

R410-17-106753-1A - FMO / CBU

This document cancels and replace test report ref. R410-17-106753-1A Ed.0

RADIO TEST REPORT

According to the standard(s):

FCC part 15 Subpart C

Equipment under test:

LXM-R11-X (125kHz)

FCC ID: OVNLXM

Company:

STID

Diffusion: Mr POITRAT

(Company: STID)

Number of pages: 20 including 1 annex

Ed.	Date	Modified page(s)	Technical verification Quality approval	Visa
			Name	
1	21 Feb. 18	2	David MONTAULON Technical manager	

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NAME OF THE EQUIPMENT UNDER TEST (E.U.T.) : LXM-R11-X (125kHz)

Serial number : /

Part number : /

Software Version : /

MANUFACTURER'S NAME : STID

APPLICANT'S ADDRESS:

Company : STID

Address : 20 Parc d'Activités des Pradeaux
Boulevard Salvador Allende
13850 GREASQUE
FRANCE

Person(s) present during the tests : None

Responsible : Mr POITRAT

DATE(S) OF TESTS : January, the 04th of 2018

TESTS LOCATION(S) : EMITECH MONTPELLIER Laboratory
145 Rue du Massacan
34740 VENDARGUES – FRANCE
EMITECH MONTPELLIER Open Area Test Site
Route de Quissac
30250 SALINELLES - FRANCE
MRA US-EU Designation Number: FR0006
IC Filling number : 4379C-1

TESTS OPERATOR(S) : Fabien MOINACHE

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1. INTRODUCTION

This document submits the results of Electromagnetic Compatibility tests performed on the equipment **LXM-R11-X (125 kHz)** (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 – Telecommunications
Chapter 1 – Federal Communications Commission
Part 15 – Radio frequency devices
Subpart C – Intentional Radiators

ANSI C63.10

2013
American National Standard of Procedures for Compliance Testing
of Unlicensed Wireless Devices.

3. EQUIPMENT UNDER TEST CONFIGURATION

Equipment under test (E.U.T.) description: Standard evolutive readers range for all secure access control applications.

LXM-R11-X (125 kHz)

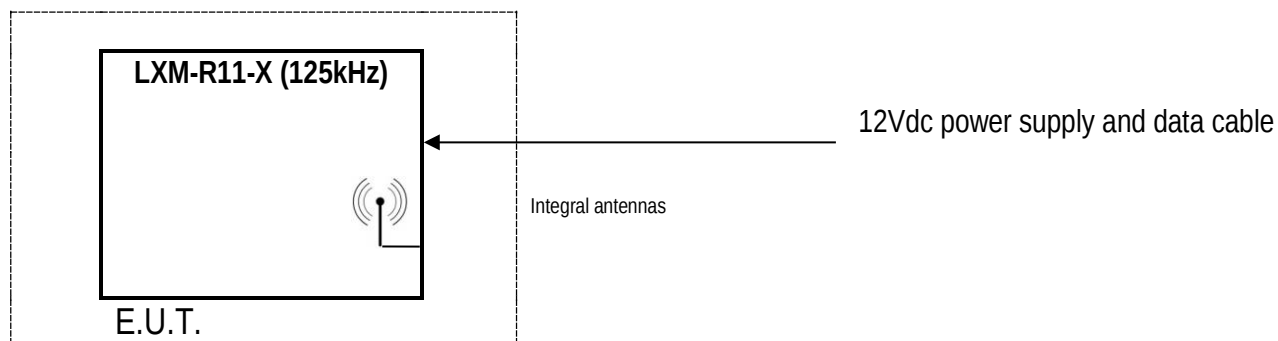
- Permanent transmitter emission with a loop coil antenna
- Integral antenna, dedicated antenna supplied with the equipment
- Maximum frequency range used by E.U.T.: 125kHz (RFID)
- Tested frequency: 125kHz (RFID)
- Equipment: single frequency
- Total channel available: 1
- Power supply: 12Vdc
- Typical installation : wall mounted
- Product is declared as a Class A device according to FCC Part 15.3 by STID

Applicant: **STID**

Model: **LXM-R11-X**

FCC ID: **OVNLXM**

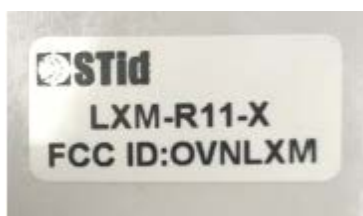
4. EQUIPMENT UNDER TEST CONFIGURATION SCHEME



Cycle and operating mode during emission tests: Permanent emission mode with modulation and data transfert on main cable.

