WIFI 5GHz Template: Release October 03rd, 2016

TEST REPORT

N°: 146019-698067D **Version : 01**

Subject	**Radio spectrum matters tests according to standards: 47 CFR Part 15.407 (RF Test Only)**
Issued to	**SAGEMCOM BROADBAND SAS** 250 Route de l' Empereur 92500 - RUEIL MALMAISON FRANCE
Apparatus under test	
Product	**DCIWA384 UHD Alt US**
Trade mark	**SAGEMCOM**
Manufacturer	**SAGEMCOM**
Model under test	**MiniBox (253697290)**
Serial number	**616476080862**
FCC ID	**VW3DCIWA384**
Test date	: December 5, 2016 to January 22, 2016
Test location	Fontenay Aux Roses & Ecuelles
Composition of document	203 pages
Document issued on	February 13, 2017

Written by :
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Tests operator

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Approved by :
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PUBLICATION HISTORY

Version	Date	Author	Modification
01	January 31, 2017	Mathieu CERISIER	Creation of the document

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**
- **ANSI C63.10-2013**

Radio requirement:

Clause (47CFR Part 15.407) Test Description	Test result - Comments			
Occupied Bandwidth	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
26dB Bandwidth	☑ PASS	☐ FAIL	☐ NA(2)	☐ NP(1)
6dB Bandwidth	☑ PASS	☐ FAIL	☐ NA(3)	☐ NP(1)
Duty Cycle	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
EIRP	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Maximum Conducted Output Power	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Power Spectral Density	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Transmit Power Control	☑ PASS	☐ FAIL	☐ NA(4)	☐ NP(1)
AC Power Line Conducted Emission	☑ PASS	☐ FAIL	☐ NA(5)	☐ NP(1)
Unwanted Emissions & Undesirable Emission	☑ PASS	☐ FAIL	☐ NA	☐ NP(1)
Frequency Stability	☑ 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 only operates outside the 5725MHz-5850MHz band
(3): EUT only operates inside the 5725MHz-5850MHz band
(4): EIRP below 27dBm or EUT only operates inside 5150MHz-5250MHz or/and 5725MHz-5850MHz bands
(5): EUT not directly or indirectly connected to the AC Power Public Network

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

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):
SAGEMCOM MiniBox (253697290) **Serial Number: 616476080862**

Equipment Under Test

Equipment Under Test

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
1	Power supply	2	☑	☐	☑	
2	Ethernet	2.5	☑	☑	☑	

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop			Use to set the EUT
Power supply°1	MSA-Z3800IC12.0-48W-P	191360131-XX	-
Power supply°2	NBS42C120380M2	191357366-XX	-
Power supply°3	LPL-C64612038026	191359307-XX	-

Equipment information:

Type:	**WIFI**			
Frequency band:	☑ 5150MHz-5250MHz	☑ 5250MHz-5350MHz	☑ 5470MHz-5725MHz	
	☑ 5725MHz-5850MHz			
Standard:	☑ 802.11a	☑ 802.11n HT20	☑ 802.11n HT40	
	☑ 802.11ac VHT20	☑ 802.11ac VHT40	☑ 802.11ac VHT80	
	☐ 802.11ac VHT160			
Spectrum Modulation:	☑ OFDM			
Channel bandwidth:	☑ 20MHz	☑ 40MHz	☑ 80MHz	☐ 160MHz
Antenna Type:	☑ Integral	☐ External	☐ Dedicated	
Antenna connector:	☑ Yes	☐ No	☐ Temporary for test	
Transmit chains:	☐ 1	☐ 2	☐ 3	☑ 4
	☐ 5	☐ 6	☐ 7	☐ 8
TPC:	☑ Yes		☐ No	
Receiver chains	☐ 1	☐ 2	☐ 3	☑ 4
	☐ 5	☐ 6	☐ 7	☐ 8
Type of equipment:	☑ Stand-alone	☐ Plug-in	☐ Combined	
Operating temperature range:	Tmin:	☐ -20°C	☑ 0°C	☐ X °C
	Tnom:	20°C		
	Tmax:	☐ 35°C	☐ 55°C	☑ 45 °C
Type of power source:	☑ AC power supply	☐ DC power supply	☐ Battery Battery Type	
Operating voltage range:	Vnom:	☑ 120V/60Hz	☐ X Vdc	
Mode:	☑ Master	☐ Slave with radar detection	☑ Slave without radar detection	
	☑ Bridge		☐ Mesh	
Fixed outdoor P to P/M application:	☐ Yes		☑ No	
System architectures:	☑ IP based		☐ Frame based	
Time require for EUT to complete its power cycle on	X s			
User access restriction:	☑ Yes (The manufacturer declares that information regarding the parameters of the detected Radar Waveforms is not available to the end user)		☐ No	

Antenna Characteristic			
Antenna assembly	**Gain (dBi)**	**Frequency Band (MHz)**	**Impedance(Ω)**
1	2.6	5180-5825	50
2	2.6	5180-5825	50
3	2.6	5180-5825	50
4	2.6	5180-5825	50
Accumulated	8.65	5180-5825	50

Note: Calculated according to KDB 662911 D01 Multiple Transmitter Output v02r01 F) 2) d) (i). All antennas can transmit simultaneously

CHANNEL PLAN		
802.11a / 802.11n HT20/ 802.11ac VHT20		
Channel	**Frequency (MHz)**	**Available Channel**
C1=36	5180	☑
C2=40	5200	☑
44	5220	☑
C3=48	5240	☑
C4=52	5260	☑
56	5280	☑
C5=60	5300	☑
C6=64	5320	☑
C7=100	5500	☑
104	5520	☑
108	5540	☑
112	5560	☑
C8=116	5580	☑
120	5600	☑
124	5620	☑
128	5640	☑
132	5660	☑
136	5680	☑
C9=140	5700	☑
C10=144	5720	☑
C11=149	5745	☑
153	5765	☑
C12=157	5785	☑
161	5805	☑
C13=165	5825	☑

CHANNEL PLAN		
802.11n HT40/ 802.11ac VHT40		
Channel	Frequency (MHz)	Available Channel
C14=36+40	5190	☑
C15=44+48	5230	☑
C16=52+56	5270	☑
C17=60+64	5310	☑
C18=100+104	5510	☑
C19=108+112	5550	☑
116+120	5590	☑
124+128	5630	☑
C20=132+136	5670	☑
C21=140+144	5710	☑
C22=149+153	5755	☑
C23=157+161	5795	☑

CHANNEL PLAN		
802.11ac VHT80		
Channel	Frequency (MHz)	Available Channel
C24=36+40+44+48	5210	☑
C25=52+56+60+64	5290	☑
C26=100+104+108+112	5530	☑
C27=116+120+124+128	5610	☑
C28=132+136+140+144	5690	☑
C29=149+153+157+161	5775	☑

No DFS Channel
DFS Channel
Weather DFS Channel

DATA RATE		
802.11a		
Data Rate (Mbps)	**Modulation Type**	**Modulation Worst Case**
6	BPSK	☑
9	BPSK	☐
12	QPSK	☐
18	QPSK	☐
24	16-QAM	☐
36	16-QAM	☐
48	64-QAM	☐
54	64-QAM	☐

DATA RATE									
802.11n HT20									
Available for EUT	MCS Index	Spatial streams	Modulation				Data Rate (Mbps)		Worst Case Modulation
							(GI = 800ns)	(GI = 400ns)	
☑	0	1	BPSK				6.5	7.2	☑
☑	1	1	QPSK				13	14.4	☐
☑	2	1	QPSK				19.5	21.7	☐
☑	3	1	16-QAM				26	28.9	☐
☑	4	1	16-QAM				39	43.3	☐
☑	5	1	64-QAM				52	57.8	☐
☑	6	1	64-QAM				58.5	65	☐
☑	7	1	64-QAM				65	72.2	☐
☑	8	2	BPSK				13	14.4	☐
☑	9	2	QPSK				26	28.9	☐
☑	10	2	QPSK				39	43.3	☐
☑	11	2	16-QAM				52	57.8	☐
☑	12	2	16-QAM				78	86.7	☐
☑	13	2	64-QAM				104	115.6	☐
☑	14	2	64-QAM				117	130.3	☐
☑	15	2	64-QAM				130	144.4	☐
☑	16	3	BPSK				19.5	21.7	☐
☑	17	3	QPSK				39	43.3	☐
☑	18	3	QPSK				58.5	65	☐
☑	19	3	16-QAM				78	86.7	☐
☑	20	3	16-QAM				117	130	☐
☑	21	3	64-QAM				156	173.3	☐
☑	22	3	64-QAM				175.5	195	☐
☑	23	3	64-QAM				195	216.7	☐
☑	24	4	BPSK				26	28.9	☑
☑	25	4	QPSK				52	57.8	☐
☑	26	4	QPSK				78	86.7	☐
☑	27	4	16-QAM				104	115.6	☐
☑	28	4	16-QAM				156	173.3	☐
☑	29	4	64-QAM				208	231.1	☐
☑	30	4	64-QAM				234	260	☐
☑	31	4	64-QAM				260	288.9	☐
☑	32	1	BPSK	-	-	-	-	-	☐
☑	33	2	16-QAM	QPSK	-	-	39	43.3	☐
☑	34	2	64-QAM	QPSK	-	-	52	57.8	☐
☑	35	2	64-QAM	16-QAM	-	-	65	72.2	☐
☑	36	2	16-QAM	QPSK	-	-	58.5	65	☐
☑	37	2	64-QAM	QPSK	-	-	78	86.7	☐
☑	38	2	64-QAM	16-QAM	-	-	97.5	108.3	☐
☑	39	3	16-QAM	QPSK	QPSK	-	52	57.8	☐
☑	40	3	16-QAM	16-QAM	QPSK	-	65	72.2	☐
☑	41	3	64-QAM	QPSK	QPSK	-	65	72.2	☐
☑	42	3	64-QAM	16-QAM	QPSK	-	78	86.7	☐
☑	43	3	64-QAM	16-QAM	16-QAM	-	91	101.1	☐
☑	44	3	64-QAM	64-QAM	QPSK	-	91	101.1	☐
☑	45	3	64-QAM	64-QAM	16-QAM	-	104	115.6	☐
☑	46	3	16-QAM	QPSK	QPSK	-	78	86.7	☐
☑	47	3	16-QAM	16-QAM	QPSK	-	97.5	108.3	☐
☑	48	3	64-QAM	QPSK	QPSK	-	97.5	108.3	☐
☑	49	3	64-QAM	16-QAM	QPSK	-	117	130	☐
☑	50	3	64-QAM	16-QAM	16-QAM	-	136.5	151.7	☐
☑	51	3	64-QAM	64-QAM	QPSK	-	136.5	151.7	☐
☑	52	3	64-QAM	64-QAM	16-QAM	-	156	173.3	☐
☑	53	4	16-QAM	QPSK	QPSK	QPSK	65	72.2	☐
☑	54	4	16-QAM	16-QAM	QPSK	QPSK	78	86.7	☐
☑	55	4	16-QAM	16-QAM	16-QAM	QPSK	91	101.1	☐
☑	56	4	64-QAM	QPSK	QPSK	QPSK	78	86.7	☐
☑	57	4	64-QAM	16-QAM	QPSK	QPSK	91	101.1	☐
☑	58	4	64-QAM	16-QAM	16-QAM	QPSK	104	115.6	☐
☑	59	4	64-QAM	16-QAM	16-QAM	16-QAM	117	130	☐
☑	60	4	64-QAM	QPSK	QPSK	QPSK	104	115.6	☐
☑	61	4	64-QAM	16-QAM	16-QAM	QPSK	117	130	☐
☑	62	4	64-QAM	16-QAM	16-QAM	16-QAM	130	144.4	☐
☑	63	4	64-QAM	64-QAM	64-QAM	QPSK	130	144.4	☐
☑	64	4	64-QAM	64-QAM	64-QAM	16-QAM	143	158.9	☐
☑	65	4	16-QAM	QPSK	QPSK	QPSK	97.5	108.3	☐
☑	66	4	16-QAM	16-QAM	QPSK	QPSK	117	130	☐
☑	67	4	16-QAM	16-QAM	16-QAM	QPSK	136.5	151.7	☐
☑	68	4	64-QAM	QPSK	QPSK	QPSK	117	130	☐
☑	69	4	64-QAM	16-QAM	QPSK	QPSK	136.5	151.7	☐
☑	70	4	64-QAM	16-QAM	16-QAM	QPSK	156	173.3	☐
☑	71	4	64-QAM	16-QAM	16-QAM	16-QAM	175.5	195	☐
☑	72	4	64-QAM	64-QAM	QPSK	QPSK	156	173.3	☐
☑	73	4	64-QAM	64-QAM	16-QAM	QPSK	175.5	195	☐
☑	74	4	64-QAM	64-QAM	16-QAM	16-QAM	195	216.7	☐
☑	75	4	64-QAM	64-QAM	64-QAM	QPSK	195	216.7	☐
☑	76	4	64-QAM	64-QAM	64-QAM	16-QAM	214.5	238.3	☐

DATA RATE									
802.11n HT40									
Available for EUT	MCS Index	Spatial streams	Modulation				Data Rate (Mbps)		Worst Case Modulation
							(GI = 800ns)	(GI = 400ns)	
☑	0	1	BPSK				13	15	☑
☑	1	1	QPSK				27	30	☐
☑	2	1	QPSK				40.5	45	☐
☑	3	1	16-QAM				54	60	☐
☑	4	1	16-QAM				81	90	☐
☑	5	1	64-QAM				108	120	☐
☑	6	1	64-QAM				121.5	135	☐
☑	7	1	64-QAM				135	150	☐
☑	8	2	BPSK				27	30	☐
☑	9	2	QPSK				54	60	☐
☑	10	2	QPSK				81	90	☐
☑	11	2	16-QAM				108	120	☐
☑	12	2	16-QAM				162	180	☐
☑	13	2	64-QAM				216	240	☐
☑	14	2	64-QAM				243	270	☐
☑	15	2	64-QAM				270	300	☐
☑	16	3	BPSK				40.5	45	☐
☑	17	3	QPSK				81	90	☐
☑	18	3	QPSK				121.5	135	☐
☑	19	3	16-QAM				162	180	☐
☑	20	3	16-QAM				243	270	☐
☑	21	3	64-QAM				324	360	☐
☑	22	3	64-QAM				364.5	405	☐
☑	23	3	64-QAM				405	450	☐
☑	24	4	BPSK				54	60	☑
☑	25	4	QPSK				108	120	☐
☑	26	4	QPSK				162	180	☐
☑	27	4	16-QAM				216	240	☐
☑	28	4	16-QAM				324	360	☐
☑	29	4	64-QAM				432	480	☐
☑	30	4	64-QAM				486	540	☐
☑	31	4	64-QAM				540	600	☐
☑	32	1	BPSK	-	-	-	6.0	6.7	☐
☑	33	2	16-QAM	QPSK	-	-	81	90.0	☐
☑	34	2	64-QAM	QPSK	-	-	108	120	☐
☑	35	2	64-QAM	16-QAM	-	-	135	150	☐
☑	36	2	16-QAM	QPSK	-	-	121.5	135	☐
☑	37	2	64-QAM	QPSK	-	-	162	180	☐
☑	38	2	64-QAM	16-QAM	-	-	202.5	225	☐
☑	39	3	16-QAM	QPSK	QPSK	-	108	120	☐
☑	40	3	16-QAM	16-QAM	QPSK	-	135	150	☐
☑	41	3	64-QAM	QPSK	QPSK	-	135	150	☐
☑	42	3	64-QAM	16-QAM	QPSK	-	162	180	☐
☑	43	3	64-QAM	16-QAM	16-QAM	-	189	210	☐
☑	44	3	64-QAM	64-QAM	QPSK	-	189	210	☐
☑	45	3	64-QAM	64-QAM	16-QAM	-	216	240	☐
☑	46	3	16-QAM	QPSK	QPSK	-	162	180	☐
☑	47	3	16-QAM	16-QAM	QPSK	-	202.5	225	☐
☑	48	3	64-QAM	QPSK	QPSK	-	202.5	225	☐
☑	49	3	64-QAM	16-QAM	QPSK	-	243	270	☐
☑	50	3	64-QAM	16-QAM	16-QAM	-	283.5	315	☐
☑	51	3	64-QAM	64-QAM	QPSK	-	283.5	315	☐
☑	52	3	64-QAM	64-QAM	16-QAM	-	324	360	☐
☑	53	4	16-QAM	QPSK	QPSK	QPSK	135	150	☐
☑	54	4	16-QAM	16-QAM	QPSK	QPSK	162	180	☐
☑	55	4	16-QAM	16-QAM	16-QAM	QPSK	189	210	☐
☑	56	4	64-QAM	QPSK	QPSK	QPSK	162	180	☐
☑	57	4	64-QAM	16-QAM	QPSK	QPSK	189	210	☐
☑	58	4	64-QAM	16-QAM	16-QAM	QPSK	216	240	☐
☑	59	4	64-QAM	16-QAM	16-QAM	16-QAM	243	270	☐
☑	60	4	64-QAM	QPSK	QPSK	QPSK	216	240	☐
☑	61	4	64-QAM	16-QAM	16-QAM	QPSK	243	270	☐
☑	62	4	64-QAM	16-QAM	16-QAM	16-QAM	270	300	☐
☑	63	4	64-QAM	64-QAM	64-QAM	QPSK	270	300	☐
☑	64	4	64-QAM	64-QAM	64-QAM	16-QAM	297	330	☐
☑	65	4	16-QAM	QPSK	QPSK	QPSK	202.5	225	☐
☑	66	4	16-QAM	16-QAM	QPSK	QPSK	243	270	☐
☑	67	4	16-QAM	16-QAM	16-QAM	QPSK	283.5	315	☐
☑	68	4	64-QAM	QPSK	QPSK	QPSK	243	270	☐
☑	69	4	64-QAM	16-QAM	QPSK	QPSK	283.5	315	☐
☑	70	4	64-QAM	16-QAM	16-QAM	QPSK	324	360	☐
☑	71	4	64-QAM	16-QAM	16-QAM	16-QAM	364.5	405	☐
☑	72	4	64-QAM	64-QAM	QPSK	QPSK	324	360	☐
☑	73	4	64-QAM	64-QAM	16-QAM	QPSK	364.5	405	☐
☑	74	4	64-QAM	64-QAM	16-QAM	16-QAM	405	450	☐
☑	75	4	64-QAM	64-QAM	64-QAM	QPSK	405	450	☐
☑	76	4	64-QAM	64-QAM	64-QAM	16-QAM	445.5	495	☐

