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FCC RADIO TEST REPORT

Applicant's company	**Broadcom Corporation**
Applicant Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.
FCC ID	**QDS-BRCM1075**
Manufacturer's company	**Broadcom Corporation**
Manufacturer Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.

Product Name	Broadcom 802.11a/b/g/n/ac WLAN + Bluetooth 4.0 NGFF2230 Mini Card
Brand Name	Broadcom
Model No.	BCM943162ZP
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5350MHz / 5470 ~ 5725MHz / 5725 ~ 5850 MHz
Received Date	Dec. 25, 2013
Final Test Date	Feb. 02, 2016
Submission Type	Class II Change

Statement

Test result included is for the IEEE 802.11n and IEEE 802.11a/ac of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013**, **47 CFR FCC Part 15 Subpart E, KDB789033 D02 v01r01, KDB662911 D01 v02r01, KDB644545 D03 v01**

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3D2546-12	Rev. 01	Initial issue of report	Feb. 03, 2016
FR3D2546-12	Rev. 02	Revise test mode description on section 3.5	Feb. 15, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	Broadcom 802.11a/b/g/n/ac WLAN + Bluetooth 4.0 NGFF2230 Mini Card
Brand Name	:	Broadcom
Model No.	:	BCM943162ZP
Applicant	:	Broadcom Corporation
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Dec. 25, 2013 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.2	15.407(e)	6dB Spectrum Bandwidth	Complies	-
4.3	15.407(a)	Maximum Conducted Output Power	Complies	9.46 dB
4.4	15.407(a)	Power Spectral Density	Complies	25.48 dB
4.5	15.407(b)	Radiated Emissions	Complies	0.02 dB
4.6	15.407(b)	Band Edge Emissions	Complies	0.04 dB
4.7	15.407(g)	Frequency Stability	Complies	-
4.8	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (1TX, 1RX)
Radio Type	Intentional Transceiver
Power Type	From host system
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5150 ~ 5350MHz / 5470 ~ 5725MHz / 5725 ~ 5850 MHz
Channel Number	25 for 20MHz bandwidth ; 12 for 40MHz bandwidth 6 for 80MHz bandwidth
Channel Band Width (99%)	For Mode 1: IEEE 802.11a: 24.83 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 25.09 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.48 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz For Mode 2: IEEE 802.11a: 23.79 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 23.88 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.77 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz
Maximum Conducted Output Power	For Mode 1: IEEE 802.11a: 20.38 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 20.38 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 18.39 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 15.15 dBm For Mode 2: IEEE 802.11a: 20.33 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 20.21 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 19.24 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 15.64 dBm

Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Note 1: The MIMO transmission mode is correlated.

Note 2: The Maximum Conducted Output Power and Channel Band Width (99%) listed are for 5GHz band 4.

Items	Description	
Communication Mode	☒ IP Based (Load Based)	☐ Frame Based
Beamforming Function	☐ With beamforming	☒ Without beamforming

Antenna and Band width

Antenna	Single (TX)		
Band width Mode	20 MHz	40 MHz	80 MHz
IEEE 802.11a	V	X	X
IEEE 802.11n	V	V	X
IEEE 802.11ac	V	V	V

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	1	MCS 0-7
802.11n (HT40)	1	MCS 0-7
802.11ac (VHT20)	1	MCS 0-9/Nss1
802.11ac (VHT40)	1	MCS 0-9/Nss1
802.11ac (VHT80)	1	MCS 0-9/Nss1

Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT supports HT20 and HT40.

Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT supports VHT20, VHT40 and VHT80.

Note 3: Modulation modes consist of below configuration:
HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac

3.2. Accessories

N/A

3.3. Table for Filed Antenna

Set	Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)				
						2.4GHz	5GHz B1	5GHz B2	5GHz B3	5GHz B4
1	1	Hitachi	HMT05/HFT17-DL07	WLAN/BT antenna	Micro Coaxial	3.9	3.9	5.6	5.8	5.8
	2	Hitachi	HMT05/HFT17-DL07	WLAN/BT antenna	Micro Coaxial	3.9	3.9	5.6	5.8	5.8
2	1	MAG.LAYERS	PCA-4077-25GC1-A1	WLAN/BT antenna	IPEX A13	3.33	5.85	5.85	6.21	6.21
	2	MAG.LAYERS	PCA-4077-25GC1-A1	WLAN/BT antenna	IPEX A13	3.33	5.85	5.85	6.21	6.21

Note: The EUT has two set of antenna and each set has two antennas.

For 2.4GHz:

For IEEE 802.11b/g/n mode (1TX/1RX)

The EUT supports the antenna with TX/RX diversity function.

Both Chain 1 and Chain 2 can be used as transmitting/receiving antenna, but only one antenna can be used as transmitting/receiving antenna at the same time.

Chain 1 generated the worst case than Chain 2, so it tested and recorded in the report.

For 5GHz:

For IEEE 802.11a/n/ac mode (1TX/1RX)

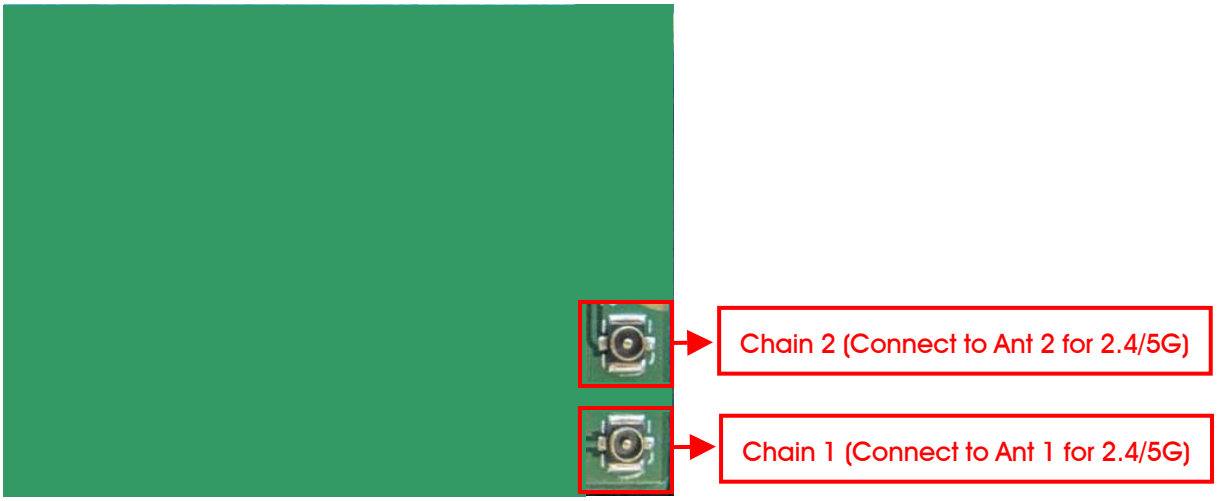
The EUT supports the antenna with TX/RX diversity function.

Both Chain 1 and Chain 2 can be used as transmitting/receiving antenna, but only one antenna can be used as transmitting/receiving antenna at the same time.

Chain 1 generated the worst case than Chain 2, so it tested and recorded in the report.

For Bluetooth mode (1TX/1RX)

Only Chain 1 can be used as transmitting/receiving antenna.



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 138, 140, 149, 153, 157, 161, 165.

For 40MHz bandwidth systems, use Channel 38, 46, 54, 62, 102, 110, 118, 126, 134, 142, 151, 159.

For 80MHz bandwidth systems, use Channel 42, 58, 106, 122, 144, 155.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5150~5250 MHz Band 1	36	5180 MHz	44	5220 MHz
	38	5190 MHz	46	5230 MHz
	40	5200 MHz	48	5240 MHz
	42	5210 MHz	-	-
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
	58	5290 MHz	-	-
5470~5725 MHz Band 3	100	5500 MHz	124	5620 MHz
	102	5510 MHz	126	5630 MHz
	104	5520 MHz	128	5640 MHz
	106	5530 MHz	132	5660 MHz
	108	5540 MHz	134	5670 MHz
	110	5550 MHz	136	5680 MHz
	112	5560 MHz	138	5690 MHz
	116	5580 MHz	140	5700 MHz
	118	5590 MHz	142	5710 MHz
	120	5600 MHz	144	5720 MHz
	122	5610 MHz	-	-
5725~5850 MHz Band 4	149	5745 MHz	157	5785 MHz
	151	5755 MHz	159	5795 MHz
	153	5765 MHz	161	5805 MHz
	155	5775 MHz	165	5825 MHz

3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode		Data Rate	Channel	Chain
Max. Conducted Output Power	11a/BPSK	Band 4	6Mbps	149/157/165	1
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1
	11ac VHT80	Band 4	MCS0/Nss1	155	1
Power Spectral Density	11a/BPSK	Band 4	6Mbps	149/157/165	1
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1
	11ac VHT80	Band 4	MCS0/Nss1	155	1
26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	11a/BPSK	Band 4	6Mbps	149/157/165	1
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1
	11ac VHT80	Band 4	MCS0/Nss1	155	1
6dB Spectrum Bandwidth Measurement	11a/BPSK	Band 4	6Mbps	149/157/165	1
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1
	11ac VHT80	Band 4	MCS0/Nss1	155	1
Radiated Emission Above 1GHz	11a/BPSK	Band 4	6Mbps	149/157/165	1
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1
	11ac VHT80	Band 4	MCS0/Nss1	155	1
Band Edge Emission	11a/BPSK	Band 4	6Mbps	149/157/165	1
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1
	11ac VHT80	Band 4	MCS0/Nss1	155	1
Frequency Stability	20 MHz	Band 4	-	157	1
	40 MHz	Band 4	-	151	1
	80 MHz	Band 4	-	155	1

Note 1: VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.

Note 2: Mode 1 for mobile device and Mode 2 for mobile/portable device, but the output power of mode 2 was based on the output power of mobile to execute all tests. The output power of portable doesn't change (please refer to Sporton report no.: FA3D2546-02 for output power of portable, Date of Grant: 05/20/2014).

For Other tests:

Mode 1. CTX- EUT + Set 1 Antenna

Mode 2. CTX- EUT + Set 2 Antenna

For Radiated Emission test above 1GHz:

The EUT was performed at X axis, Y axis and Z axis position. The worst case was found at Z axis, so it was selected to perform test and its test result was written in the report.

Mode 1. CTX- Place EUT in Z axis + Set 1 Antenna

Mode 2. CTX- Place EUT in Z axis + Set 2 Antenna

3.6. Table for Testing Locations

Test Site Location					
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.				
TEL:	886-3-656-9065				
FAX:	886-3-656-9085				
Test Site No.	**Site Category**	**Location**	**FCC Reg. No.**	**IC File No.**	**VCCI Reg. No**
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC).

3.7. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR3D2546 and FR3D2546-02

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Updating 5GHz Band 1 to "New Rules" from "Old Rules".	The output power remains the same, so it's no need to re-test.
Updating 5GHz Band 2~3 to "New Rules" from "Old Rules".	After evaluating, it's no need to re-test.
Updating test rule of 5GHz Band 4(5725~5850 MHz) to "New Rules" from "Old Rules".	1. 26dB Bandwidth and 99% Occupied Bandwidth Measurement 2. 6dB Spectrum Bandwidth 3. Maximum Conducted Output Power. 4. Power Spectral Density. 5. Radiated Emission Above 1GHz. 6. Band Edge Emissions. 7. Frequency Stability.

3.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC
Test fixture	Broadcom	BCM9NGFF2EC_1	N/A

3.9. Table for Parameters of Test Software Setting

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Test Mode: Mode 1

Test Software Version	Mtool 2.0.1.5		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5745 MHz	5785 MHz	5825 MHz
802.11a	73	86	78
802.11ac MCS0/Nss1 VHT20	72	86	77
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5755 MHz	5795 MHz	
	65	77	
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5775 MHz		
	64		

Test Mode: Mode 2

Test Software Version	Mtool 2.0.1.5		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5745 MHz	5785 MHz	5825 MHz
802.11a	75	85	82
802.11ac MCS0/Nss1 VHT20	73	85	80
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5755 MHz	5795 MHz	
	62	78	
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5775 MHz		
	64		

3.10. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.11. Duty Cycle

Test Mode: Mode 1

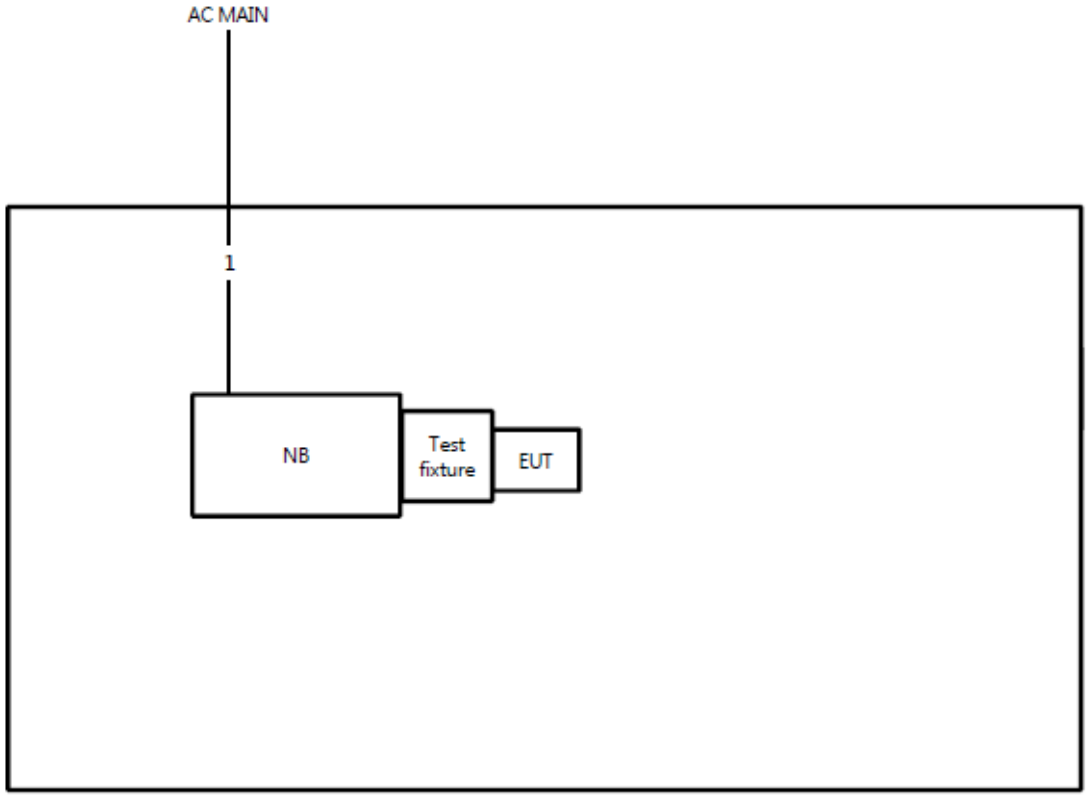
Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.058	2.083	98.80%	0.05	0.01
802.11ac MCS0/Nss1 VHT20	1.933	1.965	98.37%	0.07	0.01
802.11ac MCS0/Nss1 VHT40	0.937	0.976	96.00%	0.18	1.07
802.11ac MCS0/Nss1 VHT80	0.452	0.489	92.43%	0.34	2.21

Test Mode: Mode 2

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.048	2.096	97.71%	0.10	0.49
802.11ac MCS0/Nss1 VHT20	1.923	1.962	98.04%	0.09	0.01
802.11ac MCS0/Nss1 VHT40	0.913	0.980	93.16%	0.31	1.10
802.11ac MCS0/Nss1 VHT80	0.425	0.488	87.09%	0.60	2.35

3.12. Test Configurations

3.12.1. Radiation Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	2.6m

4. TEST RESULT

4.1. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.1.1. Limit

No restriction limits.

4.1.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

26dB Bandwidth	
Spectrum Parameters	**Setting**
Attenuation	Auto
Span Frequency	> 26dB Bandwidth
RBW	Approximately 1% of the emission bandwidth
VBW	VBW > RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto
99% Occupied Bandwidth	
Spectrum Parameters	**Setting**
Span	1.5 times to 5.0 times the OBW
RBW	1 % to 5 % of the OBW
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold

4.1.3. Test Procedures

For conducted 26dB Bandwidth and 99% Occupied Bandwidth Measurement:

1. The transmitter was conducted to the spectrum analyzer in peak hold mode.
2. Measure the maximum width of the emission that is 26 dB down from the peak of the emission.
3. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
4. Measurement perform conducted of each port.

4.1.4. Test Setup Layout

For conducted 26dB Bandwidth and 99% Occupied Bandwidth Measurement:

This test setup layout is the same as that shown in section 4.4.4.

4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.1.7. Test Result of 26dB Bandwidth and 99% Occupied Bandwidth

Temperature	21℃	Humidity	60%
Test Engineer	Lucas Huang	Test Mode	Mode 1

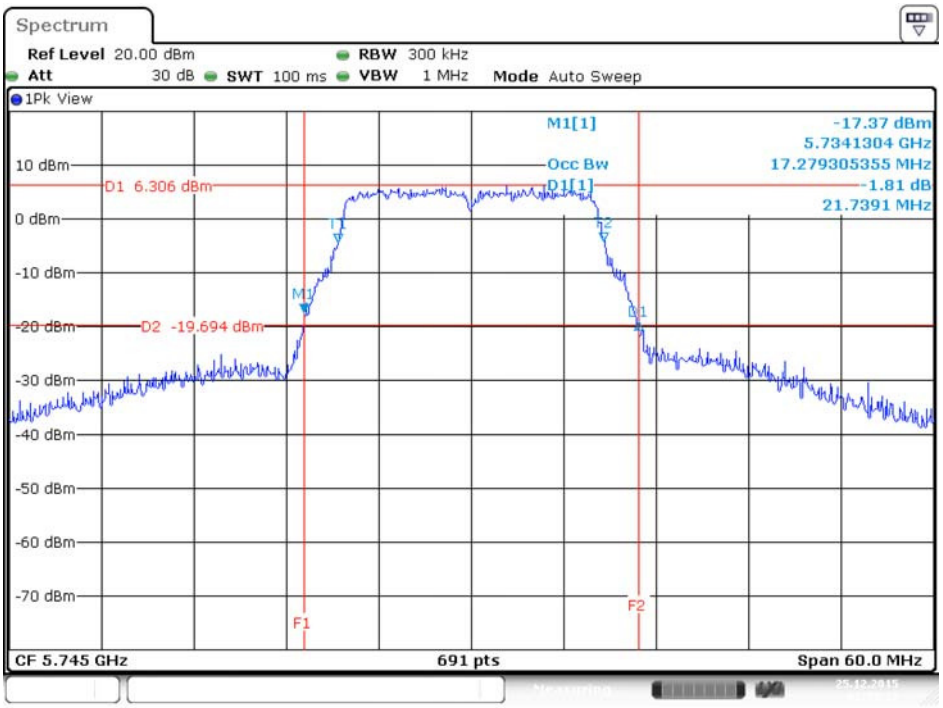
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
		Chain 1	Chain 1
802.11a	5745 MHz	21.74	17.28
	5785 MHz	43.48	24.83
	5825 MHz	27.57	17.63
802.11ac MCS0/Nss1 VHT20	5745 MHz	21.74	18.15
	5785 MHz	44.78	25.09
	5825 MHz	22.00	18.32
802.11ac MCS0/Nss1 VHT40	5755 MHz	40.87	36.61
	5795 MHz	83.04	37.48
802.11ac MCS0/Nss1 VHT80	5775 MHz	82.03	75.83

Temperature	21℃	Humidity	60%
Test Engineer	Peter Wu	Test Mode	Mode 2

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
		Chain 1	Chain 1
802.11a	5745 MHz	22.09	17.37
	5785 MHz	40.70	23.79
	5825 MHz	38.17	19.10
802.11ac MCS0/Nss1 VHT20	5745 MHz	22.09	18.32
	5785 MHz	45.91	23.88
	5825 MHz	31.39	18.67
802.11ac MCS0/Nss1 VHT40	5755 MHz	41.30	36.90
	5795 MHz	89.86	37.77
802.11ac MCS0/Nss1 VHT80	5775 MHz	82.32	75.83

Test Mode: Mode 1

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5745 MHz



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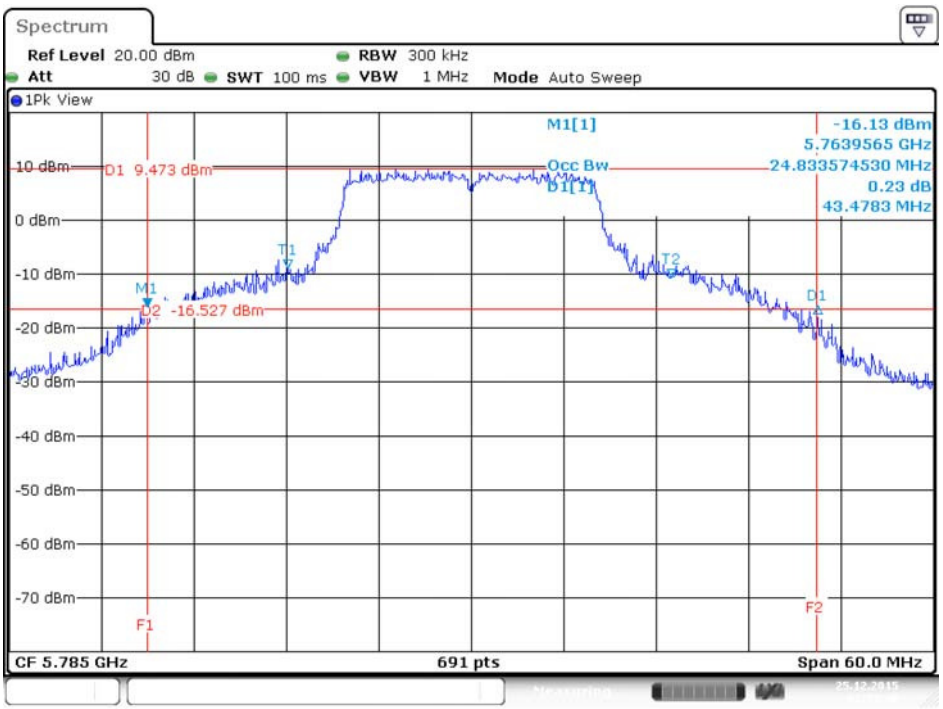
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5785 MHz



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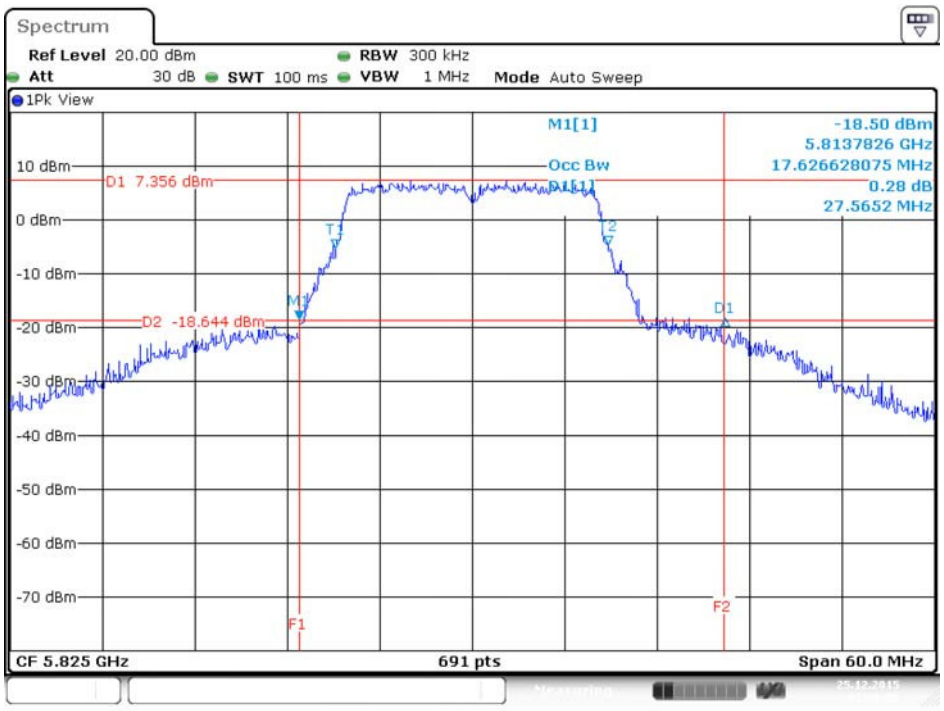
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5825 MHz



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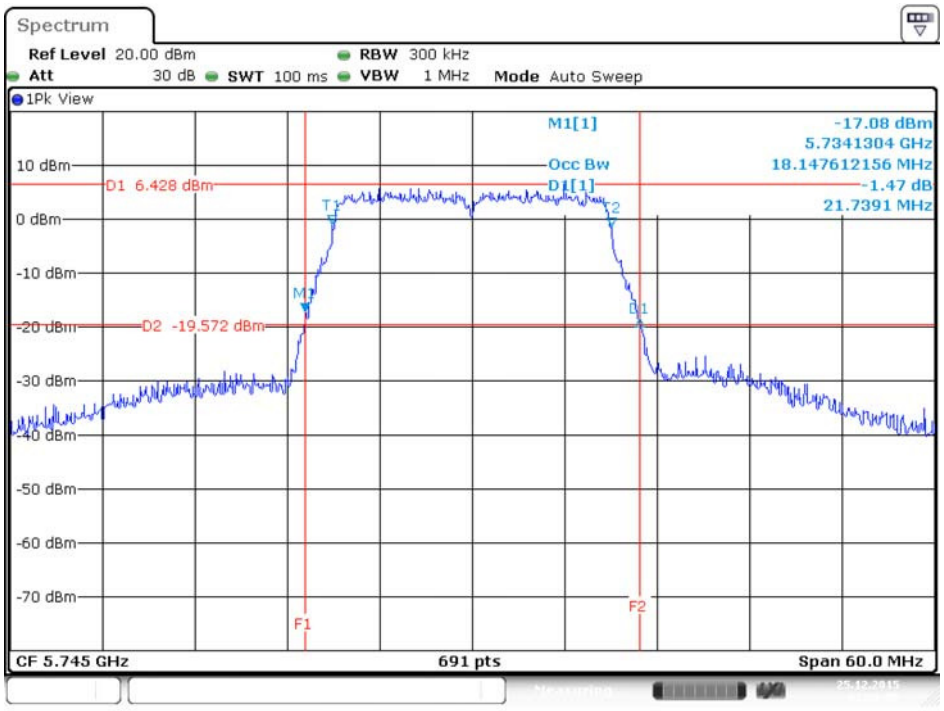
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5745 MHz



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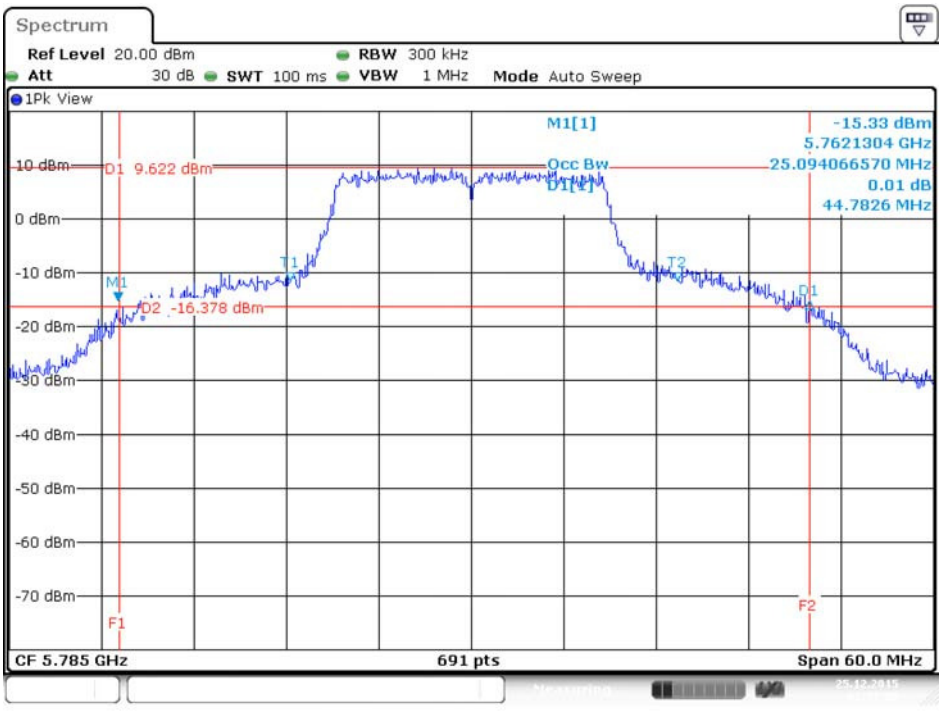
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5785 MHz



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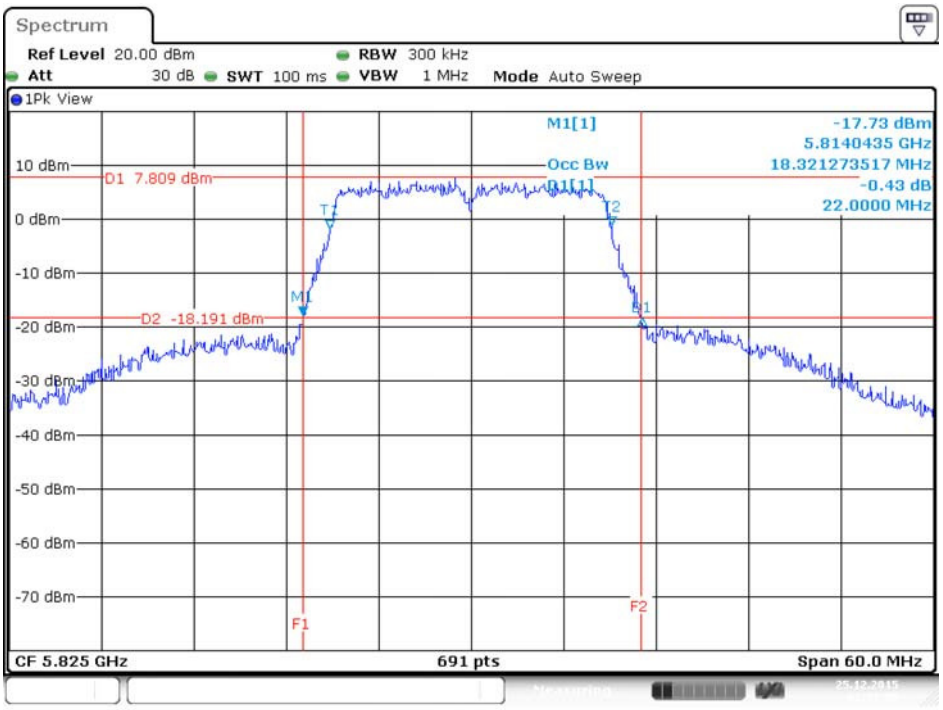
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5825 MHz



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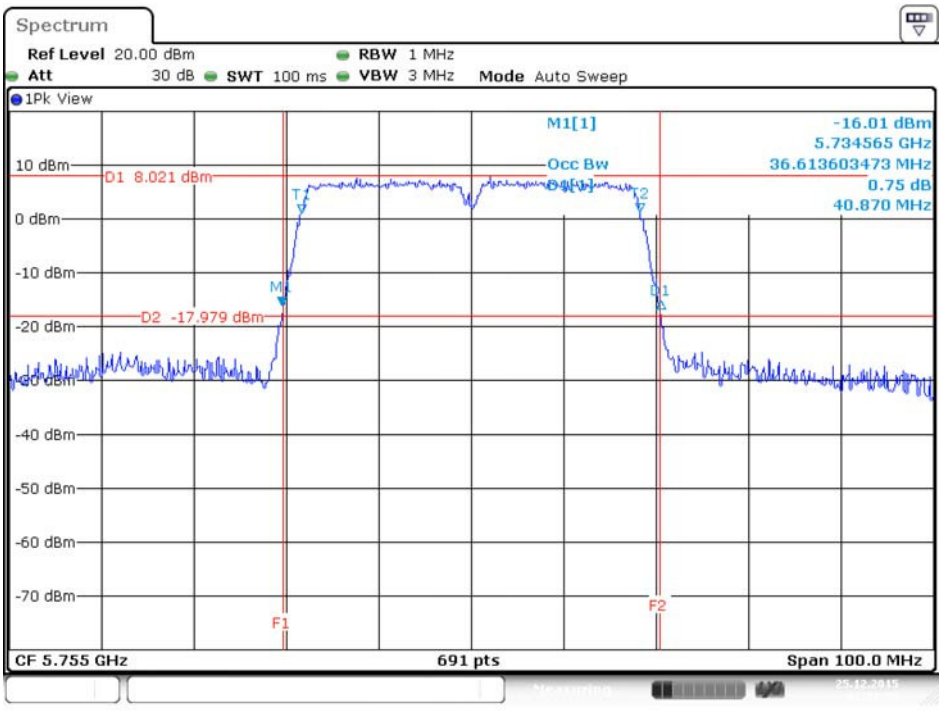
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5755 MHz



