

FCC RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART E

Test Standard	FCC Part 15.247 and RSS-247 Issue 1
FCC ID	PPQ-WN4517L
ISED No.	4491A-WN4517L
Brand name	LITE-ON
Applicant	Lite-On Technology Corp.
Product name	802.11a/b/g/n/ac, 2T2R Wireless LAN USB2.0 Module
Model No.	WN4517L
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 CCS. Inc.

The sample selected for test was production product and was provided by manufacturer.



Approved by:

Reviewed by:

Davis Tseng

Ed Chiang

Davis Tseng
Sr. Engineer

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	January 10, 2017	Initial Issue	Angel Cheng

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Lite-On Technology Corp.
Applicant address	Bldg. C, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C
Equipment	802.11a/b/g/n/ac, 2T2R Wireless LAN USB2.0 Module
Model Name	WN4517L
Model Discrepancy	N/A
EUT Functions	IEEE 802.11abgn+ac
Received Date	Nov 28, 2016
Date of Test	Nov 15, 2016 ~ Dec 12, 2016
Power Operation	☐ AC 120V/60Hz ☐ Adapter ☐ PoE ☒ Host system(NB) ☐ DC Type : ☐ Battery ☐ DC Power Supply ☐ External DC adapter
FW Version	V62/V01
Product SW/HW version	1030.12/V01
Radio SW/HW version	1030.12/V01
Test SW Version	1030.12

Output Power(W)	Band	Mode	Frequency Range (MHz)	Output Power (W)	EIRP Output Power (w)
	U-NII-1	IEEE 802.11a	5180 ~ 5240	0.0268	0.0630
		IEEE 802.11n HT 20 MHz	5180 ~ 5240	0.0456	0.1072
		IEEE 802.11n HT 40 MHz	5190 ~ 5230	0.0482	0.1132
		IEEE 802.11ac VHT 20 MHz	5180 ~ 5240	0.0451	0.1059
		IEEE 802.11ac VHT 40 MHz	5190 ~ 5230	0.0469	0.1102
		IEEE 802.11ac VHT 80 MHz	5210	0.0361	0.0849
	U-NII-2a	IEEE 802.11a	5260 ~ 5320	0.0287	0.0675
		IEEE 802.11n HT 20 MHz	5260 ~ 5320	0.0491	0.1554
		IEEE 802.11n HT 40 MHz	5270 ~ 5310	0.0481	0.1130
		IEEE 802.11ac VHT 20 MHz	5260 ~ 5320	0.0487	0.1144
		IEEE 802.11ac VHT 40 MHz	5270 ~ 5310	0.0468	0.1101
		IEEE 802.11ac VHT 80 MHz	5290	0.0361	0.0847
	U-NII-2c	IEEE 802.11a	5500 ~ 5725	0.0294	0.0690
		IEEE 802.11a	5720	0.0190	0.0447
		IEEE 802.11n HT 20 MHz	5500 ~ 5725	0.0460	0.1081
		IEEE 802.11n HT 20 MHz	5720	0.0357	0.0839
		IEEE 802.11n HT 40 MHz	5510 ~ 5670	0.0490	0.1151
		IEEE 802.11n HT 40 MHz	5710	0.0321	0.0755
		IEEE 802.11ac VHT 20 MHz	5500 ~ 5725	0.0456	0.1072
		IEEE 802.11ac VHT 20 MHz	5720	0.0333	0.0782
		IEEE 802.11ac VHT 40 MHz	5510 ~ 5670	0.0479	0.1125
		IEEE 802.11ac VHT 40 MHz	5710	0.0305	0.0718
		IEEE 802.11ac VHT 80 MHz	5530-5610	0.0313	0.0736
		IEEE 802.11ac VHT 80 MHz	5690	0.0378	0.0887
		IEEE 802.11a	5720	0.0054	-
		IEEE 802.11a	5745 ~ 5825	0.0300	-
	U-NII-3	IEEE 802.11n HT 20 MHz	5720	0.0088	-
		IEEE 802.11n HT 20 MHz	5745 ~ 5825	0.0467	-
		IEEE 802.11n HT 40 MHz	5710	0.0028	-
		IEEE 802.11n HT 40 MHz	5755 ~ 5795	0.0481	-
		IEEE 802.11ac VHT 20 MHz	5720	0.0088	-
		IEEE 802.11ac VHT 20 MHz	5745 ~ 5825	0.0618	-
		IEEE 802.11ac VHT 40 MHz	5710	0.0026	-
		IEEE 802.11ac VHT 40 MHz	5755 ~ 5795	0.0491	-
		IEEE 802.11ac VHT 80 MHz	5690	0.0011	-
		IEEE 802.11ac VHT 80 MHz	5775	0.0376	-

Remark:

1. All listed models are using an identical RF module with the only differences on number of key buttons mounted for additional functions.
2. Due to similarity of RF product constructions of given model series, only dedicated model as described in test report with the most complexity constructions was selected for testing and record.
3. For Canada the EUT Frequency Range 5600~5650MHz will be disabled.

1.2 EUT CHANNEL INFORMATION

Frequency Range	UNII-1	
	IEEE 802.11a	5180 ~ 5240 MHz
	IEEE 802.11n HT 20 MHz	5180 ~ 5240 MHz
	IEEE 802.11n HT 40 MHz	5190 ~ 5230 MHz
	IEEE 802.11ac VHT 20 MHz	5180 ~ 5240 MHz
	IEEE 802.11ac VHT 40 MHz	5190 ~ 5230 MHz
	IEEE 802.11ac VHT 80 MHz	5210 MHz
	UNII-2a	
	IEEE 802.11a	5260 ~ 5320 MHz
	IEEE 802.11n HT 20 MHz	5260 ~ 5320 MHz
	IEEE 802.11n HT 40 MHz	5270 ~ 5310 MHz
	IEEE 802.11ac VHT 20 MHz	5260 ~ 5320 MHz
	IEEE 802.11ac VHT 40 MHz	5270 ~ 5310 MHz
	IEEE 802.11ac VHT 80 MHz	5200 MHz
	UNII-2c	
	IEEE 802.11a	5500 ~ 5700 MHz
	IEEE 802.11n HT 20 MHz	5500 ~ 5700 MHz
	IEEE 802.11n HT 20 MHz	5720 MHz
	IEEE 802.11n HT 40 MHz	5510 ~ 5670 MHz
	IEEE 802.11n HT 40 MHz	5710 MHz
	IEEE 802.11ac VHT 20 MHz	5500 ~ 5700 MHz
	IEEE 802.11ac VHT 20 MHz	5720 MHz
	IEEE 802.11ac VHT 40 MHz	5510 ~ 5670 MHz
	IEEE 802.11ac VHT 40 MHz	5710 MHz
	IEEE 802.11ac VHT 80 MHz	5530-5610 MHz
	IEEE 802.11ac VHT 80 MHz	5690 MHz
	UNII-3	
	IEEE 802.11a	5745 ~ 5825 MHz
	IEEE 802.11n HT 20 MHz	5745 ~ 5825 MHz
	IEEE 802.11n HT 40 MHz	5755 ~ 5795 MHz
	IEEE 802.11ac VHT 20 MHz	5745 ~ 5825 MHz
	IEEE 802.11ac VHT 40 MHz	5755 ~ 5795 MHz
	IEEE 802.11ac VHT 80 MHz	5775 MHz
Modulation Type	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	

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

1.3 ANTENNA INFORMATION

Antenna Category	☒ Integral: antenna permanently attached ☐ External dedicated antennas ☐ External Unique antenna connector
Antenna Type	☒ PIFA ☐ PCB ☐ Dipole ☐ Coils
Antenna Gain	5150-5850MHz Ant 0: 2.95 (dBi) : On board Ant 1: 2.49 (dBi) : On board Ant 2: 4.36 (dBi) : via Antenna Cable
Power Directional gain	3.71 dBi
PSD Directional gain	3.71 dBi

Remark:

1. Antenna had two ways, one was Ant0+ Ant2(On board + via Antenna Cable), and the other one was Ant0 + Ant1(On board + On board).

2. Power Directional gain

$$=10\log(((10^{(Ant0/10)}+10^{(Ant2/10)})/2))=10\log(((10^{(2.95/10)}+10^{(4.36/10)})/2))=3.71 \text{ dBi}$$

3. Power Density Directional gain= $10\log(((10^{(Ant0/10)}+10^{(Ant2/10)})/2))+10\log(NTX/Nss)$

$$=10\log(((10^{(2.48/10)}+10^{(2.30/10)})/2))+10\log(2/2)= 3.71 \text{ dBi}$$

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.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at
NO. 989-1 Wen Shan Rd., Shang Shan Village, Qionglin Township, Hsinchu County 30741,
Taiwan (R.O.C.)

Test site	Test Engineer	Remark
AC Conduction Room	Anderson Kuo	
Radiation	ED Chiang	
RF Conducted	Ian Tu	

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
Spectrum Analyzer	R&S	FSV 40	101073	08/01/2016	07/31/2017

3M 966 Chamber Test Site					
Equipment	Manufacturer	Model	S/N	Cal Date	Cal Due
Bi-log Antenna	TESEQ	CBL 6112D	35403	07/03/2016	07/02/2017
Double Ridged BroadBand Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-778	07/15/2016	07/14/2017
Double Ridged Guide Horn Antenna	ETS • LINDGREN	3117	00078733	11/17/2016	11/16/2017
EMI Test Receiver	R&S	ESCI	100221	04/27/2016	04/26/2017
Horn Antenna	COM-POWER	AH-840	03077	12/02/2016	12/01/2017
Loop Antenna	COM-POWER	AL-130	121060	05/24/2016	05/23/2017
Preamplifier	Agilent	8447D	2944A10052	07/13/2016	07/12/2017
Preamplifier	Agilent	8449B	3008A01916	07/13/2016	07/12/2017
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	04/13/2016	04/12/2017

AC Conducted Emissions Test Site					
Equipment	Manufacturer	Model	S/N	Cal Date	Cal Due
EMI Test Receiver	R&S	ESHS 30	838550/003	10/26/2016	10/25/2017
LISN	SCHWARZBECK	NSLK 8127	8127465	07/29/2016	07/28/2017

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

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	Notebook	ACER	Z01	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 v01r03, KDB 644545 D03 v01.

1.9 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW0240
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

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
15.403(i)	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

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	5 Channels
		IEEE 802.11n HT 20 MHz	5260 ~ 5320	5 Channels
		IEEE 802.11n HT 40 MHz	5270 ~ 5310	2 Channels
		IEEE 802.11ac VHT 20 MHz	5260 ~ 5320	5 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	4 Channels
		IEEE 802.11n HT 20 MHz	5500 ~ 5700	4 Channels
		IEEE 802.11n HT 20 MHz	5720	1 Channels
		IEEE 802.11n HT 40 MHz	5510 ~ 5670	2 Channels
		IEEE 802.11n HT 40 MHz	5710	1 Channels
		IEEE 802.11ac VHT 20 MHz	5500 ~ 5700	4 Channels
		IEEE 802.11ac VHT 20 MHz	5720	1 Channels
		IEEE 802.11ac VHT 40 MHz	5510 ~ 5670	2 Channels
		IEEE 802.11ac VHT 40 MHz	5710	1 Channels
		IEEE 802.11ac VHT 80 MHz	5530	1 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.
4. Antenna had two ways, one was Ant0+ Ant2(On Board + via Antenna Cable), and the other one was Ant0 + Ant1(On Board + On Board).

