



LCIE

RFID 13,56MHz Template: Release July 3rd, 2019

TEST REPORT

N°: 162678-740210-B

Version : 01

Subject

Radio spectrum matters
tests according to standards:
47 CFR Part 15.225 & RSS 210 Issue 9 & RSS-Gen Issue 5 [5](#)

Issued to

BIOLOG ID
1, Rue du Commandant Robert Malrait
27300-BERNAY
France

Apparatus under test

- ↳ Product
- ↳ Trade mark
- ↳ Manufacturer
- ↳ Model under test
- ↳ Serial number
- ↳ FCC ID
- ↳ IC

SMART STORAGE AGITATOR SST-A240
BIOLOG ID
BIOLOG ID
PRD_7150400A
BI1930000002
2AKUFSSTA-V2

Conclusion

See Test Program chapter

Test date

: September 13, 2019 to September 17, 2019

Test location

Fontenay Aux Roses & Ecuelles

Test Site

6230B-1

Composition of document

31 pages

Document issued on

October 15, 2019

Written by :
Armand MAHOUNGOU
Tests operator



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LCIE

Laboratoire Central des Industries Electriques
Une société de Bureau Veritas

33, Av du Général Leclerc
92266 Fontenay Aux Roses
FRANCE

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



PUBLICATION HISTORY

Each new edition of this test report replaces and cancels the previous edition. The control of the old editions of report is under responsibility of client.

Version	Date	Author	Modification
01	15/10/2019	A.MAHOUNGOU	Creation of the document

Date of receipt of test item 15/07/2019



SUMMARY

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1. TEST PROGRAM

References

- 47 CFR Part 15.225
- RSS 210 Issue 9
- RSS Gen Issue 5
- ANSI C63.10-2013

Radio requirement:

Clause (47CFR Part 15.225 & RSS-210 Issue 9 & RSS-Gen Issue 5) Test Description	Test result - Comments			
Occupied Bandwidth P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
AC Power Line Conducted Emission P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA(2)	<input type="checkbox"/> NP(1)
Frequency Tolerance P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Field strength within the band 13.110-14.010MHz P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Field strength outside of the bands 13.110-14.010 MHz P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Receiver Radiated Emissions P	<input checked="" type="checkbox"/> PASS (3)	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
This table is a summary of test report, see conclusion of each clause of this test report for detail.				

(1): Limited program

(2): EUT not directly or indirectly connected to the AC Power Public Network

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

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 UNDER TEST: CONFIGURATION (DECLARED BY PROVIDER)

2.1. INFORMATIONS

-Tests are performed on the most complete product **BIOLOG ID PRD_7150400A**, SN: **B11930000002**. See Table below for difference between products.

Trade name	SST-A60	SST-A120	SST-A180	SST-A240
Product Reference	PRD_7150300A	PRD_7150500A	PRD_7150600A	PRD_7150400A
Associated HELMER Agitator	Helmer PF96	Helmer PC2200	Helmer PC3200	Helmer PC4200
Storage capacity	60 bags (5 drawers of 12 bags)	120 bags (10 drawers of 12 bags)	180 bags (15 drawers of 12 bags)	240 bags (20 drawers of 12 bags)
Number of RFID antennas	32 antennas (8 antennas x 4 satellites)	64 antennas (8 antennas x 8 satellites)	96 antennas (8 antennas x 12 satellites)	128 antennas (8 antennas x 16 satellites)
Number of satellite	4	8	12	16
Number of RFID module	1	2	3	4
Number of calculator	1	1	1	1
Power (VA) @240VAC/50Hz	16.8 VA	17.6 VA	18.4 VA	19 VA
Dimensions	793 x 383 x 276 mm	793 x 383 x 610 mm	793 x 383 x 915 mm	793 x 383 x 1220 mm
Weight	25 Kg	50 Kg	75 Kg	100 Kg

See document:” SST-A_Product_Family_V1.3.pdf” for more information about the family

2.2. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):
BIOLOG ID PRD_7150400A

Serial Number: BI1930000002



Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
1	Ethernet Cable	-	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-
2	Power supply	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	GLOBTEK GTM96900P9015-T2
3	Calculator PRD 7130001A01	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop	-	-	Use to set the EUT
HELMER	Incubator PC4200i	-	-

Equipment information:

Type:	<input checked="" type="checkbox"/> RFID			
Frequency band:	[13.553 to 13.567] MHz			
Number of Channel:	1			
Antenna Type:	<input checked="" type="checkbox"/> Integral	<input type="checkbox"/> External	<input type="checkbox"/> Dedicated	
Transmit chains:	1			
Receiver chains:	1			
Type of equipment:	<input checked="" type="checkbox"/> Stand-alone	<input type="checkbox"/> Plug-in	<input type="checkbox"/> Combined	
Equipment type:	<input checked="" type="checkbox"/> Production model		<input type="checkbox"/> Pre-production model	
Operating temperature range:	Tmin:	<input checked="" type="checkbox"/> -30°C IC <input checked="" type="checkbox"/> -20°C FCC	<input type="checkbox"/> 0°C	<input type="checkbox"/> X°C
	Tnom:	20°C		
	Tmax:	<input type="checkbox"/> 35°C	<input checked="" type="checkbox"/> 55°C	<input type="checkbox"/> X°C
Type of power source:	<input type="checkbox"/> AC power supply	<input checked="" type="checkbox"/> DC power supply		<input type="checkbox"/> Battery
Operating voltage range:	Vmin:	<input type="checkbox"/> 102V/60Hz	<input checked="" type="checkbox"/> 10,8Vdc	
	Vnom:	<input type="checkbox"/> 120V/60Hz	<input checked="" type="checkbox"/> 15Vdc	
	Vmax:	<input type="checkbox"/> 138V/60Hz	<input checked="" type="checkbox"/> 16Vdc	

2.3. RUNNING MODE

Test mode	Description of test mode
Test mode 1	Permanent emission with modulation on a fixed channel in the data rate that produced the highest power
Test mode 2	Permanent reception

