Input : 100-240VAC / 50-60Hz Output : 5VDC / 1.0A	
Radio module	Type	GSM / UMTS Modul
	Model	LISA-U230
	Manufacturer	u-blox AG
	HW Version	146AA0
	SW Version	22.40
	FCC-ID	XPYLISAU230
	IC	8595A-LISAU230N
Manufacturer	BARTEC PIXAVI AS Domkirkeplassen 2 4006 Stavanger NORWAY	
Highest emission frequency	Fmax [MHz] = 5000	
Device classification	Class B	
Equipment type	Tabletop	
Number of tested samples	1	

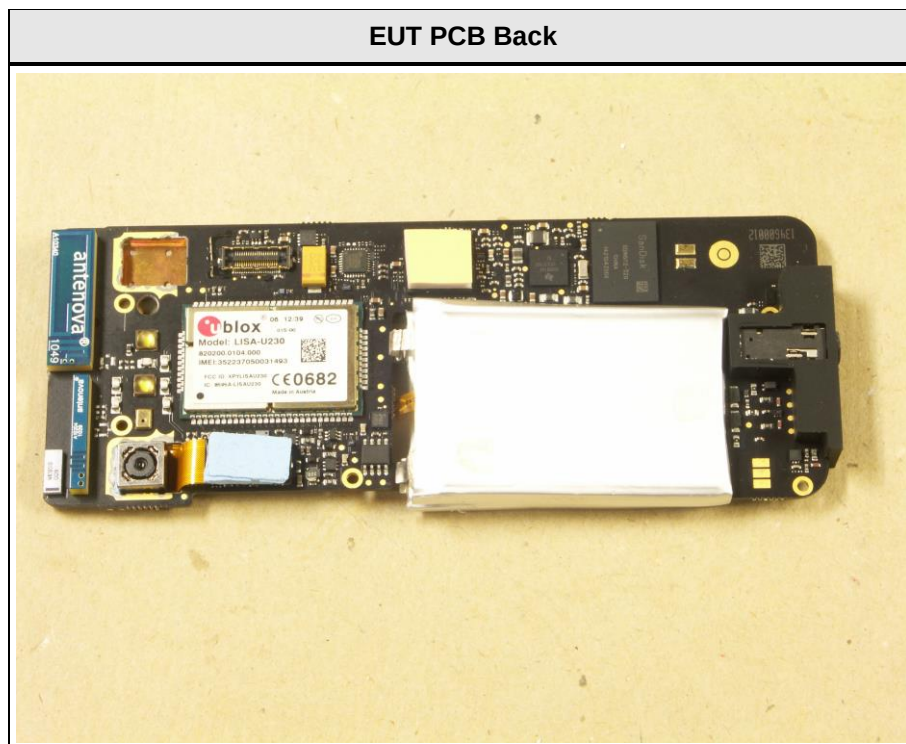
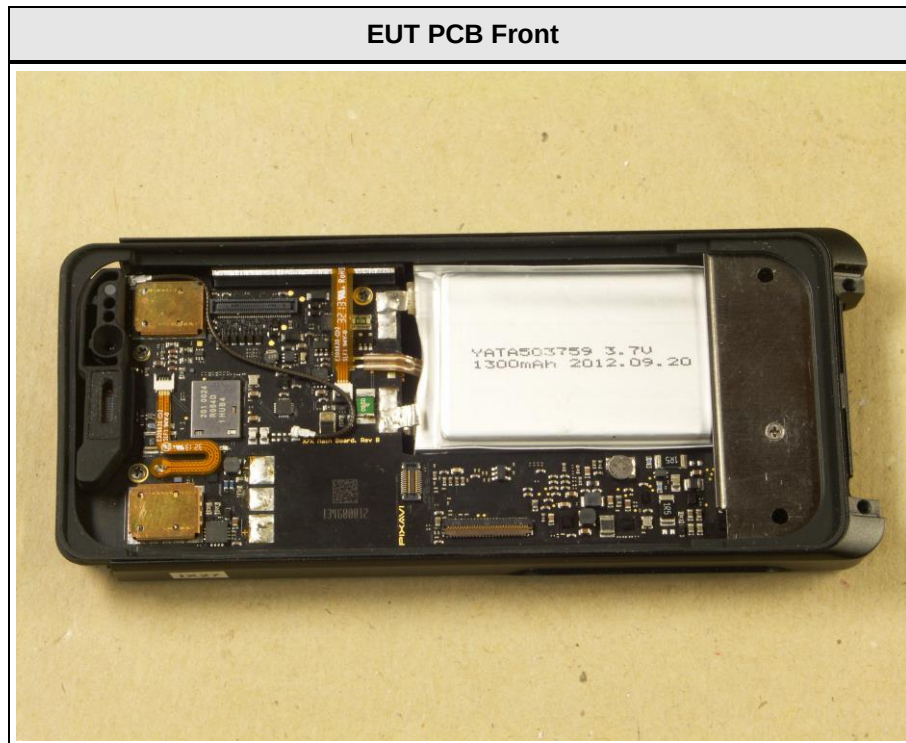
1.1 Photos – Equipment external



Test Report No.: G0M-1407-3973-EF0115B-V01

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 Storkower Str. 38c, D-15526 Reichenwalde, Germany

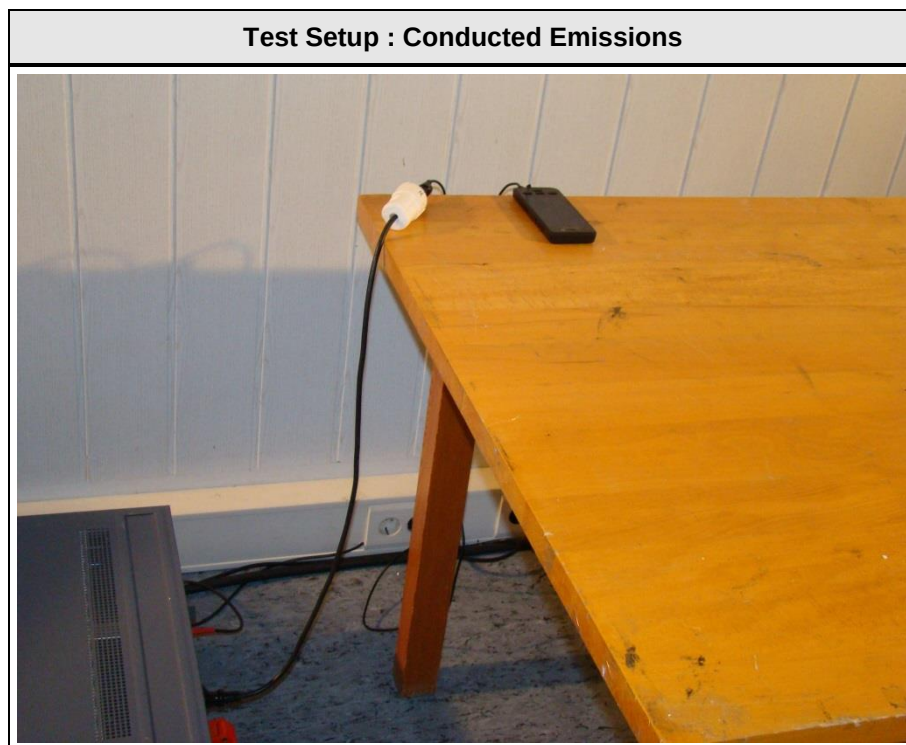
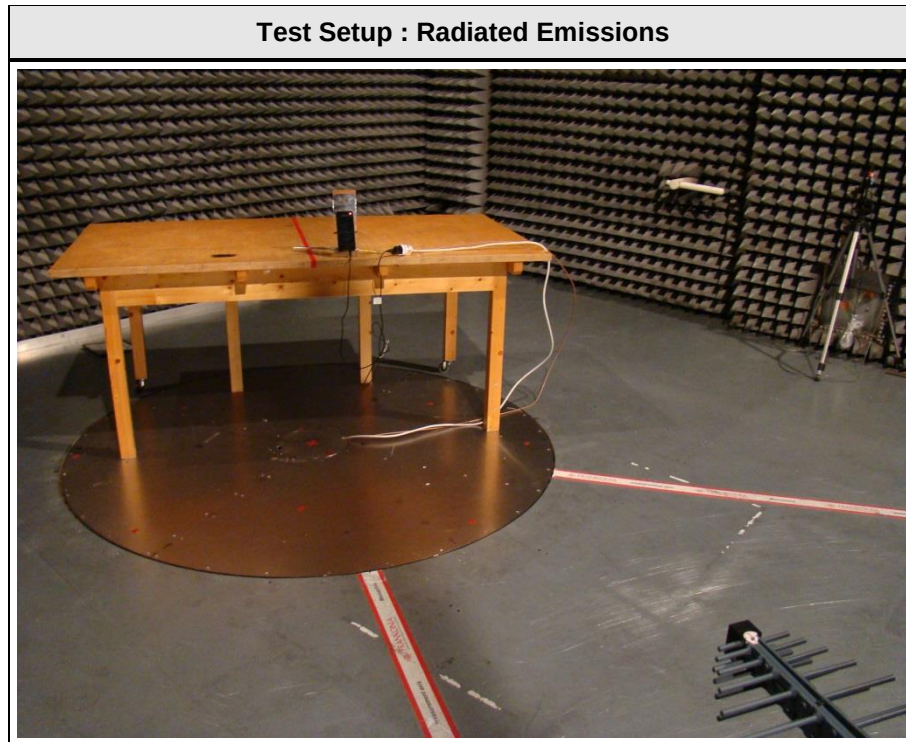
1.2 Photos – Equipment internal