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	AC Power line conducted emission for line and neutral
Voltage/Hz	120V/60Hz
Test Mode	Mode 1:EUT power by host system (Ant0 + Ant1) Mode 2:EUT power by host system (Ant0 + Ant2)
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Radiated Emission Measurement Above 1G	
Test Condition	Band edge, Emission for Unwanted and Fundamental
Voltage/Hz	120V/60Hz
Test Mode	Mode 1:EUT power by host system (Ant0 + Ant2)
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

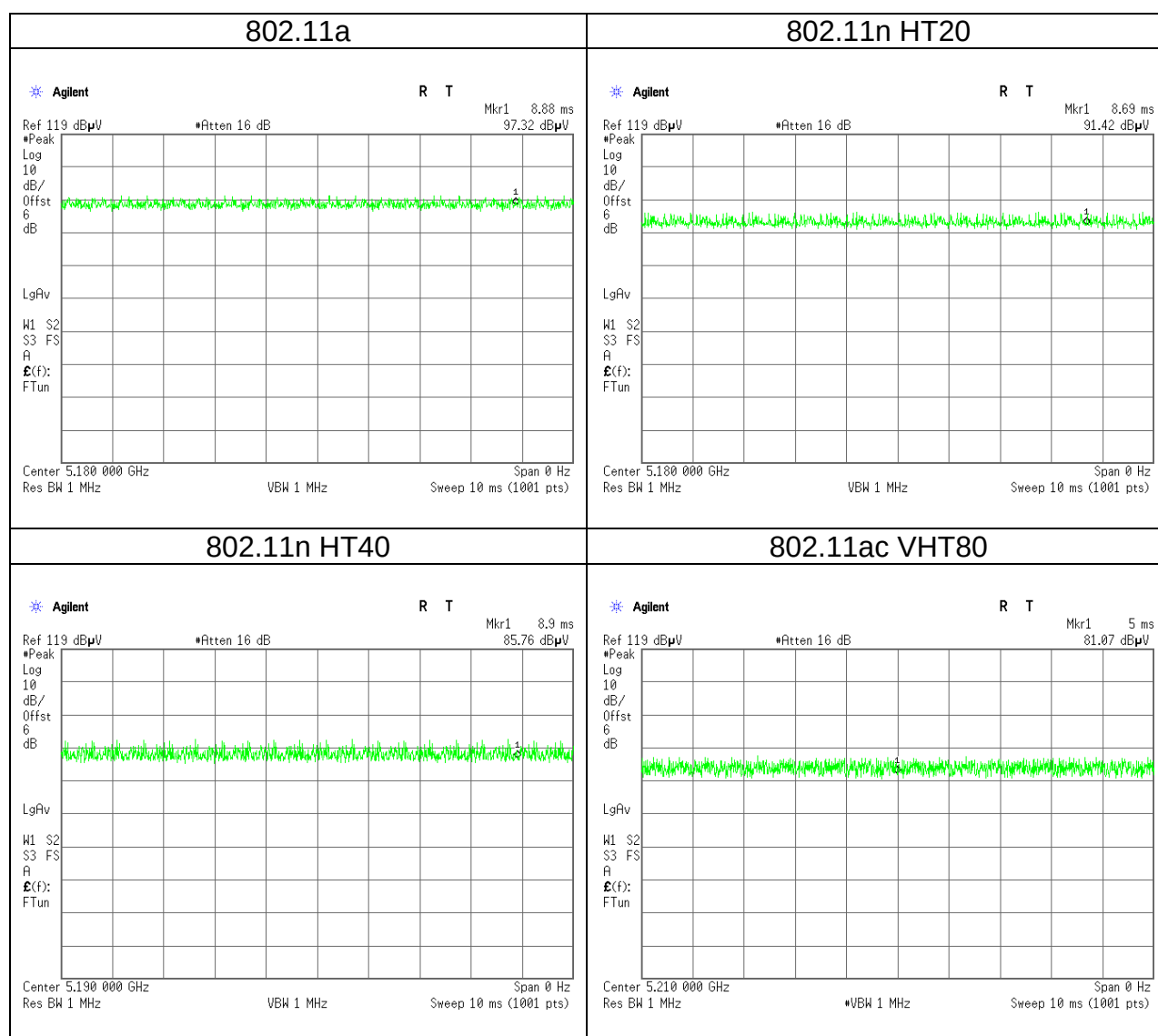
Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Voltage/Hz	120V/60Hz
Test Mode	Mode 1:EUT power by host system (Ant0 + Ant1) Mode 2:EUT power by host system (Ant0 + Ant2)
Worst Mode	☒ Mode 1 ☒ Mode 2 ☐ Mode 3 ☐ Mode 4

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 Vertical) 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.
4. EUT antenna had two ways, one was Ant0+ Ant2(On Board + via Antenna Cable), and the other one was Ant0 + Ant1(On Board + On Board). The worst case(Ant0 + Ant2, because these two antenna gain both higher than Ant1) was recorded in this report.

3.3 EUT DUTY CYCLE

Duty Cycle				
Configuration	TX ON (ms)	TX ALL (ms)	Duty Cycle (%)	Duty Factor(dB)
802.11a	1.000	1.000	100%	0.00
802.11n HT20	1.000	1.000	100%	0.00
802.11n HT40	1.000	1.000	100%	0.00
802.11ac VHT80	1.000	1.000	100%	0.00



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(dB μ V)	
	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

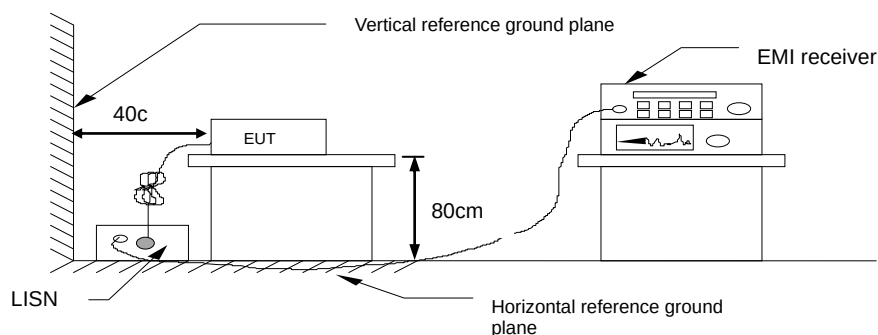
* Decreases with the logarithm of the frequency.

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

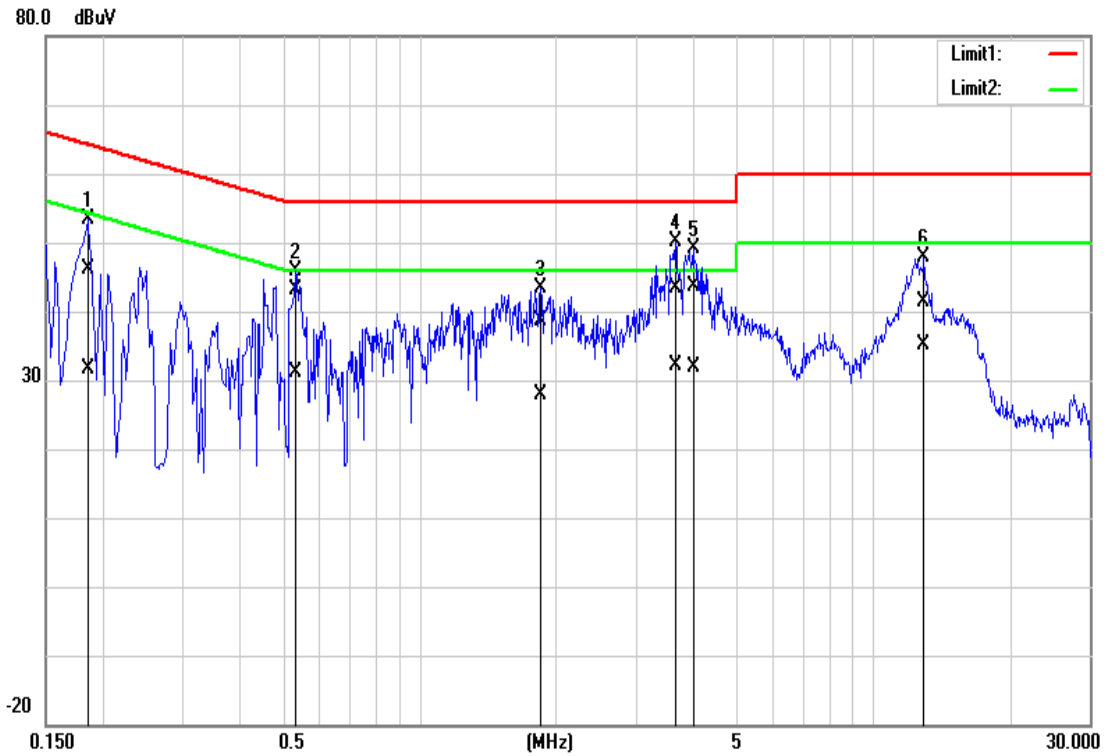


4.1.4 Test Result

Pass.

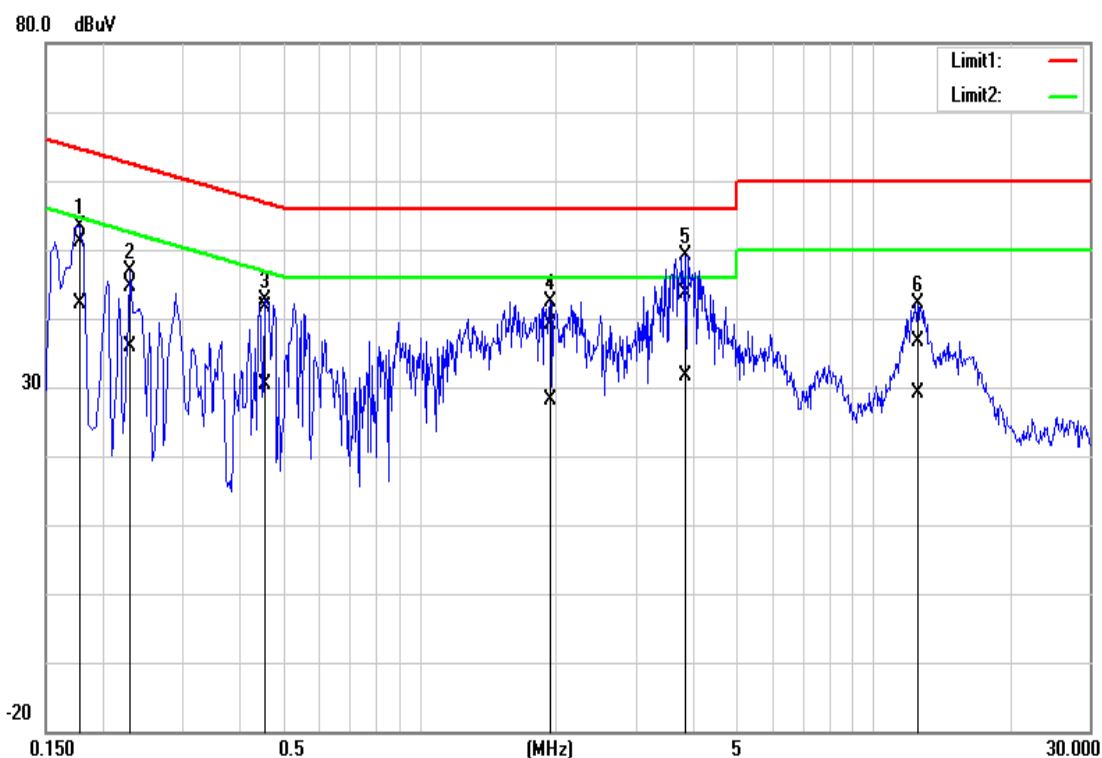
Test Data

Test Mode	Mode 1	Temp/Hum	24(°C)/ 50%RH
Test Voltage	120Vac / 60Hz	Test Date	Nov 15, 2016
Phase	Line	Test Engineer	Anderson Kuo



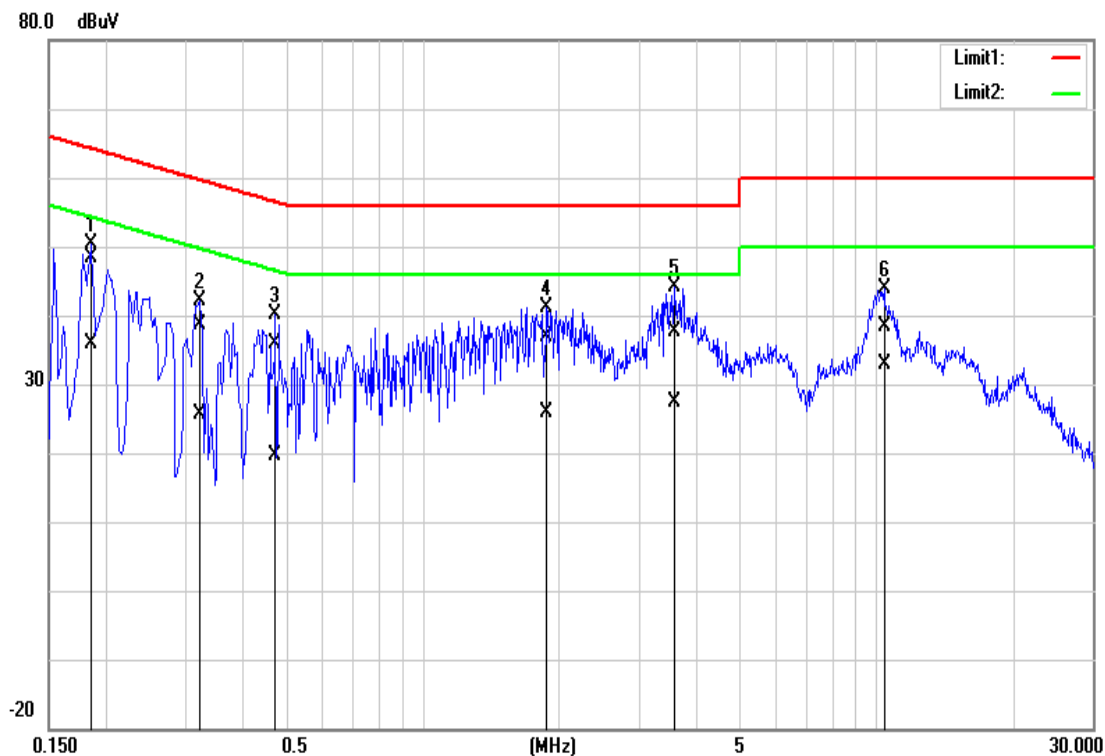
Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.1860	36.17	21.66	9.85	46.02	31.51	64.21	54.21	-18.19	-22.70	Pass
0.5340	33.19	21.37	9.83	43.02	31.20	56.00	46.00	-12.98	-14.80	Pass
1.8540	28.76	17.91	9.88	38.64	27.79	56.00	46.00	-17.36	-18.21	Pass
3.6780	33.39	22.24	9.93	43.32	32.17	56.00	46.00	-12.68	-13.83	Pass
4.0140	33.75	22.05	9.94	43.69	31.99	56.00	46.00	-12.31	-14.01	Pass
12.9260	31.21	24.85	10.23	41.44	35.08	60.00	50.00	-18.56	-14.92	Pass

