

FCC Test Firm Registration Number: 171131
Industry Canada Test Firm Number: Site# 9545A-1

Matériel testé :
Equipment under test:

HYDRAO FIRST

Constructeur:
Manufacturer: **SMART AND BLUE**
196, route des Vignes
38430 MOIRANS – France

Rapport délivré à :
Issued to: **SMART AND BLUE**
Monsieur Vincent BLIGNY
196, route des Vignes
38430 MOIRANS – France

Marque Commerciale :
Trade Mark: **HYDRAO**

Référence de la proposition :
Proposal number: 092016-22192

Date de l'essai :
Date of test: Du 10 au 18 novembre 2016
November 10th to 18th, 2016

Objectif des essais :
Test purpose: EMC qualification accordingly to following standards:
- CFR 47, FCC Part 15, Subpart C
(Chapter 15.249 - Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHz, and 24.0–24.25 GHz)

FCC ID: 2AKKL1

Lieu du test:
Test location: SMEE CE-Mesures
38 VOIRON - France

Test réalisé par :
Test realized by: Jérémy BLANCHER

Conclusion :
Conclusion: L'équipement satisfait aux prescriptions des normes citées en référence.
The appliance complies with requirements of above mentioned standards.

Ed.	Date	Modifications / Pages	Written by:	Approved by: Visa
1	December 15 th , 2016	Initial Edition	Jeremy Blancher	Laurent Chapus

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COORDONNEES

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SAS au capital de 50 000 € / RC Grenoble B534 796 453 / SIRET 534 796 453 00015 / code APE 7490B / n° TVA : FR 59 534 796 453

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1. Normatives References

FCC qualification according to:		
Standards	Applied	Title
ANSI C63.4 (2014)	X	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
ANSI C63.10 (2013)	X	American National Standard for Testing Unlicensed Wireless Devices
CFR47, Part 15	X	Telecommunication – Federal Communication Commission – Radio frequency devices, Sections 15.107 / 15.109 / 15.207 / 15.209 / 15.249

2. Test synthesis

TEST	Paragraph number FCC Part 15	Spec. FCC Part 15	RESULTS (comments)
Conducted emissions test	15.107 (a) / 15.207 (a)	Table 15.107 (a) / 15.207 (a)	N/A (1)
Radiated emission test	15.109 (a)	Table 15.109 (a)	N/A (2)
Field Strength of fundamental	15.249 (a) (c)	94dBµV/m, Av / 114dBµV/m, Pk @3m (50mV/m, Av @ 3m)	PASS
Field Strength of harmonics	15.249 (a) (c) (e)	54dBµV/m, Av / 74dBµV/m, Pk @3m (0.5mV/m, Av @ 3m)	PASS
Unwanted emissions outside the specified frequency band and harmonics	15.209 / 15.249 (d) (e)	Whichever is less stringent, either: - 50dB below level of fundamental, or; - Table part 15.209 (a), as follow <u>Measure at 300m (Q-Peak detector)</u> 9-490kHz: 2400µV/m/F(kHz) <u>Measure at 30m (Q-Peak detector)</u> 0.490-1.705: 24000µV/m/F(kHz) 1.705-30MHz: 30µV/m <u>Measure at 3m (Q-Peak detector)</u> 30MHz-88MHz : 40 dBµV/m 88MHz-216MHz : 43.5 dBµV/m 216MHz-960MHz : 46.0 dBµV/m Above 960MHz : 54.0 dBµV/m <u>Measure at 3m (Av / Peak detector)</u> Above 1GHz : 54 dBµV/m / 74dBµV/m	PASS

N/A: Not Applicable

(1): No power cable

(2): Equipment functioning only with RF function

• General conclusion:

Measures and tests performed on the sample of the product **HYDRAO FIRST**, in configuration and description presented in this test report, show compliance with standards FCC CFR 47, PART 15, Subpart C.

3. Equipment Under Test (EUT)

**Nom /
Identification**

HYDRAO FIRST

Sn: N.C

**Alimentation /
Power supply**

12V max from internal water turbine

**Auxiliaires /
Auxiliaries**

- Tablet SAMSUNG, model SM-T550 (for BLE communication only)
- Water pump for closed circuit water circulation (equipment powered by water flow)

**Entrées-Sorties /
Input / Output**

	Câbles pour essai / Cables for test	Blindé / Shielded	Prévu pour >3m / Intended for >3m
None	-	-	-

**Version programme /
Firmware version**

N.C

**Mode de fonctionnement /
Running mode**

Equipment is a shower head, powered by internal water turbine
The tested sample is able to:

- Transmit frequencies on low, middle and high channels (Bluetooth Low Energy 4.1)
- Transmit frequencies in advertising mode

**Programme de test /
Test program /**

N.C

• Equipment information:

- Frequency band: 2400 to 2483.5 MHz (Frequencies from 2402MHz to 2480MHz, Tx & Rx)
- Bluetooth chip: ST Microelectronics, model BLUENRG (BLE chip)
- Equipment is configured with maximum RF output power available.
- Antenna type: Integral (PCB antenna), max gain is 0dBi
- Powered by water turbine with 12V maximum
- Equipment intended for use as a portable station
- Equipment designed for continuous operation
- Extreme temperature range: +5°C and +60°C

4. Test conditions

Relative Humidity : 50-55%
Temperature : 19-21°C

Power supply voltage:

Equipment under test : 12V maximum at water turbine

5. Modifications of the EUT

None

6. Special accessory

None

7. Field Strength of fundamental

TEST: Field strength of fundamental / FCC part 15.249			Verdict
<p>Method: Measurements were made in a 3-meter Open Area Test Site (OATS) that complies to ANSI C63.4-2014.</p> <p>Measurements were performed with peak detector using a 100kHz RBW. The VBW is set to 300kHz. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (Peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m.</p> <p>The tested equipment is set to transmit operation with modulations on lowest, middle and highest channel. Three orthogonal axis measurements on EUT are performed to obtain the maximum peak field strength.</p>			Pass
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	10 to 40 °C	19°C	
Relative Humidity	10 to 90 %	60%	
Limits – FCC Part 15.249 (a) (c)			
Frequency (MHz)	Limits (dBµV/m)		Results
	Level / Detector / Distance		
2400 to 2483.5 MHz	94dBµV/m / Avg / 3m 114dBµV/m / Pk / 3m		Pass
Supplementary information: Test location: SMEE – CE Mesures / Test date: November 10 th , 2016 Power supply voltage: 12V max at water turbine			

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Measuring Rec.	Rohde&Schwarz	ESRP	REC-151-002	2015/7	2018/7
Horn antenna	ETS-LINDGREN	3115	ANT-141-013	2015/7	2018/7
RF cable	Div	OATS/25m	CAB-101-017	2016/3	2017/3
OATS	Div	3 / 10m	SIT-101-001	2016/8	2017/8
Antenna mast	Innco- Systems	MA4000EP	MAT-101-001	-	-
Turntable	Innco- Systems	DS1200S	PLA-101-001	-	-

Tabulated Results for Field Strength of fundamental				
FREQ	Field Strength 3m	Detector	Limit	Result
(MHz)	(dBμV/m)		(dBμV/m)	
2402.0	76.5	Pk	94 Av / 114 Pk	Pass
2440.0	76.5	Pk	94 Av / 114 Pk	Pass
2480.0	77.0	Pk	94 Av / 114 Pk	Pass
RBW:		1MHz		
Measurement distance:		3m		
Limit:		FCC Part 15.249 (a) (c)		
Final measurement detector:		Peak		
Wide Measurement Uncertainty:		± 5.2dB (k=2)		
RESULT:		PASS		
Note:		<p>(1): The field strength (level) is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation is as follow:</p> $FS = RA + AF + CF - AG$ <p>Where FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Factor AG = Amplifier Gain</p> <p>Total factor (dB) is AF + CF – AG Margin value = Emission level – Limit value</p>		

8. Field Strength of harmonics

TEST: Field Strength of harmonics / FCC part 15.249		Verdict
<p><u>Method:</u> Measurements were made in a 3-meter Open Area Test Site (OATS) that complies to ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (Peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.</p> <p>The tested equipment is set to transmit operation with modulations on lowest, middle and highest channel. Three orthogonal axis measurements on EUT are performed to obtain the maximum peak field strength.</p> <p>A pre-scan frequency identification of the EUT has been performed in full anechoic chamber. The measured radiated field of the EUT is performed at distance of 3-meters. Above 1GHz, the measuring antenna is put closer to EUT. In this case, 3-meter correction factor is added. Antenna is 1.25-meters high.</p>		Pass
Laboratory Parameters:	Required prior to the test	During the test
Ambient Temperature	10 to 40 °C	20°C
Relative Humidity	10 to 90 %	55%
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point
	30MHz – 26GHz	3 m measurement distance
Limits – FCC Part 15.249 (a) (c) (e)		
Frequency bands for harmonics (MHz)	Limits (dBµV/m)	
	Level / Detector / Distance	Results
4800 to 4967	54.0 / AV / 3m 74.0 / PK / 3m	Pass
7200 to 7450.5	54.0 / AV / 3m 74.0 / PK / 3m	Pass
9600 to 9934	54.0 / AV / 3m 74.0 / PK / 3m	Pass
12000 to 12417.5	54.0 / AV / 3m 74.0 / PK / 3m	Pass
14400 to 14901	54.0 / AV / 3m 74.0 / PK / 3m	Pass
16800 to 17384.5	54.0 / AV / 3m 74.0 / PK / 3m	Pass
19200 to 19868	54.0 / AV / 3m 74.0 / PK / 3m	Pass
21600 to 22351.5	54.0 / AV / 3m 74.0 / PK / 3m	Pass
24000 to 24835	54.0 / AV / 3m 74.0 / PK / 3m	Pass
<p>Supplementary information:</p> <p>Test location: SMEE – CE Mesures / Test date: November 10th, 2016</p> <p>Power supply voltage: 12V max at water turbine</p>		

