

R041-09-101841-3A – RG / CHB

EVALUATION OF HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

According to:

EN 50364:2001

Equipment under test:

RFID MODULE HF-AM1-IKÔN


Company:

PSION TEKLOGIX

Diffusion: Mr FORNIER

(Company: PSION TEKLOGIX)

Number of pages: 11 including 2 annexes

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NAME OF THE EQUIPMENT UNDER TEST (E.U.T.) : RFID MODULE HF-AM1-IKÔN

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
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FRANCE

Person(s) present during the tests : Mr FORNIER

Responsible : Mr FORNIER

DATE(S) OF TESTS : April, the 9th of 2009

TESTS LOCATION(S) : Emitech Grand Sud laboratory in
Vendargues (34)

TESTS SUPERVISOR(S) : None

TESTS OPERATOR(S) : Régis GONZALEZ

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1. INTRODUCTION

This report presents the results of the measurements performed on **RFID MODULE HF-AM1-IKÔN** in order to verify the compliance of this product with the European standard EN 50364 (01) which requirements are derived from the European recommendation 99/519/EC

2. REFERENCE DOCUMENTS

EN 50364:2001	Limitation of human exposure to electromagnetic fields from devices operating in the frequency range 0 Hz to 10 GHz, used in Electronic Article Surveillance (EAS), Radio Frequency Identification (RFID) and similar applications.
EN 50357:2001	Evaluation of human exposure to electromagnetic fields from devices used in Electronic Article Surveillance (EAS), Radio Frequency Identification (RFID) and similar applications.
Recommendation 99/519/EC of 12 July 1999	Limitation of exposure of the general public to electromagnetic fields.

3. EQUIPMENT UNDER TEST CONFIGURATION AND DESCRIPTION

Cycle and operating mode during emission tests: Permanent emission mode without modulation.

Equipment modifications applied during tests: No

4. SUMMARY OF TEST RESULTS

Tests designation	Results satisfying?	Comments
EMISSION		
Spacially average measurement	YES	
Measurement of limb and contact currents	YES	

N.P.: Not Performed.

N.A.: Not Applicable.

- In emission:

Sample subject to the test complies with prescriptions of the standard(s) EN 50364:2001 according to limits specified in this test report.

5. SPACIALLY AVERAGE MEASUREMENT

The Derived Reference Levels are based on spatially averaged values over the entire body of the exposed individual. The measurement was performed to verify the compliance of the EUT with the derived reference levels in the frequencies of interest.

The fundamental frequency of emission of EUT is 13.56 MHz. The compliance with radio standard EN 300 330 imposes that harmonics are low and spurious much lower, in consequence all the records are performed at fundamental frequency.

Moreover the type of tested equipment emits a near field inductive field and electric component of the electromagnetic field is lower than in plane wave.

So only H field is taken into account in the measurements and the SAR* calculated with this value will be an overvaluation of the actual SAR* (see § 4.2.2 of the EN 50357).

The limit defined for H field is 13.56 MHz at 73 mA/m.

Test configuration according to table 1 of the standard: Figure 2i

Test apparatus list:

CATEGORY	BRAND	MODEL NUMBER	N° EMITECH
Agilent E7405A	Agilent Technologies	Spectrum analyzer	2161
Boucle 7.5 CM	boucle	Antenna	2464

Climatic Conditions:

Date	Temperature (°C)	Humidity (%HR)	Pression (hPa)
April 9 th of 2009	23	55	1019

E.U.T mode: Permanent emission without modulation

Results: See Board in annex 1: H = 2.61mA/m.

Test Conclusion: Sample subject to the test can be considered as compliant with prescriptions of the standard according to limits specified in this test report.

(*) Specific absorption rate

6. MEASUREMENT OF LIMB AND CONTACT CURRENTS

Body current measurements under consideration are those defined by ICNIRP with frequencies up to 110 MHz.

Two types of current are mentioned:

- limb current.
- contact current.

Both limb and contact current arise from a person touching a metallic object isolated from the ground and charged by electromagnetic field or a charged person isolated from the ground and touching a grounded metallic object.

The limb current is set to prevent excessive SAR* in the wrists, elbows, ankle and knees. The limit is 45 mA for the relevant frequency.

The contact current is set to prevent the risk of shock, or burn from light contact of the fingers with the external object. The limit of contact current is 20 mA for the relevant frequency.

The limb and contact current assume different contact impedance.

(*) *Specific absorption rate*

Test apparatus list:

CATEGORY	BRAND	MODEL NUMBER	N° EMITECH
Agilent E7405A	Agilent Technologies	Spectrum analyzer	2161
F-80	FCC	Measurement clamp	2535

Climatic Conditions:

Date	Temperature (°C)	Humidity (%HR)	Pression (hPa)
April 9 th of 2009	23	55	1019

E.U.T mode: Permanent emission without modulation

Results: See Board in annex 1: H (limbs) = 0.4 mA.

Test Conclusion: Sample subject to the test can be considered as compliant with prescriptions of the standard according to limits specified in this test report.

