

RRA- EMISS24H886GRO-02Av0

Certification Radio test report

According to the standard:

CFR 47 FCC PART 15

RSS GEN – Issue 5

RSS 210 - Issue 11

Equipment under test:

MACONNECT

FCC ID: 2BS58-MACOMCNET01

IC NUMBER: 34932-MACOMCNET01

Company:

GROUPE MACO PHARMA INTERNATIONAL

Distribution: Mr Nicolas COASNE

(Company: GROUPE MACO PHARMA INTERNATIONAL)

Number of pages: 28 with 3 annexes

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			Name and Function	Visa
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Information in italics are declared by the manufacturer/customer and are under his responsibility

DESIGNATION OF PRODUCT: ***MACONNECT***

Serial number (S/N): *SCD00202*

Reference / model (P/N): *Maconnect 9MCN49000*

Software version: *V005*

MANUFACTURER: *GROUPE MACO PHARMA INTERNATIONAL*

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Responsible: Mr Nicolas COASNE

DATE(S) OF TEST: From 5-Jun-25 to 9-Jun-25

TESTING LOCATION: EMITECH CHASSIEU laboratory at CHASSIEU (69) FRANCE
FCC Accredited under US-EU MRA Designation Number: FR0013
Test Firm Registration Number: 807590
ISED Accredited under CANADA-EU MRA Designation Number: FR0007
Industry Canada Registration Number: 4379D

TESTED BY: T. LEDRESSEUR

VISA:



WRITTEN BY: T. LEDRESSEUR

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REVISIONS HISTORY

Revision	Date	Modified pages	Modifications
0	17-Jul-25	/	Creation

1. INTRODUCTION

This report presents the results of radio test carried out on the following radio equipment: MACONNECT , in accordance with normative reference.

The equipment under test integrates:

- 13.56MHz NFC Reader function not already certified,

2. PRODUCT DESCRIPTION

Class: A (but tested to respect class B limit)

Utilization: Specialized medical device

Antenna type and gain: 0 dBi / integral antenna PCB antenna

Operating frequency range: From 13.110 MHz to 14.010 MHz

Number of channels: 1

Channel spacing: Not concerned

Modulation: ASK

Power source: 120 Vac - 60 Hz

Power level, frequency range and channels characteristics are not user adjustable.
The details pictures of the product and the circuit boards are joined with this file.

3. NORMATIVE REFERENCE

The standards and testing methods related throughout this report are those listed below. They are applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

CFR 47 FCC Part 15 (2025)	Radio Frequency Devices
ANSI C63.10	2020 + Corrigendum (2023) + Amendment 1 (2024) Procedures for Compliance Testing of Unlicensed Wireless Devices.
RSP-100	Issue 12, August 2019 Certification of Radio Apparatus and Broadcasting equipment
RSS-Gen	Issue 5, April 2018 General Requirements for Compliance of Radio Apparatus
RSS-210	Issue 11, June 2024 Licence-Exempt Radio Apparatus: Category I equipment.

4. TEST METHODOLOGY

Radio performance tests procedures given in CFR 47 part 15:

Subpart C – Intentional Radiators

- Paragraph 203: Antenna requirement
- Paragraph 205: Restricted bands of operation
- Paragraph 207: Conducted limits
- Paragraph 209: Radiated emission limits; general requirements
- Paragraph 212: Modular transmitter
- Paragraph 215: Additional provisions to the general radiated emission limitations
- Paragraph 225: Operation within the band 13.110-14.010 MHz

Radio performance tests procedures given in RSS-Gen:

- Paragraph 2 - General
- Paragraph 3 - Normative publications and related documents
- Paragraph 4 - Labelling requirements
- Paragraph 6 - General administrative and technical requirements
- Paragraph 8 - Licence-exempt Radio Apparatus

Radio performance tests procedures given in RSS-210:

- Paragraph 5 – RSS-Gen compliance
- Paragraph 7 - Technical specifications
- Annex B - Devices Operating in Frequency Bands for Any Application
 - Annex B.6 Band 13.110-14.010 MHz

5. TEST EQUIPMENT CALIBRATION DATES

Emitech Number	Model	Type	Last calibration	Calibration interval (years)	Next calibration due
0	BAT-EMC V3.18.0.26	Software	/	/	/
1103	Electro Metrics BIA-30HF	Biconical antenna	02/08/2022	3	02/08/2025
5602	Rohde et Schwarz ESH3-Z5	LISN	07/08/2023	2	07/08/2025
5609	EMCO 3146A	Log periodic antenna	14/12/2024	3	14/12/2027
6136	N-2m	Cable	12/06/2025	2	12/06/2026
6155	EMCO 6502	Loop antenna	25/11/2024	2	25/11/2025
6527	N-2m	Cable	01/08/2023	2	01/08/2025
7537	N-10m	Cable	03/02/2025	2	03/02/2027
7564	La Crosse Technology WS-9232	Meteo station	09/06/2024	2	09/06/2026
7651	SIDT Cage	Anechoic chamber	/	/	/
7655	N-10.5m	Cable	03/02/2025	2	03/02/2027
8508	California instruments 1251RP	Power source	(1)	(1)	(1)
14648	R&S ESI	Test receiver	06/02/2025	1	06/02/2026
14831	Fluke 177	Multimeter	22/12/2023	2	22/12/2025
15202	N-3m	Cable	26/07/2024	2	26/07/2026
15776	Rohde & Schwarz FSV40	Spectrum Analyzer	22/02/2025	1	22/02/2026
16408	N-3m	Cable	01/08/2023	2	01/08/2025
16531	R&S ESIB7	Test receiver	02/08/2023	2	02/08/2025
17087	Votsch VS4200	Climatic chamber	/	/	/
17207	COM-POWER LIT-930A	Transient limiter	02/09/2024	3	02/09/2027
18361	Absorber sheath current	Emitech	26/01/2024	2	26/01/2026
/	EMITECH	Open test site	/	/	/

(1) The equipment is not verified; instead, the output voltage is checked before each measurement with the calibrated multimeter.

