

FCC 47 CFR PART 15 SUBPART E

CERTIFICATION TEST REPORT

FOR

Bluetooth & 802.11 a/b/g/n/ac 3x3 VIDEO SET TOP BOX

MODEL NUMBER: IPSTB1000, IPC3100

FCC ID: 2ABTE-8G2XL5

REPORT NUMBER: 15U22443-E3V2

ISSUE DATE: 3/16/2016

Prepared for Verizon Online, LLC 1300 I STREET, NW WASHINGTON, DC 20005, USA

Prepared by UL VERIFICATION SERVICES INC. 47173 BENICIA STREET FREMONT, CA 94538, U.S.A. TEL: (510) 771-1000 FAX: (510) 661-0888

(R)

NVLAP LAB CODE 200065-0

Revision History

| Rev. | lssue Date | Revisions | Revised By |
|------|---------------|---|-------------|
| V1 | 2/12/2016 | Initial Issue | C. VERGONIO |
| V2 | 3/16/2016 | Added Below 30 MHz data in Section 10.28, Updated Section 1, Section 3 and setup photo in Section 12. | C. VERGONIO |

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1. ATTESTATION OF TEST RESULTS

| COMPANY NAME: | VERIZON ONLINE, LLC 1300 I STREET, NW WASHINGTON, DC 20005, USA |
|------------------|---|
| EUT DESCRIPTION: | Bluetooth & 802.11 a/b/g/n/ac 3x3 Video Set Top Box |
| MODEL: | IPSTB1000, IPC3100 |
| SERIAL NUMBER: | MCNZ5Dg60018, MCNZ5Dd20040, MCNZ5Dd20056 |
| DATE TESTED: | December 25, 2015 – March 16, 2016 |
| | APPLICABLE STANDARDS |

| APPLICABLE STANDARDS | | | | |
|--------------------------|--------------|--|--|--|
| STANDARD | TEST RESULTS | | | |
| CFR 47 Part 15 Subpart E | 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:

Tested By:

CHARLES VERGONIO CONSUMER TECHNOLOGY DICISION WISE ENGINEER UL VERIFICATION SERVICES INC.

JONATHAN HSU CONSUMER TECHNOLOGY DICISION WISE LAB ENGINEER UL VERIFICATION SERVICES INC.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, and ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

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.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

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

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4.3. MEASUREMENT UNCERTAINTY

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

| PARAMETER | UNCERTAINTY |
|--|-------------|
| Conducted Disturbance, 0.15 to 30 MHz | 3.52 dB |
| Radiated Disturbance, 9KHz to 30 MHz | 2.14 dB |
| Radiated Disturbance, 30 to 1000 MHz | 4.98 dB |
| Radiated Disturbance,1000 to 6000 MHz | 3.86 dB |
| Radiated Disturbance,6000 to 18000 MHz | 4.23 dB |
| Radiated Disturbance, 18000 to 26000 MHz | 5.30 dB |
| Radiated Disturbance,26000 to 40000 MHz | 5.23 dB |

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Bluetooth and 802.11 a/b/g/n/ac 3x3 Video Set Top Box.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

5.2 GHz BAND

| Frequency Range (MHz) | Mode | Power, Chain 0 (dBm) | Power, Chain 1 (dBm) | Power, Chain 2 (dBm) | Output Power (dBm) | Output Power (mW) | |
|--------------------------|--------------------|----------------------------|----------------------------|----------------------------|--------------------------|----------------------|--|
| 5.2 GHz band, 1TX | | | | | | | |
| 5180 - 5240 | 802.11a | N/A | 17.08 | N/A | 17.08 | 51.05 | |
| 5180 - 5240 | 802.11n HT20 | N/A | 16.97 | N/A | 16.97 | 49.77 | |
| 5190 - 5230 | 802.11n HT40 | 17.97 | N/A | N/A | 17.97 | 62.66 | |
| 5.2 GHz band, 3TX | 5.2 GHz band, 3TX | | | | | | |
| 5180 - 5240 | 802.11n HT20 CDD | 15.17 | 14.70 | 14.80 | 19.67 | 92.597 | |
| 5190 - 5230 | 802.11n HT40 CDD | 13.21 | 12.67 | 12.60 | 17.61 | 57.631 | |
| 5210 | 802.11ac VHT80 CDD | 9.96 | 9.20 | 9.00 | 14.18 | 26.169 | |

