



Rapport d'essai / Test report

N° 675596-R1-E

JDE : 123011

DELIVRE A / ISSUED TO

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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 et C.
RSS-GEN / RSS-210

Matériel testé / Apparatus under test :

- Produit / Product : Imprimante industriel RFID / *RFID industrial printer*
- Marque / Trade mark : **MARKEM IMAJE**
- Constructeur / Manufacturer : **MARKEM IMAJE**
- Type / Model : **9018 & 9028**
- Type sous test / Model under test : **9028**
- N° de série / serial number : **302013A211**
- FCC ID : **2AAW8-MI9000**
- IC : **11372A-MI9000**

Date des essais / Test date

: Du 26 au 27 Aout 2013 / *From August 26th to 27th, 2013*

Lieu d'essai / Test location

: **LCIE SUD-EST**
ZI Centr'Alp – 170 rue de Chatagnon
38430 MOIRANS - FRANCE

Test réalisé par / Test performed by

: Anthony MERLIN

Ce document comporte / Composition of document : 24 pages.

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- MOIRANS, LE 1 DECEMBRE 2013 / *DECEMBER 1ST, 2013*

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1. TEST PROGRAM

Standard:

- FCC Part 15, Subpart B (Digital Devices)
- FCC Part 15, Subpart C
- ANSI C63.4 (2003)
- RSS-Gen Issue 3 – Dec 2010
- RSS-210 Issue 8 – Dec 2010

EMISSION TEST	LIMITS			RESULTS (Comments)
Limits for conducted disturbance at mains ports 150kHz-30MHz CFR 47 §15.207	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 9kHz-30MHz CFR 47 §15.209 (a) CFR 47 §15.225 RSS-Gen §4.9	Measure at 300m 9kHz-490kHz : 67.6dBµV/m /F(kHz) Measure at 30m 490kHz-1.705MHz : 87.6dBµV/m /F(kHz) 1.705MHz-30MHz : 29.5 dBµV/m			PASS
Radiated emissions 30MHz-1GHz* CFR 47 §15.209 (a) CFR 47 §15.225 RSS-Gen §4.9	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
Fundamental field strength limit CFR 47 §15.225 RSS-210 §A2.6	Operation within the band 13.110-14.010 MHz			PASS
Fundamental frequency tolerance CFR 47 §15.225 RSS-210 §A2.6	Operation within the band 13.110-14.010 MHz			PASS
Band edge compliance CFR 47 §15.225 RSS-210 §A2.6	Operation within the band 13.110-14.010 MHz			PASS
Occupied bandwidth RSS-Gen §4.6.1	No limit			See results
Receiver Spurious Emission** RSS-Gen §4.10	See RSS-Gen §4.10			NA

*§15.33: The highest internal source of a testing device is defined like more the highest frequency generated or used in the testing device or on which the testing device works or agrees.

- If the highest frequency of the internal sources of the testing device is lower than 108 MHz, measurement must be only performed until 1GHz.
- If the highest frequency of the internal sources of the testing device ranges between 108 MHz and 500 MHz, measurement must be only performed until 2GHz.
- If the highest frequency of the internal sources of the testing device ranges between 500 MHz and 1 GHz, measurement must be only performed until 5GHz.

If the highest frequency of the internal sources of the testing device is above 1 GHz, measurement must be only performed until 5 times the highest frequency or 40 GHz, while taking smallest of both.

**Testing covered the receive mode, and receiver spurious emissions are considered to be the same as transmitter.



2. SYSTEM TEST CONFIGURATION

2.1. JUSTIFICATION

The system was configured for testing in a typical fashion (as a customer would normally use it).

Printer 9018 & 9028 are same electronic, differences are:

1. Index of protection IP44 (9018), IP54 (9028)
2. Pressurization of the print head by external compressed air to the printer, air-network customer (9018); by autonomous compressor provided inside the printer(9028)
3. Possibility of impression of 3lines maximum (9018), 4 lines (9028).

RFID is activated by software following option choice by user.

All tests are performed on 9028 with RFID ON, worst case.

2.2. HARDWARE IDENTIFICATION

Equipment under test (EUT):

9028

Serial number: 302013A211

FCC ID: 2AAW8-MI9000

IC: 11372A-MI9000

- Internal max frequencies: 80MHz

Power supply:

100-240VAC, 50-60Hz, P+N+E

Input/output:

- 1 x Power supply, unshielded cable, length: 2m
- 1 x Umbilical, shielded cable, length: 3m
- 1 x Alarm, unshielded, length: 2m
- 1 x Tachymeter, unshielded, length: 6m
- 1 x Cell, unshielded, length: 9m

Auxiliary equipment used during test:

- 1 x Cell
- 1 x Tachymeter
- 1 x Beacon

2.3. EUT CONFIGURATION

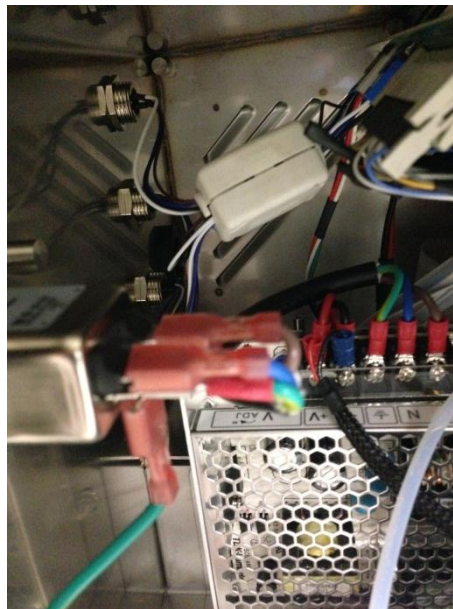
Continuous printing message 24 points and reading in loop of 3 TAGs ink, additive cartridge and MI box.