6. TESTS RESULTS SUMMARY

6.1 CFR 47 part 15 requirements

Test procedure	Description of test	Respected criteria?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.203	ANTENNA REQUIREMENT	X				Note 1
FCC Part 15.205	RESTRICTED BANDS OF OPERATION	X				
FCC Part 15.207	CONDUCTED LIMITS	X				
FCC Part 15.209	RADIATED EMISSION LIMITS; general requirements	X				Note 2
FCC Part 15.212	MODULAR TRANSMITTERS			X		
FCC part 15.215	ADDITIONAL PROVISIONS TO THE GENERAL RADIATED EMISSION LIMITATIONS					
	(a) Alternative to general radiated emission limits	X				Note 3
	(b) Unwanted emissions outside of §15.225 frequency bands	X				
	(c) 20 dB bandwidth and band-edge compliance	X				
FCC Part 15.225	OPERATION WITHIN THE BAND 13.110-14.010 MHZ					
	(a) Field strength within the band 13.553-13.567 MHz	X				
	(b) Field strength within the bands 13.410-13.553 MHz and 13.567-13.710 MHz	X				
	(c) Field strength within the bands 13.110-13.410 MHz and 13.710-14.010 MHz	X				
	(d) Field strength outside the band 13.110-14.010 MHz	X				
	(e) Carrier frequency tolerance	X				
	(f) Powered tags			X		

NAP: Not Applicable NAs: Not Asked

Note 1: Integral antenna without standard connector.

Note 2: See FCC part 15.225 (d).

Note 3: See FCC part 15.209. Unwanted emissions levels are all below the fundamental emission field strength level.

6.2 RSS-Gen requirements

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
Paragraph 2	General	X				
Paragraph 3	Normative publications and related documents	X				
Paragraph 4	Labelling requirements	X				
Paragraph 6	General administrative and technical requirements	X				
§ 6.7	Occupied bandwidth (or 99% emission bandwidth) and x dB bandwidth	X				
Paragraph 8	Licence-exempt radio apparatus					
§ 8.1	Measurement Bandwidths and Detector Functions	X				
§ 8.2	Pulsed operation	X				
§ 8.3	Prohibition of amplifiers	X				
§ 8.4	User manual notice	X				see certification documents
§ 8.5	Measurement of licence-exempt devices on-site (in-situ)			X		
§ 8.6	Operating frequency range of devices in master/slave networks			X		
§ 8.7	Radio frequency identification (RFID) devices	X				
§ 8.8	AC power line conducted emissions limits	X				
§ 8.9	Transmitter emission limits	X				
§ 8.10	Restricted frequency bands	X				
§ 8.11	Frequency stability	X				

NAp: Not Applicable

NAs: Not Asked

6.3 RSS-210 requirements

Test Procedure RSS-210	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
Paragraph 5	RSS-Gen compliance	X				
Paragraph 7	Technical Specifications					
7.1	Emission Falling Within Restricted Frequency Bands	X				
7.2	General Field Strength Limits	X				
7.3	Transmitters with wanted and unwanted emissions that are within the general field strength limits	X				
7.4	Cordless Telephones			X		
Annex B	Device Operating in Frequency Bands for Any Application					
Annex B.6	Band 13.110-14.010 MHz					
(a) i	Field strength within the band 13.553-13.567 MHz	X				
(a) ii	Field strength within the bands 13.410-13.553 MHz and 13.67-13.710 MHz	X				
(a) iii	Field strength within the bands 13.110-13.410 MHz and 13.710-14.010 MHz	X				
(a) iv	Field strength outside the band 13.110-14.010 MHz	X				
(b)	Carrier frequency stability	X				

NAp: Not Applicable

NAs: Not Asked

7. MEASUREMENT UNCERTAINTY

To declare, or not, the compliance with the specifications, it was not explicitly taken into account of uncertainty associated with the result(s)

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for normal distribution corresponds to a coverage probability of approximately 95%.

Parameter	Emitech Uncertainty
RF power, conducted	$\pm 0.8\text{dB}$
Radiated emission valid to 26 GHz	
9kHz – 30MHz	$\pm 4.3 \text{ dB}$
30MHz – 1GHz	$\pm 5.9 \text{ dB}$
1GHz – 18GHz	$\pm 4.8 \text{ dB}$
18GHz – 40GHz	$\pm 5.9 \text{ dB}$
AC Power Lines conducted emissions	$\pm 3.7 \text{ dB}$
Temperature	$\pm 0.95 \text{ }^{\circ}\text{C}$
Humidity	$\pm 4.6 \text{ \%}$

8. AC CONDUCTED EMISSIONS

Temperature (°C) : 28 to 29

Humidity (%HR): 39 to 42

Date : June 5, 2025 to
June 9, 2025

Technician : T. LEDRESSEUR

Standard: FCC Part 15
RSS-Gen

Test procedure:

For FCC Part 15: § 15.207

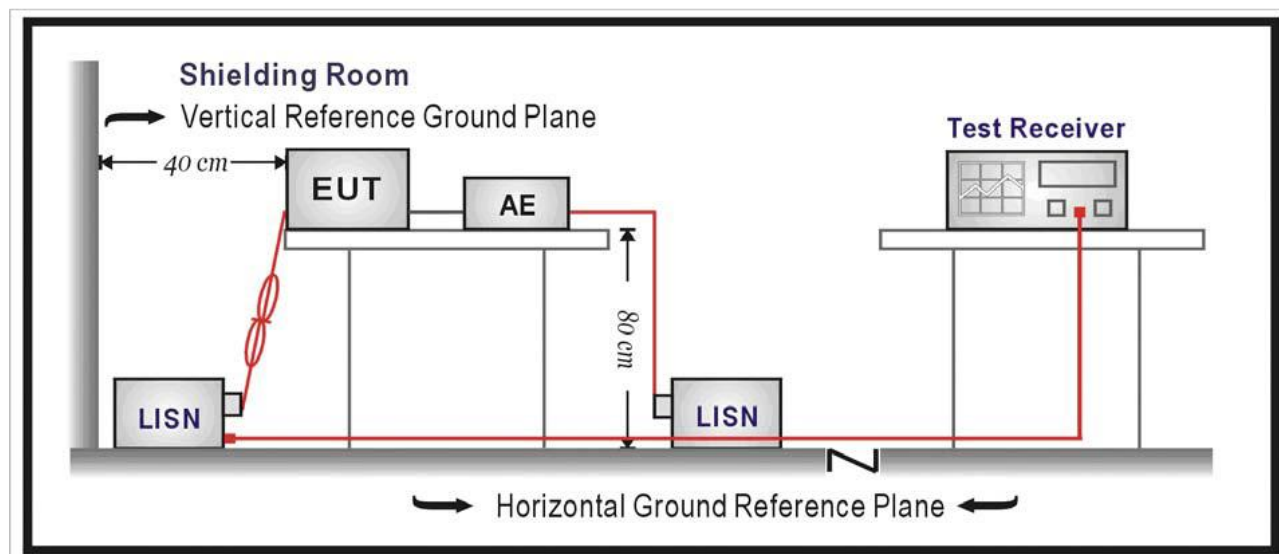
For RSS-Gen: § 8.8

Method of § 6.2 of ANSI C63.10

Software used: BAT-EMC V3.18.0.26

Test set up:

The EUT is isolated and placed on a wooden table, 0.8 m over an horizontal reference plane and 0.4 m from a vertical reference plane. It is powered by an artificial main network placed on the ground reference plane. The equipment is powered with the AC power operating voltage of 120 V / 60 Hz.



