RR051-14-106269-1-A Ed.1

This test report cancels and replaces test report RR051-14-106269-1-A Ed. 0

CERTIFICATION test report

According to the standards:
CFR 47 FCC PART 15

Equipment under test:
COIN_MAG

FCCID: RVVCOIN10XX

Company:
ELA INNOVATION

DISTRIBUTION: Mr DARMON (Company: ELA INNOVATION)

Number of pages: 17 with 5 appendixes

Ed.	Date	Modified pages	Written by Name	Visa	Technical Verification and Quality Approval Name	Visa
1	23-DEC-15	See margin vertical line	T. LEDRESSEUR	T.L	O. ROY	

Duplication of this test report is only permitted for an integral photographic facsimile. It includes the number of pages referenced here above.
This document is the result of testing a specimen or a sample of the product submitted. It does not imply an assessment of the conformity of the whole manufactured products of the tested sample.

DESIGNATION OF PRODUCT:	COIN_MAG
Serial number (S/N):	Not communicated
Reference / model (P/N):	COIN10XX
Software version:	44.06
MANUFACTURER:	ELA INNOVATION

COMPANY SUBMITTING THE PRODUCT:

Company:	ELA INNOVATION
Address:	297, rue Maurice Béjart 34080 Montpellier France
Responsible:	Mr DARMON
DATES OF TEST:	10-DEC-2014 and 12-DEC-2014
TESTING LOCATION:	EMITECH ANGERS laboratory at JUIGNE SUR LOIRE (49) FRANCE EMITECH ANGERS open area test site in JUIGNE SUR LOIRE (49) FRANCE 21 rue de la Fuye 49610 Juigne sur Loire France FCC 2.948 Listed Site Registration Number: 90469 FCC Accredited under US-EU MRA Designation Number: FR0009 Test Firm Registration Number: 873677
TESTED BY:	*T. LEDRESSEUR*

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1.INTRODUCTION

This document presents the result of RADIO test carried out on the following equipment: COIN_MAG, in accordance with normative reference.

2.PRODUCT DESCRIPTION

Class:	B
Utilization:	indoor use
Antenna type and gain:	Integral antenna, gain unknown
Operating frequency range:	433.92 MHz
Number of channels:	1
Channel spacing:	not concerned
Frequency generation:	quartz
Power source:	3.0Vdc by a CR2032 battery

Power level, frequency range and channels characteristics are not user adjustable.
The details pictures of the product and the circuit boards are joined with this file.

3.NORMATIVE REFERENCE

The standards and testing methods related throughout this report are those listed below.
They are applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

CFR 47 FCC Part 15 (2013)	Radio Frequency Devices
ANSI C63.4 (2009)	Methods of Measurement of Radio-Noise Emissions from Low-voltage Electrical and Electronics Equipment in the range of 9 kHz to 40 GHz.

4.TEST METHODOLOGY

Radio performance tests procedures given in CFR 47 part 15:

Subpart B –Unintentional Radiators
Paragraph 109: Radiated emission limits

Subpart C – Intentional Radiators
Paragraph 203: Antenna requirement
Paragraph 205: Restricted bands of operation
Paragraph 209: Radiated emission limits; general requirements
Paragraph 215: Additional provisions to the general radiated emission limitations
Paragraph 231: Periodic operation in the band 40.66-40.70 MHZ and above 70 MHz

