



R041-12-105856-3A - DM / CV

RADIO TEST REPORT

According to the standard(s):

FCC Part 15 Radio part 15.249

Equipment under test:

PE3LR-TCH

FCC ID: R8T-PE3LR-TCH


Company:

ADVEEZ

Diffusion: Mr BENDHIA

(Company: ADVEEZ)

Number of pages: 21 including 1 annex

Ed.	Date	Modified page(s)	Written by		Technical verification Quality approval	
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NAME OF THE EQUIPMENT UNDER TEST (E.U.T.) : PE3LR-TCH

Serial number : /

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

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-TCH (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.
FCC part 15.249	Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850MHz and 24.0–24.25 GHz
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 tag "PE3LR-TCH" is composed to 2 mains components: an ASIC front end LF and a transmitter RF.

The primary functions of the tag are:

- LF signal reception
- RF emit signal
- Transponder operation

1 LF signal reception

The LF signal is emitted (at 125 KHz) by the reader and the antenna (PERLR-C) on an accuracy short range (1 meter or 3 meters following the mode).

When the tag enters in the detection area, it receives the signal and he decodes the WUP (Wakes Up Pattern).

According to the WUP, the tag becomes active or not.

If the tag is active, the ASIC gives the order to the RF signal emission to respond to the reader.

2 RF emit signal

The response of the tag through the RF transmitter is at 908 MHz during a polling of 30ms. This frequency is inside a band of 15.249 parts.

The ID of the tag is encrypted inside this signal.

3 Transponder operation

In case the battery is empty, the tag has a safety mode: the proximity operation.

The tag must be stuck to the reader and the identification is operated by the transponder

The tag "PE3LR-TCH" is composed to 2 mains components: an ASIC front end LF and a transmitter RF.

The primary functions of the tag are:

- LF signal reception
- RF emit signal
- Transponder operation

FCC ID: R8T-PE3LR-TCH

Frequency range: 908MHz

Number of channels: 1

Tested frequencies: 908MHz

Power supply: CR2032 Battery

Consumption: /

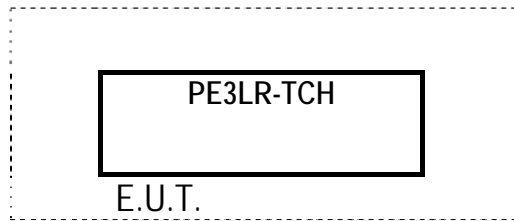
Operating temperatures: Not provided

Mounting: Hands Free Card

Antennas: integrated

Cycle and operating mode during emission tests: Permanent emission mode

Equipment modifications applied during tests: No

4. EQUIPMENT UNDER TEST CONFIGURATION SCHEME

E.U.T. is a hand free card

5. SUMMARY OF TEST RESULTS

Tests designation	Results satisfying?	Comments
Conducted power lines	N.A.	Powered by internal batteries
FCC part 15.107 and 15.207		
Field strength of fundamental and harmonics	YES	
FCC part 15 Radio part 15.249 a)		
Unwanted emissions outside of §15.249 frequency bands	YES	
FCC part 15.209 and 15.215 b) and c)		

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 part 15.249 according to limits, specified in this test report for tests made only

6. FIELD STRENGTH OF FUNDAMENTAL AND HARMONICS

Standards: FCC part 15 Radio part 15.249

Test methods: FCC part 15.249 a) c) d) e)

Test configuration: Measurement is done on an Open Area Test Site. 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
30MHz-1GHz	Front side	120kHz	3m	Quasi-peak	80cm
1GHz-10GHz	Front side	1MHz	3m	Peak and Average	80cm

Test method deviation: No

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 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.

FUNDAMENTAL

Frequency (MHz)	Polarization	Azimuth (degree)	Antenna Height (cm)	Measure (dB μ V/m)	Limit (dB μ V/m)	Comments
908.03	Horizontal	180	100	78.02	94	C

