

R041-07-104754-1A - DM / CHB

RADIO TEST REPORT

According to the standard(s):

FCC part 15: 02/2006
and
RSS-210: 06/2007

Equipment under test:

RFID Module LF-AH1-G2 (Integrated LF RFID Reader)
FCC ID: GM3AIR200X
IC ID: 2739D-AIR200X
Company:

PSION TEKLOGIX

Diffusion: Mr PORTE

(Company: PSION TEKLOGIX)

Number of pages: 17 including 1 annex

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NAME OF THE EQUIPMENT UNDER TEST (E.U.T.) : RFID Module LF-AH1-G2 (Integrated LF RFID Reader)

Serial number : None

Part number : None

Software Version : None

MANUFACTURER'S NAME : PSION TEKLOGIX

APPLICANT'S ADDRESS:

Company : PSION TEKLOGIX

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Person(s) present during the tests : Mr PORTE

Responsible : Mr PORTE

DATE(S) OF TESTS : October, the 5th and 10th of 2007

TESTS LOCATION(S) : Emitech Grand Sud Laboratory in
Vendargues (34)
Open area test site in Salinelles (30)
FCC Registration number: 8127-19
IC Filling number : 6290

TESTS SUPERVISOR(S) : None

TESTS OPERATOR(S) : David MONTAULON

CONTENTS

1. <i>INTRODUCTION</i>	4
2. <i>REFERENCE DOCUMENT(S)</i>	4
3. <i>EQUIPMENT UNDER TEST CONFIGURATION</i>	4
4. <i>EQUIPMENT UNDER TEST CONFIGURATION SCHEME</i>	5
5. <i>SUMMARY OF TEST RESULTS</i>	6
6. <i>CONDUCTED EMISSIONS SECTION 15.207 & TABLE 2 OF RSS GEN</i>	7
7. <i>RADIATED EMISSIONS - SECTION 15-209 & TABLE 2 OF RSS 210</i>	9
a) Radiated emissions (below 30MHz)	9
b) Radiated emissions (above 30MHz).....	10
8. <i>OCCUPIED BANDWIDTH</i>	14
 <i>ANNEX: PHOTOGRAPH(S)</i>	 15

1. INTRODUCTION

This document submits the results of Electromagnetic Compatibility tests performed on the equipment RFID Module LF-AH1-G2 (Integrated LF RFID Reader) (denominated hereafter E.U.T.: equipment under test) according to document(s) listed below.

Worst case configuration is used between WAP-C, WAP-S, AEA 120 antenna and with or without docking station.

