



LCIE

RFID 13,56MHz Template: Release October 12<sup>th</sup>, 2021

# TEST REPORT

N°: 174685-772411-A(FILE#3304872)

Version : 01

## Subject

Radio spectrum matters  
tests according to standards:  
47 CFR Part 15.225 & RSS 210 Issue 10 & RSS-Gen Issue 5

## Issued to

**BIO-RAD**  
7, rue de Madrid Espace Européen de l'Entreprise  
67300-SCHILTIGHEIM  
FRANCE

## Apparatus under test

Product RFID Tag Reader  
Trade mark **BIO-RAD**  
Manufacturer **BIO-RAD**  
Model under test **Model DTE41027+1**  
Serial number **2ABUUDTE41027**  
FCC ID **2ABUUDTE41027**  
IC **116588A-DTE41027**

## Conclusion

See Test Program chapter

## Test date

January 10, 2022

## Test location

Moirans

## FCC Test site

FR0008 - 197516

## ISED Test site

FR0008 - 6500A

## Sample receipt date

December 10, 2021

## Composition of document

30 pages

## Document issued on

January 31, 2022

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## PUBLICATION HISTORY

Version	Date	Author	Modification
01	January 31, 2022	Mounir BOUAMARA	Creation of the document

*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.*



## SUMMARY

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## 1. TEST PROGRAM

### References

- 47 CFR Part 15.225 (2020)
- RSS 210 Issue 10
- 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	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input checked="" type="checkbox"/> NP(1)
20dB Bandwidth	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input checked="" type="checkbox"/> NP(1)
AC Power Line Conducted Emission	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA(2)	<input checked="" type="checkbox"/> NP(1)
Frequency Tolerance	<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	<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	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Receiver Radiated Emissions	<input type="checkbox"/> PASS (3)	<input type="checkbox"/> FAIL	<input checked="" 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

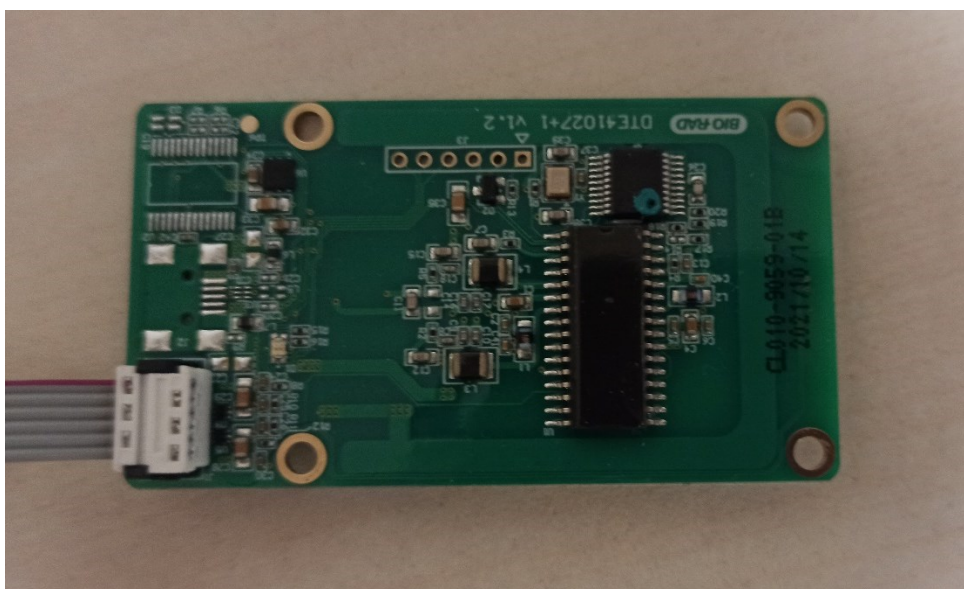
NP: Test Not Performed

## 2. EQUIPMENT UNDER TEST: CONFIGURATION (DECLARED BY PROVIDER)

### 2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

**Equipment under test (EUT):**  
**BIO-RAD Model DTE41027+1**

**Serial Number: 2ABUUDTE41027**



Equipment Under Test

#### **Power supply:**

Name	Type	Rating	Reference / Sn	Comments
Supply1	<input type="checkbox"/> AC <input checked="" type="checkbox"/> DC <input type="checkbox"/> Battery	5VDC		

#### **Inputs/outputs - Cable:**

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
1	Data	1.5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Use to set and configure the EUT

#### **Auxiliary equipment used during test:**

Type	Reference	Sn	Comments
Laptop			Use to set the EUT
RFID tag	-	-	-

### Equipment information (declaration of provider):

Type:	<input checked="" type="checkbox"/> <b>RFID</b>		
Frequency band:	[13.553 to 13.567] MHz		
Number of Channel:	1		
Antenna Type:	<input type="checkbox"/> Integral	<input type="checkbox"/> External	<input type="checkbox"/> Dedicated
Transmit chains:	1		
Receiver chains:	1		
Type of equipment:	<input type="checkbox"/> Stand-alone	<input type="checkbox"/> Plug-in	<input type="checkbox"/> Combined
Equipment arrangement:	<input type="checkbox"/> Tabletop	<input type="checkbox"/> Floor-standing	<input type="checkbox"/> Multiple orientations
Equipment type:	<input type="checkbox"/> Production model		<input type="checkbox"/> Pre-production model
Operating temperature range:	Tmin:	<input type="checkbox"/> -20°C	<input type="checkbox"/> X°C*
	Tnom:	20°C	
	Tmax:	<input type="checkbox"/> 50°C	<input type="checkbox"/> X°C*
Operating voltage:	Vmin (90% Vnom):	<input type="checkbox"/> 102V/60Hz	<input checked="" type="checkbox"/> 4.5Vdc*
	Vnom:	<input type="checkbox"/> 120V/60Hz	<input checked="" type="checkbox"/> 5Vdc*
	Vmax (110% Vnom):	<input type="checkbox"/> 138V/60Hz	<input checked="" type="checkbox"/> 5.5Vdc*

\*Ask from provider

Antenna Characteristic			
Antenna assembly	Gain (dBi)	Frequency Band (MHz)	Impedance(Ω)
1		13.56	50

Hardware information		
Software (if applicable):	V. :	MicroRWD ICODE/Mifare Combination Reader


MicroRWD ICODE/Mifare Combination Reader

File Configure Window Help


**MicroRWD MFIC RFID Reader Module**

Supports Mifare (1K, 4K and Ultralight) and ICODE SLI transponder/tag types


Click the appropriate image to configure



**Mifare Mode**



**ICODE Mode**



MicroRWD Status:

CONNECTED

Exit

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

(1) Following commands with the specific test software "X" are used to set the product:

a. – See document "X"(provided by customer) for the command used during test.

(2) Note: The test can't be performed because the transmitter and receiver are operating at the same frequency and the transmitter cannot be switched off as the carrier is used as receiver injection signal

## 2.3. EQUIPMENT LABELLING



## 2.4. EQUIPMENT MODIFICATION

☐ None ☐ Modification:



## 2.5. 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 $\mu$ 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 $\mu$ V/m.

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

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

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

## 2.6. CALIBRATION DATE

The calibration intervals are extended at 12+2 months. This extended interval is based on the fact that there is sufficient calibration data to statistically establish a trend or based on experience of use of the test equipment to assure good measurement results for a longer period



### 3. FREQUENCY TOLERANCE

#### 3.1. TEST CONDITIONS

Test performed by : Mounir BOUAMARA  
Date of test : January 5, 2022  
Ambient temperature : 23 °C  
Relative humidity : 44 %

#### 3.2. TEST SETUP

- The Equipment Under Test is installed:

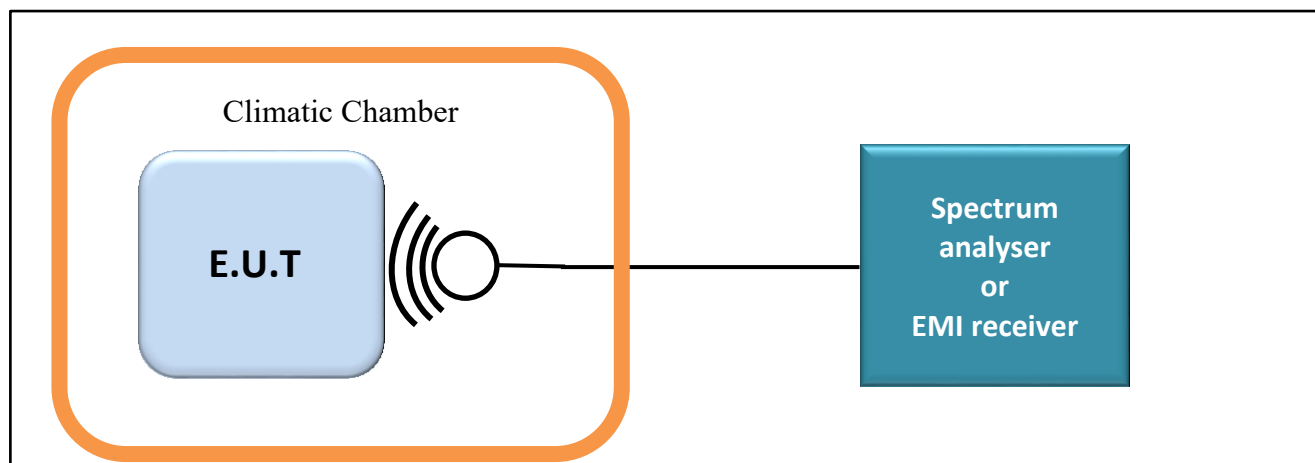
- ☐ On a table
- ☒ In a climatic chamber
- ☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

