TEST REPORT

N°: 141605-685425B V02

Subject	**Radio spectrum Matters (ERM) tests according to standards: 47CFR Part 15.407**
Test Site FCC registration number	**888863**
Issued to	**EBlink** 3 rue marcel Pagnol ZI du Clos Auchin F-91800 Boussy-Saint-Antoine France
Apparatus under test	
↳ Product	**Front Link (FL58-45) equipment**
↳ Trade mark	**EBlink**
↳ Manufacturer	**EBlink**
↳ Model under test	**FL58R2EABW45-REM**
↳ Frequency plan	**EBDIRTECH16-MEM096-11**
↳ Serial number	**EBL1613C0074**
↳ **FCC ID**	**2ACLSFL58-45**
Test date	18/04/2016 to 27/05/2016
Test location	Ecuelles Fontenay Aux Roses
Test performed by	Laurent Deneux & Arnaud Fayette
Composition of document	91 pages
Initial issued on	23/06/2016
Document corrected on	28/06/2016

Written by :	**Approved by :**
Arnaud Fayette	**Stéphane Phoudiah**
Tests operator	**Technical manager**

LABORATOIRE CENTRAL DES
S.A.S au capital de 15.745.984 €
RCS Nanterre B 408 363 174
33 avenue du General Leclerc
F - 92260 FONTENAY AUX ROSES

SUMMARY

1. TEST PROGRAM

References

- **47 CFR Part 15.407**
- **KDB 789033 D02 General U-NII Tests Procedures New Rules v01r02**
- **KDB 662911 D01 Multiple Transmitter Output v02r01**
- **KDB 644545 D03 Guidance for IEEE 802.11ac v01**
- **ANSI C63.10-2013**

Radio requirement:

Test Description	TEST RESULT - Comments
Maximum Conducted Output Power	☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP (Limited Program)**
Power Spectral Density	☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP (Limited Program)**
Undesirable Emission Limits	☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP (Limited Program)**
6dB bandwidth	☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP (Limited Program)**
AC Power Line Conducted Emissions	☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP (Limited Program)**
Unwanted Emissions	☑ **PASS** ☐ **FAIL** ☐ **NA** ☐ **NP (Limited Program)**
Frequency stability	☑ **PASS (The Manufacturer declares the EUT emission is maintained within the band of operation under all conditions of normal operation as specified in the user manual)** ☐ **FAIL** ☐ **NA** ☐ **NP (Limited Program)**
This table is a summary of test report, see conclusion of each clause of this test report for detail.	

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

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

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):
FL58R2EABW45-REM **Serial Number: EBL1613C0074**

Equipment Under Test

Inputs/outputs - Cable:

Access	Type	Comments
Power supply	-	-
Ethernet	-	-
Optical fiber * 3	-	-

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop	CEN	-	-
IQbox	Rohde & Scharwz	101208	-
Optical coupleur	Eblink	-	-

Equipment information:

Type:				
Frequency band:	☑ 5725MHz-5850MHz			
Channel bandwidth:	☑ 5MHz	☑ 10MHz	☑ 15MHz	☑ 20MHz
Antenna Type:	☐ Integral	☑ External	☐ Dedicated	
Antenna connector:	☑ Yes	☐ No	☐ Temporary for test	
Transmit chains:	☐ 1	☑ 2		
	☐ Single antenna	☑ Symmetrical	☐ Asymmetrical	
	Gain 1: 29dBi	Gain 2: 29dBi		
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:	Tnom:	20°C		
Type of power source:	☐ AC power supply	☑ DC power supply	☐ Battery (Select Type)	
Operating voltage range:	Vnom:	☐ 207V/50Hz	☑ 48Vdc	

Channel Plan
See “EBDIRTECH16-MEM096-11” EBlink document describing all configurations available for the product.

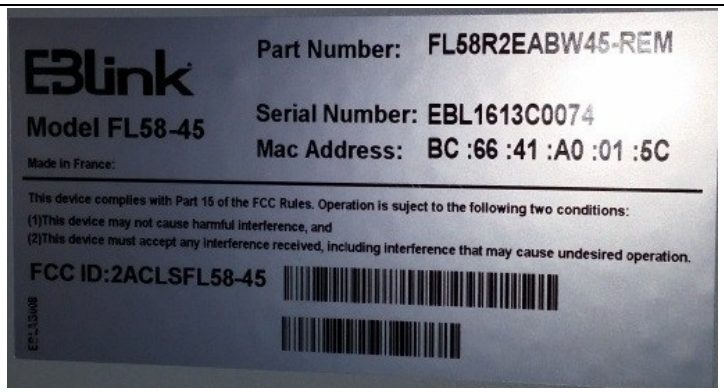
2.2. RUNNING MODE

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

The specific test software “LRMT_FL58_V2.0 Standalone” is used to set the product.

Test	Configuration Tested	Remarks
Power limits	1-2-3-4-5-6-7-8-9-10-11-12-13	Multiple configurations are available on the product. Some configurations are equivalents. So a sampling of the configurations is performed to test the product in Low, Middle, High channel for each bandwidth of the product
Power spectral density	1-2-3-4-5-6-7-8-9-10-11-12-13	Multiple configurations are available on the product. Some configurations are equivalents. So a sampling of the configurations is performed to test the product in Low, Middle, High channel for each bandwidth of the product
6db bandwidth	1-2-3-4-5-6-7-8-9-10-11-12-13	Multiple configurations are available on the product. Some configurations are equivalents. So a sampling of the configurations is performed to test the product in Low, Middle, High channel for each bandwidth of the product
AC Power Line Conducted Emissions	7	The test is performed on the worst case configuration found during Power Limits test
Unwanted Emissions below 1GHz	7	The test is performed on the worst case configuration found during Power Limits test
Unwanted Emissions above 1GHz	1-2-3-4-5-6-7-8-9-10-11-12-13	Multiple configurations are available on the product. Some configurations are equivalents. So a sampling of configurations is performed to test the product in Low & High channel for each bandwidth

2.3. EQUIPMENT LABELLING



2.4. EQUIPMENT MODIFICATION

☑ None ☐ Modification

3. MAXIMUM CONDUCTED OUTPUT POWER

3.1. TEST CONDITIONS

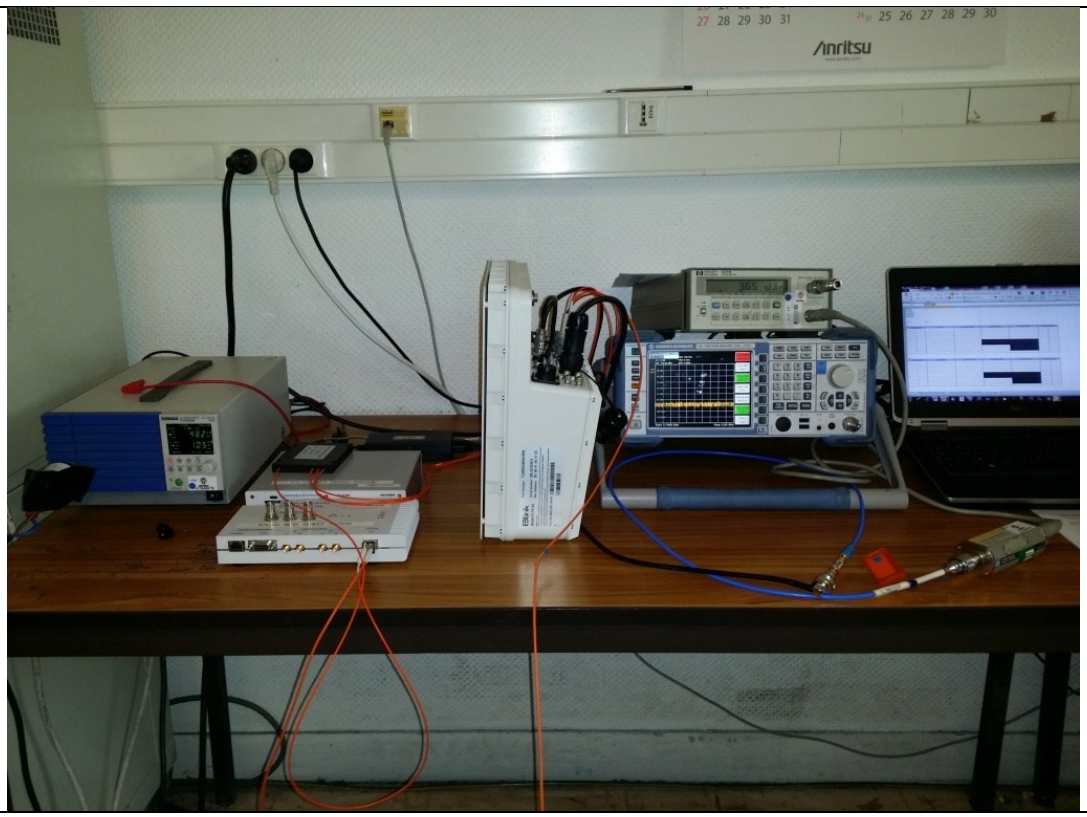
Test performed by : Arnaud Fayette
Date of test : 2016/05/24
Ambient temperature : 23°C
Relative humidity : 45%

3.2. TEST SETUP

- The Equipment under Test is installed:
☐ In the climatic chamber
☑ On a table

-Measurement is performed with a spectrum analyzer
☑ On the EUT conducted access

- Test Procedure:
☑ KDB 789033 D02 General UNII Test Procedures New Rules v01r02 § E3
☑ KDB 662911 D01 Multiple Transmitter Output v02r01
☑ KDB 644545 D03 Guidance for IEEE 802.11ac v01



Photograph for Maximum Conducted Output Power

3.3. LIMIT

The RF output power shall not exceed 1W (30dBm)

3.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal date	Cal due
Power meter	HEWLETT PACKARD	437B	A1503001	2015/09	2016/09
Multi-meter	ISOTECH	IDM 91E	A1240253	2015/08	2016/08
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7040079	2014/05	2016/05
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329675	2015/10	2016/10

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

3.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

3.6. RESULTS

Thermocouple Power Sensor Offset : Cable Loss + Attenuator = 43,2dB

Configuration	Tx1 (dBm)	Tx2 (dBm)	Maximum Conducted Output Power (dBm)
1	14,8	15,17	18,00
2	14,88	14,92	17,91
3	14,58	14,71	17,66
4	14,73	14,71	17,73
5	14,24	13,76	17,02
6	14,21	13,61	16,93
7	15,82	14,63	18,28
8	14,32	13,96	17,15
9	14,6	14,7	17,66
10	15,32	14,53	17,95
11	14,52	14,76	17,65
12	14,62	14,59	17,62
13	14,67	14,79	17,74

3.7. CONCLUSION

Maximum Conducted Output Power measurement performed on the sample of the product FL58R2EABW45-REM, SN: EBL1613C0074, in configuration and description presented in this test report, show levels **conform to** the FCC 15.407 limits.

4. POWER SPECTRAL DENSITY

4.1. TEST CONDITIONS

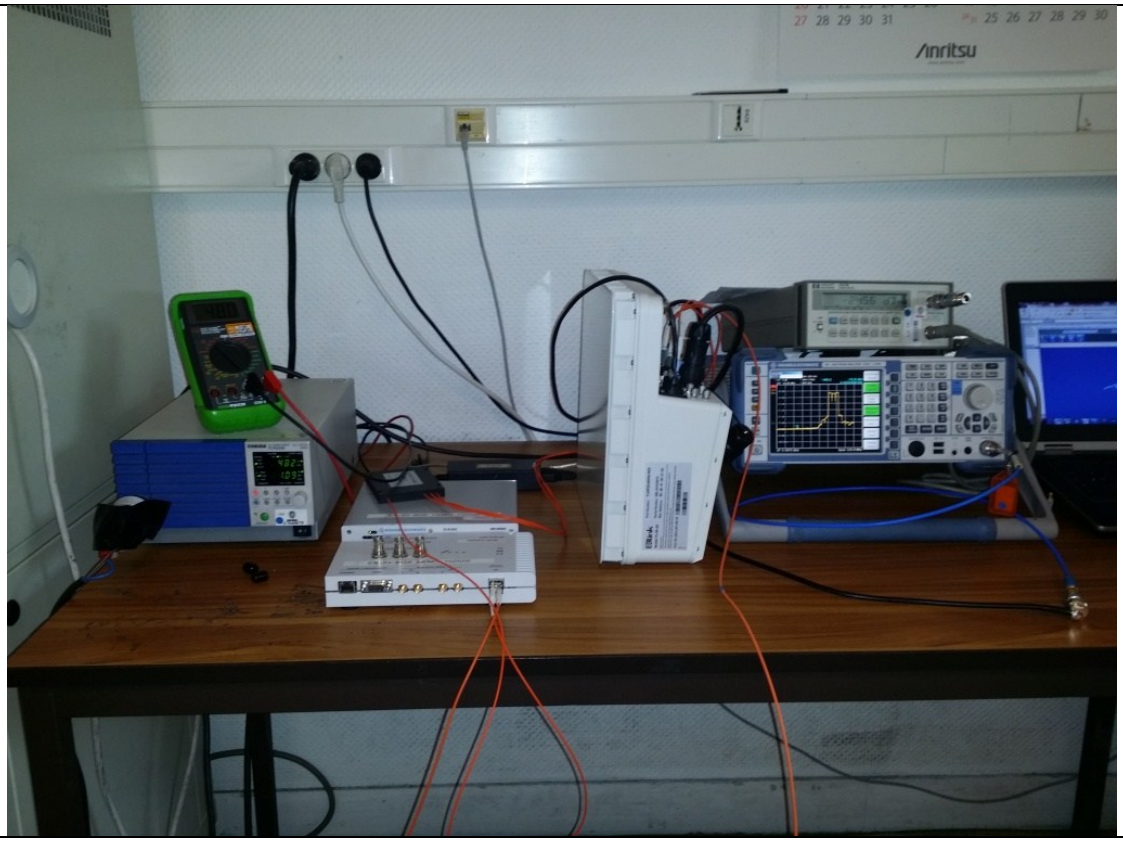
Test performed by : Arnaud Fayette
Date of test : 2016/05/24
Ambient temperature : 23°C
Relative humidity : 45%

4.2. TEST SETUP

- The Equipment under Test is installed:
☐ In the climatic chamber
☑ On a table

-Measurement is performed with a spectrum analyzer
☑ On the EUT conducted access

- Test Procedure:
☑ KDB 789033 D02 General UNII Test Procedures New Rules v01r02 § E3
☑ KDB 662911 D01 Multiple Transmitter Output v02r01
☑ KDB 644545 D03 Guidance for IEEE 802.11ac v01



Photograph for Power Spectral Density

4.3. LIMIT

The Spectral Density shall not exceed 30dBm/500kHz

4.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal date	Cal due
Multi-meter	ISOTECH	IDM 91E	A1240253	2015/08	2016/08
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7040079	2014/05	2016/05
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329675	2015/10	2016/10
Spectrum analyzer	ROHDE & SCHWARZ	FSL6	A4060032	2015/04	2017/04

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

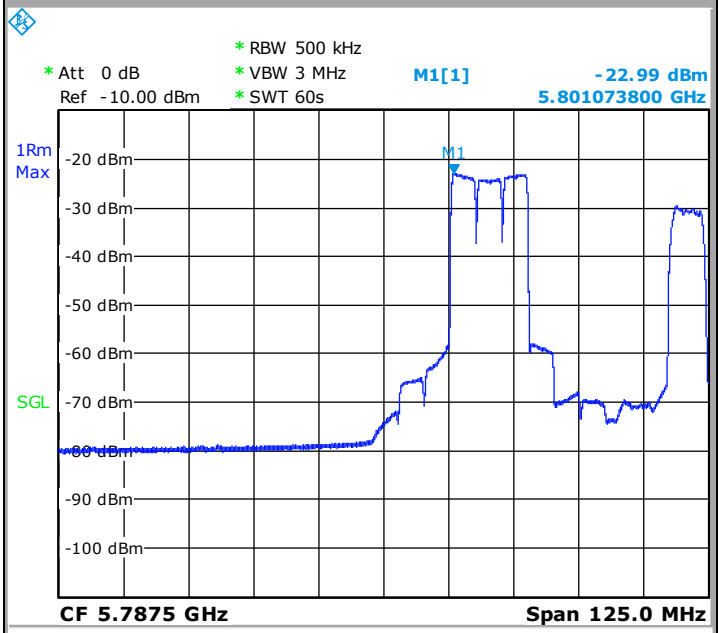
4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

4.6. GRAPHICS & RESULTS

Configuration 1

Tx1



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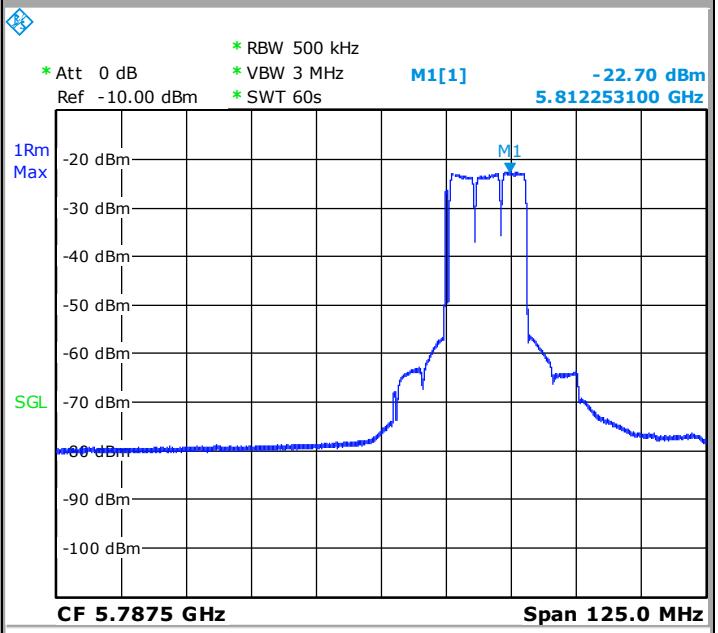

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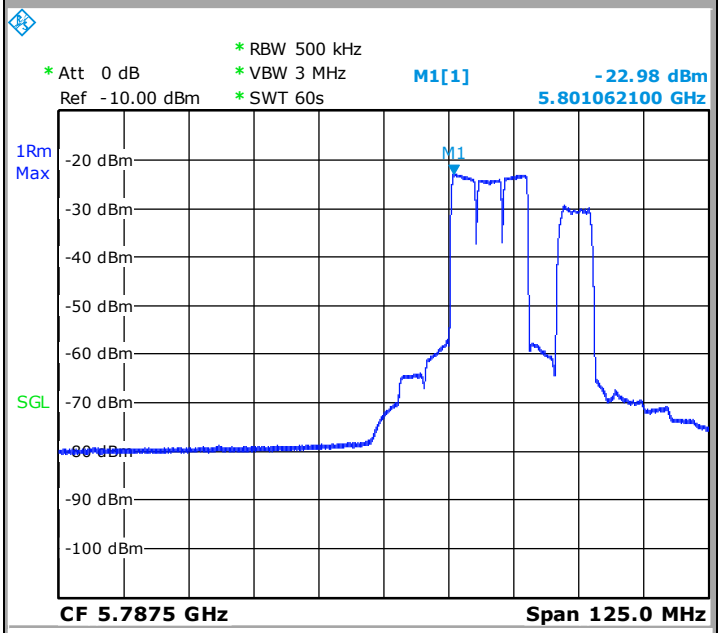
Configuration 2

Tx1



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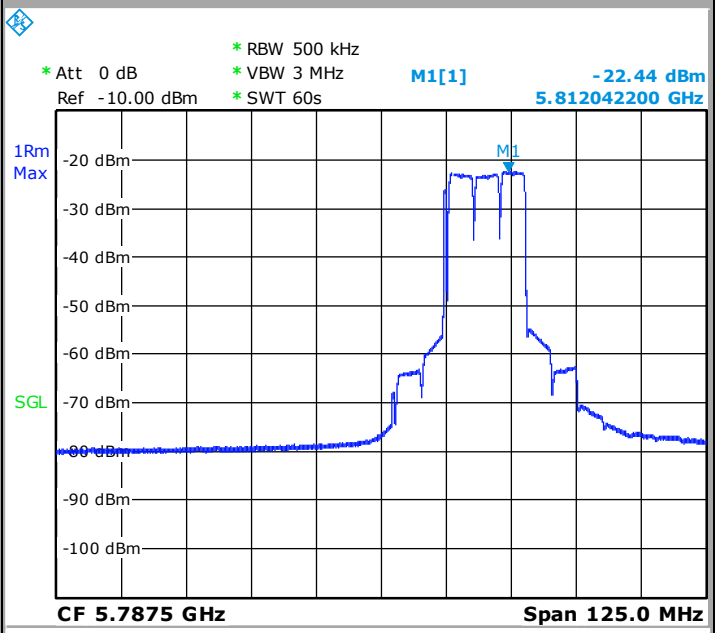

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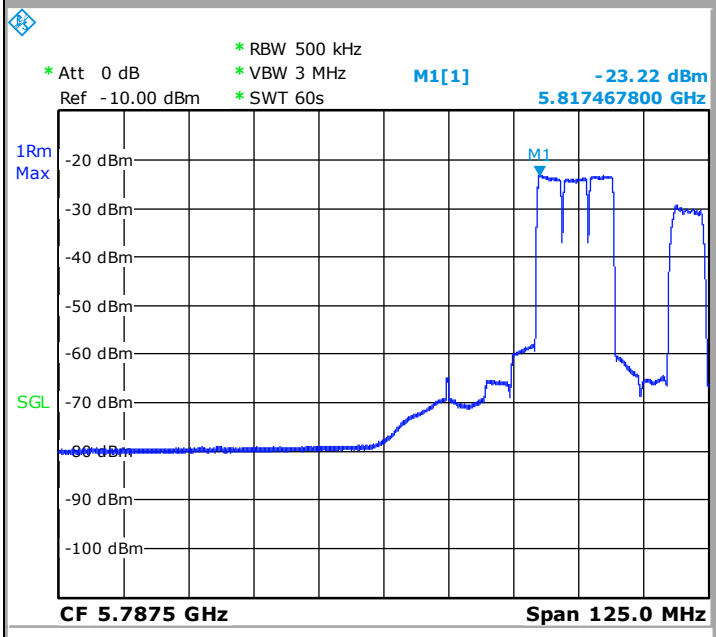
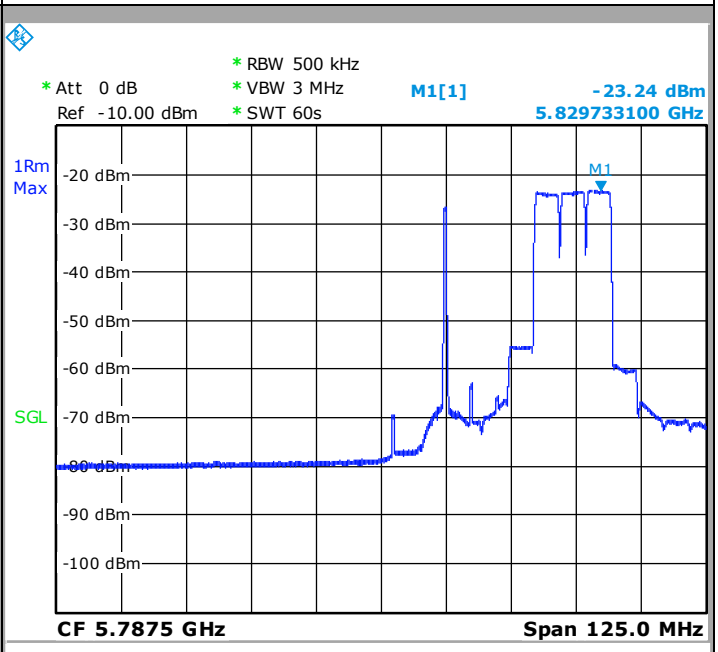
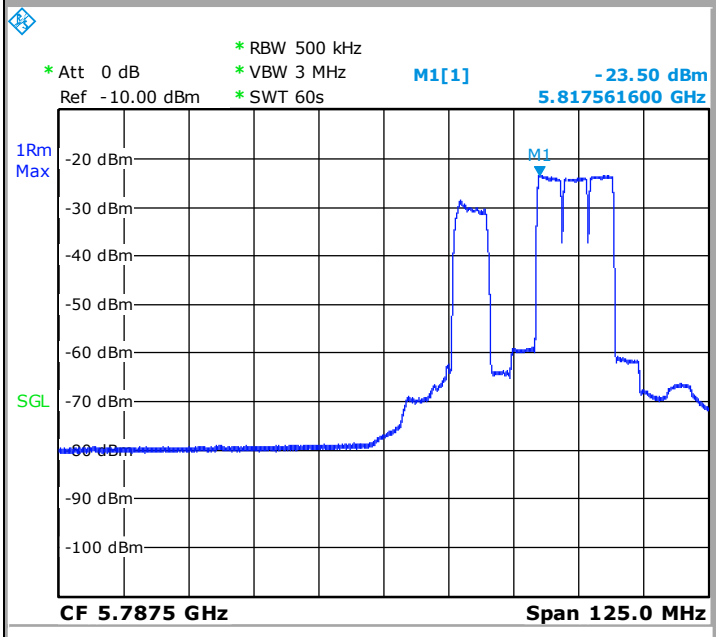
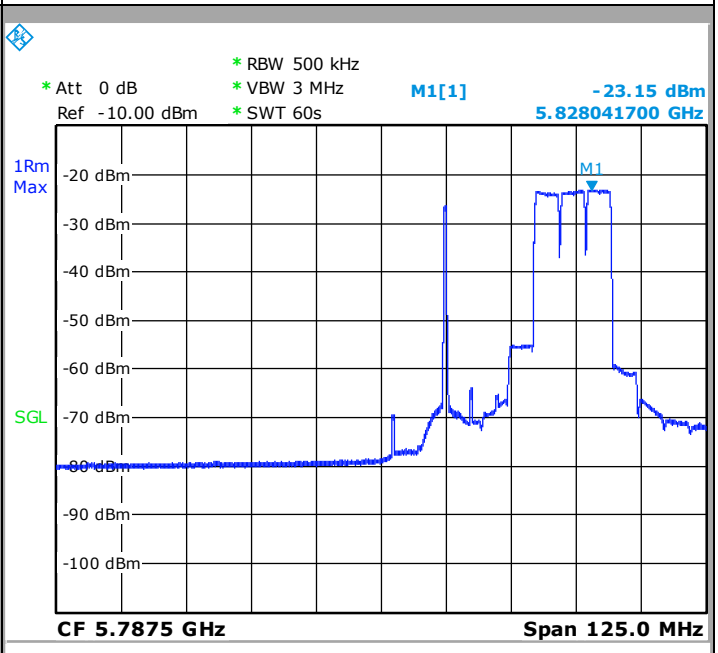
	
Configuration 4	
Tx1	**Tx2**
	

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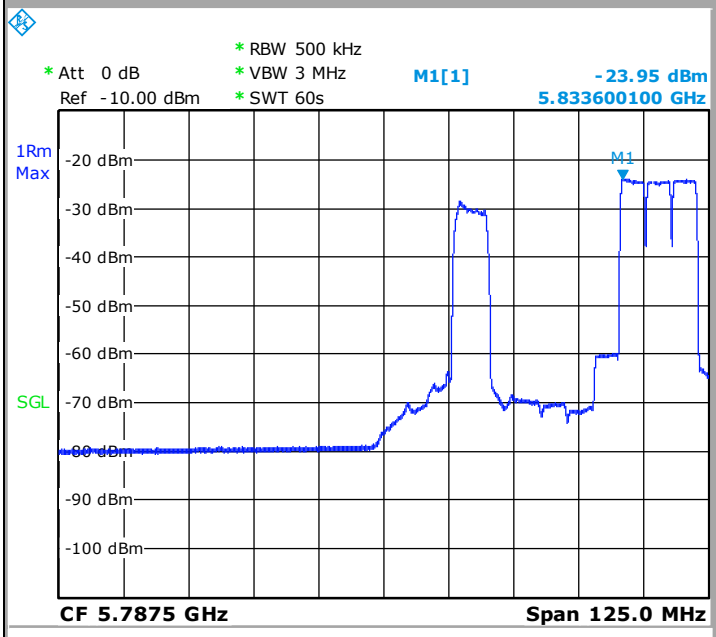
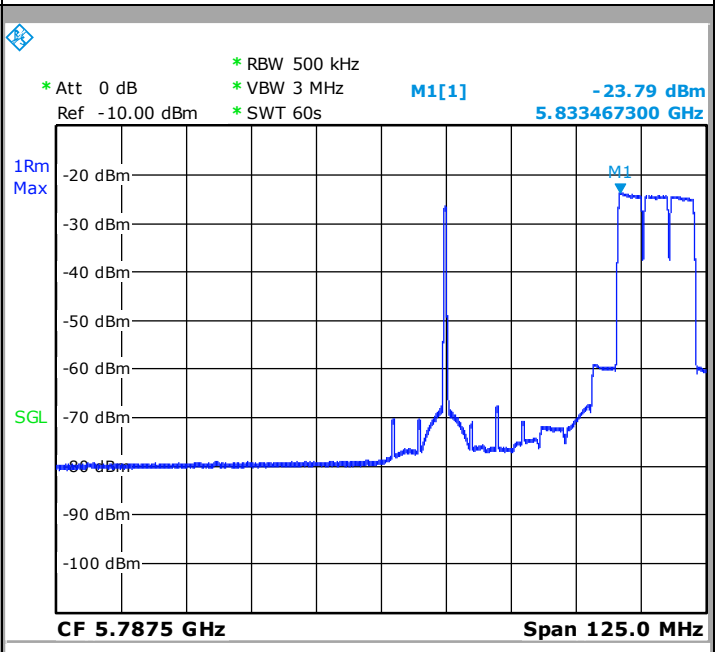
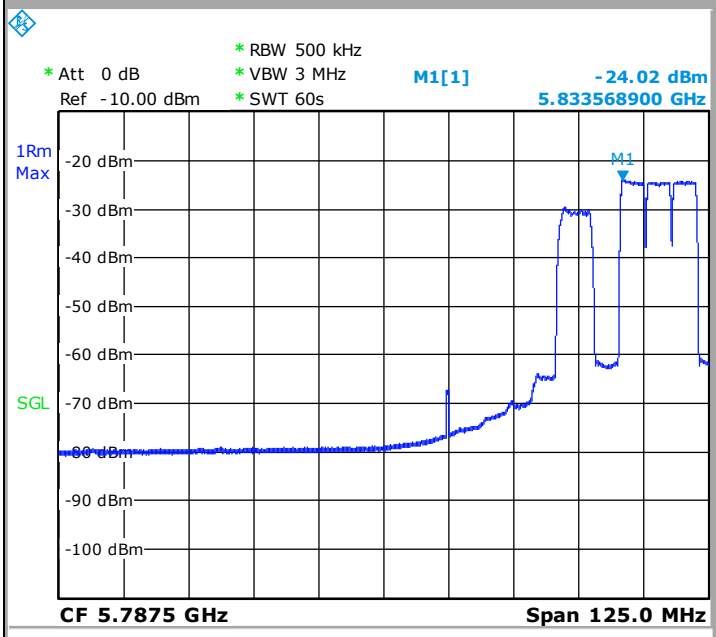
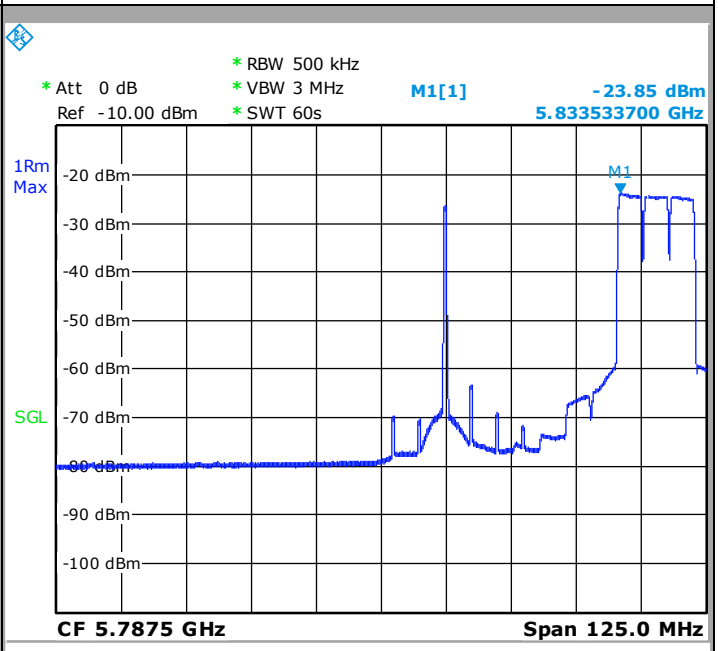
	
Configuration 6	
Tx1	**Tx2**
	

Configuration 7	
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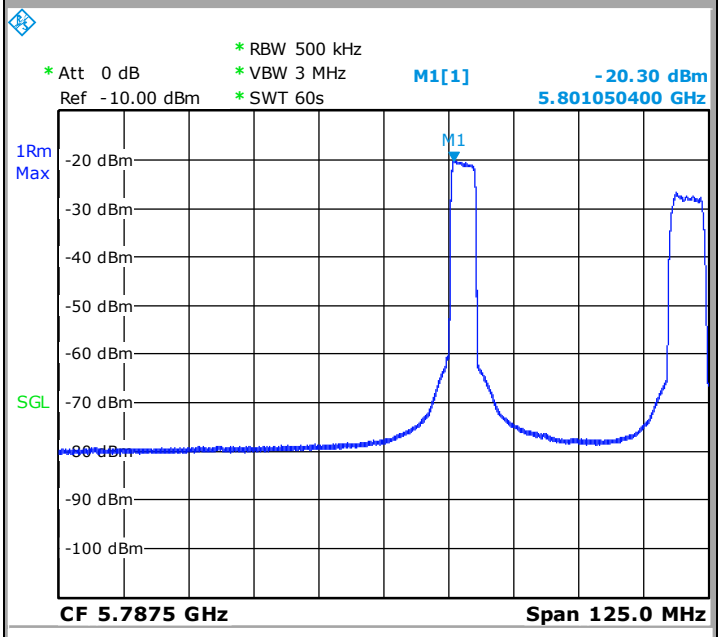	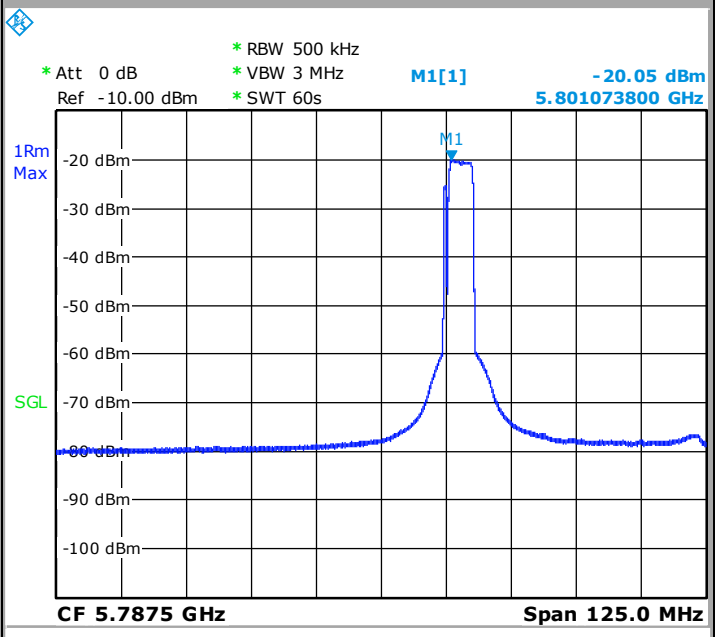
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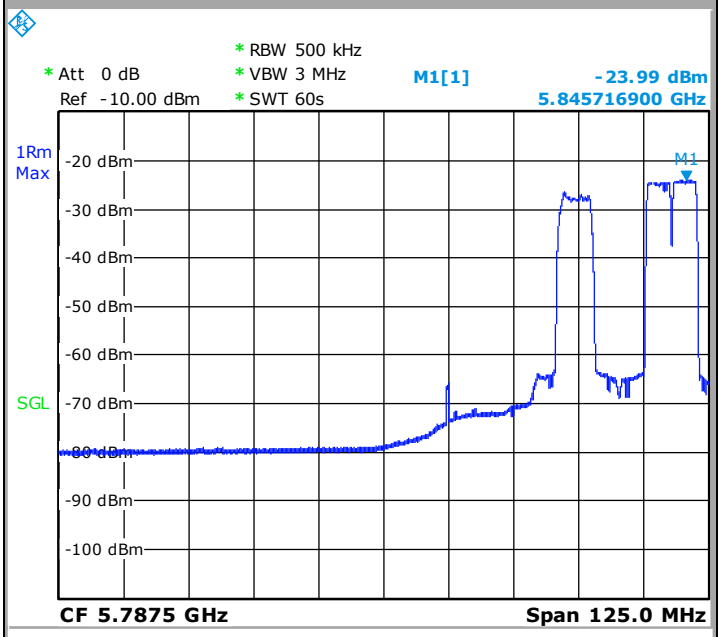	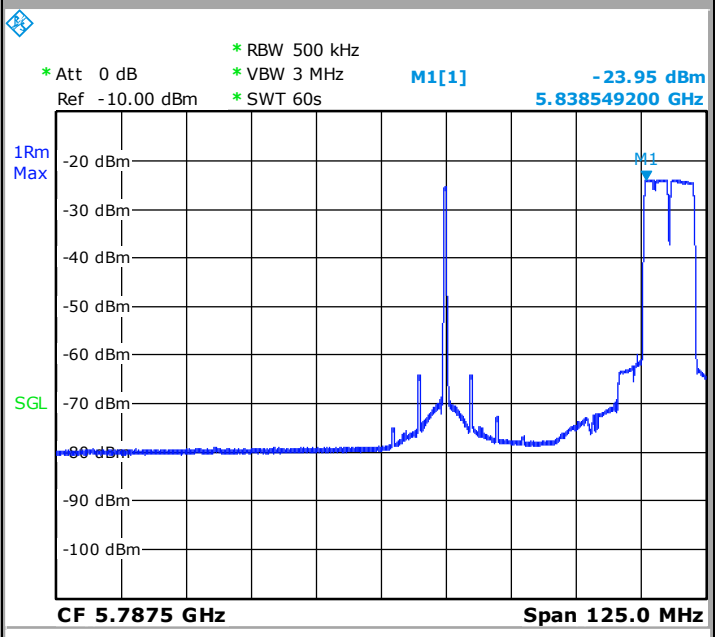
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Configuration 9	
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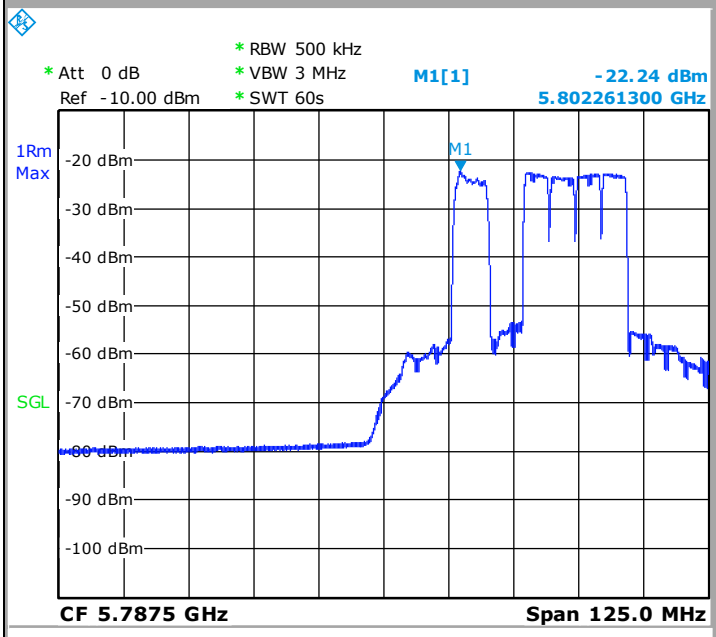	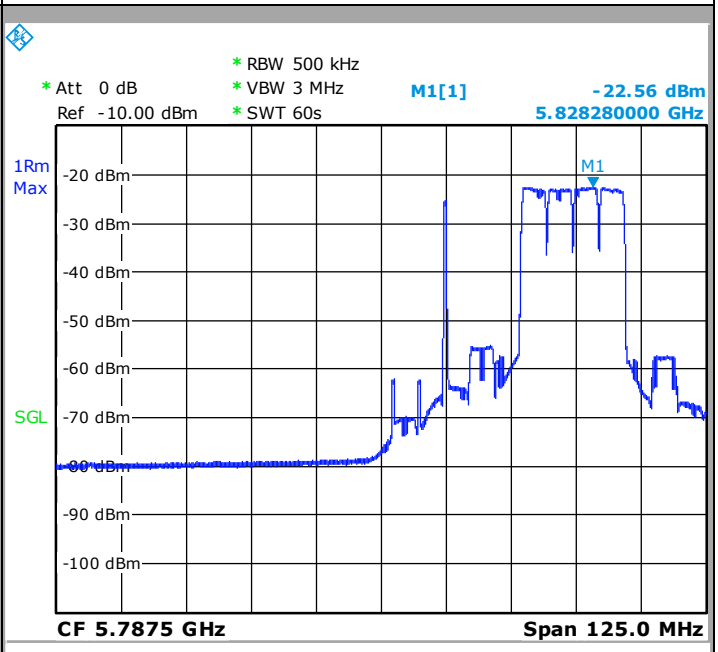
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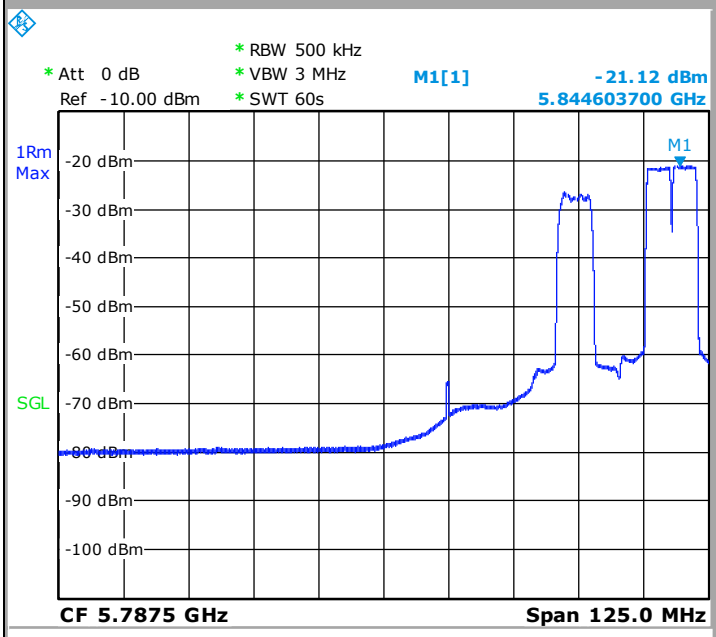	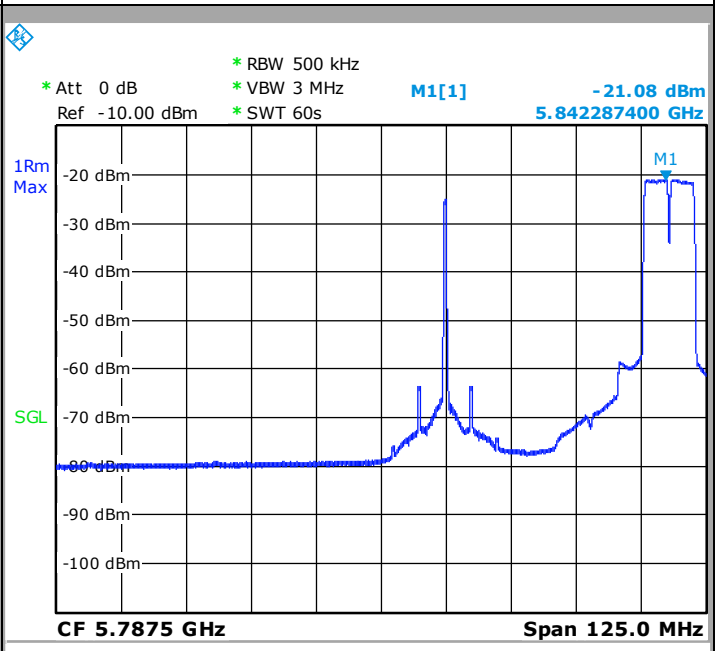

Configuration 11	
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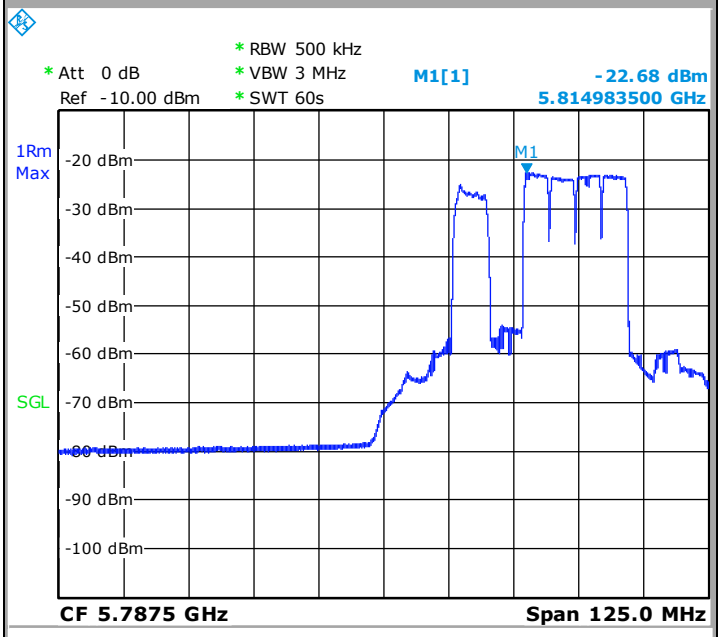	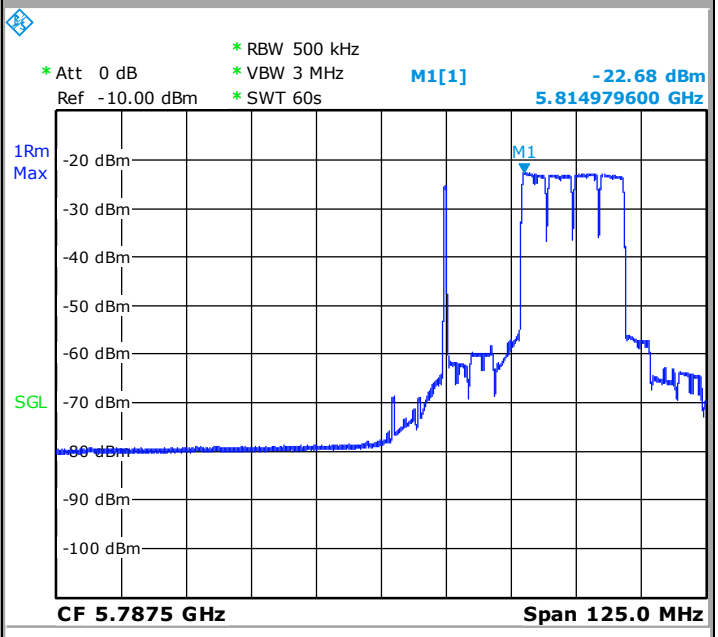
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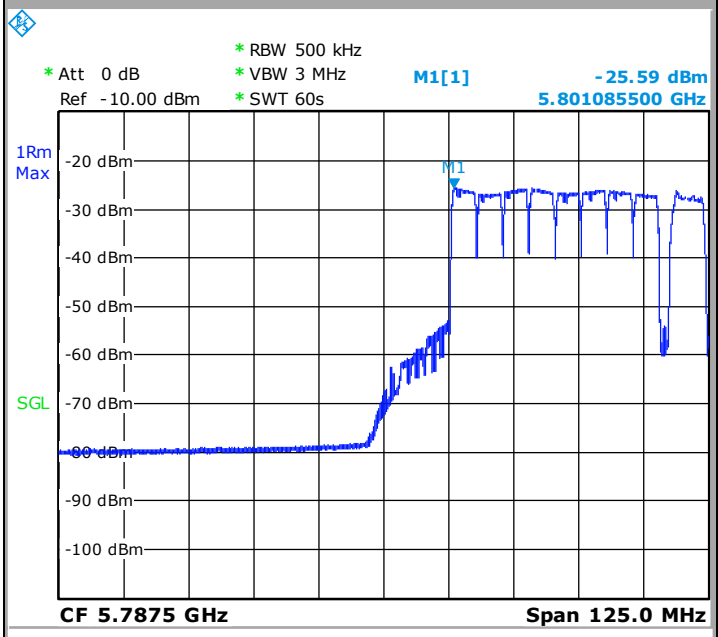	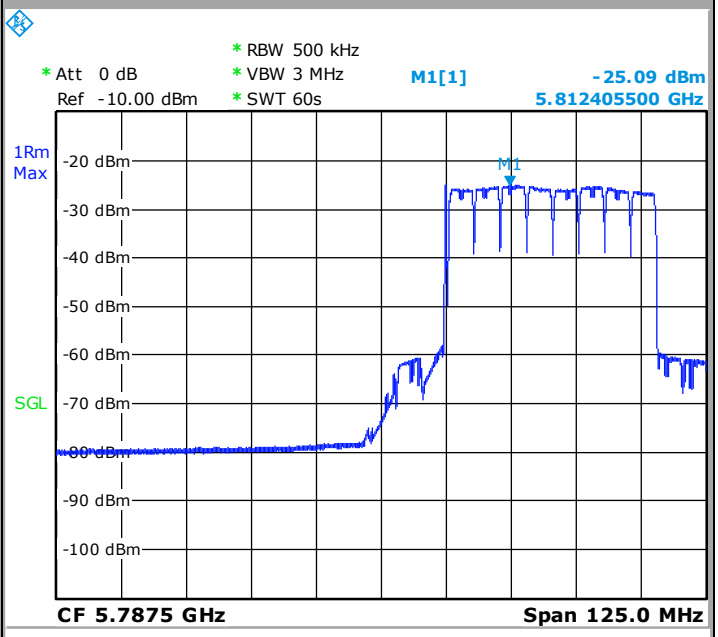
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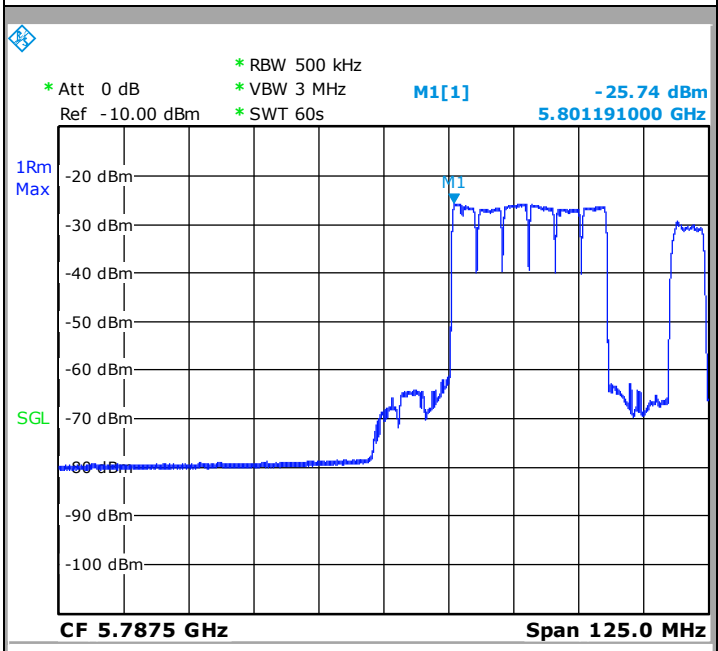
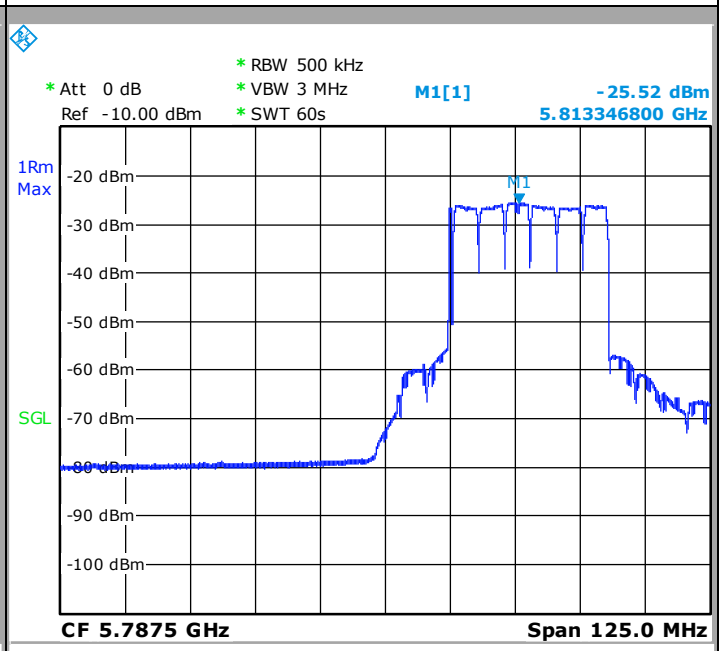
	

Spectrum Analyzer Offset:
Cable Loss + Attenuator = 23,2 dB

Configuration	Tx1 (dBm/500kHz)	Tx2 (dBm/500kHz)	Power Spectral Density (dBm/500kHz)
1	-22,99	-22,7	3,37
2	-22,98	-22,44	3,51
3	-23,22	-23,24	2,98
4	-23,5	-23,15	2,89
5	-23,95	-23,79	2,34
6	-24,02	-23,85	2,28
7	-20,3	-20,05	6,04
8	-23,99	-23,95	2,24
9	-22,24	-22,56	3,81
10	-21,12	-21,08	5,11
11	-22,68	-22,68	3,53
12	-25,59	-25,09	0,88
13	-25,74	-25,52	0,58

4.7. CONCLUSION

Power Spectral density measurement performed on the sample of the product FL58R2EABW45-REM, SN: EBL1613C0074, in configuration and description presented in this test report, show levels **conform to** the FCC 15.407 limits.