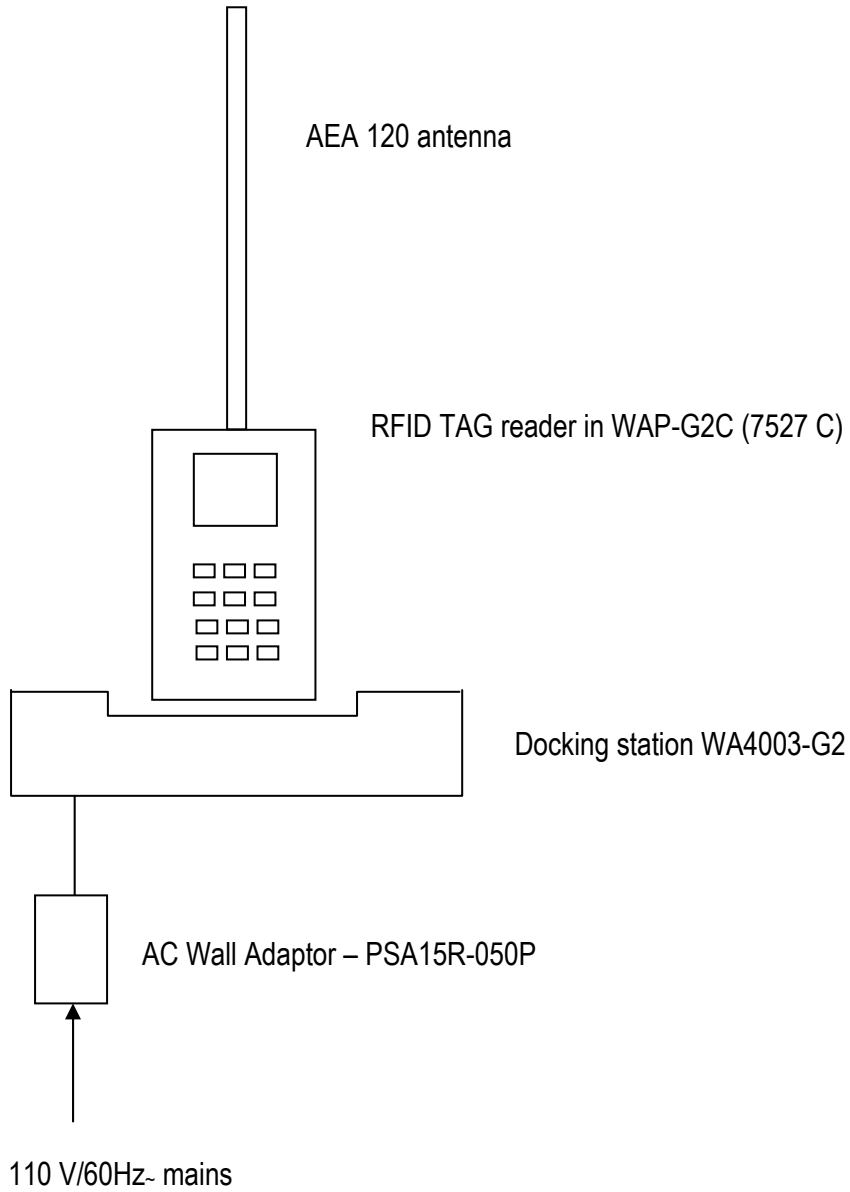
2. REFERENCE DOCUMENT(S)

RSS-210 Issue 7 (June 2007)	Low-power – Licence exempt Radiocommunication devices (All frequency bands): category 1 equipment
FCC Part 15 (February 2006)	Code of Federal Regulations Title 47 – Telecommunications Chapter 1 – Federal Communications Commission Part 15 – Radio frequency devices Subpart C – Intentional Radiators
RSS-Gen Issue 2 (June 2007)	General requirements and information for the Certification of radiocommunication equipment
ANSI C 63.4 (2003)	American National Standard for Methods of measurement of Radio-Noise from low-voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

3. EQUIPMENT UNDER TEST CONFIGURATION

<u>Product description:</u>	IC ID: 2739D-AIR200X FCC ID: GM3AIR200X ITU emission code: / Utilization: RFID TAG reader Antenna type: Incorporated antenna and external antenna (AEA 120) Antenna gain: Unknown Operating frequency range: 134.2 kHz Number of channels: 1 Channel spacing: / Modulation: / Internal higher frequency: 15.56MHz Power source: 5 Vdc (stand alone) or mains voltage (with docking) Power level and frequency range are not user adjustable
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4. EQUIPMENT UNDER TEST CONFIGURATION SCHEME



5. SUMMARY OF TEST RESULTS

Tests designation	Results satisfying?	Comments
Conducted emissions - section 15.207 & table 2 of RSS Gen	YES	
Radiated emissions - section 15-209 & table 3 of RSS 210 (below 30MHz)	YES	
Radiated emissions - section 15-209 & table 2 of RSS 210 (above 30MHz)	YES	
Occupied bandwidth – CNR Gen §4.6	YES	

N.P.: Not Performed.

N.A.: Not Applicable.

- In emission:

Sample subject to the test complies with prescriptions of the standard(s) FCC part 15: 02/2006 and RSS-210: 06/2007 according to limits specified in this test report.