5.TEST EQUIPMENT CALIBRATION DATES

Equipment	Model	Type	Last verification	Next verification	Validity
0180	Receiver ESVP	Rohde & Schwarz	18/01/2013	18/01/2015	18/03/2015
1922	Low-noise amplifier 1 to 18 GHz	Microwave DB	20/08/2014	20/08/2016	20/10/2016
4088	FSP 40	Rhode& Schwarz	22/08/2013	22/08/2015	22/10/2015
7310	High pass filter HP12/1200-5AA	Filtek	16/01/2014	16/01/2016	16/03/2016
8511	Préamplificateur 8447D	Hewlett Packard	22/08/2013	22/08/2015	22/10/2015
8526	Schwarzbeck VHBB 9124	Biconical antenna	12/06/2012	12/06/2016	12/08/2016
8530	Bi-log antenna CBL6112A	Chase	05/03/2013	05/03/2017	05/05/2017
8533	HFH2-Z2	Loop antenna	11/02/2014	11/02/2016	11/04/2016
8535	Antenna 3115	Electrometrics	29/10/2012	29/10/2016	29/12/2016
8543	Schwarzbeck UHALP 9108A	Log periodic antenna	12/06/2012	12/06/2016	12/08/2016
8593	SIDT Cage 2	Full anechoic room	/	/	/
8671	Meteo station WS-9232	La Crosse Technology	04/09/2014	04/09/2016	04/11/2016
8675	AOIP MN5102B	Multimeter	15/01/2013	15/01/2015	15/03/2015
8732	Emitech	OATS	23/08/2013	23/08/2016	23/10/2016
8750	La Crosse Technology WS-9232	Meteo station	03/09/2014	03/09/2016	03/11/2016
8896	Satellite synchronized frequency standard GPS8	ACQUISYS	/	/	/
10392	High pass filter H500-8CN	BL Microwave	24/07/2013	24/07/2015	24/09/2015

** The equipment is not verified; instead, the output voltage is checked before each measurement with the calibrated multimeter.*

6.TESTS AND CONCLUSIONS

6.1 unintentional radiator (subpart B)

Test procedure	Description of test	Respected criteria?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.109	RADIATED EMISSION LIMITS	X				

NAp: Not Applicable NAs: Not Asked

6.2 intentional radiator (subpart C)

Test procedure	Description of test	Respected criteria?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.203	ANTENNA REQUIREMENT	X				*Note 1*
FCC Part 15.205	RESTRICTED BANDS OF OPERATION	X				
FCC Part 15.209	RADIATED EMISSION LIMITS; general requirements	X				*Note 2*
FCC part 15.215	ADDITIONAL PROVISIONS TO THE GENERAL RADIATED EMISSION LIMITATIONS					
	(a) Alternative to general radiated emission limits	X				
	(b) Unwanted emissions outside of §15.231 frequency bands	X				*Note 3*
	(c) 20 dB bandwidth and band-edge compliance	X				
FCC Part 15.231	PERIODIC OPERATION IN THE BAND 40.66-40.70 MHZ AND ABOVE 70 MHz					
	(a) Transmission time restrictions			X		
	(b) Field strength of emissions	X				
	(c) Bandwidth of emission	X				*Note 4*
	(d) Carrier frequency tolerance within the band 40.66-40.70 MHz			X		
	(e) Exceeding periodic rate limitations	X				*Note 5*

NAp: Not Applicable NAs: Not Asked

Note 1: Integral antenna.

Note 2: See FCC part 15.231 (b) (e).

Note 3: See FCC part 15.209. Unwanted emissions levels are all below the fundamental emission field strength level.

*Note 4: See FCC part 15.215 (c). The bandwidth of emission is no wider than 0.25% of the center frequency (0.25/100) *433.92MHz =1.085 MHz) of the device under test. See appendix 5*

Note 5: the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.
Maximum Tx on: 331ms
Minimum Tx off to use: 16s (17s value set)

RF EXPOSURE:

In accordance with KDB 447498 D01 General RF Exposure Guidance v05r02, Paragraph 4.3.1.

The product must respect the exclusion limit for 1-g extremity SAR:

Max. power of channel, including tune-up tolerance, mW ≤ 45.45mW

The power measured is 0.001436mW (see photos in appendix 1).

« To declare, or not, the compliance with the specifications, it was not explicitly taken into account of uncertainty associated with the result(s) »

7.RADIATED EMISSION LIMITS

Standard: FCC Part 15

Test procedure: paragraph 109

Limit class: Class B

Test set up:
The measure is realized on open area test site under 1 GHz and in anechoic chamber above 1 GHz.

When the system is tested in an open area test site (OATS). The EUT is placed on a rotating table, 0.8m from a ground plane.
When the system is tested in anechoic chamber. The EUT is placed on a rotating table, 1.5m from a ground plane.
Zero degree azimuths correspond to the front of the device under test.

See photos in appendix 2.

Frequency range: From 9 kHz MHz to 2.1696GHz (5th harmonic of the highest frequency used).

