RADIO TEST REPORT
INDUSTRY CANADA RSS-247

Test Standard	**FCC Part 15.407** **IC RSS-247 issue 2 and IC RSS-GEN issue 5**
Product name	**Chiron pro**
Brand Name	**Mitac, Mio, Navman, Magellan**
Model No.	**N635**
Test Result	**Pass**
Statements of Conformity	**Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.**

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:

Kevin Tsai
Deputy Manager

Tested by:

Dally Hong
Engineer

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	January 17, 2020	Initial Issue	ALL	Allison Chen

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

FCC Applicant	Mitac Digital Technology Corporation No.200, Wen Hwa 2nd Rd.,Kuei Shan Dist. Taoyuan, 33383 Taiwan
IC Applicant	MiTAC Digital Technology Corporation No.200, Wenhua 2nd Rd., Guishan Dist. Taoyuan City 333 Taiwan
Manufacturer	MITAC COMPUTER (KUNSHAN) CO., LTD. No. 269, 2nd Avenue, District A, Comprehensive Free Trade Zone, Kunshan, Jiangsu, P.R. China
Equipment	Chiron pro
Model No.	N635
Model Discrepancy	Difference of the those trade names (list on this report) are just for marketing purpose only.
Trade Name	Mitac, Mio, Navman, Magellan
Received Date	November 5, 2019
Date of Test	November 25 ~ December 31, 2019
Power Supply	1. Power from Rechargeable Li-ion Polymer Battery. Rating: 3.7VDC, 4000mAh, 14.8Wh 2. Power from Adapter. I/P: 100-240VAC, 50/60Hz, 0.5A O/P: 5.0VDC, 2A
H/W Version	R02
S/W Version	R15

Output Power

Band	Mode	Frequency Range (MHz)	Output Power (W)	EIRP Output Power (W)
U-NII-1	IEEE 802.11a	5180 ~ 5240	0.0169	0.0225
	IEEE 802.11n HT 20 MHz	5180 ~ 5240	0.0171	0.0228
	IEEE 802.11n HT 40 MHz	5190 ~ 5230	0.0176	0.0234
	IEEE 802.11ac VHT 80 MHz	5210	0.0200	0.0267
U-NII-2a	IEEE 802.11a	5260 ~ 5320	0.0169	0.0225
	IEEE 802.11n HT 20 MHz	5260 ~ 5320	0.0167	0.0222
	IEEE 802.11n HT 40 MHz	5270 ~ 5310	0.0171	0.0228
	IEEE 802.11ac VHT 80 MHz	5290	0.0142	0.0189
U-NII-2c	IEEE 802.11a	5500 ~ 5700	0.0136	0.0181
	IEEE 802.11n HT 20 MHz	5500 ~ 5700	0.0137	0.0183
	IEEE 802.11n HT 40 MHz	5510 ~ 5670	0.0135	0.0180
	I IEEE 802.11ac VHT 80 MHz	5530	0.0108	0.0144
U-NII-3	IEEE 802.11a	5745 ~ 5825	0.0158	0.0211
	IEEE 802.11n HT 20 MHz	5745 ~ 5825	0.0159	0.0212
	IEEE 802.11n HT 40 MHz	5755 ~ 5795	0.0155	0.0207
	IEEE 802.11ac VHT 80 MHz	5775	0.0120	0.0160

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 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 80 MHz	5290 MHz
	UNII-2c	
	IEEE 802.11a	5500 ~ 5700 MHz
	IEEE 802.11n HT 20 MHz	5500 ~ 5700 MHz
	IEEE 802.11n HT 40 MHz	5510 ~ 5670 MHz
	IEEE 802.11ac VHT 80 MHz	5530 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 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 80 MHz mode: OFDM	

Remark:
Refer as ANSI C63.10: 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 Type	☐ PIFA ☐ PCB ☐ Dipole ☐ Coils ☒ Integral
Antenna Gain	Gain: 1.25 dBi
Antenna Connector	i-pex

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 0.0014
RF output power, conducted	+/- 1.14
Power density, conducted	+/- 1.40
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87

***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.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)

Test site	Test Engineer	Remark
AC Conduction Room	Dally Hong	-
Radiation	Jerry Chang	-
RF Conducted	Jane Wang	-

***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**
Coaxial Cable	Woken	WC12	CC003	06/28/2019	06/27/2020
Power Meter	Anritsu	ML2495A	1149001	02/12/2019	02/11/2020
Power Seneor	Anritsu	MA2491A	030982	02/12/2019	02/11/2020
Signal Analyzer	R&S	FSV 40	101073	09/25/2019	09/24/2020
Software	N/A				

3M 966 Chamber Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Bilog Antenna	Sunol Sciences	JB3	A030105	07/26/2019	07/25/2020
Coaxial Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/26/2019	02/25/2020
Coaxial Cable	EMCI	EMC105	190914+25111	09/20/2019	09/19/2020
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/30/2019	01/29/2020
double Ridged Guide Horn Antenna	ETC	MCTD 1209	DRH13M02003	10/04/2019	10/03/2020
High Pass Filters	MICRO TRONICS	HPM13195	003	02/26/2019	02/25/2020
Horn Antenna	ETS LINDGREN	3116	00026370	12/26/2018	12/25/2019
Loop Ant	COM-POWER	AL-130	121051	03/22/2019	03/21/2020
Pre-Amplifier	EMEC	EM330	060609	02/26/2019	02/25/2020
Pre-Amplifier	HP	8449B	3008A00965	02/26/2019	02/25/2020
Pre-Amplifier	MITEQ	AMF-6F-260400-40-8P	985646	02/26/2019	02/25/2020
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	05/29/2019	05/28/2020
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
Software	e3 6.11-20180413				

Remark:

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

2. N.C.R. = No Calibration Request.

AC line Conduction Test Room					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
CABLE	EMCI	CFD300-NL	CERF	06/27/2019	06/26/2020
EMI Test Receiver	R&S	ESCI	100064	07/26/2019	07/25/2020
LISN	SCHWARZBECK	NSLK 8127	8127-541	01/31/2019	01/30/2020
LISN	SCHAFFNER	NNB 41	03/10013	02/13/2019	02/12/2020
Software	EZ-EMC(CCS-3A1-CE)				

DFS Test					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Attenuator	E-INSTRUMENT	EPA-600H	EC1400050	07/26/2019	07/25/2020
Coaxial Cable	Woken	WC12	DC004	06/28/2019	06/27/2020
Power Divider	Solvang Technology	STI08-0015	008	08/06/2019	08/05/2020
Spectrum Analyzer	R&S	FSU 26	100258	06/20/2019	06/19/2020
Vector Signal Generator	R&S	SMU 200A	101480	03/27/2019	03/26/2020
Software	GPIBShot,DFS-Aggregate-Time FSU,R&S Pulse Sequencer DFS				

Remark:
1. Each piece of equipment is scheduled for calibration once a year.
2. N.C.R. = No Calibration Request.

1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

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

Support Equipment						
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**	**IC ID**
1	NB(J)	TOSHIBA	PT345T-00L002	N/A	PD97260H	1000M-7260H

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 789033 D02, KDB 905462 D02, RSS-247 Issue 2 and RSS-GEN Issue 5.

2. TEST SUMMARY

FCC Standard Sec.	IC Standard Sec.	Chapter	Test Item	Result
15.203	-	1.3	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 (6.7)	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)	-	4.7	Dynamic Frequency Selection	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

<table>
<tr><td>Operation mode</td><td>1. IEEE 802.11a mode: 6Mbps
2. IEEE 802.11n HT 20 MHz mode: MCS0
3. IEEE 802.11n HT 40 MHz mode: MCS0
4. IEEE 802.11ac VHT 80 MHz mode: MCS0</td></tr>
<tr><td>Operating Frequency Range &
Number of Channels</td><td>
<table>
<tr><th></th><th>Mode</th><th>Frequency Range (MHz)</th><th>Number of Channels</th></tr>
<tr><td rowspan="4">U-NII-1</td><td>IEEE 802.11a</td><td>5180 ~ 5240</td><td>4 Channels</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5180 ~ 5240</td><td>4 Channels</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5190 ~ 5230</td><td>2 Channels</td></tr>
<tr><td>IEEE 802.11ac VHT 80 MHz</td><td>5210</td><td>1 Channels</td></tr>
<tr><td rowspan="4">U-NII-2a</td><td>IEEE 802.11a</td><td>5260 ~ 5320</td><td>4 Channels</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5260 ~ 5320</td><td>4 Channels</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5270 ~ 5310</td><td>2 Channels</td></tr>
<tr><td>IEEE 802.11ac VHT 80 MHz</td><td>5290</td><td>1 Channels</td></tr>
<tr><td rowspan="4">U-NII-2c</td><td>IEEE 802.11a</td><td>5500 ~ 5700</td><td>8 Channels</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5500 ~ 5700</td><td>8 Channels</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5510 ~ 5670</td><td>3 Channels</td></tr>
<tr><td>IEEE 802.11ac VHT 80 MHz</td><td>5530</td><td>1 Channels</td></tr>
<tr><td rowspan="4">U-NII-3</td><td>IEEE 802.11a</td><td>5745 ~ 5825</td><td>5 Channels</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5745 ~ 5825</td><td>5 Channels</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5755 ~ 5795</td><td>2 Channels</td></tr>
<tr><td>IEEE 802.11ac VHT 80 MHz</td><td>5775</td><td>1 Channels</td></tr>
</table>
</td></tr>
</table>

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

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	**AC Power line conducted emission for line and neutral**
Power supply Mode	**Mode1: EUT Power by Battery (DC 3V)** **Mode 2: EUT power by adapter + Type C USB** **Mode3: EUT Power by Type C USB+ CarCharge (DC12V)** **Mode4: EUT Power by Cradle(N564)+Micro USB+Adapter** **Mode5: EUT Power by Cradle(N564)+Micro USB+ CarCharge (DC12V)** **Mode6: EUT Power by Cradle(N564) + Cable(DC 12V)** **Mode7: EUT Power by Cradle(N564_TN)+Micro USB+Adapter** **Mode8: EUT Power by Cradle(N564_TN)+Micro USB+ CarCharge (DC12V)** **Mode9: EUT Power by Cradle(N564_TN) + Cable(DC 12V)** **Mode10: EUT Power by Cradle(N635_V)+Micro USB+Adapter** **Mode11: EUT Power by Cradle(N635_V)+Micro USB+ CarCharge (DC12V)** **Mode12: EUT Power by Cradle(N635_V) + Cable(DC 12V)** **Mode13: EUT Power by Cradle(N635_VL)+Micro USB+Adapter** **Mode14: EUT Power by Cradle(N635_VL)+Micro USB+ CarCharge (DC12V)** **Mode15: EUT Power by Cradle(N635_VL) + Cable(DC 12V)** **Mode16: EUT Power by Cradle(N635_VHG) + Cable(DC 12V)**
Worst Mode	☐ **Mode 1** ☐ **Mode 2** ☐ **Mode 3** ☒ **Mode 4**

Radiated Emission Measurement Above 1G	
Test Condition	**Radiated Emission Above 1G**
Power supply Mode	**Mode1: EUT Power by Battery (DC 3V)** **Mode2: EUT Power by Adapter + Type C USB** **Mode3: EUT Power by Type C USB+ CarCharge (DC12V)** **Mode4: EUT Power by Cradle(N564)+Micro USB+Adapter** **Mode5: EUT Power by Cradle(N564)+Micro USB+ CarCharge (DC12V)** **Mode6: EUT Power by Cradle(N564) + Cable(DC 12V)** **Mode7: EUT Power by Cradle(N564_TN)+Micro USB+Adapter** **Mode8: EUT Power by Cradle(N564_TN)+Micro USB+ CarCharge (DC12V)** **Mode9: EUT Power by Cradle(N564_TN) + Cable(DC 12V)** **Mode10: EUT Power by Cradle(N635_V)+Micro USB+Adapter** **Mode11: EUT Power by Cradle(N635_V)+Micro USB+ CarCharge (DC12V)** **Mode12: EUT Power by Cradle(N635_V) + Cable(DC 12V)** **Mode13: EUT Power by Cradle(N635_VL)+Micro USB+Adapter** **Mode14: EUT Power by Cradle(N635_VL)+Micro USB+ CarCharge (DC12V)** **Mode15: EUT Power by Cradle(N635_VL) + Cable(DC 12V)** **Mode16: EUT Power by Cradle(N635_VHG) + Cable(DC 12V)**
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)**

Radiated Emission Measurement Below 1G	
Test Condition	**Radiated Emission Below 1G**
Power supply Mode	**Mode1: EUT Power by Battery (DC 3V)** **Mode2: EUT Power by Adapter + Type C USB** **Mode3: EUT Power by Type C USB+ CarCharge (DC12V)** **Mode4: EUT Power by Cradle(N564)+Micro USB+Adapter** **Mode5: EUT Power by Cradle(N564)+Micro USB+ CarCharge (DC12V)** **Mode6: EUT Power by Cradle(N564) + Cable(DC 12V)** **Mode7: EUT Power by Cradle(N564_TN)+Micro USB+Adapter** **Mode8: EUT Power by Cradle(N564_TN)+Micro USB+ CarCharge (DC12V)** **Mode9: EUT Power by Cradle(N564_TN) + Cable(DC 12V)** **Mode10: EUT Power by Cradle(N635_V)+Micro USB+Adapter** **Mode11: EUT Power by Cradle(N635_V)+Micro USB+ CarCharge (DC12V)** **Mode12: EUT Power by Cradle(N635_V) + Cable(DC 12V)** **Mode13: EUT Power by Cradle(N635_VL)+Micro USB+Adapter** **Mode14: EUT Power by Cradle(N635_VL)+Micro USB+ CarCharge (DC12V)** **Mode15: EUT Power by Cradle(N635_VL) + Cable(DC 12V)** **Mode16: EUT Power by Cradle(N635_VHG) + Cable(DC 12V)**
Worst Mode	☒ **Mode 1** ☐ **Mode 2** ☐ **Mode 3** ☐ **Mode 4**

Remark:

1. The worst mode was record in this test report.

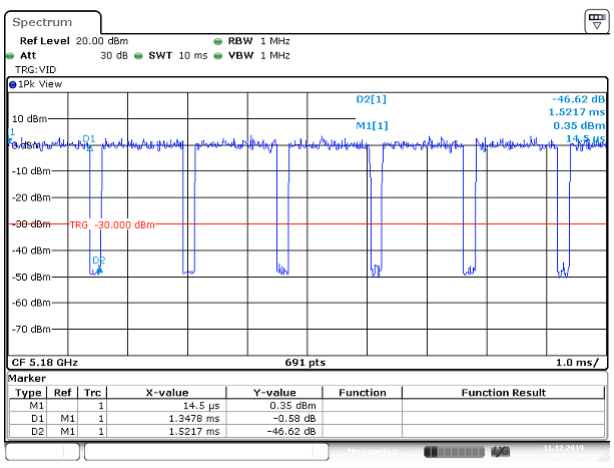
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(Z-Plane) were recorded in this report

3. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.

