TEST REPORT

N°: 163216-741765 **Version : 01**

Subject	**Radio spectrum matters tests according to standards: 47 CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 5**
Issued to	SAGEMCOM 250 Route de l'Empereur 92848-RUEIL-MALMAISONCity FRANCE
Apparatus under test	
Product	IOT LORA ENDPOINT
Trade mark	SAGEMCOM
Manufacturer	SAGEMCOM
Model under test	ATGHMP915 V2
Serial number	PROTOTYPE 3
FCC ID	VW3-ATGHMP915V2
IC	9140A-ATGHMP915V2
Conclusion	See Test Program chapter
Test date	: September 13, 2019 to September 18, 2019
Test location	Fontenay Aux Roses & Ecuelles
Test Site	6230B-1
Composition of document	107 pages
Document issued on	October 22, 2019

Written by :
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Tests operator

Approved by
Arnaud FAYETTE
Technical manager

PUBLICATION HISTORY

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

Version	Date	Author	Modification
01	22/10/2019	J. PALARD	Creation of the document

Date of receipt of test item:
August 5, 2019

SUMMARY

1. TEST PROGRAM

References

- **47 CFR Part 15.247**
- **RSS 247 Issue 2**
- **RSS Gen Issue 5**
- **KDB 558074 D01 DTS Meas Guidance v04**
- **ANSI C63.10-2013**

Radio requirement DTS mode:

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

PASS: EUT complies with standard's requirement
FAIL: EUT does not comply with standard's requirement
NA: Not Applicable
NP: Test Not Performed

Radio requirement Hybrid mode 125kHz:

Clause (47CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 5) Test Description	Test result - Comments			
Occupied Bandwidth	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
20dB Bandwidth	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Number of Hopping Frequency	☐ PASS	☐ FAIL	☐ NA	☑ NP(1)
Carrier Frequency Separation	☐ PASS	☐ FAIL	☐ NA	☑ NP(1)
Time of Occupancy	☐ PASS	☐ FAIL	☐ NA	☑ NP(1)
Duty Cycle	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Maximum Conducted Output Power	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Conducted Spurious Emission at the Band Edge	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Unwanted Emissions into Non-Restricted Frequency Bands	☑ PASS	☐ FAIL	☐ NA()	☐ NP(1)
AC Power Line Conducted Emission	☐ PASS	☐ FAIL	☑ NA(2)	☐ NP(1)
Unwanted Emissions into Restricted Frequency Bands	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Receiver Radiated emissions	☑ PASS	☐ FAIL	☐ NA	☐ 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

Radio requirement Hybrid mode 500kHz :

Clause (47CFR Part 15.247 & RSS-247 Issue 2 & RSS-Gen Issue 5) Test Description	Test result - Comments			
Occupied Bandwidth	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
20dB Bandwidth	☑ PASS	☐ FAIL	☐ NA(2)	☐ NP(1)
Number of Hopping Frequency	☐ PASS	☐ FAIL	☐ NA(2)	☑ NP(1)
Carrier Frequency Separation	☐ PASS	☐ FAIL	☐ NA	☑ NP(1)
Time of Occupancy	☐ PASS	☐ FAIL	☐ NA	☑ NP(1)
Duty Cycle	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Maximum Conducted Output Power	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Power Spectral Density	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Conducted Spurious Emission at the Band Edge	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Unwanted Emissions into Non-Restricted Frequency Bands	☑ PASS	☐ FAIL	☐ NA()	☐ NP(1)
AC Power Line Conducted Emission	☐ PASS	☐ FAIL	☑ NA(3)	☐ NP(1)
Unwanted Emissions into Restricted Frequency Bands	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
This table is a summary of test report, see conclusion of each clause of this test report for detail.				

(1): Limited program. Test already perform on Hopping mode and DTS mode
(2): 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 ATGHMP915 V2 **Serial Number: PROTOTYPE** 3

Equipment Under Test

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
-	-	-	☐	☐	☐	

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop			Use to set the EUT

Equipment information:

Type:	**DTS**			
Frequency band:	[902 – 928] MHz			
Number of Channel:	8			
Spacing channel:	1.6 MHz			
Channel bandwidth:	500 kHz			
Type:	**Hybrid mode 125 kHz**			
Frequency band:	[902 – 928] MHz			
Number of Channel:	64			
Spacing channel:	200 kHz			
Channel bandwidth:	125 kHz			
Type:	**Hybrid mode 500 kHz**			
Frequency band:	[902 – 928] MHz			
Number of Channel:	8			
Spacing channel:	1,6 MHz			
Channel bandwidth:	500 kHz			
Antenna Type:	☑ Integral	☐ External	☐ Dedicated	
Antenna connector:	☐ Yes	☑ No	☐ Temporary for test	
Transmit chains:	☑ 1	☐ 2		
Receiver chains	☑ 1	☐ 2		
Type of equipment:	☑ Stand-alone	☐ Plug-in	☐ Combined	
Ad-Hoc mode:	☐ Yes	☑ No		
Duty cycle:	☑ Continuous duty	☐ Intermittent duty	☐ 100% duty	
Equipment type:	☐ Production model	☑ Pre-production model		
Operating temperature range:	Tmin:	☑ -20°C	☐ 0°C	☐ X°C
	Tnom:	20°C		
	Tmax:	☐ 35°C	☐ 55°C	☑ 70°C
Type of power source:	☐ AC power supply	☐ DC power supply	☑ Battery	
Operating voltage range:	Vnom:	☐ 120V/60Hz	☑ 3 Vdc	

Antenna Characteristic			
Antenna assembly	**Gain (dBi)**	**Frequency Band (MHz)**	**Impedance(Ω)**
1	-1.5	902-928	50

CHANNEL PLAN (DTS)	
Channel	**Frequency (MHz)**
Cmin	903.0
Cmid	907.8
Cmax	914.2

CHANNEL PLAN (Hybrid mode 125 kHz)	
Channel	**Frequency (MHz)**
Cmin	902.3
Cmid	908.7
Cmax	914.9

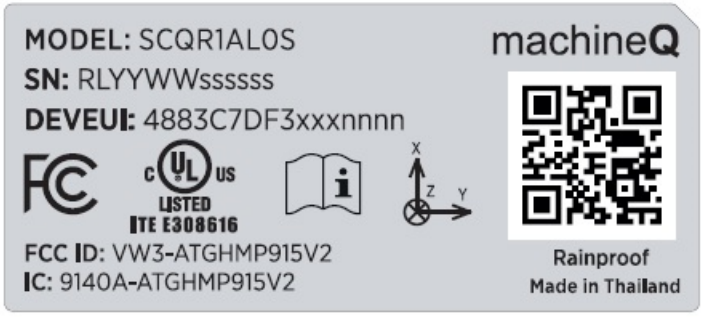
CHANNEL PLAN (Hybrid mode 500 kHz)	
Channel	**Frequency (MHz)**
Cmin	903.0
Cmid	907.8
Cmax	914.2

2.2. RUNNING MODE

The EUT is set in the following modes during tests:
- Permanent emission with modulation on a fixed channel in the data rate that produced the highest power
- Permanent emission with modulation on hopping channel in the data rate that produced the highest power

See document : « NE_Endpoint-LoRa-Siconia-V2_Pres-ESSAIS-REGUL-US_edD.docx » for further explanation on test mode.

2.3. EQUIPMENT LABELLING



2.4. EQUIPMENT MODIFICATION

☑ None ☐ Modification:

3. DTS : OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

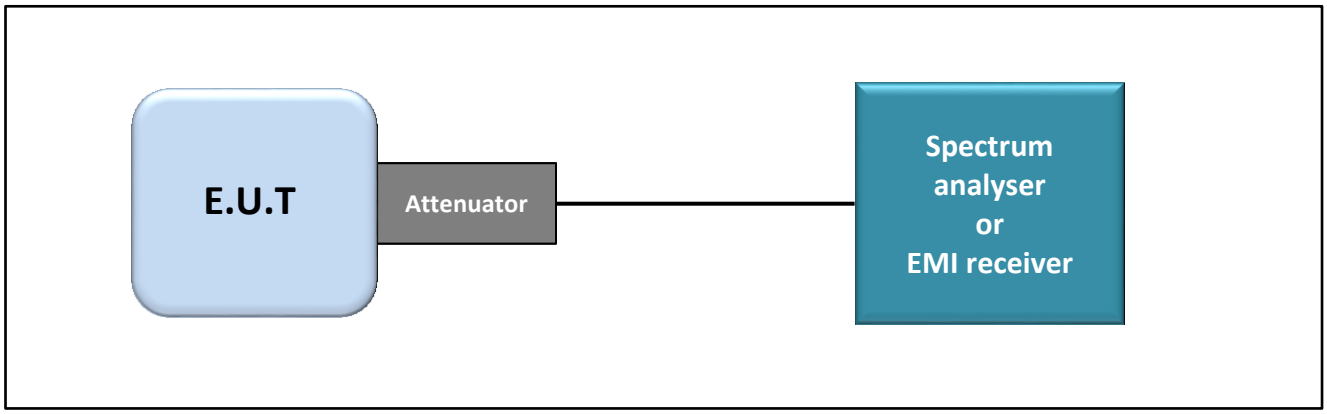
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 44 %

3.2. TEST SETUP

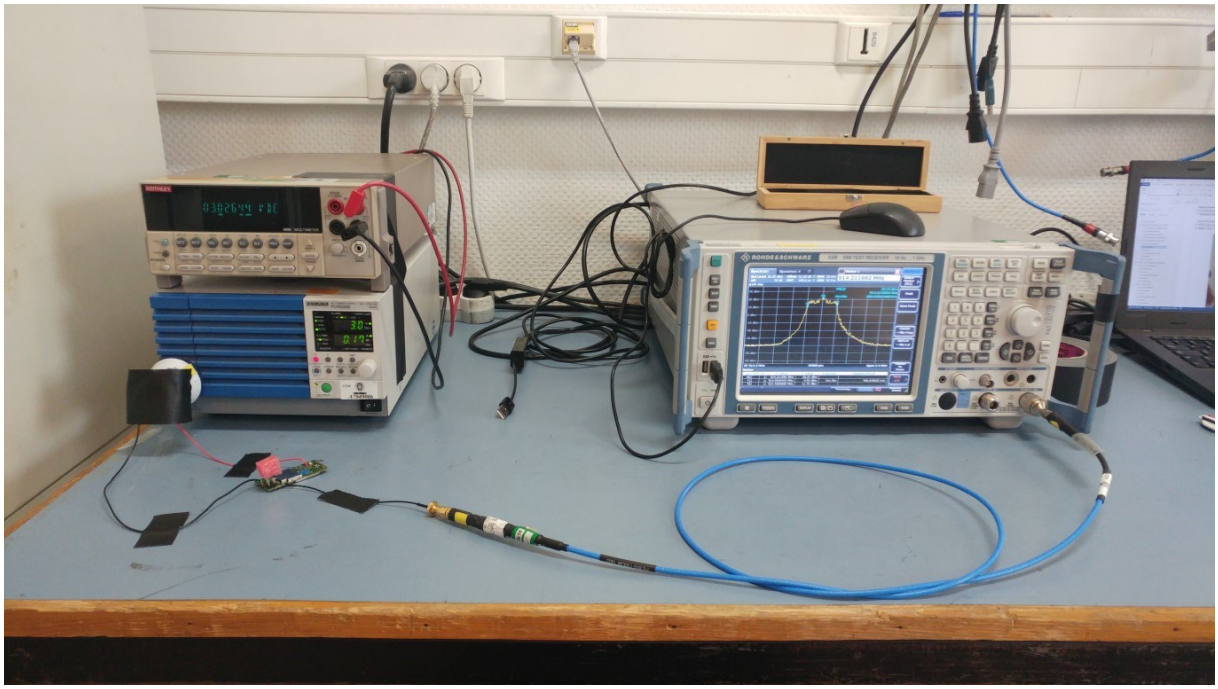
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- 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



Photograph for Occupied bandwidth

3.3. *LIMIT*

None

3.4. TEST EQUIPMENT LIST

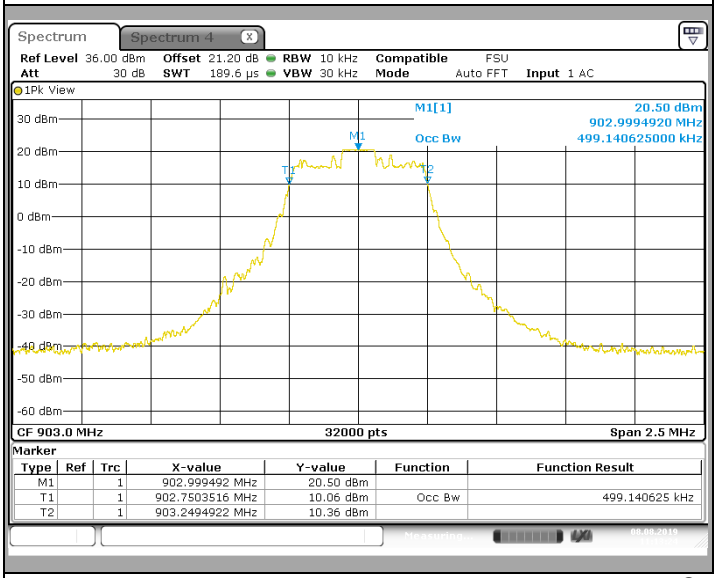
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

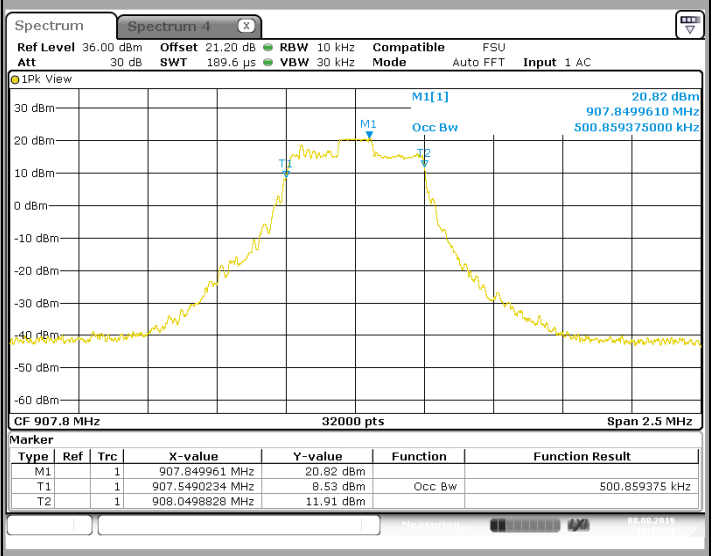
3.5. RESULTS

Occupied Bandwidth

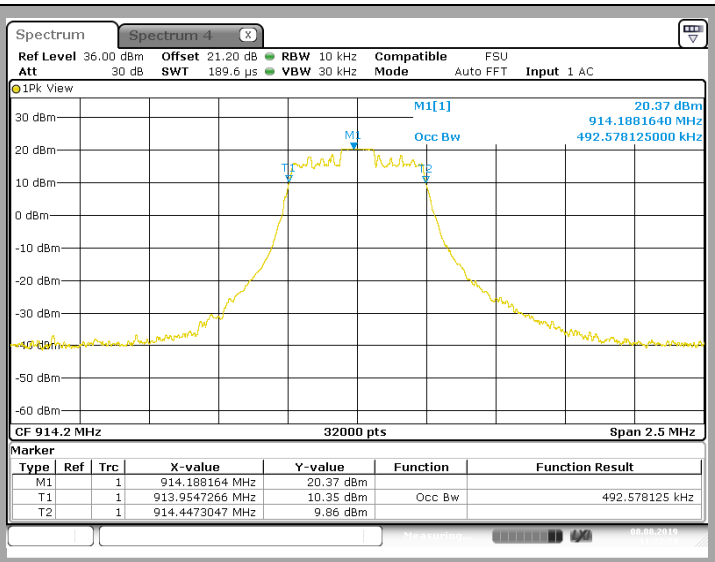
Cmin



Cnom



Cmax



Channel	Occupied Bandwidth (MHz)
Cmin	0,499
Cnom	0,501
Cmax	0,493

3.6. *CONCLUSION*

Occupied Channel Bandwidth measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS-GEN ISSUE 4** limits.

4. DTS : 6DB EMISSION BANDWIDTH

4.1. TEST CONDITIONS

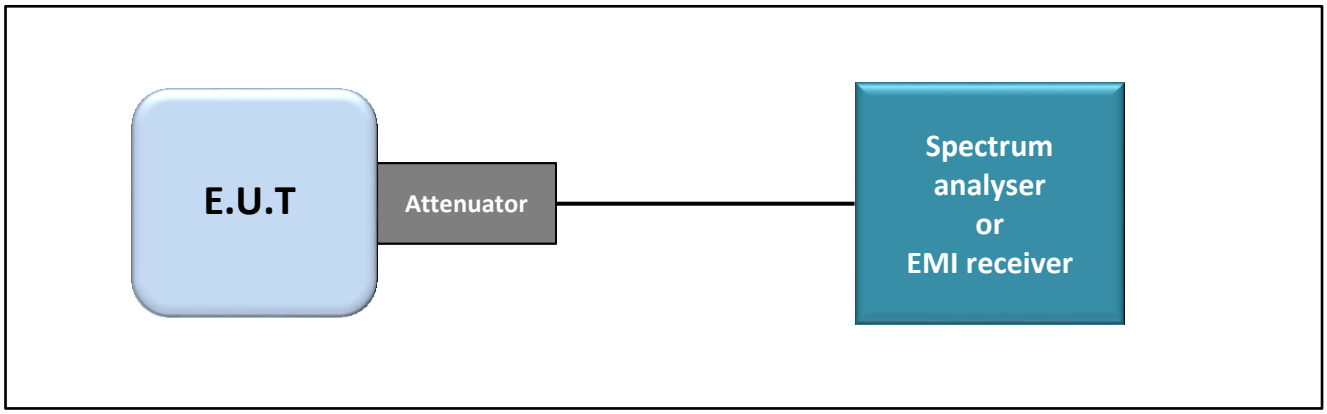
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 44 %

4.2. TEST SETUP

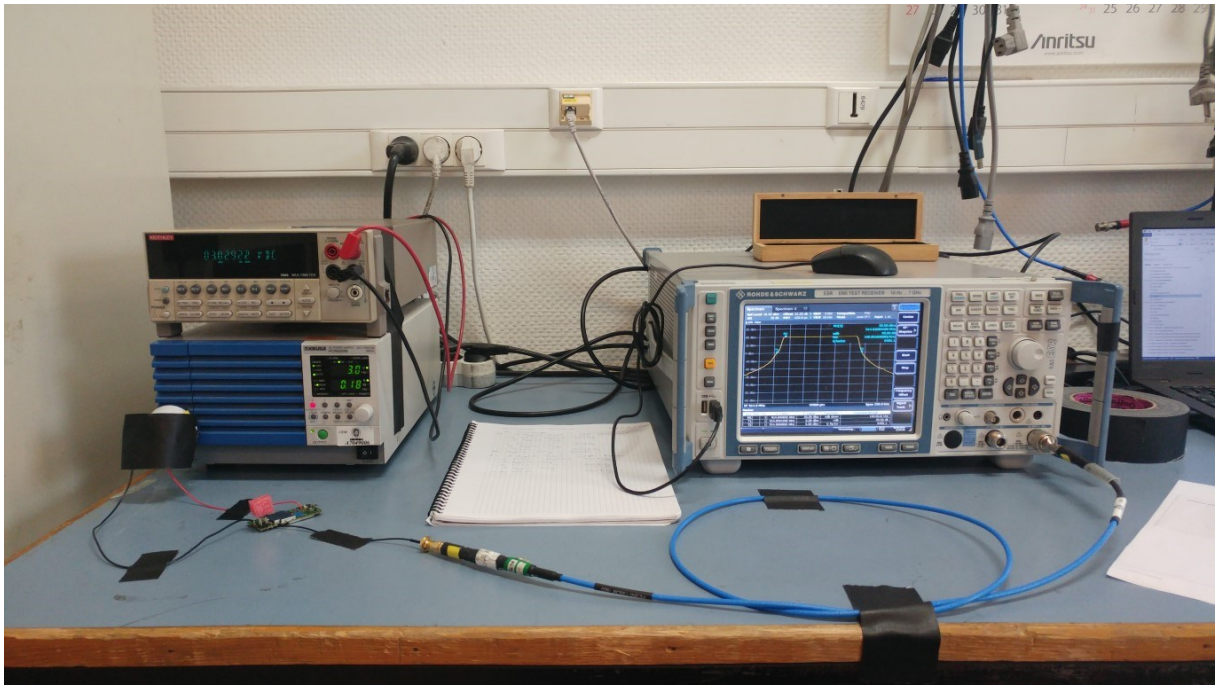
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ KDB 558074 D01 DTS Meas Guidance v04 § 8.1
☐ KDB 558074 D01 DTS Meas Guidance v04 § 8.2



Test set up



Photograph for 6dB emission bandwidth

4.3. LIMIT

The 6dB bandwidth shall be at least 500kHz

4.4. TEST EQUIPMENT LIST

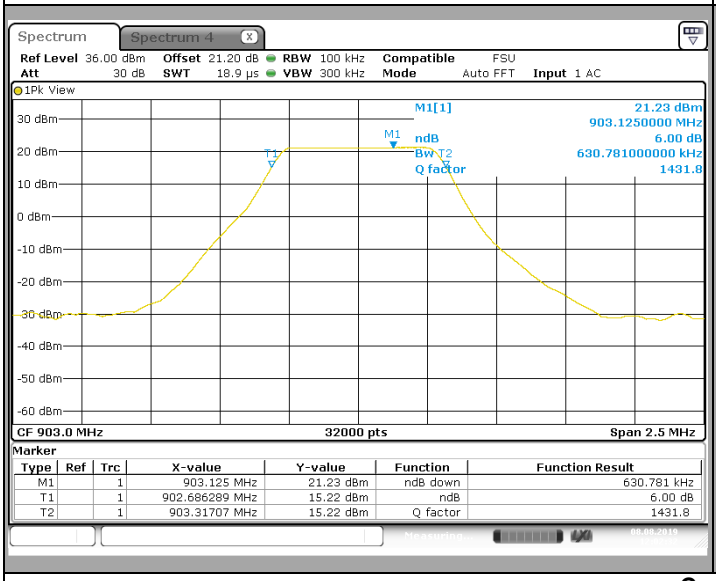
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

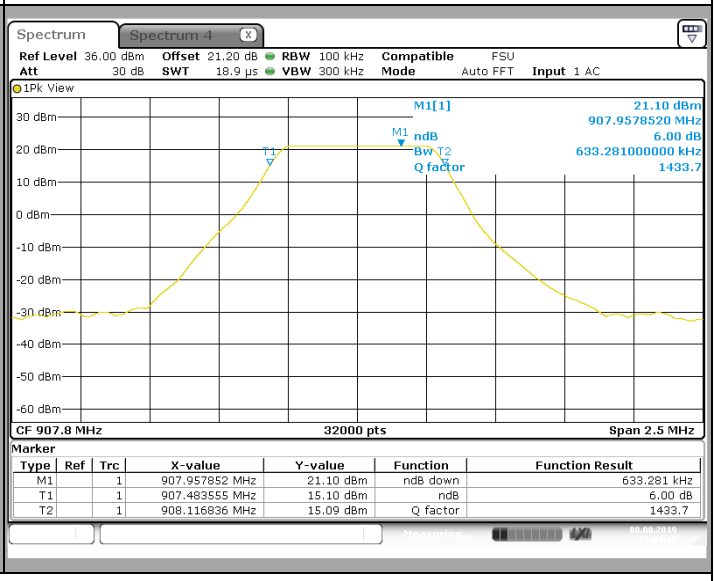
4.5. RESULTS

6dB Emission Bandwidth

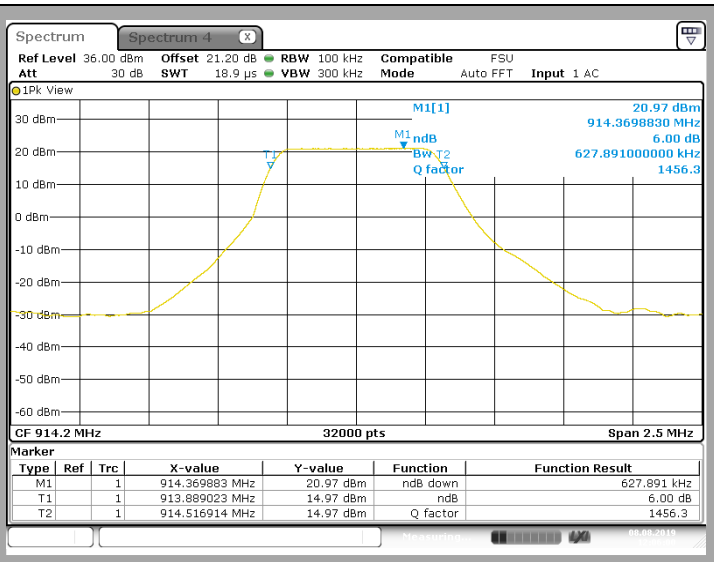
Cmin



Cnom



Cmax



Channel	6dB Emission Bandwidth (MHz)	Limit (MHz)
Cmin	0,631	Minimum 0.5
Cnom	0,633	Minimum 0.5
Cmax	0,628	Minimum 0.5

4.6. CONCLUSION

6dB Emission Bandwidth measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, 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. DTS : DUTY CYCLE

5.1. TEST CONDITIONS

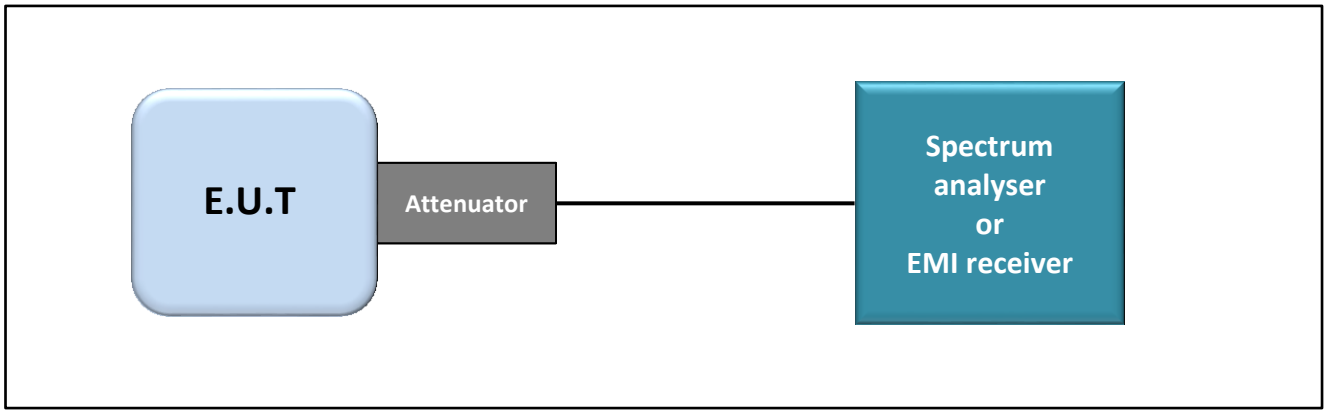
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 44 %

5.2. TEST SETUP

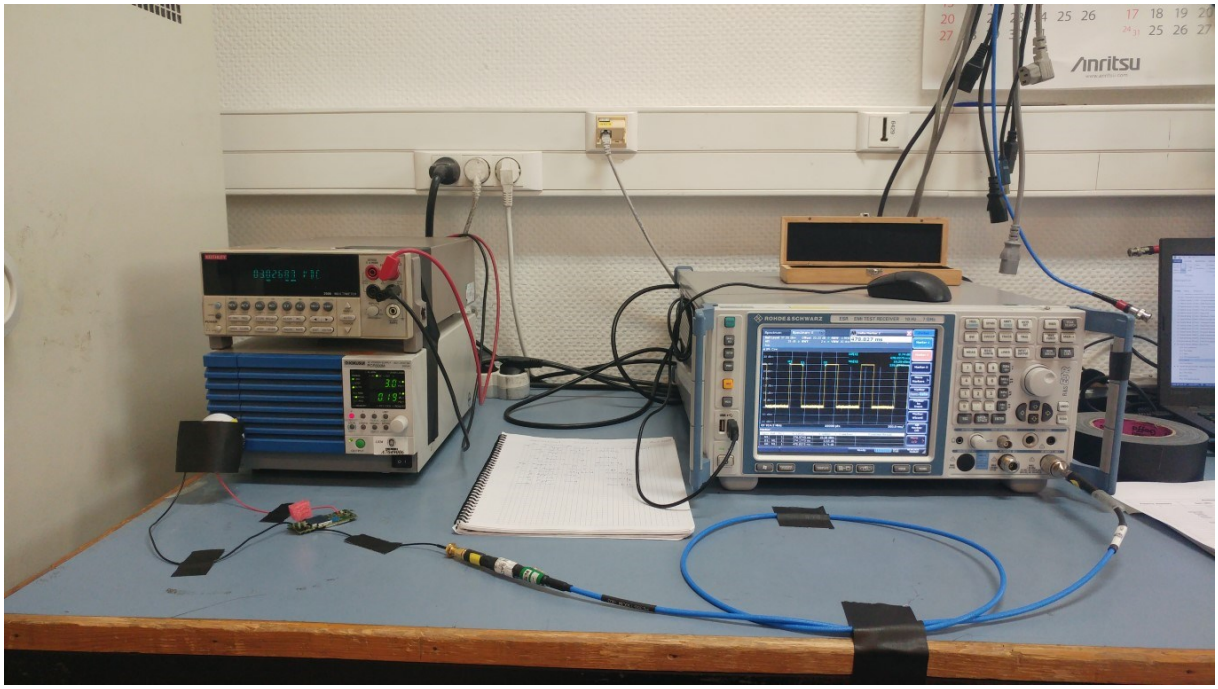
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ KDB 558074 D01 DTS Meas Guidance v04 § 6.0 b)



Test set up



Photograph for Duty Cycle

5.3. LIMIT

None

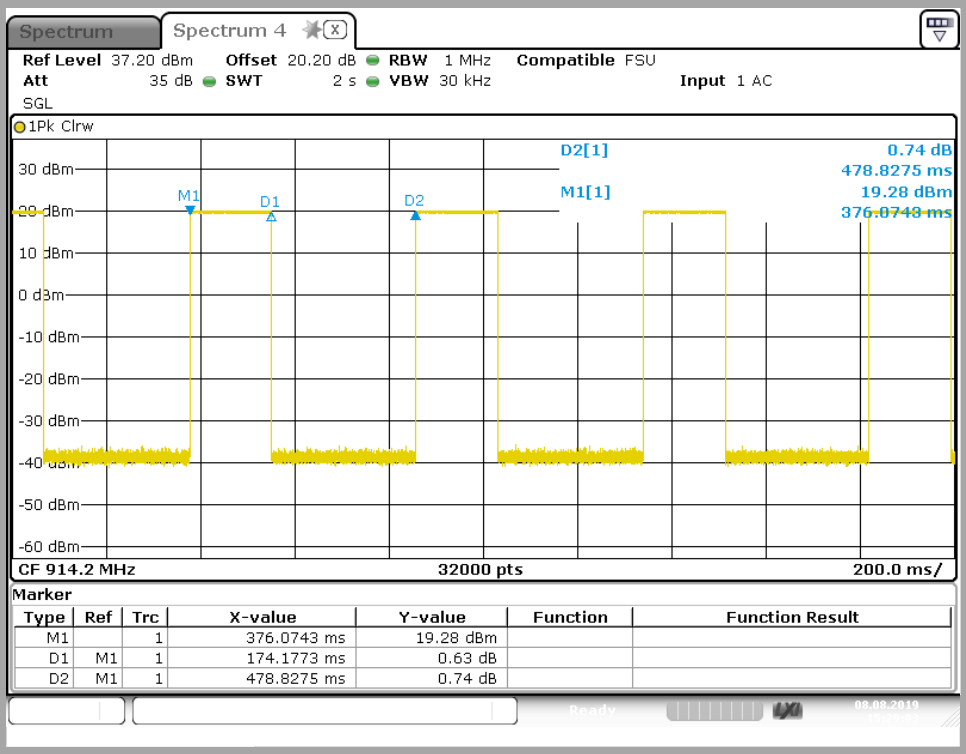
5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

5.5. RESULTS

Duty Cycle
Channel



Channel	Duty Cycle (%)	Duty Cycle Correction (dB)
Cmax	36,3	$20 \log\left(\frac{1}{duty\ cycle}\right)$= 8,8 dB

5.6. CONCLUSION

Duty Cycle measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, 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. DTS : MAXIMUM CONDUCTED OUTPUT POWER

6.1. TEST CONDITIONS

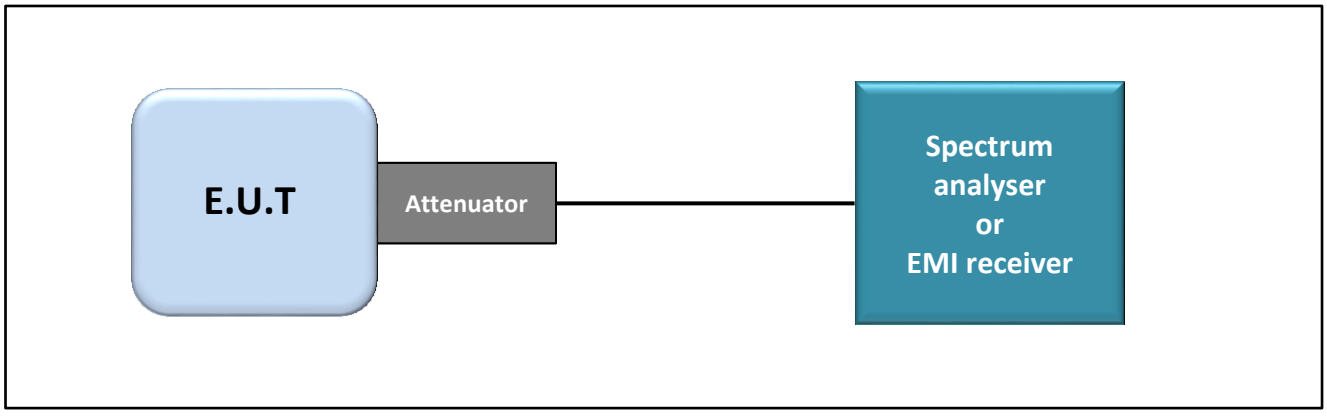
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 44 %

