RADIO TEST REPORT
FCC 47 CFR PART 15 SUBPART E
INDUSTRY CANADA RSS-247

Test Standard	**FCC Part 15.407 and RSS-247 Issue 2**
FCC ID	**PPQ-WCBN3509ANB**
ISED No.	**4491A-WCBN3509ANB**
Brand name	**LITE-ON**
Applicant	**LITE-ON Technology Corp.**
Product name	**802.11a/b/g/n/ac 2Tx2R USB WLAN Module**
Model No.	**WCBN3509A(NB)**
Test Result	**Pass**

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.
The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc.(Wugu Laboratory)

Approved by:

Sam Chuang
Manager

Reviewed by:

Jerry Chuang
Engineer

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	December 1, 2017	Initial Issue	ALL	Allison Chen

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Table of contents

1. GENERAL INFORMATION 4
1.1 EUT INFORMATION 4
1.2 EUT CHANNEL INFORMATION 6
1.3 ANTENNA INFORMATION 7
1.4 MEASUREMENT UNCERTAINTY 8
1.5 FACILITIES AND TEST LOCATION 9
1.6 INSTRUMENT CALIBRATION 9
1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT 10
1.8 TEST METHODOLOGY AND APPLIED STANDARDS 10
2. TEST SUMMERY 11
3. DESCRIPTION OF TEST MODES 12
3.1 THE WORST MODE OF OPERATING CONDITION 12
3.2 THE WORST MODE OF MEASUREMENT 13
3.3 EUT DUTY CYCLE 14
4. TEST RESULT 15
4.1 AC POWER LINE CONDUCTED EMISSION 15
4.2 26DB BANDWIDTH, 6DB BANDWIDTH AND OCCUPIED BANDWIDTH(99%) 18
4.3 OUTPUT POWER MEASUREMENT 45
4.4 POWER SPECTRAL DENSITY 51
4.5 RADIATION BANDEDGE AND SPURIOUS EMISSION 79
4.6 FREQUENCY STABILITY 233
4.7 DYNAMIC FREQUENCY SELECTION 236
APPENDIX 1 - PHOTOGRAPHS OF EUT

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	LITE-ON Technology Corp. Bldg. C, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C
Manufacturer	LITE-ON TECHNOLOGY (Changzhou) CO., LTD A9 Building,No.88 Yanghu Road, Wujin Hi-Tech Industrial Development Zone ,Changzhou City,Jiangsu Province 213100 China
Equipment	802.11a/b/g/n/ac 2Tx2R USB WLAN Module
Model Name	WCBN3509A(NB)
Model Discrepancy	N/A
Received Date	November 27, 2017
Date of Test	November 27 ~ November 30, 2017
Power Operation	Powered from host device: DC 5V
HW Version	V04
FW Version	V37.27

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Output Power(W)

Band	Mode	Frequency Range (MHz)	Output Power (W)	EIRP Output Power (w)
U-NII-1	IEEE 802.11a	5180 ~ 5240	0.0324	0.0778
	IEEE 802.11n HT 20 MHz	5180 ~ 5240	0.0501	0.1202
	IEEE 802.11n HT 40 MHz	5190 ~ 5230	0.0366	0.0879
	IEEE 802.11ac VHT 80 MHz	5210	0.0105	0.0251
U-NII-2a	IEEE 802.11a	5260 ~ 5320	0.0322	0.0773
	IEEE 802.11n HT 20 MHz	5260 ~ 5320	0.0518	0.1242
	IEEE 802.11n HT 40 MHz	5270 ~ 5310	0.0408	0.0979
	IEEE 802.11ac VHT 80 MHz	5290	0.0111	0.0266
U-NII-2c	IEEE 802.11a	5500 ~ 5725	0.0325	0.0780
	IEEE 802.11a	5720	0.0314	0.0753
	IEEE 802.11n HT 20 MHz	5500 ~ 5725	0.0515	0.1236
	EEE 802.11n HT 20 MHz	5720	0.0483	0.1159
	IEEE 802.11n HT 40 MHz	5510 ~ 5670	0.0418	0.1002
	IEEE 802.11n HT 40 MHz	5710	0.0405	0.0971
	IEEE 802.11ac VHT 80 MHz	5530-5610	0.0089	0.0214
	IEEE 802.11ac VHT 80 MHz	5690	0.0203	0.0486
U-NII-3	IEEE 802.11a	5720	0.0059	-
	IEEE 802.11a	5745 ~ 5825	0.0313	-
	IEEE 802.11n HT 20 MHz	5720	0.0097	-
	IEEE 802.11n HT 20 MHz	5745 ~ 5825	0.0511	-
	IEEE 802.11n HT 40 MHz	5710	0.0023	-
	IEEE 802.11n HT 40 MHz	5755 ~ 5795	0.0372	-
	IEEE 802.11ac VHT 80 MHz	5690	0.0009	-
	IEEE 802.11ac VHT 80 MHz	5775	0.0220	-

Remark:

1.For Canada the EUT Frequency Range 5600~5650MHz will be disabled.

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

1.2 EUT CHANNEL INFORMATION

<table>
<tr><td>Frequency Range</td><td>
<table>
<tr><td colspan="2">UNII-1</td></tr>
<tr><td>IEEE 802.11a</td><td>5180 ~ 5240 MHz</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5180 ~ 5240 MHz</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5190 ~ 5230 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 20 MHz</td><td>5180 ~ 5240 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 40 MHz</td><td>5190 ~ 5230 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 80 MHz</td><td>5210 MHz</td></tr>
<tr><td colspan="2">UNII-2a</td></tr>
<tr><td>IEEE 802.11a</td><td>5260 ~ 5320 MHz</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5260 ~ 5320 MHz</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5270 ~ 5310 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 20 MHz</td><td>5260 ~ 5320 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 40 MHz</td><td>5270 ~ 5310 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 80 MHz</td><td>5290 MHz</td></tr>
<tr><td colspan="2">UNII-2c</td></tr>
<tr><td>IEEE 802.11a</td><td>5500 ~ 5700 MHz</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5500 ~ 5700 MHz</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5720 MHz</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5510 ~ 5670 MHz</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5710 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 20 MHz</td><td>5500 ~ 5700 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 20 MHz</td><td>5720 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 40 MHz</td><td>5510 ~ 5670 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 40 MHz</td><td>5710 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 80 MHz</td><td>5530-5610 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 80 MHz</td><td>5690 MHz</td></tr>
<tr><td colspan="2">UNII-3</td></tr>
<tr><td>IEEE 802.11a</td><td>5745 ~ 5825 MHz</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5745 ~ 5825 MHz</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5755 ~ 5795 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 20 MHz</td><td>5745 ~ 5825 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 40 MHz</td><td>5755 ~ 5795 MHz</td></tr>
<tr><td>IEEE 802.11ac VHT 80 MHz</td><td>5775 MHz</td></tr>
</table>
</td></tr>
<tr><td>Modulation Type</td><td>1. IEEE 802.11a mode: OFDM
2. IEEE 802.11n HT 20 MHz mode: OFDM
3. IEEE 802.11n HT 40 MHz mode: OFDM
4. IEEE 802.11ac VHT 20 MHz mode: OFDM
5. IEEE 802.11ac VHT 40 MHz mode: OFDM
5. IEEE 802.11ac VHT 80 MHz mode: OFDM</td></tr>
</table>

Remark:
Refer as ANSI 63.10:2013 clause 5.6.1 Table 4 for test channels

Number of frequencies to be tested		
Frequency range in which device operates	**Number of frequencies**	**Location in frequency range of operation**
☐ 1 MHz or less	1	Middle
☐ 1 MHz to 10 MHz	2	1 near top and 1 near bottom
☒ More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

1.3 ANTENNA INFORMATION

<table>
<tr><td>Antenna Type</td><td>☒ PIFA ☐ PCB ☐ Dipole ☐ Coils</td></tr>
<tr><td>Antenna Gain</td><td>
<table>
<tr><th>Brand</th><th>P/N</th><th>Type</th><th>Cable length</th><th>Peak Gain</th><th>Worst case</th></tr>
<tr><td>HongBo</td><td>290-10569</td><td>PIFA</td><td>300mm</td><td>3.80dBi</td><td>V</td></tr>
</table>
1. Power Directional Gain: 3.80
2. Power Density Directional Gain: 3.80

Other antenna information:
<table>
<tr><th>Brand</th><th>P/N</th><th>Type</th><th>Cable length</th><th>Peak Gain</th></tr>
<tr><td>HongBo</td><td>290-10310</td><td>PIFA</td><td>500mm</td><td>2.85dBi</td></tr>
<tr><td>Walsin</td><td>RFMTA401032I MLB702</td><td>PIFA</td><td>320mm</td><td>3.16dBi</td></tr>
<tr><td>Walsin</td><td>RFMTA401080I MLB701</td><td>PIFA</td><td>800mm</td><td>1.85dBi</td></tr>
<tr><td>Walsin</td><td>RFMTA401082I MLB701</td><td>PIFA</td><td>820mm</td><td>1.72dBi</td></tr>
</table>
</td></tr>
</table>

Notes:

1. Power Directional Gain: 10LOG(((10^(Ant1/10)+10^(Ant2/10))/2))

2. Power Density Directional Gain: 10LOG(((10^(Ant1/10)+10^(Ant2/10))/2))+10log(NTX/NSS)

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 30 to 1000 MHz	+/- 3.97
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 1 to 18GHz	+/- 3.58
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 18 to 26 GHz	+/- 3.59
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 26 to 40 GHz	+/- 3.81
Conducted Emission (Mains Terminals), 9kHz to 30MHz	+/- 2.48

Remark:
1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)

Test site	Test Engineer	Remark
AC Conduction Room	Eric Lee	
Radiation	Jerry Chuang	
RF Conducted	Eric Lee	

Remark: *The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.*

1.6 INSTRUMENT CALIBRATION

RF Conducted Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Power Meter	Anritsu	ML2495A	1033009	04/11/2017	04/10/2018
Power Sensor	Anritsu	MA2411B	917072	07/03/2017	07/02/2018
Spectrum Analyzer	R&S	FSV 40	101073	10/02/2017	10/01/2018
Thermostatic/Hrgrosatic Chamber	GWINSTEK	GTC-288MH-CC	TH160402	05/23/2017	05/22/2018
SUCOFLEX Cable	HUBER SUHNER	SUCOFLEX 104PEA	25157	07/31/2017	07/30/2018
Divider	Solvang Technology	2-18GHz 4Way	STI08-0015	07/26/2017	07/25/2018
Coupler	Agilent	87301d	MY44350252	07/25/2017	07/24/2018

3M 966 Chamber Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Bilog Antenna	Sunol Sciences	JB3	A030105	06/20/2017	06/19/2018
EMI Test Receiver	R&S	ESCI	100064	05/17/2017	05/16/2018
Horn Antenna	ETS LINDGREN	3117	00055165	02/20/2017	02/19/2018
K Type Cable	Huber+Suhner	SUCOFLEX 102	29406/2	01/10/2017	01/09/2018
K Type Cable	Huber+Suhner	SUCOFLEX 102	22470/2	01/10/2017	01/09/2018
Pre-Amplifier	MITEQ	AMF-6F-260400-40-8P	985646	01/10/2017	01/09/2018
Pre-Amplifier	EMCI	EMC 012635	980151	08/01/2017	07/31/2018
Pre-Amplifier	EMEC	EM330	060609	07/31/2017	07/30/2018
Spectrum Analyzer	Agilent	E4446A	US42510252	11/27/2017	11/26/2018
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R

AC Conducted Emissions Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
LISN	R&S	ENV216	101054	05/18/2017	05/17/2018
LISN	SCHWARZBECK	NSLK 8127	8127-541	02/14/2017	02/13/2018
EMI Test Receiver	R&S	ESCI	100064	05/17/2017	05/16/2018

Remark: *Each piece of equipment is scheduled for calibration once a year.*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
	N/A				

Support Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
1	NB(H)	Acer	Aspire 4320 series	N/A	QDS-BRCM1018

1.8 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.407, KDB 662911 D01 v02r01, KDB 789033 D02 v01r04, KDB 644545 D03 v01, KDB 905462 D02 v02.

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

2. TEST SUMMERY

FCC Standard Sec.	IC Standard Sec.	Chapter	Test Item	Result
15.203	-	1.2	Antenna Requirement	Pass
15.207	RSS-Gen(8.8)	4.1	AC Conducted Emission	Pass
15.403(i)	-	4.2	26dB Bandwidth	Pass
15.407(e)	RSS-247(6.2.4)	4.2	6dB Bandwidth	Pass
15.403(i)	RSS-Gen(6.6)	4.2	Occupied Bandwidth (99%)	Pass
15.407(a)	RSS-247(6.2.1.1) RSS-247(6.2.2.1) RSS-247(6.2.3.1) RSS-247(6.2.4.1)	4.3	Output Power Measurement	Pass
15.407(a)	RSS-247(6.2.1.1) RSS-247(6.2.2.1) RSS-247(6.2.3.1) RSS-247(6.2.4.1)	4.4	Power Spectral Density	Pass
15.407(b)	RSS-247(6.2.1.2) RSS-247(6.2.2.2) RSS-247(6.2.3.2) RSS-247(6.2.4.2)	4.5	Radiation Band Edge	Pass
15.407(b)	RSS-247(6.2.1.2) RSS-247(6.2.2.2) RSS-247(6.2.3.2) RSS-247(6.2.4.2)	4.5	Radiation Spurious Emission	Pass
15.407(g)	RSS-Gen(6.11)	4.6	Frequency Stability	Pass
15.407(h)	RSS-247(6.3)	4.7	Dynamic Frequency Selection	Pass

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	1. IEEE 802.11a mode: 6Mbps 2. IEEE 802.11n HT 20 MHz mode: MCS8 3. IEEE 802.11n HT 40 MHz mode: MCS8 4. IEEE 802.11ac VHT 20 MHz mode: MCS8 5. IEEE 802.11ac VHT 40 MHz mode: MCS8 5. IEEE 802.11ac VHT 80 MHz mode: MCS8

Operating Frequency Range & Number of Channels

	Mode	Frequency Range (MHz)	Number of Channels
U-NII-1	IEEE 802.11a	5180 ~ 5240	4 Channels
	IEEE 802.11n HT 20 MHz	5180 ~ 5240	4 Channels
	IEEE 802.11n HT 40 MHz	5190 ~ 5230	2 Channels
	IEEE 802.11ac VHT 20 MHz	5180 ~ 5240	4 Channels
	IEEE 802.11ac VHT 40 MHz	5190 ~ 5230	2 Channels
	IEEE 802.11ac VHT 80 MHz	5210	1 Channels
U-NII-2a	IEEE 802.11a	5260 ~ 5320	4 Channels
	IEEE 802.11n HT 20 MHz	5260 ~ 5320	4 Channels
	IEEE 802.11n HT 40 MHz	5270 ~ 5310	2 Channels
	IEEE 802.11ac VHT 20 MHz	5260 ~ 5320	4 Channels
	IEEE 802.11ac VHT 40 MHz	5270 ~ 5310	2 Channels
	IEEE 802.11ac VHT 80 MHz	5290	1 Channels
U-NII-2c	IEEE 802.11a	5500 ~ 5700	11 Channels
	IEEE 802.11n HT 20 MHz	5500 ~ 5700	11 Channels
	IEEE 802.11n HT 20 MHz	5720	1 Channels
	IEEE 802.11n HT 40 MHz	5510 ~ 5670	5 Channels
	IEEE 802.11n HT 40 MHz	5710	1 Channels
	IEEE 802.11ac VHT 20 MHz	5500 ~ 5700	11 Channels
	IEEE 802.11ac VHT 20 MHz	5720	1 Channels
	IEEE 802.11ac VHT 40 MHz	5510 ~ 5670	5 Channels
	IEEE 802.11ac VHT 40 MHz	5710	1 Channels
	IEEE 802.11ac VHT 80 MHz	5530~5610	2 Channels
	IEEE 802.11ac VHT 80 MHz	5690	1 Channels
U-NII-3	IEEE 802.11a	5745 ~ 5825	5 Channels
	IEEE 802.11n HT 20 MHz	5745 ~ 5825	5 Channels
	IEEE 802.11n HT 40 MHz	5755 ~ 5795	2 Channels
	IEEE 802.11ac VHT 20 MHz	5745 ~ 5825	5 Channels
	IEEE 802.11ac VHT 40 MHz	5755 ~ 5795	2 Channels
	IEEE 802.11ac VHT 80 MHz	5775	1 Channels

Remark:
1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.
2. Covered modes are test reduction modes. The output powers on the covered modes are equal to or less than the mode referenced and use the same module
3.The mode IEEE 802.11ac VHT20 and VHT40 are only different in control messages with IEEE 802.11n HT20 and HT40, and have same power setting. Therefore, the highest power(IEEE 802.11n HT20 and HT40) were test conducted and radiated measurement and recorded in this report.

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

3.2 THE WORST MODE OF MEASUREMENT

Radiated Emission Measurement Above 1G	
Test Condition	Band edge, Emission for Unwanted and Fundamental
Voltage/Hz	5V
Test Mode	Mode 1:EUT power by Host System.
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☐ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☒ Placed in fixed position at Z-Plane (H-Plane)
Worst Polarity	☐ Horizontal ☒ Vertical

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Voltage/Hz	5V
Test Mode	Mode 1:EUT power by Host System.
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

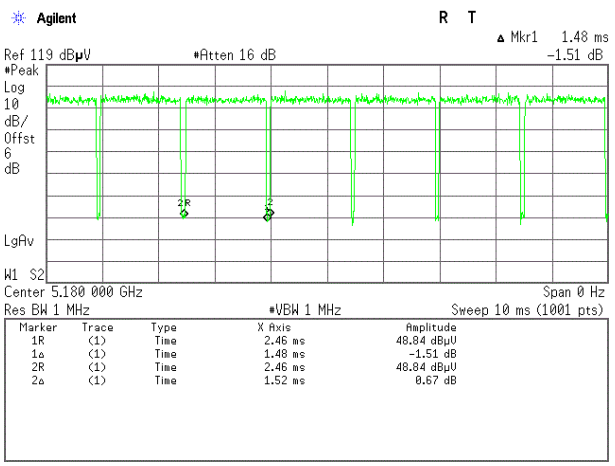
Remark:
1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, Horizontal and Vertical for radiated measurement. The worst case(Z-Plane and Horizontal) were recorded in this report
3. For below 1G, AC power line conducted emission and radiation emission were performed the EUT transmit at the highest output power channel as worse case.

