



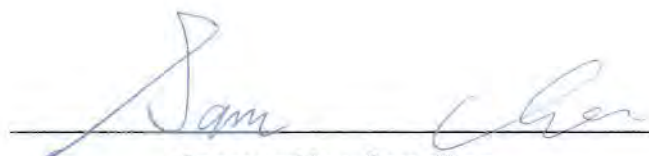
NCC RADIO TEST REPORT

Equipment : 雙頻無線接入點
Brand Name : UBIQUITI
Model Name : UAP-AC-SHD
Applicant : 香港商優比快科技有限公司台灣分公司
臺北市信義區松仁路 107 號 12 樓
Manufacturer : Ubiquiti Networks, Inc.
685 Third Avenue, 27th Floor New York, New York
10017 USA
Standard : NCC LP0002 Section 4.7

The product was received on Jun. 17, 2016, and testing was started from Aug. 05, 2016 and completed on Aug. 06, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013, NCC LP0002 (Jan. 10, 2018), KDB789033 D02 v02r01, KDB662911 D01 v02r01, ET Docket No. 13-49; FCC 16-24 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2.1	2.3	AC Power Line Conducted Emissions	PASS	-
2.2	4.7.3	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	PASS	-
2.3	4.7.5	6dB Spectrum Bandwidth	PASS	-
2.4	4.7.3	Maximum Conducted Output Power	PASS	-
2.5	4.7.3	Power Spectral Density	PASS	-
2.6	4.7.4	Radiated Emissions	PASS	-
2.7	4.7.4	Band Edge Emissions	PASS	-
2.8	4.7.8	Antenna Requirements	PASS	-
Reference to Sporton Project No.: 661623-07				

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Viola Huang

1. General Information

1.1. Product Details

Items	Description
Product Type	WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From PoE
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	5150~5250MHz / 5725~5850MHz
Channel Number	9 for 20MHz bandwidth ; 4 for 40MHz bandwidth 2 for 80MHz bandwidth
Channel Bandwidth (99%)	For non-beamforming mode For indoor use master B1 and indoor, outdoor use B4 U-NII-1: IEEE 802.11a: 15.72 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 16.50 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 35.89 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.54 MHz U-NII-3: IEEE 802.11a: 24.14 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 25.88 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 44.86 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz For indoor use slave without radar detection B1 U-NII-1: IEEE 802.11a: 15.46 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 16.41 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 35.89 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.54 MHz

	For outdoor use master B1 U-NII-1: IEEE 802.11a: 15.54 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 16.32 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.03 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.54 MHz For indoor use master and slave without radar detection U-NII-1: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 76.12 MHz U-NII-3: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 74.96 MHz For outdoor use master U-NII-1: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 76.41 MHz U-NII-3: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 71.20 MHz For beamforming mode For indoor use master B1 and indoor, outdoor use B4 U-NII-1: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.06 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.05 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.12 MHz U-NII-3: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.15 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.05 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz For indoor use slave without radar detection B1 U-NII-1: IEEE 802.11ac MCS0/Nss1 (VHT20): 17.97 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.90 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz For outdoor use master B1 U-NII-1: IEEE 802.11ac MCS0/Nss1 (VHT20): 17.97 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.90 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz
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	For indoor use master and slave without radar detection U-NII-1: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 76.12 MHz U-NII-3: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 76.12 MHz For outdoor use master B1 U-NII-1: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 76.12 MHz U-NII-3: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 76.12 MHz
Maximum Conducted Output Power	For Non-beamforming mode For indoor use master B1 and indoor, outdoor use B4 U-NII-1: IEEE 802.11a: 24.32 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 24.14 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 26.15 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 20.57 dBm U-NII-3: IEEE 802.11a: 29.04 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 28.91 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 28.66 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 23.72 dBm For indoor use slave without radar detection B1 U-NII-1: IEEE 802.11a: 18.35 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 18.24 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 21.20 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 20.57 dBm For outdoor use master B1 U-NII-1: IEEE 802.11a: 14.98 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 14.75 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 14.78 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 14.76 dBm For indoor use master U-NII-1: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 18.32 dBm

	U-NII-3: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 18.52 dBm For indoor use slave without radar detection U-NII-1: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 18.32 dBm U-NII-3: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 18.52 dBm For outdoor use master U-NII-1: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 14.70 dBm U-NII-3: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 14.63 dBm For beamforming mode For indoor use master B1 and indoor, outdoor use B4 U-NII-1: IEEE 802.11ac MCS0/Nss1 (VHT20): 23.74 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.82 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 22.36 dBm U-NII-3: IEEE 802.11ac MCS0/Nss1 (VHT20): 23.43 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.47 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 23.48 dBm For indoor use slave without radar detection B1 U-NII-1: IEEE 802.11ac MCS0/Nss1 (VHT20): 17.54 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 17.71 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.36 dBm For outdoor use master B1 U-NII-1: IEEE 802.11ac MCS0/Nss1 (VHT20): 8.65 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 8.46 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 8.33 dBm For indoor use master U-NII-1: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 18.50 dBm U-NII-3: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 18.42 dBm
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	For indoor use slave without radar detection U-NII-1: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 18.50 dBm U-NII-3: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 18.42 dBm For outdoor use master U-NII-1: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 11.86 dBm U-NII-3: IEEE 802.11ac MCS0/Nss2 (VHT80+80): 11.41 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

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

Note: The above information was declared by manufacturer.

Note: The EUT has beamforming function for 802.11n/ac.

Antenna and Bandwidth

Antenna	Four (TX)		
Bandwidth 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 Ports (NTX)	Data Rate / MCS
802.11n (HT20)	4	MCS 0-31
802.11n (HT40)	4	MCS 0-31
802.11ac (VHT20)	4	MCS 0-9/Nss1-4
802.11ac (VHT40)	4	MCS 0-9/Nss1-4
802.11ac (VHT80)	4	MCS 0-9/Nss1-4

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

1.2. Accessories

Equipment Name	Brand Name	Model Name	P/N	Rating
PoE	UBIQUITI	GP-H480-050G	POE-48-24W-G-WH	Input: 100-240V~50/60Hz, MAX 0.75A(0.75A) Output: 48V, 0.5A(0.5A)
Others				
Equipment Name		Brand Name	Model Name	Remark
Power cable*1		UBIQUITI	CH-1902+CH-1106	Non-shielded, 0.6m
Cradle*1 (plastic)				
Cradle*1 (iron)				

1.3. Table for Filed Antenna

For 2.4GHz WLAN function

Ant.	Port	Brand	Model Name	Antenna Type	Connector	TX/RX Gain (dBi)
1	1	-	-	PIFA Antenna	N/A	6
2	2	-	-	PIFA Antenna	N/A	6
3	3	-	-	PIFA Antenna	N/A	6
4	4	-	-	PIFA Antenna	N/A	6

For 5GHz WLAN function

Ant.	Port	Brand	Model Name	Antenna Type	Connector	TX/RX Gain (dBi)
5	1	-	-	PIFA Antenna	N/A	6
6	2	-	-	PIFA Antenna	N/A	6
7	3	-	-	PIFA Antenna	N/A	6
8	4	-	-	PIFA Antenna	N/A	6

For Bluetooth function

Ant.	Port	Brand	Model Name	Antenna Type	Connector	TX/RX Gain (dBi)
9	1	-	-	PIFA Antenna	N/A	1

For RX function

Ant.	Port	Brand	Model Name	Antenna Type	Connector	RX Gain (dBi)	
						2.4GHz	5GHz
10	1	-	-	PIFA Antenna	N/A	1	2

Note: The above information was declared by manufacturer.

Note: The EUT has ten antennas.

For 2.4GHz WLAN function

IEEE 802.11b/g/n/ac mode (4TX/4RX): The module has four ports.

Port 1, port 2, port 3 and port 4 can be used as transmitting/receiving antenna.

Port 1, port 2, port 3 and port 4 could transmit/receive simultaneously.

For 5GHz WLAN function

IEEE 802.11a/n/ac mode (4TX/4RX): The module has four ports.

Port 1, port 2, port 3 and port 4 can be used as transmitting/receiving antenna.

Port 1, port 2, port 3 and port 4 could transmit/receive simultaneously.

For Bluetooth function: The module has one port only.

Port 1 can be used as transmitting/receiving antenna.

For RX function (scan radio): The module has one port only.

Only Port 1 can be used as receiving antenna.

1.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 36, 40, 44, 48, 149, 153, 157, 161, 165.

For 40MHz bandwidth systems, use Channel 38, 46, 151, 159.

For 80MHz bandwidth systems, use Channel 42, 155.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5150~5250 MHz U-NII-1	36	5180 MHz	44	5220 MHz
	38	5190 MHz	46	5230 MHz
	40	5200 MHz	48	5240 MHz
	42	5210 MHz	-	-
5725~5850 MHz U-NII-3	149	5745 MHz	157	5785 MHz
	151	5755 MHz	159	5795 MHz
	153	5765 MHz	161	5805 MHz
	155	5775 MHz	165	5825 MHz

1.5. Table for 80+80 MHz Mode

Type	Channel No.	Frequency
1	42+155	5210+5775 MHz

Note: The EUT supports Non-beamforming mode and beamforming mode.

1.6. 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	Port
AC Power Conducted Emission	Intentional-CTX	-	-	-
	Unintentional-CRX	-	-	-
Max. Conducted Output Power	For non-beamforming mode			
	For B1 indoor use master and B4 indoor, outdoor use			
	11a/BPSK	U-NII-1 U-NII-3	6Mbps 36/40/48/ 149/157/165	1+2+3+4
	11ac VHT20	U-NII-1 U-NII-3	MCS0/Nss1 36/40/48/ 149/157/165	1+2+3+4
	11ac VHT40	U-NII-1 U-NII-3	MCS0/Nss1 38/46/151/159	1+2+3+4
	11ac VHT80	U-NII-1 U-NII-3	MCS0/Nss1 42/155	1+2+3+4
	For B1 indoor use slave without radar detection, B1 outdoor use master			
	11a/BPSK	U-NII-1	6Mbps 36/40/48	1+2+3+4
	11ac VHT20	U-NII-1	MCS0/Nss1 36/40/48	1+2+3+4
	11ac VHT40	U-NII-1	MCS0/Nss1 38/46	1+2+3+4
	11ac VHT80	U-NII-1	MCS0/Nss1 42	1+2+3+4
	For beamforming mode			
	For B1 indoor use master and B4 indoor, outdoor use master			
	11ac VHT20	U-NII-1 U-NII-3	MCS0/Nss1 36/40/48/ 149/157/165	1+2+3+4
	11ac VHT40	U-NII-1 U-NII-3	MCS0/Nss1 38/46/151/159	1+2+3+4
	11ac VHT80	U-NII-1 U-NII-3	MCS0/Nss1 42/155	1+2+3+4
	For B1 indoor use slave without radar detection, B1 outdoor use master			
	11ac VHT20	U-NII-1	MCS0/Nss1 36/40/48	1+2+3+4
	11ac VHT40	U-NII-1	MCS0/Nss1 38/46	1+2+3+4
	11ac VHT80	U-NII-1	MCS0/Nss1 42	1+2+3+4

Power Spectral Density	For non-beamforming mode				
	For B1 indoor use master and B4 indoor, outdoor use				
	11a/BPSK	U-NII-1 U-NII-3	6Mbps	36/40/48/ /149/157/165	1+2+3+4
	11ac VHT20	U-NII-1 U-NII-3	MCS0/Nss1	36/40/48/ /149/157/165	1+2+3+4
	11ac VHT40	U-NII-1 U-NII-3	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	U-NII-1 U-NII-3	MCS0/Nss1	42/155	1+2+3+4
	For B1 indoor use slave without radar detection, B1 outdoor use master				
	11a/BPSK	U-NII-1	6Mbps	36/40/48	1+2+3+4
	11ac VHT20	U-NII-1	MCS0/Nss1	36/40/48	1+2+3+4
	11ac VHT40	U-NII-1	MCS0/Nss1	38/46	1+2+3+4
	11ac VHT80	U-NII-1	MCS0/Nss1	42	1+2+3+4
	For beamforming mode				
	For B1 indoor use master and B4 indoor, outdoor use master				
	11ac VHT20	U-NII-1 U-NII-3	MCS0/Nss1	36/40/48/ /149/157/165	1+2+3+4
	11ac VHT40	U-NII-1 U-NII-3	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	U-NII-1 U-NII-3	MCS0/Nss1	42/155	1+2+3+4
	For B1 indoor use slave without radar detection, B1 outdoor use master				
	11ac VHT20	U-NII-1	MCS0/Nss1	36/40/48	1+2+3+4
	11ac VHT40	U-NII-1	MCS0/Nss1	38/46	1+2+3+4
	11ac VHT80	U-NII-1	MCS0/Nss1	42	1+2+3+4

26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	For non-beamforming mode				
	For B1 indoor use master and B4 indoor, outdoor use				
	11a/BPSK	U-NII-1 U-NII-3	6Mbps	36/40/48/ /149/157/165	1+2+3+4
	11ac VHT20	U-NII-1 U-NII-3	MCS0/Nss1	36/40/48/ /149/157/165	1+2+3+4
	11ac VHT40	U-NII-1 U-NII-3	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	U-NII-1 U-NII-3	MCS0/Nss1	42/155	1+2+3+4
	For B1 indoor use slave without radar detection, B1 outdoor use master				
	11a/BPSK	U-NII-1	6Mbps	36/40/48	1+2+3+4
	11ac VHT20	U-NII-1	MCS0/Nss1	36/40/48	1+2+3+4
	11ac VHT40	U-NII-1	MCS0/Nss1	38/46	1+2+3+4
	11ac VHT80	U-NII-1	MCS0/Nss1	42	1+2+3+4
	For beamforming mode				
	For B1 indoor use master and B4 indoor, outdoor use master				
	11ac VHT20	U-NII-1 U-NII-3	MCS0/Nss1	36/40/48/ 149/157/165	1+2+3+4
	11ac VHT40	U-NII-1 U-NII-3	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	U-NII-1 U-NII-3	MCS0/Nss1	42/155	1+2+3+4
	For B1 indoor use slave without radar detection, B1 outdoor use master				
	11ac VHT20	U-NII-1	MCS0/Nss1	36/40/48	1+2+3+4
	11ac VHT40	U-NII-1	MCS0/Nss1	38/46	1+2+3+4
	11ac VHT80	U-NII-1	MCS0/Nss1	42	1+2+3+4

6dB Spectrum Bandwidth Measurement	For non-beamforming mode				
	11a/BPSK	U-NII-3	6Mbps	149/157/165	1+2+3+4
	11ac VHT20	U-NII-3	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	U-NII-3	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	U-NII-3	MCS0/Nss1	155	1+2+3+4
	For beamforming mode				
	11ac VHT20	U-NII-3	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	U-NII-3	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	U-NII-3	MCS0/Nss1	155	1+2+3+4
Radiated Emission Below 1GHz	Intentional-CTX		-	-	-
	Unintentional-CRX		-	-	-
Radiated Emission Unintentional 1GHz~5 th Harmonic	Unintentional-CRX		-	-	-
Radiated Emission Intentional 1GHz~10 th Harmonic	For non-beamforming mode				
	11a/BPSK	U-NII-1 U-NII-3	6Mbps	36/40/48/ 149/157/165	1+2+3+4
	11ac VHT20	U-NII-1 U-NII-3	MCS0/Nss1	36/40/48/ 149/157/165	1+2+3+4
	11ac VHT40	U-NII-1 U-NII-3	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	U-NII-1 U-NII-3	MCS0/Nss1	42/155	1+2+3+4
	For beamforming mode				
	11ac VHT20	U-NII-1 U-NII-3	MCS0/Nss1	36/40/48/ 149/157/165	1+2+3+4
	11ac VHT40	U-NII-1 U-NII-3	MCS0/Nss1	38/46/ 151/159	1+2+3+4
	11ac VHT80	U-NII-1 U-NII-3	MCS0/Nss1	42/ 155	1+2+3+4

Band Edge Emission	For non-beamforming mode				
	11a/BPSK	U-NII-1 U-NII-3	6Mbps	36/40/48/ 149/157/165	1+2+3+4
	11ac VHT20	U-NII-1 U-NII-3	MCS0/Nss1	36/40/48/ 149/157/165	1+2+3+4
	11ac VHT40	U-NII-1 U-NII-3	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	U-NII-1 U-NII-3	MCS0/Nss1	42/155	1+2+3+4
	For beamforming mode				
	11ac VHT20	U-NII-1 U-NII-3	MCS0/Nss1	36/40/48/ 149/157/165	1+2+3+4
	11ac VHT40	U-NII-1 U-NII-3	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	U-NII-1 U-NII-3	MCS0/Nss1	42/ 155	1+2+3+4

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: There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for 802.11n/ac. All test results were recorded in the report.

Note 3: The EUT supports P to M and P to P operating mode. After evaluating, the P to M is the worst operating mode. And it was tested and recorded in the report.

802.11ac MCS0/Nss2 VHT80+80

Test Items	Mode		Data Rate	Type	Channel	Port
Max. Conducted Output Power Power Spectral Density 26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement Radiated Emission Above 1GHz Band Edge Emission	11ac VHT80+80	U-NII-1 U-NII-3	MCS0/Nss2	For indoor use master		
				1	42	1+2
					155	3+4
				For indoor use slave without radar detection, outdoor use master B1		
				1	42	1+2
155	3+4					
6dB Spectrum Bandwidth Measurement	11ac VHT80+80	U-NII-3	MCS0/Nss2	For indoor use master		
				1	42	-
					155	3+4
				For indoor use slave without radar detection, outdoor use master B1		
				1	42	-
155	3+4					

Note: The EUT supports beamforming mode supports type 1 for master and slave without radar detection.

The test mode as above, the type of slave without radar detection and outdoor master has been covered by indoor master.

The following test modes were performed for all tests:

For Conducted Emission test:

Intentional-CTX

Mode 1. EUT + 2.4GHz

Mode 2. EUT + 5GHz

Mode 3. EUT + Bluetooth

Mode 3 generated the worst test result, so it was recorded in this report.

Unintentional-CRX

Mode 1. EUT + 2.4GHz

Mode 2. EUT + 5GHz

Mode 3. EUT + Bluetooth

Mode 4. EUT + RX (scan radio_2.4GHz) function

Mode 5. EUT + RX (scan radio_5GHz) function

Mode 5 generated the worst test result, so it was recorded in this report.

For Radiated Emission test (Below 1GHz):

For 2.4GHz / 5GHz / RX (scan radio_2.4GHz) function

The EUT was performed at Y axis and Z axis position. The worst case was found at Z axis, thus the measurement will follow this same test configuration.

For Bluetooth / RX (scan radio_5GHz) function

The EUT was performed at Y axis and Z axis position. The worst case was found at Y axis, thus the measurement will follow this same test configuration.

Intentional-CTX

Mode 1. EUT in Z axis + 2.4GHz

Mode 2. EUT in Z axis + 5GHz

Mode 3. EUT in Y axis + Bluetooth

Mode 2 generated the worst test result, so it was recorded in this report.

Unintentional-CRX

Mode 1. EUT in Z axis + 2.4GHz

Mode 2. EUT in Z axis + 5GHz

Mode 3. EUT in Y axis + Bluetooth

Mode 4. EUT in Z axis + RX (scan radio_2.4GHz) function

Mode 5. EUT in Y axis + RX (scan radio_5GHz) function

Mode 3 generated the worst test result, so it was recorded in this report.

For Radiated Emission test (Unintentional 1GHz~5th Harmonic):

For 2.4GHz / 5GHz / RX (scan radio_2.4GHz) function

The EUT was performed at Y axis and Z axis position. The worst case was found at Z axis, thus the measurement will follow this same test configuration.

For Bluetooth / RX (scan radio_5GHz) function

The EUT was performed at Y axis and Z axis position. The worst case was found at Y axis, thus the measurement will follow this same test configuration.

Mode 1. EUT in Z axis + 2.4GHz

Mode 2. EUT in Z axis + 5GHz

Mode 3. EUT in Y axis + Bluetooth

Mode 4. EUT in Z axis + RX (scan radio_2.4GHz) function

Mode 5. EUT in Y axis + RX (scan radio_5GHz) function

Mode 2 generated the worst test result, so it was recorded in this report.

For Radiated Emission test (Intentional 1GHz~10th Harmonic):

The EUT was performed at Y axis and Z axis position. The worst case was found at Z axis, thus the measurement will follow this same test configuration.

Mode 1. EUT in Z axis

1.7. Table for Testing Locations

Test Site Location		
For other tests		
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	
For below 1GHz test		
Address:	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)	
TEL:	886-3-327-3456	
FAX:	886-3-327-0973	
Test Site No.	Site Category	Location
03CH05-CB	SAC	Hsin Chu
CO01-CB	Conduction	Hsin Chu
TH01-CB	OVEN Room	Hsin Chu
03CH03-HY	SAC	Hwa Ya

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

1.8. Table for Supporting Units

For Conduction (Intentional-CTX / Unintentional-CRX)

No.	Equipment	Brand Name	Model Name	FCC ID
A	LAN Notebook	DELL	E6430	N/A

For SAC (Below 1GHz: Intentional-CTX / Unintentional-CRX)

No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E5520	N/A

For SAC (Above 1GHz: Unintentional 1GHz~5th-CRX)

No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E4300	N/A

For SAC (Above 1GHz: Intentional 1GHz~10th-CTX)

For non-beamforming mode

No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E4300	N/A

For beamforming mode

No.	Equipment	Brand Name	Model Name	FCC ID
A	NB*2	DELL	E4300	N/A
B	RX Device	UBIQUITI	UAP-AC-SHD	SWX-UAPACSHD

For OVEN Room:

No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E4300	N/A
B	Fixture	UBIQUITI	UAP-AC-HD_REV03	N/A

1.9. 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.

For non-beamforming mode

For indoor use master B1 and indoor, outdoor use B4

Test Software Version	QCA					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	16.5	16.5	16.5	21	21	21
802.11ac MCS0/Nss1 VHT20	16.5	16.5	16.5	21	21	21
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz		5755 MHz	
	15.5		18.5		21	
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz			5775 MHz		
	11.5			16.5		

For indoor use slave without radar detection B1

Test Software Version	QCA		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5180 MHz	5200 MHz	5240 MHz
802.11a	10.5	10.5	10.5
802.11ac MCS0/Nss1 VHT20	10.5	10.5	10.5
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	
	13.5	13.5	
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5210 MHz		
	11.5		

For outdoor use master B1

Test Software Version	QCA		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5180 MHz	5200 MHz	5240 MHz
802.11a	6.5	6.5	6.5
802.11ac MCS0/Nss1 VHT20	6.5	6.5	6.5
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	
	6.5	6.5	
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5210 MHz		
	6.5		

802.11ac MCS0/Nss2 VHT80+80

For indoor use master and slave without radar detection.

Test Software Version	QCARCT V3.0.197.0
Mode	NCB: 80MHz+80MHz
802.11ac MCS0/Nss2 VHT80+80	Type 1
	5210+5775 MHz
	13.5

For outdoor use master B1

Test Software Version	QCA
Mode	NCB: 80MHz+80MHz
802.11ac MCS0/Nss2 VHT80+80	Type 1
	5210+5775 MHz
	9.5

For beamforming mode
For indoor use master B1 and indoor, outdoor use B4

Test Software Version	QCA v3.0.197.0					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11ac MCS0/Nss1 VHT20	22	22	22	22.5	22.5	22.5
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz		5755 MHz	
	22		22		22.5	
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz			5775 MHz		
	21.5			22		

For indoor use slave without radar detection B1

Test Software Version	QCA v3.0.197.0		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5180 MHz	5200 MHz	5240 MHz
802.11ac MCS0/Nss1 VHT20	16.5	16.5	16.5
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz
	16.5		16.5
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5210 MHz		
	16.5		

For outdoor use master B1

Test Software Version	QCA		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5180 MHz	5200 MHz	5240 MHz
802.11ac MCS0/Nss1 VHT20	7	7	7
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz
	7.5		7.5
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5210 MHz		
	7.5		

802.11ac MCS0/Nss2 VHT80+80
For indoor use master and slave without radar detection

Test Software Version	QCA
Mode	NCB: 80MHz+80MHz
802.11ac MCS0/Nss2 VHT80+80	Type 1
	5210+5775 MHz
	21

For outdoor use master B1

Test Software Version	QCA
Mode	NCB: 80MHz+80MHz
802.11ac MCS0/Nss2 VHT80+80	Type 1
	5210+5775 MHz
	14

1.10. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting/receiving mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

During the test, the following programs under WIN 7 were executed.

The program was executed as follows:

1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under Telnet.
3. Executed "Lantest.exe " to link with the remote workstation to receive and transmit packet by RX Deviec and transmit duty cycle no less 98%

1.11. Duty Cycle

For non-beamforming mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Min. VBW (kHz)
802.11a	2.060	2.140	96.26%	0.17	0.49
802.11ac MCS0/Nss1 VHT20	5.000	5.120	97.66%	0.10	0.20
802.11ac MCS0/Nss1 VHT40	2.400	2.500	96.00%	0.18	0.42
802.11ac MCS0/Nss1 VHT80	1.140	1.215	93.83%	0.28	0.88
802.11ac MCS0/Nss2 VHT80+80	2.220	2.320	95.69%	0.19	0.45

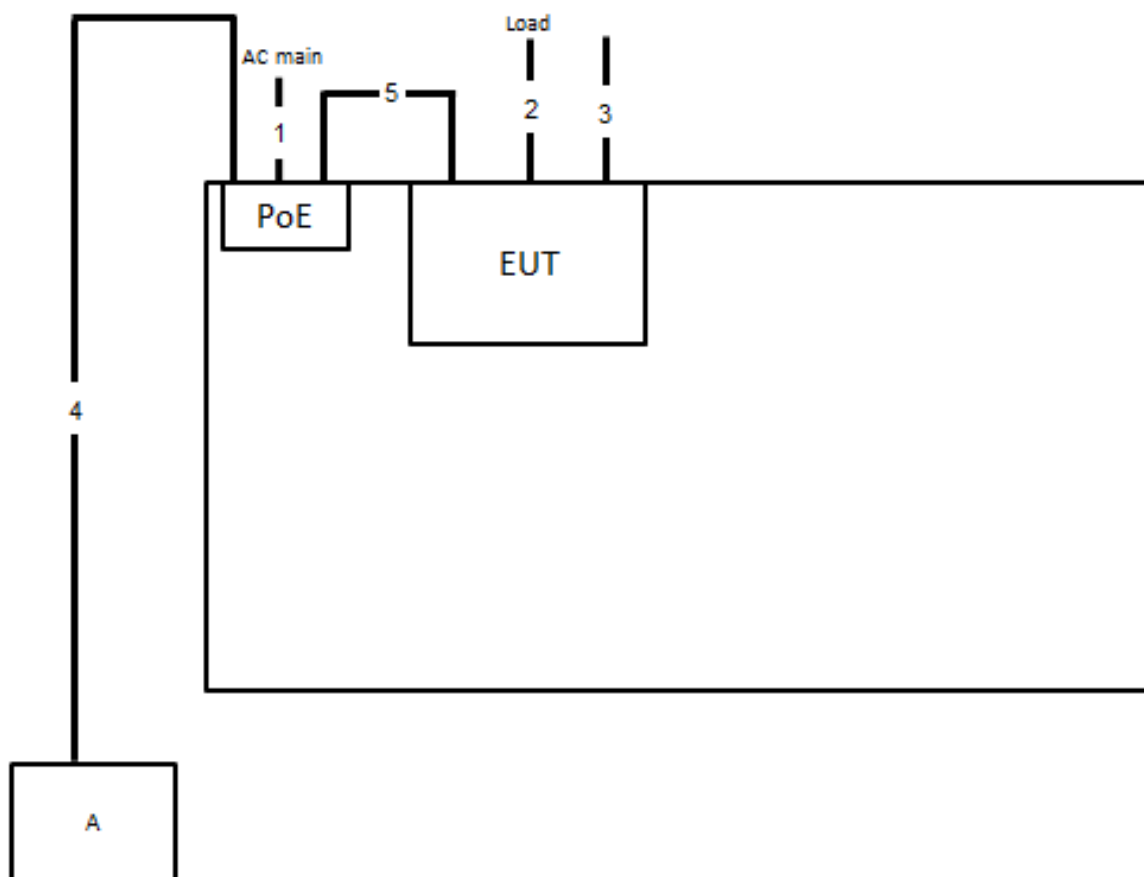
For beamforming mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Min. VBW (kHz)
802.11ac MCS0/Nss1 VHT20	1.830	1.933	94.70%	0.24	0.55
802.11ac MCS0/Nss1 VHT40	1.663	1.863	89.26%	0.49	0.60
802.11ac MCS0/Nss1 VHT80	1.947	2.127	91.54%	0.38	0.51
802.11ac MCS0/Nss2 VHT80+80	1.940	2.114	91.75%	0.37	0.52

1.12. Test Configurations

1.12.1. AC Power Line Conduction Emissions Test Configuration

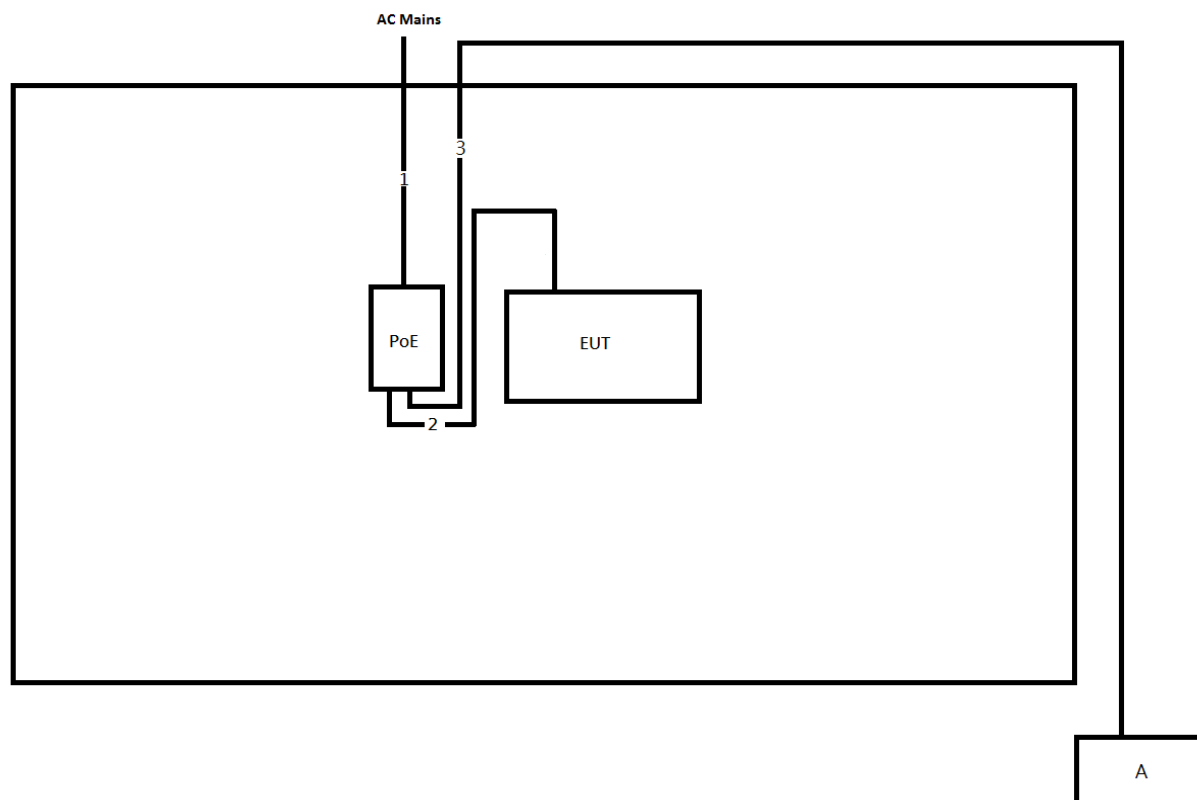
For Intentional-CTX / Unintentional-CRX



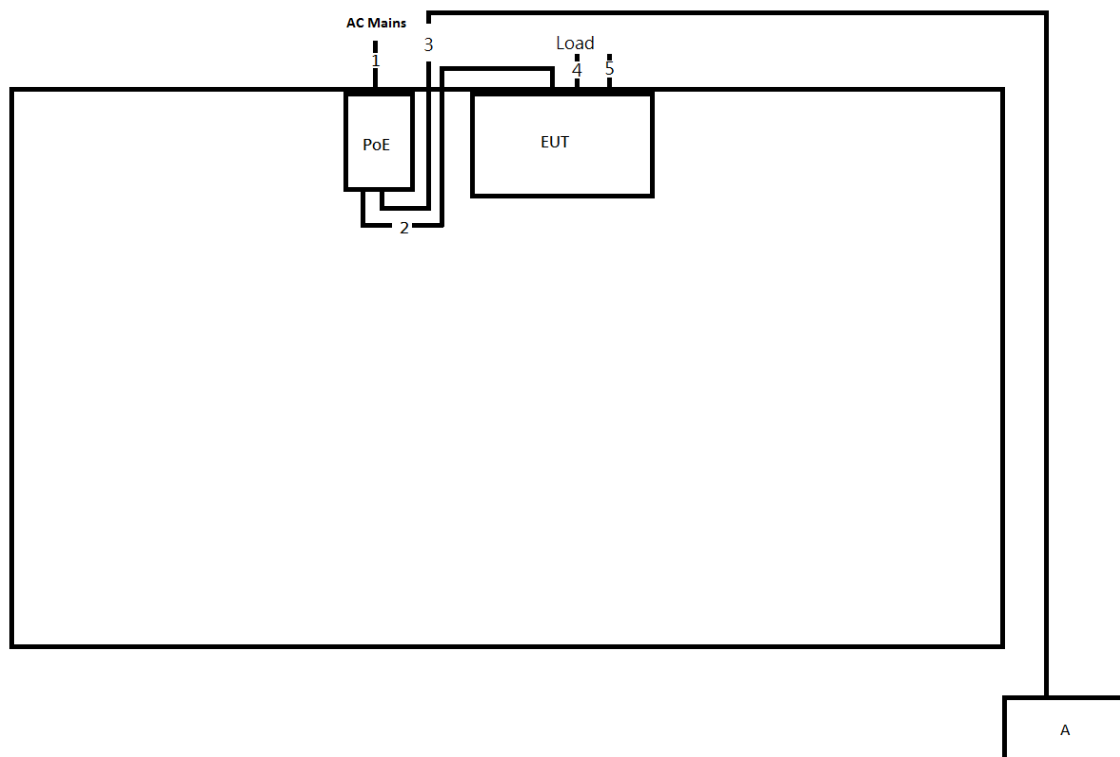
Item	Connection	Shielded	Length	Brand	Model No.
1	Power cable	No	0.6m	-	-
2	RJ-45 cable	No	1.5m	Powersync	CLN5GBR9020
3	USB cable	Yes	2m	BENEVO	BUSB0150AMMB
4	RJ-45 cable	No	10m	-	-
5	RJ-45 cable	No	1.5m	Powersync	CLN5GBR9020

1.12.2. Radiation Emissions Test Configuration

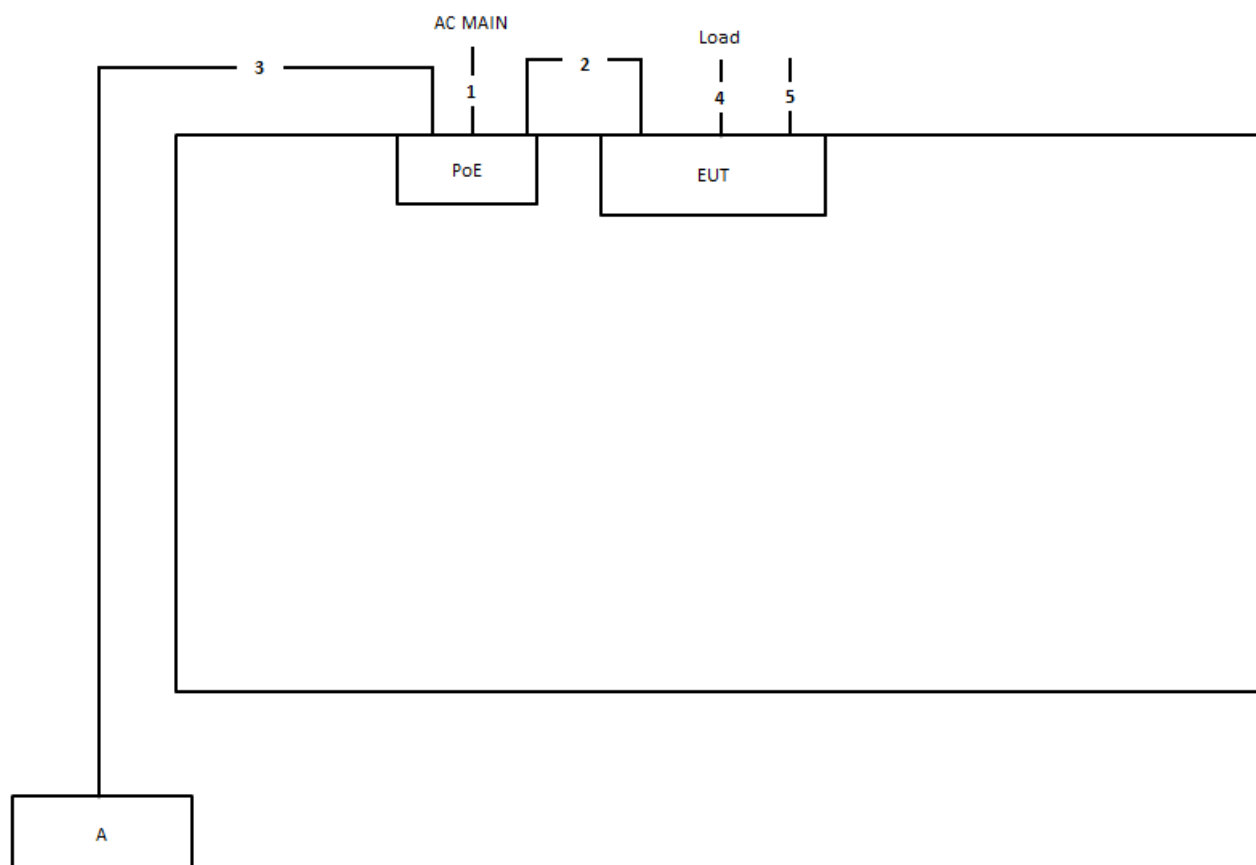
Test Configuration: 30MHz ~1GHz / For Intentional-CTX



Item	Connection	Shielded	Length	Brand	Model No.
1	Power cable	No	0.6m	-	-
2	RJ-45 cable	No	1m	Power Sync	CAT6E-01
3	RJ-45 cable	No	10 m	-	-

For Unintentional-CRX


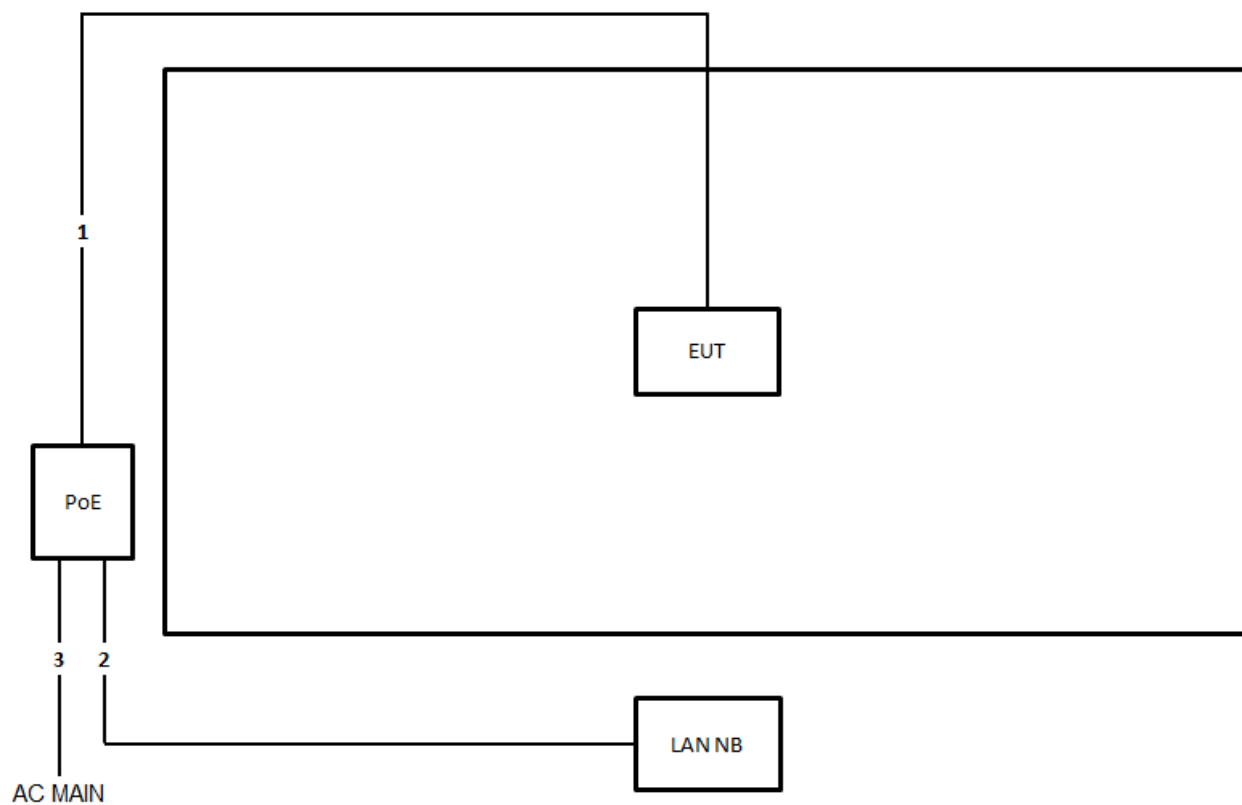
Item	Connection	Shielded	Length	Brand	Model No.
1	Power cable	No	0.6m	-	-
2	RJ-45 cable	No	1m	Power Sync	CAT6E-01
3	RJ-45 cable	No	10m	-	-
4	RJ-45 cable	No	2m	Power Sync	CAT6E-02
5	USB cable	Yes	1.2m	Hawk	04-HTE120RD

Test Configuration: above 1GHz test Unintentional 1GHz~5th-CRX


Item	Connection	Shielded	Length	Brand	Model No.
1	Power cable	No	0.6m	-	-
2	RJ-45 cable	No	1.5m	PowerSync	C65B10FL
3	RJ-45 cable	No	10m	-	-
4	RJ-45 cable	No	1.5m	PowerSync	C65B10FL
5	USB cable	Yes	2m	MYCE II	R.Link II

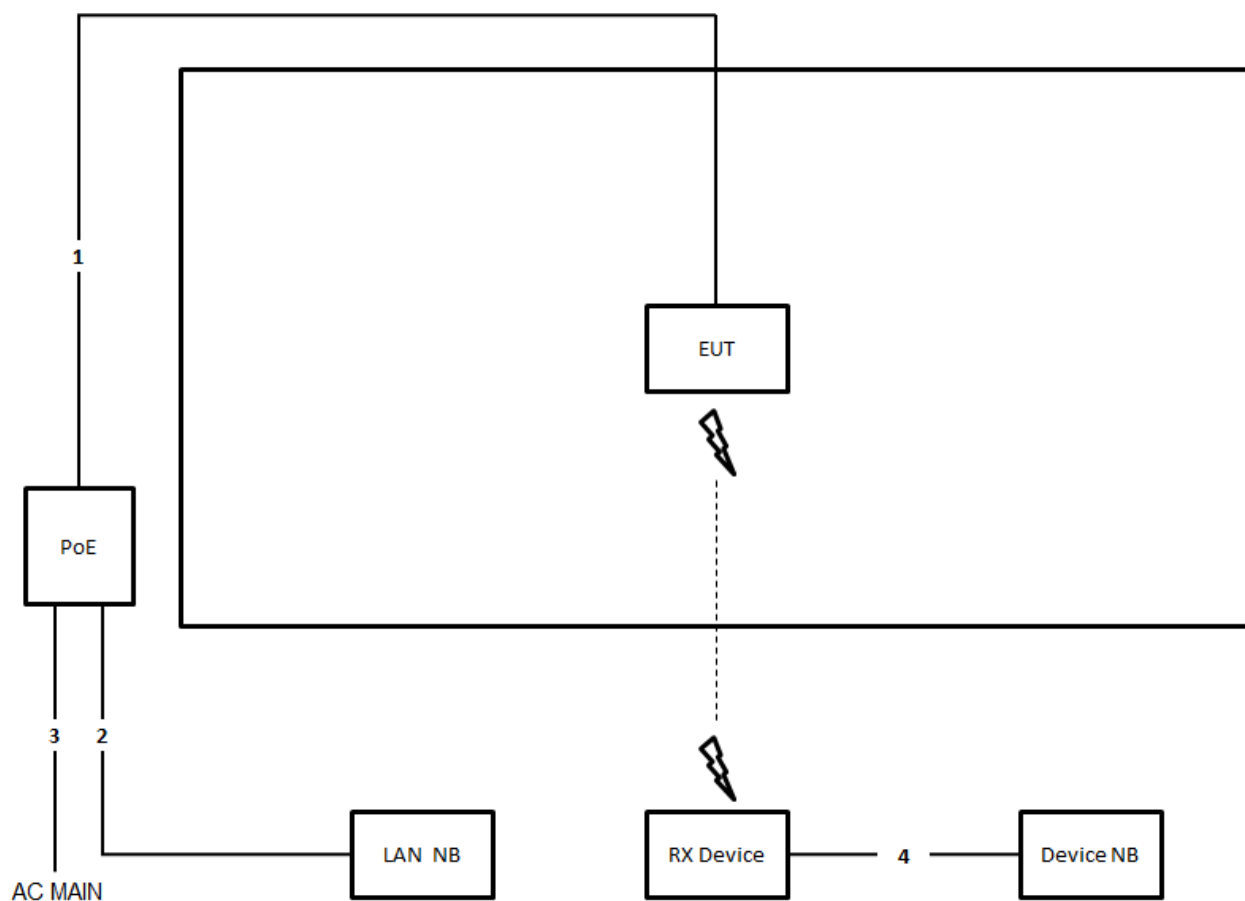
Test Configuration: above 1GHz test Intentional 1GHz~10th-CTX

For non-beamforming mode



Item	Connection	Shielded	Length	Brand	Model No.
1	RJ-45 cable	No	10m	PowerSync	C65B10FL
2	RJ-45 cable	No	1.5m	-	-
3	Power cable	No	0.6m	-	-

For beamforming mode



Item	Connection	Shielded	Length	Brand	Model No.
1	RJ-45 cable	No	10m	PowerSync	C65B10FL
2	RJ-45 cable	No	1.5m	-	-
3	Power cable	No	0.6m	-	-
4	RJ-45 cable	No	1.5m	-	-

2. Test Result

2.1. AC Power Line Conducted Emissions Measurement

2.1.1. Limit

For this product that is designed to connect to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

2.1.2. Measuring Instruments and Setting

Please refer to section 3 of equipments list in this report. The following table is the setting of the receiver.

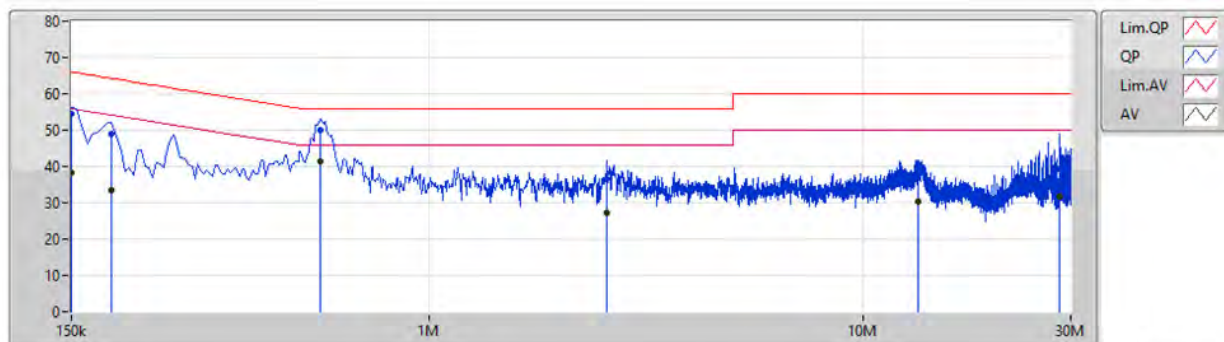
Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

2.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 kHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

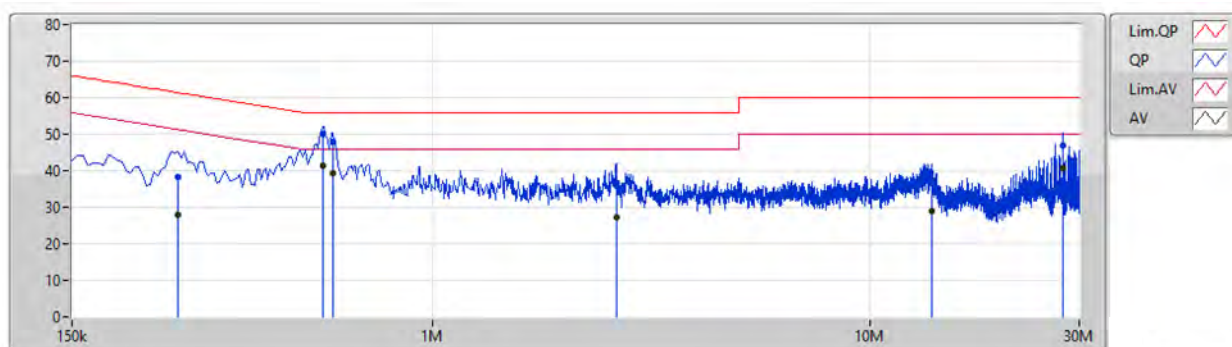
2.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23.9~24.3°C	Humidity	58~59%
Test Engineer	Max Lin	Phase	Line
Configuration	Intentional-CTX	Test Mode	Mode 3
Test date	Jun. 08, 2019		



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)
QP	150k	54.58	66.00	-11.42	9.90	Line	-	44.68	0.05	0.06	9.79
AV	150k	38.39	56.00	-17.61	9.90	Line	-	28.49	0.05	0.06	9.79
QP	186k	48.94	64.20	-15.26	9.91	Line	-	39.03	0.06	0.06	9.79
AV	186k	33.56	54.20	-20.64	9.91	Line	-	23.65	0.06	0.06	9.79
QP	559.5k	50.12	56.00	-5.88	9.94	Line	-	40.18	0.06	0.07	9.81
AV	559.5k	41.30	46.00	-4.70	9.94	Line	"Worst"	31.36	0.06	0.07	9.81
QP	2.567M	36.52	56.00	-19.48	10.06	Line	-	26.46	0.10	0.14	9.82
AV	2.567M	27.33	46.00	-18.67	10.06	Line	-	17.27	0.10	0.14	9.82
QP	13.371M	38.14	60.00	-21.86	10.38	Line	-	27.76	0.24	0.22	9.92
AV	13.371M	30.38	50.00	-19.62	10.38	Line	-	20.00	0.24	0.22	9.92
QP	28.181M	39.37	60.00	-20.63	10.72	Line	-	28.65	0.35	0.33	10.04
AV	28.181M	31.56	50.00	-18.44	10.72	Line	-	20.84	0.35	0.33	10.04

Temperature	23.9~24.3°C	Humidity	58~59%
Test Engineer	Max Lin	Phase	Neutral
Configuration	Intentional-CTX	Test Mode	Mode 3
Test date	Jun. 08, 2019		

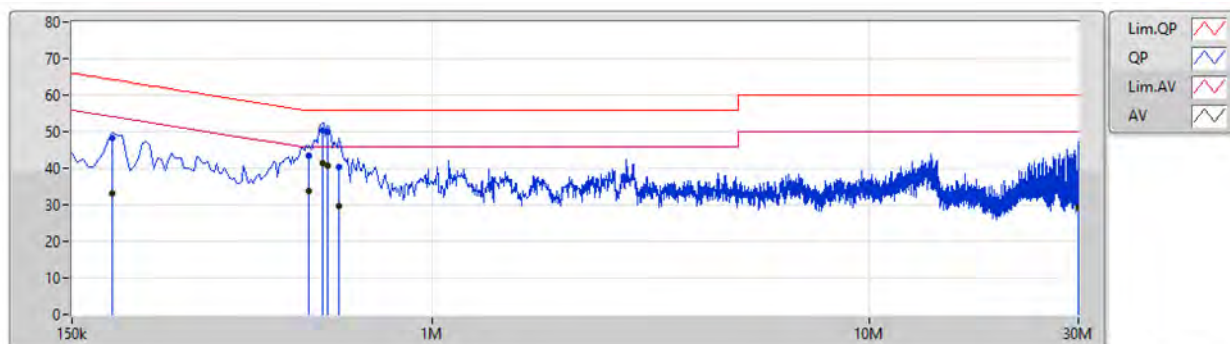


Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)			
QP	262.5k	38.12	61.35	-23.23	9.90	Neutral	-	28.22	0.04	0.06	9.80			
AV	262.5k	27.78	51.35	-23.57	9.90	Neutral	-	17.88	0.04	0.06	9.80			
QP	559.5k	50.15	56.00	-5.85	9.93	Neutral	-	40.22	0.05	0.07	9.81			
AV	559.5k	41.31	46.00	-4.69	9.93	Neutral	"Worst"	31.38	0.05	0.07	9.81			
QP	591k	48.07	56.00	-7.93	9.93	Neutral	-	38.14	0.05	0.07	9.81			
AV	591k	39.27	46.00	-6.73	9.93	Neutral	-	29.34	0.05	0.07	9.81			
QP	2.625M	36.62	56.00	-19.38	10.04	Neutral	-	26.58	0.08	0.14	9.82			
AV	2.625M	27.09	46.00	-18.91	10.04	Neutral	-	17.05	0.08	0.14	9.82			
QP	13.826M	36.53	60.00	-23.47	10.36	Neutral	-	26.17	0.22	0.22	9.92			
AV	13.826M	28.96	50.00	-21.04	10.36	Neutral	-	18.60	0.22	0.22	9.92			
QP	27.438M	46.94	60.00	-13.06	10.72	Neutral	-	36.22	0.35	0.33	10.04			
AV	27.438M	40.76	50.00	-9.24	10.72	Neutral	-	30.04	0.35	0.33	10.04			

Note:

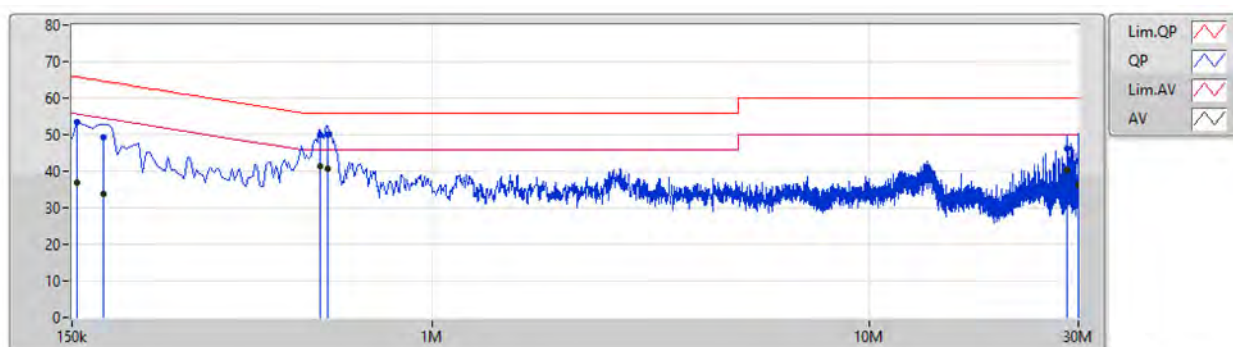
Level = Read Level + LISN Factor + Cable Loss.

Temperature	23.9~24.3°C	Humidity	58~59%
Test Engineer	Max Lin	Phase	Line
Configuration	Unintentional-CRX	Test Mode	Mode 5
Test date	Jun. 08, 2019		



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)			
QP	186k	48.13	64.20	-16.07	9.91	Line	-	38.22	0.06	0.06	9.79			
AV	186k	33.02	54.20	-21.18	9.91	Line	-	23.11	0.06	0.06	9.79			
QP	523.5k	43.36	56.00	-12.64	9.94	Line	-	33.42	0.06	0.07	9.81			
AV	523.5k	33.78	46.00	-12.22	9.94	Line	-	23.84	0.06	0.07	9.81			
QP	559.5k	50.29	56.00	-5.71	9.94	Line	-	40.35	0.06	0.07	9.81			
AV	559.5k	41.55	46.00	-4.45	9.94	Line	"Worst"	31.61	0.06	0.07	9.81			
QP	577.5k	49.92	56.00	-6.08	9.94	Line	-	39.98	0.06	0.07	9.81			
AV	577.5k	40.70	46.00	-5.30	9.94	Line	-	30.76	0.06	0.07	9.81			
QP	613.5k	40.23	56.00	-15.77	9.94	Line	-	30.29	0.06	0.07	9.81			
AV	613.5k	29.70	46.00	-16.30	9.94	Line	-	19.76	0.06	0.07	9.81			
QP	29.918M	38.53	60.00	-21.47	10.72	Line	-	27.81	0.36	0.31	10.05			
AV	29.918M	29.18	50.00	-20.82	10.72	Line	-	18.46	0.36	0.31	10.05			

Temperature	23.9~24.3°C	Humidity	58~59%
Test Engineer	Max Lin	Phase	Neutral
Configuration	Unintentional-CRX	Test Mode	Mode 5
Test date	Jun. 08, 2019		



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)			
QP	154.5k	53.41	65.75	-12.34	9.89	Neutral	-	43.52	0.04	0.06	9.79			
AV	154.5k	37.04	55.75	-18.71	9.89	Neutral	-	27.15	0.04	0.06	9.79			
QP	177k	49.47	64.62	-15.15	9.89	Neutral	-	39.58	0.04	0.06	9.79			
AV	177k	33.83	54.62	-20.79	9.89	Neutral	-	23.94	0.04	0.06	9.79			
QP	555k	49.84	56.00	-6.16	9.93	Neutral	-	39.91	0.05	0.07	9.81			
AV	555k	41.25	46.00	-4.75	9.93	Neutral	"Worst"	31.32	0.05	0.07	9.81			
QP	577.5k	49.98	56.00	-6.02	9.93	Neutral	-	40.05	0.05	0.07	9.81			
AV	577.5k	40.86	46.00	-5.14	9.93	Neutral	-	30.93	0.05	0.07	9.81			
QP	28.176M	46.15	60.00	-13.85	10.73	Neutral	-	35.42	0.36	0.33	10.04			
AV	28.176M	40.29	50.00	-9.71	10.73	Neutral	-	29.56	0.36	0.33	10.04			
QP	29.913M	42.85	60.00	-17.15	10.74	Neutral	-	32.11	0.38	0.31	10.05			
AV	29.913M	36.24	50.00	-13.76	10.74	Neutral	-	25.50	0.38	0.31	10.05			

Note:

Level = Read Level + LISN Factor + Cable Loss.

2.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

2.2.1. Limit

No restriction limits.

2.2.2. Measuring Instruments and Setting

Please refer to section 3 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	$\geq 3 \times \text{RBW}$
Detector	Peak
Trace	Max Hold

2.2.3. Test Procedures

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

1. The transmitter was radiated 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.
Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2.2.4. Test Setup Layout

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

This test setup layout is the same as that shown in section 2.6.4.

2.2.5. Test Deviation

There is no deviation with the original standard.

