

RR051-13-107425-2-A Ed. 0

Certification test report

According to the standard:
CFR 47, FCC Part 15

Equipment under test:
Plastic card printer, BADGY 200

FCC ID: ZFX0030

Company:
EVOLIS

DISTRIBUTION: Mr GODARD

(Company: EVOLIS)

Number of pages: 44 with 7 annexes

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			Name	Visa	Name	Visa
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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: Plastic card printer

Serial number (S/N): Not communicated

Reference / model (P/N): BADGY 200

Software version: 1.4.0.4

MANUFACTURER: EVOLIS

COMPANY SUBMITTING THE PRODUCT:

Company: EVOLIS

Address: 14, avenue de la Fontaine
ZI ANGERS BEAUCOUZE
49070 BEAUCOUZE
FRANCE

Responsible: Mr GODARD

DATES OF TEST: between 03-FEB-2014 to 10-FEB-2014

TESTING LOCATION: EMITECH ANGERS laboratory at JUIGNE SUR LOIRE (49) FRANCE
EMITECH ANGERS open area test site in JUIGNE SUR LOIRE (49)
FRANCE
FCC 2.948 Listed Site Registration Number: 90469
21 rue de la Fuye
49610 Juigne sur Loire
France

TESTED BY: T. LEDRESSEUR

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1. INTRODUCTION

This report presents the results of radio test carried out on the following equipment: Plastic card printer, BADGY 200, in accordance with normative reference.

2. PRODUCT DESCRIPTION

Class:	B (Residential use)
Utilization:	indoor use
Antenna type and gain:	internal antenna
Operating frequency range:	band from 13.110 MHz to to 14.010 MHz
Number of channels:	1
Channel spacing:	not concerned
Frequency generation:	Crystal
Modulation:	RFID type B
Power source:	120 Vac – 60Hz

2 differenst alimentation was used during the tests: (see photo in appendix 1)

- A1: Switchbox
- A2: Channel WELL Technology

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 (2003) 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

Paragraph 111: Antenna power conduction limits for receivers

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 225: Operation within the band 13.110-14.010 MHz

5. TEST EQUIPMENT CALIBRATION DATES

Emitech Number	Model	Type	Last verification	Next verification	Validity
0	BAT-EMC	Software	/	/	/
1211	HP 8901B	Modulation analyzer	03/05/2013	03/05/2015	03/07/2015
2593	MPC B25250	Climatic chamber	07/08/2012	07/08/2014	07/10/2014
4088	R&S FSP40	Spectrum analyser	22/08/2013	22/08/2015	22/10/2015
7001	R&S FSBS	Spectrum analyzer	04/12/2012	04/12/2014	04/02/2015
8507	Pacific 360-AMXT-UPC32	Power Source	29/08/2013	29/08/2014	29/10/2014
8511	HP 8447D	Low noise preamplifier	22/08/2013	22/08/2014	22/10/2014
8524	HP 8591EM	Test receiver	30/07/2013	30/07/2015	30/09/2015
8526	Schwarzbeck VHBB 9124	Biconical antenna	12/06/2012	12/06/2016	12/08/2016
8528	Schwarzbeck VHA 9103	Biconical antenna	24/09/2013	24/09/2017	24/11/2017
8533	R&S HFH2-Z2	Loop antenna	01/05/2012	01/05/2014	01/07/2014
8543	Schwarzbeck UHALP 9108A	Log periodic antenna	12/06/2012	12/06/2016	12/08/2016
8593	SIDT Cage 2	Full anechoic room	/	/	/
8641	SECRE ETP232	High-pass filter	12/03/2013	12/03/2015	12/05/2015
8671	HUGER	Meteo station	20/07/2012	20/07/2014	20/09/2014
8675	AOIP MN5102B	Multimeter	15/01/2013	15/01/2015	15/03/2015
8707	R&S ESI7	Test receiver	03/10/2012	03/10/2014	03/12/2014
8719	Thurbly Thandar Instruments 1600	LISN	28/05/2012	28/05/2014	28/07/2014
8732	Emitech	OATS	23/08/2013	23/08/2016	23/10/2016
8749	La Crosse Technology WS-9232	Meteo station	20/07/2012	20/07/2014	20/09/2014
8750	La Crosse Technology WS-9232	Meteo station	20/07/2012	20/07/2014	20/09/2014
8893	Emitech	Outside room	/	/	/
8896	ACQUISYS GPS8	Satellite synchronized frequency standard	/	/	/
9489	Absorber sheath current	Emitech	14/09/2012	14/09/2014	14/11/2014

6. TESTS RESULTS SUMMARY

6.1 unintentional radiator (subpart B)

Test procedure	Description of test	Respected criteria?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.107	CONDUCTED LIMITS	X				
FCC Part 15.109	RADIATED EMISSION LIMITS	X				
FCC Part 15.111	ANTENNA POWER CONDUCTED LIMITS FOR RECEIVER			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				<i>Note 1</i>
FCC Part 15.205	RESTRICTED BANDS OF OPERATION	X				
FCC Part 15.207	CONDUCTED LIMITS	X				
FCC Part 15.209	RADIATED EMISSION LIMITS; general requirements	X				<i>Note 2</i>
FCC Part 15.212	MODULAR TRANSMITTERS			X		
FCC part 15.215	ADDITIONAL PROVISIONS TO THE GENERAL RADIATED EMISSION LIMITATIONS					
	<i>(a) Alternative to general radiated emission limits</i>	X				
	<i>(b) Unwanted emissions outside of §15.225 frequency bands</i>	X				<i>Note 3</i>
	<i>(c) 20 dB bandwidth and band-edge compliance</i>	X				
FCC Part 15.225	OPERATION WITHIN THE BAND 13.110-14.010 MHZ					
	<i>(a) Field strength within the band 13.553-13.567 MHz</i>	X				
	<i>(b) Field strength within the bands 13.410-13.553 MHz and 13.567-13.710 MHz</i>	X				
	<i>(c) Field strength within the bands 13.110-13.410 MHz and 13.710-14.010 MHz</i>	X				
	<i>(d) Field strength outside the band 13.110-14.010 MHz</i>	X				
	<i>(e) Carrier frequency tolerance</i>	X				
	<i>(f) Powered tags</i>			X		

NAp: Not Applicable NAs: Not Asked

Note 1: *Integral antenna.*

Note 2: *See FCC part 15.225 (d).*

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

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

7. MEASUREMENT OF THE CONDUCTED DISTURBANCES

Standard: FCC Part 15

Test procedure: Paragraph 15.107

Limits: Class B

Software used: BAT-EMC V3.6.0.32

Test set up:

The EUT is isolated and placed on a wooden table, 0.8 m over an horizontal reference plane and 0.4 m from a vertical reference plane. It is powered by an artificial main network placed on the ground reference plane. The equipment is powered with the AC power operating voltage of 120 V / 60 Hz.

See photos in appendix 2

Frequency range: 150 kHz - 30 MHz

Detection mode: Peak / Average

Bandwidth: 10 kHz / 9 kHz

Equipment under test operating condition:

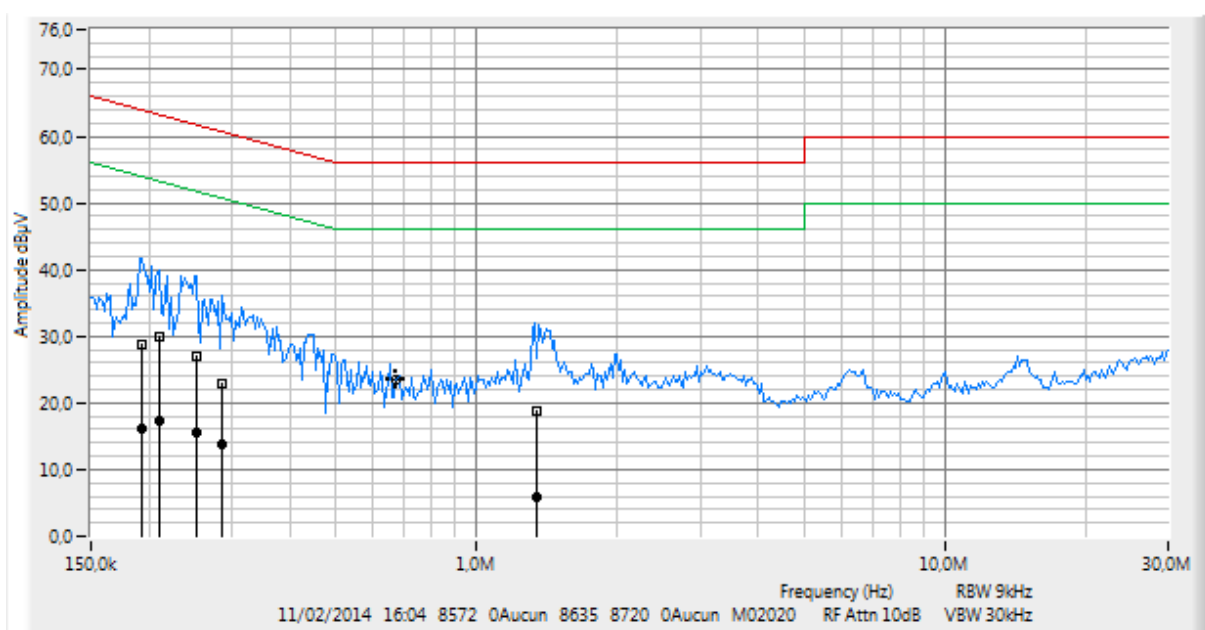
The equipment is blocked in standby mode.

Results:

Ambient temperature (°C): 21
 Relative humidity (%): 39

Sample N° 1:
Measurement on the mains power supply:
A1 Line 120V 60Hz

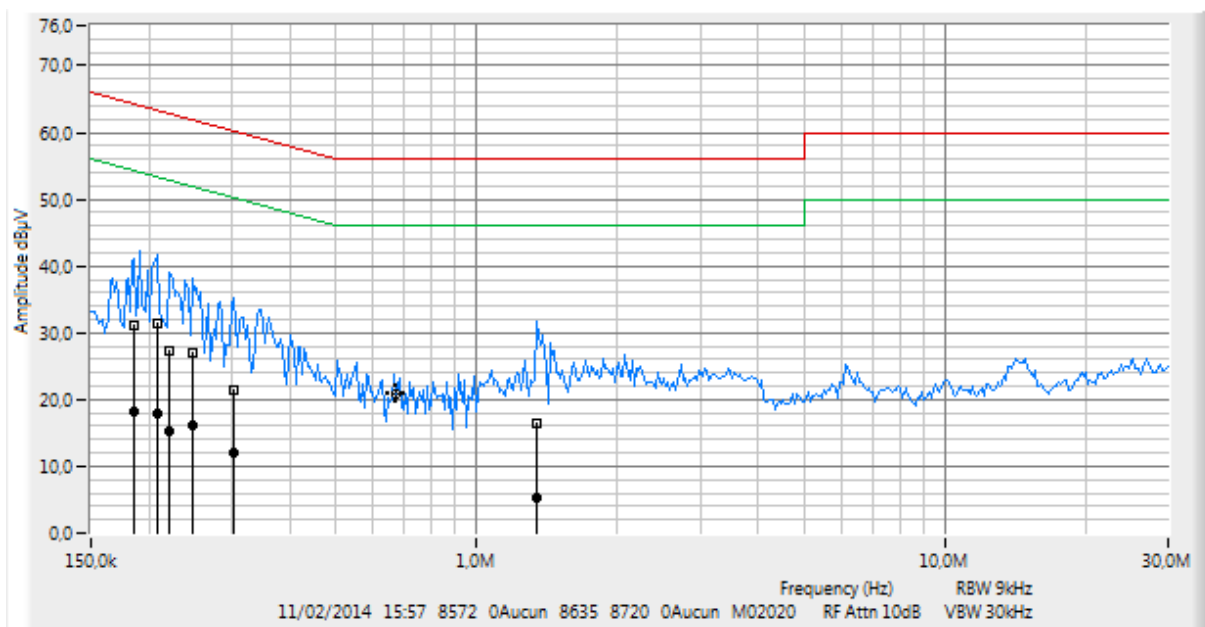
Frequency (MHz)	Quasi-peak (dBμV)	QP Limit (dBμV)	QP margin (dB)	Frequency (MHz)	Average (dBμV)	Average Limit (dBμV)	Average margin (dB)
0,193	28,9	63,9	35,0	0,193	16,2	53,9	37,7
0,211	29,9	63,2	33,3	0,211	17,2	53,2	36,0
0,252	27,1	61,7	34,6	0,252	15,6	51,7	36,1
0,286	22,8	60,6	37,8	0,286	13,7	50,6	37,0
1,345	18,7	56,0	37,3	1,345	6,0	46,0	40,0