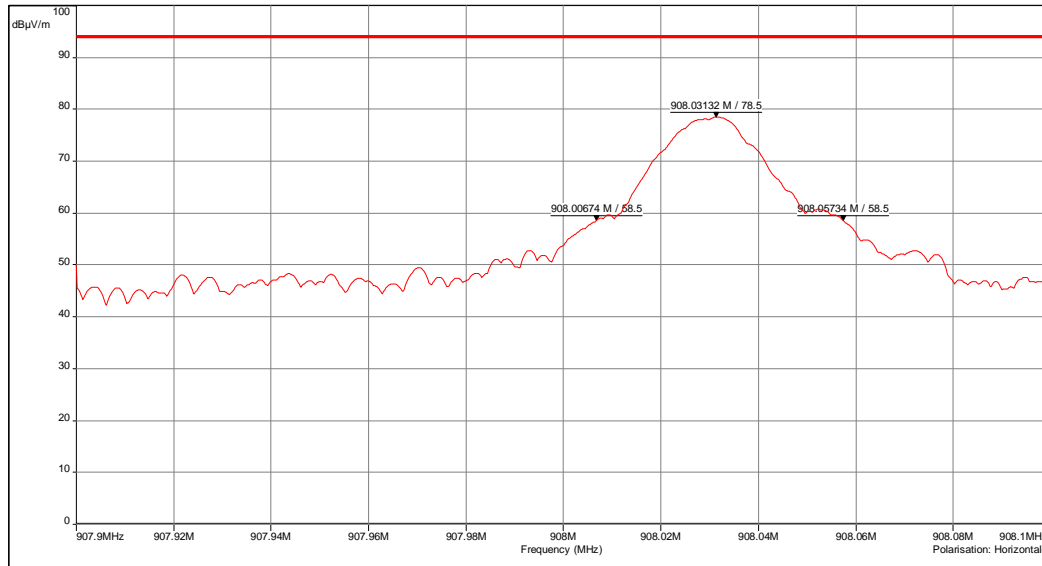
HARMONICS

Frequency (MHz)	Polarization	Azimuth (degree)	Antenna Height (cm)	Measure (dB μ V/m)		Limit (dB μ V/m)		Comments
				Peak	Average	Peak	Average	
1816.06	Vertical	27	112	50.47	34.77	74	54	C
1816.06	Horizontal	330	200	55.36	38.39	74	54	C
2724.09	Horizontal	-	-	<54	<34	74	54	C
2724.09	Vertical	18	314	62.73	44.25	74	54	C
3632.12	Horizontal	-	-	<54	<34	74	54	C
3632.12	Vertical	-	-	<54	<34	74	54	C
4540.15	Horizontal	-	-	<54	<34	74	54	C
4540.15	Vertical	-	-	<54	<34	74	54	C
5448.18	Horizontal	-	-	<54	<34	74	54	C
5448.18	Vertical	-	-	<54	<34	74	54	C
6356.21	Horizontal	-	-	<54	<34	74	54	C
6356.21	Vertical	-	-	<54	<34	74	54	C
7264.24	Horizontal	-	-	<54	<34	74	54	C
7264.24	Vertical	-	-	<54	<34	74	54	C
8172.27	Horizontal	-	-	<54	<34	74	54	C
8172.27	Vertical	-	-	<54	<34	74	54	C
9080.30	Horizontal	-	-	<54	<34	74	54	C
9080.30	Vertical	-	-	<54	<34	74	54	C

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

Radiated electric emission (measurement)
EMI979
20dB bandwidth/ PE3LR-TCH

Frequency (MHz) : 907.9 MHz - 908.1 MHz (Analyzer mode) — RADIO/fcc Part.15 (Edge 902-928M) - Class:B - QCrête/3.0m/
 Settings: RBW: 10 kHz, VBW: 10 kHz, Holding time: 1 ms/Pt, sweep count 2 — Mes.Peak (Horizontale)
 Polarisation : Horizontale
 Distance: 3 m



20dB bandwidth/ PE3LR-TCH - 02/21/2013 16:16 - 979

Date: 21/02/2013 16:16:56

Technician: DM

Class: B of the standard

 Detection:
 Peak

T (°C): 20.2

H (%): 28.4

P (hpa): 1003

Modification(s) during test:

The 20dB bandwidth of fundamental is 50.60kHz (in RBW=10kHz).

7. UNWANTED EMISSIONS OUTSIDE OF §15.249 FREQUENCY BANDS

Standards: FCC part 15 Radio part 15.249

Test methods: FCC part 15.109, 15.209, 15.215 b), 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

E.U.T. was tested from the lowest frequency generated or used (without going below 9kHz) up to the 10th harmonics of fundamental emission. 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 54dB μ V/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 dB μ A/m instead of μ V/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.