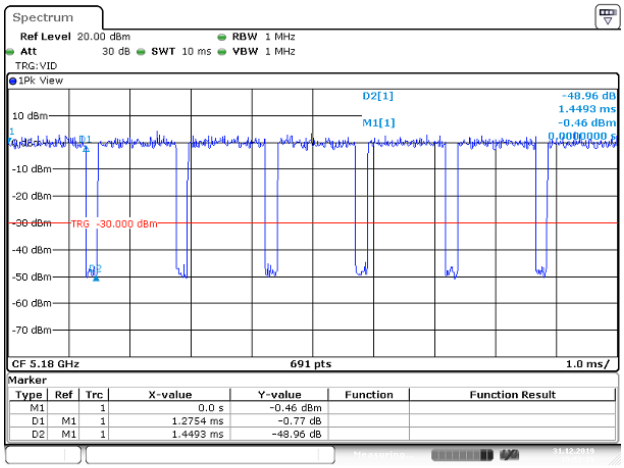
3.3 EUT DUTY CYCLE

Duty Cycle				
Configuration	Duty Cycle (%)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11a	88.57%	0.53	0.74	1.00
802.11n HT20	88.00%	0.56	0.78	1.00
802.11n HT40	85.31%	0.69	1.50	2.00
802.11ac VHT80	62.51%	2.04	3.45	4.00

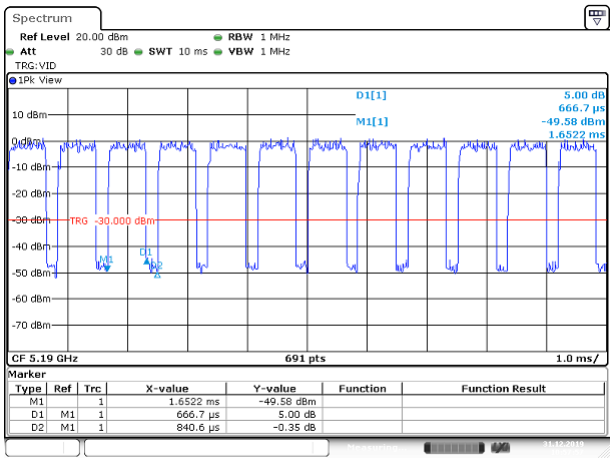
802.11a



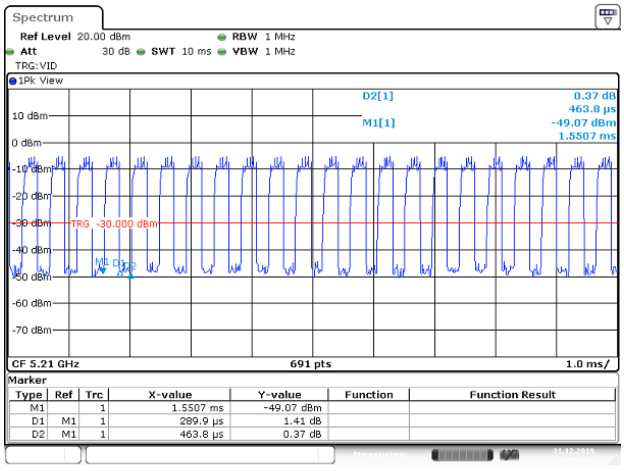
802.11n HT20



802.11n HT40



802.11ac VHT80



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

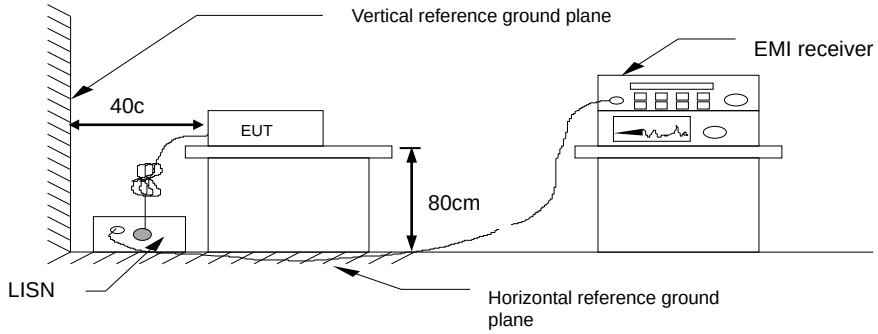
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI C63.10: 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

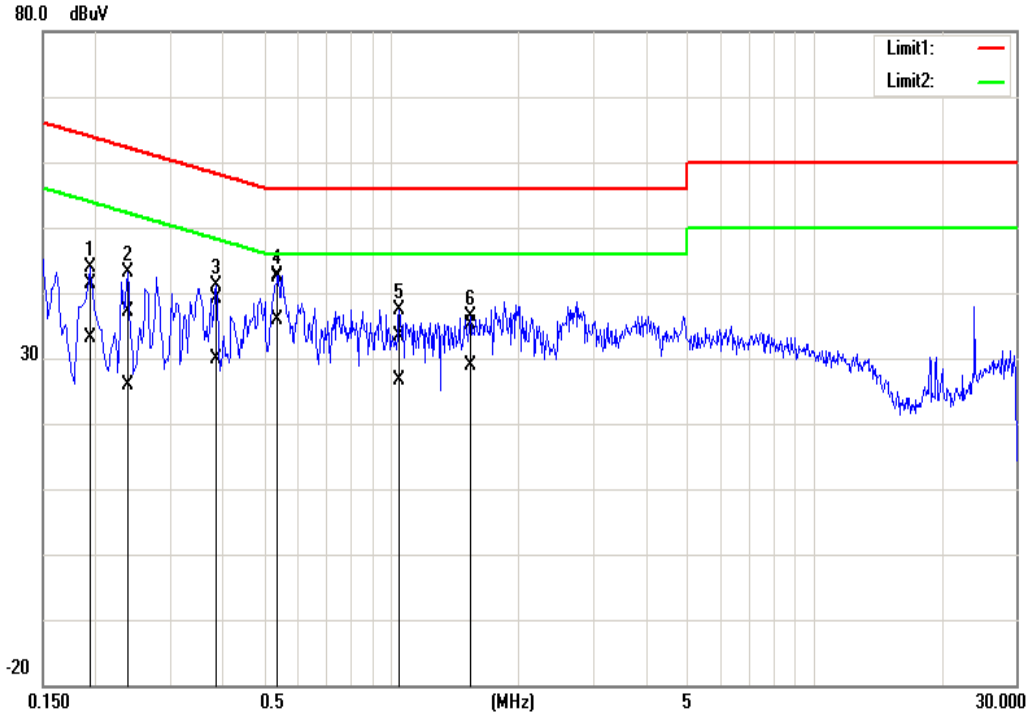


4.1.4 Test Result

Pass.

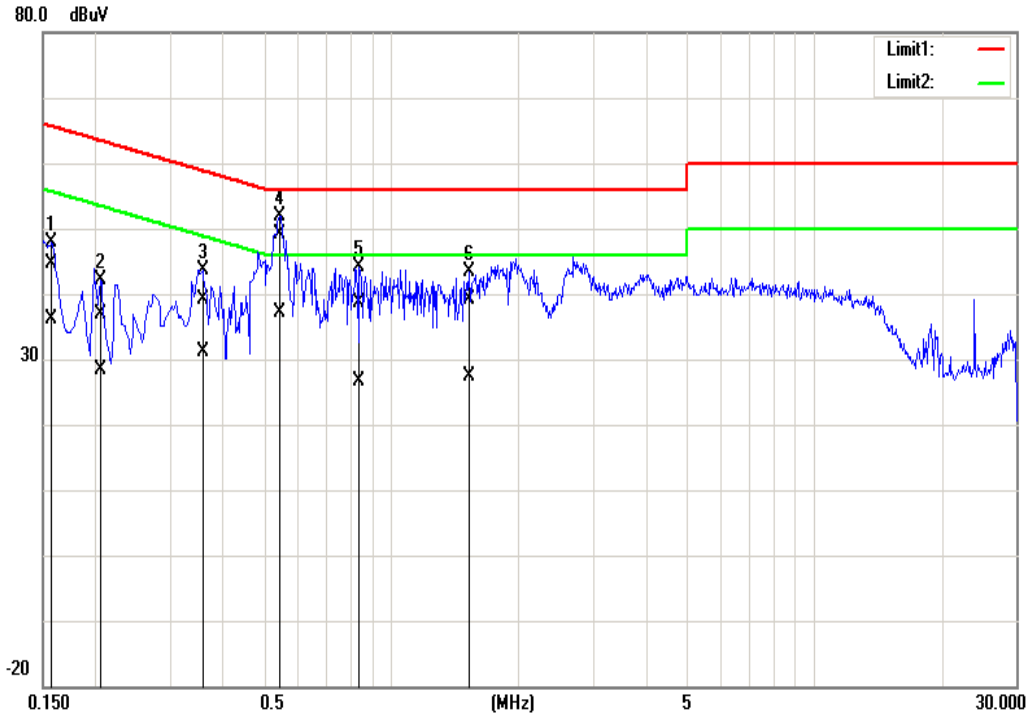
Test Data

Test Mode:	Mode 4	Temp/Hum	24(℃)/ 50%RH
Phase:	Line	Test Date	2019/11/25
		Test Engineer	Dally Hong



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
0.1940	31.16	23.05	10.13	41.29	33.18	63.86	53.86	-22.57	-20.68	Pass
0.2380	26.89	15.69	10.13	37.02	25.82	62.17	52.17	-25.15	-26.35	Pass
0.3860	29.02	19.84	10.14	39.16	29.98	58.15	48.15	-18.99	-18.17	Pass
0.5380	32.14	25.66	10.14	42.28	35.80	56.00	46.00	-13.72	-10.20	Pass
1.0460	23.27	16.34	10.17	33.44	26.51	56.00	46.00	-22.56	-19.49	Pass
1.5420	24.85	18.81	10.19	35.04	29.00	56.00	46.00	-20.96	-17.00	Pass

Test Mode:	Mode 4	Temp/Hum	24(℃)/ 50%RH
Phase:	Neutral	Test Date	2019/11/25
		Test Engineer	Dally Hong



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
0.1580	34.51	26.01	10.02	44.53	36.03	65.57	55.57	-21.04	-19.54	Pass
0.2060	26.92	18.45	10.02	36.94	28.47	63.37	53.37	-26.43	-24.90	Pass
0.3580	29.11	21.09	10.03	39.14	31.12	58.77	48.77	-19.63	-17.65	Pass
0.5460	39.02	27.22	10.03	49.05	37.25	56.00	46.00	-6.95	-8.75	Pass
0.8420	28.62	16.71	10.04	38.66	26.75	56.00	46.00	-17.34	-19.25	Pass
1.5300	28.95	17.37	10.06	39.01	27.43	56.00	46.00	-16.99	-18.57	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 ： At least 500kHz.

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

4.2.2 Test Procedure

26dB

1. This measurement setting are specified in section D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

2. Set RBW: approximately 1% of the emission bandwidth.

3. Set the VBW>RBW.

4. Detoctor = Peak.

5. Trace mode = max hold.

6. Measure the maximum width of the emission that is 26dB down from the peak of the emission. Compare this with the RBW setting of the analyser. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

6dB

1. This measurement setting are specified in section D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

2. Set RBW = 100 kHz.

3. Set the video bandwidth (VBW) ≥ 3 x RBW.

4. Detoctor = Peak.

5. Trace mode = max hold.

6. Sweep = auto couple.

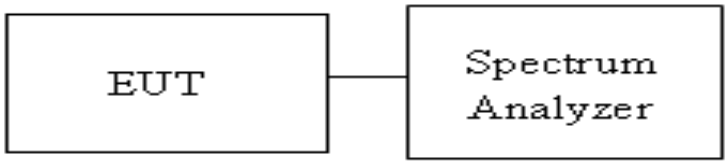
7. Allow the trace to stabilize.