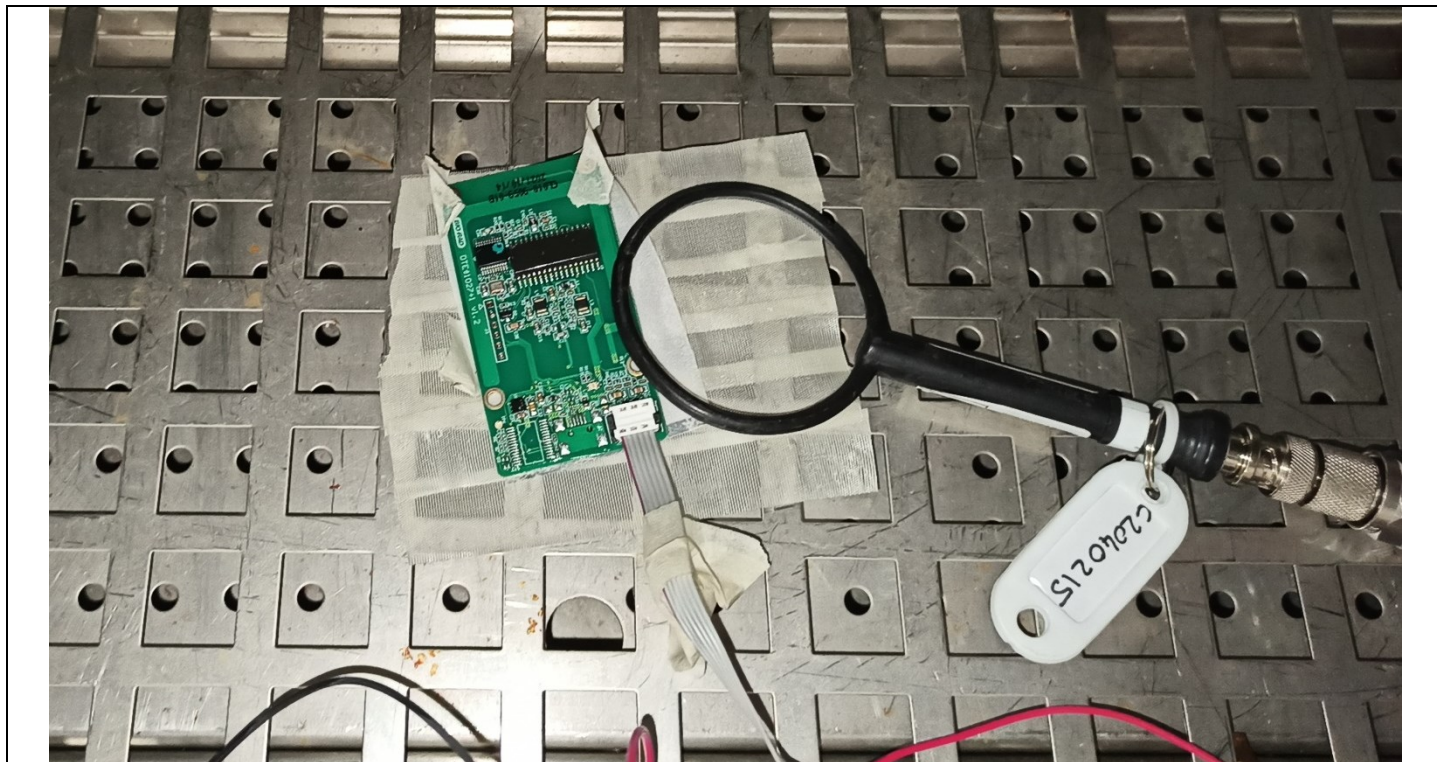
- ☐ Conducted Method
- ☒ Radiated Method

- Test Procedure:

- ☒ ANSI C63.10 § 6.8



Test set up of Occupied Bandwidth



Photograph for Frequency Tolerance

### 3.3. LIMIT

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

### 3.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due
AC source 1kW	KEYSIGHT	AC6802A	A7042305		
Antenna Loop (near field)	ELECTRO-METRICS	EM-6993	C2040215	06/19	06/22
Attenuator 10dB	AEROFLEX	—	A7122267	08/21	08/23
Cable SMA 2m	—	6GHz	A5329635	02/20	02/22
Climatic chamber	BIA CLIMATIC	CL 6-25	D1022117	12/20	12/21
Data Logger (CEM1)	AGILENT	34970A	A6440083	11/20	11/22
Frequency Counter	HEWLETT PACKARD	HP 5350B	B2082009	08/19	08/24
Multimeter - CEM	FLUKE	87	A1240251	03/21	03/23
Spectrum Analyzer 9kHz - 6GHz	ROHDE & SCHWARZ	FSL6	A2642020	08/20	08/22
Thermo-hygrometer	TESTO	608-H1	B4204120	12/20	12/22
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23



### 3.5. RESULTS

Temperature	Tnom		
Voltage:	Vmin	Vnom	Vmax
Frequency (MHz)	13.5599532	13.559968	13.5599787
Frequency Drift (%)	0.004676	0.003201	0.002127

### 3.6. CONCLUSION

Frequency tolerance measurement performed on the sample of the product **BIO-RAD Model DTE41027+1**, SN: **2ABUUDTE41027**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.225 & RSS 210 limits.

## 4. FIELD STRENGTH OUTSIDE OF THE BANDS 13.110-14.010 MHz

### 4.1. TEST CONDITIONS

Test performed by : Mounir BOUAMARA  
 Date of test : January 5, 2022  
 Ambient temperature : 23 °C  
 Relative humidity : 44 %