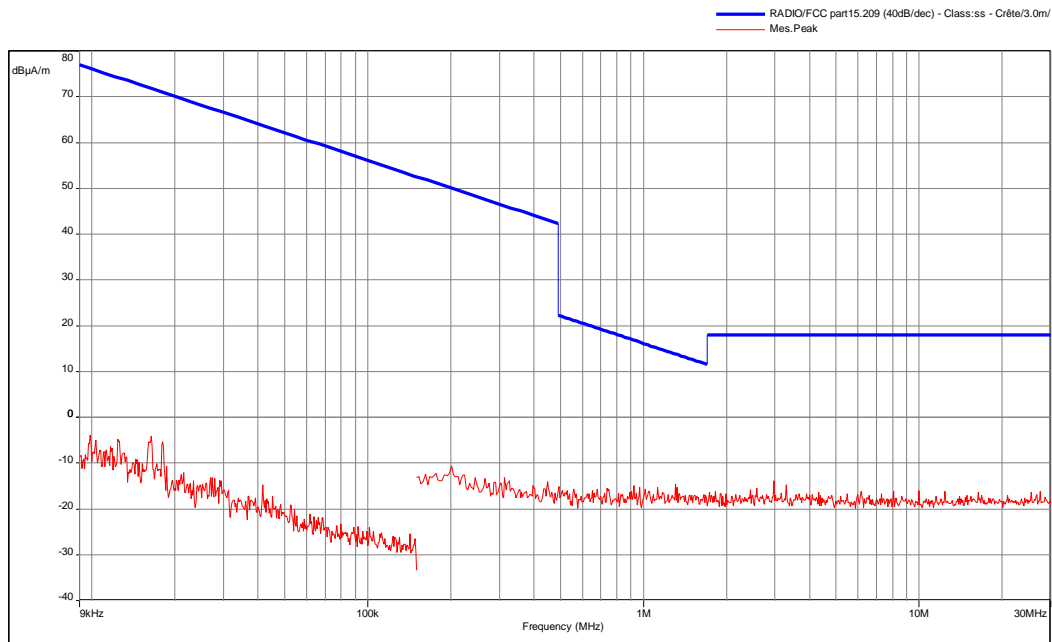
Measuring distance: 3 meters

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
Filter	Micro-Tronics	HPM 11630	4392	19-jan-2012	19-mar-2014
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)
Front side / PE3LR-TCH / antenna 0°

EMI947


Date: 11/12/2012 09:26:23

Technician: DM

Class: ss of the standard

 Detection:
Peak

T (°C): 18.2

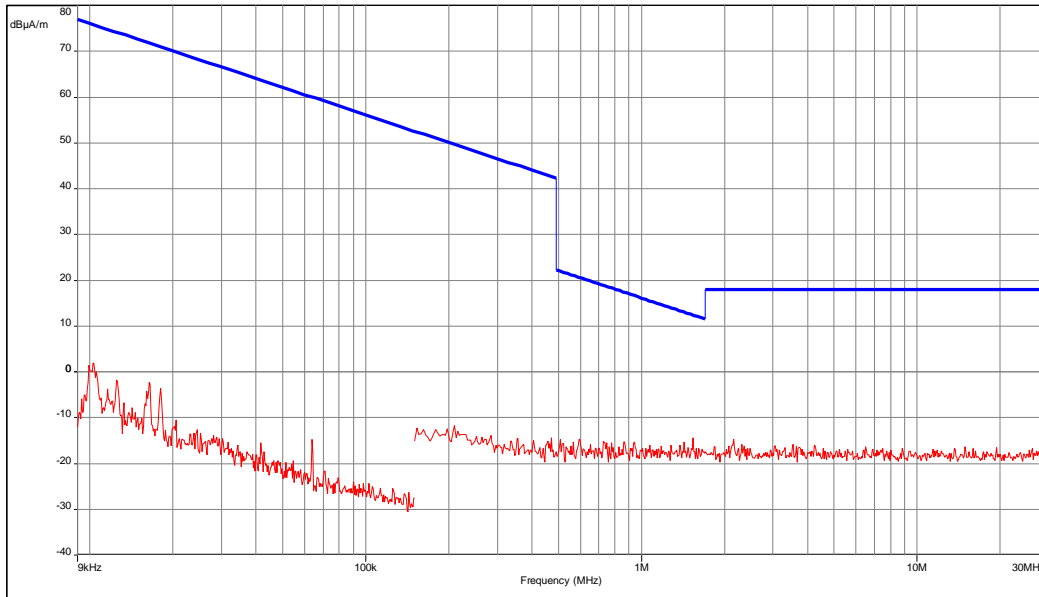
H (%): 27.1

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)
EMI946
Front side / PE3LR-TCH / antenna 45°

