



RADIO TEST REPORT

According to the standard(s):

FCC part 15: 09/2007
and
RSS-210: 06/2007

Equipment under test:

RFID Module HF-AM2-G2
FCC ID: GM3HFAM2G2
IC: 2739D-HFAM2G2


Company:

PSION TEKLOGIX

Diffusion: Mr DEBULOIS

(Company: PSION TEKLOGIX)

Number of pages: 33 including 1 annex

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NAME OF THE EQUIPMENT UNDER TEST (E.U.T.) : RFID Module HF-AM2-G2

Serial number : None

Part number : None

Software Version : None

MANUFACTURER'S NAME : PSION TEKLOGIX

APPLICANT'S ADDRESS:

Company : PSION TEKLOGIX

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FRANCE

Person(s) present during the tests : Mr DEBULOIS

Responsible : Mr DEBULOIS

DATE(S) OF TESTS : October, from 8th to 10th and December 12th
and 13th 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) : Regis GONZALEZ

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1. INTRODUCTION

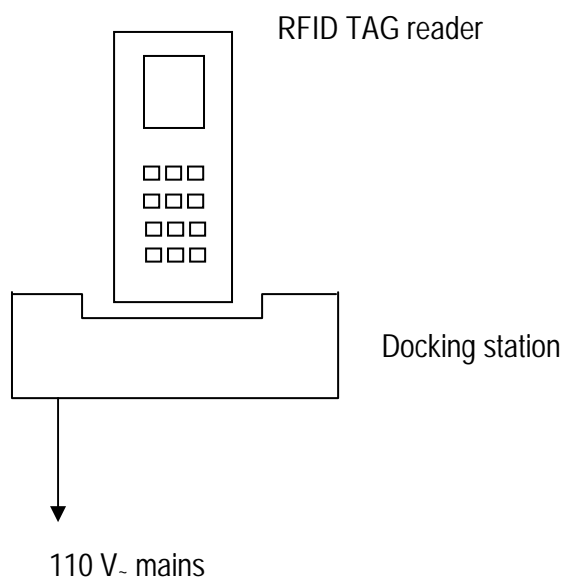
This document submits the results of Electromagnetic Compatibility tests performed on the equipment **RFID Module HF-AM2-G2** (denominated hereafter E.U.T.: equipment under test) according to document(s) listed below.

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 (September 2007)	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: 2739D-HFAM2G2 FCC ID: GM3HFAM2G2 ITU emission code: A1D Utilization: RFID TAG reader Antenna type: Incorporated antenna Antenna gain: Unknown Operating frequency range: 13.56 MHz Number of channels: 1 Channel spacing: / Modulation: / 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

This configuration includes:

- 2D Imager
- RFID reader and smart card
- Finger Print (Sagem)
- MRZ reader

5. SUMMARY OF TEST RESULTS

Tests designation	Results satisfying?	Comments
Conducted emissions - section 15.207 and table 2 of RSS-Gen	YES	
Radiated emissions - section 15:209 (below 30MHz) and table 3 of RSS-210	YES	
Radiated emissions - section 15:209 (above 30MHz) and table 2 of RSS-210	YES	
Field strength - section 15:225 and A2.6 of RSS-210	YES	
Frequency tolerance - section 15:225 and A2.6 of RSS-210	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: 09/2007 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: 09/2007 and RSS-210: 06/2007

Test method: ANSI C63.4:2003

Test configuration:

Tested cable(s)	Measure with	E.U.T. height
Mains 110 Vac/60 Hz-40 Ohms load	L.I.S.N.	80 cm

Frequency band	Tested cable(s)	Resolution bandwidth	Video bandwidth	Detection mode
150kHz-1MHz	Mains 110Vac/60Hz- 40 Ohms load	10KHz	30kHz	Peak
1MHz-10MHz	Mains 110Vac/60Hz- 40 Ohms load	10kHz	30kHz	Peak
10MHz-30MHz	Mains 110Vac/60Hz- 40 Ohms load	10KHz	30kHz	Peak

Test method deviation: No

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH
Cable			2724
Cable			2703
LISN	PMM	L3-25	0833
Receiver	Agilent Technologies	E7405A	2161
Shielding enclosure	RAY PROOF	C.GS3	1123
Software	Nexio	BAT EMC v.3.1.7.1	0000
Surges Suppressor	Hewlett Packard	11947A	0239

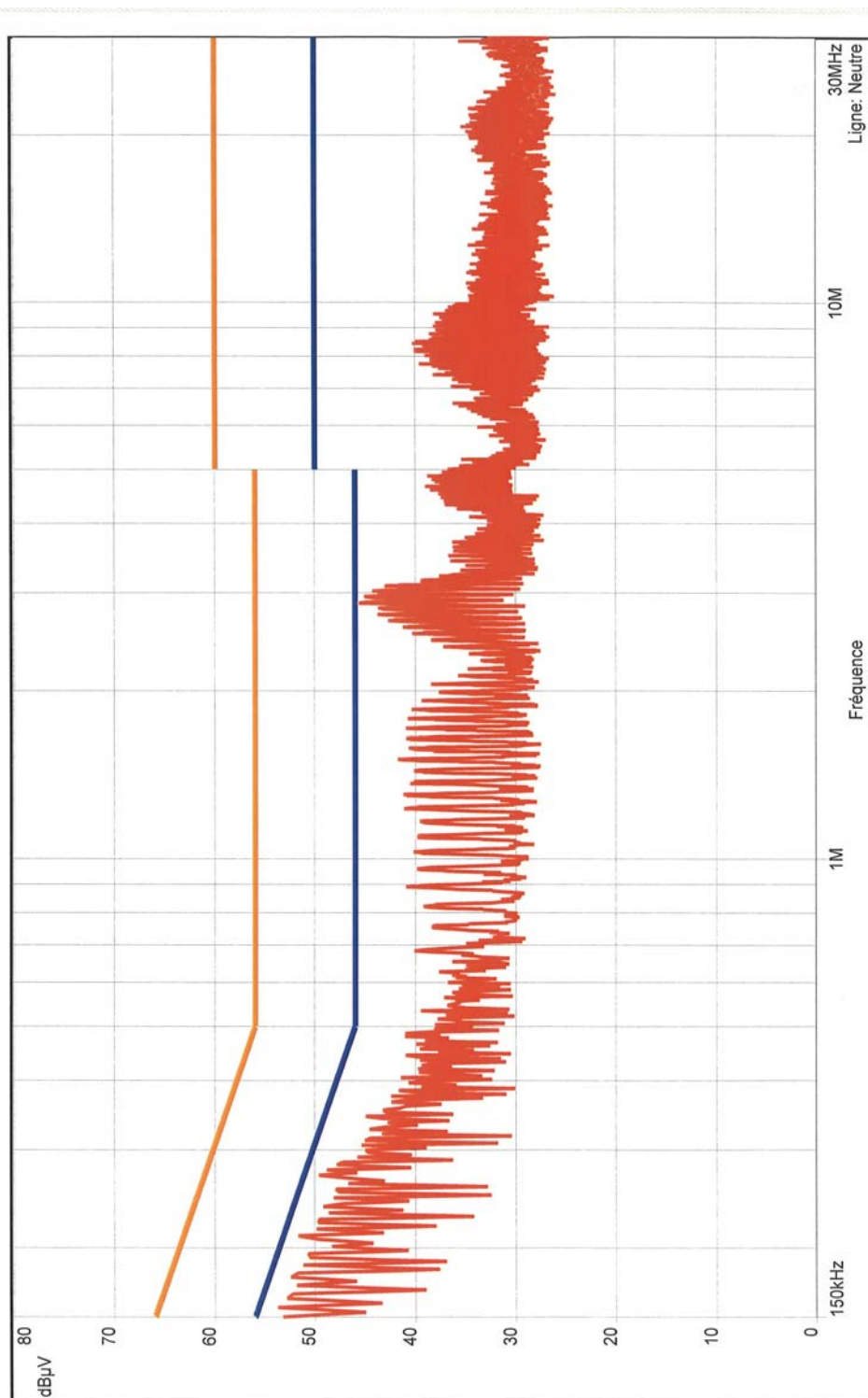
Results: See Graph(s) hereafter. Limits on the graphs are average and quasi-peak limits (upper limit).

RFID Module HF-AM2-G2

Conducted emission (measurement) on Neutral: Power supply 110Vac/60Hz with 40Ω load.