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

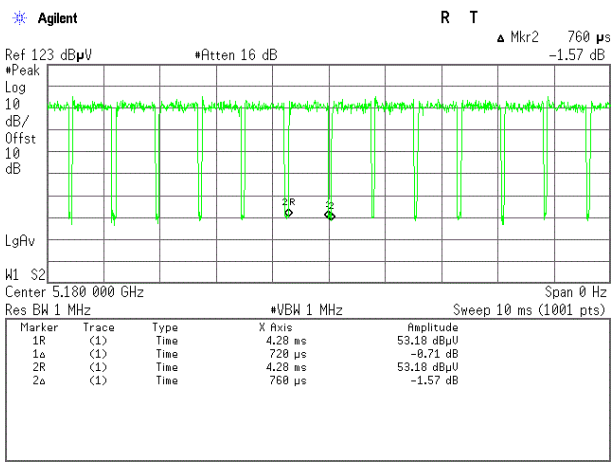
3.3 EUT DUTY CYCLE

Duty Cycle				
Configuration	TX ON (ms)	TX ALL (ms)	Duty Cycle (%)	Duty Factor(dB)
802.11a	1.4800	1.5200	97.37%	0.12
802.11n HT20	0.7200	0.7600	94.74%	0.23
802.11n HT40	0.3900	0.4500	86.67%	0.62
802.11ac VHT80	0.1200	0.1300	92.31%	0.35

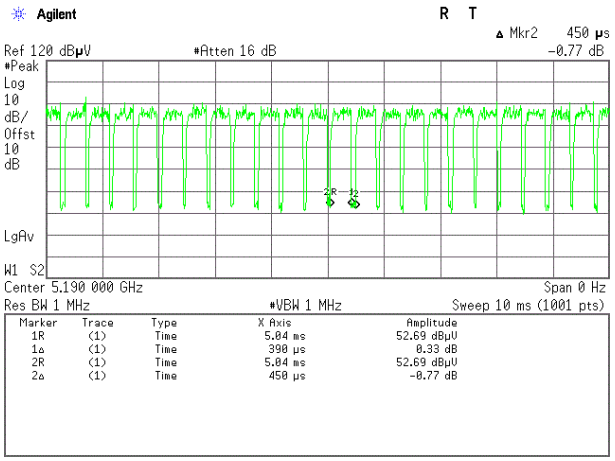
802.11a



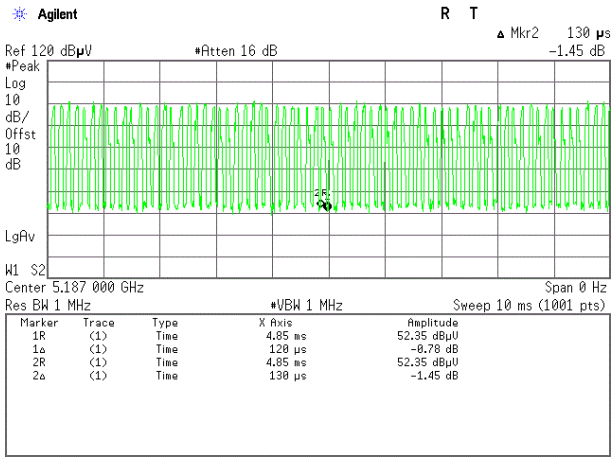
802.11n HT20



802.11n HT40



802.11ac VHT80



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a) and RSS-GEN section 8.8,

Frequency Range (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

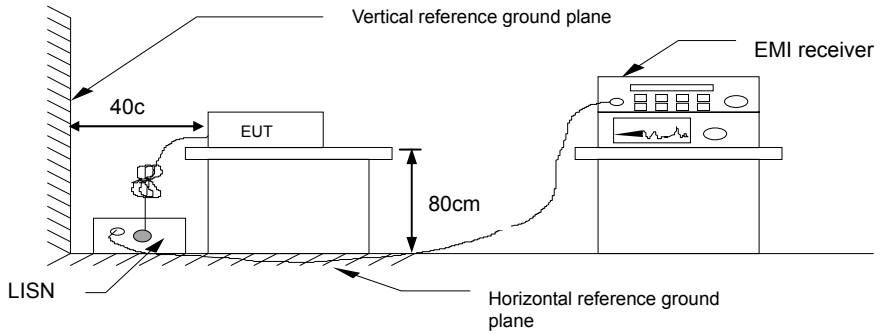
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 6.2,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup



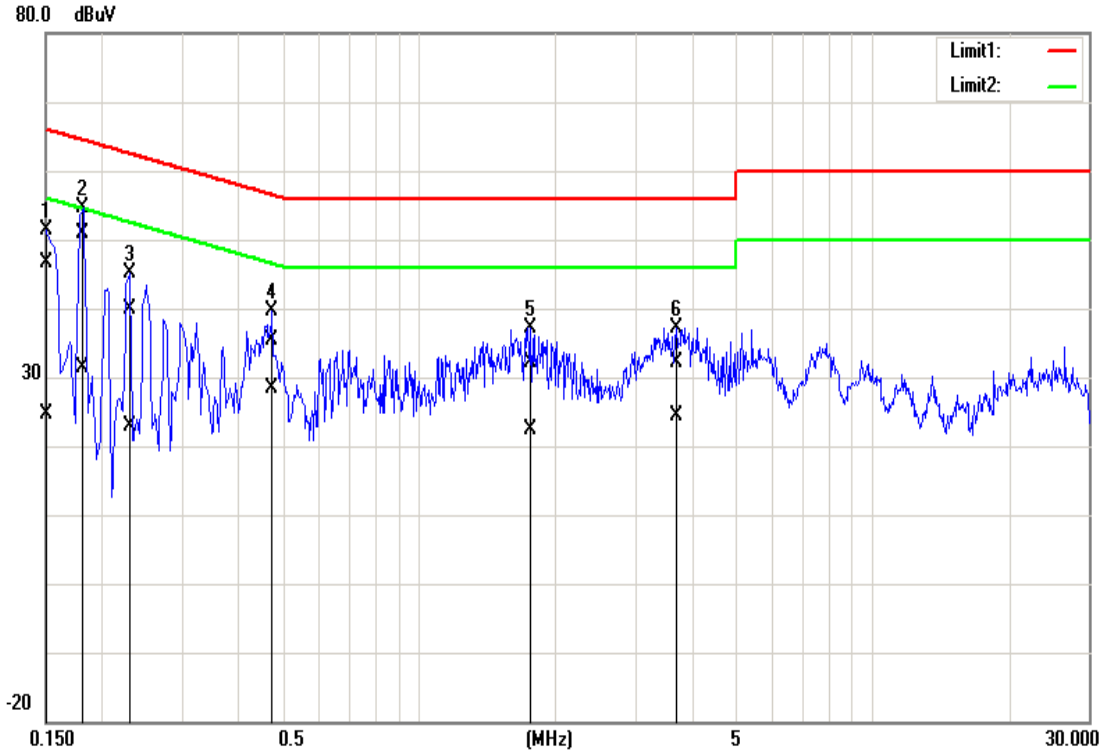
4.1.4 Test Result

Pass.

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Data

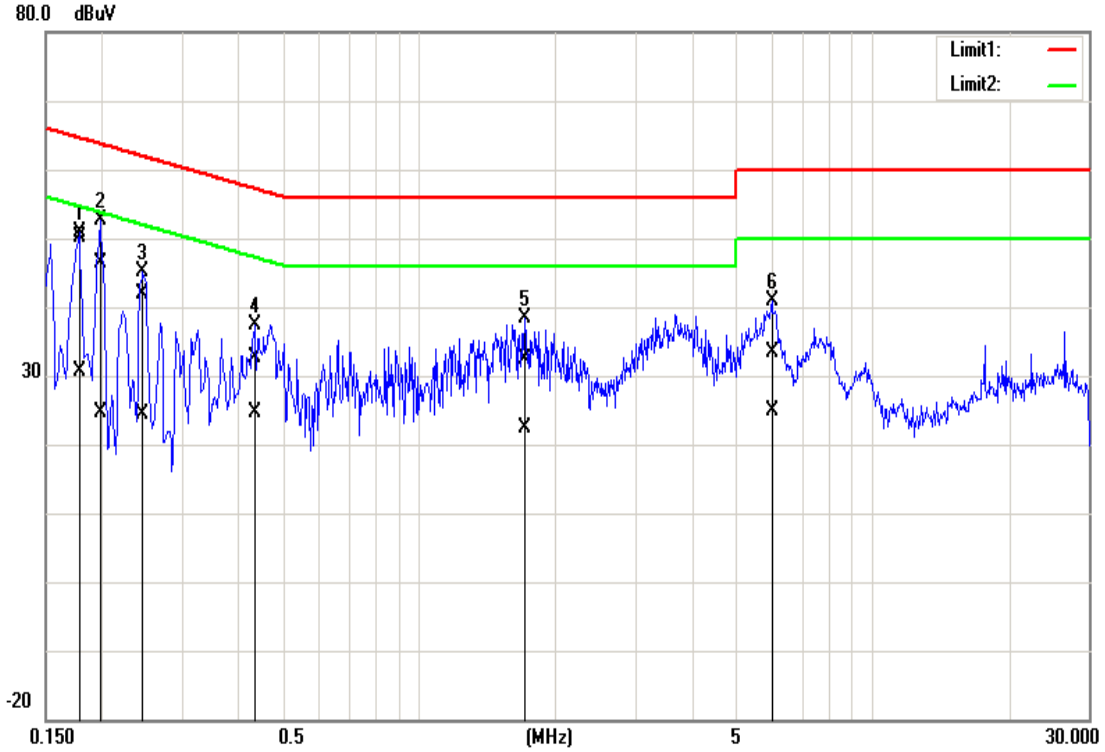
Test Mode:	Mode 1	Temp/Hum	24.5(℃)/ 52.1%RH
Test Voltage:	120Vac / 60Hz	Test Date	November 30, 2017
Phase:	Line	Test Engineer	Eric Lee



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.1500	46.67	24.58	0.08	46.75	24.66	66.00	56.00	-19.25	-31.34	Pass
0.1820	50.67	31.37	0.09	50.76	31.46	64.39	54.39	-13.63	-22.93	Pass
0.2300	39.89	22.89	0.09	39.98	22.98	62.45	52.45	-22.47	-29.47	Pass
0.4740	35.26	28.39	0.10	35.36	28.49	56.44	46.44	-21.08	-17.95	Pass
1.7700	31.86	22.27	0.16	32.02	22.43	56.00	46.00	-23.98	-23.57	Pass
3.7020	31.99	24.15	0.22	32.21	24.37	56.00	46.00	-23.79	-21.63	Pass

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode:	Mode 1	Temp/Hum	24.5(℃)/ 52.1%RH
Test Voltage:	120Vac / 60Hz	Test Date	November 30, 2017
Phase:	Neutral	Test Engineer	Eric Lee



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBu)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.1780	50.05	30.43	0.16	50.21	30.59	64.57	54.58	-14.36	-23.99	Pass
0.1980	46.25	24.43	0.16	46.41	24.59	63.69	53.69	-17.28	-29.10	Pass
0.2460	41.66	24.15	0.16	41.82	24.31	61.89	51.89	-20.07	-27.58	Pass
0.4340	32.43	24.52	0.18	32.61	24.70	57.18	47.18	-24.57	-22.48	Pass
1.7100	32.18	22.20	0.23	32.41	22.43	56.00	46.00	-23.59	-23.57	Pass
6.0180	32.94	24.63	0.37	33.31	25.00	60.00	50.00	-26.69	-25.00	Pass

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.2 26DB BANDWIDTH, 6DB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)

4.2.1 Test Limit

26 dB Bandwidth ：For reporting purposes only.

6 dB Bandwidth ：Least 500kHz.

Occupied Bandwidth(99%) ： For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as KDB 789033 D02 v01r04 Section C, D, and ANSI 63.10:2013 clause 6.9.2,

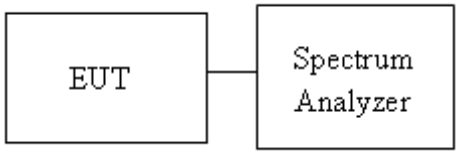
1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. UNII-1, UNII-2a and UNII-2c,

   (1) BW=20MHz : SA set RBW = 300kHz, VBW = 1MHz and Detector = Peak, to measurement 26 dB Bandwidth and 99% Bandwidth

   (2) BW=40MHz : SA set RBW = 1MHz, VBW = 3MHz and Detector = Peak, to measurement 26 dB Bandwidth and 99% Bandwidth

   (3) BW=80MHz : SA set RBW = 1MHz, VBW = 3MHz and Detector = Peak, to measurement 26 dB Bandwidth and 99% Bandwidth
4. UNII-3, SA set RBW = 100kHz, VBW = 300kHz and Detector = Peak, to measurement 26 dB Bandwidth and 99% Bandwidth
5. Measure and record the result of 6 dB Bandwidth and 99% Bandwidth. in the test report.

4.2.3 Test Setup



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.2.4 Test Result

UNII-1 5150-5250 MHz					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5180	16.3531	-	21.0870	-
Mid	5220	16.4254	-	21.3043	-
High	5240	16.4254	-	26.0145	-
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5180	17.4384	17.6555	21.8116	27.4638
Mid	5220	17.5108	17.5108	23.5507	24.4928
High	5240	17.4384	17.5832	21.4493	24.4928
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5190	36.1215	35.8900	47.304	41.391
High	5230	36.0057	35.8900	52.522	55.304
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Mid	5210	75.2532	75.2353	82.319	83.014

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-2a 5250-5350 MHz					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5260	16.3531	-	22.6812	-
Mid	5280	16.3531	-	22.6812	-
High	5320	16.3531	-	23.1884	-
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5260	17.9450	17.7279	33.1159	32.0290
Mid	5280	17.6555	17.4384	24.7101	22.6087
High	5320	17.4384	17.3661	20.4348	20.4348
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5270	36.1215	36.0057	49.8550	61.4490
High	5310	35.8900	36.1215	46.8410	48.9280
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Mid	5290	75.2532	75.0217	81.3910	83.0140

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-2c 5475-5725 MHz					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5500	16.3531	-	22.3913	-
Mid	5580	16.5701	-	30.0725	-
High	5700	16.4254	-	23.4783	-
Cross	5720	17.5832	-	21.9250	-
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5500	17.3661	17.4384	20.7971	20.3623
Mid	5580	17.5108	17.5108	21.5217	21.2319
High	5700	17.4384	17.5832	22.9710	25.9420
Cross	5720	17.3661	17.5108	26.3390	22.5760
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5510	35.8900	35.7742	44.6380	42.0870
Mid	5500	36.1215	35.8900	56.0000	48.0000
High	5670	36.0057	35.7742	54.3770	40.9280
Cross	5710	35.8900	35.7742	41.5600	44.5700
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Mid	5530	75.2532	75.4848	83.2460	82.7830
Cross	5690	75.2532	75.0217	81.7400	82.2000

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

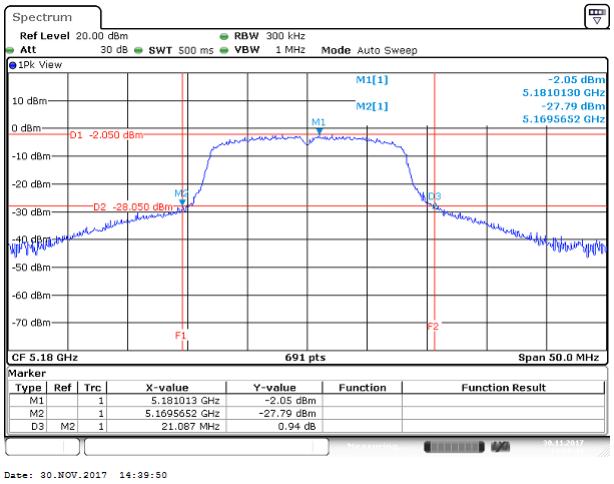
UNII-3 5725-5825MHz					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**
Low	5745	16.4978	-	15.3478	-
Mid	5785	16.4254	-	15.3478	-
High	5825	16.5701	-	15.1739	-
Cross	5720	17.5832	-	15.8900	-
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**
Low	5745	17.5832	17.5832	15.1304	16.0435
Mid	5785	17.4384	17.6555	15.1304	16.2609
High	5825	17.4384	17.5108	15.1304	15.6957
Cross	5720	17.4384	17.5108	15.3690	17.0620
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**
Low	5755	36.1215	35.8900	35.1300	35.1300
High	5795	36.2373	35.8900	35.1300	35.0140
Cross	5710	36.1215	35.7742	35.2000	34.0400
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**
Mid	5775	75.2532	75.2532	75.1300	75.1300
Cross	5690	75.2532	75.2532	71.7800	70.3900