□□□ End of report – 2 annexes to be forwarded □□□

ANNEX 1:

Board of results

Client PSION

Configuration d'essai :

Produit RFID HF-AM1-IKON

1a

Devis 09-101841

date 09-avr-09

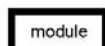
distance (x) :


T


a/b/c 0,15 m


Pa


1015

Equipment height	1 m			<table border="1"> <tr><td>9</td><td>6</td><td>3</td></tr> <tr><td>8</td><td>5</td><td>2</td></tr> <tr><td>7</td><td>4</td><td>1</td></tr> </table>			9	6	3	8	5	2	7	4	1	H*H
9	6	3														
8	5	2														
7	4	1														
measurement height	0,85 m	Records (mV)	corrected level (mA/m)													
measurement point (dBµV)																
1	49	0.28	0.76				0.57									
2	53	0.45	1.20				1.43									
3	48	0.25	0.67				0.45									
4	47	0.22	0.60				0.36									
5	49	0.28	0.76				0.57									
6	48	0.25	0.67				0.45									
7	41	0.11	0.30				0.09									
8	43	0.14	0.38				0.14									
9	40	0.10	0.27				0.07									

measurement height	1 m			<table border="1"> <tr><td>9</td><td>6</td><td>3</td></tr> <tr><td>8</td><td>5</td><td>2</td></tr> <tr><td>7</td><td>4</td><td>1</td></tr> </table>			9	6	3	8	5	2	7	4	1	H*H
9	6	3														
8	5	2														
7	4	1														
measurement point (dBµV)		Records (mV)	corrected level (mA/m)													
1	62	1.26	3.37				11.38									
2	73	4.47	11.97				143.31									
3	63	1.41	3.79				14.33									
4	59	0.89	2.39				5.71									
5	66	2.00	5.35				28.59									
6	61	1.12	3.01				9.04									
7	34	0.05	0.13				0.02									
8	43	0.14	0.38				0.14									
9	44	0.16	0.42				0.18									

measurement height	1,15 m			<table border="1"> <tr><td>9</td><td>6</td><td>3</td></tr> <tr><td>8</td><td>5</td><td>2</td></tr> <tr><td>7</td><td>4</td><td>1</td></tr> </table>			9	6	3	8	5	2	7	4	1	H*H
9	6	3														
8	5	2														
7	4	1														
measurement point (dBµV)		Records (mV)	corrected level (mA/m)													
1	61	1.12	3.01				9.04									
2	69	2.82	7.55				57.05									
3	60	1.00	2.68				7.18									
4	41	0.11	0.30				0.09									
5	43	0.14	0.38				0.14									
6	41	0.11	0.30				0.09									
7	30	0.03	0.08				0.01									
8	35	0.06	0.15				0.02									
9	29	0.03	0.08				0.01									

measurement height	1,3 m			<table border="1"> <tr><td>9</td><td>6</td><td>3</td></tr> <tr><td>8</td><td>5</td><td>2</td></tr> <tr><td>7</td><td>4</td><td>1</td></tr> </table>			9	6	3	8	5	2	7	4	1	H*H
9	6	3														
8	5	2														
7	4	1														
measurement point (dBµV)		Records (mV)	corrected level (mA/m)													
1	52	0.40	1.07				1.14									
2	60	1.00	2.68				7.18									
3	52	0.40	1.07				1.14									
4	50	0.32	0.85				0.72									
5	52	0.40	1.07				1.14									
6	47	0.22	0.60				0.36									
7	39	0.09	0.24				0.06									
8	40	0.10	0.27				0.07									
9	35	0.06	0.15				0.02									

measurement height	1,45 m			<table border="1"> <tr><td>9</td><td>6</td><td>3</td></tr> <tr><td>8</td><td>5</td><td>2</td></tr> <tr><td>7</td><td>4</td><td>1</td></tr> </table>			9	6	3	8	5	2	7	4	1	H*H
9	6	3														
8	5	2														
7	4	1														
measurement point (dBµV)		Records (mV)	corrected level (mA/m)													
1	48	0.25	0.67				0.45									
2	54	0.50	1.34				1.80									
3	48	0.25	0.67				0.45									
4	43	0.14	0.38				0.14									
5	45	0.18	0.48				0.23									
6	42	0.13	0.34				0.11									
7	40	0.10	0.27				0.07									
8	41	0.11	0.30				0.09									
9	38	0.08	0.21				0.05									

Spatially averaged measure Limits 73mA/m 305.72

	measurement point (dBµV)	Records (mV)	Limits	mA/m
Mesure à 1 cm du lecteur au centre		0.00	0.00	
Mesure du courant dans le bras	66	2.00	0.40	45mA
Mesure dans la cheville	34	0.05	0.01	45mA

ANNEX 2: PHOTOGRAPH(S)

Equipment Under Test (E.U.T.) PHOTOGRAPH(S):

RFID MODULE HF-AM1-IKÔN

Photograph(s) of E.U.T.