5.3 GHz BAND

| Frequency Range (MHz) | Mode | Power, Chain 0 (dBm) | Power, Chain 1 (dBm) | Power, Chain 2 (dBm) | Output Power (dBm) | Output Power (mW) | |
|--------------------------|--------------------|----------------------------|----------------------------|----------------------------|--------------------------|----------------------|--|
| 5.3 GHz band, 1TX | | | | | | | |
| 5260 - 5320 | 802.11a | N/A | 17.30 | N/A | 17.30 | 53.70 | |
| 5260 - 5320 | 802.11n HT20 | N/A | 17.37 | N/A | 17.37 | 54.58 | |
| 5270 - 5310 | 802.11n HT40 | 18.00 | N/A | N/A | 18.00 | 63.10 | |
| 5.3 GHz band, 3TX | 5.3 GHz band, 3TX | | | | | | |
| 5260 - 5320 | 802.11n HT20 CDD | 14.53 | 14.21 | 14.00 | 19.02 | 79.86 | |
| 5270 - 5310 | 802.11n HT40 CDD | 13.45 | 13.02 | 12.81 | 17.87 | 61.27 | |
| 5290 | 802.11ac VHT80 CDD | 11.74 | 11.07 | 11.01 | 16.06 | 40.34 | |

5.6 GHz BAND

| Frequency Range (MHz) | Mode | Power, Chain 0 (dBm) | Power, Chain 1 (dBm) | Power, Chain 2 (dBm) | Output Power (dBm) | Output Power (mW) | |
|--------------------------|--------------------|----------------------------|----------------------------|----------------------------|--------------------------|----------------------|--|
| 5.6 GHz band, 1TX | | | | | | | |
| 5500-5700 | 802.11a | N/A | 17.87 | N/A | 17.87 | 61.24 | |
| 5500-5700 | 802.11n HT20 | N/A | 17.97 | N/A | 17.97 | 62.66 | |
| 5510-5670 | 802.11n HT40 | N/A | 17.97 | N/A | 17.97 | 62.66 | |
| 5.6 GHz band, 3TX | 5.6 GHz band, 3TX | | | | | | |
| 5500-5700 | 802.11n HT20 CDD | 16.12 | 16.08 | 15.63 | 20.72 | 118.04 | |
| 5510-5670 | 802.11n HT40 CDD | 18.89 | 18.44 | 17.92 | 23.21 | 209.21 | |
| 5530 | 802.11ac VHT80 CDD | 18.65 | 18.05 | 17.70 | 22.92 | 195.99 | |

5.8 GHz BAND

| Frequency Range (MHz) | Mode | Power, Chain 0 (dBm) | Power, Chain 1 (dBm) | Power, Chain 2 (dBm) | Output Power (dBm) | Output Power (mW) |
|--------------------------|--------------------|----------------------------|----------------------------|----------------------------|--------------------------|----------------------|
| 5.8 GHz band, 1TX | | | | | | |
| 5745-5825 | 802.11a | N/A | 18.97 | N/A | 18.97 | 78.89 |
| 5755-5795 | 802.11n HT20 | N/A | 18.01 | N/A | 18.01 | 63.24 |
| 5775 | 802.11n HT40 | N/A | 18.23 | N/A | 18.23 | 66.53 |
| 5.8 GHz band, 3TX | | | | | | |
| 5745-5825 | 802.11n HT20 CDD | 17.46 | 16.81 | 17.54 | 22.05 | 160.45 |
| 5755-5795 | 802.11n HT40 CDD | 17.90 | 17.31 | 18.00 | 22.52 | 178.58 |
| 5775 | 802.11ac VHT80 CDD | 11.81 | 11.00 | 11.86 | 16.35 | 43.11 |