DATA RATE: 802.11ac VHT20							
Available for EUT	MCS Index	Nbr of spatial streams	Modulation (Stream 1/2/3/4)	Coding rate	GI = 800ns	GI = 400ns	Worst Case Modulation
☑	0	1	BPSK	1/2	6,5	7,2	☑
☑	1	1	QPSK	1/2	13	14,4	☐
☑	2	1	QPSK	3/4	19,5	21,7	☐
☑	3	1	16-QAM	1/2	26	28,9	☐
☑	4	1	16-QAM	3/4	39	43,3	☐
☑	5	1	64-QAM	2/3	52	57,8	☐
☑	6	1	64-QAM	3/4	58,5	65	☐
☑	7	1	64-QAM	5/6	65	72,2	☐
☑	8	1	256-QAM	3/4	78	86,7	☐
☑	9	1	256-QAM	5/6	N/A	N/A	☐
☑	10	2	BPSK	1/2	13	14,4	☐
☑	11	2	QPSK	1/2	26	28,8	☐
☑	12	2	QPSK	3/4	39	43,4	☐
☑	13	2	16-QAM	1/2	52	57,8	☐
☑	14	2	16-QAM	3/4	78	86,6	☐
☑	15	2	64-QAM	2/3	104	115,6	☐
☑	16	2	64-QAM	3/4	117	130	☐
☑	17	2	64-QAM	5/6	130	144,4	☐
☑	18	2	256-QAM	3/4	156	173,4	☐
☑	19	2	256-QAM	5/6	N/A	N/A	☐
☑	20	3	BPSK	1/2	19,5	21,6	☐
☑	21	3	QPSK	1/2	39	43,2	☐
☑	22	3	QPSK	3/4	58,5	65,1	☐
☑	23	3	16-QAM	1/2	78	86,7	☐
☑	24	3	16-QAM	3/4	117	129,9	☐
☑	25	3	64-QAM	2/3	156	173,4	☐
☑	26	3	64-QAM	3/4	175,5	195	☐
☑	27	3	64-QAM	5/6	195	216,6	☐
☑	28	3	256-QAM	3/4	234	260,1	☐
☑	29	3	256-QAM	5/6	N/A	N/A	☐
☑	30	4	BPSK	1/2	26	28,8	☑
☑	31	4	QPSK	1/2	52	57,6	☐
☑	32	4	QPSK	3/4	78	86,8	☐
☑	33	4	16-QAM	1/2	104	115,6	☐
☑	34	4	16-QAM	3/4	156	173,2	☐
☑	35	4	64-QAM	2/3	208	231,2	☐
☑	36	4	64-QAM	3/4	234	260	☐
☑	37	4	64-QAM	5/6	260	288,8	☐
☑	38	4	256-QAM	3/4	312	346,8	☐
☑	39	4	256-QAM	5/6	N/A	N/A	☐
☐	40	5	BPSK	1/2	32,5	36	☐
☐	41	5	QPSK	1/2	65	72	☐
☐	42	5	QPSK	3/4	97,5	108,5	☐
☐	43	5	16-QAM	1/2	130	144,5	☐
☐	44	5	16-QAM	3/4	195	216,5	☐
☐	45	5	64-QAM	2/3	260	289	☐
☐	46	5	64-QAM	3/4	292,5	325	☐
☐	47	5	64-QAM	5/6	325	361	☐
☐	48	5	256-QAM	3/4	390	433,5	☐
☐	49	5	256-QAM	5/6	N/A	N/A	☐
☐	50	6	BPSK	1/2	39	43,2	☐
☐	51	6	QPSK	1/2	78	86,4	☐
☐	52	6	QPSK	3/4	117	130,2	☐
☐	53	6	16-QAM	1/2	156	173,4	☐
☐	54	6	16-QAM	3/4	234	259,8	☐
☐	55	6	64-QAM	2/3	312	346,8	☐
☐	56	6	64-QAM	3/4	351	390	☐
☐	57	6	64-QAM	5/6	390	433,2	☐
☐	58	6	256-QAM	3/4	468	520,2	☐
☐	59	6	256-QAM	5/6	N/A	N/A	☐
☐	60	7	BPSK	1/2	45,5	50,4	☐
☐	61	7	QPSK	1/2	91	100,8	☐
☐	62	7	QPSK	3/4	136,5	151,9	☐
☐	63	7	16-QAM	1/2	182	202,3	☐
☐	64	7	16-QAM	3/4	273	303,1	☐
☐	65	7	64-QAM	2/3	364	404,6	☐
☐	66	7	64-QAM	3/4	409,5	455	☐
☐	67	7	64-QAM	5/6	455	505,4	☐
☐	68	7	256-QAM	3/4	546	606,9	☐
☐	69	7	256-QAM	5/6	N/A	N/A	☐
☐	70	8	BPSK	1/2	52	57,6	☐
☐	71	8	QPSK	1/2	104	115,2	☐
☐	72	8	QPSK	3/4	156	173,6	☐
☐	73	8	16-QAM	1/2	208	231,2	☐
☐	74	8	16-QAM	3/4	312	346,4	☐
☐	75	8	64-QAM	2/3	416	462,4	☐
☐	76	8	64-QAM	3/4	468	520	☐
☐	77	8	64-QAM	5/6	520	577,6	☐
☐	78	8	256-QAM	3/4	624	693,6	☐
☐	79	8	256-QAM	5/6	N/A	N/A	☐

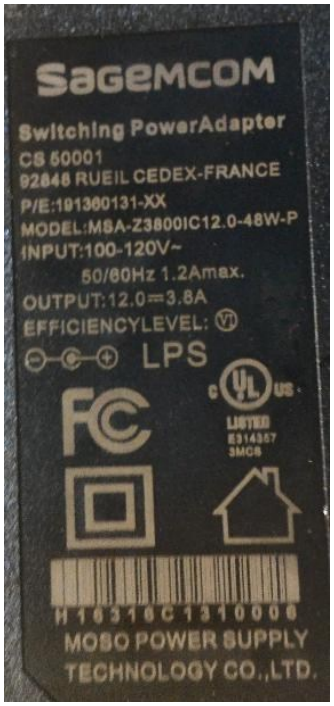
DATA RATE: 802.11ac VHT40							
Available for EUT	MCS Index	Nbr of spatial streams	Modulation (Stream 1/2/3/4)	Coding rate	GI = 800ns	GI = 400ns	Worst Case Modulation
☑	0	1	BPSK	1/2	13,5	15	☑
☑	1	1	QPSK	1/2	27	30	☐
☑	2	1	QPSK	3/4	40,5	45	☐
☑	3	1	16-QAM	1/2	54	60	☐
☑	4	1	16-QAM	3/4	81	90	☐
☑	5	1	64-QAM	2/3	108	120	☐
☑	6	1	64-QAM	3/4	121,5	135	☐
☑	7	1	64-QAM	5/6	135	150	☐
☑	8	1	256-QAM	3/4	162	180	☐
☑	9	1	256-QAM	5/6	180	200	☐
☑	10	2	BPSK	1/2	27	30	☐
☑	11	2	QPSK	1/2	54	60	☐
☑	12	2	QPSK	3/4	81	90	☐
☑	13	2	16-QAM	1/2	108	120	☐
☑	14	2	16-QAM	3/4	162	180	☐
☑	15	2	64-QAM	2/3	216	240	☐
☑	16	2	64-QAM	3/4	243	270	☐
☑	17	2	64-QAM	5/6	270	300	☐
☑	18	2	256-QAM	3/4	324	360	☐
☑	19	2	256-QAM	5/6	360	400	☐
☑	20	3	BPSK	1/2	40,5	45	☐
☑	21	3	QPSK	1/2	81	90	☐
☑	22	3	QPSK	3/4	121,5	135	☐
☑	23	3	16-QAM	1/2	162	180	☐
☑	24	3	16-QAM	3/4	243	270	☐
☑	25	3	64-QAM	2/3	324	360	☐
☑	26	3	64-QAM	3/4	364,5	405	☐
☑	27	3	64-QAM	5/6	405	450	☐
☑	28	3	256-QAM	3/4	486	540	☐
☑	29	3	256-QAM	5/6	540	600	☐
☐	30	4	BPSK	1/2	54	60	☑
☐	31	4	QPSK	1/2	108	120	☐
☐	32	4	QPSK	3/4	162	180	☐
☐	33	4	16-QAM	1/2	216	240	☐
☐	34	4	16-QAM	3/4	324	360	☐
☐	35	4	64-QAM	2/3	432	480	☐
☐	36	4	64-QAM	3/4	486	540	☐
☐	37	4	64-QAM	5/6	540	600	☐
☐	38	4	256-QAM	3/4	648	720	☐
☐	39	4	256-QAM	5/6	720	800	☐
☐	40	5	BPSK	1/2	67,5	75	☐
☐	41	5	QPSK	1/2	135	150	☐
☐	42	5	QPSK	3/4	202,5	225	☐
☐	43	5	16-QAM	1/2	270	300	☐
☐	44	5	16-QAM	3/4	405	450	☐
☐	45	5	64-QAM	2/3	540	600	☐
☐	46	5	64-QAM	3/4	607,5	675	☐
☐	47	5	64-QAM	5/6	675	750	☐
☐	48	5	256-QAM	3/4	810	900	☐
☐	49	5	256-QAM	5/6	900	1000	☐
☐	50	6	BPSK	1/2	81	90	☐
☐	51	6	QPSK	1/2	162	180	☐
☐	52	6	QPSK	3/4	243	270	☐
☐	53	6	16-QAM	1/2	324	360	☐
☐	54	6	16-QAM	3/4	486	540	☐
☐	55	6	64-QAM	2/3	648	720	☐
☐	56	6	64-QAM	3/4	729	810	☐
☐	57	6	64-QAM	5/6	810	900	☐
☐	58	6	256-QAM	3/4	972	1080	☐
☐	59	6	256-QAM	5/6	1080	1200	☐
☐	60	7	BPSK	1/2	94,5	105	☐
☐	61	7	QPSK	1/2	189	210	☐
☐	62	7	QPSK	3/4	283,5	315	☐
☐	63	7	16-QAM	1/2	378	420	☐
☐	64	7	16-QAM	3/4	567	630	☐
☐	65	7	64-QAM	2/3	756	840	☐
☐	66	7	64-QAM	3/4	850,5	945	☐
☐	67	7	64-QAM	5/6	945	1050	☐
☐	68	7	256-QAM	3/4	1134	1260	☐
☐	69	7	256-QAM	5/6	1260	1400	☐
☐	70	8	BPSK	1/2	108	120	☐
☐	71	8	QPSK	1/2	216	240	☐
☐	72	8	QPSK	3/4	324	360	☐
☐	73	8	16-QAM	1/2	432	480	☐
☐	74	8	16-QAM	3/4	648	720	☐
☐	75	8	64-QAM	2/3	864	960	☐
☐	76	8	64-QAM	3/4	972	1080	☐
☐	77	8	64-QAM	5/6	1080	1200	☐
☐	78	8	256-QAM	3/4	1296	1440	☐
☐	79	8	256-QAM	5/6	1440	1600	☐

DATA RATE: 802.11ac VHT80							
Available for EUT	MCS Index	Nbr of spatial streams	Modulation (Stream 1/2/3/4)	Coding rate	GI = 800ns	GI = 400ns	Worst Case Modulation
☑	0	1	BPSK	1/2	29.3	32.5	☑
☑	1	1	QPSK	1/2	58.5	65	☐
☑	2	1	QPSK	3/4	87.8	97.5	☐
☑	3	1	16-QAM	1/2	117	130	☐
☑	4	1	16-QAM	3/4	175.5	195	☐
☑	5	1	64-QAM	2/3	234	260	☐
☑	6	1	64-QAM	3/4	263.3	292.5	☐
☑	7	1	64-QAM	5/6	292.5	325	☐
☑	8	1	256-QAM	3/4	351	390	☐
☑	9	1	256-QAM	5/6	390	433.3	☐
☑	10	2	BPSK	1/2	58.6	65	☐
☑	11	2	QPSK	1/2	117	130	☐
☑	12	2	QPSK	3/4	175.6	195	☐
☑	13	2	16-QAM	1/2	234	260	☐
☑	14	2	16-QAM	3/4	351	390	☐
☑	15	2	64-QAM	2/3	468	520	☐
☑	16	2	64-QAM	3/4	526.6	585	☐
☑	17	2	64-QAM	5/6	585	650	☐
☑	18	2	256-QAM	3/4	702	780	☐
☑	19	2	256-QAM	5/6	780	866.6	☐
☑	20	3	BPSK	1/2	87.9	97.5	☐
☑	21	3	QPSK	1/2	175.5	195	☐
☑	22	3	QPSK	3/4	263.4	292.5	☐
☑	23	3	16-QAM	1/2	351	390	☐
☑	24	3	16-QAM	3/4	526.5	585	☐
☑	25	3	64-QAM	2/3	702	780	☐
☑	26	3	64-QAM	3/4	789.9	877.5	☐
☑	27	3	64-QAM	5/6	877.5	975	☐
☑	28	3	256-QAM	3/4	1053	1170	☐
☑	29	3	256-QAM	5/6	1170	1299.9	☐
☑	30	4	BPSK	1/2	117.2	130	☑
☑	31	4	QPSK	1/2	234	260	☐
☑	32	4	QPSK	3/4	351.2	390	☐
☑	33	4	16-QAM	1/2	468	520	☐
☑	34	4	16-QAM	3/4	702	780	☐
☑	35	4	64-QAM	2/3	936	1040	☐
☑	36	4	64-QAM	3/4	1053.2	1170	☐
☑	37	4	64-QAM	5/6	1170	1300	☐
☑	38	4	256-QAM	3/4	1404	1560	☐
☑	39	4	256-QAM	5/6	1560	1733.2	☐
☐	40	5	BPSK	1/2	146.5	162.5	☐
☐	41	5	QPSK	1/2	292.5	325	☐
☐	42	5	QPSK	3/4	439	487.5	☐
☐	43	5	16-QAM	1/2	585	650	☐
☐	44	5	16-QAM	3/4	877.5	975	☐
☐	45	5	64-QAM	2/3	1170	1300	☐
☐	46	5	64-QAM	3/4	1316.5	1462.5	☐
☐	47	5	64-QAM	5/6	1462.5	1625	☐
☐	48	5	256-QAM	3/4	1755	1950	☐
☐	49	5	256-QAM	5/6	1950	2166.5	☐
☐	50	6	BPSK	1/2	175.8	195	☐
☐	51	6	QPSK	1/2	351	390	☐
☐	52	6	QPSK	3/4	526.8	585	☐
☐	53	6	16-QAM	1/2	702	780	☐
☐	54	6	16-QAM	3/4	1053	1170	☐
☐	55	6	64-QAM	2/3	1404	1560	☐
☐	56	6	64-QAM	3/4	1579.8	1755	☐
☐	57	6	64-QAM	5/6	1755	1950	☐
☐	58	6	256-QAM	3/4	2106	2340	☐
☐	59	6	256-QAM	5/6	2340	2599.8	☐
☐	60	7	BPSK	1/2	205.1	227.5	☐
☐	61	7	QPSK	1/2	409.5	455	☐
☐	62	7	QPSK	3/4	614.6	682.5	☐
☐	63	7	16-QAM	1/2	819	910	☐
☐	64	7	16-QAM	3/4	1228.5	1365	☐
☐	65	7	64-QAM	2/3	1638	1820	☐
☐	66	7	64-QAM	3/4	1843.1	2047.5	☐
☐	67	7	64-QAM	5/6	2047.5	2275	☐
☐	68	7	256-QAM	3/4	2457	2730	☐
☐	69	7	256-QAM	5/6	2730	3033.1	☐
☐	70	8	BPSK	1/2	234.4	260	☐
☐	71	8	QPSK	1/2	468	520	☐
☐	72	8	QPSK	3/4	702.4	780	☐
☐	73	8	16-QAM	1/2	936	1040	☐
☐	74	8	16-QAM	3/4	1404	1560	☐
☐	75	8	64-QAM	2/3	1872	2080	☐
☐	76	8	64-QAM	3/4	2106.4	2340	☐
☐	77	8	64-QAM	5/6	2340	2600	☐
☐	78	8	256-QAM	3/4	2808	3120	☐
☐	79	8	256-QAM	5/6	3120	3466.4	☐

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 a fixed channel in the data rate that produced the lowest power
- Permanent reception

2.3. EQUIPMENT LABELLING



Power supply n°1

Power supply n°2

Power supply n°3

2.4. EQUIPMENT MODIFICATION

☑ None ☐ Modification:

3. OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

Test performed by	: Mathieu CERISIER
Date of test	: December 19, 2016
Ambient temperature	: 25 °C
Relative humidity	: 42 %

