



R041-12-105856-4A - DM / CV

RADIO TEST REPORT

According to the standard(s):

FCC Part 15 Radio

Equipment under test:

PE3LR-C
FCC ID: R8T-PE3LR-C


Company:

ADVEEZ

Diffusion: Mr BENDHIA

(Company: ADVEEZ)

Number of pages: 23 including 1 annex

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*NAME OF THE EQUIPMENT
UNDER TEST (E.U.T.)* : PE3LR-C

Serial number : /

P/N : FCC ID: R8T-PE3LR-C

Software version : /

MANUFACTURER'S NAME : ADVEEZ

APPLICANT'S ADDRESS:

Company : ADVEEZ

Address : Bât. MEAS
Impasse Jeanne Benozzi - CS 83 163
31027 TOULOUSE CEDEX 3
FRANCE

*Person(s) present during the
tests* : Mr CREMOUX

Responsible : Mr BENDHIA

DATE(S) OF TESTS : From December 10th to 11th of 2012
January 15th to 16th of 2013 and February 21st to 22nd of 2013

TESTS LOCATION(S) : Emitech Montpellier laboratory in Vendargues – FRANCE
Open Area Test Site in Salinelles
FCC Registration number: 8127-19

TESTS SUPERVISOR(S) : None

TESTS OPERATOR(S) : David MONTAULON

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1. INTRODUCTION

This document submits the results of Radio tests performed on the equipment PE3LR-C (denominated hereafter E.U.T.: equipment under test) according to document(s) listed below.

2. REFERENCE DOCUMENT(S)

FCC part 15

Code of federal regulations. Title 47- Telecommunication Chapter 1- Federal Communication Commission. Part 15- Radio frequency devices Subpart B- Unintentional Radiators. Limits and methods of measurement of radio disturbance. Characteristic of information technology 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

Equipment under test (E.U.T.) description:

The reader "PE3LR-C" is built around a main microcontroller to coordinate all sub-systems involved the central.

The primary functions of the reader are:

- LF Emit signal
- Receive RF signal
- Transponder operation
- Relay activation
- Manage access control
- Provision of visual and audio information to the user
- Communicate with a remote system via a bus communication
- Communicate with a wireless network interconnecting

1 LF Emit signal

The LF signal is a WUP (Wake Up Signal) at 125KHz emitted on an accuracy short range (1 meter or 3 meters following the mode) to activate tags (PERLR-T, PERLR-TCH or AD-CARE-W).

One or two antennas emit this signal following the mode: one inside the reader and another (optional) may be connected on the dedicated connector.

2 Receive RF signal

When a tag is activated the response is at 908 MHz, the reader receives this signal and decrypts the data.

3 Transponder operation

The reader is able to read several passive tags such as EM, Mifare...

Likewise if the battery of an active tag is empty, the reader can identify tag in safe mode: the proximity mode.

4 Relay activation

When an authorized tag is correctly identified, the reader controls a door opening system through a relay

PE3LR-C-OpDes Page 2

5 Provision of visual and audio information to the user

A buzzer and two LED inside the reader provide to the user visual and audio information. A bicolor LED and another buzzer are integrated inside the external antenna and provide same information. To interpret this information, go back to the notice.

6 Manage access control

To manage access control (enroll or delete tag, choice time slot, control event...) 3 modes are available: via a bus communication (confer 7), with a wireless network (confer 8) or with a master-tag (same electronic than PE3LR-T). Go back to the notice for more information.

7 Communicate with a remote system via a bus communication

Communication through a bus communication is set up in two different standards: RS485 and Wiegand.

8 Communicate with a wireless network

To allow several readers to link, a communication with a wireless network is carried by a module inside the reader. This module is certified by the FCC for use with other products without any further certification (as per FCC section 2.1091). Its FCC-ID: OUR-XBEEPRO, it's written on the label of the reader (confer PE3LR-C-LabelSmpl).