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

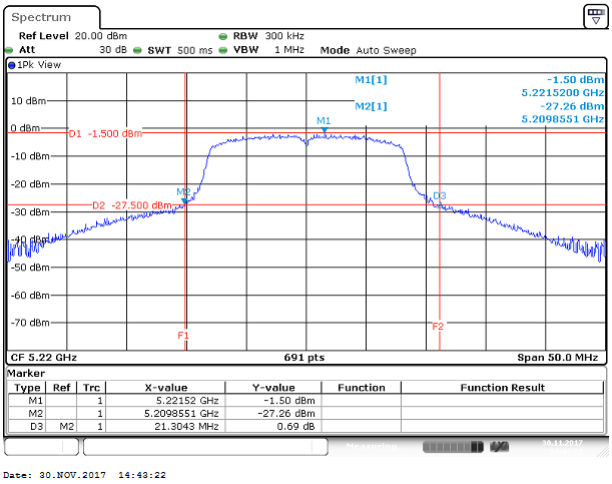
Test Data

UNII-1 IEEE 802.11a mode- chain 0

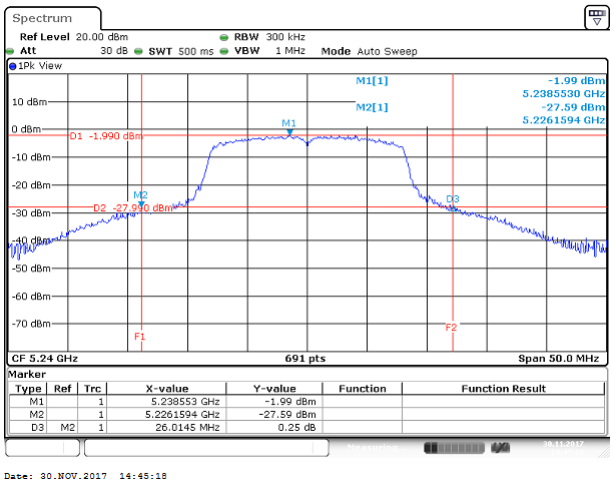
Low CH



Mid CH



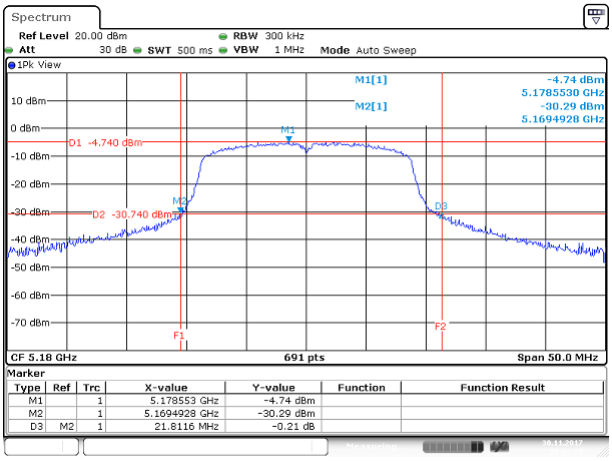
High CH



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

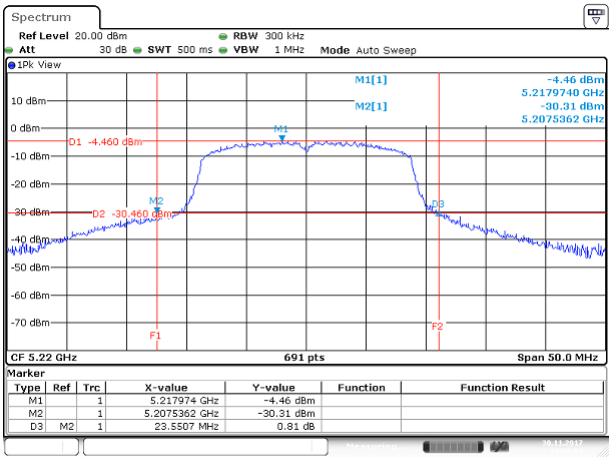
UNII-1 IEEE 802.11n HT20 mode- chain 0

Low CH



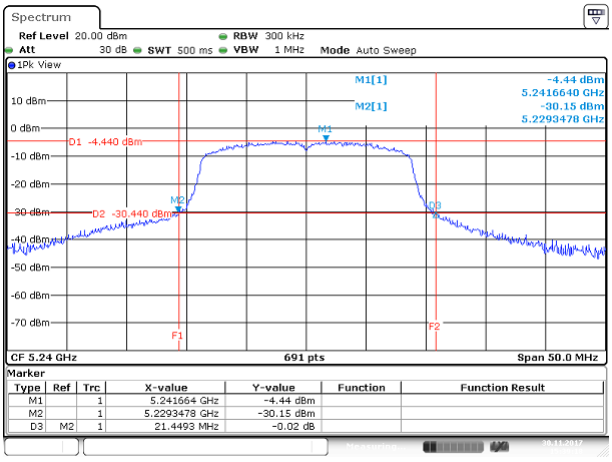
Date: 30.NOV.2017 15:32:26

Mid CH



Date: 30.NOV.2017 15:37:38

High CH

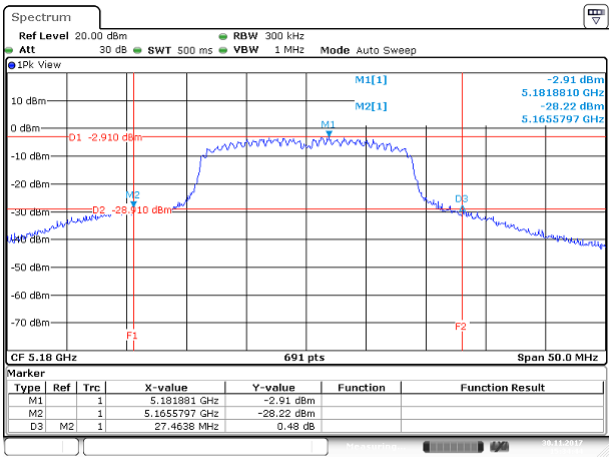


Date: 30.NOV.2017 15:39:19

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

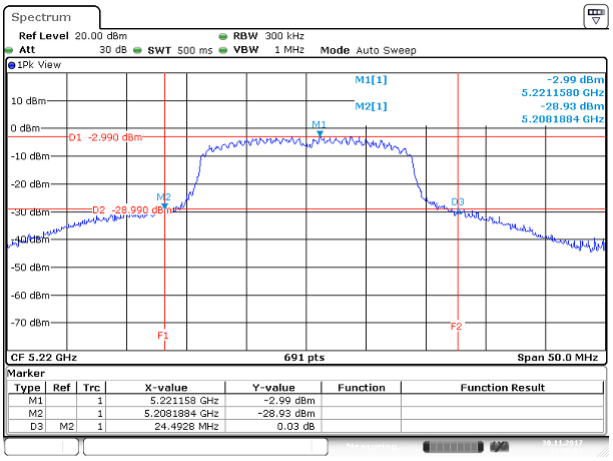
UNII-1 IEEE 802.11n HT20 mode- chain 1

Low CH



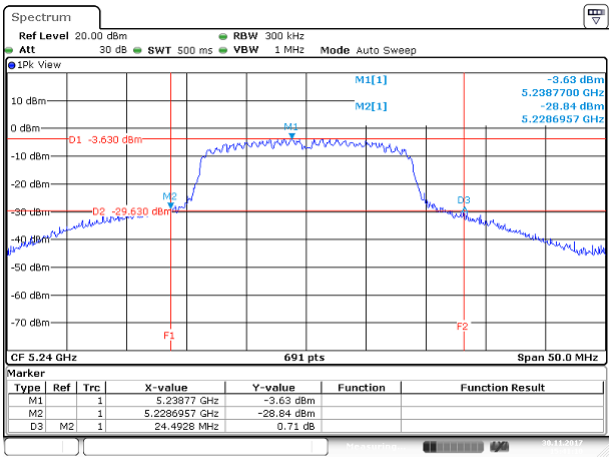
Date: 30.NOV.2017 15:34:45

Mid CH



Date: 30.NOV.2017 15:36:06

High CH

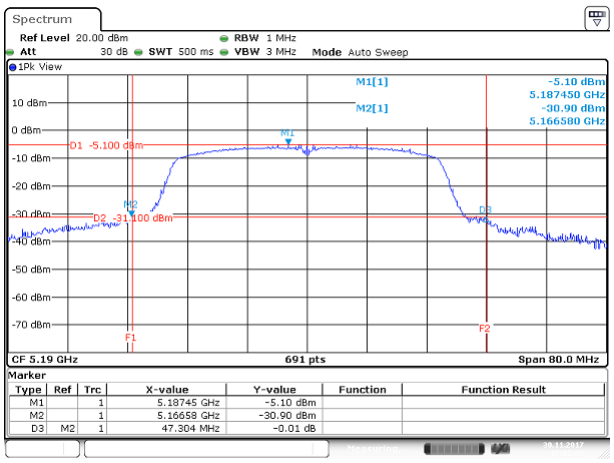


Date: 30.NOV.2017 15:41:10

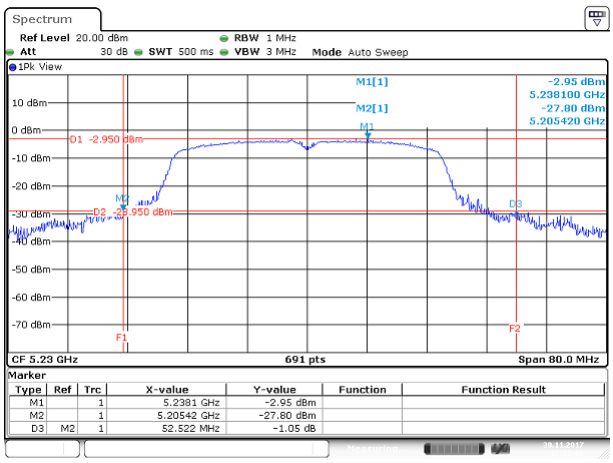
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-1 IEEE 802.11n HT40 mode- chain 0

Low CH

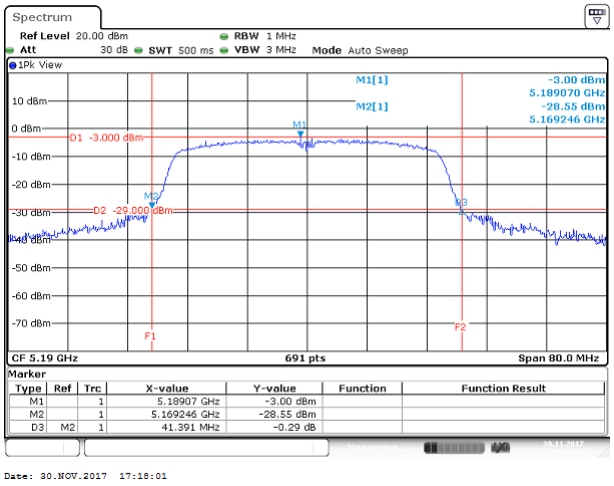


High CH

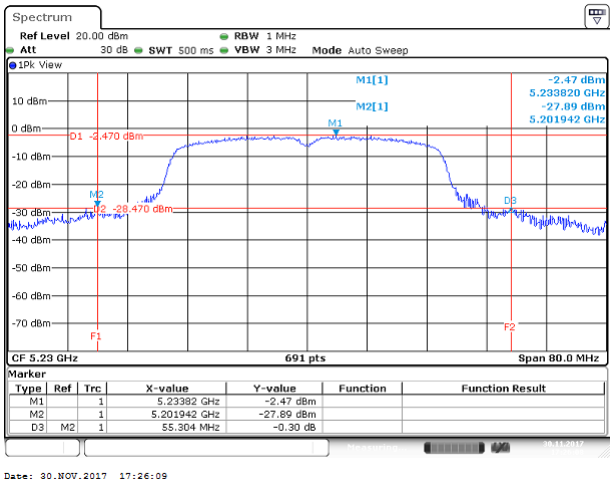


UNII-1 IEEE 802.11n HT40 mode- chain 1

Low CH



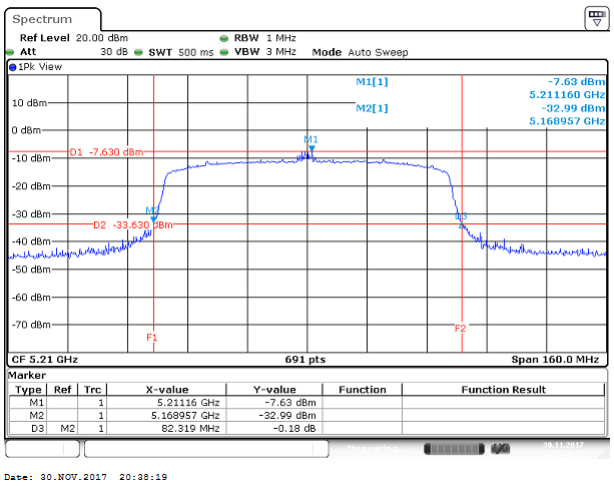
High CH



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

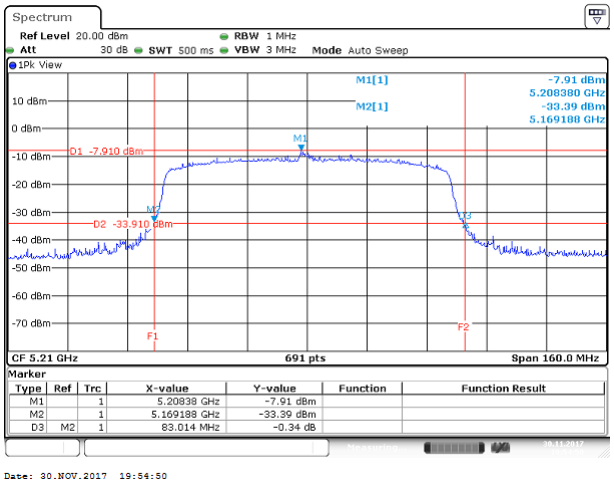
UNII-1 IEEE 802.11ac VHT80 mode- chain 0

Mid CH



UNII-1 IEEE 802.11ac VHT80 mode- chain 1

Mid CH

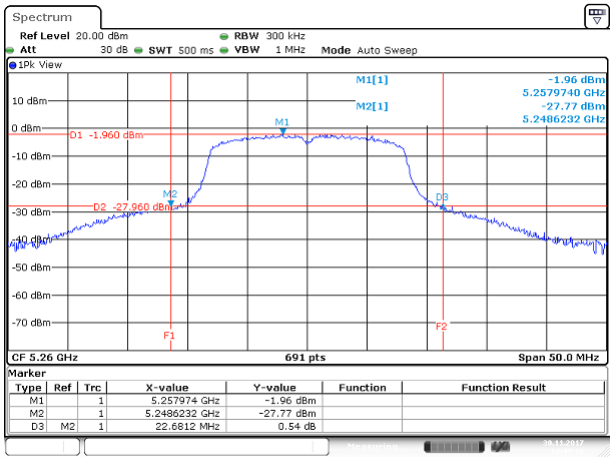


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Data

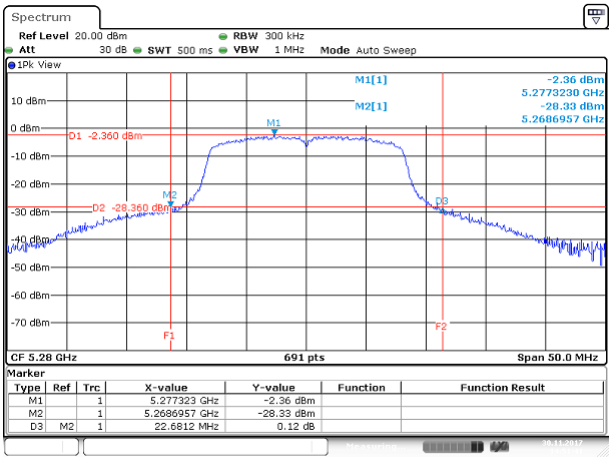
UNII-2a IEEE 802.11a mode- chain 0

Low CH



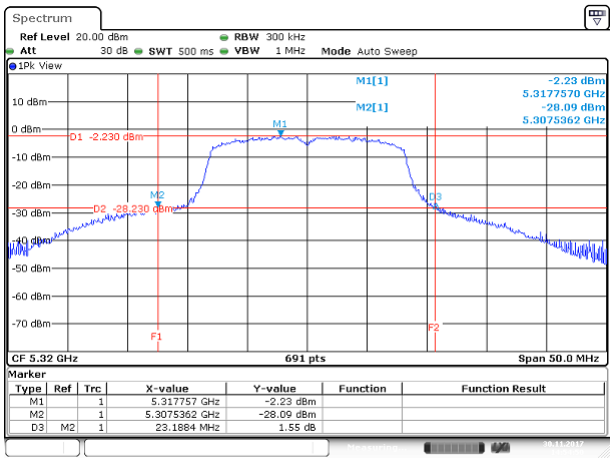
Date: 30.NOV.2017 14:49:16

Mid CH



Date: 30.NOV.2017 14:51:42

High CH

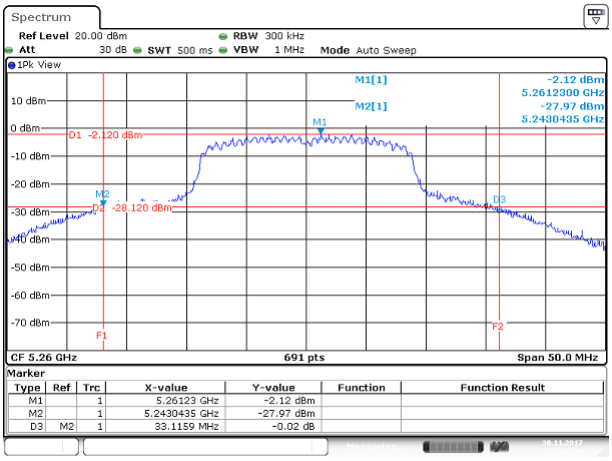


Date: 30.NOV.2017 14:54:51

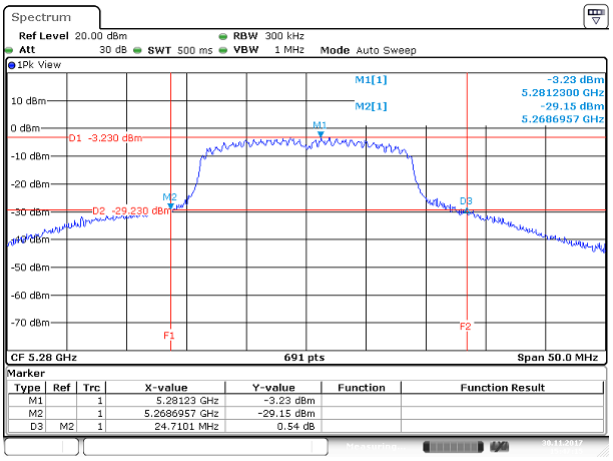
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-2a IEEE 802.11n HT20 mode- chain 0

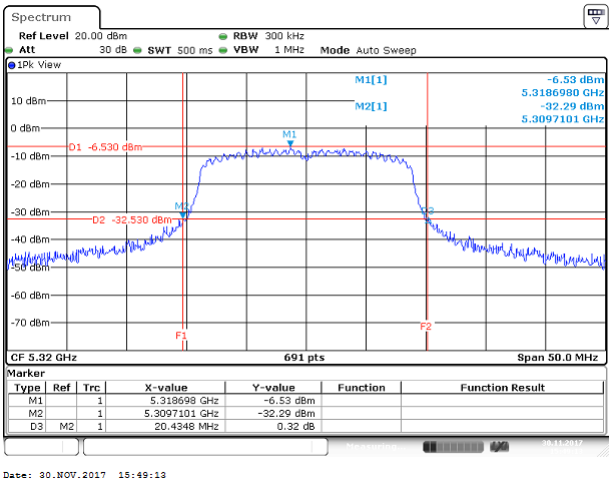
Low CH



Mid CH



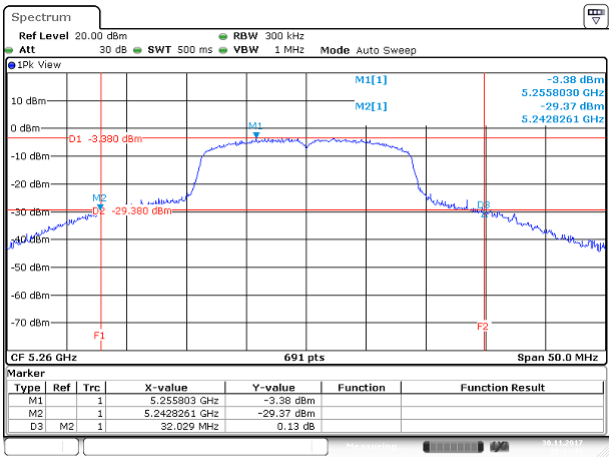
High CH



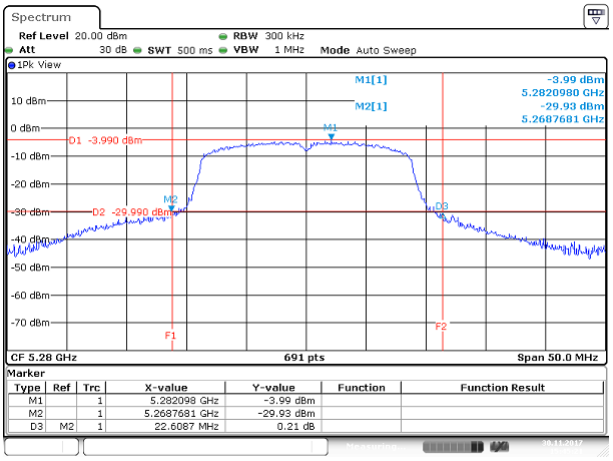
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-2a IEEE 802.11n HT20 mode- chain 1

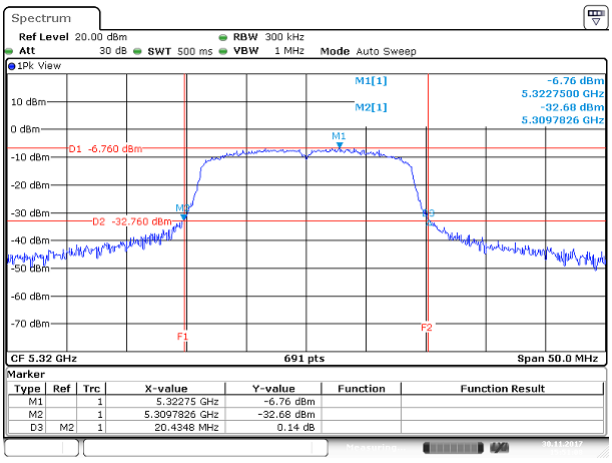
Low CH



Mid CH



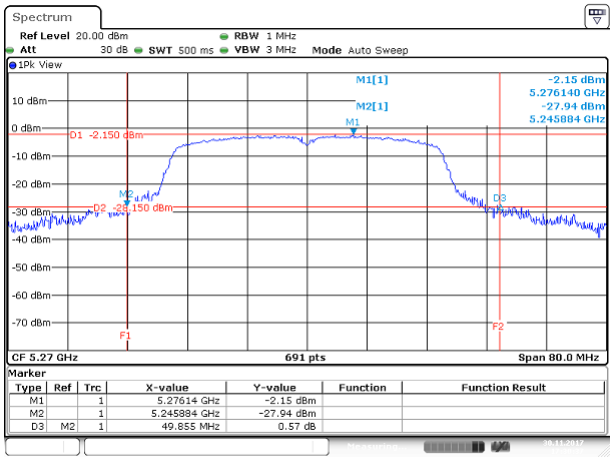
High CH



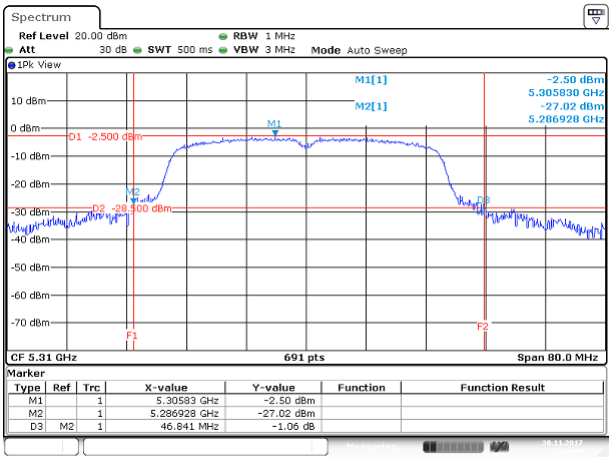
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-2a IEEE 802.11n HT40 mode- chain 0

Low CH

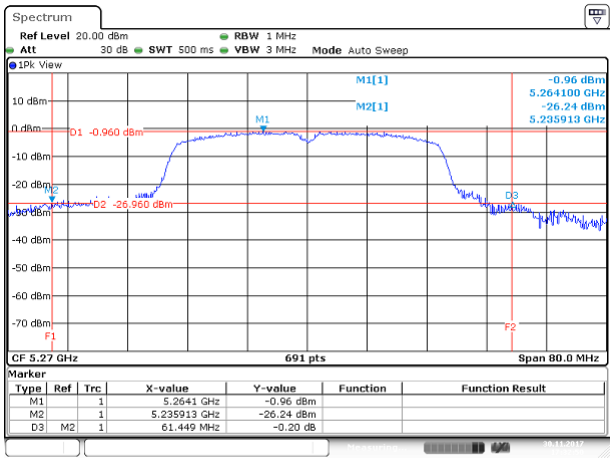


High CH

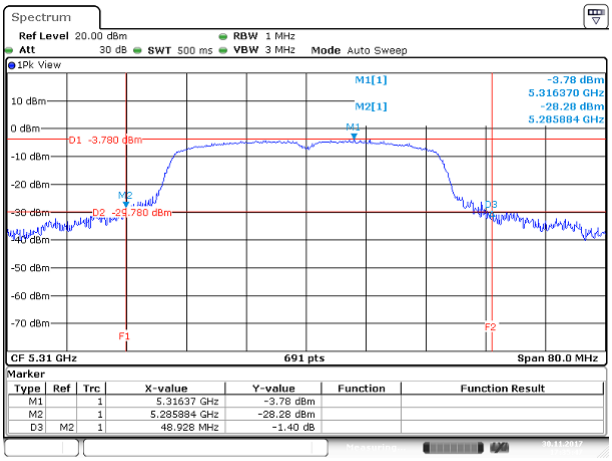


UNII-2a IEEE 802.11n HT40 mode- chain 1

Low CH



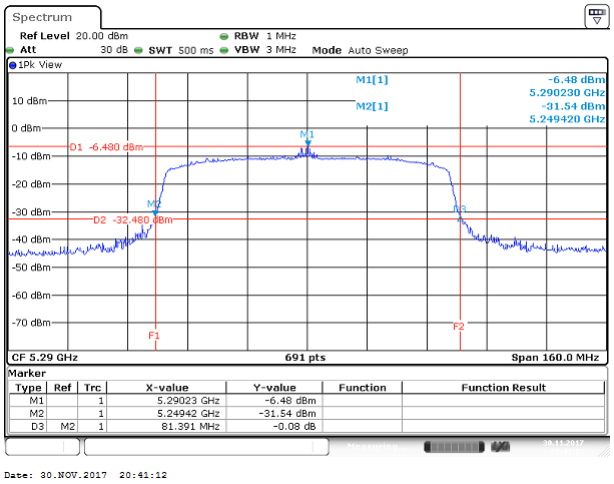
High CH



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

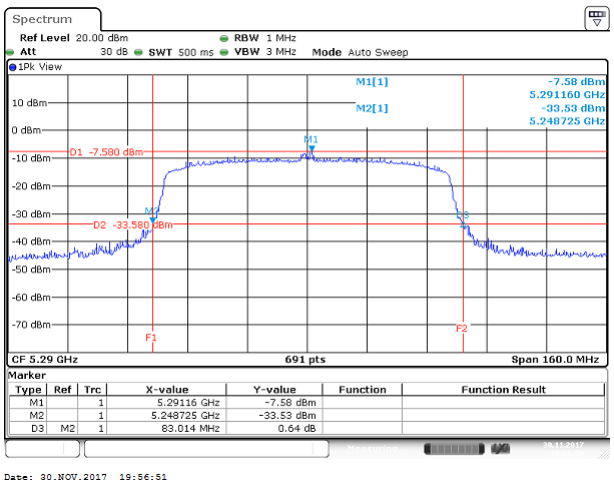
UNII-2a IEEE 802.11ac VHT80 mode- chain 0

