



L C I E

TEST REPORT



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Subject

Electromagnetic compatibility (EMC) :
Publication CFR 47 PART 15.225 RSS-210 & RSS-GEN (Limited program)

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Apparatus under test

↳ Product	Payment terminal
↳ Trade mark	Ingenico
↳ Manufacturer	Ingenico
↳ Model under test	ISC480 INT
↳ Serial number	14797SC80301170
↳ FCC ID	XKB-ISC480CLINT
↳ IC	2586D-ISC480CLINT

Test date

January 08th, 2015 to February 06th, 2015

Test location

Fontenay Aux Roses

Test performed by

F.MEDJOUDJ

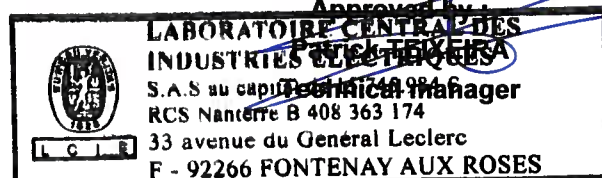
Composition of document

19 pages

Document issued on

February 10th, 2015

Written by :
Fostoki MEDJOUDJ
Tests operator



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1. Test Program

References

- 47 CFR Part 15C
- RSS-210
- RSS-Gen
- CISPR 16-4-2
- ANSI C63.4

Emission tests:

Test Description	Test Description	Test result - Comments
RSS-Gen § 4.6.1	Occupied Bandwidth	☐ PASS ☐ FAIL ☐ NA ☒ NP (Limited Program)
CFR 47 § 15.225 (e) RSS-210 § A2.6	Frequency tolerance	☐ PASS ☐ FAIL ☐ NA ☒ NP (Limited Program)
CFR 47 § 15.207 RSS-Gen § 7.2.4	AC Power Line Conducted Emissions	☒ PASS ☐ FAIL ☐ NA ☐ NP (Limited Program)
CFR 47 § 15.225 (a) (b) (c) RSS-210 § A2.6 (a) (b) (c)	Field strength within the band 13.110-14.010 MHz	☐ PASS ☐ FAIL ☐ NA ☒ NP (Limited Program)
CFR 47 § 15.209 (a) CFR 47 § 15.225 (d) RSS-210 § A2.6 (d)	Field strength outside of the bands 13.110-14.010 MHz	☒ PASS (30MHz-6GHz only) ☐ FAIL ☐ NA ☐ NP (Limited Program)
RSS-Gen § 4.10	Receiver Radiated emissions	☐ PASS ☐ FAIL ☒ NA (Transceiver equipment. Include in Field strength test) ☐ NP (Limited Program)

PASS: EUT complies with standard's requirement

FAIL: EUT does not comply with standard's requirement

NA: Not Applicable

NP: Test Not Performed

2. Equipment Description (declared by provider)

2.1. EQUIPMENT OF THE SAME FAMILY

-Tests are performed on the most complete product "ISC480 INT SN: 14797SC80301170". See Table below for difference between products.

DELTA* Old power supply	PHIHONG** New power supply
 DELTA ELECTRONICS, INC. 台達電子股份有限公司 192006210 AC/DC ADAPTER (台達) 台達電子 MODEL: TADP-048A INPUT: 115-230V 50/60Hz OUTPUT: 12V 4.0A LPS CAUTION: (警告) 适用于计算机产品 FOR USE WITH INFORMATION TECHNOLOGY EQUIPMENT FOR YOUR DISCUSS, CONTACT WITH US ATTENTION: (注意) 适用于计算机产品 适用于信息科技设备 请务必参阅使用手册 N17908 V1276 CE S/N: ABET1215000272 MODEL REV: 00	 ingenico 電源供應器/電源适配器 MODEL No. 型号(型号): PSM32W-080 INPUT 输入(输入): 115-230V ~ 50-60Hz 0.5A OUTPUT 输出(输出): 12.0V ~ 4.0A LISTED ADAPTOR LPS EFFICIENCY LEVEL 符合能源之星(ENERGY STAR)节能标准 台達電子股份有限公司 台達電子股份有限公司 台達電子股份有限公司 台達電子股份有限公司 CAUTION: For use with Information Technology Equipment. Only for system use only. 注意: 适用于信息科技设备 仅限系统使用 仅限系统使用 仅限系统使用 MADE IN CHINA 中國製造/中國製造 Z44300060A1

*The product was certified with the old power supply DELTA in June 2013.