FCC ID: R8T-PE3LR-C

Transmitter frequency range: 125kHz

Receiver frequency range : 908MHz

Number of channels: 1

Tested frequencies: 125kHz

Power supply: 12/24Vdc

Consumption: /

Operating temperatures: -20°C/+60°C

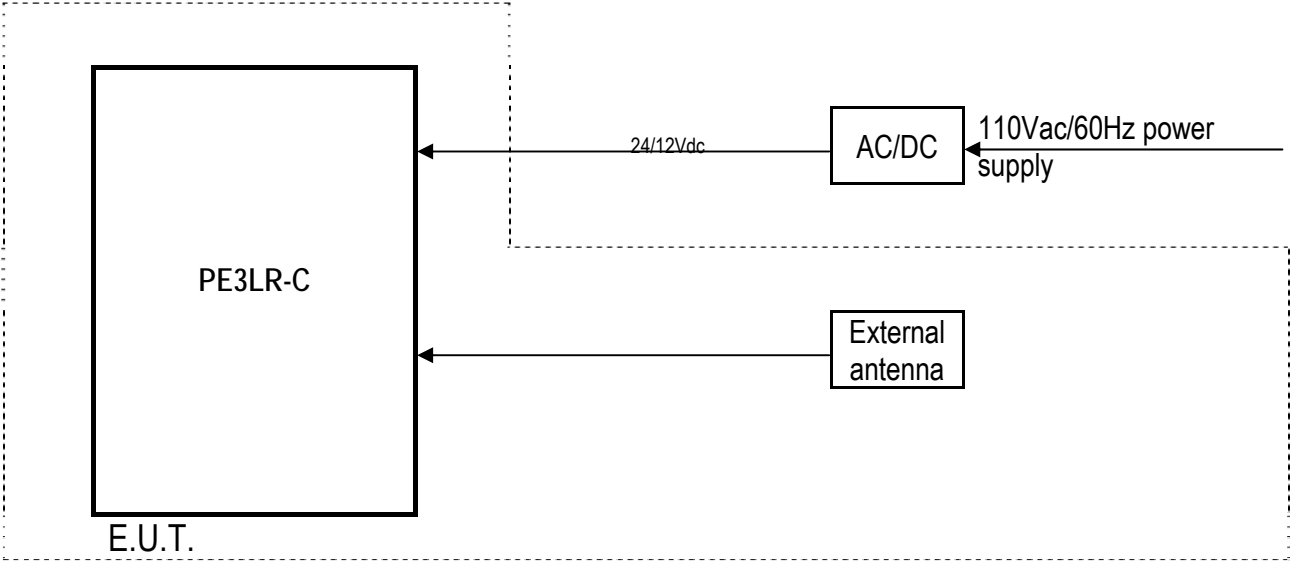
Mounting: Wall mounting

Antennas: integrated and external

Cycle and operating mode during emission tests: Permanent emission mode

Equipment modifications applied during tests: No

4. EQUIPMENT UNDER TEST CONFIGURATION SCHEME



5. SUMMARY OF TEST RESULTS

Tests designation	Results satisfying?	Comments
Conducted power lines FCC part 15.107 and 15.207 Unwanted radiated emissions FCC part 15.209 & part 15.209	YES 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 Radio parts 15.207 and 15.209 according to limits, specified in this test report for tests made only

6. CONDUCTED EMISSION

Standard: FCC part 15

Test method: FCC part 15.107 and FCC part 15.207

Test configuration:

Tested cable(s)	Measure with	E.U.T. height
110Vac/60Hz power supply	L.I.S.N.	40cm

Frequency band	Tested cable(s)	Resolution bandwidth	Video bandwidth	Detection mode
150kHz-1MHz	110Vac/60Hz power supply	10kHz	30kHz	Peak
1MHz-10MHz	110Vac/60Hz power supply	10kHz	30kHz	Peak
10MHz-30MHz	110Vac/60Hz power supply	10kHz	30kHz	Peak
150kHz-1MHz	110Vac/60Hz power supply	10kHz	30kHz	Peak
1MHz-10MHz	110Vac/60Hz power supply	10kHz	30kHz	Peak
10MHz-30MHz	110Vac/60Hz power supply	10kHz	30kHz	Peak

Test method deviation: No

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH
Cable		N-1.5m	3621
Cable	C&C	N-6m	5015
Limiter	Hewlett Packard	11947A	0239
LISN	PMM	L3-25	0821
Receiver	Agilent	E4440A	5824
Shielded enclosure	RAY PROOF	C.GS3	1123
Software	Nexio	BAT EMC	0000