Equipment modifications applied during tests: No

EUT marking plate:



5. SUMMARY OF TEST RESULTS

Tests designation	Results satisfying?	Comments
Restricted band of operation - FCC part 15.205	YES	
Conducted power lines - FCC part 15.107 & 15.207	YES	
Unwanted radiated emissions - FCC part 15.109 & 15.209	YES	

N.P.: Not Performed.

N.A.: Not Applicable.

▪ In emission:

Sample subject to the test complies with prescriptions of the standard(s) FCC part15 Subpart C according to limits specified in this test report.

To declare, or not, the compliance with the specifications, it was not explicitly taken account of uncertainty associated with the results.

6. MEASUREMENT UNCERTAINTY

Uncertainties values presented below are asked mandatory by CISPR standards:

Parameter	Maximal Emitech Uncertainty	Standard Uncertainty
Conducted emission (Artificial Mains Network) 150kHz – 30MHz	± 3.4 dB	± 3.4 dB
Radiated emission (magnetic field) 9kHz – 30MHz	± 2.7 dB	/
(electric field in the OATS/SAC) 30MHz – 1GHz	± 5.2 dB	± 6.3 dB
(electric field in the FAR) 30MHz – 1GHz	± 5.2 dB	± 5.3 dB

For the calcul of expanded uncertainty, the confidence interval is 95 % (k=2).

OATS: Open Area Test Site

SAC: Semi Anechoic Chamber

FAR: Fully Anechoic Room

7. CONDUCTED EMISSION

Temperature (°C): 20

Humidity (%HR): 39.1

Pressure (hPa): 1018

Standard: FCC 15.107 & 15.207

Test method: ANSI C63.10: 2013

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-30MHz	110Vac/60Hz power supply	10kHz	30kHz	Peak

Test method deviation: No

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH	DATE CAL.	DUE DATE
AC power source	KIKUSUI	PCR2000L	0800	15/03/2017	15/05/2018
Cable	EMITECH	Current absorber sheath	10653	19/01/2018	19/03/2020
Cable	C&C	N-3m	14332	15/12/2016	15/02/2019
Cable	C&C	N-5m	14340	15/12/2016	15/02/2019
Cable	SUCOFLEX	N-3m	14378	18/01/2017	18/03/2019
Cable	SUCOFLEX	N-3m	14379	18/01/2017	18/03/2019
LISN	AFJ	LT42C\10	12007	19/01/2018	19/03/2019
PE choke	EMITECH	CISPR 16-2-1 : 2008	10071	#	#
PE choke	EMITECH	CISPR 16-2-1 : 2008	10080	#	#
Receiver	Agilent Technologies	E4440A	5824	15/01/2016	15/03/2018
Shielded enclosure	COMTEST	SAC 3m	14494	14/02/2017	14/04/2020
Thermohygrometer	Bioblock Scientific	Météostar	0963	27/12/2016	27/02/2019
Thermohygrometer	Testo	608-H2	12269	27/11/2017	27/01/2020