Frequency range: 150 kHz - 30 MHz

Detection mode: Peak / Quasi-peak / Average

Bandwidth: 10 kHz / 9 kHz

Equipment under test operating condition:

The equipment under test is blocked in alternance of emission and reception mode with tag.

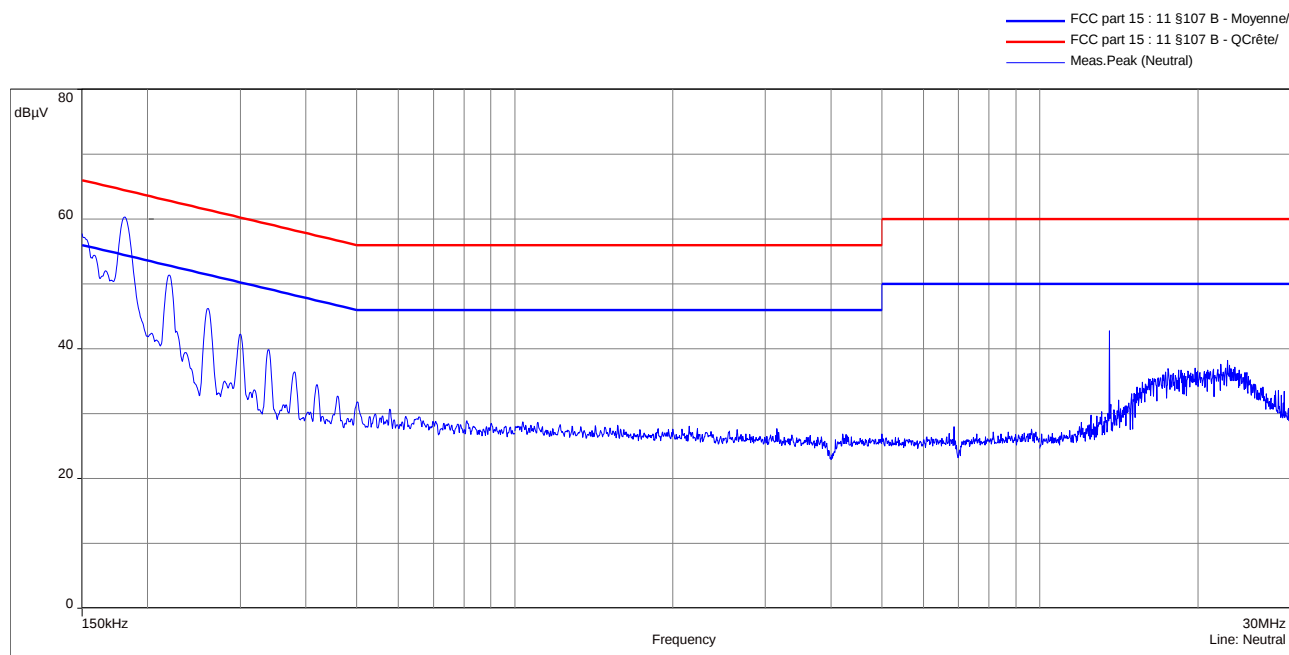
Results:

Sample N° 1:

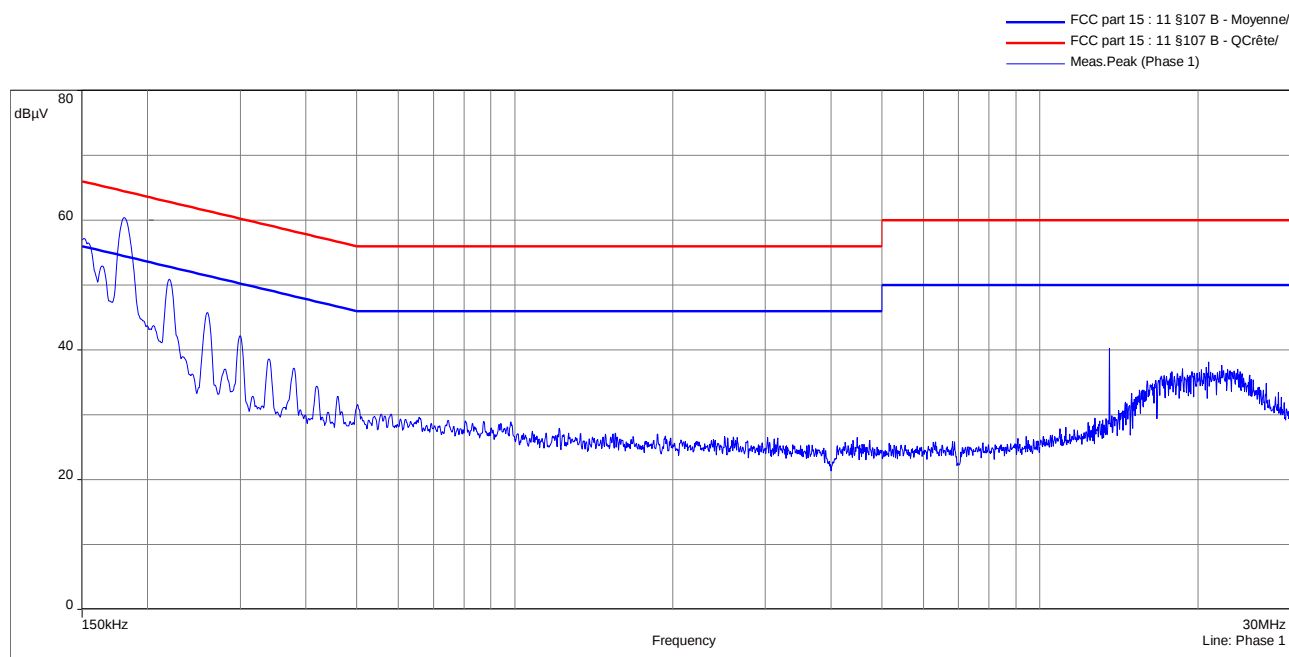
Measurement on the mains power supply:

The measurement is first realized with peak detector.