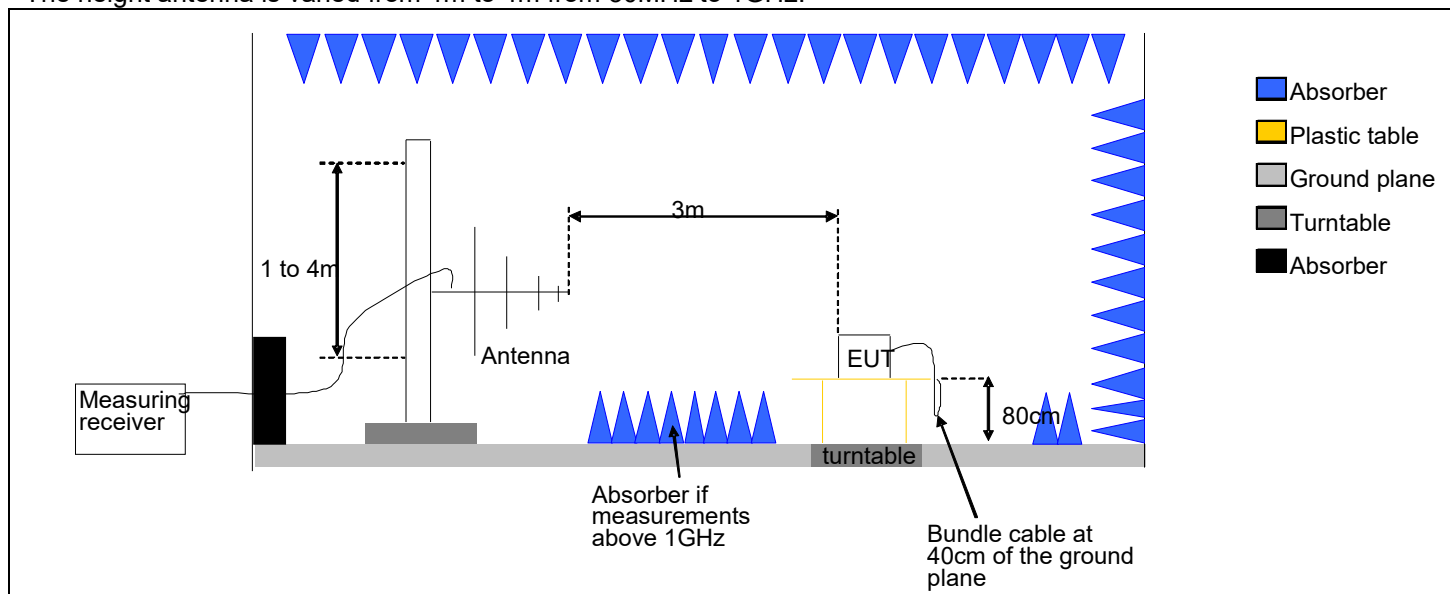
### 4.2. TEST SETUP

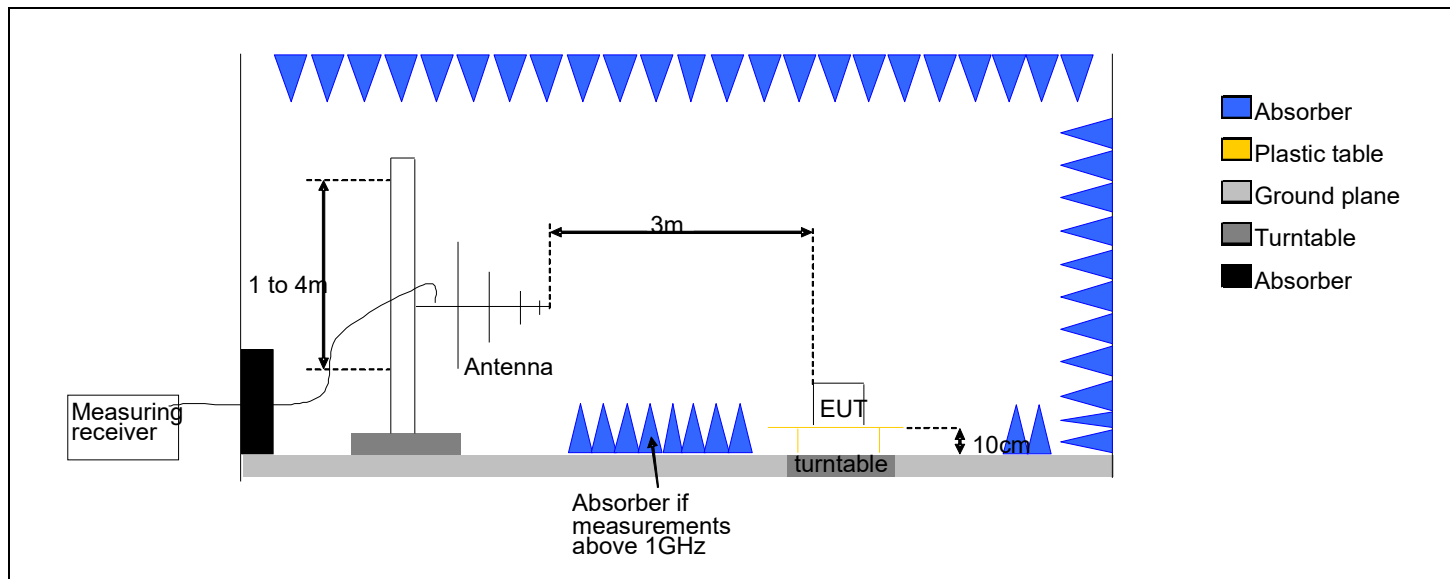
The product has been tested according to ANSI C63.10 and FCC part 15 subpart C.

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 all axis of EUT used in normal configuration. Antenna height was 1m. The EUT is placed **in a semi-anechoic chamber**. Distance between measuring antenna and the EUT is **3m**.

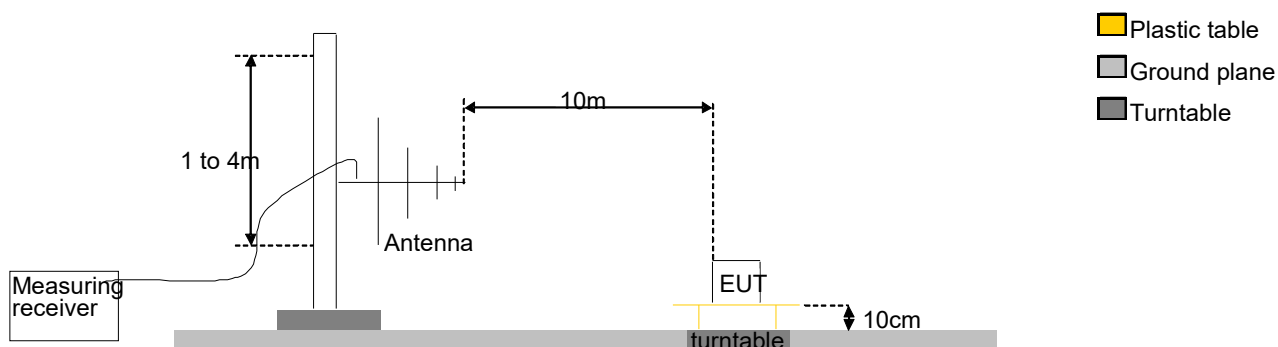
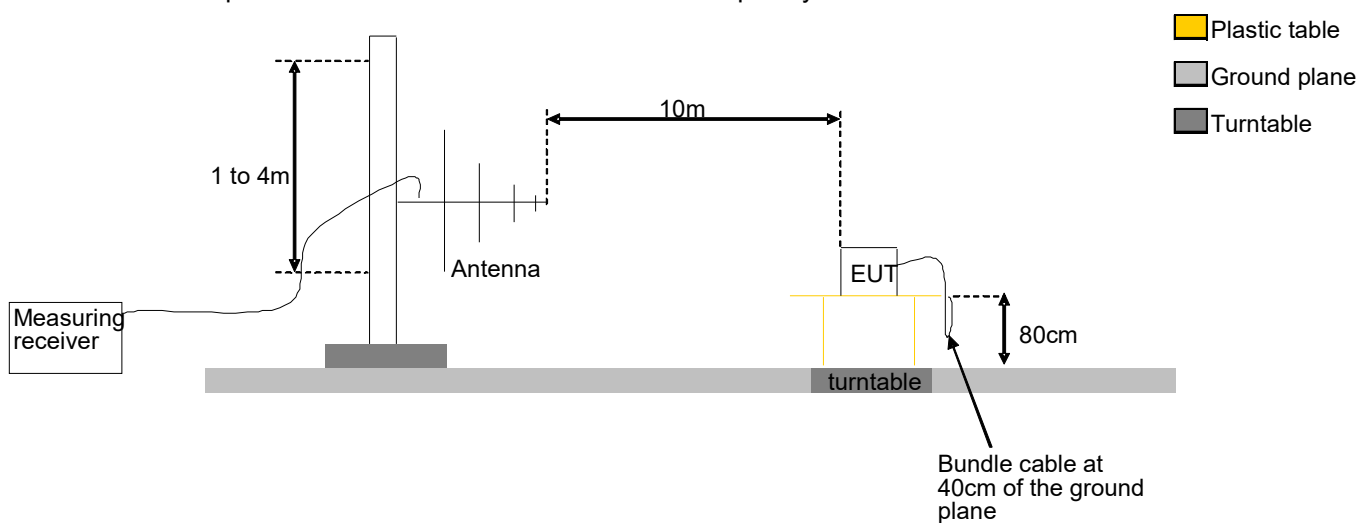
Test is performed in horizontal (H) and vertical (V) polarization with **bilog** between 30MHz & 1GHz. Measurement bandwidth was 120kHz below 1GHz. The level has been maximised by the turntable rotation of 360 degrees range on all axis of EUT used in normal configuration. The EUT is placed at 0.8m high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

The height antenna is varied from 1m to 4m from 30MHz to 1GHz.





