FCC 47 CFR PART 15 SUBPART E
INDUSTRY CANADA RSS-247 ISSUE 1

CERTIFICATION TEST REPORT

FOR

PORTABLE COMPUTER

MODEL NUMBER: A1708

FCC ID: BCGA1708
IC: 579C-A1708

REPORT NUMBER: 16U23796-E4V2

ISSUE DATE: OCTOBER 06, 2016

Prepared for
APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	09/22/2016	Initial Issue	Chin Pang
V2	10/06/2016	Addressed TCB's questions	Chin Pang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: PORTABLE COMPUTER

MODEL: A1708

SERIAL NUMBER: C02RV00WH9FM (CONDUCTED),
C02RT00HH4RK (RADIATED/DFS)

DATE TESTED: JUNE 29, - AUGUST 17, 2016

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Pass
INDUSTRY CANADA RSS-247 Issue 1	Pass
INDUSTRY CANADA RSS-GEN Issue 4	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:

CHIN PANG
SENIOR ENGINEER
UL VERIFICATION SERVICES INC.

Prepared By:

JOE VANG
EMC WISE ENGINEER
UL VERIFICATION SERVICES INC.

2. TEST METHODOLOGY

FCC: The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 14-30, FCC KDB 662911 D01 v02r01, FCC KDB 905462 D02 v02/D03 v01r01/D06 v02/ D07 v01r01, FCC KDB 789033 D02 v01r03, FCC KDB 644545 D03 v01, ANSI C63.10-2013.

IC: The tests documented in this report were performed in accordance with FCC KDB 789033 D02 v01r03, FCC KDB 905462 D02 v02/D03 v01r01, ANSI C63.10-2013, RSS-GEN Issue 4, and RSS-247 Issue 1

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☐ Chamber A	☒ Chamber D
☐ Chamber B	☒ Chamber E
☐ Chamber C	☒ Chamber F
	☒ Chamber G
	☒ Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/2000650.htm.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Radiated Disturbance,1000 to 18000 MHz	4.32 dB
Radiated Disturbance,18000 to 26000 MHz	4.45 dB
Radiated Disturbance,26000 to 40000 MHz	5.24 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Laptop Device with Bluetooth and WLAN Radios (AC 80 MHZ Beam-Forming).

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum average conducted output power as follows:

5.2GHz Band FCC

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5180 - 5240	802.11a	Covered by 802.11n HT20 SISO	
	802.11n HT20 SISO	13.74	23.66
	802.11n HT20 CDD 2TX	14.92	31.05
	802.11n HT20 2TX STBC	16.72	46.67
	802.11n VHT20 BF 2TX	14.95	31.26
5190 - 5230	802.11n HT40 SISO	13.70	23.44
	802.11n HT40 CDD 2TX	16.66	46.34
	802.11n HT40 2TX STBC	16.66	46.34
	802.11n VHT40 BF 2TX	16.70	46.77
5210	802.11ac VHT80 SISO	12.46	17.62
	802.11ac VHT80 2TX CDD	10.84	12.13
	802.11ac VHT80 2TX STBC	11.91	15.52
	802.11ac VHT80 2TX BF	9.43	8.77

5.2GHz Band IC

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5180 - 5240	802.11a	Covered by 802.11n HT20 SISO	
	802.11n HT20 SISO	10.87	12.22
	802.11n HT20 CDD 2TX	7.92	6.19
	802.11n HT20 2TX STBC	10.92	12.36
	802.11n HT20 2TX BF	7.96	6.25
5190 - 5230	802.11n HT40 SISO	13.41	21.93
	802.11n HT40 CDD 2TX	10.37	10.89
	802.11n HT40 2TX STBC	13.36	21.68
	802.11n HT40 2TX BF	10.47	11.14
5210	802.11ac VHT80 SISO	13.56	22.70
	802.11ac VHT80 2TX CDD	10.93	12.39
	802.11ac VHT80 2TX STBC	11.97	15.74
	802.11ac VHT80 2TX BF	9.45	8.81

5.3GHz Band

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5260 - 5320	802.11a	Covered by 802.11n HT20 SISO	
	802.11n HT20 SISO	12.45	17.58
	802.11n HT20 2TX CDD	14.39	27.48
	802.11n HT20 STBC 2TX	15.42	34.83
	802.11n HT20 2TX BF	14.42	27.67
5270 - 5310	802.11n HT40 SISO	12.44	17.54
	802.11n HT40 2TX CDD	15.41	34.75
	802.11n HT40 2TX STBC	15.34	34.20
	802.11n HT40 2TX BF	15.42	34.83
5290	802.11ac VHT80 SISO	12.40	17.38
	802.11ac VHT80 2TX CDD	11.92	15.56
	802.11ac VHT80 2TX STBC	12.87	19.36
	802.11ac VHT80 2TX BF	10.94	12.42

5.6GHz Band FCC

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5500 - 5700	802.11a	Covered by 802.11n HT20 SISO	
5500 - 5700	802.11n HT20 SISO	12.46	17.62
5720	802.11ac VHT20 SISO (based on UNII-2C band output power)	11.32	13.55
5500 - 5700	802.11n HT20 2TX CDD	15.46	35.16
5720	802.11ac VHT20 2TX CDD (based on UNII-2C band output power)	10.42	11.02
5500 - 5700	802.11n HT20 2TX STBC	15.42	34.83
5720	802.11ac VHT20 2TX STBC (based on UNII-2C band output power)	10.89	12.27
5500 - 5700	802.11n HT20 2TX BF	14.93	31.12
5720	802.11ac VHT20 2TX BF (based on UNII-2C band output power)	10.40	10.96
5510 - 5670	802.11n HT40 SISO	12.42	17.46
5710	802.11ac VHT40 SISO (based on UNII-2C band output power)	12.16	16.44
5510 - 5670	802.11n HT40 2TX CDD	15.40	34.67
5710	802.11ac VHT40 2TX CDD (based on UNII-2C band output power)	12.10	16.22
5510 - 5670	802.11n HT40 2TX STBC	15.43	34.91
5710	802.11ac VHT40 STBC2TX (based on UNII-2C band output power)	12.13	16.33
5510 - 5670	802.11n HT40 2TX BF	15.46	35.16
5710	802.11ac VHT40 2TX BF (based on UNII-2C band output power)	12.11	16.26
5530-5610	802.11ac VHT80 SISO	12.45	17.58
5690	802.11ac VHT80 SISO (based on UNII-2C band output power)	11.88	15.42
5530-5610	802.11ac VHT80 CDD 2TX	15.43	34.91
5690	802.11ac VHT80 CDD 2TX (based on UNII-2C band output power)	11.82	15.21
5530-5610	802.11ac VHT80 2TX STBC	15.43	34.91
5690	802.11ac VHT80 2TX STBC (based on UNII-2C band output power)	12.11	16.26
5530-5610	802.11ac VHT80 2TX BF	15.43	34.91
5690	802.11ac VHT80 2TX BF (based on UNII-2C band output power)	11.69	14.76

5.6GHz Band IC

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5500 - 5700	802.11a	Covered by 802.11n HT20 SISO	
5500 - 5700	802.11n HT20 SISO	12.46	17.62
5720	802.11ac VHT20 SISO (based on UNII-2C band output power)	11.23	13.27
5500 - 5700	802.11n HT20 2TX CDD	15.46	35.16
5720	802.11ac VHT20 2TX CDD (based on UNII-2C band output power)	10.35	10.84
5500 - 5700	802.11n HT20 2TX STBC	15.42	34.83
5720	802.11ac VHT20 2TX STBC (based on UNII-2C band output power)	10.96	12.47
5500 - 5700	802.11n HT20 2TX BF	14.93	31.12
5720	802.11ac VHT20 2TX BF (based on UNII-2C band output power)	10.40	10.96
5510 - 5670	802.11n HT40 SISO	12.42	17.46
5710	802.11ac VHT40 SISO (based on UNII-2C band output power)	12.13	16.33
5510 - 5670	802.11n HT40 2TX CDD	15.40	34.67
5710	802.11ac VHT40 2TX CDD (based on UNII-2C band output power)	12.07	16.11
5510 - 5670	802.11n HT40 2TX STBC	15.43	34.91
5710	802.11ac VHT40 STBC2TX (based on UNII-2C band output power)	12.09	16.18
5510 - 5670	802.11n HT40 2TX BF	15.46	35.16
5710	802.11ac VHT40 2TX BF (based on UNII-2C band output power)	12.08	16.14
5530-5610	802.11ac VHT80 SISO	12.45	17.58
5690	802.11ac VHT80 SISO (based on UNII-2C band output power)	11.86	15.35
5530-5610	802.11ac VHT80 CDD 2TX	15.43	34.91
5690	802.11ac VHT80 CDD 2TX (based on UNII-2C band output power)	11.80	15.14
5530-5610	802.11ac VHT80 2TX STBC	15.43	34.91
5690	802.11ac VHT80 2TX STBC (based on UNII-2C band output power)	12.10	16.22
5530-5610	802.11ac VHT80 2TX BF	15.43	34.91
5690	802.11ac VHT80 2TX BF (based on UNII-2C band output power)	11.67	14.69

5.8GHz Band FCC

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5745 - 5825	802.11a	Covered by 802.11n HT20 SISO	
5745 - 5825	802.11n HT20 SISO	13.22	20.99
5745 - 5825	802.11a 2TX CDD	Covered by 802.11n HT20 CDD 2TX	
5745 - 5825	802.11n HT20 CDD 2TX	16.23	41.98
5745 - 5825	802.11n HT20 STBC 2TX	16.24	42.07
5745 - 5825	802.11n HT20 BF 2TX	16.22	41.88
5755 - 5795	802.11n HT40 SISO	13.21	20.94
5755 - 5795	802.11n HT40 CDD 2TX	16.22	41.88
5755 - 5795	802.11n HT40 STBC 2TX	16.22	41.88
5755 - 5795	802.11n HT40 BF 2TX	16.20	41.69
5775	802.11ac VHT80 SISO	13.21	20.94
5775	802.11ac VHT80 CDD 2TX	16.14	41.11
5775	802.11ac VHT80 STBC 2TX	16.15	41.21
5775	802.11ac VHT80 BF 2TX	15.42	34.83

5.8GHz Band IC

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5745 - 5825	802.11a	Covered by 802.11n HT20 SISO	
5745 - 5825	802.11n HT20 SISO	13.22	20.99
5745 - 5825	802.11a 2TX CDD	Covered by 802.11n HT20 CDD 2TX	
5745 - 5825	802.11n HT20 CDD 2TX	16.20	41.69
5745 - 5825	802.11n HT20 STBC 2TX	16.22	41.88
5745 - 5825	802.11n HT20 BF 2TX	16.20	41.69
5755 - 5795	802.11n HT40 SISO	13.19	20.84
5755 - 5795	802.11n HT40 CDD 2TX	16.20	41.69
5755 - 5795	802.11n HT40 STBC 2TX	16.15	41.21
5755 - 5795	802.11n HT40 BF 2TX	12.89	19.45
5775	802.11ac VHT80 SISO	13.21	20.94
5775	802.11ac VHT80 CDD 2TX	16.17	41.40
5775	802.11ac VHT80 STBC 2TX	16.21	41.78
5775	802.11ac VHT80 BF 2TX	12.41	17.42

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency Band (GHz)	Antenna Gain (dBi)	
	Chain 0	Chain 1
5.2	6.6	7.0
5.3	7.1	7.6
5.5	6.4	7.9
5.8	5.8	7.7

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 7.21.163.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

For SISO modes, there are two transmission antennas. The antenna used in any given time can be either Chain 0 or Chain 1. Both antenna ports have the same power; output power and PSD measurement for SISO modes on both antennas are reported. For MIMO modes, both Chain 0 and Chain 1 used at the same time.

Worst-case data rates as provided by the client were:

802.11a mode: 6 Mbps
802.11n HT20 mode: MCS0
802.11n HT40 mode: MCS0
802.11ac VHT20 mode: MCS0
802.11ac VHT40 mode: MCS0
802.11ac VHT80 mode: MCS0

802.11ac VHT20 and VHT40 mode are different from 802.11nHT20 and HT40 only in control messages and have the same power settings.

For simultaneous transmission of multiple channels from the same antenna in BT/BLE and WLAN 5 GHz bands. Baseline testing was performed on various configurations to determine the worst case on radiated emissions.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC/ DC Adapter	Apple Inc.	A1718	N/A	N/A
Earphone	Apple Inc.	N/A	N/A	N/A

I/O CABLES (CONDUCTED TEST)

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
3	Antenna	2	SMA	Un-Shielded	0.2	To Spectrum Analyzer
1	DC	1	Lightning	Un-Shielded	2	N/A

I/O CABLES (ABOVE 1G RADIATED TEST)

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC	1	Lightning	Un-Shielded	2	N/A

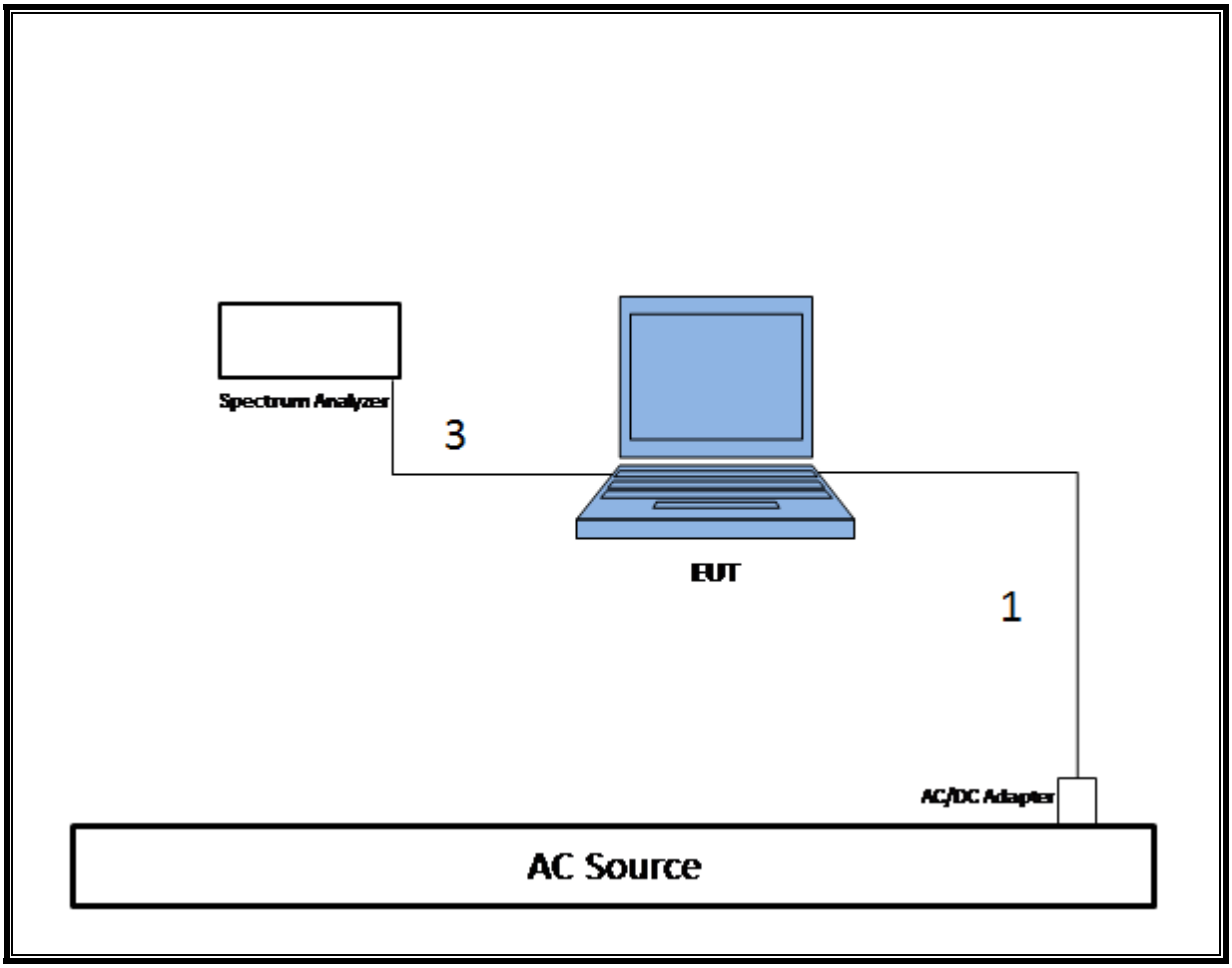
I/O CABLES (BELOW 1G RADIATED AND AC POWER CONDUCTED TEST)

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC	1	Lightning	Un-Shielded	2	NA
2	Audio	1	Jack	Un-Shielded	0.5	NA

TEST SETUP- CONDUCTED PORT

The EUT was tested connected to spectrum analyzer via antenna port. Test software exercised the EUT.

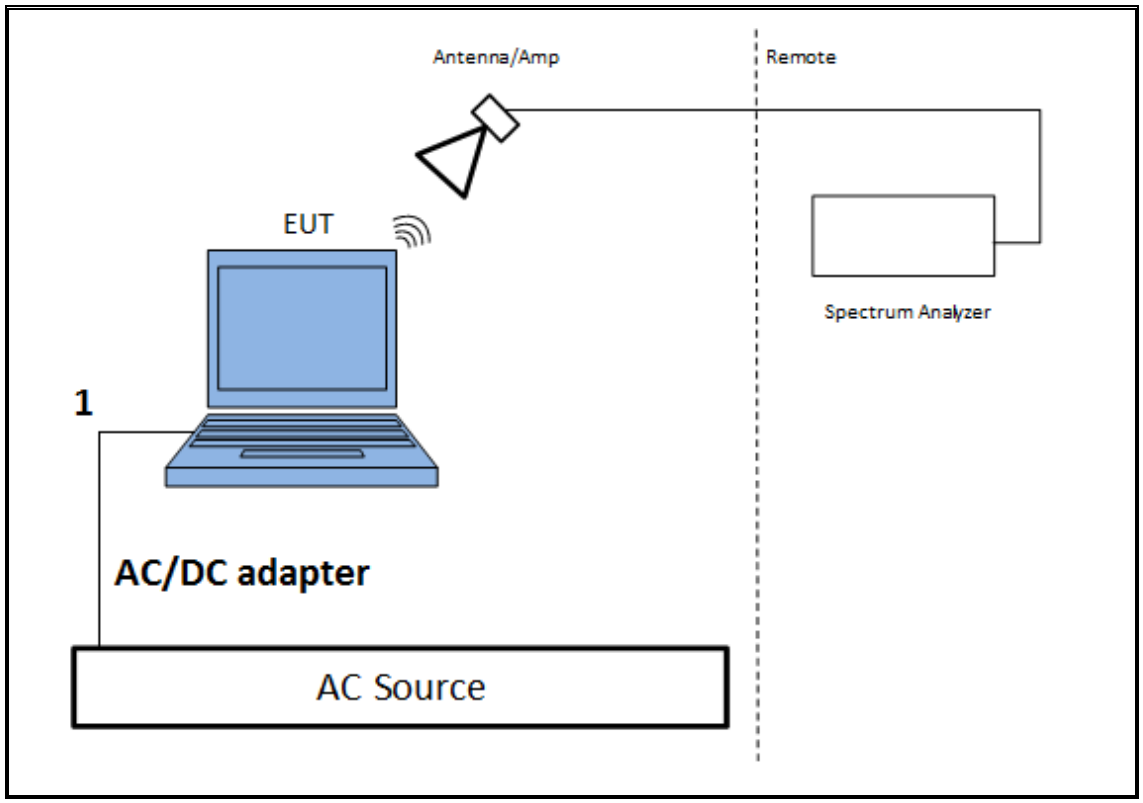
SETUP DIAGRAM



TEST SETUP- RADIATED- ABOVE 1 GHz

The EUT was powered by AC/DC adapter. Test software exercised the EUT.

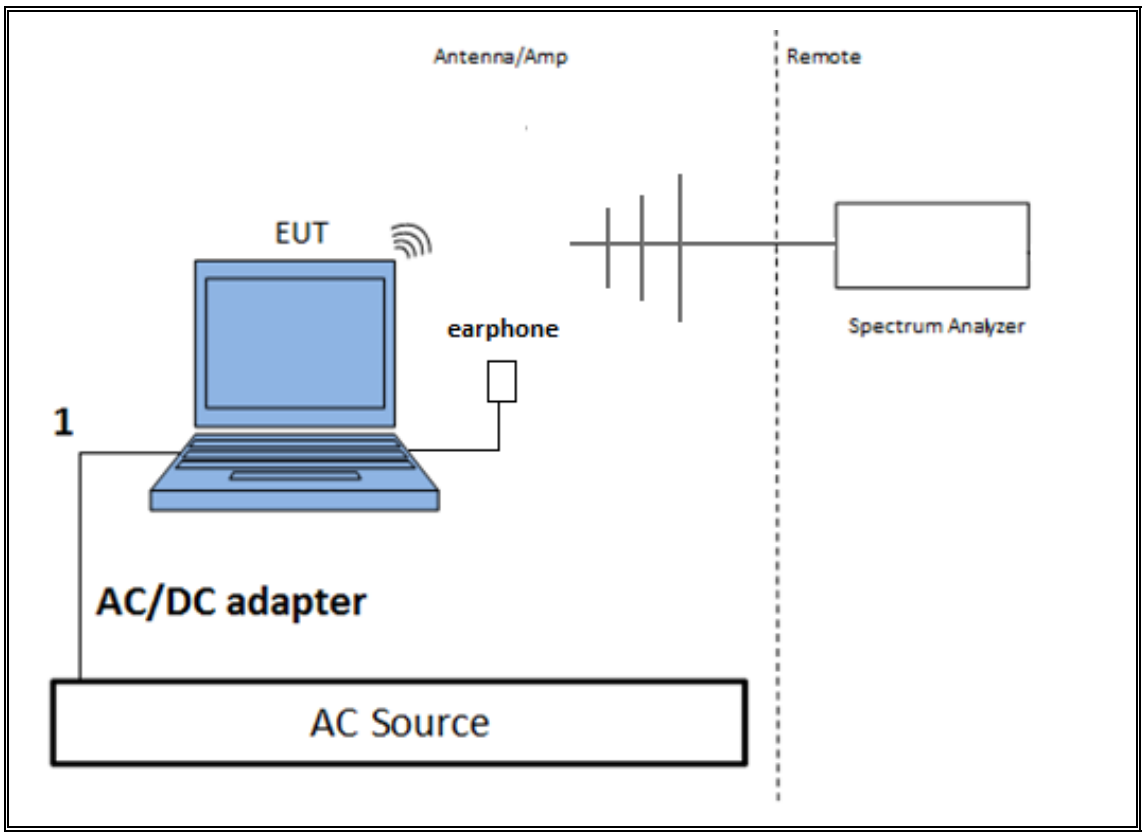
SETUP DIAGRAM



TEST SETUP- RADIATED- BELOW 1 GHz

The EUT was powered by AC/DC adapter and with earphone plugged in. Test software exercised the EUT.