6.2. TEST SETUP

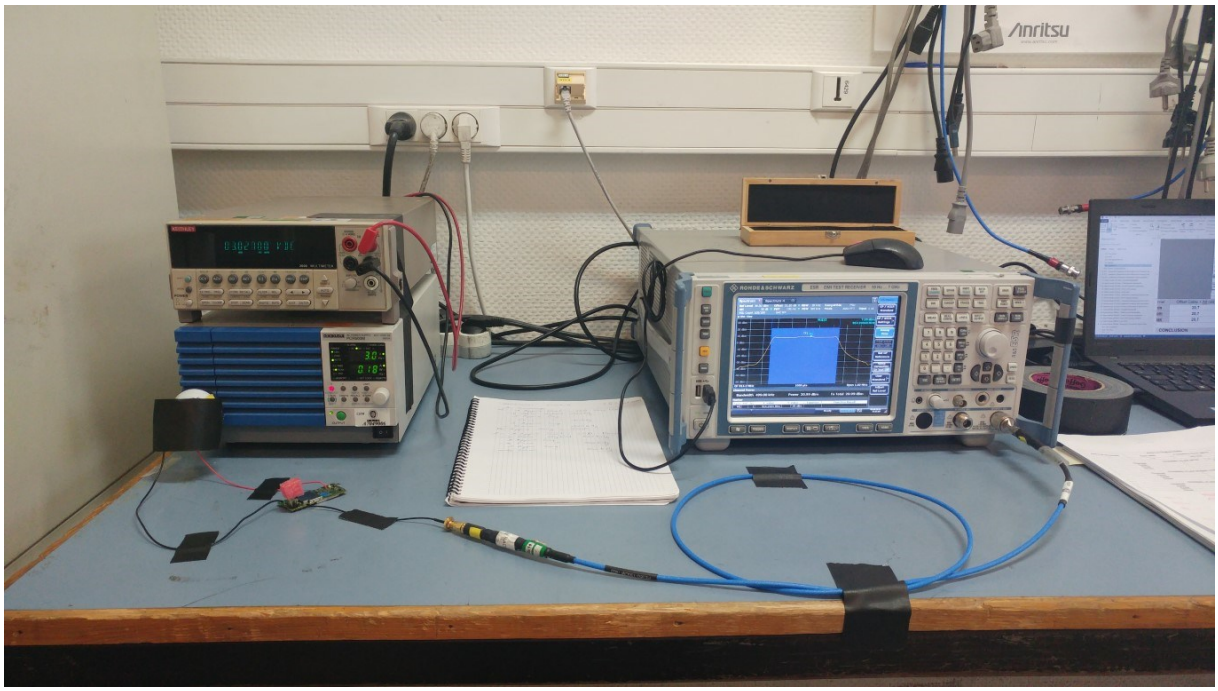
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☐ KDB 558074 D01 DTS Meas Guidance v04 § 9.1.1 (RBW≥DTS bandwidth)
☑ KDB 558074 D01 DTS Meas Guidance v04 § 9.2.2.2 (Method AVGSA-1)
☐ KDB 558074 D01 DTS Meas Guidance v04 § 9.2.2.4 (Method AVGSA-2)



Test set up



Photograph for Maximum Conducted Output Power

6.3. LIMIT

Maximum Conducted Output power:
2400MHz-2483.5MHz: Shall not exceed 30dBm
Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

6.4. TEST EQUIPMENT LIST

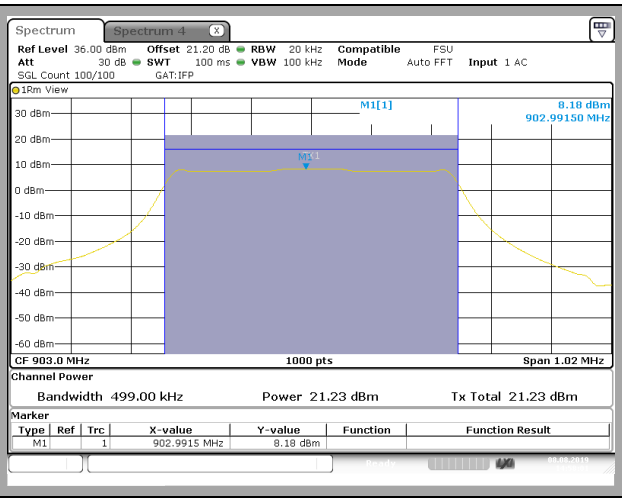
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

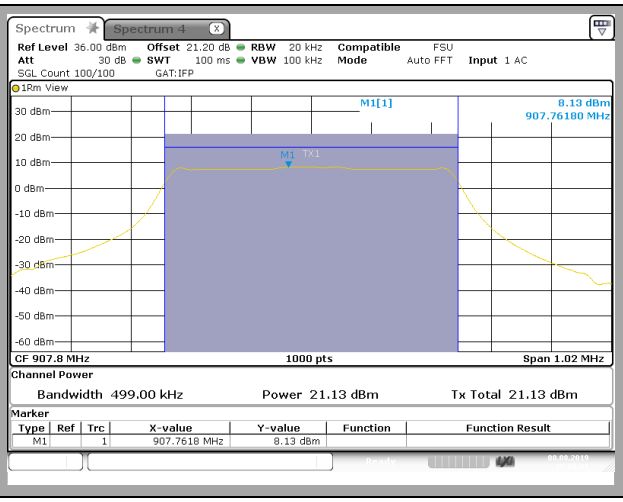
6.5. RESULTS

Maximum Conducted Output Power

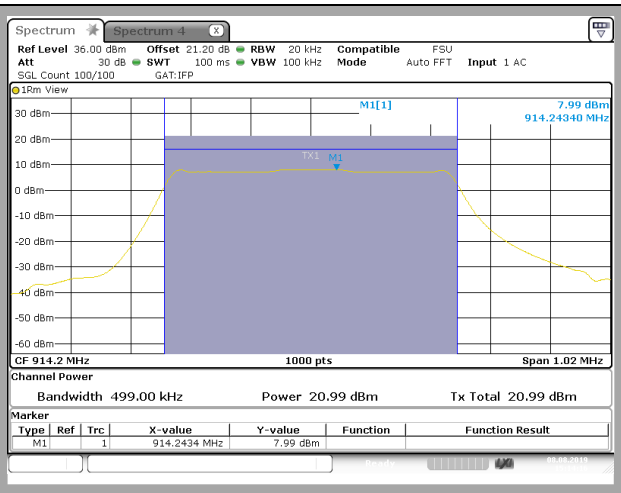
Cmin



Cnom



Cmax



Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Limit (dBm)
Cmin	**21,2**	-1,5	21,23	30
Cnom	**21,2**	-1,5	21,13	30
Cmax	**21,2**	-1,5	20,99	30

6.6. CONCLUSION

Maximum Conducted Output Power measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, 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. DTS : POWER SPECTRAL DENSITY

7.1. TEST CONDITIONS

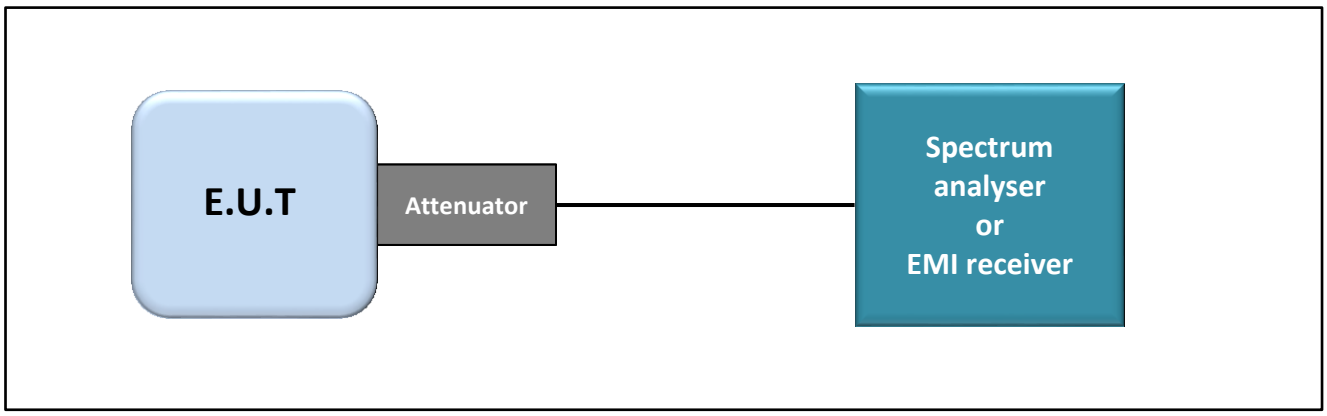
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 48 %

7.2. TEST SETUP

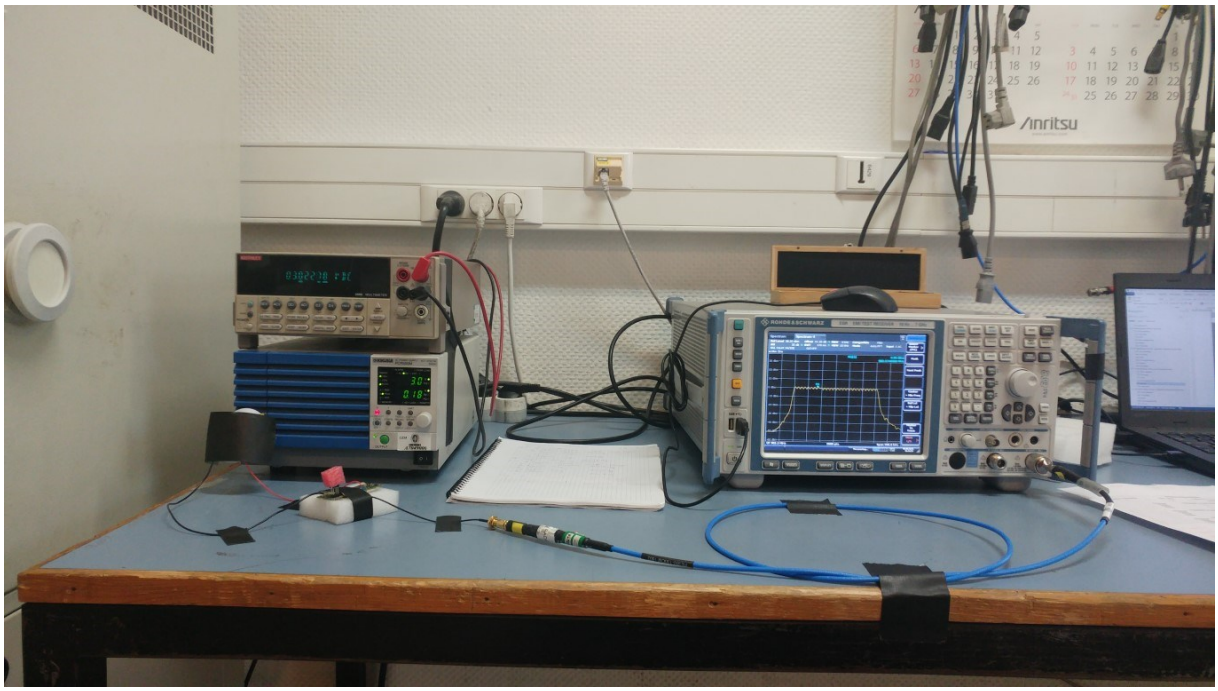
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☐ KDB 558074 D01 DTS Meas Guidance v04 § 10.2 (Method PKPSD)
☑ KDB 558074 D01 DTS Meas Guidance v04 § 10.3 (Method AVGPSD-1)



Test set up



Photograph for Power Spectral Density

7.3. LIMIT

Power Spectral Density:
902MHz-928MHz: Shall not exceed 8dBm/3kHz
Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

7.4. TEST EQUIPMENT LIST

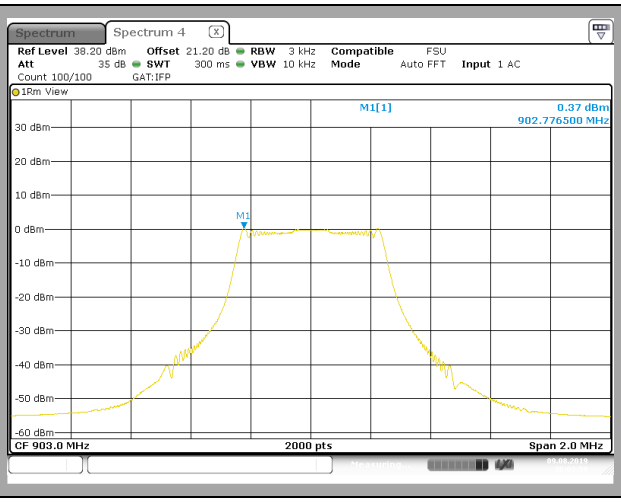
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

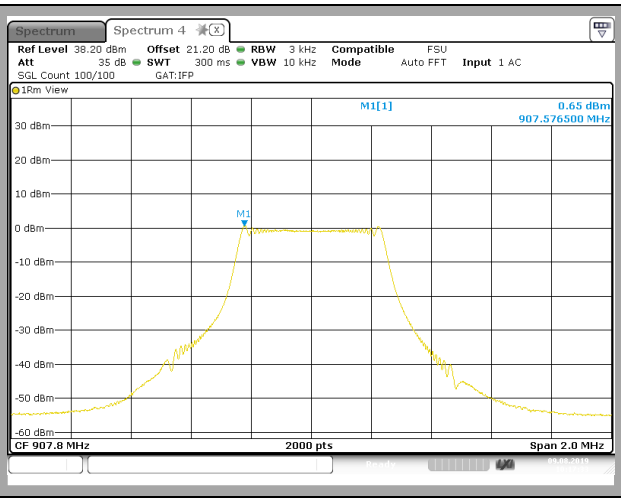
7.5. RESULTS

Power Spectral Density

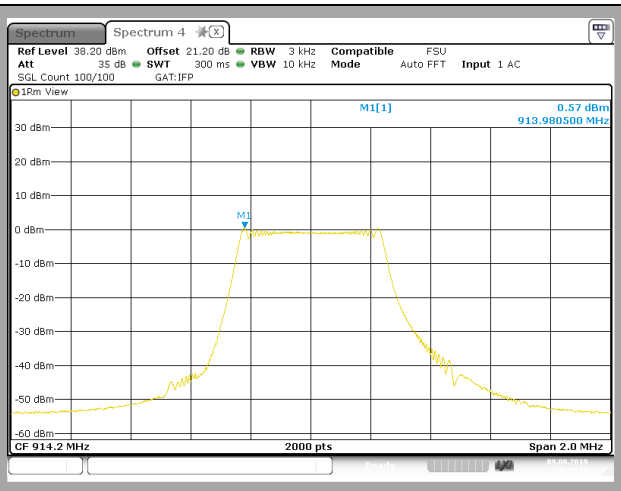
Cmin



Cnom



Cmax



Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
Cmin	**21,2**	-1,5	0,37	8
Cnom	**21,2**	-1,5	0,65	8
Cmax	**21,2**	-1,5	0,57	8

7.6. CONCLUSION

Power Spectral Density measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, 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. DTS : UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS AT THE BAND EDGE

8.1. TEST CONDITIONS

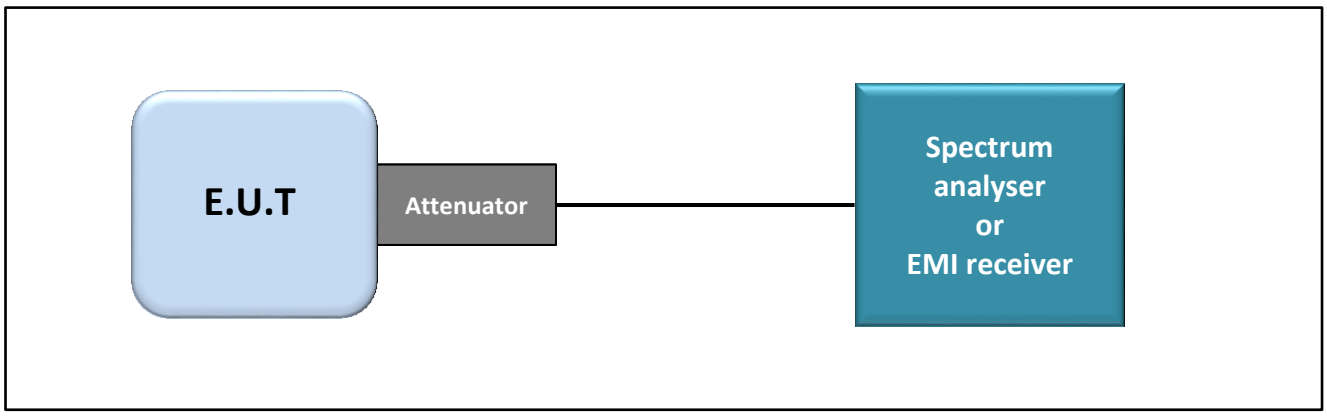
Test performed by	: Julien Palard
Date of test	: September 18, 2019
Ambient temperature	: 25 °C
Relative humidity	: 48 %

8.2. TEST SETUP

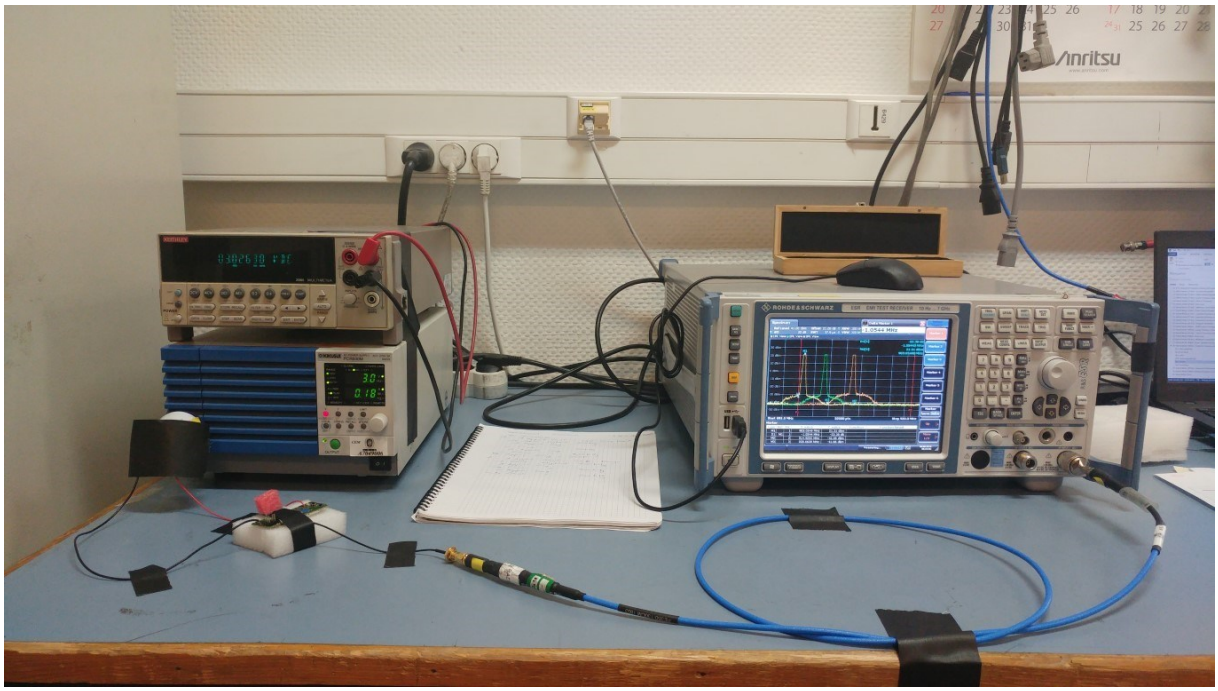
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ KDB 558074 D01 DTS Meas Guidance v04 § 11



Test set up



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

8.3. LIMIT

All Spurious Emissions must be at least 30dB (Average Conducted Power) below the Fundamental Radiator Level at the Band Edge Edge “2400MHz & 2483,5MHz”

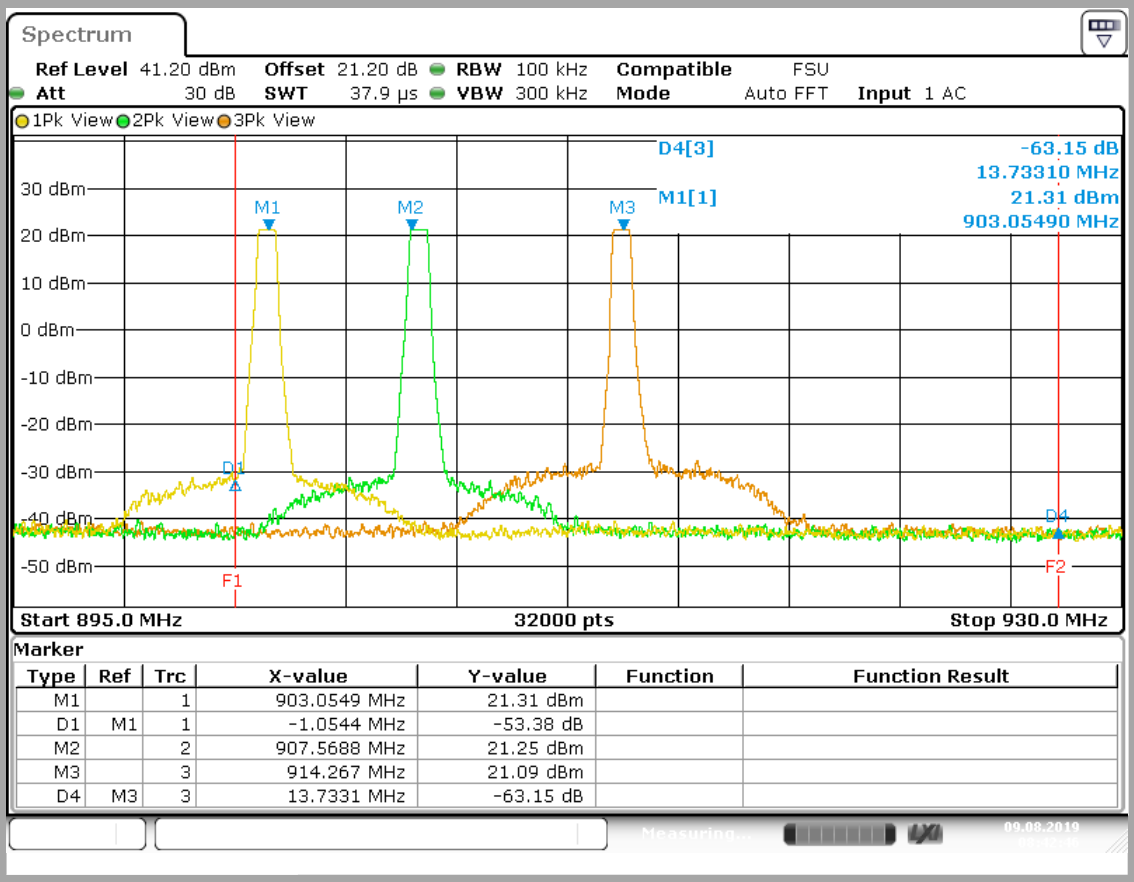
8.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

8.5. RESULTS

Cmin/Cnom/Cmax



Frequency (MHz)	Level (dBc)	Limit (dBc)
902	-53,38	30
928	-63,15	30

8.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands at the band edge measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, 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. DTS : UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS

9.1. TEST CONDITIONS

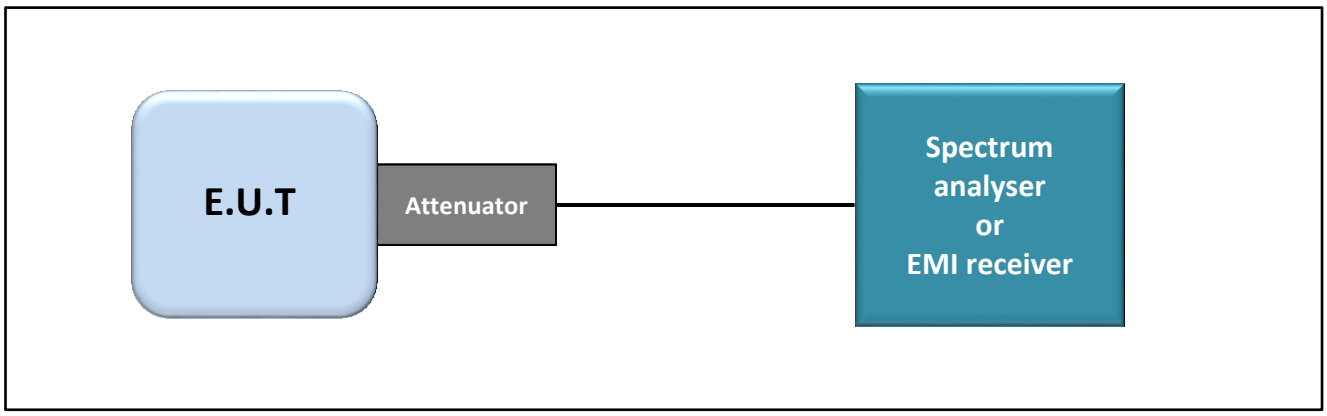
Test performed by	: Julien Palard
Date of test	: September 18, 2019
Ambient temperature	: 25 °C
Relative humidity	: 48 %

9.2. TEST SETUP

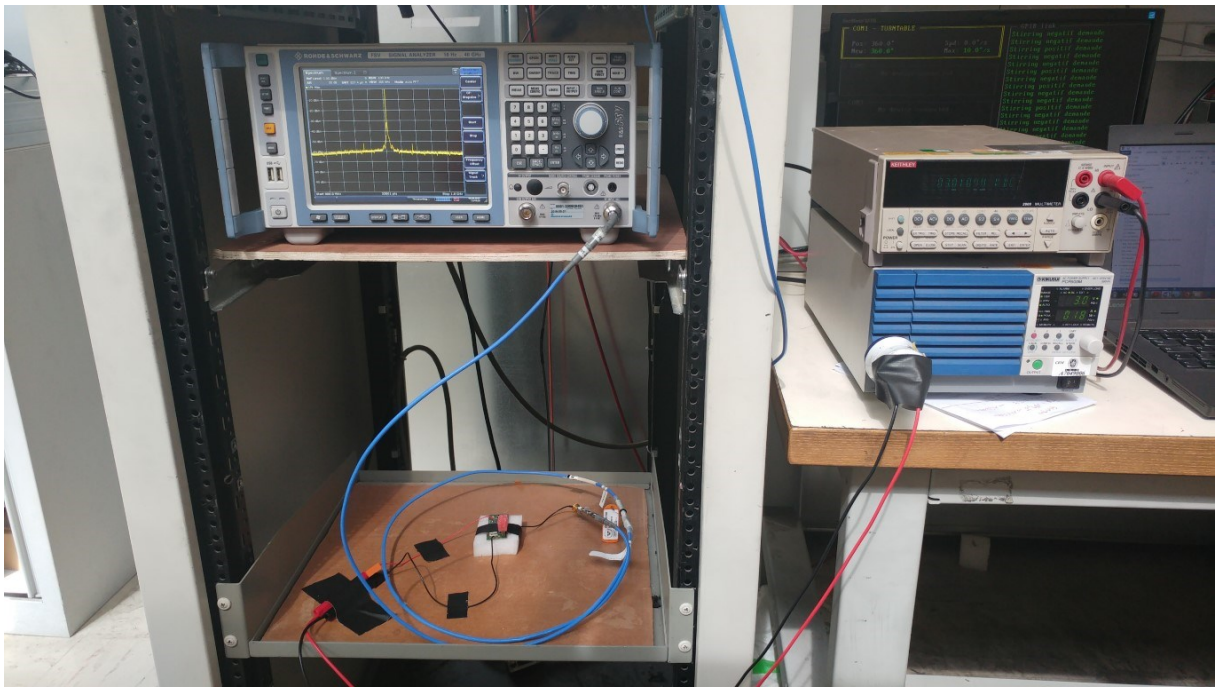
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ KDB 558074 D01 DTS Meas Guidance v04 § 11



Test set up



Photograph for Unwanted Emission into non-restricted frequency bands

9.3. LIMIT

All Spurious Emissions must be at least Choose limit below the Fundamental Radiator Level

9.4. TEST EQUIPMENT LIST

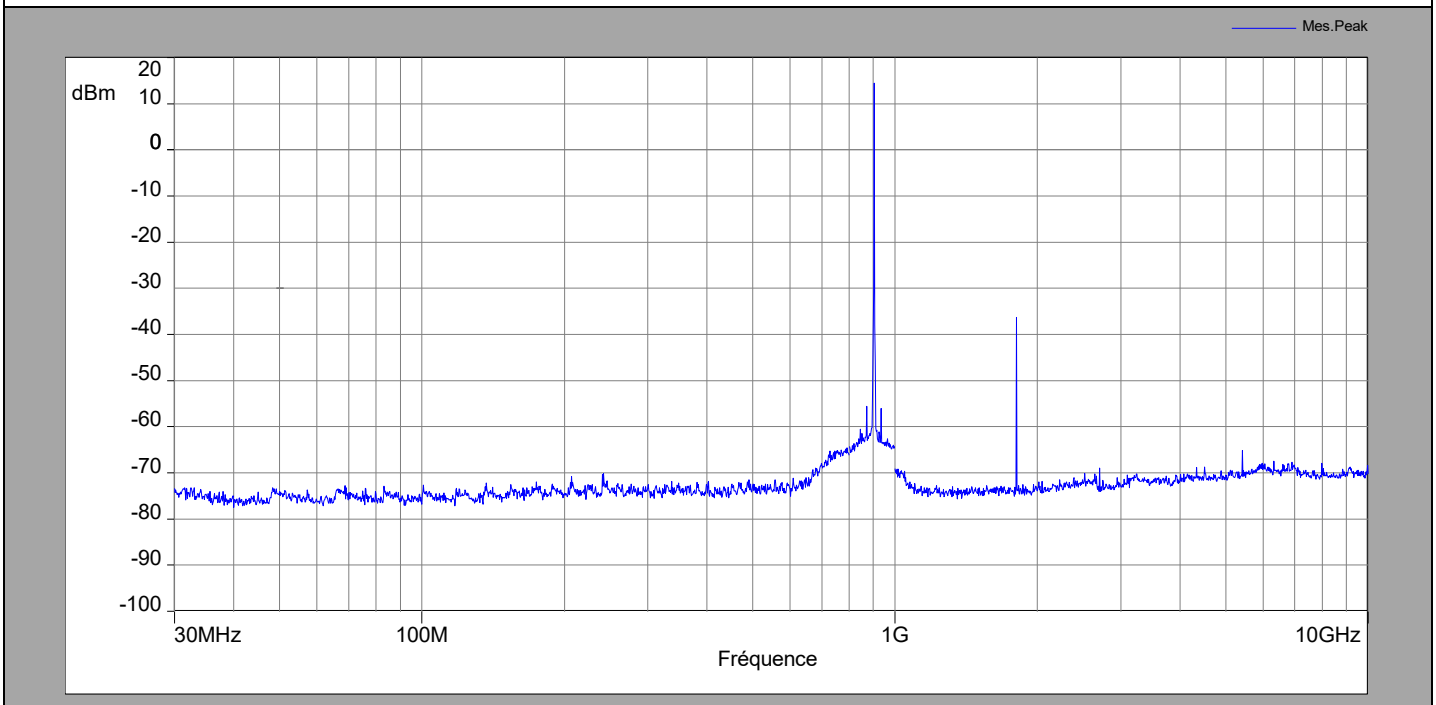
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable Conducted S36 chamber	TELEDYNE	084-0555-2MTR	A5329758	2019/02	2020/02
Attenuator 3dB Cable Spurious Conducted	-	WA54-3-12	A7122223	2019/02	2020/02
High Pass Filter 868MHz	WAINWRIGHT	WHKX12-935	A7484069	2017/10	2019/10
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2019/05	2021/05

