



R041-07-104111-3A - 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 HF-T2-G2-XMOD
FCC ID: GM3HFT2G2X
IC: 2739D-HFT2G2X
Company:

PSION TEKLOGIX

Diffusion: Mr PORTE

(Company: PSION TEKLOGIX)

Number of pages: 18 including 1 annex

Ed.	Date	Modified page(s)	Written by		Technical verification and Quality approval	
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NAME OF THE EQUIPMENT UNDER TEST (E.U.T.) : RFID Module HF-T2-G2-XMOD

Serial number : None

Part number : None

Software Version : None

MANUFACTURER'S NAME : PSION TEKLOGIX

APPLICANT'S ADDRESS:

Company : PSION TEKLOGIX

Address : 135 rue de la Duranne
BP 421000
13591 AIX EN PROVENCE CEDEX 3
FRANCE

Person(s) present during the tests : Mr PORTE

Responsible : Mr PORTE

DATE(S) OF TESTS : August 31th, September 4th and 5th 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 Filing number : 6290

TESTS SUPERVISOR(S) : None

TESTS OPERATOR(S) : David MONTAULON

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1. INTRODUCTION

This document submits the results of Electromagnetic Compatibility tests performed on the equipment **RFID Module HF-T2-G2-XMOD** (denominated hereafter E.U.T.: equipment under test) according to document(s) listed below.

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

Bluetooth is active but not tested.

RFID module already tested (FCC ID: GM3HFT2A1).

Ed. 1

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**Product description:**

IC: 2739D-HFT2G2X

FCC ID: GM3HFT2G2X

ITU emission code: /

Utilization: RFID TAG reader

Antenna type: Incorporated antenna

Antenna gain: Unknown

Operating frequency range: 13.56 MHz

Number of channels: 1

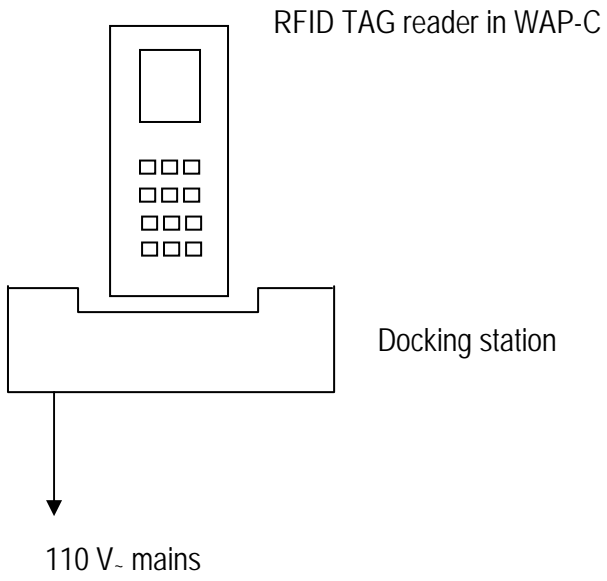
Channel spacing: /

Modulation: /

Power source: 5 Vdc (stand alone) or mains voltage (with docking)

Power level and frequency range are not user adjustable

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	
Ed. 1 Radiated emissions - section 15-209 & table 2 of RSS 210 (above 30MHz)	YES	
Field strength - section 15-225 & A 2.6 of RSS 210	YES	
Frequency tolerance - section 15.225 & A 2.6 of RSS 210	NP	(1)

N.P.: Not Performed.

N.A.: Not Applicable.

(1) RFID module already tested (FCC ID: GM3HFT2A1)

Ed. 1

- **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
110 Vac/60Hz power supply-WAP C/50 Ohms load	L.I.S.N.	80 cm

Frequency band	Tested cable(s)	Resolution bandwidth	Video bandwidth	Detection mode
150kHz-30MHz	110 Vac/60Hz power supply-WAP C/50 Ohms load	10KHz	30kHz	Peak and average

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).