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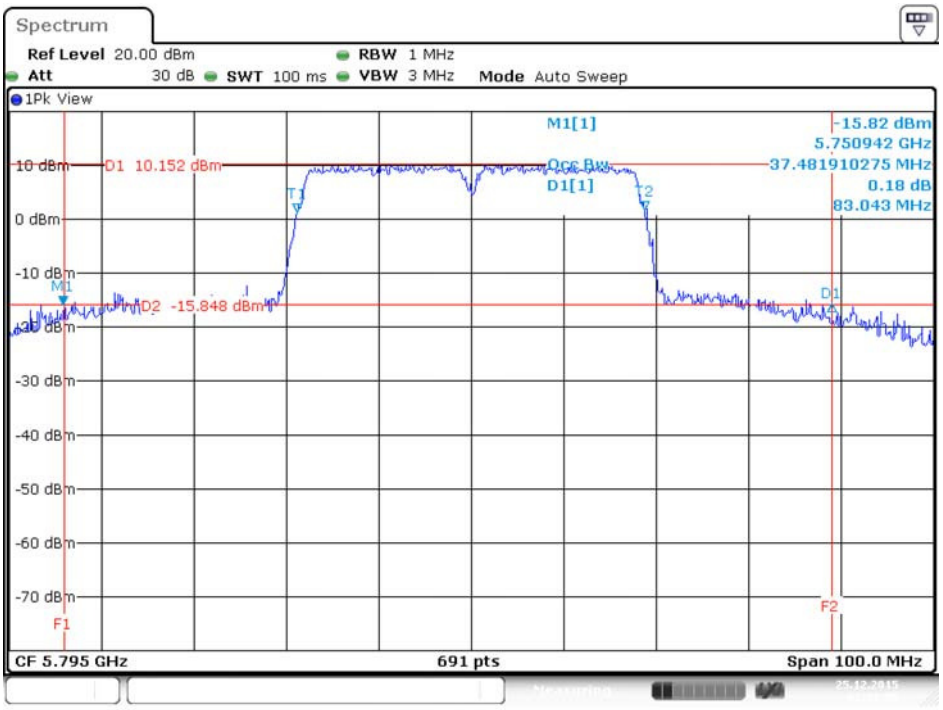
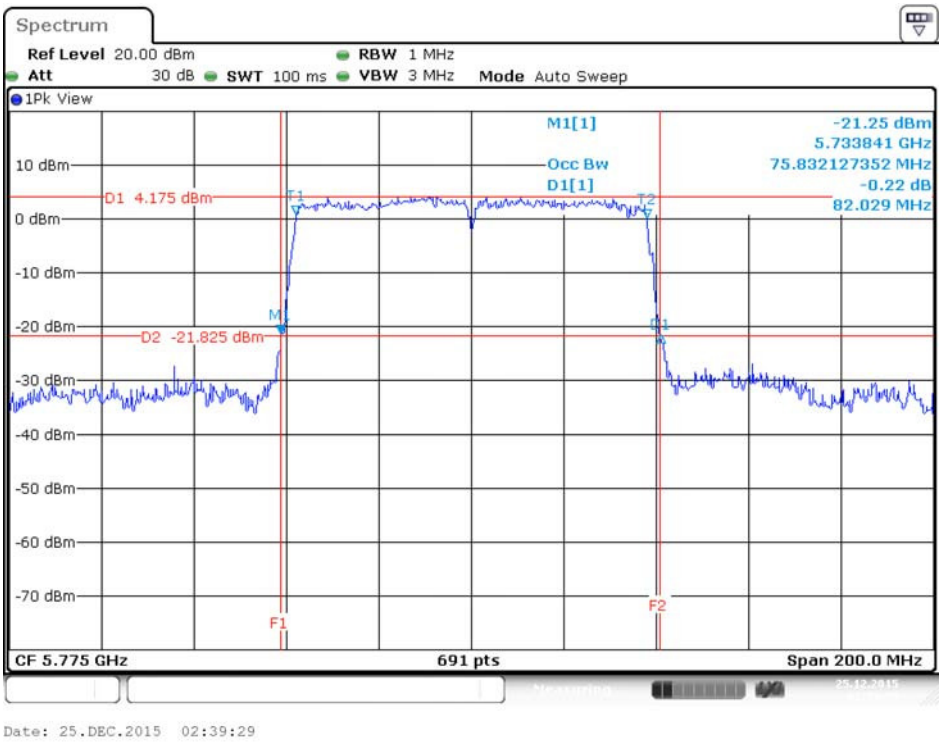
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5795 MHz



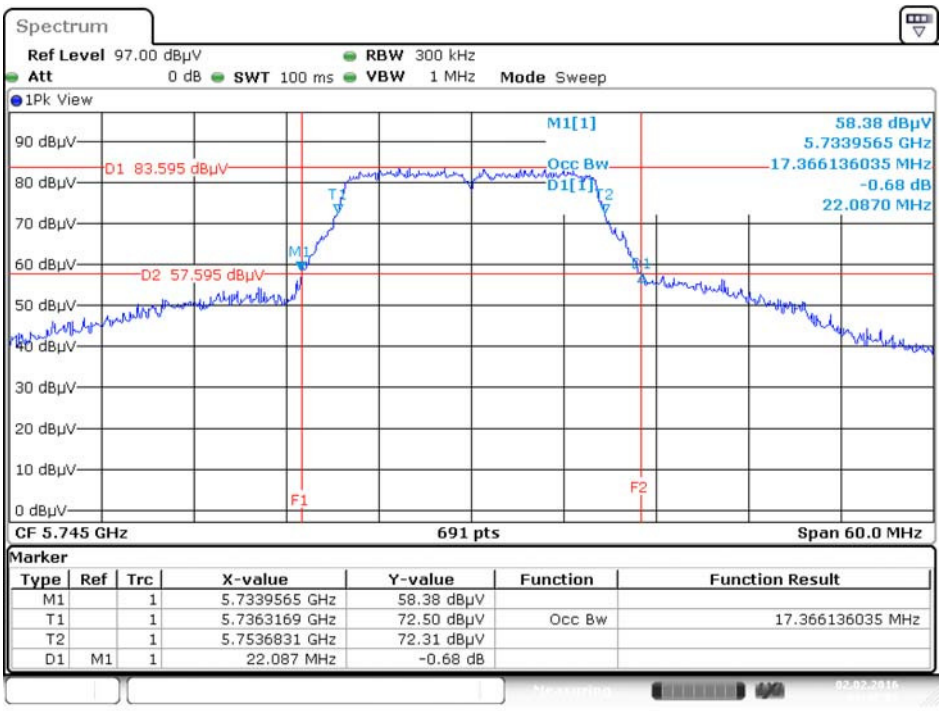
Date: 25.DEC.2015 02:38:56

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5775 MHz



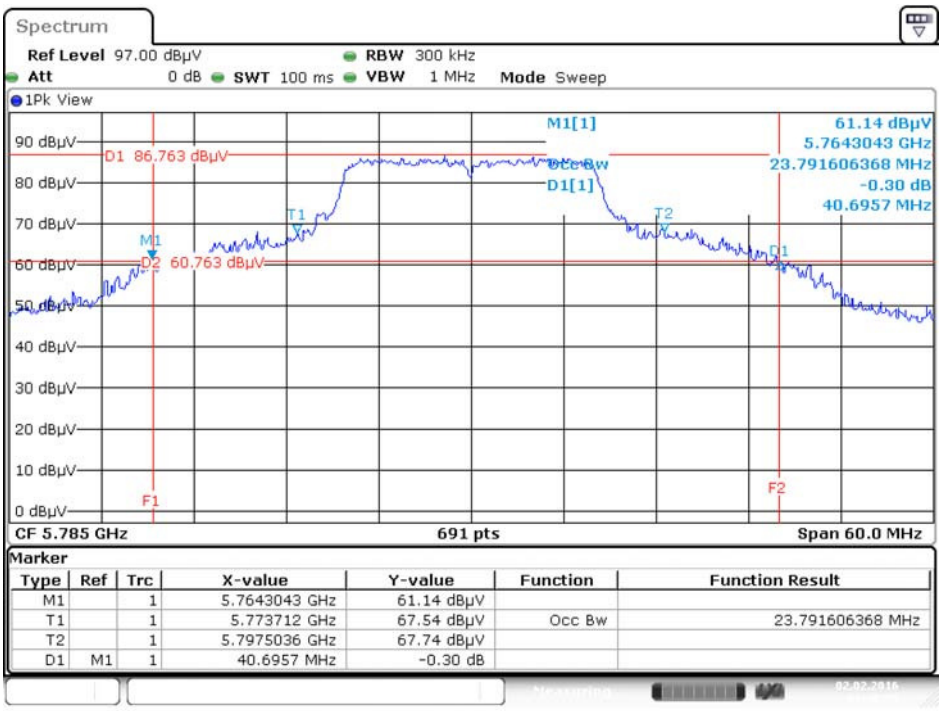
Test Mode: Mode 2

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5745 MHz



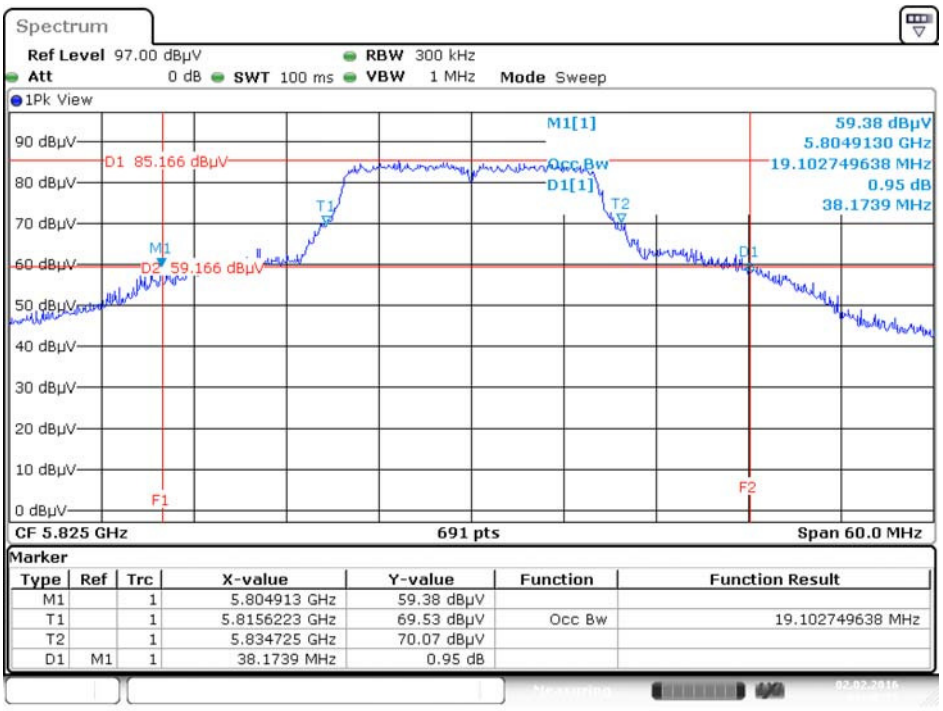
Date: 2.FEB.2016 09:47:01

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5785 MHz



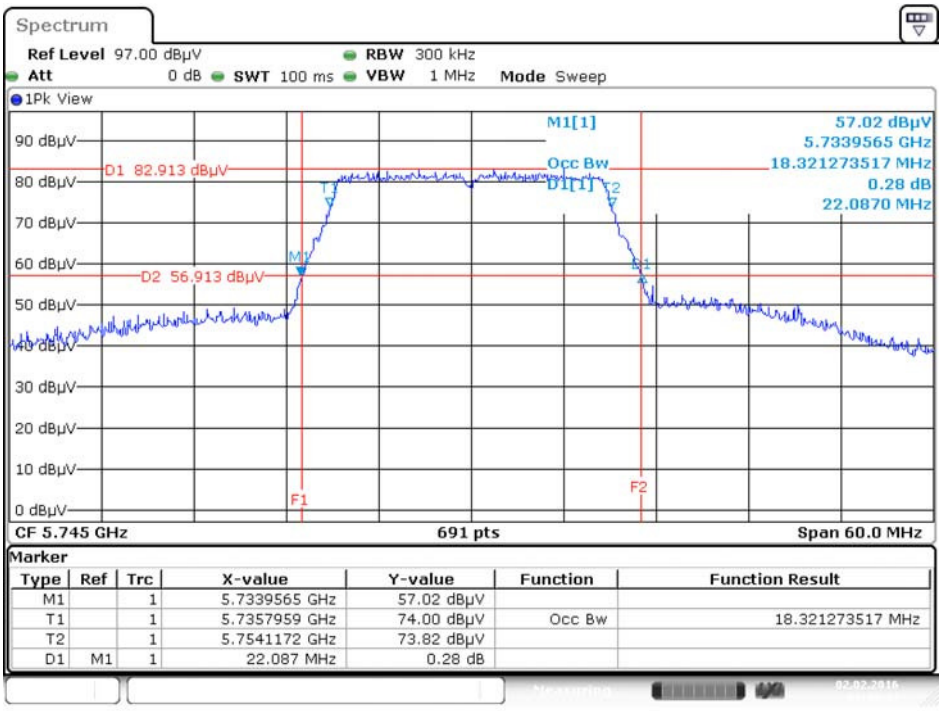
Date: 2.FEB.2016 09:48:35

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5825 MHz



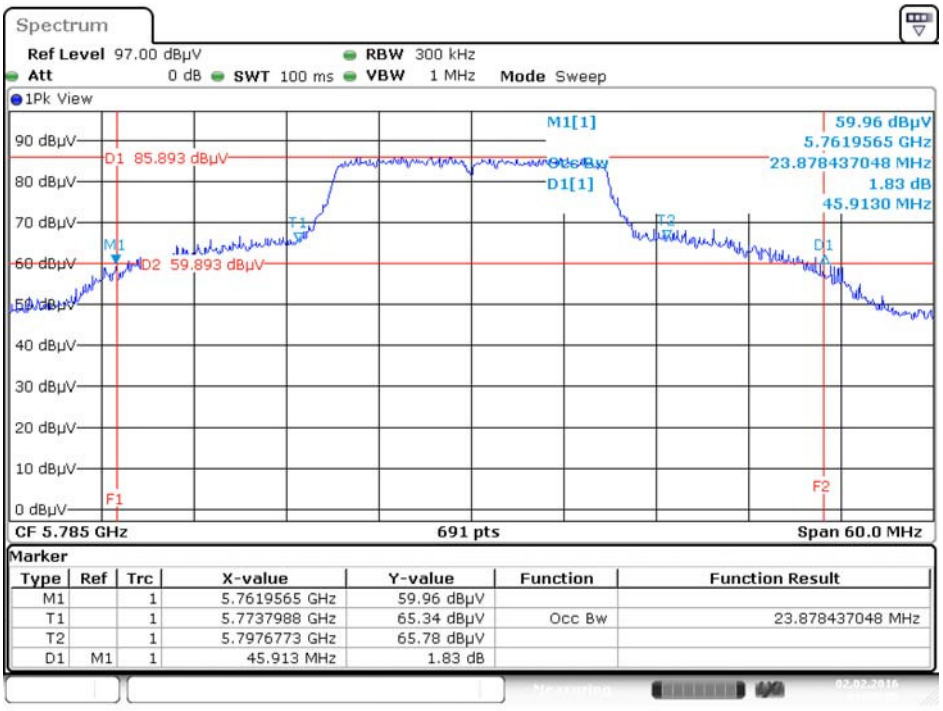
Date: 2.FEB.2016 09:48:51

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5745 MHz



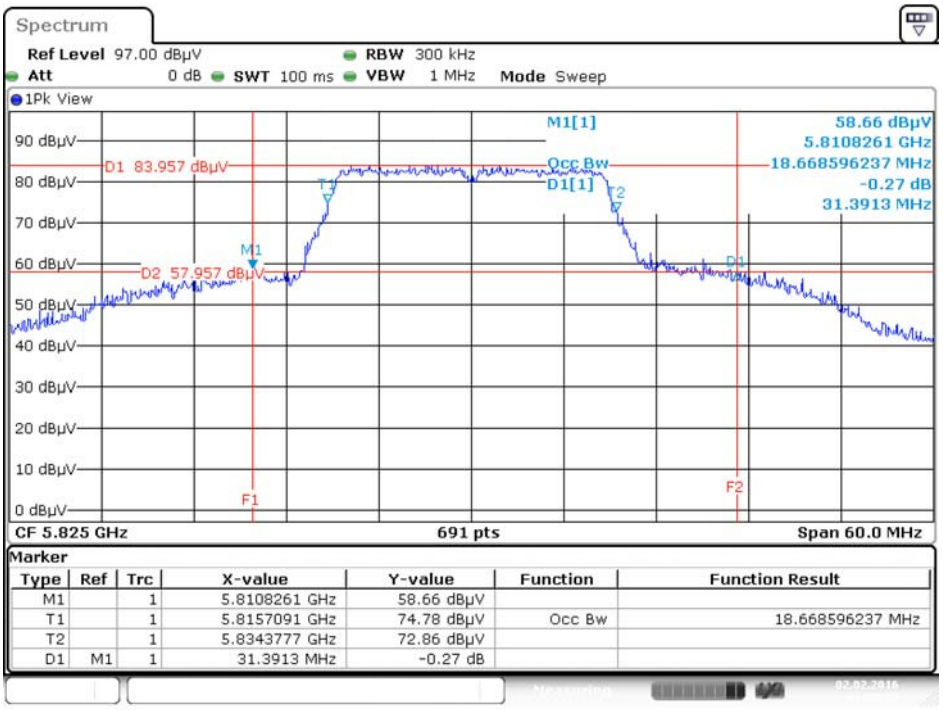
Date: 2.FEB.2016 09:49:43

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5785 MHz



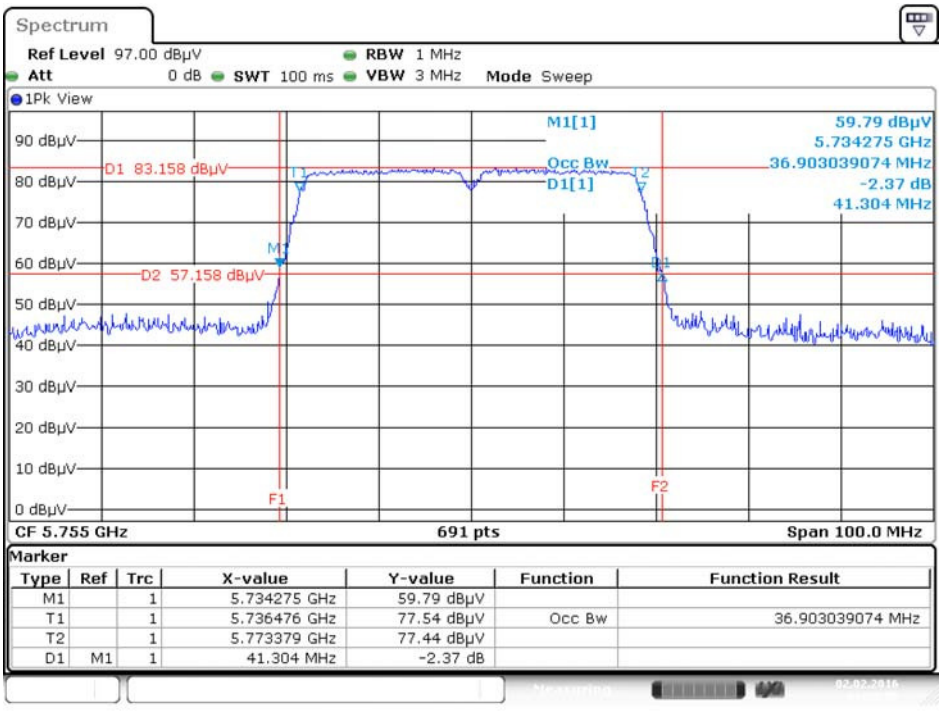
Date: 2.FEB.2016 09:50:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5825 MHz



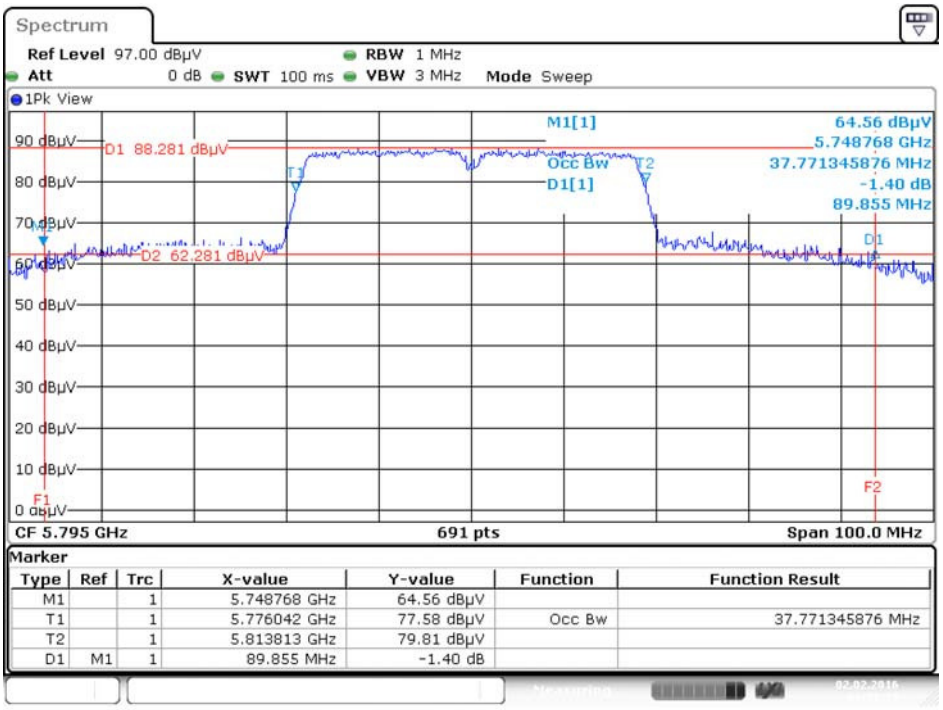
Date: 2.FEB.2016 09:50:23

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5755 MHz



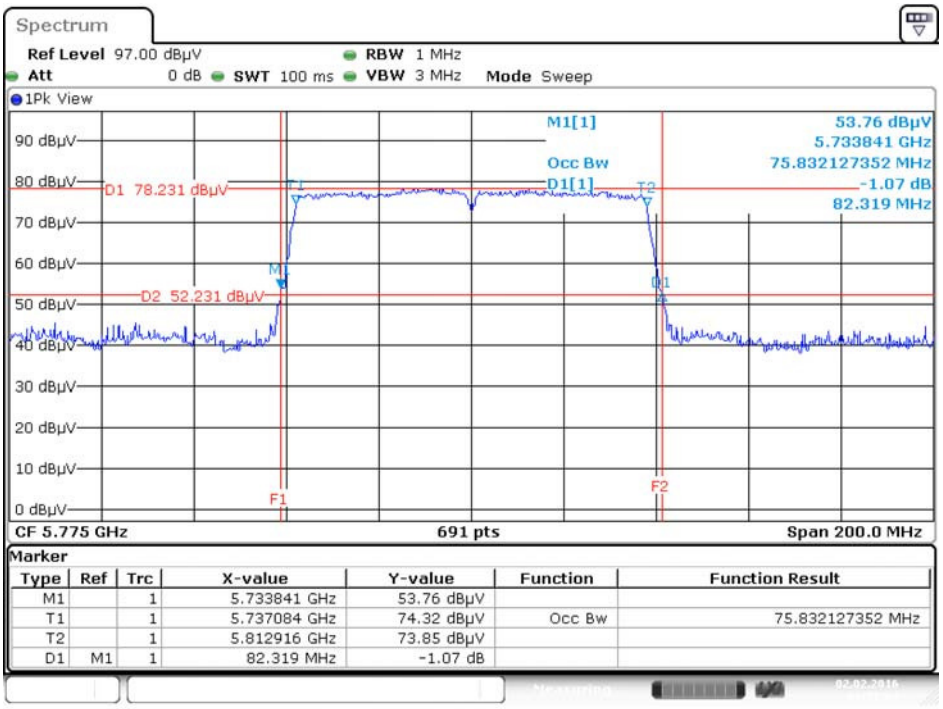
Date: 2.FEB.2016 09:50:57

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5795 MHz



Date: 2.FEB.2016 09:51:14

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5775 MHz



4.2. 6dB Spectrum Bandwidth Measurement

4.2.1. Limit

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

4.2.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

6dB Spectrum Bandwidth	
Spectrum Parameters	**Setting**
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.2.3. Test Procedures

For conducted 6dB Bandwidth Measurement:

1. The transmitter was conducted to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB789033 D02 v01r01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (C) Emission Bandwidth.
3. Multiple antenna system was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measurement perform conducted of each port.
5. Measured the spectrum width with power higher than 6dB below carrier.

4.2.4. Test Setup Layout

For conducted 6dB Bandwidth Measurement:

This test setup layout is the same as that shown in section 4.4.4.

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of 6dB Spectrum Bandwidth

Temperature	21°C	Humidity	60%
Test Engineer	Lucas Huang	Test Mode	Mode 1

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
		Chain 1		
802.11a	5745 MHz	16.29	500	Complies
	5785 MHz	16.52	500	Complies
	5825 MHz	16.35	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.57	500	Complies
	5785 MHz	17.57	500	Complies
	5825 MHz	17.57	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	36.29	500	Complies
	5795 MHz	36.29	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	75.07	500	Complies

Temperature	21℃	Humidity	60%
Test Engineer	Peter Wu	Test Mode	Mode 2

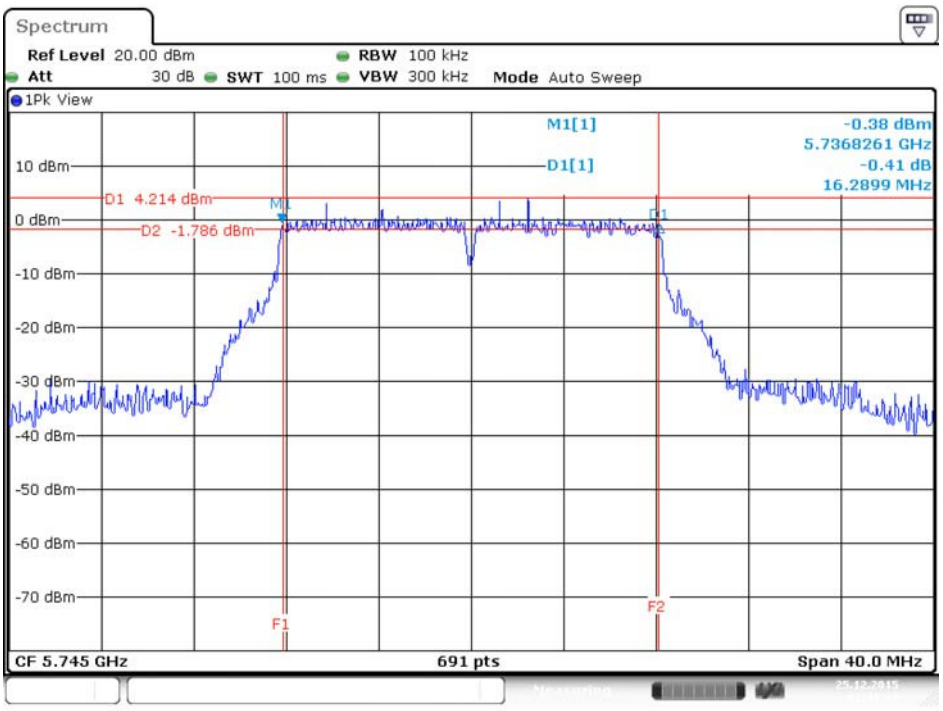
Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
		Chain 1		
802.11a	5745 MHz	16.35	500	Complies
	5785 MHz	16.46	500	Complies
	5825 MHz	16.29	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.57	500	Complies
	5785 MHz	17.57	500	Complies
	5825 MHz	17.51	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	36.29	500	Complies
	5795 MHz	36.29	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	75.07	500	Complies

Note: All the test values were listed in the report.

For plots, only the channel with worse result was shown.

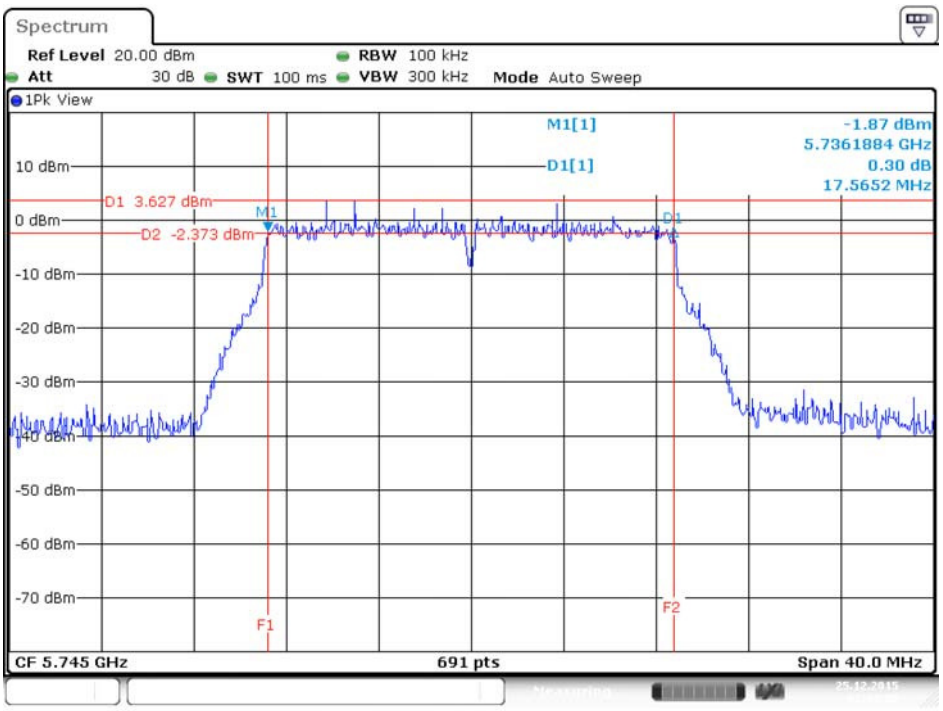
Test Mode: Mode 1

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5745 MHz



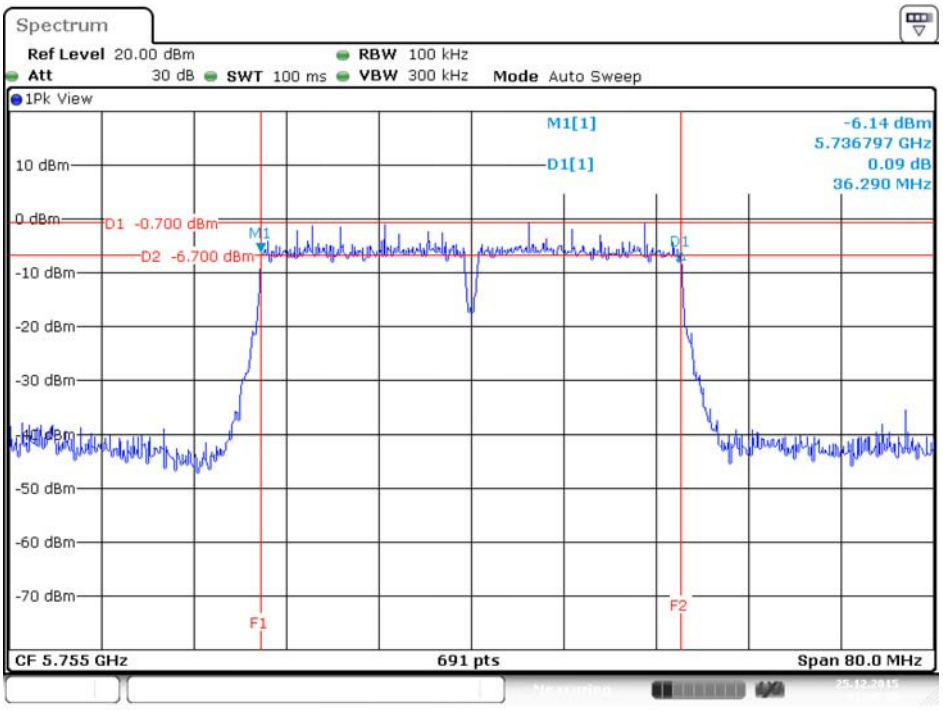
Date: 25.DEC.2015 02:41:15

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5745 MHz



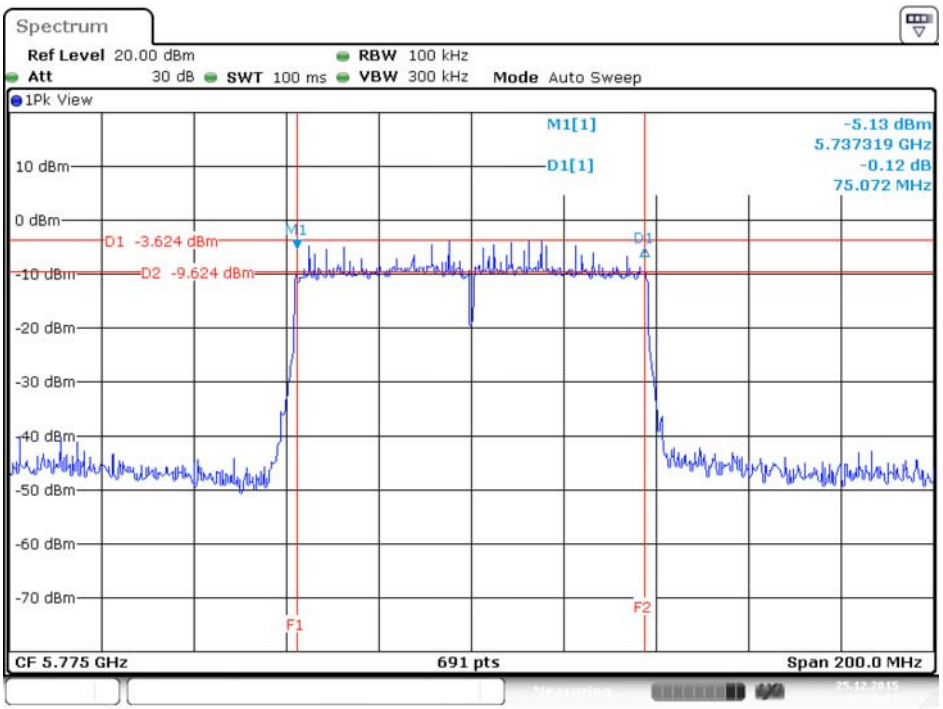
Date: 25.DEC.2015 02:43:31

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5755MHz



Date: 25.DEC.2015 02:45:09

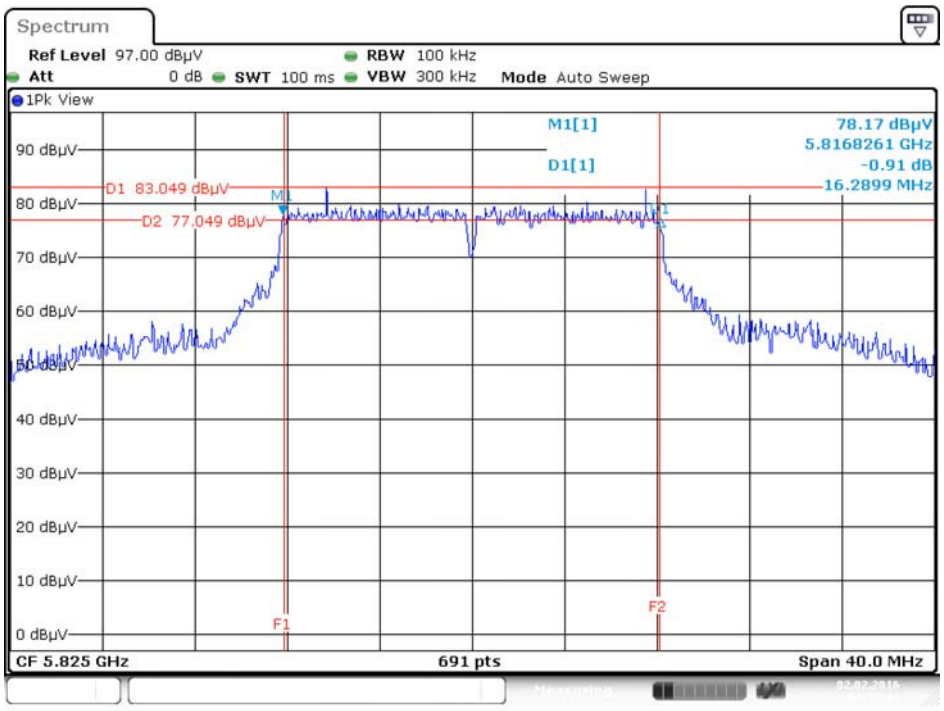
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5775 MHz