5. 6dB Bandwidth

5.1. TEST CONDITIONS

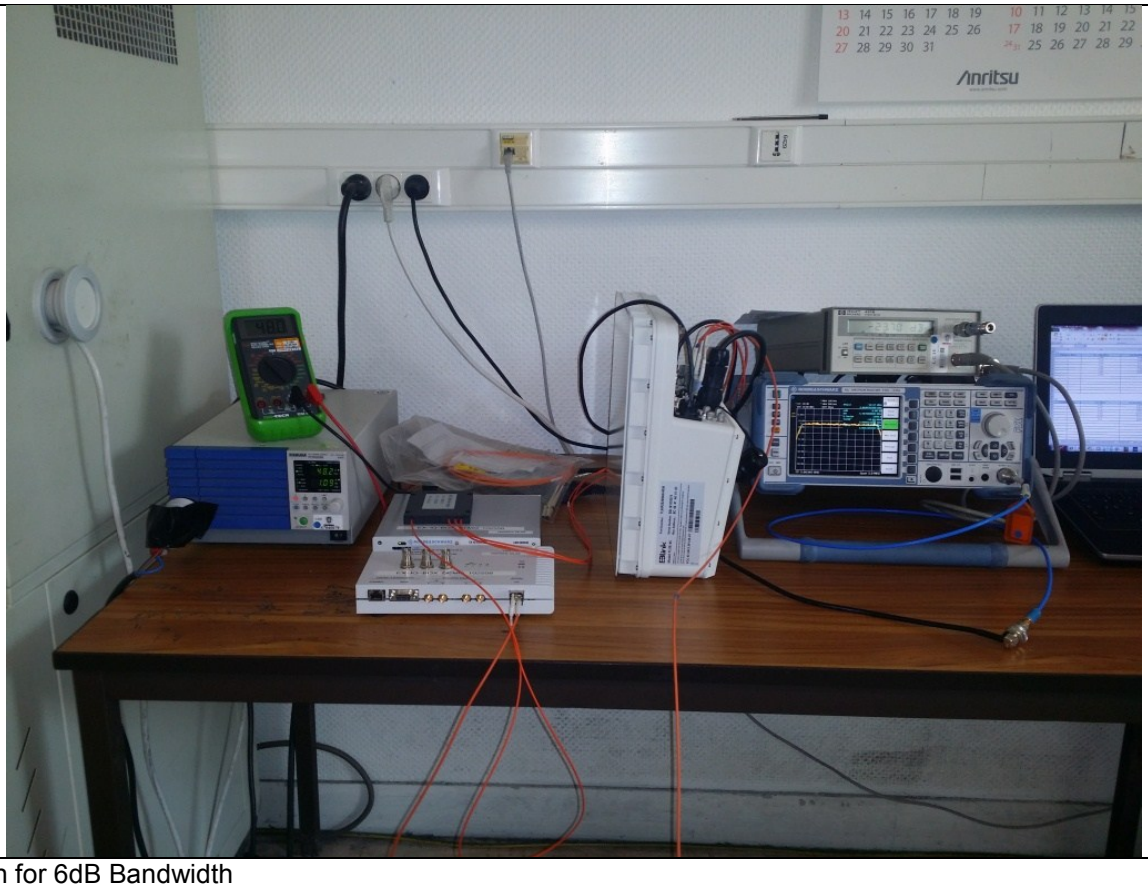
Test performed by : Arnaud Fayette
Date of test : 2016/05/24
Ambient temperature : 23°C
Relative humidity : 45%

5.2. TEST SETUP

- The Equipment under Test is installed:
☐ In the climatic chamber
☑ On a table

-Measurement is performed with a spectrum analyzer
☑ On the EUT conducted access

- Test Procedure:
☑ KDB 789033 D02 General UNII Test Procedures New Rules v01r02 § C1
☑ KDB 644545 D03 Guidance for IEEE 802.11ac v01



Photograph for 6dB Bandwidth

5.3. LIMIT

The 6dB Bandwidth shall be at least 500kHz.

5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal date	Cal due
Multi-meter	ISOTECH	IDM 91E	A1240253	2015/08	2016/08
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7040079	2014/05	2016/05
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329675	2015/10	2016/10
Spectrum analyzer	ROHDE & SCHWARZ	FSL6	A4060032	2015/04	2017/04

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

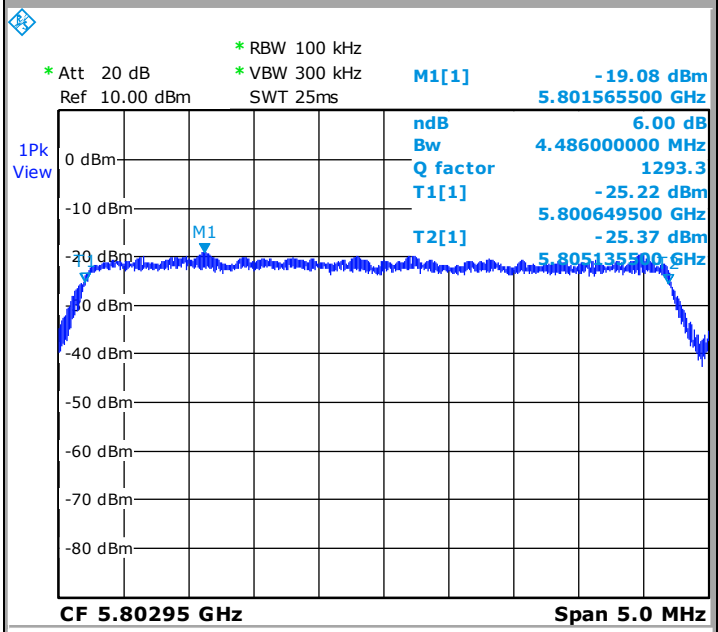
5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

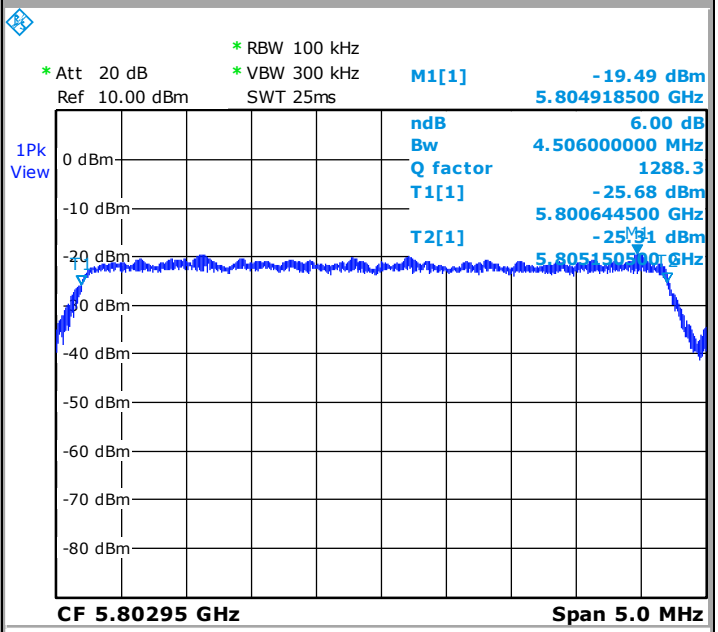
5.6. GRAPHICS & RESULTS

Configuration 1

Tx1 IQ CPRI 1

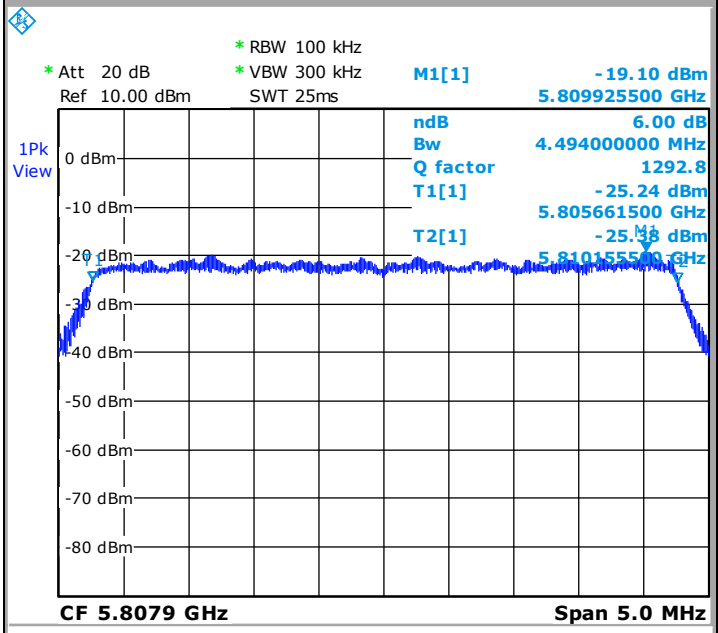


Tx2 IQ CPRI 1

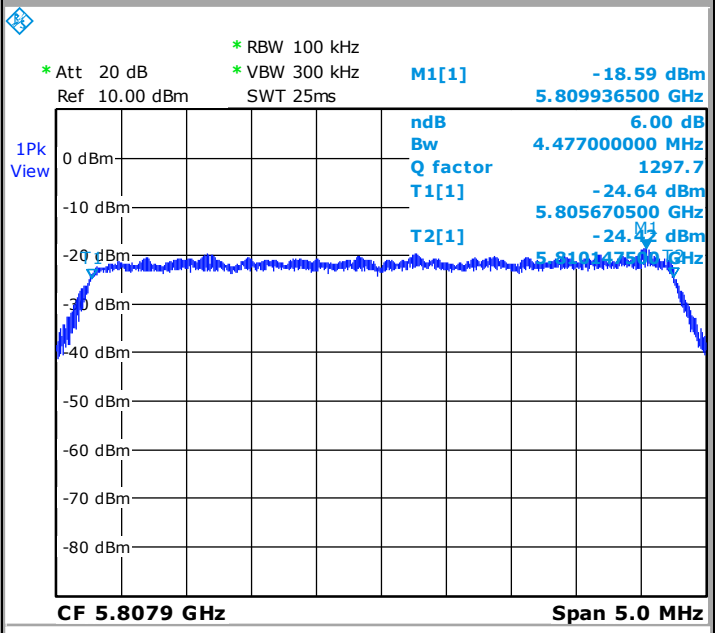


Configuration 1

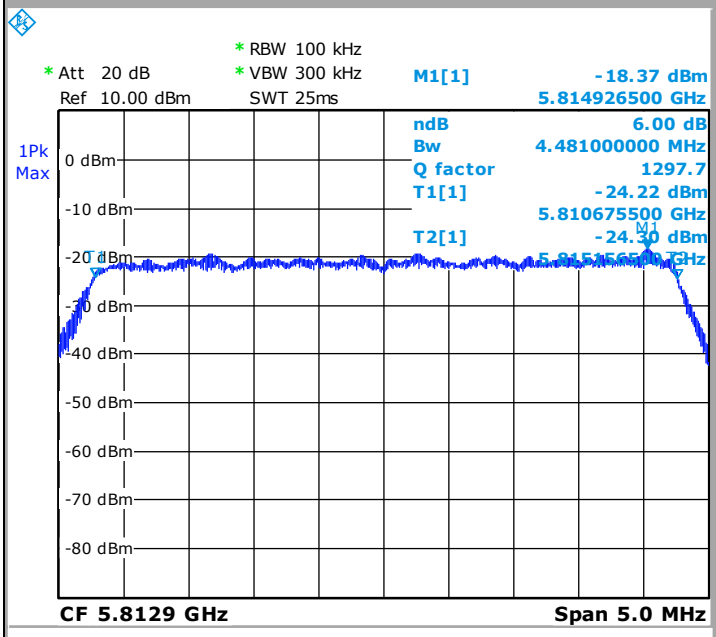
Tx1 IQ CPRI 2

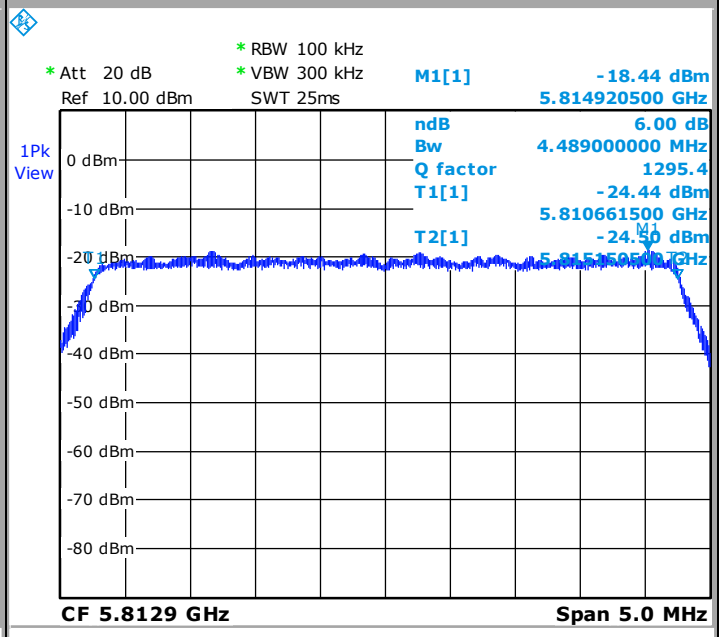


Tx2 IQ CPRI 2

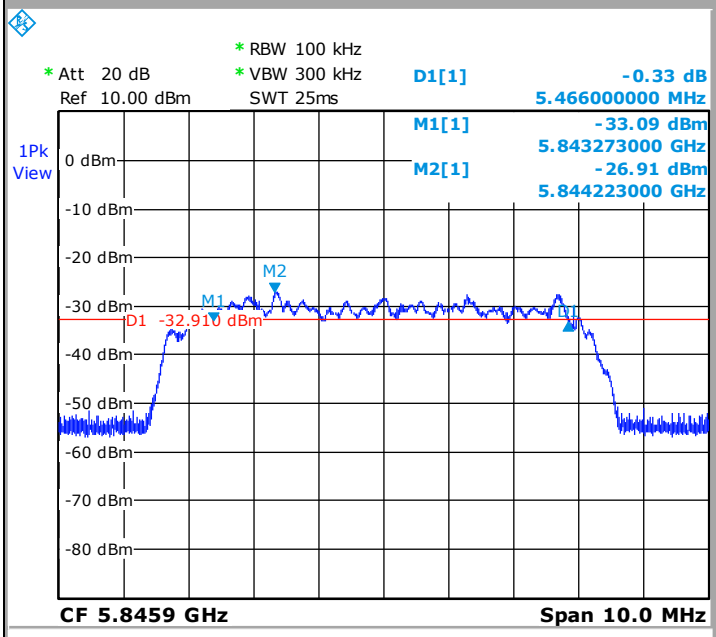


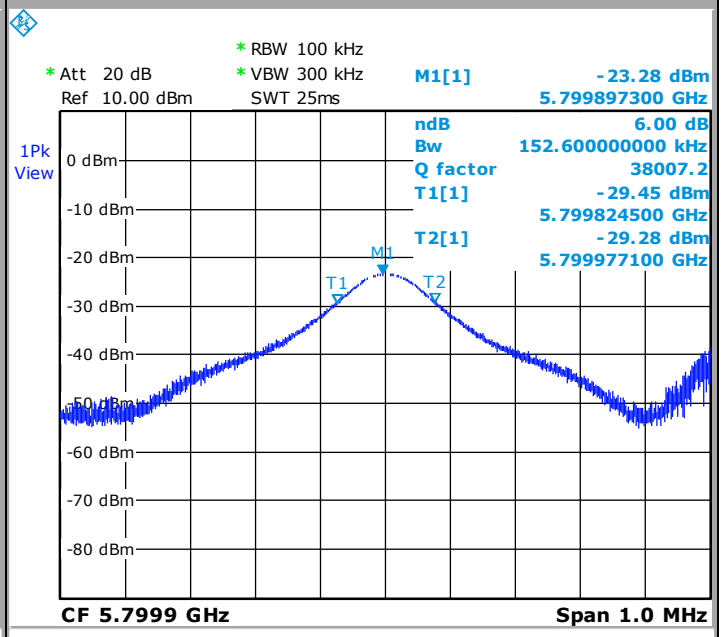
Configuration 1	
Tx1 IQ CPRI 3	**Tx2 IQ CPRI 3**



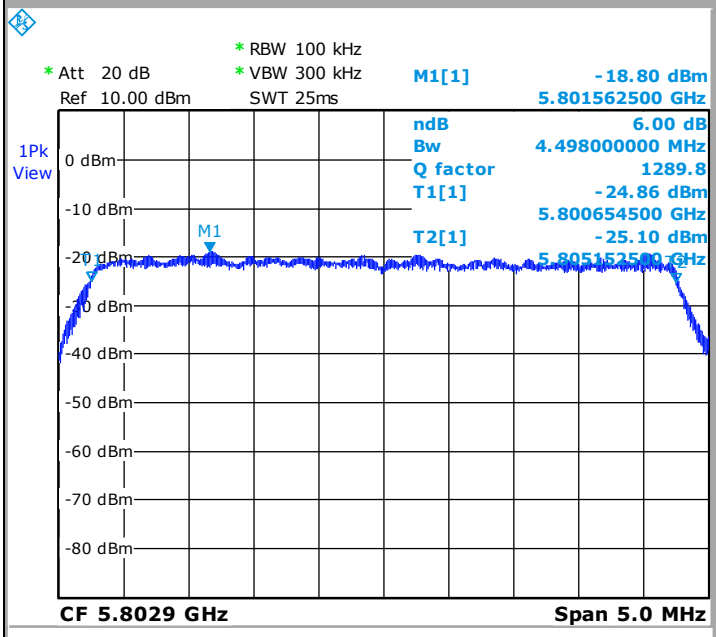


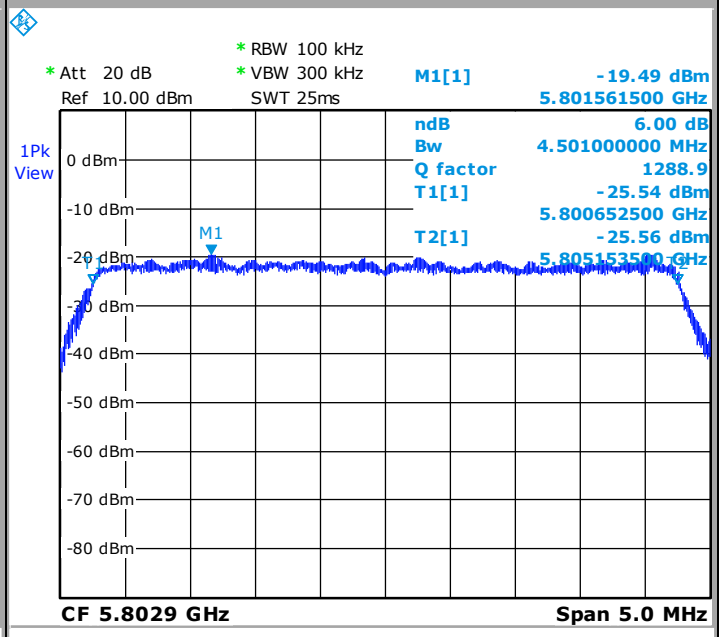
Configuration 1	
Tx1 C&M	**Tx2**



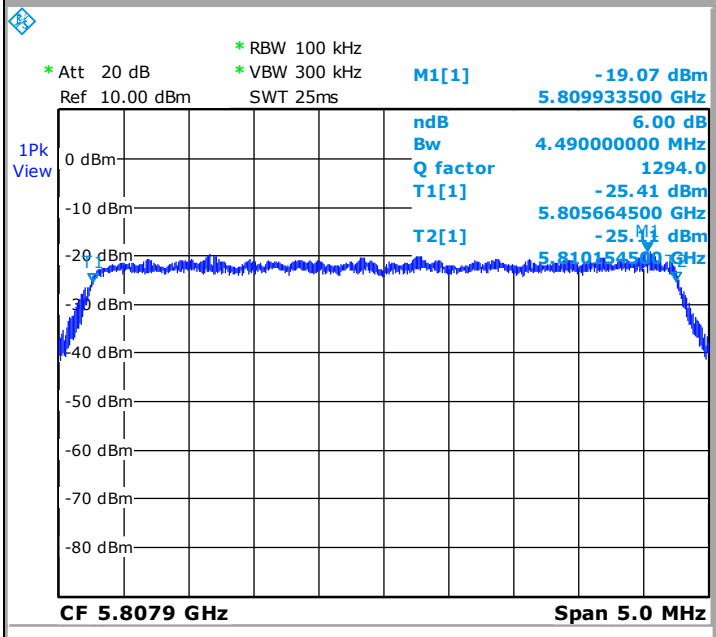


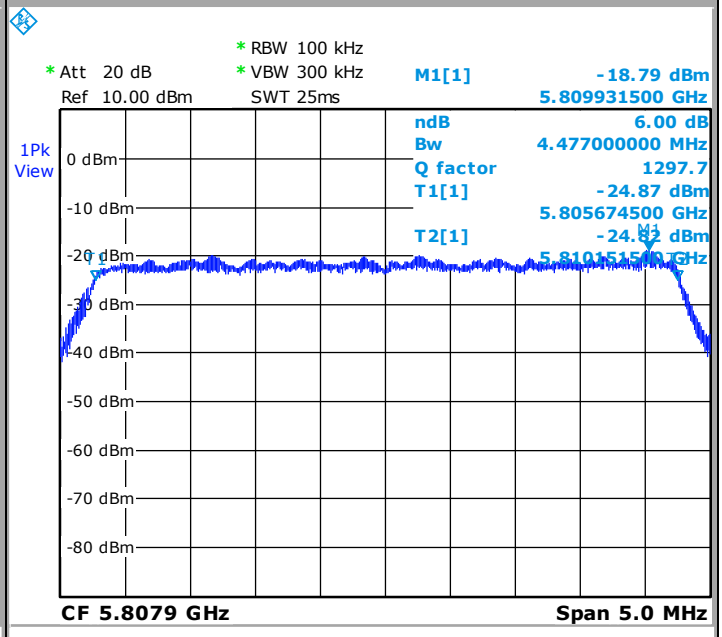
Configuration 2	
Tx1 IQ CPRI 1	**Tx2 IQ CPRI 1**



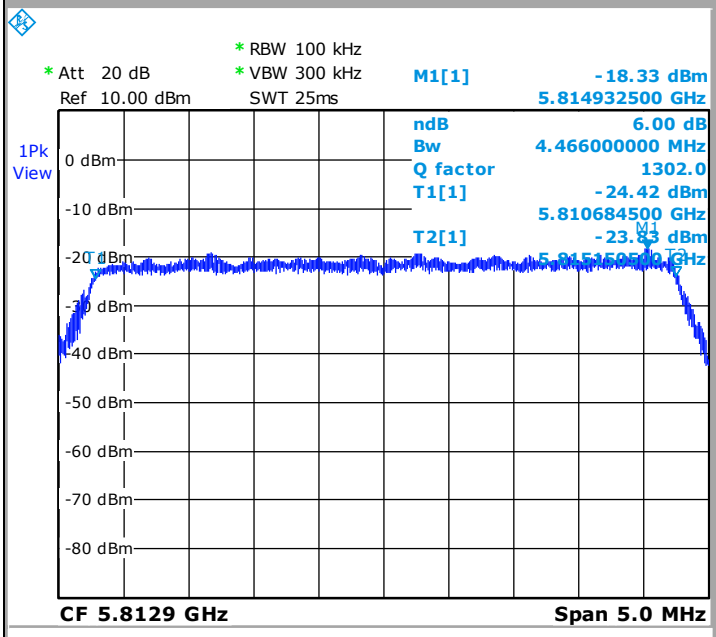


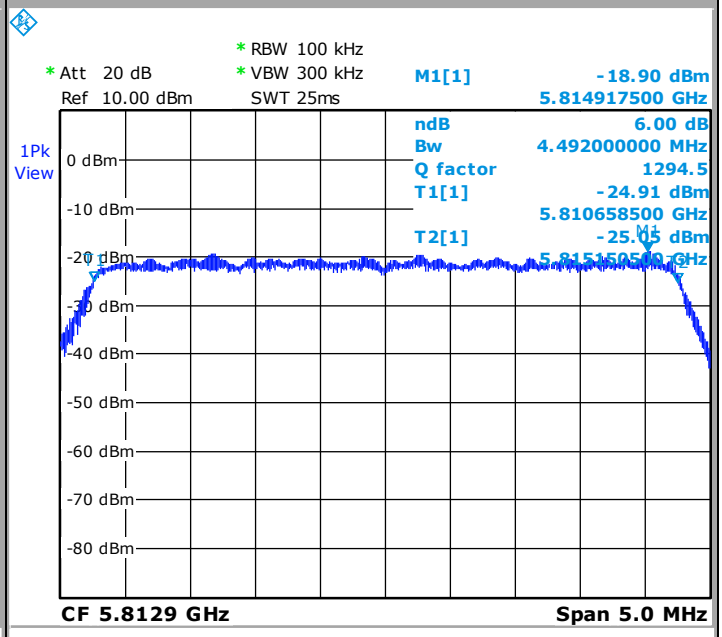
Configuration 2	
Tx1 IQ CPRI 2	**Tx2 IQ CPRI 2**



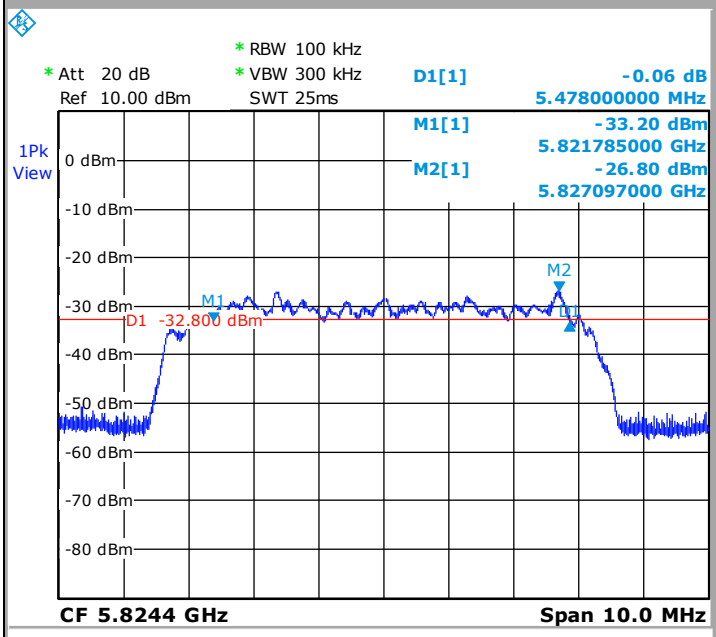


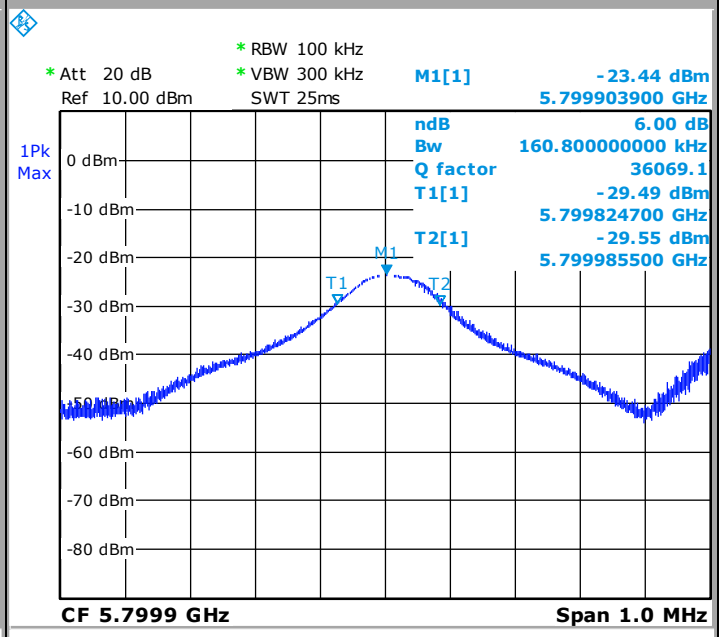
Configuration 2	
Tx1 IQ CPRI 3	**Tx2 IQ CPRI 3**



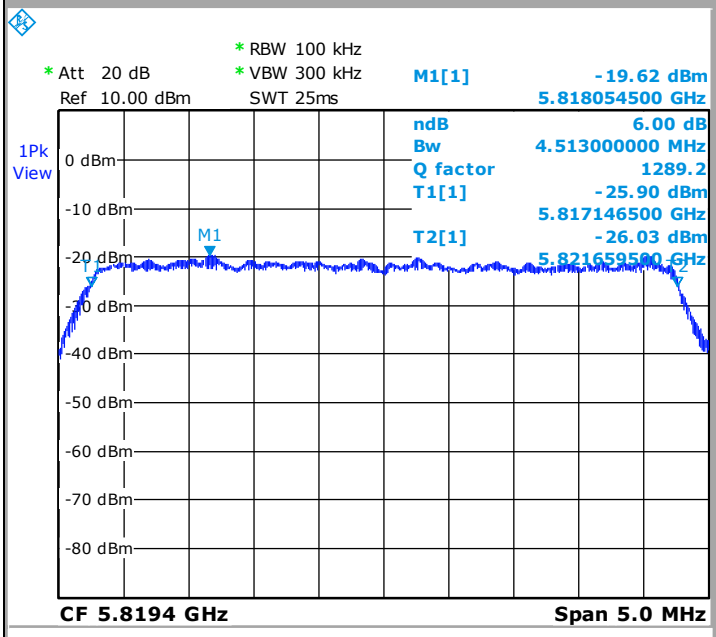


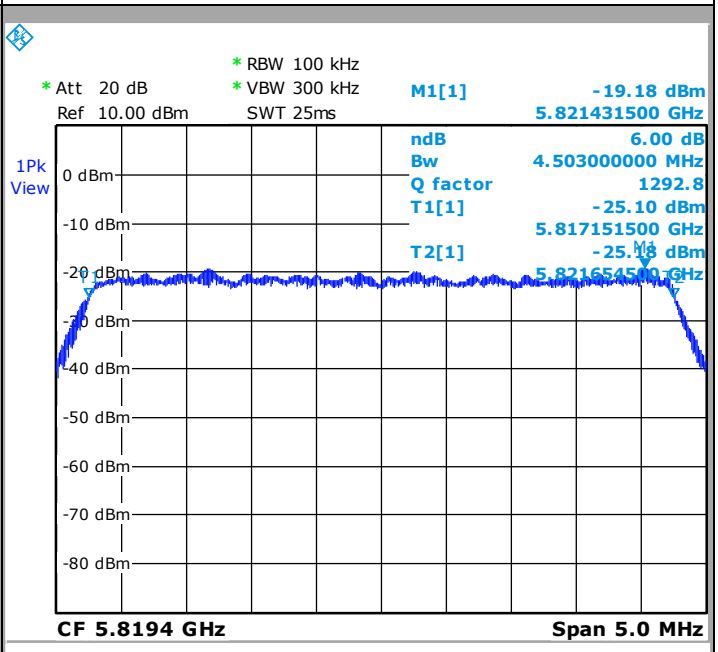
Configuration 2	
Tx1 C&M	**Tx2**



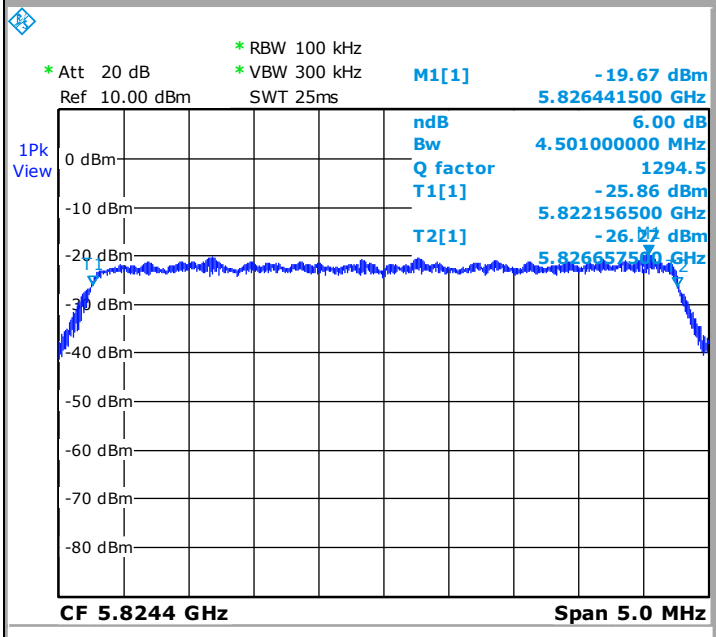


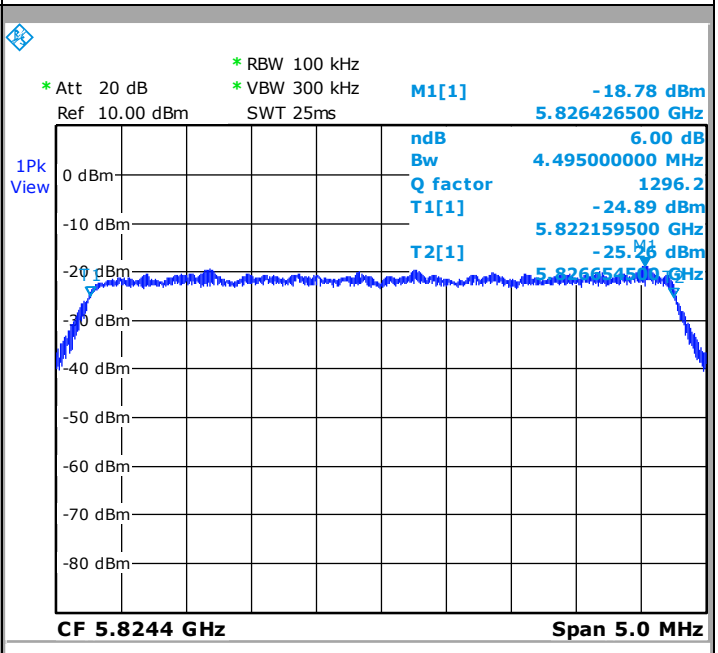
Configuration 3	
Tx1 IQ CPRI 1	**Tx2 IQ CPRI 1**



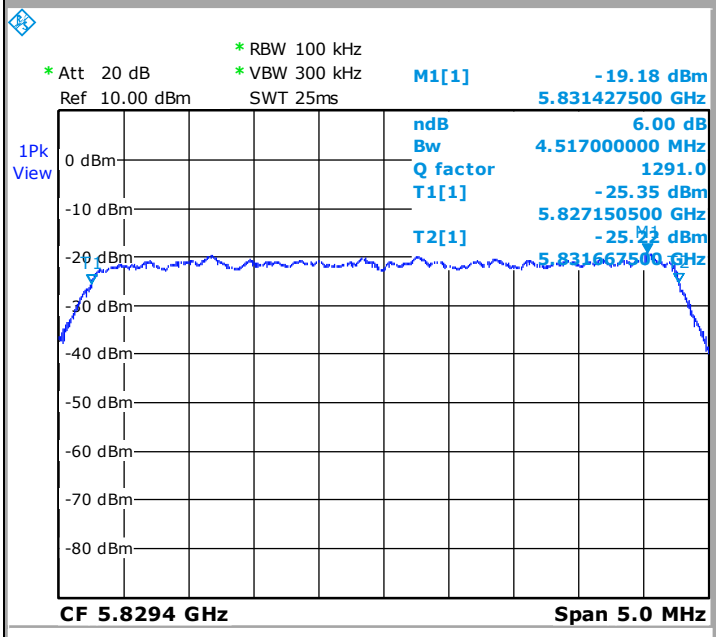


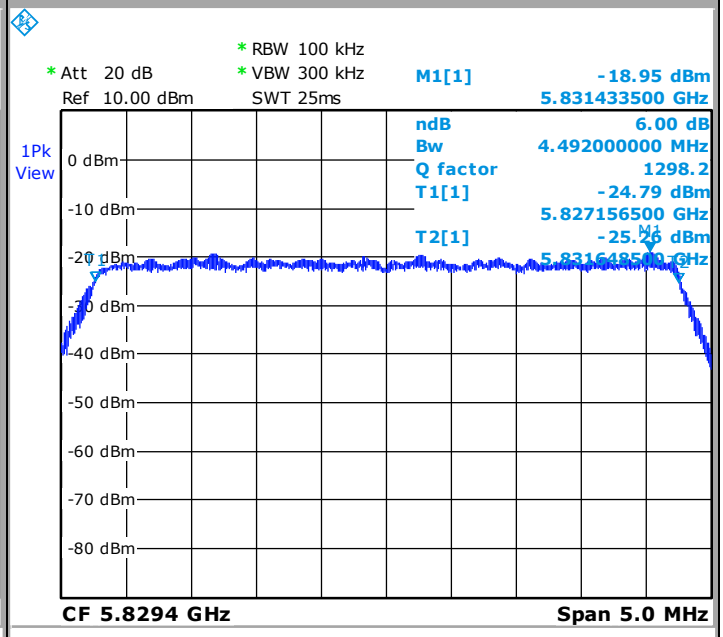
Configuration 3	
Tx1 IQ CPRI 2	**Tx2 IQ CPRI 2**



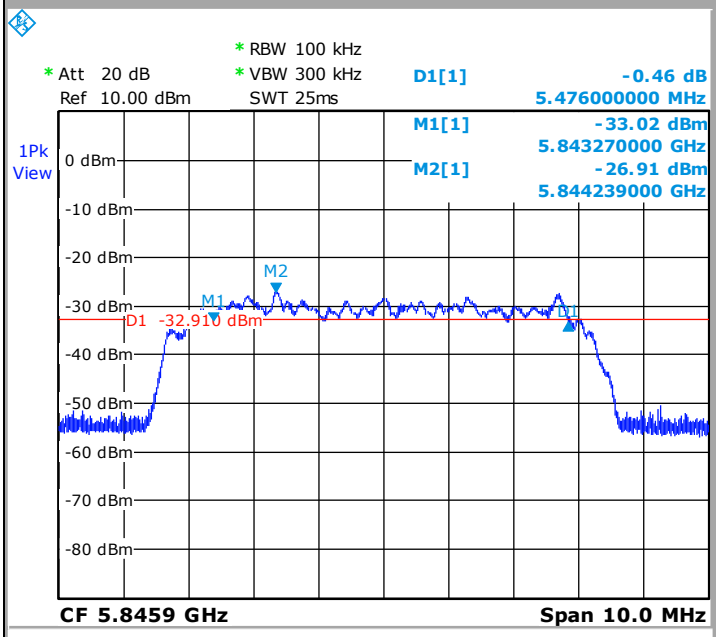


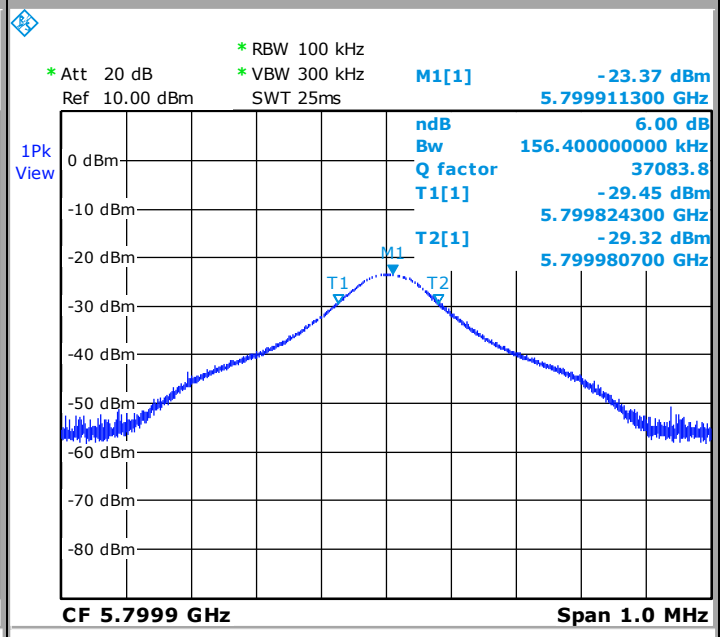
Configuration 3	
Tx1 IQ CPRI 3	**Tx2 IQ CPRI 3**



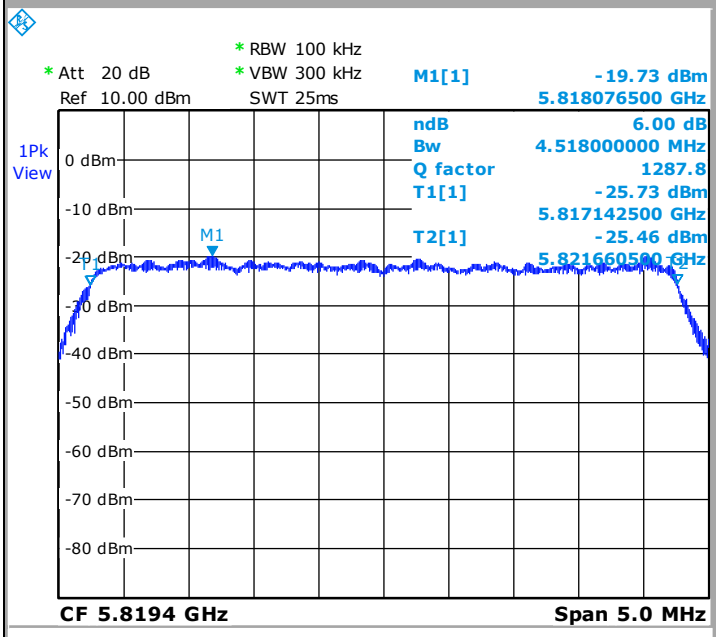


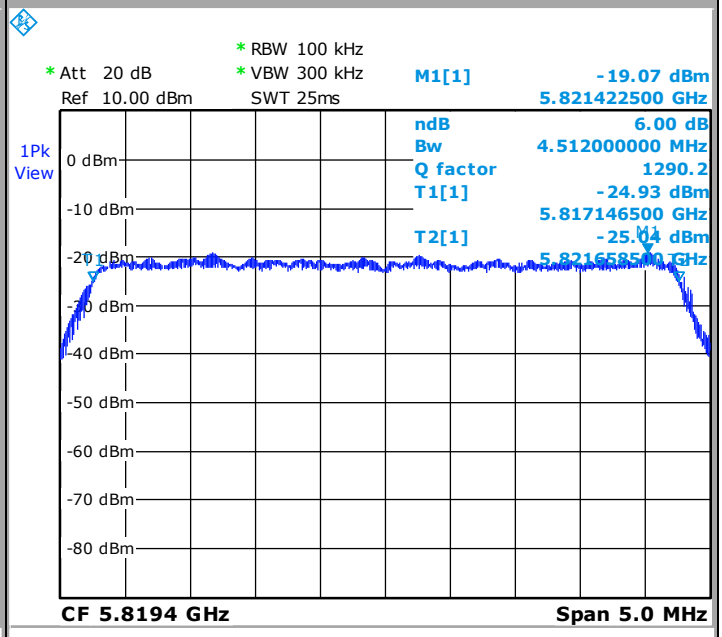
Configuration 3	
Tx1 C&M	**Tx2**



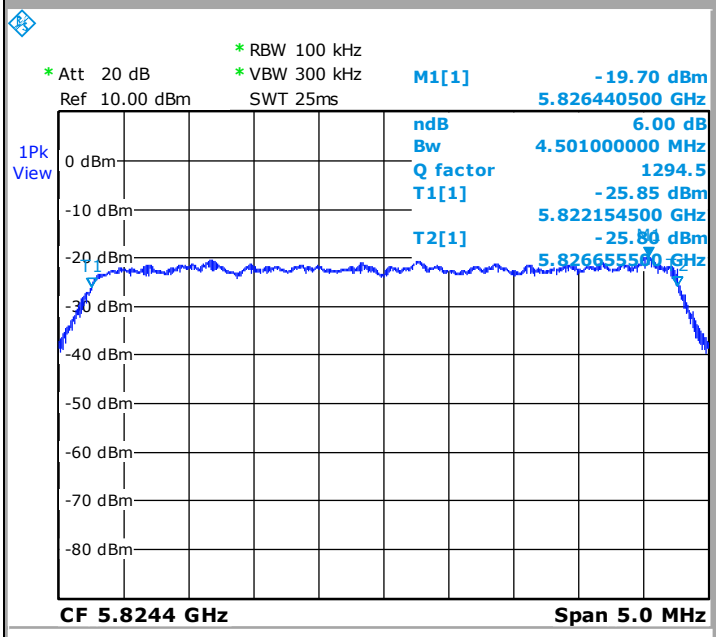


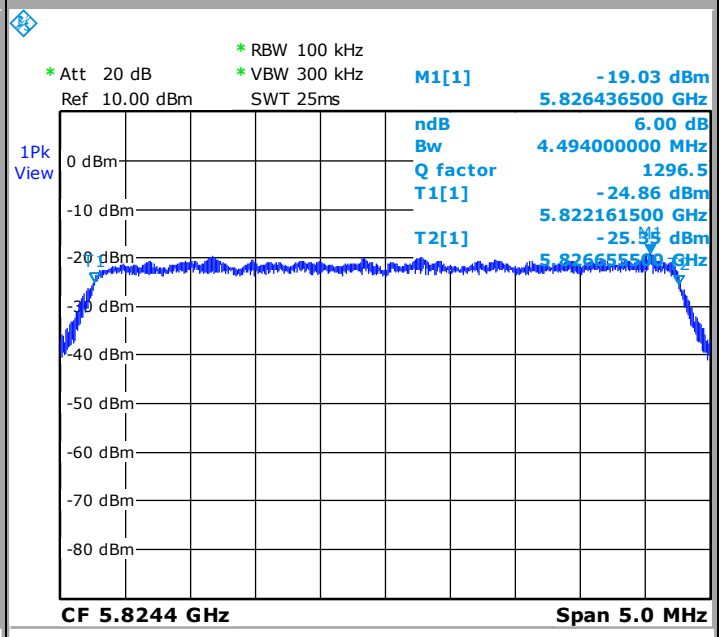
Configuration 4	
Tx1 IQ CPRI 1	**Tx2 IQ CPRI 1**



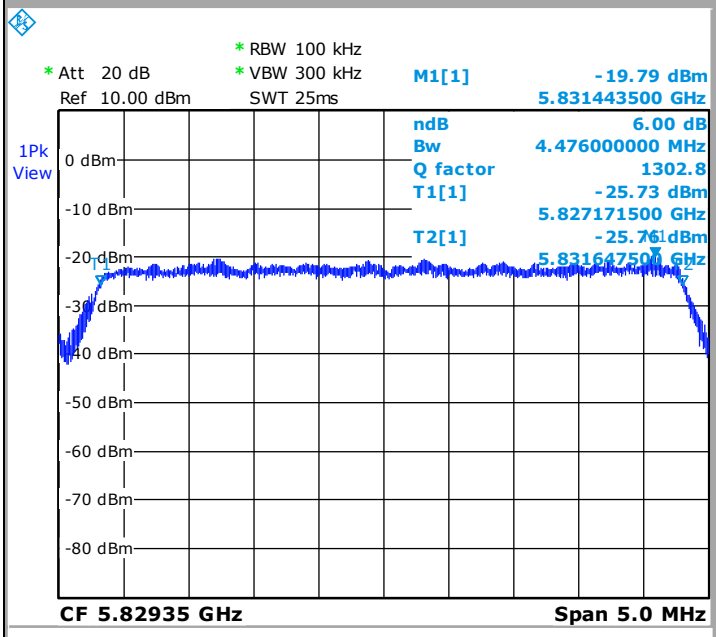


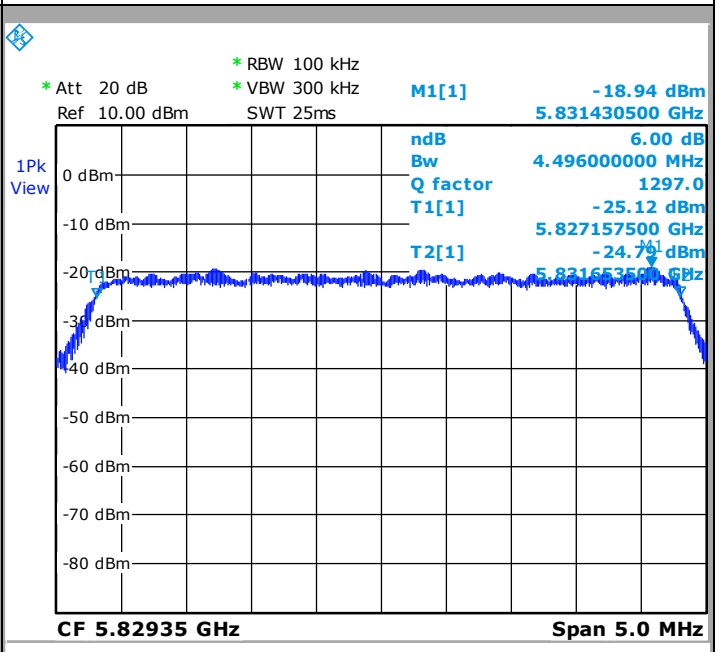
Configuration 4	
Tx1 IQ CPRI 2	**Tx2 IQ CPRI 2**