08-Oct-2007

- : FCC Part 15.207 - Class:B - AVerage
- : FCC Part 15.207 - Class:B - QPeak
- : Mes.Peak

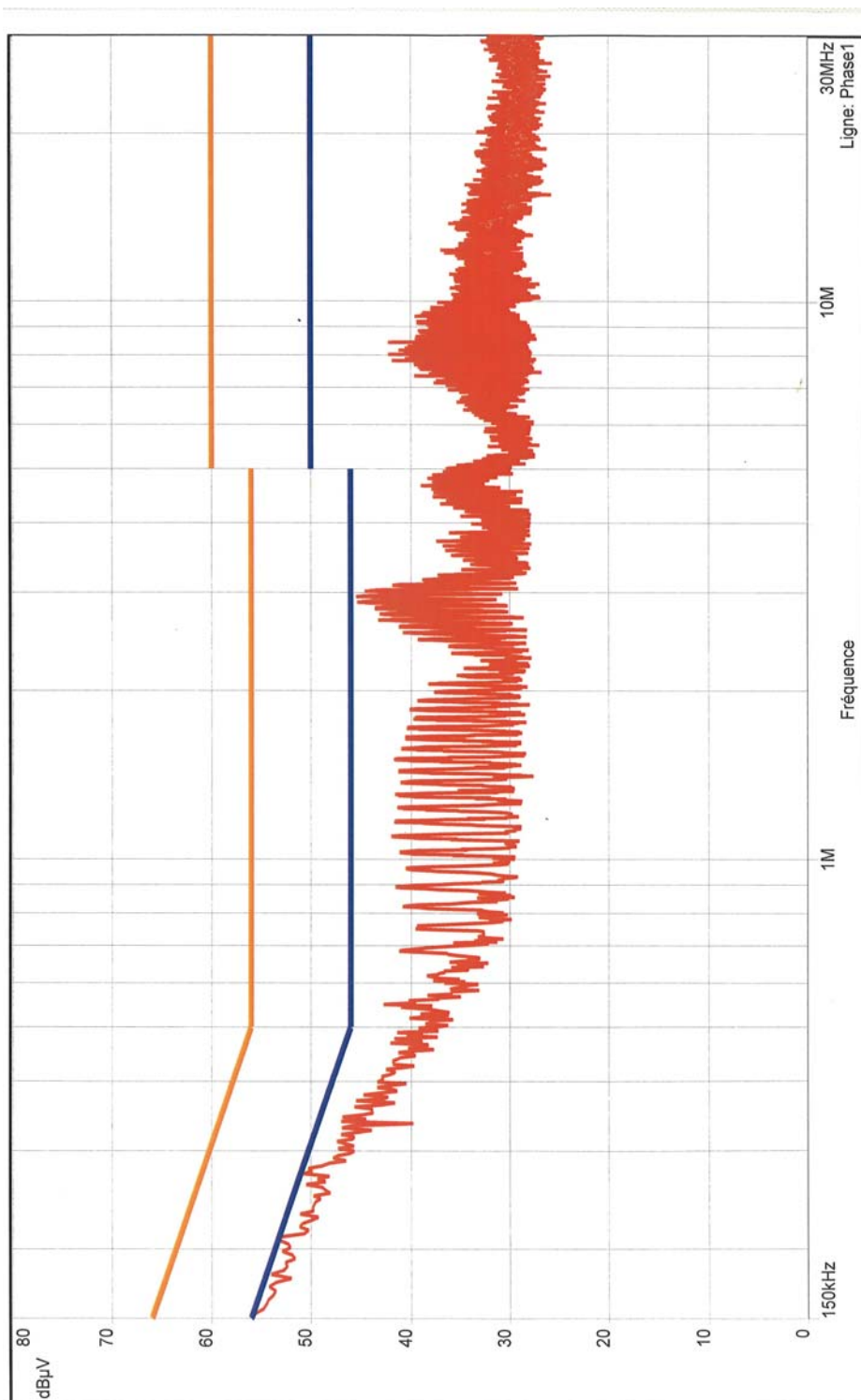


RFID Module HF-AM2-G2

Conducted emission (measurement) on Phase: Power supply 110Vac/60Hz with 40Ω load.

08-Oct-2007

- : FCC Part 15.207 - Class:B - AVerage
- : FCC Part 15.207 - Class:B - QPeak
- : Mes.Peak



7. RADIATED EMISSIONS - SECTION 15-209 & TABLE 2.3 OF RSS-210

a) Radiated emissions (below 30MHz)

Standard: FCC part 15: 09/2007 and 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 quasi peak mode:
- Measurements are given in dBμA/m instead of μV/m
- Measuring distance is 10 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 10 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		N-1m	2702
Cable		N-1m	2704
Cable		N-3m	2711
Cable		N-5m	2898
Preamplifier	Miteq	AU-1447	3199
Receiver	Agilent Technologies	E7405A	2161
Shielded enclosure	Ray Proof	C.GS3	1123

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

b) Radiated emissions (above 30MHz)

Standard: FCC part 15: 09/2007 and 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-200MHz	Front side (pre-measurement in semi anechoic chamber)	100kHz	300kHz	Peak	80cm
200MHz-1GHz	Front side (pre-measurement in semi anechoic chamber)	100kHz	300kHz	Peak	80cm
30MHz-1GHz	Open area measurement	120kHz	300kHz	Quasi peak	80cm

Test method deviation: No

Measuring distance: 3 meters

Test equipment list:

CATEGORY	BRAND	MODEL NUMBER	N° EMITECH
Antenna	Electro-Metrics	BIA-30HF	0824
Cable		N-5m	2898
Cable		N-17m	3620
Log-periodic antenna	Rohde & Schwarz	HL223	3126
OATS	Emitech	Salinelles	3482
Receiver	Rohde & Schwarz	ESVS10	3211

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

Both mode "Finger print on" and "RFID on" are tested in radiated emission with and without MRZ reader. However in magnetic emission only "RFID on" is tested because RFID emission is 13.56 MHz.

RFID Module HF-AM2-G2

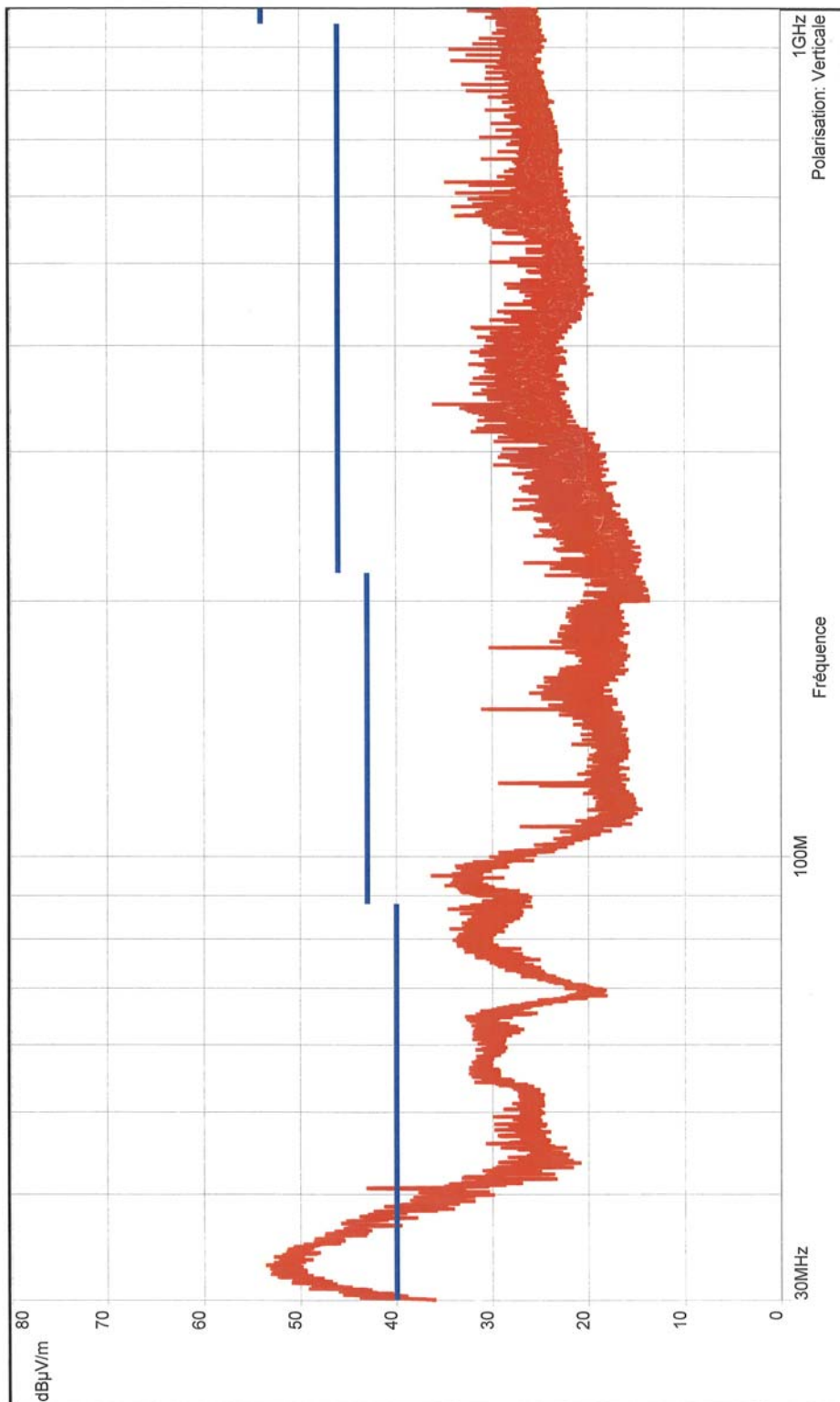
Radiated electric emission (pre measurement): Front side with docking / RFID On / Finger Print Off.