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

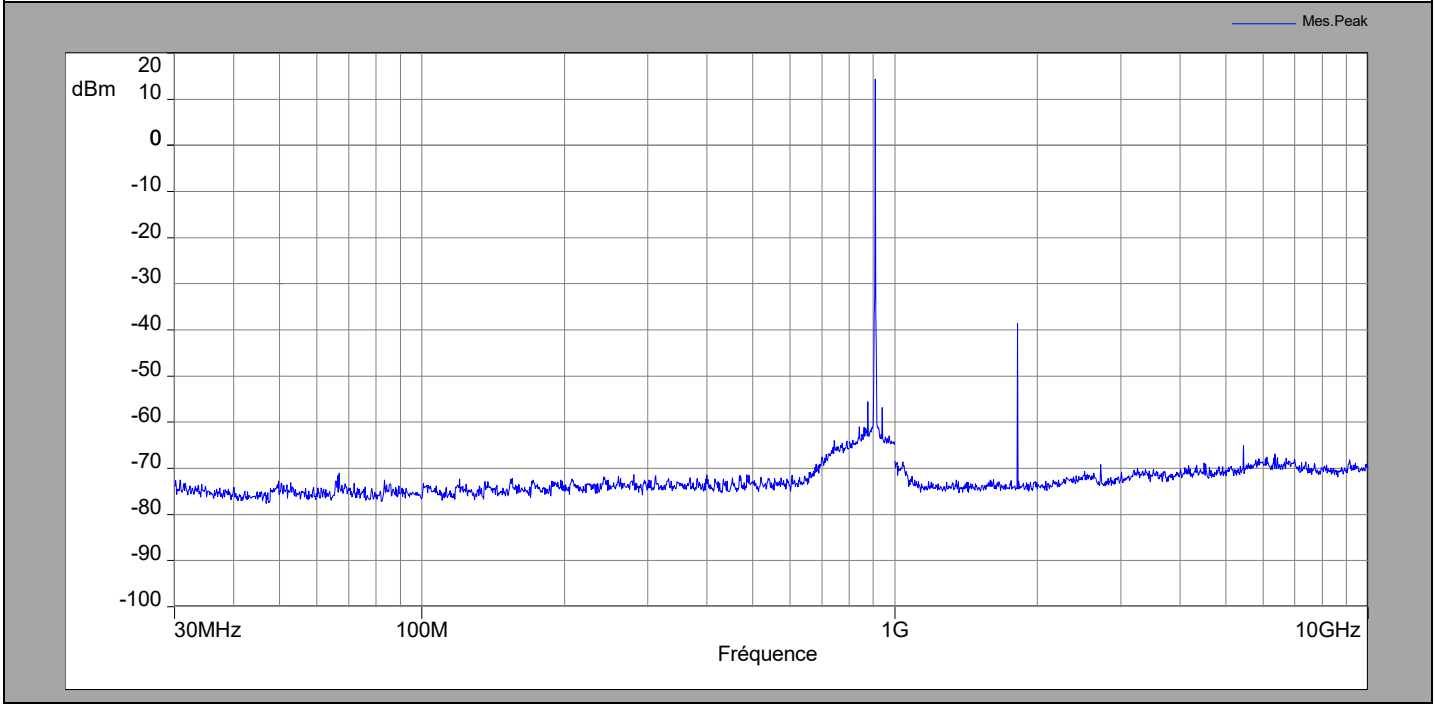
9.5. RESULTS

Single Frequency

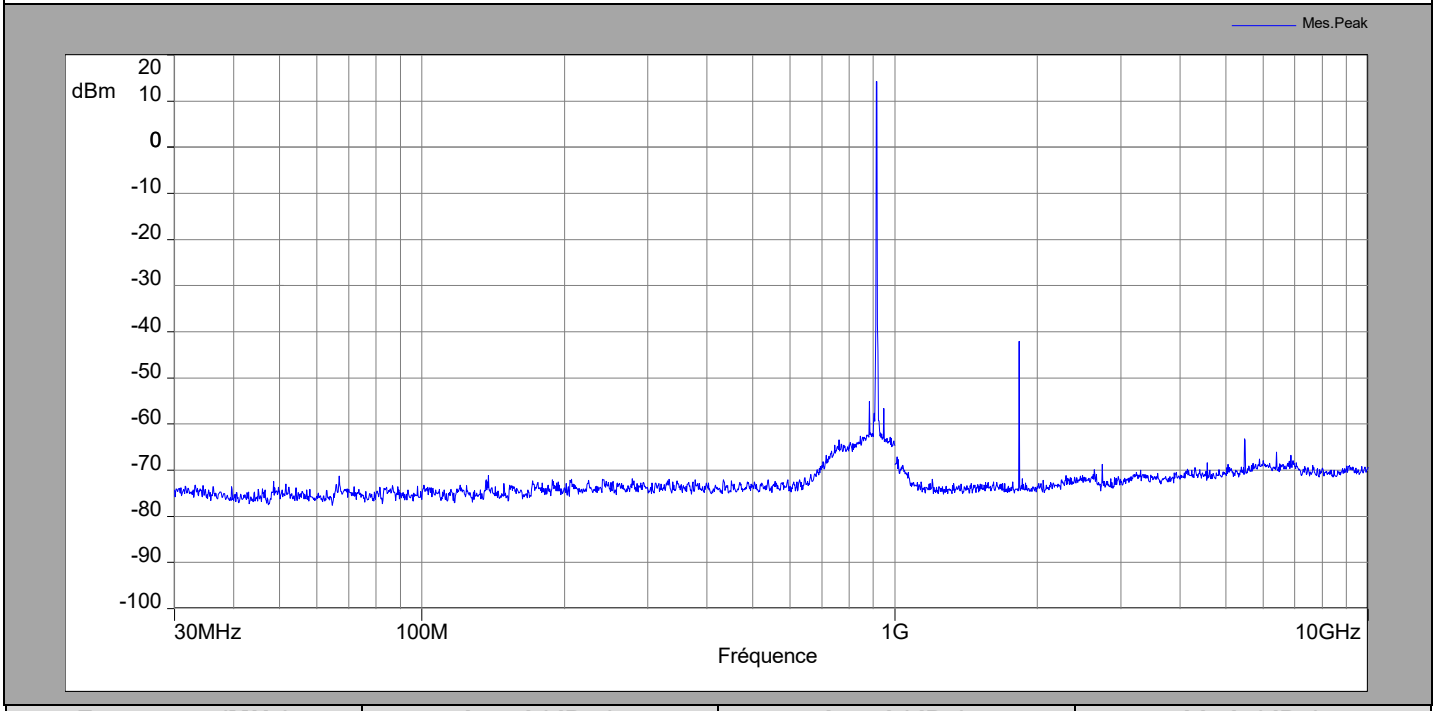
Cmin



Cnom



Cmax



Frequency (MHz)	Level (dBm)	Level (dBc)	Limit (dBc)
903	14,52		
871,1	-55,57	70,09	30
935	-56,08	70,6	30
1806	-36,43	50,95	30
907,8	14,36		
875,8	-55,56	69,92	30
939,9	-57,55	71,91	30
1815	-38,55	52,91	30
914,2	14,23		
882,1	-55,12	69,35	30
946,2	-56,66	70,89	30
1828	-42,1	56,33	30

9.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

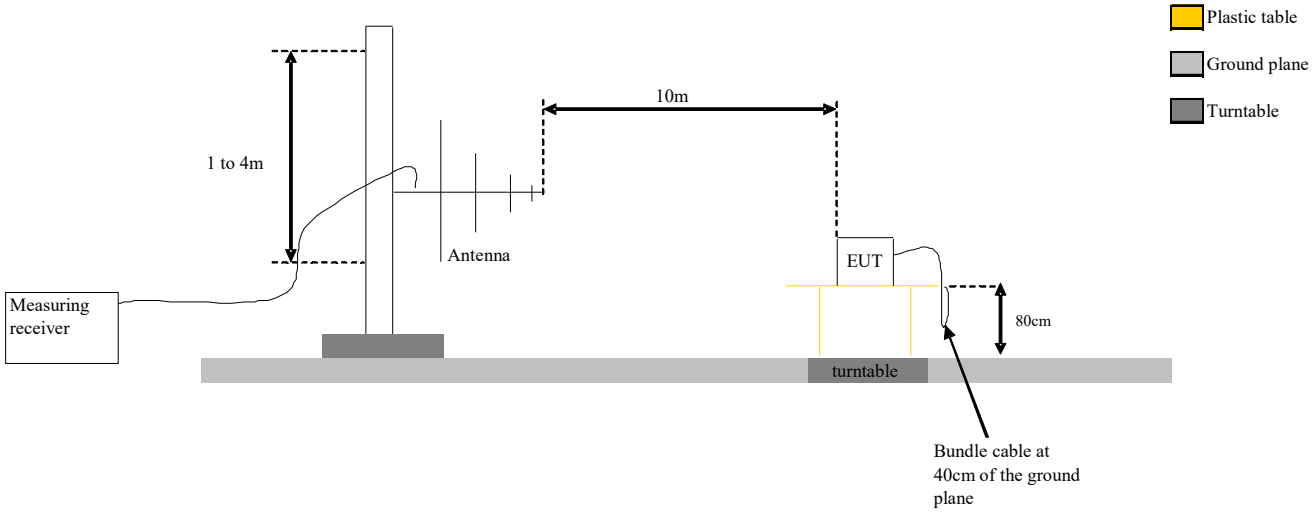
10. DTS : UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

10.1. TEST CONDITIONS

Test performed by	: Laurent DENEUX
Date of test	: September 13, 2019
Ambient temperature	: 23 °C
Relative humidity	: 47 %

10.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013).
Test is performed in parallel, perpendicular and ground parallel axis with a loop antenna below 30MHz. Measurement bandwidth was 200Hz below 150kHz and 9kHz between 150kHz & 30MHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height was 1m. The EUT is placed **on an open area test site**. Distance between measuring antenna and the EUT is **3m**.
Test is performed in horizontal (H) and vertical (V) polarization with **bilog** between 30MHz & 1GHz and with a horn antenna above 1GHz. Measurement bandwidth was 120kHz below 1GHz and 1MHz above 1GHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height search was performed from 1 to 4m. The EUT is place at 1.5m high above 1GHz and at 0.8m high under 1GHz. The EUT is placed **on an open area test site** above 1GHz and **on an open area test site** from 30MHz to 1GHz. Distance between measuring antenna and the EUT is **10m**.



Test Set up for radiated measurement in open area test site

Photograph for Unwanted Emission in restricted frequency bands

Photograph for Unwanted Emission in restricted frequency bands

10.3. LIMIT

Limit at 3m:
9kHz to 0,490MHz: 2400/F(kHz)µV/m (300m) or 20log(2400/F(kHz))dBµV/m (3m) QPeak
0,490MHz to 1.705MHz: 240000/F(kHz)µV/m (30m) or 20log(240000/F(kHz))dBµV/m (3m) QPeak
1.705MHz to 30MHz: 30µV/m (30m) or dBµV/m (3m) QPeak
30MHz to 88MHz: 40dBµV/m QPeak
88MHz to 216MHz: 43,5dBµV/m QPeak
216MHz to 960MHz: 46dBµV/m QPeak
960MHz to 1000MHz: 54dBµV/m QPeak
Above 1000MHz: 74dBµV/m Peak
54dBµV/m Average

Limit at 10m:
30MHz to 88MHz: 29.5dBµV/m QPeak
88MHz to 216MHz: 33dBµV/m QPeak
216MHz to 960MHz: 35.5dBµV/m QPeak
960MHz to 1000MHz: 43.5dBµV/m QPeak
Above 1000MHz: 63.5BµV/m Peak
43.5BµV/m Average

10.4. 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
Bilog antenna	CHASE	CBL 6112A	C2040040	2019-04	2020-04
Preamplifier	HEWLETT PACKARD	8449B	A4069002	04/2018	04/2020
Horn	EMCO	3115	C2042016	06/2019	06/2020
loop antenna	RHODE & SCHWARZ	HFH2-Z2	C2040007	2018-11	2020-11
Cable	-	-	A5329442	2018-09	2019-09
Cable			A5329542	06/2018	06/2019
Cable	-	-	A5329444	2018-09	2019-09
Cable	-	-	A5329876	2018-11	2019-11
Cable	-	-	A5326368	2018-12	2019-12
Cable	-	-	A5329416	2018-12	2019-12

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

10.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

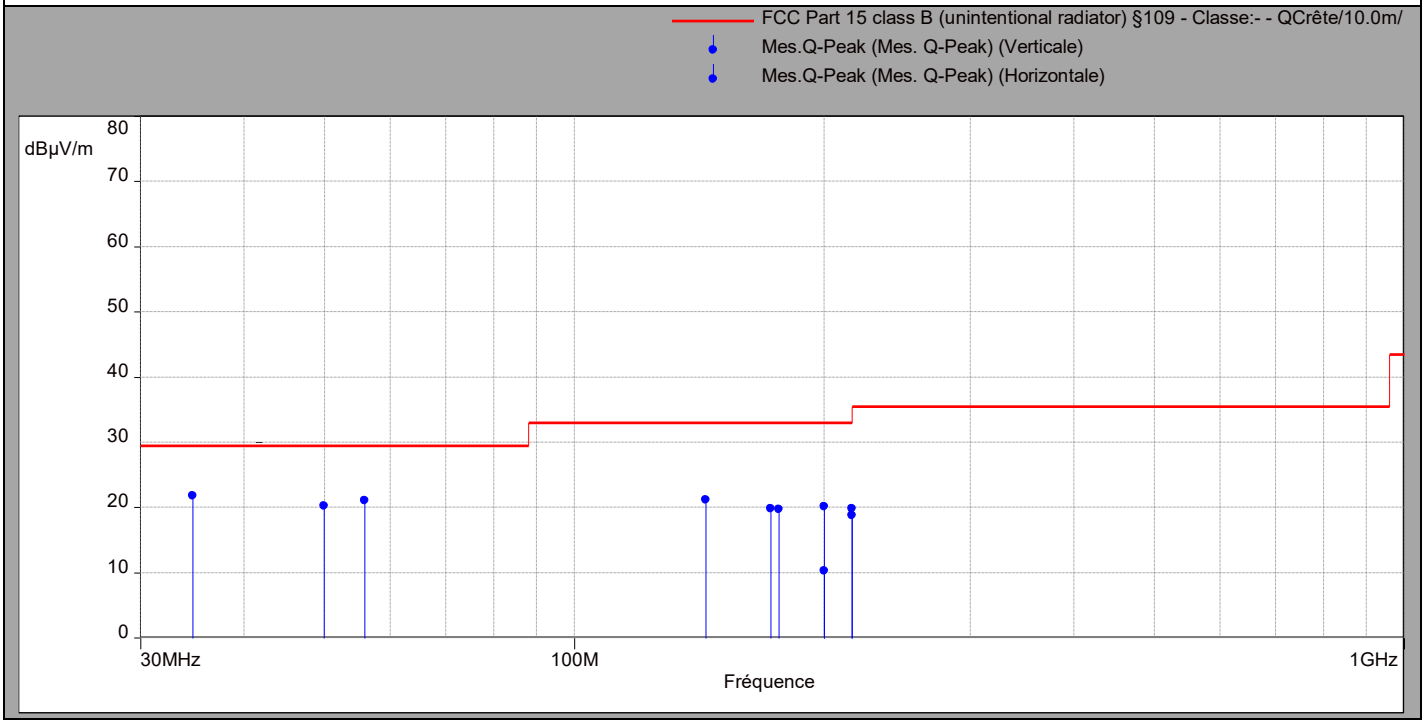
☑ None ☐ Divergence:

10.6. RESULTS

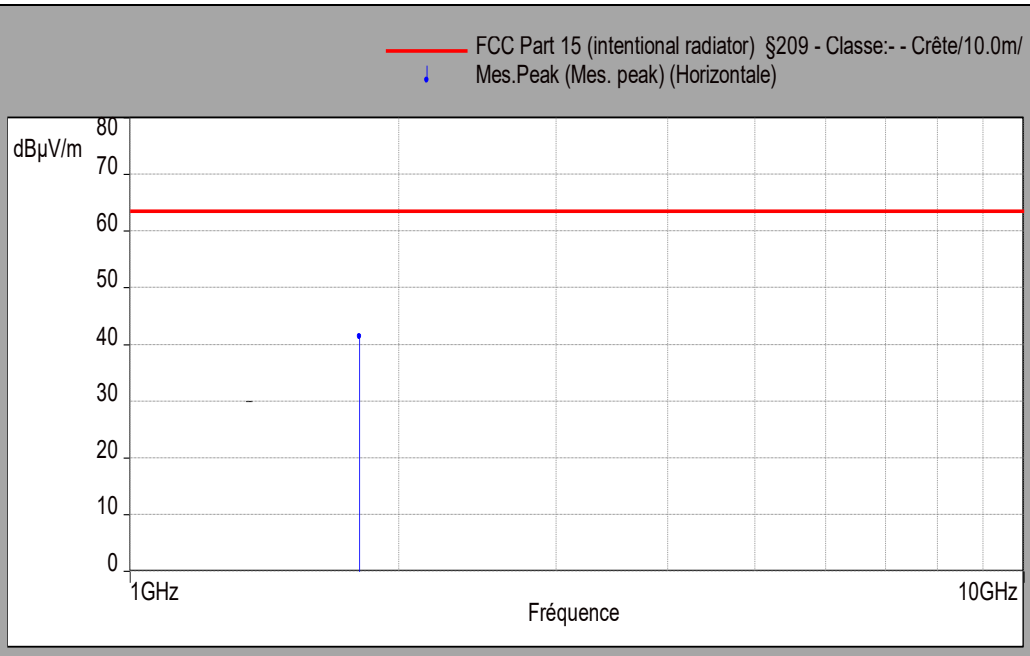
Below 1GHz

Cmin/Cnom/Cmax

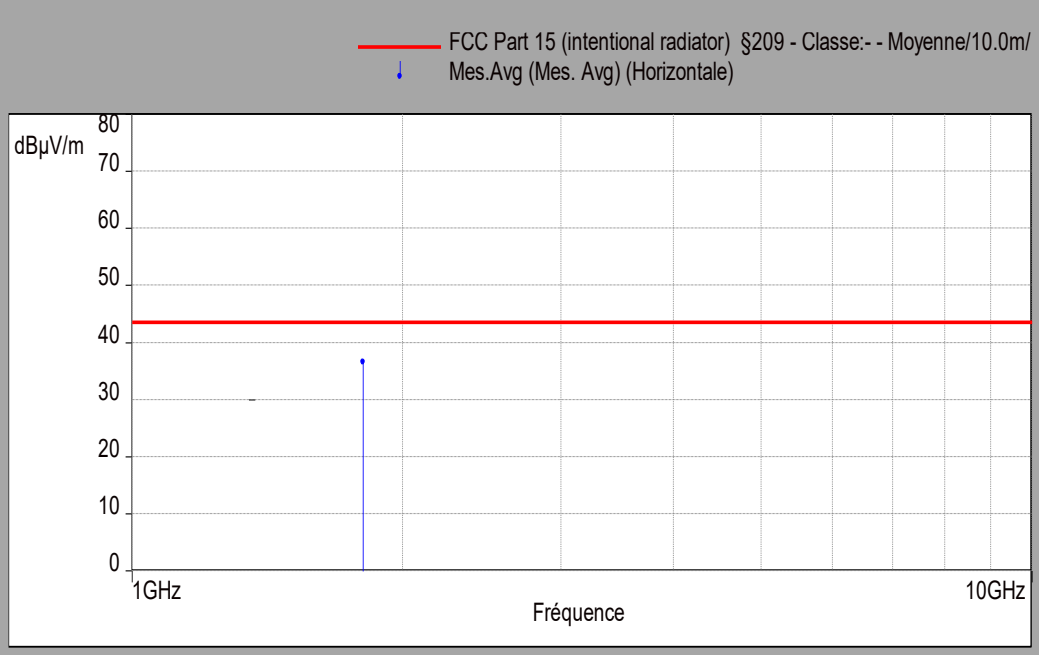
Horizontal &Vertical Polarization



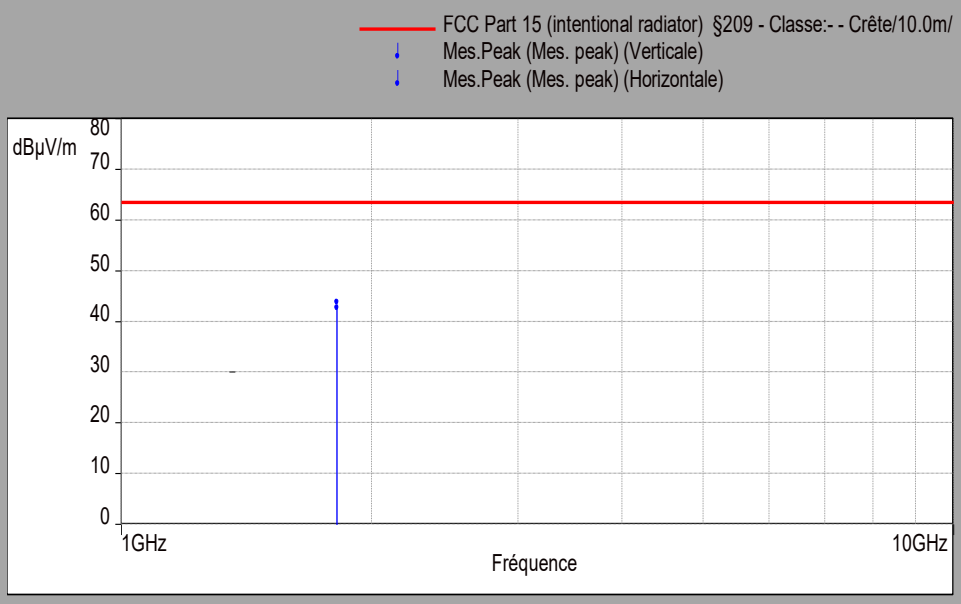
Above 1GHz (Cmin)
Peak measurement
Vertical & horizontal Polarization



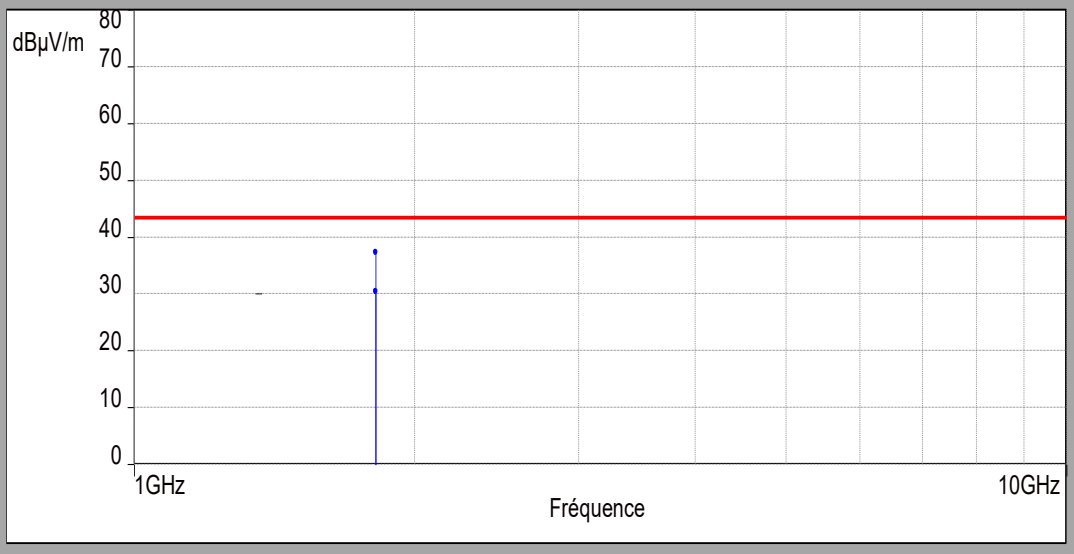
Average value
Vertical & horizontal Polarization



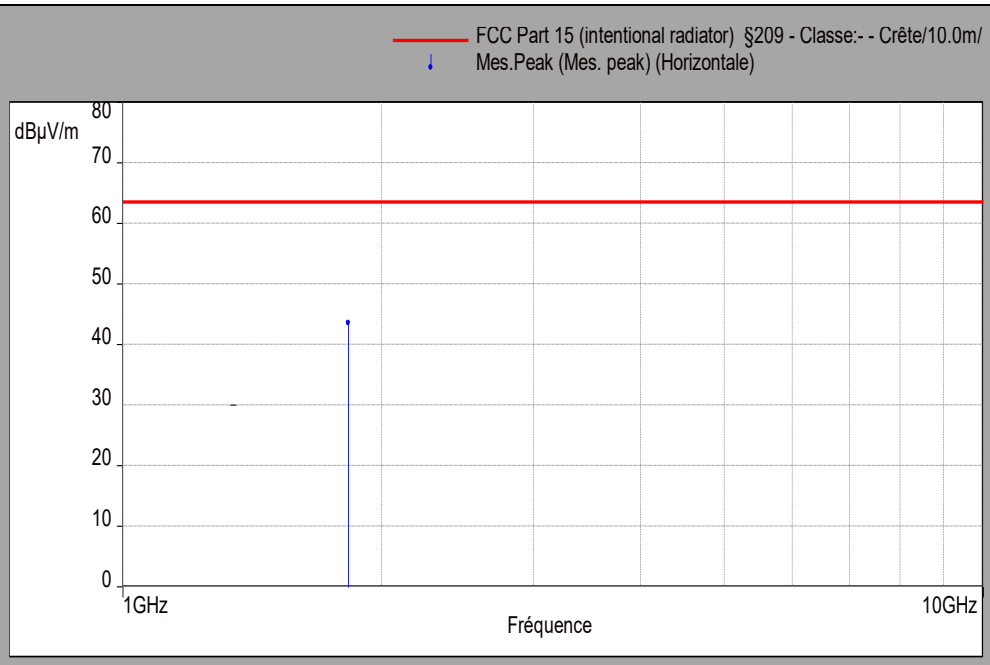
Above 1GHz (Cnom)
Peak measurement
Vertical & horizontal Polarization



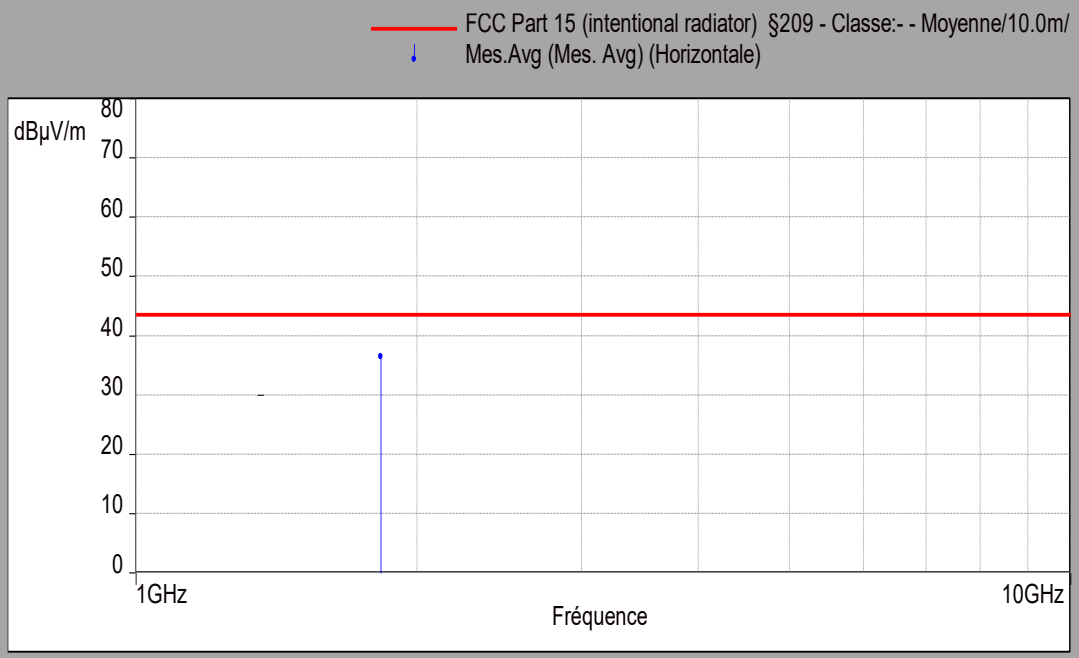
Average value
Vertical & horizontal Polarization



Above 1GHz (Cmax)
Peak measurement
Vertical & horizontal Polarization



Average value
Vertical & horizontal Polarization



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 Cmin/Cnom/Cmax					
Polarization	**Frequency (MHz)**	**Peak Level (dBµV/m)**	**QPeak Level (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dBµV/m)**
Vertical	34.7	-	21.75	29.5	7.75
Vertical	49.9	-	20.23	29.5	9.27
Vertical	55.9	-	21.06	29.5	8.44
Vertical	172.5	-	19.85	33	13.15
Vertical	200	-	20.11	33	12.89
Vertical	216	-	19.78	33	13.22
Horizontal	144	-	21.15	33	11.85
Horizontal	176.2	-	19.76	33	13.24
Horizontal	200	-	10.26	33	22.74
Horizontal	216	-	18.83	33	14.17

Above 1GHz Cmin								
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)**
horizontal	1806	24.79	33.59	43.5	9.91	41.37	63.5	22.13

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)**
horizontal	1815.3	23.53	32.33	43.5	11.17	43.82	63.5	19.68

Above 1GHz 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)**
horizontal	1828.4	23.7	32.5	43.5	11	43.3	63.5	20

10.7. CONCLUSION

Unwanted Emission in restricted frequency bands measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, 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. HYBRID MODE 125 KHZ : OCCUPIED BANDWIDTH

11.1. TEST CONDITIONS

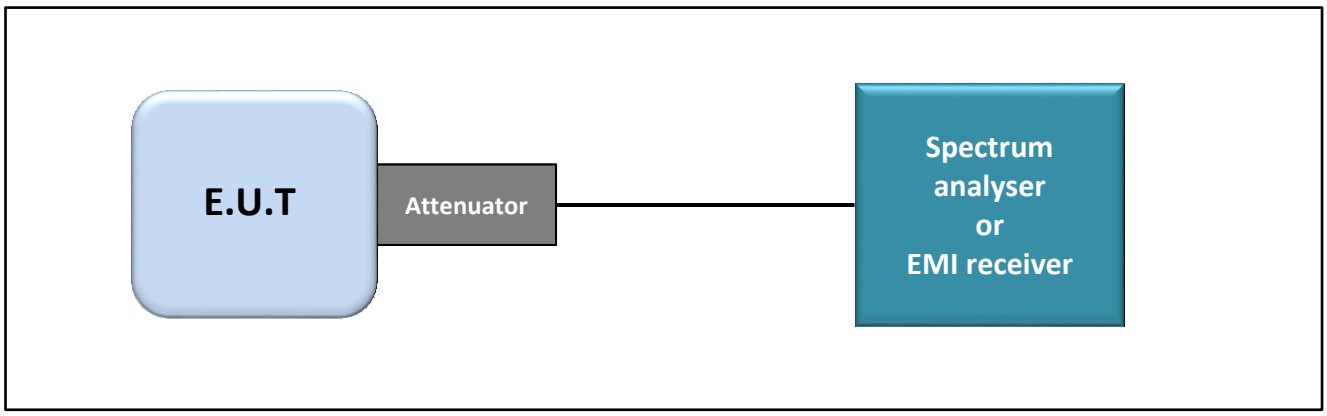
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 44 %

11.2. TEST SETUP

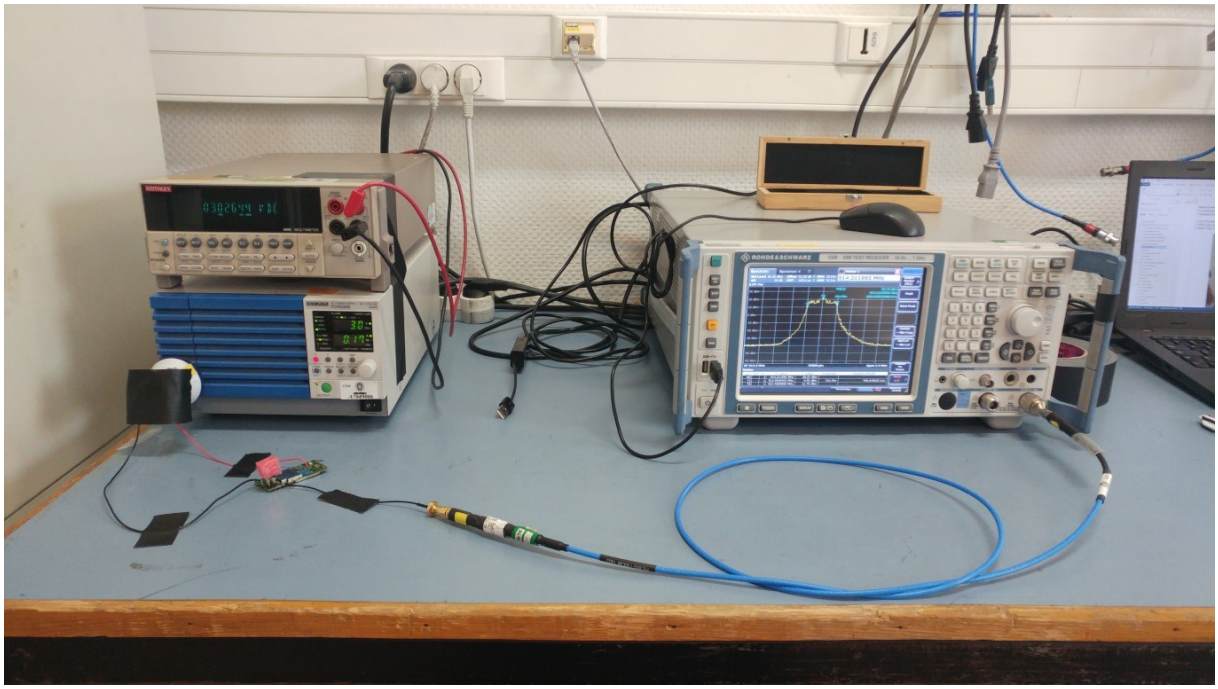
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- 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



Photograph for Occupied bandwidth

11.3. LIMIT

None

11.4. TEST EQUIPMENT LIST

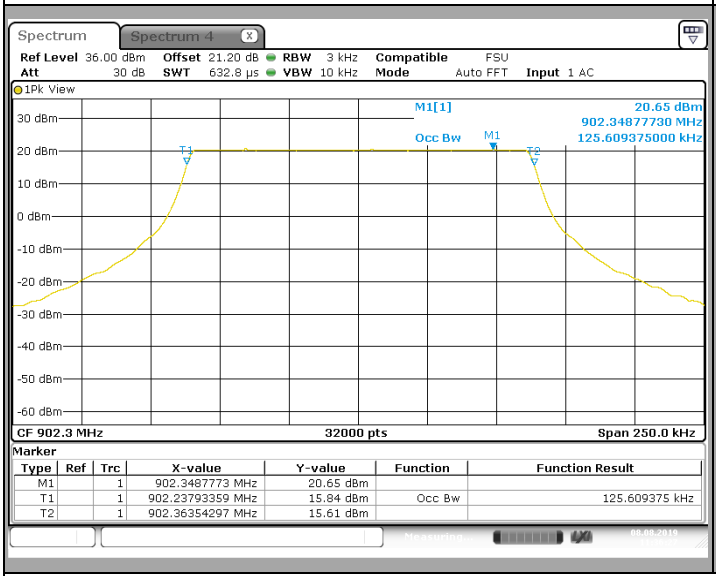
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

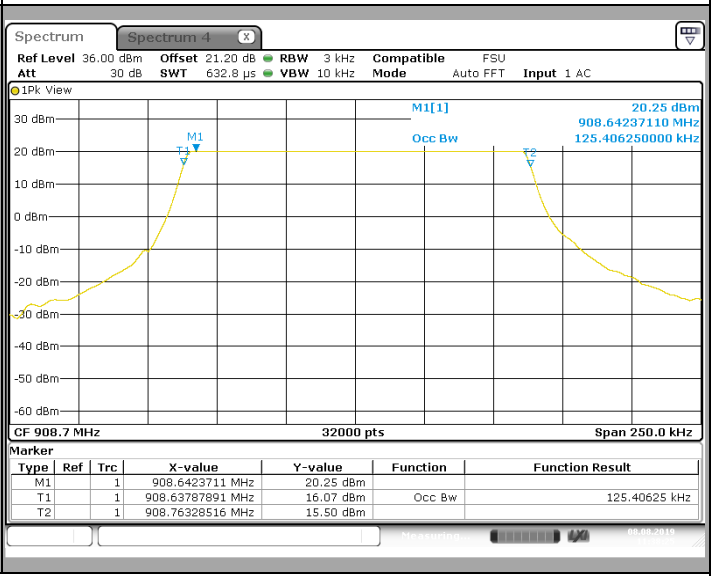
11.5. RESULTS

Occupied Bandwidth

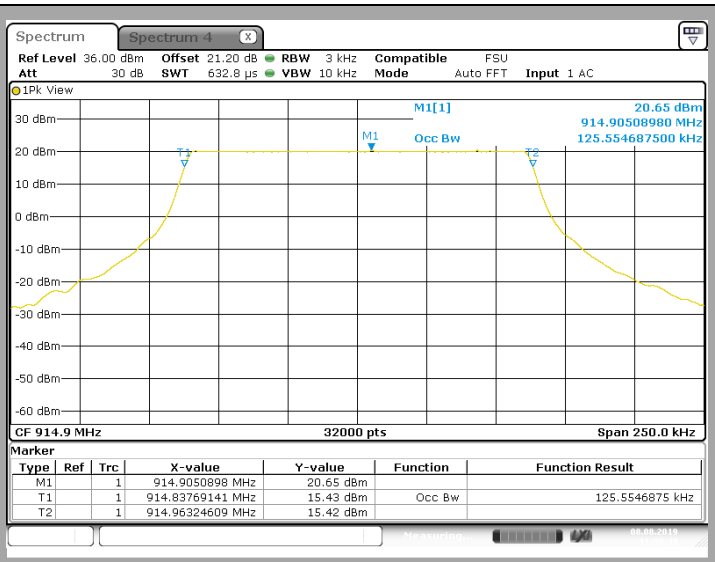
Cmin



Cnom



Cmax



Channel	Occupied Bandwidth (MHz)
Cmin	0,1256
Cnom	0,1254
Cmax	0,1256

11.6. CONCLUSION

Occupied Channel Bandwidth measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS-GEN ISSUE 4** limits.