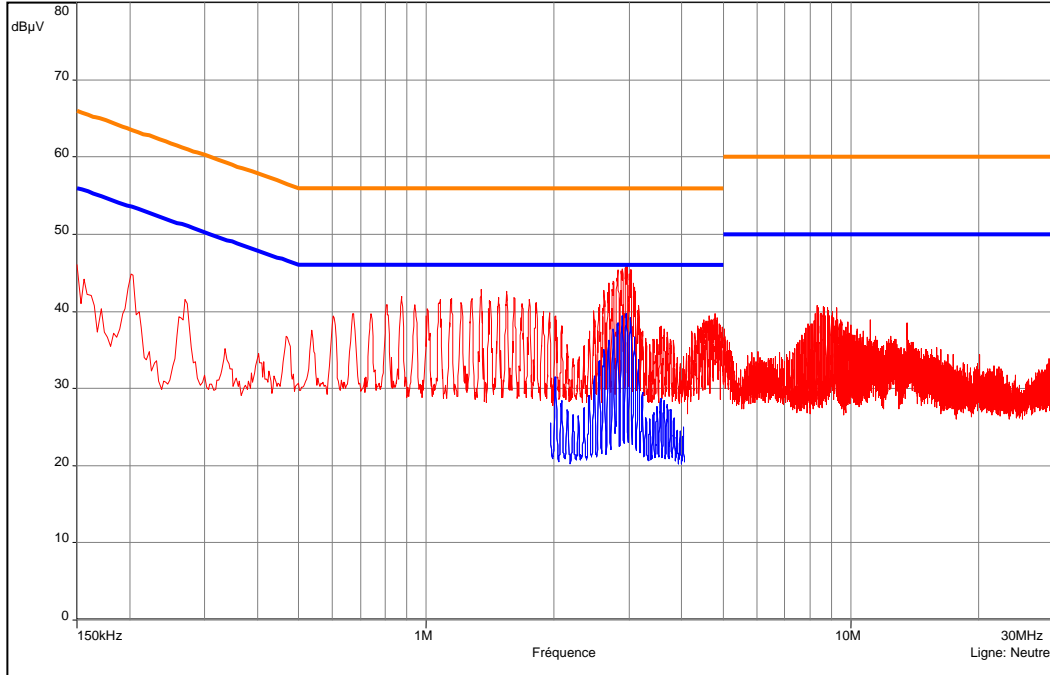
RFID Module HF-T2-G2-XMOD

Conducted voltage emission (measurement)

110Vac/60Hz power supply-WAP C/50 Ohms load in peak and average detection.

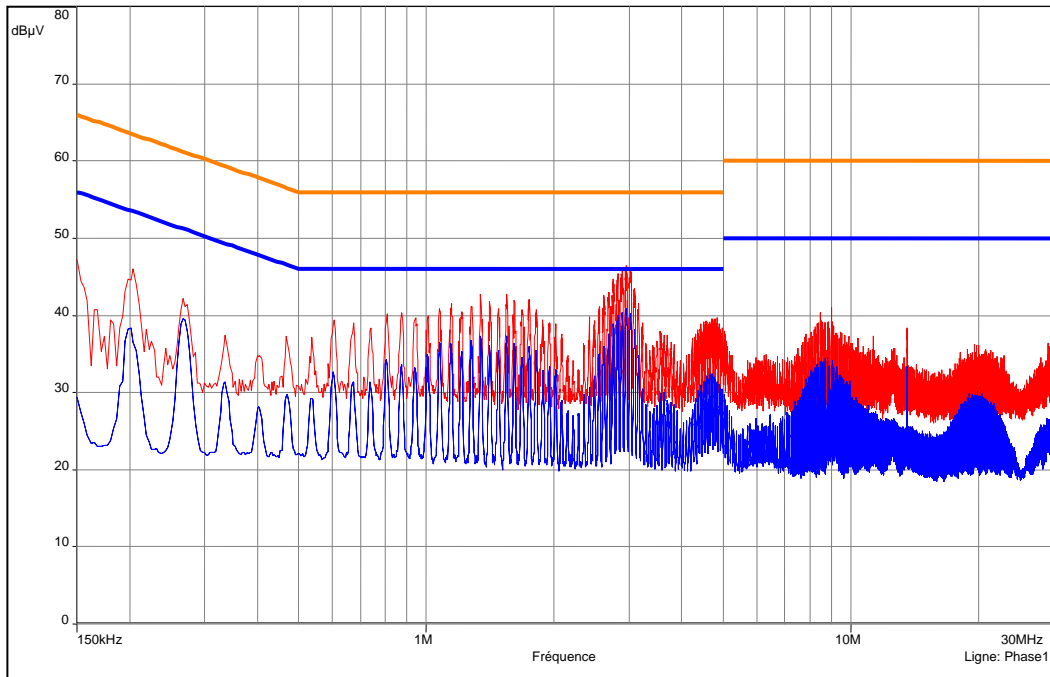
10/07/2007

- EN 55022 Ed.98 - Clas:B - Average/
- EN 55022 Ed.98 - Clas:B - QPeak//
- Mes.Peak (Neutre)
- Mes.Avg (Neutre)