Curve N° 1: measurement on the Neutral with peak detector



Curve N° 2: measurement on the Line with peak detector



The highest frequencies are then analyzed with Quasi-peak detector and Average detector

Table N° 1: measurement on the Neutral, for the frequency range:

Frequency	Quasi-peak	QP Limit	QP margin	Frequency	Average	Average Limit	Average margin
(MHz)	(dBμV)	(dBμV)	(dB)	(MHz)	(dBμV)	(dBμV)	(dB)
0.150	54.24	66.0	11.76	0.150	51.23	56.0	4.77
0.181	56.8	64.4	7.65	0.181	53.65	54.4	0.80
0.220	47.86	62.8	14.96	0.220	44.56	52.8	8.26
0.261	42.71	61.4	18.70	0.261	38.98	51.4	12.43
13.560	39.25	60.0	20.75	13.560	38.85	50.0	11.15

Table N° 2: measurement on the Line, for the frequency range:

Frequency	Quasi-peak	QP Limit	QP margin	Frequency	Average	Average Limit	Average margin
(MHz)	(dBμV)	(dBμV)	(dB)	(MHz)	(dBμV)	(dBμV)	(dB)
0.151	51.36	65.9	14.57	0.151	44.82	55.9	11.11
0.180	56.67	64.5	7.80	0.180	53.32	54.5	1.15
0.220	47.37	62.8	15.45	0.220	44.36	52.8	8.46
0.260	42.23	61.4	19.21	0.260	38.89	51.4	12.55
13.560	39.76	60.0	20.24	13.560	39.36	50.0	10.64

Test conclusion:

RESPECTED STANDARD

9. OCCUPIED BANDWIDTH

Temperature (°C) : 28 to 29

Humidity (%HR): 39 to 42

Date : June 5, 2025 to
June 9, 2025

Technician : T. LEDRESSEUR

Standard: FCC Part 15
RSS-210

Test procedure:

Method of § 6.9.3 of ANSI C63.10 (99% Measurement)

Method of § 6.9.2 of ANSI C63.10 (20dB Measurement)

Test set up:

Radiated test

Test realized in near field.

Setting:

Measure	99%	20dB
Center frequency	The centre frequency of the channel under test	
Detector	Peak	
Span	1.5 to 5 times the OBW	2 to 5 times the OBW
RBW	1% to 5% of the OBW	1% to 5% of the OBW
VBW	3 x RBW	3 x RBW
Trace	Max hold	
Sweep	Auto	

Test operating condition of the equipment:

The equipment under test is blocked in alternance of emission and reception mode with tag.

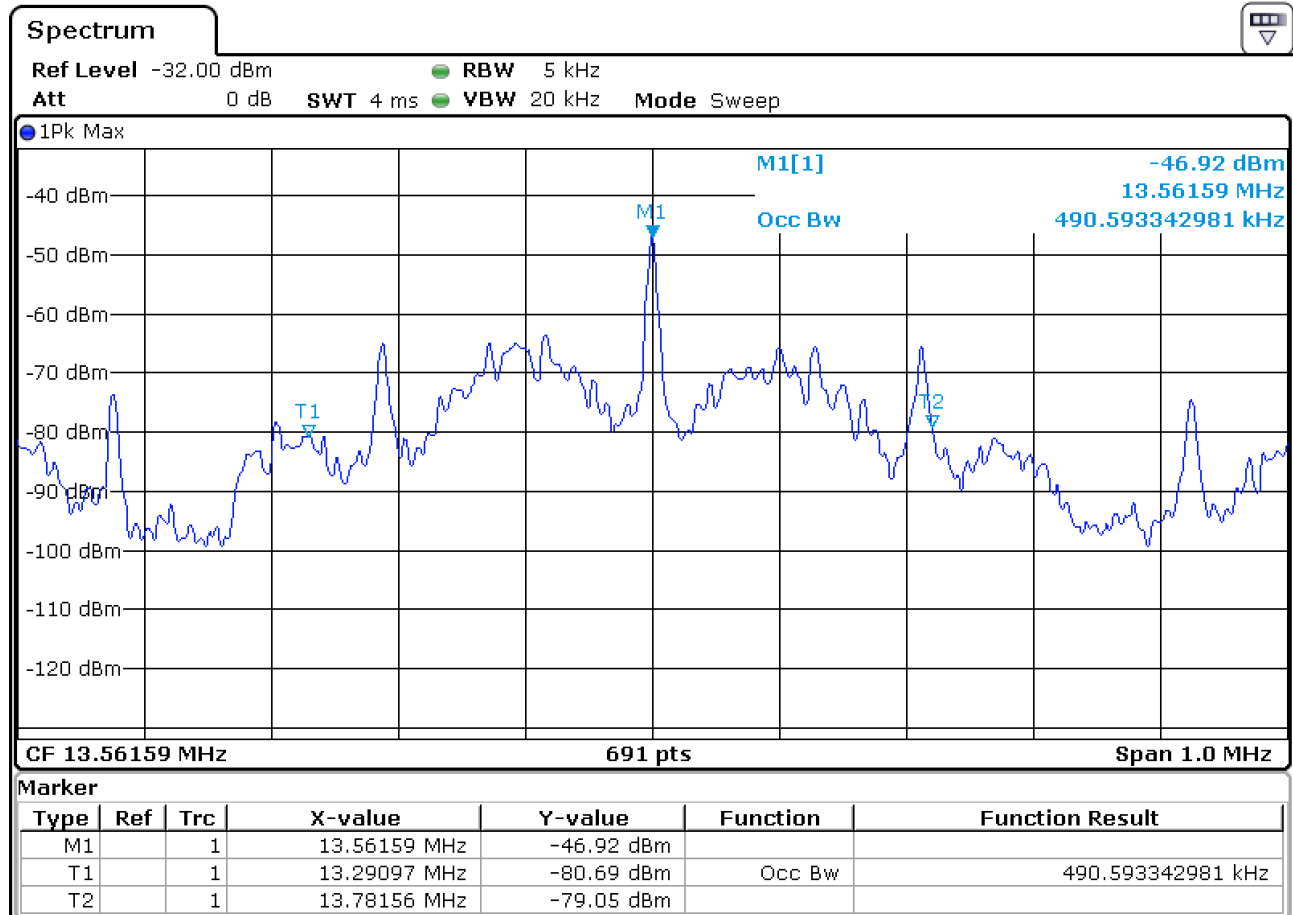
Power source: 120 Vac by an external power supply

Percentage of voltage variation during the test (%): ± 1

Results:

Sample N° 1

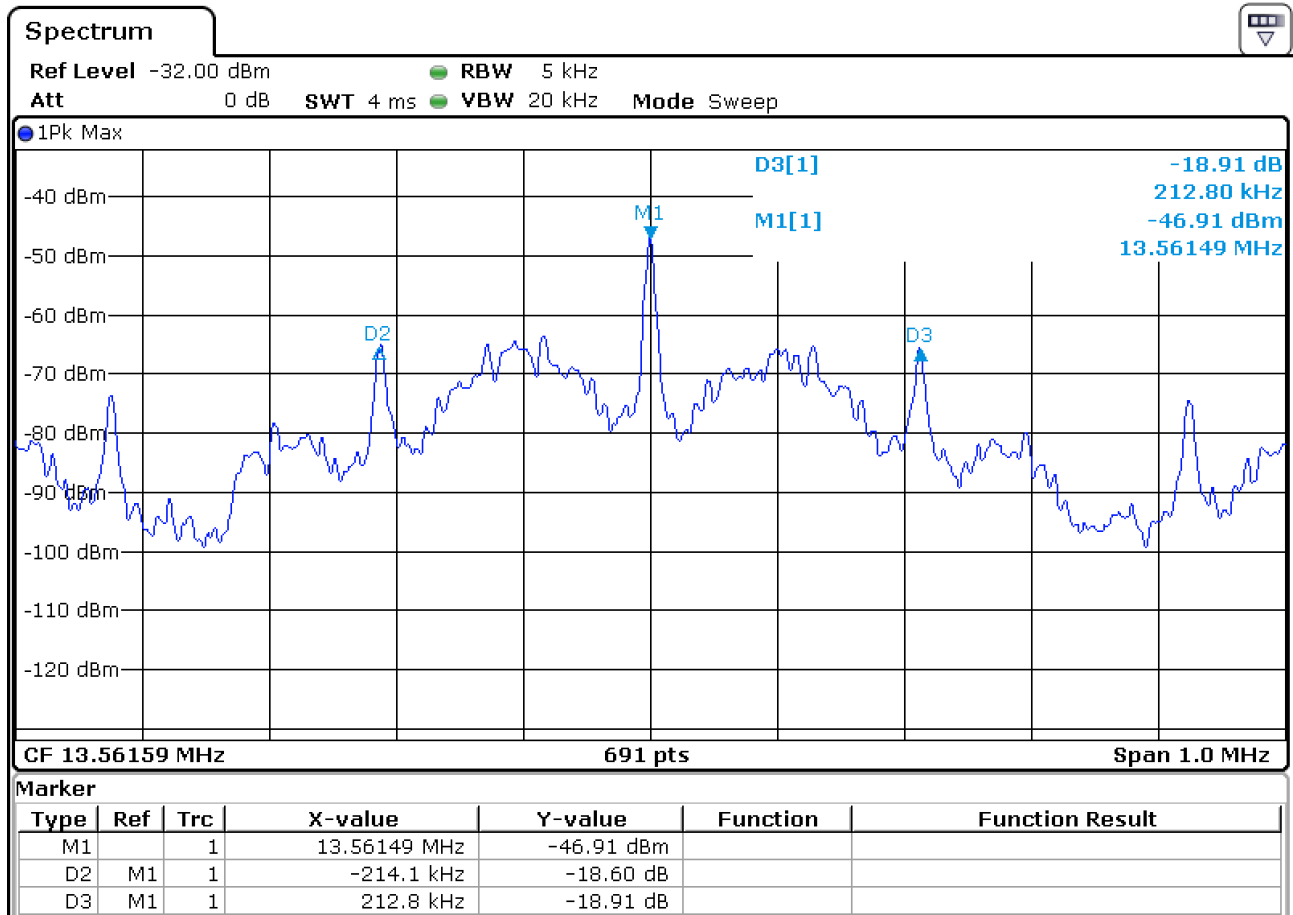
99% bandwidth



Limit:

Measure realized for reporting only

20dB bandwidth



Limit:

Contains in the frequency band

Test conclusion:

RESPECTED STANDARD

10. BAND EDGE**Temperature (°C) :** 28 to 29**Humidity (%HR):** 39 to 42**Date :** June 5, 2025 to
June 9, 2025**Technician :** T. LEDRESSEUR**Standard:** FCC Part 15**Test procedure:**

For FCC Part 15: § 15.215

Method of § 6.10.6 of ANSI C63.10

Test set up:

Test realized in near field. All field strength measurements are correlated with the radiated maximum peak output power

Test operating condition of the equipment:

The equipment under test is blocked in alternance of emission and reception mode with tag.

Power source: 120 Vac by an external power supply

Percentage of voltage variation during the test (%): ± 1

Results:

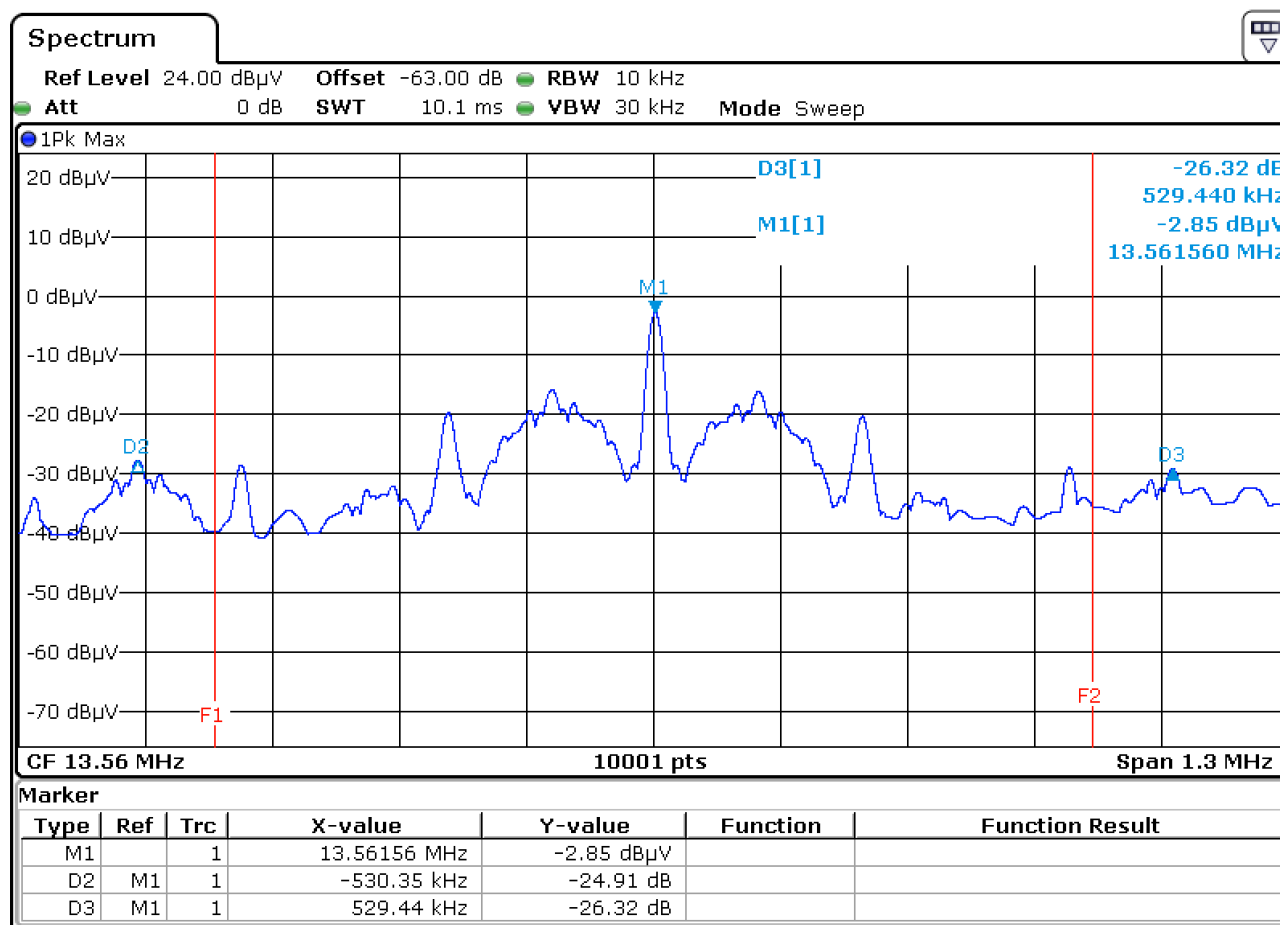
Lower Band Edge: From 13.090 MHz to 13.110 MHz