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Log-periodic antenna	TDK	PLP3003	ANT-101-001	2016/8	2017/8
Biconnic antenna	COM-POWER	AB- 900	ANT-101-003	2016/8	2017/8
Loop antenna	EMCO	6502	ANT-101-009	2016/8	2017/8
BiConiLog antenna	EMCO	3142B	ANT-101-010	2016/8	2017/8
Horn antenna	ETS-LINDGREN	3115	ANT-141-013	2015/7	2018/7
Horn antenna	ETS-LINDGREN	3116	ANT-161-014	2012/4	2019/4
RF cable	Div	OATS/25m	CAB-101-019	2016/3	2017/3
RF cable	Pasternack	PE302-120	CAB-131-024	2016/3	2017/3
RF cable	HUBER+SUHNER	RG214U	CAB-141-026	2016/3	2017/3
RF cable	HUBER+SUHNER	RG214U	CAB-141-029	2016/3	2017/3
RF cable	HUBER+SUHNER	SF104	CAB-141-030	2016/3	2017/3
High-pass filter	Mini-Circuit	VHF-3100+	FIL-151-006	2016/3	2017/3
Pre-amplifier	PE	PE1524	PRE-101-002	2016/3	2017/3
Anechoic chamber	COMTEST	214263	CAG-141-001	-	-
OATS	Div	10m	SIT-101-001	2016/8	2017/8
Antenna mast	Innco- Systems	MA4000EP	MAT-101-001	-	-
Turntable	Innco- Systems	DS1200S	PLA-101-001	-	-
Turntable	Innco- Systems	CT0800	PLA-141-001	-	-
Measuring Rec	Rohde&Schwarz	ESRP	REC-151-002	2015/7	2018/7
Spectrum analyzer	AGILENT HP	8563E	ASP-111-003	2016/9	2018/9

Tabulated Results for Field strength of harmonics (1GHz-26GHz)				
FREQ (MHz)	Field level dBμV/m	Detector	Limit (dBμV/m)	Result
4960.0	46.7	Pk	54 Av / 74 Pk	Pass
7206.0	50.1	Pk	54 Av / 74 Pk	Pass
7320.0	49.6	Pk	54 Av / 74 Pk	Pass
7440.0	50.7	Pk	54 Av / 74 Pk	Pass
9608.0	50.8	Pk	54 Av / 74 Pk	Pass
9760.0	50.9	Pk	54 Av / 74 Pk	Pass
9920.0	50.5	Pk	54 Av / 74 Pk	Pass
RBW / VBW		1MHz / 3MHz (Peak) 1MHz / 10Hz (AV)		
Measurement distance:		3m		
Limit:		FCC Part 15.249 (a) (c) (e)		
Final measurement detector:		Peak / Average		
Wide Measurement Uncertainty:		± 5.2dB (k=2)		
RESULT:		PASS		
Notes:		<p>(1): The field strength (level) is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation is as follow: $FS = RA + AF + CF - AG$ Where FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Factor AG = Amplifier Gain Total factor (dB) is $AF + CF - AG$ Margin value = Emission level – Limit value</p> <p>(2): Peak pre-scans not performed at 3-meters distance are corrected as follow: $M@3m = M@D_m + 20 \times \log(D_m / 3_m)$ Where D is the measurement distance in meter</p> <p>(3): All frequencies not specified have margin < -10dB (for peak and average detector)</p>		

9. Unwanted emissions

TEST: Unwanted emissions outside fundamental and harmonics bands / FCC part 15.209, 15.249		Verdict
<p>Method: Measurements were made in a 10 or 3-meter Open Area Test Site (OATS) that complies to ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (Peak, Quasi-peak, Average) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.</p> <p>A pre-scan frequency identification of the EUT has been performed in full anechoic chamber. The measured radiated field of the EUT is performed at distance of 3-meters. Above 1GHz, the measuring antenna is put closer to EUT. In this case, 3-meter correction factor is added. Antenna is 1.25-meters high.</p>		Pass
Laboratory Parameters:	Required prior to the test	During the test
Ambient Temperature	10 to 40 °C	20°C
Relative Humidity	10 to 90 %	55%
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point
	9kHz – 30MHz	10 m measurement distance
	30MHz – 26GHz	3 m measurement distance
Limits – FCC Part 15.209, 15.249 (d) (e)		
Whichever is less stringent, either:		
Frequency (MHz)	Limits (dBµV/m)	
	Level / Detector / Distance	Results
30 to 1000	50dB below the fundamental / QP / 3m	Not used
Above 1GHz	50dB below the fundamental / Av / 3m 30dB below the fundamental / Pk / 3m	Not used
Or		
Frequency (MHz)	Limits (dBµV/m)	
	Level / Detector / Distance	Results
0.009 to 0.490	107.6 to 72.9 / QP / 10m	Pass
0.490 to 1.705	52.9 to 42.1 / QP / 10m	Pass
1.705 to 30	48.6 / QP / 10m	Pass
30 to 88	40.0 / QP / 3m	Pass
88 to 216	43.5 / QP / 3m	Pass
216 to 960	46.0 / QP / 3m	Pass
960 to 1000	54.0 / QP / 3m	Pass
Above 1GHz	54.0 / AV / 3m 74.0 / PK / 3m	Pass
<p>Supplementary information:</p> <p>Test location: SMEE – CE Mesures / Test date: November 10th & 18th, 2016</p> <p>Power supply voltage: 12V max at water turbine</p>		

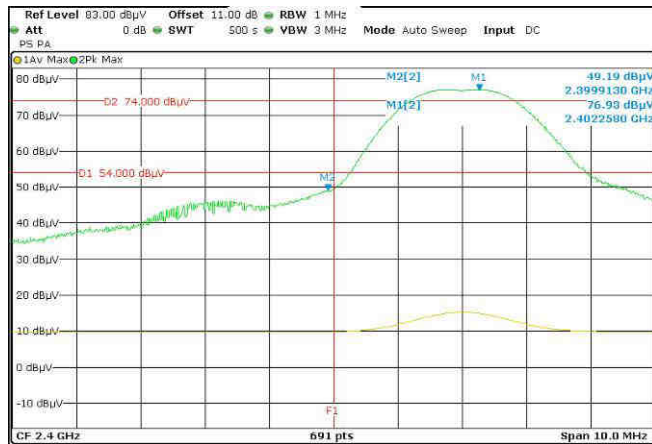
Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Log-periodic antenna	TDK	PLP3003	ANT-101-001	2016/8	2017/8
Biconnic antenna	COM-POWER	AB- 900	ANT-101-003	2016/8	2017/8
Loop antenna	EMCO	6502	ANT-101-009	2016/8	2017/8
BiConiLog antenna	EMCO	3142B	ANT-101-010	2016/8	2017/8
Horn antenna	ETS-LINDGREN	3115	ANT-141-013	2015/7	2018/7
Horn antenna	ETS-LINDGREN	3116	ANT-161-014	2012/4	2019/4
RF cable	Div	OATS/25m	CAB-101-019	2016/3	2017/3
RF cable	Pasternack	PE302-120	CAB-131-024	2016/3	2017/3
RF cable	HUBER+SUHNER	RG214U	CAB-141-026	2016/3	2017/3
RF cable	HUBER+SUHNER	RG214U	CAB-141-029	2016/3	2017/3
RF cable	HUBER+SUHNER	SF104	CAB-141-030	2016/3	2017/3
High-pass filter	Mini-Circuit	VHF-3100+	FIL-151-006	2016/3	2017/3
Pre-amplifier	PE	PE1524	PRE-101-002	2016/3	2017/3
Anechoic chamber	COMTEST	214263	CAG-141-001	-	-
OATS	Div	10m	SIT-101-001	2016/8	2017/8
Antenna mast	Innco- Systems	MA4000EP	MAT-101-001	-	-
Turntable	Innco- Systems	DS1200S	PLA-101-001	-	-
Turntable	Innco- Systems	CT0800	PLA-141-001	-	-
Measuring Rec	Rohde&Schwarz	ESRP	REC-151-002	2015/7	2018/7
Spectrum analyzer	AGILENT HP	8563E	ASP-111-003	2016/9	2018/9

Tabulated Results for Unwanted emissions (9kHz-30MHz)						
FREQ	RF field @ 30m	Limit @ 30m	Margin	Antenna angle	Table angle	Correc. Fact. (CF)
MHz	(QP) dBμV/m	(QP) dBμV/m	dB	Degree	Degree	dB
Margin < -10dB						
Supplementary information: Frequency list measured on the Open Area Test Site has been created with pre-scan results.						
Frequency band investigated:		9kHz-30MHz				
RBW:		200Hz (9kHz-150kHz)				
		9kHz (150kHz-30MHz)				
Measurement distance:		10m				
Limit:		FCC Part 15.209 – 15.249				
Final measurement detector:		Quasi-Peak				
Wide Measurement Uncertainty:		± 5 dB (k=2)				
Note:		CF: Correction factor = Antenna factor + Cable loss *1: Measure have been done at 10m distance and corrected according to requirements of 15.209.e) (M@30m = M@10m-19.1dB)				

Tabulated Results for Unwanted emissions (30MHz-1GHz)					
FREQ	Meter reading	Total factor	Field level	Limit	Margin
MHz	(QP) dBμV	dB	(QP) dBμV/m	(QP) dBμV/m	dB
Margin < -10dB					
Supplementary information: Frequency list measured on the Open Area Test Site has been created with pre-scan results.					
Frequency band investigated:		30MHz-1GHz			
RBW:		120kHz			
Measurement distance:		3m			
Limit:		FCC Part 15.209 – 15.249			
Final measurement detector:		Quasi-Peak			
Wide Measurement Uncertainty:		± 5.2dB (k=2)			
RESULT:		PASS			
Notes:		(1): The field strength (level) is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation is as follow: $FS = RA + AF + CF - AG$ Where FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Factor AG = Amplifier Gain Total factor (dB) is AF + CF – AG Margin value = Emission level – Limit value			

