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Rapport d'essai / *Test report*

JDE : 97607 N° 201001-5960C-R1-E

DELIVRE A / *ISSUED TO*	:	**INGENICO** Rue Claude Chappe B.P. 344 07503 GUILHERAND GRANGES
Objet / *Subject*	:	Essais de compatibilité électromagnétique conformément aux normes : *Electromagnetic compatibility tests according to the standards:* **FCC CFR 47 Part 15, Subpart B.** **ANSI C63.4 (2003)**

Matériel testé / *Apparatus under test* :

• Produit / *Product*	:	Lecteur de carte bancaire / *Bank payment terminal*	
• Marque / *Trade mark*	:	**INGENICO**	
• Constructeur / *Manufacturer*	:	**INGENICO**	
• Type / *Model*	:	**iPP3x0-01Txxxxx**	
• Type sous test / *Model under test*		**iPP350-01T1108A**	**iPP320-01T1185A**
• N° de série / *serial number*	:	**09350PP40063651**	**09350PP40063626**
• Configuration / *Configuration*		**Ethernet , Ethernet POE, RS232, USB**	
• FCC ID :	:	**XKB-iPP3x0-01Txxx**	

Date des essais / *Test date* : Du 14 au 27 Janvier / *January 14th to 27th, 2010*

Lieu d'essai / *Test location* : **BUREAU VERITAS LCIE SUD-EST**
ZI Centr'Alp – 170 rue de Chatagnon
38430 MOIRANS - France

Test réalisé par / *Test performed by* : Jonathan PAUC

document comporte / *Composition of document:* 57 pages

MOIRANS, LE 7 JUIN 2010 / *JUNE 7TH, 2010*

Ecrit par / *Written by*
Jonathan PAUC

Approuvé par / *Approved by,*
Jacques LORQUIN

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SUMMARY

1. TEST PROGRAM

Standard: **- FCC Part 15, Subpart B (Digital Devices)**
- ANSI C63.4 (2003)

EMISSION TEST	**LIMITS**			**RESULTS (Comments)**
Limits for conducted disturbance at mains ports 150kHz-30MHz	**Frequency**	**Quasi-peak value (dBµV)**	**Average value (dBµV)**	**PASS**
	150-500kHz	66 to 56	56 to 46	
	0.5-5MHz	56	46	
	5-30MHz	60	50	
Radiated emissions 30MHz-12.5GHz	**Measure at 3m** 30MHz-88MHz : 40 dBµV/m 88MHz-216MHz : 43.5 dBµV/m 216MHz-960MHz : 46.0 dBµV/m Above 960MHz : 54.0 dBµV/m			**PASS**

2. APPARATUS UNDER TEST: CONFIGURATION

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

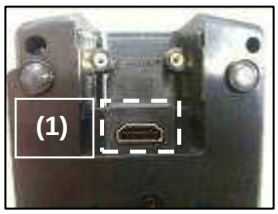
E.U.T. : **iPP350-01T1108A**
Serial number: 09350PP40063651
Model with all options without Contactless

E.U.T. : iPP320-01T1185A
Serial number: 09350PP40063626
Model with all options without Contactless

Option With color screen display
Option with black and white screen display

With Power supply FRIWO	153051	120V / 50-60Hz <-> 8Vdc	(Configuration n°1)
With Power supply PHIHONG	PSC16E-080	100-240V / 50Hz <-> 8Vdc	(Configuration n°4)

- Soft: Appli CEM: TESTCAM0102
  OS BL3: 8300640201
  Thunder II 820036 0742



- **<u>Inputs/outputs</u>:**

- 1 x Power supply / Data port (Type HDMI, “1”)

- **<u>Cables:</u>**

- 1 x Ethernet cable (2m) (AC/DC adapter input), shielded, “Configuration 1” Ref: IPP3xx-A-XXX-X
- 1 x Ethernet cable (2m) (POE), shielded “Configuration 2” Ref: IPP3xx-P-XXX-X
- 1 x USB cable (2m), shielded “Configuration 3” Ref: IPP3xx-X-XXX-X
- 1 x RS232 cable (2m), shielded “Configuration 4” Ref: IPP3xx-XX-XXX-X
- 1 x Ethernet cable (2m), FTP Cat 5e, Type CM shielded “Configuration 2”

- **Auxiliaries equipment used during test:**

Trade Mark – Model Number (Serial number)	**FCC ID**	**Description**	**Cable description**
Laptop TOSHIBA SATELLITE PS141E-04YCM	None	Laptop	Power cable unshielded
Power supply TOSHIBA PA3201U-1ACA SEB 100 P2-15.0	None	Adaptor AC/DC	Power cable unshielded
POE Injector POE30U-560 (56Vdc 0.55A) PHIHONG	None	POE Injector	Power cable unshielded

2.2. RUNNING MODE

Sequence n°1 :

A reading and writing process are performed on
- SAM1
- SAM2
- SAM3
- CAM0

Sequence n°2 :

Sequence n°1 + a continuous ping process to EUT IP address from Laptop (TOSHIBA) (Ethernet link) is performed.

Sequence n°3:

sequence n°1 + serial communication on COM0

Serial communication (RS232, COM0) consists to performed a self communication (RX and TX are bypassed)

Configuration / Running mode	**1**	**2**	**3**	**4**
Sequence n°1			x	
Sequence n°2	x	x		
Sequence n°3				x

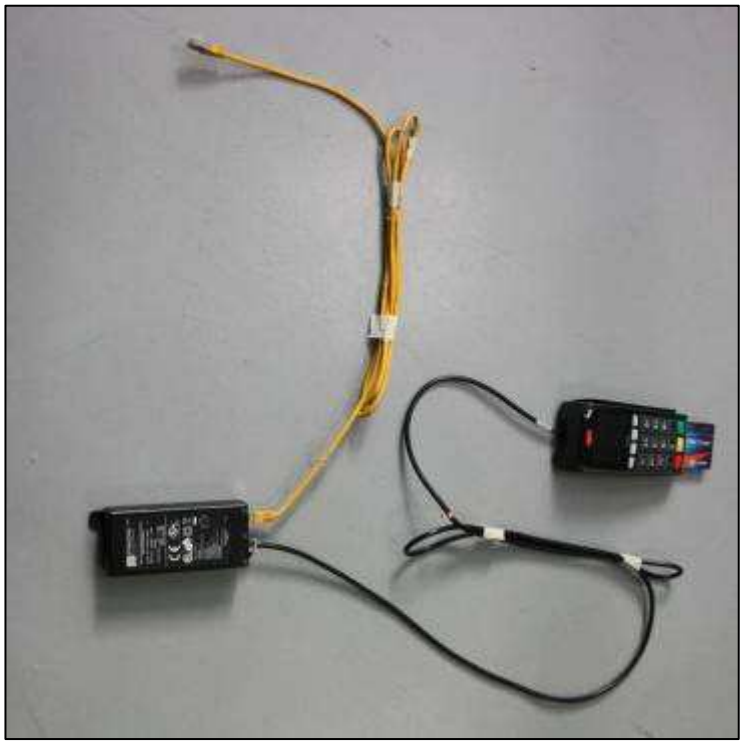
2.3. CONFIGURATION

Configuration n°1 :

Communication access : - Ethernet
Power supply : - Power supply adapter Type FRIWO 153051 (8Vdc <-> IPP3x)
Option Cable: - Ref: IPP3xx-A-XXX-X

Configuration n°2 :

Communication access : - Ethernet
Power supply : - Power over Ethernet (POE) provided by a POE injector type PHIHONG POE30U-560
Option Cable: - Ref: IPP3xx-P-XXX-X

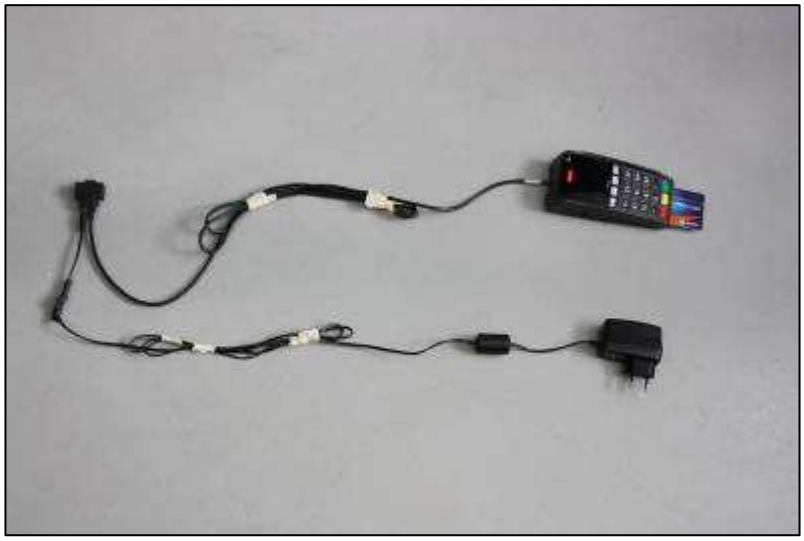


Configuration n°3 :

Communication access : - USB
Power supply : - Power provided by a Laptop (USB, 5Vdc <-> IPP3x)
Option Cable: - Ref: IPP3xx-X-XXX-X

Configuration n°4 :

Communication access : - RS232
Power supply : - Power supply adapter Type PHIHONG PSC16E-080 (8Vdc <-> IPP3x)
Option Cable: - Ref: IPP3xx-XX-XXX-X



2.4. EQUIPMENT MODIFICATIONS

None

2.5. SPECIAL ACCESSORIES

1 x Ferrite core on mains power adapter FRIWO 153051 (DC side).
1 x Ferrite core on mains power adapter PHIHONG PSC16E-080 (DC side).

3. MEASUREMENT OF CONDUCTED EMISSION (150KHZ-30MHZ)

3.1. TEST CONDITIONS

Date of test	: January 15th, 2010	January 27th, 2010
Test performed by	: Jonathan PAUC	Jonathan PAUC
Atmospheric pressure	: 999mB	999mB
Relative humidity	: 28%	30%
Ambient temperature	: 22°C	21°C

3.2. SETUP FOR CONDUCTED EMISSIONS MEASUREMENT

The product has been tested according to ANSI C63.4-(2003) and FCC Part 15 subpart B.

The product has been tested with 110V/60Hz power line voltage on laptop power supply and compared to the FCC Part 15 subpart B §15.107 limits. Measurement bandwidth was 9 kHz from 150 kHz to 30 MHz.

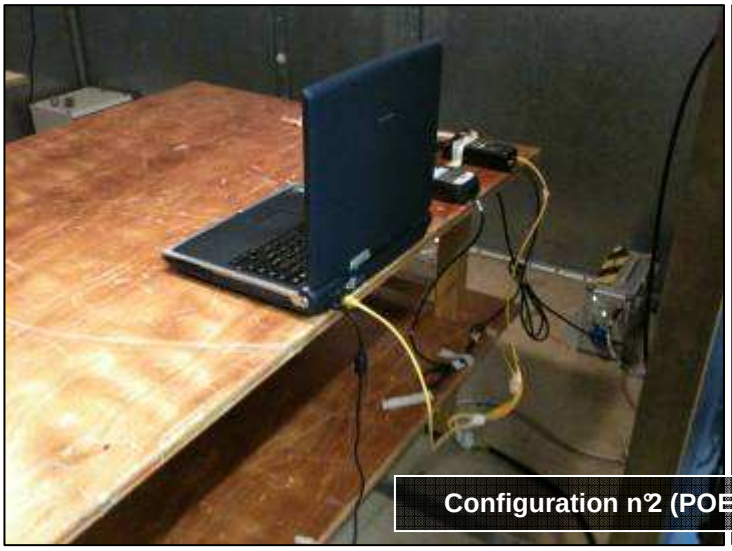
The EUT with its auxiliaries are set on a non-conducting 80cm above the ground reference plane.
The distance between the EUT and the LISN is 80cm. The EUT is 40cm away for the vertical ground plane.
The EUT is powered through the laptop that is powered through the LISN (measure).

Measurement is made with a Rohde & Schwarz ESU8 receiver in peak mode. This was followed by a Quasi-Peak, i.e. CISPR measurement for any strong signal. If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary. The LISN (measure and auxiliaries) is 50Ω / 50µH.

The Peak data are shown on plots in annex 1. Quasi-Peak and Average measurements are detailed in a table with frequencies and levels measured.

Interconnecting cables and equipment's were moved to position that maximized emission. A summary of the worst case emissions found in all test configurations and modes is shown on the following page.

Configuration n°1 : FRIWO Mains « 110V/60Hz »



Configuration n°2 (POE) : Injector POE « 110V/60Hz »

Configuration n°2 (POE): Laptop Toshiba power suppl y « 110V/60Hz »

Configuration n°3 (USB) : Laptop Toshiba power supp ly « 110V/60Hz »

Configuration n°4 : PHIHONG Mains « 110V/60Hz »

3.3. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

3.4. MEASUREMENTS RESULTS

Mains terminals 110Vac/60Hz:

Measurements are performed on the phase (L1) and neutral (N)

"IPP3xx Color Version"

Measure on L:	graph **Emc#1**	(Configuration n°1)	"performed on FRIWO power suppl y mains"	(see annex 1)
Measure on N:	graph **Emc#2**	(Configuration n°1)	"performed on FRIWO power supp ly mains"	(see annex 1)
Measure on L:	graph **Emc#3**	(Configuration n°2)	"performed on POE Injector mai ns"	(see annex 1)
Measure on N:	graph **Emc#4**	(Configuration n°2)	"performed on POE Injector ma ins"	(see annex 1)
Measure on L:	graph **Emc#5**	(Configuration n°2)	"performed on Laptop power su pply mains"	(see annex 1)
Measure on N:	graph **Emc#6**	(Configuration n°2)	"performed on Laptop power sup ply mains"	(see annex 1)
Measure on L:	graph **Emc#7**	(Configuration n°3)	"performed on Laptop power sup ply mains"	(see annex 1)
Measure on N:	graph **Emc#8**	(Configuration n°3)	"performed on Laptop power su pply mains"	(see annex 1)
Measure on L:	graph **Emc#9**	(Configuration n°4)	"performed on FRIWO power suppl y mains"	(see annex 1)
Measure on N:	graph **Emc#10**	(Configuration n°4)	"performed on PHIHONG power su pply mains"	(see annex 1)

"IPP3xx B&W Version"

Measure on L:	graph **Emc#11**	(Configuration n°1)	"performed on FRIWO power suppl y mains"	(see annex 1)
Measure on N:	graph **Emc#12**	(Configuration n°1)	"performed on FRIWO power supp ly mains"	(see annex 1)
Measure on L:	graph **Emc#13**	(Configuration n°2)	"performed on POE Injector mai ns"	(see annex 1)
Measure on N:	graph **Emc#14**	(Configuration n°2)	"performed on POE Injector ma ins"	(see annex 1)
Measure on L:	graph **Emc#15**	(Configuration n°2)	"performed on Laptop power su pply mains"	(see annex 1)
Measure on N:	graph **Emc#16**	(Configuration n°2)	"performed on Laptop power su pply mains"	(see annex 1)
Measure on L:	graph **Emc#17**	(Configuration n°3)	"performed on Laptop power su pply mains"	(see annex 1)
Measure on N:	graph **Emc#18**	(Configuration n°3)	"performed on Laptop power su pply mains"	(see annex 1)
Measure on L:	graph **Emc#19**	(Configuration n°4)	"performed on FRIWO power supp ly mains"	(see annex 1)
Measure on N:	graph **Emc#20**	(Configuration n°4)	"performed on PHIHONG power sup ply mains"	(see annex 1)

RESULT: PASS

4. MEASUREMENT OF RADIATED EMISSION (30MHZ-2GHZ)

4.1. TEST CONDITIONS

Date of test : January 14th and 15th , 2010
Test performed by : Jonathan PAUC
Atmospheric pressure : 999mB
Relative humidity : 35% to 28%
Ambient temperature : 21°C to 22°C

4.2. SETUP FOR RADIATED EMISSIONS MEASUREMENT

The installation of EUT is identical for pre-characterization measures in a 3 meters semi-anechoic chamber and for measures on the 10 meters Open site.
The EUT and auxiliaries are set on the non-conducting table of 80 cm height.

Configuration n°1: 8Vdc (Power supply adapter FRIW O).
Configuration n°2: 56Vdc (POE Injector power suppl y PHIHONG).
Configuration n°3: 5Vdc (Laptop USB power supply)
Configuration n°4: 8Vdc (Power supply adapter PHIH ONG).

4.2a \ Pre-characterisation measurement:

A pre-scan of all the setup has been performed in a 3 meters semi-anechoic chamber. The distance between EUT and antenna is 3 meters. Test is performed in horizontal (H) and vertical (V) polarization. During the measurement, the EUT is rotated on a 360° range and moved in horizontal and vertical position. Interconnecting cables and equipment's were moved to position that maximized emission. A summary of the worst case emissions found in all test configurations and modes is shown on the following page. Configuration 1 to 4 with (option color screen display or option black and white screen display).

The pre-characterization graphs are obtained in PEAK detection.

4.2b \ Characterization on 10 meters open site from 30MHz to 2GHz:

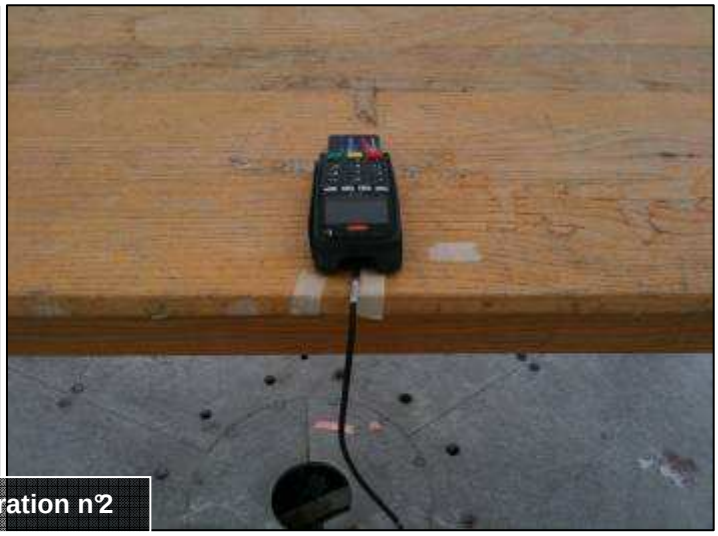
The product has been tested according to ANSI C63.4 (2003), FCC part 15 subpart B. Radiated Emissions were measured on an open area test site. A description of the facility is on file with the FCC.

The product has been tested at a distance of **10 meters** (30MHz to 2GHz) from the antenna and corrected according to requirements of 15.109.e).
Results are compared to the FCC part 15 subpart B §15.109 limits.
Measurement bandwidth was 120 kHz from 30 MHz to 1GHz.
Measurement bandwidth was 1 MHz from 1 GHz to 2GHz.

Antenna height search was performed from 1m to 4m for both horizontal and vertical polarization. Continuous linear turntable azimuth search was performed with 360 degrees range.

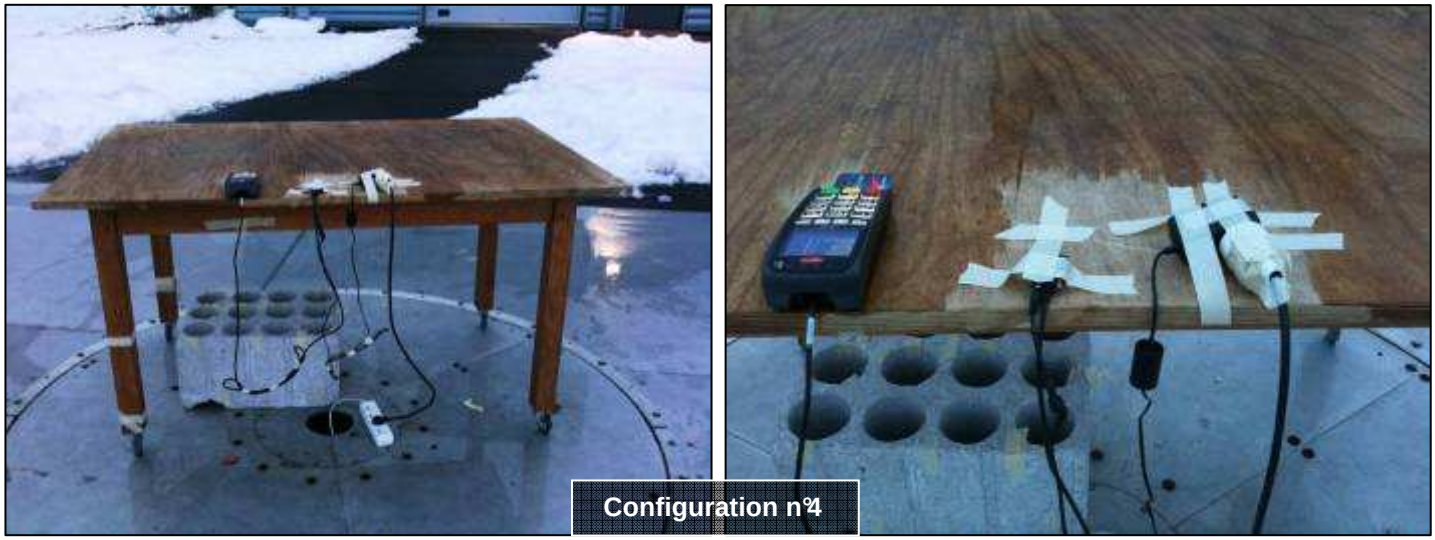
Equipment was moved (3 axis measurement) to position that maximized emission. A summary of the worst case emissions found in all test configurations and modes is shown on clauses 4.2a.

Configuration n°1



Configuration n°2

Configuration n°3



Configuration n°4

4.3. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

4.4. MEASUREMENTS RESULTS

Pre-characterisation measurement: pre-scan measurement at 3m (PEAK detection, graph examples)

Configuration n°1 (Ethernet + Power supply AC/DC Ad apter "FRIWO")

Polarisation H:	graph **Emr#1**	"IPP3xx Color Version"	(see annex 1)
Polarisation V:	graph **Emr#2**	"IPP3xx Color Version"	(see annex 1)
Polarisation H:	graph **Emr#9**	"IPP3xx B&W Version"	(see annex 1)
Polarisation V:	graph **Emr#10**	"IPP3xx B&W Version"	(see annex 1)

Configuration n°2 (Ethernet POE)

Polarisation H:	graph **Emr#3**	"IPP3xx Color Version"	(see annex 1)
Polarisation V:	graph **Emr#4**	"IPP3xx Color Version"	(see annex 1)
Polarisation H:	graph **Emr#11**	"IPP3xx B&W Version"	(see annex 1)
Polarisation V:	graph **Emr#12**	"IPP3xx B&W Version"	(see annex 1)

Configuration n°3 (USB Mode)

Polarisation H:	graph **Emr#5**	"IPP3xx Color Version"	(see annex 1)
Polarisation V:	graph **Emr#6**	"IPP3xx Color Version"	(see annex 1)
Polarisation H:	graph **Emr#13**	"IPP3xx B&W Version"	(see annex 1)
Polarisation V:	graph **Emr#14**	"IPP3xx B&W Version"	(see annex 1)

Configuration n°4 (RS232 + Power supply AC/DC Adapt er "PHIHONG")

Polarisation H:	graph **Emr#7**	"IPP3xx Color Version"	(see annex 1)
Polarisation V:	graph **Emr#8**	"IPP3xx Color Version"	(see annex 1)
Polarisation H:	graph **Emr#15**	"IPP3xx B&W Version"	(see annex 1)
Polarisation V:	graph **Emr#16**	"IPP3xx B&W Version"	(see annex 1)

QUALIFICATION: 10 / 3 meters measurement on the Open Area Test Site.