8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

99%

1. This measurement setting are specified in section D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set center frequency to the nominal EUT channel center frequency.
3. Set span = 1.5 times to 5.0 times the OBW.
4. Set RBW = 1 % to 5% of the OBW.
5. Set VBW ≧ 3 xRBW

4.2.3 Test Setup



4.2.4 Test Result

UNII-1 5150-5250 MHz			
Test mode: IEEE 802.11a mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5180	22.2141	38.3333
Mid	5220	19.2474	40.0000
High	5240	19.6092	39.2029
Test mode: IEEE 802.11n HT20 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5180	22.0694	43.5507
Mid	5220	21.4905	43.9855
High	5240	21.0564	40.0725
Test mode: IEEE 802.11n HT40 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5190	36.7004	65.8550
High	5230	36.4688	59.7100
Test mode: IEEE 802.11ac VHT80 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Mid	5210	75.7163	128.696

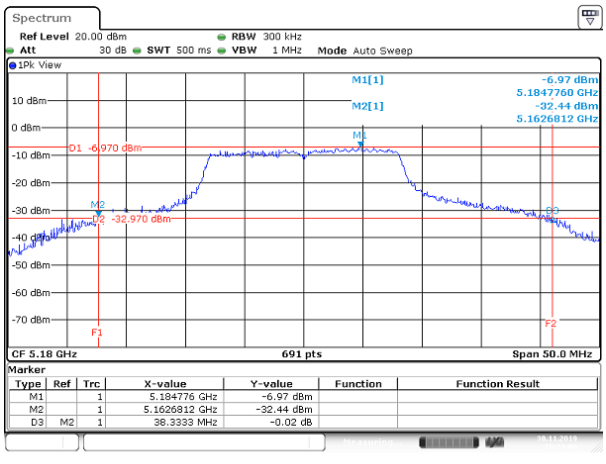
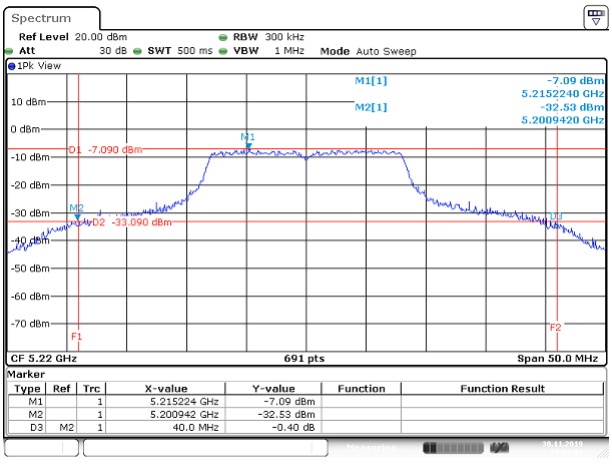
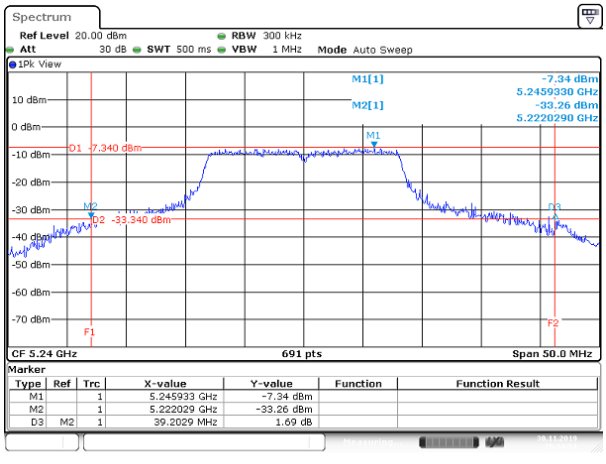
UNII-2a 5250-5350 MHz			
Test mode: IEEE 802.11a mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5260	19.8263	40.5797
Mid	5280	19.3921	40.5072
High	5320	18.6685	39.2754
Test mode: IEEE 802.11n HT20 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5260	20.9117	43.9855
Mid	5280	20.9840	43.7681
High	5320	19.6816	41.3043
Test mode: IEEE 802.11n HT40 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5270	36.4688	62.493
High	5310	36.4688	61.217
Test mode: IEEE 802.11ac VHT80 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Mid	5290	75.4848	128.696

UNII-2c 5475-5725 MHz			
Test mode: IEEE 802.11a mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5500	19.6092	40.3623
Mid	5580	21.8523	41.1594
High	5700	18.3068	39.058
Test mode: IEEE 802.11n HT20 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5500	21.6353	41.7391
Mid	5580	23.3719	41.3768
High	5700	18.8856	40.7971
Test mode: IEEE 802.11n HT40 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5510	36.8162	73.623
Mid	5550	36.5846	71.768
High	5670	36.9319	78.377
Test mode: IEEE 802.11ac VHT80 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Mid	5530	75.9479	132.174

UNII-3 5725-5825MHz			
Test mode: IEEE 802.11a mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**6dB BW (MHz)**
Low	5745	18.1620	16.3478
Mid	5785	18.1620	16.3478
High	5825	18.0897	16.3478
Test mode: IEEE 802.11n HT20 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**6dB BW (MHz)**
Low	5745	19.0303	17.5652
Mid	5785	18.9580	17.5652
High	5825	18.6685	17.5652
Test mode: IEEE 802.11n HT40 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**6dB BW (MHz)**
Low	5755	36.7004	35.246
High	5795	36.5846	35.246
Test mode: IEEE 802.11ac VHT80 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**6dB BW (MHz)**
Mid	5775	75.9479	73.739

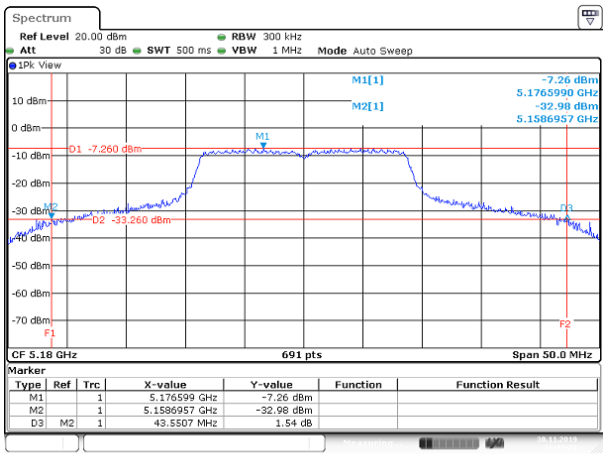
Test Data

26dB

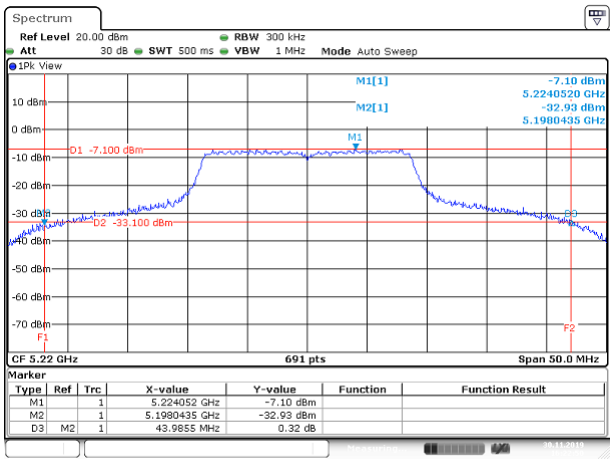
UNII-1 IEEE 802.11a mode	
Low CH	**Mid CH**
	
High CH	
	

UNII-1 IEEE 802.11n HT20 mode

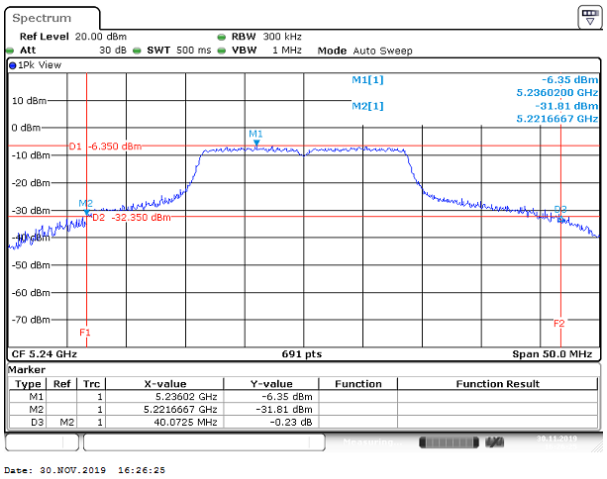
Low CH

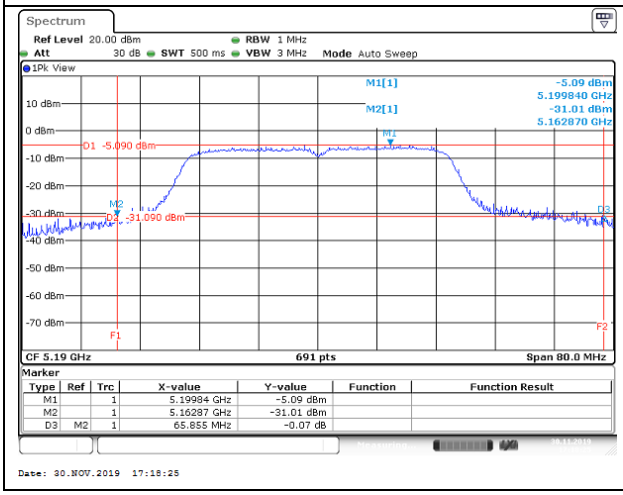
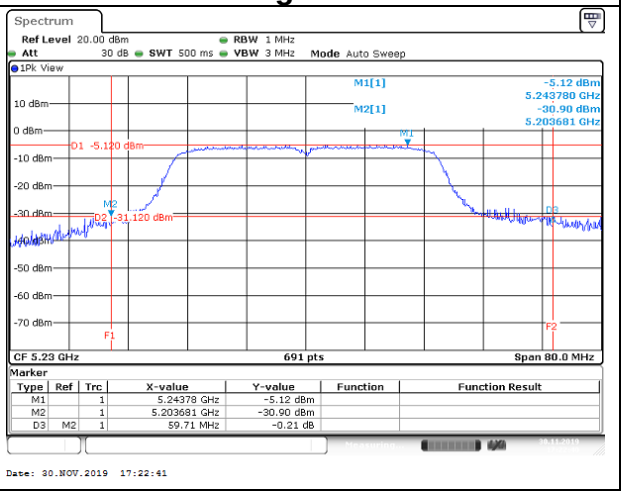