6. CONDUCTED EMISSIONS SECTION 15.207 & TABLE 2 OF RSS GEN

Standard: FCC part 15: 02/2006 / RSS-210: 06/2007

Test method: ANSI C63.4:2003

Test configuration:

Tested cable(s)	Measure with	E.U.T. height
WAP G2 C AIR 200+AEA 120 with 110Vac power supply	L.I.S.N.	80 cm

Frequency band	Tested cable(s)	Resolution bandwidth	Video bandwidth	Detection mode
150kHz-30MHz	WAP G2 C AIR 200+AEA 120 with 110Vac power supply	10KHz	30kHz	Peak and average

Test method deviation: No

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH
Cable			2700
Cable			2716
LISN	PMM	L3-25	0821
Receiver	Agilent Technologies	E7405A	2161
Shielding enclosure	RAY PROOF	C.GS1	1423
Software	Nexio	BAT EMC 3.1.7.1.	0000
Surges Suppressor	Hewlett Packard	11947A	0239

Results: See Graph(s) hereafter. Limits on the graphs are average and quasi-peak limits (upper limit).

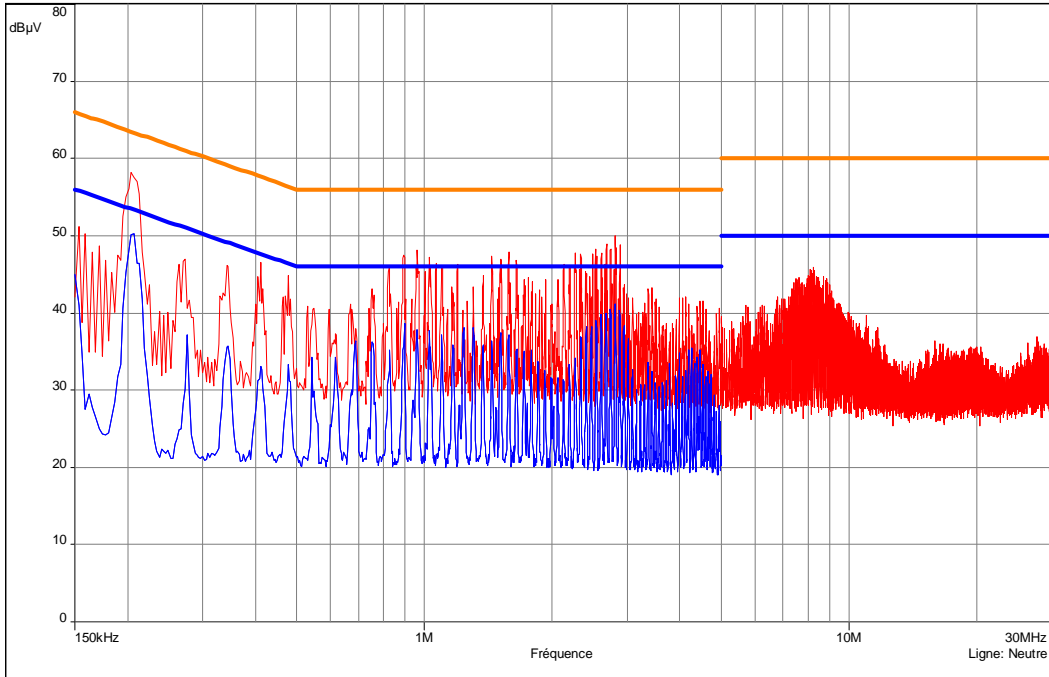
RFID Module LF-AH1-G2 (Integrated LF RFID Reader)

Conducted voltage emission (measurement)

WAP G2 C AIR 200+AEA 120 with 110Vac power supply in peak and average detection.