**EUT's power supply have changed, the new tests were carried out with the new power supply PHIHONG

2.2. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT): ISC480 INT

Serial Number: 14797SC80301170



Equipment Under Test

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Power supply AC	-	-	☒	☐	☐	Nothing to report

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
-	-	-	-

Equipment information: (Declared by provider)

Apparatus Description	On the ISC480 INT (internal Cless) the antenna zone is on the top module: 			
Type of power source:	☒ AC power supply	☐ DC power supply	☐ Battery (Select Type)	
Test source voltage:	Vmin-Vmax:	☒ 120V -60Hz	☐ Vdc	
Operating Modes	Mode 1	Loop increment:  Operation frequency : 13.56MHz		
Performance level defined by the manufacturer (only for immunity tests)	-			



2.3. EQUIPMENT LABELLING

Equipment under test



PHIHONG power Supply



2.4. EQUIPMENT MODIFICATIONS

☒ None ☐ Modification:



3. Measurement of radiated emissions

3.1. ENVIRONMENTAL CONDITIONS

Test performed by : Fostoki MEDJOUDJ
Date of test : January 8th, 2014
Ambient temperature : 21°C
Relative humidity : 46%

3.2. TEST SETUP

Specifications:

Frequency	0.15 – 30 MHz	RBW 9 kHz
	30 – 1000 MHz	RBW 120 kHz
	1-6GHz	RBW 1MHz
Detector	Peak and Quasi-Peak	

Pre characterization in semi anechoic room is performed to define the critical frequencies

Operating conditions:

- The Equipment under Test is installed:

- ☒ Measure in semi anechoic room
☐ Measure in open area site

- Measuring distance:

- ☒ 3m
☐ 10m

- Deviation method:

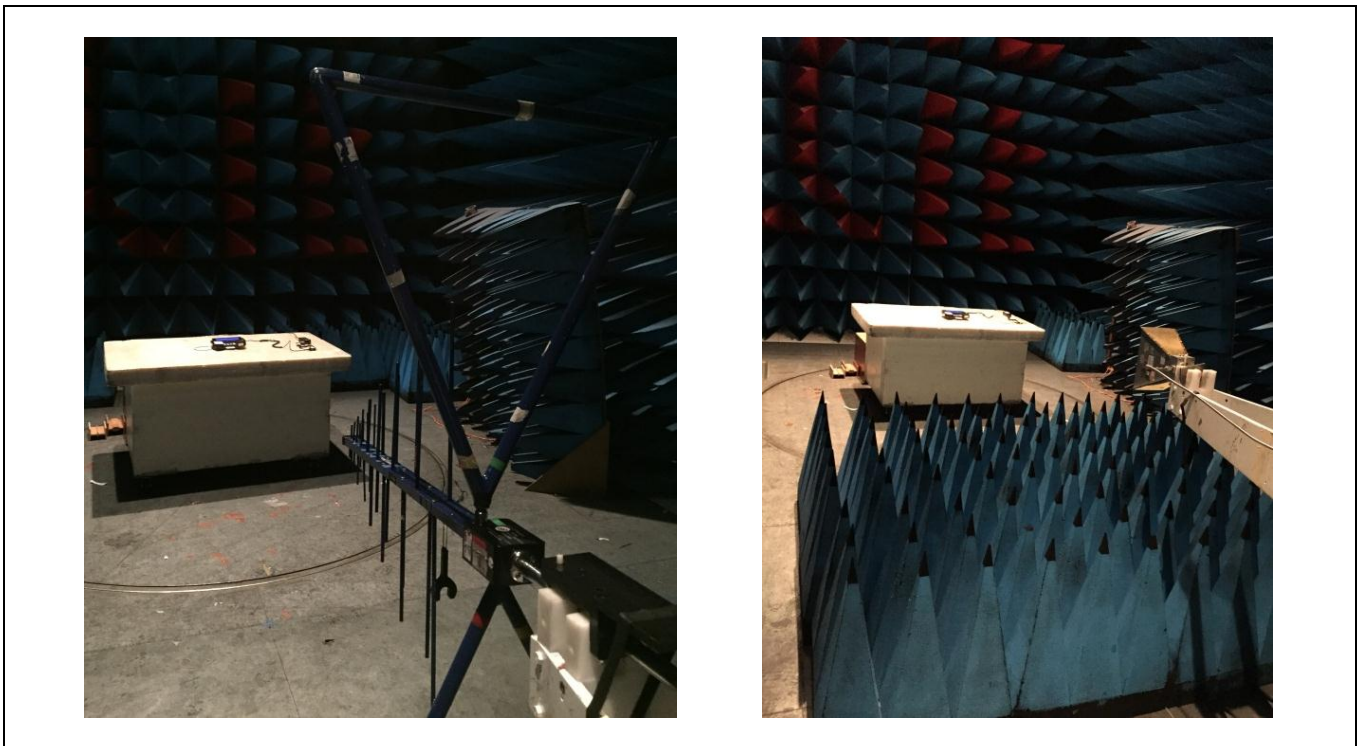
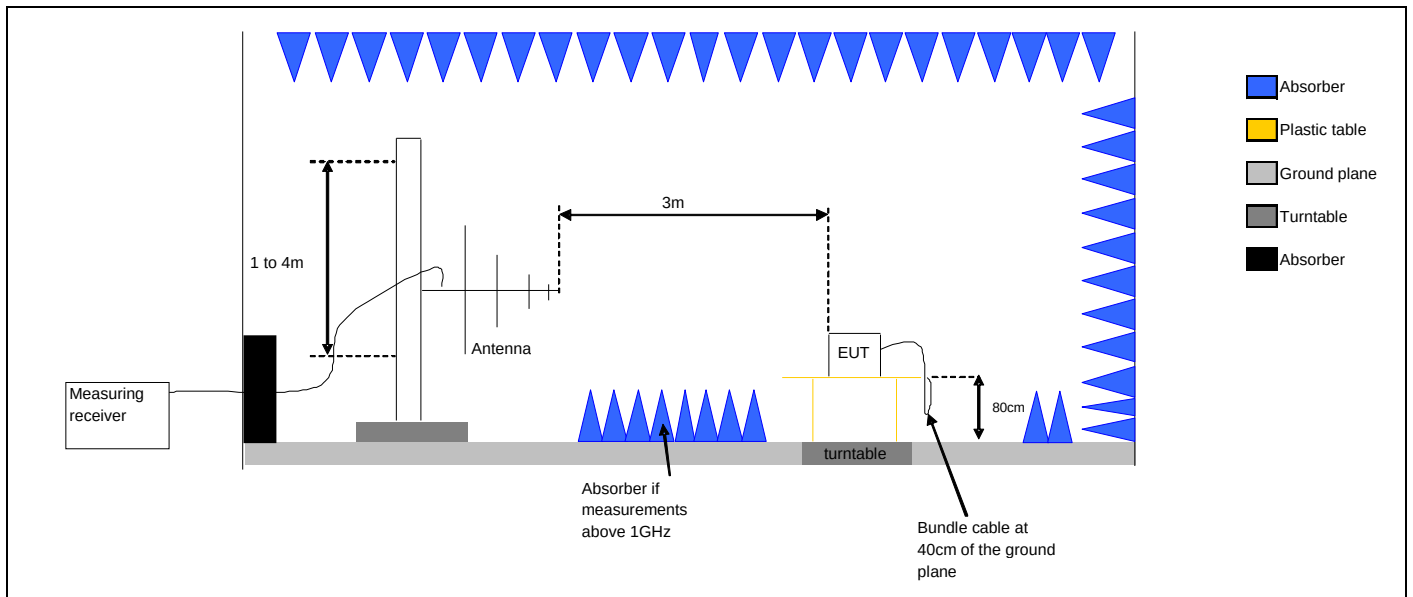
- ☐ Yes
☒ No