Date: 25.DEC.2015 02:46:33

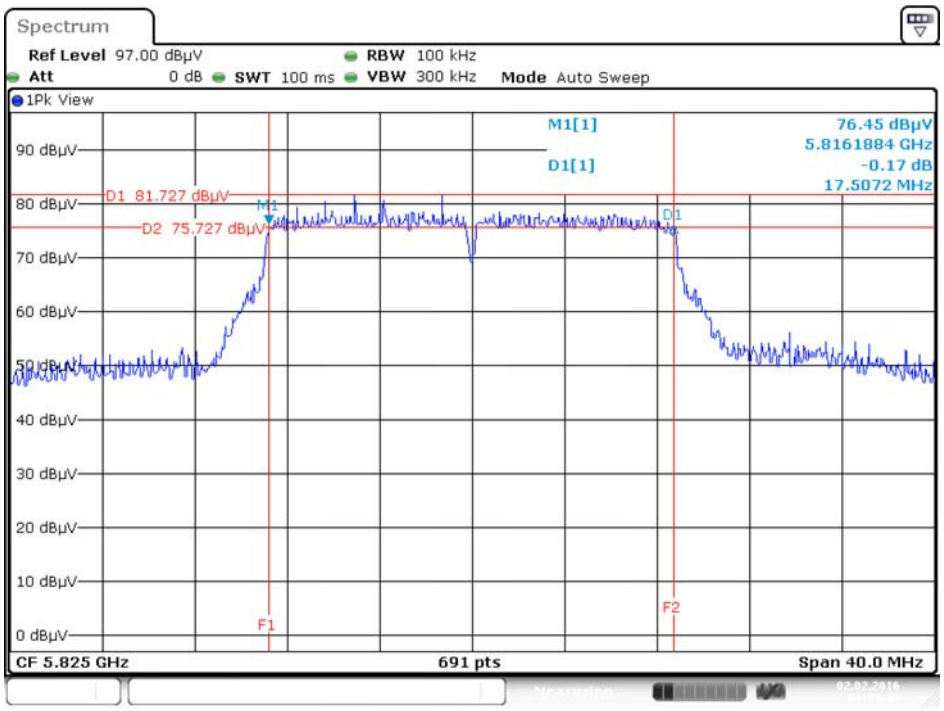
Test Mode: Mode 2

6 Db Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5825 MHz



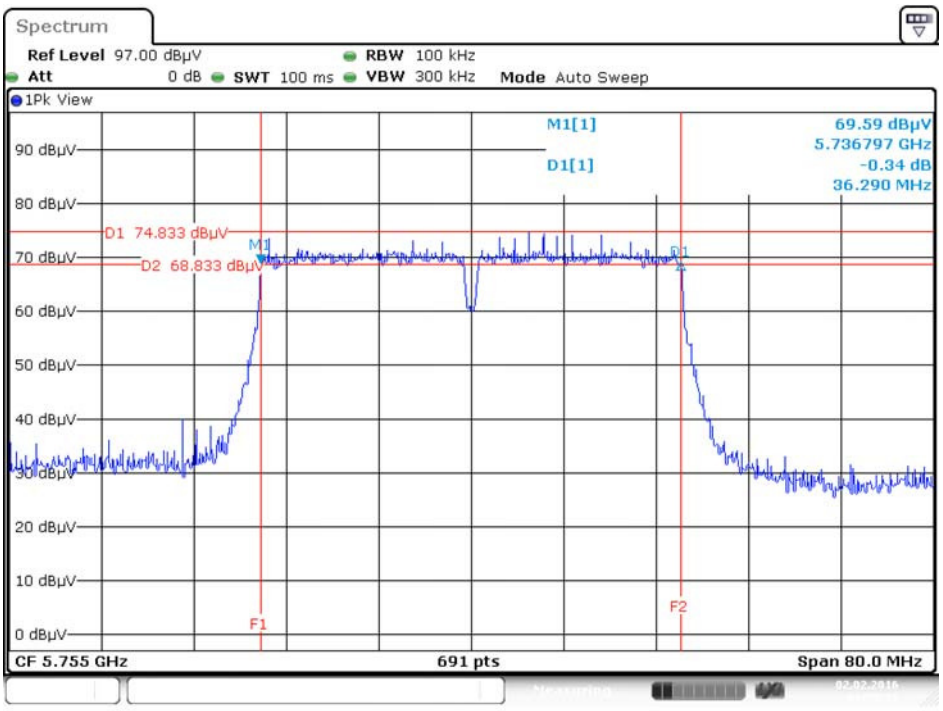
Date: 2.FEB.2016 09:53:42

6 Db Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5825 MHz



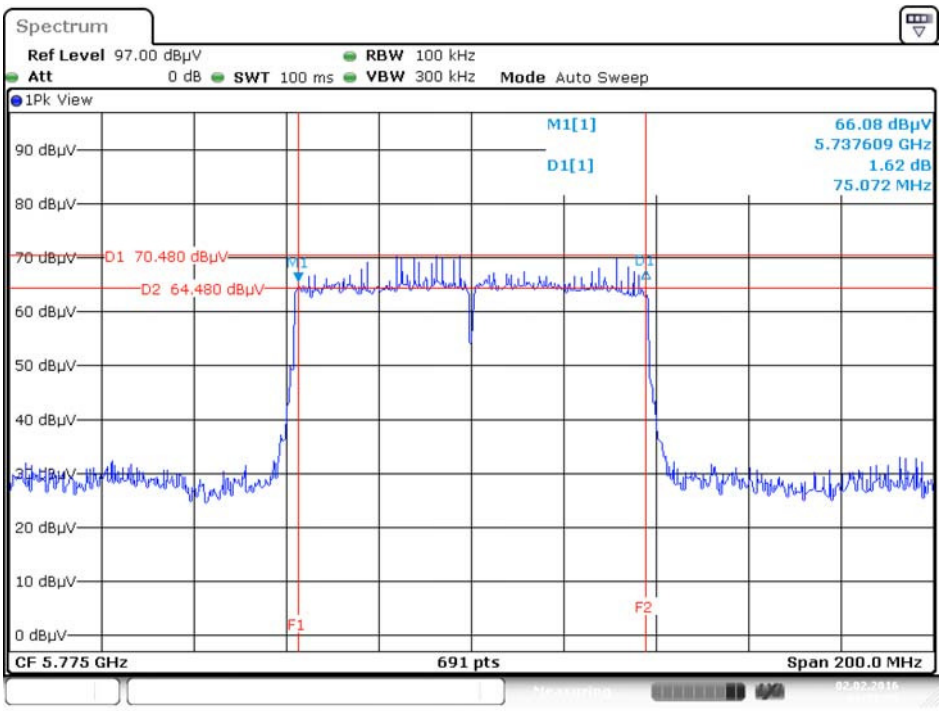
Date: 2.FEB.2016 09:54:44

6 Db Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5755MHz



Date: 2.FEB.2016 09:55:11

6 Db Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5775 MHz



Date: 2.FEB.2016 09:52:26

4.3. Maximum Conducted Output Power Measurement

4.3.1. Limit

Frequency Band		Limit
☒	5.725~5.85 GHz	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in Db that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

4.3.2. Measuring Instruments and Setting

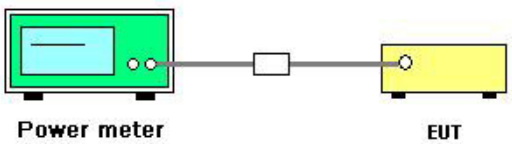
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v01r01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Maximum Conducted Output Power

Temperature	21°C	Humidity	60%
Test Engineer	Lucas Huang	Test Date	Dec. 25, 2015
Test Mode	Mode 1		

Mode	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1		
802.11a	5745 MHz	17.25	30.00	Complies
	5785 MHz	20.38	30.00	Complies
	5825 MHz	18.09	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	16.83	30.00	Complies
	5785 MHz	20.38	30.00	Complies
	5825 MHz	18.08	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	15.44	30.00	Complies
	5795 MHz	18.39	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	15.15	30.00	Complies

Temperature	21°C	Humidity	60%
Test Engineer	Peter Wu	Test Date	Feb. 01, 2016 ~ Feb. 02, 2016
Test Mode	Mode 2		

Mode	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1		
802.11a	5745 MHz	18.12	29.79	Complies
	5785 MHz	20.33	29.79	Complies
	5825 MHz	19.56	29.79	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.58	29.79	Complies
	5785 MHz	20.21	29.79	Complies
	5825 MHz	19.21	29.79	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	15.12	29.79	Complies
	5795 MHz	19.24	29.79	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	15.64	29.79	Complies

Note: Ant gain= 6.21dBi >6dBi, so limit = 30 - (6.21- 6) = 29.79dBm

4.4. Power Spectral Density Measurement

4.4.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 4.3.1.

Frequency Band		Limit
☒	5.725~5.85 GHz	30 dBm/500kHz

4.4.2. Measuring Instruments and Setting

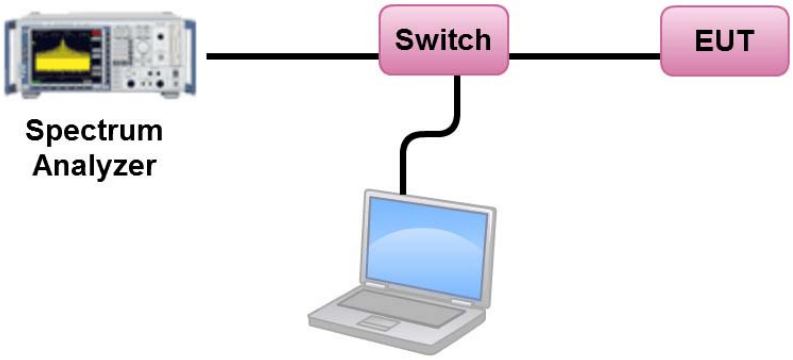
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	1000 kHz
VBW	3000 kHz
Detector	RMS
Trace	AVERAGE
Sweep Time	Auto
Trace Average	100 times
Note: If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.	

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 v01r01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements (a) Measure and sum the spectra across the outputs.
4. When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3 and so on up to the Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other frequency bins is computed in the same way.
5. For 5.725~5.85 GHz, the measured result of PSD level must add 10log(500kHz/RBW) and the final result should ≤ 30 dBm.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Power Spectral Density

Temperature	21°C	Humidity	60%
Test Engineer	Lucas Huang	Test Date	Dec. 25, 2015
Test Mode	Mode 1		

Configuration IEEE 802.11a / Chain 1

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	4.21	-3.01	1.20	30.00	Complies
157	5785 MHz	7.25	-3.01	4.24	30.00	Complies
165	5825 MHz	5.35	-3.01	2.34	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	4.09	-3.01	1.08	30.00	Complies
157	5785 MHz	7.53	-3.01	4.52	30.00	Complies
165	5825 MHz	4.93	-3.01	1.92	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	-0.58	-3.01	-3.59	30.00	Complies
159	5795 MHz	2.70	-3.01	-0.31	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	-3.68	-3.01	-6.69	30.00	Complies

Temperature	21°C	Humidity	60%
Test Engineer	Peter Wu	Test Date	Feb. 01, 2016 ~ Feb. 02, 2016
Test Mode	Mode 2		

Configuration IEEE 802.11a / Chain 1

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	5.37	-3.01	2.36	29.79	Complies
157	5785 MHz	7.32	-3.01	4.31	29.79	Complies
165	5825 MHz	6.40	-3.01	3.39	29.79	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	4.39	-3.01	1.38	29.79	Complies
157	5785 MHz	7.25	-3.01	4.24	29.79	Complies
165	5825 MHz	6.03	-3.01	3.02	29.79	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	-0.75	-3.01	-3.76	29.79	Complies
159	5795 MHz	3.51	-3.01	0.50	29.79	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	-3.30	-3.01	-6.31	29.79	Complies

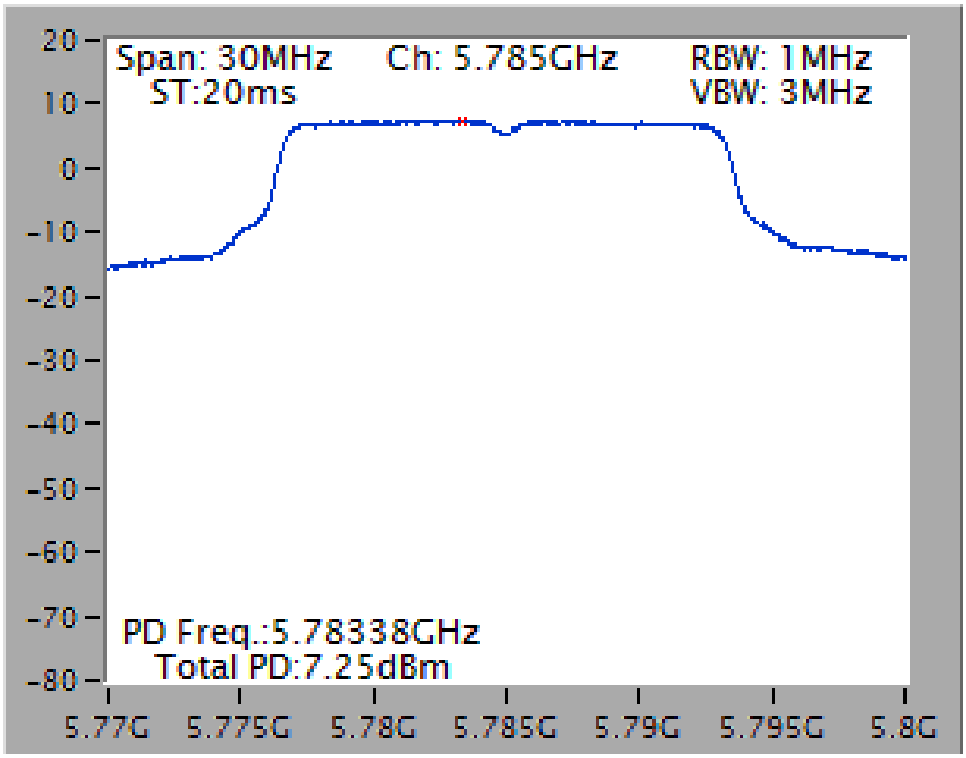
Note: Ant gain= 6.21dBi >6dBi, so limit = 30 - (6.21- 6) = 29.79 dBm/500kHz

Note: All the test values were listed in the report.

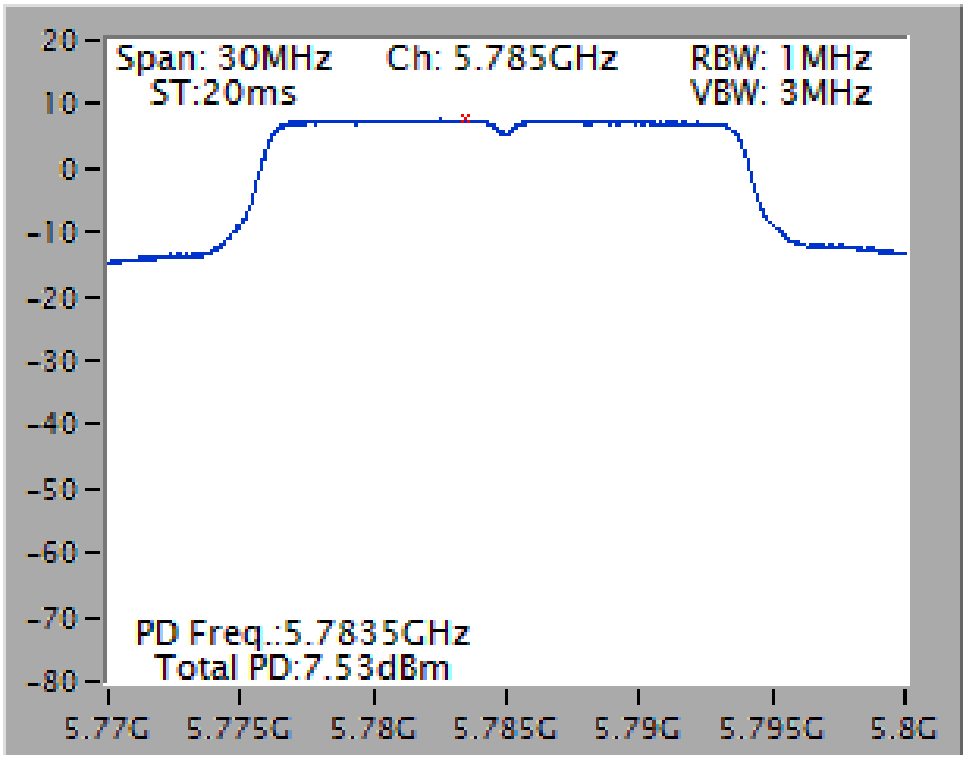
For plots, only the channel with worse result was shown.

Test Mode: Mode 1

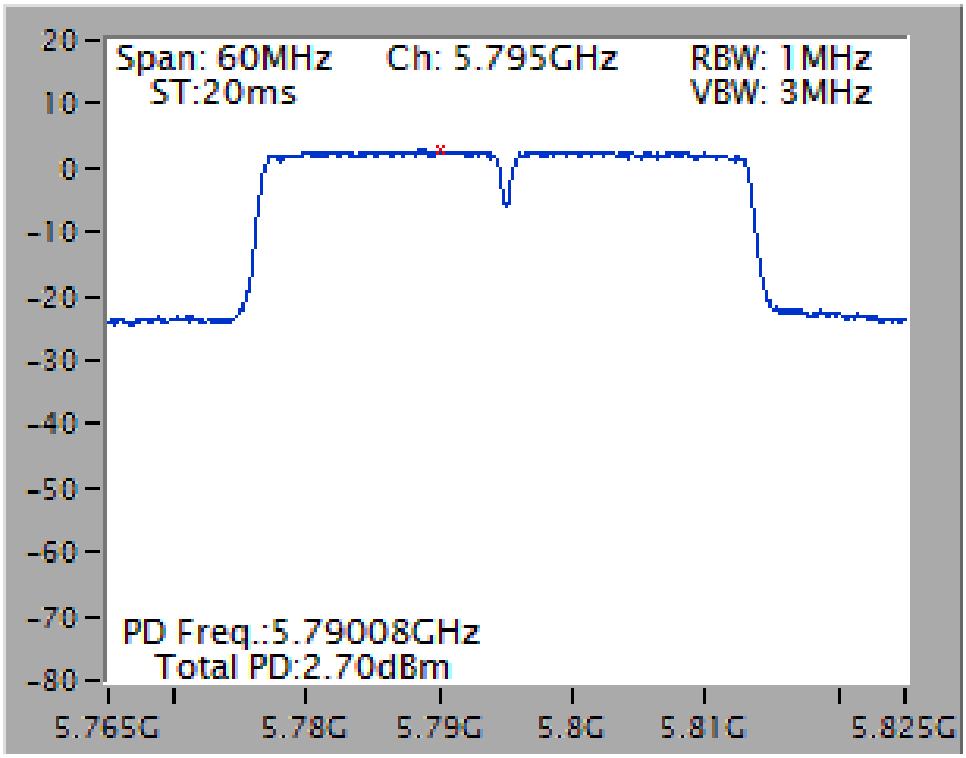
Power Density Plot on Configuration IEEE 802.11a / Chain 1 / 5785 MHz



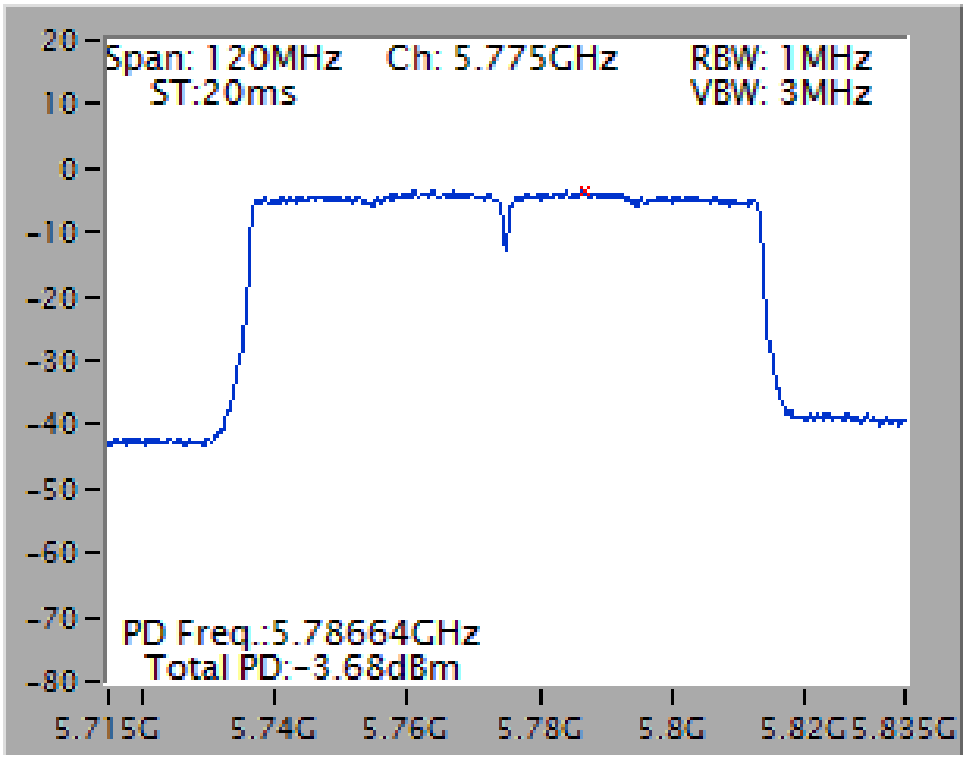
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5785 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5795 MHz

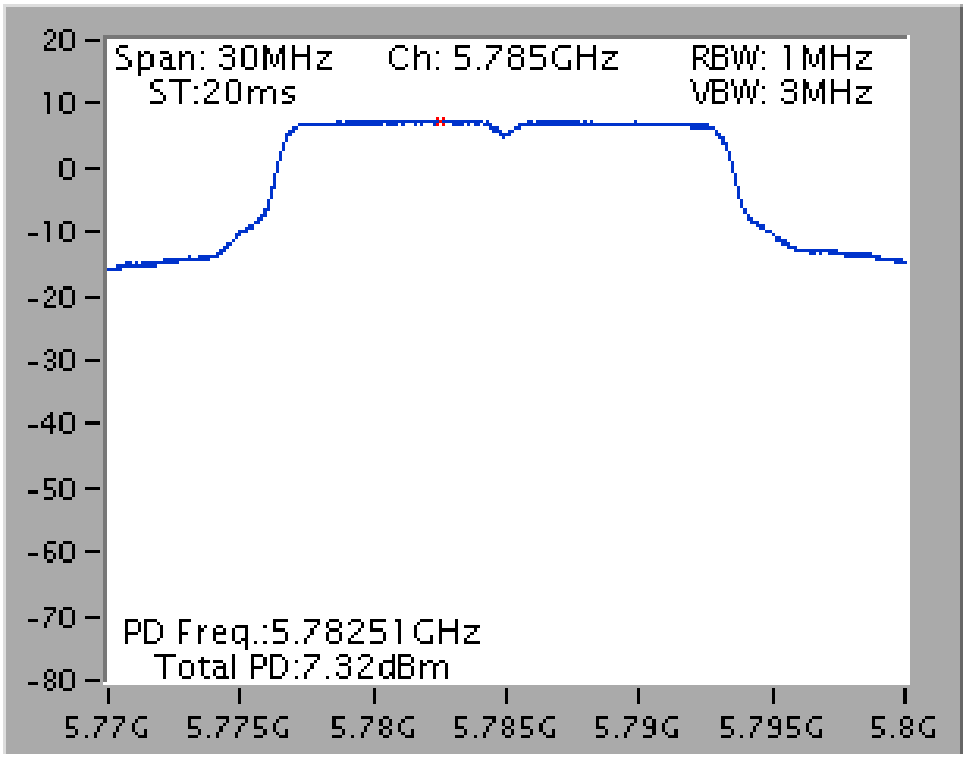


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5775 MHz

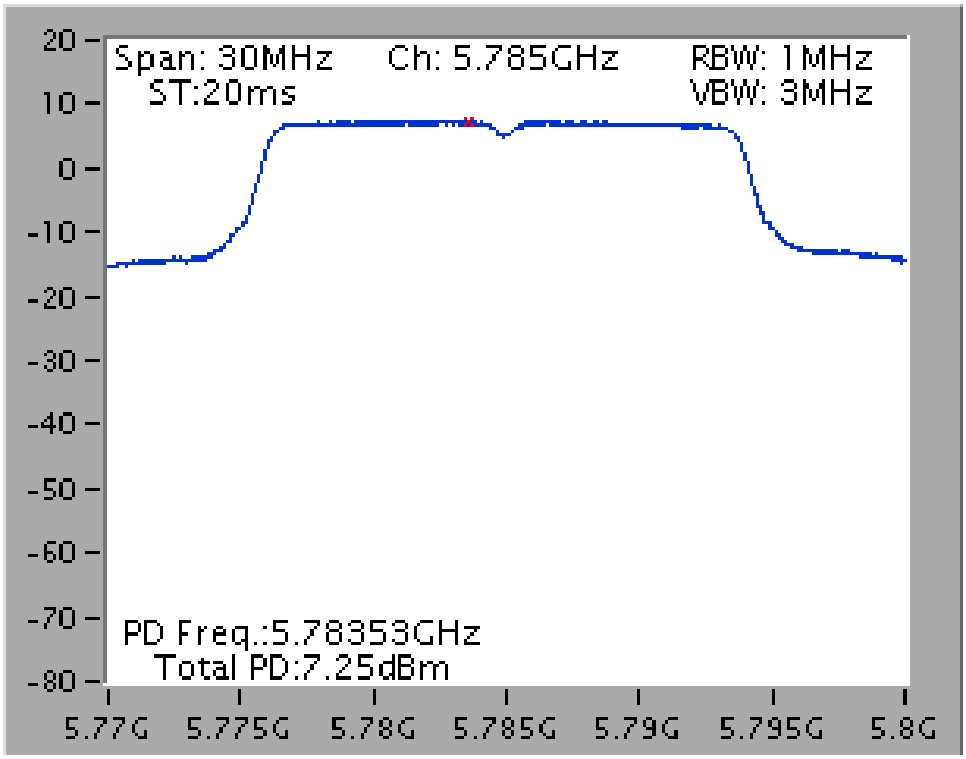


Test Mode: Mode 2

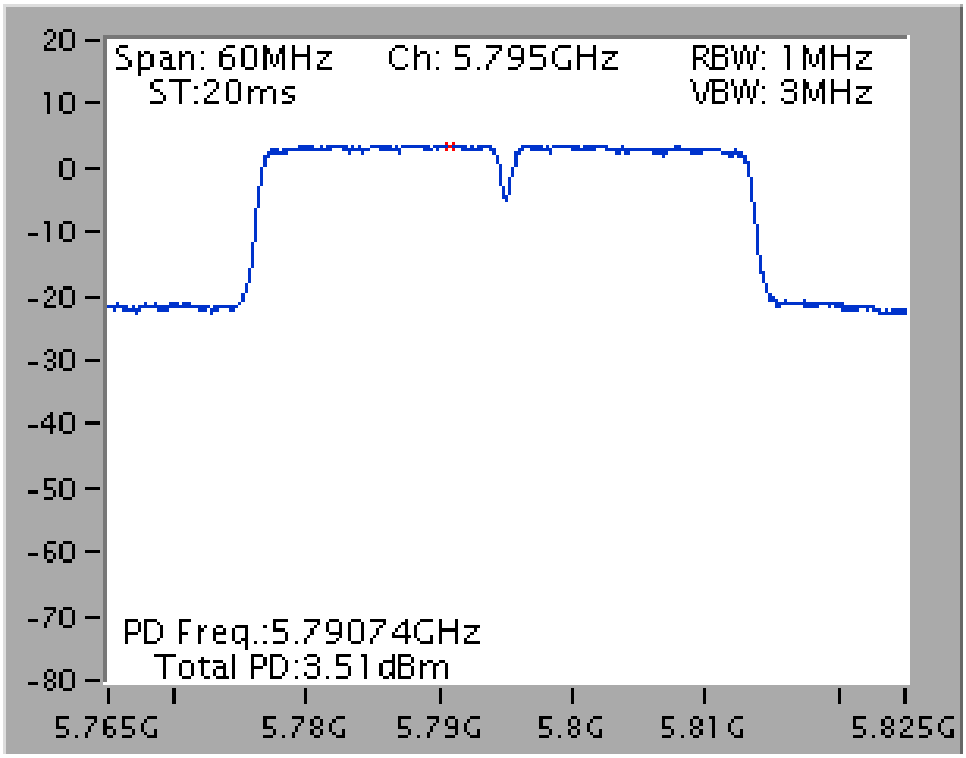
Power Density Plot on Configuration IEEE 802.11a / Chain 1 / 5785 MHz



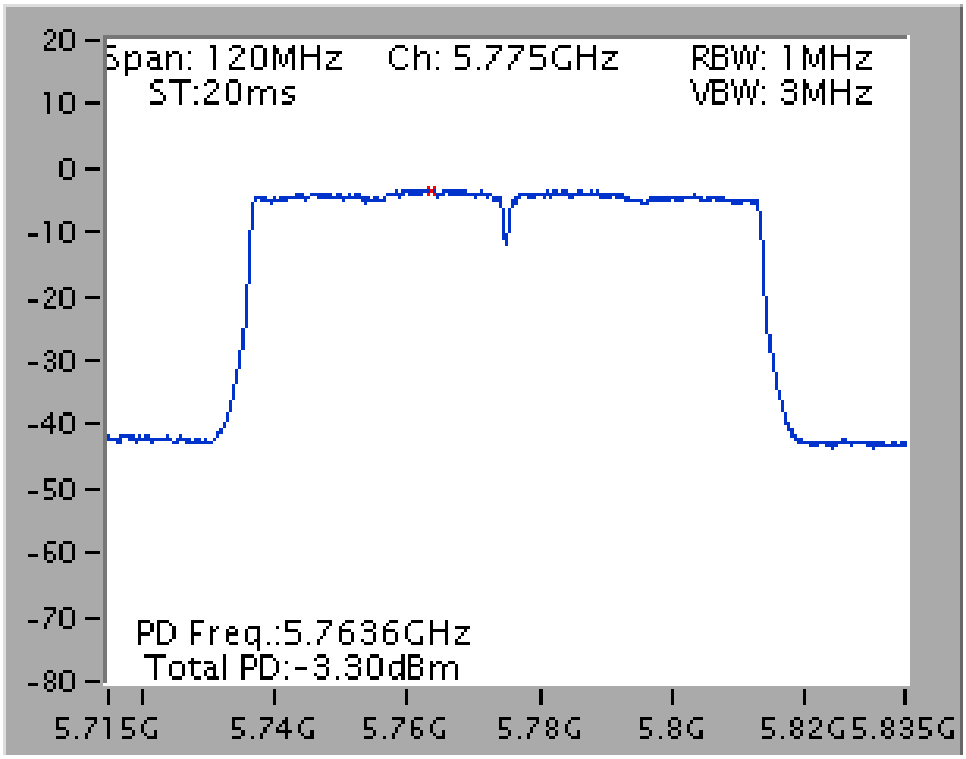
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5785 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5795 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5775 MHz



4.5. Radiated Emissions Measurement

4.5.1. Limit

For transmitters operating in the 5.725-5.85 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.5.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	1MHz / 3MHz for peak

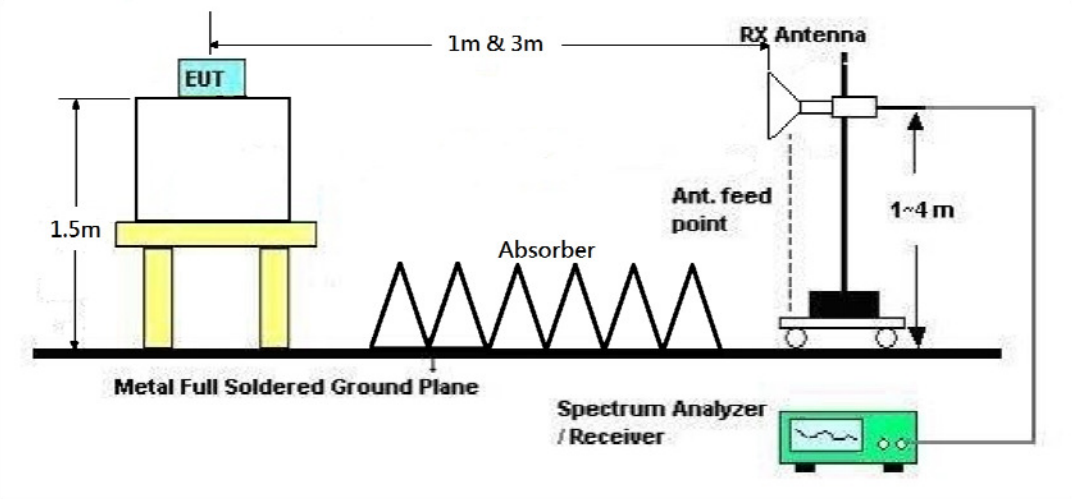
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.5.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 1/T VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.5.4. Test Setup Layout

For Radiated Emissions: Above 1GHz



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

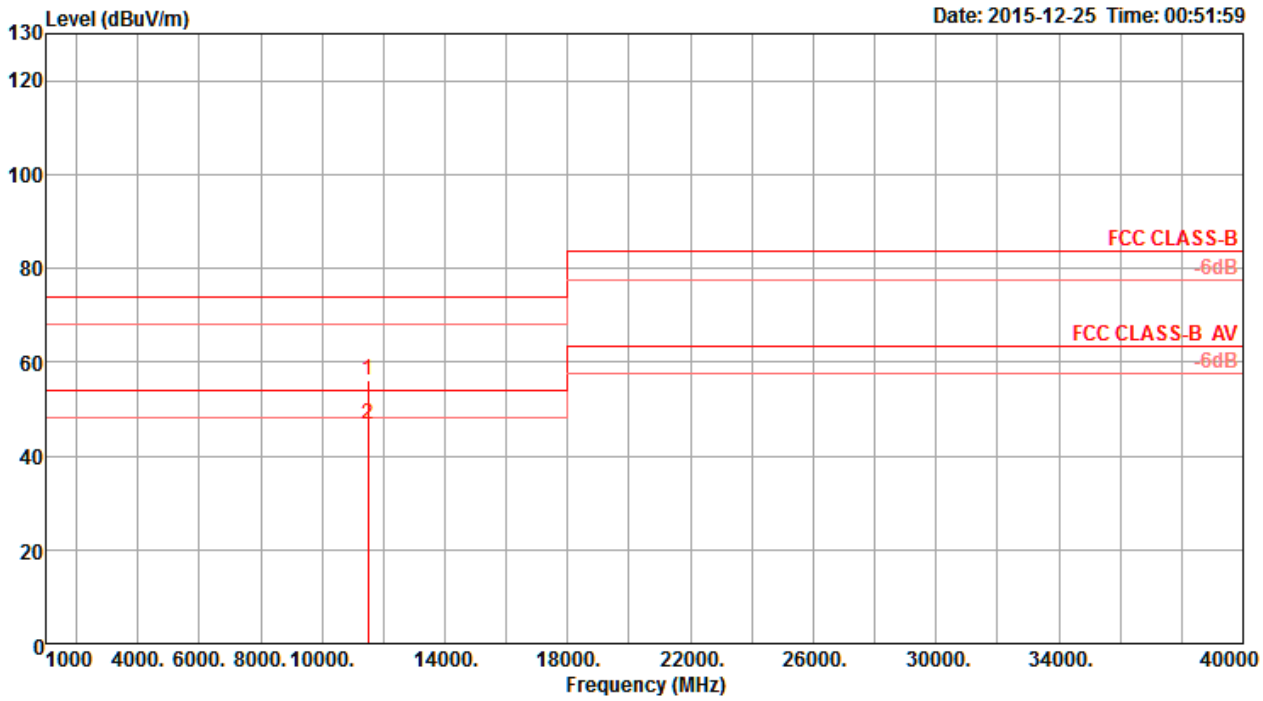
The EUT was programmed to be in continuously transmitting mode.