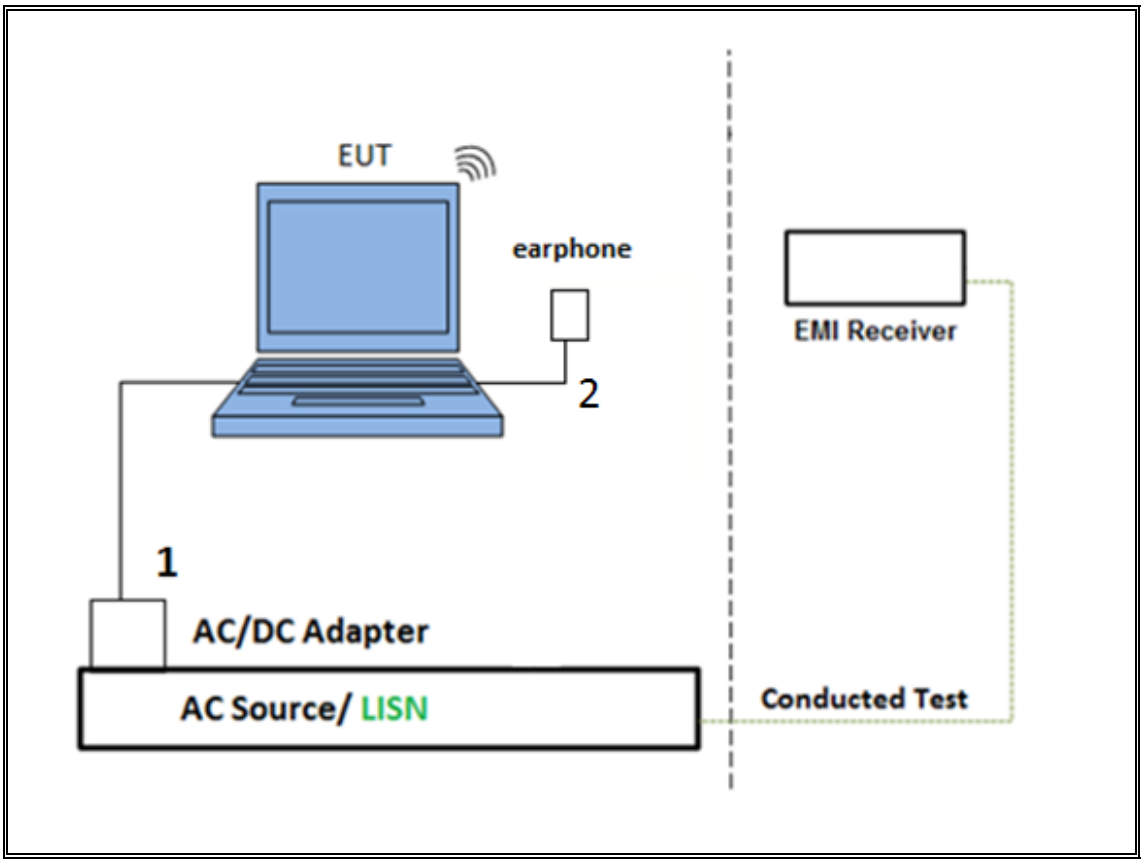
SETUP DIAGRAM



TEST SETUP- AC LINE CONDUCTED TESTS

The EUT was powered by AC/DC adapter and with earphone plugged in. Test software exercised the EUT.

SETUP DIAGRAM



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Antenna, Horn 1-18GHz	ETS Lindgren	3117	00154522	1/12/2017
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	A022813-1	10/28/2016
Amplifier, 1 - 18GHz	Miteq	AFS42-00101800-25-S-42	1782158	1/25/2017
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	323562	5/4/2017
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	MY52350675	11/15/2016
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	MY51380911	10/15/2016
Power Meter, P-series single channel	Agilent	N1911A	GB45100212	9/25/2016
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Agilent	N1921A	MY53260010	7/8/2017
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826	209336	5/26/2017
**Spectrum Analyzer, 40 GHz	Agilent	8564E	3943A01643	8/14/2016
Amplifier, 1 to 26.5GHz, 23.5dB Gain minimum	Keysight	8449B	3008A04710	7/5/2017
AC Line Conducted				
EMI Test Receiver 9Khz-7GHz	Rohde & Schwarz	ESCI7	100935	9/10/2016
LISN for Conducted Emissions CISPR-16	Fischer	50/250-25-2	161124	9/16/2016
Power Cable, Line Conducted Emissions	U L	PG1	N/A	7/28/2017
UL SOFTWARE				
* Radiated Software	UL	UL EMC	Ver 9.5, June 24, 2015	
* Conducted Software	UL	UL EMC	Ver 5.0, June 22, 2016	
* AC Line Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015	

Note: * indicates automation software version used in the compliance certification testing

** equipment was used before calibration due date.

7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

7.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

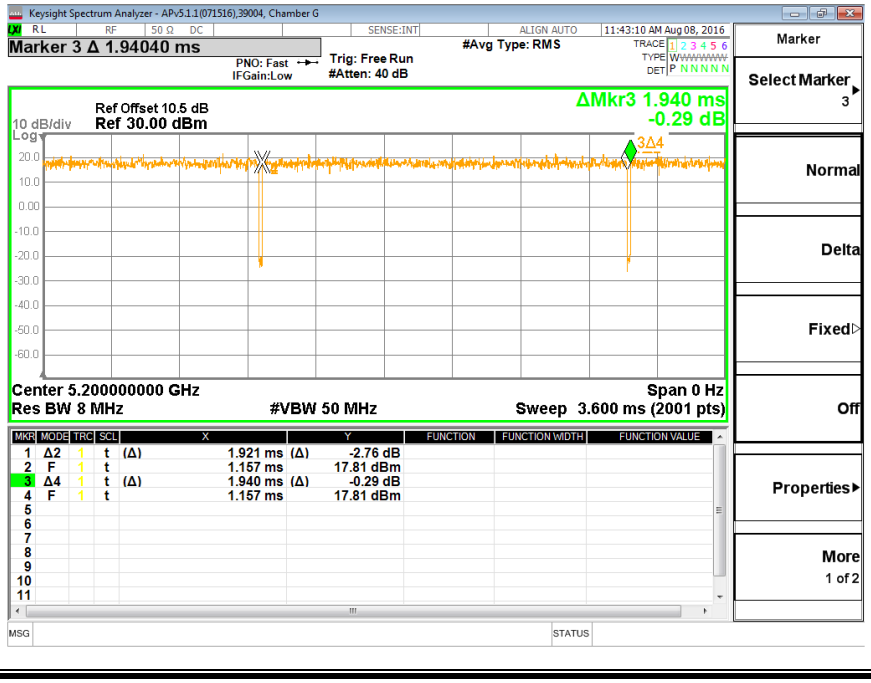
KDB 789033 Zero-Span Spectrum Analyzer Method.

RESULTS

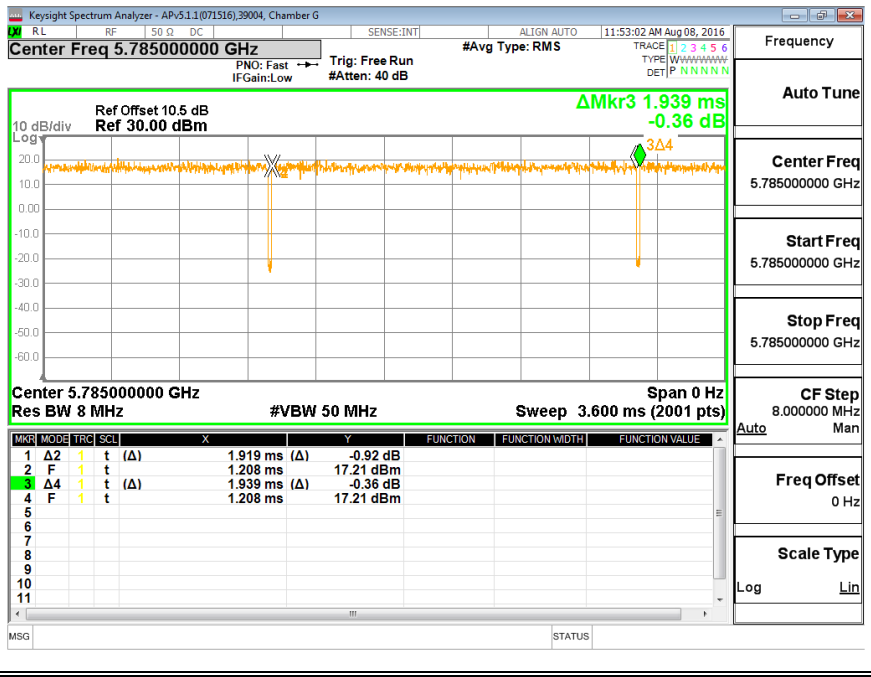
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11n HT20 1TX	1.921	1.940	0.990	99.02%	0.00	0.010
802.11n HT20 CDD	1.919	1.939	0.990	98.97%	0.00	0.010
802.11n HT20 STBC	1.918	1.941	0.988	98.82%	0.00	0.010
802.11n HT20 BeamForming	2.001	2.047	0.978	97.75%	0.10	0.500
802.11n HT40 1TX	1.119	1.141	0.981	98.07%	0.00	0.010
802.11n HT40 CDD	1.124	1.142	0.984	98.42%	0.00	0.010
802.11n HT40 STBC	1.128	1.149	0.982	98.17%	0.00	0.010
802.11n HT40 BeamForming	4.600	4.730	0.973	97.25%	0.12	0.217
802.11ac VHT80 1TX	0.459	0.483	0.950	95.03%	0.22	2.179
802.11ac VHT80 CDD	0.461	0.483	0.953	95.26%	0.21	2.172
802.11ac VHT80 STBC	0.467	0.491	0.952	95.21%	0.21	2.140
802.11ac VHT80 BeamForming	25.20	27.20	0.926	92.65%	0.33	0.040

DUTY CYCLE PLOTS

DUTY CYCLE 802.11n HT20 1TX MODE

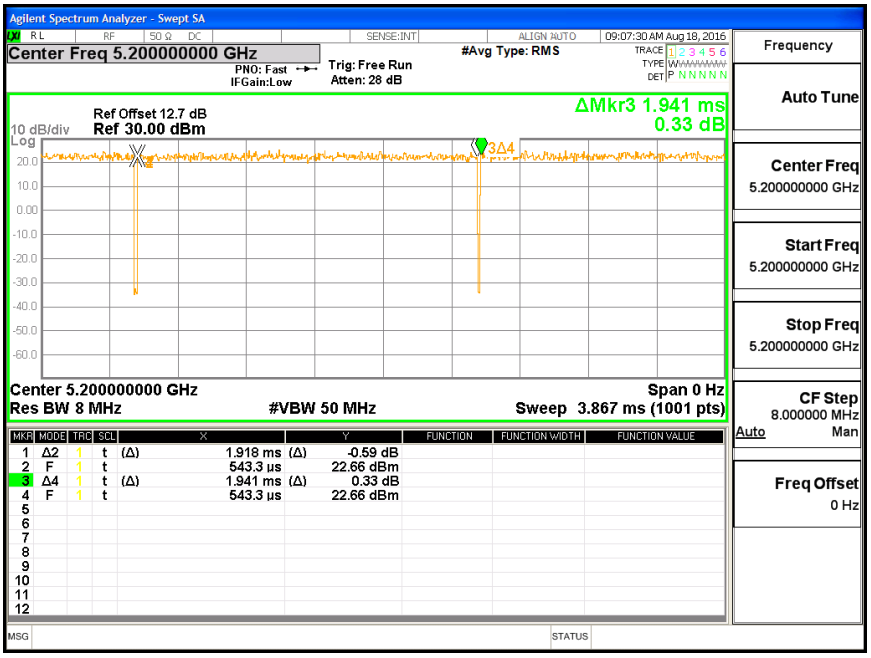


DUTY CYCLE 802.11n HT20 CDD MODE

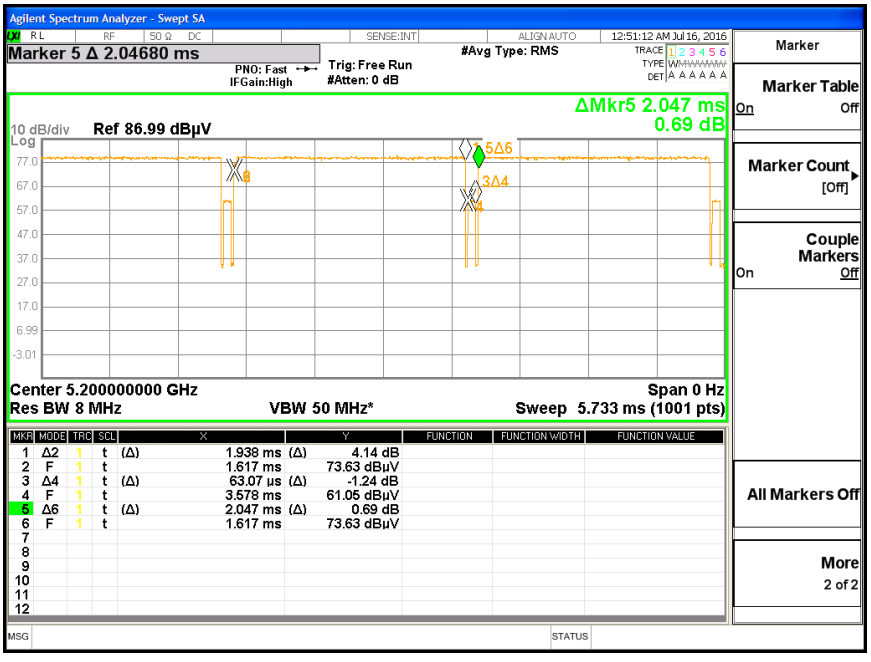


ID:	39004	Date:	8/18/16

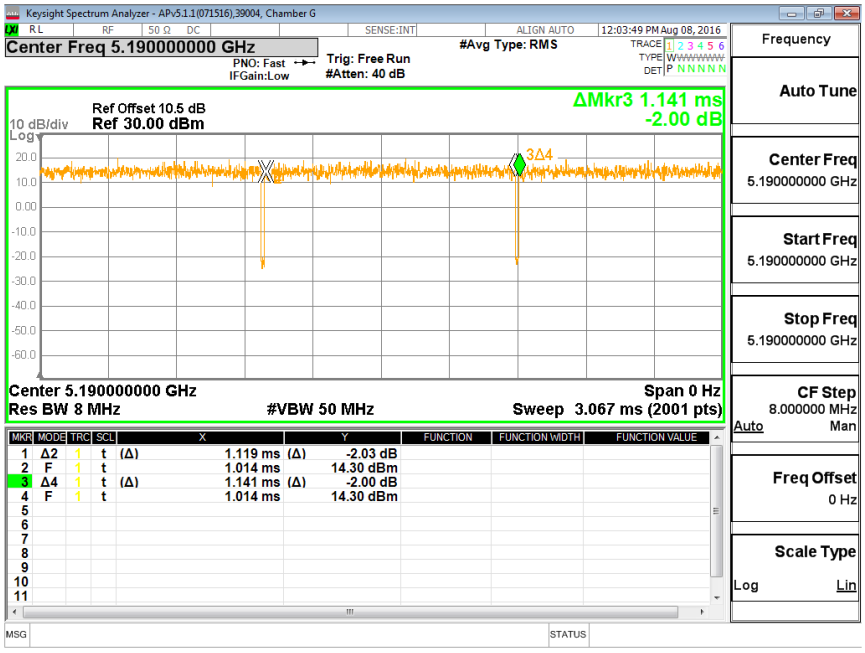
DUTY CYCLE 802.11n HT20 STBC MODE



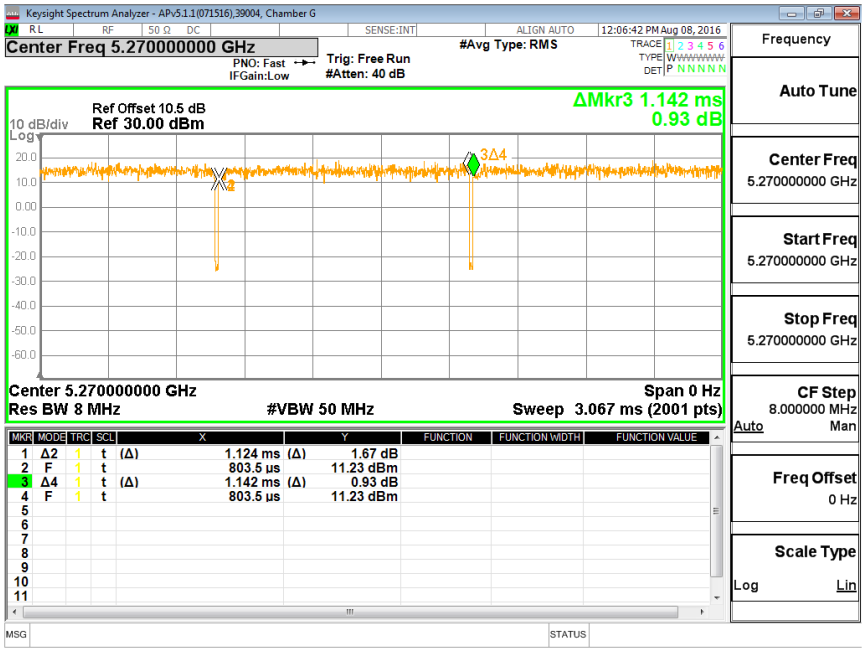
DUTY CYCLE 802.11n HT20 BEAMFORMING MODE