Detection mode: Quasi-peak (F < 1 GHz) Average (F > 1 GHz)

Bandwidth: 120 kHz (F < 1 GHz) 1 MHz (F > 1 GHz)

Distance of antenna: 10 meters (in open area test site) / 3 meters (in anechoic room)

Antenna height: 1 to 4 meters (in open area test site) / 1.5 meter (in anechoic room)

Antenna polarization: vertical and horizontal (only the highest level is recorded)

Equipment under test operating condition:

The equipment is blocked in a sequence of emission mode and standby mode.

Results:

Ambient temperature (°C): 21.3
Relative humidity (%): 45

We used for power source the internal battery of the equipment and we noted:
Voltage at the beginning of test (V): 3.277
Voltage at the end of test (V): 3.266
Percentage of voltage drop during the test (%): 0.34

Sample N° 1:

Not any spurious has been detected.

Applicable limits: for 30 MHz ≤ F ≤ 88 MHz : 40 dBµV/m at 3 meters
for 88 MHz < F ≤ 216 MHz : 43.5 dBµV/m at 3 meters
for 216 MHz < F ≤ 960 MHz : 46 dBµV/m at 3 meters
Above 960 MHz : 54 dBµV/m at 3 meters

Note: *any spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.*

Test conclusion:

RESPECTED STANDARD

8.PERIODIC OPERATION IN THE BAND 40.66 – 40.70 MHz AND ABOVE 70 MHz

Standard: FCC Part 15

Test procedure: paragraph 231 (b), (d), (e)

Test set up:

The measure is realized on open area test site under 1 GHz and in anechoic chamber above 1 GHz.

When the system is tested in an open area test site (OATS). The EUT is placed on a rotating table, 0.8m from a ground plane.
When the system is tested in anechoic chamber. The EUT is placed on a rotating table, 1.5m from a ground plane.
Zero degree azimuths correspond to the front of the device under test.

See photos in appendix 2.

Frequency range: From 9 kHz MHz to 4.3392GHz (10th harmonic of the highest frequency used).

Detection mode: Quasi-peak (F < 1 GHz) Average (F > 1 GHz)

Bandwidth: 120 kHz (F < 1 GHz) 1 MHz (F > 1 GHz)

Distance of antenna: 10 meters (in open area test site) / 3 meters (in anechoic room)

Antenna height: 1 to 4 meters (in open area test site) / 1.5 meter (in anechoic room)

Antenna polarization: vertical and horizontal (only the highest level is recorded)

Equipment under test operating condition:

The equipment is blocked in a sequence of emission mode and standby mode.

Results:

Field strength of emissions

Ambient temperature (°C): 21.3
Relative humidity (%): 45

We used for power source the internal battery of the equipment and we noted:

Voltage at the beginning of test (V):	3.028	3.277
Voltage at the end of test (V):	3.026	3.266
Percentage of voltage drop during the test (%):	0.07	0.34

Sample N° 1:

FREQUENCIES (MHz)	Detector P: Peak QP: Quasi-Peak Av: Average	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m) Measured at 10 m	Field strength (dBµV/m) Measured or computed at 3 m (2)	Limits (dBµV/m)	Margin (dB)
433.92*	QP	120	V	66.8	77.25	80.83	-3.57
867.84	QP	120	H	48.3	58.75	61.94	- 3.18
1301.76	P	1000	H		50.5 (1)	54	-3.5
1735.68	P	1000	H		44.2 (1)	61.94	-17.7
2169.6	P	1000	V		41.8 (1)	61.94	-20.1
2603.52	P	1000	V		39.8 (1)	61.94	-22.1
3037.44	P	1000	V		46.6 (1)	61.94	-15.3
3471.36	P	1000	V		46.1 (1)	61.94	-15.8
3905.28	P	1000	H		45.2 (1)	54	-8.8
4339.2	P	1000	H		50.1 (1)	54	-3.9

