TEST REPORT

According to FCC, CFR 47 Part 15
And Industry Canada
according to RSS 210

RFID Reader
AFX-100

N°236102-CC-1-b

GYL technologies
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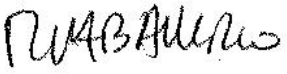
Summary

OTHER ASSOCIATED FILES:

236102 Exhibit 1 ID label NQY-30001
236102 Exhibit 3 External Photographs NQY-30001
236102 Exhibit 4 Block diagram NQY-30001
236102 Exhibit 5a Schematics main board NQY-30001
236102 Exhibit 5b Schematics main board NQY-30001
236102 Exhibit 5c Schematics main board NQY-30001
236102 Exhibit 5d Schematics PCB Bluetooth NQY-30001
236102 Exhibit 5e Schematics Battery Pack NQY-30001
236102 Exhibit 6 test report NQY-30001
236102 Exhibit 7 Test set up photos NQY-30001
236102 Exhibit 8a NQY-30001 EID_UM100109_AFX-100_UserManual_US.1_0_P5
236102 Exhibit 8b Bluetooth User Manual NQY-30001
236102 Exhibit 9 Internal Photographs NQY-30001
236102 Exhibit 12 Operational description NQY-30001

1 Reference and record of revisions of the test report:

Test report number :	Revision :	Number of pages	Modification reasons :
236102-CC-1-a	a	22	Creation, June 23, 2010
236102-CC-1-b	b	22	Re measurement of bandwidth
Redactor : Jean-Luc JAMET			**Date of writing** : 8 October 2010
Technical control: O. ROY 			**Quality Control: M. CABALLERO** 

2 Interpretation and remarks:

2.1 RESULTS:

This equipment complies with the rules of the FCC part 15.207, 15.209 and related sections for RFID function.

This equipment complies with the rules of the IC RSS-210 and related sections for RFID function.

3 GENERAL INFORMATION:

3.1 APPLICANT:

Allflex Europe
Route des eaux
35502 VITRE
France

3.2 TEST DATE:

June 3, 4 and 15, 2010,
October 8, 2010

3.3 TEST SITE:

GYL Technologies
Parc d'activités de Lanserre
49610 Juigné sur Loire – France
FCC registration Number: 90469
IC registration IC 4452

4 INTRODUCTION:

The following test report for RFID reader is written in accordance with Part 15 of the Federal Communications Commissions and RSS-210 of the Industry Canada. The Equipment under Test (EUT) was RFID reader. The test results reported in this document relate only to the item that was tested AFX-100.

All measurements contained in this Application were conducted in accordance with ANSI C63.4 Methods of Measurement of Radio Noise Emissions of 2009. The instrumentation utilized for the measurements conforms to the ANSI C63.4 standard for EMI and Field Strength Instrumentation. Some accessories are used to increase sensitivity and prevent overloading of the measuring instrument. These are explained in this report. Calibration checks are performed regularly on the instruments, and all accessories including the high pass filter, preamplifier and cables.

All conducted and radiated emissions measurements were performed manually at GYL TECHNOLOGIES. The radiated emissions measurements required by the rules were performed on the three to ten meters, open field, test site maintained by GYL Technologies Parc d'activités de Lanserre, 49610 Juigné sur Loire , France. Complete description and site attenuation measurement data have been placed on file with the Federal Communications Commission.

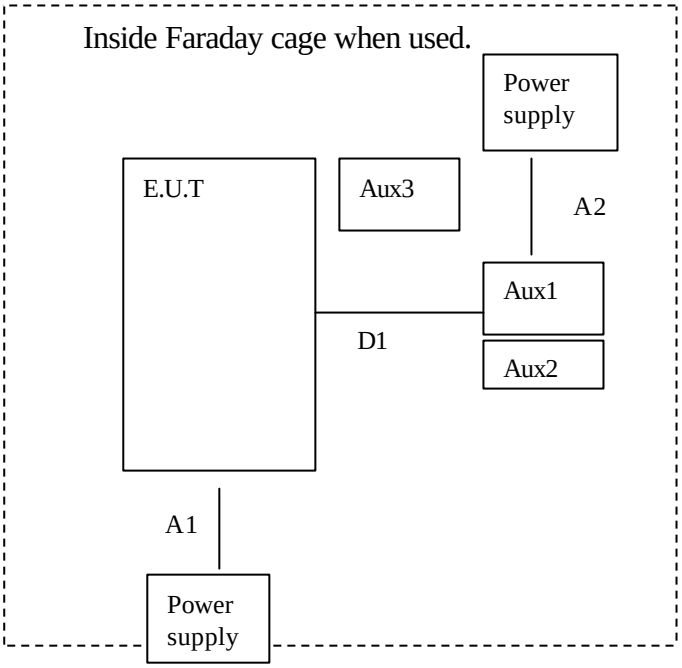
5 MEASUREMENT EQUIPMENT LIST:

PART TYPE	MANUFACTURER	MODEL	GYL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
RECEIVERS					
Receiver	Rohde & Schwarz	ESI 7	M02020	Jun-9	Jun-10
Spectrum analyzer	Rohde & Schwarz	FSEM 30	M02021	Jun-9 /Jun-10	Jun-10/Jun-11
Filter 150 KHz	Rohde & Schwarz	EZ25	M02040	March-10	March-11
Satellite synchronized frequency standard	Acquisis	GPS8	M06013	without	without
ARTIFICIAL MAINS NETWORKS					
LISN (50µH / 5/50Ω)	Rohde & Schwarz	ESH3-Z5	M02027	July-9	July-10
ANTENNAS					
Bilog (30-2000MHz)	CHASE	CBL-6112	M02031	Aug-9	Aug-10
Bilog (30-2000MHz)	CHASE	CBL-6112	M02032	Aug-9	Aug-10
Active loop antenna	Rohde & Schwarz	HFH2-Z2	M01128	April-10	April-11
Horn antenna	EMCO	3115	M02045	March-10	March-11

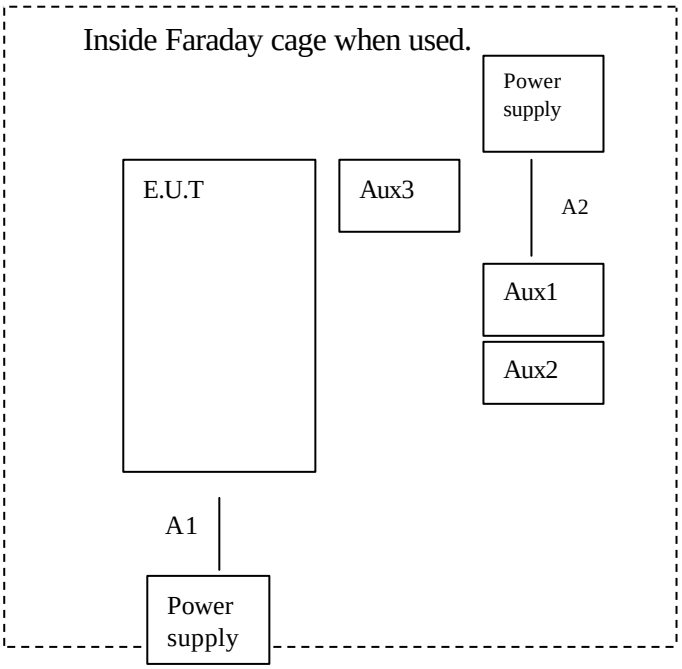
All equipments where within their calibration period when used

CONFIGURATION OF TESTED SYSTEM:

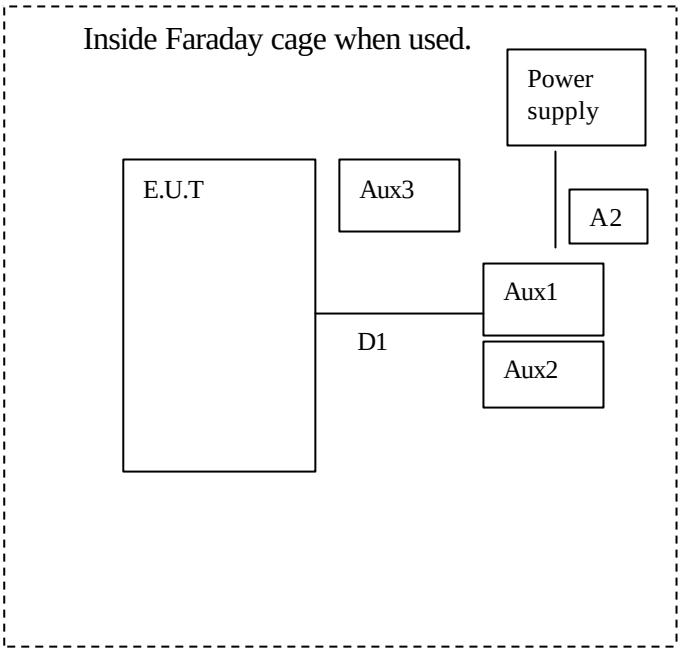
Configuration1 used for the radiated disturbance.



Configuration 1b used for conducted emission test on A1 cable



Configuration 2 used for the conducted disturbance on A2 cable



E.U.T.: Equipment under Test

5.1 Auxiliary equipment:

Aux1: Laptop
Model: Compact Ref: NC6220 Serial number: CNU5300D3C

Aux2: Bluetooth dongle
Model: ABE Ref: UB20S Serial number: 0706000391

Aux3: Tag

5.2 List of cables:

	AC power input Name	Nb phase	N Y/N	PE Y/N	test voltage1
A1	AC adapter for charger	1	Y	N	120
A2	AC adapter for laptop	1	Y	Y	120
	Data I/O Name	Shielded Y/N	Max length (m)	local network Y/N	Length for test
D1	USB cable	Y	1,5	N	1,5

6 EXERCISING TEST CONDITIONS:

The RF emission is emitted as described in exhibit 12 "Operational description" with continuous emission duration of 50ms (min) to 100ms (max) with off time of max 20 ms.

For radiated emission.

The RFID reader read every second the tag information. The information is displayed on the laptop screen according to the both transmission, Bluetooth and USB.

For conducted emissions on A1

The RFID reader read every second the tag information. The information is displayed on the laptop screen according to the Bluetooth transmission.