A1 Neutral 120V 60Hz

Frequency (MHz)	Quasi-peak (dB μ V)	QP Limit (dB μ V)	QP margin (dB)
0,185	31,1	64,3	33,2
0,208	31,5	63,3	31,8
0,220	27,3	62,8	35,6
0,247	27,0	61,9	34,9
0,302	21,6	60,2	38,6
1,345	16,5	56,0	39,5

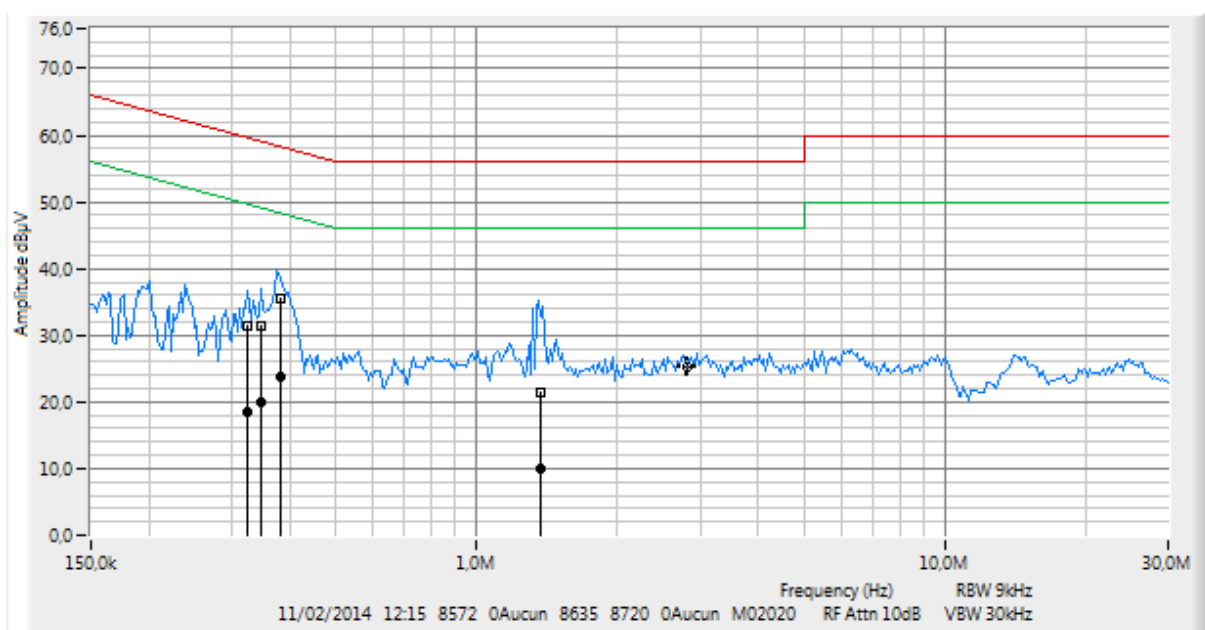
Frequency (MHz)	Average (dB μ V)	Average Limit (dB μ V)	Average margin (dB)
0,185	18,2	54,3	36,0
0,208	17,8	53,3	35,5
0,220	15,2	52,8	37,7
0,247	16,1	51,9	35,8
0,302	12,0	50,2	38,2
1,345	5,3	46,0	40,8



A2 Line 120V 60Hz

Frequency (MHz)	Quasi-peak (dBμV)	QP Limit (dBμV)	QP margin (dB)
0,323	31,4	59,6	28,3
0,345	31,5	59,1	27,6
0,380	35,5	58,3	22,8
1,376	21,3	56,0	34,7

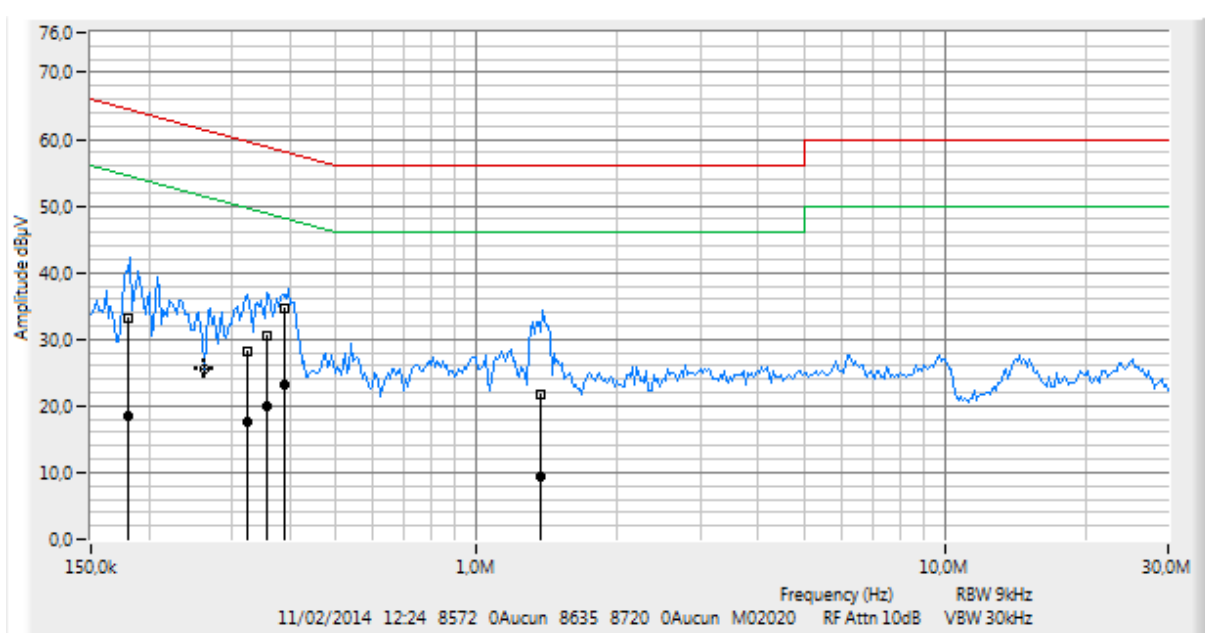
Frequency (MHz)	Average (dBμV)	Average Limit (dBμV)	Average margin (dB)
0,323	18,6	49,6	31,1
0,345	20,0	49,1	29,1
0,380	23,7	48,3	24,6
1,376	10,0	46,0	36,0



A2 Neutral 120V 60Hz

Frequency (MHz)	Quasi-peak (dBμV)	QP Limit (dBμV)	QP margin (dB)
0,180	33,0	64,5	31,5
0,325	28,3	59,6	31,3
0,356	30,5	58,8	28,3
0,388	34,6	58,1	23,5
1,366	21,8	56,0	34,2

Frequency (MHz)	Average (dBμV)	Average Limit (dBμV)	Average margin (dB)
0,180	18,6	54,5	35,9
0,325	17,5	49,6	32,1
0,356	20,0	48,8	28,9
0,388	23,2	48,1	24,9
1,366	9,5	46,0	36,5



Test conclusion:

RESPECTED STANDARD

8. RADIATED EMISSION LIMITS

Standard: FCC Part 15

Test procedure: paragraph 109

Limit class: Class B

Test set up:

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. Zero degree azimuths correspond to the front of the device under test.

See photos in appendix 2

Frequency range: From 30 MHz to 1 GHz

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

Bandwidth: 120 kHz ($F < 1$ GHz)

Distance of antenna: 3 meters

Antenna height: 1 to 4 meters

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

Equipment under test operating condition:

The equipment is blocked in standby mode.

Results:

Ambient temperature (°C): 18.9
Relative humidity (%): 45

Power source: 120 Vac-60Hz

Sample N° 1: with A1

FREQUENCIES (MHz)	Detector P: Peak QP: Quasi- Peak	Antenna height (cm)	Azimuth (degree)	Polarization H: Horizontal V: Vertical	Field strength (dBμV/m)	Limits (dBμV/m)	Margin (dB)
98.3	QP	322	134	V	26.65	43.5	16.85
196.6	QP	162	293	H	16.7	43.5	26.8
331	QP	107	14	H	13.5	46	32.5
504	QP	342	14	H	21.14	46	24.86

Sample N° 1: with A2

FREQUENCIES (MHz)	Detector P: Peak QP: Quasi- Peak	Antenna height (cm)	Azimuth (degree)	Polarization H: Horizontal V: Vertical	Field strength (dBμV/m)	Limits (dBμV/m)	Margin (dB)
98.3	QP	299	177	V	24.11	43.5	19.39
196.6	QP	168	163	H	21.01	43.5	22.49
331	QP	132	58	V	12.53	46	33.47
504	QP	336	90	H	22.53	46	23.47

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

Test conclusion:

RESPECTED STANDARD

9. MEASUREMENT OF THE CONDUCTED DISTURBANCES

Standard: FCC Part 15

Test procedure: Paragraph 15.207

Software used: BAT-EMC V3.6.0.32

Test set up:

The EUT is isolated and placed on a wooden table, 0.8 m over an horizontal reference plane and 0.4 m from a vertical reference plane. It is powered by an artificial main network placed on the ground reference plane. The equipment is powered with the AC power operating voltage of 120 V / 60 Hz.

See photos in appendix 2

Frequency range: 150 kHz - 30 MHz

Detection mode: Peak / Average

Bandwidth: 10 kHz

Equipment under test operating condition:

The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate.