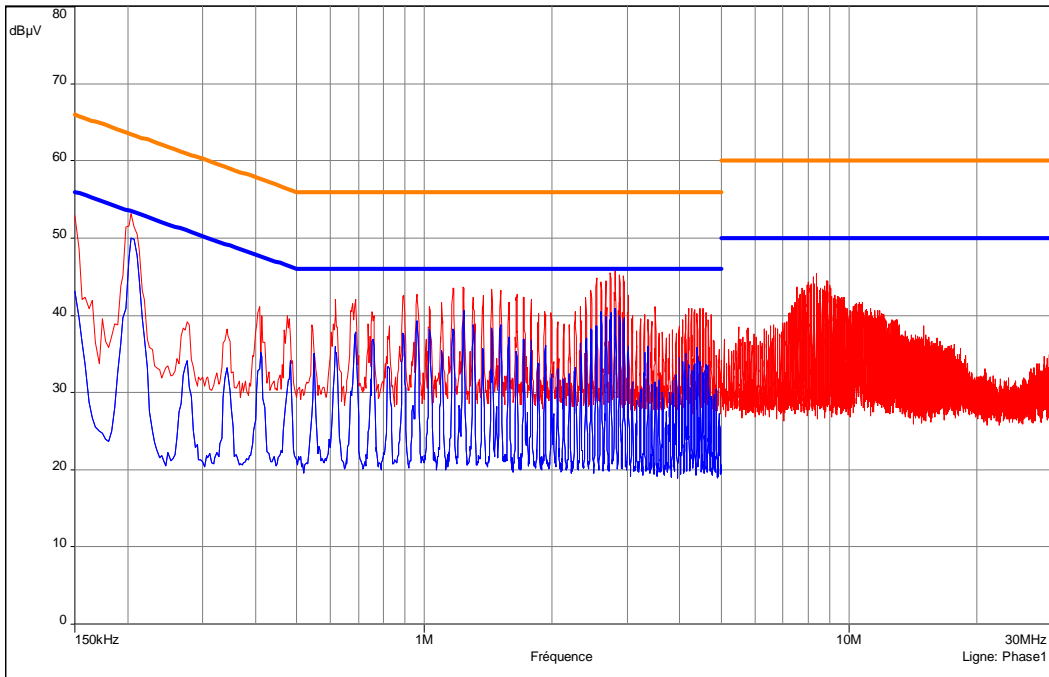
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- Class:B - Average
- Class:B - QPeak
- Mes.Peak (Neutre)
- Mes.Avg (Neutre)



WAP G2 S AIR 200+AEA 120 with 110Vac power supply - 05/10/2007 09:34 - 13

- Class:B - Average
- Class:B - QPeak
- Mes.Peak (Phase1)
- Mes.Avg (Phase1)



WAP G2 S AIR 200+AEA 120 with 110Vac power supply - 05/10/2007 09:34 - 13

7. RADIATED EMISSIONS - SECTION 15-209 & TABLE 2 OF RSS 210
a) Radiated emissions (below 30MHz)

Standard: FCC part 15: 02/2006 /RSS-210: 06/2007

Test method: ANSI C63.4:2003

Test configuration:

Frequency band	Tested side	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
9kHz-35kHz	Front side	100Hz	300Hz	Peak	80cm
35kHz-75kHz	Front side	100Hz	300Hz	Peak	80cm
75kHz-150kHz	Front side	100Hz	300Hz	Peak	80cm
150kHz-240kHz	Front side	10kHz	30kHz	Peak	80cm
240kHz-500kHz	Front side	10kHz	30kHz	Peak	80cm
500kHz-1.1MHz	Front side	10kHz	30kHz	Peak	80cm
1.1MHz-2.4MHz	Front side	10kHz	30kHz	Peak	80cm
2.4MHz-5.5MHz	Front side	10kHz	30kHz	Peak	80cm
5.5MHz-12.5MHz	Front side	10kHz	30kHz	Peak	80cm
12.5MHz-30MHz	Front side	10kHz	30kHz	Peak	80cm

Test method deviation:

Measurements are made in peak detection instead of average mode:

- Measurements are given in dB μ A/m instead of μ V/m
- Measuring distance is 3 meters instead of 30 and 300 meters

Radiated emissions limits in this frequency band are specified at 30 or 300 meters. Measurement distance used during the test, subject of this report, is 3 meters. Then published limits come from a theoretical conversion using an extrapolation factor of 40dB / decade.

