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ESSAIS
Laboratoire
d'essai accrédité
N°1-1633

Rapport d'essai / Test report

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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 : **ML30-322A-0101 (USB) / ML30-312A-0101 (RS232)**
- N° de série / serial number : **09310PP10000102**
- Configuration / Configuration : **USB / RS232**
- FCC ID : **XKB-ML30**

Date des essais / Test date : Le 12 Novembre 2009 / November 12th, 2009

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: 21 pages

MOIRANS, LE 19 JANVIER 2010 / JANUARY 19TH, 2010

Ecrit par / Written by
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Approuvé par / Approved by,
Jacques LORQUIN

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SUMMARY

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1. TEST PROGRAM

Standard : FCC CFR 47, PART 15, Subpart B

ANSI C63-4 (2003).

Requirements for unintentional radiator. Class B computer peripheral.

- Radiated emissions from 30MHz to 2GHz
- Conducted emissions from 150kHz to 30MHz

* Highest internal frequency: 171MHz

General conclusion:

Measures performed on the sample of the product ML30, SN: 09310PP10000102, in configuration and description presented in this test report, show compliance levels with FCC CFR 47, Part 15 B .



3. MEASUREMENT OF CONDUCTED EMISSION (150kHz-30MHz)

3.1. TEST CONDITIONS

Date of test : November 12th, 2009
Test performed by : J PAUC
Humidity : 38%
Temperature : 21°C
Pressure : 992mB

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).

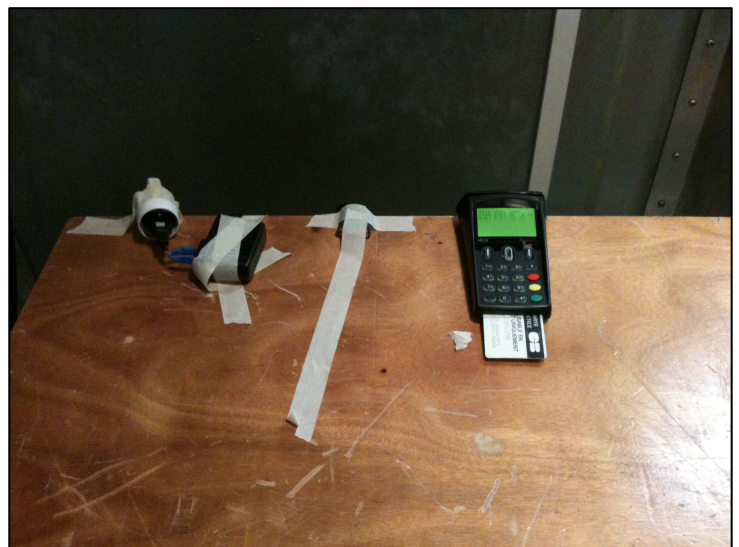
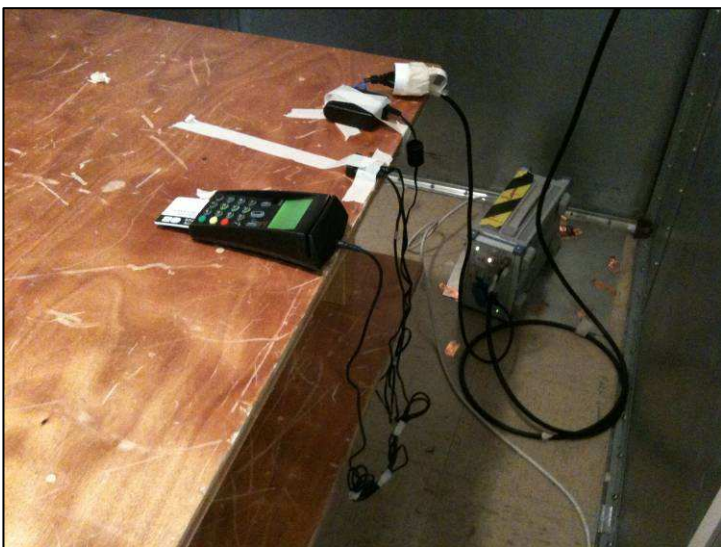
Measurement is made with a Rohde & Schwarz ESU8 receiver in peak mode. This was followed by a Quasi-Peak, i.e. CISPR measurement for any strong signal. If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is 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 (USB Mode, 322A-0101)



Configuration n°2 (RS232 Mode, 312A-0101)

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) of the power line of the PC.

| | | | |
|---------------|--------------------|---------------------------------|---------------|
| Measure on L: | graph Emc#1 | (Configuration n°1, USB mode) | (see annex 1) |
| Measure on N: | graph Emc#2 | (Configuration n°1, USB mode) | (see annex 1) |
| Measure on L: | graph Emc#3 | (Configuration n°2, RS232 mode) | (see annex 1) |
| Measure on N: | graph Emc#4 | (Configuration n°2, RS232 mode) | (see annex 1) |

RESULT: PASS



4. MEASUREMENT OF RADIATED EMISSION (30MHz-2GHz)

4.1. TEST CONDITIONS

Date of test : November 12th, 2009
Test performed by : J PAUC
Humidity : 38%
Temperature : 21°C
Pressure : 992mB

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.

The EUT is powered by laptop (Configuration n°1 : USB Mode)

The EUT is powered from power adapter 8Vdc (Configuration n°2 : RS232 Mode)

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.

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.