#: Permanent validity

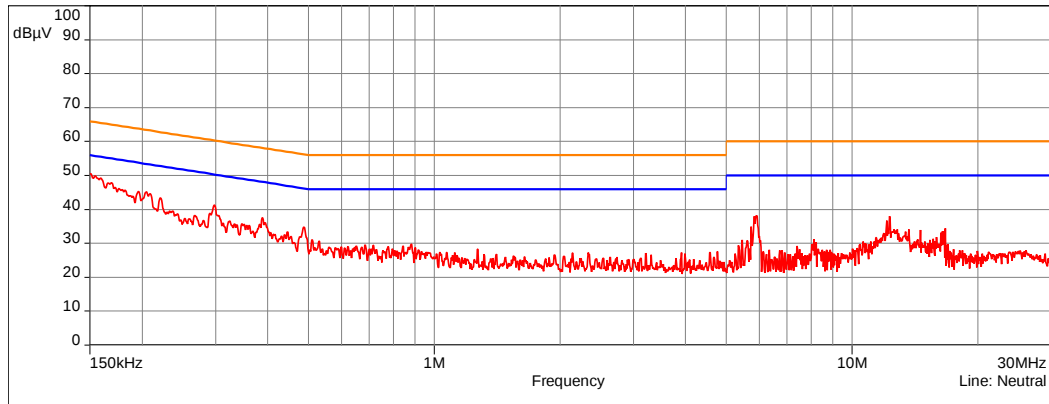
BAT-EMC software version: V3.6.0.32

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

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

Conducted voltage emission (measurement)
EMI4537
Power supply 110Vac / 60Hz

— FCC/15.207: 2017 B - Moyenne/
 — FCC/15.207: 2017 B - QCrête/
 — Meas.Peak (Neutral)



Date: 04/01/2018 10:03:19

Technician: FMO

Detection:

T (°C): 23.7

H (%): 43.2

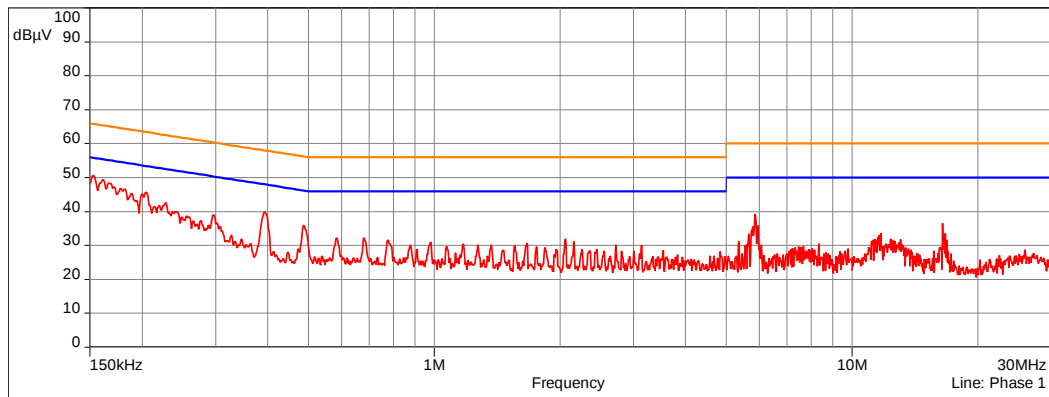
P (hpa): 1017

Comments:

Modification(s) during test:

NIA

— FCC/15.207: 2017 B - Moyenne/
 — FCC/15.207: 2017 B - QCrête/
 — Meas.Peak (Phase 1)



8. UNWANTED RADIATED EMISSIONS

Standard: FCC part 15.109 & 15.209

Tests methods: ANSI C63.10: 2013

a) **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-18GHz	Front side	1MHz	3MHz	Peak	150cm

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.
E.U.T. measurements are maximized at 360° 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 reported in the standard.