DUTY CYCLE 802.11n HT40 1TX MODE

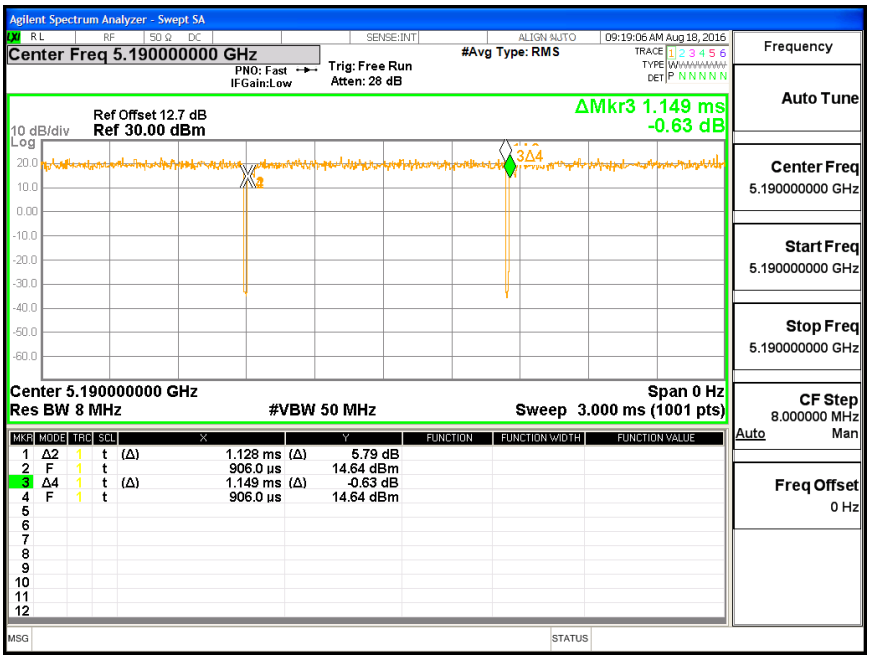


DUTY CYCLE 802.11n HT40 CDD MODE

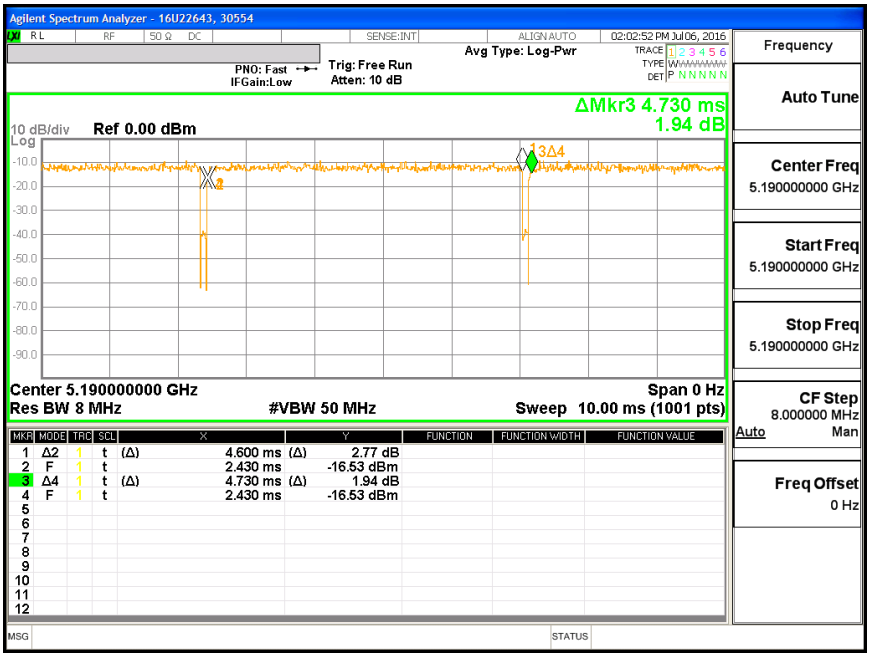


ID:	39004	Date:	8/18/16

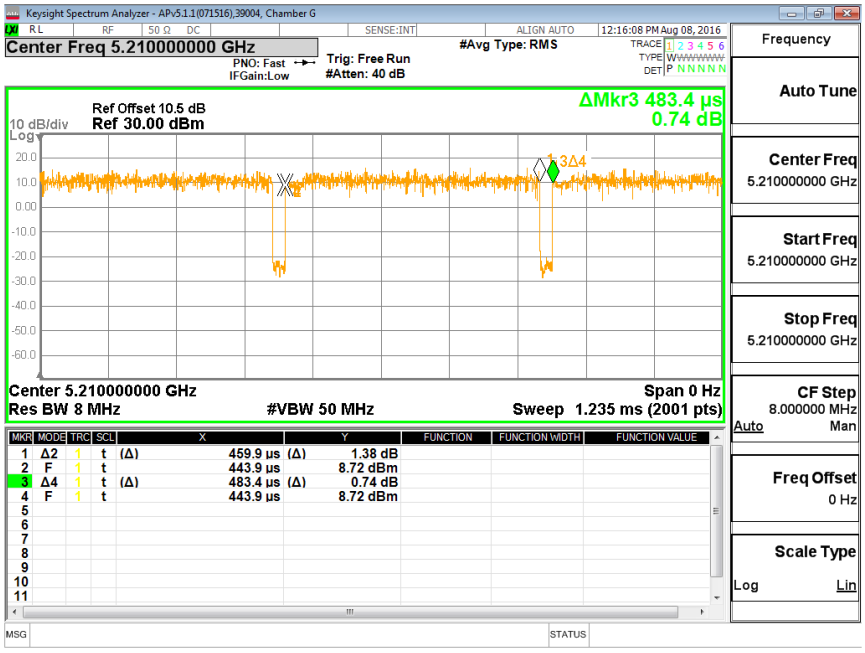
DUTY CYCLE 802.11n HT40 STBC MODE



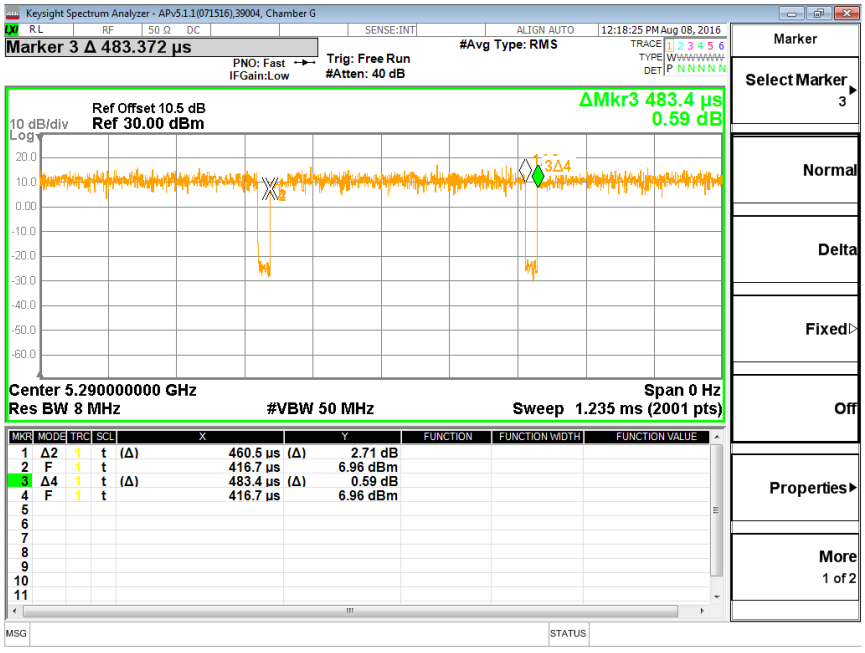
DUTY CYCLE 802.11n HT40 BEAMFORMING MODE



DUTY CYCLE 802.11ac VHT80 1TX MODE

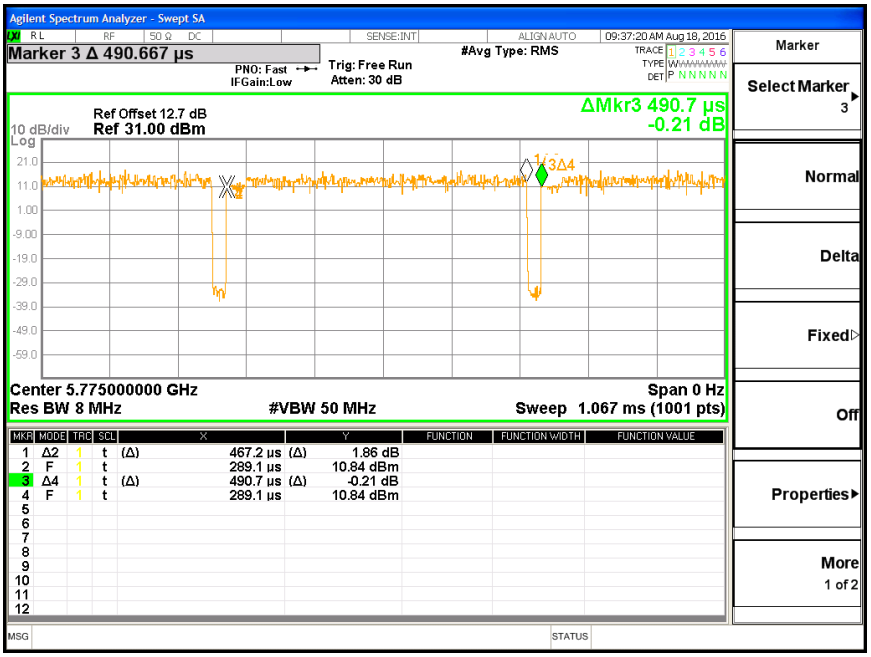


DUTY CYCLE 802.11ac VHT80 CDD MODE

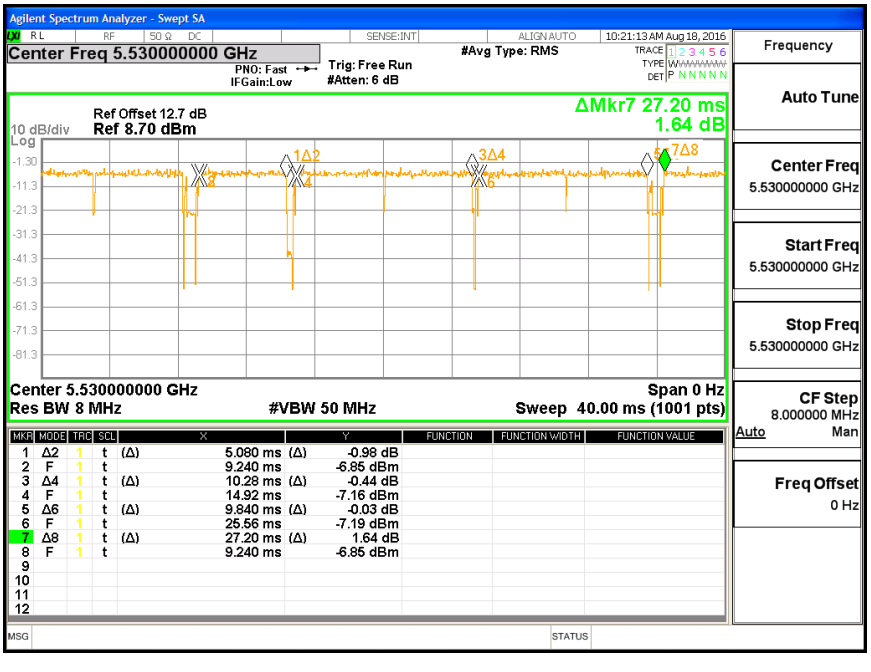


ID:	39004	Date:	8/18/16

DUTY CYCLE 802.11ac VHT80 STBC MODE



DUTY CYCLE 802.11ac VHT80 BEAMFORMING MODE



7.2. MEASUREMENT METHODS

6 dB Emission BW: KDB 789033 D02 v01r03, Section C.

26 dB Emission BW: KDB 789033 D02 v01r03, Section C.

99% Occupied BW: KDB 789033 D02 v01r03, Section D.

Conducted Output Power: KDB 789033 D02 v01r03, Section E.3.b (Method PM-G).

Power Spectral Density: KDB 789033 D02 v01r03, Section F (Method SA-2).

Unwanted emissions in restricted bands: KDB 789033 D02 v01r03, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v01r03, Sections G.3, G.4, and G.5.

8. ANTENNA PORT TEST RESULTS

8.1. 802.11n HT20 CHAIN 0 MODE IN THE 5.2 GHz BAND

8.1.1. 26 dB BANDWIDTH

LIMITS

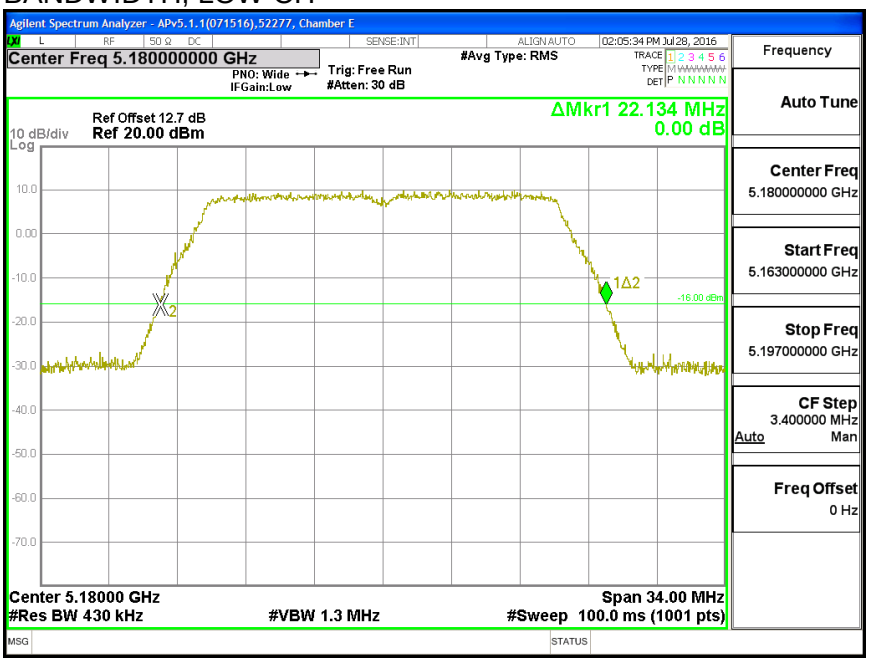
None; for reporting purposes only.

RESULTS

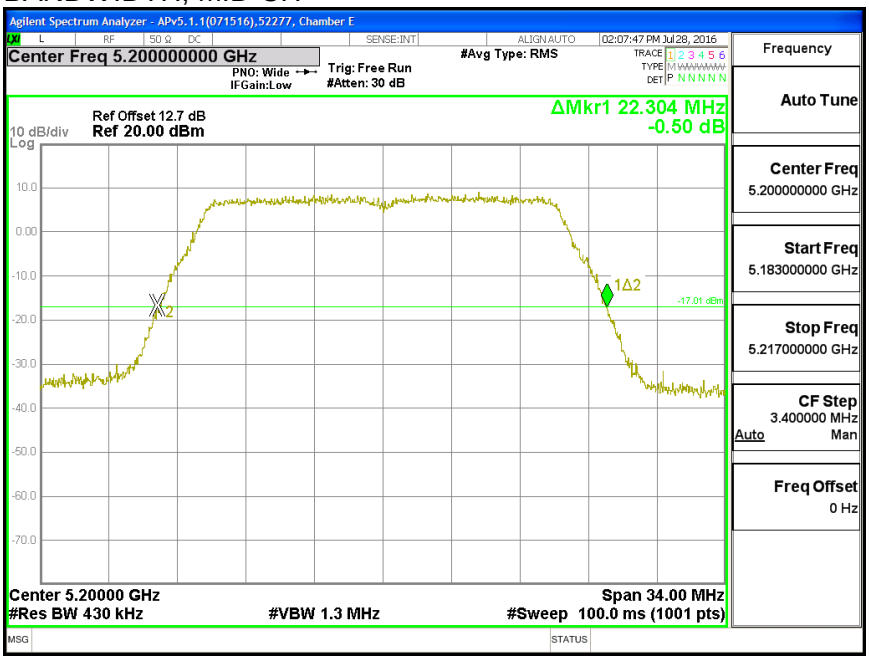
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	22.134
Mid	5200	22.304
High	5240	22.202

26 dB BANDWIDTH

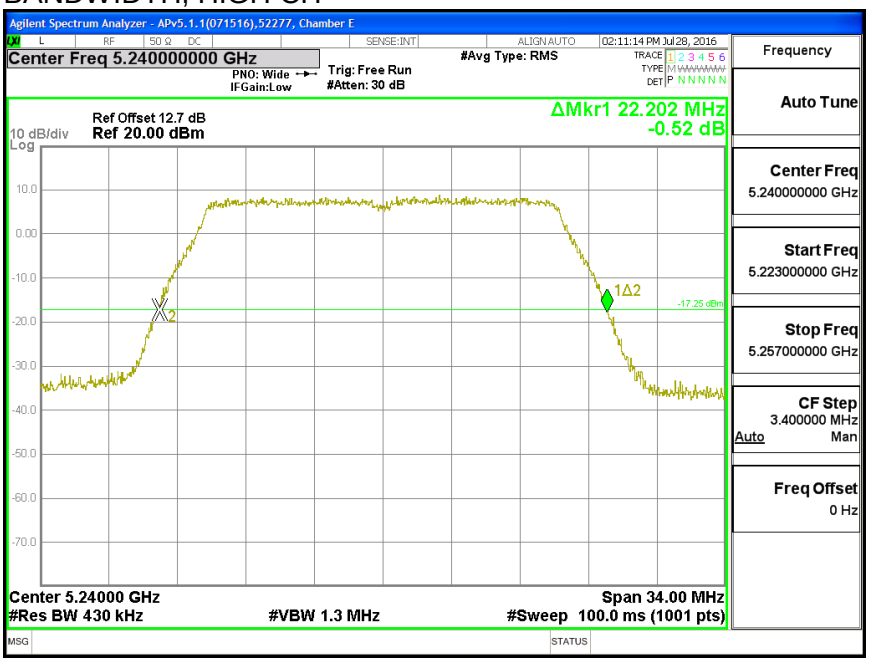
BANDWIDTH, LOW CH



BANDWIDTH, MID CH



BANDWIDTH, HIGH CH



8.1.2. 99% BANDWIDTH

LIMITS

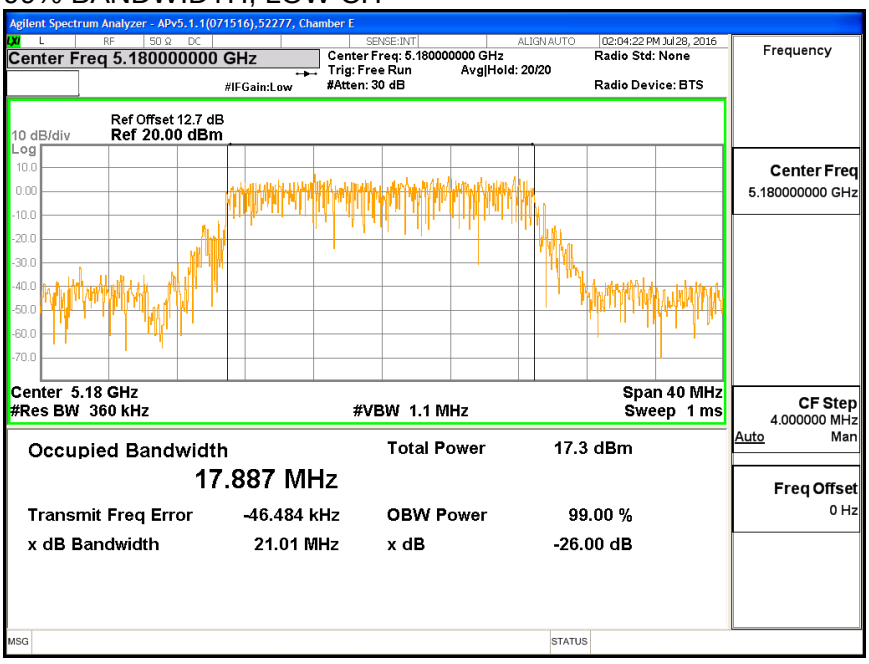
None; for reporting purposes only.

RESULTS

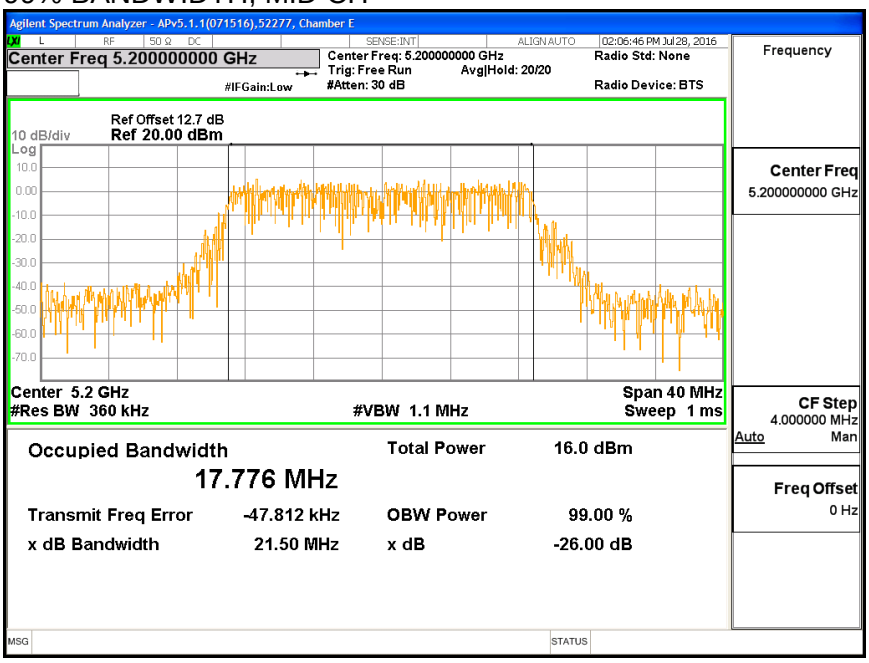
Channel	Frequency (MHz)	99% BW (MHz)
Low	5180	17.887
Mid	5200	17.776
High	5240	17.831

99% BANDWIDTH

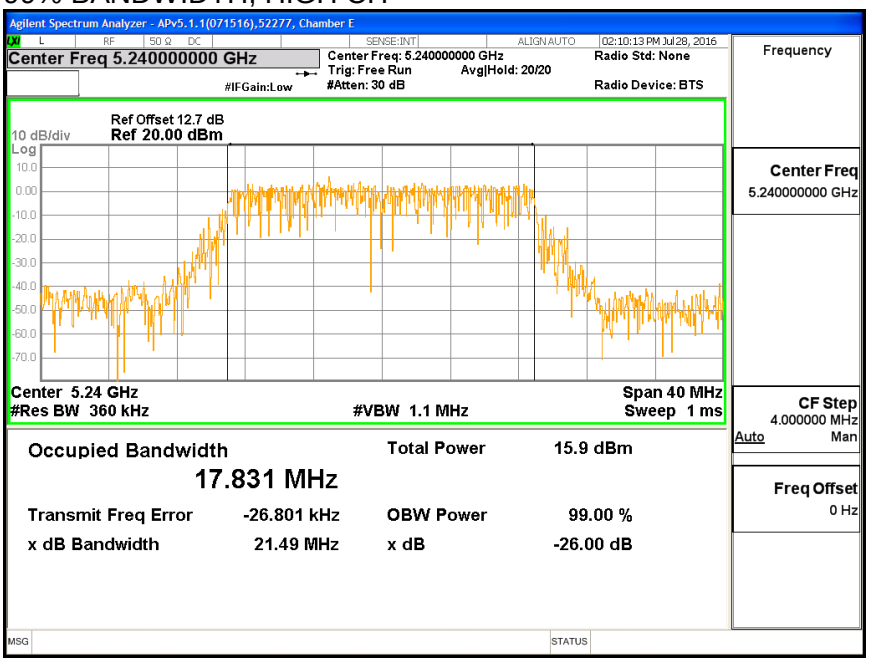
99% BANDWIDTH, LOW CH



99% BANDWIDTH, MID CH



99% BANDWIDTH, HIGH CH



8.1.3. AVERAGE POWER (FCC)

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

RESULTS

ID:	39004	Date:	9/2/16

Channel	Frequency (MHz)	Power (dBm)
Low	5180	13.68
Mid	5200	13.70
High	5240	13.72