4.5.7. Results for Radiated Emissions (1GHz~40GHz)

Test Mode: Mode 1

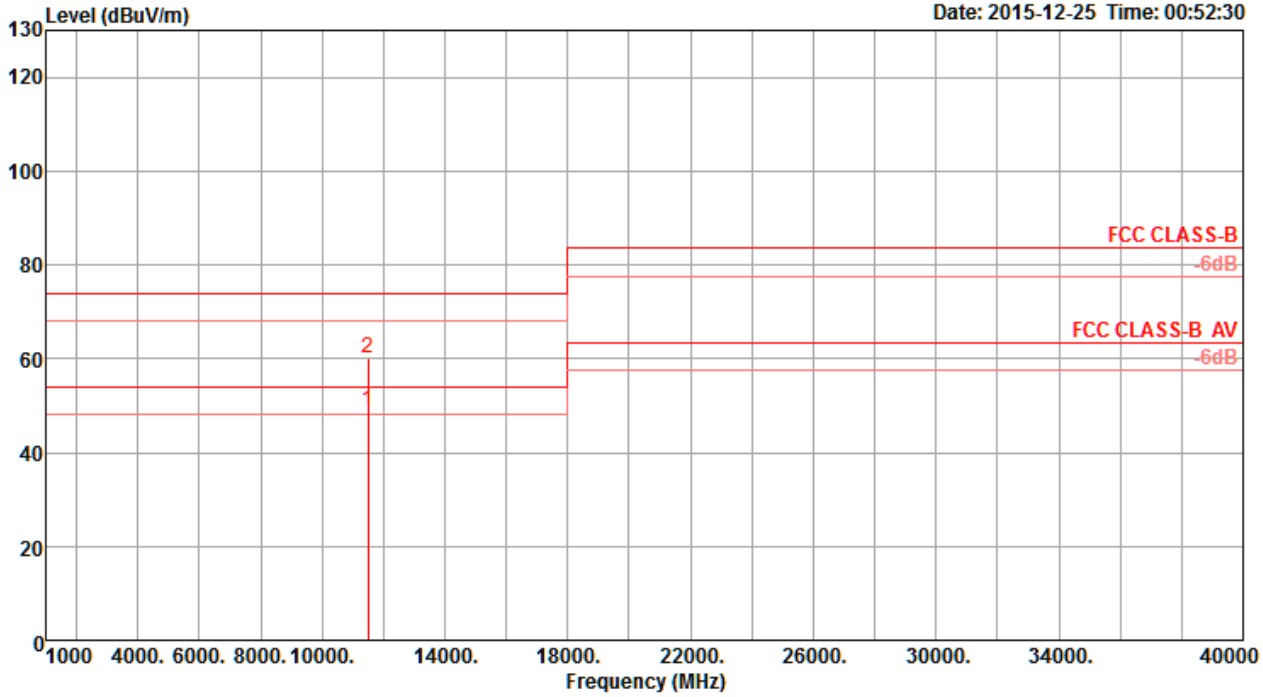
Temperature	23°C	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11a CH 149 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11489.50	56.23	74.00	-17.77	42.68	9.67	38.50	34.62	42	104	Peak	HORIZONTAL
2	11489.61	46.85	54.00	-7.15	33.30	9.67	38.50	34.62	42	104	Average	HORIZONTAL

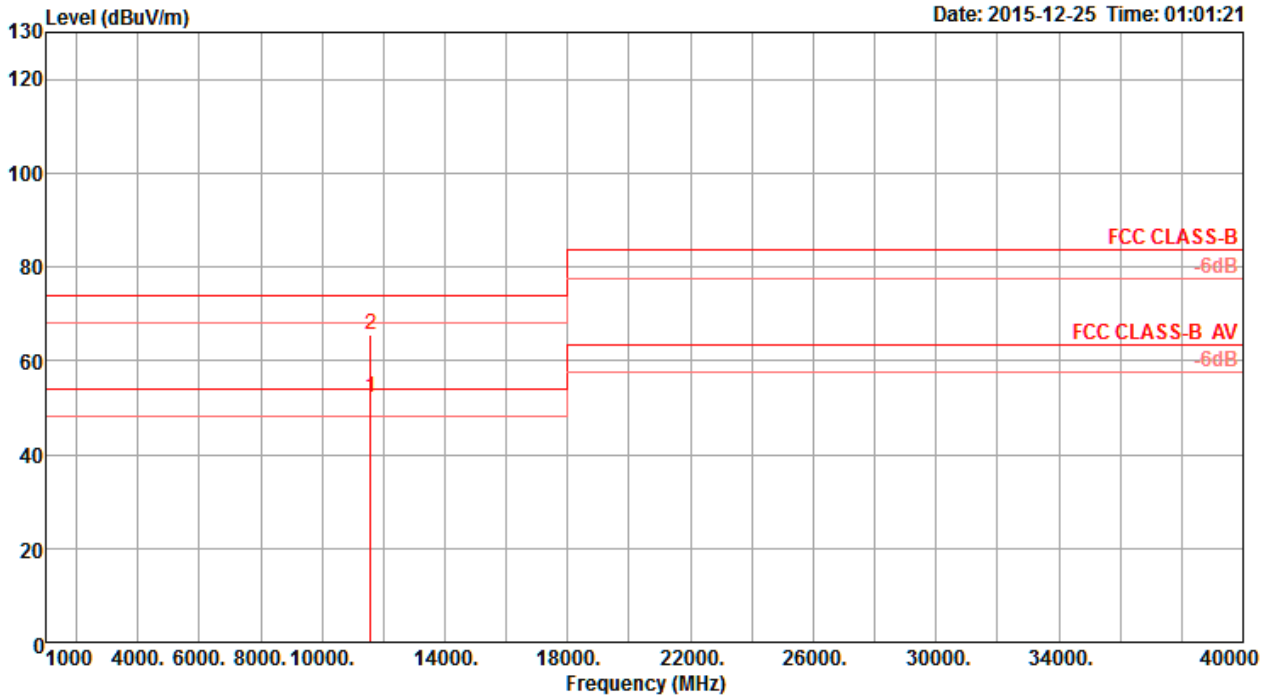
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11489.04	48.91	54.00	-5.09	35.36	9.67	38.50	34.62	351	143	Average	VERTICAL
2	11490.26	59.96	74.00	-14.04	46.41	9.67	38.50	34.62	351	143	Peak	VERTICAL

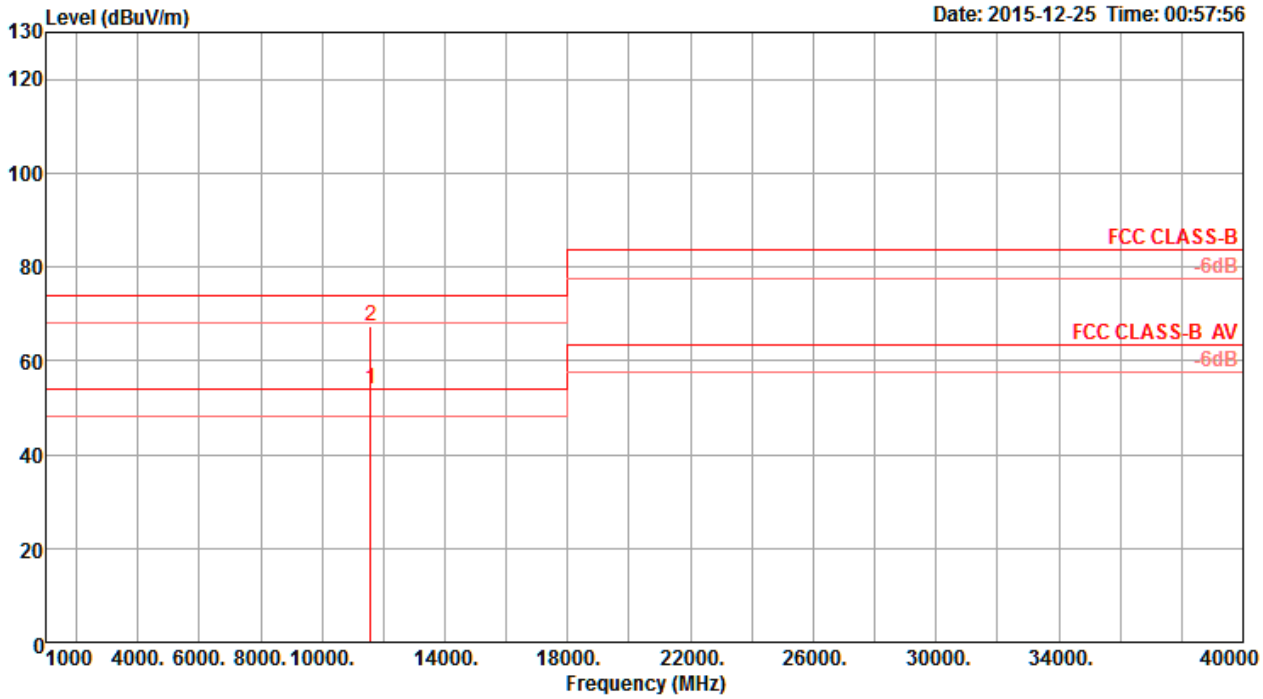
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11a CH 157 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11569.12	52.20	54.00	-1.80	38.61	9.71	38.53	34.65	172	227	Average	HORIZONTAL
2	11569.33	65.63	74.00	-8.37	52.04	9.71	38.53	34.65	172	227	Peak	HORIZONTAL

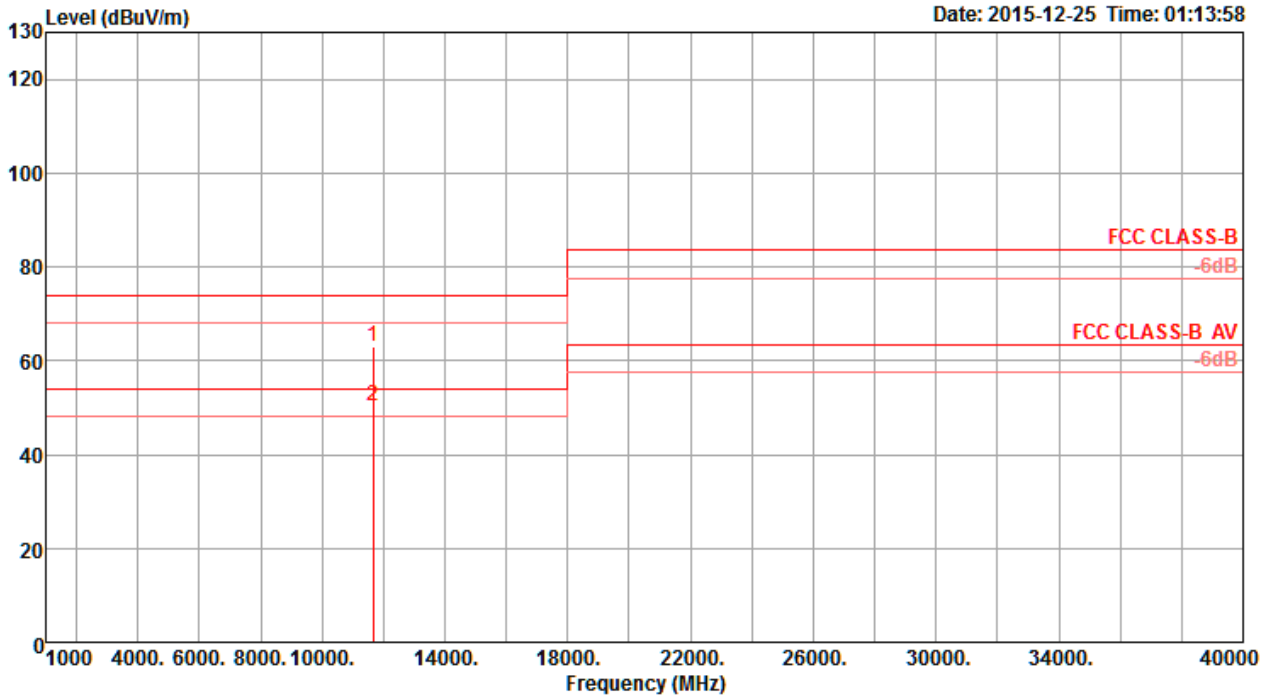
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11569.34	53.98	54.00	-0.02	40.39	9.71	38.53	34.65	15	201	Average	VERTICAL
2	11570.35	67.45	74.00	-6.55	53.86	9.71	38.53	34.65	15	201	Peak	VERTICAL

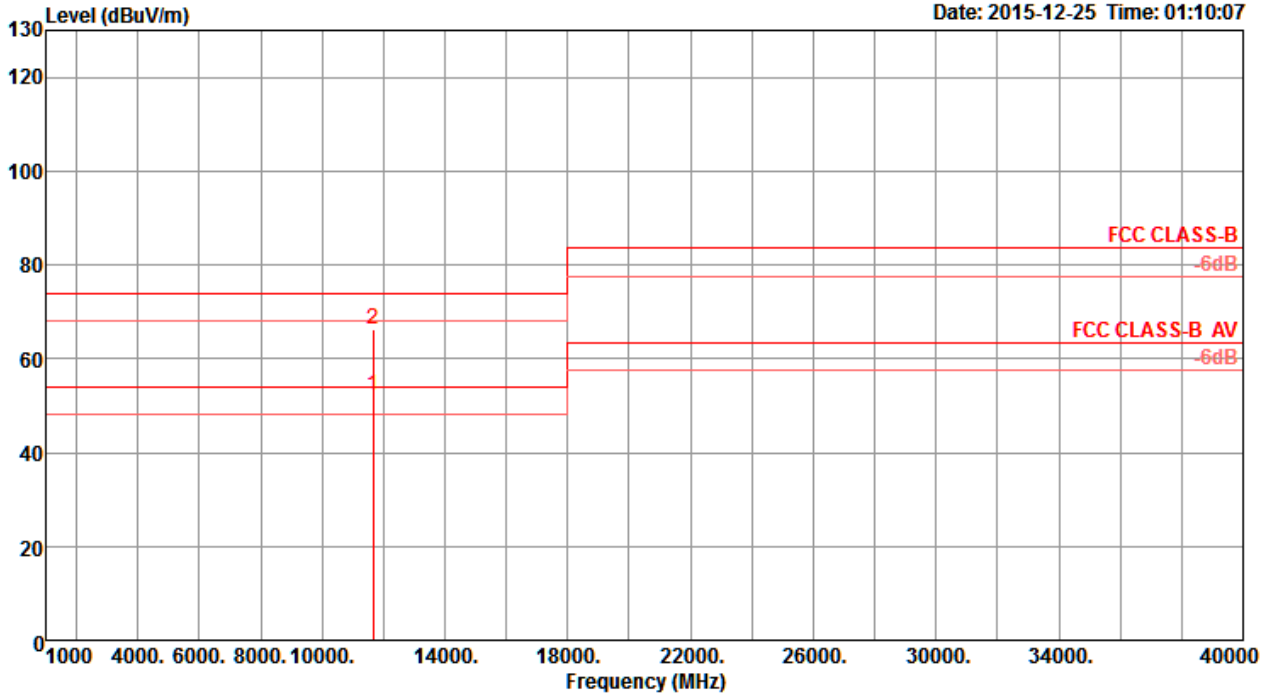
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11a CH 165 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11649.23	62.85	74.00	-11.15	49.23	9.75	38.55	34.68	143	144	Peak	HORIZONTAL
2	11650.65	50.36	54.00	-3.64	36.74	9.75	38.55	34.68	143	144	Average	HORIZONTAL

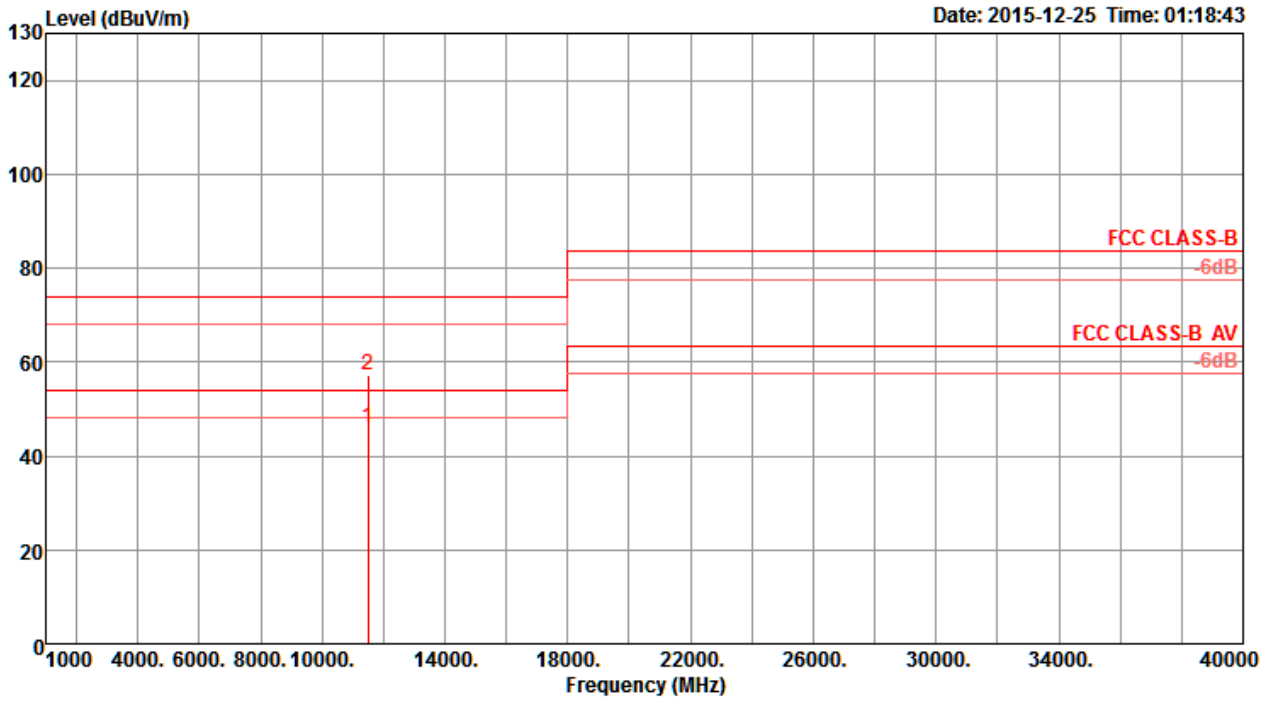
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11649.36	52.30	54.00	-1.70	38.68	9.75	38.55	34.68	155	154	Average	VERTICAL
2	11650.33	66.20	74.00	-7.80	52.58	9.75	38.55	34.68	155	154	Peak	VERTICAL

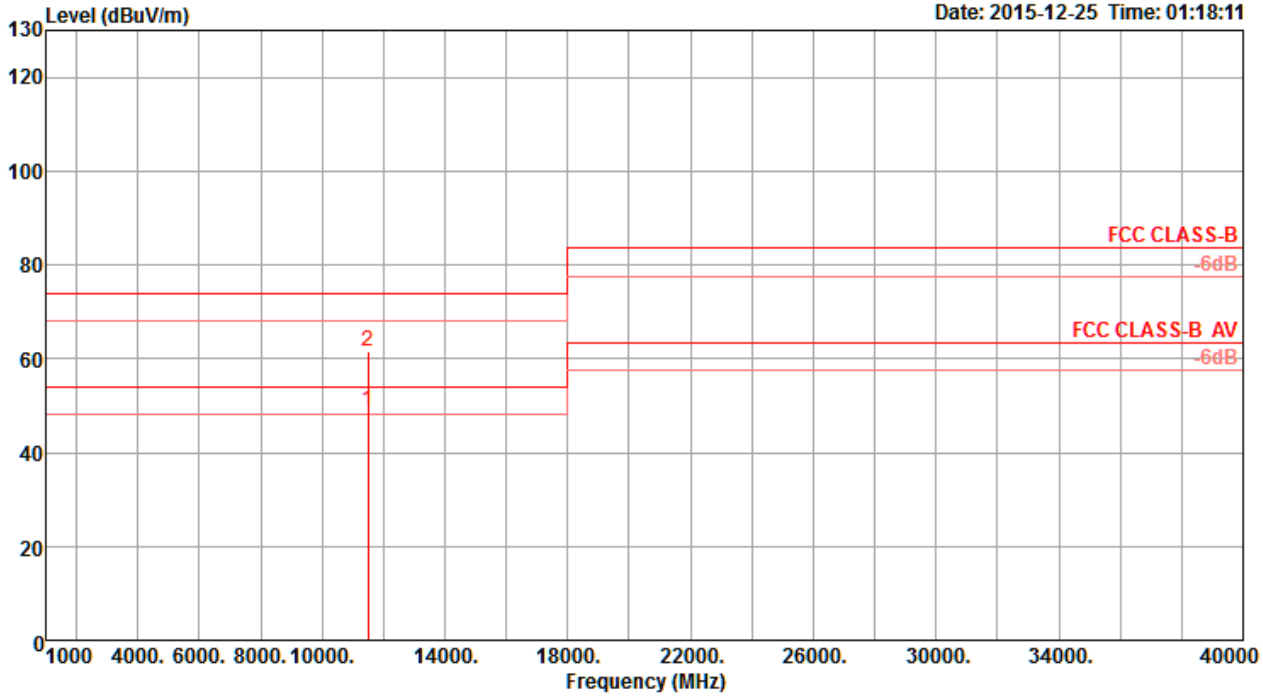
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11489.08	46.11	54.00	-7.89	32.56	9.67	38.50	34.62	35	150	Average	HORIZONTAL
2	11490.67	57.15	74.00	-16.85	43.60	9.67	38.50	34.62	35	150	Peak	HORIZONTAL

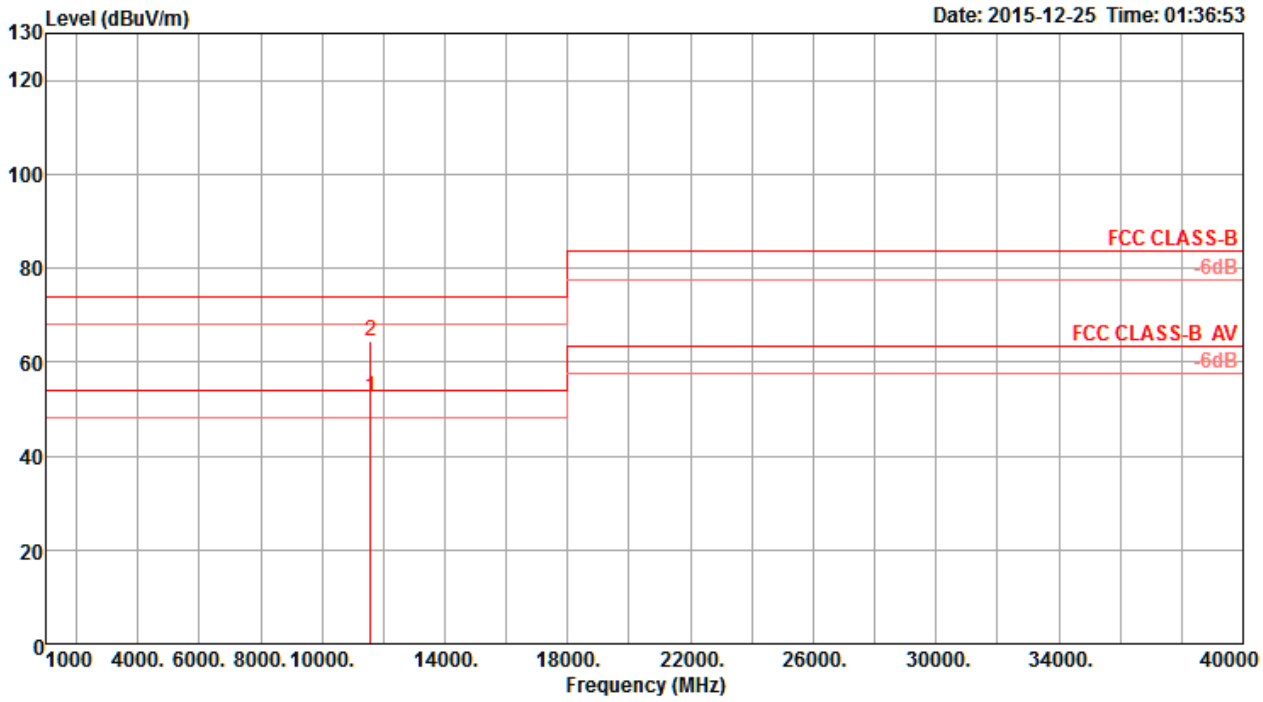
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11489.12	48.75	54.00	-5.25	35.20	9.67	38.50	34.62	154	157	Average	VERTICAL
2	11490.68	61.69	74.00	-12.31	48.14	9.67	38.50	34.62	154	157	Peak	VERTICAL

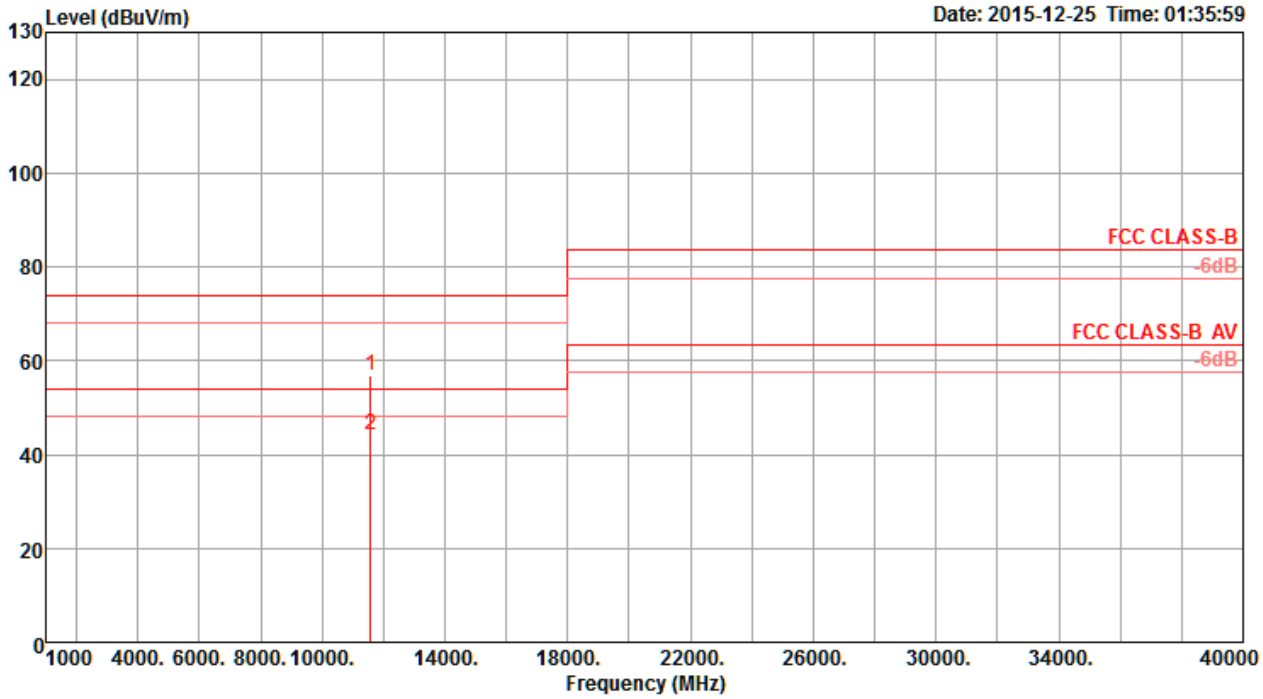
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11569.42	52.38	54.00	-1.62	38.79	9.71	38.53	34.65	131	177	Average	HORIZONTAL
2	11570.27	64.46	74.00	-9.54	50.87	9.71	38.53	34.65	131	177	Peak	HORIZONTAL

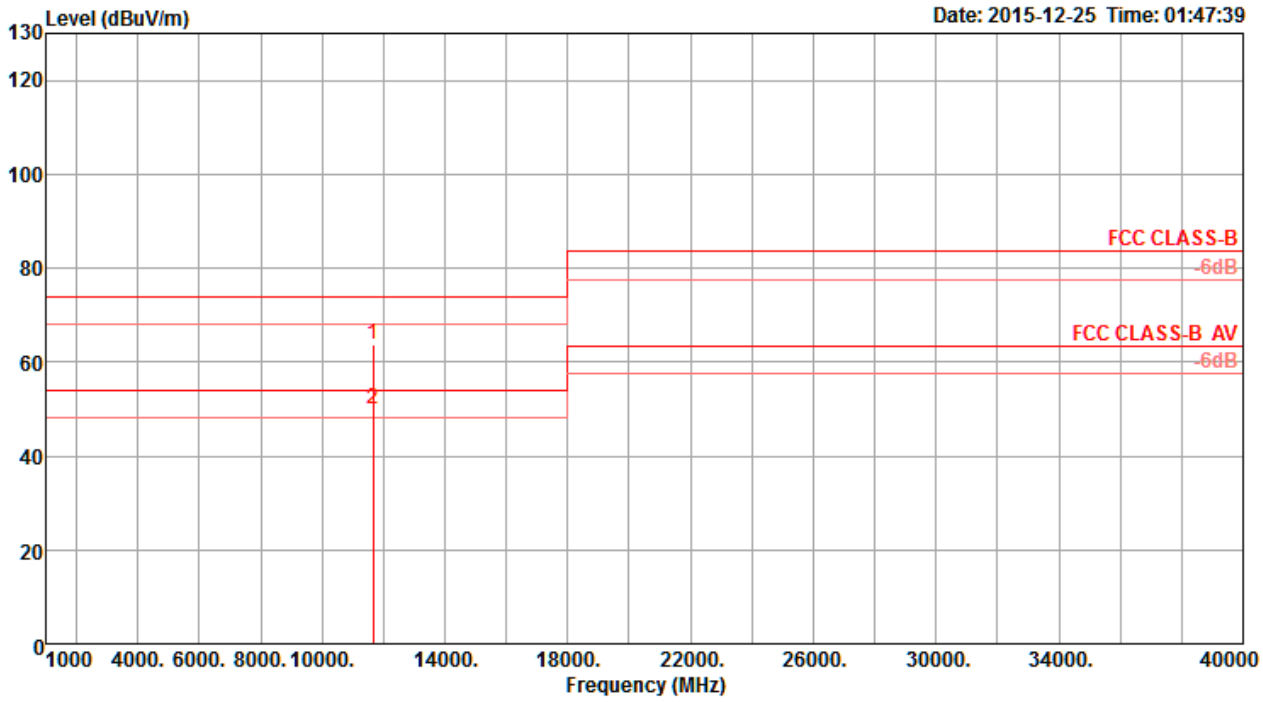
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11569.60	56.78	74.00	-17.22	43.19	9.71	38.53	34.65	170	156	Peak	VERTICAL
2	11570.41	44.10	54.00	-9.90	30.51	9.71	38.53	34.65	170	156	Average	VERTICAL

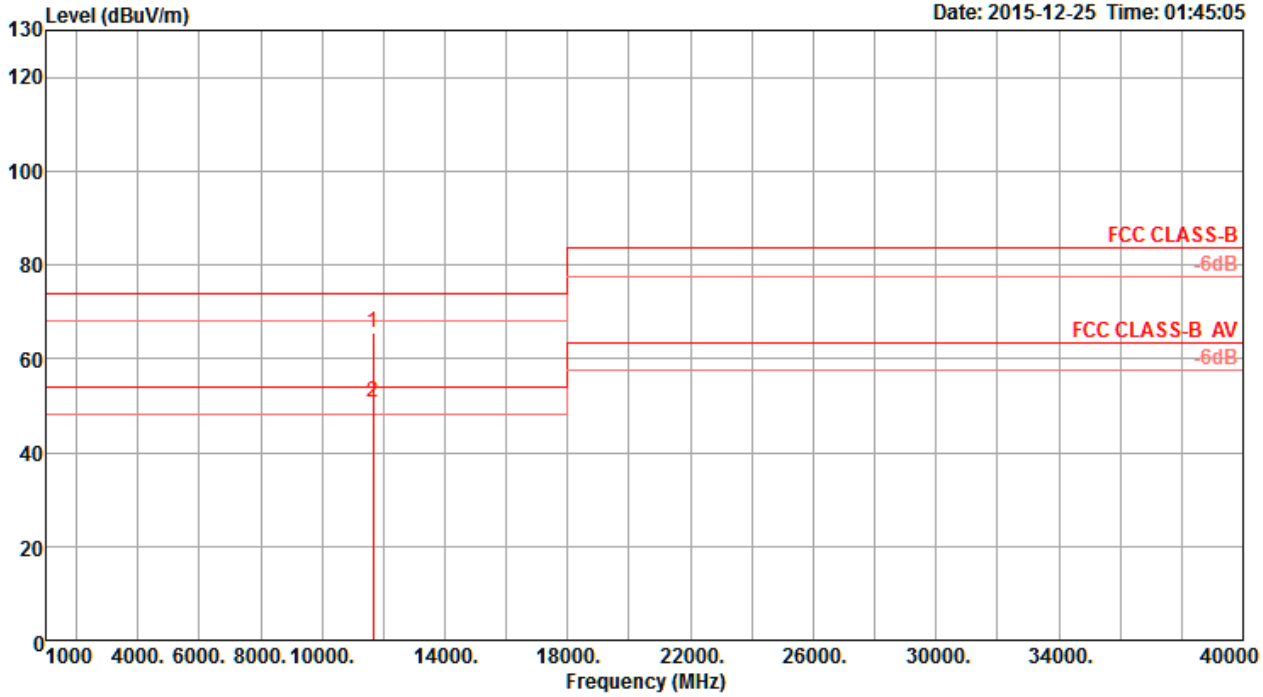
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11649.43	63.85	74.00	-10.15	50.23	9.75	38.55	34.68	174	150	Peak	HORIZONTAL
2	11650.29	50.03	54.00	-3.97	36.41	9.75	38.55	34.68	174	150	Average	HORIZONTAL