Upper Band Edge: From 14.010 MHz to 14.030 MHz

Sample N° 1:

Fundamental frequency (MHz)	Field Strength Level of fundamental (dBμV/m)	Detector (Peak or Average)	Frequency of maximum Band-edges Emission (MHz)	Delta Marker (dB) (1)	Calculated Max Out-of-Band Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
13.56159	-2.85	Peak	13.03121	-24.91	-27.76	29.54	57.3
13.56159	-2.85	Peak	14.09100	-26.32	-29.17	29.54	58.71

(1) Marker-Delta method



Test conclusion:

RESPECTED STANDARD

11. OPERATION WITHIN THE BAND 13.110 – 14.010 MHZ**Temperature (°C) :** 28 to 29**Humidity (%HR):** 39 to 42**Date :** June 5, 2025 to
June 9, 2025**Technician :** T. LEDRESSEUR**Standard:** FCC Part 15
RSS-210**Test procedure:**

For FCC Part 15: § 15.209, § 15.225 (a), (b), (c), (e)

For RSS-210: § Annex B.6 (a), (b), (c)

Method of § 6.3 of ANSI C63.10

Method of § 6.4 of ANSI C63.10

Method of § 6.8 of ANSI C63.10

Test set up:

First an exploratory radiated measurement was performed. During this phase the product is oriented in these two normal positions

Then the final measurement is realized with the product on the most critical orientation.

The system is tested in an open area test site (OATS). The EUT is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

The frequency stability measure is realized in near-field with the product in a climatic chamber.

Detection mode: Quasi-peak ($F < 1$ GHz)**Bandwidth:** 9 kHz ($150 \text{ kHz} < F < 30\text{MHz}$)**Distance of antenna:** 3 meters**Antenna height:** 1 meter**Antenna polarization:** oriented in the vertical plane. The lowest point of the loop is 1m above ground level.**Equipment under test operating condition:**

The equipment under test is blocked in alternance of emission and reception mode with tag.

Power source: 120 Vac by an external power supply

Percentage of voltage variation during the test (%):

 ± 1

Results:

Sample N° 1:

Carrier field strength

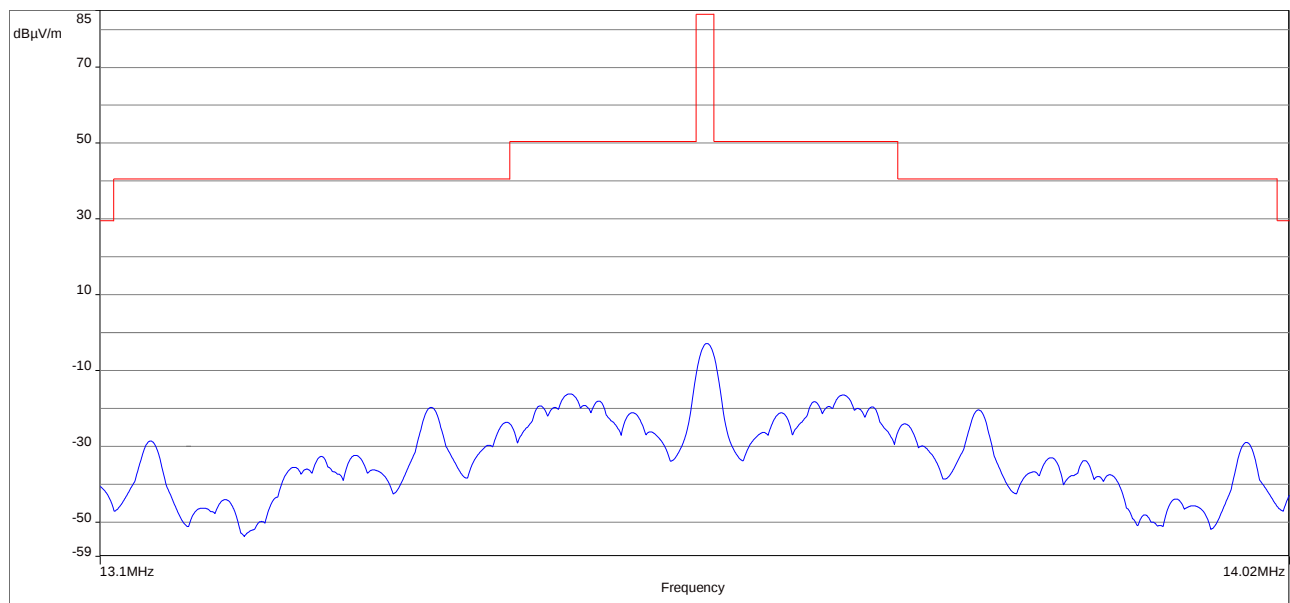
	Field strength (dB μ V/m) at frequency: 13.56 MHz
Normal test conditions measure at 3 m	37.15
Normal test conditions correlated at 30 m	-2.85 (1)
Limits at 30m (dB μ V/m) (1)	84
Margin (dB)	86.85

Polarization of test antenna: parallel at the equipment at 0 degree.