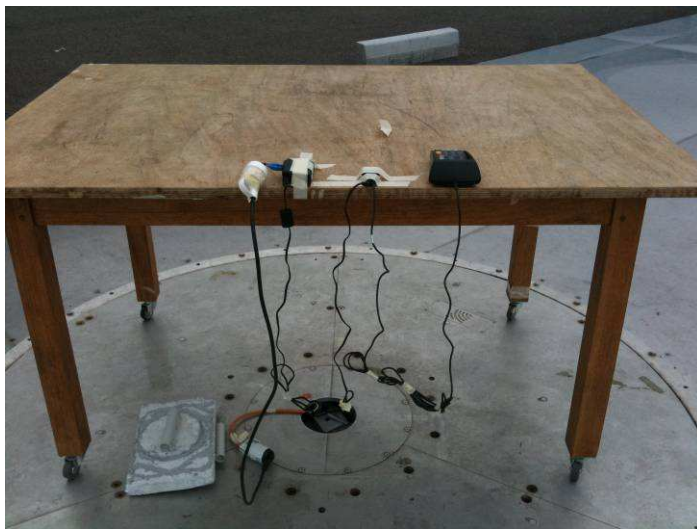
Measurement bandwidth was 1 MHz from 1 GHz to 2GHz.

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.

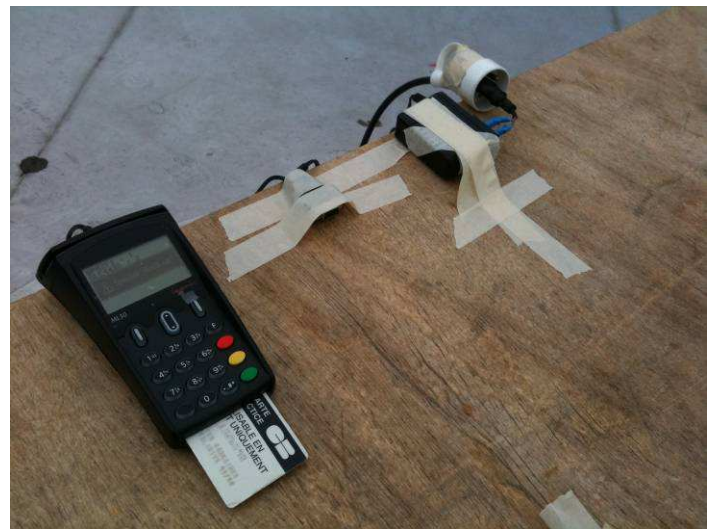
Equipment was moved (3 axis measurement) to position that maximized emission. A summary of the worst case emissions found in all test configurations and modes is shown on clauses 4.2a



Configuration n°1 (USB MODE)



Configuration n°2 (RS232 MODE)



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 (USB Mode)

Polarisation H: graph **Emr#1** (see annex 1)
 Polarisation V: graph **Emr#2** (see annex 1)

Configuration n°2 (RS232 Mode)

Polarisation H: graph **Emr#3** (see annex 1)
 Polarisation V: graph **Emr#4** (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 (USB Mode)

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 | 44.67 | 40.0 | 28.4 | -11.6 | 80 | V | 220 | 12.4 |
| 2 | 114.29 | 43.5 | 24.0 | -19.5 | 220 | V | 130 | 15.8 |
| 3 | 163.30 | 43.5 | 34.7 | -8.8 | 0 | H | 140 | 17.6 |
| 4 | 228.60 | 46.0 | 28.9 | -17.1 | 19 | H | 120 | 14.5 |

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 significant 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 significant Frequency observed | | | | | | | | |

RESULT: PASS



Configuration n°2 (RS232 Mode)

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 | 52.4 | 40.0 | 25.9 | -14.1 | 90 | V | 130 | 12.4 |
| 2 | 71.3 | 40.0 | 35.7 | -4.3 | 43 | V | 150 | 9.6 |
| 3 | 111.4 | 43.5 | 27.3 | -16.2 | 127 | V | 160 | 15.4 |
| 4 | 168.6 | 43.5 | 21.9 | -21.6 | 225 | V | 120 | 17.9 |

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 significant 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 significant 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.

$$FS = 52.5 + 7.4 + 1.1 - 29 = 32 \text{ dB}\mu\text{V/m}$$

The 32 dBµV/m value can be mathematically converted to its corresponding level in µV/m.

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32\text{dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m.}$$



