



R041-07-101281-3A - AA / SM-CHB

EVALUATION OF HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

According to the standard(s):

EN 50364:2001

Equipment under test:

RFID Tunnel Tag Reader 50x50 370

Company:

TAGSYS

Diffusion: Mr DOTTE

(Company: TAGSYS)

Number of pages: 9 including 1 annex

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Conseils & Ingénierie - Tests & Mesures - Formation

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EQUIPMENT UNDER TEST (E.U.T.) : RFID Tunnel Tag Reader 50x50 370

Serial number : T0534003

Part number : Model A0

Software Version : V 6.10

MANUFACTURER'S NAME : TAGSYS

APPLICANT'S ADDRESS:

Company : TAGSYS

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Person(s) present during the tests : Mr DOTTE, Mr d'ANNUNZIO, Mr PELLET,
Mr TRAN

Responsible : Mr DOTTE

DATE(S) OF TESTS : From 17th of May, 2007 to 20th of May, 2007,
the 05th of June, 2007 and the 08th of June,
2007

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

TESTS SUPERVISOR(S) : None

TESTS OPERATOR(S) : Augustin ALVAREZ

CONTENTS

1. <i>INTRODUCTION</i>	4
2. <i>REFERENCE DOCUMENT(S)</i>	4
3. <i>EQUIPMENT UNDER TEST CONFIGURATION</i>	4
4. <i>SUMMARY OF TEST RESULTS</i>	5
5. <i>SPACIALLY AVERAGE MEASUREMENT</i>	6
6. <i>MEASUREMENT OF LIMB AND CONTACT CURRENTS</i>	7
<i>ANNEX : RESULTS BOARD(S)</i>	8

1. INTRODUCTION

This report presents the results of the measurements performed on the **Tunnel Tag Reader 50x50 370** 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 DOCUMENT(S)

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

Equipment under test (E.U.T.) description: RFID Tag reader

Cycle and operating mode during emission tests: Permanent emission

Equipment modifications applied during tests:

- Differential mode inductor on power supply (2.4 mH/500 W)
- Mains filter ref : SCHAFFNER FN 2310X-3-06 at the entry of main frame
- Ferrite bead (2 turns) on power supply cable
- Ferrite bead (direct) on RFID internal cables near RFID module and on motor cable near motor
- All shields as short as possible to the main frame
- Not used cable length shorted (internal and external)
- Power limited to 1.75 watts (230Vac supplied)
- No more warning column

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*Temperature (°C): 25**Humidity (%HR): 44**Pressure (hPa): 1002*

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 13.56MHz. 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 electro-magnetic 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 13.56MHz at 73mA/m.

(*) *Specific absorption rate*

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

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH
Antenna	Loop	7.5 cm	2464
Receiver	Agilent Technologies	8590L	2001

Results: See Board in annex: H = 3.9 mA/m

6. MEASUREMENT OF LIMB AND CONTACT CURRENTS*Temperature (°C): 25**Humidity (%HR): 44**Pressure (hPa): 1002*

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 (not made because no external object is used).

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 45mA 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 20mA for the relevant frequency.

The limb and contact current assume different contact impedance.

(*) *Specific absorption rate*

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH
Coupling clamp	FCC	F-80	2535
Receiver	Agilent Technologies	E7405A	2161

Results: See Board in annex: $I(\text{limbs}) = 0.4\text{mA}$

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

ANNEX:

RESULTS BOARD(S)

Applicant: TAGSYS

Test configuration :

Equipment height

point	mesure (dBuV)	Measurement height
1	76.5	0.85
2	64.2	field (mA/m)
3	56.8	17.9
4	64.8	4.3
5	62.2	1.9
6	57.4	4.7
7	56.5	3.5
8	58.7	2.0
9	54.3	1.8

Product: Tunnel Tag Reader 50x50

2a

distance (x) :

0.2m

(a)=(b)=0,15m

0.80m (middle of antenna)

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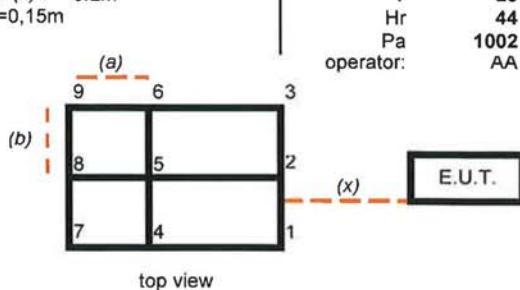
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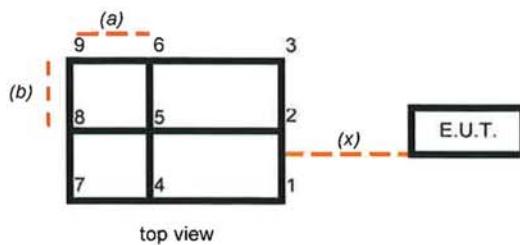
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Pa 1002

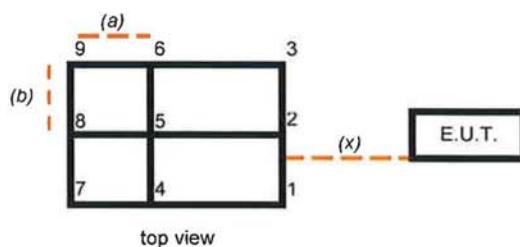
operator AA



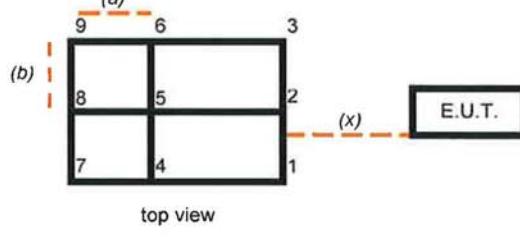
point	mesure (dBuV)	Measurement height
1	70.4	1
2	63.7	field (mA/m)
3	59.2	8.9
4	66	4.1
5	62.3	2.4
6	55.9	5.3
7	60.2	3.5
8	56.9	1.7
9	54.6	2.7



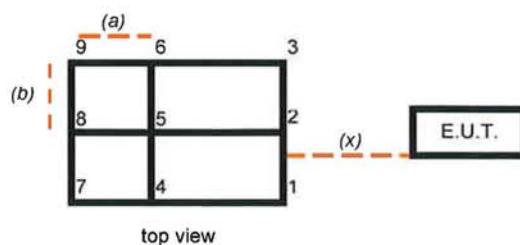
point	mesure (dBuV)	Measurement height
1	67.2	1.15
2	62.5	field (mA/m)
3	56	6.1
4	62.1	3.6
5	59.2	1.7
6	55.1	3.4
7	56.5	2.4
8	55	1.5
9	49.9	1.8



point	mesure (dBuV)	Measurement height
1	63.1	1.3
2	58.4	field (mA/m)
3	53.3	3.8
4	58.3	2.2
5	56.4	1.2
6	53	2.2
7	54.6	1.8
8	52.5	1.2
9	50.1	1.4



point	mesure (dBuV)	Measurement height
1	55.9	1.45
2	52.1	field (mA/m)
3	44.2	1.7
4	54.4	1.1
5	52.2	0.4
6	49	1.4
7	50.1	1.1
8	47.2	0.8
9	45.8	0.9



Spatially averaged measure:

mesure (mA/m)

3.9

limit (mA/m)

73

Mesure in arm:
Mesure in ankle:mesure (dB μ V)

62.9

current (mA)

0.28

limit (mA)

45

Field measure at 1cm (middle
of the reader) :mesure (dB μ V)

120.9

field (mA/m)

2972.6

limit (mA/m)

none : for information