Firmware-version

Boot: 1.0162-13
CPU: 9028_NOTAG_V3.0765M
FPGA: 0.3.0
RFID: 0.2

2.4. EQUIPMENT MODIFICATIONS

1 x Ferrite Würth Elektronik 74271132, 1 way, on alarm / tachymeter / cell cables together.



3. RADIATED EMISSION DATA

3.1. TEST CONDITIONS

Date of test : August 26th, 2013
Test performed by : A.MERLIN
Atmospheric pressure : 988hPa
Relative humidity : 45%
Ambient temperature : 23°C

3.2. TEST SETUP

The installation of EUT is identical for pre-characterization measurement in a 3 meters semi anechoic chamber and for measures on a 10 meters Open site.



Radiated emission test setup



3.3. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Amplifier 0.1MHz – 1300 MHz	HEWLETT PACKARD	8447F	A7486006
Antenna Bi-log	CHASE	CBL6111A	C2040051
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052
Antenna Bi-log	CHASE	CBL6111A	C2040172
Cable N/N	-	-	A5329038
Cable	SUCOFLEX	106G	A5329061
Cable N/N	-	-	A5329193
Cable N/N	-	-	A5329206
Cable	-	-	A5329623
Semi-Anechoic chamber #3	SIEPEL	-	D3044017
Radiated emission comb generator	BARDET	-	A3169050
OATS	-	-	F2000409
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019
Receiver 9kHz - 6GHz	ROHDE & SCHWARZ	FSL6	A2642020
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078
Thermo-hygrometer (PM2)	OREGON	BAR916HG-G	B4206011
Turntable chamber (Cage#3)	ETS Lingren	Model 2165	F2000371
Turntable / Mast controller (OATS)	ETS Lindgren	Model 2066	F2000372
Antenna mast (OATS)	ETS Lindgren	2071-2	F2000392
Turntable (OATS)	ETS Lindgren	Model 2187	F2000403
Table	LCIE	-	F2000445
Turntable controller (Cage#3)	ETS Lingren	Model 2090	F2000444

3.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None



3.5. TEST SEQUENCE AND RESULTS

3.5.1. Pre-characterization at 3 meters [9kHz-30MHz]

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. For Pre-characterization, the loop antenna was rotated during the test for maximized the emission measurement. Measurement performed on 3 axis of EUT. Frequency band investigated is 9kHz to 30MHz. The pre-characterization graphs are obtained in PEAK detection.

See graph for 9kHz-30MHz band:

0° antenna

Emr#1 (See annex 1)

90° antenna

Emr#2 (See annex 1)

3.5.2. Pre-characterization [30MHz-1GHz]

For frequency band 30MHz to 1GHz, 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 with a log-periodic antenna. The EUT is being rotated on 360° and on 3 axis during the measurement. The pre-characterization graphs are obtained in PEAK detection.

See graphs for 30MHz-1GHz:

H polarization

Emr#3 (See annex 1)

V polarization

Emr#4 (See annex 1)

3.5.3. Characterization on 10 meters open site below 30 MHz

The product has been tested according to ANSI C63.4 (2003), FCC part 15 subpart C. 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** from the antenna and compared to the FCC part 15 subpart C §15.225 limits in the frequency range 13.553MHz 13.567MHz. Measurement bandwidth was 9kHz. Antenna height was 1m for both horizontal and vertical polarization. Antenna was rotated around its vertical axis. Continuous linear turntable azimuth search was performed with 360 degrees range. Measurement performed on 3 axis of EUT. A summary of the worst case emissions found in all test configurations and modes is shown on clauses 3.2.

Frequency (MHz)	QPeak Limit (dBμV/m) @ 30m	Qpeak (dBμV) @ 10m	Qpeak (dBμV/m) @ 30m	Qpeak-Limit (Margin dB)	Turntable Angle (deg)	Ant. Pol./ Angle (deg)	Tot Corr (dB)
13.56* ¹	84.0	-13.2	3.0	-81.0	90	0	35.3

*¹: Measure have been done at 10m distance and corrected according to requirements of 15.209.e) (M@30m = M@10m-19.1dB)



Limits Sub clause §15.225

Frequency (MHz)	Field strength (μV/m)	Measurement distance (m)
13.553-13.567	15 848 84 dBμV/m	30
13.410-13.553 13.567-13.710	334 50.5 dBμV/m	30
13.110-13.410 13.710-14.010	106 40.5 dBμV/m	30

See chapter 5 of this test report for band edge measurements.

3.5.4. Characterization on 10 meters open site from 30MHz to 1GHz

The product has been tested at a distance of **10 meters** from the antenna and compared to the FCC part 15 subpart B §15.109 limits and C §15.209 limits.

Measurement bandwidth was 120kHz from 30 MHz to 1GHz. 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. Measurement performed on 3 axis of EUT.

A summary of the worst case emissions found in all test configurations and modes is shown on clause 3.2

Frequencies due to RFID are measured following Part15C §15.209 and frequencies due to industrial printer (host equipment) are measured following Part15B §15.109 class A above tenth harmonic of fundamental.