Results:

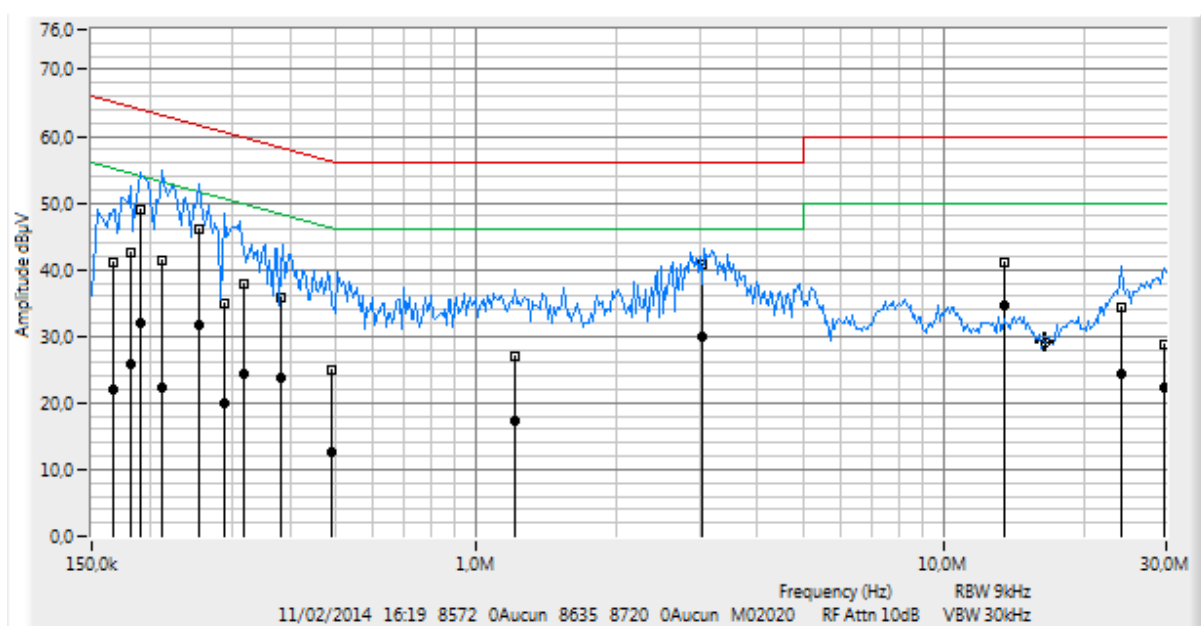
Ambient temperature (°C): 21
Relative humidity (%): 39

Sample N° 1:

Measurement on the mains power supply:

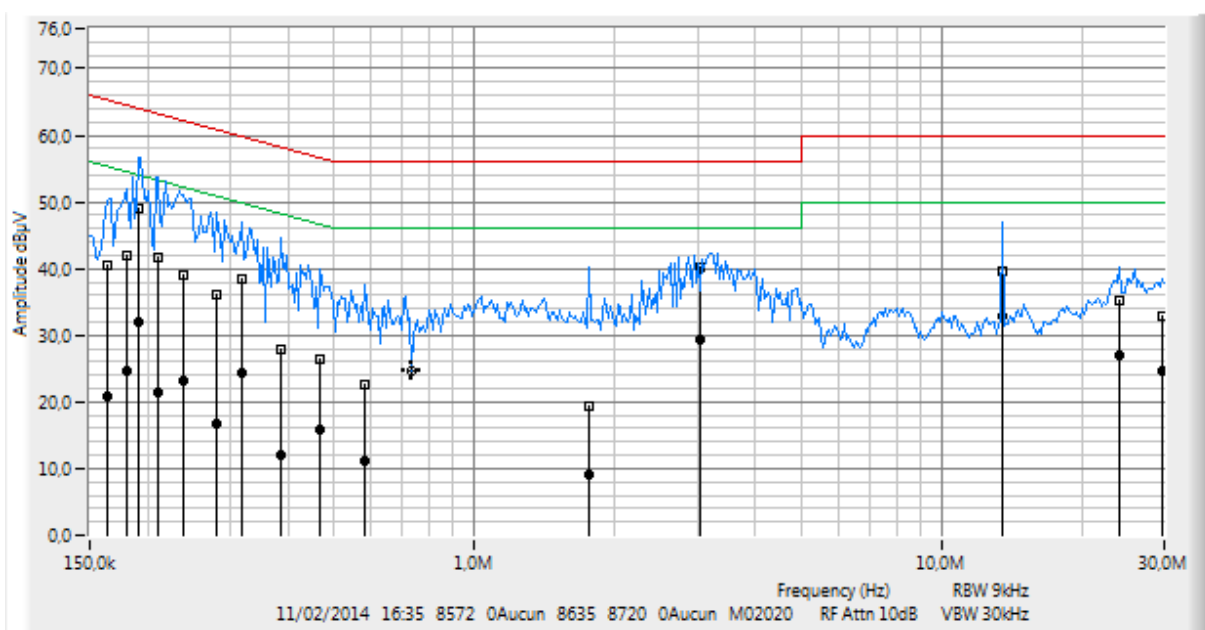
A1 Line 120V 60Hz

Frequency (MHz)	Quasi-peak (dBμV)	QP Limit (dBμV)	QP margin (dB)	Frequency (MHz)	Average (dBμV)	Average Limit (dBμV)	Average margin (dB)
0,167	41,0	65,1	24,1	0,167	22,1	55,1	33,0
0,182	42,6	64,4	21,8	0,182	25,8	54,4	28,6
0,191	48,9	64,0	15,1	0,191	31,9	54,0	22,1
0,213	41,5	63,1	21,6	0,213	22,4	53,1	30,7
0,255	46,1	61,6	15,5	0,255	31,7	51,6	19,9
0,289	34,9	60,6	25,6	0,289	20,0	50,6	30,6
0,318	37,9	59,8	21,9	0,318	24,5	49,8	25,3
0,382	35,9	58,2	22,3	0,382	23,9	48,2	24,4
0,488	24,8	56,2	31,4	0,488	12,7	46,2	33,5
1,210	26,9	56,0	29,1	1,210	17,3	46,0	28,7
3,048	40,9	56,0	15,1	3,048	30,0	46,0	16,0
13,561	41,0	60,0	19,0	13,561	34,5	50,0	15,5
24,000	34,2	60,0	25,8	24,000	24,5	50,0	25,5
29,728	28,8	60,0	31,2	29,728	22,4	50,0	27,6



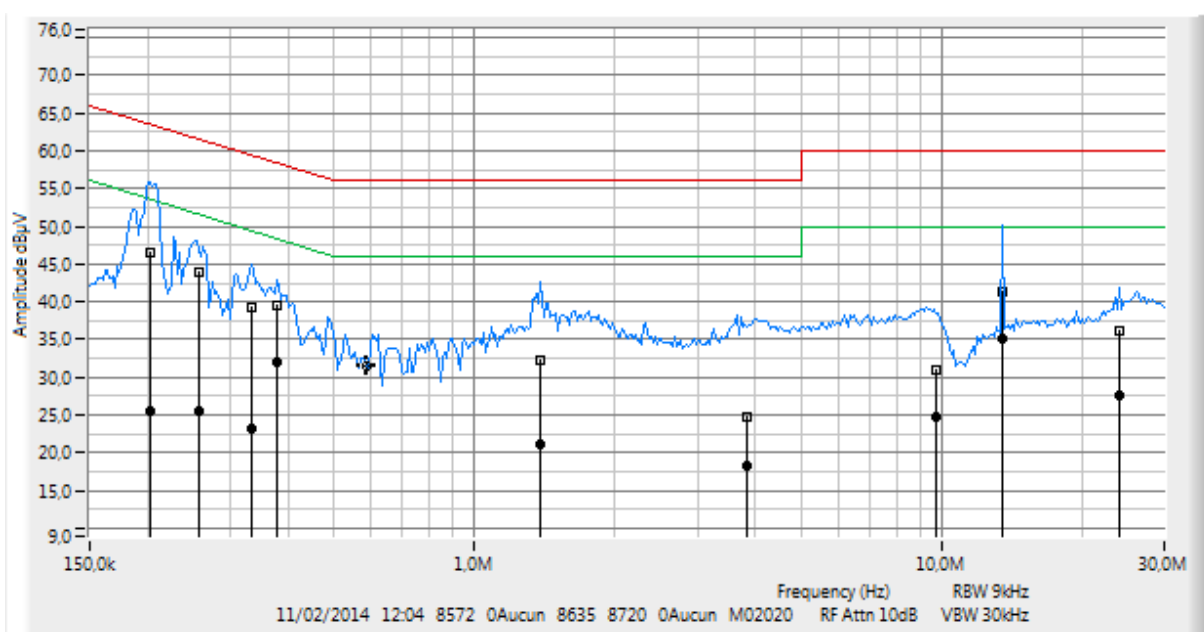
A1 Neutral 120V 60Hz

Frequency (MHz)	Quasi-peak (dBμV)	QP Limit (dBμV)	QP margin (dB)	Frequency (MHz)	Average (dBμV)	Average Limit (dBμV)	Average margin (dB)
0,163	40,4	65,3	24,9	0,163	21,0	55,3	34,4
0,180	41,9	64,5	22,6	0,180	24,6	54,5	29,9
0,191	49,0	64,0	15,0	0,191	32,0	54,0	22,0
0,211	41,6	63,2	21,6	0,211	21,4	53,2	31,7
0,239	38,9	62,1	23,2	0,239	23,3	52,1	28,9
0,280	36,0	60,8	24,8	0,280	16,7	50,8	34,1
0,318	38,5	59,8	21,3	0,318	24,2	49,8	25,5
0,385	28,0	58,2	30,2	0,385	12,0	48,2	36,2
0,466	26,3	56,6	30,3	0,466	16,0	46,6	30,6
0,582	22,6	56,0	33,4	0,582	11,2	46,0	34,8
1,753	19,4	56,0	36,6	1,753	9,0	46,0	37,0
3,048	40,3	56,0	15,7	3,048	29,3	46,0	16,7
13,561	39,7	60,0	20,3	13,561	32,8	50,0	17,3
24,001	35,3	60,0	24,7	24,001	26,9	50,0	23,1
29,718	32,8	60,0	27,3	29,718	24,7	50,0	25,3



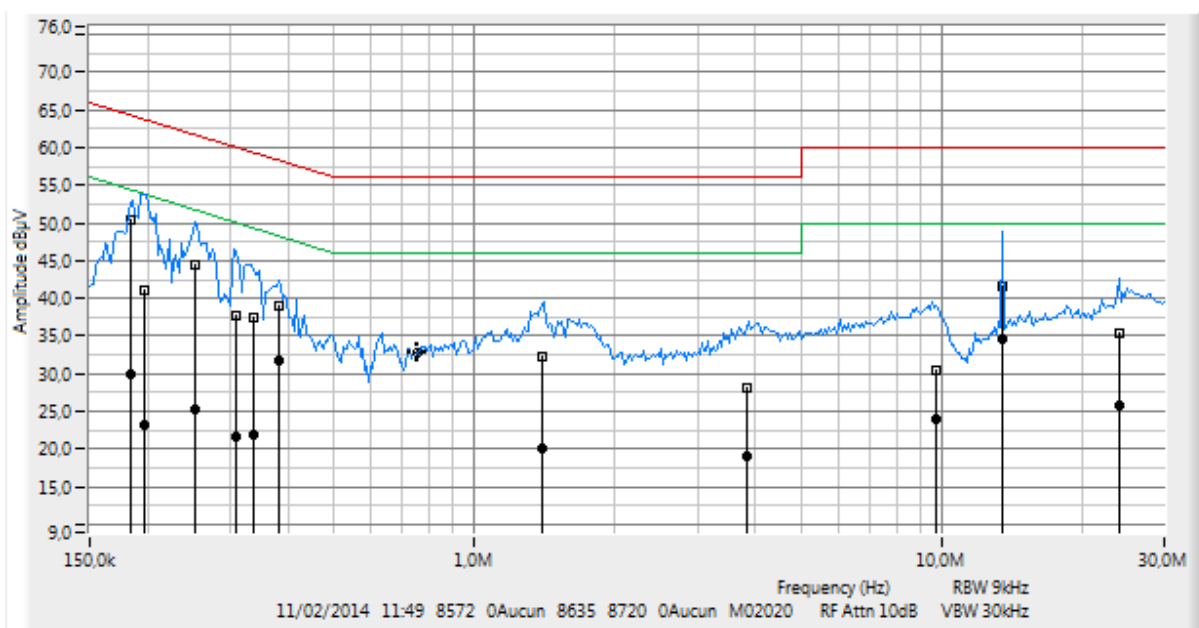
A2 Line 120V 60Hz

Frequency (MHz)	Quasi-peak (dBμV)	QP Limit (dBμV)	QP margin (dB)	Frequency (MHz)	Average (dBμV)	Average Limit (dBμV)	Average margin (dB)
0,202	46,6	63,5	16,9	0,202	25,6	53,5	27,9
0,257	43,9	61,5	17,6	0,257	25,5	51,5	26,1
0,334	39,2	59,4	20,2	0,334	23,3	49,4	26,1
0,378	39,5	58,3	18,8	0,378	32,1	48,3	16,3
1,389	32,3	56,0	23,7	1,389	21,2	46,0	24,8
3,841	24,7	56,0	31,3	3,841	18,3	46,0	27,7
9,719	31,1	60,0	28,9	9,719	24,7	50,0	25,3
13,561	41,5	60,0	18,5	13,561	35,0	50,0	15,0
24,000	36,1	60,0	23,9	24,000	27,7	50,0	22,3