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH
Antenna	Electro-Metrics	ALR-25	0263
Cable			2702
Cable			2704
Cable			2711
Cable		N-5m	2898
Preamplifier	Miteq	AU-1447	3199
Receiver	Agilent Technologies	E7405A	2161
Shielded enclosure	Ray Proof	C.GS1	1423

Results: See Graph(s) and Board(s) hereafter.

b) Radiated emissions (above 30MHz)

Standard: FCC part 15: 02/2006 / RSS-210: 06/2007

Test method: ANSI C63.4:2003

Test configuration:

Frequency band	Configuration	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
30MHz-155.6MHz	Front side (pre-measurement in semi anechoic chamber)	100kHz	300kHz	Peak	80cm
30MHz-155.6MHz	Open area measurement	120kHz	300kHz	Quasi peak	80cm

Measurement has been performed to 10th harmonic of higher internal frequency of the system.

Test method deviation: No

Measuring distance: 3 meters

Test equipment list:

CATEGORY	BRAND	MODEL NUMBER	N° EMITECH
Antenna	Electro-Metrics	BIA-30HF	1107
Cable		N-8m	3694
Cable			2704
Cable		N-17m	3620
Cable		N-5m	2716
OATS	Emitech	Salinelles	3482
Preamplifier	MINI-CIRCUITS	RF	1321
Receiver	Agilent Technologies	E7405A	2161
Software	Nexio	BAT EMC v.3.1.7.1.	0000

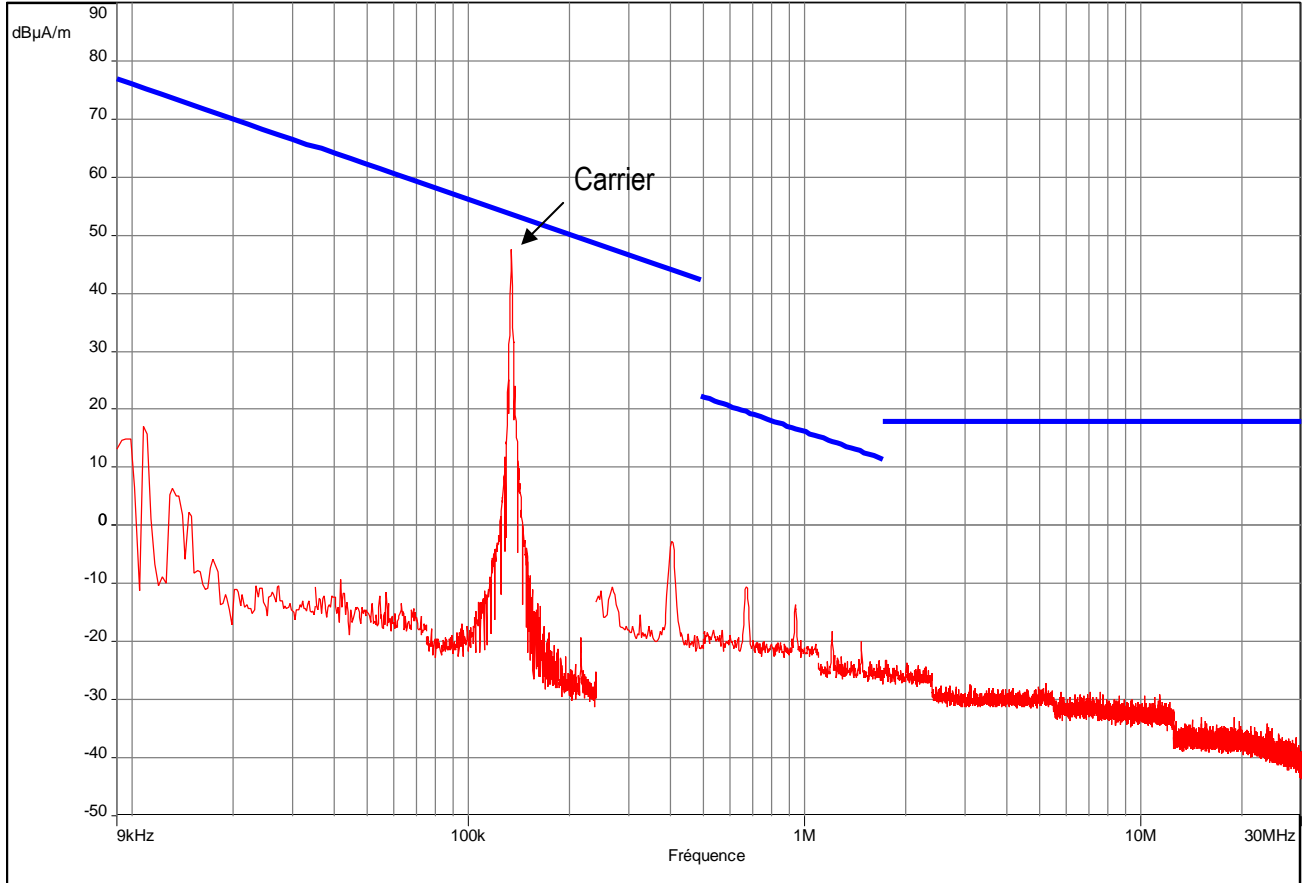
Results: See Graph(s) (indoor pre-measurements) and Board(s) hereafter