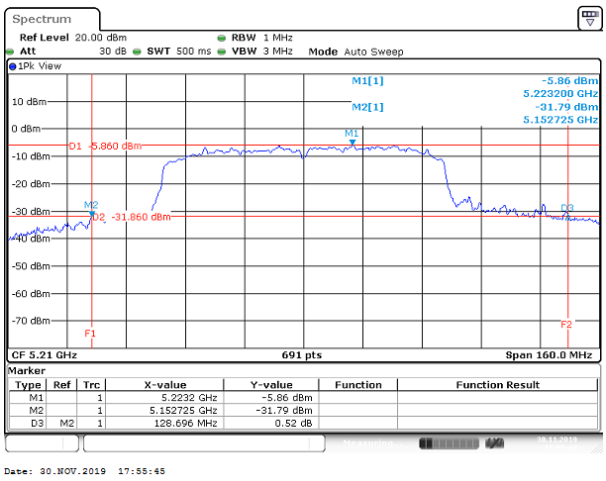
Mid CH



High CH

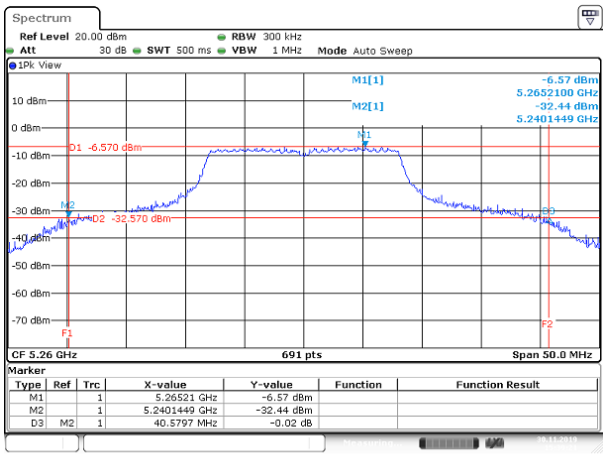


UNII-1 IEEE 802.11n HT40 mode	
Low CH	**High CH**
	

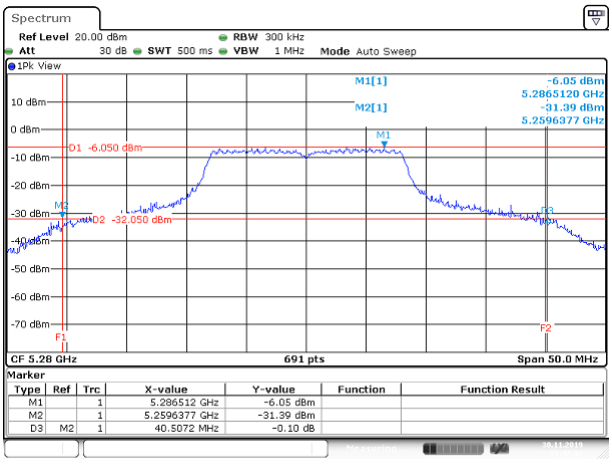
UNII-1 IEEE 802.11ac VHT80 mode	
Mid CH	
	

UNII-2a IEEE 802.11a mode

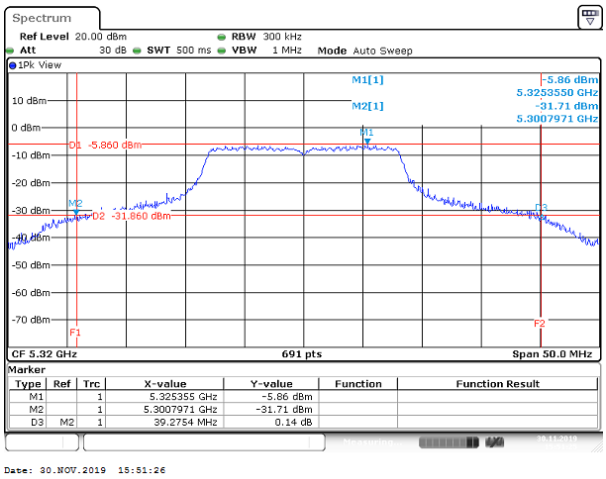
Low CH



Mid CH

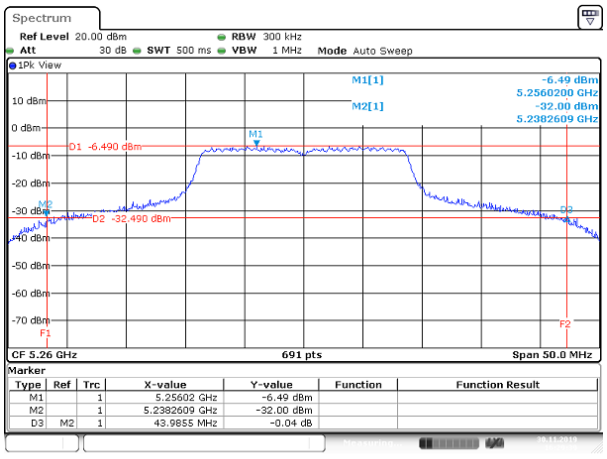


High CH

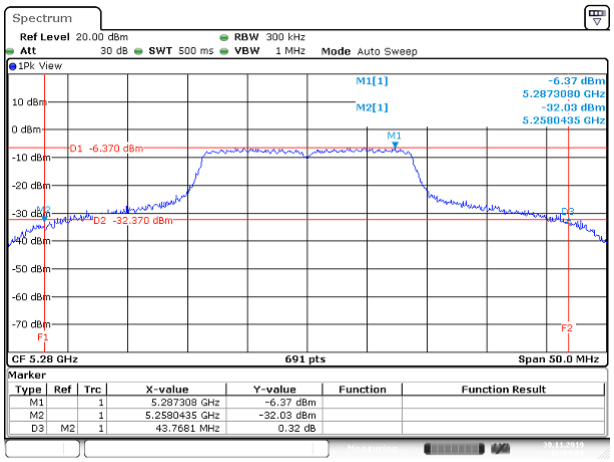


UNII-2a IEEE 802.11n HT20 mode

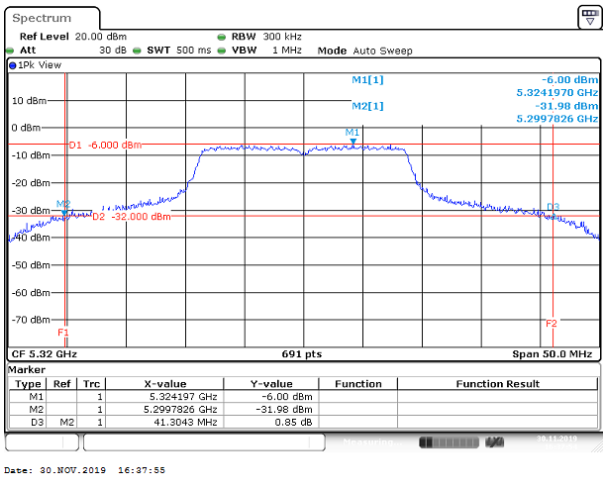
Low CH

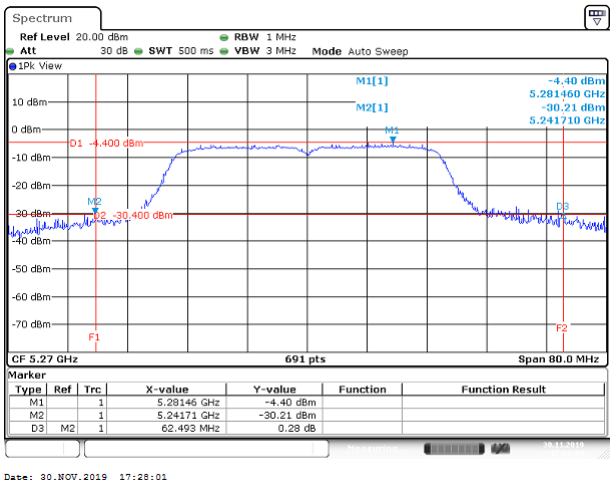
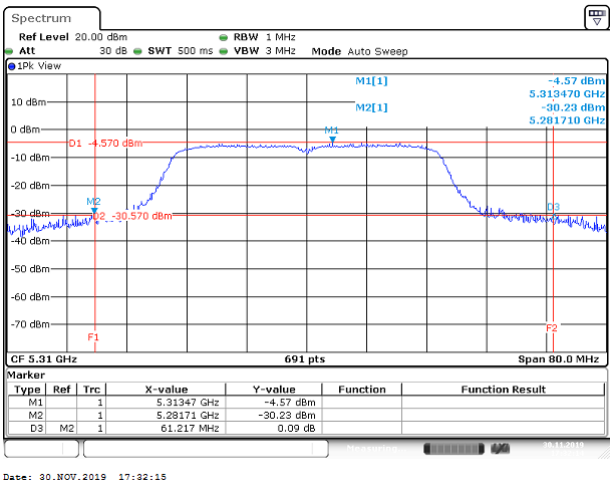


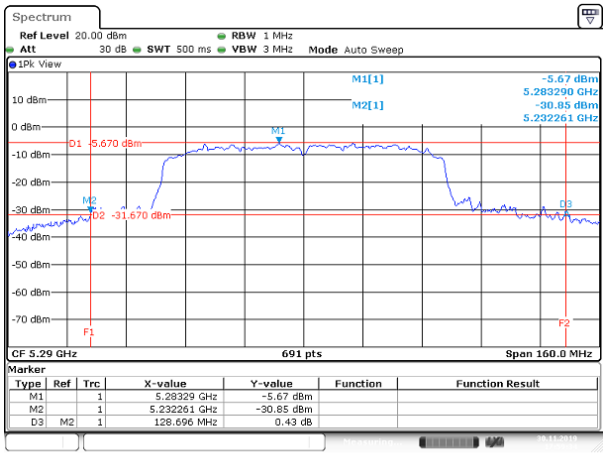
Mid CH



High CH

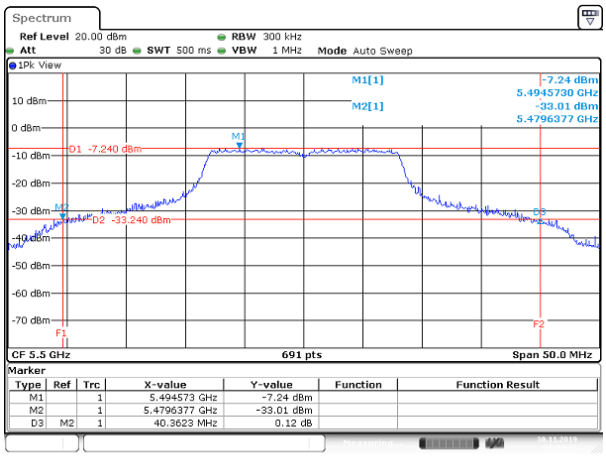


UNII-2a IEEE 802.11n HT40 mode	
Low CH	**High CH**
	

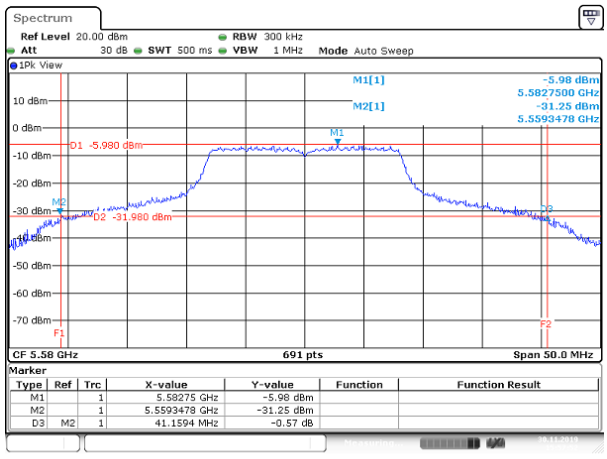
UNII-2a IEEE 802.11ac VHT80 mode	
Mid CH	
	

UNII-2c IEEE 802.11a mode

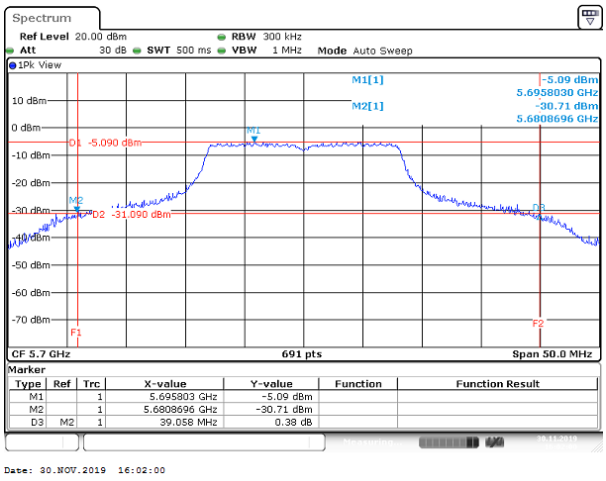
Low CH

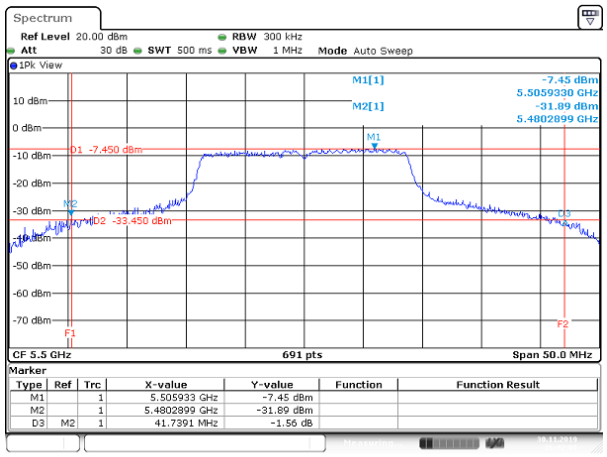
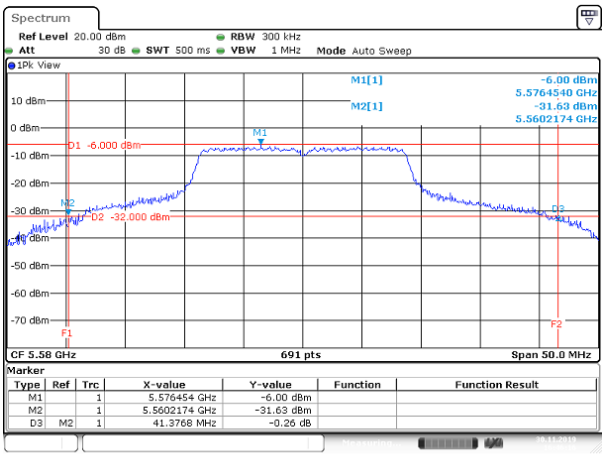
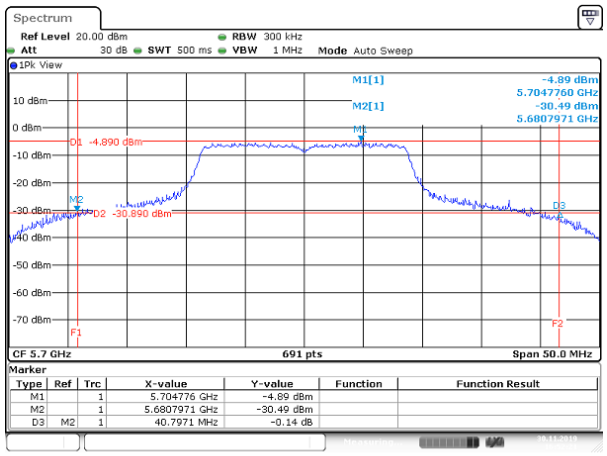