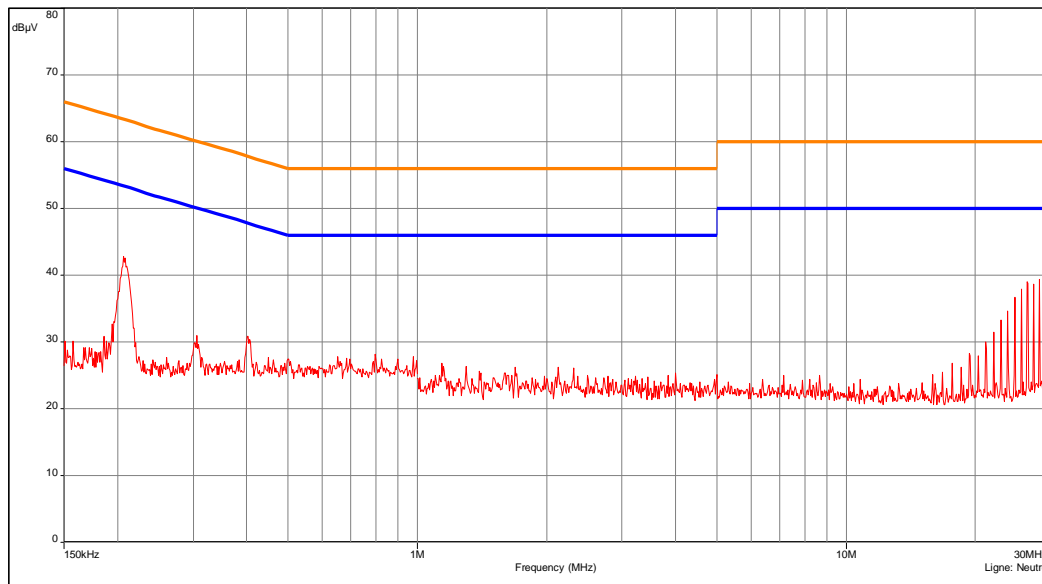
BAT-EMC software version: V3.6.0.24

Results: See Graph(s) hereafter.

Limits on the graphs are average and quasi-peak limits (upper limit).

**Conducted voltage emission (measurement)
110Vac/60Hz power supply**
EMI965

— C.E.M. (civil)/FCC part 15 - Class B - Moyenne/
— C.E.M. (civil)/FCC part 15 - Class B - QCrête/
— Mes.Peak (Neutre)



110Vac/60Hz power supply - 02/21/2013 09:22 - 965

Date: 21/02/2013 09:22:34

Technician: DM

Class: B of the standard

 Detection:
Peak, average and quasi-peak

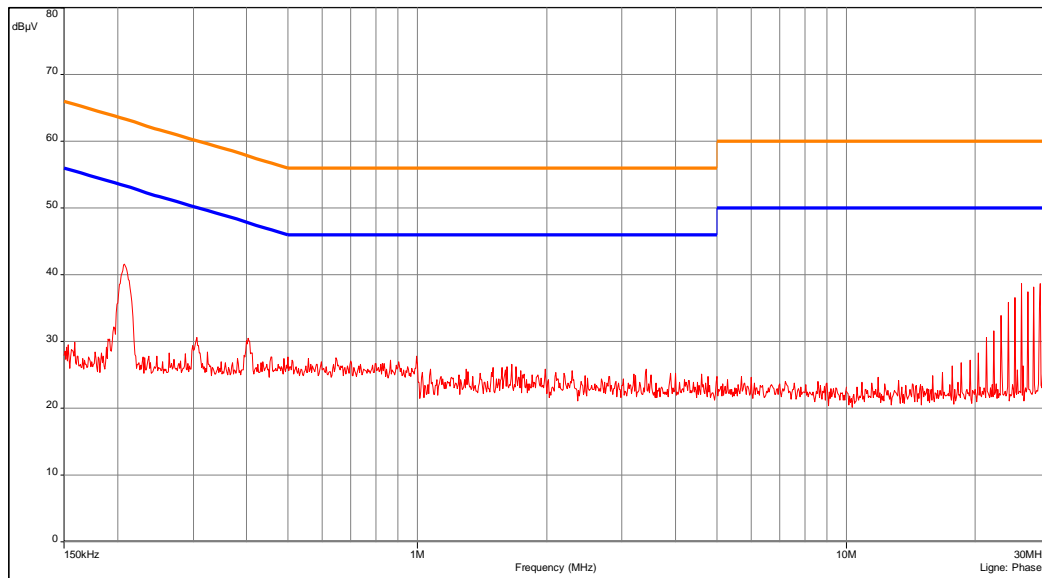
T (°C): 21.5

H (%): 23

P (hpa): 1003

Modification(s) during test:

— C.E.M. (civil)/FCC part 15 - Class B - Moyenne/
— C.E.M. (civil)/FCC part 15 - Class B - QCrête/
— Mes.Peak (Phase1)



110Vac/60Hz power supply - 02/21/2013 09:22 - 965

7. UNWANTED RADIATED EMISSIONS

Standards: FCC part 15 Radio part 15.209

Test methods: FCC part 15.109, 15.209, ANSI C63.4:2003

a) Pre-measurement in semi anechoic chamber:

Frequency band	Tested side	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
9kHz-150kHz	Front side	200Hz	1kHz	Peak	80cm
150kHz-30MHz	Front side	10kHz	30kHz	Peak	80cm
30MHz-1GHz	Front side	100kHz	300kHz	Peak	80cm
1GHz-10GHz	Front side	1MHz	3MHz	Peak	80cm

Measurements below 30MHz are done with a loop antenna as describe in the standard.

Measurements are done in semi anechoic chamber at 3m. E.U.T. is set on a wooden table.

Measurements are done in max-hold peak detection.

Limits:

From 9 kHz to 30MHz: Limit indicated on the curves is calculated with 40 dB/decade extrapolation factor and 51.5 dB conversion factor.

From 30MHz to 1GHz Quasi peak limit provided is the limit given in 15.209.

Above 1GHz average limits in restricted bands §15.205 and general limits §15.209 are 54dBµV/m. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20dB under any condition of modulation.