* Fundamental emission

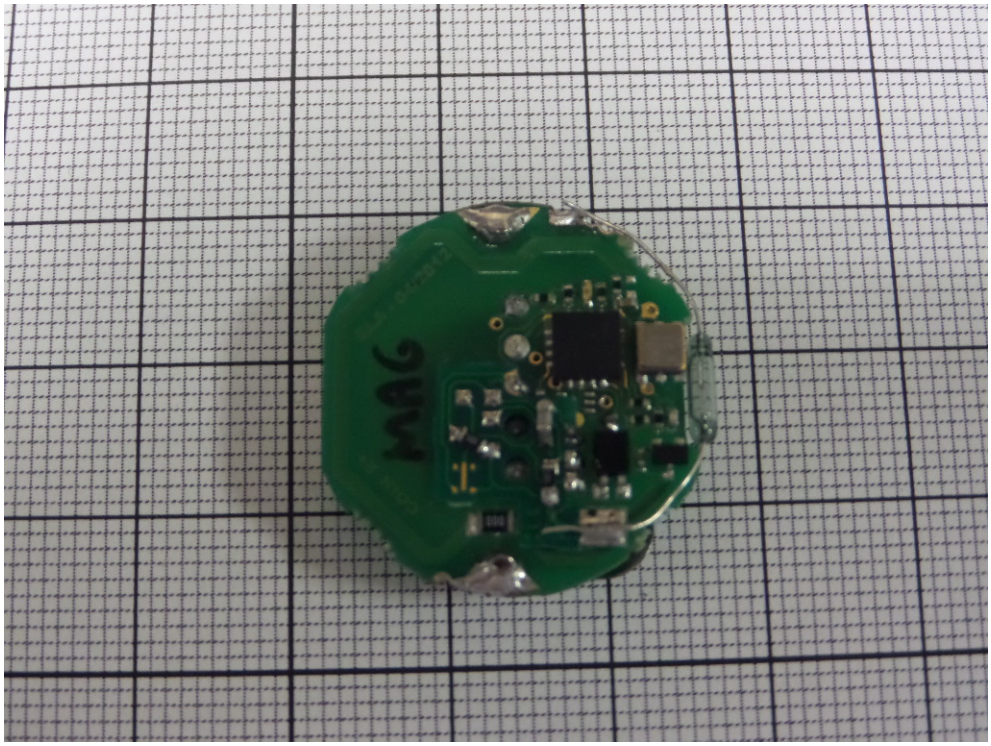
(1) *The peak level measured is lower than the average limit (54 dBµV/m) and the peak limit (74dBµV/m) in restricted bands*
(2) Distance conversion factor is 20 Log (10/3) = 10.45 dB

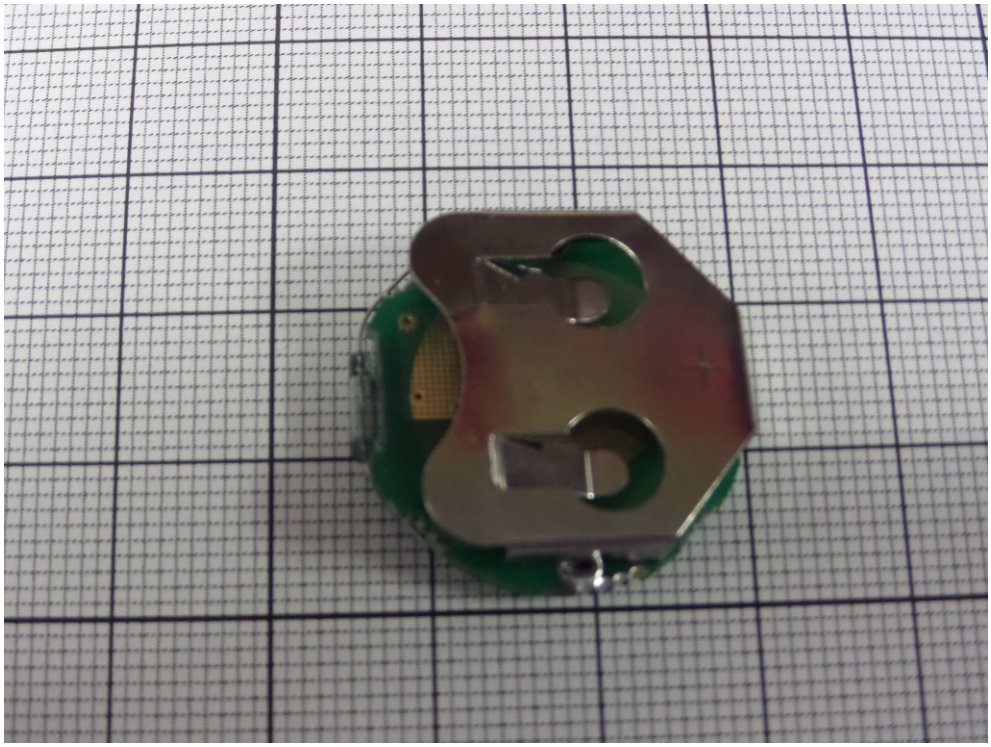
Test conclusion:

RESPECTED STANDARD

End of report, 5 appendixes to be forwarded

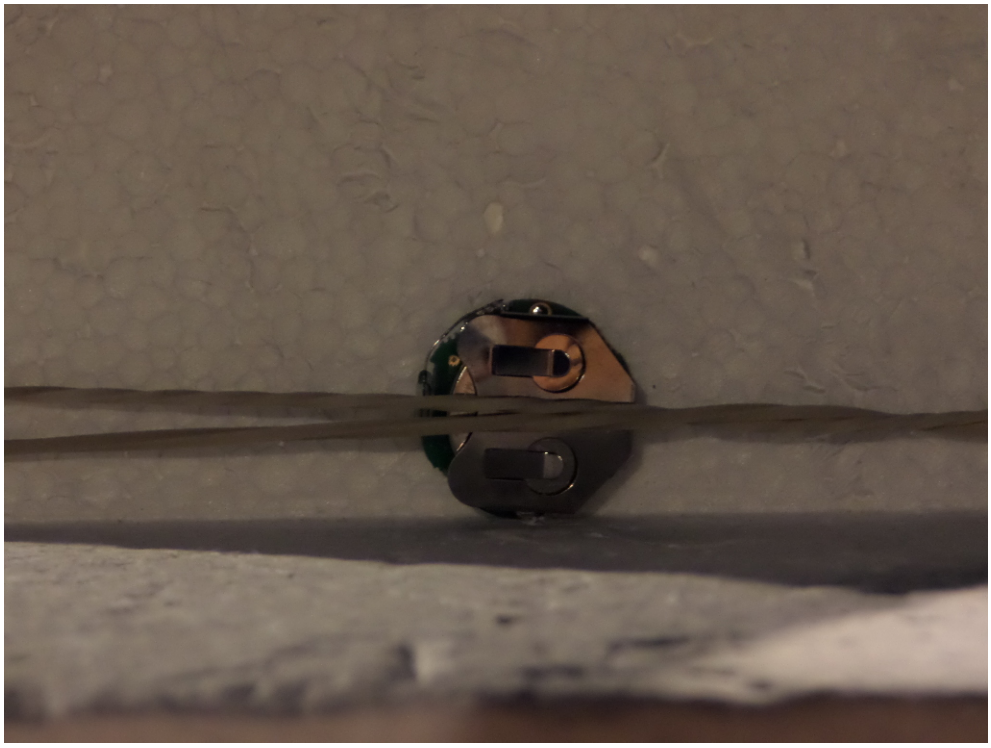
APPENDIX 1: Photos of the equipment under test