Worst case final data result:

No	Frequency (MHz)	QPeak Limit (dBμV/m)	Qpeak (dBμV/m)	Qpeak-Limit (Margin, dB)	Angle (deg)	Pol	Hgt (cm)	Tot Corr (dB)	Comments
1	189.841	43.5	36.5	-7.0	340	H	350	11.4	
2	216.962	46.0	34.9	-11.1	35	H	290	11.9	

*: Measure have been done at 10m distance and corrected according to requirements of 15.209.e)
(M@3m = M@10m+10.5dB)

No	Frequency (MHz)	QPeak Limit (dBμV/m)	Qpeak (dBμV/m)	Qpeak-Limit (Margin, dB)	Angle (deg)	Pol	Hgt (cm)	Tot Corr (dB)	Comments
1	45.455	40.0	33.1	-6.9	80	V	100	12.1	
2	160.000	54.0	48.8	-5.2	150	V	100	13.0	
3	160.000	54.0	45.7	-8.3	280	H	400	13.0	
4	320.000	56.9	42.9	-14.0	15	H	290	16.3	
5	320.000	56.9	43.7	-13.2	330	V	290	16.3	
6	373.336	56.9	40.0	-16.9	10	H	210	18.1	
7	426.669	56.9	37.0	-19.9	165	H	150	19.7	
8	480.000	56.9	41.7	-15.2	120	H	310	20.7	
9	480.000	56.9	47.1	-9.8	15	V	200	20.7	
10	640.000	56.9	49.3	-7.6	230	H	210	24.2	
11	640.000	56.9	46.3	-10.6	30	V	240	24.2	
12	800.000	56.9	48.4	-8.5	0	H	350	26.8	
13	800.000	56.9	47.6	-9.3	320	V	220	26.8	
14	960.000	60.0	52.7	-7.3	310	H	240	29.7	

RESULTS: PASS



3.6. 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 52.5dB μ V is obtained. The antenna factor of 7.4 and a cable factor of 1.1 are added. The amplifier gain of 29dB is subtracted, giving a field strength of 32 dB μ V/m.

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

The 32 dB μ V/m value can be mathematically converted to its corresponding level in μ V/m.

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

**4. FUNDAMENTAL FREQUENCY TOLERANCE (15.225E)****4.1. TEST CONDITIONS**

Date of test : August 27th, 2013
Test performed by : A.MERLIN
Atmospheric pressure : 988hPa
Relative humidity : 49%
Ambient temperature : 23°C

4.1. TEMPERATURE AND VOLTAGE FLUCTUATION

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency when the temperature is varied from -20°C to +50°C at the nominal power voltage and the primary power voltage is varied from 85% to 115% of the rated supply voltage at 20°C. (See divergence)

4.1. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Passive loop antenna	EMCO	7405-901	A2240015
Cable SMA	-	-	A5329580
HAR + Imped. Net + Output switch	CALIFORNIA INSTRUM.	-	A2089002
Climatic chamber	BIA CLIMATIC	CL 6-25	D1022117
Multimeter	FLUKE	289	A1240230
Receiver 9kHz - 6GHz	ROHDE & SCHWARZ	FSL6	A2642020

4.2. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

Temperature range declared by provider for good function, in user manual, is from 5°C to 45°C. Possible problem with ink limited the temperature of use.

**4.3. TEST SETUP**

Frequency of carrier: 13.56 MHz
Upper limit: 13.561356 MHz
Lower limit: 13.558644 MHz
The equipment (RF box) is set in a climatic chamber.

4.1. TEST SEQUENCE AND RESULTS

Voltage	Temperature	5°C	20°C	+45°C
Mains voltage: 110V/60Hz Frequency Drift (MHz) Carrier level (dBc)		+ 0.000022 + 1.40	REF REF	- 0.000028 + 0.90
Mains voltage: 93.5V/60Hz Frequency Drift (MHz) Carrier level (dBc)		+ 0.000024 + 3.20	- 0.000004 + 0.20	- 0.000028 + 0.90
Mains voltage: 126V/60Hz Frequency Drift (MHz) Carrier level (dBc)		+ 0.000022 + 1.00	- 0.000004 + 0.20	- 0.000028 + 0.80

Frequency drift measured is **28Hz** when the temperature is varied from 5°C to +45°C and voltage is varied.



5. BAND-EDGE COMPLIANCE §15.209

5.1. TEST CONDITIONS

Date of test : August 27th, 2013
 Test performed by : A.MERLIN
 Atmospheric pressure : 988hPa
 Relative humidity : 49%
 Ambient temperature : 23°C