Test method deviation:

From 9 kHz to 30MHz measurements are made in peak detection instead of average mode in frequency band 9 kHz-500 kHz

- Measurements are given in dBµA/m instead of µV/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.

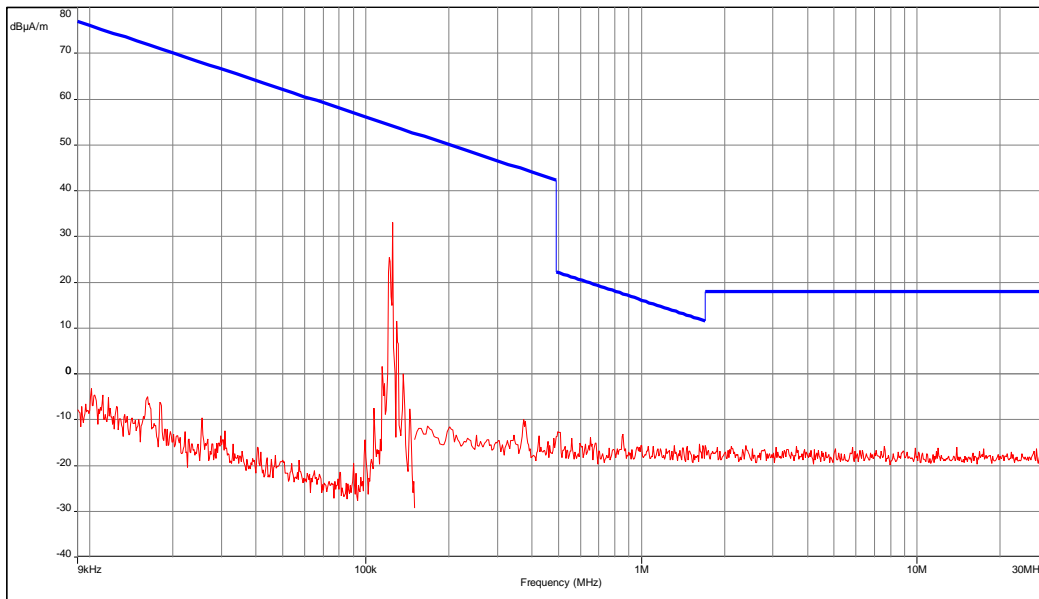
Measuring distance: 3 meters

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	Rohde & Schwarz	HFH2-Z2	5825	22-oct-2012	22-dev-2014
Antenna	Emco	3115	1053	17-aug-2012	17-oct-2016
Antenna	Electro-Metrics	BIA-30HF	1107	03-mar-2011	03-may-2015
Antenna	Electro-Metrics	LPA-30	1137	03-mar-2011	03-may-2015
Cable	C&C	N-1.5m	5016	05-dec-2011	05-fev-2014
Cable		N-1m	2701	27-dec-2012	27-fev-2015
Cable	C&C	N-6m	5015	27-dec-2012	27-fev-2015
Preamplifier	IMPULSE	CA118-546ACN	9169	27-fev-2012	27-avr-2013
Receiver	Agilent Technologies	E4440A	5824	24-aug-2011	24-oct-2013
Shielded enclosure	RAY PROOF	C.GS3	1123	-	-
Software	Nexio	BAT EMC	0000	-	-

*BAT-EMC software version: V3.6.0.24*Results: See Graphs hereafter.

Radiated magnetic field emission (measurement)
EMI951
Front side / PE3LR-C / antenna 0°