Test set up of Unwanted Emissions in Restricted Frequency Bands in semi anechoic chamber



Test Set up for radiated measurement in open area test site



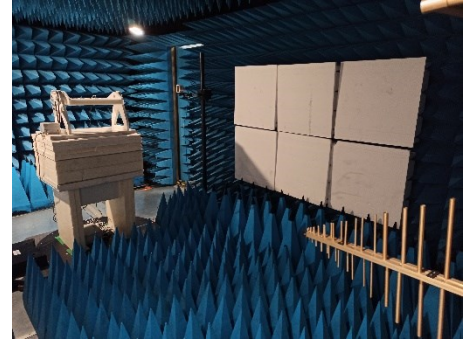
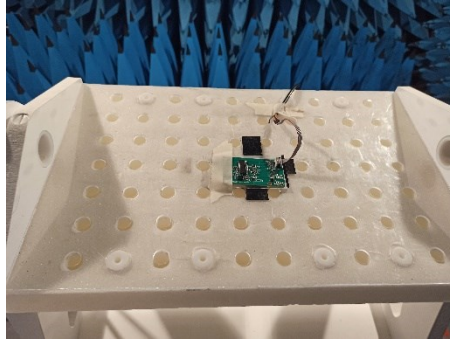
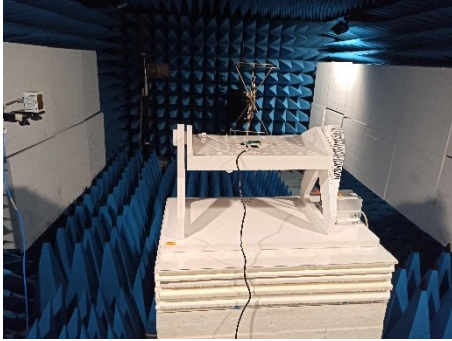


Photo Setup : anechoic chamber (XY axis)

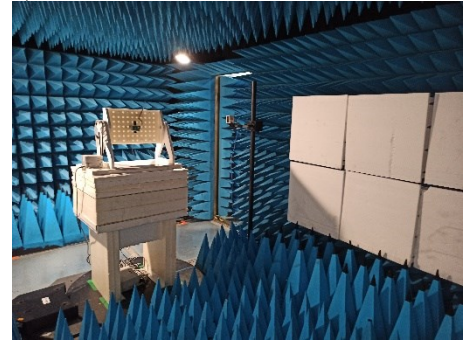
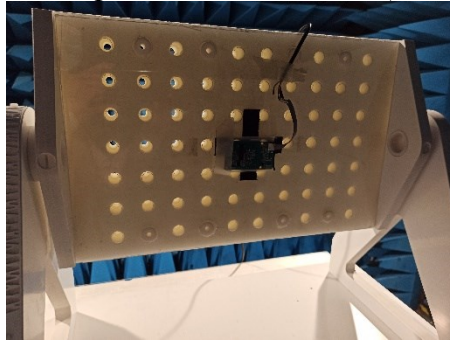


Photo Setup : anechoic chamber (Z axis)



Photo Setup – OATS

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

#### 4.3. LIMIT

Measure at 300m		
Frequency range	Level	Detector
9kHz-490kHz	67.6dB $\mu$ V/m /F(kHz)	QPeak
Measure at 30m		
Frequency range	Level	Detector
490kHz-1.705MHz	87.6dB $\mu$ V/m /F(kHz)	QPeak
1.705MHz-30MHz	29.5dB $\mu$ V/m	QPeak
Measure at 10m		
Frequency range	Level	Detector
30MHz to 88MHz	29.5dB $\mu$ V/m	QPeak
88MHz to 216MHz	33dB $\mu$ V/m	QPeak
216MHz to 960MHz	35.5B $\mu$ V/m	QPeak
960MHz to 1000MHz	43.5dB $\mu$ V/m	QPeak
Above 1000MHz	63.5dB $\mu$ V/m	Peak
	43.5dB $\mu$ V/m	Average
Measure at 3m		
Frequency range	Level	Detector
30MHz to 88MHz	40dB $\mu$ V/m	QPeak
88MHz to 216MHz	43.5dB $\mu$ V/m	QPeak
216MHz to 960MHz	46B $\mu$ V/m	QPeak
960MHz to 1000MHz	54dB $\mu$ V/m	QPeak
Above 1000MHz	74dB $\mu$ V/m	Peak
	54dB $\mu$ V/m	Average

#### 4.4. TEST EQUIPMENT LIST

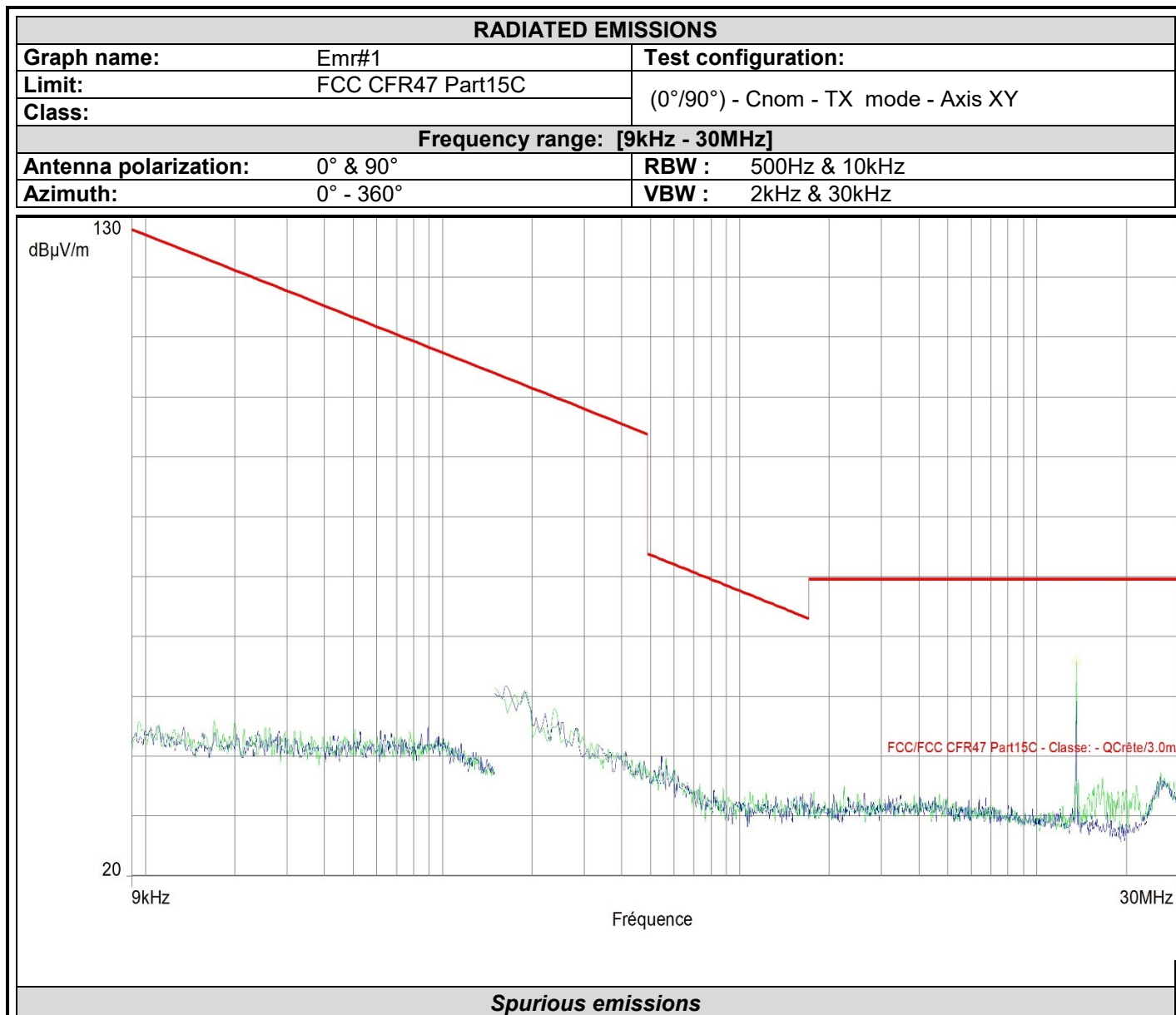
TEST EQUIPMENT USED					
Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due
Amplifier 9kHz - 40GHz	LCIE SUD EST	—	A7102082	06/20	06/22
Antenna Bi-log	AH System	SAS-521-7	C2040180	02/21	02/23
Antenna horn 18GHz	EMCO	3115	C2042029	09/18	09/21
BAT EMC	NEXIO	v3.19.1.23	L1000115		
CABLE N 3m	—	-	A5329206	07/20	07/22
Cable SMA 40GHz 40cm	WITHWAVE	W101-SM1-0.4M	A5329979	04/21	04/22
Comb EMR HF	YORK	CGE01	A3169114		
Emission Cable (SMA 1m)	TELEDYNE	26GHz	A5329874	10/20	10/21
Emission Cable (SMA 3.3m)	TELEDYNE	26GHz	A5329875	10/20	10/21
Emission Cable <1GHz (Ampl <-> Cage)	-	18GHz	A5329907	08/20	08/21*
Filter Matrice	LCIE SUD EST	Combined filters	A7484078	09/20	09/21
Multimeter - CEM	FLUKE	87	A1240251	03/21	03/23
Power supply DC	METRIX	AX503	A7042308		
Rehausse Table C3	LCIE	—	F2000507		
Rehausse Table C3	LCIE	—	F2000511		
Semi-Anechoic chamber #3 (BF)	SIEPEL	—	D3044017_BF	12/19	12/22
Semi-Anechoic chamber #3 (VSWR)	SIEPEL	—	D3044017_VSWR	12/19	12/22
Spare C3 Cable Measure	TELEDYNE	26GHz	A5329681	09/20	09/22
Spectrum analyzer	ROHDE & SCHWARZ	FSU 26	A4060058	09/21	09/23
Table C3	LCIE	—	F2000461		
Thermo-hygrometer (C3)	OREGON	BAR206	B4204078	02/21	02/23
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23
Turntable chamber (Cage#3)	ETS Lingren	Model 2165	F2000371		
Turntable controller (Cage#3)	ETS Lingren	Model 2090	F2000444		
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052	06/19	06/22

