

LCIE
Etablissement de Moirans
ZI Centr'Alp
170, rue de Chatagnon
38430 Moirans

RCS Grenoble 408 363 174

Tél. : +33 4 76 07 36 36
Fax : +33 4 76 55 90 88



Rapport d'essai / Test report

N° 201001-5974CR-R1-E

JDE : 99157

DELIVRE A / ISSUED TO

: TAGSYS S.A.
180, Chemin de Saint Lambert
13821 LA PENNE SUR HUVEAUNE
FRANCE

Objet / Subject

: Essais de compatibilité électromagnétique conformément aux normes
FCC CFR 47 Part 15, Subpart B et C.
*Electromagnetic compatibility tests according to the standards
FCC CFR 47 Part 15, Subpart B and C*

Matériel testé / Apparatus under test :

- Produit / Product : Lecteur de tag RFID / RFID tag reader
- Marque / Trade mark : TAGSYS
- Constructeur / Manufacturer : TAGSYS
- Type / Model : L-P101+LSA4 SHD
- N° de série / serial number : PROTO1
- FCC ID : QHKLIBREADERLP101

Date des essais / Test date

: Du 4 au 5 Janvier 2010 / January 4th to 5th, 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

: Anthony MERLIN

Ce document comporte / Composition of document : 24 pages.

MOIRANS, LE 17 MAI 2010 / MAY 17TH, 2010

Ecrit par / Written by,
Anthony MERLIN

Approuvé par / Approved by,
Jacques LORQUIN

CENTRAL DES
INDUSTRIES ELECTRIQUES
LCIE SUD-EST
ZI Centr'Alp
170, Rue de Chatagnon
38430 MOIRANS
Tél. 04 76 07 36 36
Fax 04 76 55 90 88

La reproduction de ce document n'est autorisée que sous sa forme intégrale. Toute reproduction partielle ou toute insertion de résultats dans un texte d'accompagnement en vue de leur diffusion doit recevoir un accord préalable et formel du LCIE. Ce document résulte d'essais effectués sur un spécimen, un échantillon ou une éprouvette. Il ne préjuge pas de la conformité de l'ensemble des produits fabriqués à l'objet essayé. Sauf indication contraire, la décision de conformité prend en compte l'incertitude de mesures. Il ne préjuge en aucun cas d'une décision de certification.

This document shall not be reproduced, except in full, without the written approval of the LCIE. This document contains results related only to the item tested. It does not imply the conformity of the whole production to the item tested. Unless otherwise specified, the decision of conformity takes into account the uncertainty of measures. This document does not anticipate any certification decision.

LCIE

33, av du Général Leclerc
BP 8
92266 Fontenay-aux-Roses cedex
France

Tél : +33 1 40 95 60 60
Fax : +33 1 40 95 86 56
contact@lcie.fr
www.lcie.fr

Société par Actions Simplifiée
au capital de 15 745 984 €
RCS Nanterre B 408 363 174
www.lcie.com



SUMMARY

1. TEST PROGRAM	3
2. SYSTEM TEST CONFIGURATION	4
3. RADIATED EMISSION DATA	5
4. BAND-EDGE COMPLIANCE §15.209.....	10
5. CONDUCTED EMISSION DATA	12
6. ANNEX 1 (GRAPHS)	15
7. TEST EQUIPMENT LIST (MOIRANS SITE)	22
8. UNCERTAINTIES CHART	24



1. TEST PROGRAM

Standard : FCC CFR 47, PART 15, Subpart C

ANSI C63-4 (2003).

Requirements for intentional radiator. Chapter 15.225 (Operation within the band 13.110-14.010MHz)

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 1GHz
- Conducted emissions from 150kHz to 30MHz

General conclusion:

Measures performed on the sample of the product L-P101+LSA4 SHD, SN: PROTO1, in configuration and description presented in this test report, show compliance levels with FCC CFR 47, Part 15 B and Part 15 C.



2. SYSTEM TEST CONFIGURATION

2.1. JUSTIFICATION

The system was configured for testing in a typical fashion (as a customer would normally use it). The RF output power is set at 1W.

2.2. HARDWARE IDENTIFICATION

- Equipment under test (EUT):**

L-P101+LSA4 SHD

Serial number: PROTO1

FCC ID:

QHKLIBREADERLP101

- Input/output:**

- 1x DC power input (12V)
- 1x USB communication port
- 1x RF antenna output

- Auxiliaries used for testing:**

Trade Mark – Model Number (Serial number)	Description	Cable description
TOSHIBA SATELITE S1410-704 (PS141E-04YCM-3V) sn: 13594938G with its power supply unit (PA3201U- 1ACA SEB100P2-15.0)	Laptop Personal Computer	Power cable unshielded USB cable: shielded
TAGSYS Medio L-P101	RFID TAG Reader	Power cable unshielded USB cable: shielded RF antenna cable shielded (Coaxial 50Ω)

- I/O cables used for testing:**

- 1x Antenna RF cable, coaxial 50Ω: 6m (with six ferrites on reader's side)
- 1x USB cable, shielded: 1m
- 1x DC power cable: 2m

2.3. EQUIPMENT MODIFICATIONS

None

2.4. EUT CONFIGURATION - EXERCISE SOFTWARE

The EUT exercise program used during radiated and conducted testing was exercised the L-P101 reader in a manner similar to a typical use.

