

FCC & IC REPORT

(UNII)

Applicant: Solaborate LLC

Address of Applicant: 8300 Utica Ave #283, Rancho Cucamonga, CA 91730

Equipment Under Test (EUT)

Product Name: HELLO 2

Model No.: HELLO2

FCC ID 2ALUI-HELLO2

IC ID: 24458-HELLO2

Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407
RSS-Gen Issue 5, April 2018
RSS-247 Issue 2, February 2017

Date of sample receipt: 26 Oct., 2018

Date of Test: 26 Oct., to 21 Dec., 2018

Date of report issued: 23 Dec., 2018

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	23 Dec., 2018	Original

Tested by:

Carrey Chen

Test Engineer

Date:

23 Dec., 2018

Reviewed by:

Wimer Zhang

Project Engineer

Date:

23 Dec., 2018

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4 Test Summary

Test Item	Section		Test Result
	FCC	IC	
AC Power Line Conducted Emission	15.207	RSS-GEN Section 8.8	Pass
Conducted Peak Output Power	15.407 (a) (1) (iv)	RSS-247 Section 6.2.1.1	Pass
26dB Occupied Bandwidth 99% Occupied Bandwidth	15.407 (a) (5)	RSS-247 Section 6.2.1.1	Pass
Power Spectral Density	15.407 (a) (1) (iv)	RSS-247 Section 6.2.1.1	Pass
Band Edge	15.407(b)	RSS-GEN Section 8.10 RSS-247 Section 6.2.1.2	Pass
Spurious Emission	15.407 (b) & 15.205 & 15.209	RSS-GEN Section 6.13 RSS-247 Section 6.2.1.2	Pass
Frequency Stability	15.407(g)	RSS-GEN Section 6.11	Pass
<i>Pass: The EUT complies with the essential requirements in the standard.</i> <i>N/A: N/A: Not Applicable.</i>			

5 General Information

5.1 Client Information

Applicant:	Solaborate LLC
Address:	8300 Utica Ave #283, Rancho Cucamonga, CA 91730
Manufacturer	Shenzhen YITOA Digital Appliance CO.,LTD
Address:	5/F,Yitoe Building,Keji South Road 5th,Hi-tech Industrial Park,Nanshan District, Shenzhen

5.2 General Description of E.U.T.

Product Name:	HELLO 2
Model No.:	HELLO2
Operation Frequency:	Band 1: 5150MHz-5250MHz
Channel numbers:	Band 1: 802.11a/802.11n20: 4, 802.11n40: 2, 802.11ac: 1
Channel separation:	802.11a/802.11n20: 20MHz, 802.11n40: 40MHz, 802.11ac: 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&802.11ac20):	MCS0: 13Mbps, MCS1:26Mbps,MCS2:39Mbps, MCS3:52Mbps, MCS4:78Mbps, MCS5:104Mbps, MCS6:117Mbps, MCS7:130Mbps
Data speed (IEEE 802.11n40&802.11ac40):	MCS0:30Mbps, MCS1:60Mbps, MCS2:90Mbps, MCS3:120Mbps, MCS4:180Mbps, MCS5:240Mbps, MCS6:270Mbps, MCS7:300Mbps
Data speed (IEEE 802.11ac80):	Up to 866.6Mbps
Antenna Type:	FPC (EUT belongs to MIMO with dual antenna)
Antenna gain:	1.5 dBi
AC adapter:	Model: EA1019AVRS-050 Input: AC100-240V, 50/60Hz, 0.8A Output: DC 5.0V, 3A
Remarks:	EUT has camera cable from two different manufacturers. Their manufacturers and models are: Unison is HELLO2-274-V8.0, and Seasons is HELLO2-274-V8.0.1. They have the same lens, but the Camera cable is different.
Test Sample Condition:	The applicant provided engineering samples for staying in continuously transmitting for testing.

Operation Frequency each of channel					
Band 1					
802.11a/802.11n20/802.11ac20		802.11n40/802.11ac40		802.11ac80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	38	5190MHz	42	5210MHz
40	5200MHz	46	5230MHz		
44	5220MHz				
48	5240MHz				

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/802.11n20/802.11ac20		802.11n40/802.11ac40		802.11ac80	
Channel	Frequency	Channel	Frequency	Channel	Frequency
Lowest channel	5180MHz	Lowest channel	5190MHz	Middle channel	5210MHz
Middle channel	5200MHz	Highest channel	5230MHz		
Highest channel	5240MHz				
Note: 802.11a is SISO, 802.11n/802.11ac is MIMO.					

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
802.11n20/802.11ac20	6.5 Mbps
802.11n40/802.11ac40	13.5 Mbps
802.11ac80	29.3 Mbps

5.4 Description of Support Units

The EUT has been tested as an independent unit.

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Emission (9kHz ~ 30MHz)	±2.22 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	±2.76 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.28 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.72 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±2.88 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 - Registration No.: 727551**

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

- **IC - Registration No.: 10106A-1**

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>

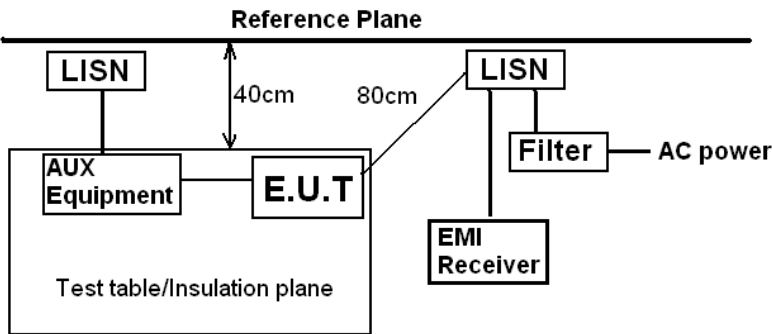
5.9 Test Instruments list

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	03-16-2018	03-15-2019
Biconical Antenna	SCHWARZBECK	VUBA9117	359	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-16-2018	03-15-2019
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-21-2017	11-20-2018
				11-21-2018	11-20-2019
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-07-2018	03-06-2019
Pre-amplifier	CD	PAP-1G18	11804	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-21-2017	11-20-2018
				11-21-2018	11-20-2019
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-07-2018	03-06-2019
Spectrum Analyzer	Agilent	N9020A	MY50510123	11-10-2017	11-09- 2018
				11-10-2018	11-09- 2019
Signal Generator	Rohde & Schwarz	SMX	835454/016	03-07-2018	03-06-2019
Signal Generator	R&S	SMR20	1008100050	03-07-2018	03-06-2019
RF Switch Unit	MWRFTTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTTEST	MTS8200	Version: 2.0.0.0		
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2018	03-06-2019
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2018	03-06-2019
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2018	03-06-2019
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	03-07-2018	03-06-2019
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-07-2018	03-06-2019
LISN	CHASE	MN2050D	1447	03-19-2018	03-18-2019
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2018	07-20-2019
Cable	HP	10503A	N/A	03-07-2018	03-06-2019
EMI Test Software	AUDIX	E3	Version: 6.110919b		

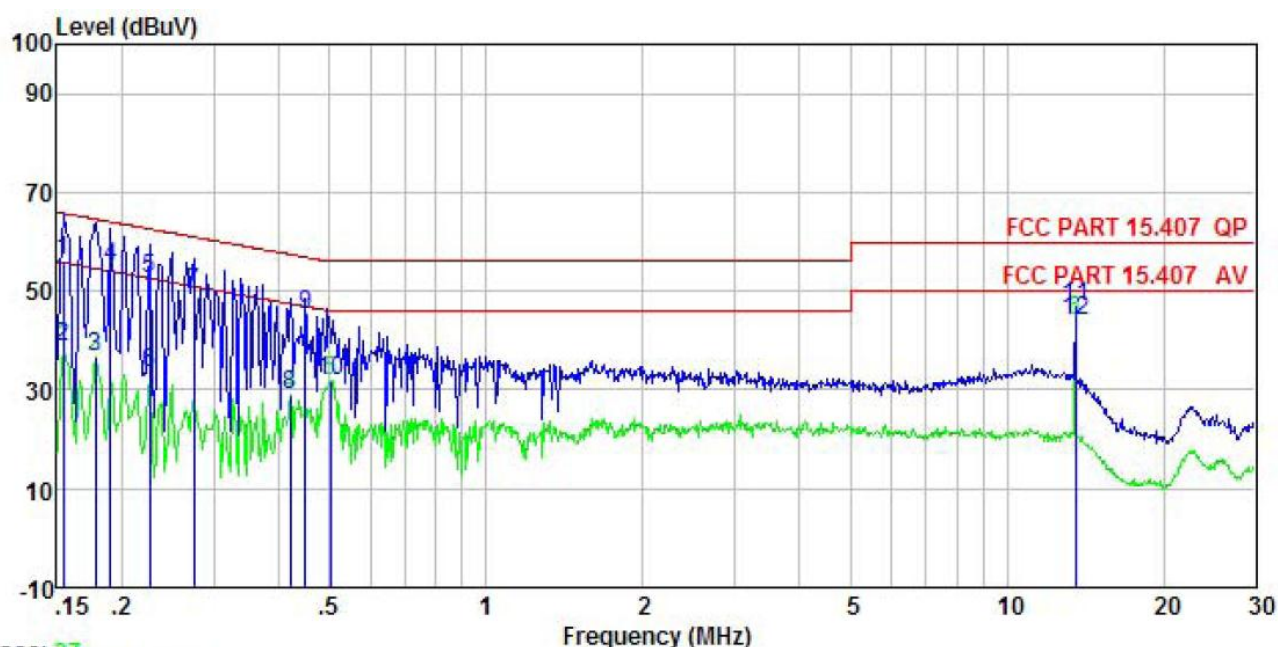
6 Test results and Measurement Data

6.1 Conducted Emission

Test Requirement:	FCC Part15 C Section 15.207 RSS-GEN Section 8.8		
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	1. 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. 2. 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). 3. 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:	 Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m		
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:	HELLO 2	Product model:	HELLO 2
Test by:	Carey	Test mode:	5G Wi-Fi Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5°C Humi: 55%



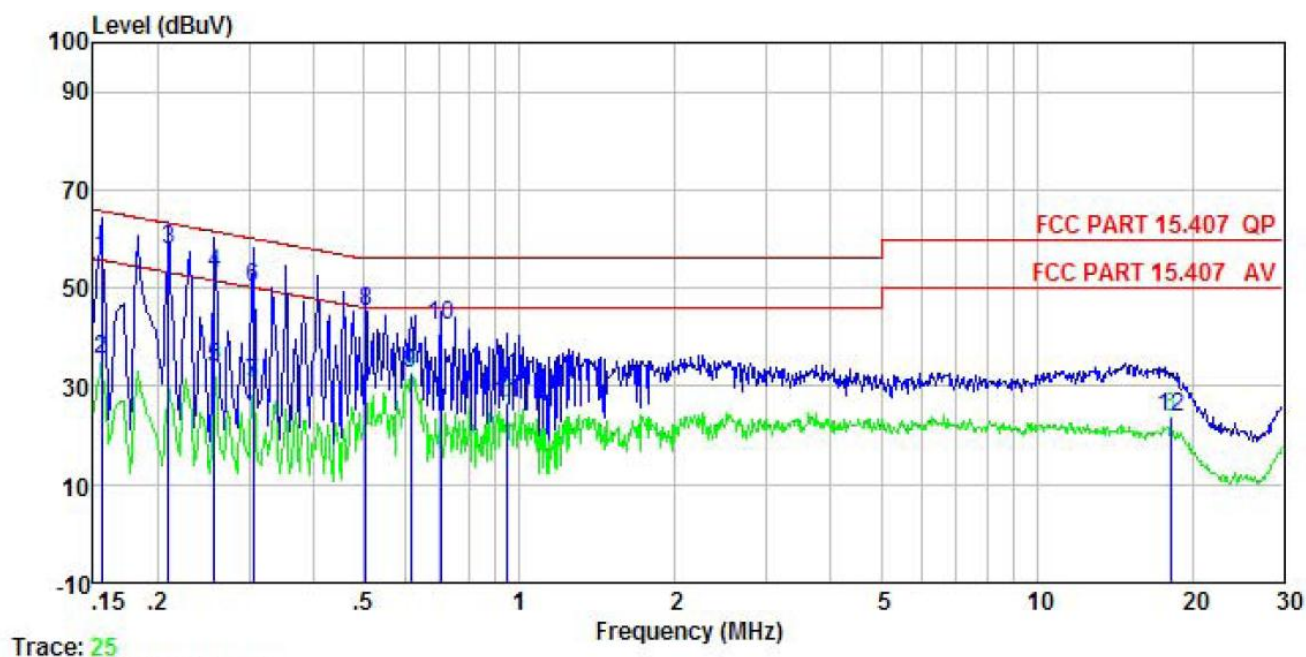
Trace: 27

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.154	45.35	0.18	10.78	56.31	65.78	-9.47	QP
2	0.154	27.69	0.18	10.78	38.65	55.78	-17.13	Average
3	0.178	25.83	0.16	10.77	36.76	54.59	-17.83	Average
4	0.190	44.02	0.16	10.76	54.94	64.02	-9.08	QP
5	0.226	41.65	0.14	10.75	52.54	62.61	-10.07	QP
6	0.226	22.58	0.14	10.75	33.47	52.61	-19.14	Average
7	0.274	38.76	0.13	10.74	49.63	60.98	-11.35	QP
8	0.421	17.94	0.12	10.73	28.79	47.42	-18.63	Average
9	0.449	34.42	0.12	10.74	45.28	56.89	-11.61	QP
10	0.502	21.02	0.12	10.76	31.90	46.00	-14.10	Average
11	13.551	35.58	0.32	10.91	46.81	60.00	-13.19	QP
12	13.551	32.80	0.32	10.91	44.03	50.00	-5.97	Average

Notes:

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

Product name:	HELLO 2	Product model:	HELLO 2
Test by:	Carey	Test mode:	5G Wi-Fi Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5°C Humi: 55%



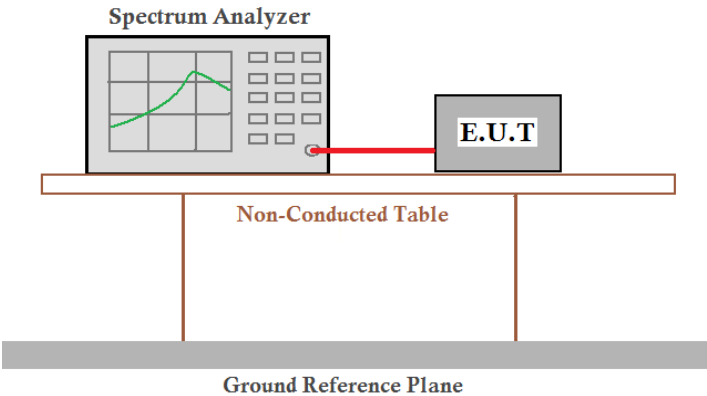
Trace: 25

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.156	44.55	0.98	10.77	56.30	65.69	-9.39	QP
2	0.156	23.57	0.98	10.77	35.32	55.69	-20.37	Average
3	0.209	45.99	0.93	10.76	57.68	63.23	-5.55	QP
4	0.258	41.24	0.95	10.75	52.94	61.51	-8.57	QP
5	0.258	22.31	0.95	10.75	34.01	51.51	-17.50	Average
6	0.305	38.29	0.97	10.74	50.00	60.10	-10.10	QP
7	0.305	18.94	0.97	10.74	30.65	50.10	-19.45	Average
8	0.505	33.41	0.97	10.76	45.14	56.00	-10.86	QP
9	0.617	20.80	0.97	10.77	32.54	46.00	-13.46	Average
10	0.705	30.58	0.97	10.77	42.32	56.00	-13.68	QP
11	0.948	14.81	0.97	10.85	26.63	46.00	-19.37	Average
12	18.135	12.12	0.76	10.92	23.80	50.00	-26.20	Average

Notes:

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

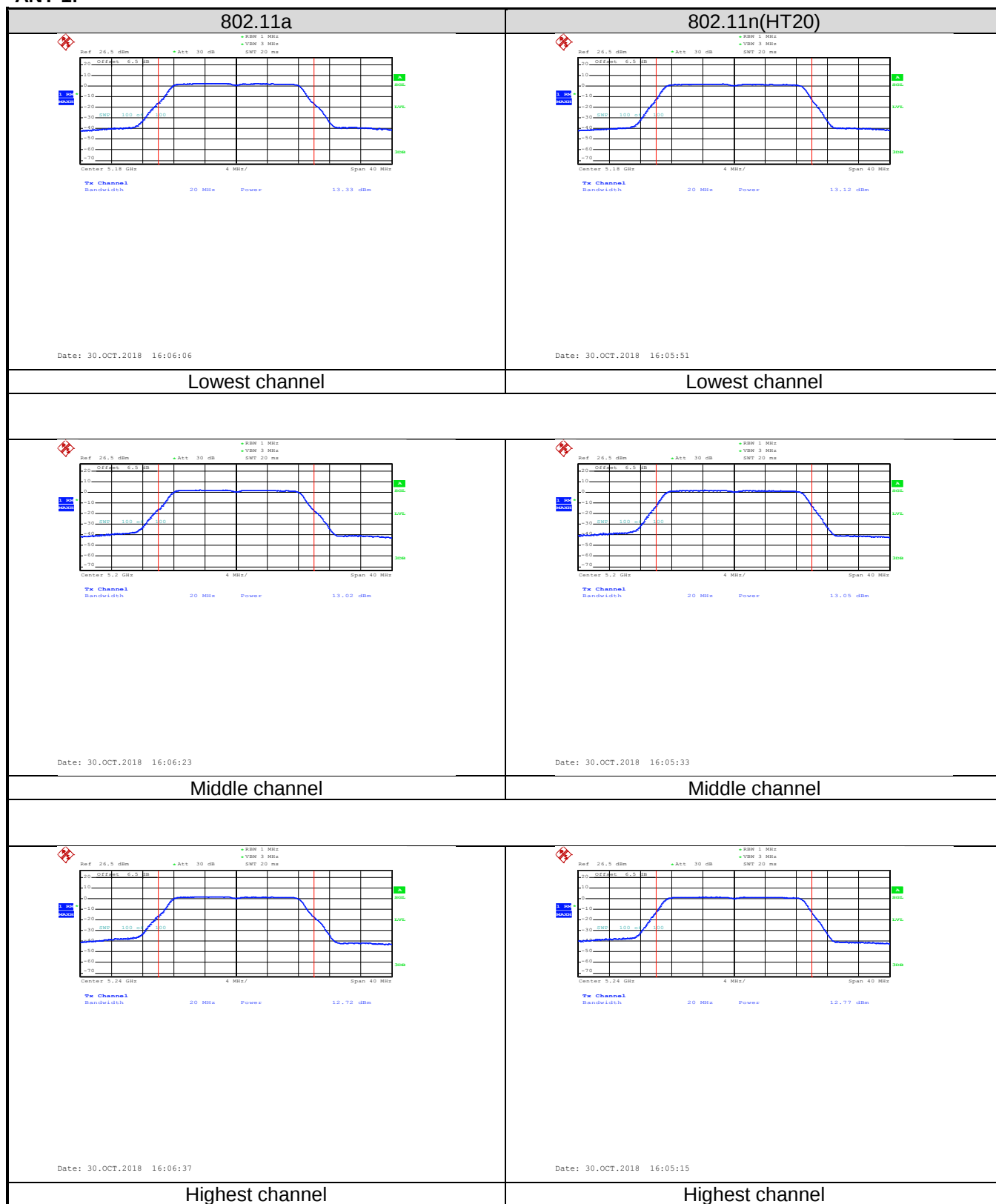
6.2 Conducted Output Power

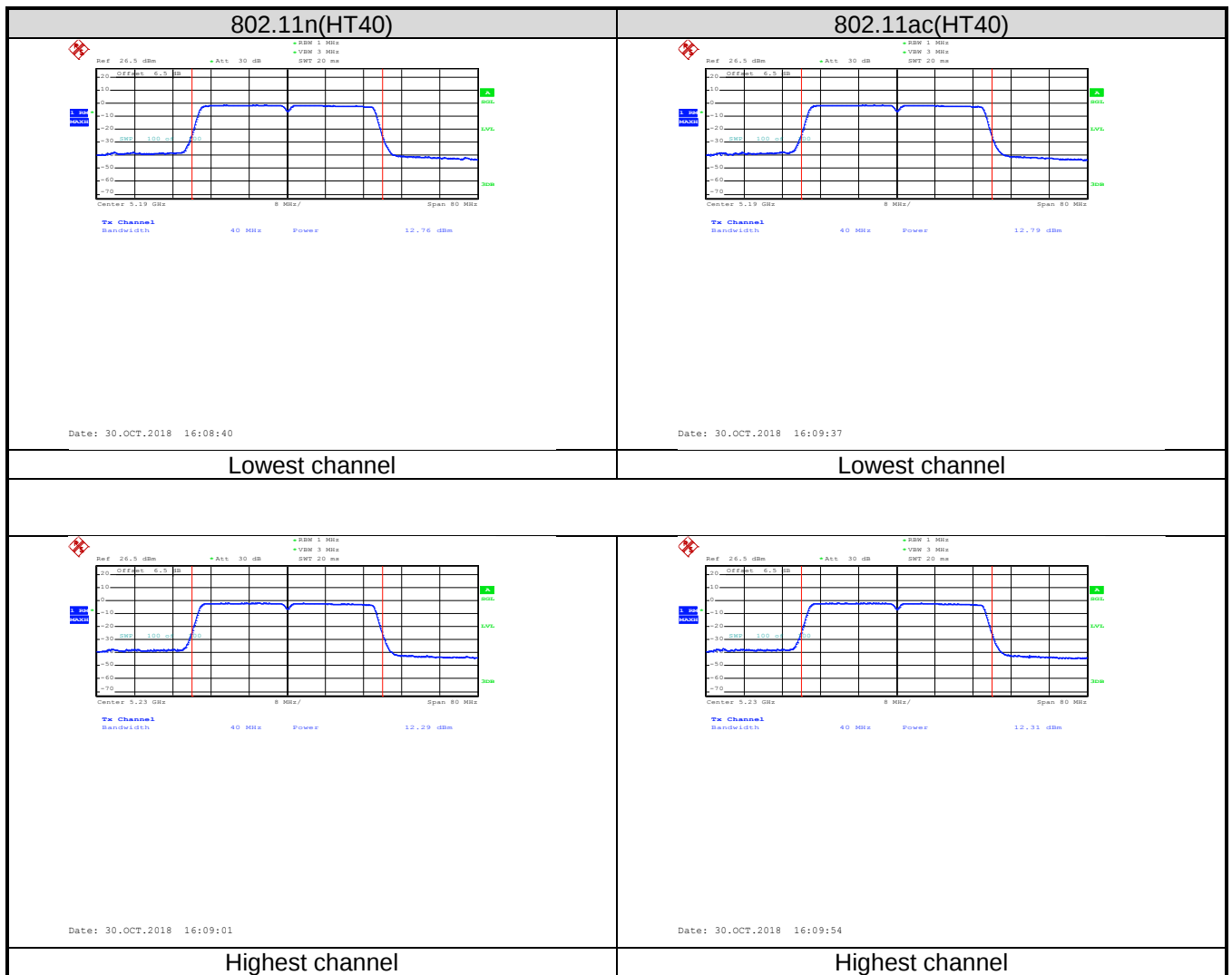
Test Requirement:	FCC Part15 E Section 15.407 (a) (1) (iv) RSS-247 Section 6.2.1.1
Test Method:	ANSI C63.10: 2013, KDB789033
Limit:	Band 1: The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever is less.
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

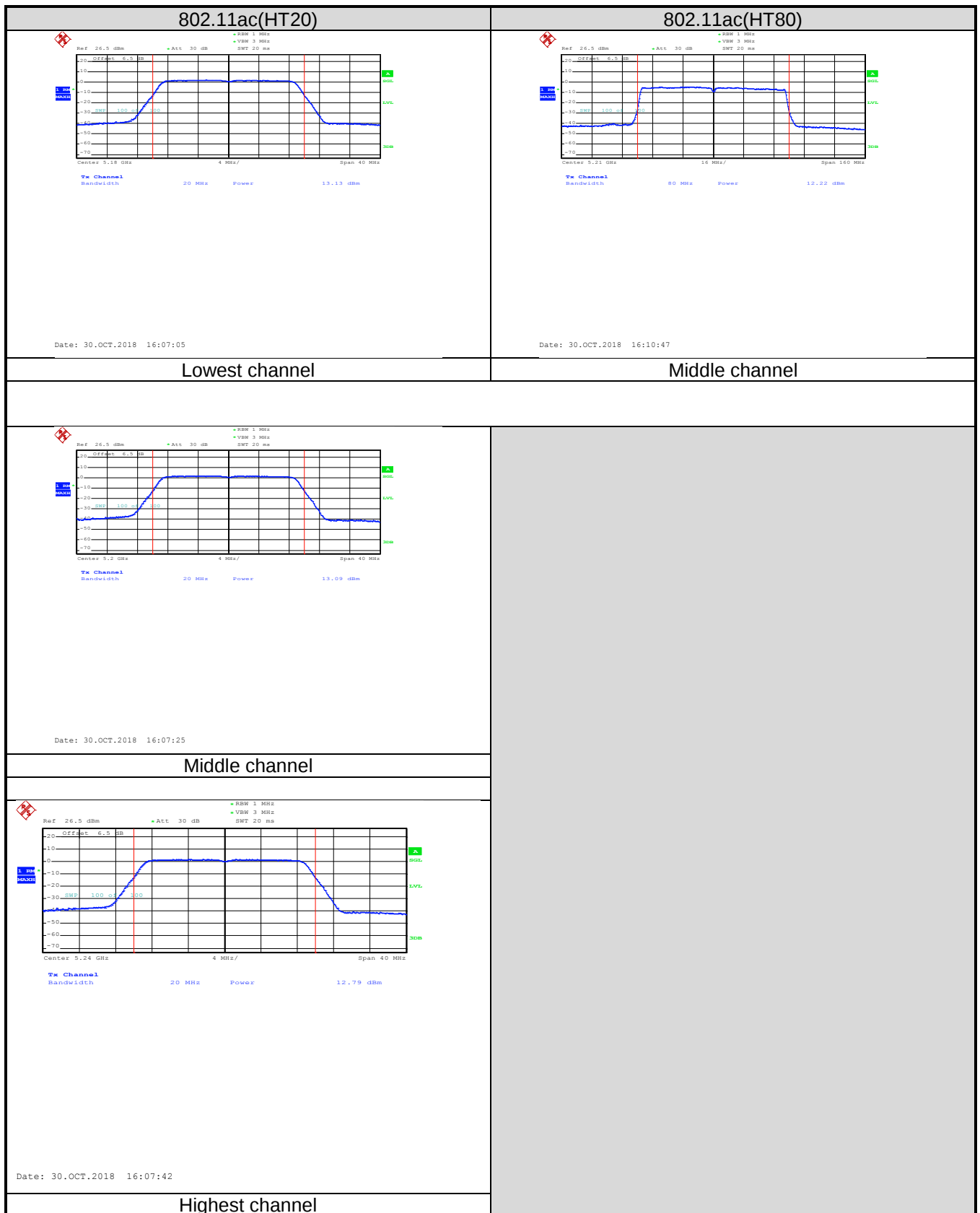
Measurement Data:

Test mode	Test channel	ANT port	Measured Power (dBm)	Total Power (dBm)	Limit(dBm)	Result
802.11a SISO	Lowest	ANT 1	13.33	/	24.00	Pass
		ANT 2	13.28			
	Middle	ANT 1	13.02	/		
		ANT 2	12.96			
	Highest	ANT 1	12.72	/		
		ANT 2	12.66			
802.11n(H20) MIMO	Lowest	ANT 1	13.12	16.18	24.00	
		ANT 2	13.22			
	Middle	ANT 1	13.05	16.00		
		ANT 2	12.92			
	Highest	ANT 1	12.77	15.69		
		ANT 2	12.58			
802.11n(H40) MIMO	Lowest	ANT 1	12.76	15.79	24.00	
		ANT 2	12.80			
	Highest	ANT 1	12.29	15.33		
		ANT 2	12.34			
802.11ac(H20) MIMO	Lowest	ANT 1	13.13	16.17	24.00	
		ANT 2	13.18			
	Middle	ANT 1	13.09	16.04		
		ANT 2	12.97			
	Highest	ANT 1	12.79	15.70		
		ANT 2	12.59			
802.11ac(H40) MIMO	Lowest	ANT 1	12.79	15.80	24.00	
		ANT 2	12.78			
	Highest	ANT 1	12.31	15.37		
		ANT 2	12.41			
802.11ac(H80) MIMO	Lowest	ANT 1	12.22	15.14	24.00	
		ANT 2	12.04			

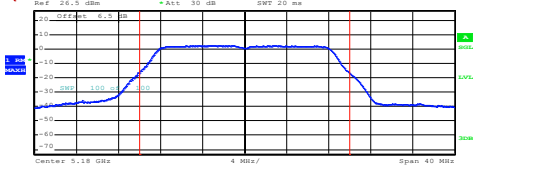
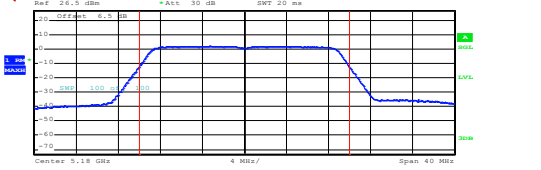
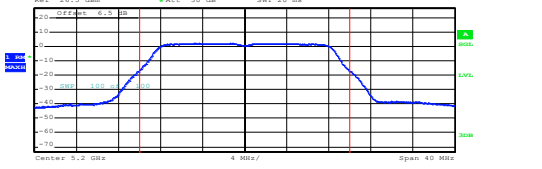
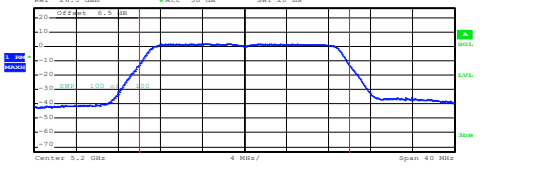
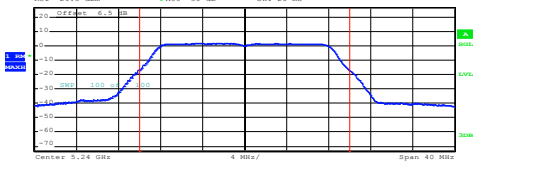
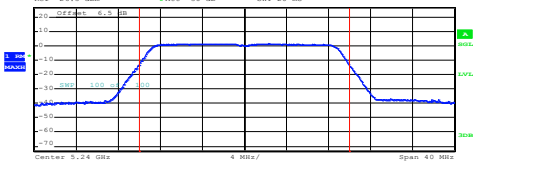
Test plot as follows:
ANT 1:

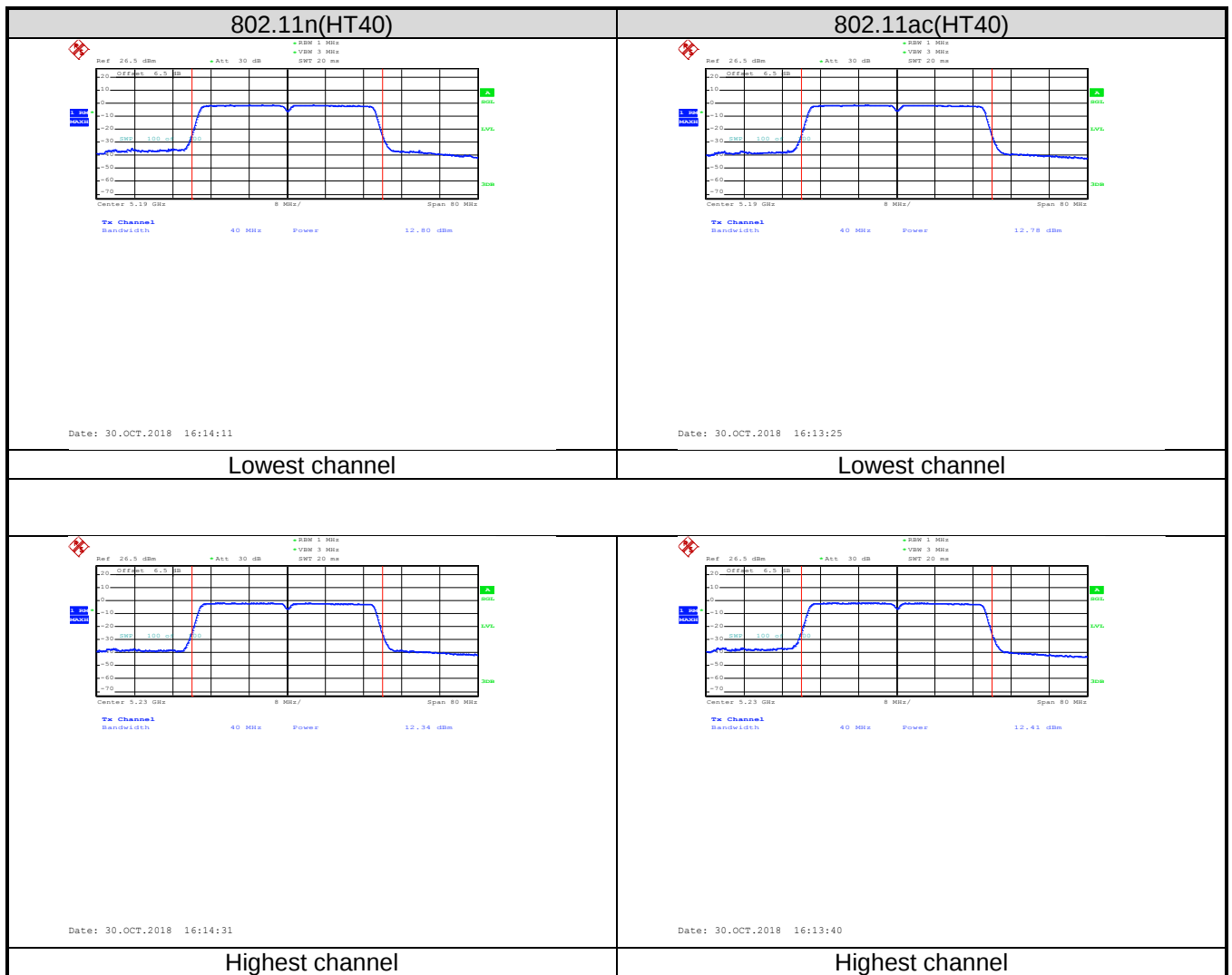


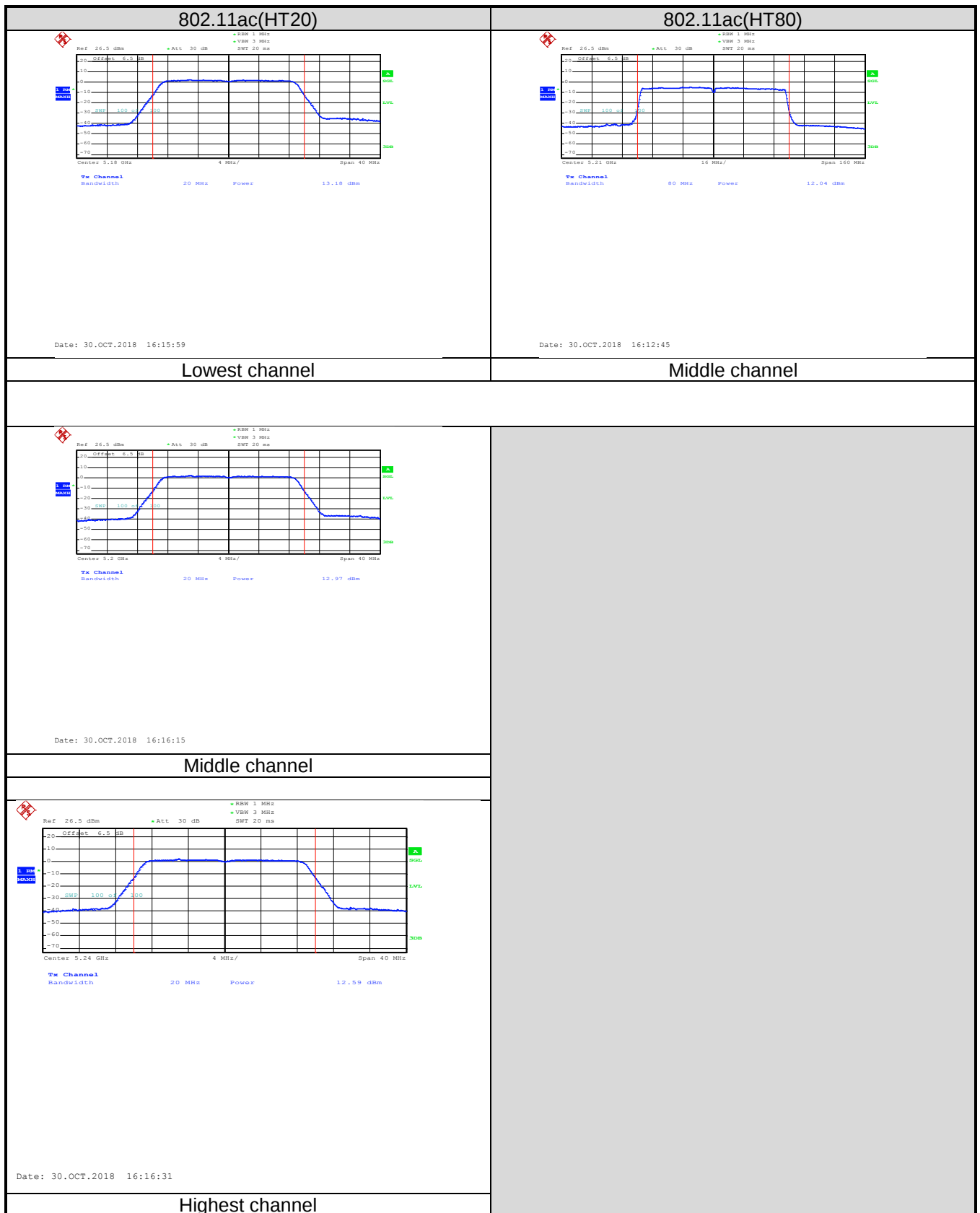




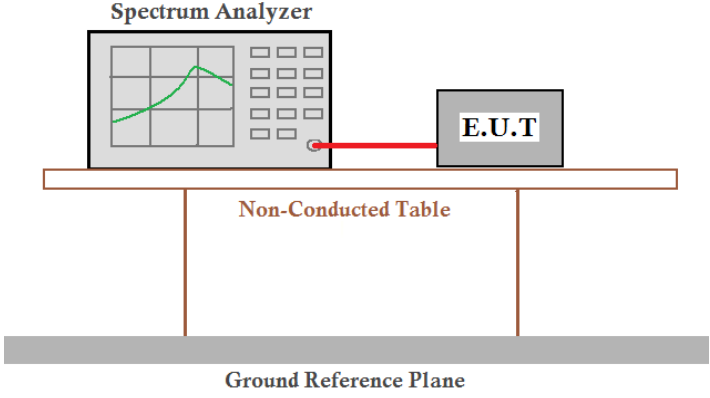
ANT 2 :

802.11a	802.11n(HT20)
 Ref: 26.5 dBm Att: 30 dB RBW: 1 MHz VSW: 3 MHz SWT: 20 ms Center: 5.18 GHz Span: 40 MHz Tx Channel Bandwidth 20 MHz Power 13.28 dBm Date: 30.OCT.2018 16:16:57	 Ref: 26.5 dBm Att: 30 dB RBW: 1 MHz VSW: 3 MHz SWT: 20 ms Center: 5.18 GHz Span: 40 MHz Tx Channel Bandwidth 20 MHz Power 13.22 dBm Date: 30.OCT.2018 16:15:02
Lowest channel	Lowest channel
 Ref: 26.5 dBm Att: 30 dB RBW: 1 MHz VSW: 3 MHz SWT: 20 ms Center: 5.2 GHz Span: 40 MHz Tx Channel Bandwidth 20 MHz Power 12.96 dBm Date: 30.OCT.2018 16:17:12	 Ref: 26.5 dBm Att: 30 dB RBW: 1 MHz VSW: 3 MHz SWT: 20 ms Center: 5.2 GHz Span: 40 MHz Tx Channel Bandwidth 20 MHz Power 12.92 dBm Date: 30.OCT.2018 16:15:18
Middle channel	Middle channel
 Ref: 26.5 dBm Att: 30 dB RBW: 1 MHz VSW: 3 MHz SWT: 20 ms Center: 5.24 GHz Span: 40 MHz Tx Channel Bandwidth 20 MHz Power 12.66 dBm Date: 30.OCT.2018 16:17:40	 Ref: 26.5 dBm Att: 30 dB RBW: 1 MHz VSW: 3 MHz SWT: 20 ms Center: 5.24 GHz Span: 40 MHz Tx Channel Bandwidth 20 MHz Power 12.58 dBm Date: 30.OCT.2018 16:15:33
Highest channel	Highest channel





6.3 Occupy Bandwidth

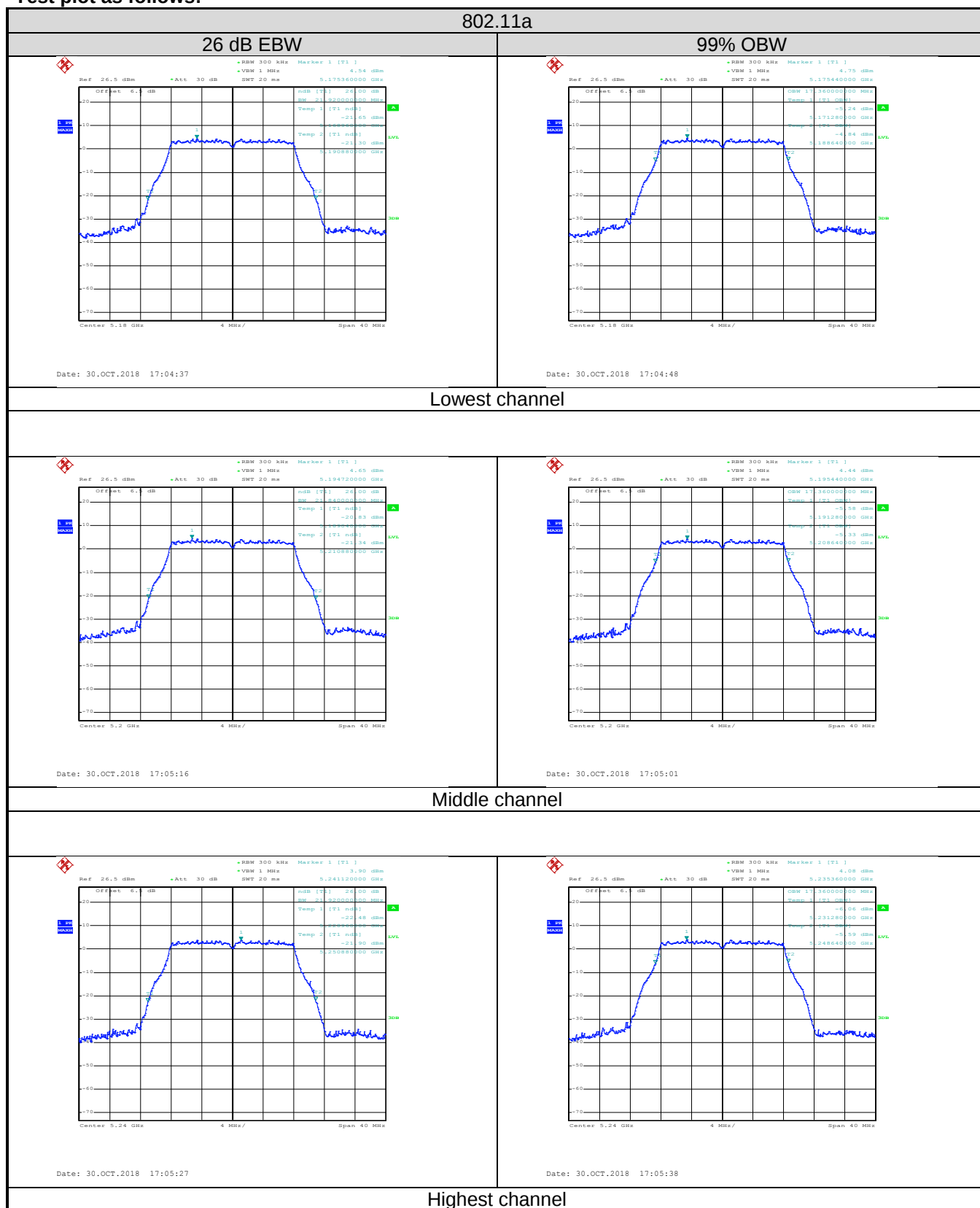
Test Requirement:	FCC Part15 E Section 15.407 (a) (5) RSS-247 Section 6.2.1.2
Test Method:	ANSI C63.10:2013 and KDB 789033
Limit:	Band 1: N/A (26dB Emission Bandwidth and 99% Occupy Bandwidth)
Test setup:	
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

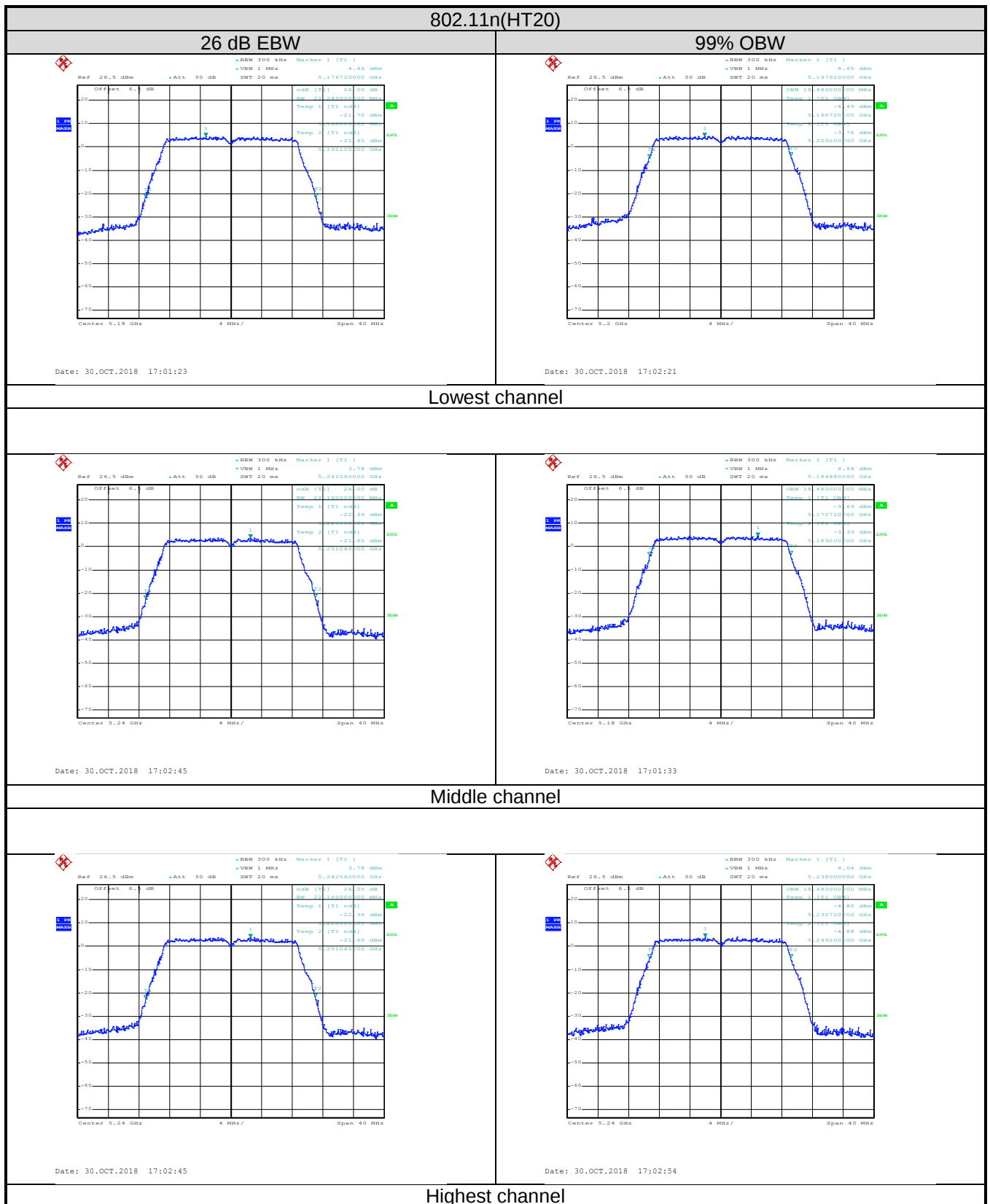
Measurement Data:

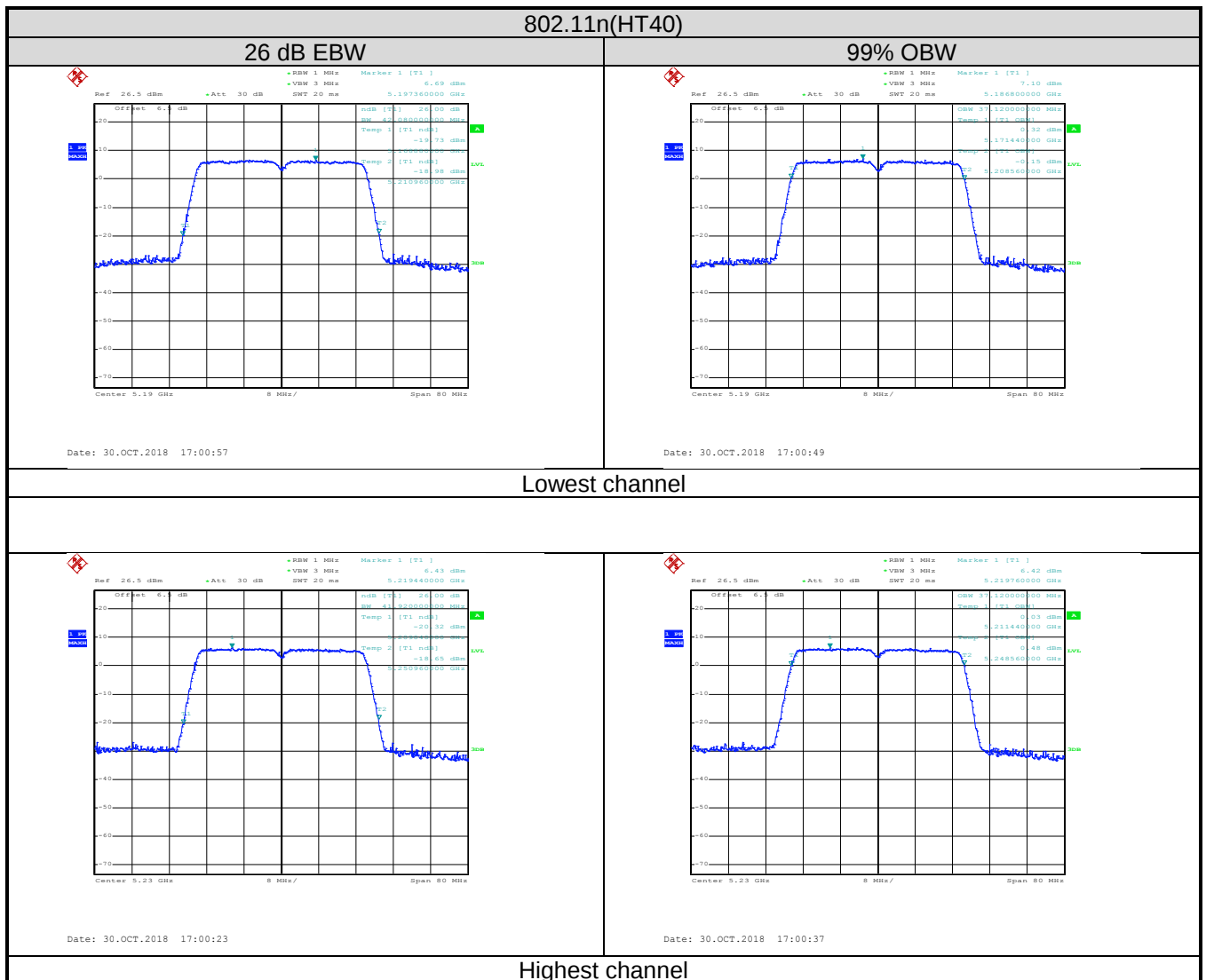
ANT1:

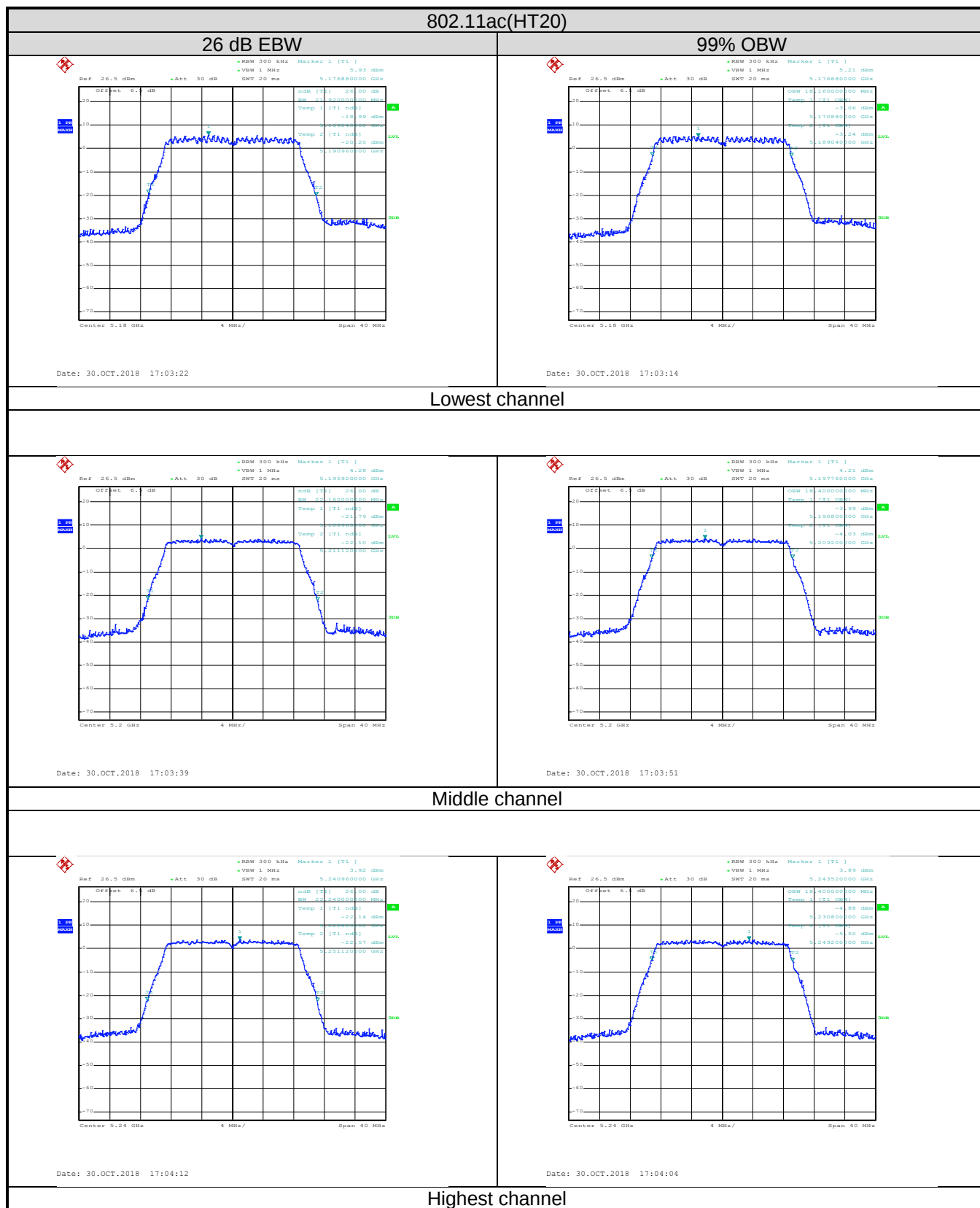
Test Channel	26dB Emission Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	21.92	22.24	42.08	21.92	42.08	---	N/A	PASS
Middle	21.84	22.16	---	22.16	---	82.88		
Highest	21.92	22.16	41.92	22.24	42.08	---		
Test Channel	99% Occupy Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	17.36	18.48	37.12	18.16	37.12	---	N/A	PASS
Middle	17.36	18.48	---	18.40	---	76.16		
Highest	17.36	18.48	37.12	18.40	36.96	---		

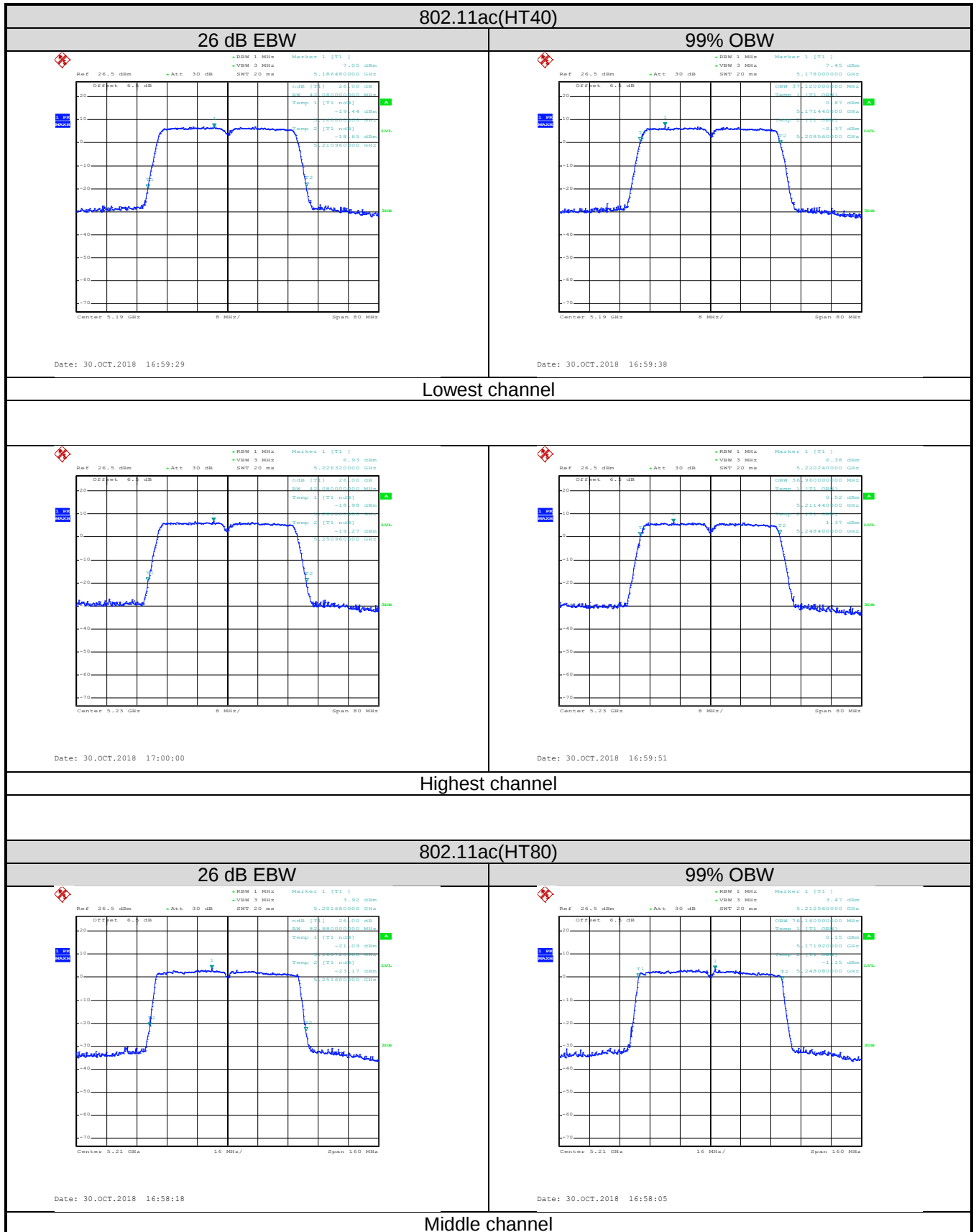
Test plot as follows:









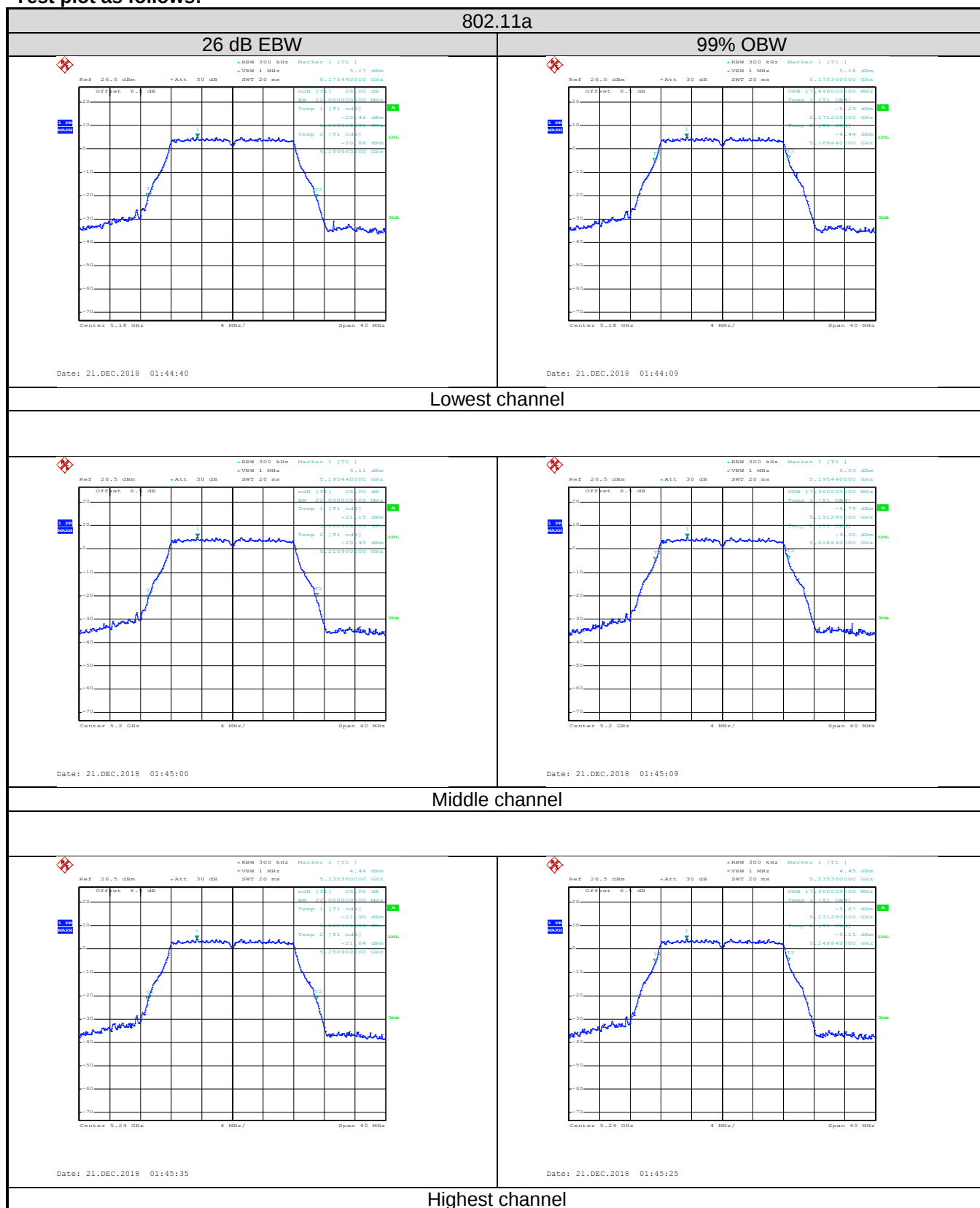


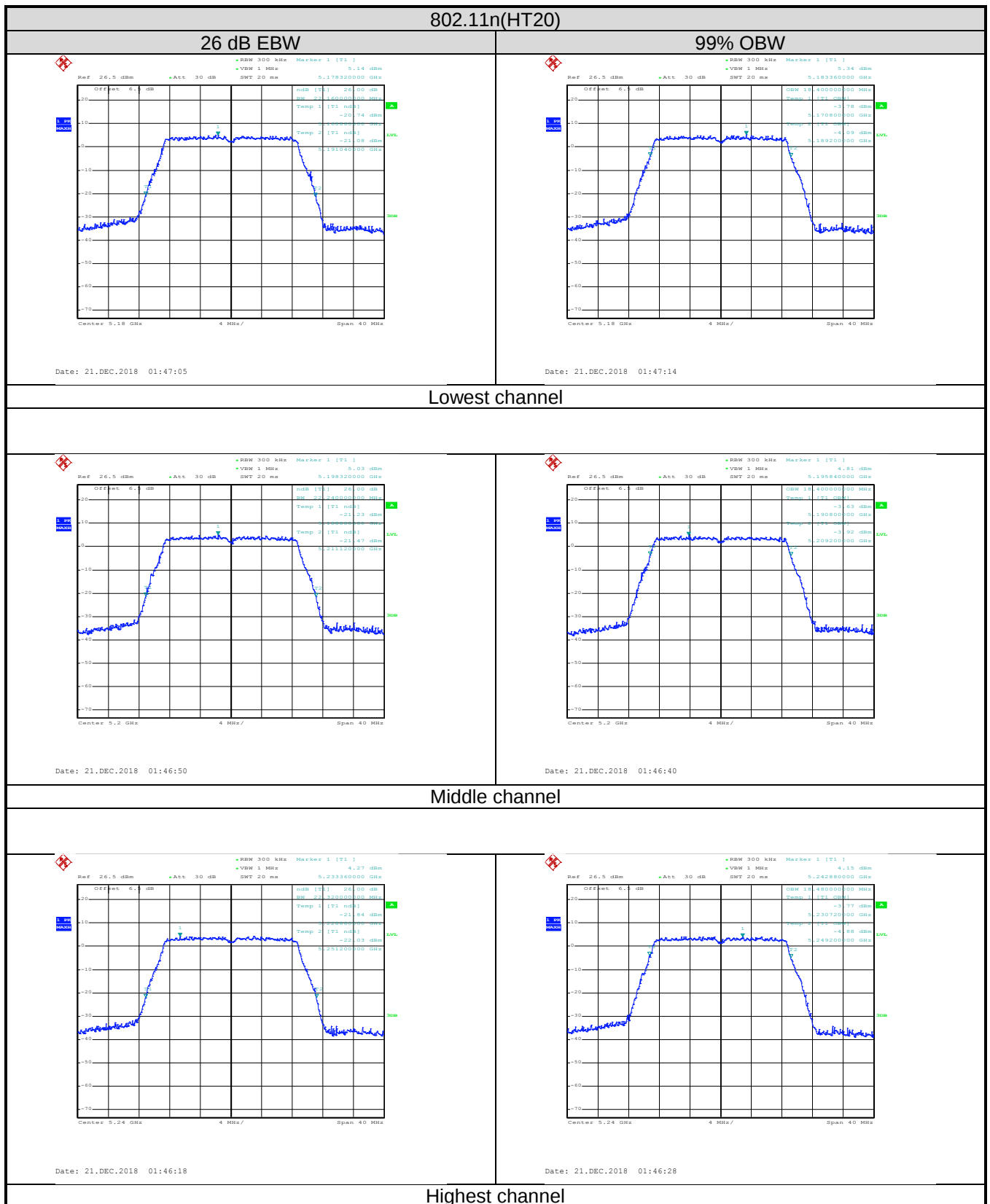
Measurement Data:

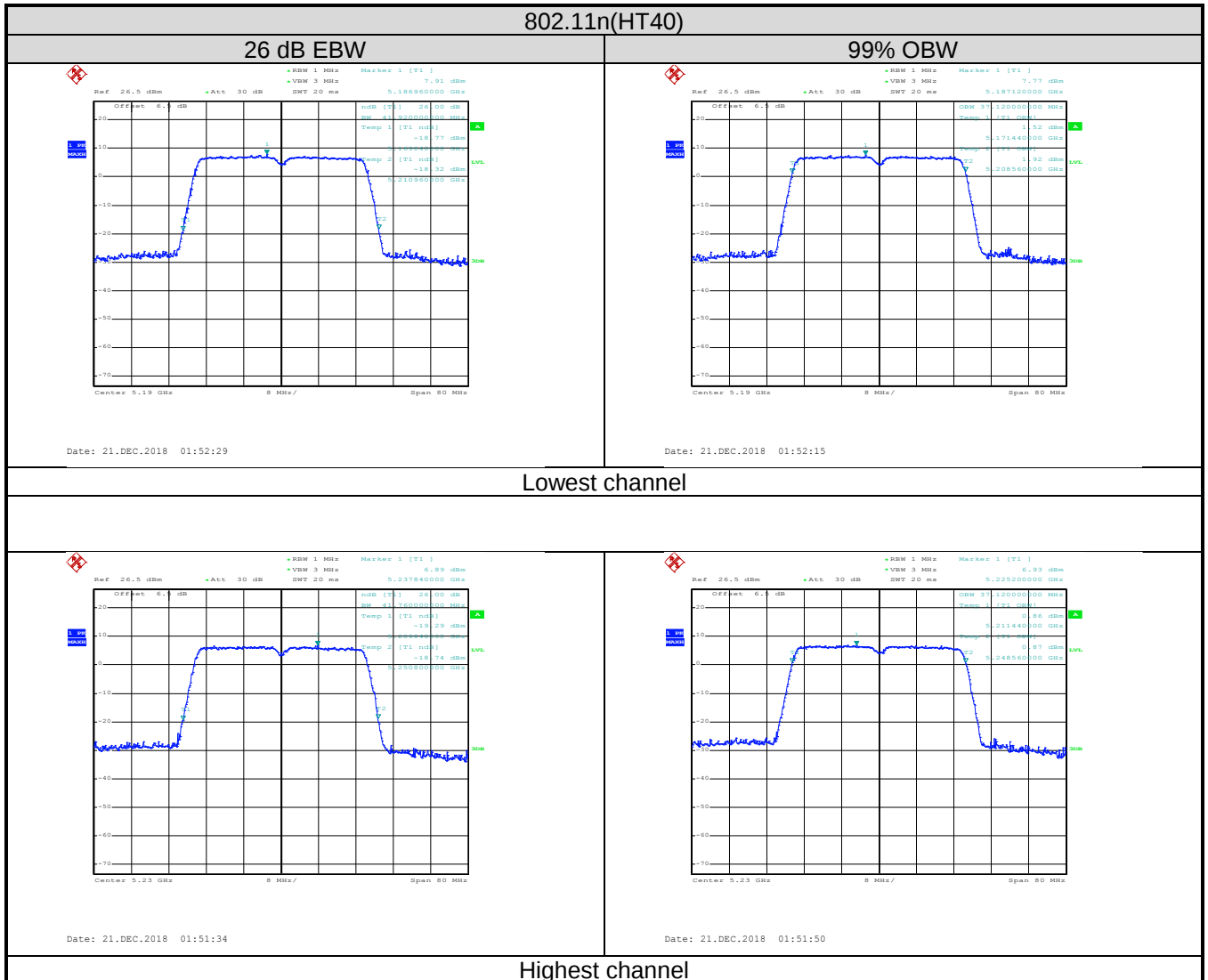
ANT2:

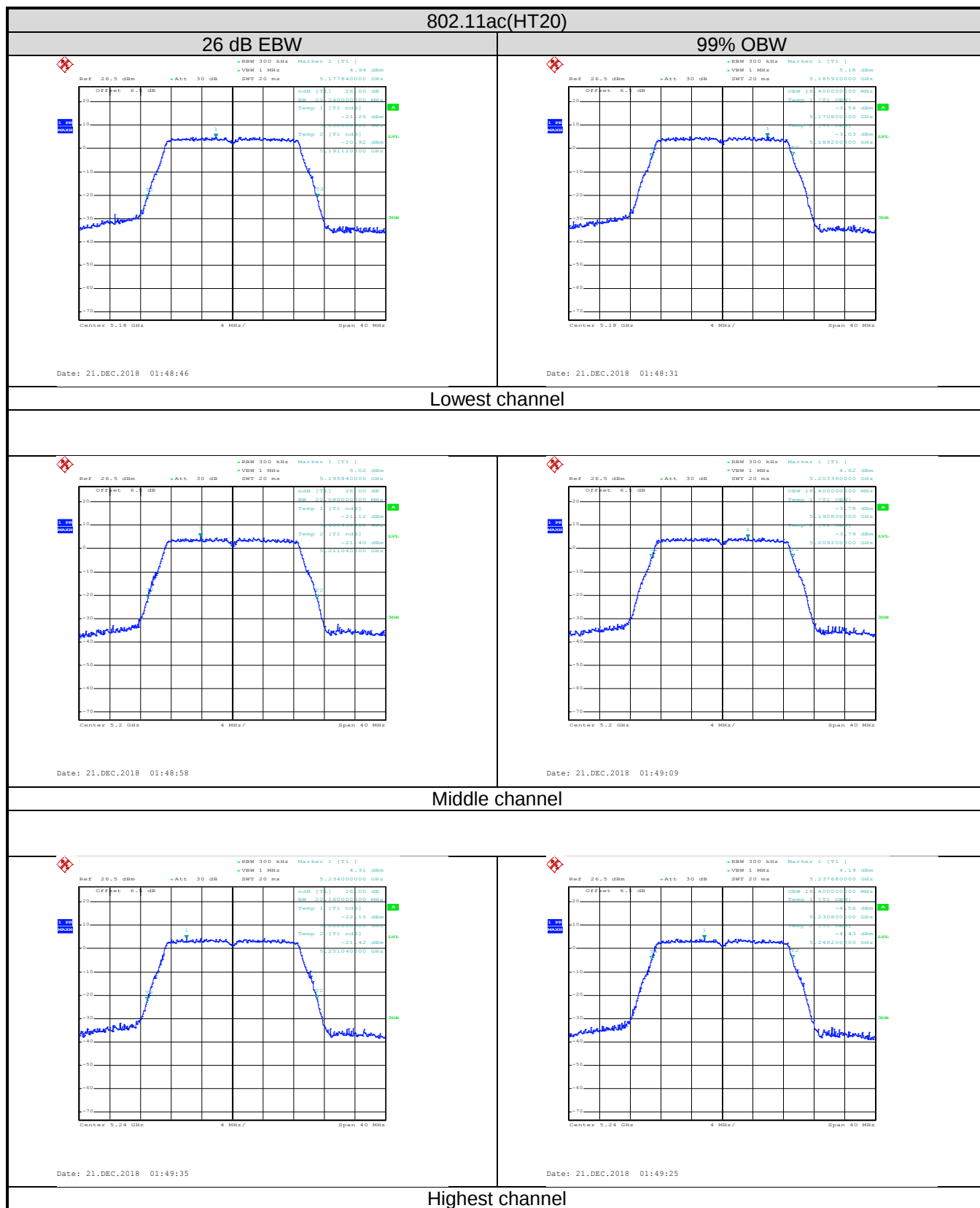
Test Channel	26dB Emission Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	22.00	22.16	41.92	22.24	41.92	---	N/A	PASS
Middle	22.00	22.24	---	22.08	---	83.52		
Highest	22.00	22.32	41.76	22.16	41.76	---		
Test Channel	99% Occupy Bandwidth (MHz)						Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	17.44	18.40	37.12	18.40	37.12	---	N/A	PASS
Middle	17.36	18.40	---	18.40	---	76.16		
Highest	17.36	18.48	37.12	18.40	37.12	---		

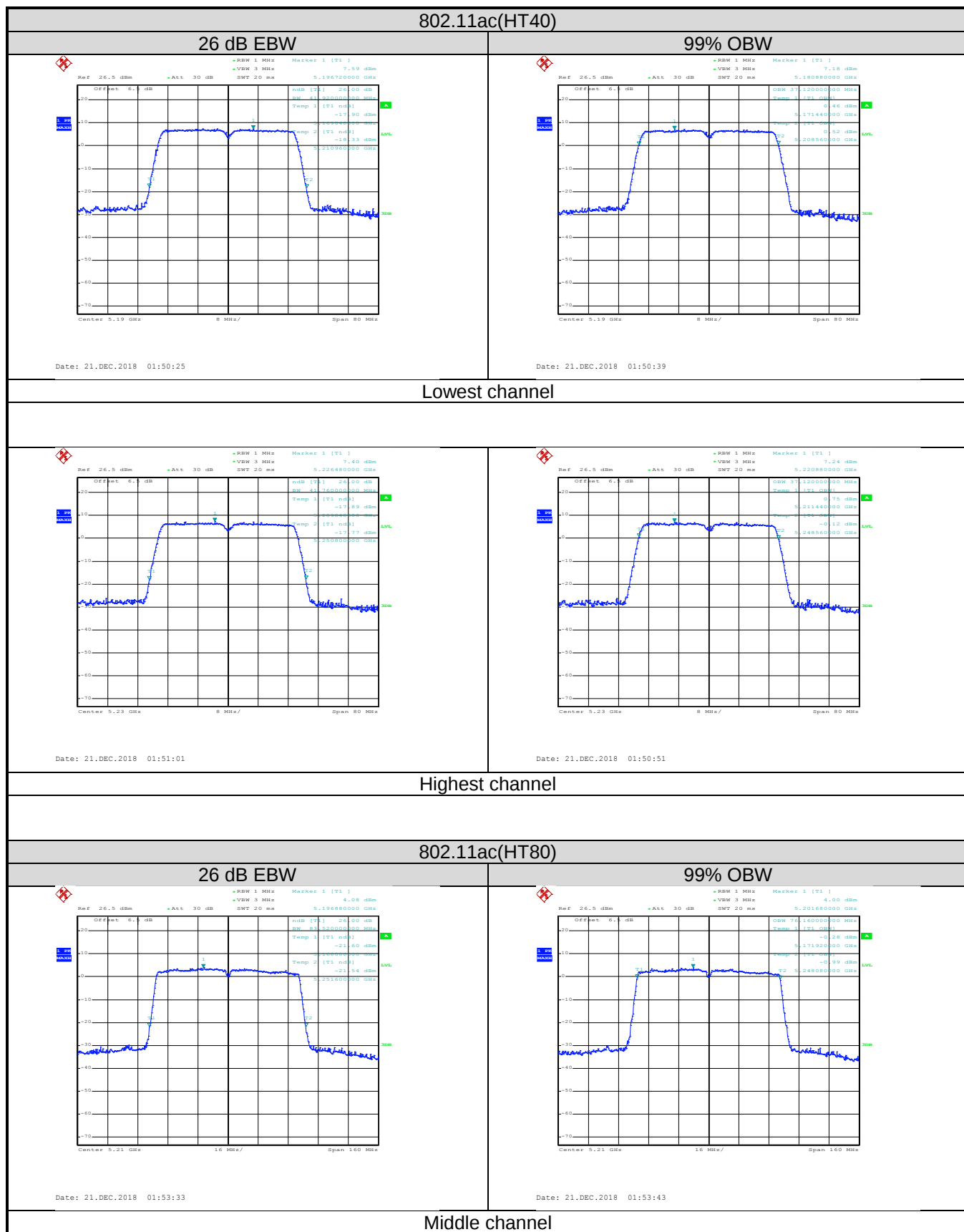
Test plot as follows:



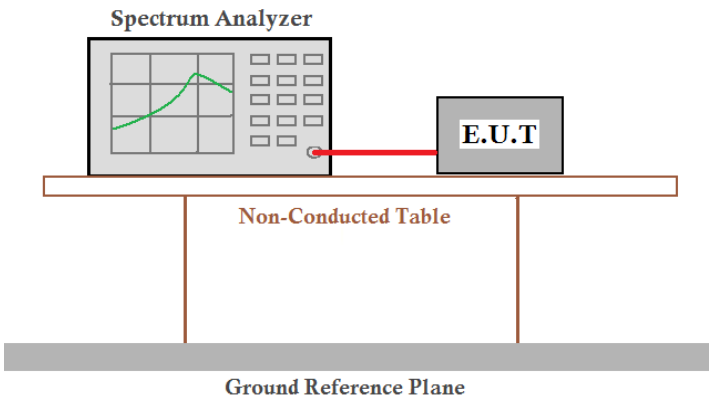








6.4 Power Spectral Density

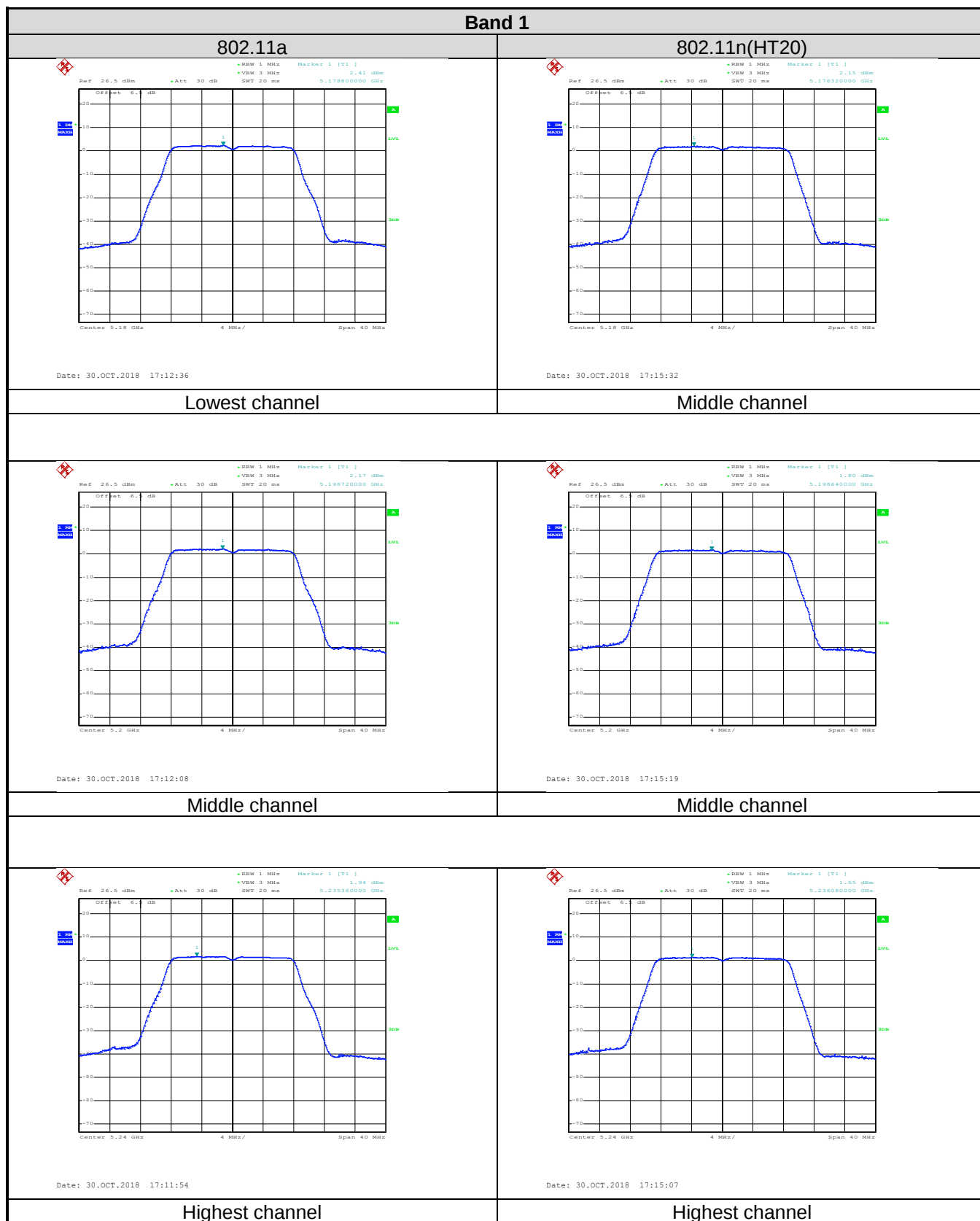
Test Requirement:	FCC Part15 E Section 15.407 (a) (1) (iv) RSS-247 Section 6.2.1.1
Test Method:	ANSI C63.10:2013, KDB 789033
Limit:	Band 1: 11dBm/MHz
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by two vertical legs. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