Mid CH



UNII-2a IEEE 802.11ac VHT80 mode- chain 0

Mid CH

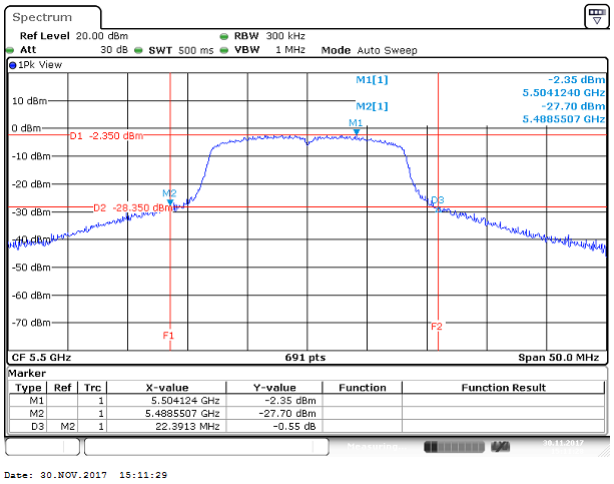


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Data

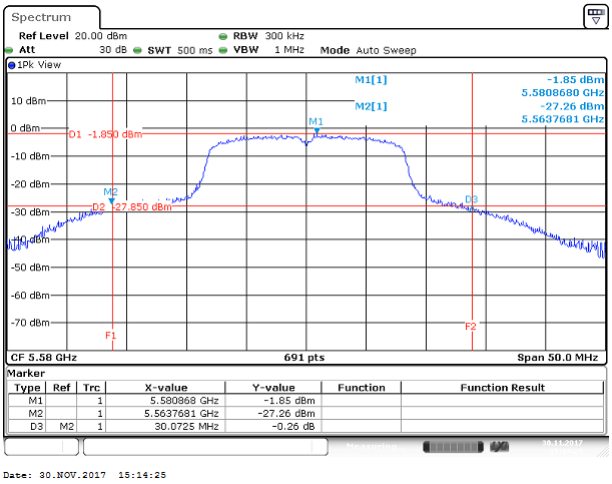
UNII-2c IEEE 802.11a mode- chain 0

Low CH



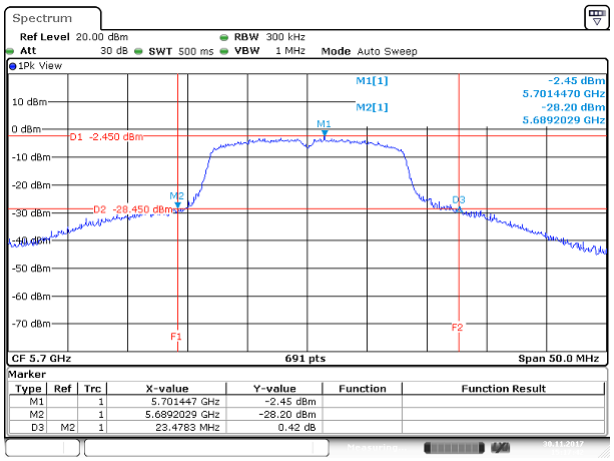
Date: 30.NOV.2017 15:11:29

Mid CH



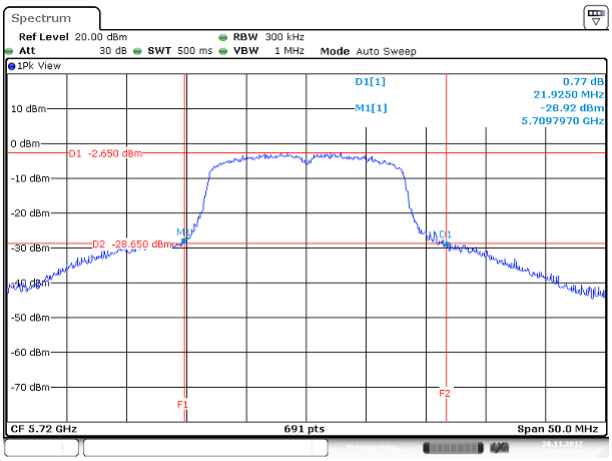
Date: 30.NOV.2017 15:14:25

High CH



Date: 30.NOV.2017 15:17:43

Cross CH

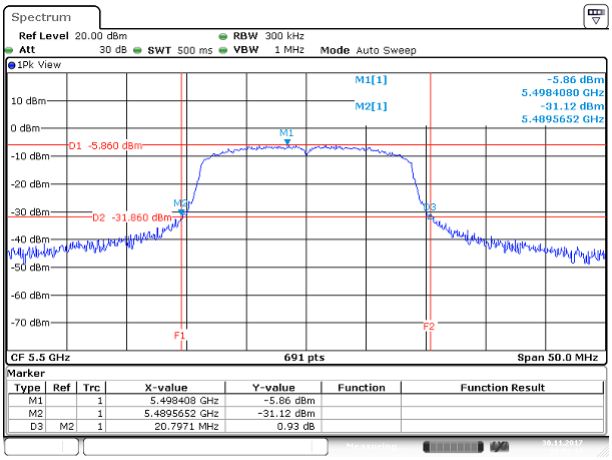


Date: 30.NOV.2017 20:57:26

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

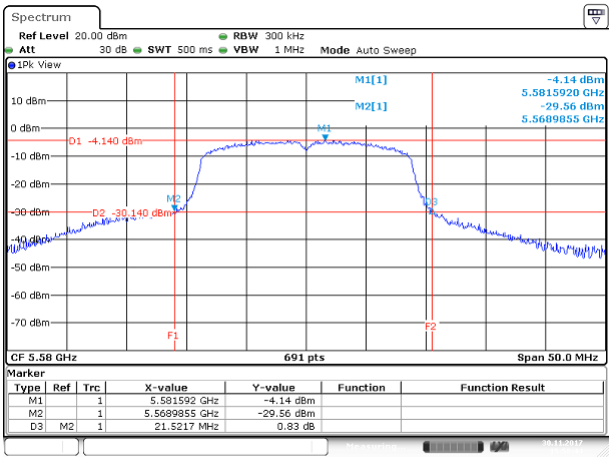
UNII-2c IEEE 802.11n HT20 mode- chain 0

Low CH



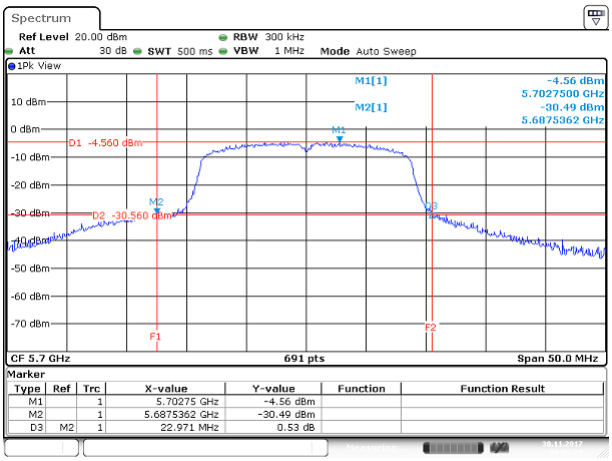
Date: 30.NOV.2017 15:52:17

Mid CH



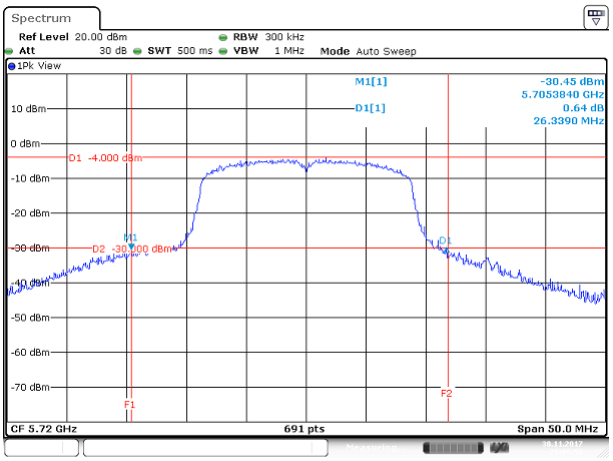
Date: 30.NOV.2017 15:58:44

High CH



Date: 30.NOV.2017 16:00:30

Cross CH

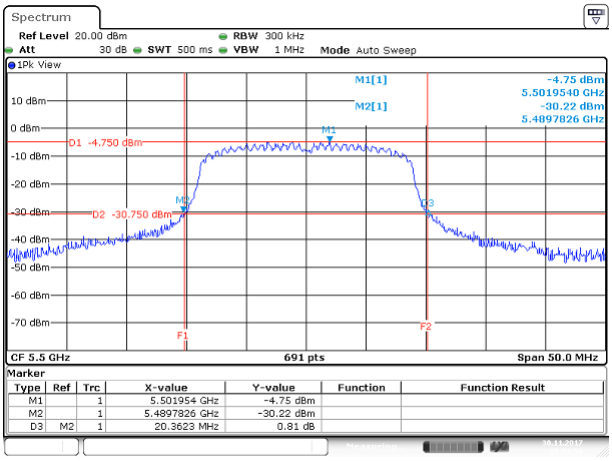


Date: 30.NOV.2017 21:09:59

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

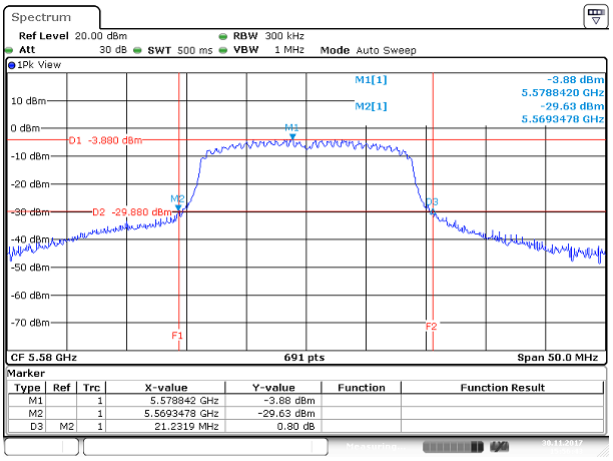
UNII-2c IEEE 802.11n HT20 mode- chain 1

Low CH



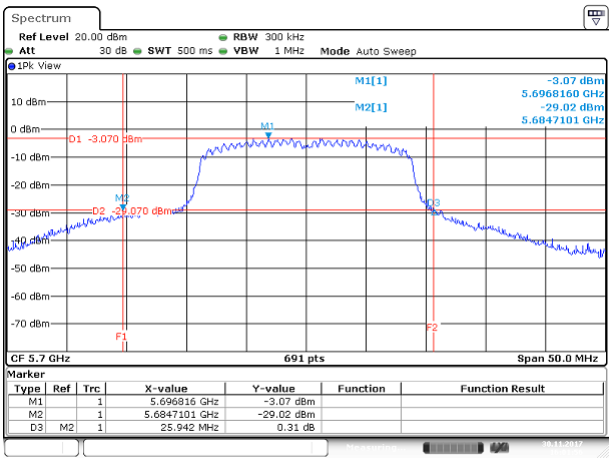
Date: 30.NOV.2017 15:54:58

Mid CH



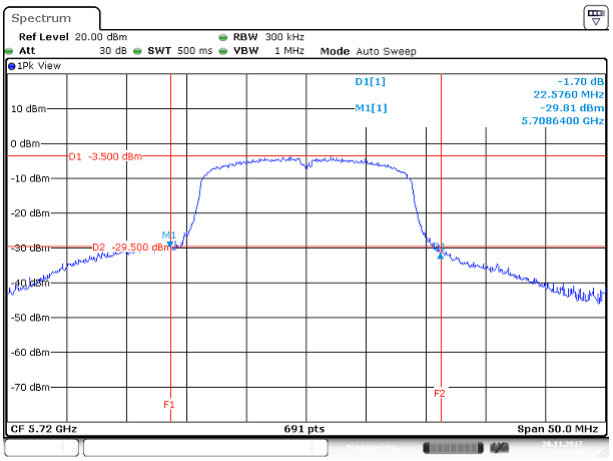
Date: 30.NOV.2017 15:56:44

High CH



Date: 30.NOV.2017 16:01:57

Cross CH

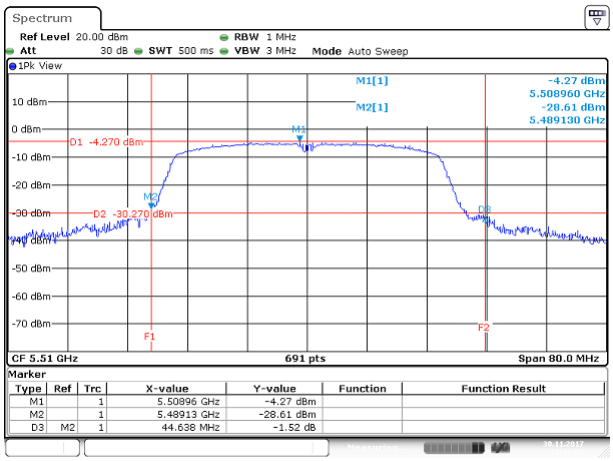


Date: 30.NOV.2017 21:51:45

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

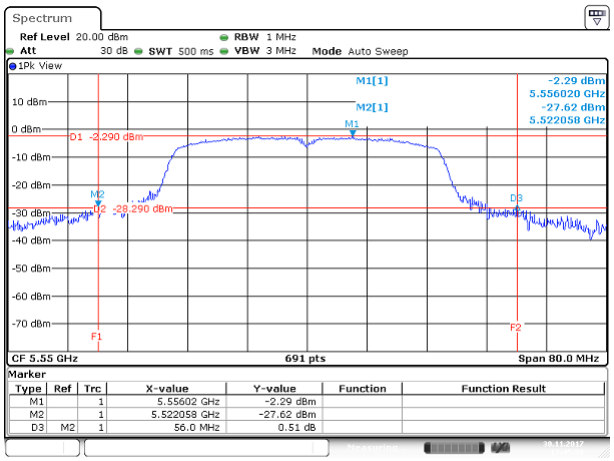
UNII-2c IEEE 802.11n HT40 mode- chain 0

Low CH



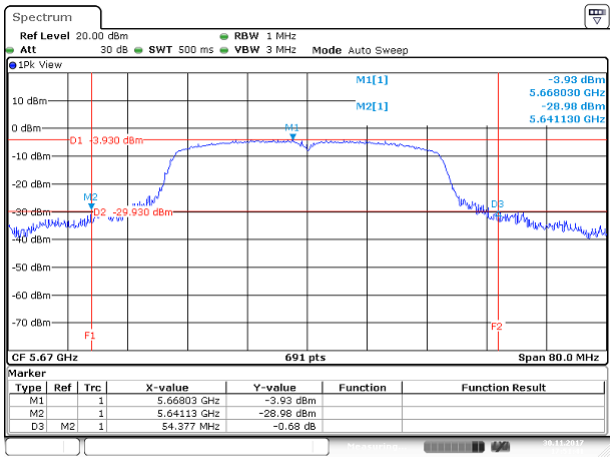
Date: 30.NOV.2017 17:41:55

Mid CH



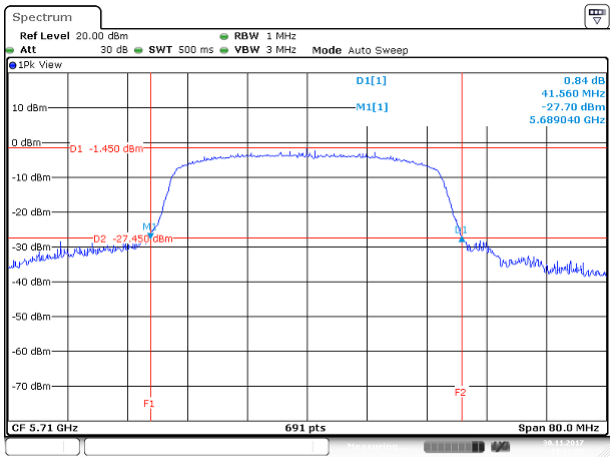
Date: 30.NOV.2017 17:45:59

High CH



Date: 30.NOV.2017 17:51:42

Cross CH

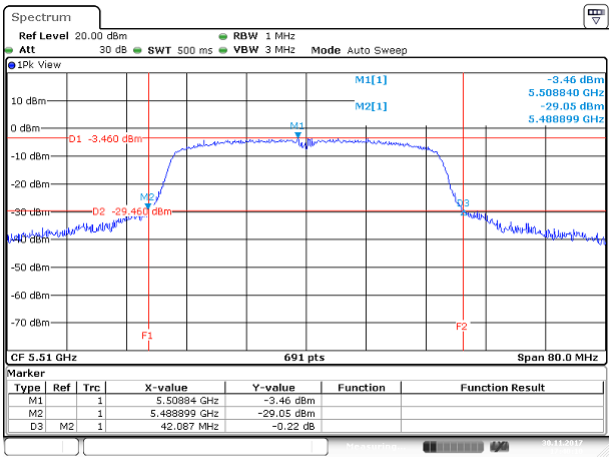


Date: 30.NOV.2017 21:23:59

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

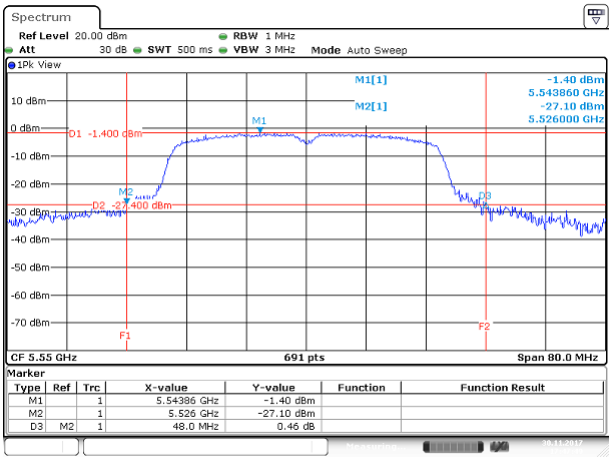
UNII-2c IEEE 802.11n HT40 mode- chain 1

Low CH



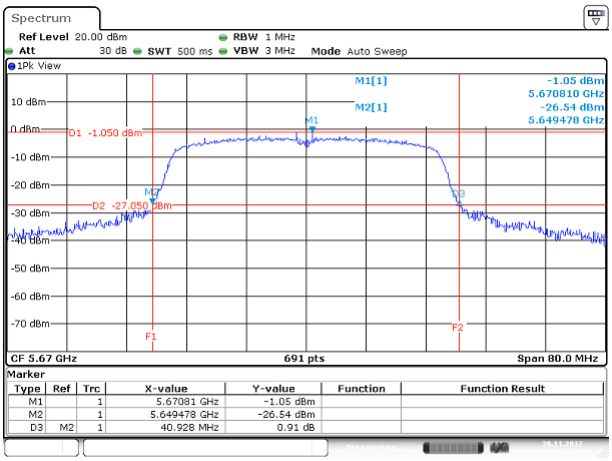
Date: 30.NOV.2017 17:40:11

Mid CH



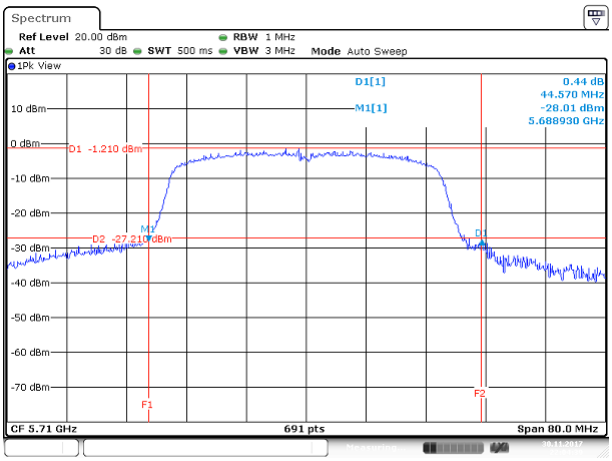
Date: 30.NOV.2017 17:47:49

High CH



Date: 30.NOV.2017 17:49:49

Cross CH

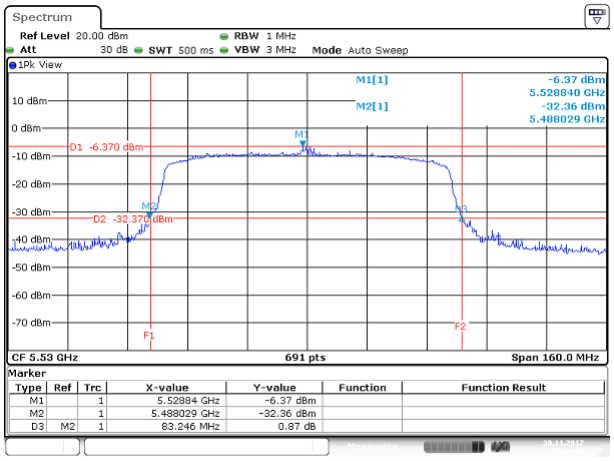


Date: 30.NOV.2017 22:04:39

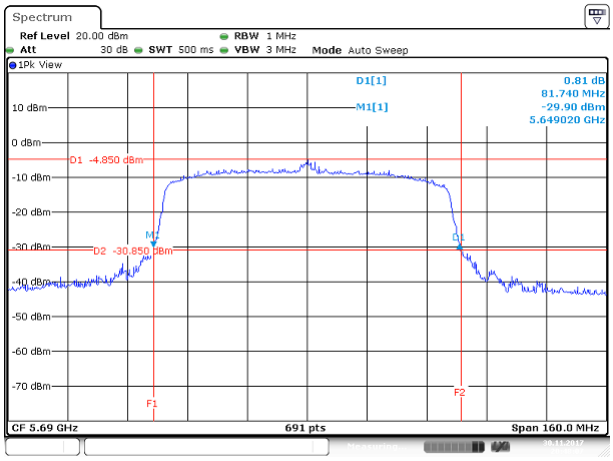
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-2c IEEE 802.11ac VHT80 mode- chain 0