The TAGSYS PX Explorer program permits the continuous reading of a tag number.

PC Software used: PX EXPLORER

Output power: 1W

2.5. SPECIAL ACCESSORIES

None

3. RADIATED EMISSION DATA

3.1. CLIMATIC CONDITIONS

Test performed by : A.MERLIN
Date of test : January 4th, 2010
Atmospheric pressure : 998mb
Relative humidity : 45%
Ambient temperature : 21°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.

Power supply: 230V/50Hz

LSA4 SHD Antenna:



Radiated emission test setup



3.3. TEST SEQUENCE AND RESULTS

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

A pre-scan of all the setup has been performed in a 3 meters full 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.

Frequency band investigated is 9kHz to 30MHz.

The pre-characterization graphs are obtained in PEAK detection.

See graphs for 150kHz-30MHz band:

LSA4 SHD ANTENNA **Emr#1** (See annex 1)

3.3.2. Pre-characterization at 3 meters [30MHz-1GHz]

A pre-scan of all the setup has been performed in a 3 meters full 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° during the measurement. The pre-characterization graphs are obtained in PEAK detection.

See graphs for 30MHz-1GHz:

LSA4 SHD ANTENNA

H polarization **Emr#2** (See annex 1)

V polarization **Emr#3** (See annex 1)

**3.3.3. 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.

A summary of the worst case emissions found in all test configurations and modes is shown on clauses 3.2.1.

LSA4 SHD ANTENNA

Frequency (MHz)	QPeak Limit (dBµV/m) @ 30m	Qpeak (dBµV/m)	Qpeak-Limit (Margin dB)	Turntable Angle (deg)	Ant. Pol./ Angle (deg)	Tot Corr (dB)
13.56 * ¹	84.0	45.0	-39.0	130	90	35.3
27.12	29.5	No frequency observed				

*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.

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

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 §15.209 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.

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

Worst case final data result:

LSA4 SHD ANTENNA

No	Frequency (MHz)	QPeak Limit (dBµV/m)	Qpeak * (dBµV/m)	Qpeak-Limit (Margin, dB)	Angle (deg)	Pol	Hgt (cm)	Tot Corr (dB)	Comments
1	33.981	40.0	28.2	-11.8	290	V	100	12.6	/
2	40.680	40.0	32.6	-7.4	250	V	100	12.0	/
3	44.840	40.0	23.3	-16.7	170	V	100	12.4	/
4	122.025	43.5	30.4	-13.1	290	H	200	16.2	/
5	144.655	43.5	27.6	-15.9	90	H	320	14.5	/
6	298.801	46.0	41.1	-4.9	240	V	100	17.4	/
7	499.871	46.0	43.4	-2.6	10	V	100	21.9	/
8	677.997	46.0	40.7	-5.3	165	H	120	25.1	/
9	697.920	46.0	36.4	-9.6	155	V	250	25.5	/

