



LCIE



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# TEST REPORT

N°: 13238937-774896

Version : 03

## Subject

Radio spectrum matters  
tests according to standards:  
47 CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 5

## Issued to

IJINUS  
25 Zone d'activité de KERVIDANOU 3 ,25 rue A.  
Schweitzer  
29300-MELLAC  
France

## Apparatus under test

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

Wireless sensor  
IJINUS  
IJINUS  
A0102  
IJA0102-0000 0111  
SE6A002  
10983A-A002

## Conclusion

See Test Program chapter

## Test date

: January 22, 2022 to January 27, 2022

## Test location

Fontenay Aux Roses & Ecuelles

## Test Site

6500A-1 & 6500A-3 & 6230B-1

## FCC Designation Number

FR0010

## FCC Test Firm Registration

582868

## Sample receipt date

January 19, 2022

## Composition of document

41 pages

## Document issued on

June 9, 2022

Written by :  
Laurent DENEUX  
Tests operator

Approved by :



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01	February 1, 2022	Laurent DENEUX	Creation of the document
02	April 25, 2022	Laurent DENEUX	Address change Adding family product
03	June 9, 2022	Laurent DENEUX	Adding FCC Test

*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.*



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## 1. TEST PROGRAM

### References

- 47 CFR Part 15.247
- RSS 247 Issue 2
- RSS Gen Issue 5
- KDB 558074 D01 DTS Meas Guidance v05r02
- ANSI C63.10-2013

### Radio requirement:

Clause (47CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 5) Test Description	Test result - Comments			
Occupied Bandwidth	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
6dB Bandwidth	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA()	<input type="checkbox"/> NP(1)
Duty Cycl	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Maximum Conducted Output Power	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Power Spectral Density	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Conducted Spurious Emission at the Band Edge	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA()	<input type="checkbox"/> NP(1)
Unwanted Emissions into Non-Restricted Frequency Bands	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA()	<input type="checkbox"/> NP(1)
AC Power Line Conducted Emission	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input checked="" type="checkbox"/> NA(2)	<input type="checkbox"/> NP(1)
Unwanted Emissions into Restricted Frequency Bands	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(1)
Receiver Radiated emissions	<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

Exemple d'information pour la qualification d'une gamme, dans le cas ou l'option full option a été testé

-Tests are performed on the most complete product **IJINUS**, SN: **IJA0102-0000 0111**. See Table below for difference between products.

We, IJINUS, declare that all the following products (PMNs) are based on the same electronics card and same mechanical basis. The products are electrically based on a mother board shared by all the A0102 products. This mother board manages the global control, the memory, and the ISM radio short range communication. Depending on the needed functionalities different peripherals can be added to the common basis.

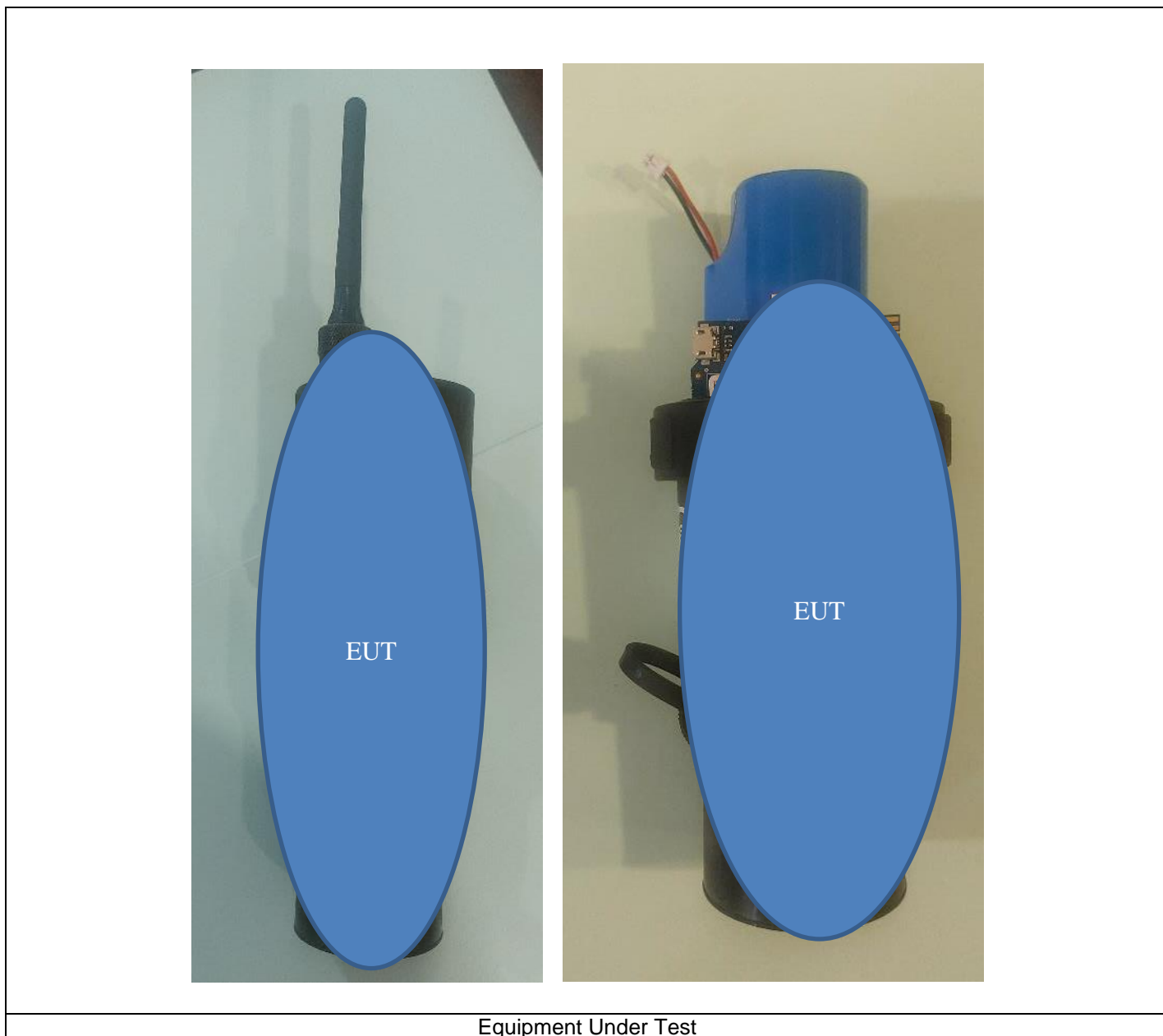
Below are listed the specific features of all the PMNs:

<b>PMN</b>	<b>Features added to the common basis</b>
LNU06V4	Level ultrasonic sensor (6m max)
LNU10V4	Level ultrasonic sensor (10m max)
CNU06V4	Level ultrasonic sensor (6m max) with 4-20mA output
CNU10V4	Level ultrasonic sensor (10m max) with 4-20mA output
LOGAZV4	Gas concentration sensor
LP025V4	Pressure sensor
BANV4	Electrochemical sensor (housing surrounded by a buoy)
LOG03V4	Datalogger with Digital and 4-20mA inputs
LOG04V4	Datalogger with Digital and RS485 inputs
LOG09V4	Datalogger with Digital, 4-20mA and RS485 inputs
LOG10V4	Level sensor with external ultrasonic probe

2.2. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

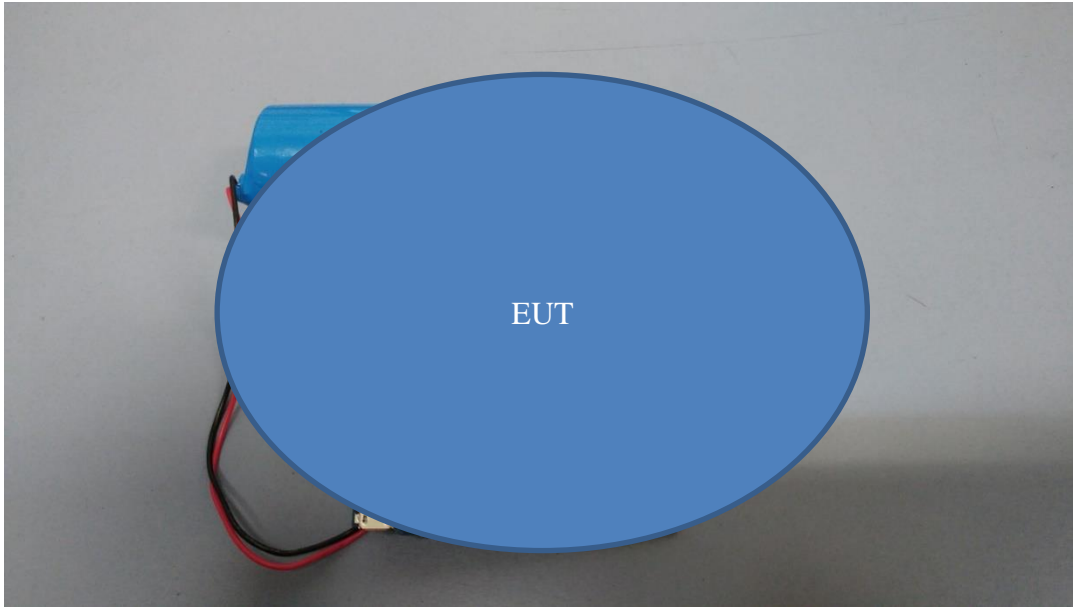
Equipment under test (EUT):  
IJINUS A0102

Serial Number: IJA0102-0000 0111





L C I E



Equipment Under Test

**Power supply:**

Name	Type	Rating	Reference / Sn	Comments
Supply1	<input type="checkbox"/> AC <input type="checkbox"/> DC <input checked="" type="checkbox"/> Battery	3.6V	FANSO ER34615H-2+1025	

**Inputs/outputs - Cable:**

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Auxiliary equipment used during test:**

Type	Reference	Sn	Comments
-	-	-	-


**Equipment information:**

Type:			
Chipset Ref :			
Frequency band:	[902 – 928] MHz		
Number of Channel:	1 (914.8MHz)		
Spacing channel:	- MHz		
Channel bandwidth:	0,6 MHz		
Antenna Type:	<input type="checkbox"/> Integral	<input checked="" type="checkbox"/> External	<input type="checkbox"/> Dedicated
Antenna connector:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Temporary for test
Antenna Requirements §15.203	The transmitter uses an integral antenna with a u.fl connector which is classified as a unique connector		
Transmit chains:	<input checked="" type="checkbox"/> 1	<input type="checkbox"/> 2	
Receiver chains	<input checked="" type="checkbox"/> 1	<input type="checkbox"/> 2	
Type of equipment:	<input checked="" 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 checked="" type="checkbox"/> Multiple orientations
Ad-Hoc mode:	<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No
Duty cycle:	<input checked="" type="checkbox"/> Continuous duty	<input type="checkbox"/> Intermittent duty	<input checked="" type="checkbox"/> 100% duty
Equipment type:	<input checked="" type="checkbox"/> Production model		<input type="checkbox"/> Pre-production model
Operating temperature range:	Tnom:	20°C	
Type of power source:	<input type="checkbox"/> AC power supply	<input type="checkbox"/> DC power supply	<input checked="" type="checkbox"/> Battery
Operating voltage range:	Vnom:	<input type="checkbox"/> 120V/60Hz	<input checked="" type="checkbox"/> 3.6 VDC
		<input type="checkbox"/> 240V/50Hz	<input type="checkbox"/> X VDC

Antenna Characteristic			
Antenna assembly	Gain (dBi)	Frequency Band (MHz)	Impedance(Ω)
1	0	900MHz to 930MHz	50