3.2. TEST SETUP

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

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

- Test Procedure:
☑ KDB 789033 D02 General UNII Test Procedures New Rules v01r02 § D

Photograph for Occupied bandwidth

3.1. LIMIT

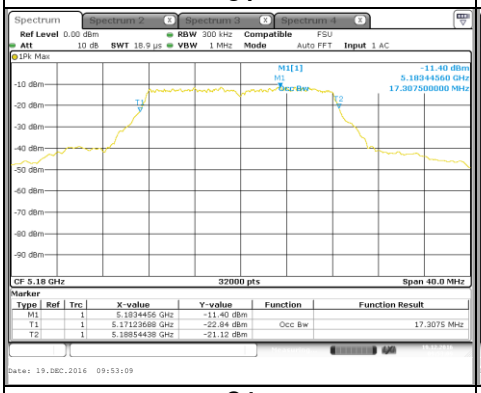
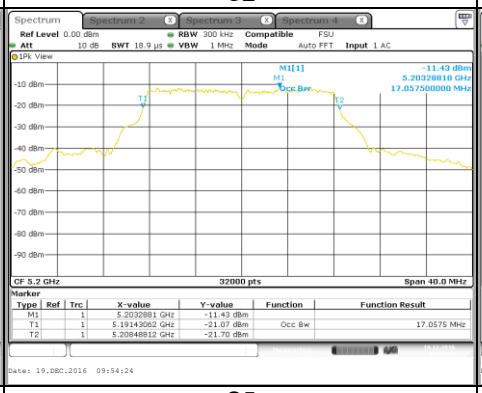
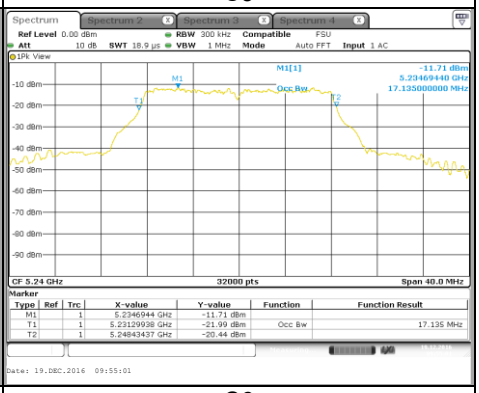
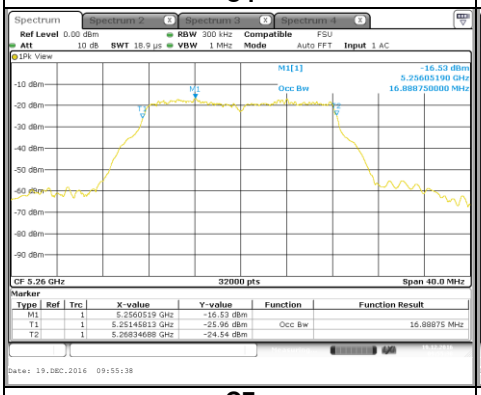
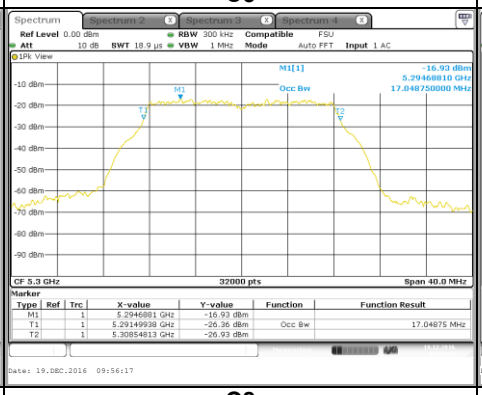
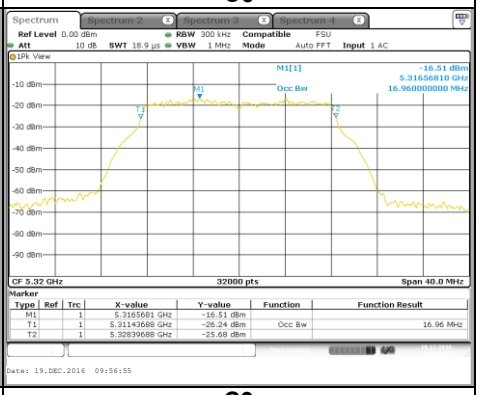
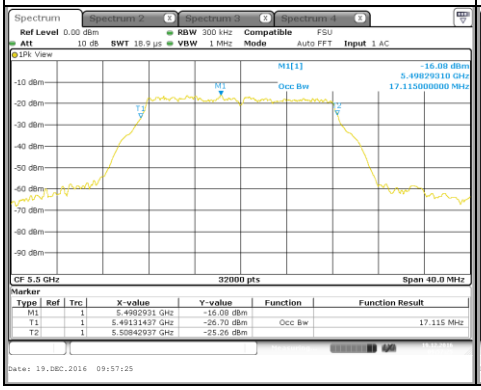
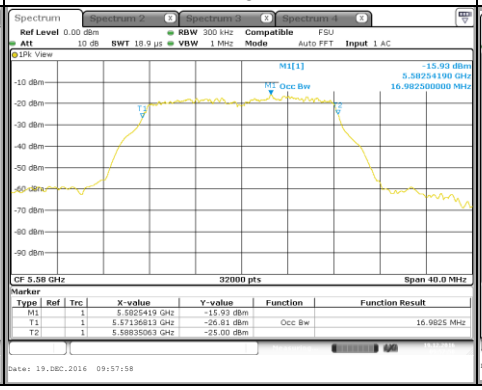
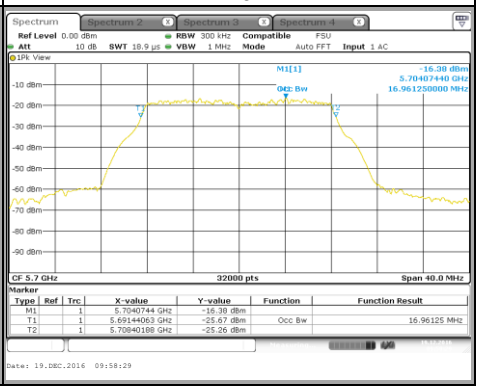
None

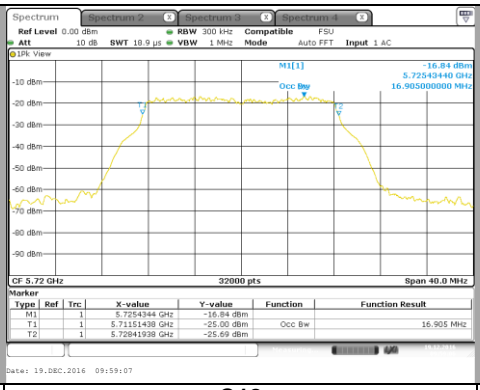
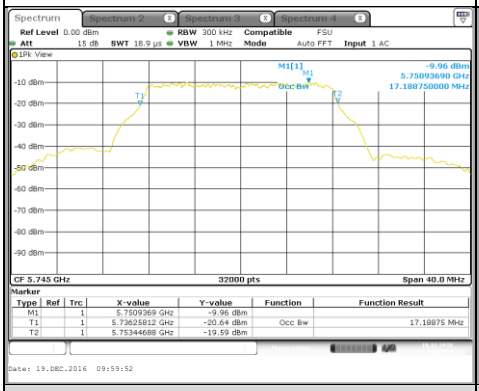
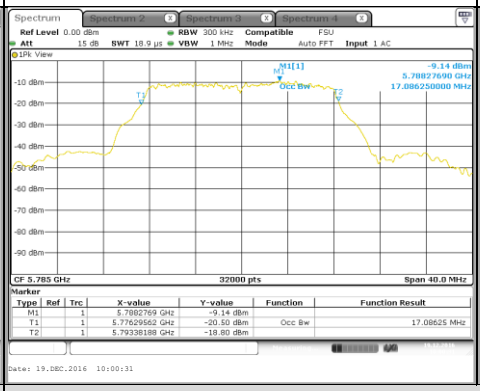
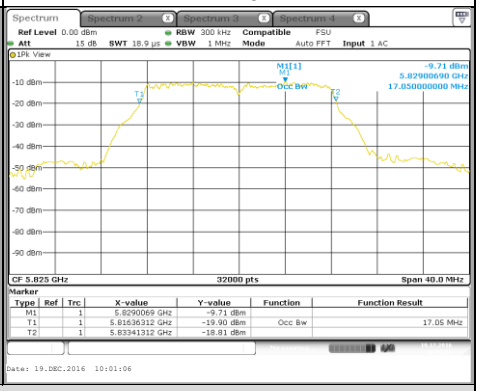
3.2. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
Multi-meter	KEITHLEY	2000	A1242090	2015/06	2017/06
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7040079	Verified with calibrated multimeter	Verified with calibrated multimeter
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329676	2016/09	2017/09

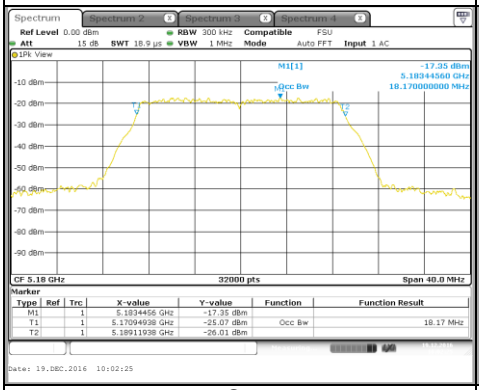
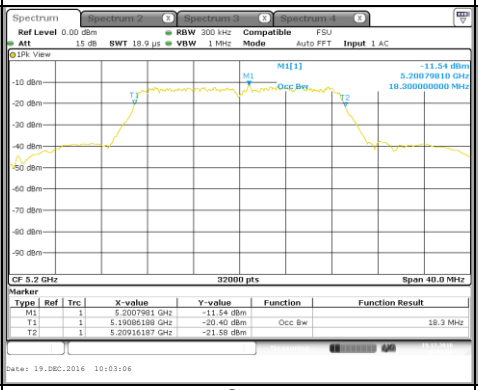
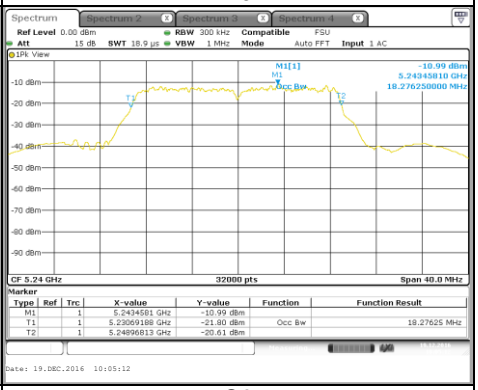
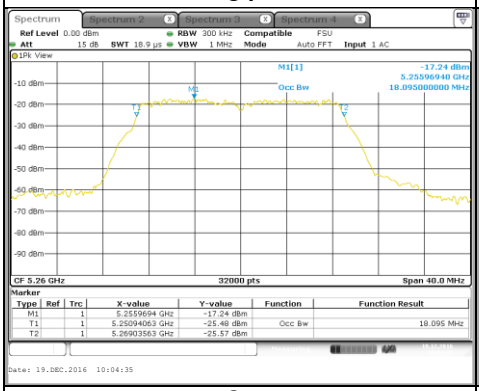
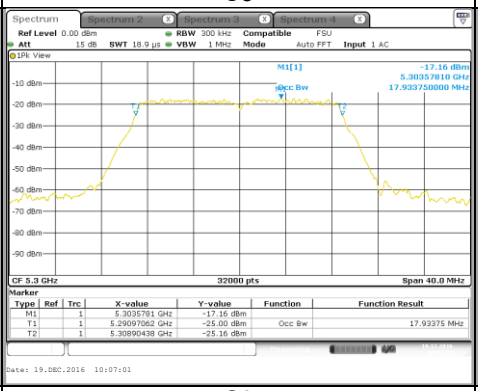
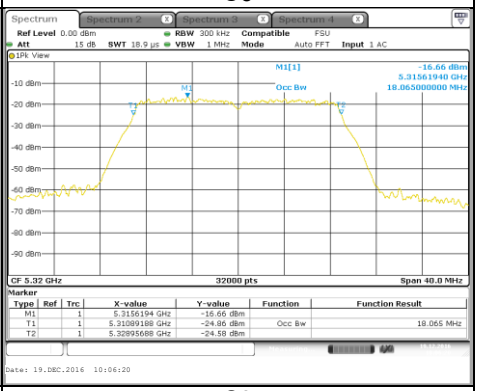
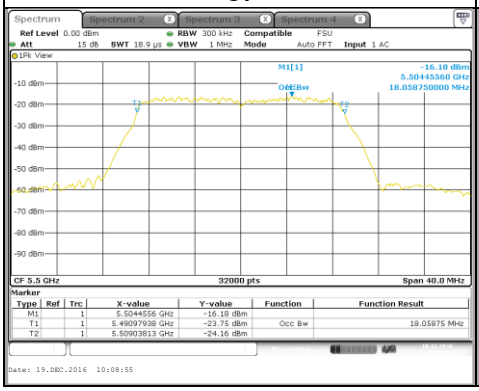
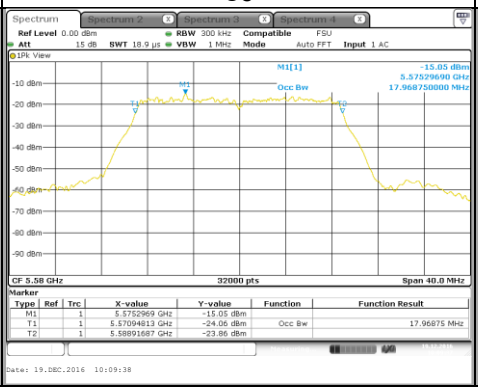
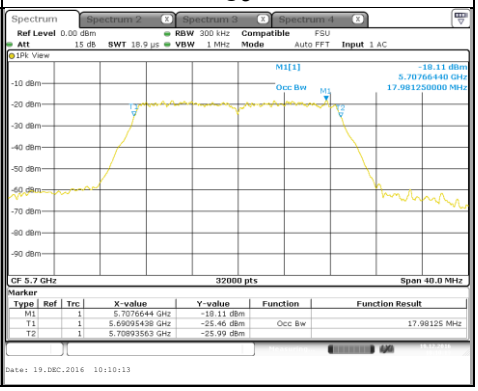
Note: In our quality system, the test equipment calibration due is more & less 2 months

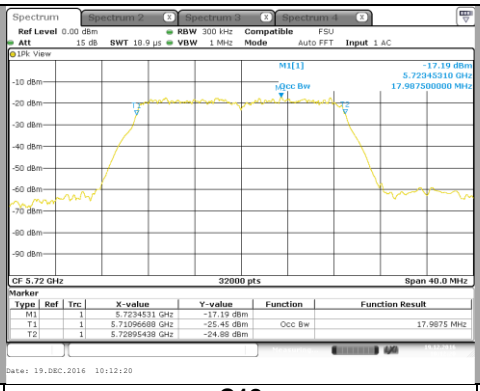
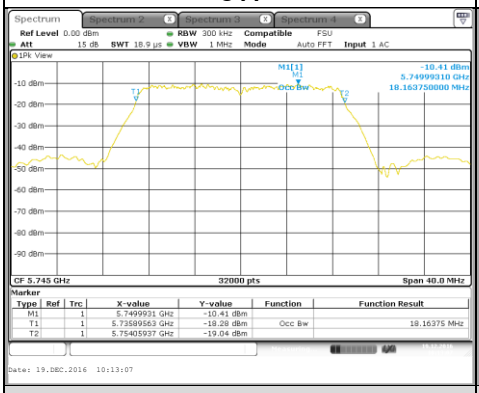
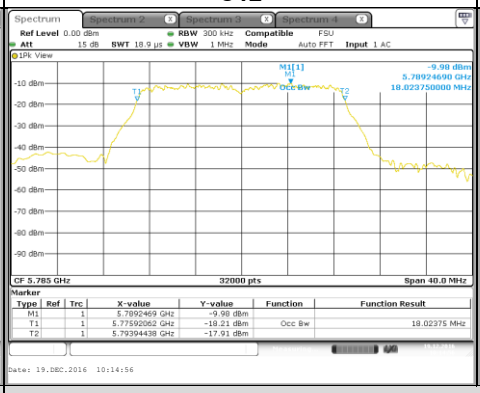
3.3. RESULTS

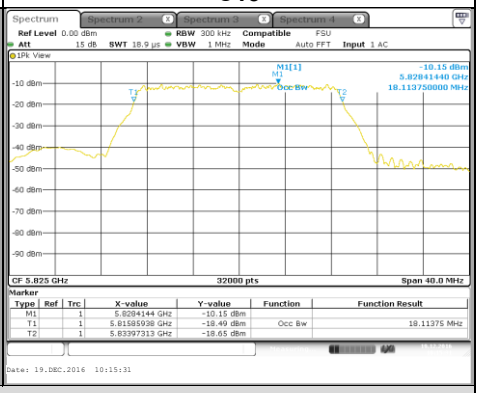
802.11a		
C1	C2	C3
		
C4	C5	C6
		
C7	C8	C9
		

802.11a		
C10		
		
C11	C12	C13
		

Channel	Occupied Channel Bandwidth (MHz)
C1	17,31
C2	17,06
C3	17,14
C4	16,89
C5	17,05
C6	16,96
C7	17,12
C8	16,98
C9	16,96
C10	16,91
C11	17,19
C12	17,09
C13	17,05