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

RESULTS: PASS

**3.4. 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. BAND-EDGE COMPLIANCE §15.209

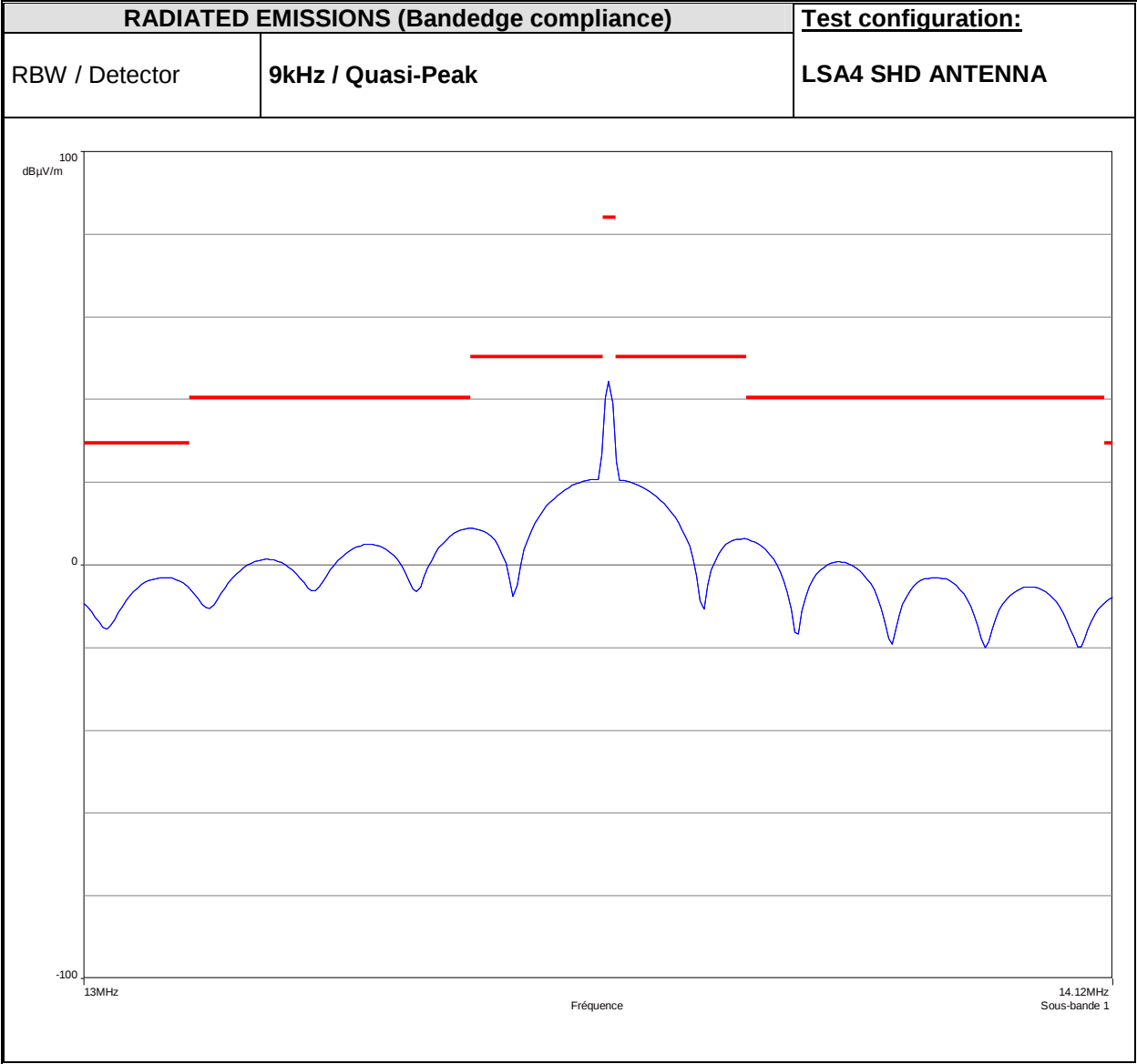
4.1. CLIMATIC CONDITIONS

Test performed by : A.MERLIN
Date of test : January 4th, 2010
Atmospheric pressure : 998mb
Relative humidity : 45%
Ambient temperature : 21°C

4.2. Frequency band 13.110-14.010MHz

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

The graphs are obtained with a measuring receiver ESU8.



RESULTS: PASS

**5. CONDUCTED EMISSION DATA****5.1. CLIMATIC CONDITIONS**

Test performed by : A.MERLIN
Date of test : January 4th, 2010
Atmospheric pressure : 998mb
Relative humidity : 45%
Ambient temperature : 21°C

5.2. SETUP FOR CONDUCTED EMISSIONS MEASUREMENT

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

The product has been tested with 110V/60Hz power line voltage and compared to the FCC Part 15 subpart C §15.207 limits. Measurement bandwidth was 9kHz from 150 kHz to 30 MHz.

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.

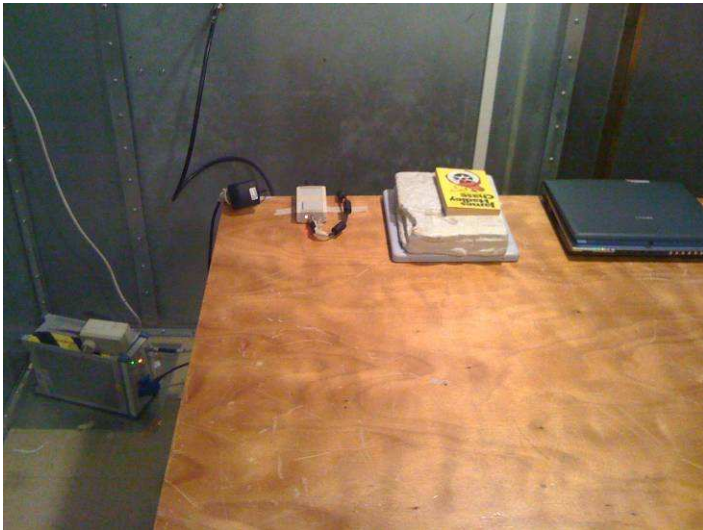
5.3. TEST SETUP

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 trough the LISN (measure).

LSA4 SHD ANTENNA:



**5.4. TEST SEQUENCE AND RESULTS**

Measurements are performed on the phase (L1) and neutral (N) of one of the two pedestals.

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.

LSA4 SHD ANTENNA:

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

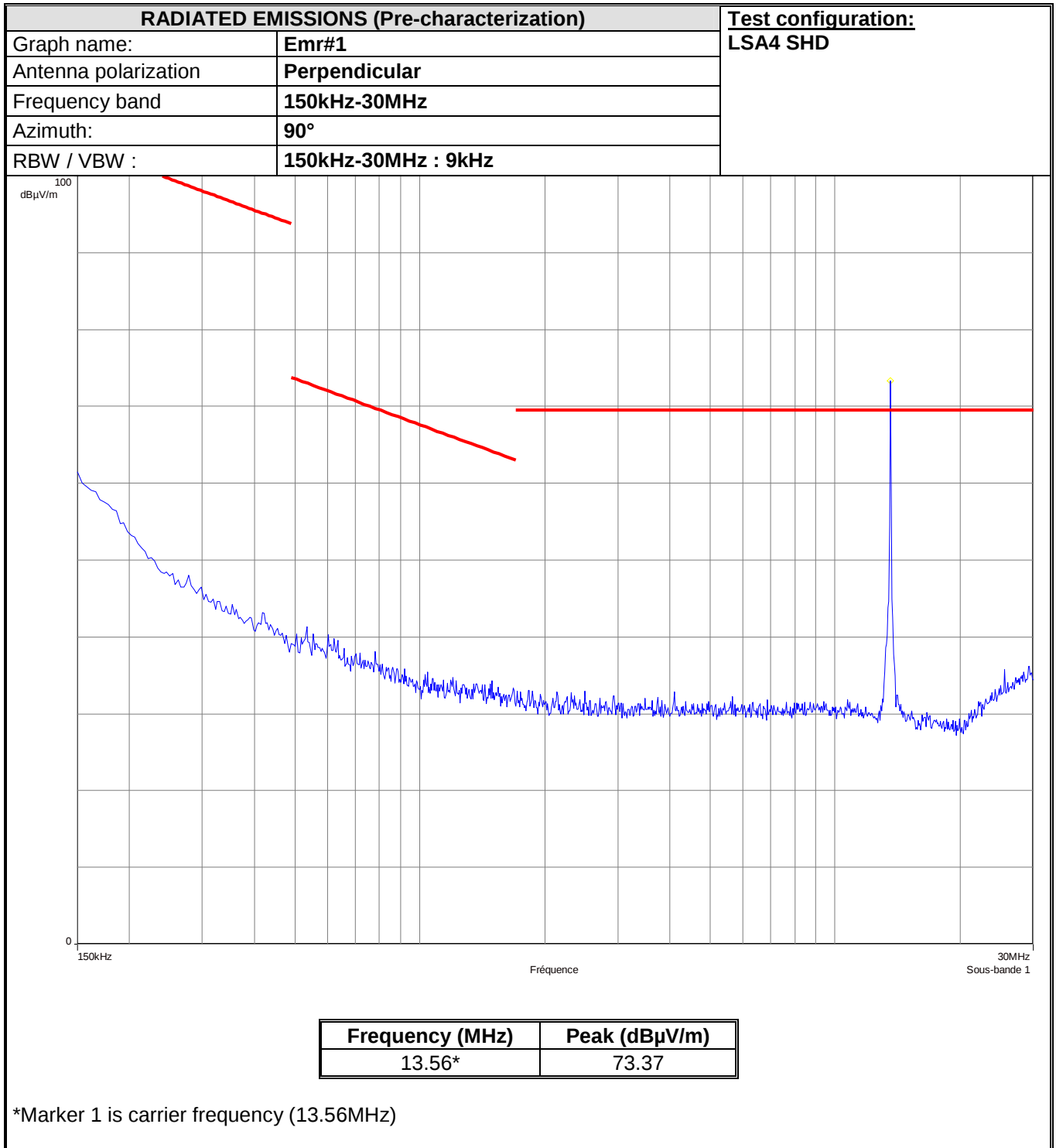
Dummy Load:

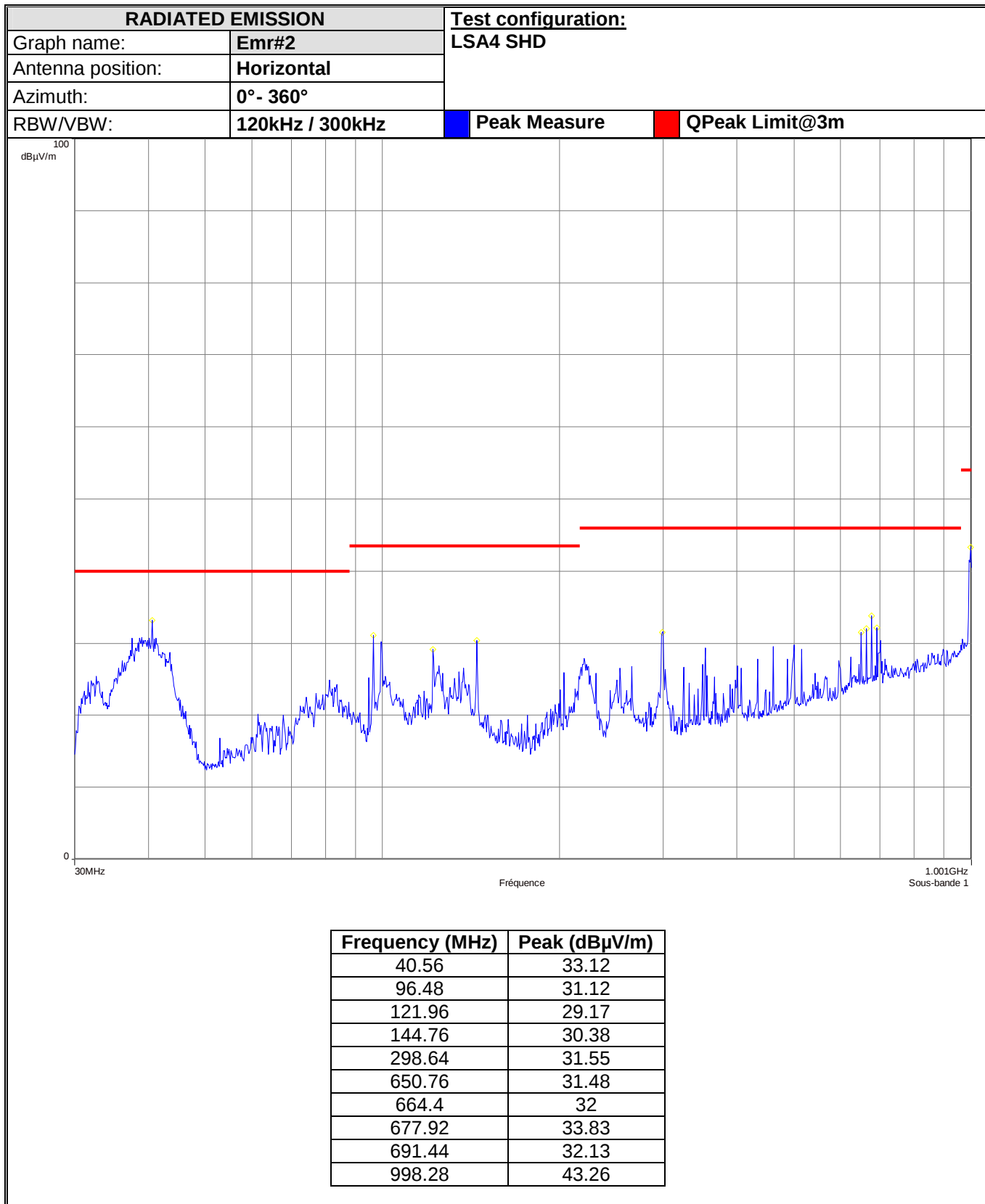
Measure on L1:	graph Emc#3	(see annex 1)
Measure on N:	graph Emc#4	(see annex 1)