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5. TEST EQUIPMENT LIST

| | N° LCIE | TYPE | COMPANY | REF | SN |
|--|------------|-------------------------------------|------------------|------------|-------------|
| RADIATED EMISSION MEASUREMENT (PRE-SCAN SEMI-ANECHOIC CHAMBER #2) | | | | | |
| | A5329032VO | Absorption clamp | LUTHI | MDS21 | 2826 |
| | A5329044VO | Absorption clamp | RHODE ET SCHWARZ | 85024A | 194.0100.50 |
| X | A4049060VO | Adapter quasi-peak | HEWLETT PACKARD | HP85650A | |
| | A7102024VO | Amplifier 8 GHz | HEROTEK | A1080304A | 222033 |
| X | A7486006VO | Amplifier 0.1MHz – 1300 MHz | HEWLETT PACKARD | 8447F | 3113A07116 |
| | 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 | C2040146VO | Antenna Bi-Log XWing | TESEQ | CBL6144 | 25904 |
| | C2042027VO | Antenna horn | EMCO | 3115 | 6382 |
| | C2042028VO | Antenna horn 26GHz | SCHWARZBECK | BBHA 9170 | BBHA9170232 |
| | C2040052VO | Antenna Loop | ELECTRO-METRICS | EM-6879 | 690234 |
| X | A5329045VO | Cable EMR (s-Anechoic chamber) | | | |
| X | A5329056VO | Cable Radiat EMI (Pre-amp/Analyzer) | | | |
| X | A5329057VO | Cable Radiat. EMI (Pre-amp/cage) | | | |
| | A2642019 | Measurement Receiver 20Hz – 8GHz | ROHDE & SCHWARZ | ESU8 | 100131 |
| X | A4060030VO | Pre-selector RF | HEWLETT PACKARD | HP85685A | |
| X | A3169050VO | Radiated emission comb generator | BARDET | | PR17B |
| X | D3044015VO | Semi-Anechoic chamber #2 | SIEPEL | | |
| X | A4060029VO | Spectrum analyzer | HEWLETT PACKARD | HP8568B | |
| X | A4060028VO | Spectrum analyzer display | HEWLETT PACKARD | HP85662A | |
| X | F2000404VO | Turntable chamber | ETS Lingren | Model 2165 | 00085780 |
| X | F2000393VO | Turntable controller chamber | ETS Lingren | Model 2066 | |
| 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 |
| | 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 |
| X | 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 |
| X | 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 | A5329054VO | Cable Conduct. EMI | | | |
| x | A5329060VO | Cable Conduct. EMI | | | |
| | A5329189VO | Shielded cable | UTIFLEX | | |
| | A5329076VO | Shielded cable | UTIFLEX | | |



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| | N°LCIE | TYPE | COMPANY | REF | SN |
|--|------------|-------------------------------------|----------------------|--------------------|------------|
| | A5329206VO | Shielded cable | UTIFLEX | | |
| | 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 |
| X | 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 |
| | C2320123VO | LISN | RHODE ET SCHWARZ | ENV216 | 100037 |
| | A2640011VO | Measurement receiver 9kHz-30MHz | ROHDE ET SCHWARZ | ESH3 | 972079/117 |
| X | 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 | | |
| MISCELLANEOUS (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 (triphase) <i>Measurement of conducted disturbances in voltage on the power port (three phases)</i> | 3.6 dB | 3.6 dB |
| Mesure des perturbations conduites en tension sur le réseau d'énergie (monophasé) <i>Measurement of conducted disturbances in voltage on the power port (single line)</i> | 3.57 dB | 3.6 dB |
| Mesure des perturbations conduites en tension sur le réseau de télécommunication <i>Measurement of conducted disturbances in voltage on the telecommunication port.</i> | 3.28 dB | A l'étude / Under consid. |
| Mesure des perturbations discontinues conduites en tension <i>Measurement of discontinuous conducted disturbances in voltage</i> | 3.47 dB | 3.6 dB |
| Mesure des perturbations conduites en courant <i>Measurement of conducted disturbances in current</i> | 2.90 dB | A l'étude / Under consid. |
| Mesure du champ électrique rayonné sur le site en espace libre de Voiron <i>Measurement of radiated electric field on the Voiron open area test site</i> | 5.07 dB | 5.2 dB |
| Mesure du champ électrique rayonné IN SITU de 30 à 1000 MHz <i>IN SITU measurement of radiated electric field from 30 to 1000MHz</i> | A l'étude / Under consideration | 5.2 dB |
| Mesure de la puissance perturbatrice / <i>Measurement of disturbance power</i> | 3.37 dB | 4.5 dB |
| Mesure des harmoniques de courant / <i>Measurement of current harmonics</i> | 11.11% | / |
| Mesure du flicker / <i>Flicker measurement</i> | 9.26% | / |