#### 4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒ None      ☐ Divergence:

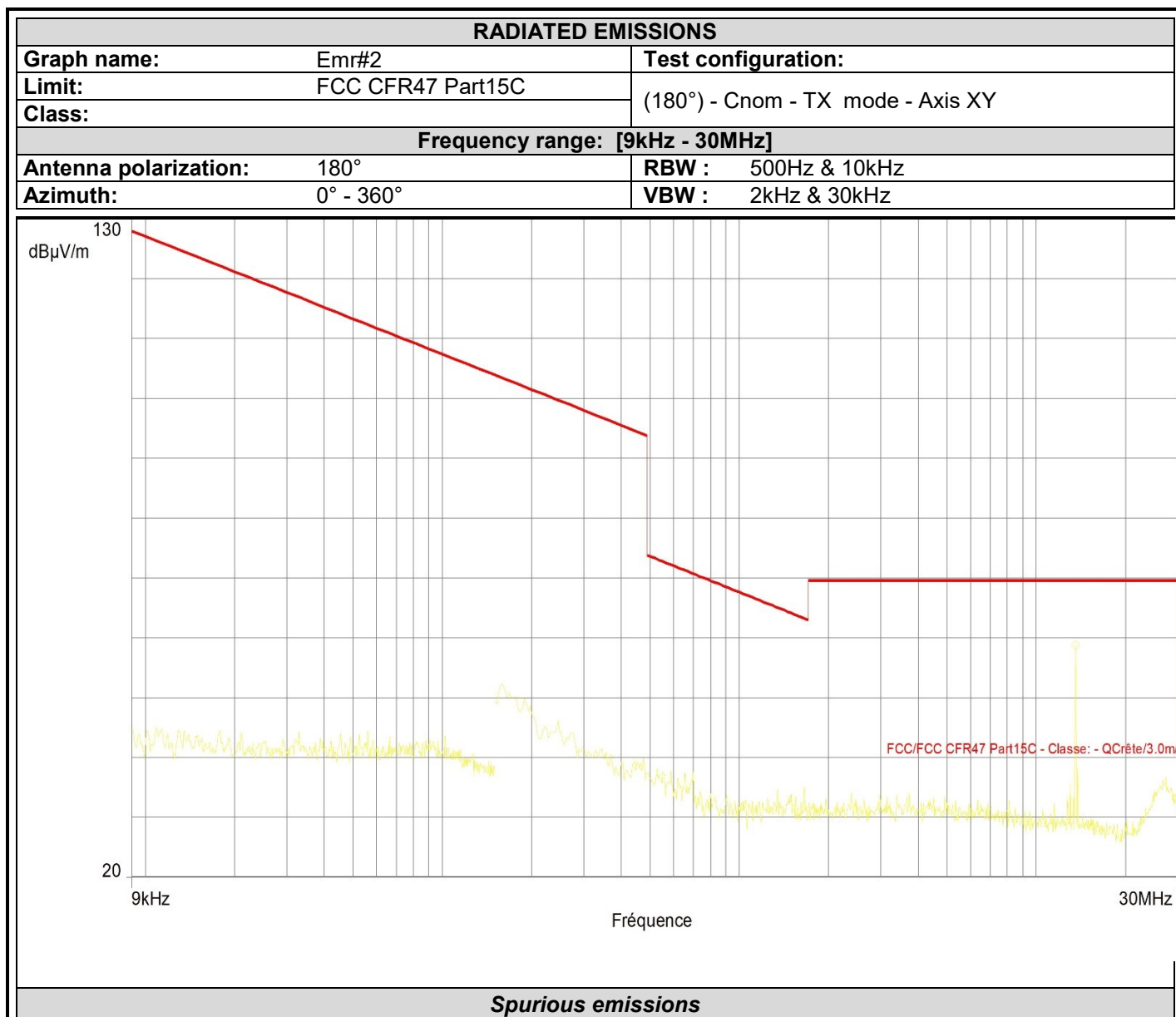


#### 4.6. RESULTS



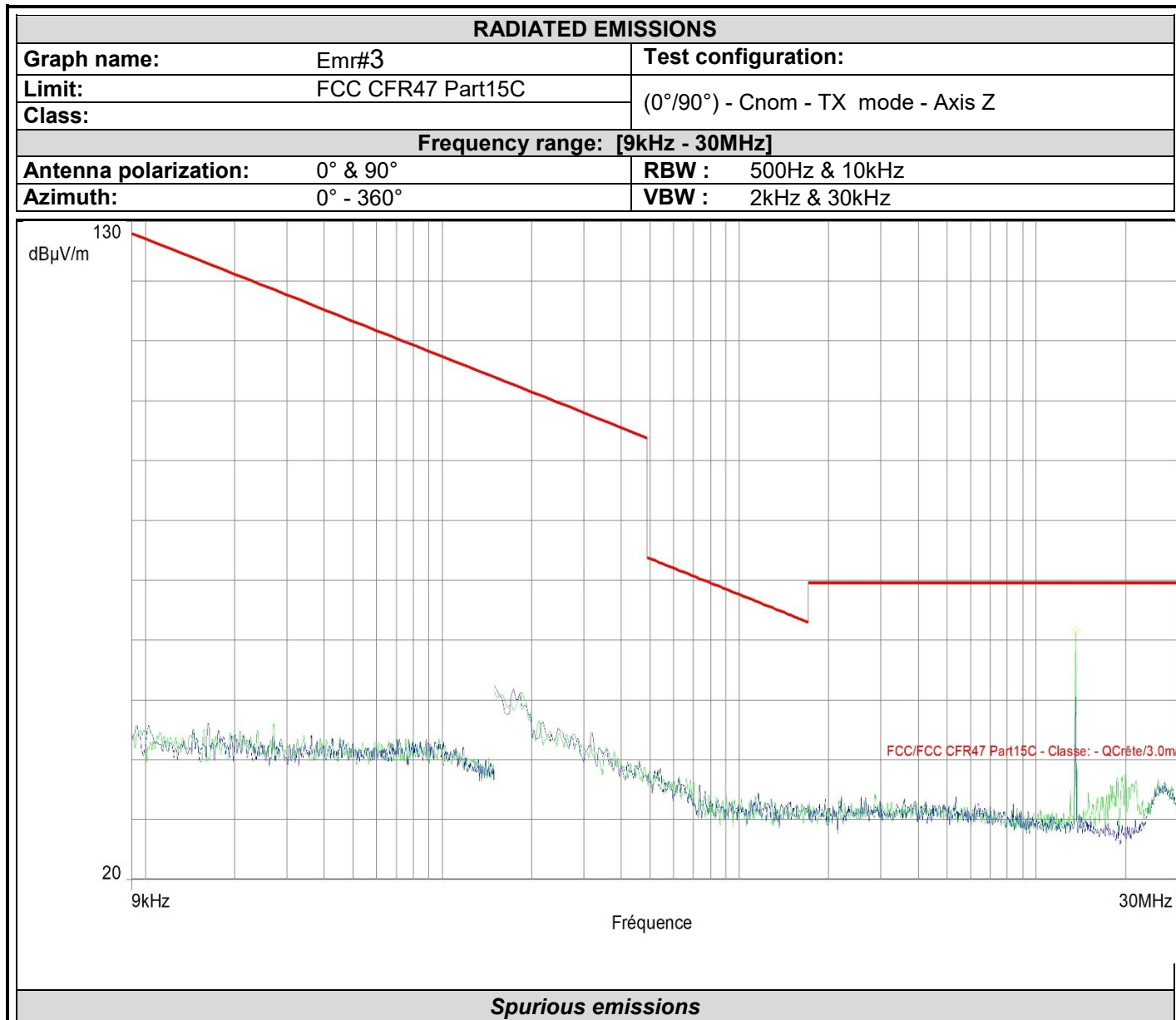
Frequency (MHz)	Peak (dBµV/m)	LimQP (dBµV/m)	Peak-LimQP (dB)	Polarization	Correction (dB)
13.559*	55.9	69.5	-13.6	Vertical	37.4

\*Carrier frequency



Frequency (MHz)	Peak (dBµV/m)	LimQP (dBµV/m)	Peak-LimQP (dB)	Polarization	Correction (dB)
13.562*	58.7	69.5	-10.8	Horizontal	37.4