Test Mode	Mode 1	Temp/Hum	27(°C)/ 53%RH
Test Voltage	120Vac / 60Hz	Test Date	Nov 15, 2016
Phase	Neutral	Test Engineer	Anderson Kuo



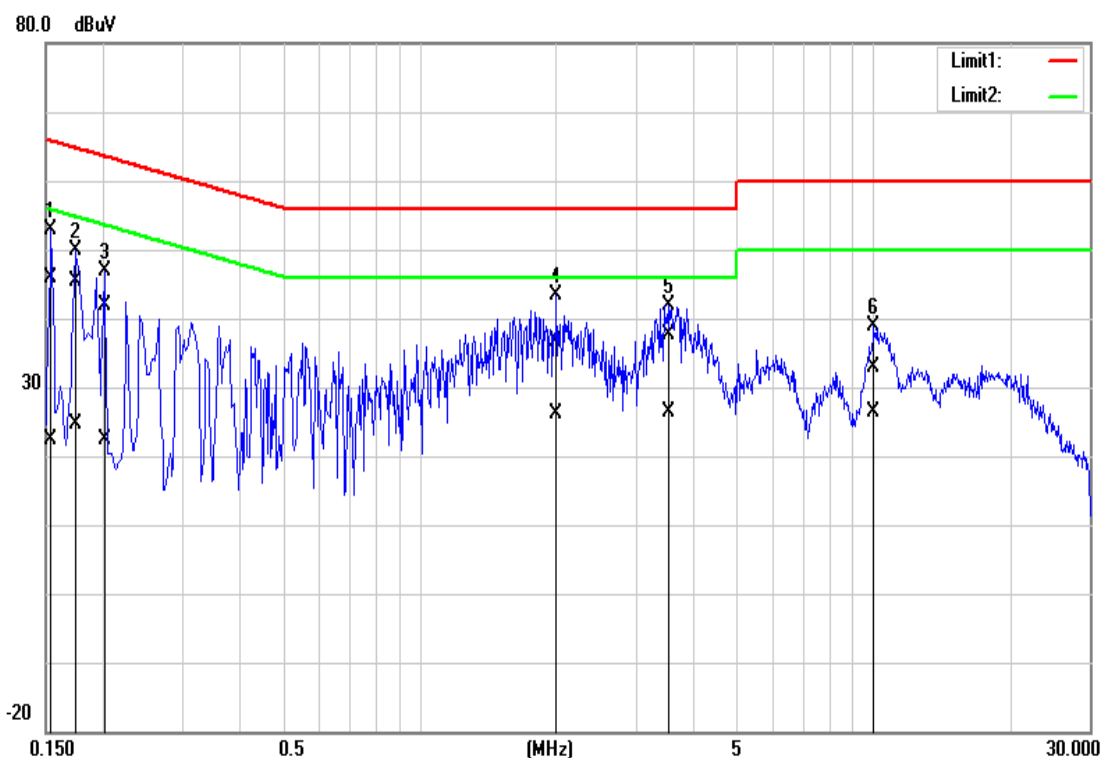
Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.1780	41.29	32.23	9.92	51.21	42.15	64.57	54.58	-13.36	-12.43	Pass
0.2300	34.78	25.88	9.93	44.71	35.81	62.45	52.45	-17.74	-16.64	Pass
0.4580	31.80	20.60	9.89	41.69	30.49	56.73	46.73	-15.04	-16.24	Pass
1.9420	29.26	18.18	9.93	39.19	28.11	56.00	46.00	-16.81	-17.89	Pass
3.8780	33.48	21.57	10.03	43.51	31.60	56.00	46.00	-12.49	-14.40	Pass
12.5340	26.11	18.69	10.49	36.60	29.18	60.00	50.00	-23.40	-20.82	Pass

Test Mode	Mode 2	Temp/Hum	24(°C)/ 50%RH
Test Voltage	120Vac / 60Hz	Test Date	Nov 15, 2016
Phase	Line	Test Engineer	Anderson Kuo



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
0.1860	38.54	26.05	9.85	48.39	35.90	64.21	54.21	-15.82	-18.31	Pass
0.3220	28.71	15.87	9.84	38.55	25.71	59.65	49.66	-21.10	-23.95	Pass
0.4740	25.95	9.75	9.83	35.78	19.58	56.44	46.44	-20.66	-26.86	Pass
1.8820	27.04	15.88	9.88	36.92	25.76	56.00	46.00	-19.08	-20.24	Pass
3.5980	27.76	17.45	9.93	37.69	27.38	56.00	46.00	-18.31	-18.62	Pass
10.4460	28.18	22.67	10.15	38.33	32.82	60.00	50.00	-21.67	-17.18	Pass

Test Mode	Mode 2	Temp/Hum	27(°C)/ 53%RH
Test Voltage	120Vac / 60Hz	Test Date	Nov 15, 2016
Phase	Neutral	Test Engineer	Anderson Kuo



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
0.1539	36.00	12.35	9.92	45.92	22.27	65.78	55.79	-19.86	-33.52	Pass
0.1740	35.58	14.73	9.92	45.50	24.65	64.76	54.77	-19.26	-30.12	Pass
0.2020	31.90	12.42	9.93	41.83	22.35	63.52	53.53	-21.69	-31.18	Pass
2.0059	26.68	16.21	9.93	36.61	26.14	56.00	46.00	-19.39	-19.86	Pass
3.5420	27.50	16.48	10.01	37.51	26.49	56.00	46.00	-18.49	-19.51	Pass
10.0659	22.49	16.05	10.37	32.86	26.42	60.00	50.00	-27.14	-23.58	Pass

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.

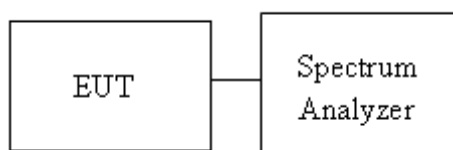
Occupied Bandwidth(99%) : For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as KDB 789033 D02 v01r03 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



4.2.4 Test Result

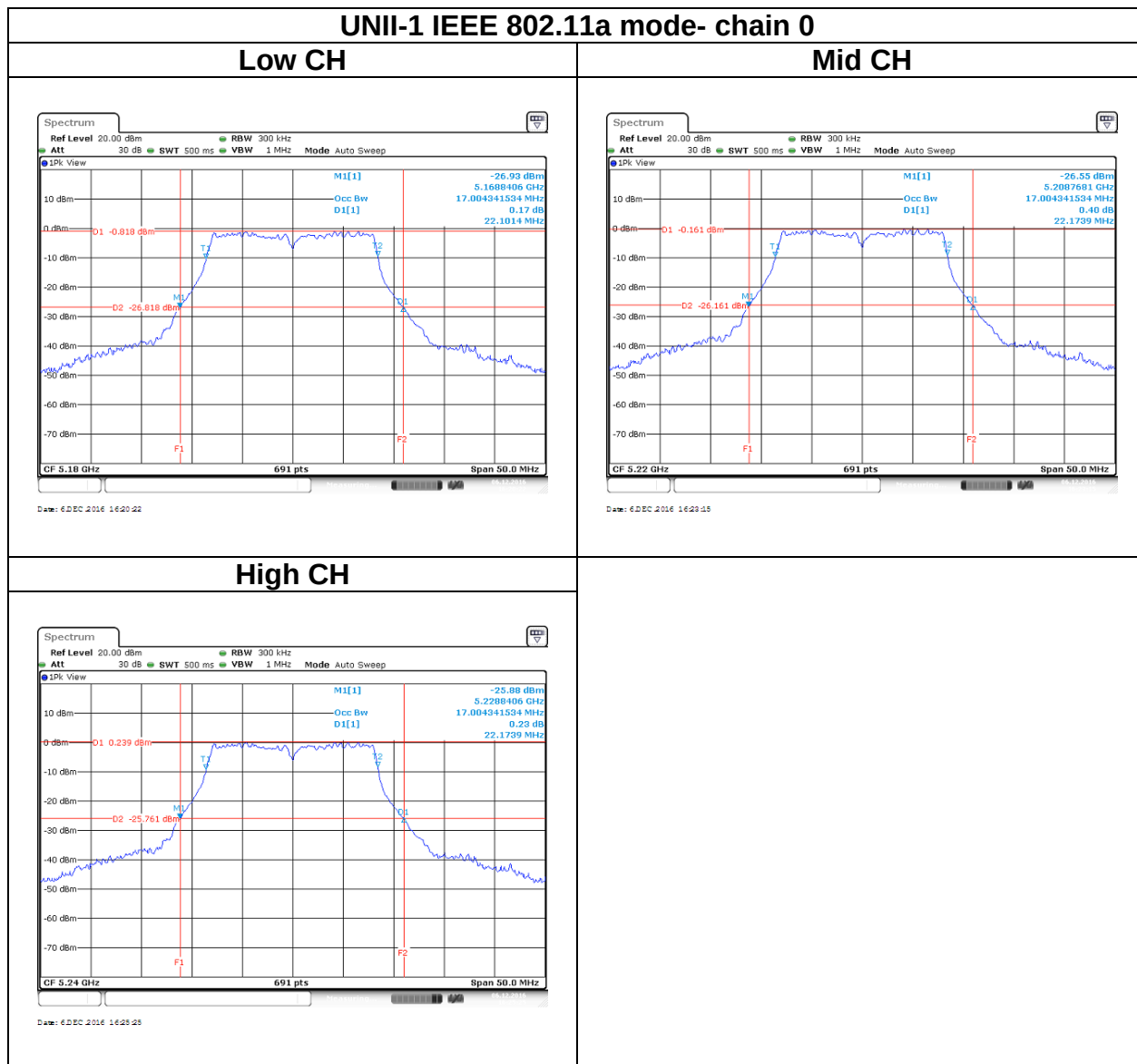
UNII-1 5150-5250 MHz					
Test mode: IEEE 802.11a mode					
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 26dB BW (MHz)	Chain 1 26dB BW (MHz)
Low	5180	17.0043	-	22.1014	-
Mid	5220	17.0043	-	22.1739	-
High	5240	17.0043	-	22.1739	-
Test mode: IEEE 802.11n HT20 mode					
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	17.9450	17.8002	21.8116	21.6667
Mid	5220	17.9450	17.8002	21.8116	21.6667
High	5240	17.9450	17.8002	21.8116	21.5942
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	37.3950	36.8162	45.565	44.754
High	5230	37.5108	36.8162	45.681	44.522
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	75.2532	82.087	81.391

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	16.8596	-	21.4493	-
Mid	5280	16.8596	-	21.5217	-
High	5320	16.8596	-	21.3768	-
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	17.9450	21.8116	21.8116
Mid	5280	17.9450	17.8002	21.8841	21.5942
High	5320	17.9450	17.8002	21.8116	21.5217
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	37.2793	36.8162	44.754	44.638
High	5310	37.3950	36.7004	45.101	44.290
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	82.087	80.928

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	18.0897	-	22.7536	-
Mid	5580	18.0173	-	22.8261	-
High	5700	18.0897	-	22.5362	-
Cross	5720	18.2344	-	33.5280	-
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	17.9450	17.8002	21.8841	21.5942
Mid	5580	17.9450	17.8002	21.8841	21.4493
High	5700	17.9450	17.8002	21.8841	21.5942
Cross	5720	22.7206	18.5238	43.4150	37.8440
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	37.3950	36.8162	45.449	44.522
High	5670	37.9350	36.8162	45.449	44.406
Cross	5710	46.1939	38.5528	90.090	67.730
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	75.2532	81.855	81.391
Cross	5690	75.7163	75.7163	110.910	110.910

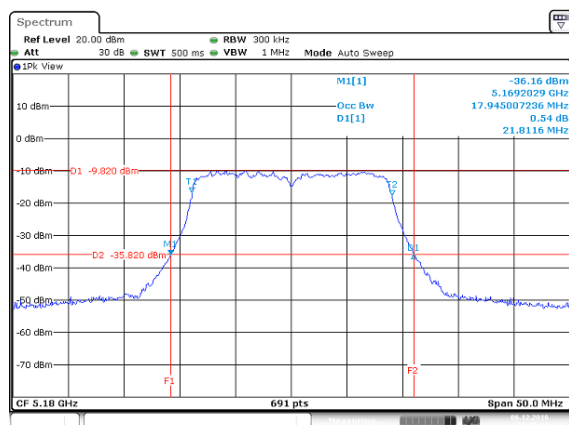
UNII-3 5725-5825MHz					
Test mode: IEEE 802.11a mode					
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (MHz)	Chain 1 6dB BW (MHz)
Low	5745	16.5412	-	16.6522	-
Mid	5785	16.5412	-	16.6522	-
High	5825	16.5412	-	16.6087	-
Cross	5720	16.5846	-	16.5990	-
Test mode: 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	17.6700	17.6266	17.8261	17.6957
Mid	5785	17.7134	17.6266	17.8261	17.6957
High	5825	17.8261	17.6266	17.7134	17.6957
Cross	5720	21.9247	20.5354	17.7570	17.7130
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	36.2373	36.638	36.522
High	5795	36.1215	36.2373	36.638	36.522
Cross	5710	58.3502	42.6049	36.580	36.240
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)
Cross	5690	99.7973	75.7163	76.133	75.480
Mid	5775	75.0217	75.2532	75.362	76.058