A2 Neutral 120V 60Hz

Frequency (MHz)	Quasi-peak (dBμV)	QP Limit (dBμV)	QP margin (dB)	Frequency (MHz)	Average (dBμV)	Average Limit (dBμV)	Average margin (dB)
0,183	50,3	64,4	14,0	0,183	30,0	54,4	24,4
0,197	41,0	63,7	22,7	0,197	23,2	53,7	30,6
0,253	44,5	61,7	17,2	0,253	25,4	51,7	26,3
0,309	37,7	60,0	22,3	0,309	21,7	50,0	28,3
0,335	37,5	59,3	21,8	0,335	21,9	49,3	27,4
0,381	39,1	58,3	19,2	0,381	31,9	48,3	16,4
1,401	32,3	56,0	23,7	1,401	20,1	46,0	25,9
3,836	28,0	56,0	28,0	3,836	19,0	46,0	27,0
9,757	30,5	60,0	29,5	9,757	24,0	50,0	26,0
13,561	41,5	60,0	18,5	13,561	34,5	50,0	15,5
24,002	35,3	60,0	24,7	24,002	25,8	50,0	24,2



Test conclusion:

RESPECTED STANDARD

10. ADDITIONAL PROVISIONS TO THE GENERAL RADIATED EMISSION LIMITATIONS

Standard: FCC Part 15

Test procedure: Paragraph 15.215

Test set up:

Test realized in near field. All field strength measurements are correlated with the radiated maximum peak output power

Test operating condition of the equipment:

The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate.

Results:

Ambient temperature (°C): 23
 Relative humidity (%): 47

Power source: 120 Vac-60Hz

Lower Band Edge: from 13.090 MHz to 13.110 MHz
 Upper Band Edge: from 14.010 MHz to 14.030 MHz

Sample N° 1: with A1

Fundamental frequency (MHz)	Carrier field strength (dBμV/m)	Detector	Band-edge frequency (MHz)	Marker delta (dB)	Out-of-band level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
13.56	40.7	Peak	13.084	-40.28	0.42	29.54	29.12
13.56	40.7	Peak	14.0352	-40.54	0.16	29.54	29.38

Sample N° 1: with A2

Fundamental frequency (MHz)	Carrier field strength (dBμV/m)	Detector	Band-edge frequency (MHz)	Marker delta (dB)	Out-of-band level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
13.56	40.5	Peak	13.084	-40.28	0.22	29.54	29.32
13.56	40.5	Peak	14.0352	-40.54	-0.04	29.54	29.58

20 dB bandwidth curves are given in appendix 5; band-edge curves are given in appendix 6.

Test conclusion:

RESPECTED STANDARD

11. OPERATION WITHIN THE BAND 13.110 – 14.010 MHz

Standard: FCC Part 15

Test procedure: paragraph 15.225 (a), (b), (c), (e)

Test set up:

The system is tested in an open area test site (OATS). The EUT is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

See photos in appendix 2

The frequency tolerance measure is realized in near-field.

Detection mode: Quasi-peak ($F < 1 \text{ GHz}$)

Bandwidth: 9 kHz ($150 \text{ kHz} < F < 30 \text{ MHz}$)

Distance of antenna: 10 meters

Antenna height: 1 meter

Antenna polarization: oriented in the vertical plane. The lowest point of the loop is 1m above ground level.

Equipment under test operating condition:

The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate.

Results:

Carrier field strength

Ambient temperature (°C): 18.9
Relative humidity (%): 45

Power source: 120Vac – 60 Hz

Sample N°1: with A1

	Field strength (dBμV/m) at frequency: MHz
Normal test conditions	40.7
Limits (dBμV/m)	84
Margin (dB)	43.3

Polarization of test antenna: perpendicular (height: 100 cm)

Position of equipment: see photo in appendix 2 (azimuth: 175 degrees)

Frequency stability

			Measured frequency difference (ppm)	Limits (ppm)
Normal test conditions	Temperature (°C): 20 Humidity (%): /	Minimal power source (V): 102 Vac	-33.91	±100
		Maximal power source (V): 138 Vac	0.00	
Extreme test conditions	Minimal temperature (°C): -20	Nominal power source (V): 120 Vac	-40.70	
	Maximal temperature (°C): +55	Nominal power source (V): 120 Vac	-33.91	

Field strength within the band 13.110-14.010 MHz

See spectrum mask in appendix 7

Sample N°1: with A2

	Field strength (dB μ V/m) at frequency: MHz
Normal test conditions	40.5
Limits (dB μ V/m)	84
Margin (dB)	43.5

Polarization of test antenna: perpendicular (height: 100 cm)

Position of equipment: see photo in appendix 2 (azimuth: 220 degrees)

Frequency stability

			Measured frequency difference (ppm)	Limits (ppm)
Normal test conditions	Temperature (°C): 20 Humidity (%): /	Minimal power source (V): 102 Vac	61.05	±100
		Maximal power source (V): 138 Vac	33.92	
Extreme test conditions	Minimal temperature (°C): -20	Nominal power source (V): 120 Vac	47.48	
	Maximal temperature (°C): +55	Nominal power source (V): 120 Vac	61.05	

Field strength within the band 13.110-14.010 MHz

See spectrum mask in appendix 7

Test conclusion:

RESPECTED STANDARD

12. FIELD STRENGTH OUTSIDE THE BAND 13.110-14.010 MHZ

Standard: FCC Part 15

Test procedure: paragraph 209
paragraph 15.225 (d)

Test set up:

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. Zero degree azimuths correspond to the front of the device under test.

See photos in appendix 2.

Frequency range: From 9 kHz to 1 GHz (10th harmonic of the highest fundamental frequency)

Detection mode: Quasi-peak ($F < 1 \text{ GHz}$) Peak / Average ($F > 1 \text{ GHz}$)

Bandwidth: 200Hz ($9 \text{ kHz} < F < 150\text{kHz}$)
9 kHz ($150 \text{ kHz} < F < 30\text{MHz}$)
120 kHz ($30 \text{ MHz} < F < 1 \text{ GHz}$)
1 MHz ($F > 1 \text{ GHz}$)

Distance of antenna: 3 / 10 meters

Antenna height: 1 to 4 meters

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

Equipment under test operating condition:

The equipment under test is blocked in continuous modulated transmission mode with impression, at the highest output power level at which the transmitter is intended to operate with impression.

Results:

Ambient temperature (°C): 18.9
Relative humidity (%): 45

Power source: 120 Vac – 60 Hz

Sample N° 1: with A1

FREQUENCIES (MHz)	Detector P: Peak QP: Quasi- Peak	Antenna height (cm)	Azimuth (degree)	Polarization H: Horizontal V: Vertical	Field strength (dBμV/m)	Limits (dBμV/m)	Margin (dB)
98.3	QP	322	134	V	26.65	43.5	16.85
110	QP	100	144	V	17.7	43.5	25.8
196.6	QP	162	293	H	16.7	43.5	26.8
331	QP	107	14	H	13.5	46	32.5
504	QP	342	14	H	21.14	46	24.86

Sample N° 1: with A2

FREQUENCIES (MHz)	Detector P: Peak QP: Quasi- Peak	Antenna height (cm)	Azimuth (degree)	Polarization H: Horizontal V: Vertical	Field strength (dBμV/m)	Limits (dBμV/m)	Margin (dB)
72	QP	283	106	H	17.63	40	22.37
98.3	QP	299	177	V	24.11	43.5	19.39
196.6	QP	170	1	H	15.83	43.5	27.67
331	QP	132	58	V	12.53	46	33.47
504	QP	336	90	H	22.53	46	23.47

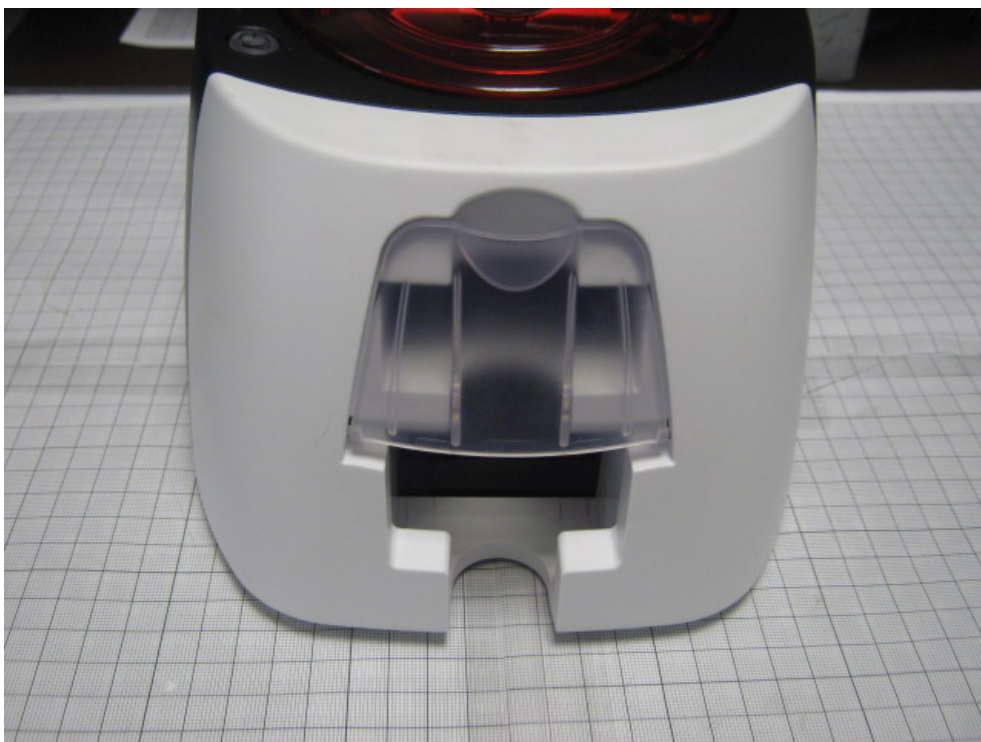
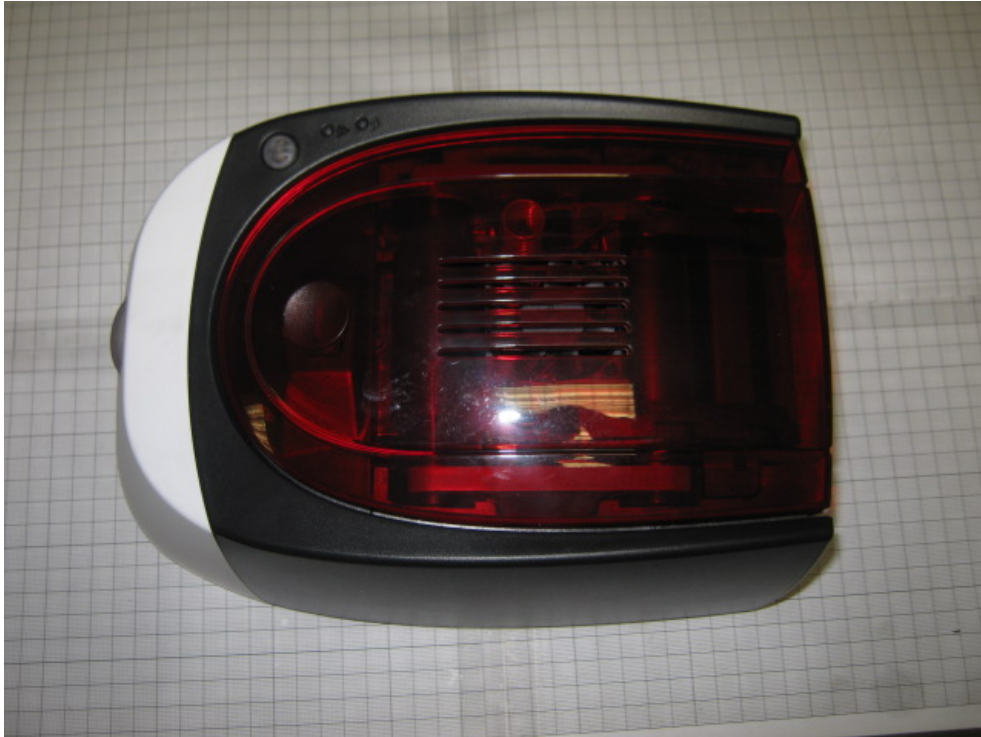
Note: any spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.