Test	Running mode
Occupied Bandwidth	<input checked="" type="checkbox"/> Test mode 1 <input type="checkbox"/> Alternative test mode()
Frequency Tolerance	<input checked="" type="checkbox"/> Test mode 1 <input type="checkbox"/> Alternative test mode()
AC Power Line Conducted Emission	<input checked="" type="checkbox"/> Test mode 1 <input type="checkbox"/> Alternative test mode()
Field strength within the band 13.110-14.010MHz	<input checked="" type="checkbox"/> Test mode 1 <input type="checkbox"/> Alternative test mode()
Field strength outside of the bands 13.110-14.010 MHz	<input checked="" type="checkbox"/> Test mode 1 <input type="checkbox"/> Alternative test mode()
Receiver Radiated Emissions	<input checked="" type="checkbox"/> Test mode 2 <input type="checkbox"/> Alternative test mode()

2.4. EQUIPMENT LABELLING



2.5. EQUIPMENT MODIFICATION

☒ None ☐ Modification:

3. OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : September 16, 2019 to September 17, 2019
Ambient temperature : 26 °C
Relative humidity : 38 %

3.2. TEST SETUP

- The Equipment Under Test is installed:

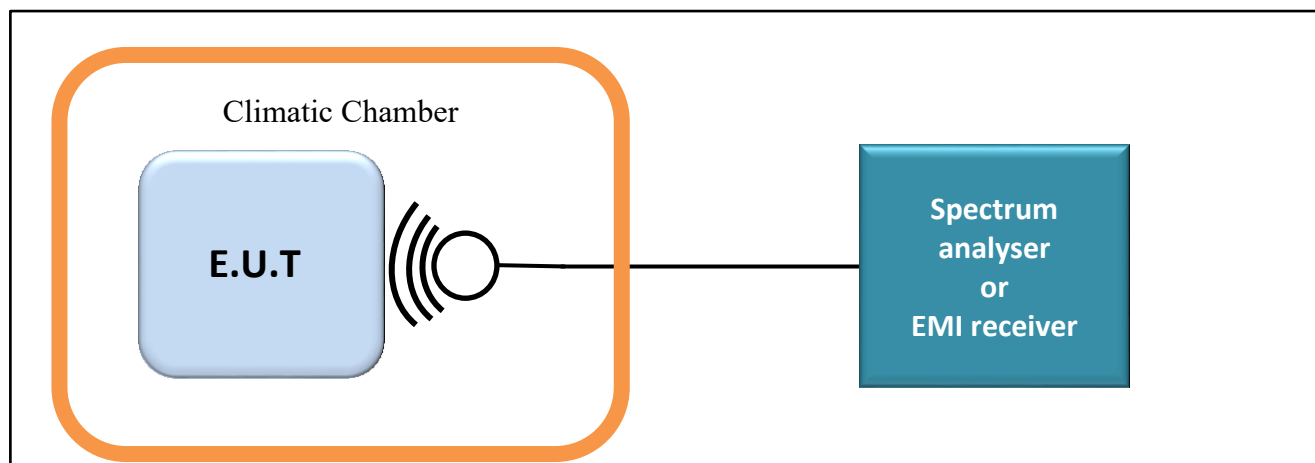
- ☐ On a table
- ☒ In a climatic chamber
- ☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- ☐ Conducted Method
- ☒ Radiated Method

- Test Procedure:

- ☒ RSS-Gen Issue 5 § 6.7



Test set up of Occupied Bandwidth



Photograph for Occupied bandwidth

3.3. LIMIT

None

3.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Climatic chamber	SECASI Technologies	-	D1025025	See cal with Thermometer	See cal with Thermometer
Thermometer	EUROTHERM 92	Climats Sapratin	D1025025	2018/03	2020/03
Spectrum analyzer	ROHDE & SCHWARZ	FSL6	A4060032	2017/10	2019/10
Multi-meter	KEITHLEY	2000	A1241084	2018/12	2020/12
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7049006	See cal with Multi-meter	See cal with Multi-meter
13,56MHz Test fixture Antenna	-	-	A5329422	See cal with FSL6	See cal with FSL6

Note: In our quality system, the test equipment calibration due is more & less 2 months



4. FREQUENCY TOLERANCE

4.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU
Date of test : September 16, 2019 to September 17, 2019
Ambient temperature : 28 °C
Relative humidity : 36 %

4.2. TEST SETUP

- The Equipment Under Test is installed:

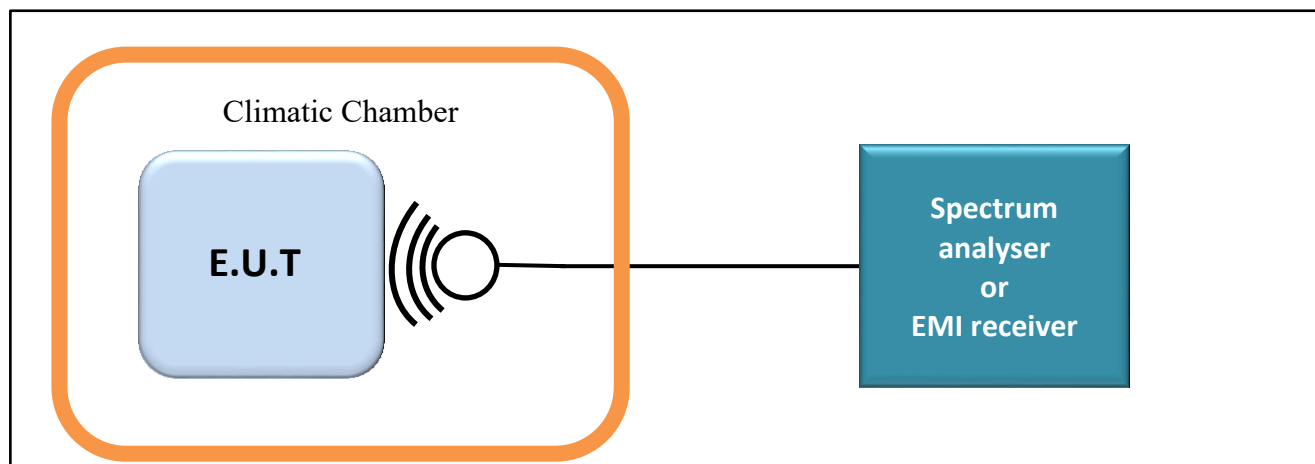
- ☐ On a table
- ☒ In a climatic chamber
- ☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- ☐ Conducted Method
- ☒ Radiated Method