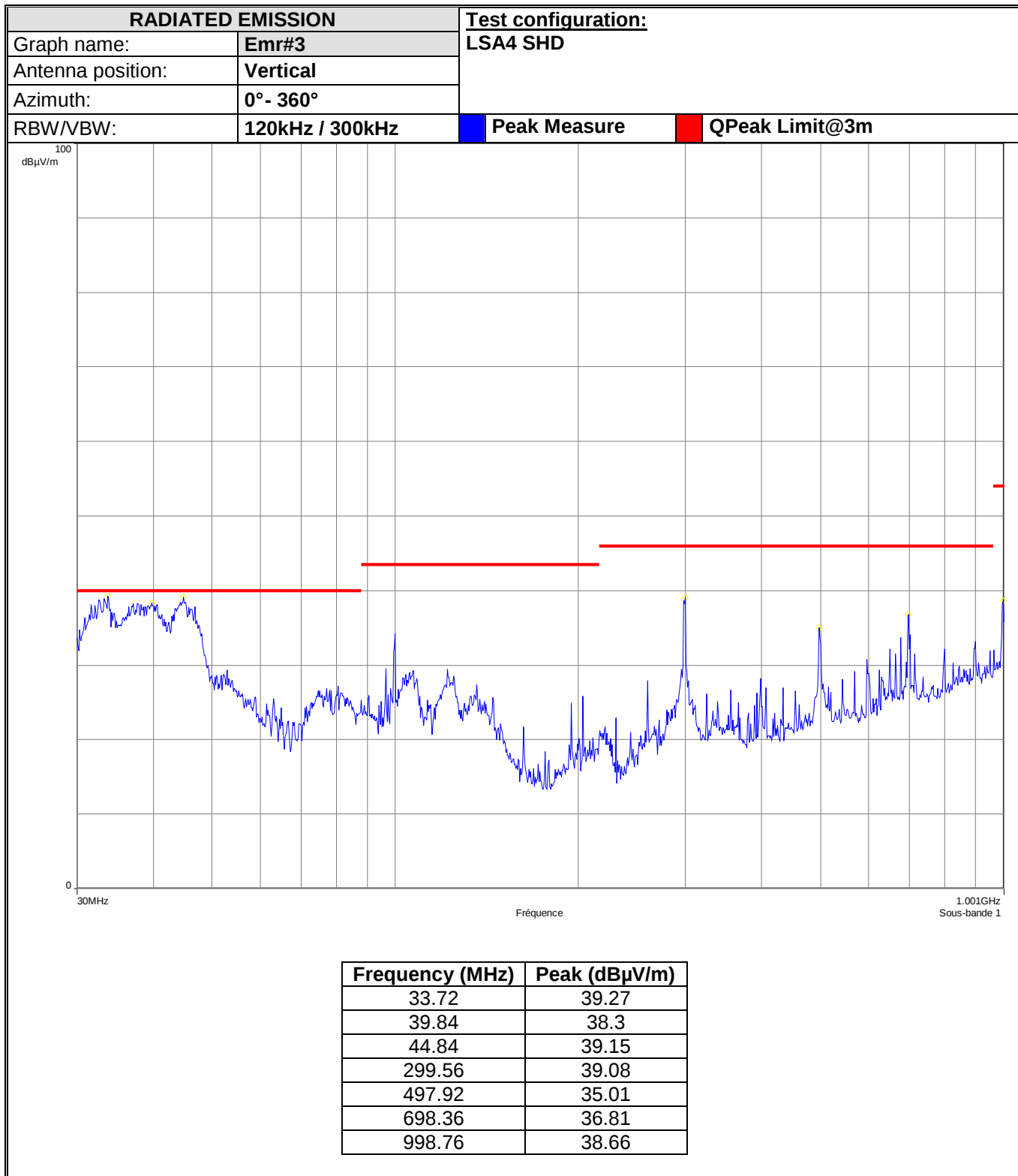
RESULT: PASS

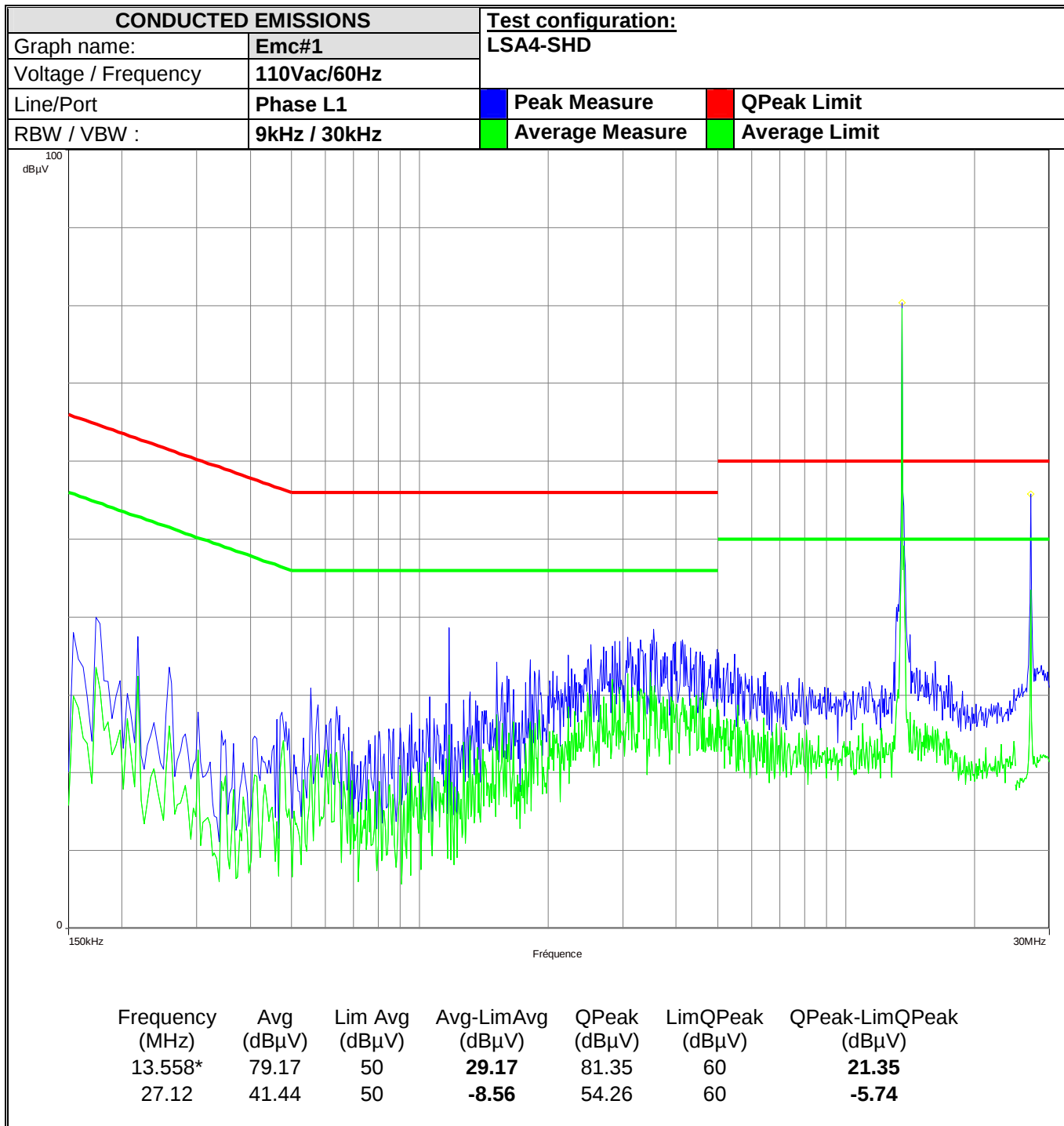


6. ANNEX 1 (GRAPHS)

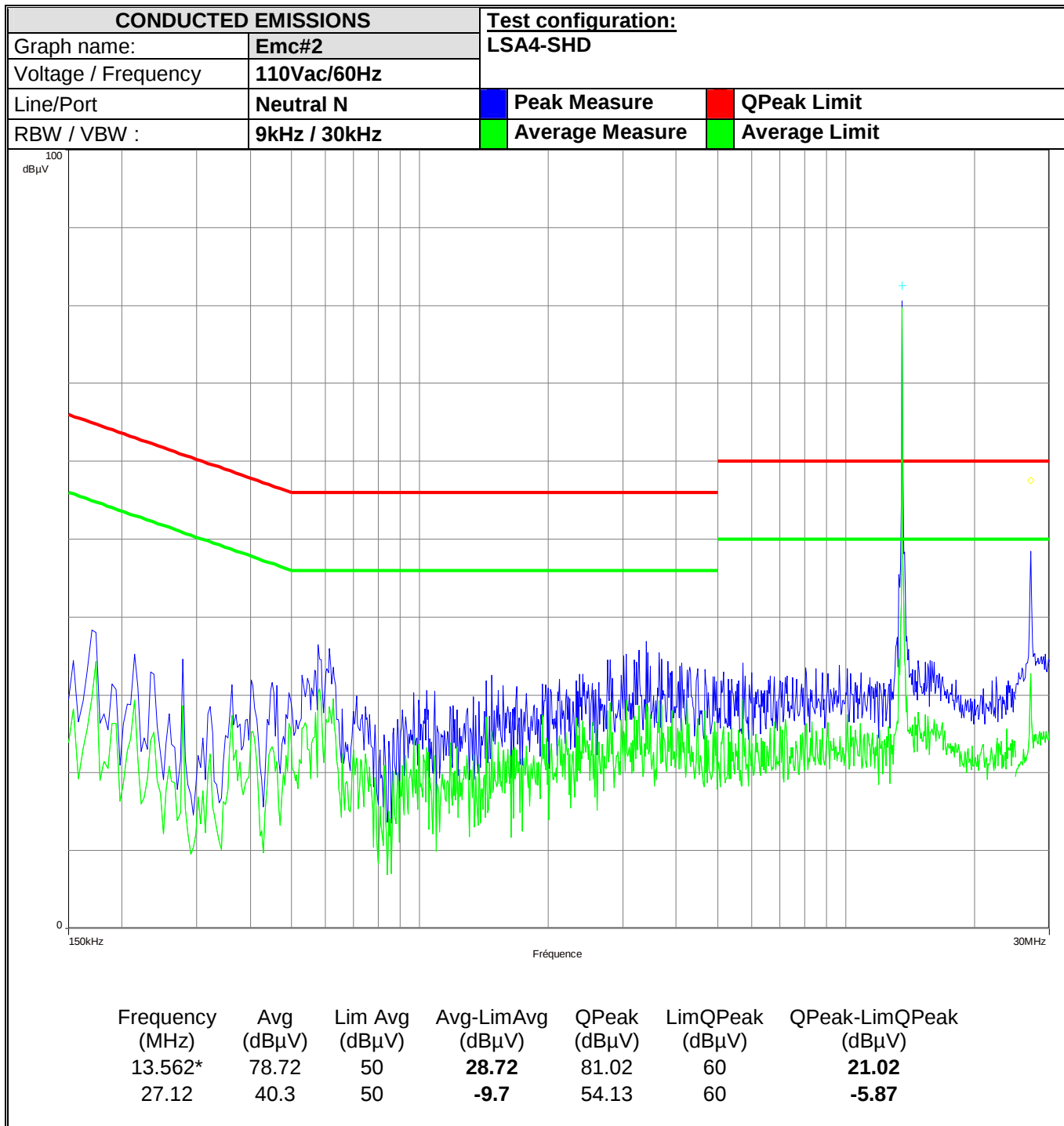




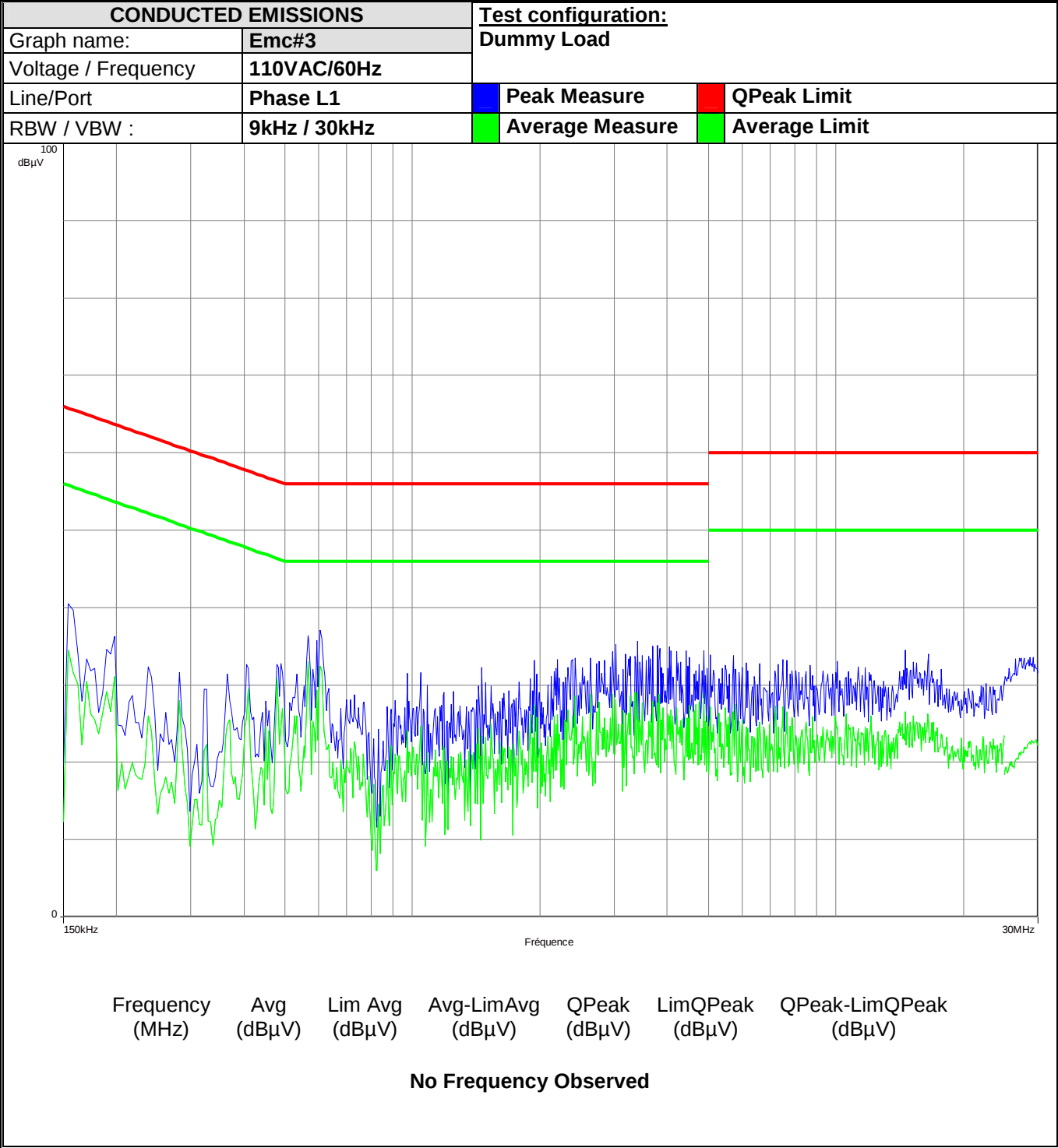


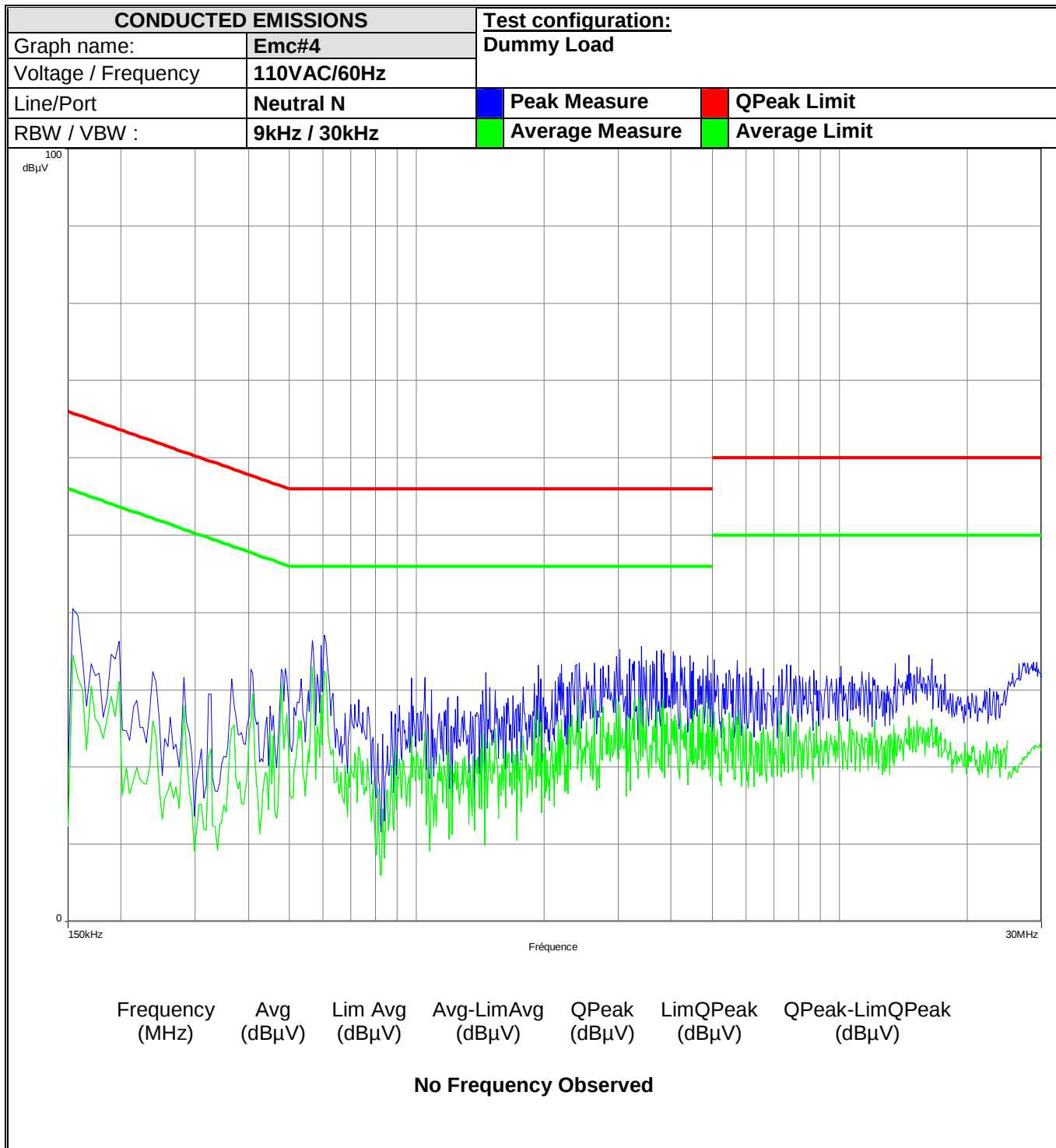


*Carrier frequency, see graphs with dummy load



*Carrier frequency, see graphs with dummy load







7. TEST EQUIPMENT LIST (MOIRANS SITE)

	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
X	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)			
X	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	A5329061VO	Cable Conduct. EMI			
X	A5329060VO	Cable Conduct. EMI			
	A5329189VO	Shielded cable	UTIFLEX		



	N°LCIE	TYPE	COMPANY	REF	SN
	A5329076VO	Shielded cable	UTIFLEX		
	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
	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
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		
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



8. UNCERTAINTIES CHART

Type de mesure / Kind of measurement	Incertitude élargie laboratoire / Wide uncertainty laboratory (k=2) $\pm x$	Incertitude limite du CISPR / CISPR uncertainty limit $\pm y$
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