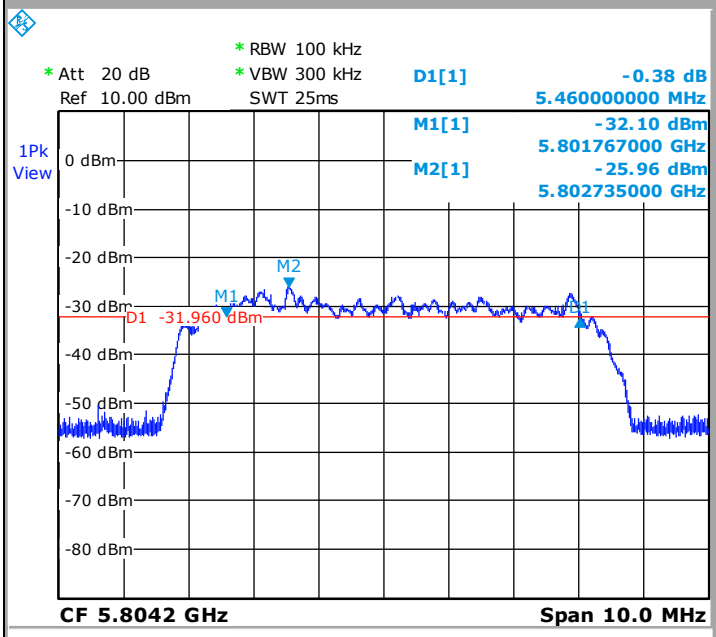


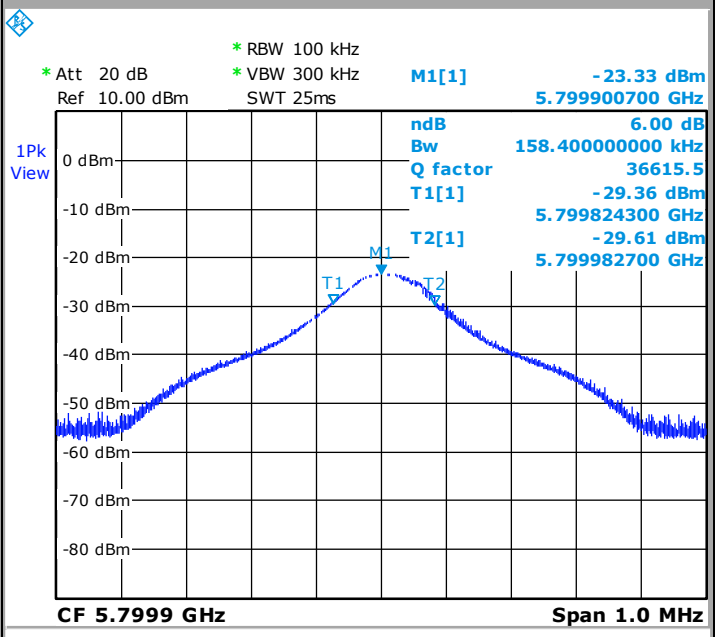
Configuration 4	
Tx1 IQ CPRI 3	**Tx2 IQ CPRI 3**



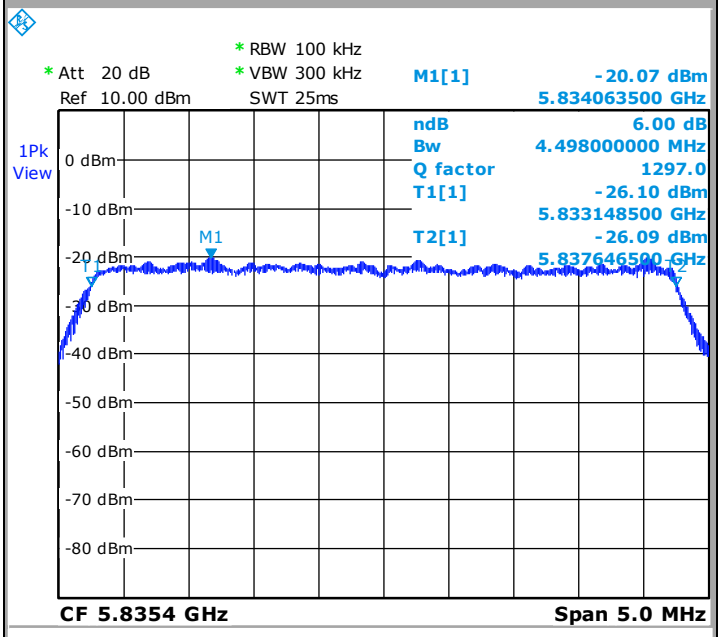


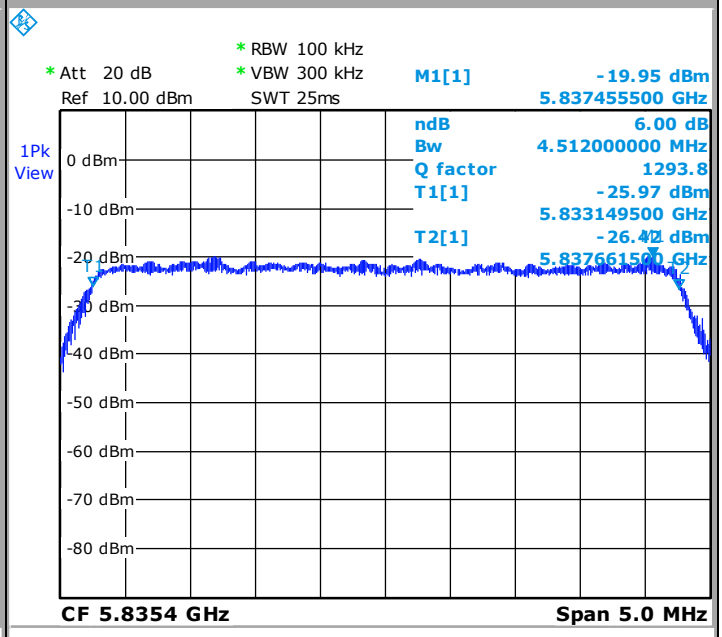
Configuration 4	
Tx1 C&M	**Tx2**



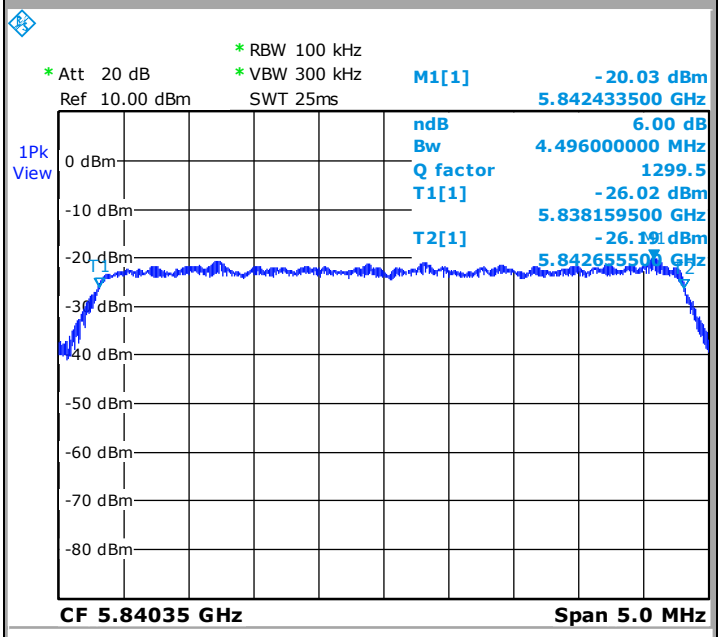


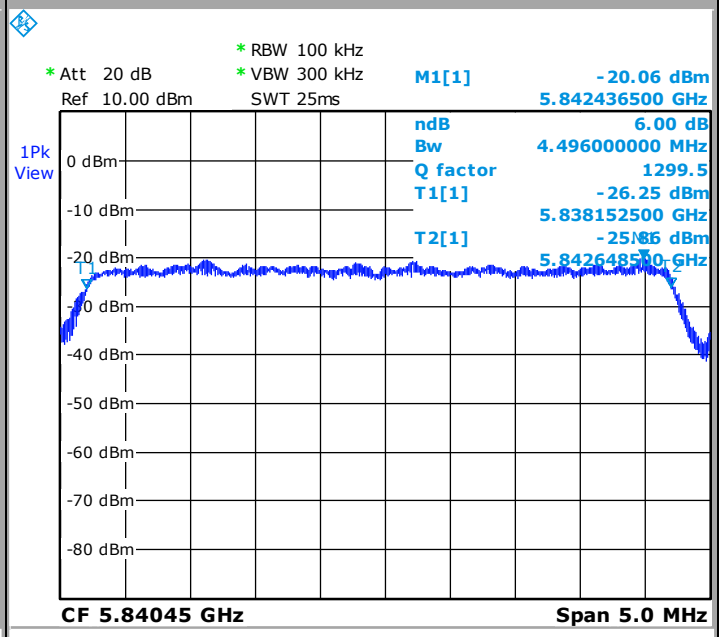
Configuration 5	
Tx1 IQ CPRI 1	**Tx2 IQ CPRI 1**



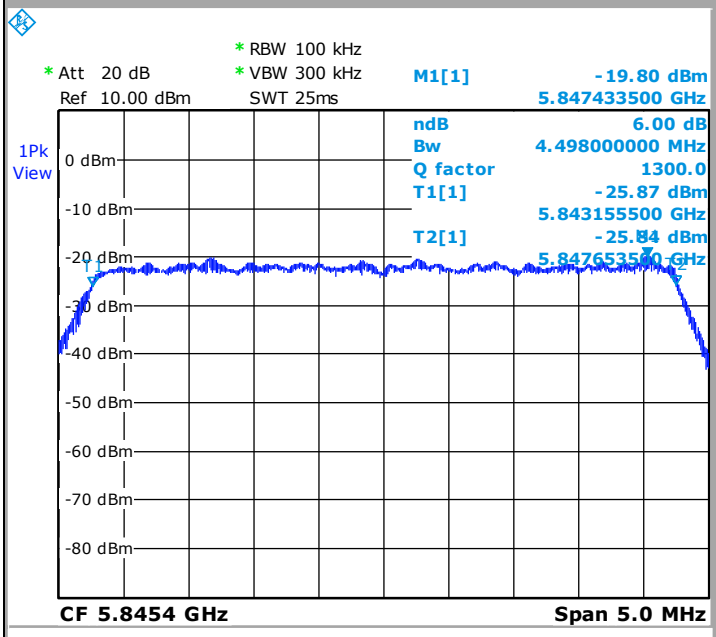


Configuration 5	
Tx1 IQ CPRI 2	**Tx2 IQ CPRI 2**

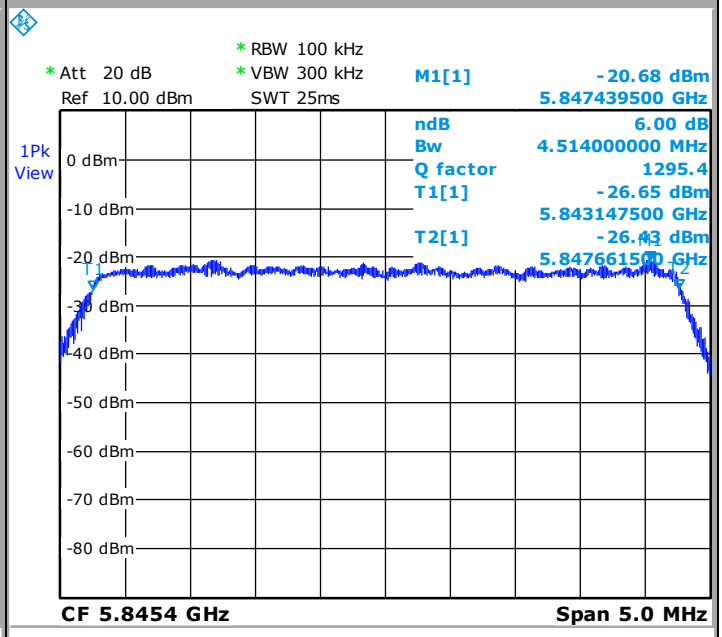




Configuration 5	
Tx1 IQ CPRI 3	**Tx2 IQ CPRI 3**

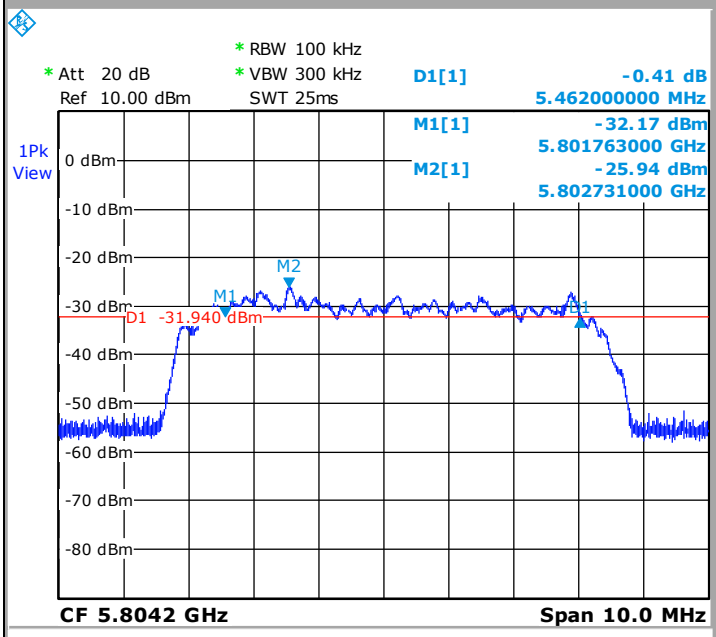


Date: 24.MAY.2016 16:07:58

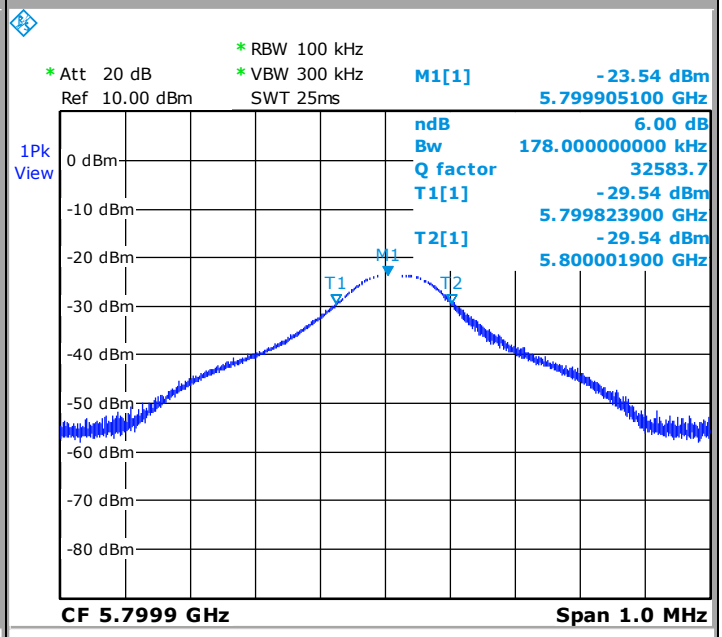


Date: 24.MAY.2016 16:10:30

Configuration 5	
Tx1 C&M	**Tx2**

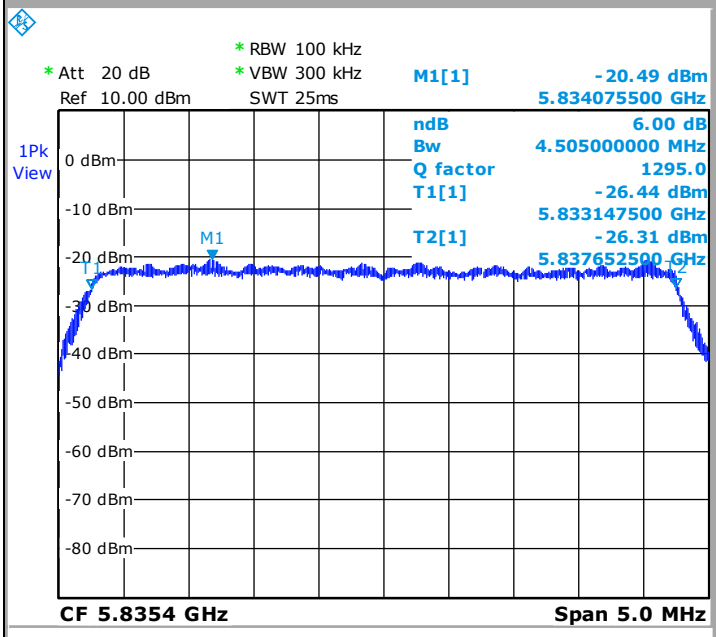


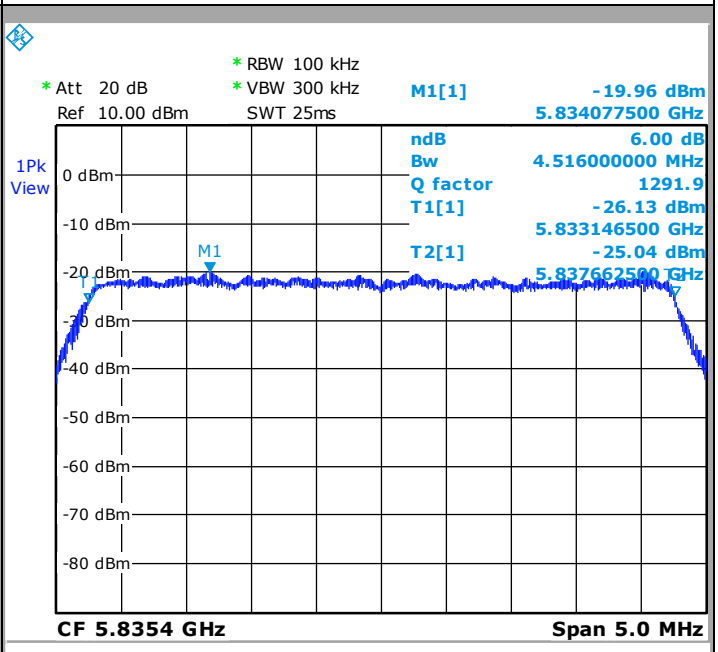
Date: 24.MAY.2016 15:58:40



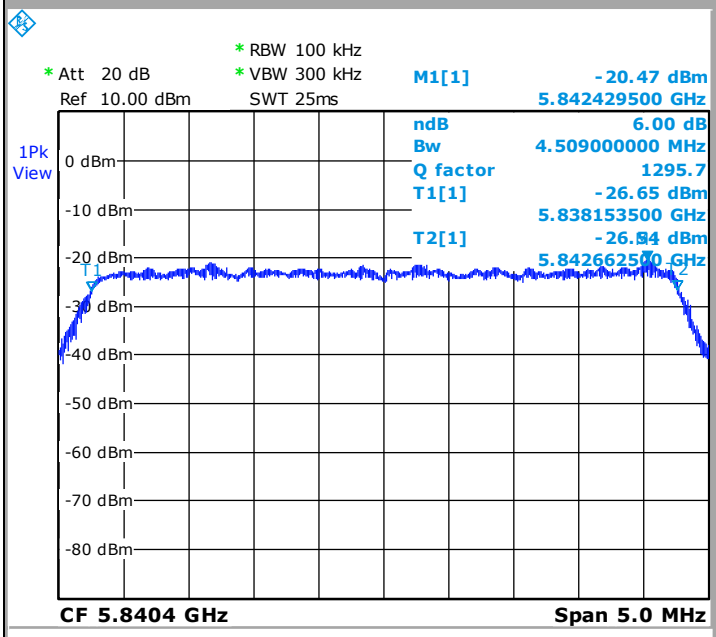
Date: 24.MAY.2016 16:16:45

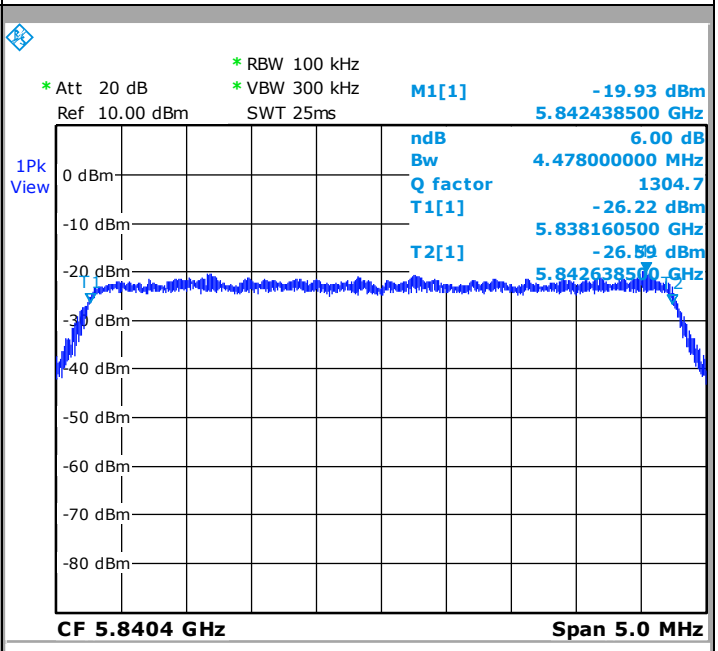
Configuration 6	
Tx1 IQ CPRI 1	**Tx2 IQ CPRI 1**



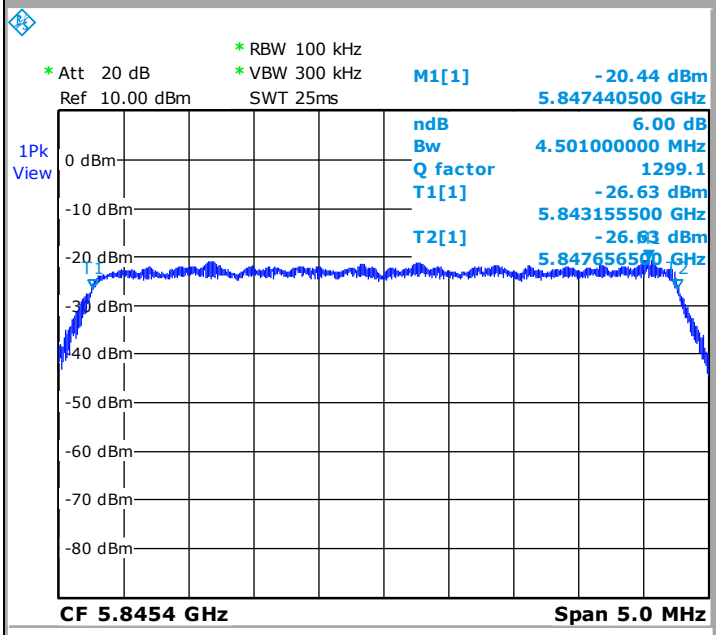


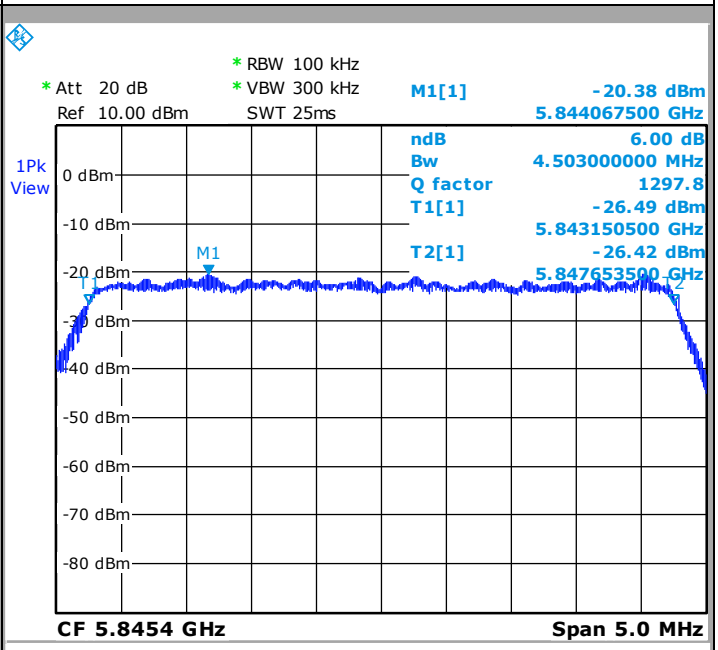
Configuration 6	
Tx1 IQ CPRI 2	**Tx2 IQ CPRI 2**



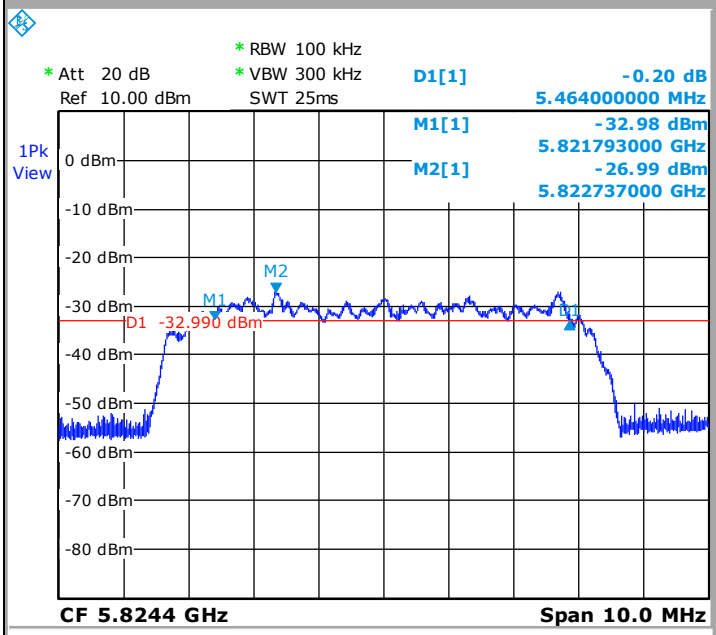


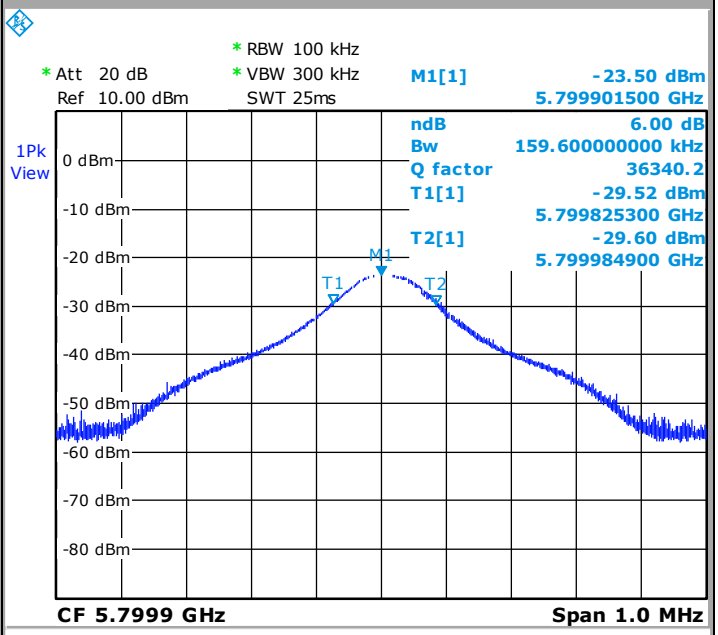
Configuration 6	
Tx1 IQ CPRI 3	**Tx2 IQ CPRI 3**



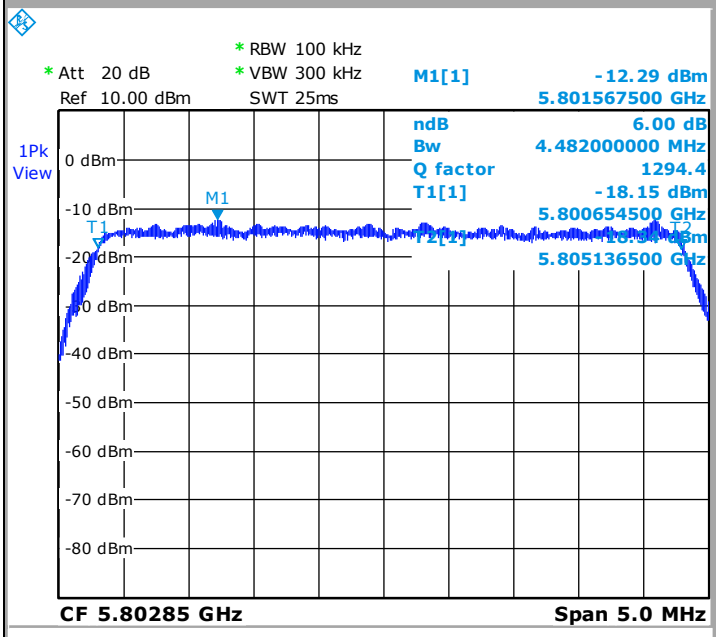


Configuration 6	
Tx1 C&M	**Tx2**

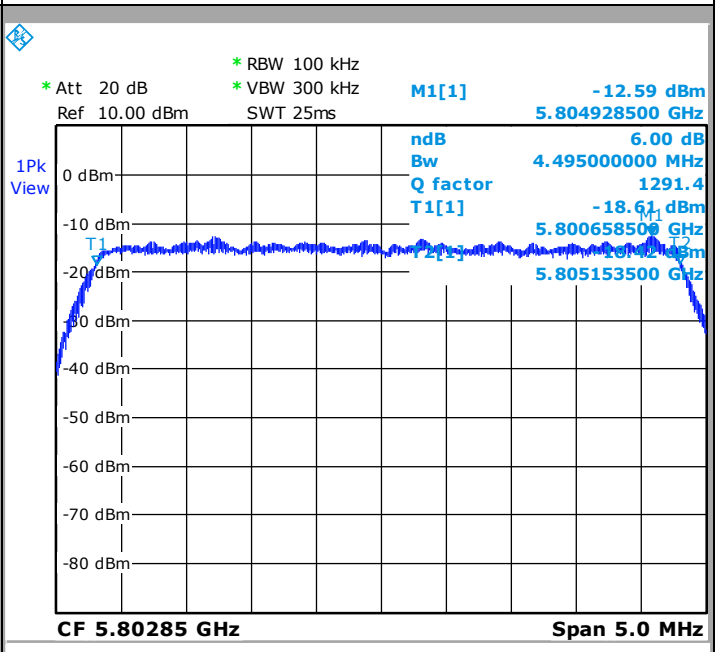




Configuration 7	
Tx1 IQ CPRI	**Tx2 IQ CPRI**

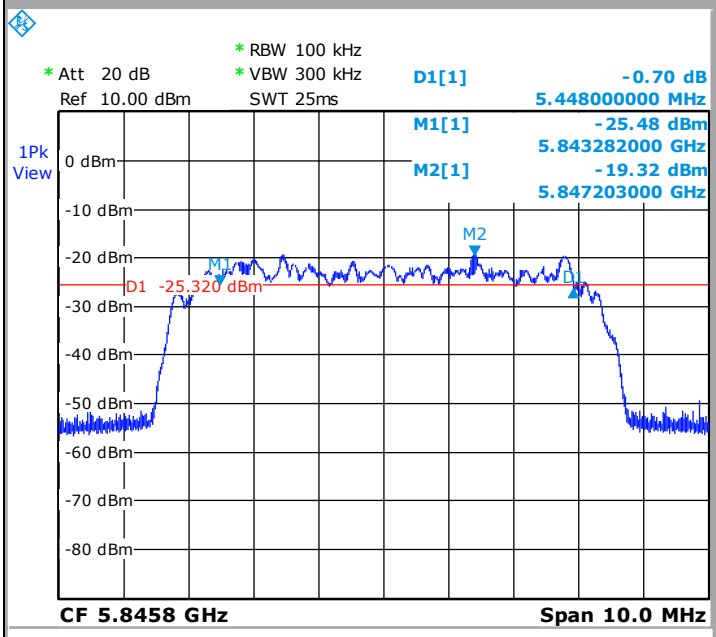


Date: 25.MAY.2016 09:59:09

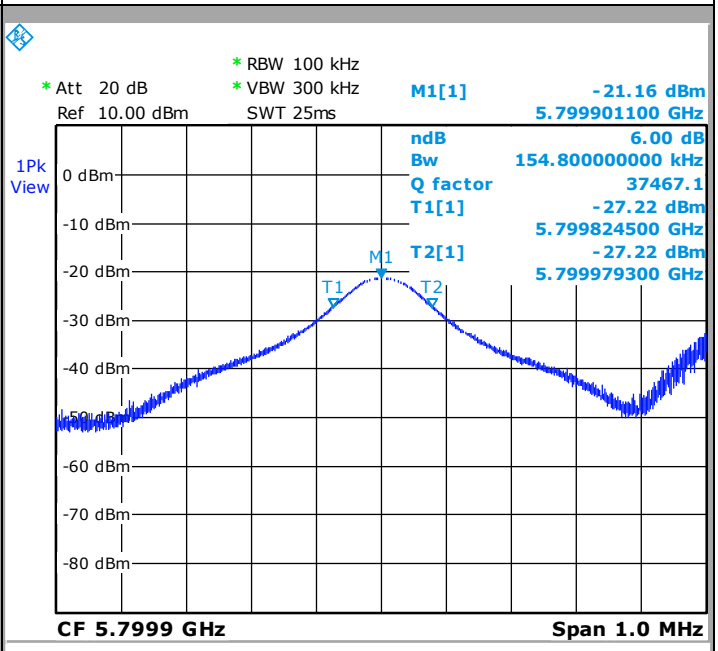


Date: 25.MAY.2016 10:00:49

Configuration 7	
Tx1 C&M	**Tx2**

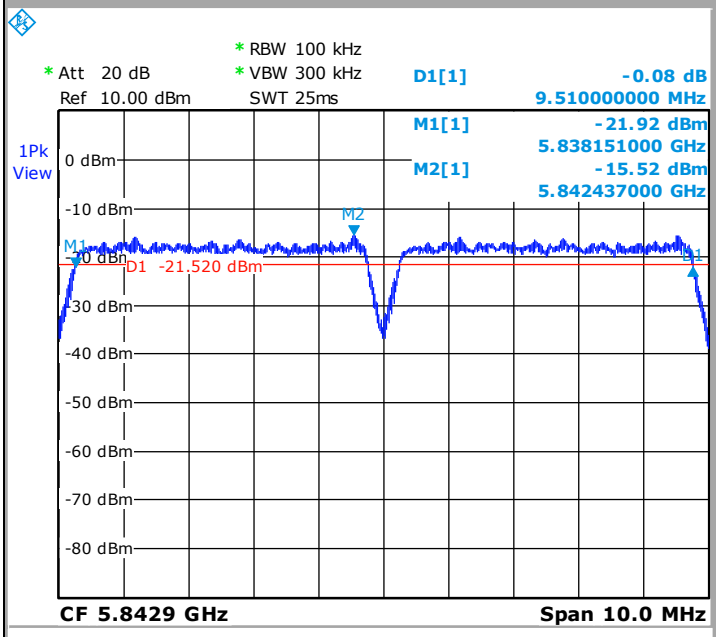


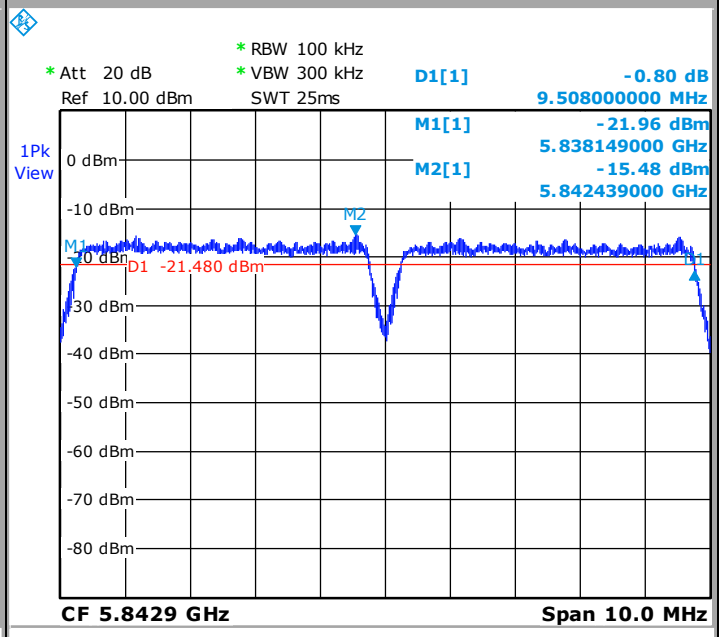
Date: 25.MAY.2016 09:57:25



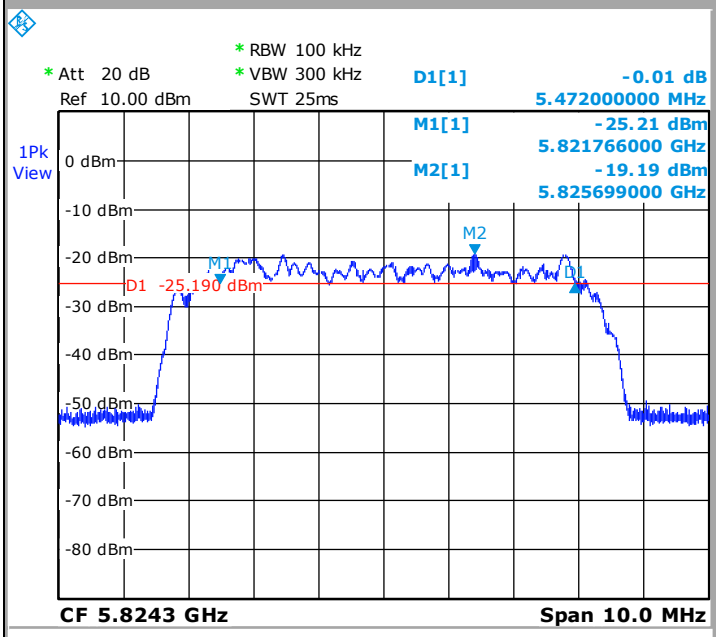
Date: 25.MAY.2016 10:02:12

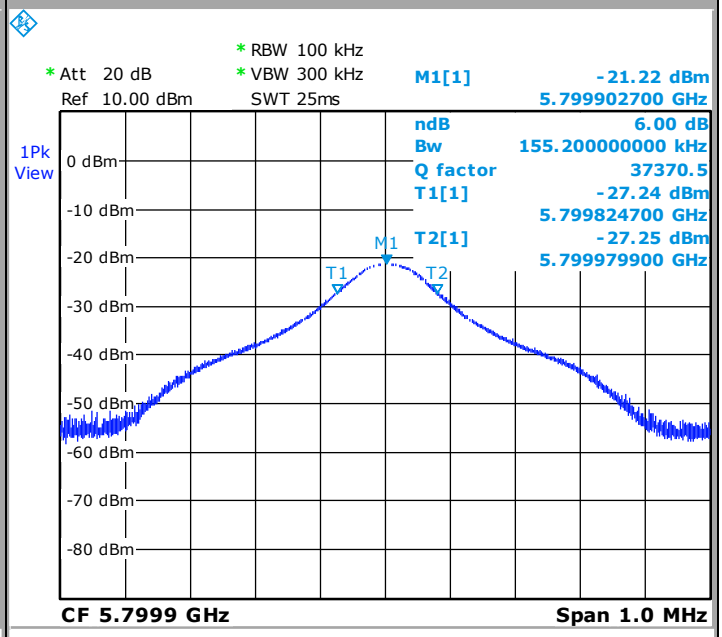
Configuration 8	
Tx1 IQ CPRI	**Tx2 IQ CPRI**



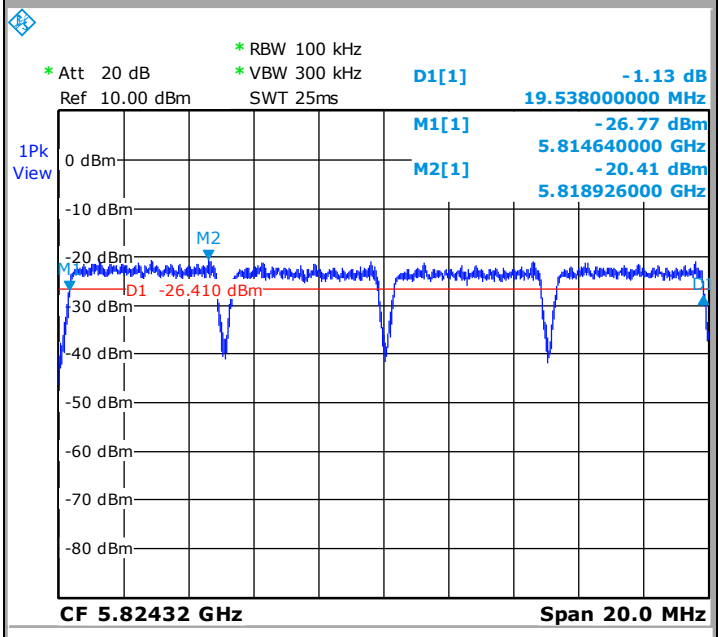


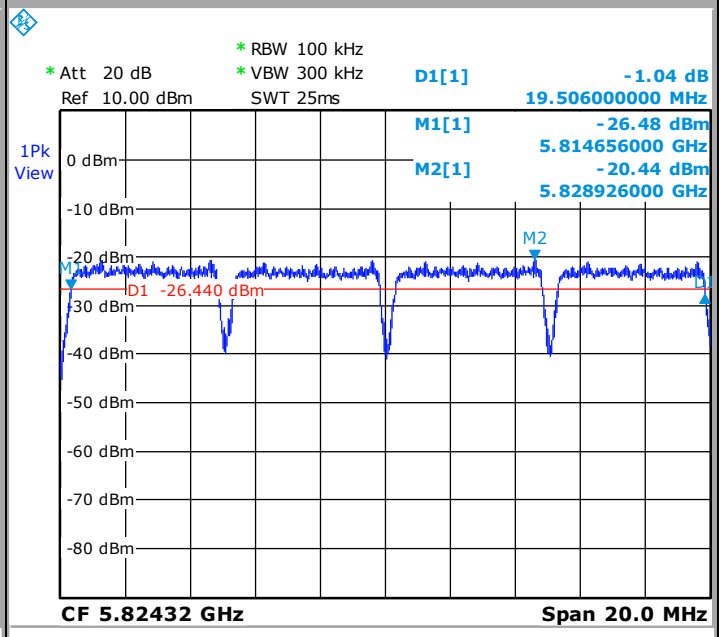
Configuration 8	
Tx1 C&M	**Tx2**



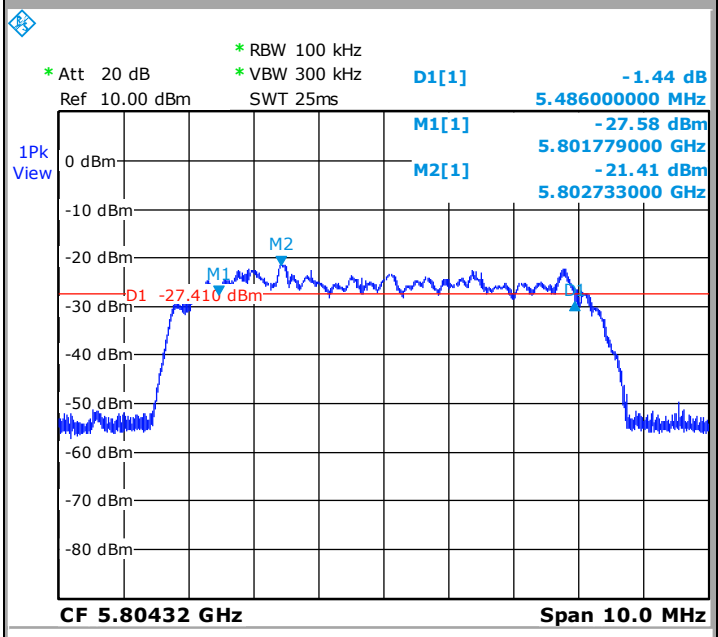


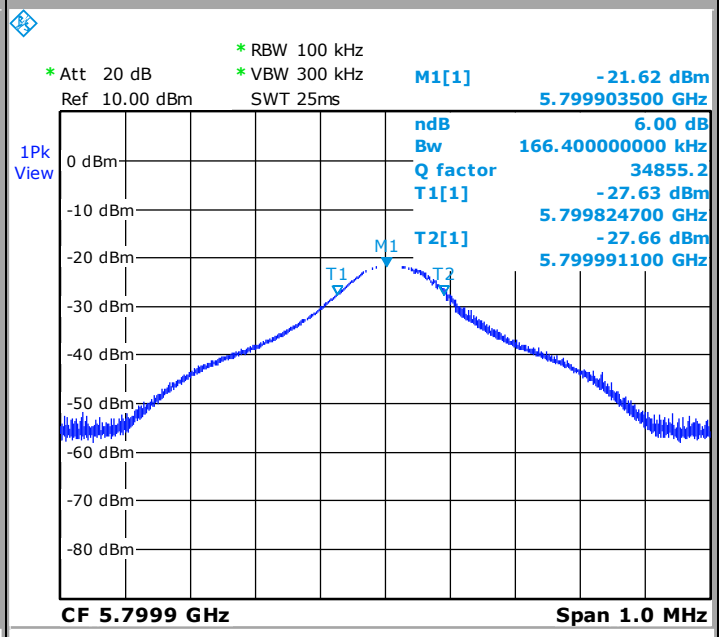
Configuration 9	
Tx1 IQ CPRI	**Tx2 IQ CPRI**



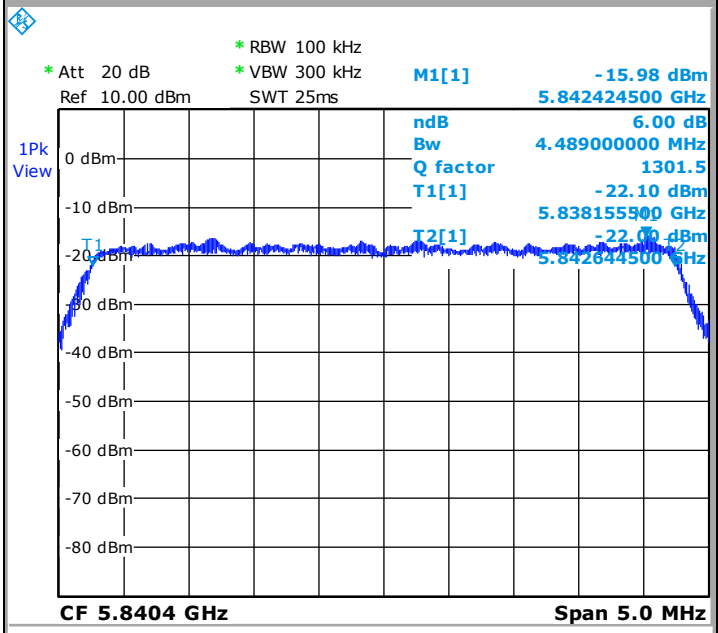


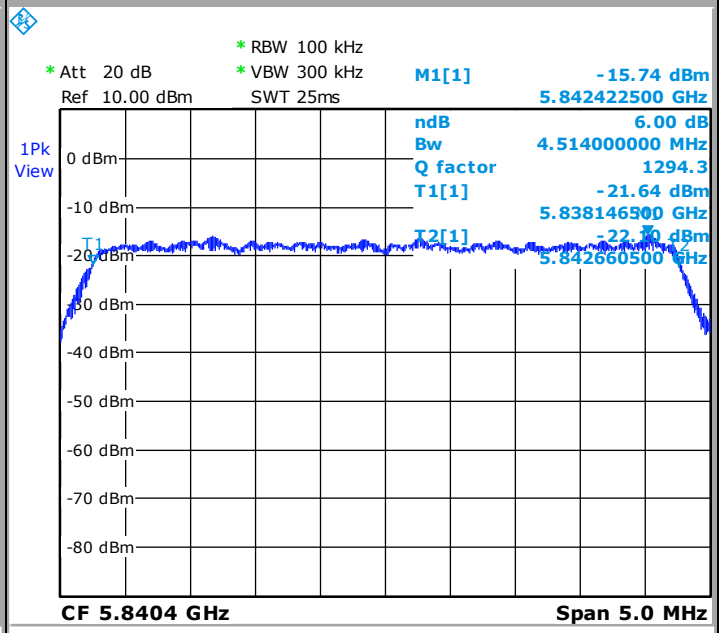
Configuration 9	
Tx1 C&M	**Tx2**



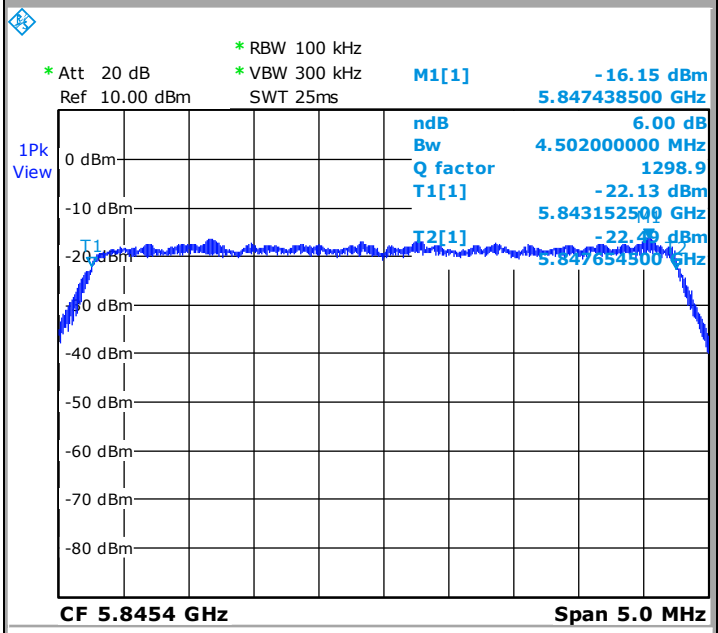


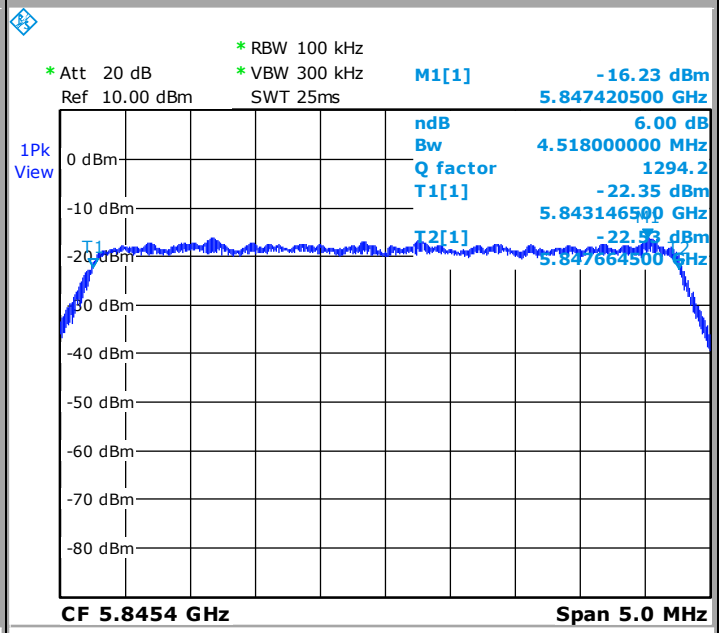
Configuration 10	
Tx1 IQ CPRI 1	**Tx2 IQ CPRI 1**