-Product installation:

- ☒ The EUT was tested as a tabletop equipment and was placed on a non-conducting platform the top of which is 0.8m above the metal ground plane.
☐ The EUT is at 10cm height from reference plane

Operating mode:

- ☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ...



Measurement of radiated disturbances.

3.3. LIMIT

30MHz to 88MHz:	100µV/m (3m) or 40dBµV/m (3m) QPeak
88MHz to 216MHz:	150µV/m (3m) or 43,5dBµV/m (3m) QPeak
216MHz to 960MHz:	200µV/m (3m) or 46dBµV/m (3m) QPeak
960MHz to 1000MHz:	500µV/m (3m) or 54dBµV/m (3m) QPeak
Above 1000MHz:	5012µV/m (3m) or 74dBµV/m Peak
	500µV/m (3m) or 54dBµV/m (3m) Average

3.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Semi anechoic chamber	SIEPEL	-	D3044008	2014/06	2015/06
EMI receiver	ROHDE & SCHWARZ	ES140 1088 740K40	A2642010	2014/02	2015/02
Preamplifier	BONN Elektronik	BLNA 3018-8F305	A7080053	2014/01	2015/01
Bilog antenna	CHASE	CBL6111C	C2040124	2014/03	2015/03
Horn antenna	EMCO	3115	C2042018	2014/07	2015/07

3.5. RESULTS

Diagram N°1
Horizontal Polarization (30MHz-1GHz)