For conducted emissions on A2

The RFID reader read every second the tag information. The information is displayed on the laptop screen according to USB transmission.

7 CONFORMANCE STATEMENT:

7.1 STANDARDS REFERENCED FOR THIS REPORT:

PART 2: 2004	Frequency allocations and Radio Treaty Matters General Rules and Regulations
PART 15: 2008	Radio frequency devices
ANSI C63.4-2009	Standard format measurements/technical report personal computer and peripherals
RSS-210 Issue 7, June 2007	Low-power License-exempt Radio communication Devices (All Frequency Bands): Category I Equipment
RSS-Gen Issue 2, June 2007	General Requirements and Information for the Certification of Radio communication Equipment

7.2 JUSTIFICATION:

As mentioned in paragraph 4 of this report, the equipment is a RFID reader. It can be installed in residential commercial or light industry areas the following sub clause of the standard mentioned above are:

- Part 15.207 and 15.209 (subpart C) for respectively conducted and radiated emission for intentional radiator.
- RSS-210 Issue 7 for intentional radiator within the band.

8 TEST ACCORDING TO CFR 47 Part 15

Tests performed by Jean-Luc JAMET at GYL Technologies laboratories on June 3, June 10 and September 13, 2010.

8.1 CONDUCTED EMISSIONS MEASUREMENTS:

The power line conducted emission measurements were performed in a semi anechoic chamber manufactured by SIDT. The EUT was assembled on a non conductive 80 centimeters high wooden table. Power was fed to the EUT through a 50 ohm / 50 micro-Henry Line Impedance Stabilization Network (EUT LISN). The EUT LISN was fed power through an A.C. filter box on the outside of the shielded enclosure. The filter box and EUT LISN housing are bonded to the ground plane of the shielded enclosure. The spectrum analyzer was connected to the A.C. line through an isolation transformer. The 50-ohm output of the EUT LISN was connected to the spectrum analyzer input through a Rohde and Schwartz 150 kHz high-pass filter. The filter is used to prevent overload of the spectrum analyzer from noise below 150 kHz. Conducted emission levels were measured on each current-carrying line with the receiver operating in the CISPR quasi-peak mode (or average mode if applicable).

8.1.1 RESULTS:

The conducted emissions initial measurement consists of a pre-scan, in order to determine the maximum quasi peak and average values.

- If the conducted emissions have limits showing a margin lower than 20dB, data collection measurement is performed on the six (6) highest frequencies to determine the compliance of the EUT.
- If the conducted emissions have limits showing a margin greater than 20dB, data collection measurement is not performed and the curves are given as evidence of compliance.

The following table lists worst-case conducted emission data. Specifically: emission frequency, measurement level (including cable loss and transducer factors) in quasi-peak and average mode and margin.

The conducted test was performed with the EUT exercise program loaded, and the emissions were scanned between 150 kHz to 30 MHz on the NEUTRAL SIDE and LIVE SIDE, herein referred to as Neutral, and Live respectively.

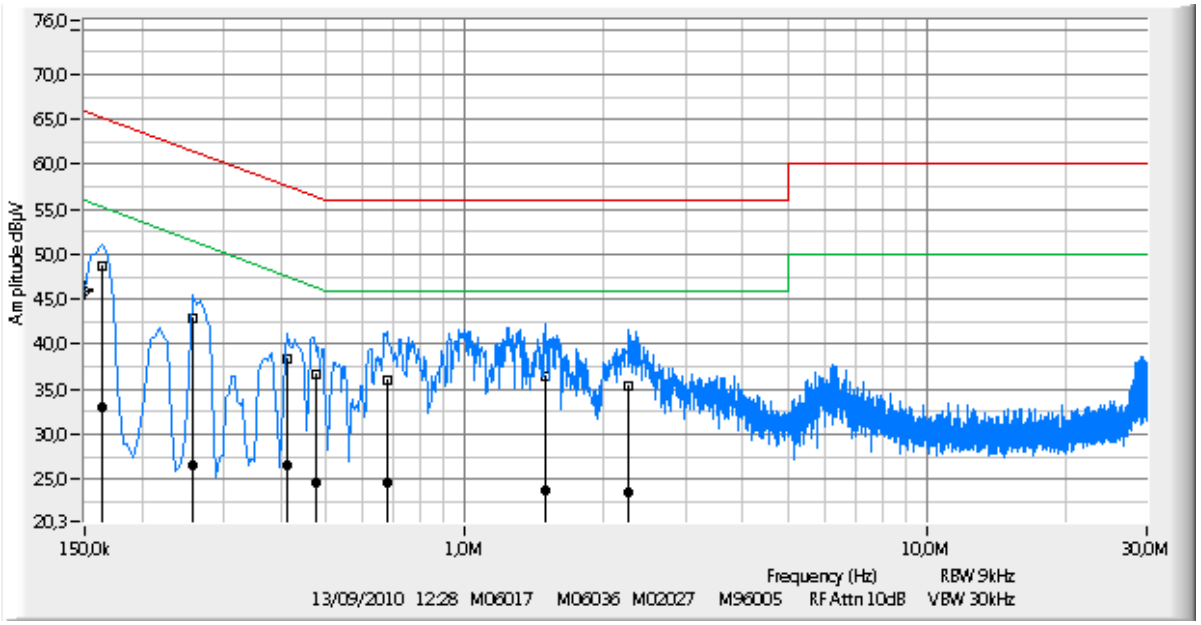
Measurements are performed with RBW of 9 kHz and VBW of 30 kHz