Position of equipment: (azimuth: 270°)

(1) Field strength extrapolated at 30 meters using 40dB/decade fall off

Field strength within the band 13.110-14.010 MHz



Frequency stability

Results for temperature variation

Realized with a power source at 120 Vac – 60 Hz through a variac

Temperature (°C)	Mesure at startup		Measure at 2 min		Measure at 5 min		Measure at 10 min		Drift limit (kHz)
	Frequency measured (MHz)	Frequency drift (kHz)	Frequency measured (MHz)	Frequency drift (kHz)	Frequency measured (MHz)	Frequency drift (kHz)	Frequency measured (MHz)	Frequency drift (kHz)	
40	13.561564	-0.026	13.561560	-0.030	13.561558	-0.032	13.561554	-0.036	± 1.356159 (b)
30	13.561587	-0.003	13.561584	-0.006	13.561581	-0.009	13.561579	-0.011	
20	13.561609	0.019	13.561606	0.016	13.561605	0.015	13.561603	0.013	
10	13.561613	0.023	13.561612	0.022	13.561612	0.022	13.561612	0.022	
0	13.561591	0.000	13.561592	0.002	13.561597	0.007	13.561603	0.013	

(a) ±0.01% of the operating frequency – 13.56159 MHz

Results for power supply variation

Realized at +20 °C

Power supply (Vac)	Frequency measured (MHz)	Frequency drift (kHz)	Drift limit (kHz)
102	13.5616036	0.0136	± 1.356159 (b)
120	13.5616091	0.0191	
138	13.5616034	0.0134	

(b) ±0.01% of the operating frequency

Test conclusion:

RESPECTED STANDARD

12. FIELD STRENGTH OUTSIDE THE BAND 13.110-14.01 MHZ**Temperature (°C) :** 28 to 29**Humidity (%HR):** 39 to 42**Date :** June 5, 2025 to
June 9, 2025**Technician :** T. LEDRESSEUR**Standard:** FCC Part 15**Standard:** FCC Part 15
RSS-210**Test procedure:**

For FCC Part 15: § 15.209, § 15.225 (d)

For RSS-210: § Annex B.6 (d)

Method of § 6.3 of ANSI C63.10

Method of § 6.4 of ANSI C63.10

Method of § 6.5 of ANSI C63.10

Test set up:

First an exploratory radiated measurement was performed. During this phase, the product is oriented in this normal position, but the arm of the product was oriented in two different positions.

Then the final measurement is realized with the product on the most critical orientation.

The system is tested in an open area test site (OATS). The EUT is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

Zero degree azimuths correspond to the front of the device under test.

Frequency range: From 9 kHz to 1000 MHz**Detection mode:** Quasi-peak ($F < 1$ GHz)**Bandwidth:** 200Hz ($9 \text{ kHz} < F < 150\text{kHz}$)
9 kHz ($150 \text{ kHz} < F < 30\text{MHz}$)
120 kHz ($30 \text{ MHz} < F < 1 \text{ GHz}$)**Distance of antenna:** 3 meters (in open area test site) / 3 meters (in anechoic room)**Antenna height:** 1 to 4 meters above 30 MHz**Antenna polarization:** vertical and horizontal (only the highest level is recorded)

Equipment under test operating condition:

The equipment under test is blocked in alternance of emission and reception mode with tag.

Power source: 120 Vac by an external power supply

Percentage of voltage variation during the test (%): ± 1

Results:

Sample N° 1:

Below 30 MHz

Frequencies (MHz)	Detector P QP Av	RBW (kHz)	Polarization: Parallel Perpendicular	Field strength Measured at 3 m (dB μ V/m)	Field strength Computed at 30 m (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
27.12	P	10	Parallel	36.5 (1)	-3.5 (2)	29.5	33

(1): Noise floor

(2): Field strength extrapolated at 30 meters using 40dB/decade fall off

Above 30 MHz

Frequencies (MHz)	Detector P QP Av	Antenna height (cm)	RBW (kHz)	Polarization H: Horizontal V: Vertical	Field strength Measured at 3 m (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
64.884	QP	120	120	V	29.34	40	10.66
67.476	QP	118	120	V	31.76	40	8.24
270.057	QP	105	120	V	35.51	46	10.49
274.458	QP	257	120	H	41.36	46	4.64
279.075	QP	254	120	H	38.85	46	7.15
283.476	QP	256	120	H	38.66	46	7.34
287.877	QP	257	120	H	37.08	46	8.92
288.255	QP	259	120	H	35.59	46	10.41
296.895	QP	263	120	H	36.38	46	9.62
305.88	QP	245	120	H	38.44	46	7.56
314.91	QP	246	120	H	38.48	46	7.52
323.87	QP	243	120	H	36.51	46	9.49
485.78	QP	112	120	V	41.55	46	4.45
494.81	QP	105	120	V	41.55	46	4.45
503.7	QP	108	120	V	43.91	46	2.09
508.39	QP	113	120	V	41.9	46	4.1
512.73	QP	143	120	V	41.44	46	4.56
517.28	QP	136	120	V	41.41	46	4.59

P= Peak, QP=Quasi-peak, Av=Average

Applicable limits: for $9 \text{ kHz} \leq F \leq 490 \text{ kHz}$: $2400/F(\text{kHz})$ at 300 meters
for $490 \text{ kHz} < F \leq 1.705 \text{ MHz}$: $24000/F(\text{kHz})$ at 30 meters
for $1.705 \text{ MHz} < F \leq 30 \text{ MHz}$: $29.5 \text{ dB}\mu\text{V/m}$ at 30 meters
for $30 \text{ MHz} < F \leq 88 \text{ MHz}$: $40 \text{ dB}\mu\text{V/m}$ at 3 meters
for $88 \text{ MHz} < F \leq 216 \text{ MHz}$: $43.5 \text{ dB}\mu\text{V/m}$ at 3 meters
for $216 \text{ MHz} < F \leq 960 \text{ MHz}$: $46 \text{ dB}\mu\text{V/m}$ at 3 meters
Above 960 MHz : $54 \text{ dB}\mu\text{V/m}$ at 3 meters

Note: any spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.