Alimentation 115Vac 60Hz sur charge 50 Ohms - 04/09/2007 10:16 - 77

- EN 55022 Ed.98 - Clas:B - Average/
- EN 55022 Ed.98 - ClasB - QPeak/
- Mes.Peak (Phase1)
- Mes.Avg (Phase1)



Alimentation 115Vac 60Hz sur charge 50 Ohms - 04/09/2007 10:16 - 77

Class: B of the standard

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
<i>9kHz-35kHz</i>	<i>Front side</i>	<i>100Hz</i>	<i>300Hz</i>	<i>Peak</i>	<i>80cm</i>
<i>35kHz-75kHz</i>	<i>Front side</i>	<i>100Hz</i>	<i>300Hz</i>	<i>Peak</i>	<i>80cm</i>
<i>75kHz-150kHz</i>	<i>Front side</i>	<i>100Hz</i>	<i>300Hz</i>	<i>Peak</i>	<i>80cm</i>
<i>150kHz-240kHz</i>	<i>Front side</i>	<i>10kHz</i>	<i>30kHz</i>	<i>Peak</i>	<i>80cm</i>
<i>240kHz-500kHz</i>	<i>Front side</i>	<i>10kHz</i>	<i>30kHz</i>	<i>Peak</i>	<i>80cm</i>
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 (in italic):

- Measurements are given in dB μ A/m instead of μ V/m (conversion factor: 51.5 dB)
- 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.GS3	1123

Results: See **Graph(s)**.

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-1GHz	Back 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:

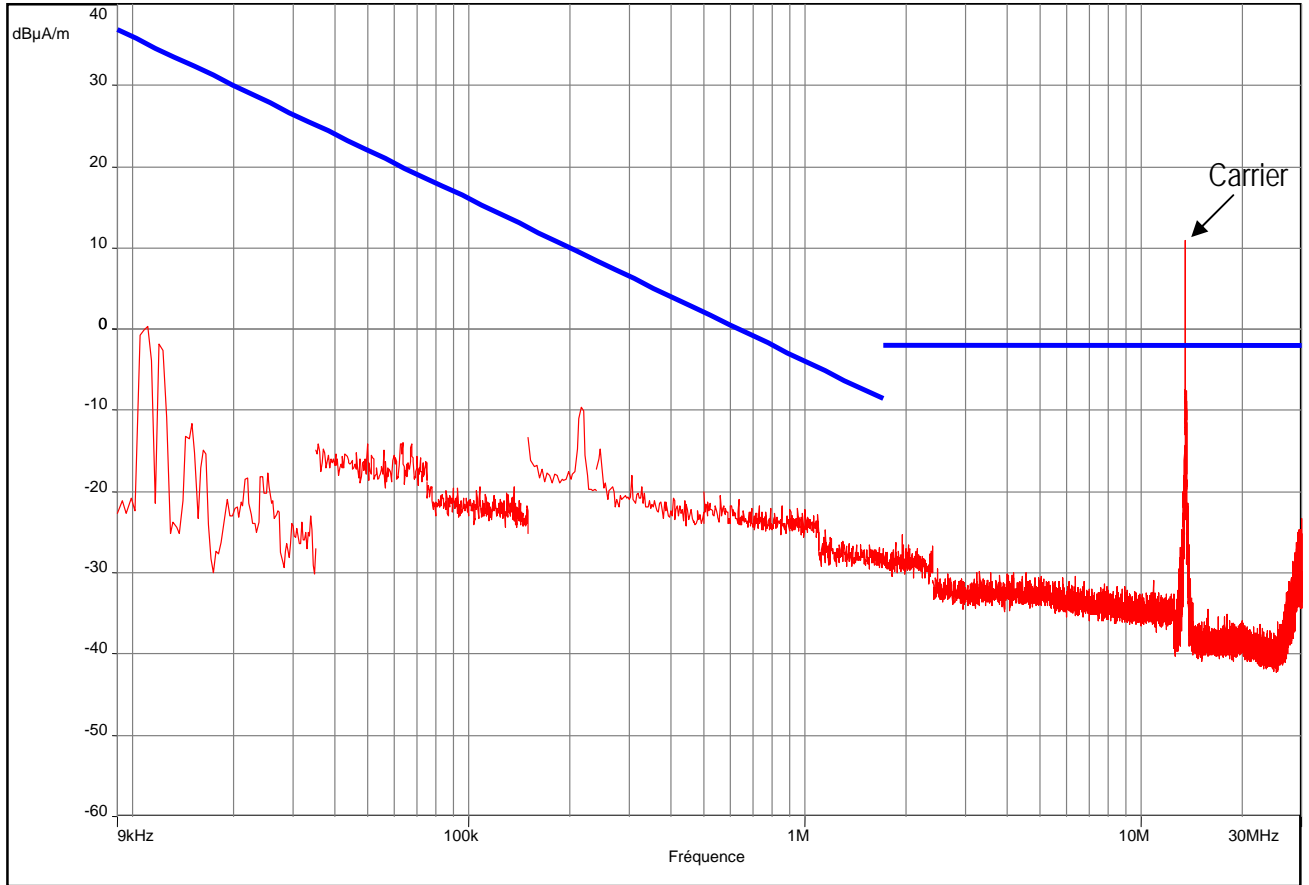
CATEGORY	BRAND	MODEL NUMBER	N° EMITECH
Antenna	Rohde & Schwarz	HL223	3126
Antenna	Electro-Metrics	BIA-30HF	1107
Cable		N-8m	3694
Cable			2704
Cable		N-17m	3620
Cable		N-5m	2716
OATS	Emitech	Salinelles	3482
Preamplifier	MINI-CIRCUITS	RF	1321
Receiver	Agilent Technologies	E7405A	2161
Software	Nexio	BAT EMC v.3.1.7.1.	0000