RFID Module LF-AH1-G2 (Integrated LF RFID Reader)

Radiated magnetic emission (pre measurement): 45°acw – peak detection – Distance: 3m

05/10/2007

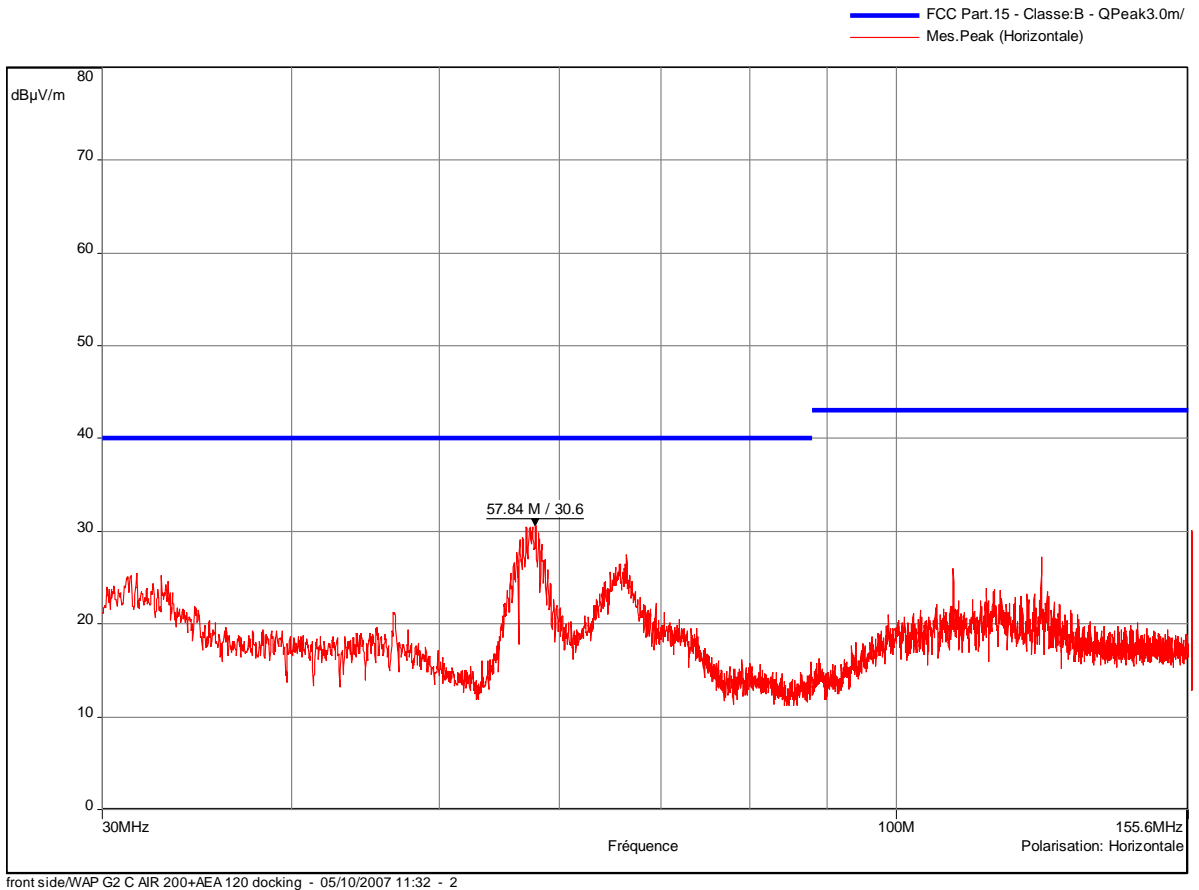
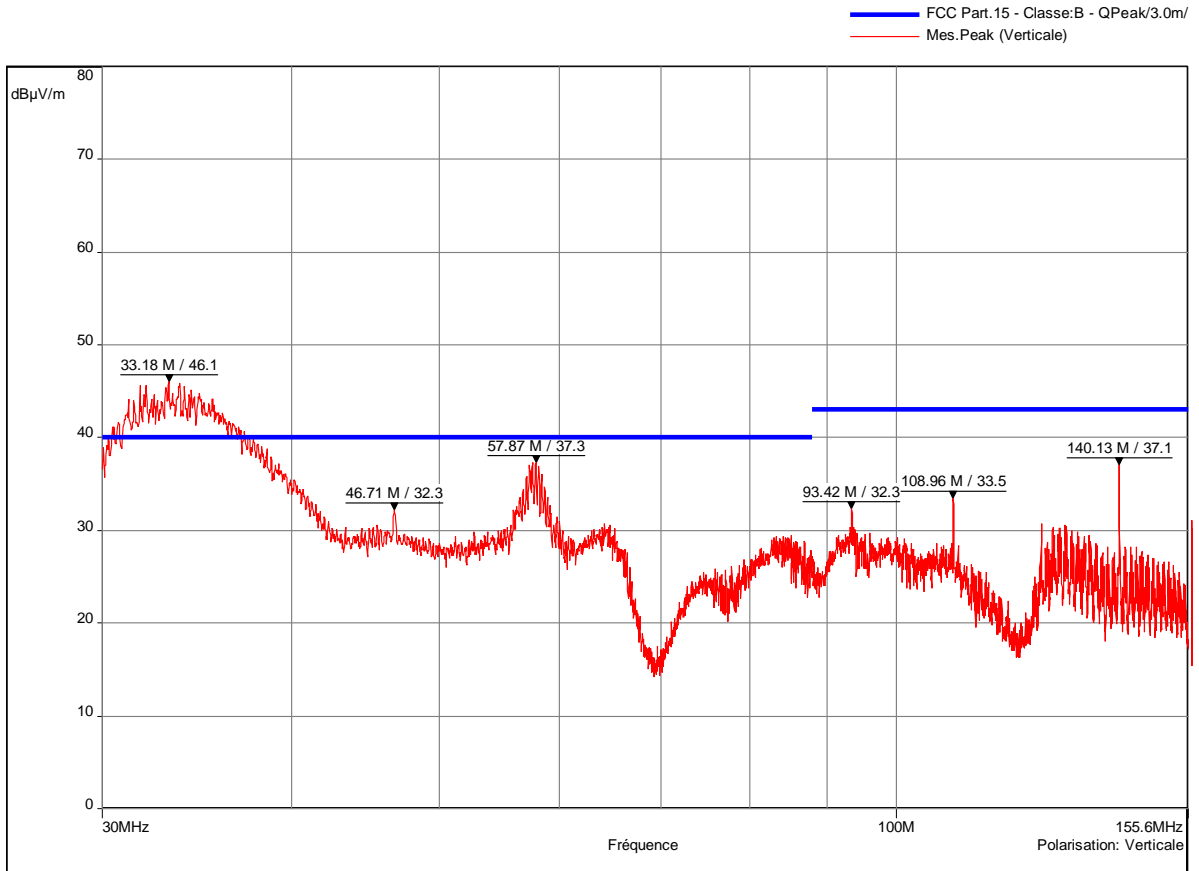
— FCC part15.209 (40dB/dec) - Classe:ss - Peak/3.0m/
 — Mes.Peak