Radio Modul



1.3 Photos – Test setup



1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
AE	Laptop	Dell	Latitude D430	-
SIM	Communication tester	Rohde & Schwarz	CMU 200	-
AE	AC/DC Adapter	ANSMANN	AN4111	-

***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	Charging, GSM900 link to CMU and WLAN link to an Laptop
2	Charging, UMTS Band 1 link to CMU and Bluetooth link to an Laptop

1.6 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
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

Conducted emissions					
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 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:

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

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	-
Remarks:				

3 Test Conditions and Results

3.1 Test Conditions and Results – Radiated emissions

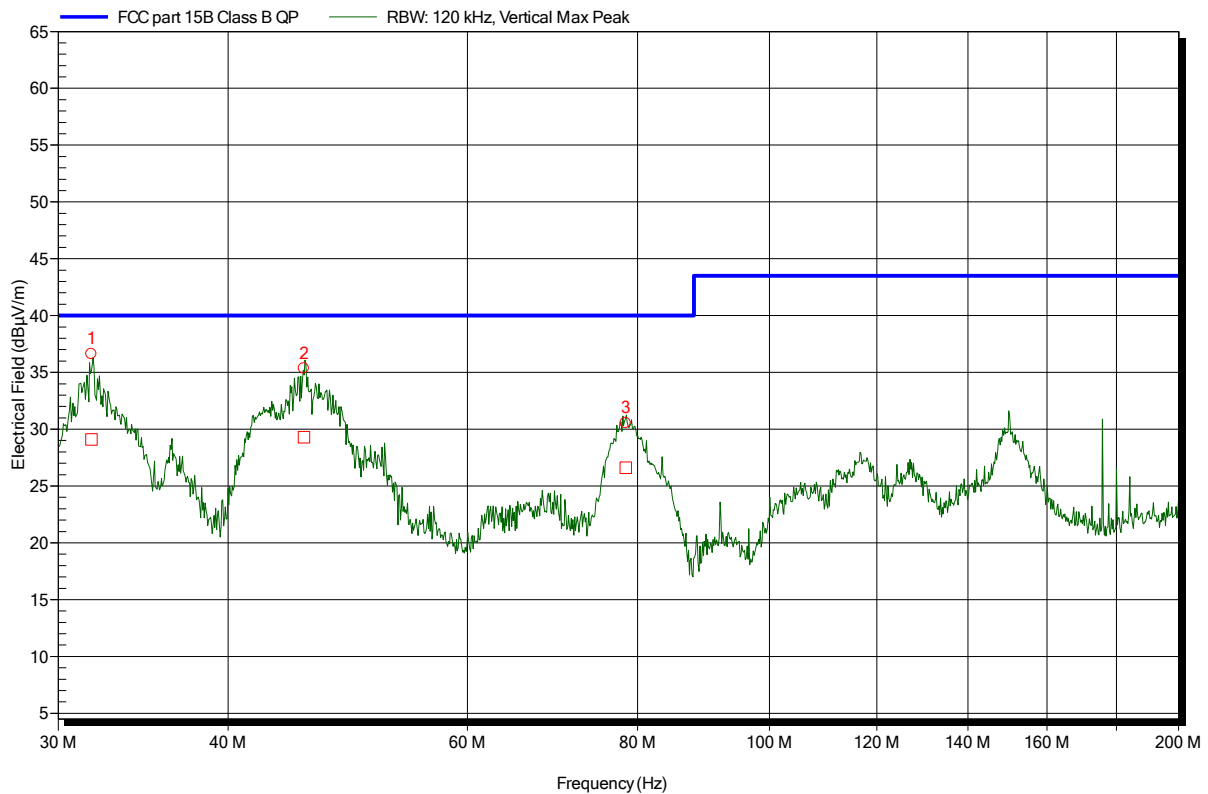
Radiated emissions acc. FCC 47 CFR 15.109 / IC RSS-Gen					Verdict: PASS	
Laboratory Parameters:		Required prior to the test		During the test		
Ambient Temperature		15 to 35 °C		23 °C		
Relative Humidity		30 to 60 %		43 %		
Test according referenced standards		Reference Method				
		ANSI C63.4				
Sample 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] = 5000				
Fully configured sample scanned over the following frequency range		Frequency range				
		30 MHz to 8 GHz				
Operating mode		1 / 2				
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: Measurements performed up to 8 GHz. Above 8 GHz no relevant disturbances determined.						

Spurious emissions under normal conditions according to FCC PART 15B

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXAVI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC(AC/DC-adapter)
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3m
 Mode: GSM-GPRS+WLAN+charging
 Test Date: 2014-09-09
 Note:

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Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
31.74 MHz	29.1 dBµV/m	40 dBµV/m	-10.9 dB	Pass
45.48 MHz	29.29 dBµV/m	40 dBµV/m	-10.71 dB	Pass
78.42 MHz	26.61 dBµV/m	40 dBµV/m	-13.39 dB	Pass