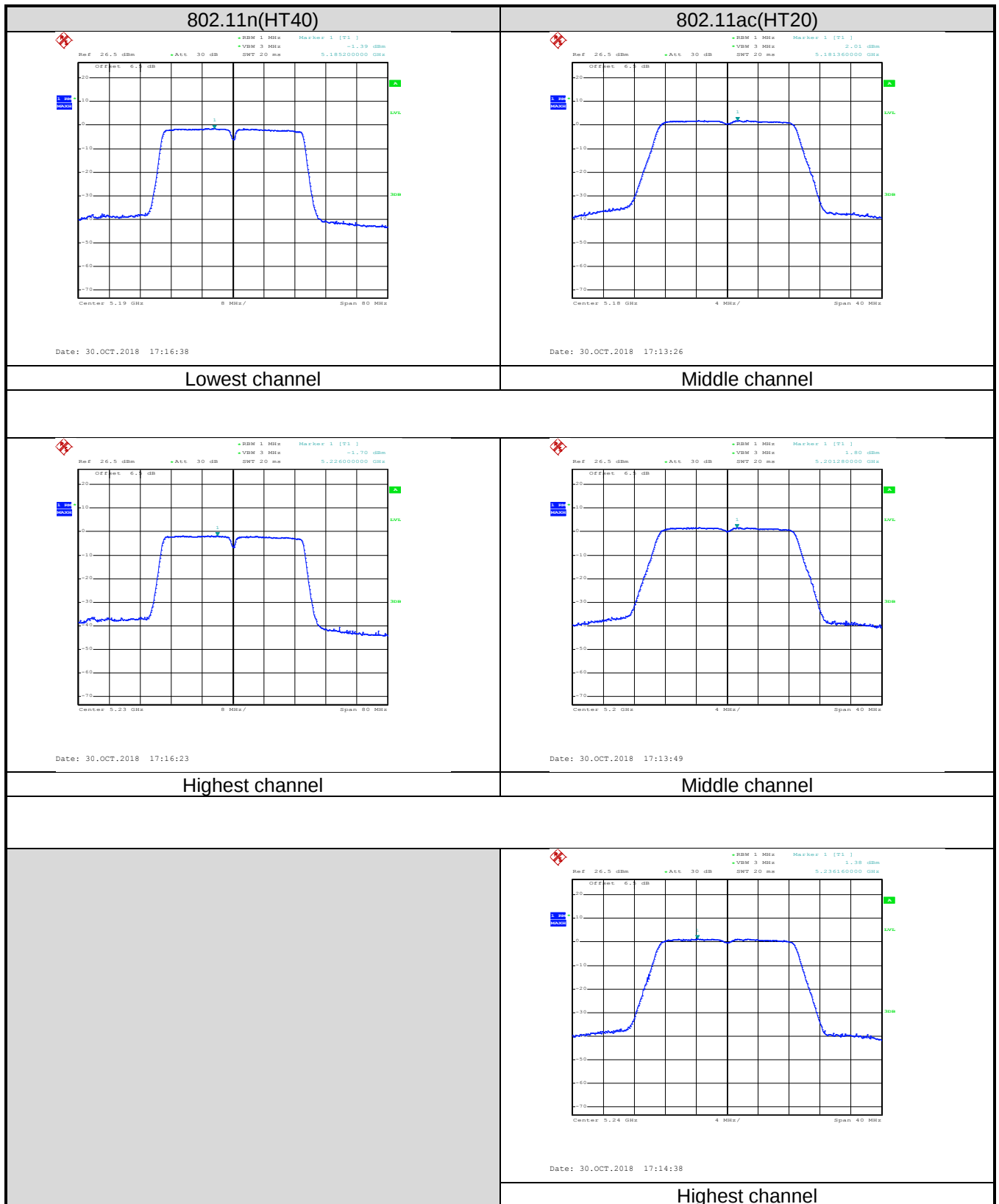
Measurement Data:

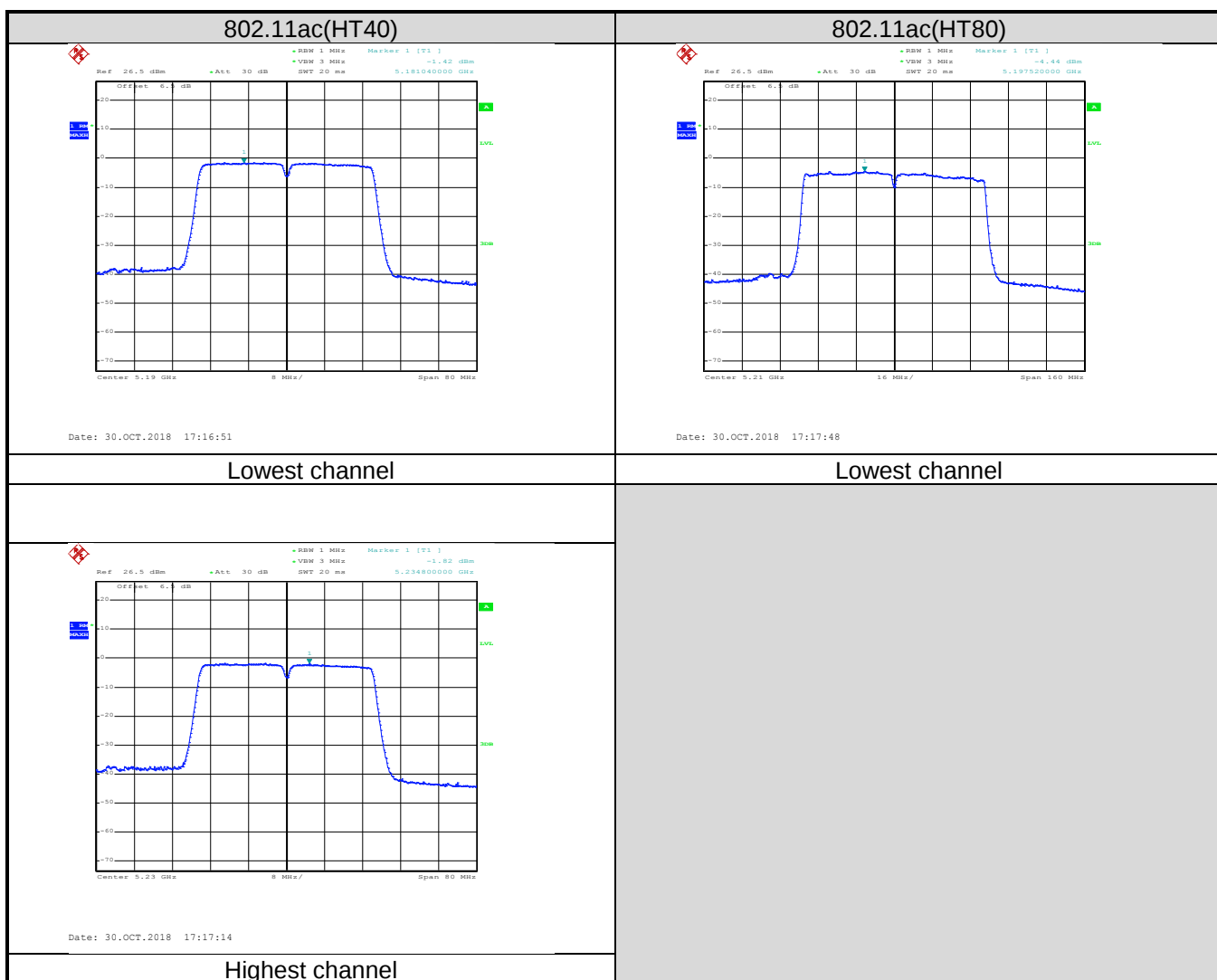
Measurement Data						
Test mode	Test channel	ANT port	Measured Power (dBm)	Total Power (dBm)	Limit(dBm)	Result
802.11a SISO	Lowest	ANT 1	2.41	/	11.00	Pass
		ANT 2	2.53			
	Middle	ANT 1	2.17	/		
		ANT 2	2.32			
	Highest	ANT 1	1.94	/		
		ANT 2	1.89			
802.11n(H20) MIMO	Lowest	ANT 1	2.15	5.14	11.00	
		ANT 2	2.10			
	Middle	ANT 1	1.80	4.86		
		ANT 2	1.90			
	Highest	ANT 1	1.55	4.54		
		ANT 2	1.51			
802.11n(H40) MIMO	Lowest	ANT 1	-1.39	1.60	11.00	
		ANT 2	-1.43			
	Highest	ANT 1	-1.70	1.30		
		ANT 2	-1.73			
802.11ac(H20) MIMO	Lowest	ANT 1	2.01	5.25	11.00	
		ANT 2	2.45			
	Middle	ANT 1	1.80	4.76		
		ANT 2	1.70			
	Highest	ANT 1	1.38	4.28		
		ANT 2	1.15			
802.11ac(H40) MIMO	Lowest	ANT 1	-1.42	1.58	11.00	
		ANT 2	-1.44			
	Highest	ANT 1	-1.82	1.05		
		ANT 2	-2.11			
802.11ac(H80) MIMO	Lowest	ANT 1	-4.44	-1.68	11.00	
		ANT 2	-4.95			

Test plot as follows:

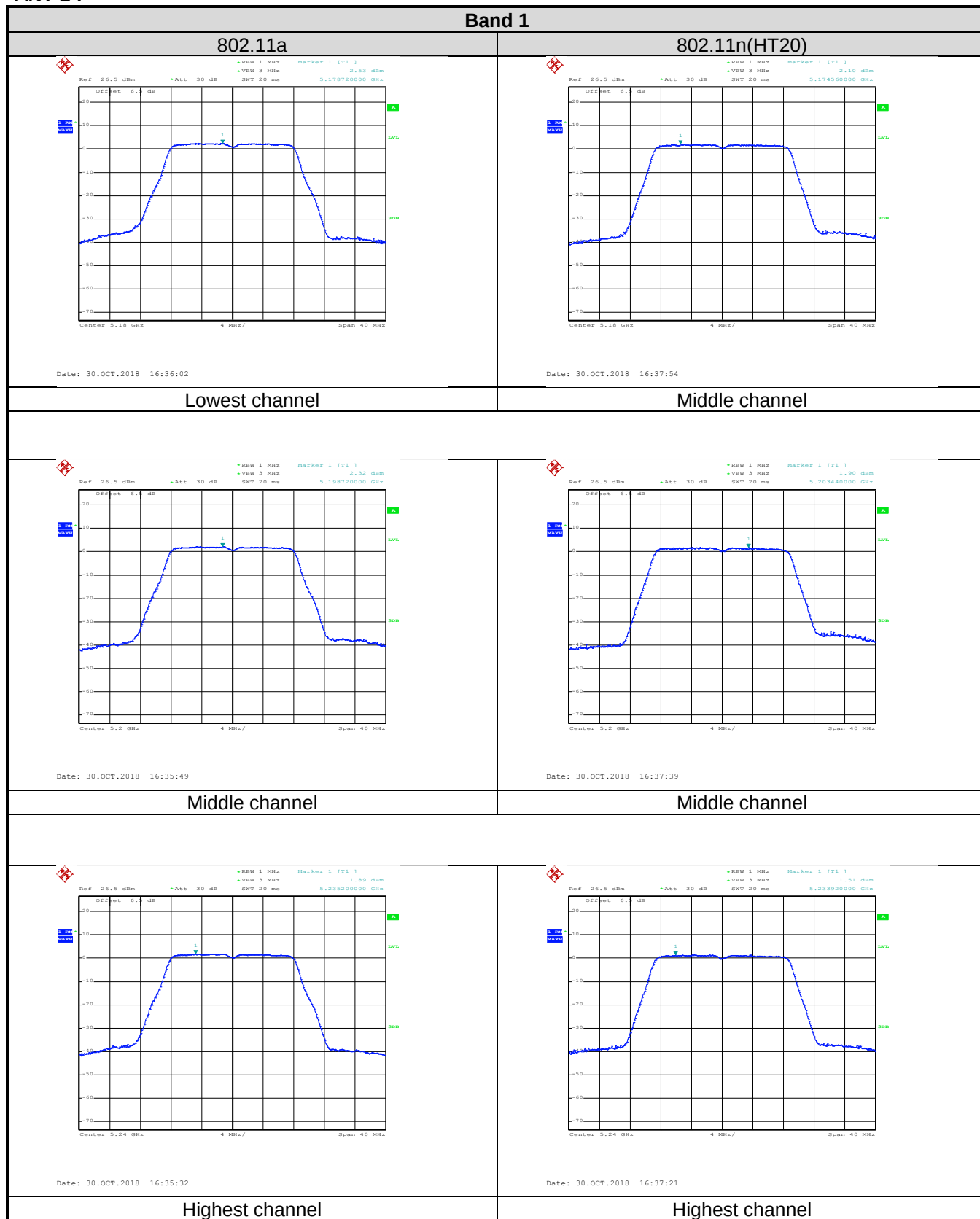
ANT 1 :