\*Carrier frequency



Frequency (MHz)	Peak (dBµV/m)	LimQP (dBµV/m)	Peak-LimQP (dB)	Polarization	Correction (dB)
13.559*	61.4	69.5	-8.0	Vertical	37.4

\*Carrier frequency

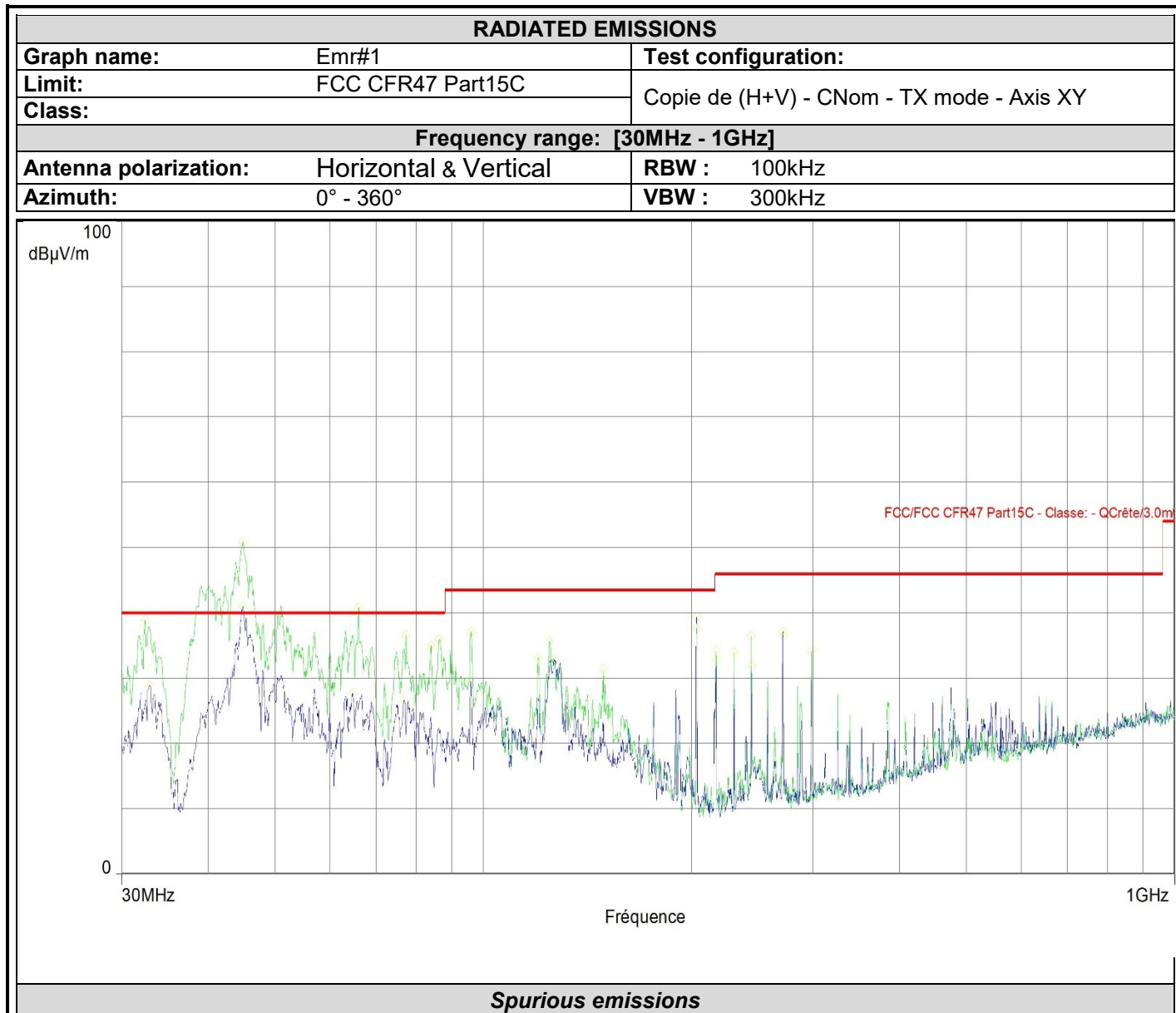


Frequency (MHz)	Peak (dBµV/m)	LimQP (dBµV/m)	Peak-LimQP (dB)	Polarization	Correction (dB)
13.559*	47.5	69.5	-22.0	Vertical	37.4

\*Carrier frequency



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Frequency (MHz)	Peak (dBμV/m)	LimQP (dBμV/m)	Peak-LimQP (dB)	Polarization	Correction (dB)
32.425	39.0	40.0	-1.0	Vertical	-17.0
44.938	51.0	40.0	11.0	Vertical	-23.1
44.938	41.0	40.0	1.0	Horizontal	-23.1
65.987	40.8	40.0	0.8	Vertical	-27.0
77.239	36.6	40.0	-3.4	Vertical	-25.0
84.029	35.0	40.0	-5.0	Vertical	-23.2
86.357	35.9	40.0	-4.1	Vertical	-22.7
96.057	37.1	43.5	-6.4	Vertical	-21.0

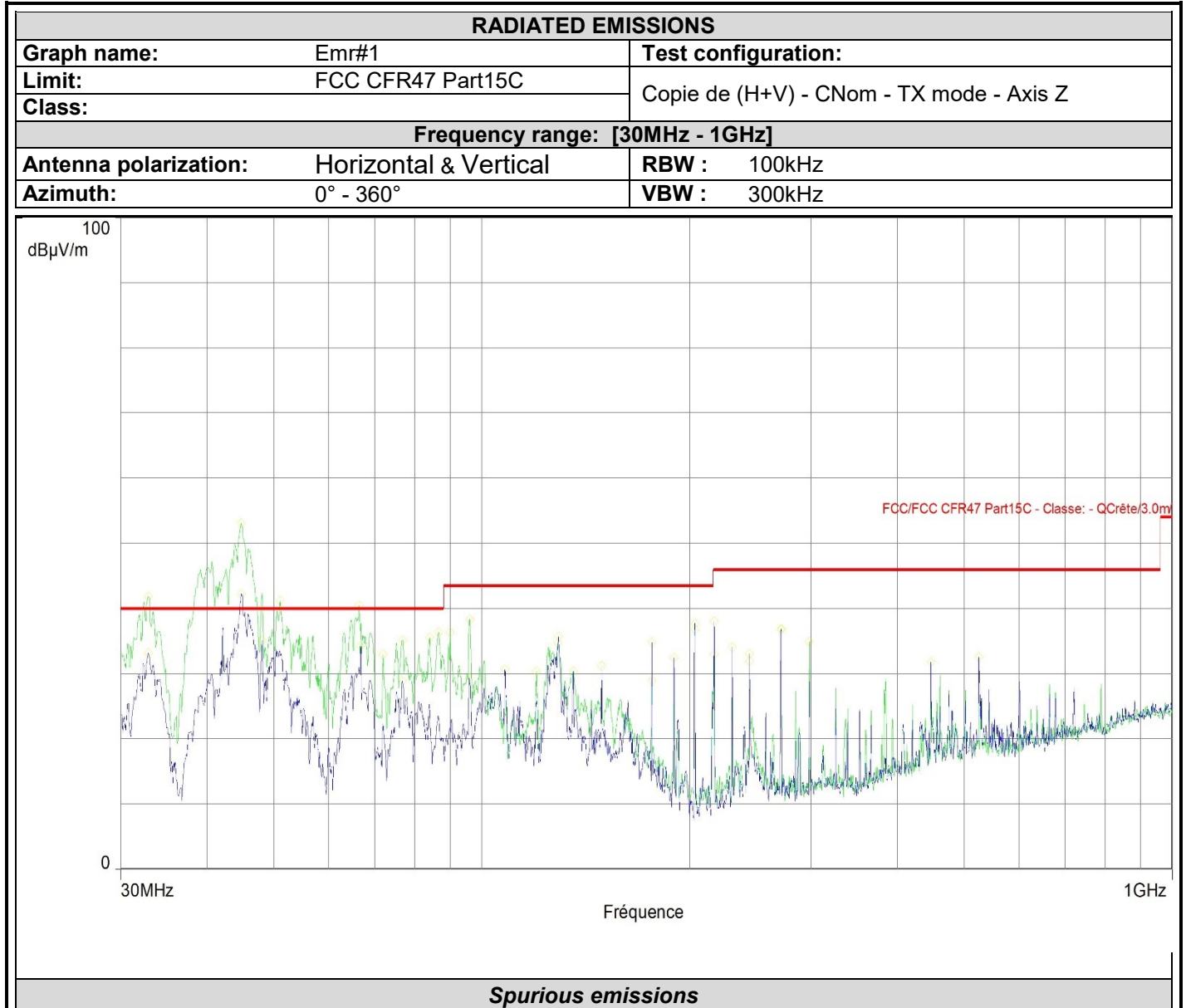


Frequency (MHz)	Peak (dB $\mu$ V/m)	LimQP (dB $\mu$ V/m)	Peak-LimQP (dB)	Polarization	Correction (dB)
124.575	35.7	43.5	-7.8	Vertical	-15.6
203.339	37.6	43.5	-5.9	Vertical	-21.7
203.436	39.4	43.5	-4.1	Horizontal	-21.7
244.079	36.4	46.0	-9.6	Vertical	-18.6
271.239	36.5	46.0	-9.5	Vertical	-19.2
271.239	37.1	46.0	-8.9	Horizontal	-19.2
298.302	34.1	46.0	-11.9	Vertical	-18.7