Frequency list has been created with semi-anechoic chamber pre-scan results.
Measurements are performed using a QUASI-PEAK detection.

Configuration n°1 (Ethernet + Power supply AC/DC Ad apter "FRIWO")

Worst case: For this configuration the worst case is option with color screen display, consequently all measurements are performed with this display.

Frequency range 30MHz to 1GHz:
Measurements are performed using a QUASI-PEAK detection (RBW=120kHz)

No	Frequency (MHz)	Limit Quasi-Peak (dBµV/m)	Measure Quasi-Peak (dBµV/m)	Margin (Meas-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)
1	43.81	40	36.4	**-3.6**	315	V	130	12.3
2	69.11	40	27.8	**-12.2**	145	V	220	10
3	110.32	43.5	36.7	**-6.8**	310	V	140	15.2
4	139.2	43.5	32.4	**-11.1**	30	V	130	14.4
5	677.19	46	39.3	**-6.7**	235	H	210	25
6	874.98	46	38.9	**-7.1**	155	V	250	27.5
7	999.99	54	45.4	**-8.6**	205	V	190	29.7

Note: Measures have been done at 10m distance and corrected according to requirements of 15.109.e) (M@3m = M@10m+10.5dB)

Frequency range 1GHz to 2GHz:
Measurements are performed using a PEAK detection (RBW= 1MHz)

No	Frequency (MHz)	Limit Average (dBµV/m)	Measure Average (dBµV/m)	Margin (Meas-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)
No siginificant Frequency observed								

No	Frequency (MHz)	Limit Peak (dBµV/m)	Measure Peak (dBµV/m)	Margin (Meas-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)
No siginificant Frequency observed								

RESULT: PASS

Configuration n°2 (Ethernet POE)

Worst case: For this configuration the worst case is option with color screen display, consequently all measurements are performed with this display.

Frequency range 30MHz to 1GHz:
Measurements are performed using a QUASI-PEAK detection (RBW=120kHz)

No	Frequency (MHz)	Limit Quasi-Peak (dBµV/m)	Measure Quasi-Peak (dBµV/m)	Margin (Meas-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)
1	42.79	40	37.3	**-2.7**	70	V	100	12.2
2	76.58	40	33	**-7**	105	V	210	8.9
3	115.59	43.5	31.5	**-12**	245	V	220	16.05
4	290.68	46	37.7	**-8.3**	95	H	280	16.9
5	677.26	46	38.5	**-7.5**	180	H	190	25.05
6	999.99	54	45.3	**-8.7**	105	H	220	29.7

Note: Measures have been done at 10m distance and corrected according to requirements of 15.109.e) (M@3m = M@10m+10.5dB)

Frequency range 1GHz to 2GHz:
Measurements are performed using a PEAK detection (RBW=1MHz)

No	Frequency (MHz)	Limit Average (dBµV/m)	Measure Average (dBµV/m)	Margin (Meas-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)
No siginificant Frequency observed								

No	Frequency (MHz)	Limit Peak (dBµV/m)	Measure Peak (dBµV/m)	Margin (Meas-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)
No siginificant Frequency observed								

RESULT: PASS

Configuration n°3 (USB Mode)

Worst case: For this configuration the worst case is option with color screen display, consequently all measurements are performed with this display.

Frequency range 30MHz to 1GHz:
Measurements are performed using a QUASI-PEAK detection (RBW=120kHz)

No	Frequency (MHz)	Limit Quasi-Peak (dBµV/m)	Measure Quasi-Peak (dBµV/m)	Margin (Meas-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)
1	41.872	40	34.2	**-5.8**	105	V	100	12.1
2	128.545	40	37.1	**-2.9**	330	V	280	15.1
3	194.64	43.5	30.9	**-12.6**	320	H	160	19.4
4	259.86	46	37.2	**-8.8**	260	V	130	15.01
5	298.67	46	36.9	**-9.1**	45	V	130	17.4
6	455	46	37.6	**-8.4**	0	V	130	20.45
7	774.63	46	38.9	**-7.1**	285	H	340	26
8	999.99	54	43.6	**-10.4**	235	H	230	29.7

Note: Measures have been done at 10m distance and corrected according to requirements of 15.109.e) (M@3m = M@10m+10.5dB)

Frequency range 1GHz to 2GHz:
Measurements are performed using a PEAK detection (RBW=1MHz)

No	Frequency (MHz)	Limit Average (dBµV/m)	Measure Average (dBµV/m)	Margin (Meas-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)
No siginificant Frequency observed								

No	Frequency (MHz)	Limit Peak (dBµV/m)	Measure Peak (dBµV/m)	Margin (Meas-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)
No siginificant Frequency observed								

RESULT: PASS

Configuration n°4 (RS232 + Power supply AC/DC Adapter "PHIHONG")

Worst case: For this configuration the worst case is option with color screen display, consequently all measurements are performed with this display.

Frequency range 30MHz to 1GHz:
Measurements are performed using a QUASI-PEAK detection (RBW=120kHz)

No	Frequency (MHz)	Limit Quasi-Peak (dBµV/m)	Measure Quasi-Peak (dBµV/m)	Margin (Meas-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)
1	35.3	40	29.2	**-10.8**	105	V	170	12.1
2	114.27	43.5	35.8	**-7.7**	265	V	220	15.8
3	185.71	43.5	38.1	**-5.4**	340	V	130	18.9
4	677.24	46	39.4	**-6.6**	255	H	370	25.1
5	999.9	54	45.7	**-8.3**	35	H	230	29.7

Note: Measures have been done at 10m distance and corrected according to requirements of 15.109.e) (M@3m = M@10m+10.5dB)

Frequency range 1GHz to 2GHz:
Measurements are performed using a PEAK detection (RBW=1MHz)

No	Frequency (MHz)	Limit Average (dBµV/m)	Measure Average (dBµV/m)	Margin (Meas-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)
No siginificant Frequency observed								

No	Frequency (MHz)	Limit Peak (dBµV/m)	Measure Peak (dBµV/m)	Margin (Meas-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. factor (dB)
No siginificant Frequency observed								

RESULT: PASS

4.5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follow:

FS = RA + AF + CF – AG

Where FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Factor
AG = Amplifier Gain

Assume a receiver reading of 52.5dBµV is obtained. The antenna factor of 7.4 and a cable factor of 1.1 is added. The amplifier gain of 29dB is subtracted, giving field strength of 32 dBµV/m.
FS = 52.5 + 7.4 + 1.1 – 29 = 32 dBµV/m
The 32 dBµV/m value can be mathematically converted to its corresponding level in µV/m.
Level in µV/m = Common Antilogarithm [(32dBµV/m)/20] = 39.8 µV/m.

5. TEST EQUIPMENT LIST

	N°LCIE	TYPE	COMPANY	REF	SN
RADIATED EMISSION MEASUREMENT (SEMI-ANECHOIC CHAMBER #1)					
	A5329032VO	Absorption clamp	LUTHI	MDS21	2826
	A5329044VO	Absorption clamp	RHODE ET SCHWARZ	85024A	194.0100.50
	A7102024VO	Amplifier 8 GHz	HEROTEK	A1080304A	222033
	A7085008VO	Amplifier 0.1MHz – 1300 MHz	HEWLETT PACKARD	8447D	2944A06838
	A7085009VO	Amplifier 0.1MHz – 1300 MHz	HEWLETT PACKARD	8447D	2944A08871
	A7085010VO	Amplifier 10MHz – 1300 MHz	A-INFO INC	JXWBLA-T	
X	C2040145VO	Antenna Bi-Log XWing	TESEQ	CBL6144	25903
	C2042027VO	Antenna horn	EMCO	3115	6382
	C2042028VO	Antenna horn 26GHz	SCHWARZBECK	BBHA 9170	BBHA9170232
	C2040052VO	Antenna Loop	ELECTRO-METRICS	EM-6879	690234
	F2000407	Antenna mast	MATURO Gmbh	AM 4.0	/037/1270308
X	A5329189VO	Cable EMI (s-Anechoic chamber)			
	A5329192VO	Cable Radiat EMI			
x	A5329198VO	Cable Radiat EMI			
X	A2642019VO	Measurement Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	100131
X	D3044016VO	Semi-Anechoic chamber #1	SIEPEL		
	A4060033VO	Spectrum Analyzer 9KHz – 12.8GHz	HEWLETT PACKARD	8596E	3409u00537
	A4060018VO	Spectrum Analyzer 9KHz – 26.5GHz	HEWLETT PACKARD	8593E	3409u00537
	A4060016VO	Spectrum analyzer 9kHz –1.8GHz	HEWLETT PACKARD	8591E	3536A00384
X	F2000406	Turntable chamber	MATURO Gmbh	TT 2.0 SI	/053/1270308
X	F2000408	Turntable controller chamber	MATURO Gmbh	Multiple Control Unit	MCU/060/1270308
x	A3169050VO	Radiated emission comb generator	BARDET		PR17B
RADIATED EMISSION MEASUREMENT (OPEN AREA TEST SITE)					
	A5329032VO	Absorption clamp	LUTHI	MDS21	2826
	A5329044VO	Absorption clamp	RHODE ET SCHWARZ	85024A	194.0100.50
X	A4049059VO	Adapter quasi-peak	HEWLETT PACKARD	HP85650A	2811A01134
	A7102024VO	Amplifier 8 GHz	HEROTEK	A1080304A	222033
	A7102026VO	Amplifier 8-26GHz	ALDETEC	ALS01452	1
	A7085008VO	Amplifier 0.1MHz – 1300 MHz	HEWLETT PACKARD	8447D	2944A06838
	A7085009VO	Amplifier 0.1MHz – 1300 MHz	HEWLETT PACKARD	8447D	2944A08871
	A7085010VO	Amplifier 10MHz – 1300 MHz	A-INFO INC	JXWBLA-T	
X	C2040050VO	Antenna biconic	EMCO	3104C	9401-4636
	C2040051VO	Antenna Bi-log	CHASE	CBL6111A	1628
X	C2042027VO	Antenna horn	EMCO	3115	6382
	C2042028VO	Antenna horn 26GHz	SCHWARZBECK	BBHA 9170	BBHA9170232
X	C2040056VO	Antenna log-periodic	EMCO	3146	2178
	C2040052VO	Antenna Loop	ELECTRO-METRICS	EM-6879	690234
	F2000288VO	Antenna mast	EMCO	1050	
X	A5329048VO	Cable EMR OATS	SUCOFLEX	106G	553
X	A5329199VO	Cable OATS (Mast at 10m)	UTIFLEX		
X	A5329188VO	Cable OATS (Mast at 10m)	UTIFLEX		
	A5329076VO	Cable OATS (Mast at 3m)	UTIFLEX		
	A5329196VO	Cable OATS (Turntable)	UTIFLEX		
	A5329187VO	Cable OATS (Turntable)	UTIFLEX		
	A2640011VO	Measurement receiver 9kHz–30MHz	ROHDE ET SCHWARZ	ESH3	972079/117
X	A2642019	Measurement Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	100131
	A4060027VO	Pre-selector RF	HEWLETT PACKARD	HP85685A	2837A00784
X	A3169050VO	Radiated emission comb generator	BARDET		PR17B
X	A4060017VO	Spectrum analyzer	HEWLETT PACKARD	HP8568B	2732A04155
	A4060018VO	Spectrum Analyzer 9KHz – 26.5GHz	HEWLETT PACKARD	8593E	3409u00537
	A4060016VO	Spectrum analyzer 9kHz –1.8GHz	HEWLETT PACKARD	8591E	3536A00384
X	A4060019VO	Spectrum analyzer display	HEWLETT PACKARD	HP85662A	2816A16603
X	F2000403VO	Turntable	ETS LINDGREN	Model 2187	
x	F2000286VO	Turntable / Antenna mast controller	ETS LINDGREN	Model 2066	
CONDUCTED MEASUREMENT EMISSION					
X	A5329061VO	Cable Conduct. EMI			
	A5329060VO	Cable Conduct. EMI			
	A5329189VO	Shielded cable	UTIFLEX		
	A5329076VO	Shielded cable	UTIFLEX		
	A5329206VO	Shielded cable	UTIFLEX		

	N°LCIE	TYPE	COMPANY	REF	SN
	A5329207VO	Shielded cable	UTIFLEX		
	A5329060VO	Shielded cable	UTIFLEX		
	A5329071VO	Shielded cable	UTIFLEX		
X	A3169049VO	Conducted emission comb generator	BARDET		CGPR12
	A4040015	Clickmeter	SCHAFFNER	DIA1512D	22338
	A5329037VO	Current injection probe	SCHAFFNER	CIP8213	52
	A1290017VO	Current probe	SCHAFFNER	CSP9160	1097
	A5329036VO	Direct Injection Module 100+50 Ohms	LCIE	MID01-100 ohms	
	A7156004VO	Direct Injection Module 100+50 Ohms	LUTHI	CR100A	221
	A5329042VO	Ferrite Tube	LUTHI	FTC 101	4485
	A1092042VO	Ferrite Tube	LUTHI	FTC101	4763
	C2320059VO	LISN	EMCO	3810/2SH	9511/1182
	C2320068VO	LISN	EMCO	3825/2	9309/2122
	C2320061VO	LISN	TELEMETER ELECTRONIC	NNB-2/16Z	98010
	C2320062VO	LISN tri-phase ESH2-Z5	RHODE ET SCHWARZ	33852.19.53	841223/008
	C2320063VO	LISN tri-phase ESH2-Z5	RHODE ET SCHWARZ	33852.19.53	841223/007
X	C2320123VO	LISN	RHODE ET SCHWARZ	ENV216	100037
	A2640011VO	Measurement receiver 9kHz–30MHz	ROHDE ET SCHWARZ	ESH3	972079/117
	A2642019VO	Measurement Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	100131
	C2320067VO	ISN 2 x 2 wires	RHODE ET SCHWARZ	ENY22	836727/015
	C2320066VO	ISN 4 wires	RHODE ET SCHWARZ	ENY41	838119/023
	C2320124VO	ISN 4 wires	TESEQ	T400A	24873
	D3044016VO	Semi-Anechoic chamber #1	SIEPEL		
	D3044017VO	Semi-Anechoic chamber #3	SIEPEL		
	D3044015VO	Semi-Anechoic chamber #2	SIEPEL		
X	D3044010VO	Faraday Cage	RAY PROOF		4854
X	A4049061VO	Transient limiter	HEWLETT PACKARD	11947A	3107A01596
	A4089117VO	Voltage probe	LCIE		
MISCALLENOUS (CONTROL EQUIPMENT)					
	A6440068VO	Data Logger	AGILENT	34970A	US37043935
	A2120003VO	Programable PSU, HAR/FLK	HEWLETT PACKARD	6842A	3531A00109
	A6440068VO	Data Logger Board	AGILENT	34901A	MY41037442
	D1022117VO	Climatic chamber	BIA CLIMATIC	CL 6-25	200 105 6
	A7043037VO	Power supply DC 30V 10A	ELC	AL924	95/00600
	A1240170VO	Multimeter	Fluke	87	75250745
	A1240171VO	Multimeter	FLUKE	189	89770115
	A4024018VO	Oscilloscope 500 MHz	Hewlett Packard	54542C	US36040602
	A4024019VO	Oscilloscope	Hewlett Packard	54720A	7426600
x	B4204052VO	Thermo-hygrometer	HUGER		
	A7043036VO	Power supply DC 300W / 150V-6A	SODILEC	7SDLIN/GB AUTO 300	493711
	A4083040VO	Oscilloscope 100 MHz 500Ms/s	Tektronix	TDS30-25	H712103

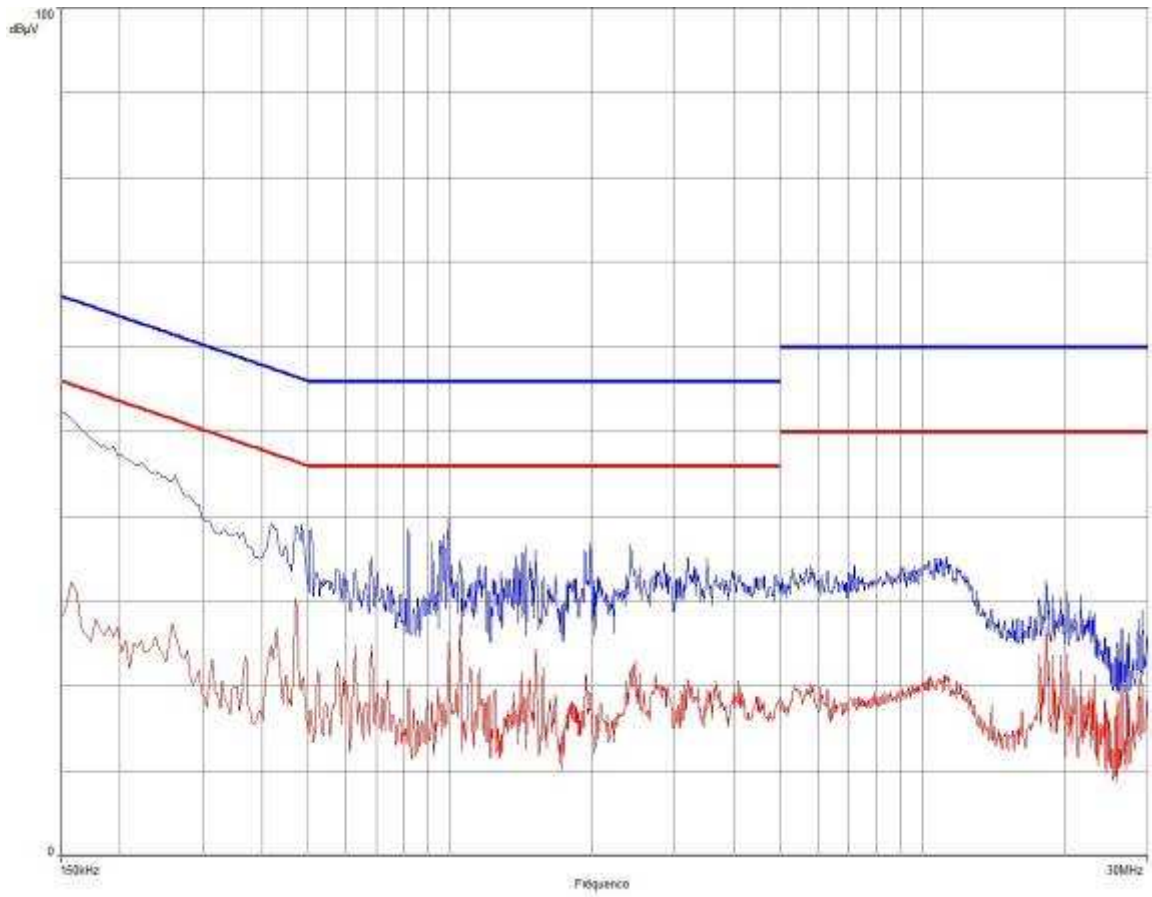
6. UNCERTAINTIES CHART

Type de mesure / *Kind of measurement*	**Incertitude élargie laboratoire / *Wide uncertainty laboratory* (k=2) ± x**	**Incertitude limite du CISPR / *CISPR uncertainty limit* ± y**
Mesure des perturbations conduites en tension sur le réseau d'énergie (triphasé) *Measurement of conducted disturbances in voltage on the power port (three phases)*	3.6 dB	3.6 dB
Mesure des perturbations conduites en tension sur le réseau d'énergie (monophasé) *Measurement of conducted disturbances in voltage on the power port (single line)*	3.57 dB	3.6 dB
Mesure des perturbations conduites en tension sur le réseau de télécommunication *Measurement of conducted disturbances in voltage on the telecommunication port.*	3.28 dB	A l'étude / Under consid.
Mesure des perturbations discontinues conduites en tension *Measurement of discontinuous conducted disturbances in voltage*	3.47 dB	3.6 dB
Mesure des perturbations conduites en courant *Measurement of conducted disturbances in current*	2.90 dB	A l'étude / Under consid.
Mesure du champ électrique rayonné sur le site en espace libre de Voiron *Measurement of radiated electric field on the Voiron open area test site*	5.07 dB	5.2 dB
Mesure du champ électrique rayonné IN SITU de 30 à 1000 MHz *IN SITU measurement of radiated electric field from 30 to 1000MHz*	A l'étude / Under consideration	5.2 dB
Mesure de la puissance perturbatrice / *Measurement of disturbance power*	3.37 dB	4.5 dB
Mesure des harmoniques de courant / *Measurement of current harmonics*	11.11%	/
Mesure du flicker / *Flicker measurement*	9.26%	/