WAP G2 C AIR 200+AEA 120 docking - 05/10/2007 10:37 - 17

Limit indicated on this plot is calculated with 40 dB/decade extrapolation factor and 51.5 dB conversion factor.

RFID Module LF-AH1-G2 (Integrated LF RFID Reader)
 Radiated electric emission (pre-measurement): back side – peak detection
 05/10/2007



Radiated emissions (below 30MHz) on Open Area Test Site et 3m:

Frequency (kHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ A/m)	Standard limit (dB μ A/m)	Comments
134.2	180	100	48.5	53.5	C
267.40	180	100	Background noise \approx -20dB μ A/m	47.6	C
402.60	180	100	-3	44	C
536.80	0	100	Background noise \approx -20dB μ A/m	21.5	C
671.00	180	100	-13	19.5	C
805.20	0	100	Background noise \approx -20dB μ A/m	18	C
939.40	180	100	-17.30	16.6	C
1073.60	0	100	Background noise \approx -20dB μ A/m	15.5	C

C= Compliant

NC= Not compliant

Radiated emissions (above 30MHz) on Open Area Test Site at 3m:
VERTICAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
33.18	170	100	20.40	40	C
46.71	160	120	26.60	40	C
57.87	170	120	33.40	40	C
93.42	FM Broadcast=39.10dB μ V/m		< 39.10	43	C
108.96	0	120	35.70	43	C
140.13	285	100	41.3	43	C

C= Compliant

NC= Not compliant

HORIZONTAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
57.84	270	318	31.20	40	C

C= Compliant

NC= Not compliant

All other radiated emissions are very lower than limit.

8. OCCUPIED BANDWIDTH

Standard: CNR 210 Ed. 6:2005 Annex A2.6

Test method: CNR-GEN Ed.1:2005

Test configuration: A near field probe detects magnetic field near equipment (relative measurement).

Test method deviation: No

Test equipment list:

CATEGORY	BRAND	MODEL NUMBER	N° EMITECH
Spectrum analyser	HP	HP90L	2001
Near field probe	EMITECH	H.M.	-

Occupied bandwidth is measured at 99% of carrier emission bandwidth.

Equipment emission mode: Permanent emission with modulation

Resolution:

Resolution bandwidth	Video bandwidth
1kHz	1kHz

Results: See Board below

		Frequency (kHz)	Occupied bandwidth (kHz)
Normal condition	Température: 20° C	134.2	3.11

□□□ End of report – 1 annex to be forwarded □□□

ANNEX: PHOTOGRAPH(S)

EQUIPEMENT UNDER TEST (E.U.T.) PHOTOGRAPH(S)

RFID Module LF-AH1-G2 (Integrated LF RFID Reader)

Radiated electric field emission on OATS



Conducted emission



Occupied bandwidth