Neutral: A1 cable

Frequency (MHz)	Quasi-peak (dBµV)	QP Limit (dBµV)	QP margin (dB)
0,164	48,7	65,3	16,6
0,258	42,8	61,5	18,7
0,412	38,4	57,6	19,2
0,475	36,7	56,4	19,8
0,678	36,1	56,0	19,9
1,494	36,4	56,0	19,7
2,266	35,3	56,0	20,7

Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average margin (dB)
0,164	32,9	55,3	22,3
0,258	26,6	51,5	24,9
0,412	26,6	47,6	21,0
0,475	24,7	46,4	21,8
0,678	24,6	46,0	21,4
1,494	23,7	46,0	22,3
2,266	23,5	46,0	22,5

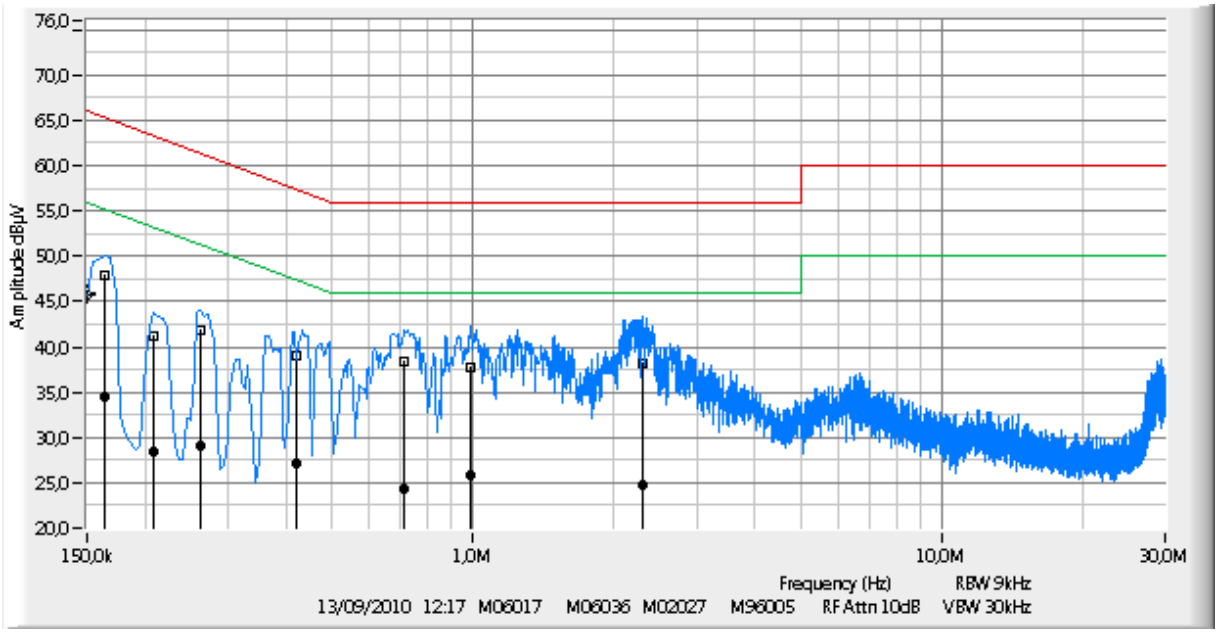
Legend: Blue curve represents the peak values



Live: A1 cable

Frequency (MHz)	Quasi-peak (dBµV)	QP Limit (dBµV)	QP margin (dB)
0,164	47,9	65,3	17,3
0,209	41,2	63,2	22,0
0,263	41,9	61,3	19,5
0,421	39,0	57,4	18,5
0,714	38,4	56,0	17,6
0,989	37,7	56,0	18,3
2,297	38,2	56,0	17,8

Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average margin (dB)
0,164	34,6	55,3	20,7
0,209	28,3	53,2	24,9
0,263	29,1	51,3	22,3
0,421	27,2	47,4	20,2
0,714	24,2	46,0	21,8
0,989	25,8	46,0	20,2
2,297	24,7	46,0	21,3