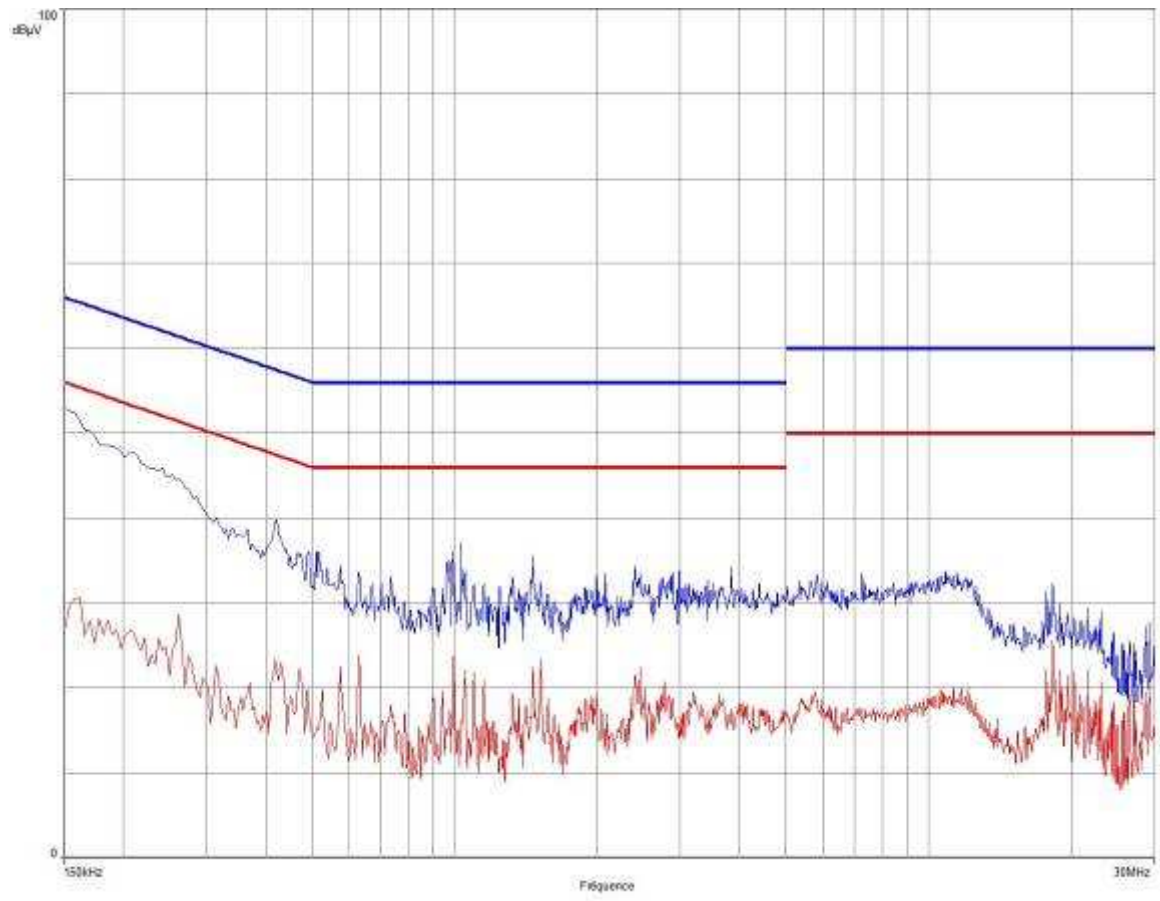
Les valeurs d'incertitudes calculées du laboratoire étant inférieures aux valeurs d'incertitudes limites établies par le CISPR, la conformité de l'échantillon est établie directement par les niveaux limites applicables. / *The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the CISPR. The conformity of the sample is directly established by the applicable limits values.*

7. ANNEX 1 (GRAPHS)

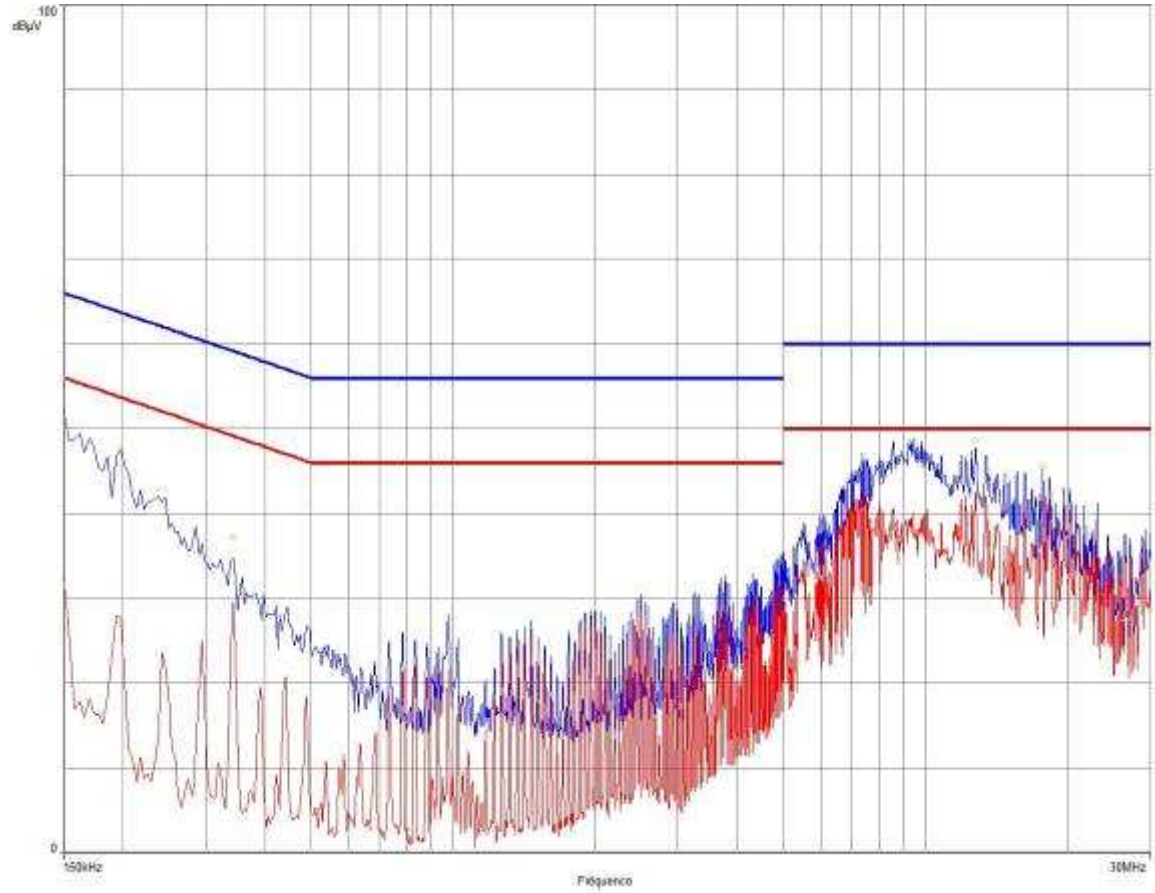
CONDUCTED EMISSIONS					
Graph name :	**Emc#1**	**Configuration 1 : (FRIWO Power supply mains)**			
Voltage / Frequency :	**110Vac/60Hz**	**"IPP3xx Color Version"**			
Limite / Classe :	**EN 55011 / EN55022/B**				
Line/Port :	**Phase**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



CONDUCTED EMISSIONS		**Configuration 1 : (FRIWO Power supply mains)** “IPP3xx Color Version”			
Graph name :	**Emc#2**				
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**				
Line/Port :	**Neutral**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**

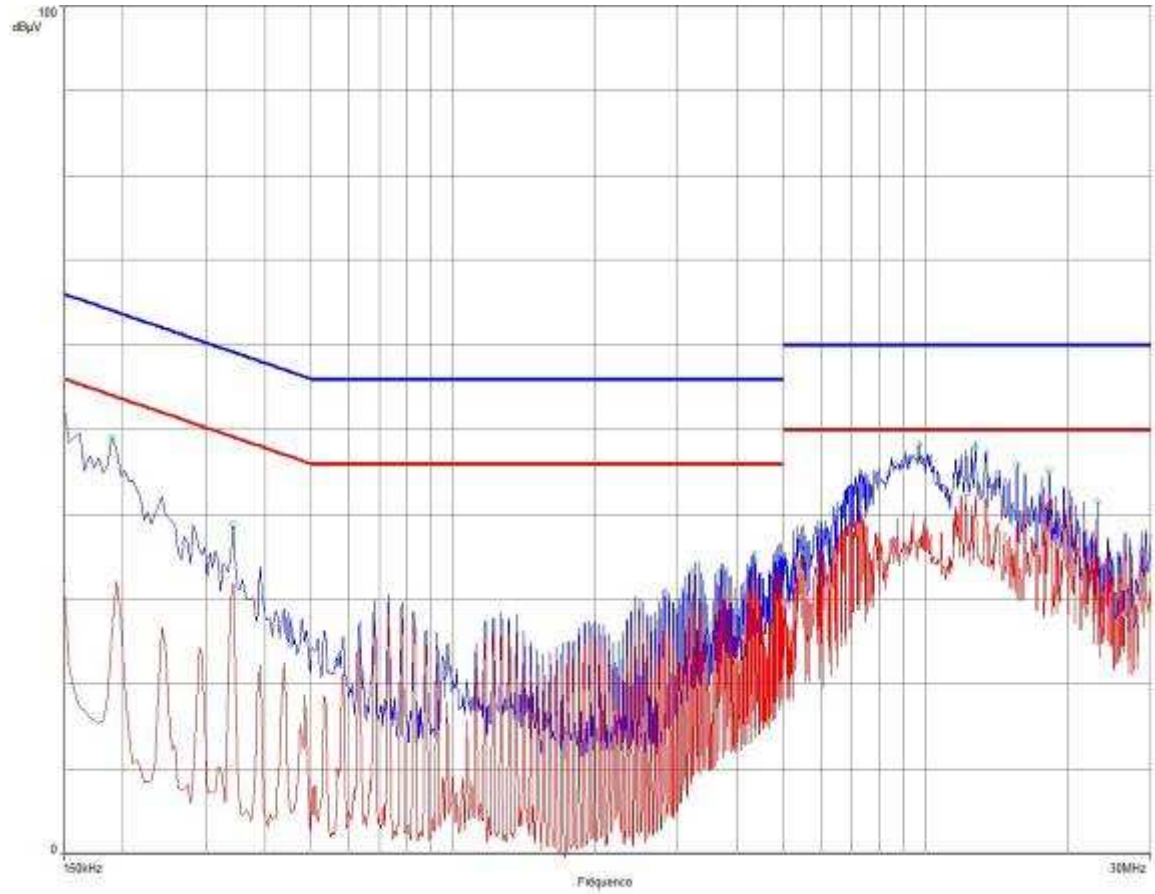


CONDUCTED EMISSIONS					
Graph name :	**Emc#3**	**Configuration 2 : (POE Injector mains)**			
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**	**"IPP3xx Color Version"**			
Line/Port :	**Phase**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



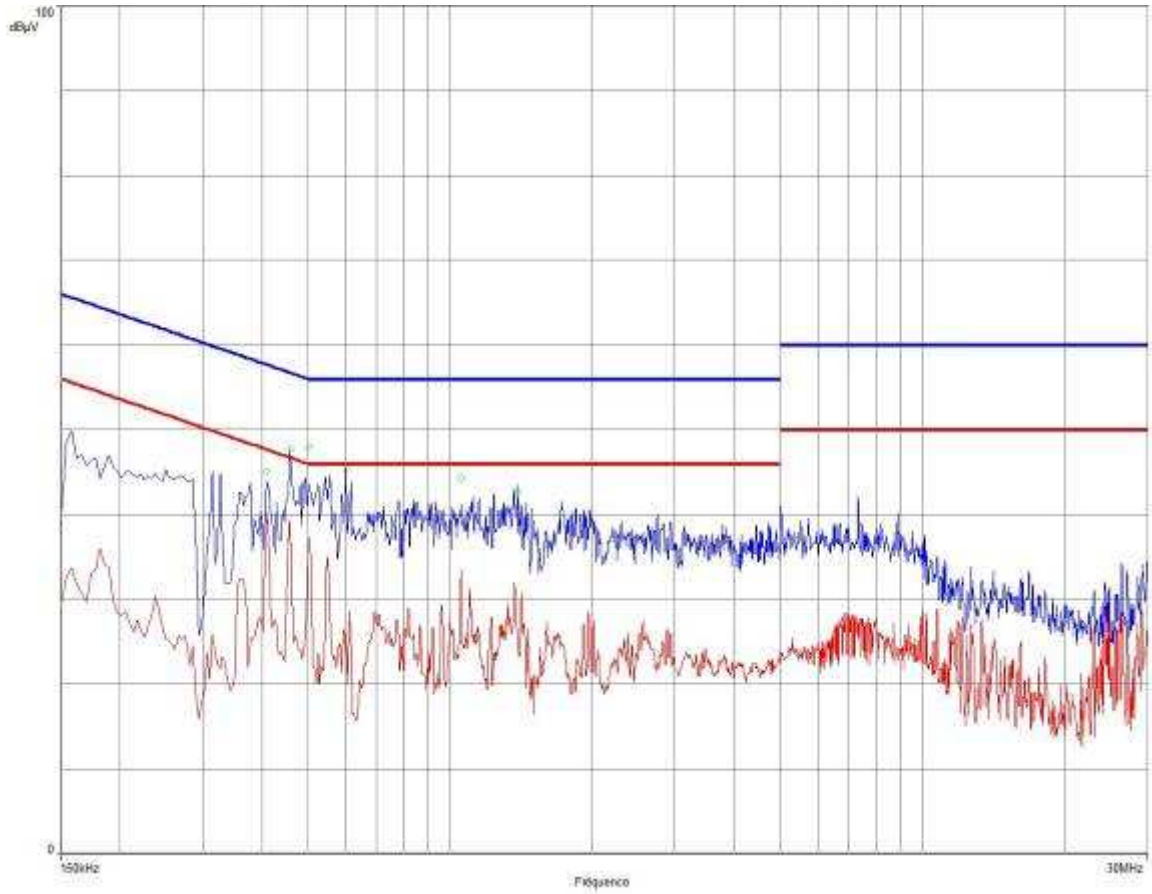
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.198	47.56	27.5	53.69	-26.2	41.16	63.69
0.342	37.28	29.65	49.15	-19.5	33.46	59.15
8.55	46.08	32.45	50	-17.55	39.49	60
9.386	48.47	38.48	50	-11.52	43.7	60
12.746	48.6	41.9	50	-8.1	44.67	60
17.694	45.59	41.28	50	-8.72	42.68	60

CONDUCTED EMISSIONS					
Graph name :	**Emc#4**	**Configuration 2 : (POE Injector mains)**			
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**	**"IPP3xx Color Version"**			
Line/Port :	**Neutral**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



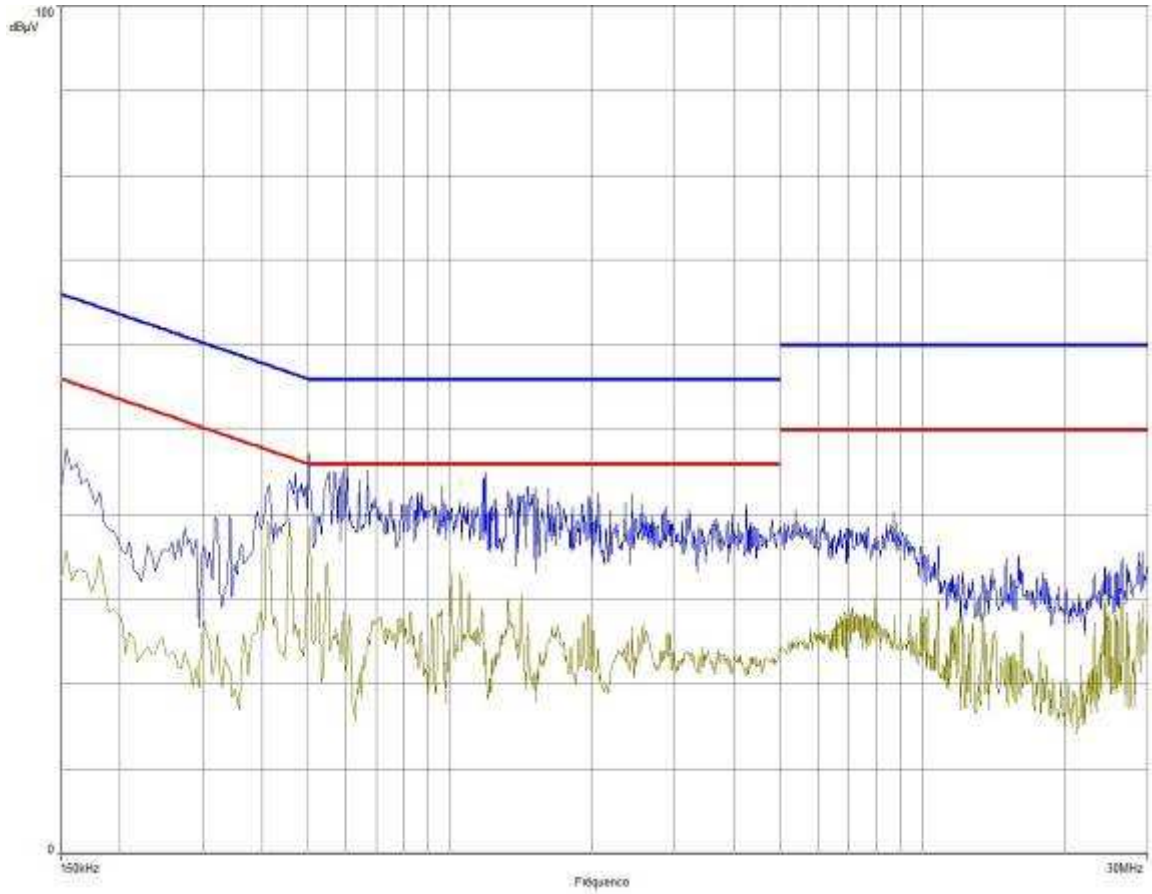
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.19	49.06	27.57	54.0	-26.47	39.9	64.04
0.342	38.86	30.9	49.1	-18.26	34.61	59.15
5.354	30.85	18.62	50.0	-31.38	24.91	60
9.694	48.29	37.67	50.0	-12.33	43.43	60
12.746	47.96	41.88	50.0	-8.12	44.72	60
15.618	45.84	38.03	50.0	-11.97	43.08	60
18.242	45.26	42.54	50.0	-7.46	43.63	60
23.13	41.54	39.12	50.0	-10.88	40.66	60

CONDUCTED EMISSIONS					
Graph name :	**Emc#5**	**Configuration 2 : (Laptop power supply mains)**			
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**	**"IPP3xx Color Version"**			
Line/Port :	**Phase**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



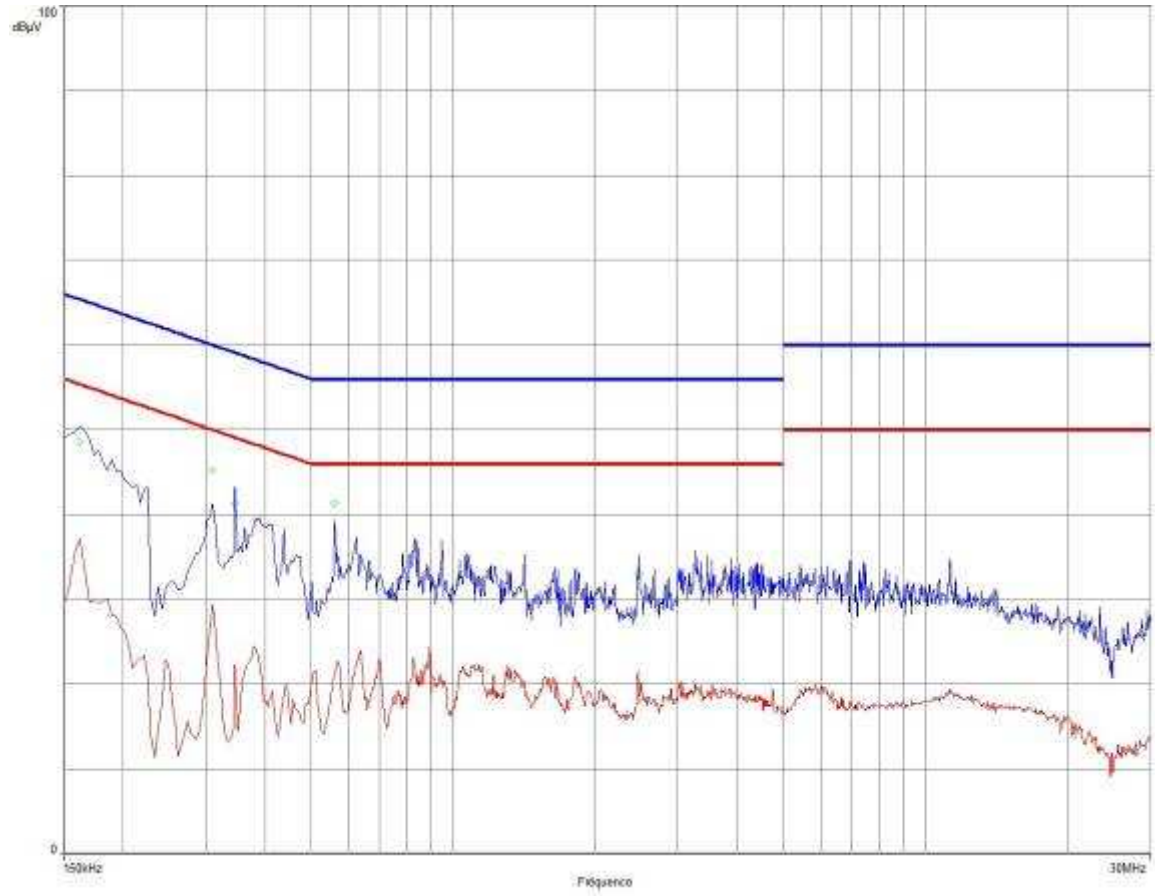
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.41	45.01	37.57	47.65	-10.07	40.15	57.65
0.458	47.73	38.94	46.73	-7.79	41.58	56.73
0.502	47.91	36.96	46	-9.04	42.01	56
0.602	45.36	21.51	46	-24.49	37.41	56
1.058	44.35	25.82	46	-20.18	34.43	56
1.386	42.65	26.14	46	-19.86	34.55	56

CONDUCTED EMISSIONS					
Graph name :	**Emc#6**	**Configuration 2 : (Laptop power supply mains)**			
Voltage / Frequency :	**110Vac/60Hz**	**"IPP3xx Color Version"**			
Limite / Classe :	**EN 55011 / EN55022/B**				
Line/Port :	**Neutral**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