Test Data

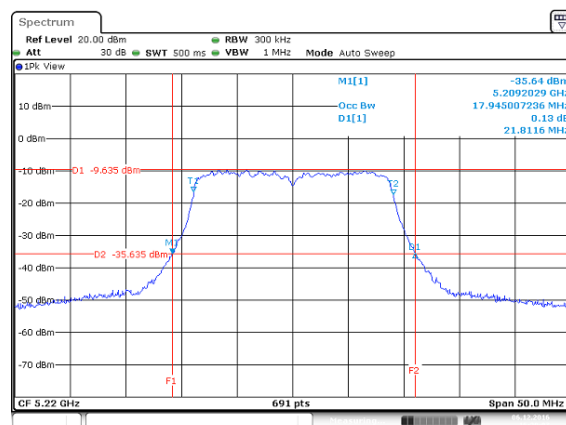


UNII-1 IEEE 802.11n HT20 mode- chain 0

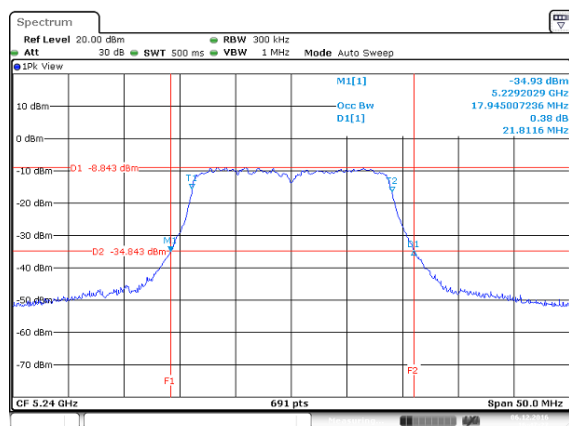
Low CH



Mid CH

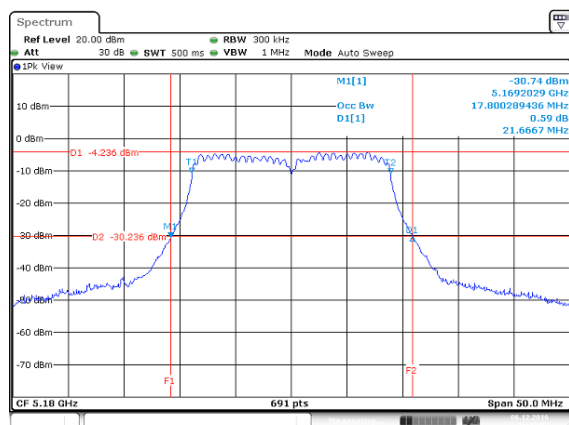


High CH

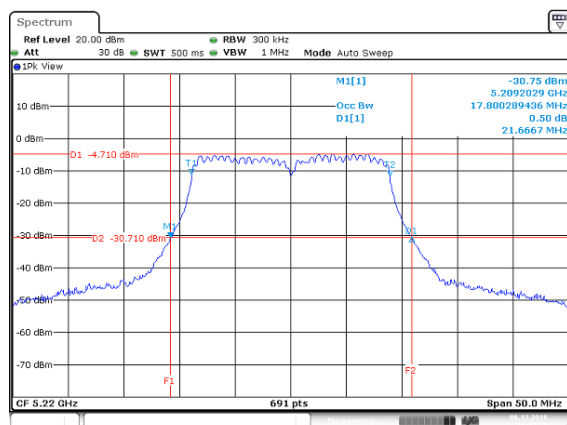


UNII-1 IEEE 802.11n HT20 mode- chain 1

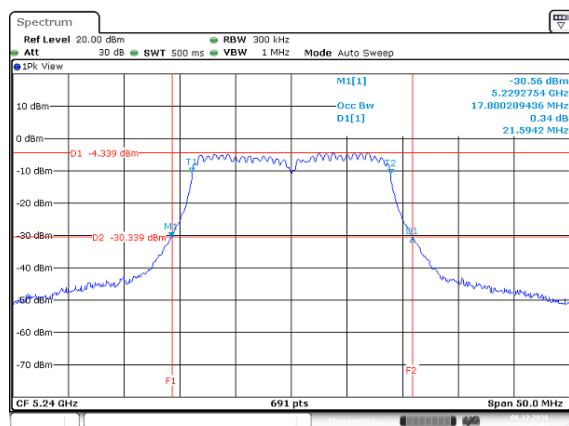
Low CH



Mid CH

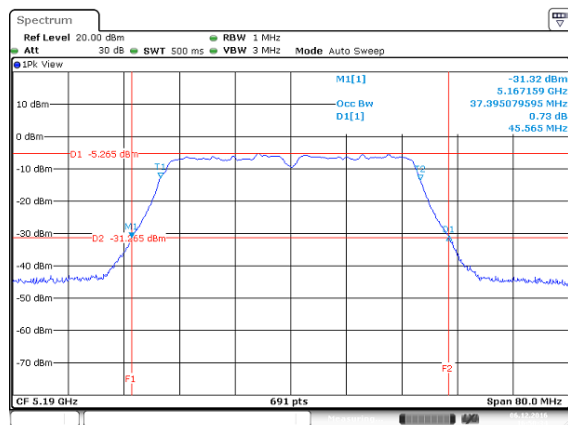


High CH

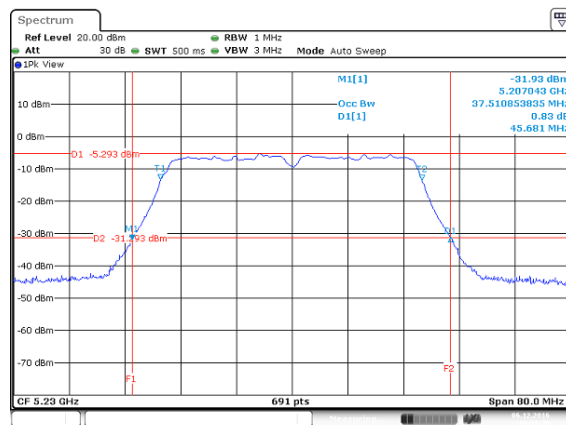


UNII-1 IEEE 802.11n HT40 mode- chain 0

Low CH

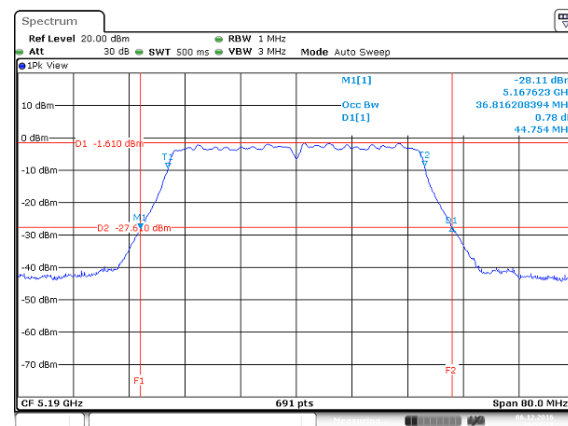


High CH

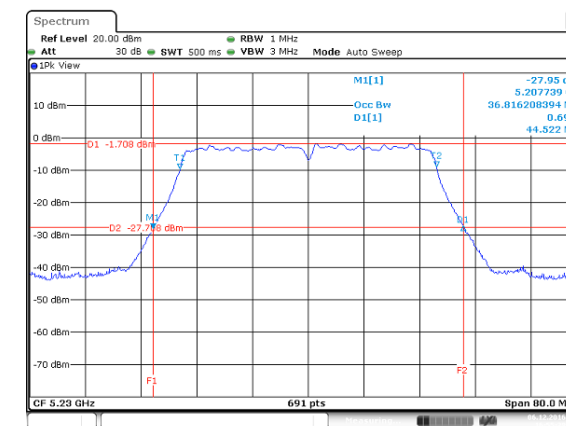


UNII-1 IEEE 802.11n HT40 mode- chain 1

Low CH

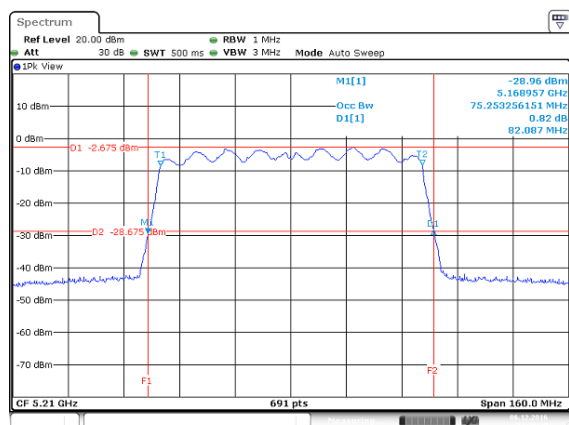


High CH



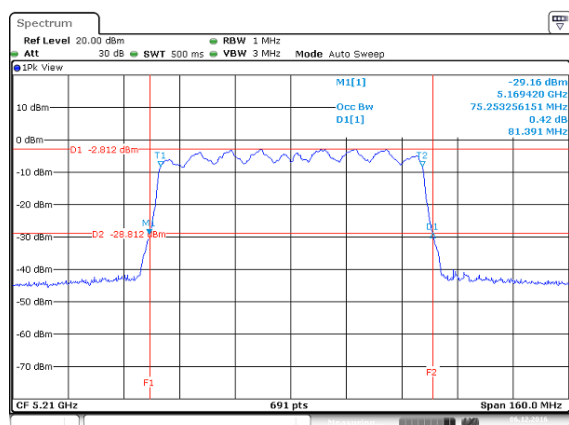
UNII-1 IEEE 802.11ac VHT80 mode- chain 0