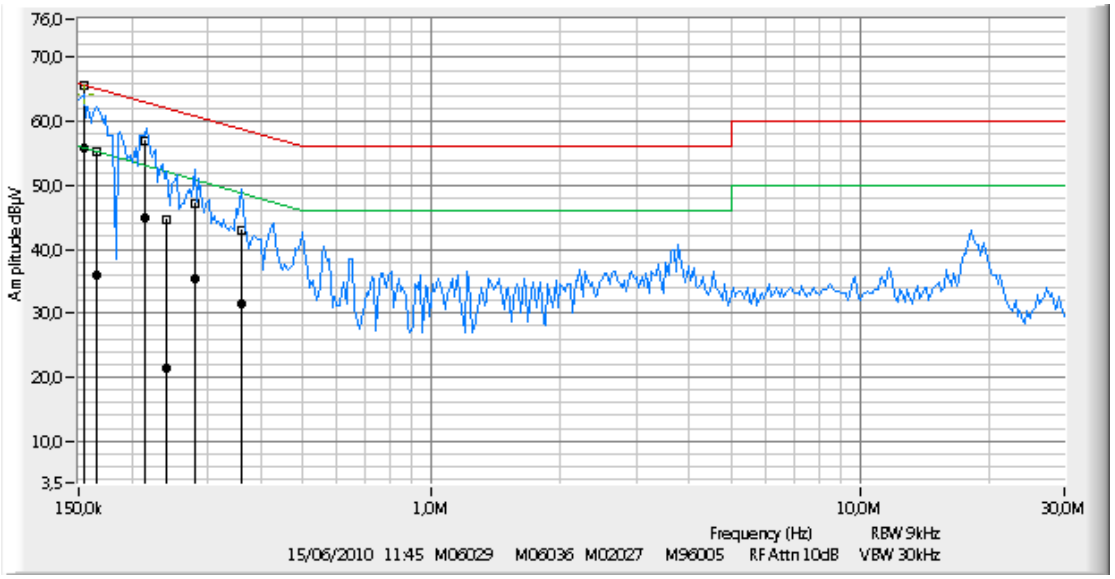


Neutral: A2 cable

Frequency (MHz)	Quasi-peak (dBµV)	QP Limit (dBµV)	QP margin (dB)
0,154	63,3	65,7	2,4
0,165	55,2	65,2	10,0
0,214	57,0	63,0	6.0
0,241	44,7	62,0	17,3
0,279	47,3	60,9	13,6
0,359	42,9	58,7	15,8

Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average margin (dB)
0,154	54,2	55,8	1,6
0,165	35,9	55,2	19,3
0,214	45,0	53,0	8,0
0,241	21,4	52,1	30,7
0,279	35,4	50,9	15,5
0,359	31,5	48,8	17,3

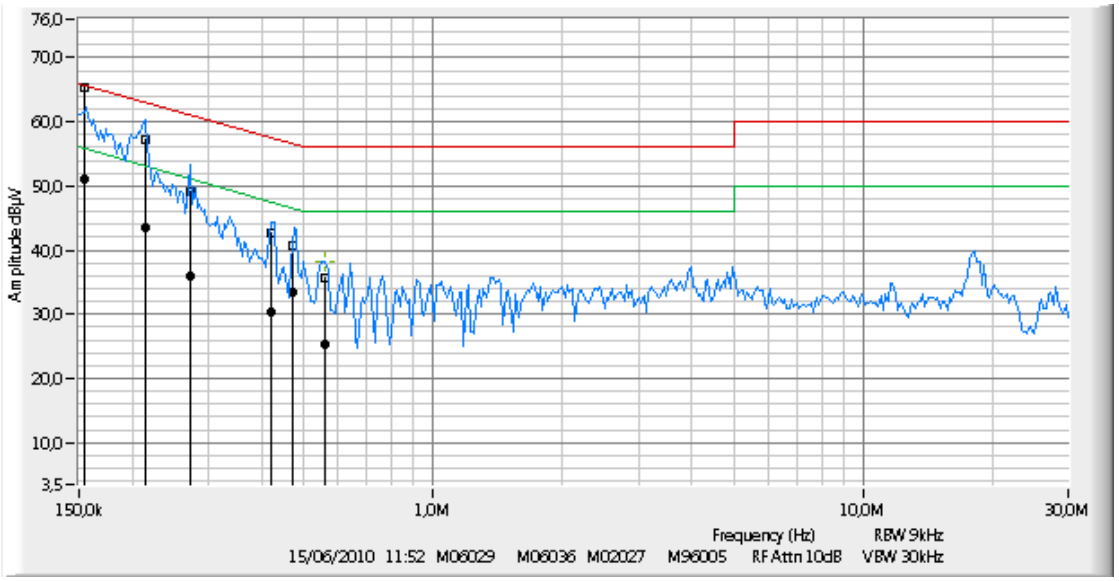
Legend: Blue curve represents the peak values



Live: A2 cable

Frequency (MHz)	Quasi-peak (dBµV)	QP Limit (dBµV)	QP margin (dB)
0,154	65,3	65,8	0,5
0,214	57,2	63,0	5,8
0,272	49,0	61,1	12,1
0,420	42,6	57,4	14,8
0,473	40,7	56,4	15,7
0,562	35,7	56.0	20,3

Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average margin (dB)
0,154	51,2	55,8	4,6
0,214	43,6	53,1	9,5
0,272	36,0	51,1	15,1
0,420	30,4	47,4	17.0
0,473	33,4	46,4	13,0
0,562	25,3	46.0	20,7



8.2 INTENTIONAL RADIATOR OPERATION RSS-210 AND FCC PART 15.209:

Maximization is performed in all possible positions of the E.U.T.

Measurements are performed with full charged battery.