Mid CH

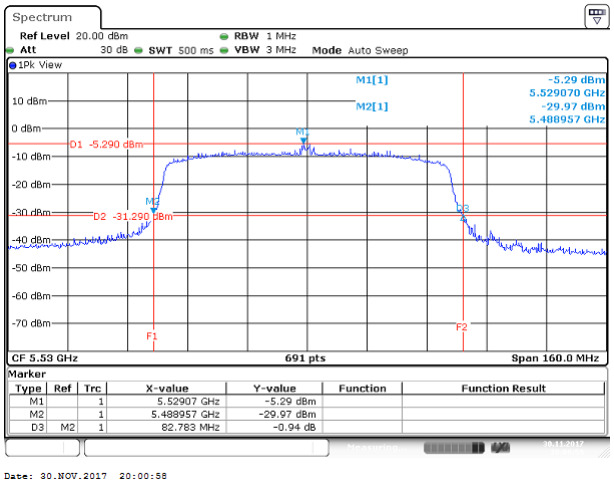


Cross CH

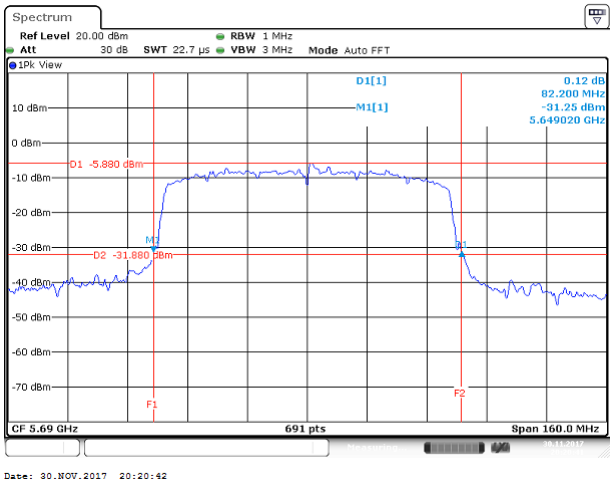


UNII-2c IEEE 802.11ac VHT80 mode- chain 1

Mid CH



Cross CH

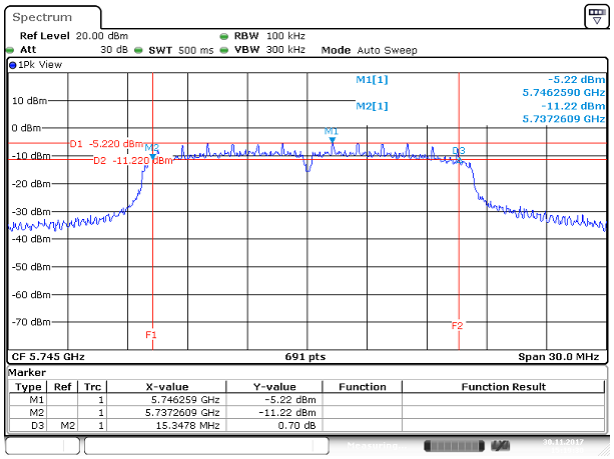


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

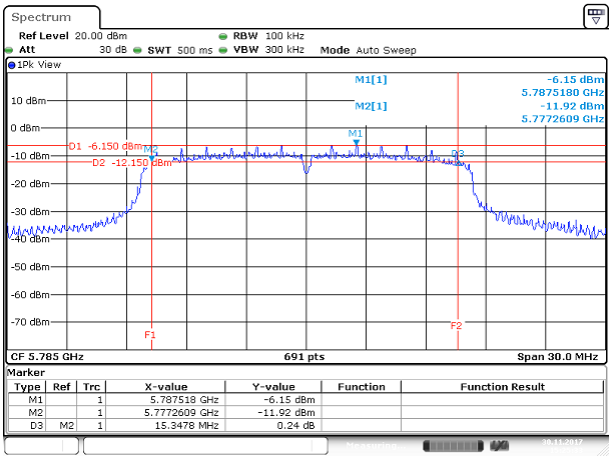
Test Data

UNII-3 IEEE 802.11a mode- chain 0

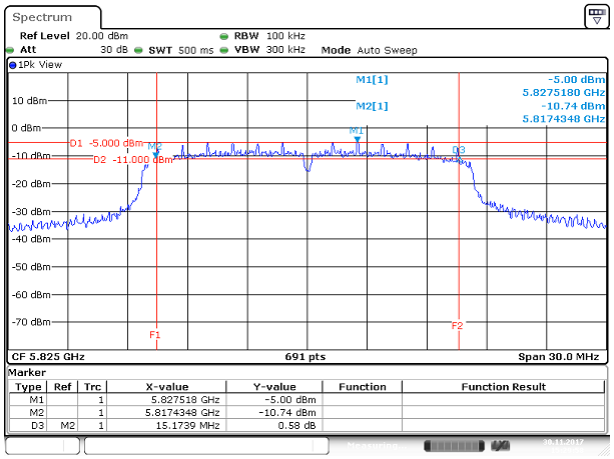
Low CH



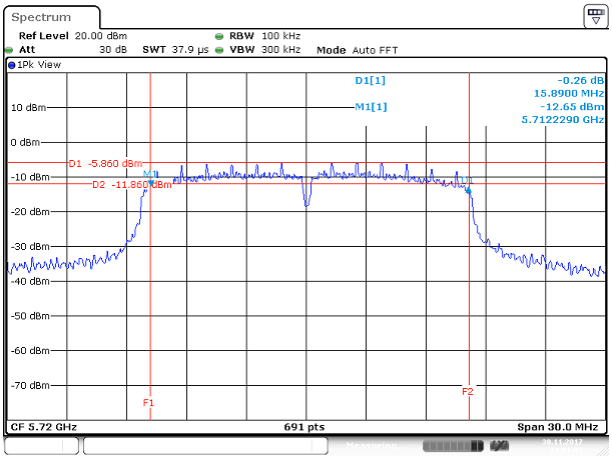
Mid CH



High CH



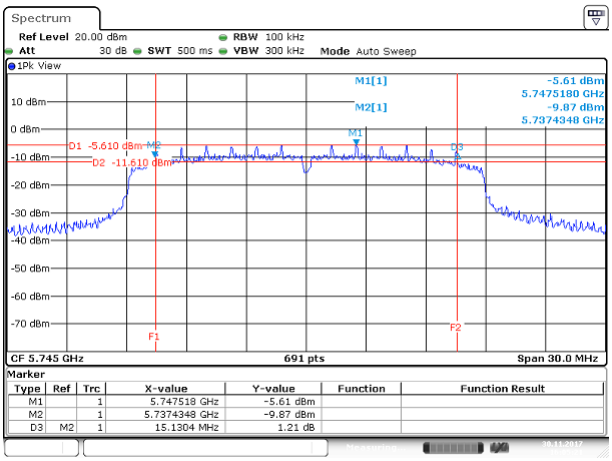
Cross CH



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

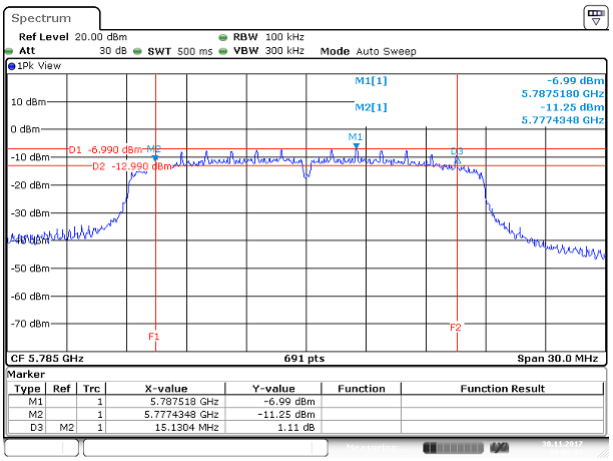
UNII-3 IEEE 802.11n HT20 mode- chain 0

Low CH



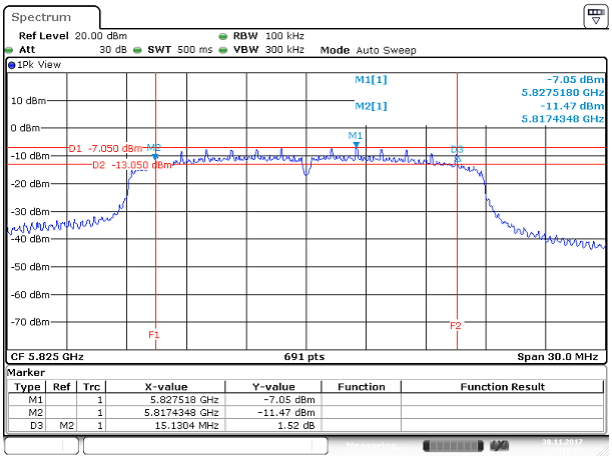
Date: 30.NOV.2017 16:05:21

Mid CH



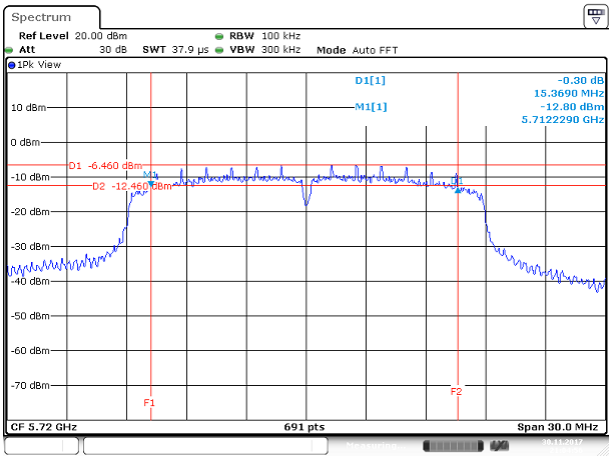
Date: 30.NOV.2017 16:06:58

High CH



Date: 30.NOV.2017 16:18:58

Cross CH

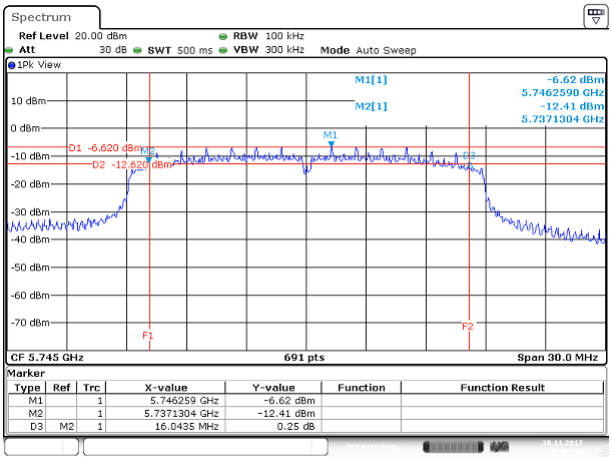


Date: 30.NOV.2017 21:04:57

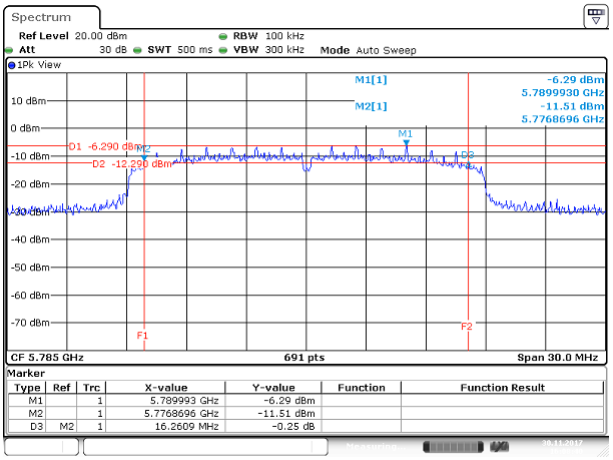
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-3 IEEE 802.11n HT20 mode- chain 1

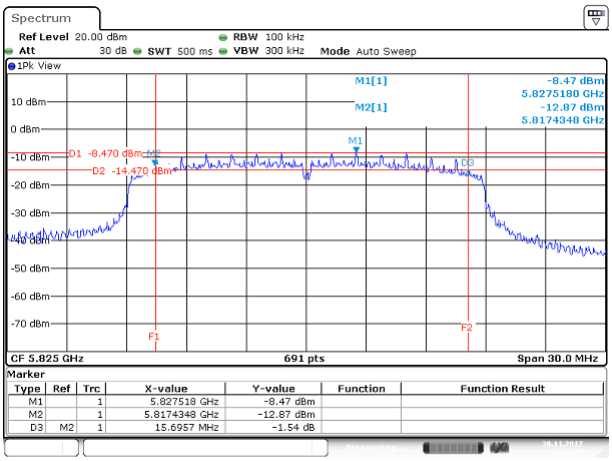
Low CH



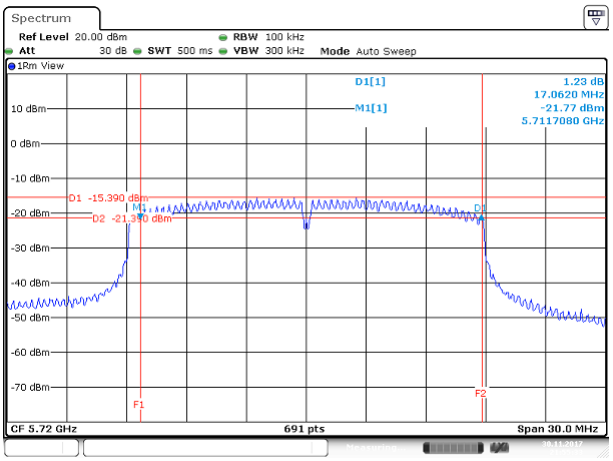
Mid CH



High CH



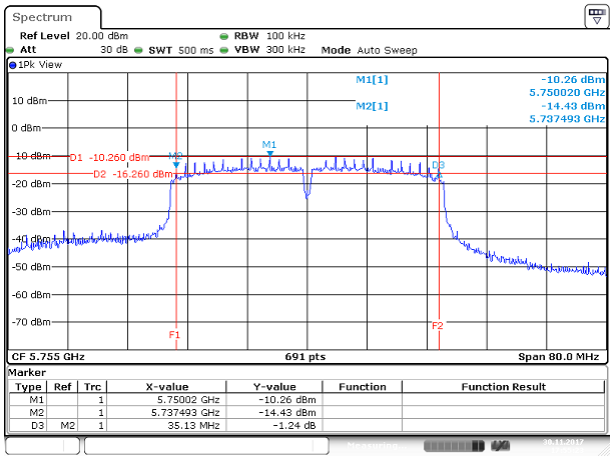
Cross CH



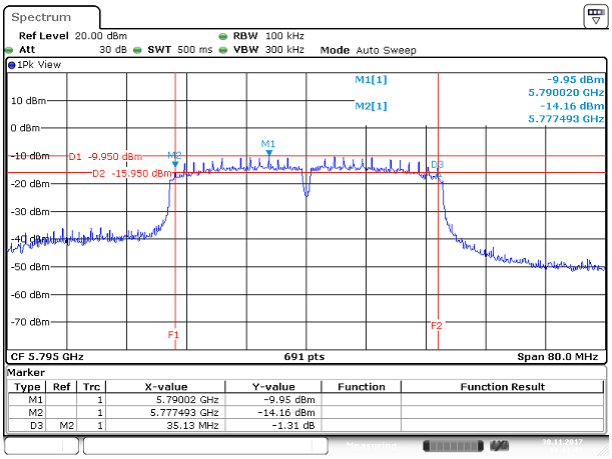
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-3 IEEE 802.11n HT40 mode- chain 0