STRADDLE CHANNELS

| Frequency Range (MHz) | Mode | Power, Chain 0 (dBm) | Power, Chain 1 (dBm) | Power, Chain 2 (dBm) | Output Power (dBm) | Output Power (mW) | | | |
|---|---|----------------------------|----------------------------|----------------------------|--------------------------|----------------------|--|--|--|
| 5.6 GHz band, 1TX (Channels overlapping UNII-2C and UNII-3) | | | | | | | | | |
| 5720 (Whole signal) | 802.11a | N/A | 17.91 | N/A | 17.91 | 61.80 | | | |
| 5720 (Whole signal) | 802.11n HT20 | N/A | 17.89 | N/A | 17.89 | 61.52 | | | |
| 5710 (Whole signal) | 802.11n HT40 | N/A | 18.42 | N/A | 18.42 | 69.50 | | | |
| 5.6 GHz band, 3TX (Cha | 5.6 GHz band, 3TX (Channels overlapping UNII-2C and UNII-3) | | | | | | | | |
| 5720 (Whole signal) | 802.11n HT20 CDD | 15.81 | 15.89 | 15.21 | 20.42 | 110.11 | | | |
| 5710 (Whole signal) | 802.11n HT40 CDD | 18.71 | 18.78 | 18.91 | 23.57 | 227.61 | | | |
| 5690 (Whole signal) | 802.11ac VHT80 CDD | 18.33 | 18.12 | 18.04 | 22.94 | 196.62 | | | |

List of test reduction and modes covering other modes:

| Antenna Port Testing | | | | | | |
|----------------------|------------------------------|------------------------|--|--|--|--|
| Band | Mode | Covered by | | | | |
| 5 GHz bands | 802.11n HT20 1TX | 802.11n HT20 CDD 3TX | | | | |
| 5 GHz bands | 802.11n HT20 CDD/SDWSTBC 2TX | 802.11n HT20 CDD 3TX | | | | |
| 5 GHz bands | 802.11n HT20 STBC 3TX | 802.11n HT20 CDD 3TX | | | | |
| 5 GHz bands | 802.11n HT40 1TX | 802.11n HT40 CDD 3TX | | | | |
| 5 GHz bands | 802.11n HT40 CDD/SDWSTBC 2TX | 802.11n HT40 CDD 3TX | | | | |
| 5 GHz bands | 802.11n HT40 STBC 3TX | 802.11n HT40 CDD 3TX | | | | |
| 5 GHz bands | 802.11ac VHT80 STBC 3TX | 802.11ac VHT80 CDD 3TX | | | | |

| | Radiated Testing | | | | | | |
|-------------|--------------------------------|------------------------|--|--|--|--|--|
| Band | Mode | Covered by | | | | | |
| 5 GHz bands | 802.11n HT20 CDD/SDWSTBC 2TX | 802.11n HT20 CDD 3TX | | | | | |
| 5 GHz bands | 802.11n HT20 STBC 3TX | 802.11n HT20 CDD 3TX | | | | | |
| 5 GHz bands | 802.11n HT40 CDD/SDWSTBC 2TX | 802.11n HT40 CDD 3TX | | | | | |
| 5 GHz bands | 802.11n HT40 STBC 3TX | 802.11n HT40 CDD 3TX | | | | | |
| 5 GHz bands | 802.11ac VHT80 CDD/SDWSTBC 2TX | 802.11ac VHT80 CDD 3TX | | | | | |
| 5 GHz bands | 802.11ac VHT80 STBC 3TX | 802.11ac VHT80 CDD 3TX | | | | | |

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5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes the following antenna:

| No. | Antenna Type | Peak gain@ 5150-5250MHz | Peak gain@ 5250-5350MHz | Peak gain@ 5470-5725MHz | Peak gain@ 5725 - 5850MHz |
|-----|--------------|----------------------------|----------------------------|----------------------------|---------------------------------|
| 1 | Chip Antenna | 4.45 | 4.77 | 3.77 | 4.56 |
| 2 | Chip Antenna | 3.96 | 3.92 | 3.46 | 3.27 |
| 3 | Chip Antenna | 2.9 | 3.23 | 1.88 | 2.89 |

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was Broadcom, rev. 7.14.124.54 (R585938 BCMINT).