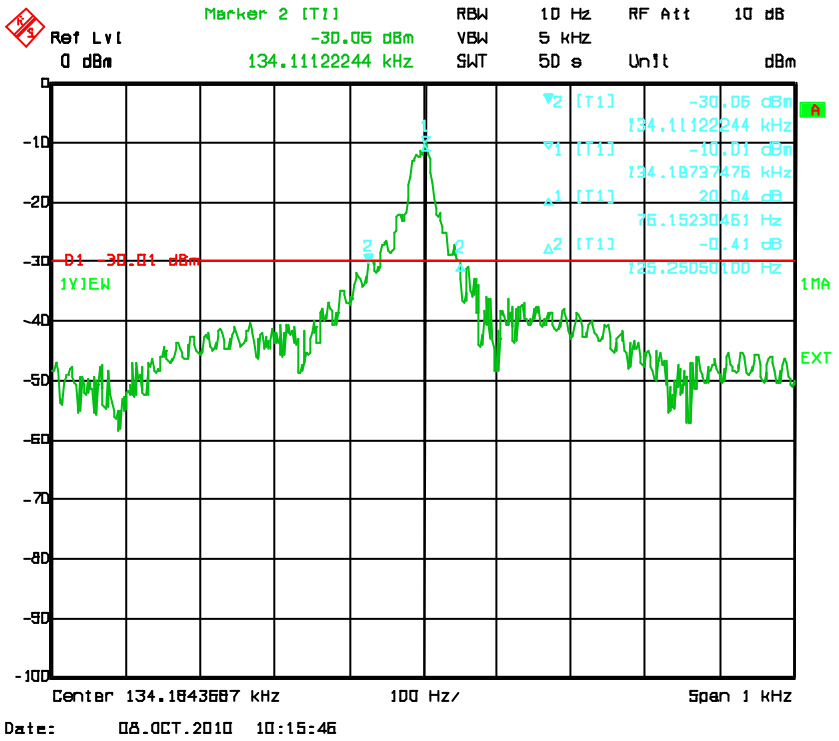
8.2.1 Field strength for the emitter

According to the §15.31 f (2) the distance extrapolation factor (two measurement) is used.

The spectrum analyzer's bandwidth settings is RBW= 200 Hz (greater than the 20 dB bandwidth), VBW= 1kHz with a max peak detector function (no averaging)

Frequency kHz	3m measurement dB(µV/m)	10m measurement dB(µV/m)	300 m (computed) dB(µV/m)	300 m limit dB(µV/m)	Margin dB
134.2	103.17	74.45	-6.7	25	31.7

20dB bandwidth or 99% bandwidth (relative measurement with close loop antenna)
RBW = 10Hz (1% of Span) and VBW = 5kHz, greater than 3 RBW.



20 dB bandwidth or 99% bandwidth is 125 Hz.

8.3 SPURIOUS EMISSIONS (15.209)

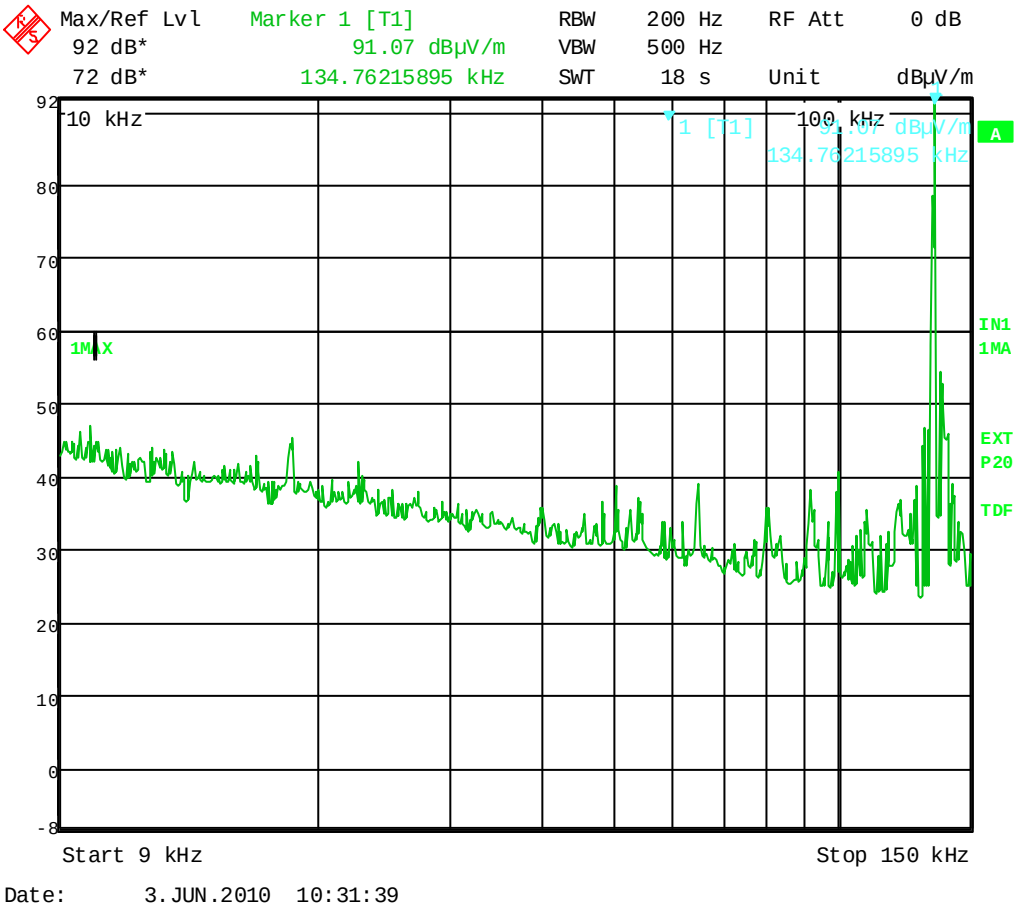
Measurements are performed from 9 kHz to 1000 MHz (intentional radiator at 134.20 kHz).