8.1.4. OUTPUT POWER AND PSD (FCC)

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. 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).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. 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. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

ID:	39004	Date:	9/2/16

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5180	6.60	6.60	23.40	10.40
Mid	5200	6.60	6.60	23.40	10.40
High	5240	6.60	6.60	23.40	10.40

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

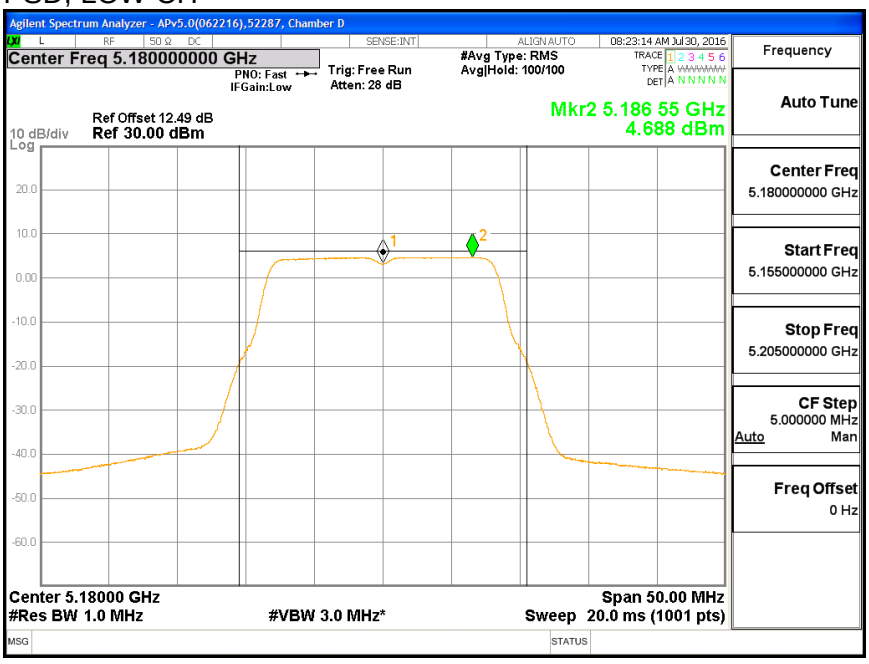
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	13.68	13.68	23.40	-9.72
Mid	5200	13.70	13.70	23.40	-9.70
High	5240	13.72	13.72	23.40	-9.68

PSD Results

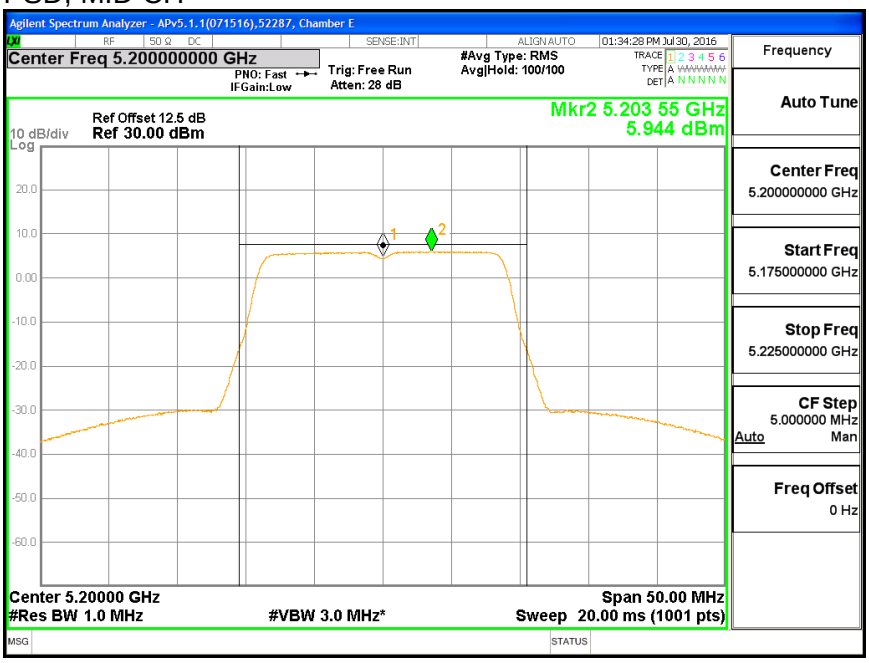
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	4.69	4.69	10.40	-5.71
Mid	5200	5.94	5.94	10.40	-4.46
High	5240	5.91	5.91	10.40	-4.50

PSD

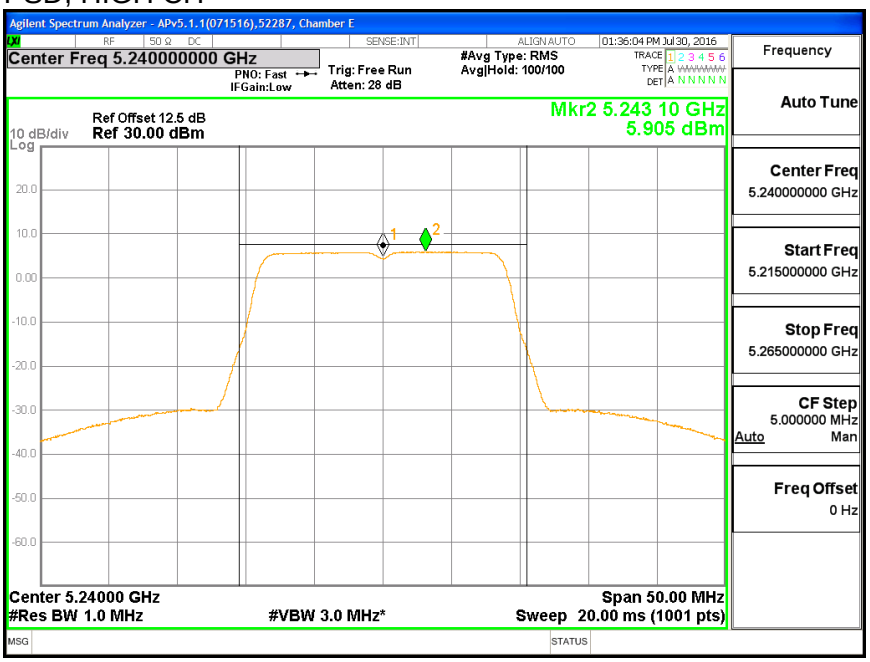
PSD, LOW CH



PSD, MID CH



PSD, HIGH CH



8.1.5. AVERAGE POWER (IC)

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

RESULTS

ID:	39004	Date:	9/2/16

Channel	Frequency (MHz)	Power (dBm)
Low	5180	10.73
Mid	5200	10.77
High	5240	10.84

8.1.6. OUTPUT POWER AND PSD (IC)

LIMITS

IC RSS-247 (6.2.1) (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 12.7 dB (including 10 dB pad and 2.7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

ID:	39004	Date:	9/2/16

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 99% BW (MHz)	Direction Gain (dBi)
Low	5180	17.887	6.60
Mid	5200	17.776	6.60
High	5240	17.831	6.60

Limits

Channel	Frequency (MHz)	IC EIRP Limit (dBm)	Max IC Power (dBm)	IC eirp PSD Limit (dBm)	Max IC PSD (dBm)
Low	5180	22.53	15.93	10.00	3.40
Mid	5200	22.50	15.90	10.00	3.40
High	5240	22.51	15.91	10.00	3.40

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

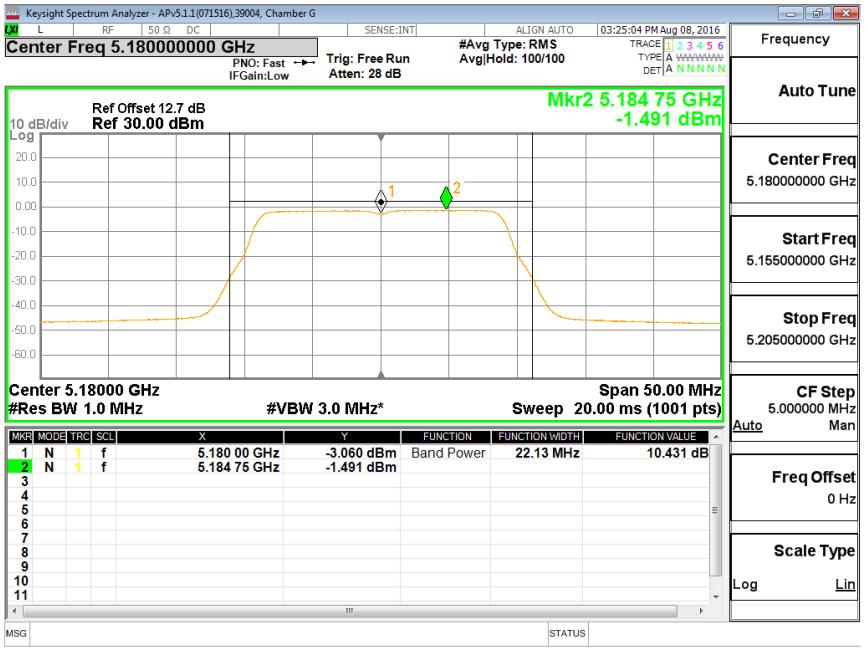
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	10.73	10.73	15.93	-5.19
Mid	5200	10.77	10.77	15.90	-5.13
High	5240	10.84	10.84	15.91	-5.07

PSD Results

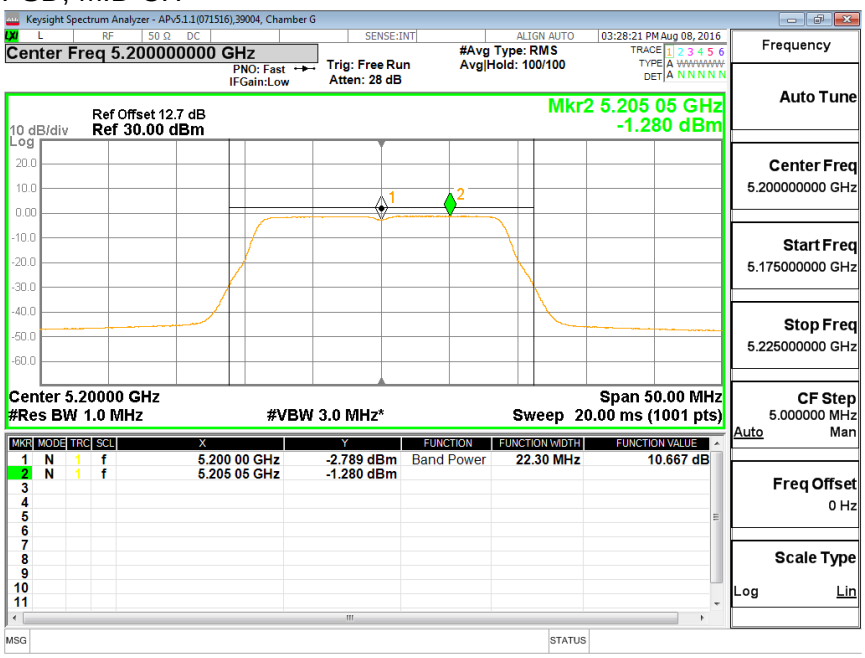
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	-1.49	-1.49	3.40	-4.89
Mid	5200	-1.28	-1.28	3.40	-4.68
High	5240	-1.14	-1.14	3.40	-4.54

PSD

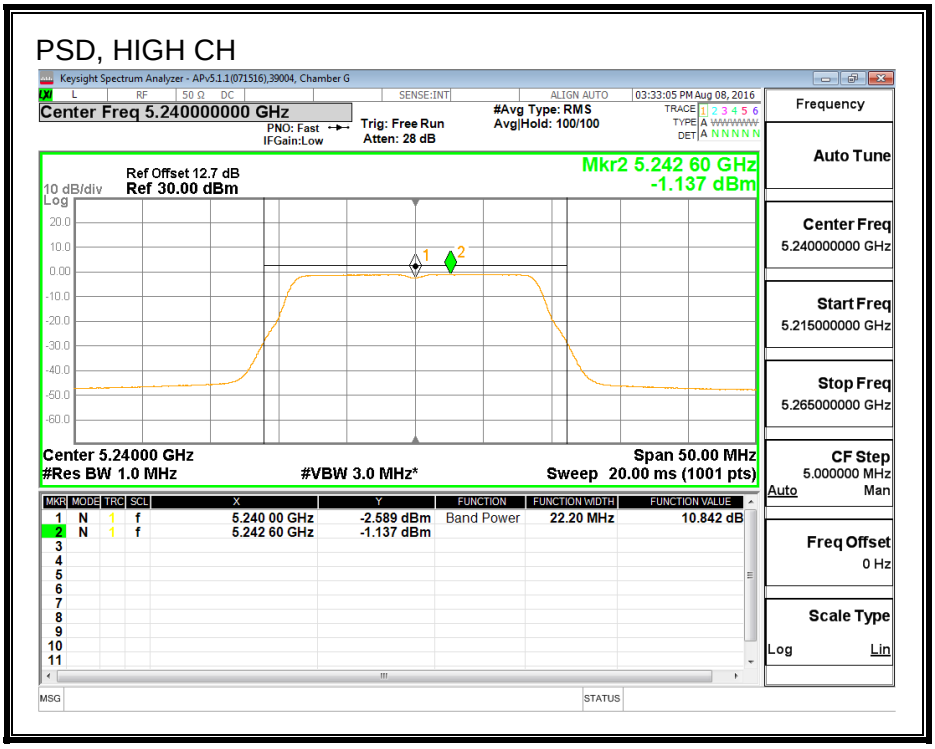
PSD, LOW CH



PSD, MID CH



PSD, HIGH CH



8.2. 802.11n HT20 CHAIN 1 MODE IN THE 5.2 GHz BAND

8.2.1. 26 dB BANDWIDTH

LIMITS

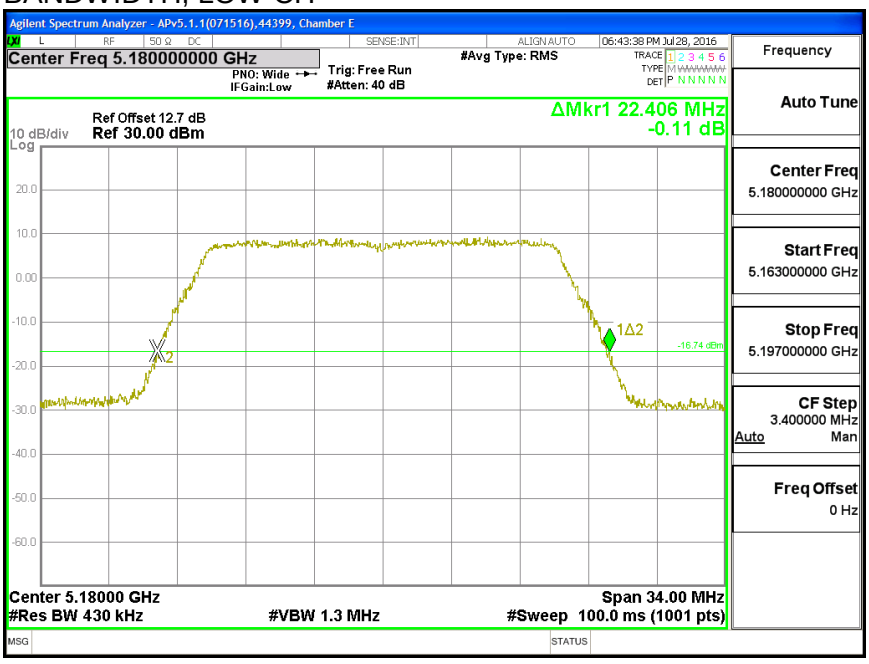
None; for reporting purposes only.

RESULTS

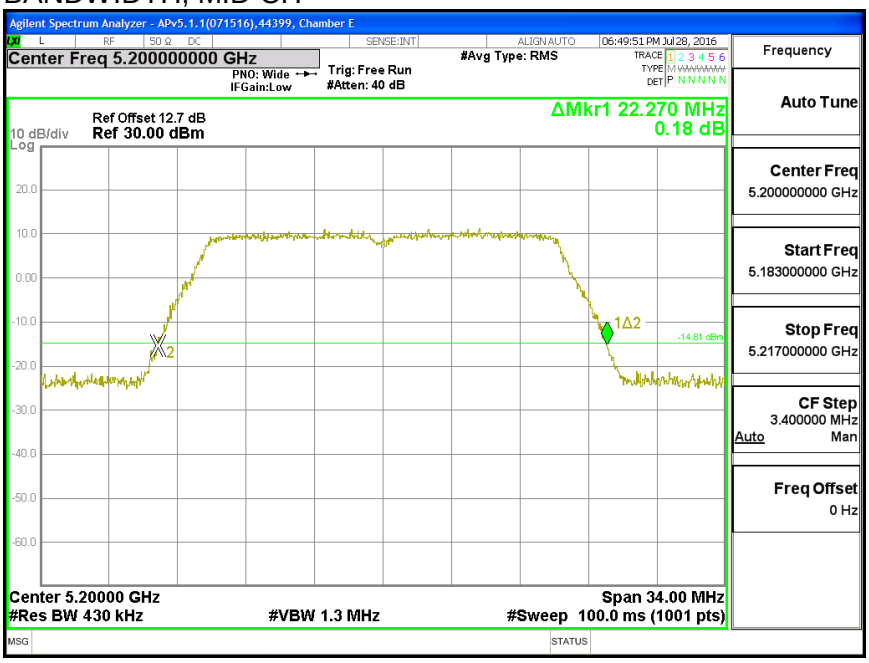
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	22.406
Mid	5200	22.270
High	5240	22.236

26 dB BANDWIDTH

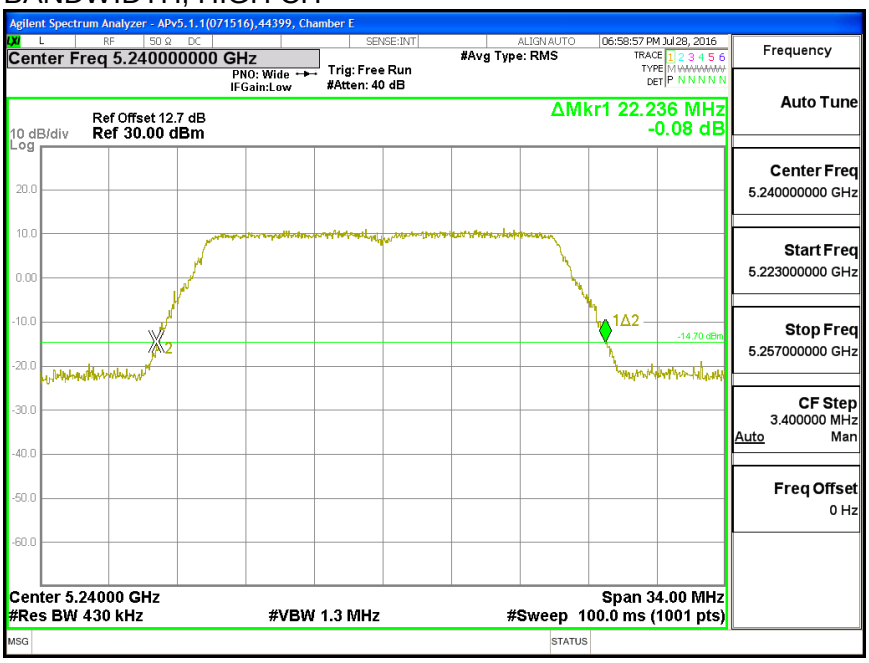
BANDWIDTH, LOW CH



BANDWIDTH, MID CH



BANDWIDTH, HIGH CH



8.2.2. 99% BANDWIDTH

LIMITS

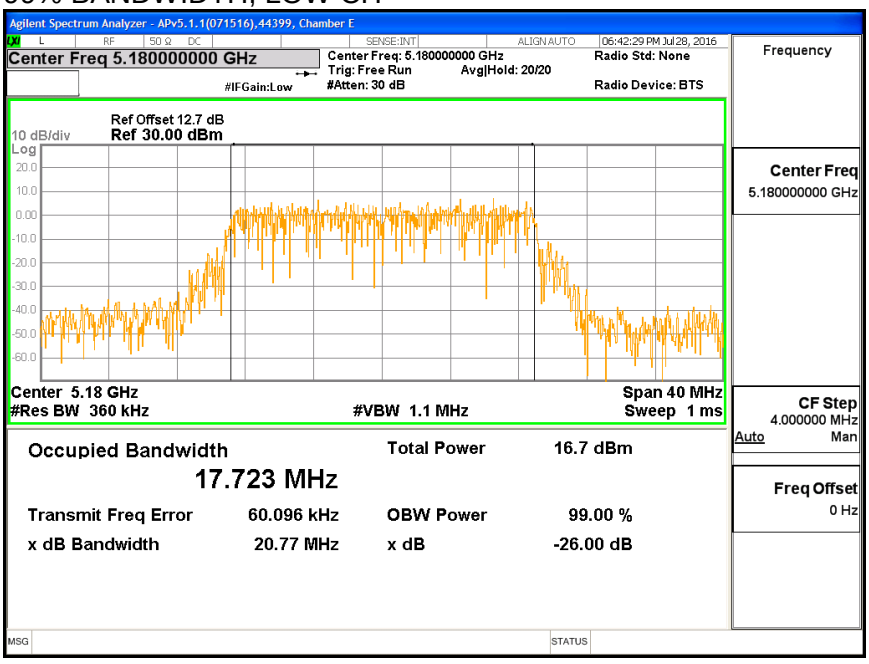
None; for reporting purposes only.