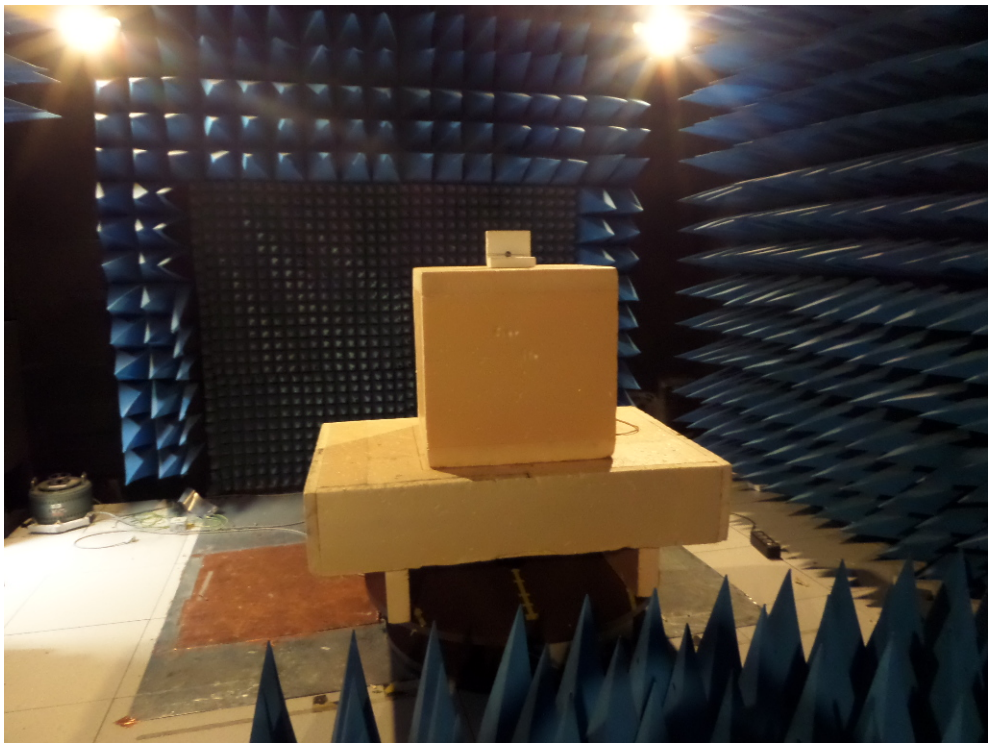




APPENDIX 2: Test set up

Anechoic chamber





Open area test site

APPENDIX 3: Test equipment list

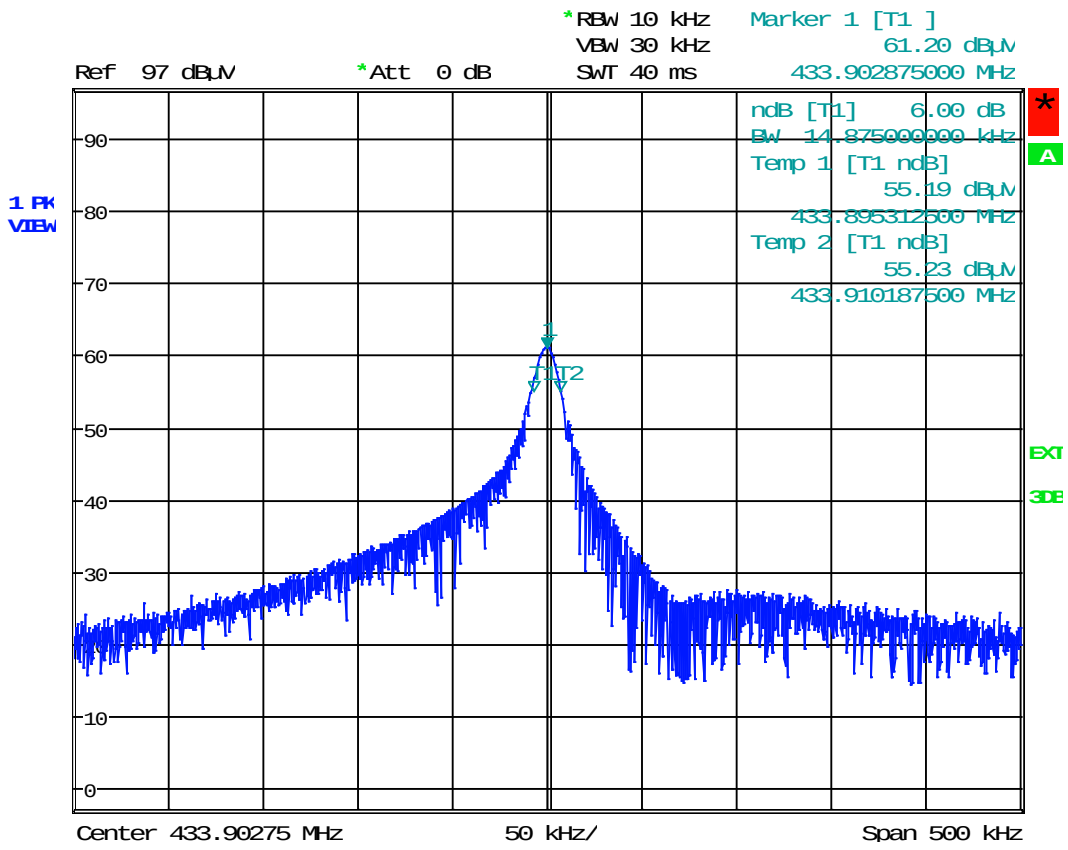
RADIATED EMISSION LIMITS

TYPE	MANUFACTURER	EMITECH NUMBER
Anechoic Chamber	EMITECH	8593
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESVP	Rohde & Schwarz	0180
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Biconical antenna VHBB 9124	Schwarzbeck	8526
Log periodic antenna UHALP 9108A	Schwarzbeck	8543
Antenna 3115	Electrometrics	8535
Préamplificateur 8447D	Hewlett Packard	8511
Low-noise amplifier 1 to 18 GHz	Microwave DB	1922
Multimeter MN5102B	AOIP	8675
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC	0000