CHANNEL PLAN	
Channel	Frequency (MHz)
Cmid	914.8

Modulation Type	Worst Case Modulation
GFSK	<input checked="" type="checkbox"/>

Hardware information		
Software (if applicable):	V. :	-





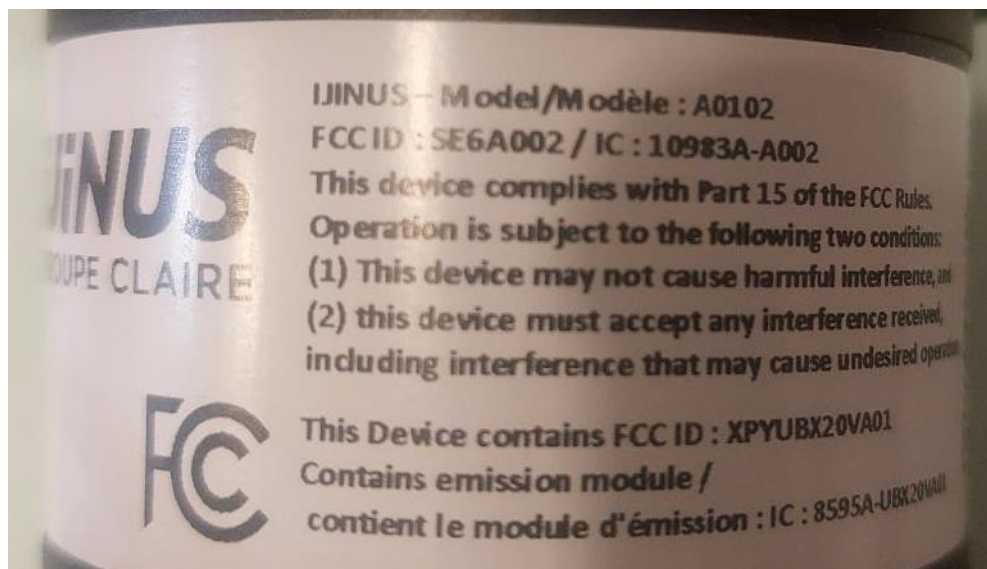
### 2.3. RUNNING MODE

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	Running mode	
Occupied Bandwidth	<input checked="" type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
6dB Bandwidth	<input checked="" type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Duty Cycle	<input checked="" type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Maximum Conducted Output Power	<input checked="" type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Power Spectral Density	<input checked="" type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Conducted Spurious Emission at the Band Edge	<input checked="" type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Unwanted Emissions into Non-Restricted Frequency Bands	<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()
Unwanted Emissions into Restricted Frequency Bands	<input checked="" type="checkbox"/> Test mode 1 (1)	<input type="checkbox"/> Alternative test mode()
Receiver Radiated emissions	<input type="checkbox"/> Test mode 2 (1)	<input checked="" type="checkbox"/> Alternative test mode(1)

- (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.

## 2.4. PMENT LABELLING



## 2.5. EQUIPMENT MODIFICATION

None       Modification:

- Changed power setting from : Power 0: [16 dBm] to Power 2: [12 dBm]

## 2.6. 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.

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



## 2.7. 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. OCCUPIED BANDWIDTH

#### 3.1. TEST CONDITIONS

Test performed by : Julien Palard  
Date of test : January 27, 2022  
Ambient temperature : 24 °C  
Relative humidity : 41 %

#### 3.2. TEST SETUP

- The Equipment Under Test is installed:

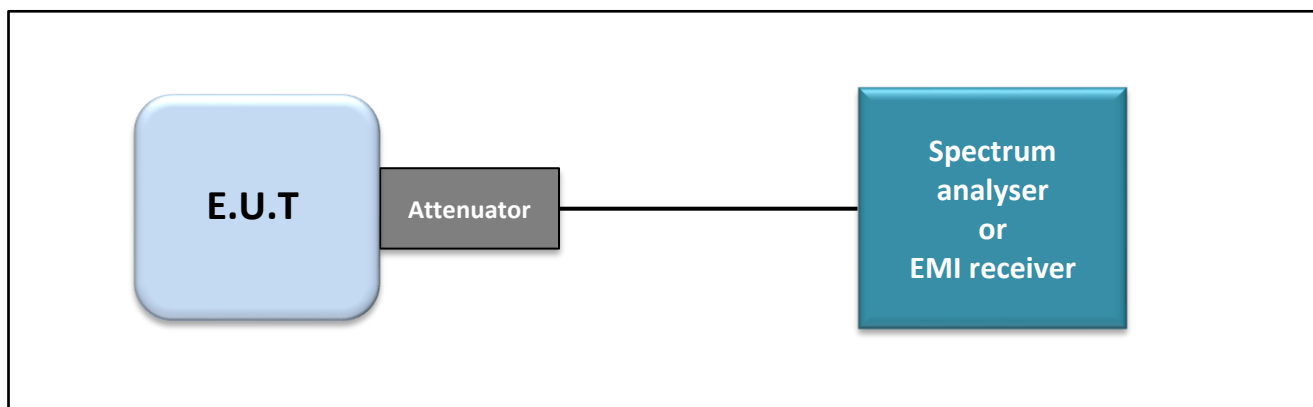
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

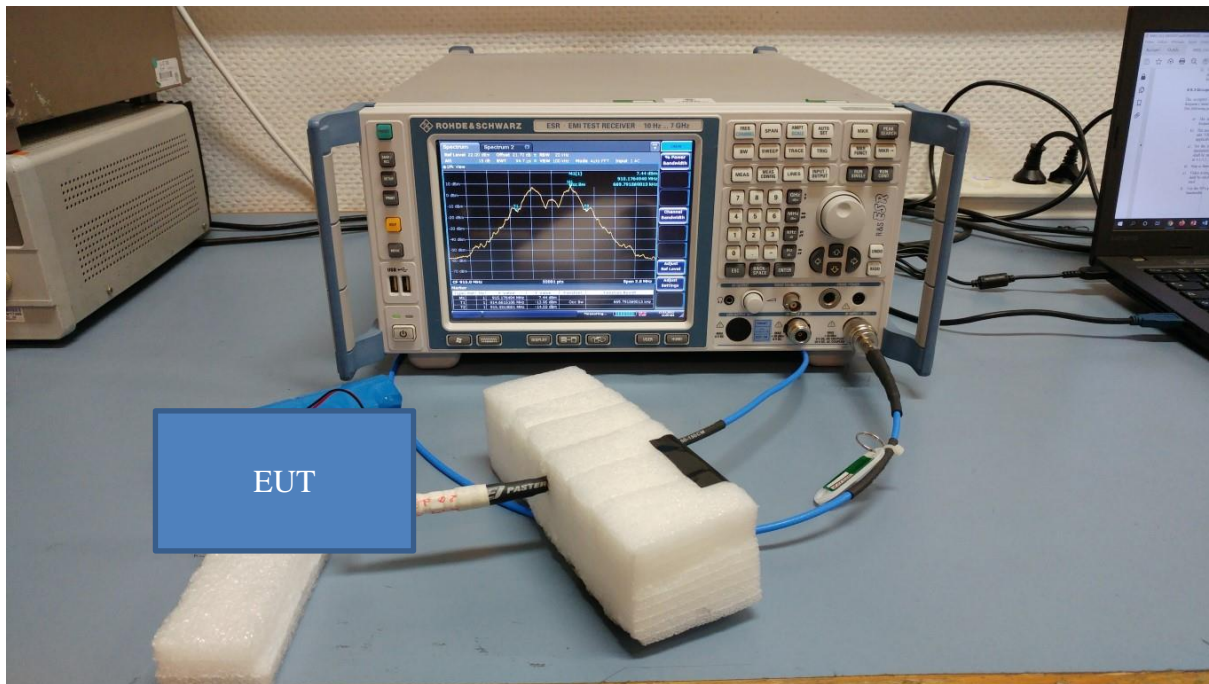
- Conducted Method
- Radiated Method

- Test Procedure:

- RSS-Gen Issue 5 § 6.7
- ANSI C63.10 § 6.9.2



Test set up of Occupied Bandwidth



Photograph for Occupied bandwidth

### 3.3. LIMIT

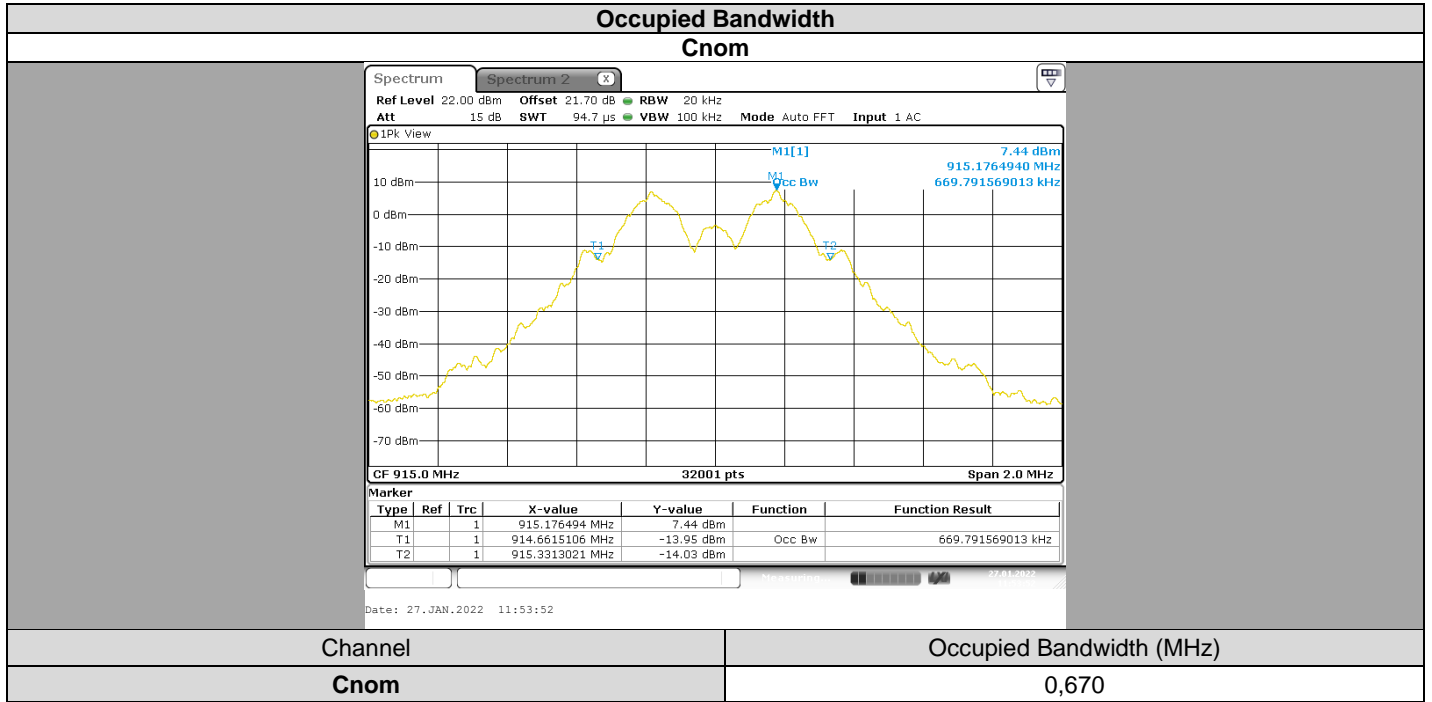
None

### 3.4. TEST EQUIPMENT LIST

Apparatus	Trade Mark	Type	Registration number	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329973	2020/09	2022/09
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2021/04	2023/04

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

### 3.5. RESULTS



### 3.6. CONCLUSION

Occupied Channel Bandwidth measurement performed on the sample of the product **IJINUS A0102**, SN: **IJA0102-0000 0111**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS-GEN ISSUE 5** limits.