RESULTS

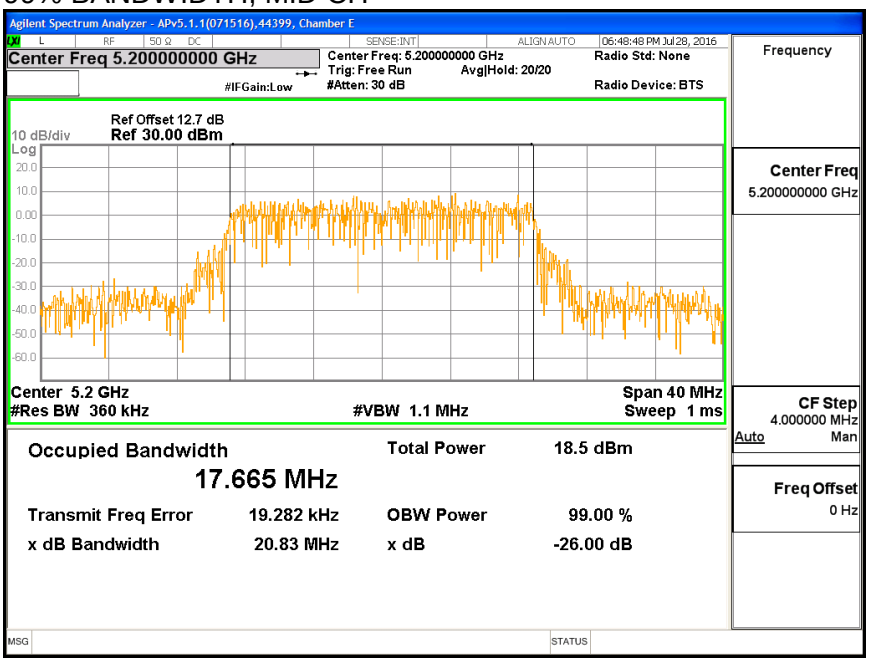
Channel	Frequency (MHz)	99% BW (MHz)
Low	5180	17.723
Mid	5200	17.665
High	5240	17.789

99% BANDWIDTH

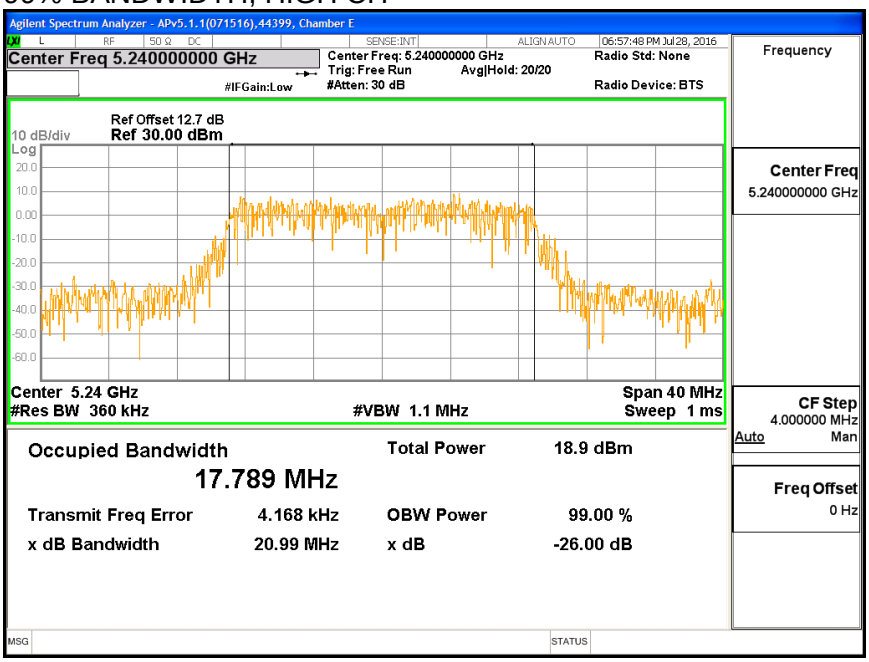
99% BANDWIDTH, LOW CH



99% BANDWIDTH, MID CH



99% BANDWIDTH, HIGH CH



8.2.3. AVERAGE POWER (FCC)

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

RESULTS

ID:	39004	Date:	9/2/16

Channel	Frequency (MHz)	Power (dBm)
Low	5180	13.66
Mid	5200	13.74
High	5240	13.73

8.2.4. OUTPUT POWER AND PSD (FCC)

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. 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).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. 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. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

ID:	39004	Date:	9/2/16

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5180	7.00	7.00	23.00	10.00
Mid	5200	7.00	7.00	23.00	10.00
High	5240	7.00	7.00	23.00	10.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

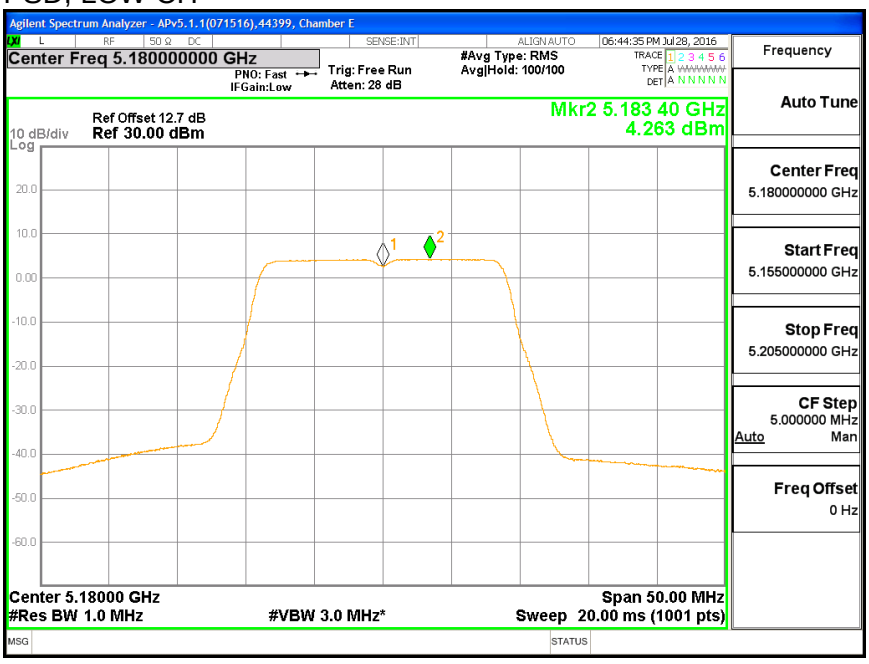
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	13.66	13.66	23.00	-9.34
Mid	5200	13.74	13.74	23.00	-9.26
High	5240	13.73	13.73	23.00	-9.27

PSD Results

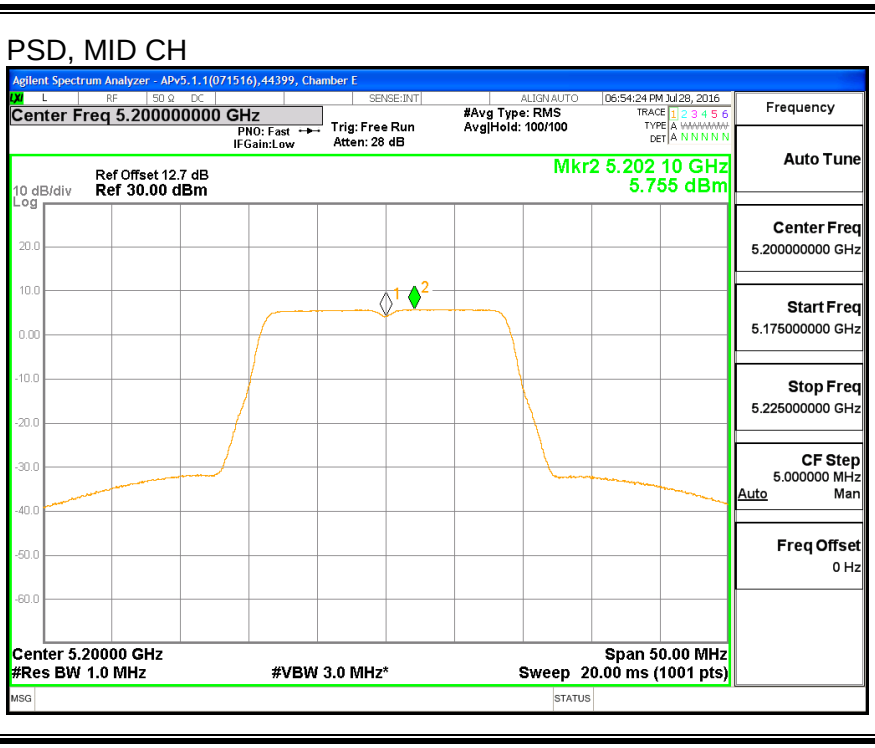
Channel	Frequency (MHz)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	4.26	4.26	10.00	-5.74
Mid	5200	5.76	5.76	10.00	-4.25
High	5240	6.16	6.16	10.00	-3.84

PSD

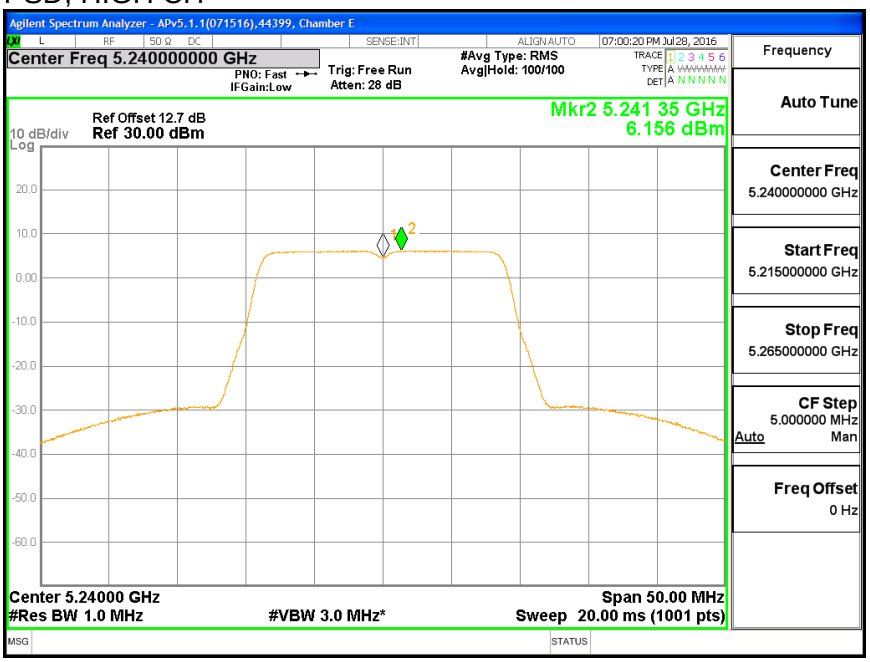
PSD, LOW CH



PSD, MID CH



PSD, HIGH CH



8.2.6. AVERAGE POWER (IC)

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

RESULTS

ID:	39004	Date:	9/2/16

Channel	Frequency (MHz)	Power (dBm)
Low	5180	10.84
Mid	5200	10.87
High	5240	10.80

8.2.7. OUTPUT POWER AND PSD (IC)

LIMITS

IC RSS-247 (6.2.1) (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 12.7 dB (including 10 dB pad and 2.7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

ID:	39004	Date:	9/2/16

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 99% BW (MHz)	Direction Gain (dBi)
Low	5180	17.72	7.00
Mid	5200	17.67	7.00
High	5240	17.79	7.00

Limits

Channel	Frequency (MHz)	IC EIRP Limit (dBm)	Max IC Power (dBm)	IC eirp PSD Limit (dBm)	Max IC PSD (dBm)
Low	5180	22.49	15.49	10.00	3.00
Mid	5200	22.47	15.47	10.00	3.00
High	5240	22.50	15.50	10.00	3.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

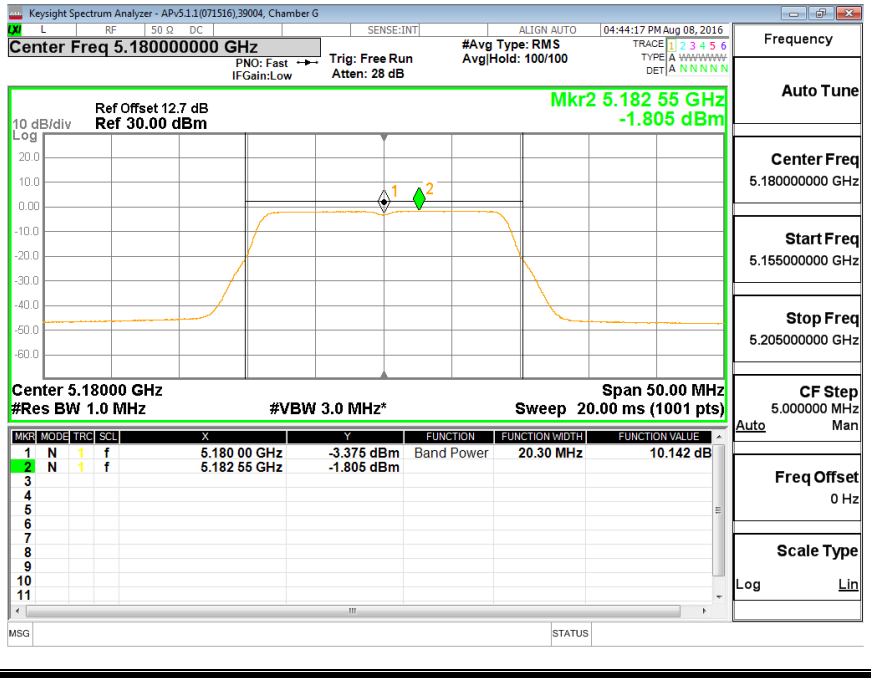
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	10.84	10.84	15.49	-4.64
Mid	5200	10.87	10.87	15.47	-4.60
High	5240	10.80	10.80	15.50	-4.70

PSD Results

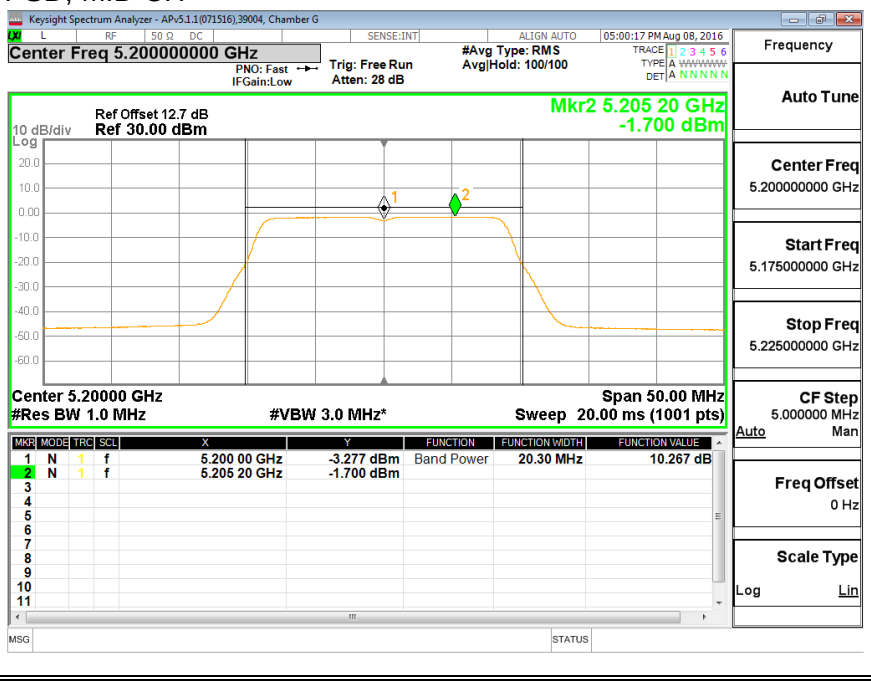
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	-1.805	-1.81	3.00	-4.81
Mid	5200	-1.700	-1.70	3.00	-4.70
High	5240	-1.994	-1.99	3.00	-4.99

PSD, CHAIN 1

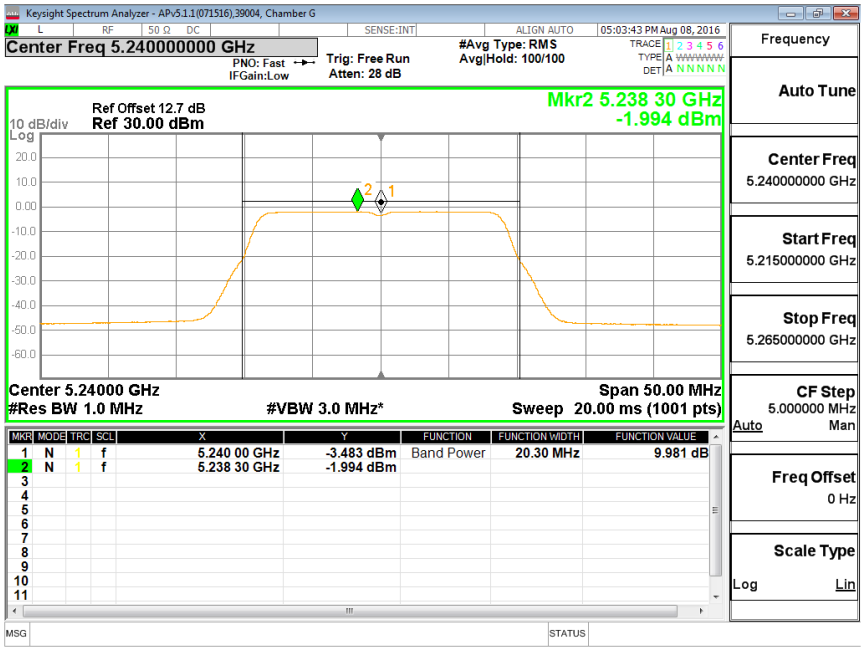
PSD, LOW CH



PSD, MID CH



PSD, HIGH CH



8.3. 802.11n HT20 2Tx CDD MODE IN THE 5.2 GHz BAND

8.3.1. 26 dB BANDWIDTH

LIMITS

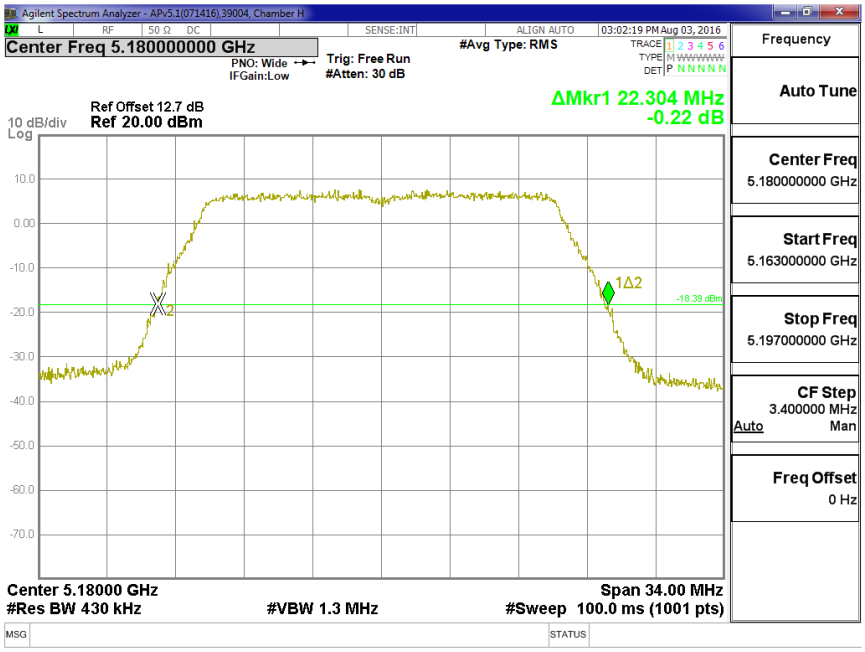
None; for reporting purposes only.