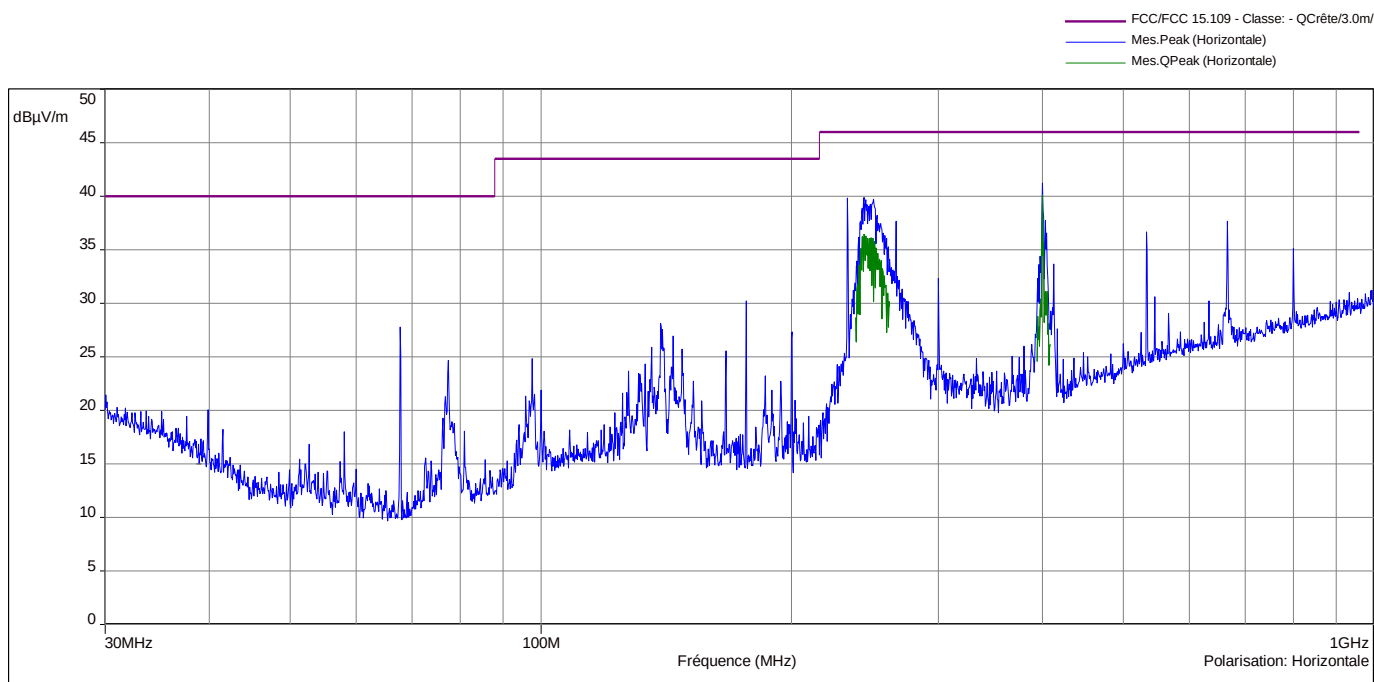


Diagram N°2
Horizontal Polarization (1GHz-6GHz)



— FCC/FCC 15.109 - Classe: - Moyenne/3.0m/
— FCC/FCC 15.109 - Classe: - Crête/3.0m/
— Mes.Peak (Horizontale)
— Mes.Avg (Horizontale)

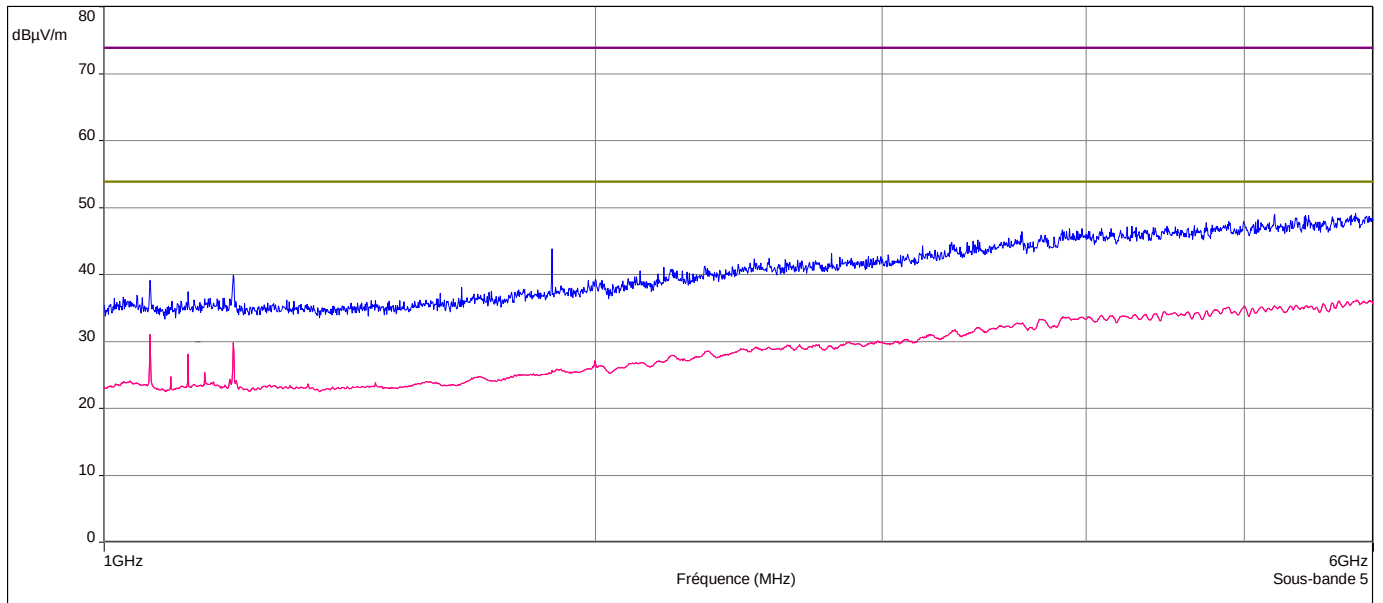




Diagram N°3
Vertical Polarization (30MHz-1GHz)