Test Report No.: G0M-1407-3973-EF0115B-V01

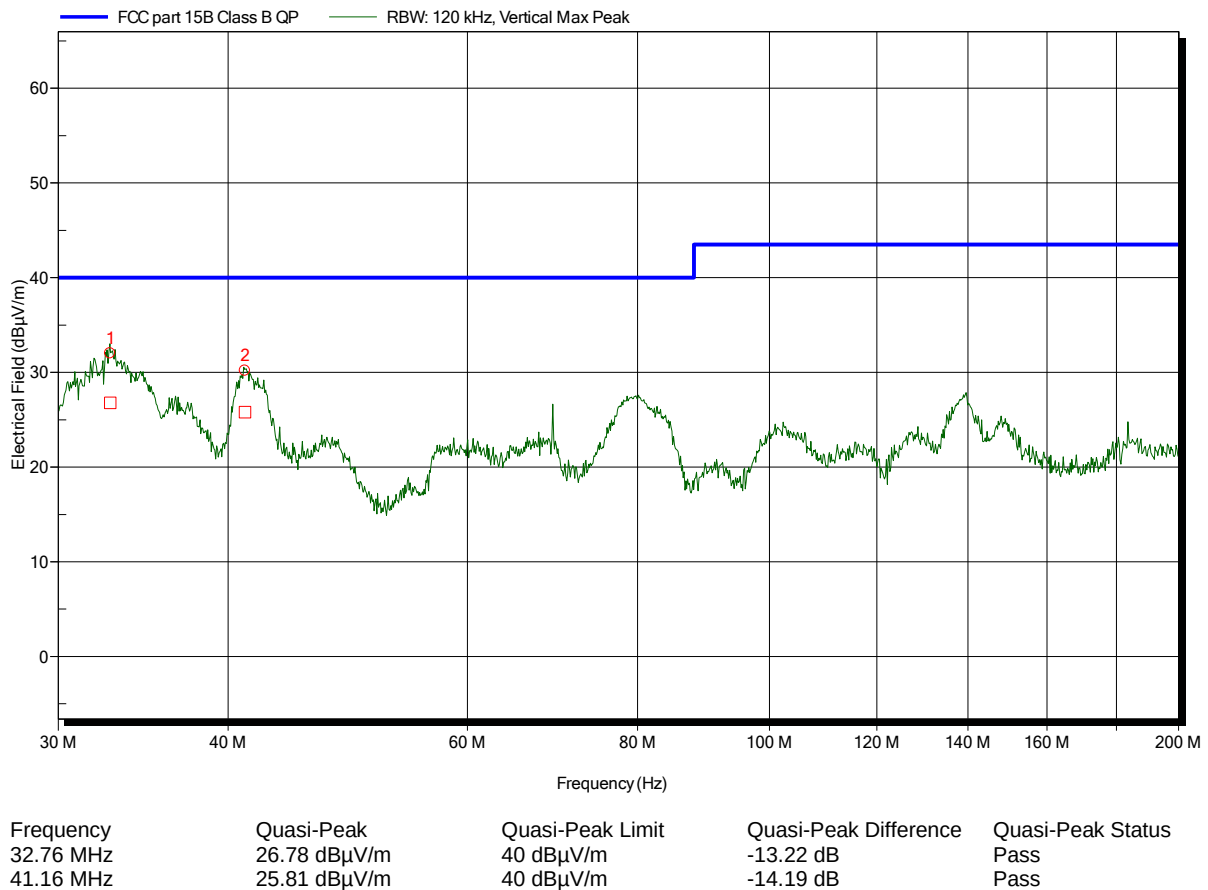
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions under normal conditions according to FCC PART 15B

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXAVI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC(AC/DC-adapter)
 Antenna: Rohde & Schwarz HK 116, Vertical (2)
 Measurement distance: 3m
 Mode: GSM-GPRS+WLAN+charging
 Test Date: 2014-09-09
 Note:

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Test Report No.: G0M-1407-3973-EF0115B-V01

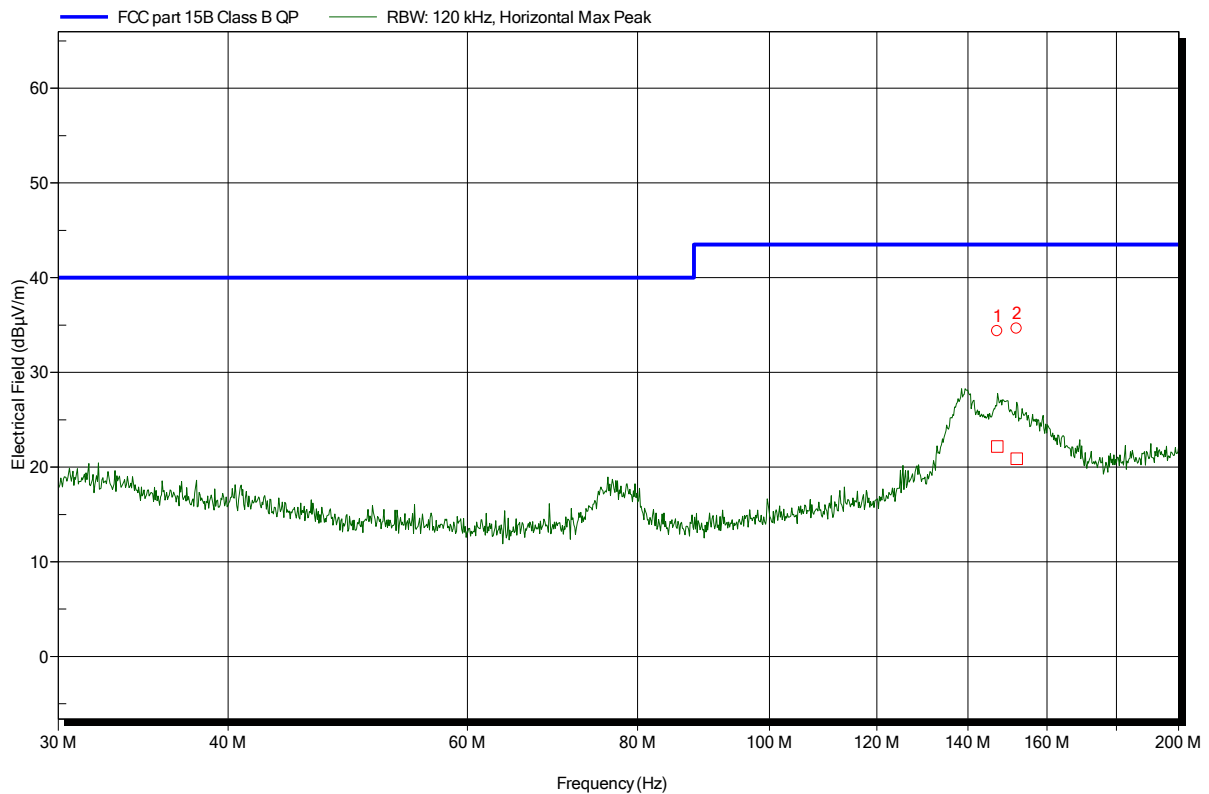
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions under normal conditions according to FCC PART 15B

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXAVI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC(AC/DC-adapter)
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3m
 Mode: GSM-GPRS+WLAN+charging
 Test Date: 2014-09-09
 Note:

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Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
147.12 MHz	22.18 dBµV/m	43.5 dBµV/m	-21.32 dB	Pass
152.04 MHz	20.9 dBµV/m	43.5 dBµV/m	-22.6 dB	Pass