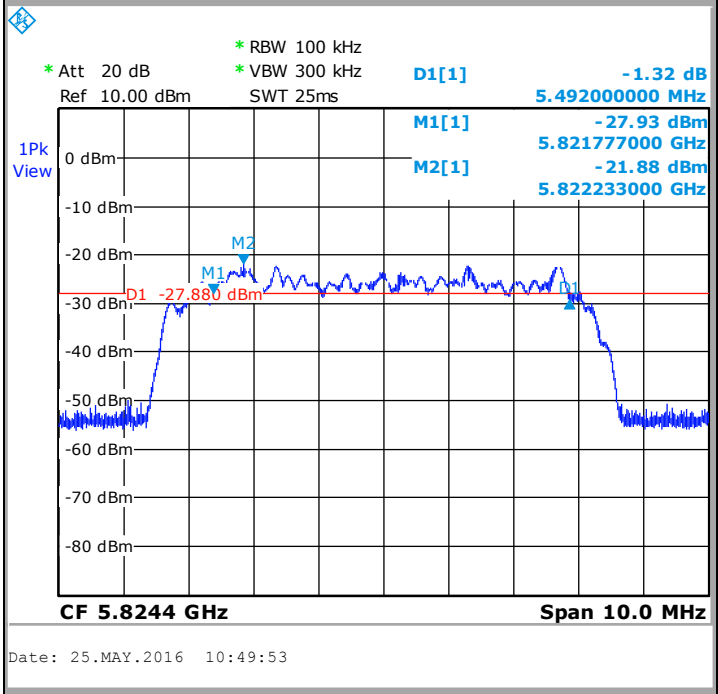


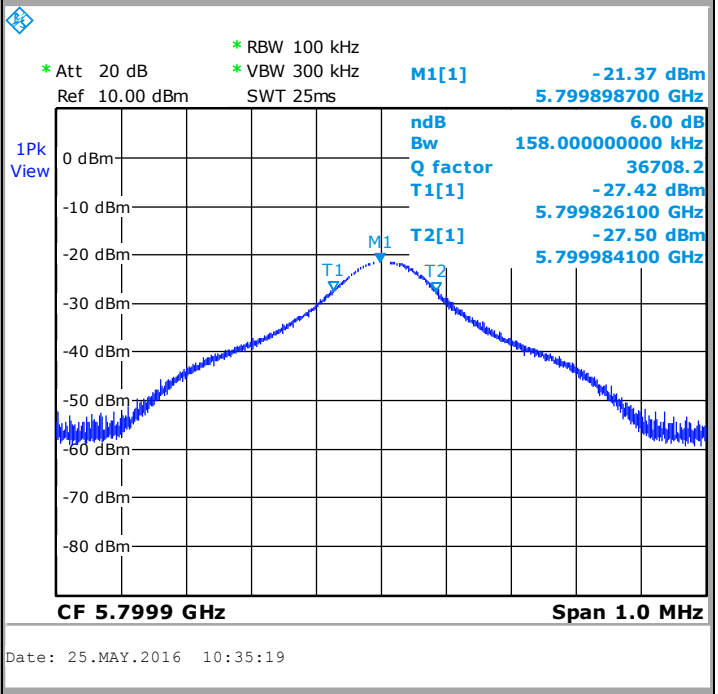
Configuration 10	
Tx1 IQ CPRI 2	**Tx2 IQ CPRI 2**



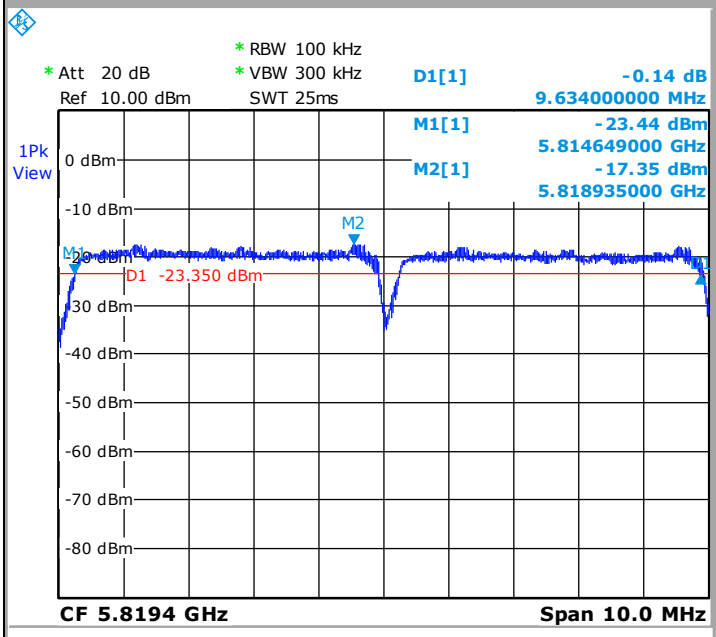


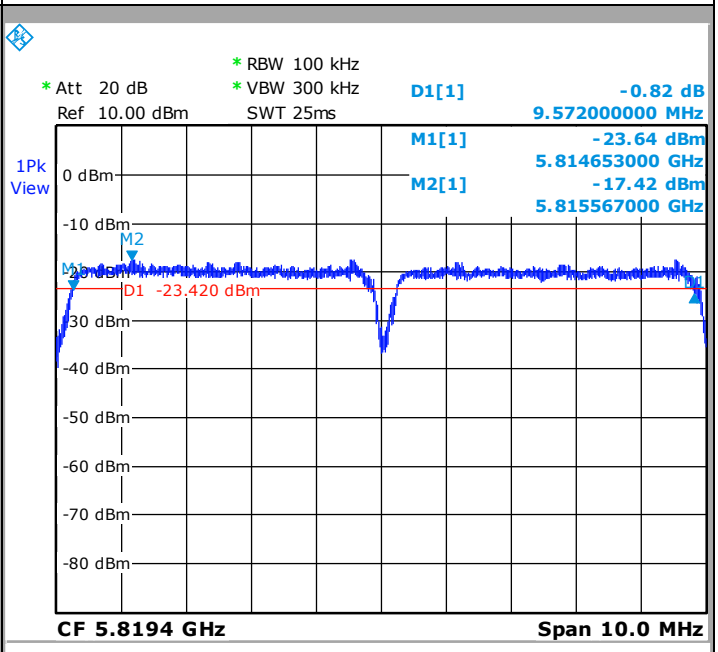
Configuration 10	
Tx1 C&M	**Tx2**



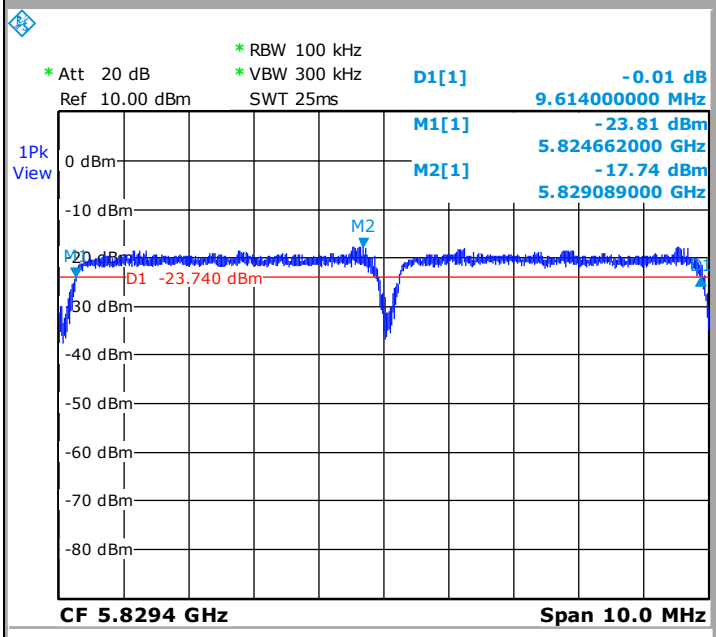


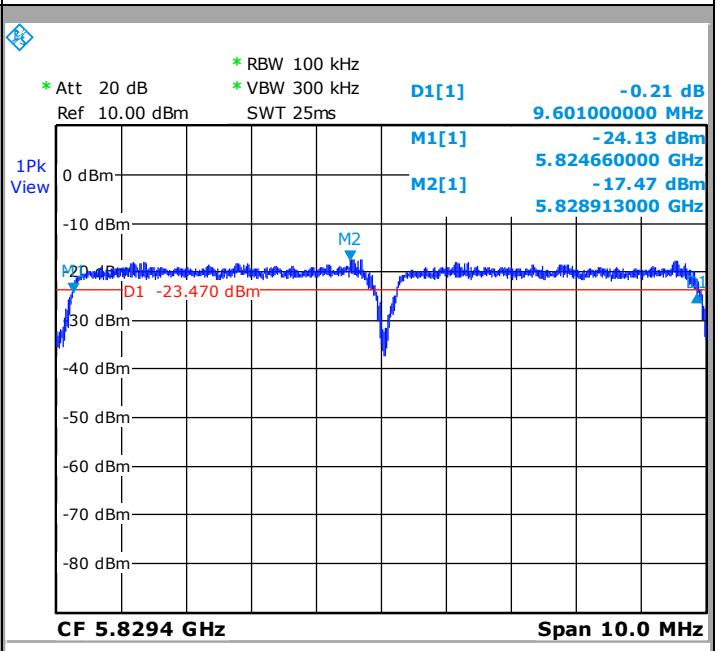
Configuration 11	
Tx1 IQ CPRI 1	**Tx2 IQ CPRI 1**



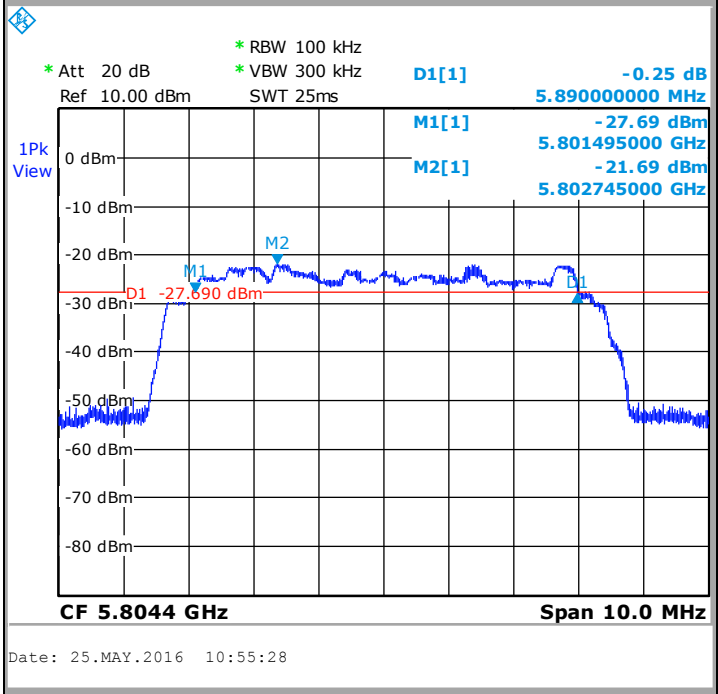


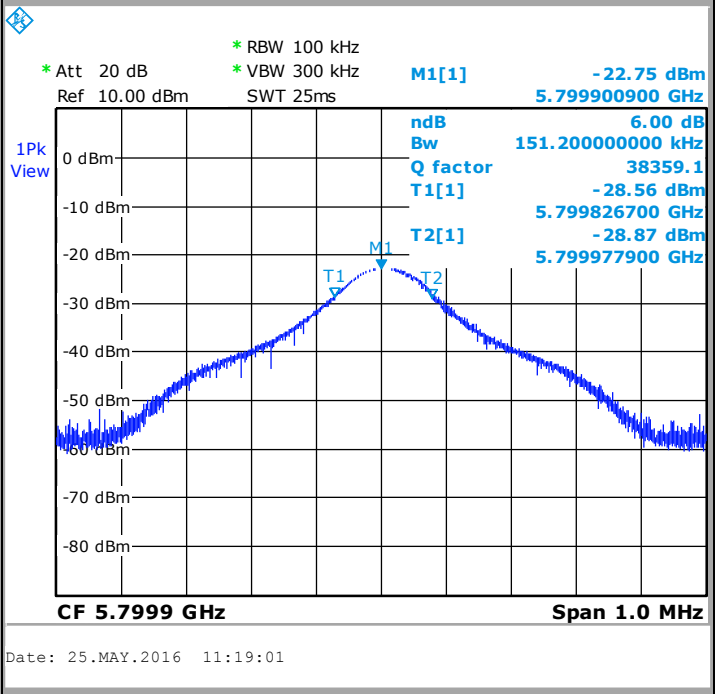
Configuration 11	
Tx1 IQ CPRI 2	**Tx2 IQ CPRI 2**

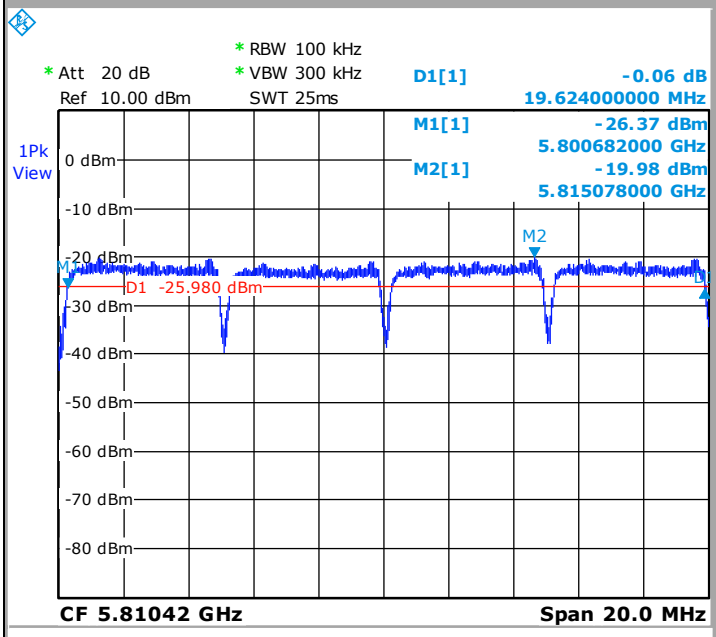
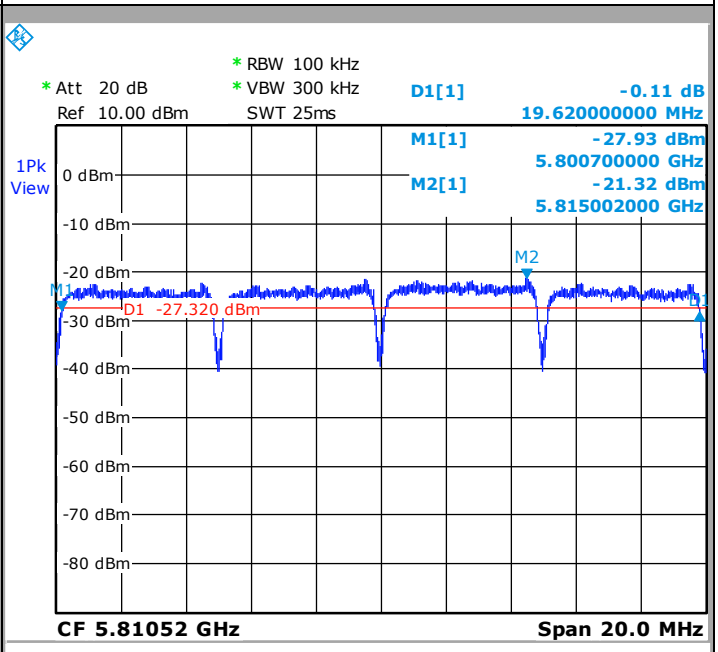


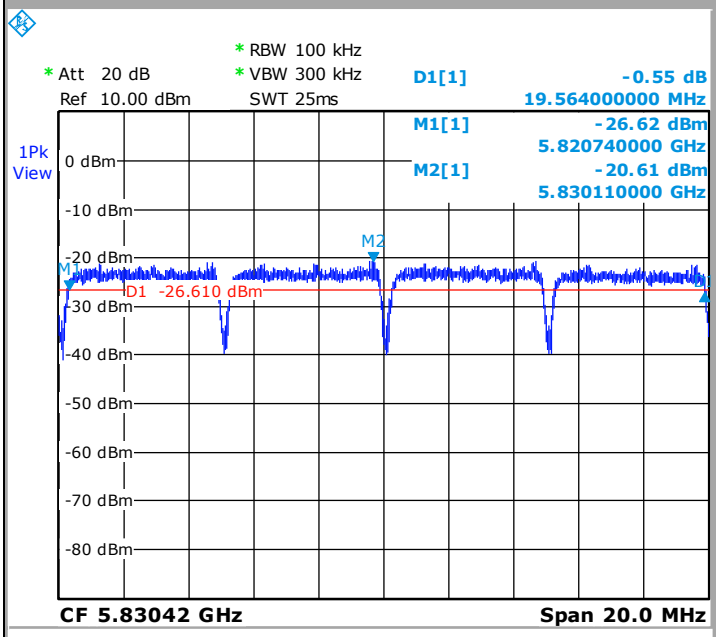
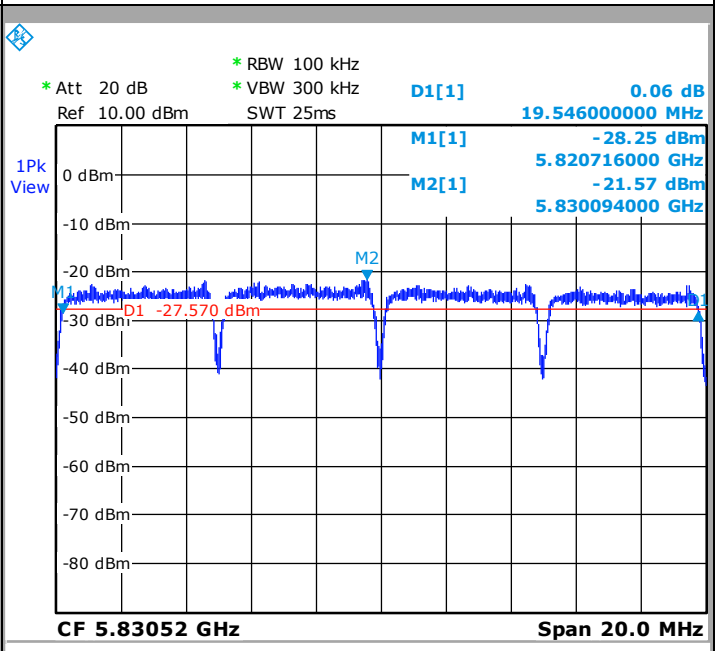


Configuration 11	
Tx1 C&M	**Tx2**

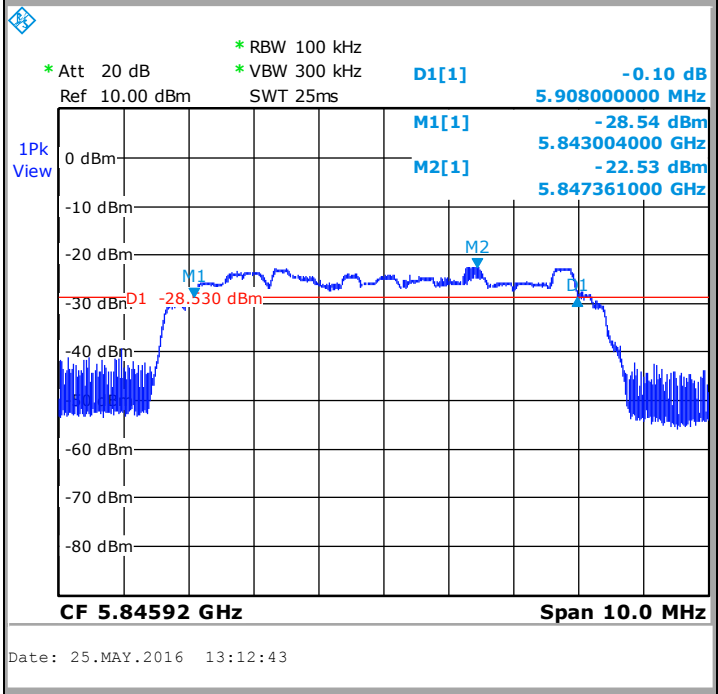


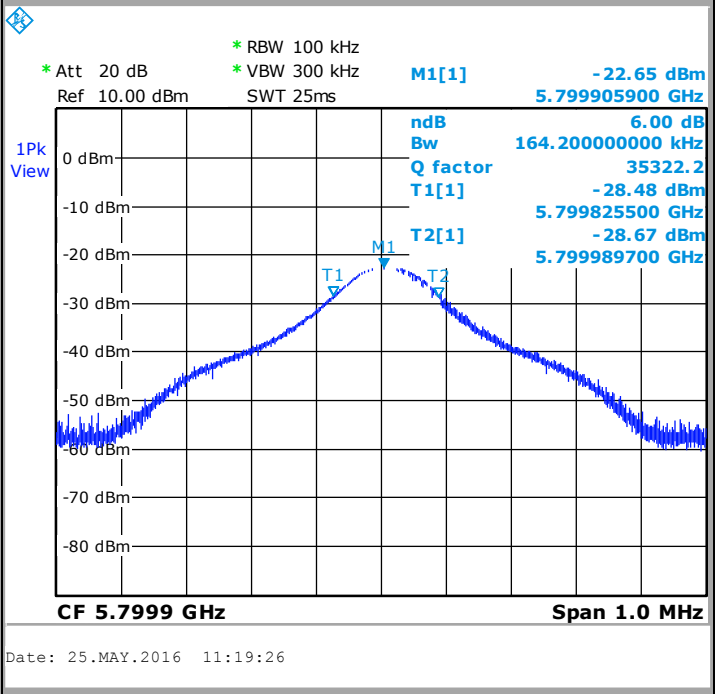


Configuration 12	
Tx1 IQ CPRI 1	**Tx2 IQ CPRI 1**
	
Date: 25.MAY.2016 13:06:53	Date: 25.MAY.2016 13:17:24

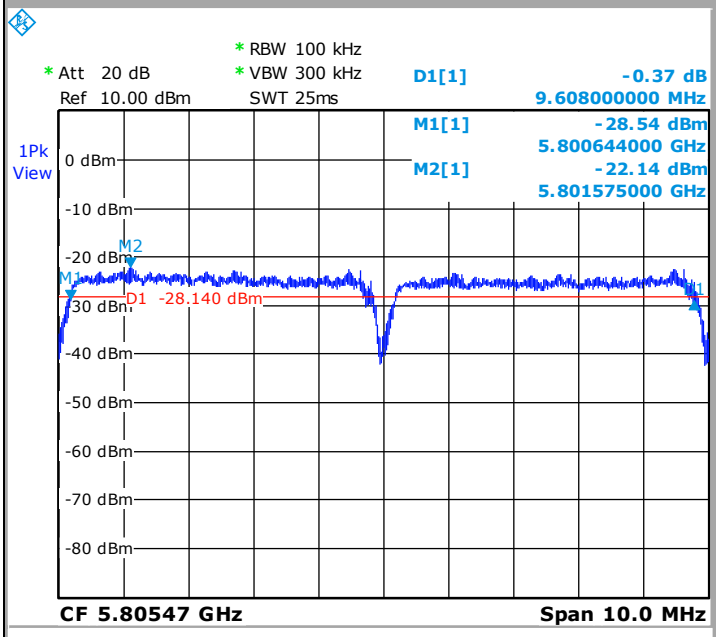
Configuration 12	
Tx1 IQ CPRI 2	**Tx2 IQ CPRI 2**
	
Date: 25.MAY.2016 13:09:09	Date: 25.MAY.2016 13:19:55

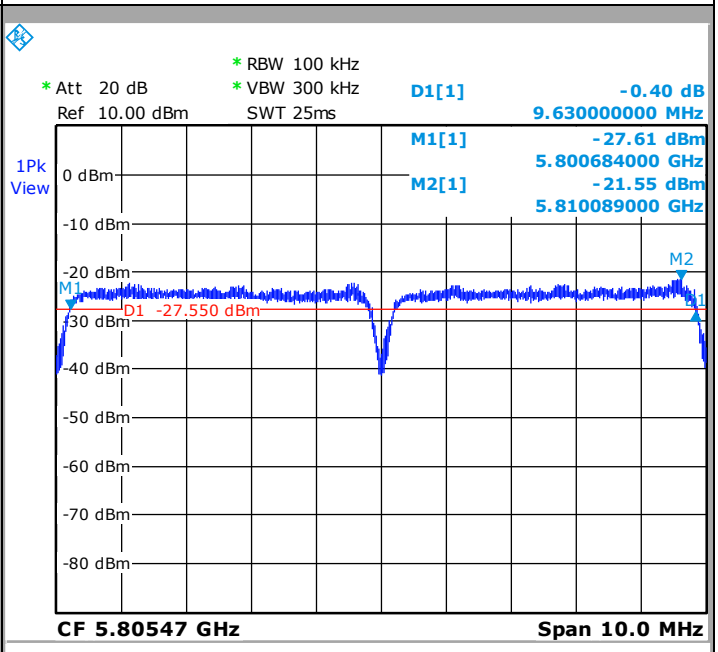
Configuration 12	
Tx1 C&M	**Tx2**



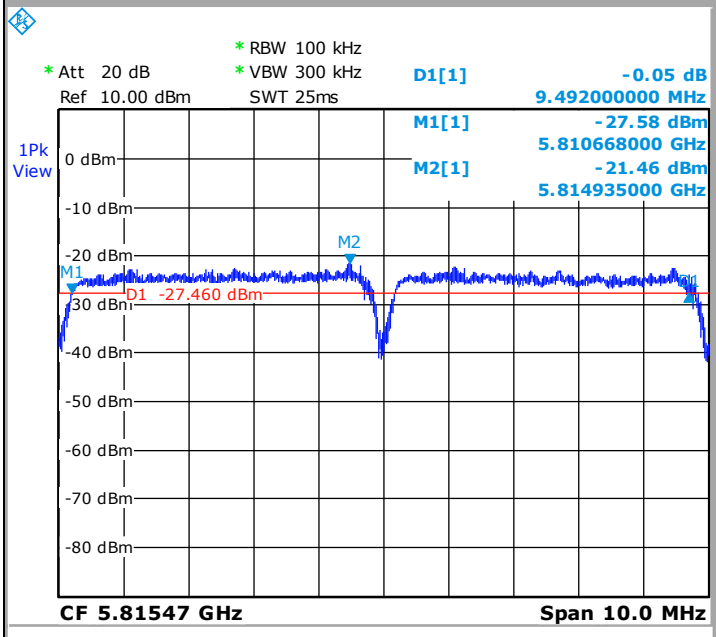


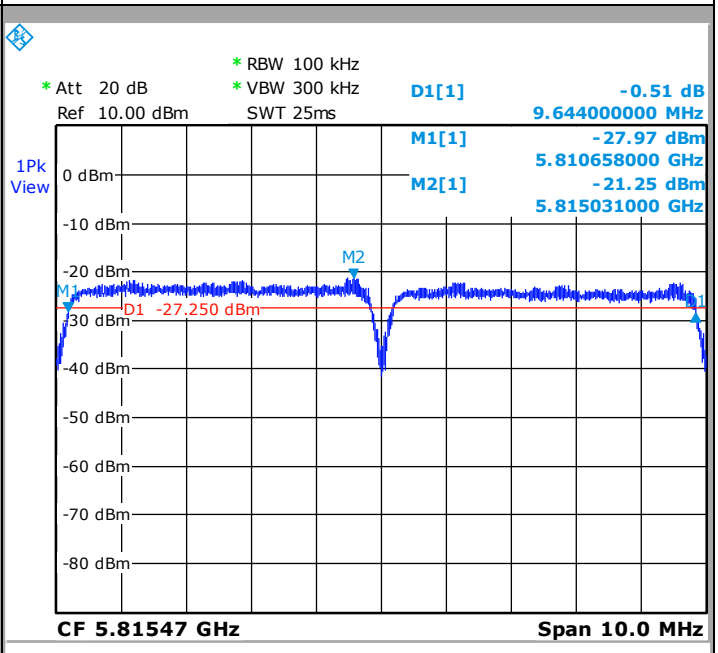
Configuration 13	
Tx1 IQ CPRI 1	**Tx2 IQ CPRI 1**



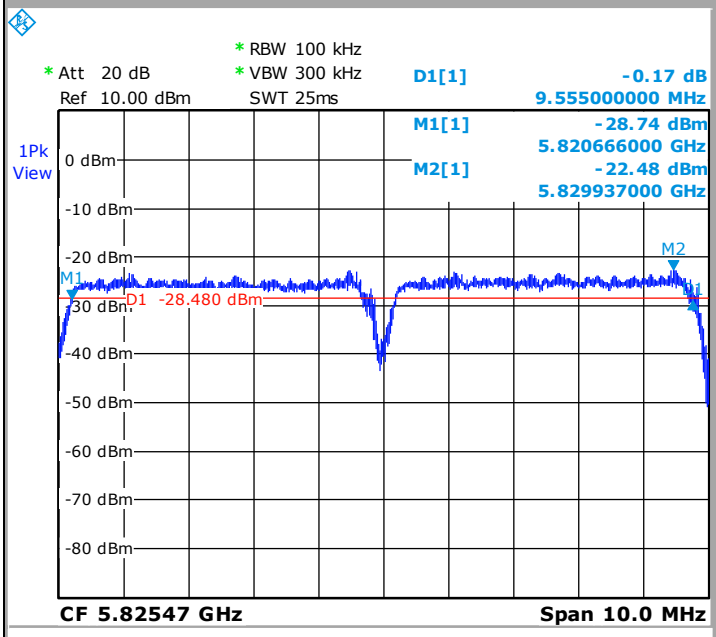


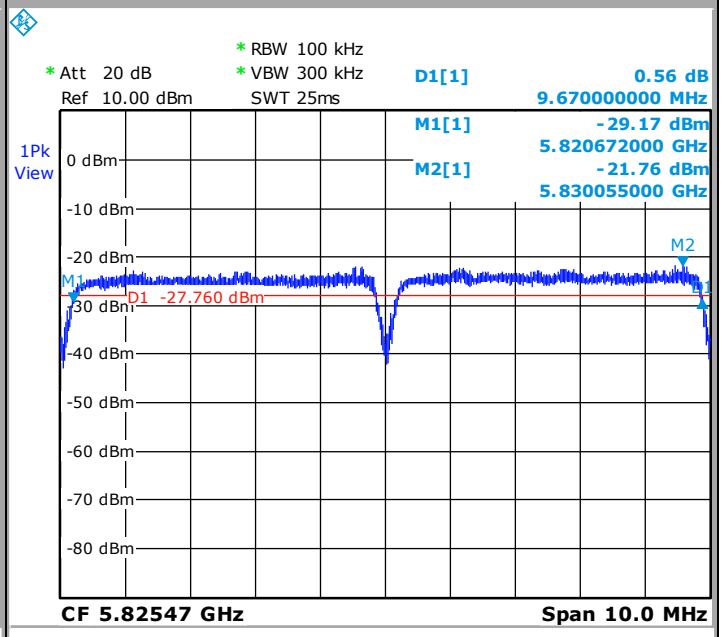
Configuration 13	
Tx1 IQ CPRI 2	**Tx2 IQ CPRI 2**



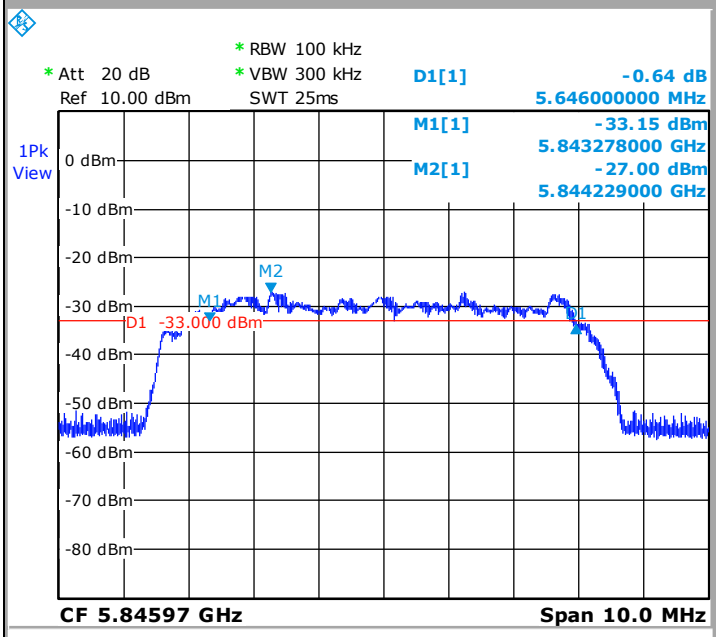


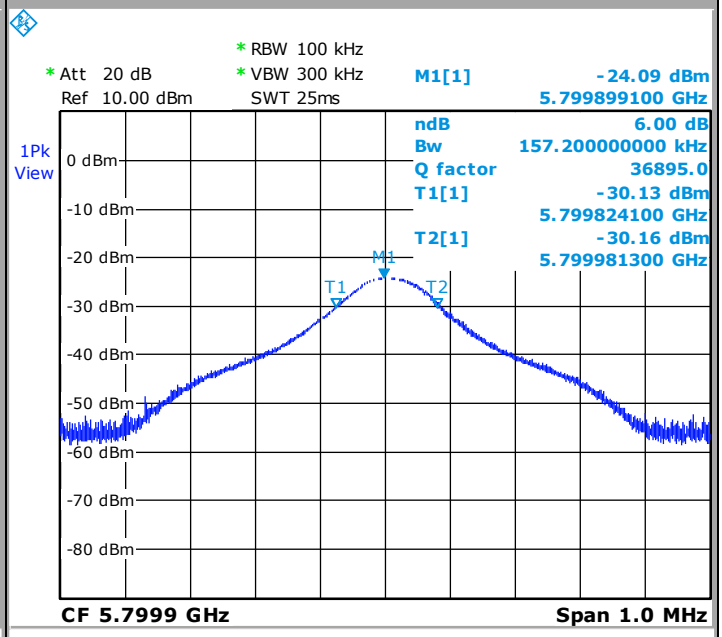
Configuration 13	
Tx1 IQ CPRI 3	**Tx2 IQ CPRI 3**





Configuration 13	
Tx1 C&M	**Tx2**





Configuration	Tx1 (MHz)	Tx2 (MHz)	Minimum 6dB Bandwidth (MHz)
1	18,927	13,625	13,625
2	18,932	13,631	13,631
3	19,007	13,646	13,646
4	18,913	13,66	13,66
5	18,954	13,7	13,7
6	18,979	13,657	13,657
7	9,93	4,65	4,65
8	14,982	9,663	9,663
9	25,024	19,672	19,672
10	14,483	9,19	9,19
11	25,138	19,324	19,324
12	45,096	39,33	39,33
13	34.301	29,101	29.101

5.7. CONCLUSION

6dB Bandwidth measurement performed on the sample of the product FL58R2EABW45-REM, SN: EBL1613C0074, in configuration and description presented in this test report, show levels **conform to** the FCC 15.407 limits.

6. AC POWER LINE CONDUCTED EMISSIONS

6.1. TEST CONDITIONS

Test performed by : Laurent DENEUX
Date of test : April 24th,2016
Ambient temperature : 21°C
Relative humidity : 53%

6.2. 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 (Front View)

Photograph for AC Power Line Conducted Emissions (Rear View)

6.3. LIMIT

AC Power Line Conducted Emissions shall not exceed value below:

Quasi-Peak
0,15kHz to 0,5MHz: 66dBµV to 56dBµV*
0,5MHz to 5MHz: 56dBµV
5MHz to 30MHz: 60dBµV

Average
0,15kHz to 0,5MHz: 56dBµV/m to 46dBµV*
0,5MHz to 5MHz: 46dBµV
5MHz to 30MHz: 50dBµV

*Decreases with the logarithm of the frequency

6.4. TEST EQUIPMENT LIST

Apparatus	Mark	Type	Registration number	Cal date	Cal due
EMI Test Receiver	ROHDE & SCHWARZ	ESU	A2642019	2016-03	2017-03
V ISLN	ROHDE & SCHWARZ	ESH2-Z5	C2322001	2015-06	2016-06
Pulse limiter	ROHDE & SCHWARZ	ESH3-Z2	A2649007	2015-07	2016-07
Cable	-	-	A5329417	2015-10	2016-10
Ground plane	LCIE	-	-	-	-

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

6.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

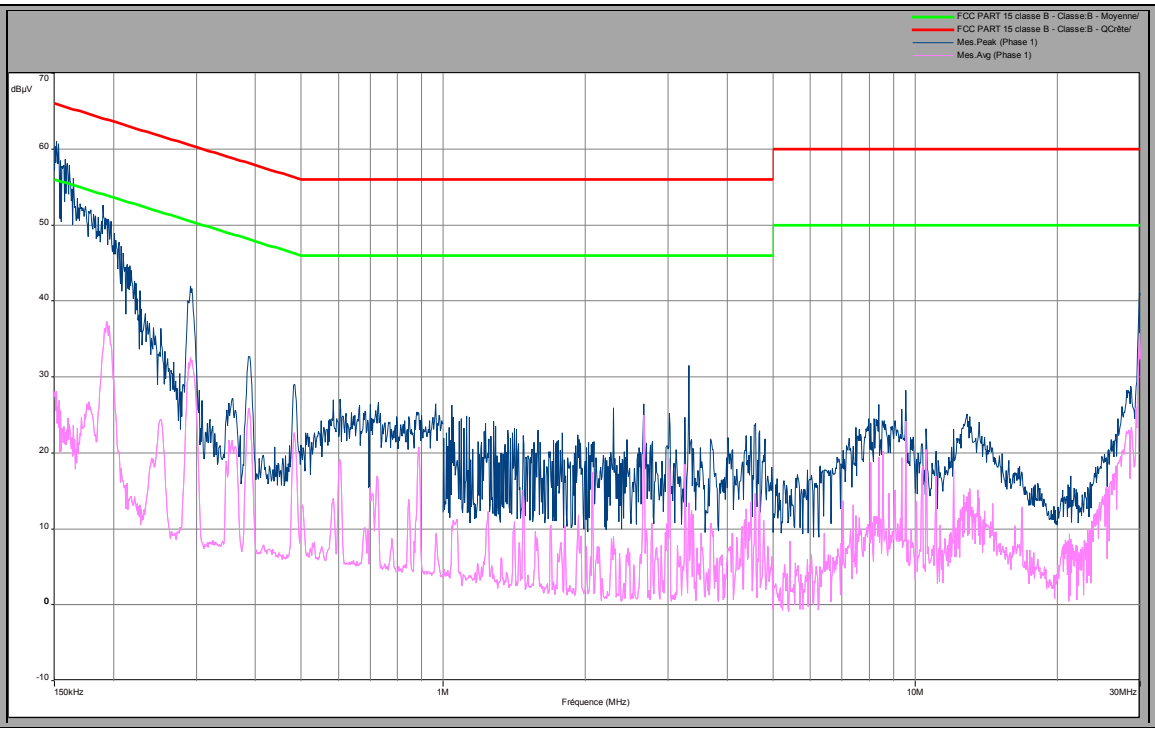
☒None ☐Divergence:

6.6. GRAPHICS & RESULTS

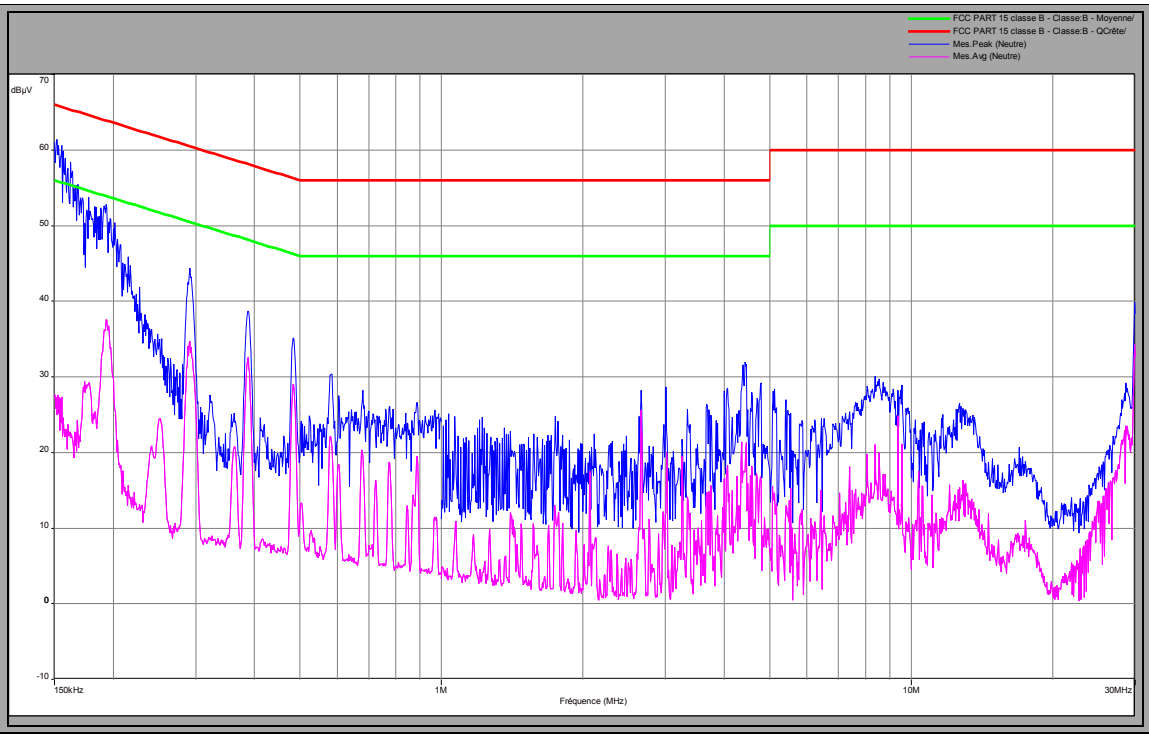
Configuration 1

AC Power Line Conducted Emissions

Phase Line



Neutral Line



Configuration 1					
Phase Line					
Frequencies (kHz)	Peak Level (dBµV)	Quasi-Peak Level (dBµV)	Average Level (dBµV)	Quasi-Peak Limit (dBµV)	Average Limit (dBµV)
151.5	61	-	37.2	65.9	55.9
291.5	42	-	32.5	605	50.5
2662	26.4	-	25	56	46
9558	28.2	-	24.2	60	50
26440	21.2	-	16	60	50
Neutral Line					
Frequencies (kHz)	Peak Level (dBµV)	Quasi-Peak Level (dBµV)	Average Level (dBµV)	Quasi-Peak Limit (dBµV)	Average Limit (dBµV)
150	61	-	28	66	56
291	44.39	-	34.7	60.4	50.4
2662	28.2	-	25.5	56	46
4452	31.6	-	21.2	56	46
29708	32.5	-	26.6	60	50

6.7. CONCLUSION

AC Power Line Conducted Emissions measurement performed on the sample of the product FL58R2EABW45-REM, SN: EBL1613C0074, in configuration and description presented in this test report, show levels **conform to** the FCC 15.407 limits.

7. UNWANTED EMISSIONS & UNDESIRABLE EMISSION

7.1. TEST CONDITIONS

Test performed by : Laurent DENEUX & Arnaud FAYETTE
Date of test : April and May 2016
Ambient temperature : 17 to 23°C
Relative humidity : 45 to 55%

7.2. TEST SETUP

- The Equipment under Test is installed:
☒SAR ☒OATS

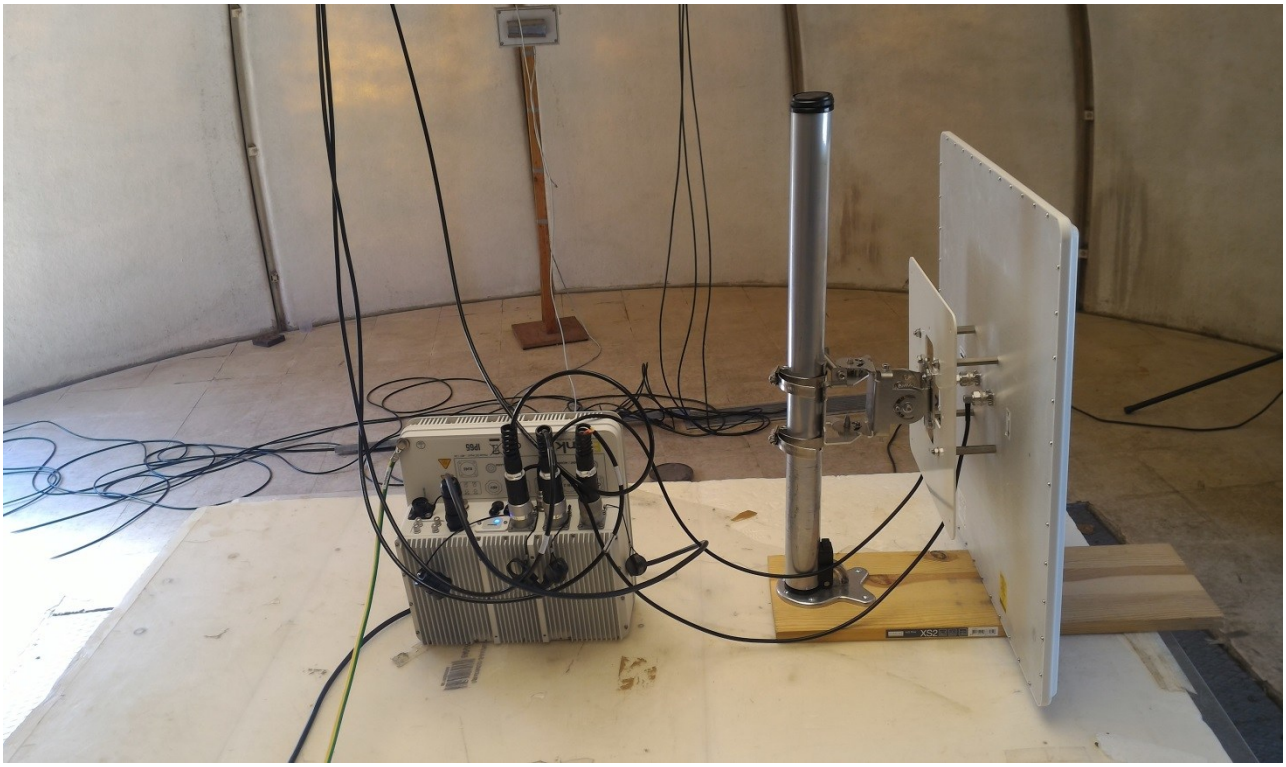
- Distance between EUT and the measuring antenna is:
☒3m ☒10m

- Choice of measuring antenna below 1GHz:
☒Bilog ☐Log periodic ☐Biconic ☐Dipole antenna

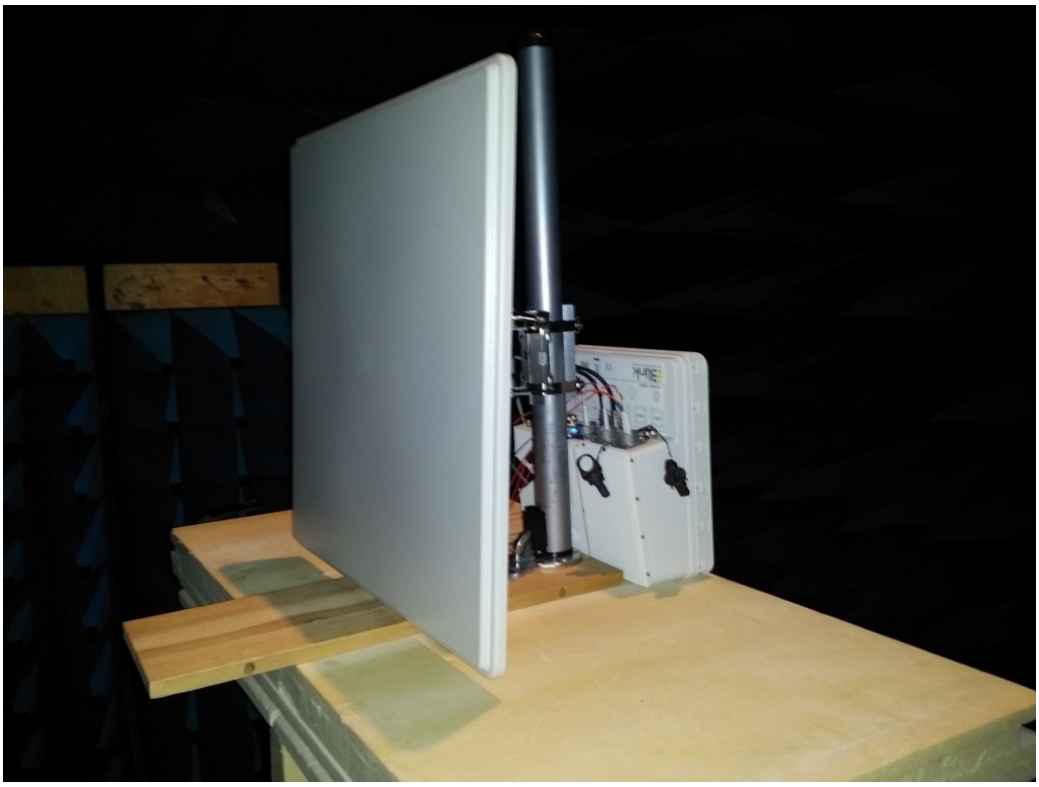
- Choice of measuring antenna above 1GHz:
☒Horn

The product has been tested according to ANSI C63.10 (2013). Test is performed in horizontal (H) and vertical (V) polarization. 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.