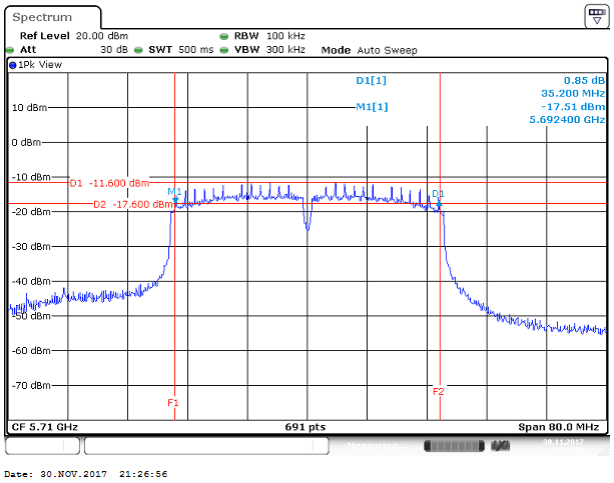
Low CH



High CH



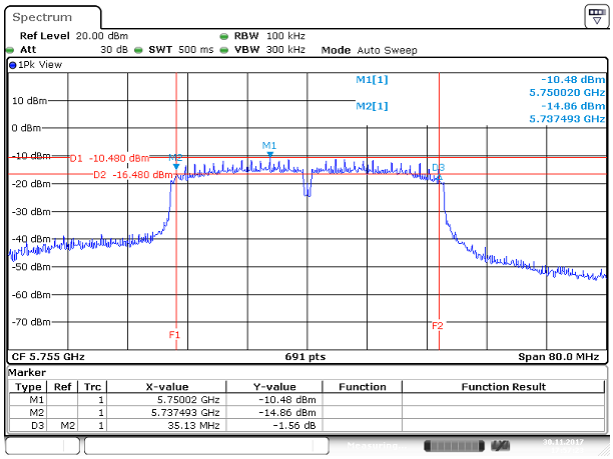
Cross CH



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

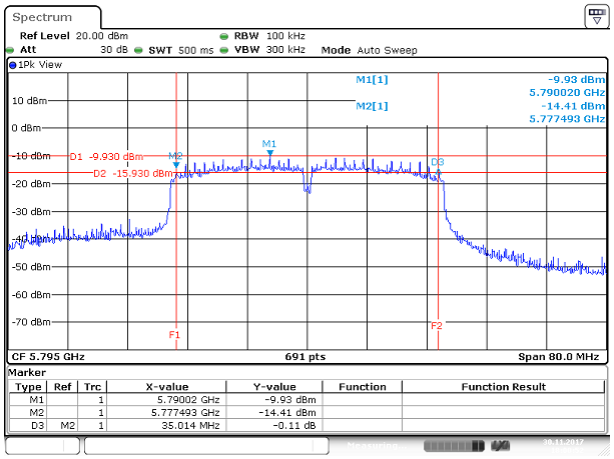
UNII-3 IEEE 802.11n HT40 mode- chain 1

Low CH



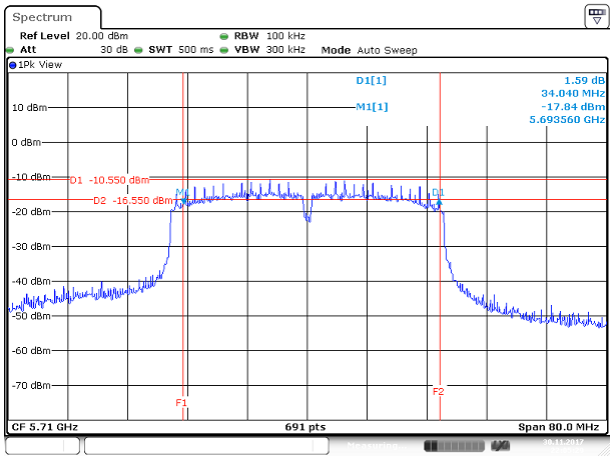
Date: 30.NOV.2017 17:57:24

High CH



Date: 30.NOV.2017 18:00:53

Cross CH

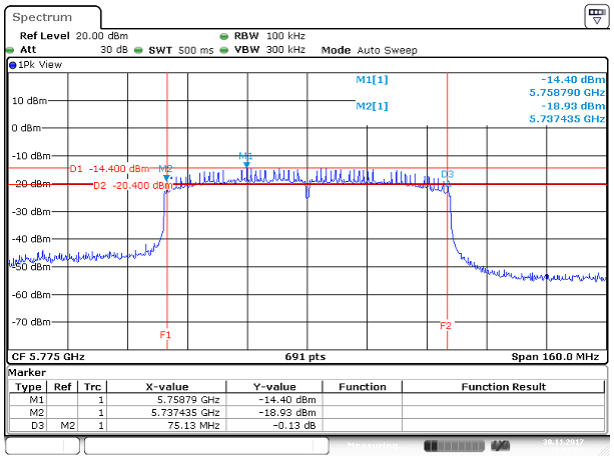


Date: 30.NOV.2017 22:05:30

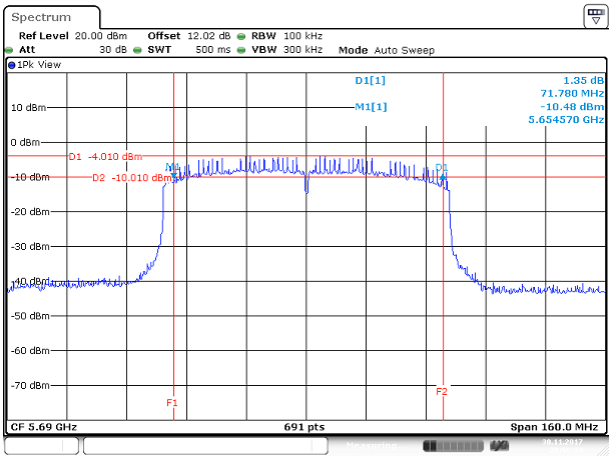
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-3 IEEE 802.11ac VHT80 mode- chain 0

Mid CH

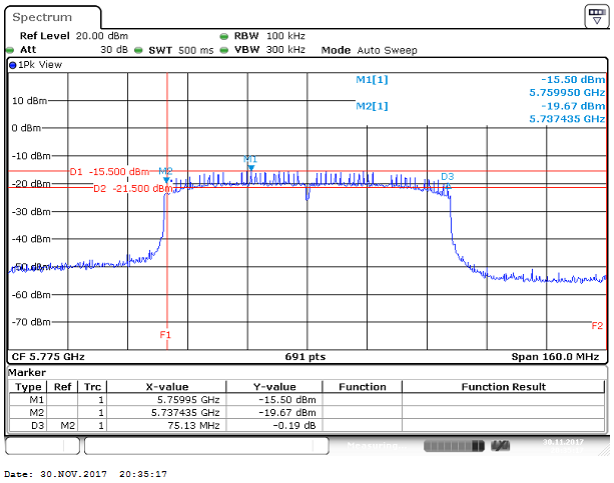


Cross CH

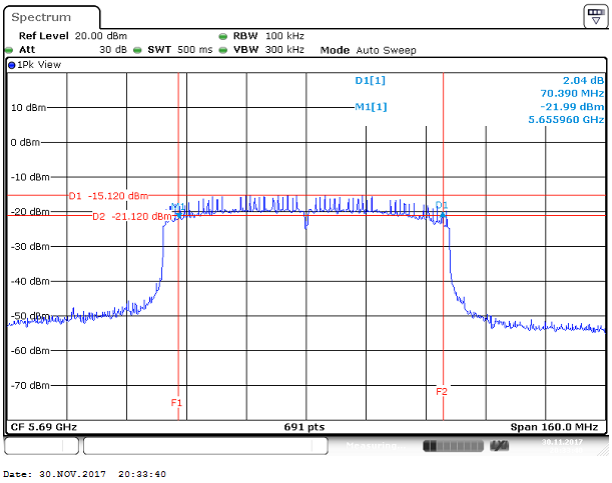


UNII-3 IEEE 802.11ac VHT80 mode- chain 1

Mid CH



Cross CH



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.407 (a)(1), 15.407(a)(2) and 15.407(a)(3) and RSS-247 section 6.2.1.1, section 6.2.2.1, section 6.2.3.1 and section 6.2.4.1

UNII-1 :

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW(24 dBm) and The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz ,provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

UNII-2a and 2c:

the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. and The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 Log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

UNII-3:

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

UNII-1 Limit	☒ Antenna not exceed 6 dBi：24dBm (EIRP : 23dBm) ☐ Antenna with DG greater than 6 dBi： [Limit = 24 – (DG – 6)]
UNII-2a/2c Limit	☒ Antenna not exceed 6 dBi：24dBm (EIRP : 30dBm) ☐ Antenna with DG greater than 6 dBi： [Limit = 24 – (DG – 6)]
UNII-3 Limit	☒ Antenna not exceed 6 dBi：30dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)]

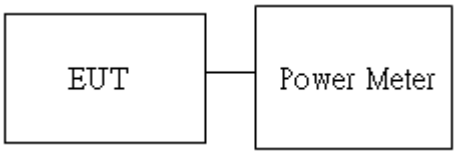
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.3.2 Test Procedure

Test method Refer as KDB 789033 D02 v01r04, Section E.3.b.

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Average output power. in the test report.

4.3.3 Test Setup



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.3.4 Test Result

Conducted output power：

UNII-1													
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	EIRP AV Total Power (dBm)	AV Total Power (W)	EIRP AV Total Power (W)	DG (dBi)	Limit (dBm)	EIRP Limit (dBm)
			chain0	chain1	chain0	chain1							
IEEE 802.11a Data rate: 6Mbps	36	5180	16	-	14.99	-	14.99	18.79	0.0316	0.0757	3.8	24	23
	44	5220	16	-	15.00	-	15.00	18.80	0.0316	0.0759			
	48	5240	16	-	15.11	-	15.11	18.91	0.0324	0.0778			
IEEE 802.11n HT20 Data rate: MCS8	36	5180	14.00	14.00	12.72	13.11	15.93	19.73	0.0392	0.0940			
	44	5220	14.50	14.50	14.01	13.97	17.00	20.80	0.0501	0.1202			
	48	5240	14.50	14.50	13.81	13.93	16.88	20.68	0.0488	0.1169			
IEEE 802.11n HT40 Data rate: MCS8	38	5190	12.00	12.00	11.33	12.25	14.83	18.63	0.0304	0.0729			
	46	5230	13.00	13.00	12.38	12.87	15.64	19.44	0.0366	0.0879			
IEEE 802.11ac VHT80 Data rate: MCS8	42	5210	9.00	9.00	6.84	7.52	10.20	14.00	0.0105	0.0251			

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-2a													
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	EIRP AV Total Power (dBm)	AV Total Power (W)	EIRP AV Total Power (W)	DG (dBi)	Limit (dBm)	EIRP Limit (dBm)
			chain0	chain1	chain0	chain1							
IEEE 802.11a Data rate: 6Mbps	52	5260	16	-	14.95	-	14.95	18.75	0.0313	0.0750	3.8	24	30
	56	5280	16	-	15.08	-	15.08	18.88	0.0322	0.0773			
	64	5320	16	-	14.87	-	14.87	18.67	0.0307	0.0736			
IEEE 802.11n HT20 Data rate: MCS8	52	5260	16	16	13.92	14.07	17.01	20.81	0.0502	0.1205			
	56	5280	15	15	14.22	14.04	17.14	20.94	0.0518	0.1242			
	64	5320	12.5	12.5	11.62	11.67	14.66	18.46	0.0292	0.0701			
IEEE 802.11n HT40 Data rate: MCS8	54	5270	14	14	12.93	13.26	16.11	19.91	0.0408	0.0979			
	62	5310	12	12	10.78	11.34	14.08	17.88	0.0256	0.0614			
IEEE 802.11ac VHT80 Data rate: MCS8	58	5290	9	9	7.56	7.31	10.45	14.25	0.0111	0.0266			

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-2c													
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	EIRP AV Total Power (dBm)	AV Total Power (W)	EIRP AV Total Power (W)	DG (dBi)	Limit (dBm)	EIRP Limit (dBm)
			chain0	chain1	chain0	chain1							
IEEE 802.11a Data rate: 6Mbps	100	5500	16.5	-	14.89	-	14.89	18.69	0.0308	0.0740	3.8	24	30
	116	5580	16	-	15.12	-	15.12	18.92	0.0325	0.0780			
	140	5700	14.5	-	14.66	-	14.66	18.46	0.0292	0.0701			
	144	5720	14.5	-	14.97	-	14.97	18.77	0.0314	0.0753			
IEEE 802.11n HT20 Data rate: MCS8	100	5500	13.5	13.5	12.70	12.89	15.81	19.61	0.0381	0.0914			
	116	5580	14	14	14.25	13.72	17.01	20.81	0.0502	0.1205			
	140	5700	14	14	14.11	14.10	17.12	20.92	0.0515	0.1236			
	144	5720	12	12	13.88	13.78	16.84	20.64	0.0483	0.1159			
IEEE 802.11n HT40 Data rate: MCS8	102	5510	12	12	10.83	10.95	13.90	17.70	0.0245	0.0589			
	110	5550	14	14	13.23	13.17	16.21	20.01	0.0418	0.1002			
	134	5670	12	12	11.55	11.73	14.65	18.45	0.0292	0.0700			
	142	5710	10	10	13.00	13.12	16.07	19.87	0.0405	0.0971			
IEEE 802.11ac VHT80 Data rate: MCS8	106	5530	9	9	6.60	6.38	9.50	13.30	0.0089	0.0214			
	138	5690	11	11	9.97	10.14	13.07	16.87	0.0203	0.0486			

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-3										
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
			chain0	chain1	chain0	chain1				
IEEE 802.11a Data rate: 6Mbps	144	5720	14.5	-	7.69	-	7.69	0.0059	3.8	30
	149	5745	14.5	-	14.89	-	14.89	0.0308		
	157	5785	15	-	14.98	-	14.98	0.0315		
	165	5825	15.5	-	14.96	-	14.96	0.0313		
IEEE 802.11n HT20 Data rate: MCS8	144	5720	14	14	7.11	6.60	9.88	0.0097		
	149	5745	14	14	14.24	13.88	17.08	0.0511		
	157	5785	14	14	14.17	13.67	16.94	0.0494		
	165	5825	14	14	14.06	11.71	16.06	0.0404		
IEEE 802.11n HT40 Data rate: MCS8	142	5710	13	13	0.32	0.88	3.62	0.0023		
	151	5755	13	13	12.92	12.29	15.63	0.0366		
	159	5795	13.5	13.5	12.67	12.73	15.71	0.0372		
IEEE 802.11ac VHT80 Data rate: MCS8	138	5690	11	11	-3.94	-3.49	-0.70	0.0009		
	155	5775	12.00	12.00	10.55	10.29	13.43	0.0220		

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.407 (a)(1), 15.407(a)(2) and 15.407(a)(3) and RSS-247 section 6.2.1(1), section 6.2.2(1), section 6.2.3(1) and section 6.2.4(1)

UNII-1 :

FCC: The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

IC: The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

UNII-2a and 2c:

The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

UNII-3:

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.i.

UNII-1 Limit	☒ Antenna not exceed 6 dBi：11 dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 11 – (DG – 6)]
UNII-2a Limit	☒ Antenna not exceed 6 dBi：11 dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 11 – (DG – 6)]
UNII-2c Limit	☒ Antenna not exceed 6 dBi：11 dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 11 – (DG – 6)]
UNII-3 Limit	☒ Antenna not exceed 6 dBi：30 dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)]

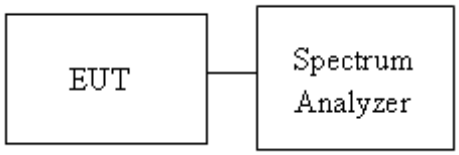
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.4.2 Test Procedure

Test method Refer as KDB 789033 D02 v01r04, Section F

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. UNII-1, UNII-2a and UNII-2c, SA set RBW = 1MHz, VBW = 3MHz and Detector = RMS, to measurement Power Density.
4. UNII-3, SA set RBW = 500kHz, VBW = 2MHz and Detector = RMS, to measurement Power Density
5. The path loss and Duty Factor were compensated to the results for each measurement by SA.
6. Mark the maximum level.
7. Measure and record the result of power spectral density. in the test report.

4.4.3 Test Setup



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.4.4 Test Result

UNII-1 5150-5250 MHz						
Test mode: IEEE 802.11a mode						
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**	**IC Limit (dBm)**
Low	5180	6.37	-	6.37	11	10
Mid	5220	6.71	-	6.71		
High	5240	6.87	-	6.87		
Test mode: IEEE 802.11n HT20 mode						
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**	**IC Limit (dBm)**
Low	5180	3.91	4.45	7.20	11	10
Mid	5220	3.92	4.76	7.37		
High	5240	4.10	4.06	7.09		
Test mode: IEEE 802.11n HT40 mode						
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**	**IC Limit (dBm)**
Low	5190	-1.69	-1.27	1.54	11	10
High	5230	-0.68	-0.41	2.47		
Test mode: IEEE 802.11ac VHT80 mode						
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**	**IC Limit (dBm)**
Mid	5210	-8.17	-8.23	-5.19	11	10

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-2a 5250-5350 MHz					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**
Low	5260	6.51	-	6.51	11
Mid	5280	6.39	-	6.39	
High	5320	6.68	-	6.68	
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**
Low	5260	5.34	5.28	8.32	11
Mid	5280	4.71	4.19	7.47	
High	5320	0.63	1.76	4.24	
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**
Low	5270	0.46	0.88	3.69	11
High	5310	-1.25	-1.67	1.56	
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**
Mid	5290	-7.57	-7.93	-4.74	11

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

UNII-2c 5470-5725 MHz					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**
Low	5500	6.47	-	6.47	11
Mid	5580	6.68	-	6.68	
High	5700	5.93	-	5.93	
Cross	5720	5.26	-	5.26	
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**
Low	5500	2.69	2.77	5.74	11
Mid	5580	4.40	3.84	7.14	
High	5700	4.10	4.43	7.28	
Cross	5720	4.04	3.72	6.89	
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**
Low	5510	-2.08	-1.85	1.05	11
Mid	5500	0.00	0.38	3.20	
High	5670	-1.47	-0.83	1.87	
Cross	5710	-0.69	-0.07	2.64	
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**
Mid	5530	-6.30	-6.11	-3.19	11
Cross	5690	-8.33	-4.94	-3.30	

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

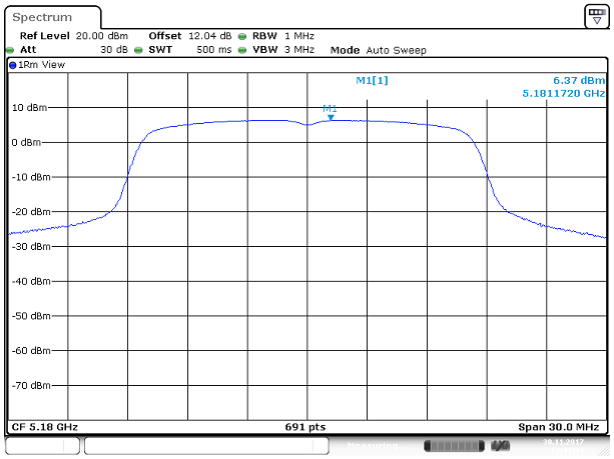
UNII-3 5725-5825 MHz					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**
Low	5745	12.31	-	12.31	30
Mid	5785	12.06	-	12.06	
High	5825	12.68	-	12.68	
Cross	5720	2.12	-	2.12	
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**
Low	5745	11.54	12.07	14.82	30
Mid	5785	10.02	12.56	14.48	
High	5825	9.62	10.31	12.99	
Cross	5720	0.82	0.92	3.88	
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**
Low	5755	6.38	7.76	10.13	30
High	5795	6.99	9.21	11.25	
Cross	5710	-5.99	-5.30	-2.62	
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PPSD (dBm)**	**Limit (dBm)**
Mid	5690	-12.08	-11.10	-8.55	30
Mid	5775	3.69	2.58	6.18	