Vertical Polarization - Distance of measurement: 3m (Indoor)

Without MRZ Reader

08-Oct-2007

— : FCC Part 15 - Class:B - QPeak/3.0m
— : Meas.Peak



RFID Module HF-AM2-G2

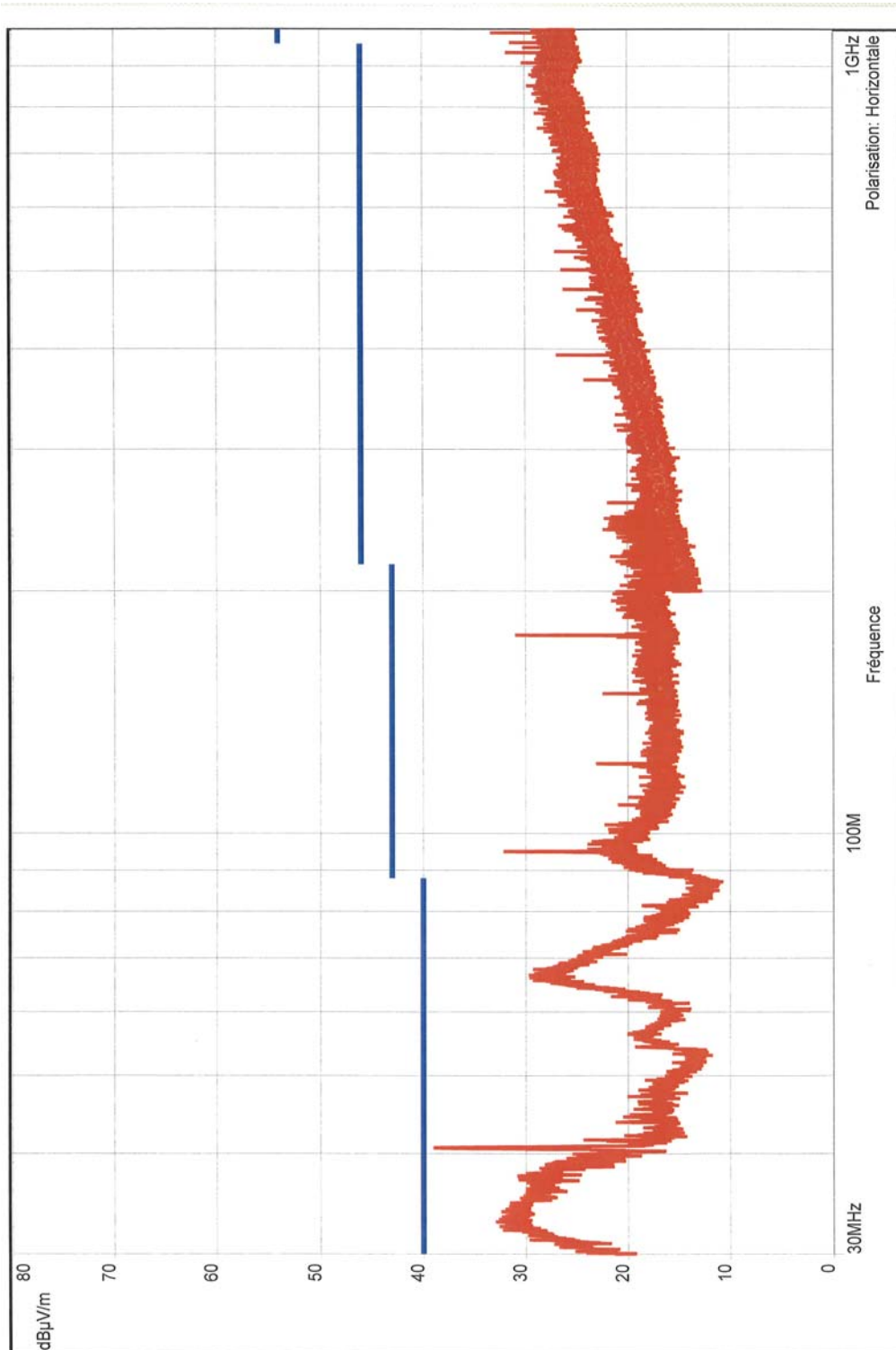
Radiated electric emission (pre measurement): Front side with docking / RFID On / Finger Print Off.

Horizontal Polarization - Distance of measurement: 3m (Indoor)

Without MRZ Reader

08-Oct-2007

— : FCC Part 15 - Class:B - QPeak/3.0m
— : Meas.Peak



RFID Module HF-AM2-G2

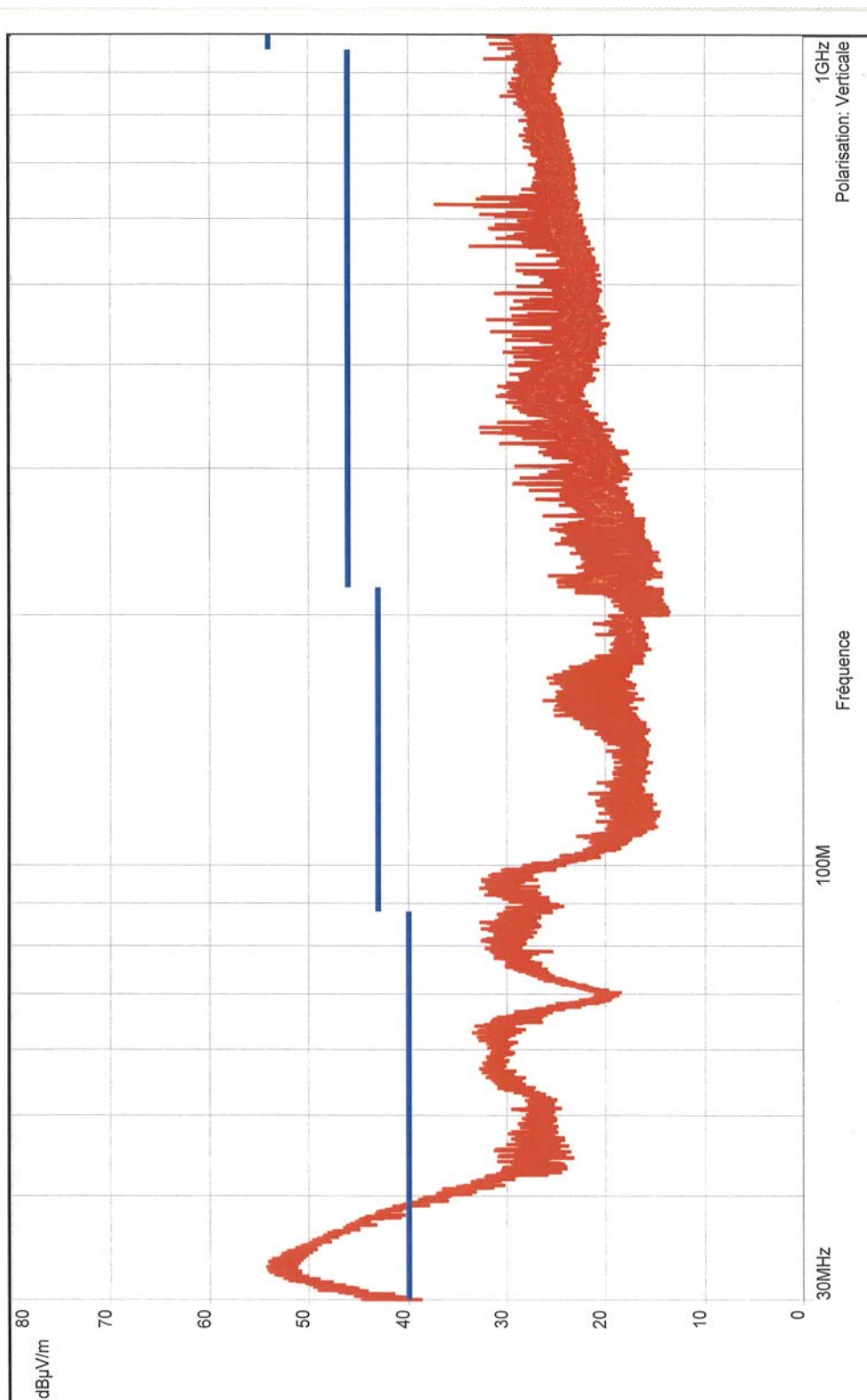
Radiated electric emission (pre measurement): Front side with docking / RFID Off / Finger Print On.