Tabulated Results for Unwanted emissions (1GHz-26GHz)				
FREQ (MHz)	Field level dBμV/m	Detector	Limit (dBμV/m)	Result
2400.0	49.2	Pk	54 Av / 74 Pk	Pass
2483.5	48.0	Pk	54 Av / 74 Pk	Pass
RBW / VBW		1MHz / 3MHz (Peak) 1MHz / 10Hz (AV)		
Measurement distance:		3m		
Limit:		FCC Part 15.209 – 15.249		
Final measurement detector:		Peak / Average		
Wide Measurement Uncertainty:		± 5.2dB (k=2)		
RESULT:		PASS		
Notes:		<p>(1): The field strength (level) is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation is as follow: $FS = RA + AF + CF - AG$ Where FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Factor AG = Amplifier Gain Total factor (dB) is $AF + CF - AG$ Margin value = Emission level – Limit value</p> <p>(2): Limits used are FCC part 15.209: Less stringent than fundamental field strength minus 50dB 15.249 limits → 26.5dBμV/m Av @ 3m (= 76.5dBμV/m - 50dB)</p> <p>(3): Peak pre-scans not performed at 3-meters distance are corrected as follow: $M@3m = M@D_m + 20 \times \log(D_m / 3_m)$ Where D is the measurement distance in meter</p> <p>(4): All frequencies not specified have margin < -10dB (for peak and average detector)</p>		

Graphical representation of Band-edge compliance (Radiated)



Low band-edge compliance

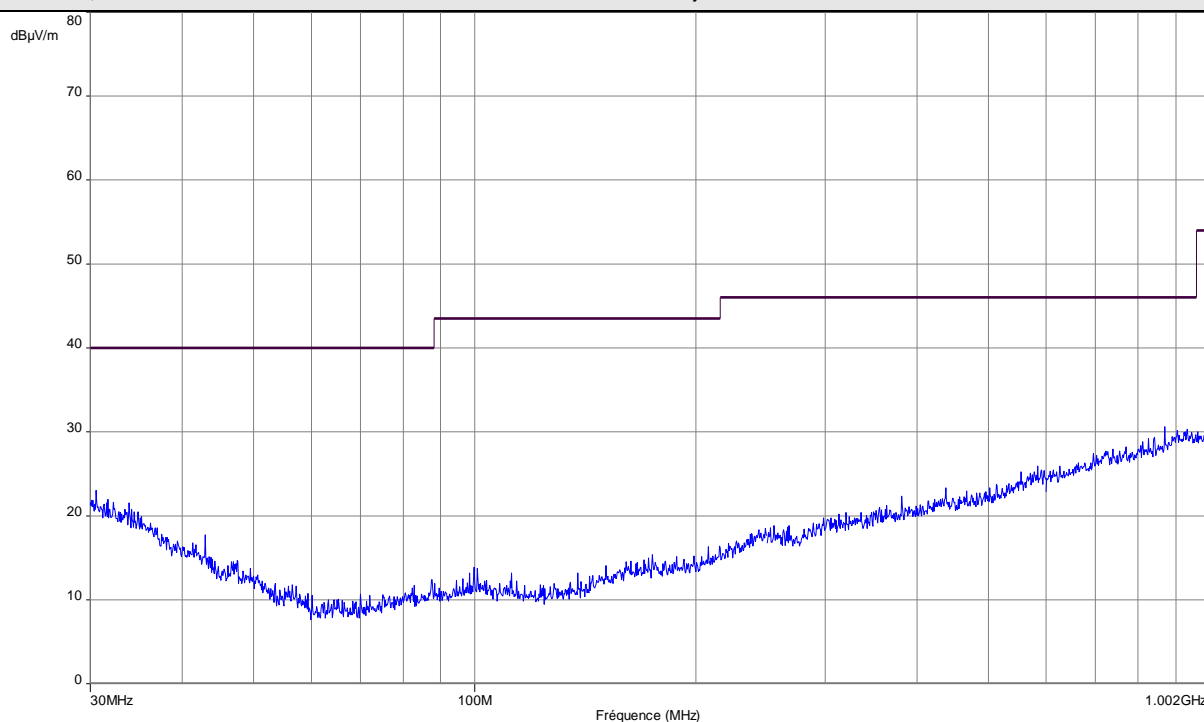
F1 = 2400MHz
Peak level below 2400MHz is 49.2dBμV/m max at 3m
(Average limit is 54dBμV/m - Peak limit is 74dBμV/m @ 3m)
RESULT: PASS
Note: Radiated measurement



High band-edge compliance

F1 = 2483.5MHz
Peak level below 2483.5MHz is 48.0dBμV/m max at 3m
(Average limit is 54dBμV/m - Peak limit is 74dBμV/m @ 3m)
RESULT: PASS
Note: Radiated measurement

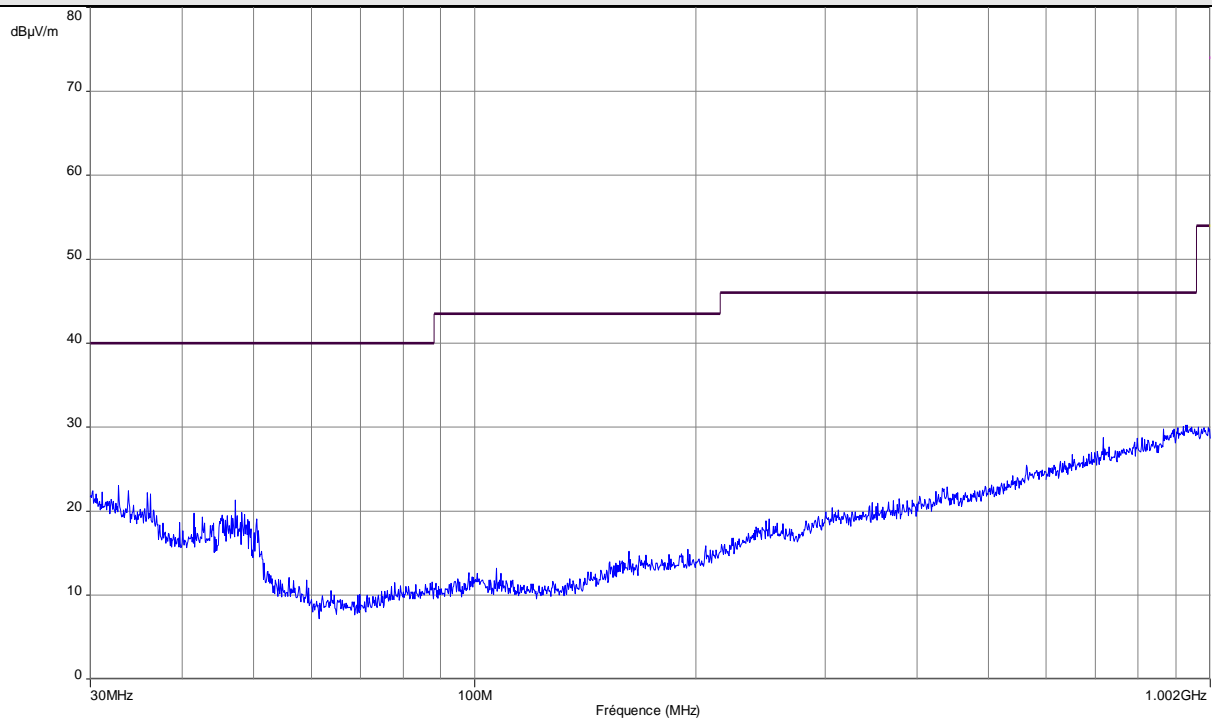
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 30MHz-1GHz / 3m / Horizontal / Transmit mode)



Notes: Pre-scan graph only for identification purpose.
Same result for transmit mode at 2402MHz, 2440MHz or 2480MHz.

Frequency band investigated:	30MHz-1GHz
Unit :	dBµV/m
RBW :	100kHz
Antenna polarization :	Horizontal
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

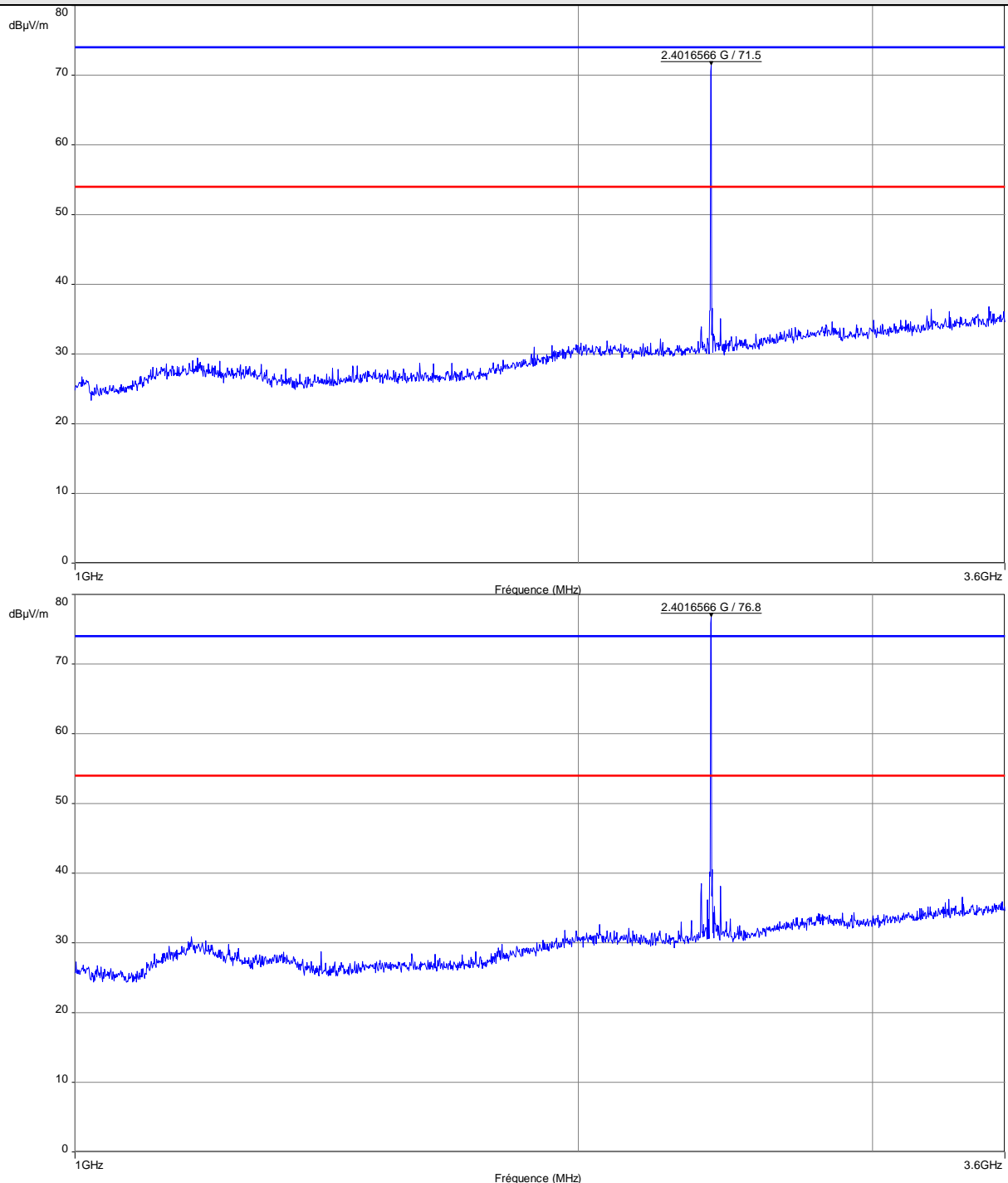
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 30MHz-1GHz / 3m / Vertical / Transmit mode)



Notes: Pre-scan graph only for identification purpose.
Same result for transmit mode at 2402MHz, 2440MHz or 2480MHz.