2.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	22°C	Humidity	54%
Test Engineer	Gary Chu		

For non-beamforming mode

For indoor use master B1 and indoor, outdoor use B4

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	17.22	15.72
	5200 MHz	17.22	15.11
	5240 MHz	17.04	14.94
	5745 MHz	26.78	15.63
	5785 MHz	27.22	22.06
	5825 MHz	35.39	24.14
802.11ac MCS0/Nss1 VHT20	5180 MHz	18.52	16.50
	5200 MHz	18.44	16.15
	5240 MHz	18.35	15.80
	5745 MHz	33.65	16.76
	5785 MHz	33.13	21.62
	5825 MHz	34.70	25.88
802.11ac MCS0/Nss1 VHT40	5190 MHz	39.28	35.75
	5230 MHz	38.84	35.89
	5755 MHz	45.36	36.90
	5795 MHz	83.48	44.86
802.11ac MCS0/Nss1 VHT80	5210 MHz	79.13	75.54
	5775 MHz	79.42	75.83

For indoor use slave without radar detection B1

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	17.30	15.46
	5200 MHz	17.39	15.37
	5240 MHz	17.13	15.20
802.11ac MCS0/Nss1 VHT20	5180 MHz	18.44	16.41
	5200 MHz	18.44	16.24
	5240 MHz	18.35	15.89
802.11ac MCS0/Nss1 VHT40	5190 MHz	38.70	35.60
	5230 MHz	39.13	35.89
802.11ac MCS0/Nss1 VHT80	5210 MHz	79.13	75.54

For outdoor use master B1

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	17.48	15.54
	5200 MHz	17.39	15.37
	5240 MHz	17.04	15.02
802.11ac MCS0/Nss1 VHT20	5180 MHz	18.26	16.32
	5200 MHz	18.43	16.15
	5240 MHz	18.26	15.63
802.11ac MCS0/Nss1 VHT40	5190 MHz	38.99	35.75
	5230 MHz	39.13	36.03
802.11ac MCS0/Nss1 VHT80	5210 MHz	79.42	75.54

802.11ac MCS0/Nss2 VHT80+80
For indoor use master and slave without radar detection

Type	Frequency	26dB BW (MHz)	99% OBW (MHz)	26dB Total BW (MHz)
1	5210 MHz	80.00	76.12	158.84
	5775 MHz	78.84	74.96	

For outdoor use master B1

Type	Frequency	26dB BW (MHz)	99% OBW (MHz)	26dB Total BW (MHz)
1	5210 MHz	80.00	76.41	158.26
	5775 MHz	78.26	71.20	

For beamforming mode
For indoor use master B1 and indoor, outdoor use B4

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT20	5180 MHz	22.78	18.06
	5200 MHz	23.13	17.97
	5240 MHz	21.74	17.89
	5745 MHz	21.39	17.97
	5785 MHz	21.74	17.97
	5825 MHz	25.30	18.15
802.11ac MCS0/Nss1 VHT40	5190 MHz	45.94	37.05
	5230 MHz	45.51	36.76
	5755 MHz	47.25	37.05
	5795 MHz	47.25	37.05
802.11ac MCS0/Nss1 VHT80	5210 MHz	100.87	76.12
	5775 MHz	99.13	76.41

For indoor use slave without radar detection B1

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT20	5180 MHz	21.83	17.89
	5200 MHz	21.22	17.97
	5240 MHz	21.65	17.89
802.11ac MCS0/Nss1 VHT40	5190 MHz	44.78	36.90
	5230 MHz	45.07	36.90
802.11ac MCS0/Nss1 VHT80	5210 MHz	85.80	76.41

For outdoor use master B1

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT20	5180 MHz	22.26	17.97
	5200 MHz	21.57	17.89
	5240 MHz	21.74	17.89
802.11ac MCS0/Nss1 VHT40	5190 MHz	44.93	36.90
	5230 MHz	44.93	36.76
802.11ac MCS0/Nss1 VHT80	5210 MHz	84.93	76.41

802.11ac MCS0/Nss2 VHT80+80
For indoor use master and slave without radar detection

Type	Frequency	26dB BW (MHz)	99% OBW (MHz)	26dB Total BW (MHz)
1	5210 MHz	80.00	76.12	160.00
	5775 MHz	80.00	76.12	

For outdoor use master B1

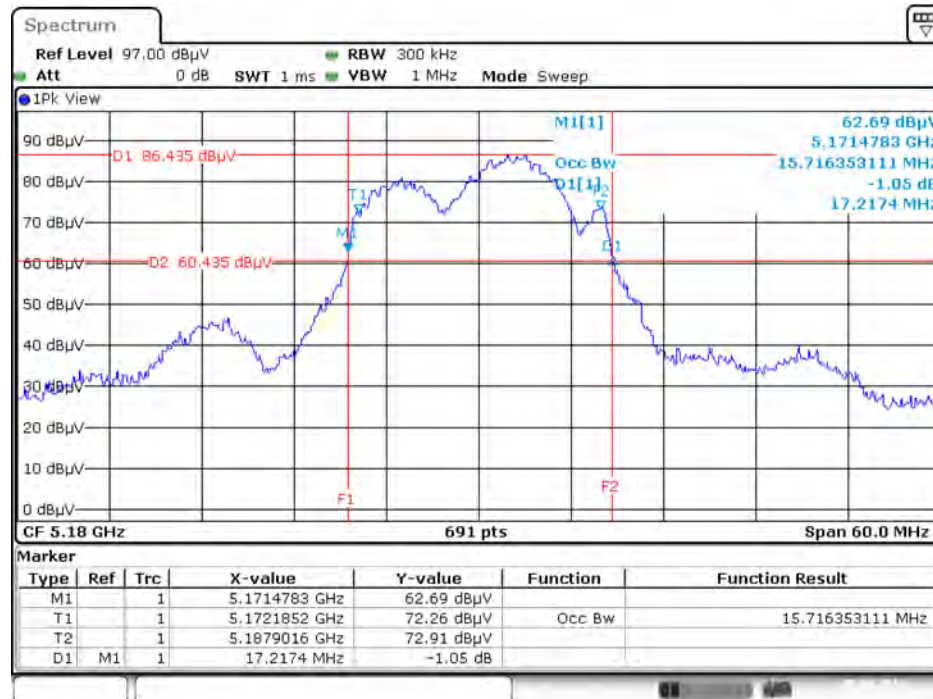
Type	Frequency	26dB BW (MHz)	99% OBW (MHz)	26dB Total BW (MHz)
1	5210 MHz	78.84	76.12	158.84
	5775 MHz	80.00	76.12	

For non-beamforming mode

For indoor use master B1 and indoor, outdoor use B4

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2

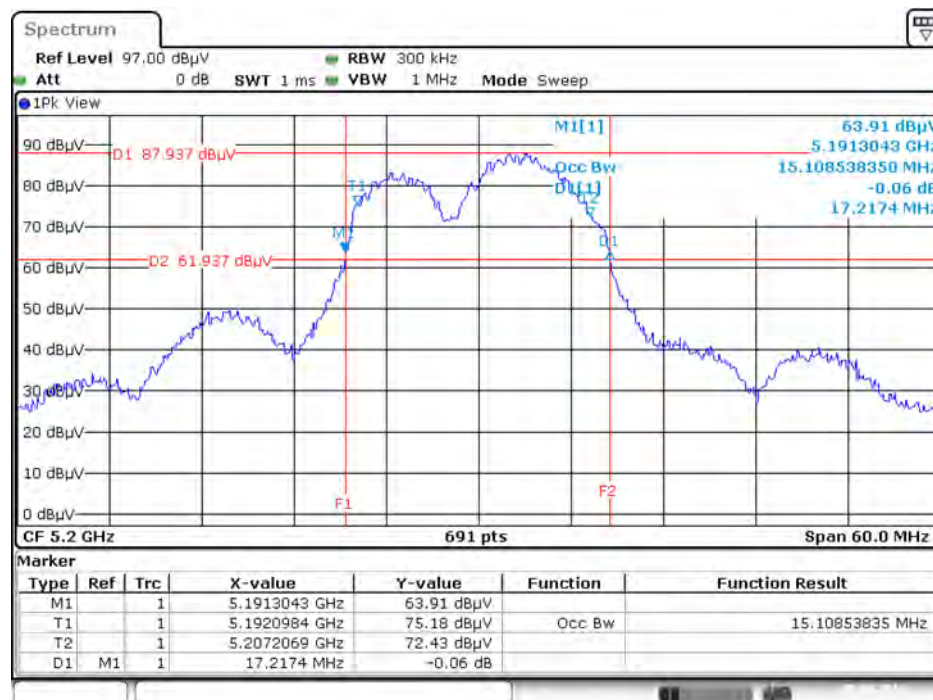
+ Port 3 + Port 4 / 5180 MHz



Date: 5.AUG.2016 11:20:05

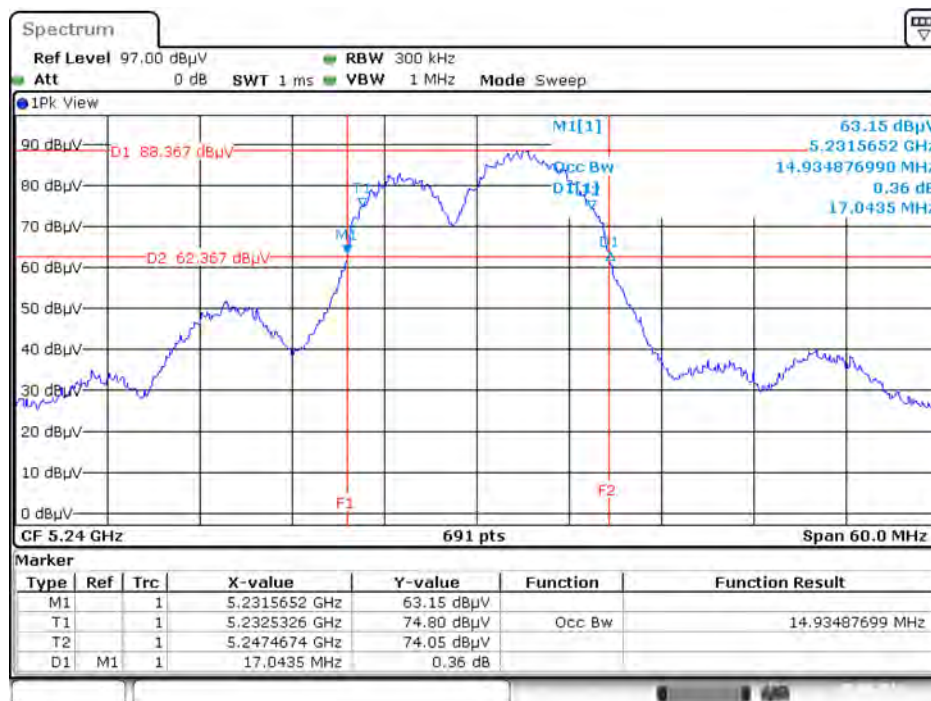
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2

+ Port 3 + Port 4 / 5200 MHz



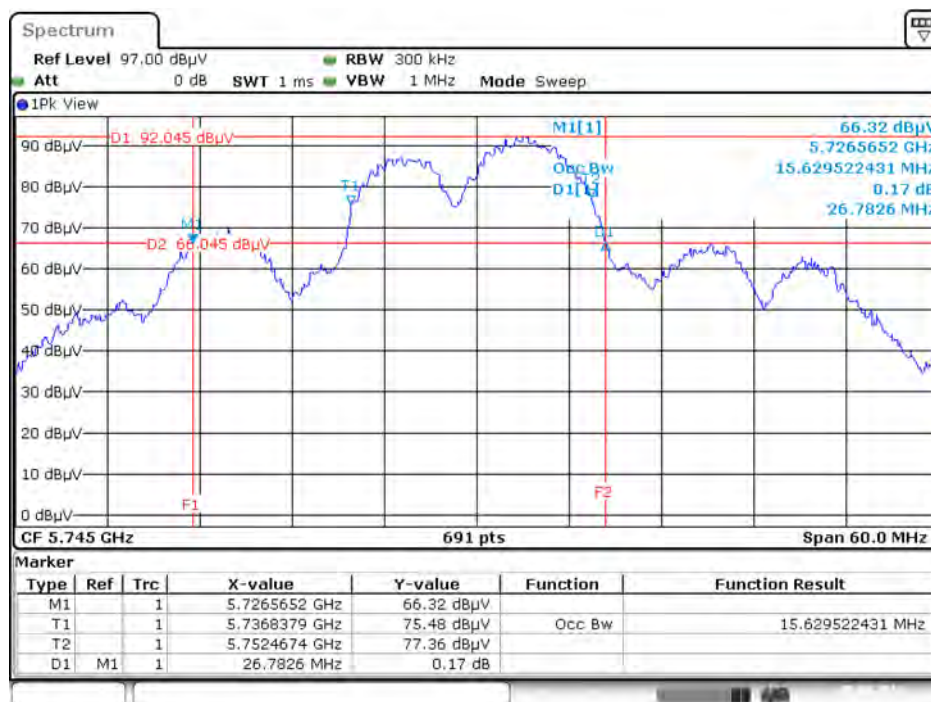
Date: 5.AUG.2016 11:35:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5240 MHz



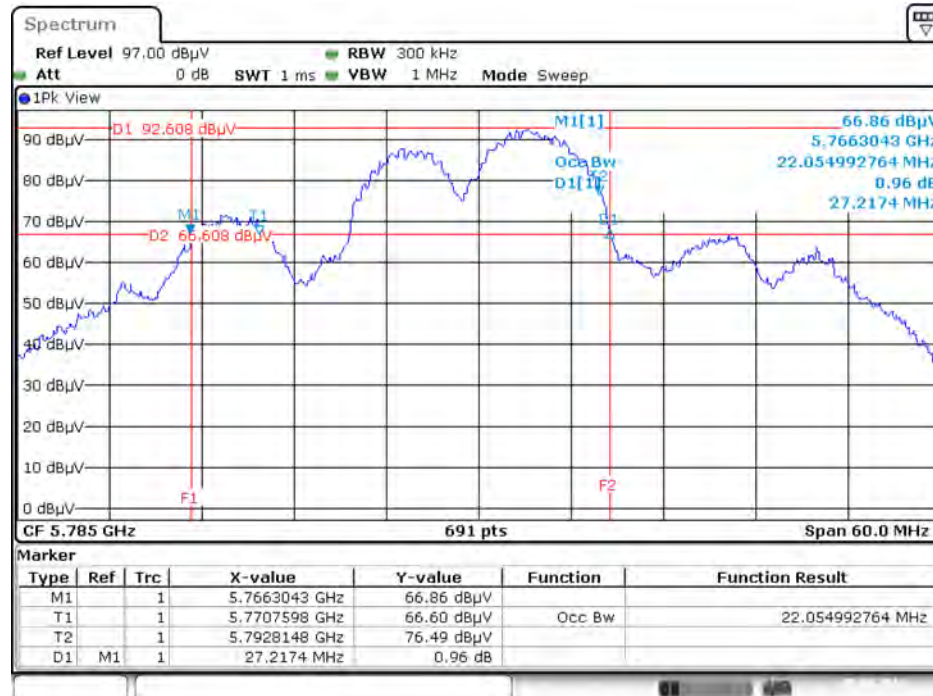
Date: 5.AUG.2016 11:44:35

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5745 MHz



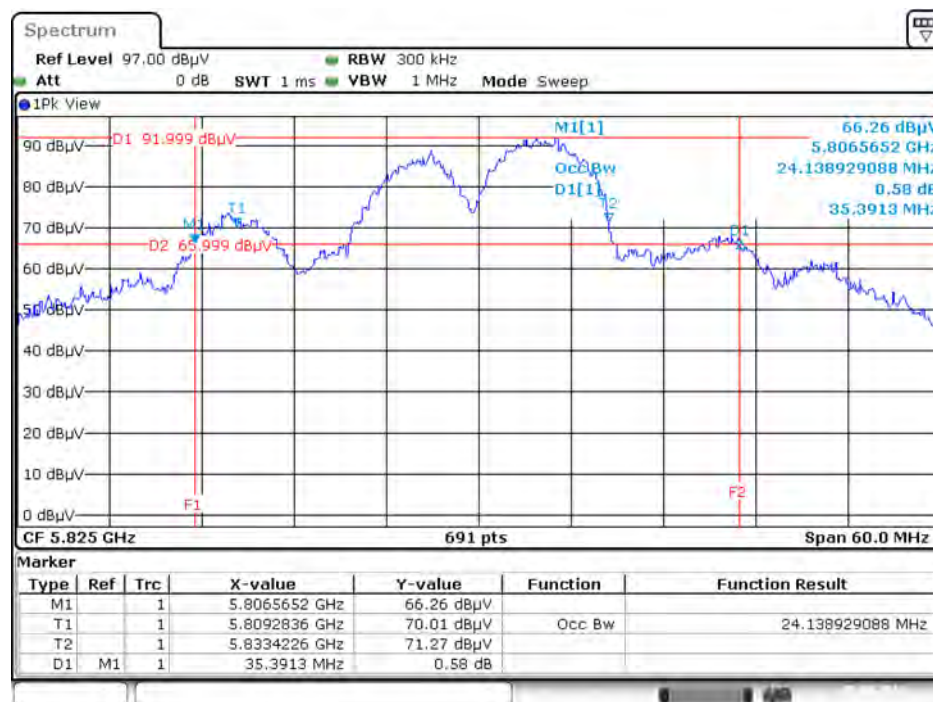
Date: 5.AUG.2016 11:47:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5785 MHz



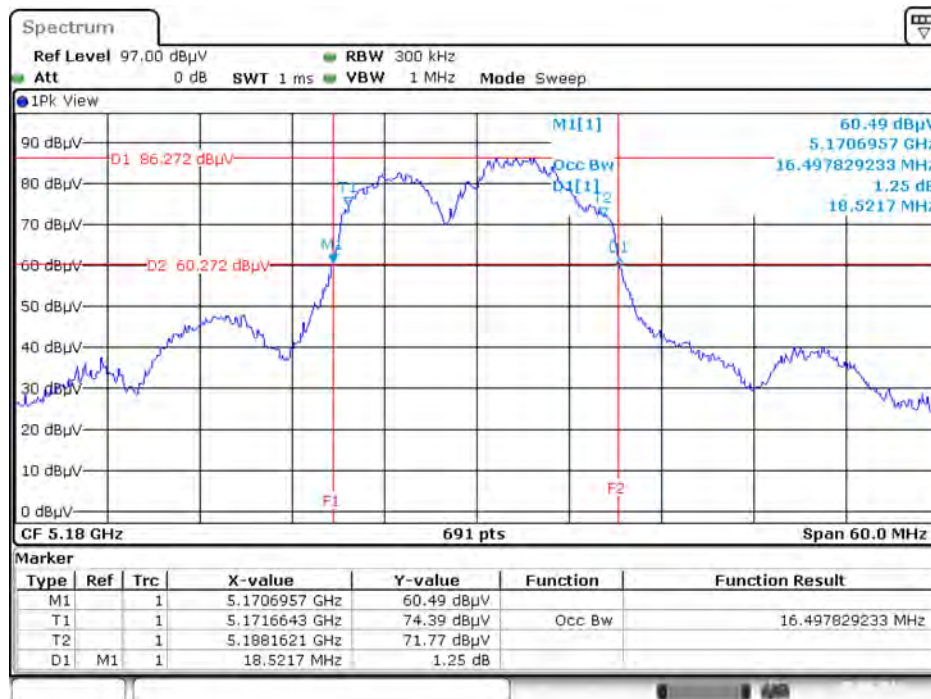
Date: 5.AUG.2016 11:48:24

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5825 MHz



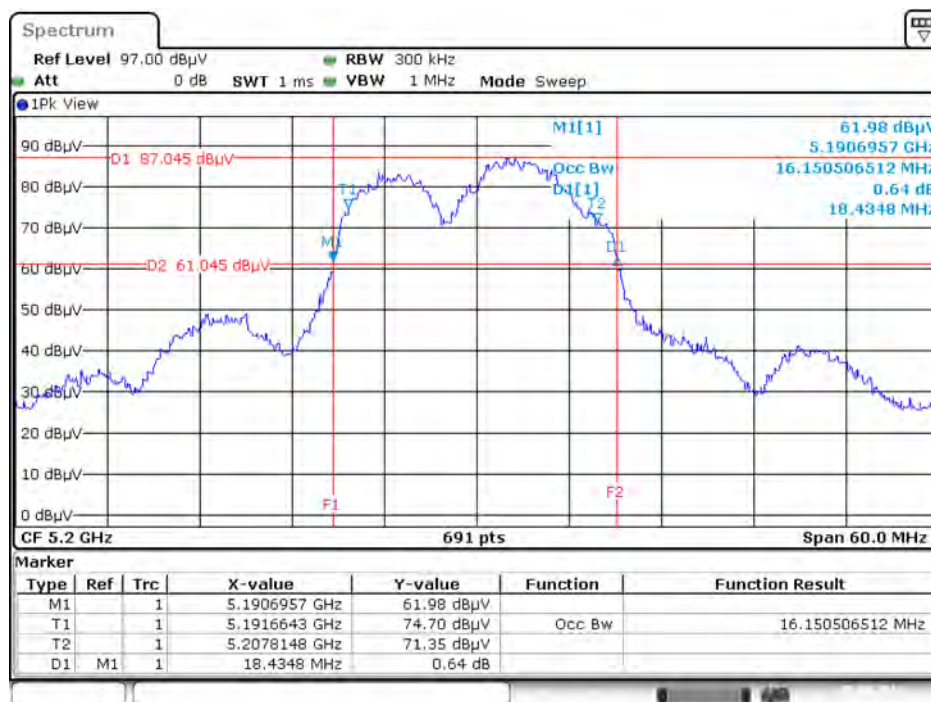
Date: 5.AUG.2016 11:48:44

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5180 MHz



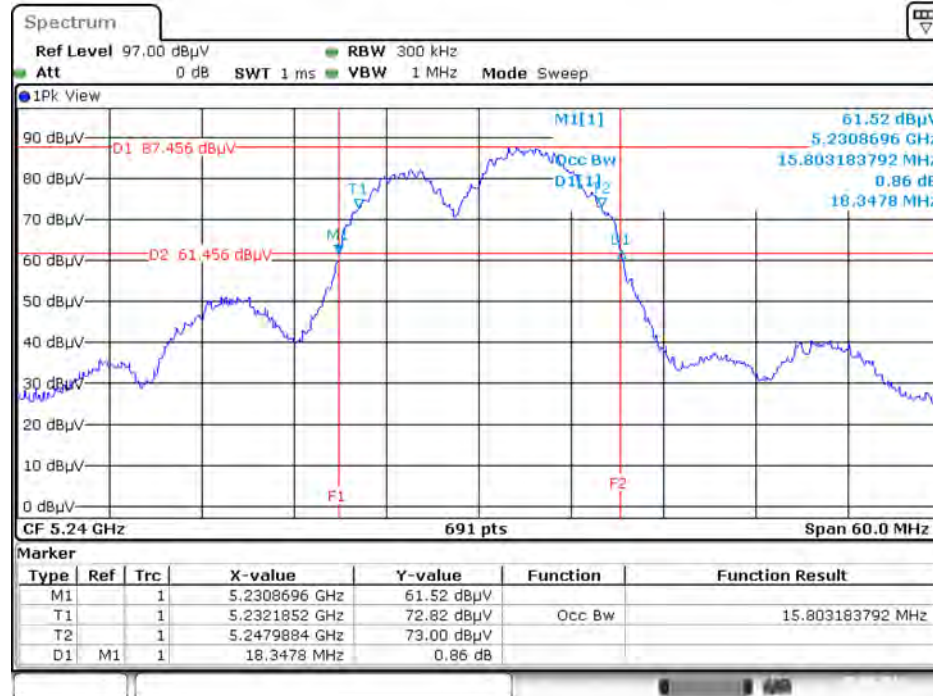
Date: 5.AUG.2016 11:50:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5200 MHz



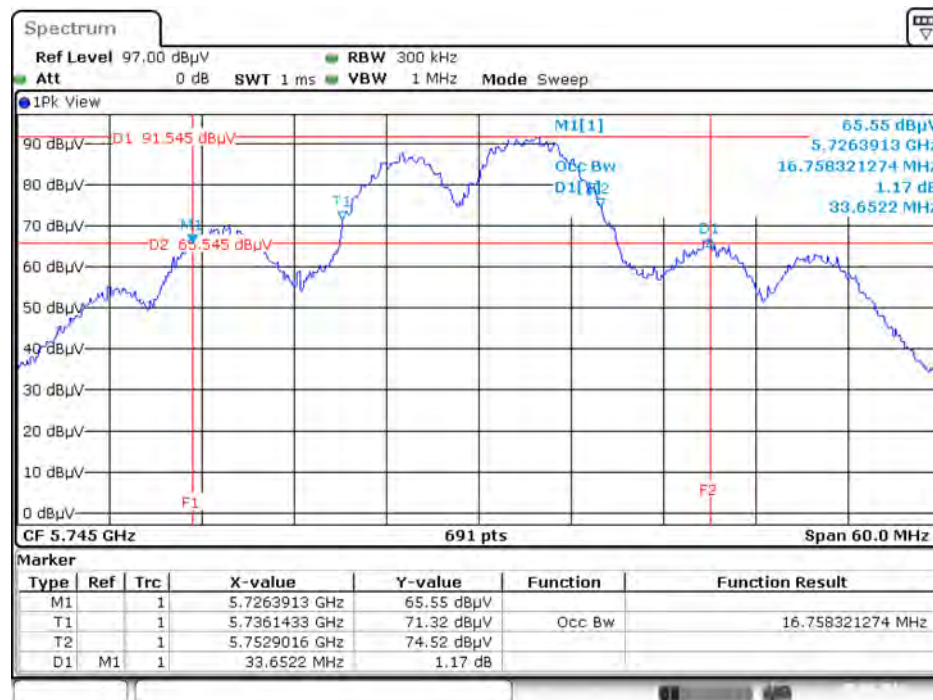
Date: 5.AUG.2016 11:50:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5240 MHz



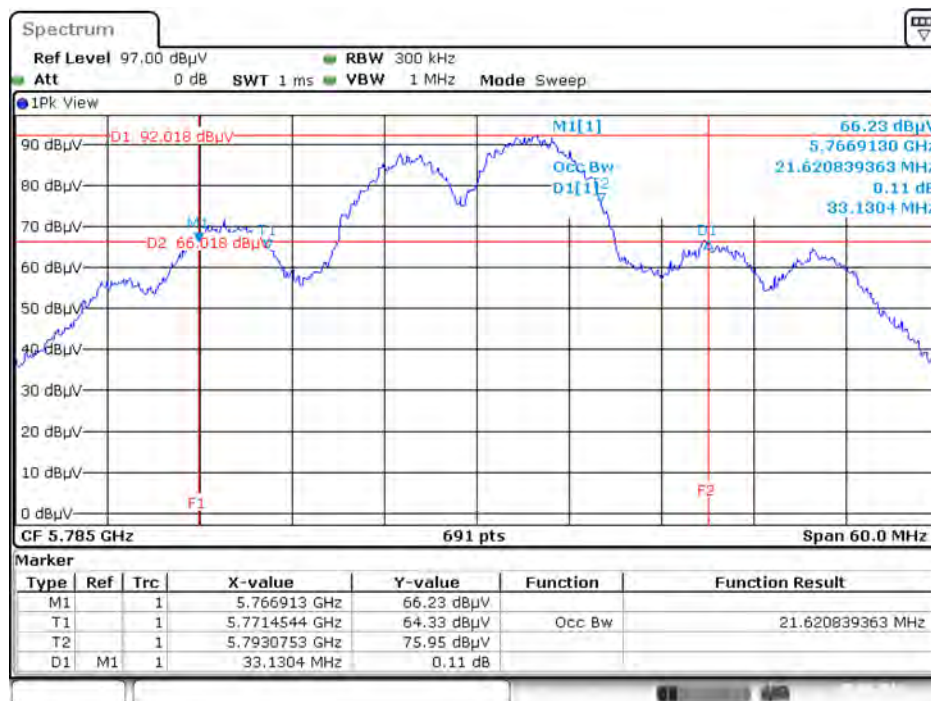
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5745 MHz



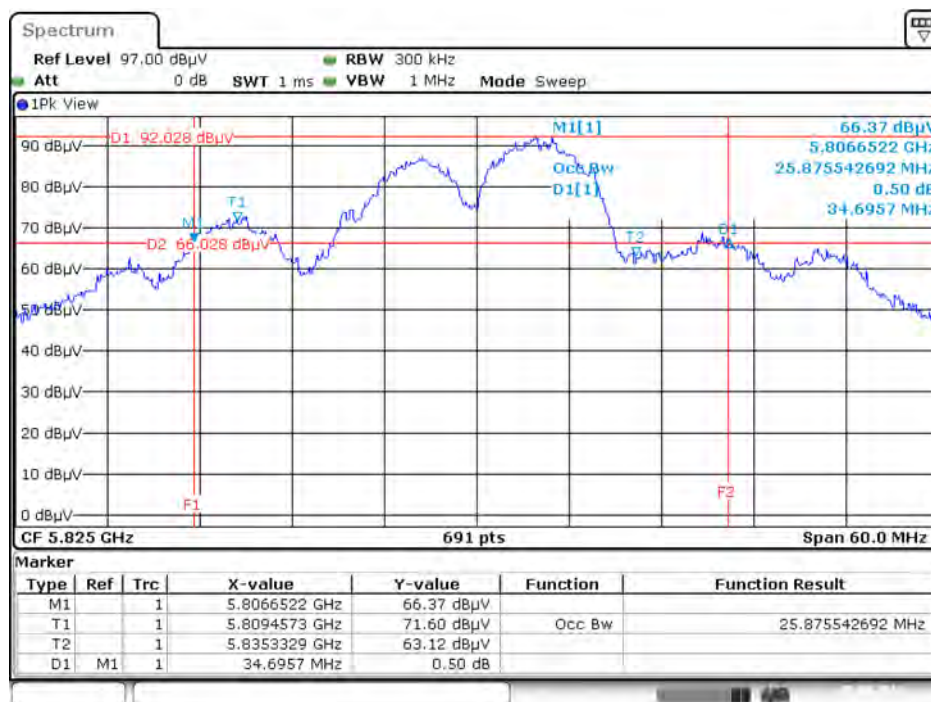
Date: 5.AUG.2016 11:56:08

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5785 MHz



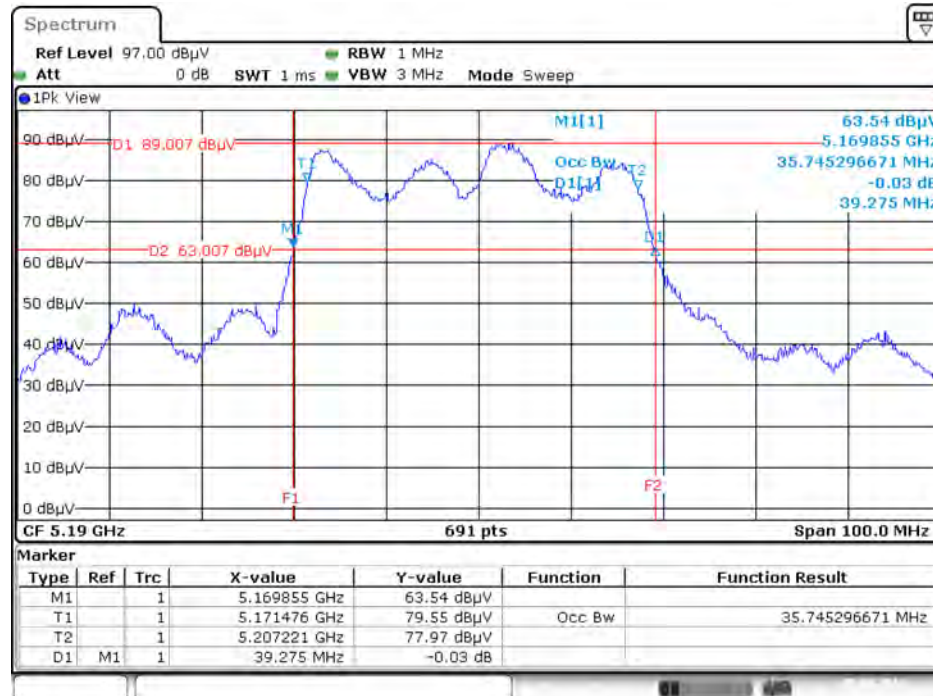
Date: 5.AUG.2016 11:56:29

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5825 MHz



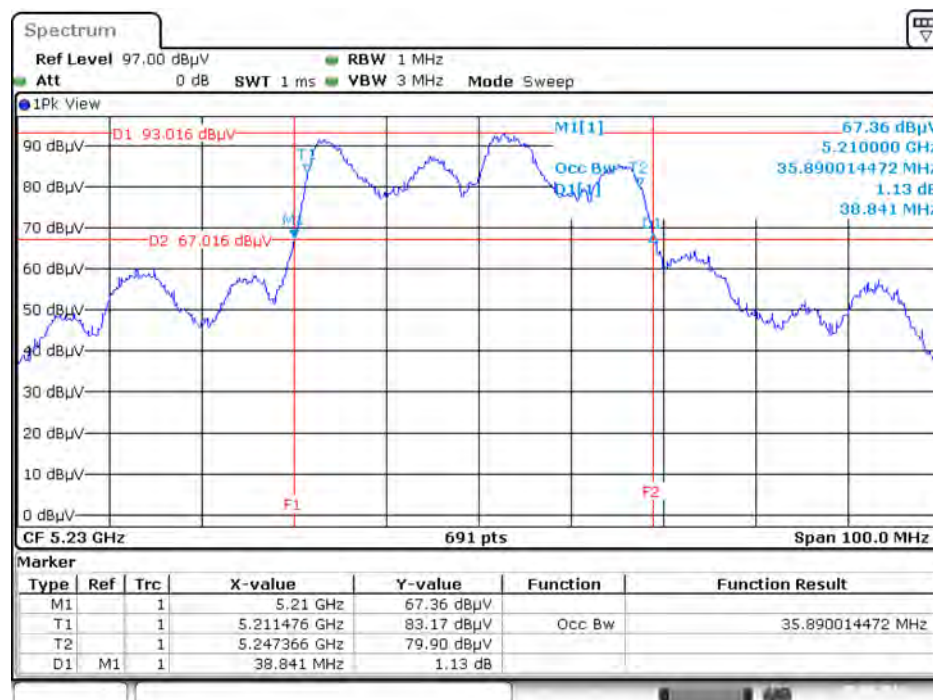
Date: 5.AUG.2016 11:56:48

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5190 MHz



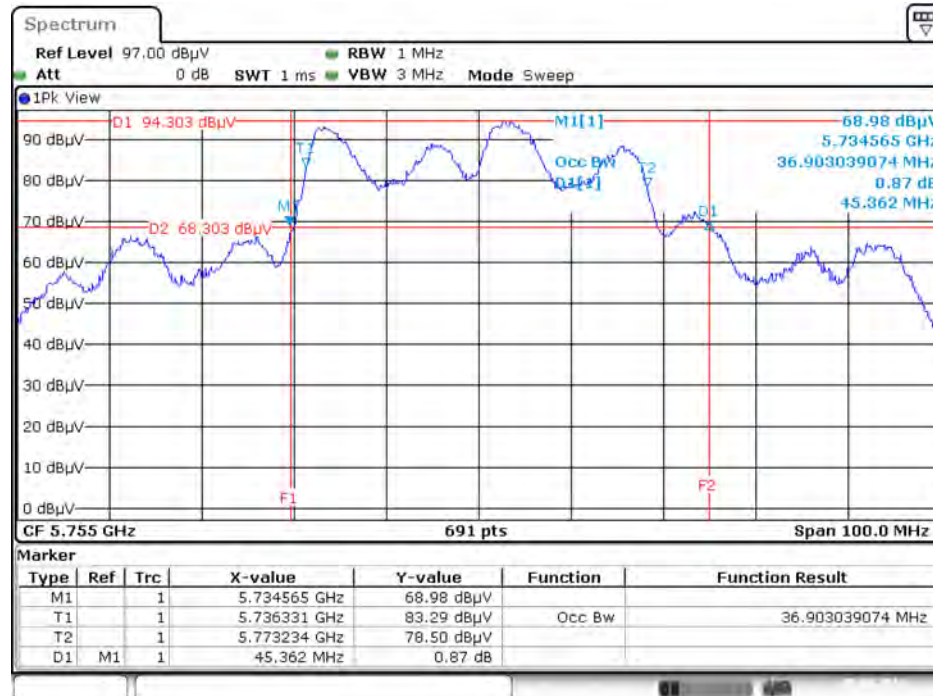
Date: 5.AUG.2016 11:57:42

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5230 MHz



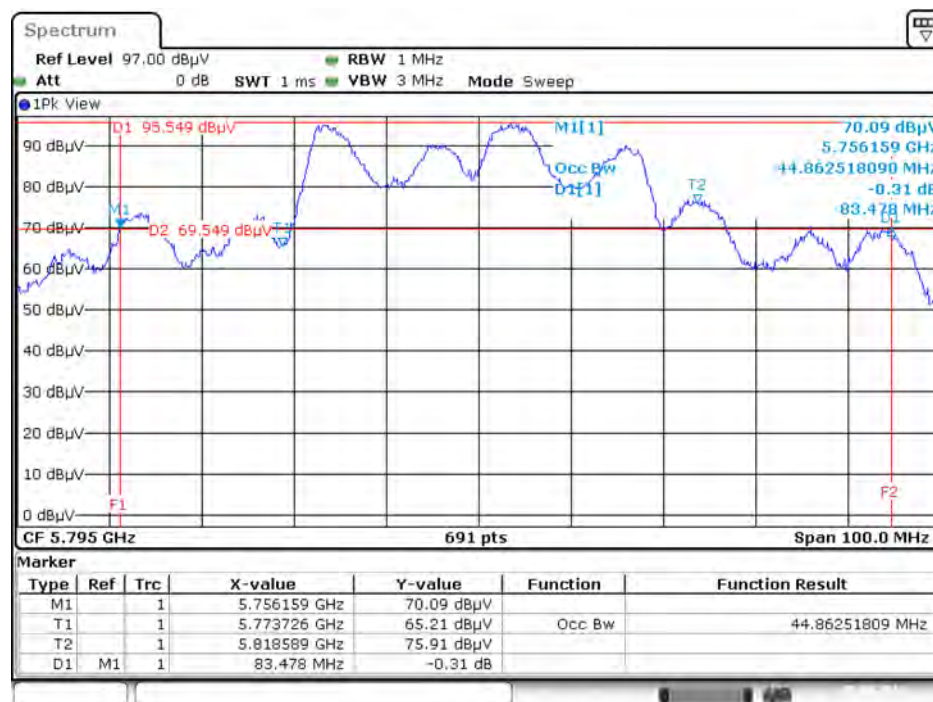
Date: 5.AUG.2016 11:58:02

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5755 MHz



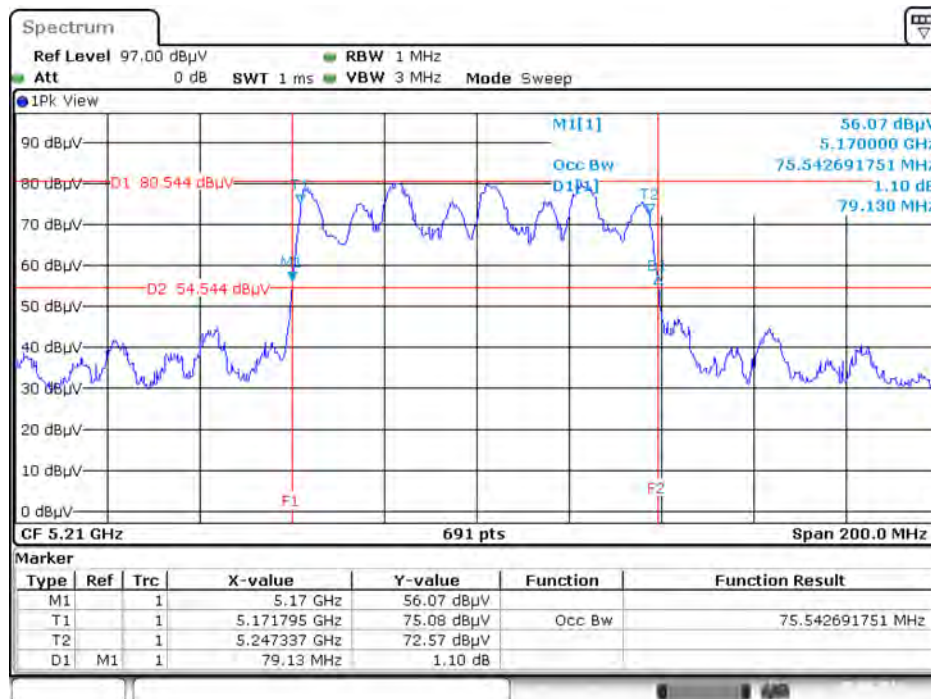
Date: 5.AUG.2016 12:02:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5795 MHz



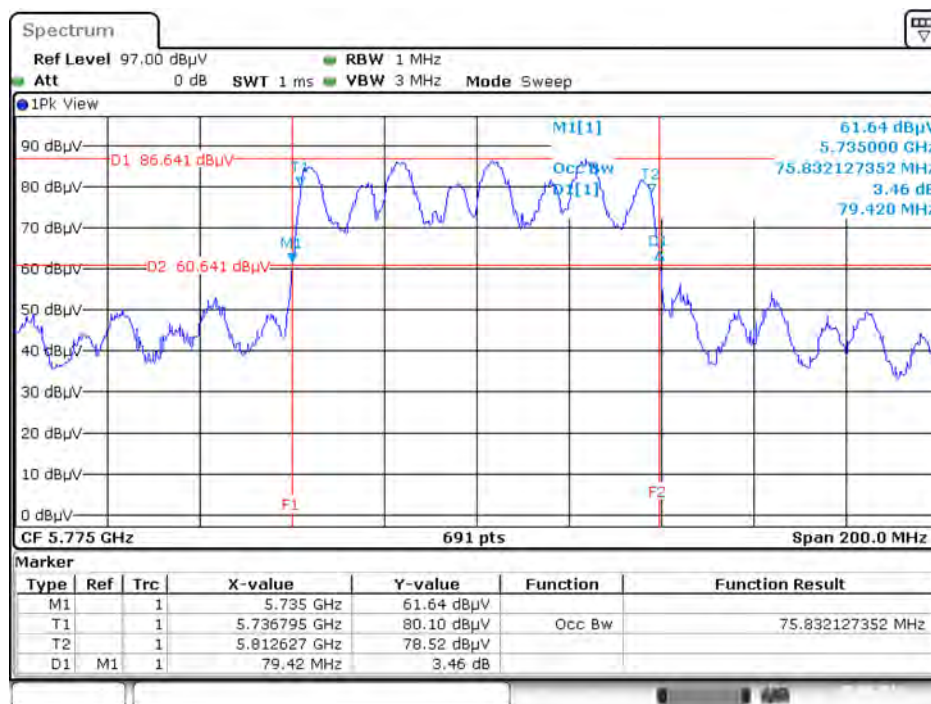
Date: 5.AUG.2016 12:03:01

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5210 MHz



Date: 5.AUG.2016 12:03:56

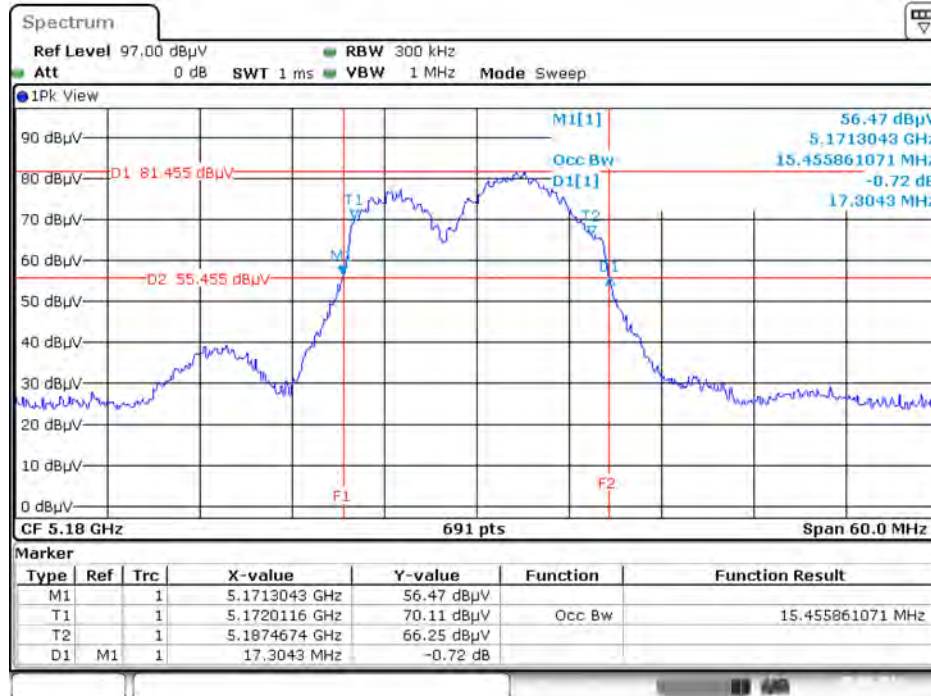
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5775 MHz



Date: 5.AUG.2016 12:05:57

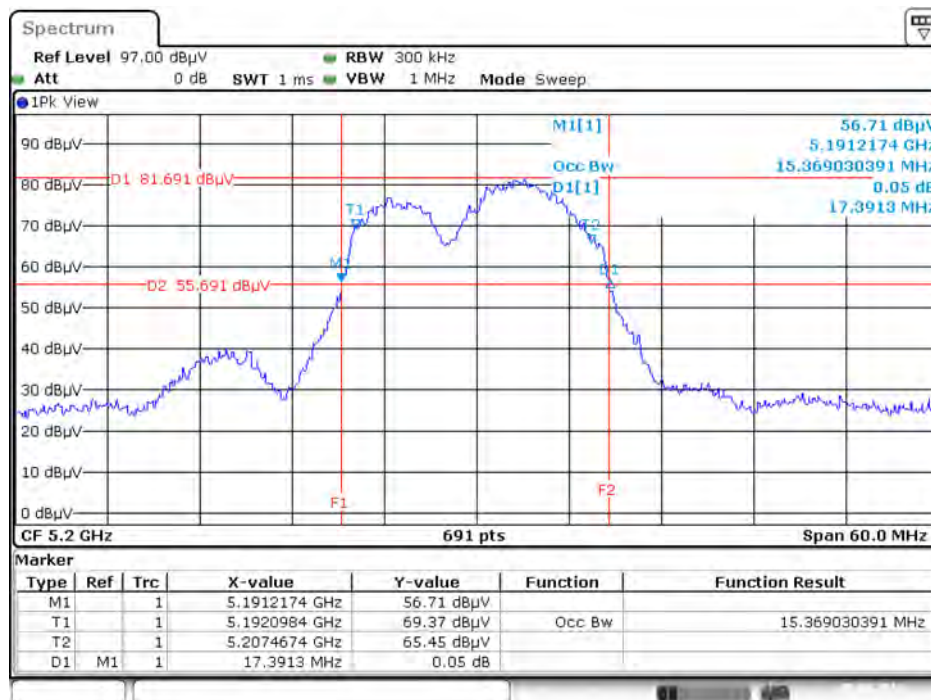
For indoor use slave without radar detection B1

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2
+ Port 3 + Port 4 / 5180 MHz



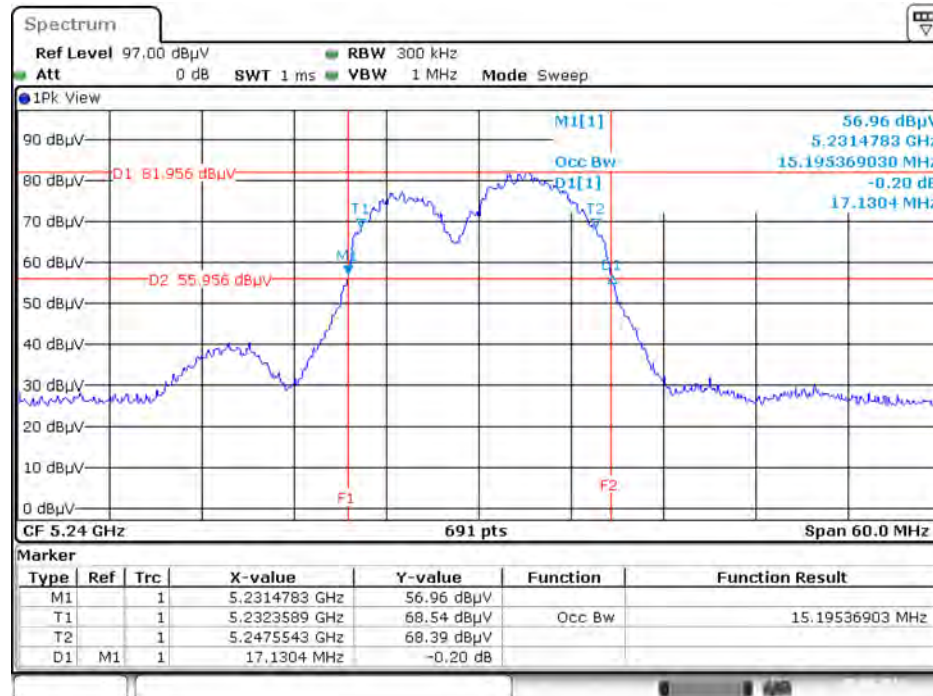
Date: 5.AUG.2016 16:32:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2
+ Port 3 + Port 4 / 5200 MHz



Date: 5.AUG.2016 16:33:07

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5240 MHz



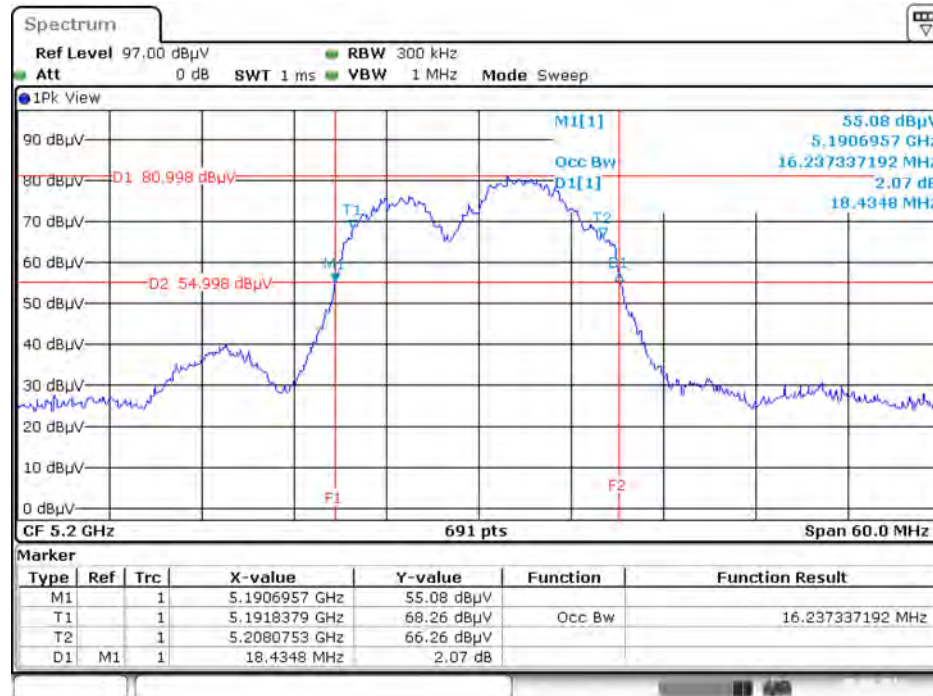
Date: 5.AUG.2016 16:34:35

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5180 MHz



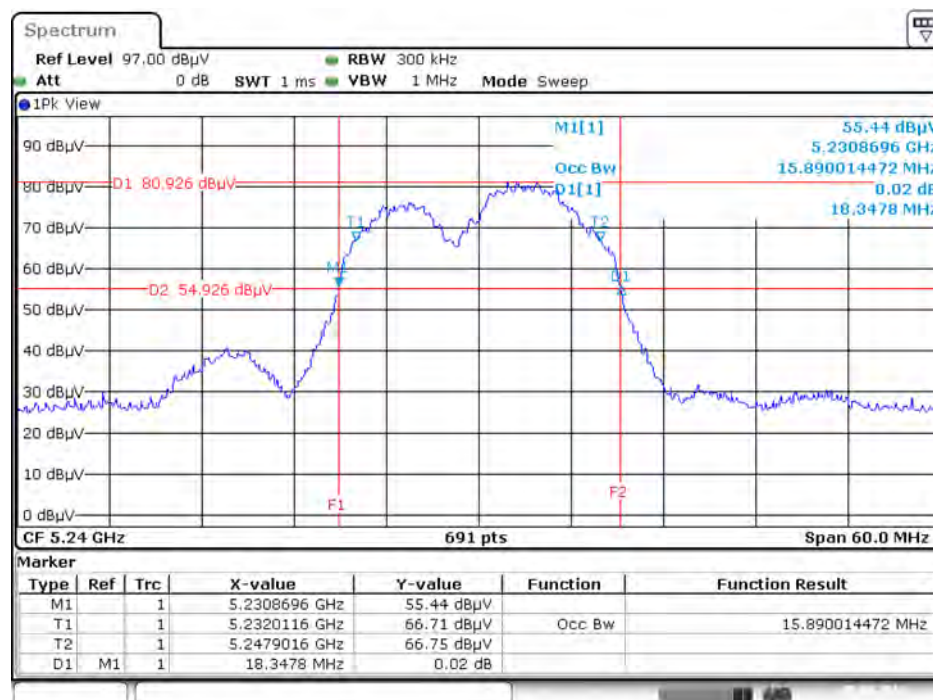
Date: 5.AUG.2016 16:35:39

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5200 MHz**



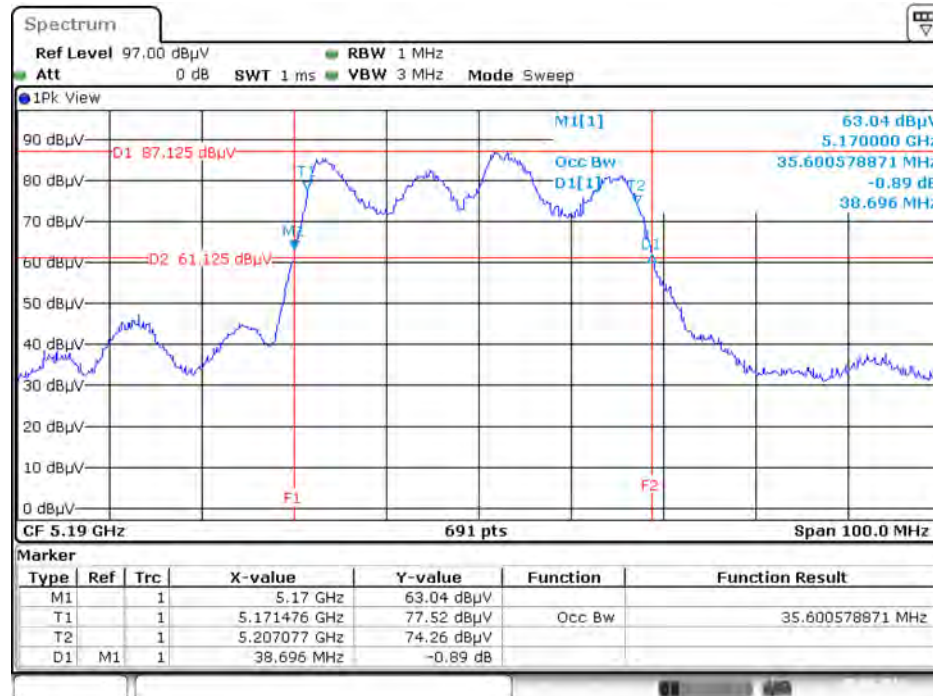
Date: 5.AUG.2016 16:35:58

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5240 MHz**



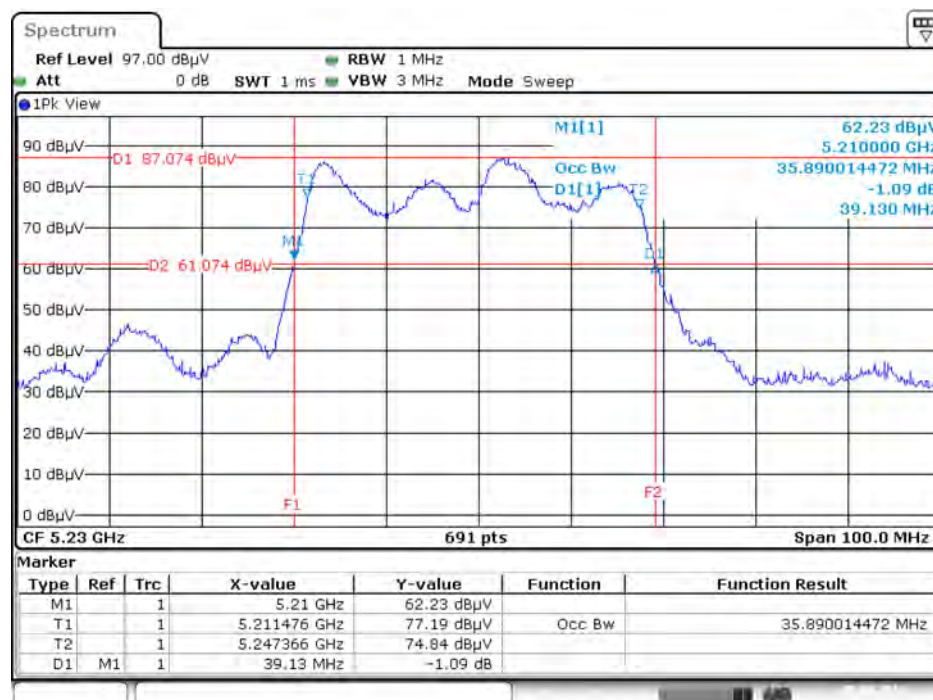
Date: 5.AUG.2016 16:33:48

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5190 MHz



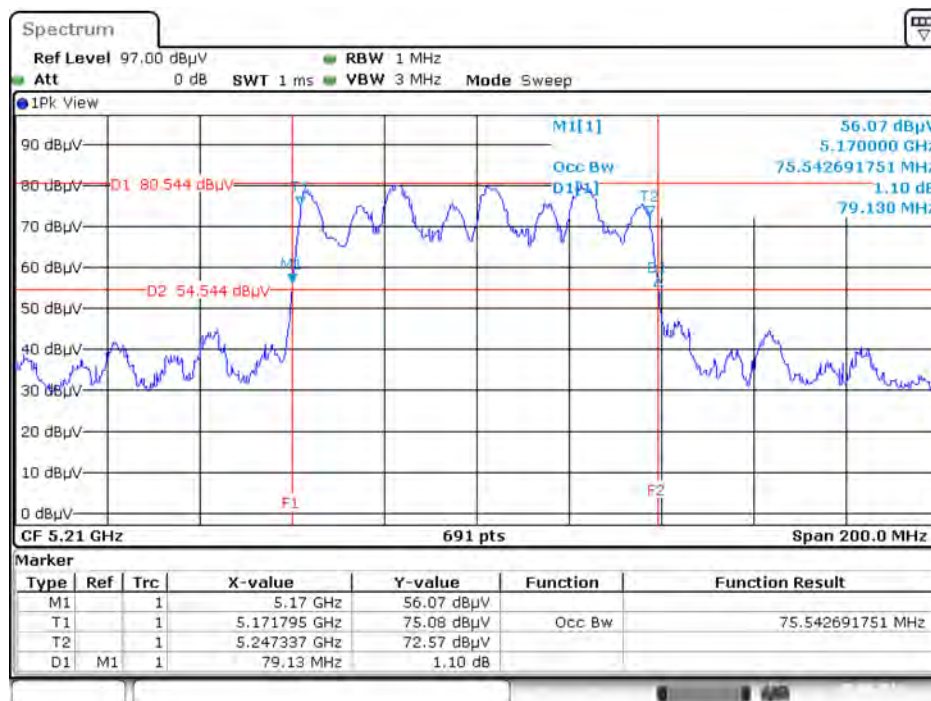
Date: 5.AUG.2016 16:37:09

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5230 MHz



Date: 5.AUG.2016 16:37:31

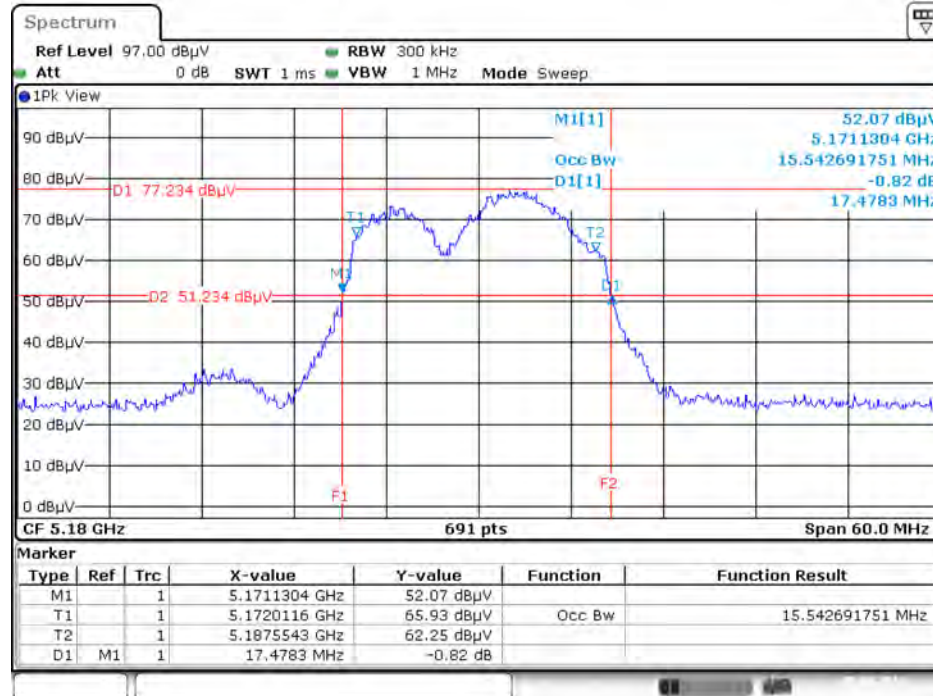
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5210 MHz