Vertical Polarization - Distance of measurement: 3m (Indoor)

Without MRZ Reader

08-Oct-2007

— : FCC Part 15 - Class:B - QPeak/3.0m
— : Meas.Peak



RFID Module HF-AM2-G2

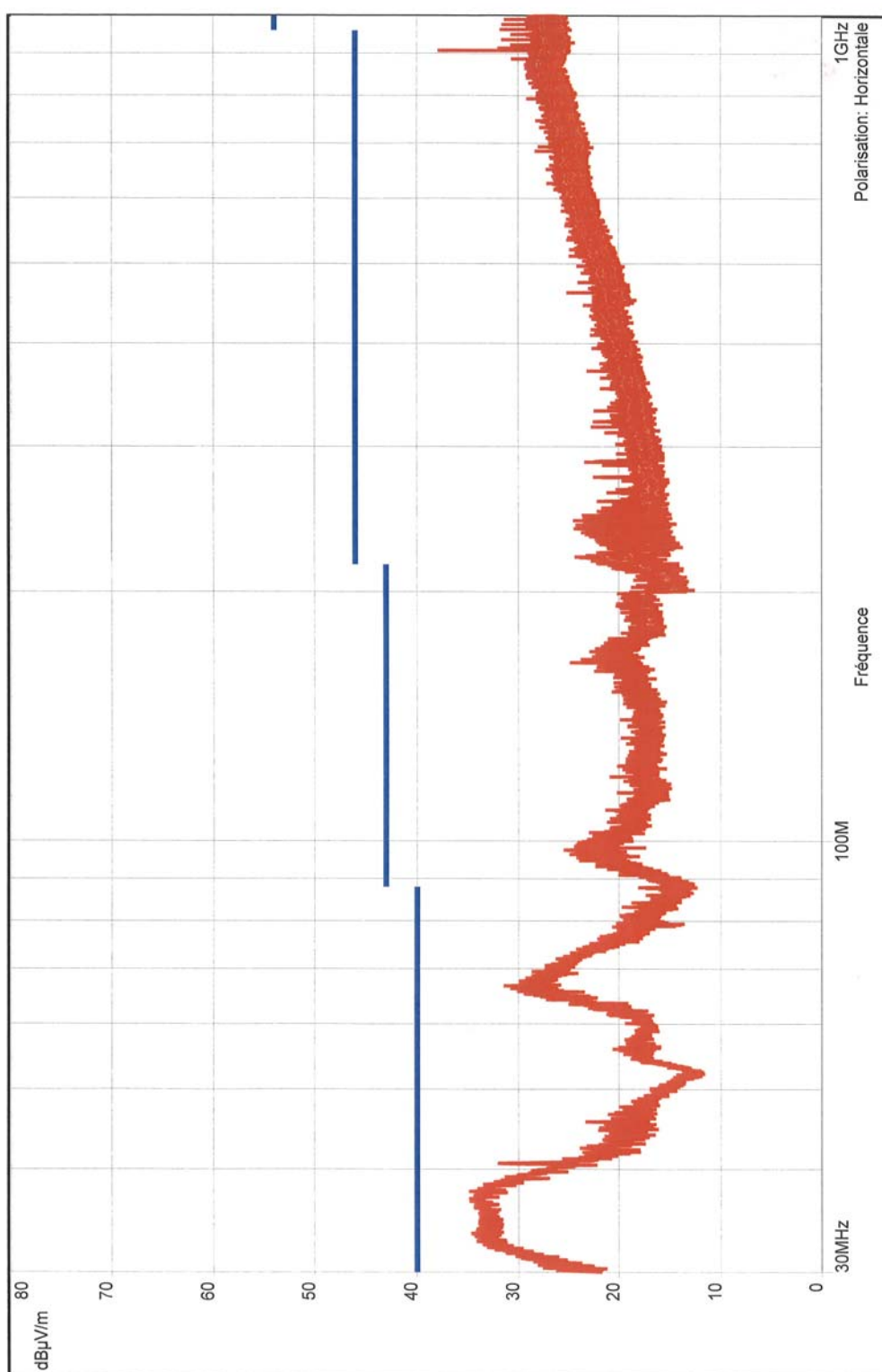
Radiated electric emission (pre measurement): Front side with docking / RFID Off / Finger Print On.

Horizontal Polarization - Distance of measurement: 3m (Indoor)

Without MRZ Reader

08-Oct-2007

— : FCC Part 15 - Class:B - QPeak/3.0m
— : Meas.Peak



RFID Module HF-AM2-G2

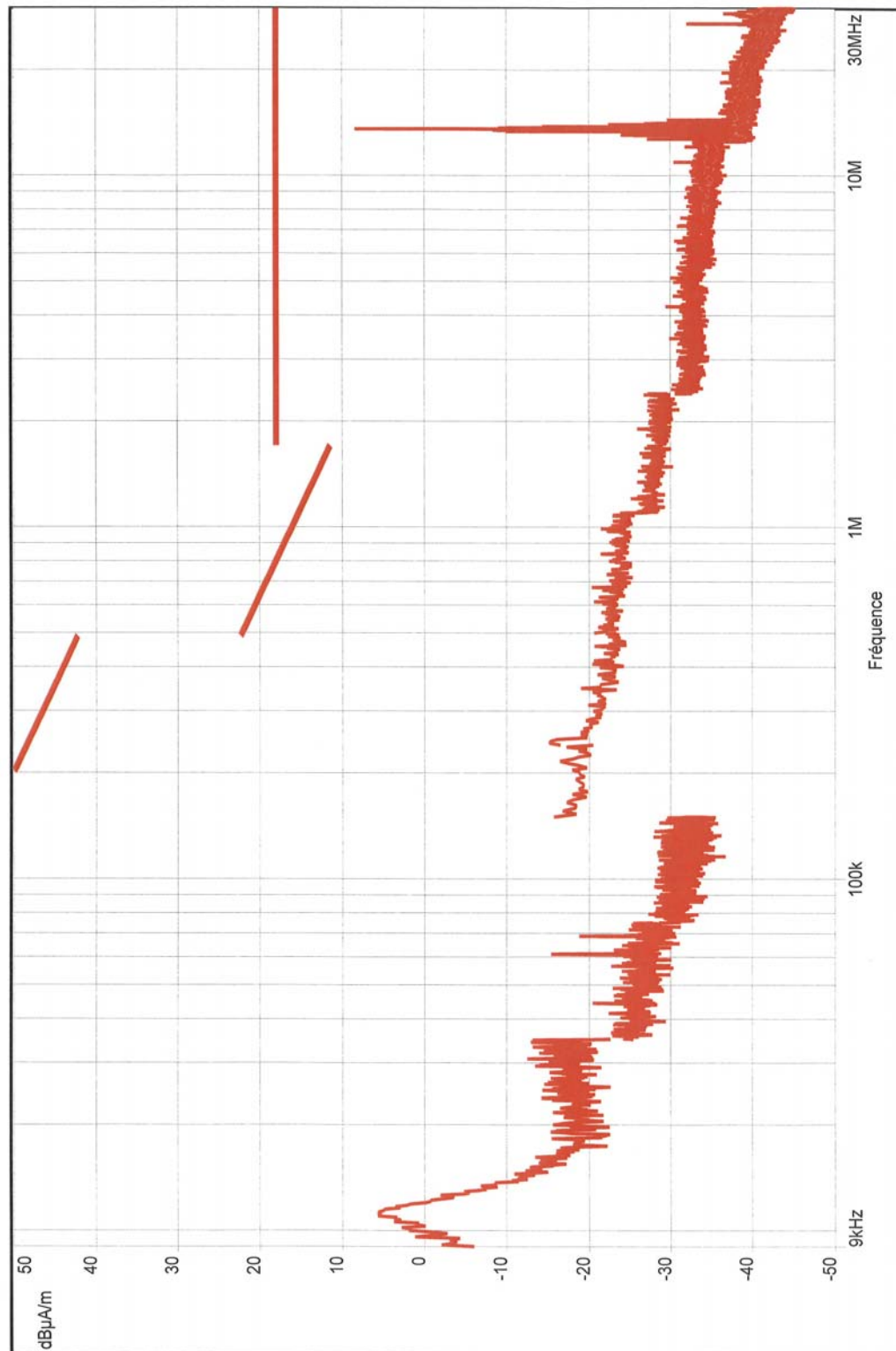
Radiated magnetic emission (measurement): Front side with docking / RFID On / Finger Print Off.