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


Date: 11/12/2012 09:23:08

Technician: DM

Class: ss of the standard

 Detection:
 Peak

T (°C): 18.2

H (%): 27.1

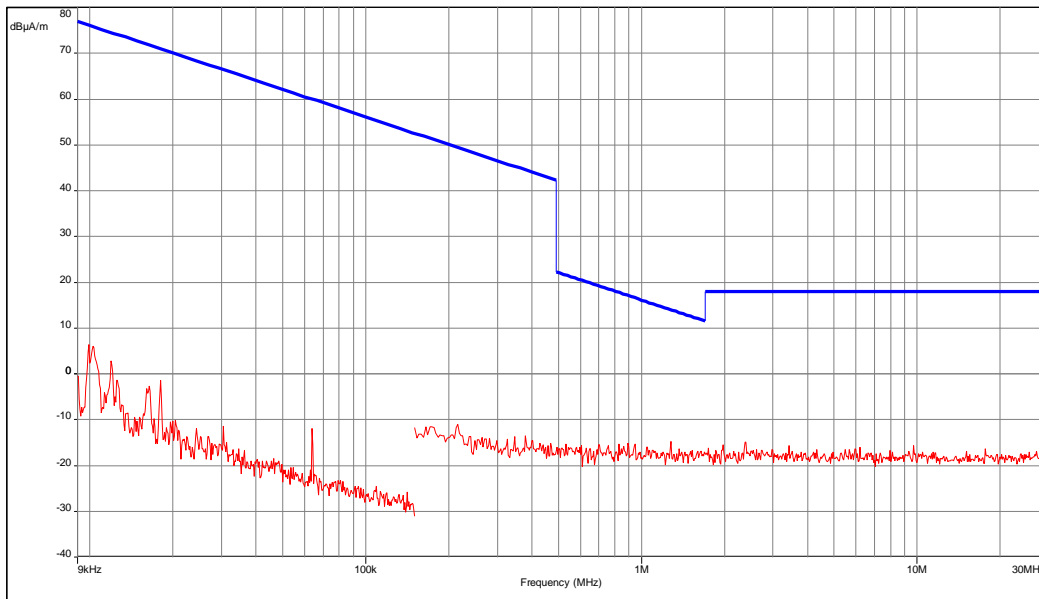
P (hpa): 1013

Modification(s) during test:

Front side / PE3LR-TCH / antenna 45° - 12/11/2012 09:23 - 946

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

Radiated magnetic field emission (measurement)
EMI945
Front side / PE3LR-TCH / antenna 90°

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


Date: 11/12/2012 09:20:15

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-TCH / antenna 90° - 12/11/2012 09:20 - 945