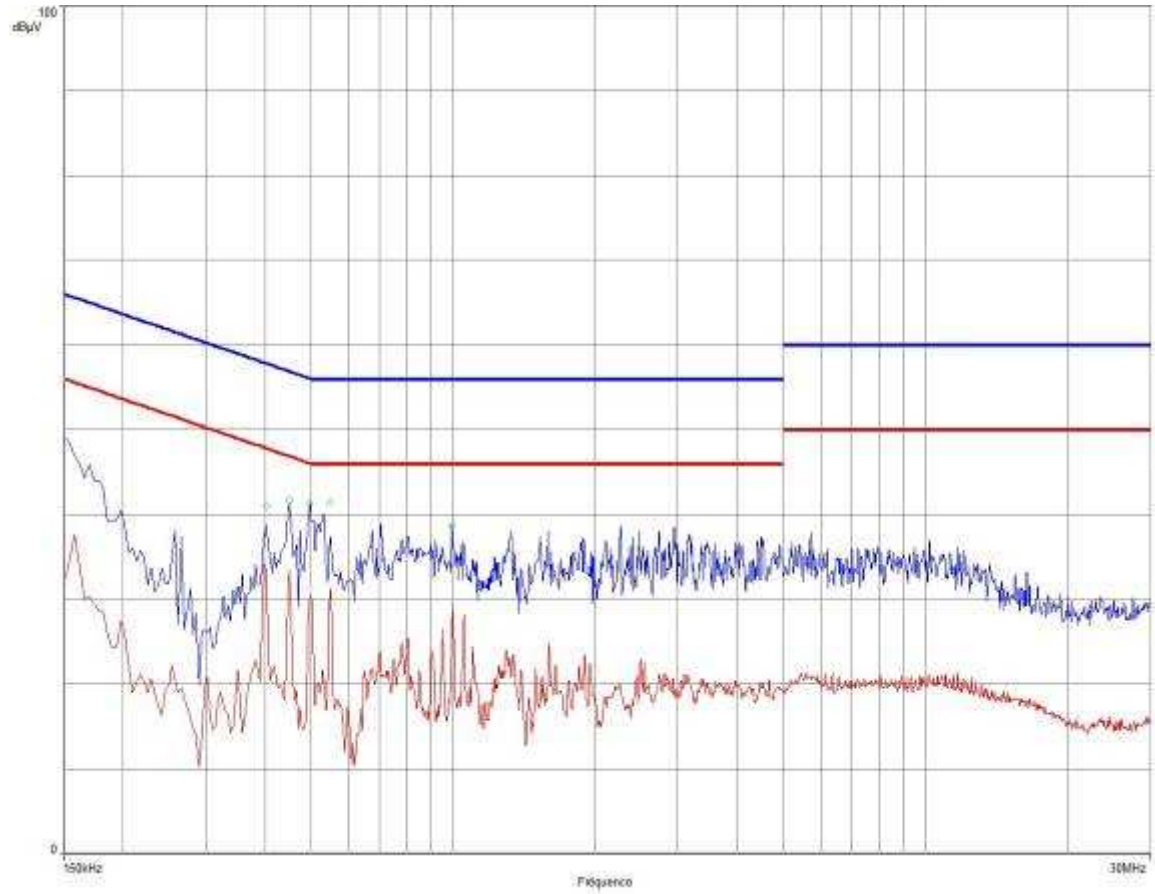
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.414	44.96	38.29	47.57	-9.28	40.9	57.57
0.458	47.05	38.67	46.73	-8.06	41.27	56.73
0.502	47.04	36.93	46	-9.07	41.71	56
0.554	45.82	28.01	46	-17.99	38.98	56
1.05	43.89	32.61	46	-13.39	37.33	56
1.186	43.93	22.31	46	-23.69	34.45	56
10.794	36.76	29.23	50	-20.77	32.45	60

CONDUCTED EMISSIONS					
Graph name :	**Emc#7**	**Configuration 3 : (Laptop power supply mains)**			
Voltage / Frequency :	**110Vac/60Hz**	**"IPP3xx Color Version"**			
Limite / Classe :	**EN 55011 / EN55022/B**				
Line/Port :	**Phase**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



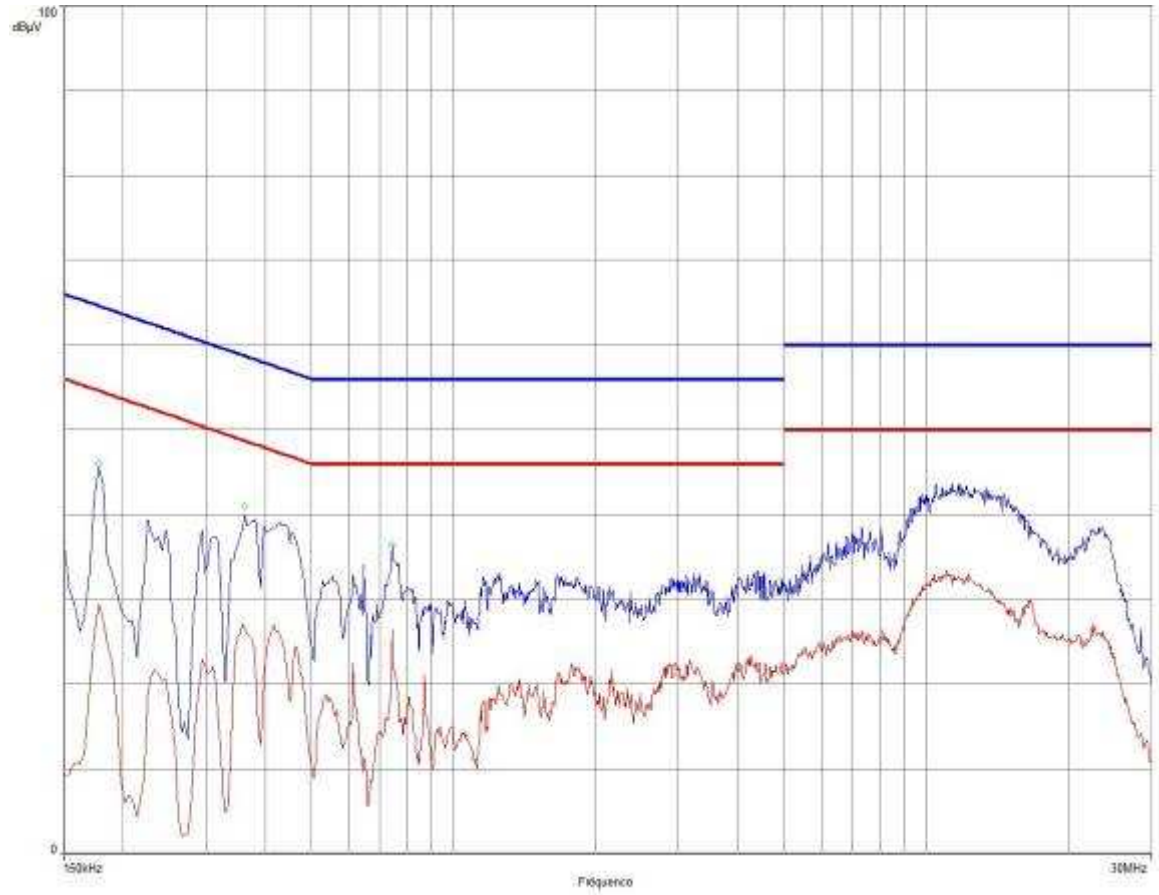
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.162	48.55	24.37	55.36	-30.99	42.76	65.36
0.31	45.21	19.57	49.97	-30.4	35.45	59.97
0.346	41.32	21.37	49.06	-27.69	32.11	59.06
0.562	41.36	19.89	46	-26.11	31.11	56
2.478	33.02	18.46	46	-27.54	26.06	56

CONDUCTED EMISSIONS					
Graph name :	**Emc#8**	**Configuration 3 : (Laptop power supply mains)**			
Voltage / Frequency :	**110Vac/60Hz**	**"IPP3xx Color Version"**			
Limite / Classe :	**EN 55011 / EN55022/B**				
Line/Port :	**Neutral**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



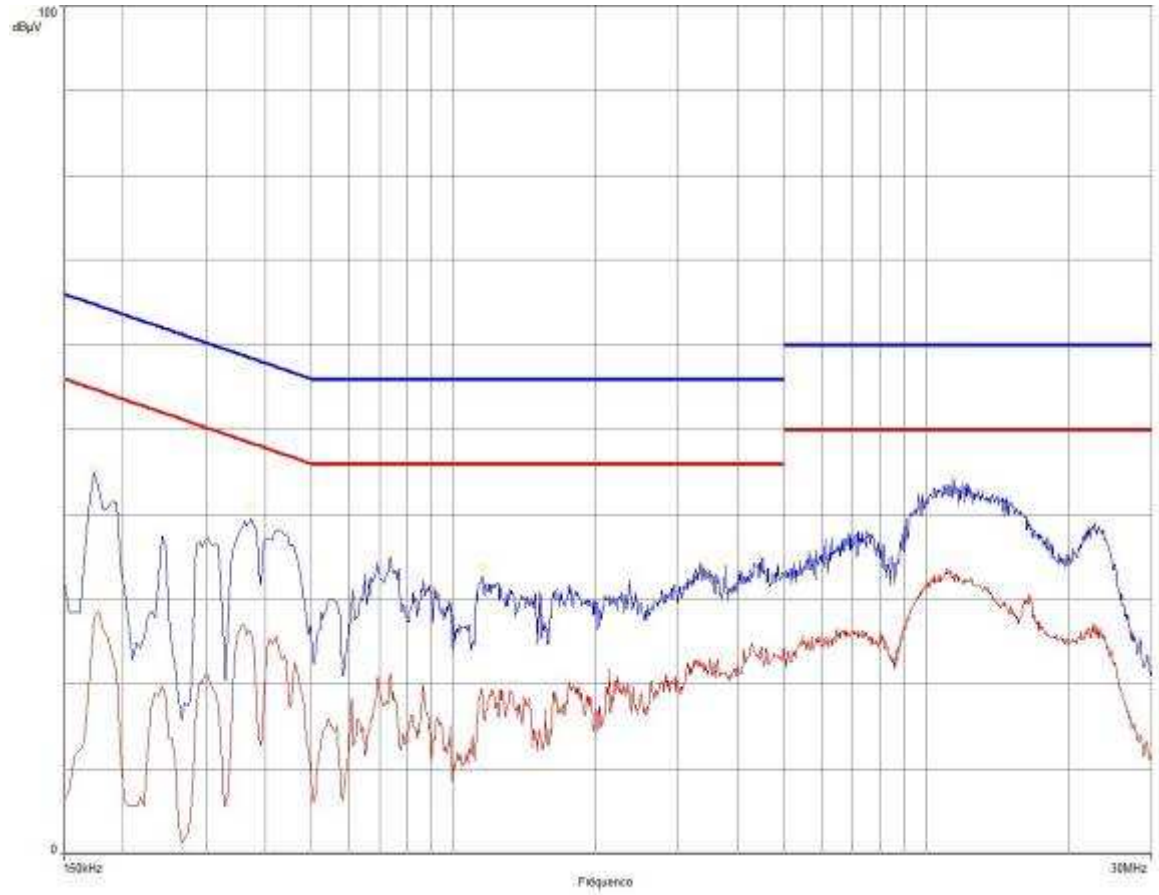
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.402	41.04	33.94	47.81	-13.87	36.4	57.81
0.45	41.65	31.68	46.88	-15.19	37.43	56.88
0.498	41.32	29.56	46.03	-16.47	34.77	56.03
0.55	41.43	29.72	46	-16.28	33.26	56
0.994	38.66	22.7	46	-23.3	30.97	56
0.402	41.04	33.94	47.81	-13.87	36.4	57.81

CONDUCTED EMISSIONS		**Configuration 4 : (FRIWO Power supply mains) "IPP3xx Color Version"**		
Graph name :	**Emc#9**			
Voltage / Frequency :	**110Vac/60Hz**			
Limite / Classe :	**EN 55011 / EN55022/B**			
Line/Port :	**Phase**	**Peak Measure**	**QPeak Limit**	
RBW / VBW :	**9kHz/30kHz**	**Average Measure**	**Average Limit**	



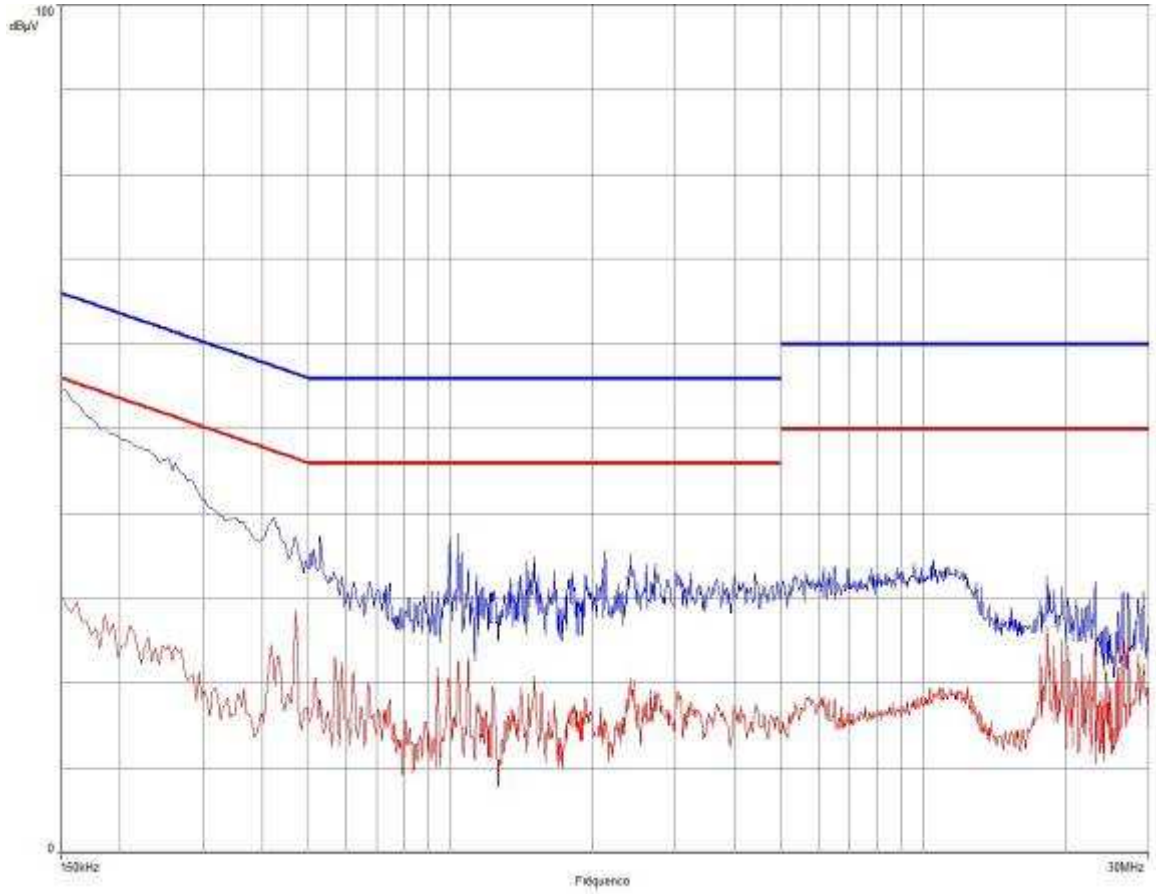
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.178	45.98	28.92	54.58	-25.66	42.2	64.58
0.362	40.97	27.44	48.68	-21.25	38.12	58.68
0.742	36.35	21.43	46	-24.57	33.34	56
11.762	43.05	31.51	50	-18.49	37.32	60

CONDUCTED EMISSIONS					
Graph name :	**Emc#10**	**Configuration 4 : (FRIWO Power supply mains)**			
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**	**"IPP3xx Color Version"**			
Line/Port :	**Neutral**	**Peak Measure**		**QPeak Limit**	
RBW / VBW :	**9kHz/30kHz**	**Average Measure**		**Average Limit**	

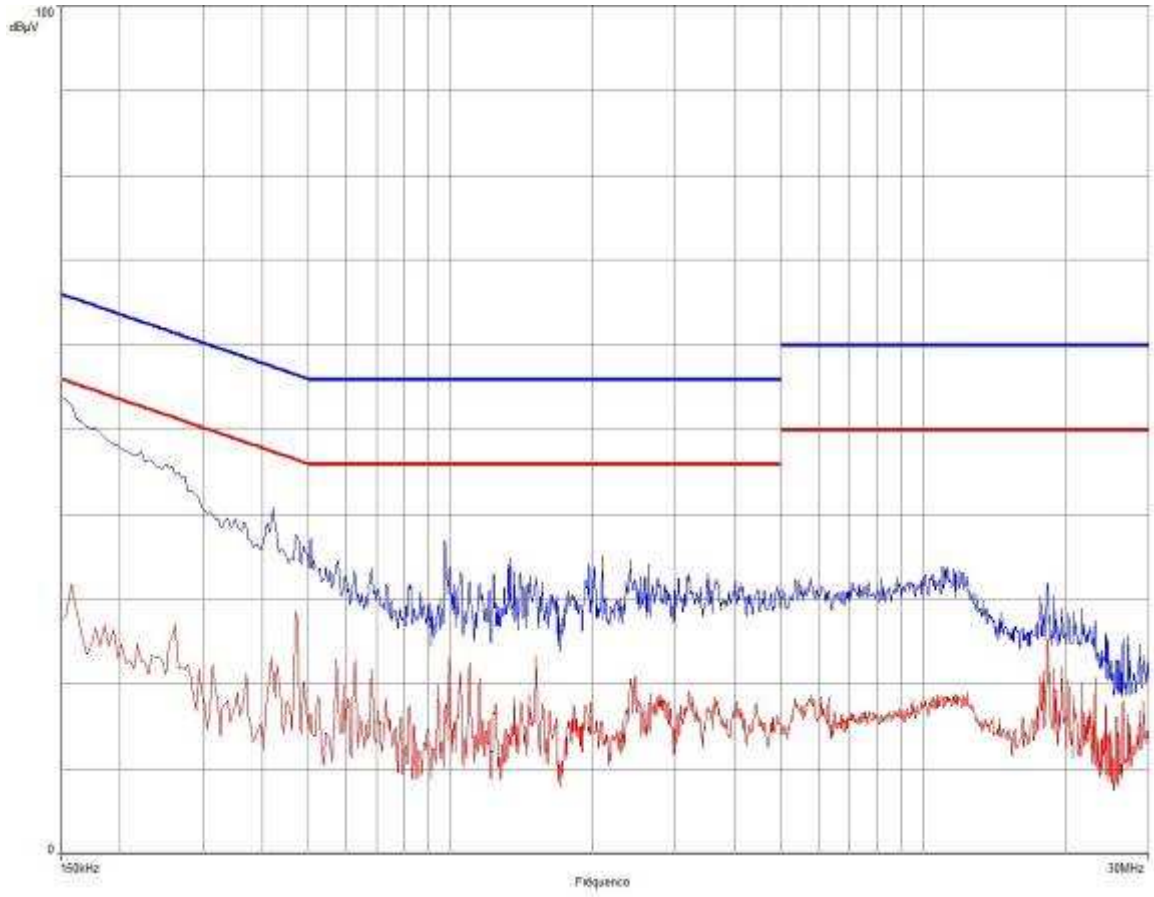


Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.174	45.36	27.68	54.77	-27.09	41.56	64.77
0.374	40.9	26.84	48.41	-21.57	38.53	58.41
0.734	34.84	19.11	46	-26.89	31.89	56
1.15	33.66	16.47	46	-29.53	28.29	56
11.454	44.28	32.49	50	-17.51	38.87	60
22.686	39.04	25.45	50	-24.55	34.65	60

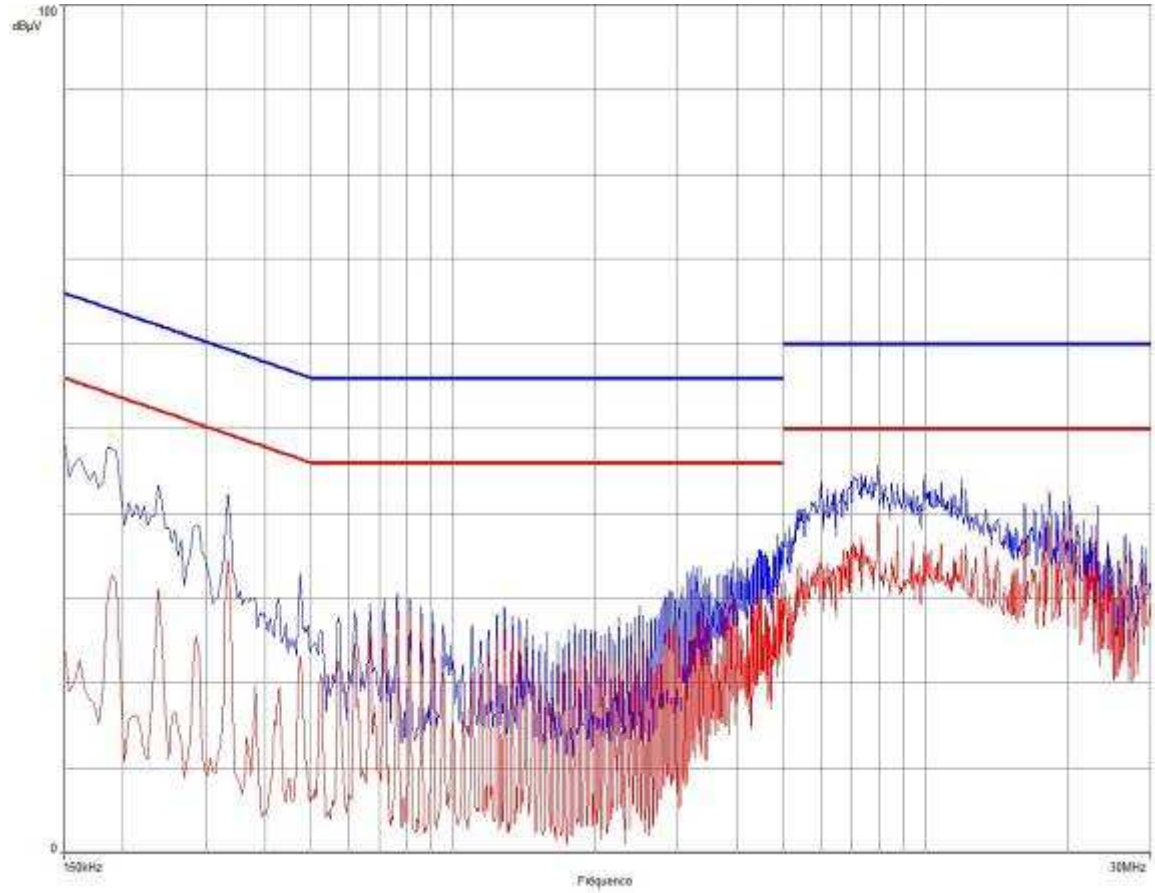
CONDUCTED EMISSIONS					
Graph name :	**Emc#11**	**Configuration 1 : FRIWO Power supply mains "IPP3xx B&W Version"**			
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**				
Line/Port :	**Phase**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



CONDUCTED EMISSIONS					
Graph name :	**Emc#12**	**Configuration 1 : FRIWO Power supply mains "IPP3xx B&W Version"**			
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**				
Line/Port :	**Neutral**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**