Mid CH

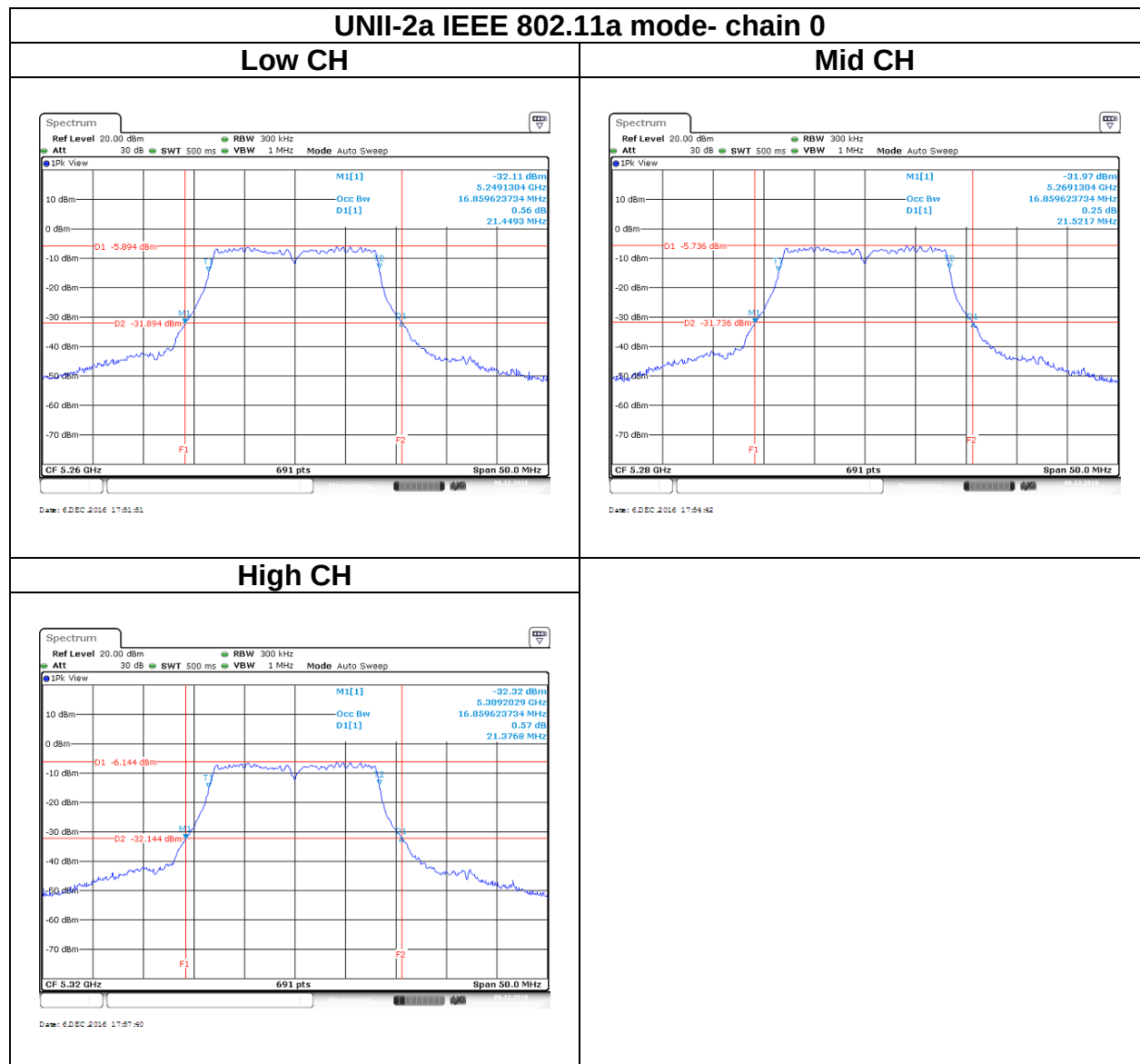


UNII-1 IEEE 802.11ac VHT80 mode- chain 1

Mid CH

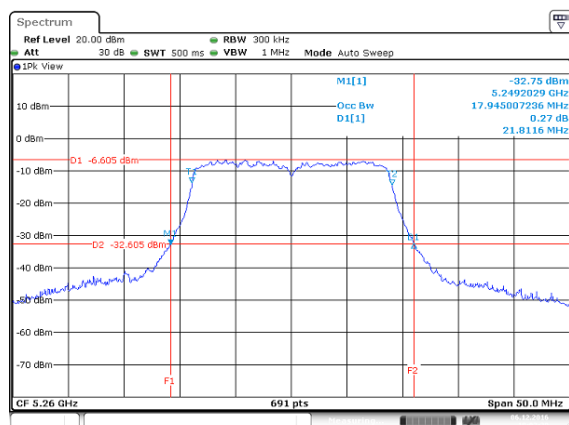


Test Data

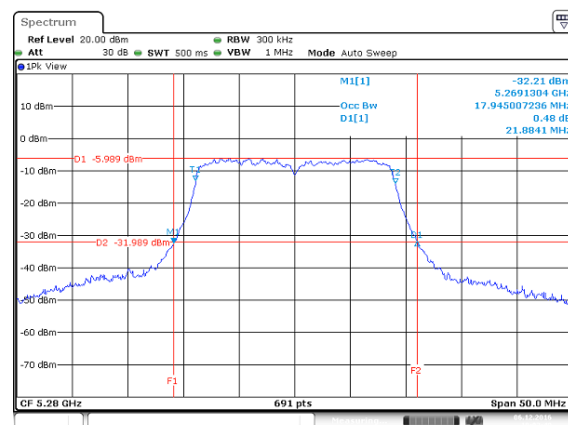


UNII-2a IEEE 802.11n HT20 mode- chain 0

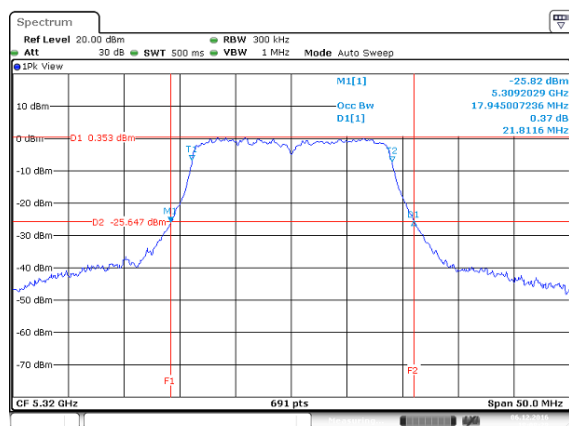
Low CH



Mid CH

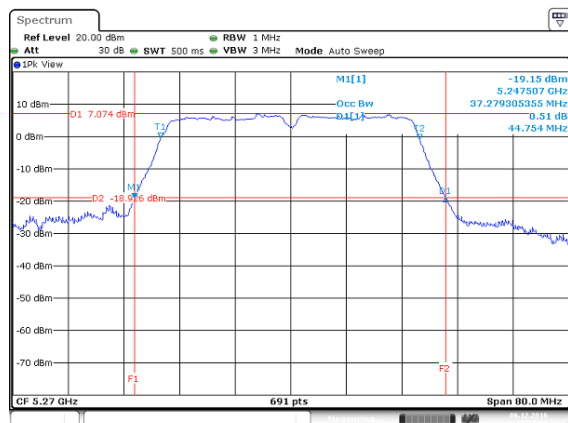


High CH

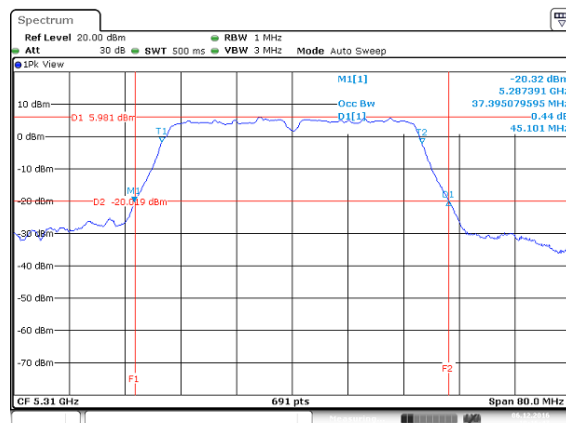


UNII-2a IEEE 802.11n HT40 mode- chain 0

Low CH

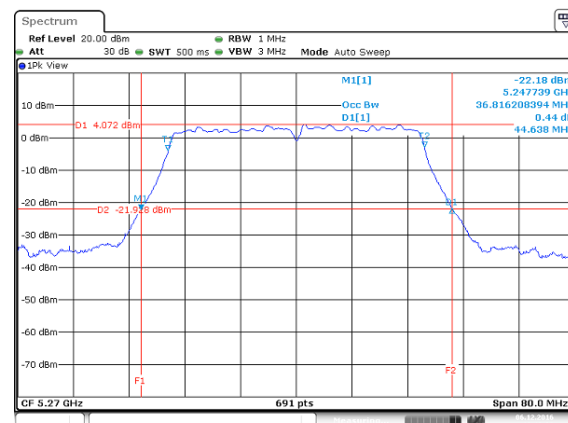


High CH

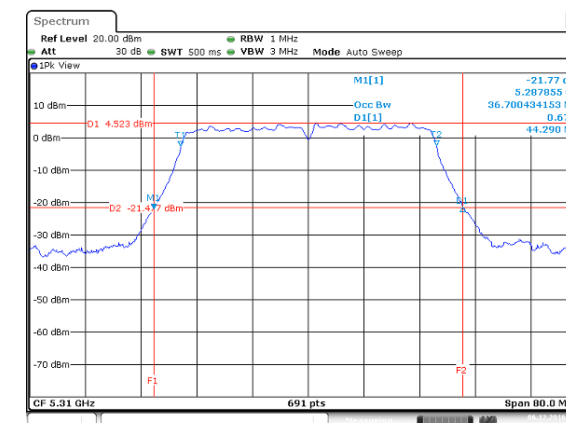


UNII-2a IEEE 802.11n HT40 mode- chain 1

Low CH

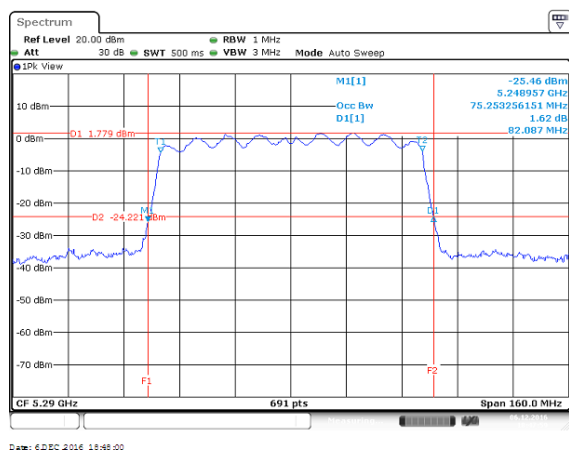


High CH



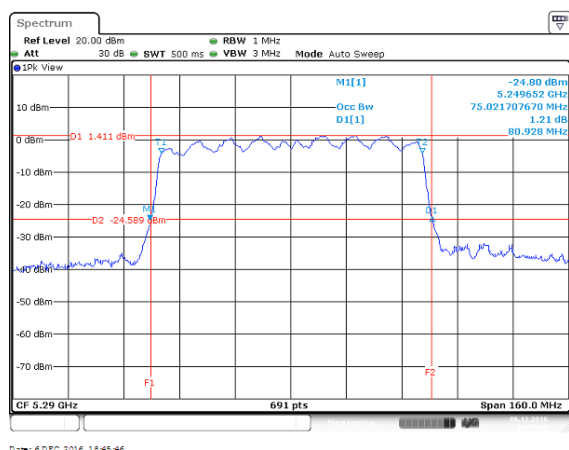
UNII-2a IEEE 802.11ac VHT80 mode- chain 0

Mid CH

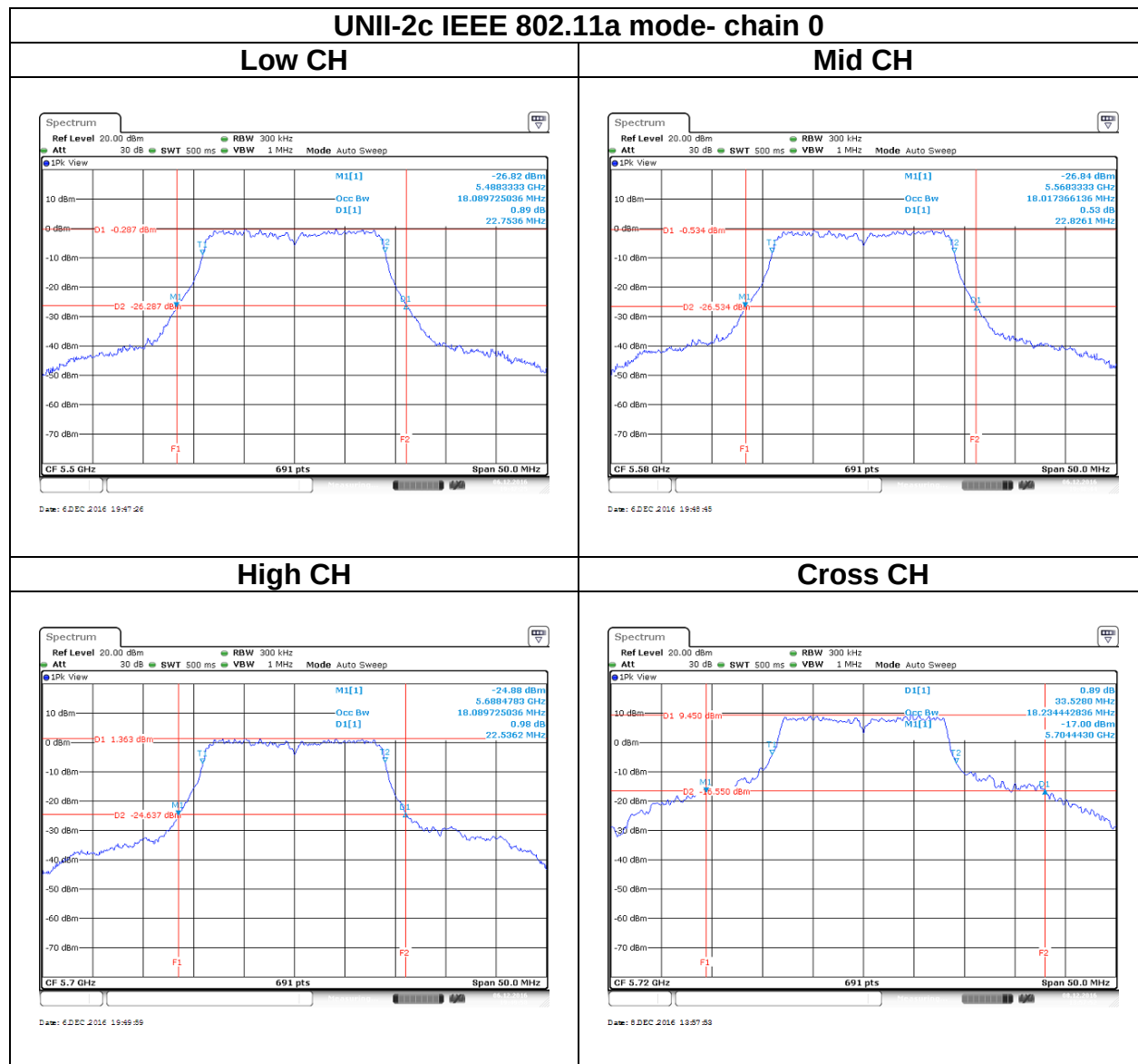


UNII-2a IEEE 802.11ac VHT80 mode- chain 1

Mid CH

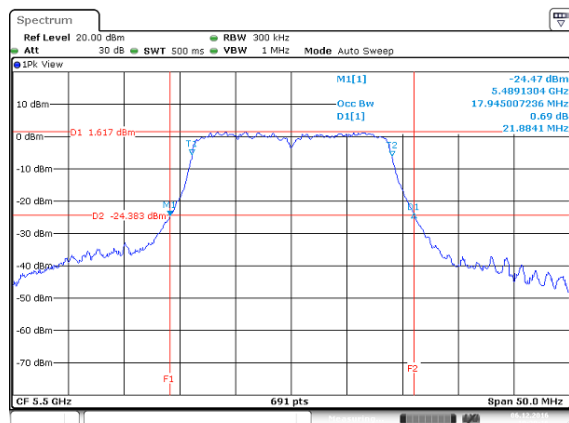


Test Data



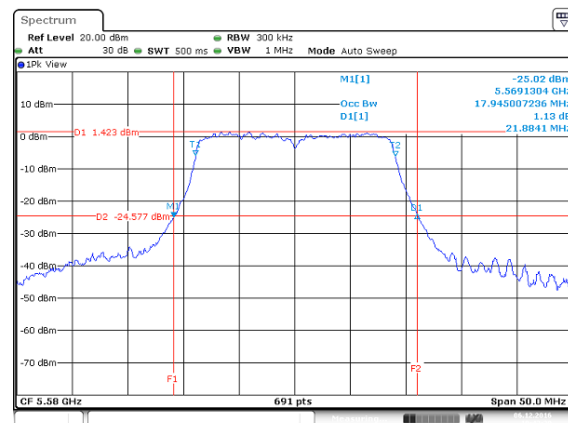
UNII-2c IEEE 802.11n HT20 mode- chain 0

Low CH



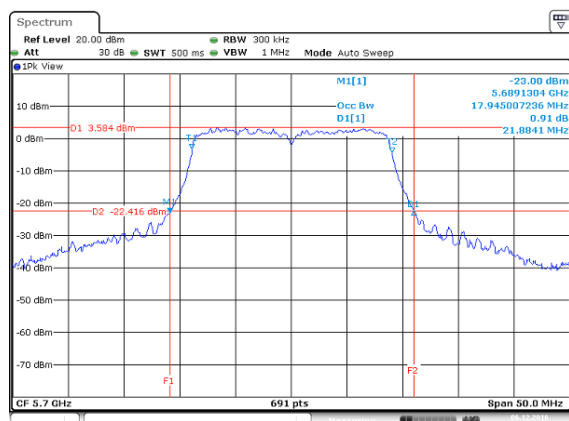
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Mid CH