802.11n HT20/ac VHT20		
C1	C2	C3
		
C4	C5	C6
		
C7	C8	C9
		

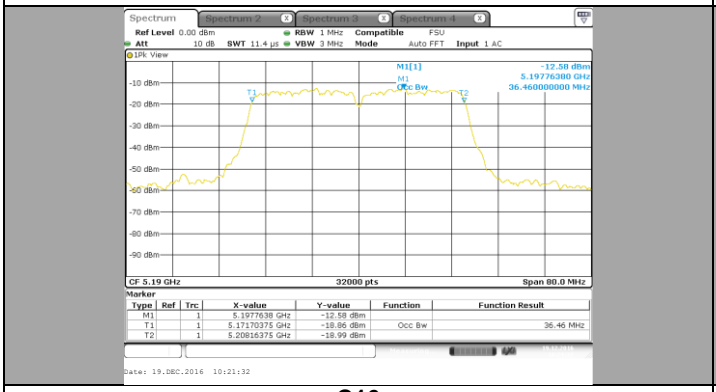
802.11n HT20/ac VHT20	
C10	
	
C11	C12
	

C13


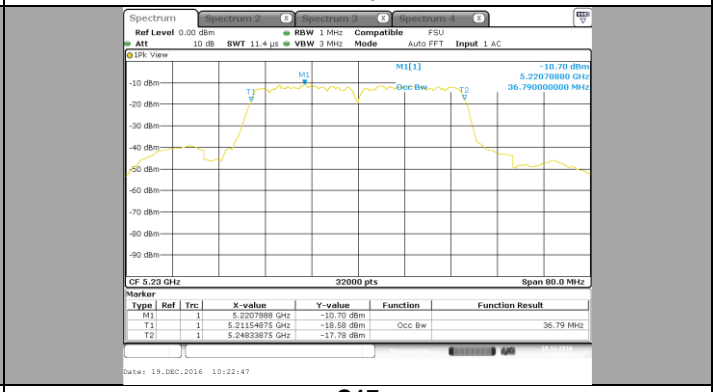
Channel	Occupied Channel Bandwidth (MHz)
C1	18,17
C2	18,3
C3	18,28
C4	18,1
C5	17,93
C6	18,07
C7	18,06
C8	17,97
C9	17,98
C10	17,99
C11	18,16
C12	18,02
C13	18,11

802.11n HT40/ac VHT40

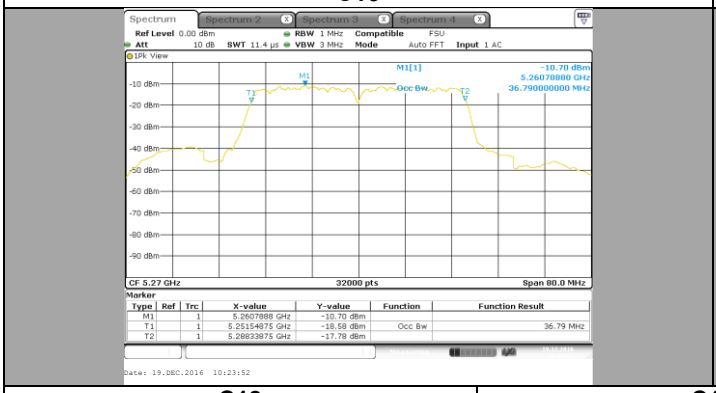
C14



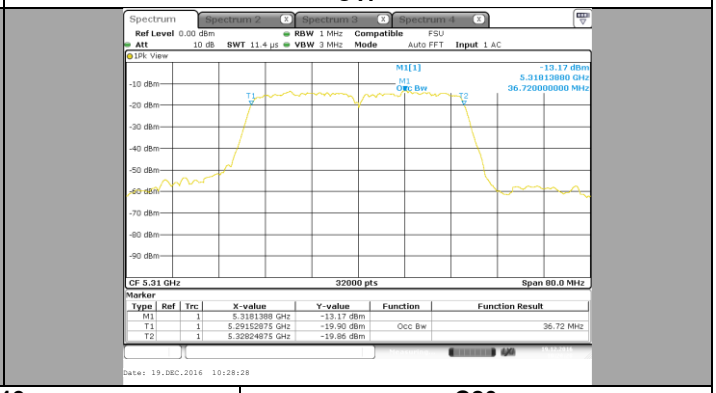
C15



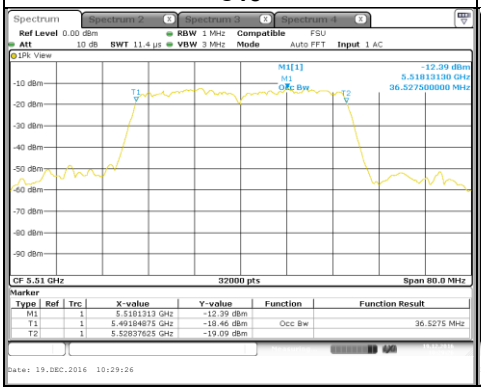
C16



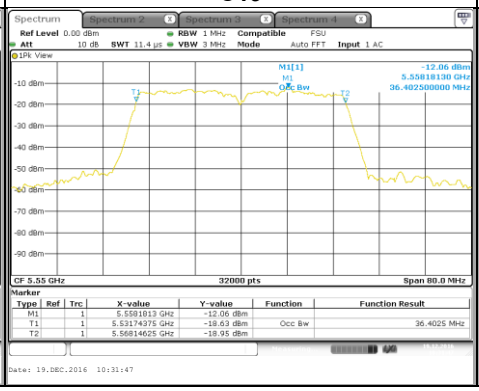
C17



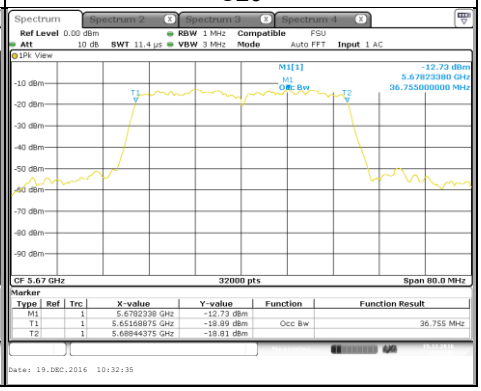
C18

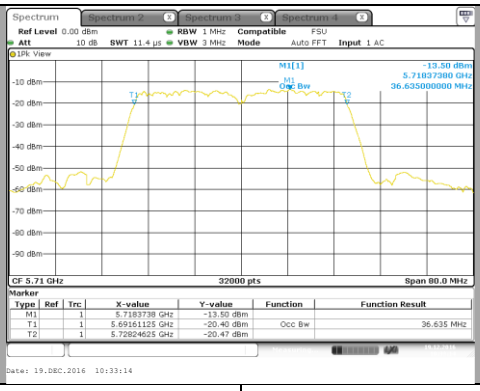
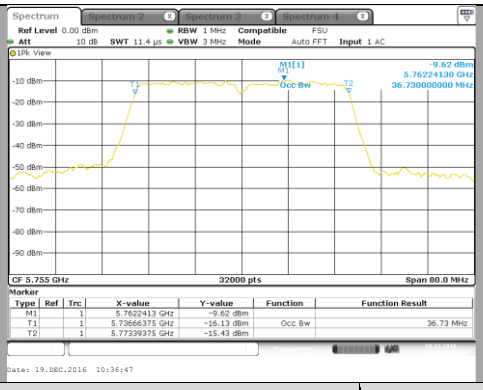
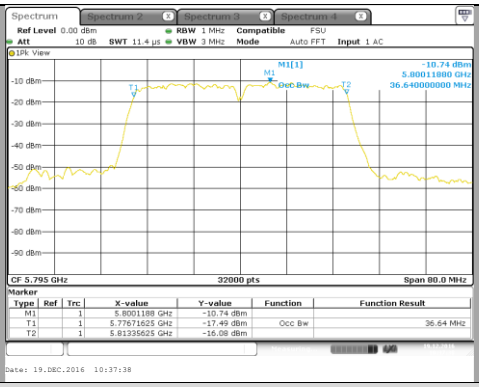


C19

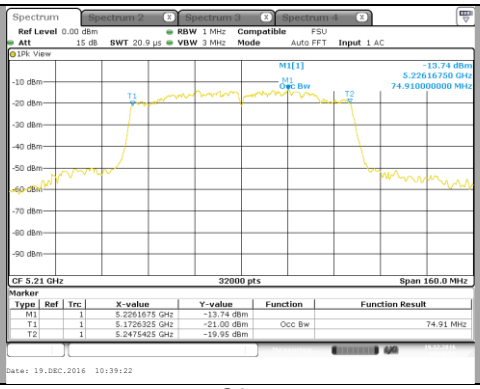
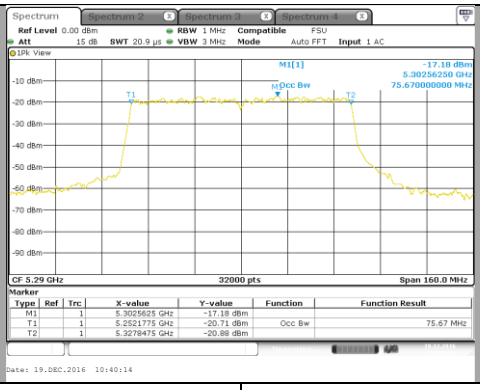
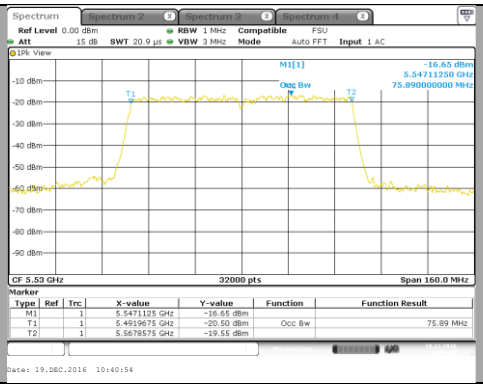
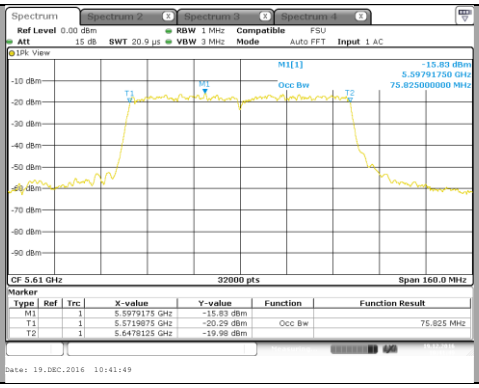


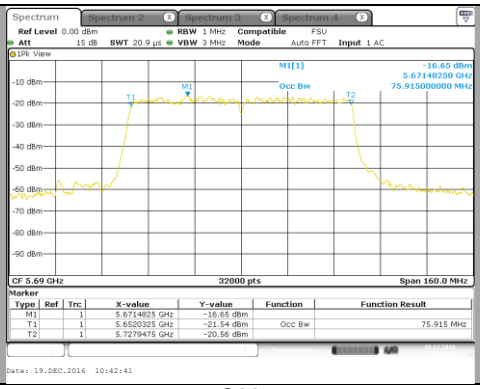
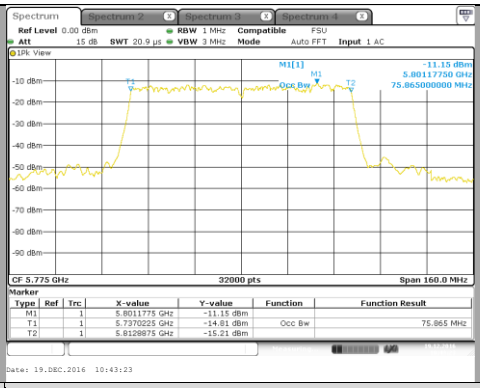
C20



802.11n HT40/ac VHT40	
C21	
	
C22	C23
	

Channel	Occupied Channel Bandwidth (MHz)
C14	36,46
C15	36,79
C16	36,79
C17	36,72
C18	36,53
C19	36,4
C20	36,76
C21	36,64
C22	36,73
C23	36,64

802.11ac VHT80	
C24	
	
C25	
	
C26	C27
	

802.11ac VHT80	
C28	
	
C29	
	
Channel	Occupied Channel Bandwidth (MHz)
C24	74,91
C25	75,67
C26	75,89
C27	75,83
C28	75,92
C29	75,87

3.1. CONCLUSION

Occupied Channel Bandwidth measurement performed on the sample of the product **SAGEMCOM MiniBox (253697290)**, SN: **616476080862**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.407** limits.

4. CARRIER FREQUENCIES

4.1. TEST CONDITIONS

Test performed by	: Mathieu CERISIER
Date of test	: November 30, 2016
Ambient temperature	: 22 °C
Relative humidity	: 37 %

4.2. TEST SETUP

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

-Measurement is performed with a spectrum analyzer
☑ On the EUT conducted access
☐ With a test fixture

-Method of measurement
☐ Unmodulated (Spectrum Analyzer Counter Function)
☑ Modulated (Spectrum Analyzer NdB down Function)

In case of smart antenna systems operating in a multiple transmit chains active simultaneously, the measurement is only performed on one of the active transmit chains.

Photograph for Carrier Frequencies

4.3. LIMIT

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

4.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Multi-meter	KEITHLEY	2000	A1241084	2016/05	2018/05
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7040079	Verified with calibrated multimeter	Verified with calibrated multimeter
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/03	2017/03
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329676	2016/09	2017/09
Climatic chamber	SECASI Technologies	SLT-34	D1024029	Verified with calibrated Thermometer	Verified with calibrated Thermometer
Thermometer	AOIP	TM 6630	B4041042	2016/09	2018/03

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

4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

☑ None ☐ Divergence:

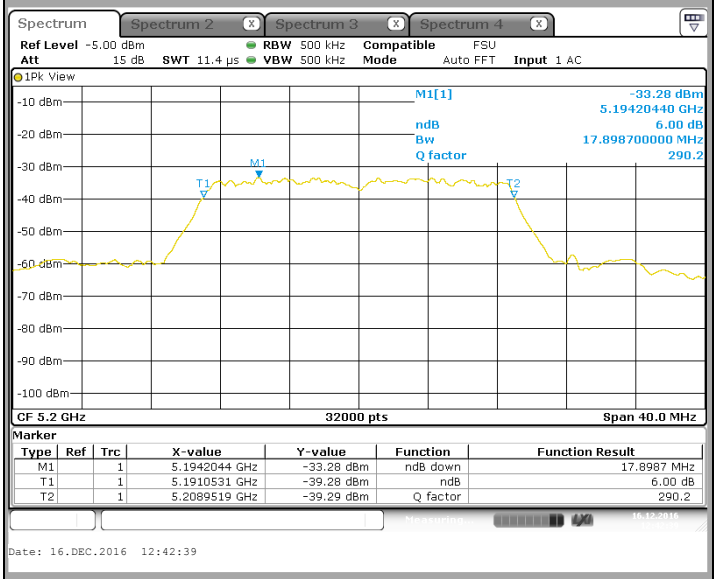
4.6. RESULTS

802.11a/802.11nHT20/ac VHT20

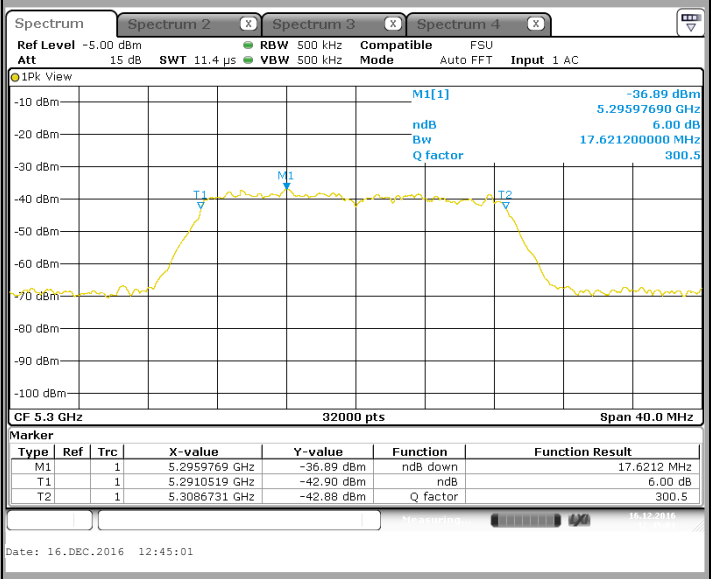
Tmin

Vmin

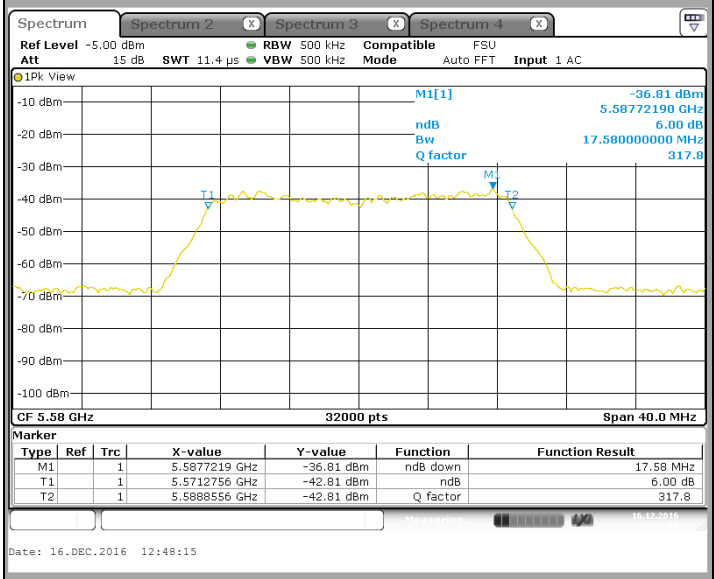
C2



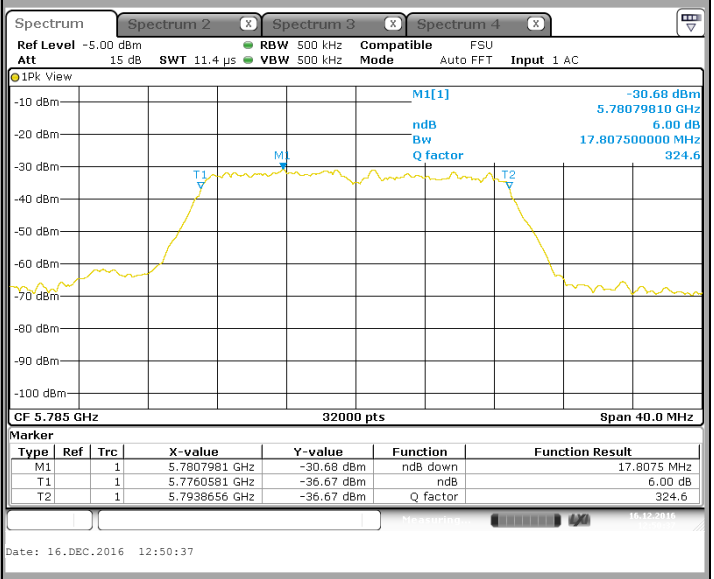
C5



C8



C12

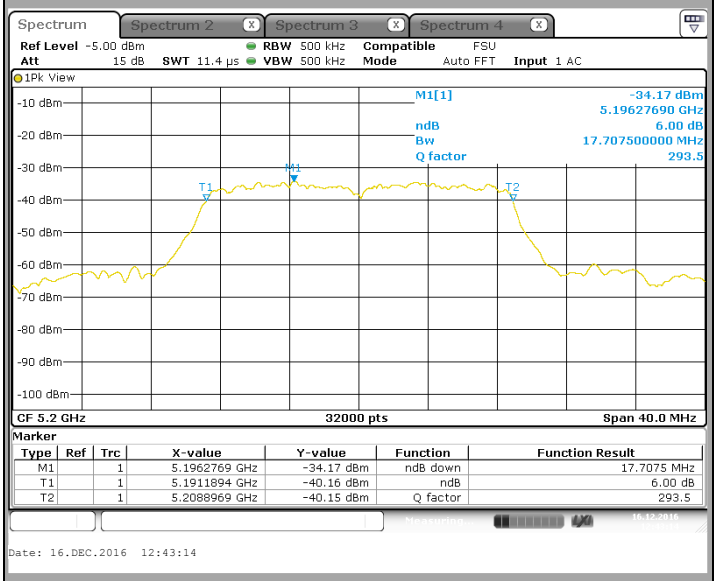


802.11a/802.11nHT20/ac VHT20

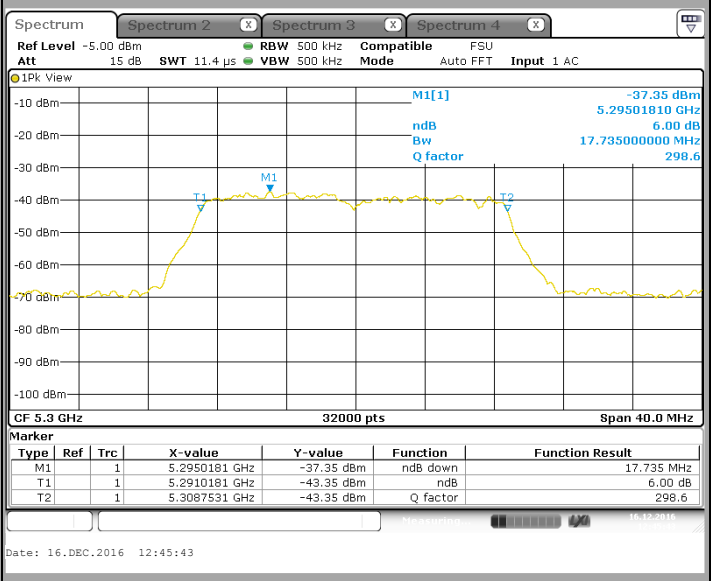
Tmin

Vnom

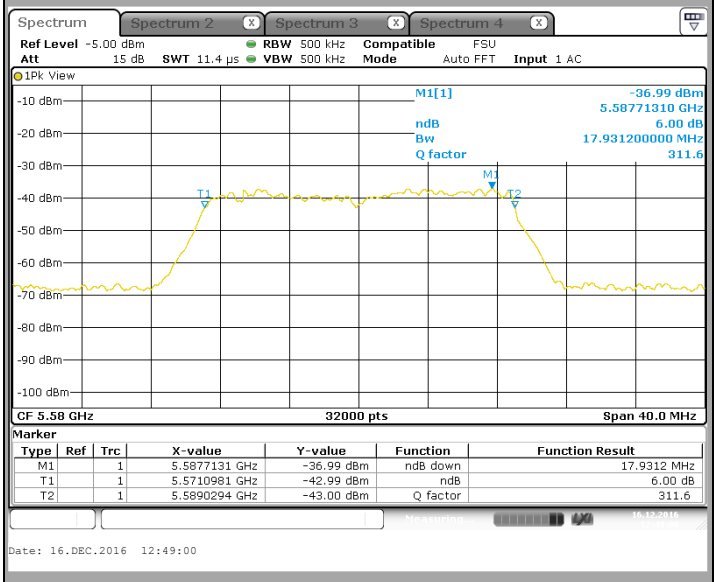
C2



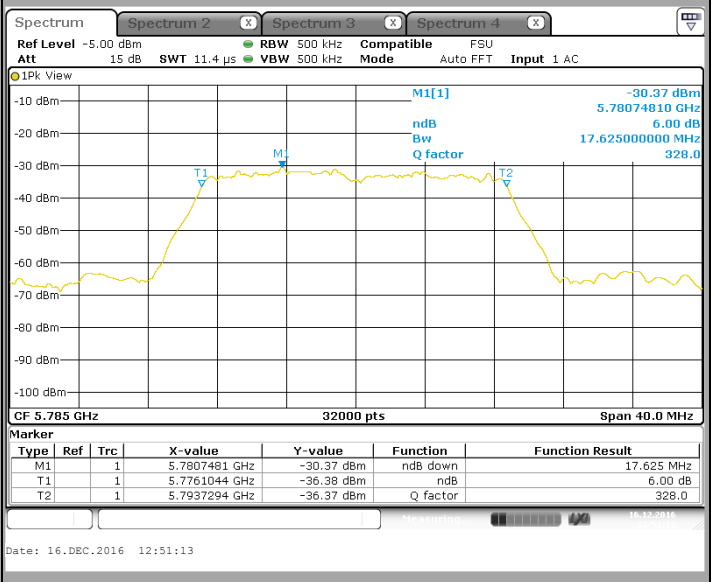
C5



C8



C12

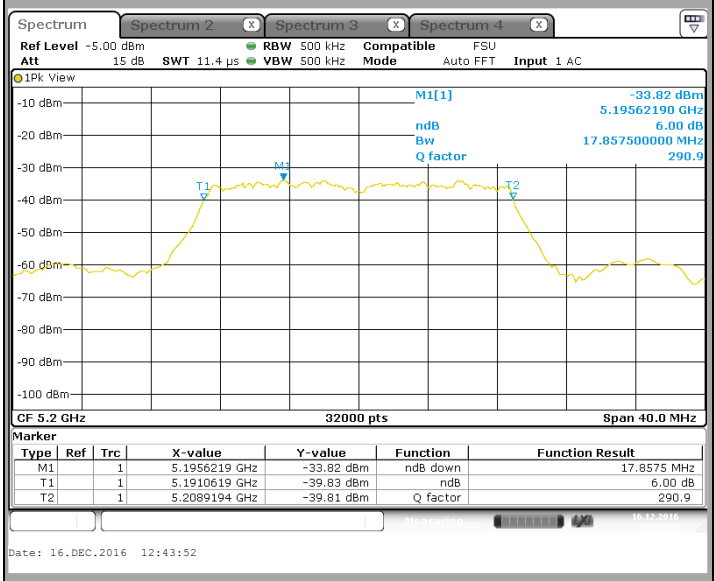


802.11a/802.11nHT20/ac VHT20

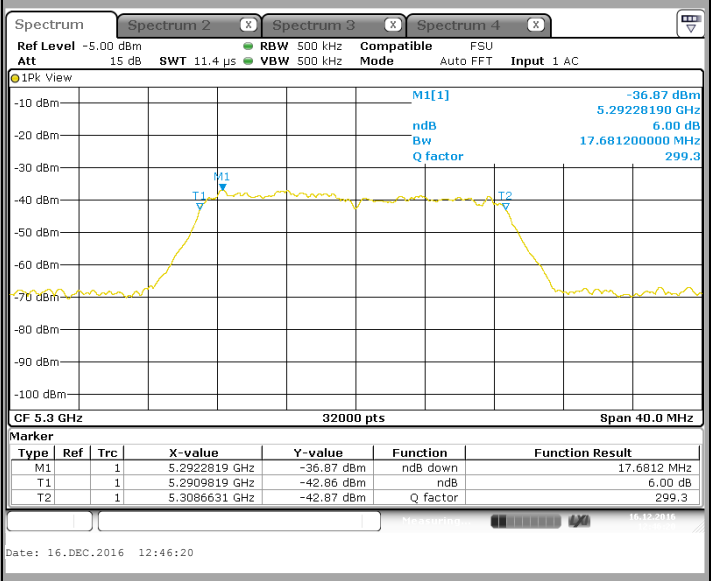
Tmin

Vmax

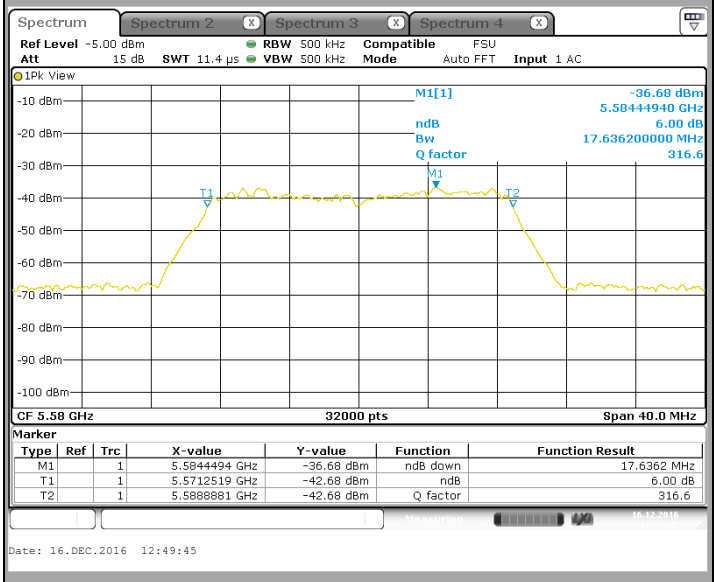
C2



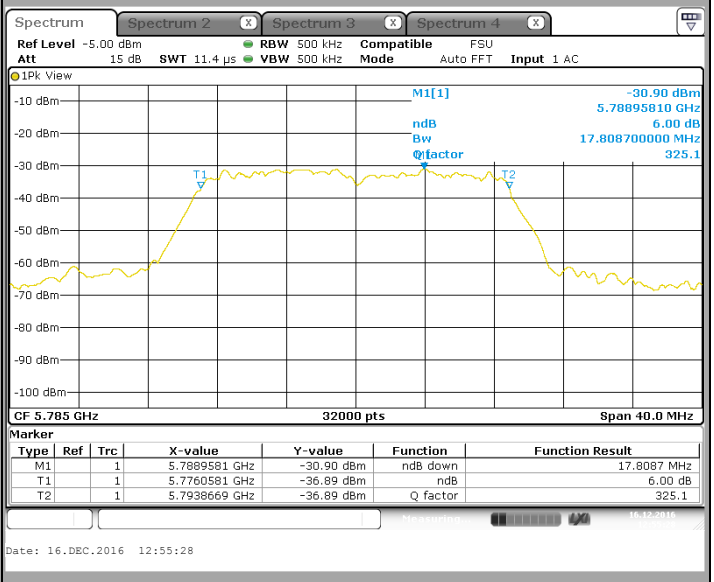
C5

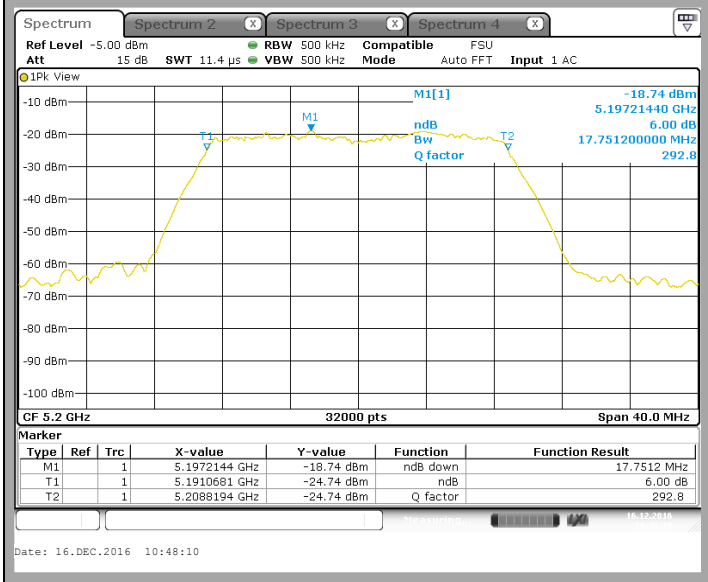
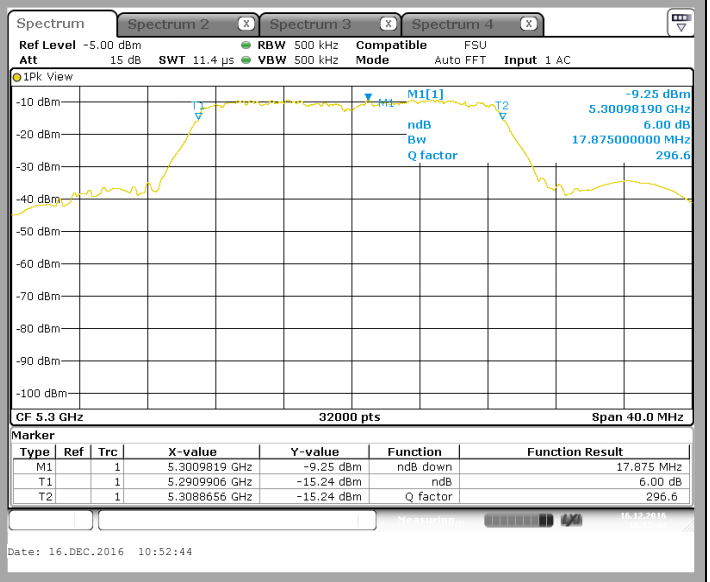
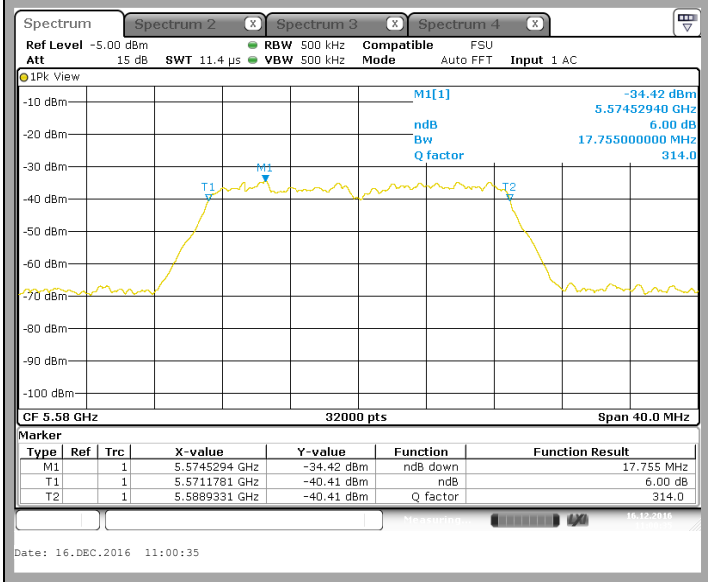
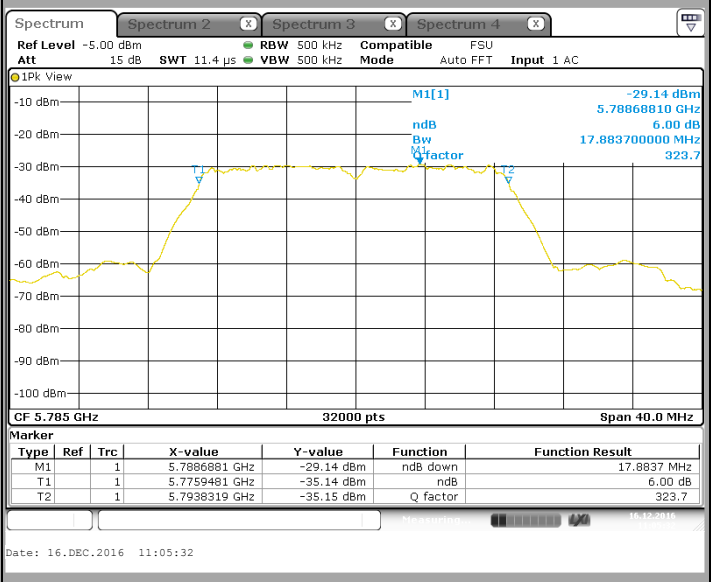