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 expressed 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. Pre 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	DATE CAL.	DUE DATE
Antenna	Rohde & Schwarz	HFH2-Z2	5825	20/09/2017	20/11/2019
Antenna	Electro Metrics	BIA-30HF	0824	25/04/2015	25/06/2018
Antenna	Rohde & Schwarz	HL223	3126	25/04/2015	25/06/2018
Antenna	ETS-Lindgren	3117	8387	10/02/2017	10/04/2018
Antenna mast	Maturo	NCD	14656	#	#
Cable	STORM MICROWAVE	N-0.2m	10265	05/10/2016	05/12/2018
Cable	SUCOFLEX	N-3m	14378	18/01/2017	18/03/2019
Cable	SUCOFLEX	N-3m	14379	18/01/2017	18/03/2019
Cable	SUCOFLEX	N-6,5m	14380	18/01/2017	18/03/2019
Cable	SUCOFLEX	N-5,5m	14381	18/01/2017	18/03/2019
Cable	Huber Suhner	N-10m	8472	16/02/2017	16/04/2019
Preamplifier	IMPULSE	CA118-546ACN	9169	13/10/2017	13/12/2018
Receiver	Agilent Technologies	E4440A	5824	15/01/2016	15/03/2018
Receiver	Rohde & Schwarz	ESI	9704	04/10/2017	04/12/2019
Shielded enclosure	COMTEST	SAC 3m	14494	14/02/2017	14/04/2020
Software	Nexio	BAT EMC v3.6.0.32	0000	#	#
Thermohygrometer	Testo	608-H2	12269	27/11/2017	27/01/2020
Turntable	Maturo	NCD	14657	#	#

#: Permanent validity

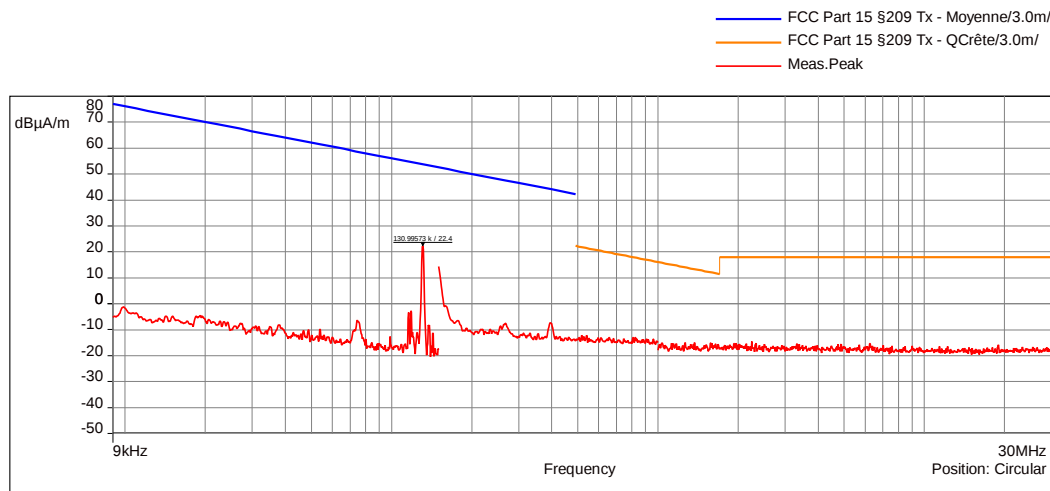
BAT-EMC software version: V3.6.0.32

Results: See **Graphs** hereafter.