Distance of measurement: 3m (Indoor)

Without MRZ Reader

08-Oct-2007

— : FCC Part 15 - Class:B - QPeak/3.0m
— : Meas.Peak



RFID Module HF-AM2-G2

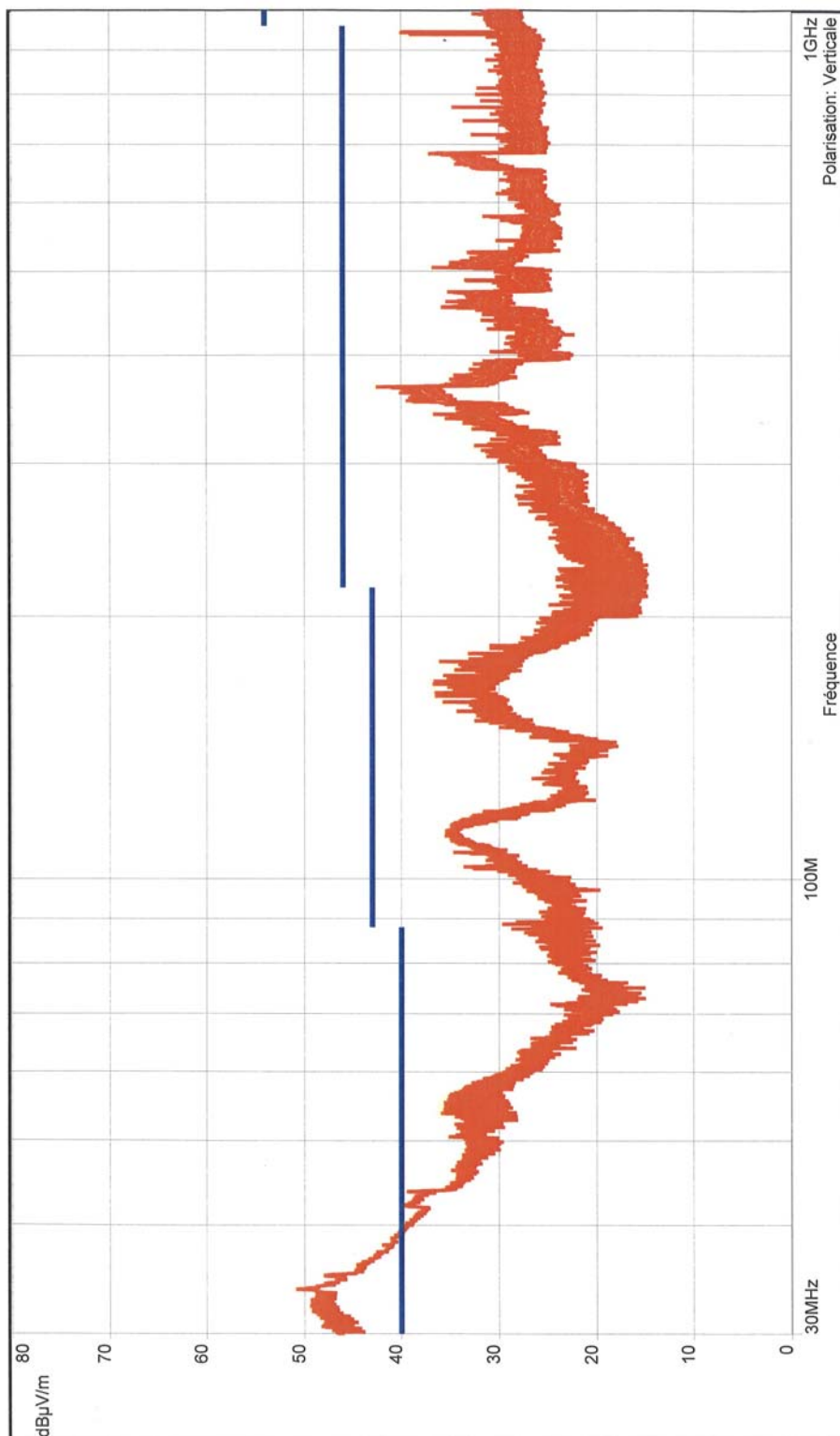
Radiated electric emission (pre measurement): Front side with docking / RFID On / Finger Print Off.

Vertical Polarization - Distance of measurement: 3m (Indoor)

With MRZ Reader

12-Dec-2007

— : FCC Part 15 - Class:B - QPeak/3.0m
— : Meas.Peak



RFID Module HF-AM2-G2

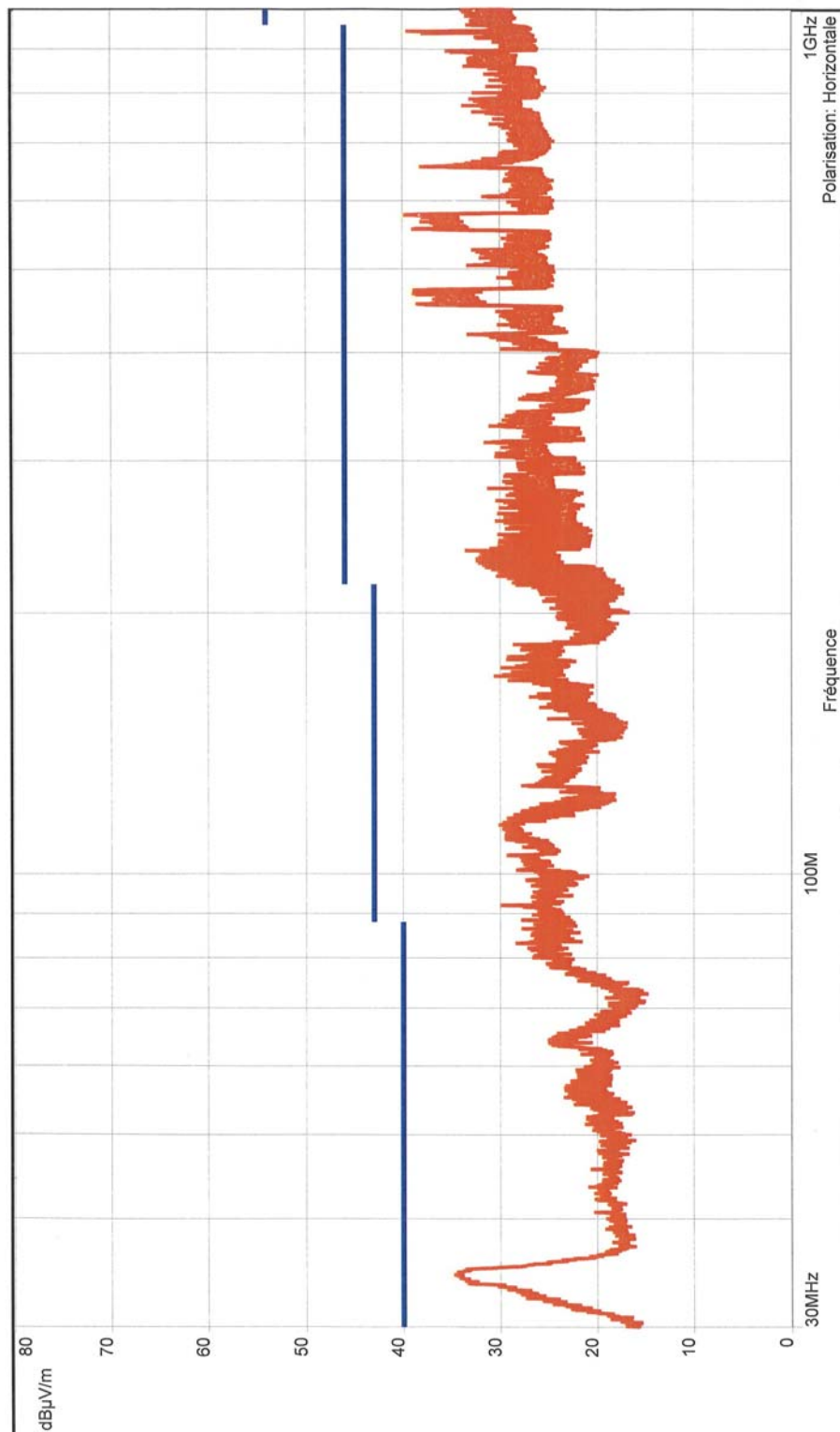
Radiated electric emission (pre measurement): Front side with docking / RFID On / Finger Print Off.