Test Report No.: G0M-1407-3973-EF0115B-V01

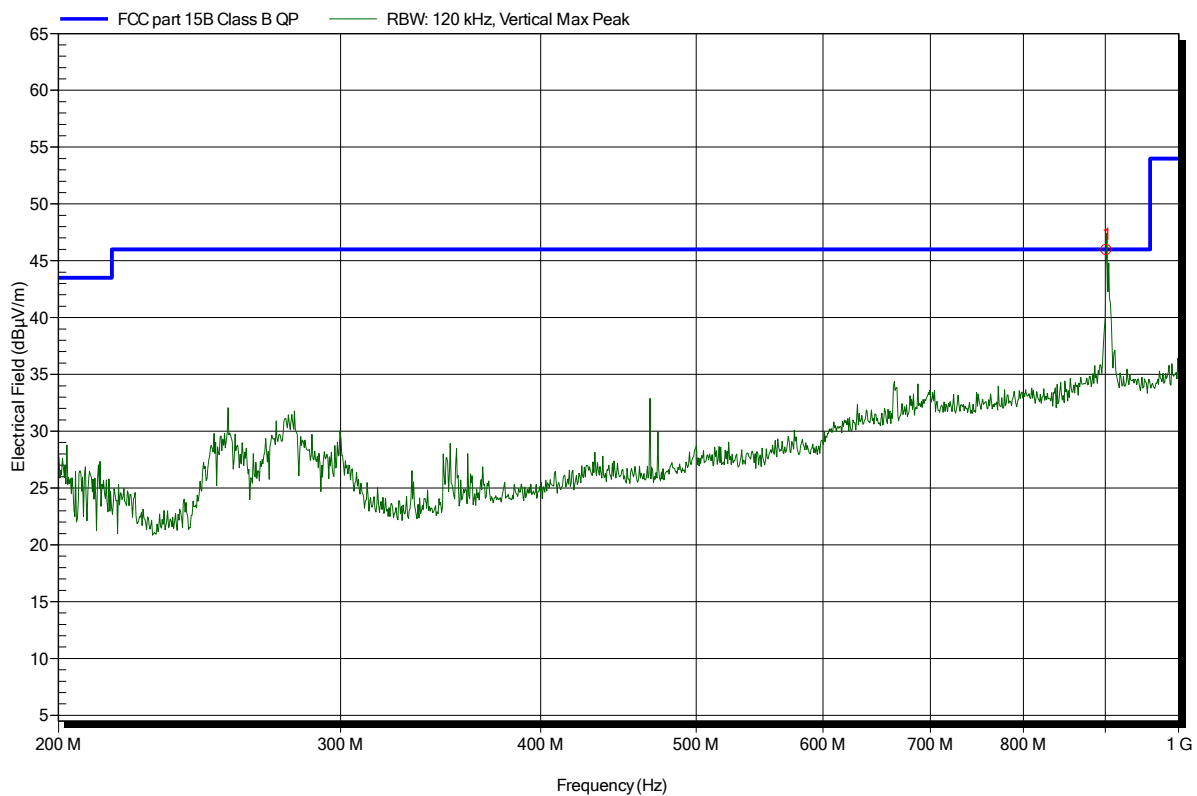
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions under normal conditions according to FCC PART 15B

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXAVI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC(AC/DC-adapter)
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3m
 Mode: GSM-GPRS+WLAN+charging
 Test Date: 2014-09-12
 Note:

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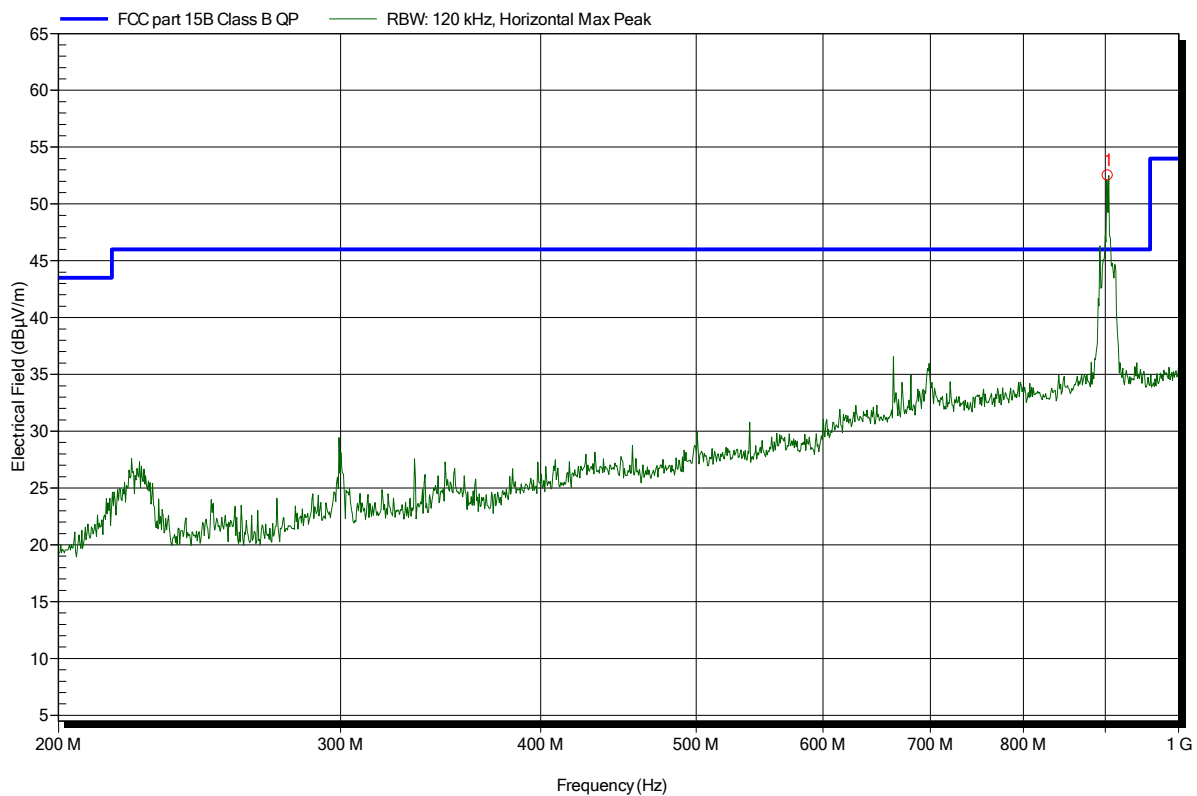
Frequency
 TX-901.52 MHz

Spurious emissions under normal conditions according to FCC PART 15B

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXAVI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC(AC/DC-adapter)
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3m
 Mode: GSM-GPRS+WLAN+charging
 Test Date: 2014-09-12
 Note:

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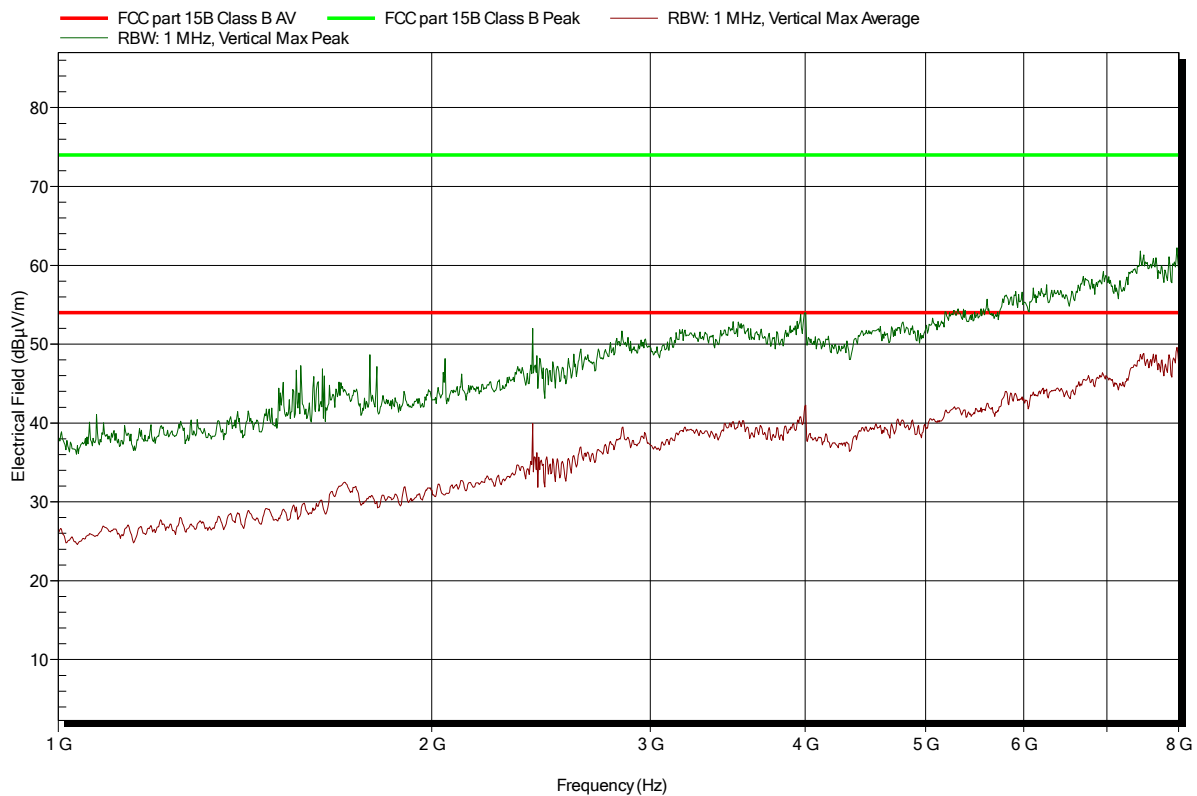
Frequency
 TX-903.25 MHz