5.2. TEST EQUIPMENT LIST

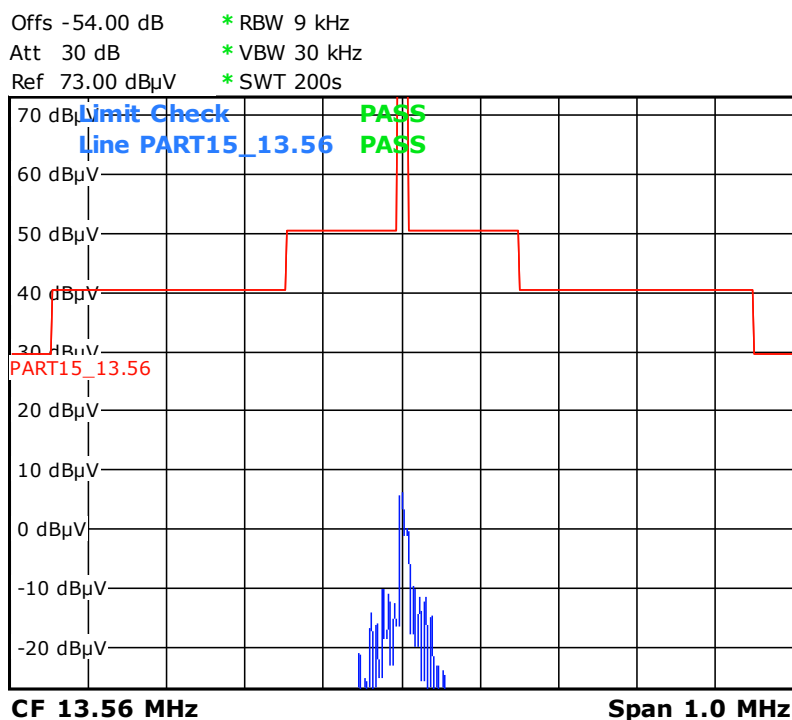
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052
Cable SMA	-	-	A5329580
Receiver 9kHz - 6GHz	ROHDE & SCHWARZ	FSL6	A2642020

5.3. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

5.4. FREQUENCY BAND 13.110-14.010MHZ / 13.553-13.567MHZ

Following plots show radiated emission level in the frequency band 13.110-14.010MHz with a RBW of 9kHz and a quasi-peak detector.

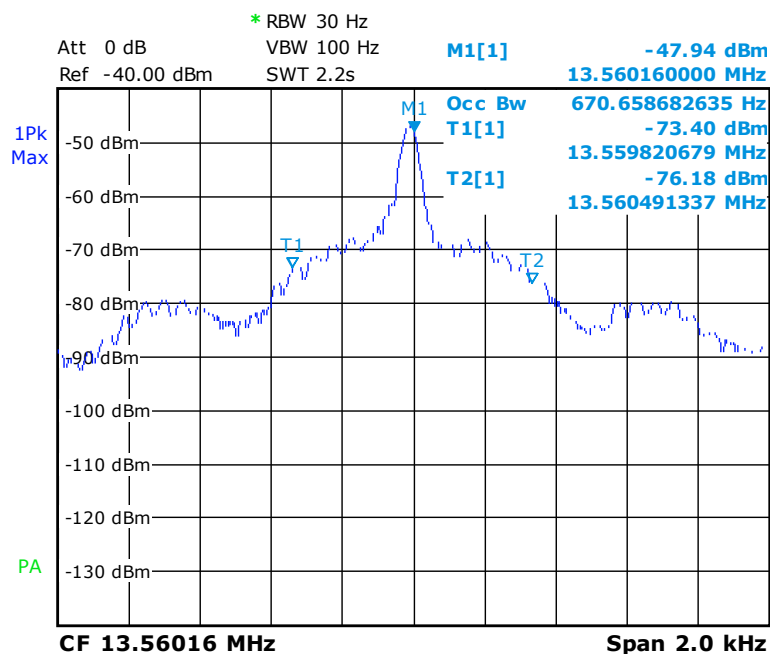


6. OCCUPIED BANDWIDTH

6.1. TEST CONDITIONS

Date of test : August 27th, 2013
 Test performed by : A.MERLIN
 Atmospheric pressure : 988hPa
 Relative humidity : 49%
 Ambient temperature : 23°C

6.2. TEST RESULTS



Measured occupied bandwidth is **671Hz**

Measurement settings:

RBW used should not be lower than 1% of the selected span

RBW = 30Hz / Video BW = 100Hz / SPAN = 2kHz / PEAK / Maxhold / OBW function

The occupied bandwidth is measured with OBW function of spectrum analyzer.

6.3. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Passive loop antenna	EMCO	7405-901	A2240015
Cable SMA	-	-	A5329580
Receiver 9kHz - 6GHz	ROHDE & SCHWARZ	FSL6	A2642020

6.1. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

7. CONDUCTED EMISSION DATA

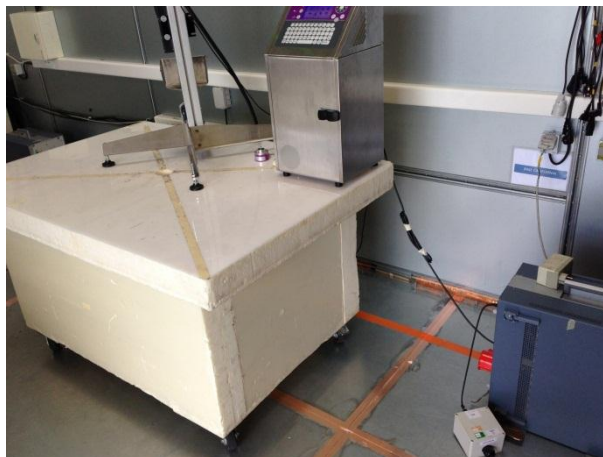
7.1. TEST CONDITIONS

Date of test : August 26th, 2013
Test performed by : A.MERLIN
Atmospheric pressure : 988hPa
Relative humidity : 45%
Ambient temperature : 23°C

7.2. SETUP FOR CONDUCTED EMISSIONS MEASUREMENT

The product has been tested according to ANSI C63.4-(2003) and FCC Part 15 subpart B and C. The product has been tested with 120V/60Hz power line voltage and compared to the FCC Part 15 subpart B §15.107 and C §15.207 limits. Measurement bandwidth was 9kHz from 150kHz to 30MHz. 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) 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.