Radiated field strength

RNE_TX / 0°

EMI5726



RNE_TX / 0° - 01/04/2018 11:39 - 5726

Date: 04/01/2018 11:39:13

Technician: FMO

Detection:
Peak

T (°C): 23.7
H (%): 43.2
P (hpa): 1017

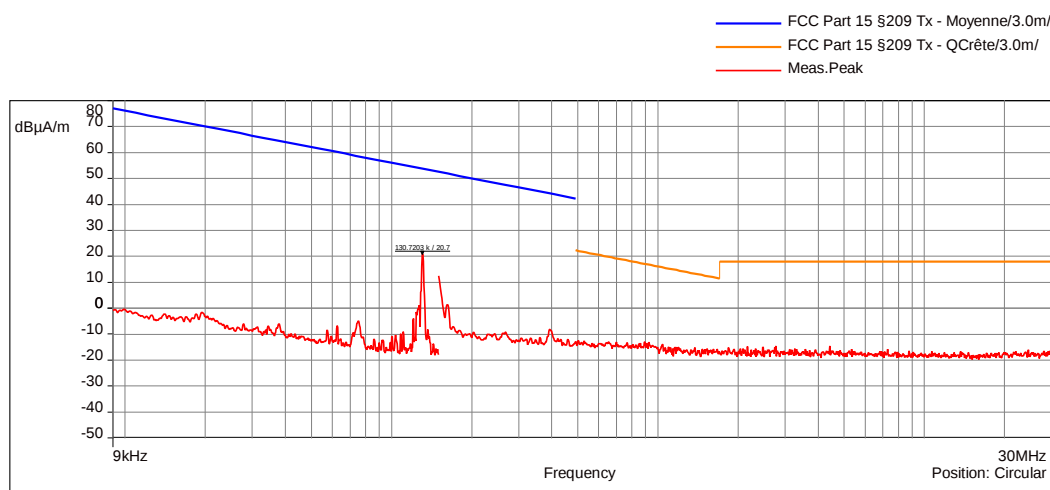
Comments:

Modification(s) during test:
N/A

Radiated field strength

RNE_TX / 45°

EMI5727



RNE_TX / 45° - 01/04/2018 11:53 - 5727

Date: 04/01/2018 11:53:36

Technician: FMO

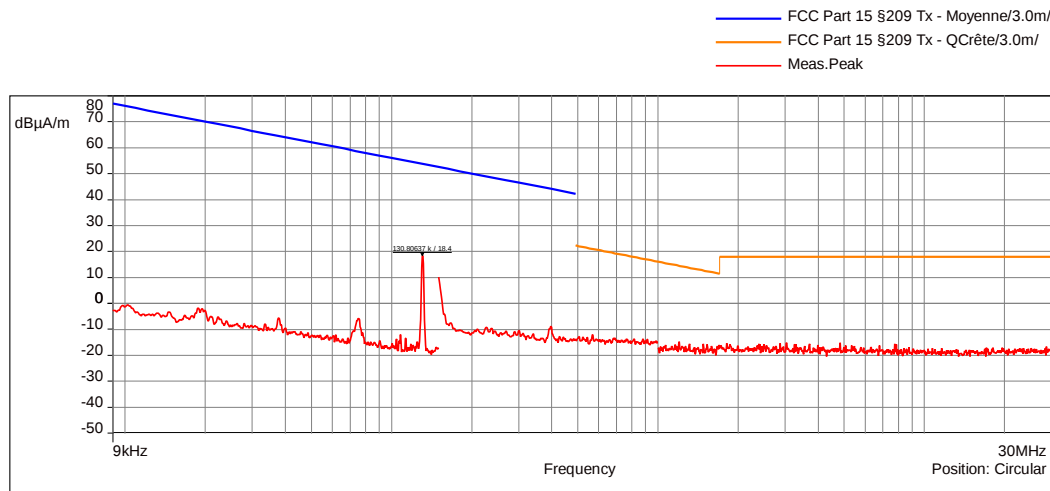
Detection:
Peak

T (°C): 23.7
H (%): 43.2
P (hpa): 1017

Comments:

Modification(s) during test:
N/A

Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor.