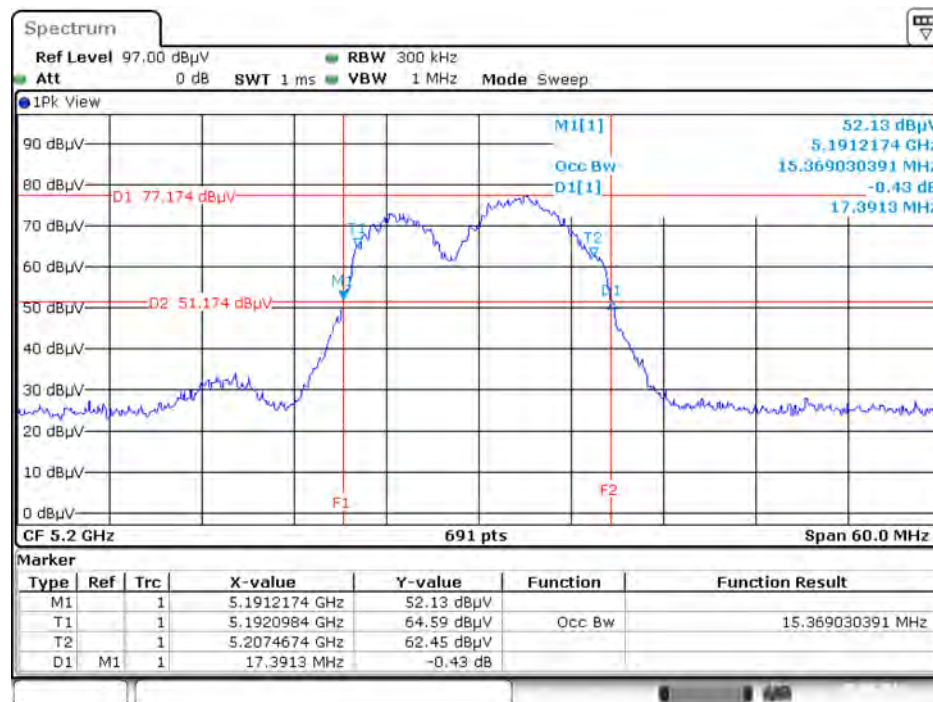
Date: 5.AUG.2016 12:03:56

For outdoor use master B1

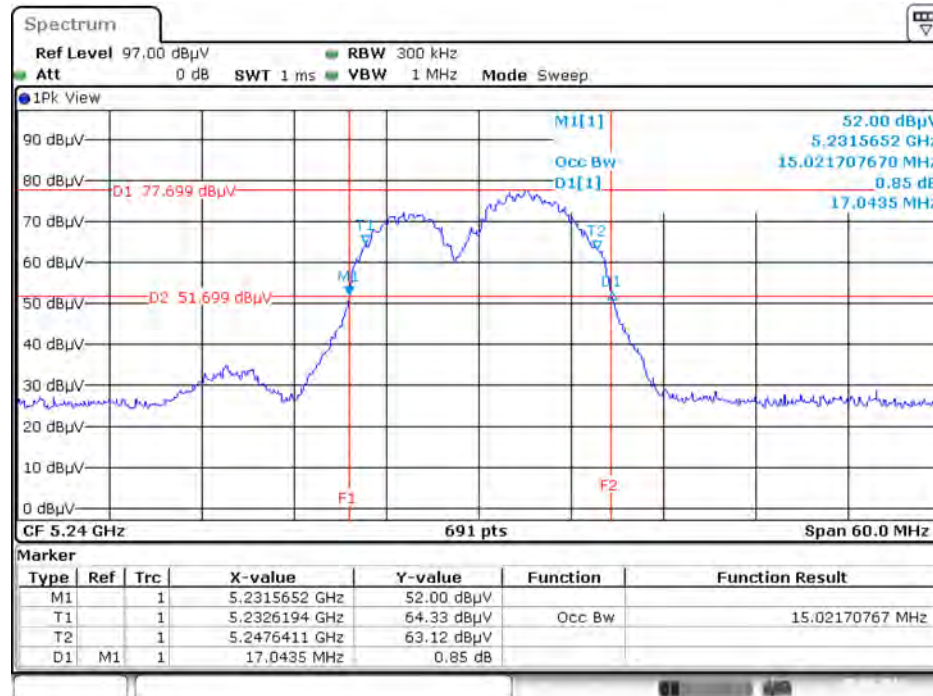
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2
+ Port 3 + Port 4 / 5180 MHz



26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2
+ Port 3 + Port 4 / 5200 MHz

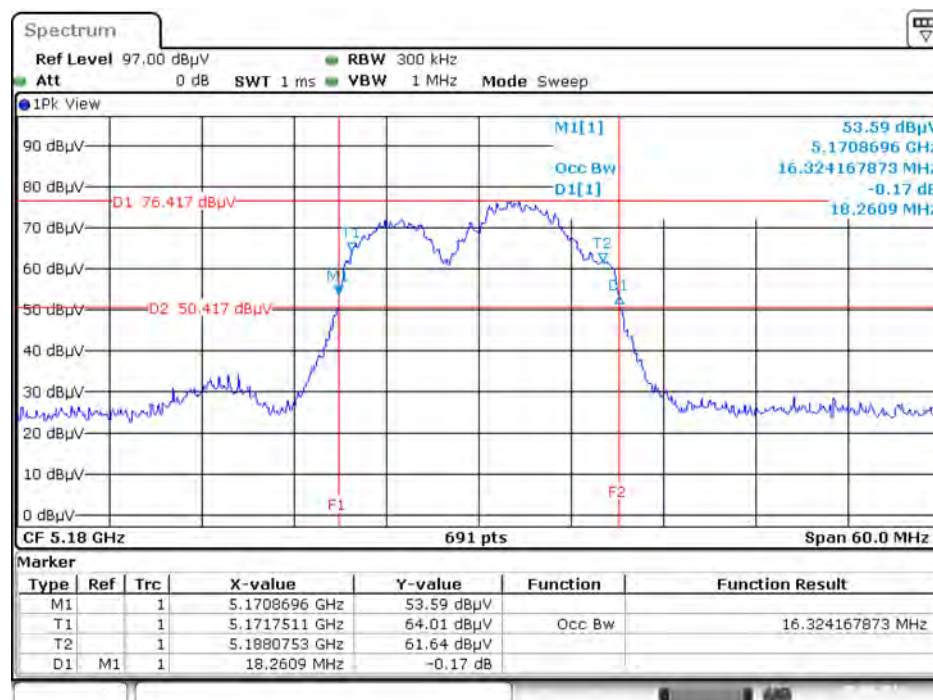


26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5240 MHz



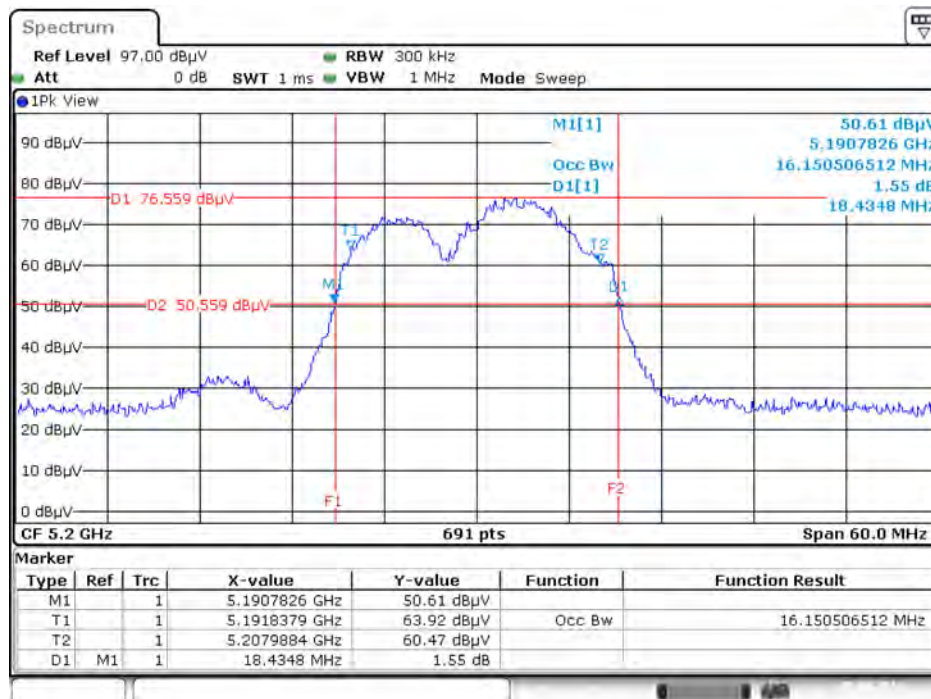
Date: 5.AUG.2016 19:38:24

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5180 MHz



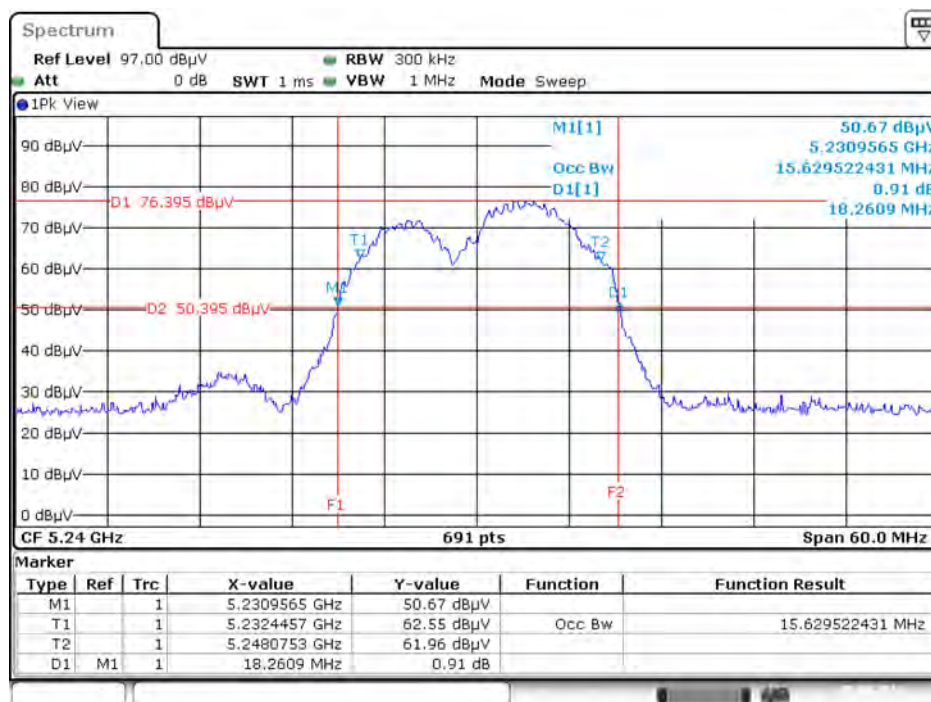
Date: 5.AUG.2016 19:41:52

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5200 MHz**



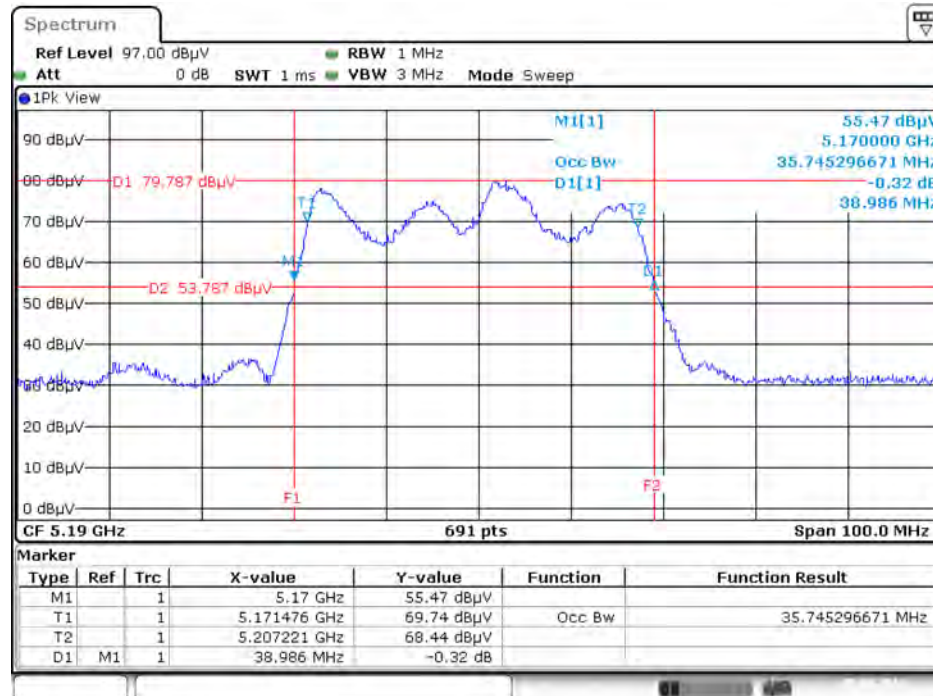
Date: 5.AUG.2016 19:48:54

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5240 MHz**



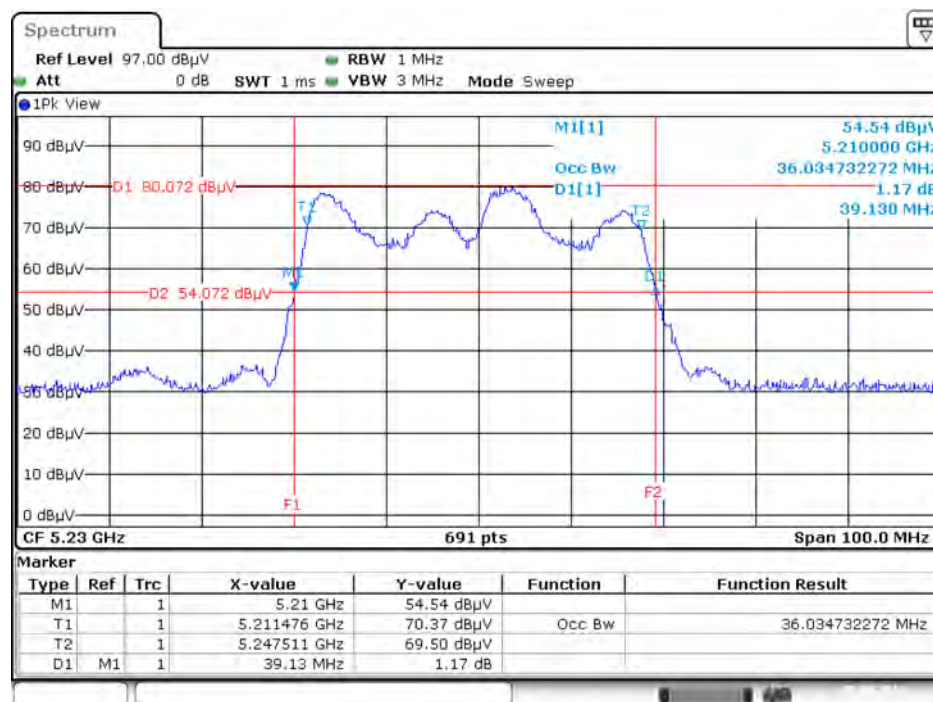
Date: 5.AUG.2016 19:52:03

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5190 MHz



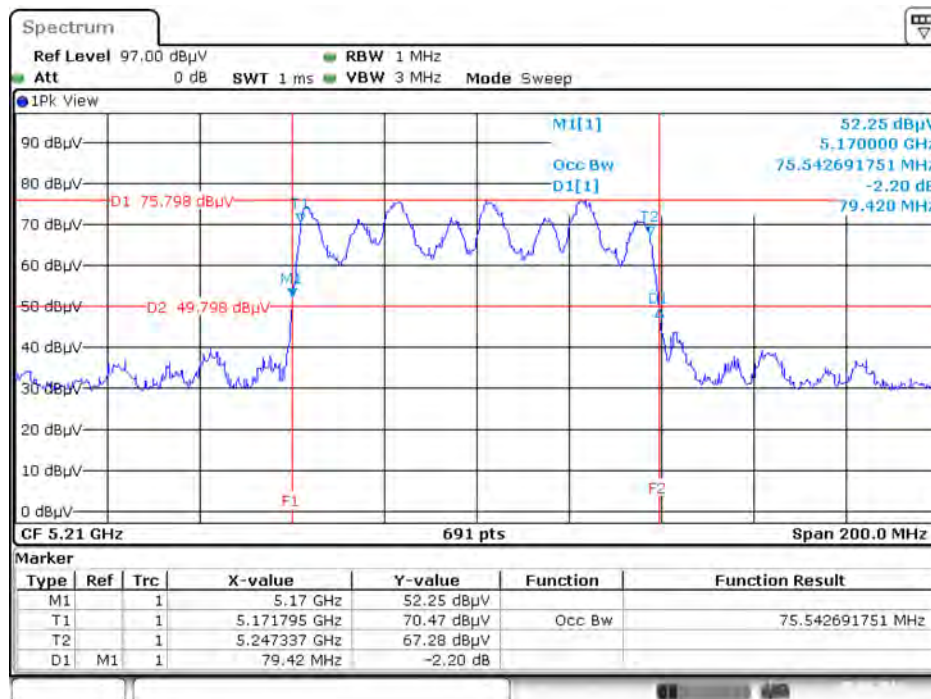
Date: 5.AUG.2016 19:55:47

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5230 MHz



Date: 5.AUG.2016 19:58:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5210 MHz



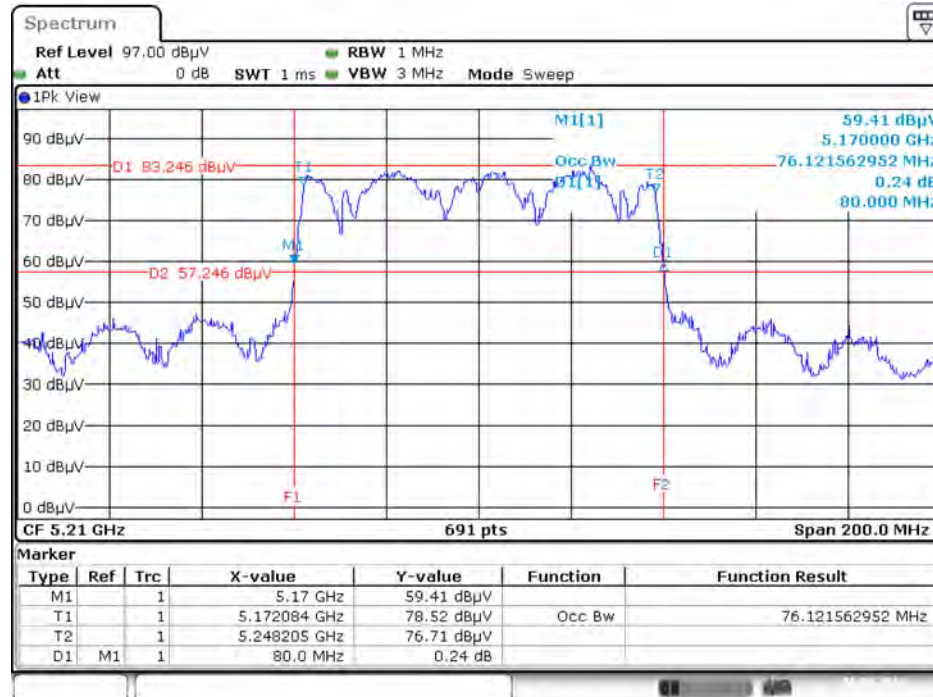
Date: 5.AUG.2016 20:01:01

802.11ac MCS0/Nss2 VHT80+80

For indoor use master and slave without radar detection

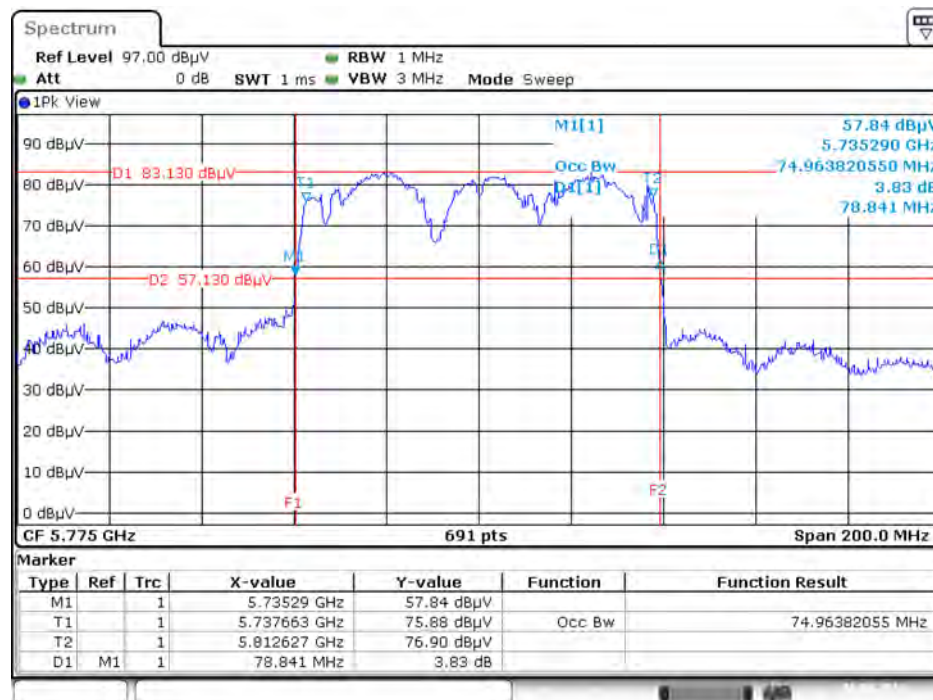
Type 1

26dB Bandwidth and 99% Occupied Bandwidth Plot on Port 1 + Port 2 / 5210 MHz



Date: 6 AUG. 2016 15:06:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Port 3 + Port 4 / 5775 MHz

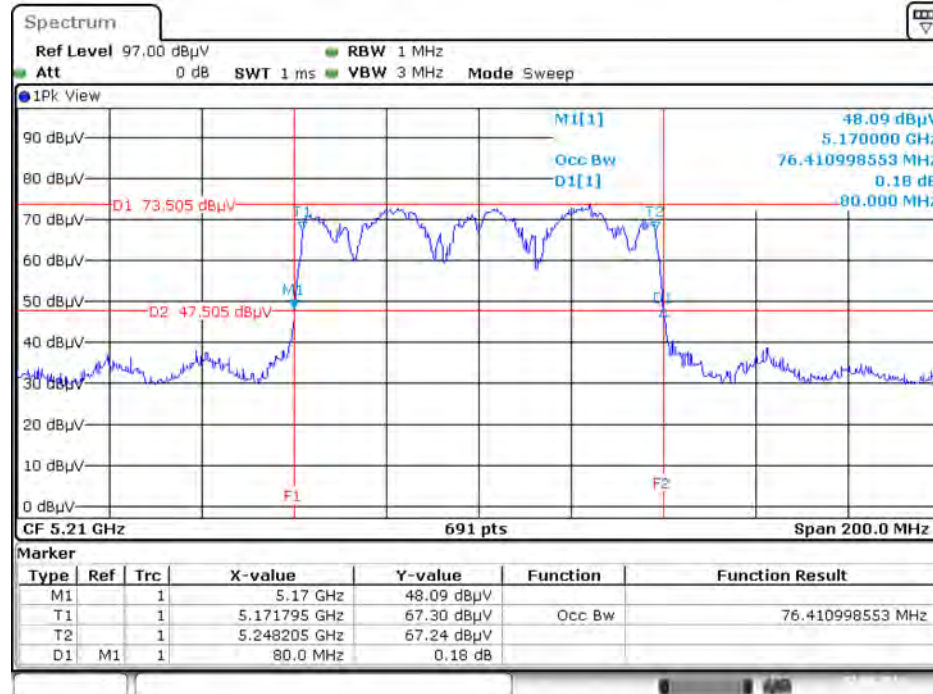


Date: 6 AUG. 2016 15:16:28

For outdoor use master B1

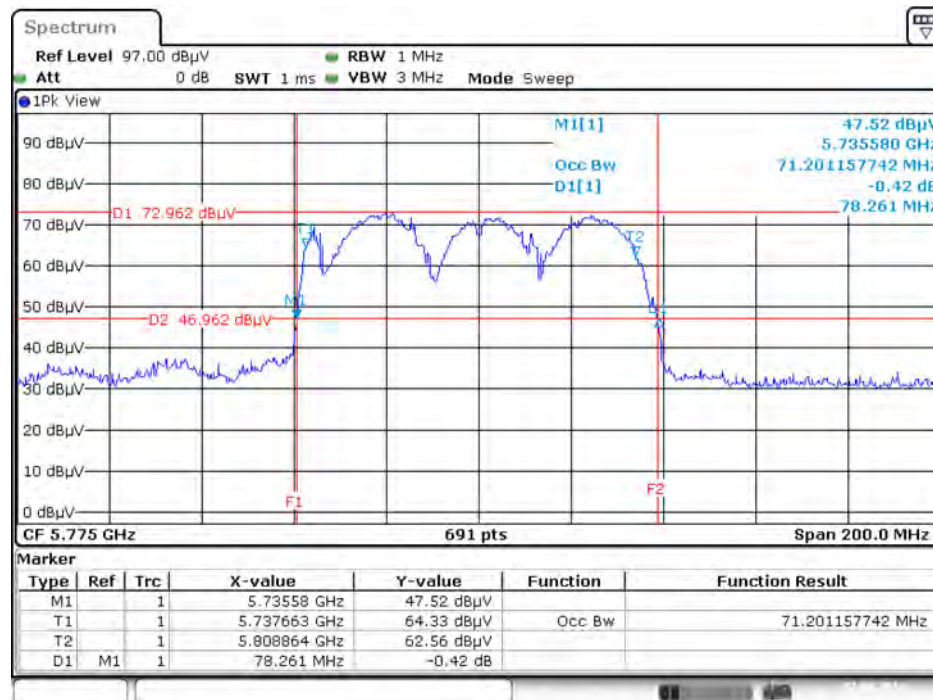
Type 1

26dB Bandwidth and 99% Occupied Bandwidth Plot on Port 1 + Port 2 / 5210 MHz



Date: 7.AUG.2016 11:37:34

26dB Bandwidth and 99% Occupied Bandwidth Plot on Port 3 + Port 4 / 5775 MHz



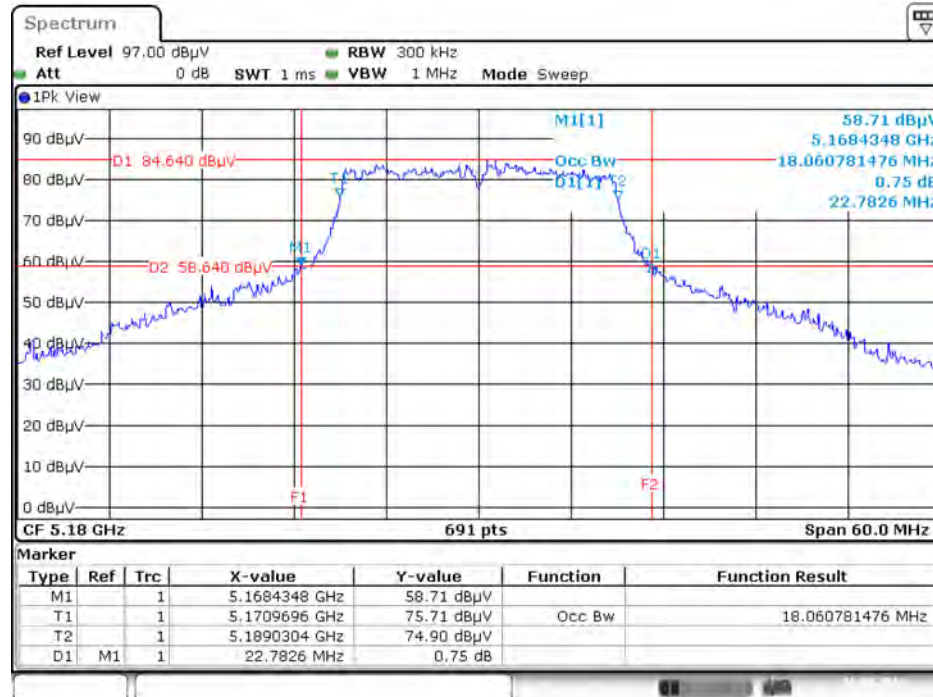
Date: 7.AUG.2016 11:52:00

For beamforming mode

For indoor use master B1 and indoor, outdoor use B4

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1

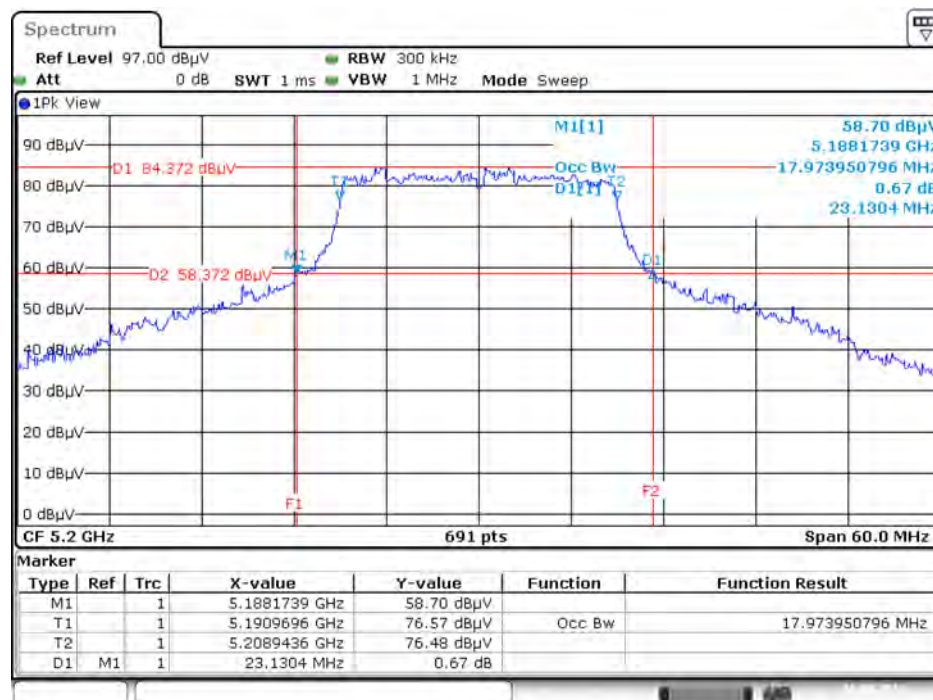
VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5180 MHz



Date: 10.AUG.2016 00:06:04

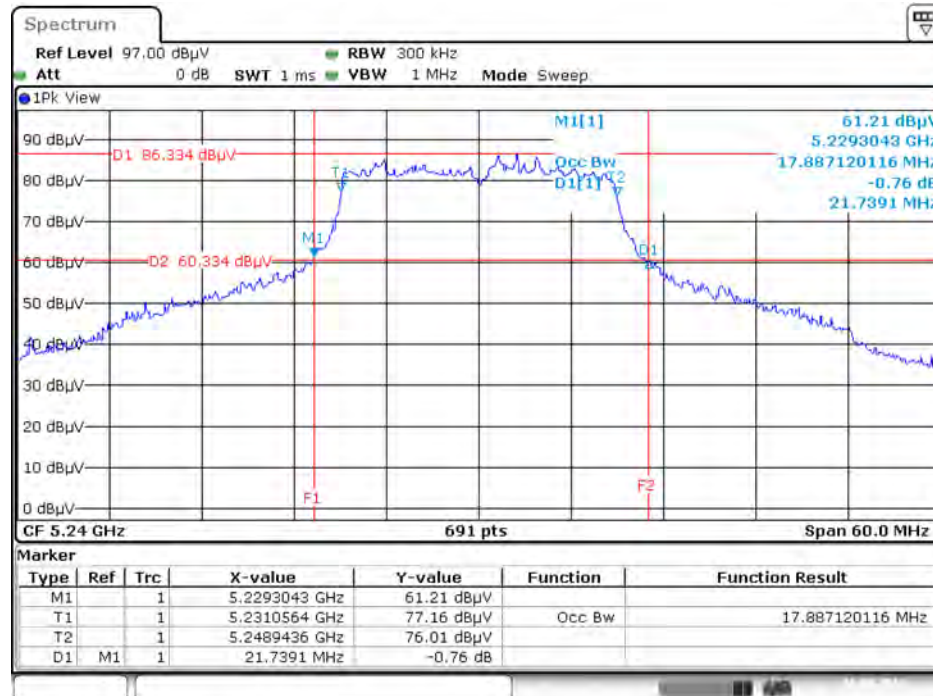
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1

VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5200 MHz



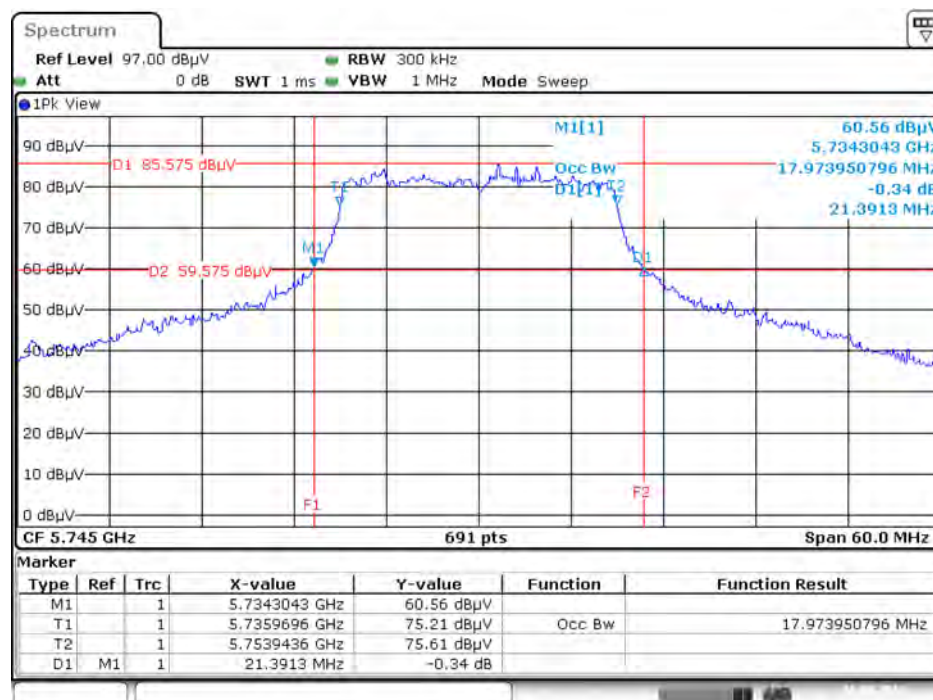
Date: 10.AUG.2016 00:07:40

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5240 MHz



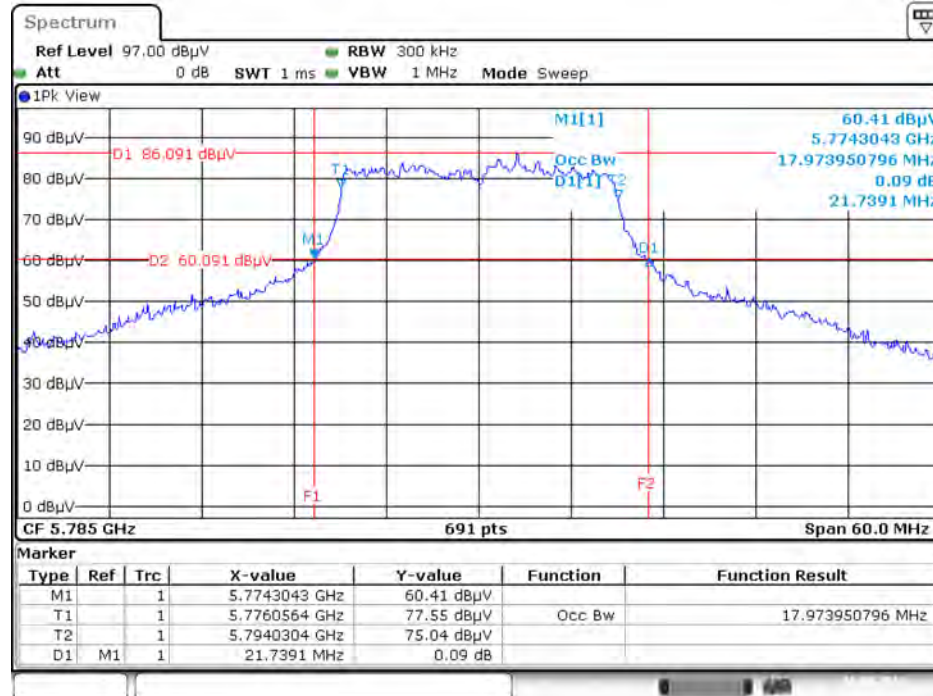
Date: 10.AUG.2016 00:12:11

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5745 MHz



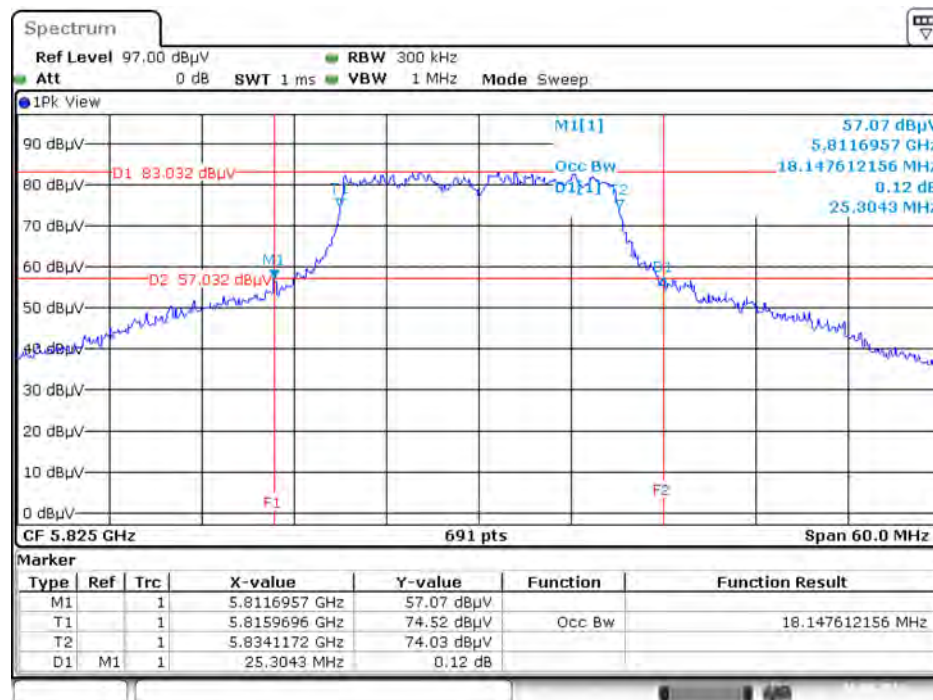
Date: 10.AUG.2016 00:23:07

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5785 MHz**



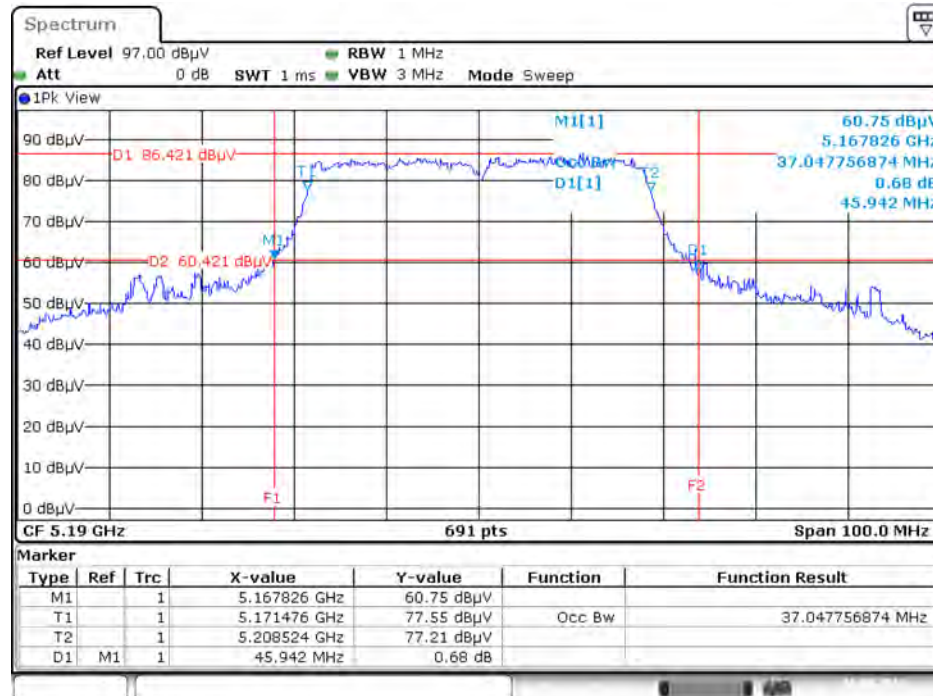
Date: 10.AUG.2016 00:24:49

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5825 MHz**



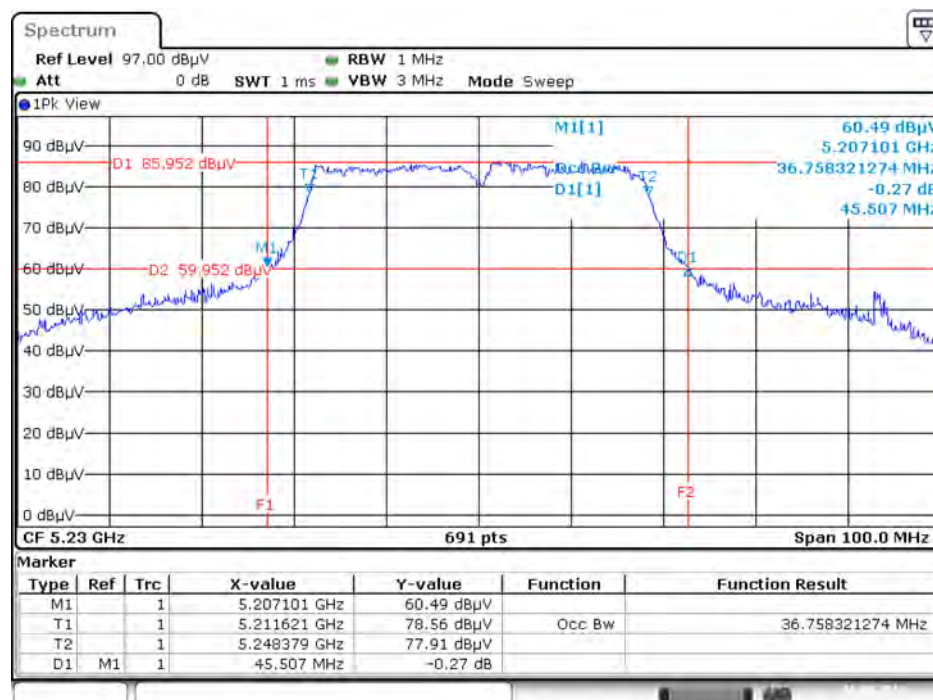
Date: 10.AUG.2016 00:26:53

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5190 MHz**



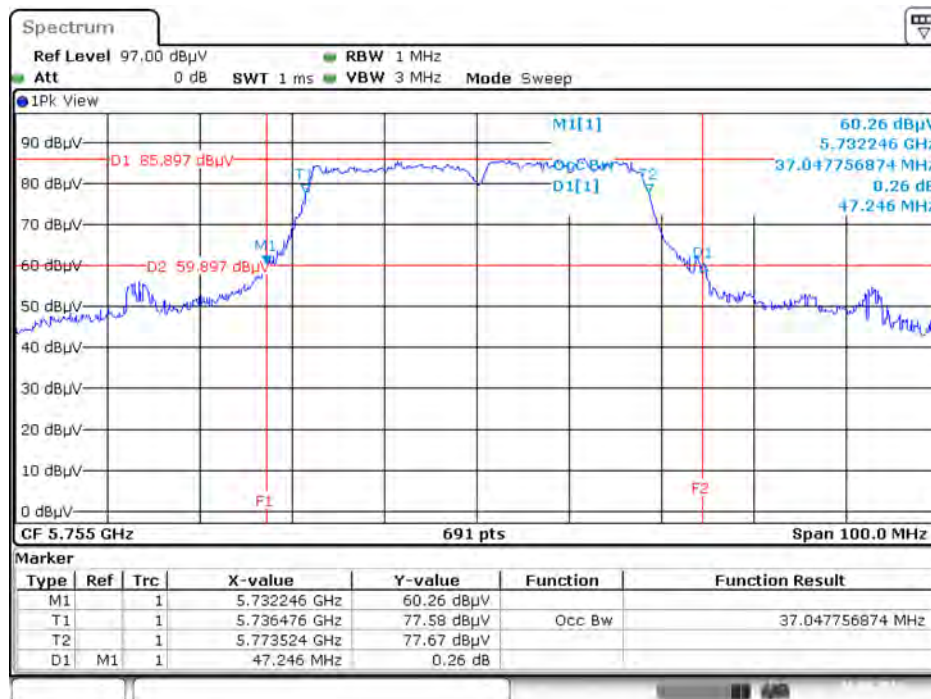
Date: 10.AUG.2016 01:08:46

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5230 MHz**



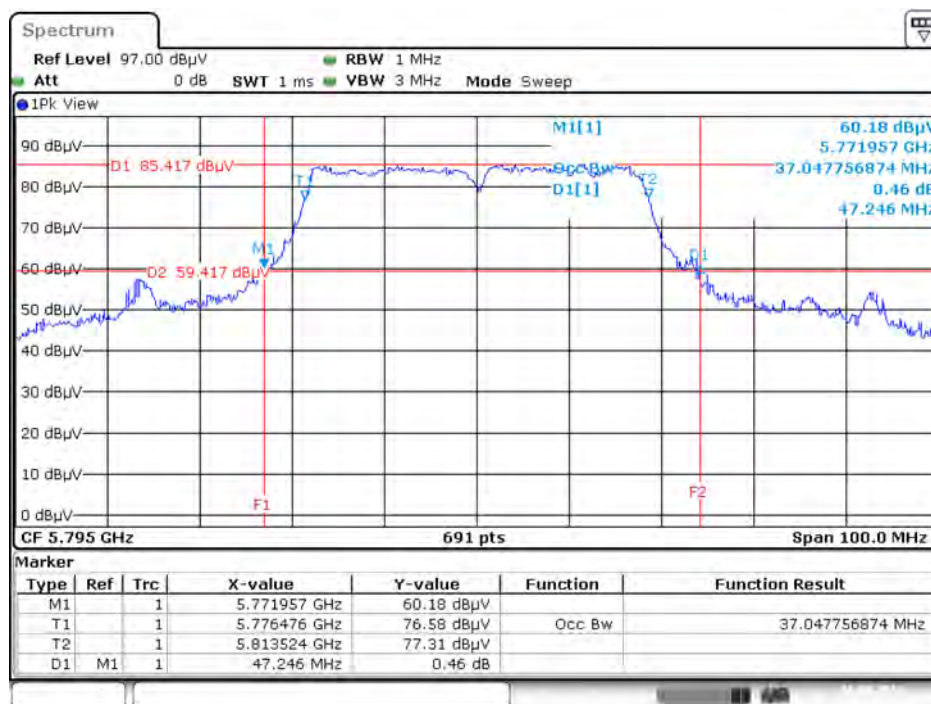
Date: 10.AUG.2016 01:09:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5755 MHz



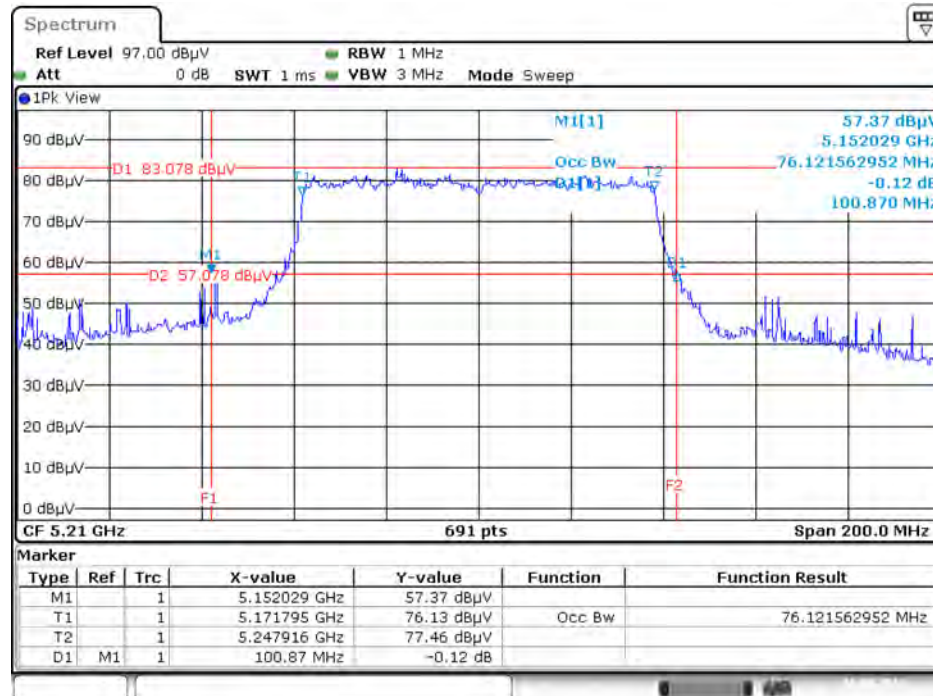
Date: 10.AUG.2016 01:20:32

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5795 MHz



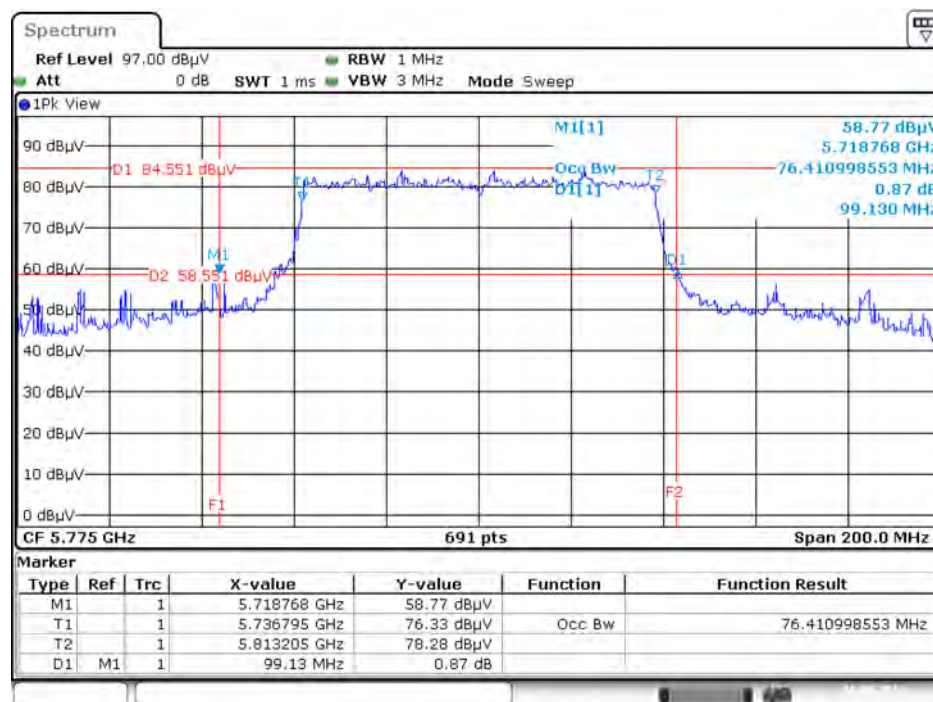
Date: 10.AUG.2016 01:22:25

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5210 MHz**



Date: 10.AUG.2016 01:25:18

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5775 MHz**

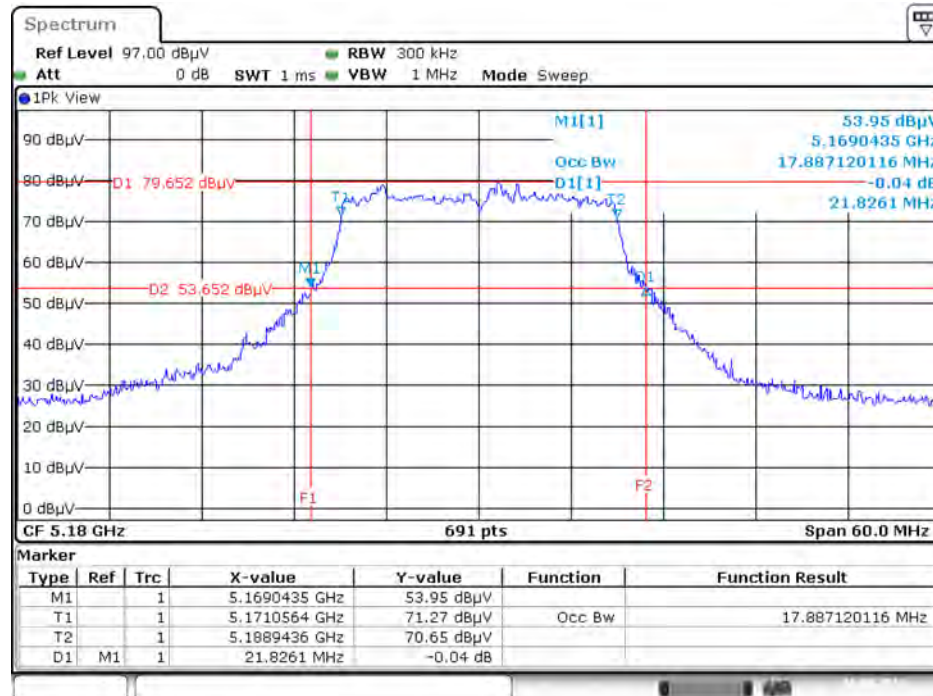


Date: 10.AUG.2016 01:34:51

For indoor use slave without radar detection B1

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1

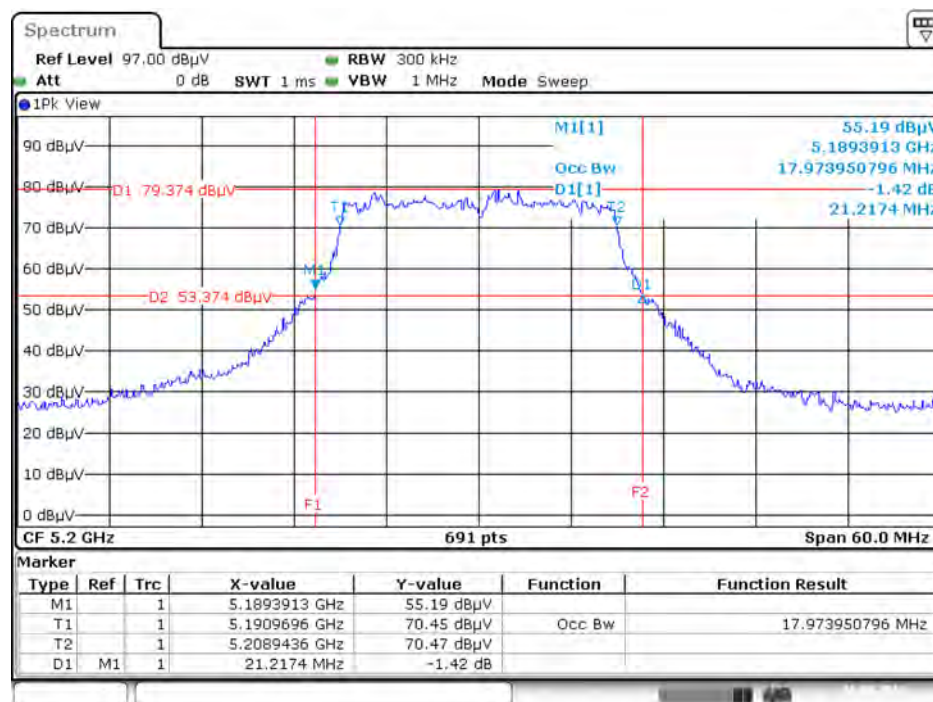
VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5180 MHz



Date: 10.AUG.2016 02:06:57

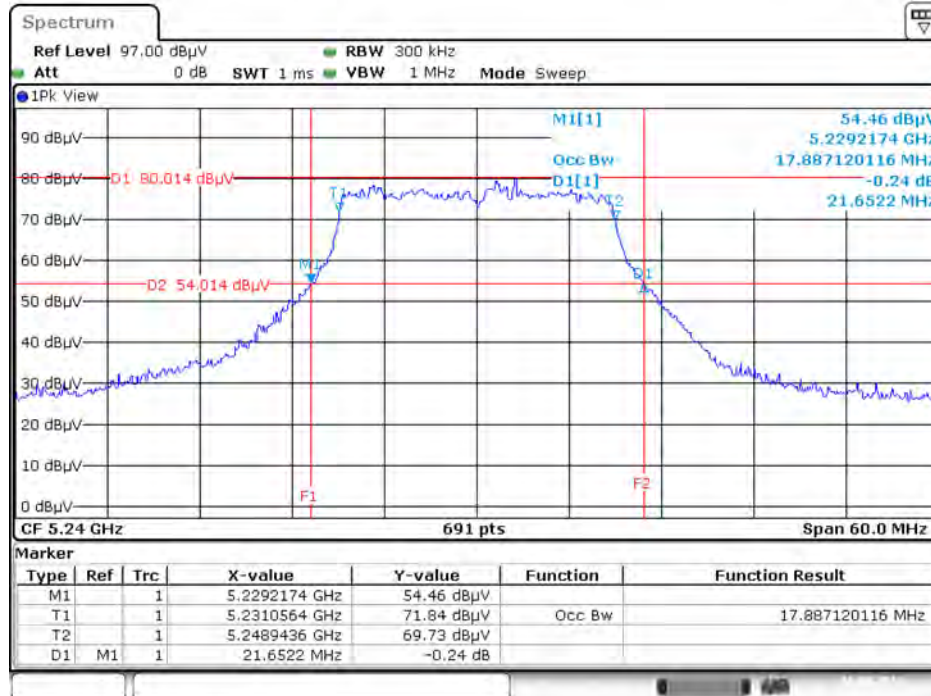
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1

VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5200 MHz



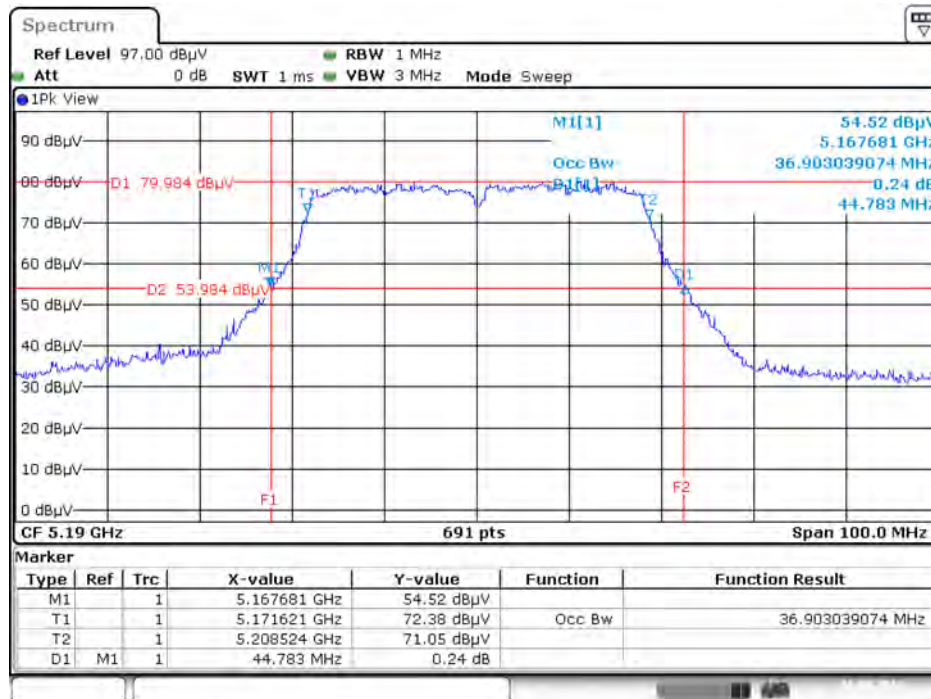
Date: 10.AUG.2016 02:08:45

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5240 MHz**



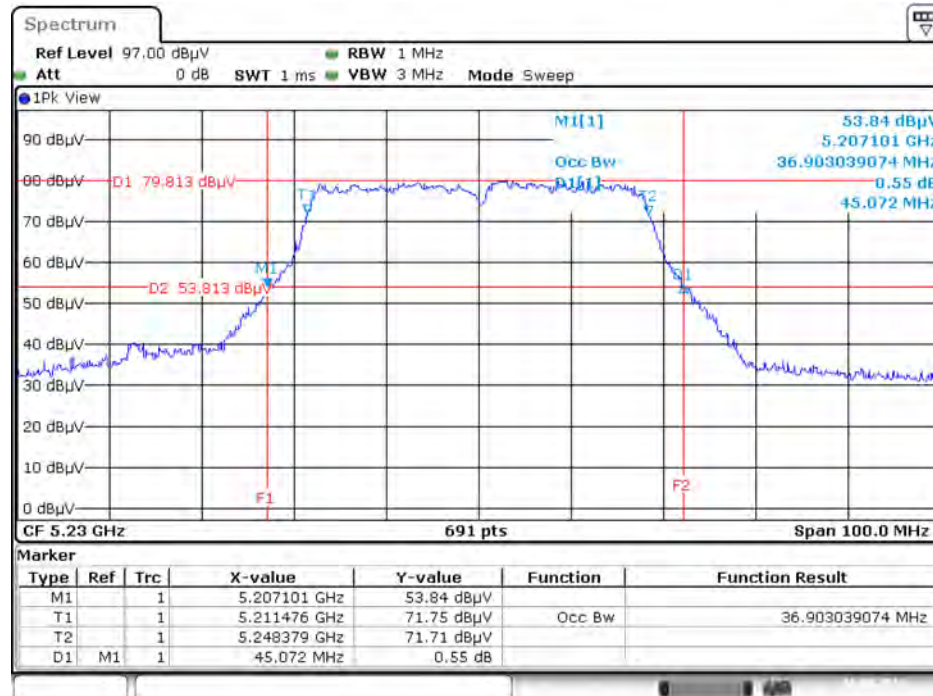
Date: 10.AUG.2016 02:10:56

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5190 MHz**



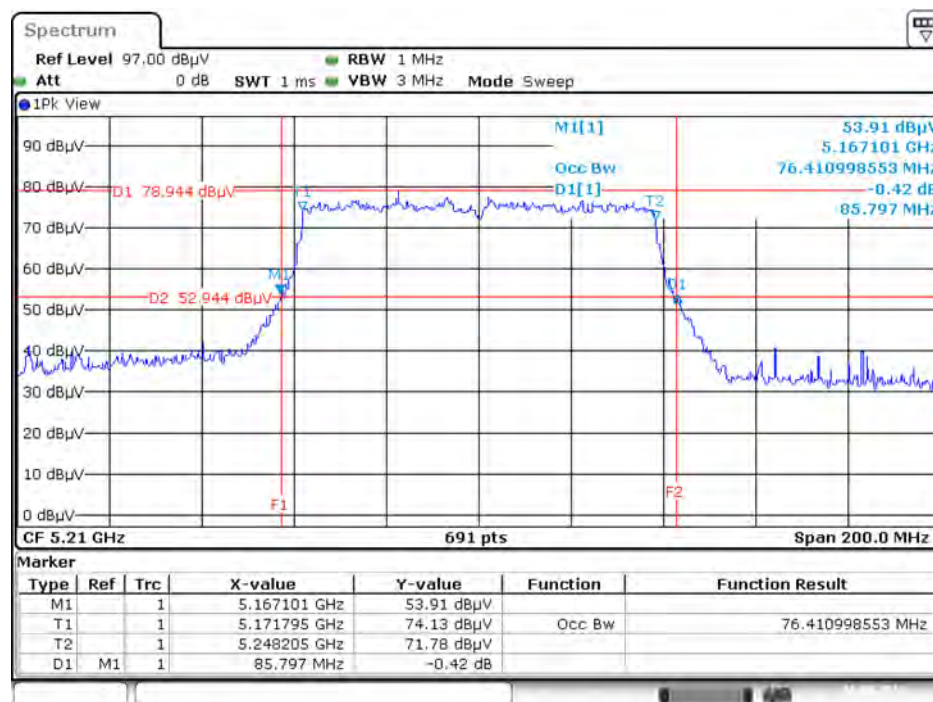
Date: 10.AUG.2016 02:17:44

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5230 MHz



Date: 10.AUG.2016 02:19:22

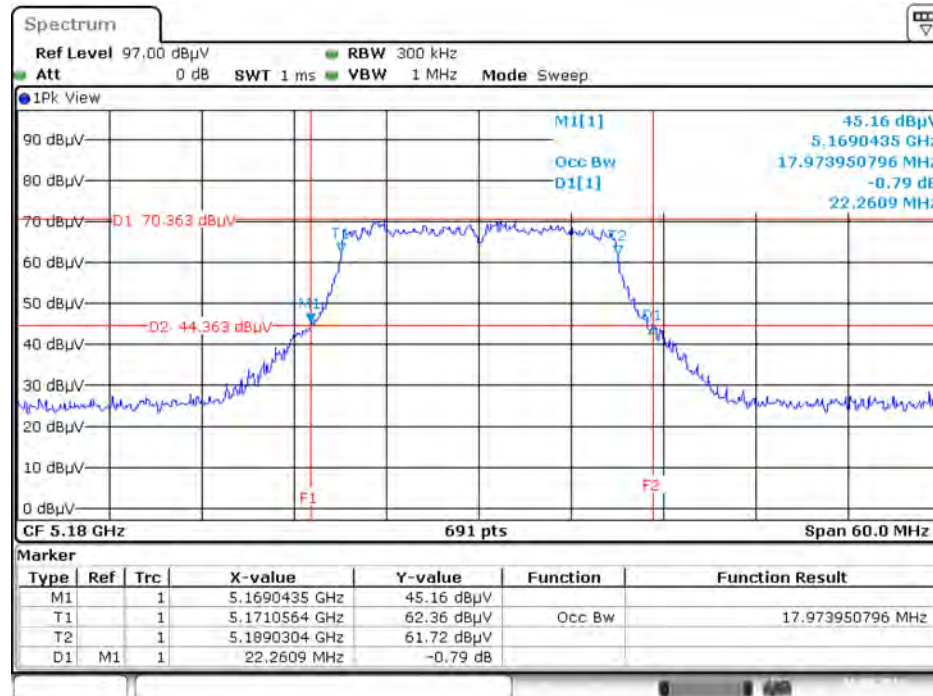
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5210 MHz



Date: 10.AUG.2016 02:22:03

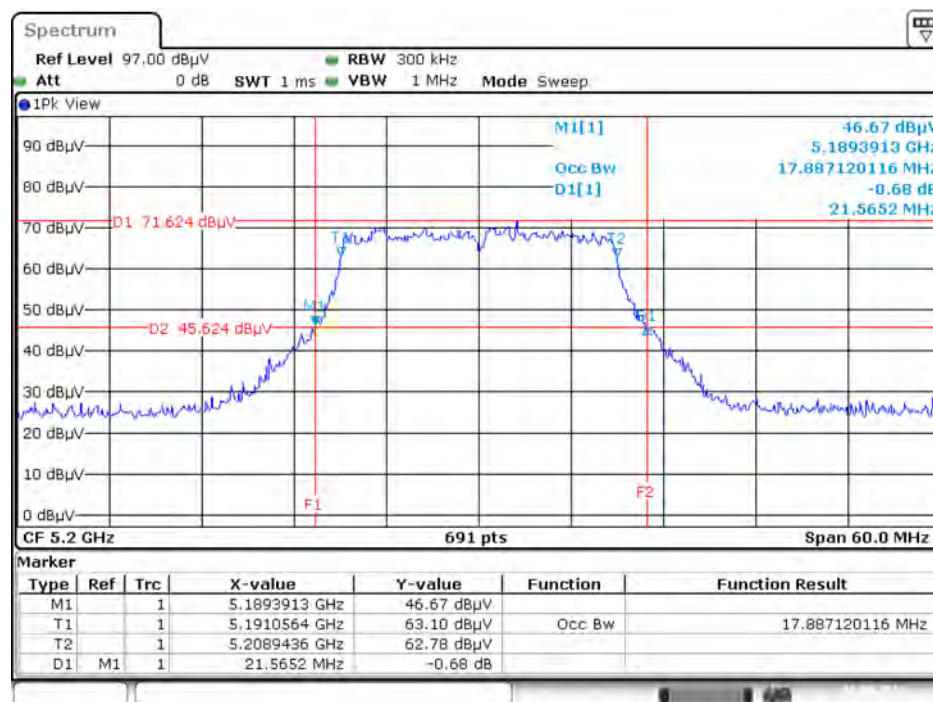
For outdoor use master B1

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5180 MHz



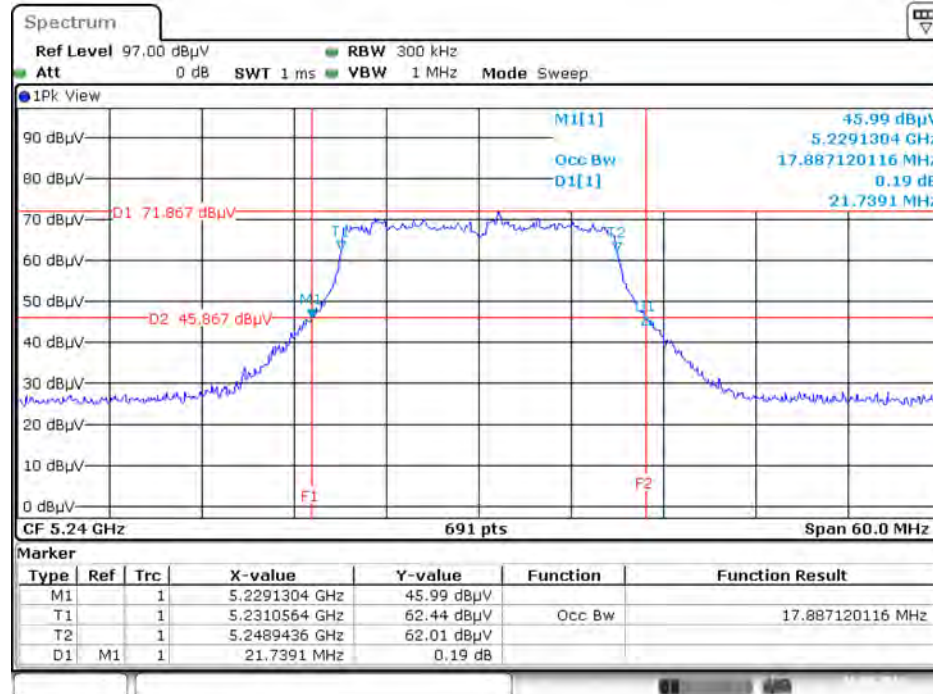
Date: 10.AUG.2016 02:29:39

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5200 MHz



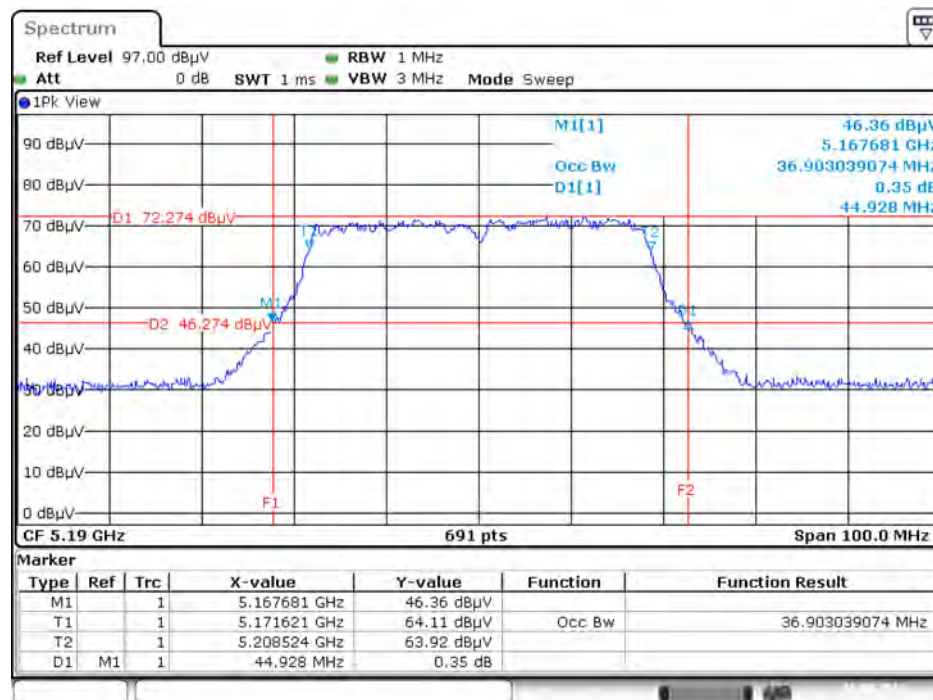
Date: 10.AUG.2016 02:30:52

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5240 MHz**



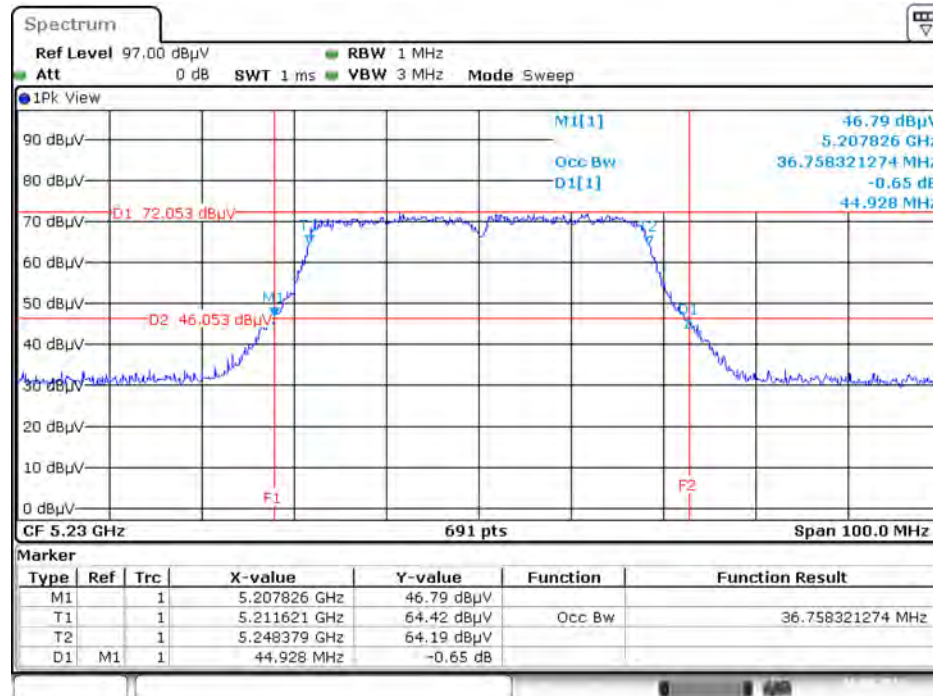
Date: 10.AUG.2016 02:33:14

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5190 MHz**



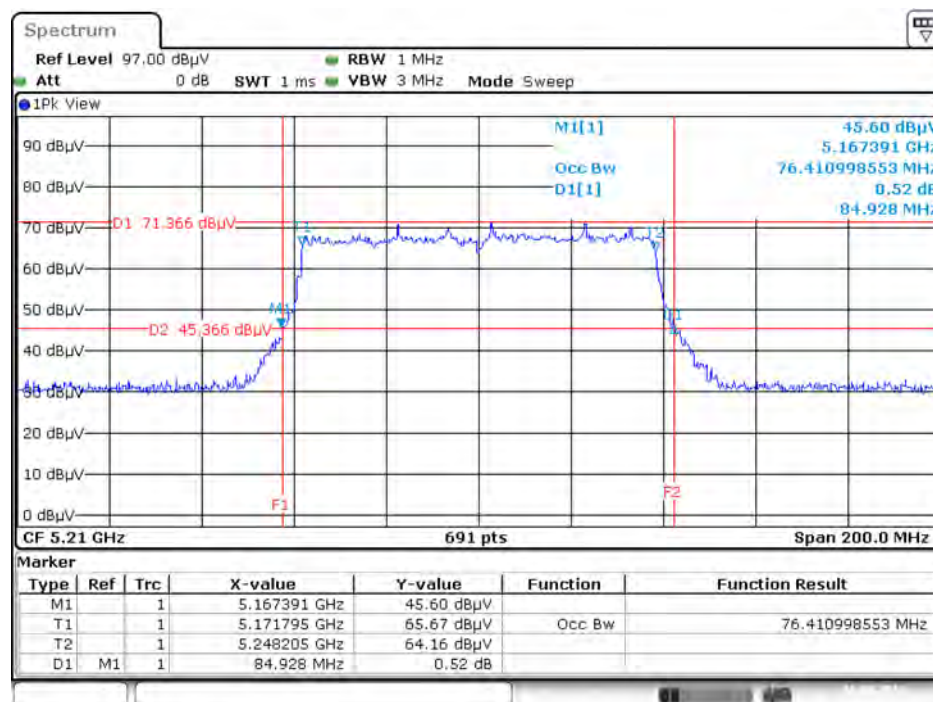
Date: 10.AUG.2016 02:36:14

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5230 MHz**



Date: 10.AUG.2016 02:37:54

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1
VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5210 MHz**



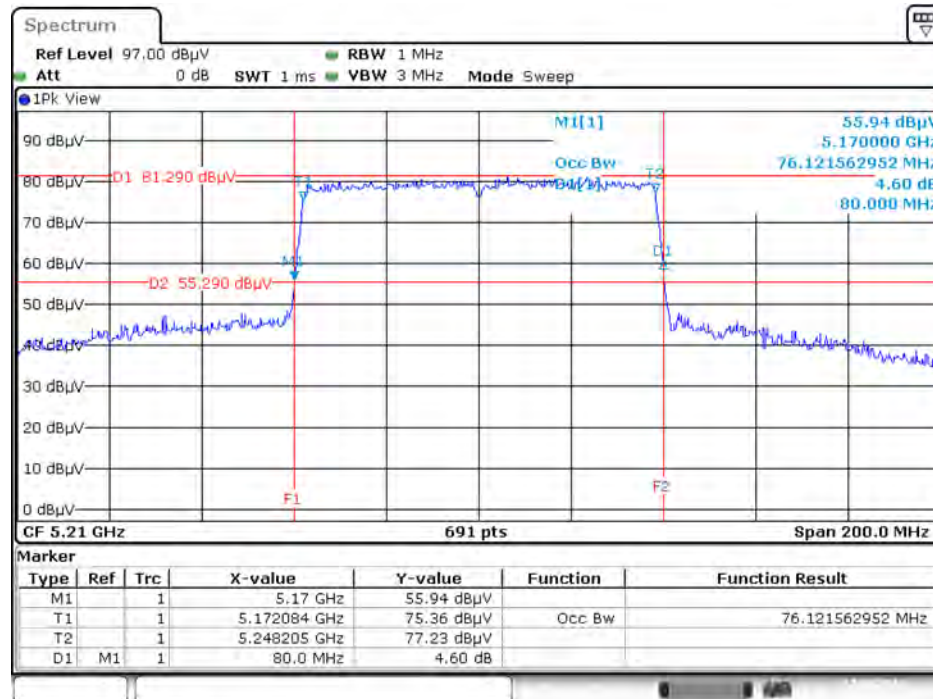
Date: 10.AUG.2016 02:40:29

802.11ac MCS0/Nss2 VHT80+80

For indoor use master and slave without radar detection

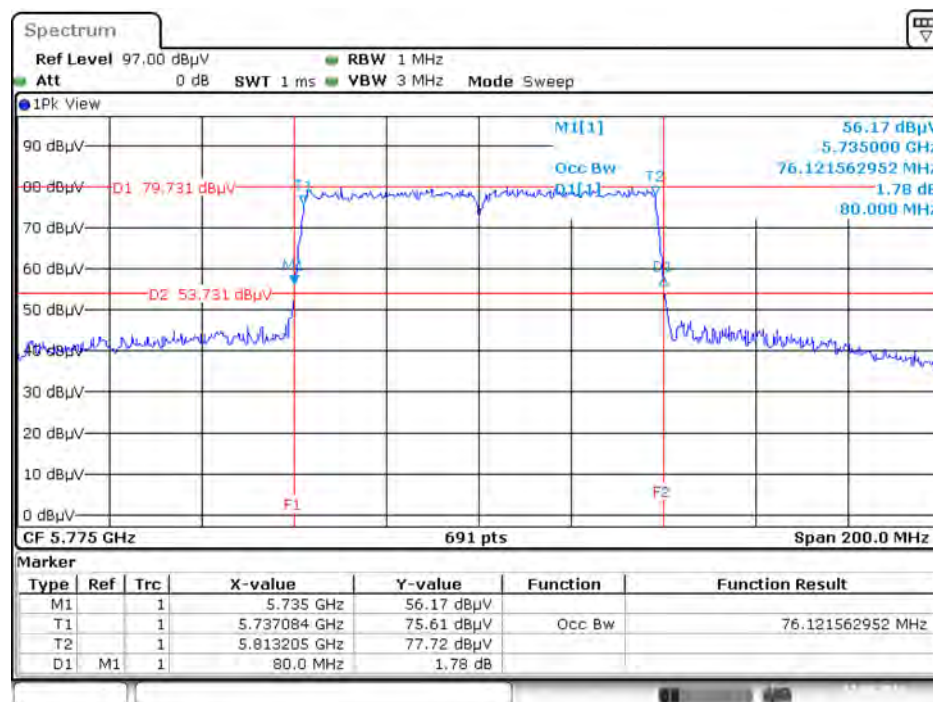
Type 1

26dB Bandwidth and 99% Occupied Bandwidth Plot on Port 1 + Port 2 / 5210 MHz



Date: 17.AUG.2016 11:08:07

26dB Bandwidth and 99% Occupied Bandwidth Plot on Port 3 + Port 4 / 5775 MHz

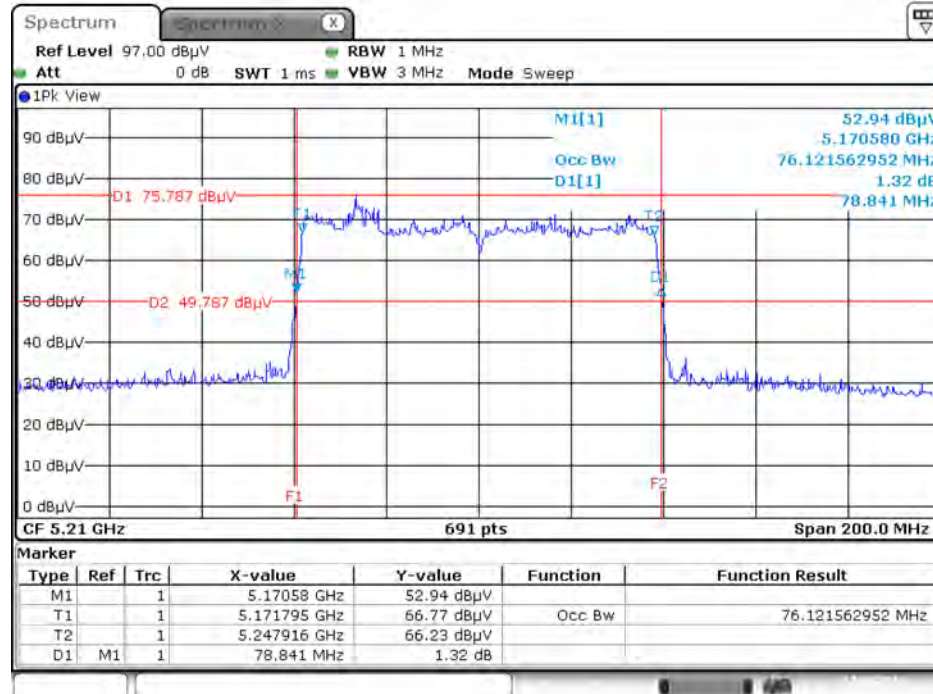


Date: 17.AUG.2016 11:14:37

For outdoor use master B1

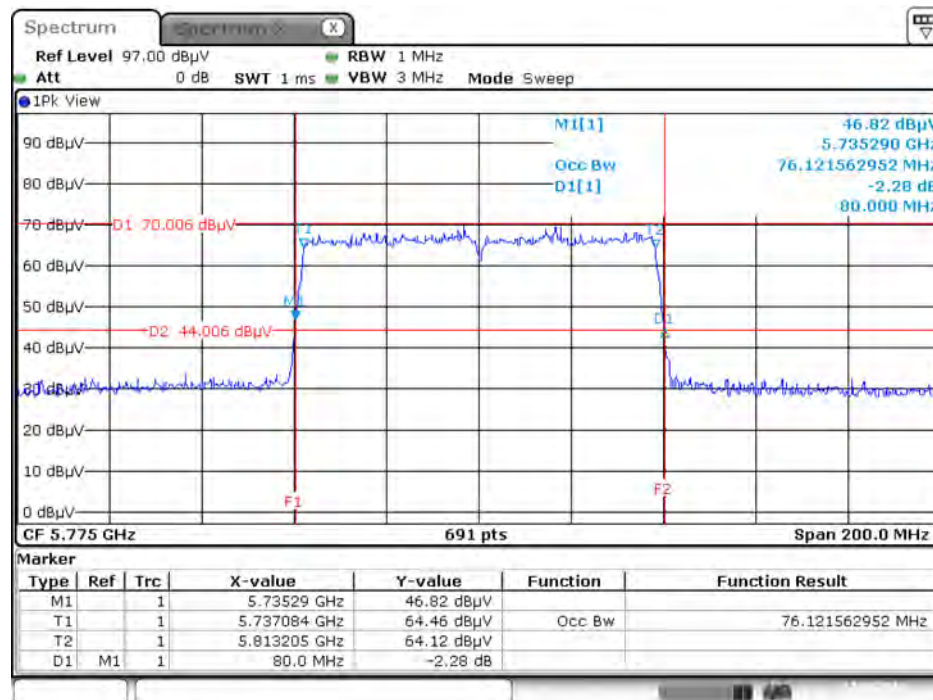
Type 1

26dB Bandwidth and 99% Occupied Bandwidth Plot on Port 1 + Port 2 / 5210 MHz



Date: 17.AUG.2016 16:28:56

26dB Bandwidth and 99% Occupied Bandwidth Plot on Port 3 + Port 4 / 5775 MHz



Date: 17.AUG.2016 16:36:48

2.3. 6dB Spectrum Bandwidth Measurement

2.3.1. Limit

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

2.3.2. Measuring Instruments and Setting

Please refer to section 3 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	$\geq 3 \times \text{RBW}$
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

2.3.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB789033 D02 v02r01 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. Measured the spectrum width with power higher than 6dB below carrier.

2.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

This test setup layout is the same as that shown in section 2.6.4.

2.3.5. Test Deviation

There is no deviation with the original standard.

2.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.3.7. Test Result of 6dB Spectrum Bandwidth

Temperature	22°C	Humidity	54%
Test Engineer	Gary Chu		

For non-beamforming mode

For indoor, outdoor use master and slave without radar detection

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	3.88	500	PASS
	5785 MHz	3.77	500	PASS
	5825 MHz	10.73	500	PASS
802.11ac MCS0/Nss1 VHT20	5745 MHz	12.00	500	PASS
	5785 MHz	11.71	500	PASS
	5825 MHz	11.77	500	PASS
802.11ac MCS0/Nss1 VHT40	5755 MHz	34.55	500	PASS
	5795 MHz	32.81	500	PASS
802.11ac MCS0/Nss1 VHT80	5775 MHz	75.36	500	PASS

802.11ac MCS0/Nss2 VHT80+80

For indoor use master and slave without radar detection

Type	Frequency	6dB BW (MHz)	Min. Limit (kHz)	Test Result
1	5210 MHz	-		
	5775 MHz	70.15	500	PASS

For outdoor use master B1

Type	Frequency	6dB BW (MHz)	Min. Limit (kHz)	Test Result
1	5210 MHz	-		
	5775 MHz	73.91	500	PASS

For beamforming mode
For indoor, outdoor use master and slave without radar detection

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.74	500	PASS
	5785 MHz	17.74	500	PASS
	5825 MHz	17.28	500	PASS
802.11ac MCS0/Nss1 VHT40	5755 MHz	33.97	500	PASS
	5795 MHz	32.70	500	PASS
802.11ac MCS0/Nss1 VHT80	5775 MHz	74.20	500	PASS

802.11ac MCS0/Nss2 VHT80+80
For indoor use master and slave without radar detection

Type	Frequency	6dB BW (MHz)	Min. Limit (kHz)	Test Result
1	5210 MHz	-		
	5775 MHz	73.91	500	PASS

For outdoor use master B1

Type	Frequency	6dB BW (MHz)	Min. Limit (kHz)	Test Result
1	5210 MHz	-		
	5775 MHz	74.78	500	PASS

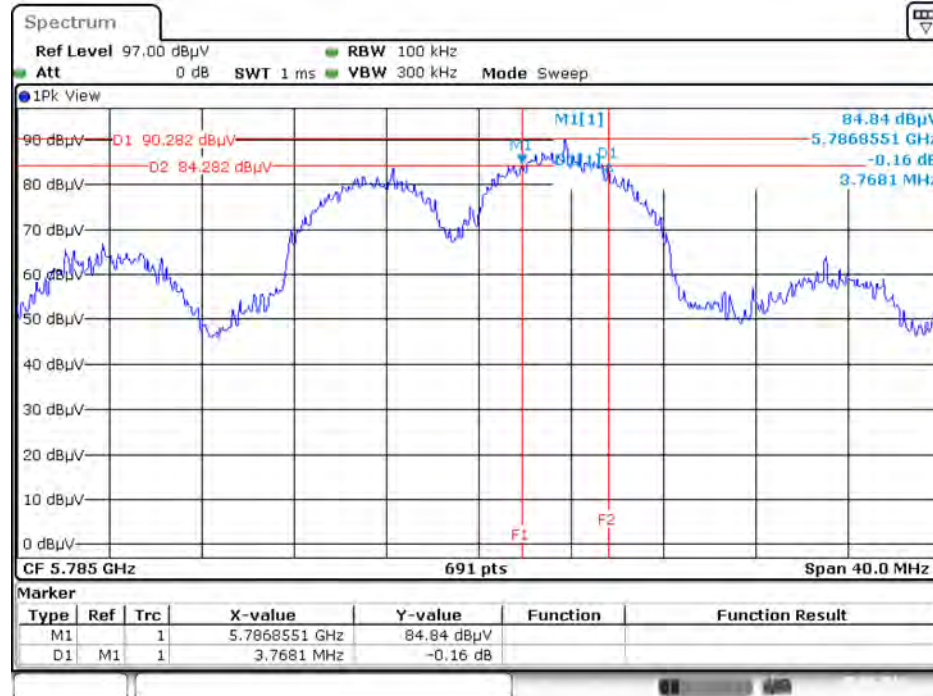
Note: All the test values were listed in the report.

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

For non-beamforming mode

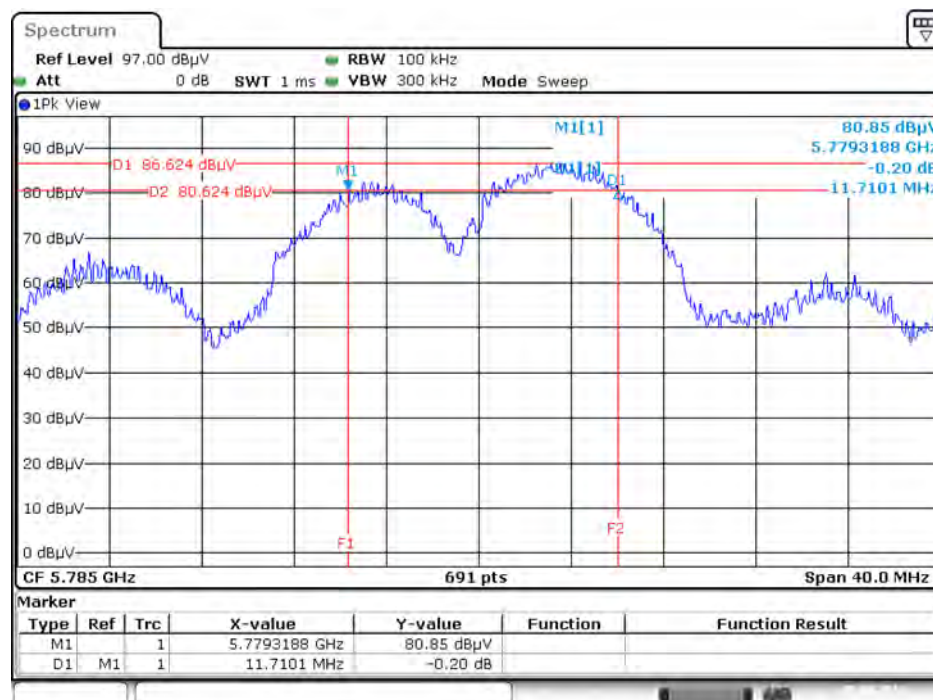
For indoor, outdoor use master and slave without radar detection

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5785 MHz



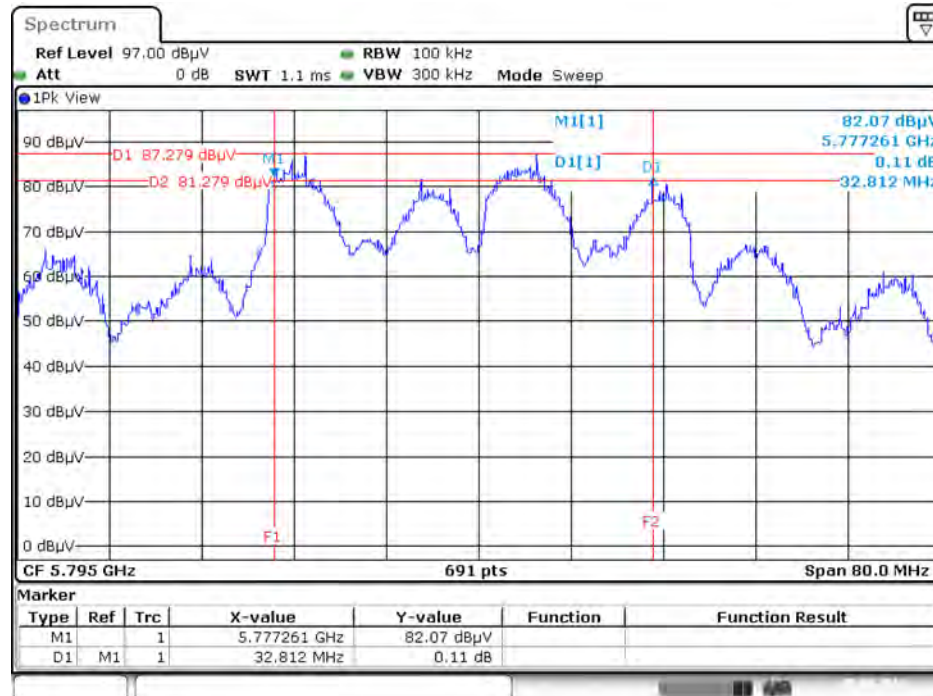
Date: 5.AUG.2016 13:45:08

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5785 MHz



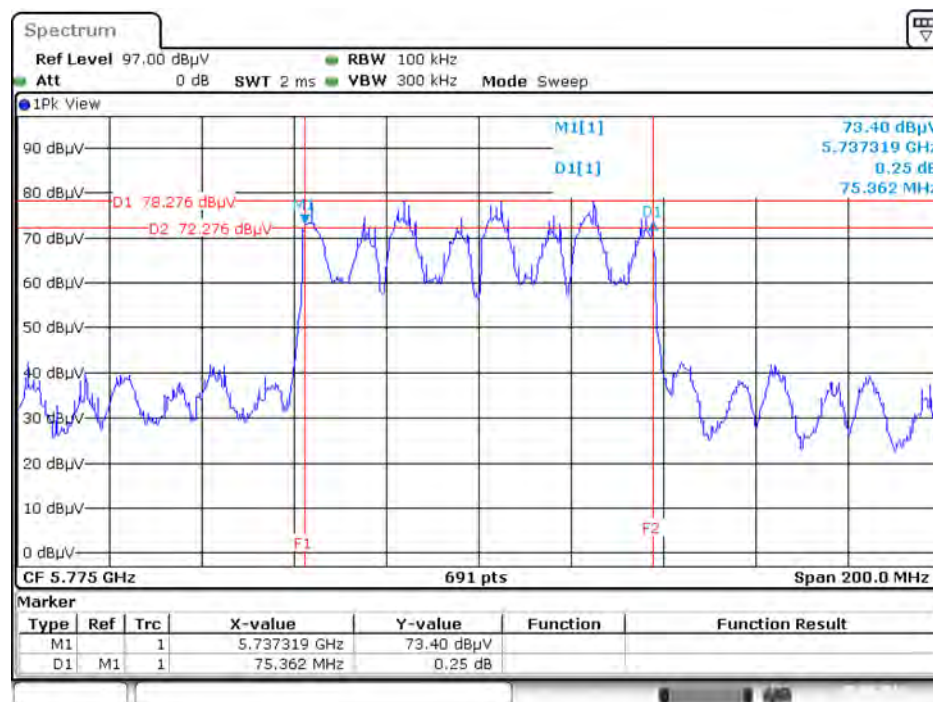
Date: 5.AUG.2016 13:47:09

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5795 MHz



Date: 5.AUG.2016 13:49:08

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5775 MHz



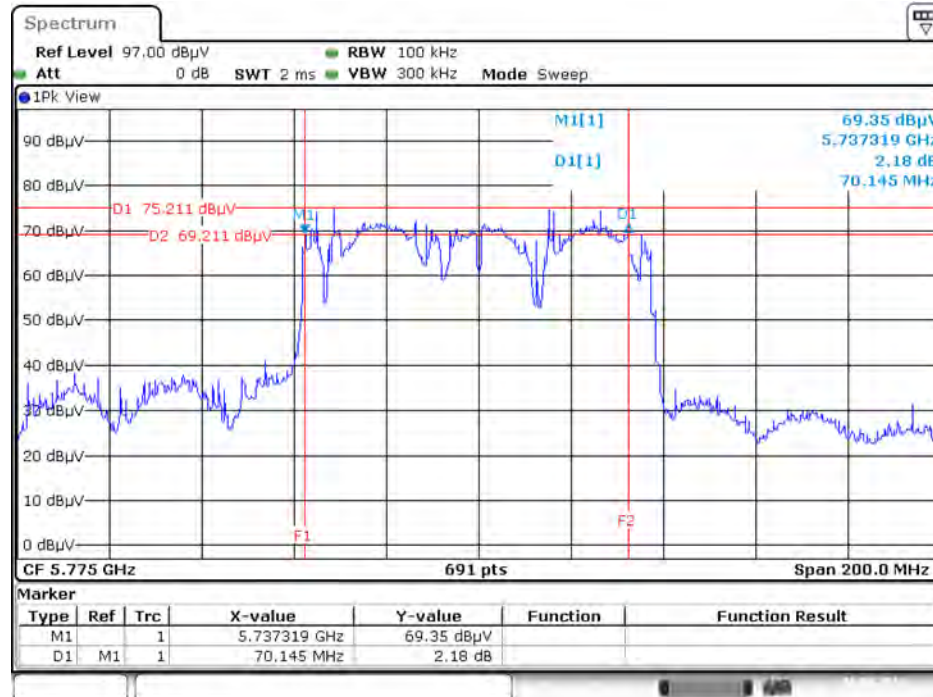
Date: 5.AUG.2016 13:50:02

802.11ac MCS0/Nss2 VHT80+80

For indoor use master and slave without radar detection

Type 1

6 dB Bandwidth Plot on Port 3 + Port 4 / 5775 MHz

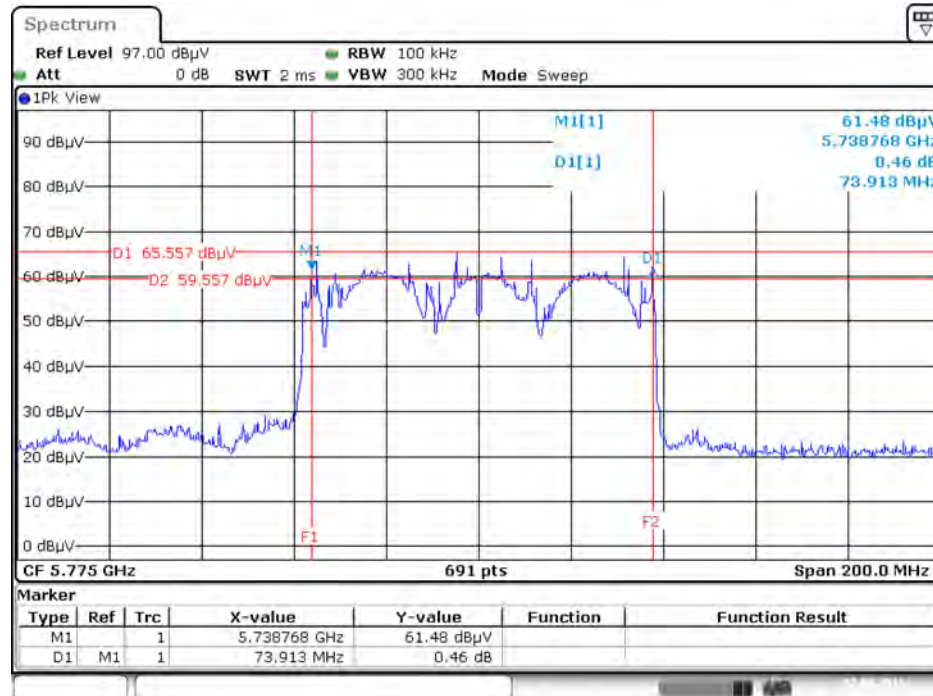


Date: 6 AUG. 2016 15:24:06

For outdoor use master B1

Type 1

6 dB Bandwidth Plot on Port 3 + Port 4 / 5775 MHz

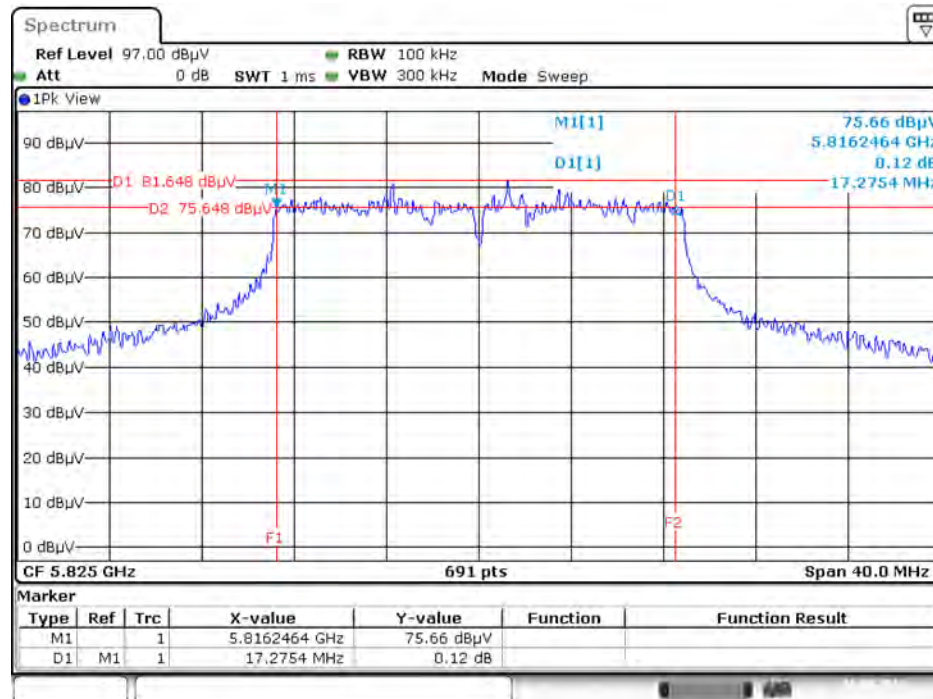


Date: 7.AUG.2016 11:50:50

For beamforming mode

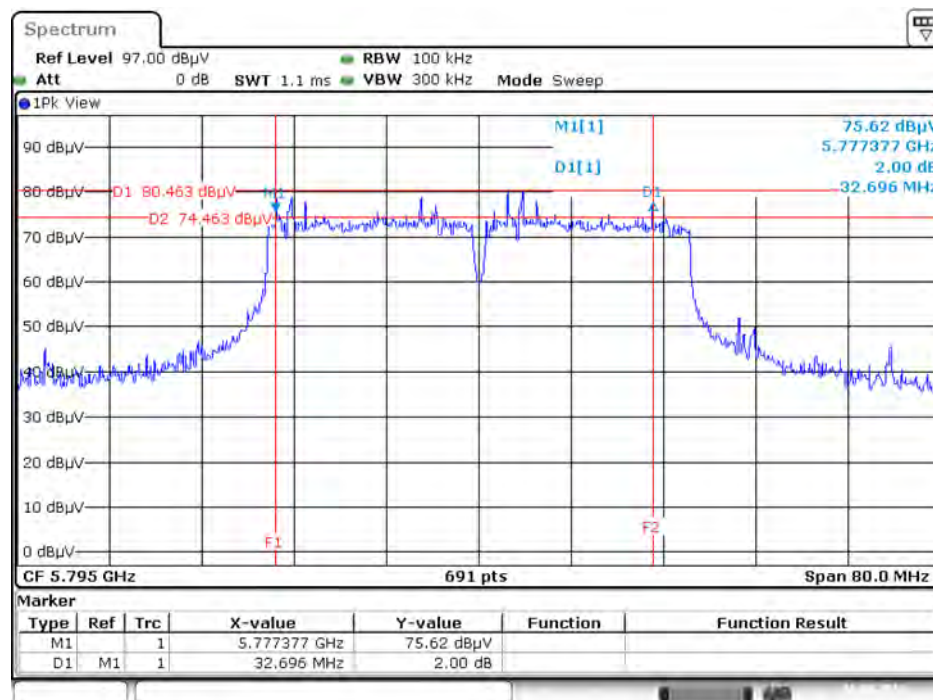
For indoor, outdoor use master and slave without radar detection

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5825 MHz



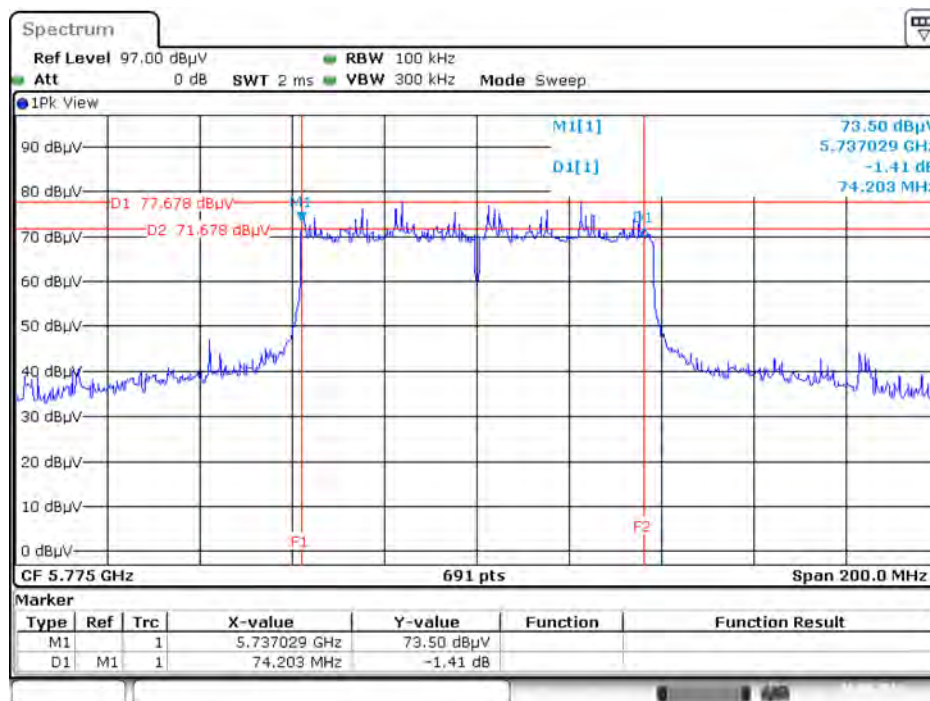
Date: 10.AUG.2016 01:48:45

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5795 MHz



Date: 10.AUG.2016 01:41:23

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5775 MHz



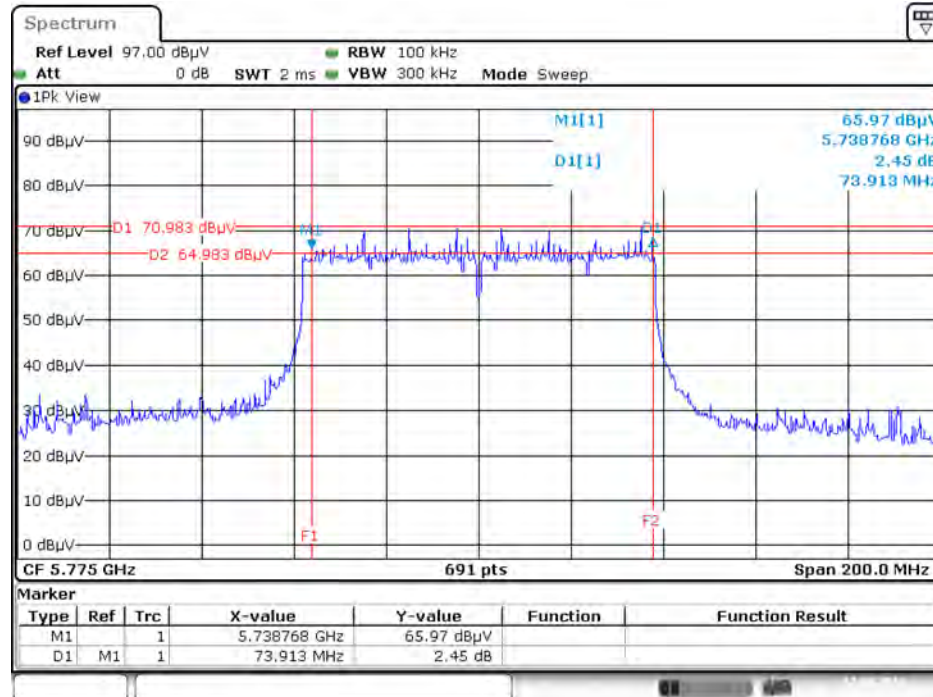
Date: 10.AUG.2016 01:37:48

802.11ac MCS0/Nss2 VHT80+80

For indoor use master and slave without radar detection

Type 1

6 dB Bandwidth Plot on Port 3 + Port 4 / 5775 MHz

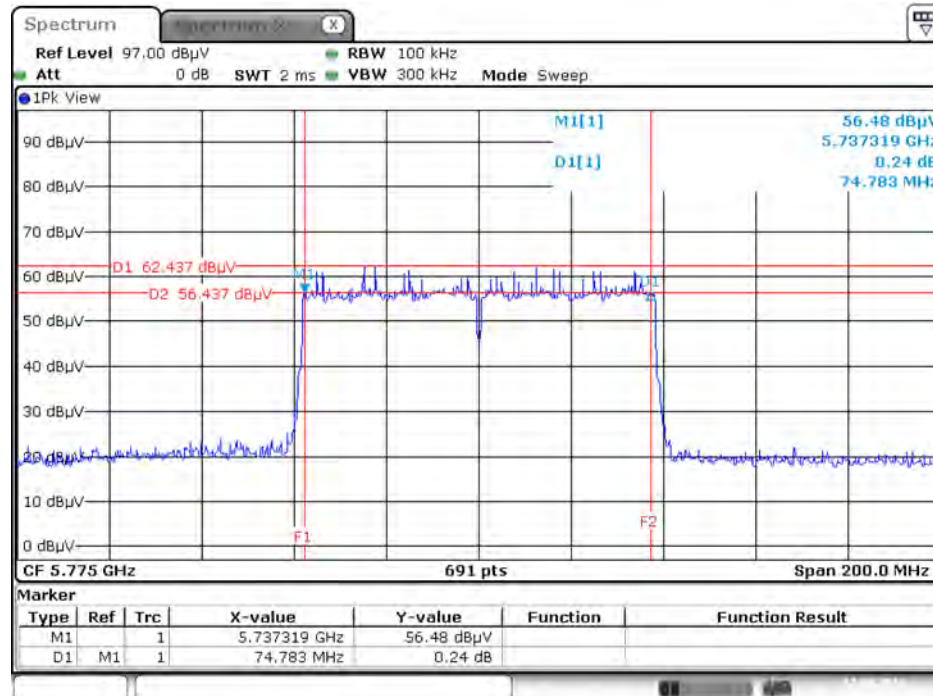


Date: 17.AUG.2016 11:29:56

For outdoor use master B1

Type 1

6 dB Bandwidth Plot on Port 3 + Port 4 / 5775 MHz



Date: 17.AUG.2016 16:39:30

2.4. Maximum Conducted Output Power Measurement

2.4.1. Limit

Frequency Band		Limit
☒	5.15~5.25 GHz	
	Operating Mode	
☒	Outdoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).
☒	Indoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. 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.
☐	Fixed point-to-point access points	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.
☒	Client devices	The maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. 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.

☒	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.
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2.4.2. Measuring Instruments and Setting

For other channel

Please refer to section 3 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

For straddle channel

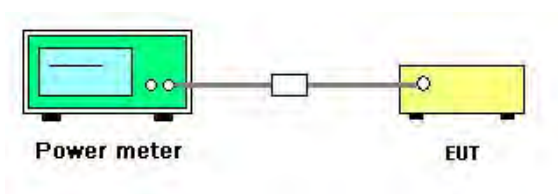
Please refer to section 3 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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 count 100
Sweep Time	Auto

2.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v02r01 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.

2.4.4. Test Setup Layout



2.4.5. Test Deviation

There is no deviation with the original standard.

2.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4.7. Test Result of Maximum Conducted Output Power

Temperature	22°C	Humidity	54%
Test Engineer	Gary Chu		

For non-beamforming mode

For indoor use master B1 and indoor, outdoor use B4

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total		
802.11a	5180 MHz	18.25	18.39	18.03	18.41	24.29	30.00	PASS
	5200 MHz	18.28	18.34	18.16	18.43	24.32	30.00	PASS
	5240 MHz	18.32	18.45	18.15	18.28	24.32	30.00	PASS
	5745 MHz	22.56	22.89	23.04	23.54	29.04	30.00	PASS
	5785 MHz	22.07	22.83	23.47	22.43	28.75	30.00	PASS
	5825 MHz	22.34	23.12	23.93	22.45	29.03	30.00	PASS
802.11ac MCS0/Nss1 VHT20	5180 MHz	17.88	18.27	18.16	17.92	24.08	30.00	PASS
	5200 MHz	17.82	18.19	18.11	17.93	24.04	30.00	PASS
	5240 MHz	17.94	18.32	18.17	18.02	24.14	30.00	PASS
	5745 MHz	22.05	22.31	22.97	22.36	28.46	30.00	PASS
	5785 MHz	21.66	22.74	23.18	22.31	28.53	30.00	PASS
	5825 MHz	22.13	22.89	23.93	22.37	28.91	30.00	PASS
802.11ac MCS0/Nss1 VHT40	5190 MHz	16.93	17.16	17.07	17.04	23.07	30.00	PASS
	5230 MHz	20.01	20.27	20.15	20.08	26.15	30.00	PASS
	5755 MHz	20.85	21.33	21.96	21.27	27.39	30.00	PASS
	5795 MHz	21.94	22.75	23.37	22.36	28.66	30.00	PASS
802.11ac MCS0/Nss1 VHT80	5210 MHz	14.26	14.81	14.46	14.63	20.57	30.00	PASS
	5775 MHz	17.17	17.74	18.18	17.65	23.72	30.00	PASS

For indoor use slave without radar detection B1

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total		
802.11a	5180 MHz	12.22	12.41	12.16	12.36	18.31	23.98	PASS
	5200 MHz	12.24	12.42	12.25	12.37	18.34	23.98	PASS
	5240 MHz	12.25	12.38	12.41	12.26	18.35	23.98	PASS
802.11ac	5180 MHz	11.86	12.29	12.03	12.12	18.10	23.98	PASS
MCS0/Nss1	5200 MHz	11.77	12.24	12.07	12.05	18.06	23.98	PASS
VHT20	5240 MHz	12.08	12.45	12.14	12.21	18.24	23.98	PASS
802.11ac	5190 MHz	15.02	15.21	15.09	15.04	21.11	23.98	PASS
MCS0/Nss1	5230 MHz	15.07	15.28	15.22	15.13	21.20	23.98	PASS
VHT40								
802.11ac	5210 MHz	14.26	14.81	14.46	14.63	20.57	23.98	PASS
MCS0/Nss1								
VHT80								

For outdoor use master B1

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total		
802.11a	5180 MHz	8.86	8.72	9.02	8.99	14.92	30.00	PASS
	5200 MHz	8.9	8.86	9.09	9	14.98	30.00	PASS
	5240 MHz	8.71	8.66	8.81	9.02	14.82	30.00	PASS
802.11ac	5180 MHz	8.76	8.82	8.64	8.71	14.75	30.00	PASS
MCS0/Nss1	5200 MHz	8.78	8.83	8.53	8.61	14.71	30.00	PASS
VHT20	5240 MHz	8.82	8.53	8.69	8.88	14.75	30.00	PASS
802.11ac	5190 MHz	8.84	8.56	8.76	8.78	14.76	30.00	PASS
MCS0/Nss1	5230 MHz	8.64	8.63	8.91	8.85	14.78	30.00	PASS
VHT40								
802.11ac	5210 MHz	8.64	8.67	8.89	8.76	14.76	30.00	PASS
MCS0/Nss1								
VHT80								

802.11ac MCS0/Nss2 VHT80+80
For indoor use master

Type	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total		
1	5210 MHz	15.16	15.45	-	-	18.32	30.00	PASS
	5775 MHz	-	-	15.23	15.77	18.52	30.00	PASS

For indoor use slave without radar detection B1

Type	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total		
1	5210 MHz	15.16	15.45	-	-	18.32	23.98	PASS
	5775 MHz	-	-	15.23	15.77	18.52	30.00	PASS

For outdoor use master B1

Type	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total		
1	5210 MHz	11.66	11.71	-	-	14.70	30.00	PASS
	5775 MHz	-	-	11.36	11.87	14.63	30.00	PASS

For beamforming mode

For indoor use master B1 and indoor, outdoor use B4

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total		
802.11ac MCS0/Nss1 VHT20	5180 MHz	17.51	17.85	17.52	17.87	23.71	23.98	PASS
	5200 MHz	17.57	17.84	17.49	17.95	23.74	23.98	PASS
	5240 MHz	17.64	17.86	17.56	17.61	23.69	23.98	PASS
	5745 MHz	16.71	17.31	17.05	17.64	23.21	23.98	PASS
	5785 MHz	16.85	17.35	17.13	17.95	23.36	23.98	PASS
	5825 MHz	16.81	17.48	17.18	18.07	23.43	23.98	PASS
802.11ac MCS0/Nss1 VHT40	5190 MHz	17.63	17.98	17.66	17.72	23.77	23.98	PASS
	5230 MHz	17.65	18.01	17.85	17.67	23.82	23.98	PASS
	5755 MHz	17.46	16.78	17.55	17.93	23.47	23.98	PASS
	5795 MHz	16.79	17.18	17.63	17.56	23.32	23.98	PASS
802.11ac MCS0/Nss1 VHT80	5210 MHz	16.24	16.62	16.44	16.03	22.36	23.98	PASS
	5775 MHz	17.03	16.88	17.4	18.37	23.48	23.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02 \text{dBi} > 6 \text{dBi}$, so B1 B4 limit = $30 - (12.02 - 6) = 23.98 \text{dBm}$.