The EUT is placed on the ground reference plane, at 80cm from the LISN. The distance between the EUT and the vertical ground plane is 40cm. Auxiliaries are powered by another LISN. The cable has been shorted to 1meter length. The EUT is powered through the LISN (measure).





**7.3. TEST EQUIPMENT LIST**

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Cable	-	-	A5329578
Conducted emission comb generator	BARDET	-	A3169049
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019
Thermo-hygrometer (PM2)	OREGON	BAR916HG-G	B4206011
Transient limiter	RHODE & SCHWARZ	ESH3-Z2	A7122204

7.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

7.5. TEST SEQUENCE AND RESULTS

Measurements are performed on the phase (L1) and neutral (N) of power line voltage. A measurement is also performed with a 50Ω dummy load replacing the transmitter antenna in order to demonstrate that some 13.56MHz may be cross-coupled to AC line connection. Graphs are obtained in PEAK detection. Measures are also performed in Quasi-Peak and Average for any strong signal.

Measure on L1: graph Emc#1 (see annex 1)
Measure on N: graph Emc#2 (see annex 1)

RESULT: PASS



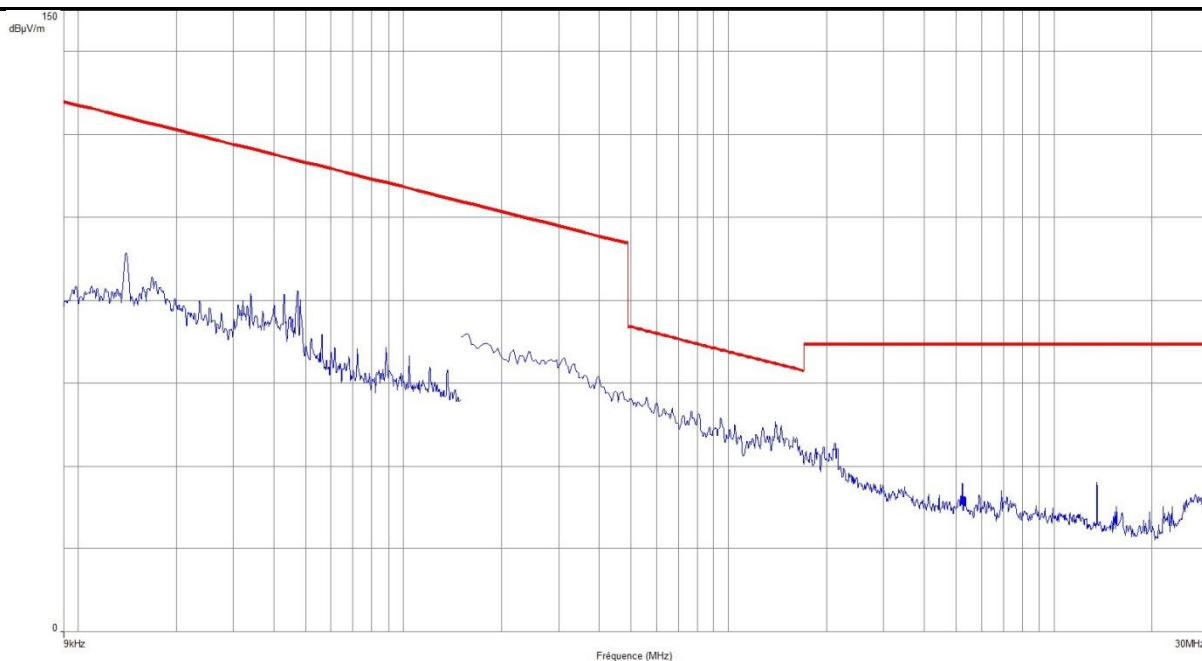
8. ANNEX 1 (GRAPHS)

RADIATED EMISSIONS

Graph name :	Emr#1	Test configuration:
Limit :	FCC Part15C	
Class :		

PARAMETERS

Antenna polarization:	0°	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	300Hz / 10kHz	
VBW :	1kHz / 30kHz	QPeak Limit@3m
Frequency :	9kHz - 30MHz	