Spurious emissions under normal conditions according to FCC PART 15B

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXAVI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC(AC/DC-adapter)
 Antenna: Rohde & Schwarz HL 025, Vertical
 Measurement distance: 3m
 Mode: GSM-GPRS+WLAN+charging
 Test Date: 2014-09-12
 Note:

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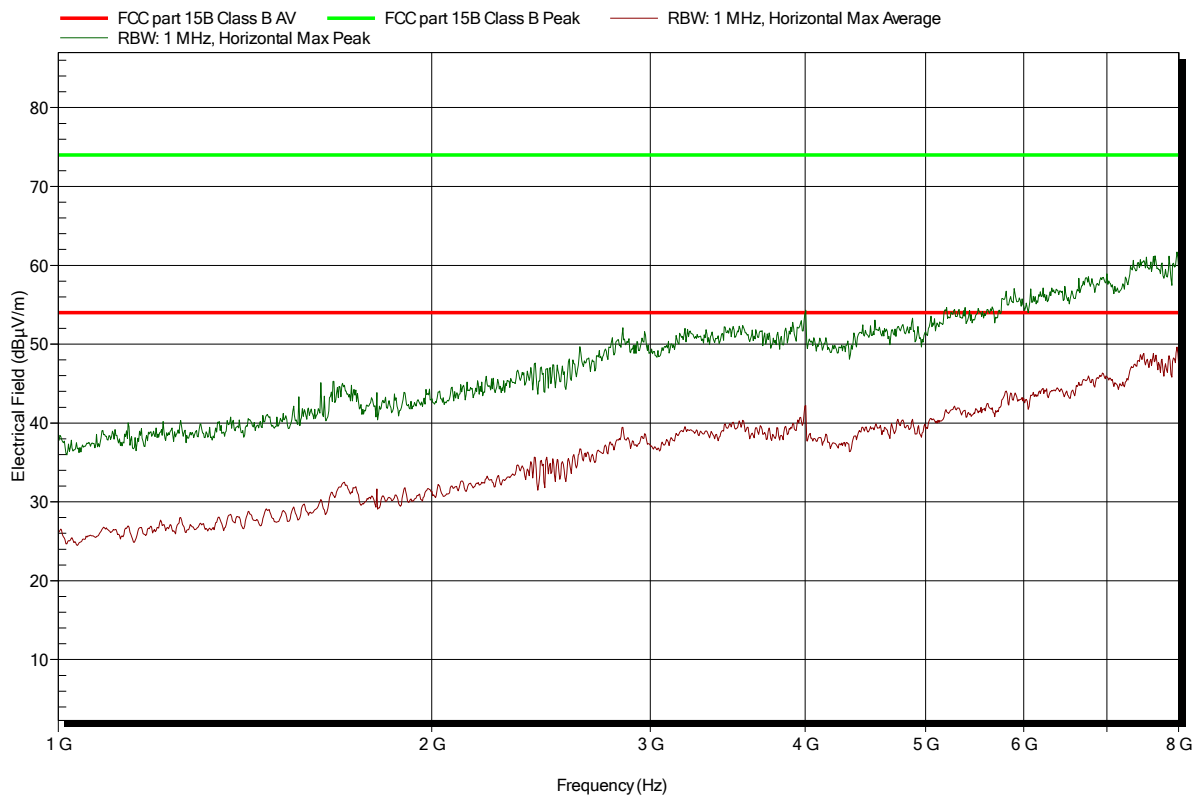


Spurious emissions under normal conditions according to FCC PART 15B

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXAVI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC(AC/DC-adapter)
 Antenna: Rohde & Schwarz HL 025, Horizontal
 Measurement distance: 3m
 Mode: GSM-GPRS+WLAN+charging
 Test Date: 2014-09-12
 Note:

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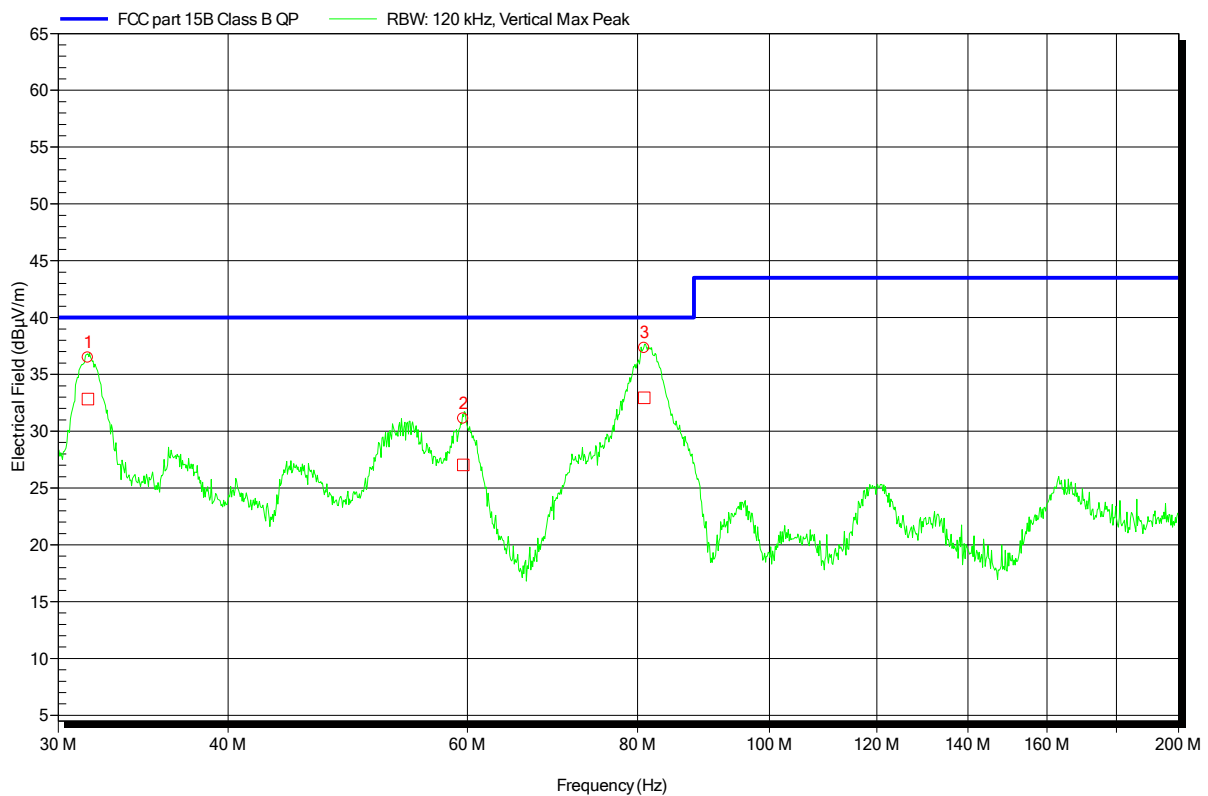