 RADIO/FCC part15.209 (40dB/dec) - Class:ss - Critère/3.0m/
 Mes.Peak


Front side / PE3LR-C / antenna 0° - 12/11/2012 14:54 - 951

Date: 11/12/2012 14:54:11

Technician: DM

Class: ss of the standard

 Detection:
 Peak

T (°C): 18.2

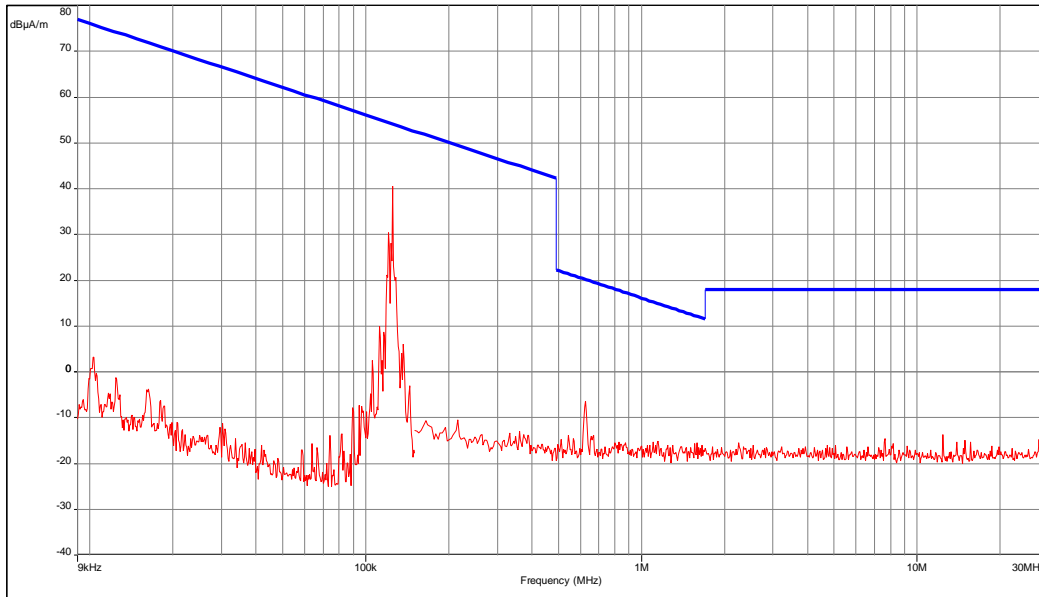
H (%): 27.1

P (hpa): 1013

Modification(s) during test:

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

Radiated magnetic field emission (measurement)
EMI952
Front side / PE3LR-C / antenna 45°

 RADIO/FCC part15.209 (40dB/dec) - Class:ss - Critère:3.0m/
 Mes.Peak


Front side / PE3LR-C / antenna 45° - 12/11/2012 14:57 - 952

Date: 11/12/2012 14:57:18

Technician: DM

Class: ss of the standard

 Detection:
 Peak

T (°C): 18.2

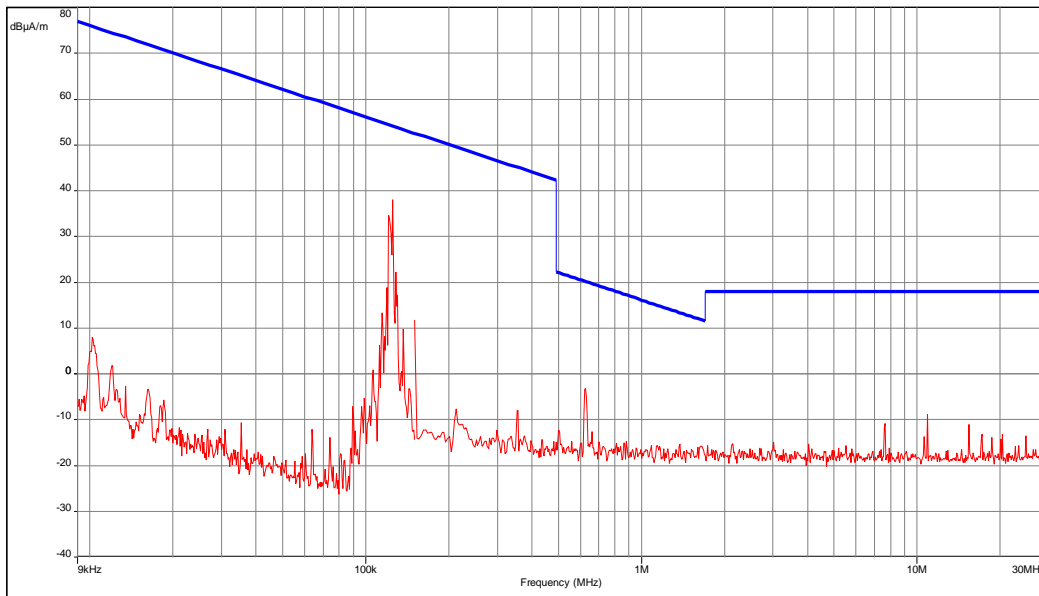
H (%): 27.1

P (hpa): 1013

Modification(s) during test:

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

Radiated magnetic field emission (measurement)
EMI953
Front side / PE3LR-C / antenna 90°

 RADIO/FCC part15.209 (40dB/dec) - Class:ss - Crête/3.0m/
 Mes.Peak


Date: 11/12/2012 15:00:09

Technician: DM

Class: ss of the standard

 Detection:
 Peak

T (°C): 18.2

H (%): 27.1

P (hpa): 1013

Modification(s) during test:

Front side / PE3LR-C / antenna 90° - 12/11/2012 15:00 - 953

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

Radiated electric emission (measurement)
Front side / PE3LR-C
EMI971

- C.E.M. (civil)/FCC Part.15 - Class:B - Moyenne/3.0m/
- C.E.M. (civil)/FCC Part.15 - Class:B - Crête/3.0m/
- C.E.M. (civil)/FCC Part.15 - Class:B - Crête/3.0m/
- Mes. Peak (Horizontale)
- Mes. Avg (Horizontale)
- Peak/LimAvg (Horizontale)
- Peak/LimQ-Peak (Horizontale)

