RR051-14-101064-1-A Ed. 0

Certification test report

According to the standard:
CFR47 FCC PART 15

Equipment under test:
Autonomous Wheel S10 or S300

Model: ezW10x

FCCID:
2ACF9EZW10X1

Company:
EZ WHEEL

DISTRIBUTION: Mrs Marie **(Company: EZ WHEEL)**

Number of pages: 42 with 6 appendixes

Ed.	Date	Modified pages	Written by Name	Visa	Technical Verification and Quality Approval Name	Visa
0	2-July-2014	Creation	M. DUMESNIL	M. D.	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:	**Autonomous Wheel S10 or S300**
Serial number (S/N):	11299AA01A10
Reference / model (P/N):	ezW10x
Software version:	Not communicated
MANUFACTURER:	EZ WHEEL

COMPANY SUBMITTING THE PRODUCT:

Company:	EZ WHEEL
Address:	P.A. du Grand Girac Rue Jean Doucet 16470 SAINT MICHEL (FRANCE)
Responsible:	Mrs Marie
Person(s) present(s) during the tests:	Mr Nicouleaud
DATE(S) OF TEST:	17 April 2014 05 and 20 May 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:	M. DUMESNIL & T. LEDRESSEUR

dumesnil

CONTENTS

1. INTRODUCTION

This document presents the result of RADIO test carried out on the following equipment: Autonomous Wheel S10 or S300, in accordance with normative reference.

2. PRODUCT DESCRIPTION

Class:	A (Industrial)
Utilization:	Wheel
Antenna type and gain:	internal antenna, unknow gain
Operating frequency range:	from 2405 MHz to 2480 MHz
Number of channels:	16
Channel spacing:	5 Mz
Frequency generation:	Crystal
Modulation:	Zigbee 802.15.4
Power source:	Internal battery pack Lithium-ion (7.5V – 10.6Ah).

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 (2014)	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.
KDB 558074 D01 v03r02	Guidance for Performing Compliance on Digital Transmission Systems Operating under §15.247

4. TEST METHODOLOGY

Radio performance tests procedures given in CFR 47 part 15:

Subpart B –Unintentional Radiators
- Paragraph 107: Conducted limits
- 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 207: Conducted limits
- Paragraph 209: Radiated emission limits; general requirements
- Paragraph 212: Modular transmitter
- Paragraph 215: Additional provisions to the general radiated emission limitations
- Paragraph 247: Operation within the bands 902-928 MHZ, 2400-2483.5 MHz and 5725-5850 MHz

5. TEST EQUIPMENT CALIBRATION DATES

Equipment	Model	Type	Last verification	Next verification	Validity
0000	BAT-EMC	Software	/	/	/
1922	Microwave DB C020180F-4B1	Low-noise amplifier 1 to 18 GHz	12/09/2013	12/09/2014	12/11/2014
1939	IMC WR42	Horn antenna	20/04/2012	20/04/2016	20/06/2016
1940	IMC WR42	Horn antenna	20/04/2012	20/04/2016	20/06/2016
4088	R&S FSP40	Spectrum Analyzer	22/08/2013	22/08/2015	22/10/2015
7299	Microtronics BRM50702	reject band filter	25/10/2013	25/10/2015	25/12/2015
8507	Pacific 360-AMXT-UPC32	Power Source	29/08/2013	29/08/2014	29/10/2014
8508	California instruments 1251RP	Power source	29/08/2013	29/08/2014	29/10/2014
8511	Hewlett Packard 8447D	Low noise amplifier	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	11/02/2014	11/02/2016	11/04/2016
8535	Emco 3115	Horn antenna	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
8572	GYL Technologies N-4m RG214	Cable	24/02/2014	24/02/2016	24/04/2016
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
8720	R&S ESH3-Z5	LISN	22/08/2012	22/08/2014	22/10/2014
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	/	/	/
10651	Absorber sheath current	Emitech	17/10/2013	17/10/2015	17/12/2015

6. TESTS AND CONCLUSIONS

6.1 unintentional radiator (subpart B)

Test procedure	Description of test	Respected criteria?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.107	CONDUCTED LIMITS	X				*Note*
FCC Part 15.109	RADIATED EMISSION LIMITS	X				*Note*
FCC Part 15.111	ANTENNA POWER CONDUCTED LIMITS FOR RECEIVER			X		

NAp: Not Applicable NAs: Not Asked

Note : Charging mode, with ferrite Würth Elektronik, reference 74271622 with two turn (photo in appendix 2).
the device must be sold with this ferrite bead attached to the power line

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 15.207	CONDUCTED LIMITS			X		
FCC Part 15.209	RADIATED EMISSION LIMITS; general requirements	X				*Note 2*
FCC Part 15.212	MODULAR TRANSMITTERS			X		
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 §15.247 frequency bands	X				*Note 3*
	(c) 20 dB bandwidth and band-edge compliance	X				
FCC Part 15.247	OPERATION WITHIN THE BANDS 902-928 MHZ, 2400-2483.5 MHz and 5725-5850 MHz					
	(a) (1) Hopping systems			X		
	(a) (2) Digital modulation techniques	X				*Note 4*
	(b) Maximum peak output power	X				*Note 5*
	(c) Operation with directional antenna gains > 6 dBi			X		
	(d) Intentional radiator	X				
	(e) Peak power spectral density	X				
	(f) Hybrid system			X		
	(g) Frequency hopping requirements			X		
	(h) Frequency hopping intelligence			X		
	(i) RF exposure compliance	X				

NAp: Not Applicable NAs: Not Asked

Note 1: Integral antenna. Professionally installed equipment.

Note 2: See FCC part 15.247 (d).

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

Note 4: The minimum 6 dB bandwidth of the equipment is1830 kHz (see appendix 4).

Note 5 : Conducted measurement is not possible (integral antenna), so we used the radiated method in open field.

RF EXPOSURE:

Maximum measured power = 85.1 dBµV/m = 0.097 mW
($P = (E \times d)^2 / (30 \times Gp)$ with d = 3 m and Gp = 1)

$PSD = EIRP/4*\pi*R^2 = 0.097 / 4*\pi*(20\ cm)^2 = 19.3 \times 10^{-6}$ mW/cm² (limit= 0.612 mW/cm²).

The equipment fulfils the requirements on power density for general population/uncontrolled exposure and therefore fulfils the requirements of 47 CFR §1.1310.

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

7. MEASUREMENT OF THE CONDUCTED DISTURBANCES

Standard: FCC Part 15

Test procedure: Paragraph 15.107

Limits: Class A

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.

A ferrite Würth Elektronik, reference 74271622 with two turn has been added for this test.

See photos in appendix 2

Frequency range: 150 kHz - 30 MHz

Detection mode: Peak / Average

Bandwidth: 10 kHz / 9kHz

Equipment under test operating condition:

The equipment is blocked in standby / reception mode.

Results:

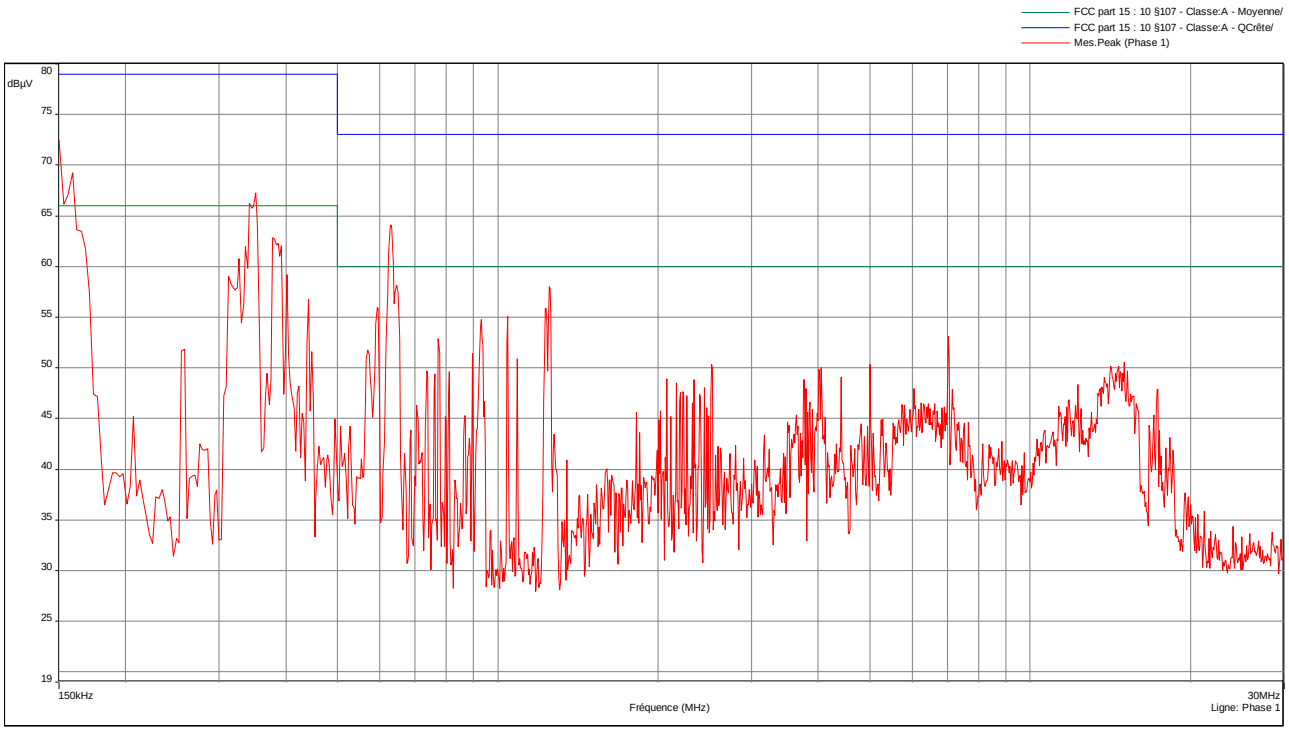
Ambient temperature (°C): 23
Relative humidity (%): 46

Sample N° 1:

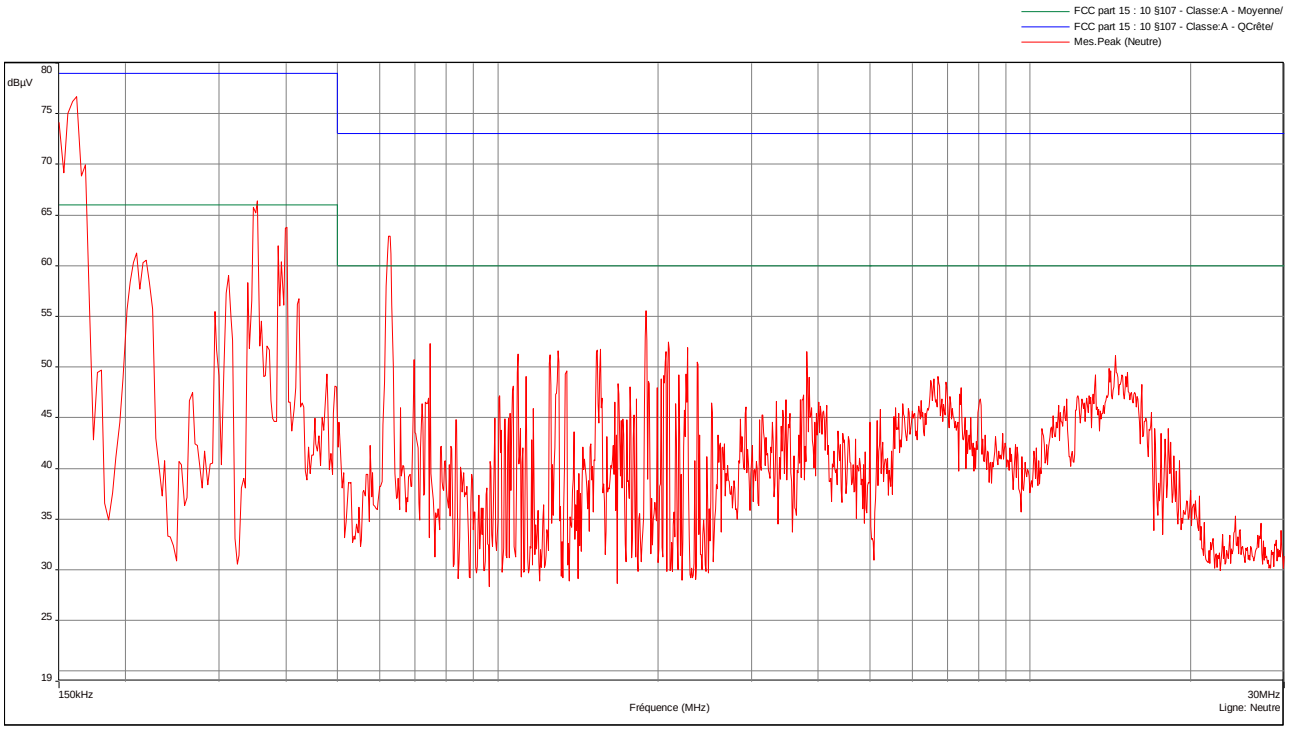
Measurement on the mains power supply:

The measurement is first realized with Peak detector.