- Test Procedure:

- ☒ ANSI C63.10 § 6.8



Test set up of Occupied Bandwidth



Photograph for Frequency Tolerance

4.3. LIMIT

$\pm 0.01\%$ ($\pm 100\text{ppm}$)

4.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Climatic chamber	SECASI Technologies	-	D1025025	See cal with Thermometer	See cal with Thermometer
Thermometer	EUROTHERM 92	Climats Sapratin	D1025025	2018/03	2020/03
Spectrum analyzer	ROHDE & SCHWARZ	FSL6	A4060032	2017/10	2019/10
Multi-meter	KEITHLEY	2000	A1241084	2018/12	2020/12
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7049006	See cal with Multi-meter	See cal with Multi-meter
13,56MHz Test fixture Antenna	-	-	A5329422	See cal with FSL6	See cal with FSL6

Note: In our quality system, the test equipment calibration due is more & less 2 months

4.5. RESULTS

Frequency	13,56									
EUT ACTIVATION	Start up									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602
Frequency Drift (%)	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015
EUT ACTIVATION	2min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602
Frequency Drift (%)	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015
EUT ACTIVATION	5min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602
Frequency Drift (%)	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015
EUT ACTIVATION	10min									
Voltage	Vnom									
Temperature	-30	-20	-10	0	10	20	30	40	50	55
Frequency (MHz)	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602	13,5602
Frequency Drift (%)	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015	0,0015

Temperature	Tnom		
Voltage	Vmin	Vnom	Vmax
Frequency (MHz)	13,5602	13,5602	13,5602
Frequency Drift (%)	0,0015	0,0015	0,0015

4.6. CONCLUSION

Frequency tolerance measurement performed on the sample of the product **BIOLOG ID PRD_7150400A**, SN: **BI1930000002**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.225 & RSS 210 ISSUE 9 limits.

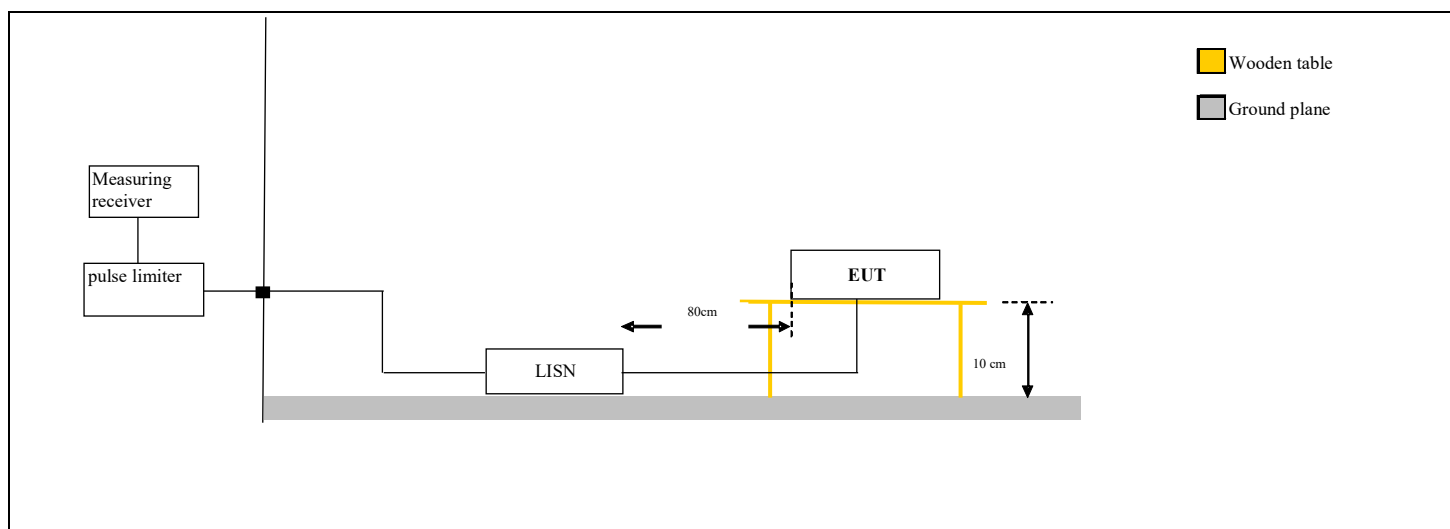
5. AC POWER LINE CONDUCTED EMISSIONS

5.1. TEST CONDITIONS

Test performed by : Willy Daclinat
 Date of test : September 13, 2019
 Ambient temperature : 22 °C
 Relative humidity : 38 %

5.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013) method. 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. Measurement is made with a 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 $50\Omega / 50\mu\text{H}$. Interconnecting cables and equipment's were moved to position that maximized emission.



Test set up of AC Power Line Conducted Emissions



Photograph for AC Power Line Conducted Emissions

5.3. LIMIT

Quasi-Peak

0,15kHz to 0,5MHz: 66dB μ V to 56dB μ V*

0,5MHz to 5MHz: 56dB μ V

5MHz to 30MHz: 60dB μ V

Average

0,15kHz to 0,5MHz: 56dB μ V to 46dB μ V*

0,5MHz to 5MHz: 46dB μ V

5MHz to 30MHz: 50dB μ V

*Decreases with the logarithm of the frequency

5.4. TEST EQUIPMENT LIST

Description	Constructor	Model	N°	Cal. Date	Cal. Due
Cable	-	-	A5329412	2018/10	2019/10
RSIL	ROHDE & SCHWARZ	ESH2-Z5	C2322001	2018/11	2019/11
EMI Receiver	ROHDE & SCHWARZ	ESU	A2642018	2019/01	2021/01
Cable	-	-	A5329531	2019/03	2020/03
SEMI ANECHOIC CHAMBER	SIEPEL	VSWR	D3044008	2016/06	2020/06
(*) : In our Quality System, the calibration due of our equipment is more or less 2 months.					

