



LCIE

Bluetooth Low Energy Template: Release February 06<sup>th</sup>, 2020

# TEST REPORT

N°: 167005-751005-A

Version : 01

## Subject

Radio spectrum matters  
tests according to standards:  
47 CFR Part 15.247 (Limited Program)

## Issued to

SAGEMCOM BROADBAND  
250 Route de l'Empereur  
92500 - RUEIL MALMAISON  
FRANCE

## Apparatus under test

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

Set Top Box  
SAGEMCOM  
SAGEMCOM  
DCIW384 UHD Alt US V4  
195005290000030  
VW3DCIW384-V4

## Conclusion

See Test Program chapter

## Test date

May 4, 2020 to May 15, 2020

## Test location

Fontenay Aux Roses & Ecuelles

## Test Site

6230B-1

## Sample receipt date

May 4, 2020

## Composition of document

39 pages

## Document issued on

June 23, 2020

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## PUBLICATION HISTORY

Version	Date	Author	Modification
01	June 23, 2020	Armand MAHOUNGOU	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.*



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## 1. TEST PROGRAM

### References

- 47 CFR Part 15.247
- KDB 558074 D01 DTS Meas Guidance v05r02
- KDB 484596 D01 Referencing Test Data v01
- ANSI C63.10-2013

### Radio requirement:

Clause (47CFR Part 15.247) Test Description	Test result - Comments
Occupied Bandwidth <a href="#">P</a>	<input checked="" type="checkbox"/> PASS(1) <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP
6dB Bandwidth <a href="#">P</a>	<input checked="" type="checkbox"/> PASS(1) <input type="checkbox"/> FAIL <input type="checkbox"/> NA() <input type="checkbox"/> NP
Duty Cycle <a href="#">P</a>	<input checked="" type="checkbox"/> PASS(1) <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP
Maximum Conducted Output Power <a href="#">P</a>	<input checked="" type="checkbox"/> PASS(1) <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP
Power Spectral Density <a href="#">P</a>	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input checked="" type="checkbox"/> NP(2)
Conducted Spurious Emission at the Band Edge <a href="#">P</a>	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA() <input checked="" type="checkbox"/> NP(2)
Unwanted Emissions into Non-Restricted Frequency Bands <a href="#">P</a>	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA() <input checked="" type="checkbox"/> NP(2)
AC Power Line Conducted Emission <a href="#">P</a>	<input checked="" type="checkbox"/> PASS(1) <input type="checkbox"/> FAIL <input type="checkbox"/> NA(3) <input type="checkbox"/> NP
Unwanted Emissions into Restricted Frequency Bands <a href="#">P</a>	<input checked="" type="checkbox"/> PASS(1) <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP
Receiver Radiated emissions <a href="#">P</a>	<input checked="" type="checkbox"/> PASS(1) <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP
This table is a summary of test report, see conclusion of each clause of this test report for detail.	

(1): Spot check verification. For additional results see test report: 155636-721608-A (FCC ID: VW3DCIWA384-V2)

(2): Limited program. See test report 155636-721608-A (FCC ID: VW3DCIWA384-V2)

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

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):

**SAGEMCOM DCIW384 UHD AIt US V4**

**Serial Number: 195005290000030**

#### Power supply:

During all the tests, EUT is supplied by  $V_{nom}$ : 120V-60Hz

For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference / Sn	Comments
Supply1	<input checked="" type="checkbox"/> AC <input type="checkbox"/> DC <input type="checkbox"/> Battery	100-127V	NBS30G120250VU 191600824-xx	NETBIT

#### Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
1	Power supply	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

#### Equipment information:

Bluetooth LE Type:	<input checked="" type="checkbox"/> BLE	<input type="checkbox"/> v4.0	<input type="checkbox"/> v4.1	<input checked="" type="checkbox"/> v4.2
Frequency band:	[2400 – 2483.5] MHz			
Number of Channel:	40			
Spacing channel:	2MHz			
Channel bandwidth:	1MHz			
Antenna Type:	<input checked="" type="checkbox"/> Integral	<input type="checkbox"/> External	<input type="checkbox"/> Dedicated	
Antenna connector:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Temporary for test	
Transmit chains:	1			
	Single antenna			
Receiver chains	1			
Type of equipment:	<input checked="" type="checkbox"/> Stand-alone	<input type="checkbox"/> Plug-in	<input type="checkbox"/> Combined	
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 type="checkbox"/> 100% duty	
Equipment type:	<input checked="" type="checkbox"/> Production model		<input type="checkbox"/> Pre-production model	
Operating temperature range:	Tmin:	<input type="checkbox"/> -20°C	<input checked="" type="checkbox"/> 0°C	<input type="checkbox"/> X°C
	Tnom:	20°C		
	Tmax:	<input type="checkbox"/> 35°C	<input type="checkbox"/> 55°C	<input checked="" type="checkbox"/> 45°C
Type of power source:	<input checked="" type="checkbox"/> AC power supply	<input type="checkbox"/> DC power supply	<input type="checkbox"/> Battery	
Operating voltage range:	Vnom:	<input checked="" type="checkbox"/> 120V/60Hz	<input type="checkbox"/> X Vdc	
		<input type="checkbox"/> 240V/50Hz	<input type="checkbox"/> X Vdc	

Antenna Characteristic			
Antenna assembly	Gain (dBi)	Frequency Band (MHz)	Impedance( $\Omega$ )
1	2.5	2400 – 2483.5	50

Hardware information		
Software (if applicable):	V. :	To be defined by customer

CHANNEL PLAN			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
<b>Cmin: 0</b>	2402	<b>Cmid: 20</b>	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	<b>Cmax: 39</b>	2480

DATA RATE		
Data Rate (Mbps)	Modulation Type	Worst Case Modulation
1	GFSK	<input checked="" type="checkbox"/>
2	GFSK	<input type="checkbox"/>


## 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	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()
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()

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

- a. – See document "SD-2020\_05\_06 - FCC part15 - Bluetooth compliance test commands of M384US-4L mainboard.docx"(provided by customer) for the command used during test.

## 2.3. EQUIPMENT LABELLING

 <p>AC/DC ADAPTOR <b>Sagemcom</b> P/N: 191800824-xx MODEL: NBS30G120250VU INPUT: 100-127V ~ 50/60Hz 0.6A OUTPUT: 12V = 2.5A UL LISTED NB02 E344329 Power supply MADE IN CAMBODIA BY NetBit®</p>	<div style="border: 1px dashed black; padding: 10px;"> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Code barre type 128</p> <p>MSO Part Number: XXXXX</p> <p>Code barre type 128 12 Digits</p> <p>SGCSN: 123456789012</p> <p>Code barre type 128</p> <p>STB MAC: XXXXXXXXXXXXX</p> <p>Code barre type 128</p> <p>Wi-Fi 5 GHz MAC: XXXXXXXXXXXXX</p> </div> <div style="width: 50%;"> <p style="text-align: center; font-size: 1.2em;"><b>Sagemcom</b></p> <p style="text-align: center;">DCIW384 UHD Alt US V4 253866952-ind</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>FC</b> Tested To Comply With FCC Standards FCC ID: VW3DCIW384-V4</p> </div> <div style="text-align: center;"> <p><b>UL LISTED</b> I.T.E. E308616</p> </div> </div> <p style="font-size: 0.8em;">This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.</p> <div style="display: flex; justify-content: center; gap: 10px;"> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; text-align: center;">5 Ghz</div> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; text-align: center;"><del>2.4 Ghz</del></div> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; text-align: center;">HPF</div> </div> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">CA S/N: XXXXXXXXXXXXX</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Code barre type 128</p> </div> </div>
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## 2.4. EQUIPMENT MODIFICATION

☒ None
 ☐ Modification:



### 3. OCCUPIED BANDWIDTH

#### 3.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU  
Date of test : May 14, 2020  
Ambient temperature : 23°C  
Relative humidity : 43%

#### 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:

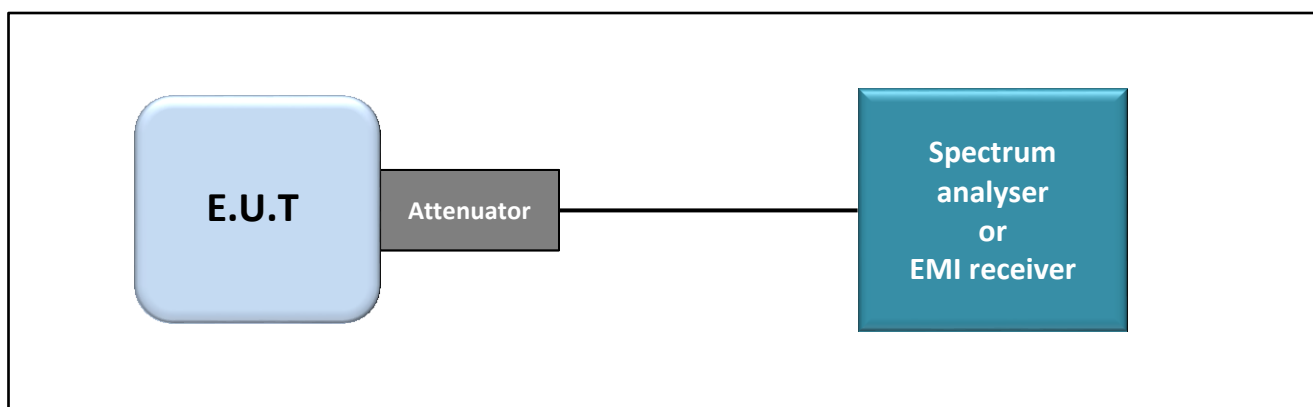
- ☒ Conducted Method  
☐ Radiated Method

- Test Procedure:

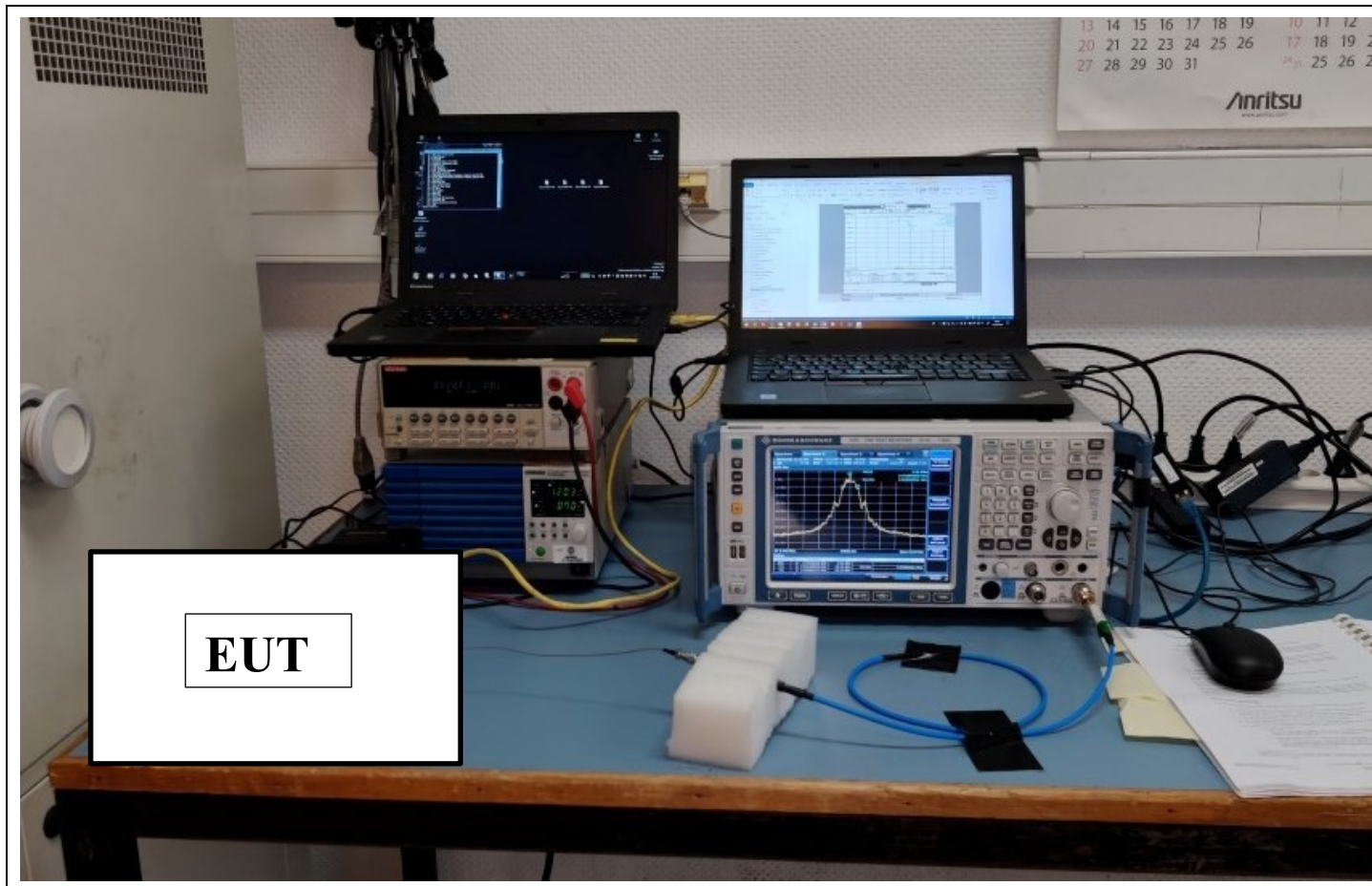
- ☒ ANSI C63.10 § 6.9.2

#### **Measurement Procedure:**

- RBW shall be in the range of 1% to 5% of the anticipated occupied bandwidth
- Set the video bandwidth (VBW)  $\geq 3 \times$  RBW
- SPAN = Capture all products of the modulation process
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- OBW 99% function of spectrum analyzer used



Test set up of Occupied Bandwidth



Photograph for Occupied bandwidth

### 3.3. LIMIT

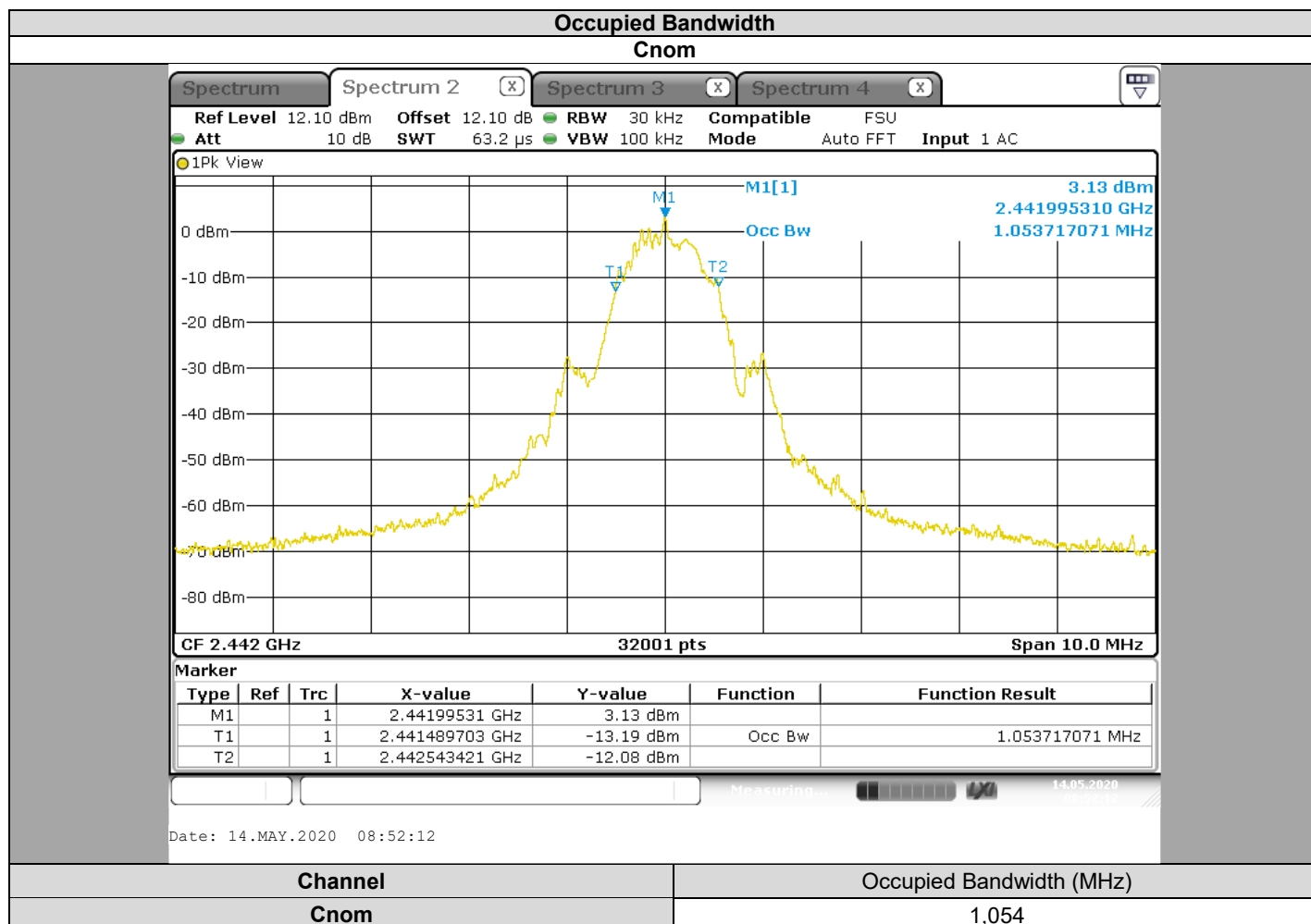
None

### 3.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Multimeter	Keithley	2000	A1241084	2019/05	2021/05
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
Cable + Attenuateur 10dB	PASTERNAK	PE350-100CM	A5329768	2019/08	2020/08

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 **SAGEMCOM DCIW384 UHD AIt US V4**, SN: **195005290000030**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247** limits.

## 4. 6dB EMISSION BANDWIDTH

### 4.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU  
Date of test : May 14, 2020  
Ambient temperature : 23°C  
Relative humidity : 43%

### 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:

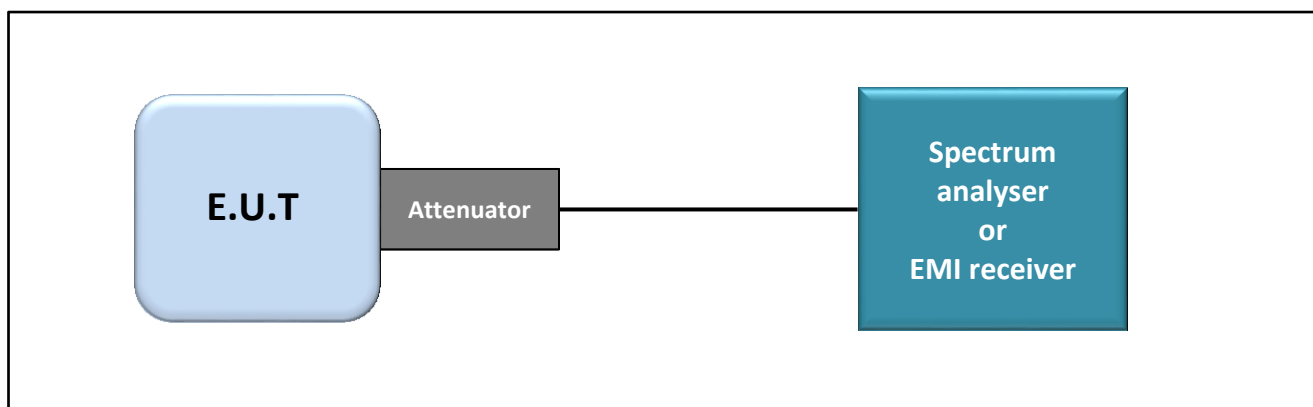
- ☒ Conducted Method  
☐ Radiated Method

- Test Procedure:

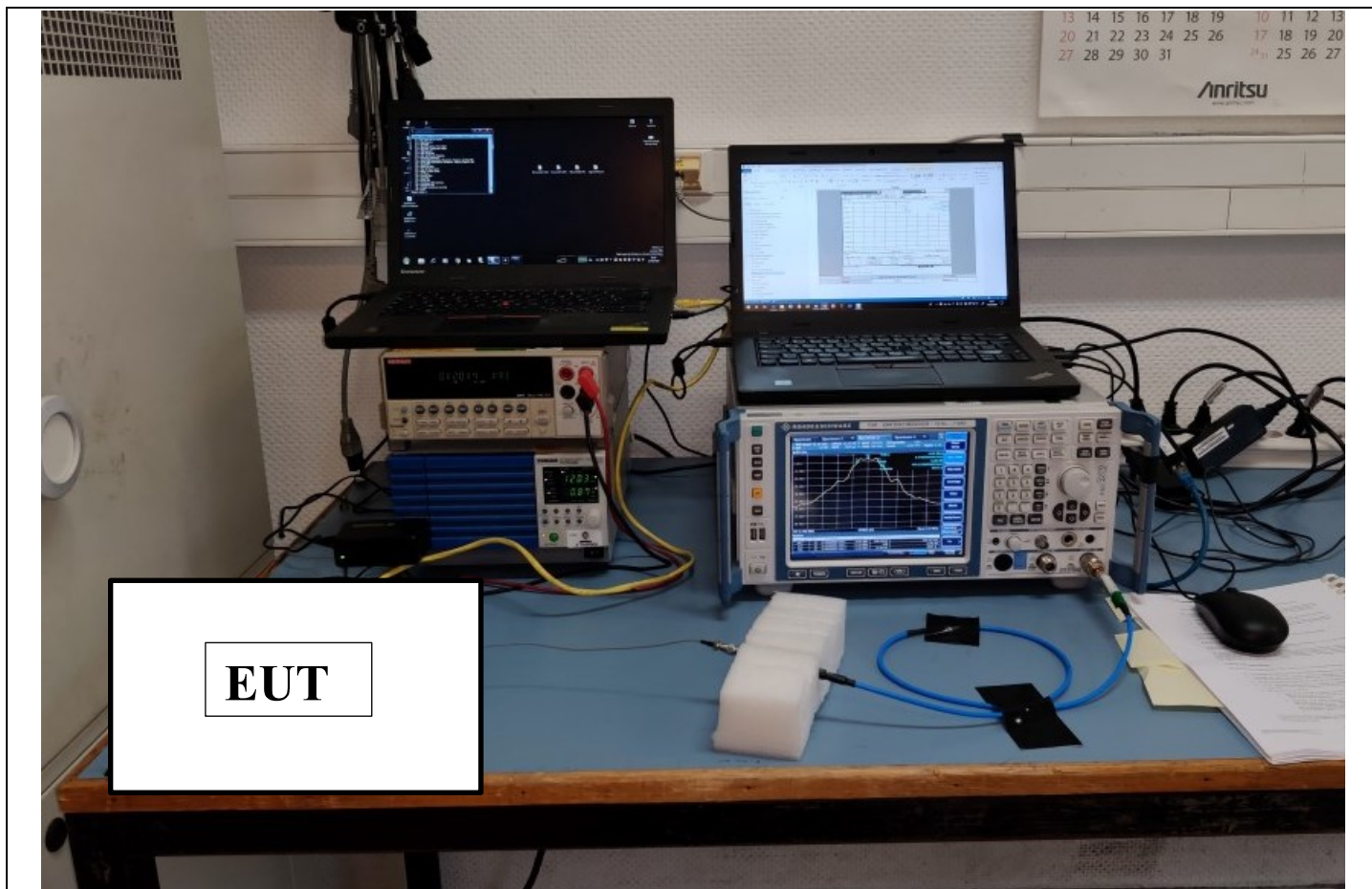
- ☒ ANSI C63.10 § 11.8.1  
☐ ANSI C63.10 § 11.8.2