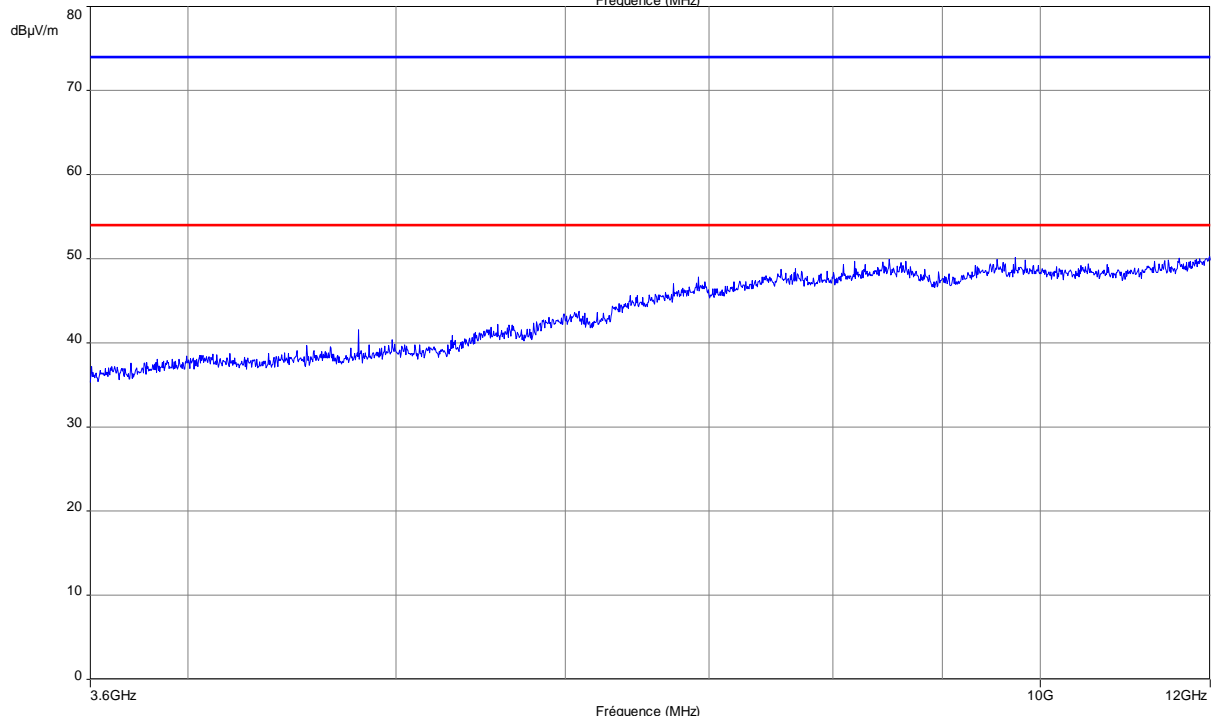
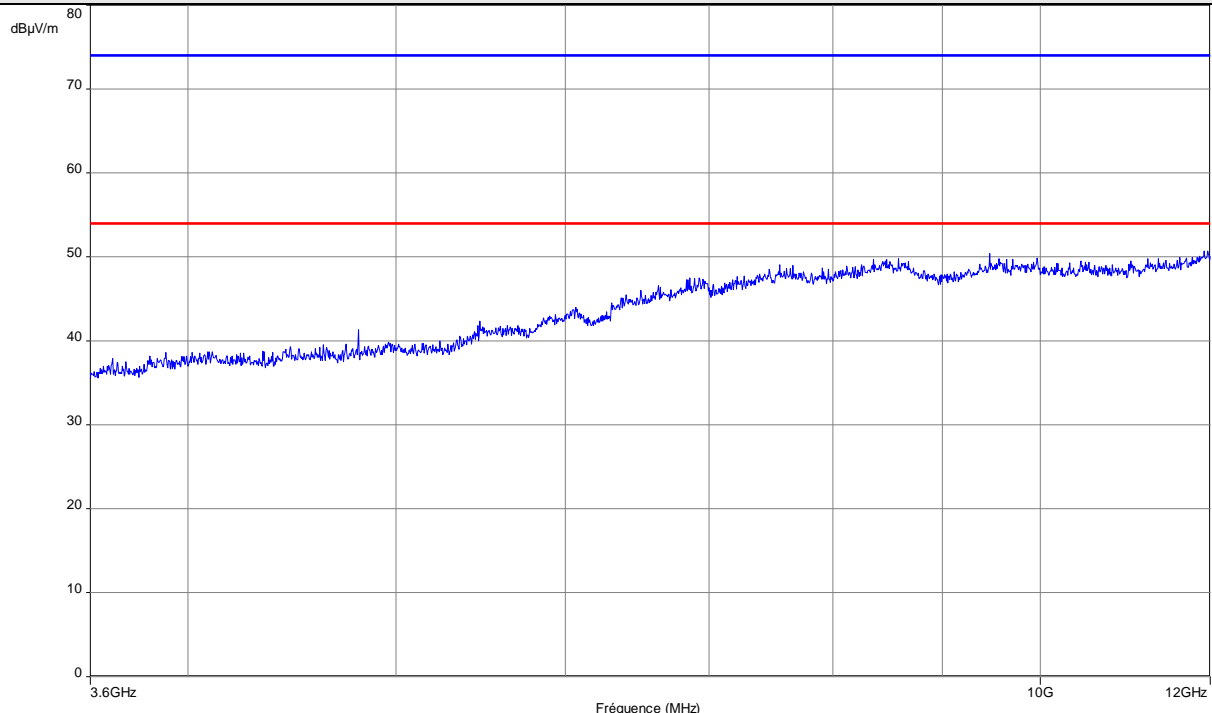
Frequency band investigated:	30MHz-1GHz
Unit :	dBμV/m
RBW :	100kHz
Antenna polarization :	Vertical
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 1GHz-3.6GHz / 3m / Horizontal & Vertical / Transmit mode at 2402MHz)



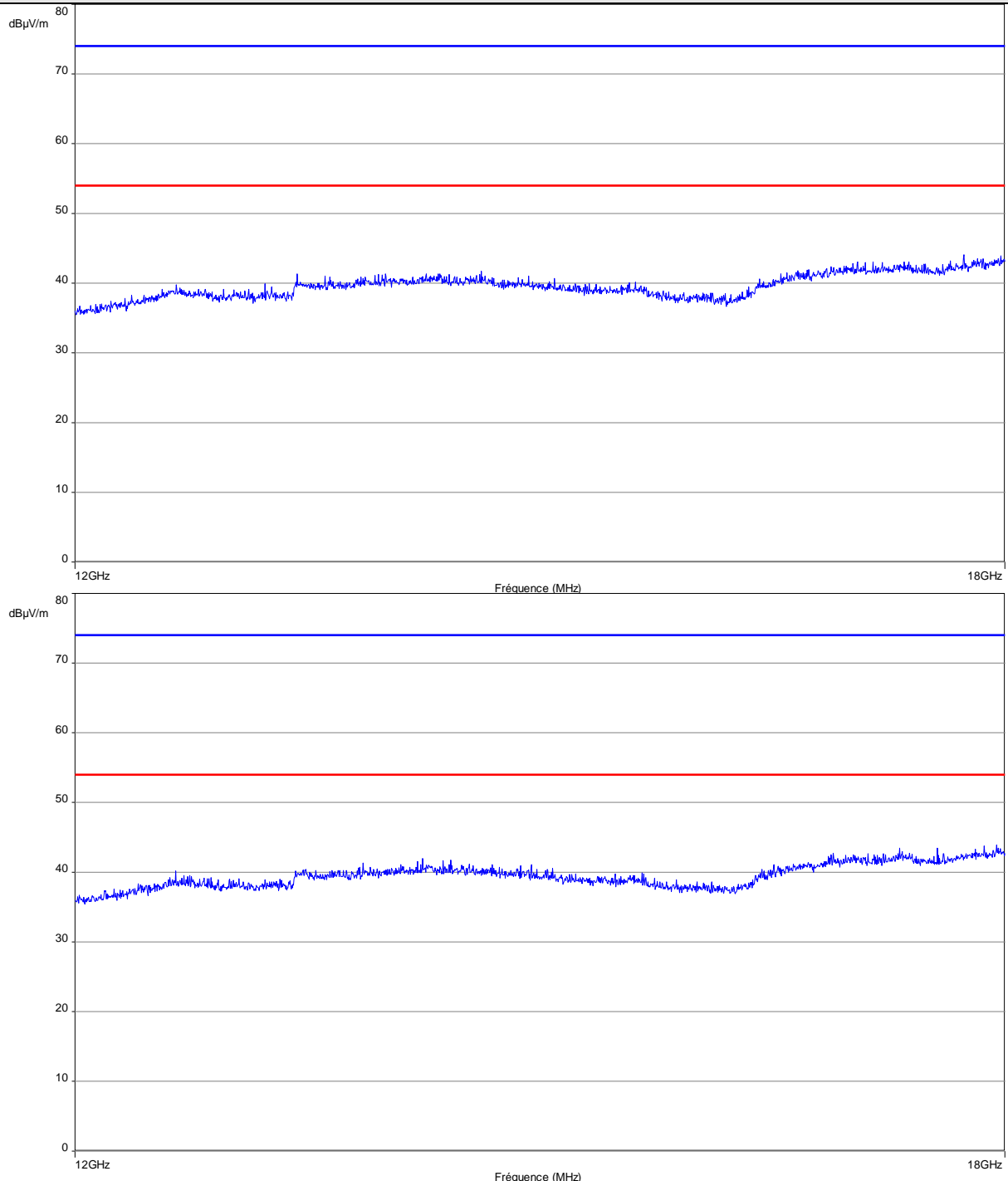
Frequency band investigated:	1GHz-3.6GHz
Unit :	dBμV/m
RBW :	1MHz
Antenna polarization :	Horizontal & Vertical
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 3.6GHz-12GHz / 3m / Horizontal & Vertical / Transmit mode at 2402MHz)