Radiated field strength
RNE_TX / 90°
EMI5728


RNE_TX / 90° - 01/04/2018 12:00 - 5728

Date: 04/01/2018 12:00:00

Technician: FMO

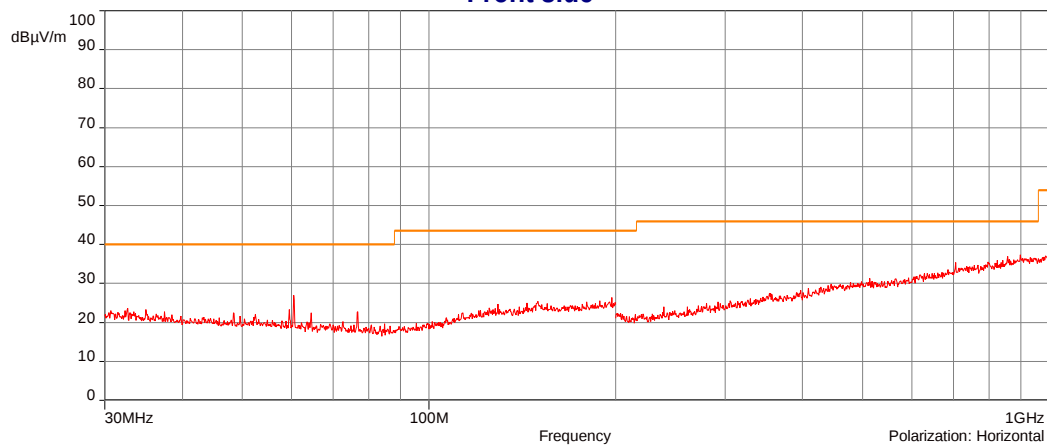
Detection:
Peak

T (°C): 23.7
H (%): 43.2
P (hpa): 1017

Comments:

Modification(s) during test:
N/A

Limit indicated on these plots are calculated with 40 dB/decade extrapolation factor and 51.5dB conversion factor.

Radiated electric field measurement
Front side
EMI5734


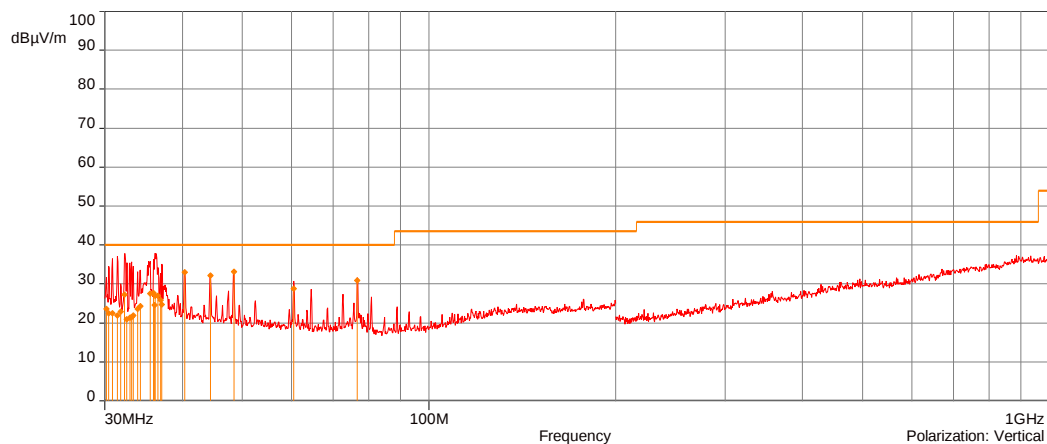
Date: 04/01/2018 14:05:35

Technician: FMO

Detection:

T (°C): 23.7
H (%): 43.2
P (hpa): 1017

Comments:

Modification(s) during test:
N/A


b) Final measurement with quasi peak detector in the frequency band 30MHz-1GHz:

Results:

Frequency (MHz)	Polarization	Measure (dBμV/m)	Limit (dBμV/m)	Comments
30.16	Vertical	23.59	40	C
32.30	Vertical	27.23	40	C
33.88	Vertical	23.65	40	C
34.21	Vertical	24.26	40	C
35.95	Vertical	27.17	40	C
36.55	Vertical	26.92	40	C
37.09	Vertical	24.77	40	C
60.53	Vertical	28.84	40	C

C= Compliant

N.C. = Not Compliant

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

c) Final measurement on open area test site in the frequency band 9kHz-1GHz:

Temperature (°C): 15

Humidity (%HR): 56

Pressure (hPa): -

Test configuration: For each measured frequencies, E.U.T. is set via a turntable in order to find the highest level. 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	10m	Average	80cm

Test method deviation: Between 9 kHz to 30MHz: measurements are expressed 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	DATE CAL.	DUE DATE
Antenna	Rohde & Schwarz	HFH2-Z2	5825	20/09/2017	20/11/2019
Cable	MICRO-COAX	N-3m	10535	06/04/2017	06/06/2019
Cable	Huber + Suhner	N-20m	8385	11/10/2017	11/12/2019
Open area test site	EMITECH	Salinelles	3482	10/10/2017	10/12/2020
Receiver	Rohde & Schwarz	ESHS10	3371	22/08/2017	22/10/2019
Turntable	Heinrich Deisel	D4420	4038	#	#
Turntable controller	Heinrich Deisel	HD100	4036	#	#

#: Permanent validity

Results: See **Boards** hereafter.