RADIATED EMISSION LIMITS

TYPE	MANUFACTURER	EMITECH NUMBER
Open test site	EMITECH	8732
Anechoic Chamber	EMITECH	8593
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESVP	Rohde & Schwarz	0180
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Active loop antenna HFH2-Z2	Rohde & Schwarz	8533
Biconical antenna VHBB 9124	Schwarzbeck	8526
Bi-log antenna CBL6112A	Chase	8530
Log periodic antenna UHALP 9108A	Schwarzbeck	8543
Antenna 3115	Electrometrics	8535
Préamplificateur 8447D	Hewlett Packard	8511
Low-noise amplifier 1 to 18 GHz	Microwave DB	1922
High pass filter H500-8CN	BL Microwave	10392
High pass filter HP12/1200-5AA	Filtek	7310
Multimeter MN5102B	AOIP	8675
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC	0000

APPENDIX 4: 6 dB bandwidth



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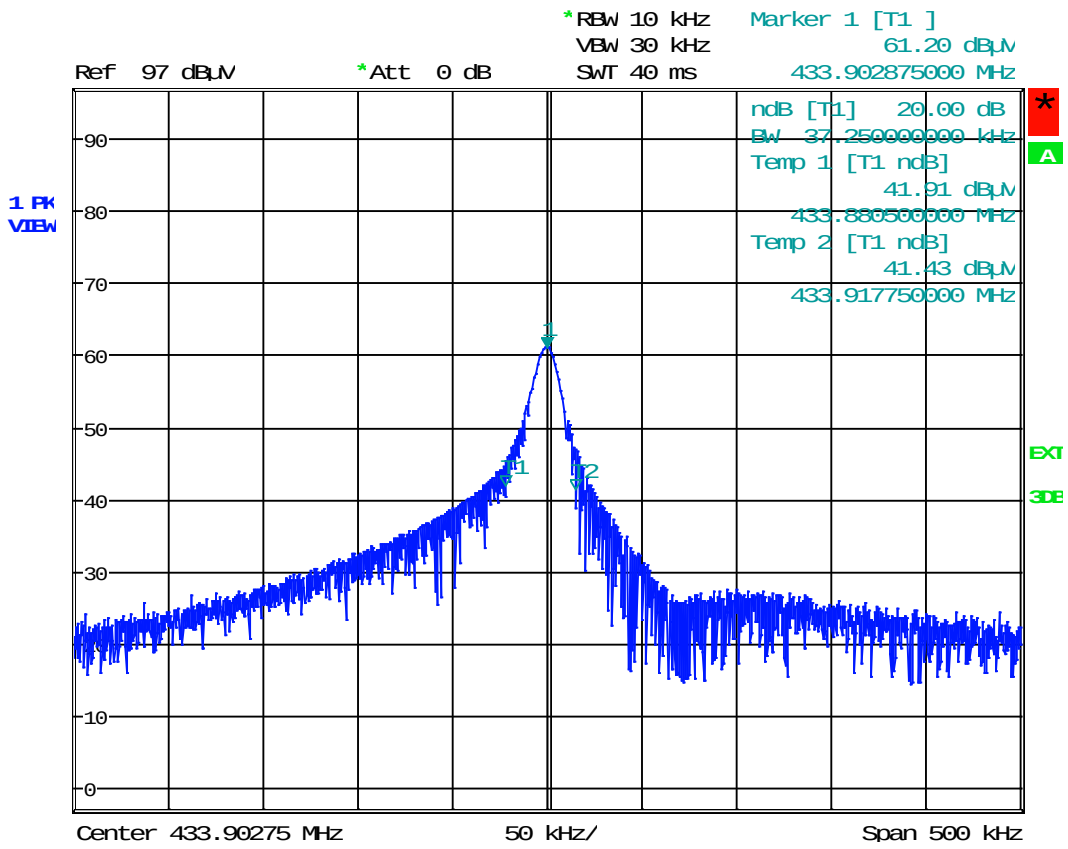
APPENDIX 5: 20 dB bandwidth



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