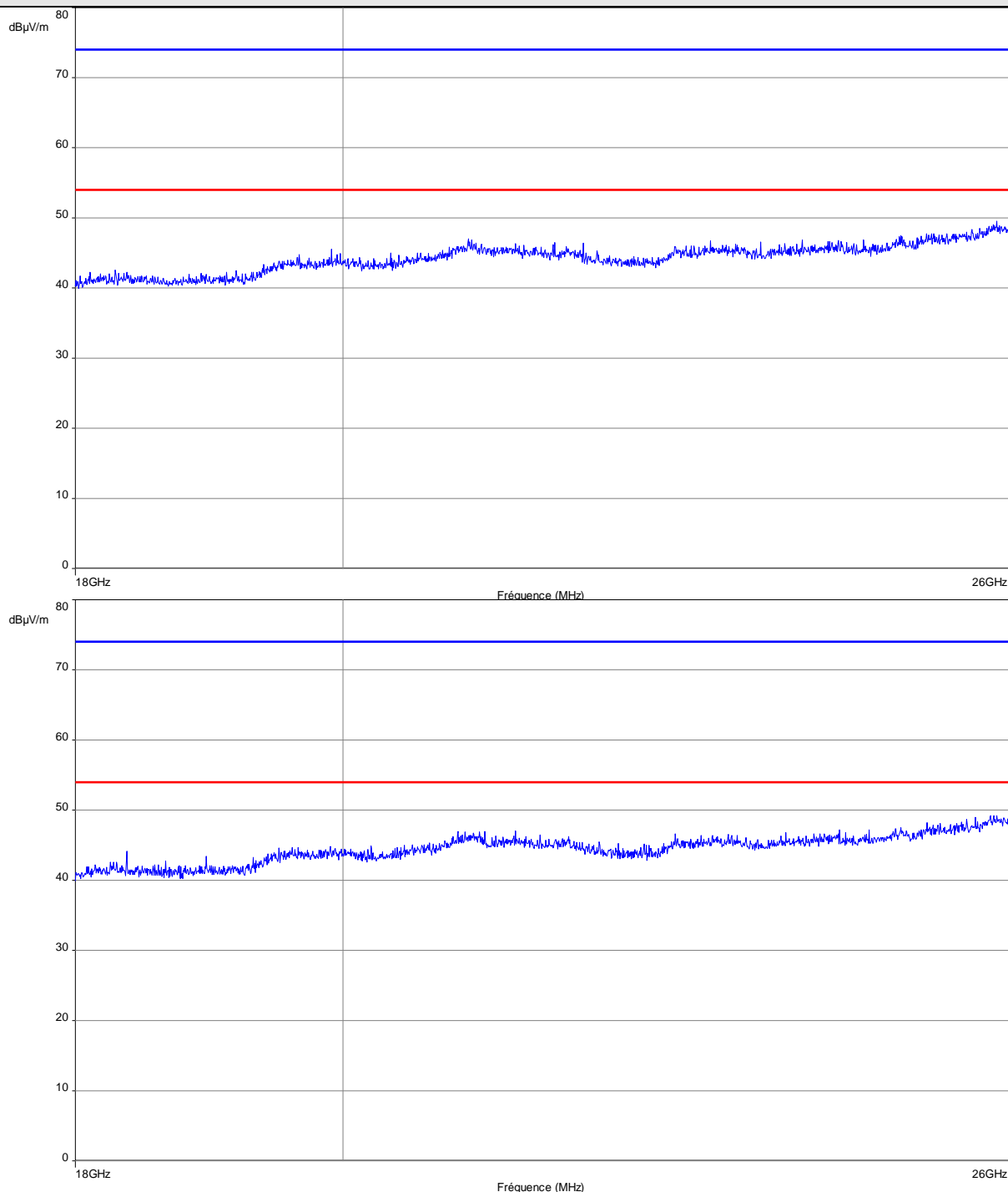
Frequency band investigated:	3.6GHz-12GHz
Unit :	dBμV/m
RBW :	1MHz
Antenna polarization :	Horizontal & Vertical
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 12GHz-18GHz / 3m / Horizontal & Vertical / Transmit mode at 2402MHz)



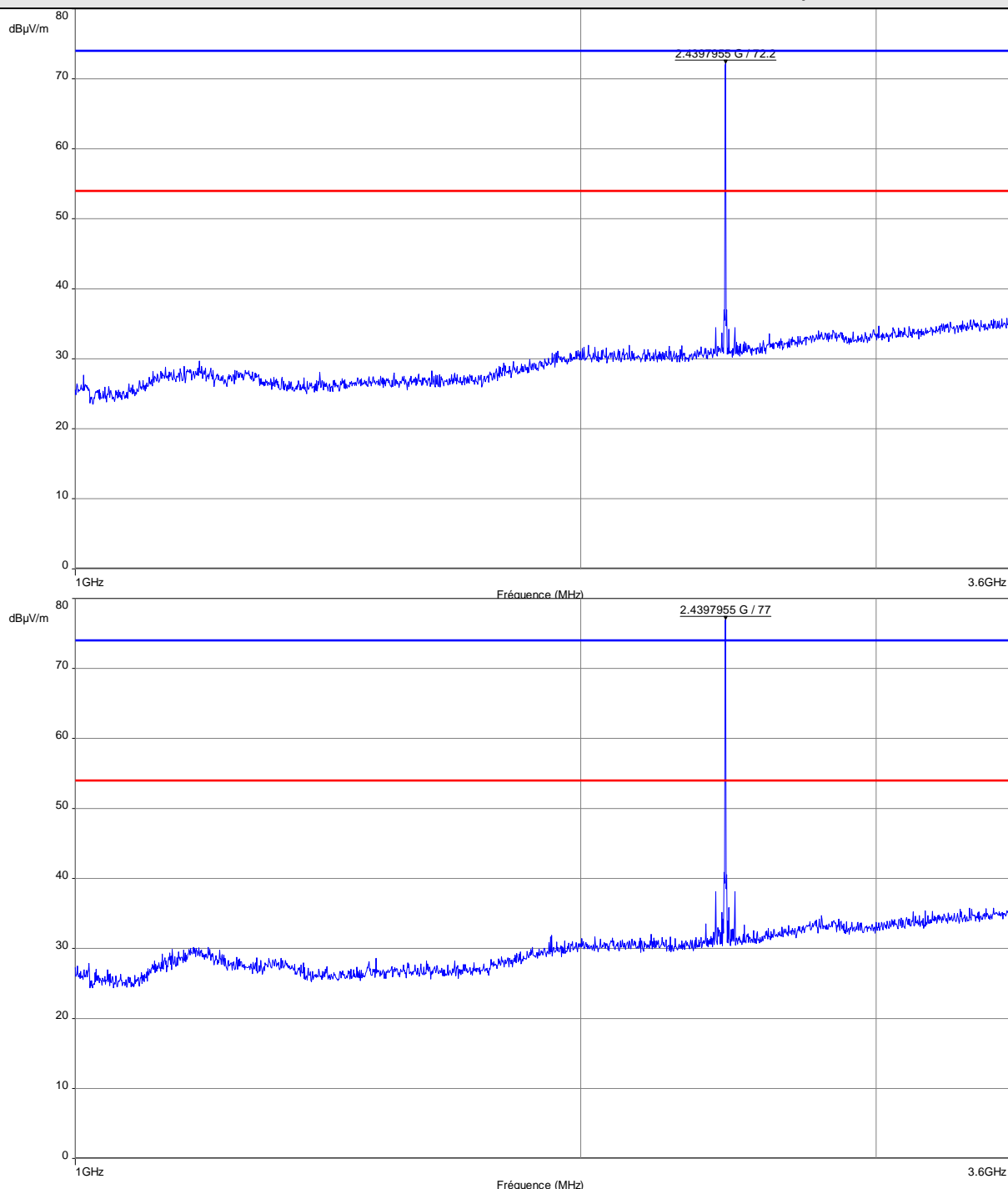
Frequency band investigated:	12GHz-18GHz
Unit :	dBµV/m
RBW :	1MHz
Antenna polarization :	Horizontal & Vertical
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 18GHz-26GHz / 3m / Horizontal & Vertical / Transmit mode at 2402MHz)