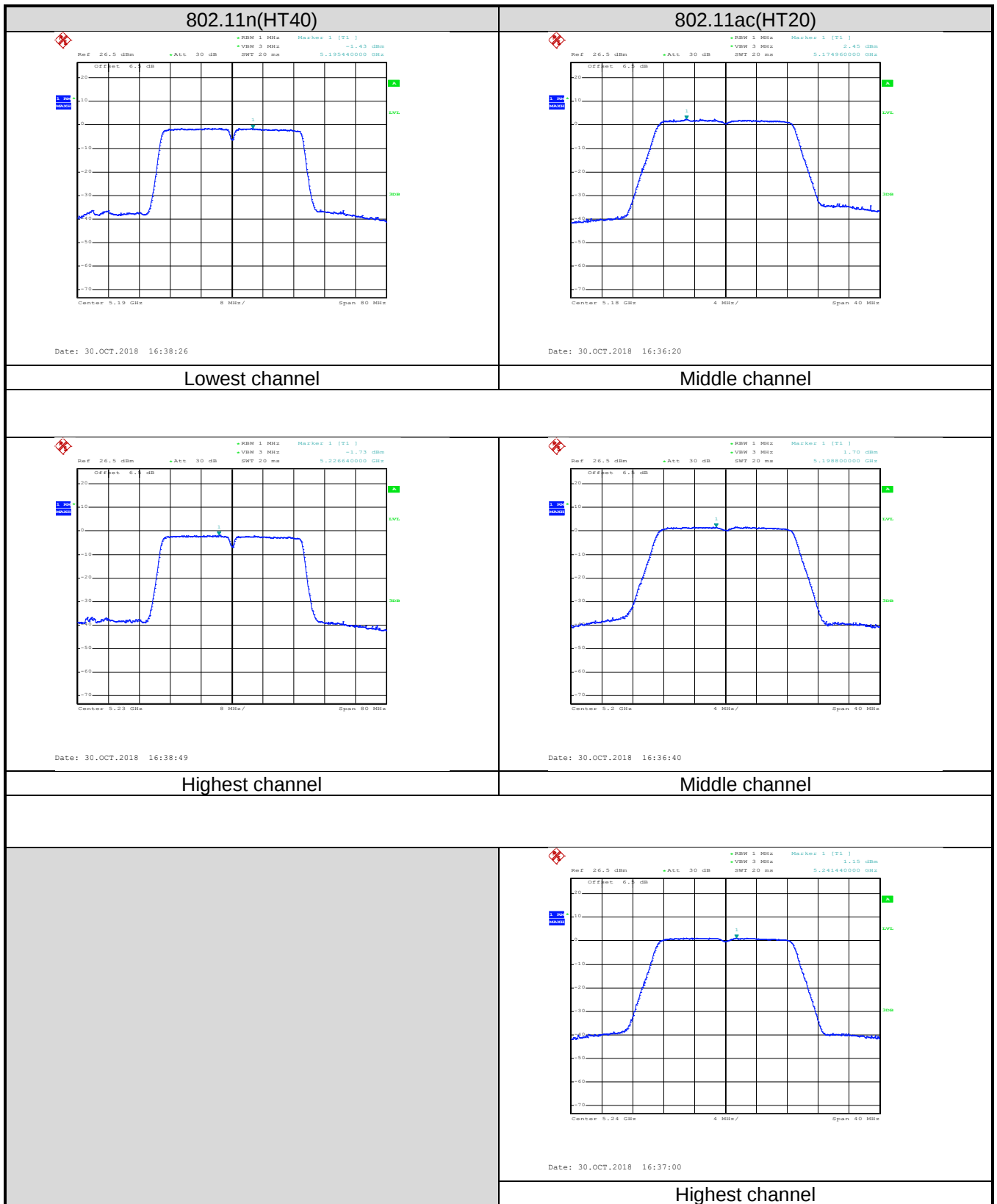


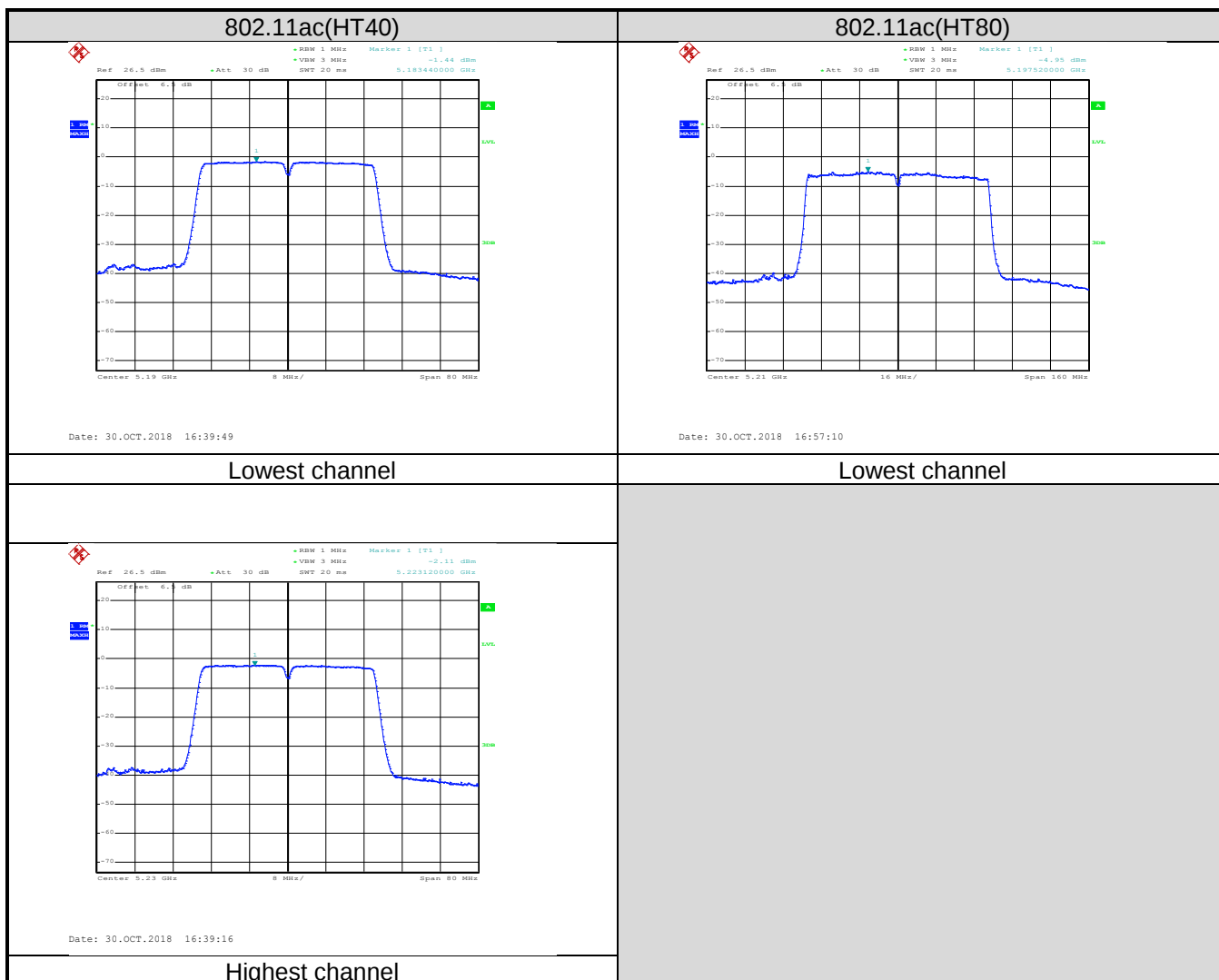




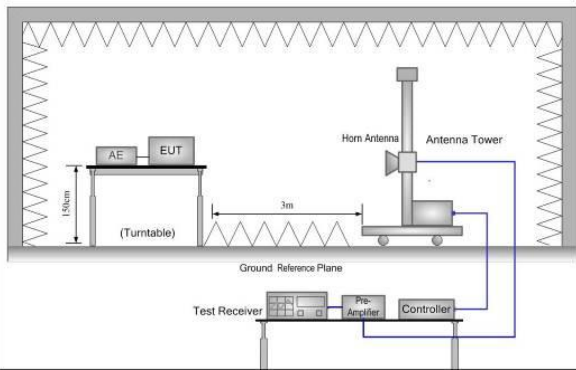
ANT 2 :







6.5 Band Edge

Test Requirement:	FCC Part 15 E Section 15.407 (b) RSS-GEN Section 8.10, RSS-247 Section 6.2.1.2			
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 (dBuV/m @3m)	Remark
	Band 1		68.20	Peak Value
			54.00	Average Value
	Remark:			
1. Band 1/2/3 limit: $E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2 = 68.2 \text{ dB}\mu\text{V/m}$, for $\text{EIPR}[\text{dBm}] = -27\text{dBm}$.				
Test Procedure:	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):

SISO ANT 1 :

Band 1 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	48.27	36.23	7.05	41.93	49.62	68.20	-18.58	Horizontal
5150.00	47.99	36.23	7.05	41.93	49.34	68.20	-18.86	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	38.68	36.23	7.05	41.93	40.03	54.00	-13.97	Horizontal
5150.00	38.94	36.23	7.05	41.93	40.29	54.00	-13.71	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	48.45	35.37	7.11	41.89	49.04	68.20	-19.16	Horizontal
5350.00	47.39	35.37	7.11	41.89	47.98	68.20	-20.22	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	38.05	35.37	7.11	41.89	38.64	54.00	-15.36	Horizontal
5350.00	38.68	35.37	7.11	41.89	39.27	54.00	-14.73	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.								

SISO ANT 2 :

Band 1 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	48.42	36.23	7.05	41.93	49.77	68.20	-18.43	Horizontal
5150.00	47.57	36.23	7.05	41.93	48.92	68.20	-19.28	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	38.99	36.23	7.05	41.93	40.34	54.00	-13.66	Horizontal
5150.00	38.15	36.23	7.05	41.93	39.50	54.00	-14.50	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	48.36	35.37	7.11	41.89	48.95	68.20	-19.25	Horizontal
5350.00	47.74	35.37	7.11	41.89	48.33	68.20	-19.87	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	38.62	35.37	7.11	41.89	39.21	54.00	-14.79	Horizontal
5350.00	38.66	35.37	7.11	41.89	39.25	54.00	-14.75	Vertical
Remark: 3. <i>Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.</i> 4. <i>The emission levels of other frequencies are very lower than the limit and not show in test report.</i>								

MIMO:

Band 1 – 802.11n(HT20)								
Test channel: Lowest channel								
Detector: Peak								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	48.95	36.23	7.05	41.93	50.30	68.20	-17.90	Horizontal
5150.00	47.41	36.23	7.05	41.93	48.76	68.20	-19.44	Vertical
Detector: Average								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	38.54	36.23	7.05	41.93	39.89	54.00	-14.11	Horizontal
5150.00	38.29	36.23	7.05	41.93	39.64	54.00	-14.36	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	48.96	35.37	7.11	41.89	49.55	68.20	-18.65	Horizontal
5350.00	47.41	35.37	7.11	41.89	48.00	68.20	-20.20	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	38.82	35.37	7.11	41.89	39.41	54.00	-14.59	Horizontal
5350.00	38.91	35.37	7.11	41.89	39.50	54.00	-14.50	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(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	48.36	7.05	41.93	41.93	55.41	68.20	-12.79	Horizontal
5150.00	47.97	7.05	41.93	41.93	55.02	68.20	-13.18	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	38.11	7.05	41.93	41.93	45.16	54.00	-8.84	Horizontal
5150.00	38.18	7.05	41.93	41.93	45.23	54.00	-8.77	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	48.31	35.37	35.37	7.11	41.89	68.20	-26.31	Horizontal
5350.00	48.05	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)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	38.22	35.37	7.11	41.89	38.81	54.00	-15.19	Horizontal
5350.00	38.58	35.37	7.11	41.89	39.17	54.00	-14.83	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)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	48.29	36.23	7.05	41.93	49.64	68.20	-18.56	Horizontal
5150.00	48.11	36.23	7.05	41.93	49.46	68.20	-18.74	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	38.19	36.23	7.05	41.93	39.54	54.00	-14.46	Horizontal
5150.00	38.68	36.23	7.05	41.93	40.03	54.00	-13.97	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	48.68	35.37	7.11	41.89	49.27	68.20	-18.93	Horizontal
5350.00	47.76	35.37	7.11	41.89	48.35	68.20	-19.85	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	38.47	35.37	7.11	41.89	39.06	54.00	-14.94	Horizontal
5350.00	38.54	35.37	7.11	41.89	39.13	54.00	-14.87	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)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	48.89	7.05	41.93	41.93	55.94	68.20	-12.26	Horizontal
5150.00	47.93	7.05	41.93	41.93	54.98	68.20	-13.22	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	38.89	7.05	41.93	41.93	45.94	54.00	-8.06	Horizontal
5150.00	38.11	7.05	41.93	41.93	45.16	54.00	-8.84	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	48.57	35.37	35.37	7.11	41.89	68.20	-26.31	Horizontal
5350.00	48.35	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)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	37.58	35.37	7.11	41.89	38.17	54.00	-15.83	Horizontal
5350.00	37.97	35.37	7.11	41.89	38.56	54.00	-15.44	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)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	48.54	35.37	35.37	7.11	41.89	68.20	-26.31	Horizontal
5150.00	47.26	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)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	38.66	35.37	7.11	41.89	39.25	54.00	-14.75	Horizontal
5150.00	38.06	35.37	7.11	41.89	38.65	54.00	-15.35	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.								

6.6 Spurious Emission

6.6.1 Restricted Band

Test Requirement:	FCC Part15 E Section 15.407(b) RSS-GEN Section 6.13, RSS-247 Section 6.2.1.2				
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
		RMS	1MHz	3MHz	Average Value
Limit:	Frequency	Limit (dBuV/m @3m)		Remark	
	Above 1GHz	74.00		Peak Value	
		54.00		Average Value	
Test Procedure:	1. 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. 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 rota table 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):

SISO ANT 1 :

Band 1 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	47.56	31.00	6.80	42.05	43.31	74.00	-30.69	Horizontal
4500.00	47.78	31.00	6.80	42.05	43.53	74.00	-30.47	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	37.74	31.00	6.80	42.05	33.49	54.00	-20.51	Horizontal
4500.00	37.62	31.00	6.80	42.05	33.37	54.00	-20.63	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	47.03	32.36	7.18	41.85	44.72	74.00	-29.28	Horizontal
5460.00	47.58	32.36	7.18	41.85	45.27	74.00	-28.73	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	37.03	32.36	7.18	41.85	34.72	54.00	-19.28	Horizontal
5460.00	37.62	32.36	7.18	41.85	35.31	54.00	-18.69	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.								

SISO ANT 2 :

Band 1 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	47.58	31.00	6.80	42.05	43.33	74.00	-30.67	Horizontal
4500.00	47.97	31.00	6.80	42.05	43.72	74.00	-30.28	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	37.53	31.00	6.80	42.05	33.28	54.00	-20.72	Horizontal
4500.00	37.29	31.00	6.80	42.05	33.04	54.00	-20.96	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	47.62	32.36	7.18	41.85	45.31	74.00	-28.69	Horizontal
5460.00	47.41	32.36	7.18	41.85	45.10	74.00	-28.90	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	37.11	32.36	7.18	41.85	34.80	54.00	-19.20	Horizontal
5460.00	37.98	32.36	7.18	41.85	35.67	54.00	-18.33	Vertical
Remark: 3. <i>Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.</i> 4. <i>The emission levels of other frequencies are very lower than the limit and not show in test report.</i>								

MIMO:

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	47.26	31.00	6.80	42.05	43.01	74.00	-30.99	Horizontal
4500.00	47.52	31.00	6.80	42.05	43.27	74.00	-30.73	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	37.51	31.00	6.80	42.05	33.26	54.00	-20.74	Horizontal
4500.00	37.10	31.00	6.80	42.05	32.85	54.00	-21.15	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	47.37	32.36	7.18	41.85	45.06	74.00	-28.94	Horizontal
5460.00	47.36	32.36	7.18	41.85	45.05	74.00	-28.95	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	37.82	32.36	7.18	41.85	35.51	54.00	-18.49	Horizontal
5460.00	37.43	32.36	7.18	41.85	35.12	54.00	-18.88	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(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	47.11	31.00	6.80	42.05	42.86	74.00	-31.14	Horizontal
4500.00	47.18	31.00	6.80	42.05	42.93	74.00	-31.07	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	37.25	31.00	6.80	42.05	33.00	54.00	-21.00	Horizontal
4500.00	37.29	31.00	6.80	42.05	33.04	54.00	-20.96	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	47.37	32.36	7.18	41.85	45.06	74.00	-28.94	Horizontal
5460.00	47.82	32.36	7.18	41.85	45.51	74.00	-28.49	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	37.39	32.36	7.18	41.85	35.08	54.00	-18.92	Horizontal
5460.00	37.48	32.36	7.18	41.85	35.17	54.00	-18.83	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.								

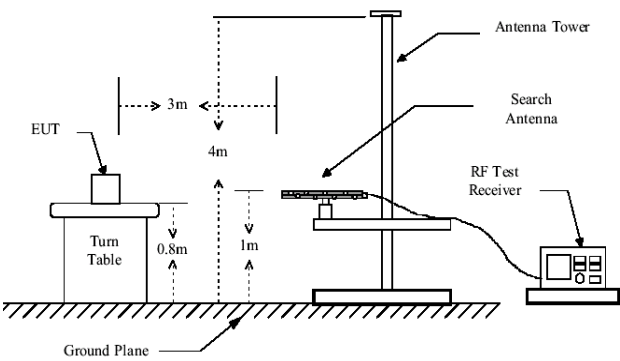
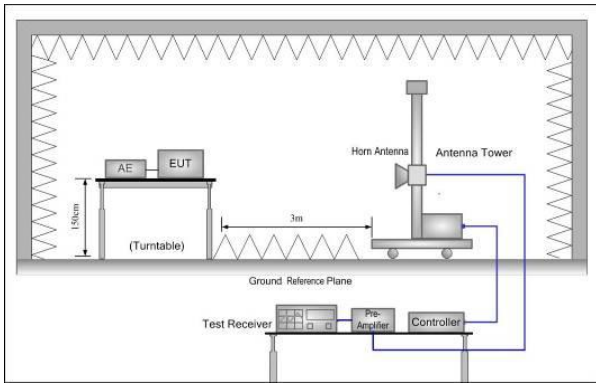
Band 1 – 802.11ac(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	47.75	31.00	6.80	42.05	43.50	74.00	-30.50	Horizontal
4500.00	47.03	31.00	6.80	42.05	42.78	74.00	-31.22	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	37.11	31.00	6.80	42.05	32.86	54.00	-21.14	Horizontal
4500.00	37.45	31.00	6.80	42.05	33.20	54.00	-20.80	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	47.35	32.36	7.18	41.85	45.04	74.00	-28.96	Horizontal
5460.00	47.67	32.36	7.18	41.85	45.36	74.00	-28.64	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	37.68	32.36	7.18	41.85	35.37	54.00	-18.63	Horizontal
5460.00	37.31	32.36	7.18	41.85	35.00	54.00	-19.00	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	47.75	31.00	6.80	42.05	43.50	74.00	-30.50	Horizontal
4500.00	47.77	31.00	6.80	42.05	43.52	74.00	-30.48	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	37.91	31.00	6.80	42.05	33.66	54.00	-20.34	Horizontal
4500.00	37.42	31.00	6.80	42.05	33.17	54.00	-20.83	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	47.86	32.36	7.18	41.85	45.55	74.00	-28.45	Horizontal
5460.00	47.42	32.36	7.18	41.85	45.11	74.00	-28.89	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	37.38	32.36	7.18	41.85	35.07	54.00	-18.93	Horizontal
5460.00	37.66	32.36	7.18	41.85	35.35	54.00	-18.65	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)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	47.68	31.00	6.80	42.05	43.43	74.00	-30.57	Horizontal
4500.00	47.39	31.00	6.80	42.05	43.14	74.00	-30.86	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	37.25	31.00	6.80	42.05	33.00	54.00	-21.00	Horizontal
4500.00	37.85	31.00	6.80	42.05	33.60	54.00	-20.40	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	47.56	32.36	7.18	41.85	45.25	74.00	-28.75	Horizontal
5460.00	47.32	32.36	7.18	41.85	45.01	74.00	-28.99	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	37.47	32.36	7.18	41.85	35.16	54.00	-18.84	Horizontal
5460.00	37.42	32.36	7.18	41.85	35.11	54.00	-18.89	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.								