## 4. 6dB EMISSION BANDWIDTH

### 4.1. TEST CONDITIONS

Test performed by : Julien Palard  
Date of test : January 27, 2022  
Ambient temperature : 24 °C  
Relative humidity : 41 %

### 4.2. TEST SETUP

- The Equipment Under Test is installed:

- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

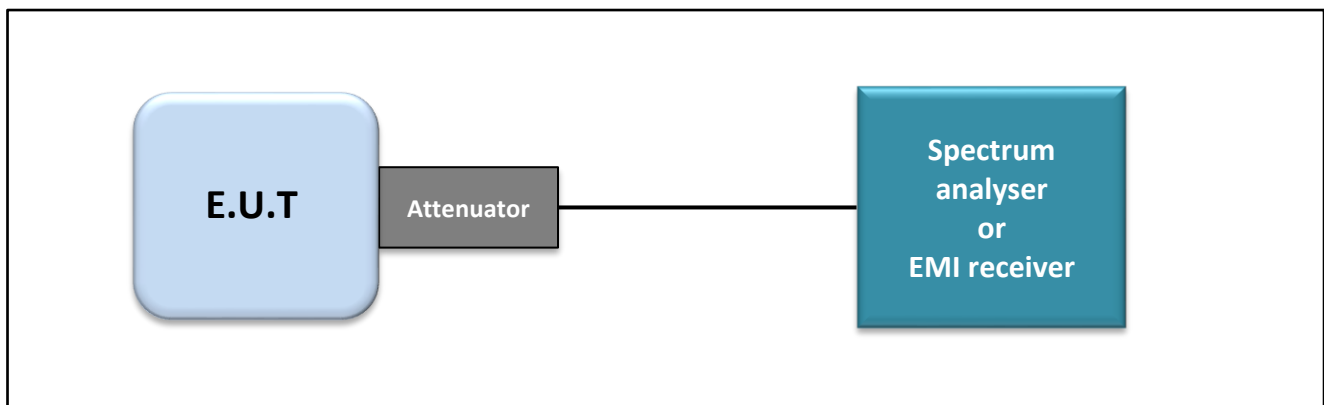
- Conducted Method
- Radiated Method

- Test Procedure:

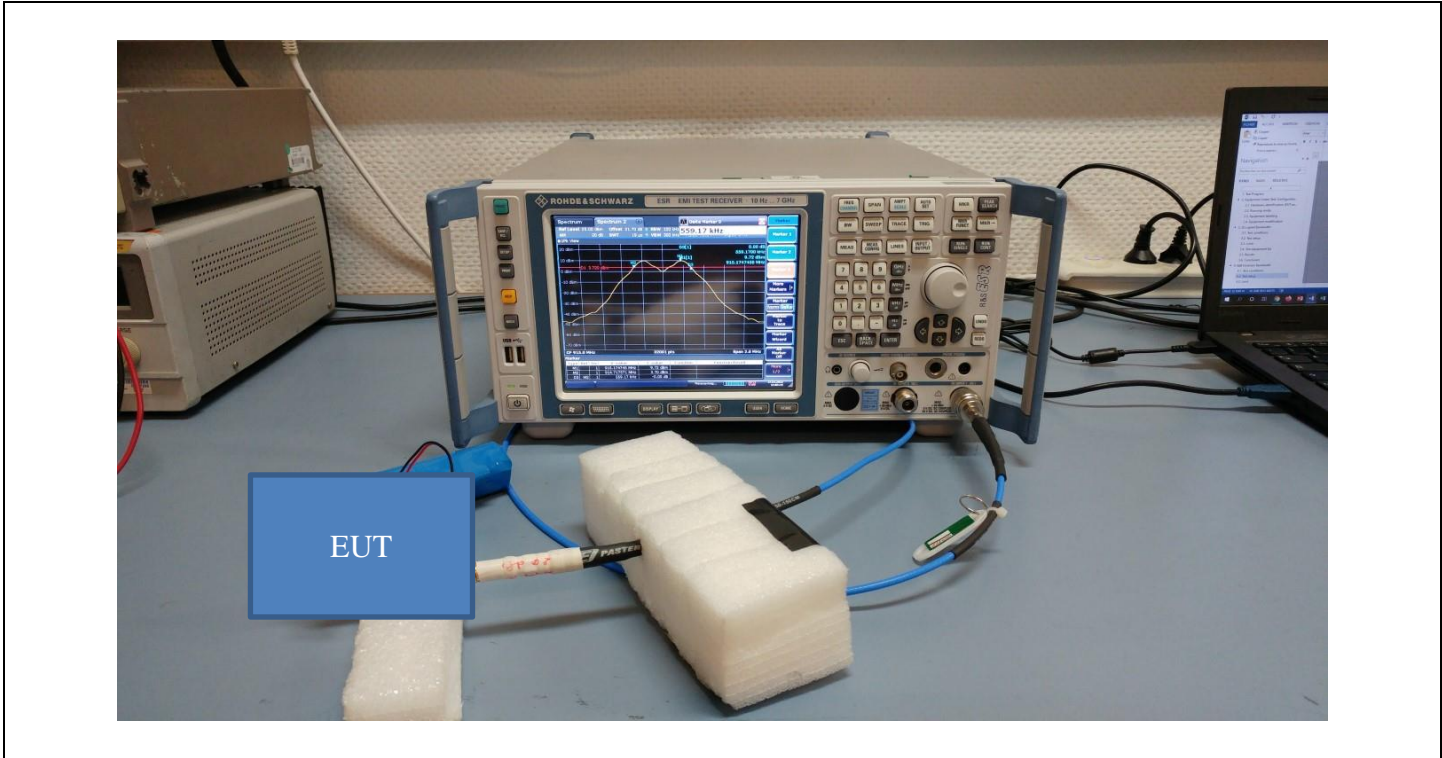
- ANSI C63.10 § 11.8.1
- ANSI C63.10 § 11.8.2

#### **Measurement Procedure:**

1. Set resolution bandwidth (RBW) = 100kHz.
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. Compare the resultant bandwidth with the RBW setting of the analyzer.



Test set up of 6dB Emission Bandwidth



Photograph for 6dB emission bandwidth

**4.3. LIMIT**

<b>Frequency range</b> 2400MHz to 2483.5MHz	<b>The 6dB bandwidth Limit</b> ≥ 500kHz
--	--

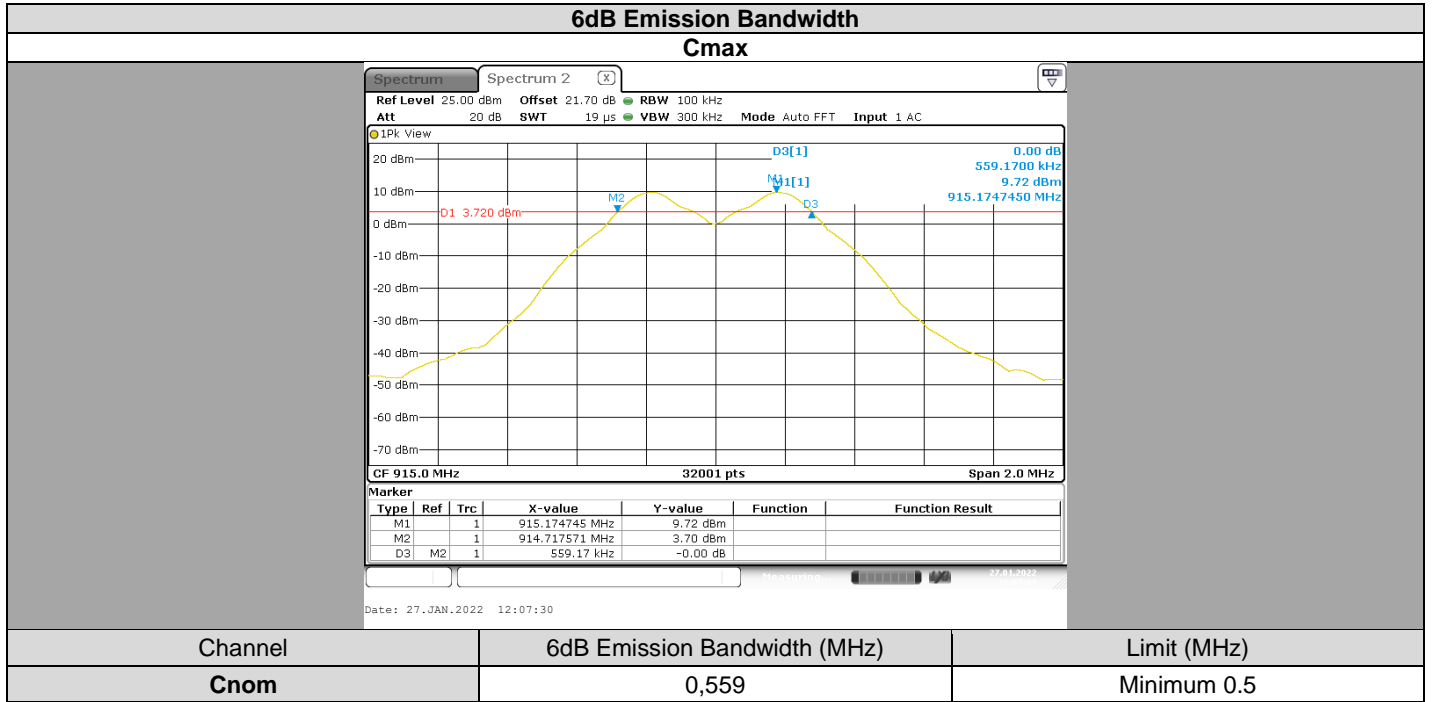
**4.4. TEST EQUIPMENT LIST**

Apparatus	Trade Mark	Type	Registration number	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329973	2020/09	2022/09
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2021/04	2023/04

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



#### 4.5. RESULTS



#### 4.6. CONCLUSION

6dB Emission Bandwidth measurement performed on the sample of the product **IJINUS A0102**, SN: **IJA0102-0000 0111**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