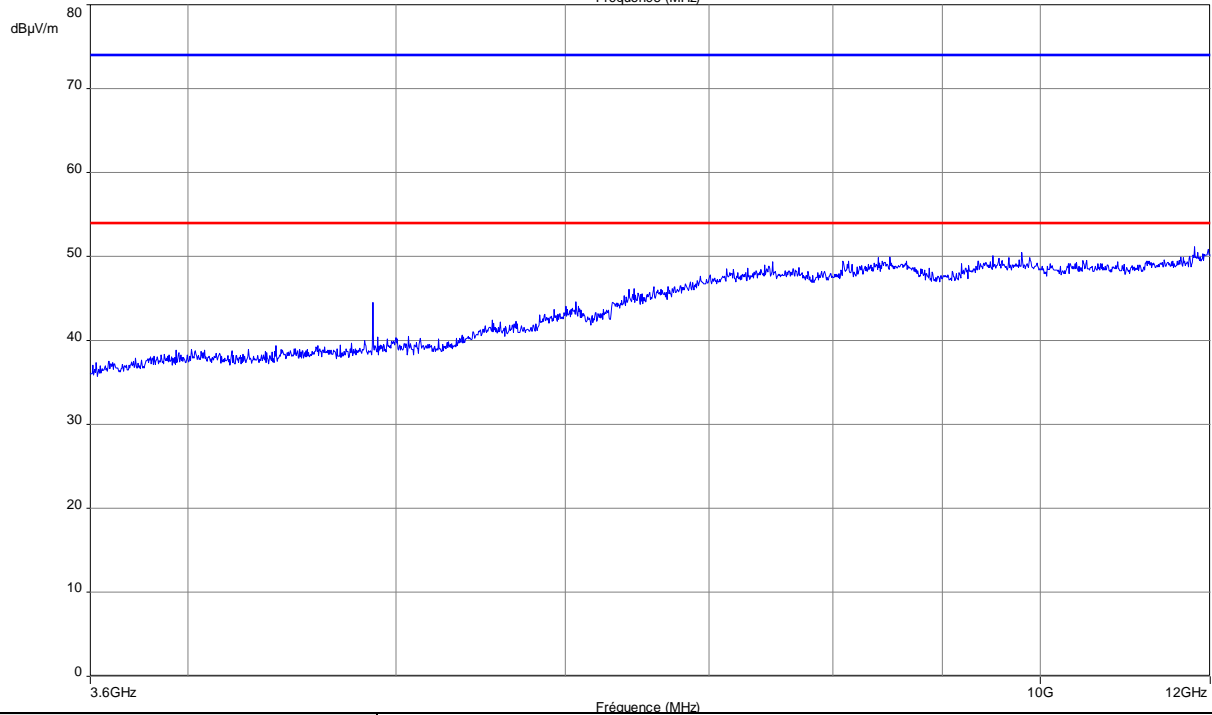
Frequency band investigated:	18GHz-26GHz
Unit :	dBμV/m
RBW :	1MHz
Antenna polarization :	Horizontal & Vertical
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 1GHz-3.6GHz / 3m / Horizontal & Vertical / Transmit mode at 2440MHz)



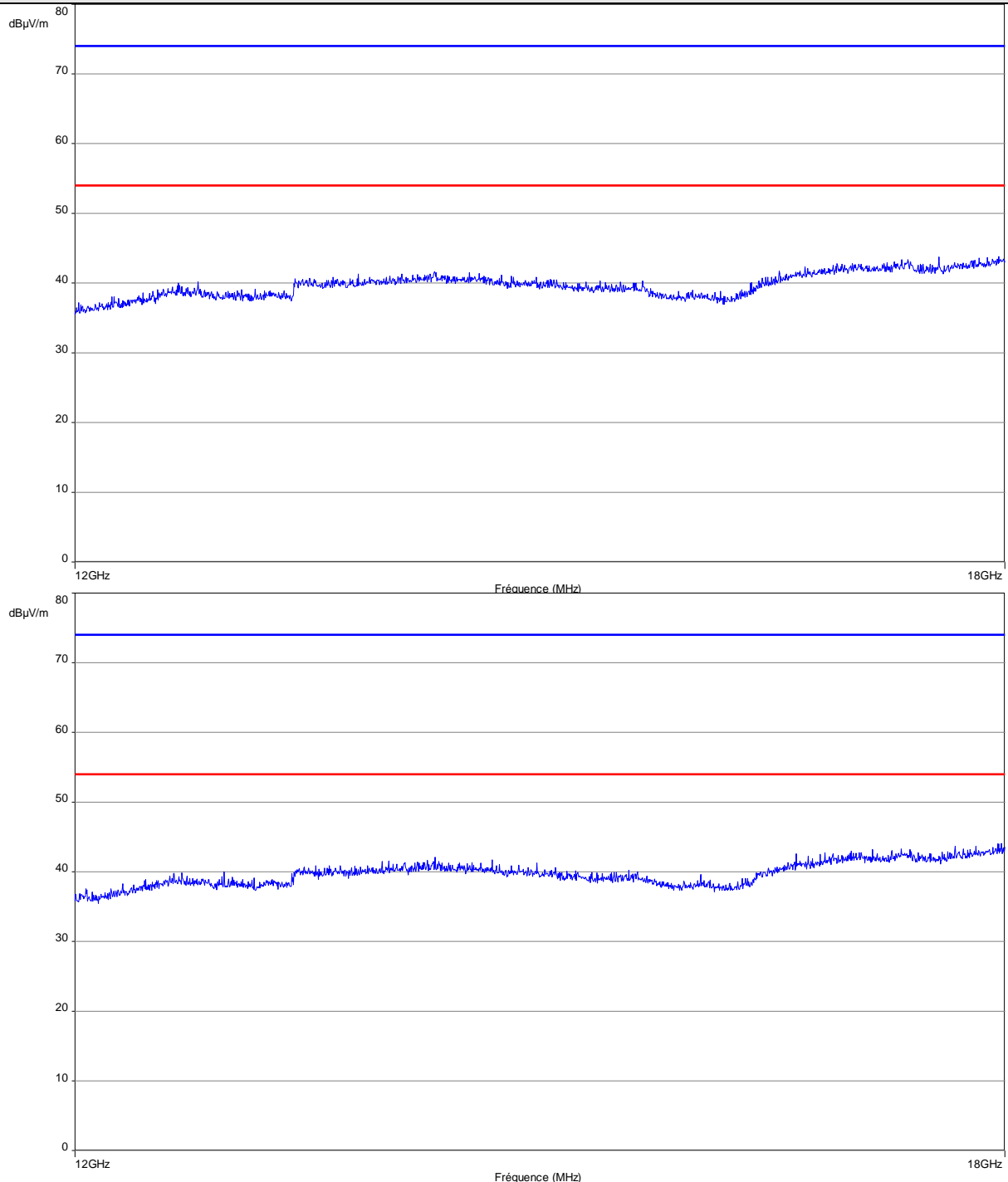
Frequency band investigated:	1GHz-3.6GHz
Unit :	dBμV/m
RBW :	1MHz
Antenna polarization :	Horizontal & Vertical
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 3.6GHz-12GHz / 3m / Horizontal & Vertical / Transmit mode at 2440MHz)



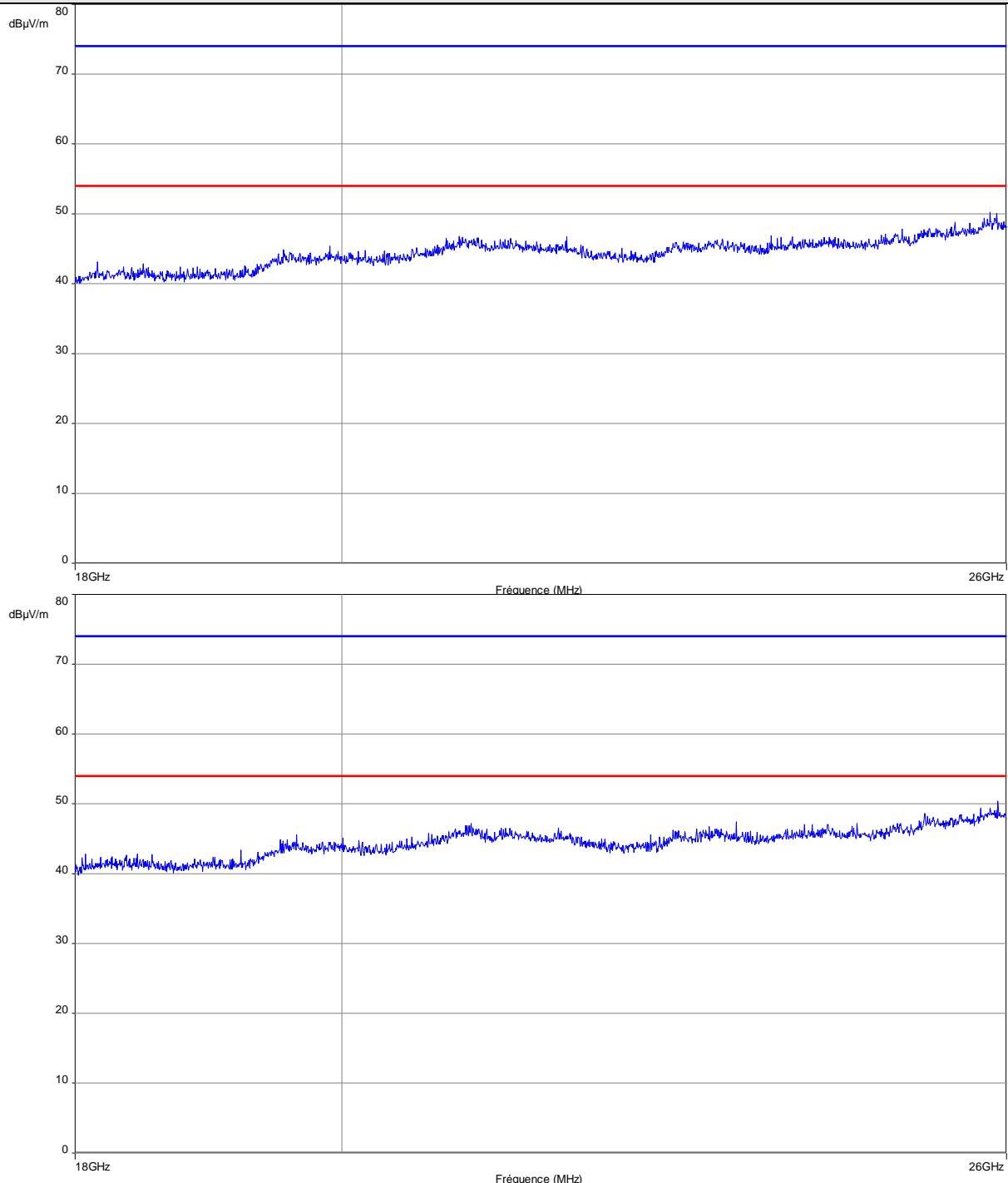
Frequency band investigated:	3.6GHz-12GHz
Unit :	dBμV/m
RBW :	1MHz
Antenna polarization :	Horizontal & Vertical
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 12GHz-18GHz / 3m / Horizontal & Vertical / Transmit mode at 2440MHz)