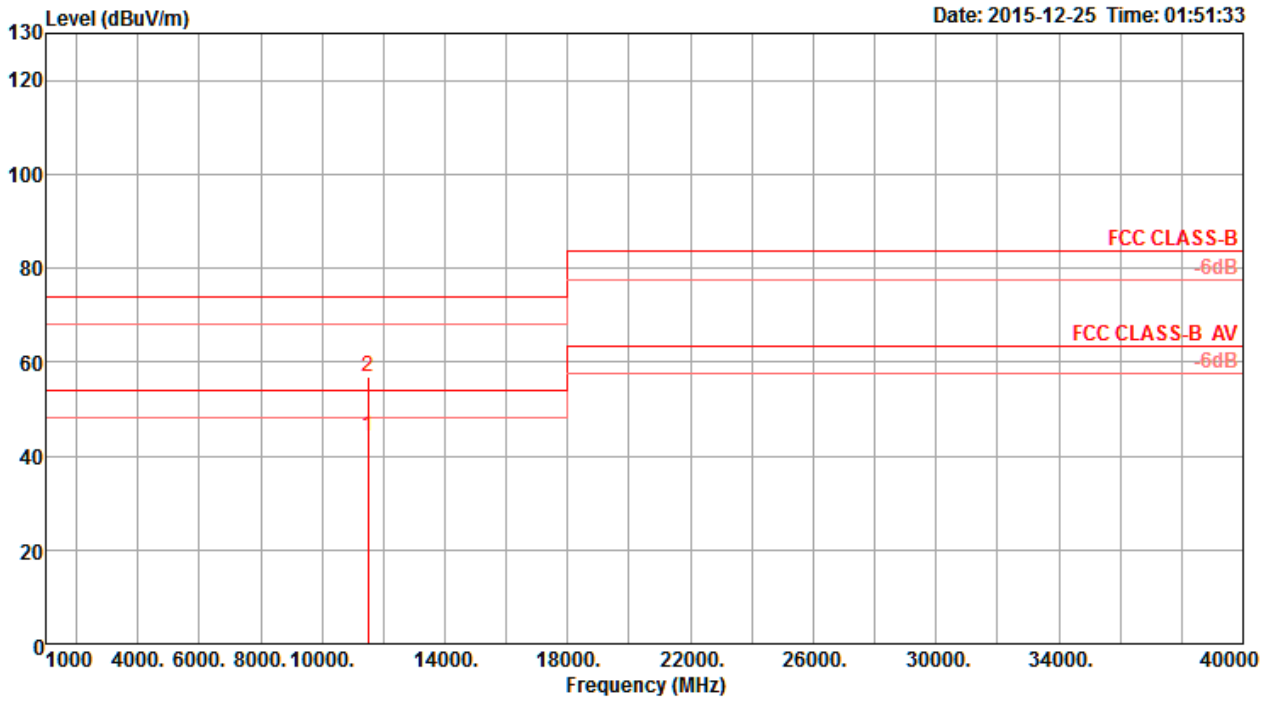
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11649.06	65.57	74.00	-8.43	51.95	9.75	38.55	34.68	156	150	Peak	VERTICAL
2	11650.69	50.80	54.00	-3.20	37.18	9.75	38.55	34.68	156	150	Average	VERTICAL

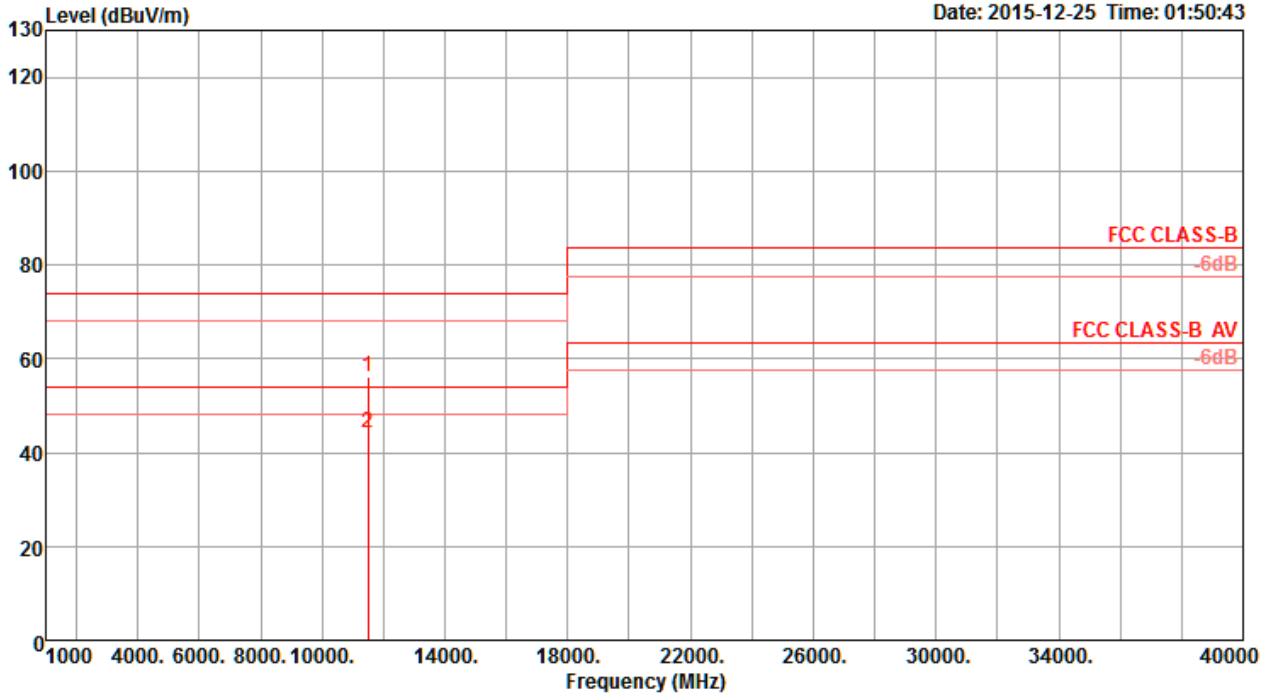
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11509.16	44.00	54.00	-10.00	30.46	9.67	38.50	34.63	115	137	Average	HORIZONTAL
2	11509.63	56.84	74.00	-17.16	43.30	9.67	38.50	34.63	115	137	Peak	HORIZONTAL

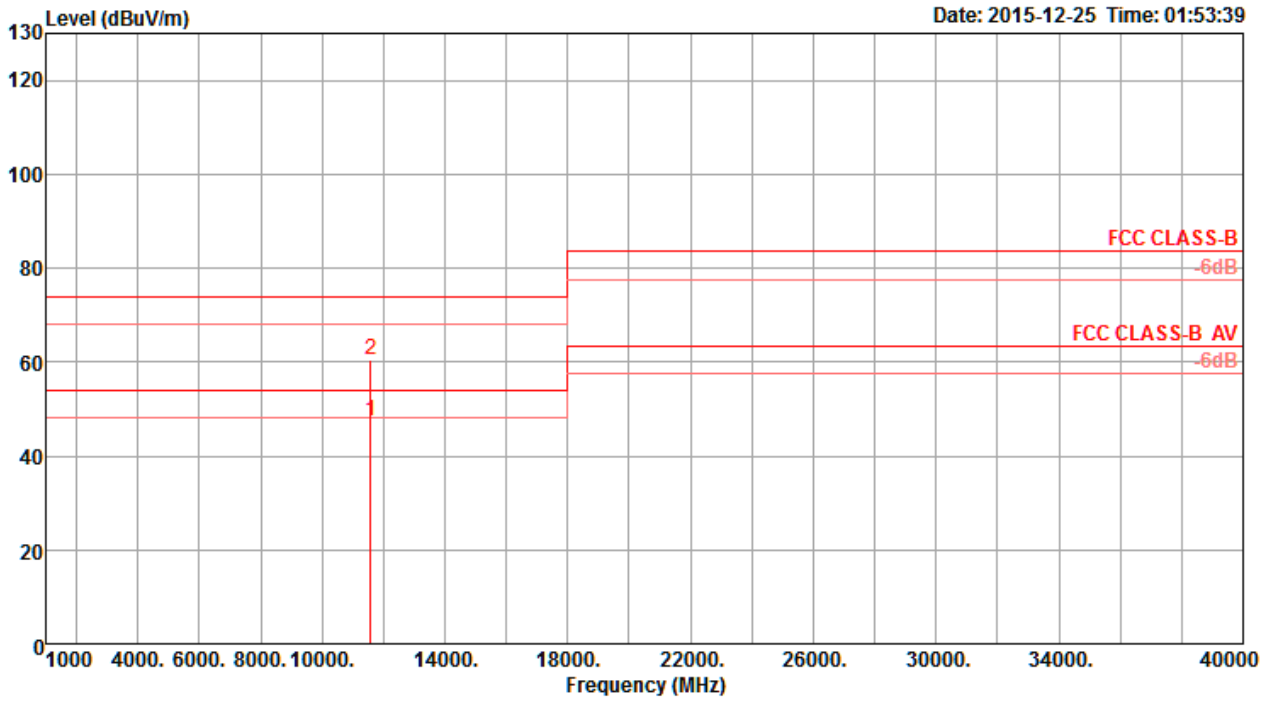
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11509.04	56.30	74.00	-17.70	42.76	9.67	38.50	34.63	334	145	Peak	VERTICAL
2	11509.72	44.20	54.00	-9.80	30.66	9.67	38.50	34.63	334	145	Average	VERTICAL

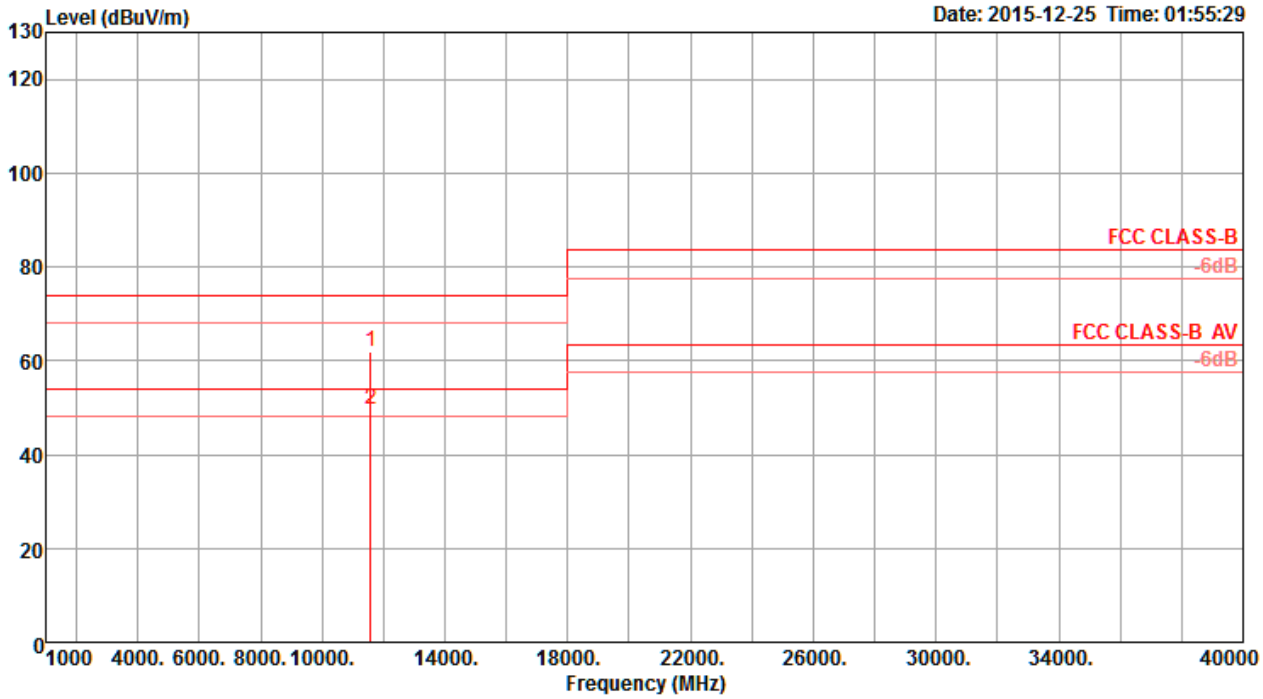
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11590.07	47.38	54.00	-6.62	33.77	9.73	38.54	34.66	173	144	Average	HORIZONTAL
2	11591.27	60.32	74.00	-13.68	46.71	9.73	38.54	34.66	173	144	Peak	HORIZONTAL

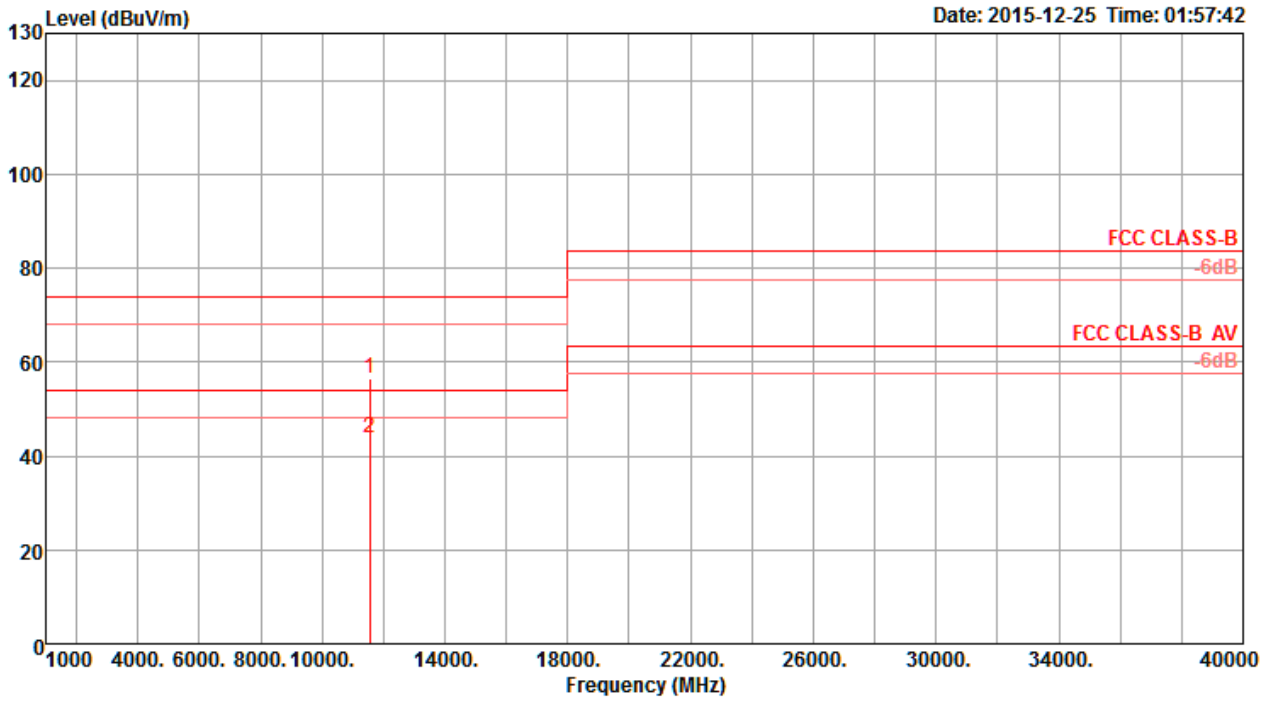
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11588.39	62.09	74.00	-11.91	48.48	9.73	38.54	34.66	23	141	Peak	VERTICAL
2	11590.39	49.45	54.00	-4.55	35.84	9.73	38.54	34.66	23	141	Average	VERTICAL

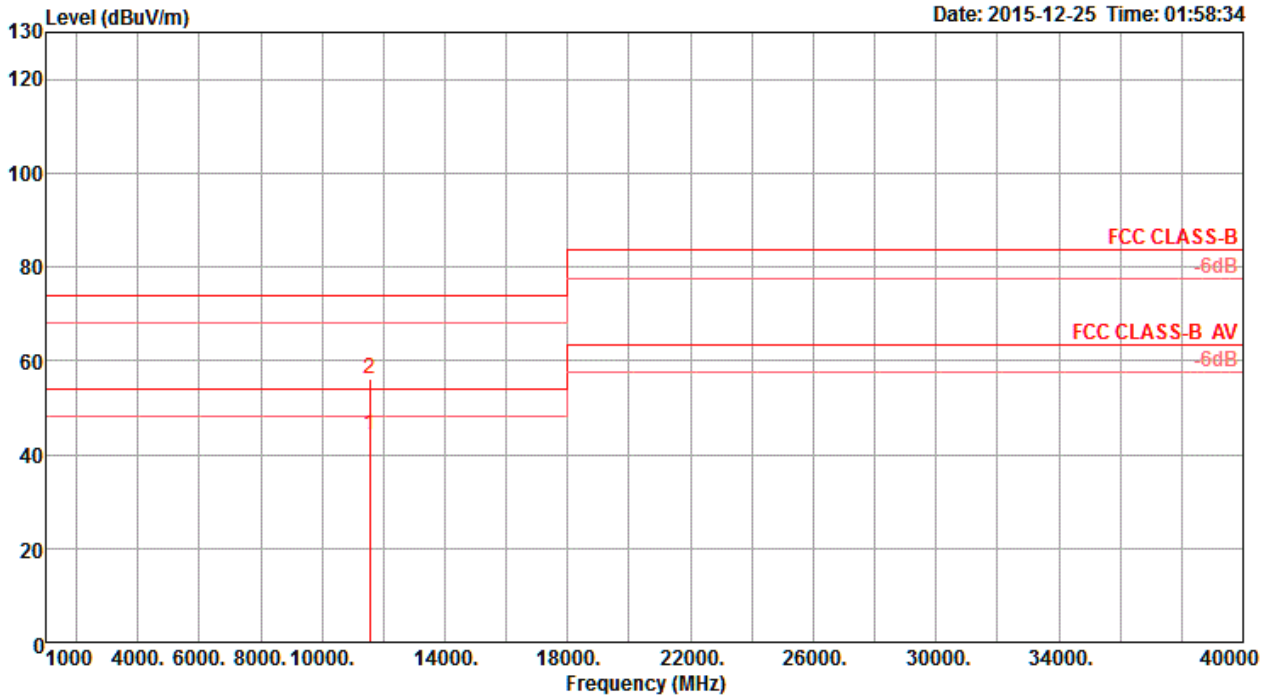
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11548.79	56.45	74.00	-17.55	42.90	9.69	38.51	34.65	27	148	Peak	HORIZONTAL
2	11549.42	43.91	54.00	-10.09	30.36	9.69	38.51	34.65	27	148	Average	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11550.16	44.13	54.00	-9.87	30.58	9.69	38.51	34.65	284	136	Average	VERTICAL
2	11551.86	55.96	74.00	-18.04	42.37	9.71	38.53	34.65	284	136	Peak	VERTICAL

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

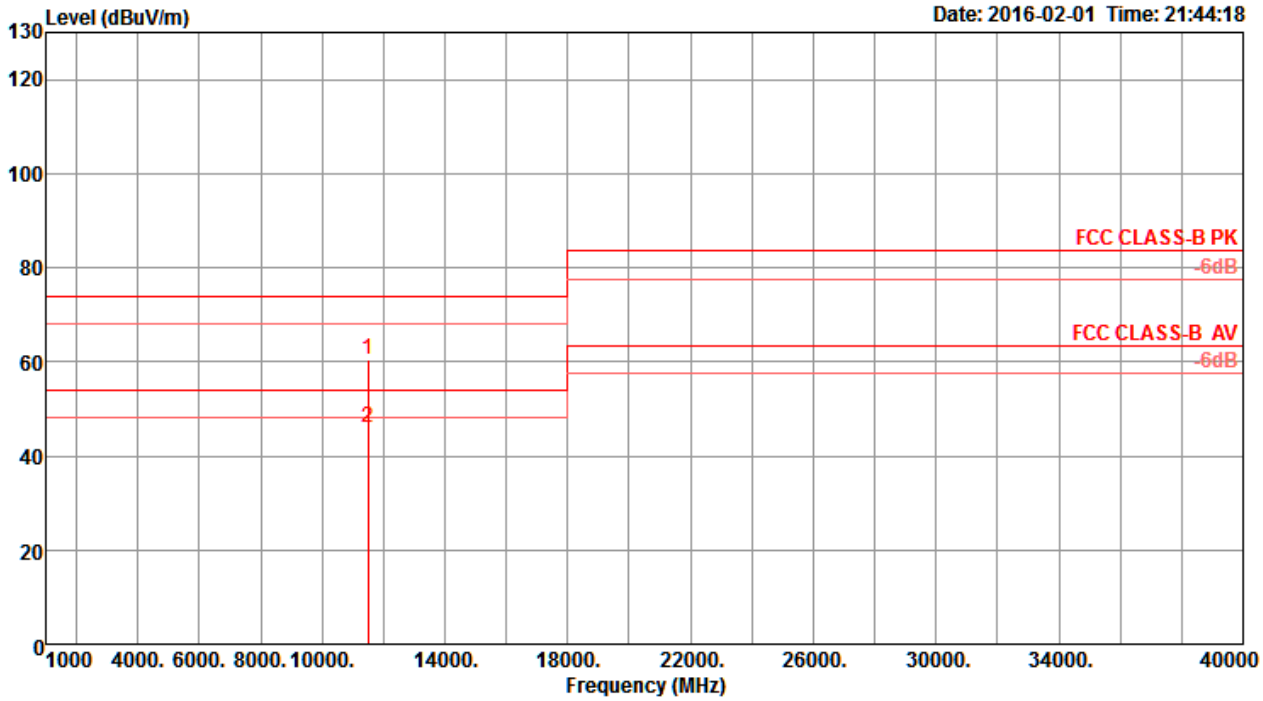
Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Test Mode: Mode 2

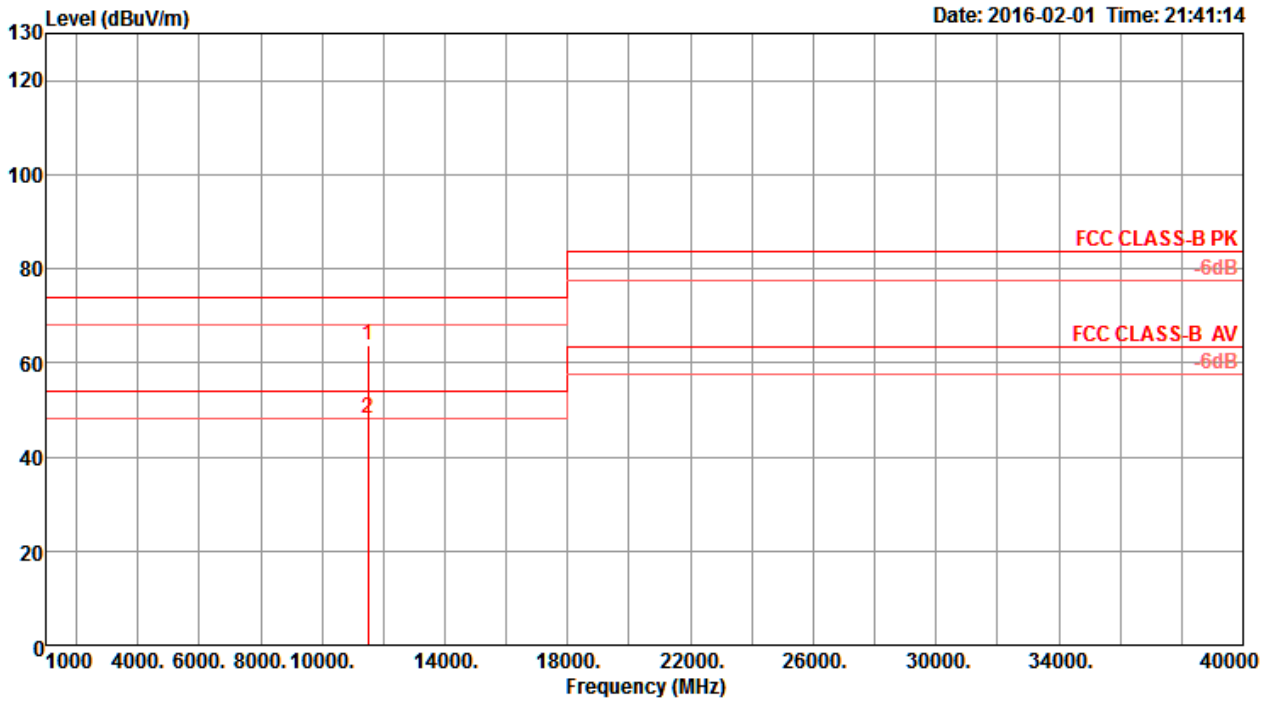
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11a CH 149 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11488.71	60.35	74.00	-13.65	46.80	9.67	38.50	34.62	127	100	Peak	HORIZONTAL
2	11489.25	45.99	54.00	-8.01	32.44	9.67	38.50	34.62	127	100	Average	HORIZONTAL

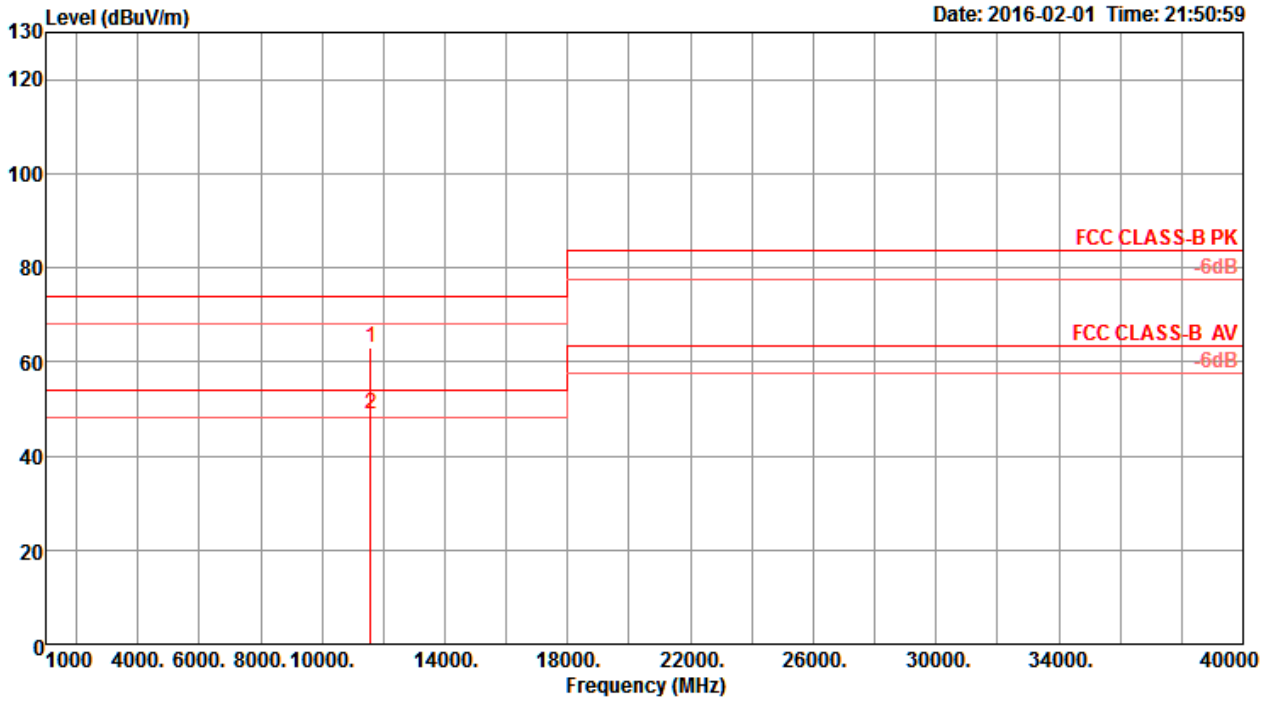
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11490.23	63.57	74.00	-10.43	50.02	9.67	38.50	34.62	134	100	Peak	VERTICAL
2	11491.69	48.23	54.00	-5.77	34.68	9.67	38.50	34.62	134	100	Average	VERTICAL

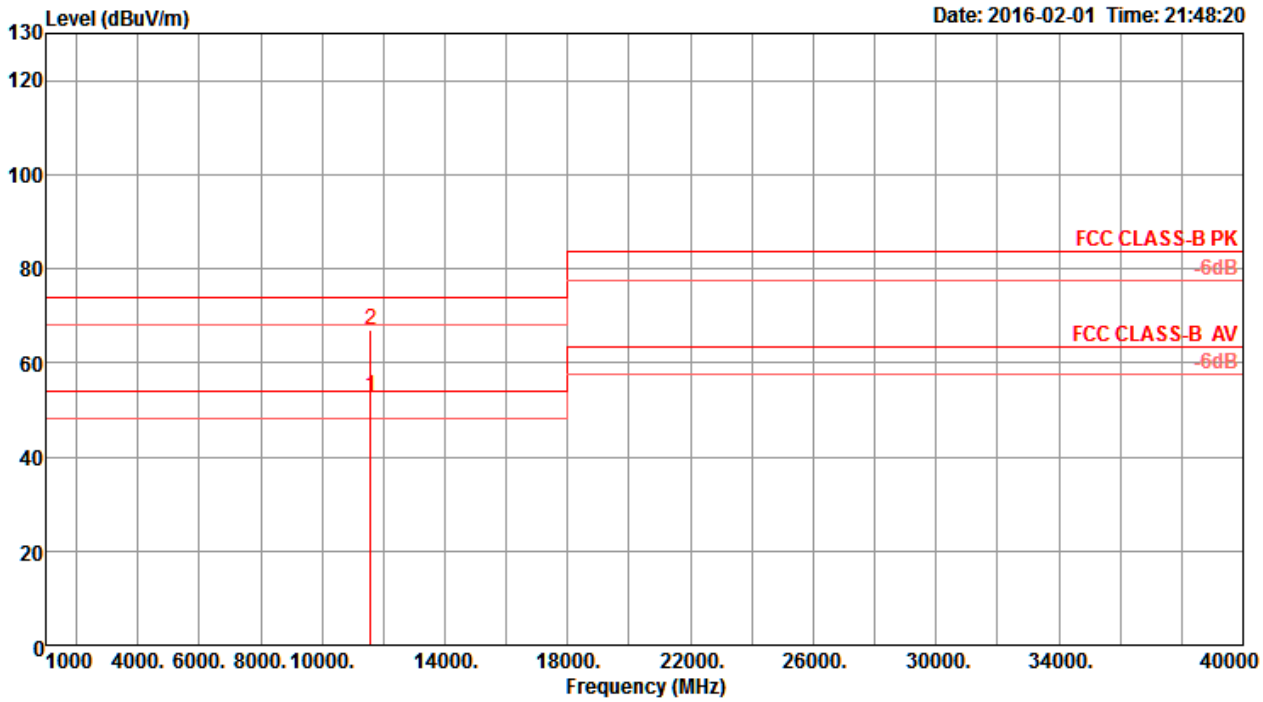
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11a CH 157 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11569.14	63.08	74.00	-10.92	49.49	9.71	38.53	34.65	135	100	Peak	HORIZONTAL
2	11569.61	49.01	54.00	-4.99	35.42	9.71	38.53	34.65	135	100	Average	HORIZONTAL

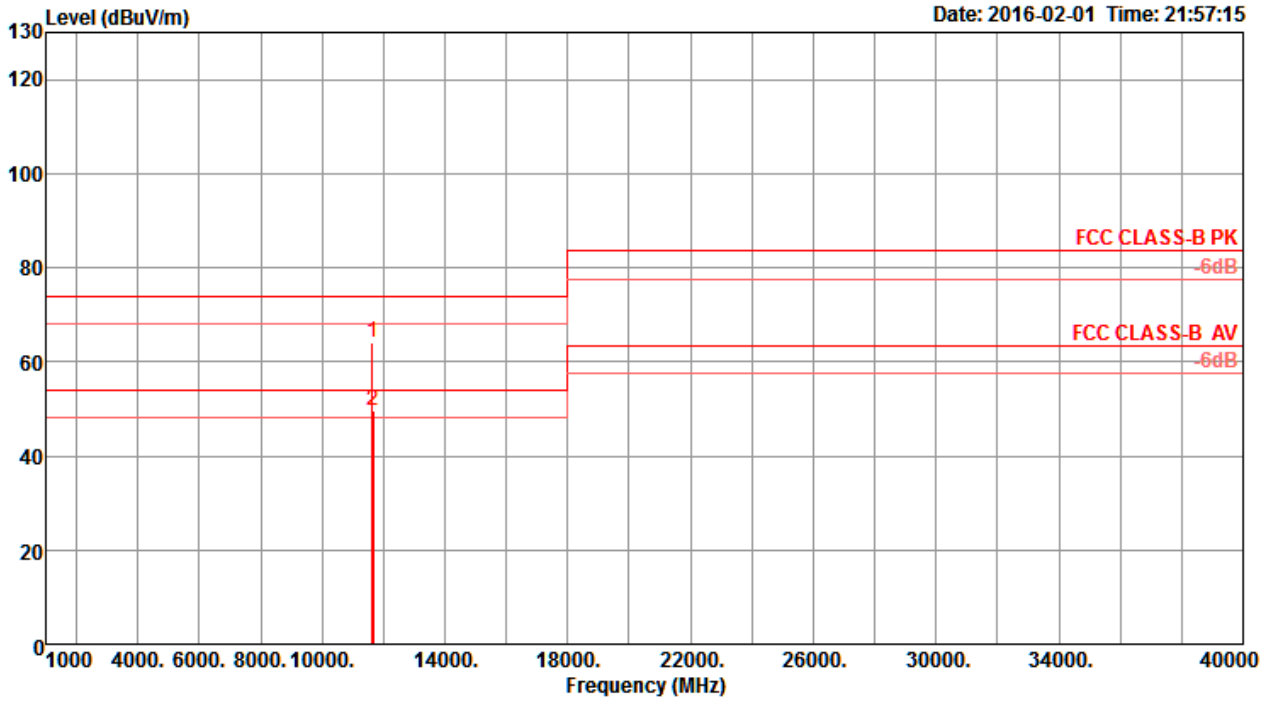
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11569.87	52.77	54.00	-1.23	39.18	9.71	38.53	34.65	134	162	Average	VERTICAL
2	11570.36	66.94	74.00	-7.06	53.35	9.71	38.53	34.65	134	162	Peak	VERTICAL