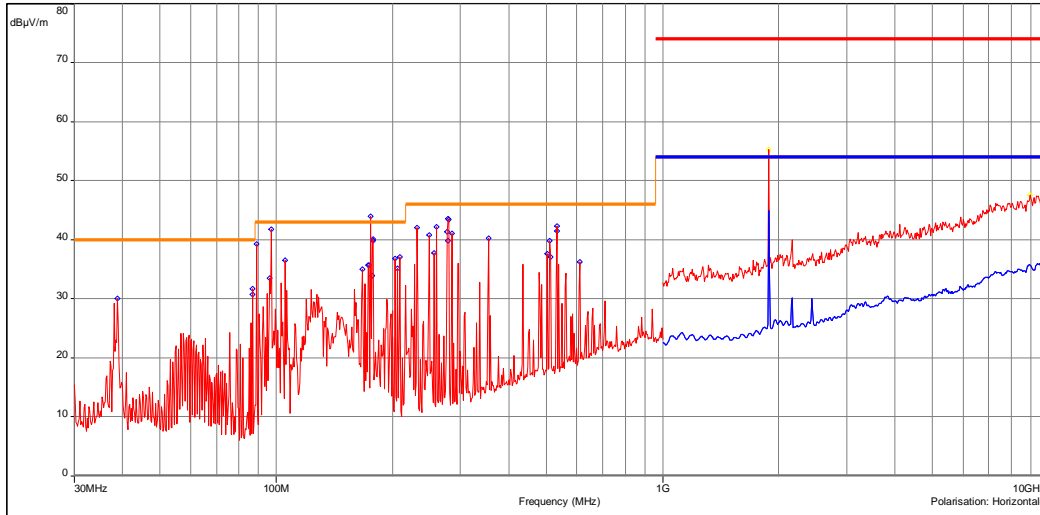
Date: 21/02/2013 09:46:38

Technician: DM

Class: B of the standard

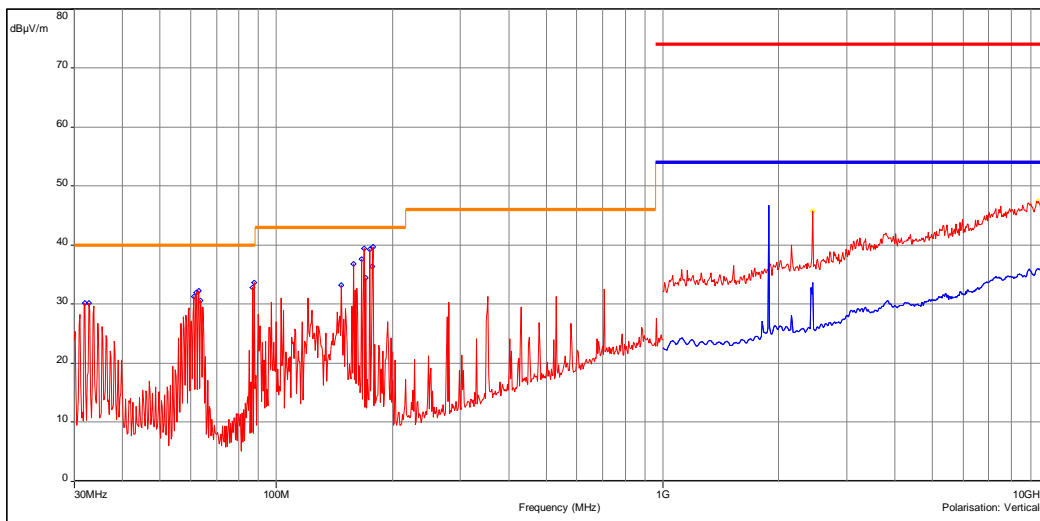
 Detection:
 Peak

 T (°C): 20.2
 H (%): 28.4
 P (hpa): 1003

 Frequency identification:
 1840MHz : Ambient DCS
 2100MHz : Ambient network
 2440MHz : Local Wifi network


Front side / PE3LR-C - 02/21/2013 09:46 - 971

- C.E.M. (civil)/FCC Part.15 - Class:B - Moyenne/3.0m/
- C.E.M. (civil)/FCC Part.15 - Class:B - Crête/3.0m/
- C.E.M. (civil)/FCC Part.15 - Class:B - Crête/3.0m/
- Mes. Peak (Verticale)
- Mes. Avg (Verticale)
- Peak/LimAvg (Verticale)
- Peak/LimQ-Peak (Verticale)



Front side / PE3LR-C - 02/21/2013 09:46 - 971

b) Measurement at 3 meters on open area test site:

Temperature (°C): 21

Humidity (%HR): 39

Pressure (hPa): 1004

Test configuration: For each measured frequencies, E.U.T. is set via a turntable in order to find the highest level. Test antenna is set between 1m and 4m in order to find the highest level in vertical and horizontal polarization. Only highest levels are recorded.