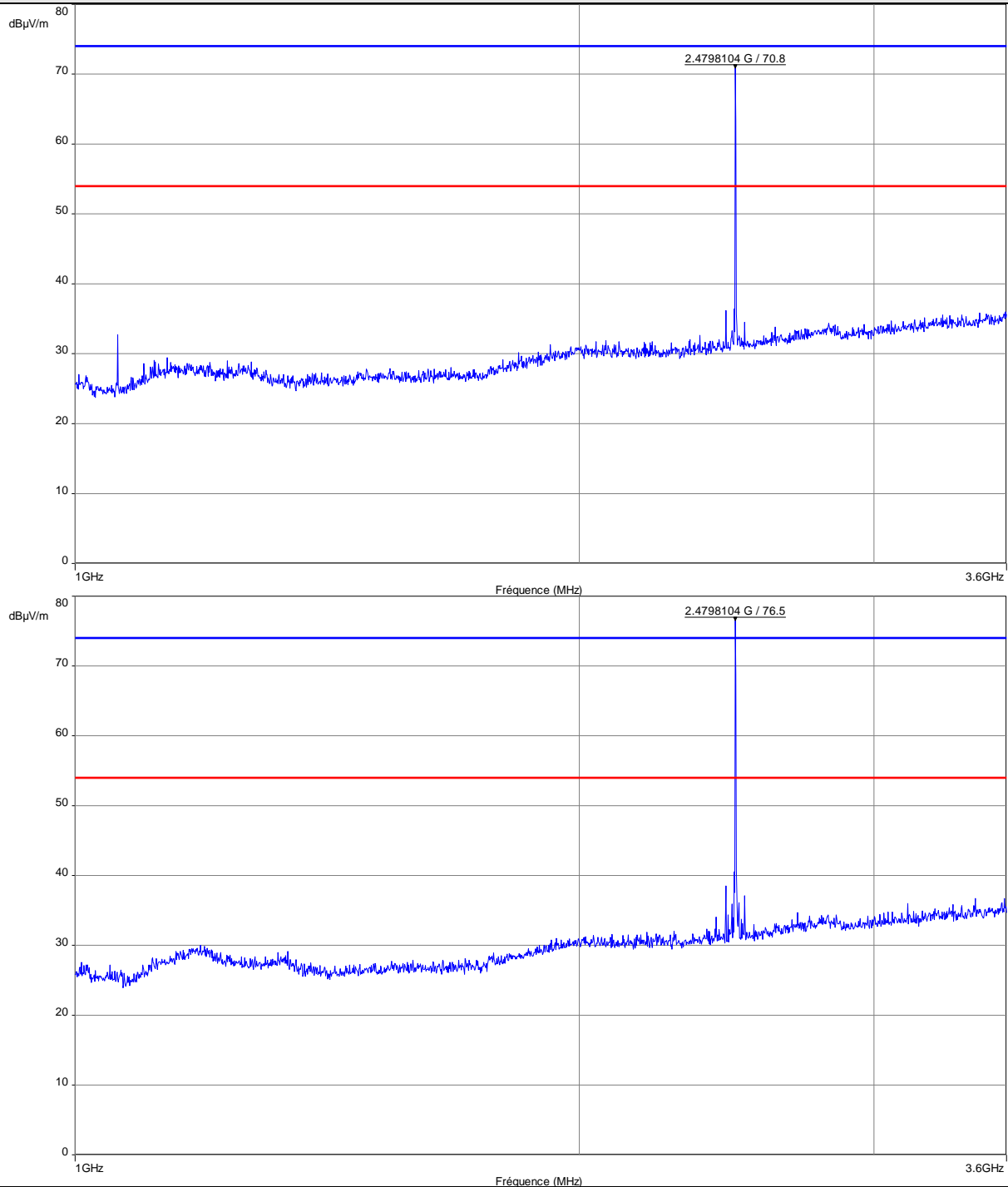
Frequency band investigated:	12GHz-18GHz
Unit :	dBμV/m
RBW :	1MHz
Antenna polarization :	Horizontal & Vertical
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 18GHz-26GHz / 3m / Horizontal & Vertical / Transmit mode at 2440MHz)



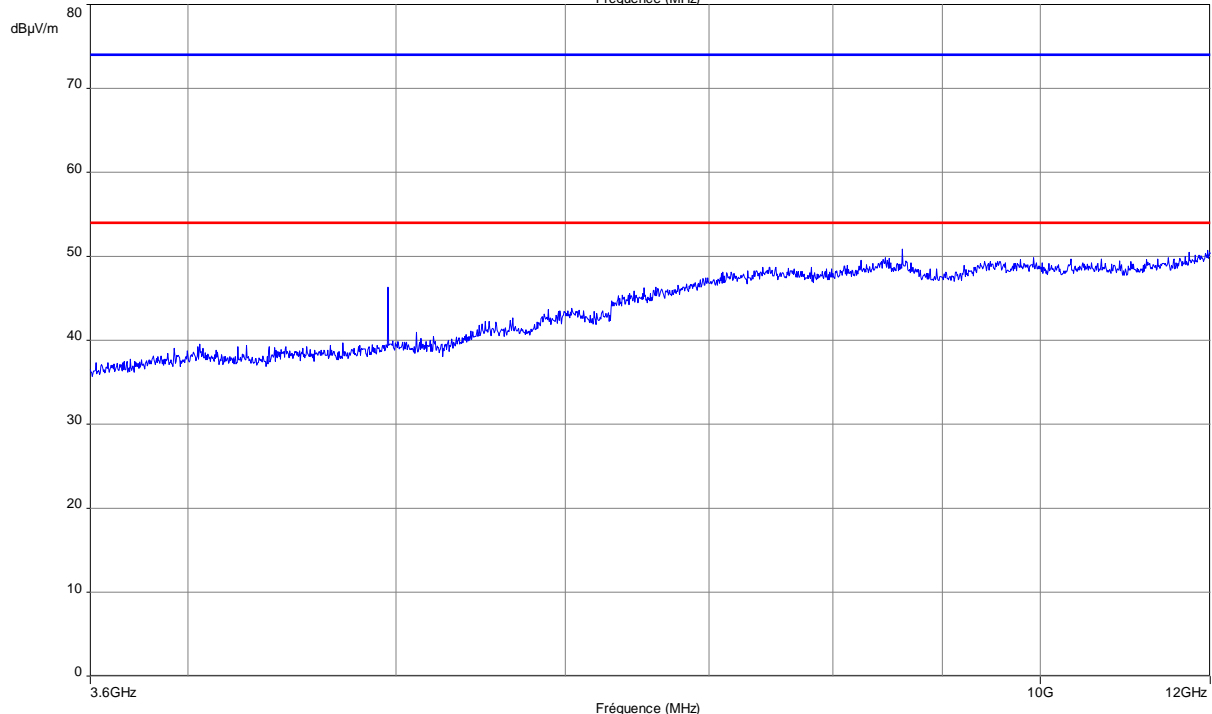
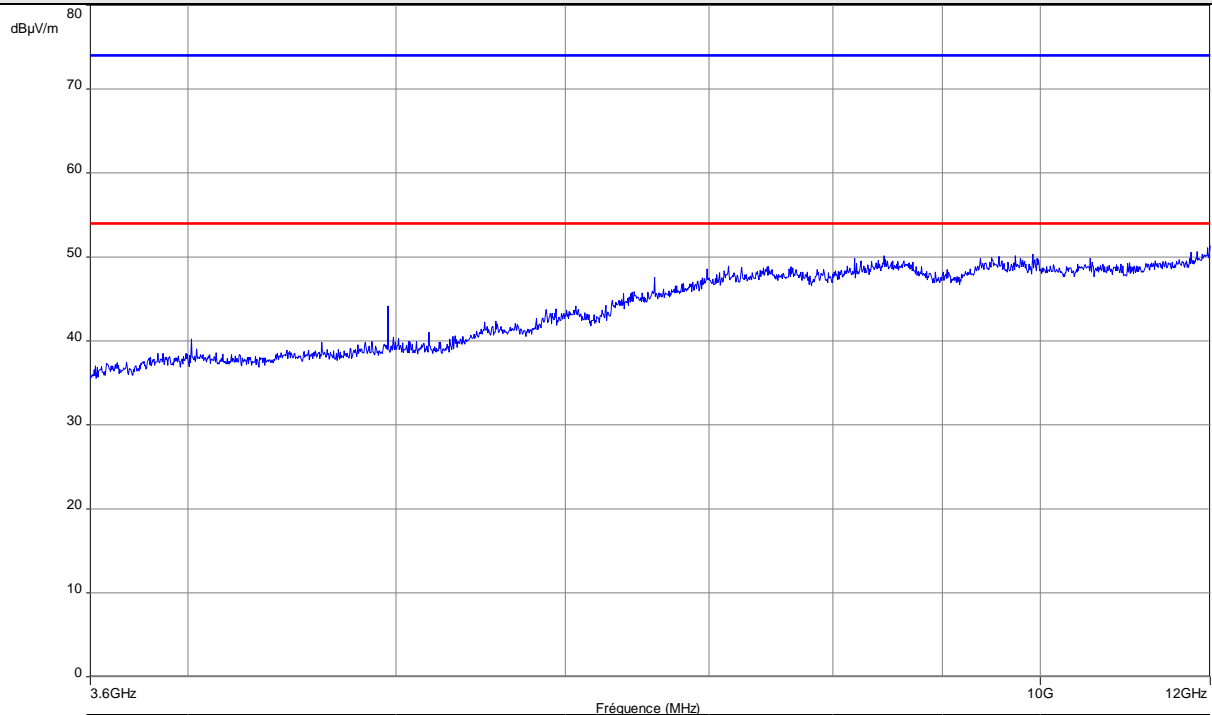
Frequency band investigated:	18GHz-26GHz
Unit :	dBµV/m
RBW :	1MHz
Antenna polarization :	Horizontal & Vertical
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 1GHz-3.6GHz / 3m / Horizontal & Vertical / Transmit mode at 2480MHz)