For indoor use slave without radar detection B1

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total		
802.11ac MCS0/Nss1 VHT20	5180 MHz	11.21	11.88	11.45	11.33	17.50	17.96	PASS
	5200 MHz	11.63	11.29	11.48	11.43	17.48	17.96	PASS
	5240 MHz	11.79	11.44	11.51	11.31	17.54	17.96	PASS
802.11ac MCS0/Nss1 VHT40	5190 MHz	11.89	11.93	11.45	11.48	17.71	17.96	PASS
	5230 MHz	11.96	11.38	11.56	11.39	17.60	17.96	PASS
802.11ac MCS0/Nss1 VHT80	5210 MHz	11.24	11.62	11.44	11.03	17.36	17.96	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi} > 6\text{dBi}$, so limit = 23.98 - (12.02 - 6) = 17.96dBm.

For outdoor use master B1

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total		
802.11ac MCS0/Nss1 VHT20	5180 MHz	2.53	2.61	2.72	2.66	8.65	23.98	PASS
	5200 MHz	2.45	2.64	2.55	2.69	8.60	23.98	PASS
	5240 MHz	2.58	2.68	2.75	2.52	8.65	23.98	PASS
802.11ac MCS0/Nss1 VHT40	5190 MHz	1.96	2.23	2.09	2.37	8.19	23.98	PASS
	5230 MHz	2.68	2.41	2.52	2.12	8.46	23.98	PASS
802.11ac MCS0/Nss1 VHT80	5210 MHz	2.09	2.62	2.21	2.29	8.33	23.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi} > 6\text{dBi}$, so limit = 30 - (12.02 - 6) = 23.98dBm.

802.11ac MCS0/Nss2 VHT80+80
For indoor use master

Type	Frequency	Conducted Power (dBm)						Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total	Band Total		
1	5210 MHz	15.71	15.26	-	-	18.50	-	26.99	PASS
	5775 MHz	-	-	15.02	15.76	18.42	-	26.99	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01\text{dBi} > 6\text{dBi}$, so limit = 30-(9.01-6)=26.99dBm.

For indoor use slave without radar detection B1

Type	Frequency	Conducted Power (dBm)						Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total	Band Total		
1	5210 MHz	15.71	15.26	-	-	18.50	-	20.97	PASS
	5775 MHz	-	-	15.02	15.76	18.42	-	26.99	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01\text{dBi} > 6\text{dBi}$, so limit = 23.98-(9.01-6)=20.97dBm.

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01\text{dBi} > 6\text{dBi}$, so limit = 30-(9.01-6)=26.99dBm.

For outdoor use master B1

Type	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total		
1	5210 MHz	8.93	8.76	-	-	11.86	26.99	PASS
	5775 MHz	-	-	8.23	8.56	11.41	26.99	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01\text{dBi} > 6\text{dBi}$, so limit = 30-(9.01-6)=26.99dBm.

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

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

2.5. Power Spectral Density Measurement

2.5.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 2.4.1.

Frequency Band		Limit
☒	5.15~5.25 GHz	
	Operating Mode	
☒	Outdoor access point	17 dBm/MHz
☒	Indoor access point	17 dBm/MHz
☐	Fixed point-to-point access points	17 dBm/MHz
☒	Mobile and portable client devices	11 dBm/MHz
☒	5.725~5.85 GHz	30 dBm/500kHz

2.5.2. Measuring Instruments and Setting

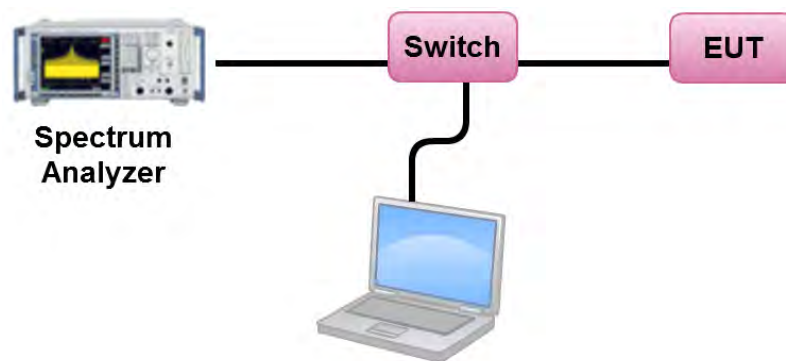
Please refer to section 3 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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 $10\log(500\text{kHz}/\text{RBW})$ to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.	

2.5.3. 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 v02r01 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 and sum the spectra across the outputs.
4. For 5.725~5.85 GHz, the measured result of PSD level must add $10\log(500\text{kHz}/\text{RBW})$ and the final result should ≤ 30 dBm.

2.5.4. Test Setup Layout



2.5.5. Test Deviation

There is no deviation with the original standard.

2.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.5.7. Test Result of Power Spectral Density

Temperature	22°C	Humidity	54%
Test Engineer	Gary Chu		

For non-beamforming mode

For indoor use master B1 and indoor, outdoor use B4

Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	10.92	10.98	PASS
40	5200 MHz	10.92	10.98	PASS
48	5240 MHz	10.96	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B1 limit = 17-(12.02-6)=10.98dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	15.87	-3.01	12.86	23.98	PASS
157	5785 MHz	15.61	-3.01	12.60	23.98	PASS
165	5825 MHz	15.74	-3.01	12.73	23.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B4 limit = 30-(12.02-6)=23.98dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	10.87	10.98	PASS
40	5200 MHz	10.89	10.98	PASS
48	5240 MHz	10.80	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B1 limit = 17 - (12.02 - 6) = 10.98 dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	15.10	-3.01	12.09	23.98	PASS
157	5785 MHz	15.43	-3.01	12.42	23.98	PASS
165	5825 MHz	15.50	-3.01	12.49	23.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B4 limit = 30 - (12.02 - 6) = 23.98 dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	6.88	10.98	PASS
46	5230 MHz	9.94	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B1 limit = 17-(12.02-6)=10.98dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	11.02	-3.01	8.01	23.98	PASS
159	5795 MHz	12.63	-3.01	9.62	23.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B4 limit = 30-(12.02-6)=23.98dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-1.39	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B1 limit = 17-(12.02-6)=10.98dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	4.60	-3.01	1.59	23.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B4 limit = 30-(12.02-6)=23.98dBm/500kHz.

For indoor use slave without radar detection B1

Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	4.97	4.98	PASS
40	5200 MHz	4.86	4.98	PASS
48	5240 MHz	4.90	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 11-(12.02-6)=4.98dBm/MHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	4.69	4.98	PASS
40	5200 MHz	4.64	4.98	PASS
48	5240 MHz	4.77	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 11-(12.02-6)=4.98dBm/MHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	4.91	4.98	PASS
46	5230 MHz	4.83	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 11-(12.02-6)=4.98dBm/MHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-1.39	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 11-(12.02-6)=4.98dBm/MHz.

For outdoor use master B1

Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	1.69	10.98	PASS
40	5200 MHz	1.76	10.98	PASS
48	5240 MHz	1.59	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B1 limit = 17 - (12.02 - 6) = 10.98 dBm/MHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	1.53	10.98	PASS
40	5200 MHz	1.46	10.98	PASS
48	5240 MHz	1.51	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B1 limit = 17 - (12.02 - 6) = 10.98 dBm/MHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-1.50	10.98	PASS
46	5230 MHz	-1.47	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B1 limit = 17 - (12.02 - 6) = 10.98 dBm/MHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-4.34	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B1 limit = $17 - (12.02 - 6) = 10.98\text{dBm/MHz}$.

802.11ac MCS0/Nss2 VHT80+80
For indoor use master

Type	Frequency	Power Density (dBm/MHz)	10log(500kHz/RB W) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Max. Limit (dBm/MHz)	Result
1	5210 MHz	-0.79	-			13.99	PASS
	5775 MHz	-0.71	-3.01	-3.72	26.99	-	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01\text{dBi}$, so limit=17-(9.01-6)=13.99dBm/MHz.

For indoor use slave without radar detection B1

Type	Frequency	Power Density (dBm/MHz)	10log(500kHz/RB W) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Max. Limit (dBm/MHz)	Result
1	5210 MHz	-0.79	-			7.99	PASS
	5775 MHz	-0.71	-3.01	-3.72	26.99	-	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01\text{dBi}$, so limit=11-(9.01-6)=7.99dBm/MHz.

For outdoor use master B1

Type	Frequency	Power Density (dBm/MHz)	10log(500kHz/RB W) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Max. Limit (dBm/MHz)	Result
1	5210 MHz	-4.51	-			13.99	PASS
	5775 MHz	-4.76	-3.01	-7.77	26.99	-	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01\text{dBi}$, so limit=17-(9.01-6)=13.99dBm/MHz.

For beamforming mode

For indoor use master B1 and indoor, outdoor use B4

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	10.36	10.98	PASS
40	5200 MHz	10.41	10.98	PASS
48	5240 MHz	10.31	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B1 limit = 17-(12.02-6)=10.98dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	9.92	-3.01	6.91	23.98	PASS
157	5785 MHz	10.02	-3.01	7.01	23.98	PASS
165	5825 MHz	10.08	-3.01	7.07	23.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B4 limit = 30-(12.02-6)=23.98dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	7.46	10.98	PASS
46	5230 MHz	7.54	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B1 limit = 17-(12.02-6)=10.98dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	7.21	-3.01	4.20	23.98	PASS
159	5795 MHz	7.06	-3.01	4.05	23.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B4 limit = 30-(12.02-6)=23.98dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	5.25	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B1 limit = 17-(12.02-6)=10.98dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	4.27	-3.01	1.26	23.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B4 limit = 30-(12.02-6)=23.98dBm/500kHz.

For indoor use slave without radar detection B1

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	4.13	4.98	PASS
40	5200 MHz	4.10	4.98	PASS
48	5240 MHz	4.20	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 11-(12.02-6)=4.98dBm/MHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	1.42	4.98	PASS
46	5230 MHz	1.34	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 11-(12.02-6)=4.98dBm/MHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-1.79	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 11-(12.02-6)=4.98dBm/MHz.

For outdoor use master B1

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	-4.52	10.98	PASS
40	5200 MHz	-4.55	10.98	PASS
48	5240 MHz	-4.52	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 17-(12.02-6)=10.98dBm/MHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-7.94	10.98	PASS
46	5230 MHz	-7.74	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 17-(12.02-6)=10.98dBm/MHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-10.77	10.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 17-(12.02-6)=10.98dBm/MHz.

802.11ac MCS0/Nss2 VHT80+80
For indoor use master

Type	Frequency	Power Density (dBm/MHz)	10log(500kHz/RB W) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Max. Limit (dBm/MHz)	Result
1	5210 MHz	-0.68	-			13.99	PASS
	5775 MHz	-1.05	-3.01	-4.06	26.99	-	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01\text{dBi}$, so limit=17-(9.01-6)=13.99dBm/MHz.

For indoor use slave without radar detection B1

Type	Frequency	Power Density (dBm/MHz)	10log(500kHz/RB W) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Max. Limit (dBm/MHz)	Result
1	5210 MHz	-0.68	-			7.99	PASS
	5775 MHz	-1.05	-3.01	-4.06	26.99	-	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01\text{dBi}$, so limit=11-(9.01-6)=7.99dBm/MHz.

For outdoor use master B1

Type	Frequency	Power Density (dBm/MHz)	10log(500kHz/RB W) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Max. Limit (dBm/MHz)	Result
1	5210 MHz	-7.42	-			13.99	PASS
	5775 MHz	-7.77	-3.01	-10.78	26.99	-	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01\text{dBi}$, so limit=17-(9.01-6)=13.99dBm/MHz.

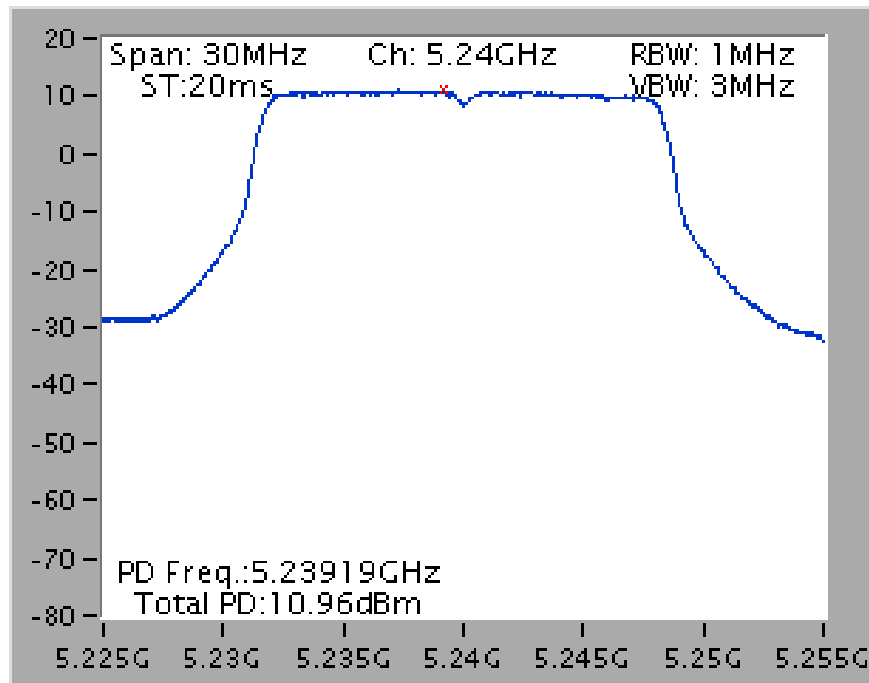
Note: All the test values were listed in the report.

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

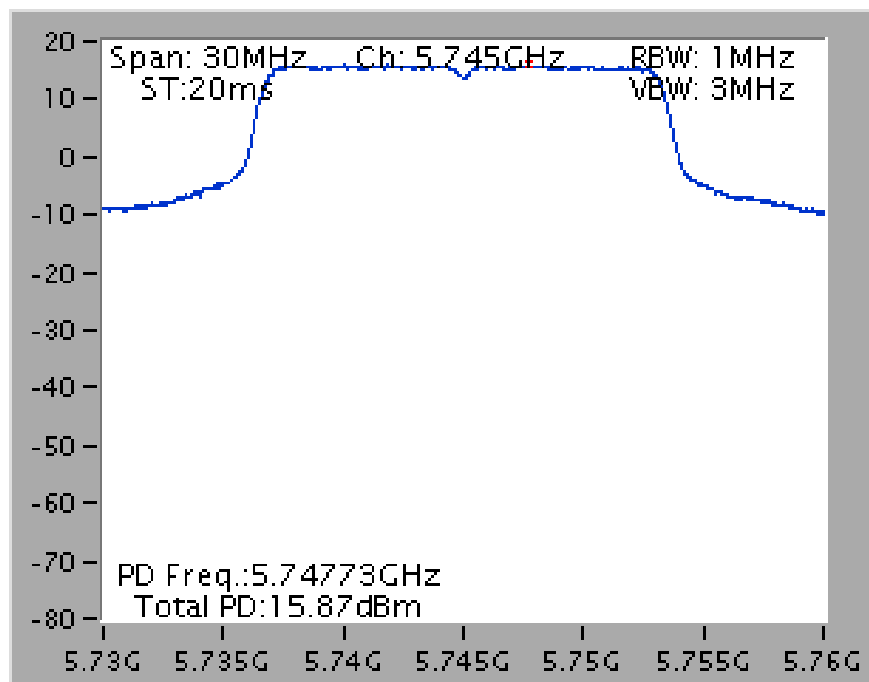
For non-beamforming mode

For indoor use master B1 and indoor, outdoor use B4

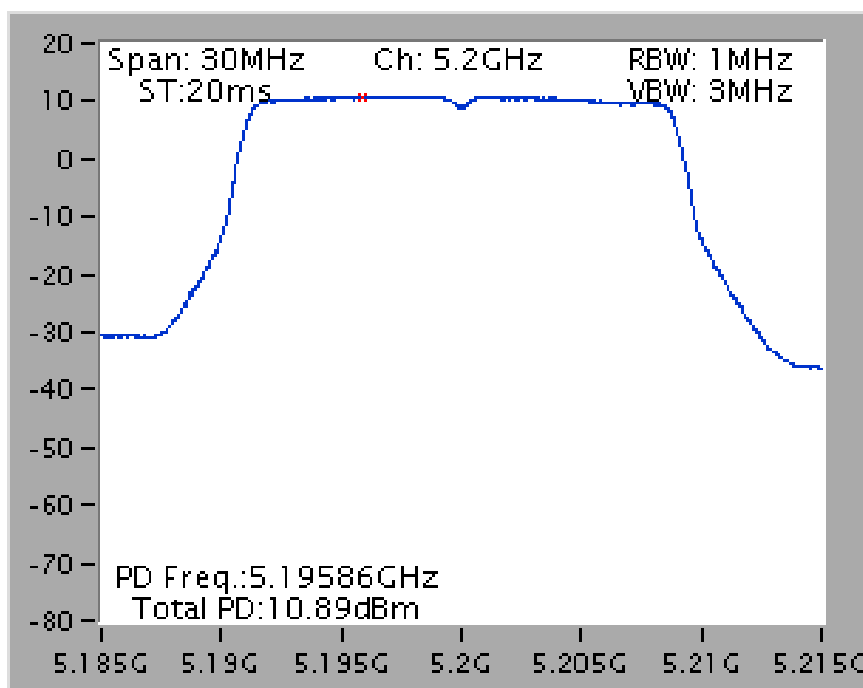
Power Density Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5240 MHz



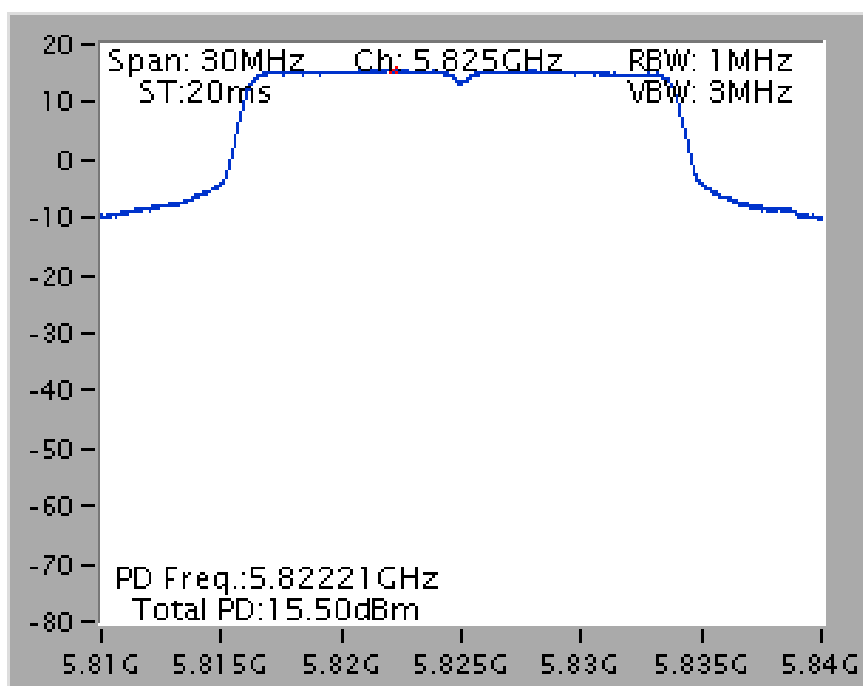
Power Density Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5745 MHz



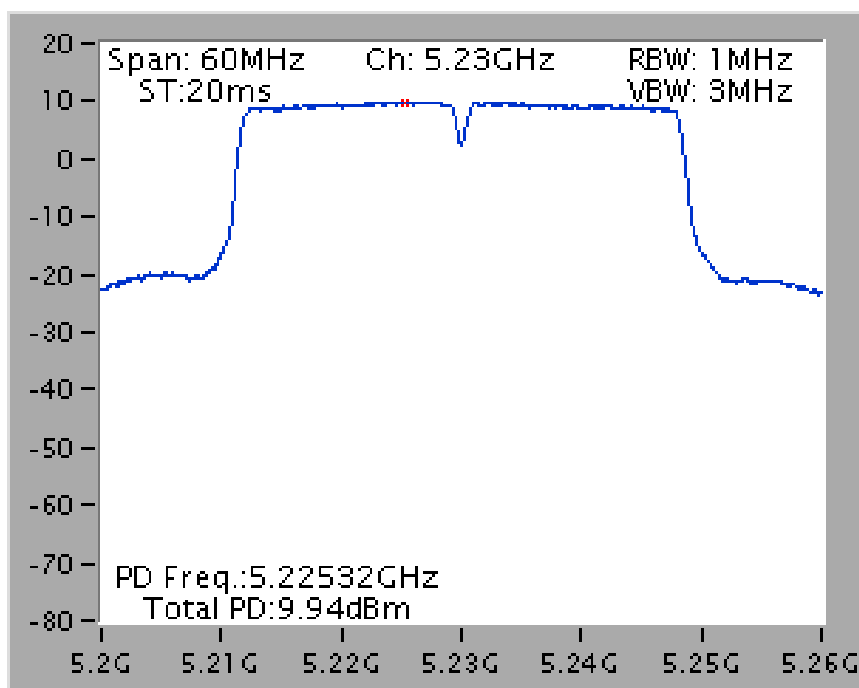
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5200 MHz



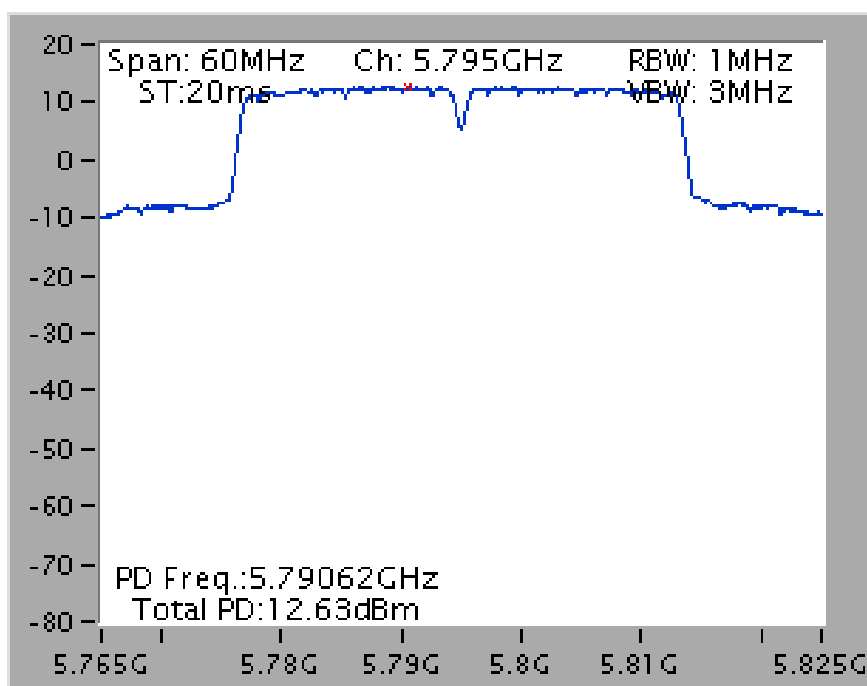
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5825 MHz



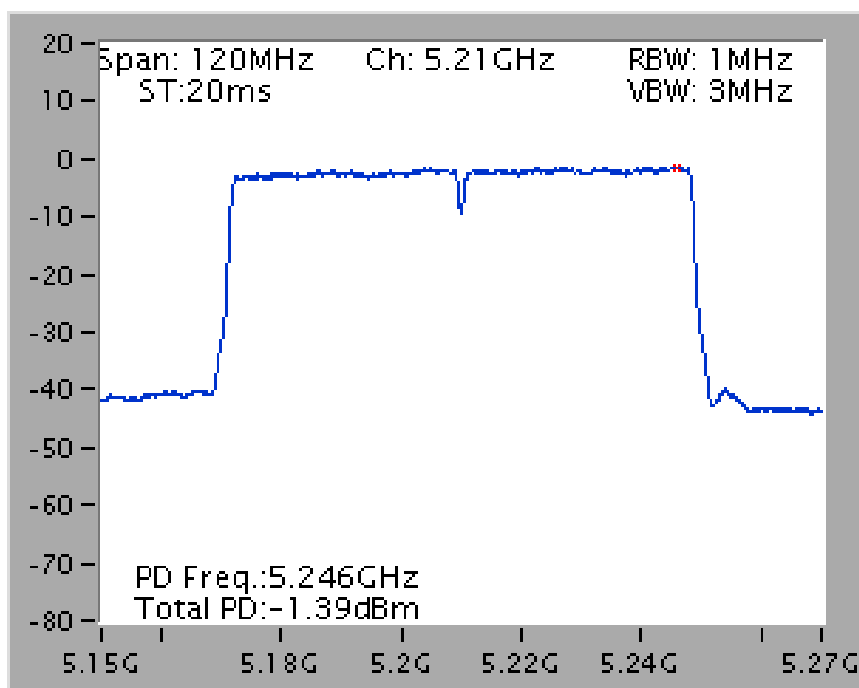
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5230 MHz



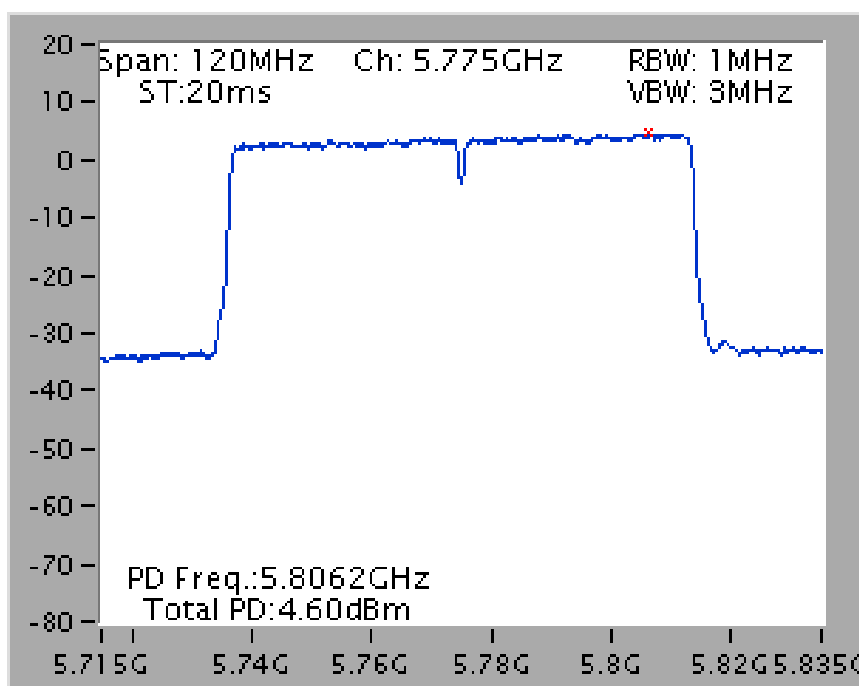
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5795 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5210 MHz

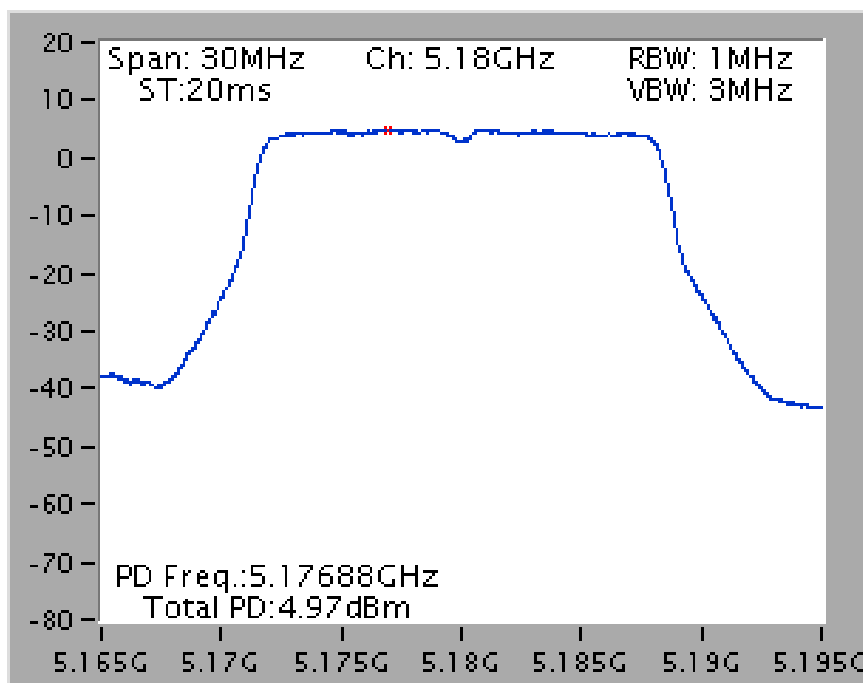


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5775 MHz

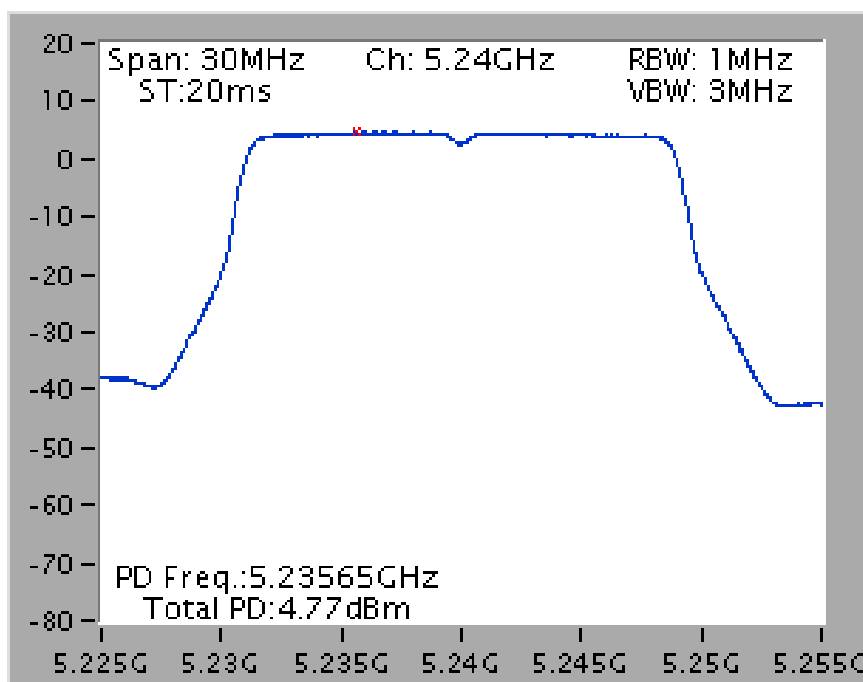


For indoor use slave without radar detection B1

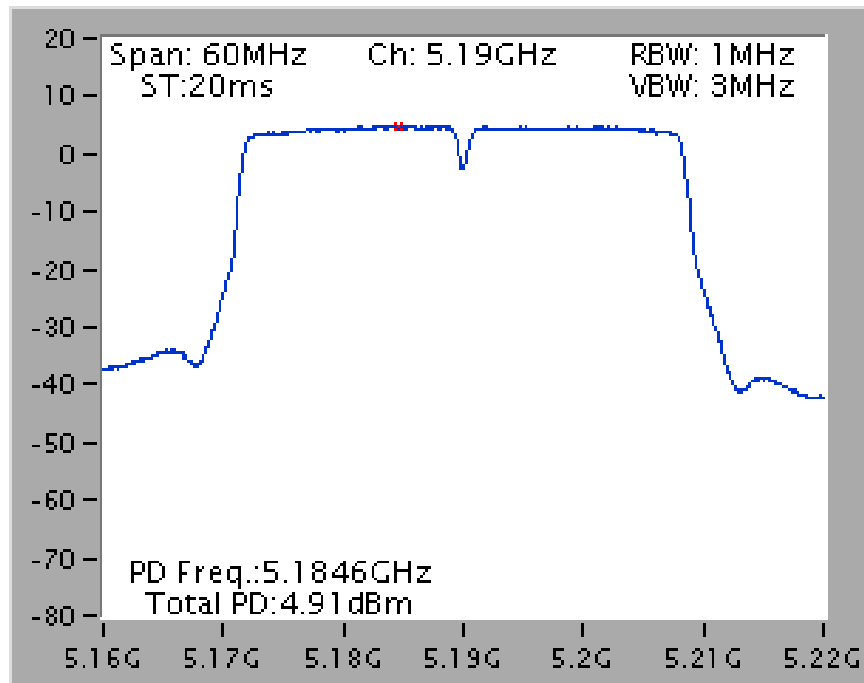
Power Density Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5180 MHz



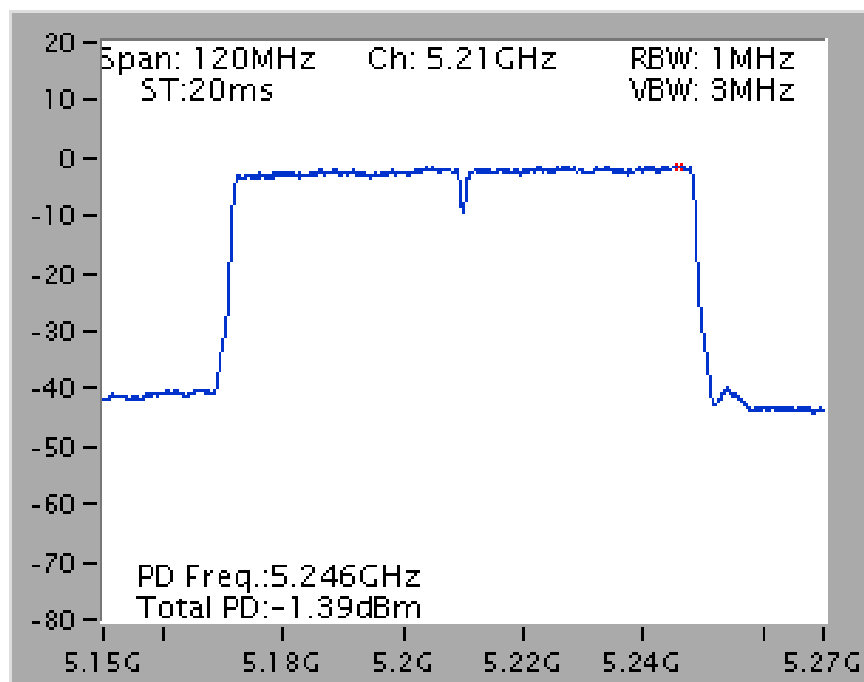
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5240 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5190 MHz

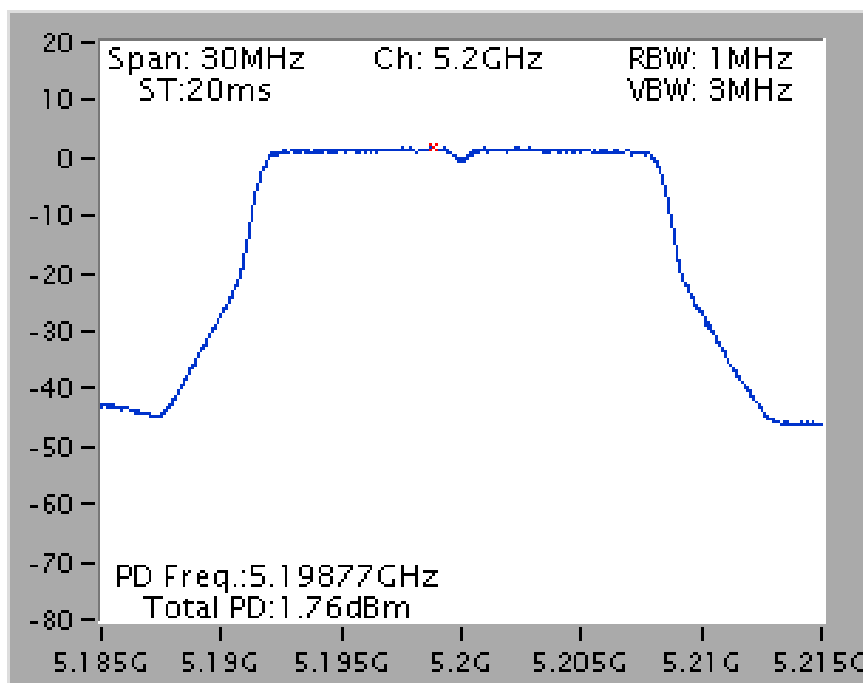


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5210 MHz

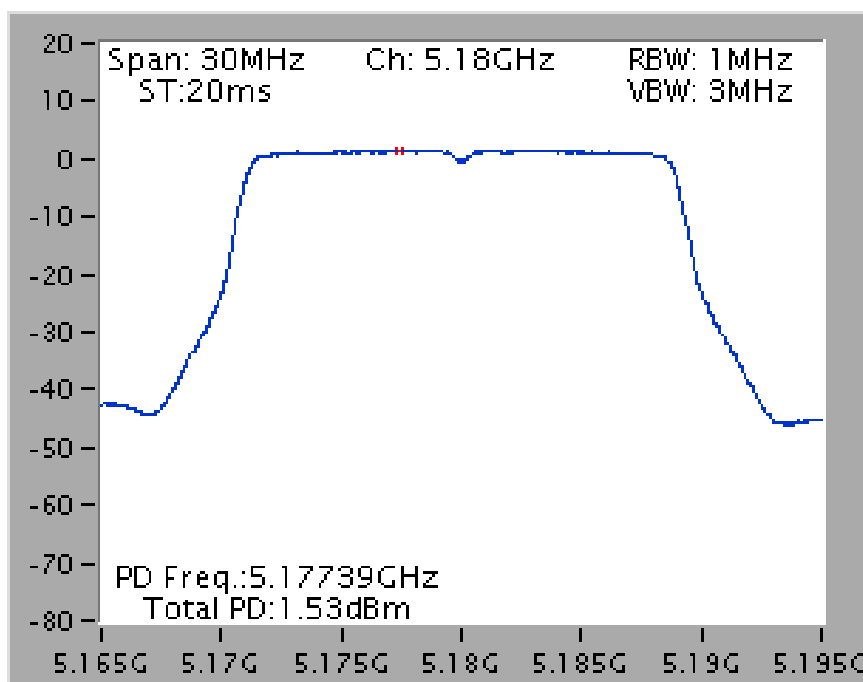


For outdoor use master B1

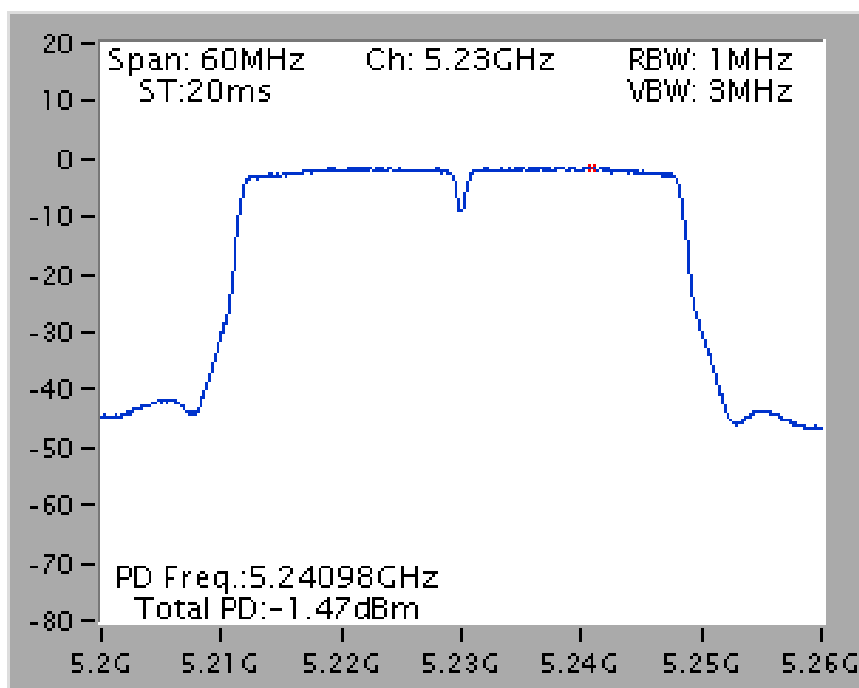
Power Density Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5200 MHz



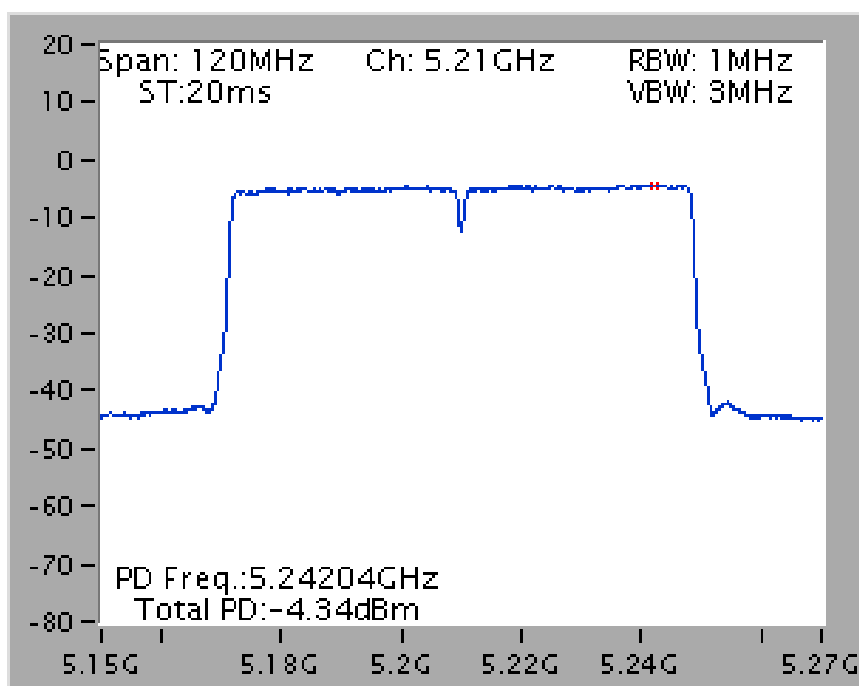
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5180 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5230 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5210 MHz

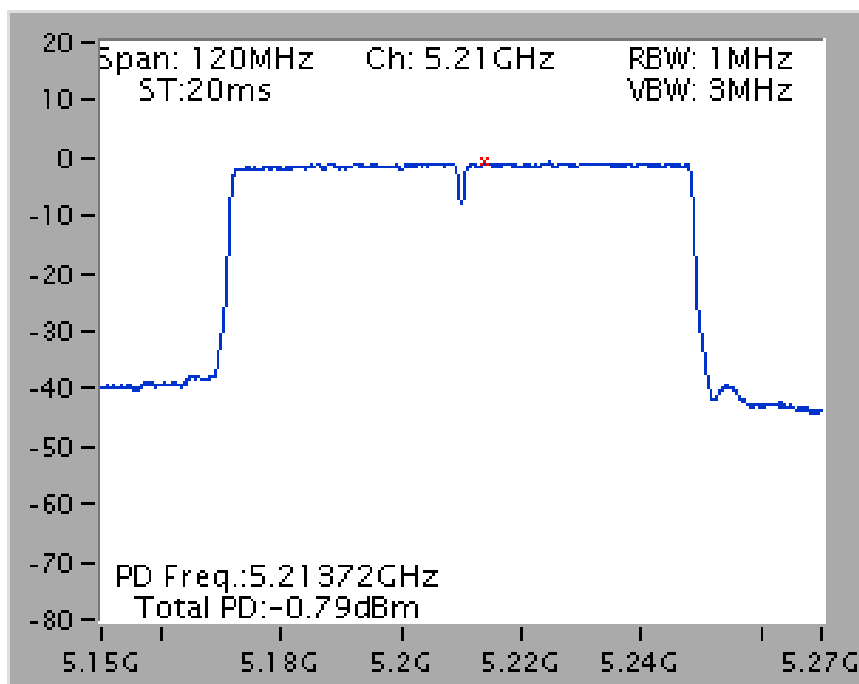


802.11ac MCS0/Nss2 VHT80+80

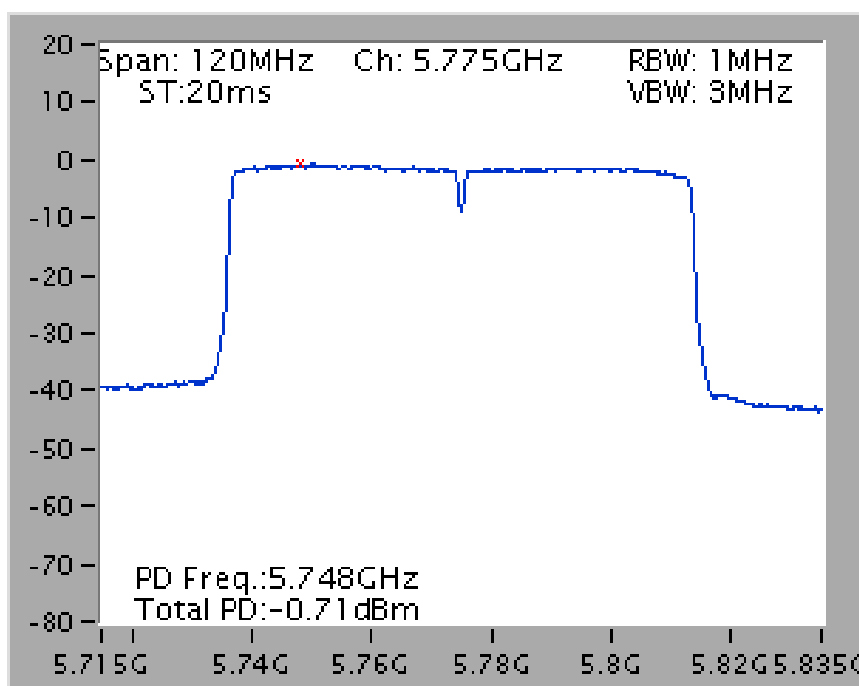
For indoor use master and slave without radar detection

Type 1

Power Density Plot on Port 1 + Port 2 / 5210 MHz



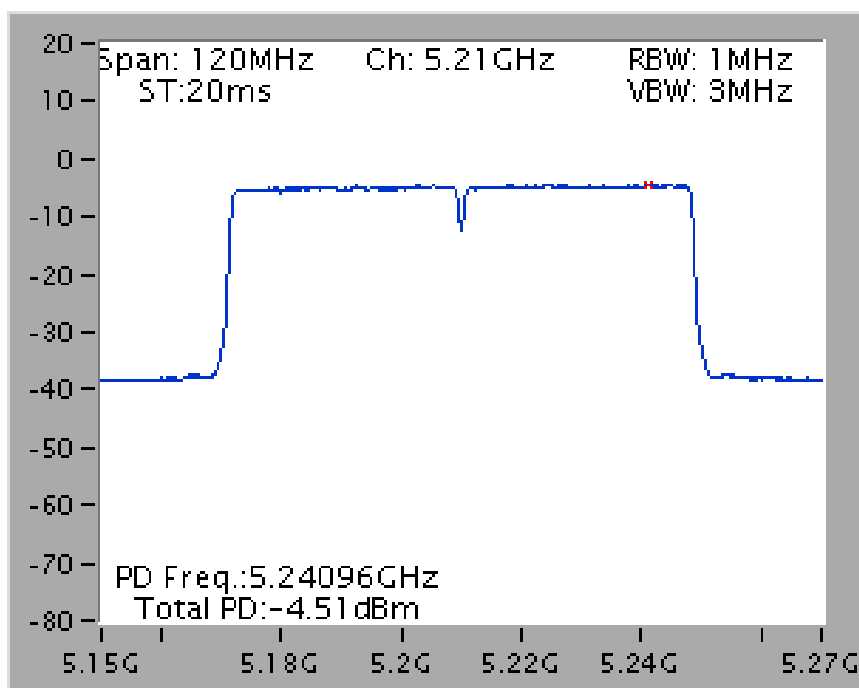
Power Density Plot on Port 3 + Port 4 / 5775 MHz



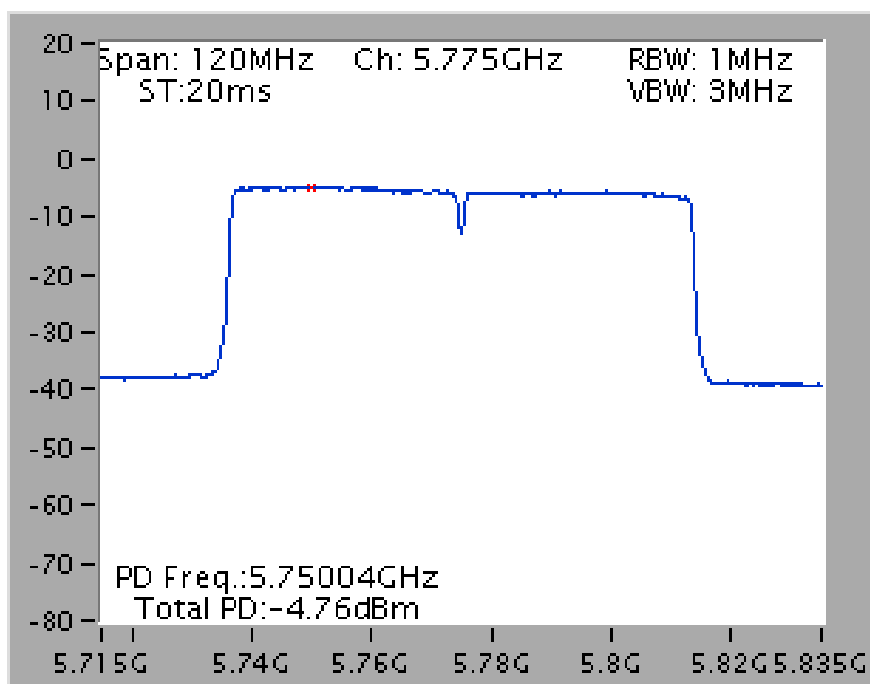
For outdoor use master B1

Type 1

Power Density Plot on Port 1 + Port 2 / 5210 MHz



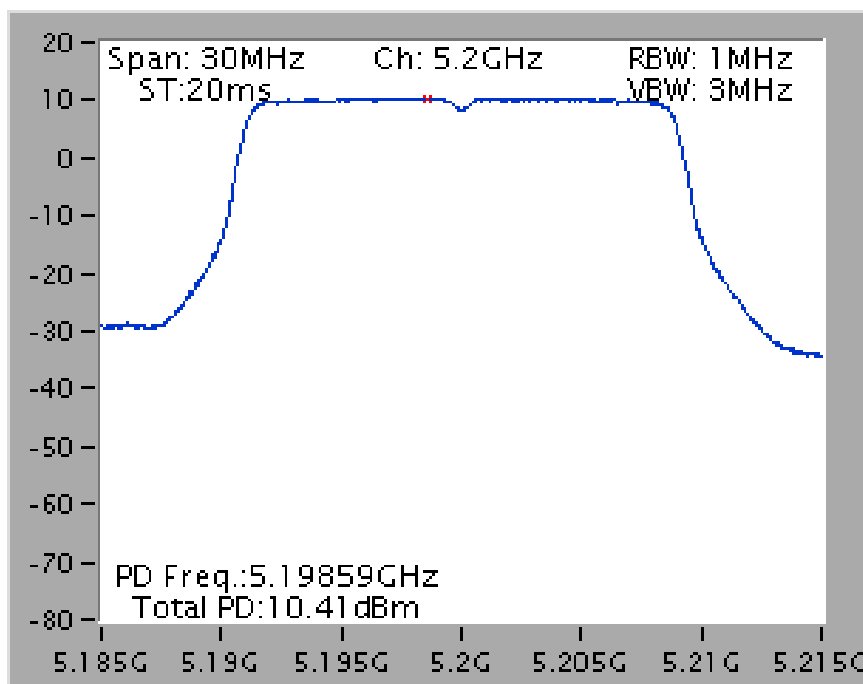
Power Density Plot on Port 3 + Port 4 / 5775 MHz



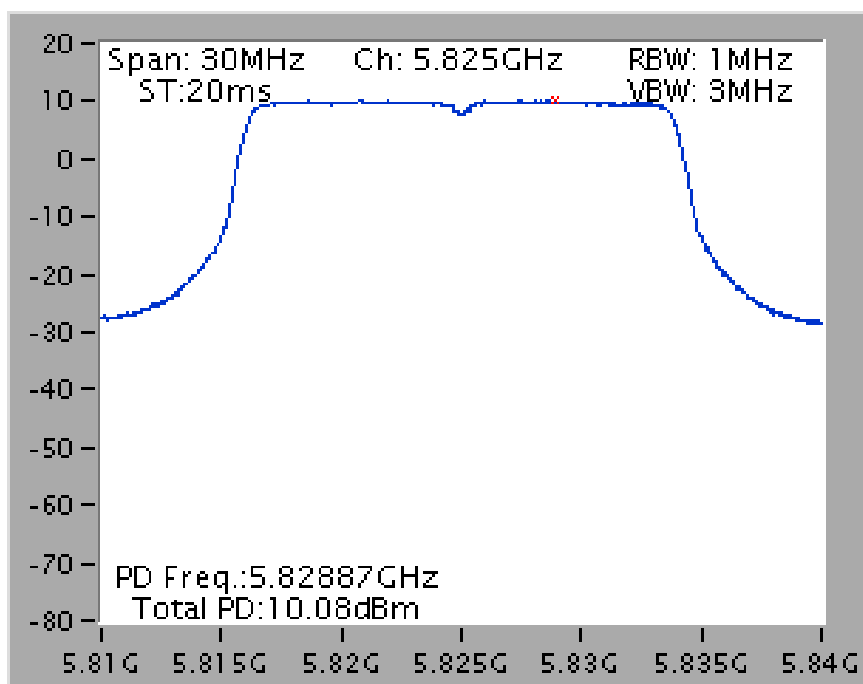
For beamforming mode

For indoor use master B1 and indoor, outdoor use B4

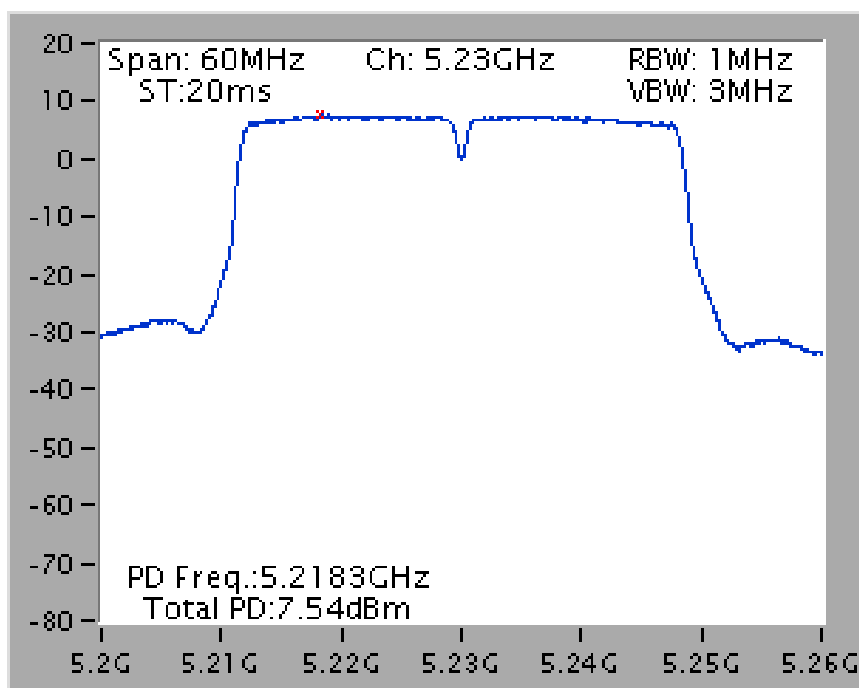
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5200 MHz



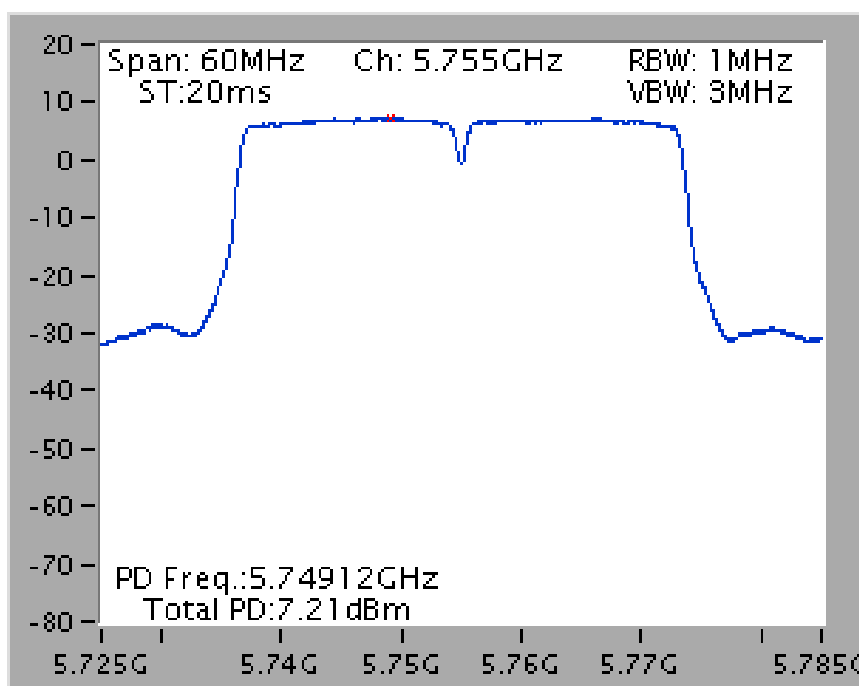
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5825 MHz



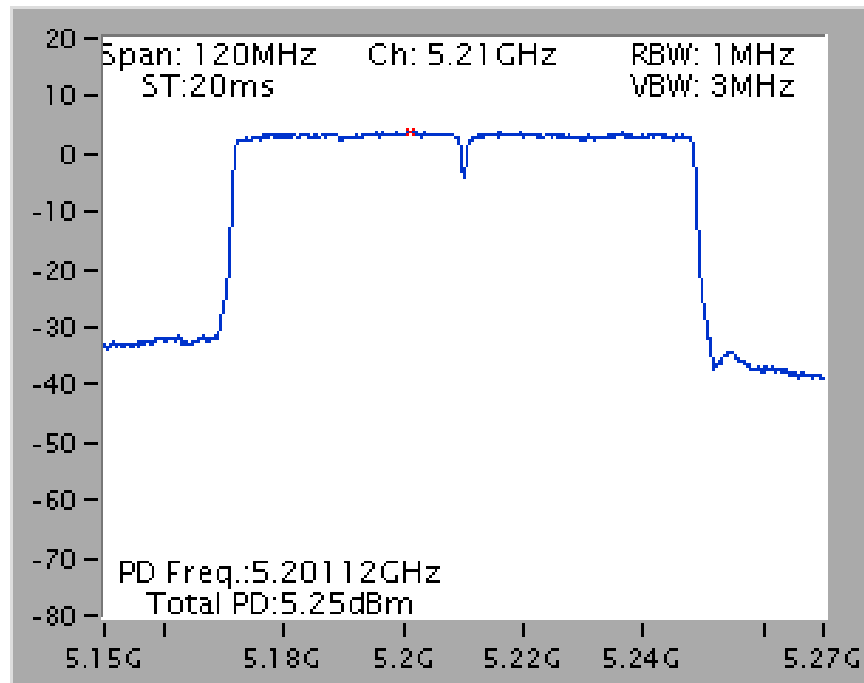
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5230 MHz