Mid CH



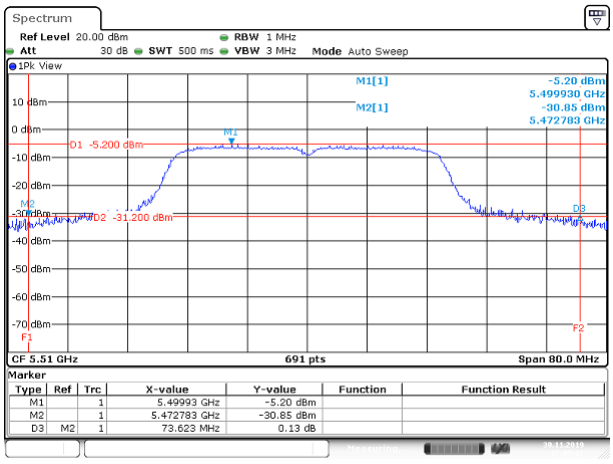
High CH



UNII-2c IEEE 802.11n HT20 mode	
Low CH	**Mid CH**
	
High CH	
	

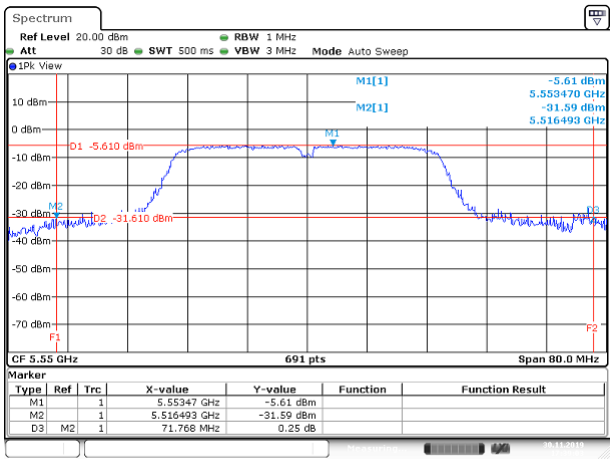
UNII-2c IEEE 802.11n HT40 mode

Low CH



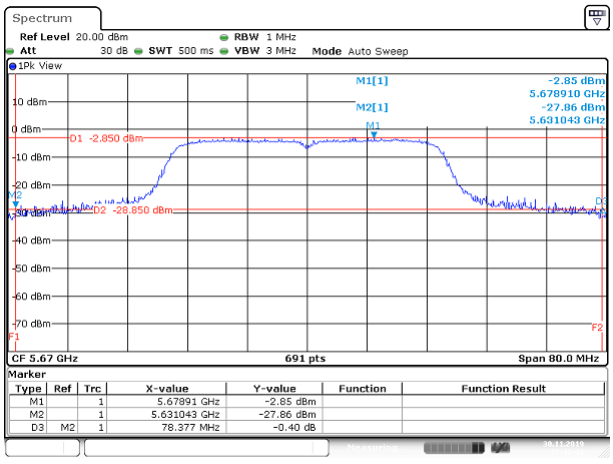
Date: 30.NOV.2019 17:35:18

Mid CH



Date: 30.NOV.2019 17:39:04

High CH



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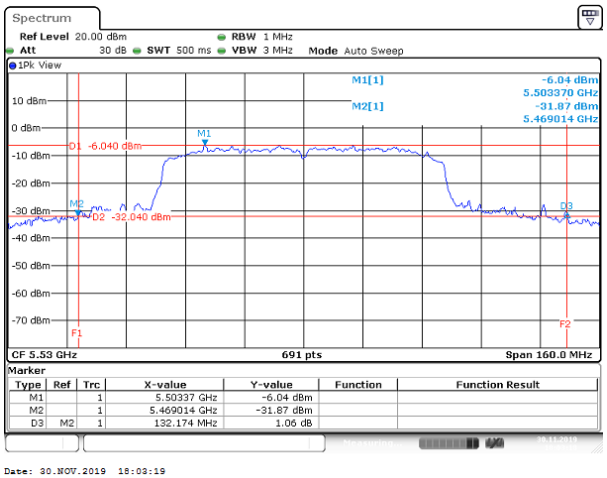
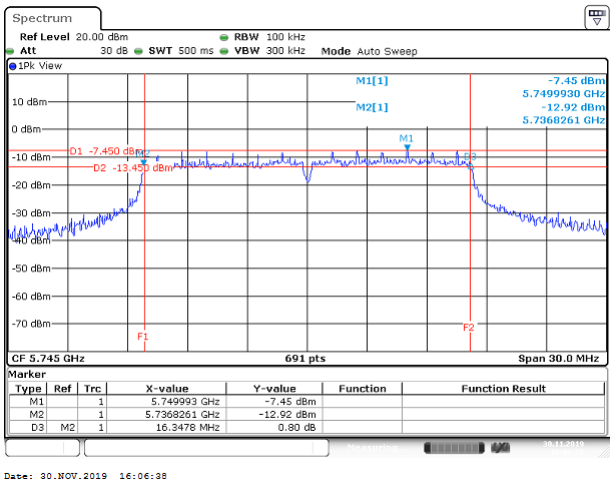
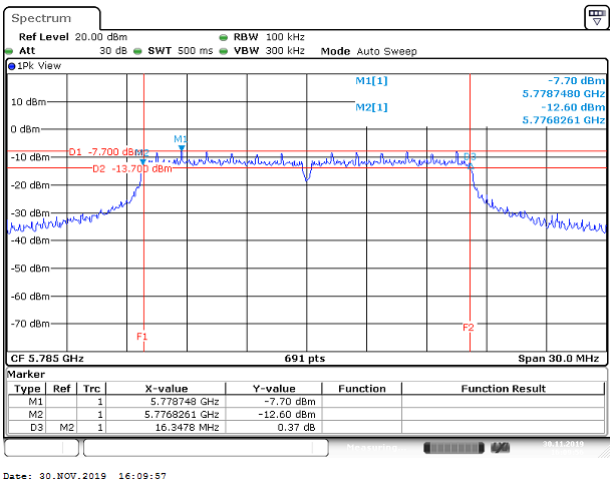
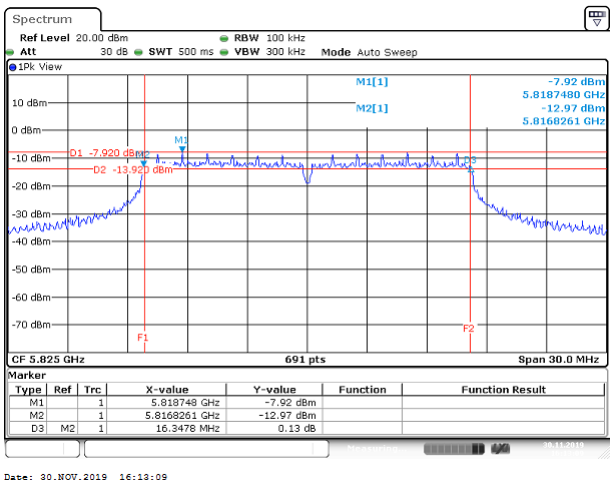
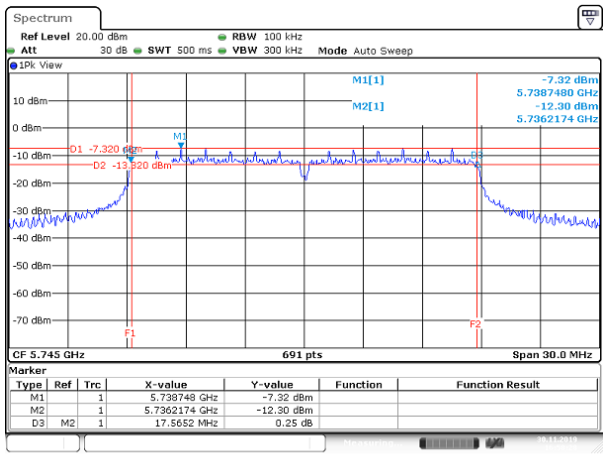
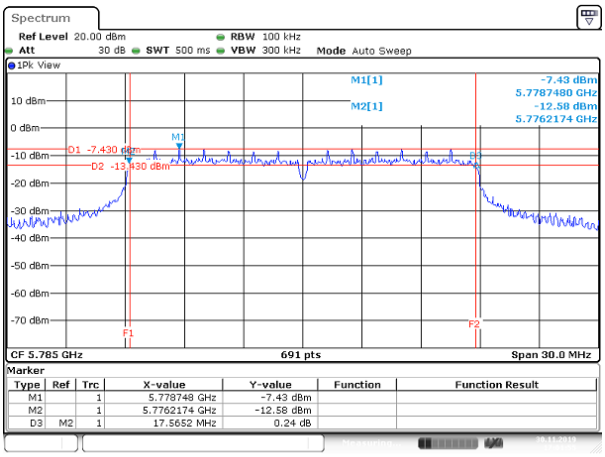
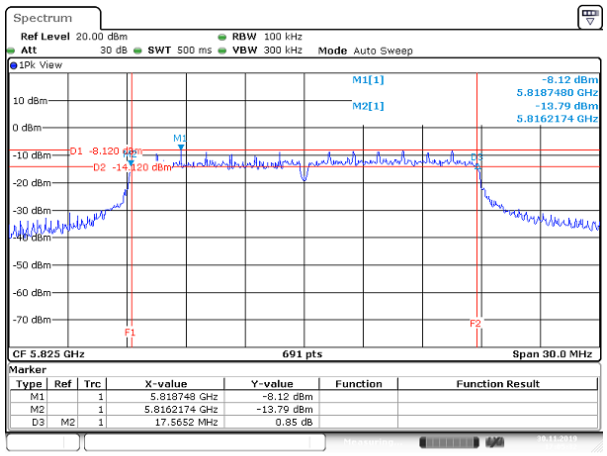
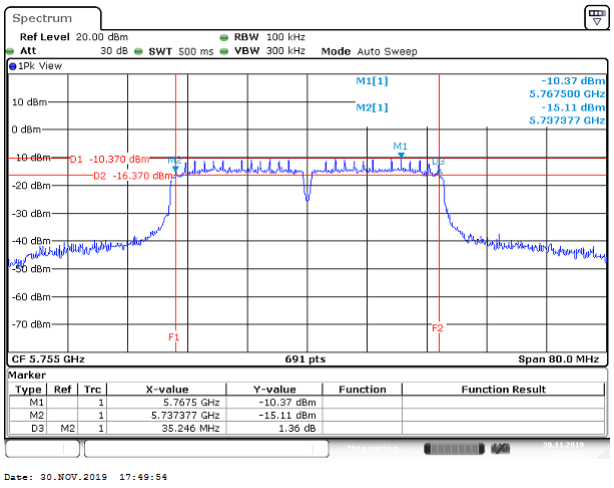
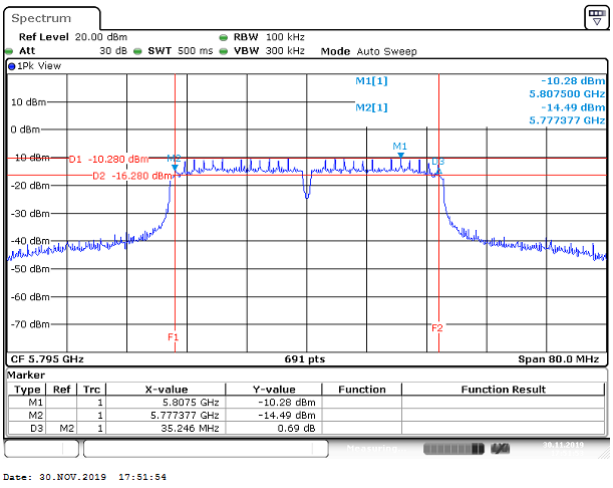
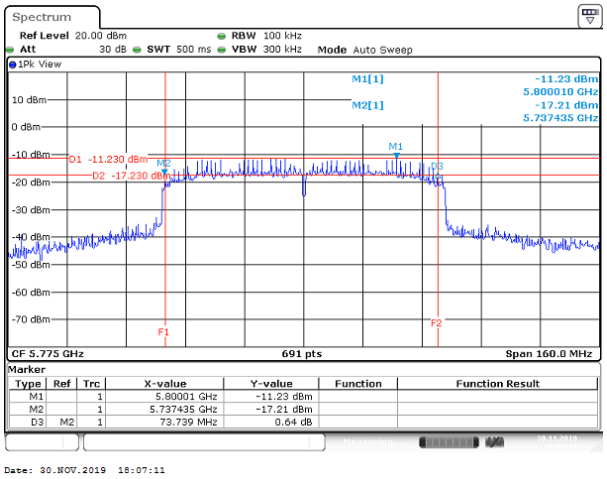
UNII-2c IEEE 802.11ac VHT80 mode	
Mid CH	
	

6dB

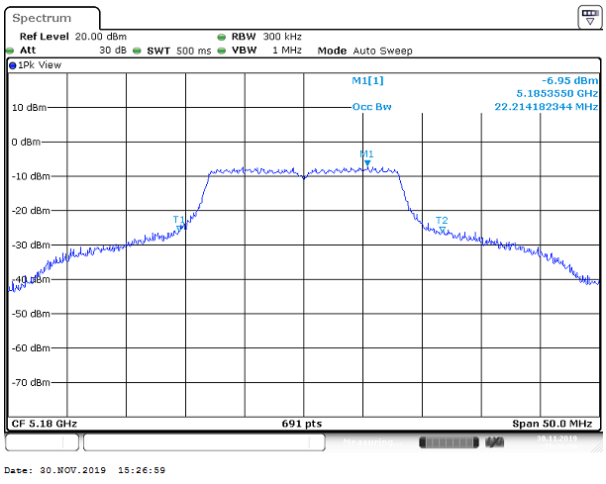
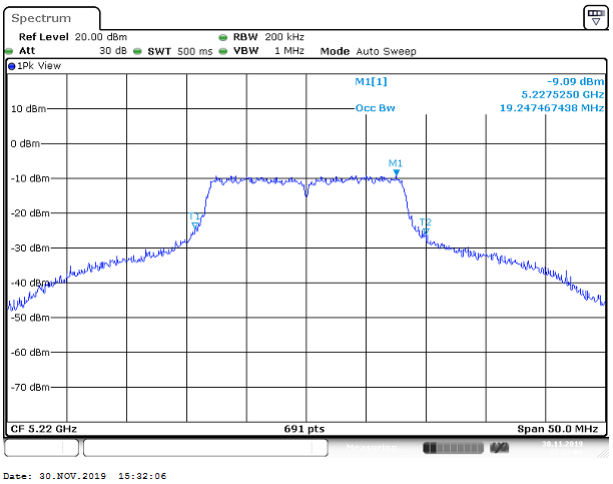
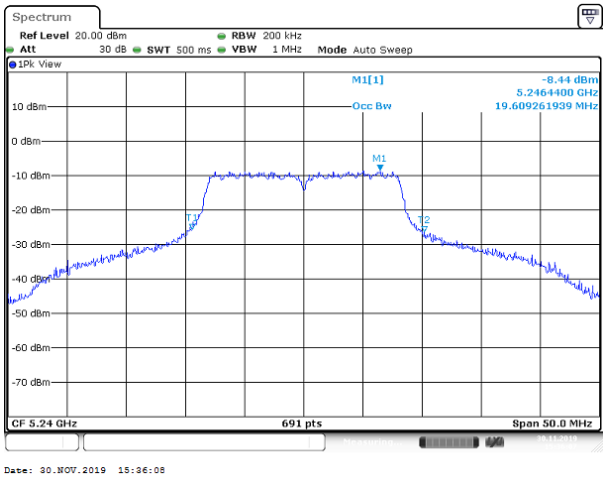
UNII-3 IEEE 802.11a mode	
Low CH	**Mid CH**
	