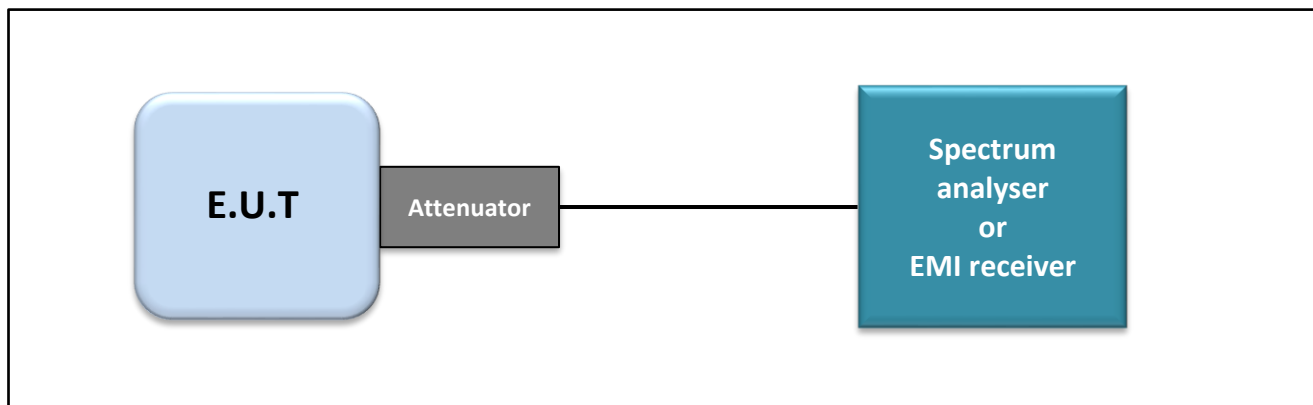
## 5. DUTY CYCLE

### 5.1. TEST CONDITIONS

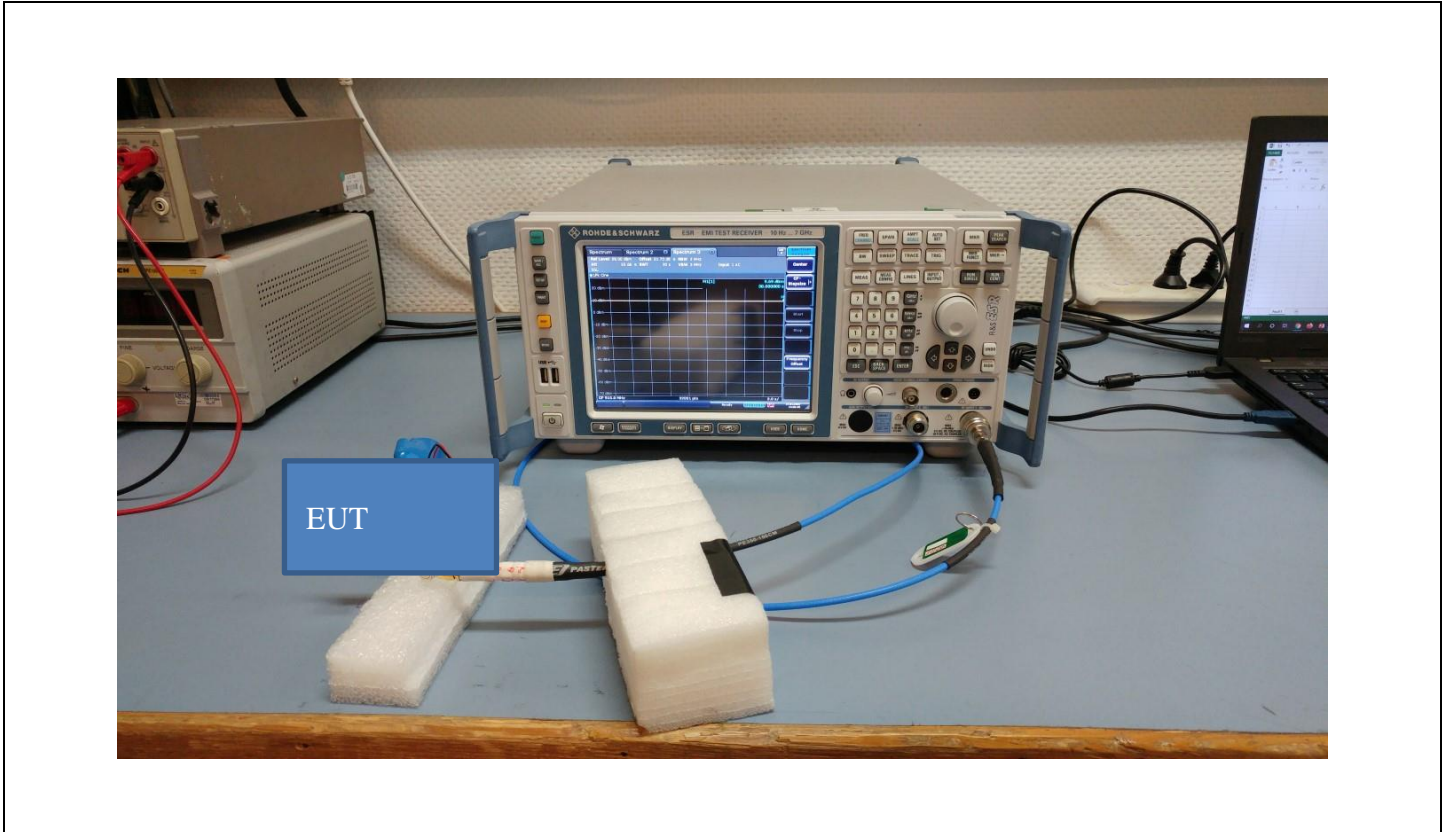
Test performed by : Julien Palard  
Date of test : January 27, 2022  
Ambient temperature : 24 °C  
Relative humidity : 41 %

### 5.2. TEST SETUP

- The Equipment Under Test is installed:
  - On a table
  - In an anechoic chamber
- Measurement is performed with a spectrum analyzer in:
  - Conducted Method
  - Radiated Method
- Test Procedure:
  - ANSI C63.10 § 11.6



Test set up of Duty Cycle



Photograph for Duty Cycle

**5.3. LIMIT**

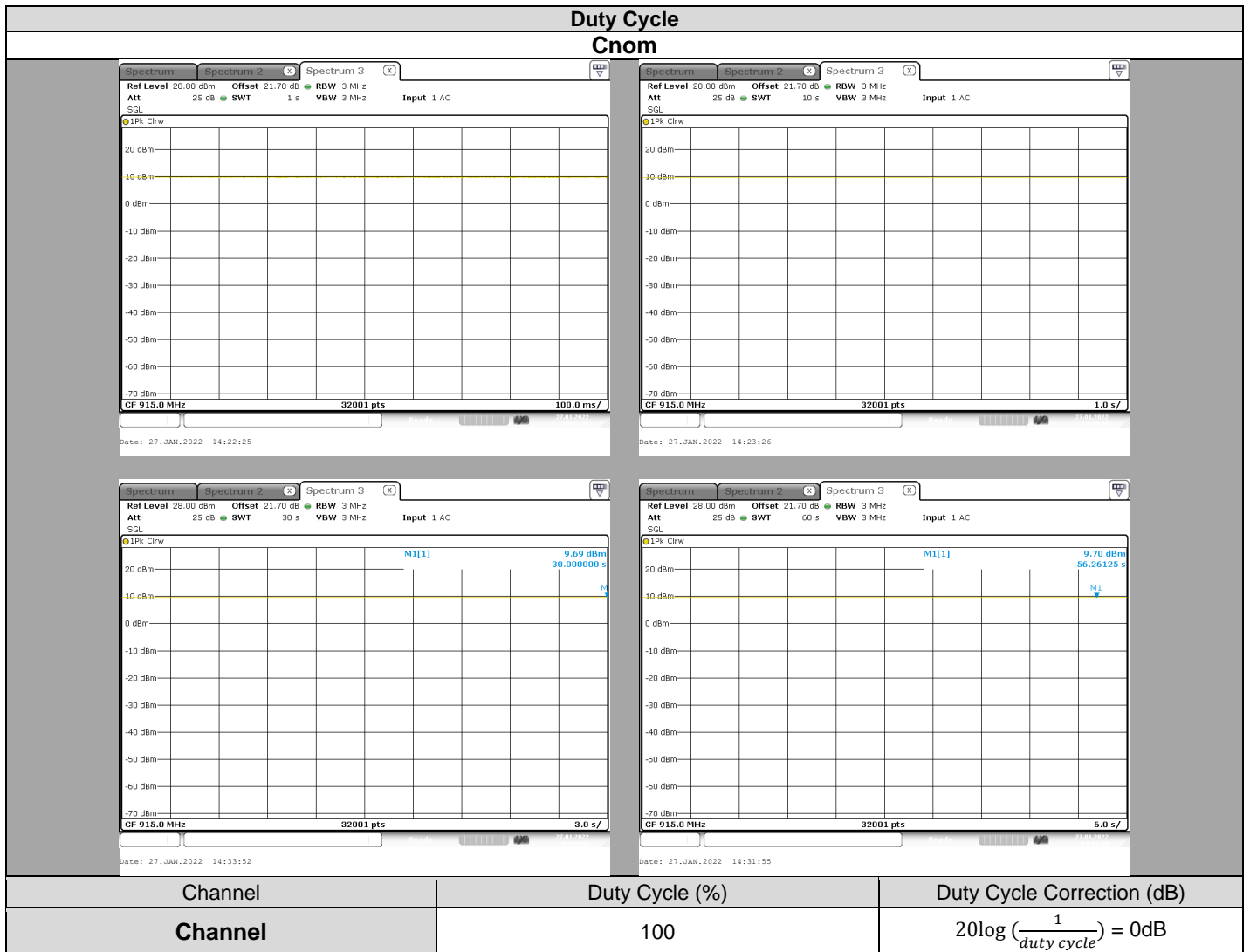
None

**5.4. TEST EQUIPMENT LIST**

Apparatus	Trade Mark	Type	Registration number	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329973	2020/09	2022/09
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2021/04	2023/04

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

## 5.5. RESULTS



## 5.6. CONCLUSION

Duty Cycle measurement performed on the sample of the product **IJINUS A0102**, SN: **IJA0102-0000 0111**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

## 6. MAXIMUM CONDUCTED OUTPUT POWER

### 6.1. TEST CONDITIONS

Test performed by : Julien Palard  
Date of test : January 27, 2022  
Ambient temperature : 24 °C  
Relative humidity : 41 %

### 6.2. TEST SETUP

- The Equipment Under Test is installed:

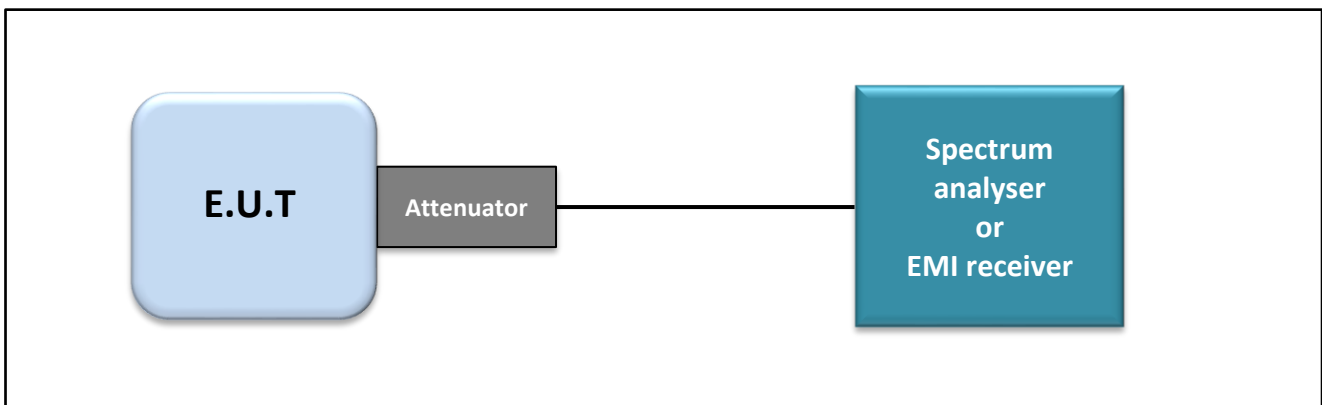
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

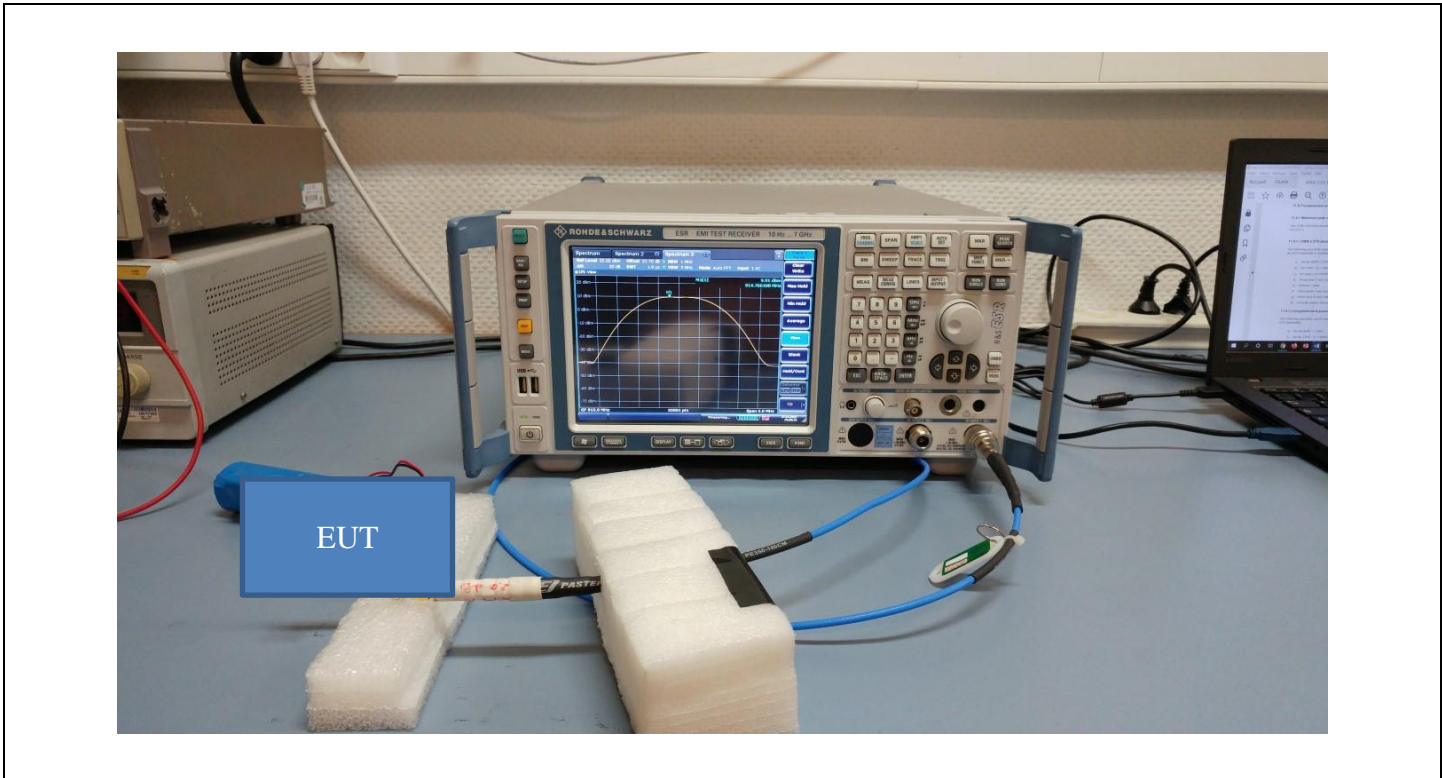
- Conducted Method
- Radiated Method

- Test Procedure:

- ANSI C63.10 § 11.9.1.1
- ANSI C63.10 § 11.9.1.2
- ANSI C63.10 § 11.9.2.2.2 (Method AVGSA-1)
- ANSI C63.10 § 11.9.2.2.4 (Method AVGSA-2)



Test set up of Maximum Conducted Output Power



Photograph for Maximum Conducted Output Power

### 6.3. LIMIT

Frequency range	Maximum Conducted Output Power
2400MHz to 2483.5MHz	≤30dBm*

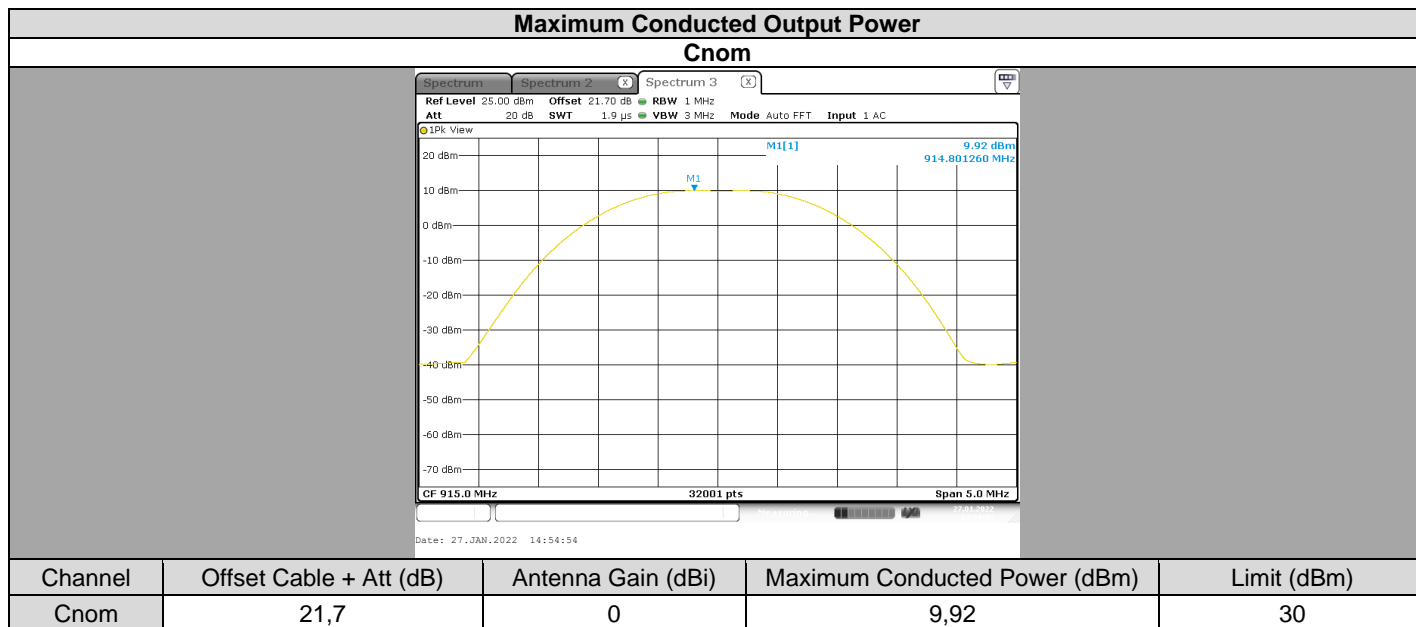
\*Remark: Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

### 6.4. TEST EQUIPMENT LIST

Apparatus	Trade Mark	Type	Registration number	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329973	2020/09	2022/09
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2021/04	2023/04

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

## 6.5. RESULTS



## 6.6. CONCLUSION

Maximum Conducted Output Power measurement performed on the sample of the product **IJINUS A0102**, SN: **IJA0102-0000 0111**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

## 7. POWER SPECTRAL DENSITY

### 7.1. TEST CONDITIONS

Test performed by : Julien Palard  
Date of test : January 27, 2022  
Ambient temperature : 24 °C  
Relative humidity : 41 %

### 7.2. TEST SETUP

- The Equipment Under Test is installed:

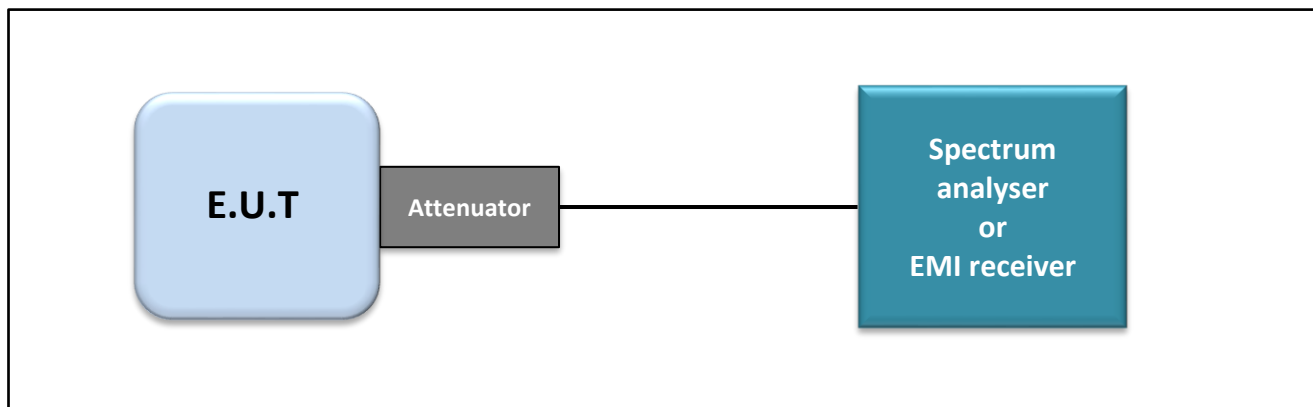
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- Conducted Method
- Radiated Method

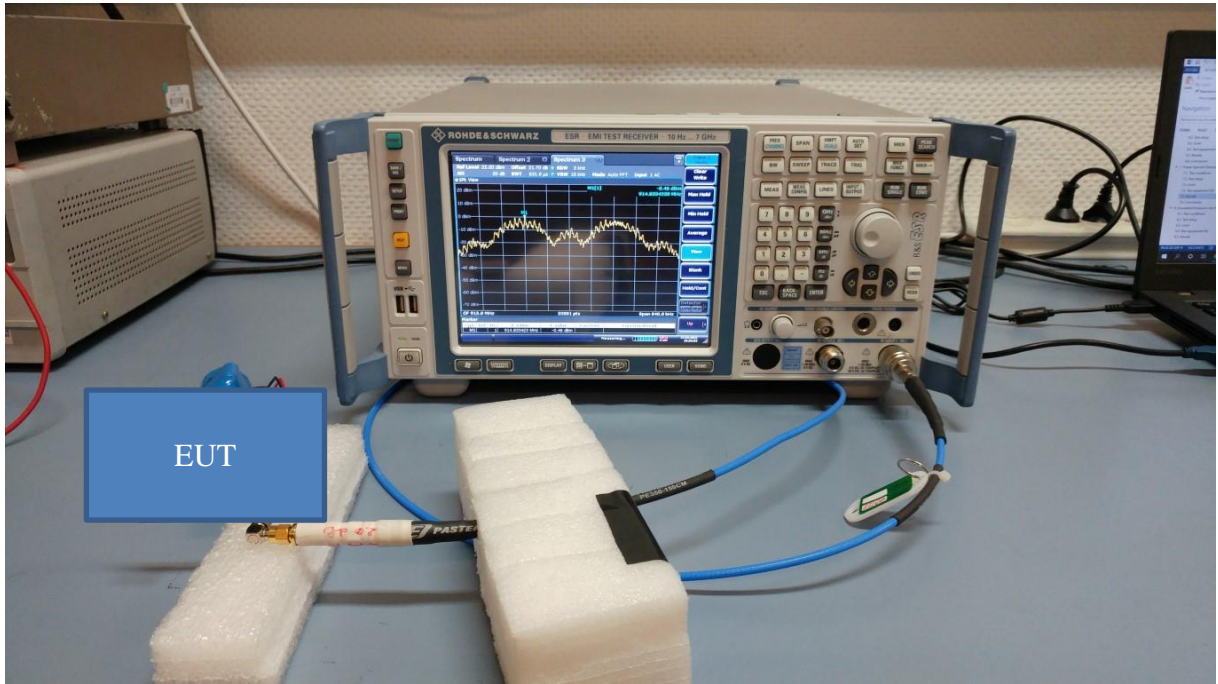
- Test Procedure:

- ANSI C63.10 § 11.10.2 (Method PKPSD)
- ANSI C63.10 § 11.10.3 (Method AVGPSD-1)



Test set up of Power Spectral Density





Photograph for Power Spectral Density

### 7.3. LIMIT

Frequency range	Power Spectral Density
2400MHz to 2483.5MHz	≤8dBm/3kHz*

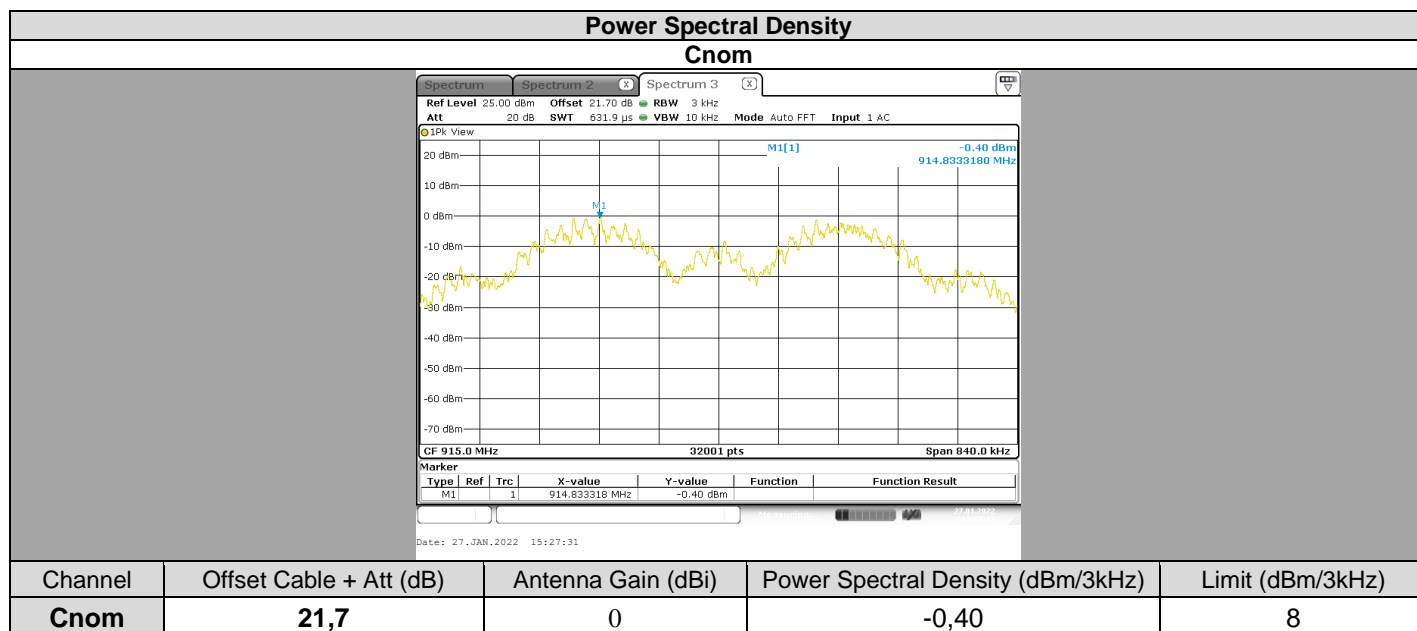
\*Remark: Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