#### **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

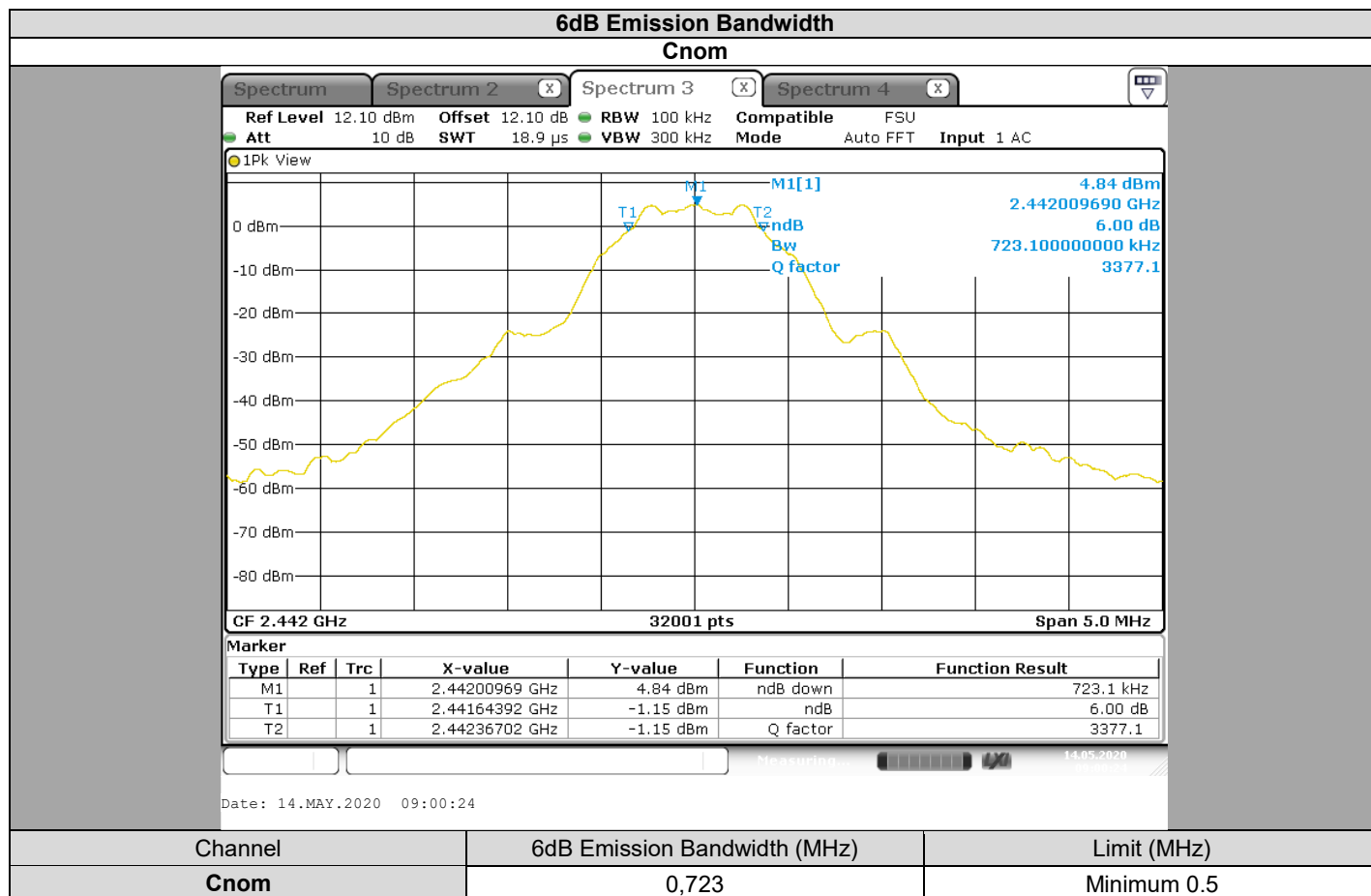
Frequency range	The 6dB bandwidth Limit
2400MHz to 2483.5MHz	≤500kHz

#### 4.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Multimeter	Keithley	2000	A1241084	2019/05	2021/05
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
Cable + Attenuateur 10dB	PASTERNAK	PE350-100CM	A5329768	2019/08	2020/08

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 **SAGEMCOM DCIW384 UHD AIt US V4**, SN: **195005290000030**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247** limits.

## 5. DUTY CYCLE

### 5.1. TEST CONDITIONS

Test performed by : Armand MAHOUNGOU  
Date of test : May 14, 2020  
Ambient temperature : 23°C  
Relative humidity : 43%

### 5.2. TEST SETUP

- The Equipment under Test is installed:

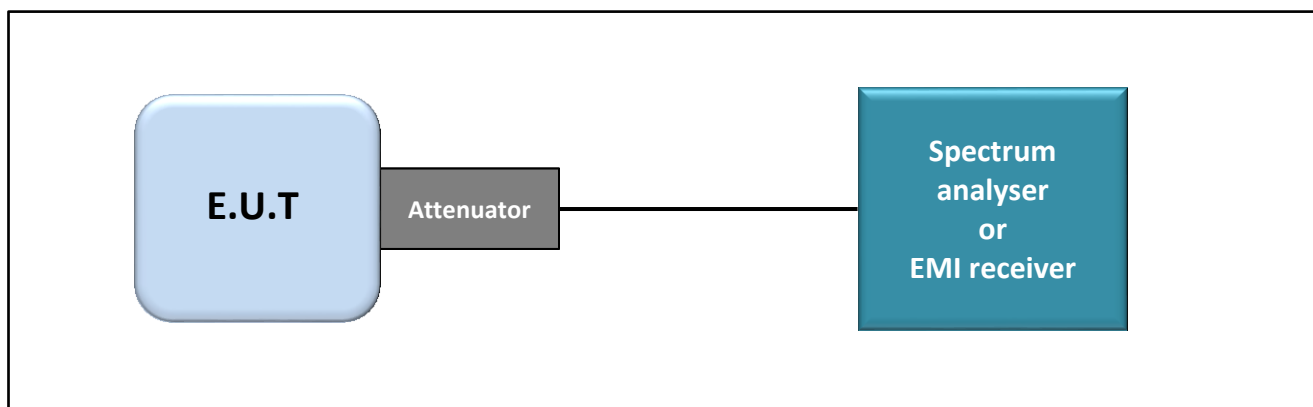
- ☒ On a table
- ☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

- ☒ Conducted Method
- ☐ Radiated Method

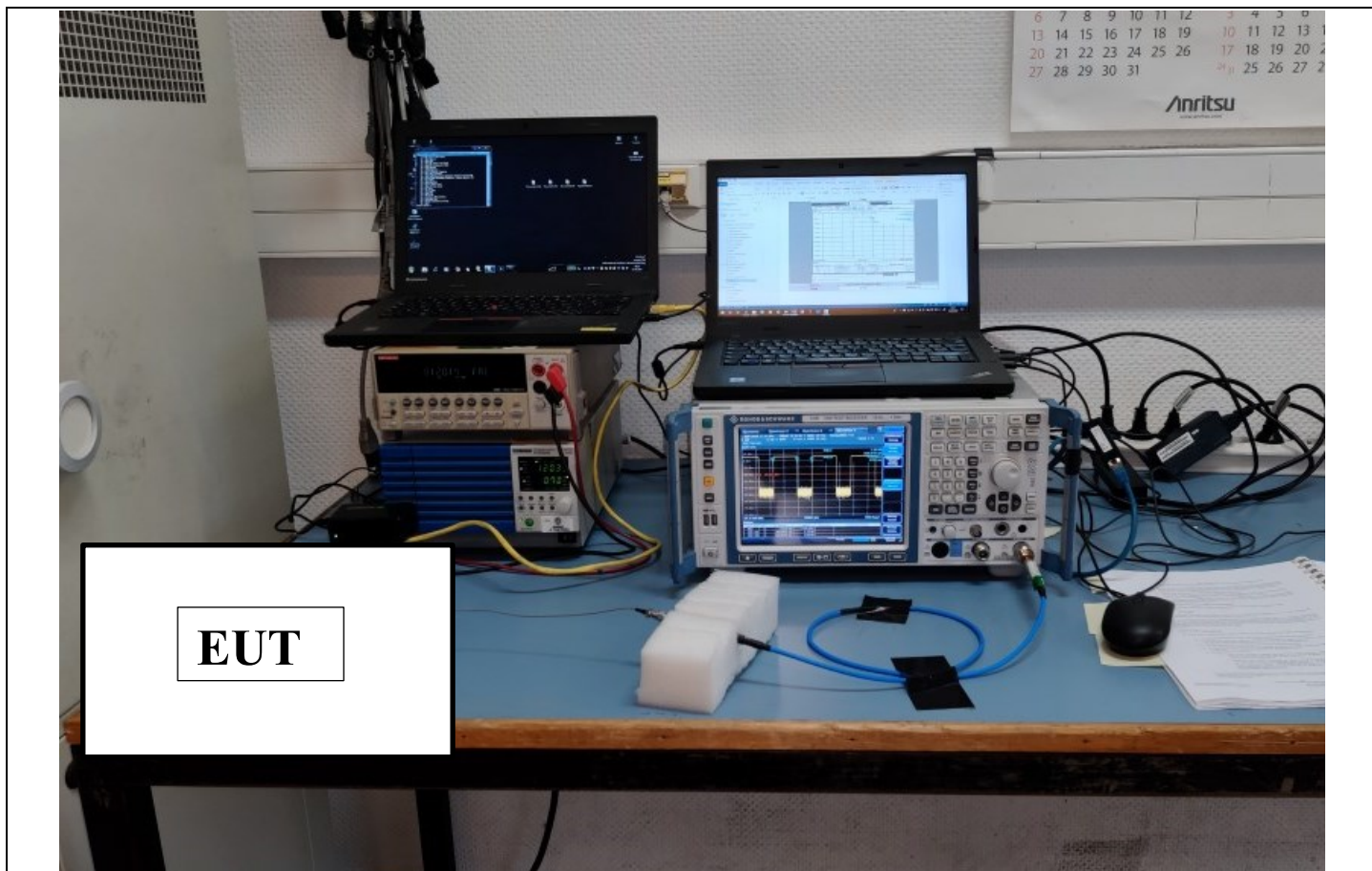
- Test Procedure:

- ☒ ANSI C63.10 § 11.6



Test set up of Duty Cycle





Photograph for Duty Cycle

### 5.3. LIMIT

None

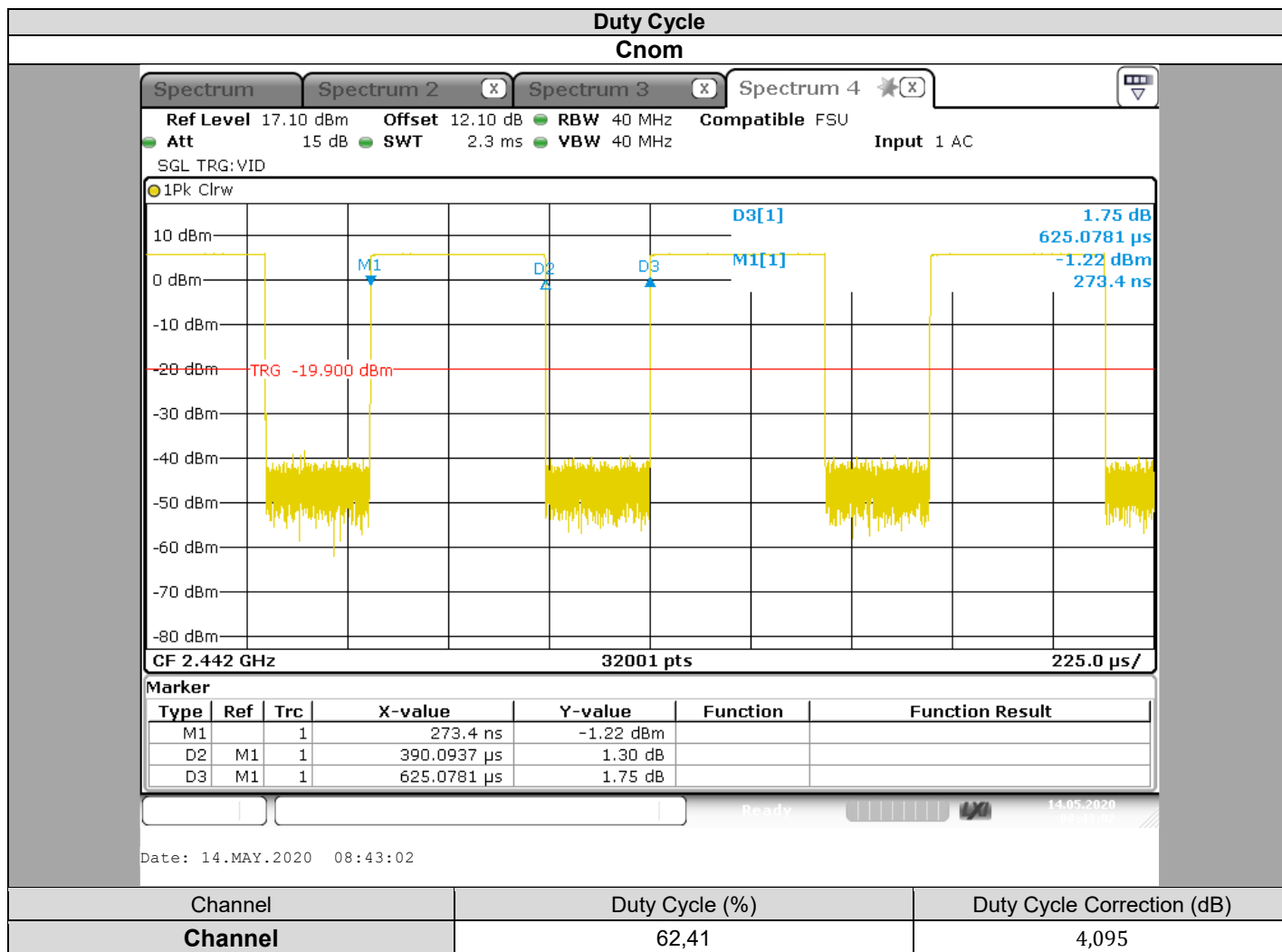
### 5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Multimeter	Keithley	2000	A1241084	2019/05	2021/05
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
Cable + Attenuateur 10dB	PASTERNAK	PE350-100CM	A5329768	2019/08	2020/08

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 **SAGEMCOM DCIW384 UHD Ait US V4**, SN: **195005290000030**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247** limits.

## 6. MAXIMUM CONDUCTED OUTPUT POWER

### 6.1. TEST CONDITIONS

Test performed by : Armand MAHOUGOU  
Date of test : May 14, 2020  
Ambient temperature : 23°C  
Relative humidity : 43%

### 6.2. TEST SETUP

- The Equipment under Test is installed:

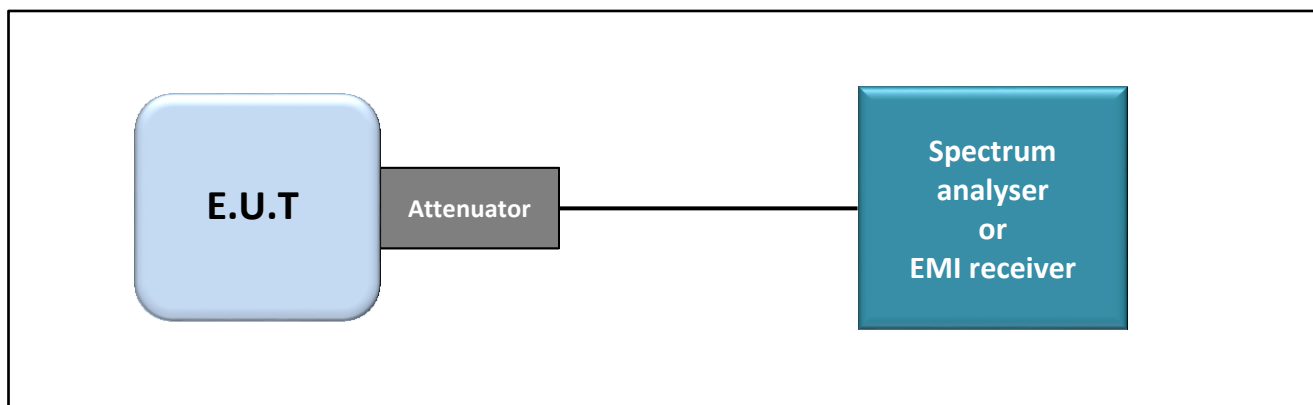
- ☒ On a table
- ☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:

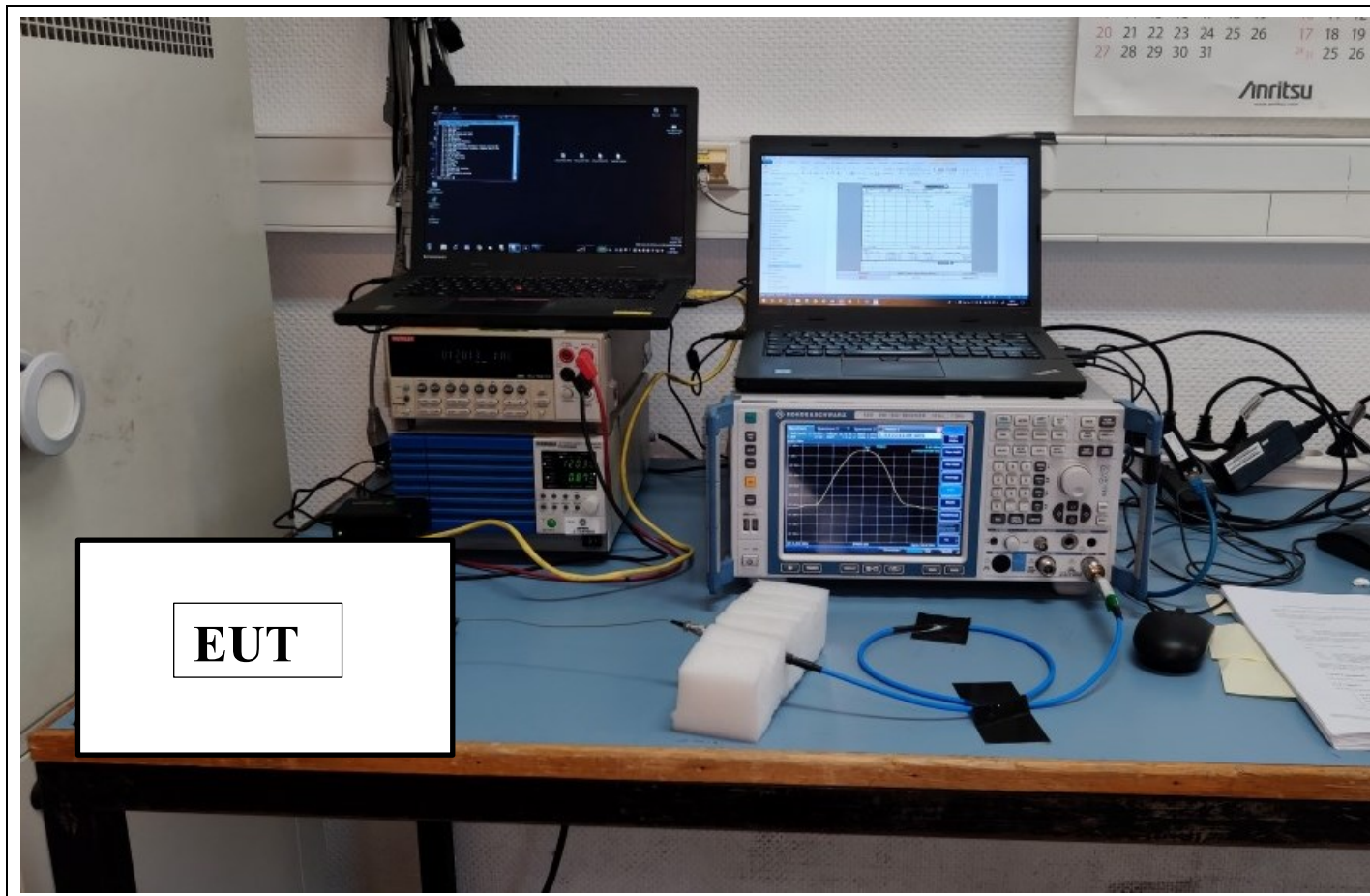
- ☒ Conducted Method
- ☐ Radiated Method