Curve N° 1: measurement on the Neutral with peak detector

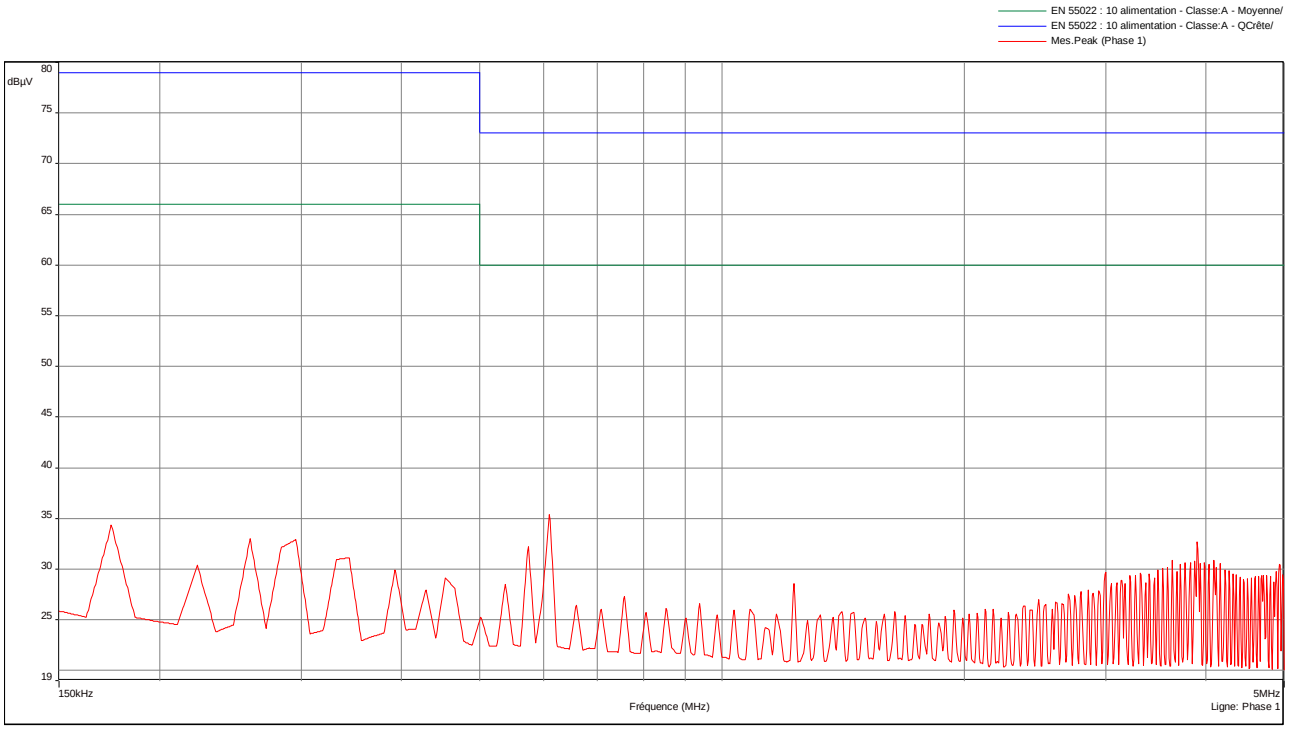


Curve N° 2: measurement on the Line with peak detector

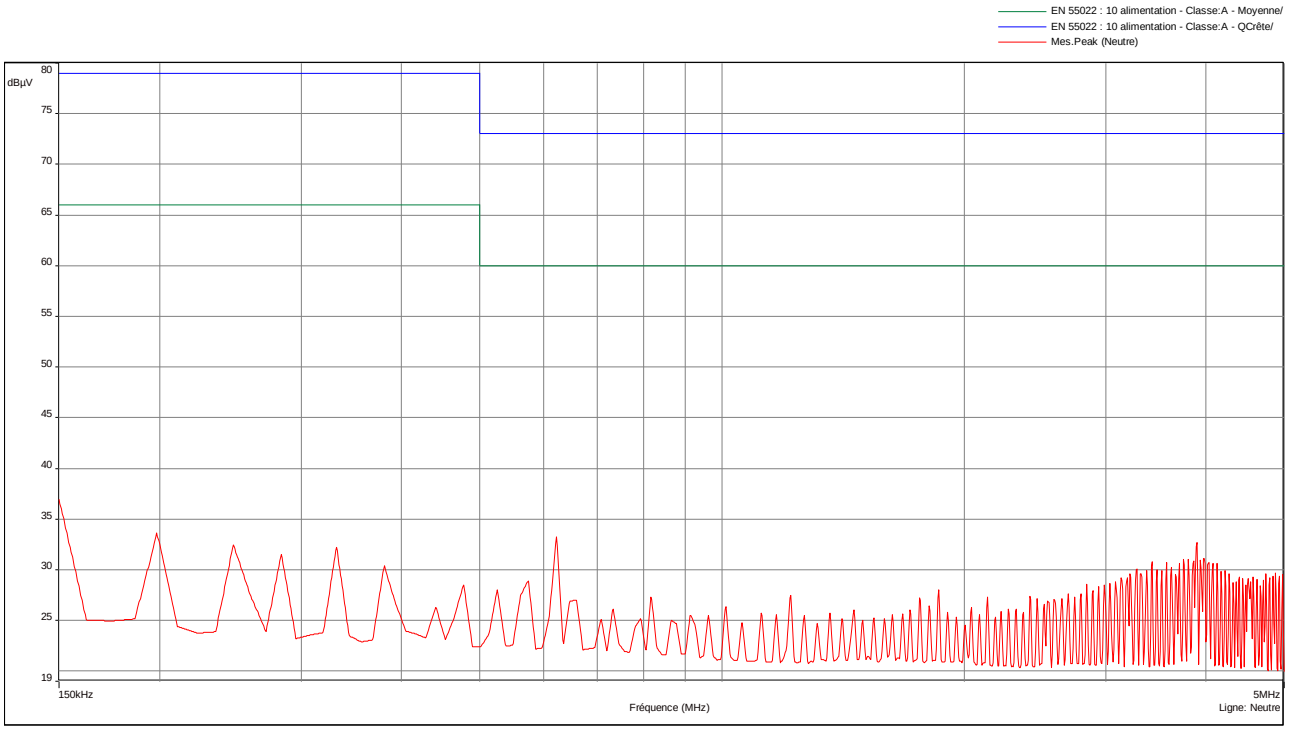


The frequencies which are not 6 dB under the Average limit are then analyzed with Average detector.

Curve N° 3: average measurement on the Neutral, for the frequency range: 150 kHz to 5 MHz.



Curve N° 4: average measurement on the Line, for the frequency range: 150 kHz to 5 MHz.



Test conclusion:

RESPECTED STANDARD

8. RADIATED EMISSION LIMITS

Standard: FCC Part 15

Test procedure: paragraph 109

Limit class: Class A

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.

A ferrite Würth Elektronik, reference 74271622 with two turn has been added for this test.

See photos in appendix 2.

Frequency range: From 30 MHz to 5th harmonic of the highest frequency used (12.4 GHz).

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 standby / reception mode.

Results:

Ambient temperature (°C): 21.9
Relative humidity (%): 52

Power source: 120Vac / 60Hz

Sample N° 1 Low channel, F = 2405 MHz

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)
31.76	QP	100	251	V	18.76	39.1	20.34
85.23	QP	152	55	H	15.79	39.1	23.31
117.43	QP	102	77	V	18.41	43.5	25.09
144.02	QP	312	179	H	27.25	43.5	16.25

Sample N° 1 Central channel, F = 2440 MHz

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)
31.76	QP	100	251	V	18.76	39.1	20.34
85.23	QP	152	55	H	15.79	39.1	23.31
117.43	QP	102	77	V	18.41	43.5	25.09
144.02	QP	312	179	H	27.25	43.5	16.25

Sample N° 1 high channel, F = 2480 MHz

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)
31.76	QP	100	251	V	18.76	39.1	20.34
85.23	QP	152	55	H	15.79	39.1	23.31
117.43	QP	102	77	V	18.41	43.5	25.09
144.02	QP	312	179	H	27.25	43.5	16.25

Applicable limits: for 30 MHz ≤ F ≤ 88 MHz : 39.1 dBµV/m at 10 meters
for 88 MHz < F ≤ 216 MHz : 43.5 dBµV/m at 10 meters
for 216 MHz < F ≤ 960 MHz : 46.4 dBµV/m at 10 meters
Above 960 MHz : 49.5 dBµV/m at 10 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

9. 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 transmission mode, modulated by internal data signal, at the highest output power level which the transmitter is intended to operate.

Results:

Ambient temperature (°C): 24.5
Relative humidity (%): 29

Power source: internal batteries fully charged

Lower Band Edge: band from 2398 MHz to 2400 MHz
Upper Band Edge: band from 2483.5 MHz to 2485.5 MHz

Sample N° 1:

FUNDAMENTAL FREQUENCY (MHZ)	FIELD STRENGTH LEVEL OF FUNDAMENTAL (DBµV/M)	DETECTOR (PEAK OR AVERAGE)	FREQUENCY OF MAXIMUM BAND-EDGES EMISSION (MHZ)	DELTA MARKER (DB)*	CALCULATED MAX OUT-OF-BAND EMISSION LEVEL (DBµV/M)	LIMIT (DBµV/M)	MARGIN (DB)
2405	78.6	peak	2398.7875	-33.59	45.01	58.6	13.59
2480	81.15	peak	2483.50125	-23.69	57.46	74	16.54
2480	81.15	average	2483.495625	-37.24	43.91	54	10.09

* *Marker-Delta method*

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

Test conclusion:

RESPECTED STANDARD

10. MAXIMUM PEAK OUTPUT POWER

Standard: FCC Part 15

Test procedure: paragraph 15.247 (b)

Test set up:

The system is tested in anechoic chamber. The EUT is placed on a rotating table, 1.5m from a ground plane. Zero degree azimuth corresponds to the front of the device under test.

The measurement of the electro-magnetic field is realized, with a resolution bandwidth adjusted at 10 MHz and video bandwidth at 10 MHz (measurement procedure paragraph 9.1.1 of 558074).