### 7.4. TEST EQUIPMENT LIST

Apparatus	Trade Mark	Type	Registration number	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329973	2020/09	2022/09
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2021/04	2023/04

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

## 7.5. RESULTS



## 7.6. CONCLUSION

Power Spectral Density measurement performed on the sample of the product **IJINUS A0102**, SN: **IJA0102-0000 0111**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

## 8. UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS AT THE BAND EDGE

### 8.1. TEST CONDITIONS

Test performed by : Julien Palard  
Date of test : January 27, 2022  
Ambient temperature : 24 °C  
Relative humidity : 41 %

### 8.2. TEST SETUP

- The Equipment Under Test is installed:

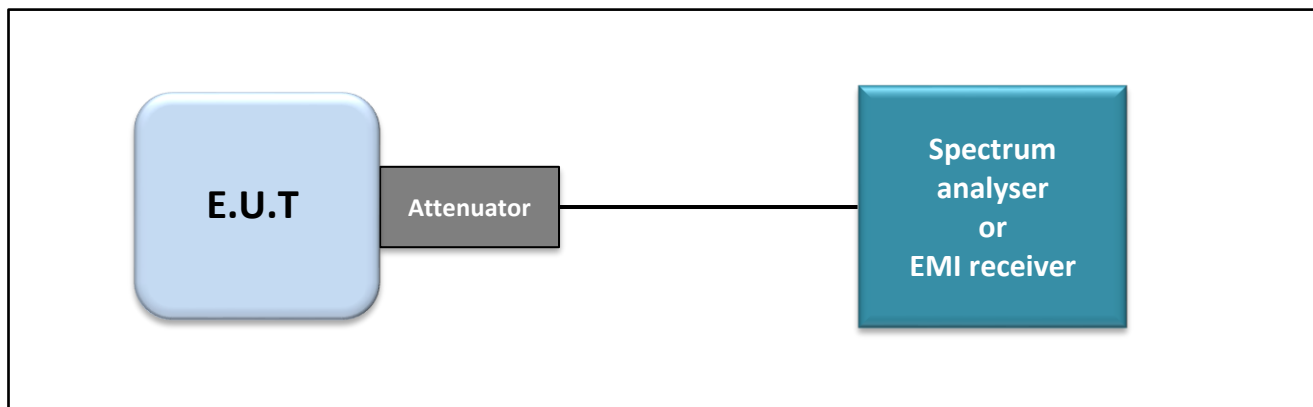
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

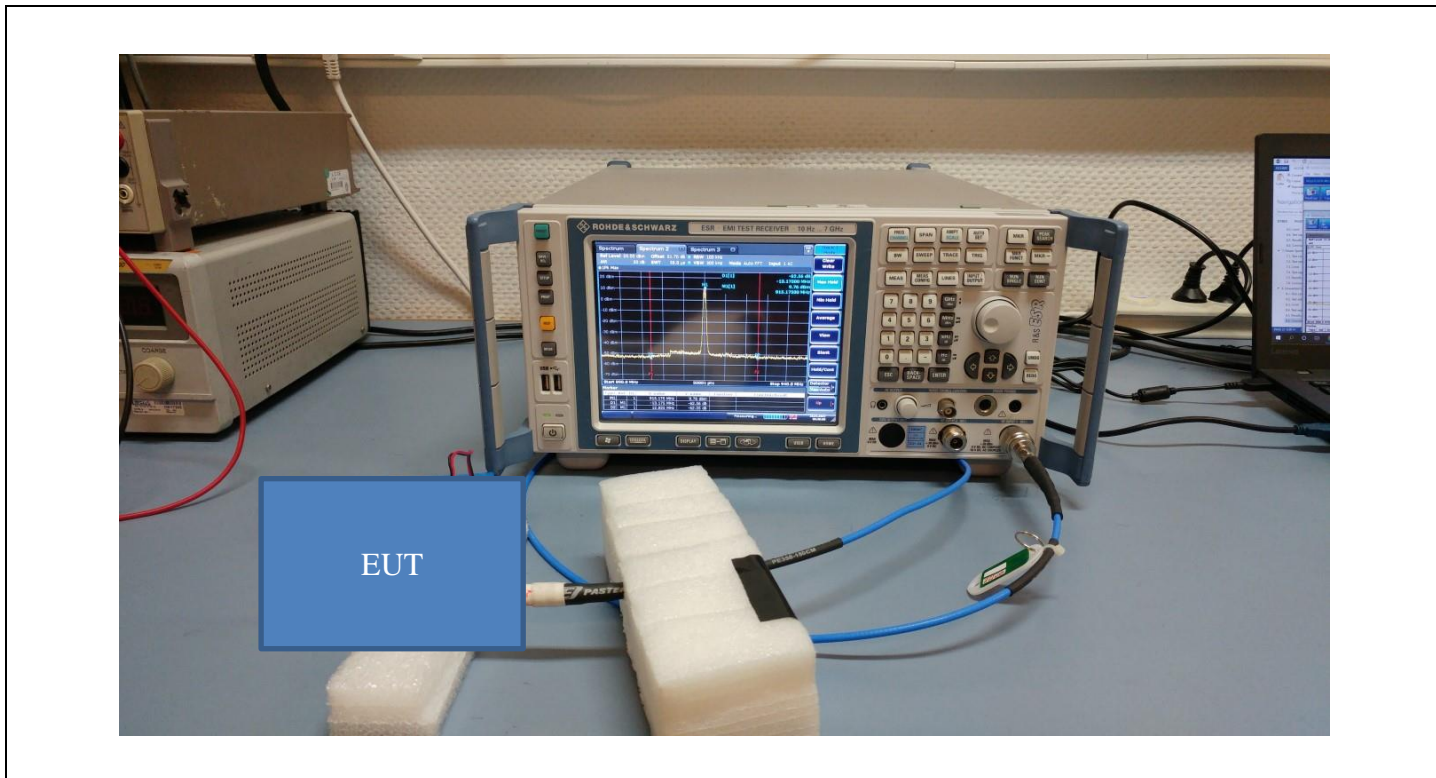
- Conducted Method
- Radiated Method

- Test Procedure:

- ANSI C63.10 § 11.11



Test set up of Unwanted Emissions into Non-Restricted Frequency Bands at the Band Edge



Photograph for Unwanted Emission into non-restricted frequency bands at the band edge

### 8.3. LIMIT

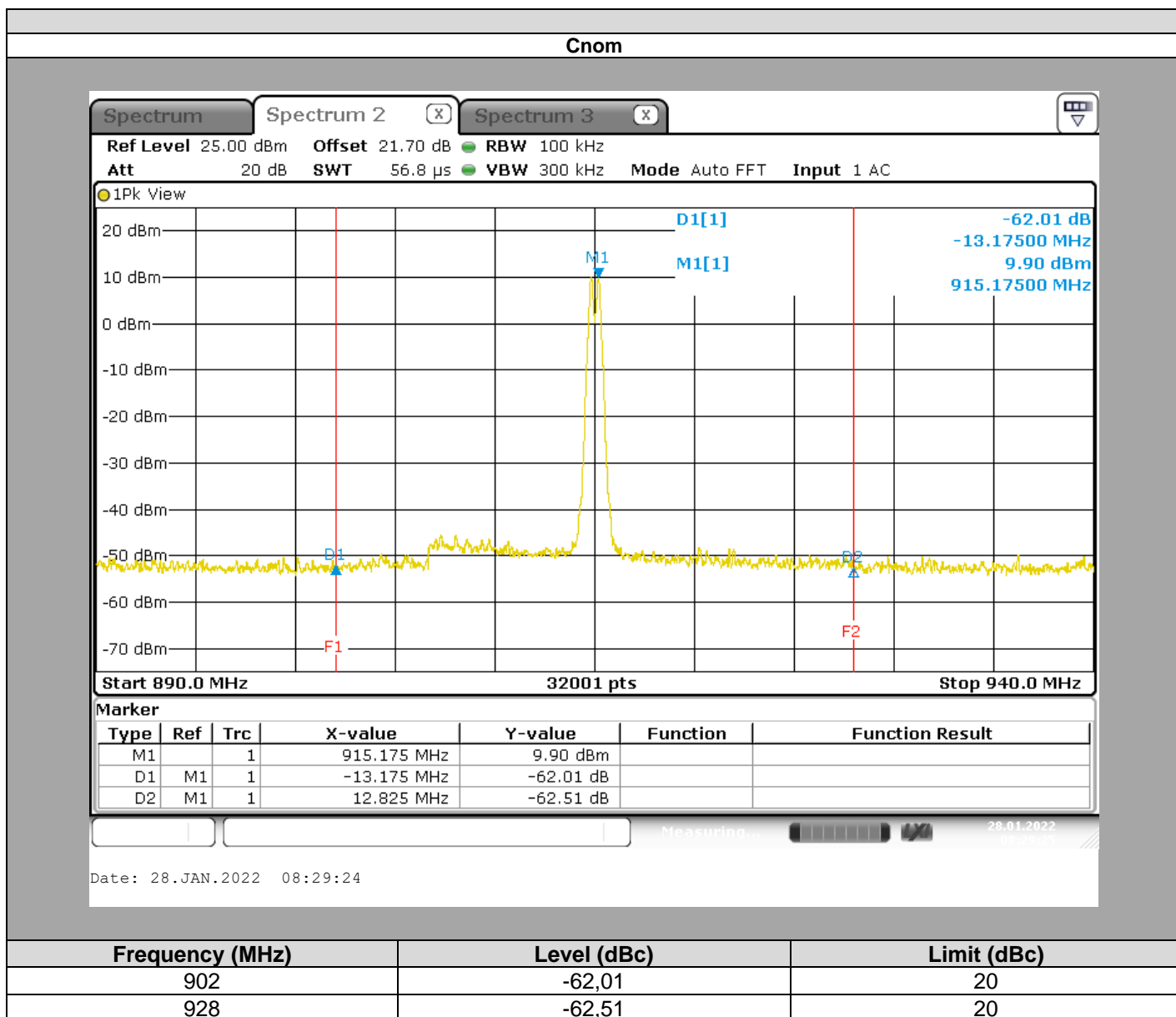
All Spurious Emissions must be at least 20dB (Maximum Conduced Power) below the Fundamental Radiator Level at the Band Edge “902MHz & 928MHz”

### 8.4. TEST EQUIPMENT LIST

Apparatus	Trade Mark	Type	Registration number	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNAK	PE350-150CM	A5329973	2020/09	2022/09
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2021/04	2023/04

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

## 8.5. RESULTS



## 8.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands at the band edge measurement performed on the sample of the product **IJINUS A0102**, SN: **IJA0102-0000 0111**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

## 9. UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS

### 9.1. TEST CONDITIONS

Test performed by : Julien Palard  
Date of test : January 27, 2022  
Ambient temperature : 24 °C  
Relative humidity : 41 %

### 9.2. TEST SETUP

- The Equipment Under Test is installed:

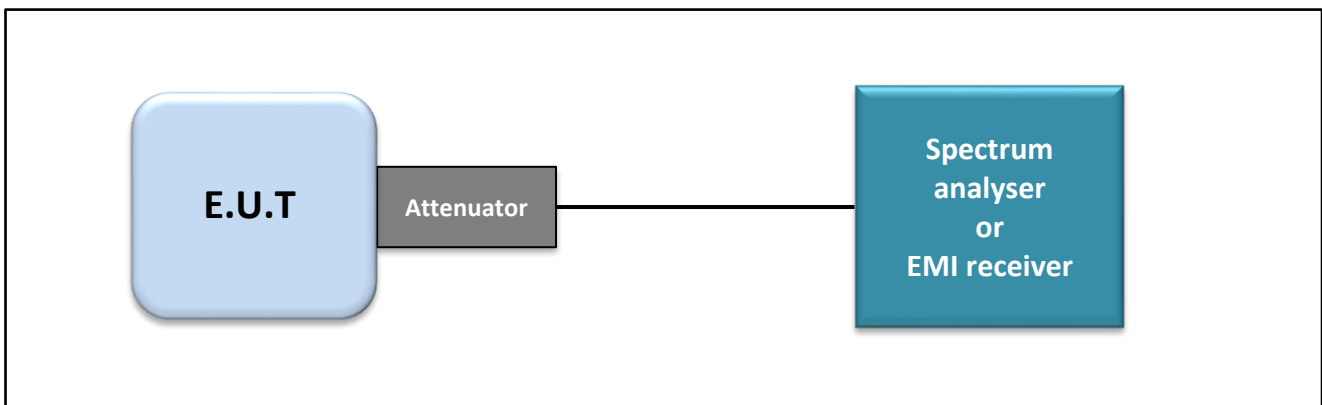
- On a table
- In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