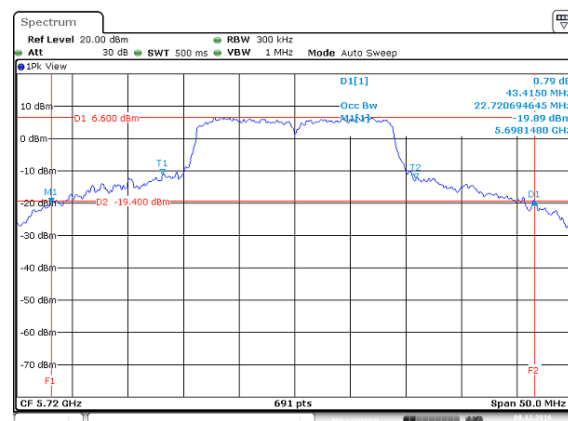
Date: 6 DEC 2016 19:40:39

High CH



Date: 6 DEC 2016 19:44:56

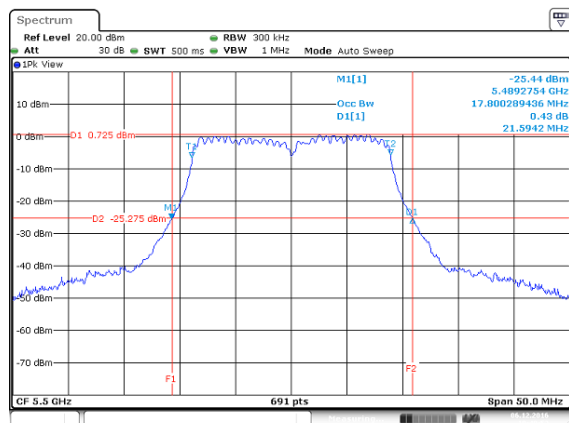
Cross CH



Date: 6 DEC 2016 14:07:37

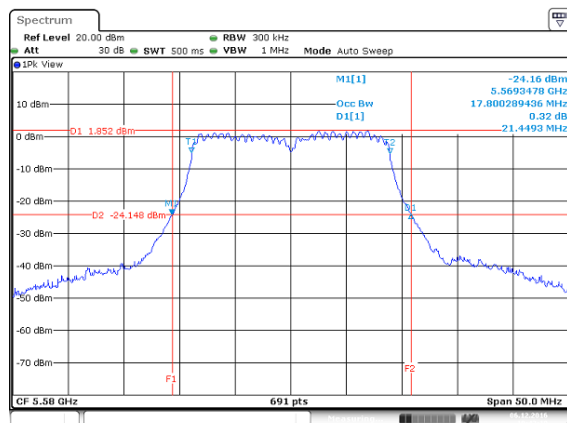
UNII-2c IEEE 802.11n HT20 mode- chain 1

Low CH



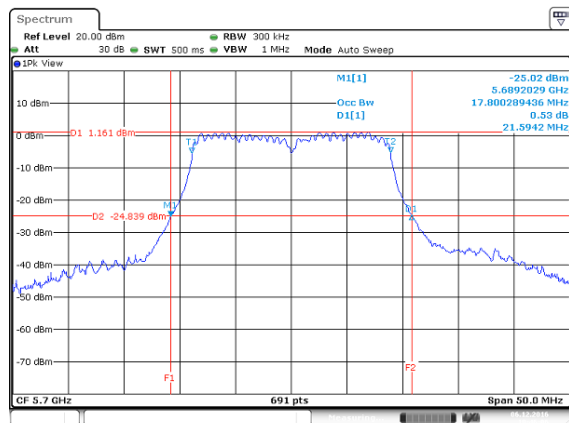
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Mid CH



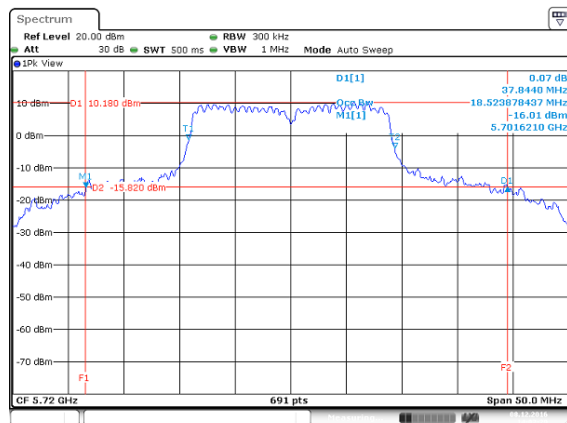
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High CH



Date: 6 DEC 2016 19:46:06

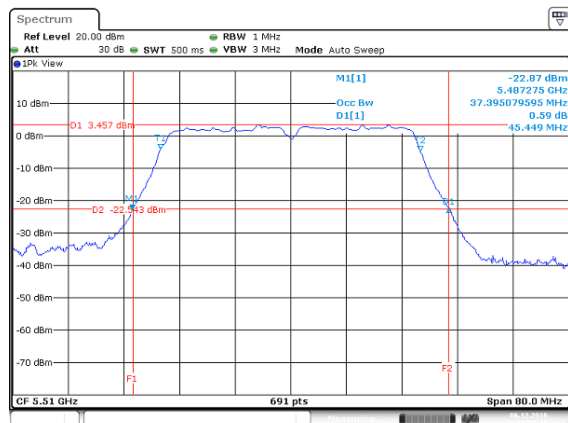
Cross CH



Date: 6 DEC 2016 14:03:29

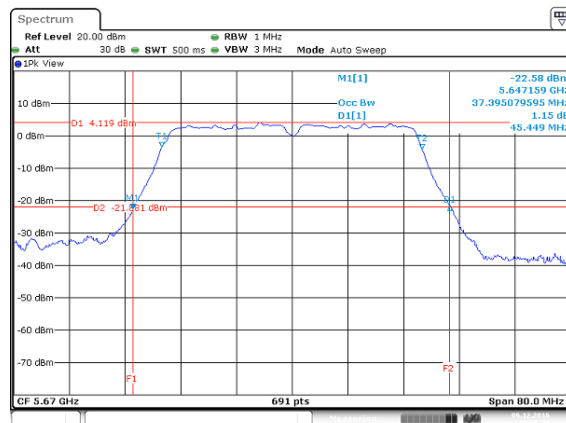
UNII-2c IEEE 802.11n HT40 mode- chain 0

Low CH



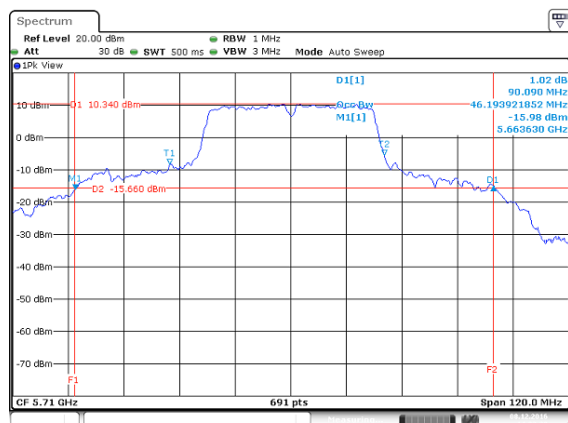
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High CH