6.6.2 Unwanted Emissions out of the Restricted Bands

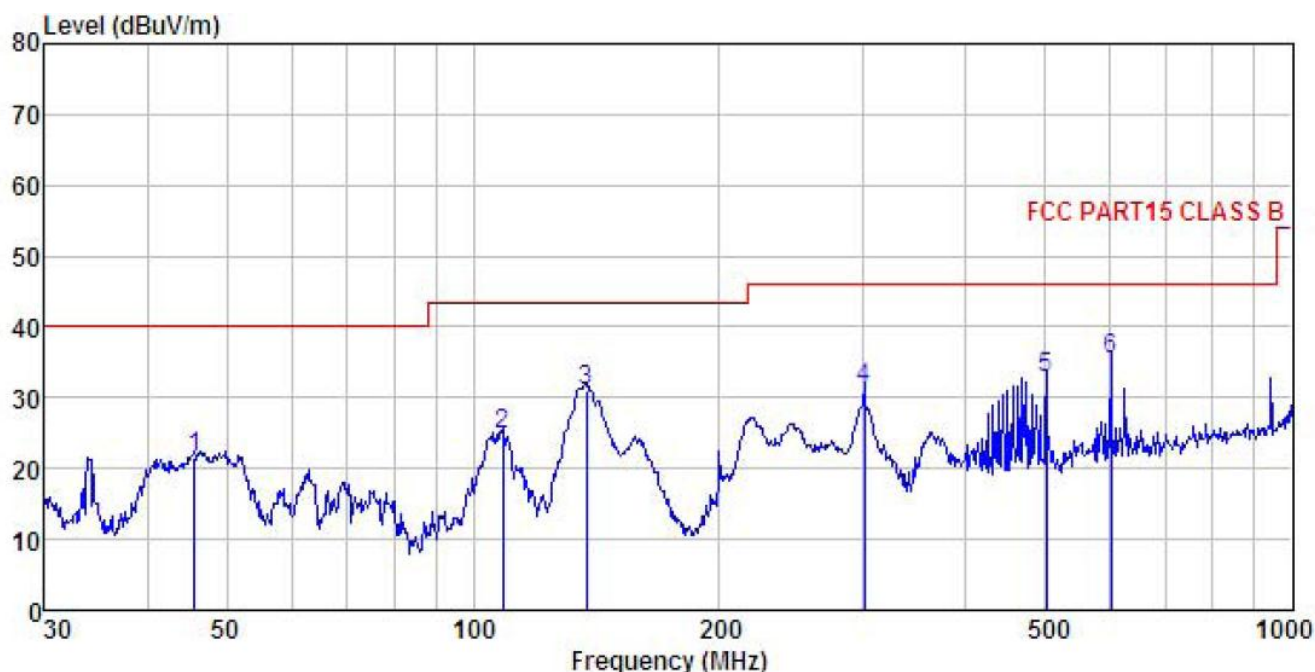
Test Requirement:	FCC Part15 C Section 15.209 and 15.205 RSS-GEN Section 6.13, RSS-247 Section 6.2.1.2				
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	30MHz to 40GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	100kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value
Limit:	Frequency		Limit (dBuV/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
	Remark: Above 1GHz limit: $E[dBuV/m] = EIRP[dBm] + 95.2=68.2 \text{ dBuV/m}$, for $EIPR[dBm]=-27dBm$.				
Test Procedure:	1. 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. 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 rota table 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:	Below 1GHz				

	 Above 1GHz 
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:	HELLO 2	Product Model:	HELLO 2
Test By:	Carey	Test mode:	5G Wi-Fi Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%

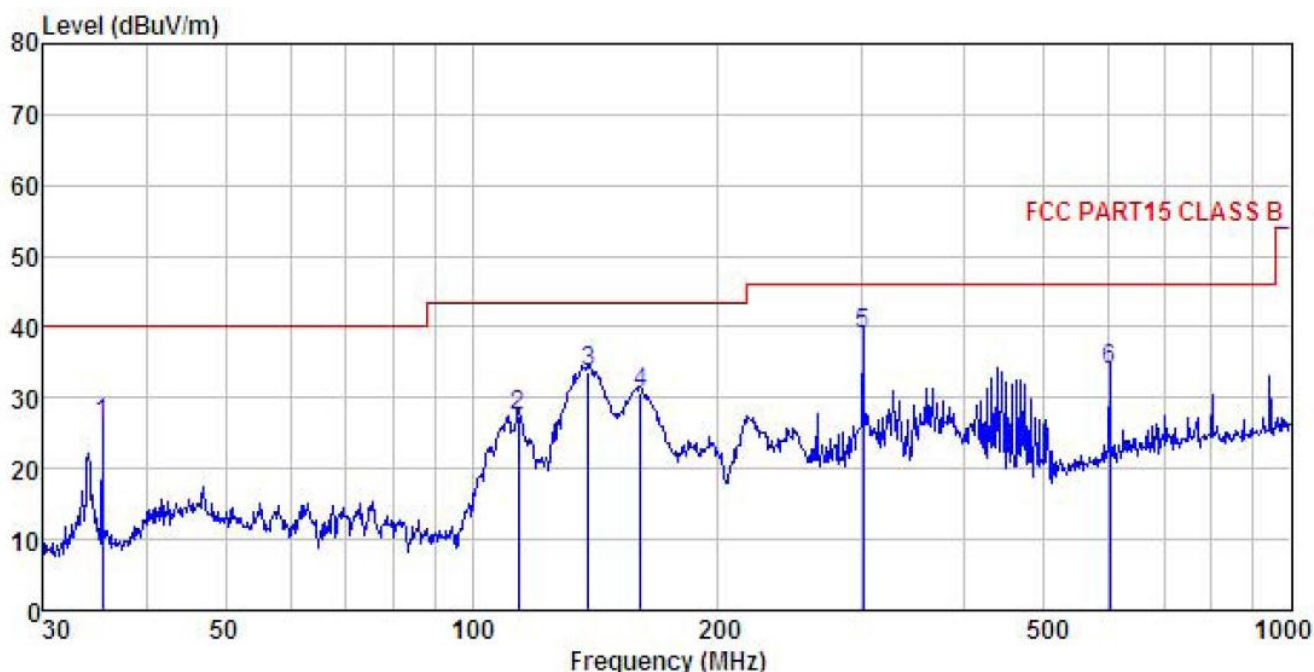


	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit	
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	45.695	36.32	13.76	1.29	29.85	21.52	40.00	-18.48 QP
2	108.647	39.90	12.22	2.03	29.47	24.68	43.50	-18.82 QP
3	137.420	49.61	8.25	2.37	29.29	30.94	43.50	-12.56 QP
4	300.367	43.10	13.61	2.94	28.45	31.20	46.00	-14.80 QP
5	501.179	40.69	17.51	3.63	28.96	32.87	46.00	-13.13 QP
6	601.427	41.29	19.22	3.94	28.93	35.52	46.00	-10.48 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.

Product Name:	HELLO 2	Product Model:	HELLO 2
Test By:	Carey	Test mode:	5G Wi-Fi Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24°C Humi: 57%



	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit	
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	35.375	43.47	11.79	1.07	29.95	26.38	40.00	-13.62 QP
2	114.114	43.28	11.41	2.10	29.43	27.36	43.50	-16.14 QP
3	138.874	52.27	8.17	2.38	29.28	33.54	43.50	-9.96 QP
4	160.909	48.00	9.13	2.60	29.12	30.61	43.50	-12.89 QP
5	300.367	50.91	13.61	2.94	28.45	39.01	46.00	-6.99 QP
6	601.427	39.80	19.22	3.94	28.93	34.03	46.00	-11.97 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:
SISO ANT 1 :

Band 1 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	47.62	40.10	9.82	41.97	55.57	68.20	-12.63	Vertical
10360.00	47.34	40.10	9.82	41.97	55.29	68.20	-12.91	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	37.53	40.10	9.82	41.97	45.48	54.00	-8.52	Vertical
10360.00	37.84	40.10	9.82	41.97	45.79	54.00	-8.21	Horizontal
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	47.39	40.00	9.85	41.95	55.29	68.20	-12.91	Vertical
10400.00	47.84	40.00	9.85	41.95	55.74	68.20	-12.46	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	37.61	40.00	9.85	41.95	45.51	54.00	-8.49	Vertical
10400.00	37.45	40.00	9.85	41.95	45.35	54.00	-8.65	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	47.37	39.70	9.96	41.88	55.15	68.20	-13.05	Vertical
10480.00	47.21	39.70	9.96	41.88	54.99	68.20	-13.21	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	37.96	39.70	9.96	41.88	45.74	54.00	-8.26	Vertical
10480.00	37.94	39.70	9.96	41.88	45.72	54.00	-8.28	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.								

SISO ANT 2 :

Band 1 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	47.22	40.10	9.82	41.97	55.17	68.20	-13.03	Vertical
10360.00	47.63	40.10	9.82	41.97	55.58	68.20	-12.62	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	37.17	40.10	9.82	41.97	45.12	54.00	-8.88	Vertical
10360.00	37.41	40.10	9.82	41.97	45.36	54.00	-8.64	Horizontal
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	47.29	40.00	9.85	41.95	55.19	68.20	-13.01	Vertical
10400.00	47.36	40.00	9.85	41.95	55.26	68.20	-12.94	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	37.22	40.00	9.85	41.95	45.12	54.00	-8.88	Vertical
10400.00	37.29	40.00	9.85	41.95	45.19	54.00	-8.81	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	47.17	39.70	9.96	41.88	54.95	68.20	-13.25	Vertical
10480.00	47.93	39.70	9.96	41.88	55.71	68.20	-12.49	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	37.35	39.70	9.96	41.88	45.13	54.00	-8.87	Vertical
10480.00	37.41	39.70	9.96	41.88	45.19	54.00	-8.81	Horizontal
Remark: 3. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor. 4. The emission levels of other frequencies are very lower than the limit and not show in test report.								

MIMO:

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	47.17	40.10	9.82	41.97	55.12	68.20	-13.08	Vertical
10360.00	47.69	40.10	9.82	41.97	55.64	68.20	-12.56	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	37.35	40.10	9.82	41.97	45.30	54.00	-8.70	Vertical
10360.00	37.46	40.10	9.82	41.97	45.41	54.00	-8.59	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	47.76	40.00	9.85	41.95	55.66	68.20	-12.54	Vertical
10400.00	47.22	40.00	9.85	41.95	55.12	68.20	-13.08	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	37.52	40.00	9.85	41.95	45.42	54.00	-8.58	Vertical
10400.00	37.94	40.00	9.85	41.95	45.84	54.00	-8.16	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	47.19	39.70	9.96	41.88	54.97	68.20	-13.23	Vertical
10480.00	47.22	39.70	9.96	41.88	55.00	68.20	-13.20	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	37.21	39.70	9.96	41.88	44.99	54.00	-9.01	Vertical
10480.00	37.46	39.70	9.96	41.88	45.24	54.00	-8.76	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.								

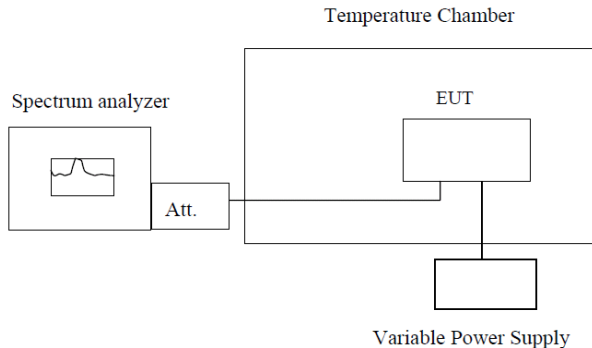
Band 1 – 802.11n(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	47.45	40.00	9.85	41.95	55.35	68.20	-12.85	Vertical
10380.00	47.87	40.00	9.85	41.95	55.77	68.20	-12.43	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	37.28	40.00	9.85	41.95	45.18	54.00	-8.82	Vertical
10380.00	37.96	40.00	9.85	41.95	45.86	54.00	-8.14	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	47.96	39.80	9.92	41.90	55.78	68.20	-12.42	Vertical
10460.00	47.46	39.80	9.92	41.90	55.28	68.20	-12.92	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	37.14	39.80	9.92	41.90	44.96	54.00	-9.04	Vertical
10460.00	37.93	39.80	9.92	41.90	45.75	54.00	-8.25	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 – 802.11ac(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	47.85	40.10	9.82	41.97	55.80	68.20	-12.40	Vertical
10360.00	47.52	40.10	9.82	41.97	55.47	68.20	-12.73	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	37.12	40.10	9.82	41.97	45.07	54.00	-8.93	Vertical
10360.00	37.74	40.10	9.82	41.97	45.69	54.00	-8.31	Horizontal
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	47.92	40.00	9.85	41.95	55.82	68.20	-12.38	Vertical
10400.00	47.37	40.00	9.85	41.95	55.27	68.20	-12.93	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	37.98	40.00	9.85	41.95	45.88	54.00	-8.12	Vertical
10400.00	37.46	40.00	9.85	41.95	45.36	54.00	-8.64	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	47.84	39.70	9.96	41.88	55.62	68.20	-12.58	Vertical
10480.00	47.52	39.70	9.96	41.88	55.30	68.20	-12.90	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	37.24	39.70	9.96	41.88	45.02	54.00	-8.98	Vertical
10480.00	37.92	39.70	9.96	41.88	45.70	54.00	-8.30	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 – 802.11ac(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	47.63	40.00	9.85	41.95	55.53	68.20	-12.67	Vertical
10380.00	47.32	40.00	9.85	41.95	55.22	68.20	-12.98	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	37.49	40.00	9.85	41.95	45.39	54.00	-8.61	Vertical
10380.00	37.29	40.00	9.85	41.95	45.19	54.00	-8.81	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	47.32	39.80	9.92	41.90	55.14	68.20	-13.06	Vertical
10460.00	47.41	39.80	9.92	41.90	55.23	68.20	-12.97	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	37.32	39.80	9.92	41.90	45.14	54.00	-8.86	Vertical
10460.00	37.39	39.80	9.92	41.90	45.21	54.00	-8.79	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 – 802.11ac(HT80)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10420.00	47.93	40.00	9.85	41.95	55.83	68.20	-12.37	Vertical
10420.00	47.29	40.00	9.85	41.95	55.19	68.20	-13.01	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10420.00	37.94	40.00	9.85	41.95	45.84	54.00	-8.16	Vertical
10420.00	37.41	40.00	9.85	41.95	45.31	54.00	-8.69	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.								

6.7 Frequency stability

Test Requirement:	FCC Part15 E Section 15.407 (g) RSS-GEN Section 6.11
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:	 Temperature Chamber Spectrum analyzer Att. EUT Variable Power Supply Note : Measurement setup for testing on Antenna connector
Test procedure:	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(℃)	Voltage(ac)		
20	102V	5179.997643	0.45
	120V	5179.974779	4.87
	138V	5179.963951	6.96

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

Test conditions		Frequency(MHz)	Max. Deviation (ppm)
Voltage(ac)	Temp(℃)		
120V	-20	5179.987033	2.50
	-10	5179.995377	0.89
	0	5179.968421	6.10
	10	5179.987556	2.40
	20	5179.996681	0.64
	30	5179.974290	4.96
	40	5179.963775	6.99
	50	5179.974929	4.84