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-TCH
EMI973

- 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 11:23:17

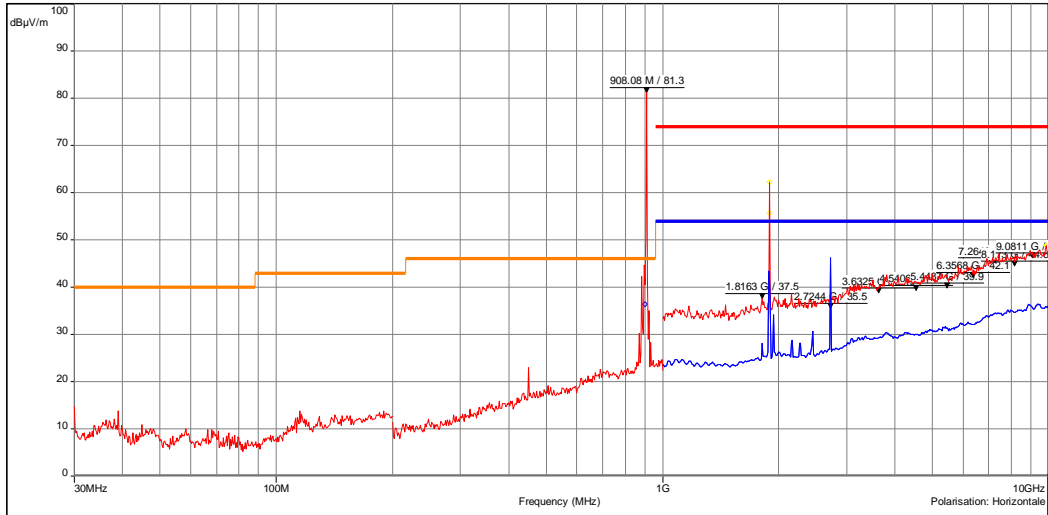
Technician: DM

Class: B of the standard

 Detection:
 Peak

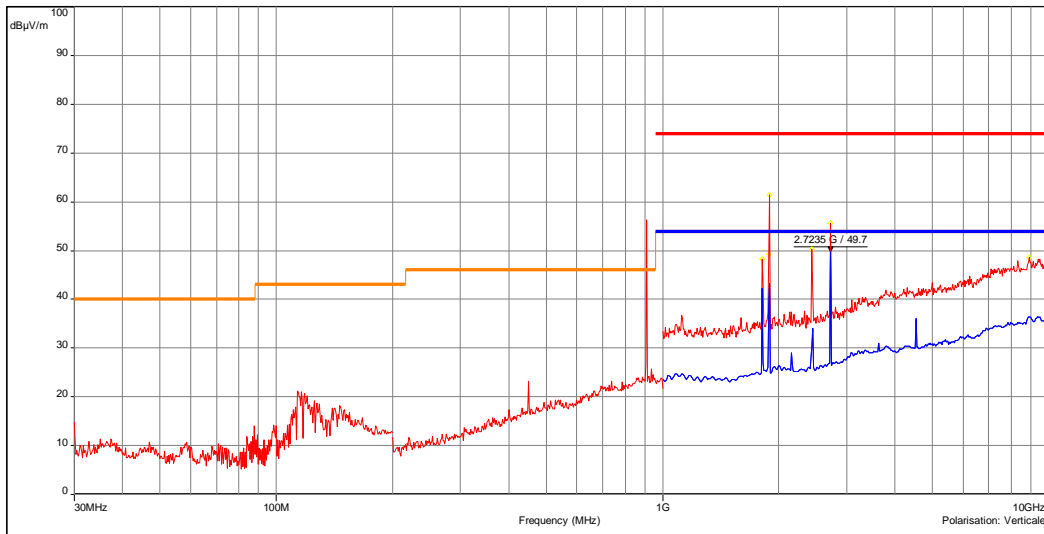
 T (°C): 20.2
 H (%): 28.4
 P (hpa): 1003

Modification(s) during test:



Front side / PE3LR-TCH - 02/21/2013 11:23 - 973

- 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)

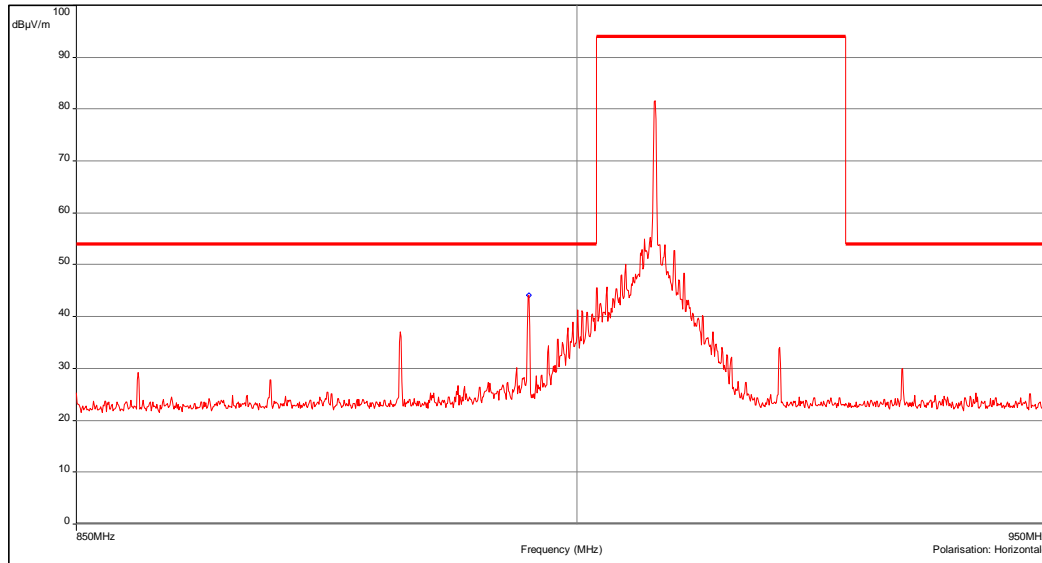


Front side / PE3LR-TCH - 02/21/2013 11:23 - 973

Radiated electric emission (measurement)
EMI976
Band Edge / PE3LR-TCH

Frequency (MHz) : 850 MHz - 950 MHz (Analyzer mode)
 Settings: RBW: 100 kHz, VBW: 300 kHz, Holding time: 1 ms/Pt, sweep count 2
 Polarisation : Horizontale
 Distance: 3 m