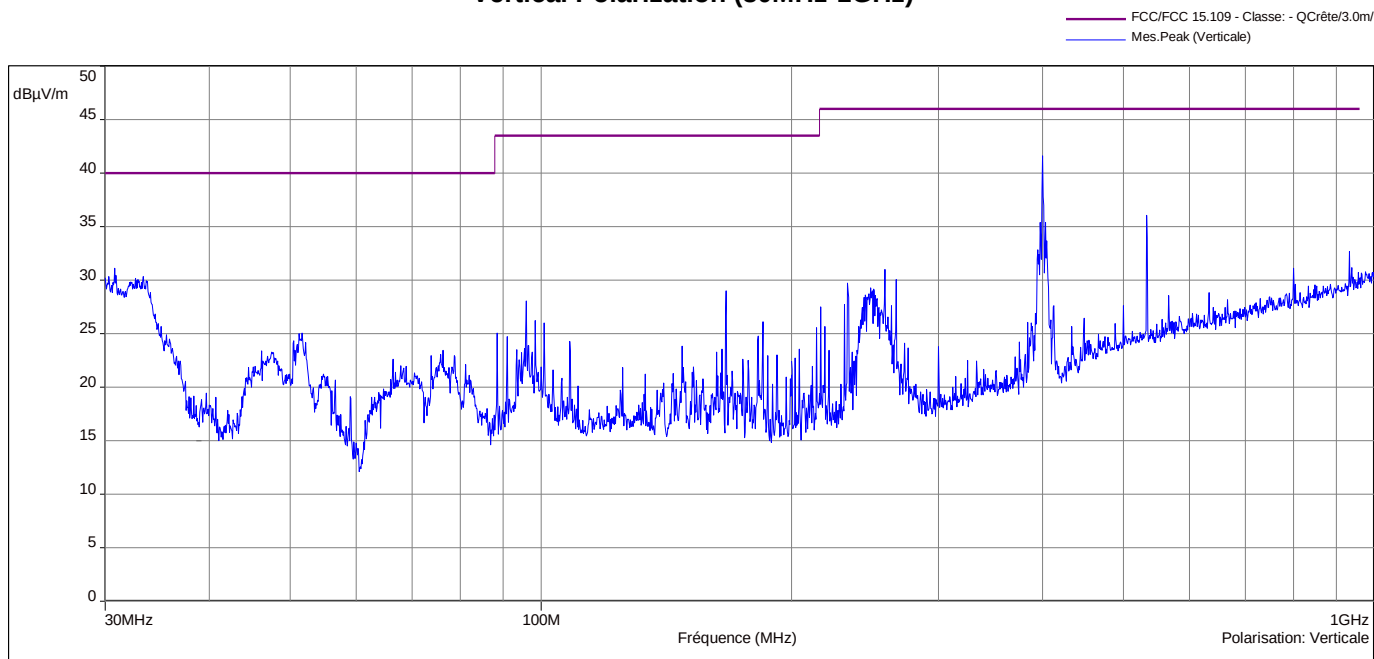
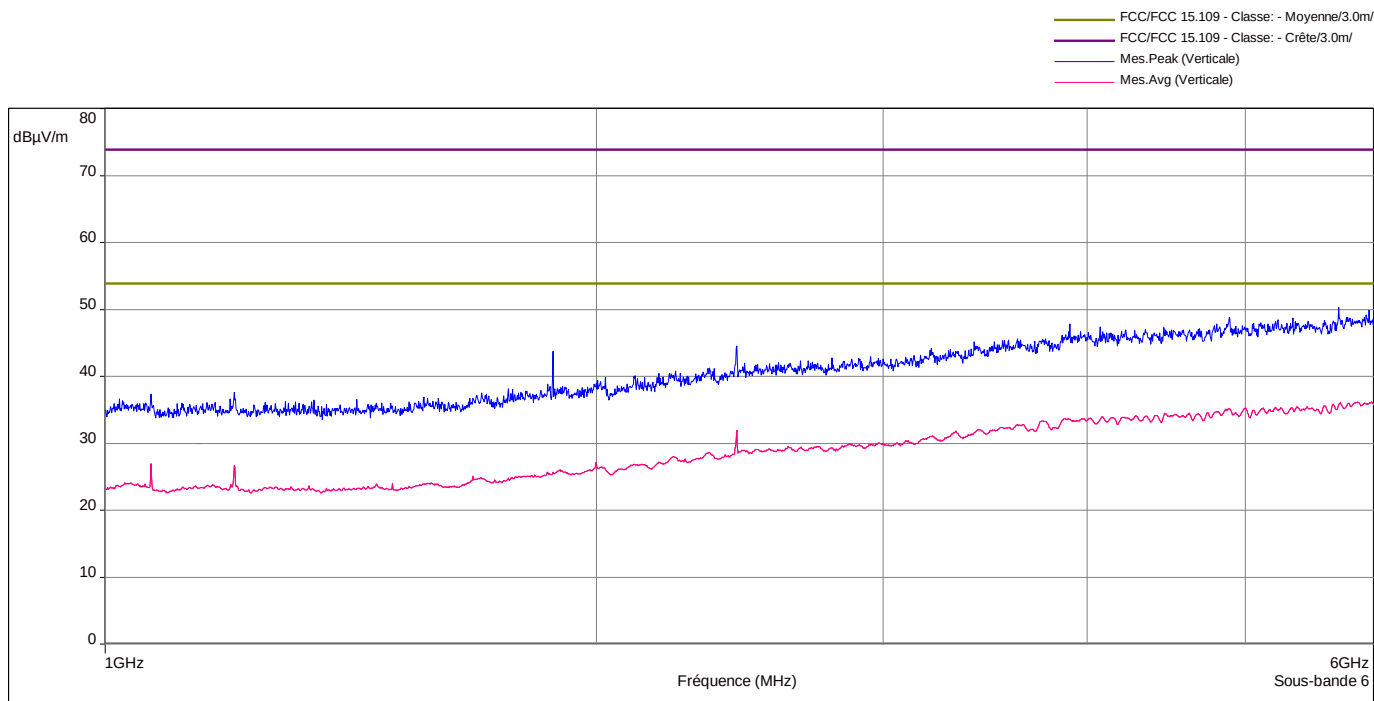