12. HYBRID MODE 125 KHZ : 20DB EMISSION BANDWIDTH

12.1. TEST CONDITIONS

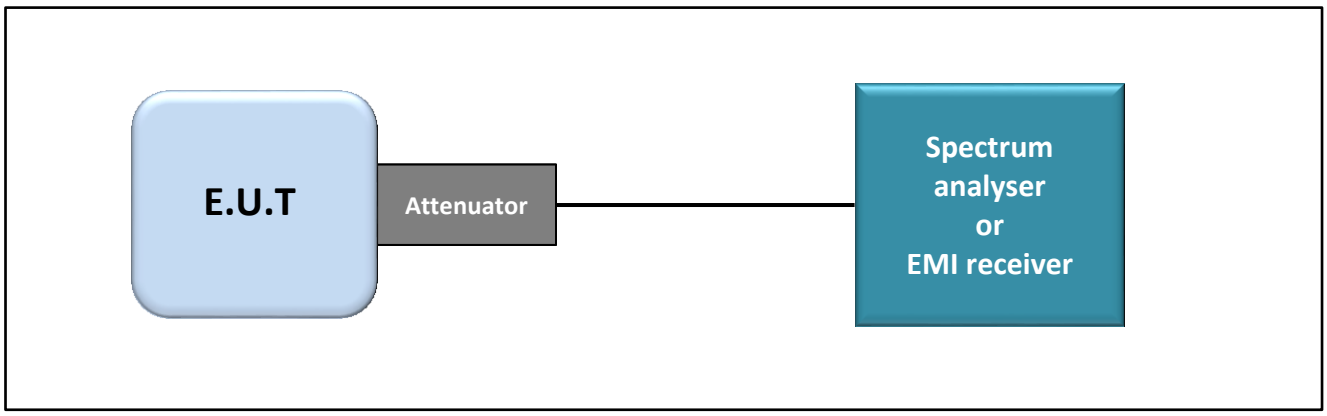
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 44 %

12.2. TEST SETUP

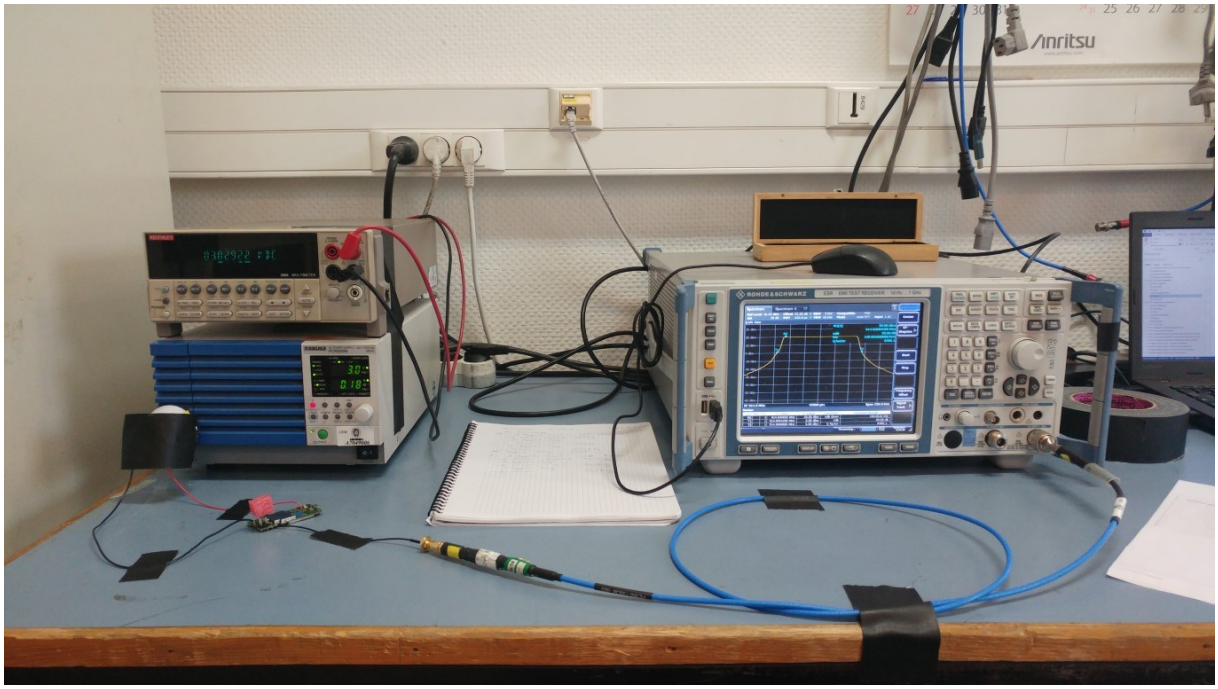
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ ANSI C63.10 § 6.9.2



Test set up



Photograph for 6dB emission bandwidth

12.3. LIMIT

There is no limit for hybrid mode

12.4. TEST EQUIPMENT LIST

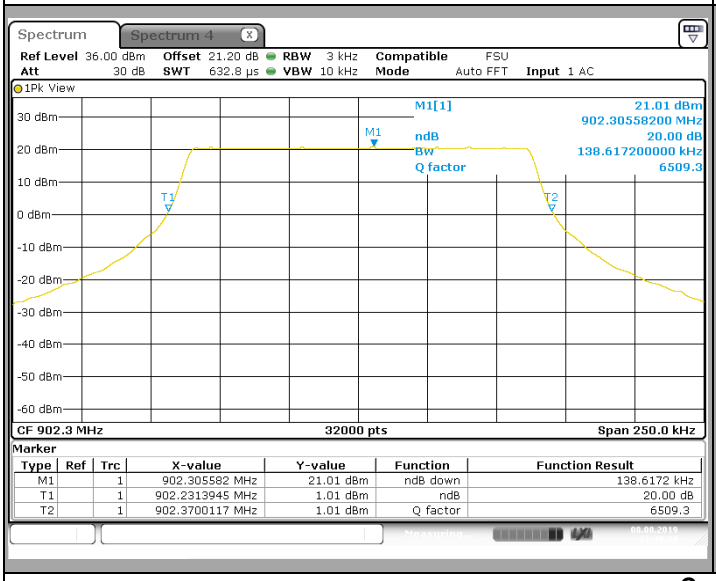
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

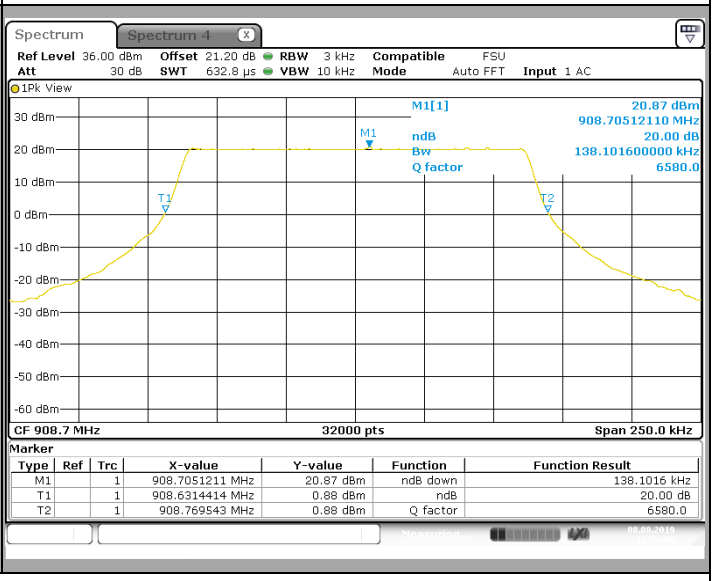
12.5. RESULTS

20dB Emission Bandwidth

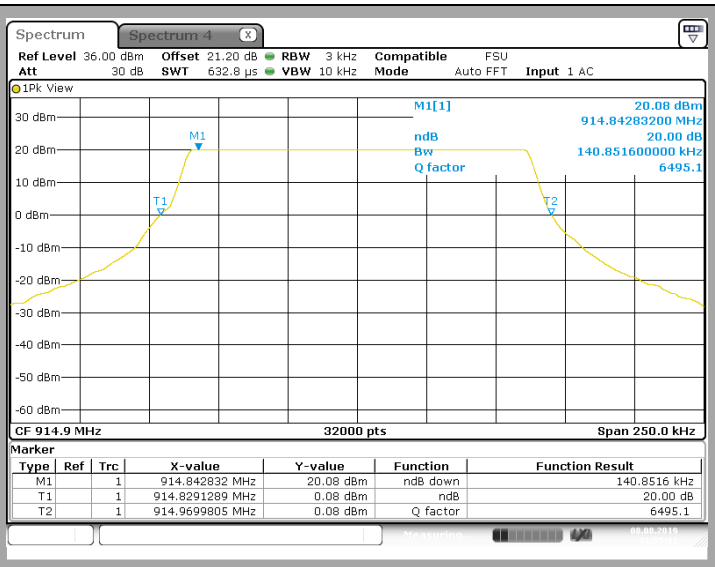
Cmin



Cnom



Cmax



Channel	6dB Emission Bandwidth (MHz)	Limit (MHz)
Cmin	0,139	No limit for hybrid mode
Cnom	0,138	No limit for hybrid mode
Cmax	0,141	No limit for hybrid mode

12.6. CONCLUSION

6dB Emission Bandwidth measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

13. HYBRID MODE 125 KHZ : DUTY CYCLE

13.1. TEST CONDITIONS

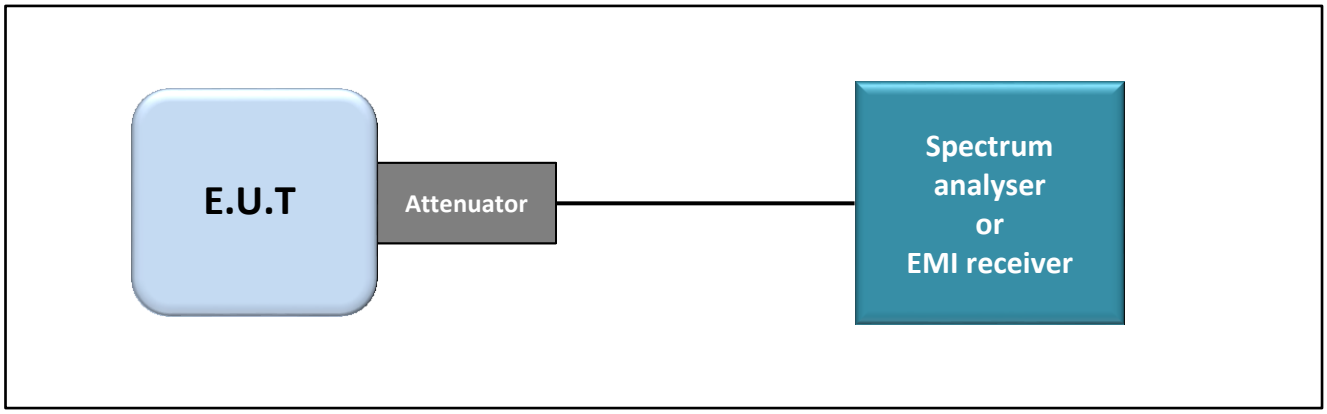
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 44 %

13.2. TEST SETUP

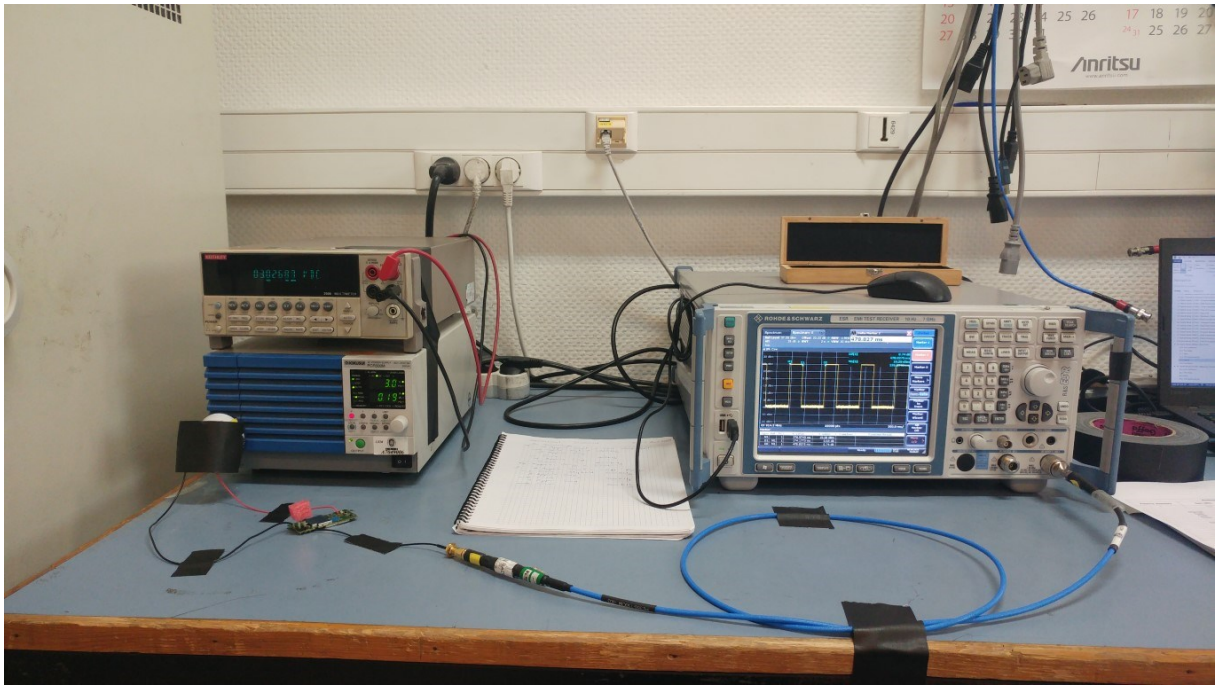
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ ANSI C63.10 § 11.6



Test set up



Photograph for Duty Cycle

13.3. LIMIT

None

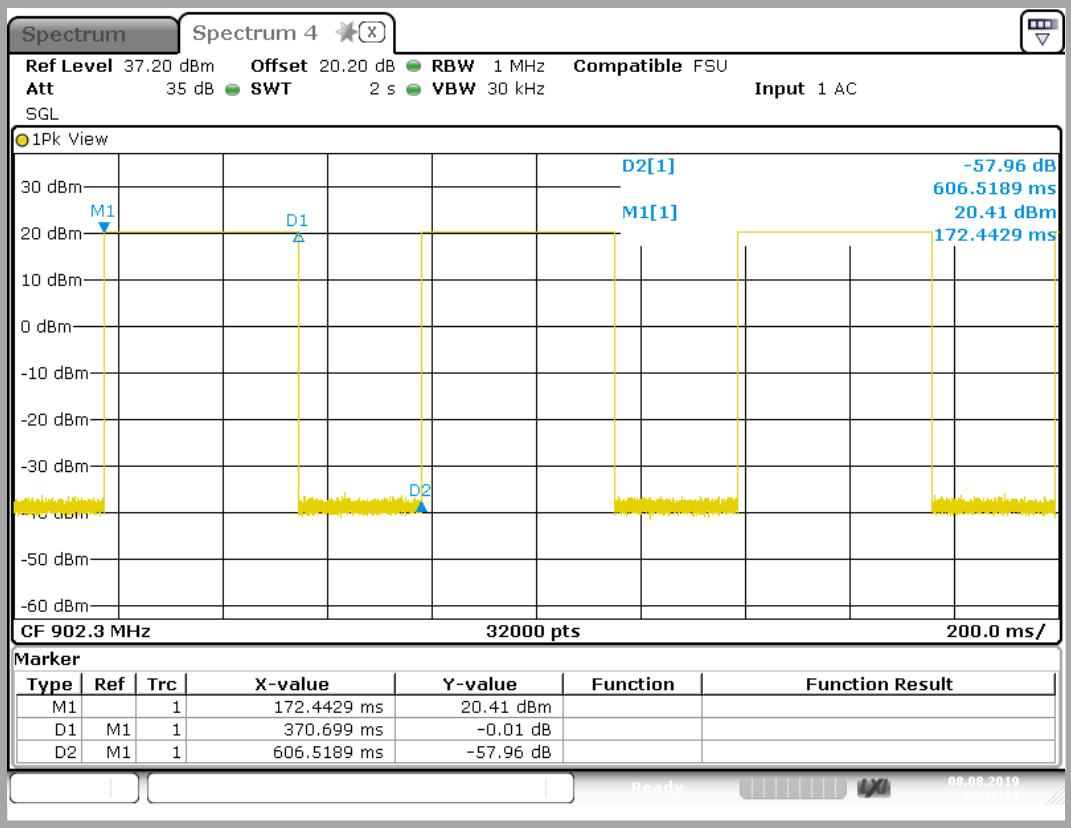
13.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

13.5. RESULTS

Duty Cycle
Channel



Channel	Duty Cycle (%)	Duty Cycle Correction (dB)
Channel	61,1	$20\log(\frac{1}{duty\ cycle})$= 4,28 dB

13.6. CONCLUSION

Duty Cycle measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

14. HYBRID MODE 125 KHZ : MAXIMUM CONDUCTED OUTPUT POWER

14.1. TEST CONDITIONS

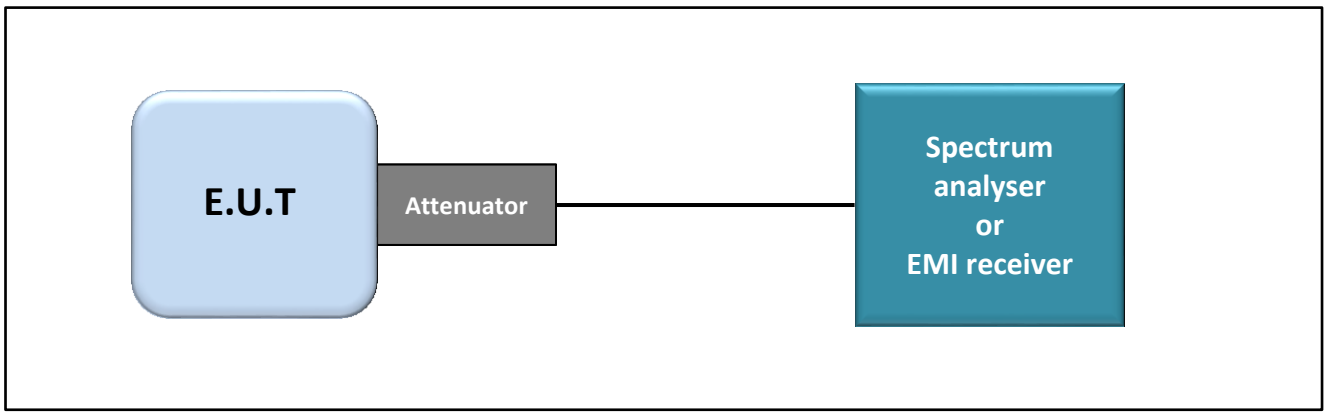
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 44 %

14.2. TEST SETUP

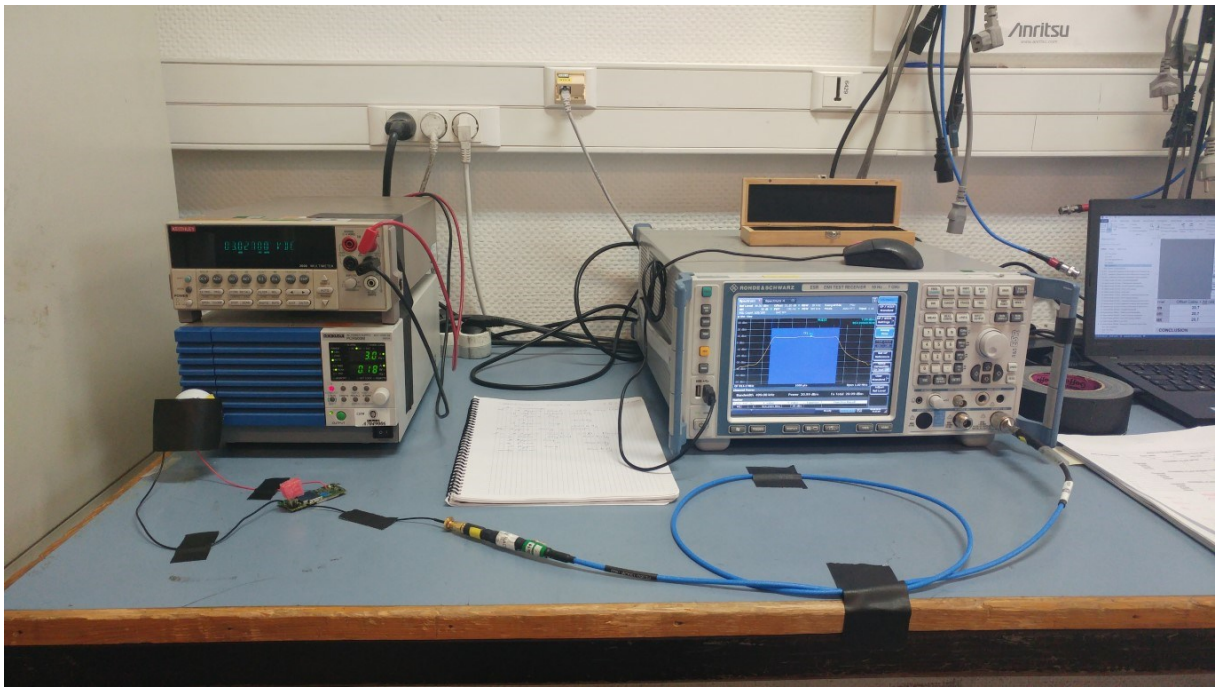
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ ANSI C63.10 § 7.8.5



Test set up



Photograph for Maximum Conducted Output Power

14.3. LIMIT

Maximum Conducted Output power:
Shall not exceed 30dBm if number of hopping channels is above 50
Shall not exceed 24dBm if number of hopping channels is below 50
Limits are reduced by G-6dBi if Antenna Gain above 6dBi

14.4. TEST EQUIPMENT LIST

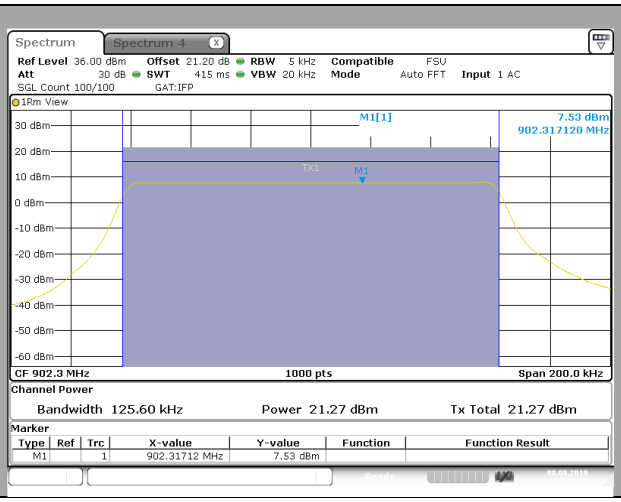
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

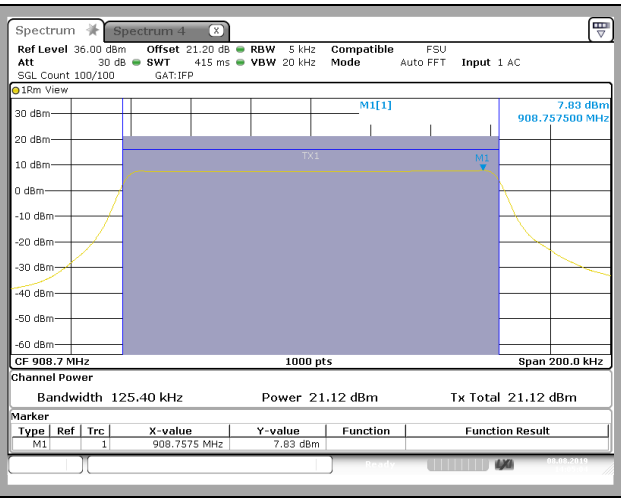
14.5. RESULTS

Maximum Conducted Output Power

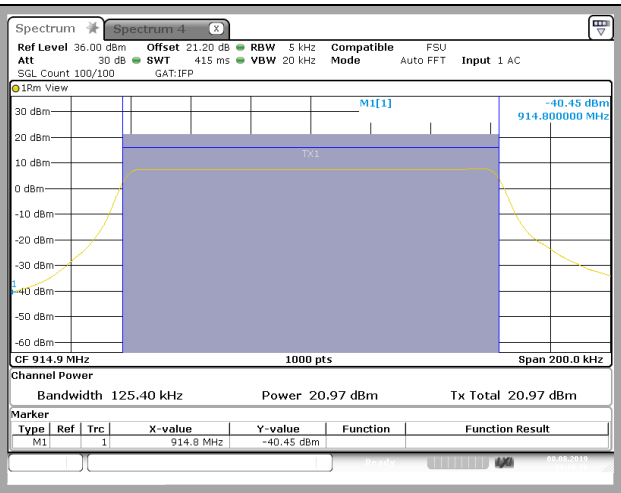
Cmin



Cnom



Cmax



Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Limit (dBm)
Cmin	**21,2**	-1,5	21,27	24
Cnom	**21,2**	-1,5	21,12	24
Cmax	**21,2**	-1,5	20,97	24

14.6. CONCLUSION

Maximum Conducted Output Power measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

15. HYBRID MODE 125KHZ : POWER SPECTRAL DENSITY

15.1. TEST CONDITIONS

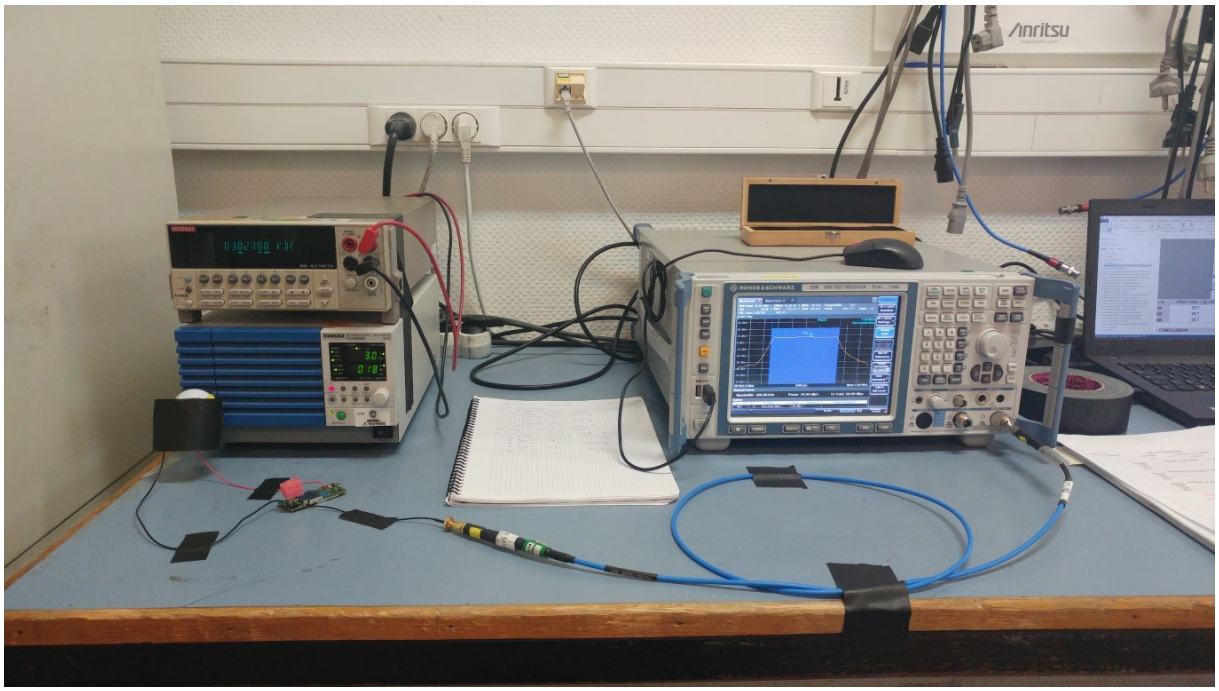
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 48 %

15.2. 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:
☐ KDB 558074 D01 DTS Meas Guidance v05 § 10.2 (Method PKPSD)
☐ KDB 558074 D01 DTS Meas Guidance v05 § 10.3 (Method AVGPSD-1)
☑ ANSI C63.10 § 11.10.3



Photograph for Power Spectral Density

15.3. LIMIT

Power Spectral Density:
902MHz-928MHz: Shall not exceed 8dBm/3kHz
Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

15.4. TEST EQUIPMENT LIST

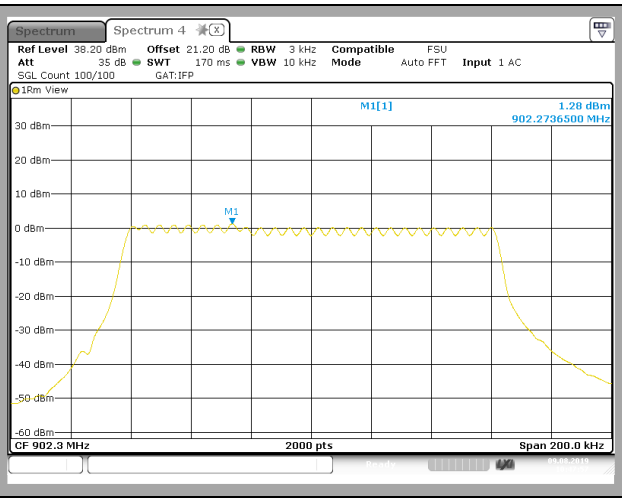
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

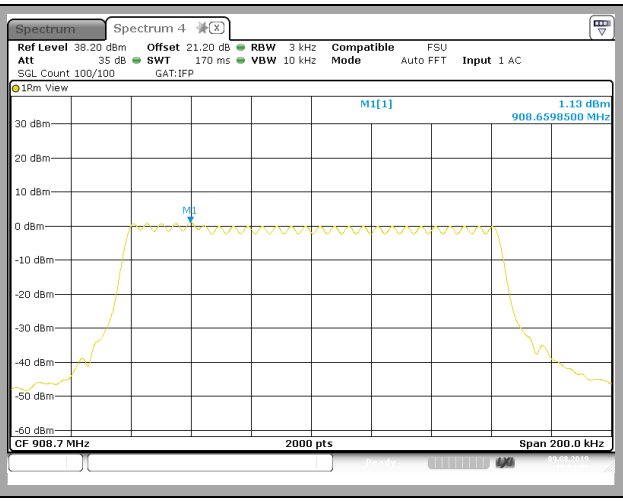
15.5. RESULTS

Power Spectral Density

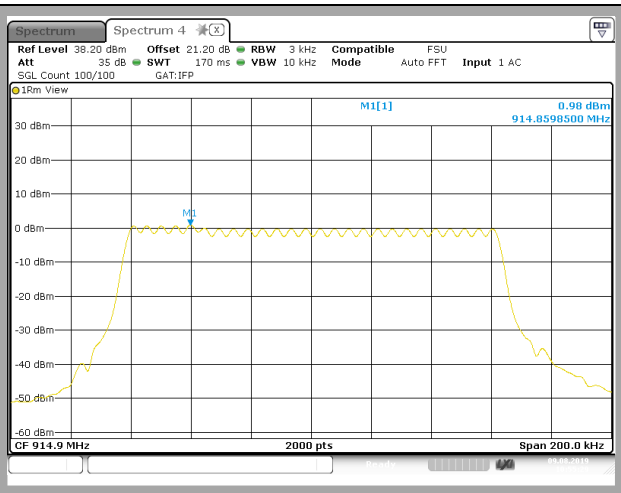
Cmin



Cnom



Cmax



Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
Cmin	**21,2**	-1,5	1,28	8
Cnom	**21,2**	-1,5	1,13	8
Cmax	**21,2**	-1,5	0,98	8