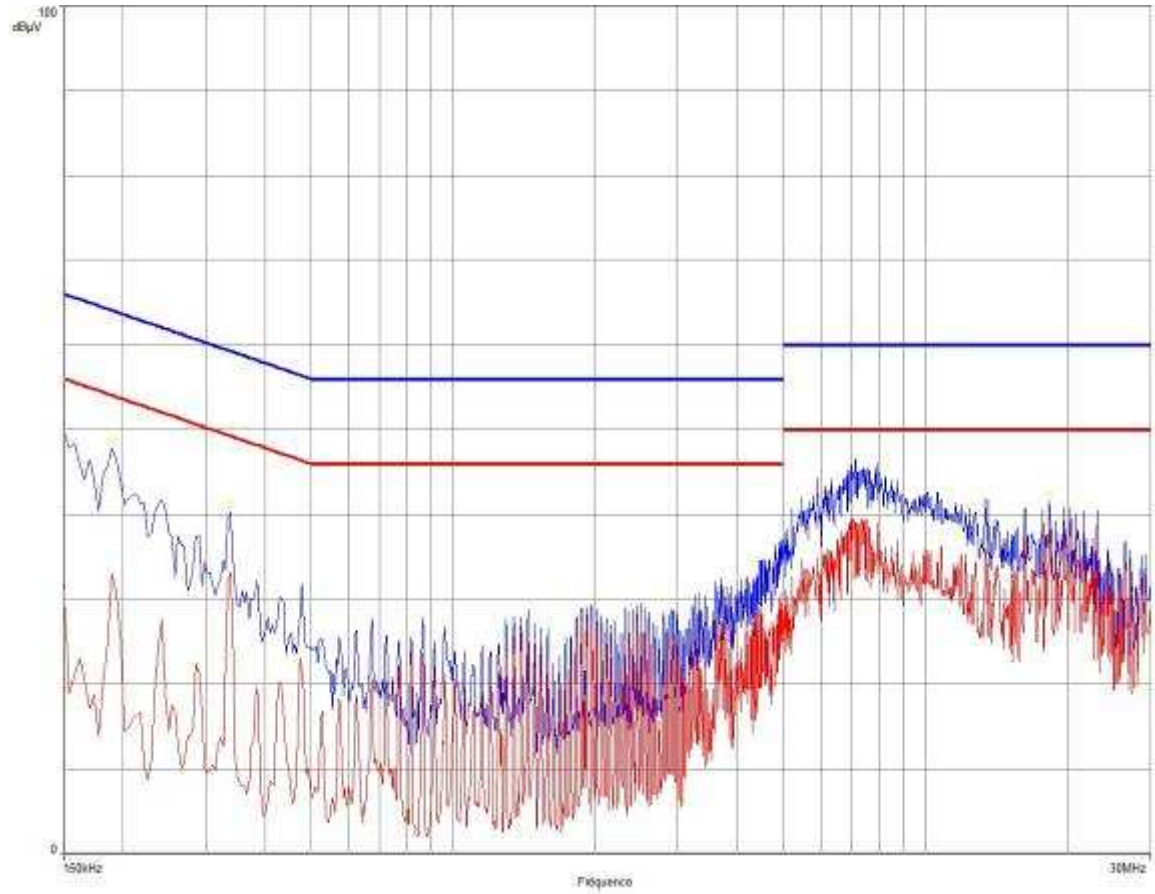


CONDUCTED EMISSIONS					
Graph name :	**Emc#13**	**Configuration 2 : (POE Injector mains)**			
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**	**"IPP3xx B&W Version"**			
Line/Port :	**Phase**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



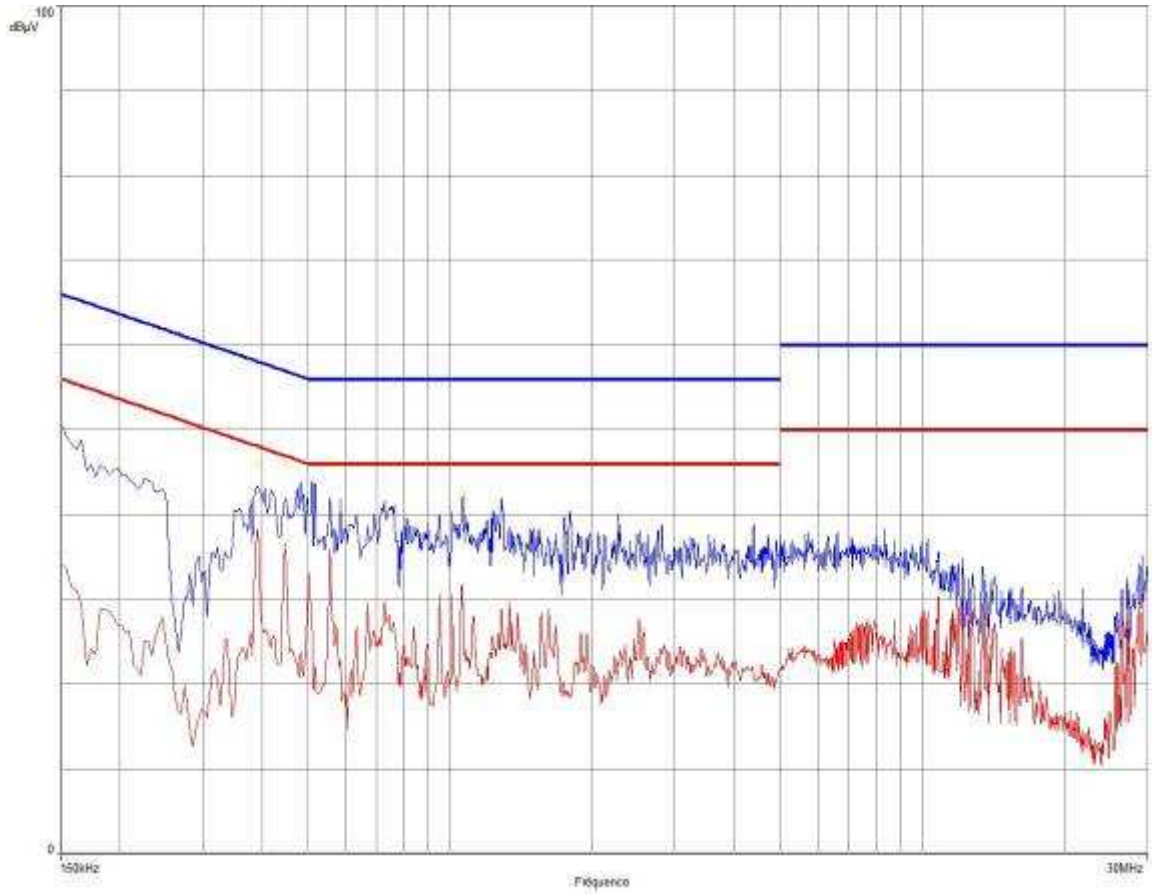
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.19	49.34	33.41	54.04	-20.63	45.85	64.04
0.334	41.96	34.12	49.35	-15.23	39.9	59.35
7.922	47.05	38.74	50	-11.26	42.75	60
18.242	42.29	38.85	50	-11.15	40.7	60
23.13	40.52	38.16	50	-11.84	39.62	60

CONDUCTED EMISSIONS					
Graph name :	**Emc#14**	**Configuration 2 : (POE Injector mains)**			
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**	**"IPP3xx B&W Version"**			
Line/Port :	**Neutral**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



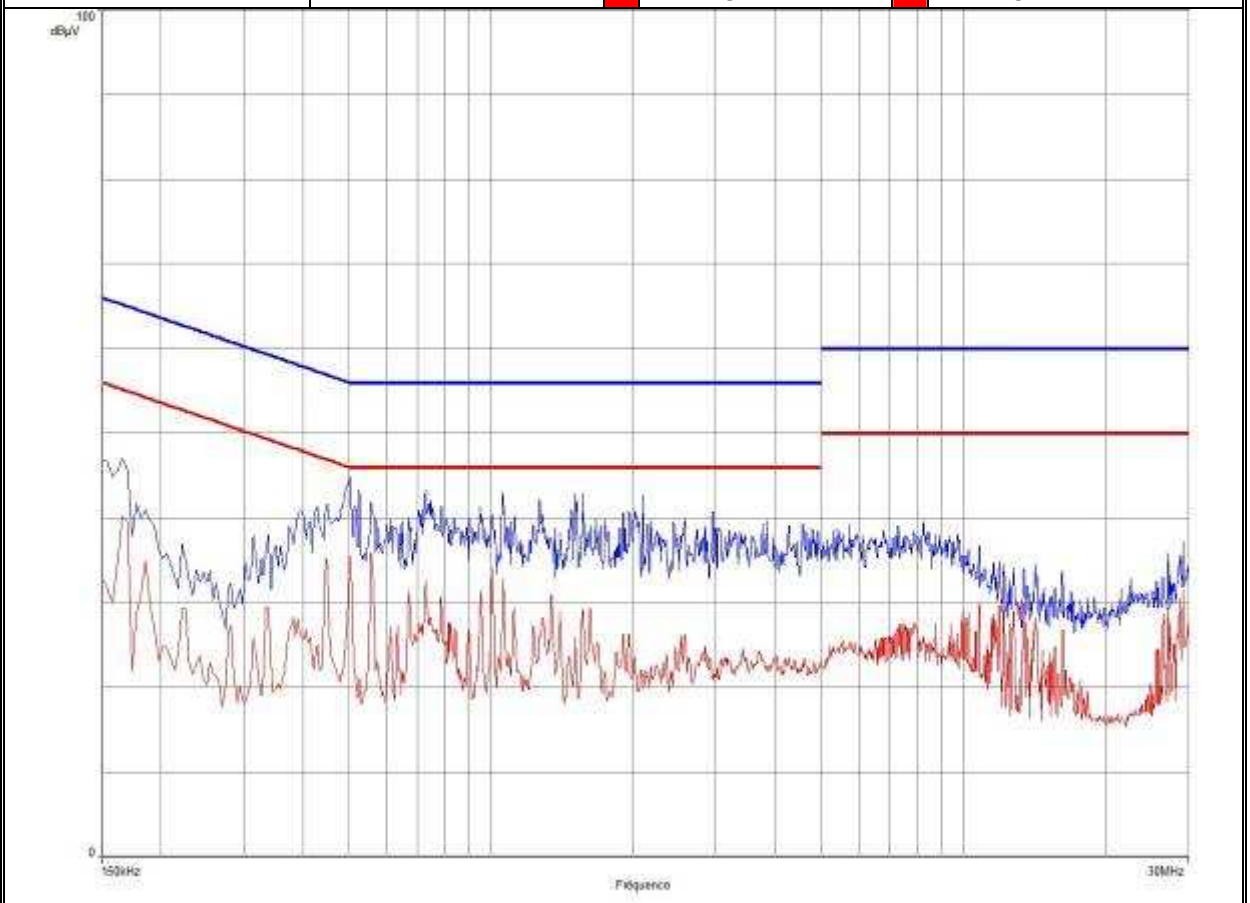
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.19	48.96	30.34	54.04	-23.7	42.93	64.04
0.338	41.29	34.11	49.25	-15.14	39.52	59.25
7.11	42.99	31.35	50	-18.65	36.93	60
18.242	42.22	38.85	50	-11.15	40.63	60

CONDUCTED EMISSIONS					
Graph name :	**Emc#15**	**Configuration 2 : (Laptop power supply mains)**			
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**	**"IPP3xx B&W Version"**			
Line/Port :	**Phase**	**Peak Measure**		**QPeak Limit**	
RBW / VBW :	**9kHz/30kHz**	**Average Measure**		**Average Limit**	



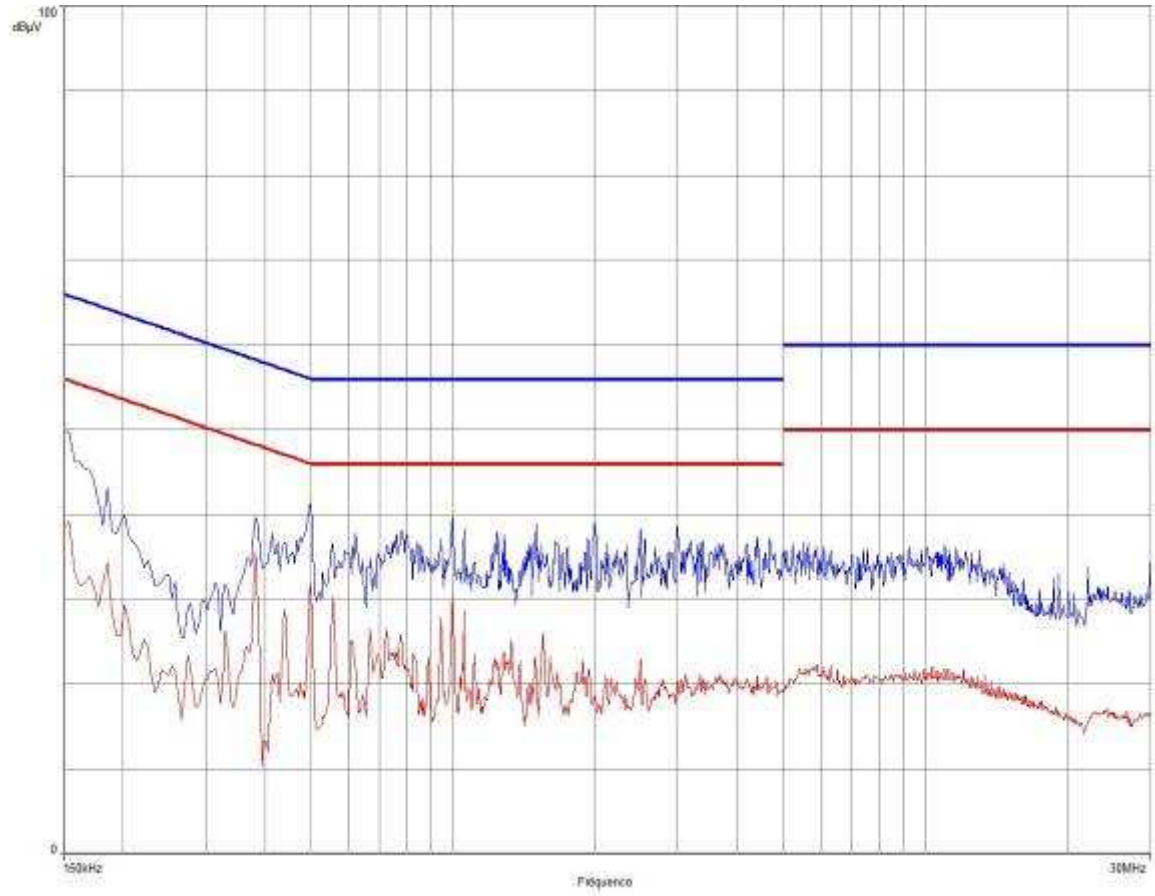
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.39	45.99	37.27	48.06	-10.79	40.24	58.06
0.45	45.83	34.54	46.88	-12.33	38.64	56.88
0.558	46.48	35.53	46	-10.47	38.31	56
1.066	42.43	29.8	46	-16.2	36.68	56

CONDUCTED EMISSIONS		**Configuration 2 : (Laptop power supply mains)** “IPP3xx B&W Version”			
Graph name :	**Emc#16**				
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**				
Line/Port :	**Neutral**	**Peak Measure**	**QPeak Limit**		
RBW / VBW :	**9kHz/30kHz**	**Average Measure**	**Average Limit**		



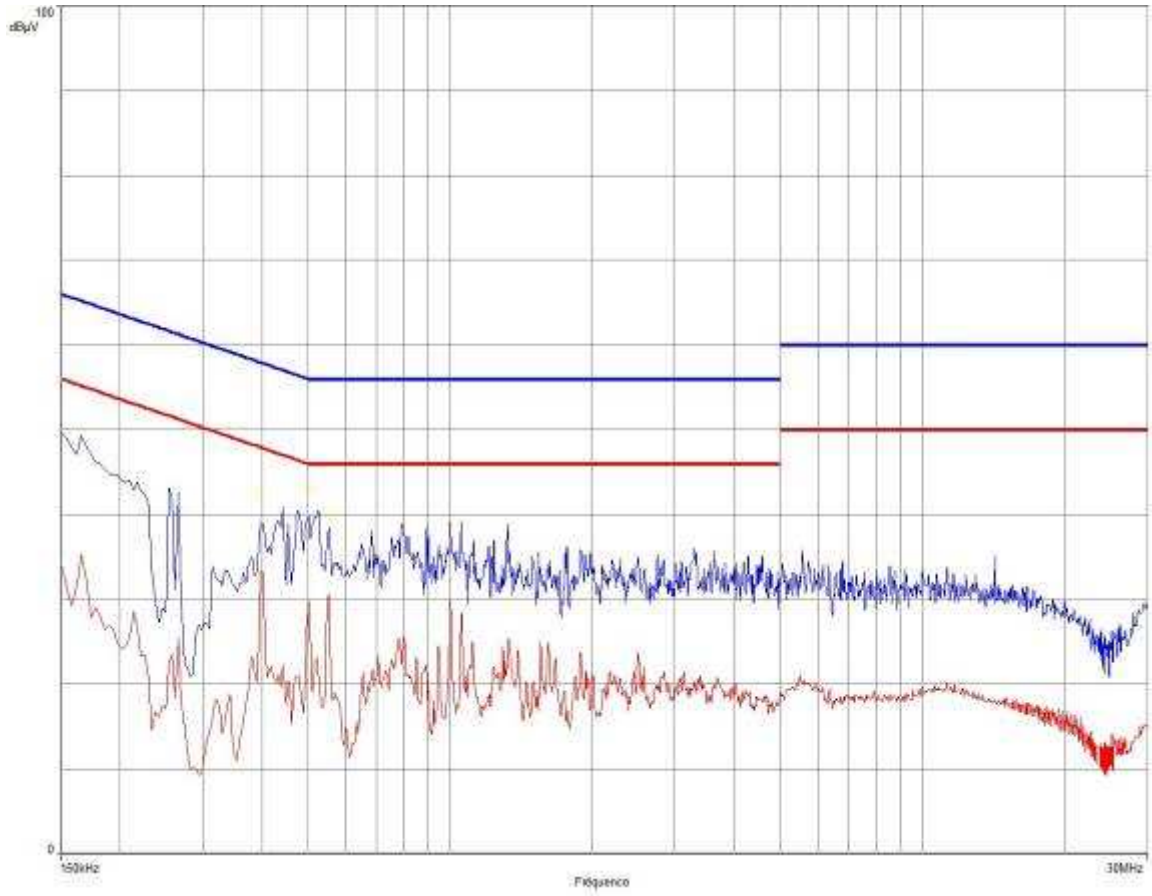
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.166	46.53	33.92	55.16	-21.24	41.06	65.16
0.45	45.72	36.49	46.88	-10.38	39.51	56.88
0.502	46.6	35.39	46	-10.61	40.58	56
0.558	46.24	35.44	46	-10.56	38.72	56

CONDUCTED EMISSIONS					
Graph name :	**Emc#17**	**Configuration 3 : (Laptop power supply mains)**			
Voltage / Frequency :	**110Vac/60Hz**	**"IPP3xx B&W Version"**			
Limite / Classe :	**EN 55011 / EN55022/B**				
Line/Port :	**Phase**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



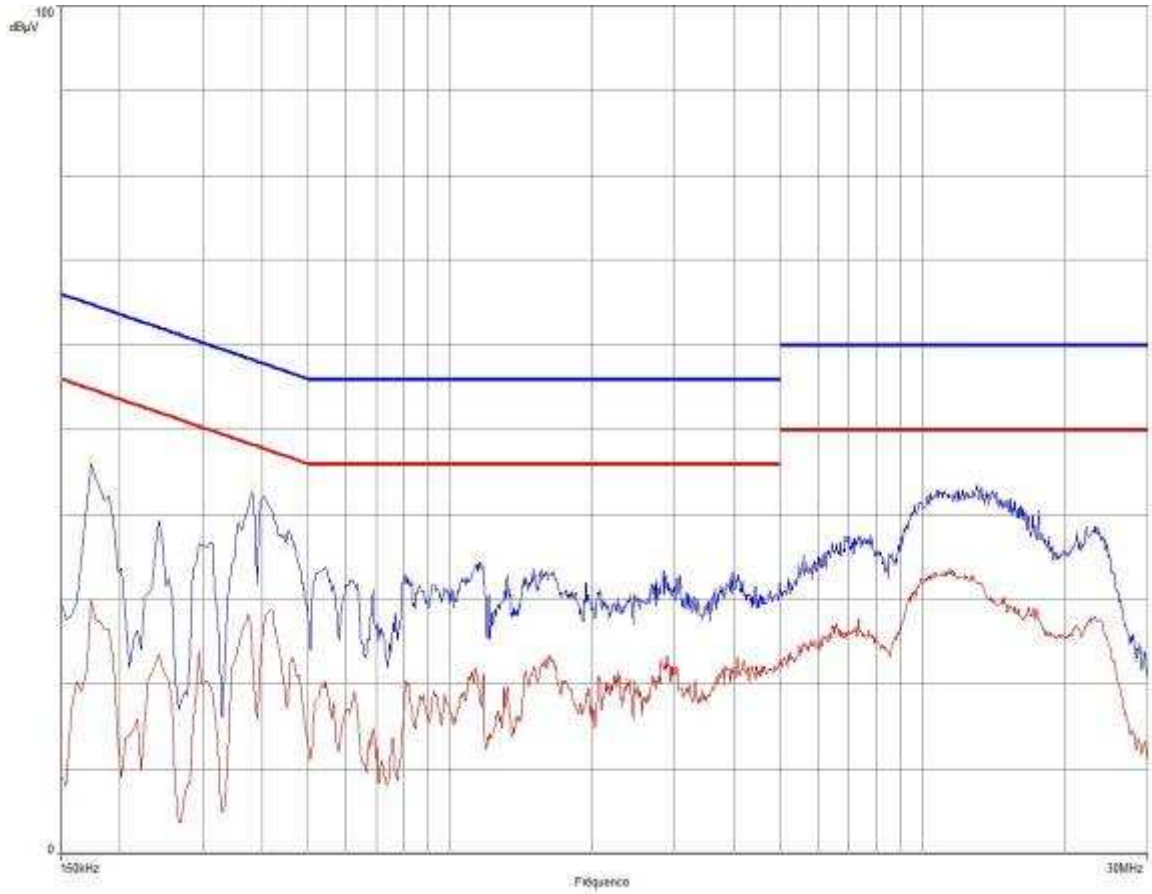
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.154	49.51	31.39	55.78	-24.4	45.52	65.78
0.382	39.37	24.79	48.24	-23.44	30.91	58.24
0.498	42.03	29.73	46.03	-16.31	38.01	56.03
0.998	40.21	28.21	46	-17.79	34.36	56

CONDUCTED EMISSIONS		**Configuration 3 : (Laptop power supply mains)** “IPP3xx B&W Version”			
Graph name :	**Emc#18**				
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**				
Line/Port :	**Neutral**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