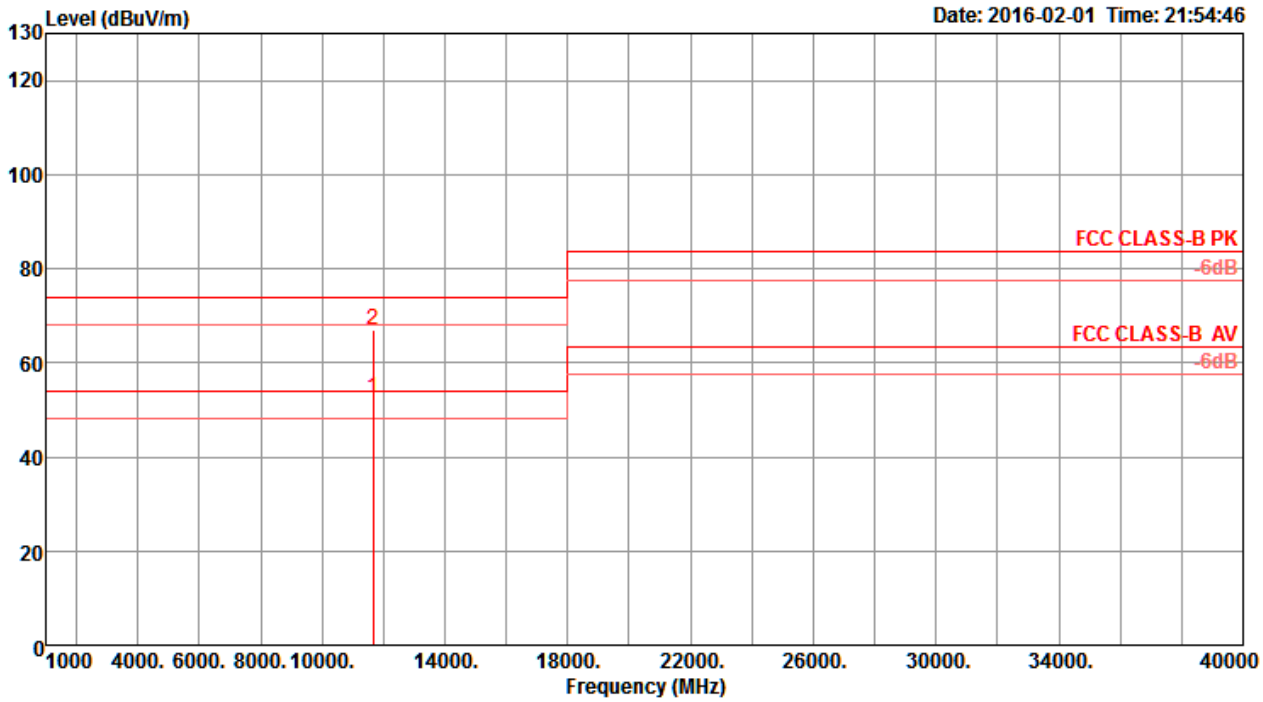
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11a CH 165 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11648.89	64.26	74.00	-9.74	50.64	9.75	38.55	34.68	136	100	Peak	HORIZONTAL
2	11649.21	49.67	54.00	-4.33	36.05	9.75	38.55	34.68	136	100	Average	HORIZONTAL

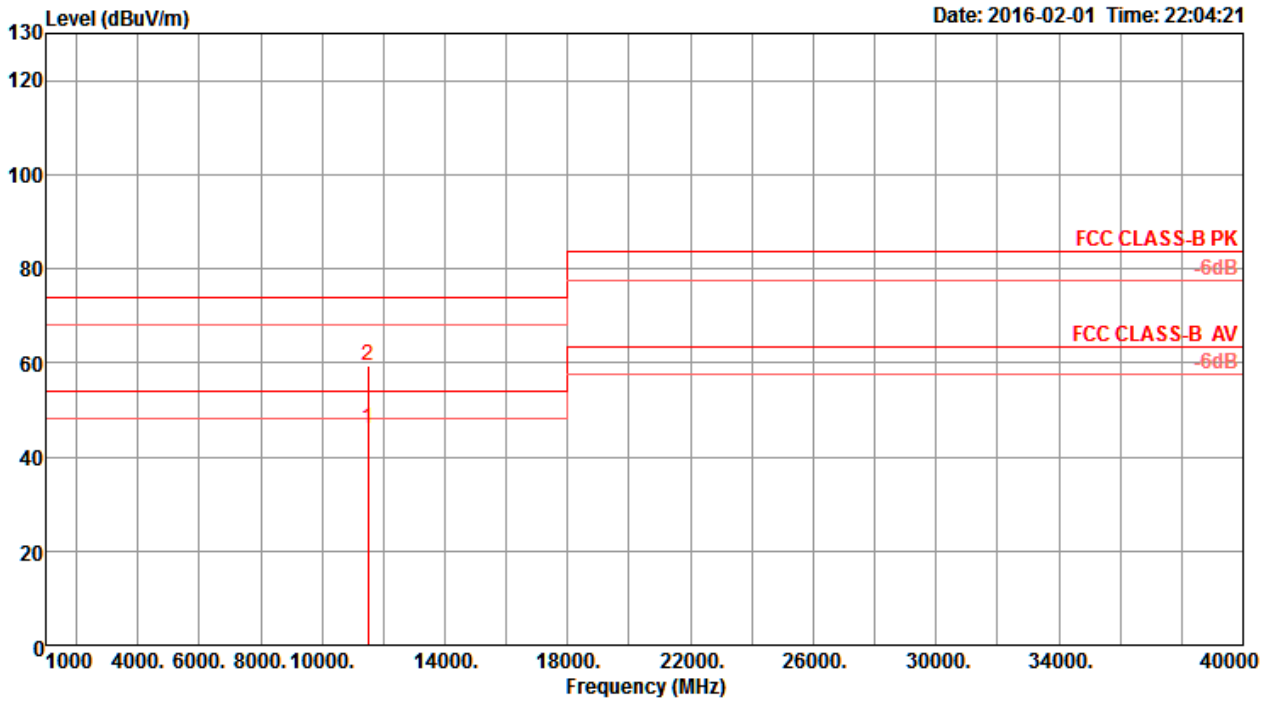
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11649.90	52.50	54.00	-1.50	38.88	9.75	38.55	34.68	128	100	Average	VERTICAL
2	11650.25	67.02	74.00	-6.98	53.40	9.75	38.55	34.68	128	100	Peak	VERTICAL

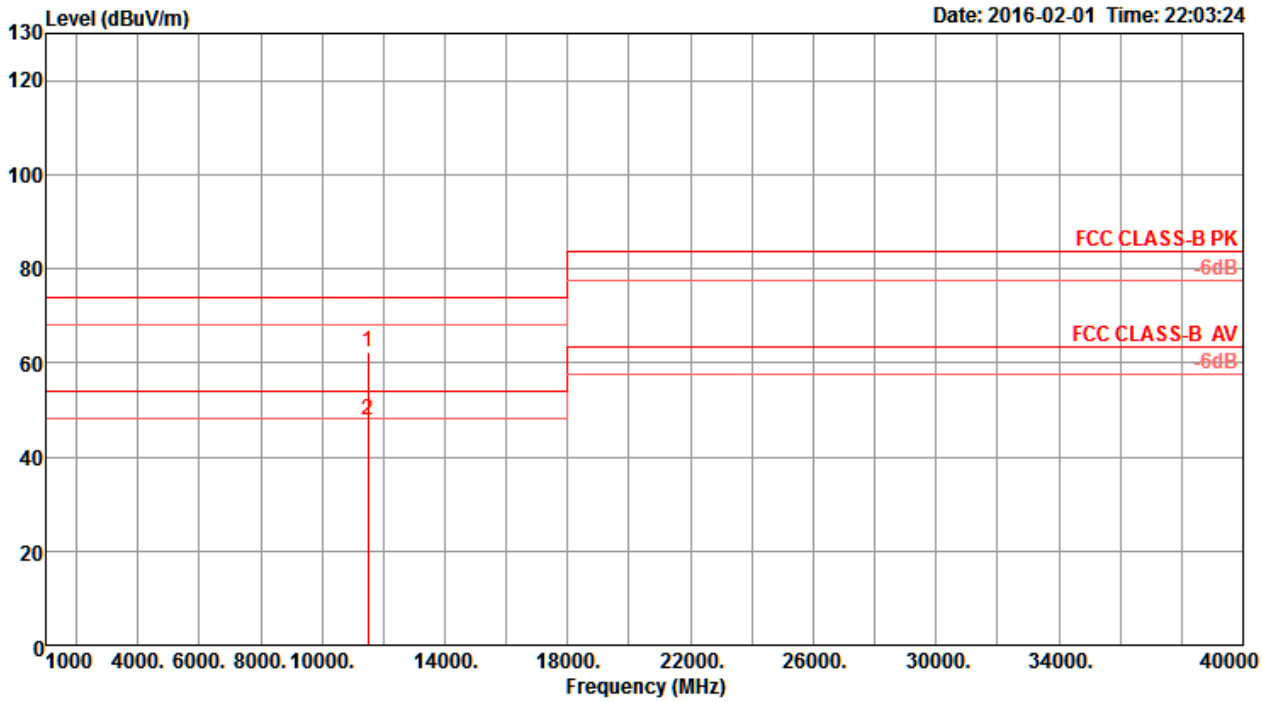
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11490.98	45.95	54.00	-8.05	32.40	9.67	38.50	34.62	128	100	Average	HORIZONTAL
2	11491.81	59.34	74.00	-14.66	45.79	9.67	38.50	34.62	128	100	Peak	HORIZONTAL

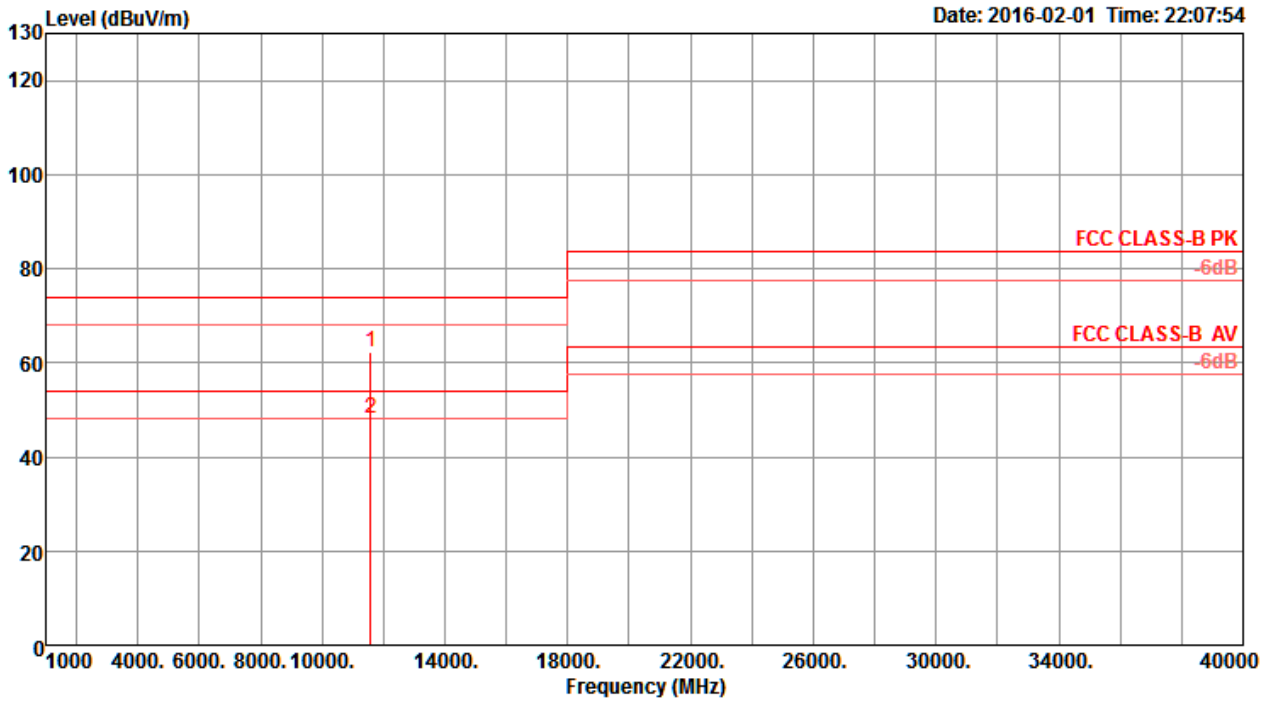
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11488.68	62.16	74.00	-11.84	48.61	9.67	38.50	34.62	135	100	Peak	VERTICAL
2	11489.33	47.97	54.00	-6.03	34.42	9.67	38.50	34.62	135	100	Average	VERTICAL

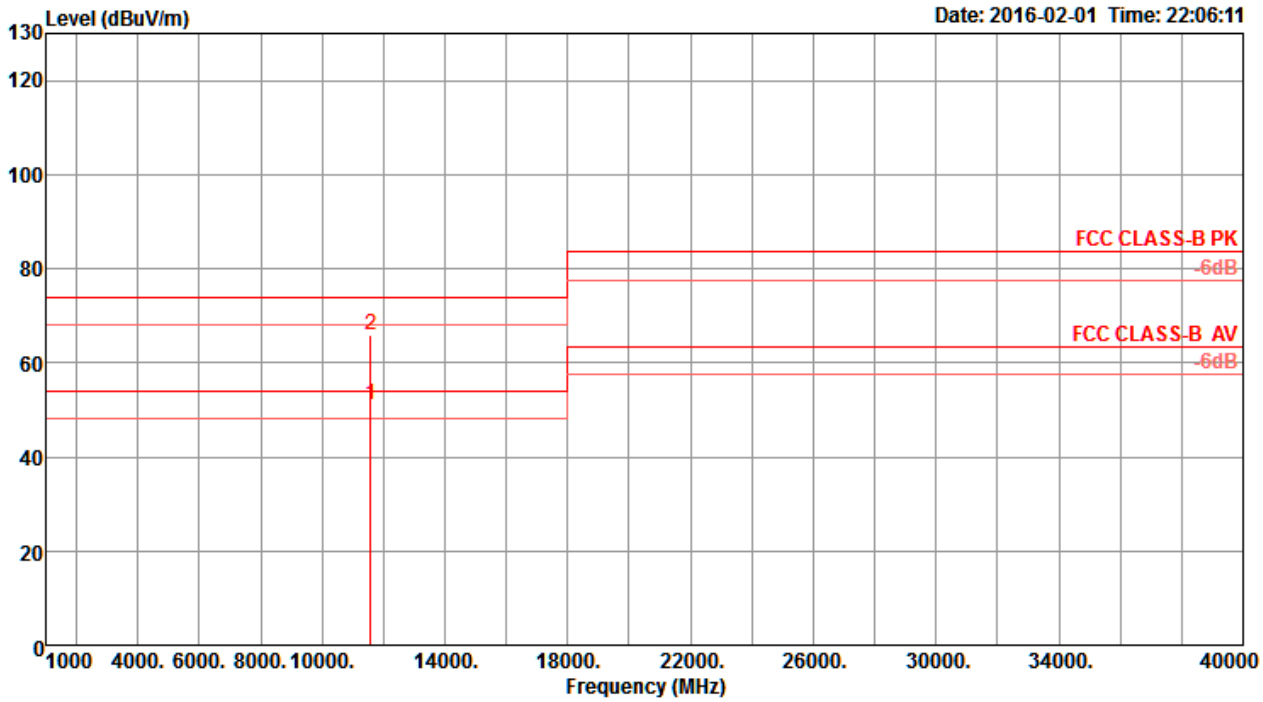
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11568.78	62.12	74.00	-11.88	48.53	9.71	38.53	34.65	128	100	Peak	HORIZONTAL
2	11569.43	48.02	54.00	-5.98	34.43	9.71	38.53	34.65	128	100	Average	HORIZONTAL

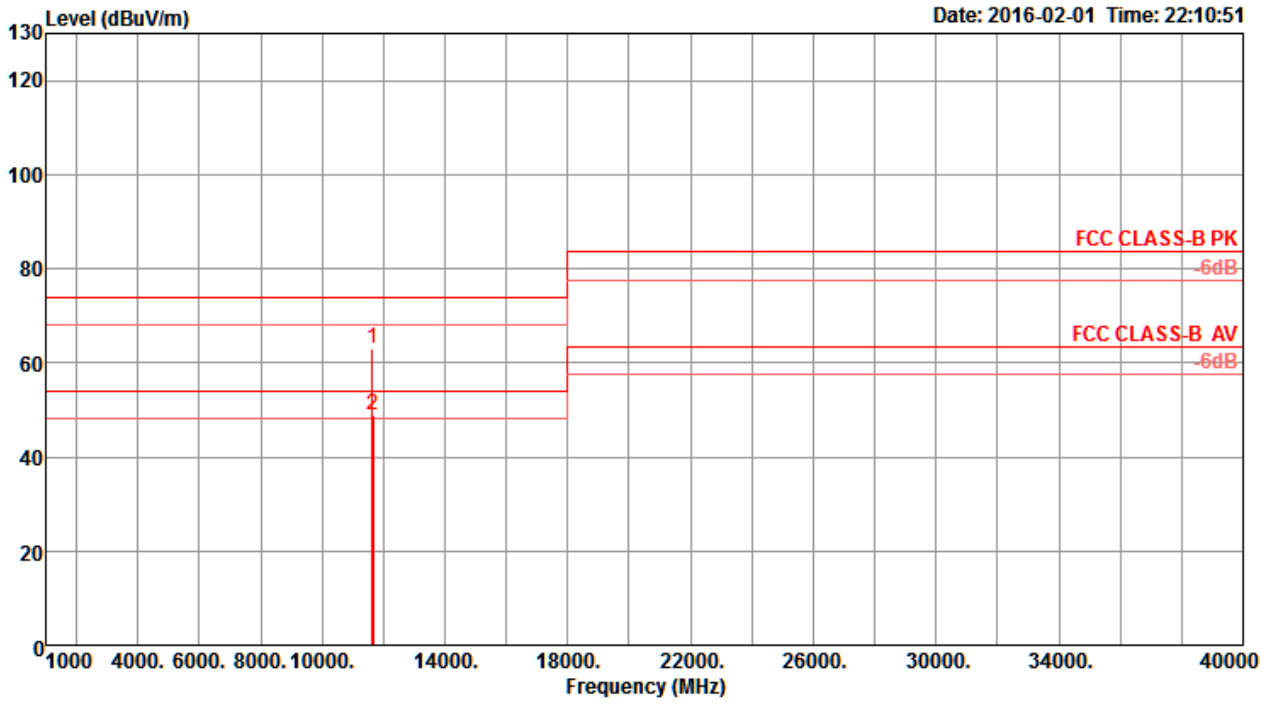
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11568.65	51.22	54.00	-2.78	37.63	9.71	38.53	34.65	135	100	Average	VERTICAL
2	11569.25	66.06	74.00	-7.94	52.47	9.71	38.53	34.65	135	100	Peak	VERTICAL

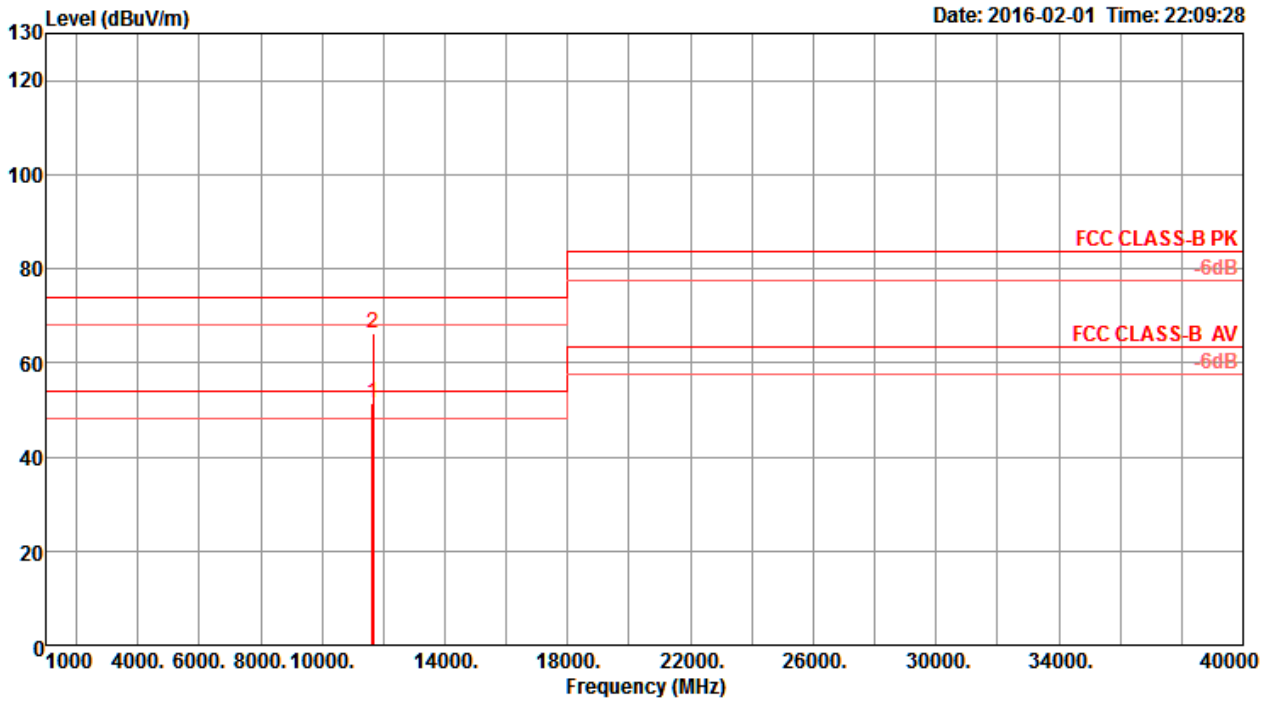
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11648.32	62.94	74.00	-11.06	49.32	9.75	38.55	34.68	136	100	Peak	HORIZONTAL
2	11651.21	48.89	54.00	-5.11	35.23	9.77	38.57	34.68	136	100	Average	HORIZONTAL

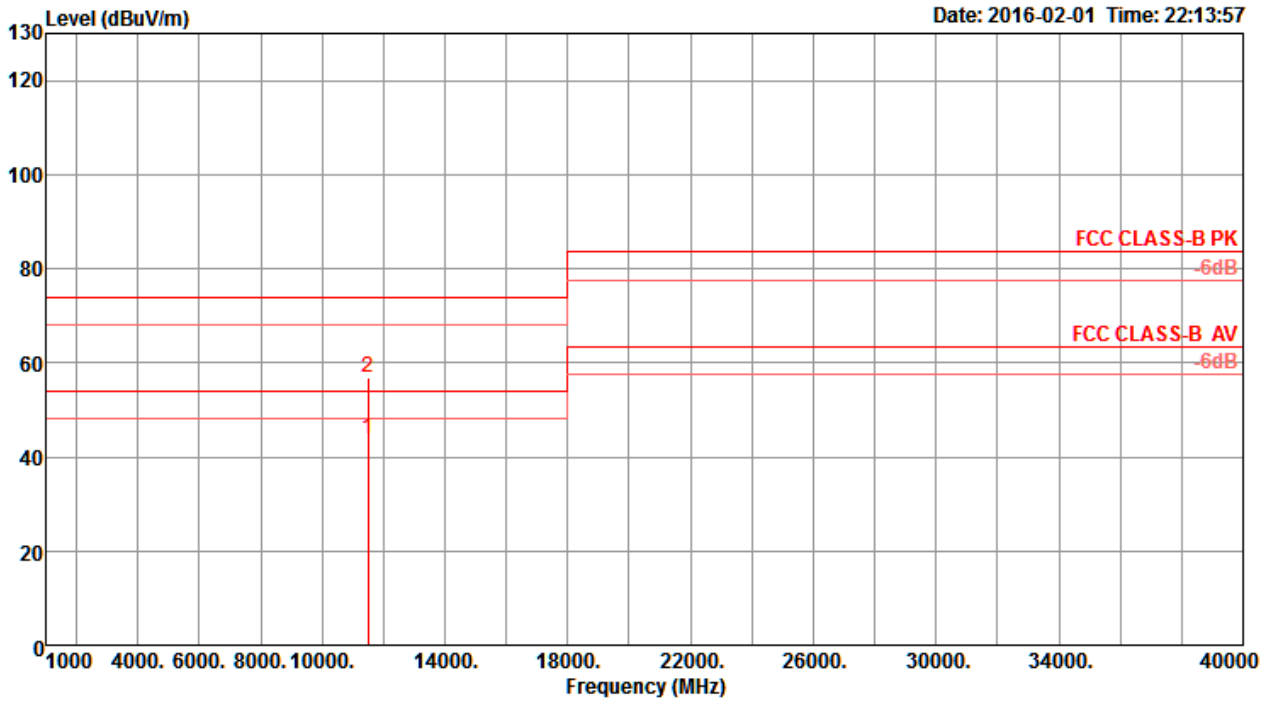
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11648.57	51.37	54.00	-2.63	37.75	9.75	38.55	34.68	128	100	Average	VERTICAL
2	11650.73	66.15	74.00	-7.85	52.53	9.75	38.55	34.68	128	100	Peak	VERTICAL

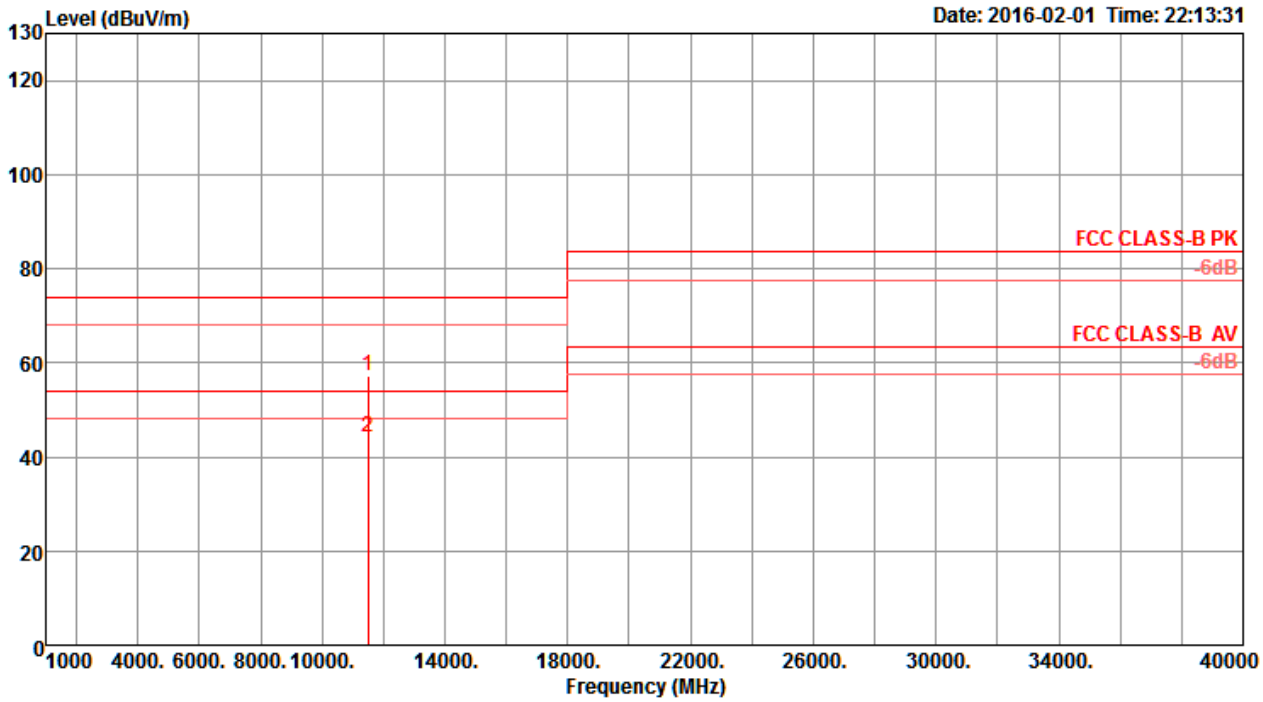
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11508.30	43.86	54.00	-10.14	30.31	9.67	38.50	34.62	128	100	Average	HORIZONTAL
2	11508.49	56.93	74.00	-17.07	43.38	9.67	38.50	34.62	128	100	Peak	HORIZONTAL

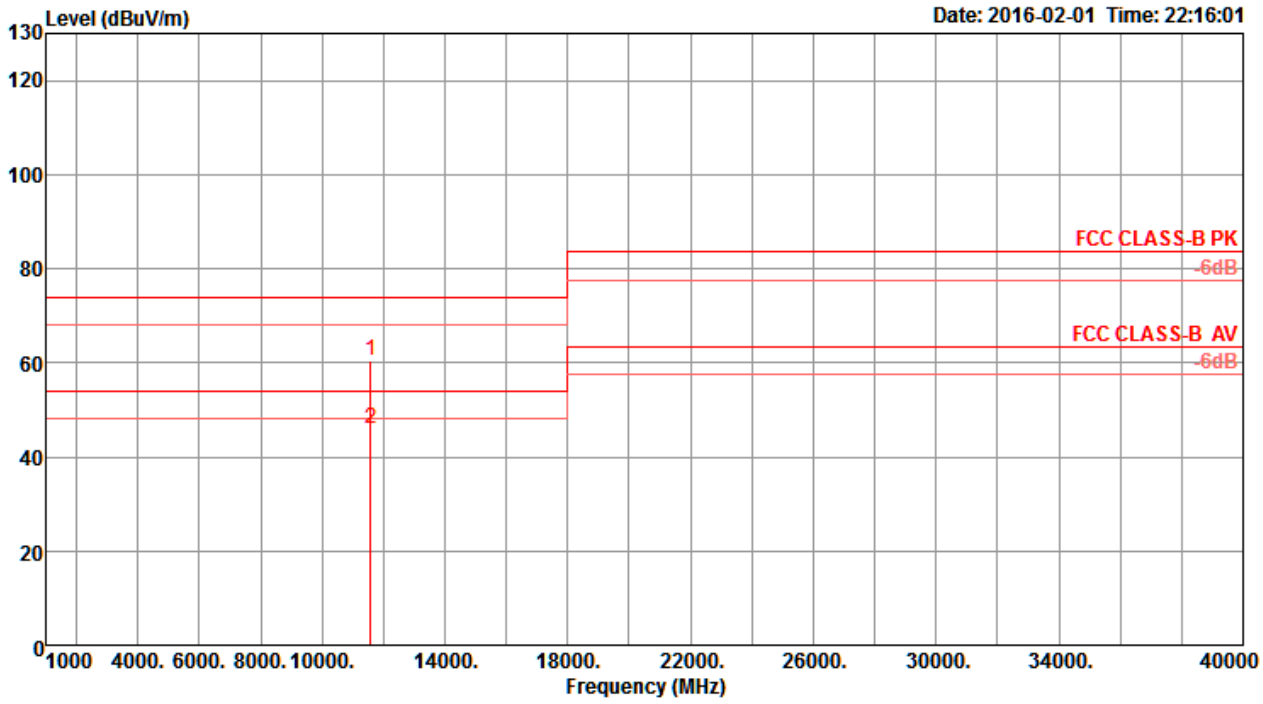
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11507.62	57.25	74.00	-16.75	43.70	9.67	38.50	34.62	144	100	Peak	VERTICAL
2	11509.98	44.12	54.00	-9.88	30.58	9.67	38.50	34.63	144	100	Average	VERTICAL

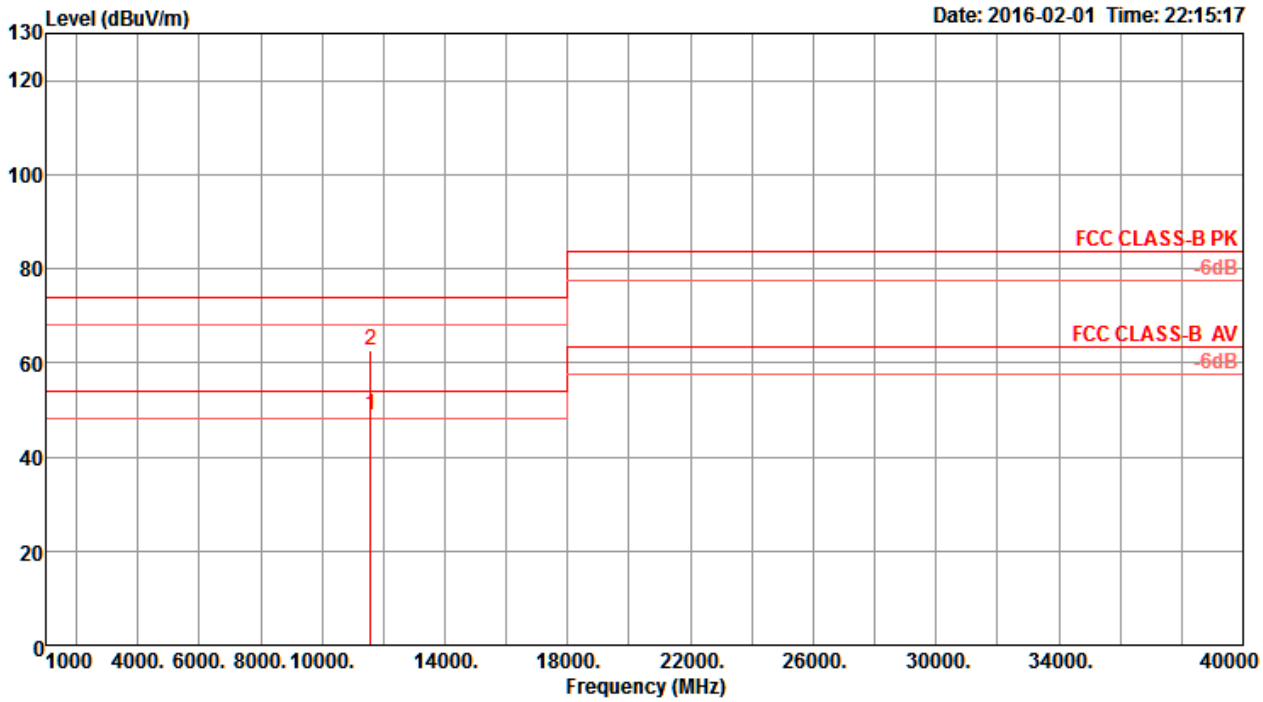
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11589.18	60.48	74.00	-13.52	46.87	9.73	38.54	34.66	136	100	Peak	HORIZONTAL
2	11589.86	46.06	54.00	-7.94	32.45	9.73	38.54	34.66	136	100	Average	HORIZONTAL