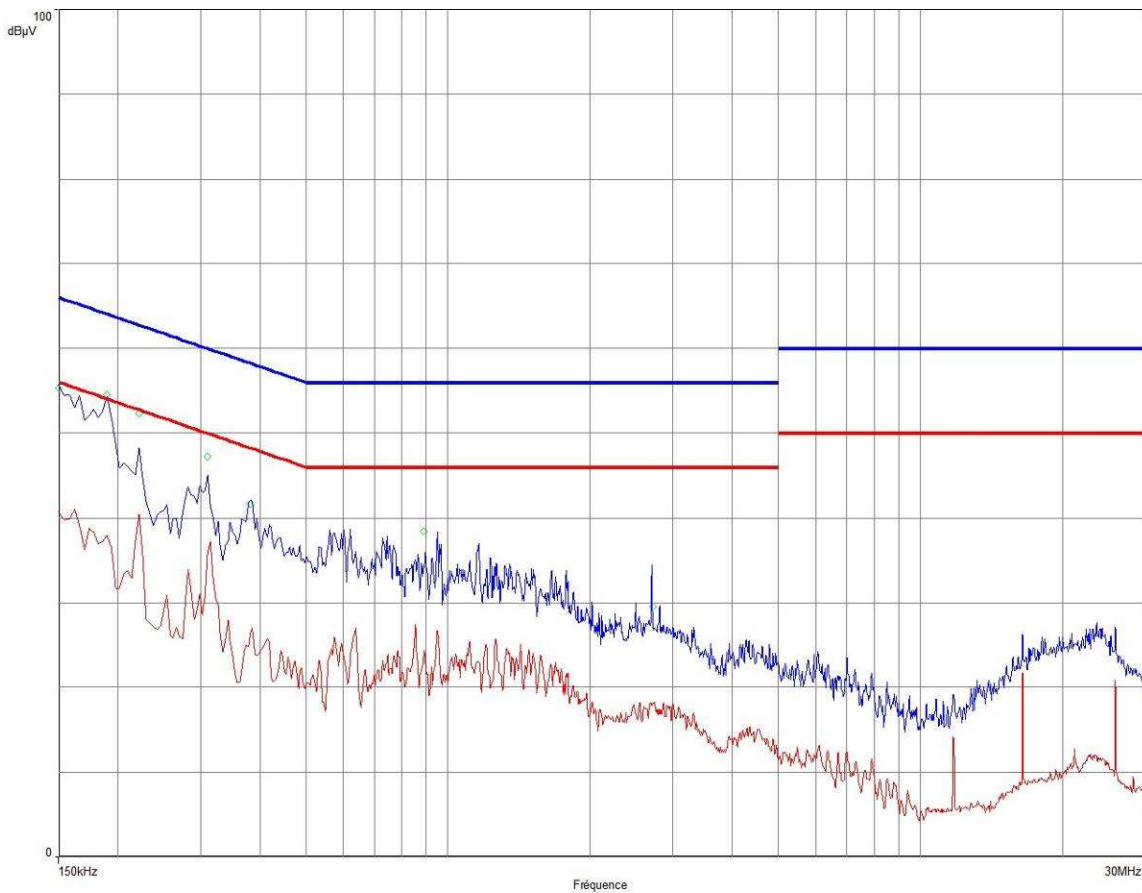
Les valeurs d'incertitudes calculées du laboratoire étant inférieures aux valeurs d'incertitudes limites établies par le CISPR, la conformité de l'échantillon est établie directement par les niveaux limites applicables. / *The uncertainty values calculated by the laboratory are lower than limit uncertainty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



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7. ANNEX 1 (GRAPHS)

| CONDUCTED EMISSIONS | | | |
|-----------------------|-------------------------|---|---------------|
| Graph name : | Emc#1 | (110V-60Hz) Laptop Power supply Adapter ML30 Phase , ML30-322A-0101 (USB Mode) | |
| 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 |