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Data

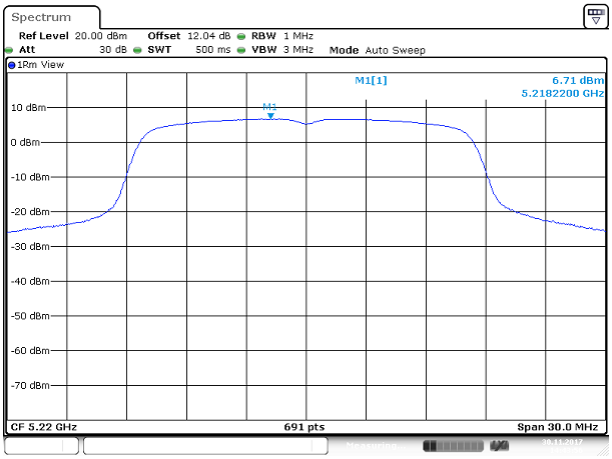
UNII-1 IEEE 802.11a mode- chain 0

Low CH



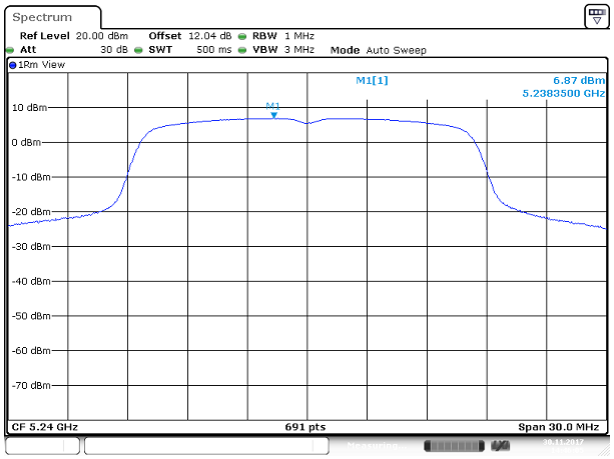
Date: 30.NOV.2017 14:41:44

Mid CH



Date: 30.NOV.2017 14:43:57

High CH

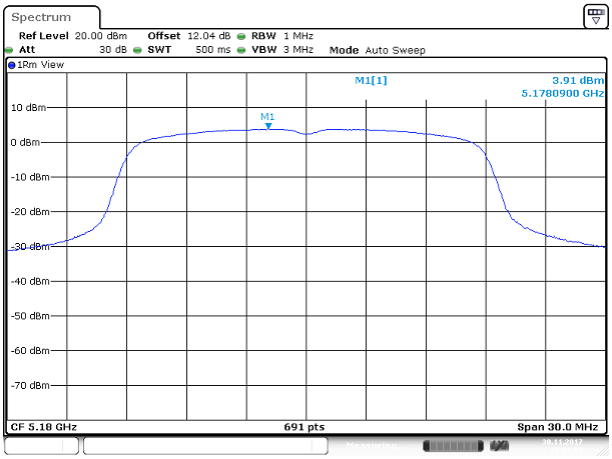


Date: 30.NOV.2017 14:46:06

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

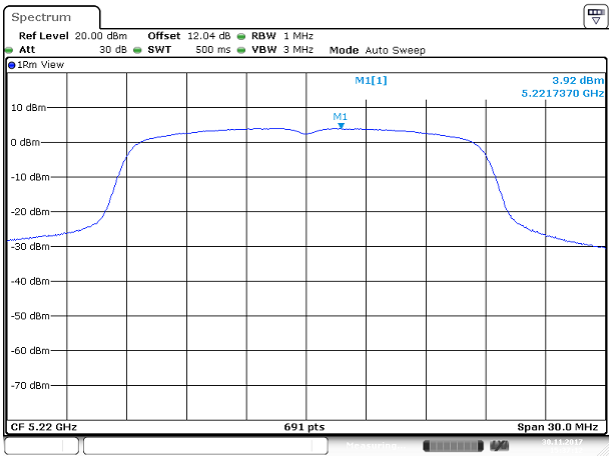
UNII-1 IEEE 802.11n HT20 mode- chain 0

Low CH



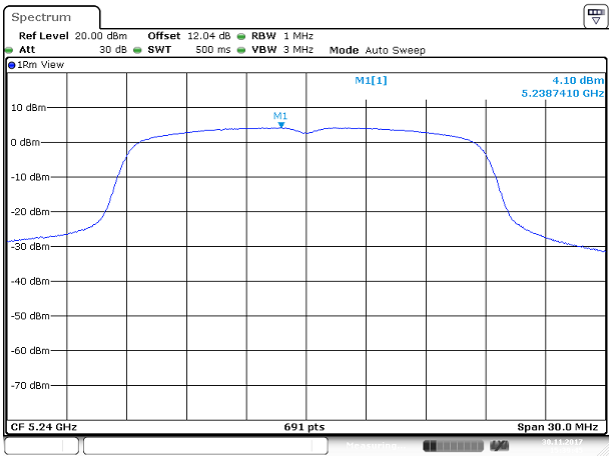
Date: 30.NOV.2017 15:33:03

Mid CH



Date: 30.NOV.2017 15:37:13

High CH

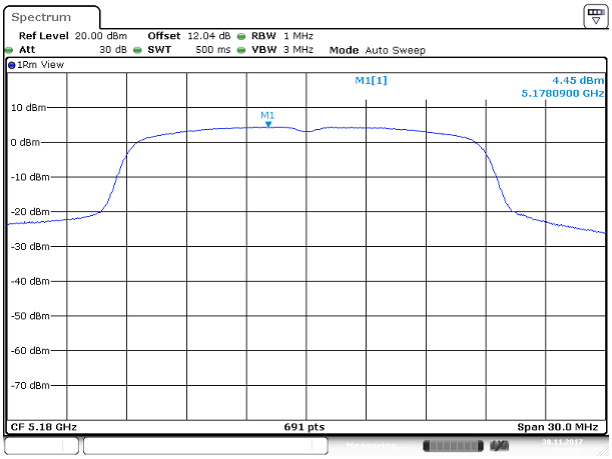


Date: 30.NOV.2017 15:39:46

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

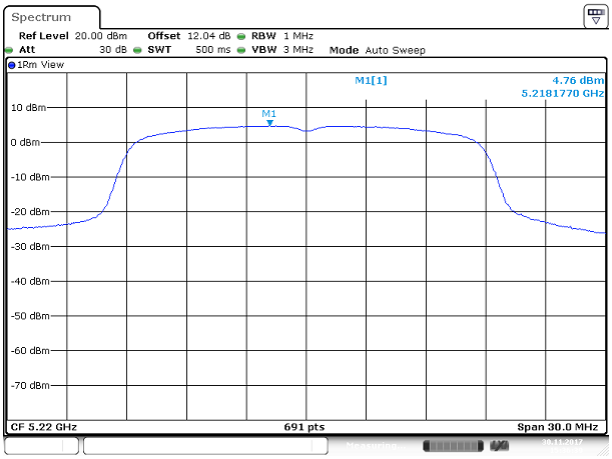
UNII-1 IEEE 802.11n HT20 mode- chain 1

Low CH



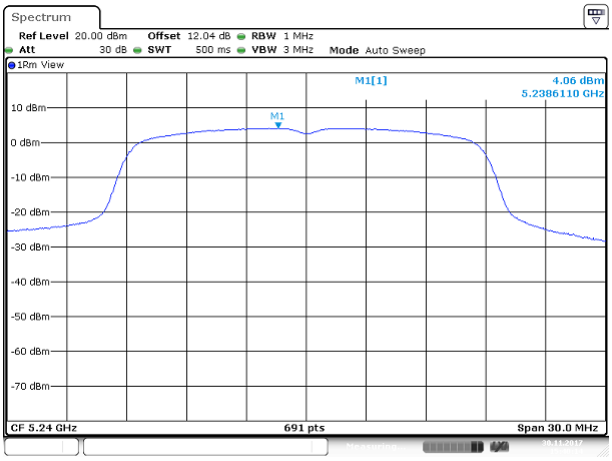
Date: 30.NOV.2017 15:33:48

Mid CH



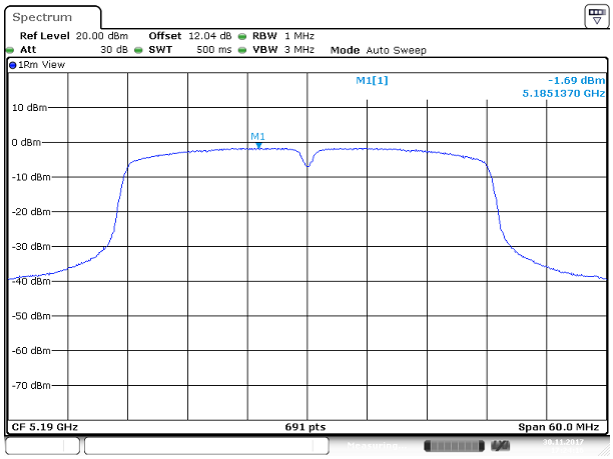
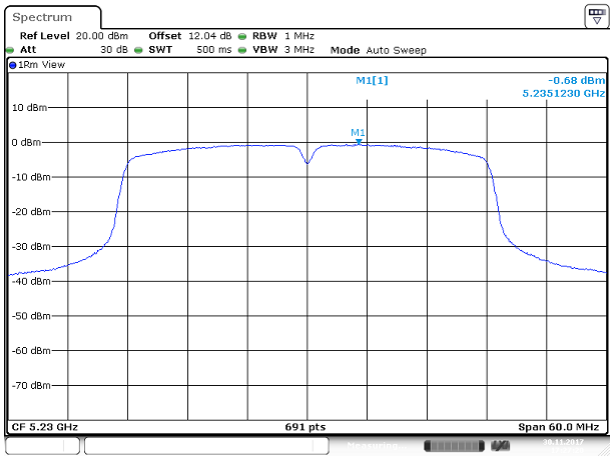
Date: 30.NOV.2017 15:36:39

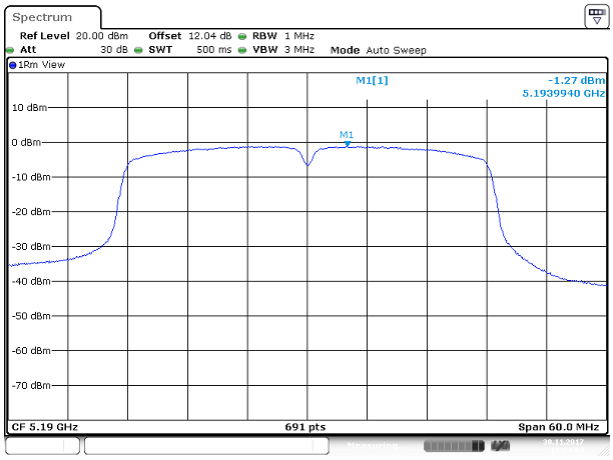
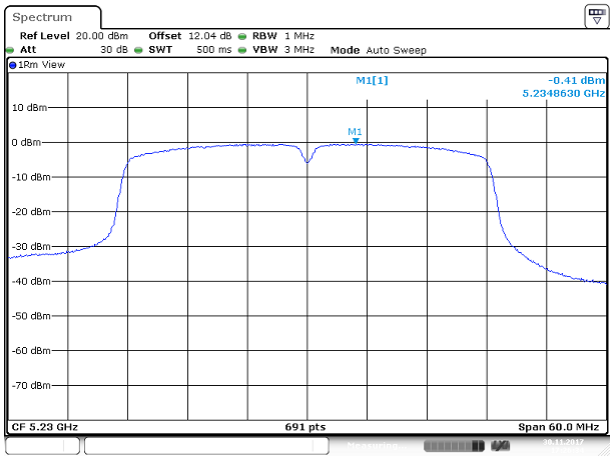
High CH



Date: 30.NOV.2017 15:40:14

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

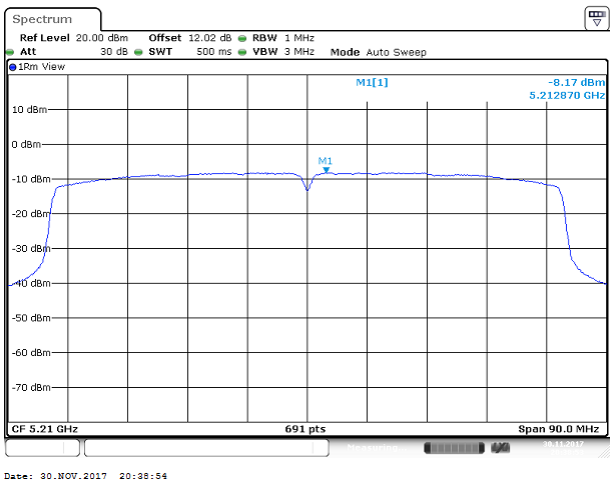
UNII-1 IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
 Date: 30.NOV.2017 17:24:17	 Date: 30.NOV.2017 17:27:21

UNII-1 IEEE 802.11n HT40 mode- chain 1	
Low CH	**High CH**
 Date: 30.NOV.2017 17:24:55	 Date: 30.NOV.2017 17:26:35

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

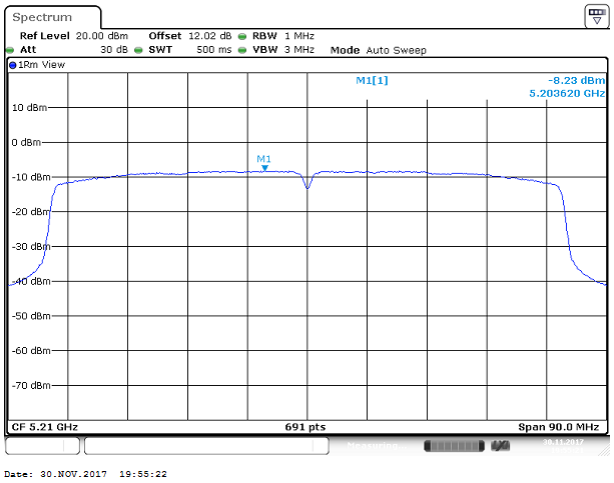
UNII-1 IEEE 802.11ac VHT80 mode- chain 0

Mid CH



UNII-1 IEEE 802.11ac VHT80 mode- chain 1

Mid CH

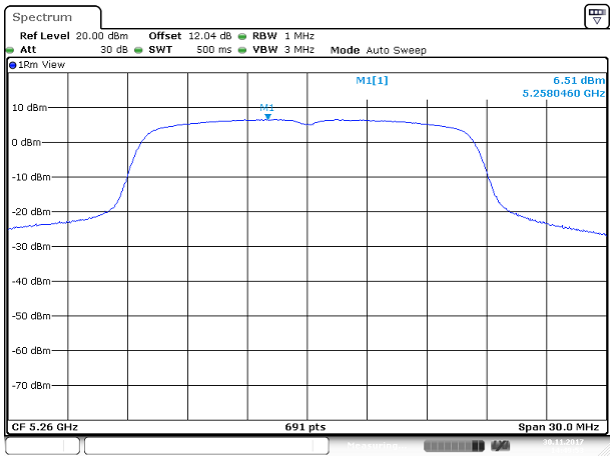


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Data

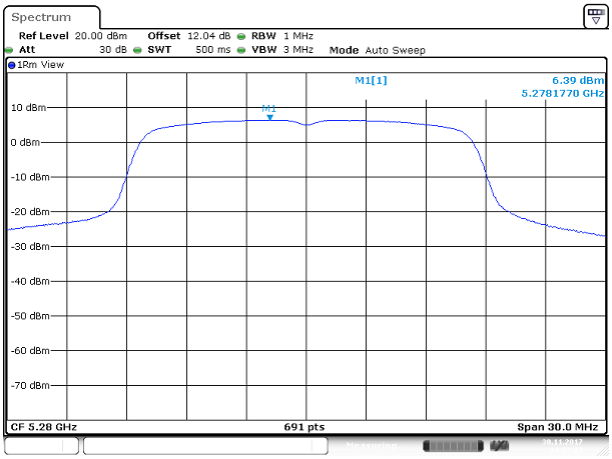
UNII-2a IEEE 802.11a mode- chain 0

Low CH



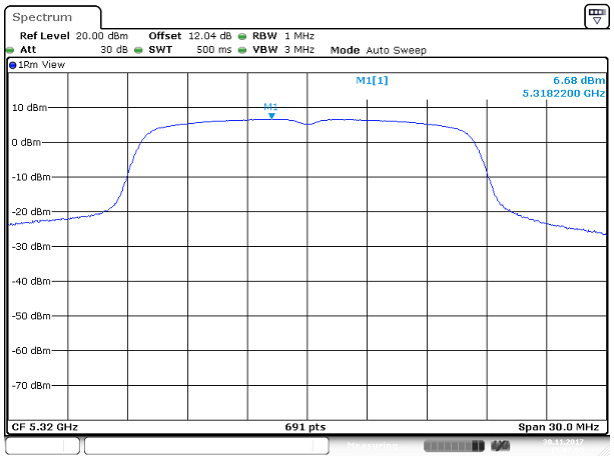
Date: 30.NOV.2017 14:49:54

Mid CH



Date: 30.NOV.2017 14:53:28

High CH

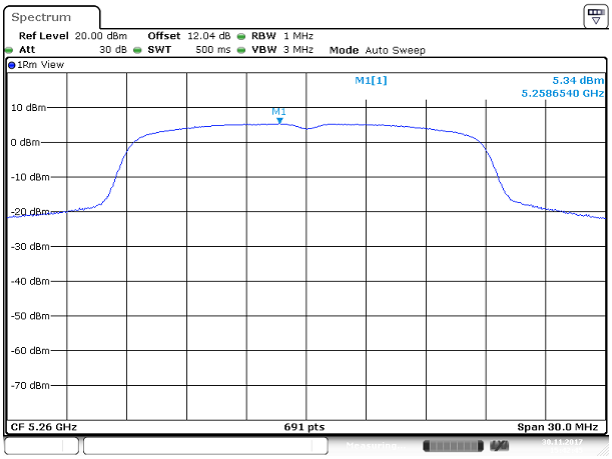


Date: 30.NOV.2017 15:07:56

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

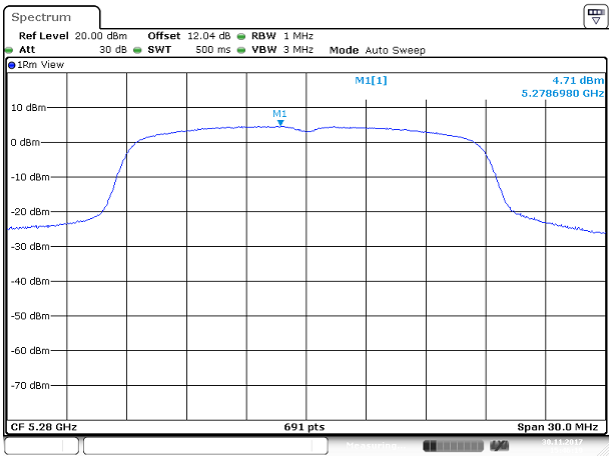
UNII-2a IEEE 802.11n HT20 mode- chain 0

Low CH



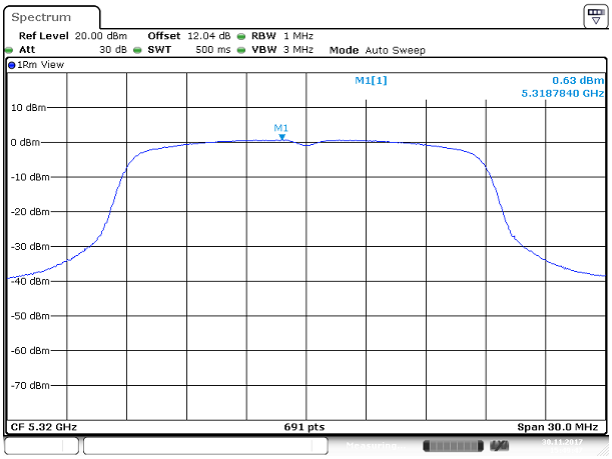
Date: 30.NOV.2017 15:42:46

Mid CH



Date: 30.NOV.2017 15:46:20

High CH

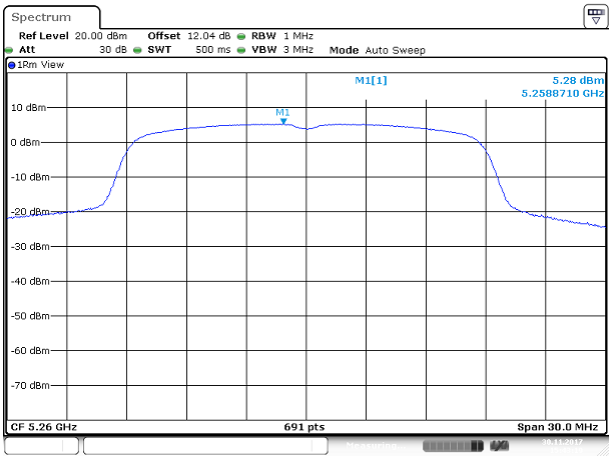


Date: 30.NOV.2017 15:49:47

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

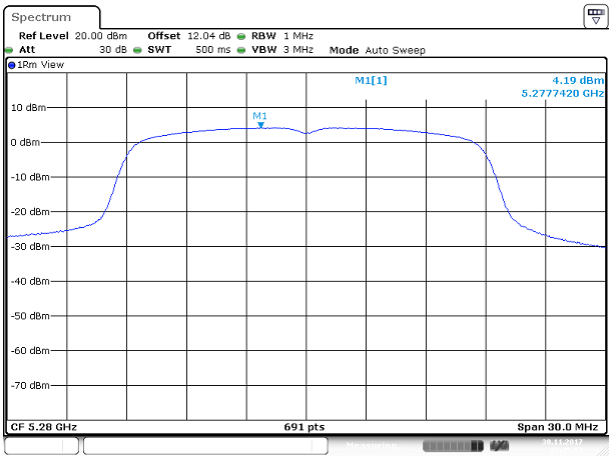
UNII-2a IEEE 802.11n HT20 mode- chain 1

Low CH



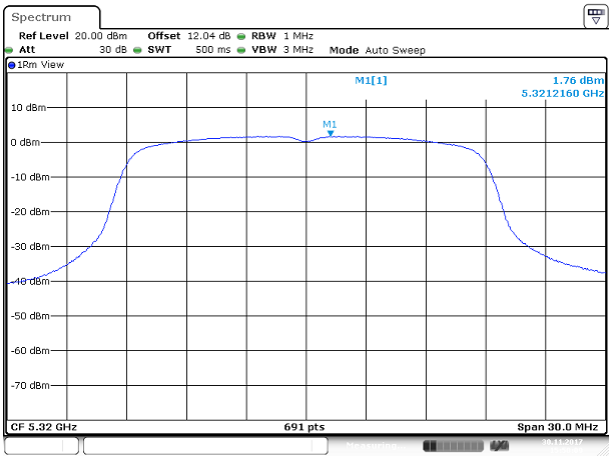
Date: 30.NOV.2017 15:43:20

Mid CH



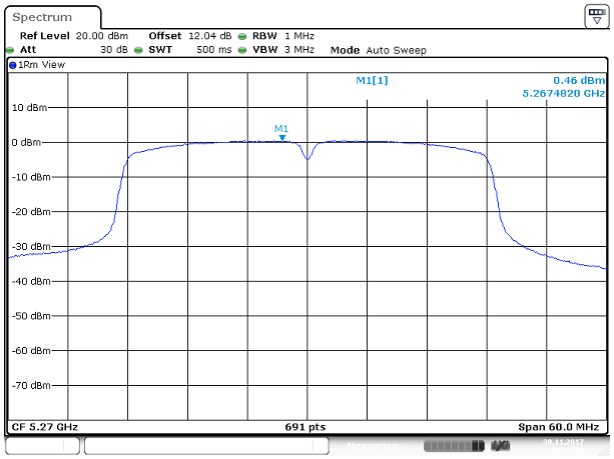
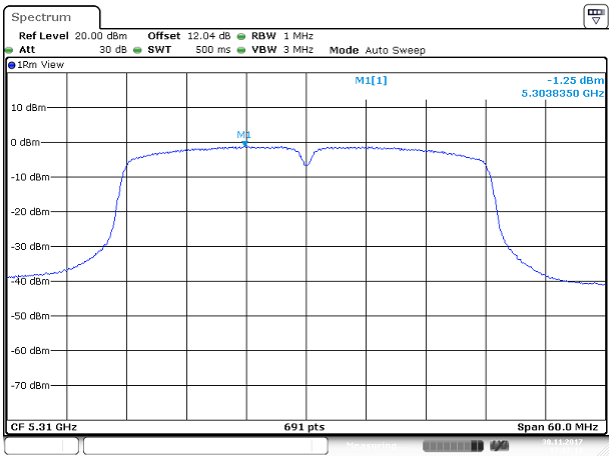
Date: 30.NOV.2017 15:45:52