Test conclusion:

RESPECTED STANDARD

□□□ End of report, (3) appendixes to be forwarded □□□

APPENDIX 1: Calculation example for radiated spurious emission

Frequencies (MHz)	Level (dBμV/m) (1)	Margin (dB) (2)	Limit (dBμV/m)	Read level (dBμV)	Antenna Factor (dBm)	Cable Loss (dB)	Preamp Factor (dB)
2390 (Peak)	57.63	16.37	74	64.3	32.7	3.27	42.64
2390 (Av)	46.43	7.57	54	53.1	32.7	3.27	42.64

(1) Level (dBμV/m) = Antenna Factor (dBm) + Cable loss (dB) + Read level (dBμV) – Preamp Factor (dB)

(2) Margin (dB) = Limit (dBμV/m) - Level (dBμV/m)

For Peak Limit @ 2390MHz:

(1) Level (dBμV/m)

= Antenna Factor (dBm) + Cable loss (dB) + Read level (dBμV) – Preamp Factor (dB)

= 32.7 (dBm) + 3.27 (dB) + 64.3 (dBμV) - 42.64 (dB)

= 57.63 (dBμV/m)

(2) Margin (dB)

= Limit (dBμV/m) - Level (dBμV/m)

= 74 (dBμV/m) - 57.63 (dBμV/m)

= 16.37 (dB)

For Average Limit @ 2390MHz:

(1) Level (dBμV/m)

= Antenna Factor (dBm) + Cable loss (dB) + Read level (dBμV) – Preamp Factor (dB)

= 32.7 (dBm) + 3.27 (dB) + 53.1 (dBμV) - 42.64 (dB)

= 46.43 (dBμV/m)

(2) Margin (dB)

= Limit (dBμV/m) - Level (dBμV/m)

= 54 (dBμV/m) – 46.43 (dBμV/m)

= 7.57 (dB)

APPENDIX 2: Test equipment list

AC Conducted emissions

TYPE	MANUFACTURER	EMITECH NUMBER
Outside room Hors cage	Emitech	/
Test receiver ESIB7	Rohde & Schwarz	16531
Transient limiter LIT-930A	COM-POWER	17207
LISN ESH3-Z5	Rohde & Schwarz	5602
Absorber sheath current	Emitech	18361
Cable N-2m	/	6527
Cable N-3m	/	16408
Power source 1251RP	California instruments	8508
Multimeter 177	Fluke	14831
Meteo station WS-9232	La Crosse Technology	7564
Software	BAT-EMC V3.18.0.26	0000

Occupied bandwidth

TYPE	MANUFACTURER	EMITECH NUMBER
Spectrum Analyzer FSV40	Rohde & Schwarz	15776
Climatic chamber VS4200	Votsch	17087
Multimeter 177	Fluke	14831
Power source 1251RP	California instruments	8508
Meteo station WS-9232	La Crosse Technology	7564
Software	BAT-EMC V3.18.0.26	0000
Software GPIBShot	Rohde et Schwarz	/

Band edge

TYPE	MANUFACTURER	EMITECH NUMBER
Spectrum Analyzer FSV40	Rohde & Schwarz	15776
Climatic chamber VS4200	Votsch	17087
Multimeter 177	Fluke	14831
Power source 1251RP	California instruments	8508
Meteo station WS-9232	La Crosse Technology	7564
Software	BAT-EMC V3.18.0.26	0000
Software GPIBShot	Rohde et Schwarz	/

Operation within the band 13.110 – 14.010 MHz

TYPE	MANUFACTURER	EMITECH NUMBER
Open test site	EMITECH	/
Spectrum Analyzer FSV40	Rohde & Schwarz	15776
Climatic chamber VS4200	Votsch	17087
Active loop antenna 6502	Emco	6155
Cable N-2m	/	6527
Cable N-3m	/	16408
Power source 1251RP	California instruments	8508
Multimeter 177	Fluke	14831
Meteo station WS-9232	La Crosse Technology	7564
Software	BAT-EMC V3.18.0.26	0000

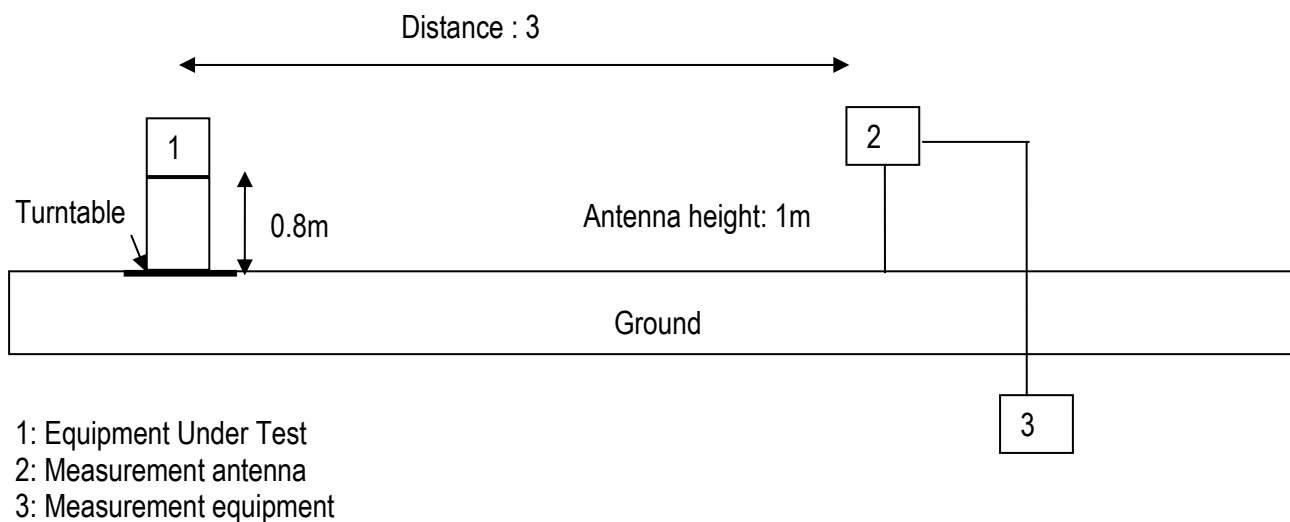
Field strength outside the band 13.110-14.010 MHz

TYPE	MANUFACTURER	EMITECH NUMBER
Open test site	EMITECH	/
Anechoic Chamber	EMITECH	7651
Test receiver ESI	Rohde & Schwarz	14648
Spectrum Analyzer FSV40	Rohde & Schwarz	15776
Active loop antenna 6502	Emco	6155
Biconical antenna BIA-30HF	Electro Metrics	1103
Log periodic antenna 3146A	EMCO	5609
Low-noise amplifier RF30400-27-LNA	RFPA	6136
N-10M Cable	/	7537
N-10.5M Cable	HYTEM	7655
N-3M Cable	H&S	15202
Cable N-2m	/	6527
Cable N-3m	/	16408
Power source 1251RP	California instruments	8508
Multimeter 177	Fluke	14831
Meteo station WS-9232	La Crosse Technology	7564
Software	BAT-EMC V3.18.0.26	0000

APPENDIX 3: Radiated Test Setup

Open area setup

Below 30 MHz



Semi anechoic chamber setup

Between 30 MHz and 1 GHz