15.6. CONCLUSION

Power Spectral Density measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 **V2**, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

16. HYBRID MODE 125 KHZ : UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS AT THE BAND EDGE

16.1. TEST CONDITIONS

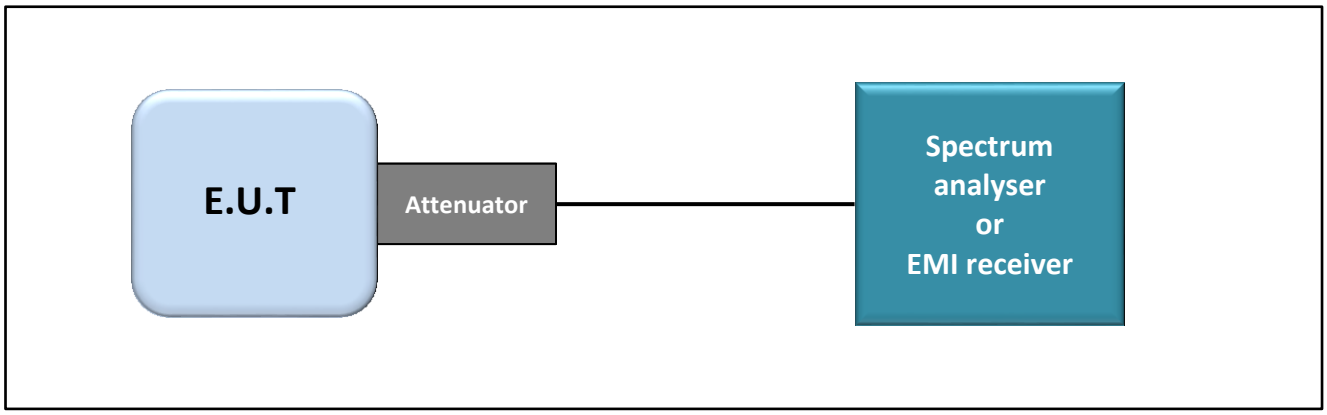
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 48 %

16.2. TEST SETUP

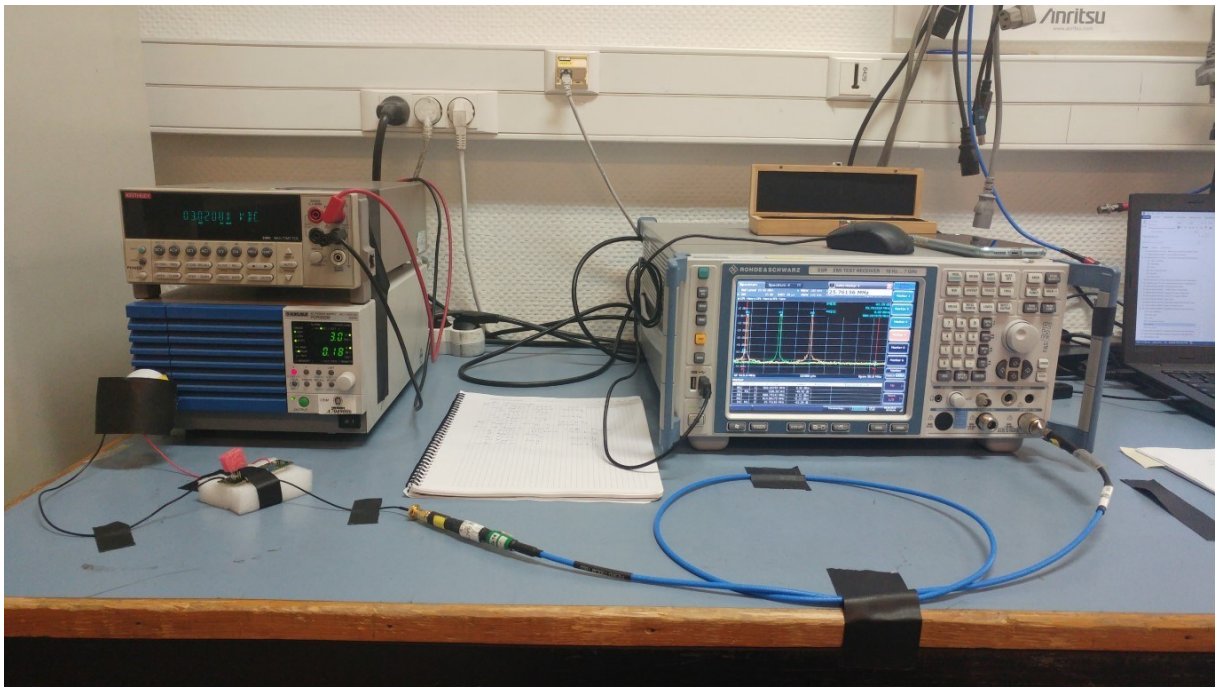
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ ANSI C63.10 § 7.8.6



Test set up



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

16.3. LIMIT

All Spurious Emissions must be at least 30dB below the Fundamental Radiator Level at the Band Edge Edge “902MHz & 928MHz”

16.4. TEST EQUIPMENT LIST

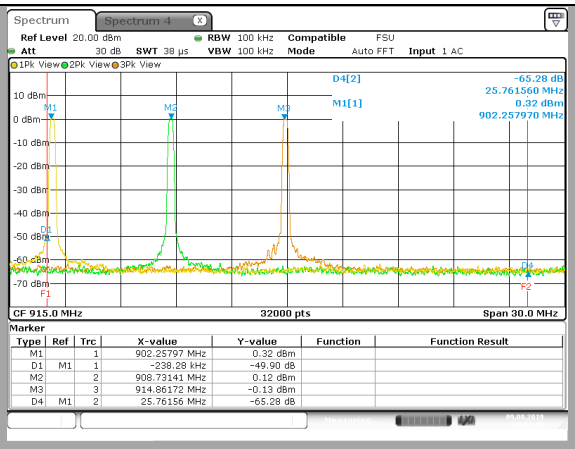
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

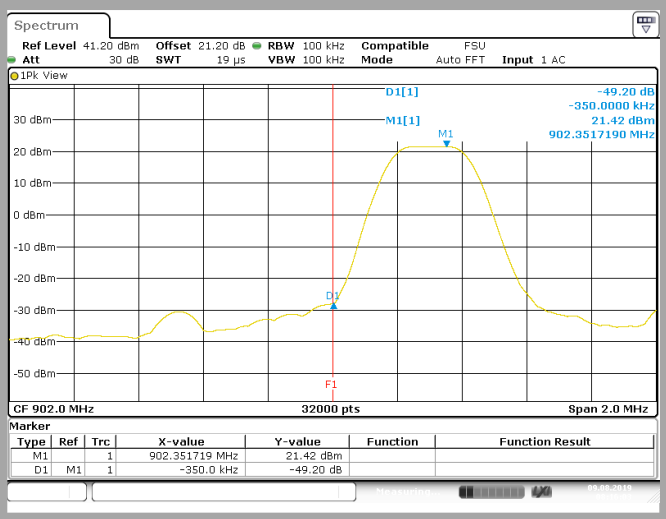
Note: In our quality system, the test equipment calibration due is more & less 2 months

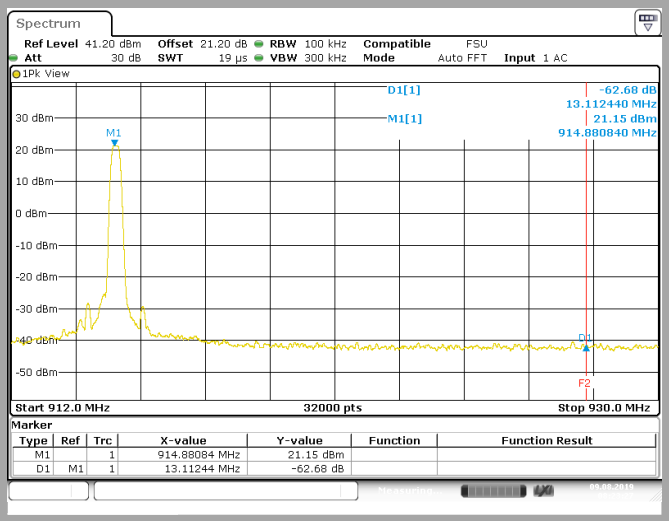
16.5. RESULTS

Single Frequency

Cmin/Cnom/Cmax







Frequency (MHz)	Level (dBc)	Limit (dBc)
902	49,20	30
928	62,68	30

16.6. *CONCLUSION*

Unwanted Emission into non-restricted frequency bands at the band edge measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

17. HYBRID MODE 125 KHZ : UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS

17.1. TEST CONDITIONS

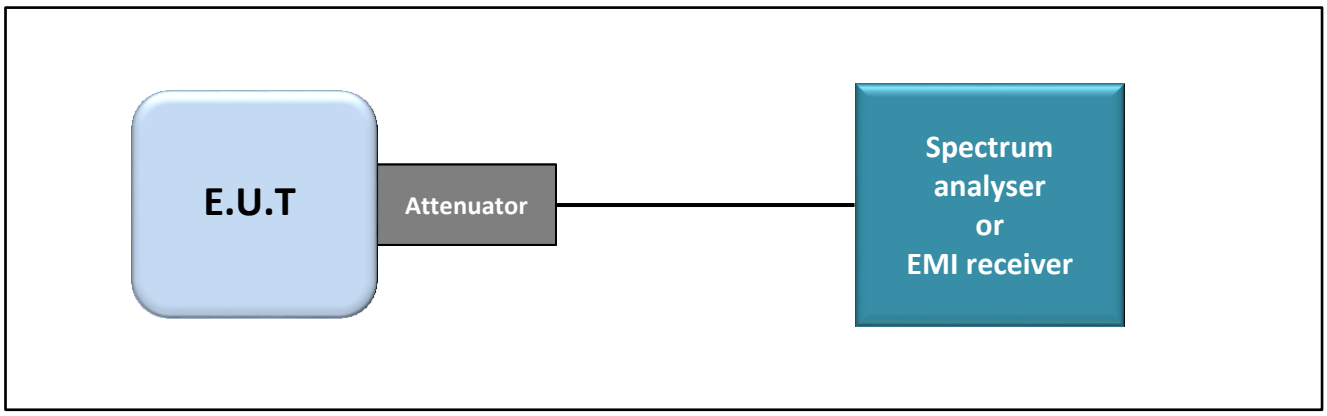
Test performed by	: Julien Palard
Date of test	: September 18, 2019
Ambient temperature	: 25 °C
Relative humidity	: 48 %

17.2. TEST SETUP

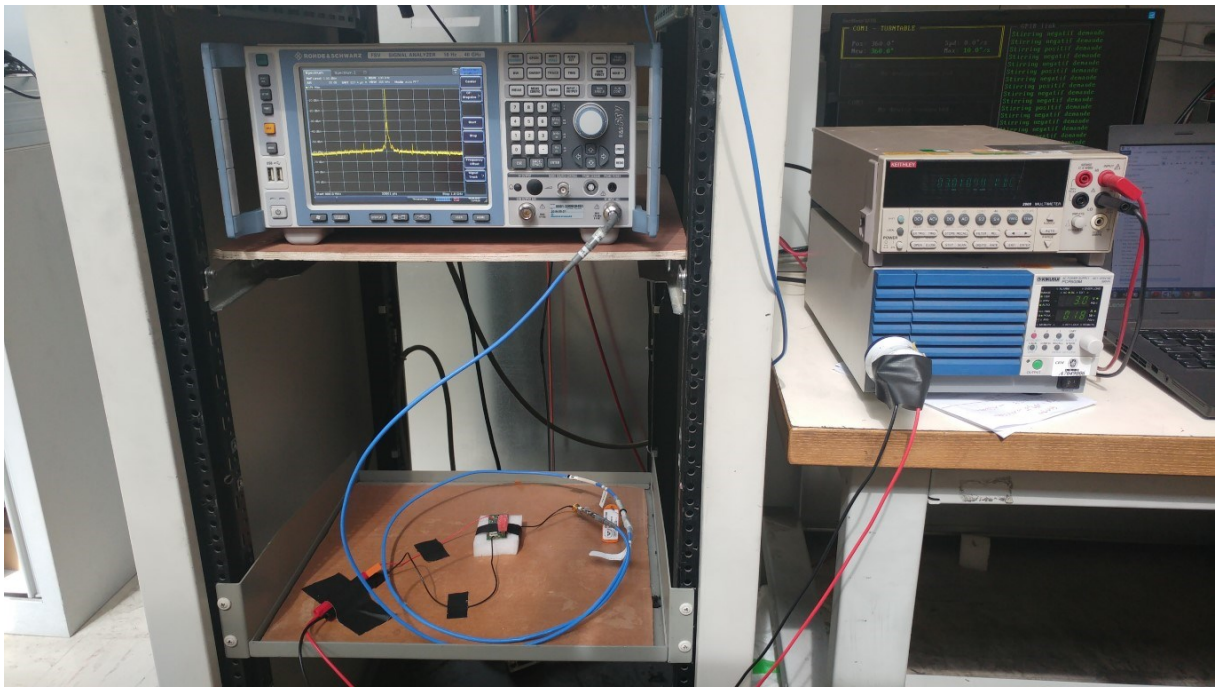
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ ANSI C63.10 § 7.8.8



Test set up



Photograph for Unwanted Emission into non-restricted frequency bands

17.3. LIMIT

All Spurious Emissions must be at least 30dB below the Fundamental Radiator Level

17.4. TEST EQUIPMENT LIST

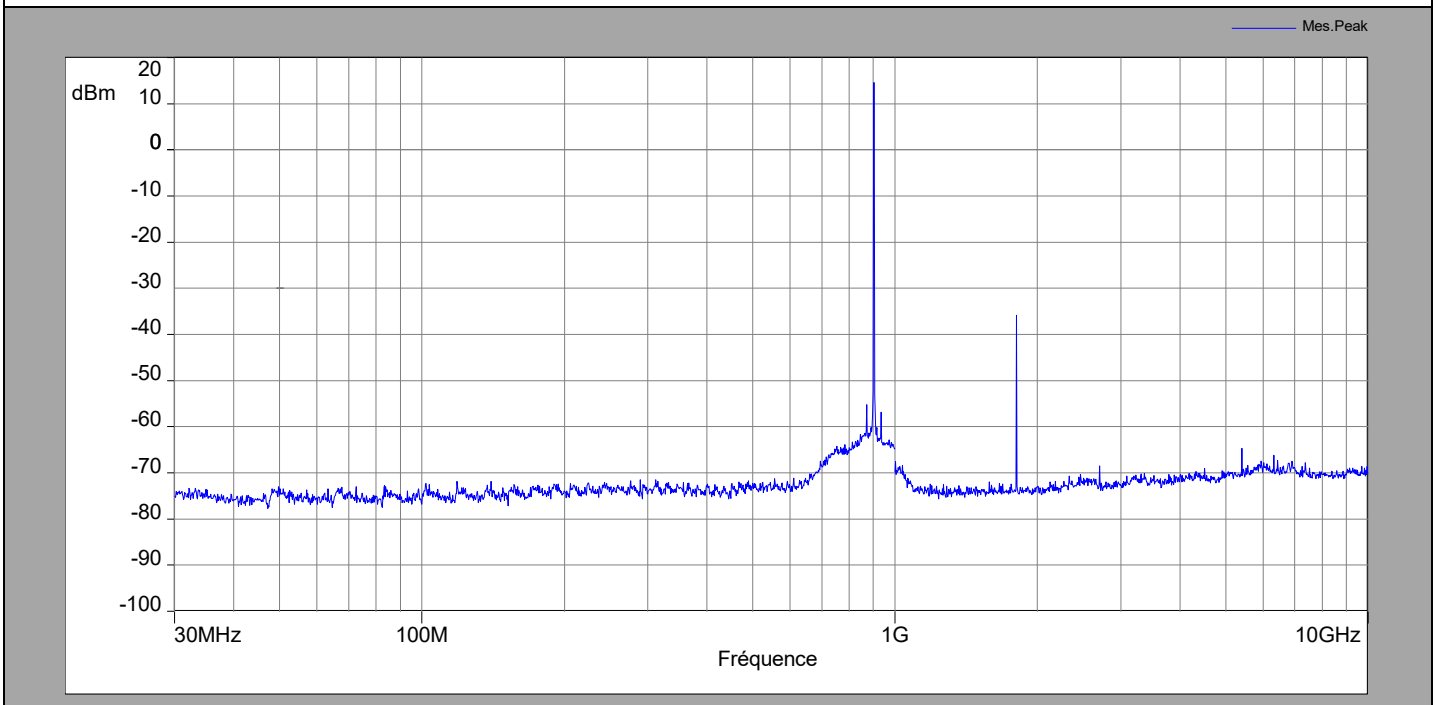
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable Conducted S36 chamber	TELEDYNE	084-0555-2MTR	A5329758	2019/02	2020/02
Attenuator 3dB Cable Spurious Conducted	-	WA54-3-12	A7122223	2019/02	2020/02
High Pass Filter 868MHz	WAINWRIGHT	WHKX12-935	A7484069	2017/10	2019/10
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2019/05	2021/05

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

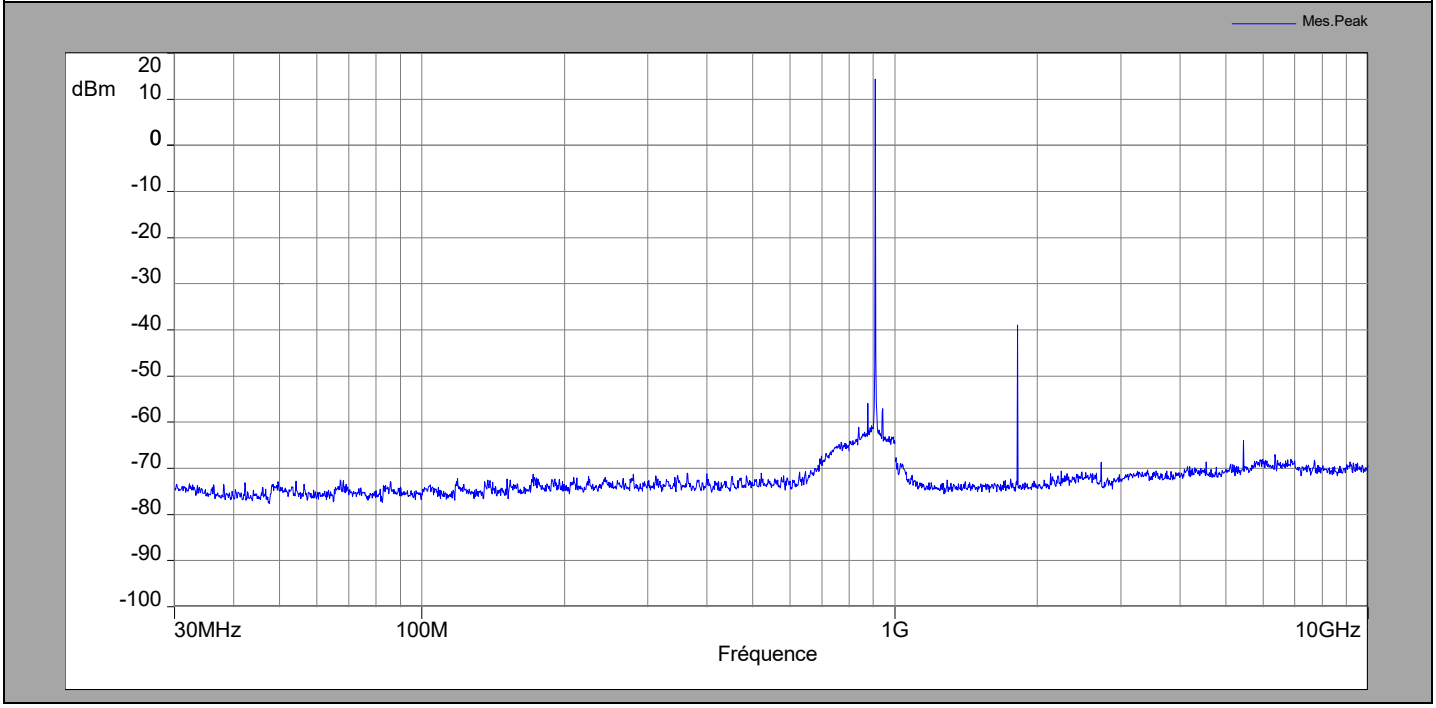
17.5. RESULTS

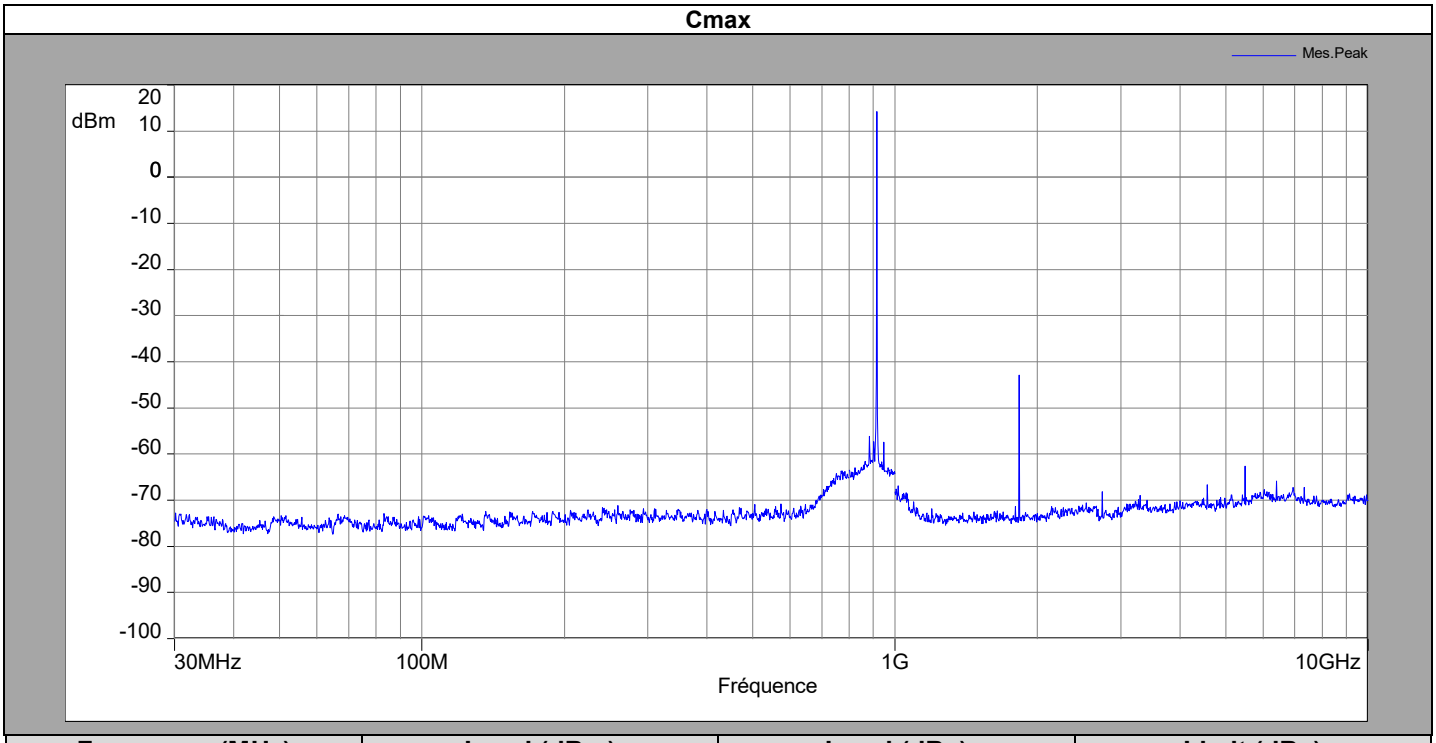
Single Frequency

Cmin



Cnom





Frequency (MHz)	Level (dBm)	Level (dBc)	Limit (dBc)
902,3	14,59		
870,34	-55,23	69,82	30
934,35	-56,82	71,41	30
1804	-35,86	50,45	30
908,7	14,32		
876,6	-55,98	70,3	30
940,8	-57,07	71,39	30
1817	-38,95	53,27	30
914,9	14,2		
882,9	-56,13	70,33	30
946,9	-57,36	71,56	30
1830	-42,83	57,03	30

17.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

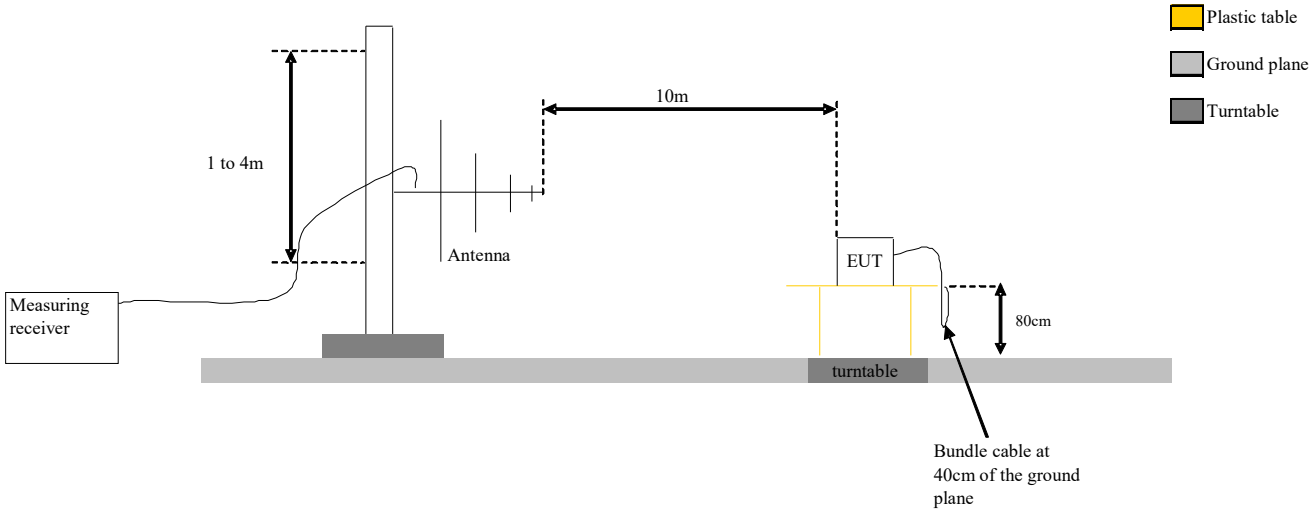
18. HYBRID MODE 125 KHZ : UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

18.1. TEST CONDITIONS

Test performed by	: Laurent DENEUX
Date of test	: September 13, 2019
Ambient temperature	: 23 °C
Relative humidity	: 47 %

18.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013).
Test is performed in parallel, perpendicular and ground parallel axis with a loop antenna below 30MHz. Measurement bandwidth was 200Hz below 150kHz and 9kHz between 150kHz & 30MHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height was 1m. The EUT is placed **on an open area test site**. Distance between measuring antenna and the EUT is **3m**.
Test is performed in horizontal (H) and vertical (V) polarization with **bilog** between 30MHz & 1GHz and with a horn antenna above 1GHz. Measurement bandwidth was 120kHz below 1GHz and 1MHz above 1GHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height search was performed from 1 to 4m. The EUT is place at 1.5m high above 1GHz and at 0.8m high under 1GHz. The EUT is placed **on an open area test site** above 1GHz and **on an open area test site** from 30MHz to 1GHz. Distance between measuring antenna and the EUT is **10m**.



Test Set up for radiated measurement in open area test site

Photograph for Unwanted Emission in restricted frequency bands

Photograph for Unwanted Emission in restricted frequency bands

18.3. LIMIT

Limit at 3m:
9kHz to 0,490MHz: 2400/F(kHz)µV/m (300m) or 20log(2400/F(kHz))dBµV/m (3m) QPeak
0,490MHz to 1.705MHz: 240000/F(kHz)µV/m (30m) or 20log(240000/F(kHz))dBµV/m (3m) QPeak
1.705MHz to 30MHz: 30µV/m (30m) or dBµV/m (3m) QPeak
30MHz to 88MHz: 40dBµV/m QPeak
88MHz to 216MHz: 43,5dBµV/m QPeak
216MHz to 960MHz: 46dBµV/m QPeak
960MHz to 1000MHz: 54dBµV/m QPeak
Above 1000MHz: 74dBµV/m Peak
54dBµV/m Average

Limit at 10m:
30MHz to 88MHz: 29.5dBµV/m QPeak
88MHz to 216MHz: 33dBµV/m QPeak
216MHz to 960MHz: 35.5dBµV/m QPeak
960MHz to 1000MHz: 43.5dBµV/m QPeak
Above 1000MHz: 63.5BµV/m Peak
43.5BµV/m Average

18.4. 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
Bilog antenna	CHASE	CBL 6112A	C2040040	2019-04	2020-04
Preamplifier	HEWLETT PACKARD	8449B	A4069002	04/2018	04/2020
Horn	EMCO	3115	C2042016	06/2019	06/2020
loop antenna	RHODE & SCHWARZ	HFH2-Z2	C2040007	2018-11	2020-11
Cable	-	-	A5329442	2018-09	2019-09
Cable			A5329542	06/2018	06/2019
Cable	-	-	A5329444	2018-09	2019-09
Cable	-	-	A5329876	2018-11	2019-11
Cable	-	-	A5326368	2018-12	2019-12
Cable	-	-	A5329416	2018-12	2019-12

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

18.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

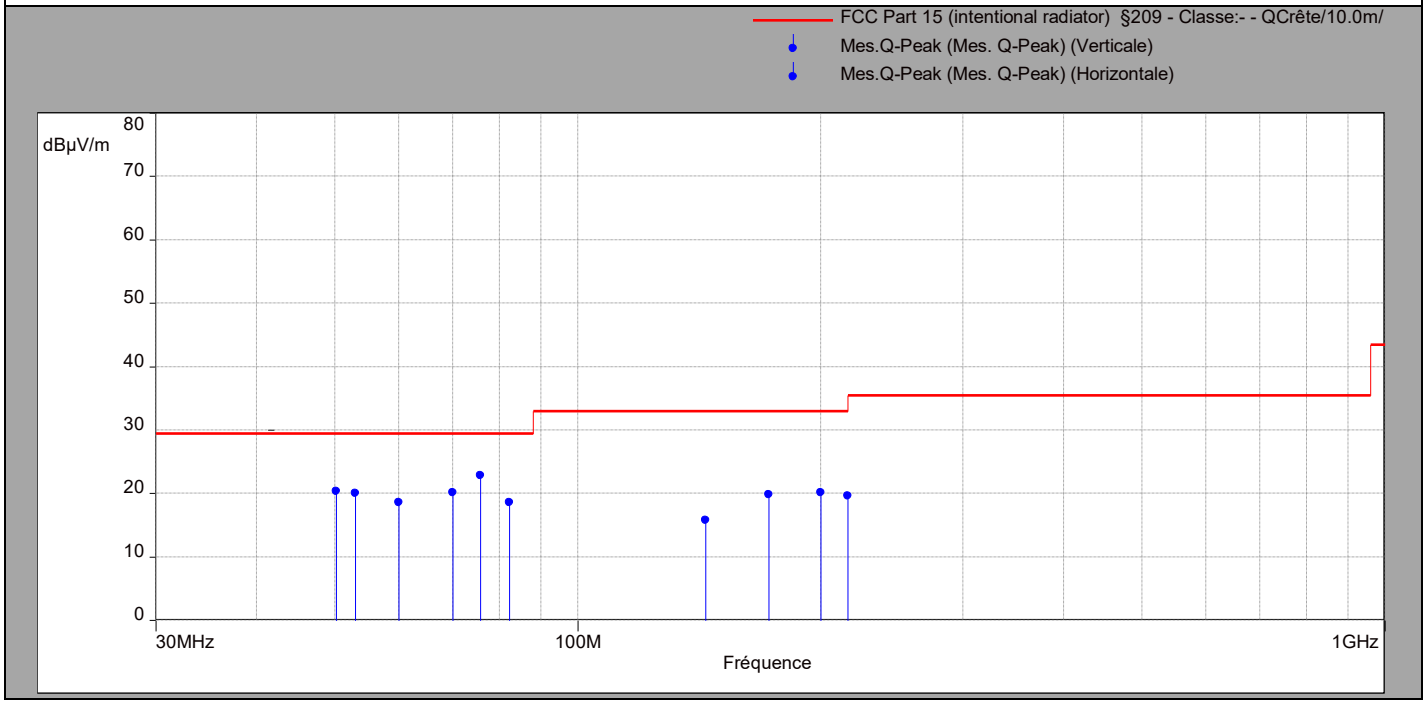
☑ None ☐ Divergence:

18.6. RESULTS

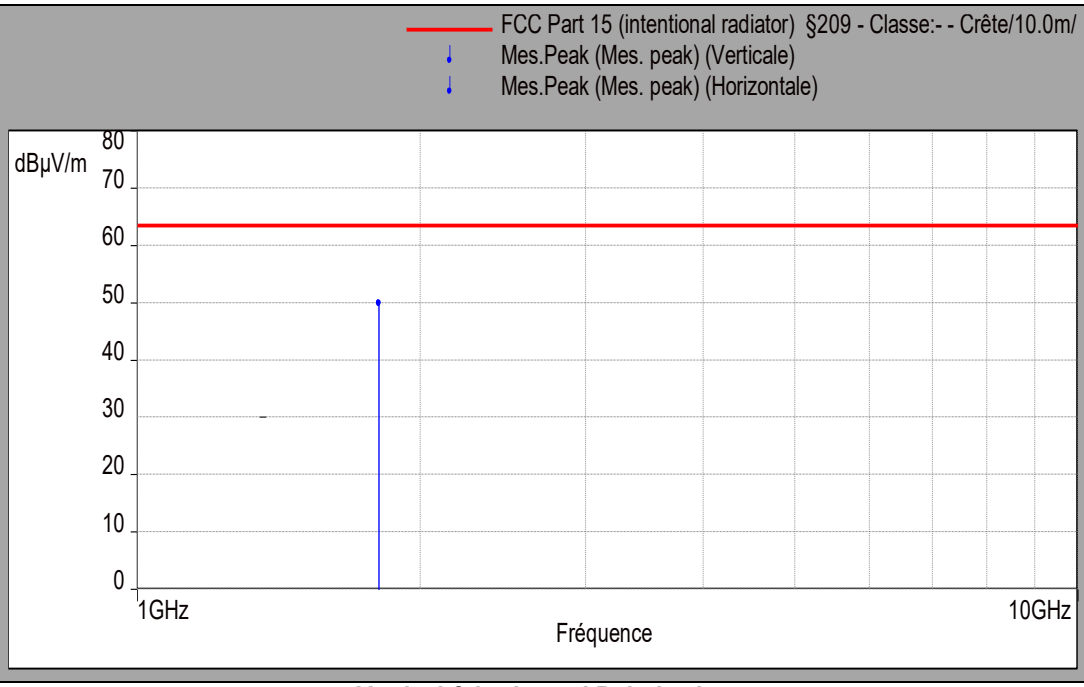
Below 1GHz

Cmin/Cnom/Cmax

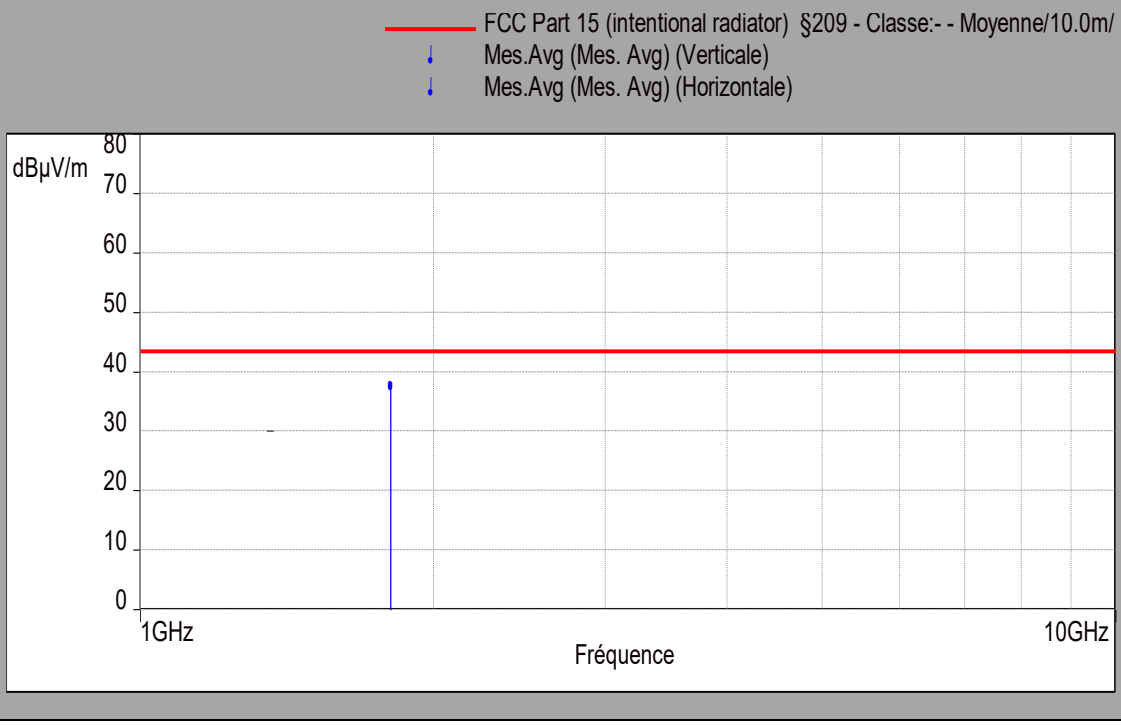
Vertical & horizontal Polarization



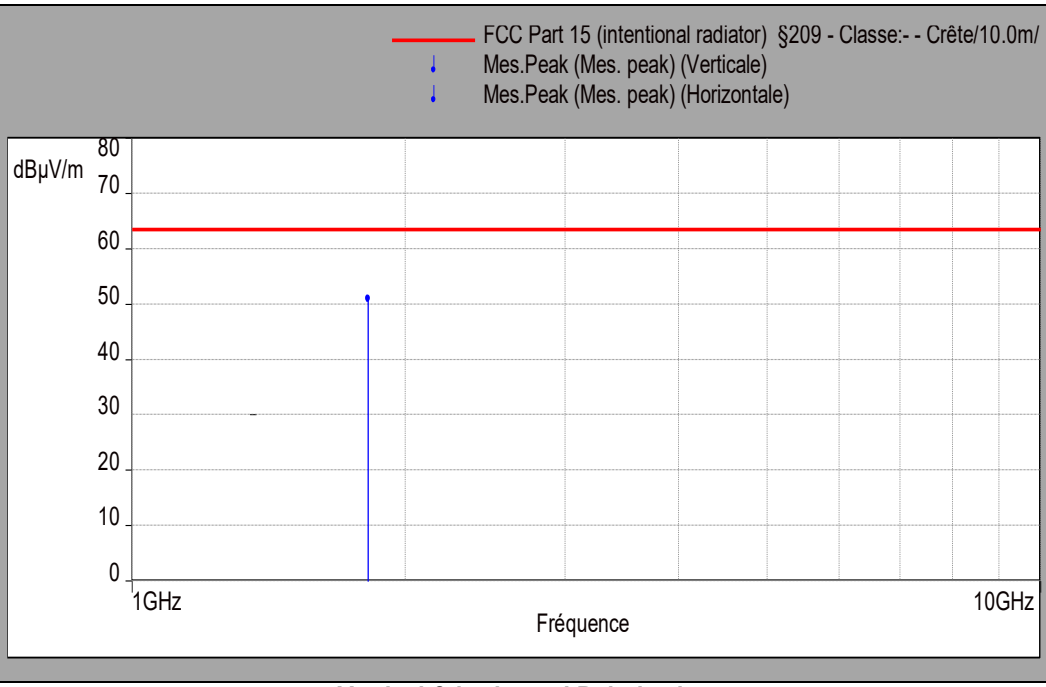
Above 1GHz Cmin
Vertical & horizontal Polarization
Peak measurement



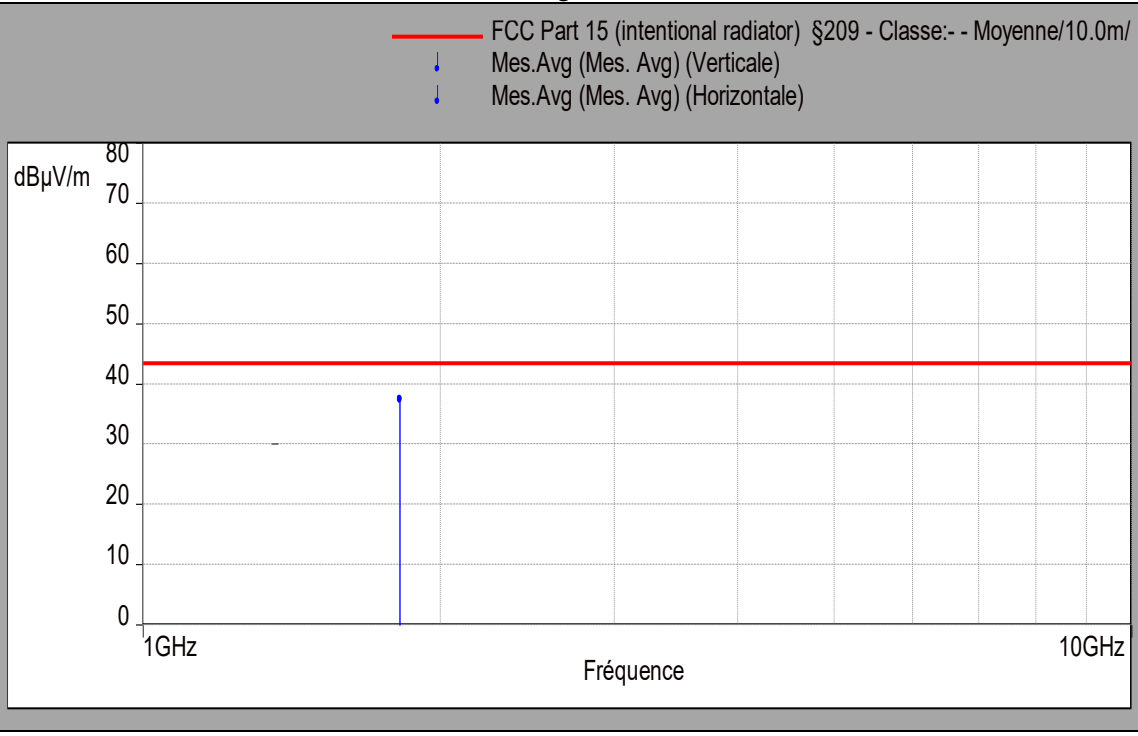
Vertical & horizontal Polarization
Average value



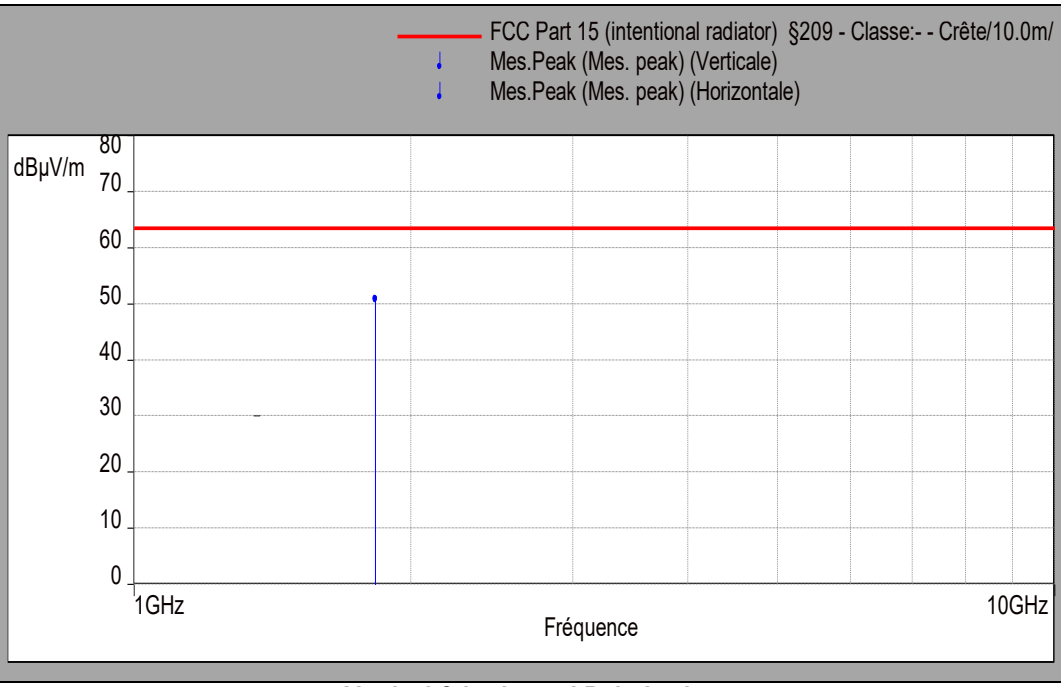
Above 1GHz Cnom
Vertical & horizontal Polarization
Peak measurement



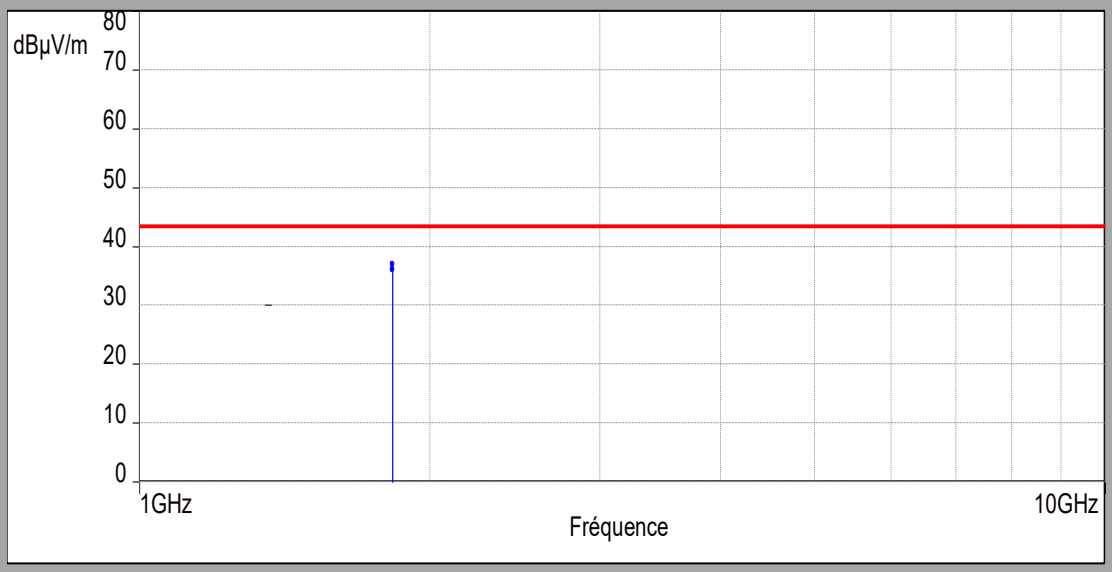
Vertical & horizontal Polarization
Average value



Above 1GHz Cmax
Vertical & horizontal Polarization
Peak measurement



Vertical & horizontal Polarization
Average value



9kHz to 30MHz1GHz (Cmin/Cnom/Cmax)				
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 (Cmin/Cnom/Cmax)					
Polarization	**Frequency (MHz)**	**Peak Level (dBµV/m)**	**QPeak Level (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dBµV/m)**
Vertical	50.2	-	19.32	29.5	10.18
Vertical	53	-	20.06	29.5	9.44
Vertical	60	-	16.57	29.5	12.93
Vertical	70	-	17.13	29.5	12.37
Vertical	75.8	-	18.81	29.5	10.69
Vertical	82.29	-	18.54	29.5	10.96
Vertical	144	-	19.75	33	13.25
Vertical	172.4	-	19.85	33	13.15
Horizontal	200	-	20.11	33	12.89
Horizontal	216	-	19.58	33	13.42

Above 1GHz								
Cmin								
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)**
horizontal	1804.6	29.55	33.83	43.5	9.67	49.86	63.5	13.64
vertical	1804.6	29.57	33.85	43.5	9.65	47.13	63.5	16.37

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)**
horizontal	1817.4	29.28	33.56	43.5	9.94	51.10	63.5	12.4
vertical	1817.4	29.07	33.35	43.5	10.15	50.85	63.5	12.65

Above 1GHz								
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)**
horizontal	1828.4	28.72	33	43.5	10.5	50.67	63.5	12.83
vertical	1828.4	28.64	32.92	43.5	10.58	50.92	63.5	12.58

18.7. CONCLUSION

Unwanted Emission in restricted frequency bands measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 & RSS 247 ISSUE 2 limits.

19. HYBRID MODE 500 KHZ : OCCUPIED BANDWIDTH

19.1. TEST CONDITIONS

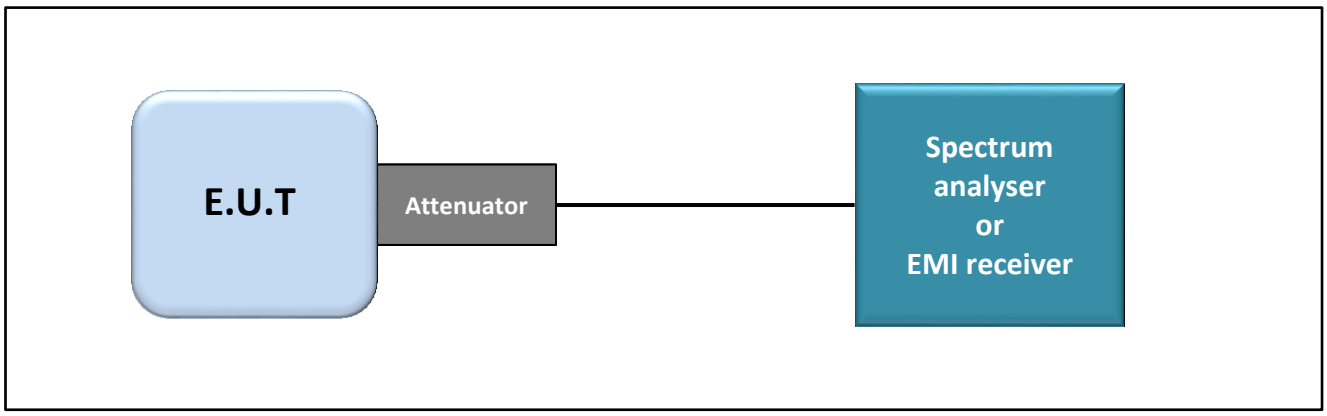
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 44 %

19.2. TEST SETUP

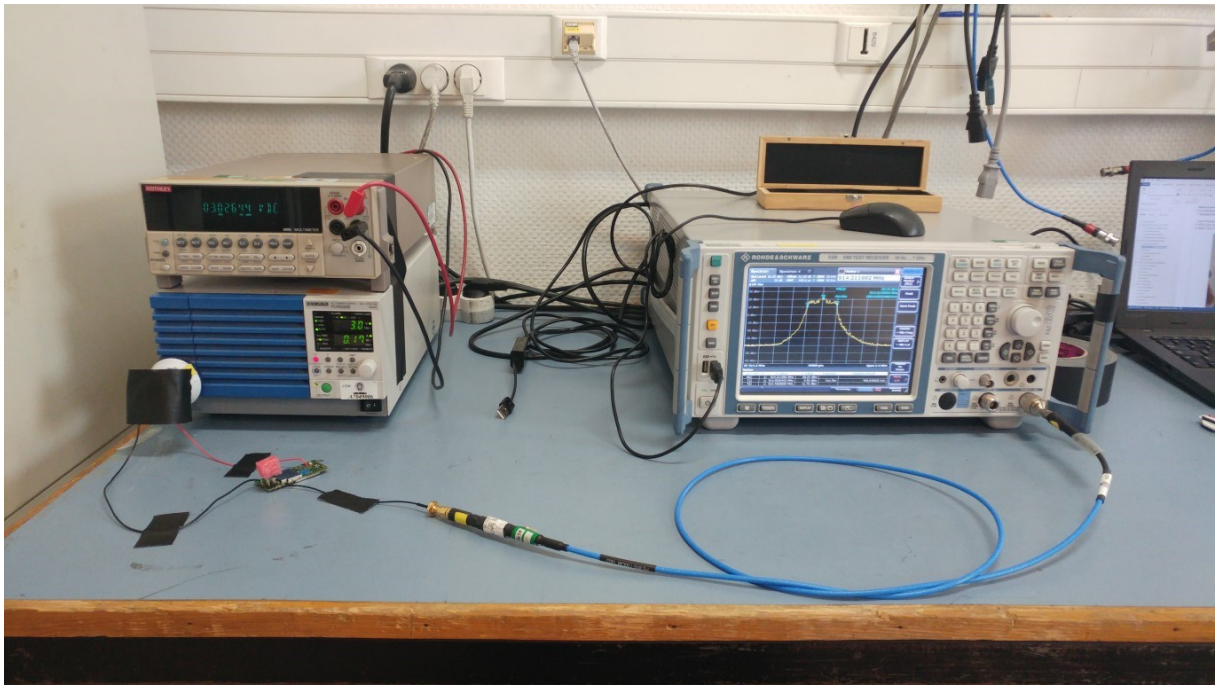
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- 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



Photograph for Occupied bandwidth

19.3. LIMIT

None

19.4. TEST EQUIPMENT LIST

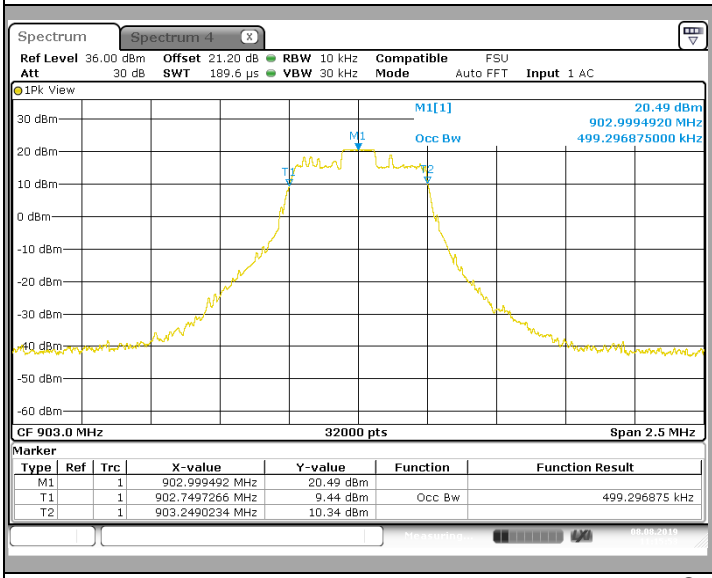
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

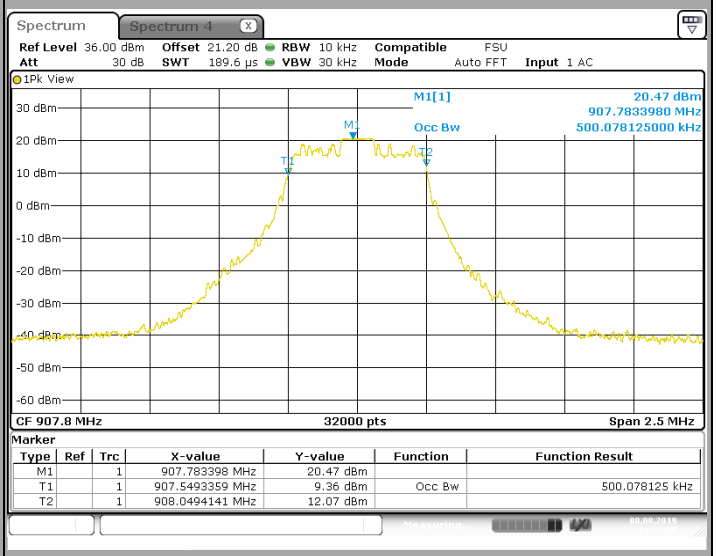
19.5. RESULTS

Occupied Bandwidth

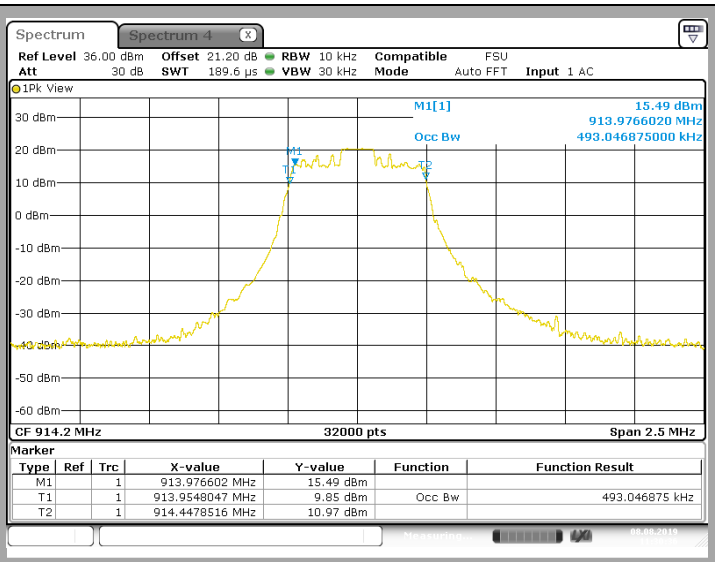
Cmin



Cnom



Cmax



Channel	Occupied Bandwidth (MHz)
Cmin	0,499
Cnom	0,500
Cmax	0,493

19.6. CONCLUSION

Occupied Channel Bandwidth measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS-GEN ISSUE 4** limits.

20. HYBRID MODE 500 KHZ : 20DB EMISSION BANDWIDTH

20.1. TEST CONDITIONS

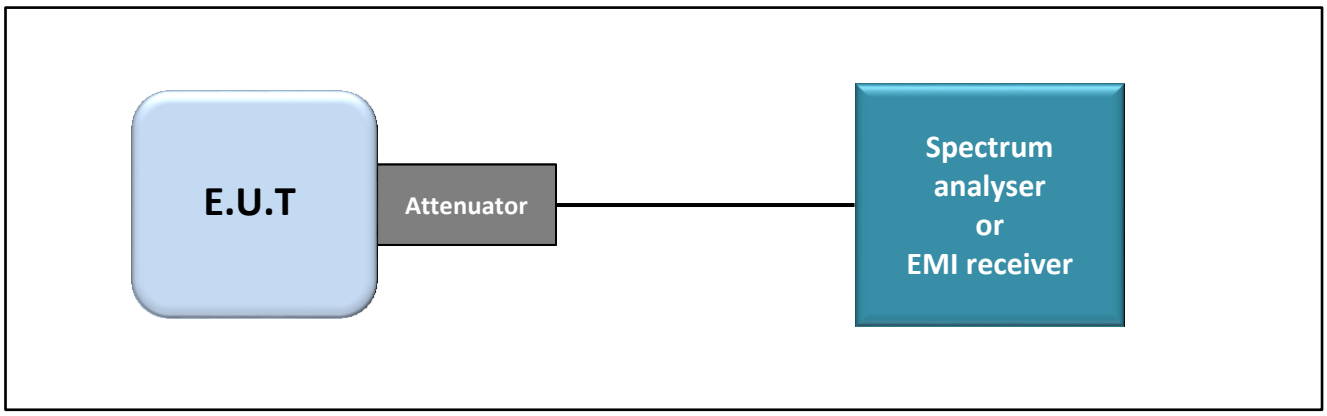
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 44 %

20.2. TEST SETUP

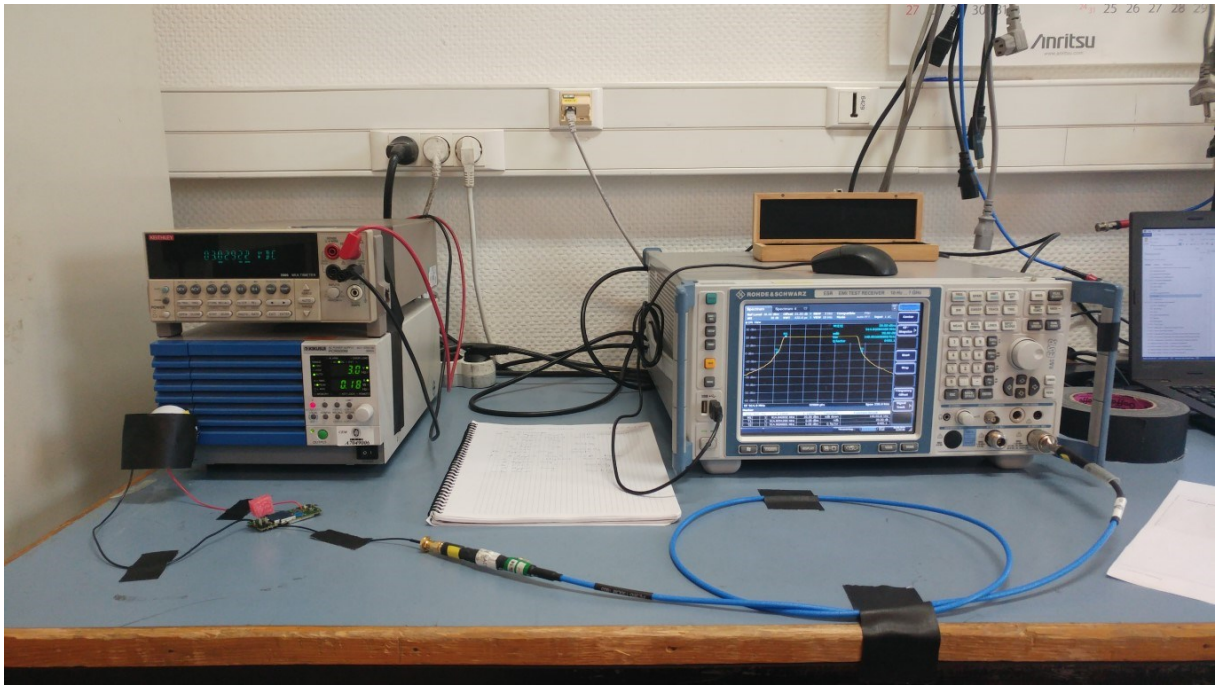
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ ANSI C63.10 § 6.9.2



Test set up



Photograph for 6dB emission bandwidth

20.3. LIMIT

No limit are applicable for hybrid mode.

20.4. TEST EQUIPMENT LIST

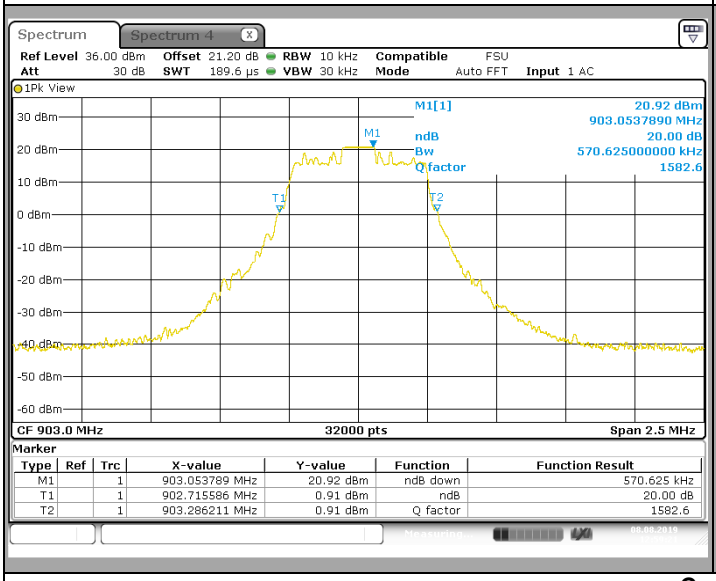
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

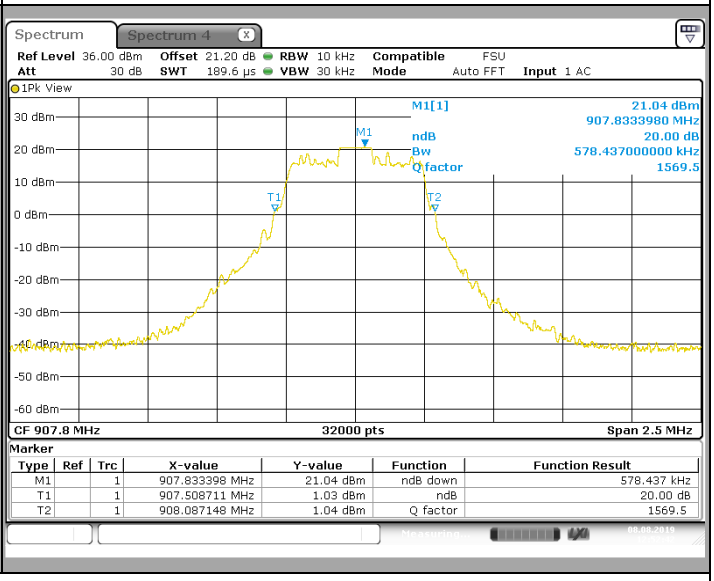
20.5. RESULTS

6dB Emission Bandwidth

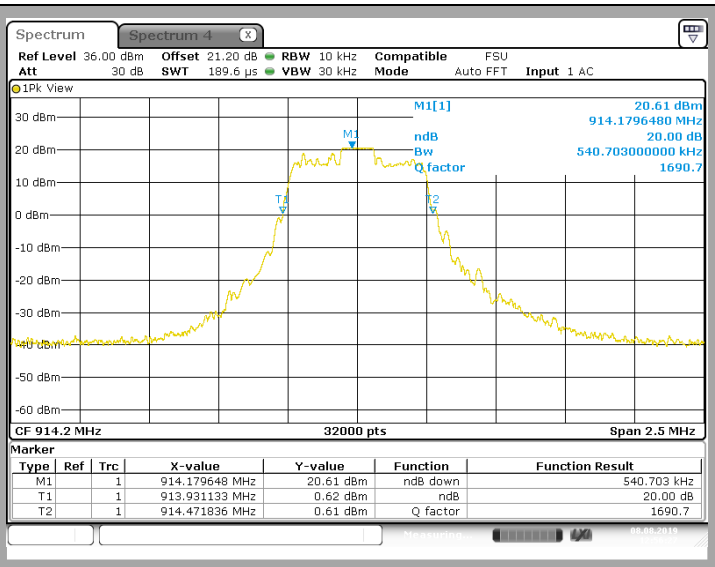
Cmin



Cnom



Cmax



Channel	6dB Emission Bandwidth (MHz)	Limit (MHz)
Cmin	0,571	No limit for Hybrid mode
Cnom	0,578	No limit for Hybrid mode
Cmax	0,541	No limit for Hybrid mode

20.6. CONCLUSION

6dB Emission Bandwidth measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

21. HYBRID MODE 500 KHZ : DUTY CYCLE

21.1. TEST CONDITIONS

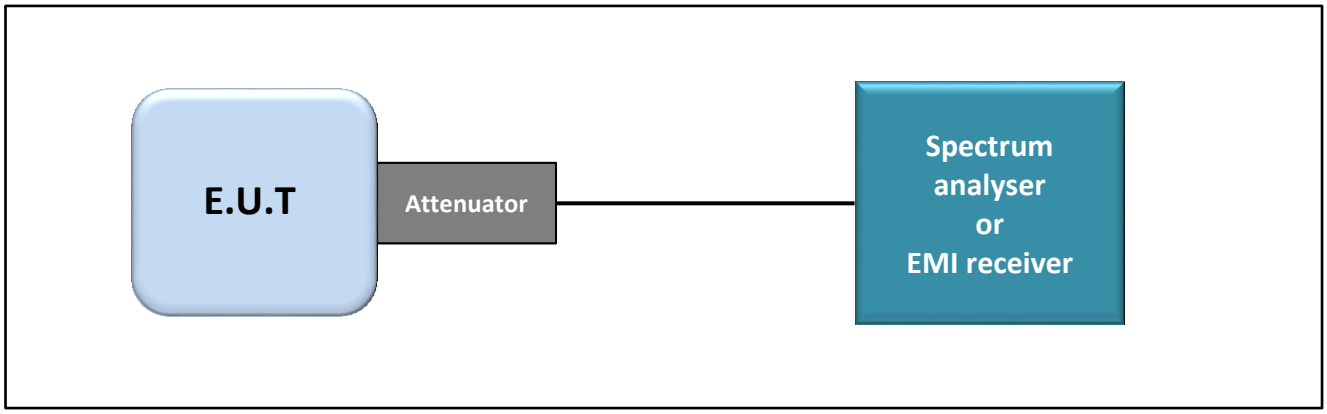
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 44 %