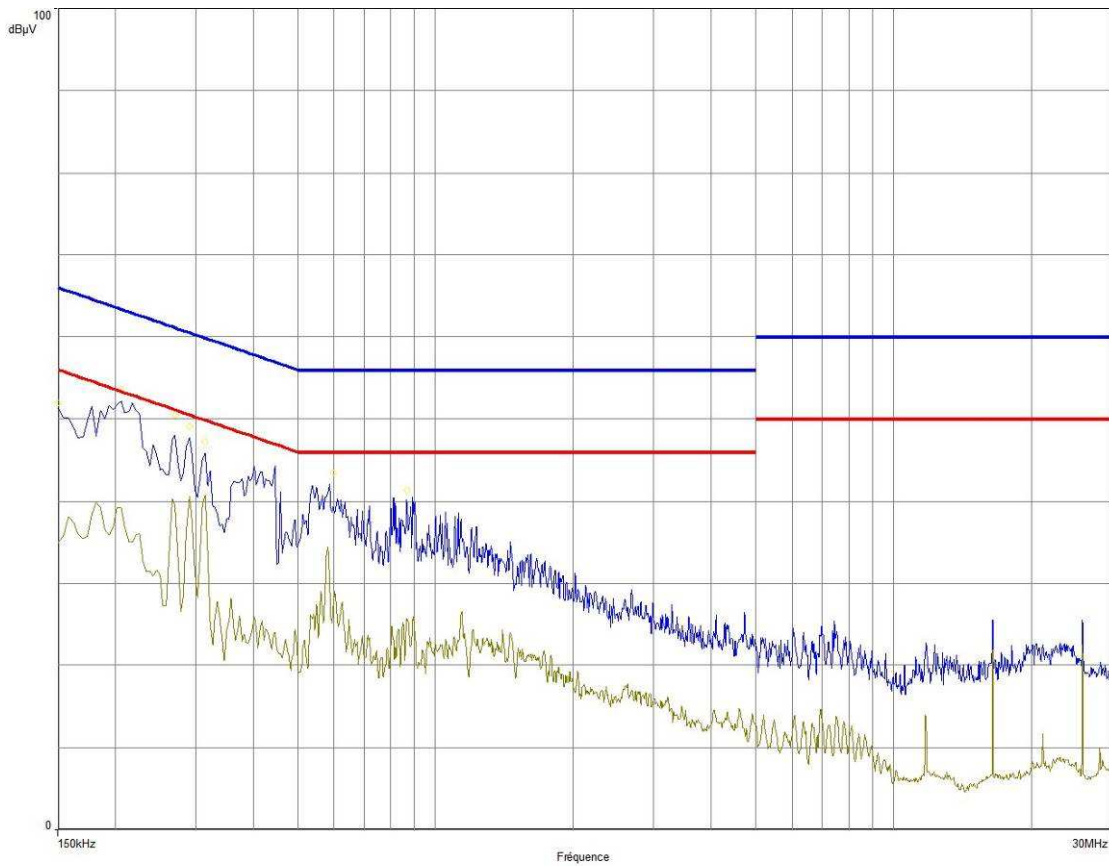


| Frequency (MHz) | Avg (dBµV) | Lim Avg (dBµV) | Avg-LimAvg (dBµV) | QPeak (dBµV) | LimQPeak (dBµV) | QPeak-LimQPeak (dBµV) |
|-----------------|------------|----------------|-------------------|--------------|-----------------|-----------------------|
| 0.15 | 36.42 | 56 | -19.58 | 51.26 | 66 | -14.74 |
| 0.19 | 36.27 | 54.04 | -17.76 | 49.67 | 64.04 | -14.36 |
| 0.222 | 37.21 | 52.74 | -15.54 | 47.21 | 62.74 | -15.54 |
| 0.31 | 38.35 | 49.97 | -11.62 | 43.22 | 59.97 | -16.75 |
| 0.382 | 25.31 | 48.24 | -22.93 | 36.24 | 58.24 | -22 |
| 0.886 | 23.17 | 46 | -22.83 | 32.23 | 56 | -23.77 |
| 2.718 | 17.22 | 46 | -28.78 | 23.2 | 56 | -32.8 |



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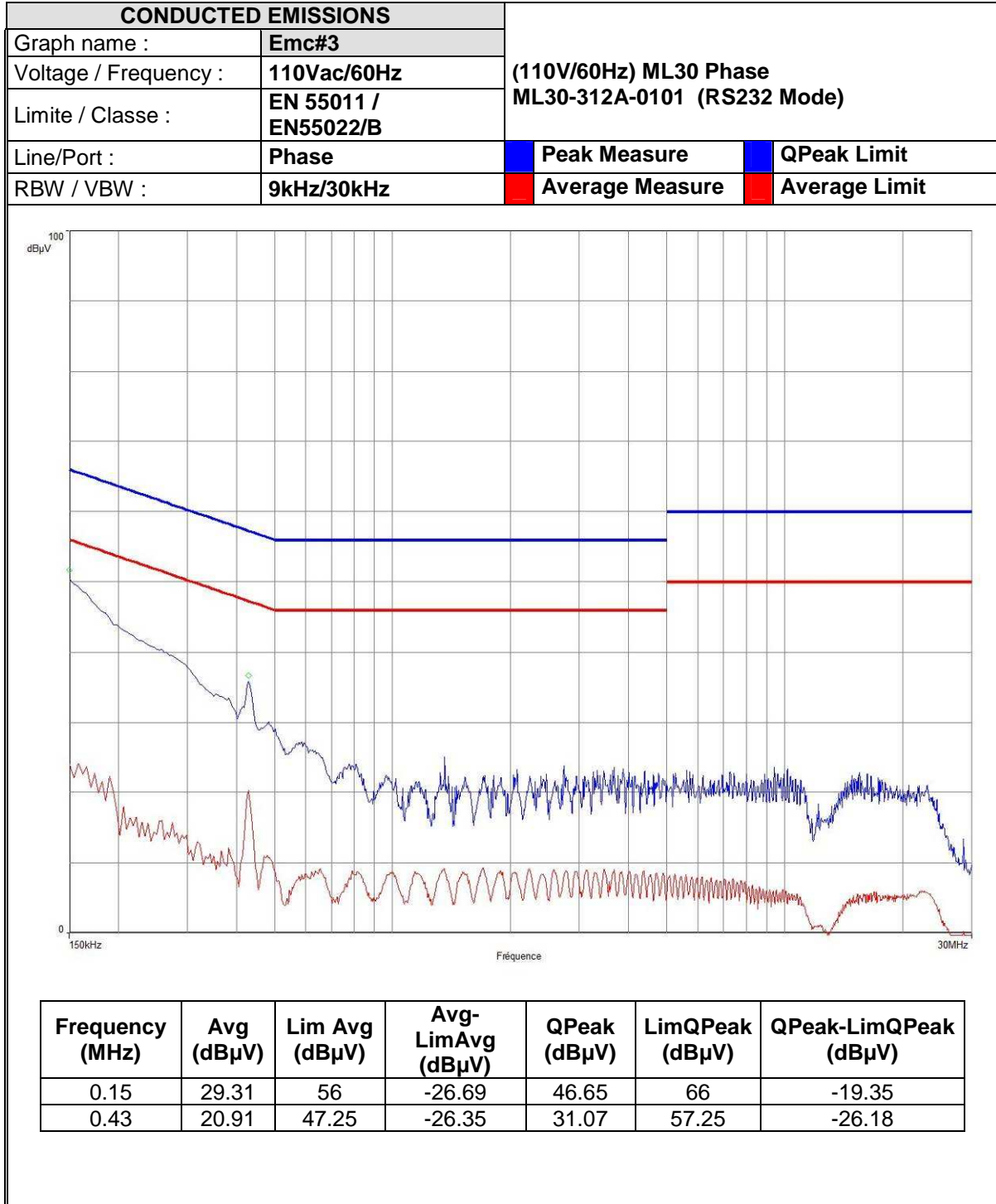
| CONDUCTED EMISSIONS | | | |
|-----------------------|-------------------------|---|---------------|
| Graph name : | Emc#2 | (110/60Hz) Laptop Power supply Adapter ML30 Neutre ML30-322A-0101 (USB Mode) | |
| Voltage / Frequency : | 110Vac/60Hz | | |
| Limite / Classe : | EN 55011 / EN55022/B | | |
| 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) |
|-----------------|------------|----------------|-------------------|--------------|-----------------|-----------------------|
| 0.15 | 35.06 | 56 | -20.94 | 47.52 | 66 | -18.48 |
| 0.206 | 40.32 | 53.37 | -13.04 | 49.08 | 63.37 | -14.29 |
| 0.27 | 41.28 | 51.12 | -9.84 | 45.13 | 61.12 | -15.99 |
| 0.29 | 40.85 | 50.52 | -9.68 | 44.36 | 60.52 | -16.16 |
| 0.314 | 40.3 | 49.86 | -9.56 | 42.56 | 59.86 | -17.3 |
| 0.598 | 27.99 | 46 | -18.01 | 38.76 | 56 | -17.24 |
| 0.87 | 23.88 | 46 | -22.12 | 33.57 | 56 | -22.43 |