Horizontal Polarization - Distance of measurement: 3m (Indoor)

With MRZ Reader

12-Dec-2007

— : FCC Part 15 - Class:B - QPeak/3.0m
— : Meas.Peak



RFID Module HF-AM2-G2

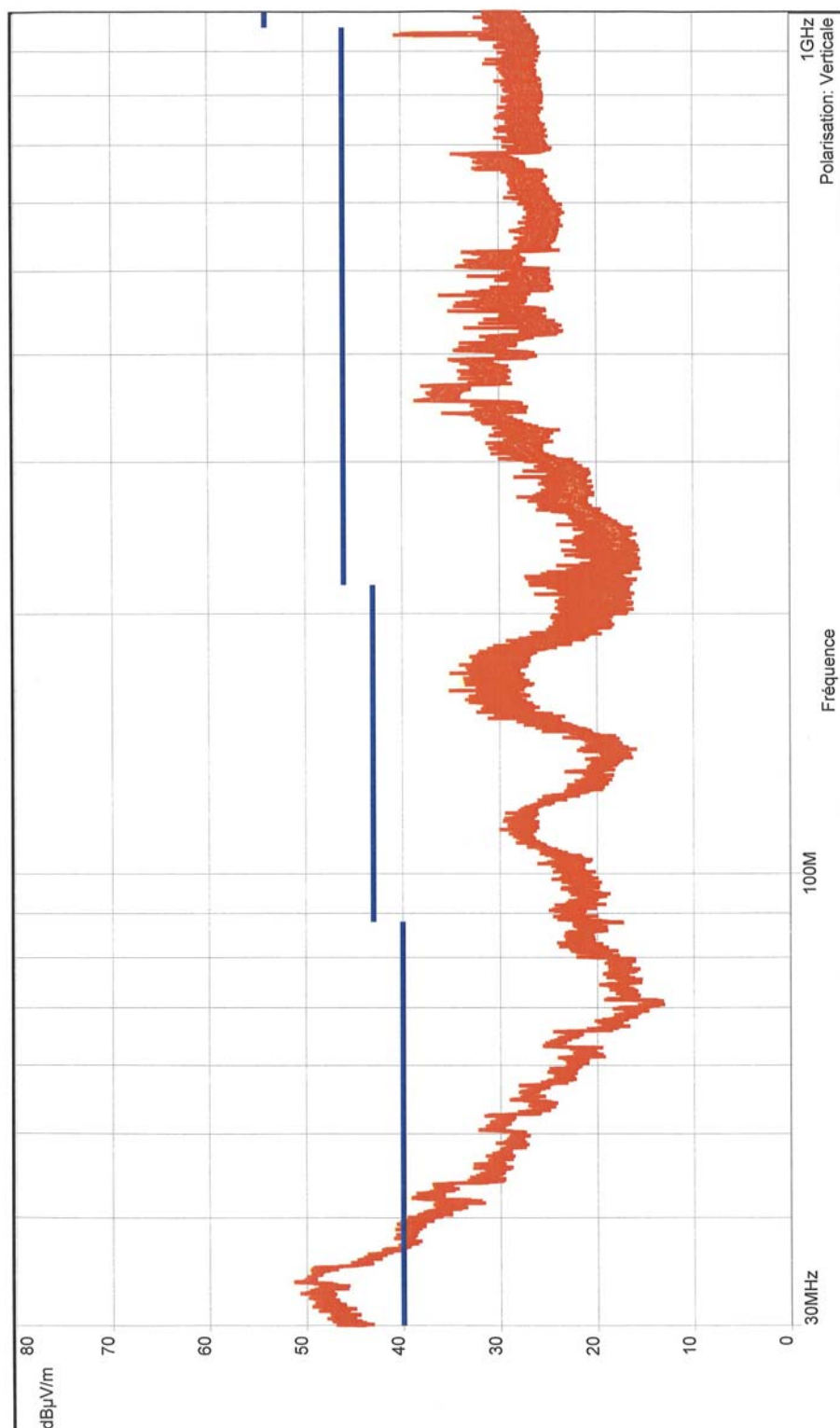
Radiated electric emission (pre measurement): Front side with docking / RFID Off / Finger Print On.

Vertical Polarization - Distance of measurement: 3m (Indoor)

With MRZ Reader

12-Dec-2007

— : FCC Part 15 - Class:B - QPeak/3.0m
— : Meas.Peak



RFID Module HF-AM2-G2

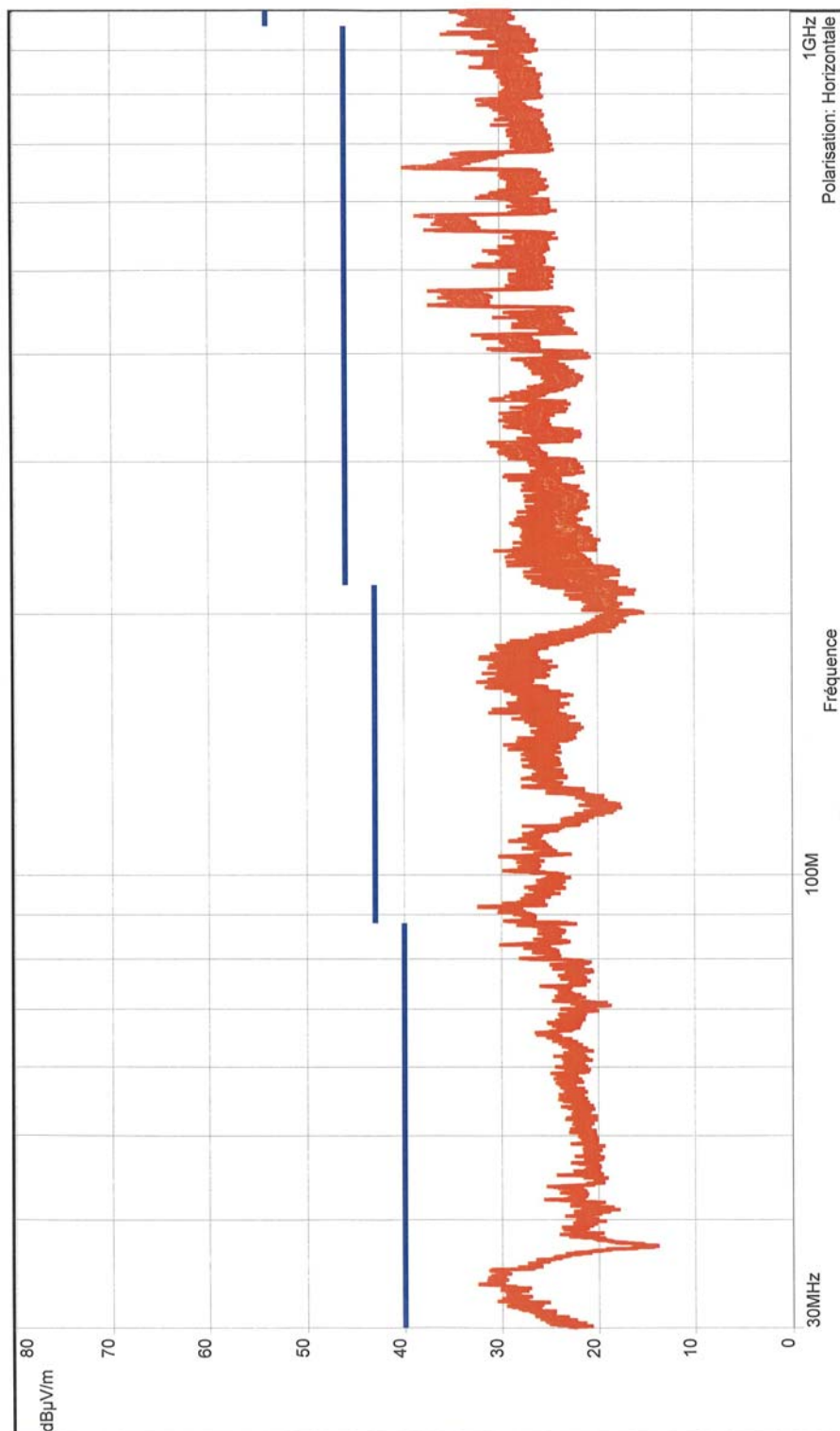
Radiated electric emission (pre measurement): Front side with docking / RFID Off / Finger Print On.

Horizontal Polarization - Distance of measurement: 3m (Indoor)