5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒ None ☐ Divergence:

5.6. RESULTS

AC Power Line Conducted Emission 120V/60Hz

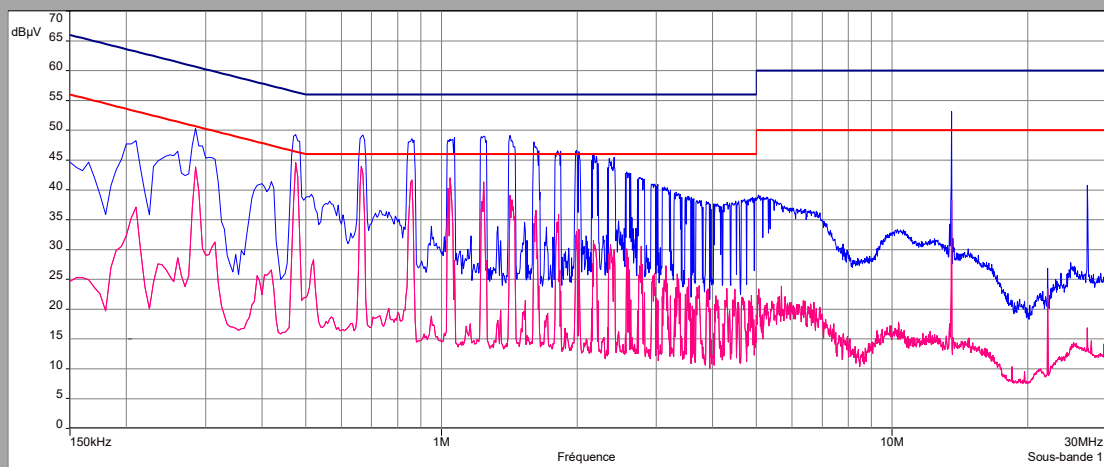
Phase

Description Sous-bande 1

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

Réglages: RBW: 9kHz, VBW: Auto, Durée balayage: 50 ms/Pts, Atténuation: 10 dB, Nombre de Balayages: 1, Preamp: Off, LN Preamp: Off, Preselecteur: On

Ligne: Phase 1



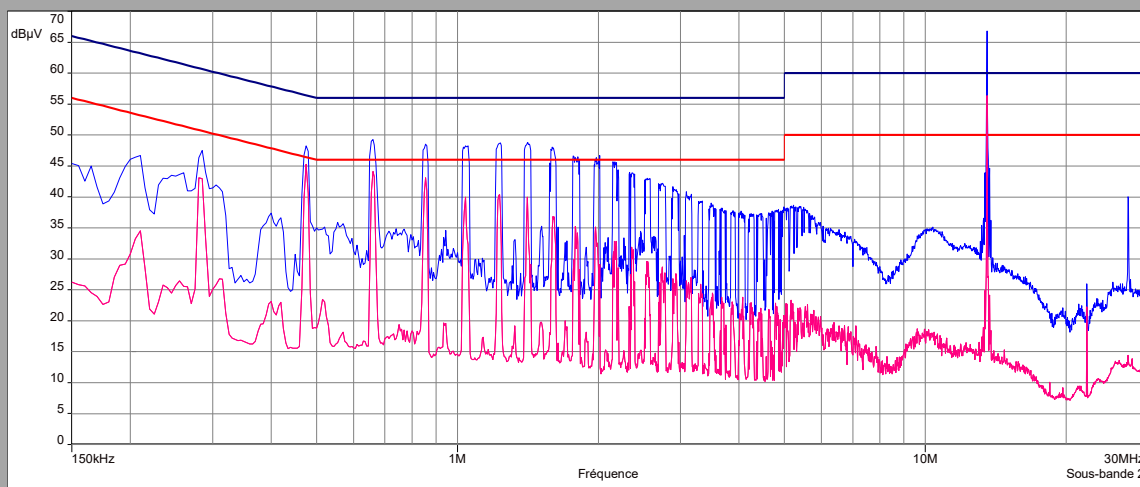
Line

Description Sous-bande 2

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

Réglages: RBW: 9kHz, VBW: Auto, Durée balayage: 50 ms/Pts, Atténuation: 10 dB, Nombre de Balayages: 1, Preamp: Off, LN Preamp: Off, Preselecteur: On

Ligne: Neutre



Phase Line							
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Peak Limit (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0.21	48.24	-	-	63.2	37.1	53.2	16.1
0.29	50.32	-	-	60.7	43.8	50.7	6.9
0.48	49.27	-	-	56.4	44.6	46.4	1.8
0.67	49.2	-	-	56	43.9	46	2.1
0.86	48.6	-	-	56	41.7	46	4.3
1.04	48.8	-	-	56	42	46	4
1.3	49	-	-	56	41.3	46	4.7
1.42	49.1	-	-	56	39.1	46	6.9
1.6	48.1	-	-	56	36.5	46	9.5
1.8	47.2	-	-	56	35.9	46	10.1
2.1	46.7	-	-	56	33.4	46	12.6
2.2	46.1	-	-	56	31.5	46	14.5
2.4	45.4	-	-	56	30.9	46	15.1
2.6	43.1	-	-	56	30.1	46	15.9
22.1	27.1	-	-	60	22.1	50	27.9
27.1	40.9	-	-	60	16.9	50	33.1