Frequency band	Initial position (0°)	Resolution bandwidth	Measuring distance	Detection mode	E.U.T. height
9kHz-150kHz	Front side	200Hz	3m	Peak	80cm
150kHz-30MHz	Front side	10kHz	3m	Peak	80cm
30MHz-1GHz	Front side	120kHz	3m	Quasi-peak	80cm
1GHz-10GHz	Front side	1MHz	3m	Average	80cm

Test method deviation: Between 9 kHz to 30MHz: measurements are given in dBμA/m instead of dBμV/m (conversion factor: 51.5dB) and measuring distance is 10 meters instead of 300m.

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	ETS LINDGREN	3117	5456	17-aug-2012	17-oct-2016
Antenna	Rohde & Schwarz	HL223	3126	03-mar-2011	03-may-2015
Antenna	Rohde & Schwarz	HFH2-Z2	5825	22-oct-2012	22-dec-2014
Antenna	Electro-Metrics	BIA-30HF	1107	03-mar-2011	03-may-2015
Antenna mast	Heinrich Deisel	MA240	4037	-	-
Cable	Cables & Connetiques	N-1.5m	4203	27-oct-2011	27-dec-2013
Cable	Huber Sumner	N-14m	8146	09-mar-2011	09-may-2013
Filter	Micro-Tronics	HPM 11630	4392	19-jan-2012	19-mar-2014
Mast controller	Heinrich Deisel	HD100	4036	-	-
Open area test site	Emitech	Salinelles	3482	04-mar-2011	04-may-2014
Preamplifier	IMPULSE	CA118-546ACN	9169	27-fev-2012	27-apr-2013
Receiver	Agilent	E4440A	5824	24-aug-2011	24-aug-2013
Turntable	Heinrich Deisel	D4420	4038	-	-

Results: See Boards hereafter.

Frequency (MHz)	Polarization	Azimut (degree)	Antenna Height (cm)	Measure (dBμA/m)	Limit (dBμA/m) (*)	Comments
0.125	Circular 0°	0	100	10.68	33.24	C
0.125	Circular 45°	7	100	8.52	33.24	C
0.125	Circular 90°	78	100	6.13	33.24	C

C=Compliant

Carrier measurement at 10m: 10.68 dBμA/m (≈ 62.18dBμV/m)

Using an extrapolation factor of 40 dB/decade (*) (as described in section 15.31 (f)), the level at 300m is about 3.09dBμV/m (1.428μV/m) for a limit at 19.2 μV/m.

Frequency (MHz)	Polarization	Azimuth (degree)	Antenna Height (cm)	Measure (dB μ V/m)	Limit (dB μ V/m)	Comments
32.57	Vertical	0	100	22.87	40	C
62.54	Vertical	0	100	20.76	40	C
87.96	Vertical	0	100	32.87	40	C
144.00	Vertical	0	100	25.91	43	C
152.00	Vertical	242	200	30.54	43	C
176.00	Vertical	0	100	18.98	43	C
39.00	Horizontal	0	100	15.64	40	C
88.00	Horizontal	0	100	25.47	40	C
176.00	Horizontal	90	200	25.84	43	C
184.00	Horizontal	90	160	28.37	43	C
200.00	Horizontal	0	160	32.03	43	C
204.00	Horizontal	0	100	23.22	43	C
208.00	Horizontal	0	150	27.21	43	C
216.00	Horizontal	0	150	32.55	43	C
232.00	Horizontal	0	110	32.78	46	C
248.00	Horizontal	0	100	29.65	46	C
284.00	Horizontal	170	100	29.71	46	C
340.00	Horizontal	0	100	19.93	46	C
514.00	Horizontal	0	100	32.93	46	C
602.40	Horizontal	0	100	26.45	46	C

C=Compliant



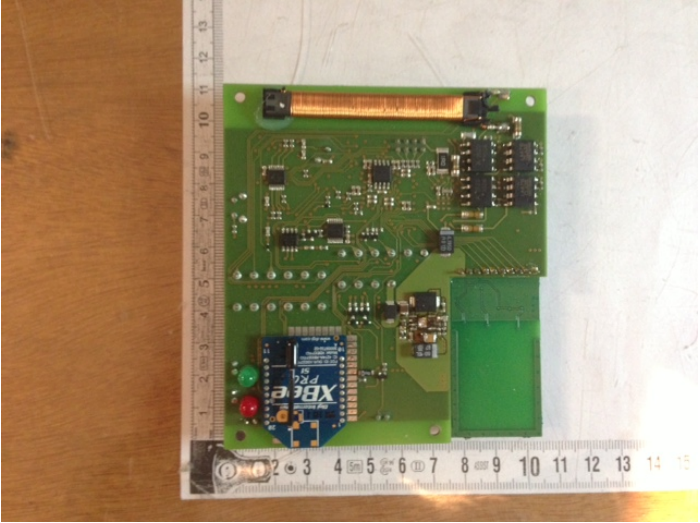
All other unwanted radiated spurious are at least 20 dB below specified limits