See Qualification measurement results in OATS



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Frequency (MHz)	Peak (dBμV/m)	LimQP (dBμV/m)	Peak-LimQP (dB)	Polarization	Correction (dB)
32.910	41.9	40.0	1.9	Vertical	-17.3
32.910	33.2	40.0	-6.8	Horizontal	-17.3
44.841	53.1	40.0	13.1	Vertical	-23.0
44.841	42.3	40.0	2.3	Horizontal	-23.0
48.042	35.1	40.0	-4.9	Horizontal	-24.5
51.049	41.3	40.0	1.3	Vertical	-25.6
66.472	40.6	40.0	0.6	Vertical	-26.9
66.666	34.2	40.0	-5.8	Horizontal	-26.9



Frequency (MHz)	Peak (dBμV/m)	LimQP (dBμV/m)	Peak-LimQP (dB)	Polarization	Correction (dB)
72.001	33.0	40.0	-7.0	Vertical	-26.0
76.851	35.1	40.0	-4.9	Vertical	-25.1
84.029	35.6	40.0	-4.4	Vertical	-23.2
86.551	36.3	40.0	-3.7	Vertical	-22.7
89.946	36.3	43.5	-7.2	Vertical	-22.1
96.057	38.3	43.5	-5.2	Vertical	-21.0
128.940	34.7	43.5	-8.8	Vertical	-14.9
129.037	35.8	43.5	-7.7	Horizontal	-14.9
176.276	29.0	43.5	-14.6	Vertical	-18.4
176.276	34.8	43.5	-8.7	Horizontal	-18.4
203.436	37.7	43.5	-5.8	Horizontal	-21.7
203.436	36.8	43.5	-6.7	Vertical	-21.7
216.919	38.0	46.0	-8.0	Horizontal	-21.6
271.239	36.8	46.0	-9.2	Horizontal	-19.2
271.239	36.9	46.0	-9.1	Vertical	-19.2

See Qualification measurement results in OATS

#### \* Worst case see in pre-characterization

Test Frequency (MHz)	Azimuth (Degrees)	Antenna Height (cm)	Transducer Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
32.42	0	100	14.5	34.8	40.0	-5.2
44.93	0	100	13.8	39.1	40.0	-0.9
66	0	100	8.0	32.5	40.0	-7.5
77.23	40	100	9.8	39.6	40.0	-0.4
86.35	30	100	9.7	35.9	40.0	-4.1
96	67	100	11.7	32.04	43.5	-11.5
124.57	90	150	14.0	34.0	43.5	-9.5
203.43	90	140	12.4	39.4	43.5	-4.1
216.9	90	200	12.6	36.9	46.0	-9.1
230.5	200	250	13.8	36.3	46.0	-9.7
244.07	200	250	15.4	38.4	46.0	-7.6
271	200	250	16.6	35.1	46.0	-10.9
298.3	180	350	17.5	33.0	46.0	-13.0

#### 4.7. CONCLUSION

Field strength outside of the bands 13.110-14.010 MHz measurement performed on the sample of the product **BIO-RAD Model DTE41027+1**, SN: **2ABUUDTE41027**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.225 & RSS-Gen limits.



## 5. FIELD STRENGTH WITHIN THE BAND 13.110-14.010MHz

### 5.1. TEST CONDITIONS

Test performed by : Mounir BOUAMARA  
 Date of test : January 5, 2022  
 Ambient temperature : 23 °C  
 Relative humidity : 44 %

### 5.2. TEST SETUP

Measurement procedure:

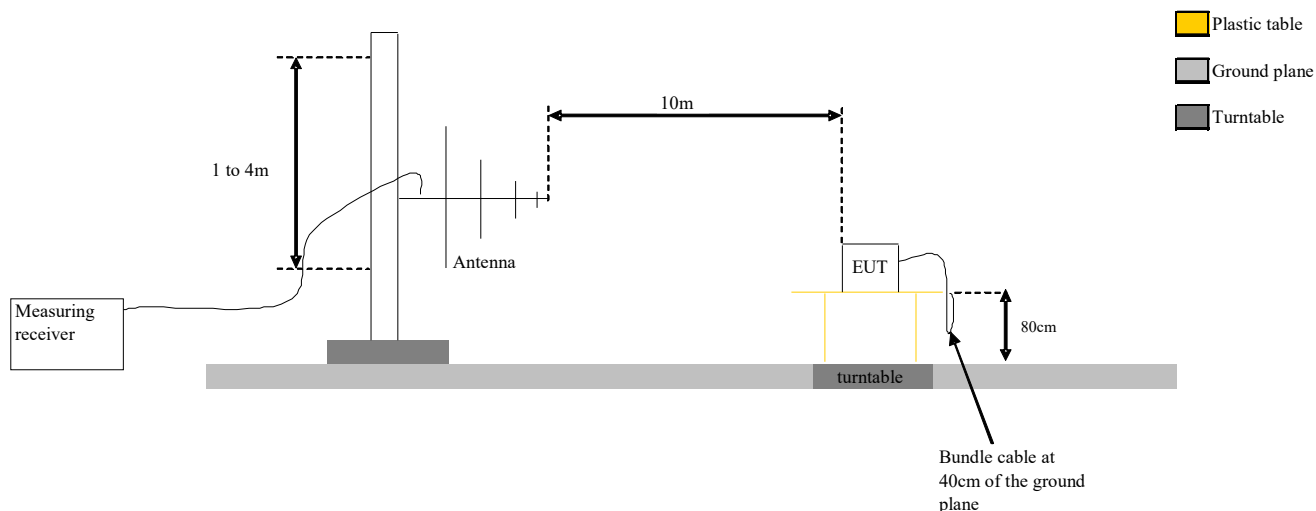
- ☐ Open Area Test Site
- ☒ Open Area Test Site + Test fixture in climatic chamber

The product has been tested according to ANSI C63.10.

The EUT is placed **on an open area test site**. Distance between measuring antenna and the EUT is **Distance**.

Test is performed in parallel, perpendicular and ground parallel axis with a loop antenna below 30MHz.

Measurement bandwidth was 9kHz between 150kHz & 30MHz. The level has been maximised by the turntable rotation of 360 degrees range on all axis of EUT used in normal configuration. Antenna height search was performed from 1 to 4m. The EUT is place at 0.8m.