The EUT driver software installed during testing was Broadcom, rev. 7.14RC124.54.

The test utility software used during testing was Broadcom MTool, rev. 2.0.2.6.

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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.

The EUT can only be setup in desktop orientation; therefore, all radiated testing was performed with the EUT in desktop orientation.

Radiated emission below 1GHz, above 18GHz, 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 5GHz, band edge preliminary investigation showed that antenna port J0, horizontal polarization was worst case.

Worst-case chains as provided by the client were:

For SISO modes:

- 5.2 GHz, 5.3 GHz band: chain 1 (connector J1) was tested for 11a, and 11n H20 modes; chain 0 (connector J0) was tested for 11n HT40 mode
- 5.6 GHz, 5.8 GHz: chain 1 (connector J1) was tested for 11a, 11n HT20, and 11n HT40 modes.

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 VHT80 mode: MCS0

Radiated emissions for EUT with antenna was performed and passed; therefore, antenna port spurious was not performed.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

| Support Equipment List | | | | | | | |
|------------------------|--------------|------------------|-----------------|--------|--|--|--|
| Description | Manufacturer | Model | Serial Number | FCC ID | | | |
| AC Adapter | Delta | IPSTB1000-PS | HSPD5A6001R | N/A | | | |
| Laptop | HP | Elite Book 8440P | CND0451B4G | N/A | | | |
| Laptop AC Adapter | HP | РРР016Н | F1-09090462500A | N/A | | | |
| Laptop | НР | Elite Book 2560P | CNU2092200 | N/A | | | |
| Laptop AC Adapter | HP | PPP0017H | F3-07100545060C | N/A | | | |

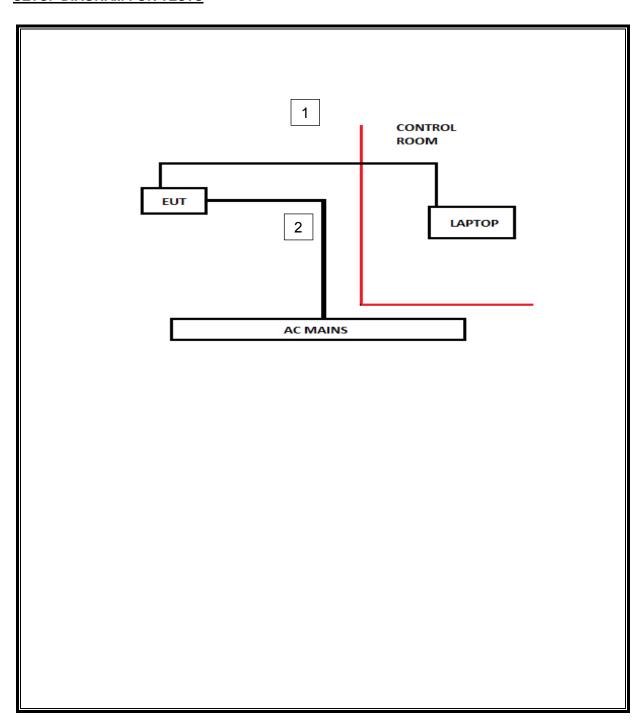
I/O CABLES

| | I/O Cable List | | | | | | | |
|-------|----------------|----------------|-----------|------------|------------|---------|--|--|
| Cable | Port | # of identical | Connector | Cable Type | Cable | Remarks | | |
| No | | ports | Туре | | Length (m) | | | |
| 1 | RJ45 | 1 | RJ45 | Unshielded | 1.2 | N/A | | |
| 2 | AC | 1 | 2-Prong | Unshielded | 1.5 | N/A | | |

TEST SETUP

The EUT was tested stand alone and the communication was established via RJ45 cable between EUT and support laptop. Test software exercised the radio.