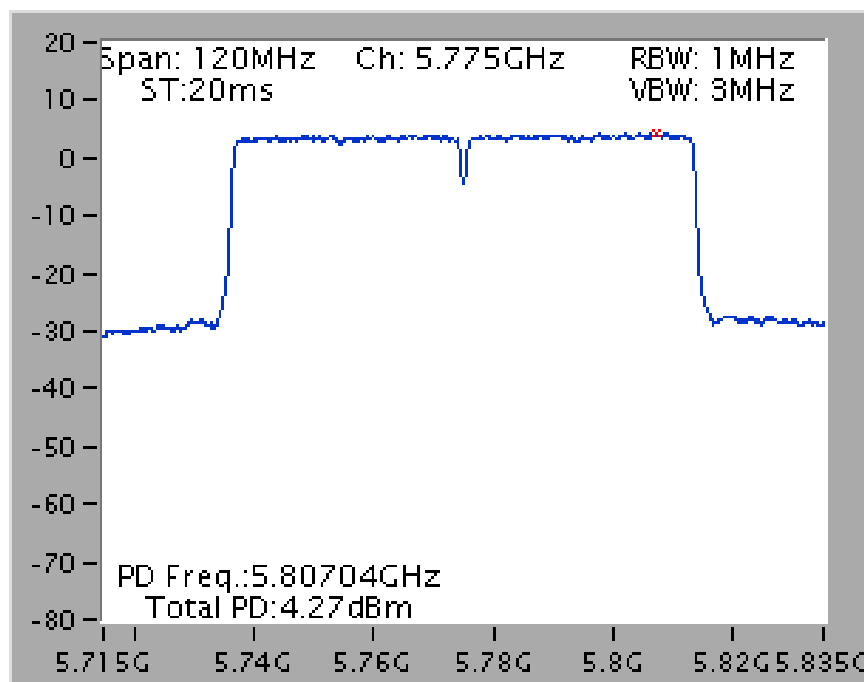
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5755 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5210 MHz

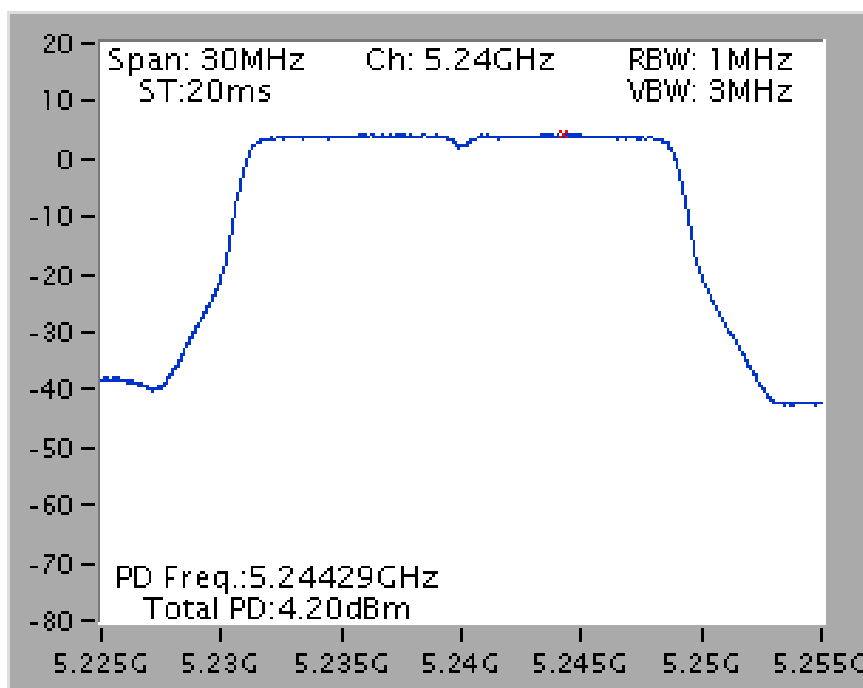


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5775 MHz

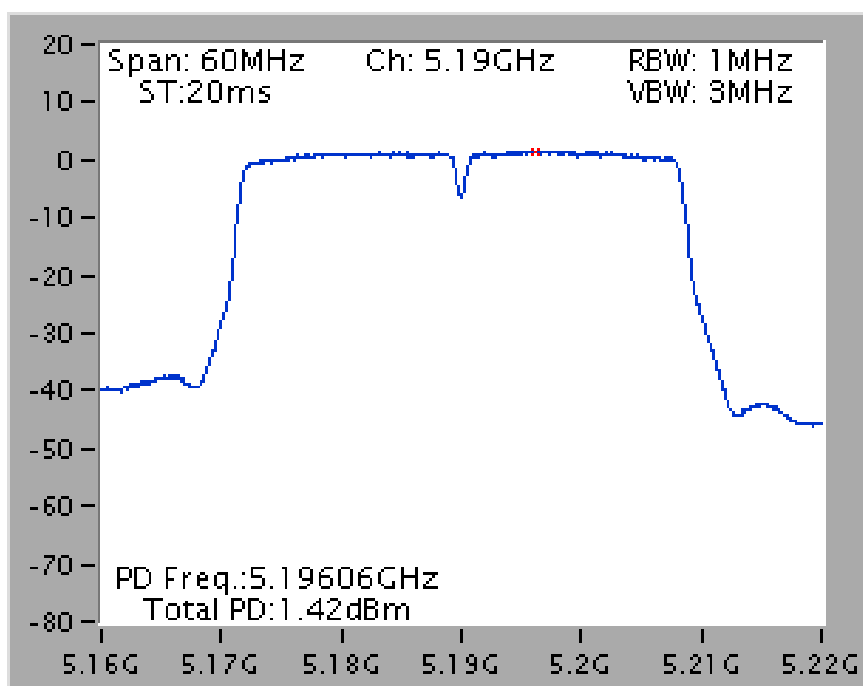


For indoor use slave without radar detection B1

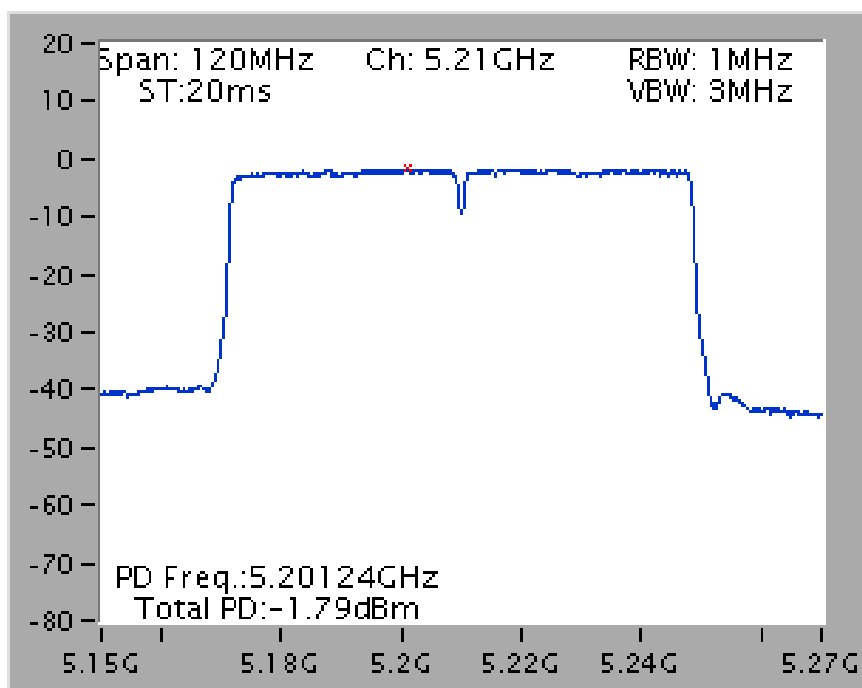
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5240 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5190 MHz

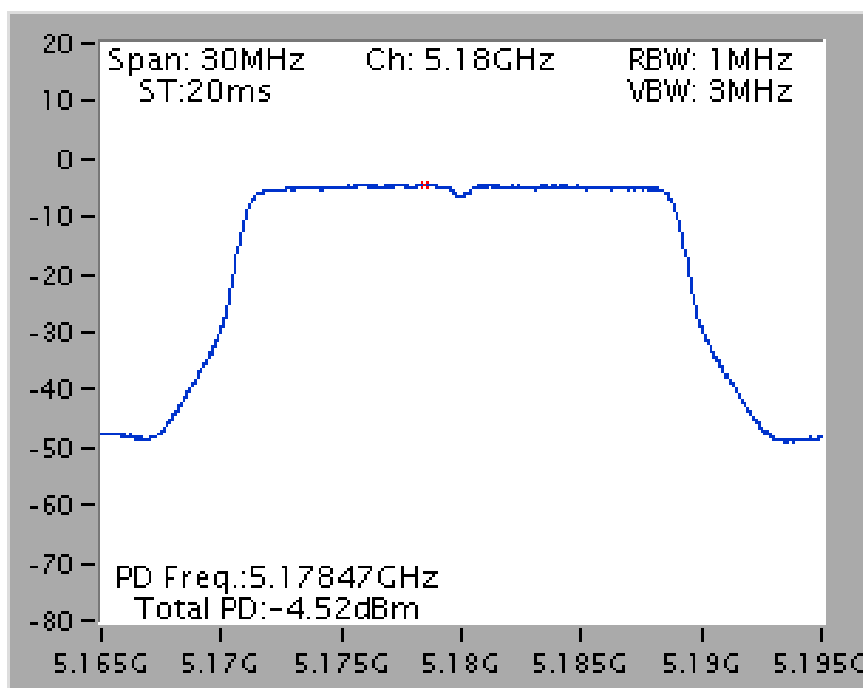


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5210 MHz

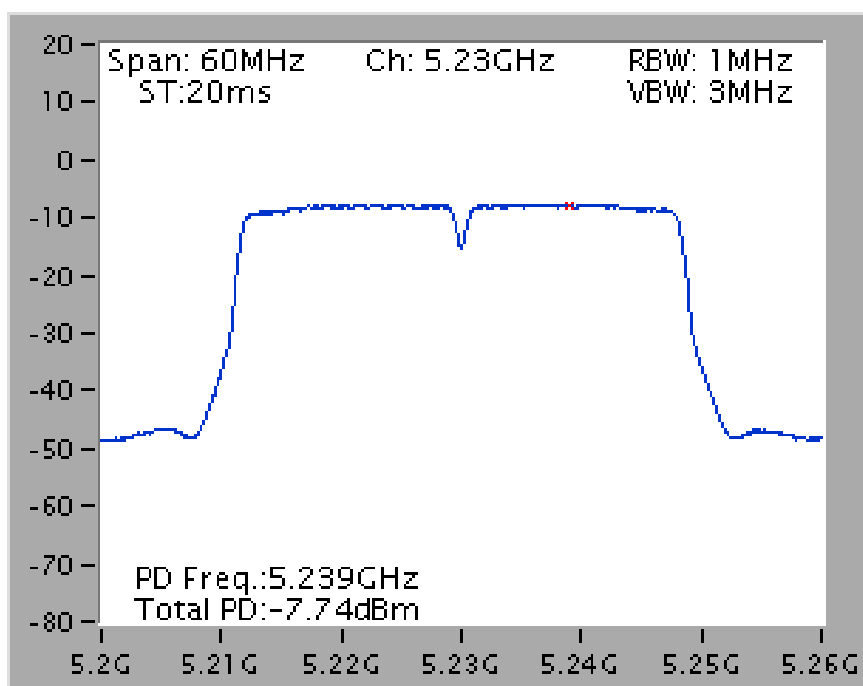


For outdoor use master B1

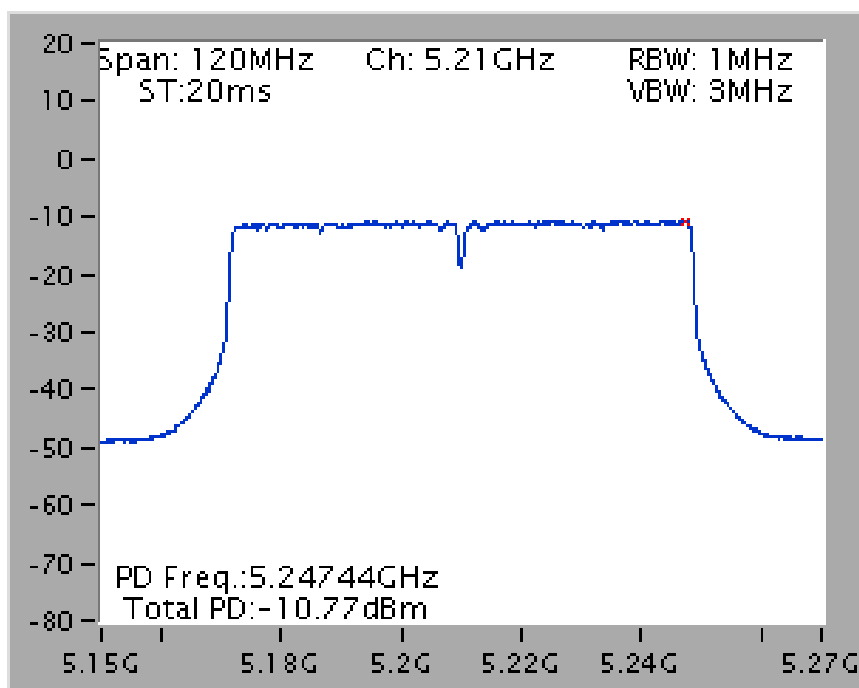
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5180 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5230 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5210 MHz

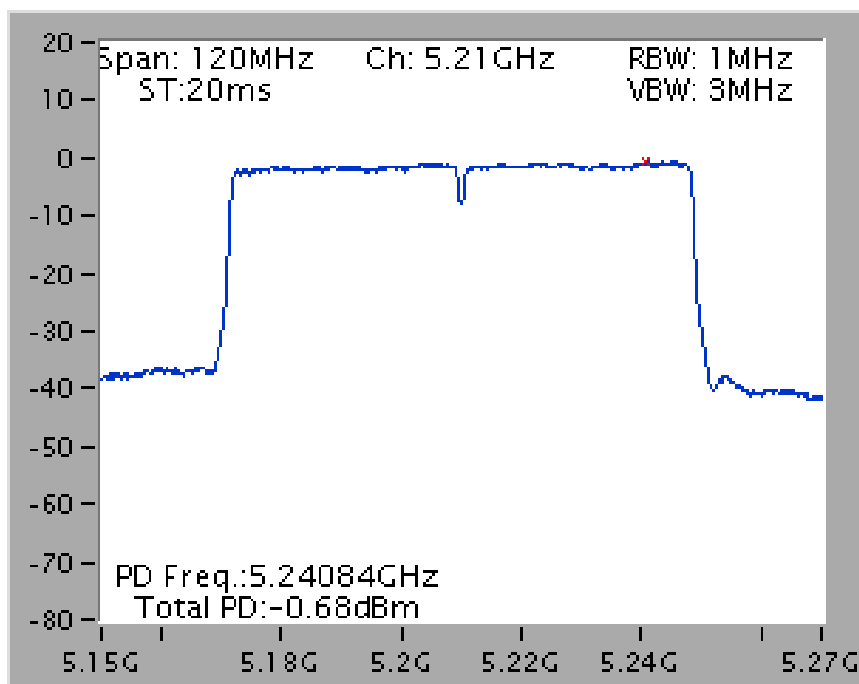


802.11ac MCS0/Nss2 VHT80+80

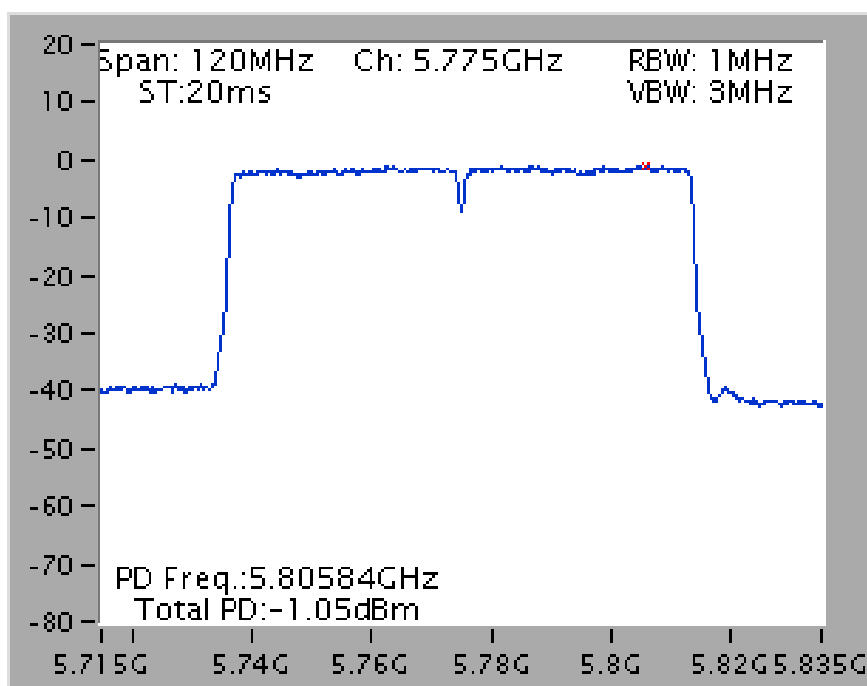
For indoor use master and slave without radar detection

Type 1

Power Density Plot on Port 1 + Port 2 / 5210 MHz



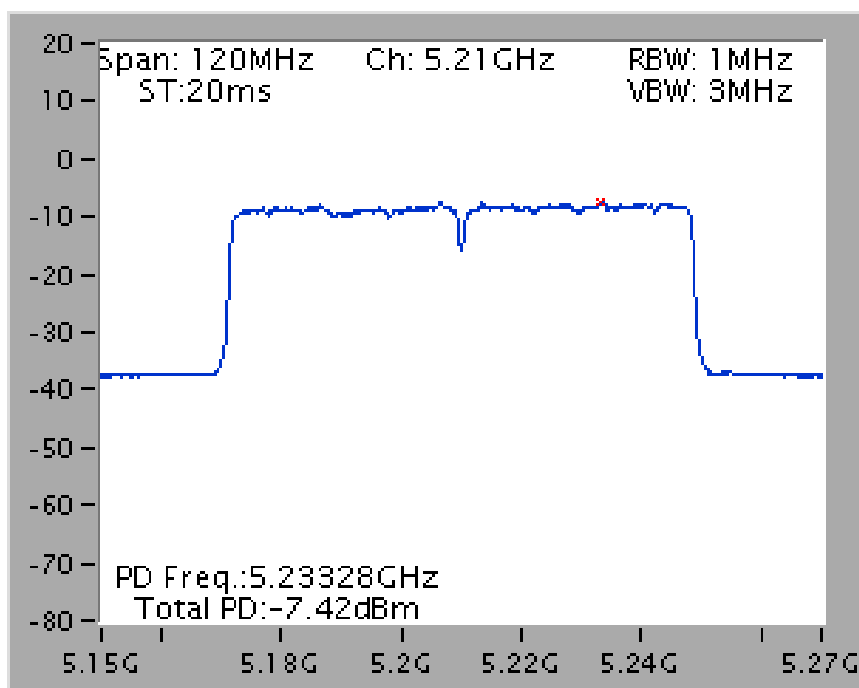
Power Density Plot on Port 3 + Port 4 / 5775 MHz



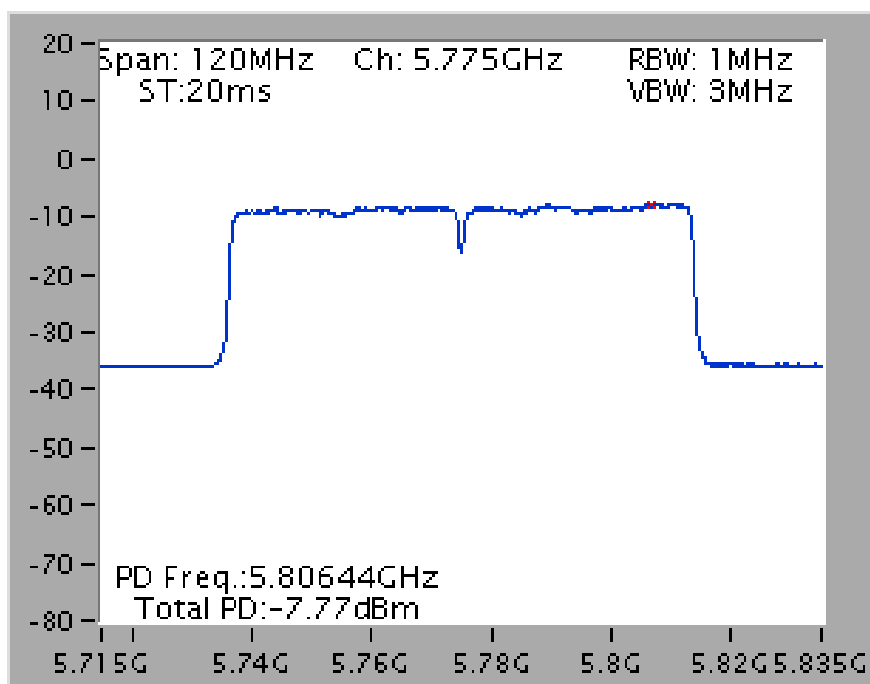
For outdoor use master B1

Type 1

Power Density Plot on Port 1 + Port 2 / 5210 MHz



Power Density Plot on Port 3 + Port 4 / 5775 MHz



2.6. Radiated Emissions Measurement

2.6.1. Limit

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.25 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

In addition, In case the emission fall within the restricted band specified on 2.7, then the 2.8 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

2.6.2. Measuring Instruments and Setting

Please refer to section 3 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

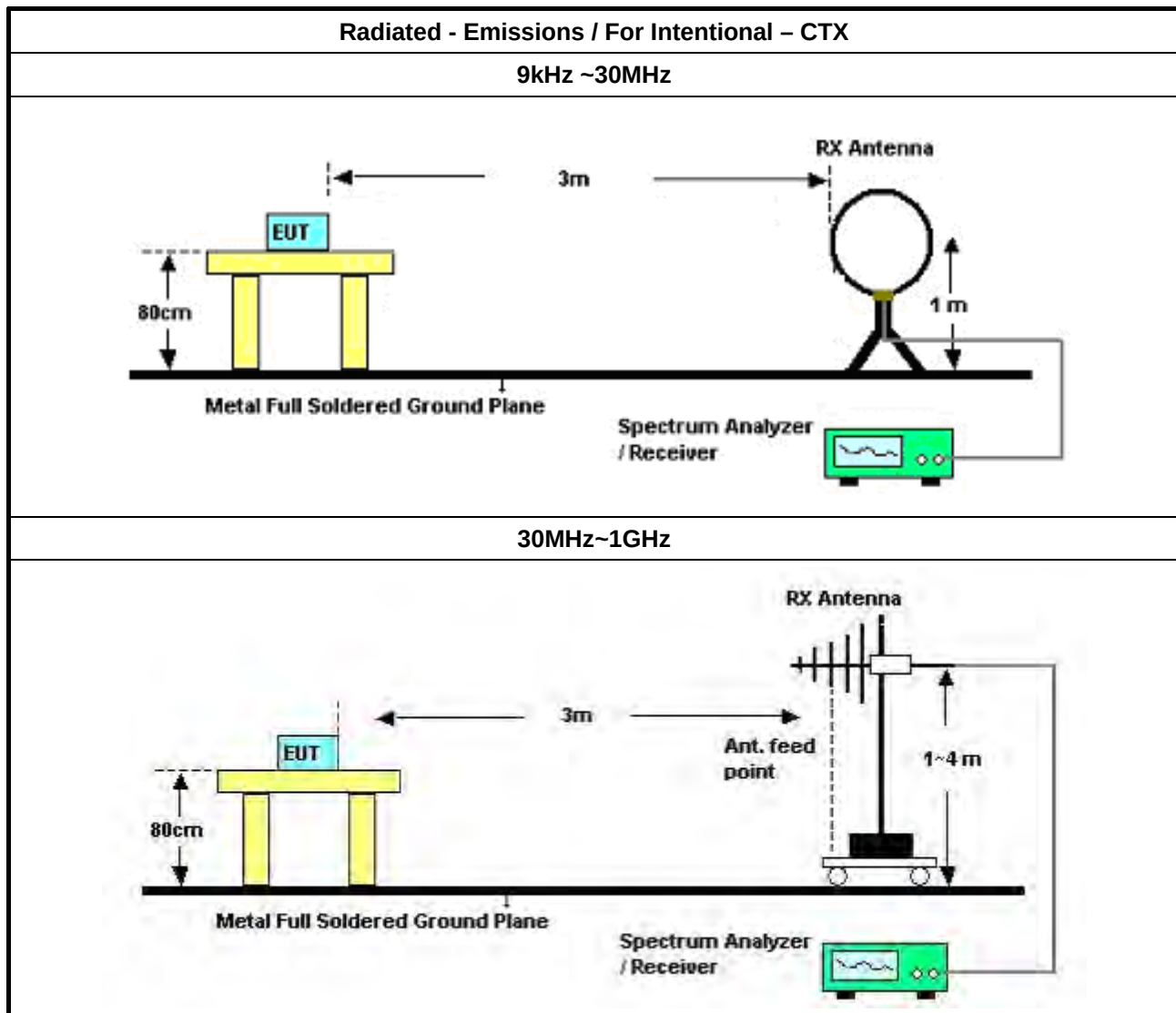
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	1MHz / 3MHz for peak

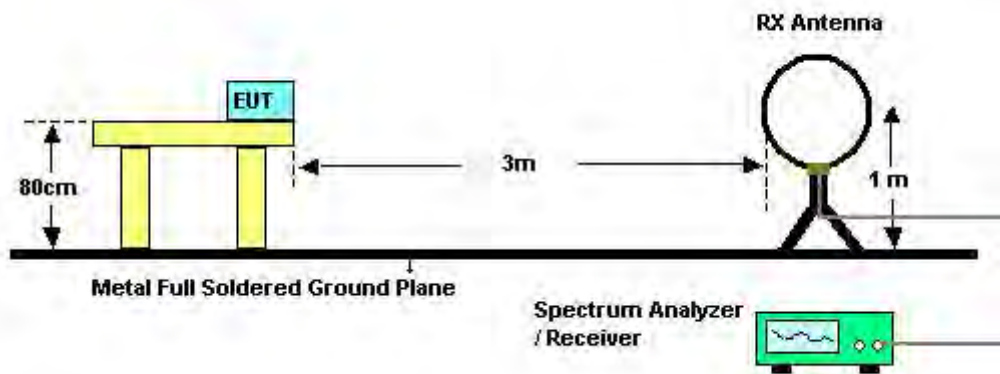
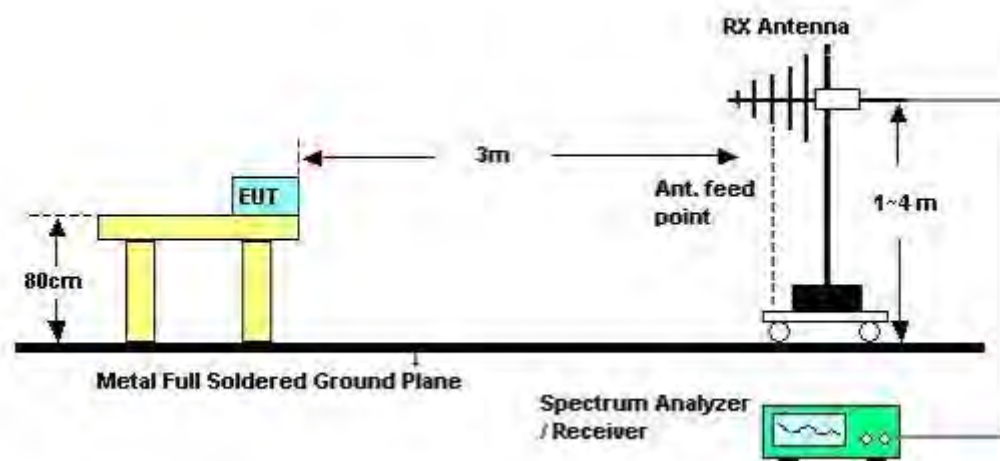
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

2.6.3. Test Procedures

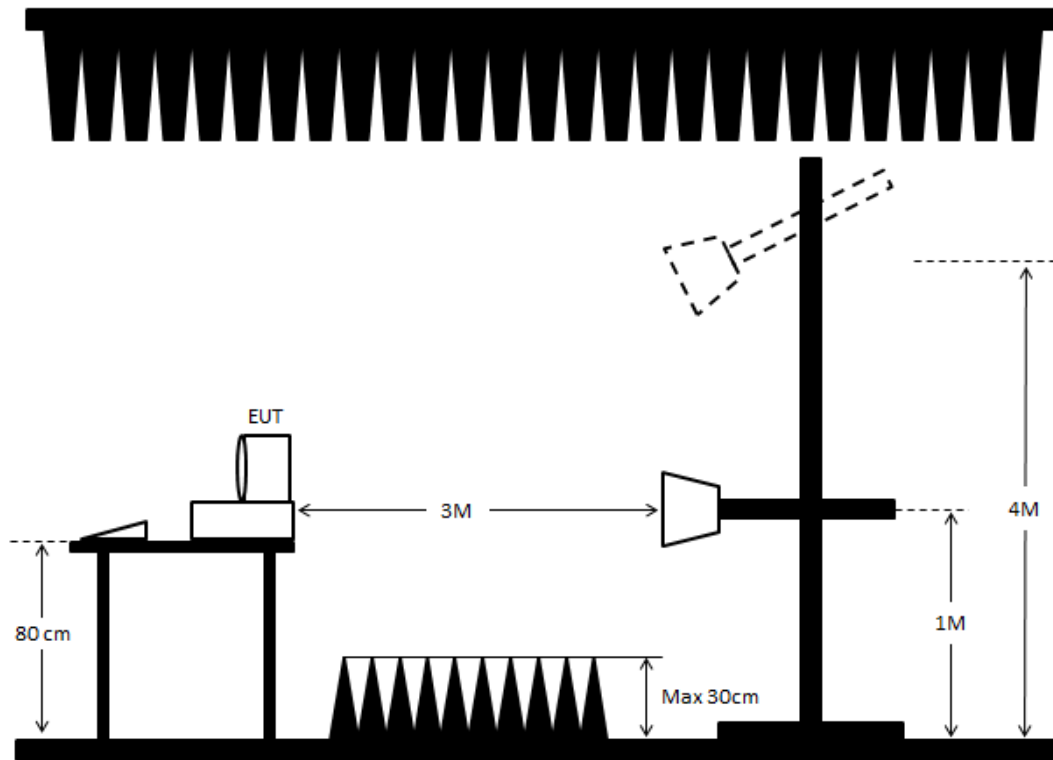
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting 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 PASS 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.

2.6.4. Test Setup Layout

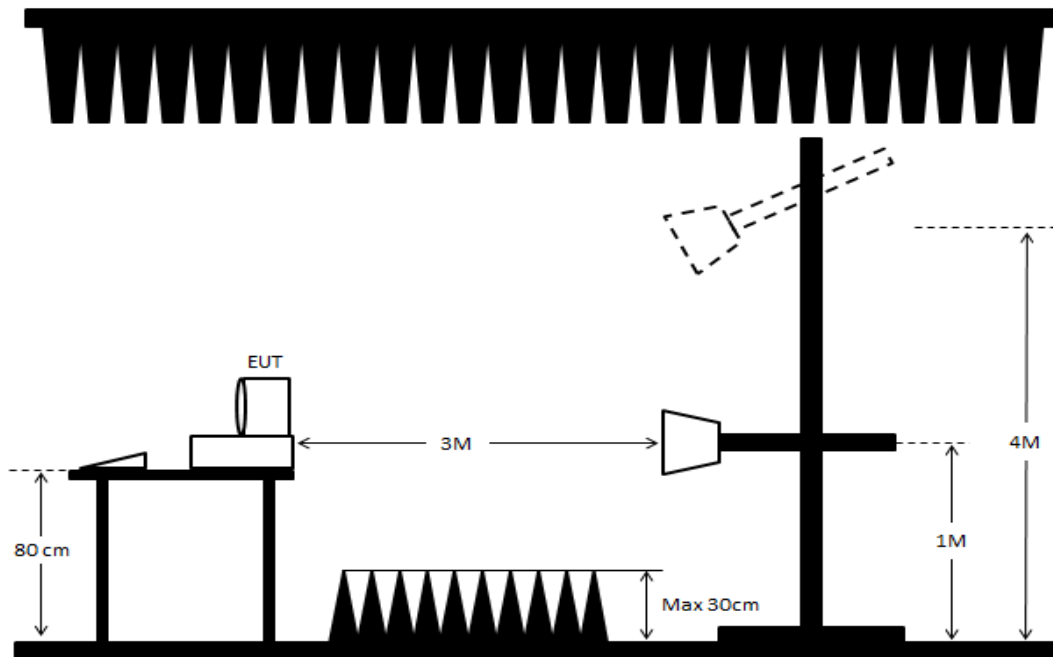


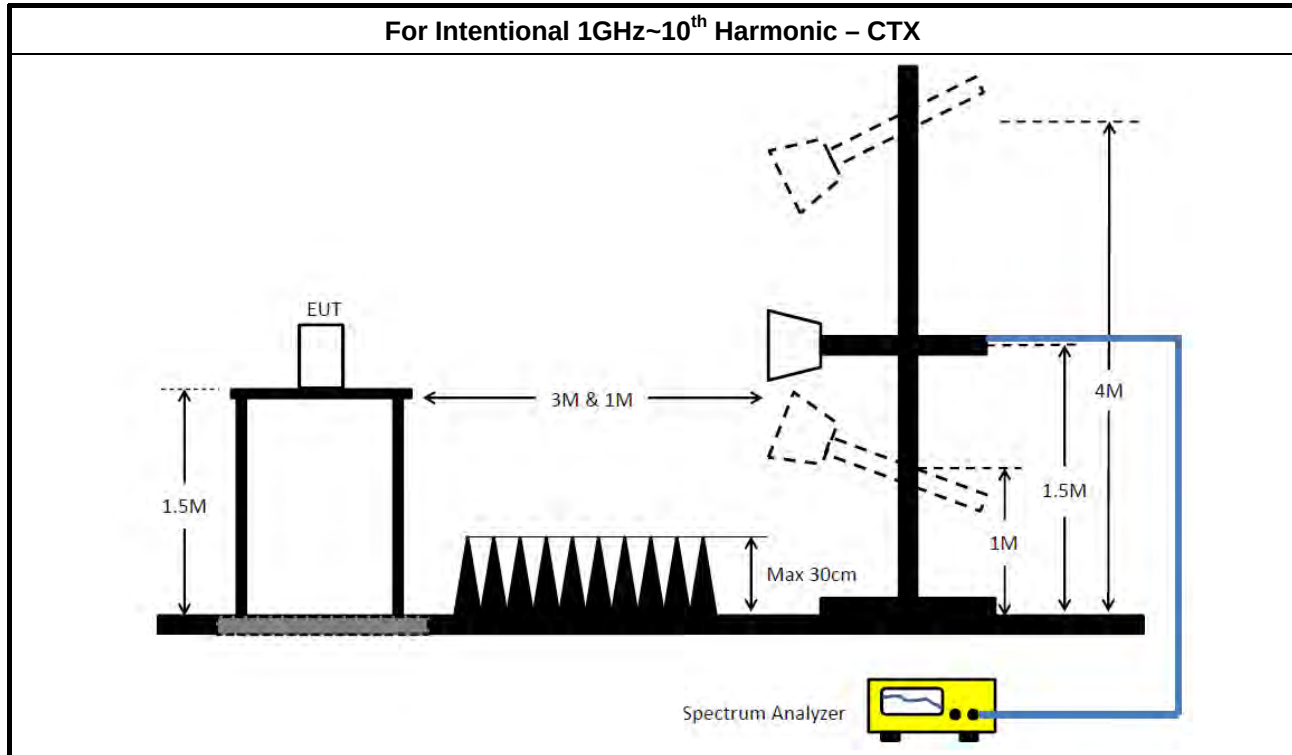
For Unintentional – CRX
9kHz ~30MHz

30MHz~1GHz


For Unintentional 1GHz~5th Harmonic – CRX (1,000~18,000 MHz)



For Unintentional 1GHz~5th Harmonic – CRX (18,000~30,000 MHz)





2.6.5. Test Deviation

There is no deviation with the original standard.

2.6.6. EUT Operation during Test

For Non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

2.6.7. Results of Radiated Emissions (9kHz~30MHz)

Temperature	19.9~25.6°C	Humidity	50.2~54.6%
Test Engineer	Justin Pan	Configurations	Intentional-CTX
Test Date	Jul. 29, 2019~Jul. 30, 2019	Test Mode	Mode 2

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

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

Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

Temperature	19.9~25.6°C	Humidity	50.2~54.6%
Test Engineer	Justin Pan	Configurations	Unintentional-CRX
Test Date	Jul. 29, 2019~Jul. 30, 2019	Test Mode	Mode 3

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

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

Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

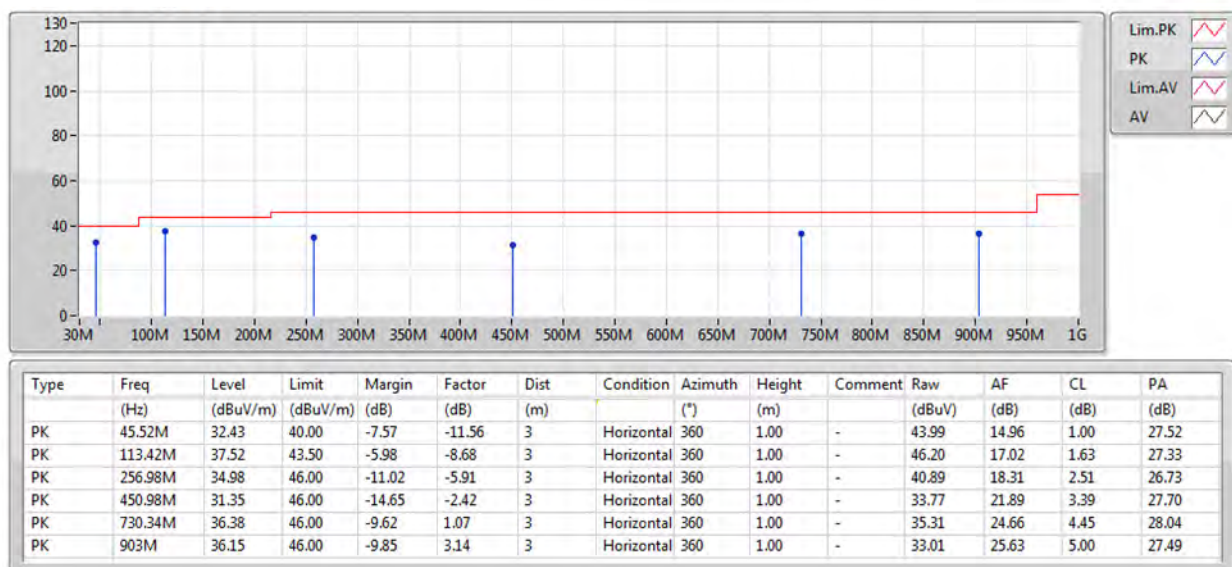
Limit line = specific limits (dBuV) + distance extrapolation factor.

2.6.8. Results of Radiated Emissions (30MHz~1GHz)

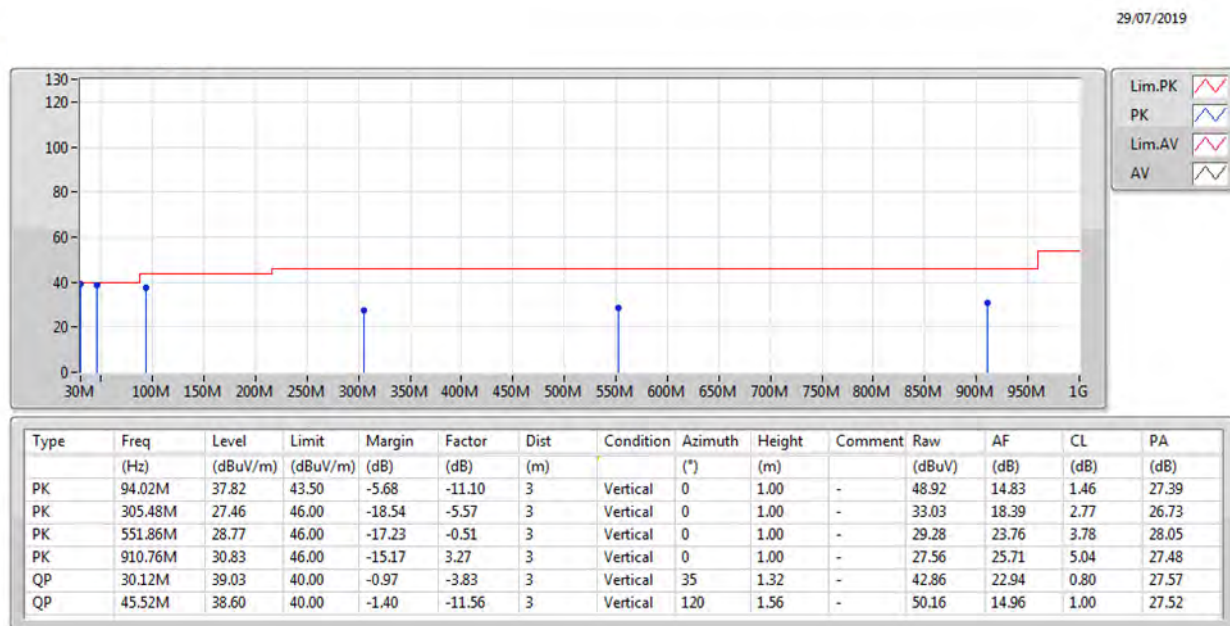
Temperature	19.9~25.6°C	Humidity	50.2~54.6%
Test Engineer	Justin Pan	Configurations	Intentional-CTX
Test Mode	Mode 2		

Horizontal

29/07/2019



Vertical



Note:

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

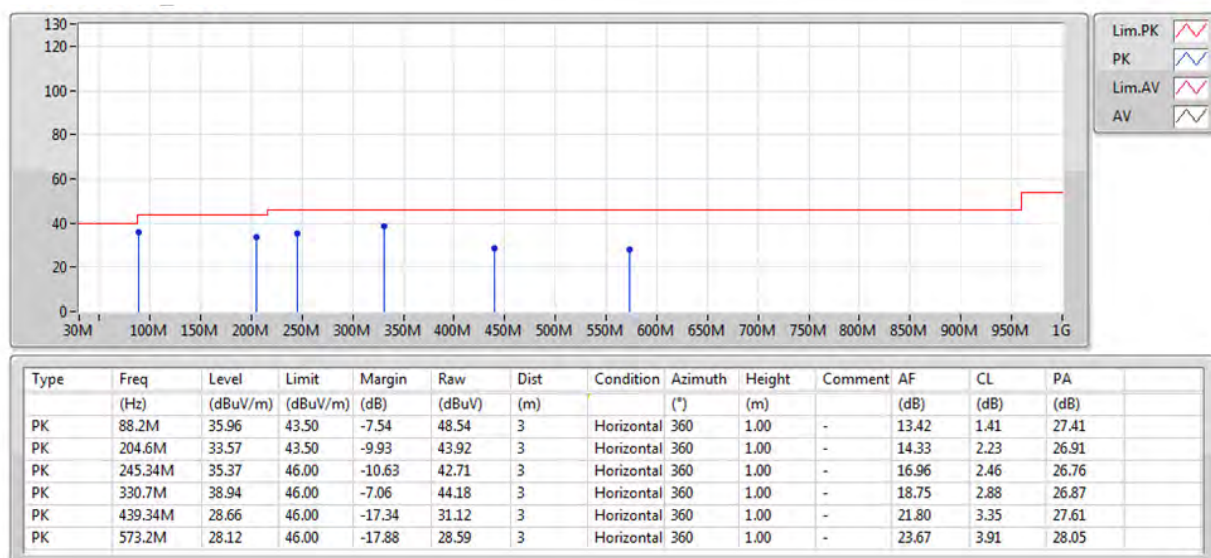
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

Temperature	19.9~25.6°C	Humidity	50.2~54.6%
Test Engineer	Justin Pan	Configurations	Unintentional-CRX
Test Mode	Mode 3		

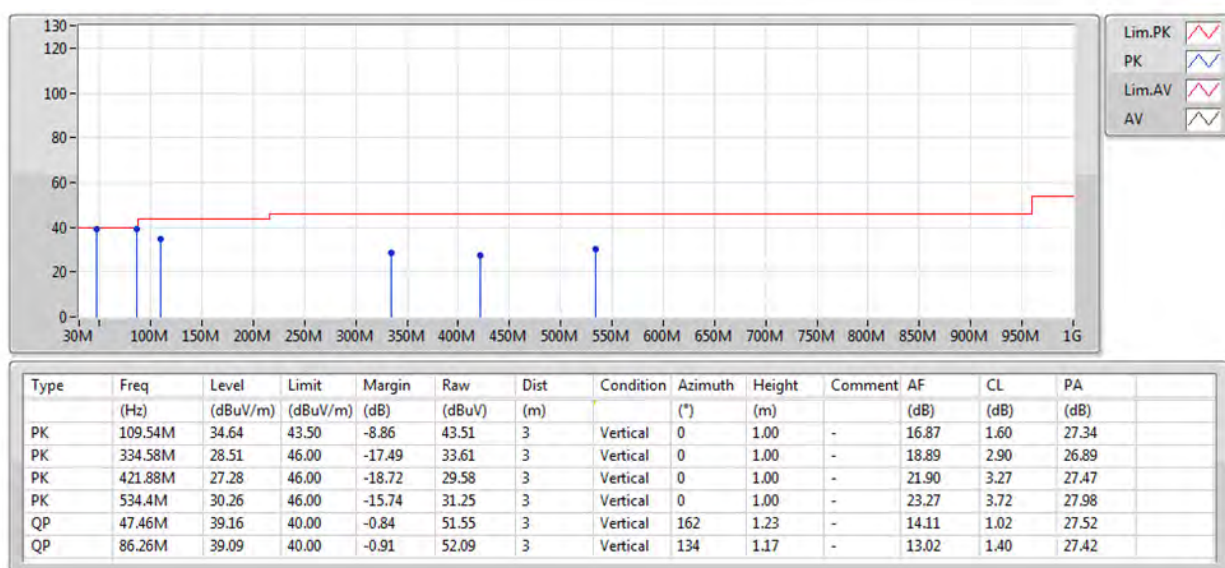
Horizontal

30/07/2019



Vertical

30/07/2019



Note:

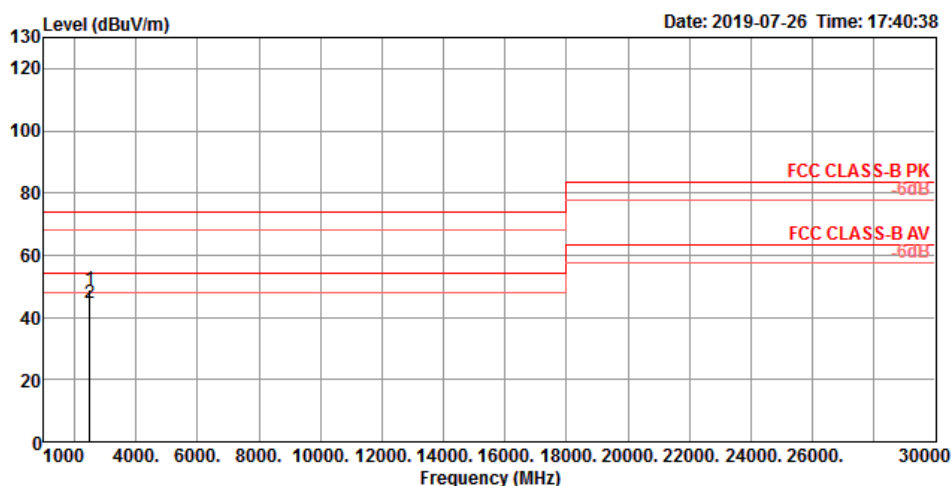
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

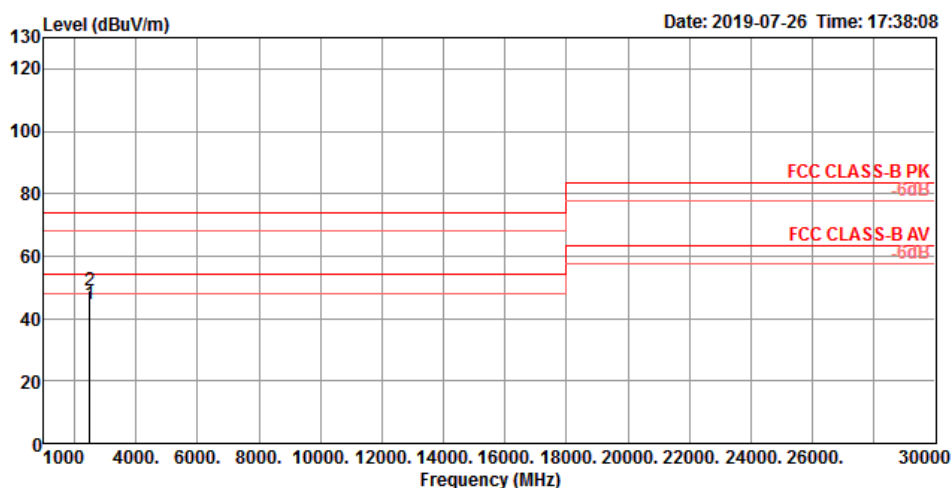
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

2.6.9. Results for Radiated Emissions (Unintentional 1GHz~5th-CRX)

Temperature	26.3~27.2°C	Humidity	61~65%
Test Engineer	Cola Fan	Configurations	Intentional-CTX
Test Mode	Mode 2		

Horizontal


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	2500.37	48.91	74.00	-25.09	51.32	4.00	30.20	36.61	118	204 Peak	HORIZONTAL
2	2500.43	44.52	54.00	-9.48	46.93	4.00	30.20	36.61	118	204 Average	HORIZONTAL

Vertical


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	2500.45	44.68	54.00	-9.32	47.09	4.00	30.20	36.61	120	205 Average	VERTICAL
2	2500.46	48.79	74.00	-25.21	51.20	4.00	30.20	36.61	120	205 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.

2.6.10. Results for Radiated Emissions (Intentional 1GHz~10th-CTX)
For non-beamforming mode

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 36 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 20, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10358.00	54.52	68.20	-13.68	43.33	7.96	38.34	35.11	148	291	Peak	HORIZONTAL
2	15541.38	47.21	54.00	-6.79	34.10	9.47	38.34	34.70	133	351	Average	HORIZONTAL
3	15541.68	60.15	74.00	-13.85	47.04	9.47	38.34	34.70	133	351	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10363.24	54.15	68.20	-14.05	42.94	7.96	38.34	35.09	140	351	Peak	VERTICAL
2	15546.40	60.01	74.00	-13.99	46.90	9.47	38.34	34.70	190	48	Peak	VERTICAL
3	15548.04	46.56	54.00	-7.44	33.45	9.47	38.34	34.70	190	48	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 40 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15595.64	56.72	74.00	-17.28	39.38	11.99	38.06	32.71	144	157	Peak	HORIZONTAL
2	15597.10	43.21	54.00	-10.79	25.87	11.99	38.06	32.71	144	157	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15604.32	44.29	54.00	-9.71	26.94	12.01	38.06	32.72	204	68	Average	VERTICAL
2	15604.76	57.14	74.00	-16.86	39.79	12.01	38.06	32.72	204	68	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 48 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15720.34	43.10	54.00	-10.90	25.88	12.05	37.89	32.72	206	172	Average	HORIZONTAL
2	15724.26	56.13	74.00	-17.87	38.91	12.05	37.89	32.72	206	172	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15721.44	43.83	54.00	-10.17	26.61	12.05	37.89	32.72	283	17	Average	VERTICAL
2	15722.50	56.78	74.00	-17.22	39.56	12.05	37.89	32.72	283	17	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 149 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11486.42	55.93	74.00	-18.07	39.55	10.33	38.79	32.74	278	201	Peak	HORIZONTAL
2	11486.68	42.81	54.00	-11.19	26.43	10.33	38.79	32.74	278	201	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11488.06	45.41	54.00	-8.59	29.03	10.33	38.79	32.74	120	155	Average	VERTICAL
2	11488.38	58.17	74.00	-15.83	41.79	10.33	38.79	32.74	120	155	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 157 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11567.72	55.19	74.00	-18.81	38.74	10.36	38.83	32.74	139	258	Peak	HORIZONTAL
2	11568.00	42.25	54.00	-11.75	25.80	10.36	38.83	32.74	139	258	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11568.12	45.29	54.00	-8.71	28.84	10.36	38.83	32.74	104	139	Average	VERTICAL
2	11568.14	58.26	74.00	-15.74	41.81	10.36	38.83	32.74	104	139	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 165 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11648.08	42.35	54.00	-11.65	25.83	10.39	38.86	32.73	173	343	Average	HORIZONTAL
2	11653.18	55.94	74.00	-18.06	39.41	10.40	38.86	32.73	173	343	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11648.00	58.13	74.00	-15.87	41.61	10.39	38.86	32.73	222	283	Peak	VERTICAL
2	11648.12	44.93	54.00	-9.07	28.41	10.39	38.86	32.73	222	283	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15537.66	43.21	54.00	-10.79	25.80	11.97	38.15	32.71	245	15	Average	HORIZONTAL
2	15538.60	55.81	74.00	-18.19	38.40	11.97	38.15	32.71	245	15	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15542.16	46.71	54.00	-7.29	29.30	11.97	38.15	32.71	196	125	Average	VERTICAL
2	15542.86	60.91	74.00	-13.09	43.50	11.97	38.15	32.71	196	125	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15599.72	55.47	74.00	-18.53	38.13	11.99	38.06	32.71	152	271	Peak	HORIZONTAL
2	15603.66	42.82	54.00	-11.18	25.47	12.01	38.06	32.72	152	271	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15596.84	45.58	54.00	-8.42	28.24	11.99	38.06	32.71	208	151	Average	VERTICAL
2	15597.46	61.04	74.00	-12.96	43.70	11.99	38.06	32.71	208	151	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15715.12	50.91	74.00	-23.09	33.69	12.05	37.89	32.72	232	132	Peak	HORIZONTAL
2	15717.88	43.34	54.00	-10.66	26.12	12.05	37.89	32.72	232	132	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15724.32	44.65	54.00	-9.35	27.43	12.05	37.89	32.72	299	273	Average	VERTICAL
2	15724.82	57.72	74.00	-16.28	40.50	12.05	37.89	32.72	299	273	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11486.15	55.73	74.00	-18.27	39.35	10.33	38.79	32.74	216	185	Peak	HORIZONTAL
2	11486.19	42.60	54.00	-11.40	26.22	10.33	38.79	32.74	216	185	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11486.94	43.92	54.00	-10.08	27.54	10.33	38.79	32.74	115	150	Average	VERTICAL
2	11487.39	57.37	74.00	-16.63	40.99	10.33	38.79	32.74	115	150	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11566.89	54.92	74.00	-19.08	38.47	10.36	38.83	32.74	139	92	Peak	HORIZONTAL
2	11568.40	41.85	54.00	-12.15	25.40	10.36	38.83	32.74	139	92	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11566.94	44.39	54.00	-9.61	27.94	10.36	38.83	32.74	108	143	Average	VERTICAL
2	11567.66	59.05	74.00	-14.95	42.60	10.36	38.83	32.74	108	143	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11645.79	55.64	74.00	-18.36	39.12	10.39	38.86	32.73	198	124	Peak	HORIZONTAL
2	11648.75	42.14	54.00	-11.86	25.62	10.39	38.86	32.73	198	124	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11647.50	58.51	74.00	-15.49	41.99	10.39	38.86	32.73	234	165	Peak	VERTICAL
2	11647.55	44.31	54.00	-9.69	27.79	10.39	38.86	32.73	234	165	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15571.71	56.02	74.00	-17.98	38.64	11.99	38.10	32.71	166	270	Peak	HORIZONTAL
2	15572.77	42.75	54.00	-11.25	25.37	11.99	38.10	32.71	166	270	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15573.08	43.77	54.00	-10.23	26.39	11.99	38.10	32.71	191	140	Average	VERTICAL
2	15574.46	56.43	74.00	-17.57	39.05	11.99	38.10	32.71	191	140	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15685.96	56.21	74.00	-17.79	38.97	12.03	37.93	32.72	251	235	Peak	HORIZONTAL
2	15688.11	43.25	54.00	-10.75	26.01	12.03	37.93	32.72	251	235	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15692.76	61.67	74.00	-12.33	44.41	12.05	37.93	32.72	198	128	Peak	VERTICAL
2	15693.65	48.98	54.00	-5.02	31.72	12.05	37.93	32.72	198	128	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11508.24	54.49	74.00	-19.51	38.10	10.33	38.80	32.74	214	231	Peak	HORIZONTAL
2	11509.71	41.53	54.00	-12.47	25.14	10.33	38.80	32.74	214	231	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11505.61	41.89	54.00	-12.11	25.50	10.33	38.80	32.74	241	181	Average	VERTICAL
2	11515.10	55.56	74.00	-18.44	39.16	10.33	38.81	32.74	241	181	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11585.67	55.04	74.00	-18.96	38.58	10.37	38.83	32.74	160	195	Peak	HORIZONTAL
2	11590.71	41.75	54.00	-12.25	25.29	10.37	38.83	32.74	160	195	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11589.58	42.64	54.00	-11.36	26.18	10.37	38.83	32.74	109	145	Average	VERTICAL
2	11589.94	55.10	74.00	-18.90	38.64	10.37	38.83	32.74	109	145	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15628.24	55.33	74.00	-18.67	38.01	12.01	38.03	32.72	210	86	Peak	HORIZONTAL
2	15633.08	42.43	54.00	-11.57	25.13	12.01	38.01	32.72	210	86	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15627.88	42.78	54.00	-11.22	25.46	12.01	38.03	32.72	193	117	Average	VERTICAL
2	15631.67	55.97	74.00	-18.03	38.67	12.01	38.01	32.72	193	117	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11548.72	41.54	54.00	-12.46	25.12	10.34	38.82	32.74	154	97	Average	HORIZONTAL
2	11559.46	55.01	74.00	-18.99	38.57	10.36	38.82	32.74	154	97	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11543.33	55.18	74.00	-18.82	38.77	10.34	38.81	32.74	172	139	Peak	VERTICAL
2	11552.92	41.81	54.00	-12.19	25.37	10.36	38.82	32.74	172	139	Average	VERTICAL

802.11ac MCS0/Nss2 VHT80+80

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss2 VHT80+80 Type 1 / CH 42+155 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 25, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11545.04	55.56	74.00	-18.44	38.95	10.34	39.01	32.74	126	113	Peak	HORIZONTAL
2	11549.64	42.27	54.00	-11.73	25.66	10.34	39.01	32.74	126	113	Average	HORIZONTAL
3	15628.26	56.02	74.00	-17.98	38.91	12.01	37.82	32.72	163	92	Peak	HORIZONTAL
4	15634.68	42.86	54.00	-11.14	25.75	12.01	37.82	32.72	163	92	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11545.10	42.16	54.00	-11.84	25.55	10.34	39.01	32.74	190	22	Average	VERTICAL
2	11553.18	55.73	74.00	-18.27	39.10	10.36	39.01	32.74	190	22	Peak	VERTICAL
3	15625.74	55.59	74.00	-18.41	38.48	12.01	37.82	32.72	188	297	Peak	VERTICAL
4	15633.02	43.11	54.00	-10.89	26.00	12.01	37.82	32.72	188	297	Average	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.