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

RFID Module HF-T2-G2-XMOD
Radiated magnetic emission: 45°acw – peak detection

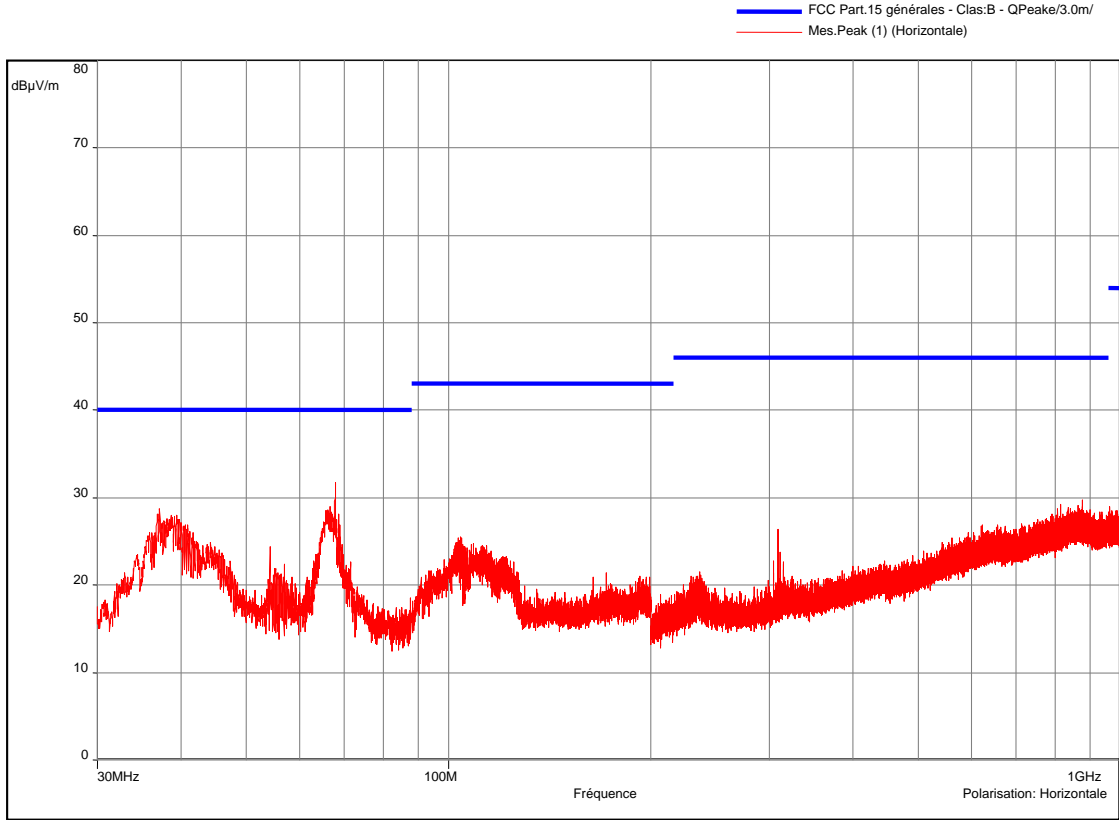
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— CNR-210 - Clas.b - QPeak/3.0m/
— Mes.Peak