21.2. TEST SETUP

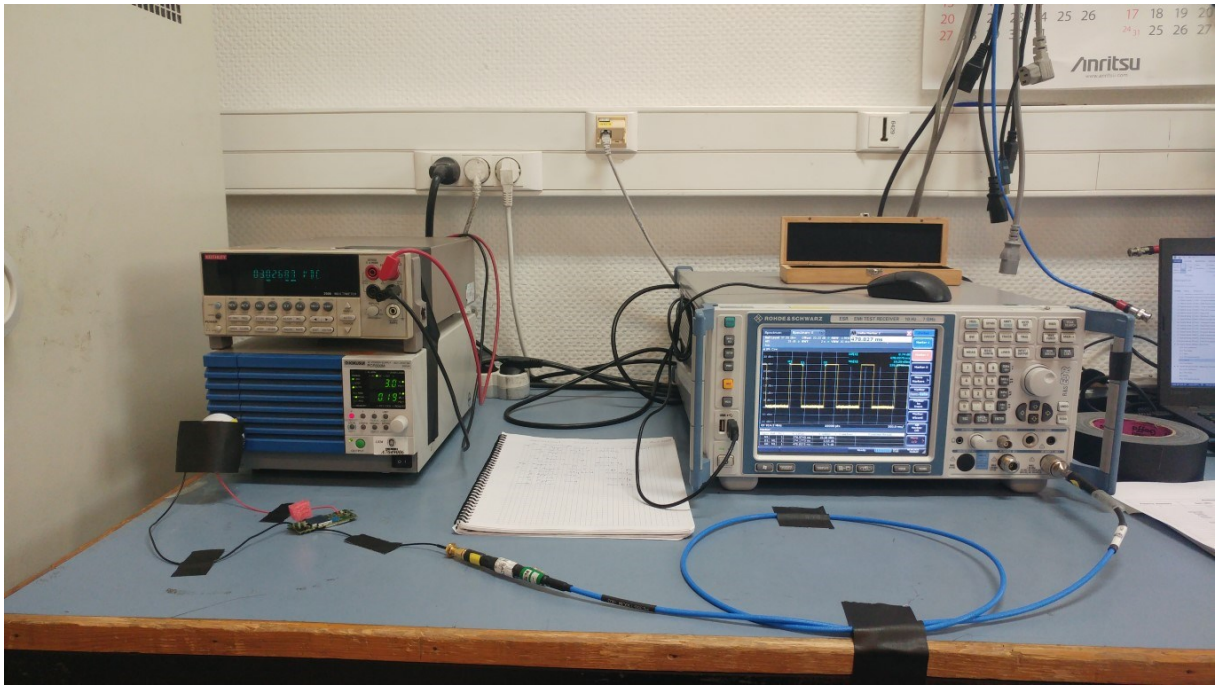
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ ANSI C63.10 § 11.6



Test set up



Photograph for Duty Cycle

21.3. LIMIT

None

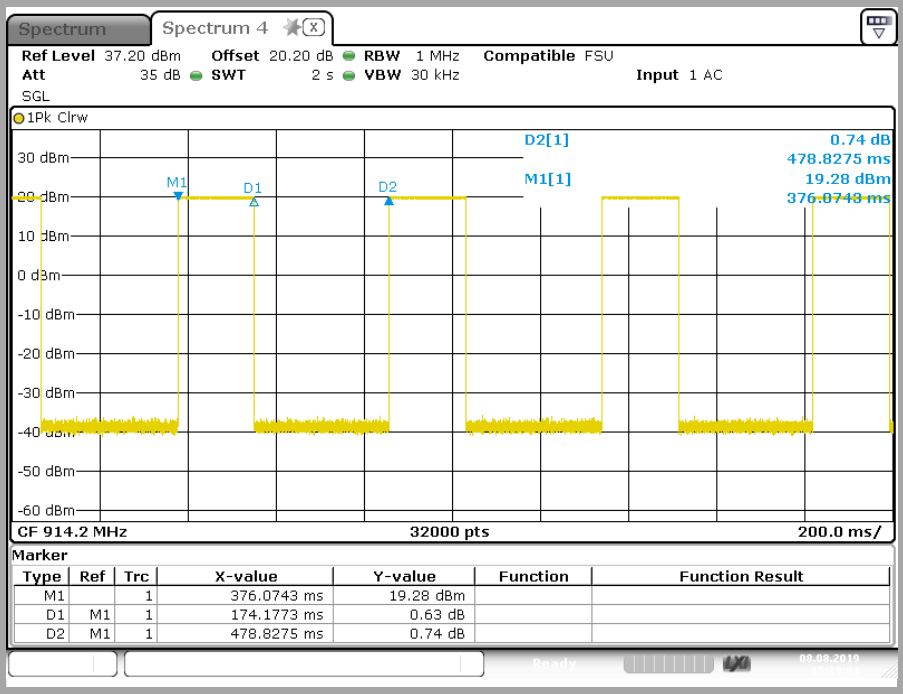
21.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

21.5. RESULTS

Duty Cycle
Channel



Channel	Duty Cycle (%)	Duty Cycle Correction (dB)
Cmax	36,3%	$20\log(\frac{1}{duty\ cycle})$ = 8,8 dB

21.6. CONCLUSION

Duty Cycle measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

22. HYBRID MODE 500 KHZ : MAXIMUM CONDUCTED OUTPUT POWER

22.1. TEST CONDITIONS

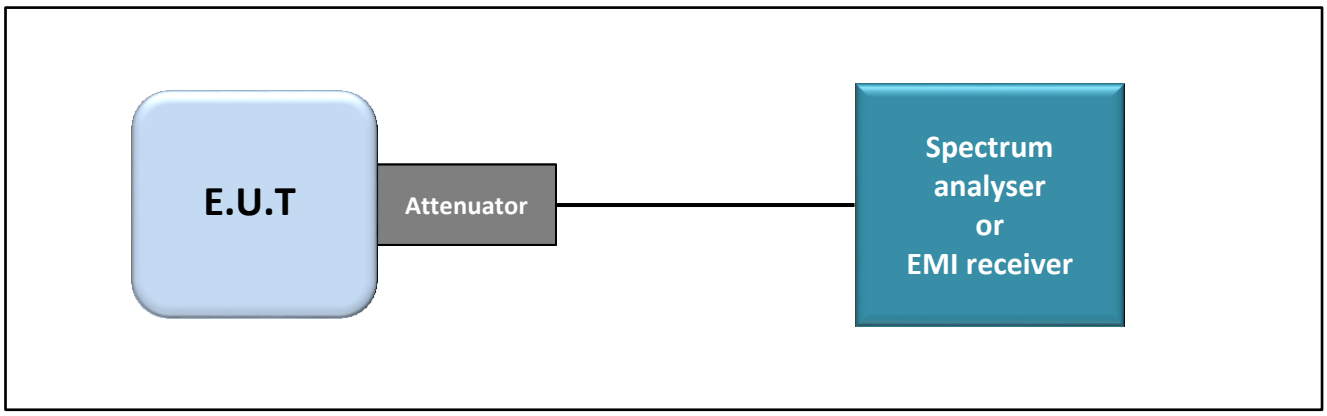
Test performed by	: Julien Palard
Date of test	: September 17, 2019
Ambient temperature	: 25 °C
Relative humidity	: 44 %

22.2. TEST SETUP

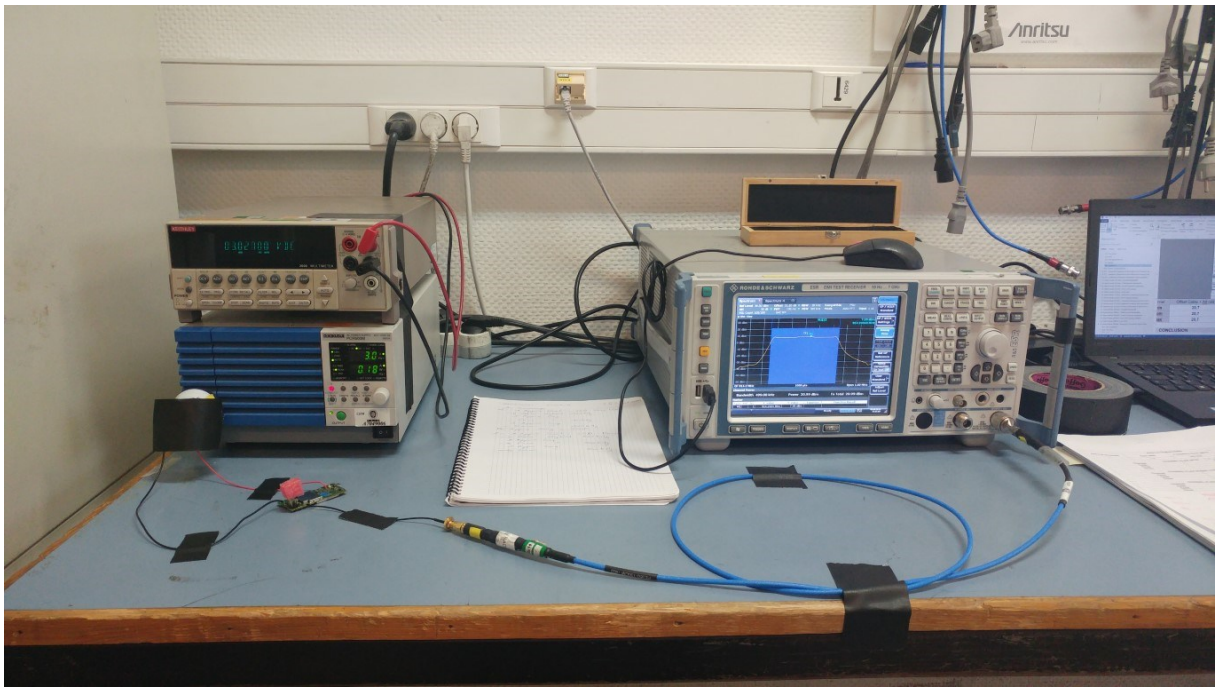
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☐ ANSI C63.10 § 7.8.5



Test set up



Photograph for Maximum Conducted Output Power

22.3. LIMIT

Maximum Conducted Output power:
Shall not exceed 30dBm if number of hopping channels is above 50
Shall not exceed 24dBm if number of hopping channels is below 50
Limits are reduced by G-6dBi if Antenna Gain above 6dBi

22.4. TEST EQUIPMENT LIST

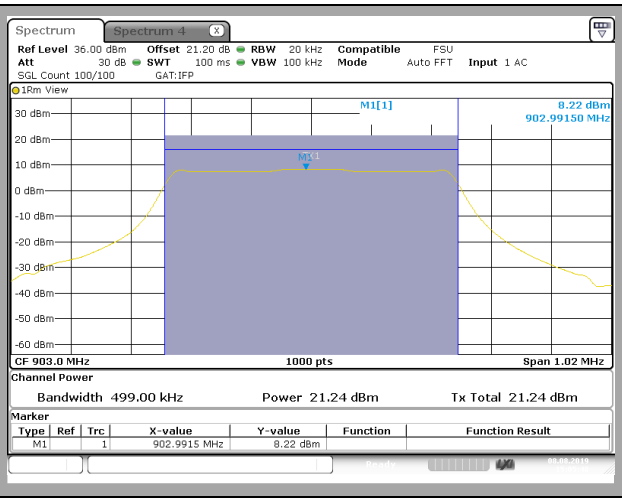
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

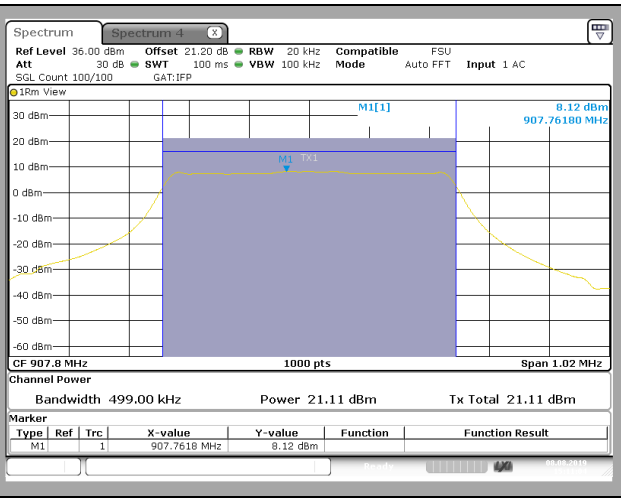
22.5. RESULTS

Maximum Conducted Output Power

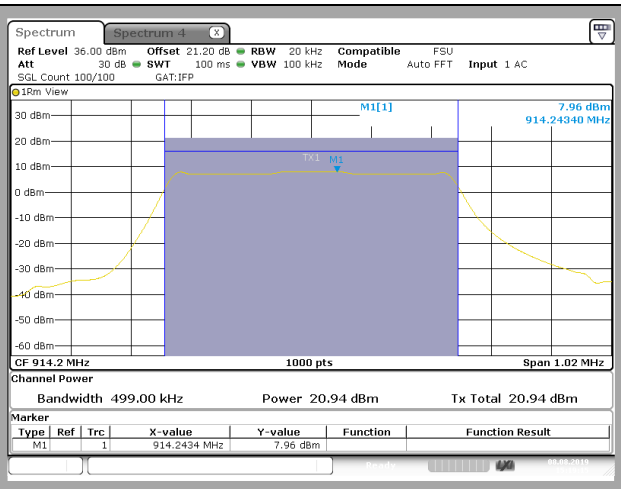
Cmin



Cnom



Cmax



Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Limit (dBm)
Cmin	**21,2**	-1,5	21,24	24
Cnom	**21,2**	-1,5	21,11	24
Cmax	**21,2**	-1,5	20,94	24

22.6. CONCLUSION

Maximum Conducted Output Power measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

23. HYBRID MODE 500KHZ : POWER SPECTRAL DENSITY

23.1. TEST CONDITIONS

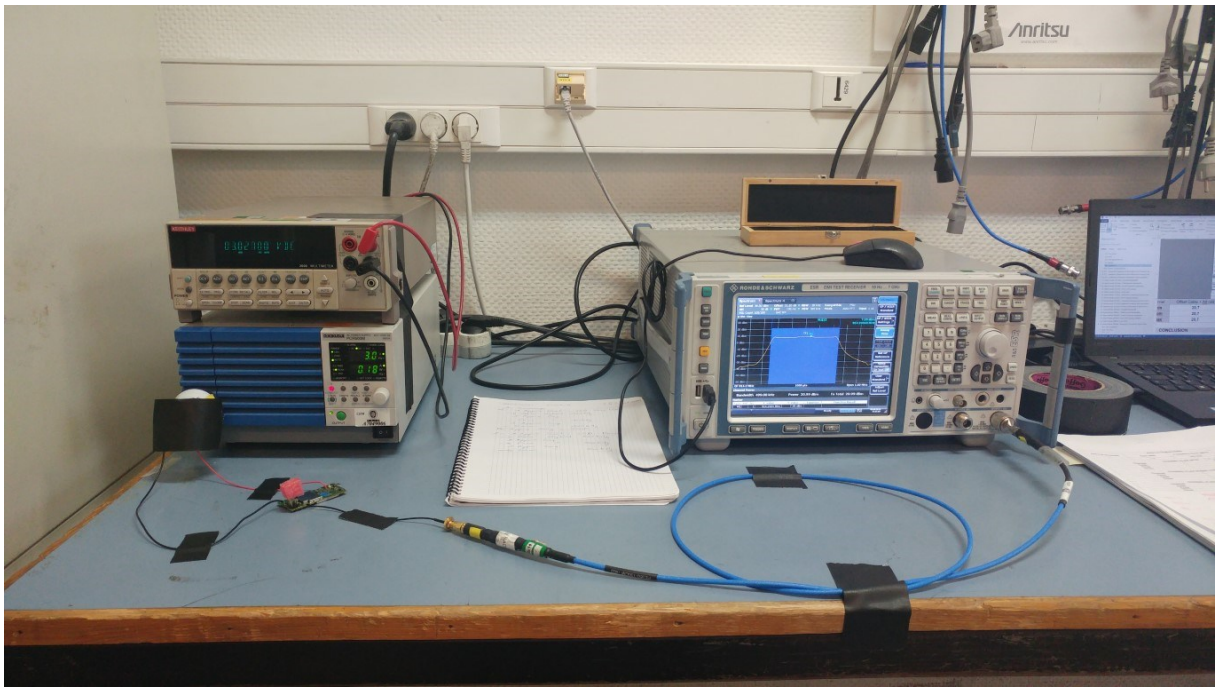
Test performed by	: Julien Palard
Date of test	: September 18, 2019
Ambient temperature	: 25 °C
Relative humidity	: 48 %

23.2. 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:
☐ KDB 558074 D01 DTS Meas Guidance v05 § 10.2 (Method PKPSD)
☑ KDB 558074 D01 DTS Meas Guidance v05 § 10.3 (Method AVGPSD-1)
☑ ANSI C63.10 § 11.10.3



Photograph for Power Spectral Density

23.3. LIMIT

Power Spectral Density:
902MHz-928MHz: Shall not exceed 8dBm/3kHz
Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

23.4. TEST EQUIPMENT LIST

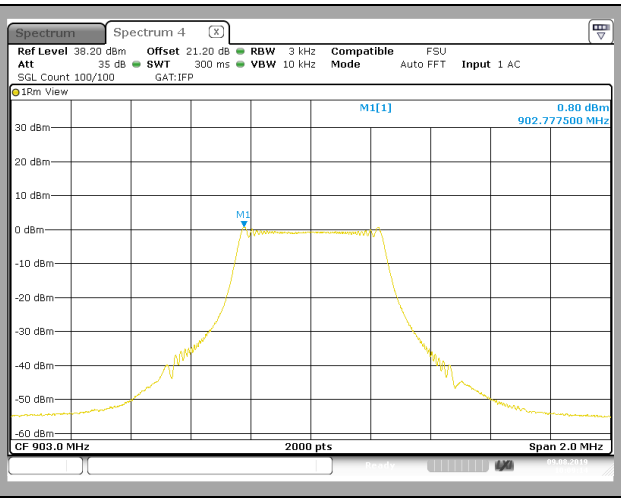
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

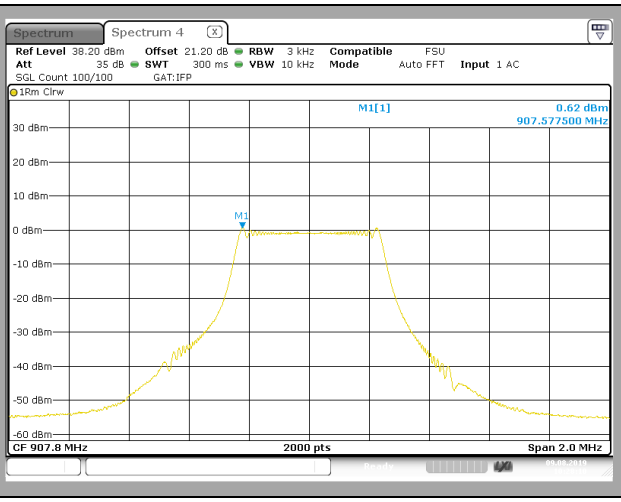
23.5. RESULTS

Power Spectral Density

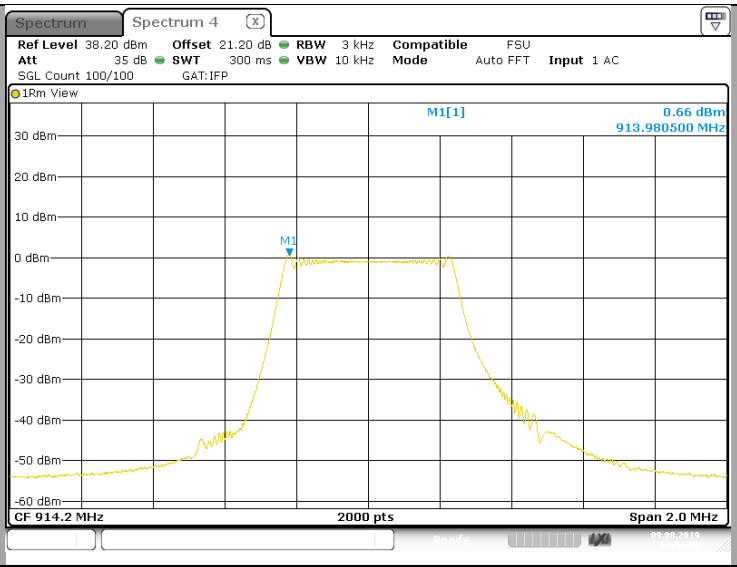
Cmin



Cnom



Cmax



Channel	Offset Cable + Att (dB)	Antenna Gain (dBi)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
Cmin	**21,2**	-1,5	0,80	8
Cnom	**21,2**	-1,5	0,62	8
Cmax	**21,2**	-1,5	0,66	8

23.6. CONCLUSION

Power Spectral Density measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 **V2**, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

24. HYBRID MODE 500 KHZ : UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS AT THE BAND EDGE

24.1. TEST CONDITIONS

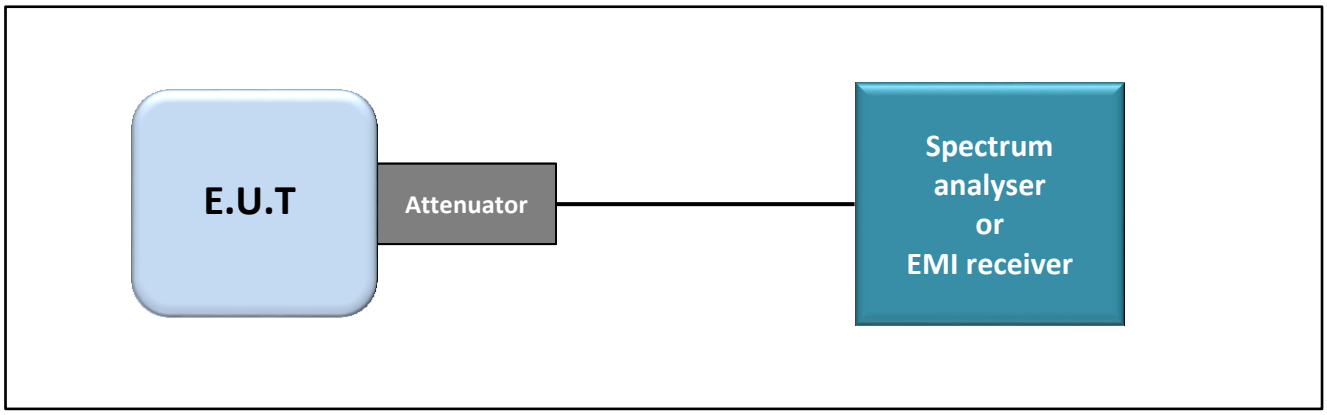
Test performed by	: Julien Palard
Date of test	: September 18, 2019
Ambient temperature	: 25 °C
Relative humidity	: 48 %

24.2. TEST SETUP

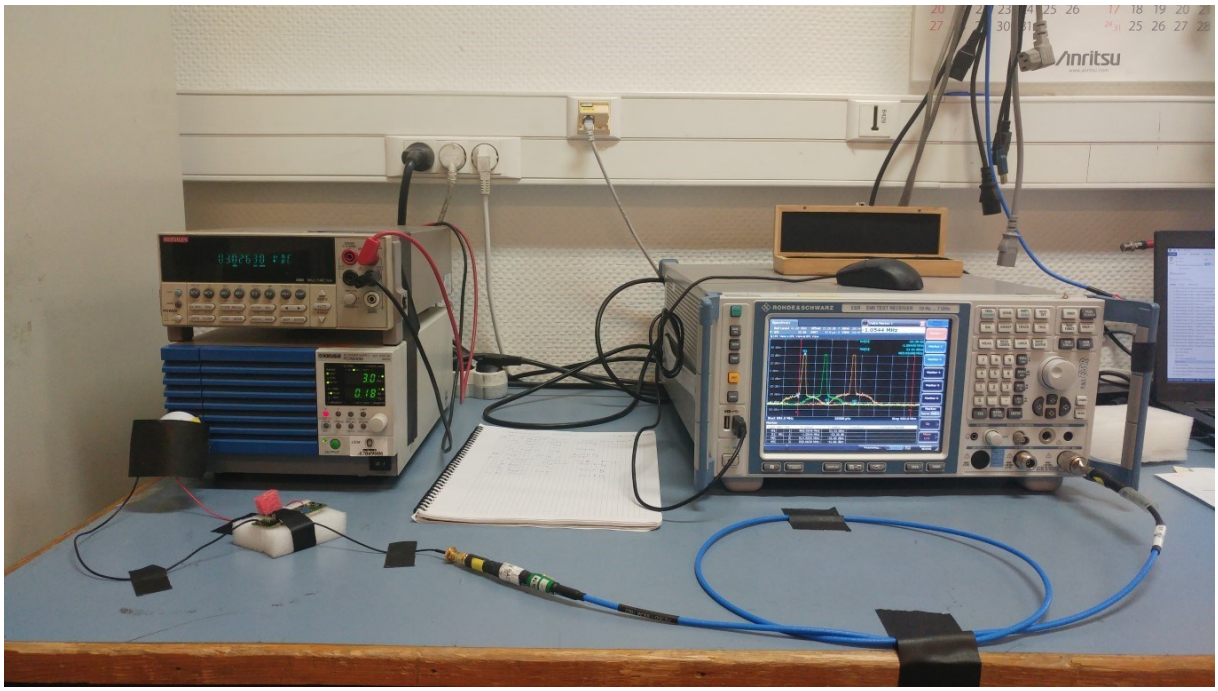
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ ANSI C63.10 § 7.8.6



Test set up



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

24.3. LIMIT

All Spurious Emissions must be at least 30dB below the Fundamental Radiator Level at the Band Edge Edge “902MHz & 928MHz”

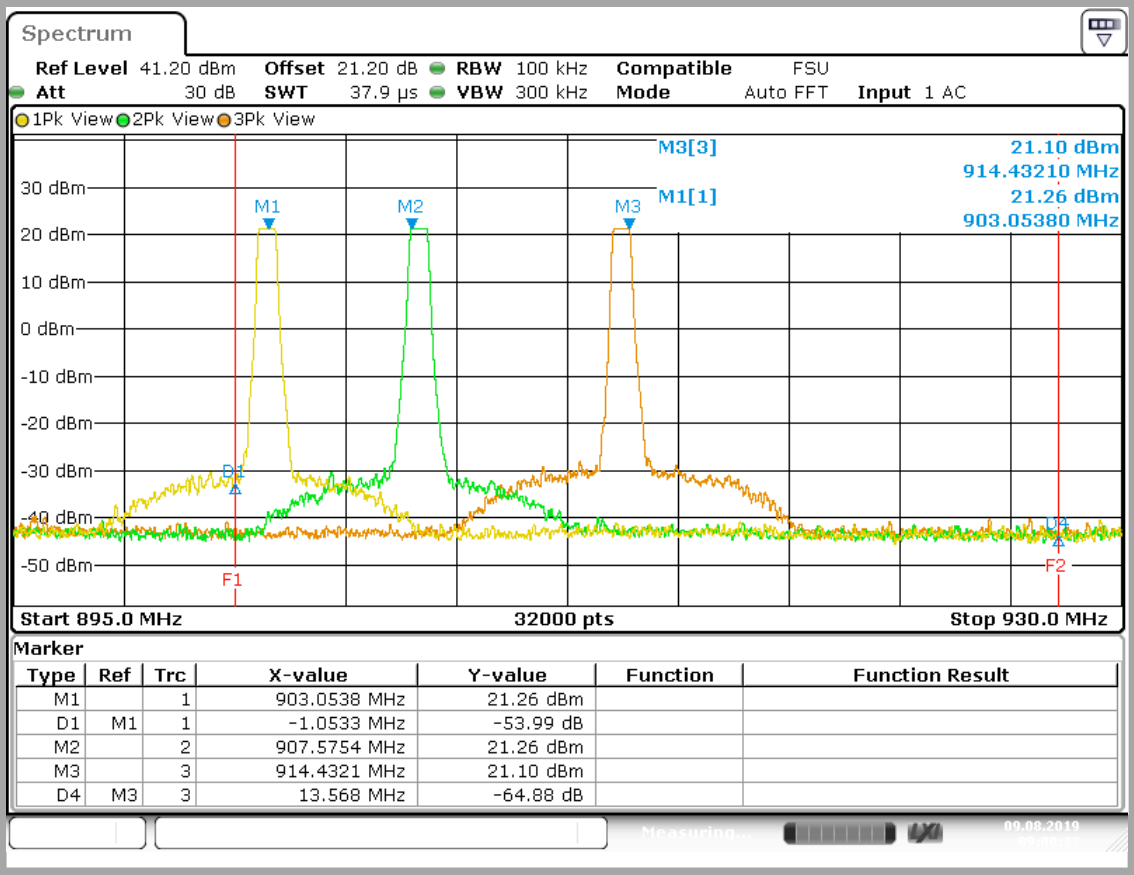
24.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable + Attenuateur 20dB	PASTERNACK	PE350-150CM	A5329867	2018/12	2019/12
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	ESR7	A2642023	2019/01	2021/01

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

24.5. RESULTS

Single Frequency
Cmin/Cnom/Cmax



Frequency (MHz)	Level (dBc)	Limit (dBc)
902	-53,99	30
928	-64,88	30

24.6. *CONCLUSION*

Unwanted Emission into non-restricted frequency bands at the band edge measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

25. HYBRID MODE 500 KHZ : UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS

25.1. TEST CONDITIONS

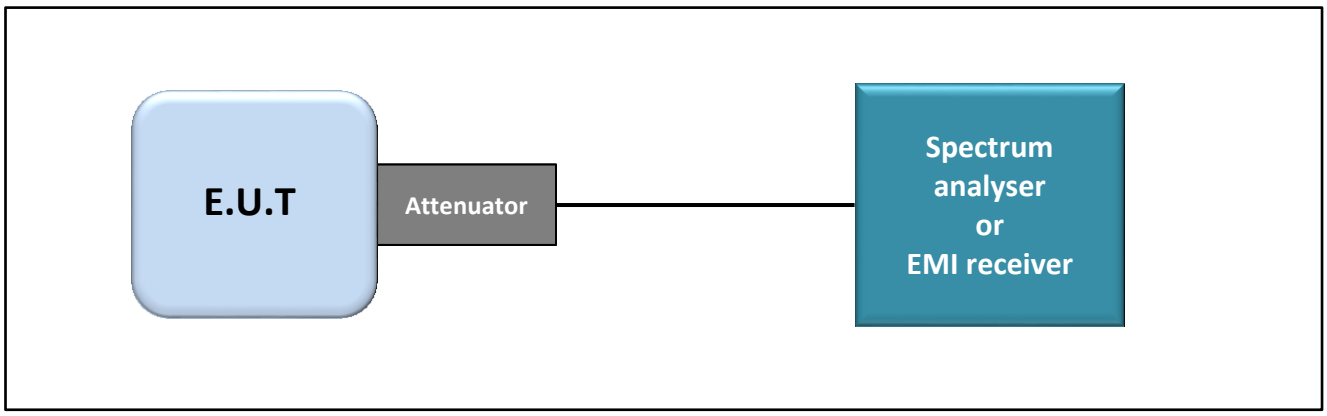
Test performed by	: Julien Palard
Date of test	: September 18, 2019
Ambient temperature	: 25 °C
Relative humidity	: 48 %

25.2. TEST SETUP

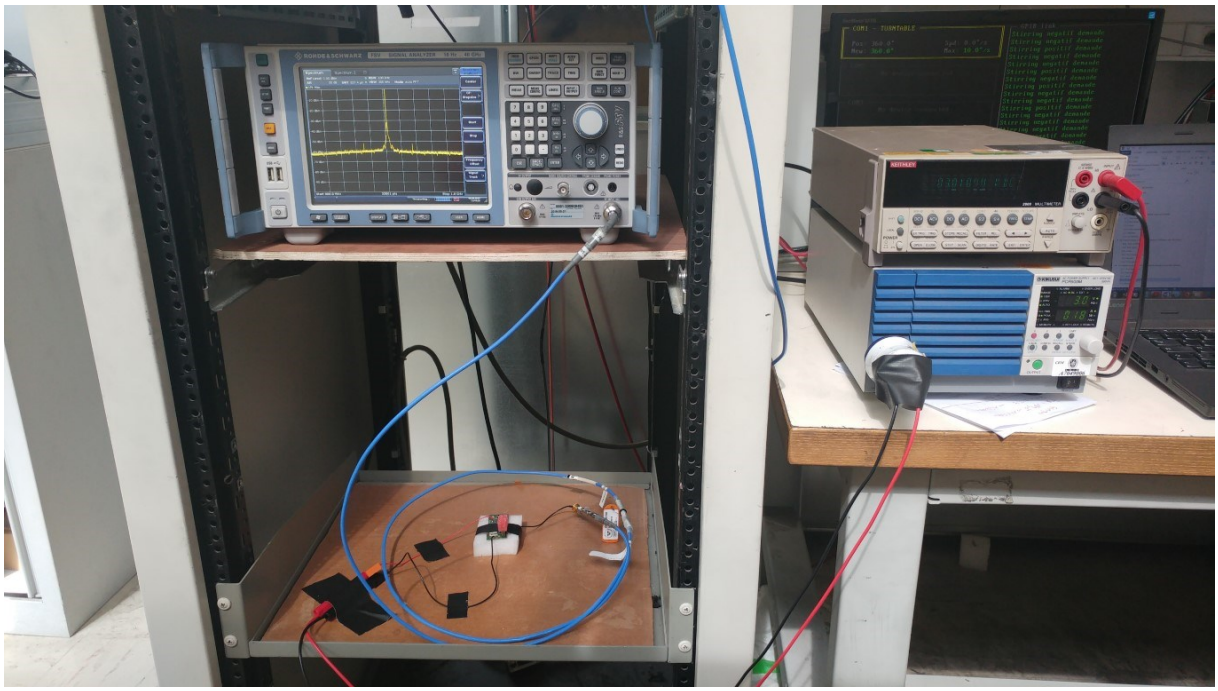
- The Equipment Under Test is installed:
☑ On a table
☐ In an anechoic chamber