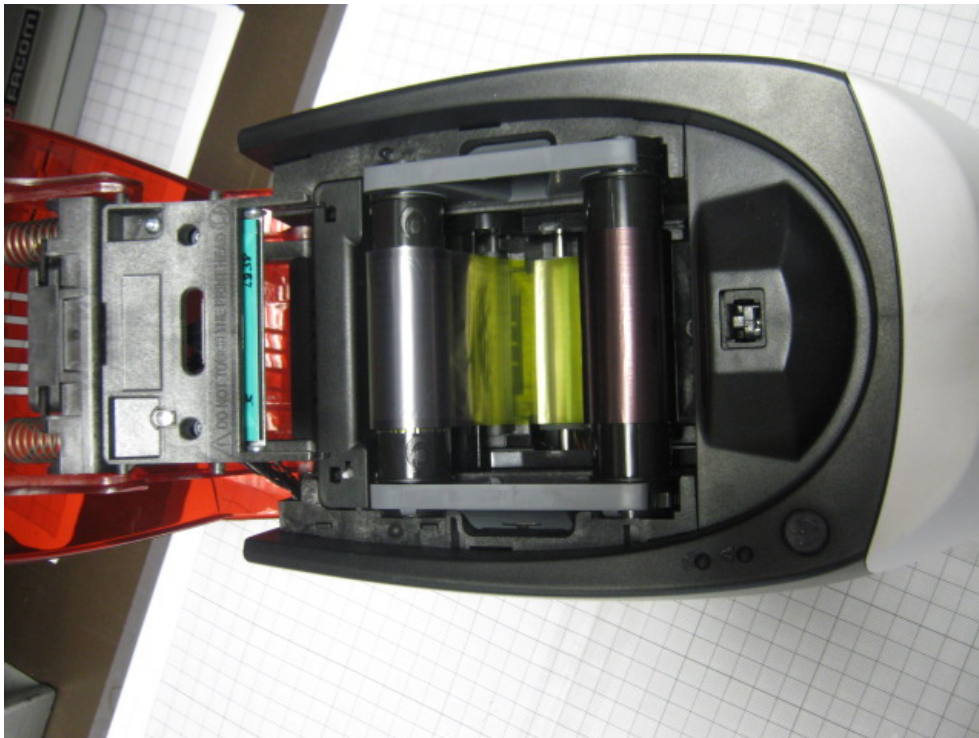
Test conclusion:

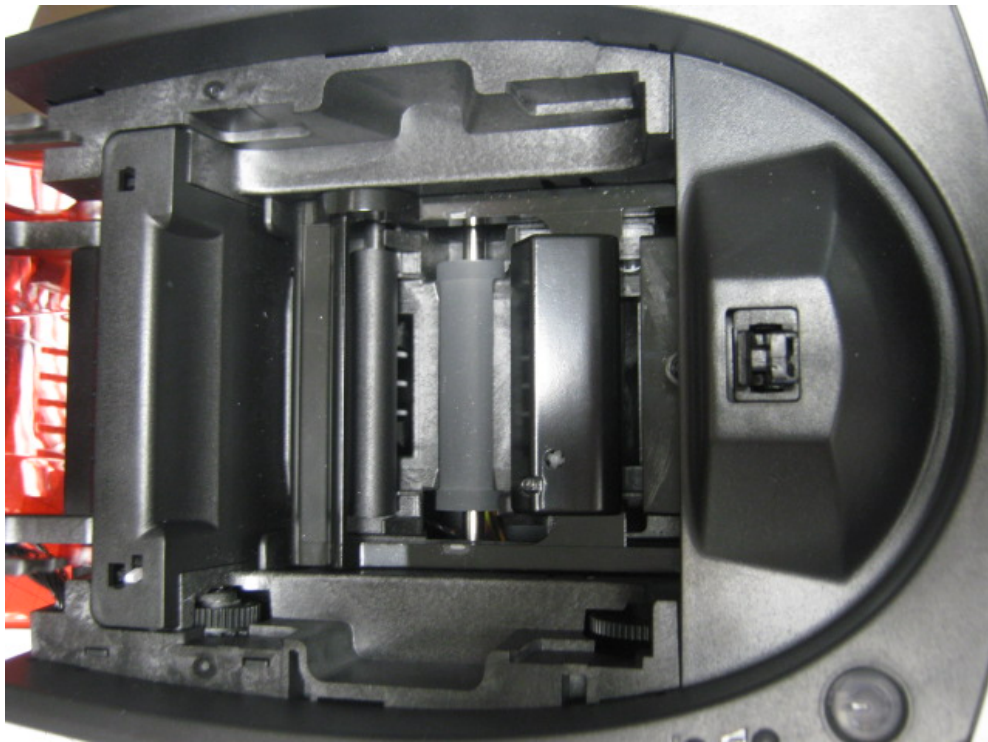
RESPECTED STANDARD

□□□ End of report, 7 appendixes to be forwarded □□□

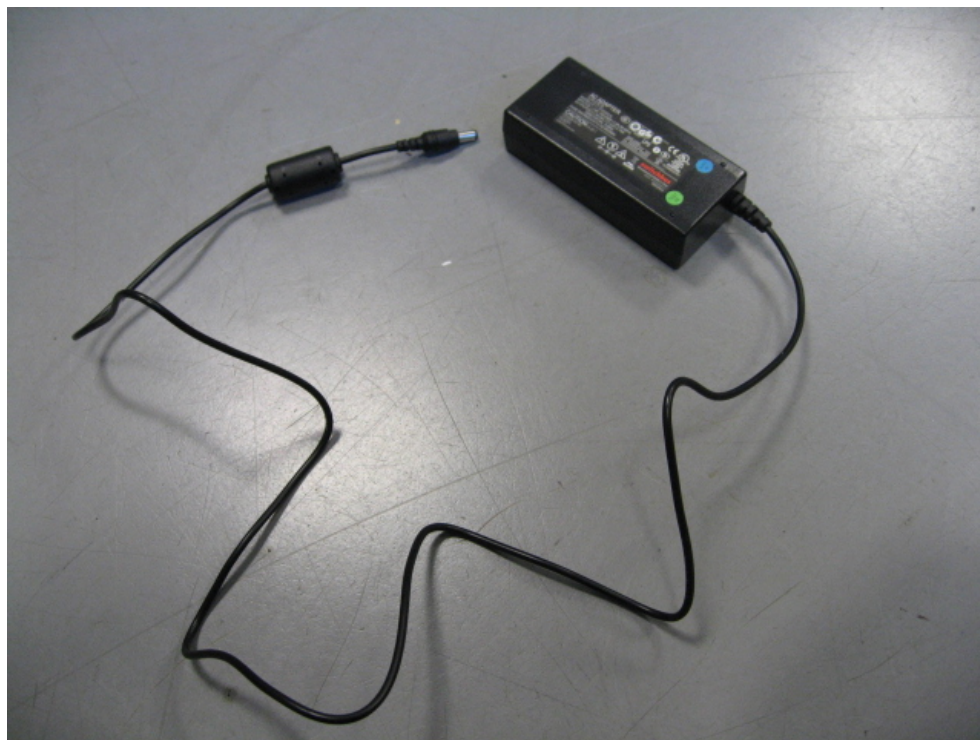
APPENDIX 1: Photos of the equipment under test



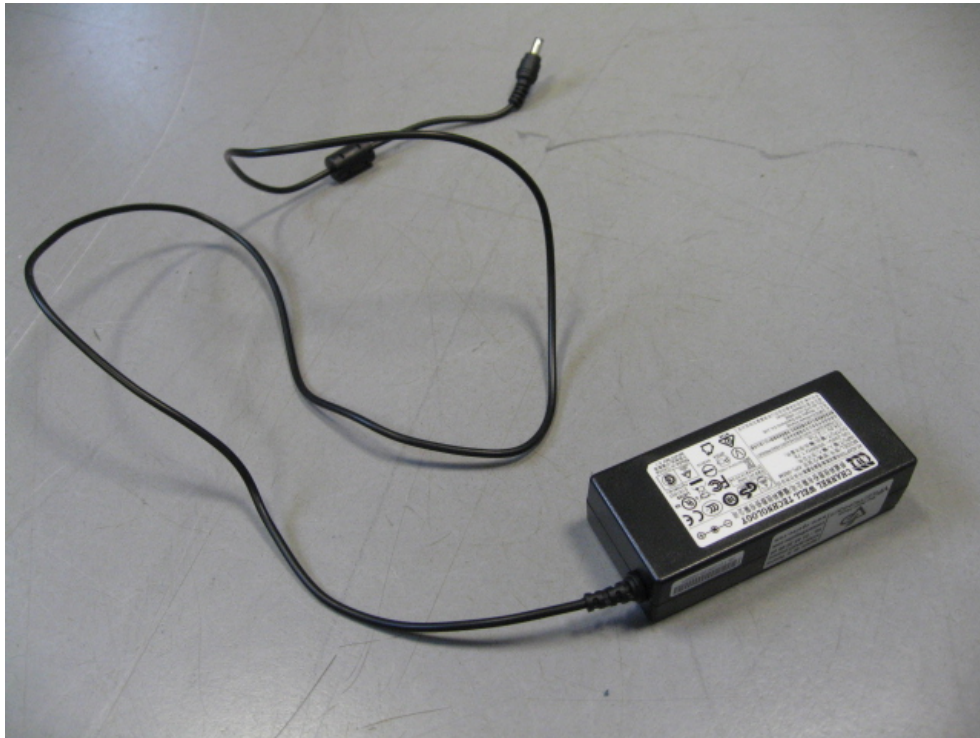




Power supply A1



Power supply A2

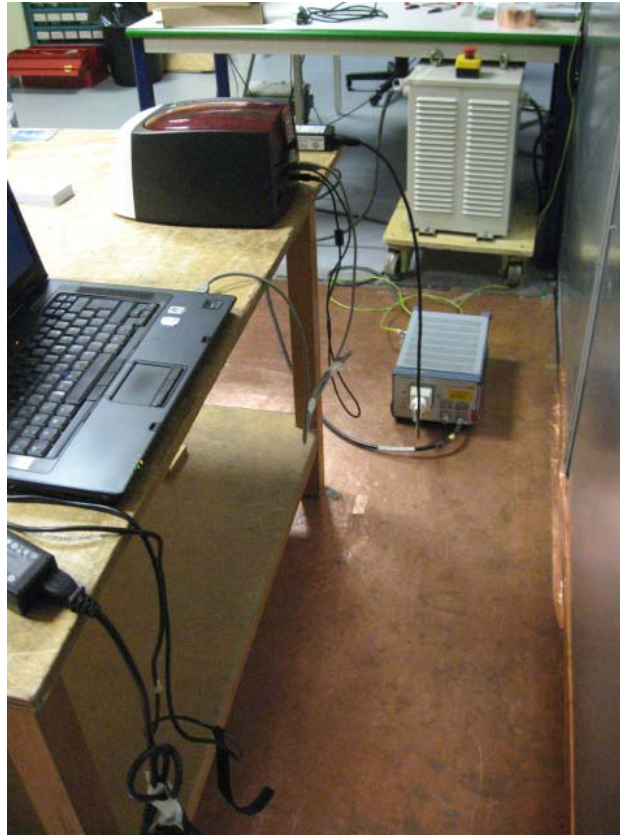


APPENDIX 2: Test set up

Radiated setup



Conducted setup



APPENDIX 3: Test equipment list

Measurement of the conducted disturbances

TYPE	MANUFACTURER	EMITECH NUMBER
Outside room Hors cage	Emitech	8893
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver HP 8591EM	Hewlett Packard	8524
LISN 1600	Thurby Thandar Instruments	8719
High-pass filter ETP232	SECRE	8641
Absorber sheath current	Emitech	9489
Power Source 360-AMXT-UPC32	Pacific	8507
Multimeter MN5102B	AOIP	8675
Meteo station	HUGER	8671