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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 | T Number | Cal Due | | | |
| Antenna, Biconolog, 30MHz-1 GHz | Sunol Sciences | JB1 | 477 | 06/10/16 | | | |
| Antenna, Horn, 18GHz | ETS Lindgren | 3117 | 136 | 03/03/16 | | | |
| Antenna, Horn, 26.5 GHz | ARA | MWH-1826/B | 447 | 05/12/16 | | | |
| RF Preamplifier, 1GHz - 18GHz | Miteq | NSP4000-SP2 | 88 | 04/07/16 | | | |
| RF Preamplifier, 1GHz - 26.5GHz | НР | 8449B | 404 | 06/29/16 | | | |
| Spectrum Analyzer, PXA, 3 Hz to 44 GHz | Keysight | N9030A | PRE0126762 | 12/08/16 | | | |
| Spectrum Analyzer, PXA, 3 Hz to 44 GHz | Keysight | E4446A | 99 | 06/10/16 | | | |
| EMI Test Receiver, 9 KHz to 7 GHz | Rohde & Schwarz | ECSI7 | 284 | 09/10/16 | | | |
| Peak Power Meter | Agilent / HP | N1911A | 229 | 07/30/16 | | | |
| Peak / Average Power Sensor | Keysight | N1921A | 1225 | 07/06/16 | | | |
| LISN for Conducted Emission | Ficher | FCC-LISN-50/250- | 1310 | 9/16/2016 | | | |
| Reject Filter, 2.4GHz | Micro-Tronics | BRM50702 | 160 | CNR | | | |
| Low Pass Filter 5GHz | Micro-Tronics | LPS17541 | 417 | 05/04/16 | | | |
| High Pass Filter 6GHz | Micro-Tronics | HPS17542 | 893 | 04/25/16 | | | |
| High Pass Filter 3GHz | Micro-Tronics | HPS17543 | 898 | 04/25/16 | | | |

| Test Software List | | | | | | |
|-----------------------|--------------|--------|-------------------------|--|--|--|
| Description | Manufacturer | Model | Version | | | |
| Radiated Software | UL | UL EMC | Ver 9.5, June 24, 2015 | | | |
| Conducted Software | UL | UL EMC | Ver 9.5, May 26, 2015 | | | |
| Antenna Port Software | UL | UL RF | Ver 3.9.1, Dec 28, 2015 | | | |

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7. SUMMARY TABLE

| FCC Part Section | Test Description | Test Limit | Test Condition | Test Result |
|------------------------|--|------------------|-------------------|----------------|
| 15.407 (a) | Occupied Band width (26dB) | N/A | | Pass |
| 15.407 | 6dB Band width (5.8Ghz) | 500KHz | | Pass |
| 15.407 (a)(1) | TX Cond. Power, 5.15-5.25 | <24dBm | | Pass |
| 15.407 (a)(2) | TX Cond. Power, 5.25-5.35 & 5.47-5.725 | <24dBm | Conducted | Pass |
| 15.407 (a)(3) | TX Cond. Power 5.725-5.825 | < 30dBm | | Pass |
| 15.407 (a)(1) | PSD (5.1GHz) | <11dBm | | Pass |
| 15.407 (a)(5) | PSD (5.3,5.5GHz) | <11dBm | | Pass |
| 15.407 (a)(5) | PSD (5.8GHz) | 30dBm per 500kHz | | Pass |
| 15.207 (a) | AC Power Line conducted emissions | Section 10 | Radiated | Pass |
| 15.407 (b) & 15.209 | Radiated Spurious Emission | < 54dBuV/m | raulated | Pass |

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8. MEASUREMENT METHODS

On Time and Duty Cycle: KDB 789033 D02 v01, Section B.

6 dB Emission BW: KDB 789033 D02 v01r01, Section C.

26 dB Emission BW: KDB 789033 D02 v01r01, Section C.

<u>99% Occupied BW</u>: KDB 789033 D02 v01r01, Section D.

Conducted Output Power: KDB 789033 D02 v01r01, Section E.3.b (Method PM-G), and KDB 662911 D01 v02r01.

Power Spectral Density: KDB 789033 D02 v01r01, Section F, and KDB 662911 D01 v02r01.

<u>Unwanted emissions in restricted bands</u>: KDB 789033 D02 v01r01, Sections G.3, G.4, G.5, and G.6.