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

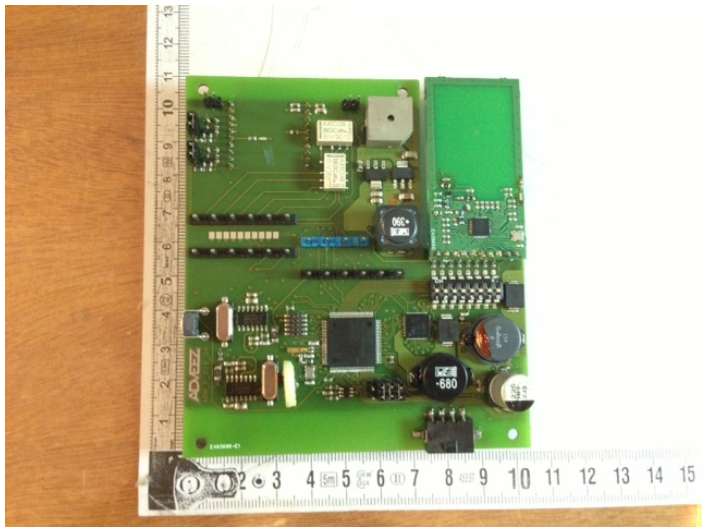
ANNEX: PHOTOGRAPH(S)

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

PE3LR-C

<p>External top view</p>	
<p>External bottom view</p>	
<p>Internal view: LF receive part</p>	

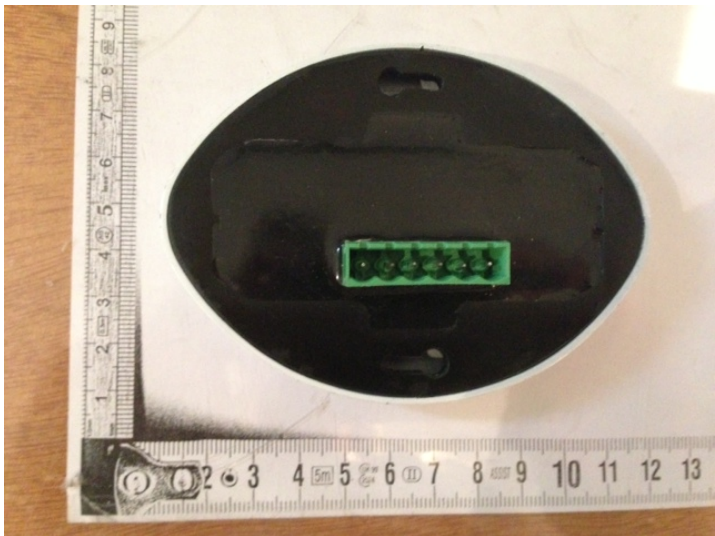
Internal view:
RF part



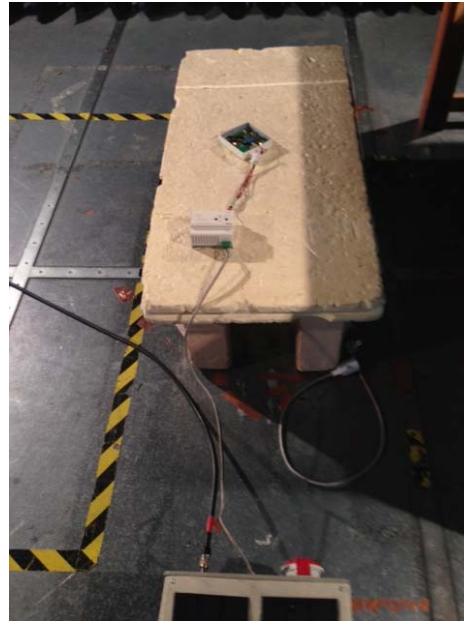
External antenna
Top view



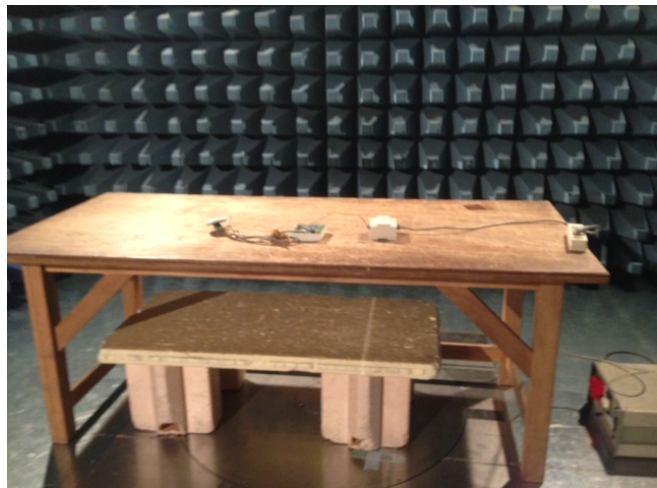
External antenna
bottom view



Conducted emissions



Unwanted emission pre measurement



Open area test site measurement
(below 30MHz)



Open area test site measurement