8.3.1 Measurement from 9 kHz to 30 MHz

The pre-scan has been done in shielded enclosure with RBW of 200Hz and VBW of 500Hz below 150kHz and a RBW of 10kHz and VBW of 30kHz from 150kHz to 30 MHz, with max peak detector an maxhold function. According to these three axes, the maximum level is searched.
As peak measurements are far below (more than 20 dB) average limits in the 9-90kHz and 110-490 kHz band (and peak limits 20 dB over) and quasi-peak limits outside these bands, there is no need of further evaluation.

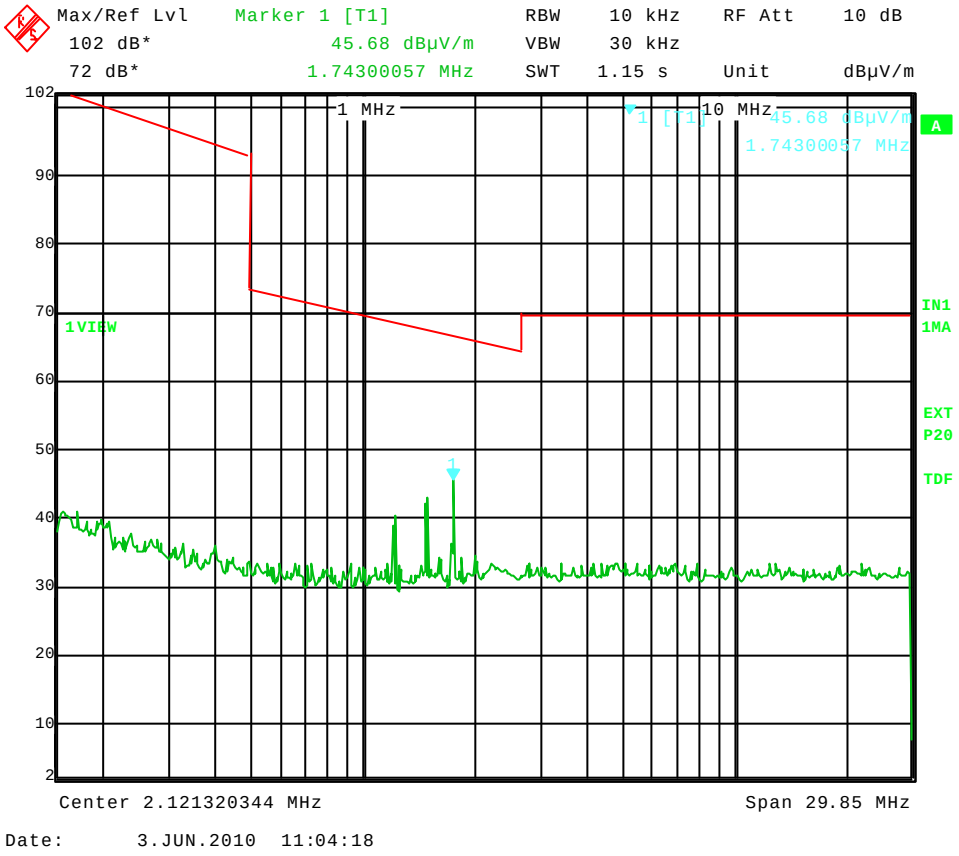
No emission needs to be maximized in open area test site excepted for the 134.20 kHz voluntary emission (see previous §).

Frequency from 9 kHz to 150 kHz.



The computed limit (with the 40dB/dec correction factor) from 9 kHz to 150 kHz is 128.52 dBµV/m to 104.08 dBµV/m so above the scale of the graph.

Frequency from 150 kHz to 30 MHz



8.3.2 Measurement from 30MHz to 1GHz

Before final measurements of radiated emissions were made on the open-field three/ten meter range; the EUT was pre-scanned in the semi anechoic at one meter distance. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to insure that maximum emission amplitudes were attained. The maximum level is searched, according to the three axes of the EUT.