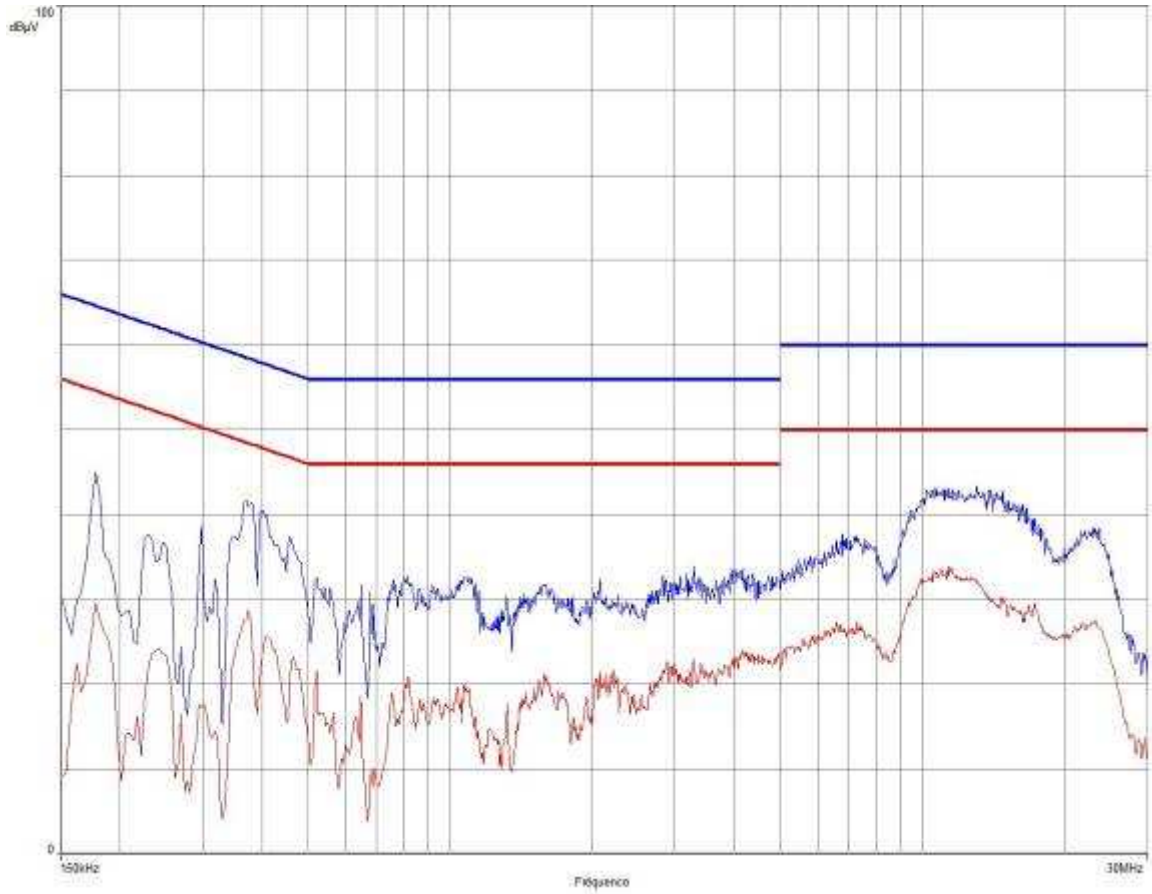
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.166	49.03	31.73	55.16	-23.42	44.66	65.16
0.398	42.61	31.86	47.9	-16.03	35.72	57.9
0.502	42.91	28.79	46	-17.21	37.16	56
0.554	39.82	30.17	46	-15.83	33.61	56
1.002	38.83	27.46	46	-18.54	32.98	56

CONDUCTED EMISSIONS		**Configuration 4 : (FRIWO Power supply mains)** “IPP3xx B&W Version”			
Graph name :	**Emc#19**				
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**				
Line/Port :	**Phase**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



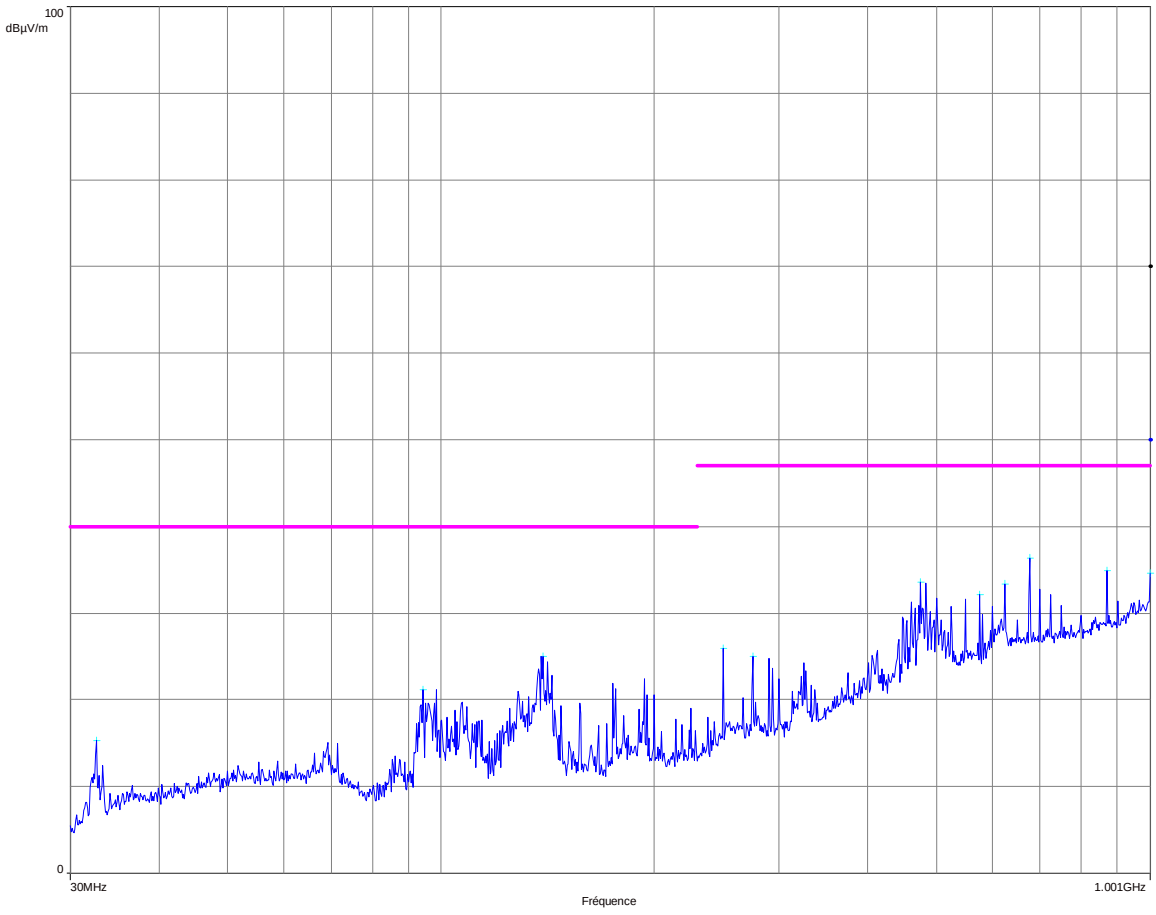
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.174	46.39	27.49	54.77	-27.28	41.57	64.77
0.382	43.32	24.39	48.24	-23.85	40.6	58.24
1.158	34.38	17.91	46	-28.09	30.92	56

CONDUCTED EMISSIONS		**Configuration 4 : (FRIWO Power supply mains)** “IPP3xx B&W Version”			
Graph name :	**Emc#20**				
Voltage / Frequency :	**110Vac/60Hz**				
Limite / Classe :	**EN 55011 / EN55022/B**				
Line/Port :	**Neutral**		**Peak Measure**		**QPeak Limit**
RBW / VBW :	**9kHz/30kHz**		**Average Measure**		**Average Limit**



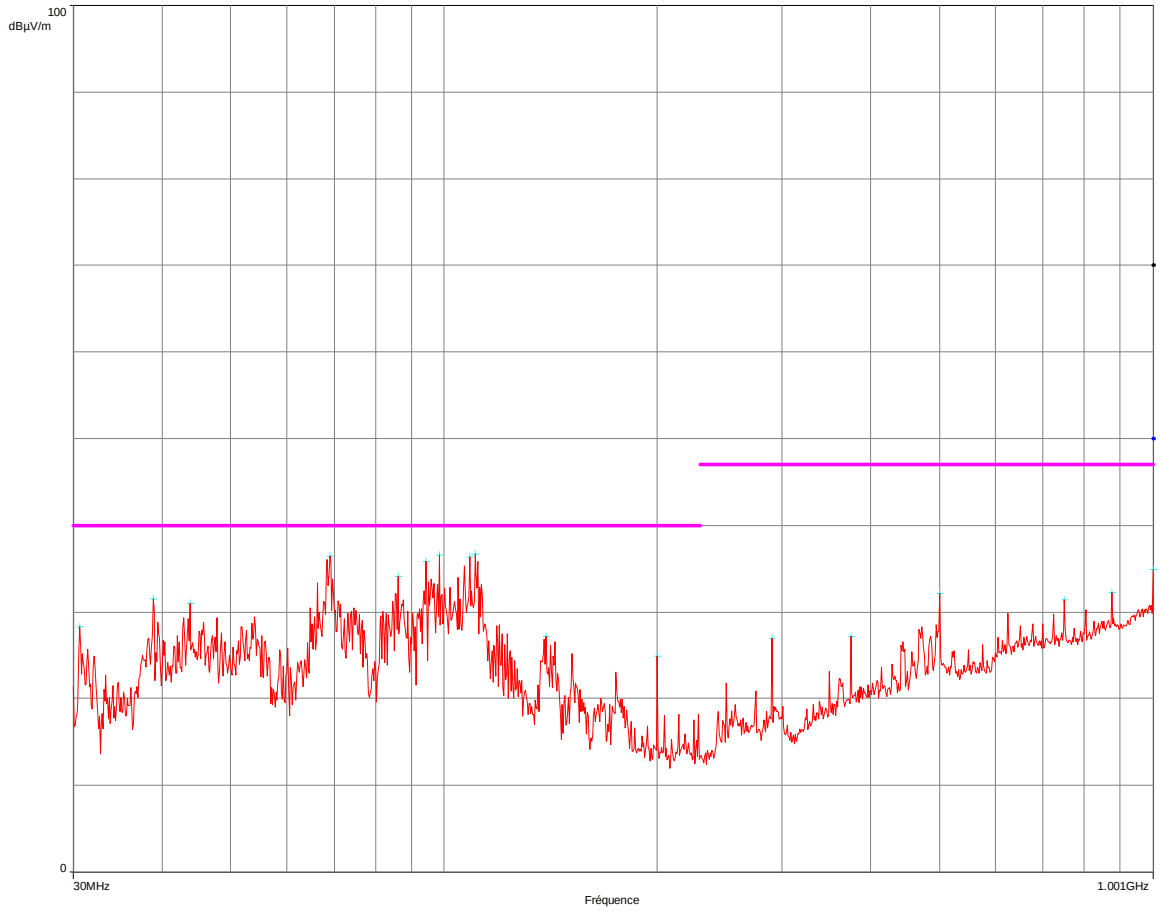
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	Avg-LimAvg (dBµV)	QPeak (dBµV)	LimQPeak (dBµV)	QPeak-LimQPeak (dBµV)
0.178	44.48	28.4	54.58	-26.18	40.96	64.58
0.298	36.23	17.49	50.3	-32.81	29.32	60.3
0.37	42.27	28.4	48.5	-20.1	40.06	58.5
10.658	42.27	31.74	50	-18.26	36.99	60

RADIATED EMISSIONS					
Graph name :	**Emr#1**	**Pol H - Configuration 1 :**			
Azimuth :	**0°- 360°**				
Limite / Classe :	**EN 55022 Class B**	**"IPP3xx Color Version"**			
Antenna position :	**Horizontale**				
RBW/VBW :	**120kHz/300kHz**		**Peak Measure**		**QPeak Limit@3m**



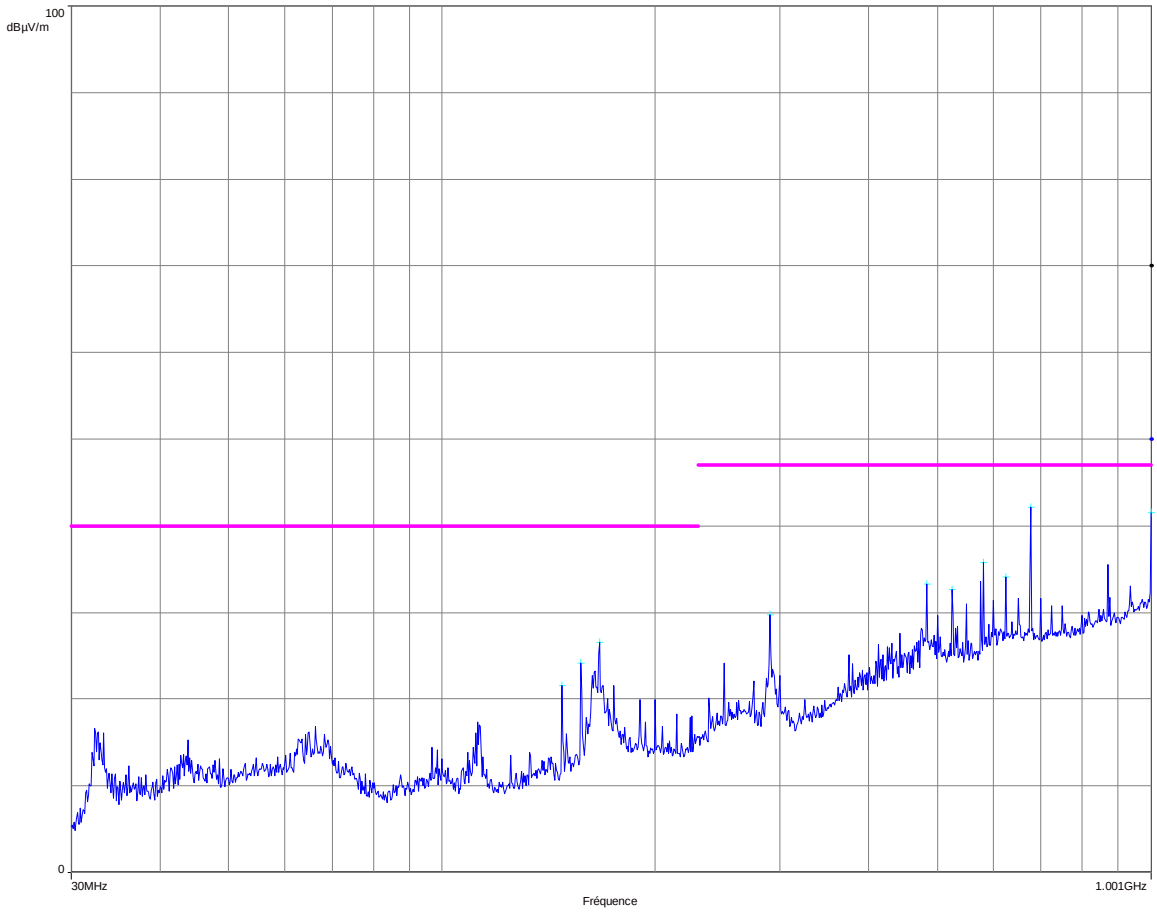
Frequency (MHz)	Peak Lvl (dBµV/m)
32.6	15.26
94.4	21.19
139.2	24.98
250	25.93
275	25.05
475	33.56
575	32.16
625	33.41
677.25	36.33
870.65	34.92
1000	34.66

RADIATED EMISSIONS		Pol V - **Configuration 1** :
Graph name :	**Emr#2**	
Azimuth :	**0°- 360°**	**(Ethernet+BA FRIWO)**
Limite / Classe :	**EN 55022 Class B**	**"IPP3xx Color Version"**
Antenna position :	**Verticale**	
RBW/VBW :	**120kHz/300kHz**	**Peak Measure** / **QPeak Limit@3m**



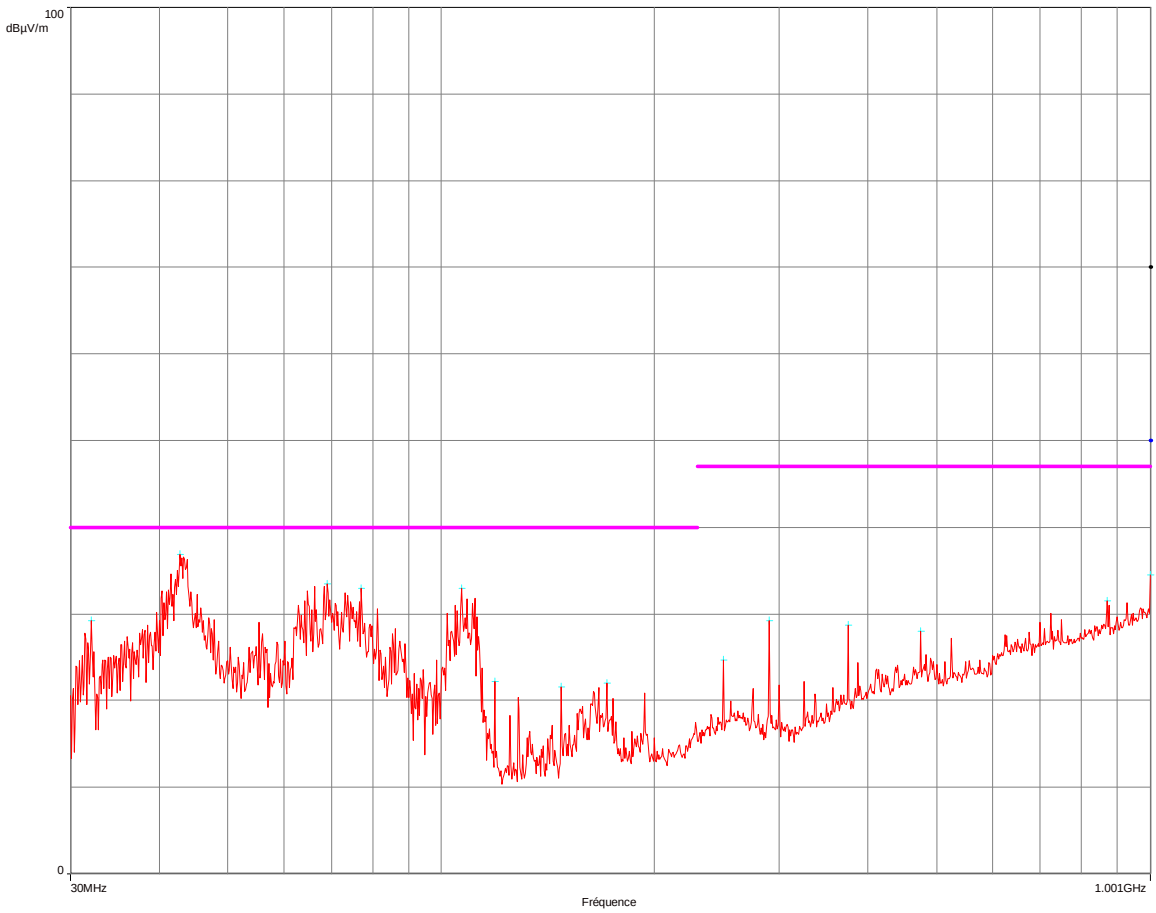
Frequency (MHz)	Peak Lvl (dBµV/m)	Frequency (MHz)	Peak Lvl (dBµV/m)
30.65	28.33	**110.8**	36.63
38.9	31.51	**139.2**	27.18
43.8	30.97	**200**	24.92
69	36.47	**290.3**	26.94
86.05	34.06	**375**	27.15
94.4	35.83	**500**	32.09
98.45	36.55	**750**	31.37
108.8	36.35	**875**	32.27
110.8	36.63	**1000**	34.92

RADIATED EMISSIONS		Pol H - Configuration 2 : (Ethernet POE) “IPP3xx Color Version”
Graph name :	**Emr#3**	
Azimuth :	**0°- 360°**	
Limite / Classe :	**EN 55022 Class B**	
Antenna position :	**Horizontale**	
RBW/VBW :	**120kHz/300kHz**	**Peak Measure** / **QPeak Limit@3m**



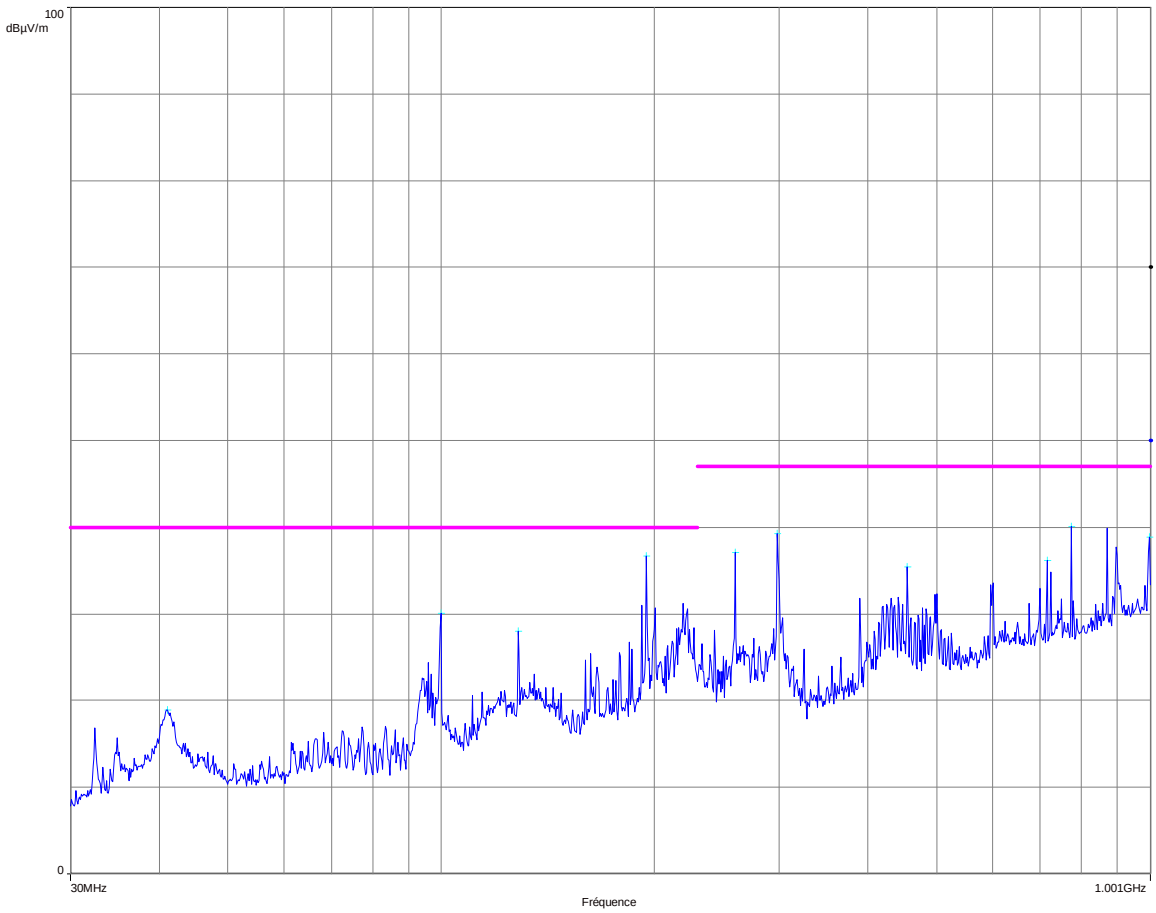
Frequency (MHz)	Peak Lvl (dBµV/m)
147.6	21.64
157.15	24.17
166.65	26.53
290.35	29.8
483.8	33.28
525	32.66
580.55	35.73
625	34.07
677.35	42.2
1000	41.51