- 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*

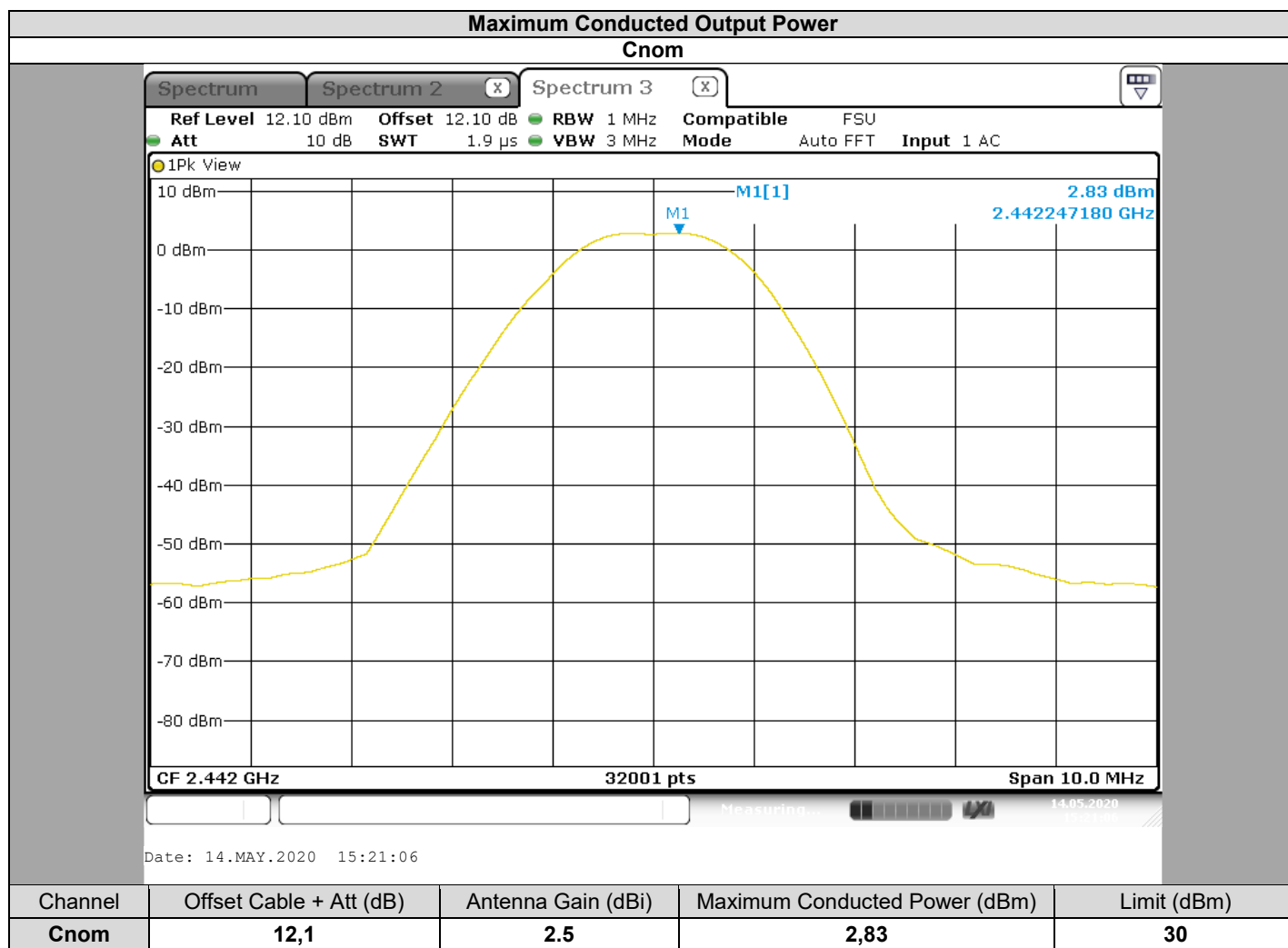
\*Remark: Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

### 6.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2019/01	2021/01
Multimeter	Keithley	2000	A1241084	2019/05	2021/05
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
Cable + Attenuateur 10dB	PASTERNAK	PE350-100CM	A5329768	2019/08	2020/08

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 **SAGEMCOM DCIW384 UHD Alt US V4**, SN: **195005290000030**, in configuration and description presented in this test report, show levels **Select Result** to the **47 CFR PART 15.247** limits.

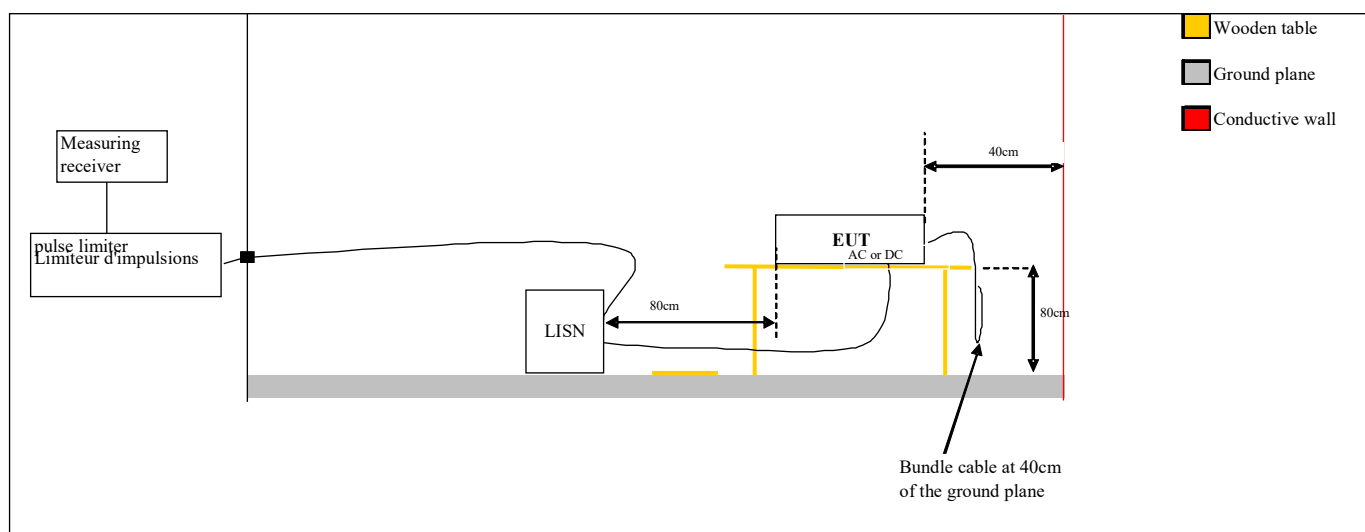
## 7. AC POWER LINE CONDUCTED EMISSIONS

### 7.1. TEST CONDITIONS

Test performed by : Laurent DENEUX  
 Date of test : May 4, 2020  
 Ambient temperature : 20°C  
 Relative humidity : 48%

### 7.2. 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 50Ω / 50μH. Interconnecting cables and equipment's were moved to position that maximized emission.





Photograph for AC Power Line Conducted Emissions



Photograph for AC Power Line Conducted Emissions

### 7.3. LIMIT

Frequency range	Level	Detector
0,15kHz to 0,5MHz	66dB $\mu$ V to 56 $\mu$ V*	QPeak
	56dB $\mu$ V to 46 $\mu$ V*	Average
0,5MHz to 5MHz	56dB $\mu$ V	QPeak
	46dB $\mu$ V	Average
5MHz to 30MHz	60B $\mu$ V	QPeak
	50dB $\mu$ V	Average

\*Decreases with the logarithm of the frequency



#### 7.4. TEST EQUIPMENT LIST

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	A2642021	10/2018	10/2020
V ISLN	ROHDE & SCHWARZ	ESH2-Z5	C2322001	08/2019	08/2020
Pulse limiter	R&S	ESH3-Z2	A2649008	03/2019	03/2020
Cable	-	-	A5329417	12/2018	12/2020
Cable	-	-	A5329589	10/2019	10/2020
Ground plane	LCIE	-	-	-	-

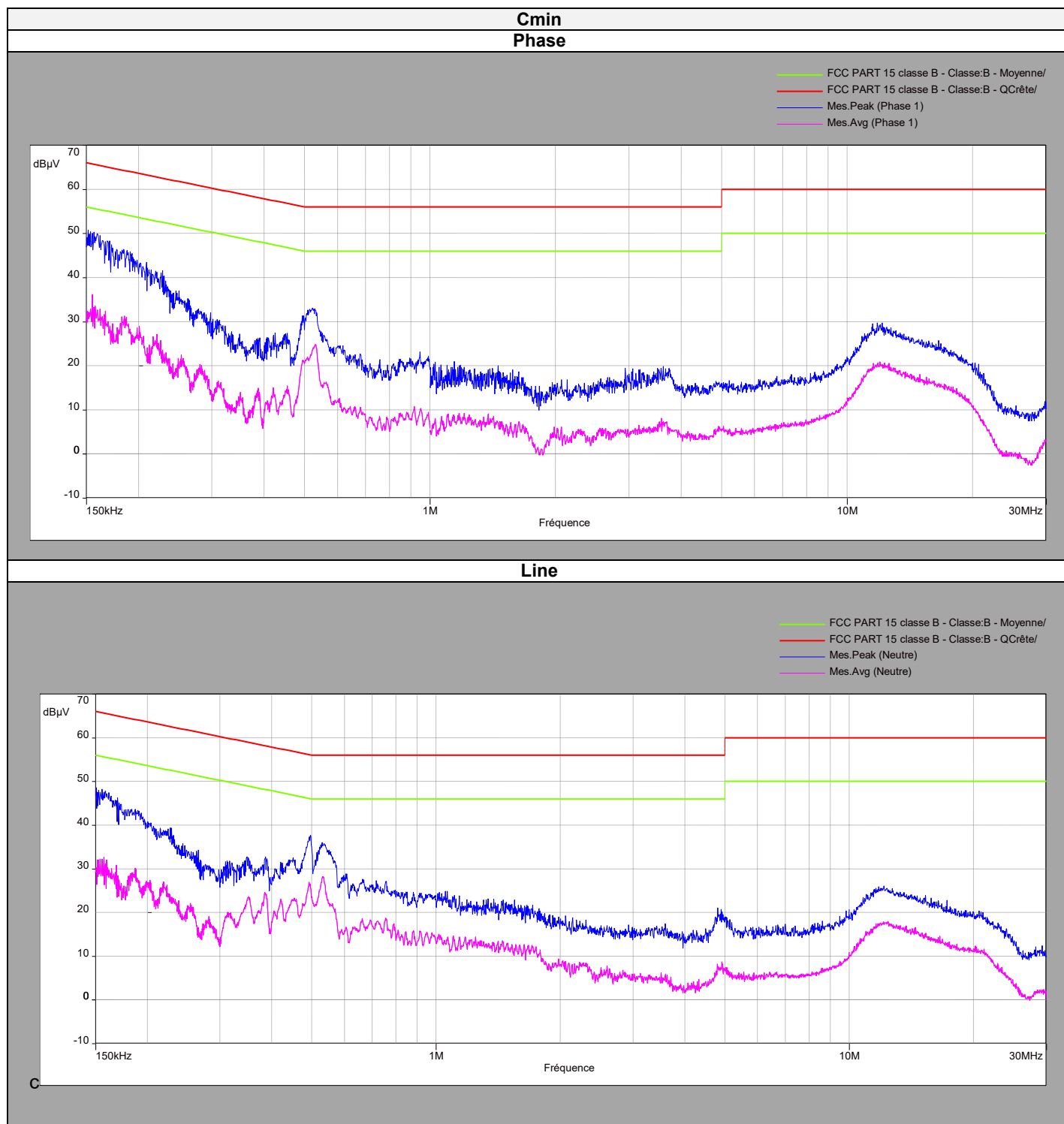
Note: In our quality system, the test equipment calibration due is more & less 2 months

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

☒ None      ☐ Divergence:



## 7.6. RESULTS



#### Phase line

Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.155	50	-	65.6	15.6	36	55.6	19.6
0.53	32.6	-	56	23.4	24.8	46	21.2
0.945	23	-	56	33	10.2	46	35.8
3.62	20	-	56	36	7.3	46	38.7
11.81	29.7	-	60	30.3	20.8	50	29.2

#### Neutral line

Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.155	48.2	-	65.6	17.4	32.2	55.6	23.4
0.53	36	-	56	20	28	46	18
1.1	23	-	56	33	15	46	31
4.91	20.2	-	56	35.8	8.6	46	37.4
12.13	26	-	60	34	16.5	50	33.5

## 7.7. CONCLUSION

Ac Power Line Conducted Emission measurement performed on the sample of the product **SAGEMCOM DCIW384 UHD Alt US V4**, SN: **195005290000030**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 limits.