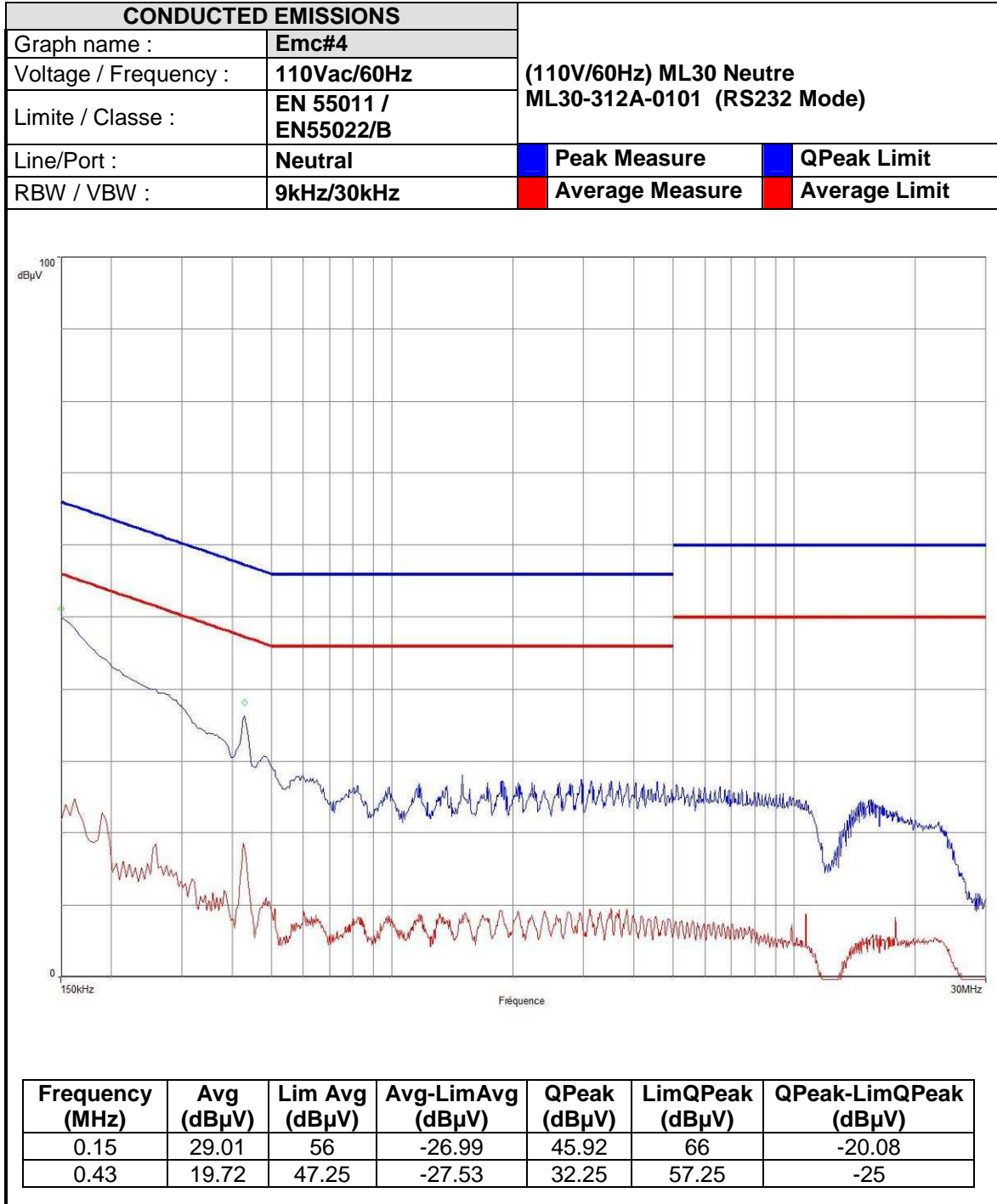


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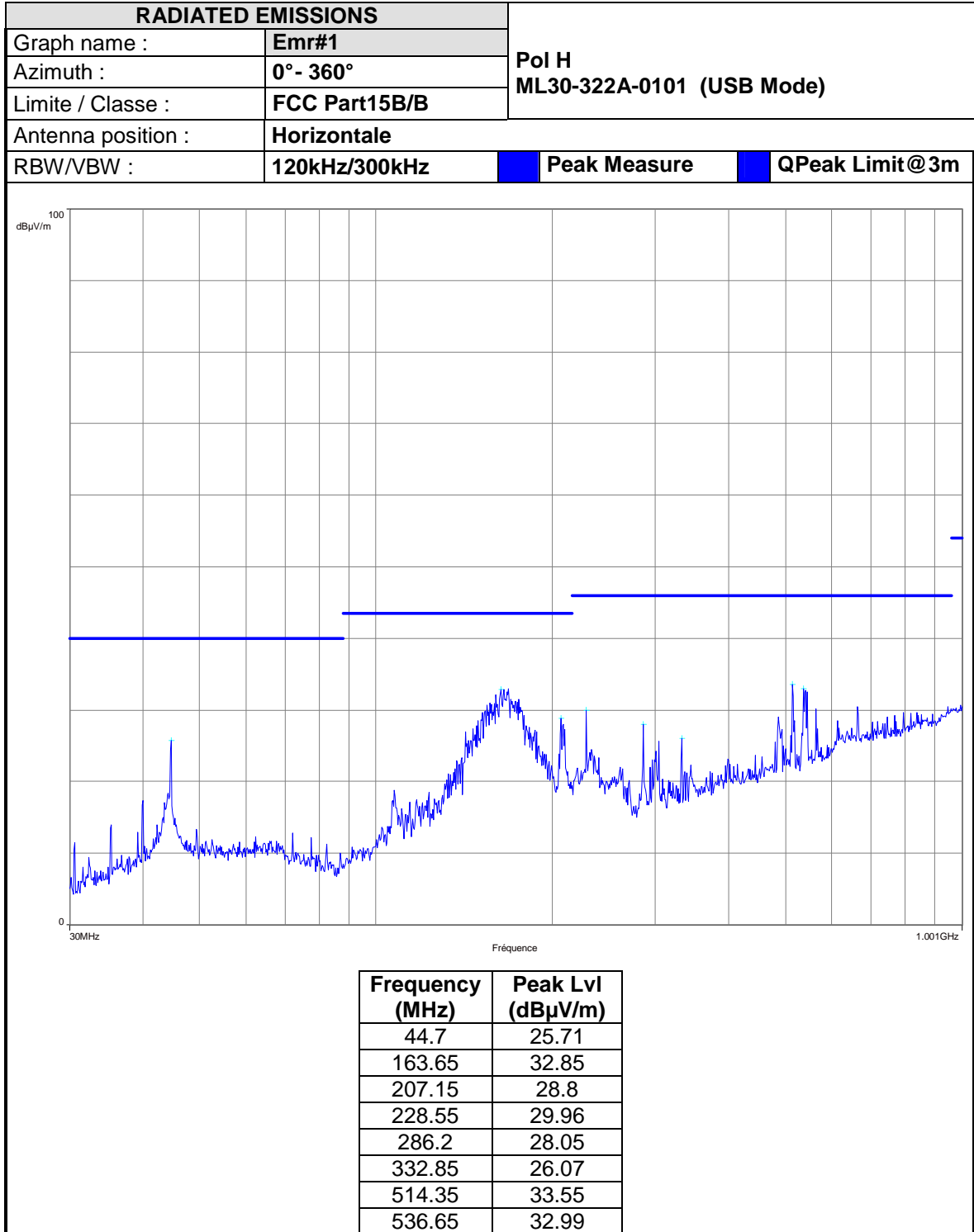