Diagram N°4
Vertical Polarization (1GHz-6GHz)





3.6. CONCLUSION

Measures of Radiated Emission, performed on the sample of the product **ISC480 INT**, SN: **14797SC80301170**, in configuration and description presented in this test report, show levels **conform to** the FCC part 15 & RSS-GEN §7.2.4 limits.



4. Measurement of conducted disturbance

4.1. ENVIRONMENTAL CONDITIONS

Test performed by : Fostoki MEDJOUDJ
Date of test : January 8th, 2014
Ambient temperature : 21°C
Relative humidity : 46%

4.2. TEST SETUP

Specifications:

Frequency 0.15 – 30 MHz RBW 9 kHz
Detector Peak , Quasi Peak and average

The measurement is performed on power supply with a LISN and telecommunication lines with RSI or current clamp for shielded cables.

Operating conditions:

- Deviation method:

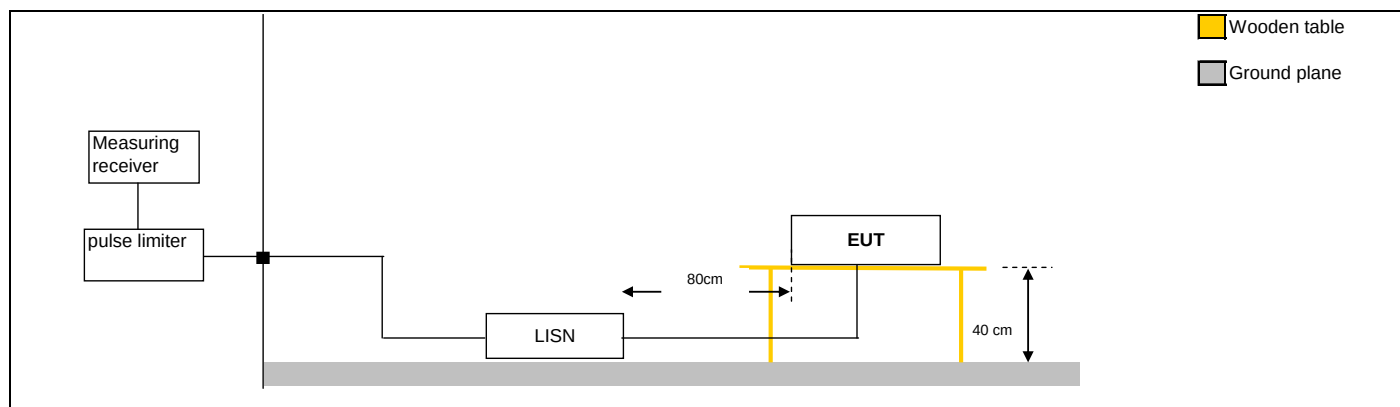
- ☐ Yes
☒ No

-Product installation:

- ☐ The EUT is installed on a wooden table 80 cm above the reference plane, at 80cm of the LISN and at 40cm of the vertical conductive wall
☒ The EUT is installed on a wooden table 40 cm above the reference plane, at 80cm of the LISN.
☐ The EUT is installed 10 cm above the reference plane, at 80cm of the LISN..

Operating mode:

- ☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ...