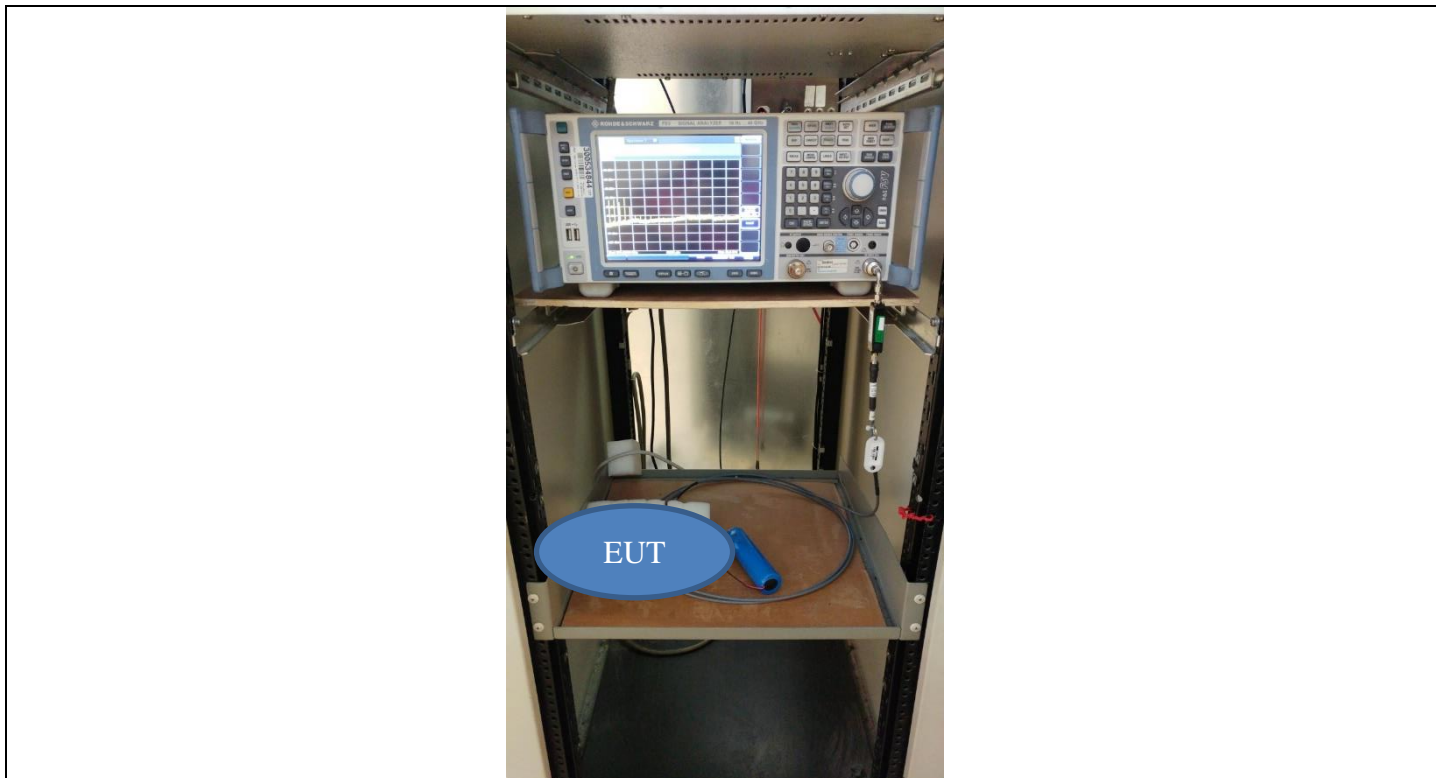
- Conducted Method
- Radiated Method

- Test Procedure:

- ANSI C63.10 § 11.11



Test set up of Unwanted Emissions into Non-Restricted Frequency Bands



Photograph for Unwanted Emission into non-restricted frequency bands

### 9.3. LIMIT

All Spurious Emissions must be at least 20dB (Maximum Conduced Power) below the Fundamental Radiator Level

### 9.4. TEST EQUIPMENT LIST

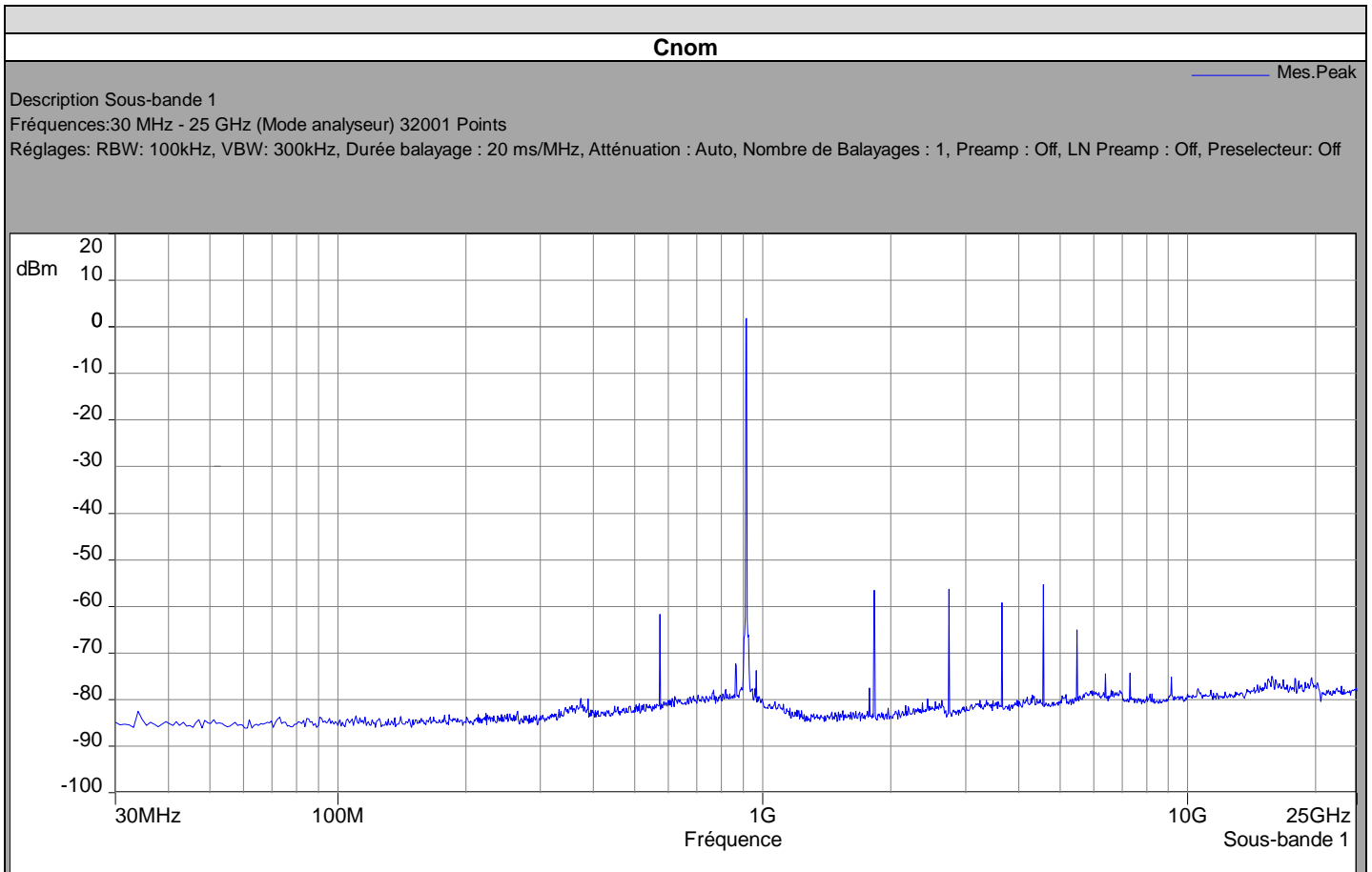
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
BAT EMC Software	NEXIO	Version 3,19,1,18	-	-	-
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2019/12	2021/12
Cable S36 chamber	PASTERNAK	PE360-3000CM	A5329961	2021/02	2022/02
Attenuator 3dB Cable Spurious Conducted	-	WA54-3-12	A7122223	2021/09	2023/09
High Pass Filter 868MHz	WAINWRIGHT	WHKX12-935	A7484069	2021/12	2023/12

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



L C I E

## 9.5. RESULTS



Frequency (MHz)	Level (dBm)	Level (dBc)	Limit (dBc)
915	1,8		
573	-61,6	63,4	20
864	-72,3	74,1	20
964	-74,8	76,6	20
1830	-56,5	58,3	20
2745	-56,4	58,2	20
3660	-59,2	61	20
4574	-55,3	57,1	20
5490	-65,2	67	20
6404	-74,4	76,2	20
7321	-74,4	76,2	20
9152	-75,1	76,9	20





## 9.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands measurement performed on the sample of the product **IJINUS A0102**, SN: **IJA0102-0000 0111**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

## 10. UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

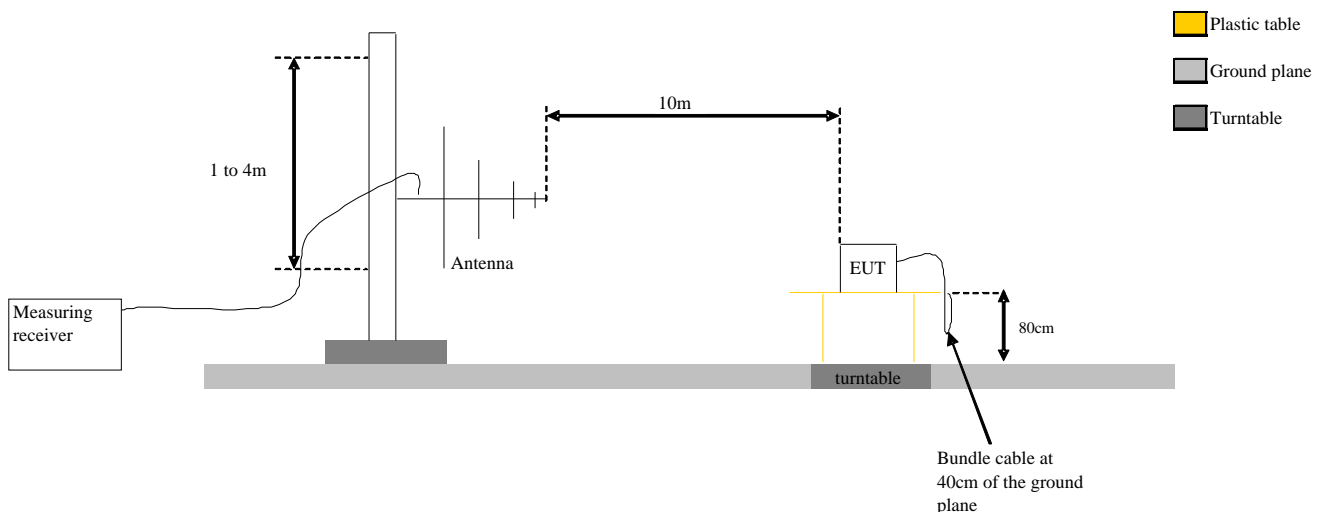
### 10.1. TEST CONDITIONS

Test performed by : Laurent DENEUX  
 Date of test : January 21, 2022 to January 24, 2022  
 Ambient temperature : 18 °C  
 Relative humidity : 45 %

### 10.2. TEST SETUP

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

Frequency range :	Below 30MHz	From 30MHz to 1GHz	Above 1GHz
Antenna Polarization :	Parallel, Perpendicular And Ground parallel	Horizontal And Vertical	Horizontal And Vertical
Antenna Height :	1m	Varied from 1m to 4m	Varied from 1m to 4m
Antenna Type :	Loop	Bi-Log	Horn
RBW Filter :	200Hz below 150kHz 9kHz above 150kHz	120kHz	1MHz
Maximization :	Turntable rotation of 360 degrees range		
EUT height :	0.8m		1.5m
Test site :	Open Aera Test Site	Semi-Anechoic Chamber	Open Aera Test Site
Distance EUT-Antenna :	3m	10m	10m