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 ESI7	Rohde & Schwarz	8707
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Biconical antenna VHBB 9124	Schwarzbeck	8526
Biconical antenna VHA 9103	Schwarzbeck	8528
Log periodic antenna UHALP 9108A	Schwarzbeck	8543
Low-noise amplifier 8447D	Hewlett Packard	8511
Power Source 360-AMXT-UPC32	Pacific	8507
Multimeter MN5102B	AOIP	8675
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC	0000

Measurement of the conducted disturbances

TYPE	MANUFACTURER	EMITECH NUMBER
Outside room Hors cage	Emitech	8893
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver HP 8591EM	Hewlett Packard	8524
LISN 1600	Thurbly Thandar Instruments	8719
High-pass filter ETP232	SECRE	8641
Absorber sheath current	Emitech	9489
Power Source 360-AMXT-UPC32	Pacific	8507
Multimeter MN5102B	AOIP	8675
Meteo station	HUGER	8671

Additional provisions to the general radiated emission limitations

TYPE	MANUFACTURER	EMITECH NUMBER
Anechoic Chamber	EMITECH	8593
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Loop antenna HFH2-Z2	Rohde & Schwarz	8533
Power Source 360-AMXT-UPC32	Pacific	8507
Multimeter MN5102B	AOIP	8675
Meteo station WS-9232	La Crosse Technology	8750

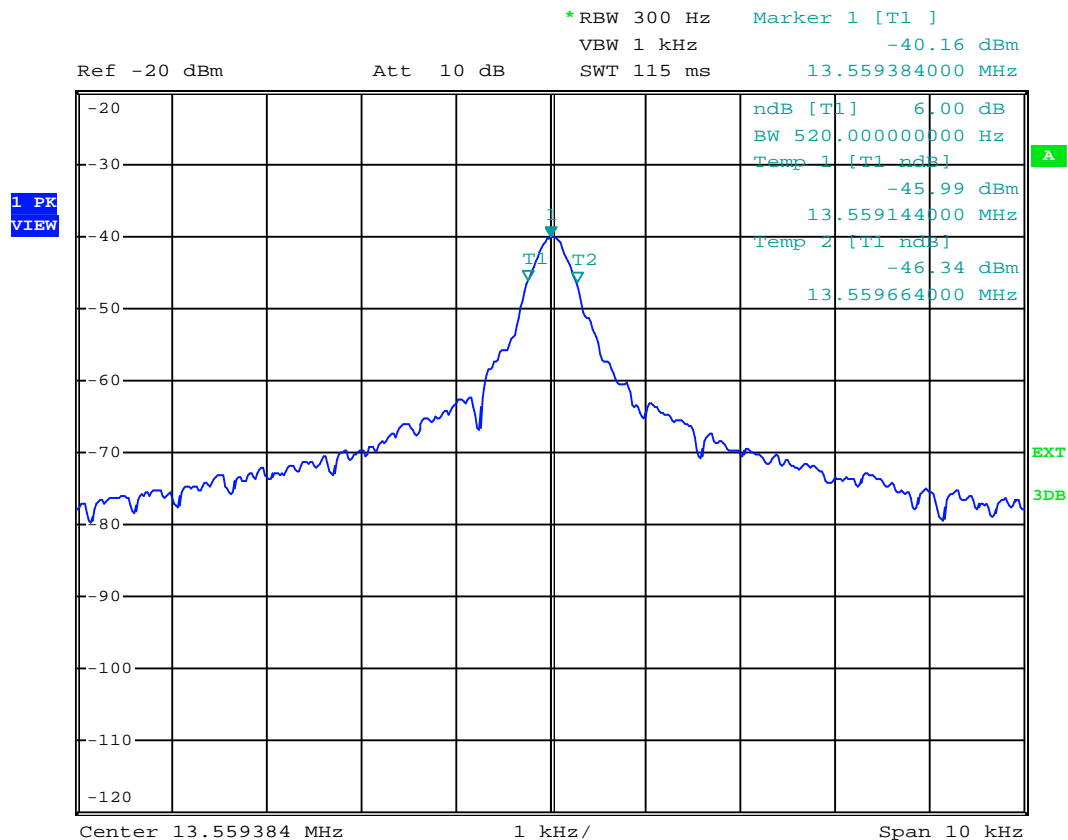
Operation within the band 13.110 – 14.010 MHz

TYPE	MANUFACTURER	EMITECH NUMBER
Open test site	EMITECH	8732
Modulation analyzer HP 8901B	Hewlett Packard	1211
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESI7	Rohde & Schwarz	8707
Spectrum Analyzer FSBS	Rohde & Schwarz	7001
Loop antenna HFH2-Z2	Rohde & Schwarz	8533
Climatic chamber	MPC	2593
Power Source 360-AMXT-UPC32	Pacific	8507
Multimeter MN5102B	AOIP	8675
Meteo station WS-9232	La Crosse Technology	8749
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC	0000

Field strength outside the band 13.110-14.010 MHz

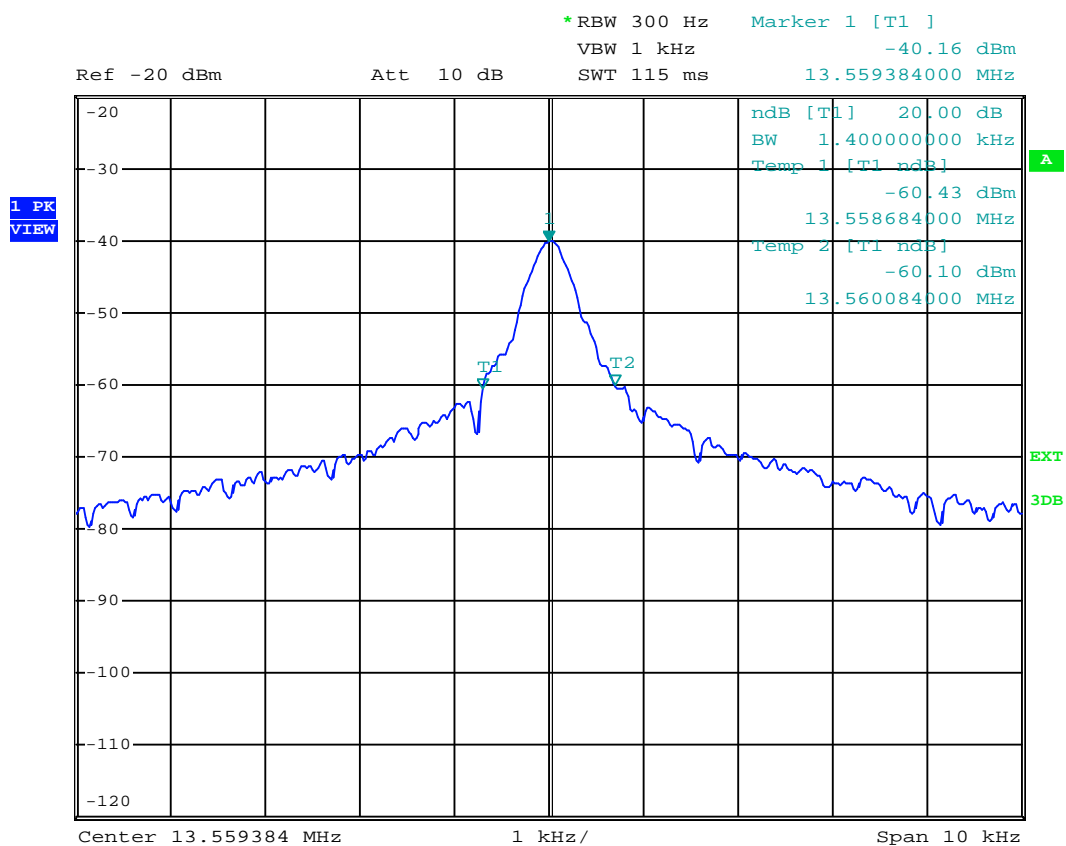
TYPE	MANUFACTURER	EMITECH NUMBER
Open test site	EMITECH	8732
Anechoic Chamber	EMITECH	8593
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESI7	Rohde & Schwarz	8707
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Loop antenna HFH2-Z2	Rohde & Schwarz	8533
Biconical antenna VHBB 9124	Schwarzbeck	8526
Biconical antenna VHA 9103	Schwarzbeck	8528
Log periodic antenna UHALP 9108A	Schwarzbeck	8543
Low-noise amplifier 8447D	Hewlett Packard	8511
Power Source360-AMXT-UPC32	Pacific	8507
Multimeter MN5102B	AOIP	8675
Meteo station WS-9232	La Crosse Technology	8749
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC	0000