- Measurement is performed with a spectrum analyzer in:
☑ Conducted Method
☐ Radiated Method

- Test Procedure:
☑ ANSI C63.10 § 7.8.8



Test set up



Photograph for Unwanted Emission into non-restricted frequency bands

25.3. LIMIT

All Spurious Emissions must be at least 30dB below the Fundamental Radiator Level

25.4. TEST EQUIPMENT LIST

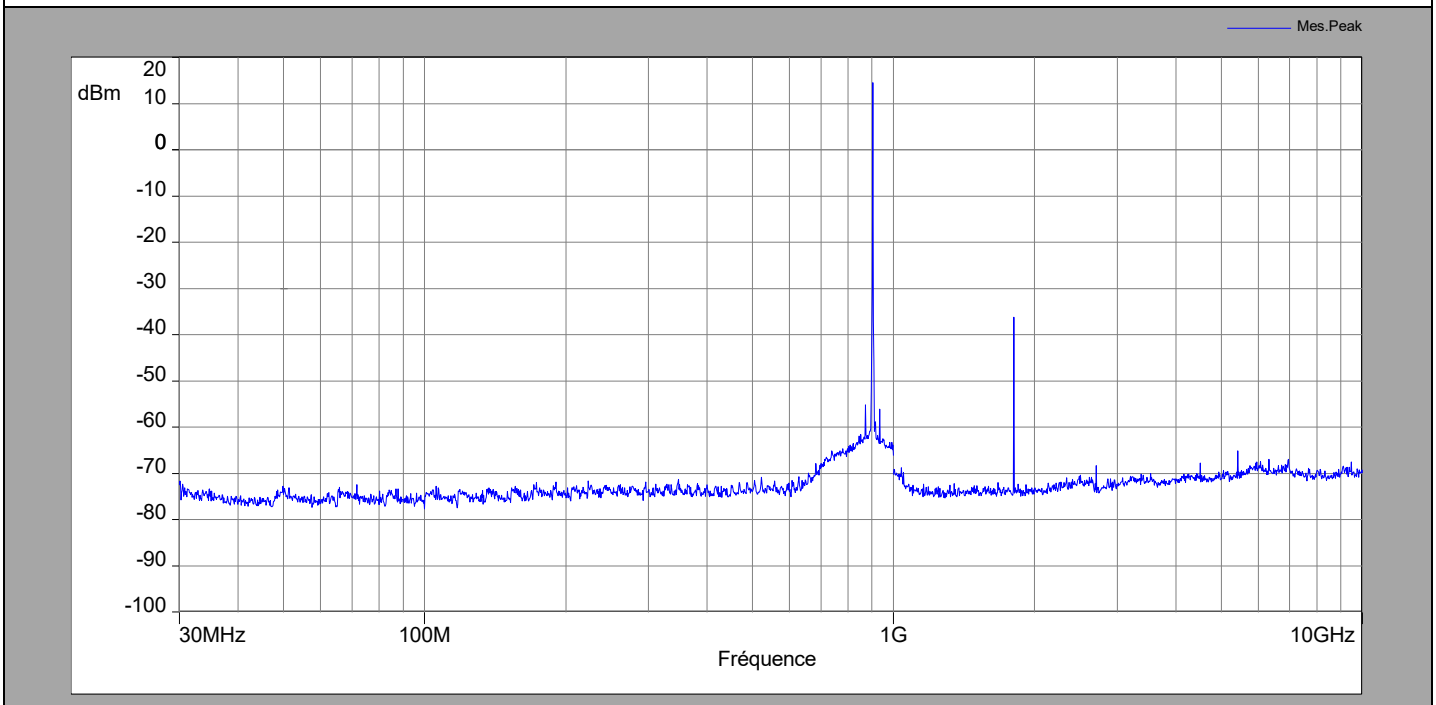
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Cable Conducted S36 chamber	TELEDYNE	084-0555-2MTR	A5329758	2019/02	2020/02
Attenuator 3dB Cable Spurious Conducted	-	WA54-3-12	A7122223	2019/02	2020/02
High Pass Filter 868MHz	WAINWRIGHT	WHKX12-935	A7484069	2017/10	2019/10
Multimeter	KEITHLEY	2000	A1241084	2018/12	2020/12
Power supply	KIKUSUI	PCR500M	A7049006	See Multimeter	See Multimeter
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2019/05	2021/05

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

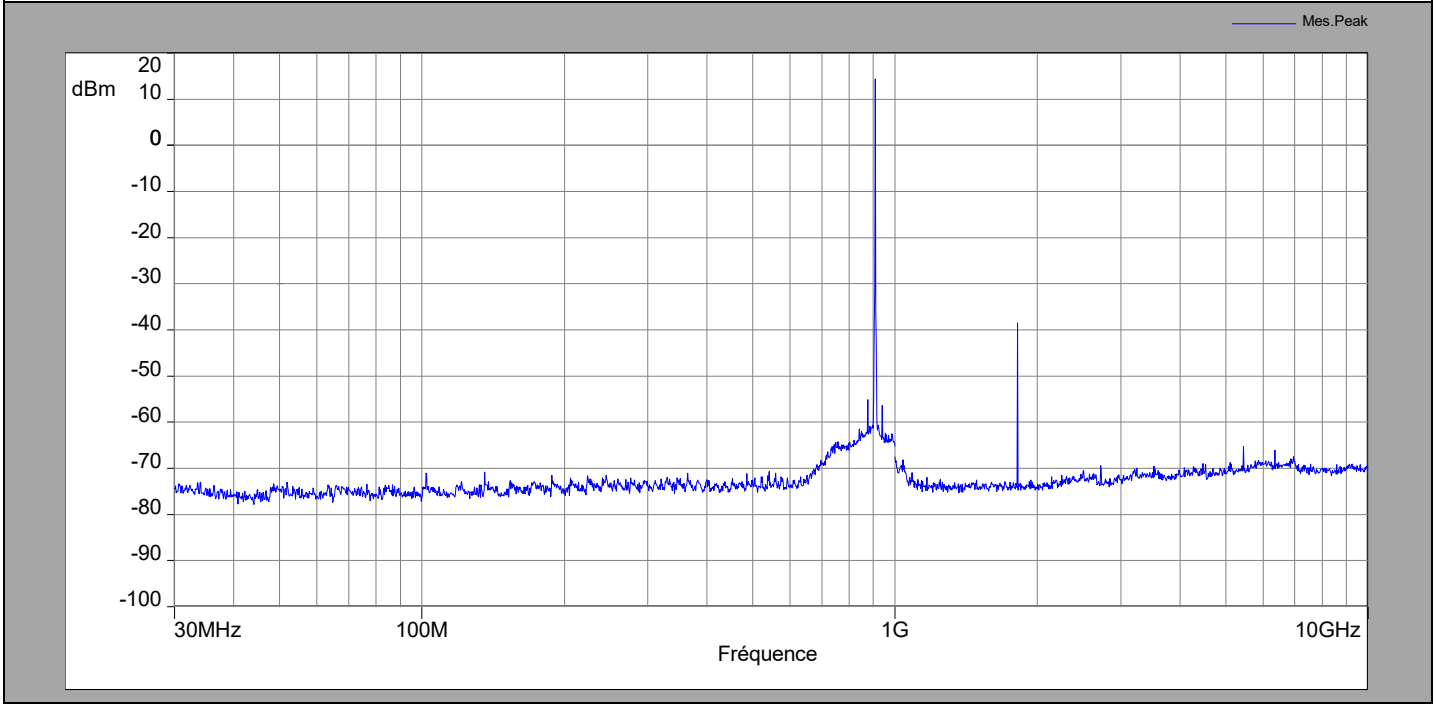
25.5. RESULTS

Single Frequency

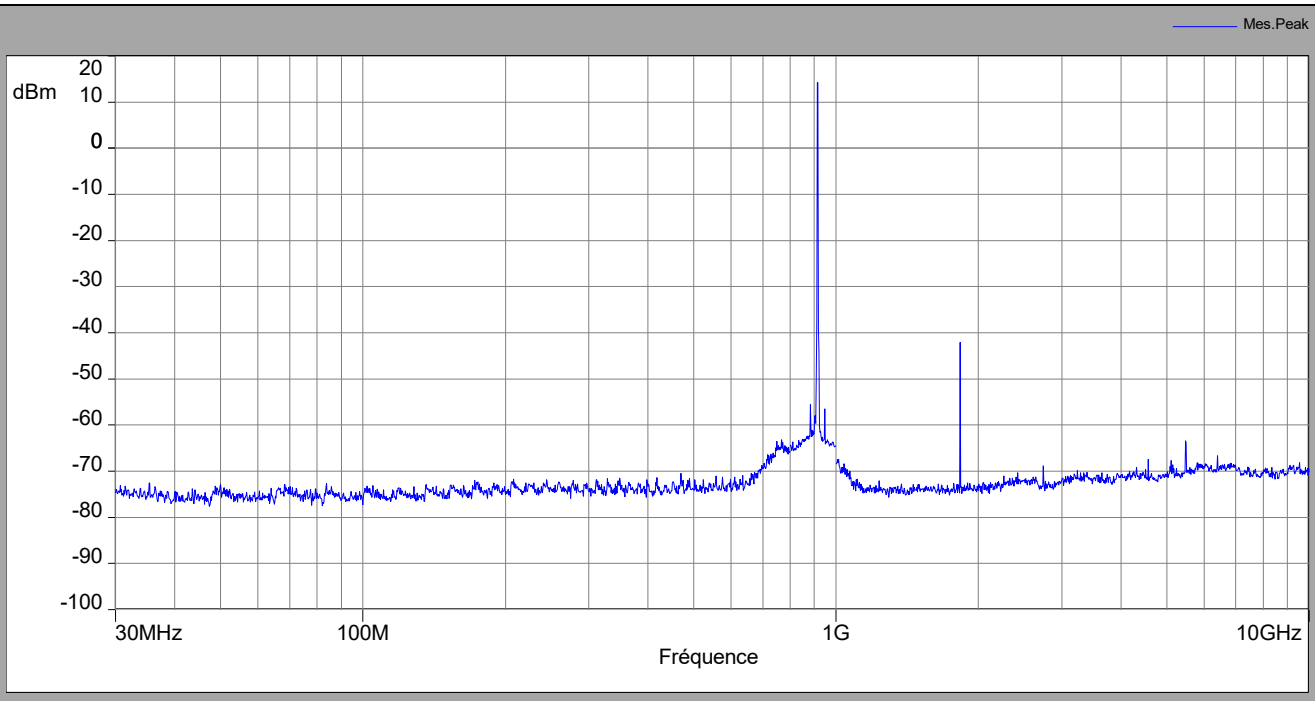
Cmin



Cnom



Cmax



Frequency (MHz)	Level (dBm)	Level (dBc)	Limit (dBc)
903	14,51		
871,1	-55,14	69,65	30
935	-56,07	70,58	30
1806	-36,28	50,79	30
907,8	14,35		
875,8	-55,13	69,48	30
939,9	-56,36	70,71	30
1815	-38,53	52,88	30
914,2	14,24		
882,1	-55,55	69,79	30
946,2	-56,46	70,7	30
1828	-42,18	56,42	30

25.6. CONCLUSION

Unwanted Emission into non-restricted frequency bands measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247 ISSUE 2** limits.

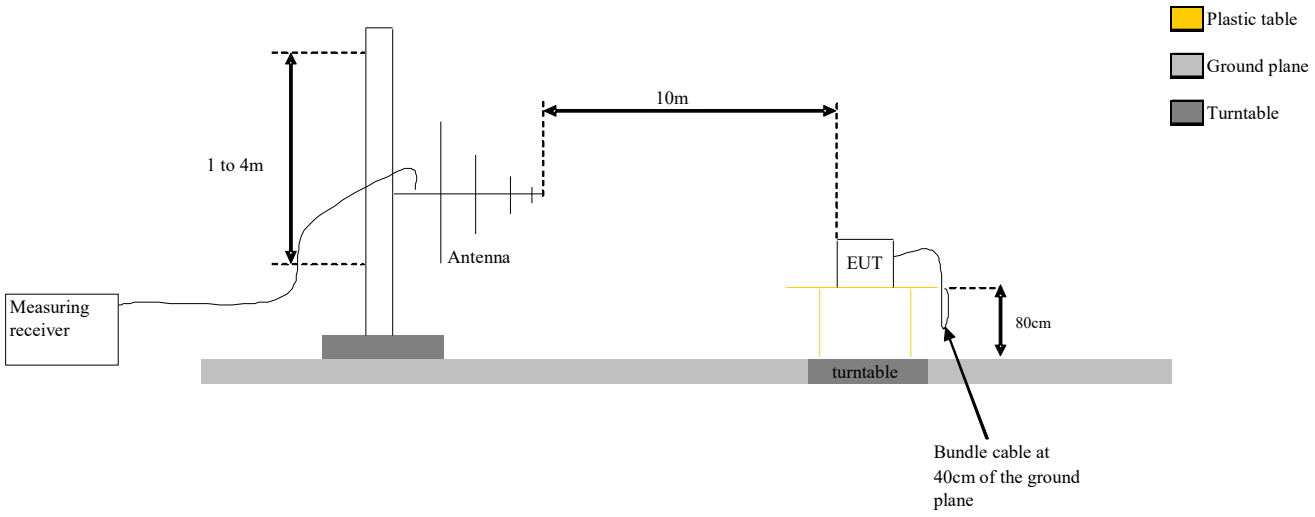
26. HYBRID MODE 500 KHZ : UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

26.1. TEST CONDITIONS

Test performed by	: Laurent DENEUX
Date of test	: September 13, 2019
Ambient temperature	: 23 °C
Relative humidity	: 47 %

26.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013).
Test is performed in parallel, perpendicular and ground parallel axis with a loop antenna below 30MHz. Measurement bandwidth was 200Hz below 150kHz and 9kHz between 150kHz & 30MHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height was 1m. The EUT is placed **on an open area test site**. Distance between measuring antenna and the EUT is **3m**.
Test is performed in horizontal (H) and vertical (V) polarization with **bilog** between 30MHz & 1GHz and with a horn antenna above 1GHz. Measurement bandwidth was 120kHz below 1GHz and 1MHz above 1GHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height search was performed from 1 to 4m. The EUT is place at 1.5m high above 1GHz and at 0.8m high under 1GHz. The EUT is placed **on an open area test site** above 1GHz and **on an open area test site** from 30MHz to 1GHz. Distance between measuring antenna and the EUT is **10m**.



Test Set up for radiated measurement in open area test site

Photograph for Unwanted Emission in restricted frequency bands

Photograph for Unwanted Emission in restricted frequency bands

26.3. LIMIT

Limit at 3m:
9kHz to 0,490MHz: 2400/F(kHz)µV/m (300m) or 20log(2400/F(kHz))dBµV/m (3m) QPeak
0,490MHz to 1.705MHz: 240000/F(kHz)µV/m (30m) or 20log(240000/F(kHz))dBµV/m (3m) QPeak
1.705MHz to 30MHz: 30µV/m (30m) or dBµV/m (3m) QPeak
30MHz to 88MHz: 40dBµV/m QPeak
88MHz to 216MHz: 43,5dBµV/m QPeak
216MHz to 960MHz: 46dBµV/m QPeak
960MHz to 1000MHz: 54dBµV/m QPeak
Above 1000MHz: 74dBµV/m Peak
54dBµV/m Average

Limit at 10m:
30MHz to 88MHz: 29.5dBµV/m QPeak
88MHz to 216MHz: 33dBµV/m QPeak
216MHz to 960MHz: 35.5dBµV/m QPeak
960MHz to 1000MHz: 43.5dBµV/m QPeak
Above 1000MHz: 63.5BµV/m Peak
43.5BµV/m Average

26.4. 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
Bilog antenna	CHASE	CBL 6112A	C2040040	2019-04	2020-04
Preamplifier	HEWLETT PACKARD	8449B	A4069002	04/2018	04/2020
Horn	EMCO	3115	C2042016	06/2019	06/2020
loop antenna	RHODE & SCHWARZ	HFH2-Z2	C2040007	2018-11	2020-11
Cable	-	-	A5329442	2018-09	2019-09
Cable			A5329542	06/2018	06/2019
Cable	-	-	A5329444	2018-09	2019-09
Cable	-	-	A5329876	2018-11	2019-11
Cable	-	-	A5326368	2018-12	2019-12
Cable	-	-	A5329416	2018-12	2019-12

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

26.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

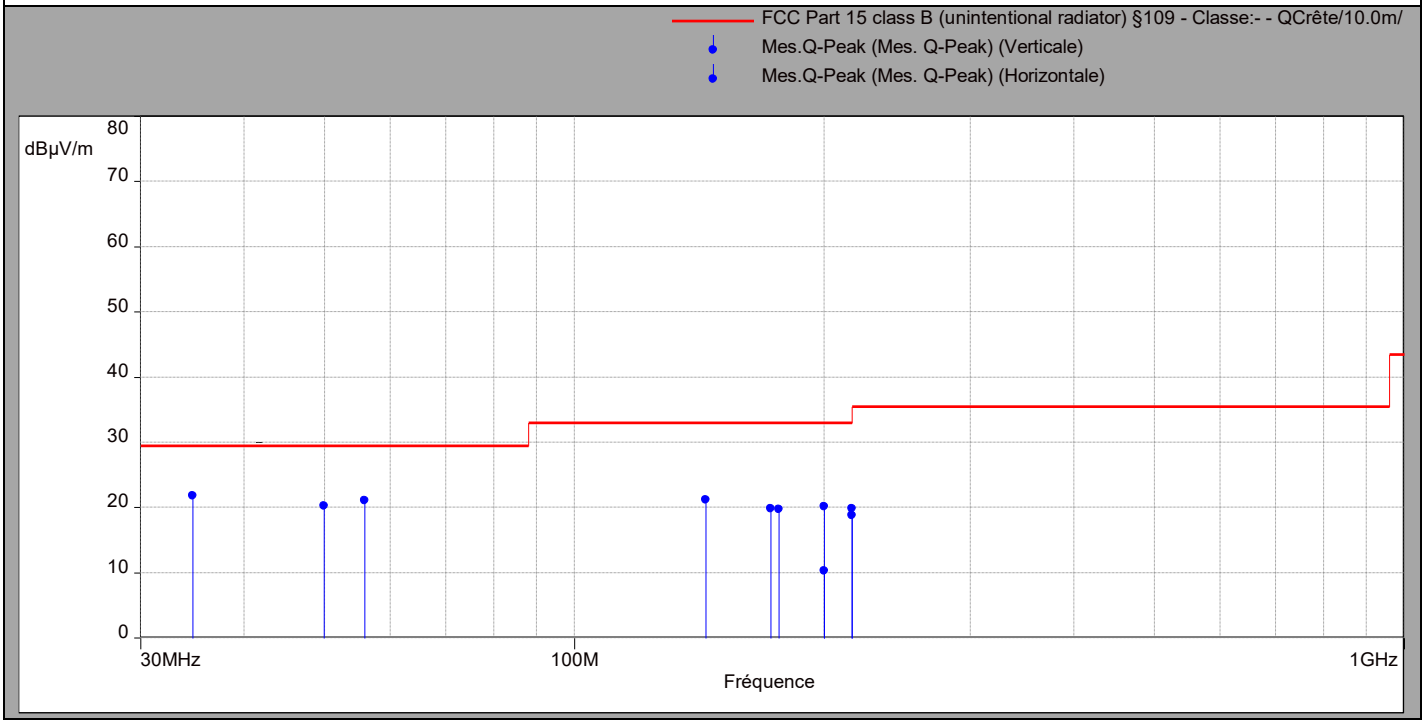
☑ None ☐ Divergence:

26.6. RESULTS

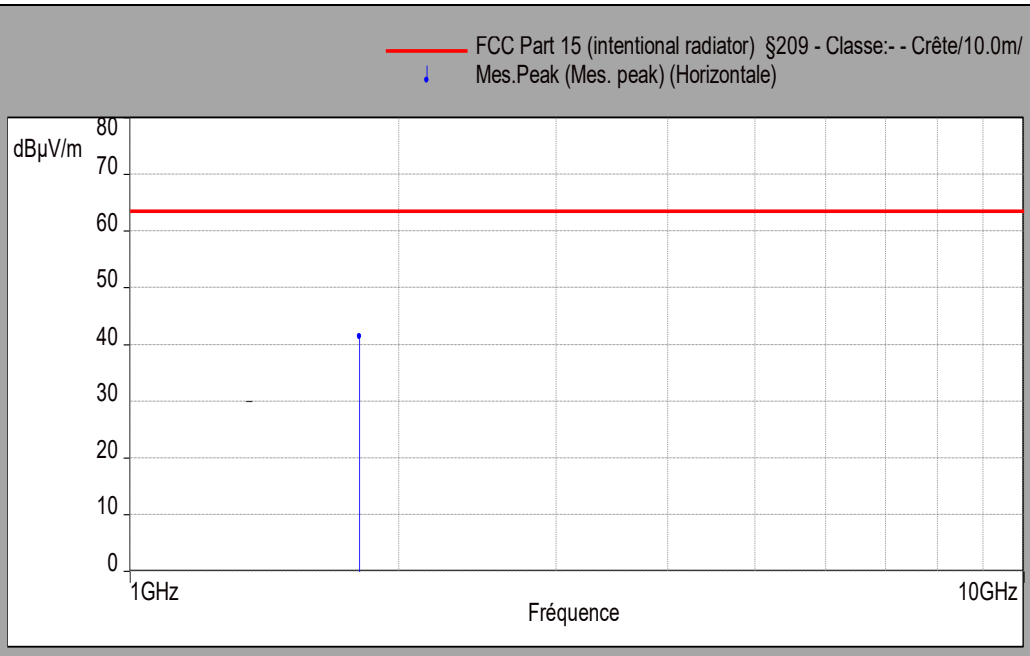
Below 1GHz

Cmin/Cnom/Cmax

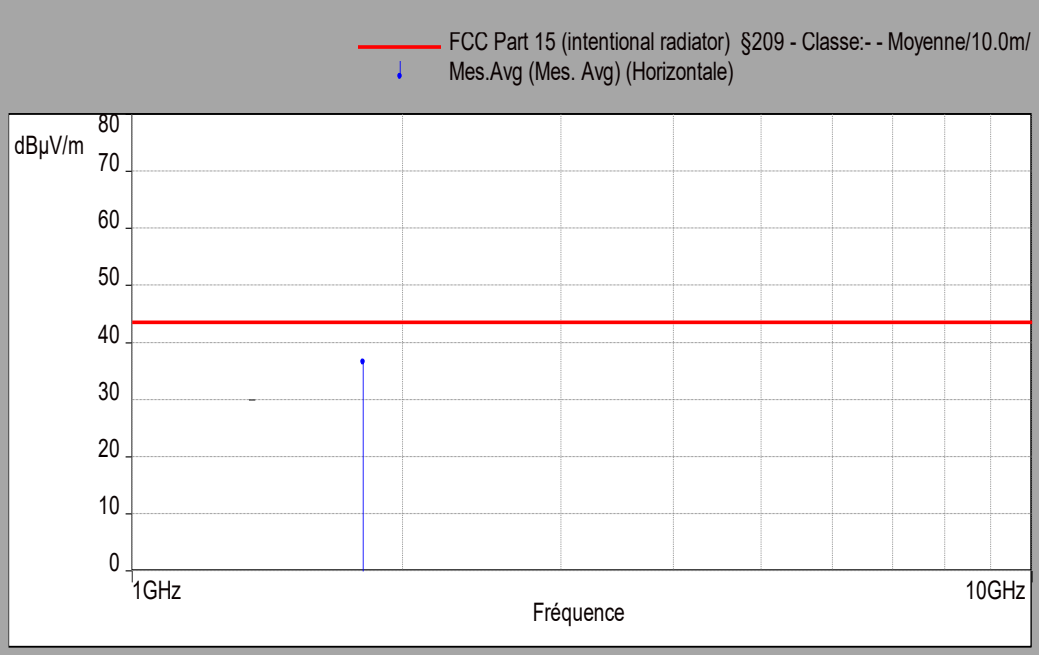
Horizontal &Vertical Polarization



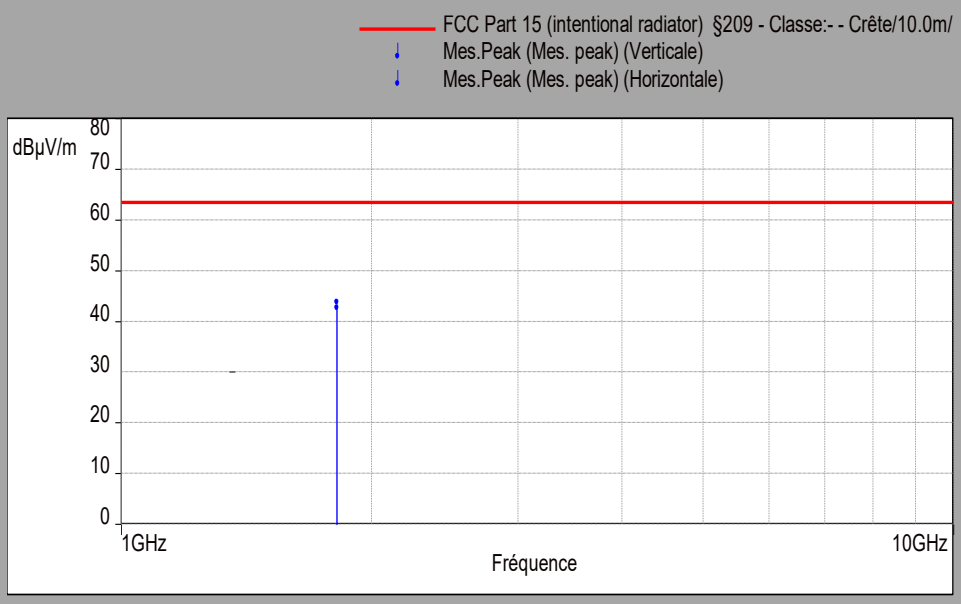
Above 1GHz (Cmin)
Peak measurement
Vertical & horizontal Polarization



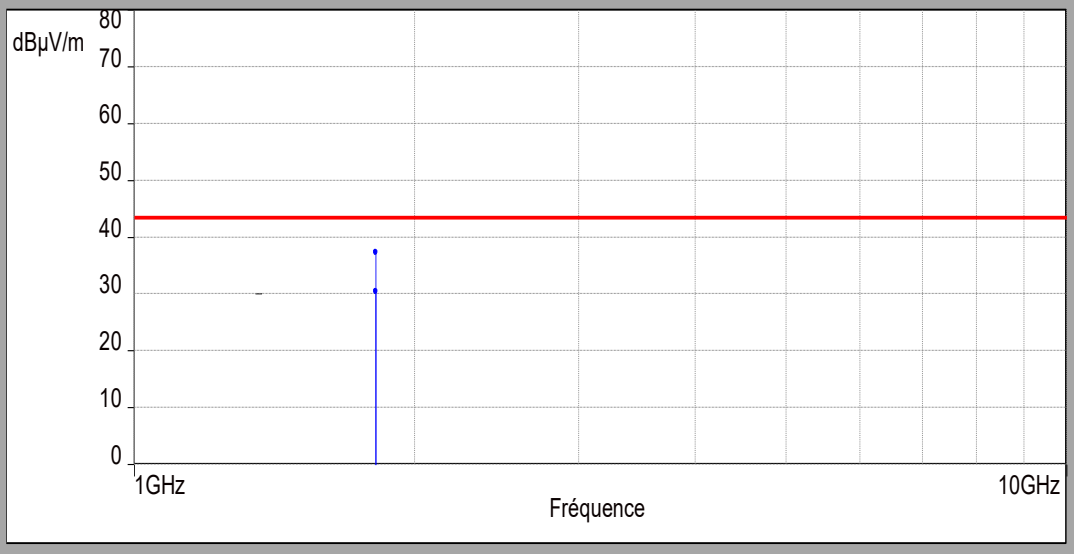
Average value
Vertical & horizontal Polarization



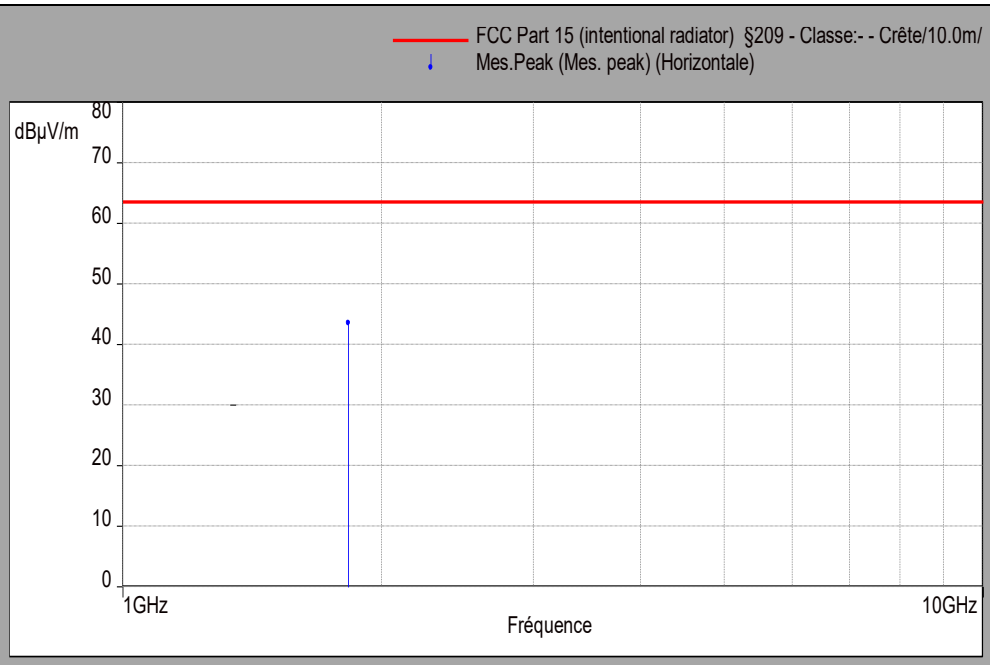
Above 1GHz (Cnom)
Peak measurement
Vertical & horizontal Polarization



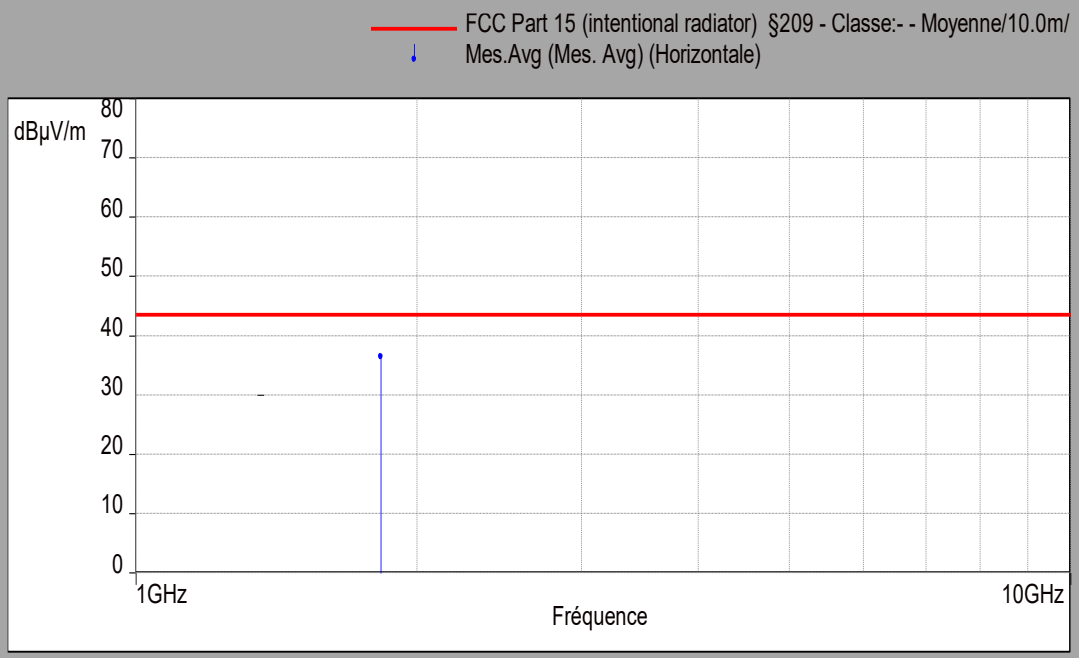
Average value
Vertical & horizontal Polarization



Above 1GHz (Cmax)
Peak measurement
Vertical & horizontal Polarization



Average value
Vertical & horizontal Polarization



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 Cmin/Cnom/Cmax					
Polarization	**Frequency (MHz)**	**Peak Level (dBµV/m)**	**QPeak Level (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dBµV/m)**
Vertical	34.7	-	21.75	29.5	7.75
Vertical	49.9	-	20.23	29.5	9.27
Vertical	55.9	-	21.06	29.5	8.44
Vertical	172.5	-	19.85	33	13.15
Vertical	200	-	20.11	33	12.89
Vertical	216	-	19.78	33	13.22
Horizontal	144	-	21.15	33	11.85
Horizontal	176.2	-	19.76	33	13.24
Horizontal	200	-	10.26	33	22.74
Horizontal	216	-	18.83	33	14.17

Above 1GHz Cmin								
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)**
horizontal	1806	24.79	33.59	43.5	9.91	41.37	63.5	22.13

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)**
horizontal	1815.3	23.53	32.33	43.5	11.17	43.82	63.5	19.68

Above 1GHz 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)**
horizontal	1828.4	23.7	32.5	43.5	11	43.3	63.5	20

26.7. CONCLUSION

Unwanted Emission in restricted frequency bands measurement performed on the sample of the product **SAGEMCOM** ATGHMP915 V2, SN: **PROTOTYPE** 3, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.247 & RSS 247 ISSUE 2 limits.

27. 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