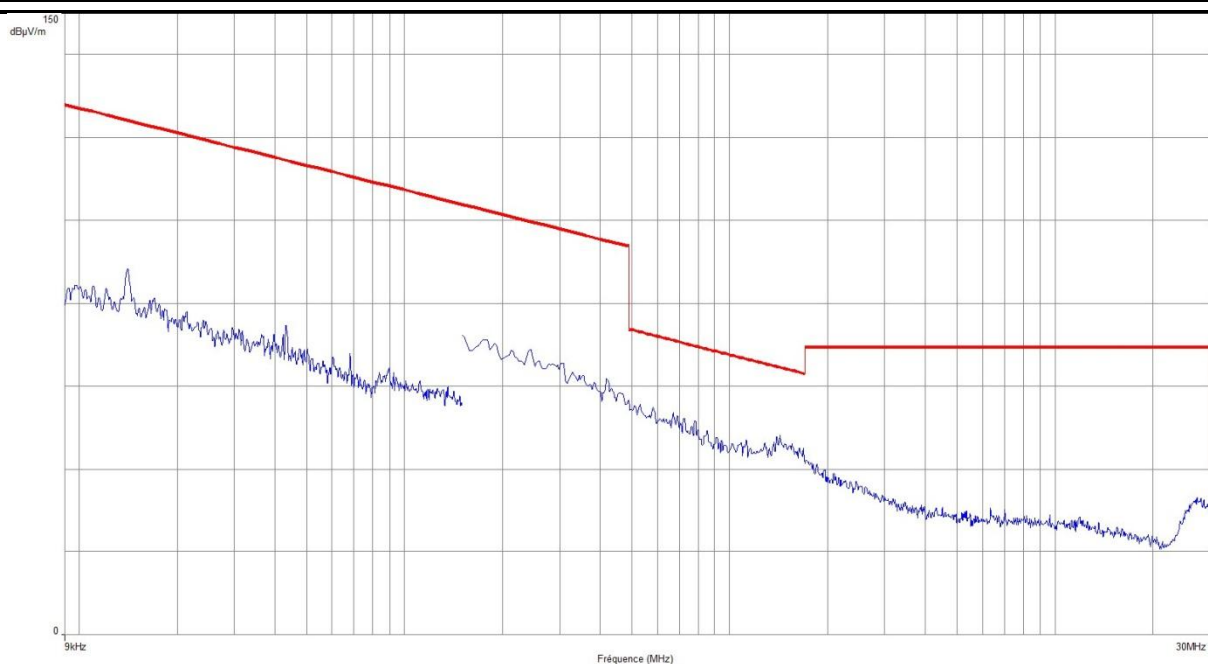


Frequency (MHz)	Peak (dBμV/m)
13.561605*	36.09



*Carrier frequency

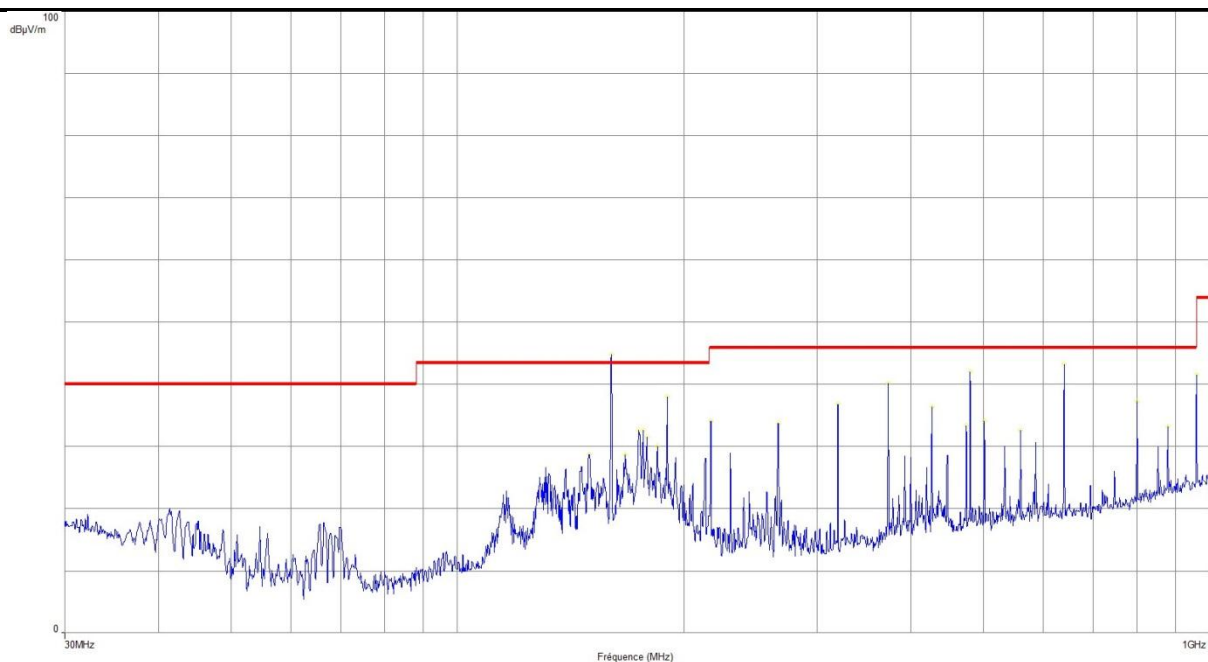


RADIATED EMISSIONS		
Graph name :	Emr#2	Test configuration:
Limit :	FCC Part15C	
Class :		
PARAMETERS		
Antenna polarization:	90°	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	300Hz / 10kHz	
VBW :	1kHz / 30kHz	QPeak Limit@3m
Frequency :	9kHz - 30MHz	