Distance of antenna: 3 meters

Antenna height: 1.5 meter

Antenna polarization: vertical and horizontal

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): 21.3
Relative humidity (%): 32

Power source: internal batteries fully charged

Sample N° 1 Low channel, F = 2405 MHz

	Electro-magnetic field (dBµV/m):	Conducted power * (mW)	Limit (mW)
Nominal supply voltage:	85.1	0.097	1000

Polarization of test antenna: horizontal (height: 150 cm)
Position of equipment: see photos in annex 2 (azimuth: 17 degrees)

Sample N° 1 Central channel, F = 2440 MHz

	Electro-magnetic field (dBµV/m):	Conducted power * (mW)	Limit (mW)
Nominal supply voltage:	83	0.060	1000

Polarization of test antenna: horizontal (height: 150 cm)
Position of equipment: see photos in annex 2 (azimuth: 15 degrees)

Sample N° 1 High channel, F = 2480 MHz

	Electro-magnetic field (dBµV/m):	Conducted power * (mW)	Limit (mW)
Nominal supply voltage:	81.9	0.046	1000

Polarization of test antenna: horizontal (height: 150 cm)
Position of equipment: see photos in annex 2 (azimuth: 18 degrees)

** $P = (E \times d)^2 / (30 \times Gp)$ with d = 3 m and Gp = 1*

Test conclusion:

RESPECTED STANDARD

11. INTENTIONAL RADIATOR

Standard: FCC Part 15

Test procedure: paragraph 15.205, paragraph 15.209, paragraph 15.247 (d)

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.

The measurement of the electro-magnetic field is realized, with a resolution bandwidth adjusted at 100 kHz or 1 MHz and video bandwidth at 300 kHz or 3 MHz (measurement procedure paragraph 12.2.5.2 of 558074).

Frequency range: From 9 kHz to 10th harmonic of the highest fundamental frequency (24 GHz).

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

Bandwidth: 200Hz (9 kHz < F < 150kHz)
9 kHz (150 kHz < F < 30MHz)
120 kHz (30 MHz < F < 1 GHz)
100 kHz / 1 MHz (F > 1 GHz)

Distance of antenna: 3 meters

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 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): 22.1
Relative humidity (%): 31

Power source: internal batteries fully charged

Sample N° 1 Low channel, F = 2405 MHz

FREQUENCIES (MHz)	Detector P: Peak QP: Quasi-Peak Av: Average	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
886.3	QP	/	/	120	V	< 42.1	58.6	> 16.5
7215	P	150	350	100	V	47.8	58.6	10.8

Sample N° 1 Central channel, F = 2440 MHz

FREQUENCIES (MHz)	Detector P: Peak QP: Quasi-Peak Av: Average	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
889.6	QP	/	/	120	V	< 48.5	58.6	> 10.1
7320	P	150	352	1000	V	55.4*	74	18.6
7320	Av	150	352	1000	V	51.56*	54	2.44

Sample N° 1 High channel, F = 2480 MHz

FREQUENCIES (MHz)	Detector P: Peak QP: Quasi-Peak Av: Average	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
886.6	QP	/	/	120	V	< 48.3	58.6	> 10.3

* restricted bands of operation in 15.205

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

Applicable limits: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

The highest level recorded in a 100 kHz bandwidth is 78.6 dBµV/m on low channel.
So the applicable limit is58.6 dBµV/m.
In addition, radiated emissions which fall in the restricted band, as defined in section 15.205 (a), must also comply with the radiated emission limits specified in section 15.209 (a) (see section 15.205 (c)).

Test conclusion:

RESPECTED STANDARD

12. PEAK POWER DENSITY

Standard: FCC Part 15

Test procedure: paragraph 15.247 (e)

Test set up:

The system is tested in anechoic chamber. The EUT is placed on a rotating table, 1.5m from a ground plane. Zero degree azimuth corresponds to the front of the device under test.

The measuring distance between the equipment and the test antenna is 3 m. The test antenna has been oriented in two polarizations (Vertical and Horizontal) and raised and lowered from 1m to 4m above the ground level. Only the highest level of each measurement is reported.

We used the same method of the peak output power measurement, but the equipment under test power level is recorded with the spectrum analyzer (measurement procedure paragraph 10.2 of 558074).

Resolution bandwidth: 3 kHz
Video 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): 21.3
Relative humidity (%): 32

Power source: internal batteries fully charged

Sample N° 1 Low channel, F =2405 MHz

	Peak power density* at frequency: 2405 MHz
Normal test conditions	-24.63 dBm
Limits	+8 dBm

Polarization of test antenna: horizontal (height: 150 cm)
Position of equipment: see photos in annex 2 (azimuth: 17 degrees)

Sample N° 1 Central channel, F = 2440 MHz

	Peak power density* at frequency: 2440 MHz
Normal test conditions	-26.43 dBm
Limits	+8 dBm

Polarization of test antenna: horizontal (height: 150 cm)
Position of equipment: see photos in annex 2 (azimuth: 15 degrees)

Sample N° 1 High channel, F= 2480 MHz

	Peak power density* at frequency: 2480 MHz
Normal test conditions	-27.23 dBm
Limits	+8 dBm

Polarization of test antenna: horizontal (height: 150 cm)
Position of equipment: see photos in annex 2 (azimuth: 18 degrees)

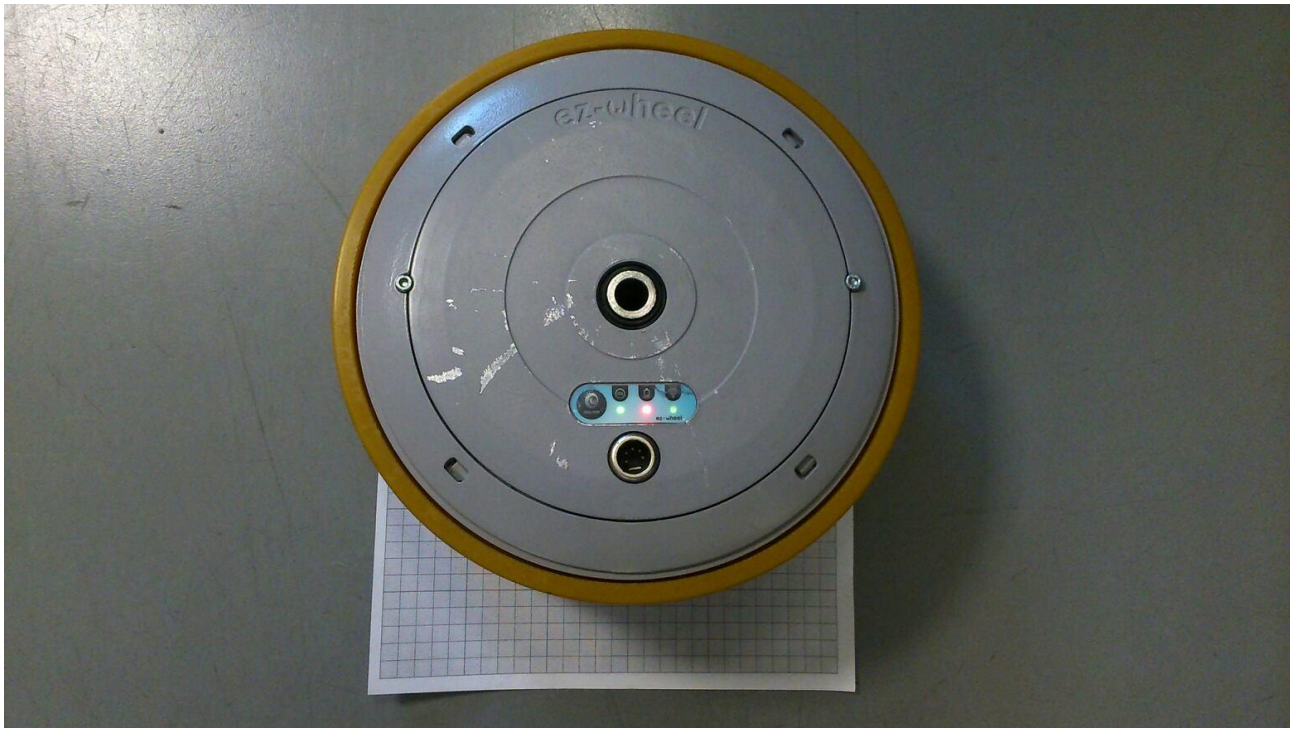
** $P = (E \times d)^2 / (30 \times Gp)$ with d = 3 m and Gp = 1*

Test conclusion:

RESPECTED STANDARD

□□□ End of report, 6 appendixes to be forwarded □□□

APPENDIX 1: Photos of the equipment under test




ezW10l
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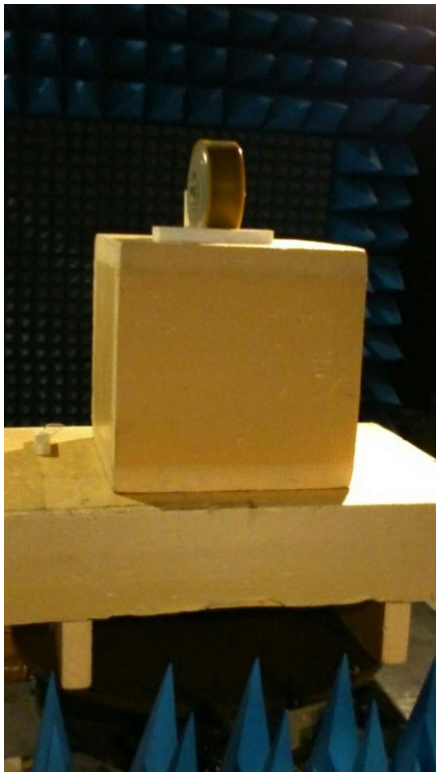
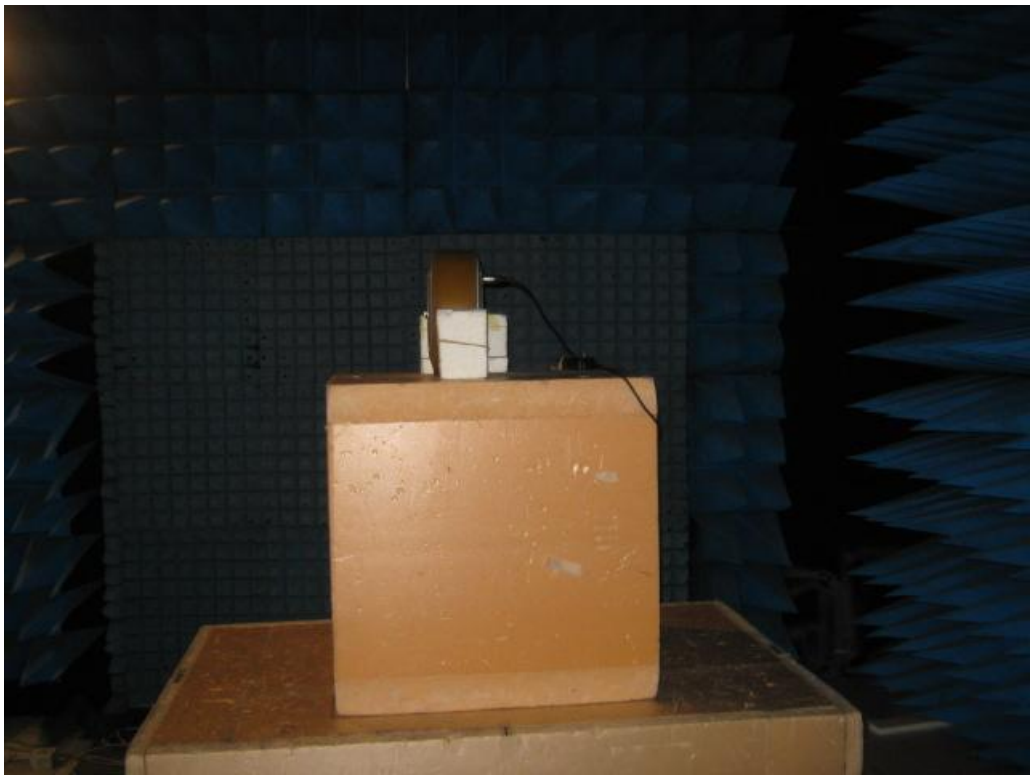
APPENDIX 2: Test set up

Anechoic room

Battery fully charged mode



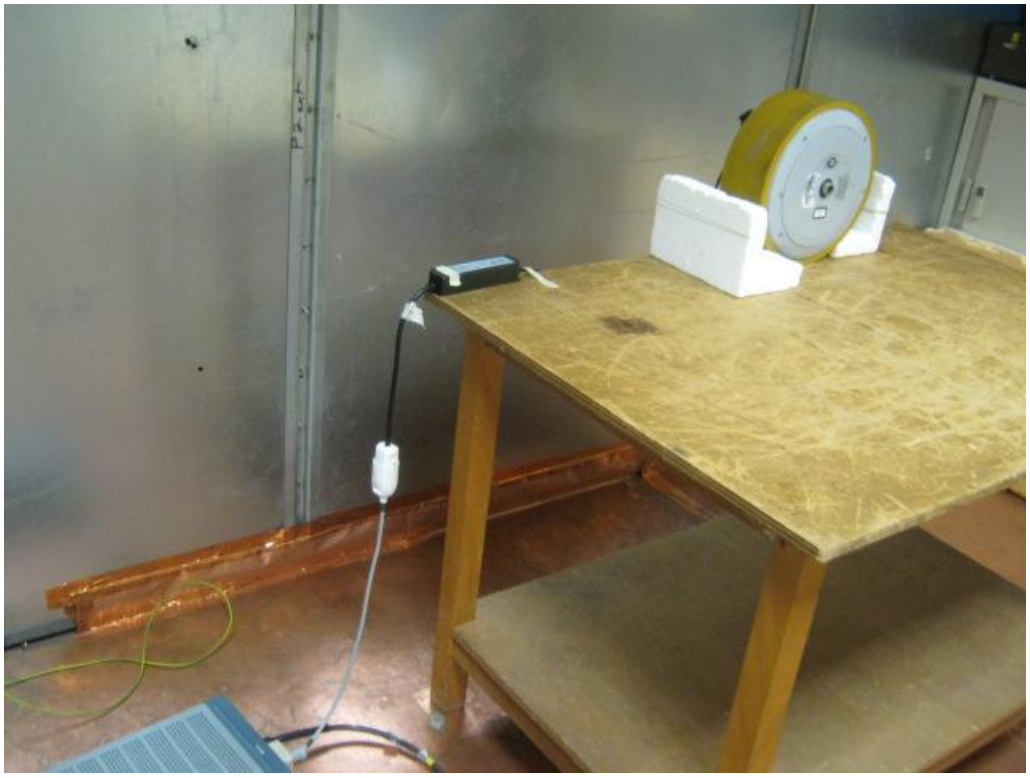
Charging mode



Open area test site

Charging mode

Conducted mode



Modification

The ferrite “742 716 22” from Wurth Elektronik was used during test

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 ESH3-Z5	Rohde & Schwarz	8720
High-pass filter ETP232	SECRE	8641
Absorber sheath current	Emitech	10651
Cable N-4m RG214	GYL Technologies	8572
Power Source 360-AMXT-UPC32	Pacific	8507
Multimeter MN5102B	AOIP	8675
Meteo station	HUGER	8671
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 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
Antenna 3115	Electrometrics	8535
Low-noise amplifier 8447D	Hewlett Packard	8511
Low-noise amplifier C020180F-4B1	Microwave DB	1922
Power source 1251RP	California instruments	8508
Multimeter MN5102B	AOIP	8675
Meteo station WS-9232	La Crosse Technology	8749
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC	0000

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
Antenna 3115	Electrometrics	8535
Multimeter MN5102B	AOIP	8675
Meteo station WS-9232	La Crosse Technology	8750

Maximum peak output power

TYPE	MANUFACTURER	EMITECH NUMBER
Anechoic Chamber	EMITECH	8593
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Antenna 3115	Electrometrics	8535
Multimeter MN5102B	AOIP	8675
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC	0000