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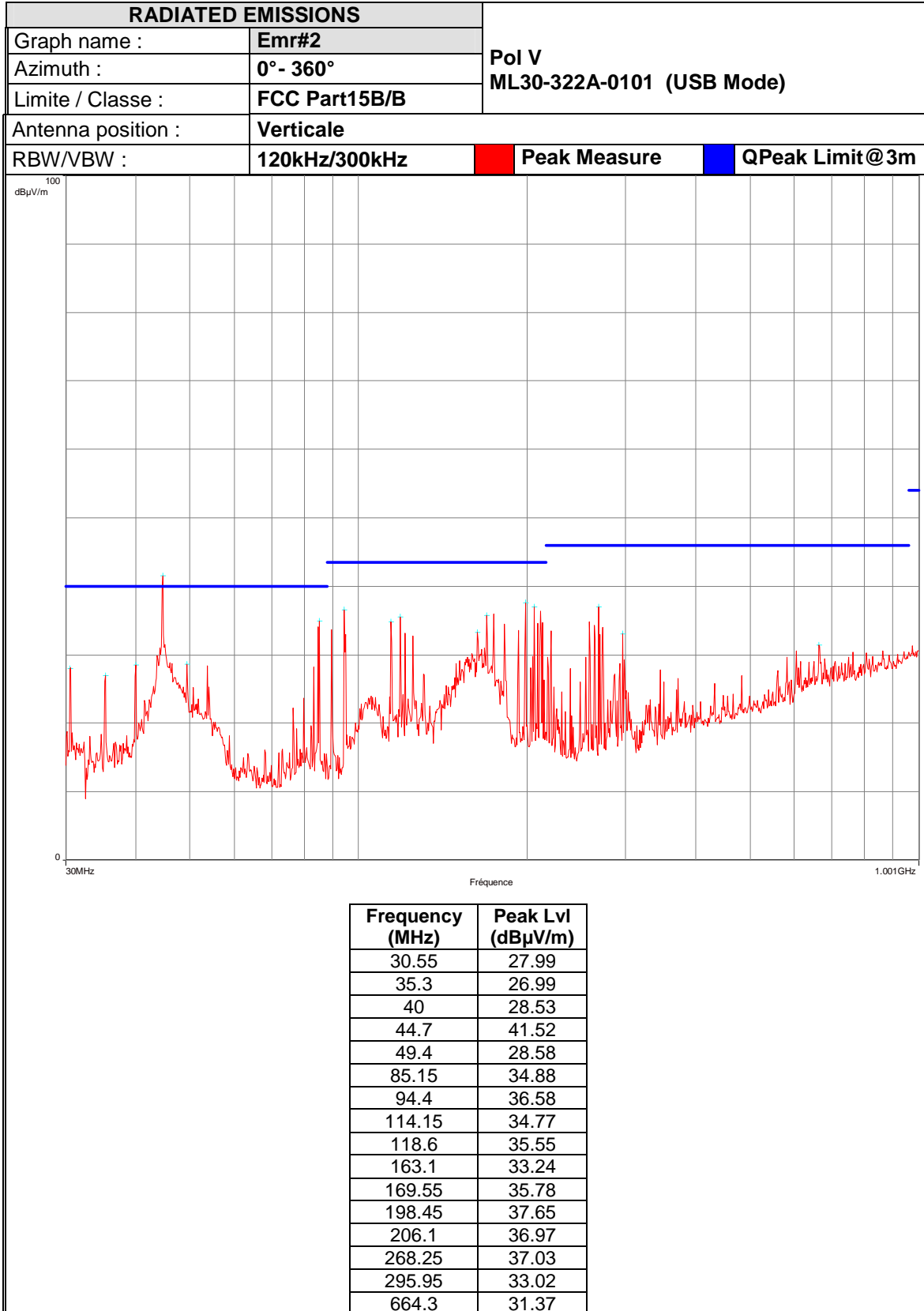