RESULTS

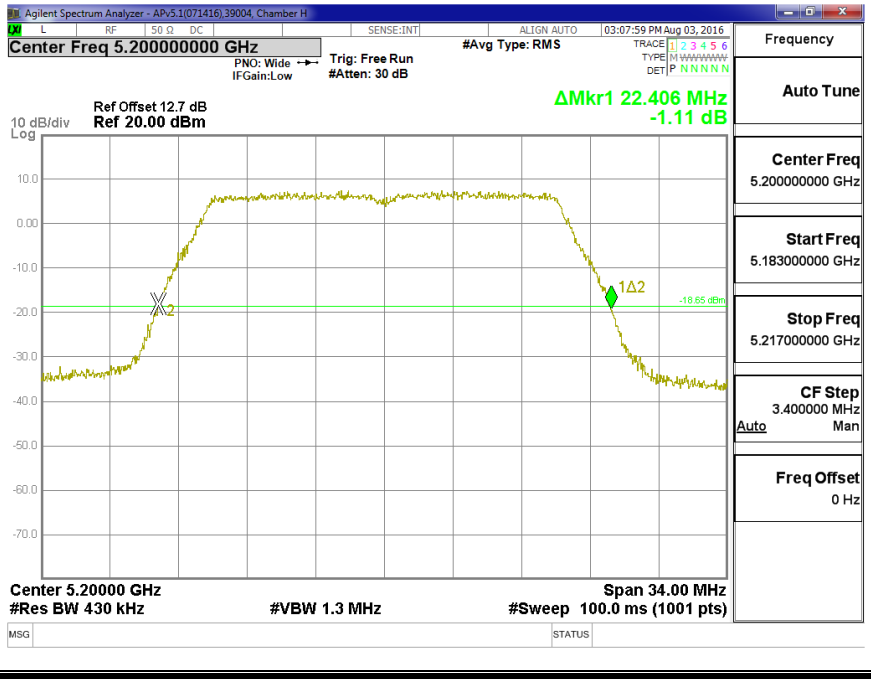
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5180	22.30	22.37
Mid	5200	22.41	22.44
High	5240	22.30	22.27

26 DB BANDWIDTH, CHAIN 0

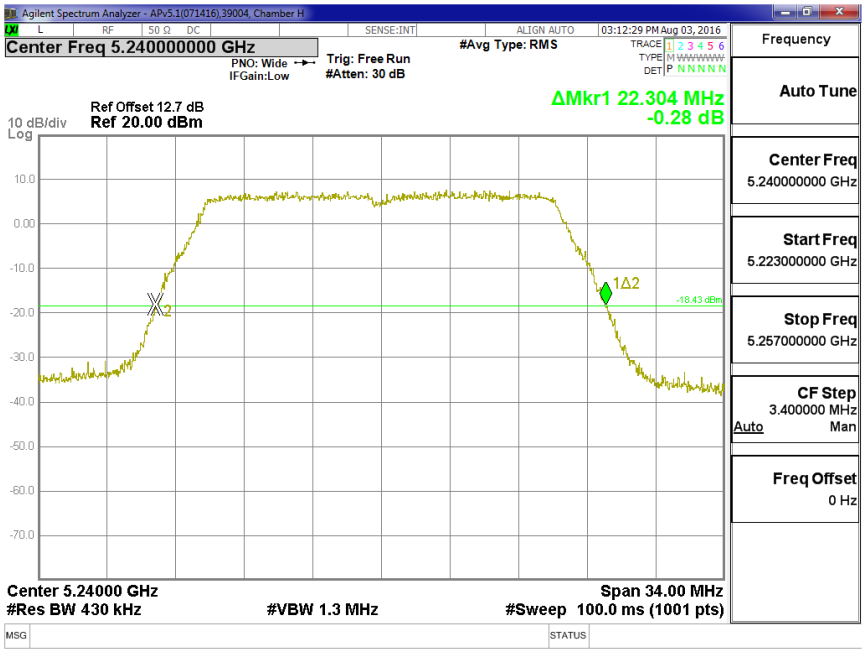
BANDWIDTH, LOW CH



BANDWIDTH, MID CH

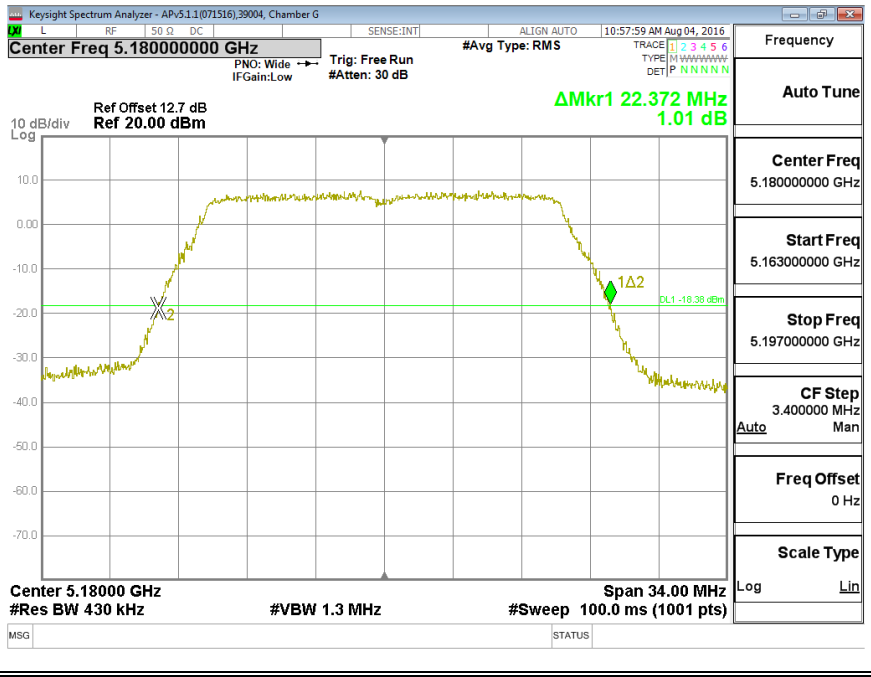


BANDWIDTH, HIGH CH

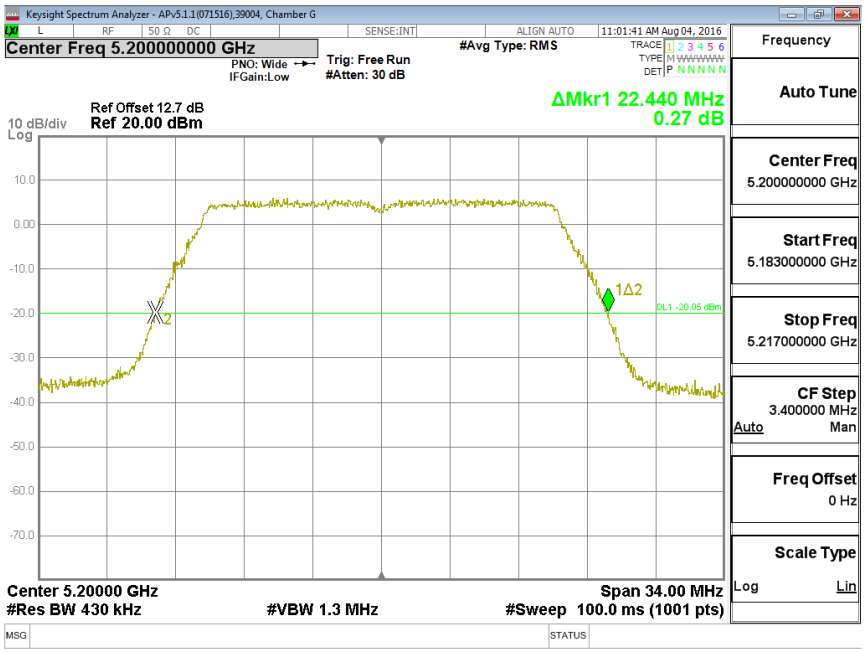


26 DB BANDWIDTH, CHAIN 1

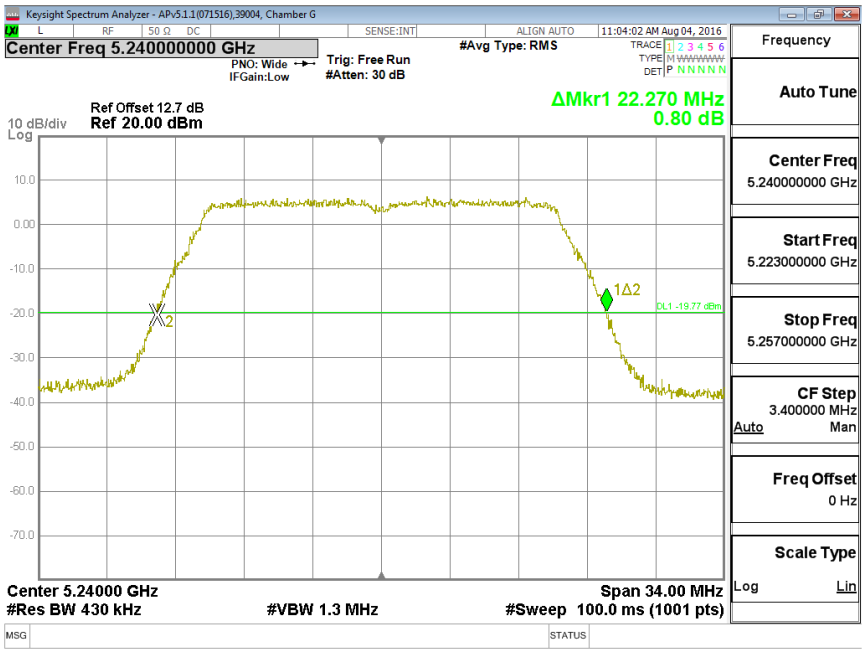
BANDWIDTH, LOW CH



BANDWIDTH, MID CH



BANDWIDTH, HIGH CH



8.3.2. 99% BANDWIDTH

LIMITS

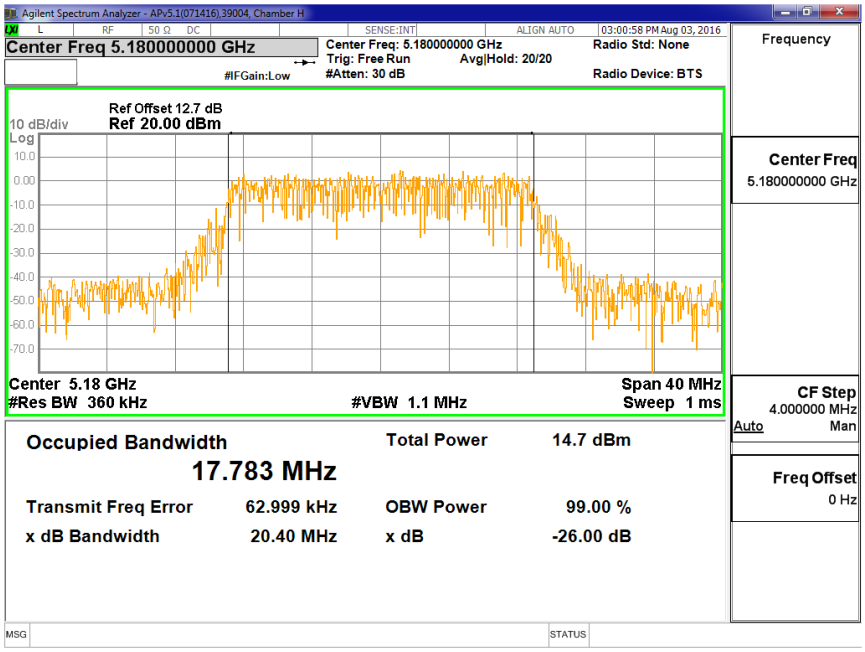
None; for reporting purposes only.

RESULTS

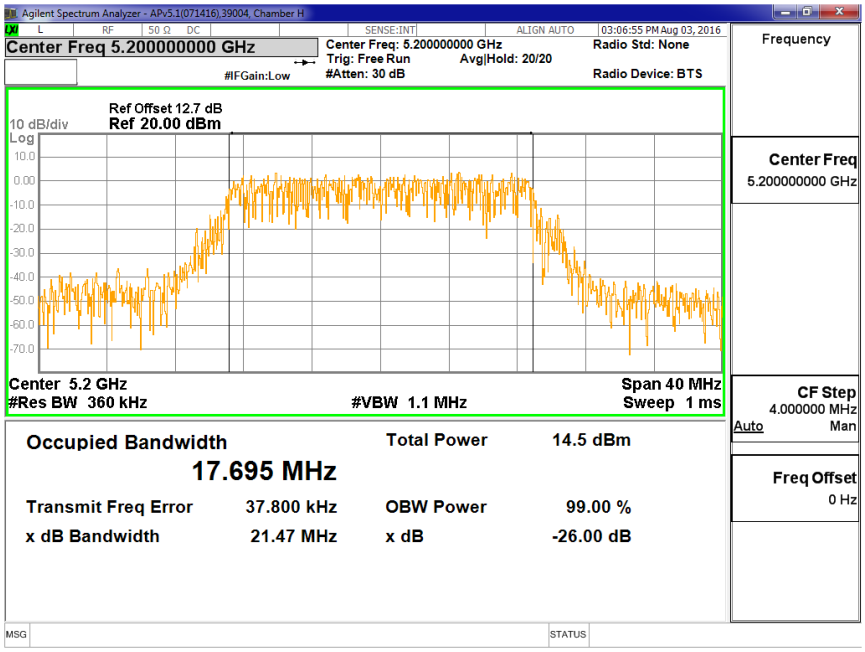
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	17.783	17.702
Mid	5200	17.695	17.849
High	5240	17.878	17.804

99% BANDWIDTH, CHAIN 0

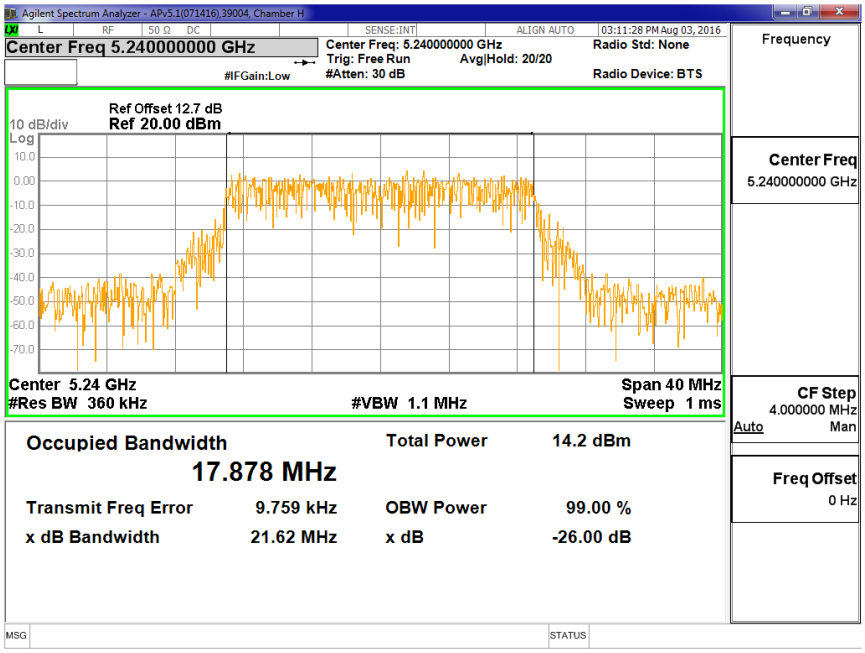
99% BANDWIDTH, LOW CH



99% BANDWIDTH, MID CH

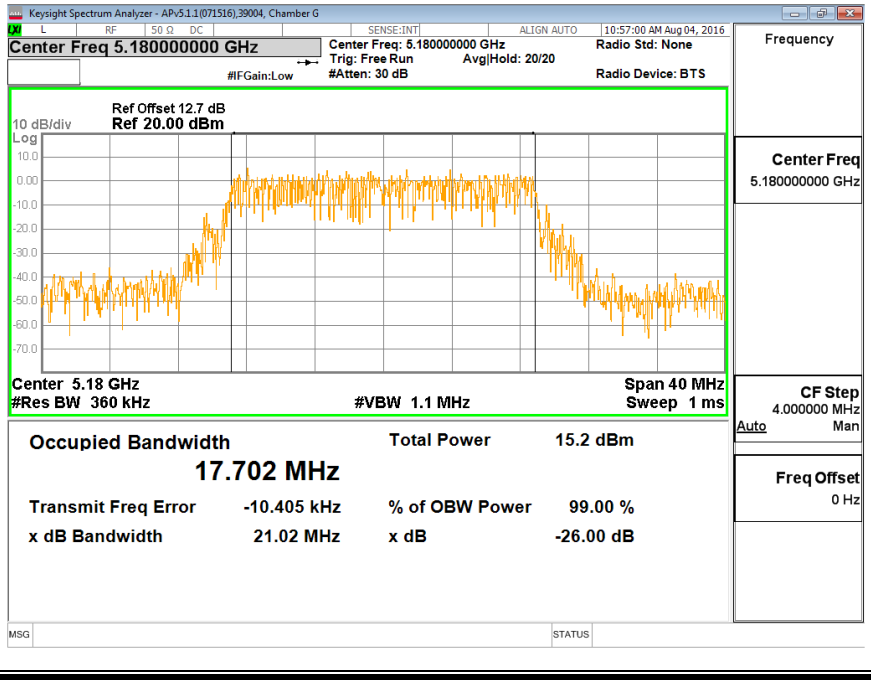


99% BANDWIDTH, HIGH CH

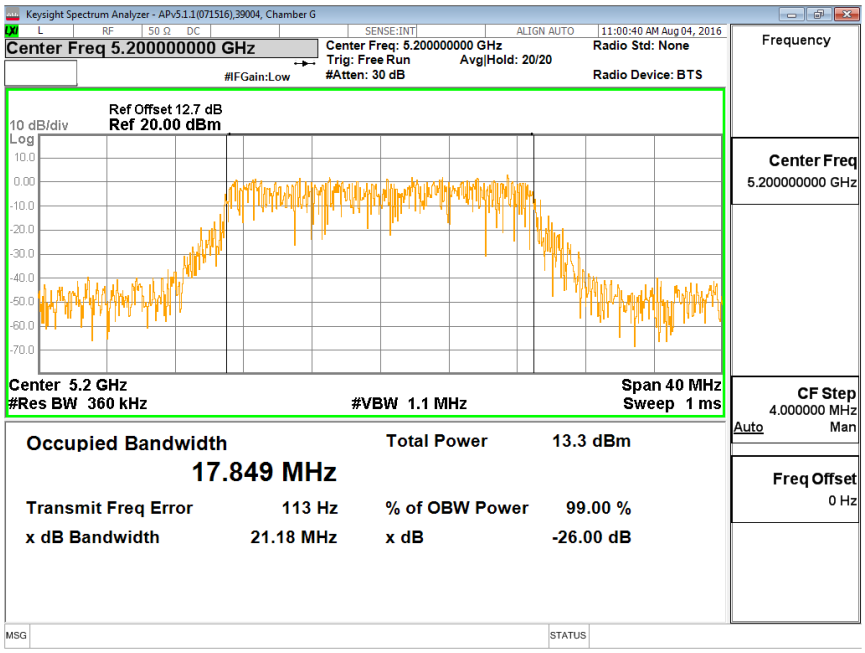


99% BANDWIDTH, CHAIN 1

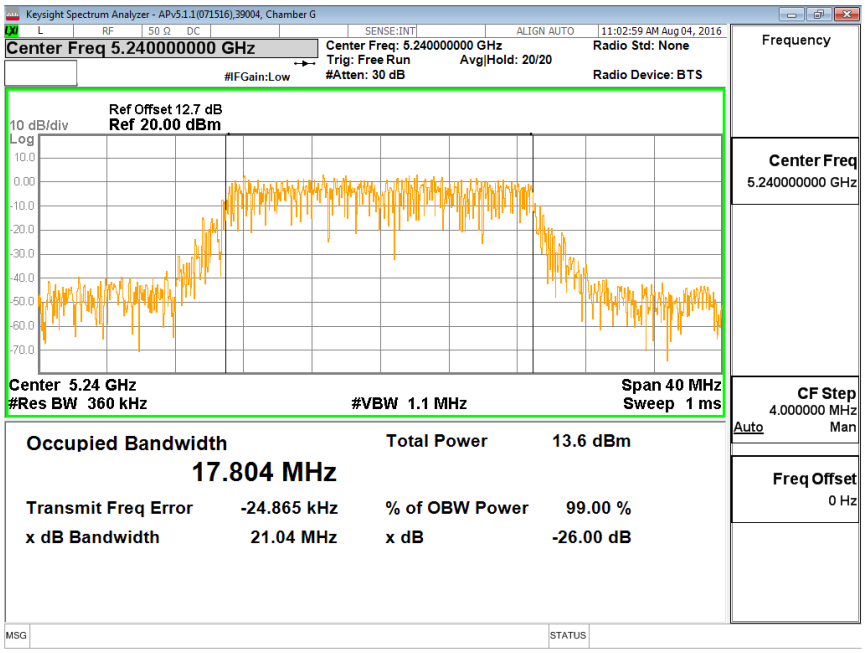
99% BANDWIDTH, LOW CH



99% BANDWIDTH, MID CH



99% BANDWIDTH, HIGH CH



8.3.3. AVERAGE POWER (FCC)

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

RESULTS

ID:	39004	Date:	9/2/16

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5180	11.89	11.92	14.92
Mid	5200	11.86	11.88	14.88
High	5240	11.92	11.90	14.92

8.3.4. OUTPUT POWER AND PSD (FCC)

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. 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).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. 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. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
6.60	7.00	6.80

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
6.60	7.00	9.81

RESULTS

ID:	39004	Date:	9/2/16

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5180	6.80	9.81	23.20	7.19
Mid	5200	6.80	9.81	23.20	7.19
High	5240	6.80	9.81	23.20	7.19