High CH	
	

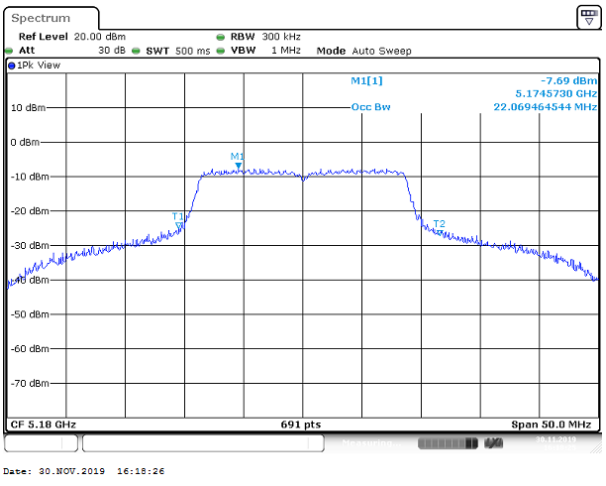
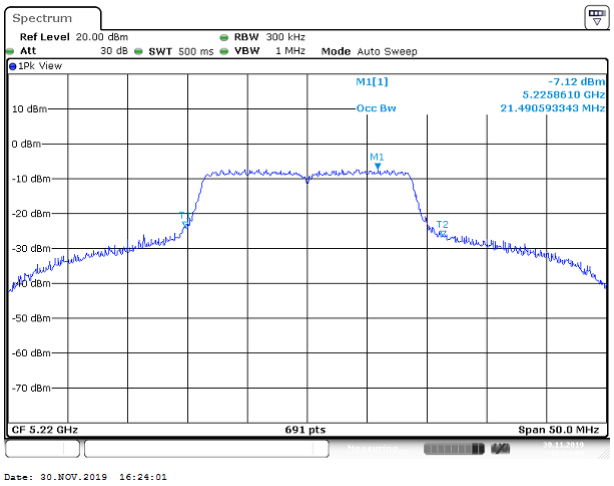
UNII-3 IEEE 802.11n HT20 mode	
Low CH	**Mid CH**
	
High CH	
	

UNII-3 IEEE 802.11n HT40 mode	
Low CH	**High CH**
	

UNII-3 IEEE 802.11ac VHT80 mode	
Mid CH	
	

OBW (99%)

UNII-1 IEEE 802.11a mode	
Low CH	**Mid CH**
	
High CH	
	

UNII-1 IEEE 802.11n HT20 mode	
Low CH	**Mid CH**
	
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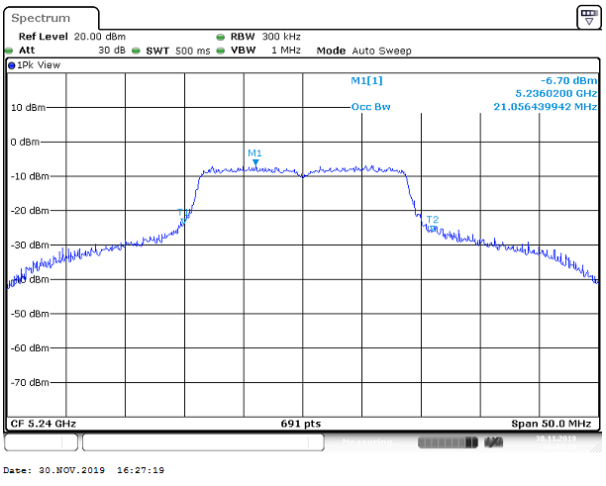
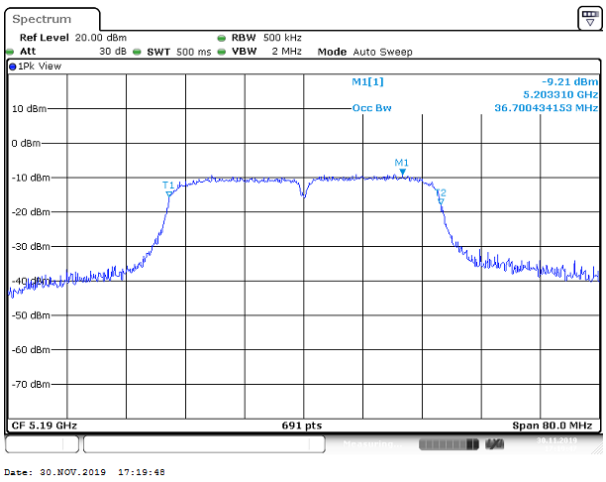
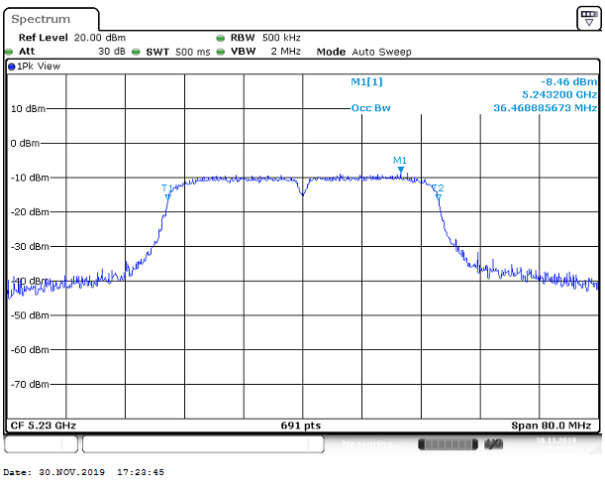
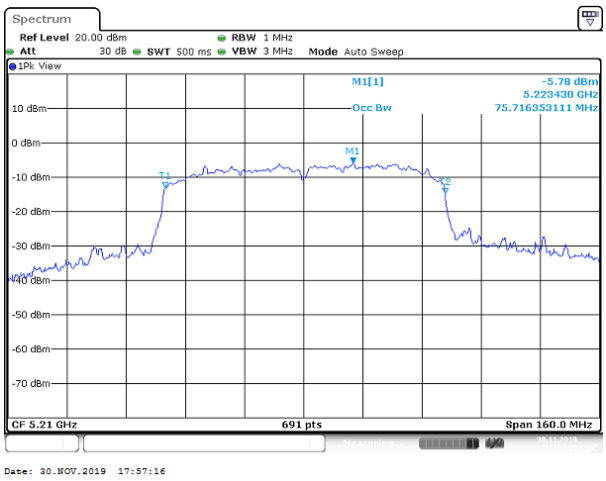
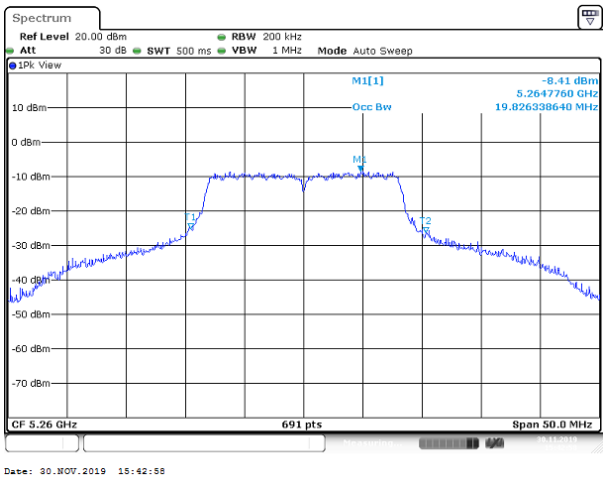
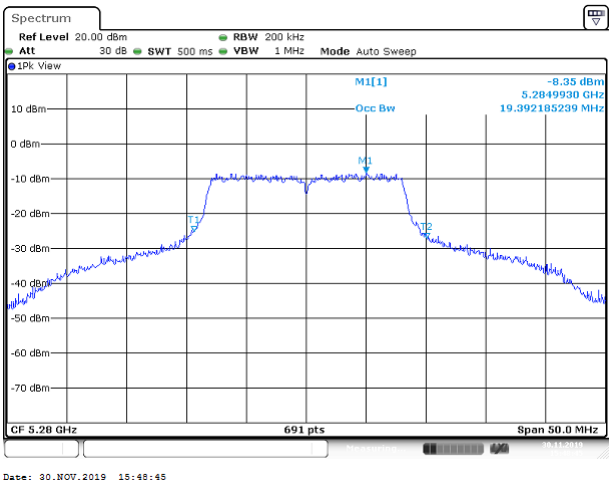
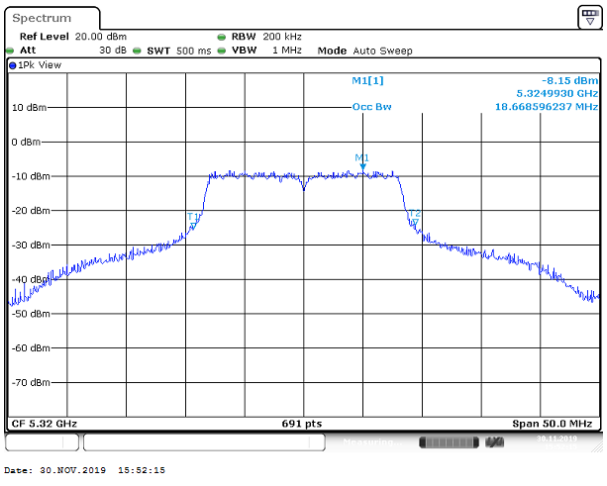
	

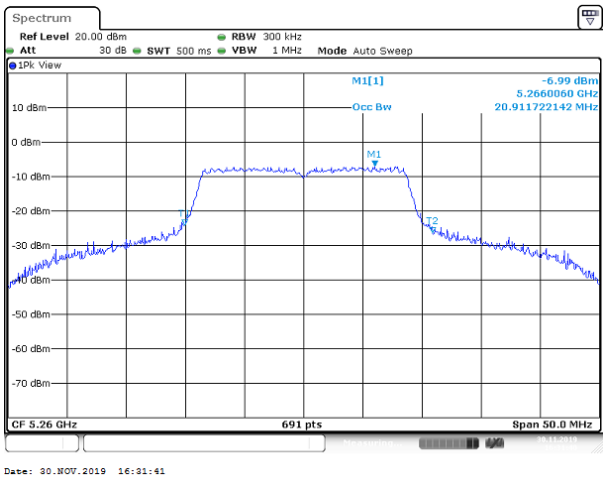
UNII-1 IEEE 802.11n HT40 mode	
Low CH	**High CH**
	

UNII-1 IEEE 802.11ac VHT80 mode	
Mid CH	
	

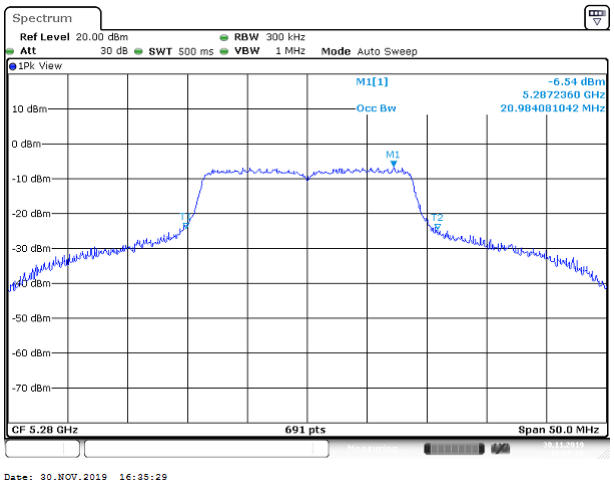
UNII-2a IEEE 802.11a mode	
Low CH	**Mid CH**
	