## 8. UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

### 8.1. TEST CONDITIONS

Test performed by : Armand MAHOUGOU & Laurent DENEUX  
 Date of test : May 5 to 13, 2020  
 Ambient temperature : 21 to 25°C  
 Relative humidity : 44 to 46%

### 8.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013) and FCC part 15 subpart C.

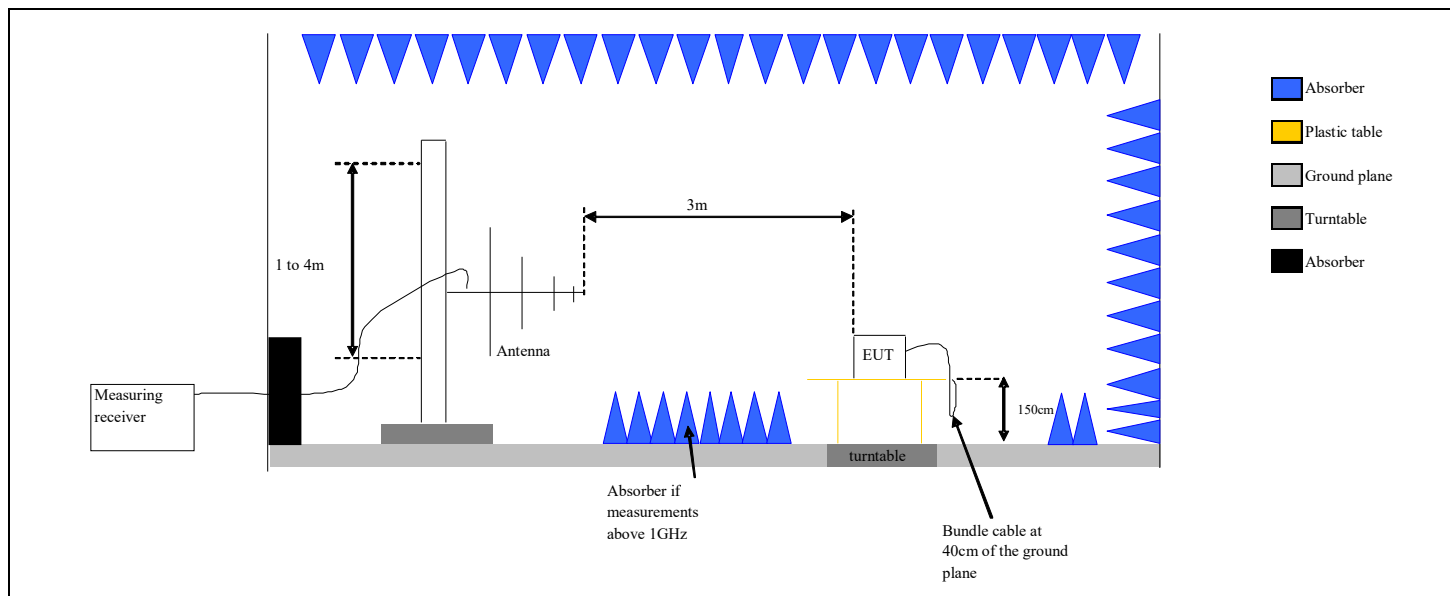
Test is performed in parallel, perpendicular and ground parallel axis with a loop antenna below 30MHz. Measurement bandwidth was 200Hz below 150kHz and 9kHz between 150kHz & 30MHz. The level has been maximised by the turntable rotation of 360 degrees range on all axis of EUT used in normal configuration.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

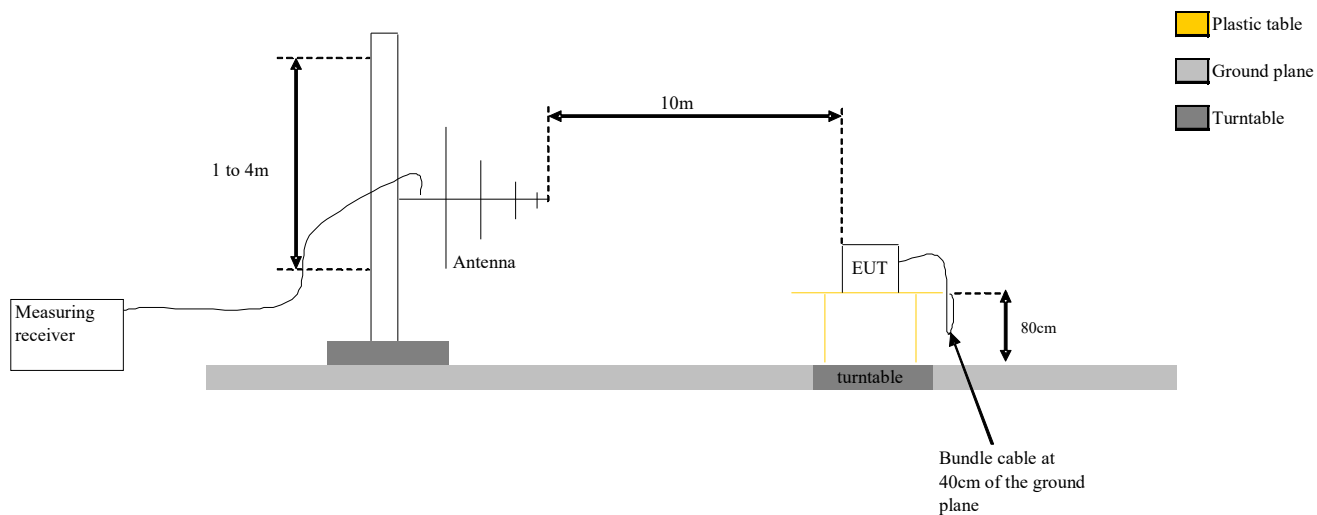
Test is performed in horizontal (H) and vertical (V) polarization with **bilog** between 30MHz & 1GHz and with a horn antenna above 1GHz. Measurement bandwidth was 120kHz below 1GHz and 1MHz above 1GHz. The level has been maximised by the turntable rotation of 360 degrees range on all axis of EUT used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

The height antenna is varied from 1m to 4m from 30MHz to 1GHz and above 1GHz is :

☐ On mast, varied from 1m to 4m

☒ Fixed and centered on the EUT (EUT smaller than the bandwidth of the measurement antenna, ANSI C63.10 §6.6.5)