Neutral Line							
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Peak Limit (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0.21	46.8	-	-	63.2	34.5	53.2	18.7
0.29	47.6	-	-	60.7	42.9	50.7	7.8
0.48	48.5	-	-	56.4	45.3	46.4	1.1
0.67	49.6	-	-	56	44.1	46	1.9
0.86	48.9	-	-	56	43.1	46	2.9
1.04	48.3	-	-	56	39.9	46	6.1
1.3	48.8	-	-	56	40.4	46	5.6
1.42	48.8	-	-	56	39.9	46	6.1
1.6	48.2	-	-	56	36.9	46	9.1
1.8	46.6	-	-	56	35.2	46	10.8
2.1	46.7	-	-	56	35.2	46	10.8
2.2	46.1	-	-	56	31.5	46	14.5
2.4	45.4	-	-	56	30.9	46	15.1
2.6	43.1	-	-	56	30.1	46	15.9
22.1	25.8	-	-	60	22.3	50	27.7
27.1	40.4	-	-	60	14.4	50	35.6

AC Power Line Conducted Emission 240V/50Hz

Phase

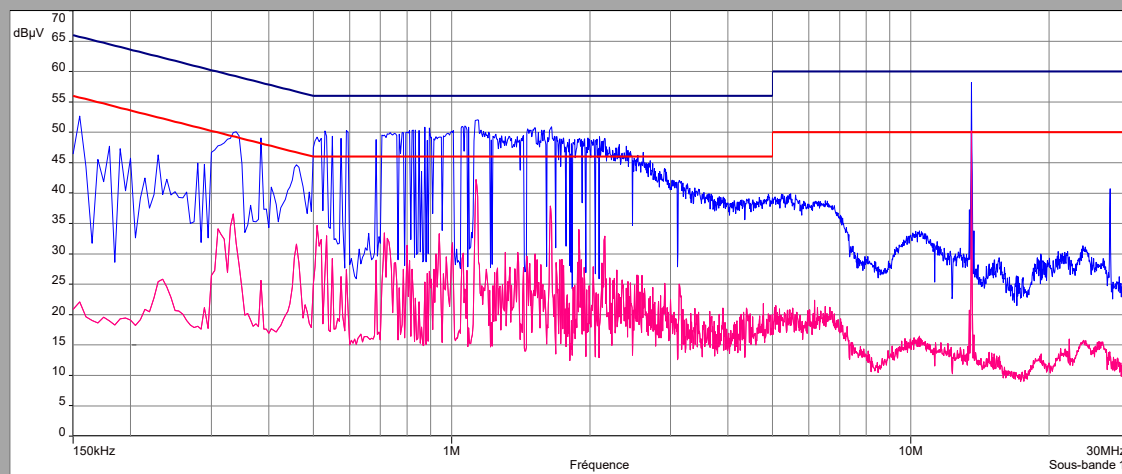
Description Sous-bande 1

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

Réglages: RBW: 9kHz, VBW: Auto, Durée balayage: 50 ms/Pts, Atténuation: 10 dB, 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. Avg (Phase 1)



Line

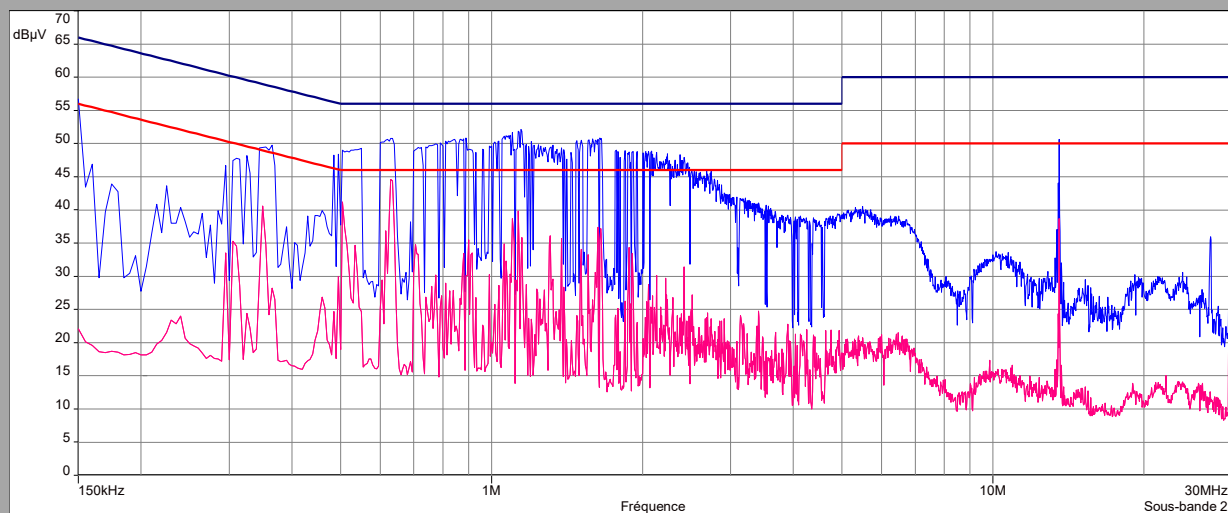
Description Sous-bande 2

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

Réglages: RBW: 9kHz, VBW: Auto, Durée balayage: 50 ms/Pts, Atténuation: 10 dB, 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. Avg (Neutre)



Phase Line							
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Peak Limit (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0.15	52.7	-	-	65.7	22.1	55.7	33.6
0.33	50.1	-	-	50.3	36.5	49.3	12.8
0.51	49.3	-	-	56	34.6	46	11.4
0.71	49.7	-	-	56	33.4	46	12.6
0.94	49.4	-	-	56	33.3	46	12.7
1.2	52.2	-	-	56	42.2	46	3.8
1.7	51.1	-	-	56	37.8	46	8.2
1.9	48.9	-	-	56	34	46	12
2.2	49.2	-	-	56	32.9	46	13.1
27.1	40.7	-	-	60	15.3	50	34.7

Neutral Line							
Quasi-Peak Limit (dBμV)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Peak Limit (dBμV)	Average Level (dBμV)	Average Limit (dBμV)	Margin Average (dBμV)
0.15	56.7	-	-	65.7	22.1	55.7	33.6
0.3	47.7	-	-	59.9	35.3	49.9	14.6
0.35	49.6	-	-	58.9	34.6	48.9	14.3
0.5	49.1	-	-	56	41.2	46	4.8
0.63	50.8	-	-	56	44.4	46	1.6
1.1	52.1	-	-	56	39.8	46	6.2
1.3	49.9	-	-	56	36.1	46	9.9
1.9	49.1	-	-	56	34.3	46	11.7
2.4	48.4	-	-	56	31.4	46	14.6
26.2	36.7	-	-	60	13.8	50	36.2

5.7. CONCLUSION

Ac Power Line Conducted Emission measurement performed on the sample of the product **BIOLOG ID PRD_7150400A**, SN: **BI1930000002**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.225 & RSS Gen ISSUE 5 limits.