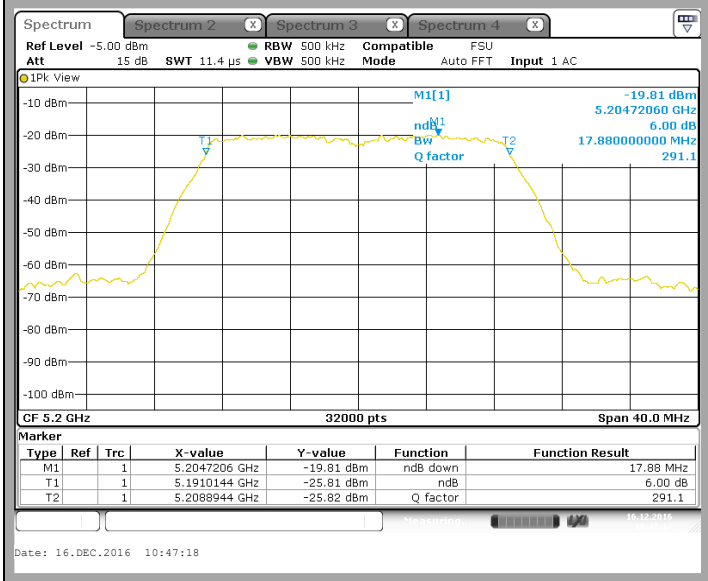
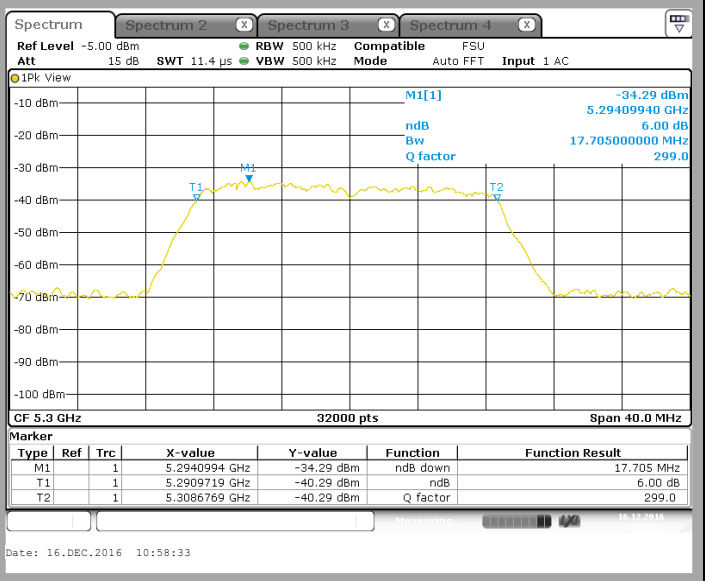
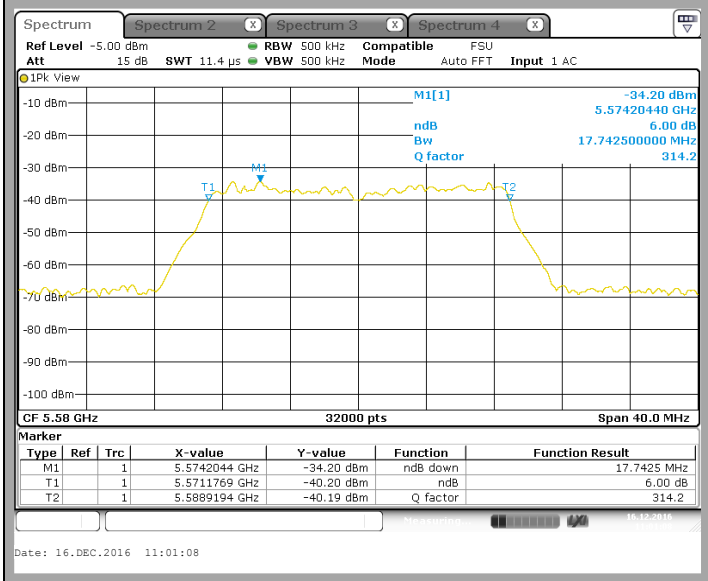
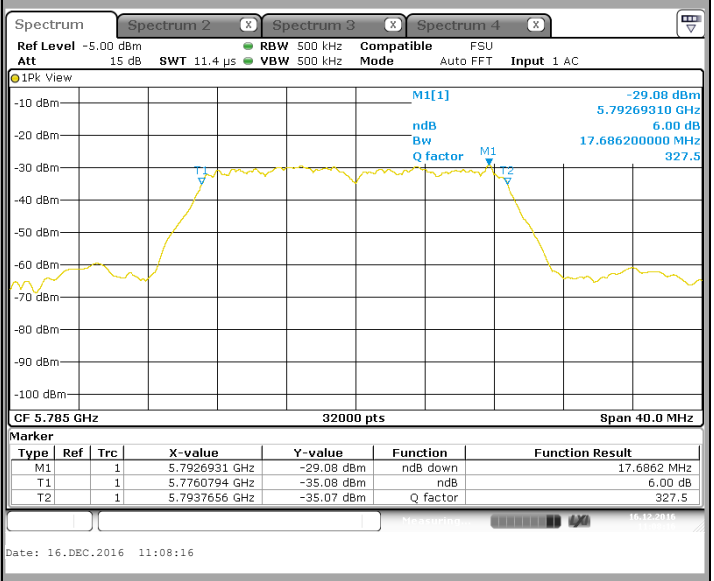
C8

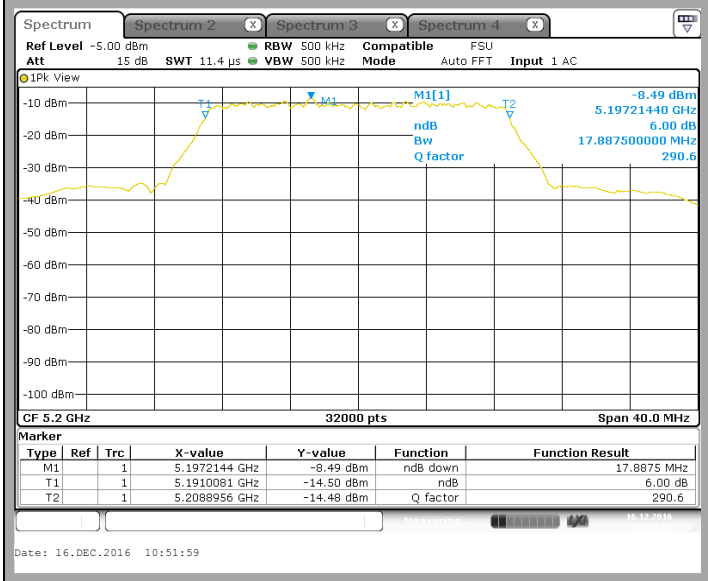
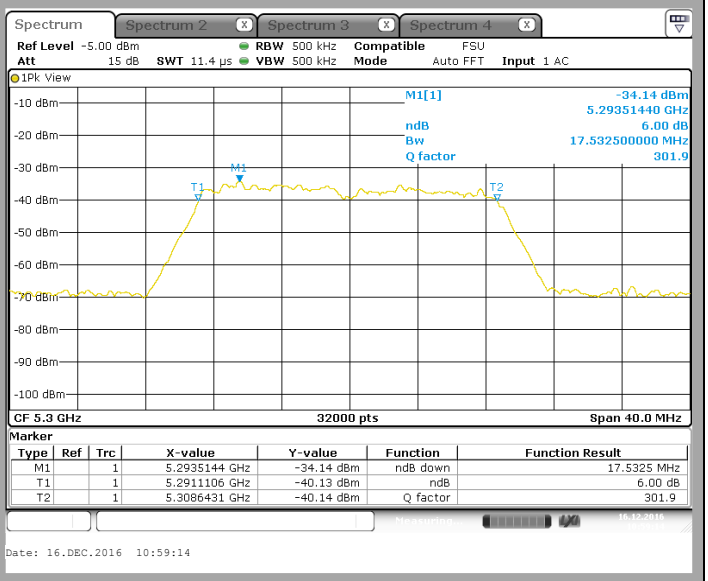
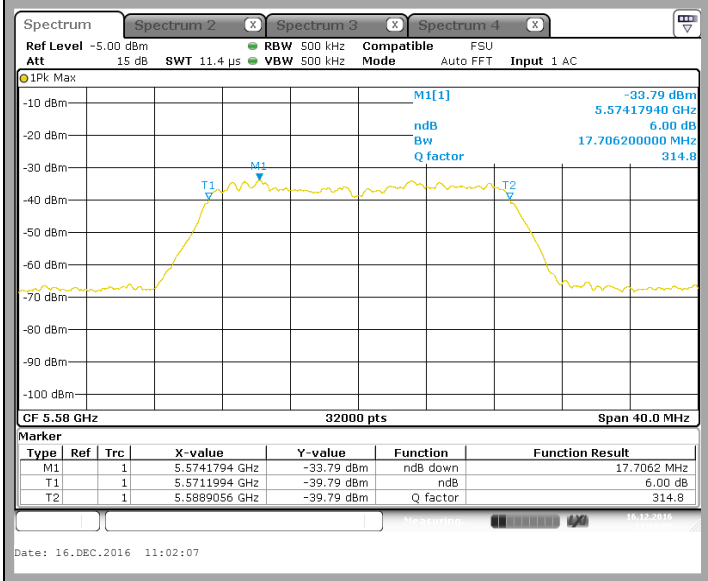
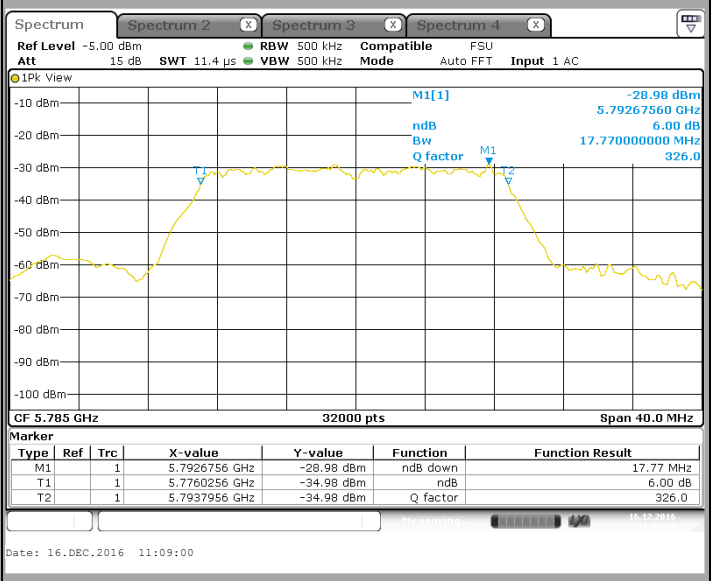


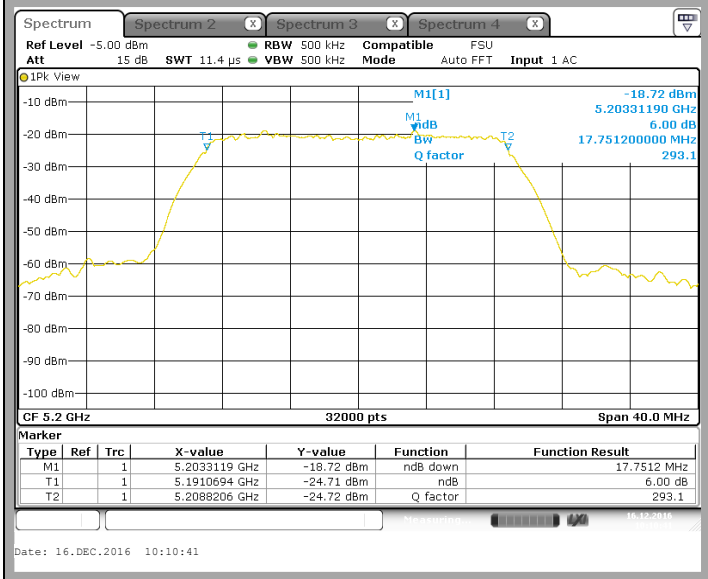
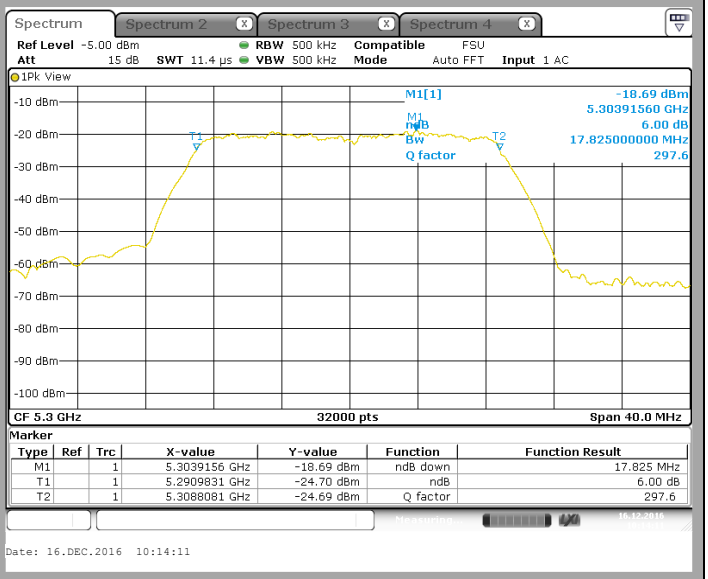
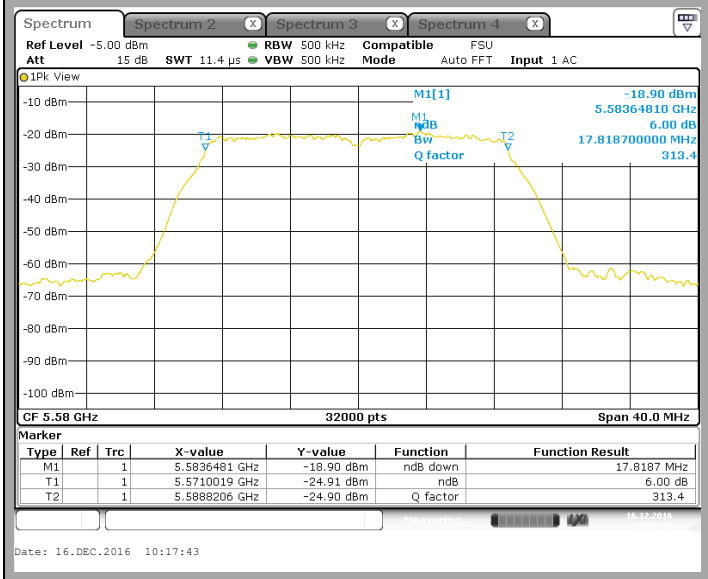
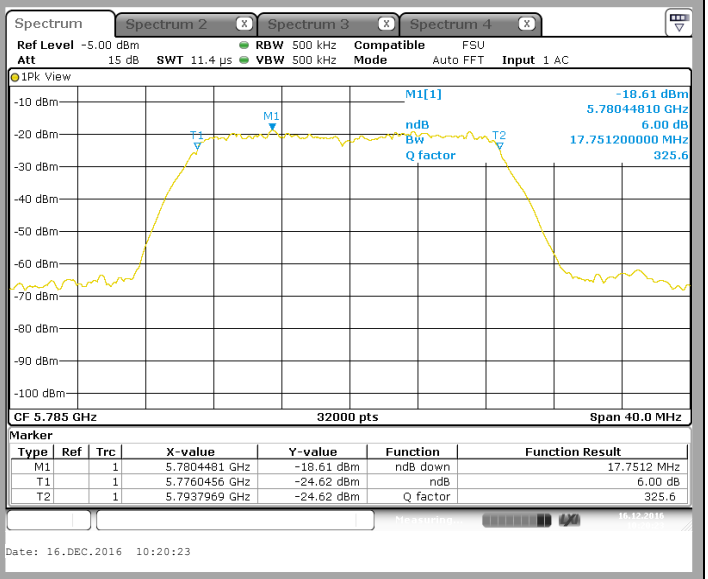
C12