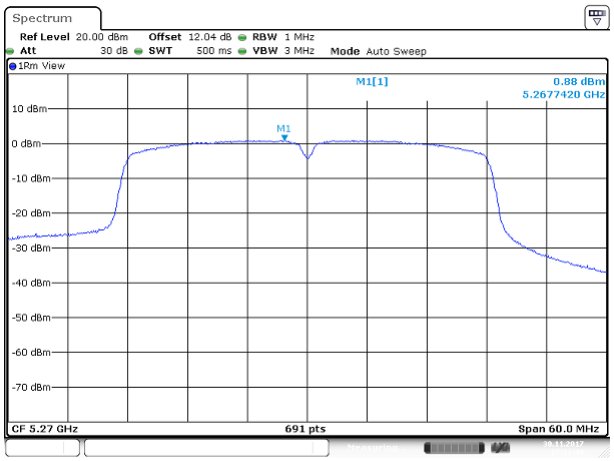
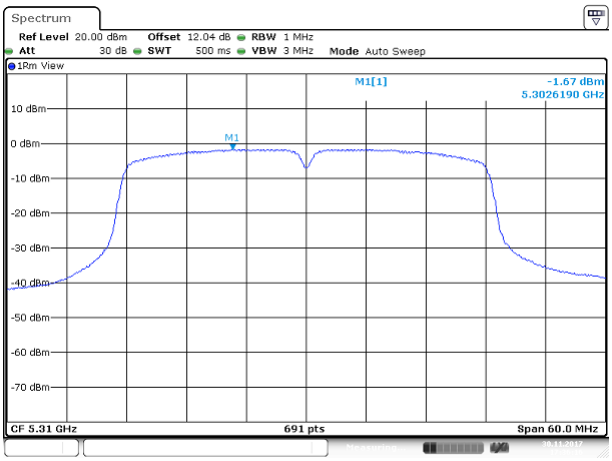
High CH



Date: 30.NOV.2017 15:50:10

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

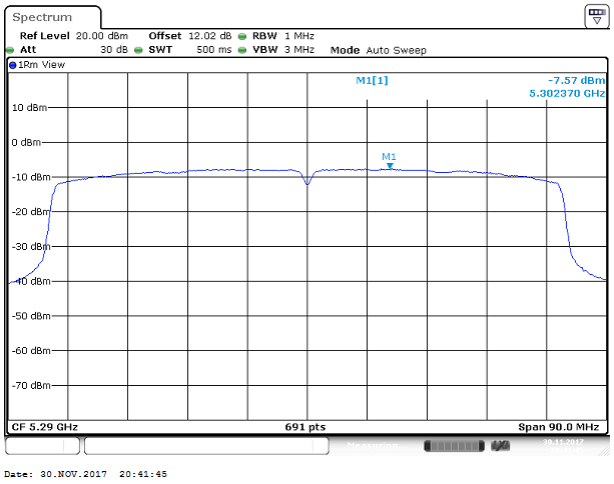
UNII-2a IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

UNII-2a IEEE 802.11n HT40 mode- chain 1	
Low CH	**High CH**
	

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

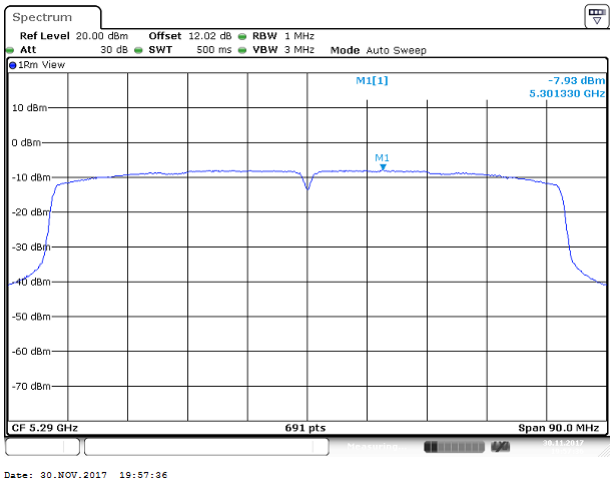
UNII-2a IEEE 802.11ac VHT80 mode- chain 0

Mid CH



UNII-2a IEEE 802.11ac VHT80 mode- chain 1

Mid CH

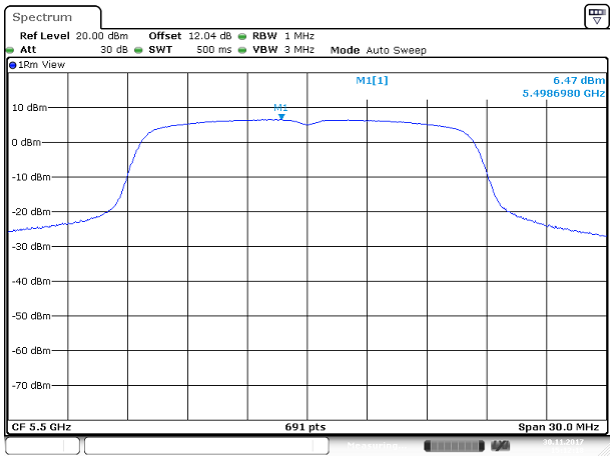


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Data

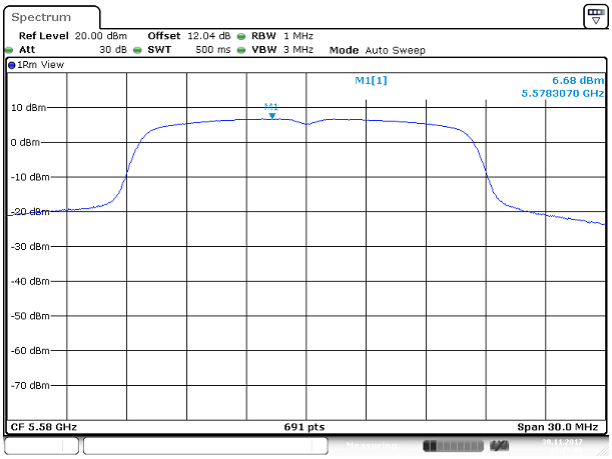
UNII-2c IEEE 802.11a mode- chain 0

Low CH



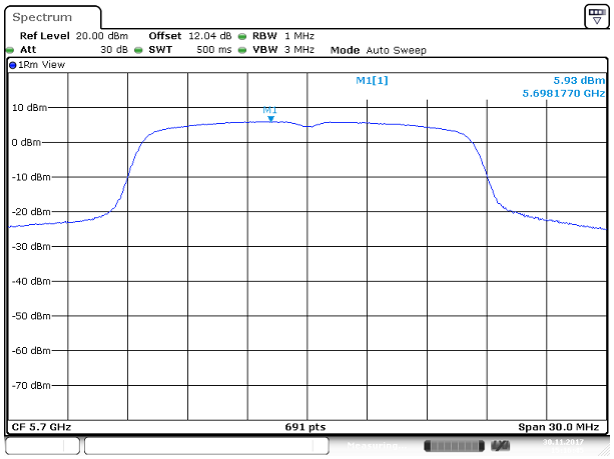
Date: 30.NOV.2017 15:12:19

Mid CH



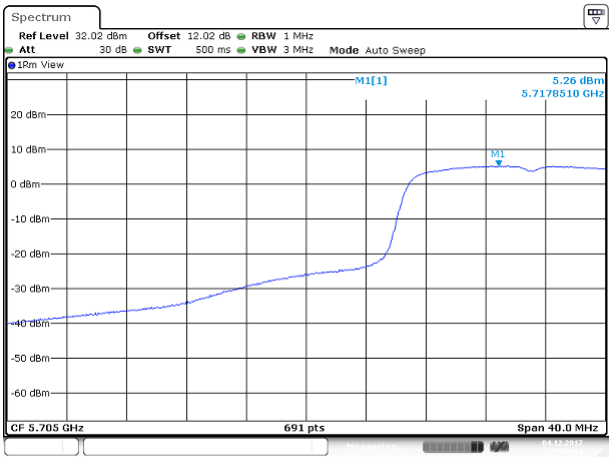
Date: 30.NOV.2017 15:15:01

High CH



Date: 30.NOV.2017 15:16:45

Cross CH

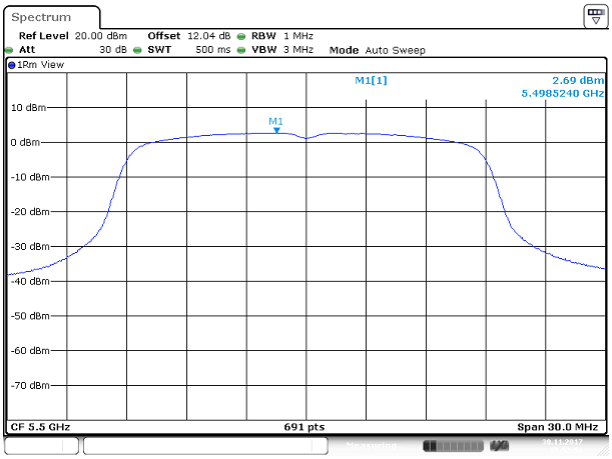


Date: 4.DEC.2017 20:56:41

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

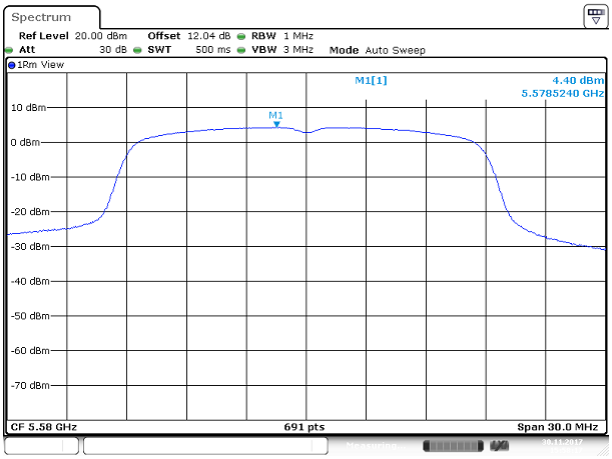
UNII-2c IEEE 802.11n HT20 mode- chain 0

Low CH



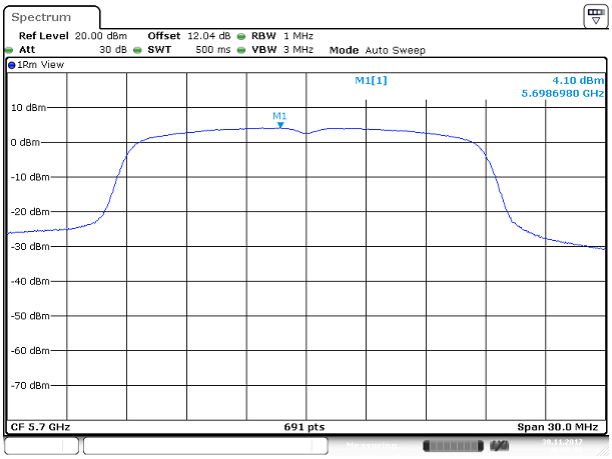
Date: 30.NOV.2017 15:52:51

Mid CH



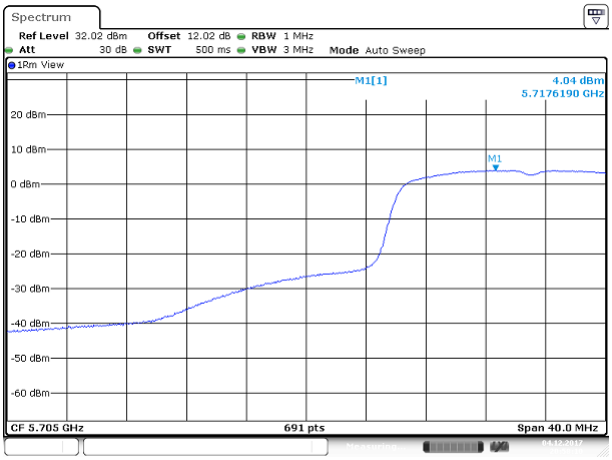
Date: 30.NOV.2017 15:58:17

High CH



Date: 30.NOV.2017 16:00:57

Cross CH

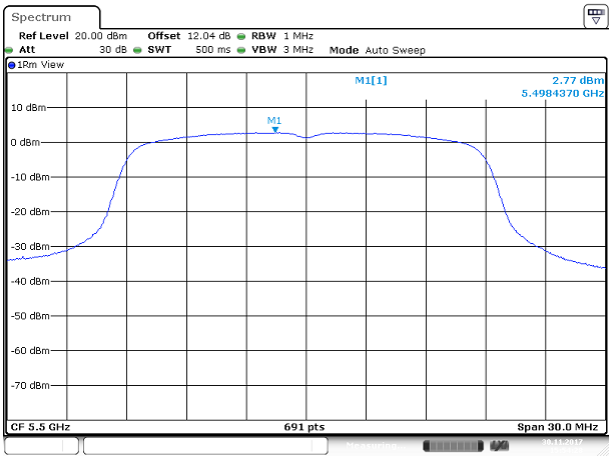


Date: 4.DEC.2017 20:58:11

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

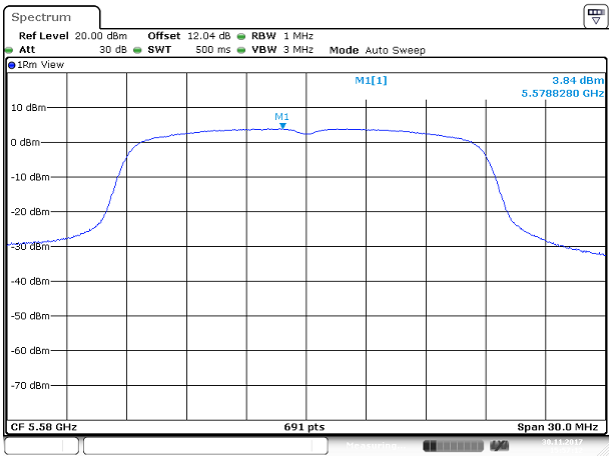
UNII-2c IEEE 802.11n HT20 mode- chain 1

Low CH



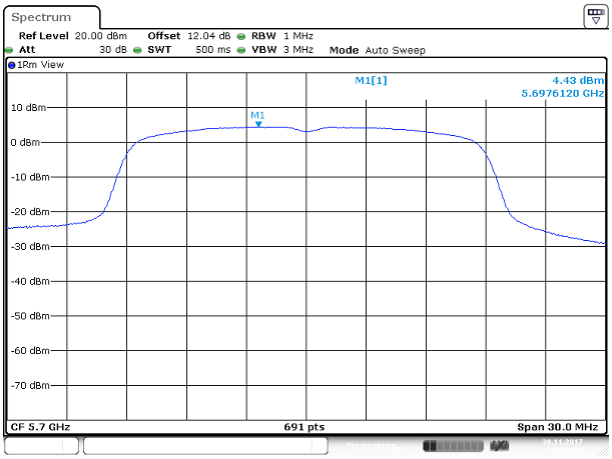
Date: 30.NOV.2017 15:54:28

Mid CH



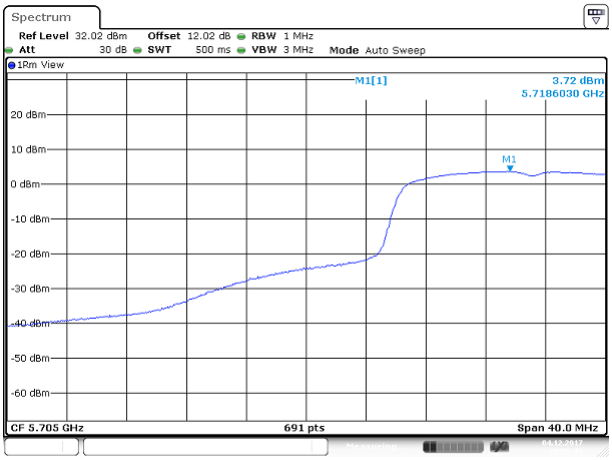
Date: 30.NOV.2017 15:57:13

High CH



Date: 30.NOV.2017 16:01:22

Cross CH

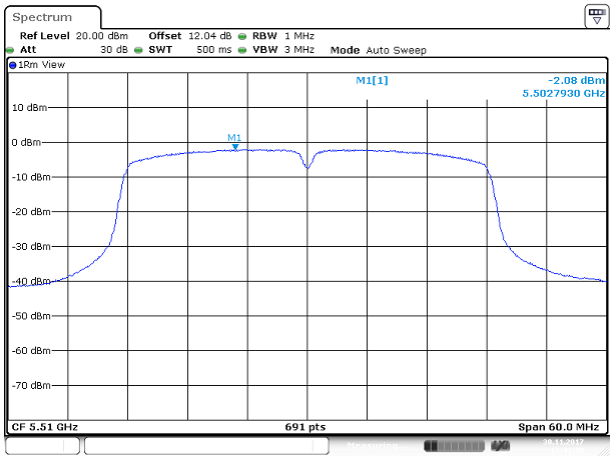


Date: 4.DEC.2017 20:58:48

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

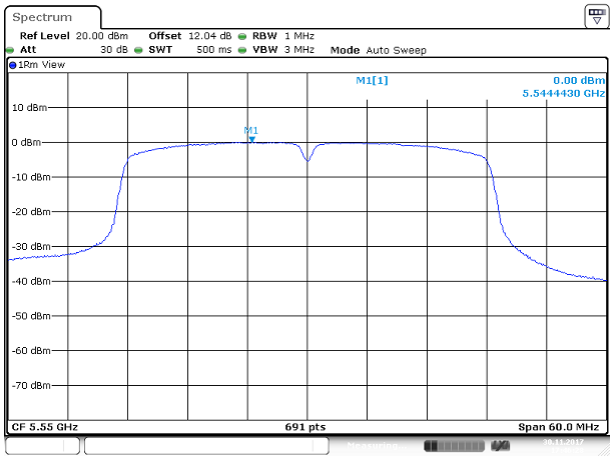
UNII-2c IEEE 802.11n HT40 mode- chain 0

Low CH



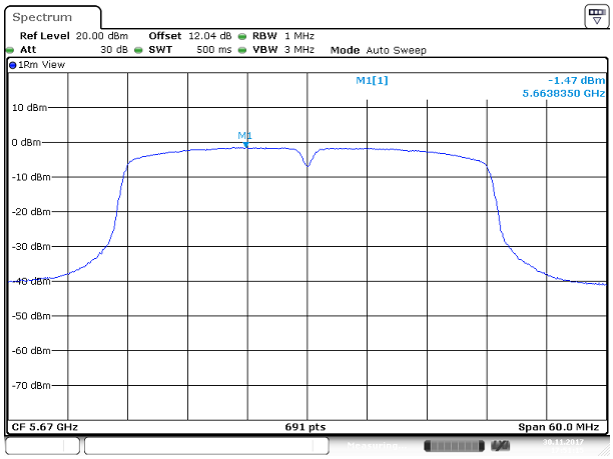
Date: 30.NOV.2017 17:41:30

Mid CH



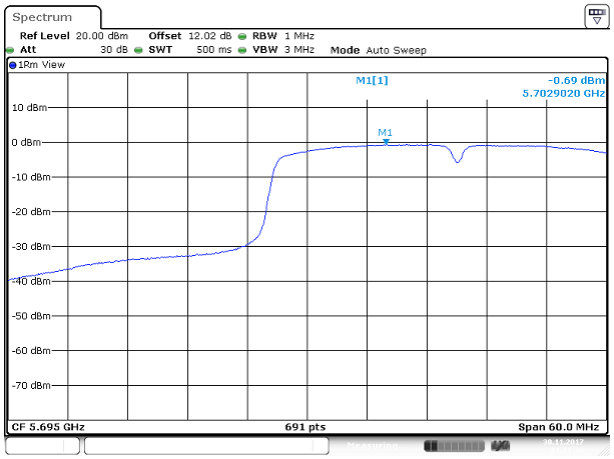
Date: 30.NOV.2017 17:46:29

High CH



Date: 30.NOV.2017 17:51:15

Cross CH



Date: 30.NOV.2017 21:21:37

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.