6. FIELD STRENGTH OUTSIDE OF THE BANDS 13.110-14.010 MHz

6.1. TEST CONDITIONS

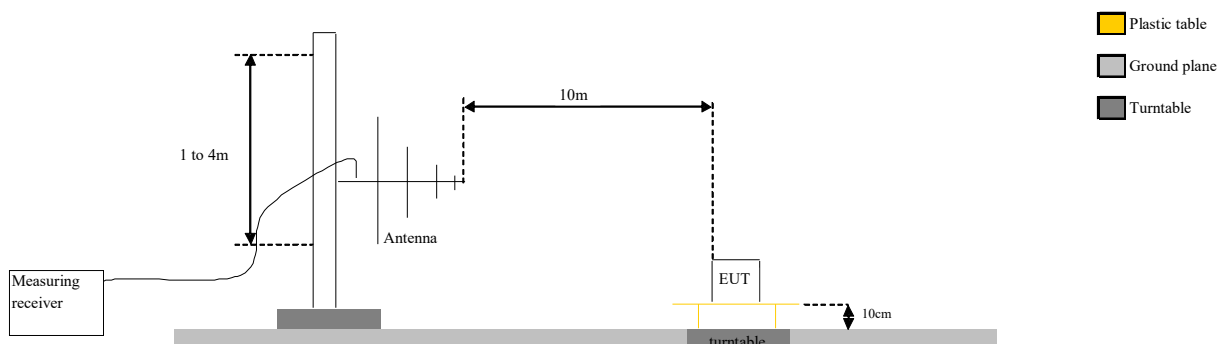
Test performed by : Laurent DENEUX
 Date of test : September 13, 2019 to September 17, 2019
 Ambient temperature : 22 °C
 Relative humidity : 48 %

6.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013).

Test is performed in parallel, perpendicular and ground parallel axis with a loop antenna below 30MHz. Measurement bandwidth was 200Hz below 150kHz and 9kHz between 150kHz & 30MHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height was 1m. The EUT is placed **on an open area test site**. Distance between measuring antenna and the EUT is **3m**.

Test is performed in horizontal (H) and vertical (V) polarization with **bilog** between 30MHz & 1GHz and with a horn antenna above 1GHz. Measurement bandwidth was 120kHz below 1GHz and 1MHz above 1GHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height search was performed from 1 to 4m. The EUT is place at 1.5m high above 1GHz and at 0.8m high under 1GHz. The EUT is placed **on an open area test site** above 1GHz and **on an open area test site** from 30MHz to 1GHz. Distance between measuring antenna and the EUT is **10m**.



Test Set up for radiated measurement in open area test site



Photograph for Field strength outside of the bands 13.110-14.010 MHz

6.3. LIMIT

Limit at 3m:

9kHz to 0,490MHz: $2400/F(\text{kHz})\mu\text{V/m}$ (300m) or $20\log(2400/F(\text{kHz}))\text{dB}\mu\text{V/m}$ (3m) QPeak
 0,490MHz to 1.705MHz: $240000/F(\text{kHz})\mu\text{V/m}$ (30m) or $20\log(240000/F(\text{kHz}))\text{dB}\mu\text{V/m}$ (3m) QPeak
 1.705MHz to 30MHz: $30\mu\text{V/m}$ (30m) or $\text{dB}\mu\text{V/m}$ (3m) QPeak
 30MHz to 88MHz: $40\text{dB}\mu\text{V/m}$ QPeak
 88MHz to 216MHz: $43,5\text{dB}\mu\text{V/m}$ QPeak
 216MHz to 960MHz: $46\text{dB}\mu\text{V/m}$ QPeak
 960MHz to 1000MHz: $54\text{dB}\mu\text{V/m}$ QPeak
 Above 1000MHz: $74\text{dB}\mu\text{V/m}$ Peak
 $54\text{dB}\mu\text{V/m}$ Average

Limit at 10m:

30MHz to 88MHz: $29,5\text{dB}\mu\text{V/m}$ QPeak
 88MHz to 216MHz: $33\text{dB}\mu\text{V/m}$ QPeak
 216MHz to 960MHz: $35,5\text{dB}\mu\text{V/m}$ QPeak
 960MHz to 1000MHz: $43,5\text{dB}\mu\text{V/m}$ QPeak
 Above 1000MHz: $63,5\text{dB}\mu\text{V/m}$ Peak
 $43,5\text{dB}\mu\text{V/m}$ Average