APPENDIX 4: 6 dB bandwidth



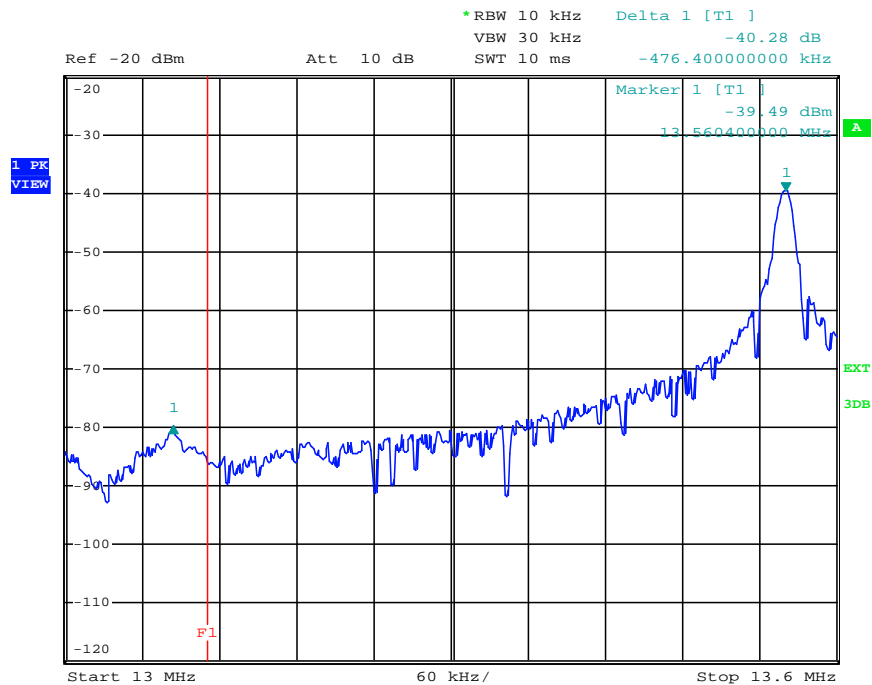
Date: 10.FEB.2014 13:09:14

APPENDIX 5: 20 dB bandwidth

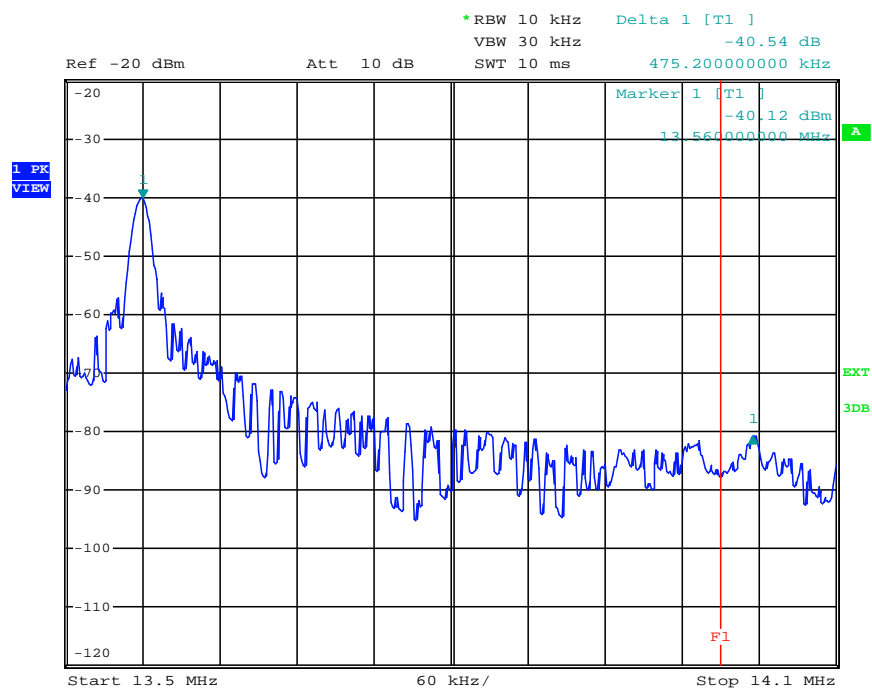


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APPENDIX 6: band edge



Date: 10.FEB.2014 13:13:06

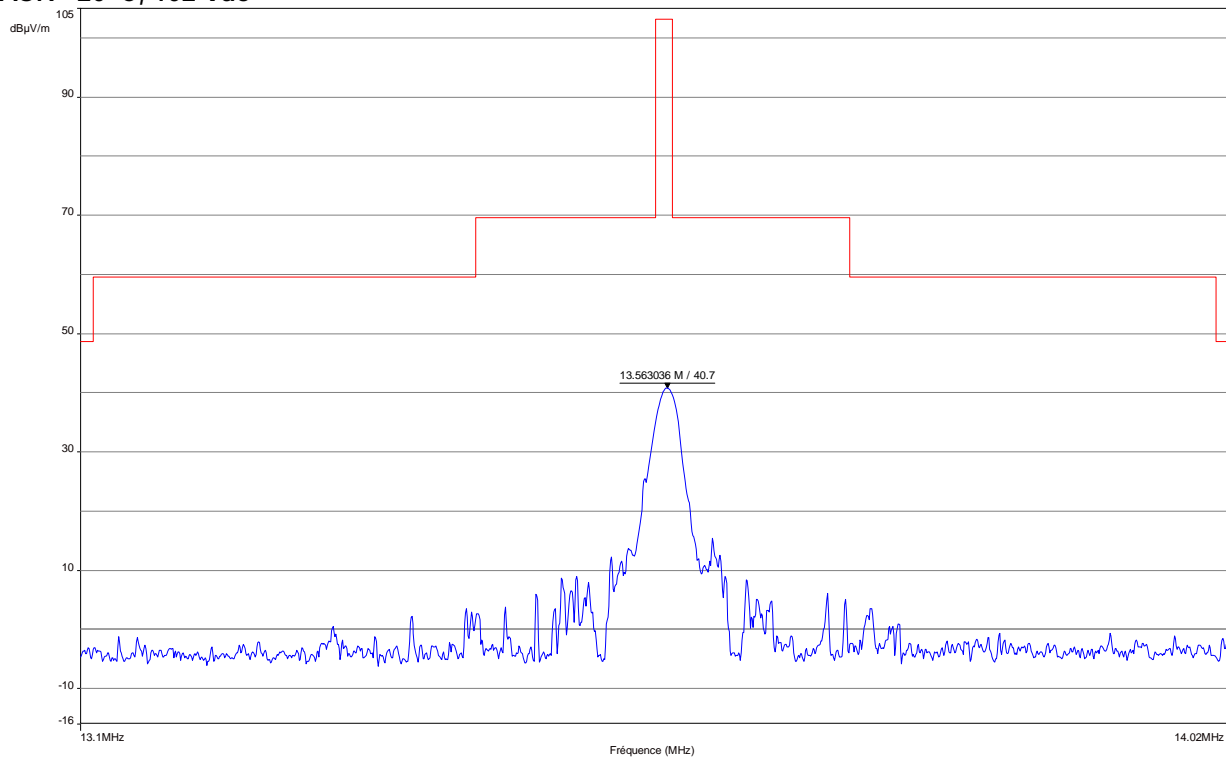


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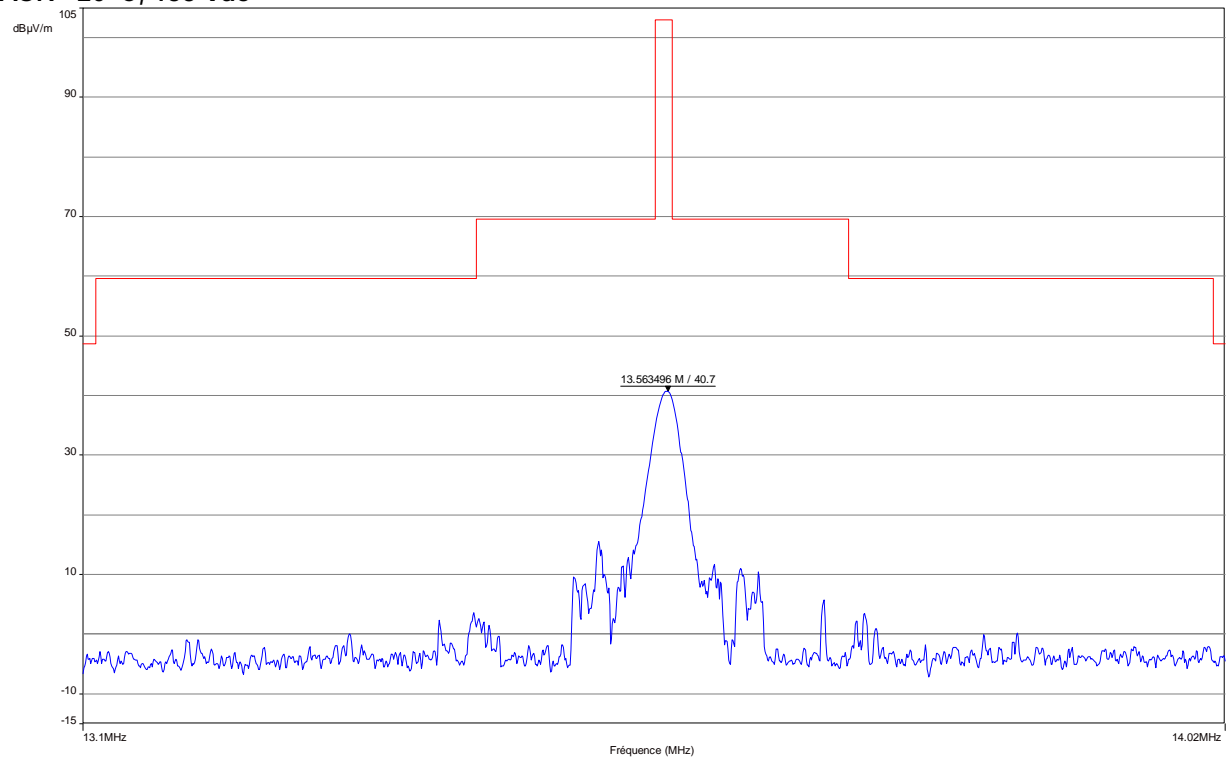
APPENDIX 7: Spectrum mask