Photograph for Unwanted Emissions

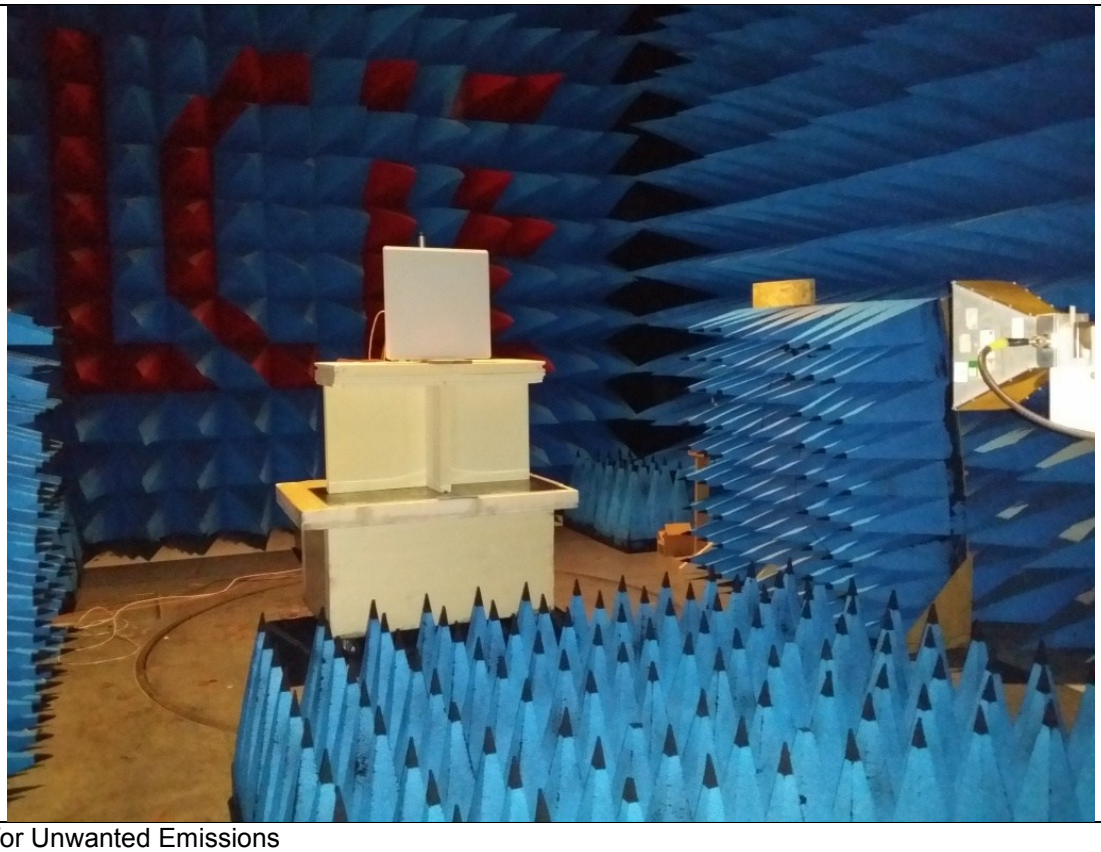


Photograph for Unwanted Emissions

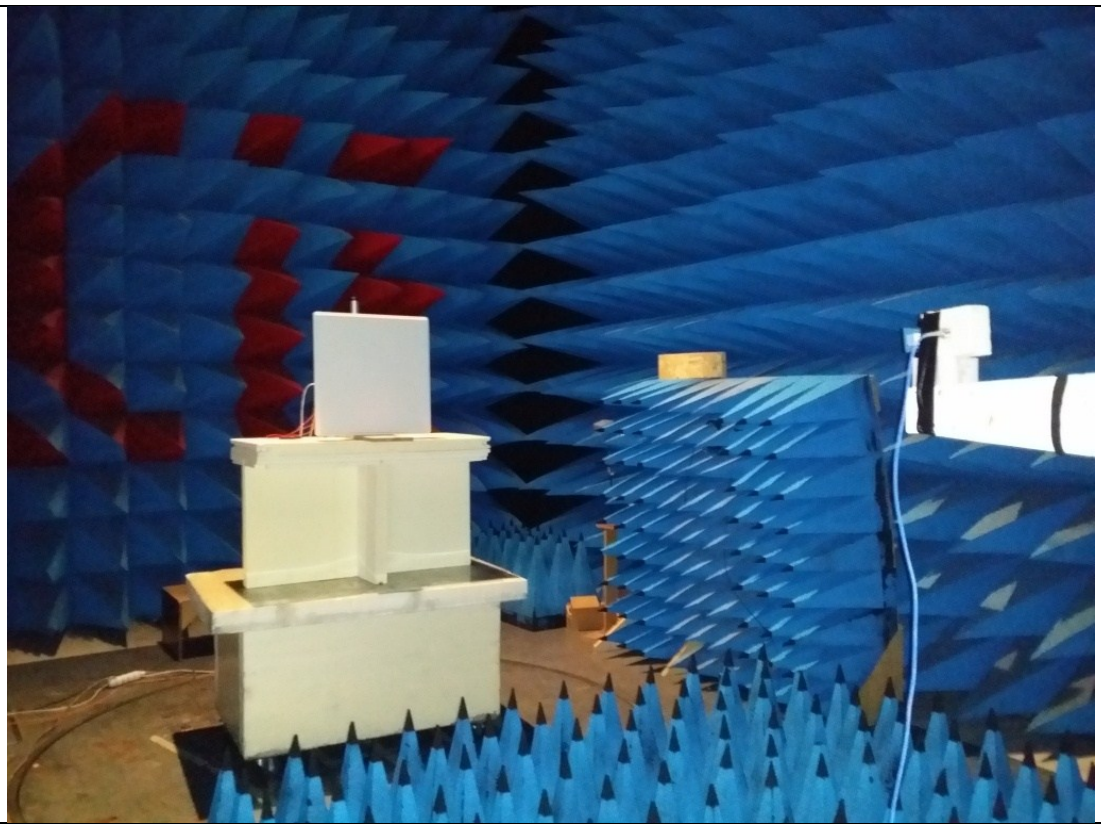


Photograph for Unwanted Emissions

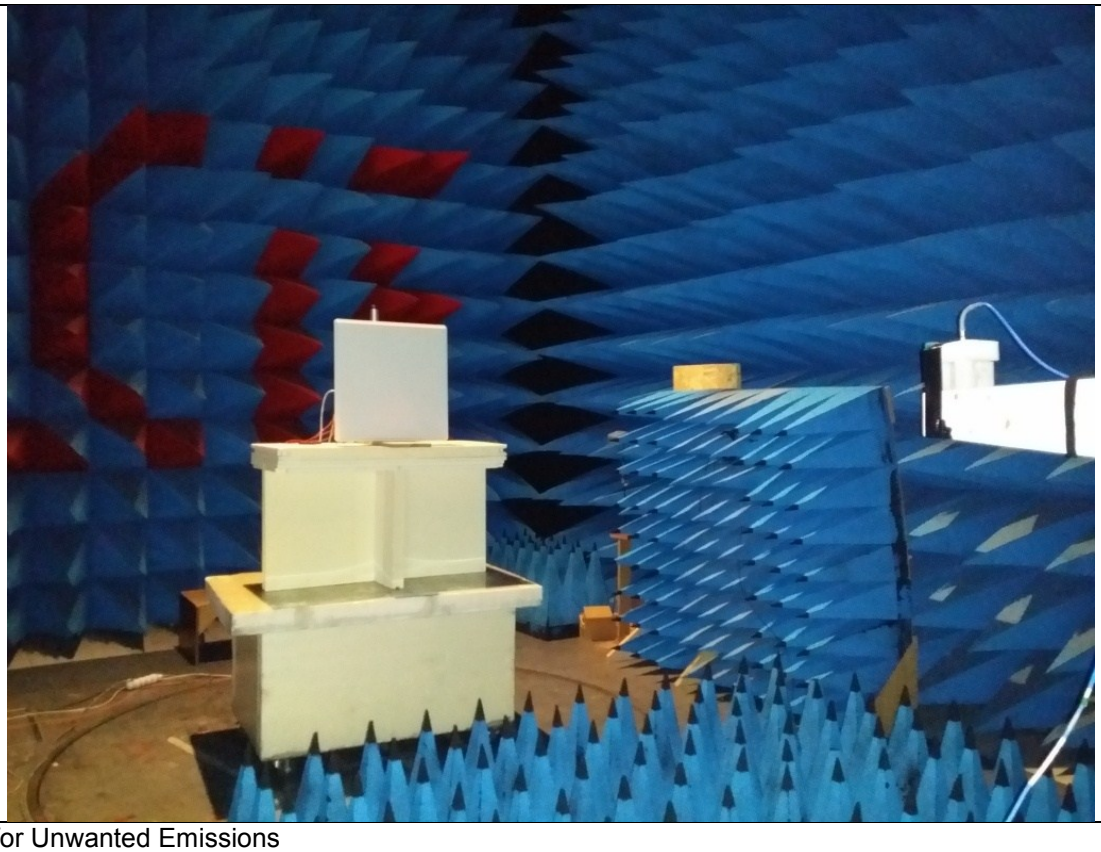
Photograph for Unwanted Emissions



Photograph for Unwanted Emissions



Photograph for Unwanted Emissions



Photograph for Unwanted Emissions

7.3. LIMIT

Unwanted Emissions shall not exceed value below:
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: 63.5dBµV/m Peak
43.5dBµV/m Average

All emissions shall be limited to a level of −27 dBm/MHz (68.2dBµV/m) at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz (105.2dBµV/m) at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz (110.8dBµV/m) at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz (122.2dBµV/m) at the band edge.

7.4. TEST EQUIPMENT LIST

Test	Appareil	Marque	Type	Immatriculation	Cal. date	Cal. Due
Open area test site						
X	Open test site	LCIE	-	F2000400	2015-06	2016-06
X	EMI Test Receiver	ROHDE & SCHWARZ	ESU	A2642018	2016-03	2017-03
X	Bilog antenna	CHASE	CBL 6112A	C2040040	2016-01	2017-01
X	Cable	-	-	A5329449	2015-11	2016-11
X	Cable	-	-	A5329368	2015-11	2016-11
X	cable	-	-	A5329444	2015-11	2016-11
X	Preamplifier	LCIE; LCIE	LCIE-ALB-001	A7080073	2015/06	2016/06
X	EMI receiver	ROHDE & SCHWARZ	ESI40 1088 740K40	A2642010	2015/05	2016/05
X	EMI receiver	ROHDE & SCHWARZ	ESIB26	A2642021	2015/12	2016/12
X	RF cable	RADIALL; CDI	30990-7M	A5329711	2016/03	2017/03
X	Measurement RF cable	-	Cordon 082-5454-1.5mtr	A5329624	2015/12	2016/12
X	Measurement RF cable	-	082-0404-1MTR	A5329625	2015/10	2016/10
X	Measurement RF cable	-	-	A5329626	2015/10	2016/10
X	Horn antenna	EMCO	3115	C2042018	2015/05	2016/05
X	Measurement horn antenna 18-26,5GHz	PASTERNACK	PE9852/2F-20	C2042048	2015/05	2017/05
X	Horn antenna 26,5-40GHz	PASTERNACK	PE9850/2F-20	C2042052	2016/04	2018/04
X	Filter	MICRO-TRONICS	HPS17421	A7484059	2015/07	2016/07

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

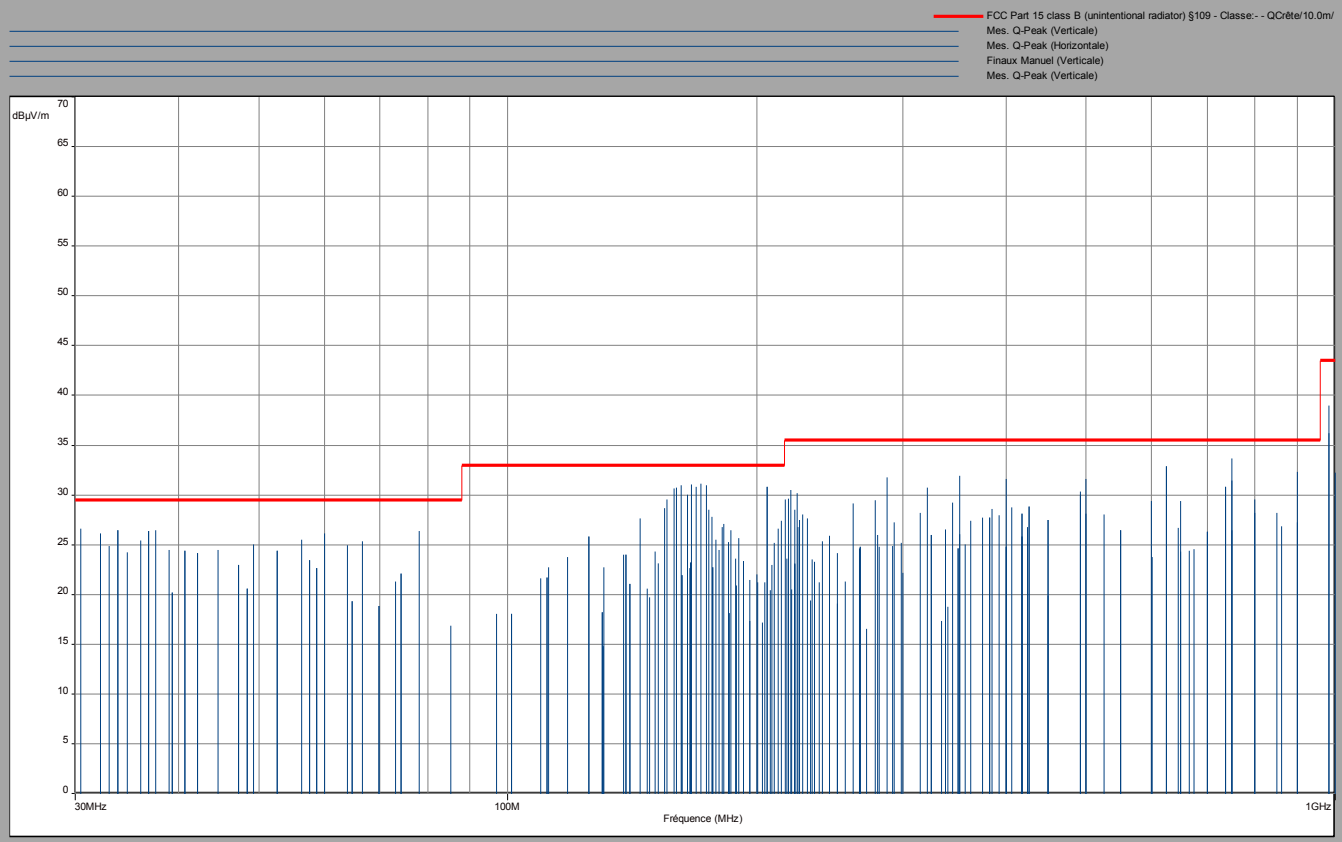
7.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☒None ☐Divergence:

7.6. GRAPHICS & RESULTS

Configuration 1

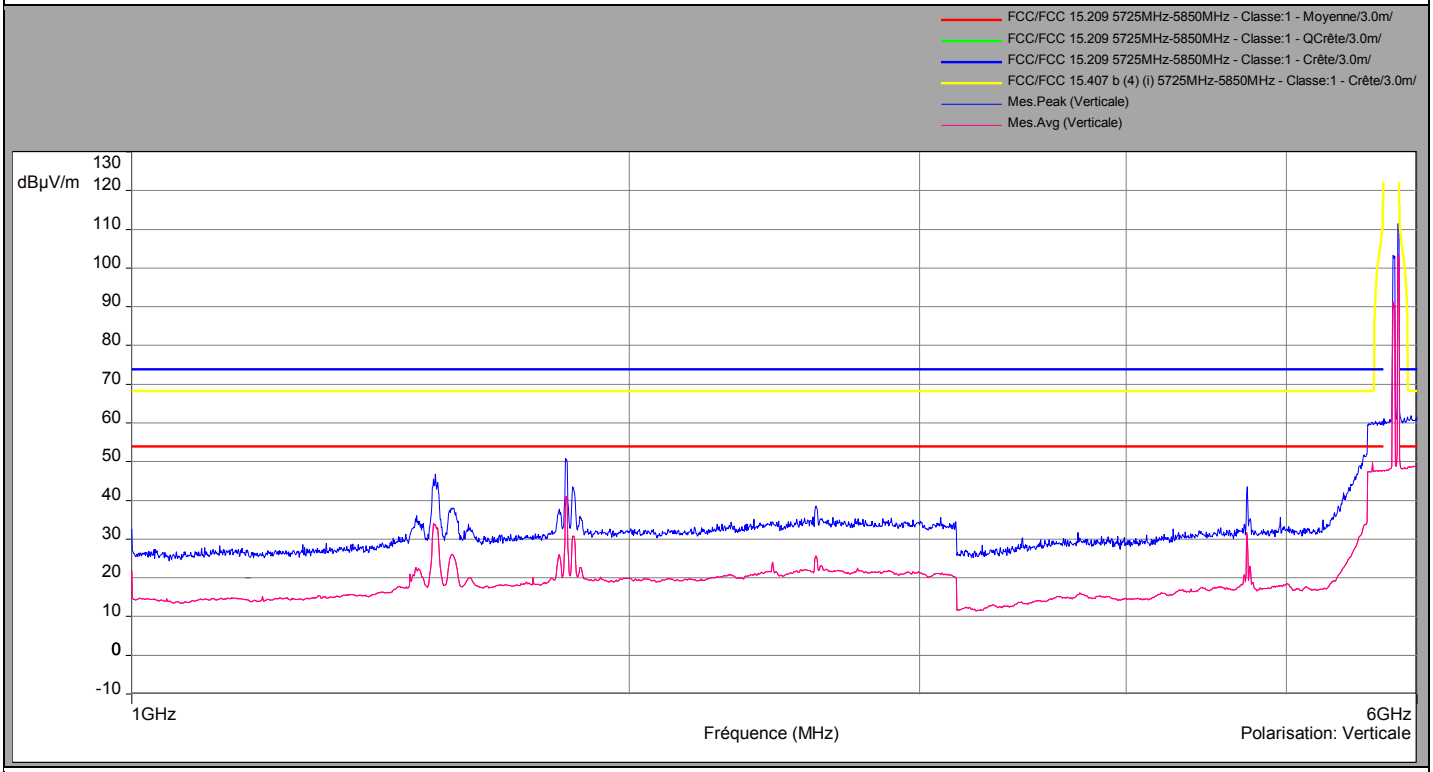
Below 1GHz



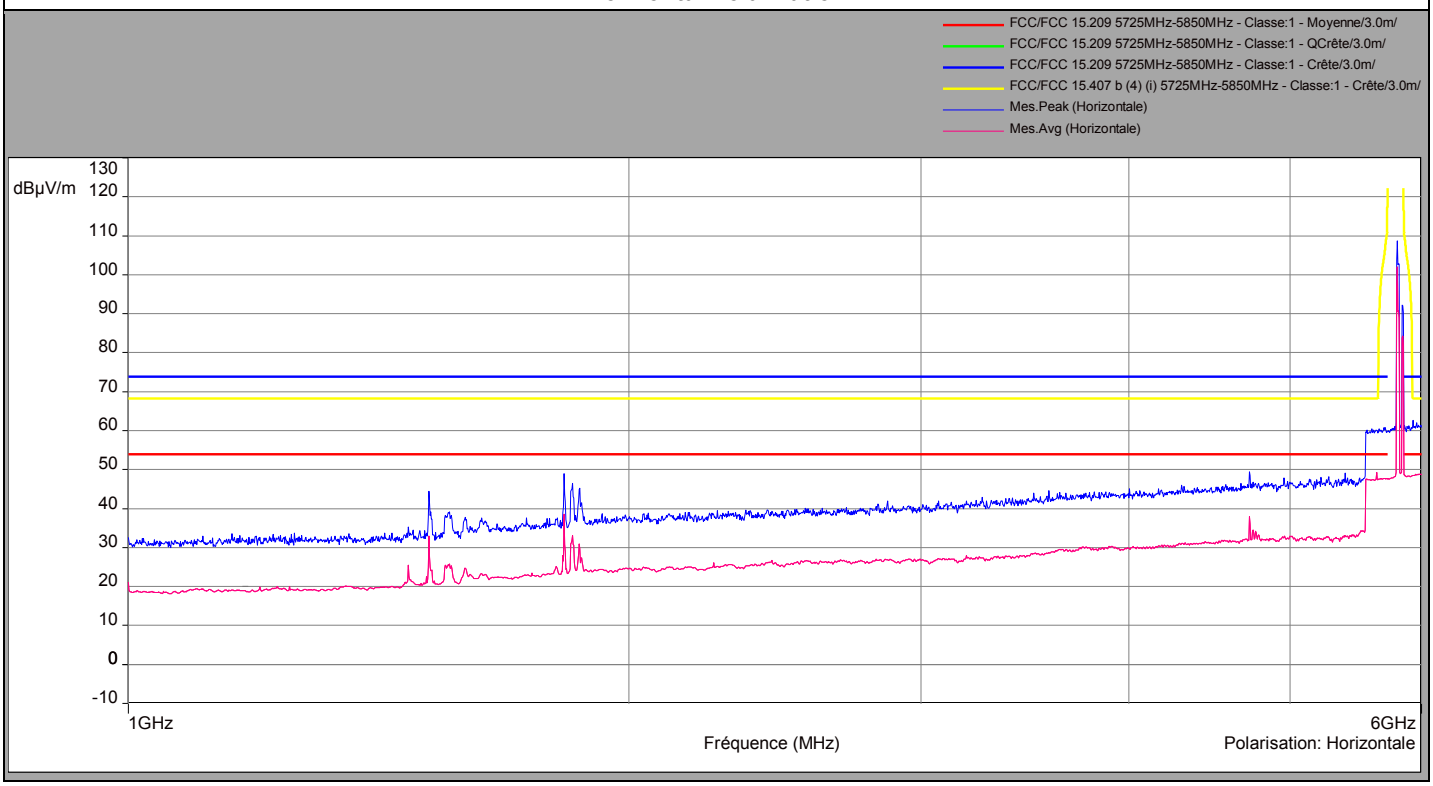
Configuration 1

Above 1GHz

Vertical Polarization



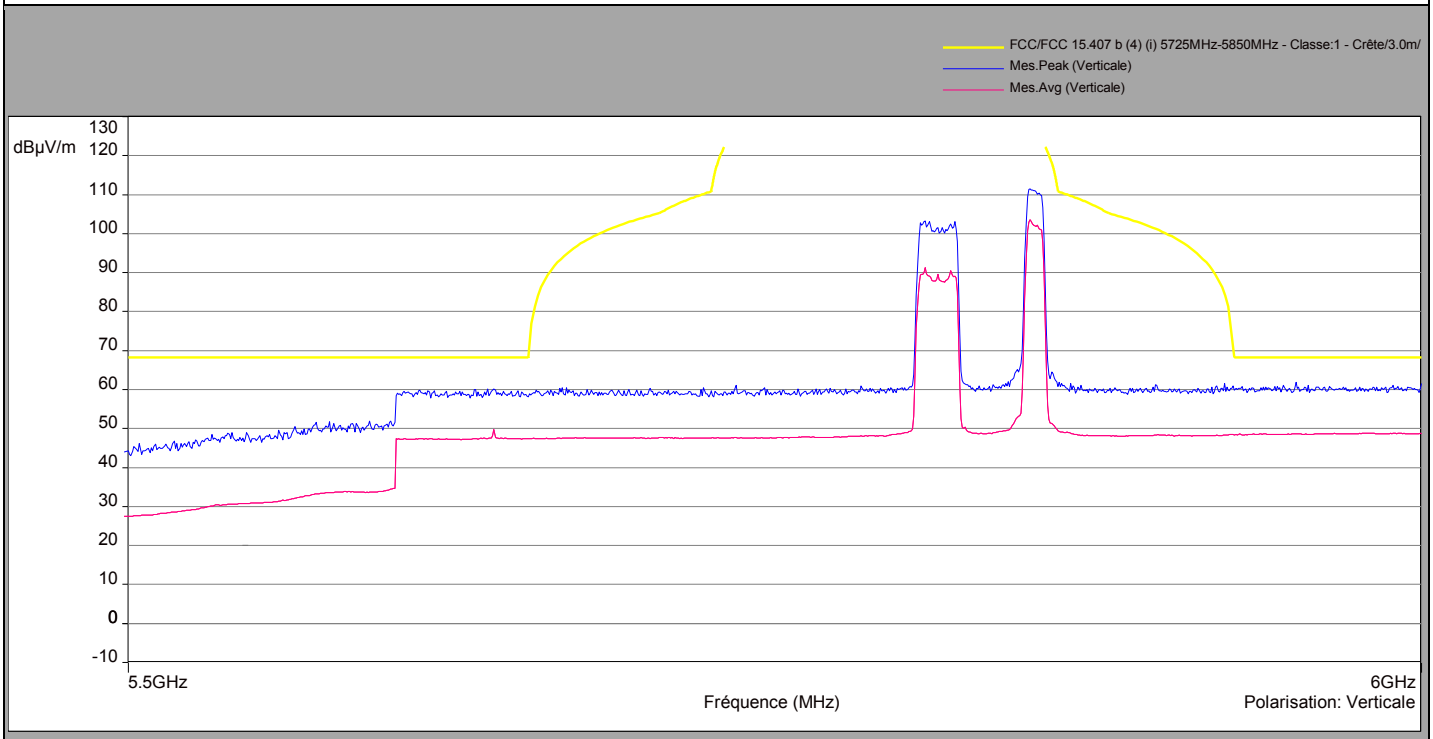
Horizontal Polarization



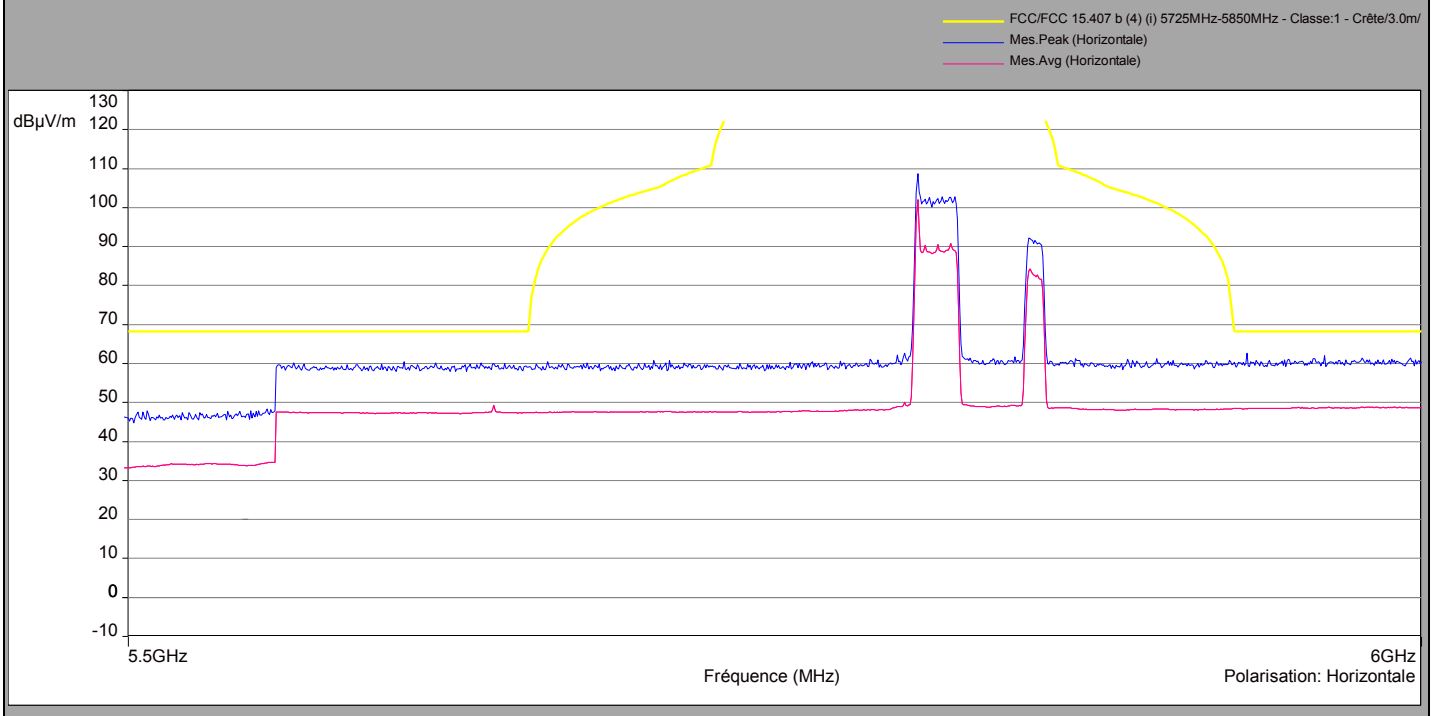
Configuration 1

Above 1GHz

Vertical Polarization



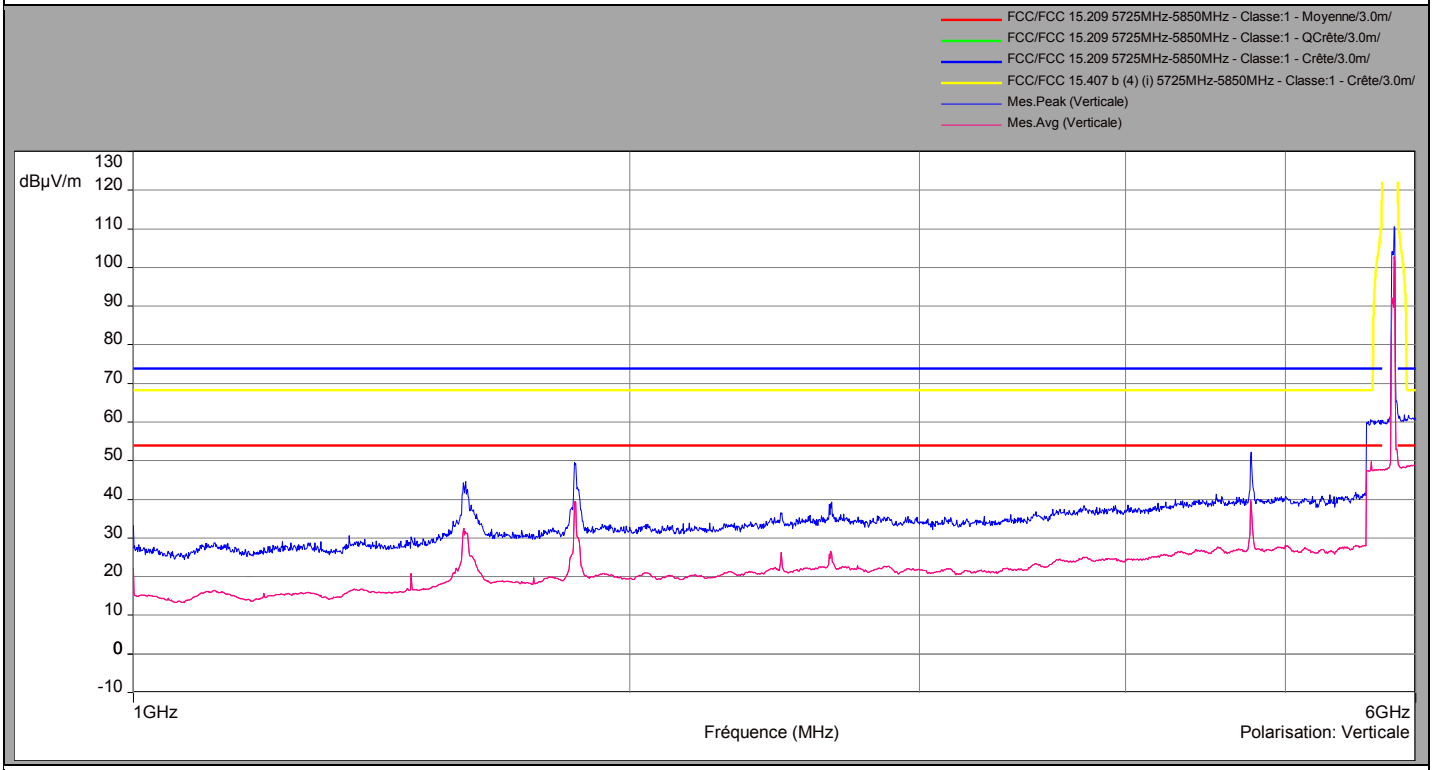
Horizontal Polarization



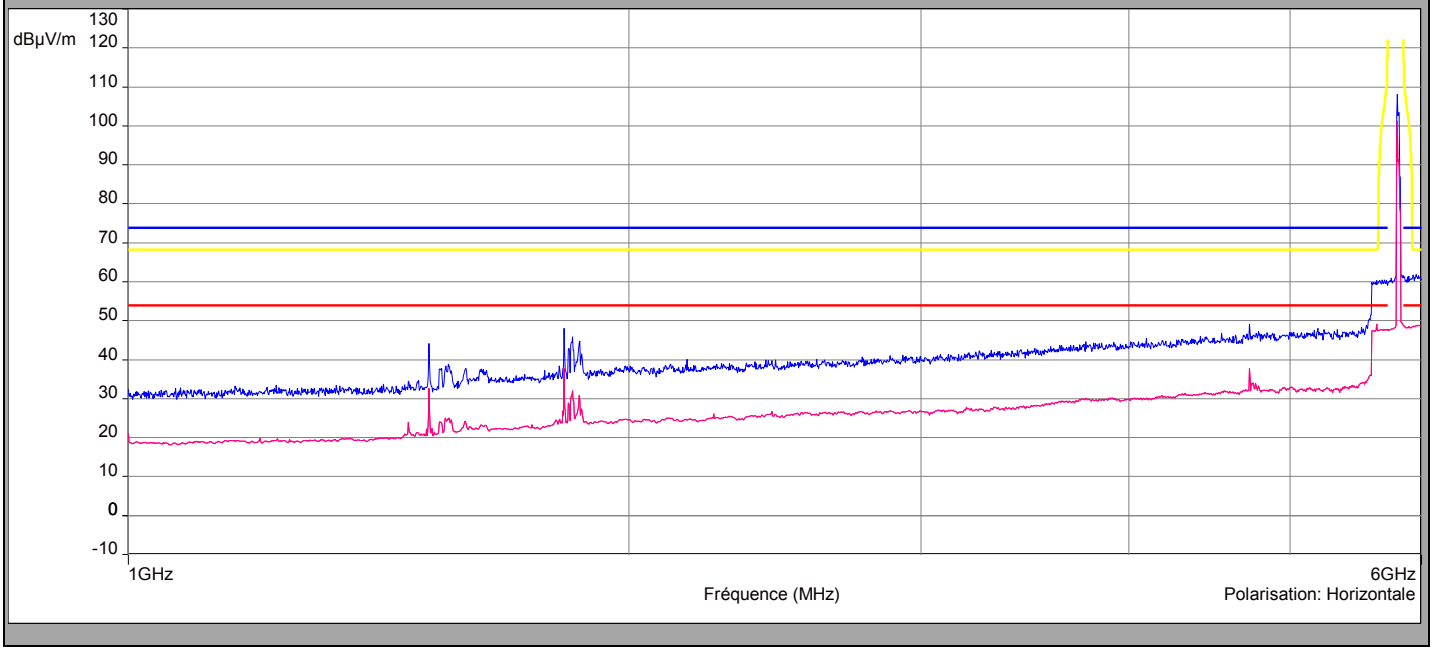
Configuration 2

Above 1GHz

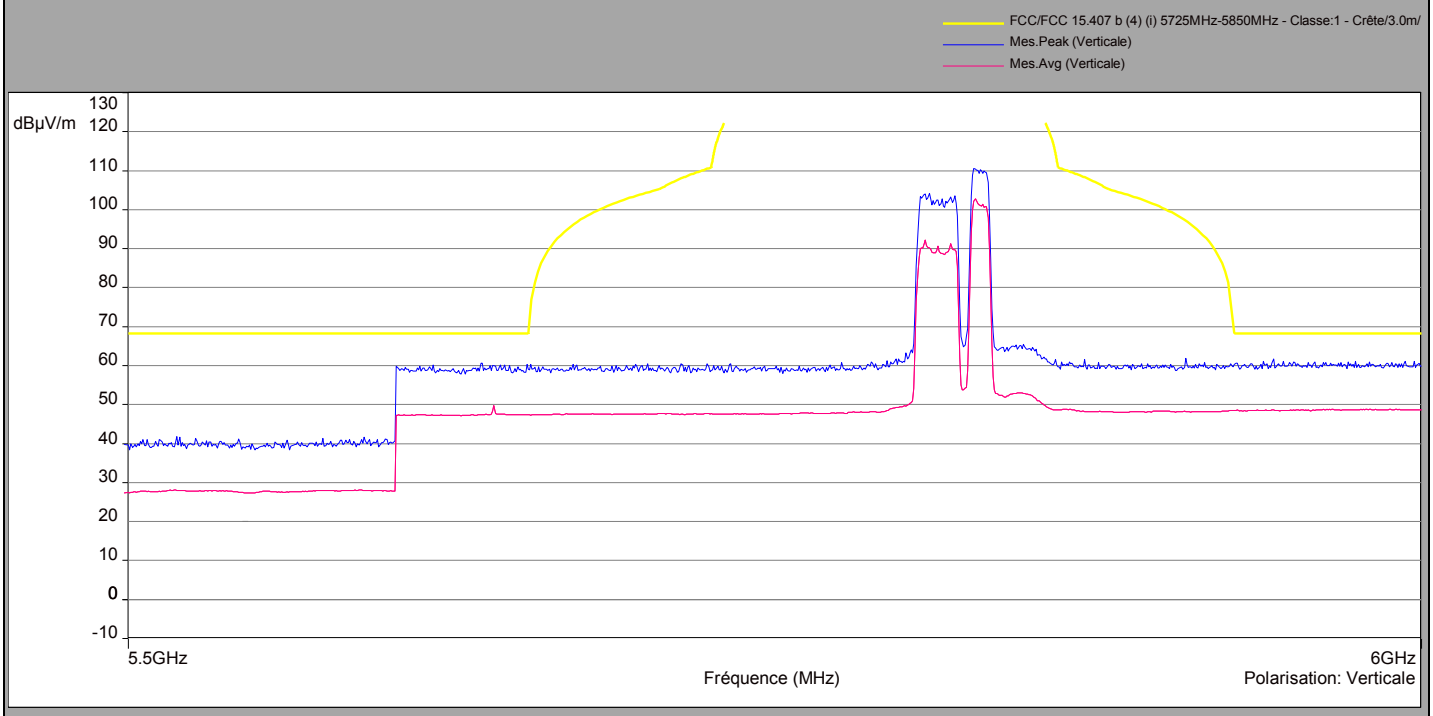
Vertical Polarization



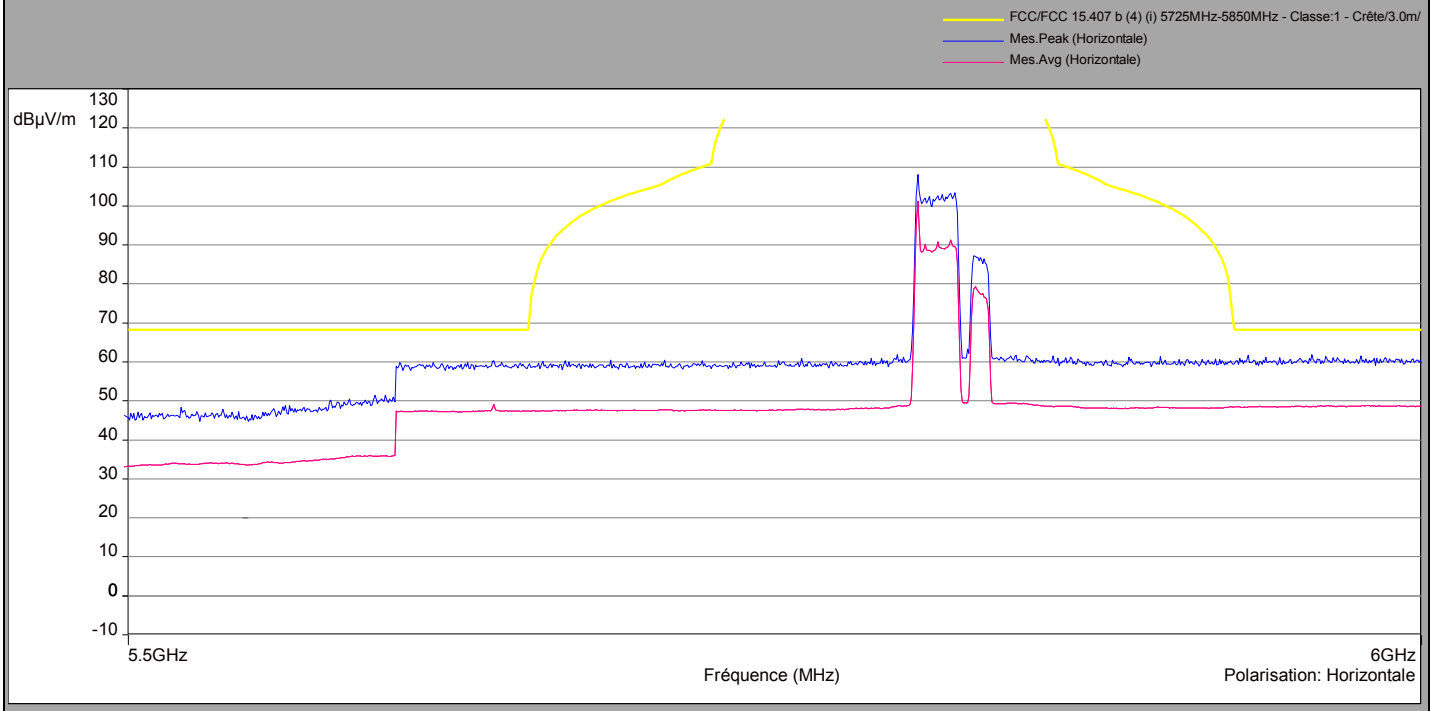
Horizontal Polarization



Configuration 2
Above 1GHz
Vertical Polarization



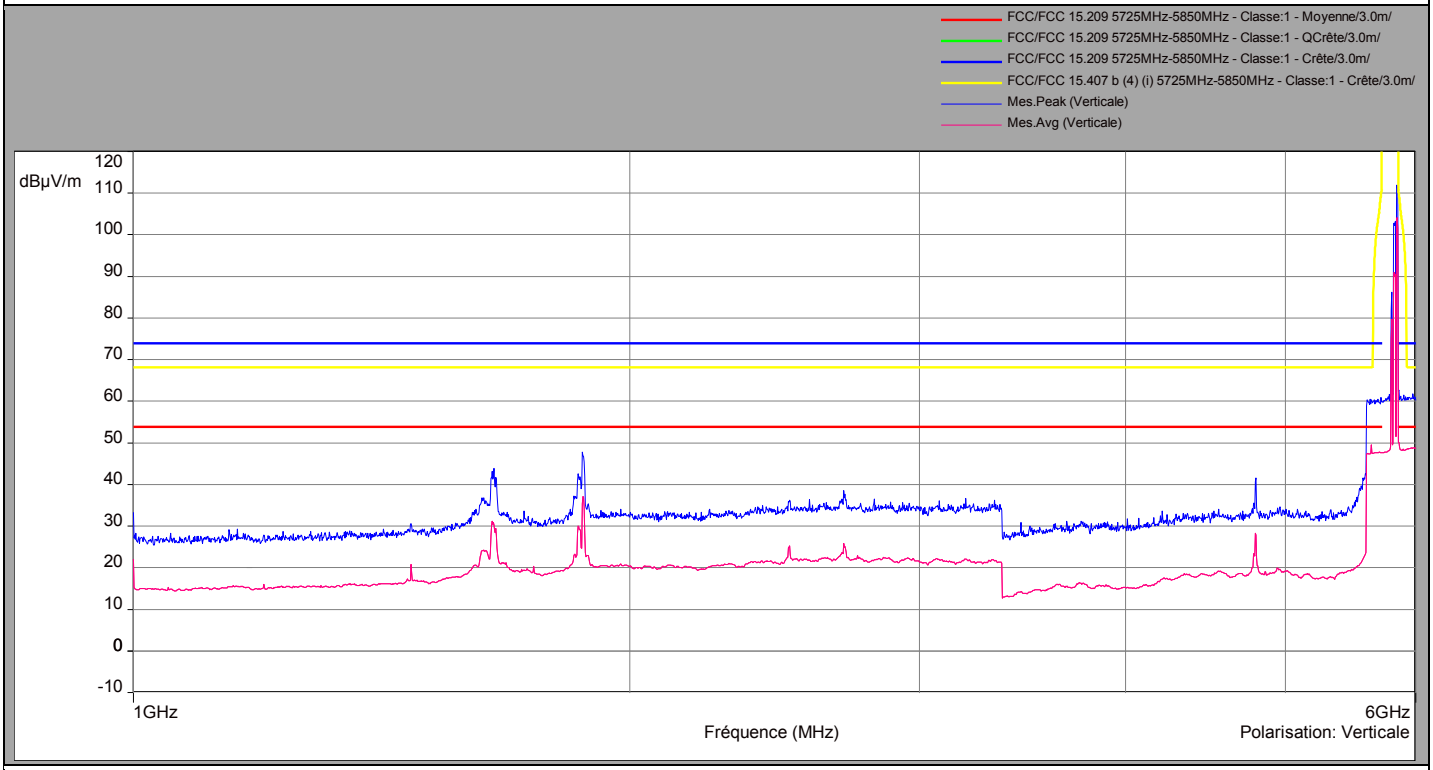
Horizontal Polarization



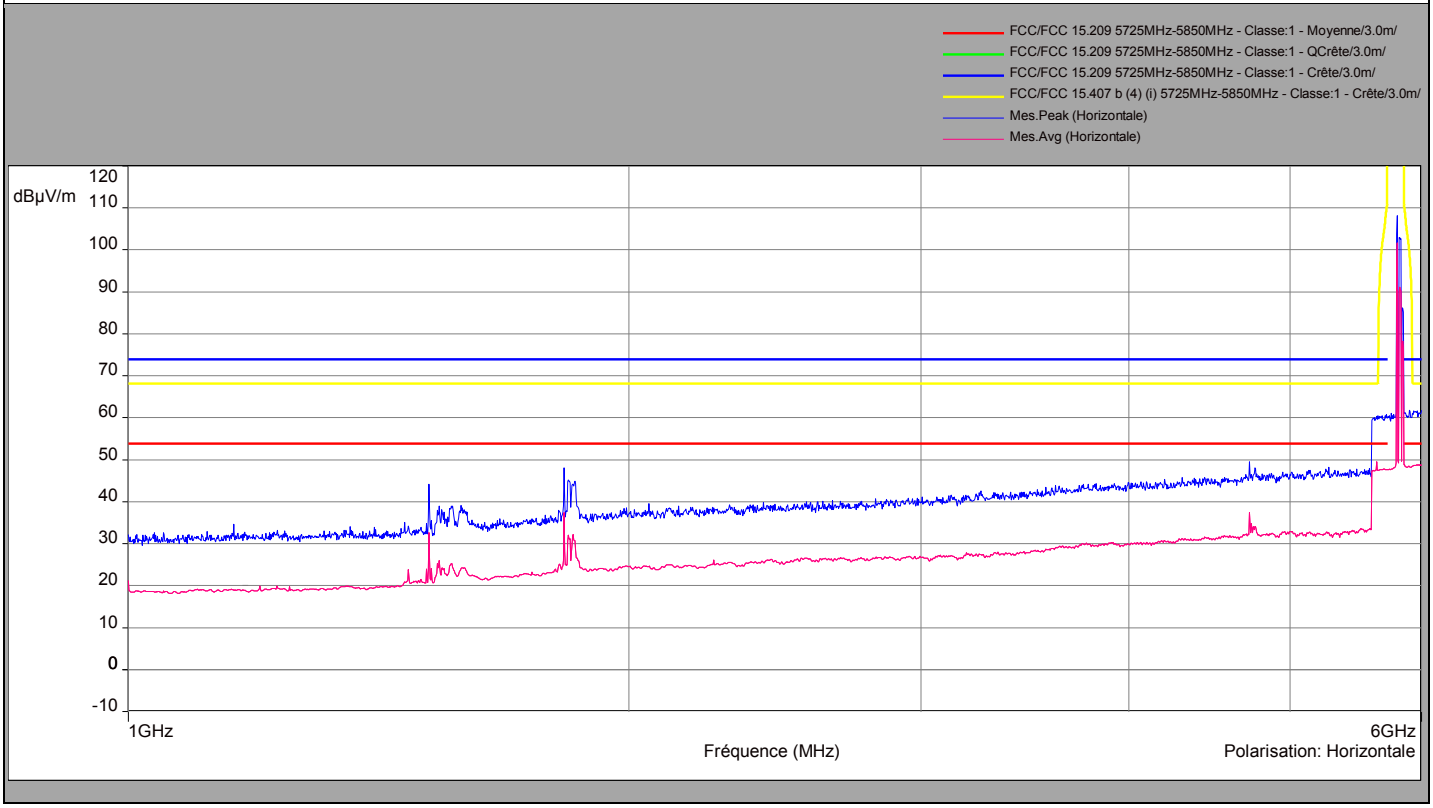
Configuration 3

Above 1GHz

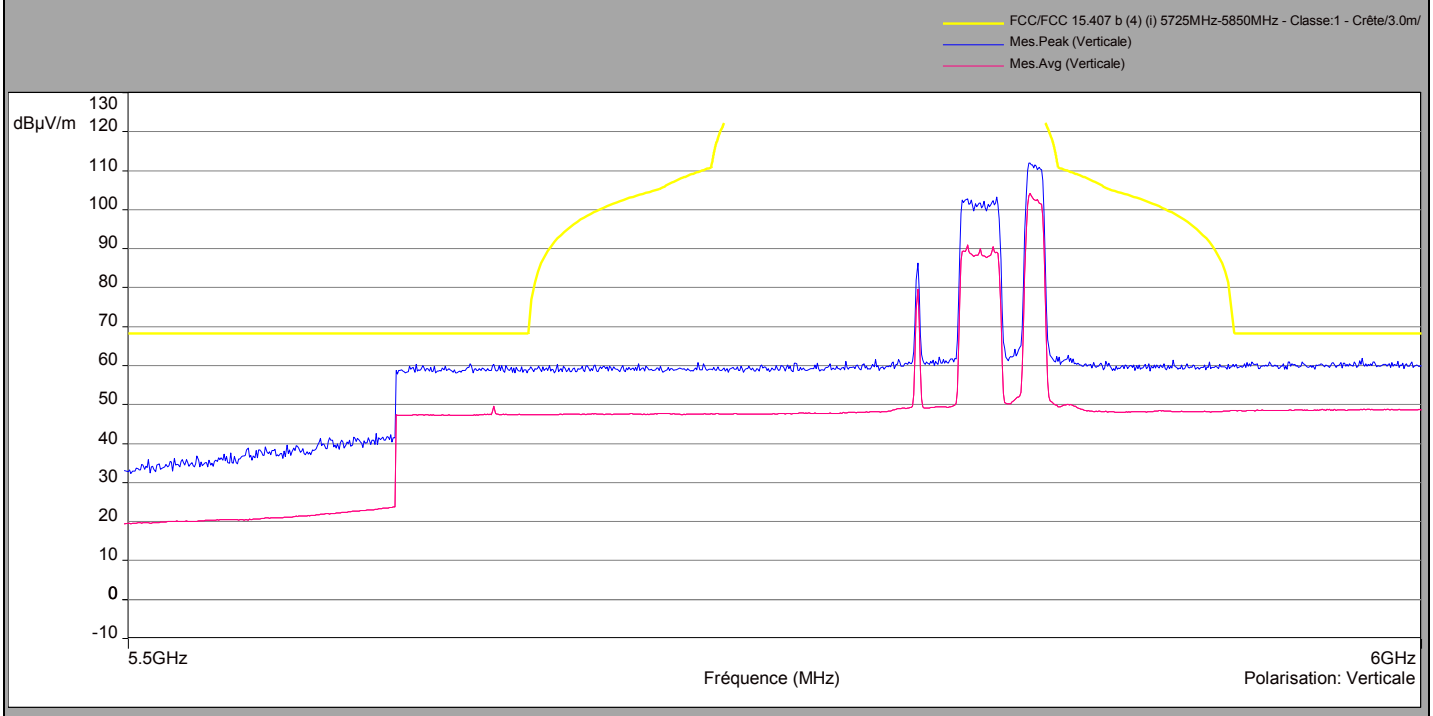
Vertical Polarization



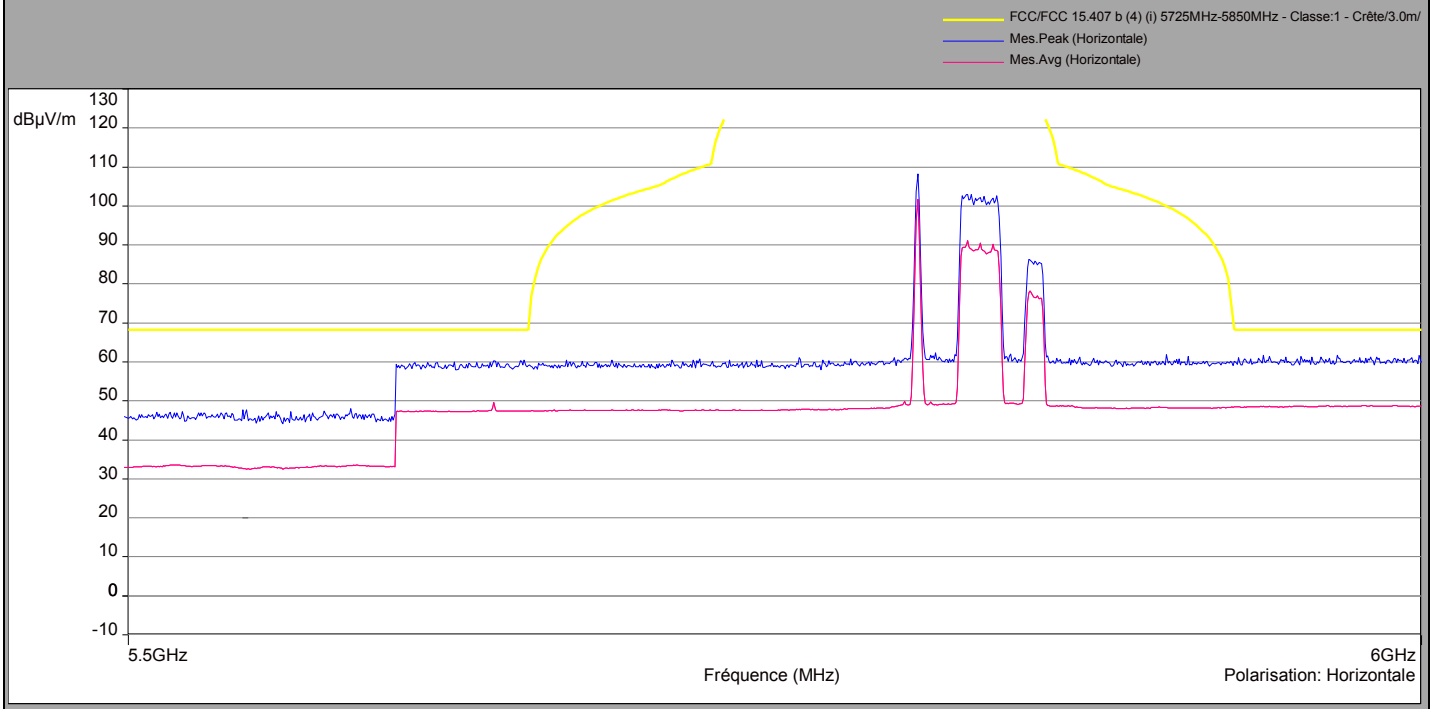
Horizontal Polarization



Configuration 3
Above 1GHz
Vertical Polarization



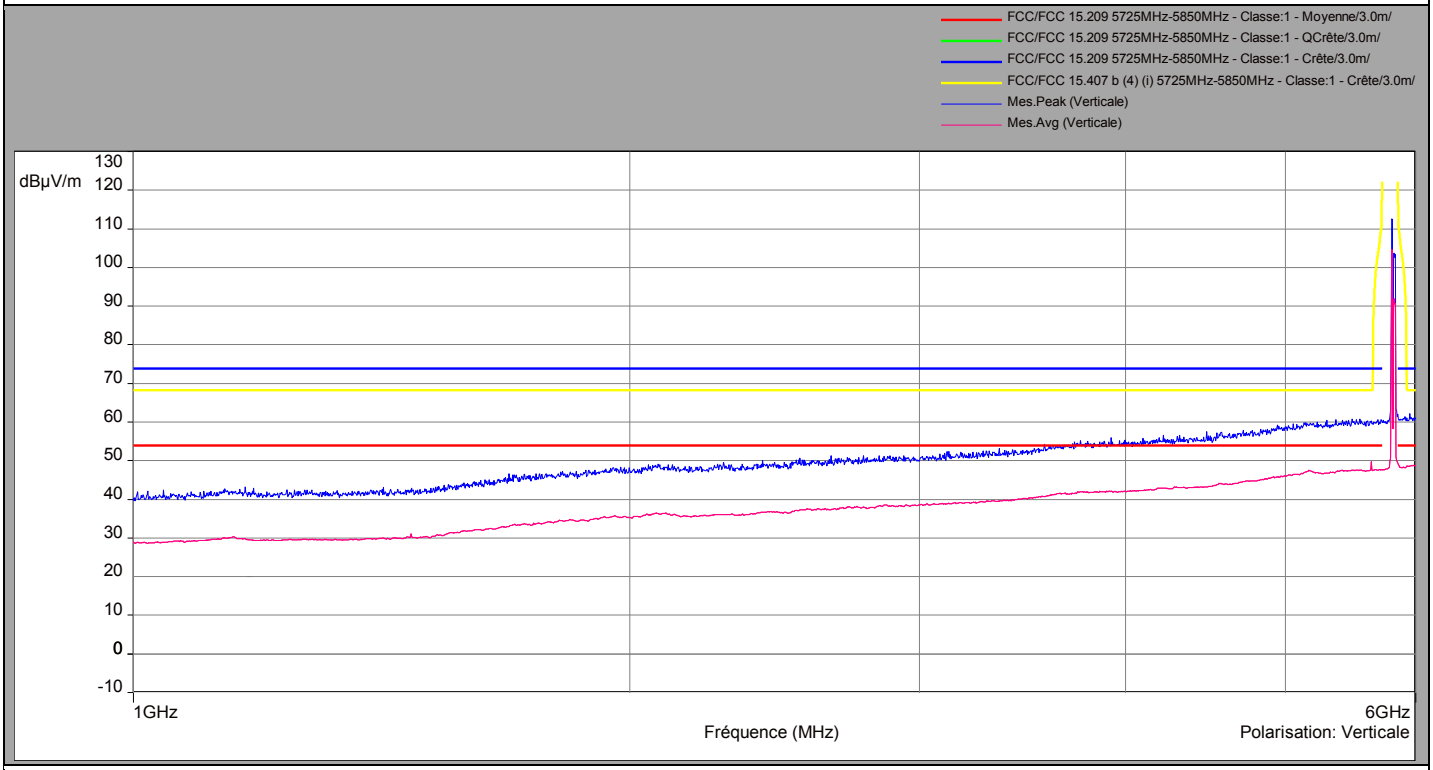
Horizontal Polarization



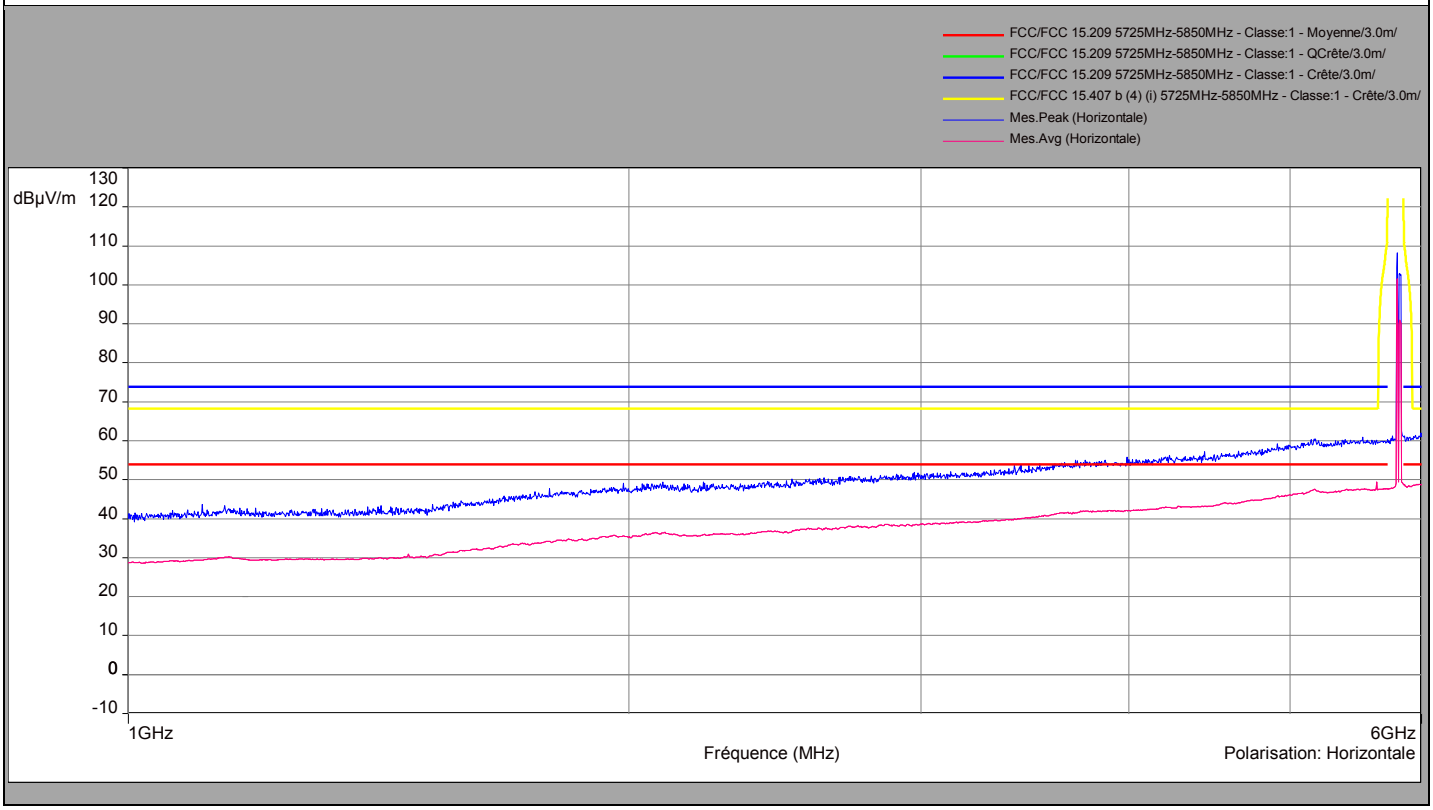
Configuration 4

Above 1GHz

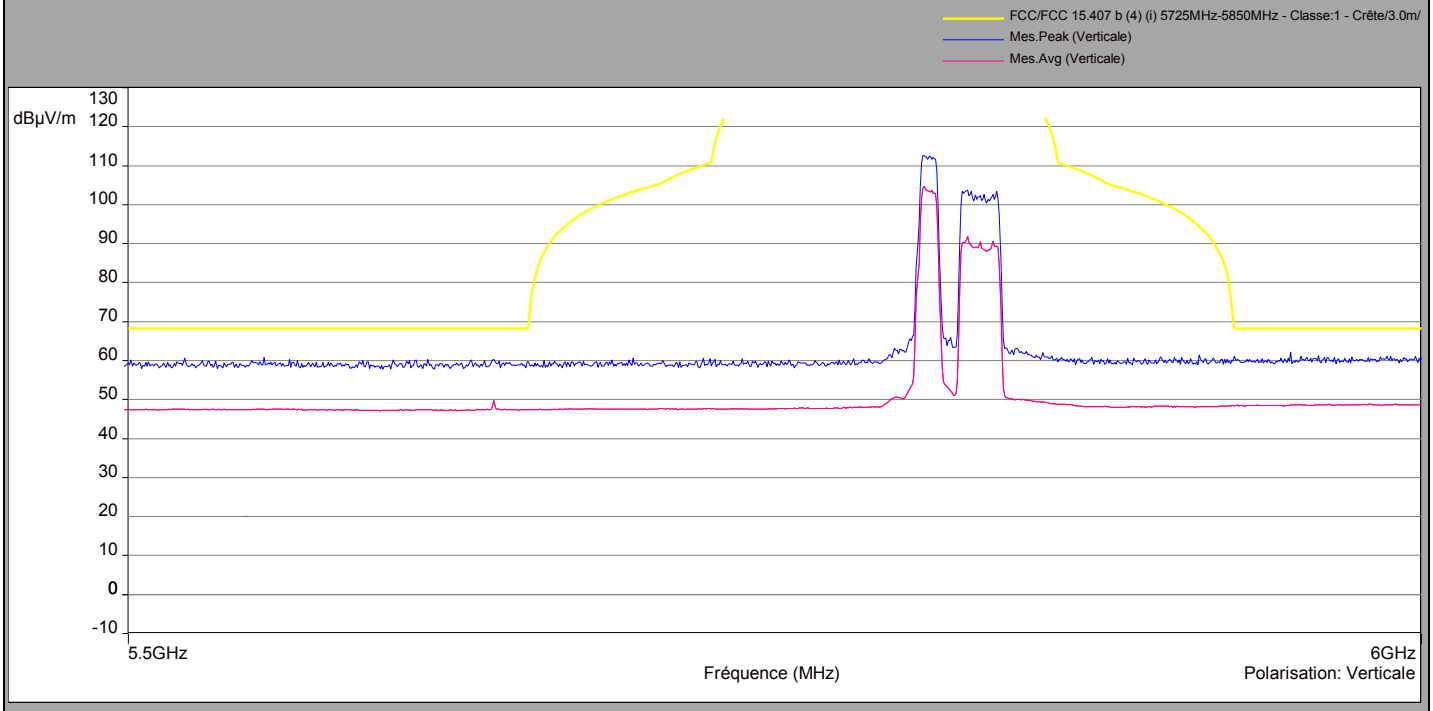
Vertical Polarization



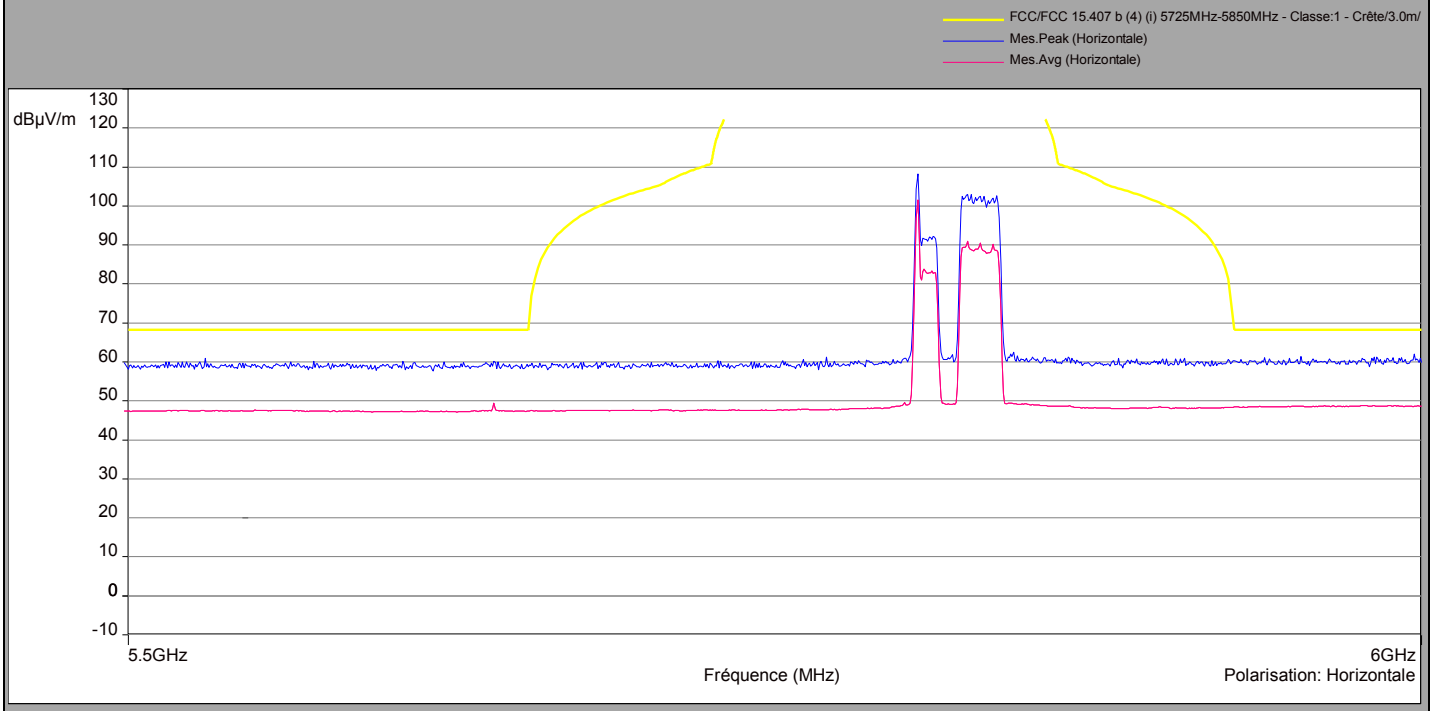
Horizontal Polarization



Configuration 4
Above 1GHz
Vertical Polarization



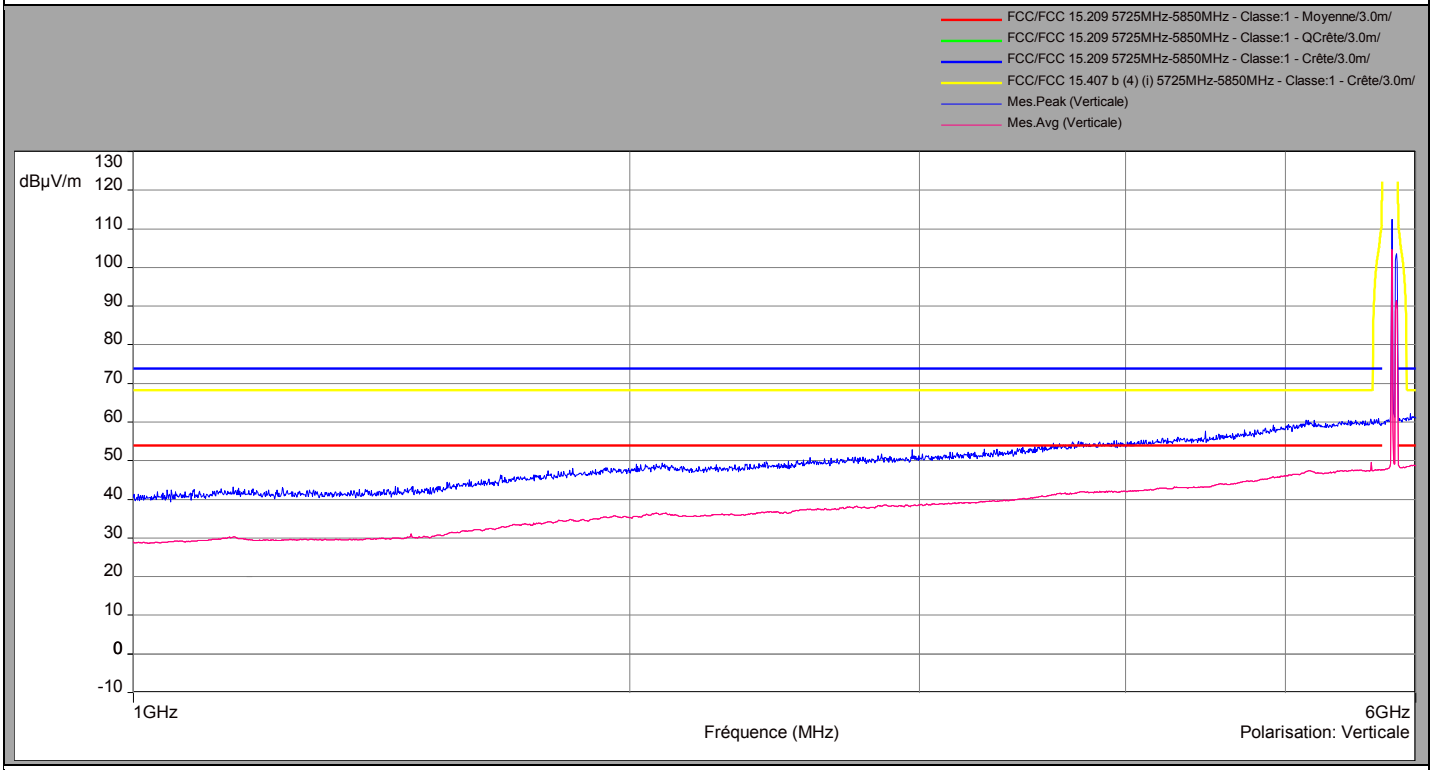
Horizontal Polarization



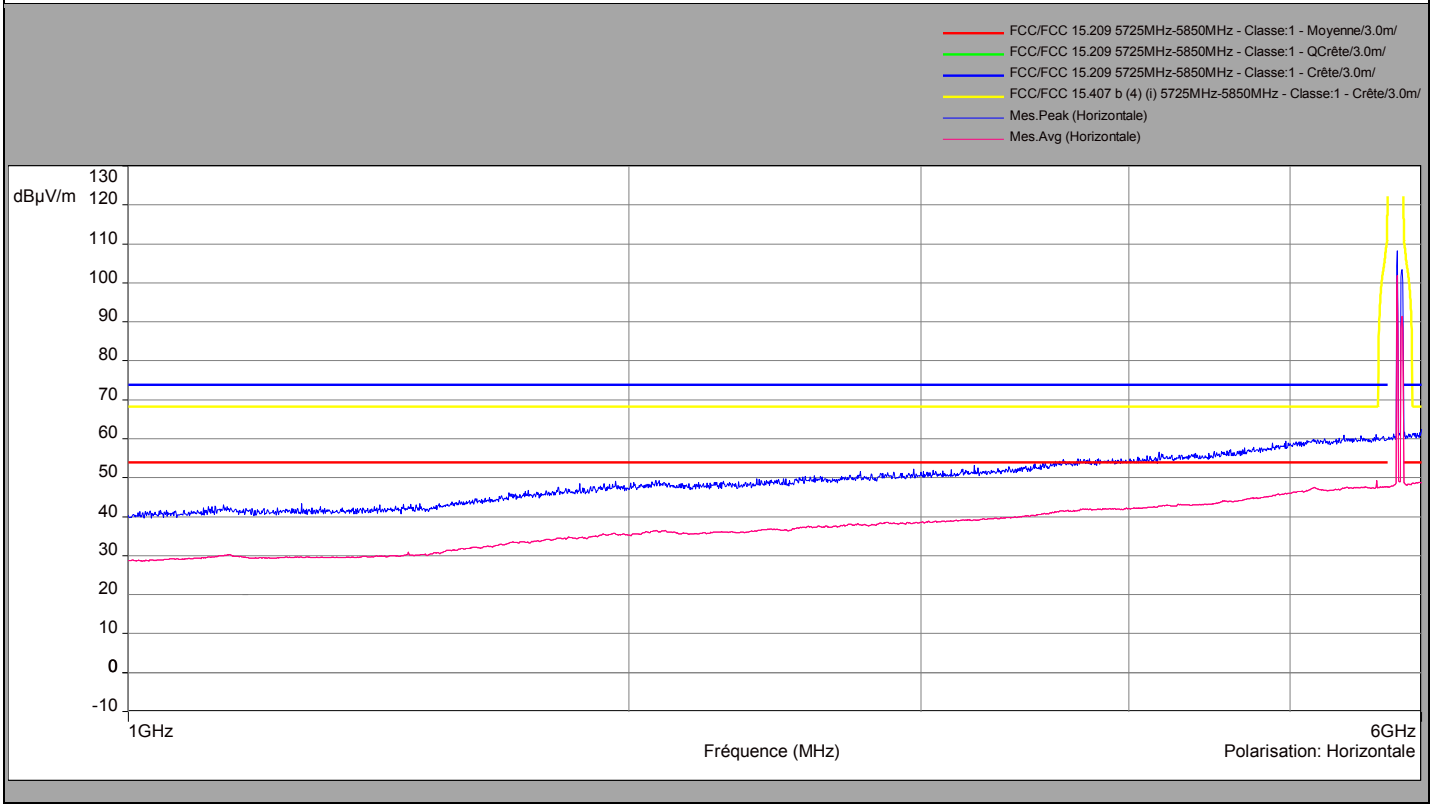
Configuration 5

Above 1GHz

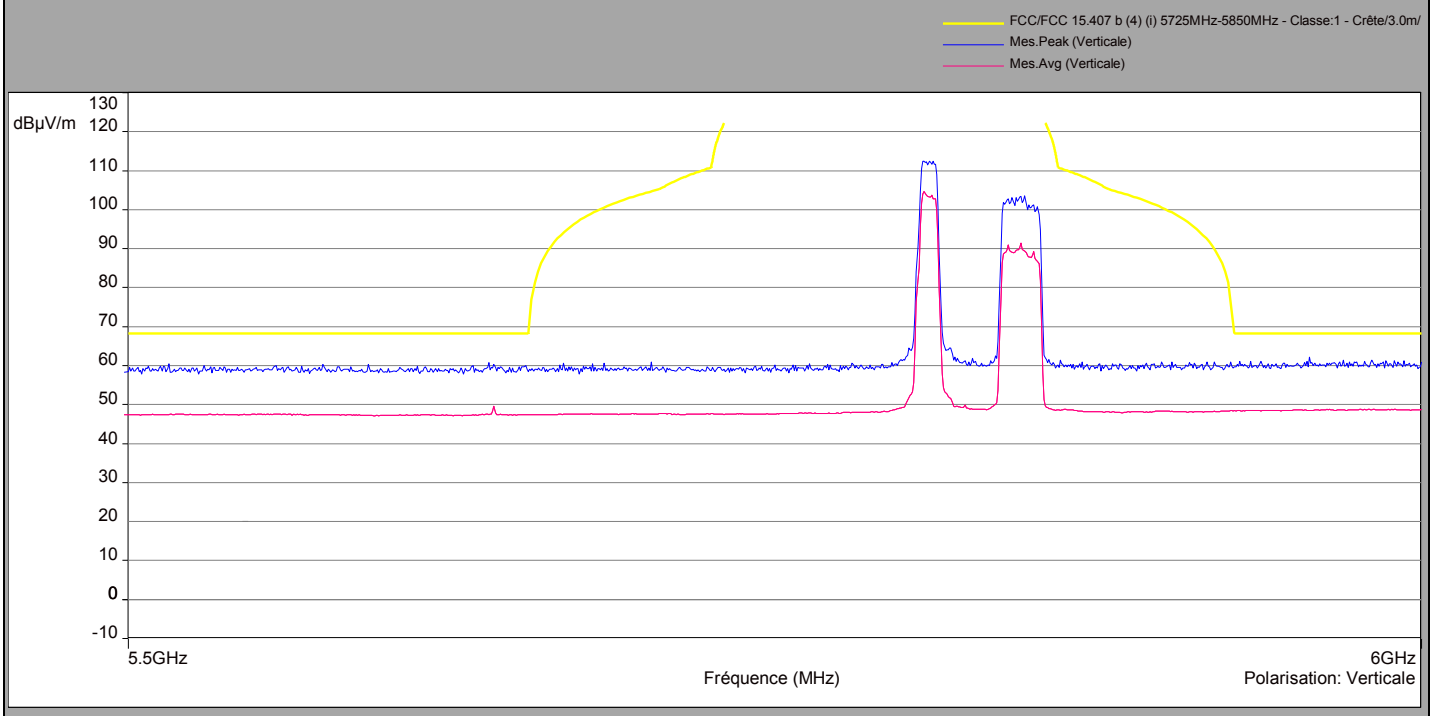
Vertical Polarization



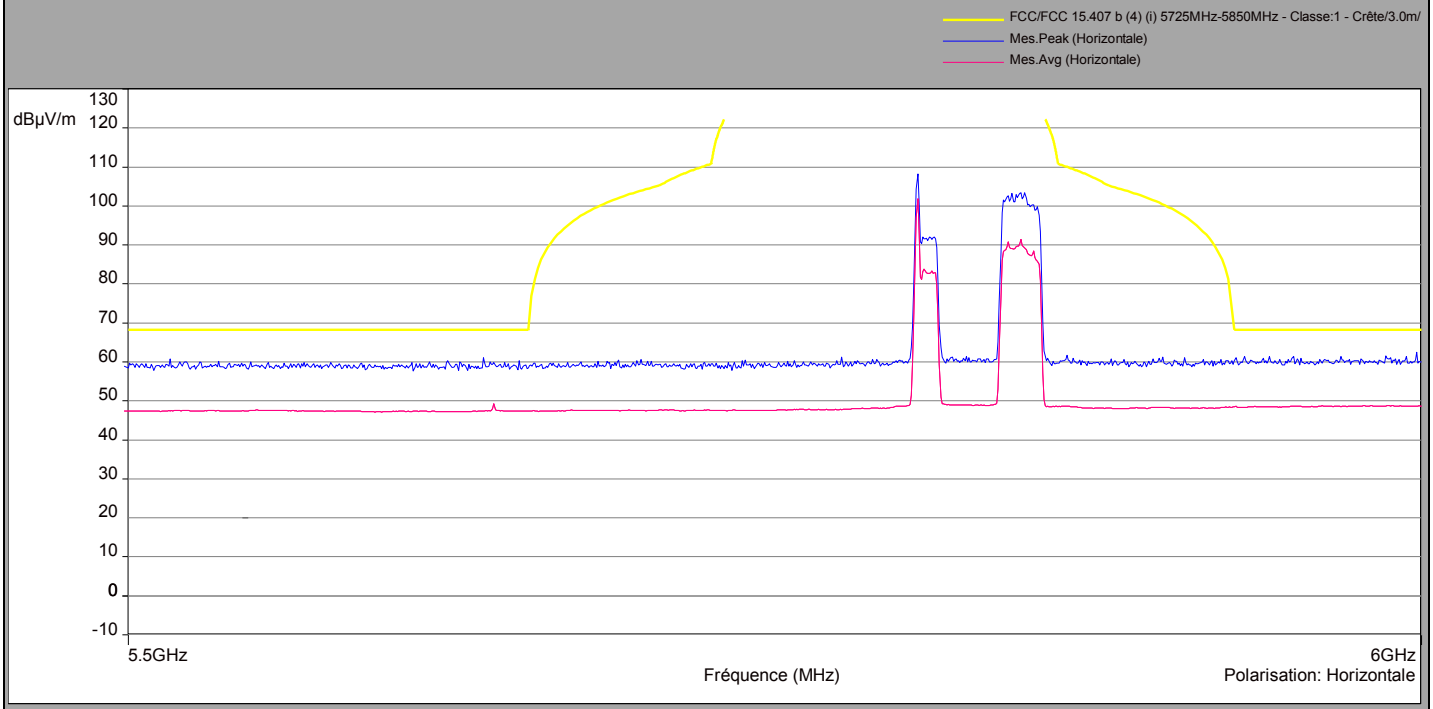
Horizontal Polarization



Configuration 5
Above 1GHz
Vertical Polarization



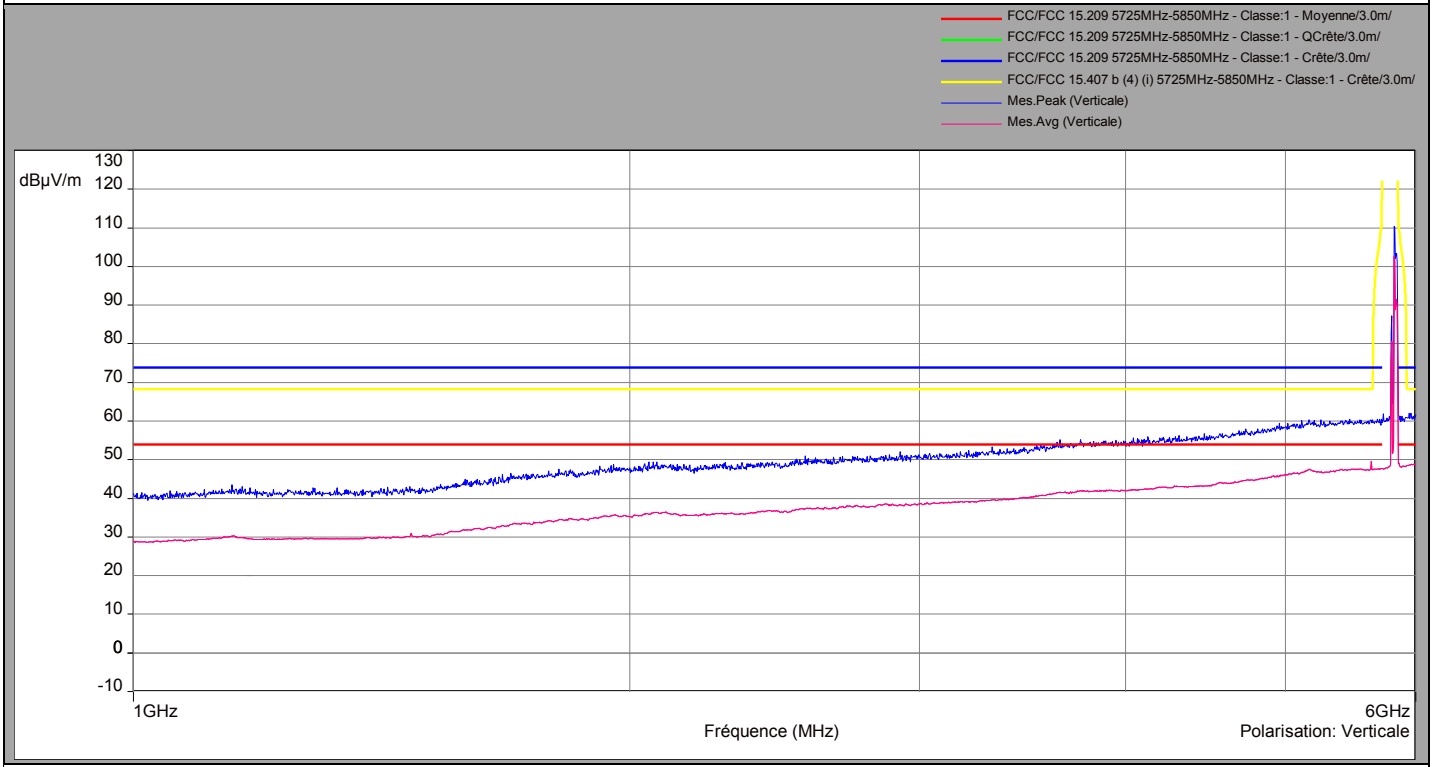
Horizontal Polarization



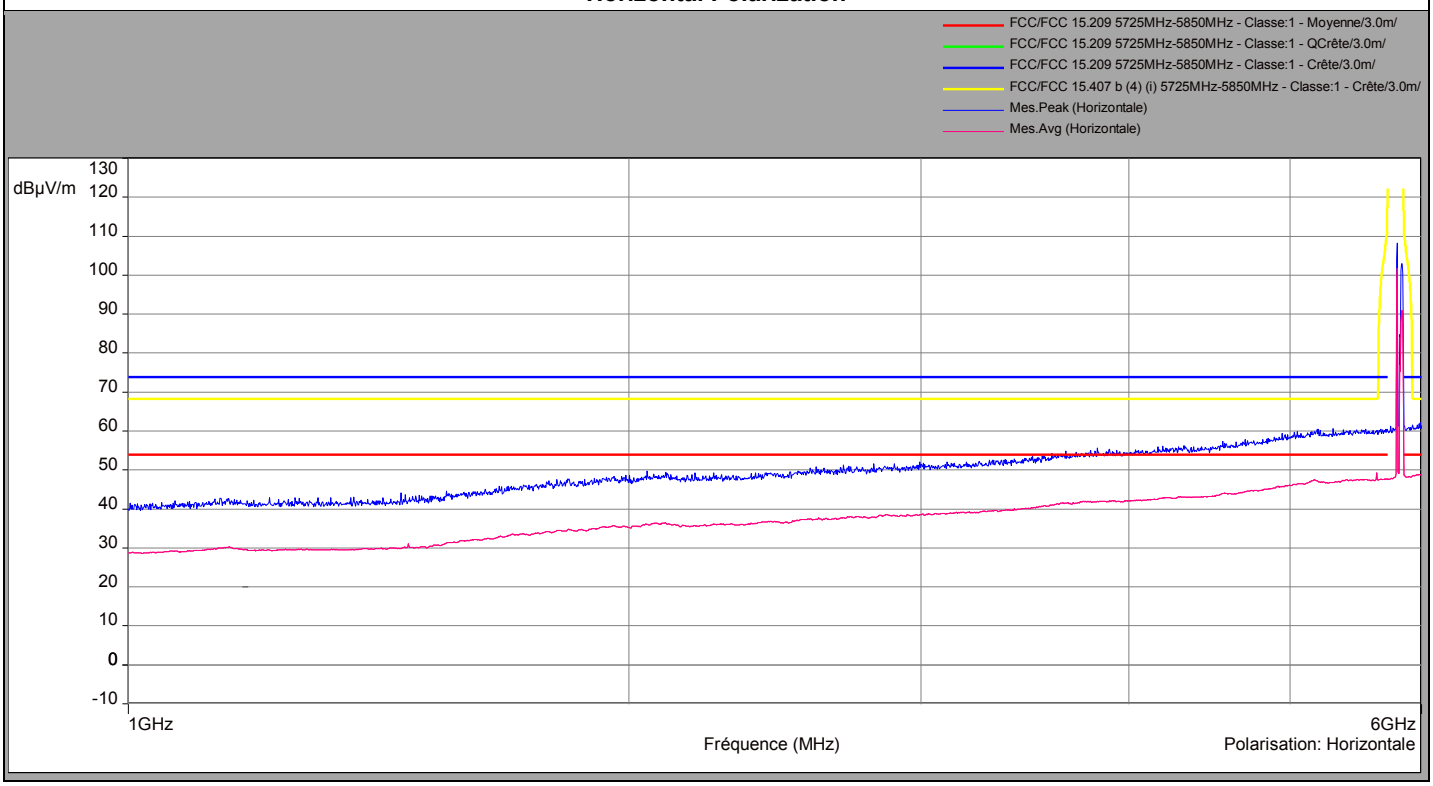
Configuration 6

Above 1GHz

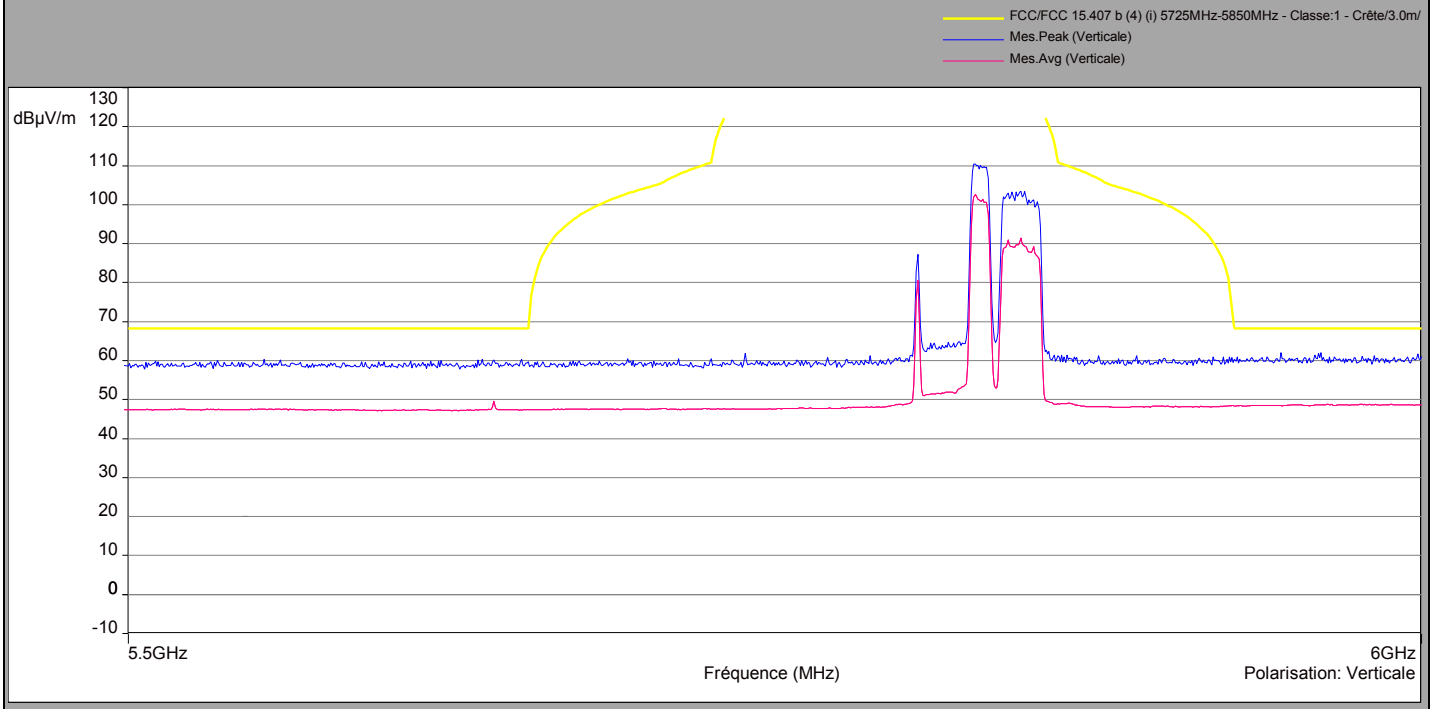
Vertical Polarization



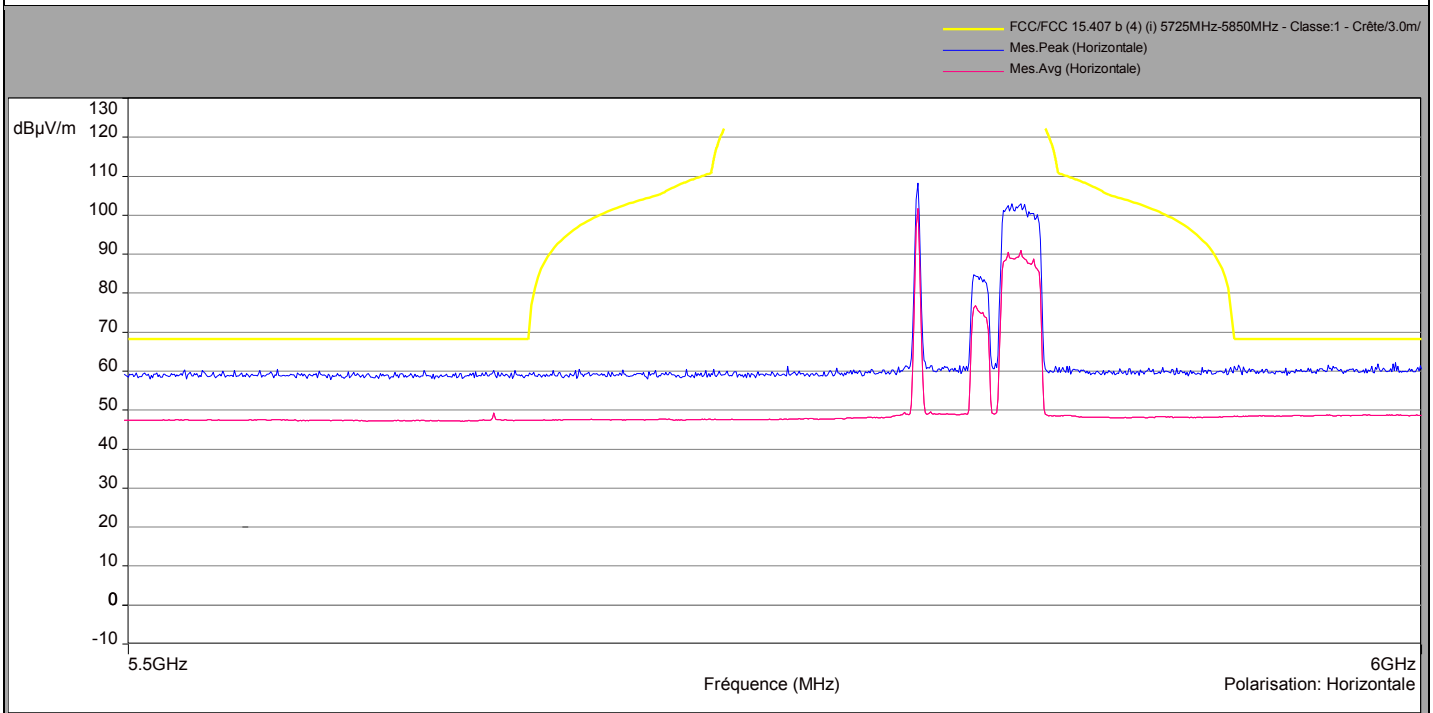
Horizontal Polarization



Configuration 6
Above 1GHz
Vertical Polarization



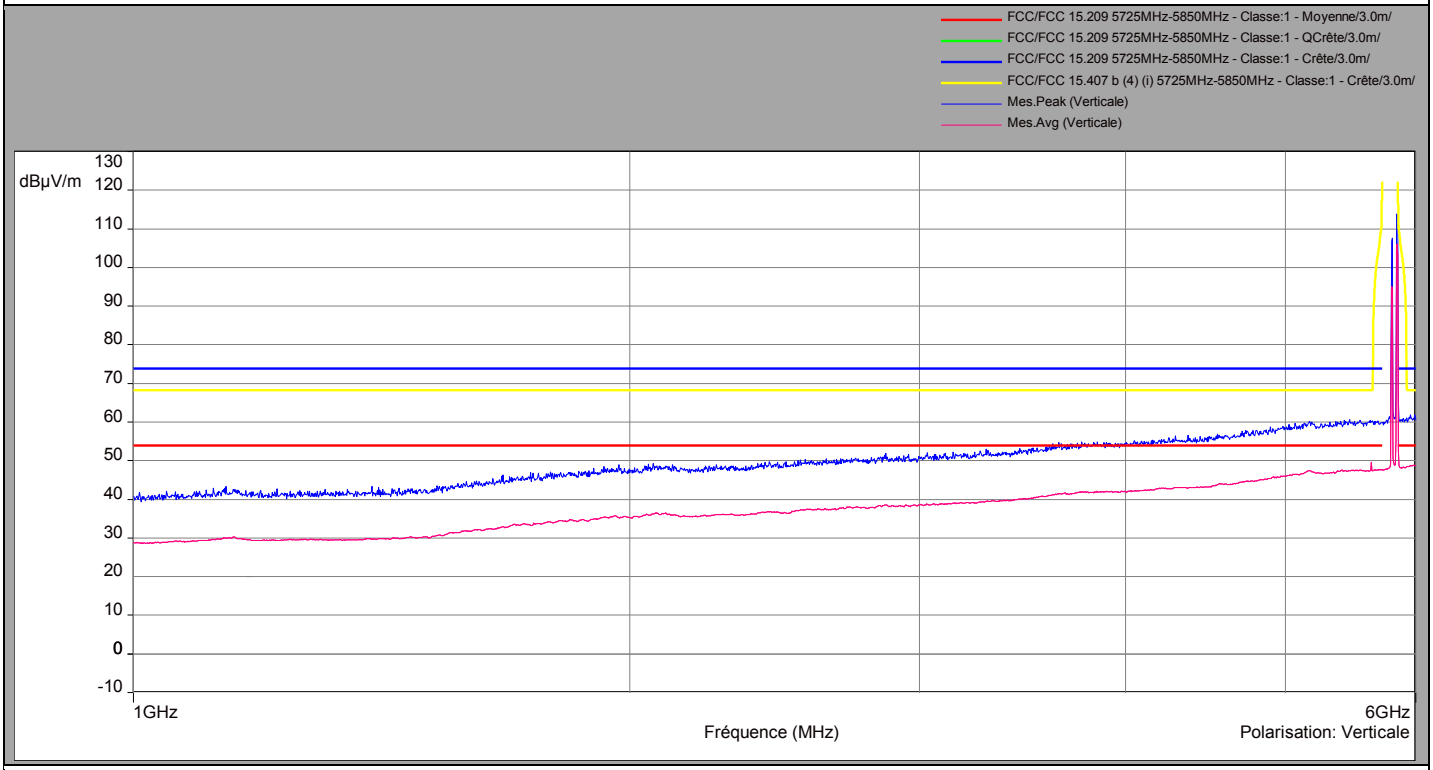
Horizontal Polarization



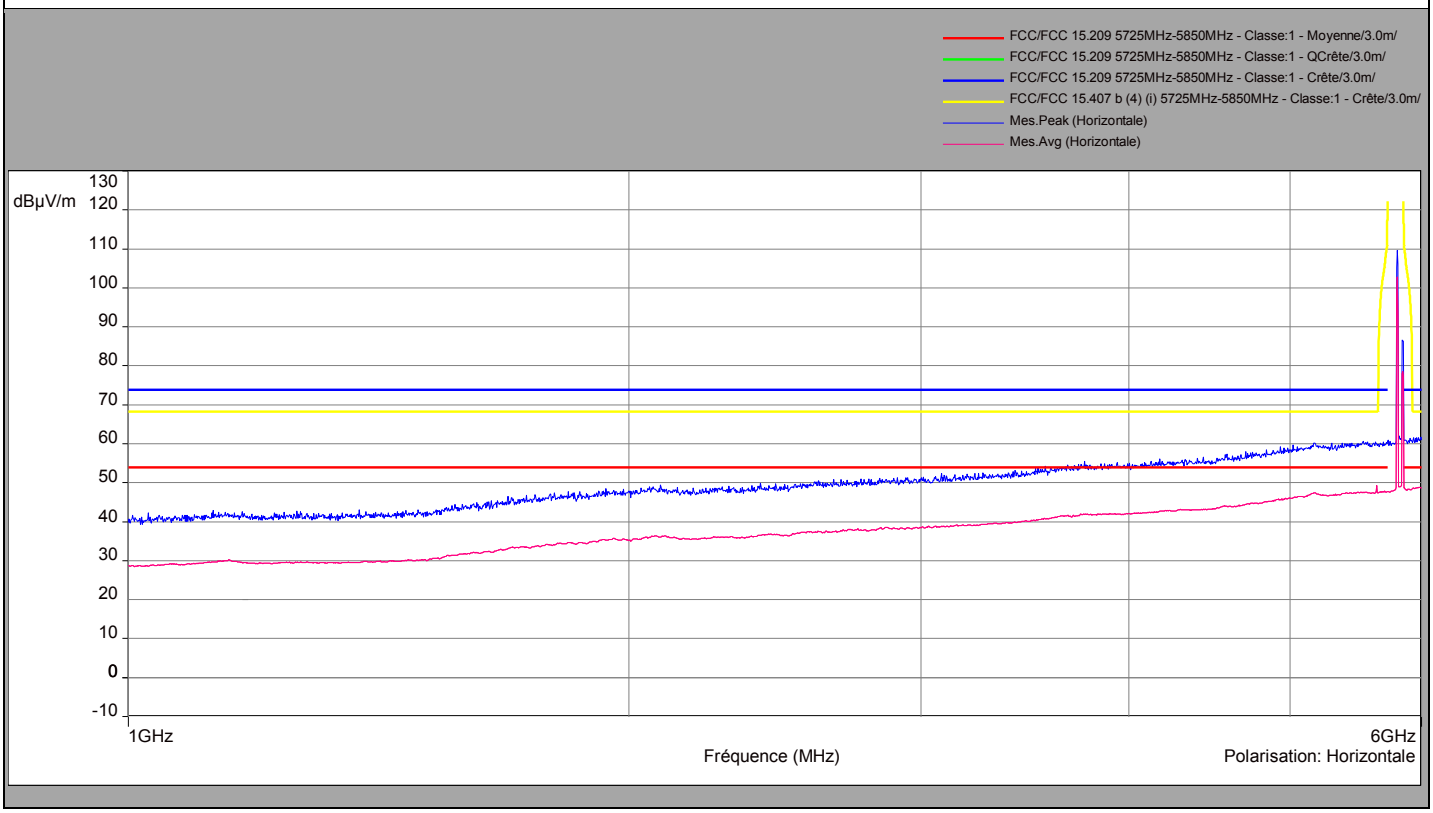
Configuration 7

Above 1GHz

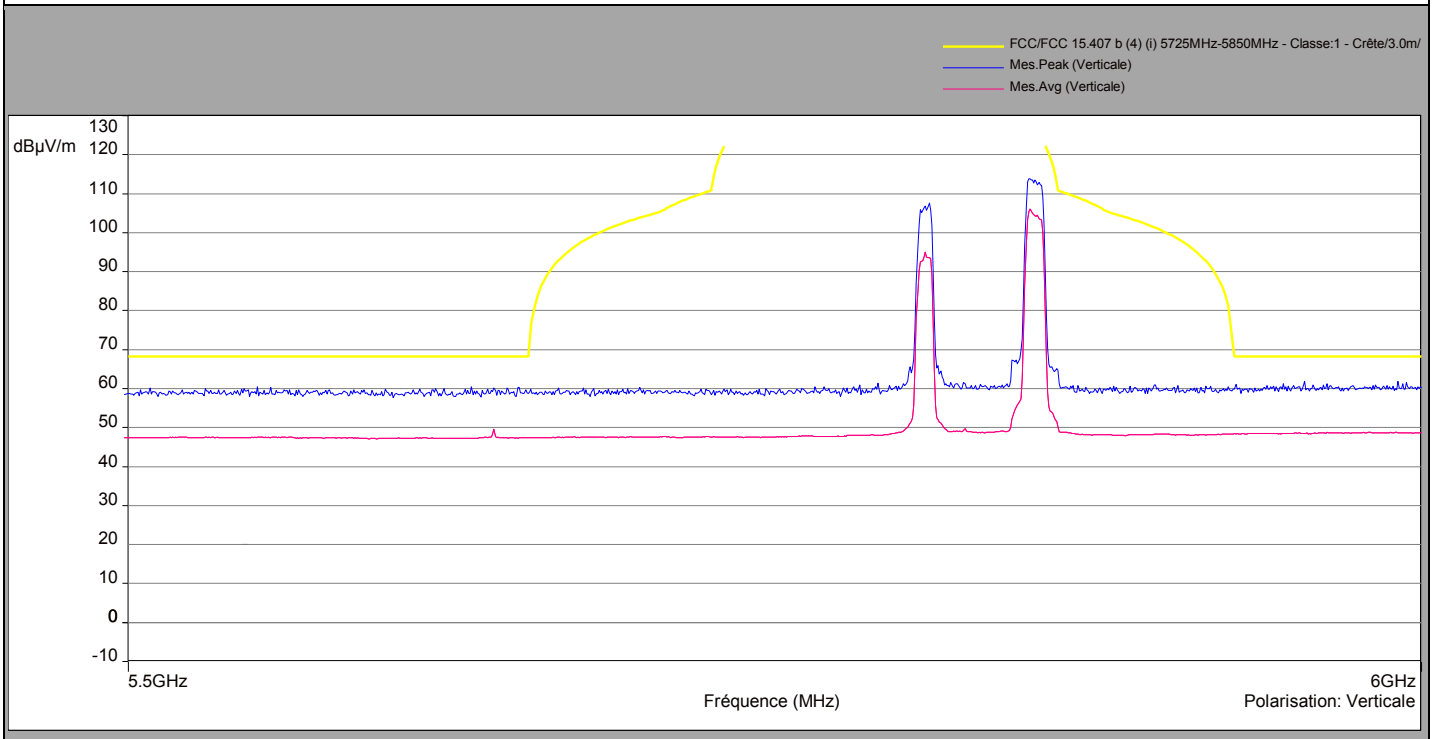
Vertical Polarization



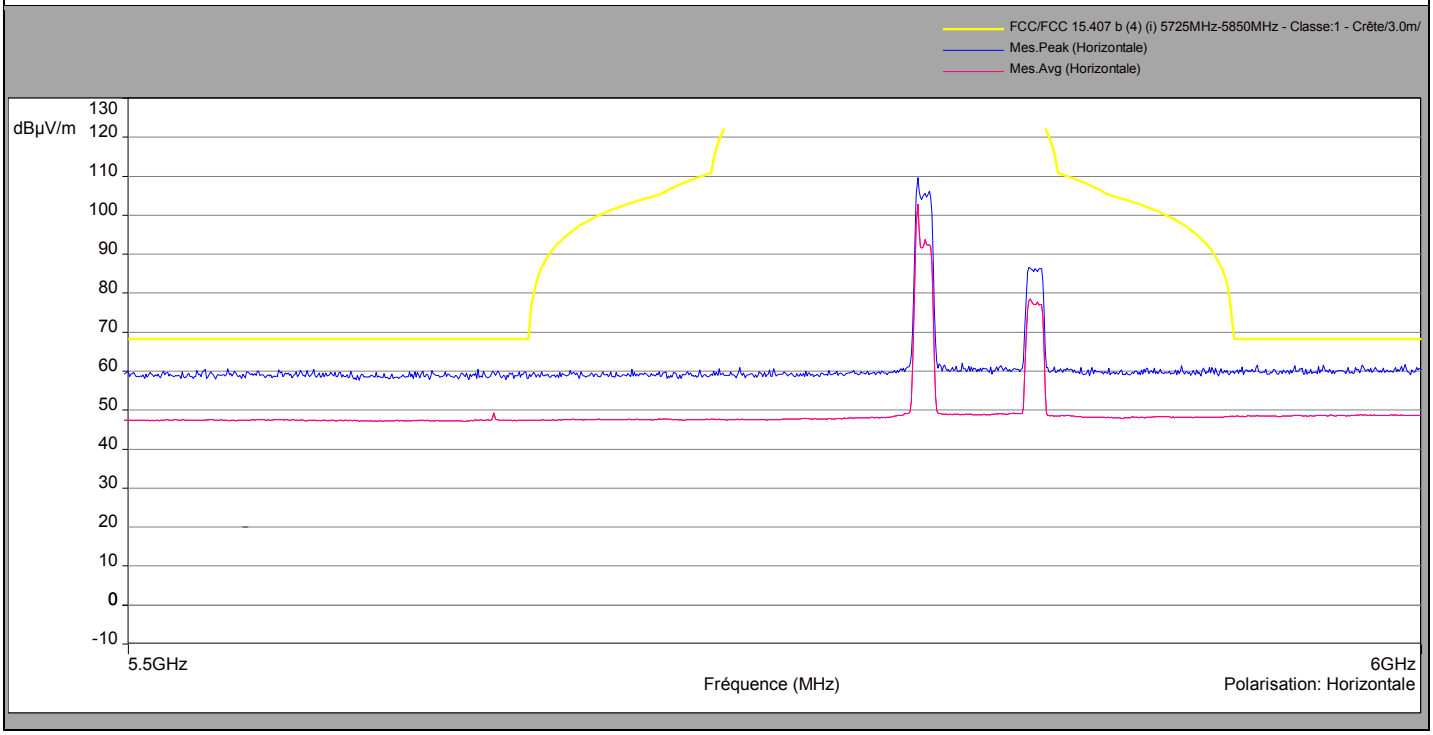
Horizontal Polarization



Configuration 7
Above 1GHz
Vertical Polarization



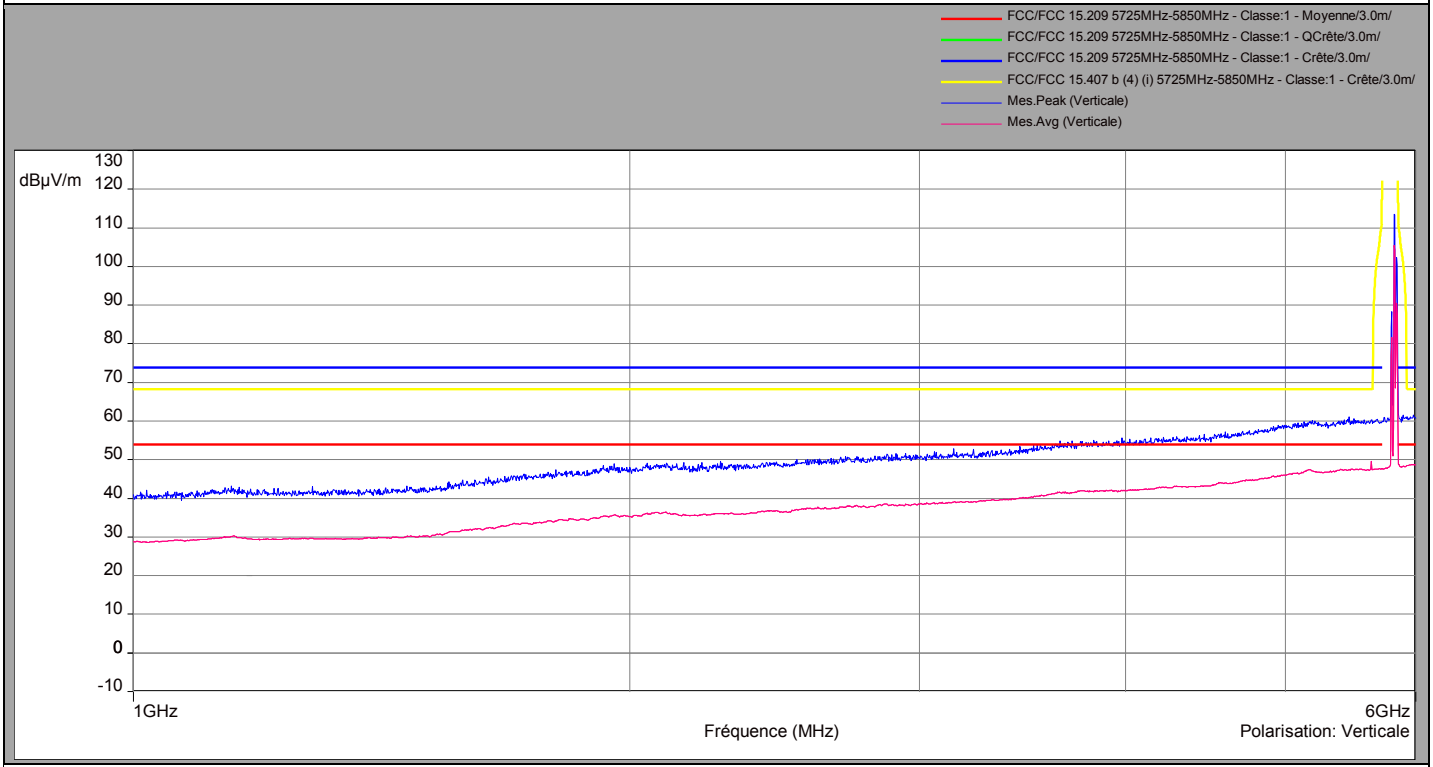
Horizontal Polarization



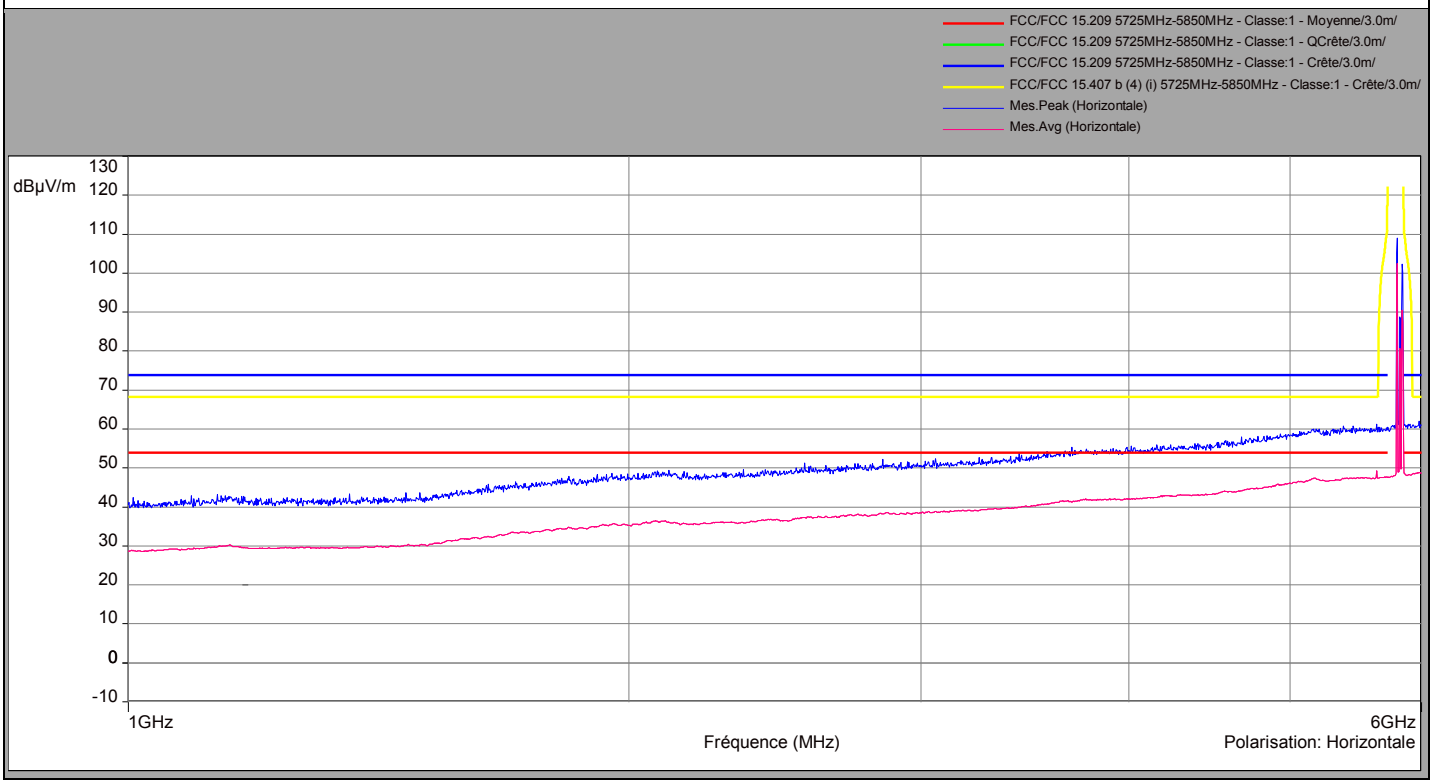
Configuration 8

Above 1GHz

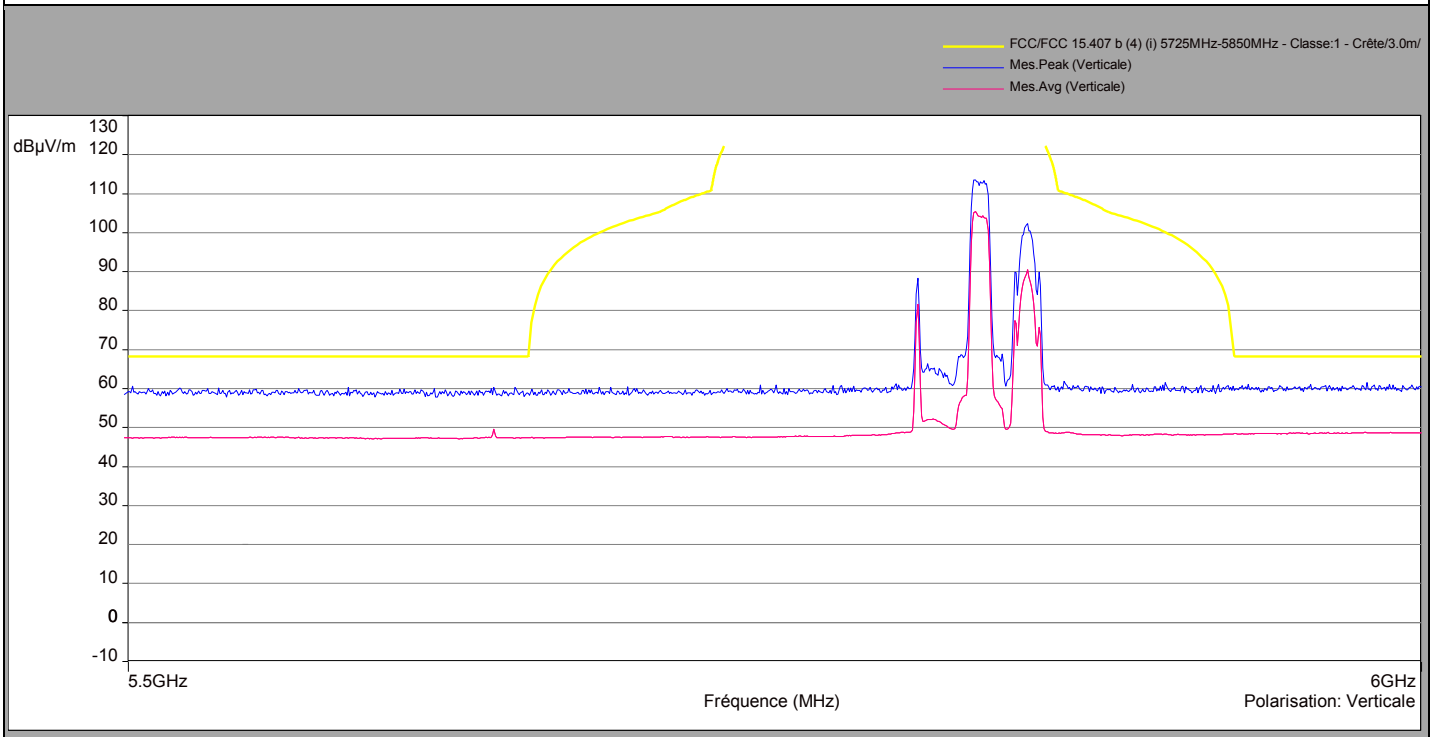
Vertical Polarization



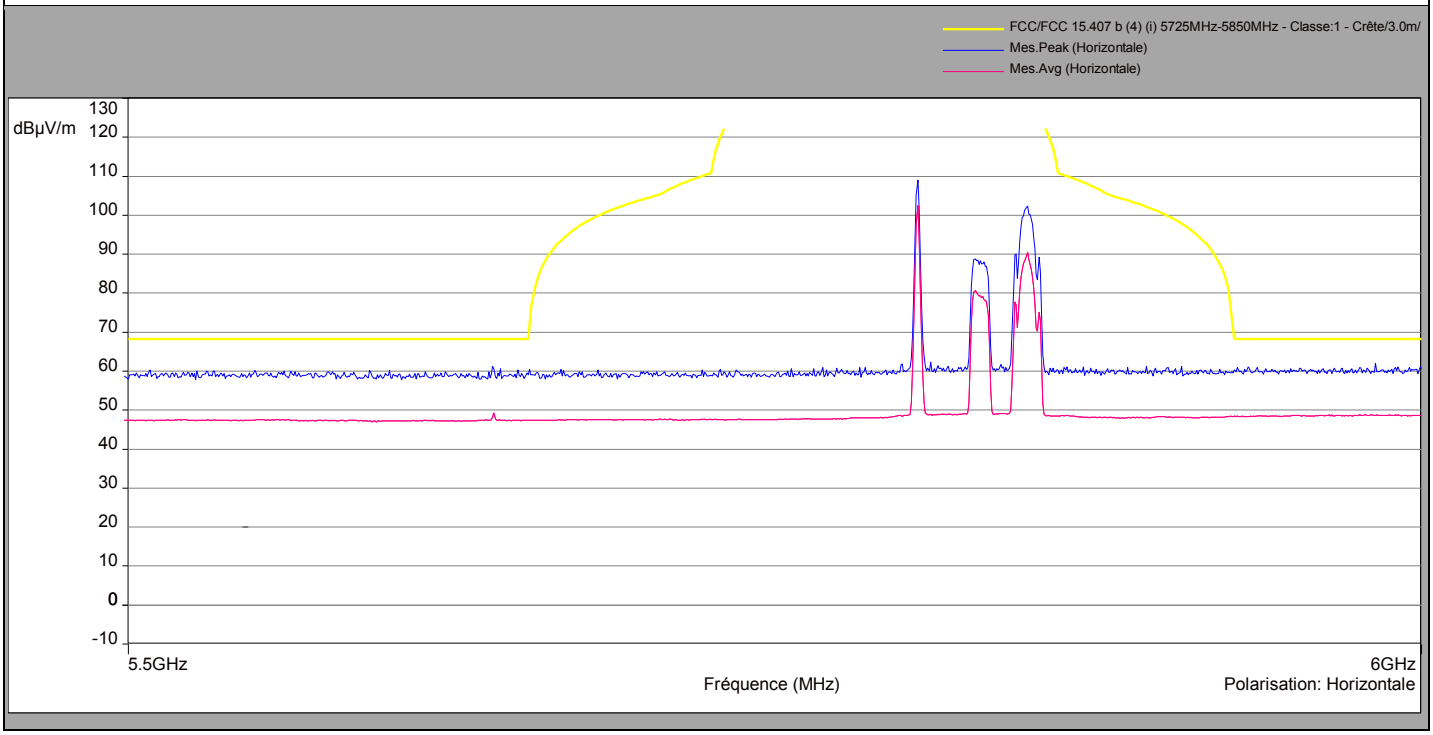
Horizontal Polarization



Configuration 8
Above 1GHz
Vertical Polarization



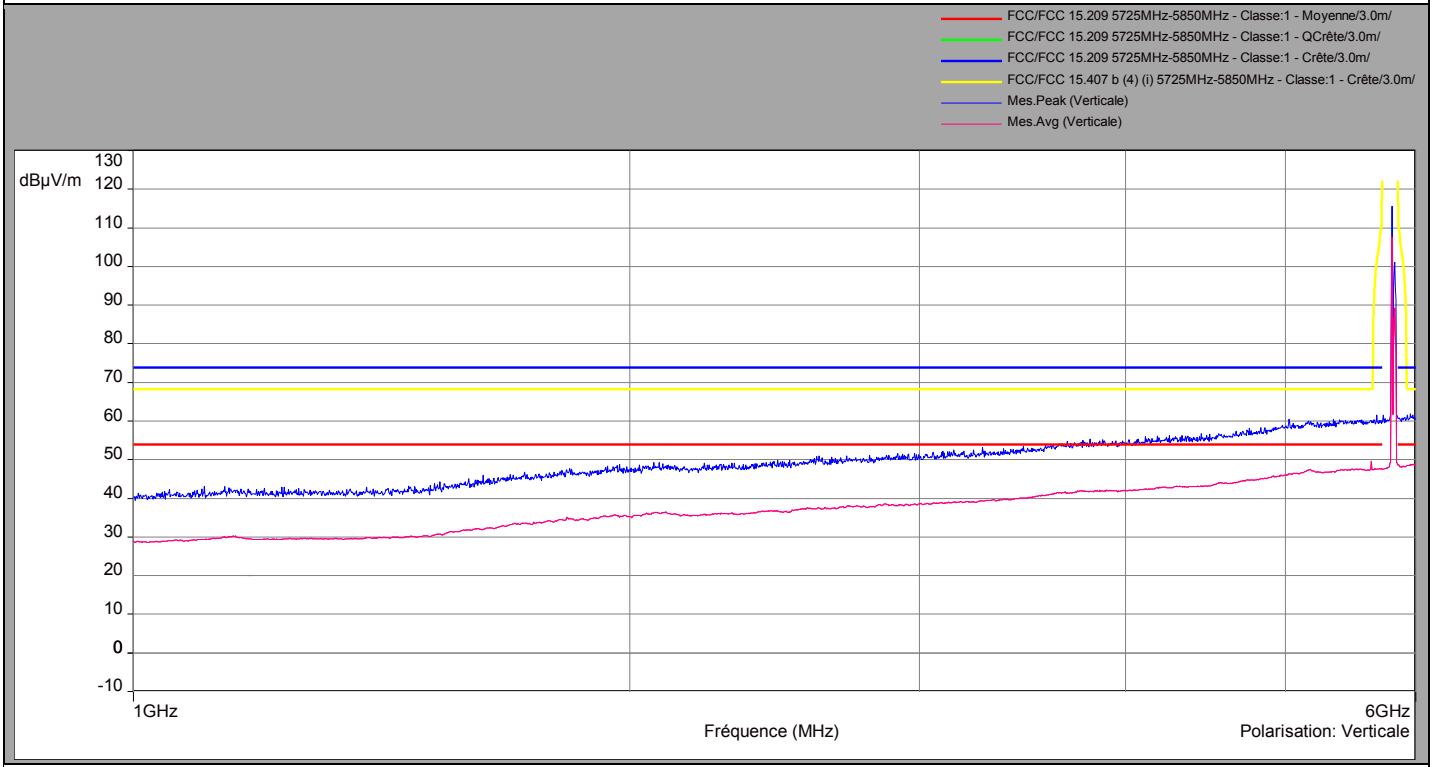
Horizontal Polarization



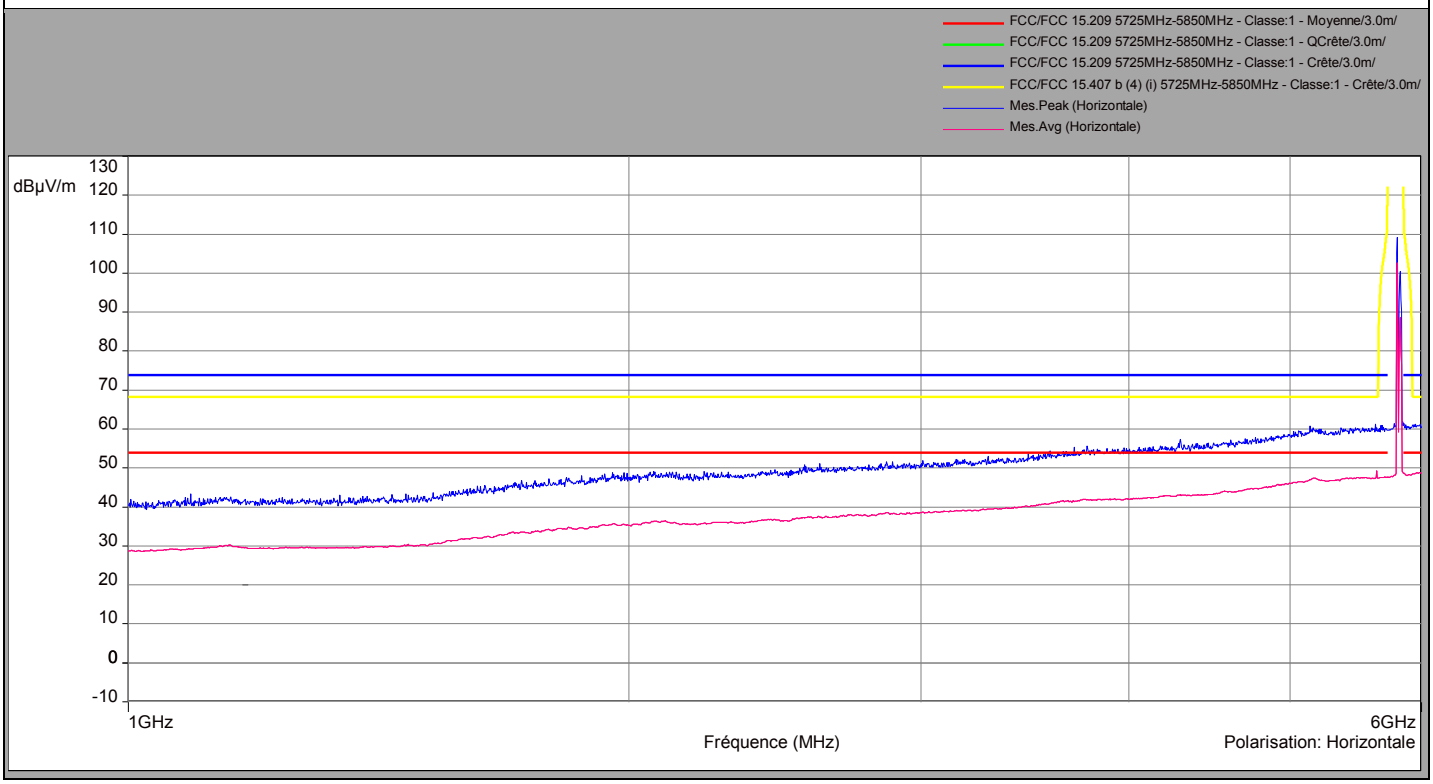
Configuration 9

Above 1GHz

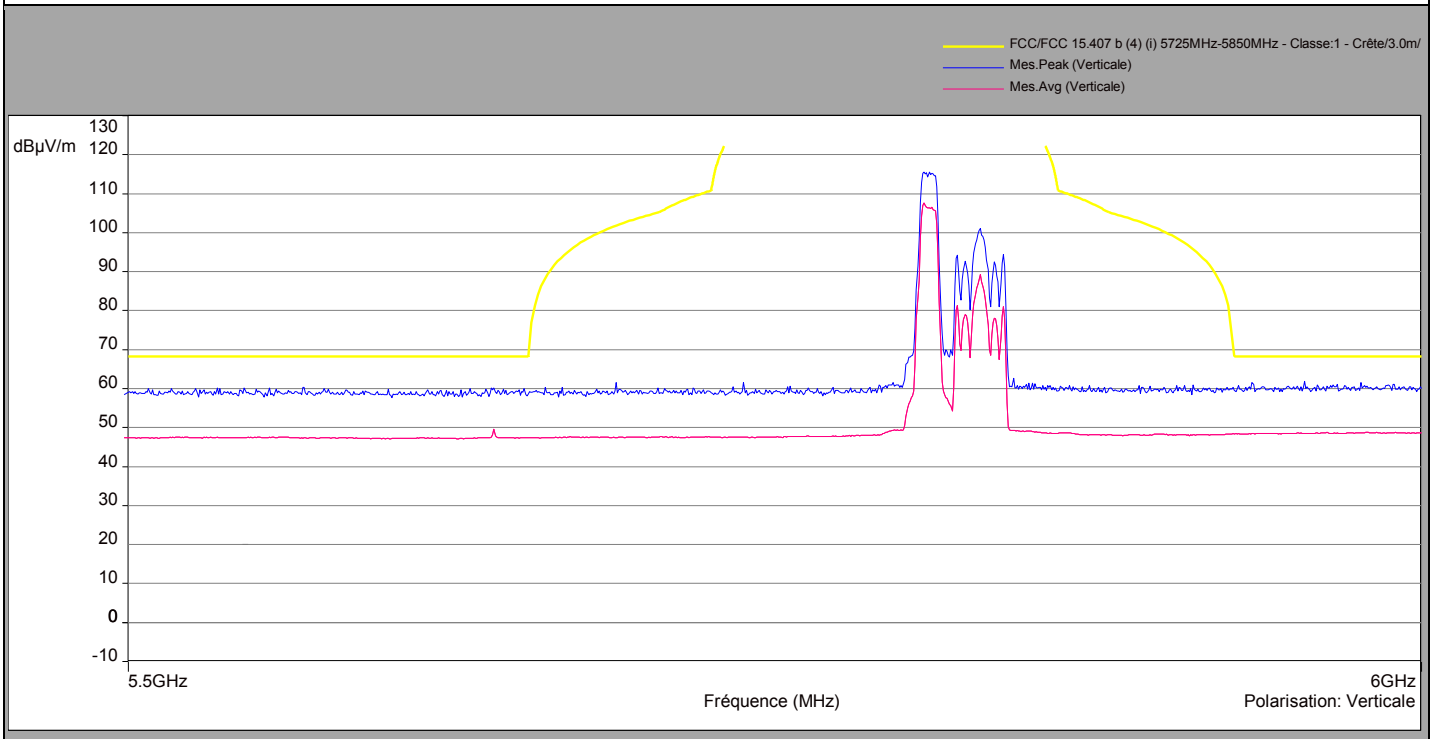
Vertical Polarization



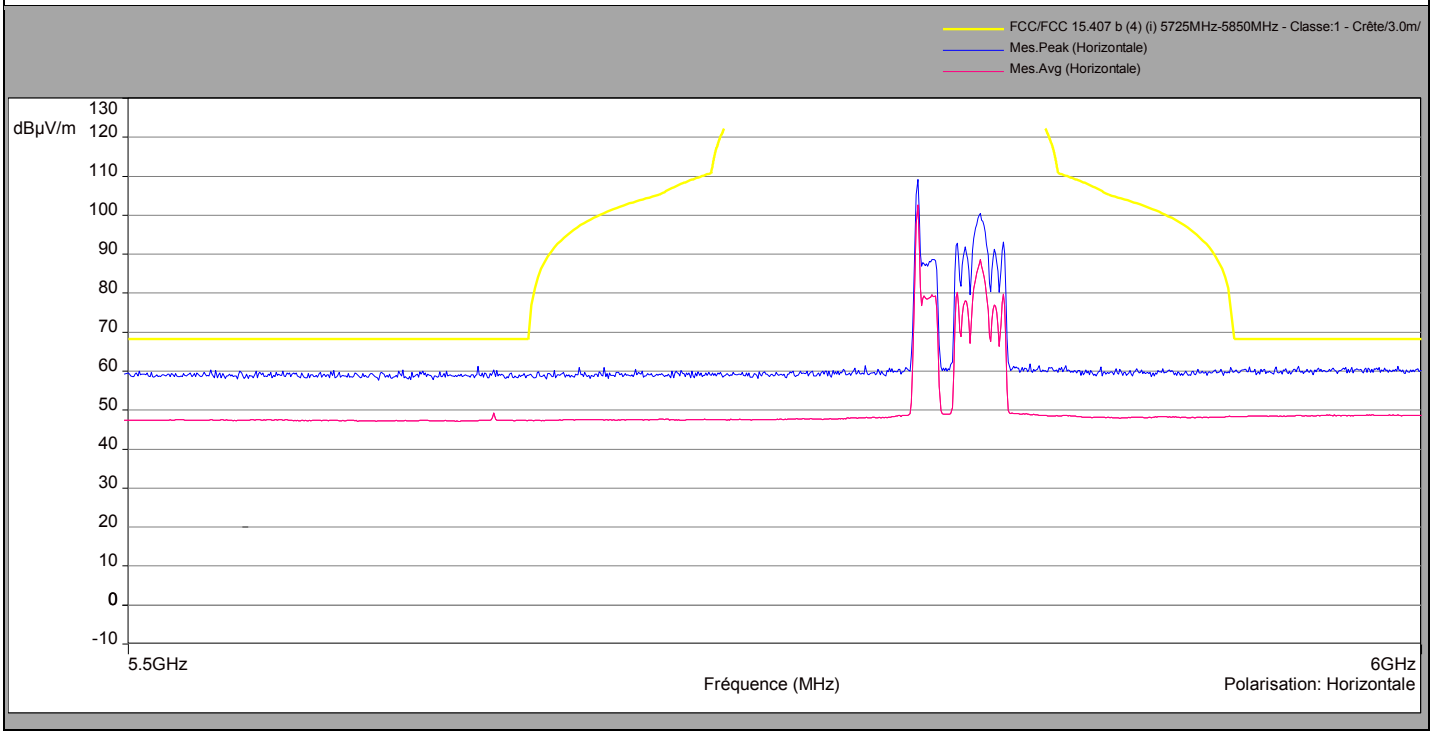
Horizontal Polarization



Configuration 9
Above 1GHz
Vertical Polarization



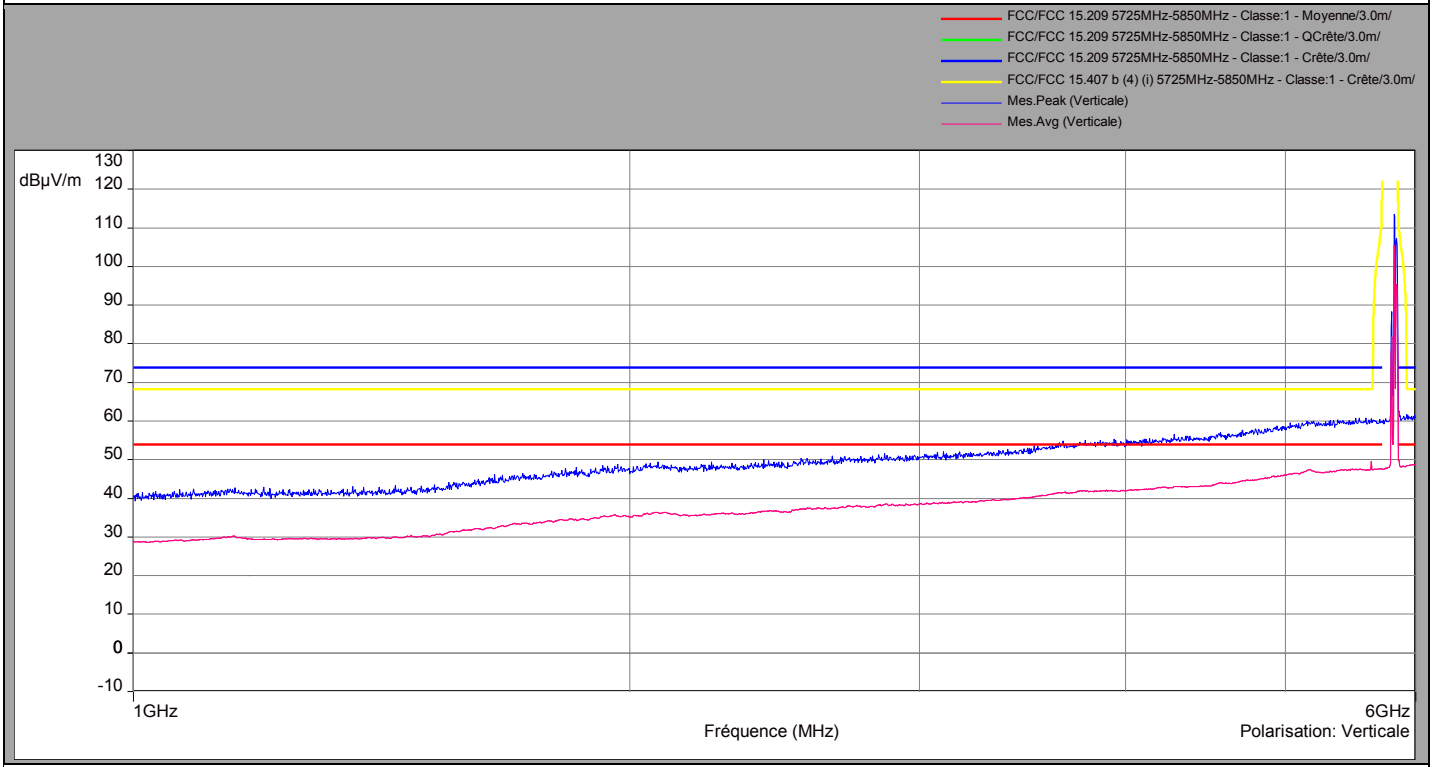
Horizontal Polarization



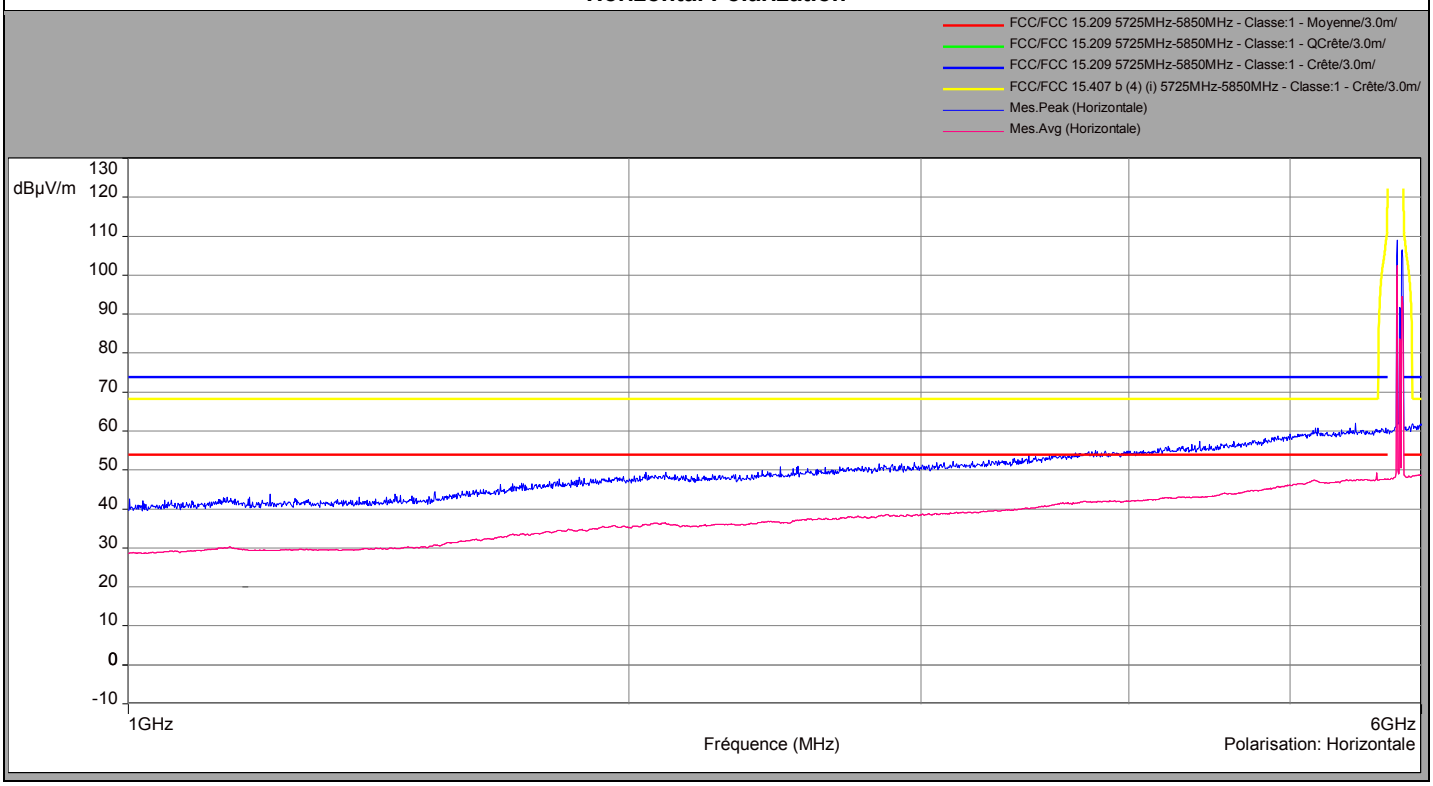
Configuration 10

Above 1GHz

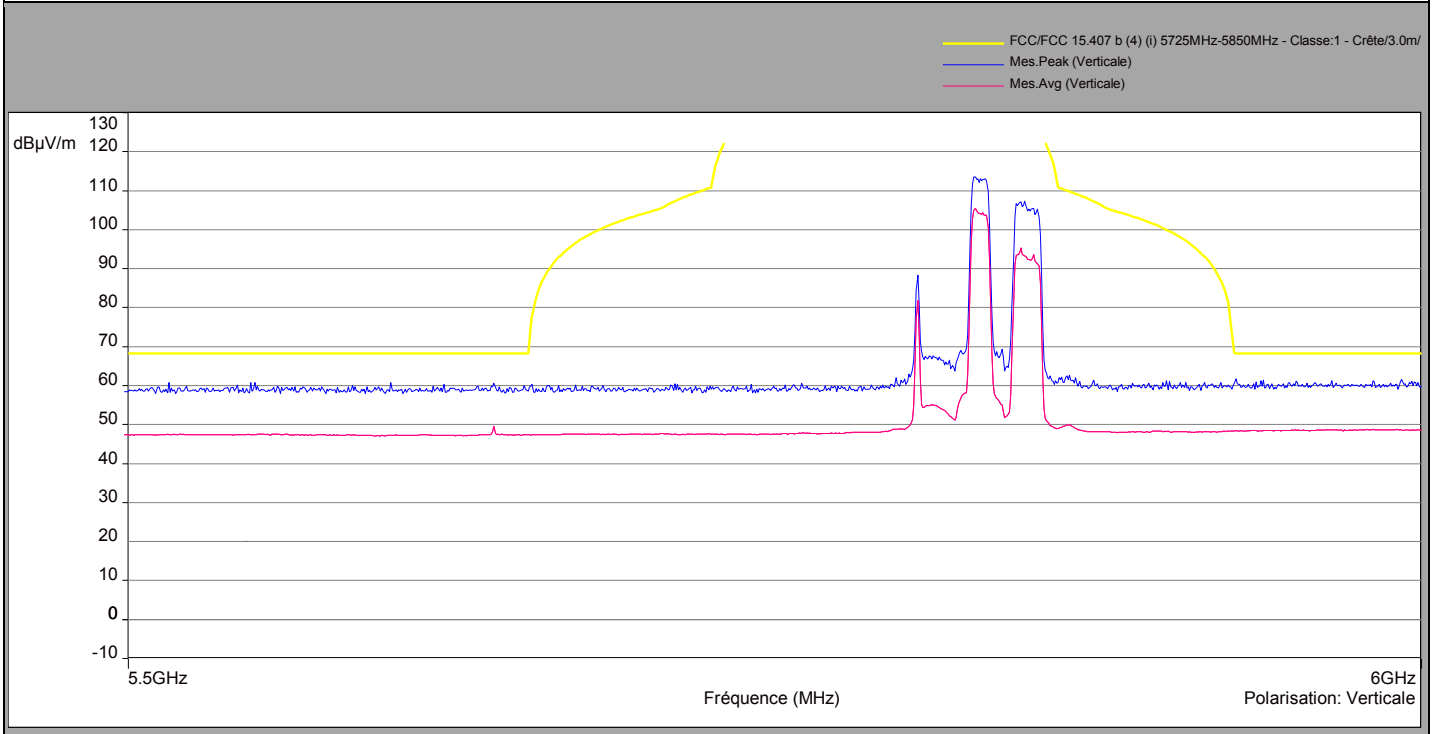
Vertical Polarization



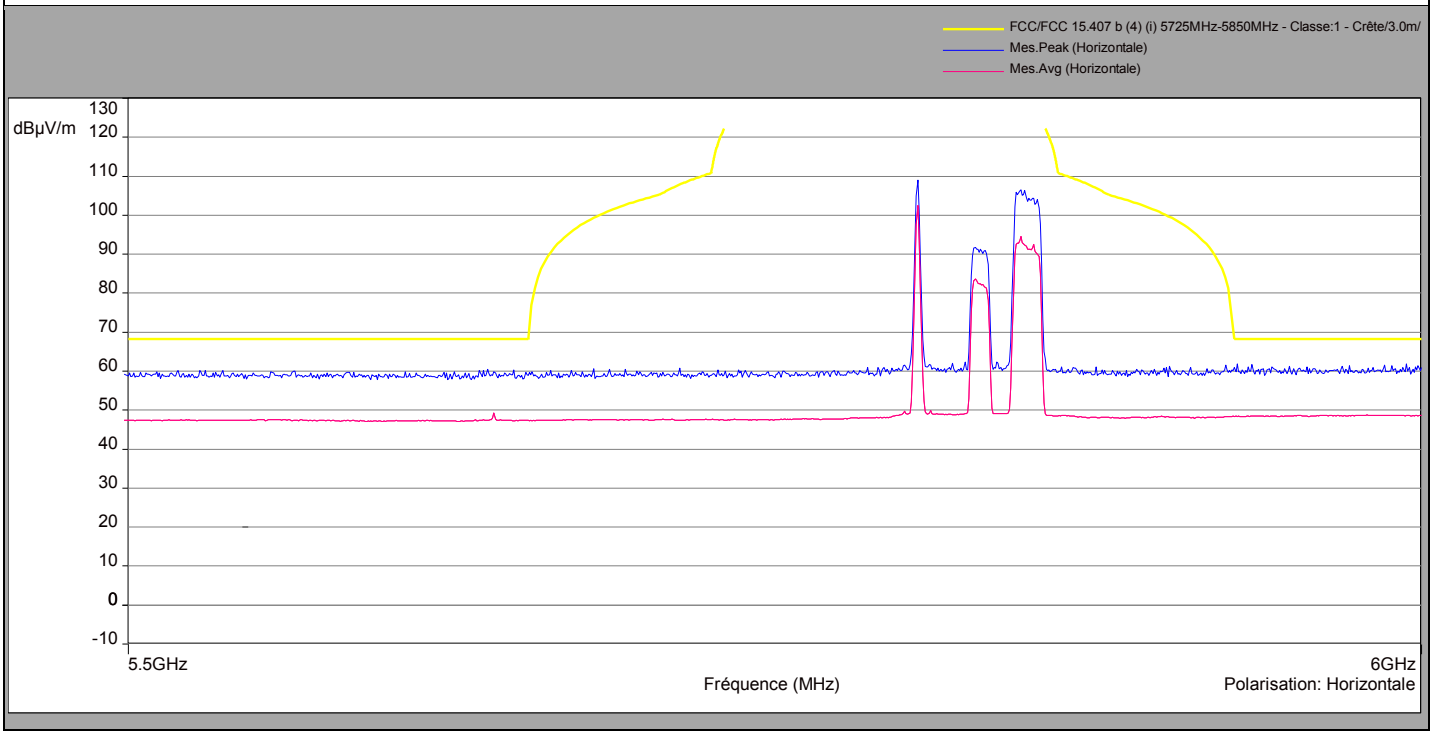
Horizontal Polarization



Configuration 10
Above 1GHz
Vertical Polarization



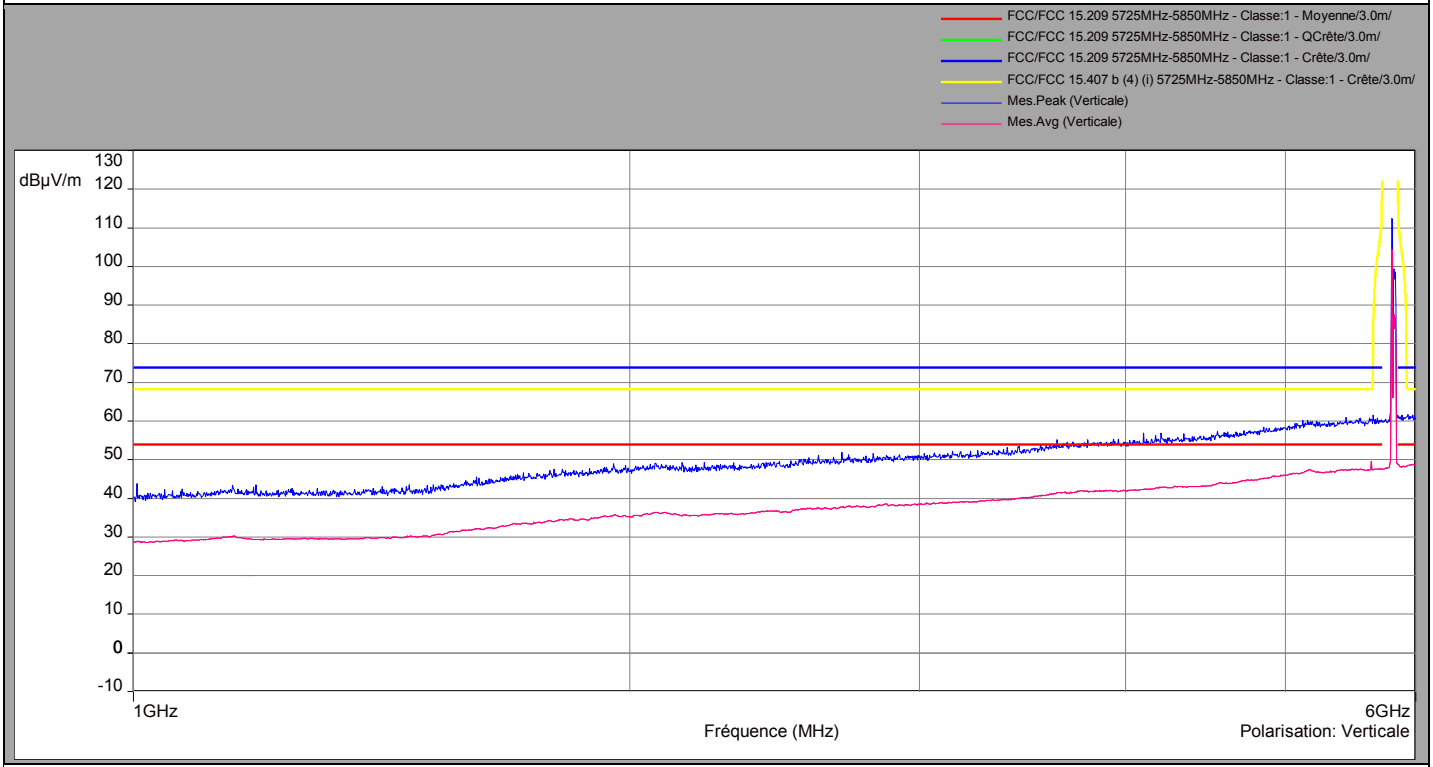
Horizontal Polarization



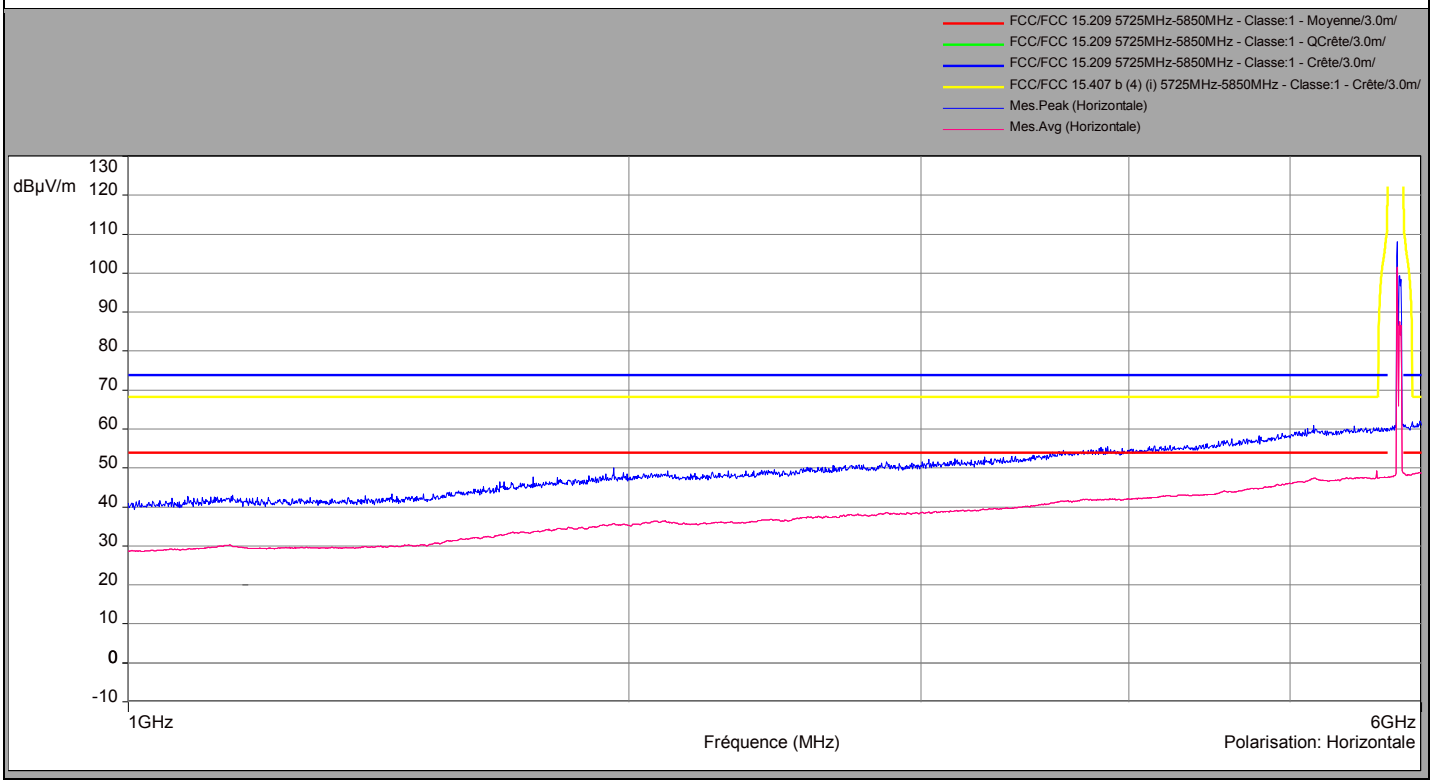
Configuration 11

Above 1GHz

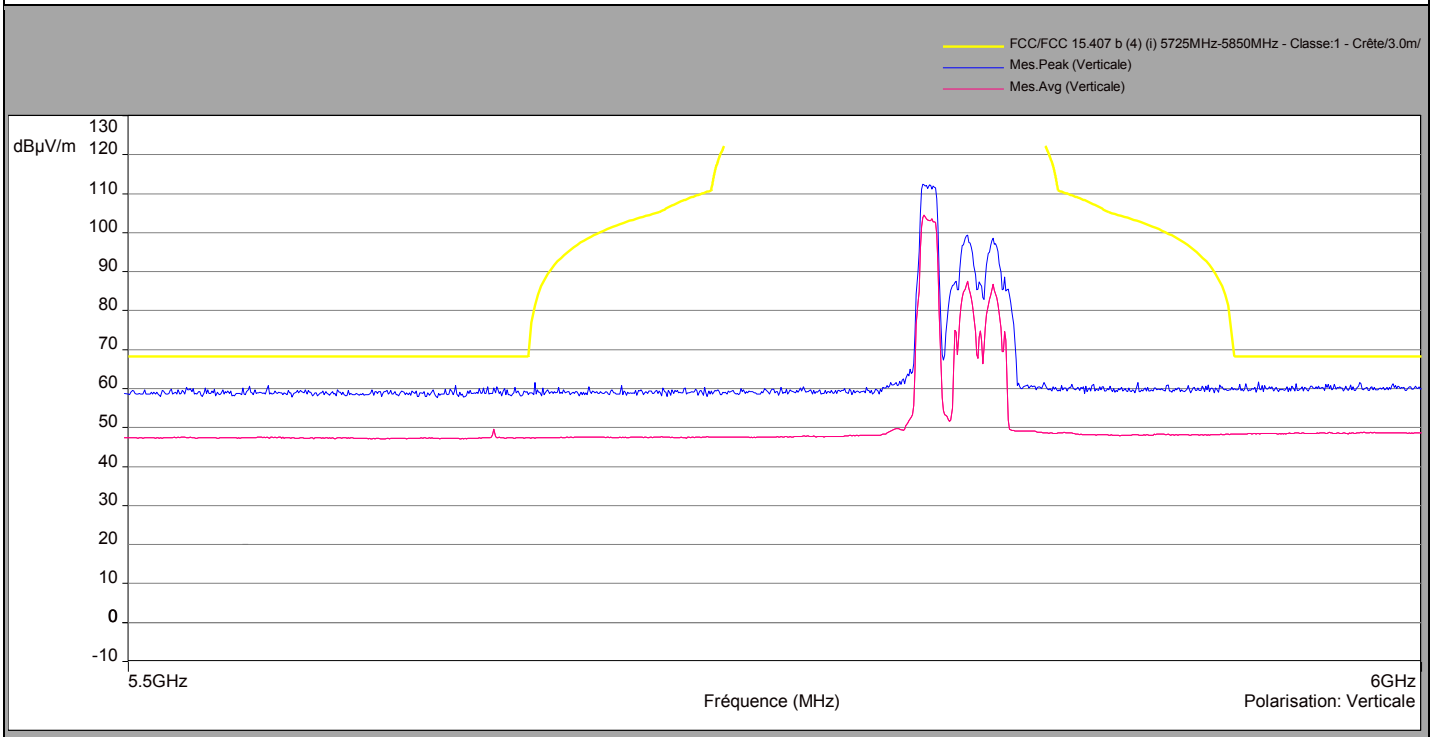
Vertical Polarization



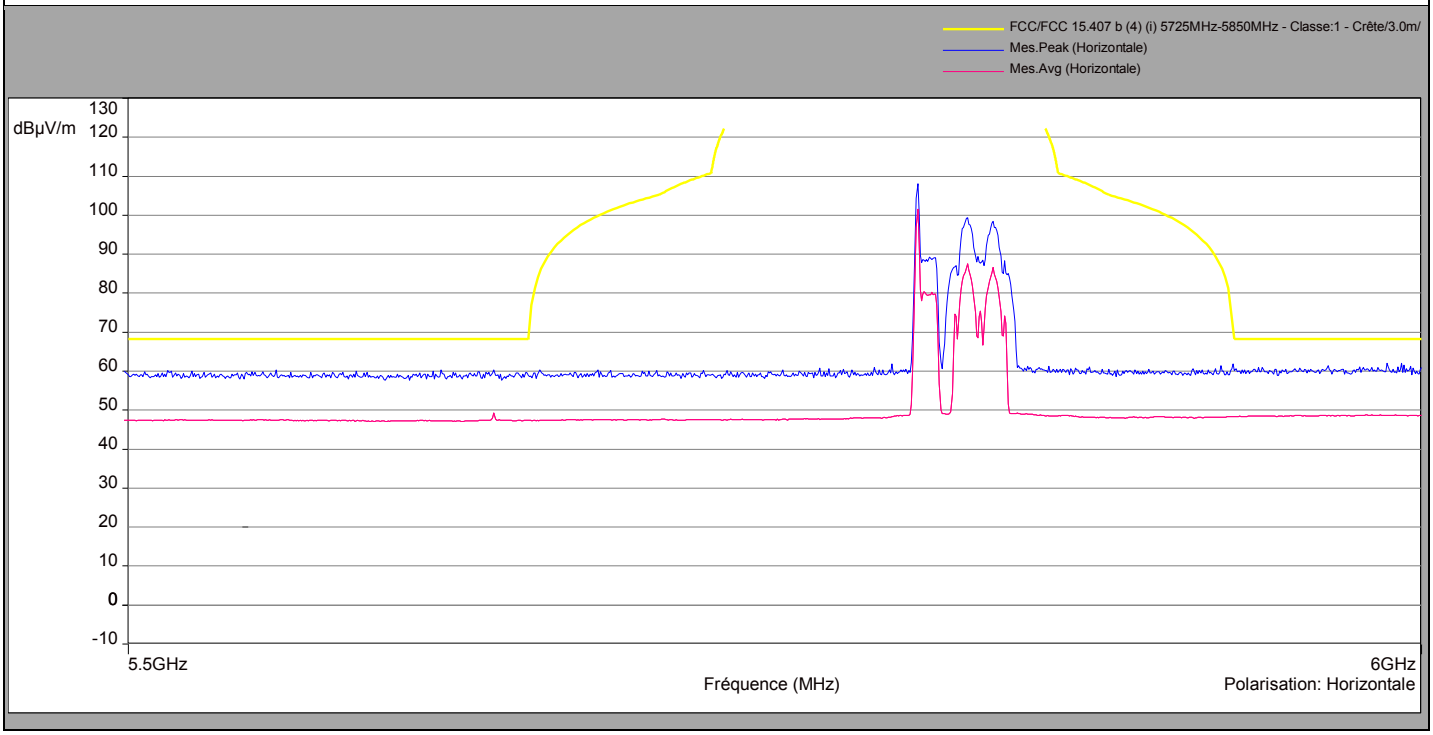
Horizontal Polarization



Configuration 11
Above 1GHz