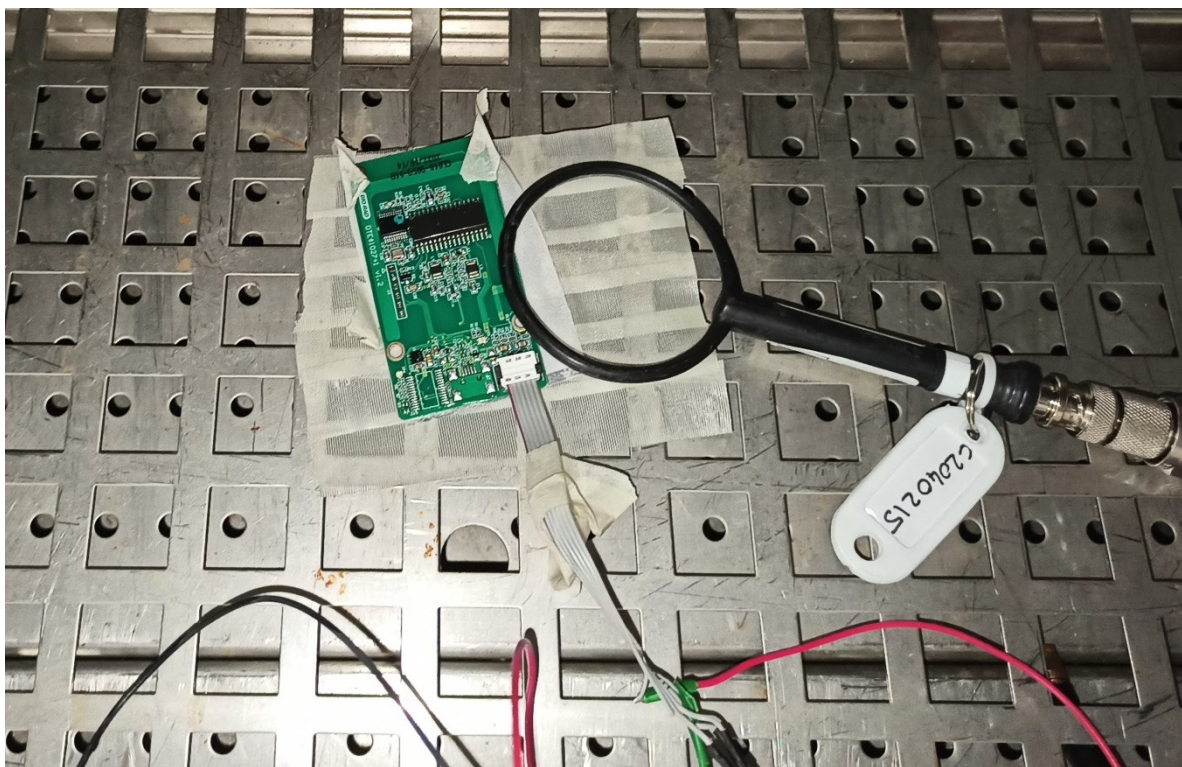


Test Set up for radiated measurement in open area test site

For measurement with test fixture is used, the power level calibration of the spectrum analyzer shall then be related to the power level or field strength measured with temperature during OATS measure taking in consideration in climatic chamber. The calculation will be used to calculate the absolute level of the sideband power.

### 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.



*Photo Setup : climatic chamber*



*Photo Setup – OATS*

Photograph for Field strength within the band 13.110-14.010MHz

### 5.3. LIMIT

Frequency (MHz)	Field strength ( $\mu\text{V/m}$ ) @30m	Field strength ( $\text{dB}\mu\text{V/m}$ ) @30m	Field strength ( $\text{dB}\mu\text{V/m}$ ) @3m
13.553-13.567	15 848	84.0	124.0
13.410-13.553 13.567-13.710	334.0	50.5	90.5
13.110-13.410 13.710-14.010	106.0	40.5	80.5
Below 13.110MHz Above 14.010MHz	30.0	29.5	69.5

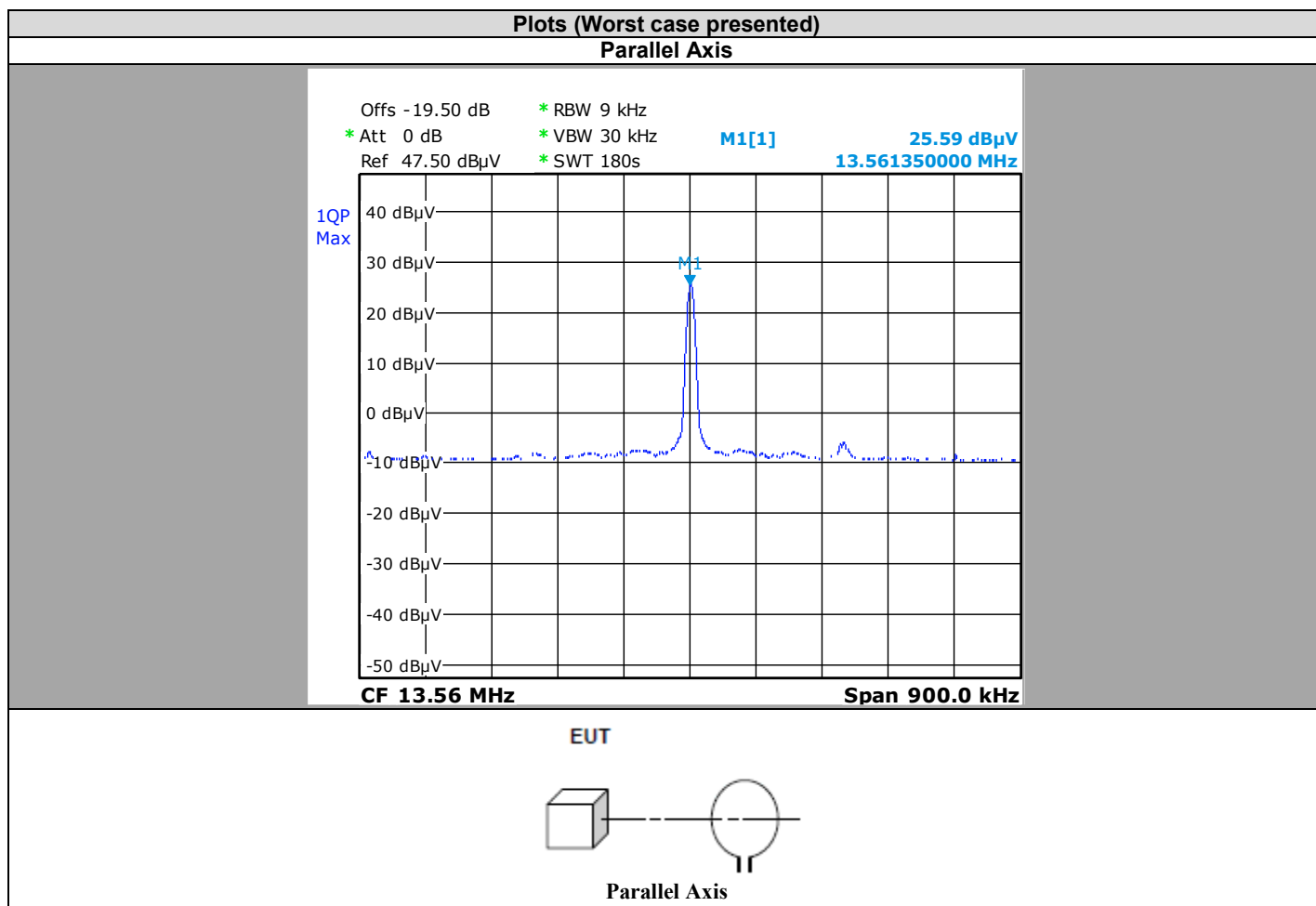
#### 5.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due
Antenna Bi-log	CHASE	CBL6111A	C2040051	07/20	07/22
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052	06/19	06/22
Antenna Mat (OATS)	ETS Lingren	2071-2	F2000392		
Cable (OATS)	—	1GHz	A5329623	05/20	05/22
Emission Cable	SUCOFLEX	6GHz	A5329061	08/21	08/22
Multimeter - CEM	FLUKE	87	A1240251	03/21	03/23
OATS	—	—	F2000409	04/21	04/22
RADIO ERP_EIRP	LCIE SUD EST	v4	L2000034		
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	11/20	11/22
Rehausse Table C1/OATS	LCIE	—	F2000512		
Table C1/OATS	LCIE	—	F2000445		
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23
Turntable (OATS)	ETS Lingren	Model 2187	F2000403		
Turntable / Mast controller (OATS)	ETS Lingren	Model 2066	F2000372		
Antenna Dipole precision	SCHWARZBECK	UHAP	C2040075	08/20	08/22
Cable substitution (OATS)	—	1GHz	A5329057	05/20	05/22
Frequency generator 0.1-2060MHz	HEWLETT PACKARD	8657B	A5442025	05/20	05/22
AC source 1kW	KEYSIGHT	AC6802A	A7042305		
Antenna Loop (near field)	ELECTRO-METRICS	EM-6993	C2040215	06/19	06/22
Attenuator 10dB	AEROFLEX	—	A7122267	08/21	08/23
Cable SMA 2m	—	6GHz	A5329635	02/20	02/22
Climatic chamber	BIA CLIMATIC	CL 6-25	D1022117	12/20	12/21
Data Logger (CEM1)	AGILENT	34970A	A6440083	11/20	11/22
Frequency Counter	HEWLETT PACKARD	HP 5350B	B2082009	08/19	08/24
Multimeter - CEM	FLUKE	87	A1240251	03/21	03/23
Spectrum Analyzer 9kHz - 6GHz	ROHDE & SCHWARZ	FSL6	A2642020	08/20	08/22
Thermo-hygrometer	TESTO	608-H1	B4204120	12/20	12/22
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23

#### 5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒ None ☐ Divergence:

## 5.6. RESULTS



Frequency (MHz)	QPeak Limit (dBμV/m) @ 30m	Qpeak (dBμV/m) @ 30m	Margin (Mes-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. Factor (dB)	Comments
13.56	84.0	25	59	180°	90°	120°	35.6	

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

## 5.7. CONCLUSION

Field strength within the band 13.110-14.010MHz measurement performed on the sample of the product **BIO-RAD Model DTE41027+1**, SN: **2ABUUDTE41027**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.225 & RSS 210 limits.

## 6. 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