Intentional radiator

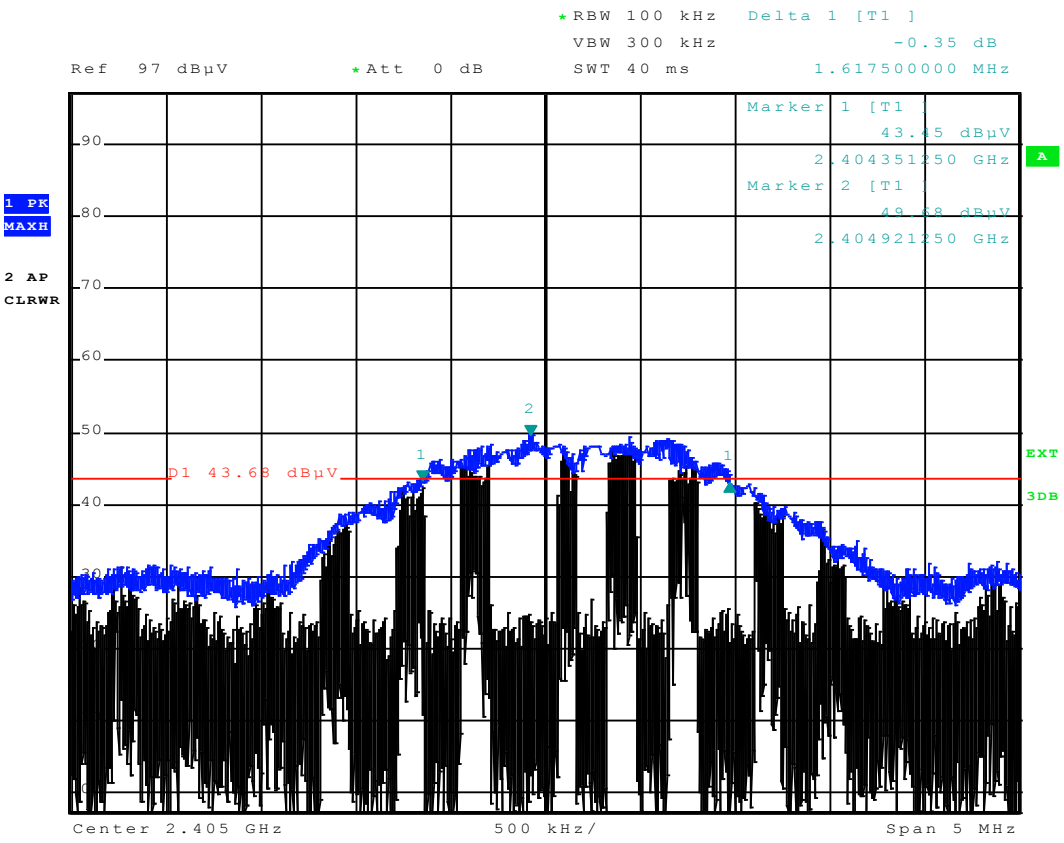
TYPE	MANUFACTURER	EMITECH NUMBER
Open test site	EMITECH	8732
Anechoic Chamber	EMITECH	8593
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESI7	Rohde & Schwarz	8707
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Loop antenna HFH2-Z2	Rohde & Schwarz	8533
Biconical antenna VHBB 9124	Schwarzbeck	8526
Biconical antenna VHA 9103	Schwarzbeck	8528
Log periodic antenna UHALP 9108A	Schwarzbeck	8543
Antenna 3115	Electrometrics	8535
Antenna WR42	IMC	1939
Antenna WR42	IMC	1940
Low-noise amplifier 8447D	Hewlett Packard	8511
Low-noise amplifier C020180F-4B1	Microwave DB	1922
Low-noise amplifier ALN02-0102	ALC Microwave	3036
Reject band filter BRM50702	Microtronics	7299
Multimeter MN5102B	AOIP	8675
Meteo station WS-9232	La Crosse Technology	8749
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC	0000

Peak power density

TYPE	MANUFACTURER	EMITECH NUMBER
Anechoic Chamber	EMITECH	8593
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Spectrum Analyzer FSP40	Rohde & Schwarz	4088
Antenna 3115	Electrometrics	8535
Multimeter MN5102B	AOIP	8675
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC	0000

APPENDIX 4: 6 dB bandwidth

Low channel



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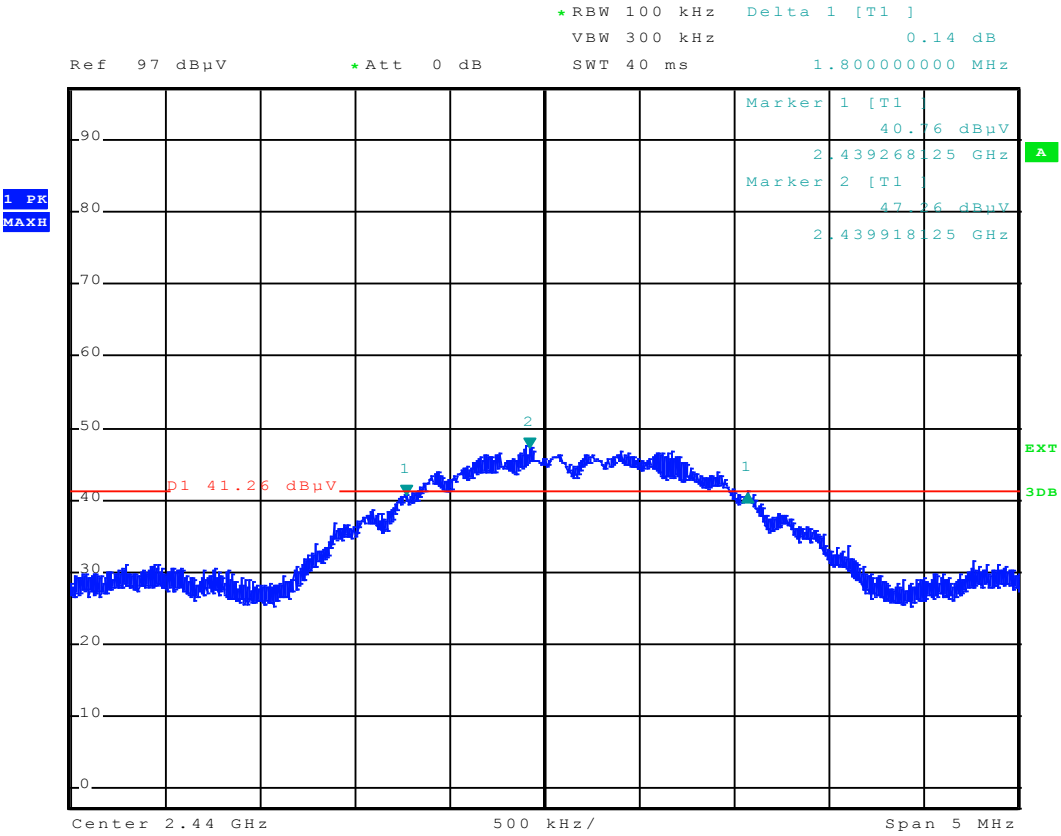
Central channel