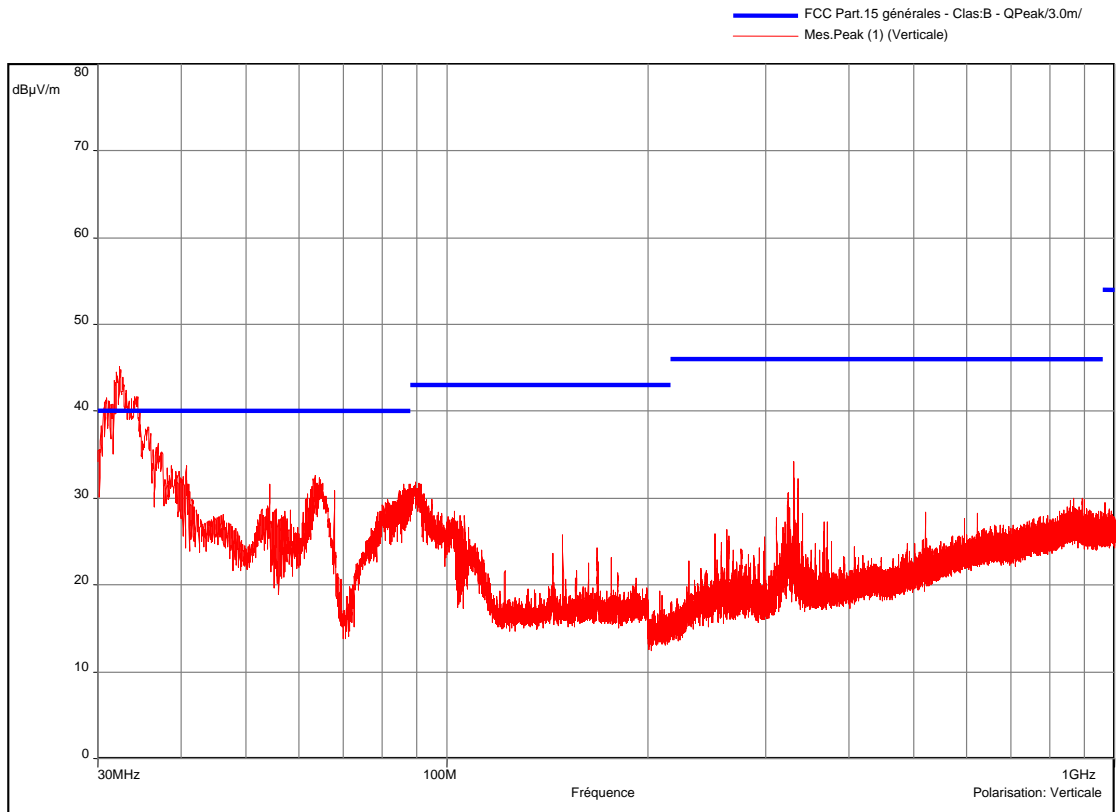


RFID Module HF-T2-G2-XMOD

Radiated electric emission (pre-measurement): back side – peak detection
27/08/2007



Back side - 27/08/2007 15:18 - 1



Back side - 27/08/2007 15:18 - 1

VERTICAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna height (cm)	Measure (dB μ V/m)	Standard limit (dB μ V/m)	Comments
32.40	0	143	16.13	40	C
40.68	0	141	30.47	40	C
54.24	0	140	28.67	40	C
63.48	0	100	15.46	40	C
67.80	0	150	13.63	40	C
89.67	FM Band		45.27	43	(*)
330.17	0	150	24.71	46	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
67.80	0	150	8.17	40	C

C= Compliant
NC= Not compliant

All other radiated emissions are very lower than limit.

(*) Indoor measurement (semi anechoic chamber): 89.67 MHz: 31.8 dB μ V/m (maximum level measured)

8. OPERATION WITHIN THE BAND 13.110-14.010 MHz - SECTION 15-225 AND A 2.6

a) Field strength

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
13.11MHz-14.01MHz	Lateral side (90°)	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 10 meters instead of 30 m

Test equipment list:

CATEGORY	BRAND	MODEL NUMBER	N° EMITECH
Antenna	Electro-Metrics	ALR-25	0263
Cable		N-8m	3694
Cable		N-17m	3620
OATS	Emitech	Salinelles	3482
Preamplifier	MINI-CIRCUITS	RF	1321
Receiver	Agilent Technologies	Agilent E7405A	2161

Results: See **Graph(s)** hereafter.