Spurious emissions under normal conditions according to FCC part 15b

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXAVI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC(AC/DC-adapter)
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement distance: 3m
 Mode: UMTS band 1+ Bluetooth + charging
 Test Date: 2014-09-17
 Note:

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Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
31.56 MHz	32.82 dBμV/m	40 dBμV/m	-7.18 dB	Pass
59.58 MHz	27.04 dBμV/m	40 dBμV/m	-12.96 dB	Pass
80.94 MHz	32.93 dBμV/m	40 dBμV/m	-7.07 dB	Pass

Test Report No.: G0M-1407-3973-EF0115B-V01

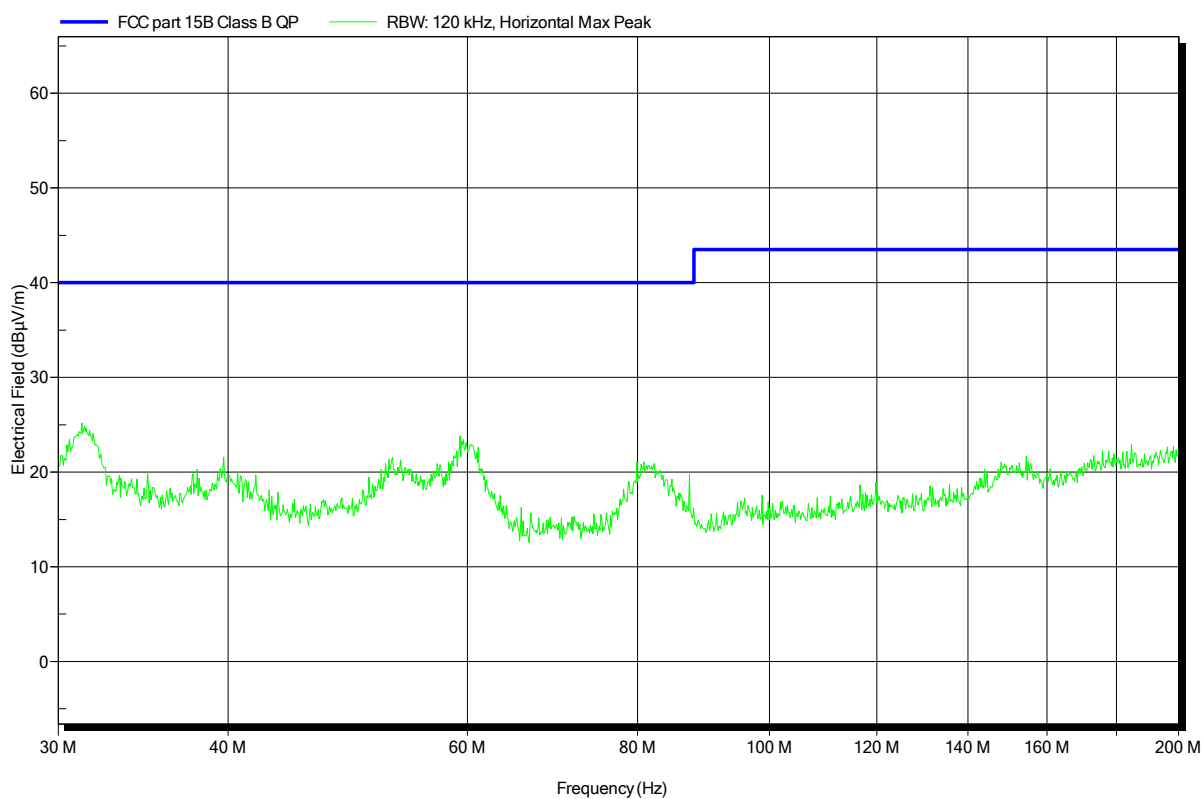
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Spurious emissions under normal conditions according to FCC part 15b

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXAVI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC(AC/DC-adapter)
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement distance: 3m
 Mode: UMTS band 1+ Bluetooth + charging
 Test Date: 2014-09-17
 Note:

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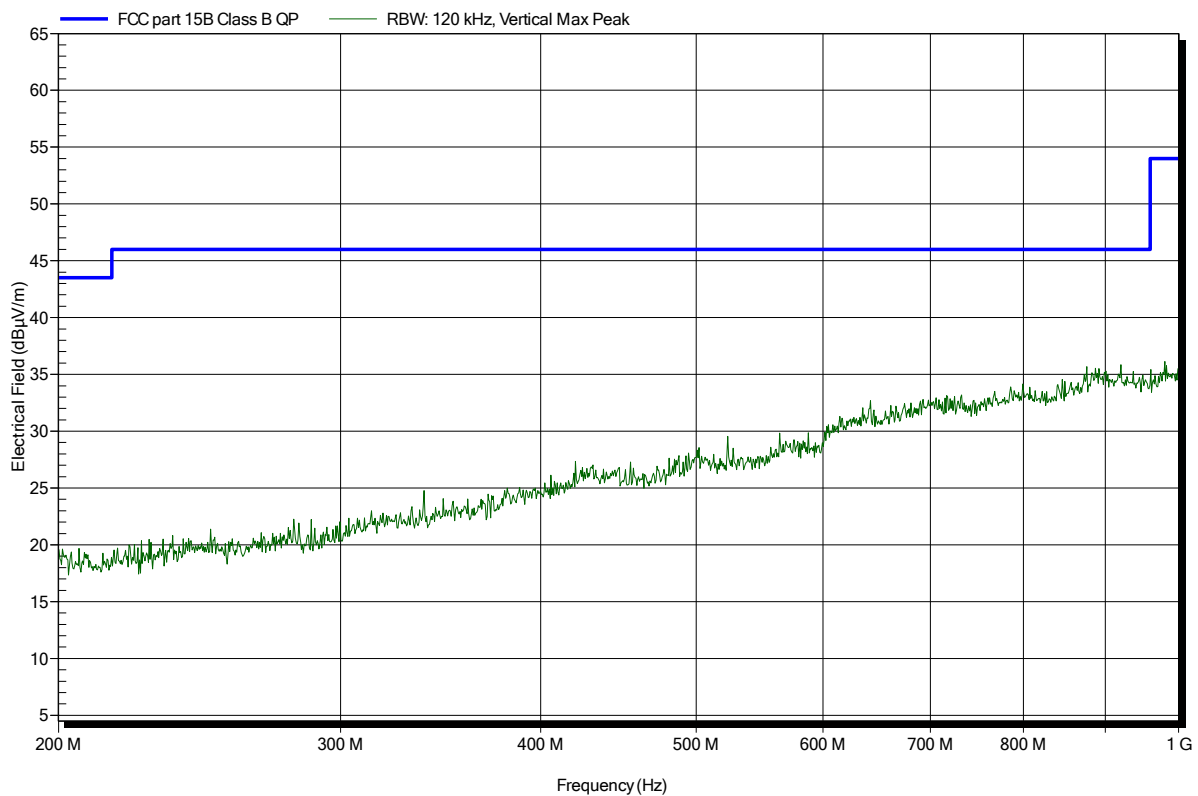