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

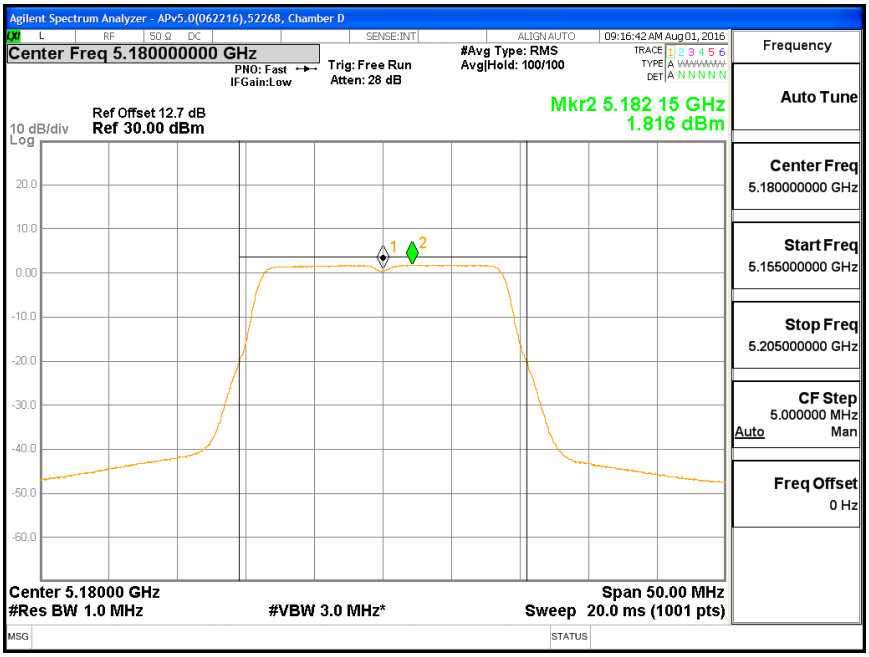
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	11.89	11.92	14.92	23.20	-8.28
Mid	5200	11.86	11.88	14.88	23.20	-8.32
High	5240	11.92	11.90	14.92	23.20	-8.28

PSD Results

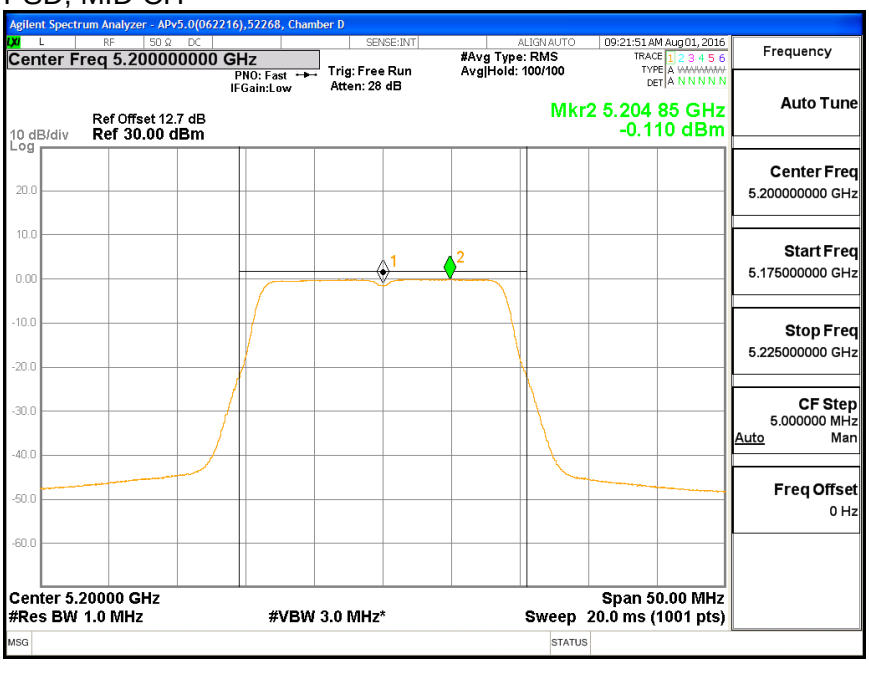
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	1.82	1.79	4.82	7.19	-2.37
Mid	5200	-0.11	-0.10	2.90	7.19	-4.29
High	5240	-0.01	-0.03	2.99	7.19	-4.20

PSD, CHAIN 0

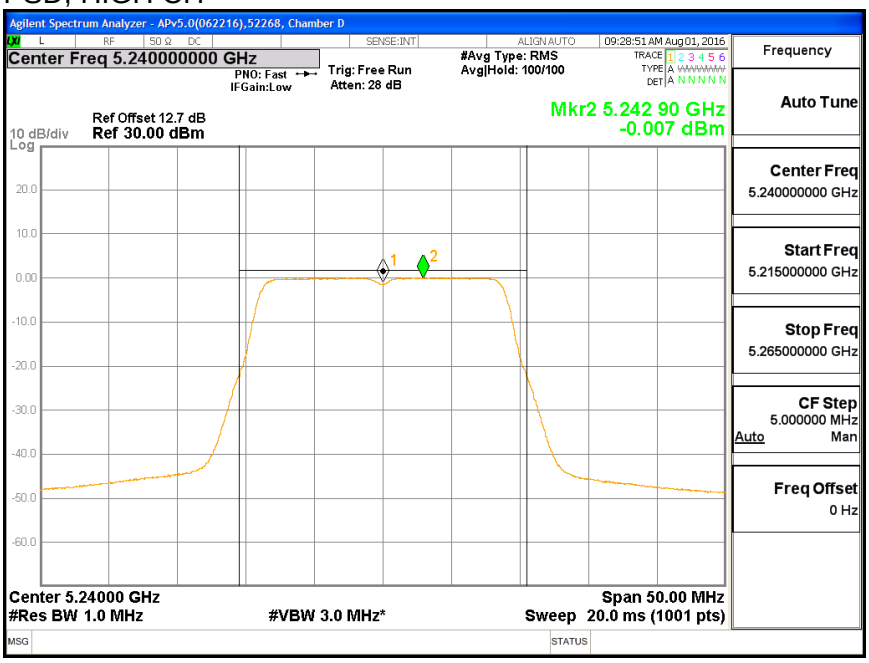
PSD, LOW CH
PSD WAS TESTED WITH HIGH POWER



PSD, MID CH

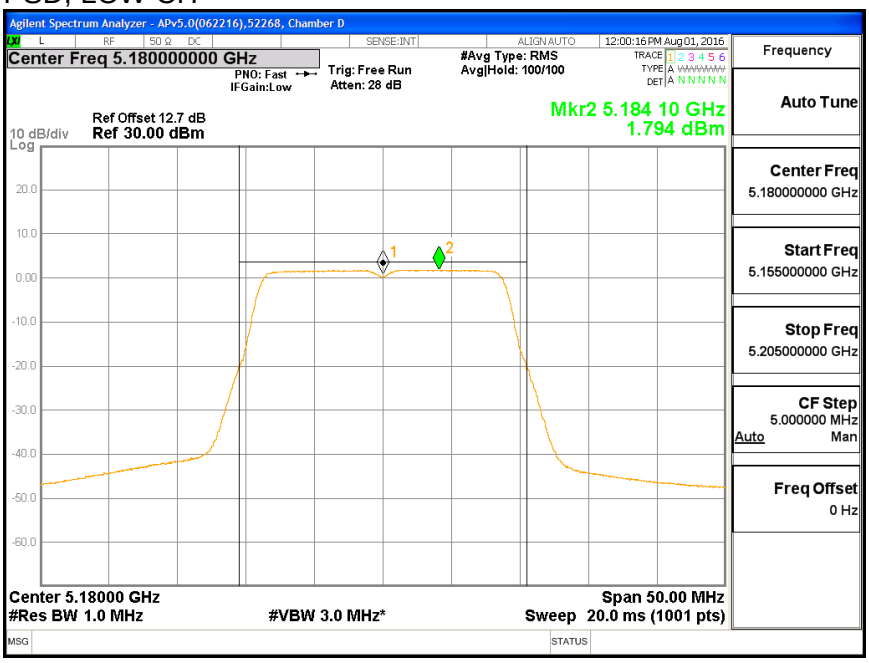


PSD, HIGH CH

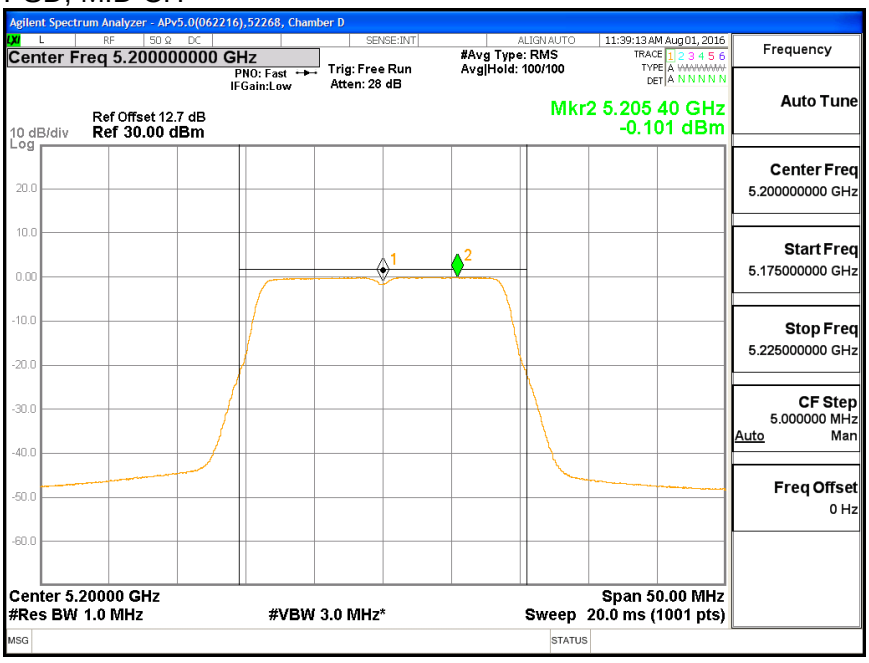


PSD, CHAIN 1

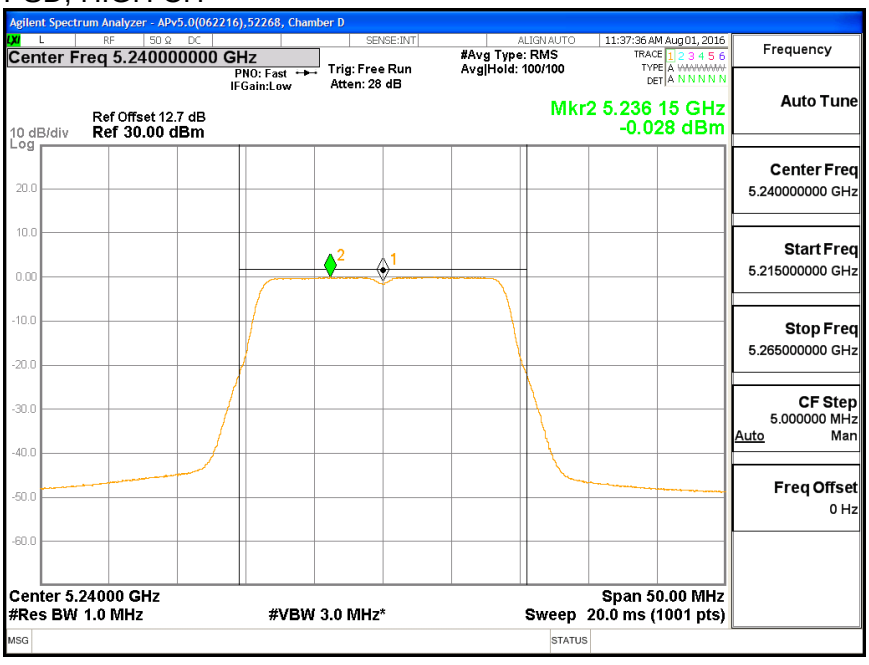
PSD, LOW CH



PSD, MID CH



PSD, HIGH CH



8.3.5. AVERAGE POWER (IC)

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

RESULTS

ID:	39004	Date:	9/2/16

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5180	4.89	4.91	7.91
Mid	5200	4.92	4.90	7.92
High	5240	4.86	4.87	7.87

8.3.6. OUTPUT POWER AND PSD (IC)

LIMITS

IC RSS-247 (6.2.1) (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST PROCEDURE

The transmitter output is connected to a power meter. The power meter was setup for a gated power measurement.

The cable assembly insertion loss of 12.7 dB (including 10 dB pad and 2.7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
6.60	7.00	6.80

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
6.60	7.00	9.81

RESULTS

ID:	39004	Date:	9/2/16

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)
Low	5180	17.78	6.80	9.81
Mid	5200	17.85	6.80	9.81
High	5240	17.88	6.80	9.81

Limits

Channel	Frequency (MHz)	IC EIRP Limit (dBm)	Max IC Power (dBm)	IC eirp PSD Limit (dBm)	Max IC PSD (dBm)
Low	5180	22.50	15.70	10.00	0.19
Mid	5200	22.52	15.72	10.00	0.19
High	5240	22.52	15.72	10.00	0.19

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

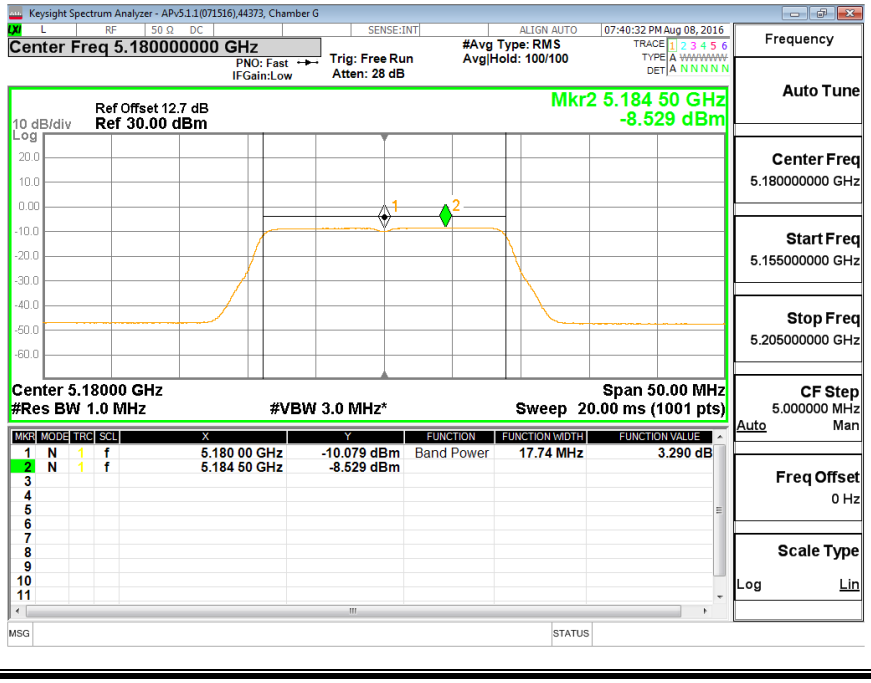
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	4.89	4.91	7.91	15.70	-7.79
Mid	5200	4.92	4.90	7.92	15.72	-7.80
High	5240	4.86	4.87	7.87	15.72	-7.85

PSD Results

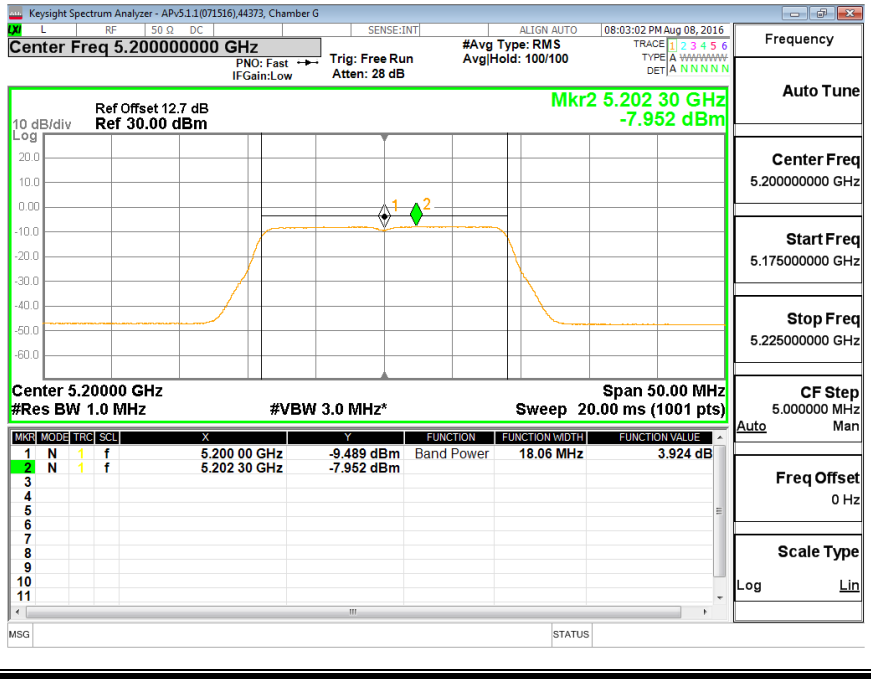
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	-8.53	-5.34	-3.64	0.19	-3.83
Mid	5200	-7.95	-5.23	-3.37	0.19	-3.56
High	5240	-7.00	-5.31	-3.06	0.19	-3.25