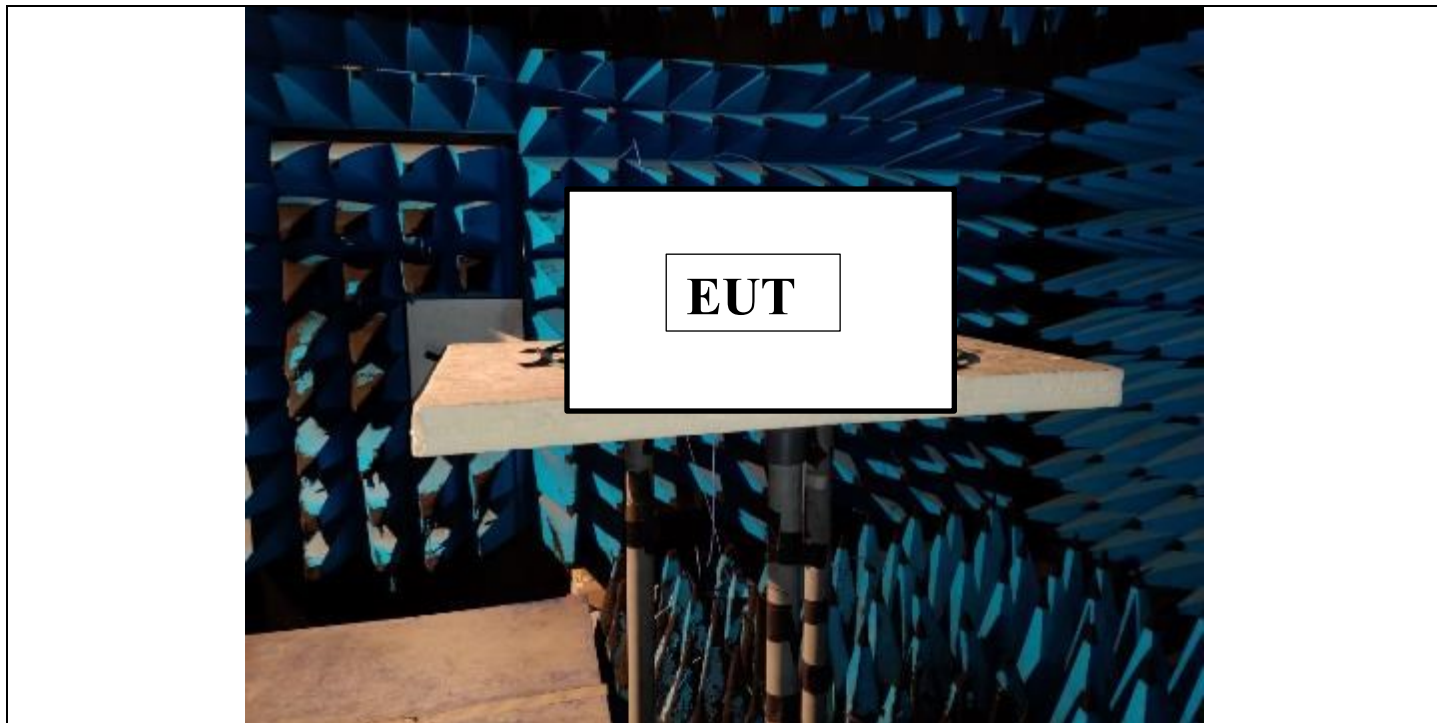




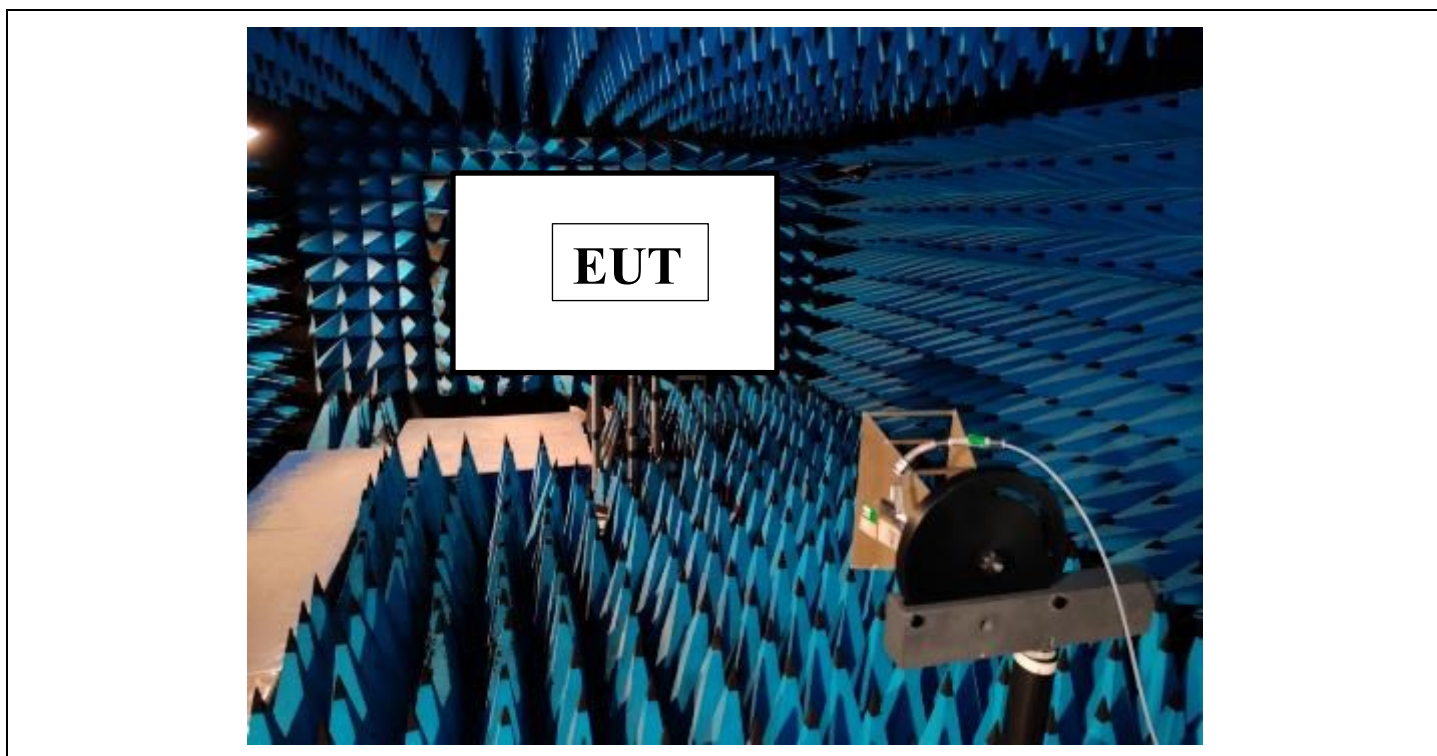
Test Set up for radiated measurement in open area test site



Photograph for Unwanted Emission in restricted frequency bands

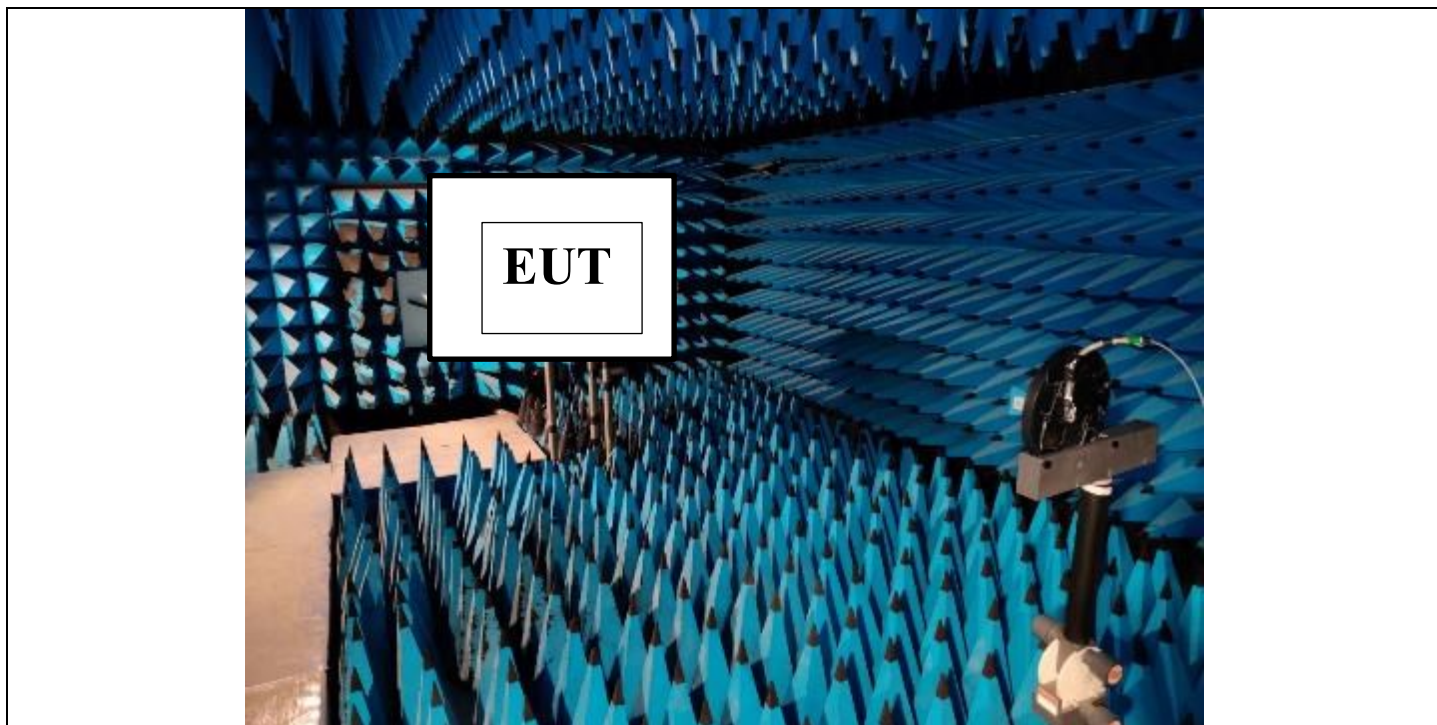


Photograph for Unwanted Emission in restricted frequency bands



Photograph for Unwanted Emission in restricted frequency bands





Photograph for Unwanted Emission in restricted frequency bands

### 8.3. 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

#### 8.4. 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
Cable	-	-	A5329444	2019-12	2020-12
Bilog antenna	CHASE	CBL 6112A	C2040040	2019-04	2020-04
Cable	-	-	A5329449	2019-12	2020-12
Cable	-	-	A5329876	2019-12	2020-12
Cable	-	-	A5329542	2019-08	2020-08
Cable	-	-	A5329368	2019-12	2020-12
Cable	-	-	A5329416	2019-12	2020-12
Loop antenna	Scharzbeck	FMZB	C2040209	2018-03	2020-03
Full anechoic chamber	SIEPEL	-	D3044019	2019/10	2023/10
Preamplifier	LCIE	LCIE-ALB-001	A7080073	2018/12	2020/12
Horn antenna	AH SYSTEMS	SAS 571	C2042041	2019/11	2021/11
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2019/05	2021/05
High Pass Filter 2,4GHz	WAINWRIGHT	WHK12-2494	A7484068	2019/07	2021/07
Cable S36 chamber	PASTERNAK	PE360-3000CM	A5329872	2020/01	2021/01
Cable S36 chamber	PASTERNAK	PE360-1000CM	A5329939	2020/01	2021/01
Cable S36 chamber	PASTERNAK	PE360-1500CM	A5329940	2020/01	2021/01
Horn antenna (18-26,5GHz)	PASTERNAK	PE9852/2F-20	C2042048	2019/12	2021/12

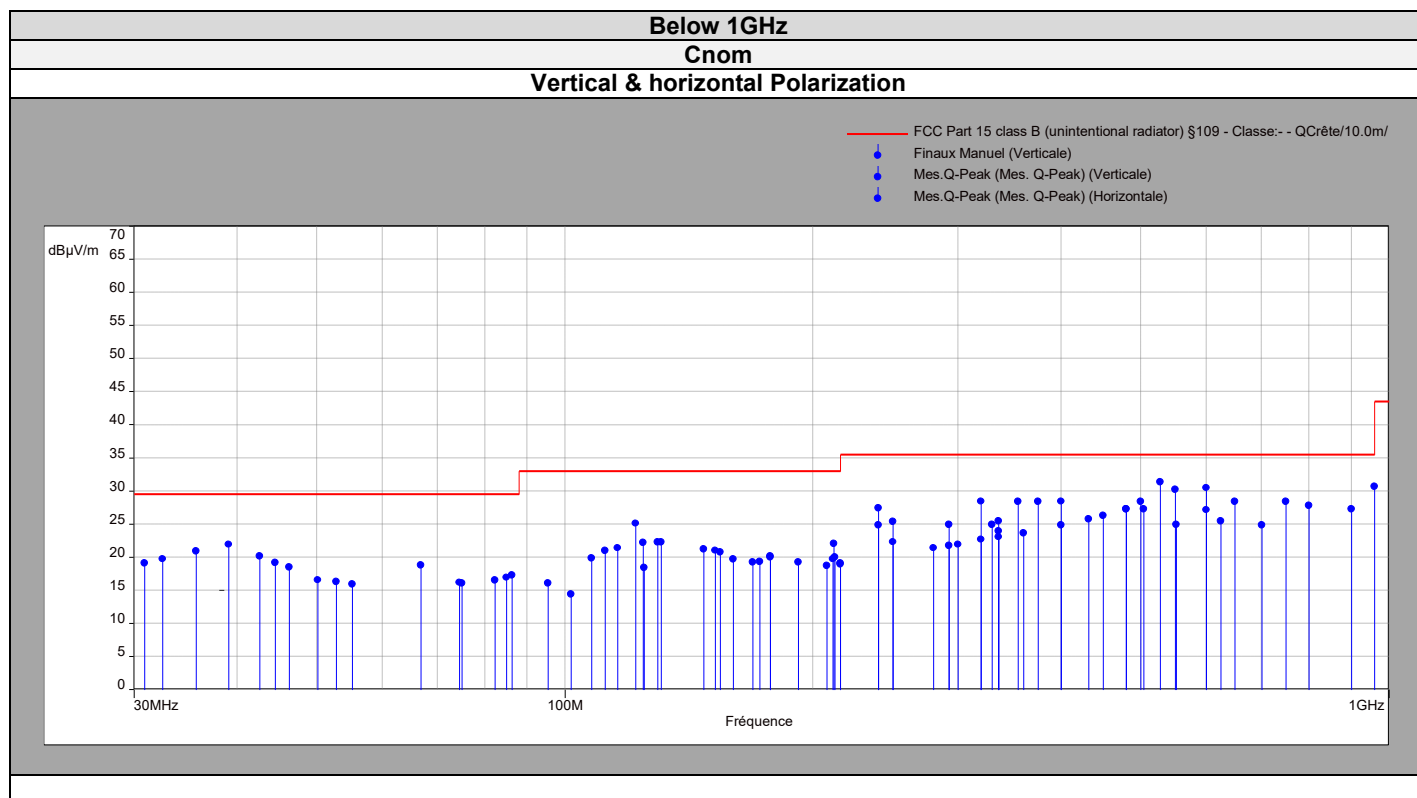
Note: In our quality system, the test equipment calibration due is more & less 2 months

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

☒ None      ☐ Divergence:



## 8.6. RESULTS

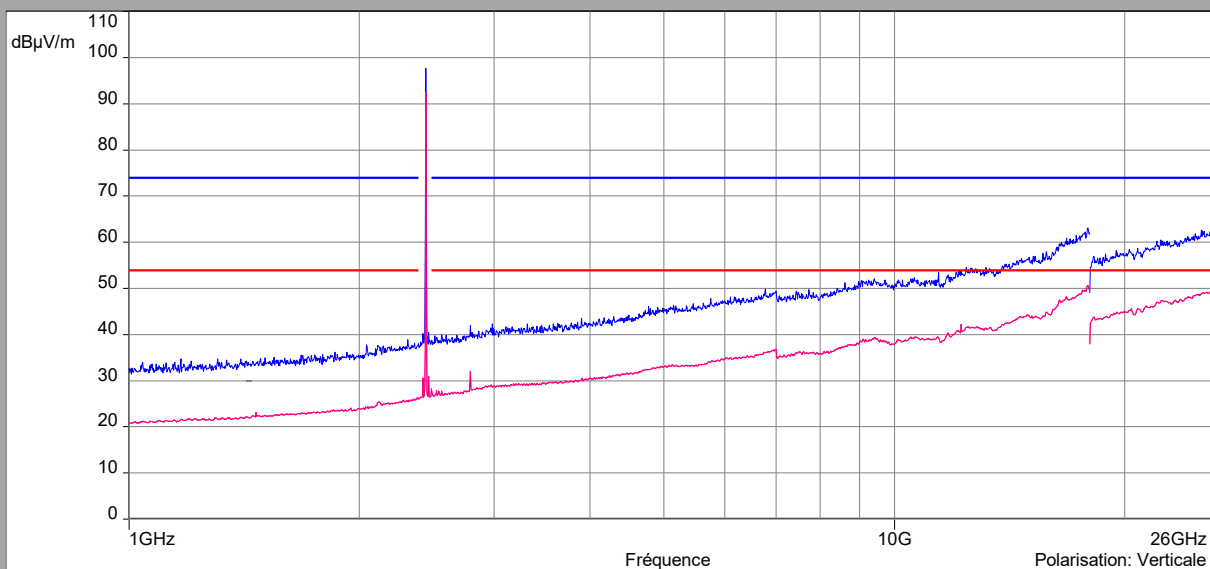


**Above 1GHz**

**Cnom**

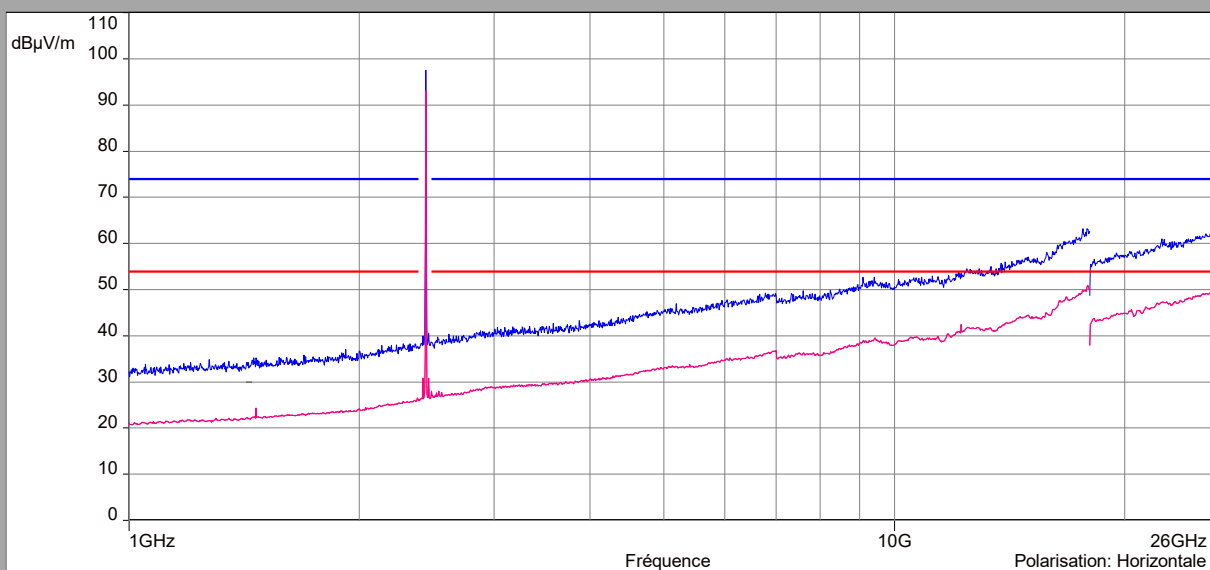
**Vertical Polarization**

- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
- Mes.Peak (Verticale)
- Mes.Avg (Verticale)



**Horizontal polarization**

- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
- Mes.Peak (Horizontale)
- Mes.Avg (Horizontale)



## Above 1GHz Zoom 2310MHz-2500MHz

### Cnom

#### Vertical Polarization

- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
- Mes.Peak (Verticale)
- Mes.Avg (Verticale)

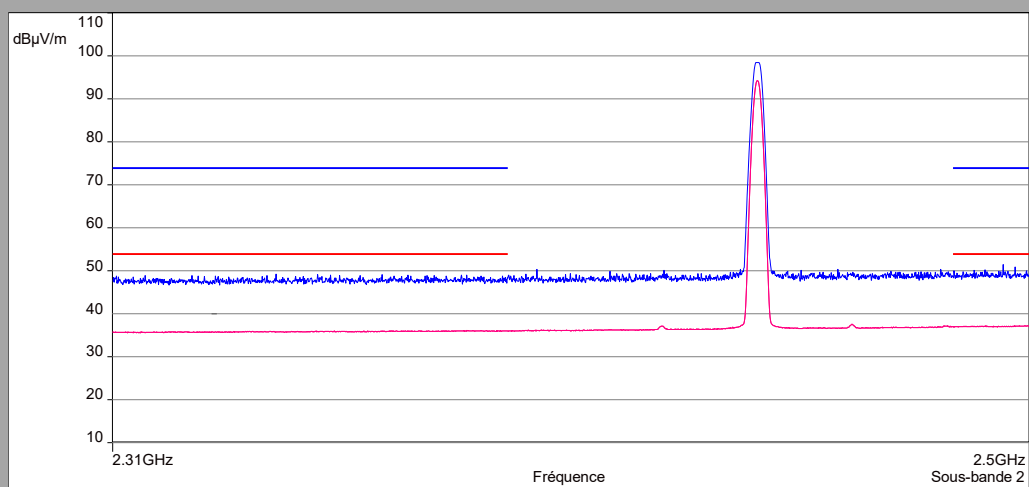
Description Sous-bande 2

Fréquences:2.31 GHz - 2.5 GHz (Mode analyseur) 32001 Points

Réglages: RBW: 1MHz, VBW: 3MHz, Durée balayage : 2 ms/Pts, Atténuation : 0 dB, Nombre de Balayages : 1, Preamp : C

Polarisation:Verticale

Distance: 3 m



#### Horizontal polarization

- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Moyenne/3.0m/
- FCC/FCC 15.209 2400MHz-2483MHz Band - Classe:1 - Crête/3.0m/
- Mes.Peak (Horizontale)
- Mes.Avg (Horizontale)

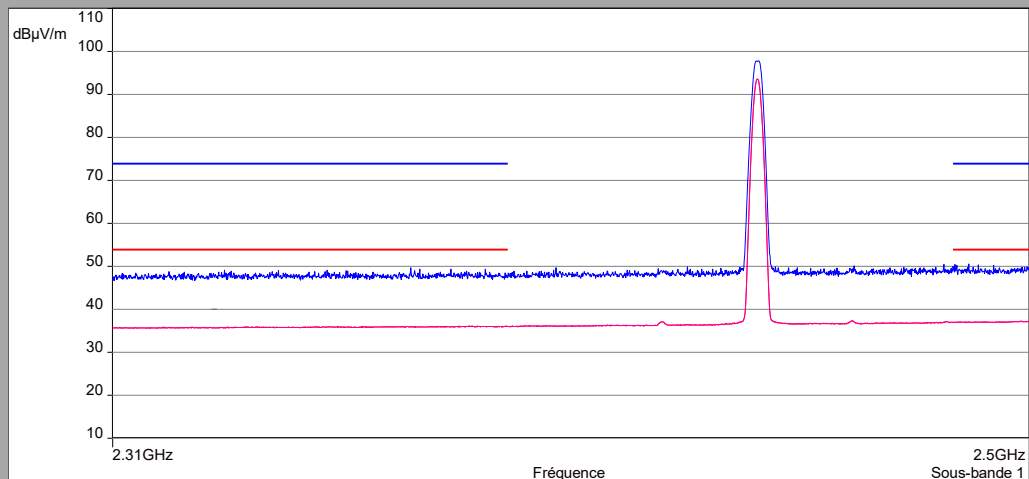
Description Sous-bande 1

Fréquences:2.31 GHz - 2.5 GHz (Mode analyseur) 32001 Points

Réglages: RBW: 1MHz, VBW: 3MHz, Durée balayage : 2 ms/Pts, Atténuation : 0 dB, Nombre de Balayages : 1, Preamp : C

Polarisation:Horizontale

Distance: 3 m



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	39.1	-	21.95	29.5	7.55
Horizontal	121.9	-	25.12	33	7.88
Vertical	528	-	31.3	35.5	4.2
Vertical	550	-	30.24	35.5	5.26
Horizontal	600	-	30.51	35.5	4.99
Vertical	960	-	30.69	35.5	4.81

Above 1GHz								
Cmin/Cnom/Cmax								
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)
Horizontale	2390	36.10	40.195	54	13.805	46.68	74	27.32
Verticale	2390	36.01	40.105	54	13.895	47.13	74	26.87
Horizontale	2483.5	36.89	40.985	54	13.015	48.37	74	25.63
Verticale	2483.5	36.86	40.955	54	13.045	47.39	74	26.61
Verticale	2789.78	31.97	36.065	54	17.935	41.92	74	32.08

## 8.7. CONCLUSION

Unwanted Emission in restricted frequency bands measurement performed on the sample of the product **SAGEMCOM DCIW384 UHD Alt US V4**, SN: **195005290000030**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 limits.

## 9. 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



## 10. ANNEX: DIFFERENCE BETWEEN FCC ID

# Sagemcom

Date: May 27th, 2020

Object: Creation variant "DCIW384 Alt US V4"

TO WHOM MIGHT BE CONCERNED

Dear Sirs,

Hereby, we declare that the Set Top Box "DCIW384 Alt US V4" is a variant of the Set Top Box "DCIWA384 Alt US V2".  
This variant is created by removing Wi-Fi 2.4GHz chipset and Wi-Fi 5GHz AP functionality.  
The radio equipment's and the software of the variant "DCIW384 Alt US V4" are the same as for the reference product "DCIWA384 Alt US V2".

See the description of the differences between "DCIW384 Alt US V4" and "DCIWA384 Alt US V2" on the next pages.

Sincerely,

Name: Boris FONTAINE  
Title: R&D Director  
Audio & Video Solution Business Unit

SAGEMCOM BROADBAND SAS  
250 Route de l'Empereur  
92848 RUEIL MALMAISON CEDEX  
FRANCE

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# Sagemcom

List of differences between "DCIW384 Alt US V4" and "DCIWA384 Alt US V2":

- Wi-Fi chipset 2,4GHz removal
- Wi-Fi AP 5GHz functionality removal
- Power Supply Unit maximum power changed from 3.5A to 2.5A
- Power jack shape change
- Rear panel marking 12V/3.5A replaced by 12V/2.5A