With MRZ Reader

12-Dec-2007

— : FCC Part 15 - Class:B - QPeak/3.0m
— : Meas.Peak



RFID Module HF-AM2-G2

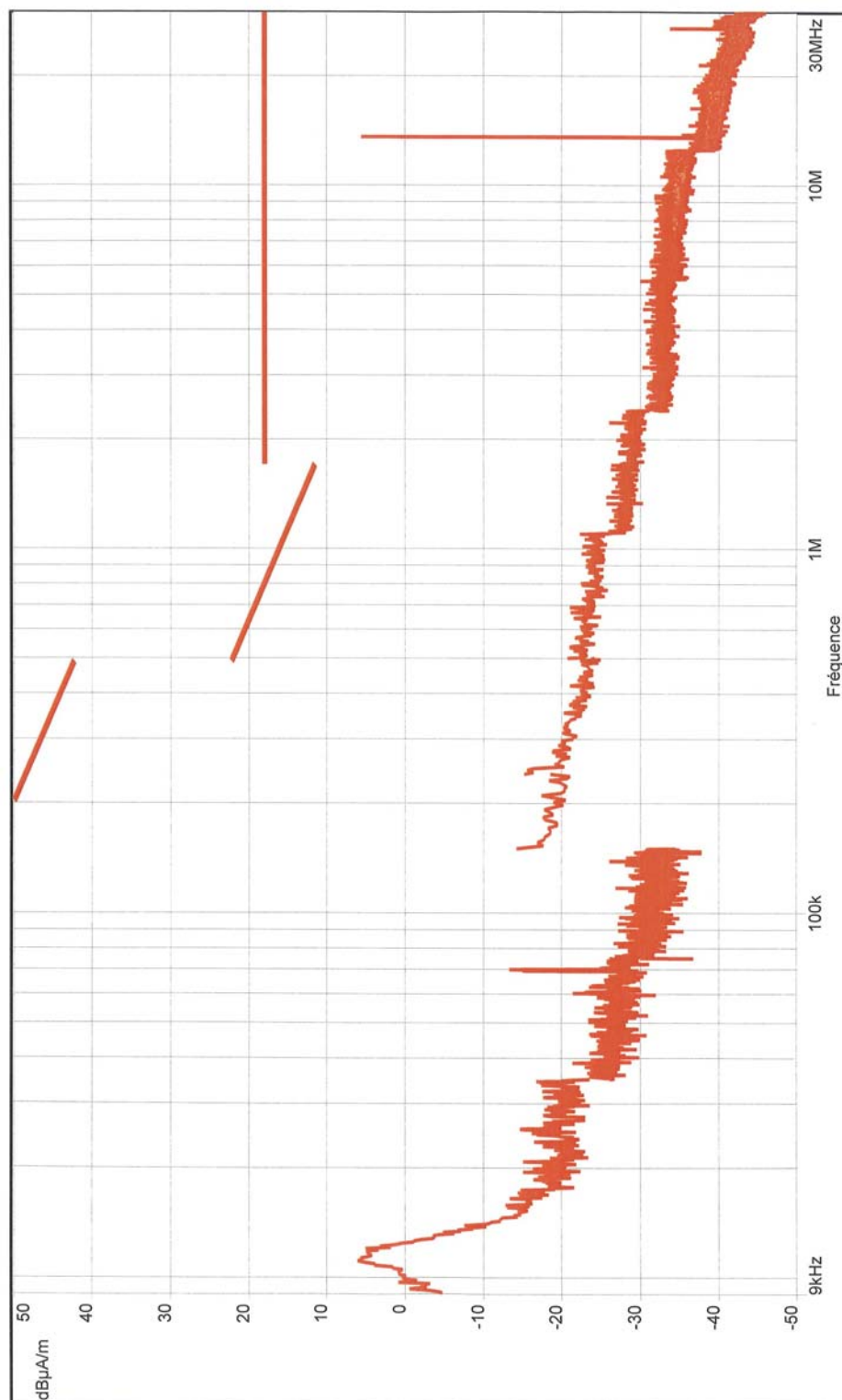
Radiated magnetic emission (measurement): Front side with docking / RFID On / Finger Print Off.

Distance of measurement: 3m (Indoor)

With MRZ Reader

12-Dec-2007

— : FCC Part 15 - Class:B - QPeak/3.0m
— : Meas.Peak



RFID Module HF-AM2-G2

Radiated electric emission (measurement)
Distance of measurement: 3m (Open Area Test Site)
Quasi peak detection

RFID mode / without MRZ reader

VERTICAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
33.00	0	100	25.70	40.00	C
40.70	266	100	28.60*	40.00	C
64.50	0	100	21.80	40.00	C
86.50	0	100	21.40	40.00	C
94.00	-	-	30.40 (FM Band)	40.00	C
341.50	0	100	29.50	40.00	C
569.70	0	100	36.80	46.00	C
585.00	0	100	34.40	46.00	C
605.00	0	100	32.50	46.00	C
624.00	0	100	34.40	46.00	C
813.00	0	100	40.70	46.00	C
894.00	0	100	41.60	46.00	C

C= Compliant

NC= Not compliant

* Mesure without tag

HORIZONTAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
33.00	0	100	23.20	40.00	C
40.70	185	267	35.40	40.00	C
94.00	-	-	21.40 (FM Band)	40.00	C
176.00	0	100	39.10	43.00	C

C= Compliant

NC= Not compliant

All other radiated emissions are very lower than limit.

RFID Module HF-AM2-G2

Radiated electric emission (measurement)
Distance of measurement: 3m (Open Area Test Site)
Quasi peak detection

Finger Print Mode / without MRZ reader

VERTICAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
33.00	0	100	28.70	40.00	C
63.00	320	100	21.80	40.00	C
85.20	0	100	21.20	40.00	C
94.00	-	-	30.40 (FM Band)	40.00	C
555.00	0	100	34.40	46.00	C
620.00	0	100	34.50	46.00	C
620.00	0	100	36.80	46.00	C
633.00	0	100	34.50	46.00	C

C= Compliant

NC= Not compliant

* Mesure without tag

HORIZONTAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
33.00	0	100	23.10	40.00	C
37.00	0	100	22.70	40.00	C
40.70	0	100	28.80	40.00	C
66.90	0	100	20.80	40.00	C
908.70	0	100	41.60	46.00	C

C= Compliant

NC= Not compliant

All other radiated emissions are very lower than limit.

RFID Module HF-AM2-G2

Radiated magnetic emission (measurement)
Distance of measurement: 10m (Open Area Test Site)
Quasi peak detection

RFID mode / without MRZ reader

MAGNETIC EMISSION

Frequency (kHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ A/m)	Standard limit (dB μ A/m)	Comments
13.56	0	130	-1.7	52.5	C

C= Compliant

NC= Not compliant

All other radiated emissions are very lower than limit.

RFID Module HF-AM2-G2

Radiated electric emission (measurement)
Distance of measurement: 3m (Open Area Test Site)
Quasi peak detection

RFID mode (without tag) / With MRZ reader

VERTICAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
33.75	100	100	29.78	40.00	C
53.31	0	100	21.60	40.00	C
112.08	150	130	25.33	43.00	C
168.80	0	100	31.02	43.00	C
361.00	240	100	38.10	46.00	C
504.60	150	100	34.00	46.00	C
692.91	100	100	35.60	46.00	C

C= Compliant

NC= Not compliant

* Mesure without tag

HORIZONTAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
33.74	253	250	17.78	40.00	C
455.45	200	130	35.00	46.00	C
472.25	0	304	34.25	46.00	C
577.22	0	227	35.35	46.00	C
656.72	335	210	43.40	46.00	C

C= Compliant

NC= Not compliant

All other radiated emissions are very lower than limit.

RFID Module HF-AM2-G2

Radiated electric emission (measurement)
Distance of measurement: 3m (Open Area Test Site)
Quasi peak detection

Finger Print Mode / With MRZ reader

VERTICAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
33.71	145	250	30.68	40.00	C
42.18	200	100	33.00	40.00	C
168.80	0	250	36.70	43.00	C
353.36	270	100	37.80	46.00	C
468.05	150	100	37.15	46.00	C

C= Compliant

NC= Not compliant

* Mesure without tag

HORIZONTAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
33.74	253	250	17.78	40.00	C
83.01	230	250	20.00	40.00	C
455.15	135	100	38.05	46.00	C
472.46	150	100	38.60	46.00	C
577.58	0	276	36.30	46.00	C
657.00	329	200	43.33	46.00	C

C= Compliant

NC= Not compliant

All other radiated emissions are very lower than limit.

RFID Module HF-AM2-G2

Radiated magnetic emission (measurement)
Distance of measurement: 3m (Open Area Test Site)
Quasi peak detection

RFID mode (without tag) / With MRZ reader

MAGNETIC EMISSION

Frequency (kHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ A/m)	Standard limit (dB μ A/m)	Comments
13.56	0	100	0.3	52.5	C

C= Compliant

NC= Not compliant

All other radiated emissions are very lower than limit.

8. OPERATING WITHIN THE BAND 13.110-14.010 MHz - SECTION 15-225**a) Field strength**

Standard: FCC part 15:09/2007 and 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
13.11MHz-14.01MHz	Front side	10kHz	30kHz	Peak	80cm

Test method deviation:

Measurements are given in dB μ A/m instead of dB μ V/m (conversion factor: 51.5 dB)

Measuring distance is 3 and 10 meters instead of 30 m

Test equipment list:

CATEGORY	BRAND	MODEL NUMBER	N° EMITECH
1 input powermeter	Hewlett Packard	HP	2001
Antenna	Electro-Metrics	ALR-25	0263
Cable		N-5m	2898
Cable		N-17m	3620
OATS	Emitech	Salinelles	3482
Preamplifier	Miteq	AU-1447	3199

Results: See **Graph(s)** hereafter (3 metres indoor pre-measurement).

Without MRZ reader

Measurement at 10 m: -1.7 dB μ A/m (~ 50 dB μ V/m)

Using an extrapolation factor of 20 dB/decade (worst case), the level is about 40 dB μ V/m (0.1 mV/m) for a limit at 15.848 mV/m.

Using an extrapolation factor of 40 dB/decade (as described in section 15.31 (f)), the level is about 30 dB μ V/m (0.03 mV/m) for a limit at 15.848 mV/m.