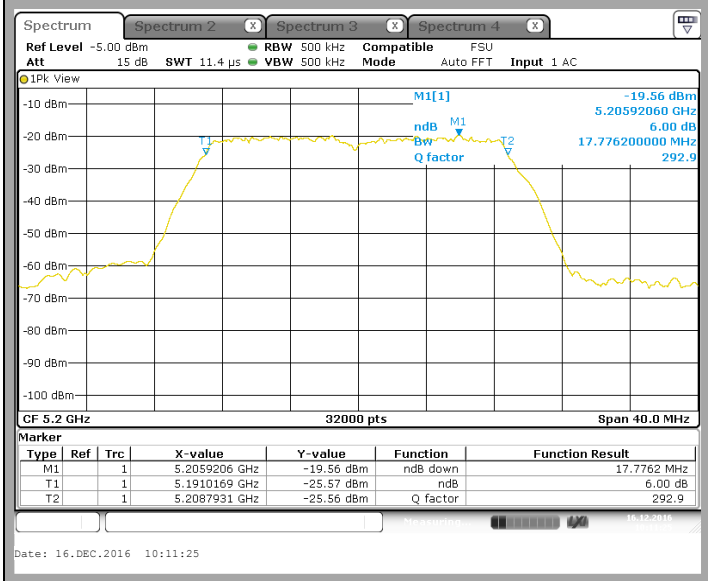
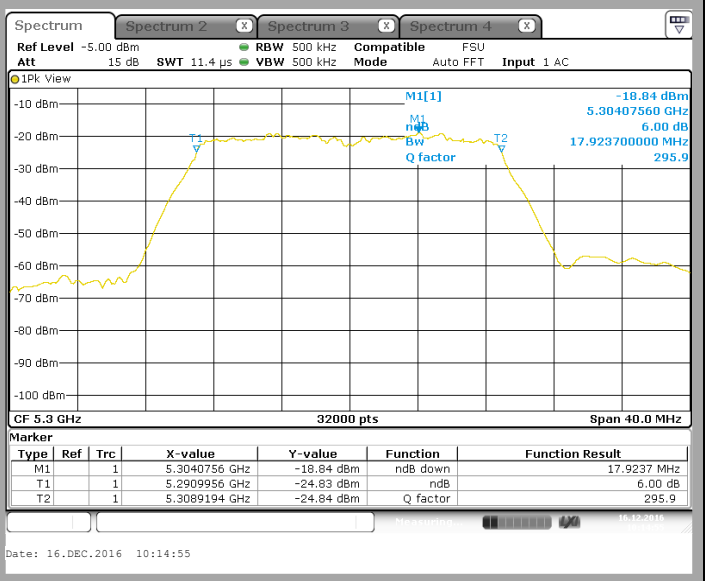
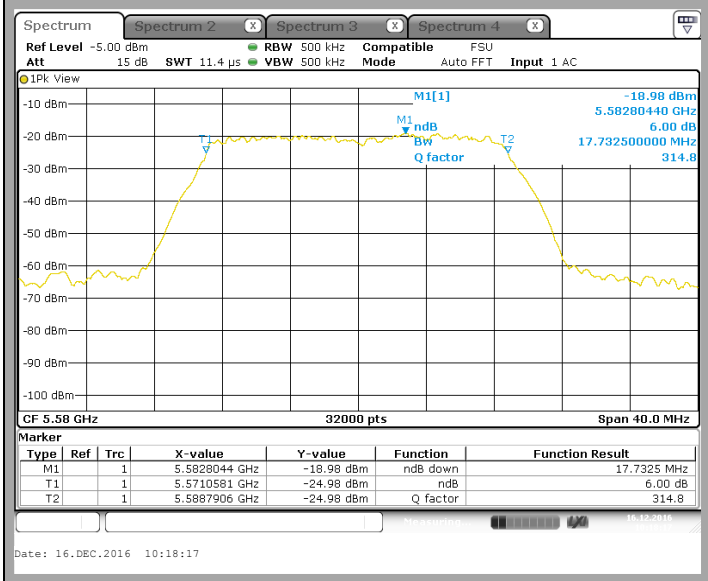
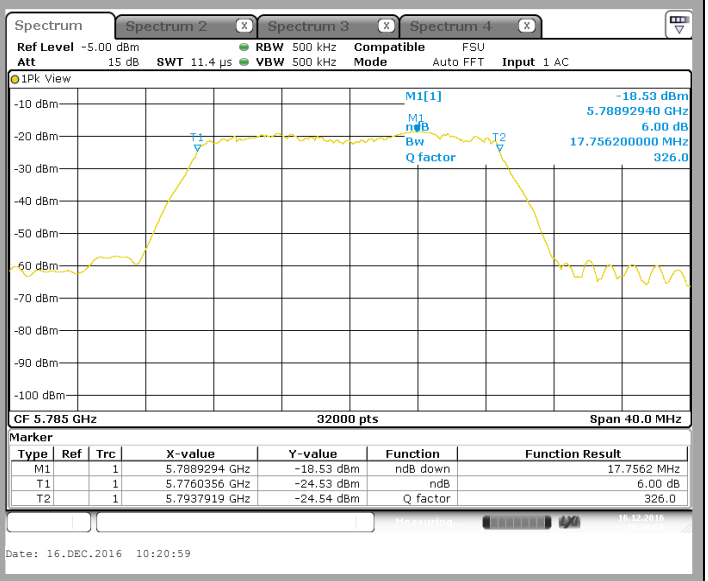


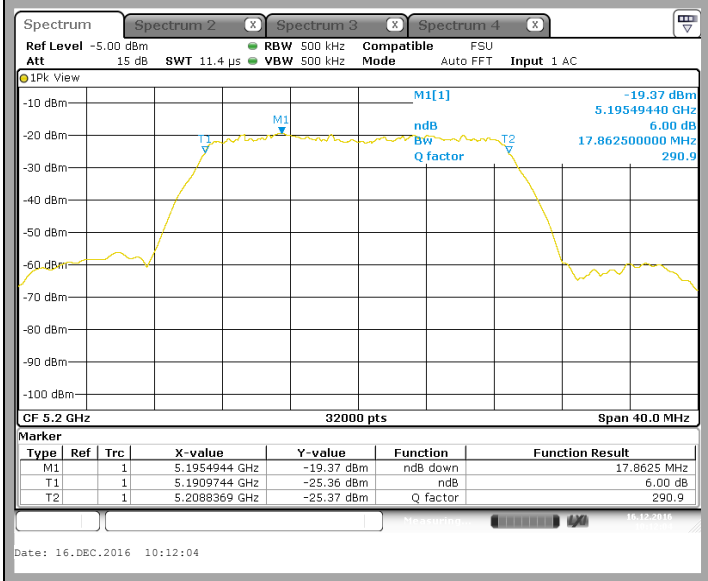
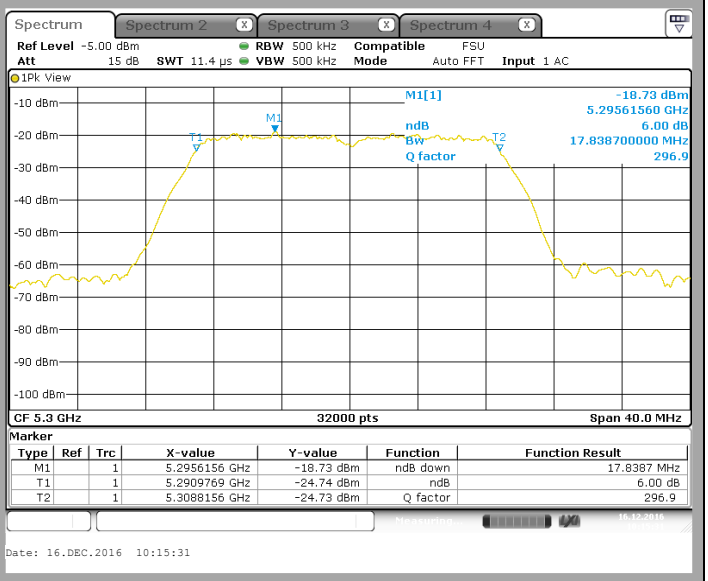
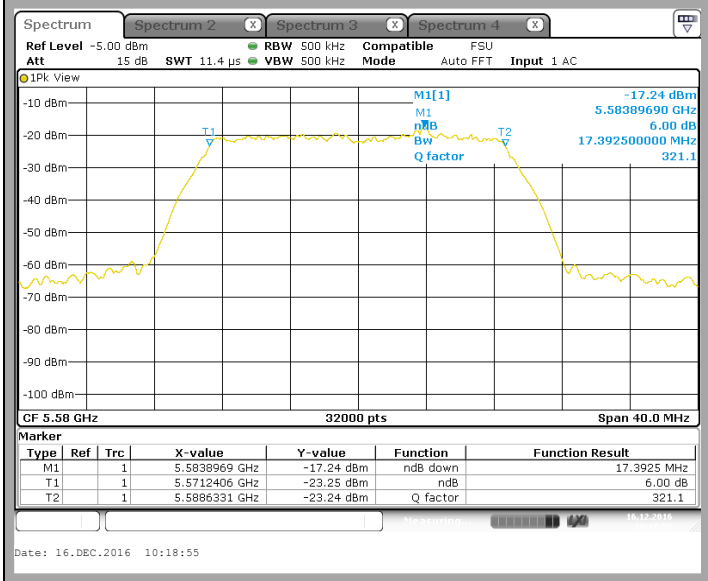
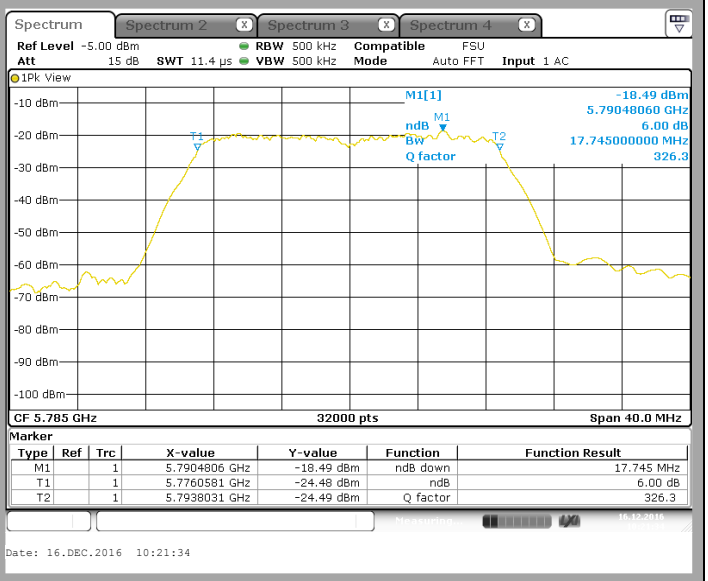
802.11a/802.11nHT20/ac VHT20	
Tnom	
Vmin	
C2	C5
	
C8	C12
	

802.11a/802.11nHT20/ac VHT20	
Tnom	
Vnom	
C2	C5
	
C8	C12
	

802.11a/802.11nHT20/ac VHT20	
Tnom	
Vmax	
C2	C5
	
C8	C12
	

802.11a/802.11nHT20/ac VHT20	
Tmax	
Vmin	
C2	C5
	
C8	C12
	

802.11a/802.11nHT20/ac VHT20	
Tmax	
Vnom	
C2	C5
	
C8	C12
	

802.11a/802.11nHT20/ac VHT20	
Tmax	
Vmax	
C2	C5
	
C8	C12
	

802.11a/802.11nHT20/ac VHT20

Temperature	Tmin				Tnom				Tmax			
Voltage	**Vmin**											
Channel	C2	C5	C8	C12	C2	C5	C8	C12	C2	C5	C8	C12
Frequency drift (ppm)	0,5	-25,9	11,8	-6,6	-8,8	-13,6	10,0	-19,0	-10,6	-19,7	-15,9	-13,6
Voltage	**Vnom**											
Channel	C2	C5	C8	C12	C2	C5	C8	C12	C2	C5	C8	C12
Frequency drift (ppm)	8,3	-21,6	11,4	-14,4	-10,8	-33,1	8,6	-13,4	-18,3	-8,0	-13,6	-14,9
Voltage												
Channel	C2	C5	C8	C12	C2	C5	C8	C12	C2	C5	C8	C12
Frequency drift (ppm)	-1,8	-33,5	12,5	-6,5	-9,3	-23,2	9,4	-15,5	-18,1	-19,6	-11,3	-12,0

4.7. CONCLUSION

Carrier frequencies measurement performed on the sample of the product **SAGEMCOM MiniBox (253697290)**, SN: **616400107098** in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.407 limits.

5. 26DB EMISSION BANDWIDTH

5.1. TEST CONDITIONS

Test performed by	: Mathieu CERISIER
Date of test	: December 19, 2016
Ambient temperature	: 25 °C
Relative humidity	: 42 %

5.2. TEST SETUP

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

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

- Test Procedure:
☑ KDB 789033 D02 General UNII Test Procedures New Rules v01r02 § C1

Photograph for 26dB emission bandwidth

5.3. LIMIT

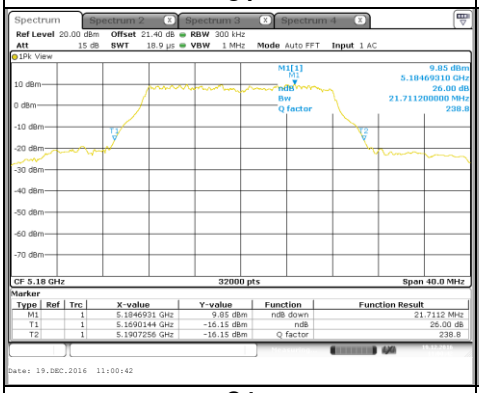
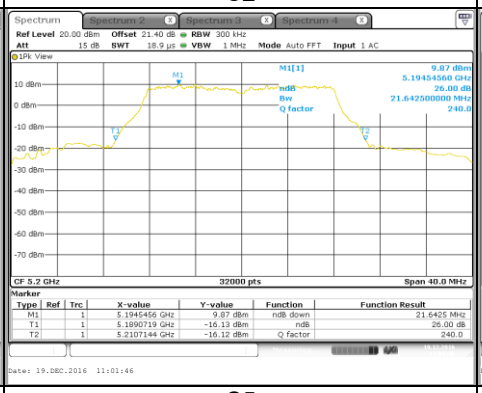
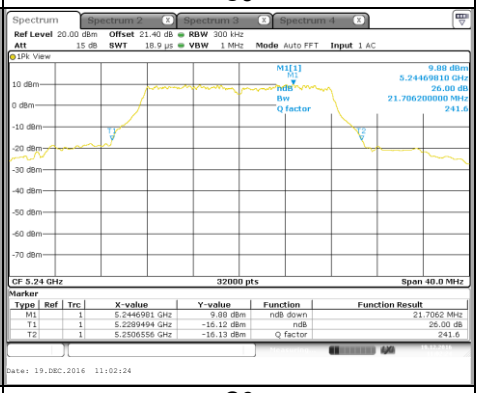
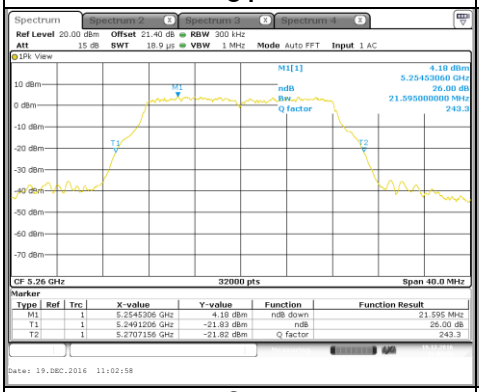
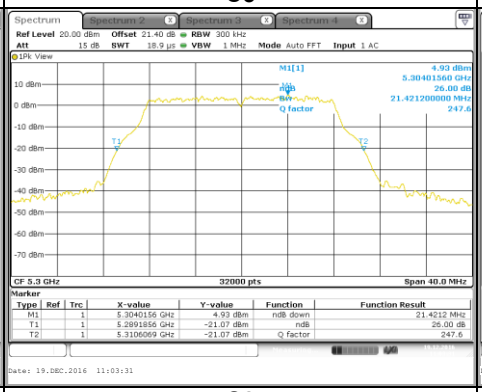
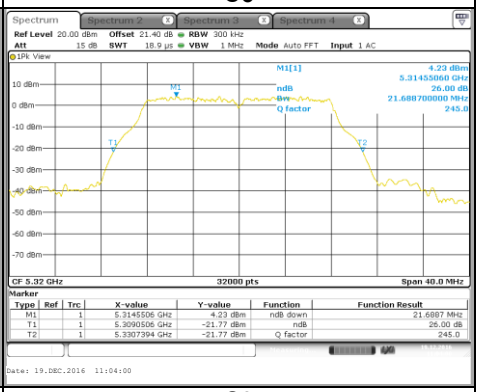
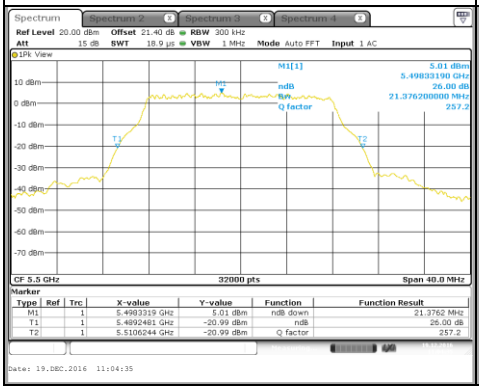
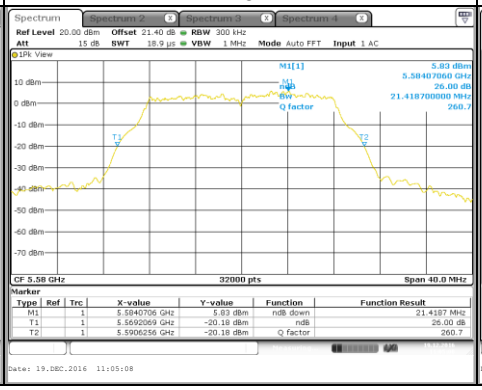
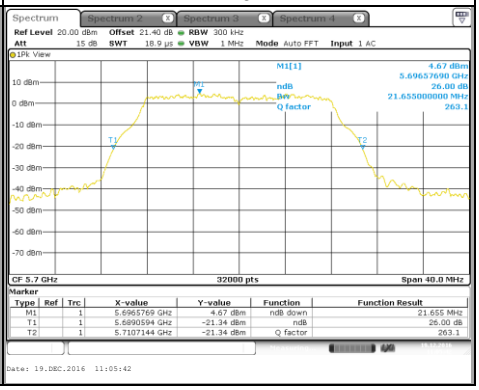
None

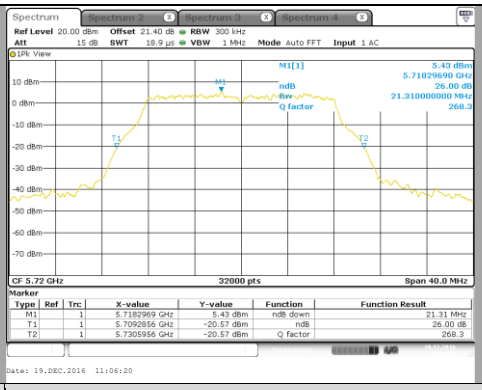
5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Calibration date	Calibration due
Multi-meter	KEITHLEY	2000	A1242090	2015/06	2017/06
Programmable AC/DC power supply	-; KIKUSUI	PCR500M	A7040079	Verified with calibrated multimeter	Verified with calibrated multimeter
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2016/09	2017/09
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329676	2016/09	2017/09