For beamforming mode

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15538.76	43.02	54.00	-10.98	25.89	11.97	37.87	32.71	148	190	Average	HORIZONTAL
2	15538.86	56.51	74.00	-17.49	39.38	11.97	37.87	32.71	148	190	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15537.30	43.27	54.00	-10.73	26.14	11.97	37.87	32.71	176	272	Average	VERTICAL
2	15540.82	56.86	74.00	-17.14	39.73	11.97	37.87	32.71	176	272	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15600.38	42.98	54.00	-11.02	25.85	11.99	37.85	32.71	279	172	Average	HORIZONTAL
2	15602.06	56.02	74.00	-17.98	38.91	12.01	37.82	32.72	279	172	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15597.12	56.75	74.00	-17.25	39.62	11.99	37.85	32.71	221	64	Peak	VERTICAL
2	15602.60	42.82	54.00	-11.18	25.71	12.01	37.82	32.72	221	64	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15722.30	43.18	54.00	-10.82	26.09	12.05	37.76	32.72	166	338	Average	HORIZONTAL
2	15724.28	56.61	74.00	-17.39	39.52	12.05	37.76	32.72	166	338	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15718.00	56.51	74.00	-17.49	39.42	12.05	37.76	32.72	204	285	Peak	VERTICAL
2	15718.26	43.25	54.00	-10.75	26.16	12.05	37.76	32.72	204	285	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11486.66	56.51	74.00	-17.49	39.92	10.33	39.00	32.74	141	241	Peak	HORIZONTAL
2	11492.08	42.56	54.00	-11.44	25.97	10.33	39.00	32.74	141	241	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11486.02	42.38	54.00	-11.62	25.79	10.33	39.00	32.74	178	148	Average	VERTICAL
2	11487.22	55.16	74.00	-18.84	38.57	10.33	39.00	32.74	178	148	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11566.28	55.03	74.00	-18.97	38.40	10.36	39.01	32.74	204	230	Peak	HORIZONTAL
2	11573.00	42.36	54.00	-11.64	25.73	10.36	39.01	32.74	204	230	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11568.48	42.40	54.00	-11.60	25.77	10.36	39.01	32.74	173	340	Average	VERTICAL
2	11570.32	55.09	74.00	-18.91	38.46	10.36	39.01	32.74	173	340	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11647.20	55.45	74.00	-18.55	38.76	10.39	39.03	32.73	214	253	Peak	HORIZONTAL
2	11648.26	42.45	54.00	-11.55	25.76	10.39	39.03	32.73	214	253	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11648.74	55.73	74.00	-18.27	39.04	10.39	39.03	32.73	164	142	Peak	VERTICAL
2	11652.12	42.30	54.00	-11.70	25.60	10.40	39.03	32.73	164	142	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15569.68	42.94	54.00	-11.06	25.81	11.99	37.85	32.71	196	264	Average	HORIZONTAL
2	15569.94	56.31	74.00	-17.69	39.18	11.99	37.85	32.71	196	264	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15566.54	56.52	74.00	-17.48	39.39	11.99	37.85	32.71	167	328	Peak	VERTICAL
2	15574.78	43.02	54.00	-10.98	25.89	11.99	37.85	32.71	167	328	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15687.02	43.16	54.00	-10.84	26.06	12.03	37.79	32.72	221	198	Average	HORIZONTAL
2	15689.42	56.12	74.00	-17.88	39.02	12.03	37.79	32.72	221	198	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15691.02	42.96	54.00	-11.04	25.87	12.05	37.76	32.72	163	301	Average	VERTICAL
2	15692.56	56.07	74.00	-17.93	38.98	12.05	37.76	32.72	163	301	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11511.28	42.15	54.00	-11.85	25.56	10.33	39.00	32.74	278	327	Average	HORIZONTAL
2	11514.46	55.43	74.00	-18.57	38.84	10.33	39.00	32.74	278	327	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11507.14	54.98	74.00	-19.02	38.39	10.33	39.00	32.74	234	172	Peak	VERTICAL
2	11509.00	41.96	54.00	-12.04	25.37	10.33	39.00	32.74	234	172	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11590.12	42.30	54.00	-11.70	25.65	10.37	39.02	32.74	161	64 Average	HORIZONTAL
2	11594.62	55.13	74.00	-18.87	38.48	10.37	39.02	32.74	161	64 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11585.32	55.31	74.00	-18.69	38.66	10.37	39.02	32.74	167	225 Peak	VERTICAL
2	11593.14	42.24	54.00	-11.76	25.59	10.37	39.02	32.74	167	225 Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15631.24	42.97	54.00	-11.03	25.86	12.01	37.82	32.72	149	45	Average	HORIZONTAL
2	15633.62	55.99	74.00	-18.01	38.88	12.01	37.82	32.72	149	45	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15626.32	42.75	54.00	-11.25	25.64	12.01	37.82	32.72	105	173	Average	VERTICAL
2	15626.58	55.89	74.00	-18.11	38.78	12.01	37.82	32.72	105	173	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11551.50	55.53	74.00	-18.47	38.90	10.36	39.01	32.74	153	322	Peak	HORIZONTAL
2	11554.46	42.30	54.00	-11.70	25.67	10.36	39.01	32.74	153	322	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11551.32	55.62	74.00	-18.38	38.99	10.36	39.01	32.74	134	273	Peak	VERTICAL
2	11554.24	42.22	54.00	-11.78	25.59	10.36	39.01	32.74	134	273	Average	VERTICAL

802.11ac MCS0/Nss2 VHT80+80

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss2 VHT80+80 Type 1 / CH 42+155 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 26, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11551.20	43.18	54.00	-10.82	26.55	10.36	39.01	32.74	213	136	Average	HORIZONTAL
2	11562.96	55.92	74.00	-18.08	39.29	10.36	39.01	32.74	213	136	Peak	HORIZONTAL
3	15631.08	43.60	54.00	-10.40	26.49	12.01	37.82	32.72	162	247	Average	HORIZONTAL
4	15639.00	57.24	74.00	-16.76	40.13	12.01	37.82	32.72	162	247	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11548.38	43.08	54.00	-10.92	26.47	10.34	39.01	32.74	228	61	Average	VERTICAL
2	11555.04	55.97	74.00	-18.03	39.34	10.36	39.01	32.74	228	61	Peak	VERTICAL
3	15636.06	57.36	74.00	-16.64	40.25	12.01	37.82	32.72	193	142	Peak	VERTICAL
4	15643.86	43.80	54.00	-10.20	26.69	12.01	37.82	32.72	193	142	Average	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.

2.7. Band Edge Emissions Measurement

2.7.1. Limit

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.25 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

In addition, In case the emission fall within the restricted band specified on 2.7, then the 2.8 limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micровolts/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

2.7.2. Measuring Instruments and Setting

Please refer to section 3 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

2.7.3. Test Procedures

1. The test procedure is the same as section 2.6.3.

2.7.4. Test Setup Layout

This test setup layout is the same as that shown in section 2.6.4.

2.7.5. Test Deviation

There is no deviation with the original standard.

2.7.6. EUT Operation during Test

For Non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

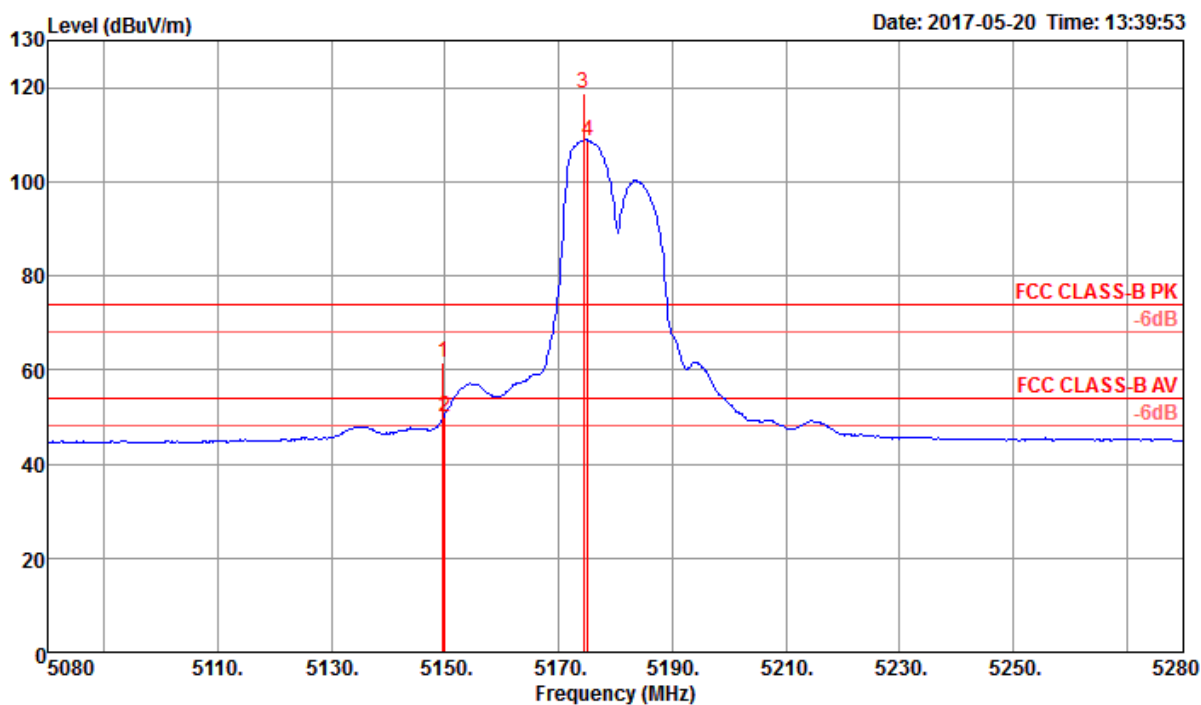
The EUT was programmed to be in beamforming transmitting mode.

2.7.7. Test Result of Band Edge and Fundamental Emissions

For non-beamforming mode

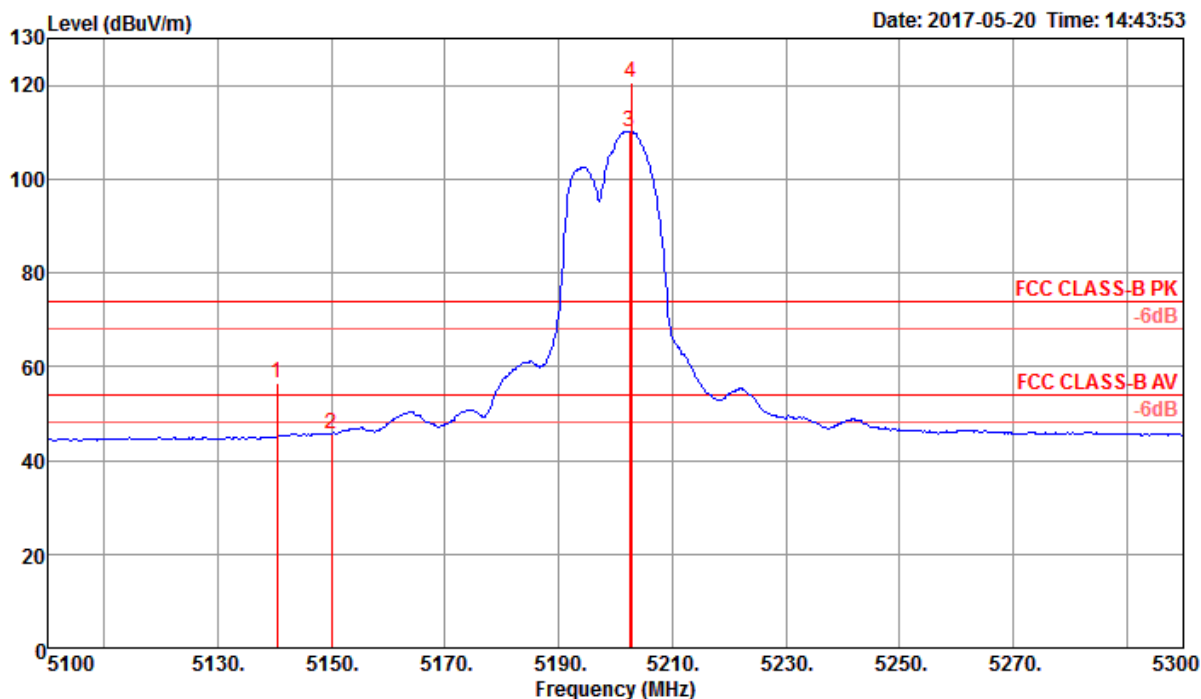
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 36, 40, 48 / Port 1 + Port 2 + Port 3 + Port 4

Channel 36



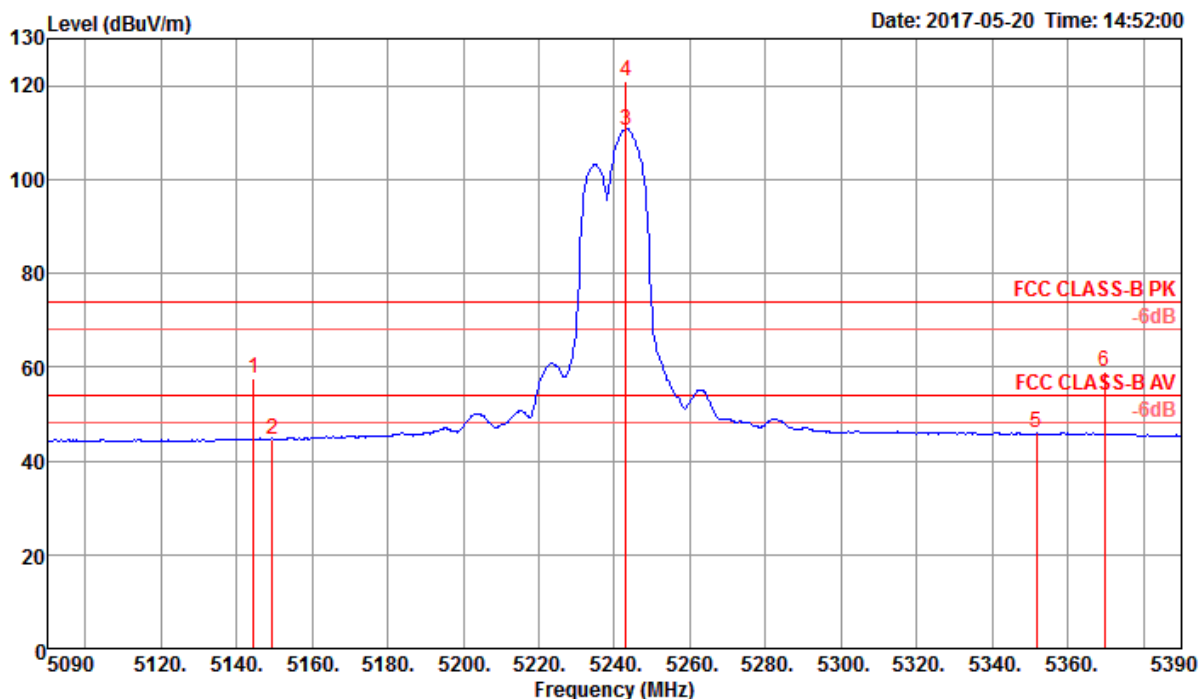
	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5149.60	61.55	74.00	-12.45	57.28	5.47	33.27	34.47	176	295	Peak	HORIZONTAL
2	5150.00	50.13	54.00	-3.87	45.86	5.47	33.27	34.47	176	295	Average	HORIZONTAL
3 @	5174.40	118.92			114.57	5.49	33.33	34.47	176	295	Peak	HORIZONTAL
4 @	5175.20	108.68			104.33	5.49	33.33	34.47	176	295	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5180 MHz.

Channel 40


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5140.40	56.62	74.00	-17.38	52.38	5.46	33.25	34.47	258	276	Peak	VERTICAL
2	5150.00	45.64	54.00	-8.36	41.37	5.47	33.27	34.47	258	276	Average	VERTICAL
3 @	5202.40	110.12			105.71	5.50	33.38	34.47	258	276	Average	VERTICAL
4 @	5202.80	120.64			116.23	5.50	33.38	34.47	258	276	Peak	VERTICAL

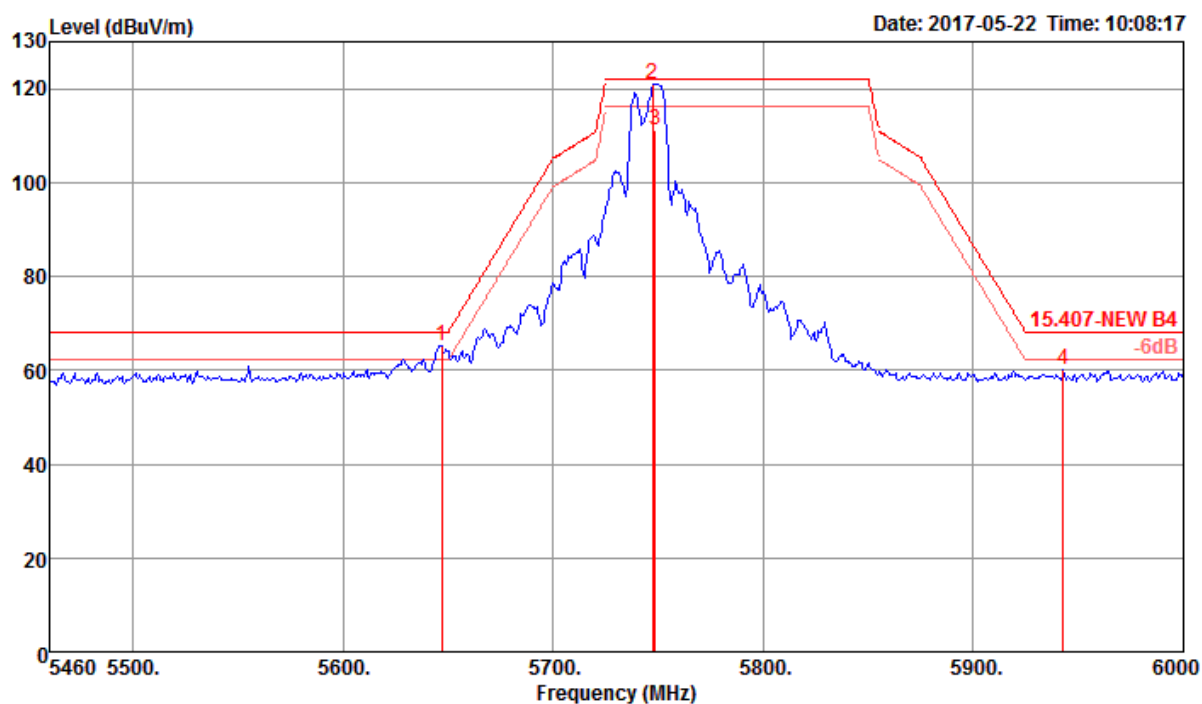
Item 3, 4 are the fundamental frequency at 5200 MHz.

Channel 48


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5144.60	57.74	74.00	-16.26	53.47	5.47	33.27	34.47	283	278	Peak
2	5149.40	44.71	54.00	-9.29	40.44	5.47	33.27	34.47	283	278	Average
3 @	5243.00	110.62			106.15	5.51	33.44	34.48	283	278	Average
4 @	5243.00	120.95			116.48	5.51	33.44	34.48	283	278	Peak
5	5351.60	45.86	54.00	-8.14	41.18	5.53	33.63	34.48	283	278	Average
6	5369.60	58.87	74.00	-15.13	54.13	5.54	33.68	34.48	283	278	Peak

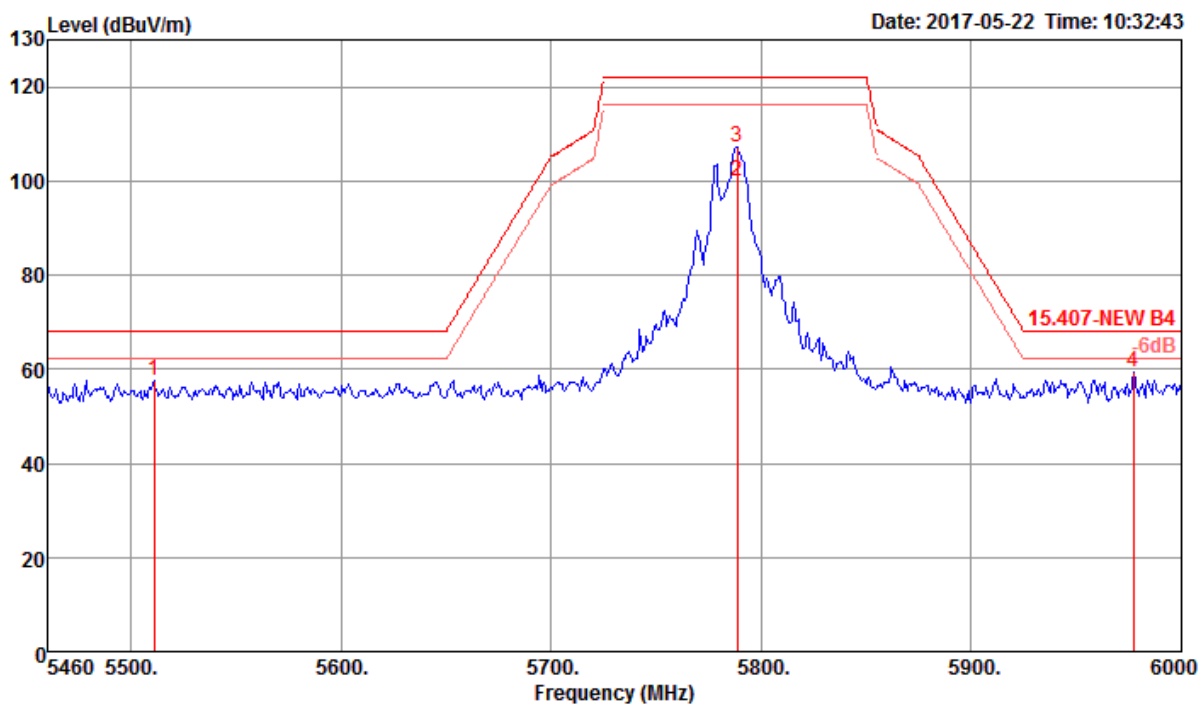
Item 3, 4 are the fundamental frequency at 5240 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 149, 157, 165 / Port 1 + Port 2 + Port 3 + Port 4

Channel 149


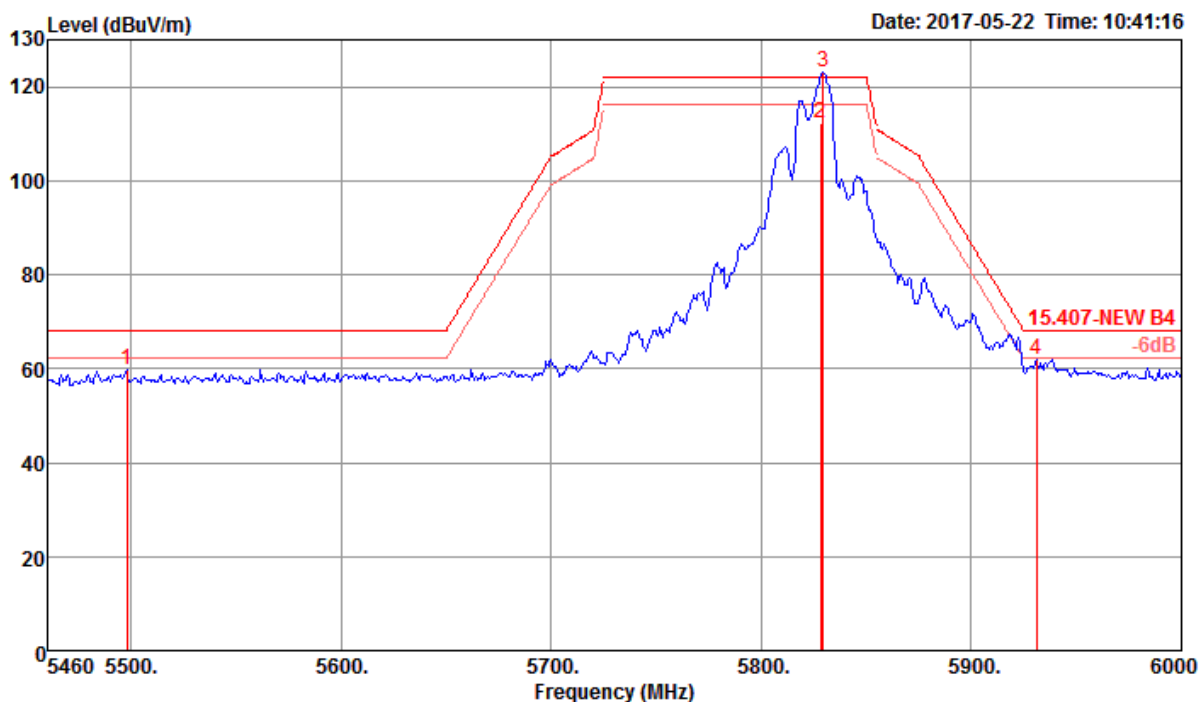
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5646.84	65.24	68.20	-2.96	55.45	6.81	34.06	31.08	261	356 Peak	VERTICAL
2	5747.28	121.11			111.30	6.83	34.10	31.12	261	356 Peak	VERTICAL
3	5748.36	111.11			101.30	6.83	34.10	31.12	261	356 Average	VERTICAL
4	5942.76	59.94	68.20	-8.26	49.91	7.05	34.18	31.20	261	356 Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5745 MHz.

Channel 157


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBUV/m	dBUV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5510.76	57.60	68.20	-10.60	47.91	6.71	34.00	31.02	140	162 Peak	HORIZONTAL
2	5788.32	99.99			90.16	6.84	34.12	31.13	140	162 Average	HORIZONTAL
3	5788.32	107.19			97.36	6.84	34.12	31.13	140	162 Peak	HORIZONTAL
4	5977.32	59.46	68.20	-8.74	49.38	7.10	34.19	31.21	140	162 Peak	HORIZONTAL

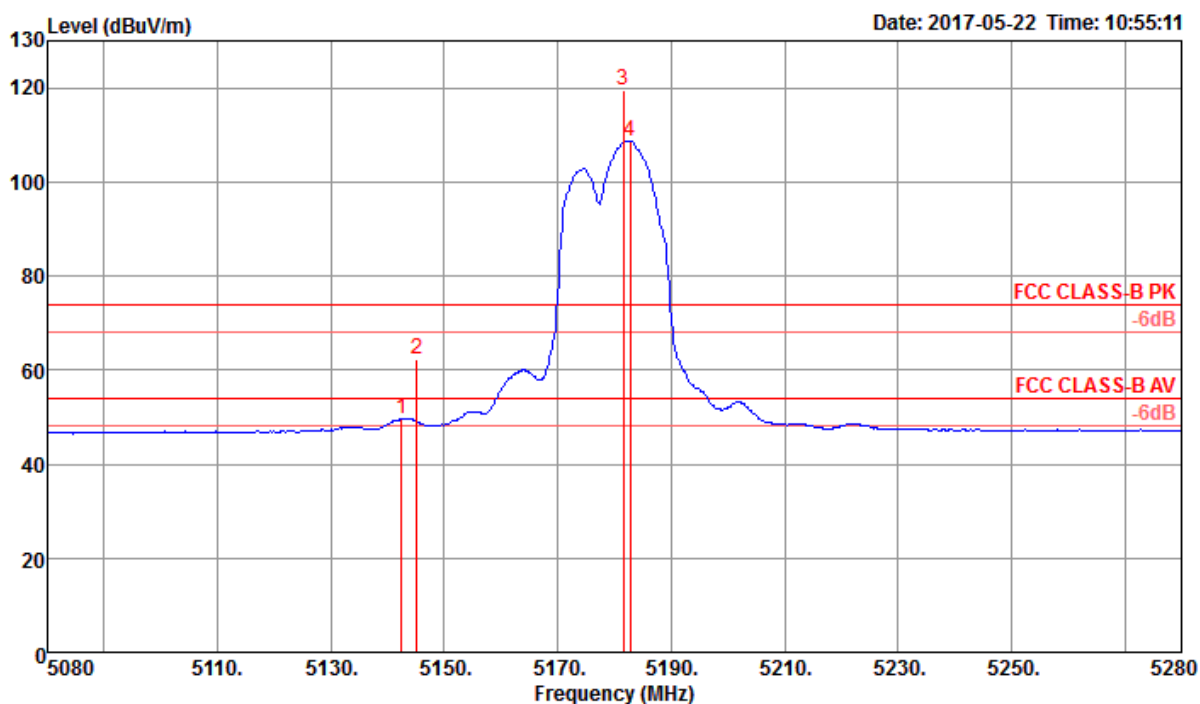
Item 2, 3 are the fundamental frequency at 5785 MHz.

Channel 165


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	Limit	Level	Loss	Factor	Factor	cm	deg	
1	5497.80	59.66	68.20	-8.54	49.97	6.71	34.00	31.02	282	355 Peak	VERTICAL
2	5828.28	112.19			102.32	6.89	34.13	31.15	282	355 Average	VERTICAL
3 @	5829.36	123.19			113.32	6.89	34.13	31.15	282	355 Peak	VERTICAL
4	5930.88	62.04	68.20	-6.16	52.03	7.03	34.17	31.19	282	355 Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5825 MHz.

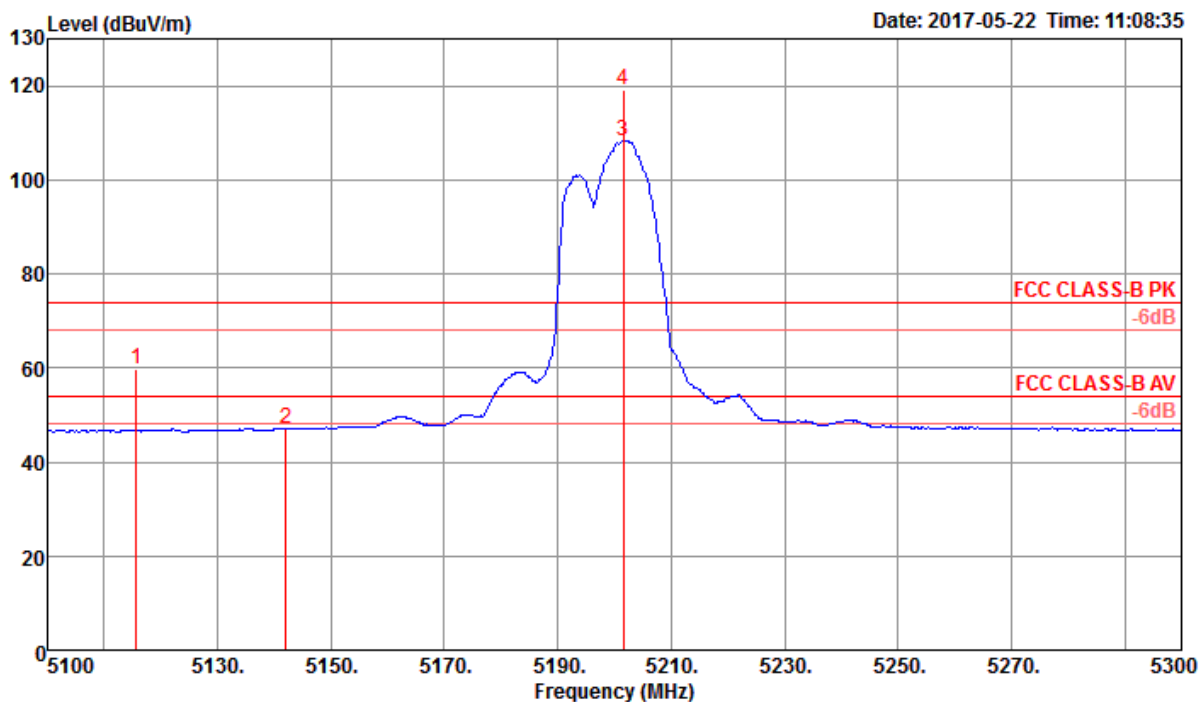
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Port 1 + Port 2 + Port 3 + Port 4

Channel 36


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5142.40	49.61	54.00	-4.39	40.67	6.48	33.51	31.05	269	272	Average	VERTICAL
2	5145.20	62.33	74.00	-11.67	53.39	6.48	33.51	31.05	269	272	Peak	VERTICAL
3 @	5181.60	119.61			110.59	6.51	33.56	31.05	269	272	Peak	VERTICAL
4 @	5182.80	108.71			99.69	6.51	33.56	31.05	269	272	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5180 MHz.

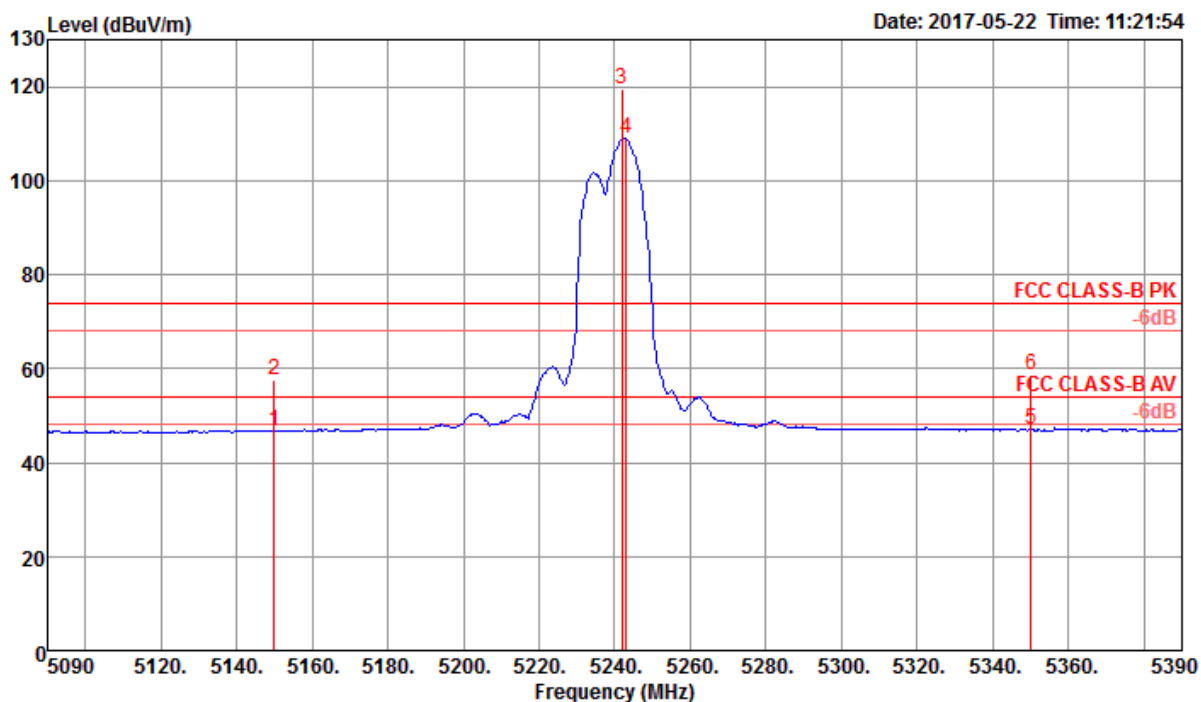
Channel 40



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	cm	deg	
1	5115.60	59.90	74.00	-14.10	51.06	6.44	33.46	31.06	218	272	Peak
2	5142.00	47.07	54.00	-6.93	38.13	6.48	33.51	31.05	218	272	Average
3 @	5201.60	108.29			99.22	6.54	33.58	31.05	218	272	Average
4 @	5201.60	119.32			110.25	6.54	33.58	31.05	218	272	Peak

Item 3, 4 are the fundamental frequency at 5200 MHz.

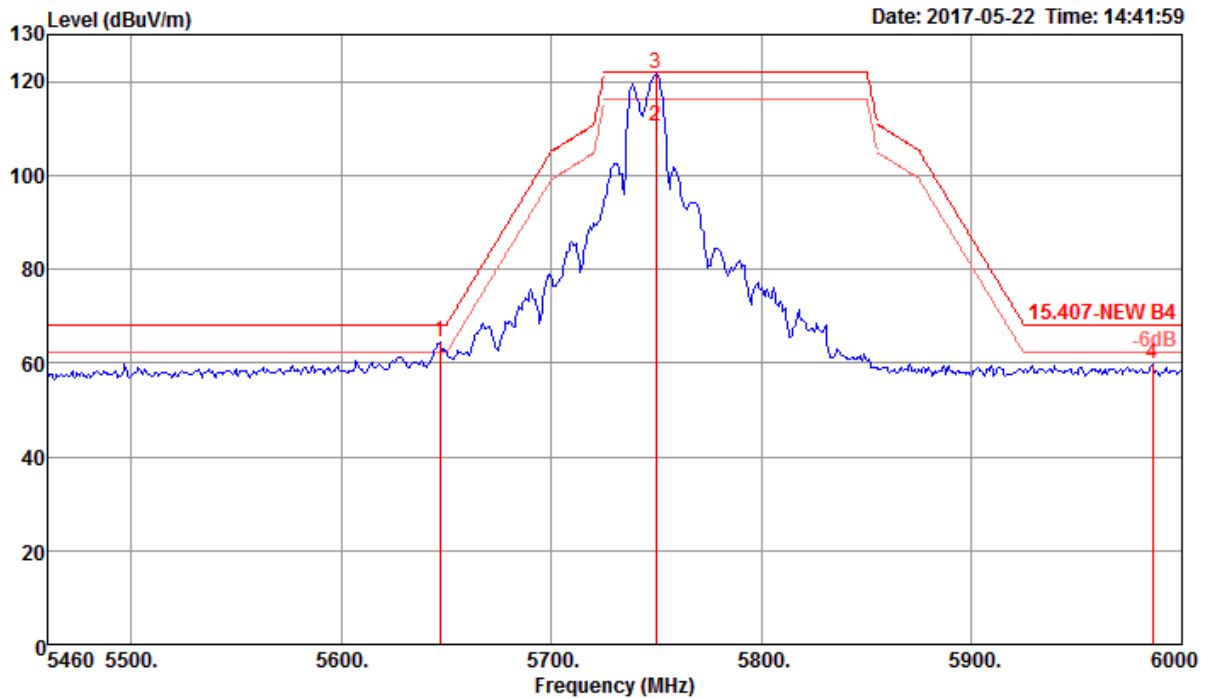
Channel 48



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5150.00	46.69	54.00	-7.31	37.75	6.48	33.51	31.05	252	272 Average	VERTICAL
2	5150.00	57.58	74.00	-16.42	48.64	6.48	33.51	31.05	252	272 Peak	VERTICAL
3 @	5241.80	119.59			110.44	6.55	33.65	31.05	252	272 Peak	VERTICAL
4 @	5243.00	108.93			99.78	6.55	33.65	31.05	252	272 Average	VERTICAL
5	5350.00	46.94	54.00	-7.06	37.61	6.58	33.79	31.04	252	272 Average	VERTICAL
6	5350.00	58.81	74.00	-15.19	49.48	6.58	33.79	31.04	252	272 Peak	VERTICAL

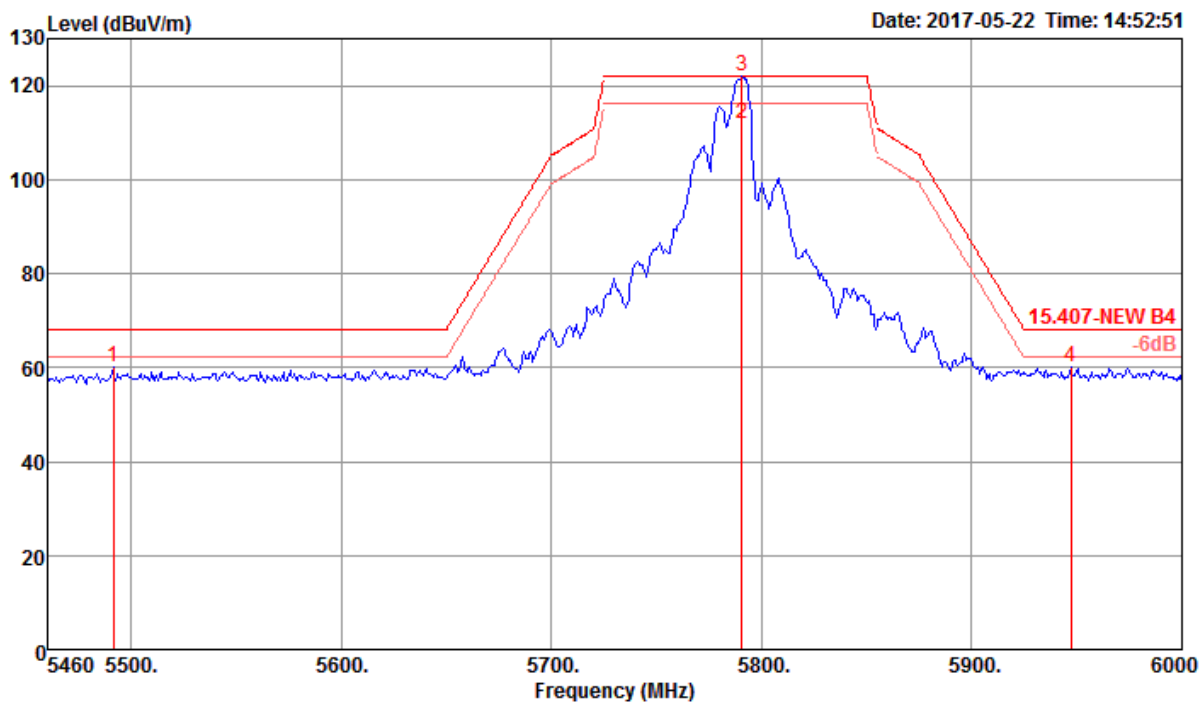
Item 3, 4 are the fundamental frequency at 5240 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Port 1 + Port 2 + Port 3 + Port 4

Channel 149


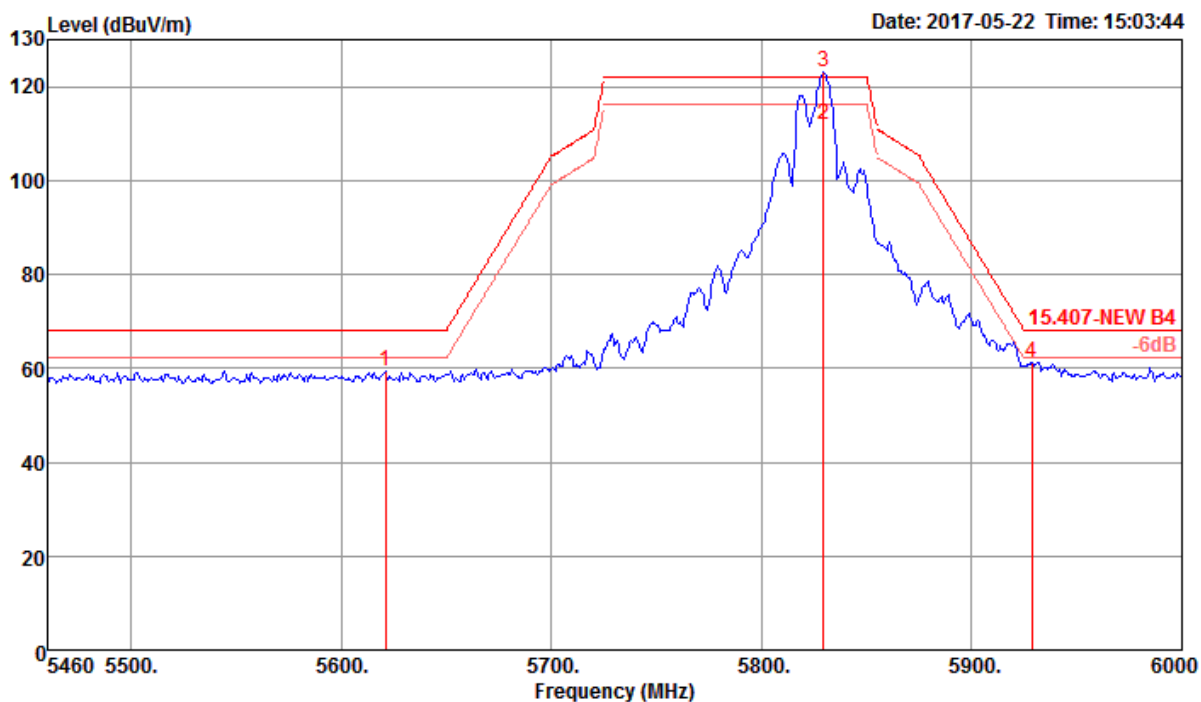
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5646.84	64.56	68.20	-3.64	54.77	6.81	34.06	31.08	230	355 Peak	VERTICAL
2	5749.44	110.43			100.62	6.83	34.10	31.12	230	355 Average	VERTICAL
3	5749.44	121.67			111.86	6.83	34.10	31.12	230	355 Peak	VERTICAL
4	5985.96	59.78	68.20	-8.42	49.70	7.10	34.19	31.21	230	355 Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5745 MHz.

Channel 157


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5491.32	60.03	68.20	-8.17	50.38	6.69	33.98	31.02	252	361 Peak	VERTICAL
2	5790.48	111.75			101.93	6.84	34.12	31.14	252	361 Average	VERTICAL
3	5790.48	121.94			112.12	6.84	34.12	31.14	252	361 Peak	VERTICAL
4	5947.08	60.07	68.20	-8.13	50.04	7.05	34.18	31.20	252	361 Peak	VERTICAL

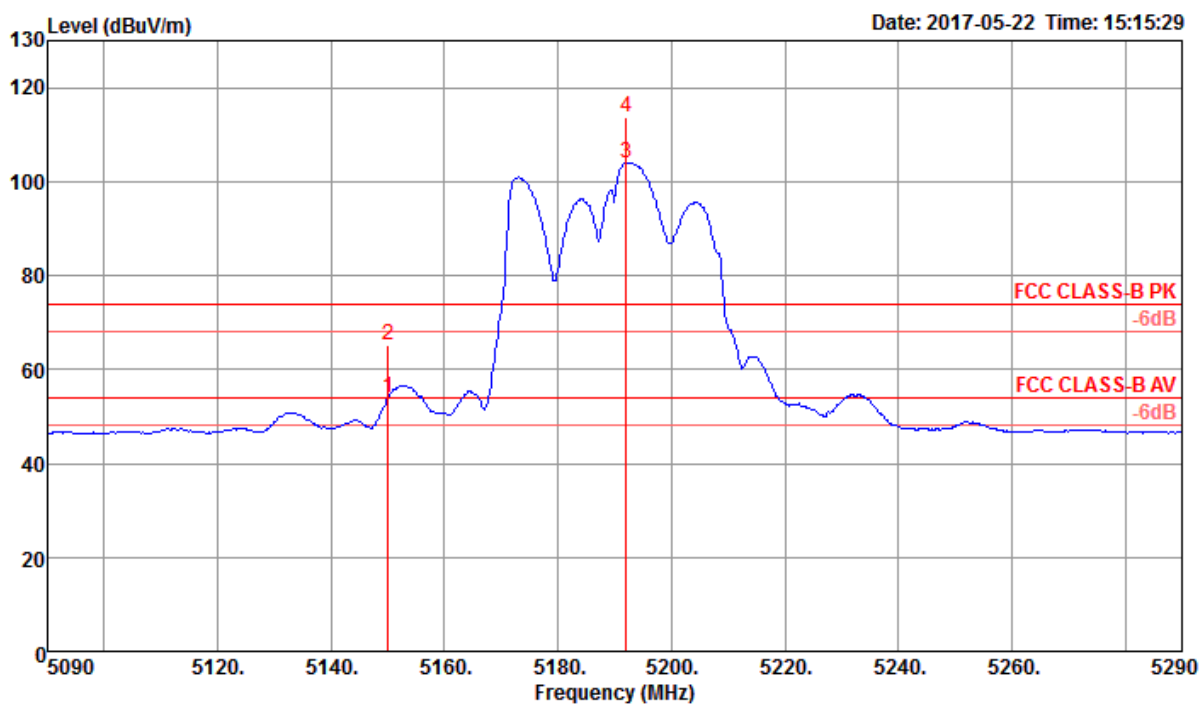
Item 2, 3 are the fundamental frequency at 5785 MHz.

Channel 165


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5620.92	59.43	68.20	-8.77	49.65	6.80	34.05	31.07	266	352 Peak	VERTICAL
2	5829.36	111.94			102.07	6.89	34.13	31.15	266	352 Average	VERTICAL
3 @	5829.36	123.23			113.36	6.89	34.13	31.15	266	352 Peak	VERTICAL
4	5928.72	61.30	68.20	-6.90	51.29	7.03	34.17	31.19	266	352 Peak	VERTICAL

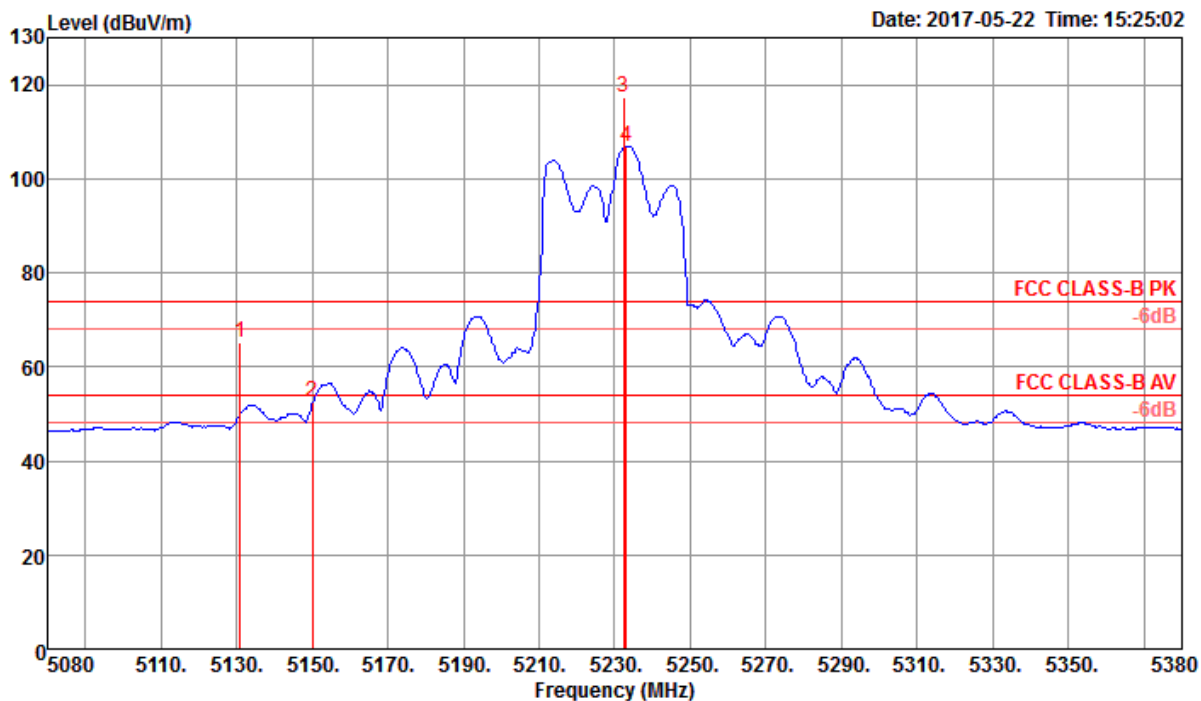
Item 2, 3 are the fundamental frequency at 5825 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Port 1 + Port 2 + Port 3 + Port 4

Channel 38


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5150.00	53.91	54.00	-0.09	44.97	6.48	33.51	31.05	265	270 Average	VERTICAL
2	5150.00	65.04	74.00	-8.96	56.10	6.48	33.51	31.05	265	270 Peak	VERTICAL
3 @	5192.00	103.91			94.85	6.53	33.58	31.05	265	270 Average	VERTICAL
4 @	5192.00	113.66			104.60	6.53	33.58	31.05	265	270 Peak	VERTICAL

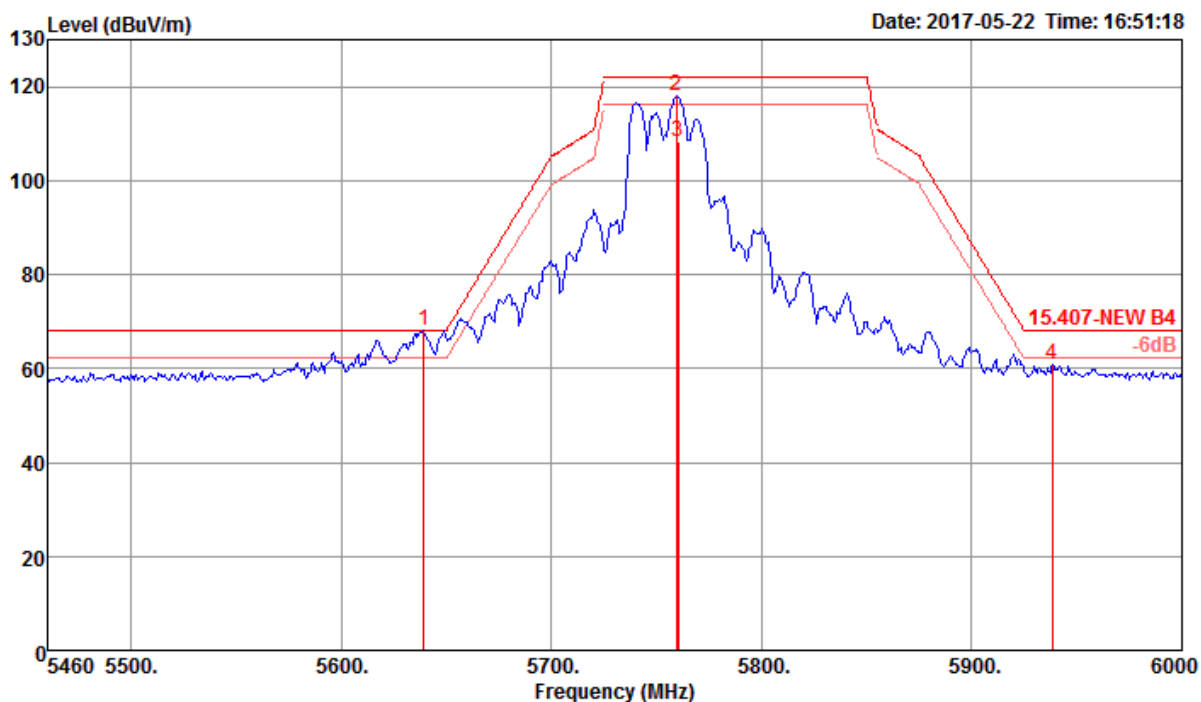
Item 3, 4 are the fundamental frequency at 5190 MHz.

Channel 46


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5131.00	65.23	74.00	-8.77	56.34	6.46	33.49	31.06	274	273	Peak	VERTICAL
2	5150.00	52.40	54.00	-1.60	43.46	6.48	33.51	31.05	274	273	Average	VERTICAL
3 @	5232.40	117.19			108.06	6.55	33.63	31.05	274	273	Peak	VERTICAL
4 @	5233.00	106.84			97.71	6.55	33.63	31.05	274	273	Average	VERTICAL

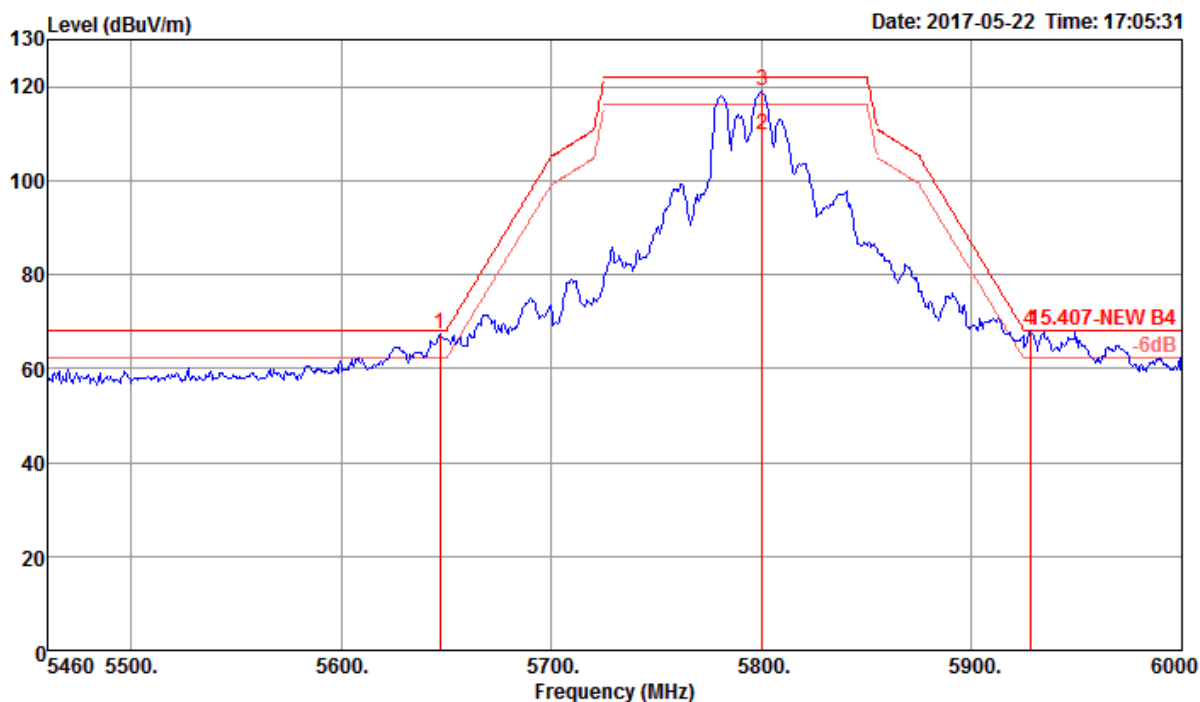
Item 3, 4 are the fundamental frequency at 5230 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Port 1 + Port 2 + Port 3 + Port 4

Channel 151


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5639.28	68.16	68.20	-0.04	58.36	6.81	34.06	31.07	252	360 Peak	VERTICAL
2	5759.16	118.22			108.42	6.83	34.10	31.13	252	360 Peak	VERTICAL
3	5760.24	108.17			98.37	6.83	34.10	31.13	252	360 Average	VERTICAL
4	5938.44	60.83	68.20	-7.37	50.82	7.03	34.17	31.19	252	360 Peak	VERTICAL

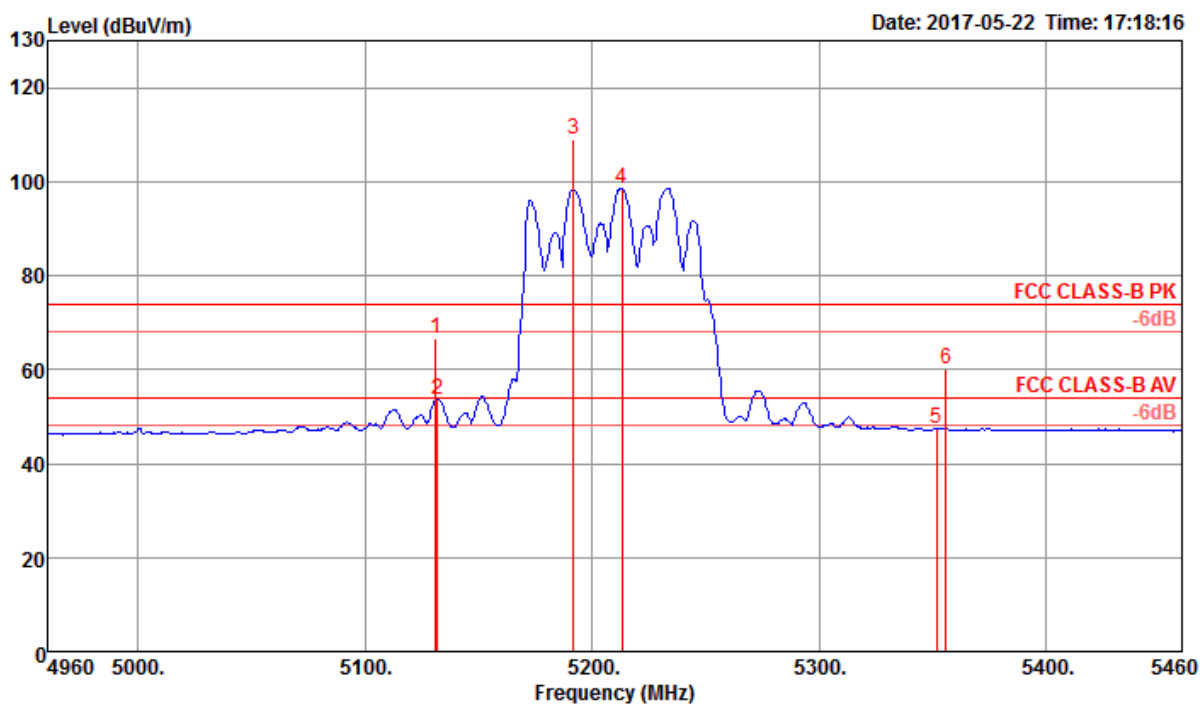
Item 2, 3 are the fundamental frequency at 5755 MHz.