<u>Unwanted emissions in non-restricted bands</u>: KDB 789033 D02 v01r01, Sections G.3, G.4, and G.5.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

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9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

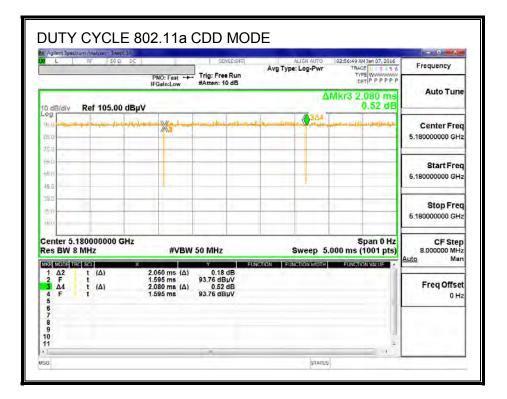
PROCEDURE

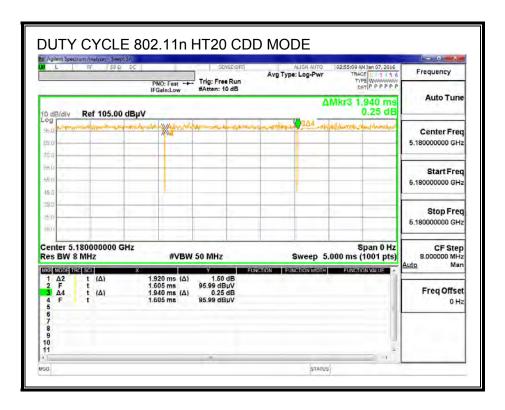
KDB 789033 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

| Mode | ON Time | Period | Duty Cycle | Duty | Duty Cycle | 1/B |
|--------------------|----------------|--------|-------------------|--------|--------------------------|-------------|
| | В | | x | Cycle | Correction Factor | Minimum VBW |
| | (msec) | (msec) | (linear) | (%) | (dB) | (kHz) |
| 802.11a CDD | 2.060 | 2.080 | 0.990 | 99.04% | 0.00 | 0.010 |
| 802.11n HT20 CDD | 1.920 | 1.940 | 0.990 | 98.97% | 0.00 | 0.010 |
| 802.11n HT40 CDD | 0.944 | 0.962 | 0.981 | 98.13% | 0.00 | 0.010 |
| 802.11ac VHT80 CDD | 0.460 | 0.478 | 0.962 | 96.23% | 0.17 | 2.174 |

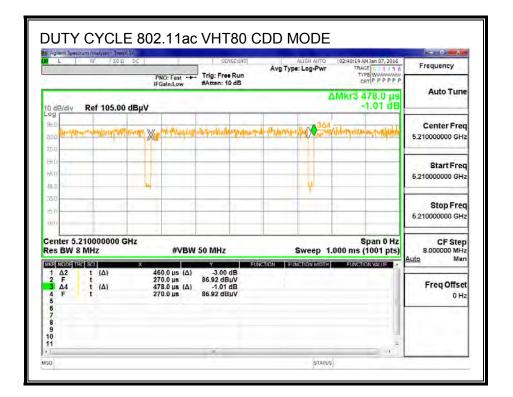
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| 1 | RF 50 | PM | IO: Fast 🔸 | SENSE:UNT | ALICH AUTO Avg Type: Log-Pwr | 02:52:29 AM Jan 07, 2016 TRACE 1 1 5 6 TYPE WWWWWWWW DET P P P P P P | Frequency |
|--|--------------------------|----------------|--|---|--|--|-------------------------------------|
| | | | iain:Low | #Atten: 10 dB | ۵ | Mkr3 962.0 µs -0.43 dB | Auto Tune |
| o dB/div og | Ref 105.0 | | | La Sectiones | 304 | -0.45 UB | 1973 - 1974 |
| 95.0 85:0 | **** | X | acominister of | ilen die | and all the set of the set of the second | and a second | Center Free 5.19000000 GHz |
| 75.0 Hali | - | | | | | | StartFree |
| 45.0 (5.0 | | 0 | | | N.C. | | 5.190000000 GH; |
| 360 2011 | | | | | | | Stop Fred 5.19000000 GHz |
| | | GHz | #VBW | 50 MHz | Sweep 2.0 | Span 0 Hz 00 ms (1001 pts) | CF Step 8.000000 MHz Auto Man |
| 1 Δ2 1 2 F 3 Δ4 4 F 5 6 | t (Δ) t t (Δ) t | 94 50 96 | 4.0 μs (Δ) 0.0 μs 2.0 μs (Δ) 0.0 μs | 0.00 dB 91.18 dBµV -0.43 dB 91.18 dBµV | NK, DON FUNCTION WITH | FUNCTION VIEW | Freq Offset 0 Ha |
| 7 8 9 10 | | | | | | | |