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

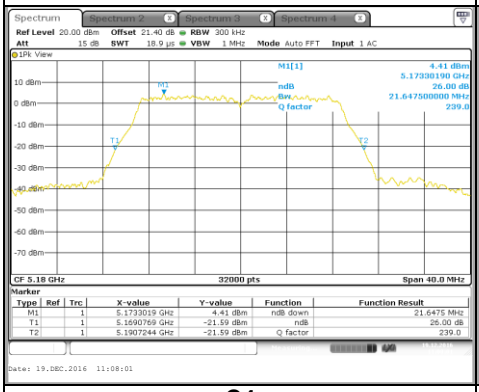
5.5. RESULTS

802.11a		
C1	C2	C3
		
C4	C5	C6
		
C7	C8	C9
		

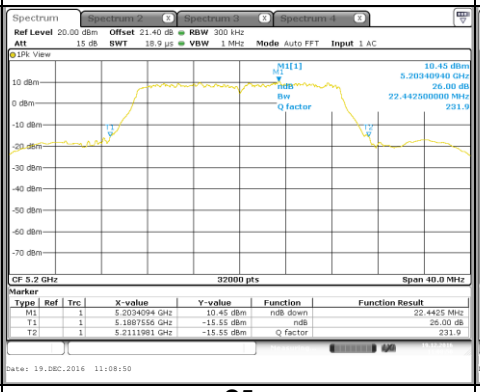
802.11a	
C10	
	
Channel	26dB Emission Bandwidth (MHz)
C1	21,71
C2	21,64
C3	21,71
C4	21,6
C5	21,42
C6	21,69
C7	21,38
C8	21,42
C9	21,66
C10	21,31

802.11n HT20/ac VHT20

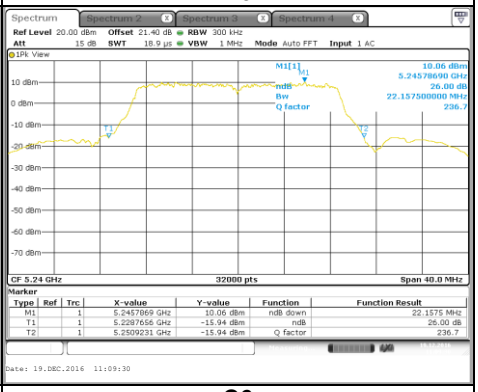
C1



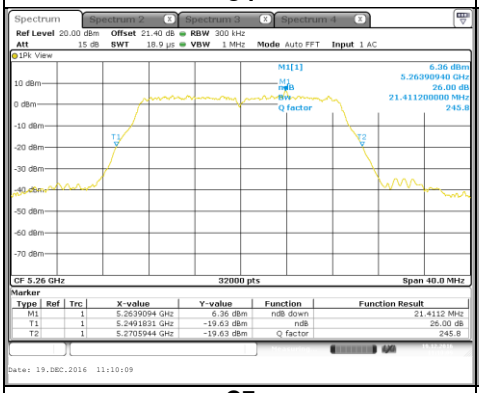
C2



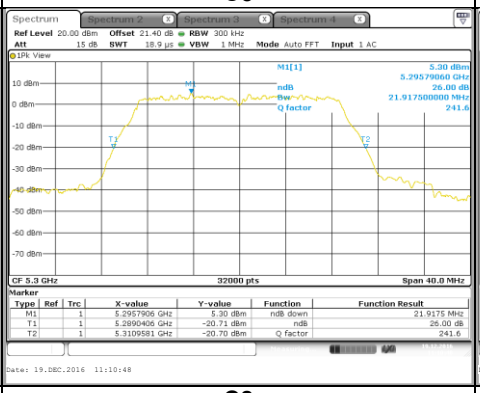
C3



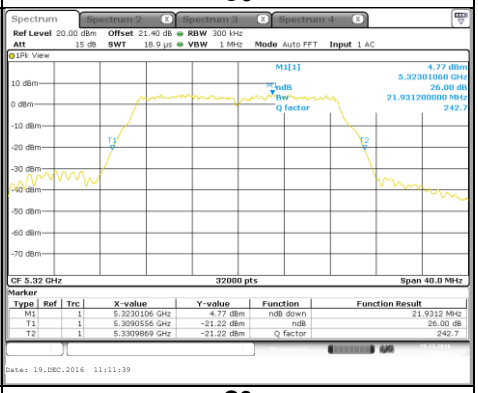
C4



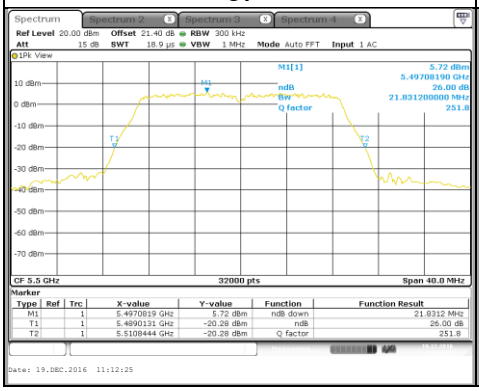
C5



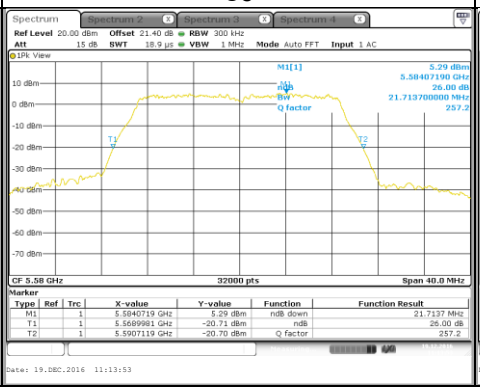
C6



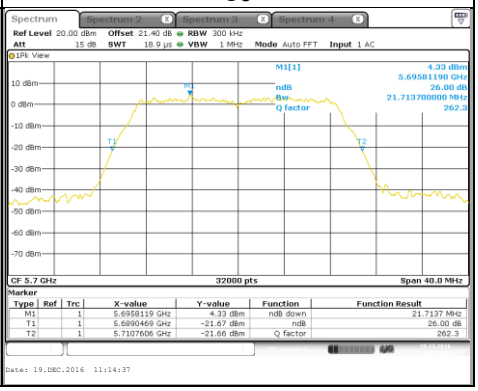
C7

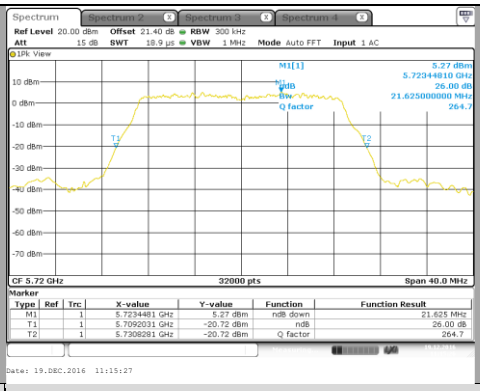


C8



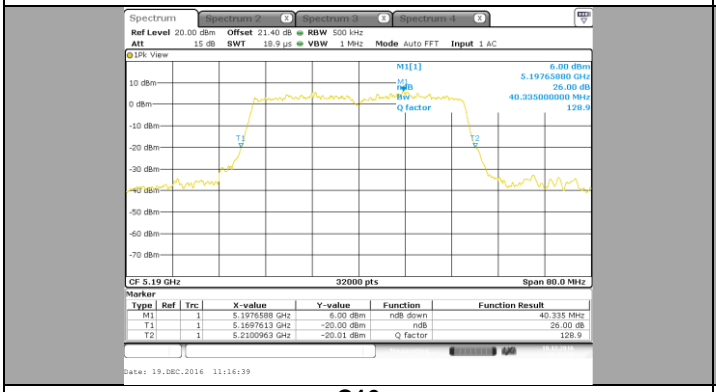
C9



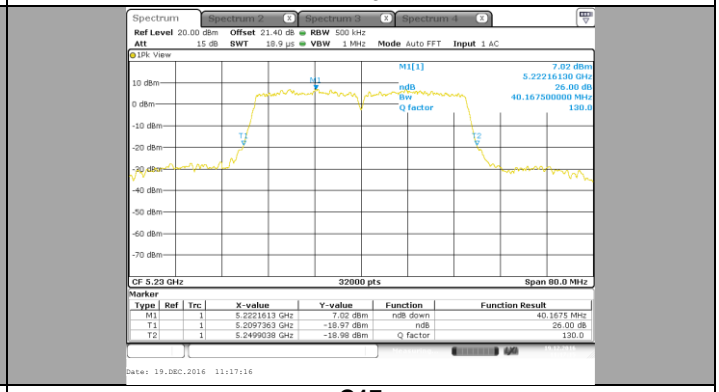
802.11n HT20/ac VHT20	
C10	
	
Channel	26dB Emission Bandwidth (MHz)
C1	21,65
C2	22,44
C3	22,16
C4	21,41
C5	21,92
C6	21,93
C7	21,83
C8	21,71
C9	21,71
C10	21,63

802.11n HT40/ac VHT40

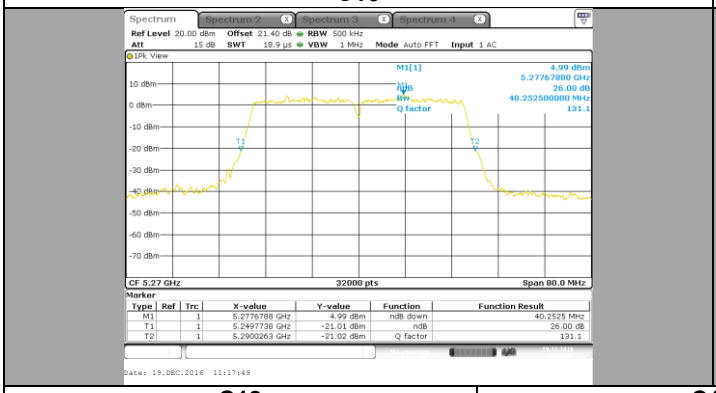
C14



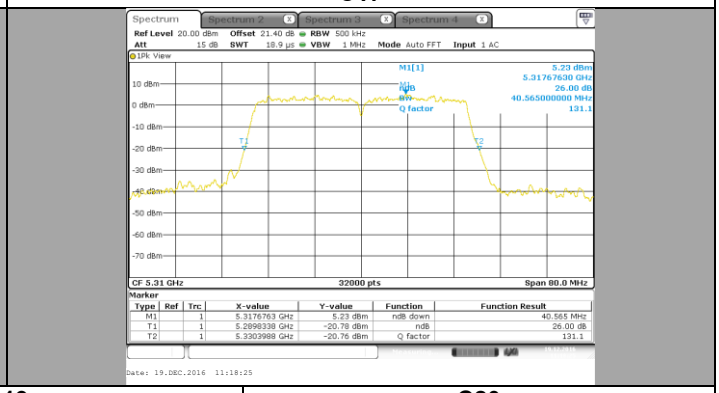
C15



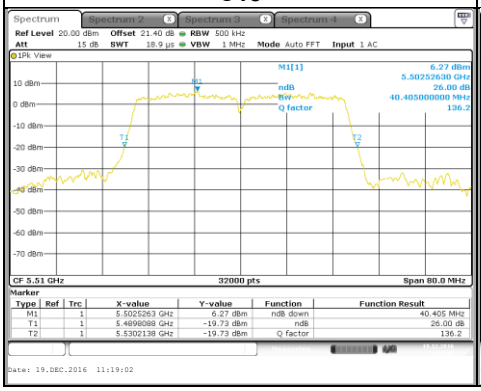
C16



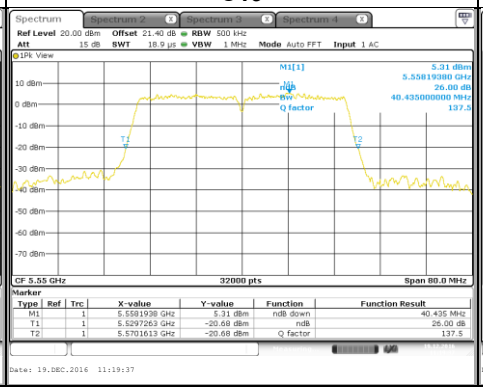
C17



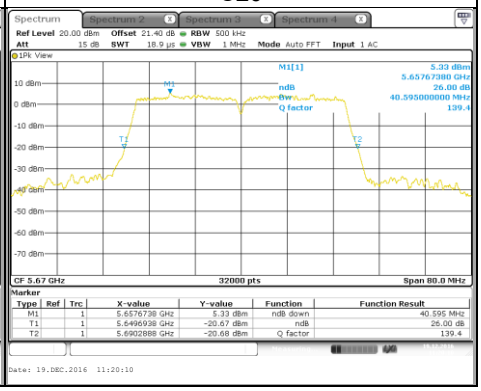
C18

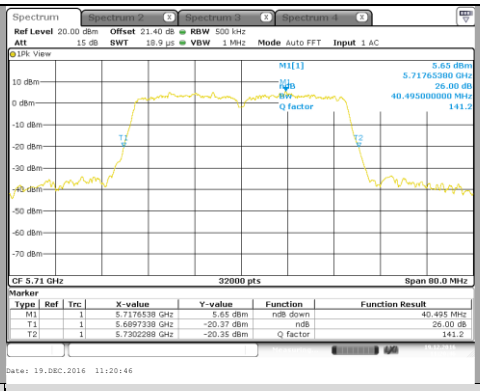


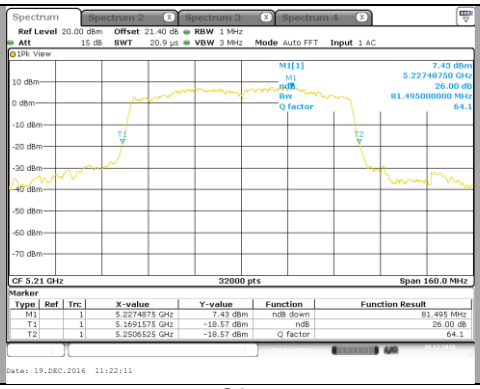
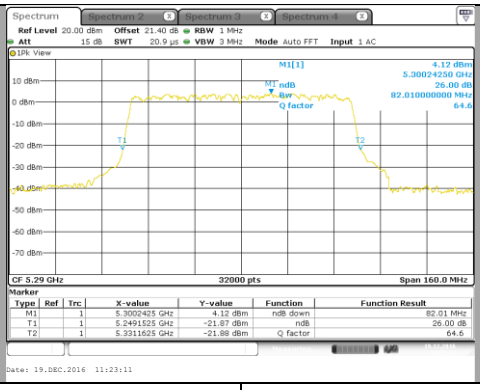
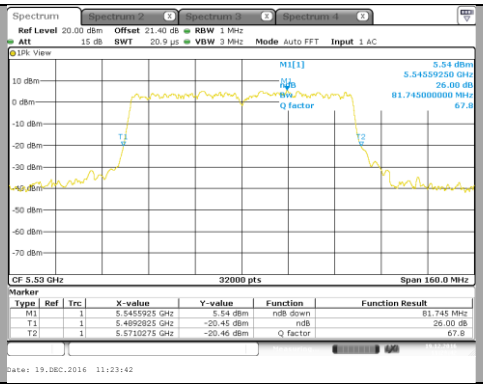
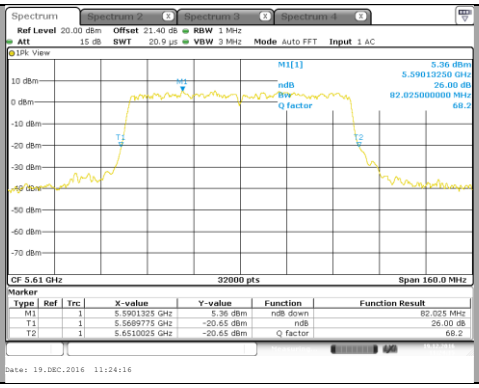
C19

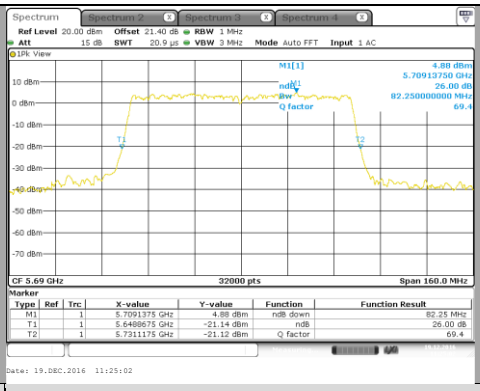


C20



802.11n HT40/ac VHT40	
C21	
	
Channel	26dB Emission Bandwidth (MHz)
C14	40,34
C15	40,17
C16	40,26
C17	40,57
C18	40,41
C19	40,44
C20	40,6
C21	40,5

802.11ac VHT80	
C24	
	
C25	
	
C26	C27
	

802.11ac VHT80	
C28	
	
Channel	26dB Emission Bandwidth (MHz)
C24	81,5
C25	82,01
C26	81,75
C27	82,03
C28	82,25

5.6. CONCLUSION

26dB Emission Bandwidth measurement performed on the sample of the product **SAGEMCOM MiniBox (253697290)**, SN: **616476080862**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.407** limits.