6.4. TEST EQUIPMENT LIST

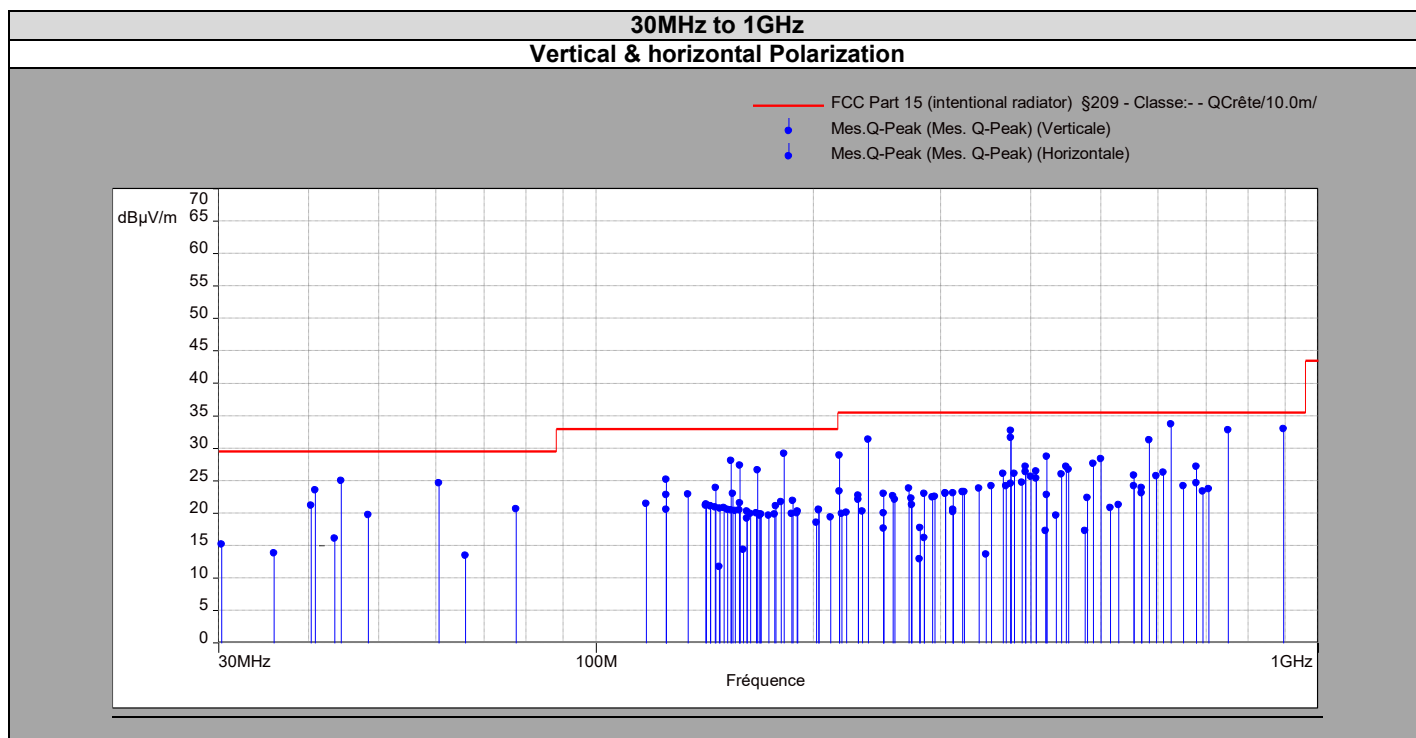
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Open test site	LCIE	-	F2000400	2018-06	2019-06
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2018-10	2020-10
Bilog antenna	CHASE	CBL 6112A	C2040040	2019-04	2020-04
loop antenna	RHODE & SCHWARZ	HFH2-Z2	C2040007	2018-11	2020-11
Cable	-	-	A5329442	2018-09	2019-09
Cable	-	-	A5329444	2018-09	2019-09
Cable	-	-	A5329876	2018-11	2019-11
Cable	-	-	A5326368	2018-12	2019-12
Cable	-	-	A5329416	2018-12	2019-12

Note: In our quality system, the test equipment calibration due is more & less 2 months

6.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒ None
 ☐ Divergence:

6.6. RESULTS





9kHz to 30MHz					
Polarization	Frequency (MHz)	Peak Level (dBμV/m)	QPeak Level (dBμV/m)	Limit (dBμV/m)	Margin QPeak (dBμV/m)
all emissions were greater than 20 dB below the limit					

30MHz to 1GHz					
Polarization	Frequency (MHz)	Peak Level (dBμV/m)	QPeak Level (dBμV/m)	Limit (dBμV/m)	Margin QPeak (dBμV/m)
Vertical	44.3	-	24.95	29.5	4.55
Vertical	125	-	25.14	33	7.86
Vertical	153.8	-	28.02	33	4.98
Vertical	182.1	-	29.17	33	3.83
Vertical	217	-	28.86	35.5	6.64
Vertical	375	-	31.59	35.5	3.91
Horizontal	583.1	-	31.24	35.5	4.26
Horizontal	625	-	33.69	35.5	1.81
Horizontal	750	-	32.81	35.5	2.69

Above 1GHz								
Polarization	Frequency (MHz)	Duty cycle correction (dB)	Average Level (dBμV/m)	Average Limit (dBμV/m)	Margin Average (dBμV/m)	Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Margin Peak (dBμV/m)
all emissions were greater than 20 dB below the limit								

6.7. CONCLUSION

Field strength outside of the bands 13.110-14.010 MHz measurement performed on the sample of the product **BIOLOG ID PRD_7150400A**, SN: **BI1930000002**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.225 & RSS-Gen ISSUE 5 limits.

7. FIELD STRENGTH WITHIN THE BAND 13.110-14.010MHz

7.1. TEST CONDITIONS

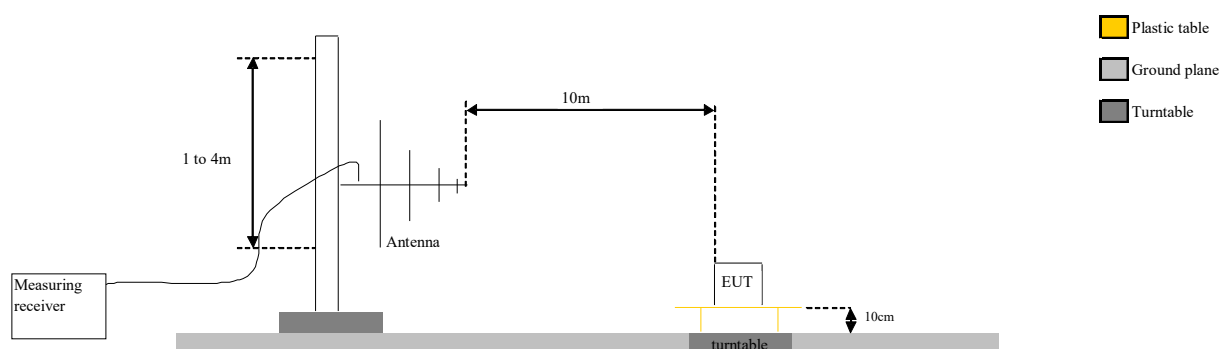
Test performed by : Laurent DENEUX
 Date of test : September 13, 2019
 Ambient temperature : 22 °C
 Relative humidity : 46 %

7.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013). The EUT is placed **on an open area test site**. Distance between measuring antenna and the EUT is **10m**.