High CH	
	

UNII-2a IEEE 802.11n HT20 mode

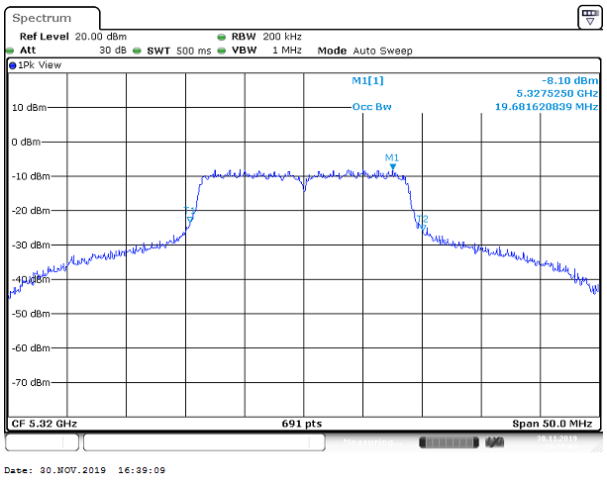
Low CH

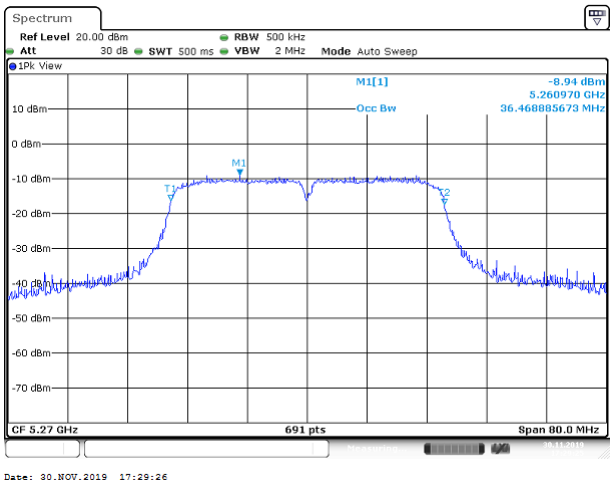
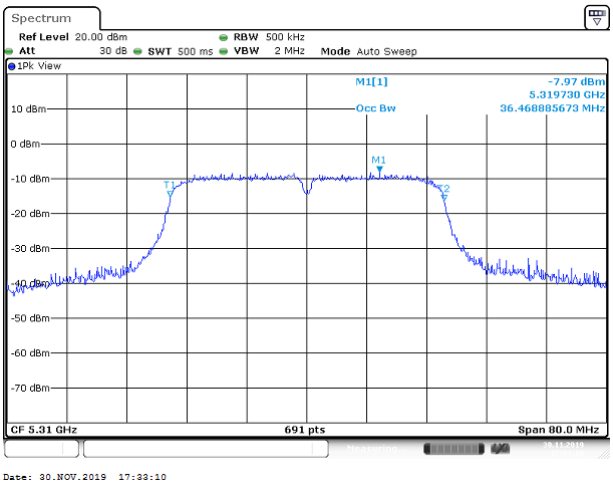


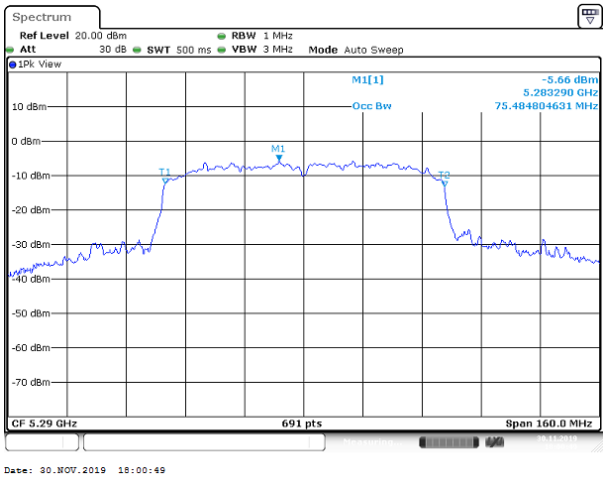
Mid CH

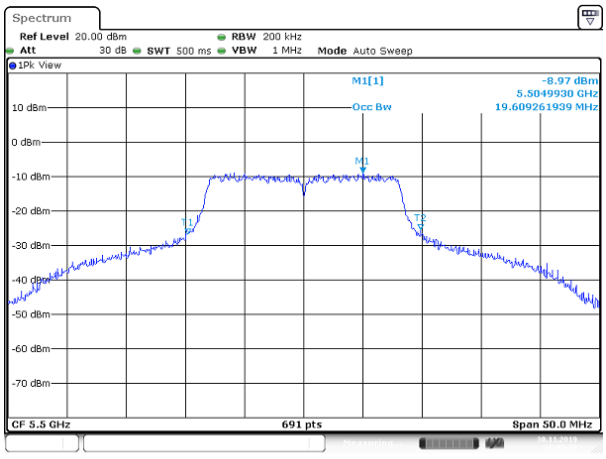
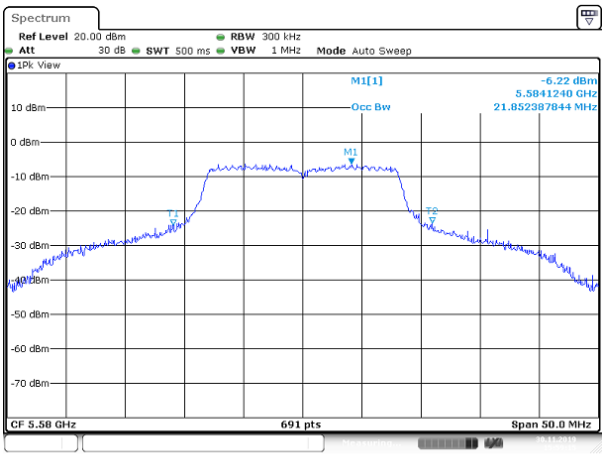
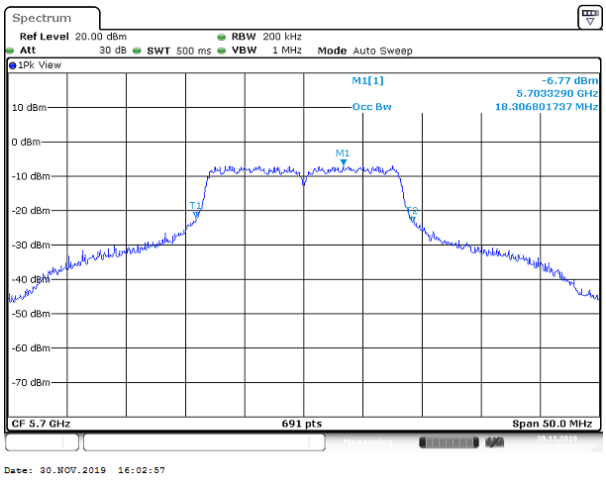


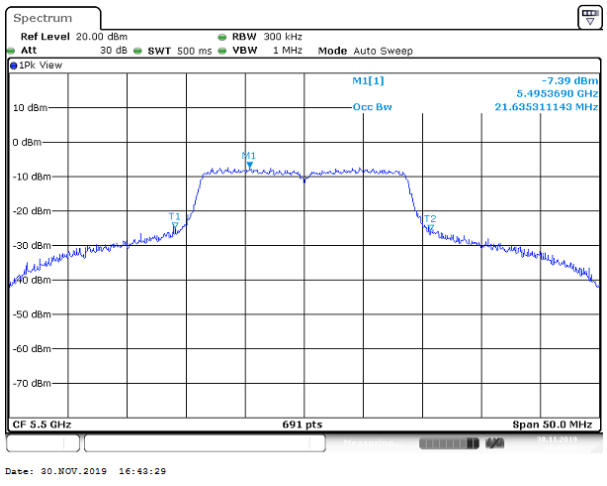
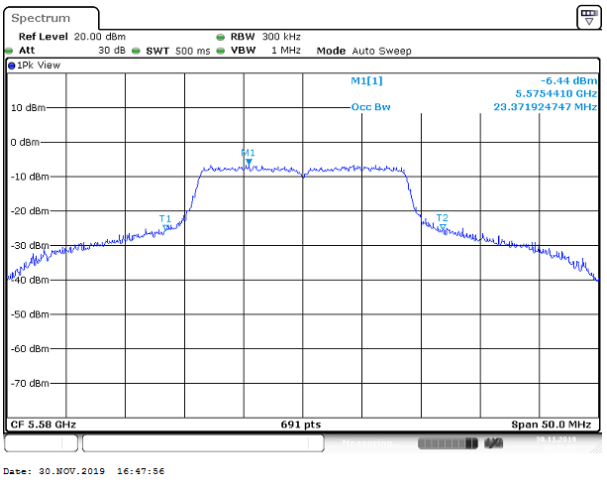
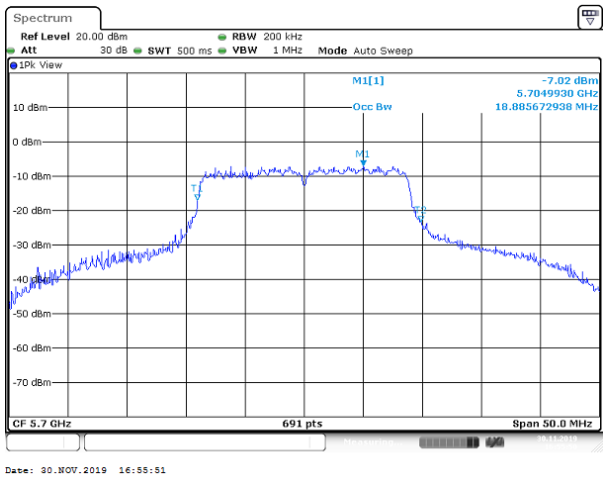
High CH

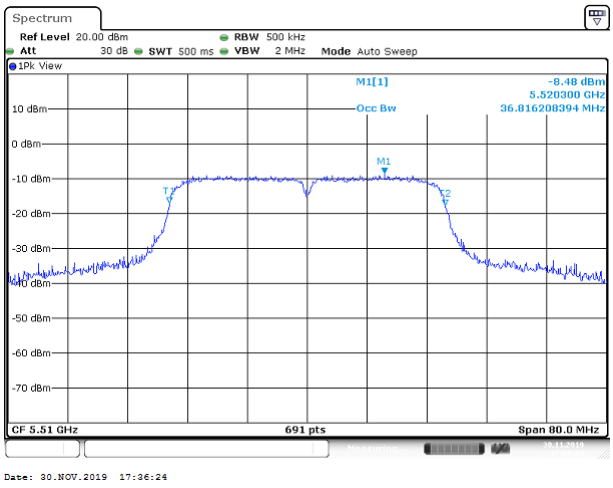
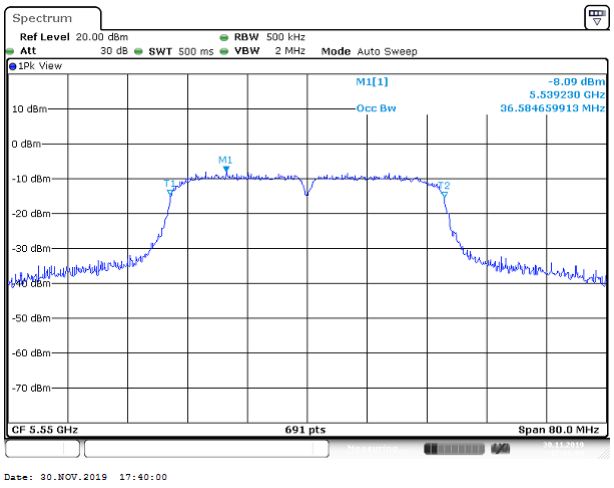
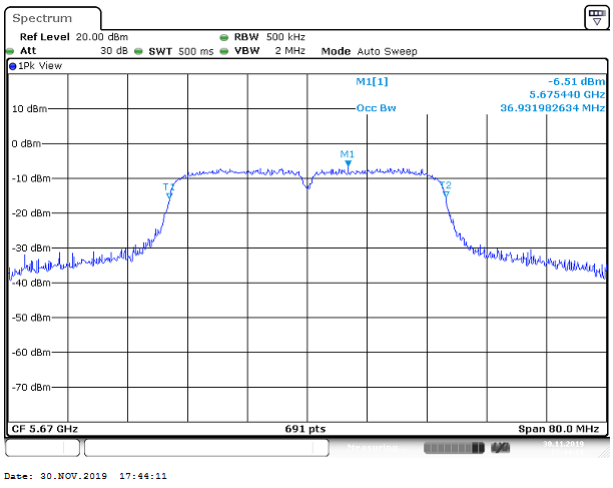


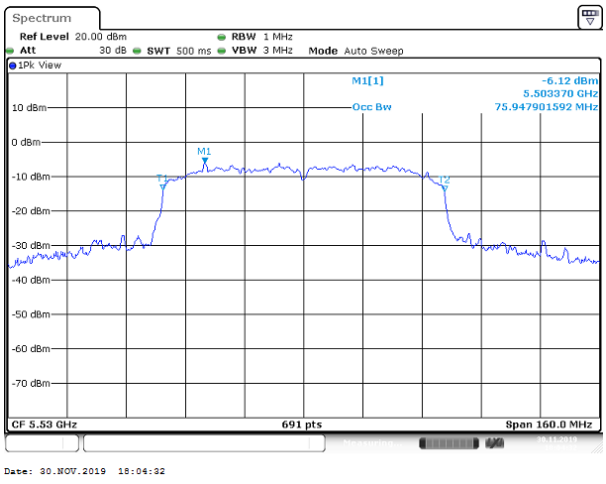
UNII-2a IEEE 802.11n HT40 mode	
Low CH	**High CH**
	