Channel 159


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5646.84	67.24	68.20	-0.96	57.45	6.81	34.06	31.08	270	360 Peak	VERTICAL
2	5800.20	109.58			99.76	6.84	34.12	31.14	270	360 Average	VERTICAL
3	5800.20	118.96			109.14	6.84	34.12	31.14	270	360 Peak	VERTICAL
4	5927.64	68.17	68.20	-0.03	58.16	7.03	34.17	31.19	270	360 Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5795 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Port 1 + Port 2 + Port 3 + Port 4

Channel 42


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5131.00	66.45	74.00	-7.55	57.56	6.46	33.49	31.06	251	274 Peak	VERTICAL
2	5132.00	53.68	54.00	-0.32	44.79	6.46	33.49	31.06	251	274 Average	VERTICAL
3 @	5192.00	108.94			99.88	6.53	33.58	31.05	251	274 Peak	VERTICAL
4 @	5213.00	98.60			89.51	6.54	33.60	31.05	251	274 Average	VERTICAL
5	5352.00	47.47	54.00	-6.53	38.14	6.58	33.79	31.04	251	274 Average	VERTICAL
6	5356.00	59.95	74.00	-14.05	50.60	6.59	33.79	31.03	251	274 Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5210 MHz.



Level (dBuV/m)

Date: 2017-05-22 Time: 18:27:23

130

120

100

80

60

40

20

0

5460 5500 5600 5700 5800 5900 6000

Frequency (MHz)

1

2

3

4

15.407-MHz B4

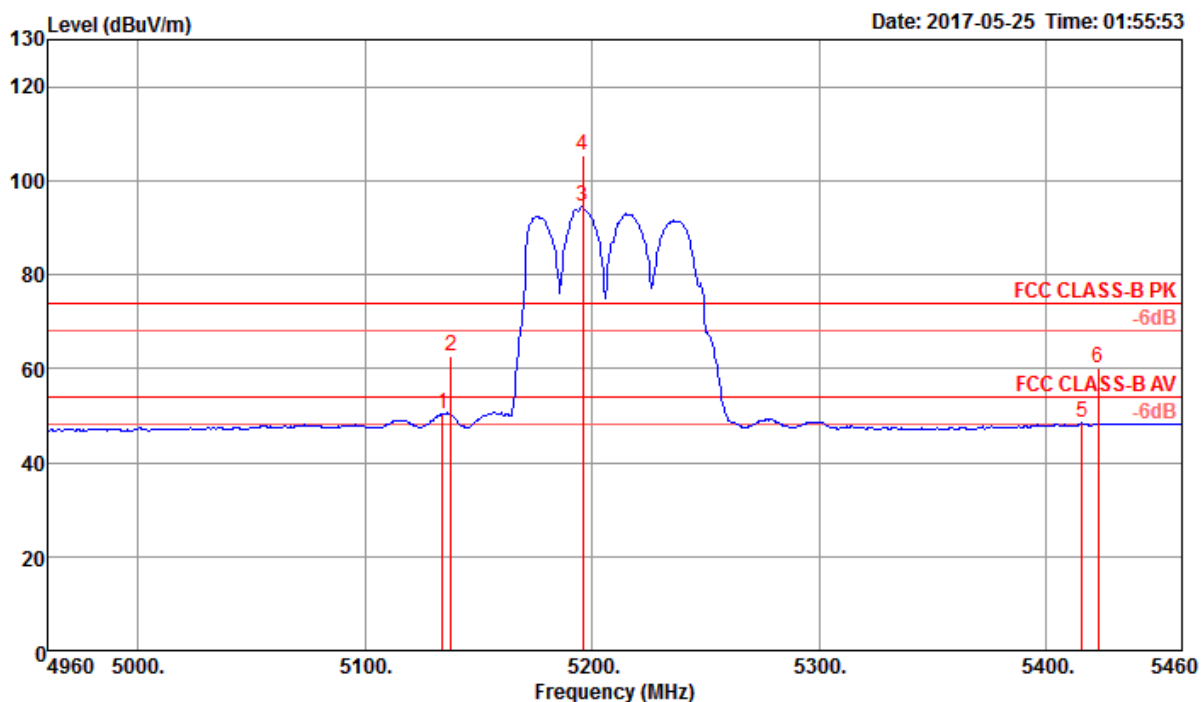
-6dB

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5637.12	66.97	68.20	-1.23	57.17	6.81	34.06	31.07	260	359	Peak	VERTICAL
2	5799.12	101.30			91.48	6.84	34.12	31.14	260	359	Average	VERTICAL
3	5800.20	111.08			101.26	6.84	34.12	31.14	260	359	Peak	VERTICAL
4	5940.60	62.89	68.20	-5.31	52.87	7.03	34.18	31.19	260	359	Peak	VERTICAL

TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB Ver1.0

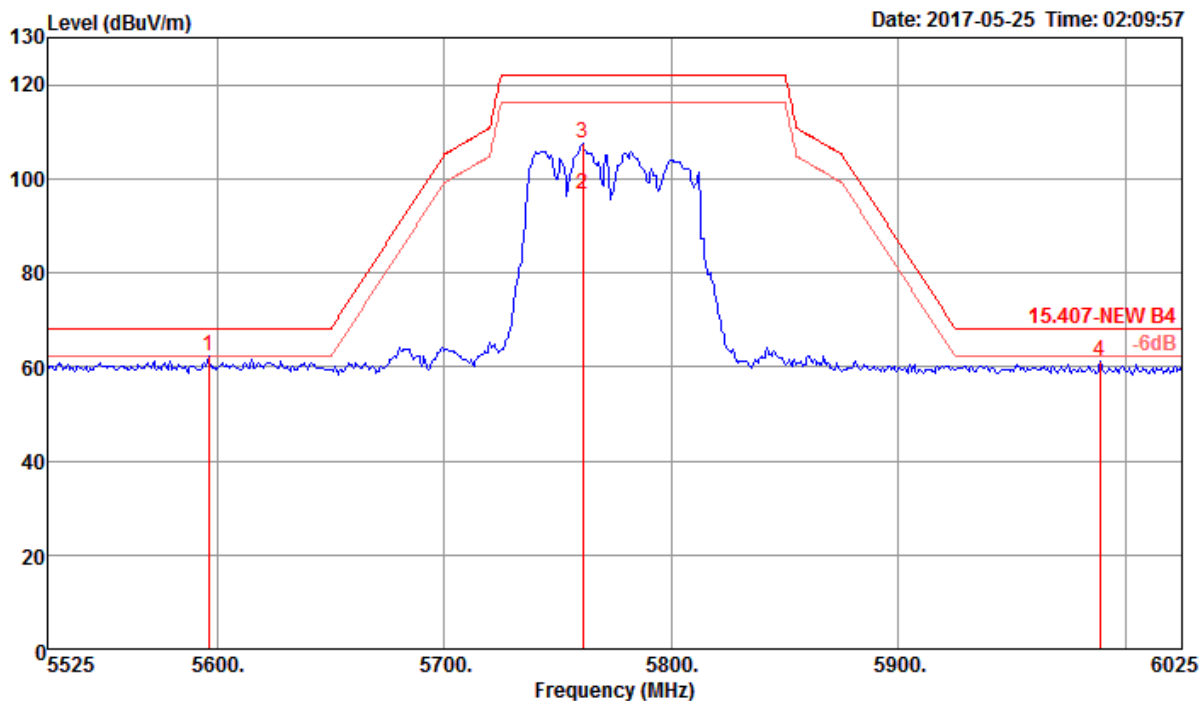
802.11ac MCS0/Nss2 VHT80+80

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss2 VHT80+80 Type 1 / CH 42+155 / Port 1 + Port 2 + Port 3 + Port 4

Channel 42


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5134.00	50.46	54.00	-3.54	41.47	6.46	33.59	31.06	297	60	Average	VERTICAL
2	5138.00	62.83	74.00	-11.17	53.84	6.46	33.59	31.06	297	60	Peak	VERTICAL
3 @	5196.00	94.48			85.32	6.53	33.68	31.05	297	60	Average	VERTICAL
4 @	5196.00	105.28			96.12	6.53	33.68	31.05	297	60	Peak	VERTICAL
5	5416.00	48.37	54.00	-5.63	38.81	6.62	33.97	31.03	297	60	Average	VERTICAL
6	5423.00	60.15	74.00	-13.85	50.56	6.63	33.99	31.03	297	60	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5210 MHz.

Channel 155


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5596.00	62.18	68.20	-6.02	52.30	6.80	34.14	31.06	252	352	Peak	VERTICAL
2	5761.00	96.57			86.66	6.83	34.21	31.13	252	352	Average	VERTICAL
3	5761.00	107.54			97.63	6.83	34.21	31.13	252	352	Peak	VERTICAL
4	5989.00	61.13	68.20	-7.07	50.95	7.10	34.29	31.21	252	352	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5775 MHz.

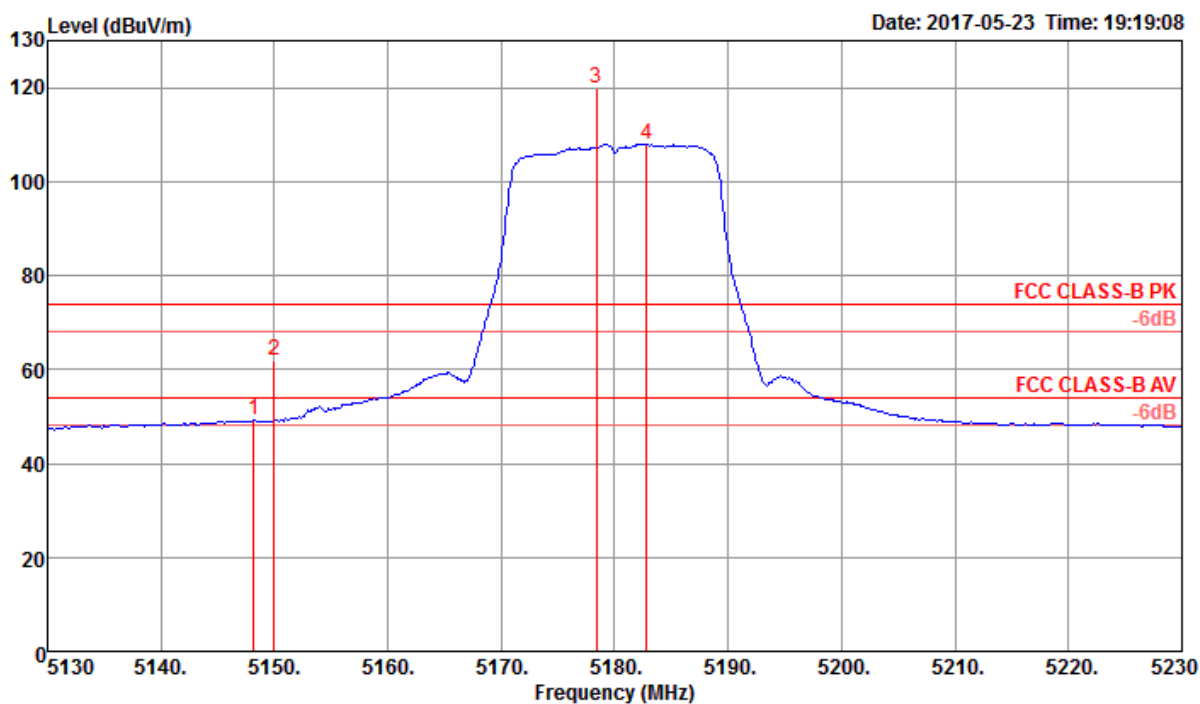
Note:

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

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

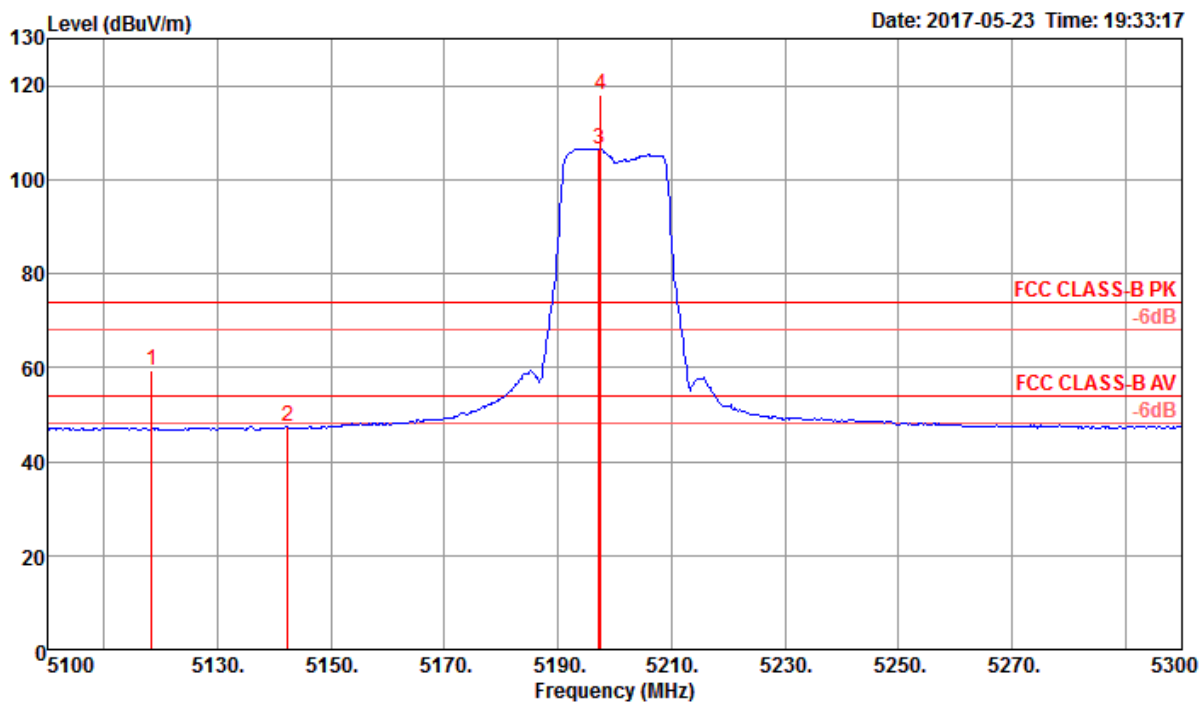
For beamforming mode

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Port 1 + Port 2 + Port 3 + Port 4

Channel 36


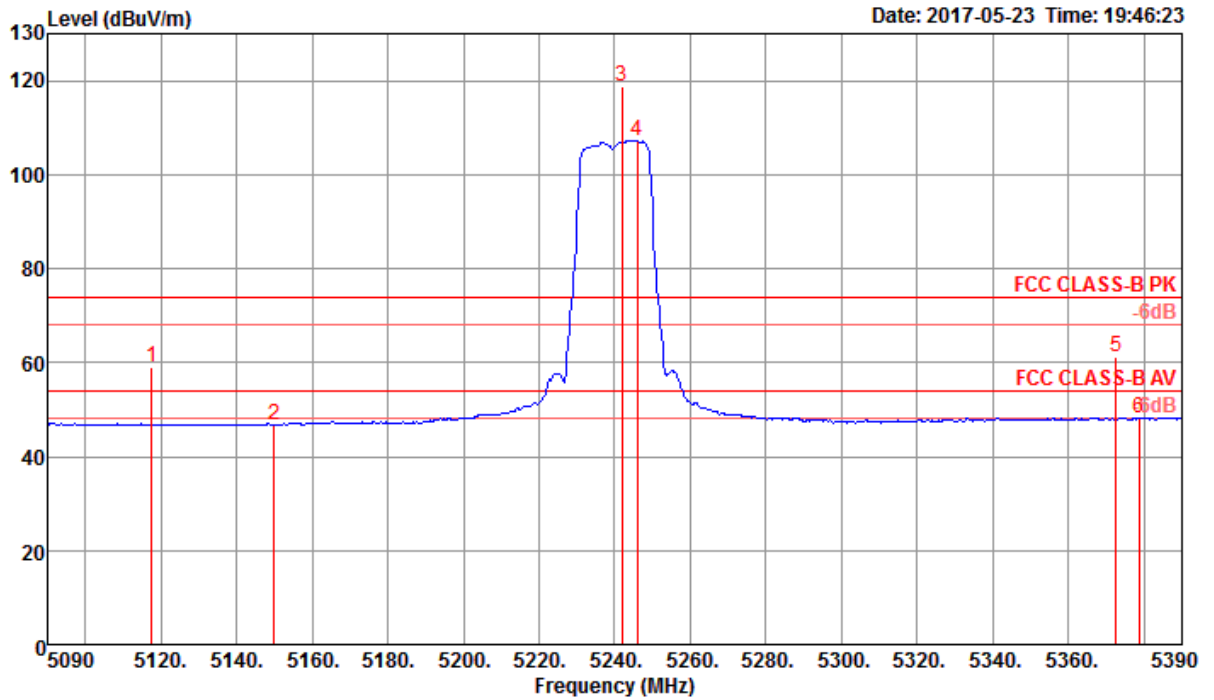
	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.20	49.13	54.00	-4.87	40.19	6.48	33.51	31.05	238	347	Average	VERTICAL
2	5150.00	61.82	74.00	-12.18	52.88	6.48	33.51	31.05	238	347	Peak	VERTICAL
3 @	5178.40	120.03			111.01	6.51	33.56	31.05	238	347	Peak	VERTICAL
4 @	5182.80	108.06			99.04	6.51	33.56	31.05	238	347	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5180 MHz.

Channel 40


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5118.40	59.53	74.00	-14.47	50.69	6.44	33.46	31.06	252	269	Peak	VERTICAL
2	5142.40	47.38	54.00	-6.62	38.44	6.48	33.51	31.05	252	269	Average	VERTICAL
3 @	5197.20	106.62			97.56	6.53	33.58	31.05	252	269	Average	VERTICAL
4 @	5197.60	118.00			108.94	6.53	33.58	31.05	252	269	Peak	VERTICAL

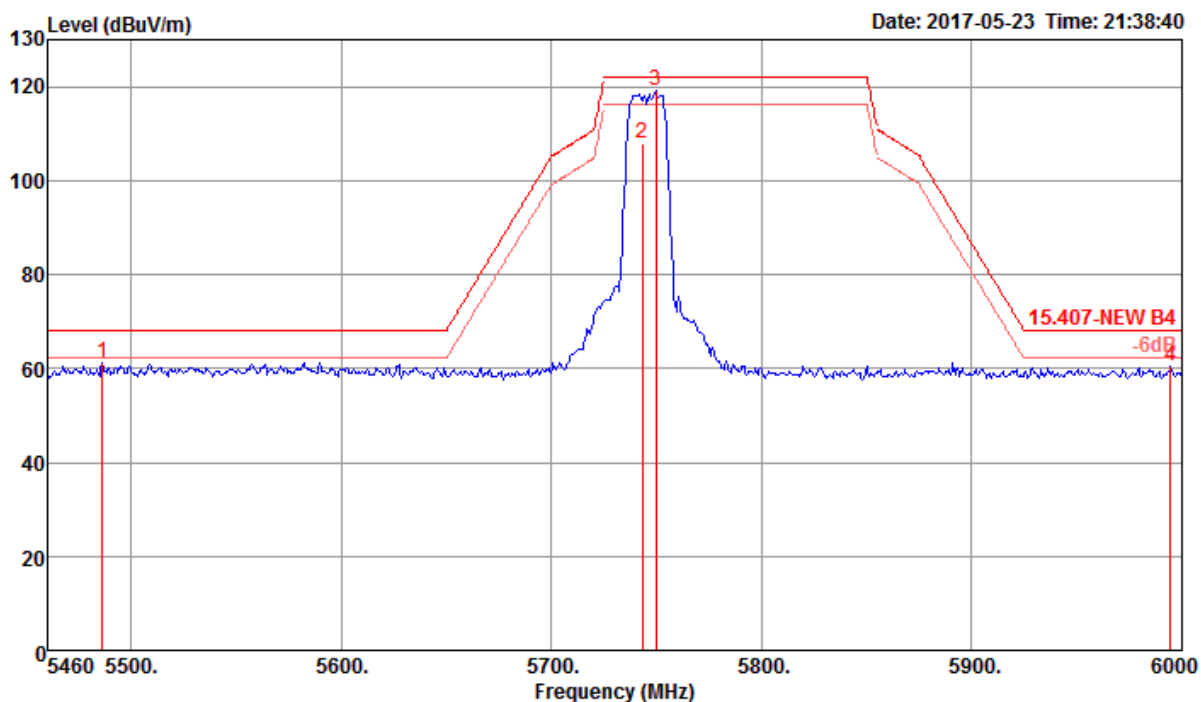
Item 3, 4 are the fundamental frequency at 5200 MHz.

Channel 48


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5117.60	58.95	74.00	-15.05	50.11	6.44	33.46	31.06	253	276	Peak	VERTICAL
2	5150.00	46.68	54.00	-7.32	37.74	6.48	33.51	31.05	253	276	Average	VERTICAL
3 @	5241.80	118.81			109.66	6.55	33.65	31.05	253	276	Peak	VERTICAL
4 @	5246.00	107.06			97.91	6.55	33.65	31.05	253	276	Average	VERTICAL
5	5372.60	61.38	74.00	-12.62	52.01	6.59	33.81	31.03	253	276	Peak	VERTICAL
6	5378.60	48.25	54.00	-5.75	38.85	6.59	33.84	31.03	253	276	Average	VERTICAL

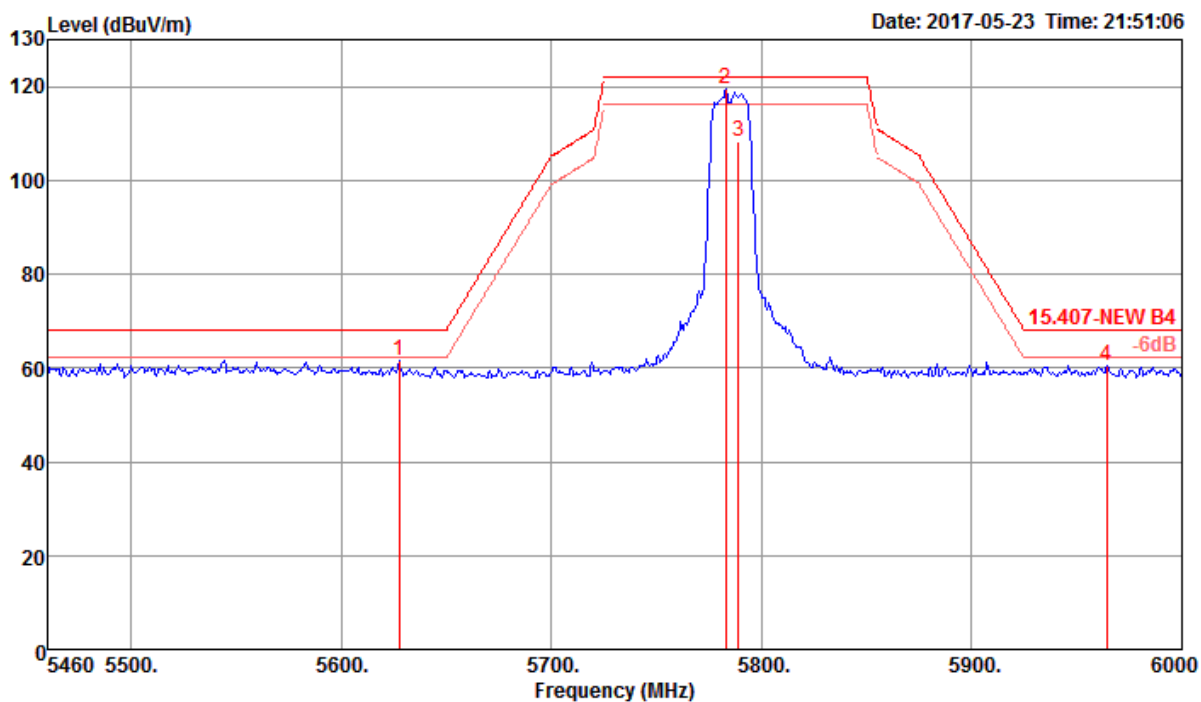
Item 3, 4 are the fundamental frequency at 5240 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Port 1 + Port 2 + Port 3 + Port 4

Channel 149


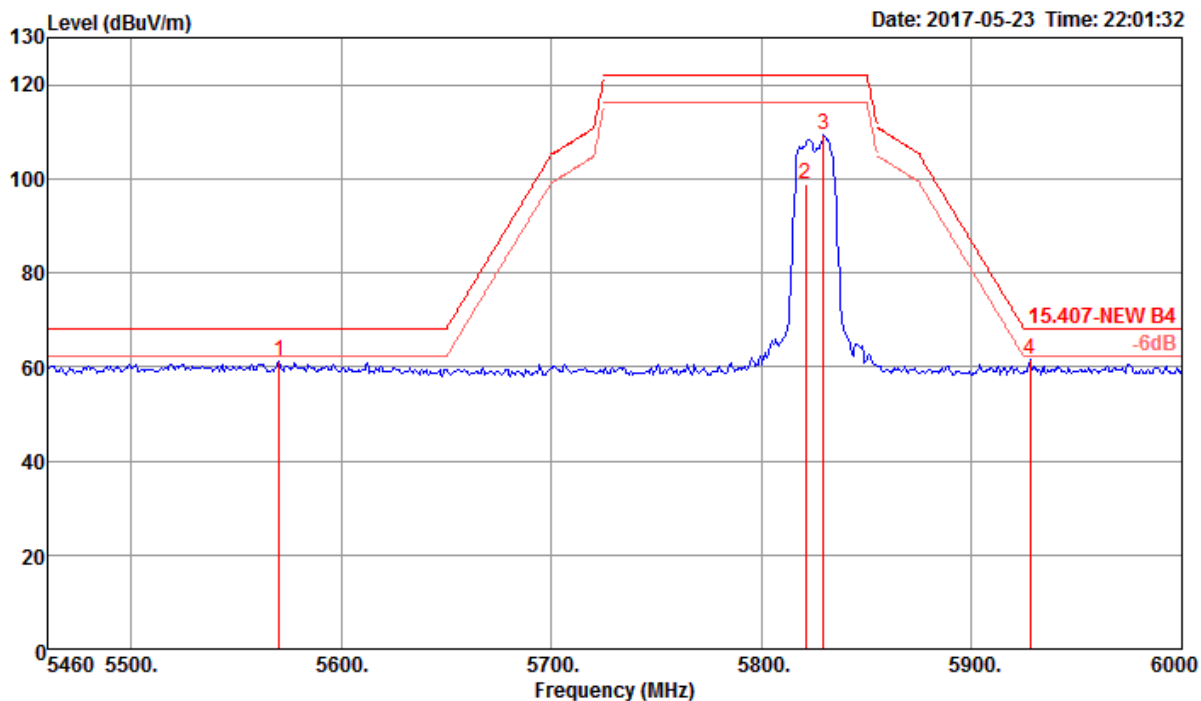
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5485.92	61.38	68.20	-6.82	51.73	6.69	33.98	31.02	278	353 Peak	VERTICAL
2	5742.96	107.81			98.00	6.83	34.10	31.12	278	353 Average	VERTICAL
3	5749.44	119.03			109.22	6.83	34.10	31.12	278	353 Peak	VERTICAL
4	5994.60	60.32	68.20	-7.88	50.22	7.12	34.20	31.22	278	353 Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5745 MHz.

Channel 157


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5627.40	61.68	68.20	-6.52	51.89	6.81	34.05	31.07	287	352 Peak	VERTICAL
2	5782.92	119.60			109.78	6.84	34.11	31.13	287	352 Peak	VERTICAL
3	5788.92	108.14			98.32	6.84	34.12	31.14	287	352 Average	VERTICAL
4	5964.36	60.58	68.20	-7.62	50.53	7.07	34.19	31.21	287	352 Peak	VERTICAL

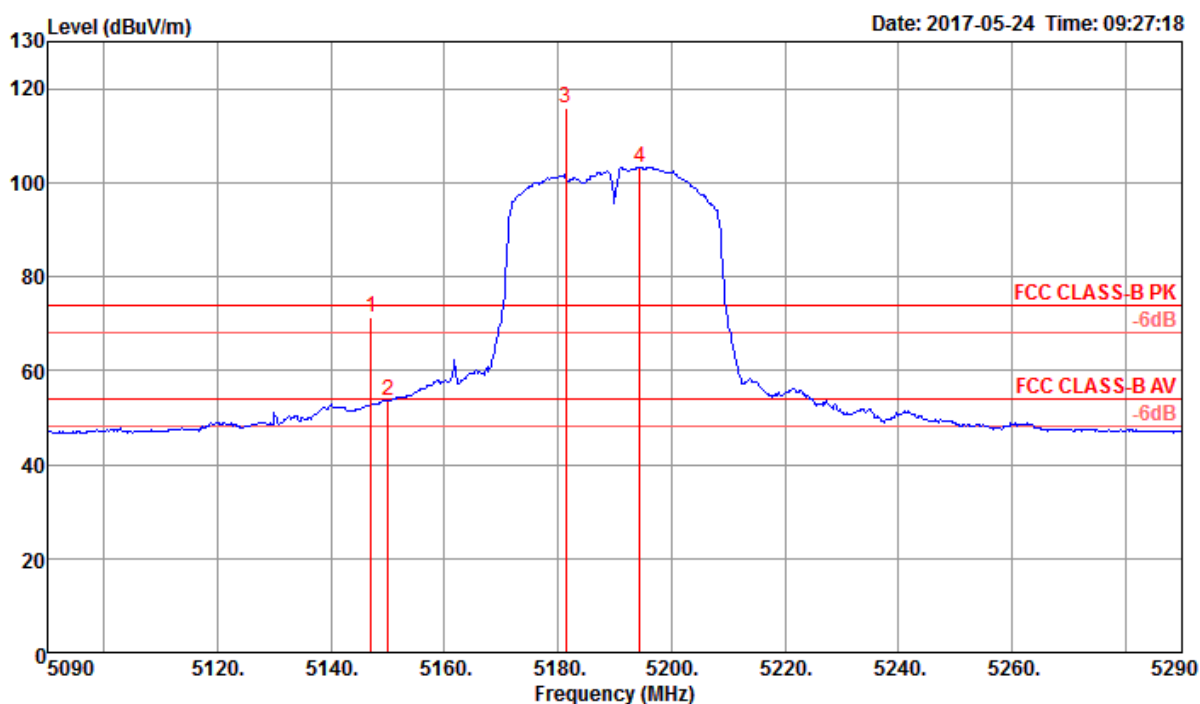
Item 2, 3 are the fundamental frequency at 5785 MHz.

Channel 165


	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5570.16	61.32	68.20	-6.88	51.57	6.77	34.03	31.05	288	200 Peak	HORIZONTAL
2	5821.00	98.72			88.88	6.86	34.13	31.15	288	200 Average	HORIZONTAL
3	5829.36	109.34			99.47	6.89	34.13	31.15	288	200 Peak	HORIZONTAL
4	5927.64	61.53	68.20	-6.67	51.52	7.03	34.17	31.19	288	200 Peak	HORIZONTAL

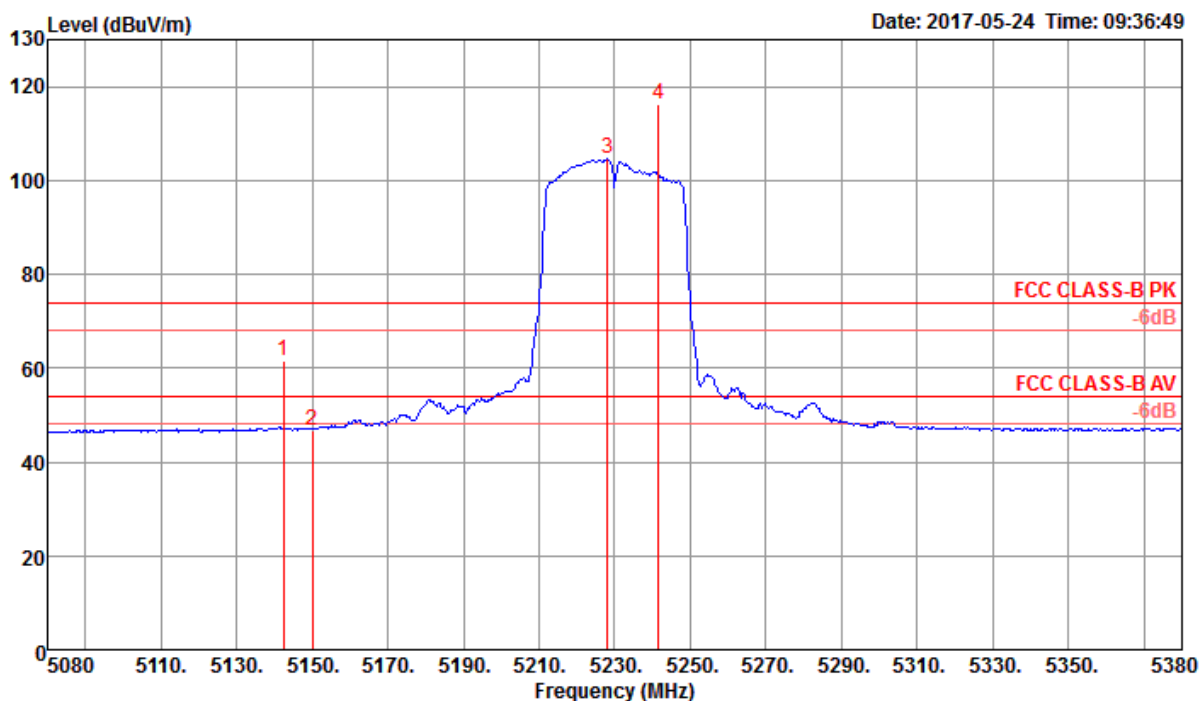
Item 2, 3 are the fundamental frequency at 5825 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Port 1 + Port 2 + Port 3 + Port 4

Channel 38


	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5147.05	71.49	74.00	-2.51	62.45	6.48	33.61	31.05	244	267 Peak	VERTICAL
2	5150.00	53.71	54.00	-0.29	44.67	6.48	33.61	31.05	244	267 Average	VERTICAL
3 @	5181.35	115.71			106.60	6.51	33.65	31.05	244	267 Peak	VERTICAL
4 @	5194.40	103.32			94.16	6.53	33.68	31.05	244	267 Average	VERTICAL

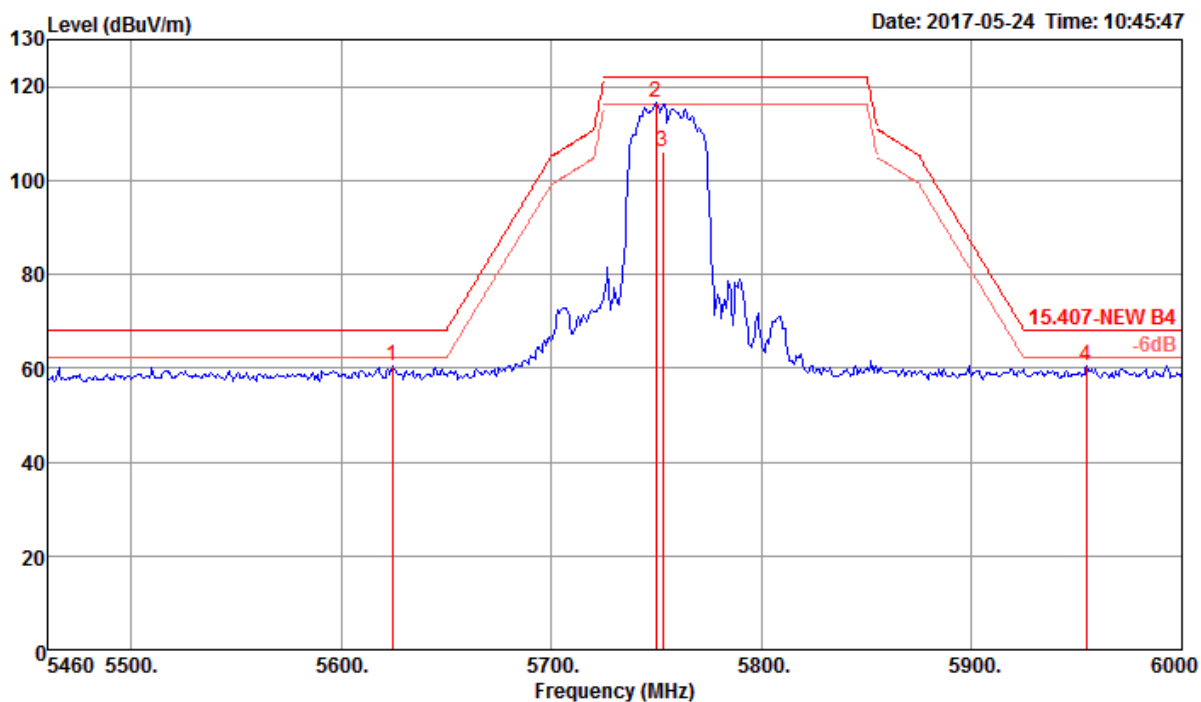
Item 3, 4 are the fundamental frequency at 5190 MHz.

Channel 46


	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5142.50	61.72	74.00	-12.28	52.68	6.48	33.61	31.05	262	270 Peak	VERTICAL
2	5150.00	46.89	54.00	-7.11	37.85	6.48	33.61	31.05	262	270 Average	VERTICAL
3 @	5228.08	104.50			95.29	6.54	33.72	31.05	262	270 Average	VERTICAL
4 @	5241.54	116.25			107.01	6.55	33.74	31.05	262	270 Peak	VERTICAL

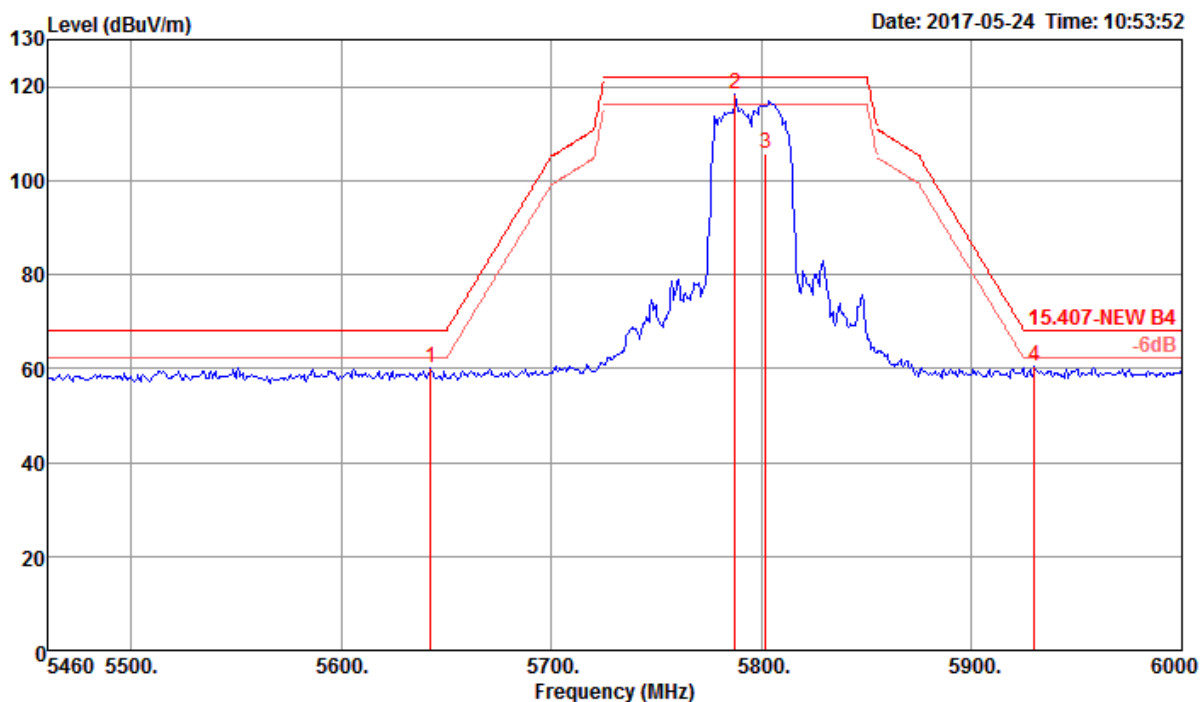
Item 3, 4 are the fundamental frequency at 5230 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Port 1 + Port 2 + Port 3 + Port 4

Channel 151


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5624.16	60.29	68.20	-7.91	50.40	6.81	34.15	31.07	299	360 Peak	VERTICAL
2	5749.44	116.48			106.57	6.83	34.20	31.12	299	360 Peak	VERTICAL
3	5752.76	106.06			96.15	6.83	34.20	31.12	299	360 Average	VERTICAL
4	5954.64	60.61	68.20	-7.59	50.48	7.05	34.28	31.20	299	360 Peak	VERTICAL

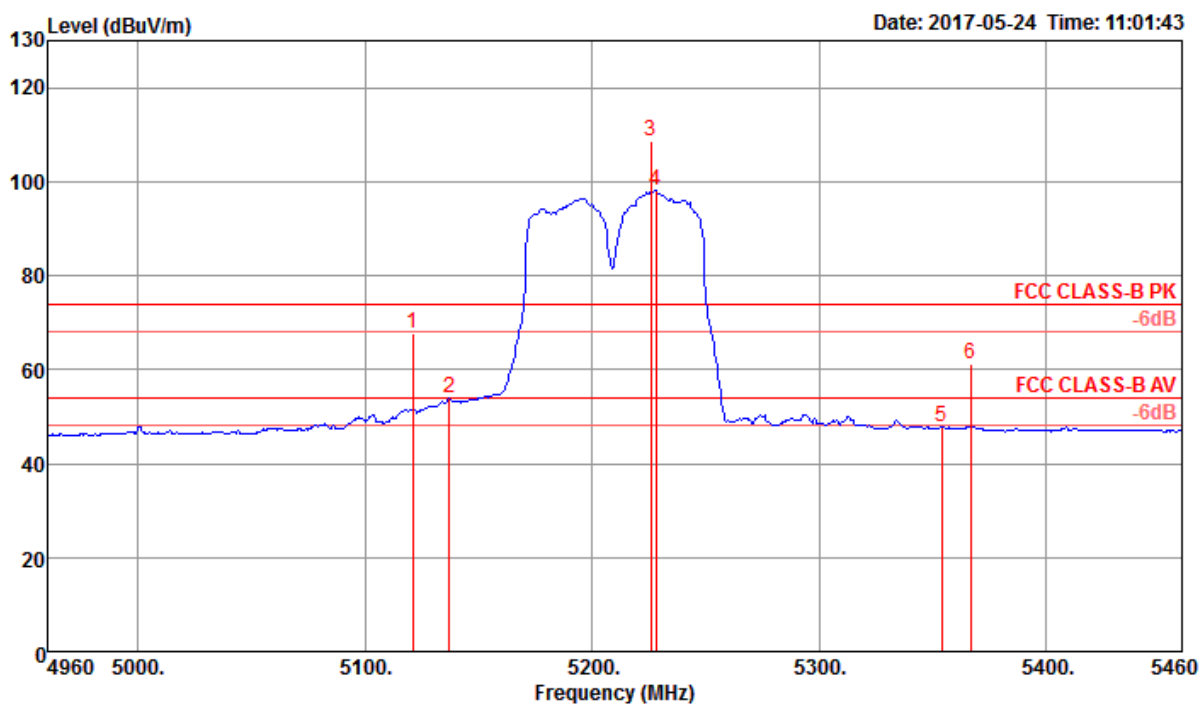
Item 2, 3 are the fundamental frequency at 5755 MHz.

Channel 159


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5642.52	60.25	68.20	-7.95	50.36	6.81	34.16	31.08	247	352 Peak	VERTICAL
2	5787.24	118.25			108.33	6.84	34.21	31.13	247	352 Peak	VERTICAL
3	5801.80	105.83			95.91	6.84	34.22	31.14	247	352 Average	VERTICAL
4	5929.80	60.37	68.20	-7.83	50.26	7.03	34.27	31.19	247	352 Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5795 MHz.

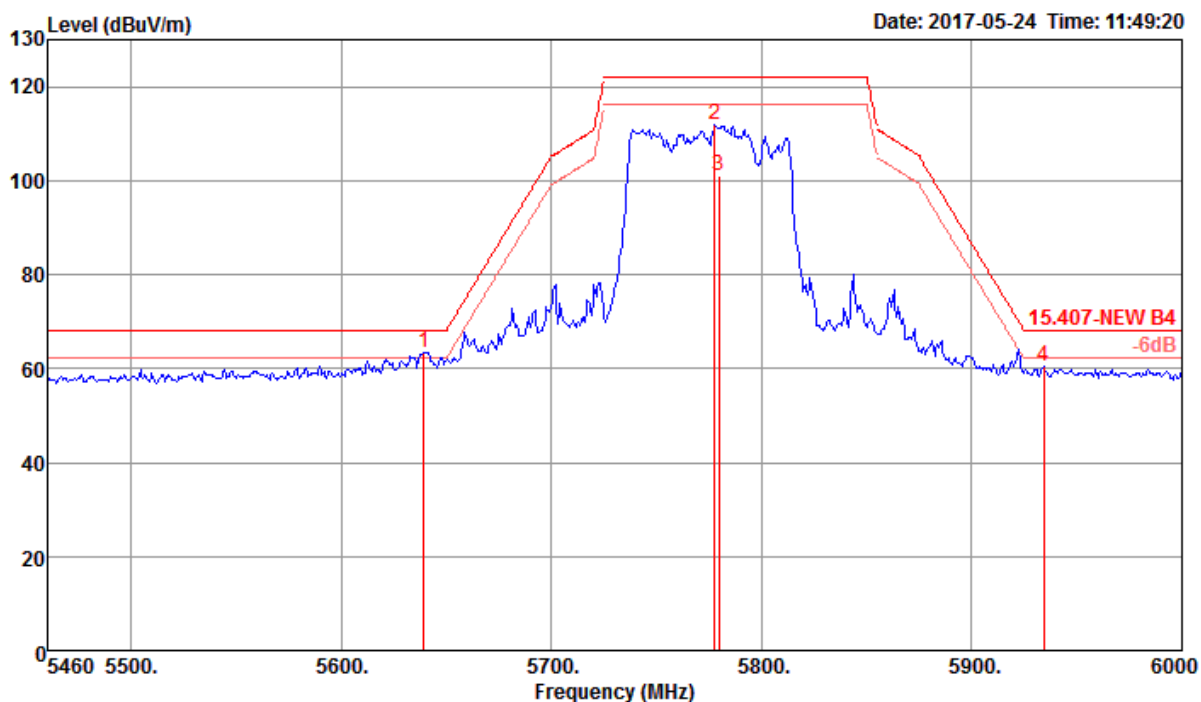
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Port 1 + Port 2 + Port 3 + Port 4

Channel 42


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5121.00	67.74	74.00	-6.26	58.79	6.44	33.57	31.06	252	265 Peak	VERTICAL
2	5137.00	53.79	54.00	-0.21	44.80	6.46	33.59	31.06	252	265 Average	VERTICAL
3 @	5226.00	108.78			99.57	6.54	33.72	31.05	252	265 Peak	VERTICAL
4 @	5228.00	98.10			88.89	6.54	33.72	31.05	252	265 Average	VERTICAL
5	5354.00	47.96	54.00	-6.04	38.53	6.58	33.89	31.04	252	265 Average	VERTICAL
6	5367.00	61.33	74.00	-12.67	51.86	6.59	33.91	31.03	252	265 Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5210 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Port 1 + Port 2 + Port 3 + Port 4

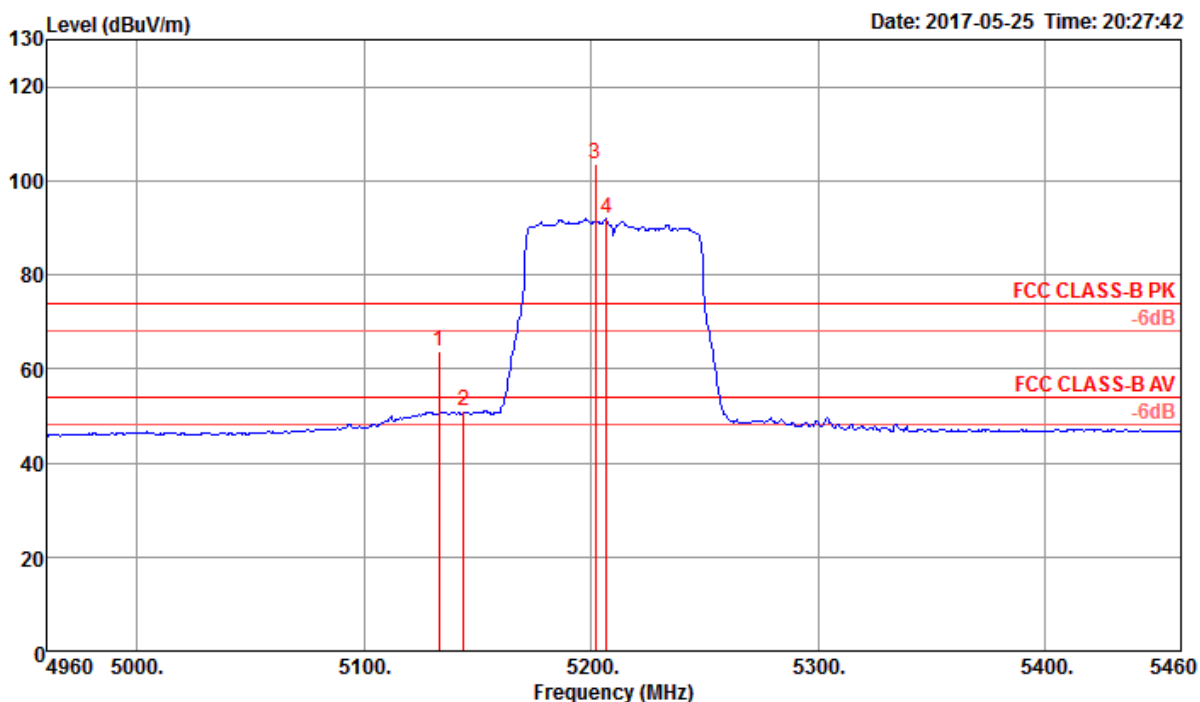
Channel 155


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5639.28	63.41	68.20	-4.79	53.52	6.81	34.15	31.07	299	53 Peak	VERTICAL
2	5777.52	111.97			102.05	6.84	34.21	31.13	299	53 Peak	VERTICAL
3	5779.68	101.01			91.09	6.84	34.21	31.13	299	53 Average	VERTICAL
4	5934.12	60.60	68.20	-7.60	50.49	7.03	34.27	31.19	299	53 Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5775 MHz.

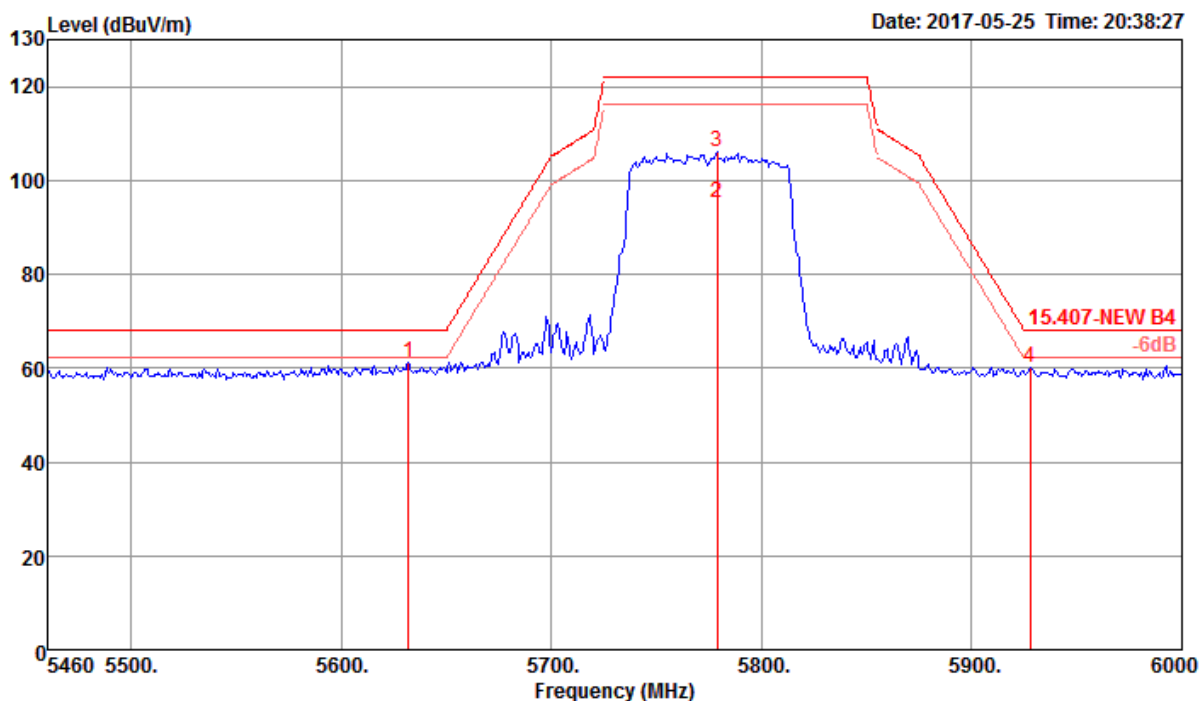
802.11ac MCS0/Nss2 VHT80+80

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss2 VHT80+80 Type 1 / CH 42+155 / Port 1 + Port 2 + Port 3 + Port 4

Channel 42


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5133.00	63.61	74.00	-10.39	54.62	6.46	33.59	31.06	247	31 Peak	VERTICAL
2	5144.00	51.01	54.00	-2.99	41.97	6.48	33.61	31.05	247	31 Average	VERTICAL
3 @	5202.00	103.61			94.42	6.54	33.70	31.05	247	31 Peak	VERTICAL
4 @	5207.00	92.12			82.93	6.54	33.70	31.05	247	31 Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5210 MHz.

Channel 155


	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5631.72	61.21	68.20	-6.99	51.32	6.81	34.15	31.07	261	354 Peak	VERTICAL
2	5778.60	95.16			85.24	6.84	34.21	31.13	261	354 Average	VERTICAL
3	5778.60	106.01			96.09	6.84	34.21	31.13	261	354 Peak	VERTICAL
4	5927.64	59.94	68.20	-8.26	49.83	7.03	34.27	31.19	261	354 Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5775 MHz.

Note:

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

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

2.8. Antenna Requirements

2.8.1. 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.

2.8.2. Antenna Connector Construction

The antenna connector complied with the requirements.

3. List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 28, 2019	Jan. 27, 2020	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz~100MHz	Dec. 24, 2018	Dec. 23, 2019	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Jan. 11, 2019	Jan. 10, 2020	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 21, 2019	May 20, 2020	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	Oct. 30, 2018	Oct. 29, 2019	Radiation (03CH03-HY)
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	Apr. 22, 2019	Apr. 21, 2020	Radiation (03CH03-HY)
Signal Analyzer	R&S	FSP40	100593	9kHz ~ 40GHz	Dec. 27, 2018	Dec. 26, 2019	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Mar. 22, 2019	Mar. 21, 2020	Radiation (03CH03-HY)
Bilog Antenna with 5dB Pad	ETS	3142B & MTJ6102-05	00022055	26 MHz - 3 GHz	Nov. 19, 2018	Nov. 18, 2019	Radiation (03CH03-HY)
EMI Test Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	Apr. 09, 2019	Apr. 08, 2020	Radiation (03CH03-HY)
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	Mar. 15, 2019	Mar. 14, 2020	Radiation (03CH03HY)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 10, 2016	Nov. 09, 2017	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 25, 2016	Jul. 26, 2017	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 16, 2017	Jan. 15, 2018	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jun. 28, 2016	Jun. 27, 2017	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 22, 2016	Nov. 21, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Test Software	Audix	E3	6.2009-I0-7	N/A	N/A	N/A	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1291	1GHz~18GHz	Oct. 12, 2018	Oct. 11, 2019	Radiation (03CH05-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC12630SE	980287	1GHz – 26.5GHz	Mar. 28, 2019	Mar. 27, 2020	Radiation (03CH05-CB)
Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 04, 2018	Jul. 03, 2019	Radiation (03CH05-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Jan. 31, 2019	Jan. 30, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-04	1GHz~18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-04+23	30MHz~18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH05-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Dec. 08, 2016	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 03, 2016	Jun. 02, 2017	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Nov. 01, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Nov. 01, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Nov. 01, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Nov. 01, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Nov. 01, 2016	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Nov. 01, 2016	Conducted (TH01-CB)

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

N.C.R. means Non-Calibration required.

4. Measurement Uncertainty

For CO01-CB, 03CH03-HY and 03CH05-CB

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%

For TH01-CB and 03CH01-CB

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%

Appendix B. Maximum e.i.r.p. at any elevation angle above 30 degrees

1. Maximum e.i.r.p. at any elevation angle above 30 degrees

Mode	Frequency	Modulation	Channel	Data Rate	Conducted Pass Setting	Chain1 (dBm)	Chain2 (dBm)	Chain3 (dBm)	Chain4 (dBm)	Total (dBm)	Elevation angle above 30° Max gain (dBi)	Elevation angle above 30° Max EIRP (dBm)	EIRP Power Limit (dBm)
Non BF	5180MHz	OFDM	Ch36	6Mbps	6.5	8.86	8.72	9.02	8.99	14.92	6.000	20.92	21
	5200MHz	OFDM	Ch40	6Mbps	6.5	8.9	8.86	9.09	9	14.98	6.000	20.98	21
	5240MHz	OFDM	Ch48	6Mbps	6.5	8.71	8.66	8.81	9.02	14.82	6.000	20.82	21
	5180MHz	VHT20	Ch36	MCS0-Nss1	6.5	8.76	8.82	8.64	8.71	14.75	6.000	20.75	21
	5200MHz	VHT20	Ch40	MCS0-Nss1	6.5	8.78	8.83	8.53	8.61	14.71	6.000	20.71	21
	5240MHz	VHT20	Ch48	MCS0-Nss1	6.5	8.82	8.53	8.69	8.88	14.75	6.000	20.75	21
	5190MHz	VHT40	Ch38	MCS0-Nss1	6.5	8.84	8.56	8.76	8.78	14.76	6.000	20.76	21
	5230MHz	VHT40	Ch46	MCS0-Nss1	6.5	8.64	8.63	8.91	8.85	14.78	6.000	20.78	21
	5210MHz	VHT80	Ch42	MCS0-Nss1	6.5	8.64	8.67	8.89	8.76	14.76	6.000	20.76	21
BF	5180MHz	VHT20	Ch36	MCS0-Nss1	7	2.53	2.61	2.72	2.66	8.65	12.021	20.67	21
	5200MHz	VHT20	Ch40	MCS0-Nss1	7	2.45	2.64	2.55	2.69	8.60	12.021	20.62	21
	5240MHz	VHT20	Ch48	MCS0-Nss1	7	2.58	2.68	2.75	2.52	8.65	12.021	20.67	21
	5190MHz	VHT40	Ch38	MCS0-Nss1	7.5	1.96	2.23	2.09	2.37	8.19	12.021	20.21	21
	5230MHz	VHT40	Ch46	MCS0-Nss1	7.5	2.68	2.41	2.52	2.12	8.46	12.021	20.48	21
	5210MHz	VHT80	Ch42	MCS0-Nss1	7.5	2.09	2.62	2.21	2.29	8.33	12.021	20.35	21
Test Result													Complies

Note: BF: Beamforming

————THE END————