— RADIO/icc Part.15 (Edge 902-928M) - Class:B - QCrête/3.0m/
 — Mes. Peak (Horizontale)
 ◆ Peak/LimQ-Peak (Horizontale)


Date: 21/02/2013 15:24:38
Technician: DM
Class: B of the standard
*Detection:
Peak*
*T (°C): 20.2
H (%): 28.4
P (hpa): 1003*
Modification(s) during test:

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: No

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	-	-



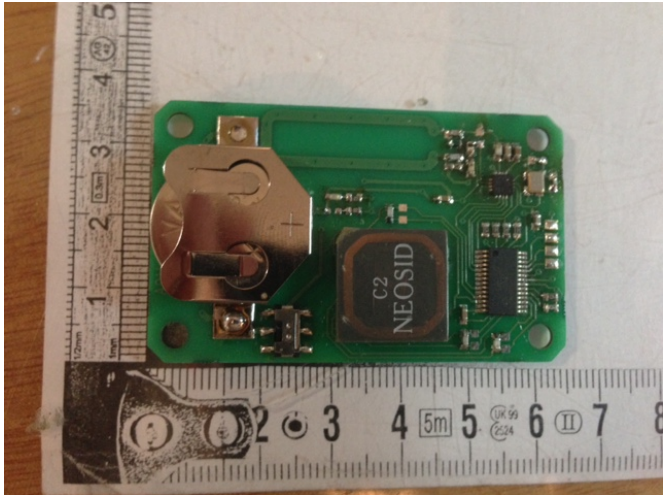
Results: All unwanted radiated spurious are at least 20 dB below specified limits

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

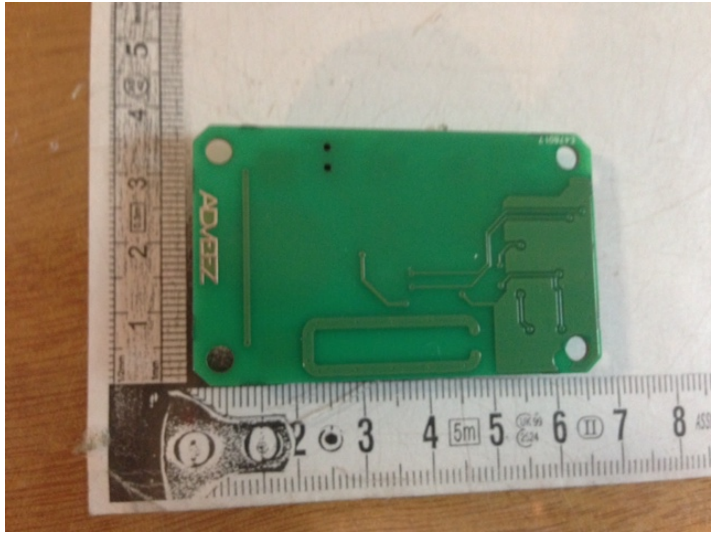
ANNEX: PHOTOGRAPH(S)

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

PE3LR-TCH

<p>External top view</p>	 A photograph showing the external top view of a small, black, rectangular device. The device is placed on a white surface next to a ruler for scale. The ruler shows markings from 1 to 12 centimeters. The device is approximately 4.5 cm wide and 2.5 cm high.
<p>External bottom view</p>	 A photograph showing the external bottom view of the device. The device is white with a black border. The number "0005718547" is printed on the bottom left corner. The device is placed on a white surface next to a ruler for scale. The ruler shows markings from 1 to 11 centimeters.
<p>Internal view: LF receive part</p>	 A photograph showing the internal view of the device, specifically the LF receive part. The device is a green printed circuit board (PCB) with various components, including a large metal component, a small black component labeled "C2 NEOSID", and several other electronic components. The device is placed on a white surface next to a ruler for scale. The ruler shows markings from 1 to 8 centimeters.

Internal view:
RF part



Unwanted emission pre
measurement



Open area test site measurement