Test set up of conducted emission on power supply



Test set up of conducted emission on power supply



4.3. LIMIT

☐ Power supply Class A

Frequency Bands/frequencies	dB (μV/m) quasi-peak	dB (μV/m) average
0.15-0.5MHz	79	66
0.5-30 MHz	73	60

☒ Power supply Class B

Frequency Bands/frequencies	dB (μV/m) quasi-peak	dB (μV/m) average
0.15-0.5MHz	66-56	56-46
0.5-5 MHz	56	46
5-30 MHz	60	50

4.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESI40	A2642010	2014/02	2015/02
V LISN	ROHDE & SCHWARZ	ENV216	C2320163	2013/12	2014/12
Semi anechoic chamber	SIEPEL	C01	D3044008	2014/06	2015/06

4.5. RESULTS

Diagram N°1 Phase

Description Sous-bande 1

Fréquences: 150 kHz - 30 MHz (Mode: Lin, Pas: 5 kHz)

Réglages: RBW: 9 kHz, VBW: Auto, Temps de mesure: 50 ms/Pts, Nombre de Balayages: 1, Preamp: Off, LN Preamp: Off, Preselecteur: On

Ligne: Phase 1

FCC/FCC 15.107 - Classe: B - Moyenne/
FCC/FCC 15.107 - Classe: B - QCrête/
Mes. Peak (Phase 1)
Mes. QPeak (Phase 1)
Mes. Avg (Phase 1)