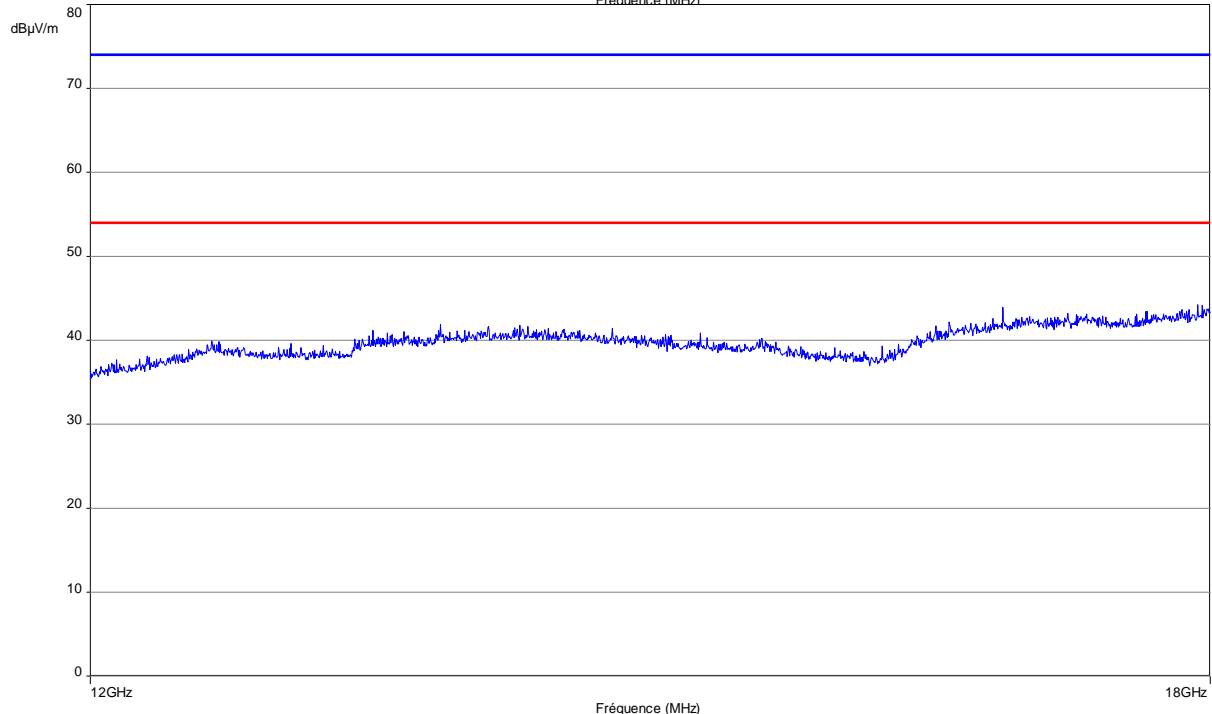
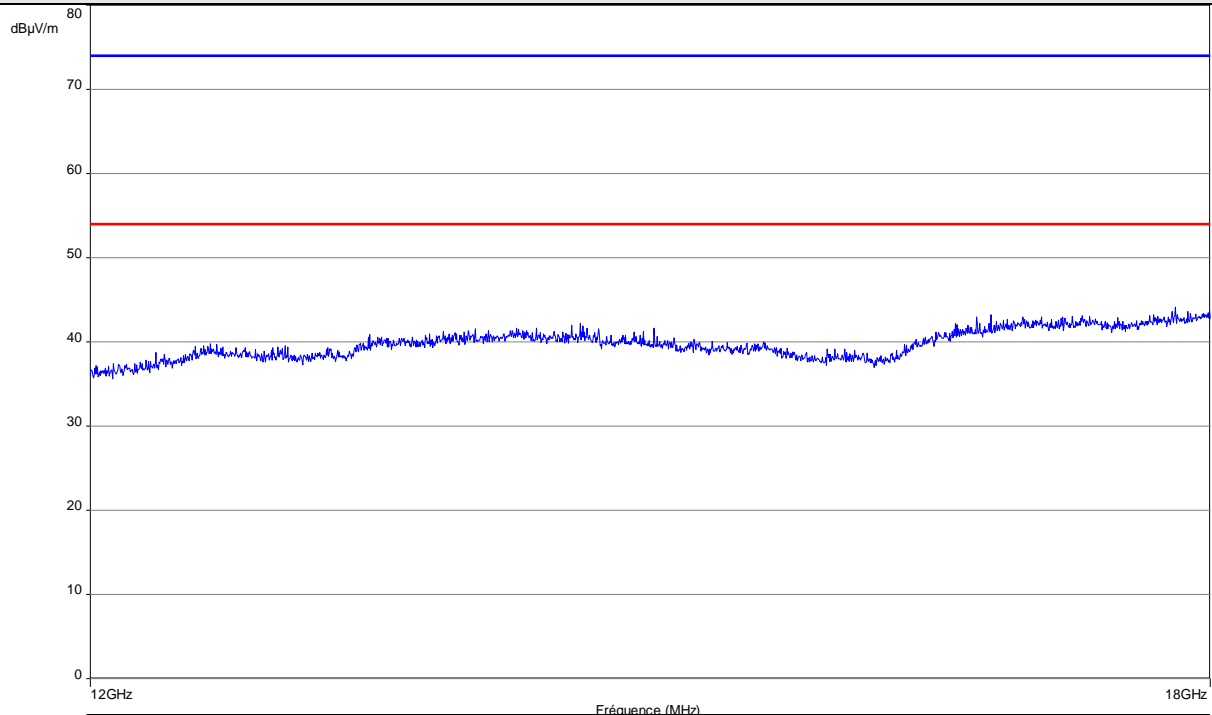
Frequency band investigated:	1GHz-3.6GHz
Unit :	dBμV/m
RBW :	1MHz
Antenna polarization :	Horizontal & Vertical
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 3.6GHz-12GHz / 3m / Horizontal & Vertical / Transmit mode at 2480MHz)



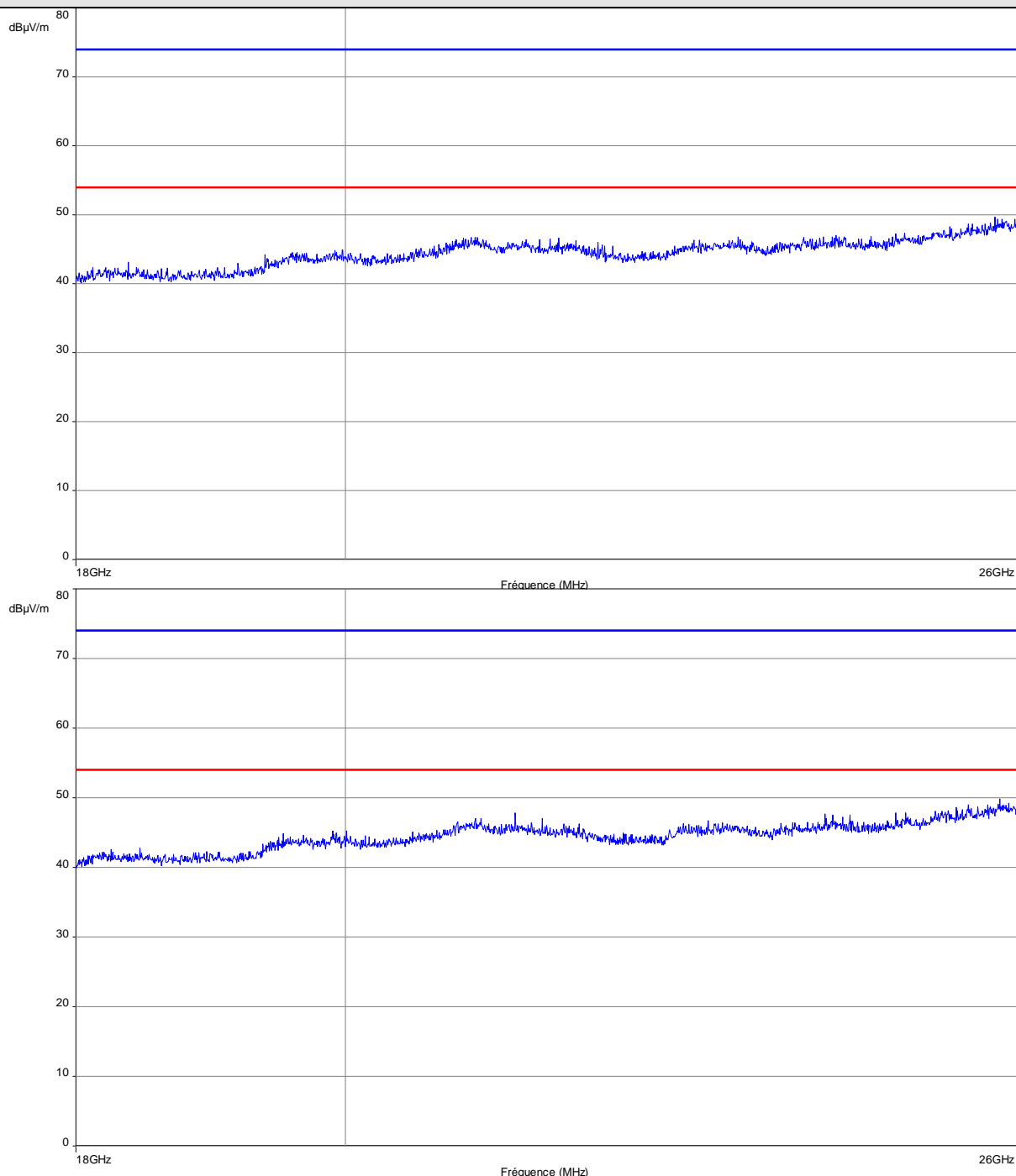
Frequency band investigated:	3.6GHz-12GHz
Unit :	dBμV/m
RBW :	1MHz
Antenna polarization :	Horizontal & Vertical
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 12GHz-18GHz / 3m / Horizontal & Vertical / Transmit mode at 2480MHz)



Frequency band investigated:	12GHz-18GHz
Unit :	dBμV/m
RBW :	1MHz
Antenna polarization :	Horizontal & Vertical
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 18GHz-26GHz / 3m / Horizontal & Vertical / Transmit mode at 2480MHz)



Frequency band investigated:	18GHz-26GHz
Unit :	dBμV/m
RBW :	1MHz
Antenna polarization :	Horizontal & Vertical
Voltage:	12V max. at water turbine
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)