RADIATED EMISSIONS					
Graph name :	**Emr#4**	**PoI V - Configuration 2 : (Ethernet POE) "IPP3xx Color Version"**			
Azimuth :	**0°- 360°**				
Limite / Classe :	**EN 55022 Class B**				
Antenna position :	**Verticale**				
RBW/VBW :	**120kHz/300kHz**		**Peak Measure**		**QPeak Limit@3m**



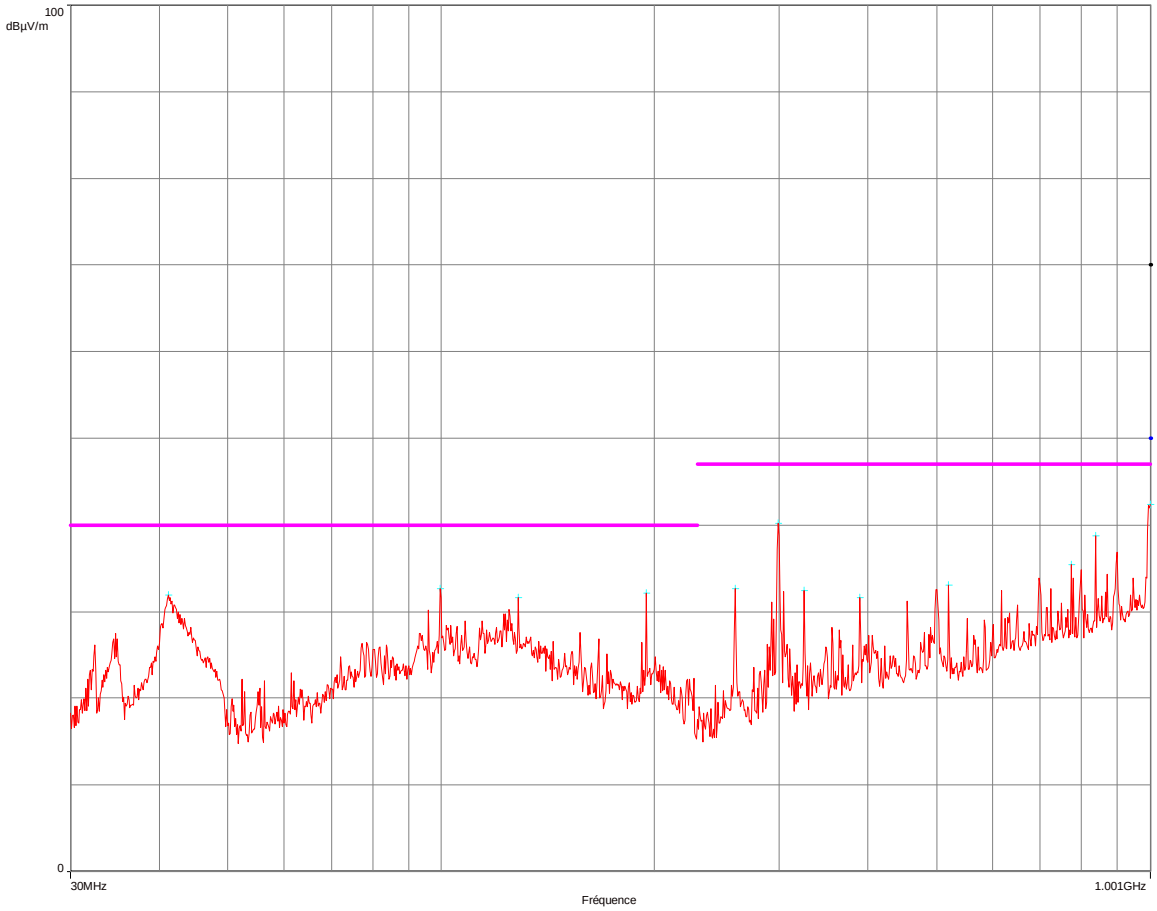
Frequency (MHz)	Peak (dBµV/m)	Frequency (MHz)	Peak (dBµV/m)
32.05	29.2	**171.4**	22.02
42.8	36.92	**250**	24.72
69.1	33.51	**290.25**	29.24
77.2	32.99	**375**	28.69
106.7	32.91	**475**	28.04
119.05	22.25	**870.65**	31.54
147.6	21.61	**1000**	34.47

RADIATED EMISSIONS					
Graph name :	**Emr#5**	**Pol H - Configuration 3 : (USB)**			
Azimuth :	**0°- 360°**	**"IPP3xx Color Version"**			
Limite / Classe :	**EN 55022 Class B**				
Antenna position :	**Horizontal**				
RBW/VBW :	**120kHz/300kHz**		**Peak Measure**		**QPeak Limit@3m**



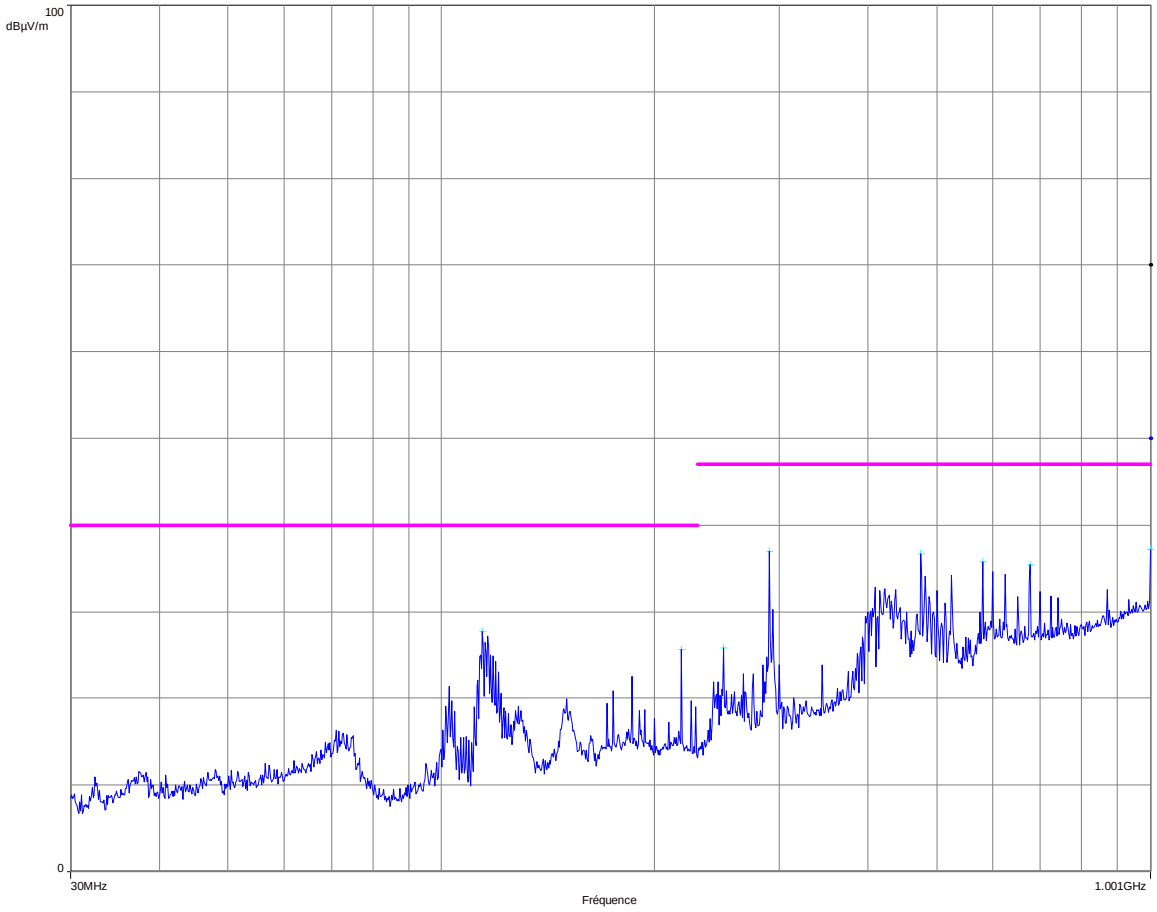
Frequency (MHz)	Peak Lvl (dBµV/m)
41.05	18.86
99.8	30.09
128.55	28.02
194.95	36.73
259.85	37.07
298.25	39.24
454.75	35.48
715.45	36.16
774.1	40.13
999.45	38.86

RADIATED EMISSIONS					
Graph name :	**Emr#6**	**Pol V - Configuration 3 : (USB)**			
Azimuth :	**0°- 360°**	**"IPP3xx Color Version"**			
Limite / Classe :	**EN 55022 Class B**				
Antenna position :	**Vertical**				
RBW/VBW :	**120kHz/300kHz**		**Peak Measure**		**QPeak Limit@3m**



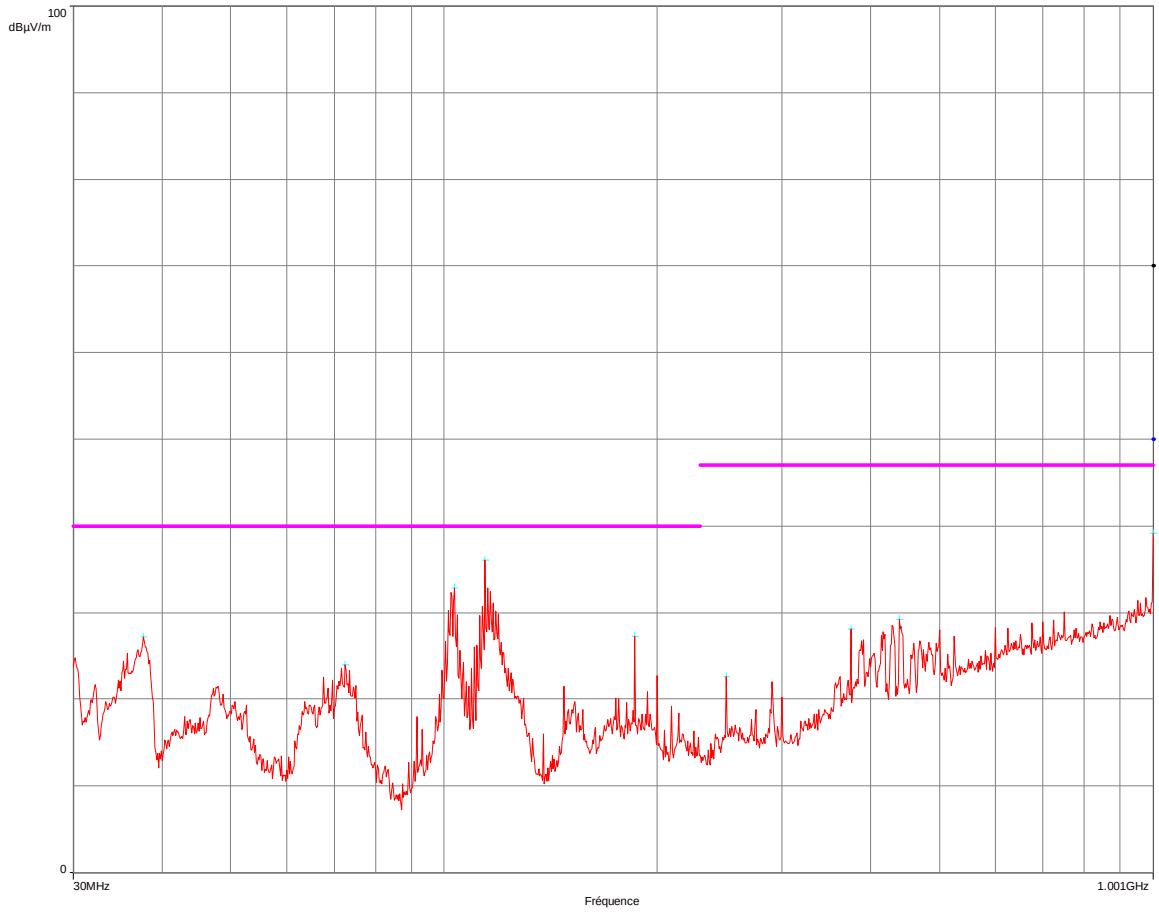
Frequency (MHz)	Peak Lvl (dBµV/m)	Frequency (MHz)	Peak Lvl (dBµV/m)
41.25	31.9	**324.85**	32.45
99.75	32.67	**389.8**	31.63
128.55	31.58	**519.75**	33.11
194.95	32.12	**773.8**	35.43
259.85	32.69	**838.55**	38.75
299.05	40.22	**1000**	42.34

RADIATED EMISSIONS					
Graph name :	**Emr#7**	**Pol H - Configuration 4 : (RS232+ BA PHIHONG)**			
Azimuth :	**0°- 360°**	**"IPP3xx Color Version"**			
Limite / Classe :	**EN 55022 Class B**				
Antenna position :	**Horizontal**				
RBW/VBW :	**120kHz/300kHz**		**Peak Measure**		**QPeak Limit@3m**



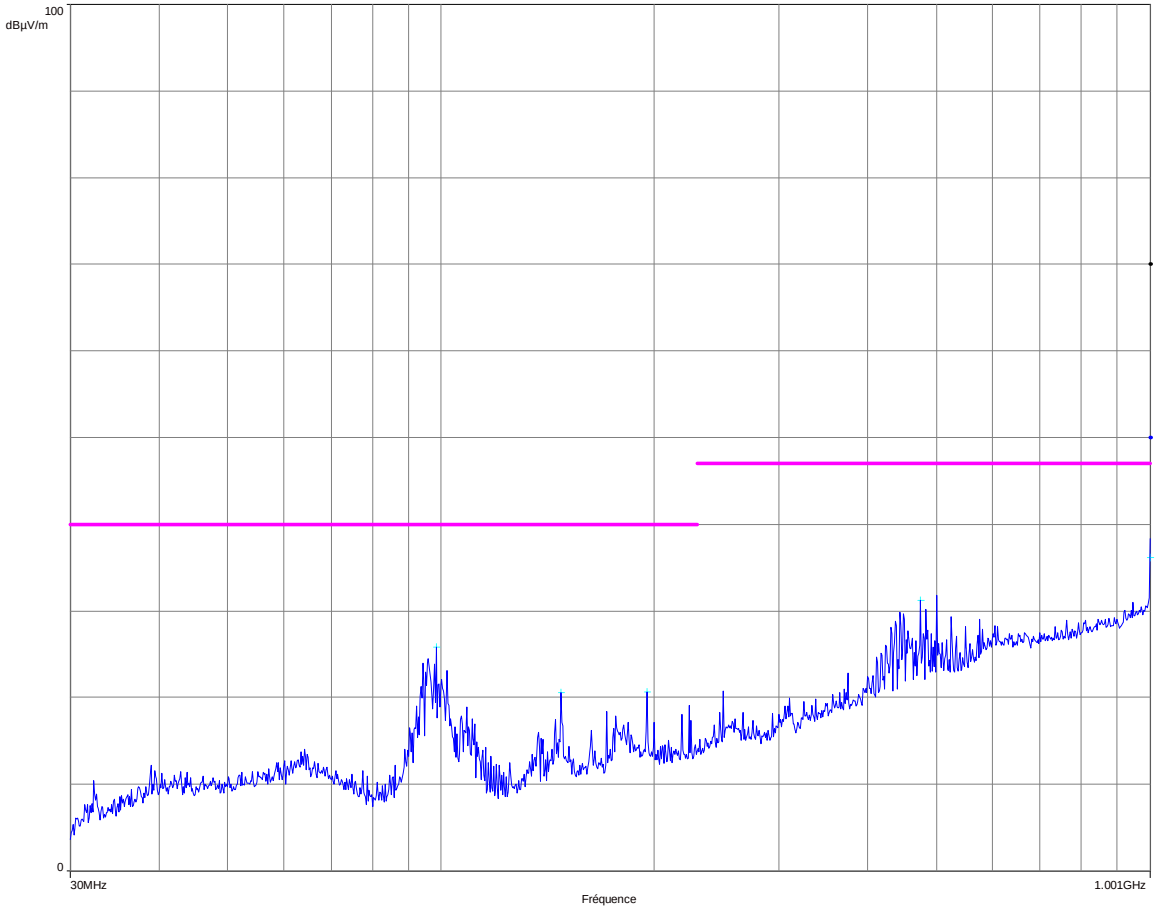
Frequency (MHz)	Peak Lvl (dBµV/m)
114.25	27.67
218.1	25.64
250	25.78
290.35	36.95
475	36.66
580.6	35.74
677.5	35.4
1000	37.17

RADIATED EMISSIONS					
Graph name :	**Emr#8**	**Pol V - Configuration 4 : (RS232+ BA PHIHONG)**			
Azimuth :	**0°- 360°**	**"IPP3xx Color Version"**			
Limite / Classe :	**EN 55022 Class B**				
Antenna position :	**Vertical**				
RBW/VBW :	**120kHz/300kHz**		**Peak Measure**		**QPeak Limit@3m**



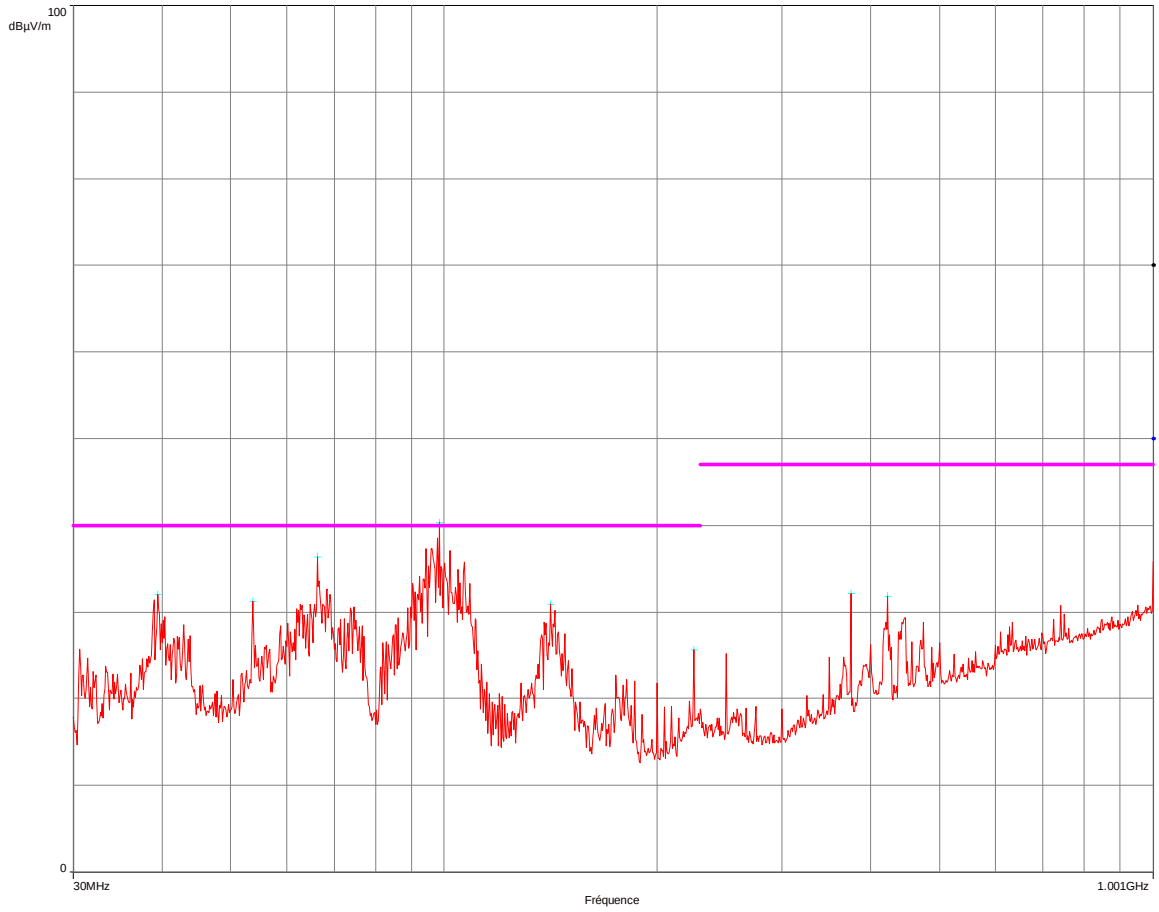
Frequency (MHz)	Peak Lvl (dBµV/m)
37.7	27.17
72.6	23.98
103.45	32.85
114.3	36.05
185.7	27.24
250	22.61
375	28.1
439.5	29.25
1000	39.21

RADIATED EMISSIONS					
Graph name :	**Emr#9**	**Pol H - Configuration 1 :**			
Azimuth :	**0°- 360°**				
Limite / Classe :	**EN 55022 Class B**	**"IPP3xx B&W Version"**			
Antenna position :	**Horizontale**				
RBW/VBW :	**120kHz/300kHz**		**Peak Measure**		**QPeak Limit@3m**



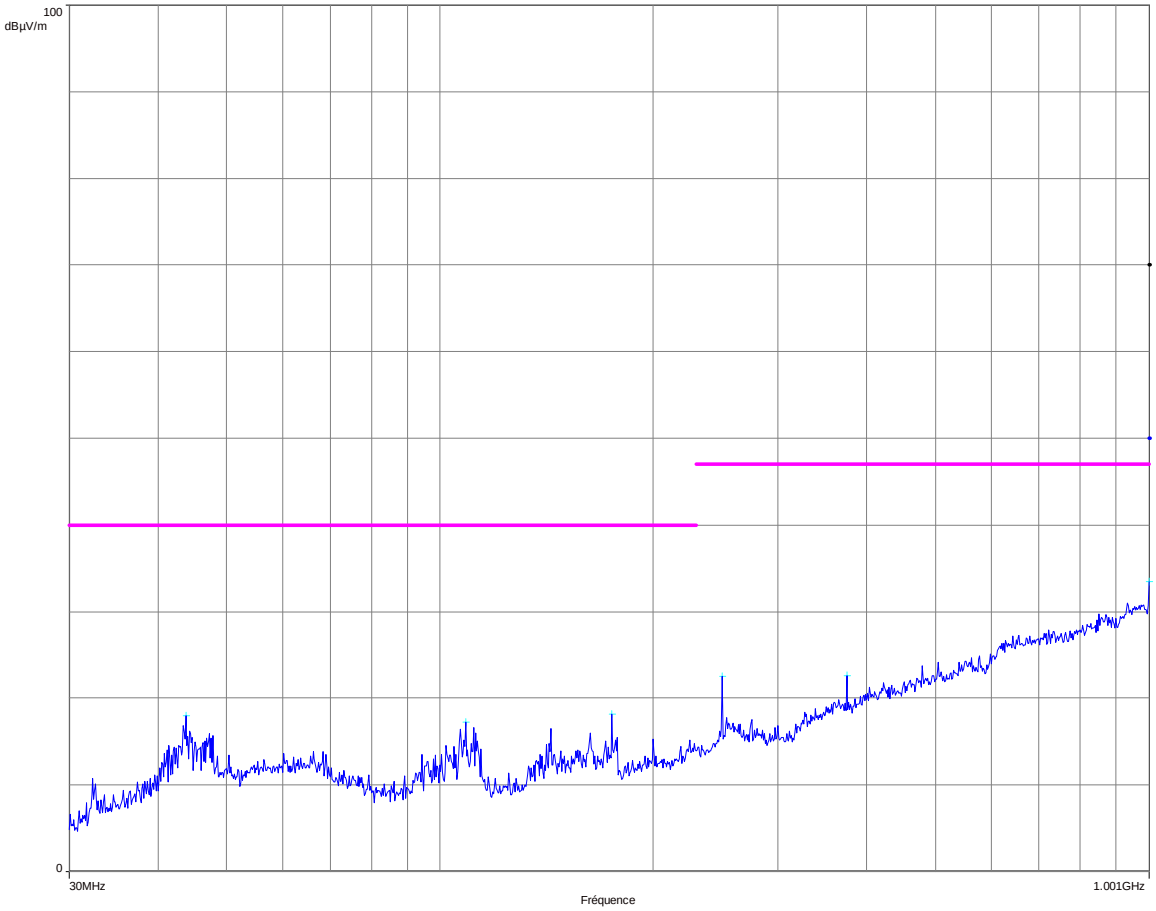
Frequency (MHz)	Peak Lvl (dBµV/m)
98.5	25.81
147.6	20.59
195.2	20.66
475	31.16
999.95	36.18