Carrier measurement at 10m: **-1 dB μ A/m (\approx 50.5 dB μ V/m)**

Using an extrapolation factor of 40 dB/decade (as described in section 15.31 (f)), the level is about 30.5dB μ V/m (34 μ V/m) for a limit at 15.848 mV/m.

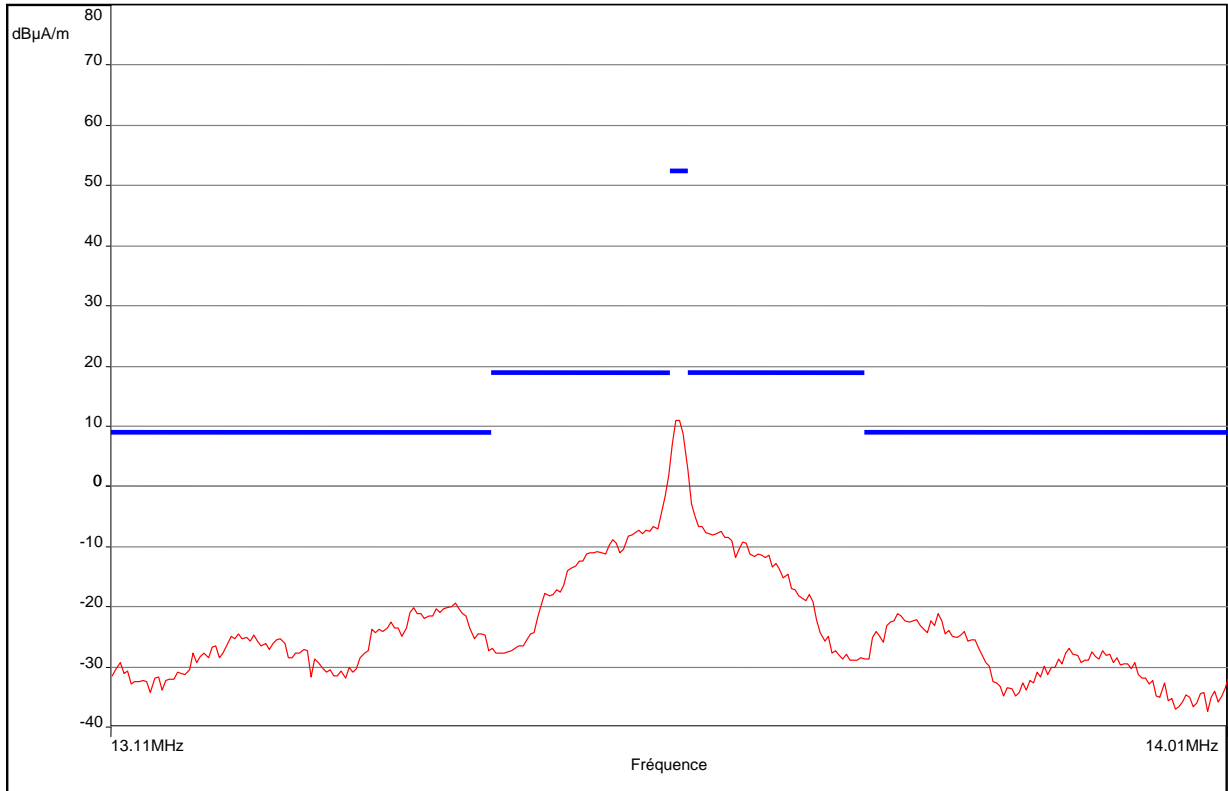
RFID Module HF-T2-G2-XMOD

Radiated magnetic field emission: in peak detection

15/06/2007

Frequency : 13 MHz - 14.01 MHz (Pas: 3 kHz)
 Réglage: RBW: 9 kHz, VBW: 30 kHz, Measurement time: 5 ms/Pts, number of sweep 10
 Polarisation : Circulaire
 Distance: 3 m

— FCC Part.15 (13.56MHz) - Classe:em - QCrête/3.0m/
 — Mes.Peak



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

ANNEX: PHOTOGRAPH(S)

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

RFID Module HF-T2-G2-XMOD

<p>E.U.T. Photograph(s)</p>	
<p>Radiated electric field emission on OATS</p>	

Radiated electric field emission on OATS



Conducted emission