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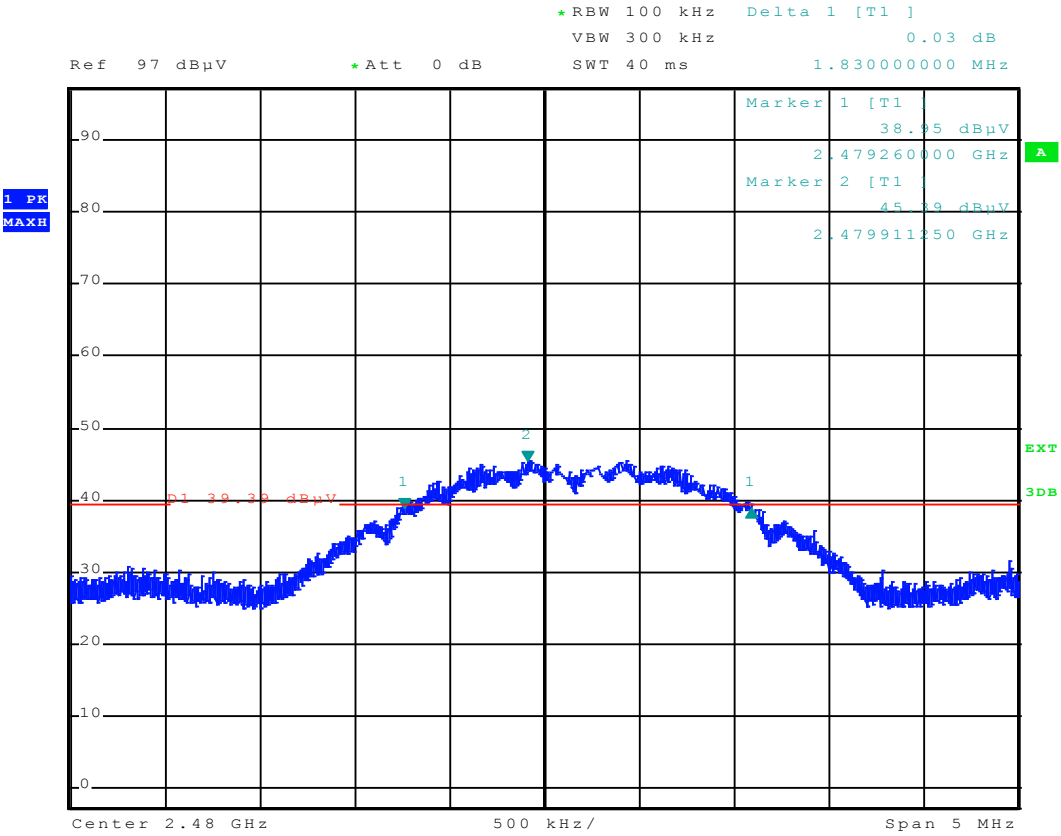
High channel



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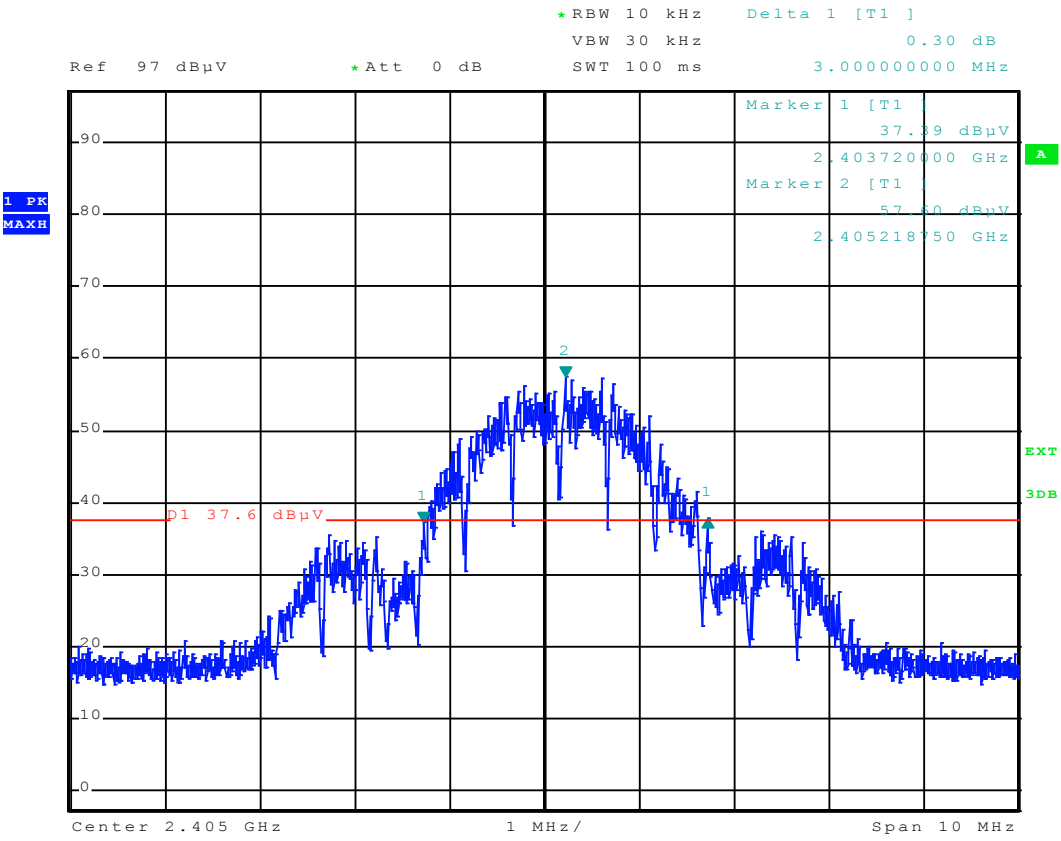
APPENDIX 5: 20 dB bandwidth

Low channel



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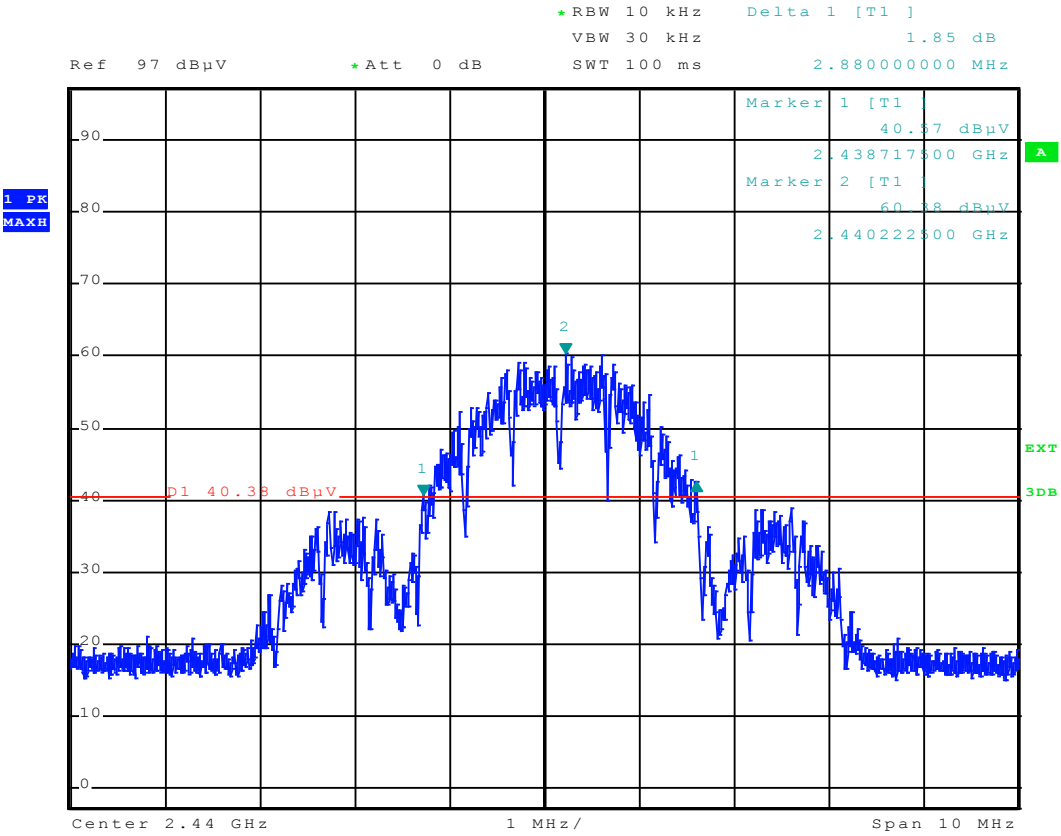
Central channel