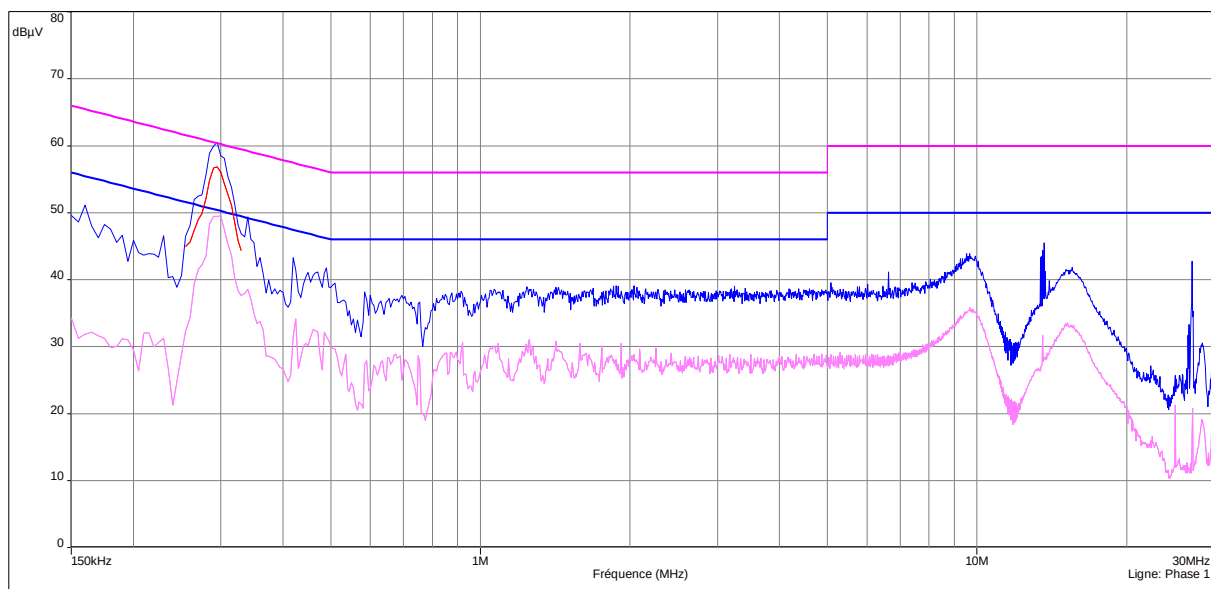


Diagram N°2 Neutral

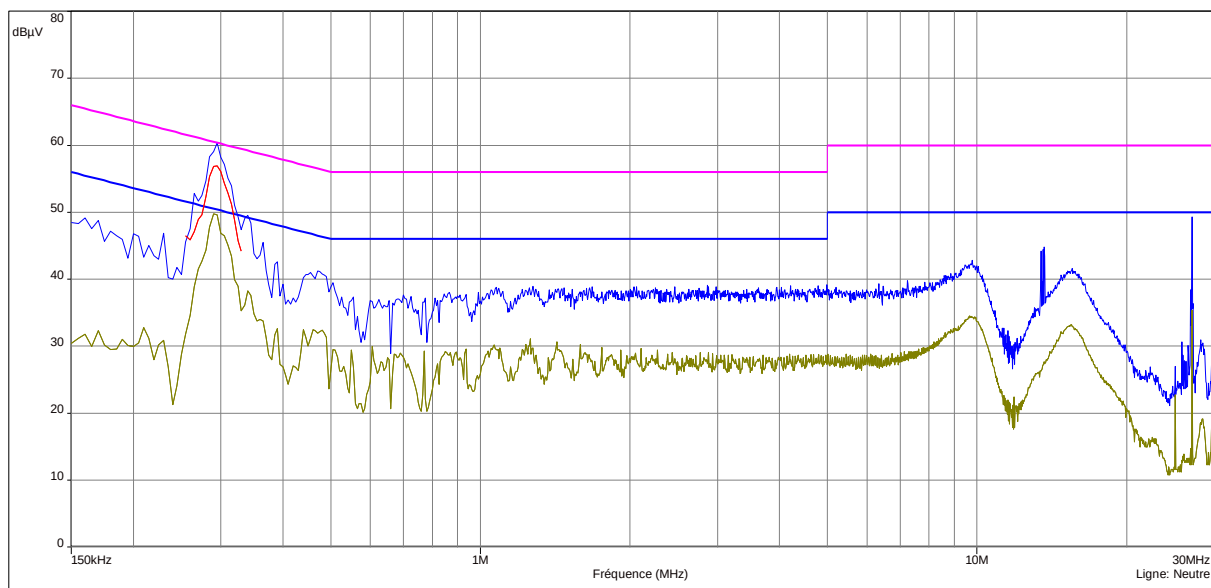
Description Sous-bande 2

Fréquences: 150 kHz - 30 MHz (Mode: Lin, Pas: 5 kHz)

Réglages: RBW: 9 kHz, VBW: Auto, Temps de mesure: 50 ms/Pts, Nombre de Balayages: 1, Preamp: Off, LN Preamp: Off, Preselecteur: On

Ligne: Neutre

FCC/FCC 15.107 - Classe: B - Moyenne/
FCC/FCC 15.107 - Classe: B - QCrête/
Mes. Peak (Neutre)
Mes. QPeak (Neutre)
Mes. Avg (Neutre)





4.6. CONCLUSION

Measures of Conducted Emission, performed on the sample of the product **ISC480 INT**, SN: **14797SC80301170**, in configuration and description presented in this test report, show levels **conform to** the FCC part 15 RSS-GEN §7.2.5 limits.



5. Uncertainties Chart

Kind of measurement	Wide uncertainty laboratory (k=2) $\pm x$ (dB)	CISPR uncertainty limit $\pm y$ (dB)
Measurement of conducted disturbances in voltage on the AC power port on the Fontenay-aux-Roses site.	3.51	3.6
Measurement of discontinuous conducted disturbances in voltage on the AC power port on the Fontenay-aux-Roses site. (S48 room)	3.45	3.6
Measurement of conducted disturbances in voltage on the AC power port on the Ecuelles site.	3.86	3.6
In Situ measurement of conducted disturbances in voltage on the AC power port with ESH2 receiver	3.51	3.6
Measurement of conducted disturbances in voltage on the DC power port on the Fontenay-aux-Roses site.	3.49	3.6
Measurement of conducted disturbances in voltage on the DC power port on the Ecuelles site.	3.72	3.6
Measurement of conducted disturbances in voltage on the telecommunication port.	3.26	Under consideration
Measurement of conducted disturbances in voltage on the telecommunication port at Ecuelles Site.	3.45	Under consideration
Measurement of conducted disturbances in current	3.09	Under consideration
Measurement of radiated electric field from 30 to 200MHz on the Fontenay-aux-Roses site (with EATON 96002 antenna)	5.2	5.2
Measurement of radiated electric field from 200 to 1000MHz on the Fontenay-aux-Roses site	5.3	5.2
Measurement of radiated electric field from 1 to 18GHz on the Fontenay-aux-Roses site	4.8	Under consideration
Measurement of radiated electric field from 30 to 80MHz in horizontal position on the Ecuelles site (dipole antenna)	3.77	5.2
Measurement of radiated electric field from 30 to 80MHz in vertical position on the Ecuelles site (dipole antenna)	4.12	5.2
Measurement of radiated electric field from 80 to 1000MHz in horizontal position on the Ecuelles site (R&S HL023 A2 logper antenna)	4.19	5.2
Measurement of radiated electric field from 80 to 1000MHz in vertical position on the Ecuelles site (R&S HL023 A2 logper antenna)	4.50	5.2
Measurement of radiated electric field from 30 to 1000MHz in horizontal position on the Ecuelles site (CBL6112 bilog antenna)	4.24	5.2
Measurement of radiated electric field from 30 to 1000MHz in vertical position on the Ecuelles site (CBL6112 bilog antenna)	4.55	5.2
Measurement of radiated electric field from 1 to 18GHz on the Ecuelles site	5.16	Under consideration
Measurement of current harmonics	11.11%	/
Flicker measurement	9.26%	/
Measurement of disturbance power	3.32	4.5
Immunity to conducted disturbances, induced by radio-frequency fields	2.36	/
Immunity to conducted disturbances, induced by radio-frequency fields with injection clamp	2.76	/
Immunity to radiated electromagnetic field	2.64	/
EMF measurement according to EN62233 from 10KHz to 400KHz	23,51%	/

Unless otherwise specified, the decision of conformity takes into account the uncertainty of measures.

End of test report