Date: 6 DEC 2016 19:26:49

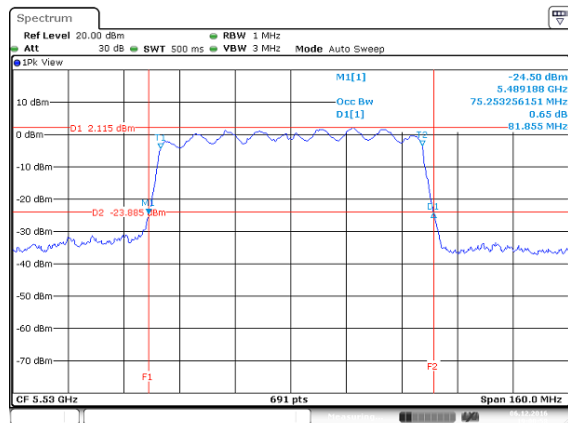
Cross CH



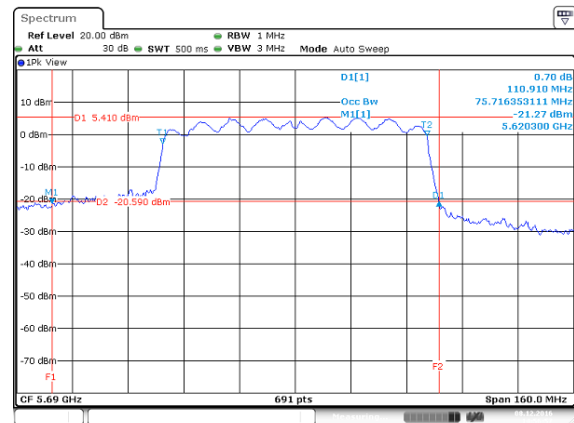
Date: 8 DEC 2016 14:29:29

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

Mid CH

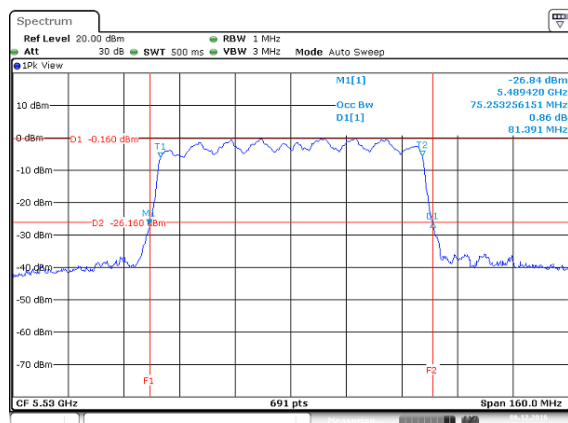


Cross CH

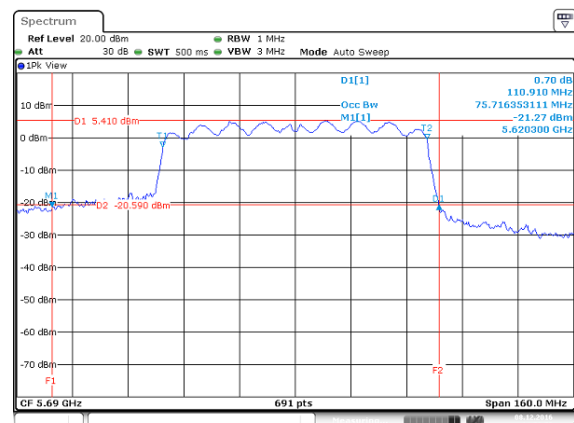


UNII-2c IEEE 802.11ac VHT80 mode- chain 1

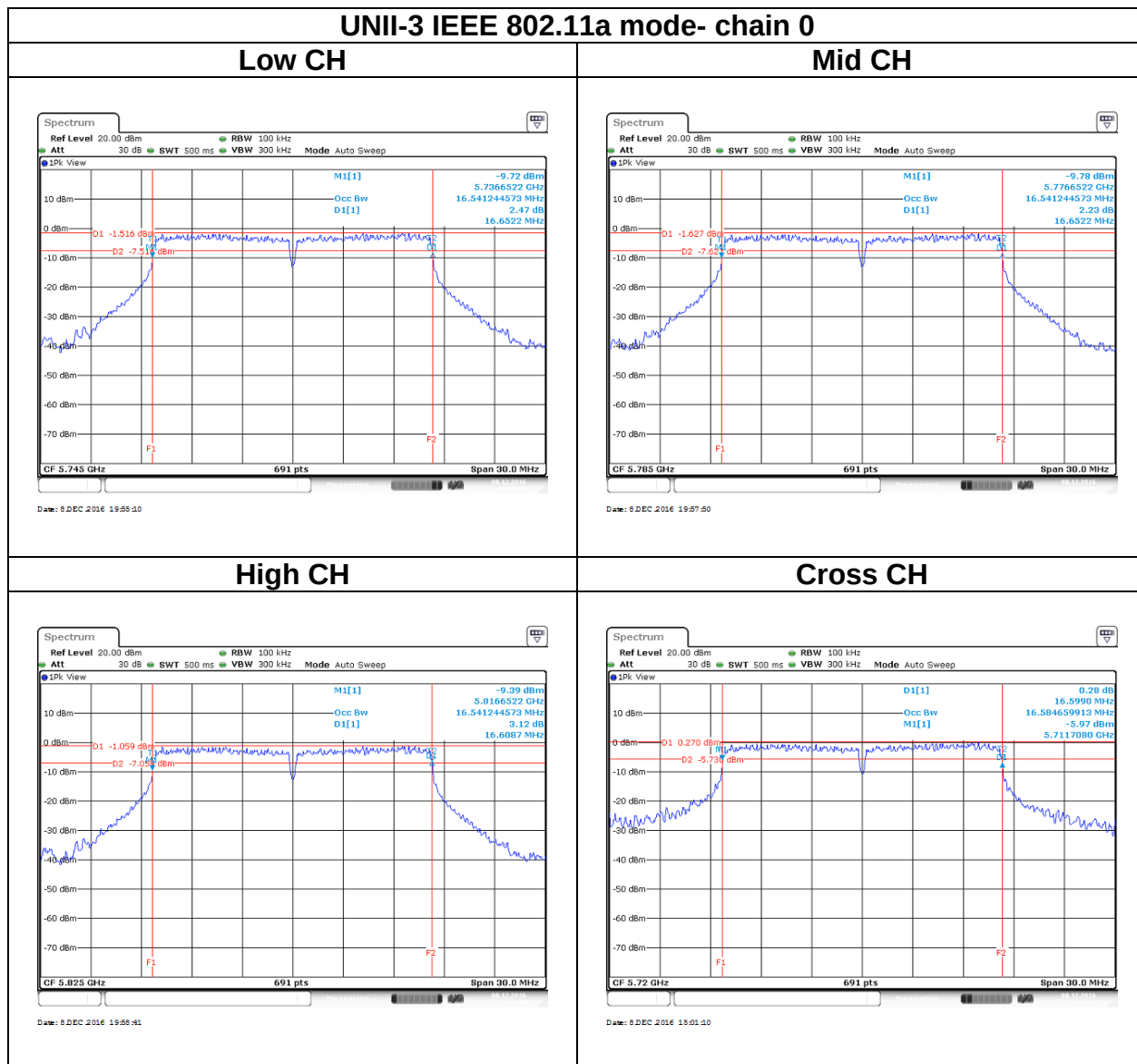
Mid CH



Cross CH

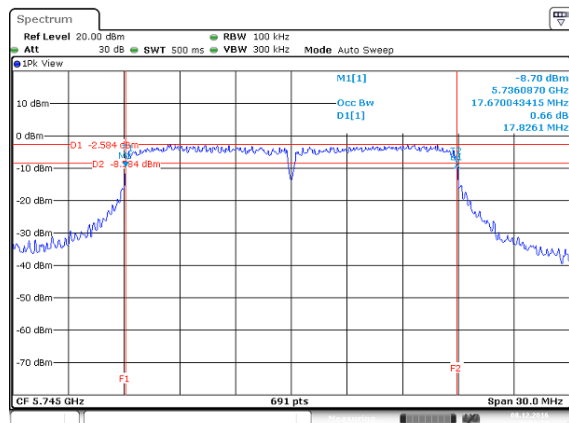


Test Data

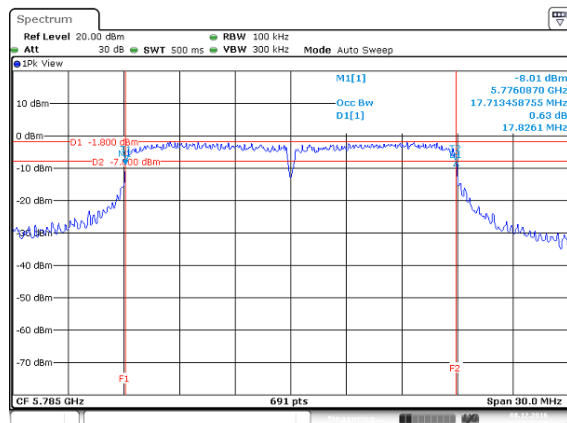


UNII-3 IEEE 802.11n HT20 mode- chain 0

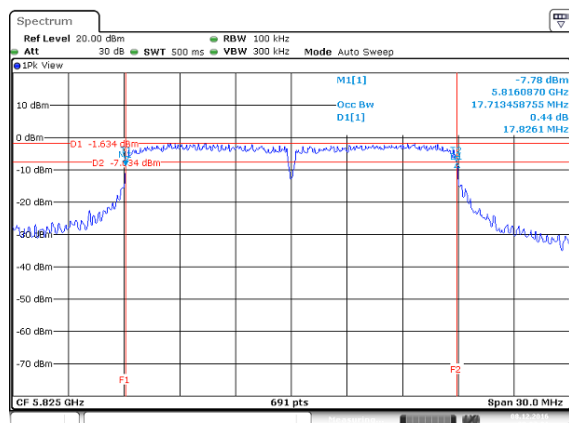
Low CH



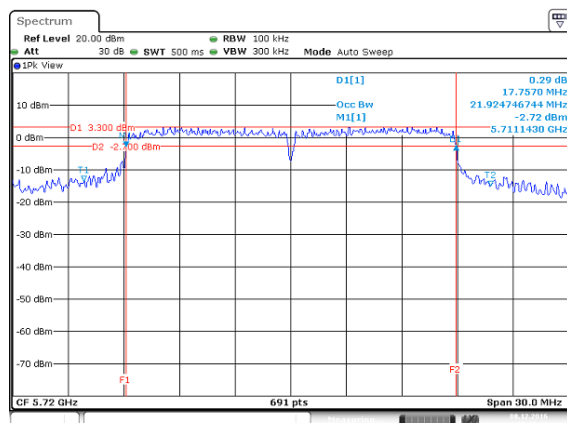
Mid CH



High CH

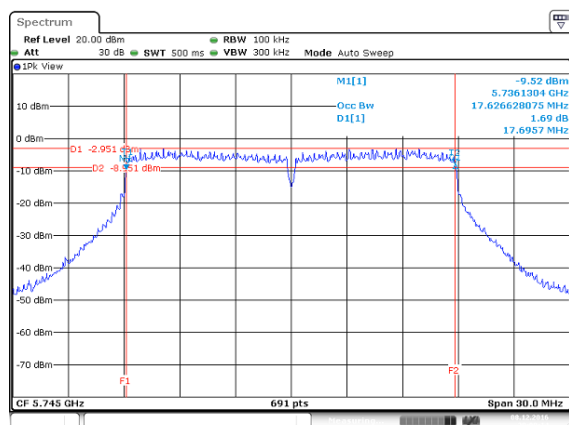


Cross CH

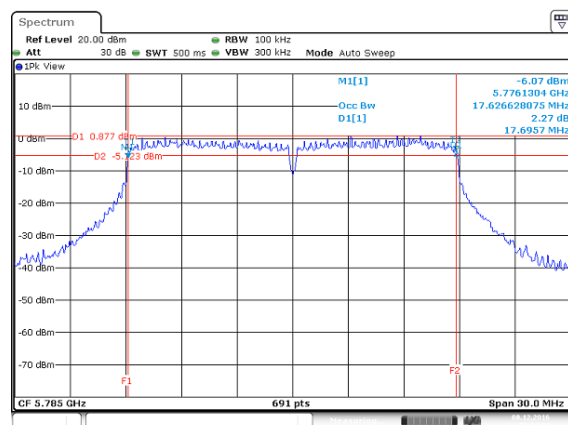


UNII-3 IEEE 802.11n HT20 mode- chain 1

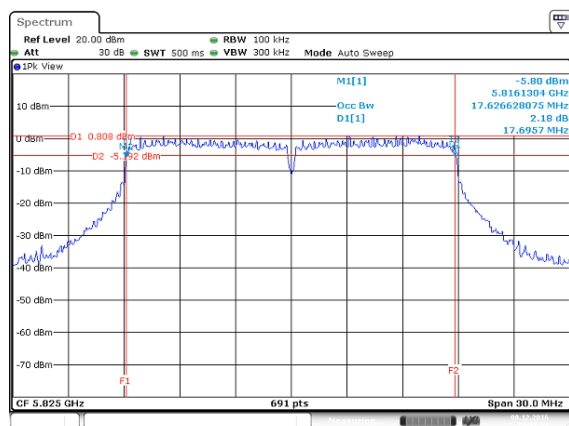
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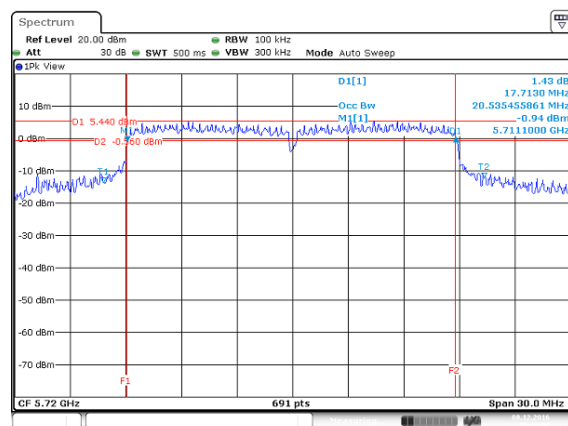
Mid CH



High CH

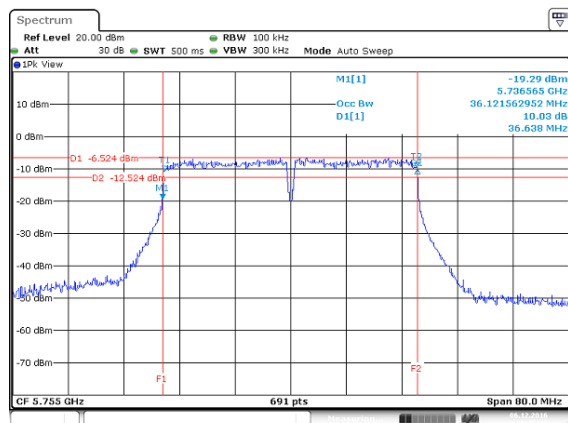


Cross CH



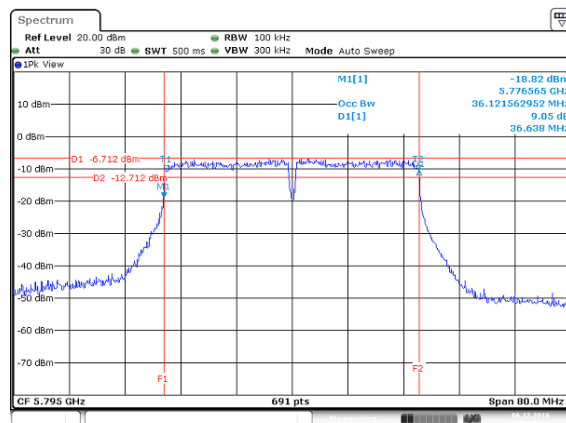
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Low CH



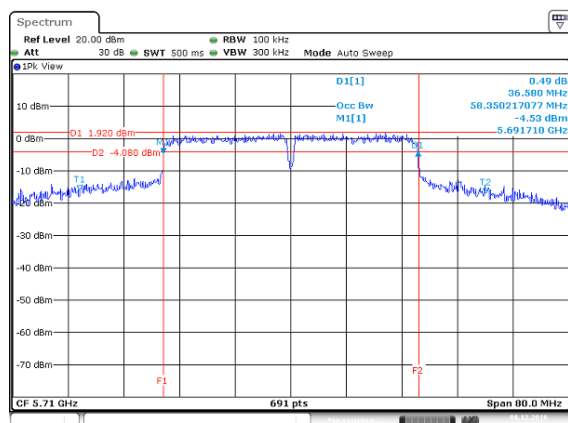
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High CH