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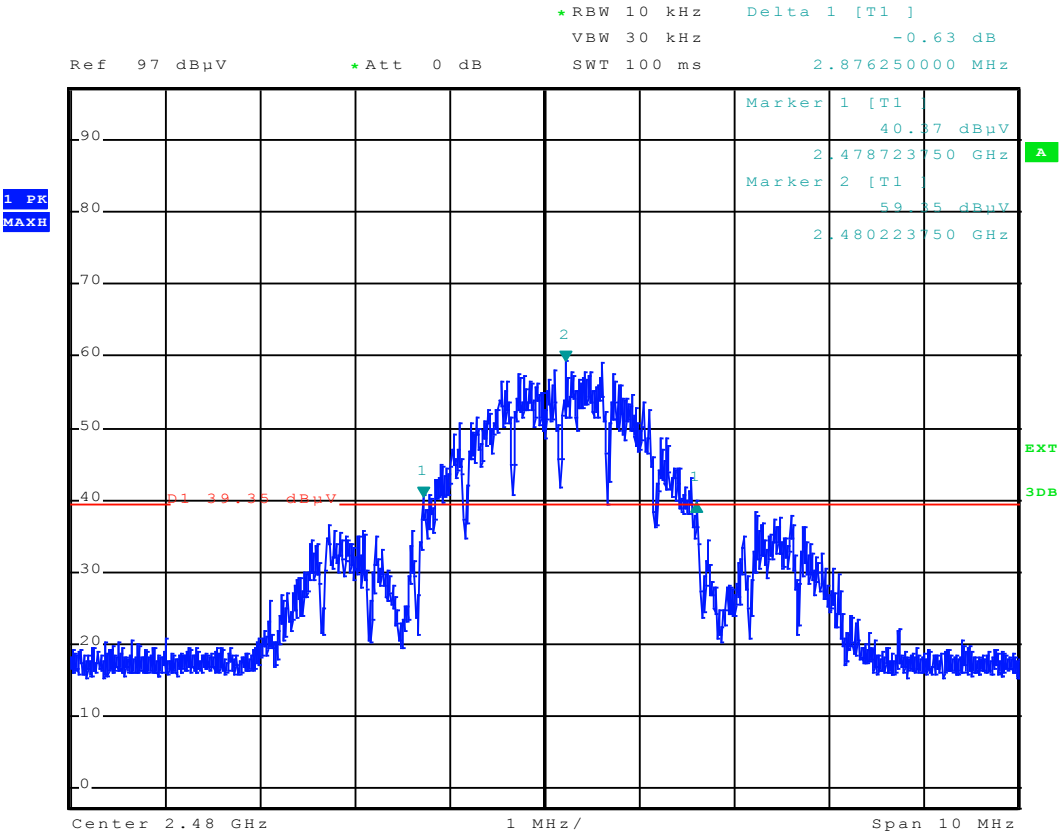
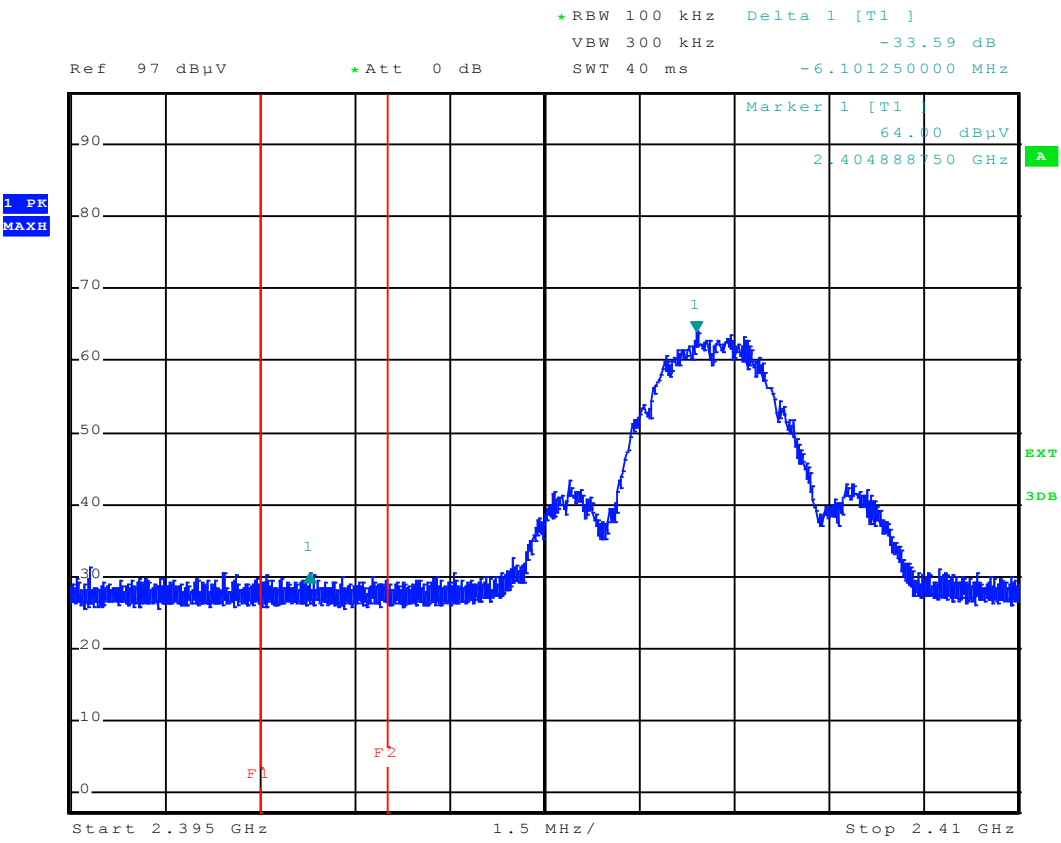
High channel



Date: 17.APR.2014 17:52:28

APPENDIX 6: Band edge

Lower band edge



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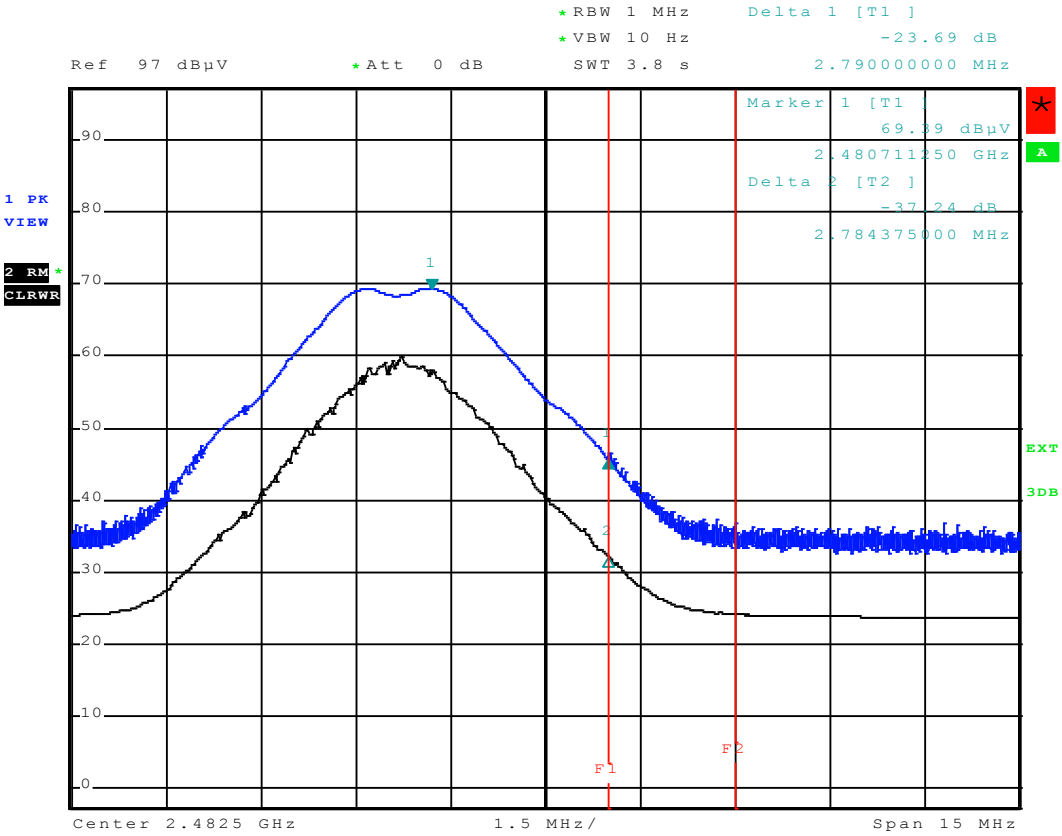
Upper band edge



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