RADIATED EMISSIONS		Pol V - Configuration 1 : (Ethernet+BA FRIWO) "IPP3xx B&W Version"
Graph name :	**Emr#10**	
Azimuth :	**0°- 360°**	
Limite / Classe :	**EN 55022 Class B**	
Antenna position :	**Verticale**	
RBW/VBW :	**120kHz/300kHz**	**Peak Measure** / **QPeak Limit@3m**



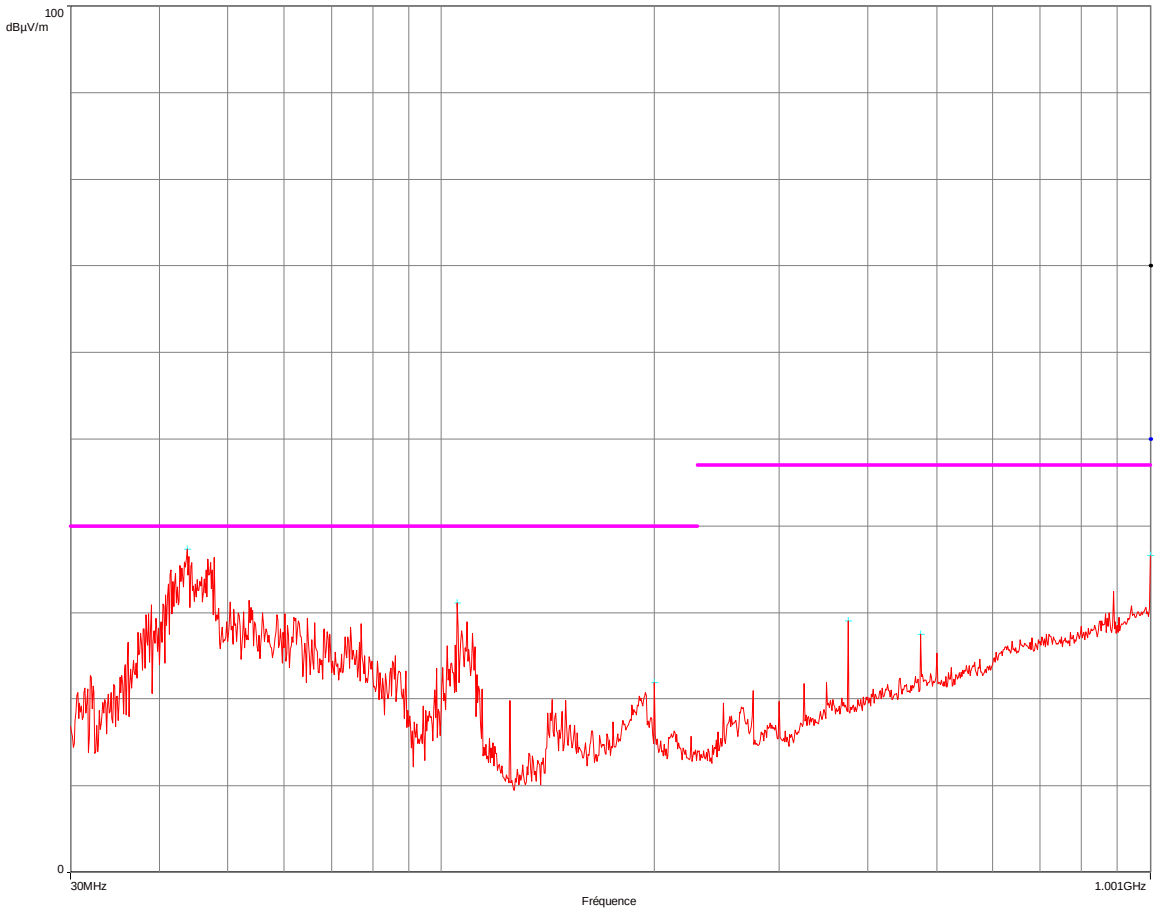
Frequency (MHz)	Peak Lvl (dBµV/m)
39.5	32.07
53.8	31.21
66.3	36.37
98.4	40.28
141.2	30.91
225	25.58
375	32.1
422.4	31.84

RADIATED EMISSIONS					
Graph name :	**Emr#11**	**Pol H - Configuration 2 : (Ethernet POE)**			
Azimuth :	**0°- 360°**	**"IPP3xx B&W Version"**			
Limite / Classe :	**EN 55022 Class B**				
Antenna position :	**Horizontale**				
RBW/VBW :	**120kHz/300kHz**		**Peak Measure**		**QPeak Limit@3m**



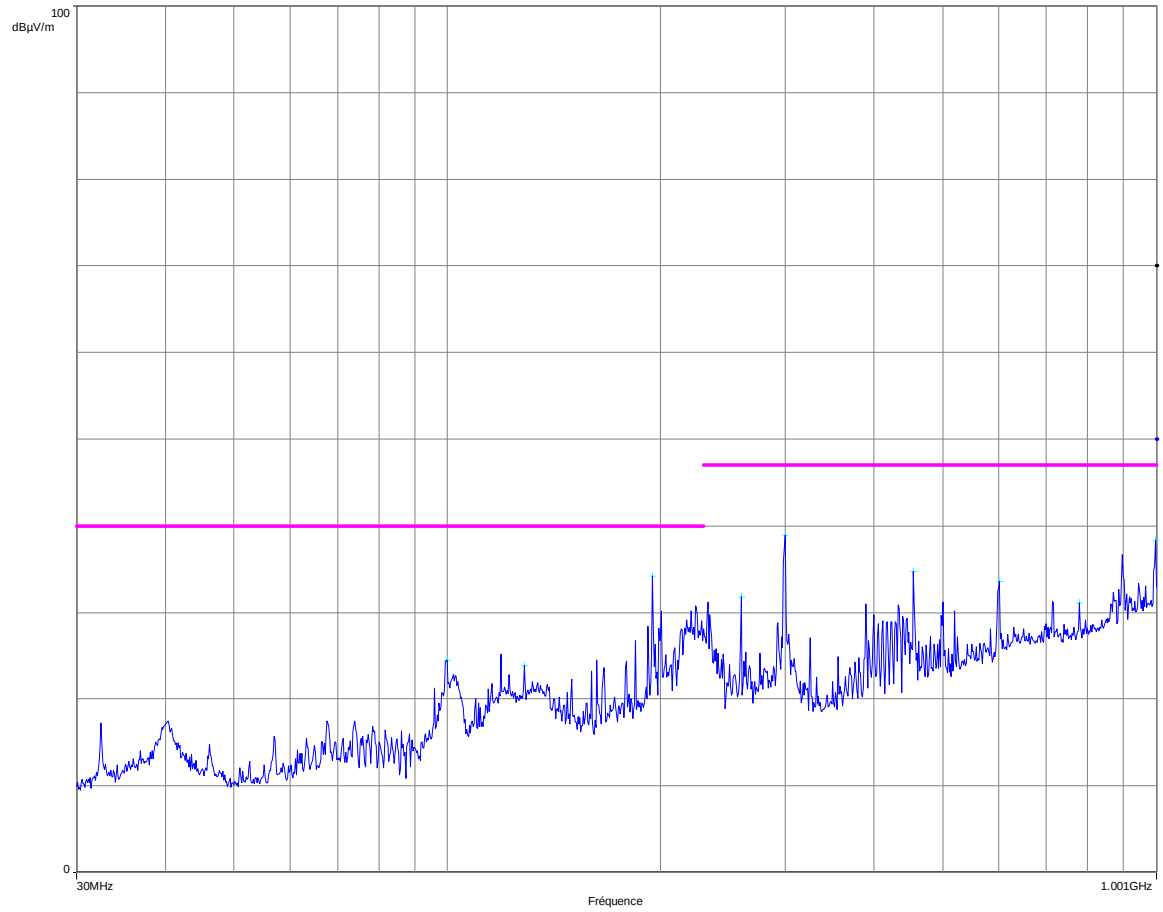
Frequency (MHz)	Peak Lvl (dBµV/m)
43.75	18.02
108.8	17.29
175	18.21
250	22.5
375	22.58
1000	33.43

RADIATED EMISSIONS					
Graph name :	**Emr#12**	**Pol V - Configuration 2 : (Ethernet POE) "IPP3xx B&W Version"**			
Azimuth :	**0°- 360°**				
Limite / Classe :	**EN 55022 Class B**				
Antenna position :	**Verticale**				
RBW/VBW :	**120kHz/300kHz**		**Peak Measure**		**QPeak Limit@3m**



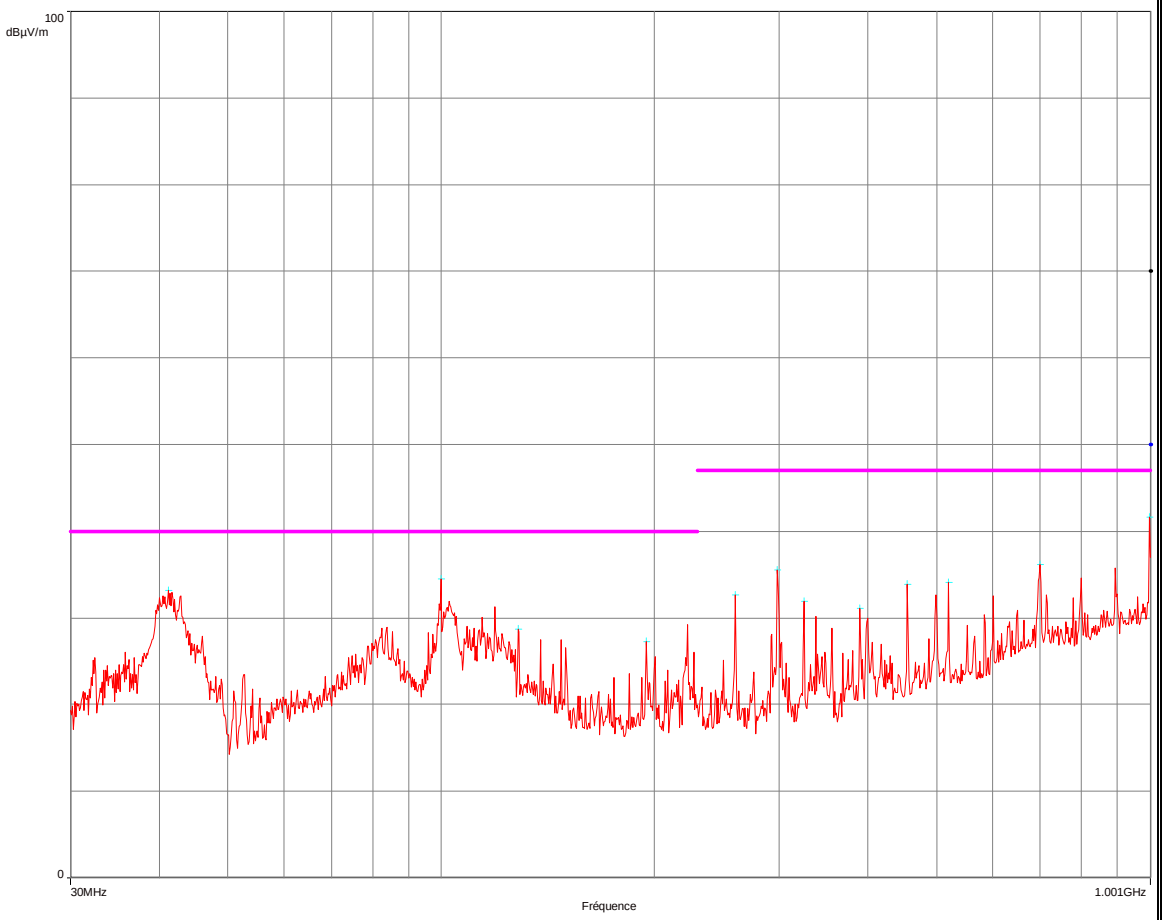
Frequency (MHz)	Peak (dBµV/m)
43.8	37.26
105.4	31.05
200	21.88
375	29.01
475	27.49
1000	36.58

RADIATED EMISSIONS		Pol H - Configuration 3 : (USB) “IPP3xx B&W Version”
Graph name :	**Emr#13**	
Azimuth :	**0°- 360°**	
Limite / Classe :	**EN 55022 Class B**	
Antenna position :	**Horizontal**	
RBW/VBW :	**120kHz/300kHz**	**Peak Measure** / **QPeak Limit@3m**



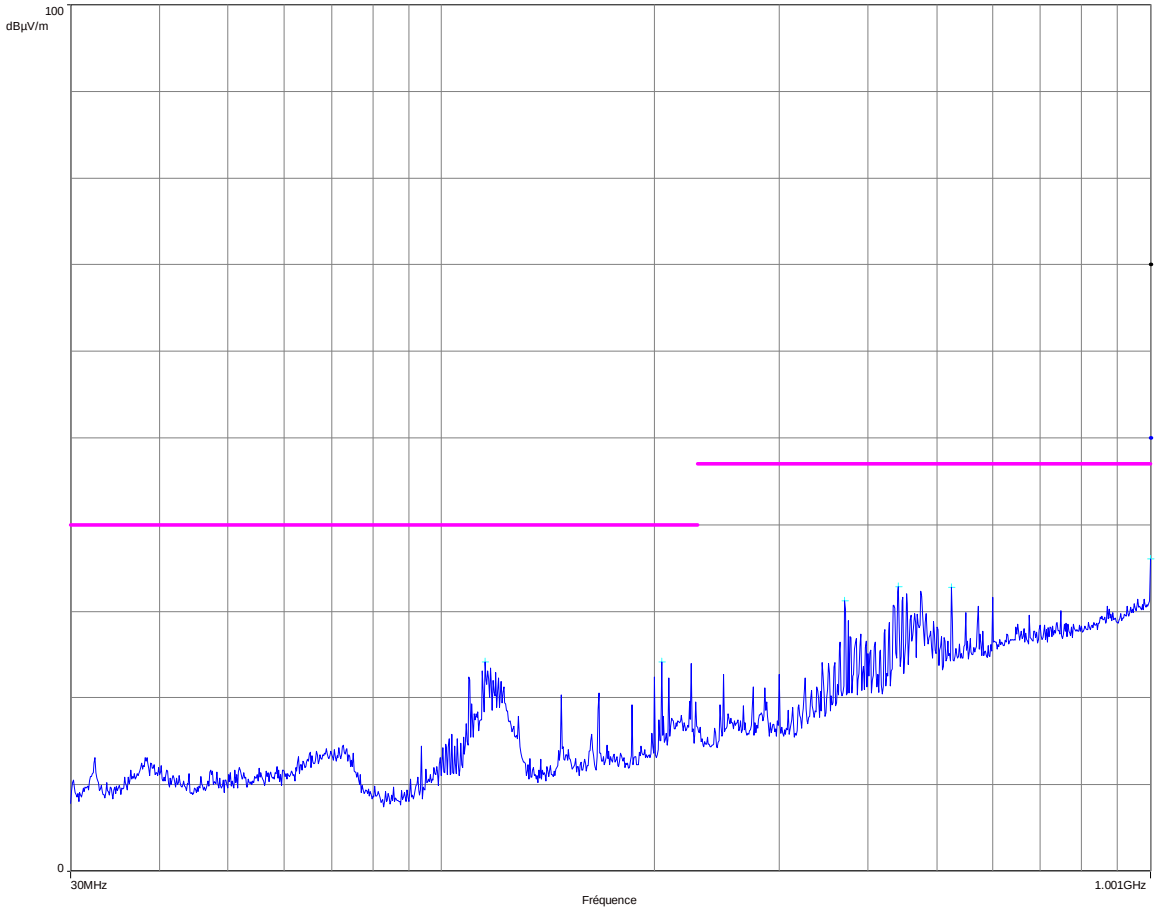
Frequency (MHz)	Peak Lvl (dBµV/m)
99.95	24.46
128.55	23.83
194.85	34.25
259.85	31.77
299.9	38.98
454.8	34.68
601.1	33.59
780	31.14
998.2	38.29
194.85	34.25

RADIATED EMISSIONS					
Graph name :	**Emr#14**	**Pol V - Configuration 3 : (USB)**			
Azimuth :	**0°- 360°**	**"IPP3xx B&W Version"**			
Limite / Classe :	**EN 55022 Class B**				
Antenna position :	**Vertical**				
RBW/VBW :	**120kHz/300kHz**		**Peak Measure**		**QPeak Limit@3m**



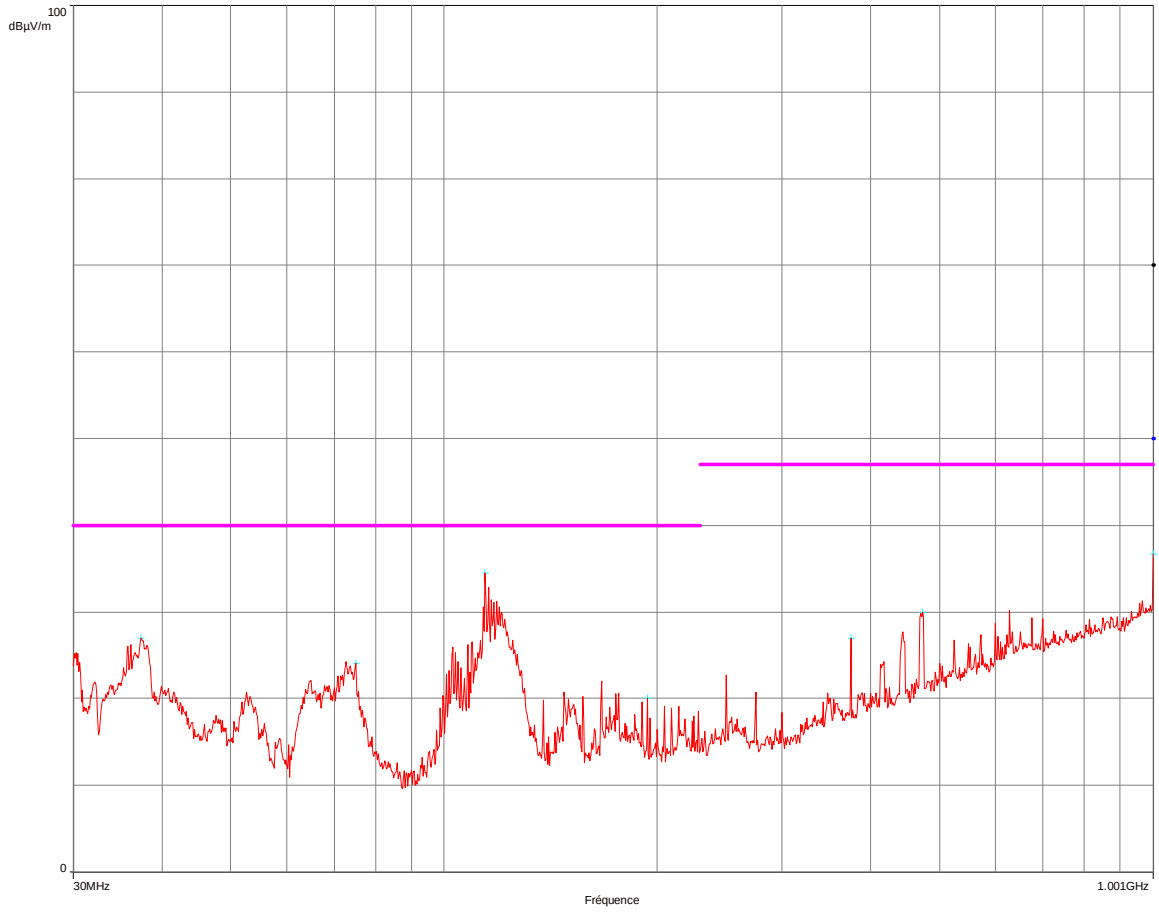
Frequency (MHz)	Peak Lvl (dBµV/m)	Frequency (MHz)	Peak Lvl (dBµV/m)
41.2	33.14	**324.85**	31.87
99.85	34.55	**389.8**	31.05
128.55	28.76	**454.8**	33.89
194.95	27.27	**519.75**	34.09
259.85	32.65	**699.8**	36.11
298.25	35.56	**998.65**	41.65

RADIATED EMISSIONS					
Graph name :	**Emr#15**	**Pol H - Configuration 4 : (RS232+ BA PHIHONG)**			
Azimuth :	**0°- 360°**	**"IPP3xx B&W Version"**			
Limite / Classe :	**EN 55022 Class B**				
Antenna position :	**Horizontal**				
RBW/VBW :	**120kHz/300kHz**		**Peak Measure**		**QPeak Limit@3m**



Frequency (MHz)	Peak Lvl (dBµV/m)
115.4	24.22
204.75	24.13
371.05	31.19
441.3	32.82
525	32.71
1000	36.09

RADIATED EMISSIONS					
Graph name :	**Emr#16**	**Pol V - Configuration 4 : (RS232+ BA PHIHONG)**			
Azimuth :	**0°- 360°**	**"IPP3xx B&W Version"**			
Limite / Classe :	**EN 55022 Class B**				
Antenna position :	**Vertical**				
RBW/VBW :	**120kHz/300kHz**		**Peak Measure**		**QPeak Limit@3m**



Frequency (MHz)	Peak Lvl (dBµV/m)
37.35	26.99
75	24.1
114.3	34.5
193.55	20.08
375	26.97
473	30.01
1000	36.65