Vertical Polarization



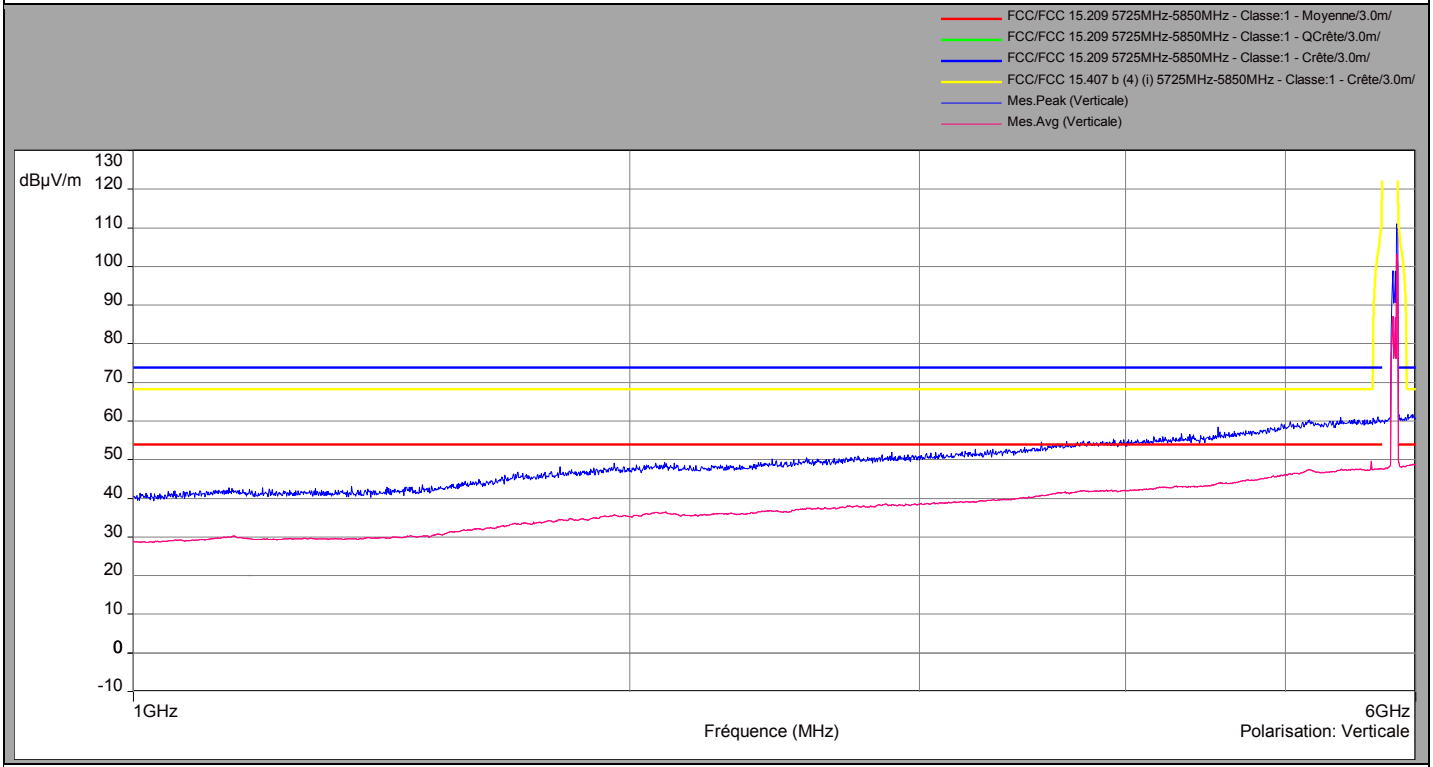
Horizontal Polarization



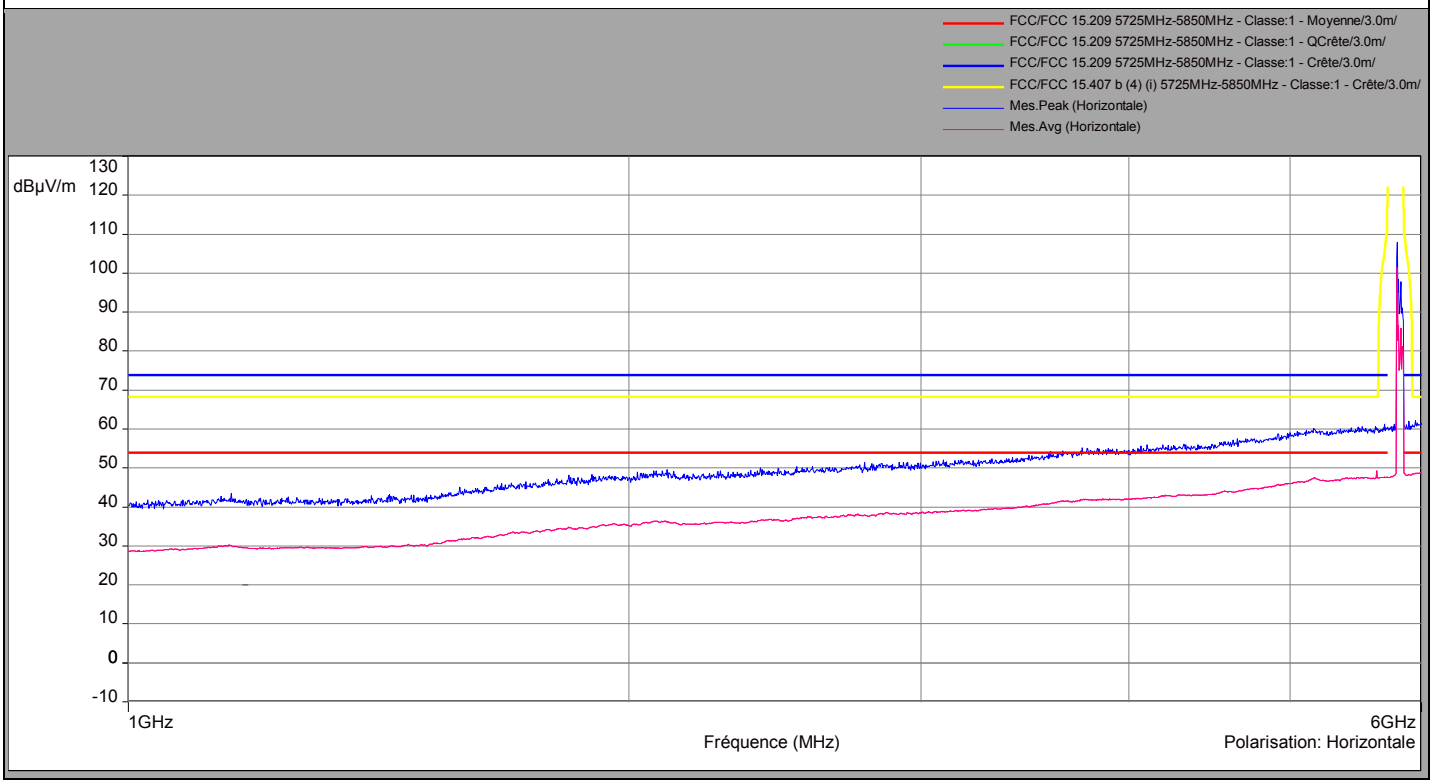
Configuration 12

Above 1GHz

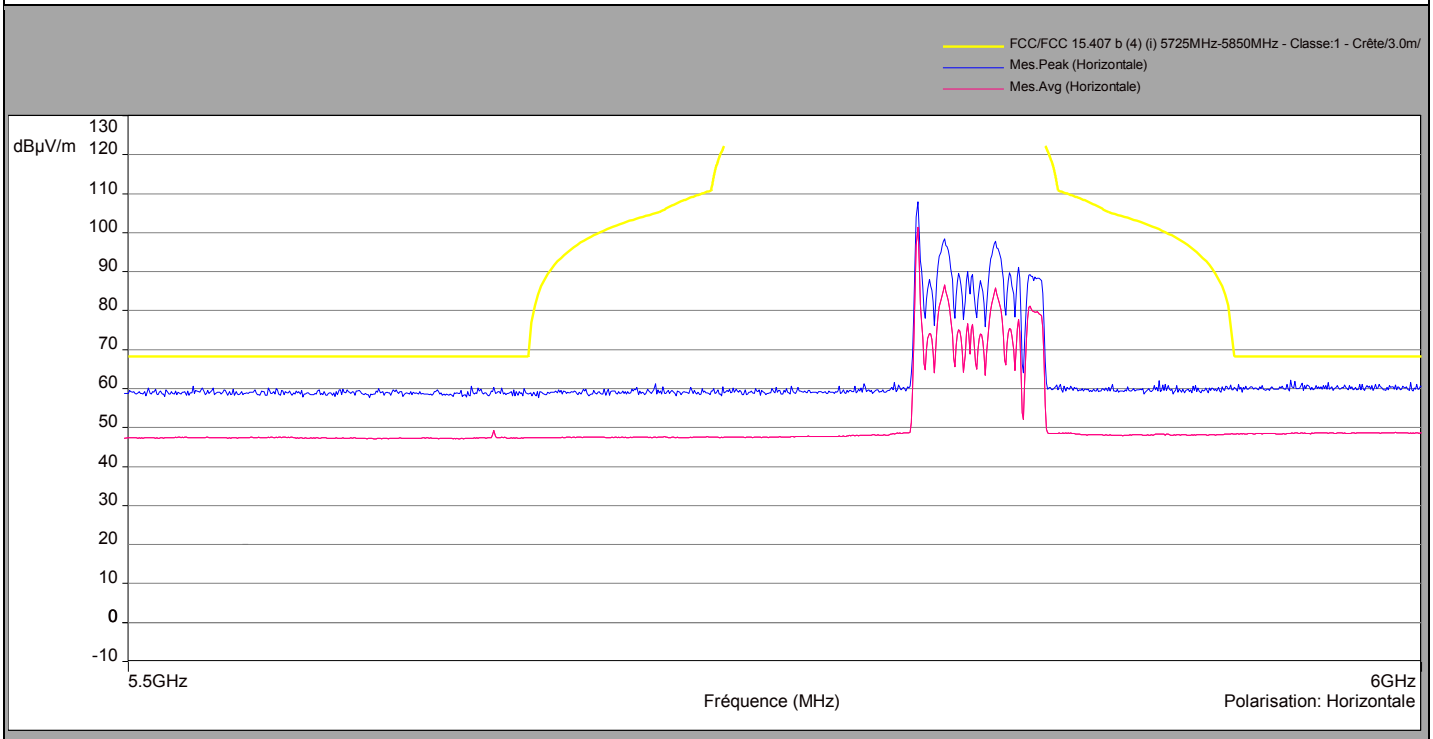
Vertical Polarization



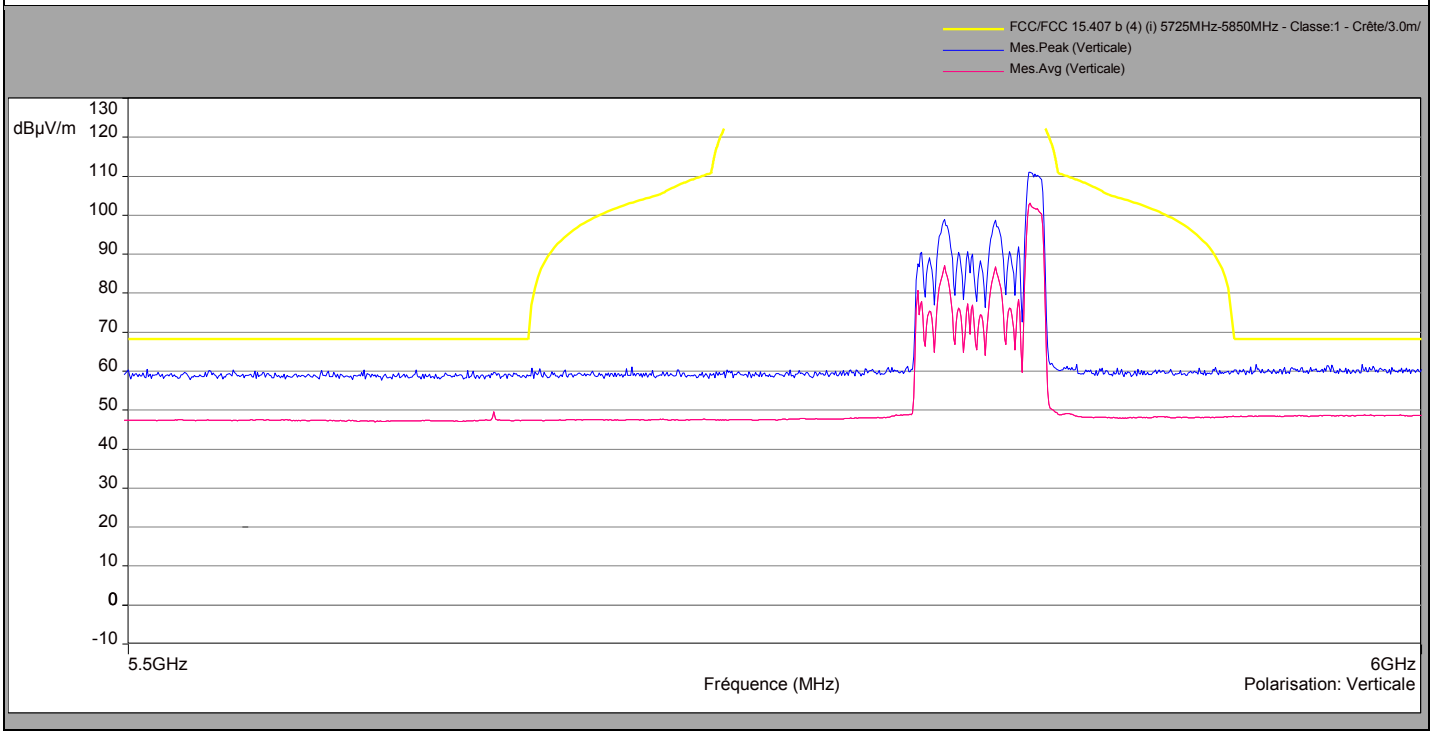
Horizontal Polarization



Configuration 12
Above 1GHz
Vertical Polarization



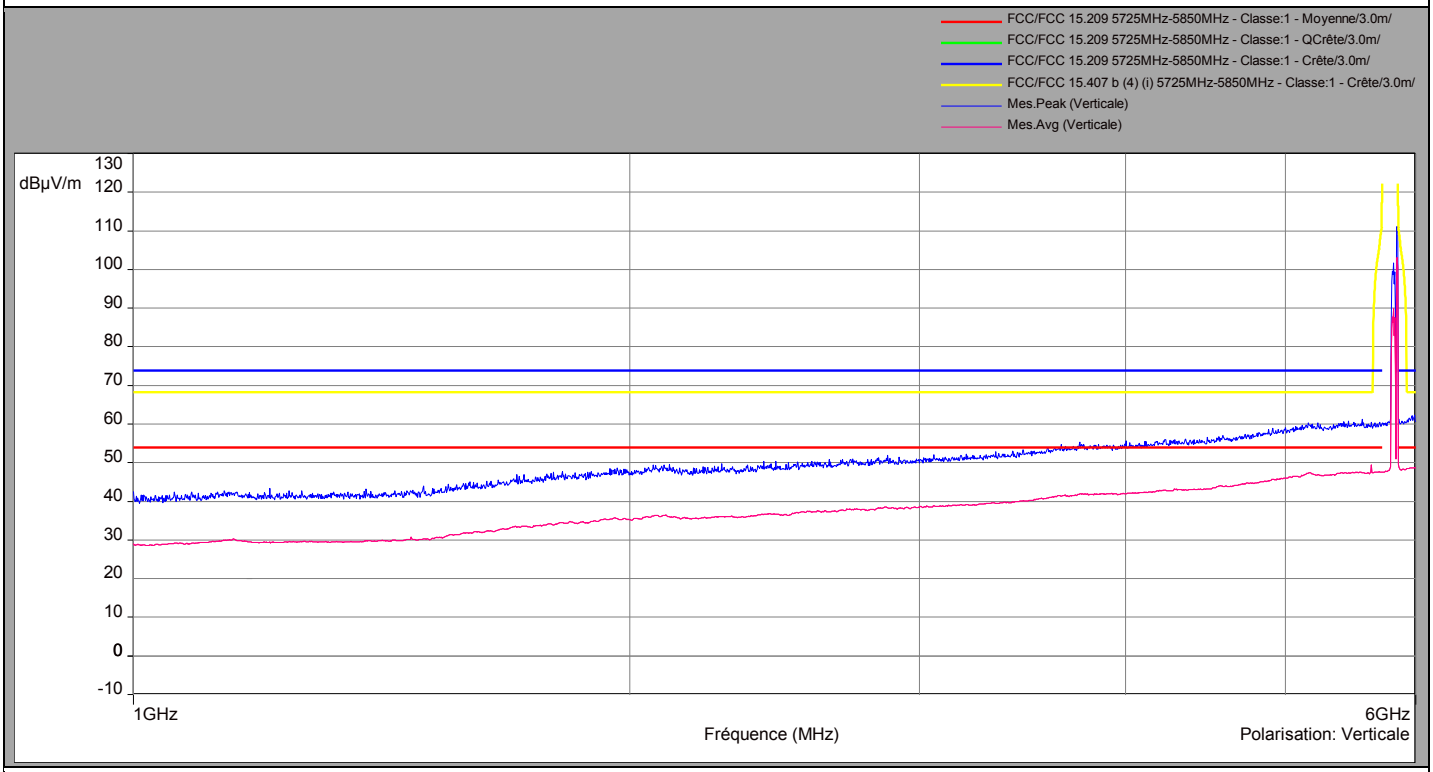
Horizontal Polarization



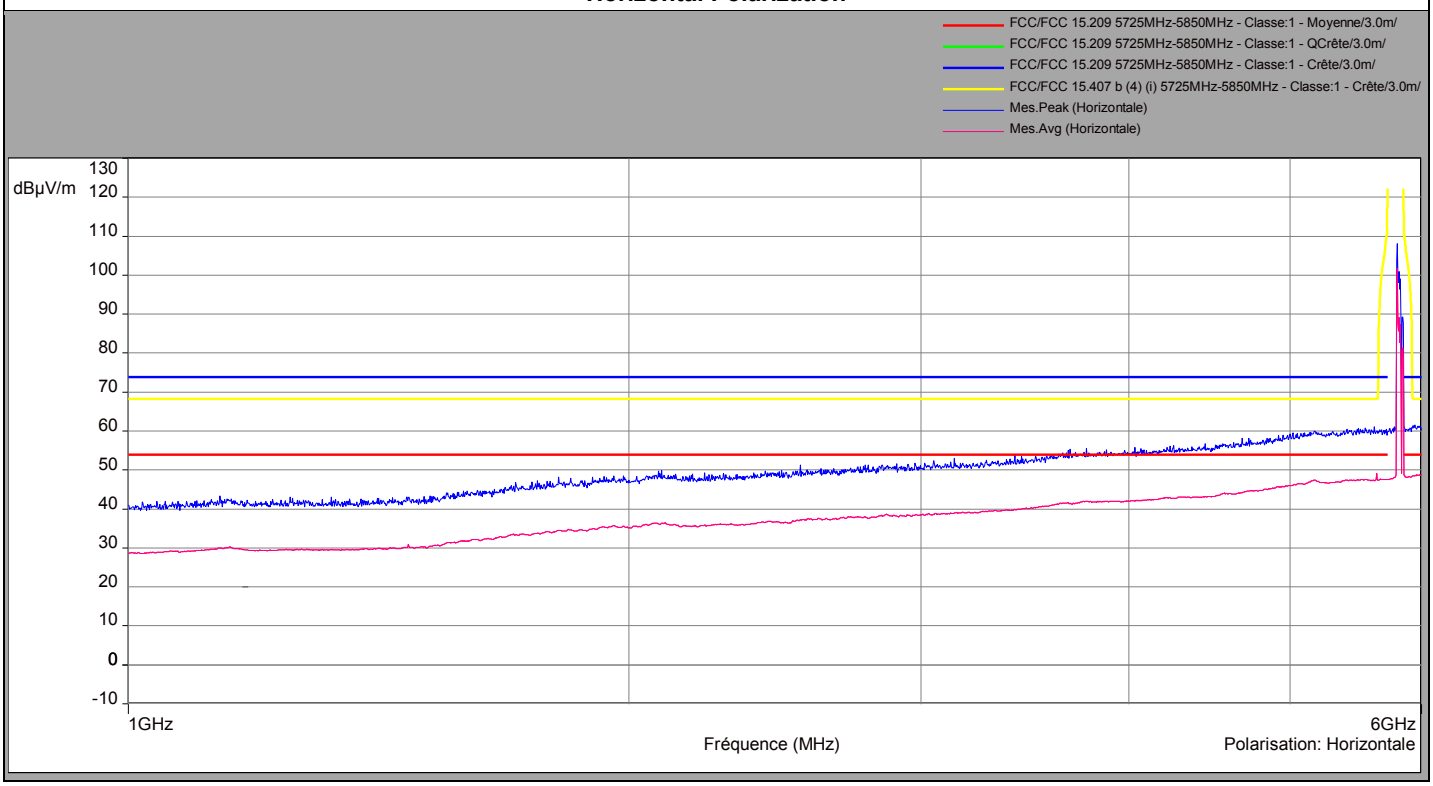
Configuration 13

Above 1GHz

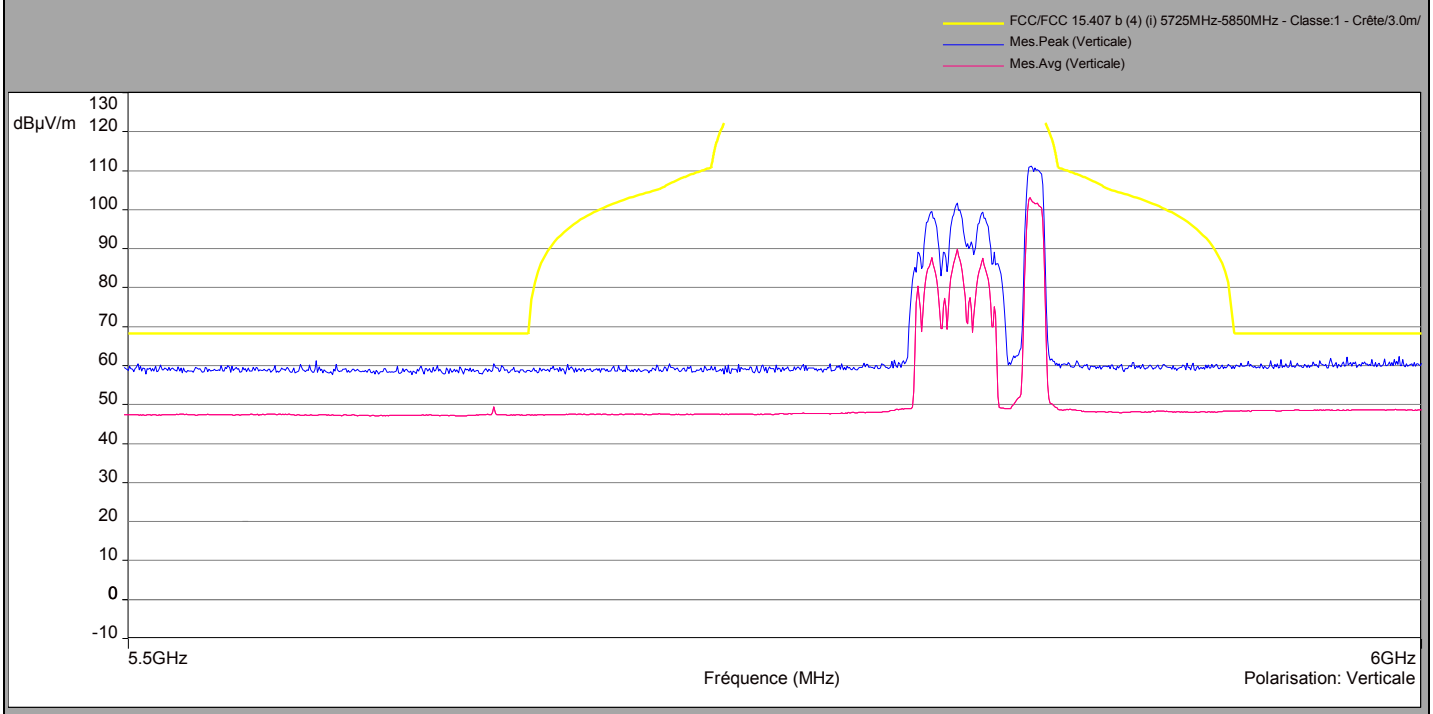
Vertical Polarization



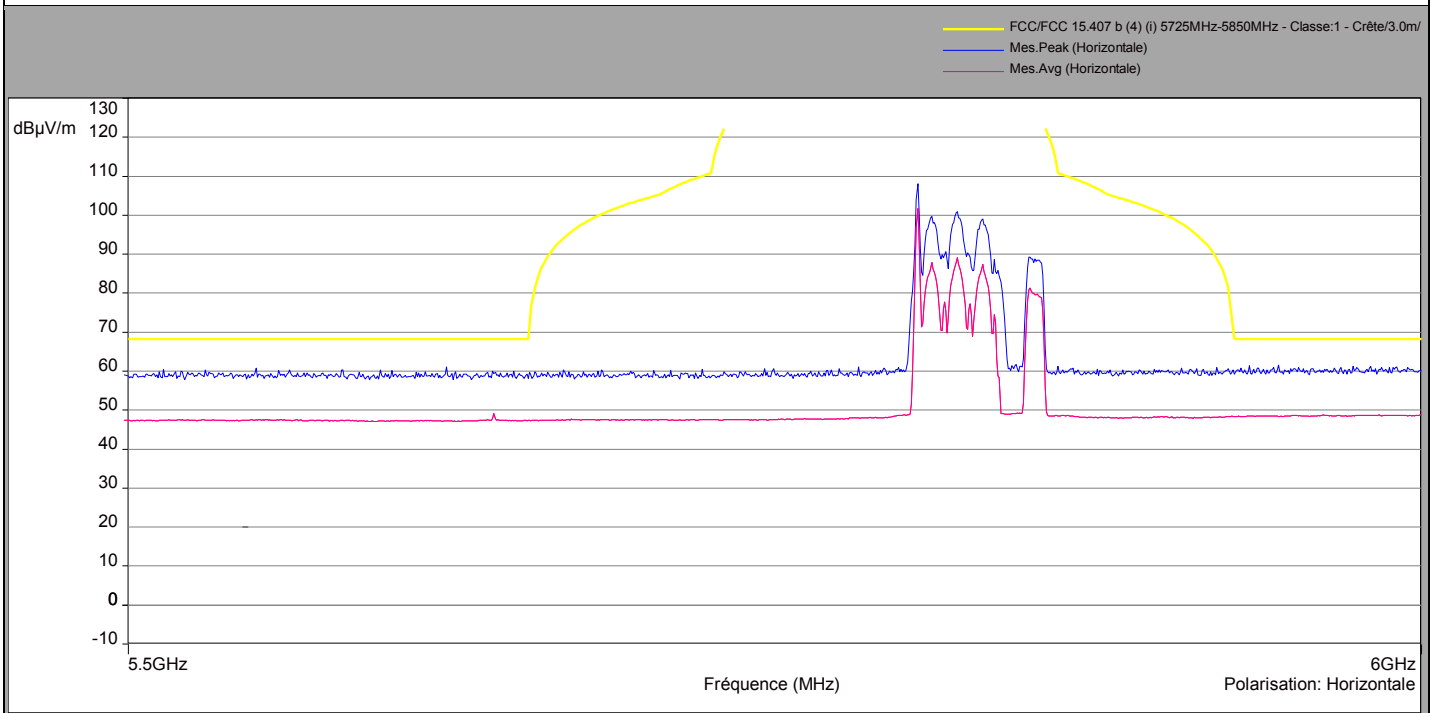
Horizontal Polarization



Configuration 13
Above 1GHz
Vertical Polarization



Horizontal Polarization



Configuration 1			
Below 1GHz			
Polarization	Frequencies (MHz)	Quasi-Peak Level (dBµV/m)	Quasi-Peak Limit (dBµV/m)
Vertical	30.5	26.62	29.5
Vertical	32.2	26.16	29.5
Vertical	33	24.92	29.5
Vertical	33.8	26.51	29.5
Vertical	34.7	24.29	29.5
Vertical	36	25.44	29.5
Vertical	36.8	26.42	29.5
Vertical	37.5	26.46	29.5
Vertical	39	24.52	29.5
Vertical	39.3	20.22	29.5
Vertical	40.7	24.38	29.5
Vertical	42.2	24.15	29.5
Vertical	44.6	24.51	29.5
Vertical	47.3	23.03	29.5
Vertical	48.4	20.58	29.5
Vertical	48.4	20.58	29.5
Vertical	49.3	25.05	29.5
Vertical	52.6	24.45	29.5
Vertical	56.3	25.5	29.5
Vertical	57.6	23.48	29.5
Vertical	58.8	22.65	29.5
Vertical	60	26.14	29.5
Vertical	64	25	29.5
Vertical	64.9	19.34	29.5
Vertical	66.7	25.39	29.5
Vertical	69.9	18.91	29.5
Vertical	73.2	21.31	29.5
Vertical	74.3	22.13	29.5
Vertical	78.2	26.37	29.5
Vertical	85.3	16.88	29.5
Vertical	101.1	18.04	33
Vertical	109.7	21.66	33
Vertical	111.6	21.7	33
Vertical	112	22.75	33

Configuration 1			
Below 1GHz			
Polarization	Frequencies (MHz)	Quasi-Peak Level (dBµV/m)	Quasi-Peak Limit (dBµV/m)
Vertical	118.2	23.79	33
Vertical	125.2	25.87	33
Vertical	130	18.23	33
Vertical	130.6	22.78	33
Vertical	138.1	24	33
Vertical	138.9	24	33
Vertical	144.4	27.65	33
Vertical	147.4	20.61	33
Vertical	148.5	19.75	33
Vertical	150.8	24.38	33
Vertical	152.1	23.13	33
Vertical	154.8	28.67	33
Vertical	155.7	29.59	33
Vertical	158.7	30.69	33
Vertical	160	30.76	33
Vertical	162	30.99	33
Vertical	165	30.05	33
Vertical	166.1	22.7	33
Vertical	166.7	31.07	33
Vertical	168.8	30.83	33
Vertical	171	31.17	33
Vertical	173.8	31.01	33
Vertical	174.8	28.51	33
Vertical	176.5	27.85	33
Vertical	178.5	25.56	33
Vertical	180.1	24.47	33
Vertical	181.5	26.8	33
Vertical	182.5	27.12	33
Vertical	185	25.25	33
Vertical	186	26.48	33
Vertical	188.6	23.66	33
Vertical	190	25.7	33
Vertical	192.6	23.38	33
Vertical	196.1	17.39	33

Configuration 1			
Below 1GHz			
Polarization	Frequencies (MHz)	Quasi-Peak Level (dBµV/m)	Quasi-Peak Limit (dBµV/m)
Vertical	205.8	30.8	33
Vertical	205.8	30.8	33
Vertical	208.5	22.98	33
Vertical	210.1	25.18	33
Vertical	214.3	27.47	33
Vertical	216.6	29.57	35.5
Vertical	218.2	29.68	35.5
Vertical	219.6	30.48	35.5
Vertical	220.3	20.51	35.5
Vertical	222	23.17	35.5
Vertical	222.4	28.55	35.5
Vertical	223.7	30.21	35.5
Vertical	224.4	26.8	35.5
Vertical	225.4	27.54	35.5
Vertical	227.3	28.04	35.5
Vertical	230	27.66	35.5
Vertical	232.4	19.43	35.5
Vertical	234.9	23.31	35.5
Vertical	237.8	21.22	35.5
Vertical	240	25.37	35.5
Vertical	245	25.92	35.5
Vertical	261.3	29.17	35.5
Vertical	266.2	24.69	35.5
Vertical	266.7	24.85	35.5
Vertical	271.4	16.57	35.5
Vertical	278	29.46	35.5
Vertical	281.4	24.82	35.5
Vertical	287.3	31.77	35.5
Vertical	292.8	27.27	35.5
Vertical	298.9	25.2	35.5
Vertical	315.2	28.19	35.5
Vertical	325	25.96	35.5
Vertical	334	17.37	35.5
Vertical	340.1	18.8	35.5

Configuration 1			
Below 1GHz			