With MRZ reader

Measurement at 3 m: 0.3 dB μ A/m (~ 52 dB μ V/m)

Using an extrapolation factor of 20 dB/decade (worst case), the level is about 32 dB μ V/m (0.04 mV/m) for a limit at 15.848 mV/m.

Using an extrapolation factor of 40 dB/decade (as described in section 15.31 (f)), the level is about 12 dB μ V/m (4 μ V/m) for a limit at 15.848 mV/m.

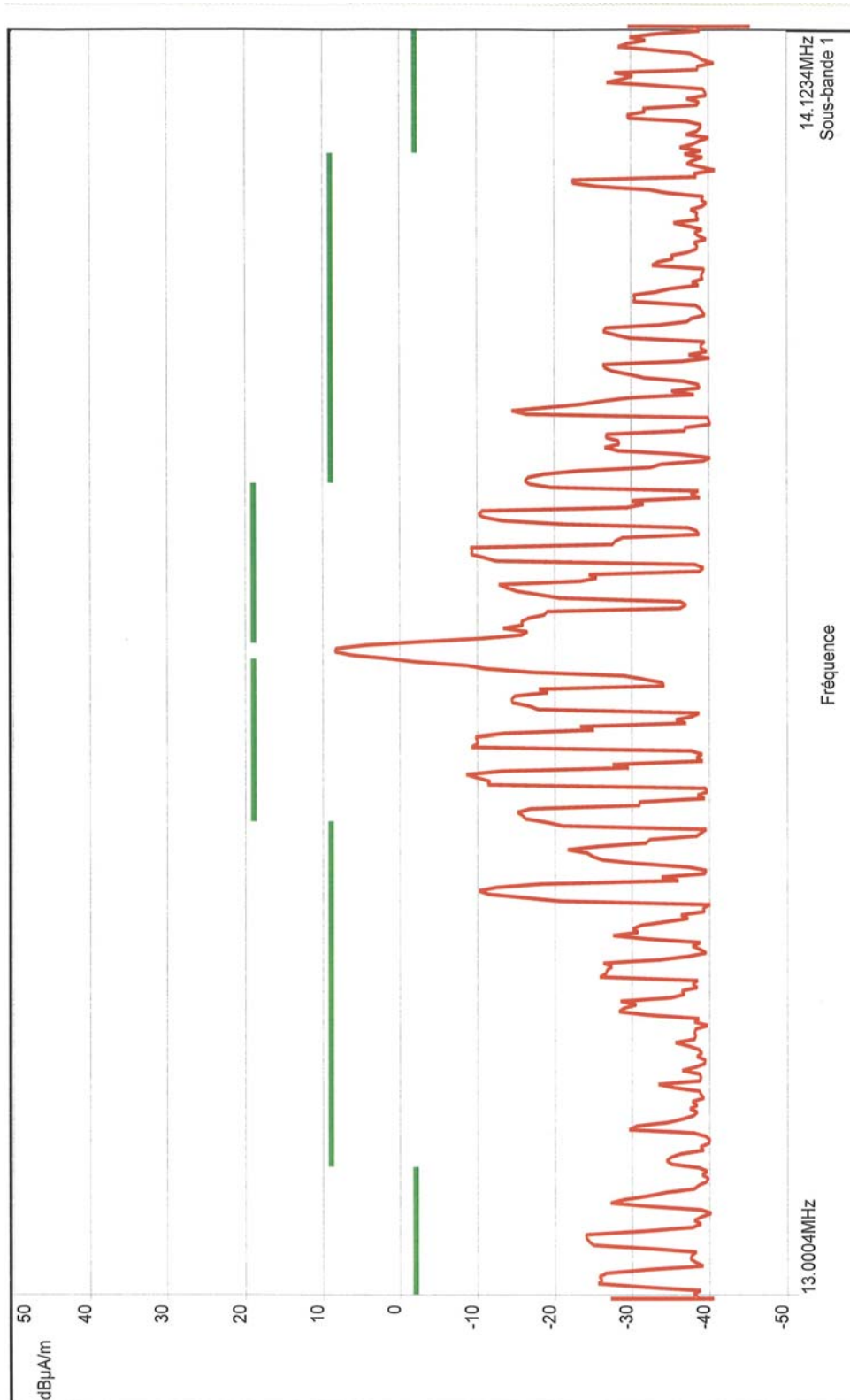
RFID Module HF-AM2-G2

Radiated magnetic emission (measurement): Front side with docking / RFID On / Finger Print Off.

Distance of measurement: 3m (Indoor) ; RBW : 9 kHz ; VBW : 30 kHz

08-Oct-2007

—:: FCC Part 15.225- Peak/3.0m
—: Meas.Peak



b) Frequency tolerance

Date	Temperature (°C)	Humidity (%HR)	Pression (hPa)
October the 10th of 2007	20	52	1010

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

Test method: ANSI C63.4:2003

Test method deviation: No

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH
Climatic enclosure	Sécasi	SM600C	1670
Receiver	Agilent	E7405A	2161
H-Loop	Emitech	-	-

Results: See Board(s) hereafter

Test condition	Frequency (MHz)	Limit (± 0.01%) of nominal frequency	Comments
Nominal voltage (5Vdc) Nominal temperature (20°C)	13.559973	± 1.36 kHz-	C
5Vdc / -10° C	13.560052	± 1.36 kHz-	C
5Vdc / -20° C	13.560088	± 1.36 kHz-	C
5Vdc / +50° C	13.569966	± 1.36 kHz-	C

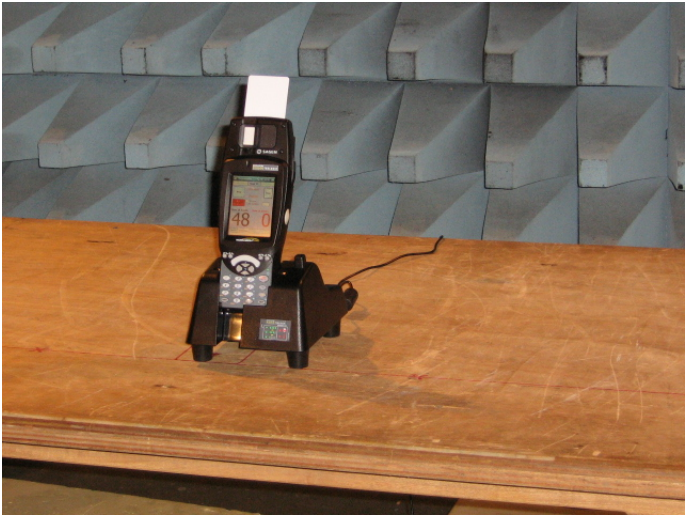


		Frequency (MHz)		
Température (°C)	Supply voltage (Vdc)	Measure	Limit inf.	Limitsup.
- 10	5	13.560052	13.558644	13.561356
- 20	5	13.560088	13.558644	13.561356
+20	5	13.559973	13.558644	13.561356
+50	5	13.569966	13.558644	13.561356

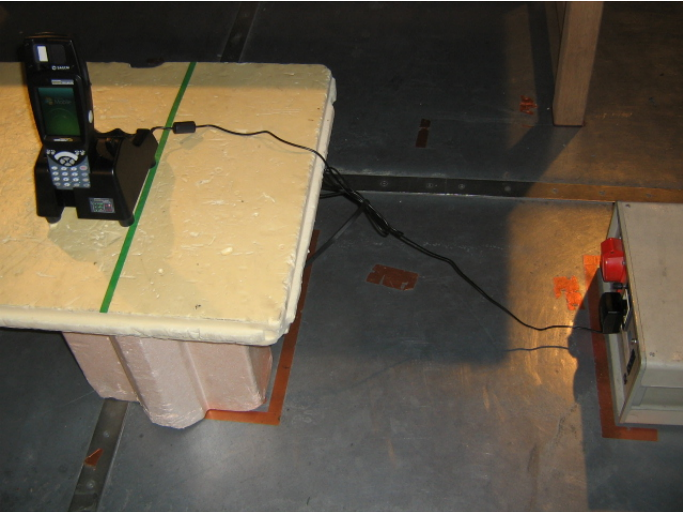
□□□ End of report – 1 annex to be forwarded □□□

ANNEX: PHOTOGRAPH(S)

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

RFID Module LF-AM2-G2

<p>E.U.T. Photograph(s) Without MRZ</p>	 <p>A black handheld device with a screen and keypad is placed on a wooden table. The screen displays '48 0'. The background consists of blue acoustic foam panels.</p>
<p>E.U.T. Photograph(s) With MRZ</p>	 <p>The same black handheld device is on the wooden table. A white label next to it reads 'D041-07-105078 PSION TEKLOGIX'. The background is the same blue acoustic foam. A white electronic device is visible on the floor to the right.</p>
<p>Radiated electric field emission on OATS</p>	 <p>The black handheld device is on the wooden table, connected by a cable to a white electronic device on the floor. The background is a dark, textured surface.</p>

<p>Conducted emission</p>	
<p>Frequency tolerance</p>	