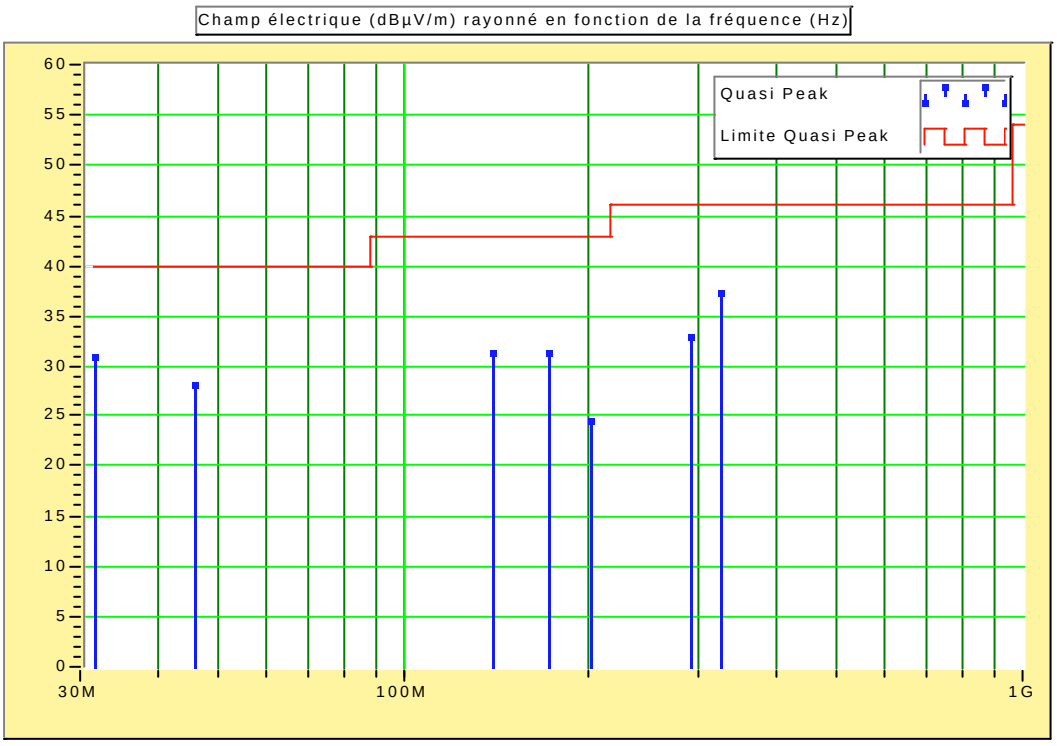
Final radiated emissions measurements were made on the ten-meter, open-field test site. The EUT was placed on a conductive turntable on isolated support, table, 0.8 meter above the ground plane. At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters in order to determine the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarizations. The spectrum analyzer's 6 dB bandwidth was set to 100 kHz for peak measurement and 120 kHz for quasi-peak, and the analyzer was operated in the CISPR quasi-peak detection mode when needed. VBW was set to 1MHz. The range of the frequency spectrum to be investigated is specified in FCC Part 15. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

8.3.2.1 Spurious RESULTS:

The following data table lists the most significant emission frequencies, measured level, correction factor (includes cable and antenna corrections), corrected reading and the limit.

3 m open area test site final measurements results

Frequency in MHz	Peak Value in dBµV/m	Quasi-Peak Value in dBµV/m	Quasi-Peak Limit in dBµV/m	Margin in dB	Pol	Height in cm	Angles in °	Correction Factors in dB
31,601	35,5	31,1	40,0	8,9	V	123	0	18,6
45,931	33,9	28,0	40,0	12,1	V	113	0	12,1
139,006	15,9	31,4	43,0	11,6	H	110	0	14,0
171,704	25,5	31,4	43,0	11,6	H	174	0	12,4
200,314	26,1	24,4	43,0	18,6	V	104	0	11,7
291,978	19,7	33,0	46,0	13,0	V	108	180	16,3
326,372	19,7	37,3	46,0	8,7	H	109	0	17,7



8.3.3 Measurement above 1000 MHz

Measurements are performed from 1000 MHz to 25000 MHz (intentional radiator at 2.4 GHz Bluetooth).

A pre-scan measurement is done very close to the product (less than 10cm) with 100 kHz RBW and 1 MHz VBW and a max peak detector. Then measurements are performed at 3 m with 1MHz RBW and a video averaging (10Hz) and 1MHz RBW/VBW for peak values.

Lists of the most significant emission frequencies

Maximization is performed in all possible positions of the E.U.T.

Frequency (MHz)	Peak (dBµV)	Peak Limit (dBµV)	Peak margin (dB)
1600	42,0	74	32,0
1737	35,6	74	38,4
3312	41,6	74	32,4
4875	46,4	74	27,6

Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average margin (dB)
1600	32,0	54	22,0
1737	21.4	54	32,6
3312	29.7	54	24,3
4875	38.5	54	15,5

8.4 Exposition of public to radio frequency energy

This kind of mobile device is not subject to routine evaluation according to bulletin 65 and FCC part 2.1091 and 2.1093.

8.5 Antenna requirements

Not applicable because the antenna is located inside the equipment and is not replaceable without modifying the product.

8.6 Measurement of frequency stability

Measurements were conducted according to the operating temperature range given by the applicant.

Rated voltage for US and Canada is 120V : 120V-15% = 102V; 120V+15% = 138 V

Test is performed with a larger voltage range.

Frequencies (kHz)

Temperature	20°C		-10°C		40°C	
Power Supply	100	240	100	240	100	240
134.2	134.19499	134.19499	134.19499	134.19499	134.19499	134.19499

Neither voltage nor temperature variations affect the frequency stability that is better than ±10 ppm.