Frequency (MHz)	Polarization	Azimet (degree)	Antenna Height (cm)	Measure (dBμA/m)	Limit (dBμA/m)	Comments
0.130	-	0	0°	-18.9	32.9	C
0.130	-	90	45°	-12.1	32.9	C
0.130	-	90	90°	-7	32.9	C

C= Compliant

Carrier measurement at 10m: -7dBμA/m ($\approx 44.5\text{dB}\mu\text{V/m}$)

Using an extrapolation factor of 40 dB/decade (as described in section 15.31 (f)), the level at 300m is about -14.58dBμV/m ($\approx 0.187\mu\text{V/m}$) for a limit at 18.846 μV/m.

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

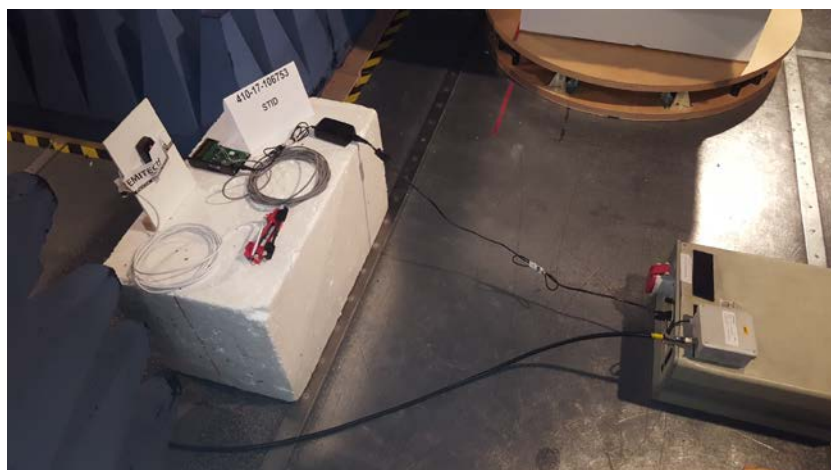
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ANNEX: PHOTOGRAPH(S)

**E.U.T.
Power supply**



Conducted emissions



Carriers measurements



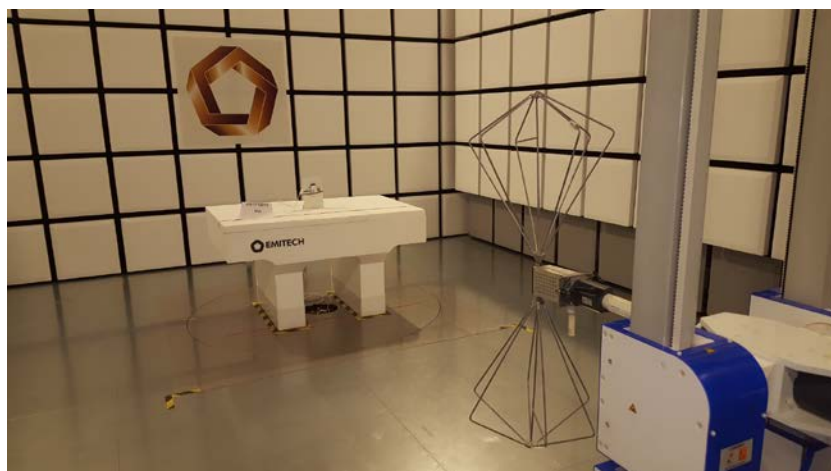
Carriers measurements



Radiated measurement



Radiated measurement



Radiated measurement