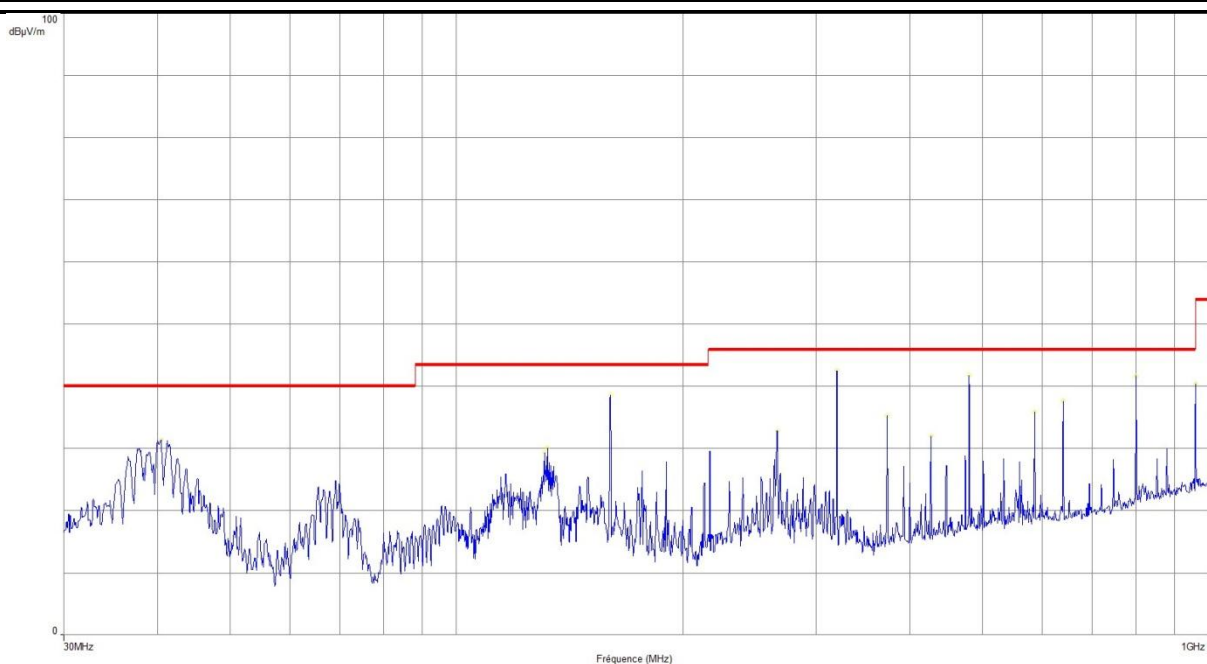
RADIATED EMISSIONS		
Graph name :	Emr#3	Test configuration:
Limit :	FCC Part15C	2
Class :		
PARAMETERS		
Antenna polarization:	Horizontal	Legend:
Azimuth :	0° - 360°	 Peak Measure
RBW :	100kHz	
VBW :	300kHz	 QPeak Limit @3m
Frequency :	30MHz - 1GHz	



Frequency (MHz)	Peak Level (dBµV/m)
160.033	44.79
167.071	28.66
173.973	32.61
176.302	32.61
178.308	31.51
184.343	30.03
189.868	38.07
216.96	34.1
266.68	33.68
320	36.9
373.32	40.21
426.68	36.32
474.6	33.37
480	42.05
501.76	34.13
560	32.6
640	43.24
800	37.17
880	33.13
960	41.63



RADIATED EMISSIONS		
Graph name :	Emr#4	Test configuration:
Limit :	FCC Part15C	2
Class :		
PARAMETERS		
Antenna polarization:	Vertical	Legend:
Azimuth :	0° - 360°	 Peak Measure
RBW :	100kHz	
VBW :	300kHz	 QPeak Limit@3m
Frequency :	30MHz - 1GHz	