Test is performed in parallel, perpendicular and ground parallel axis with a loop antenna below 30MHz. Measurement bandwidth was 200Hz below 150kHz and 9kHz between 150kHz & 30MHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height was 1m.

The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height search was performed from 1 to 4m. The EUT is placed at 0.8m.



Test Set up for radiated measurement in open area test site



Photograph for Field strength within the band 13.110-14.010MHz



7.3. LIMIT

Limit:

Below 13.110MHz:	30 μ V/m (30m) or 69.5dB μ V/m (3m) QPeak
13.110MHz to 13.410MHz:	106 μ V/m (30m) or 80.5dB μ V/m (3m)
13.410MHz to 13.553MHz:	334 μ V/m (30m) or 90.5dB μ V/m (3m)
13.553MHz to 13.567MHz:	15848 μ V/m (30m) or 124dB μ V/m (3m)
13.567MHz to 13.710MHz:	334 μ V/m (30m) or 90.5dB μ V/m (3m)
13.710MHz to 14.010MHz:	106 μ V/m (30m) or 80.5dB μ V/m (3m)
Above 14.010MHz:	30 μ V/m (30m) or 69.5dB μ V/m (3m) QPeak

7.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Open test site	LCIE	-	F2000400	2019-06	2020-06
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2018-10	2020-10
loop antenna	RHODE & SCHWARZ	HFH2-Z2	C2040007	2018-11	2020-11
Cable	-	-	A5329442	2018-09	2019-09
Cable	-	-	A5329416	2018-12	2019-12

Note: In our quality system, the test equipment calibration due is more & less 2 months

7.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒ None ☐ Divergence:

7.6. RESULTS

Parallel Axis			
Frequency (MHz)	Peak Level (dB μ V/m) (3m)	QPeak Level (dB μ V/m) (3m)	Limit (dB μ V/m) (3m)
Below 13.110	-	30	69.5
13.110 to 13.410	-	31	80.5
13.410 to 13.553	-	35	90.5
13.553 to 13.567	-	63	124
13.567 to 13.710	-	33	90.5
13.710 to 14.010	-	32	80.5
Above 14.010	-	29	69.5

Ground Parallel Axis			
Frequency (MHz)	Peak Level (dB μ V/m) (3m)	QPeak Level (dB μ V/m) (3m)	Limit (dB μ V/m) (3m)
Below 13.110	-	28	69.5
13.110 to 13.410	-	29	80.5
13.410 to 13.553	-	31	90.5
13.553 to 13.567	-	49.6	124
13.567 to 13.710	-	31	90.5
13.710 to 14.010	-	29	80.5
Above 14.010	-	27	69.5

Perpendicular Axis			
Frequency (MHz)	Peak Level (dB μ V/m) (3m)	QPeak Level (dB μ V/m) (3m)	Limit (dB μ V/m) (3m)
Below 13.110	-	32	69.5
13.110 to 13.410	-	33	80.5
13.410 to 13.553	-	34	90.5
13.553 to 13.567	-	60.5	124
13.567 to 13.710	-	36	90.5
13.710 to 14.010	-	30	80.5
Above 14.010	-	29	69.5

7.7. CONCLUSION

Field strength within the band 13.110-14.010MHz measurement performed on the sample of the product **BIOLOG ID PRD_7150400A**, SN: **BI1930000002**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.225 & RSS 210 ISSUE 9 limits.

8. UNCERTAINTIES CHART

47 CFR Part 15.209 & 15.207 Kind of test	Wide uncertainty laboratory (k=2) $\pm x(\text{dB}) / (\text{Hz}) / \text{ms}$	Uncertainty limit
Measurement of conducted disturbances in voltage on the AC power port (9 kHz – 150 kHz)	2,67	3.8
Measurement of conducted disturbances in voltage on the AC power port (150 kHz – 30 MHz)	2,67	3.4
Measurement of conducted disturbances in voltage on the telecommunication port. (AAN)	3,67	5.0
Measurement of conducted disturbances in current (current clamp)	2,73	2.9
Measurement of disturbance power	2,67	4.5
Measurement of radiated magnetic field from 10kHz to 30MHz in SAC V01	4,48	/
Measurement of radiated magnetic field from 10kHz to 30MHz in SAC C01	4,48	/
Measurement of radiated electric field from 30 to 1000MHz in horizontal position on the OATS (Ecuelles)	4,88	6.3
Measurement of radiated electric field from 1 to 18GHz on the Ecuelles site	5.16	/
Measurement of radiated electric field from 30 to 1000MHz in vertical position on the OATS (Ecuelles)	4,99	6.3
Measurement of radiated electric field from 30 to 1000MHz in horizontal position in SAC C01	5,08	6.3
Measurement of radiated electric field from 30 to 1000MHz in vertical position in SAC C01	5,16	6.3
Measurement of radiated electric field from 30 to 1000MHz in horizontal position in SAC V01	5,08	6.3
Measurement of radiated electric field from 30 to 1000MHz in vertical position in SAC V01	5,15	6.3
Measurement of radiated electric field from 1 to 6 GHz C01	5,1	5.2
Measurement of radiated electric field from 1 to 6 GHz V01	4,85	5.2
Measurement of radiated magnetic field from 10kHz to 30MHz on the OATS (Ecuelles)	4,48	/

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. This table includes all uncertainties maximum feasible for testing in the laboratory, whether or not made in this report