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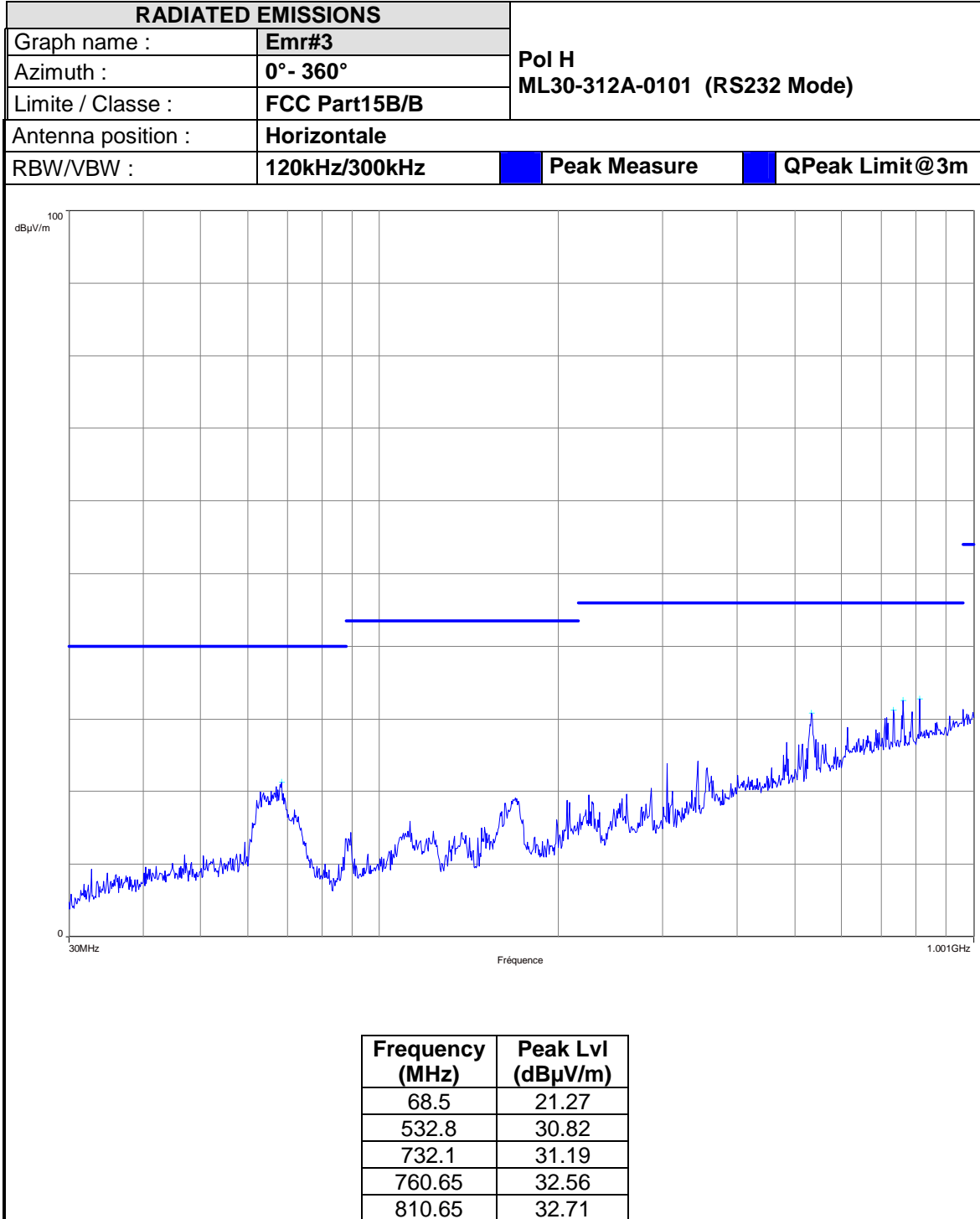


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