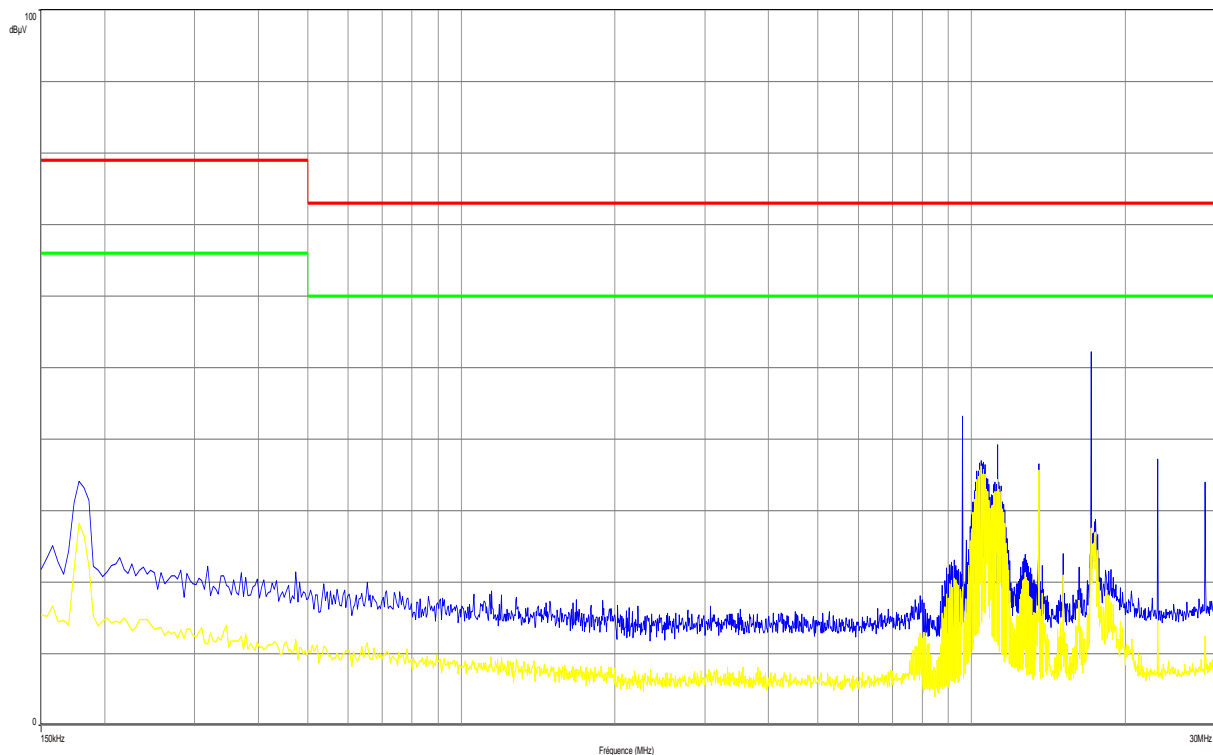


Frequency (MHz)	Peak Level (dBμV/m)
40.455	31.4
130.929	29.37
132.102	30.08
160.033	38.64
266.68	32.78
320	42.52
373.32	35.33
426.68	32.05
480	41.81
586.68	35.88
639.96	37.72
800	41.57
960	40.41



CONDUCTED EMISSIONS		
Graph name :	Emc#1	Test configuration:
Limit :	EN 55022	110 P
Class :	A	

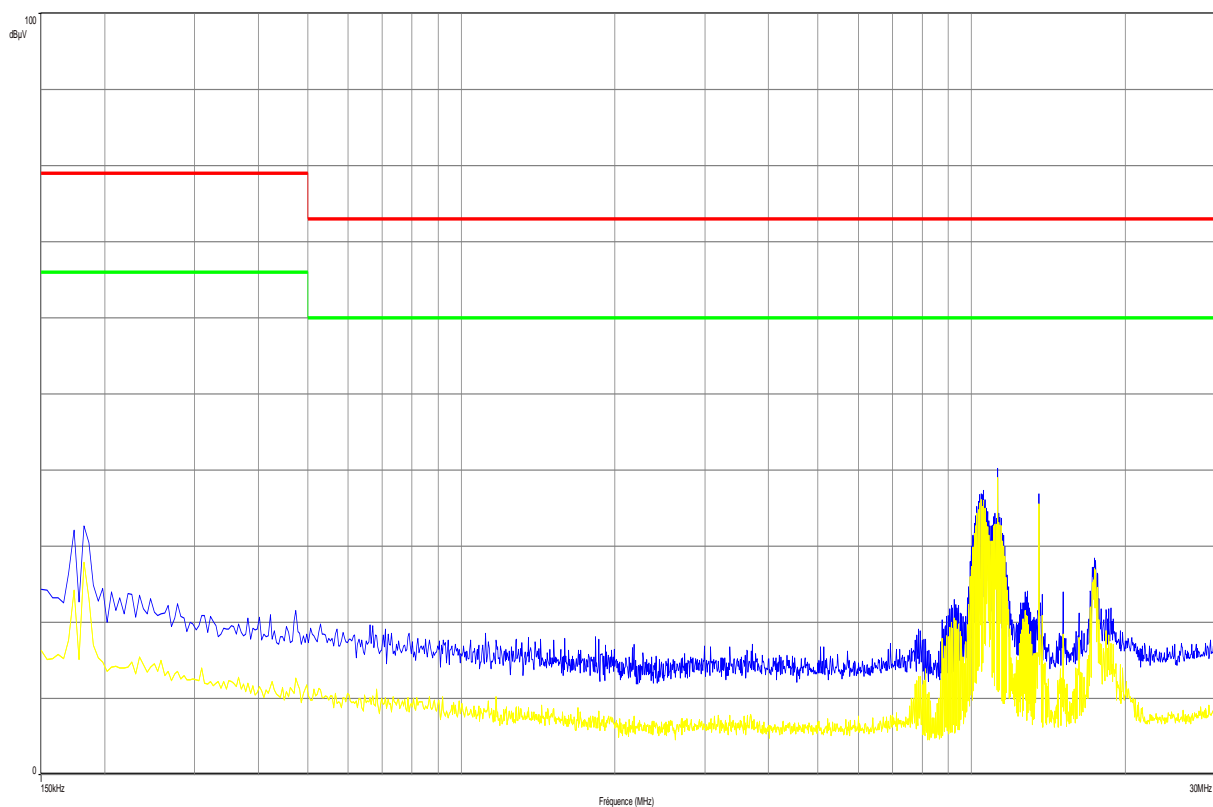
PARAMETERS			
Voltage / Frequency :	110VAC / 60Hz	Legend:	
Line :	Phase 1	Peak Measure	Average Measure
RBW :	9kHz		
VBW :	30kHz	QPeak Limit	Average Limit
Frequency :	150kHz- 30MHz		





CONDUCTED EMISSIONS		
Graph name :	Emc#2	Test configuration:
Limit :	EN 55022	110 N
Class :	A	

PARAMETERS			
Voltage / Frequency :	110VAC / 60Hz	Legend:	
Line :	Neutre	Peak Measure	Average Measure
RBW :	9kHz		
VBW :	30kHz	QPeak Limit	Average Limit
Frequency :	150kHz- 30MHz		



**9. 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 <i>Measurement of conducted disturbances in voltage on the power port</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 Moirans <i>Measurement of radiated electric field on the Moirans open area test site</i>	5.07 dB	5.2 dB

Les valeurs d'incertitudes calculées du laboratoire étant inférieures aux valeurs d'incertitudes limites établies par la norme, 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 standard. The conformity of the sample is directly established by the applicable limits values.