Spurious emissions under normal conditions according to FCC part 15b

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXAVI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC(AC/DC-adapter)
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement distance: 3m
 Mode: UMTS band 1+ Bluetooth + charging
 Test Date: 2014-09-12
 Note:

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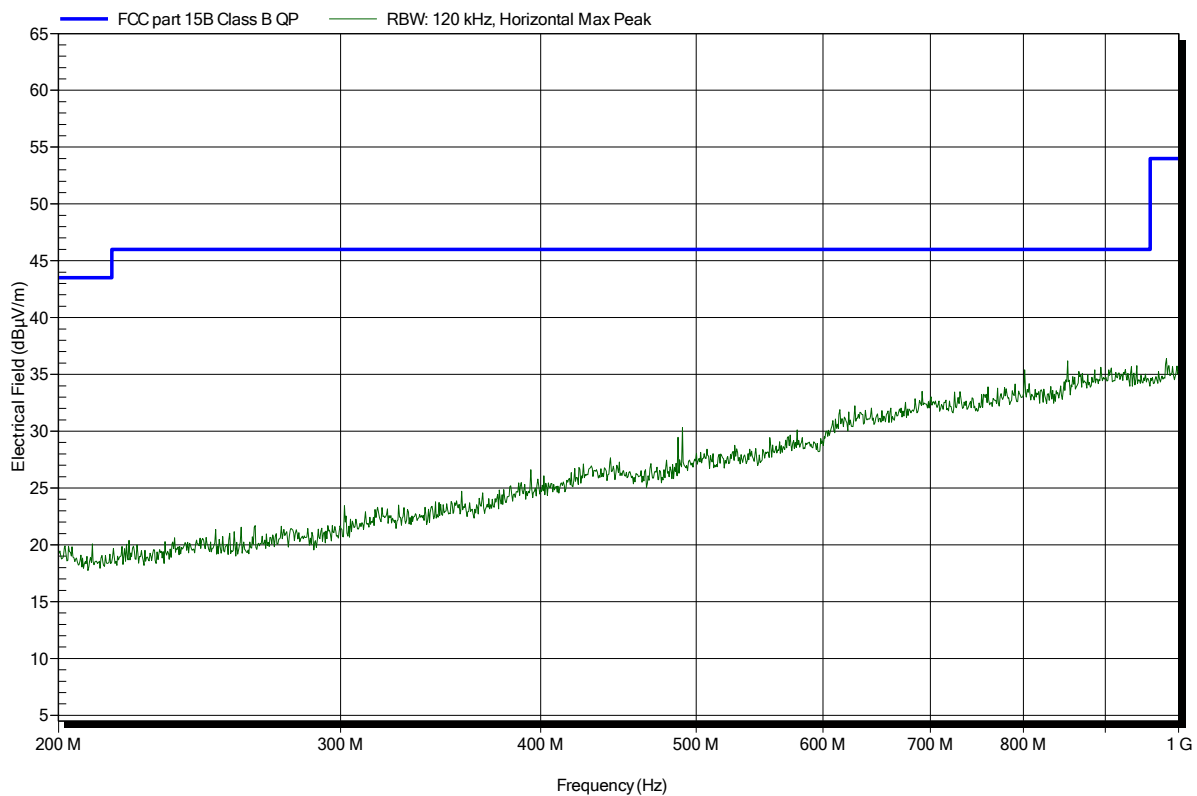


Spurious emissions under normal conditions according to FCC part 15b

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXAVI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC(AC/DC-adapter)
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement distance: 3m
 Mode: UMTS band 1+ Bluetooth + charging
 Test Date: 2014-09-12
 Note:

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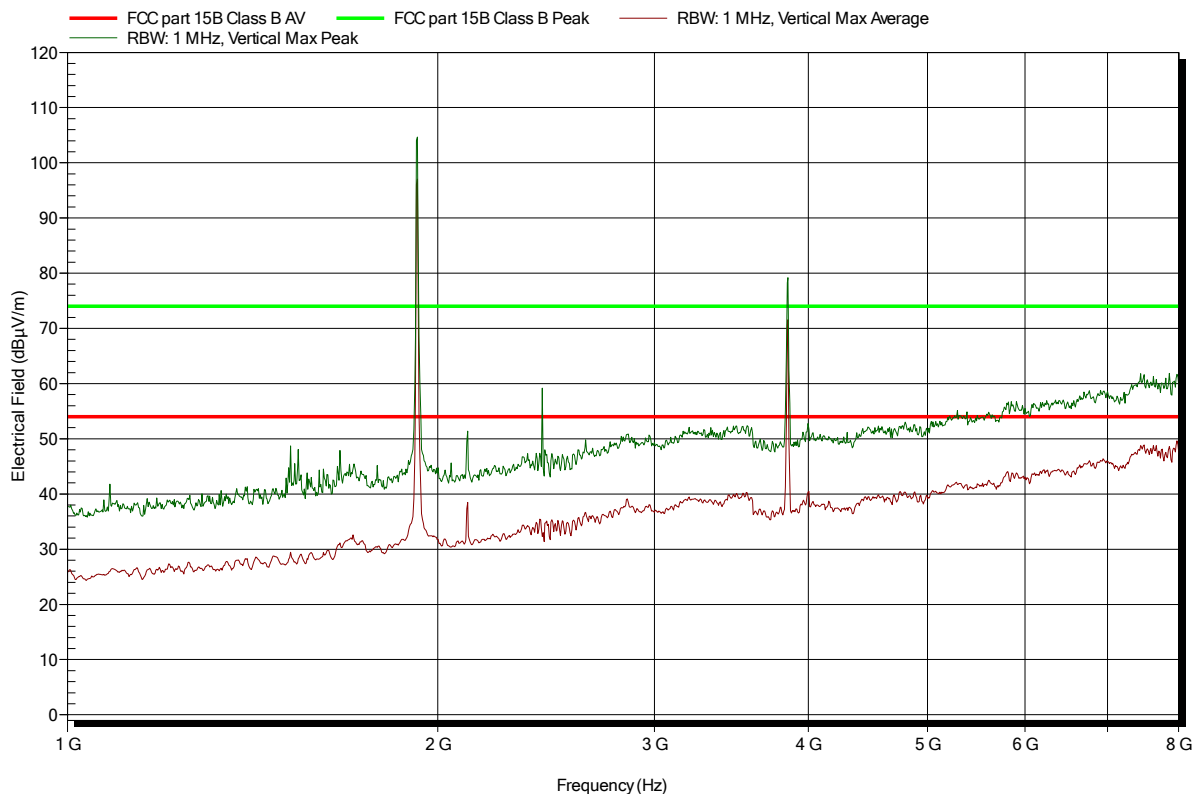


Spurious emissions under normal conditions according to FCC part 15b

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXAVI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC(AC/DC-adapter)
 Antenna: Rohde & Schwarz HL 025, Vertical
 Measurement distance: 3m
 Mode: UMTS band 1+ Bluetooth + charging
 Test Date: 2014-09-12
 Note:

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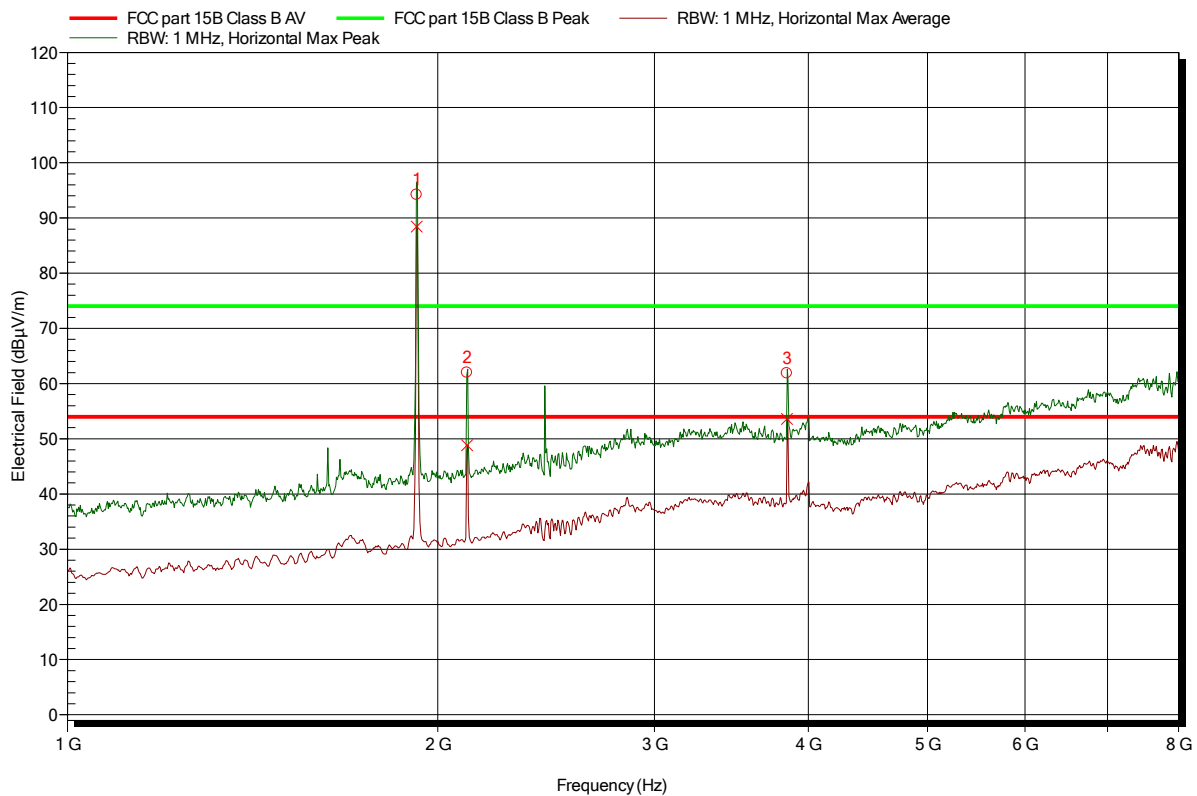
Frequency
 1.923 GHz TX UMTS band 1
 3.843 GHz Harmonics TX

Spurious emissions under normal conditions according to FCC part 15b

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXAVI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC(AC/DC-adapter)
 Antenna: Rohde & Schwarz HL 025, Horizontal
 Measurement distance: 3m
 Mode: UMTS band 1+ Bluetooth + charging
 Test Date: 2014-09-12
 Note:

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Frequency

1.923 GHz TX UMTS band 1

2.113 GHz

3.843 GHz Harmonics TX

48.82 dBμV/m

54 dBμV/m

Pass

Test Report No.: G0M-1407-3973-EF0115B-V01

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

3.2 Test Conditions and Results – AC power line conducted emissions

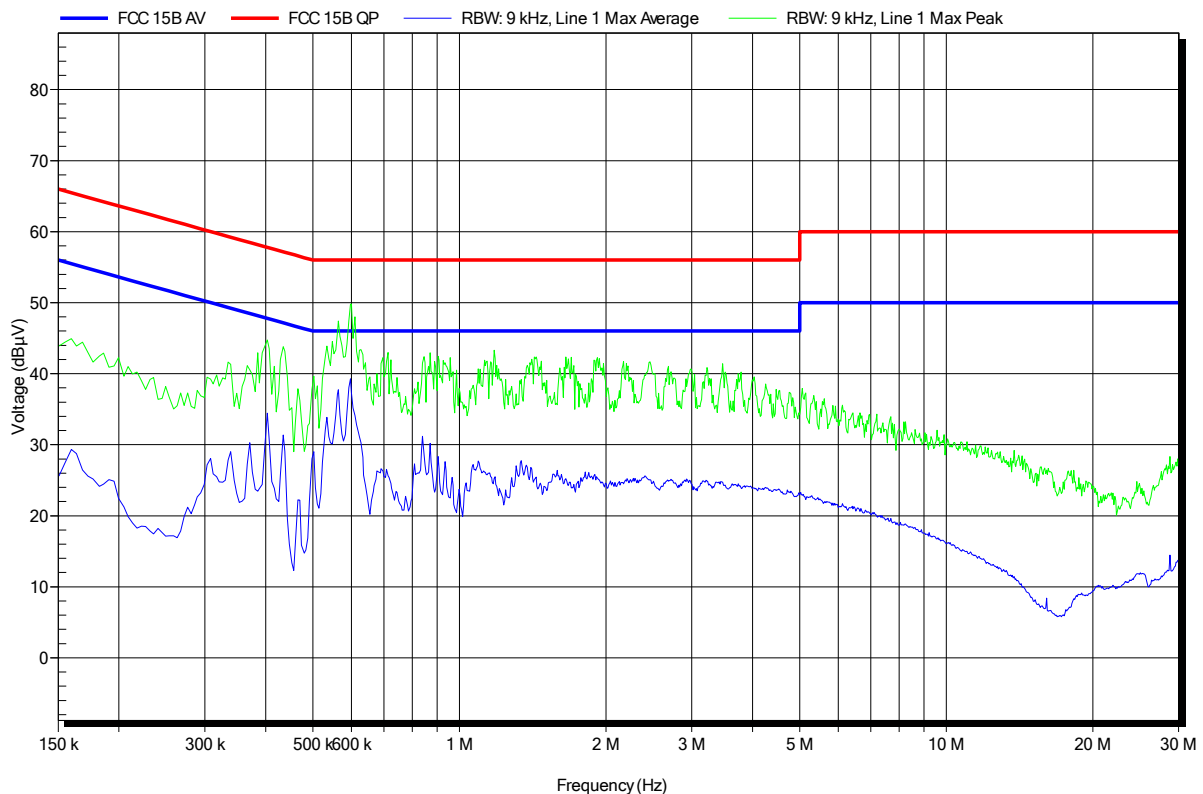
Conducted emissions acc. FCC 47 CFR 15.107 / IC RSS-Gen			Verdict: PASS	
Laboratory Parameters:		Required prior to the test	During the test	
Ambient Temperature		15 to 35 °C	23 °C	
Relative Humidity		30 to 60 %	43 %	
Test according referenced standards		Reference Method		
		ANSI C63.4		
Fully configured 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				
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.				

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

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXA VI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 23°C, Unom: 120VAC (AC/DC-adapter,AN4111)
 LISN: ESH2-Z5 L
 Mode: charging+GSM900MHz,p15+WLAN
 Test Date: 2014-08-26
 Note:

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

Project number: G0M-1407-3973

Manufacturer: BARTEC PIXA VI AS
 EUT Name: Smartphone
 Model: Impact X
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Pflug
 Test Conditions: Tnom: 25°C, Unom: 120VAC (AC/DC-adapter,AN4111)
 LISN: ESH2-Z5 N
 Mode: charging+GSM900MHz,p15+WLAN
 Test Date: 2014-08-26
 Note:

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