Date: 6 DEC 2016 20:10:18

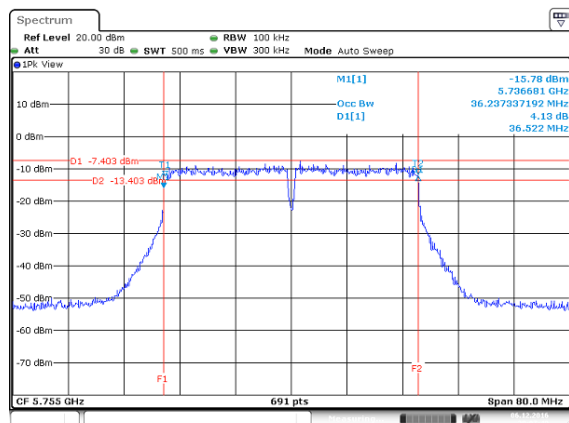
Cross CH



Date: 8 DEC 2016 15:44:09

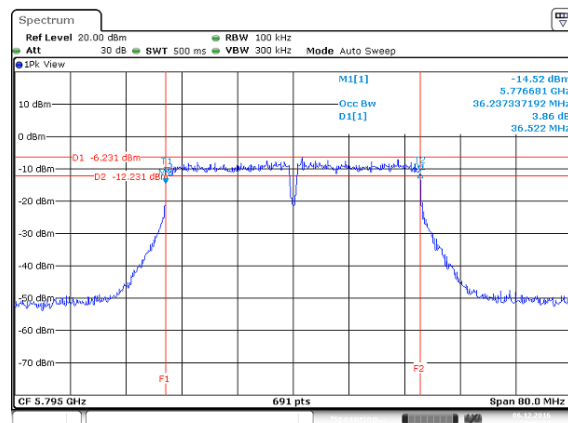
UNII-3 IEEE 802.11n HT40 mode- chain 1

Low CH



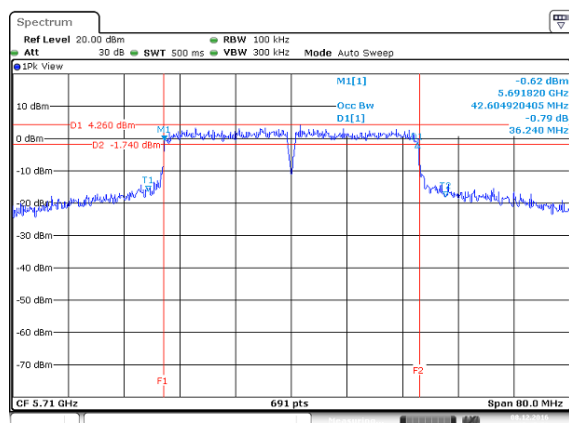
Date: 6 DEC 2016 20:07:50

High CH



Date: 6 DEC 2016 20:08:51

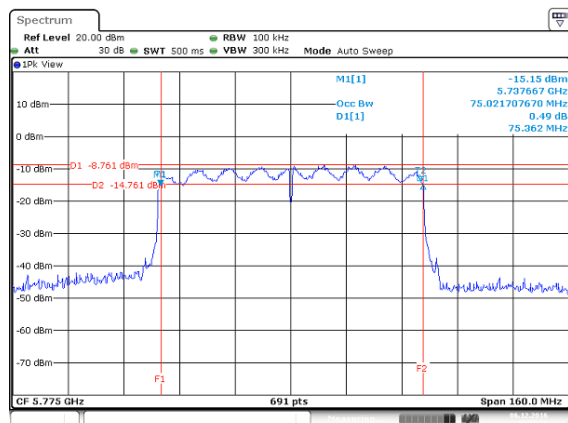
Cross CH



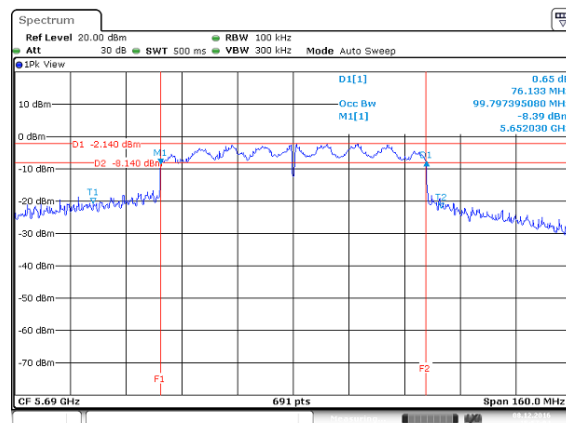
Date: 8 DEC 2016 15:47:53

UNII-3 IEEE 802.11ac VHT80 mode- chain 0

Mid CH

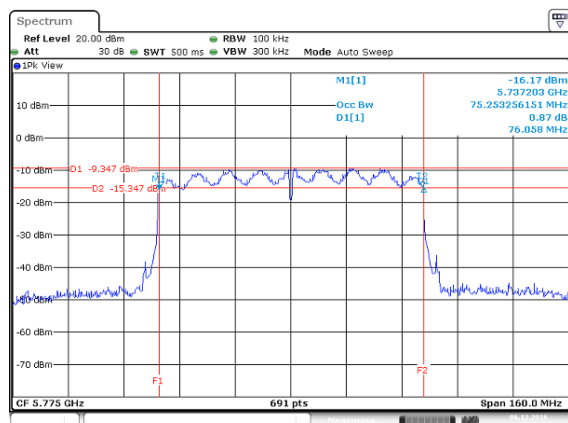


Cross CH

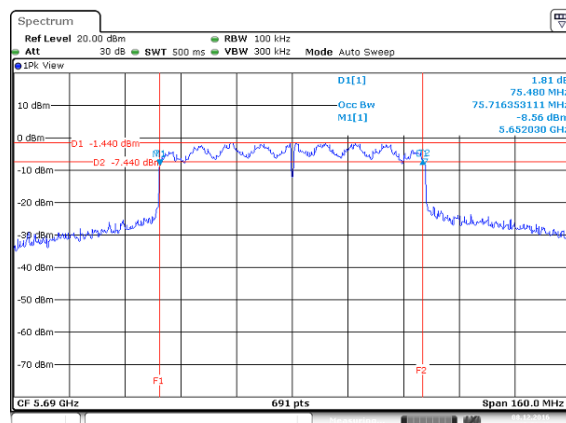


UNII-3 IEEE 802.11ac VHT80 mode- chain 1

Mid CH



Cross CH



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 $10 + 10 \log_{10} B$, 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 $11 \text{ dBm} + 10 \log B$, 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 $17 + 10 \log_{10} B$, 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.

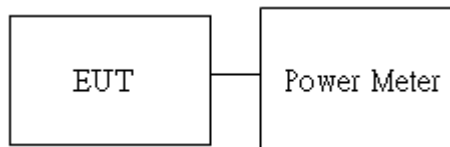
UNII-1 Limit	☒ Antenna not exceed 6 dBi : 24dBm (EIRP : 23dBm) ☐ Antenna with DG greater than 6 dBi : [Limit = $30 - (DG - 6)$]
UNII-2a/2c Limit	☒ Antenna not exceed 6 dBi : 24dBm (EIRP : 30dBm) ☐ Antenna with DG greater than 6 dBi : [Limit = $30 - (DG - 6)$]
UNII-3 Limit	☒ Antenna not exceed 6 dBi :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

4.3.2 Test Procedure

Test method Refer as KDB 789033 D02 v01r03, 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



4.3.4 Test Result

Conducted output power :

UNII-1											
Config	CH	Freq. (MHz)	AV Power(dBm)		AV Total Power (dBm)	ERP AV Total Power (dBm)	AV Total Power (W)	ERP AV Total Power (W)	DG (dBi)	Limit (dBm)	ERP Limit (dBm)
			chain0	chain1							
IEEE 802.11a Data rate: 6Mbps	36	5180	-	14.28	14.28	17.99	0.0268	0.0630	3.71	24	23
	44	5220	-	14.17	14.17	17.88	0.0261	0.0614			
	48	5240	-	14.13	14.13	17.84	0.0259	0.0608			
IEEE 802.11n HT20 Data rate: MCS8	36	5180	13.62	13.53	16.59	20.30	0.0456	0.1072			
	44	5220	13.55	13.51	16.55	20.26	0.0452	0.1062			
	48	5240	13.54	13.50	16.53	20.24	0.0450	0.1057			
IEEE 802.11n HT40 Data rate: MCS8	38	5190	13.85	13.78	16.83	20.54	0.0482	0.1132			
	46	5230	13.81	13.67	16.75	20.46	0.0473	0.1112			
IEEE 802.11ac VHT20 Data rate: MCS8	36	5180	13.56	13.49	16.54	20.25	0.0451	0.1059			
	44	5220	13.52	13.48	16.52	20.23	0.0449	0.1054			
	48	5240	13.50	13.46	16.49	20.20	0.0446	0.1047			
IEEE 802.11ac VHT40 Data rate: MCS8	38	5190	13.78	13.61	16.71	20.42	0.0469	0.1102			
	46	5230	13.69	13.58	16.65	20.36	0.0462	0.1086			
IEEE 802.11ac VHT80 Data rate: MCS8	42	5210	12.51	12.62	15.58	19.29	0.0361	0.0849			

UNII-2a											
Config	CH	Freq. (MHz)	AV Power(dBm)		AV Total Power (dBm)	ERP AV Total Power (dBm)	AV Total Power (dBm)	ERP AV Total Power (W)	DG (dBi)	Limit (dBm)	ERP Limit (dBm)
			chain0	chain1							
IEEE 802.11a Data rate: 6Mbps	52	5260	-	14.55	14.55	18.26	0.0285	0.0670	3.71	24	30
	56	5280	-	14.52	14.52	18.23	0.0283	0.0665			
	64	5320	-	14.58	14.58	18.29	0.0287	0.0675			
IEEE 802.11n HT20 Data rate: MCS8	52	5260	13.96	13.63	16.81	20.52	0.0480	0.1127			
	56	5280	13.92	13.88	16.91	20.62	0.0491	0.1154			
	64	5320	13.64	13.81	16.74	20.45	0.0472	0.1108			
IEEE 802.11n HT40 Data rate: MCS8	54	5270	13.80	13.65	16.74	20.45	0.0472	0.1108			
	62	5310	13.86	13.76	16.82	20.53	0.0481	0.1130			
IEEE 802.11ac VHT20 Data rate: MCS8	52	5260	13.92	13.60	16.77	20.48	0.0476	0.1118			
	56	5280	13.88	13.85	16.88	20.59	0.0487	0.1144			
	64	5320	13.60	13.78	16.70	20.41	0.0468	0.1099			
IEEE 802.11ac VHT40 Data rate: MCS8	54	5270	13.77	13.62	16.71	20.42	0.0468	0.1101			
	62	5310	13.73	13.38	16.57	20.28	0.0454	0.1066			
IEEE 802.11ac VHT80 Data rate: MCS8	58	5290	12.59	12.53	15.57	19.28	0.0361	0.0847			

UNII-2c														
Config	CH	Freq. (MHz)	AV Power(dBm)		AV Total Power (dBm)	ERP AV Total Power (dBm)	AV Total Power (W)	ERP AV Total Power (W)	DG (dBi)	Limit (dBm)	ERP Limit (dBm)			
			chain0	chain1										
IEEE 802.11a Data rate: 6Mbps	100	5500	-	14.68	14.68	18.39	0.0294	0.0690	3.71	24	24			
	116	5580	-	14.61	14.61	18.32	0.0289	0.0679						
	140	5700	-	14.58	14.58	18.29	0.0287	0.0675						
	144	5720	-	12.79	12.79	16.50	0.0190	0.0447						
IEEE 802.11n HT20 Data rate: MCS8	100	5500	13.48	13.75	16.63	20.34	0.0460	0.1081						
	116	5580	13.53	13.52	16.54	20.25	0.0451	0.1059						
	140	5700	13.42	13.65	16.55	20.26	0.0452	0.1062						
	144	5720	12.36	12.67	15.53	19.24	0.0357	0.0839						
IEEE 802.11n HT40 Data rate: MCS8	102	5510	13.82	13.82	16.83	20.54	0.0482	0.1132						
	110	5550	13.81	13.72	16.78	20.49	0.0476	0.1119						
	134	5670	13.86	13.92	16.90	20.61	0.0490	0.1151						
	142	5710	11.95	12.16	15.07	18.78	0.0321	0.0755						
IEEE 802.11ac VHT20 Data rate: MCS8	100	5500	13.45	13.71	16.59	20.30	0.0456	0.1072						
	116	5580	13.49	13.46	16.49	20.20	0.0446	0.1047						
	140	5700	13.38	13.61	16.51	20.22	0.0448	0.1052						
	144	5720	11.79	12.45	15.22	18.93	0.0333	0.0782						
IEEE 802.11ac VHT40 Data rate: MCS8	102	5510	13.79	13.78	16.80	20.51	0.0479	0.1125						
	110	5550	13.62	13.65	16.65	20.36	0.0462	0.1086						
	134	5670	13.51	13.88	16.71	20.42	0.0469	0.1102						
	142	5710	11.17	12.42	14.85	18.56	0.0305	0.0718						
IEEE 802.11ac VHT80 Data rate: MCS8	138	5690	12.75	12.77	15.77	19.48	0.0378	0.0887						
	155	5775	11.65	12.23	14.96	18.67	0.0313	0.0736						

UNII-3								
Config	CH	Freq. (MHz)	AV Power(dBm)		AV Total Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
			chain0	chain1				
IEEE 802.11a Data rate: 6Mbps	144	5720	-	7.34	7.34	0.0054	3.71	30
	149	5745	-	14.44	14.44	0.0278		
	157	5785	-	14.77	14.77	0.0300		
	165	5825	-	14.62	14.62	0.0290		
IEEE 802.11n HT20 Data rate: MCS0	144	5720	6.31	6.52	9.43	0.0088		
	149	5745	13.54	13.47	16.52	0.0449		
	157	5785	13.58	13.78	16.69	0.0467		
	165	5825	13.71	13.51	16.62	0.0459		
IEEE 802.11n HT40 Data rate: MCS0	142	5710	1.29	1.53	4.42	0.0028		
	151	5755	13.90	13.62	16.77	0.0475		
	159	5795	13.80	13.81	16.82	0.0481		
IEEE 802.11ac VHT20 Data rate: MCS0	144	5720	6.39	6.45	9.43	0.0088		
	149	5745	14.92	14.88	17.91	0.0618		
	157	5785	14.73	14.63	17.69	0.0587		
	165	5825	14.82	14.30	17.58	0.0573		
IEEE 802.11ac VHT40 Data rate: MCS0	142	5710	1.07	1.26	4.18	0.0026		
	151	5755	13.95	13.85	16.91	0.0491		
	159	5795	13.82	13.72	16.78	0.0476		
IEEE 802.11ac VHT80 Data rate: MCS0	138	5690	-2.59	-2.69	0.37	0.0011		
	155	5775	12.85	12.62	15.75	0.0376		