PSD, CHAIN 0

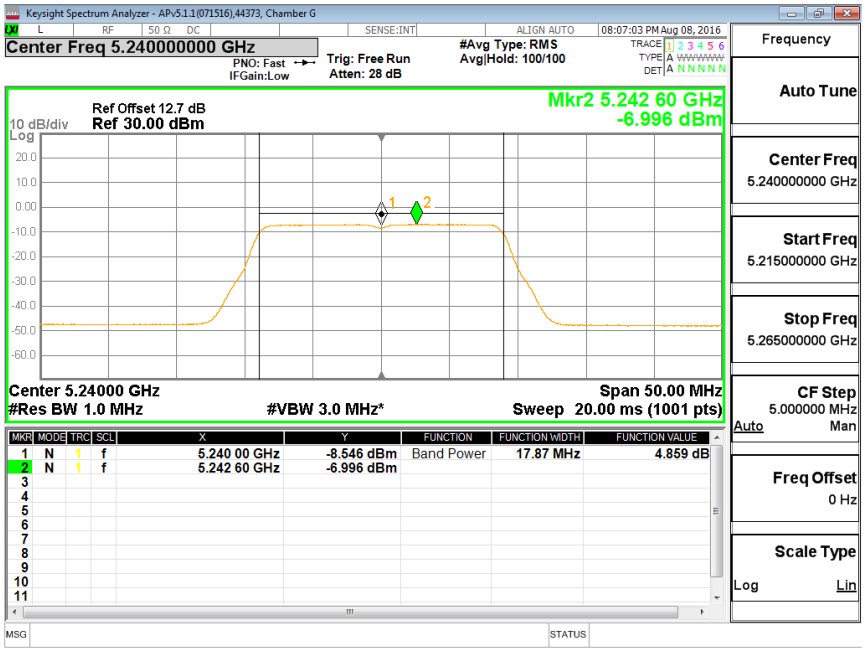
PSD, LOW CH



PSD, MID CH

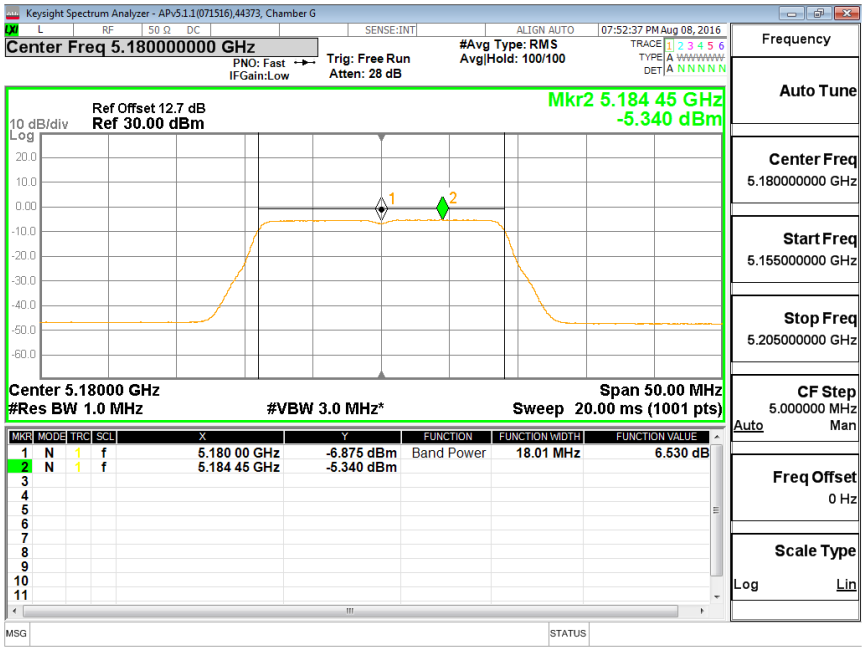


PSD, HIGH CH

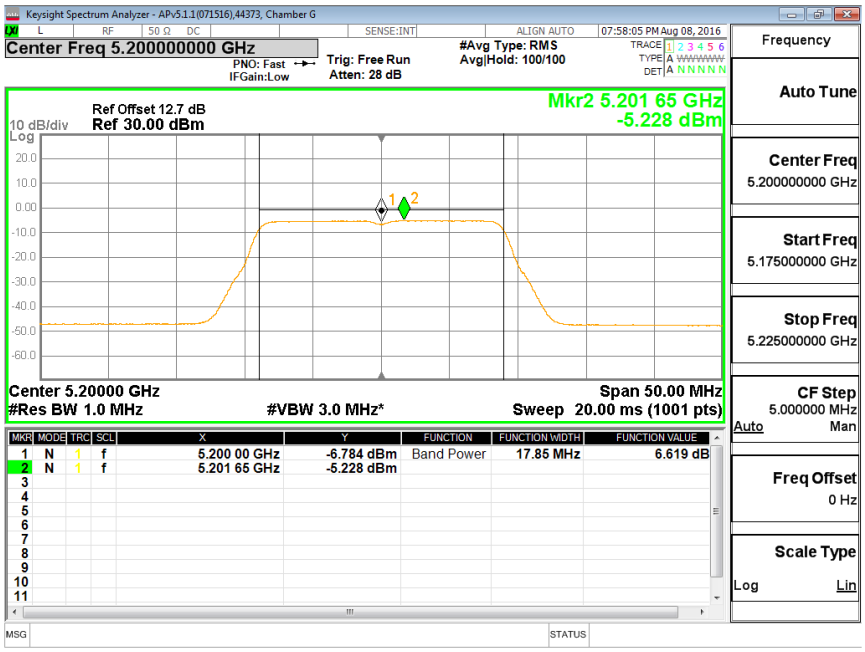


PSD, CHAIN 1

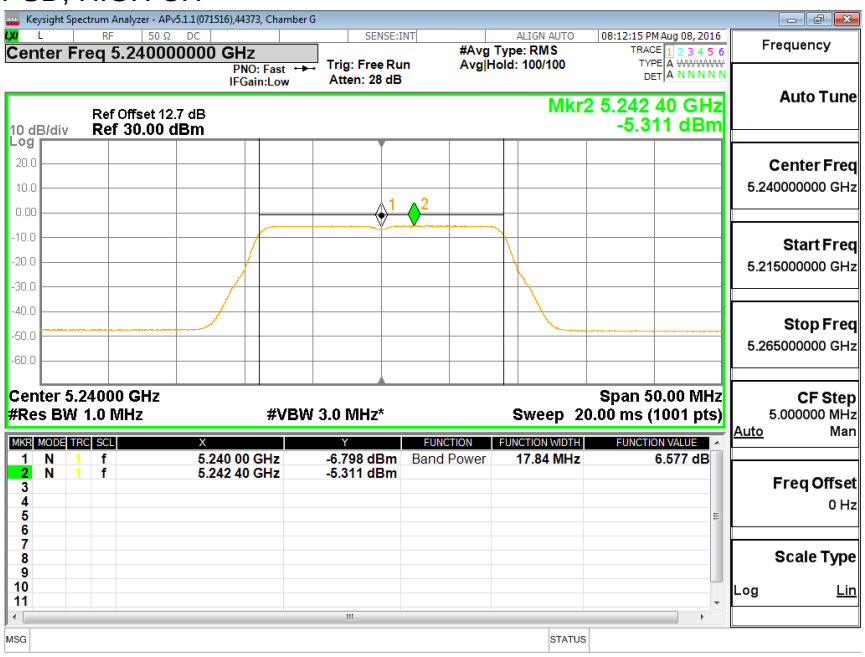
PSD, LOW CH



PSD, MID CH



PSD, HIGH CH



8.4. 802.11n HT20 2Tx STBC MODE IN THE 5.2 GHz BAND

8.4.1. 26 dB BANDWIDTH

LIMITS

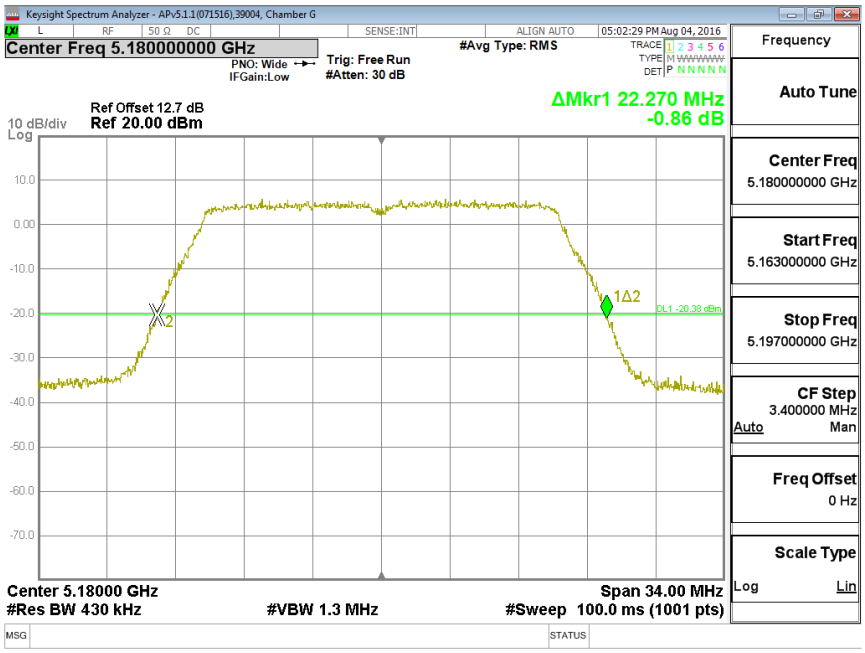
None; for reporting purposes only.

RESULTS

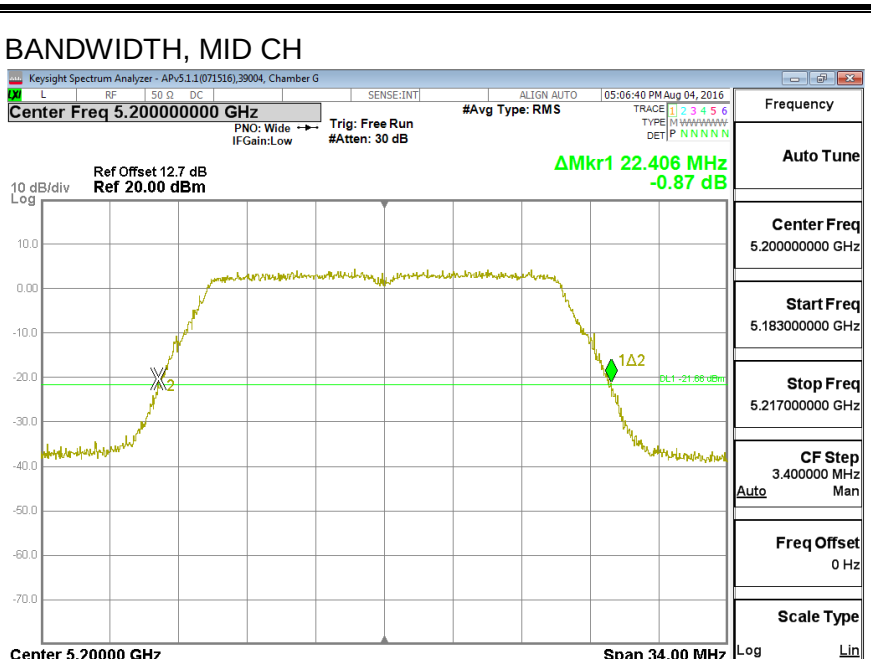
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5180	22.270	22.236
Mid	5200	22.406	22.270
High	5240	22.372	22.270

26 DB BANDWIDTH, CHAIN 0

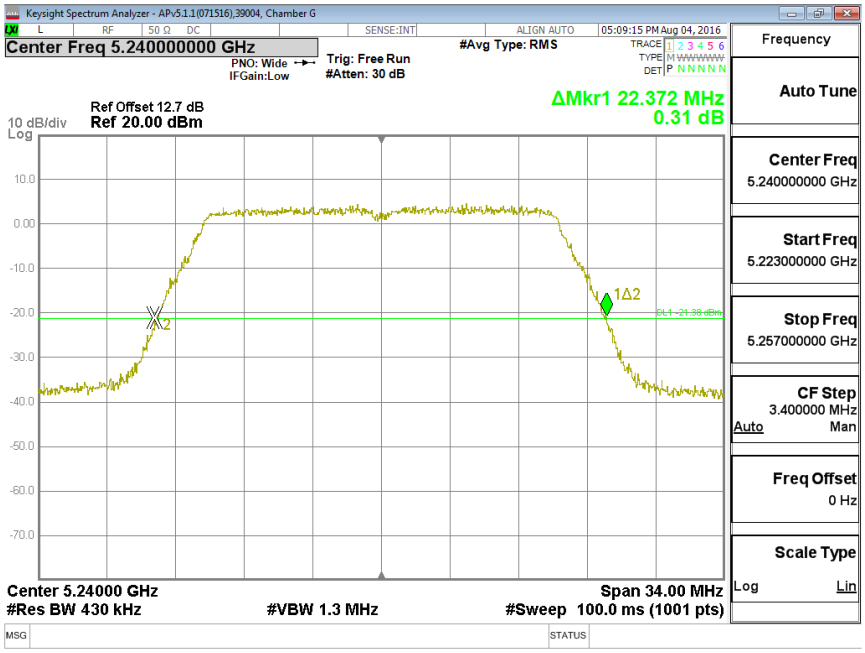
BANDWIDTH, LOW CH



BANDWIDTH, MID CH

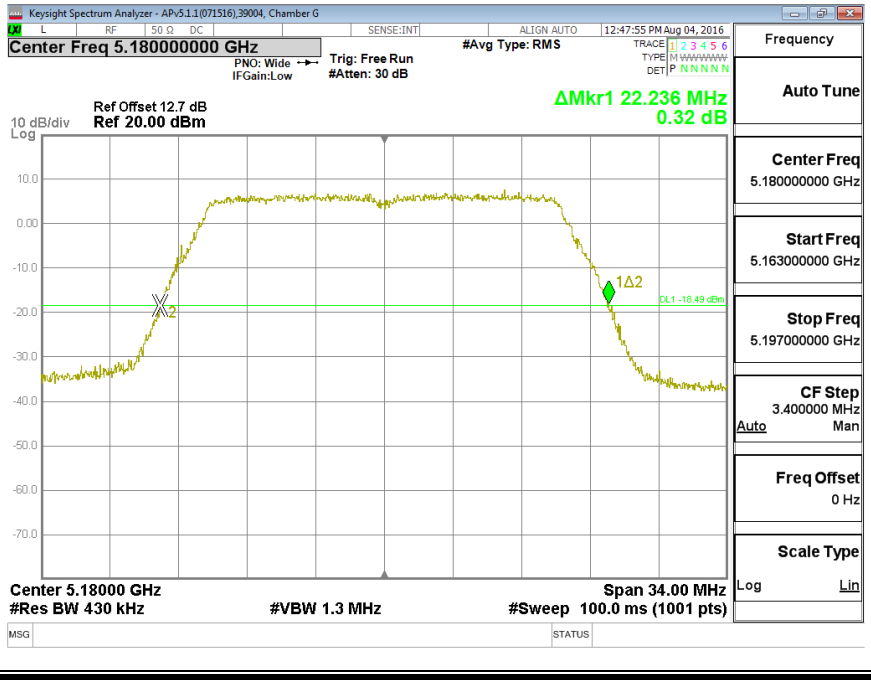


BANDWIDTH, HIGH CH

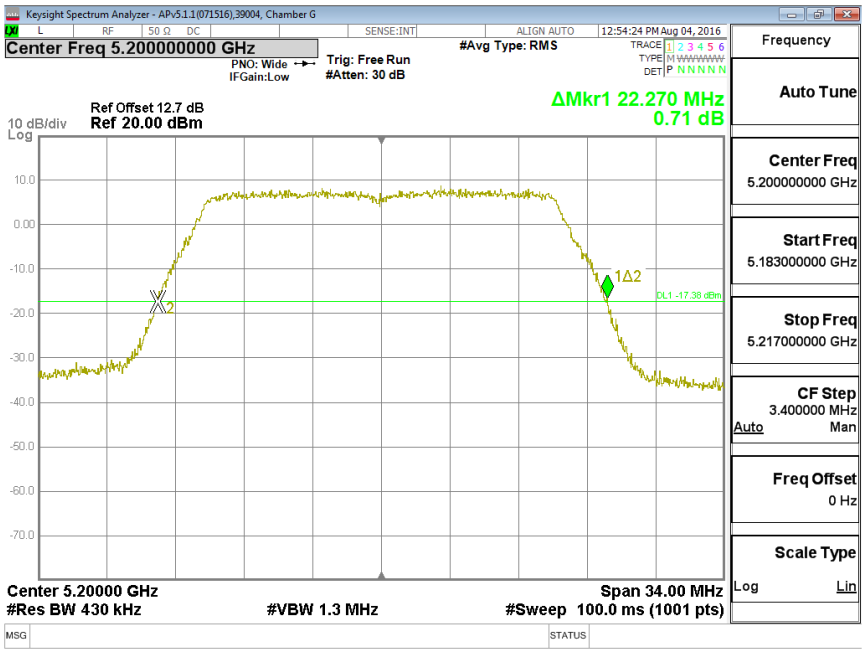


26 DB BANDWIDTH, CHAIN 1

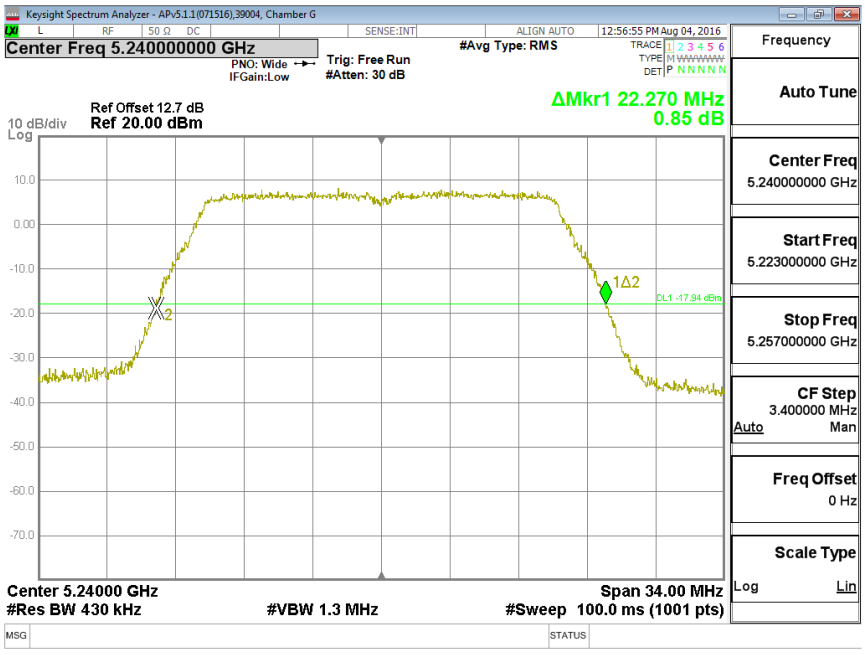
BANDWIDTH, LOW CH



BANDWIDTH, MID CH



BANDWIDTH, HIGH CH



8.4.2. 99% BANDWIDTH

LIMITS

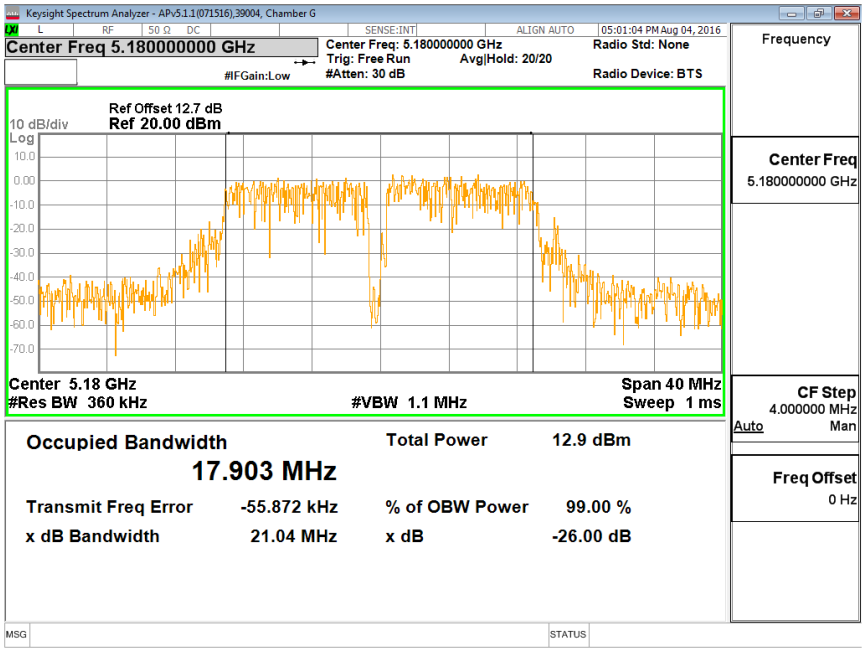
None; for reporting purposes only.

RESULTS

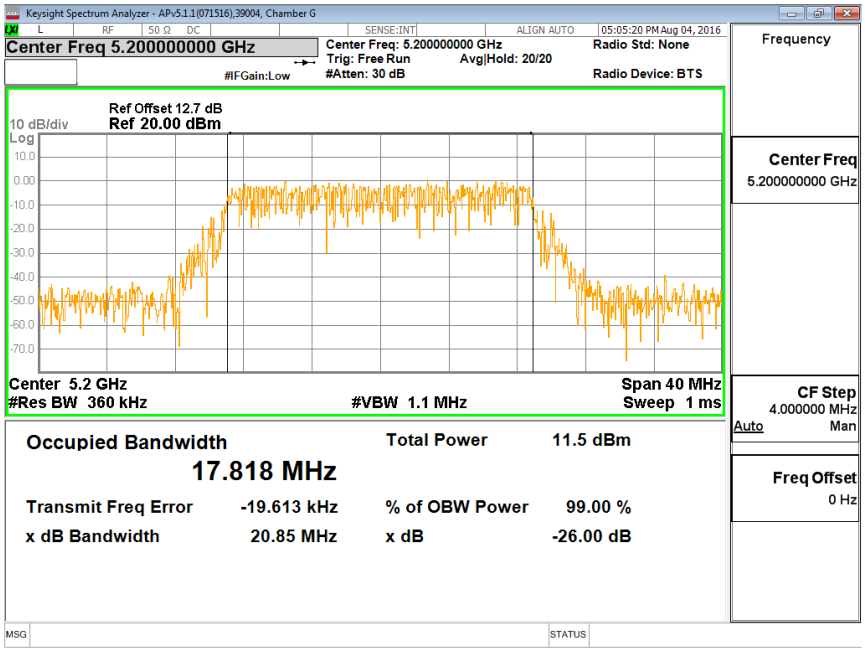
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	17.903	17.816
Mid	5200	17.818	17.958
High	5240	17.863	17.896

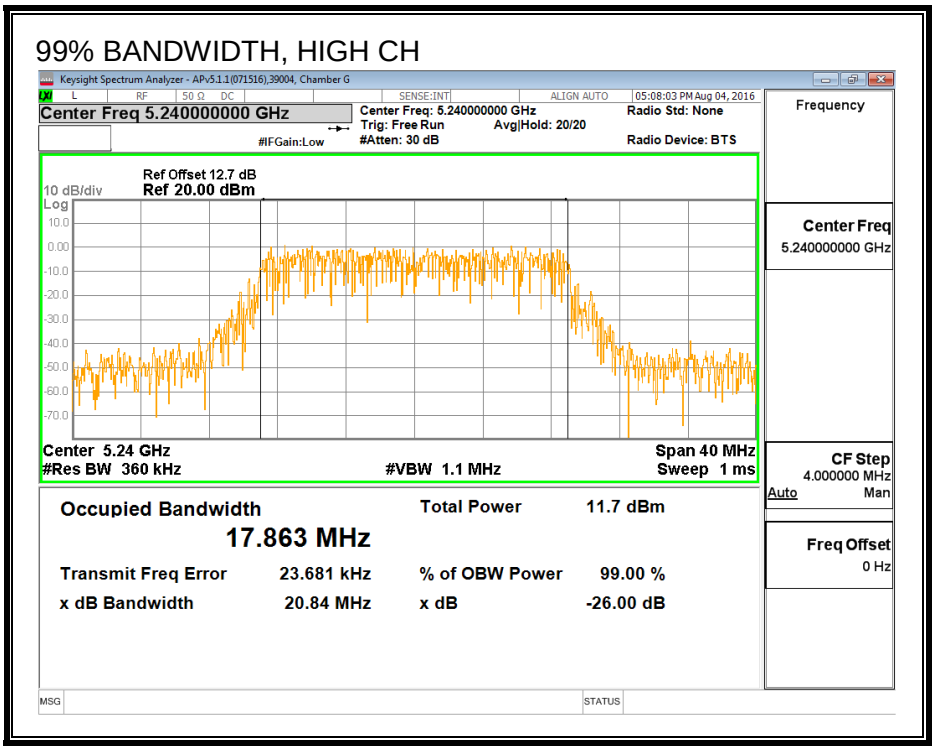
99% BANDWIDTH, CHAIN 0

99% BANDWIDTH, LOW CH



99% BANDWIDTH, MID CH





99% BANDWIDTH, CHAIN 1