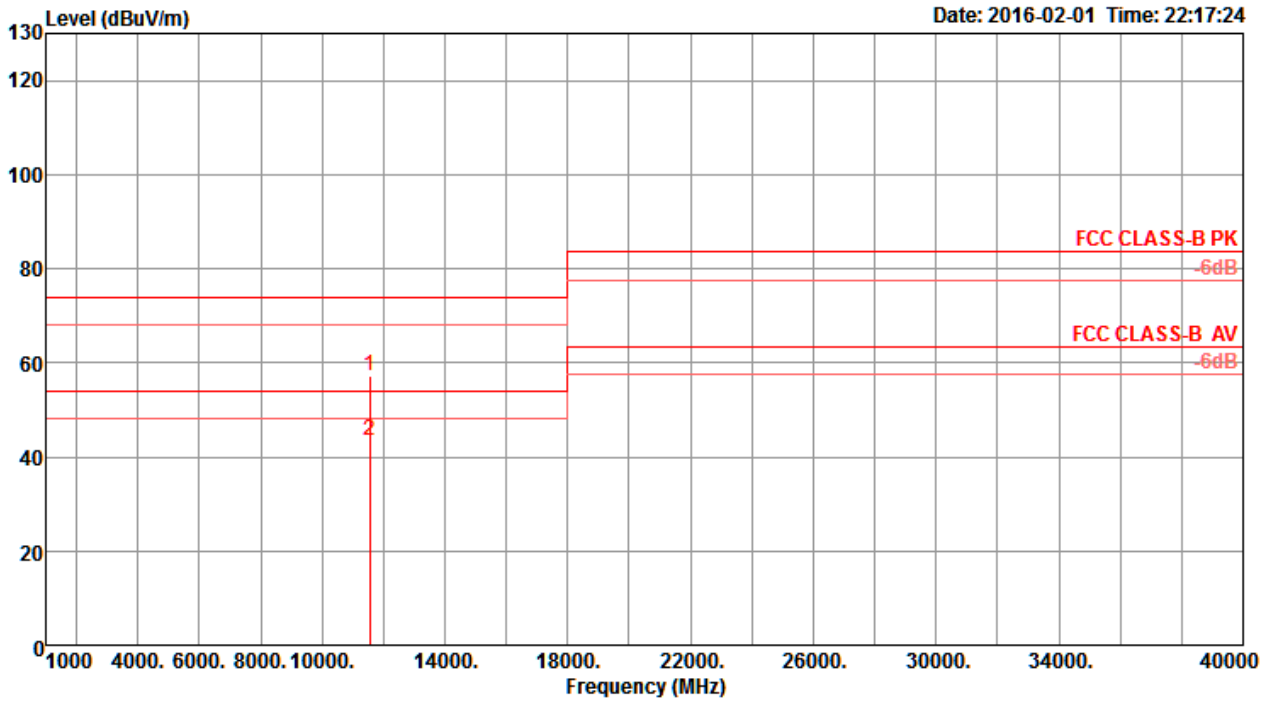
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11590.80	48.72	54.00	-5.28	35.11	9.73	38.54	34.66	134	100	Average	VERTICAL
2	11591.41	62.78	74.00	-11.22	49.17	9.73	38.54	34.66	134	100	Peak	VERTICAL

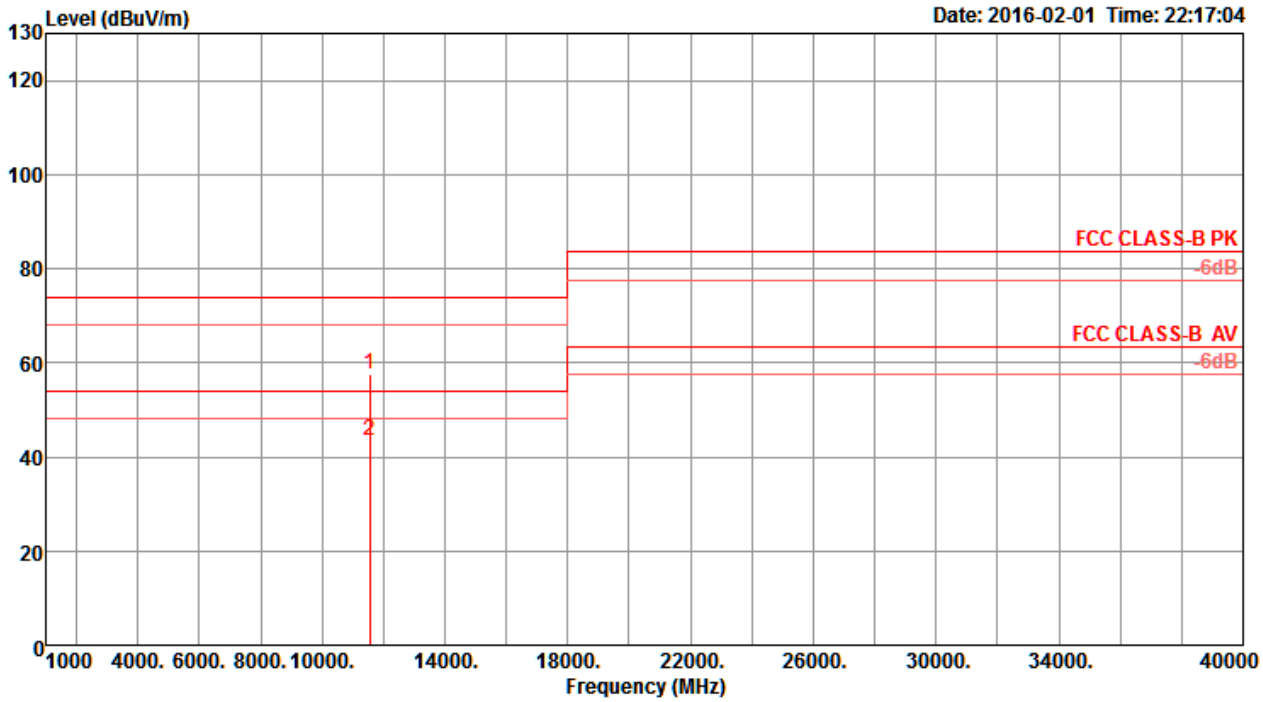
Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11549.20	57.17	74.00	-16.83	43.62	9.69	38.51	34.65	130	100	Peak	HORIZONTAL
2	11551.01	43.34	54.00	-10.66	29.75	9.71	38.53	34.65	130	100	Average	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11550.46	57.42	74.00	-16.58	43.83	9.71	38.53	34.65	141	100	Peak	VERTICAL
2	11550.92	43.42	54.00	-10.58	29.83	9.71	38.53	34.65	141	100	Average	VERTICAL

4.6. Band Edge Emissions Measurement

4.6.1. Limit

For transmitters operating in the 5.725-5.85 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.6.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	1MHz / 3MHz for Peak

4.6.3. Test Procedures

1. The test procedure is the same as section 4.5.3.

4.6.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.5.4.

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

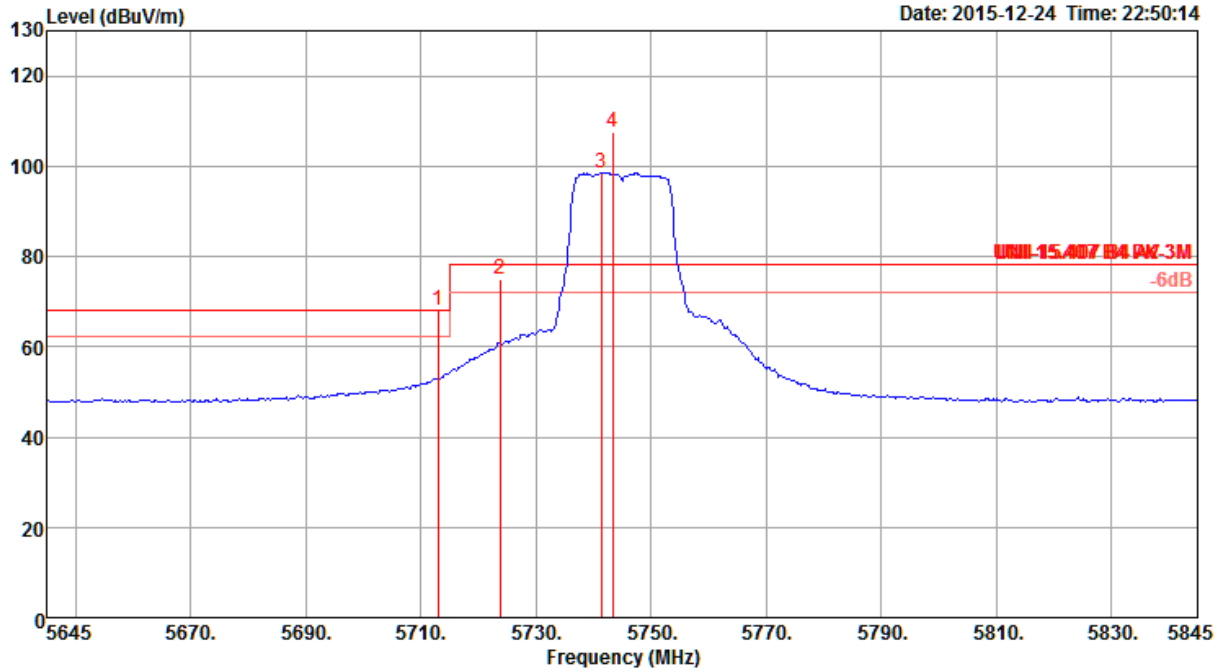
The EUT was programmed to be in continuously transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Test Mode: Mode 1

Temperature	23°C	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 1

Channel 149

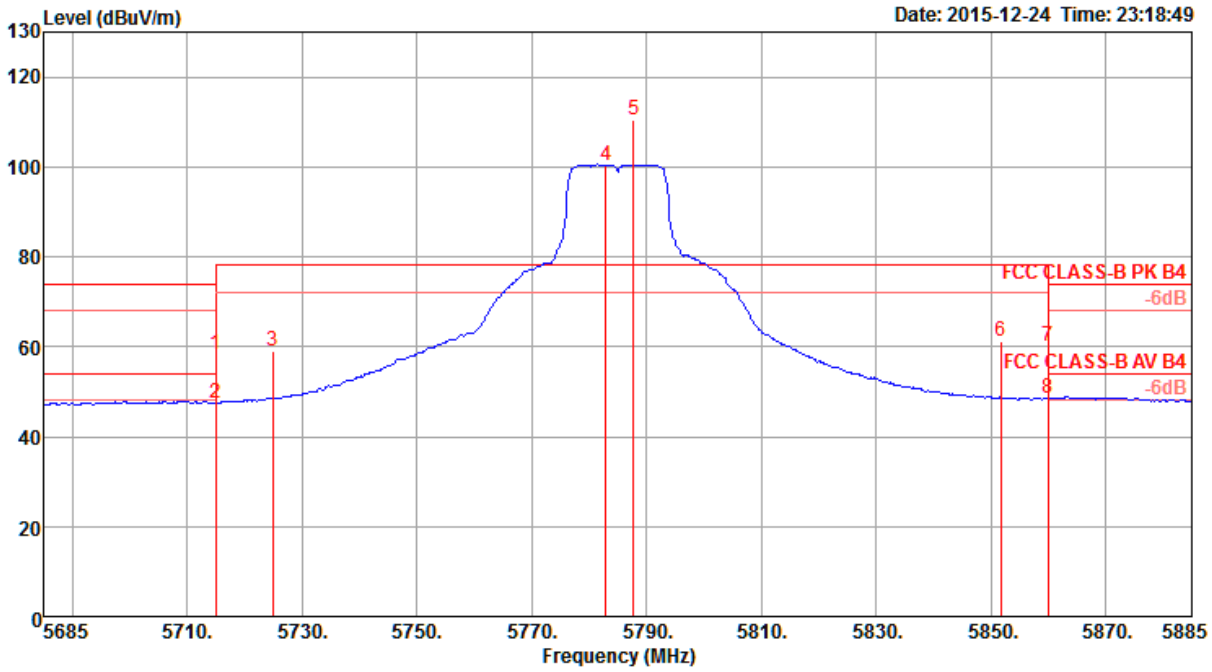


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5713.00	68.16	68.20	-0.04	61.72	6.50	34.45	34.51	264	250	Peak	VERTICAL
2	5723.80	75.11	78.20	-3.09	68.69	6.43	34.50	34.51	264	250	Peak	VERTICAL
3	5741.40	98.50			92.11	6.36	34.55	34.52	264	250	Average	VERTICAL
4	5743.40	107.60			101.21	6.36	34.55	34.52	264	250	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5745 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Channel 157

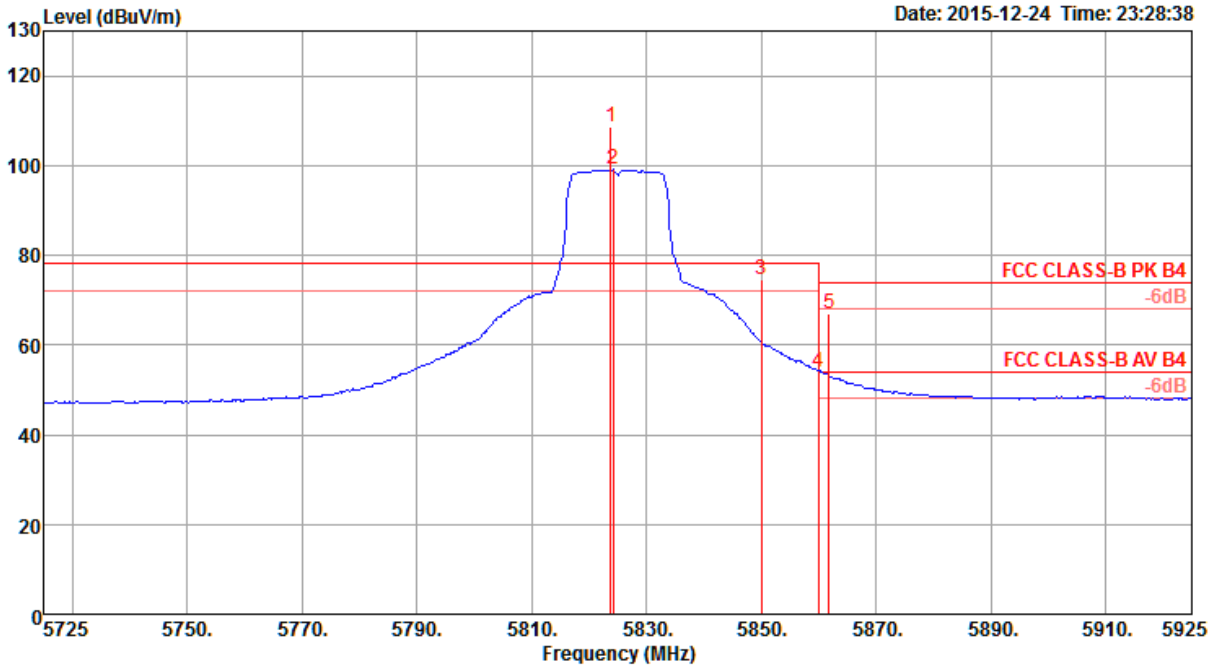


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5715.00	58.36	74.00	-15.64	51.92	6.50	34.45	34.51	179	175	Peak	HORIZONTAL
2	5715.00	47.31	54.00	-6.69	40.87	6.50	34.45	34.51	179	175	Average	HORIZONTAL
3	5725.00	59.04	78.20	-19.16	52.62	6.43	34.50	34.51	179	175	Peak	HORIZONTAL
4	5783.00	100.42			94.08	6.22	34.65	34.53	179	175	Average	HORIZONTAL
5	5787.80	110.57			104.23	6.22	34.65	34.53	179	175	Peak	HORIZONTAL
6	5851.80	61.16	78.20	-17.04	54.46	6.39	34.85	34.54	179	175	Peak	HORIZONTAL
7	5860.00	60.08	74.00	-13.92	53.25	6.47	34.90	34.54	179	175	Peak	HORIZONTAL
8	5860.00	48.64	54.00	-5.36	41.81	6.47	34.90	34.54	179	175	Average	HORIZONTAL

Item 4, 5 are the fundamental frequency at 5785 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Channel 165



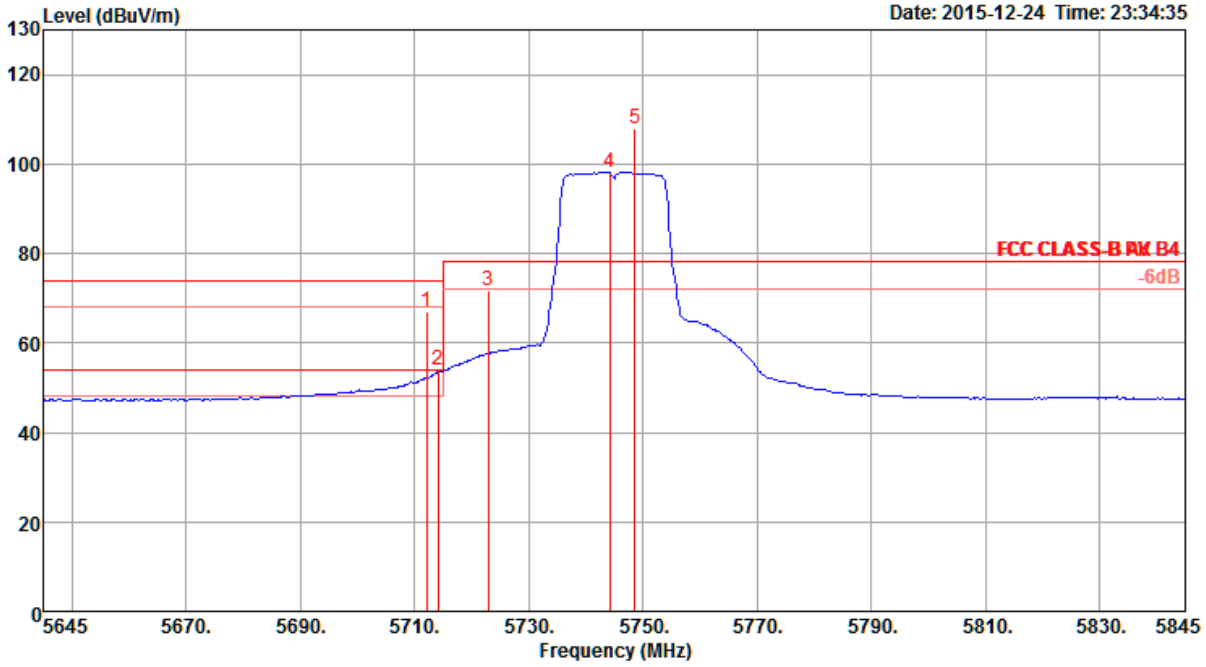
	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5823.80	108.56			101.99	6.31	34.80	34.54	174	196	Peak	HORIZONTAL
2	5824.20	99.06			92.49	6.31	34.80	34.54	174	196	Average	HORIZONTAL
3	5850.00	74.50	78.20	-3.70	67.80	6.39	34.85	34.54	174	196	Peak	HORIZONTAL
4	5860.00	53.91	54.00	-0.09	47.08	6.47	34.90	34.54	174	196	Average	HORIZONTAL
5	5861.80	67.11	74.00	-6.89	60.28	6.47	34.90	34.54	174	196	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5825 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1

Channel 149

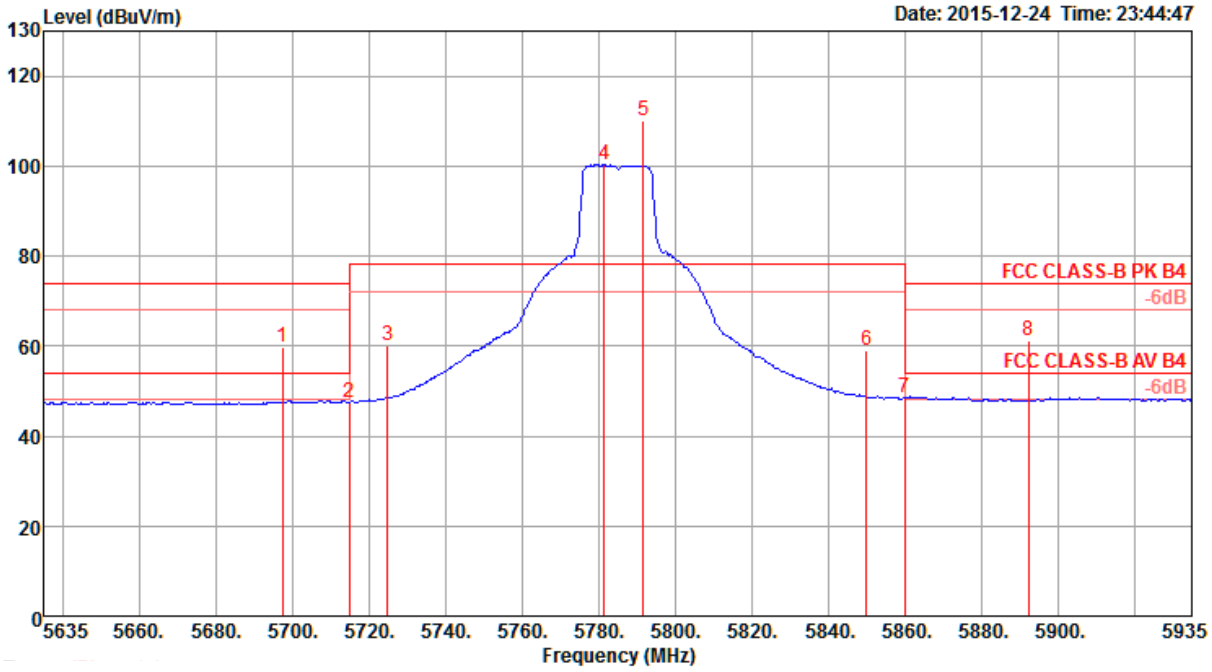


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5712.20	67.09	74.00	-6.91	60.65	6.50	34.45	34.51	101	304	Peak	VERTICAL
2	5714.20	53.90	54.00	-0.10	47.46	6.50	34.45	34.51	101	304	Average	VERTICAL
3	5723.00	71.72	78.20	-6.48	65.30	6.43	34.50	34.51	101	304	Peak	VERTICAL
4	5744.20	98.14			91.75	6.36	34.55	34.52	101	304	Average	VERTICAL
5	5748.60	107.79			101.40	6.36	34.55	34.52	101	304	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5745 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Channel 157

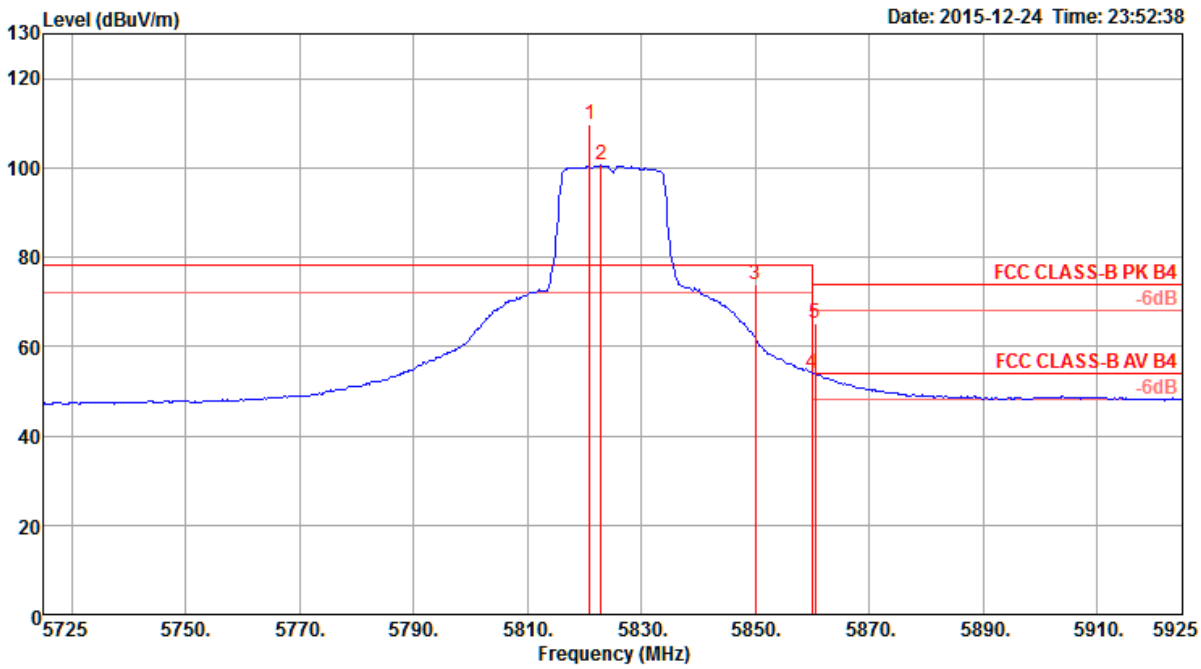


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5697.40	59.66	74.00	-14.34	53.20	6.57	34.40	34.51	174	175	Peak	HORIZONTAL
2	5715.00	47.40	54.00	-6.60	40.96	6.50	34.45	34.51	174	175	Average	HORIZONTAL
3	5725.00	60.04	78.20	-18.16	53.62	6.43	34.50	34.51	174	175	Peak	HORIZONTAL
4	5781.40	100.38			94.04	6.22	34.65	34.53	174	175	Average	HORIZONTAL
5	5791.60	110.10			103.78	6.15	34.70	34.53	174	175	Peak	HORIZONTAL
6	5850.00	58.92	78.20	-19.28	52.22	6.39	34.85	34.54	174	175	Peak	HORIZONTAL
7	5860.00	48.57	54.00	-5.43	41.74	6.47	34.90	34.54	174	175	Average	HORIZONTAL
8	5892.40	61.18	74.00	-12.82	54.10	6.63	35.00	34.55	174	175	Peak	HORIZONTAL

Item 4, 5 are the fundamental frequency at 5785 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Channel 165



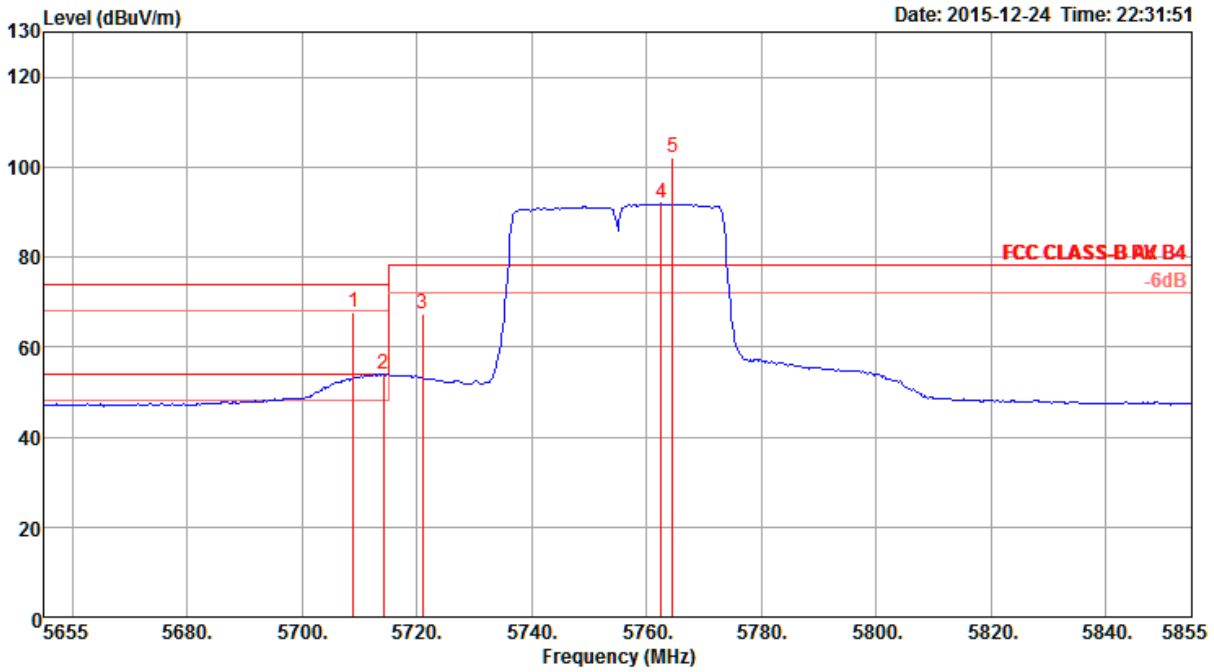
	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5821.00	109.57			103.13	6.23	34.75	34.54	101	305	Peak	VERTICAL
2	5823.00	100.53			93.96	6.31	34.80	34.54	101	305	Average	VERTICAL
3	5850.00	73.79	78.20	-4.41	67.09	6.39	34.85	34.54	101	305	Peak	VERTICAL
4	5860.00	53.87	54.00	-0.13	47.04	6.47	34.90	34.54	101	305	Average	VERTICAL
5	5860.60	65.11	74.00	-8.89	58.28	6.47	34.90	34.54	101	305	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 5825 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1

Channel 151

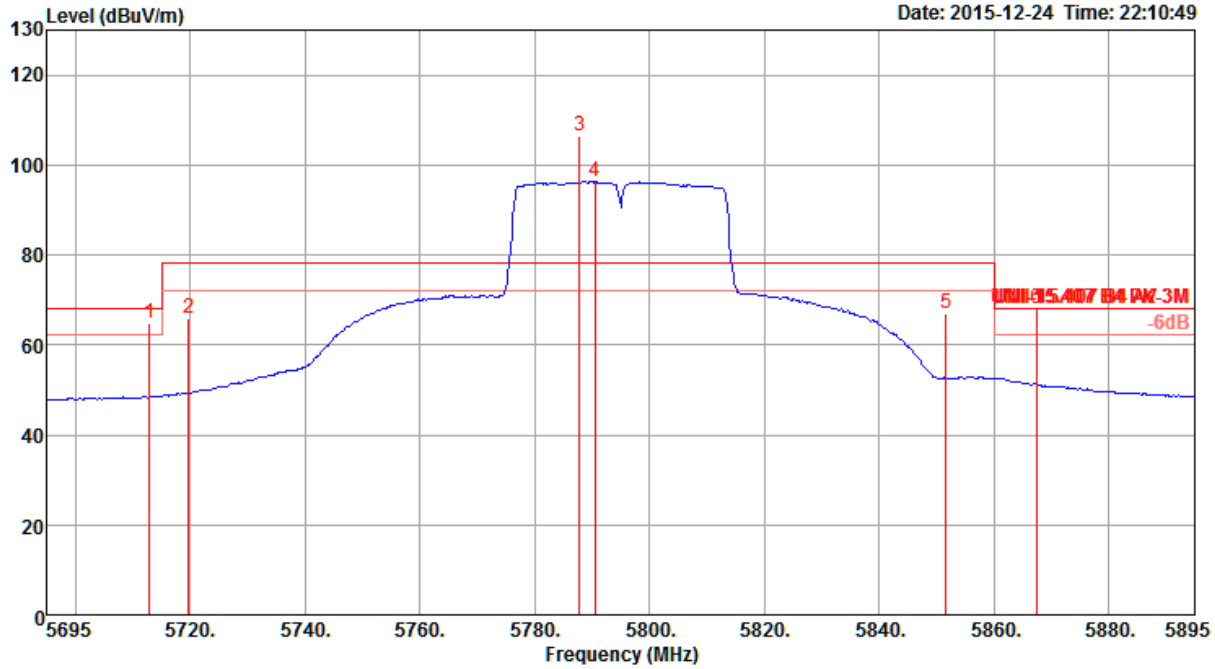


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5709.00	67.75	74.00	-6.25	61.31	6.50	34.45	34.51	179	202	Peak	HORIZONTAL
2	5714.20	53.89	54.00	-0.11	47.45	6.50	34.45	34.51	179	202	Average	HORIZONTAL
3	5721.00	67.19	78.20	-11.01	60.75	6.50	34.45	34.51	179	202	Peak	HORIZONTAL
4	5762.60	91.82			85.45	6.29	34.60	34.52	179	202	Average	HORIZONTAL
5	5764.60	102.15			95.79	6.29	34.60	34.53	179	202	Peak	HORIZONTAL

Item 4, 5 are the fundamental frequency at 5755 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Channel 159



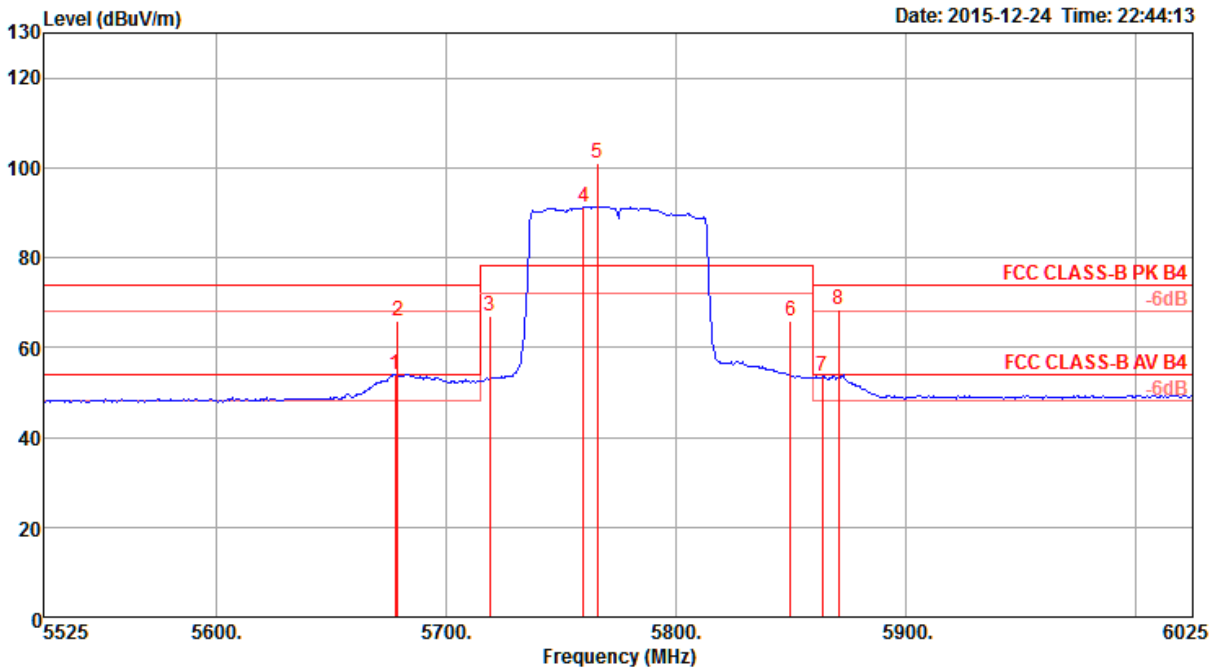
	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5713.00	64.67	68.20	-3.53	58.23	6.50	34.45	34.51	179	175	Peak	HORIZONTAL
2	5719.80	65.75	78.20	-12.45	59.31	6.50	34.45	34.51	179	175	Peak	HORIZONTAL
3	5787.80	106.55			100.21	6.22	34.65	34.53	179	175	Peak	HORIZONTAL
4	5790.60	96.27			89.95	6.15	34.70	34.53	179	175	Average	HORIZONTAL
5	5851.60	67.00	78.20	-11.20	60.30	6.39	34.85	34.54	179	175	Peak	HORIZONTAL
6	5867.40	68.02	68.20	-0.18	61.19	6.47	34.90	34.54	179	175	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5795 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1

Channel 155



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5678.00	53.88	54.00	-0.12	47.39	6.65	34.35	34.51	107	312	Average	VERTICAL
2	5679.00	66.04	74.00	-7.96	59.55	6.65	34.35	34.51	107	312	Peak	VERTICAL
3	5719.00	66.97	78.20	-11.23	60.53	6.50	34.45	34.51	107	312	Peak	VERTICAL
4	5760.00	91.42			85.05	6.29	34.60	34.52	107	312	Average	VERTICAL
5	5766.00	100.97			94.61	6.29	34.60	34.53	107	312	Peak	VERTICAL
6	5850.00	66.04	78.20	-12.16	59.34	6.39	34.85	34.54	107	312	Peak	VERTICAL
7	5864.00	53.58	54.00	-0.42	46.75	6.47	34.90	34.54	107	312	Average	VERTICAL
8	5871.00	68.35	74.00	-5.65	61.52	6.47	34.90	34.54	107	312	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5775 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Note:

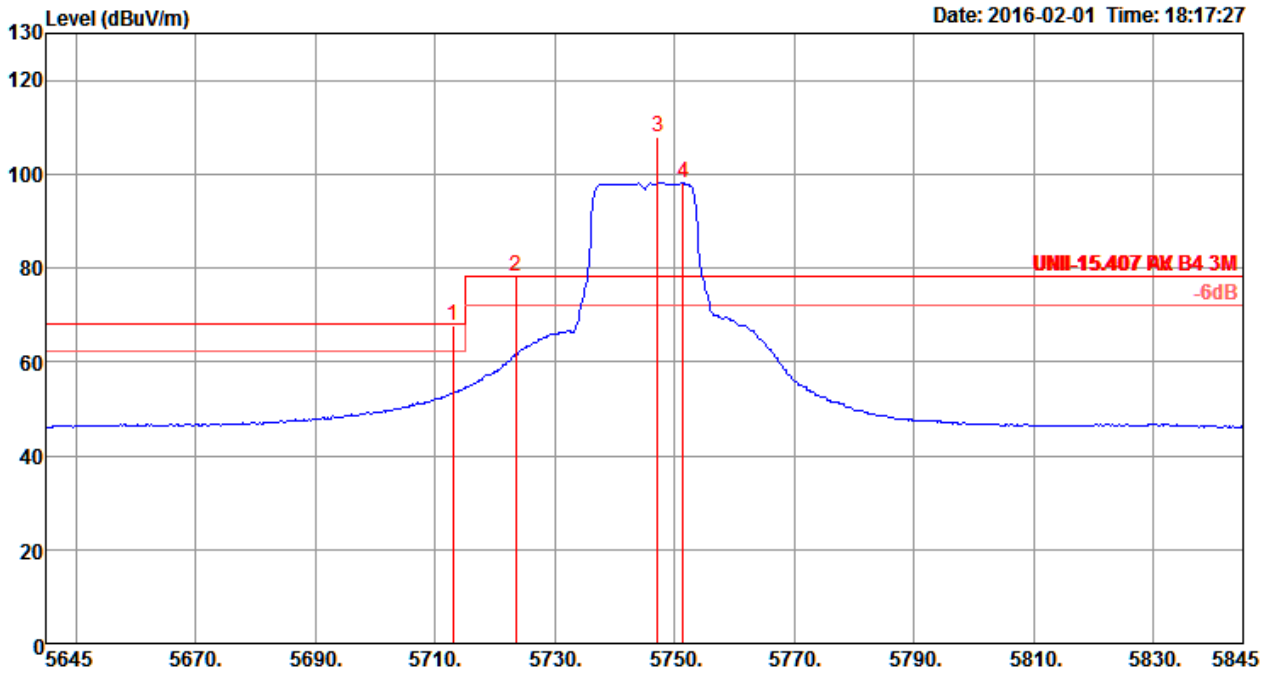
Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Test Mode: Mode 2

Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 1

Channel 149

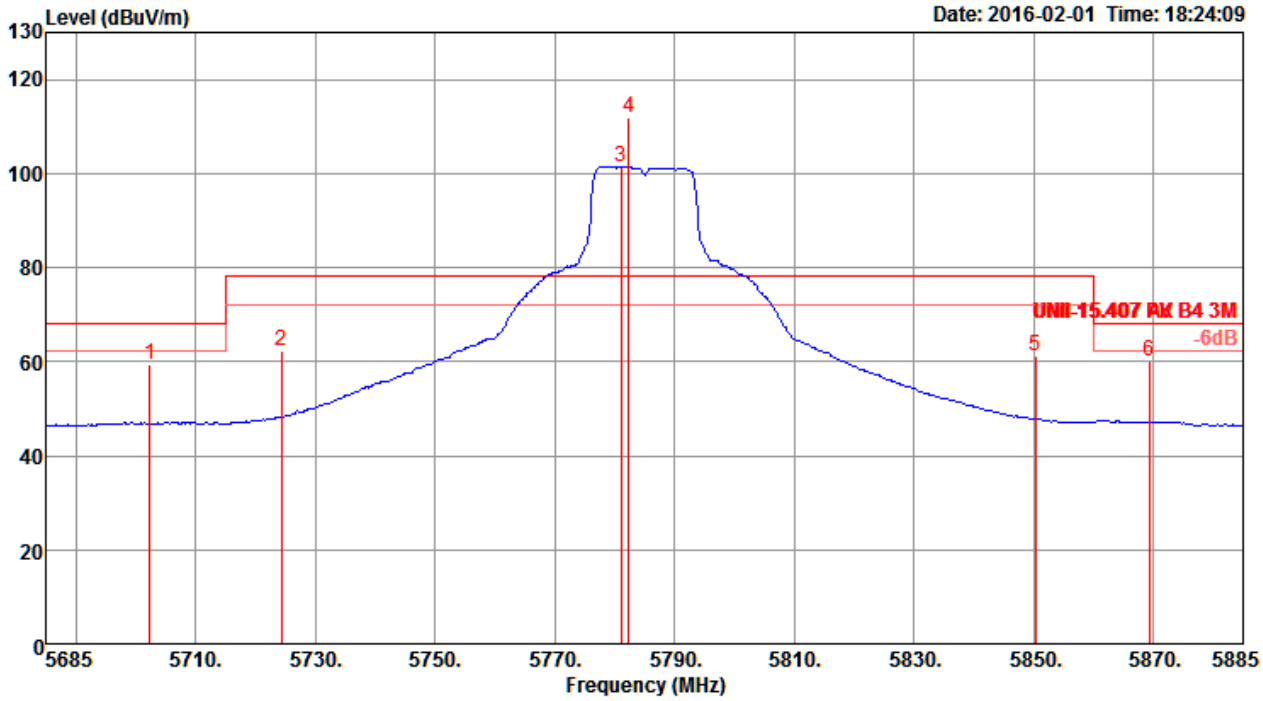


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5712.95	67.55	68.20	-0.65	61.11	6.50	34.45	34.51	159	100	Peak	VERTICAL
2	5723.53	78.12	78.20	-0.08	71.70	6.43	34.50	34.51	159	100	Peak	VERTICAL
3	5747.24	108.04			101.65	6.36	34.55	34.52	159	100	Peak	VERTICAL
4	5751.41	98.04			91.65	6.36	34.55	34.52	159	100	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5745 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Channel 157

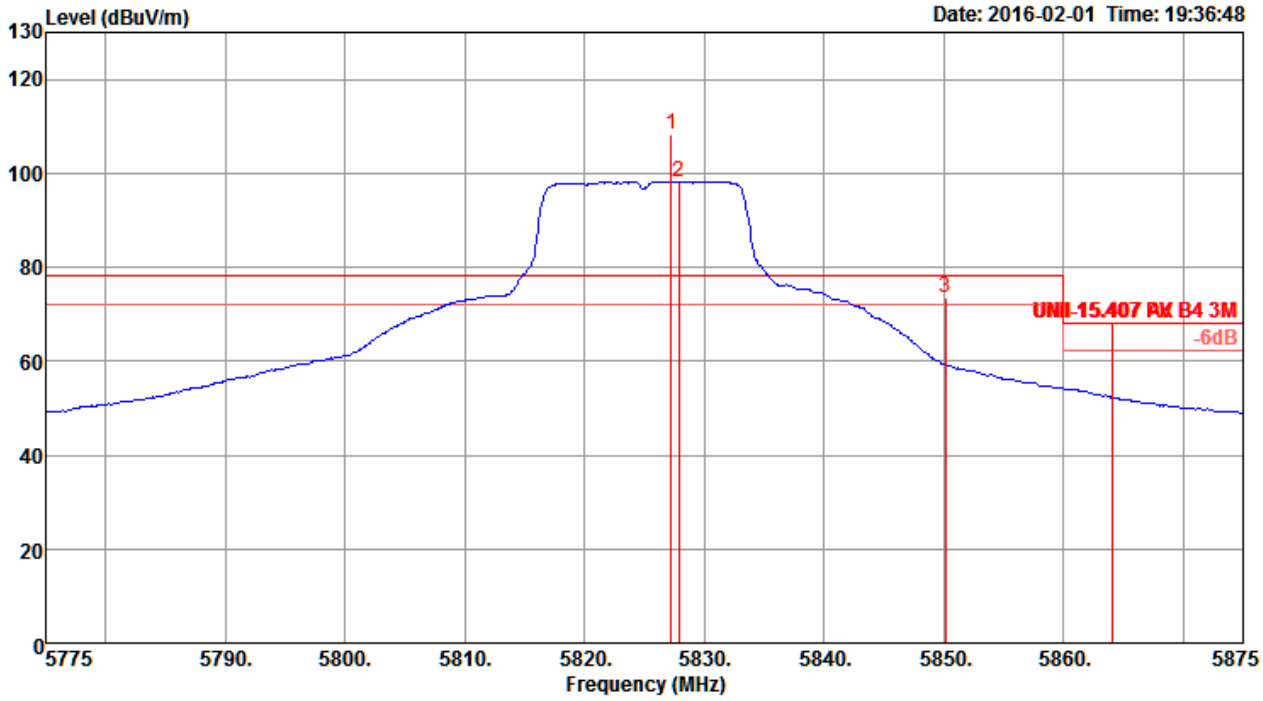


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5702.31	59.31	68.20	-8.89	52.85	6.57	34.40	34.51	134	176	Peak	VERTICAL
2	5724.42	62.19	78.20	-16.01	55.77	6.43	34.50	34.51	134	176	Peak	VERTICAL
3	5781.15	101.48			95.14	6.22	34.65	34.53	134	176	Average	VERTICAL
4	5782.44	111.73			105.39	6.22	34.65	34.53	134	176	Peak	VERTICAL
5	5850.39	61.20	78.20	-17.00	54.50	6.39	34.85	34.54	134	176	Peak	VERTICAL
6	5869.30	60.25	68.20	-7.95	53.42	6.47	34.90	34.54	134	176	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5785 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Channel 165



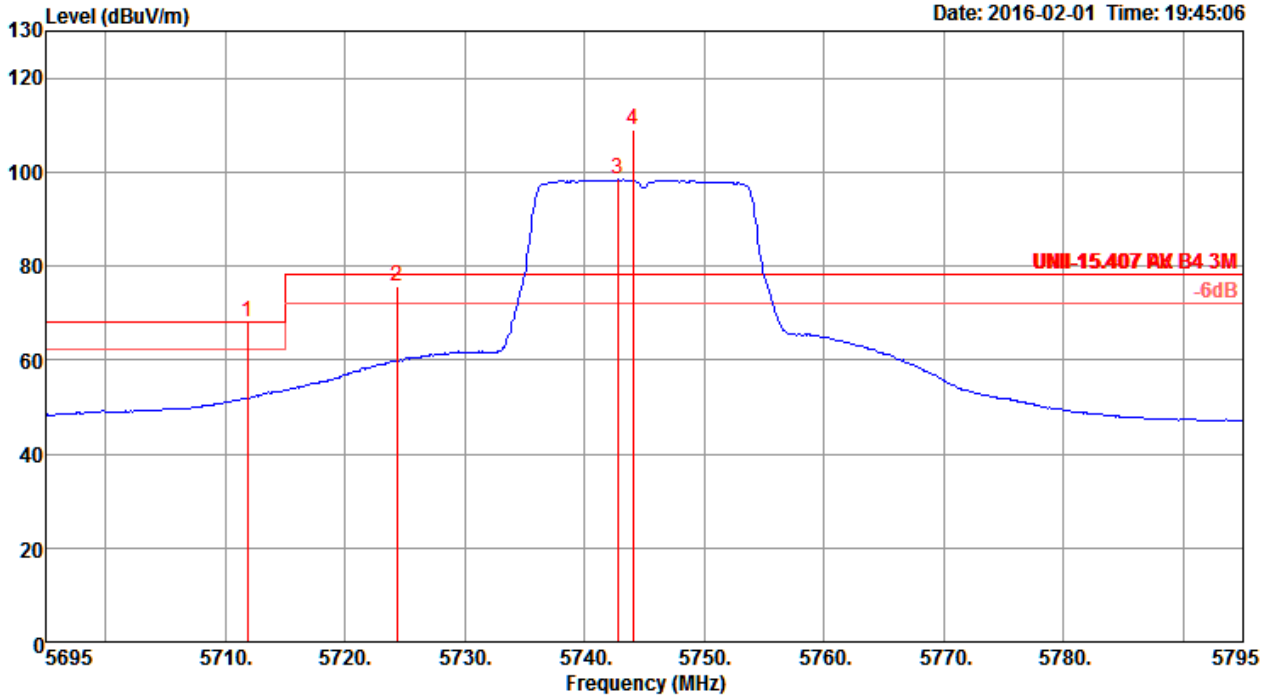
	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5827.24	108.41			101.84	6.31	34.80	34.54	144	100	Peak	HORIZONTAL
2	5827.89	98.24			91.67	6.31	34.80	34.54	144	100	Average	HORIZONTAL
3	5850.16	73.56	78.20	-4.64	66.86	6.39	34.85	34.54	144	100	Peak	HORIZONTAL
4	5864.10	68.15	68.20	-0.05	61.32	6.47	34.90	34.54	144	100	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5825 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1

Channel 149

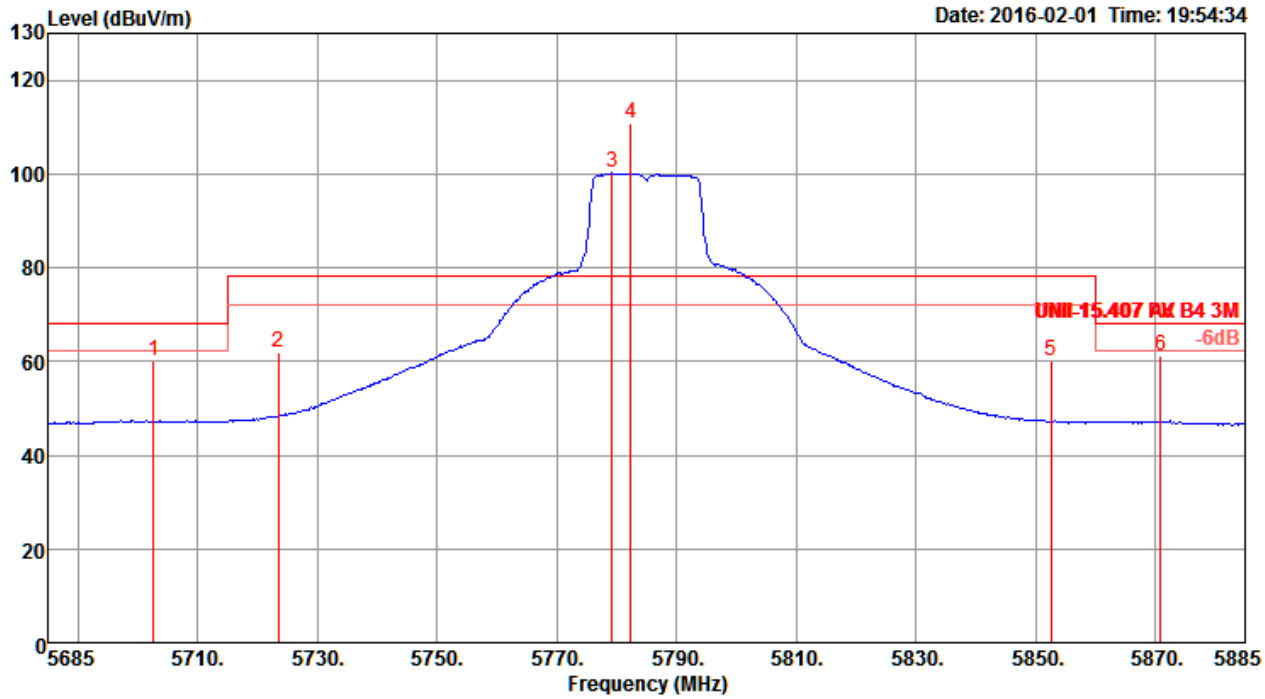


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5711.83	67.91	68.20	-0.29	61.47	6.50	34.45	34.51	158	103	Peak	VERTICAL
2	5724.33	75.61	78.20	-2.59	69.19	6.43	34.50	34.51	158	103	Peak	VERTICAL
3	5742.76	98.39			92.00	6.36	34.55	34.52	158	103	Average	VERTICAL
4	5744.04	109.12			102.73	6.36	34.55	34.52	158	103	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5745 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Channel 157

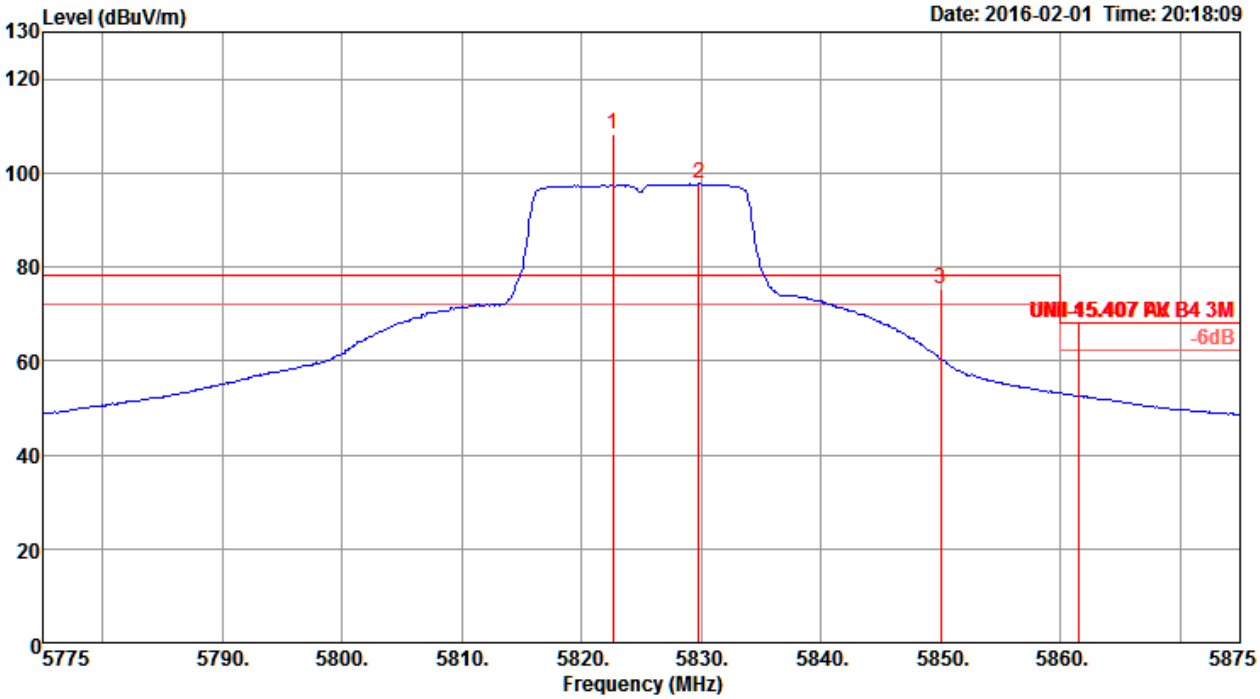


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5702.63	60.07	68.20	-8.13	53.61	6.57	34.40	34.51	159	102	Peak	VERTICAL
2	5723.46	61.93	78.20	-16.27	55.51	6.43	34.50	34.51	159	102	Peak	VERTICAL
3	5779.23	100.15			93.81	6.22	34.65	34.53	159	102	Average	VERTICAL
4	5782.44	110.94			104.60	6.22	34.65	34.53	159	102	Peak	VERTICAL
5	5852.56	59.99	78.20	-18.21	53.29	6.39	34.85	34.54	159	102	Peak	VERTICAL
6	5870.90	61.16	68.20	-7.04	54.33	6.47	34.90	34.54	159	102	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5785 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Channel 165



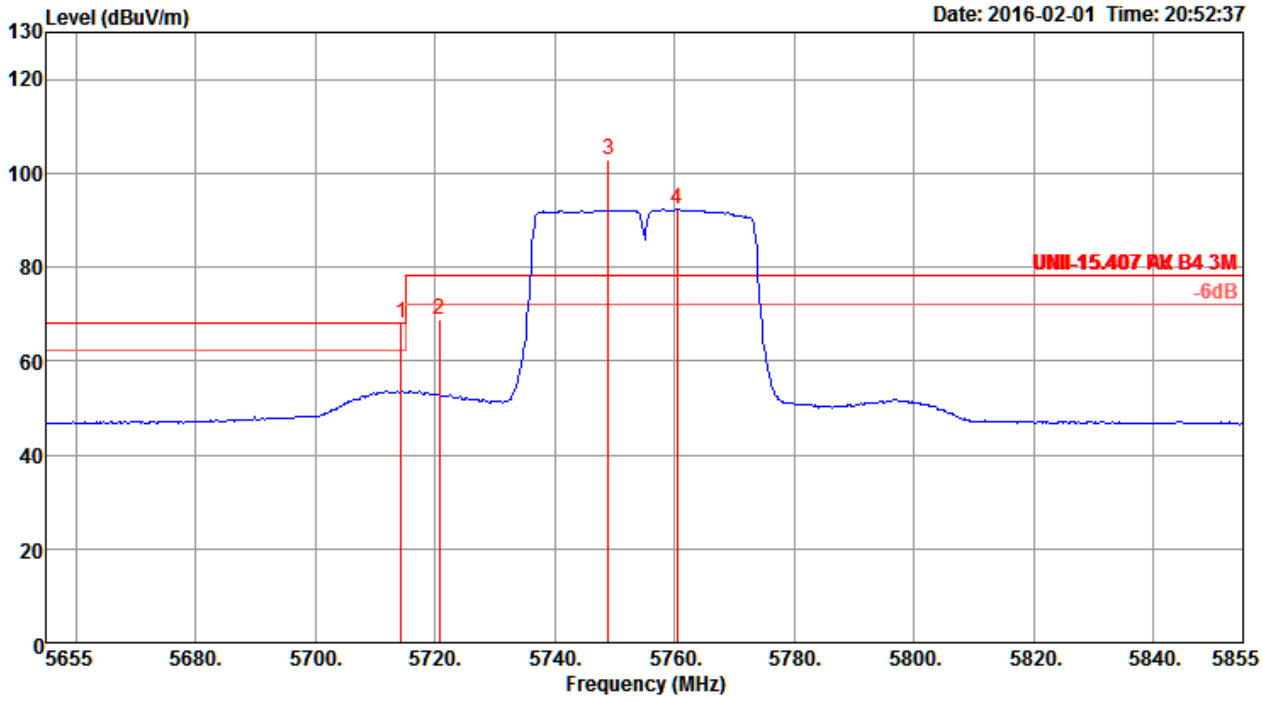
	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5822.60	108.12			101.55	6.31	34.80	34.54	144	100	Peak	HORIZONTAL
2	5829.81	97.60			91.03	6.31	34.80	34.54	144	100	Average	HORIZONTAL
3	5850.00	75.38	78.20	-2.82	68.68	6.39	34.85	34.54	144	100	Peak	HORIZONTAL
4	5861.54	68.01	68.20	-0.19	61.18	6.47	34.90	34.54	144	100	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5825 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1

Channel 151

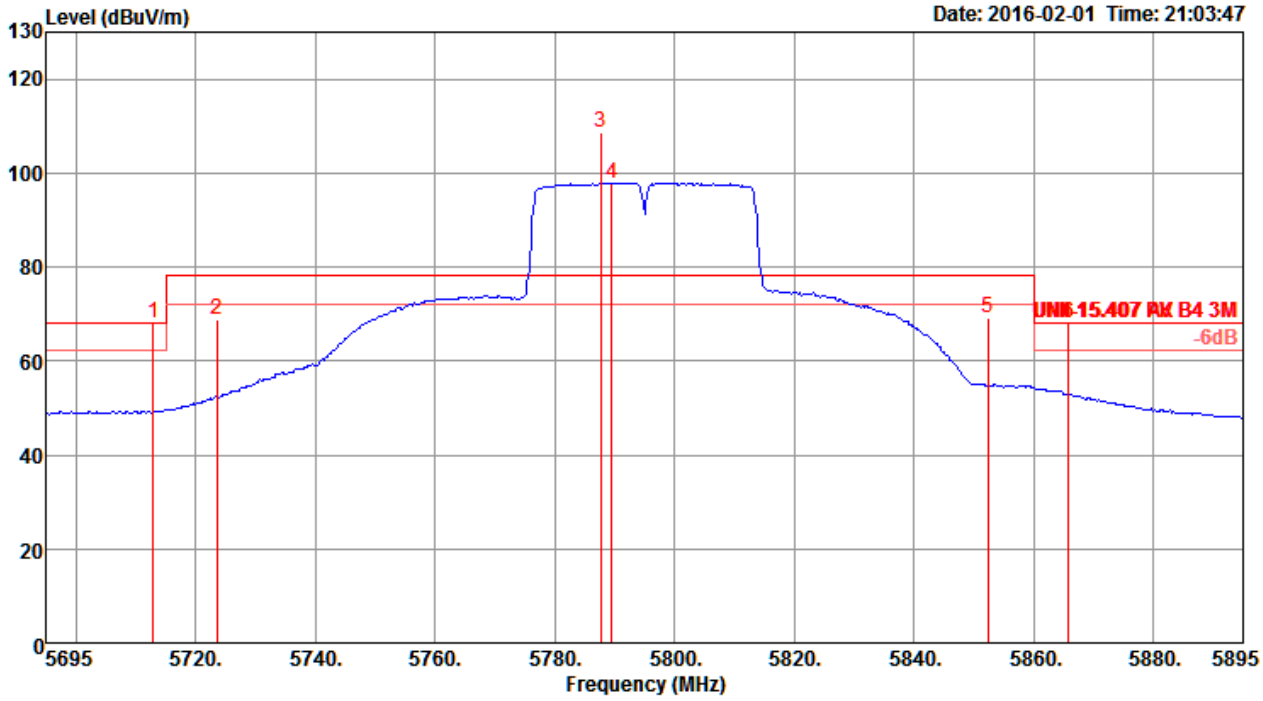


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5714.30	68.11	68.20	-0.09	61.67	6.50	34.45	34.51	157	100	Peak	VERTICAL
2	5720.71	68.75	78.20	-9.45	62.31	6.50	34.45	34.51	157	100	Peak	VERTICAL
3	5748.91	103.00			96.61	6.36	34.55	34.52	157	100	Peak	VERTICAL
4	5760.45	92.36			85.99	6.29	34.60	34.52	157	100	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5755 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Channel 159



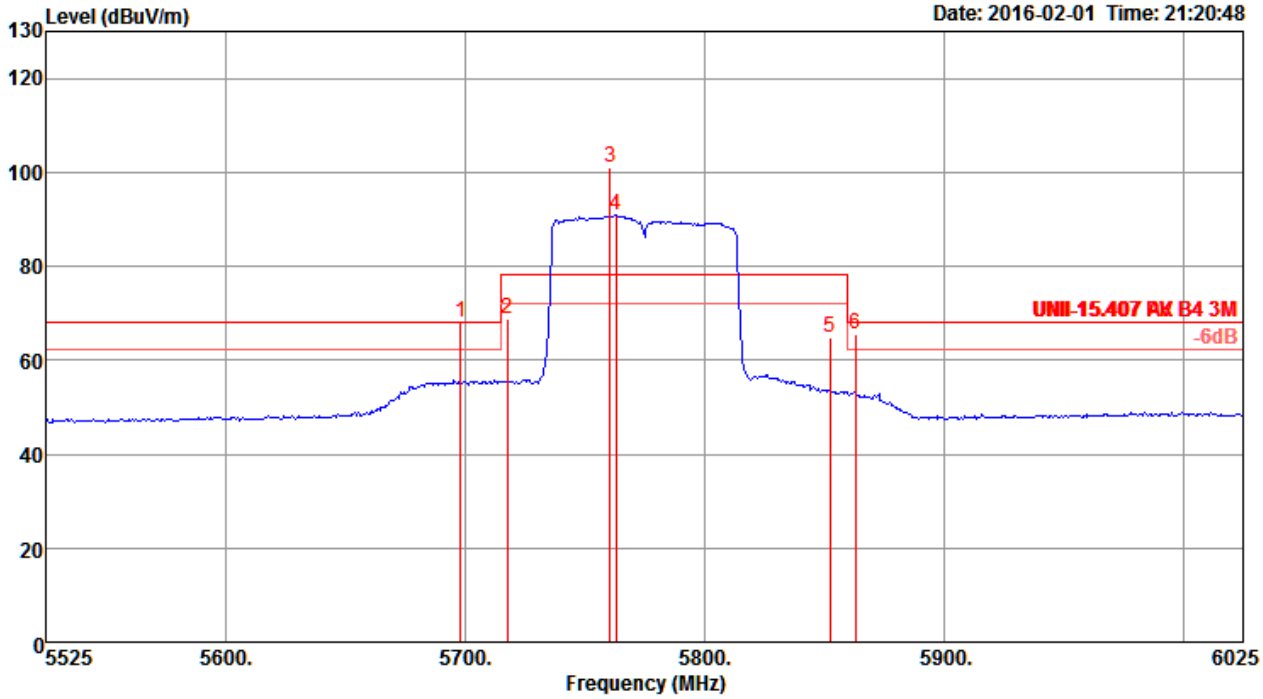
	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5712.95	68.02	68.20	-0.18	61.58	6.50	34.45	34.51	131	203	Peak	VERTICAL
2	5723.53	68.77	78.20	-9.43	62.35	6.43	34.50	34.51	131	203	Peak	VERTICAL
3	5787.63	108.70			102.36	6.22	34.65	34.53	131	203	Peak	VERTICAL
4	5789.55	97.93			91.61	6.15	34.70	34.53	131	203	Average	VERTICAL
5	5852.37	69.14	78.20	-9.06	62.44	6.39	34.85	34.54	131	203	Peak	VERTICAL
6	5865.83	68.14	68.20	-0.06	61.31	6.47	34.90	34.54	131	203	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5795 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	23℃	Humidity	60%
Test Engineer	Gary Chu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1

Channel 155



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5698.08	67.98	68.20	-0.22	61.52	6.57	34.40	34.51	158	100	Peak	VERTICAL
2	5717.79	68.82	78.20	-9.38	62.38	6.50	34.45	34.51	158	100	Peak	VERTICAL
3	5760.58	101.11			94.74	6.29	34.60	34.52	158	100	Peak	VERTICAL
4	5762.98	90.83			84.46	6.29	34.60	34.52	158	100	Average	VERTICAL
5	5852.40	64.68	78.20	-13.52	57.98	6.39	34.85	34.54	158	100	Peak	VERTICAL
6	5863.14	65.37	68.20	-2.83	58.54	6.47	34.90	34.54	158	100	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5775 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

4.7. Frequency Stability Measurement

4.7.1. Limit

In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).

4.7.2. Measuring Instruments and Setting

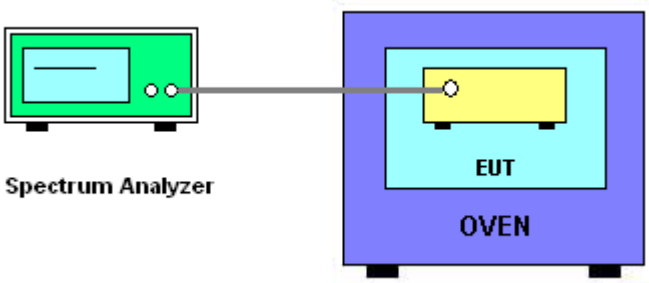
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RBW	10 kHz
VBW	10 kHz
Sweep Time	Auto

4.7.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
6. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
7. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
8. Extreme temperature is 0°C~70°C.

4.7.4. Test Setup Layout



4.7.5. Test Deviation

There is no deviation with the original standard.

4.7.6. EUT Operation during Test

The EUT was programmed to be in continuously un-modulation transmitting mode.

4.7.7. Test Result of Frequency Stability

Temperature	21°C	Humidity	60%
Test Engineer	Lucas Huang	Test Date	Dec. 25, 2015

Mode: 20 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9485	5784.9471	5784.9453	5784.9432
110.00	5784.9473	5784.9460	5784.9444	5784.9425
93.50	5784.9459	5784.9448	5784.9436	5784.9414
Max. Deviation (MHz)	0.0541	0.0552	0.0564	0.0586
Max. Deviation (ppm)	9.35	9.54	9.75	10.13
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5784.9532	5784.9520	5784.9501	5784.9479
10	5784.9519	5784.9506	5784.9491	5784.9473
20	5784.9507	5784.9494	5784.9478	5784.9459
30	5784.9493	5784.9482	5784.9468	5784.9452
40	5784.9477	5784.9462	5784.9446	5784.9426
50	5784.9460	5784.9448	5784.9433	5784.9406
60	5784.9460	5784.9448	5784.9433	5784.9406
70	5784.9460	5784.9448	5784.9433	5784.9406
Max. Deviation (MHz)	0.0540	0.0552	0.0567	0.0594
Max. Deviation (ppm)	9.33	9.54	9.80	10.27
Result	Complies			

Mode: 40 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9439	5754.9425	5754.9407	5754.9386
110.00	5754.9427	5754.9414	5754.9398	5754.9379
93.50	5754.9413	5754.9402	5754.9390	5754.9368
Max. Deviation (MHz)	0.0587	0.0598	0.0610	0.0632
Max. Deviation (ppm)	10.20	10.39	10.60	10.98
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5754.9420	5754.9408	5754.9389	5754.9367
10	5754.9407	5754.9394	5754.9379	5754.9361
20	5754.9395	5754.9382	5754.9366	5754.9347
30	5754.9381	5754.9370	5754.9356	5754.9340
40	5754.9365	5754.9350	5754.9334	5754.9314
50	5754.9348	5754.9336	5754.9321	5754.9294
60	5754.9348	5754.9336	5754.9321	5754.9294
70	5754.9348	5754.9336	5754.9321	5754.9294
Max. Deviation (MHz)	0.0652	0.0664	0.0679	0.0706
Max. Deviation (ppm)	11.33	11.54	11.80	12.27
Result	Complies			

Mode: 80 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9398	5774.9384	5774.9366	5774.9345
110.00	5774.9386	5774.9373	5774.9357	5774.9338
93.50	5774.9372	5774.9361	5774.9349	5774.9327
Max. Deviation (MHz)	0.0628	0.0639	0.0651	0.0673
Max. Deviation (ppm)	10.87	11.06	11.27	11.65
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5774.9433	5774.9421	5774.9402	5774.9380
10	5774.9420	5774.9407	5774.9392	5774.9374
20	5774.9408	5774.9395	5774.9379	5774.9360
30	5774.9394	5774.9383	5774.9369	5774.9353
40	5774.9378	5774.9363	5774.9347	5774.9327
50	5774.9361	5774.9349	5774.9334	5774.9307
60	5774.9361	5774.9349	5774.9334	5774.9307
70	5774.9361	5774.9349	5774.9334	5774.9307
Max. Deviation (MHz)	0.0639	0.0651	0.0666	0.0693
Max. Deviation (ppm)	11.06	11.27	11.53	11.99
Result	Complies			

4.8. Antenna Requirements

4.8.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. 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 shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.8.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 12, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Feb.10, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-l0-7	N/A	N/A	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%