Test Set up for radiated measurement in open area test site



Photograph for Unwanted Emission in restricted frequency bands



Photograph for Unwanted Emission in restricted frequency bands



### 10.3. 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

### 10.4. TEST EQUIPMENT LIST

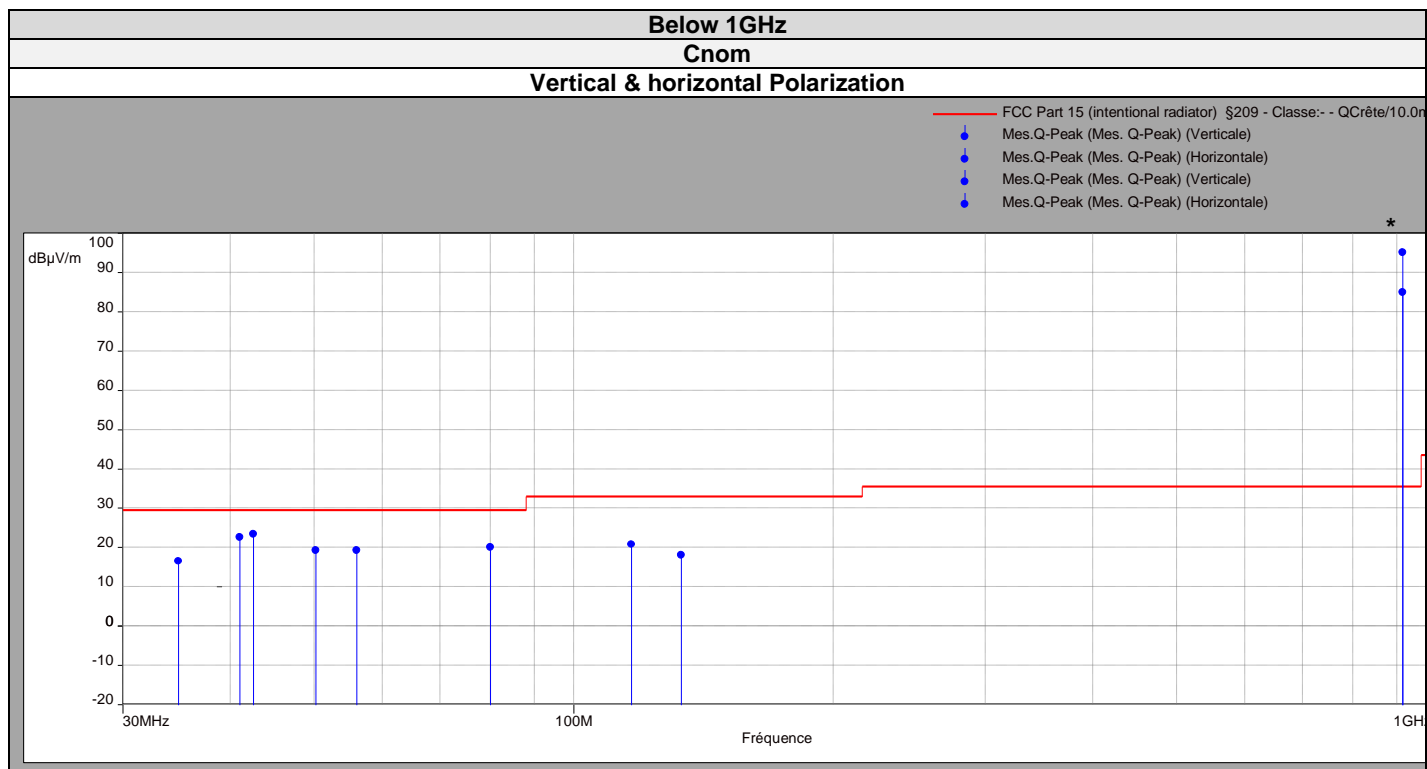
Description	Manufacturer	Model	Identifier	Last Calibration date	Calibration due date
Open test site	LCIE	-	F2000400	2021-02	2022-02
EMI Test Receiver	ROHDE & SCHWARZ	ESU	A2642018	2020-10	2022-10
Cable	-	-	A5329416	2021-02	2022-02
Cable	-	-	A5329442	2021-11	2022-11
Loop antenna	R&S	HFH2-Z2	C2040269	2020-09	2022-09
Preamplifier	R&S	8449B	A4069002	2020-09	2022-09
Horn antenna	EMCO	3115	C2042016	2020-04	2023-04
Cable	-	-	A5329542	2021-11	2022-11
Antenne bilog	CHASE	CBL 6112A	C2040040	2021-04	2022-04
Cable	-	-	A5329876	2021-12	2022-12
Cable	-	-	A5329449	2021-11	2022-11

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

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

None       Divergence:

**10.6. RESULTS**



\*Transmitter frequency



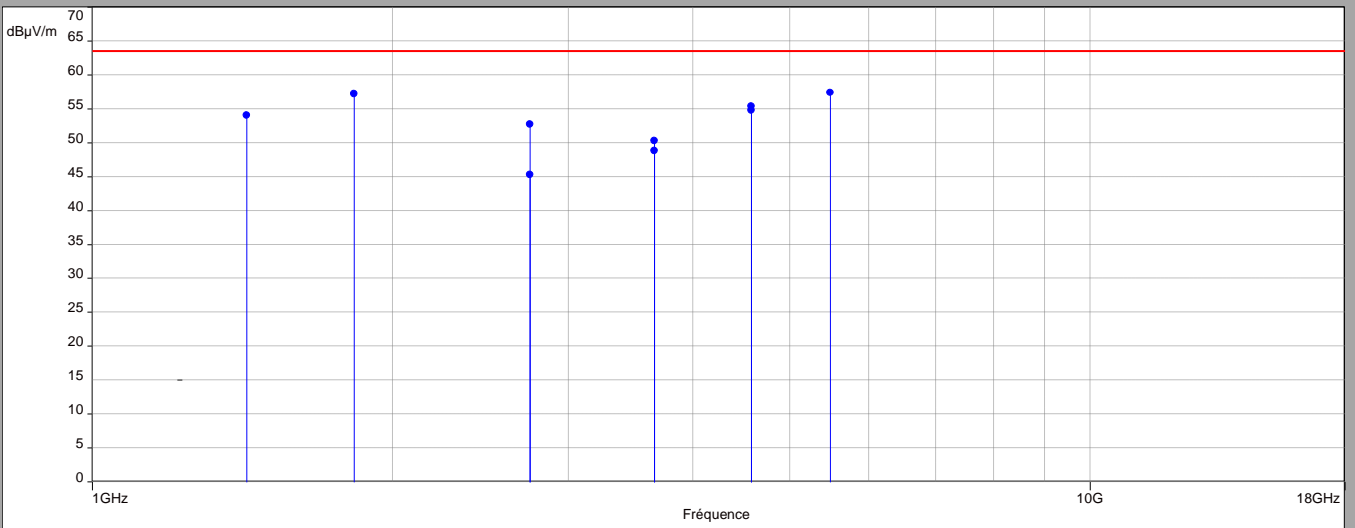
L C I E

Above 1GHz

Cnom

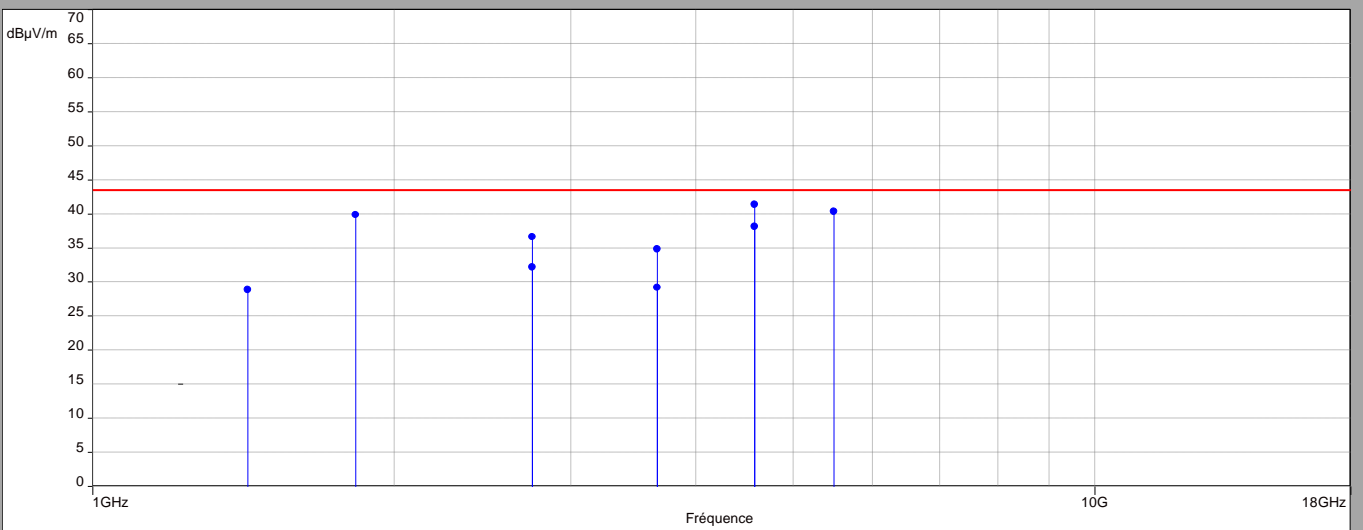
Vertical & horizontal Polarization

- FCC Part 15 (intentional radiator) §209 - Classe:- - Crête/10.0m/
- Mes.Peak (Mes. peak) (Verticale)
- Mes.Peak (Mes. peak) (Horizontale)



Vertical & horizontal Polarization

- FCC Part 15 (intentional radiator) §209 - Classe:- - Moyenne/10.0m/
- Mes.Avg (Mes. Avg) (Verticale)
- Mes.Avg (Mes. Avg) (Horizontale)



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

Below 1GHz					
Polarization	Frequency (MHz)	Peak Level (dBµV/m)	QPeak Level (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)
Vertical	34.8	-	16.52	29.5	12.98
Vertical	41	-	22.58	29.5	6.92
Vertical	42.5	-	23.36	29.5	6.14
Vertical	50.17403846	-	19.21	29.5	10.29
Vertical	56.00448718	-	19.29	29.5	10.21
Vertical	80	-	20.07	29.5	9.43
Horizontal	116.7	-	20.9	33	12.1
Horizontal	133.3358974	-	18.08	33	14.92

Above 1GHz								
Cnom								
Polarization	Frequency (MHz)	Average Level (dBµV/m)	Average Level + Duty Cycle Factor (dBµV/m)	Average Limit (dBµV/m)	Average Margin Level (dBµV/m)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin Level (dBµV/m)
Vertical	1428.5	28.87	28.87	43.5	14.63	54.06	63.5	9.44
Vertical	1829.6	39.88	39.88	43.5	3.62	57.21	63.5	6.29
Vertical	2745.508	32.17	32.17	43.5	11.33	45.29	63.5	18.21
Vertical	3659.2	34.84	34.84	43.5	8.66	48.78	63.5	14.72
Vertical	4574	38.13	38.13	43.5	5.37	54.75	63.5	8.75
Vertical	5488.9	40.37	40.37	43.5	3.13	57.41	63.5	6.09
Horizontal	2745.5	36.67	36.67	43.5	6.83	52.68	63.5	10.82
Horizontal	3660.7	29.21	29.21	43.5	14.29	50.26	63.5	13.24
Horizontal	4574	41.41	41.41	43.5	2.09	55.35	63.5	8.15

## 10.7. CONCLUSION

Unwanted Emission in restricted frequency bands measurement performed on the sample of the product **IJINUS A0102**, SN: **IJA0102-0000 0111**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 & RSS 247 ISSUE 2 limits.



## 11. UNCERTAINTIES CHART

47 CFR Part 15.209 & 15.207 Kind of test	Wide uncertainty laboratory (k=2) ±x(dB) / (Hz)/ 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