Polarization	Frequencies (MHz)	Quasi-Peak Level (dBµV/m)	Quasi-Peak Limit (dBµV/m)
Vertical	350	24.63	35.5
Vertical	351.3	31.92	35.5
Vertical	362.9	27.42	35.5
Vertical	375	27.72	35.5
Vertical	392.7	27.96	35.5
Vertical	400	31.64	35.5
Vertical	425	26.82	35.5
Vertical	450	19.87	35.5
Vertical	491.5	30.06	35.5
Vertical	500	28.13	35.5
Vertical	525	28.04	35.5
Vertical	600.5	23.81	35.5
Vertical	650	29.42	35.5
Vertical	666.7	24.45	35.5
Vertical	675.1	24.55	35.5
Vertical	700	26.32	35.5
Vertical	750	31.46	35.5
Vertical	800	29.6	35.5
Vertical	850	28.2	35.5
Vertical	899.1	27.25	35.5
Vertical	983	38.97	43.5
Vertical	1000	32.23	43.5

Configuration 1			
Below 1GHz			
Polarization	Frequencies (MHz)	Quasi-Peak Level (dBµV/m)	Quasi-Peak Limit (dBµV/m)
Horizontal	130.4	14.83	33
Horizontal	140.4	21.08	33
Horizontal	162.2	21.99	33
Horizontal	166.5	23.23	33
Horizontal	176.7	22.76	33
Horizontal	185.1	18.12	33
Horizontal	189.1	20.94	33
Horizontal	196.2	21.47	33
Horizontal	200.5	21.26	33
Horizontal	207.7	20.44	33
Horizontal	212.3	26.65	33
Horizontal	217.2	23.65	35.5
Horizontal	222.3	23.08	35.5
Horizontal	233.2	23.58	35.5
Horizontal	250	24.16	35.5
Horizontal	266.9	24.78	35.5
Horizontal	280	26	35.5
Horizontal	291.8	24.91	35.5
Horizontal	300	22.19	35.5
Horizontal	321.7	30.78	35.5
Horizontal	338	26.59	35.5
Horizontal	344.8	29.28	35.5
Horizontal	351.6	26.11	35.5
Horizontal	357	25.03	35.5
Horizontal	382.5	27.74	35.5
Horizontal	384.7	28.62	35.5
Horizontal	400	24.85	35.5
Horizontal	406.9	28.75	35.5
Horizontal	418	25.82	35.5
Horizontal	418.7	28.11	35.5
Horizontal	427	28.86	35.5
Horizontal	450	27.48	35.5
Horizontal	491.5	30.38	35.5
Horizontal	500	31.61	35.5

Configuration 1			
Below 1GHz			
Polarization	Frequencies (MHz)	Quasi-Peak Level (dBµV/m)	Quasi-Peak Limit (dBµV/m)
Horizontal	550	26.47	35.5
Horizontal	600	29.41	35.5
Horizontal	625	32.91	35.5
Horizontal	646	26.74	35.5
Horizontal	700	26.28	35.5
Horizontal	737.3	30.88	35.5
Horizontal	750	33.69	35.5
Horizontal	800	28.2	35.5
Horizontal	861.4	26.86	35.5
Horizontal	900	32.32	35.5
Horizontal	983	36.26	43.5

Worst case results among the configurations 1-2-3-4-5-6-7-8-9-10-11-12-13					
Above 1GHz					
Polarization	Frequencies (MHz)	Peak Level (dBµV/m)	Average Level (dBµV/m)	Peak Limit (dBµV/m)	Average Limit (dBµV/m)
Vertical	1527.5	46.71	34.08	63,5	43,5
Vertical	1830.5	50.84	40.97	63,5	43,5
Vertical	2595	38.496	25.643	63,5	43,5
Vertical	4734.5	43.52	31.65	63,5	43,5
Vertical	5850	90.353	-	122.2	-
Vertical	5950	61.95	-	68.2	-

Worst case results among the configurations 1-2-3-4-5-6-7-8-9-10-11-12-13					
Above 1GHz					
Polarization	Frequencies (MHz)	Peak Level (dBµV/m)	Average Level (dBµV/m)	Peak Limit (dBµV/m)	Average Limit (dBµV/m)
Horizontal	1517	44.47	32.93	63,5	43,5
Horizontal	1829	48.95	38.56	63,5	43,5
Horizontal	1850	46.43	33.05	63,5	43,5
Horizontal	1869.5	45.21	30.95	63,5	43,5
Horizontal	4729	49.39	37.98	63,5	43,5
Horizontal	5850	65.52	-	122.2	-

7.7. CONCLUSION

Unwanted Emission into Restricted Bands measurement performed on the sample of the product FL58R2EABW45-REM, SN: EBL1613C0074, in configuration and description presented in this test report, show levels **conform to** the FCC 15.407 limits.

8. UNCERTAINTIES CHART

Kind of test	Measurement uncertainties (k=2) ±x(dB) / (Hz)	Limit for uncertainties ±y(dB)
REQUIREMENTS		
RF output power, conducted	±0.6 dB	±1,5 dB
Power Spectral Density, conducted	±0.6 dB	±1,5 dB
Unwanted Emissions, conducted	±0.6 dB	±1,5 dB
Radiated emissions • Frequency < 1000 MHz • Frequency > 1000 MHz	±3.9 dB ±3.1 dB	±6 dB
Temperature	±0.5°C	±1°C
Humidity	±2.5 %	±5 %