

FCC REPORT (UNII)

Applicant: PAX Technology Limited

Address of Applicant: Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong

Equipment Under Test (EUT)

Product Name: CM20 Communication Module

Model No.: CM20

Trade mark: PAX

FCC ID: V5PCM20W

Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407

Date of sample receipt: 23 Aug., 2019

Date of Test: 24 Aug., to 24 Sep., 2019

Date of report issued: 18 Oct., 2019

Test Result: PASS*

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2 Version

Version No.	Date	Description
00	25 Sep., 2019	Original
01	18 Oct., 2019	Update page 12, 13, 39~43, 81

Tested by:



Date:

18 Oct., 2019

Test Engineer

Reviewed by:



Date:

18 Oct., 2019

Project Engineer

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4 Test Summary

Test Item	Section in CFR 47	Test Result
Antenna requirement	15.203 & 15.407 (a)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.407 (a) (1) (iv) & (a) (3)	Pass
26dB Occupied Bandwidth	15.407 (a) (5)	Pass
6dB Emission Bandwidth	15.407(e)	Pass
Power Spectral Density	15.407 (a) (1) (iv) & (a) (3)	Pass
Band Edge	15.407(b)	Pass
Spurious Emission	15.407 (b) & 15.205 & 15.209	Pass
Frequency Stability	15.407(g)	Pass

Pass: The EUT complies with the essential requirements in the standard.
N/A: N/A: Not Applicable.

5 General Information

5.1 Client Information

Applicant:	PAX Technology Limited
Address:	Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong
Manufacturer:	PAX Computer Technology (Shenzhen) Co., Ltd.
Address:	4/F, No.3 Building, Software Park, Second Central Science-Tech Road, High-Tech industrial Park, Shenzhen, Guangdong, P.R.C.

5.2 General Description of E.U.T.

Product Name:	CM20 Communication Module
Model No.:	CM20
Operation Frequency:	Band 1: 5150MHz-5250MHz, Band 4: 5725MHz-5825MHz
Channel numbers:	Band 1: 802.11a/802.11n/ac20: 4, 802.11n/ac40: 2, 802.11ac80: 1 Band 4: 802.11a/802.11n/ac20: 5, 802.11n/ac40: 2, 802.11ac80: 1
Channel separation:	802.11a/802.11n/ac20: 20MHz, 802.11n/ac40: 40MHz, 802.11ac80: 80MHz
Modulation technology (IEEE 802.11a):	BPSK, QPSK, 16-QAM, 64-QAM
Modulation technology (IEEE 802.11n):	BPSK, QPSK, 16-QAM, 64-QAM
Modulation technology (IEEE 802.11ac):	BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
Data speed (IEEE 802.11a):	6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps
Data speed (IEEE 802.11n20):	MCS0: 6.5Mbps, MCS1:13Mbps, MCS2:19.5Mbps, MCS3:26Mbps, MCS4:39Mbps, MCS5:52Mbps, MCS6:58.5Mbps, MCS7:65Mbps
Data speed (IEEE 802.11n40):	MCS0:15Mbps, MCS1:30Mbps, MCS2:45Mbps, MCS3:60Mbps, MCS4:90Mbps, MCS5:120Mbps, MCS6:135Mbps, MCS7:150Mbps
Data speed (IEEE 802.11ac):	Up to 433.3Mbps
Antenna Type:	External Antenna
Antenna gain:	1.0 dBi
AC adapter:	Model No: GLH0901000 Input: AC100-240V, 50/60Hz, 0.5A Output: DC 9.0V, 1.0A
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

Operation Frequency each of channel					
Band 1					
802.11a/802.11n/ac20		802.11n/ac40		802.11ac80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	38	5190MHz	42	5210MHz
40	5200MHz	46	5230MHz		
44	5220MHz				
48	5240MHz				
Band 4					
802.11a/802.11n/ac20		802.11n/ac40		802.11ac80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745MHz	151	5755MHz	155	5775MHz
153	5765MHz	159	5795MHz		
157	5785MHz				
161	5805MHz				
165	5825MHz				

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Band 1					
802.11a/802.11n/ac20		802.11n/ac40		802.11ac80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
Lowest	5180MHz	Lowest	5190MHz	Middle	5210MHz
Middle	5200MHz	Highest	5230MHz		
Highest	5240MHz				
Band 4					
802.11a/802.11n/ac20		802.11n/ac40		802.11ac80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
Lowest	5745MHz	Lowest	5755MHz	Middle	5775MHz
Middle	5785MHz	Highest	5795MHz		
Highest	5825MHz				

5.3 Test environment and test mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Continuously transmitting mode	Keep the EUT in 100% duty cycle transmitting with modulation.
We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:	
Per-scan all kind of data rate, and found the follow list were the worst case.	
Mode	Data rate
802.11a	6 Mbps
802.11n20	6.5 Mbps
802.11n40	13 Mbps
802.11ac	29.3 Mbps

5.4 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
LENOVO	Laptop	SL510	2847A65	DoC

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Emission (9kHz ~ 30MHz)	±1.60 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.38 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±3.36 dB (k=2)

5.6 Related Submittal(s) / Grant (s)

This is an original grant, no related submittals and grants.

5.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Designation No.: CN1211**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

- **ISED – CAB Identifier.: CN0021**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

5.8 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
 Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,
 Bao'an District, Shenzhen, Guangdong, China
 Tel: +86-755-23118282, Fax: +86-755-23116366
 Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

5.9 Test Instruments list

Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-18-2019	03-17-2020
Biconical Antenna	SCHWARZBECK	VUBA9117	359	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-18-2019	03-17-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-21-2018	11-20-2019
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-18-2019	03-17-2020
Pre-amplifier	CD	PAP-1G18	11804	03-18-2019	03-17-2020
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-18-2019	03-17-2020
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-21-2018	11-20-2019
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-18-2019	03-17-2020
Spectrum Analyzer	Agilent	N9020A	MY50510123	11-10-2018	11-09- 2019
Signal Generator	Rohde & Schwarz	SMX	835454/016	03-18-2019	03-17-2020
Signal Generator	R&S	SMR20	1008100050	03-18-2019	03-17-2020
RF Switch Unit	MWRFTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTEST	MTS8200	Version: 2.0.0.0		
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-18-2019	03-17-2020
Cable	MICRO-COAX	MFR64639	K10742-5	03-18-2019	03-17-2020
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-18-2019	03-17-2020
DC Power Supply	XinNuoEr	WYK-10020K	1409050110020	10-31-2018	10-30-2019
Temperature Humidity Chamber	HengPu	HPGDS-500	20140828008	09-24-2018	09-23-2019
Simulated Station	Rohde & Schwarz	CMW500	140493	07-16-2018	07-15-2019

Conducted Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESCI	101189	03-18-2019	03-17-2020
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-18-2019	03-17-2020
LISN	CHASE	MN2050D	1447	03-18-2019	03-17-2020
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2018	07-20-2021
Cable	HP	10503A	N/A	03-18-2019	03-17-2020
EMI Test Software	AUDIX	E3	Version: 6.110919b		

6 Test results and Measurement Data

6.1 Antenna requirement

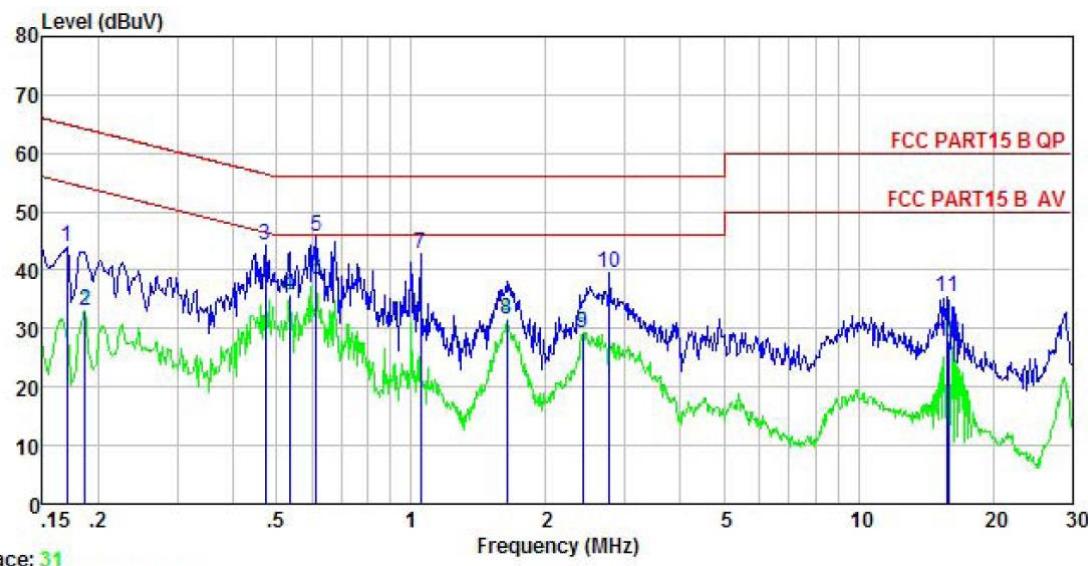
Standard requirement:	FCC Part15 E Section 15.203 /407(a)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.
E.U.T Antenna:	The Wi-Fi antenna is an External antenna which cannot replace by end-user, the best case gain of the antenna is 1.0 dBi.
<p>A photograph of the test equipment. On the left is a black power adapter with a cord. Next to it is a black omnidirectional Wi-Fi antenna with a coiled cable. To the right is the main device, a black rectangular unit with various ports and labels: 'Digital I/O', 'USB-HOST', 'RS232', 'LAN', 'USB-SLAVE', 'RST', and 'POWER'. A red arrow points to the 'Wi-Fi ANT' port on the top edge of the device. A red box highlights the 'Wi-Fi ANT Port' label. A metal ruler is positioned vertically next to the device for scale, showing markings from 0 to 250 mm.</p>	

6.2 Conducted Emission

Test Requirement:	FCC Part15 C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9kHz, VBW=30kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	
	0.15-0.5	66 to 56*	0.15-0.5
	0.5-5	56	0.5-5
	5-30	60	5-30
* Decreases with the logarithm of the frequency.			
Test procedure	<ol style="list-style-type: none"> The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). It provides a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 		
Test setup:	<p style="text-align: center;">Reference Plane</p> <p><i>Remark:</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>		
Test Instruments:	Refer to section 5.9 for details		
Test mode:	Refer to section 5.3 for details.		
Test results:	Passed		

Measurement Data:

Product name:	CM20 Communication Module	Product model:	CM20
Test by:	Mike	Test mode:	802.11a-5745MHz TX mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5°C Huni: 55%

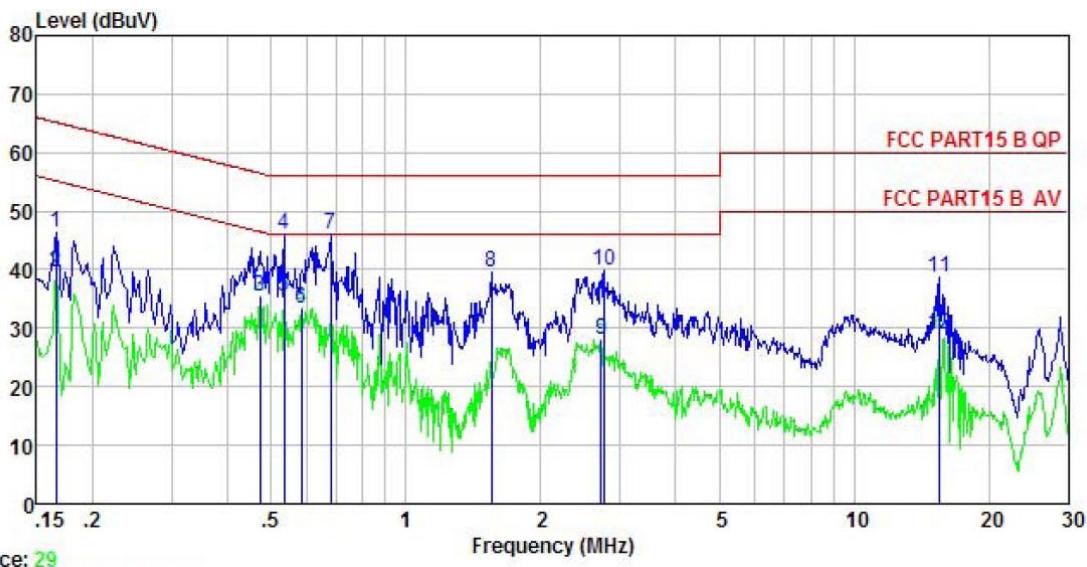


Freq	Read	LISN	Cable	Limit	Over	Line	Limit	Remark
	Freq	Level	Factor					
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.170	33.50	-0.43	10.77	43.84	64.94	-21.10	QP
2	0.186	22.71	-0.42	10.76	33.05	54.20	-21.15	Average
3	0.471	33.83	-0.38	10.75	44.20	56.49	-12.29	QP
4	0.535	25.45	-0.39	10.76	35.82	46.00	-10.18	Average
5	0.614	35.42	-0.38	10.77	45.81	56.00	-10.19	QP
6	0.614	27.92	-0.38	10.77	38.31	46.00	-7.69	Average
7	1.049	32.16	-0.38	10.88	42.66	56.00	-13.34	QP
8	1.636	21.11	-0.40	10.93	31.64	46.00	-14.36	Average
9	2.422	18.77	-0.42	10.94	29.29	46.00	-16.71	Average
10	2.779	29.02	-0.43	10.93	39.52	56.00	-16.48	QP
11	15.718	25.27	-0.73	10.90	35.44	60.00	-24.56	QP
12	15.970	17.48	-0.74	10.91	27.65	50.00	-22.35	Average

Notes:

- An initial pre-scan was performed on the line and neutral lines with peak detector.
- Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- Final Level = Receiver Read level + LISN Factor + Cable Loss.

Product name:	CM20 Communication Module	Product model:	CM20
Test by:	Mike	Test mode:	802.11a-5745MHz TX mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5°C Huni: 55%

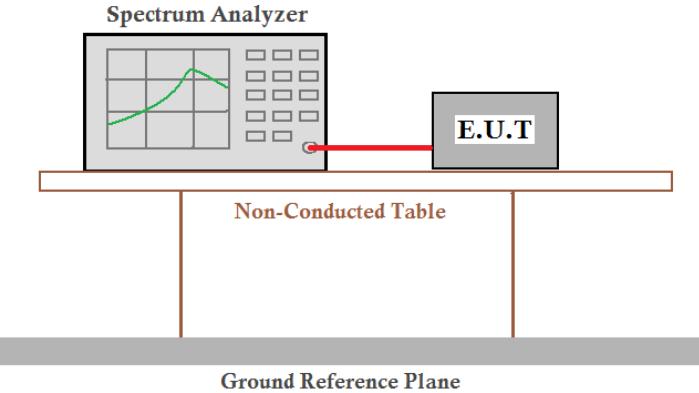


Freq MHz	Read Level dBuV	LISN Factor dB	Cable Loss dB	Level dBuV	Limit Line dBuV	Over Limit dB	Over Line Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.166	36.16	-0.68	10.77	46.25	65.16	-18.91 QP
2	0.166	29.59	-0.68	10.77	39.68	55.16	-15.48 Average
3	0.471	25.28	-0.65	10.75	35.38	46.49	-11.11 Average
4	0.535	35.82	-0.65	10.76	45.93	56.00	-10.07 QP
5	0.535	25.44	-0.65	10.76	35.55	46.00	-10.45 Average
6	0.585	23.33	-0.65	10.76	33.44	46.00	-12.56 Average
7	0.679	35.98	-0.64	10.77	46.11	56.00	-9.89 QP
8	1.552	29.27	-0.66	10.93	39.54	56.00	-16.46 QP
9	2.721	17.79	-0.67	10.93	28.05	46.00	-17.95 Average
10	2.765	29.71	-0.67	10.93	39.97	56.00	-16.03 QP
11	15.470	28.53	-0.87	10.90	38.56	60.00	-21.44 QP
12	15.552	18.85	-0.89	10.90	28.86	50.00	-21.14 Average

Notes:

- An initial pre-scan was performed on the line and neutral lines with peak detector.
- Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- Final Level =Receiver Read level + LISN Factor + Cable Loss.

6.3 Conducted Output Power

Test Requirement:	FCC Part15 E Section 15.407 (a) (1) (iv) & (a) (3)
Test Method:	ANSI C63.10: 2013, KDB789033
Limit:	Band 1: 24dBm Band 4: 30dBm
Test setup:	
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

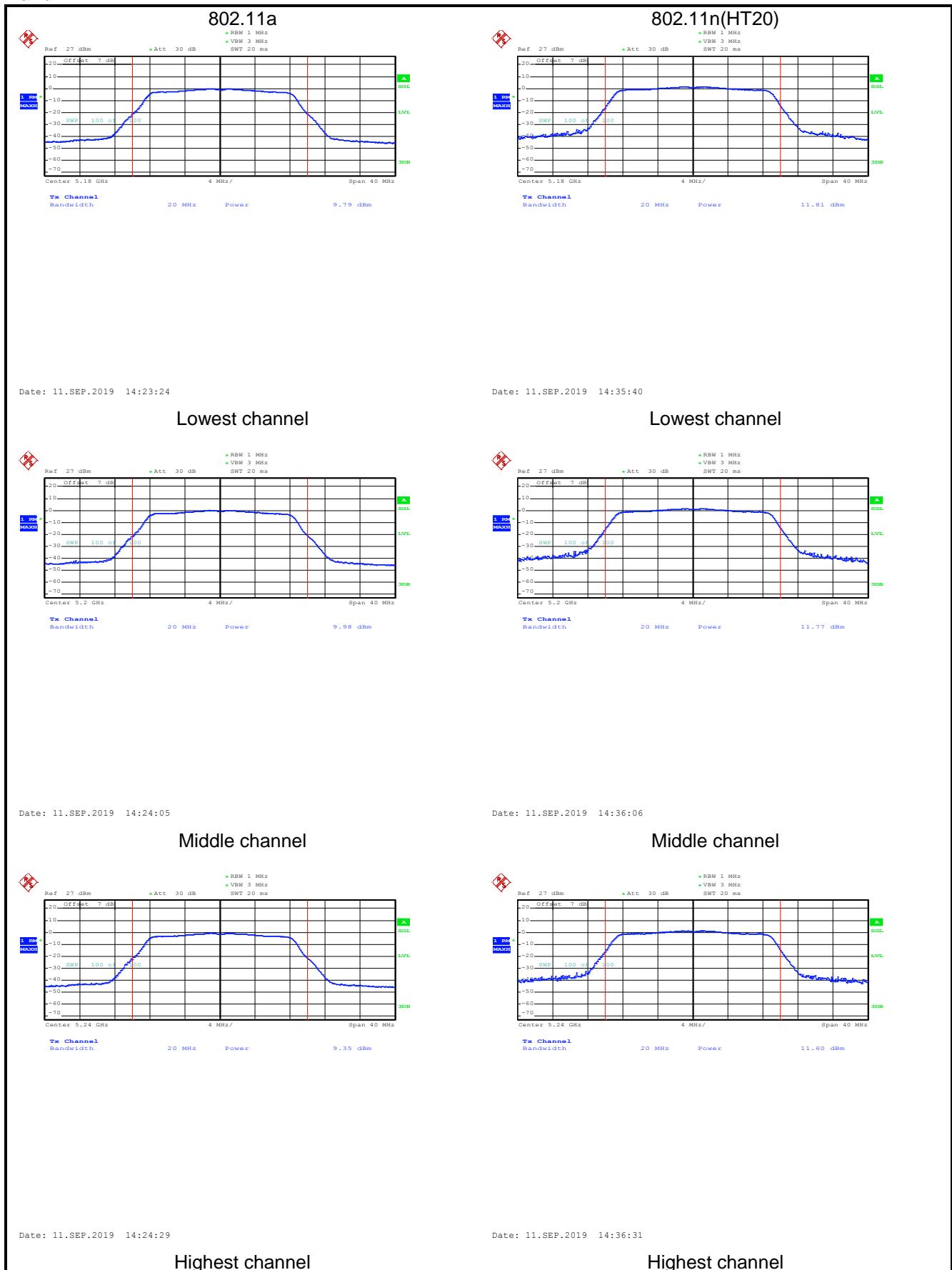
Measurement Data:

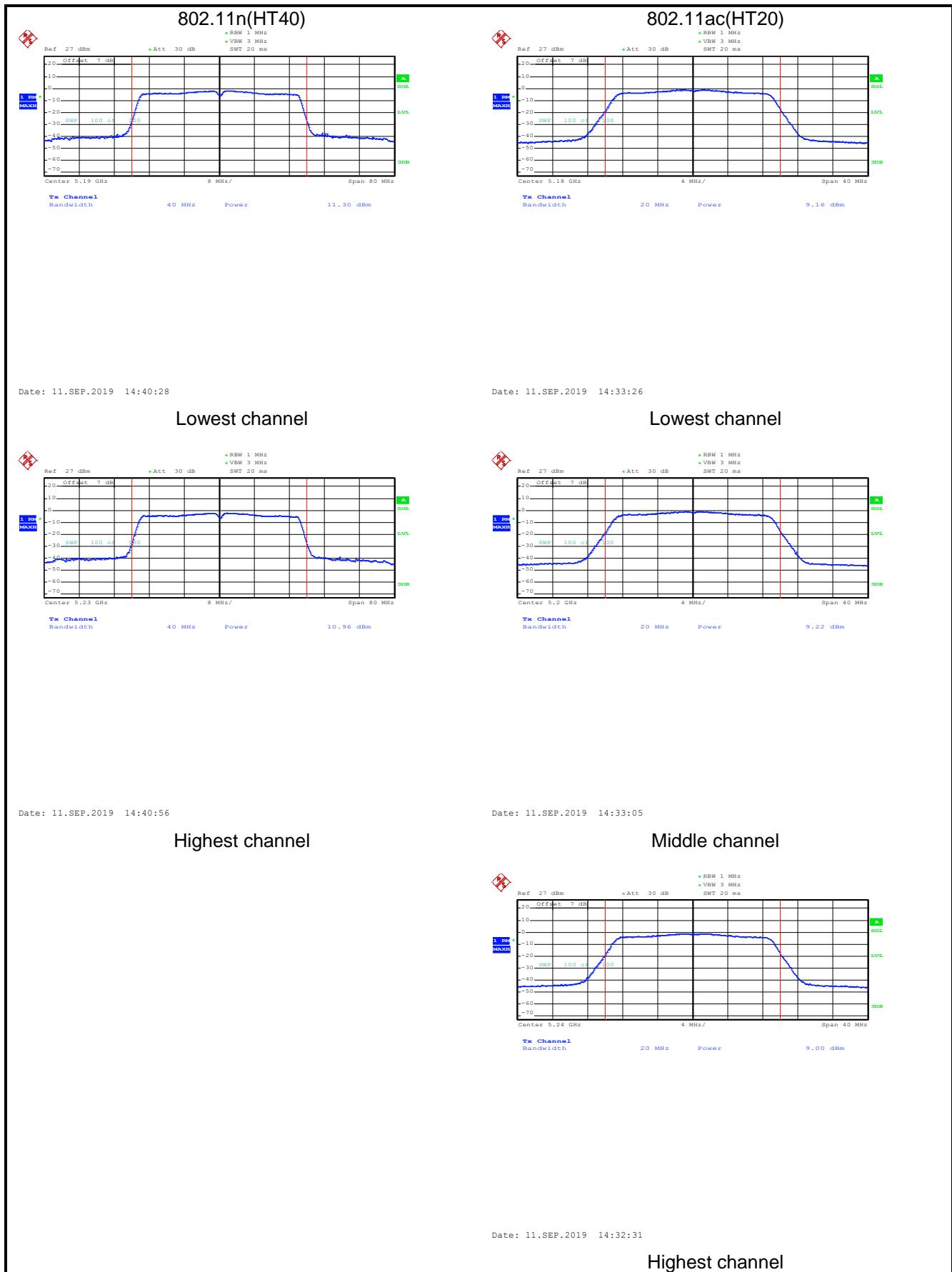
Band 1				
Mode	Test CH	Conducted Output power (dBm)	Limit (dBm)	Result
802.11a	Lowest	9.79	24.00	Pass
	Middle	9.98		
	Highest	9.35		
802.11n20	Lowest	11.81	24.00	Pass
	Middle	11.77		
	Highest	11.60		
802.11n40	Lowest	11.30	24.00	Pass
	Highest	10.96		
802.11ac20	Lowest	9.16	24.00	Pass
	Middle	9.22		
	Highest	9.00		
802.11ac40	Lowest	11.30	24.00	Pass
	Highest	11.02		
802.11ac80	Lowest	11.31	24.00	Pass

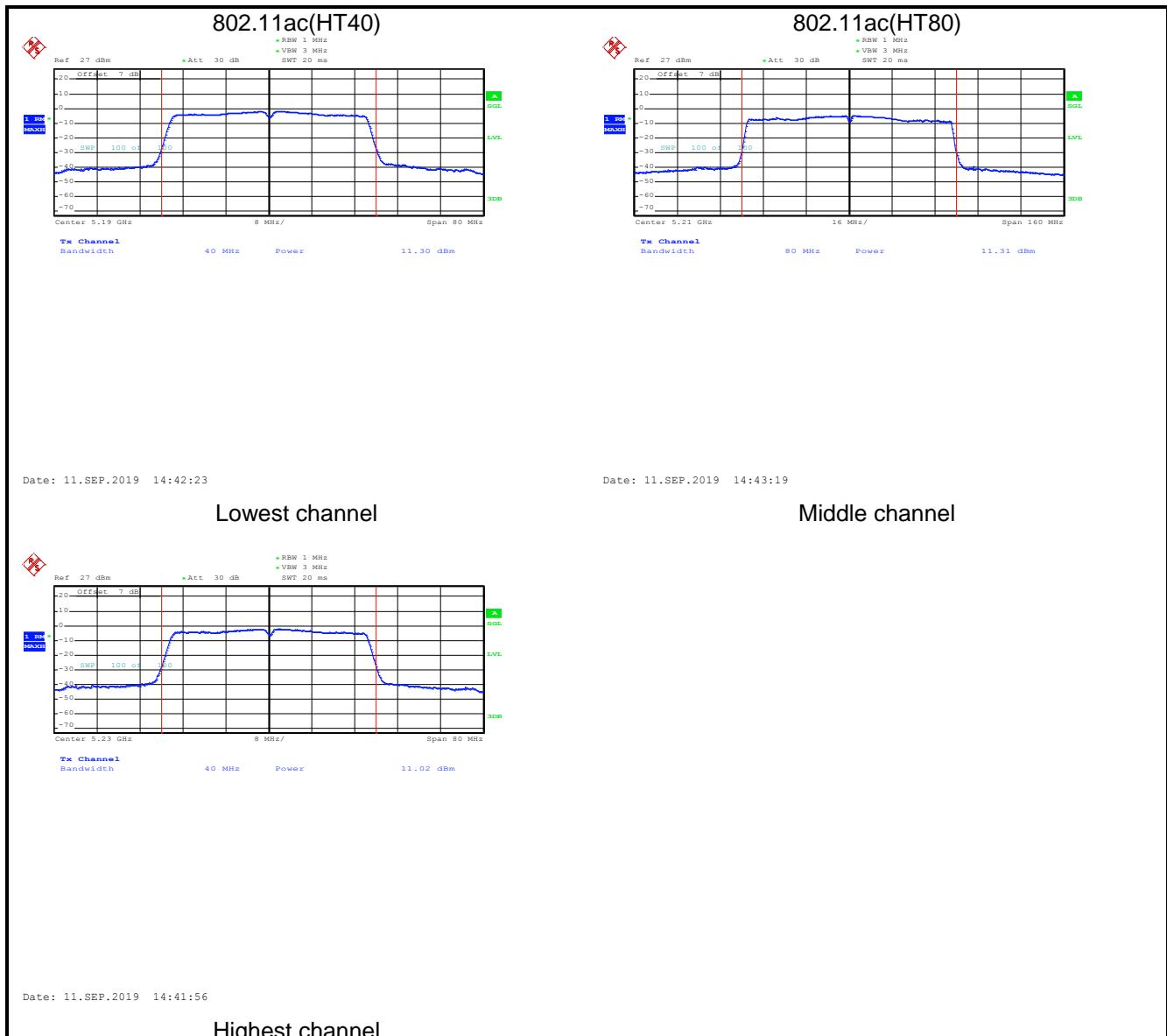
Band 4				
Mode	Test CH	Conducted Output power (dBm)	Limit (dBm)	Result
802.11a	Lowest	13.10	30.00	Pass
	Middle	12.82		
	Highest	12.61		
802.11n20	Lowest	12.90	30.00	Pass
	Middle	12.65		
	Highest	12.54		
802.11n40	Lowest	12.40	30.00	Pass
	Highest	12.17		
802.11ac20	Lowest	12.95	30.00	Pass
	Middle	12.67		
	Highest	12.65		
802.11ac40	Lowest	12.18	30.00	Pass
	Highest	12.10		
802.11ac80	Lowest	12.41	30.00	Pass

Test plot as follows:

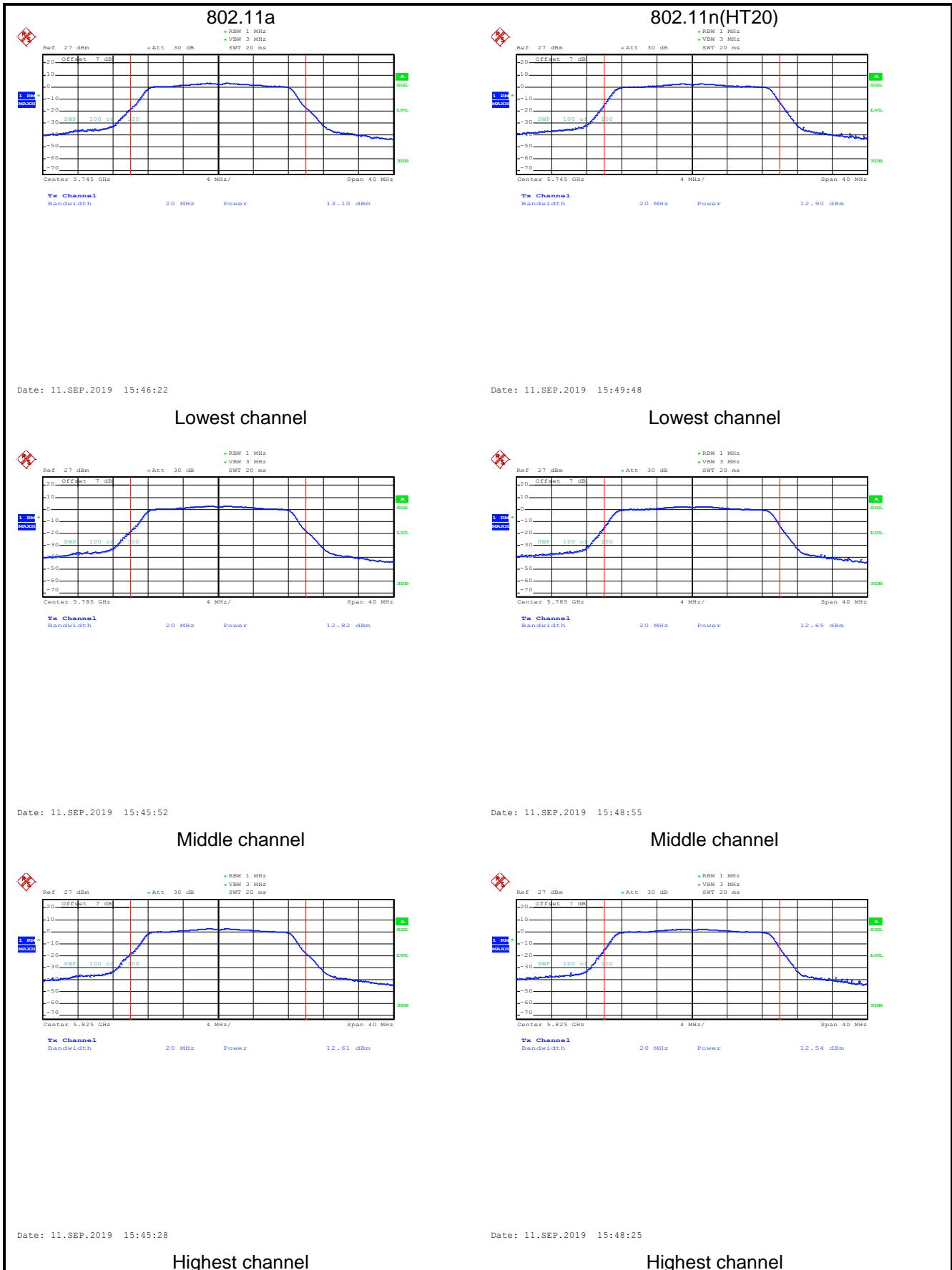
Band 1:

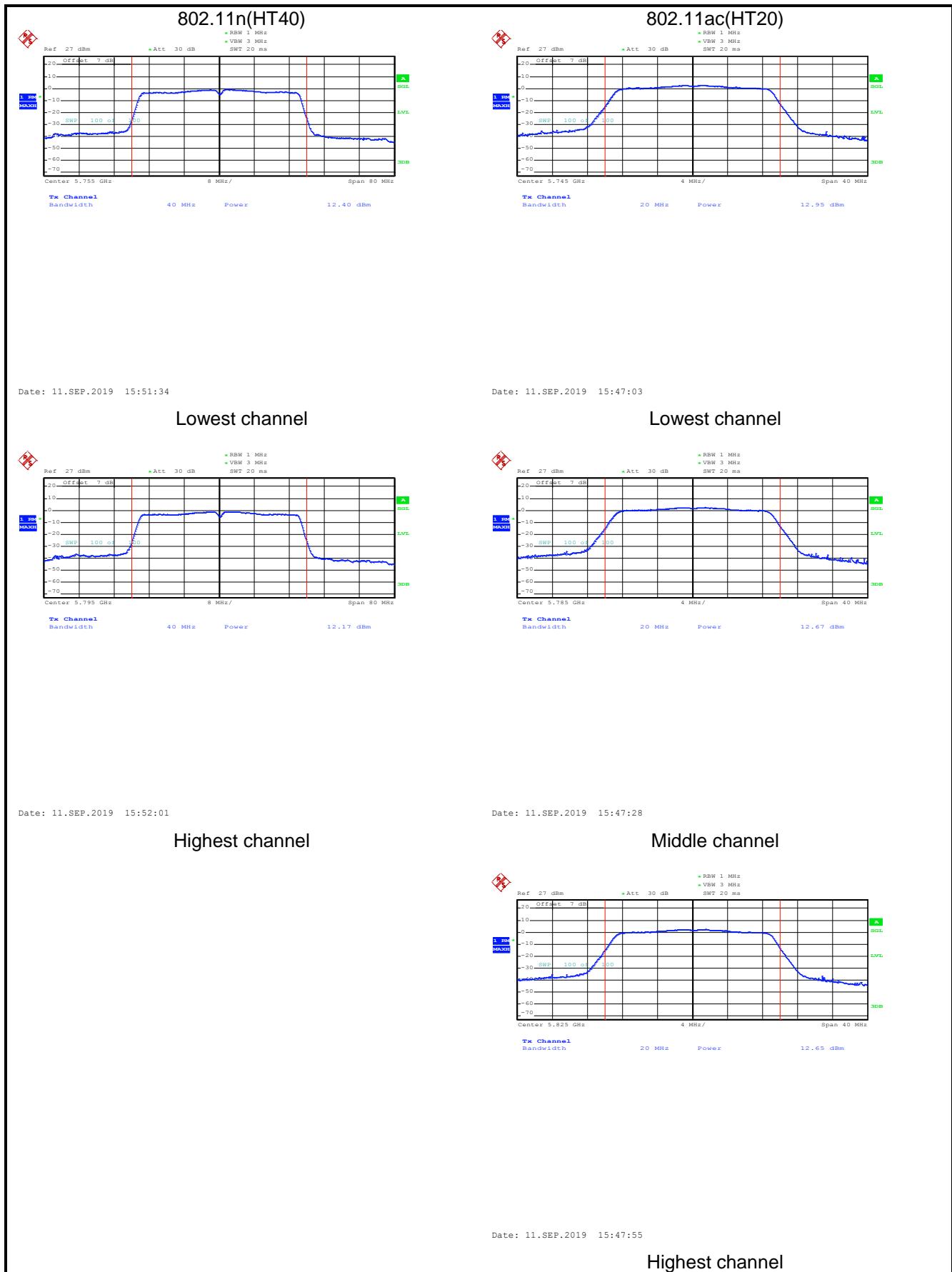


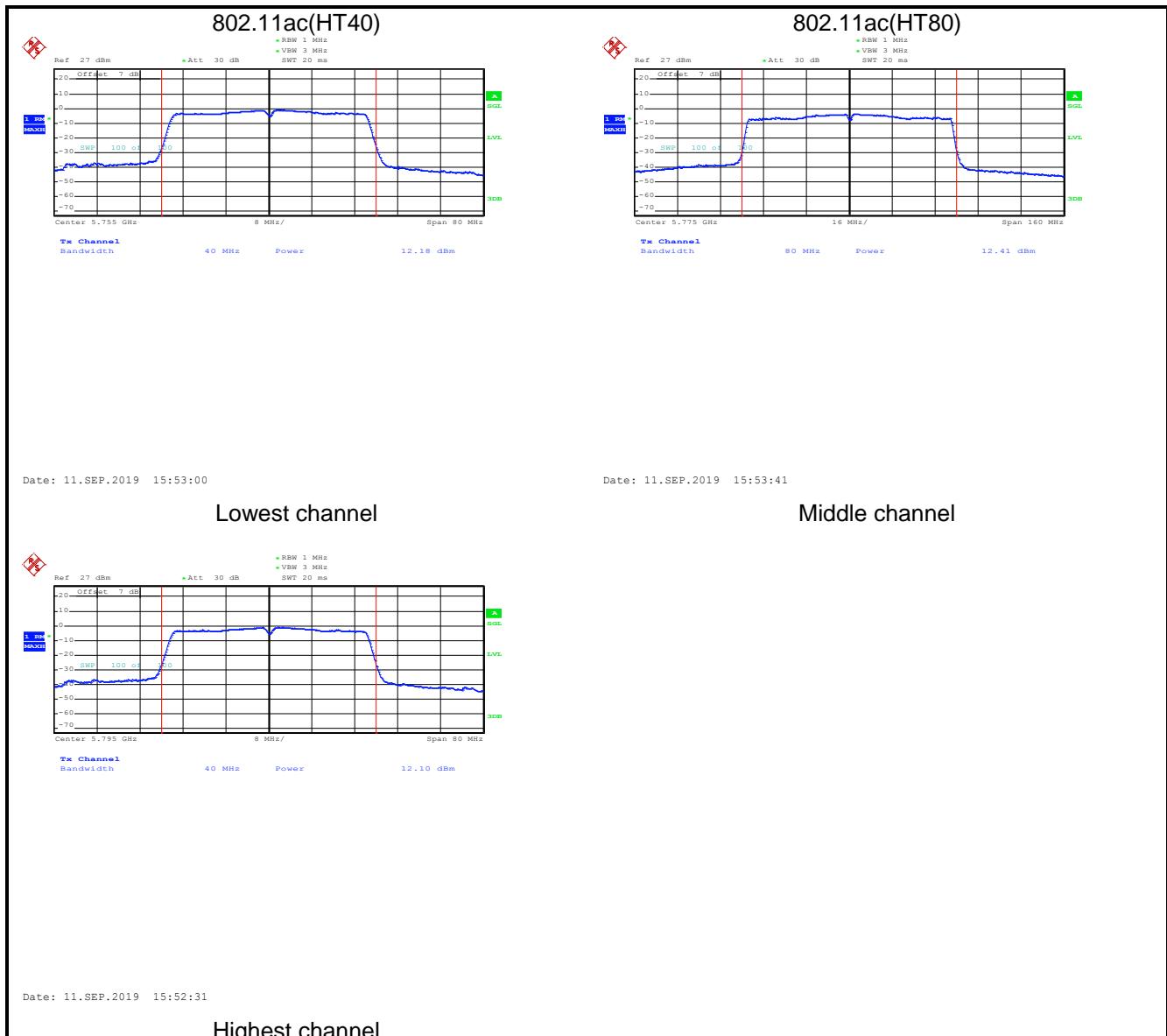




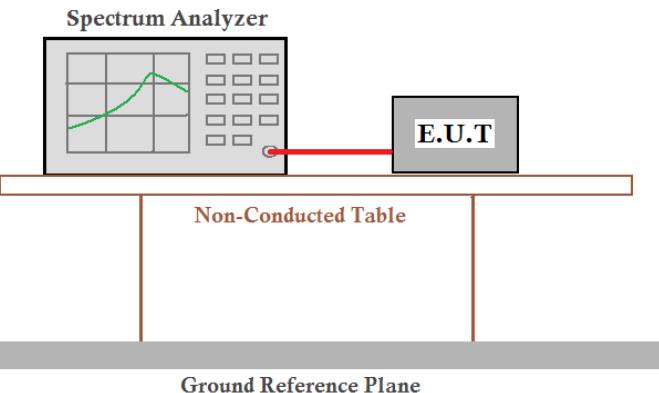
Band 4:







6.4 Occupy Bandwidth

Test Requirement:	FCC Part15 E Section 15.407 (a) (5) and Section 15.407 (e)
Test Method:	ANSI C63.10:2013 and KDB 789033
Limit:	Band 1/4: N/A (26dB Emission Bandwidth and 99% Occupy Bandwidth) Band 4: >500kHz (6dB Bandwidth)
Test setup:	 <p>The diagram illustrates the test setup for occupy bandwidth measurement. A Spectrum Analyzer is connected to the E.U.T (Equipment Under Test) via a cable. The E.U.T is placed on a Non-Conducted Table. The entire assembly sits on a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:**Band 1:**

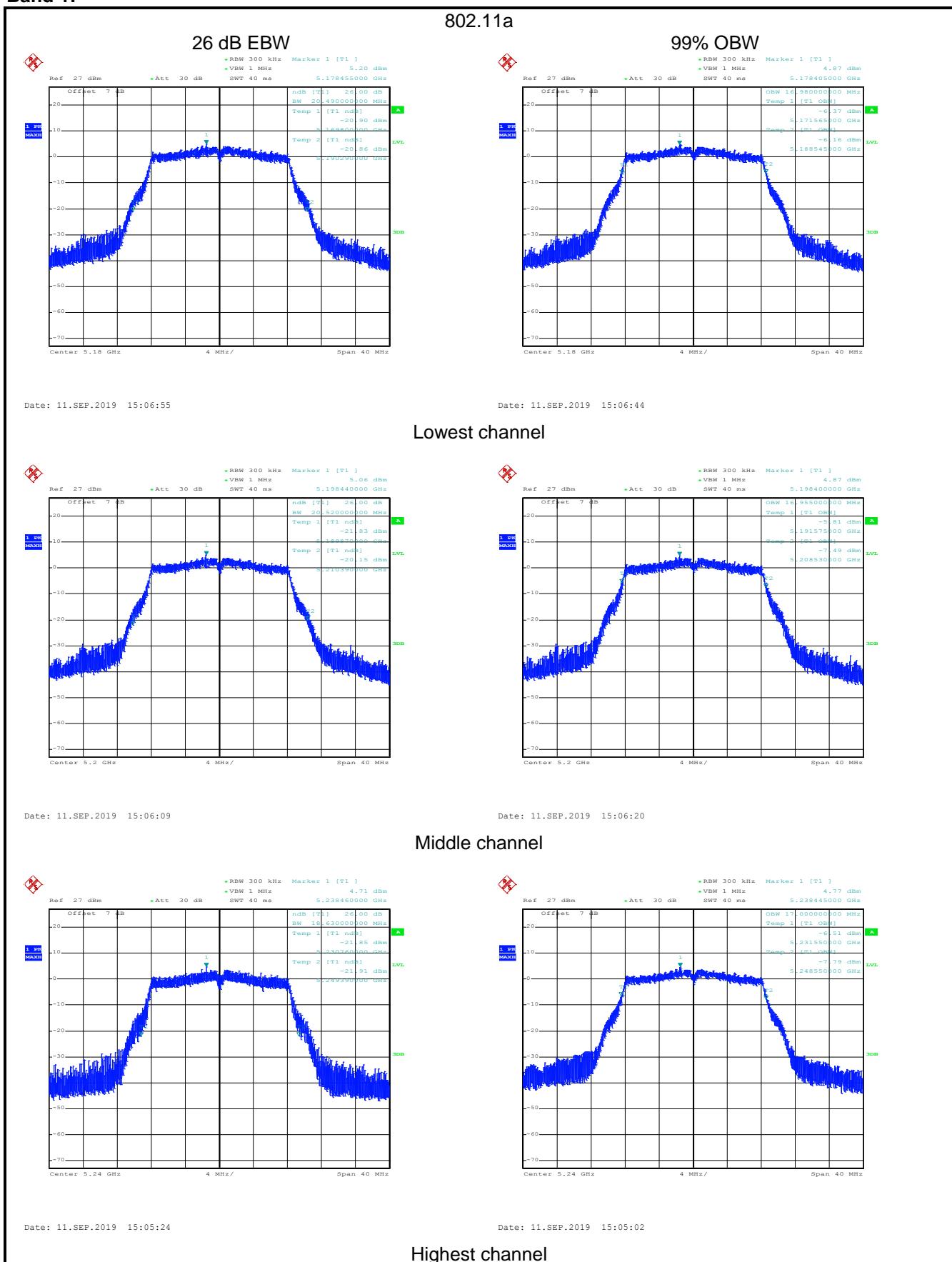
Test Channel	26dB Emission Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	20.49	21.08	40.38	20.89	40.67	---	N/A	PASS
Middle	20.52	21.25	---	20.94	---	79.92		
Highest	18.63	20.08	40.01	19.84	39.63	---		
Test Channel	99% Occupy Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	16.98	18.03	36.55	18.01	36.53	---	N/A	PASS
Middle	16.96	18.03	---	18.02	---	75.54		
Highest	17.00	18.09	36.59	18.04	36.55	---		

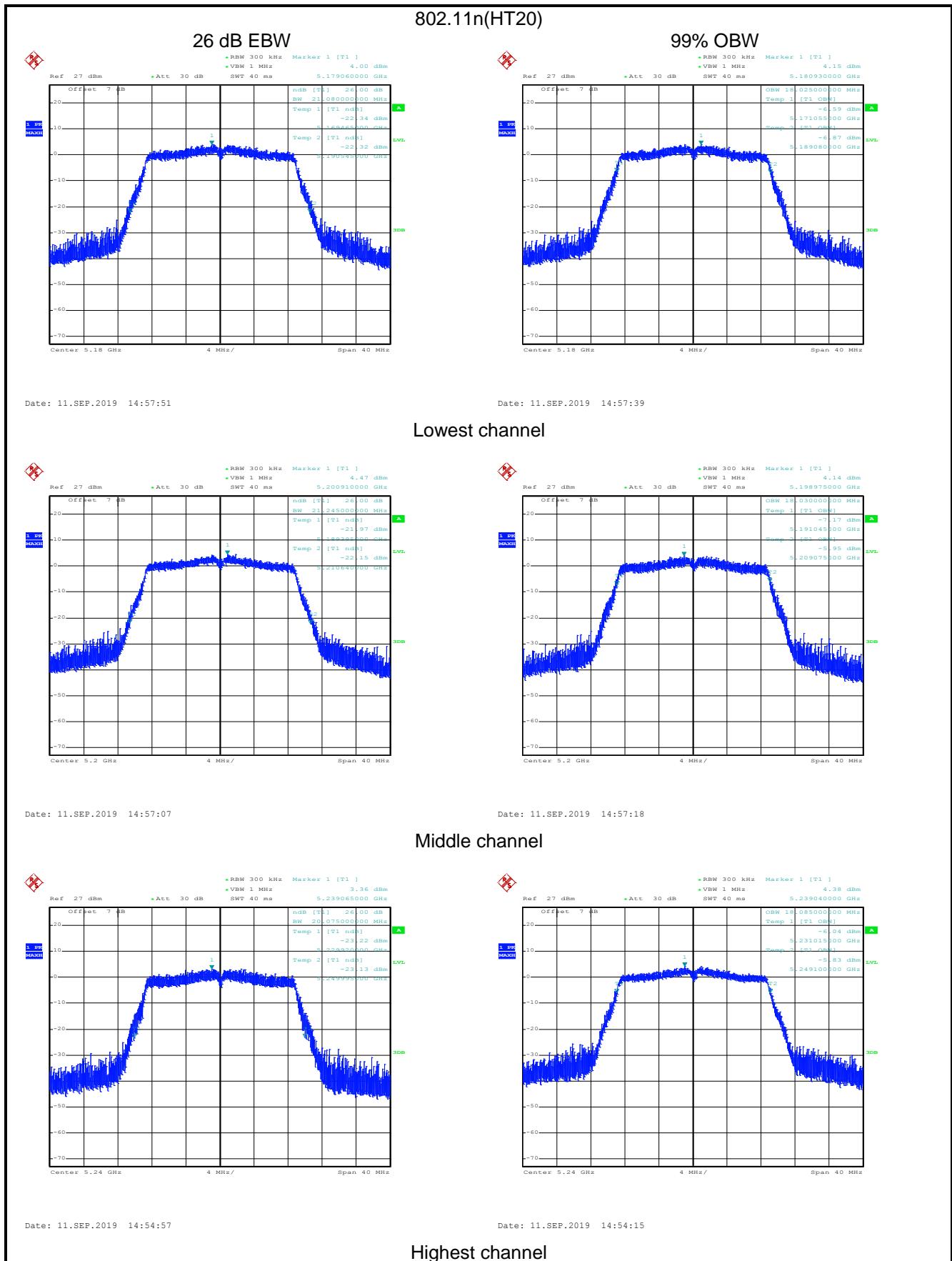
Band 4:

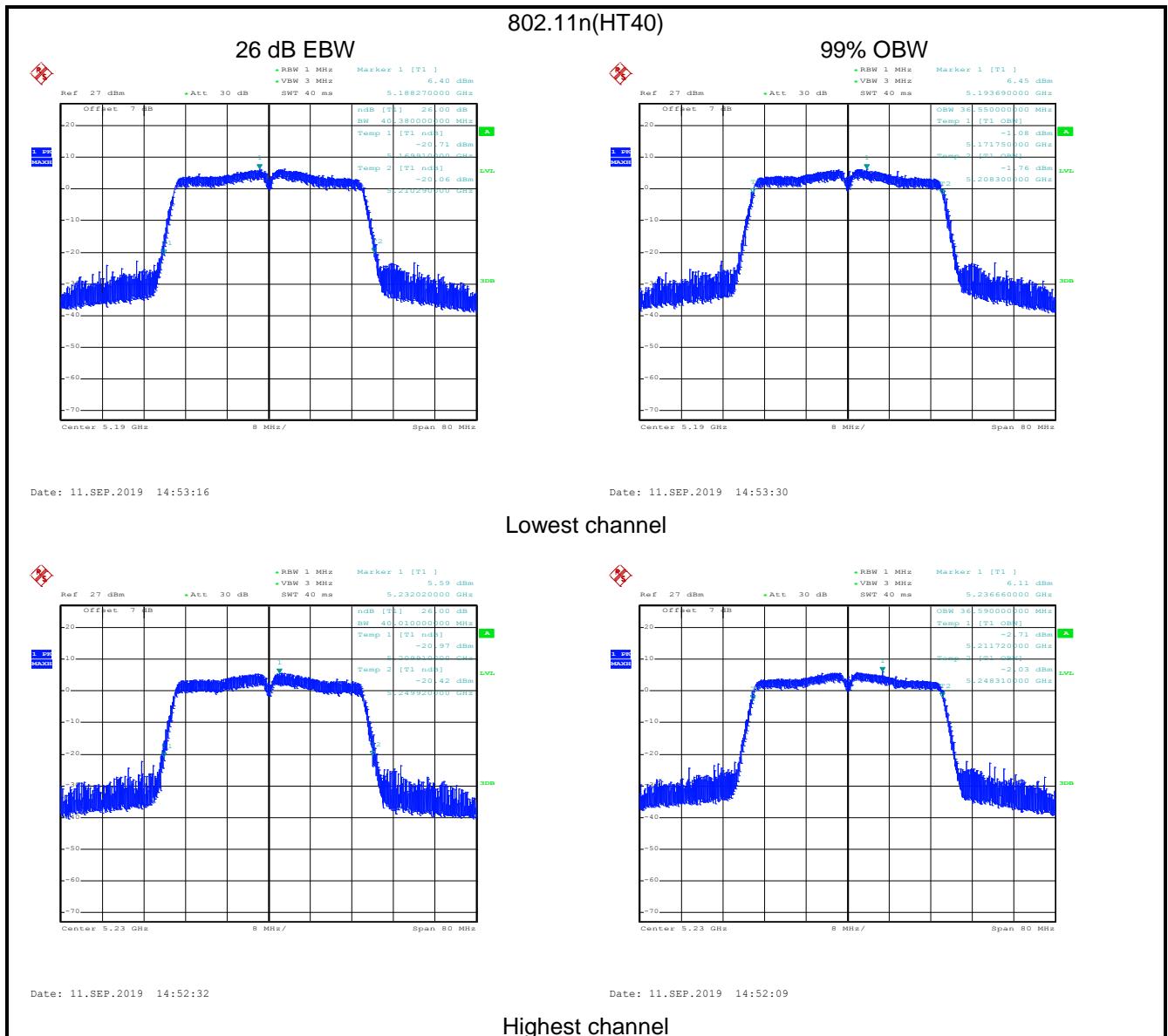
Test Channel	26dB Emission Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	20.53	21.51	40.53	21.05	40.97	---	N/A	PASS
Middle	20.56	21.11	---	21.16	---	81.00		
Highest	20.77	20.95	40.58	20.93	40.43	---		
Test Channel	99% Occupy Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	16.98	18.04	36.58	18.04	36.52	---	N/A	PASS
Middle	16.99	18.02	---	18.00	---	75.56		
Highest	17.03	18.01	36.53	18.04	36.50	---		
Test Channel	6dB Emission Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	16.48	17.76	36.48	17.76	36.48	---	>500kHz	PASS
Middle	16.48	17.76	---	17.76	---	75.84		
Highest	16.48	17.76	36.32	17.76	36.32	---		

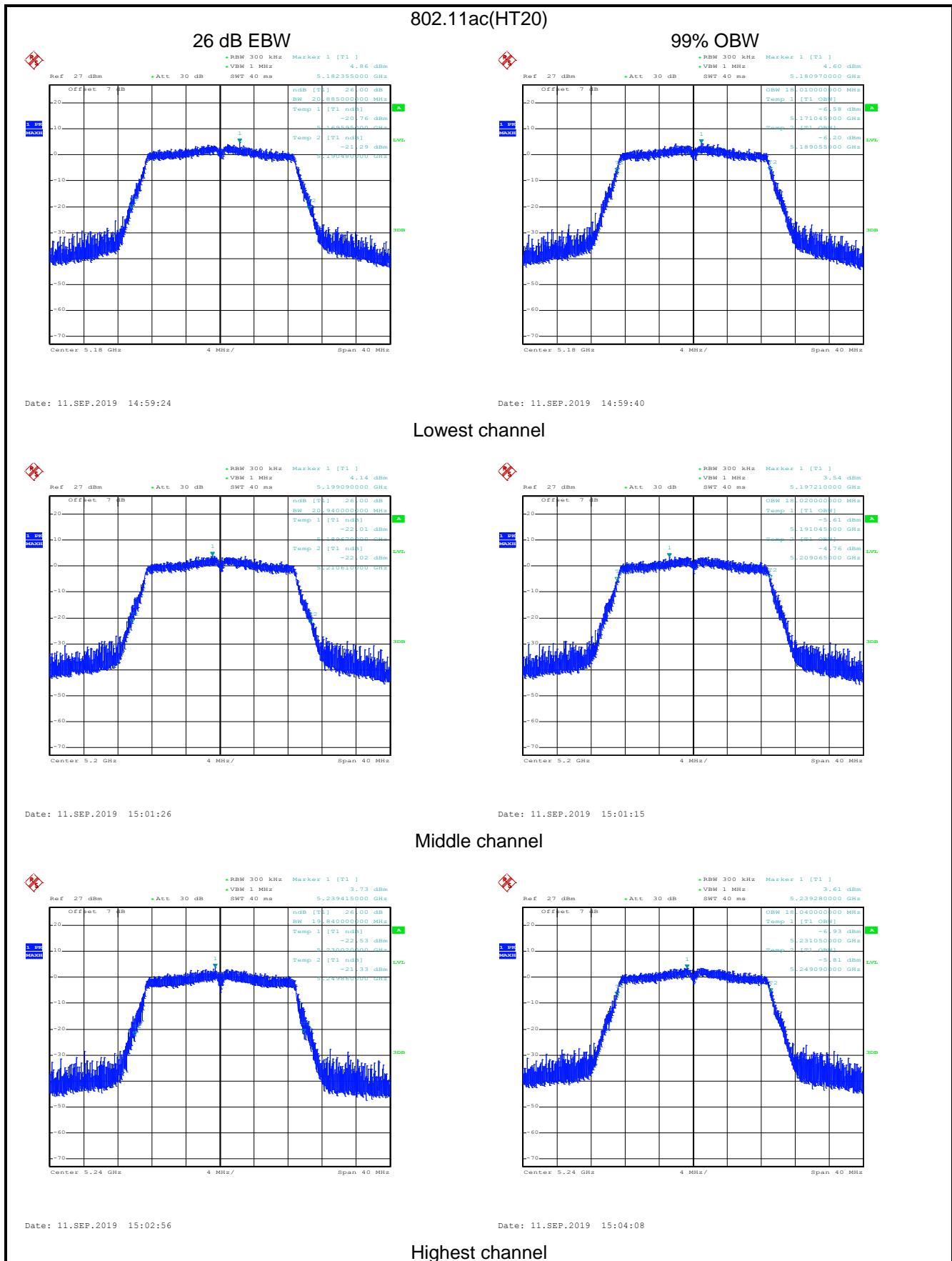
Test plot as follows:

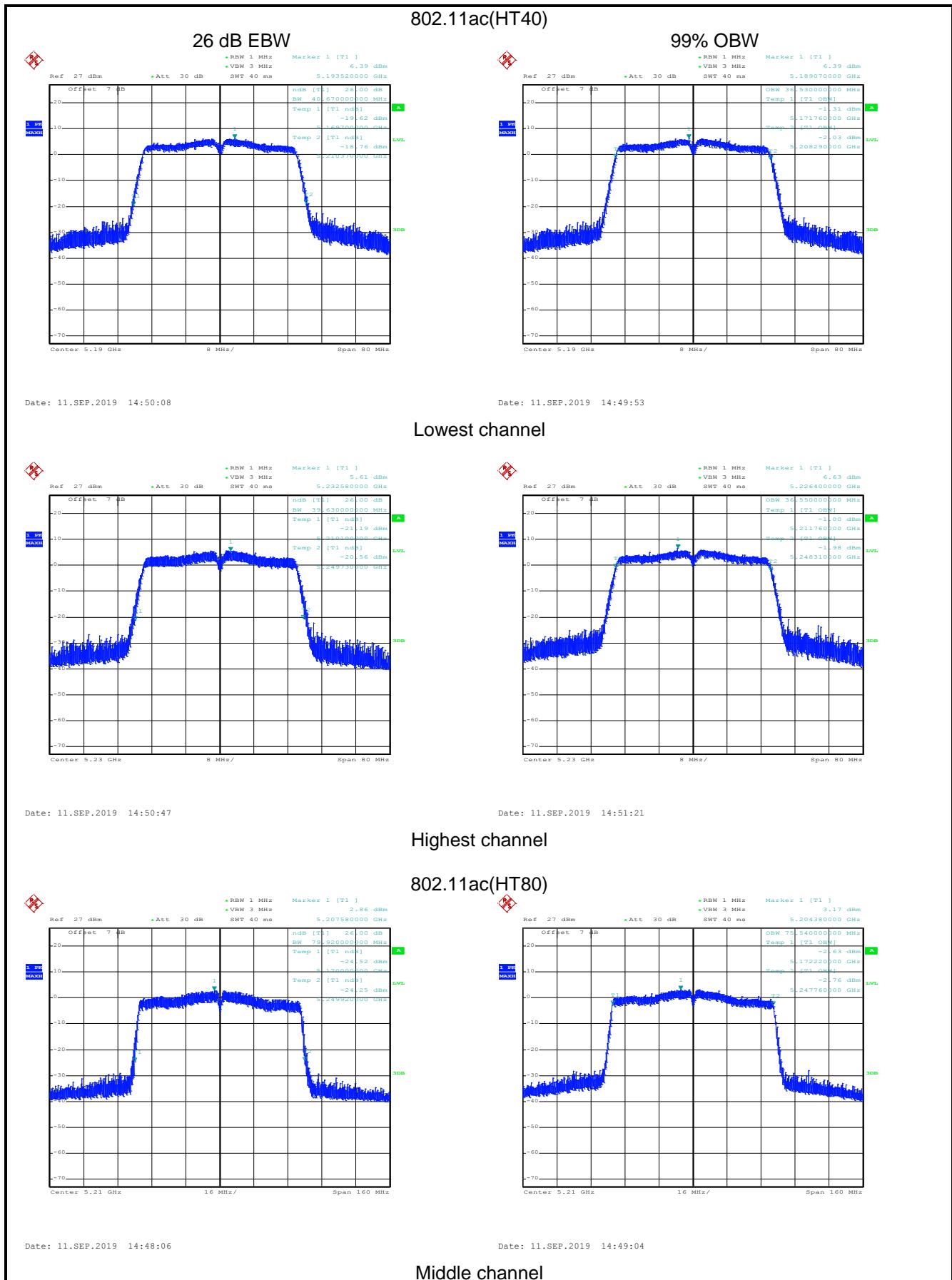
Band 1:



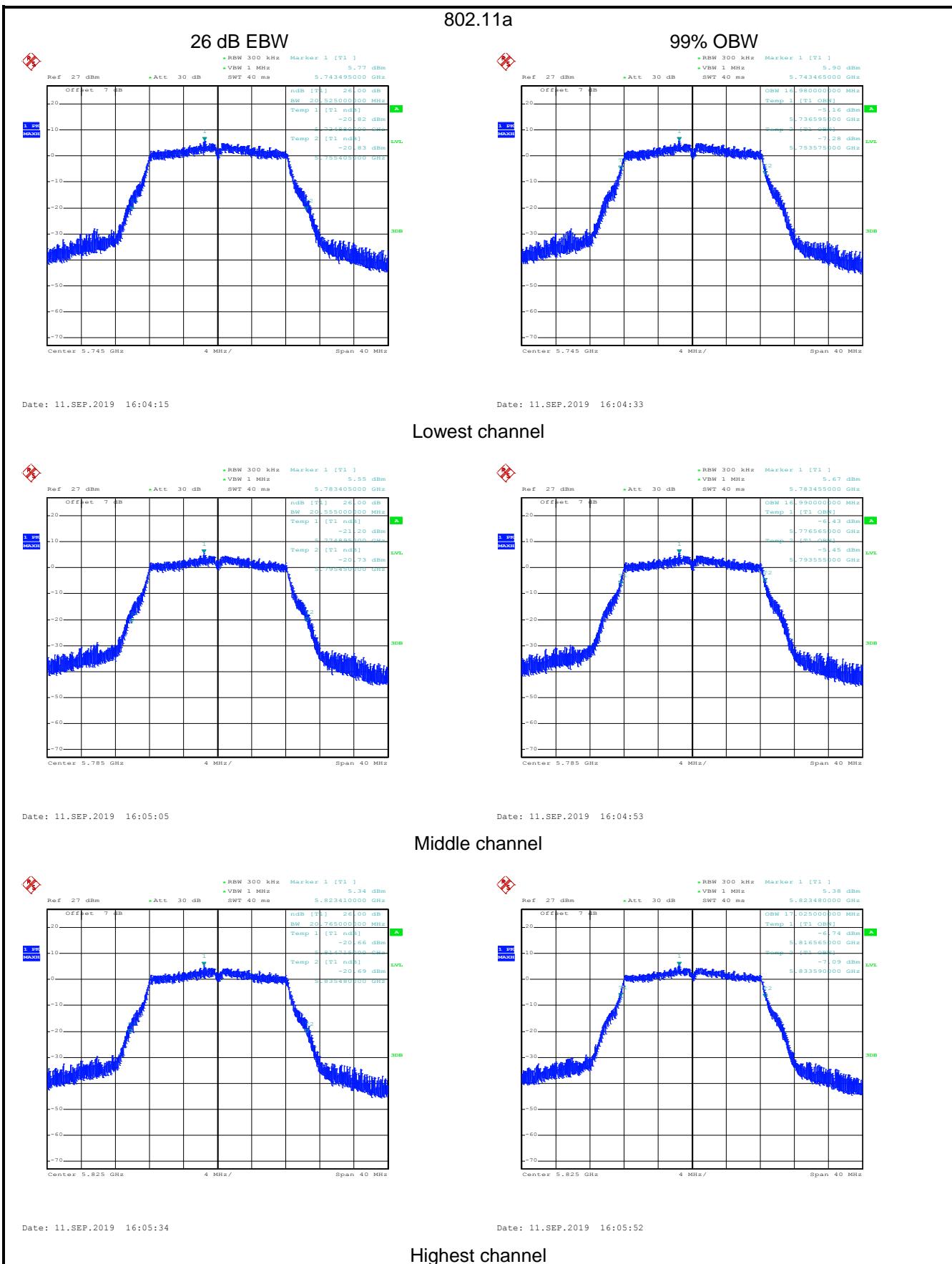


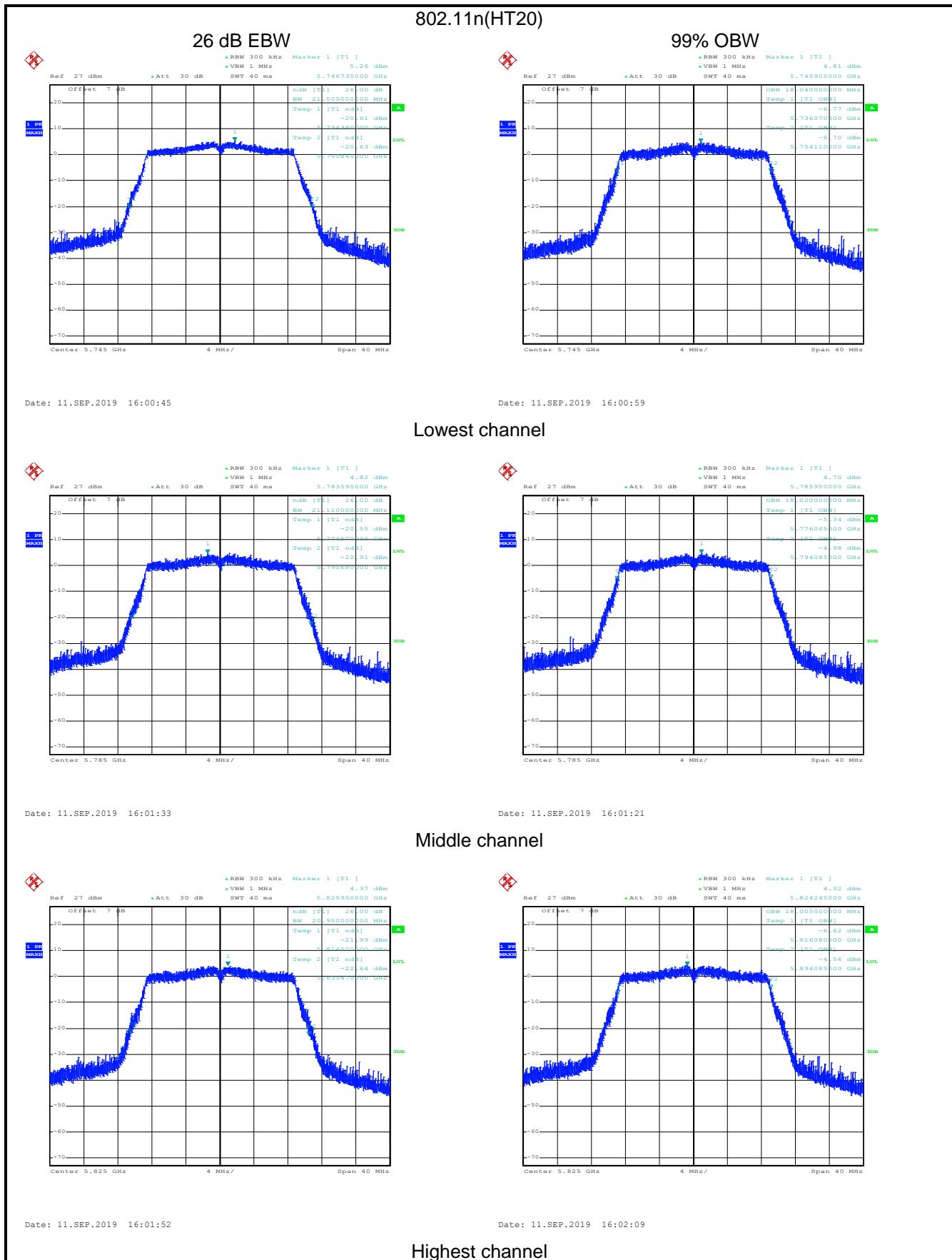


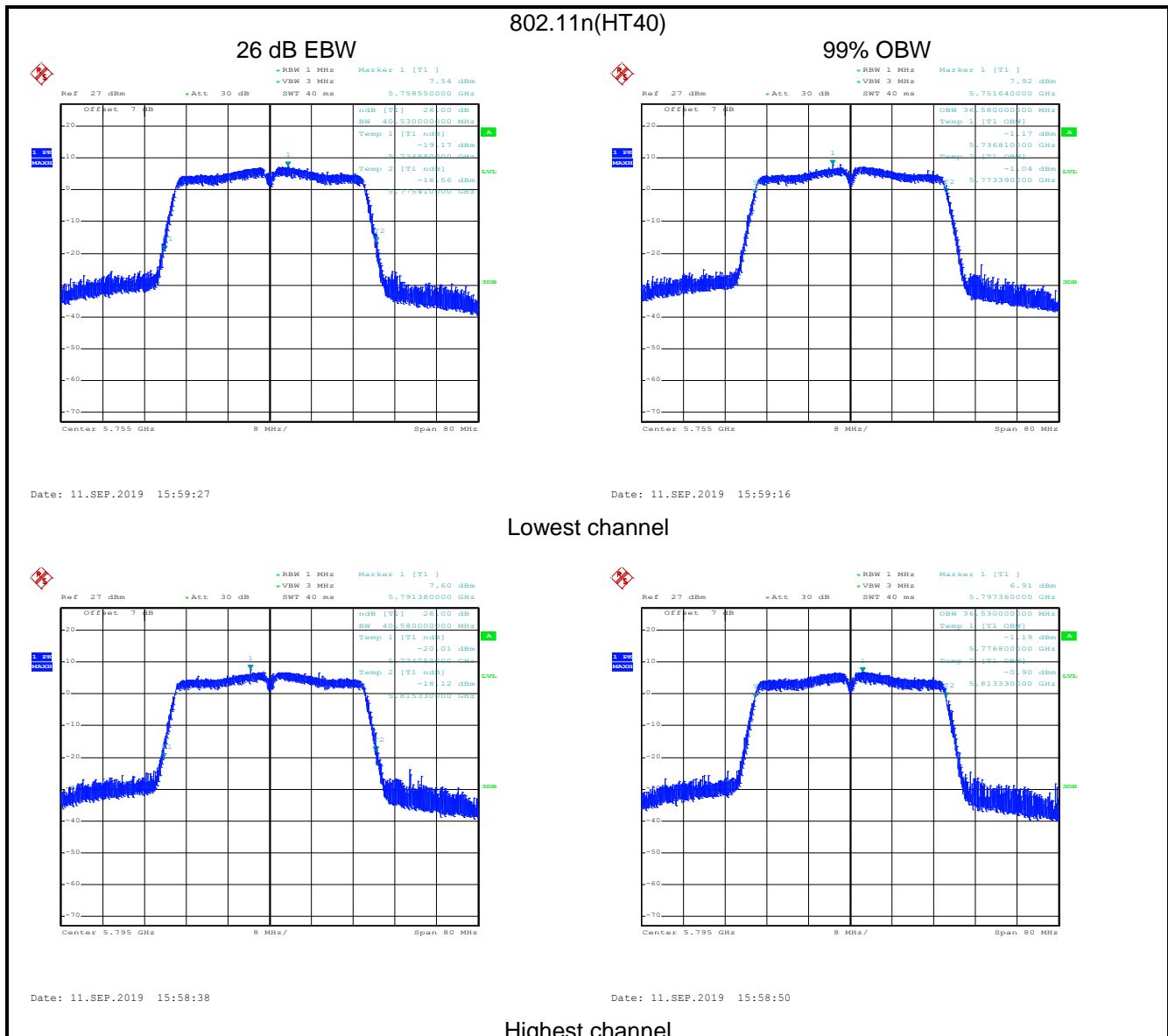


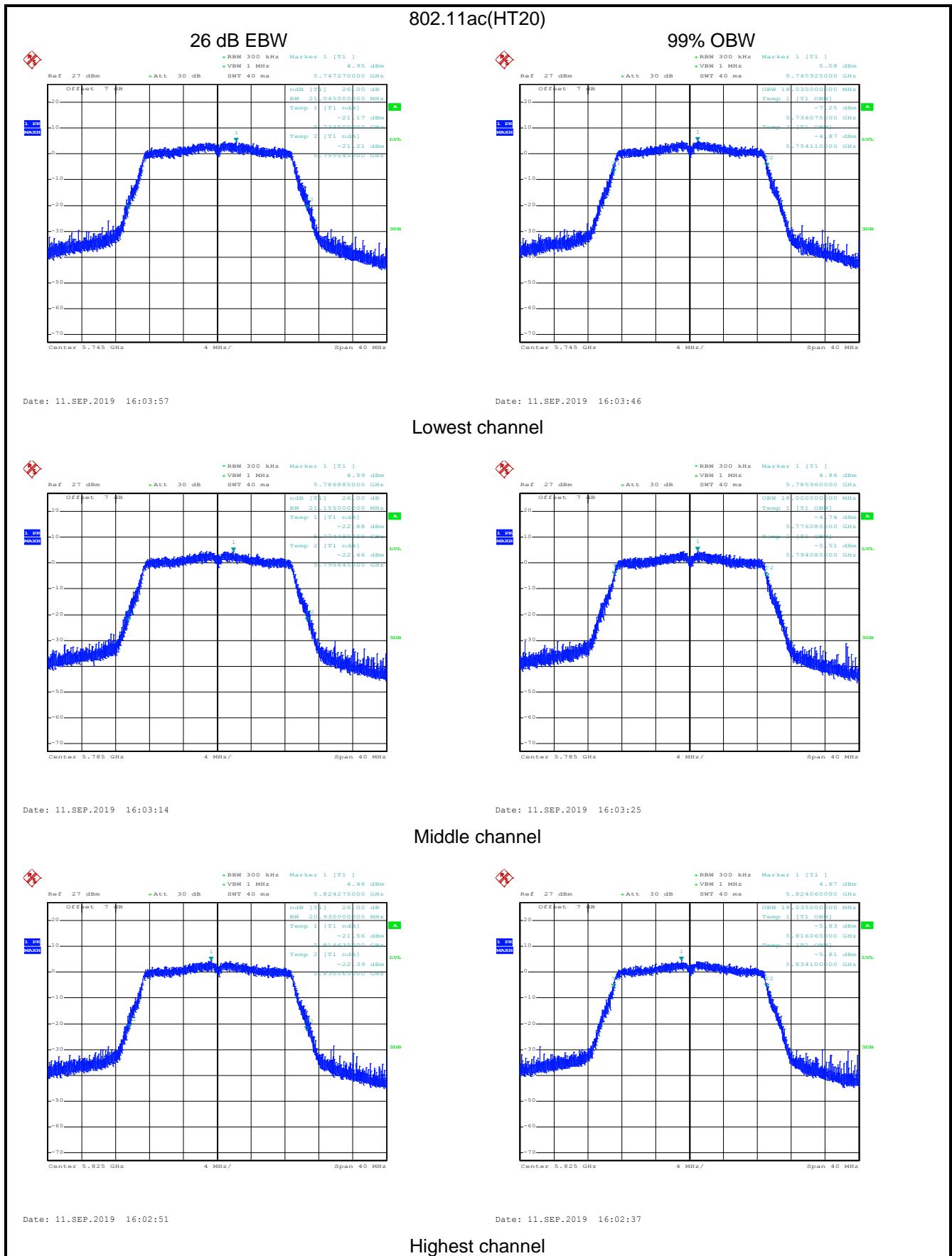


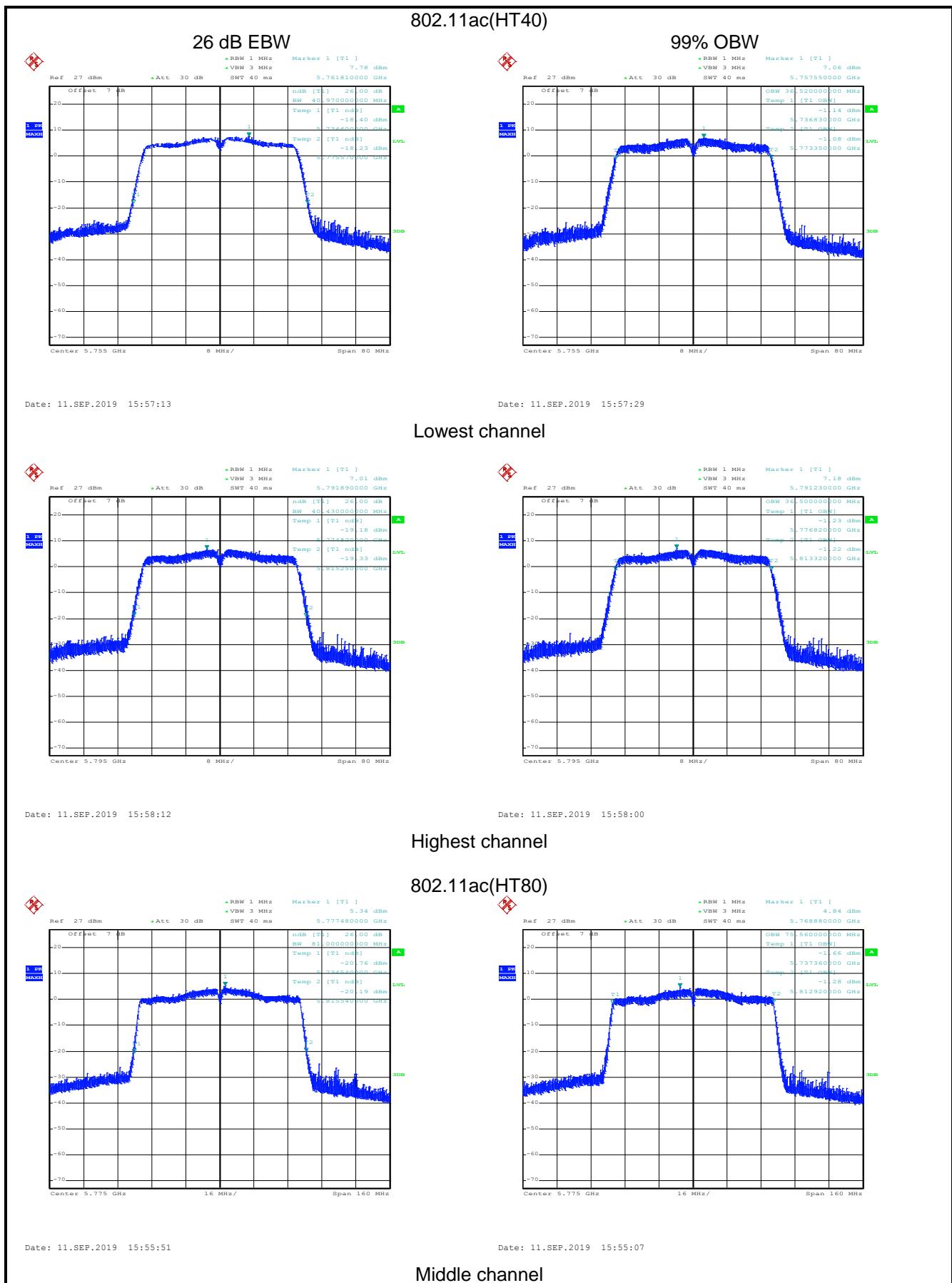
Band 4:

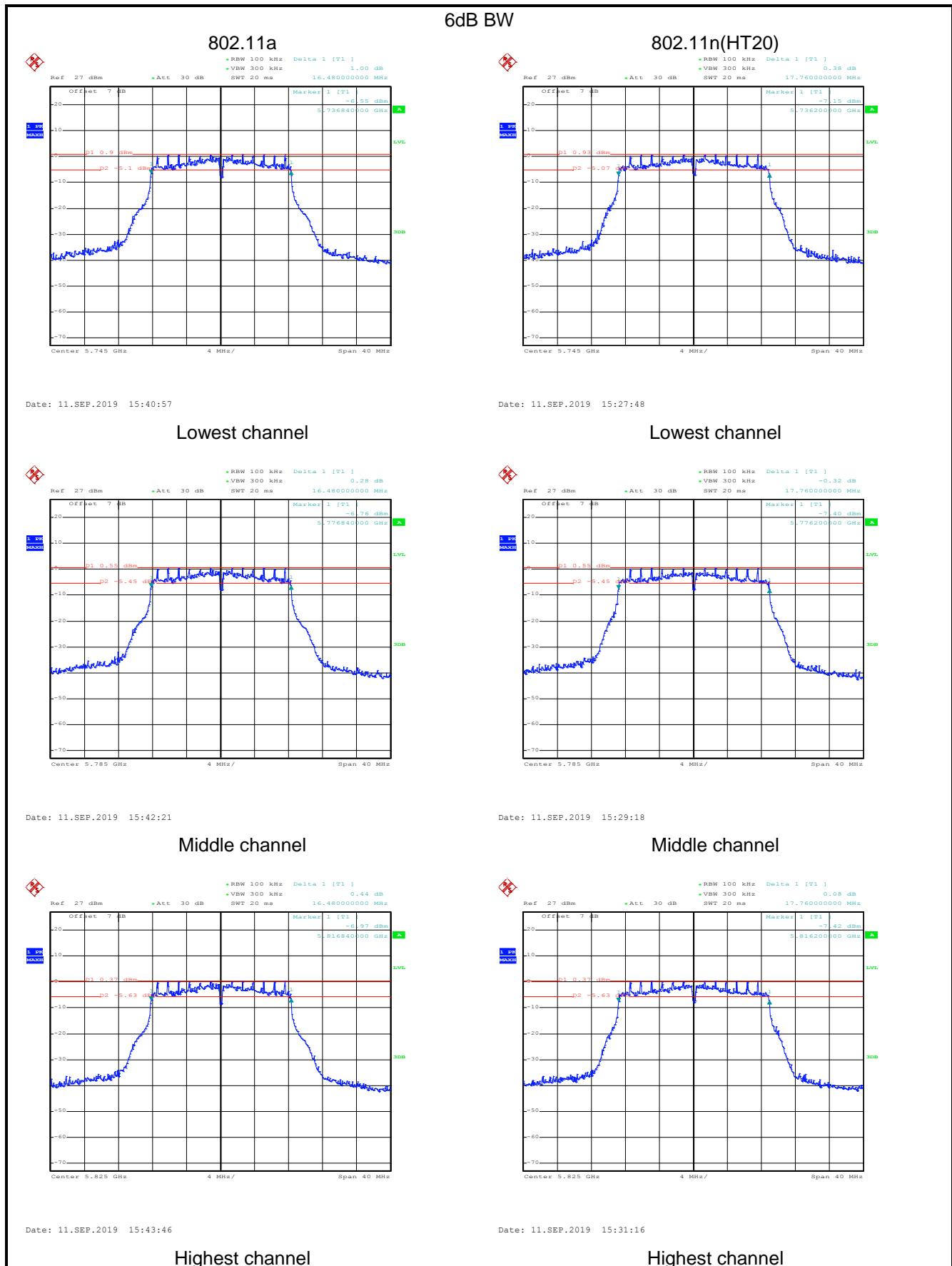


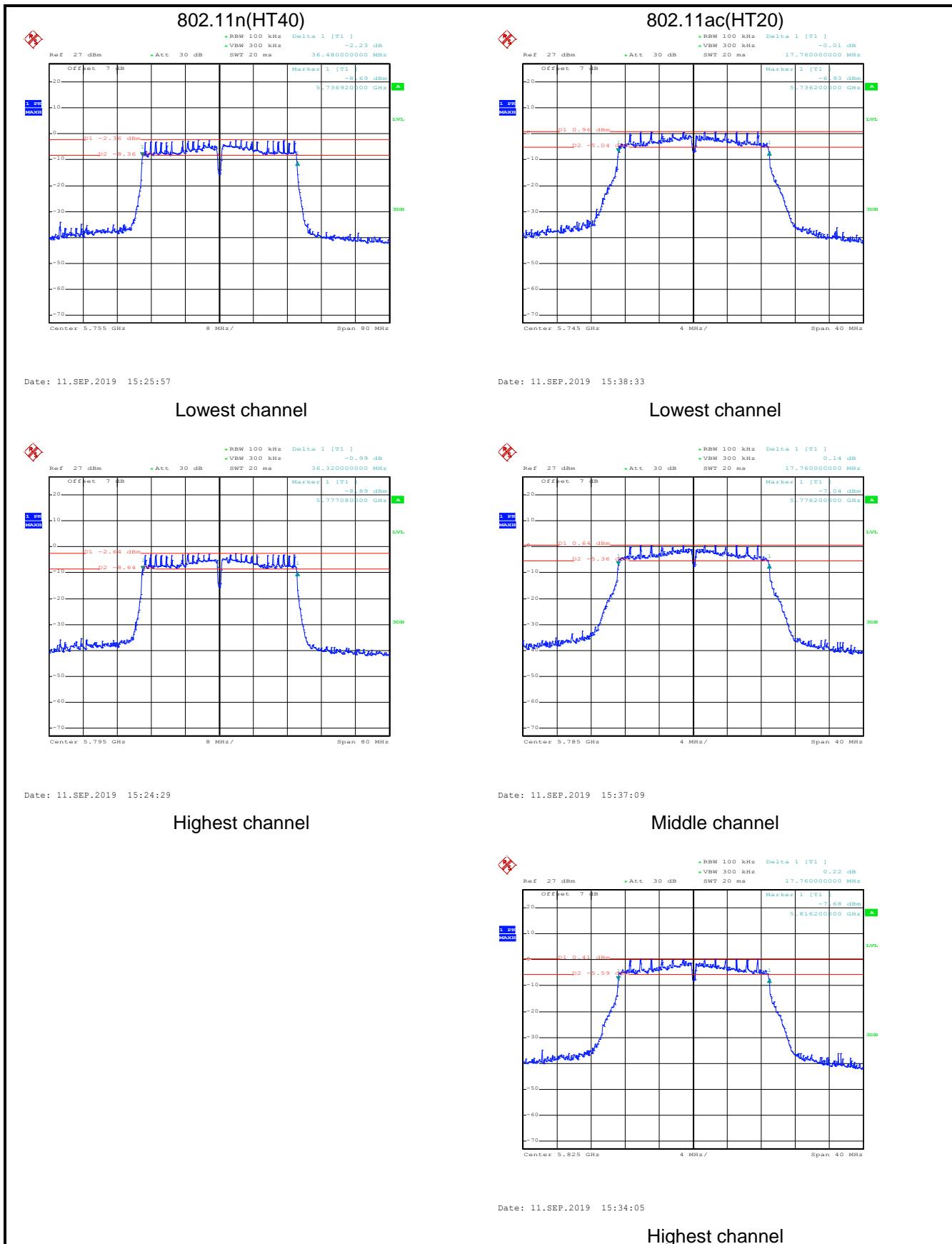


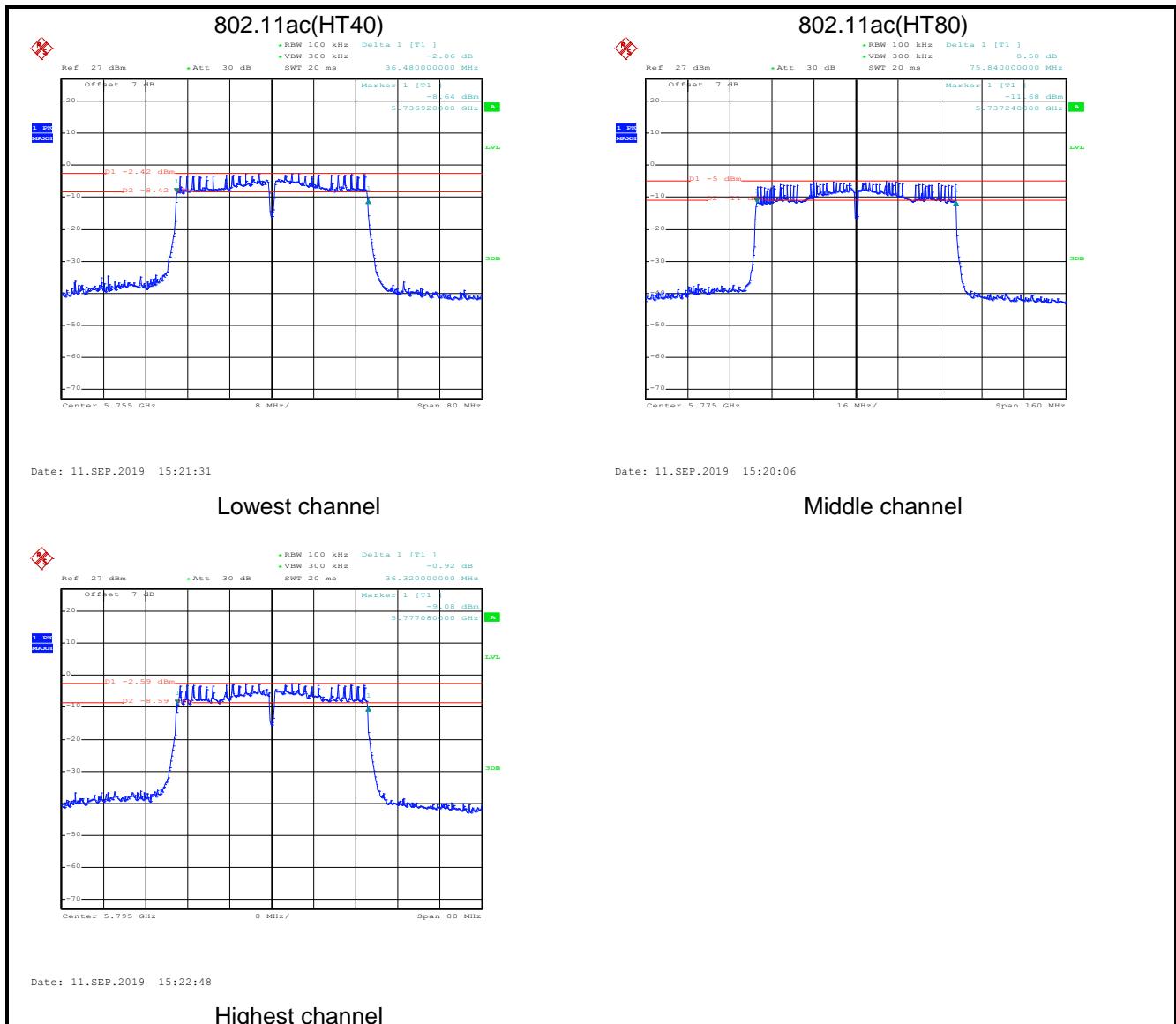




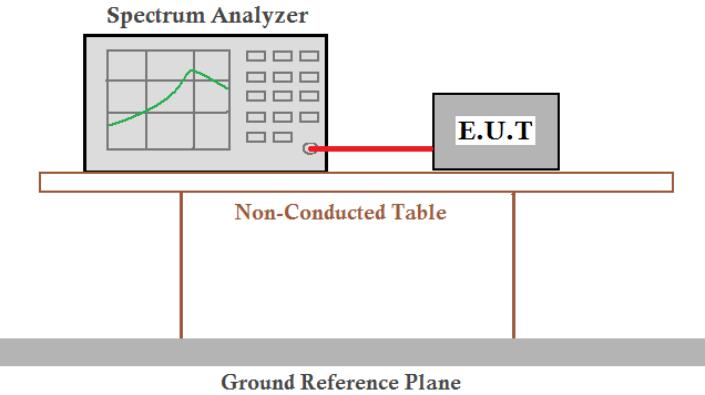








6.5 Power Spectral Density

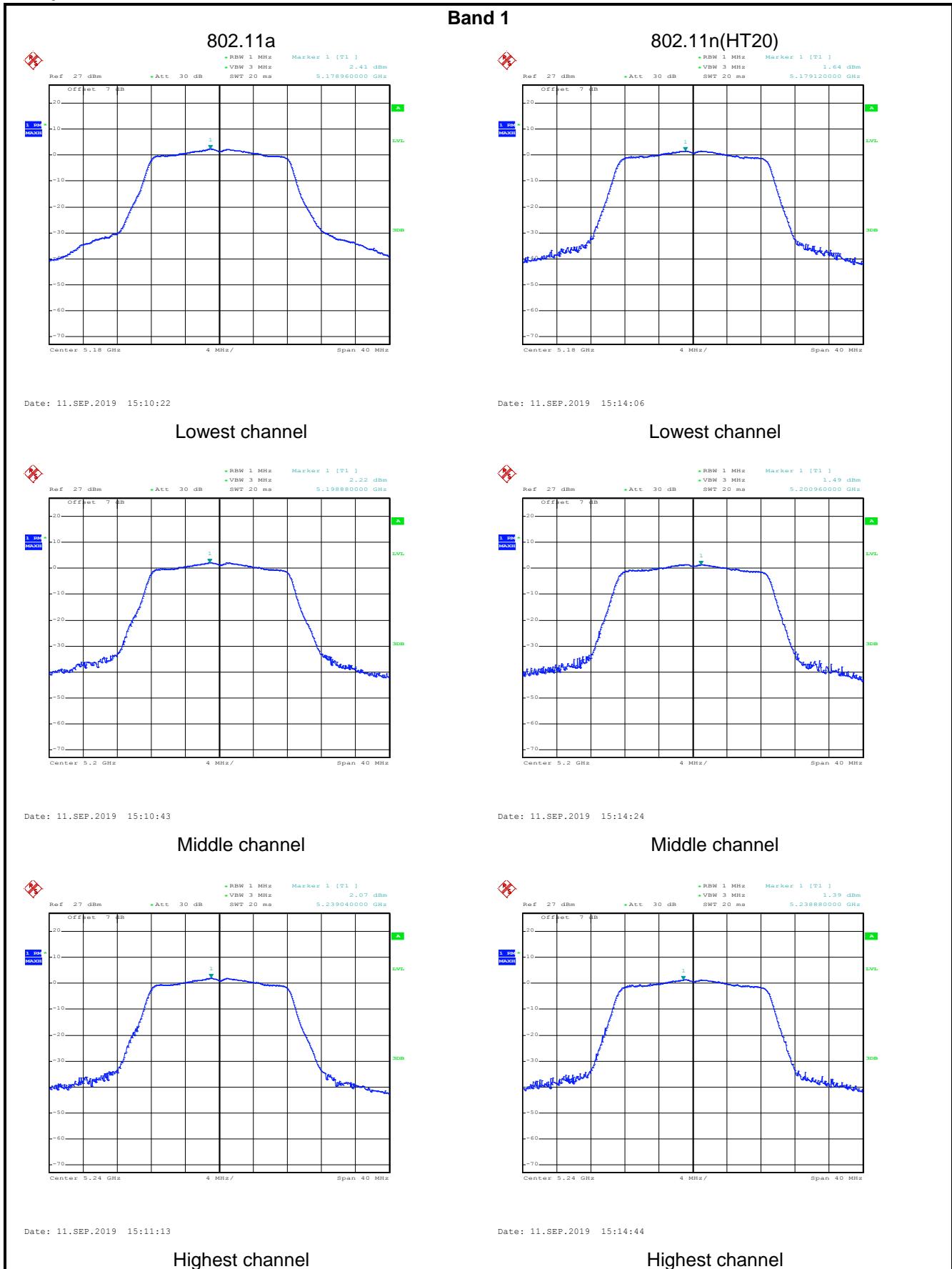
Test Requirement:	FCC Part15 E Section 15.407 (a) (1) (iv) & (a)(3)
Test Method:	ANSI C63.10:2013, KDB 789033
Limit:	Band 1: 11 dBm/MHz Band 4: 30 dBm/500kHz
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is positioned at the top left, showing a green waveform on its screen. A red horizontal line extends from the output of the analyzer to a grey rectangular box labeled "E.U.T". This entire assembly rests on a light blue rectangular platform labeled "Non-Conducted Table". Below the table is a thick grey horizontal bar labeled "Ground Reference Plane".</p>
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

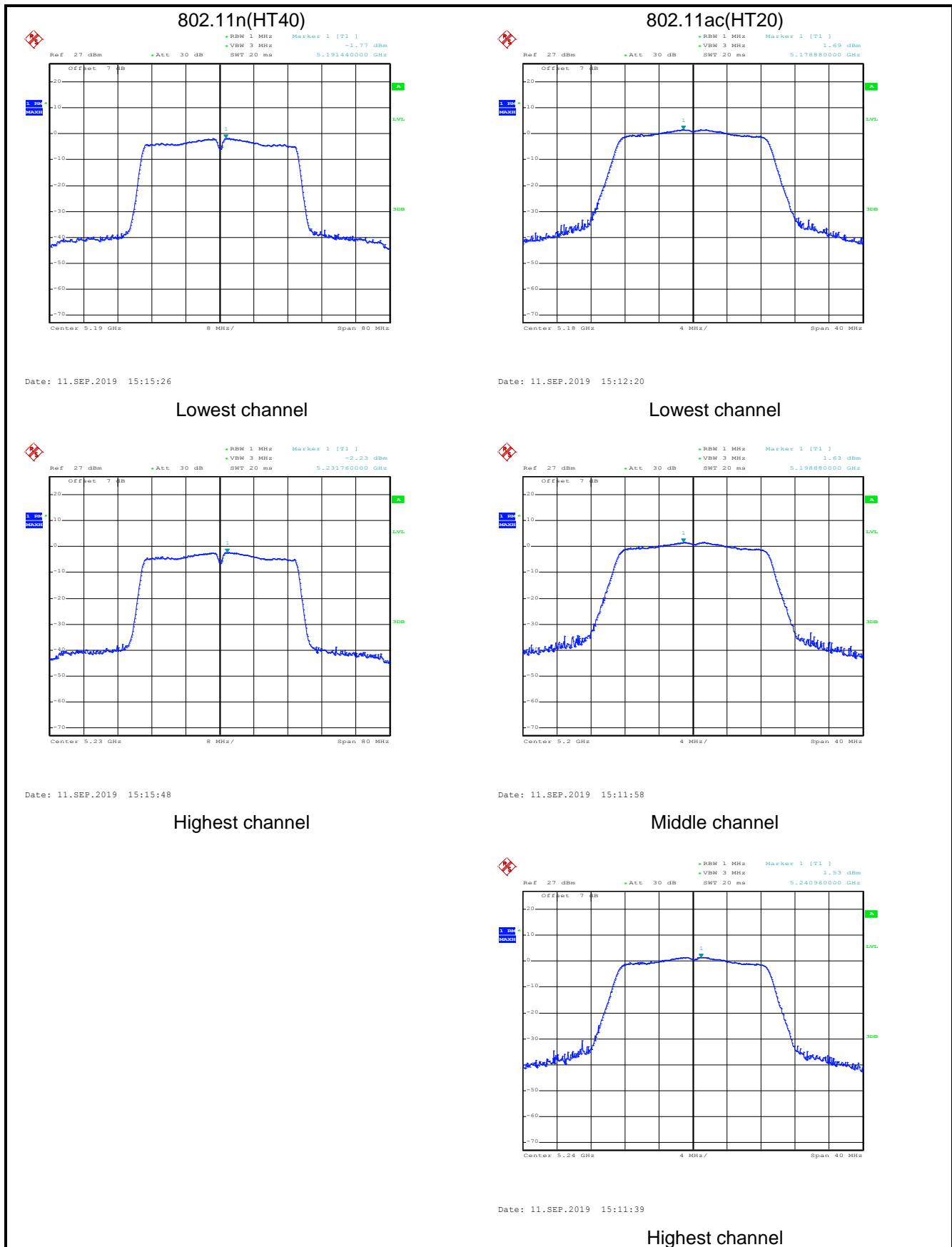
Measurement Data:

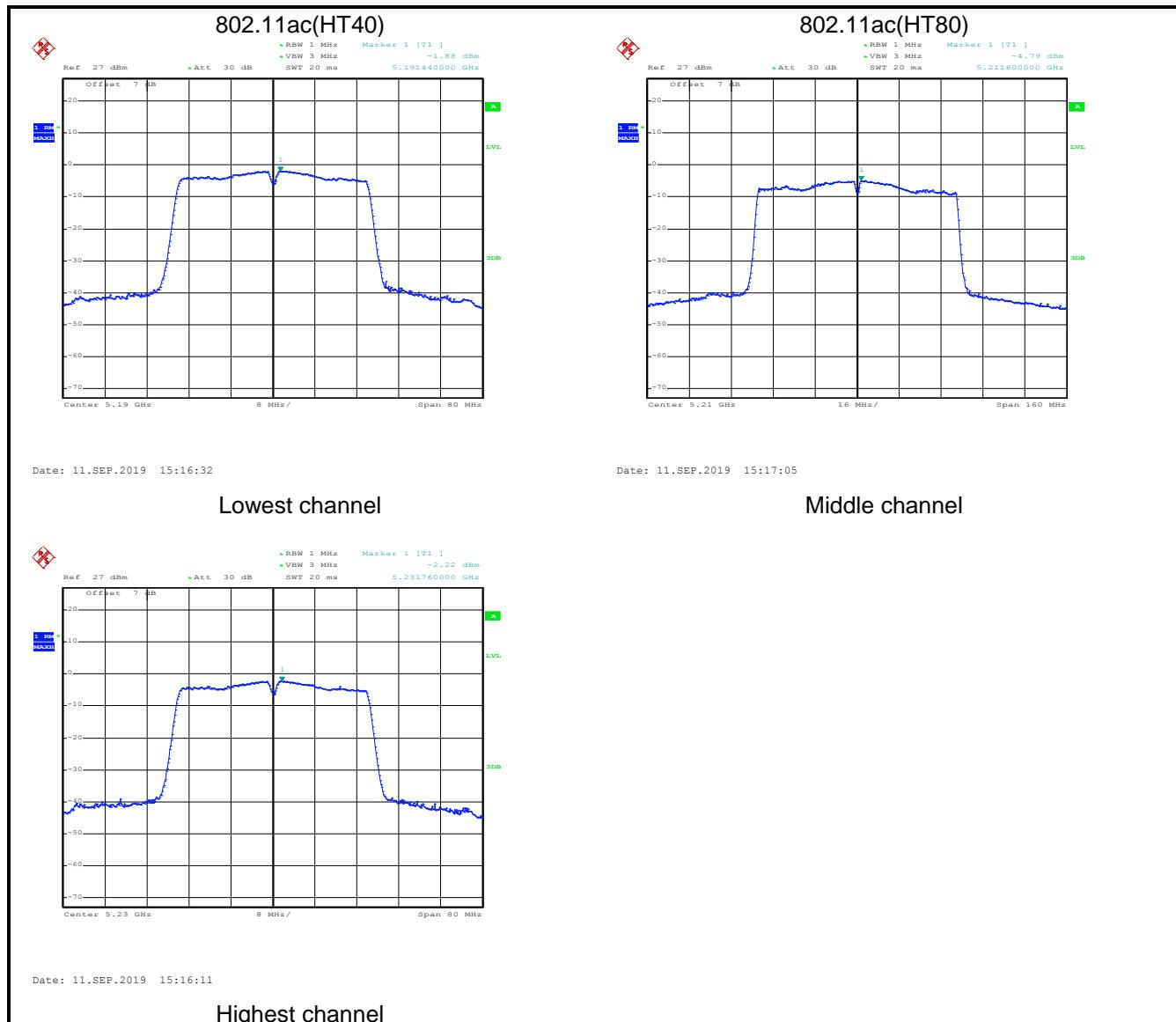
Band 1				
Mode	Test CH	PSD (dBm)	Limit (dBm)	Result
802.11a	Lowest	2.41	11.00	Pass
	Middle	2.22		
	Highest	2.07		
802.11n(HT20)	Lowest	1.64	11.00	Pass
	Middle	1.49		
	Highest	1.39		
802.11n(HT40)	Lowest	-1.77	11.00	Pass
	Highest	-2.23		
802.11ac(HT20)	Lowest	1.69	11.00	Pass
	Middle	1.63		
	Highest	1.53		
802.11ac(HT40)	Lowest	-1.88	11.00	Pass
	Highest	-2.22		
802.11ac(HT80)	Middle	-4.79	11.00	Pass

Band 4				
Mode	Test CH	PSD (dBm)	Limit (dBm)	Result
802.11a	Lowest	6.85	30.00	Pass
	Middle	5.81		
	Highest	5.91		
802.11n20	Lowest	5.65	30.00	Pass
	Middle	4.34		
	Highest	5.36		
802.11n40	Lowest	2.30	30.00	Pass
	Highest	1.44		
802.11ac20	Lowest	5.12	30.00	Pass
	Middle	5.38		
	Highest	5.93		
802.11ac40	Lowest	1.69	30.00	Pass
	Highest	1.32		
802.11ac80	Middle	-1.61	30.00	Pass

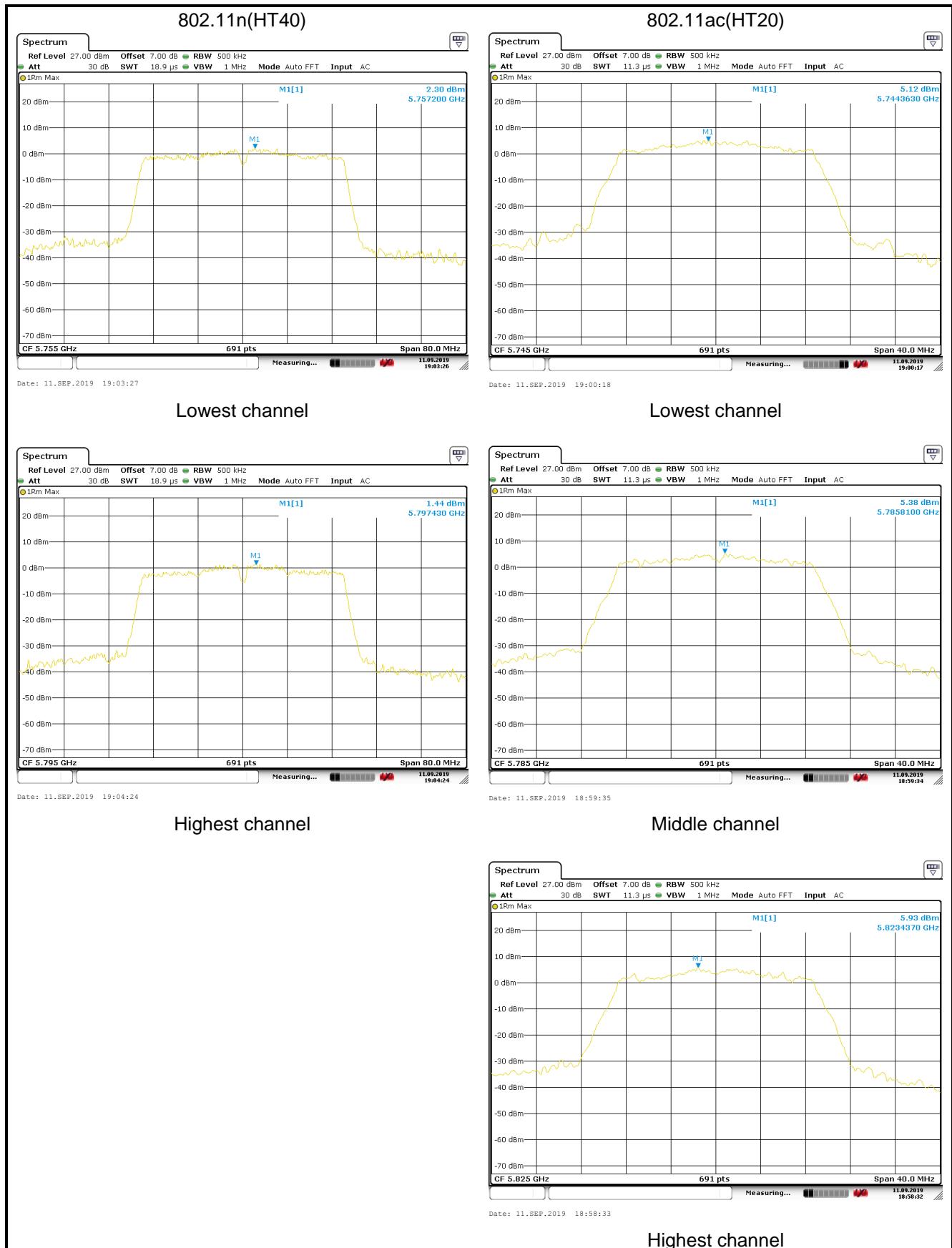
Test plot as follows:

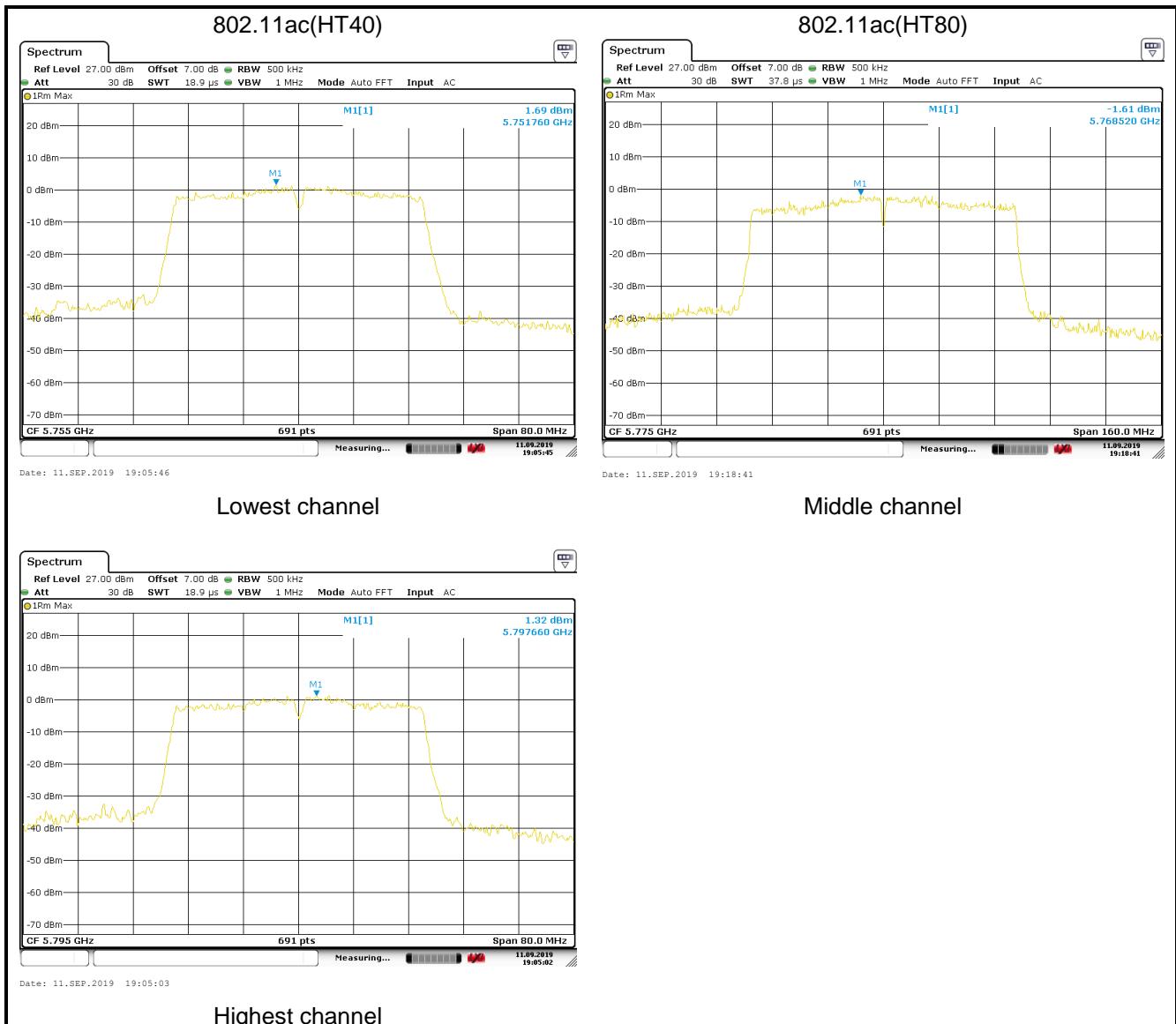






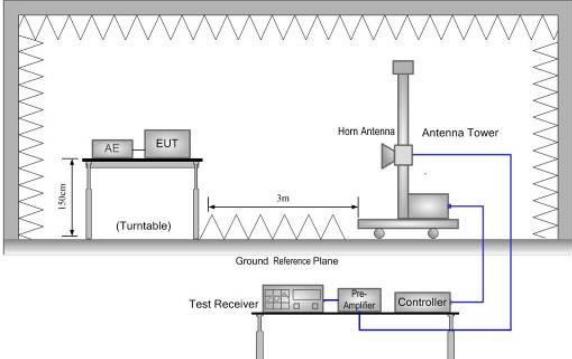






6.6 Band Edge

Test Requirement:	FCC Part 15 E Section 15.407 (b)						
Test Method:	ANSI C63.10:2013 , KDB 789033						
Receiver setup:	Detector	RBW	VBW	Remark			
	Quasi-peak	120kHz	300kHz	Quasi-peak Value			
	RMS	1MHz	3MHz	Average Value			
Limit:	Band	Limit (dB μ V/m @3m)		Remark			
	Band 1/2/3	68.20	Peak Value				
		54.00	Average Value				
	Band 4	78.20	Peak Value				
		54.00	Average Value				
<p>Band 4 limit: For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</p>							
<p>Remark:</p> <ol style="list-style-type: none"> 1. Band 1/2/3 limit: $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 68.2 \text{ dB}\mu\text{V}/\text{m}$, for $\text{EIPR}[\text{dBm}] = -27 \text{ dBm}$. 2. Band 4 limit: $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 68.2 \text{ dB}\mu\text{V}/\text{m}$, for $\text{EIPR}[\text{dBm}] = -27 \text{ dBm}$. $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 105.2 \text{ dB}\mu\text{V}/\text{m}$, for $\text{EIPR}[\text{dBm}] = 10 \text{ dBm}$. $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 110.8 \text{ dB}\mu\text{V}/\text{m}$, for $\text{EIPR}[\text{dBm}] = 15.6 \text{ dBm}$. $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2 = 122.2 \text{ dB}\mu\text{V}/\text{m}$, for $\text{EIPR}[\text{dBm}] = 27 \text{ dBm}$. 							
Test Procedure:	<ol style="list-style-type: none"> 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. 						

Test setup:	
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data (worst case):**Band 1:**

Band 1 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	51.89	36.23	7.05	41.93	53.24	68.20	-14.96	Horizontal
5150.00	49.68	36.23	7.05	41.93	51.03	68.20	-17.17	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	41.58	36.23	7.05	41.93	42.93	54.00	-11.07	Horizontal
5150.00	39.64	36.23	7.05	41.93	40.99	54.00	-13.01	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	49.86	35.37	7.11	41.89	50.45	68.20	-17.75	Horizontal
5350.00	48.67	35.37	7.11	41.89	49.26	68.20	-18.94	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	39.17	35.37	7.11	41.89	39.76	54.00	-14.24	Horizontal
5350.00	38.46	35.37	7.11	41.89	39.05	54.00	-14.95	Vertical
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 1 – 802.11n(HT20)								
Test channel: Lowest channel								
Detector: Peak								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	51.83	36.23	7.05	41.93	53.18	68.20	-15.02	Horizontal
5150.00	50.06	36.23	7.05	41.93	51.41	68.20	-16.79	Vertical
Detector: Average								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	41.59	36.23	7.05	41.93	42.94	54.00	-11.06	Horizontal
5150.00	39.64	36.23	7.05	41.93	40.99	54.00	-13.01	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	49.26	35.37	7.11	41.89	49.85	68.20	-18.35	Horizontal
5350.00	48.37	35.37	7.11	41.89	48.96	68.20	-19.24	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	39.64	35.37	7.11	41.89	40.23	54.00	-13.77	Horizontal
5350.00	39.58	35.37	7.11	41.89	40.17	54.00	-13.83	Vertical
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 1 – 802.11n(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	52.26	34.98	7.05	41.93	52.36	68.20	-15.84	Horizontal
5150.00	49.68	34.98	7.05	41.93	49.78	68.20	-18.42	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	40.89	34.98	7.05	41.93	40.99	54.00	-13.01	Horizontal
5150.00	39.87	34.98	7.05	41.93	39.97	54.00	-14.03	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	49.86	35.37	35.37	7.11	41.89	68.20	-26.31	Horizontal
5350.00	49.38	35.37	35.37	7.11	41.89	68.20	-26.31	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	39.65	35.37	7.11	41.89	40.24	54.00	-13.76	Horizontal
5350.00	39.46	35.37	7.11	41.89	40.05	54.00	-13.95	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 1 – 802.11ac(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	50.62	36.23	7.05	41.93	51.97	68.20	-16.23	Horizontal
5150.00	49.83	36.23	7.05	41.93	51.18	68.20	-17.02	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	40.86	36.23	7.05	41.93	42.21	54.00	-11.79	Horizontal
5150.00	39.37	36.23	7.05	41.93	40.72	54.00	-13.28	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	49.53	35.37	7.11	41.89	50.12	68.20	-18.08	Horizontal
5350.00	49.25	35.37	7.11	41.89	49.84	68.20	-18.36	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	39.37	35.37	7.11	41.89	39.96	54.00	-14.04	Horizontal
5350.00	38.76	35.37	7.11	41.89	39.35	54.00	-14.65	Vertical
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 1 – 802.11ac(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	49.89	34.98	7.05	41.93	49.99	68.20	-18.21	Horizontal
5150.00	50.26	34.98	7.05	41.93	50.36	68.20	-17.84	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	39.86	34.98	7.05	41.93	39.96	54.00	-14.04	Horizontal
5150.00	40.35	34.98	7.05	41.93	40.45	54.00	-13.55	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	49.36	35.37	35.37	7.11	41.89	68.20	-26.31	Horizontal
5350.00	49.67	35.37	35.37	7.11	41.89	68.20	-26.31	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	39.58	35.37	7.11	41.89	40.17	54.00	-13.83	Horizontal
5350.00	39.61	35.37	7.11	41.89	40.20	54.00	-13.80	Vertical

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 1 – 802.11ac(HT80)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	51.60	36.23	7.05	41.93	52.95	68.20	-15.25	Horizontal
5150.00	49.89	36.23	7.05	41.93	51.24	68.20	-16.96	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	41.18	36.23	7.05	41.93	42.53	54.00	-11.47	Horizontal
5150.00	39.62	36.23	7.05	41.93	40.97	54.00	-13.03	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	49.83	35.37	7.11	41.89	50.42	68.20	-17.78	Horizontal
5350.00	49.67	35.37	7.11	41.89	50.26	68.20	-17.94	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	39.52	35.37	7.11	41.89	40.11	54.00	-13.89	Horizontal
5350.00	39.36	35.37	7.11	41.89	39.95	54.00	-14.05	Vertical
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 4:

Band 4 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5650.00	49.87	32.68	7.45	41.85	48.15	68.20	-20.05	Horizontal
5700.00	50.36	32.77	7.60	41.90	48.83	105.20	-56.37	Horizontal
5720.00	53.42	32.81	7.64	41.92	51.95	110.80	-58.85	Horizontal
5725.00	54.38	32.81	7.69	41.94	52.94	122.20	-69.26	Horizontal
5650.00	49.86	32.68	7.45	41.85	48.14	68.20	-20.06	Vertical
5700.00	50.17	32.77	7.60	41.90	48.64	105.20	-56.56	Vertical
5720.00	57.16	32.81	7.64	41.92	55.69	110.80	-55.11	Vertical
5725.00	58.56	32.81	7.69	41.94	57.12	122.20	-65.08	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	49.67	33.04	7.45	41.85	48.31	122.20	-73.89	Horizontal
5855.00	49.32	33.05	7.60	41.90	48.07	110.80	-62.73	Horizontal
5875.00	48.86	33.08	7.64	41.92	47.66	105.20	-57.54	Horizontal
5925.00	48.35	33.17	7.69	41.94	47.27	68.20	-20.93	Horizontal
5850.00	49.73	33.04	7.45	41.85	48.37	122.20	-73.83	Vertical
5855.00	49.35	33.05	7.60	41.90	48.10	110.80	-62.70	Vertical
5875.00	48.89	33.08	7.64	41.92	47.69	105.20	-57.51	Vertical
5925.00	48.62	33.17	7.69	41.94	47.54	68.20	-20.66	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 4 – 802.11n(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5650.00	49.87	32.68	7.45	41.85	48.15	68.20	-20.05	Horizontal
5700.00	49.68	32.77	7.60	41.90	48.15	105.20	-57.05	Horizontal
5720.00	52.76	32.81	7.64	41.92	51.29	110.80	-59.51	Horizontal
5725.00	54.87	32.81	7.69	41.94	53.43	122.20	-68.77	Horizontal
5650.00	49.52	32.68	7.45	41.85	47.80	68.20	-20.40	Vertical
5700.00	49.98	32.77	7.60	41.90	48.45	105.20	-56.75	Vertical
5720.00	56.86	32.81	7.64	41.92	55.39	110.80	-55.41	Vertical
5725.00	57.98	32.81	7.69	41.94	56.54	122.20	-65.66	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	49.86	33.04	7.45	41.85	48.50	122.20	-73.70	Horizontal
5855.00	49.62	33.05	7.60	41.90	48.37	110.80	-62.43	Horizontal
5875.00	48.97	33.08	7.64	41.92	47.77	105.20	-57.43	Horizontal
5925.00	48.89	33.17	7.69	41.94	47.81	68.20	-20.39	Horizontal
5850.00	49.67	33.04	7.45	41.85	48.31	122.20	-73.89	Vertical
5855.00	49.53	33.05	7.60	41.90	48.28	110.80	-62.52	Vertical
5875.00	49.37	33.08	7.64	41.92	48.17	105.20	-57.03	Vertical
5925.00	48.73	33.17	7.69	41.94	47.65	68.20	-20.55	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 4 – 802.11n(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5650.00	49.89	32.68	7.45	41.85	48.17	68.20	-20.03	Horizontal
5700.00	50.37	32.77	7.60	41.90	48.84	105.20	-56.36	Horizontal
5720.00	51.06	32.81	7.64	41.92	49.59	110.80	-61.21	Horizontal
5725.00	52.98	32.81	7.69	41.94	51.54	122.20	-70.66	Horizontal
5650.00	49.63	32.68	7.45	41.85	47.91	68.20	-20.29	Vertical
5700.00	51.06	32.77	7.60	41.90	49.53	105.20	-55.67	Vertical
5720.00	52.84	32.81	7.64	41.92	51.37	110.80	-59.43	Vertical
5725.00	54.35	32.81	7.69	41.94	52.91	122.20	-69.29	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	48.89	33.04	7.45	41.85	47.53	122.20	-74.67	Horizontal
5855.00	49.12	33.05	7.60	41.90	47.87	110.80	-62.93	Horizontal
5875.00	49.36	33.08	7.64	41.92	48.16	105.20	-57.04	Horizontal
5925.00	49.75	33.17	7.69	41.94	48.67	68.20	-19.53	Horizontal
5850.00	48.96	33.04	7.45	41.85	47.60	122.20	-74.60	Vertical
5855.00	49.31	33.05	7.60	41.90	48.06	110.80	-62.74	Vertical
5875.00	49.68	33.08	7.64	41.92	48.48	105.20	-56.72	Vertical
5925.00	49.86	33.17	7.69	41.94	48.78	68.20	-19.42	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 4 – 802.11ac(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5650.00	48.37	32.68	7.45	41.85	46.65	68.20	-21.55	Horizontal
5700.00	48.92	32.77	7.60	41.90	47.39	105.20	-57.81	Horizontal
5720.00	51.96	32.81	7.64	41.92	50.49	110.80	-60.31	Horizontal
5725.00	53.27	32.81	7.69	41.94	51.83	122.20	-70.37	Horizontal
5650.00	48.86	32.68	7.45	41.85	47.14	68.20	-21.06	Vertical
5700.00	49.64	32.77	7.60	41.90	48.11	105.20	-57.09	Vertical
5720.00	52.89	32.81	7.64	41.92	51.42	110.80	-59.38	Vertical
5725.00	53.36	32.81	7.69	41.94	51.92	122.20	-70.28	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	49.86	33.04	7.45	41.85	48.50	122.20	-73.70	Horizontal
5855.00	49.61	33.05	7.60	41.90	48.36	110.80	-62.44	Horizontal
5875.00	48.79	33.08	7.64	41.92	47.59	105.20	-57.61	Horizontal
5925.00	48.36	33.17	7.69	41.94	47.28	68.20	-20.92	Horizontal
5850.00	50.89	33.04	7.45	41.85	49.53	122.20	-72.67	Vertical
5855.00	49.67	33.05	7.60	41.90	48.42	110.80	-62.38	Vertical
5875.00	48.75	33.08	7.64	41.92	47.55	105.20	-57.65	Vertical
5925.00	48.69	33.17	7.69	41.94	47.61	68.20	-20.59	Vertical

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 4 – 802.11ac(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5650.00	48.86	32.68	7.45	41.85	47.14	68.20	-21.06	Horizontal
5700.00	49.07	32.77	7.60	41.90	47.54	105.20	-57.66	Horizontal
5720.00	51.98	32.81	7.64	41.92	50.51	110.80	-60.29	Horizontal
5725.00	53.43	32.81	7.69	41.94	51.99	122.20	-70.21	Horizontal
5650.00	48.89	32.68	7.45	41.85	47.17	68.20	-21.03	Vertical
5700.00	49.37	32.77	7.60	41.90	47.84	105.20	-57.36	Vertical
5720.00	52.46	32.81	7.64	41.92	50.99	110.80	-59.81	Vertical
5725.00	53.87	32.81	7.69	41.94	52.43	122.20	-69.77	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	50.29	33.04	7.45	41.85	48.93	122.20	-73.27	Horizontal
5855.00	49.87	33.05	7.60	41.90	48.62	110.80	-62.18	Horizontal
5875.00	49.36	33.08	7.64	41.92	48.16	105.20	-57.04	Horizontal
5925.00	48.83	33.17	7.69	41.94	47.75	68.20	-20.45	Horizontal
5850.00	50.94	33.04	7.45	41.85	49.58	122.20	-72.62	Vertical
5855.00	49.86	33.05	7.60	41.90	48.61	110.80	-62.19	Vertical
5875.00	48.92	33.08	7.64	41.92	47.72	105.20	-57.48	Vertical
5925.00	48.46	33.17	7.69	41.94	47.38	68.20	-20.82	Vertical

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 4 – 802.11ac(HT80)								
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5650.00	49.83	32.68	7.45	41.85	48.11	68.20	-20.09	Horizontal
5700.00	50.36	32.77	7.60	41.90	48.83	105.20	-56.37	Horizontal
5720.00	55.91	32.81	7.64	41.92	54.44	110.80	-56.36	Horizontal
5725.00	58.64	32.81	7.69	41.94	57.20	122.20	-65.00	Horizontal
5650.00	49.86	32.68	7.45	41.85	48.14	68.20	-20.06	Vertical
5700.00	51.38	32.77	7.60	41.90	49.85	105.20	-55.35	Vertical
5720.00	58.89	32.81	7.64	41.92	57.42	110.80	-53.38	Vertical
5725.00	59.61	32.81	7.69	41.94	58.17	122.20	-64.03	Vertical
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	48.74	33.04	7.45	41.85	47.38	122.20	-74.82	Horizontal
5855.00	48.62	33.05	7.60	41.90	47.37	110.80	-63.43	Horizontal
5875.00	49.37	33.08	7.64	41.92	48.17	105.20	-57.04	Horizontal
5925.00	48.86	33.17	7.69	41.94	47.78	68.20	-20.42	Horizontal
5850.00	49.23	33.04	7.45	41.85	47.87	122.20	-74.33	Vertical
5855.00	49.00	33.05	7.60	41.90	47.75	110.80	-63.05	Vertical
5875.00	49.06	33.08	7.64	41.92	47.86	105.20	-57.34	Vertical
5925.00	48.53	33.17	7.69	41.94	47.45	68.20	-20.75	Vertical

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

6.7 Spurious Emission

6.7.1 Restricted Band

Test Requirement:	FCC Part15 E Section 15.407(b)								
Test Method:	ANSI C63.10: 2013								
Test Frequency Range:	4.5 GHz to 5.15 GHz and 5.35GHz to 5.46GHz								
Test site:	Measurement Distance: 3m								
Receiver setup:	Frequency	Detector	RBW	VBW	Remark				
	Above 1GHz	Peak	1MHz	3MHz	Peak Value				
Limit:	Frequency	Limit (dBuV/m @3m)		Remark					
	Above 1GHz	74.00		Peak Value					
Test Procedure:	<ol style="list-style-type: none"> The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. 								
Test setup:	<p>The diagram illustrates the test setup for spurious emission testing. An Equipment Under Test (EUT) is positioned on a turntable 1.5m above the ground. A horn antenna is mounted on an antenna tower 3m away. The setup is connected to a test receiver, pre-amplifier, and controller.</p>								
Test Instruments:	Refer to section 5.9 for details								
Test mode:	Refer to section 5.3 for details								
Test results:	Passed								

Measurement Data (worst case):**Band 1:**

Band 1 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	49.26	34.50	6.80	42.05	48.51	74.00	-25.49	Horizontal
4500.00	49.17	34.50	6.80	42.05	48.42	74.00	-25.58	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	38.47	34.50	6.80	42.05	37.72	54.00	-16.28	Horizontal
4500.00	38.96	34.50	6.80	42.05	38.21	54.00	-15.79	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	49.76	34.90	7.18	41.85	49.99	74.00	-24.01	Horizontal
5460.00	48.69	34.90	7.18	41.85	48.92	74.00	-25.08	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	39.25	34.90	7.18	41.85	39.48	54.00	-14.52	Horizontal
5460.00	39.83	34.90	7.18	41.85	40.06	54.00	-13.94	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 1 – 802.11n(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	49.12	34.50	6.80	42.05	48.37	74.00	-25.63	Horizontal
4500.00	49.38	34.50	6.80	42.05	48.63	74.00	-25.37	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	39.56	34.50	6.80	42.05	38.81	54.00	-15.19	Horizontal
4500.00	39.14	34.50	6.80	42.05	38.39	54.00	-15.61	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	49.58	34.90	7.18	41.85	49.81	74.00	-24.19	Horizontal
5460.00	49.37	34.90	7.18	41.85	49.60	74.00	-24.40	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	38.73	34.90	7.18	41.85	38.96	54.00	-15.04	Horizontal
5460.00	39.62	34.90	7.18	41.85	39.85	54.00	-14.15	Vertical
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 1 – 802.11n(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	49.58	34.50	6.80	42.05	48.83	74.00	-25.17	Horizontal
4500.00	49.76	34.50	6.80	42.05	49.01	74.00	-24.99	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	39.24	34.50	6.80	42.05	38.49	54.00	-15.51	Horizontal
4500.00	39.26	34.50	6.80	42.05	38.51	54.00	-15.49	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	49.83	34.90	7.18	41.85	50.06	74.00	-23.94	Horizontal
5460.00	49.64	34.90	7.18	41.85	49.87	74.00	-24.13	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	39.53	34.90	7.18	41.85	39.76	54.00	-14.24	Horizontal
5460.00	39.21	34.90	7.18	41.85	39.44	54.00	-14.56	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 1 – 802.11ac(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	49.86	34.50	6.80	42.05	49.11	74.00	-24.89	Horizontal
4500.00	49.98	34.50	6.80	42.05	49.23	74.00	-24.77	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	39.47	34.50	6.80	42.05	38.72	54.00	-15.28	Horizontal
4500.00	39.83	34.50	6.80	42.05	39.08	54.00	-14.92	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	49.37	34.90	7.18	41.85	49.60	74.00	-24.40	Horizontal
5460.00	49.25	34.90	7.18	41.85	49.48	74.00	-24.52	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	39.06	34.90	7.18	41.85	39.29	54.00	-14.71	Horizontal
5460.00	39.24	34.90	7.18	41.85	39.47	54.00	-14.53	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 1 – 802.11ac(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	49.53	34.50	6.80	42.05	48.78	74.00	-25.22	Horizontal
4500.00	49.89	34.50	6.80	42.05	49.14	74.00	-24.86	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	38.67	34.50	6.80	42.05	37.92	54.00	-16.08	Horizontal
4500.00	39.12	34.50	6.80	42.05	38.37	54.00	-15.63	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	49.87	34.90	7.18	41.85	50.10	74.00	-23.90	Horizontal
5460.00	49.56	34.90	7.18	41.85	49.79	74.00	-24.21	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	39.64	34.90	7.18	41.85	39.87	54.00	-14.13	Horizontal
5460.00	39.37	34.90	7.18	41.85	39.60	54.00	-14.40	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 1 – 802.11ac(HT80)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	49.86	34.50	6.80	42.05	49.11	74.00	-24.89	Horizontal
4500.00	49.35	34.50	6.80	42.05	48.60	74.00	-25.40	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	39.28	34.50	6.80	42.05	38.53	54.00	-15.47	Horizontal
4500.00	38.43	34.50	6.80	42.05	37.68	54.00	-16.32	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	49.26	34.90	7.18	41.85	49.49	74.00	-24.51	Horizontal
5460.00	49.67	34.90	7.18	41.85	49.90	74.00	-24.10	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	39.17	34.90	7.18	41.85	39.40	54.00	-14.60	Horizontal
5460.00	39.28	34.90	7.18	41.85	39.51	54.00	-14.49	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 4:

Band 4 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	49.64	35.37	7.11	41.89	50.23	74.00	-23.77	Horizontal
5350.00	49.57	35.37	7.11	41.89	50.16	74.00	-23.84	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	38.96	35.37	7.11	41.89	39.55	54.00	-14.45	Horizontal
5350.00	39.84	35.37	7.11	41.89	40.43	54.00	-13.57	Vertical
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	49.69	34.90	7.18	41.85	49.92	74.00	-24.08	Horizontal
5460.00	49.36	34.90	7.18	41.85	49.59	74.00	-24.41	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	38.53	34.90	7.18	41.85	38.76	54.00	-15.24	Horizontal
5460.00	38.87	34.90	7.18	41.85	39.10	54.00	-14.90	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 4 – 802.11n(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	49.57	35.37	7.11	41.89	50.16	74.00	-23.84	Horizontal
5350.00	49.83	35.37	7.11	41.89	50.42	74.00	-23.58	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	39.49	35.37	7.11	41.89	40.08	54.00	-13.92	Horizontal
5350.00	39.61	35.37	7.11	41.89	40.20	54.00	-13.80	Vertical
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	49.76	34.90	7.18	41.85	49.99	74.00	-24.01	Horizontal
5460.00	49.91	34.90	7.18	41.85	50.14	74.00	-23.86	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	38.62	34.90	7.18	41.85	38.85	54.00	-15.15	Horizontal
5460.00	38.83	34.90	7.18	41.85	39.06	54.00	-14.94	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 4 – 802.11n(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	49.61	35.37	7.11	41.89	50.20	74.00	-23.80	Horizontal
5350.00	49.89	35.37	7.11	41.89	50.48	74.00	-23.52	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	39.67	35.37	7.11	41.89	40.26	54.00	-13.74	Horizontal
5350.00	39.86	35.37	7.11	41.89	40.45	54.00	-13.55	Vertical
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	49.79	34.90	7.18	41.85	50.02	74.00	-23.98	Horizontal
5460.00	49.52	34.90	7.18	41.85	49.75	74.00	-24.25	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	39.38	34.90	7.18	41.85	39.61	54.00	-14.39	Horizontal
5460.00	39.64	34.90	7.18	41.85	39.87	54.00	-14.13	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 4 – 802.11ac(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	49.49	35.37	7.11	41.89	50.08	74.00	-23.92	Horizontal
5350.00	49.35	35.37	7.11	41.89	49.94	74.00	-24.06	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	38.83	35.37	7.11	41.89	39.42	54.00	-14.58	Horizontal
5350.00	39.07	35.37	7.11	41.89	39.66	54.00	-14.34	Vertical
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	49.59	34.90	7.18	41.85	49.82	74.00	-24.18	Horizontal
5460.00	49.38	34.90	7.18	41.85	49.61	74.00	-24.39	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	38.49	34.90	7.18	41.85	38.72	54.00	-15.28	Horizontal
5460.00	39.37	34.90	7.18	41.85	39.60	54.00	-14.40	Vertical

Remark:

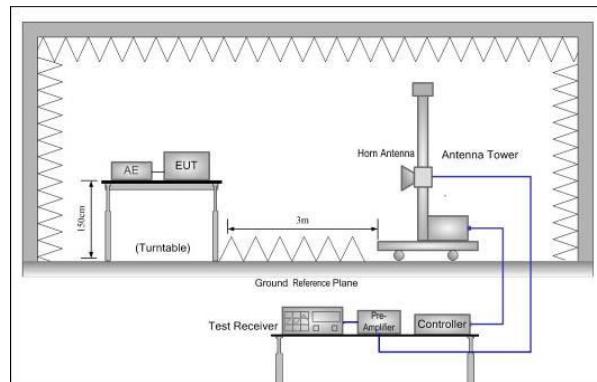
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 4 – 802.11ac(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	49.29	35.37	7.11	41.89	49.88	74.00	-24.12	Horizontal
5350.00	49.48	35.37	7.11	41.89	50.07	74.00	-23.93	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	38.96	35.37	7.11	41.89	39.55	54.00	-14.45	Horizontal
5350.00	39.17	35.37	7.11	41.89	39.76	54.00	-14.24	Vertical
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	49.29	34.90	7.18	41.85	49.52	74.00	-24.48	Horizontal
5460.00	49.34	34.90	7.18	41.85	49.57	74.00	-24.43	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	38.89	34.90	7.18	41.85	39.12	54.00	-14.88	Horizontal
5460.00	39.43	34.90	7.18	41.85	39.66	54.00	-14.34	Vertical
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 4 – 802.11ac(HT80)								
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	49.86	35.37	7.11	41.89	50.45	74.00	-23.55	Horizontal
5350.00	49.65	35.37	7.11	41.89	50.24	74.00	-23.76	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	39.12	35.37	7.11	41.89	39.71	54.00	-14.29	Horizontal
5350.00	39.38	35.37	7.11	41.89	39.97	54.00	-14.03	Vertical
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	49.47	34.90	7.18	41.85	49.70	74.00	-24.30	Horizontal
5460.00	49.58	34.90	7.18	41.85	49.81	74.00	-24.19	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	38.67	34.90	7.18	41.85	38.90	54.00	-15.10	Horizontal
5460.00	38.89	34.90	7.18	41.85	39.12	54.00	-14.88	Vertical
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

6.7.2 Unwanted Emissions out of the Restricted Bands

Test Requirement:	FCC Part15 C Section 15.209 and 15.205								
Test Method:	ANSI C63.10: 2013								
Test Frequency Range:	30MHz to 40GHz								
Test site:	Measurement Distance: 3m								
Receiver setup:	Frequency	Detector	RBW	VBW	Remark				
	30MHz-1GHz	Quasi-peak	100kHz	300kHz	Quasi-peak Value				
	Above 1GHz	Peak	1MHz	3MHz	Peak Value				
Limit:	RMS	1MHz	3MHz	Average	Value				
	Frequency	Limit (dB μ V/m @3m)		Remark					
	30MHz-88MHz	40.0		Quasi-peak Value					
	88MHz-216MHz	43.5		Quasi-peak Value					
	216MHz-960MHz	46.0		Quasi-peak Value					
	960MHz-1GHz	54.0		Quasi-peak Value					
	Above 1GHz	68.20		Peak Value					
		54.00		Average Value					
	<i>Remark:</i>								
	<i>Above 1GHz limit: E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBμV/m, for EIPR[dBm]=-27dBm.</i>								
Test Procedure:	<ol style="list-style-type: none"> The EUT was placed on the top of a rotating table 0.8m(below 1GHz)/1.5m(above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. 								
Test setup:	<p>Below 1GHz</p> <p>Above 1GHz</p>								



Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

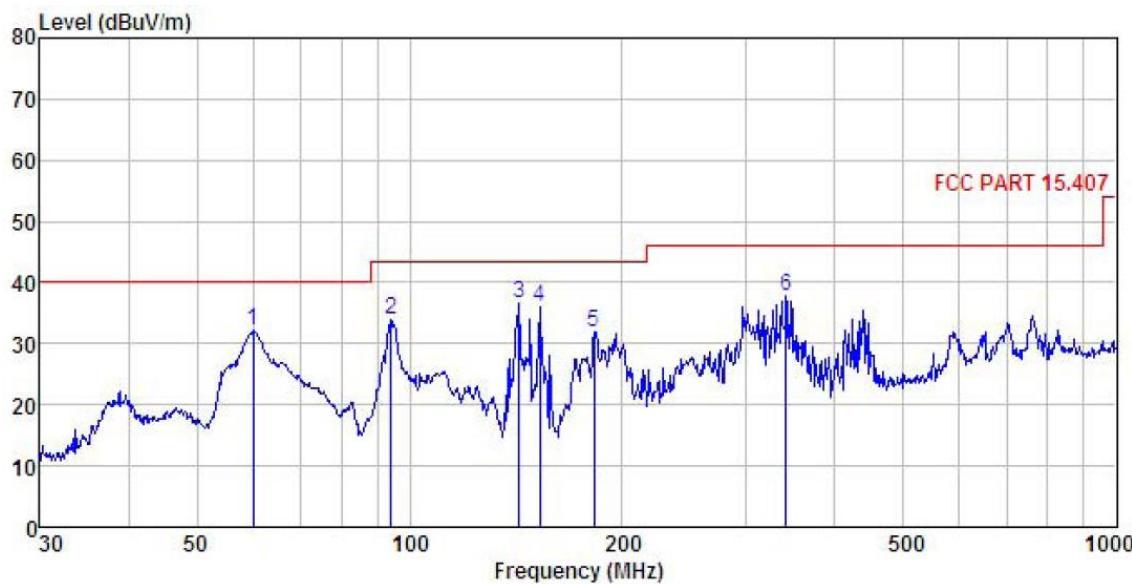
Measurement Data (worst case):**Below 1GHz**

Product Name:	CM20 Communication Module			Product Model:	CM20			
Test By:	Mike			Test mode:	5G Wi-Fi Tx mode			
Test Frequency:	30 MHz ~ 1 GHz			Polarization:	Vertical			
Test Voltage:	AC 120/60Hz			Environment:	Temp: 24°C Huni: 57%			
Freq	Read MHz	Antenna Level dBuV	Cable Factor	Preamp Loss dB	Line Level dBuV/m	Limit Line dBuV/m	Over Line dB	Remark
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB	
1	34.517	54.08	11.14	1.04	29.95	36.31	40.00	-3.69 QP
2	48.163	53.44	12.17	1.27	29.83	37.05	40.00	-2.95 QP
3	58.819	54.78	11.45	1.38	29.78	37.83	40.00	-2.17 QP
4	125.007	54.03	10.51	2.22	29.36	37.40	43.50	-6.10 QP
5	309.998	47.36	13.82	2.97	28.47	35.68	46.00	-10.32 QP
6	696.857	39.74	20.36	4.16	28.68	35.58	46.00	-10.42 QP

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Product Name:	CM20 Communication Module	Product Model:	CM20
Test By:	Mike	Test mode:	5G Wi-Fi Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Huni: 57%



Freq MHz	Read Level dBuV	Antenna Factor dB/m	Cable Loss Factor dB	Preamp Level dB	Line dBuV/m	Limit Line dBuV/m	Over Limit dB	Over Remark
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB	
1	60.069	49.08	11.40	1.38	29.77	32.09	40.00	-7.91 QP
2	94.098	50.50	11.08	2.01	29.55	34.04	43.50	-9.46 QP
3	142.824	54.11	9.31	2.43	29.26	36.59	43.50	-6.91 QP
4	152.664	53.69	9.00	2.53	29.20	36.02	43.50	-7.48 QP
5	182.559	47.98	10.06	2.75	28.95	31.84	43.50	-11.66 QP
6	340.782	48.79	14.44	3.07	28.54	37.76	46.00	-8.24 QP

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Above 1GHz:**Band 1:**

Band 1 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10360.00	49.89	40.10	9.82	41.97	57.84	68.20	-10.36	Vertical
10360.00	49.37	40.10	9.82	41.97	57.32	68.20	-10.88	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10360.00	40.23	40.10	9.82	41.97	48.18	54.00	-5.82	Vertical
10360.00	39.67	40.10	9.82	41.97	47.62	54.00	-6.38	Horizontal
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10400.00	48.96	40.00	9.85	41.95	56.86	68.20	-11.34	Vertical
10400.00	48.79	40.00	9.85	41.95	56.69	68.20	-11.51	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10400.00	38.60	40.00	9.85	41.95	46.50	54.00	-7.50	Vertical
10400.00	38.64	40.00	9.85	41.95	46.54	54.00	-7.46	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10480.00	48.96	39.70	9.96	41.88	56.74	68.20	-11.46	Vertical
10480.00	49.67	39.70	9.96	41.88	57.45	68.20	-10.75	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10480.00	39.15	39.70	9.96	41.88	46.93	54.00	-7.07	Vertical
10480.00	38.56	39.70	9.96	41.88	46.34	54.00	-7.66	Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 1 – 802.11n(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10360.00	49.89	40.10	9.82	41.97	57.84	68.20	-10.36	Vertical
10360.00	48.95	40.10	9.82	41.97	56.90	68.20	-11.30	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10360.00	39.58	40.10	9.82	41.97	47.53	54.00	-6.47	Vertical
10360.00	39.61	40.10	9.82	41.97	47.56	54.00	-6.44	Horizontal
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10400.00	49.76	40.00	9.85	41.95	57.66	68.20	-10.54	Vertical
10400.00	49.62	40.00	9.85	41.95	57.52	68.20	-10.68	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10400.00	39.74	40.00	9.85	41.95	47.64	54.00	-6.36	Vertical
10400.00	39.56	40.00	9.85	41.95	47.46	54.00	-6.54	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10480.00	49.86	39.70	9.96	41.88	57.64	68.20	-10.56	Vertical
10480.00	49.52	39.70	9.96	41.88	57.30	68.20	-10.90	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10480.00	40.71	39.70	9.96	41.88	48.49	54.00	-5.51	Vertical
10480.00	39.89	39.70	9.96	41.88	47.67	54.00	-6.33	Horizontal
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 1 – 802.11n(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10380.00	49.78	40.00	9.85	41.95	57.68	68.20	-10.52	Vertical
10380.00	48.96	40.00	9.85	41.95	56.86	68.20	-11.34	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10380.00	40.37	40.00	9.85	41.95	48.27	54.00	-5.73	Vertical
10380.00	40.26	40.00	9.85	41.95	48.16	54.00	-5.84	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10460.00	49.38	39.80	9.92	41.90	57.20	68.20	-11.00	Vertical
10460.00	49.23	39.80	9.92	41.90	57.05	68.20	-11.15	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10460.00	39.64	39.80	9.92	41.90	47.46	54.00	-6.54	Vertical
10460.00	39.38	39.80	9.92	41.90	47.20	54.00	-6.80	Horizontal
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 1 – 802.11ac(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10360.00	49.49	40.10	9.82	41.97	57.44	68.20	-10.76	Vertical
10360.00	49.32	40.10	9.82	41.97	57.27	68.20	-10.93	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10360.00	40.06	40.10	9.82	41.97	48.01	54.00	-5.99	Vertical
10360.00	39.83	40.10	9.82	41.97	47.78	54.00	-6.22	Horizontal
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10400.00	49.98	40.00	9.85	41.95	57.88	68.20	-10.32	Vertical
10400.00	49.56	40.00	9.85	41.95	57.46	68.20	-10.74	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10400.00	41.06	40.00	9.85	41.95	48.96	54.00	-5.04	Vertical
10400.00	39.07	40.00	9.85	41.95	46.97	54.00	-7.03	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10480.00	49.98	39.70	9.96	41.88	57.76	68.20	-10.44	Vertical
10480.00	49.65	39.70	9.96	41.88	57.43	68.20	-10.77	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10480.00	40.86	39.70	9.96	41.88	48.64	54.00	-5.36	Vertical
10480.00	40.37	39.70	9.96	41.88	48.15	54.00	-5.85	Horizontal
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 1 – 802.11ac(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10380.00	49.67	40.00	9.85	41.95	57.57	68.20	-10.63	Vertical
10380.00	49.36	40.00	9.85	41.95	57.26	68.20	-10.94	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10380.00	39.72	40.00	9.85	41.95	47.62	54.00	-6.38	Vertical
10380.00	39.08	40.00	9.85	41.95	46.98	54.00	-7.02	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10460.00	49.75	39.80	9.92	41.90	57.57	68.20	-10.63	Vertical
10460.00	49.86	39.80	9.92	41.90	57.68	68.20	-10.52	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10460.00	39.64	39.80	9.92	41.90	47.46	54.00	-6.54	Vertical
10460.00	39.53	39.80	9.92	41.90	47.35	54.00	-6.65	Horizontal
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 1 – 802.11ac(HT80)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10420.00	47.16	40.10	9.82	41.97	55.11	68.20	-13.09	Vertical
10420.00	48.52	40.10	9.82	41.97	56.47	68.20	-11.73	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
10420.00	39.85	40.10	9.82	41.97	47.80	54.00	-6.20	Vertical
10420.00	39.15	40.10	9.82	41.97	47.10	54.00	-6.90	Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 4:

Band 4 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11490.00	49.87	41.50	10.81	42.29	59.89	74.00	-14.11	Vertical
11490.00	48.92	41.50	10.81	42.29	58.94	74.00	-15.06	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11490.00	39.64	41.50	10.81	42.29	49.66	54.00	-4.34	Vertical
11490.00	38.89	41.50	10.81	42.29	48.91	54.00	-5.09	Horizontal
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11570.00	49.68	41.38	10.78	42.27	59.57	74.00	-14.43	Vertical
11570.00	49.23	41.38	10.78	42.27	59.12	74.00	-14.88	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11570.00	39.57	41.38	10.78	42.27	49.46	54.00	-4.54	Vertical
11570.00	38.76	41.38	10.78	42.27	48.65	54.00	-5.35	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11650.00	49.25	41.26	10.76	42.26	59.01	74.00	-14.99	Vertical
11650.00	49.12	41.26	10.76	42.26	58.88	74.00	-15.12	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11650.00	39.37	41.26	10.76	42.26	49.13	54.00	-4.87	Vertical
11650.00	39.26	41.26	10.76	42.26	49.02	54.00	-4.98	Horizontal
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 4 – 802.11n(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11490.00	49.59	41.50	10.81	42.29	59.61	74.00	-14.39	Vertical
11490.00	49.38	41.50	10.81	42.29	59.40	74.00	-14.60	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11490.00	39.28	41.50	10.81	42.29	49.30	54.00	-4.70	Vertical
11490.00	39.06	41.50	10.81	42.29	49.08	54.00	-4.92	Horizontal
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11570.00	49.86	41.38	10.78	42.27	59.75	74.00	-14.25	Vertical
11570.00	49.67	41.38	10.78	42.27	59.56	74.00	-14.44	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11570.00	39.82	41.38	10.78	42.27	49.71	54.00	-4.29	Vertical
11570.00	39.65	41.38	10.78	42.27	49.54	54.00	-4.46	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11650.00	49.58	41.26	10.76	42.26	59.34	74.00	-14.66	Vertical
11650.00	49.32	41.26	10.76	42.26	59.08	74.00	-14.92	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11650.00	38.76	41.26	10.76	42.26	48.52	54.00	-5.48	Vertical
11650.00	38.92	41.26	10.76	42.26	48.68	54.00	-5.32	Horizontal
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 4 – 802.11n(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11510.00	49.28	41.50	10.81	42.29	59.30	74.00	-14.70	Vertical
11510.00	49.37	41.50	10.81	42.29	59.39	74.00	-14.61	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11510.00	39.29	41.50	10.81	42.29	49.31	54.00	-4.69	Vertical
11510.00	39.34	41.50	10.81	42.29	49.36	54.00	-4.64	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11590.00	48.76	41.32	10.77	42.27	58.58	74.00	-15.42	Vertical
11590.00	48.64	41.32	10.77	42.27	58.46	74.00	-15.54	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11590.00	38.27	41.32	10.77	42.27	48.09	54.00	-5.91	Vertical
11590.00	38.56	41.32	10.77	42.27	48.38	54.00	-5.62	Horizontal
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 4 – 802.11ac(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11490.00	49.38	41.50	10.81	42.29	59.40	74.00	-14.60	Vertical
11490.00	49.26	41.50	10.81	42.29	59.28	74.00	-14.72	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11490.00	39.56	41.50	10.81	42.29	49.58	54.00	-4.42	Vertical
11490.00	39.24	41.50	10.81	42.29	49.26	54.00	-4.74	Horizontal
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11570.00	49.87	41.38	10.78	42.27	59.76	74.00	-14.24	Vertical
11570.00	49.56	41.38	10.78	42.27	59.45	74.00	-14.55	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11570.00	39.34	41.38	10.78	42.27	49.23	54.00	-4.77	Vertical
11570.00	39.23	41.38	10.78	42.27	49.12	54.00	-4.88	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11650.00	49.85	41.26	10.76	42.26	59.61	74.00	-14.39	Vertical
11650.00	49.71	41.26	10.76	42.26	59.47	74.00	-14.53	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11650.00	39.68	41.26	10.76	42.26	49.44	54.00	-4.56	Vertical
11650.00	39.73	41.26	10.76	42.26	49.49	54.00	-4.51	Horizontal
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

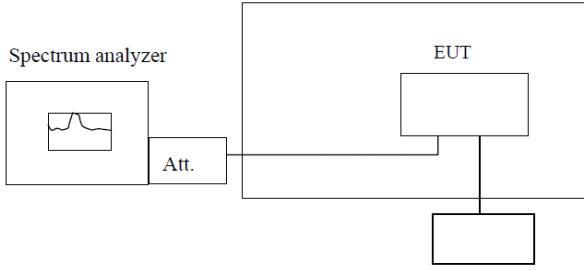
Band 4 – 802.11ac(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11510.00	49.89	41.50	10.81	42.29	59.91	74.00	-14.09	Vertical
11510.00	49.67	41.50	10.81	42.29	59.69	74.00	-14.31	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11510.00	39.86	41.50	10.81	42.29	49.88	54.00	-4.12	Vertical
11510.00	39.61	41.50	10.81	42.29	49.63	54.00	-4.37	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11590.00	49.38	41.32	10.77	42.27	59.20	74.00	-14.80	Vertical
11590.00	49.16	41.32	10.77	42.27	58.98	74.00	-15.02	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11590.00	39.24	41.32	10.77	42.27	49.06	54.00	-4.94	Vertical
11590.00	39.08	41.32	10.77	42.27	48.90	54.00	-5.10	Horizontal

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Band 4 – 802.11ac(HT80)								
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
11550.00	49.73	41.50	10.81	42.29	59.75	74.00	-14.25	Vertical
11550.00	49.32	41.50	10.81	42.29	59.34	74.00	-14.66	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11550.00	39.53	41.50	10.81	42.29	49.55	54.00	-4.45	Vertical
11550.00	39.24	41.50	10.81	42.29	49.26	54.00	-4.74	Horizontal
<i>Remark:</i>								
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.								
2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

6.8 Frequency stability

Test Requirement:	FCC Part15 E Section 15.407 (g)
Limit:	Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.
Test setup:	<p style="text-align: center;">Temperature Chamber</p>  <p style="text-align: center;">Note : Measurement setup for testing on Antenna connector</p>
Test procedure:	<ol style="list-style-type: none"> 1. The EUT is installed in an environment test chamber with external power source. 2. Set the chamber to operate at 50 centigrade and external power source to output at nominal voltage of EUT. 3. A sufficient stabilization period at each temperature is used prior to each frequency measurement. 4. When temperature is stabled, measure the frequency stability. 5. The test shall be performed under -30 to 50 centigrade and 85 to 115 percent of the nominal voltage. Change setting of chamber and external power source to complete all conditions.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data (the worst channel):**Band 1:****Voltage vs. Frequency Stability (Lowest channel=5180MHz)**

Test conditions		Frequency(MHz)	Max. Deviation (ppm)
Temp(°C)	Voltage(ac)		
20	102V	5180.020752	4.01
	120V	5180.010465	2.02
	138V	5180.014614	2.82

Temperature vs. Frequency Stability (Lowest channel=5180MHz)

Test conditions		Frequency(MHz)	Max. Deviation (ppm)
Voltage(ac)	Temp(°C)		
120V	-20	5180.017843	3.44
	-10	5180.016064	3.10
	0	5180.014758	2.85
	10	5180.013646	2.63
	20	5180.014536	2.81
	30	5180.013468	2.60
	40	5180.014356	2.77
	50	5180.013542	2.61

Band 4:**Voltage vs. Frequency Stability (Lowest channel=5745MHz)**

Test conditions		Frequency(MHz)	Max. Deviation (ppm)
Temp(°C)	Voltage(ac)		
20	102V	5745.016064	2.80
	120V	5745.014540	2.53
	138V	5745.013796	2.40

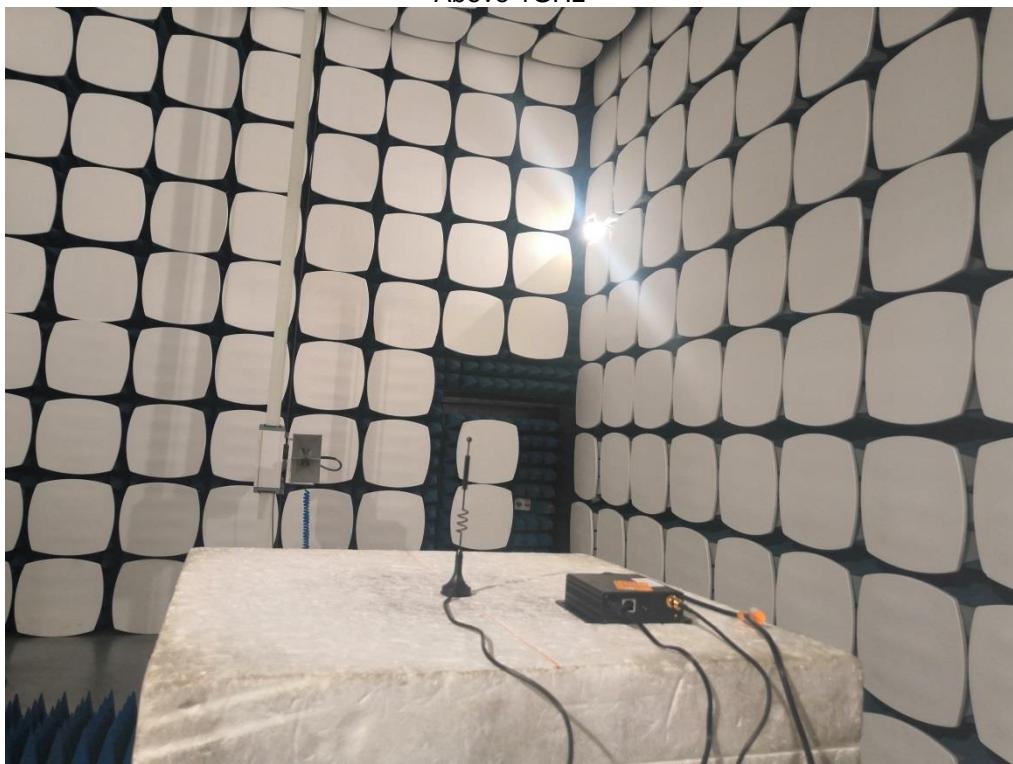
Temperature vs. Frequency Stability (Lowest channel=5745MHz)

Test conditions		Frequency(MHz)	Max. Deviation (ppm)
Voltage(ac)	Temp(°C)		
120V	-20	5745.013446	2.34
	-10	5745.013375	2.33
	0	5745.012934	2.25
	10	5745.013248	2.31
	20	5745.013765	2.96
	30	5745.012893	2.24
	40	5745.013129	2.29
	50	5745.012946	2.25

7 Test Setup Photo

Radiated Spurious Emission

Below 1GHz

**Above 1GHz**

Conducted Emission**8 EUT Constructional Details**

Reference to the test report No.: CCISE190808501

-----End of report-----