Alimentation A1

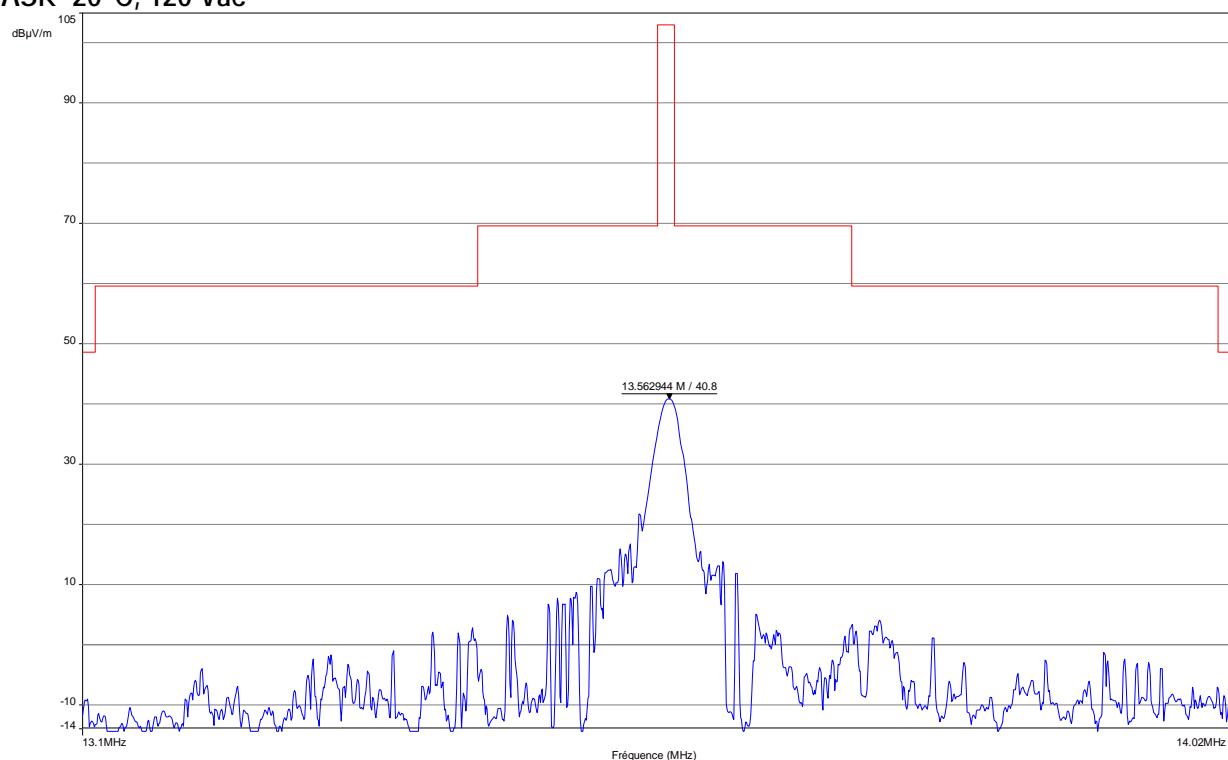
MASK +20°C, 102 Vac



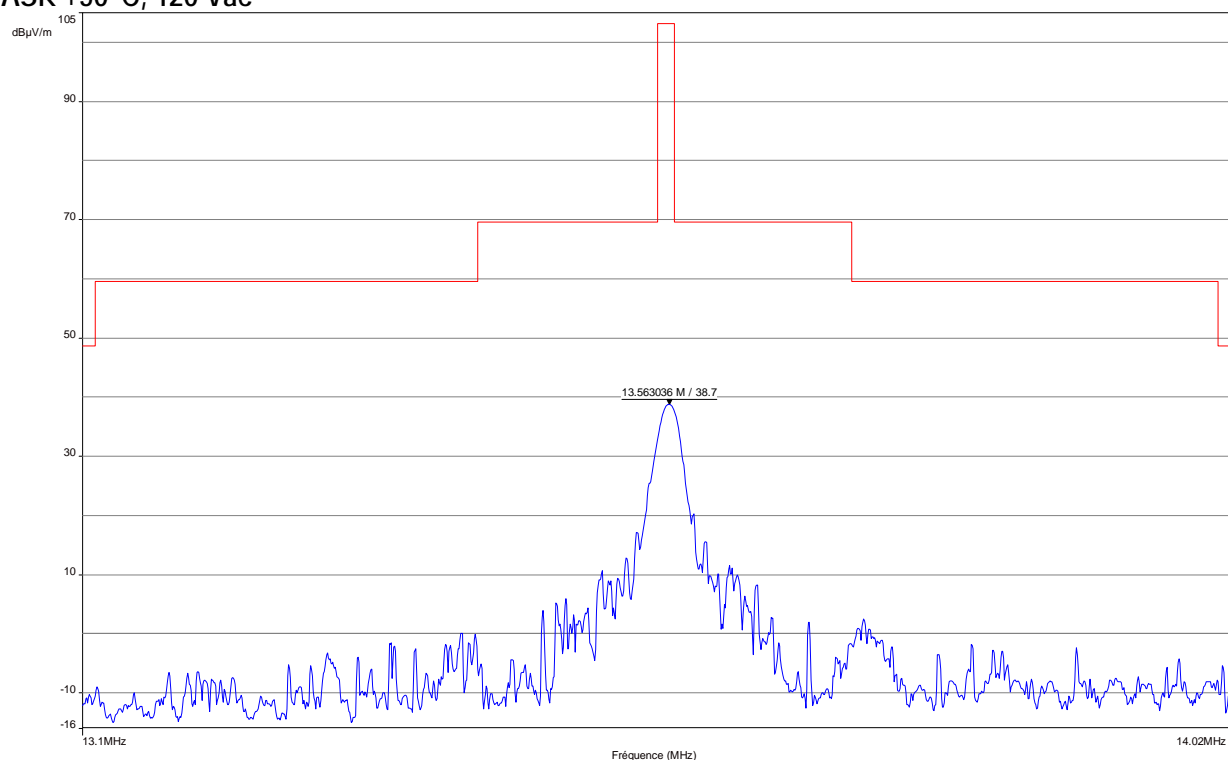
MASK +20°C, 138 Vac



MASK -20°C, 120 Vac

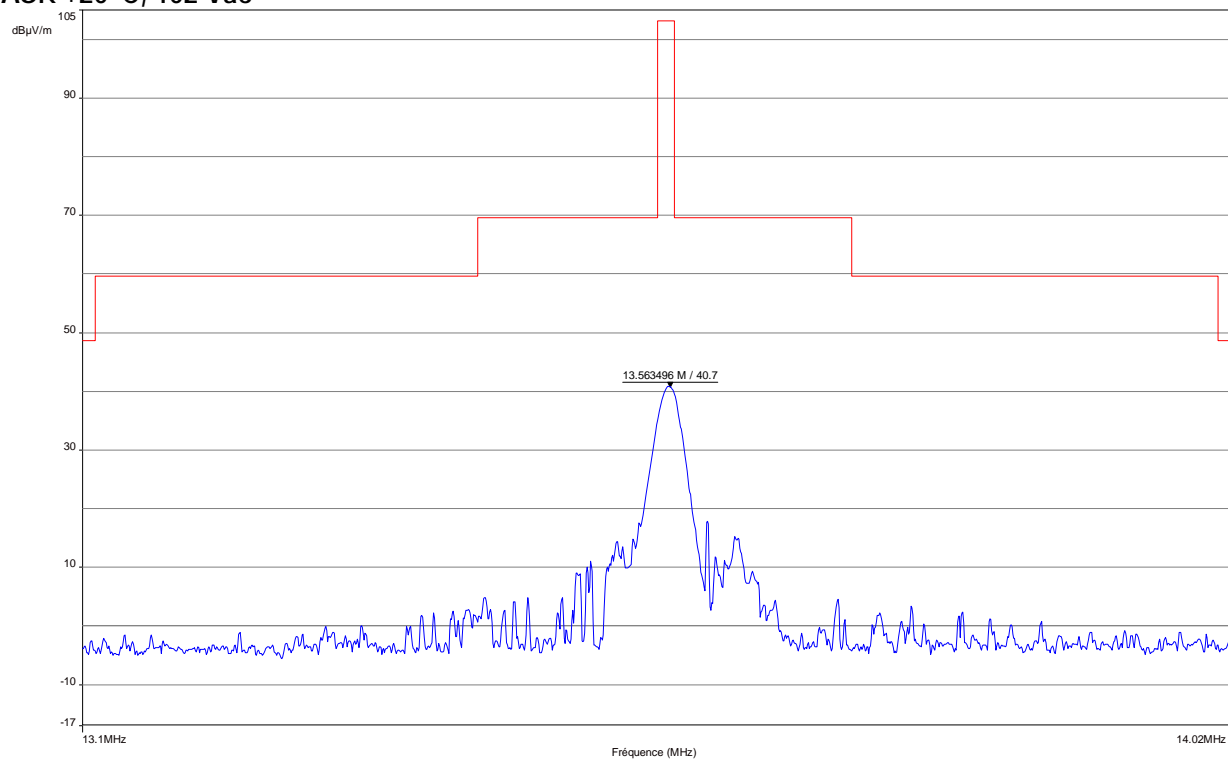


MASK +50°C, 120 Vac

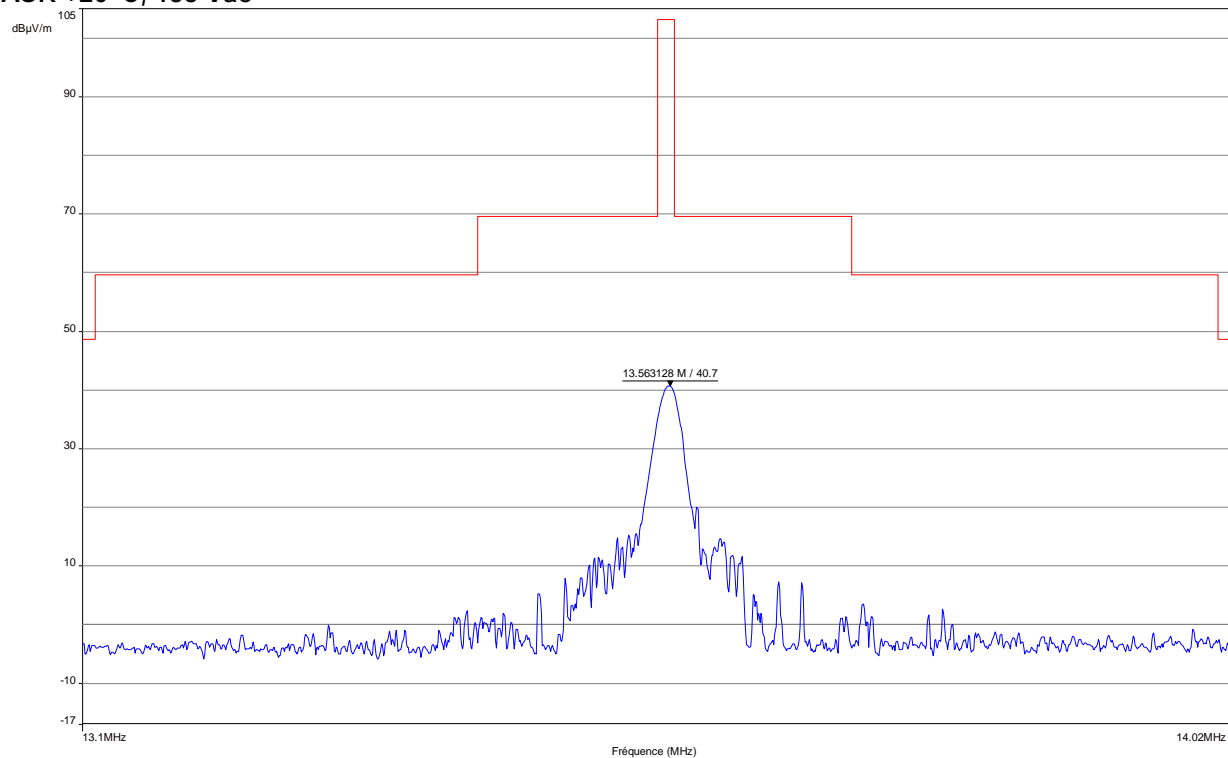


Alimentation A2

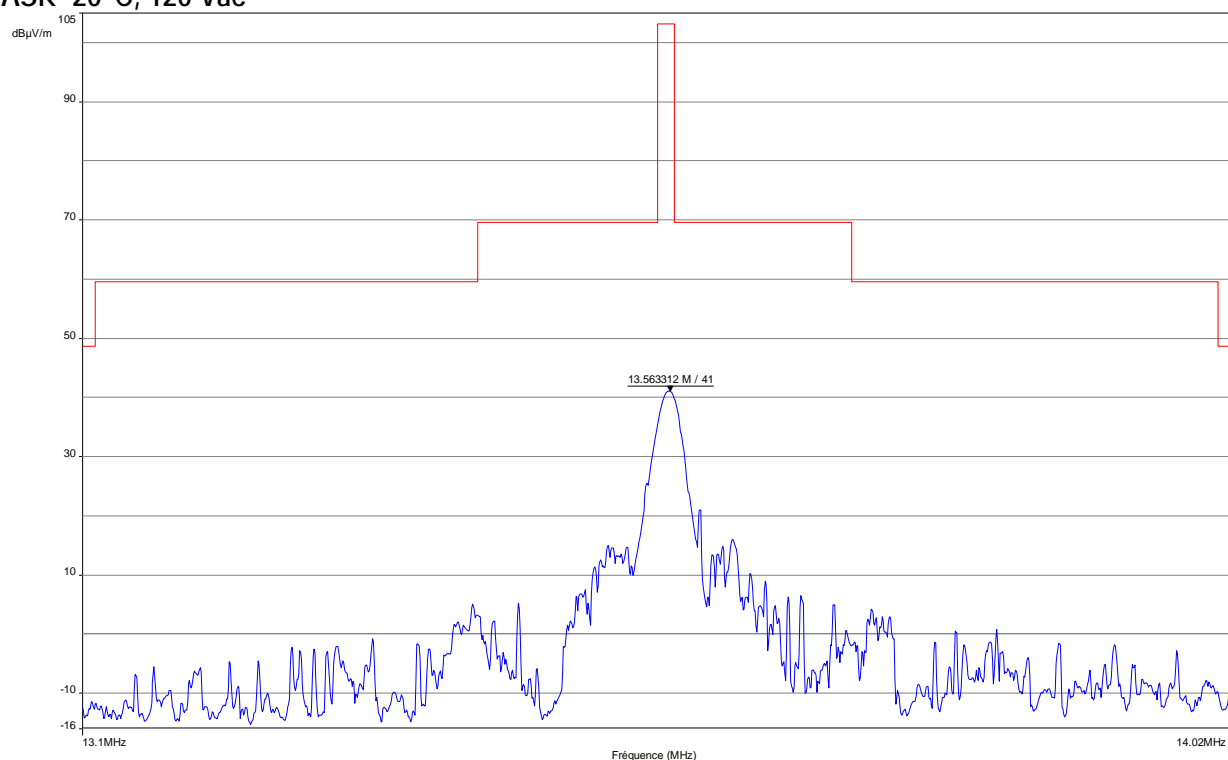
MASK +20°C, 102 Vac



MASK +20°C, 138 Vac



MASK -20°C, 120 Vac



MASK +50°C, 120 Vac