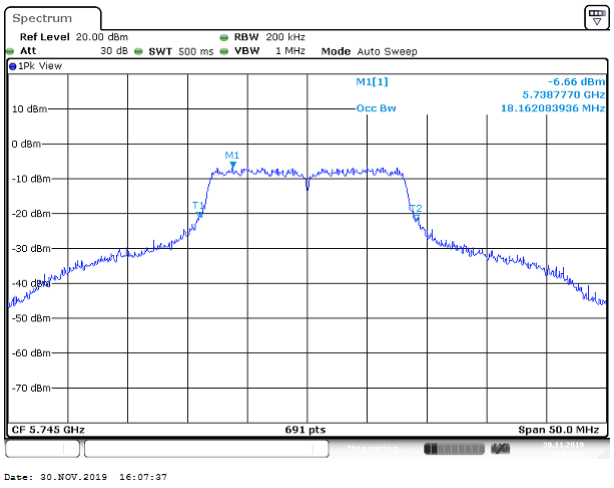
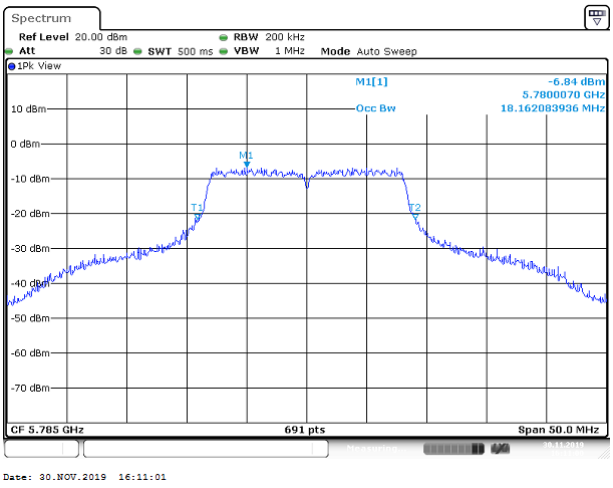
UNII-2a IEEE 802.11ac VHT80 mode	
Mid CH	
	

UNII-2c IEEE 802.11a mode	
Low CH	**Mid CH**
	
High CH	
	

UNII-2c IEEE 802.11n HT20 mode	
Low CH	**Mid CH**
	
High CH	
	

UNII-2c IEEE 802.11n HT40 mode	
Low CH	**Mid CH**
	
High CH	
	

UNII-2c IEEE 802.11ac VHT80 mode	
Mid CH	
	

UNII-3 IEEE 802.11a mode	
Low CH	**Mid CH**
	
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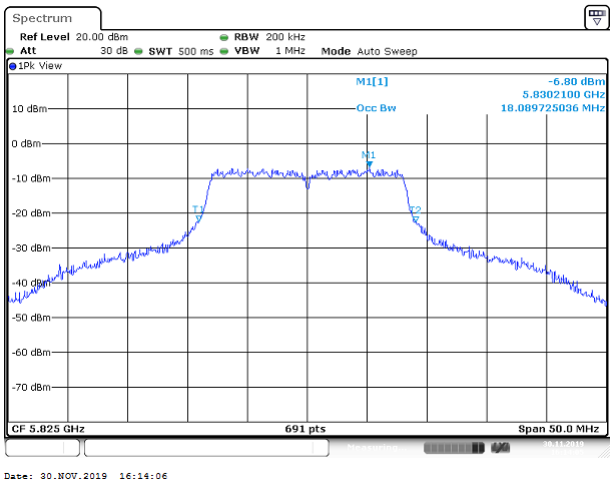
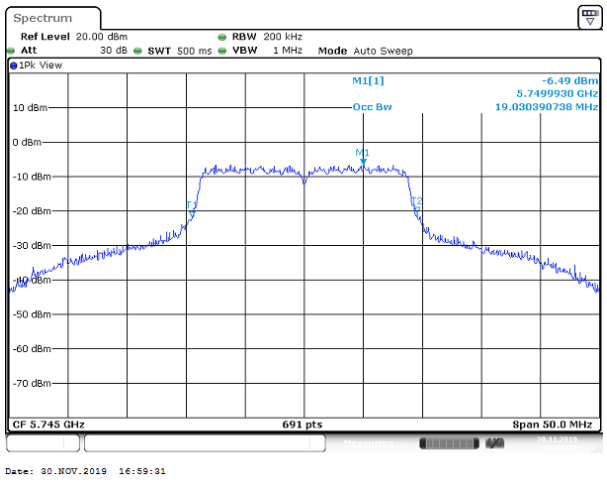
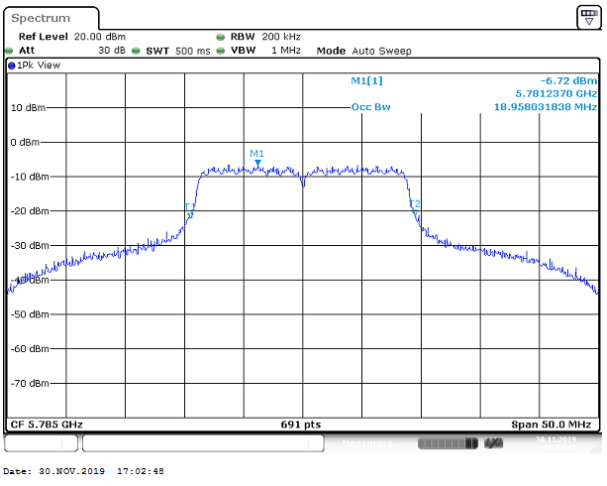
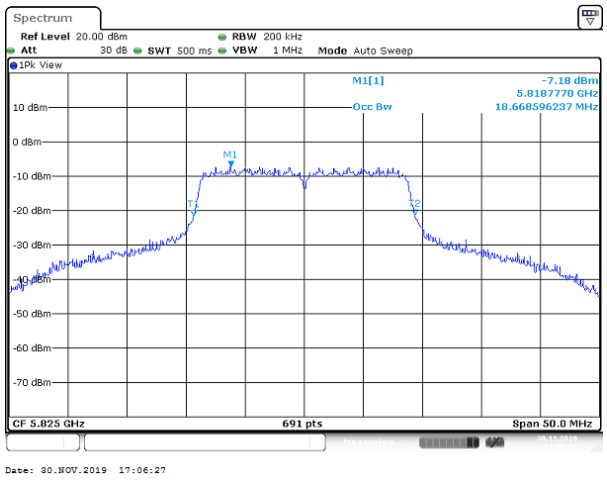
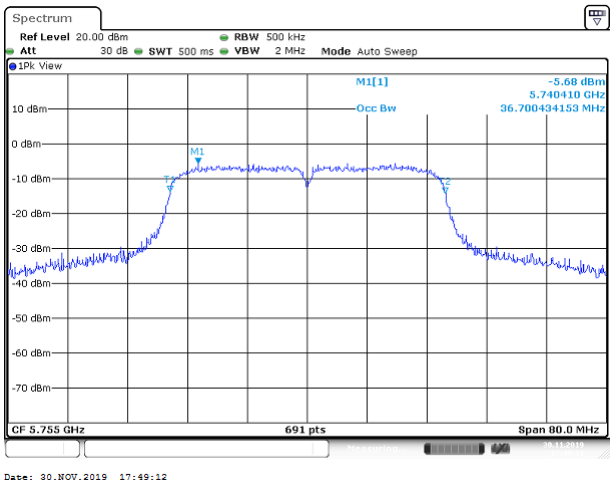
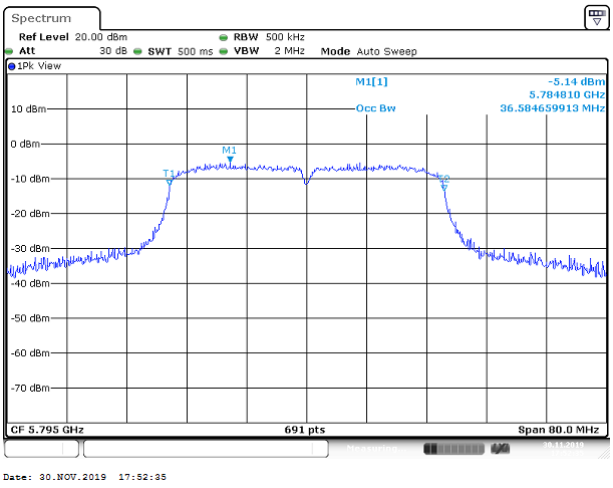
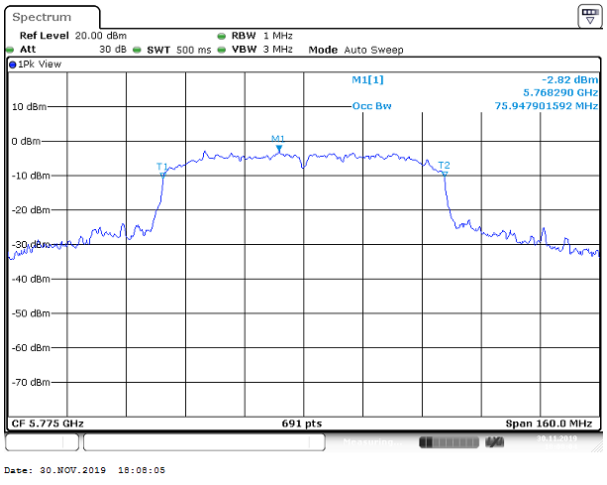
	

UNII-3 IEEE 802.11n HT20 mode	
Low CH	**Mid CH**
	
High CH	
	

UNII-3 IEEE 802.11n HT40 mode	
Low CH	**High CH**
	

UNII-3 IEEE 802.11ac VHT80 mode	
Mid 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

FCC:

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), 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.

IC:

UNII-1 :

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, 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. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

UNII-2a and 2c:

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

UNII-2c (5470-5600 MHz and 5650-5725 MHz)

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

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.

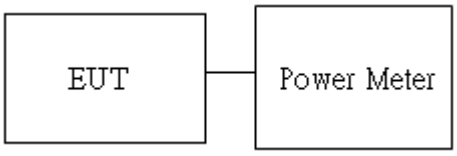
UNII-1 Limit	☒ Antenna not exceed 6 dBi：24dBm (EIRP: 23dBm) ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)]
UNII-2a/2c Limit	☒ Antenna not exceed 6 dBi：24dBm (EIRP: 30dBm) ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)]
UNII-3 Limit	☒ Antenna not exceed 6 dBi：30dBm ☐ Antenna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

4.3.2 Test Procedure

Test method Refer as KDB 789033 D02,

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)	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)
IEEE 802.11a	36	5180	15.5	12.04	12.04	13.29	0.0160	0.0213	1.25	24	23
	44	5220	15.0	12.02	12.02	13.27	0.0159	0.0212			
	48	5240	15.5	12.27	12.27	13.52	0.0169	0.0225			
IEEE 802.11n HT20	36	5180	15.5	12.33	12.33	13.58	0.0171	0.0228			
	44	5220	15.5	12.32	12.32	13.57	0.0170	0.0227			
	48	5240	17	12.13	12.13	13.38	0.0163	0.0218			
IEEE 802.11n HT40	38	5190	15.0	12.25	12.25	13.50	0.0168	0.0224			
	46	5230	15.5	12.45	12.45	13.70	0.0176	0.0234			
IEEE 802.11ac VHT80	42	5210	14.0	13.01	13.01	14.26	0.0200	0.0267			

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)
IEEE 802.11a	52	5260	14.0	12.06	12.06	13.31	0.0161	0.0214	1.25	24	30
	56	5280	14.5	12.27	12.27	13.52	0.0169	0.0225			
	64	5320	14.5	12.07	12.07	13.32	0.0161	0.0215			
IEEE 802.11n HT20	52	5260	14.0	12.09	12.09	13.34	0.0162	0.0216			
	56	5280	14.5	12.22	12.22	13.47	0.0167	0.0222			
	64	5320	14.5	11.97	11.97	13.22	0.0157	0.0210			
IEEE 802.11n HT40	54	5270	14.5	12.31	12.31	13.56	0.0170	0.0227			
	62	5310	17.0	12.33	12.33	13.58	0.0171	0.0228			
IEEE 802.11ac VHT80	58	5290	15.0	11.51	11.51	12.76	0.0142	0.0189			

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)**
IEEE 802.11a	100	5500	15.0	11.34	11.34	12.59	0.0136	0.0181	1.25	24	30
	116	5580	14.0	11.21	11.21	12.46	0.0132	0.0176			
	140	5700	12.5	11.32	11.32	12.57	0.0135	0.0181			
IEEE 802.11n HT20	100	5500	15.0	11.38	11.38	12.63	0.0137	0.0183			
	116	5580	14.0	11.27	11.27	12.52	0.0134	0.0179			
	140	5700	12.5	11.29	11.29	12.54	0.0135	0.0179			
IEEE 802.11n HT40	102	5510	15.0	11.25	11.25	12.50	0.0133	0.0178			
	110	5550	14.5	11.15	11.15	12.40	0.0130	0.0174			
	134	5670	13.0	11.30	11.30	12.55	0.0135	0.0180			
IEEE 802.11ac VHT80	106	5530	12.0	10.32	10.32	11.57	0.0108	0.0144			

UNII-3										
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)**
IEEE 802.11a	149	5745	12.5	11.53	11.53	12.78	0.0142	0.0190	1.25	30
	157	5785	13.0	11.99	11.99	13.24	0.0158	0.0211		
	165	5825	13.0	11.97	11.97	13.22	0.0157	0.0210		
IEEE 802.11n HT20	149	5475	12.5	11.48	11.48	12.73	0.0141	0.0187		
	157	5785	12.5	11.54	11.54	12.79	0.0143	0.0190		
	165	5825	13.0	12.01	12.01	13.26	0.0159	0.0212		
IEEE 802.11n HT40	151	5755	13.0	11.68	11.68	12.93	0.0147	0.0196		
	159	5795	13.5	11.90	11.90	13.15	0.0155	0.0207		
IEEE 802.11ac VHT80	155	5775	11.5	10.80	10.80	12.05	0.0120	0.0160		