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9.2. 802.11a LEGACY MODE IN THE 5.2 GHz BAND

9.2.1. 26 dB BANDWIDTH

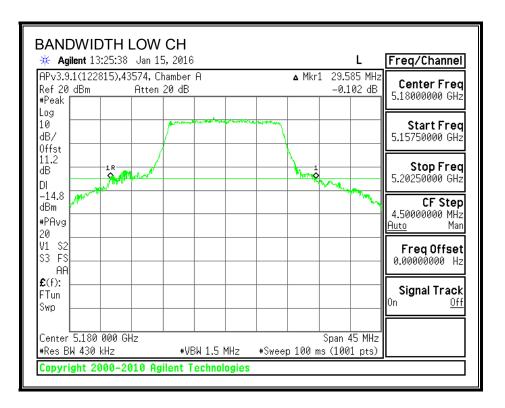
LIMITS

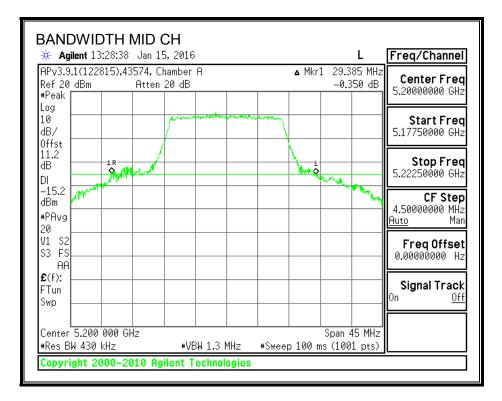
None; for reporting purposes only.

RESULTS

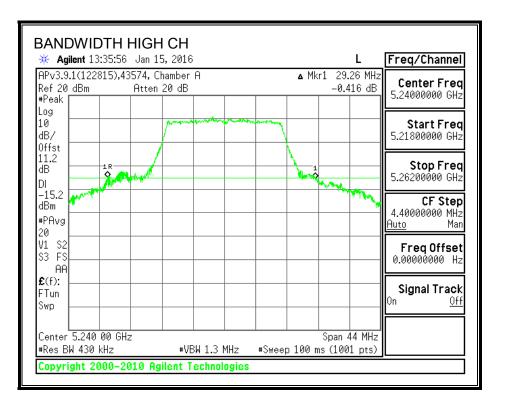
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5180 | 29.585 |
| Mid | 5200 | 29.385 |
| High | 5240 | 29.260 |

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9.2.2. 99% BANDWIDTH

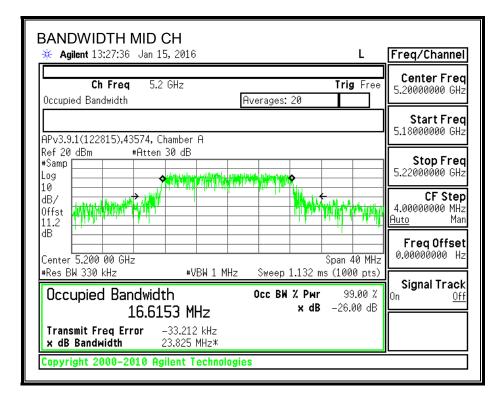
LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5180 | 16.5913 |
| Mid | 5200 | 16.6153 |
| High | 5240 | 16.5954 |

| Ch Freq 5.18 GHz Trig Free Occupied Bandwidth Averages: 20 Start Freq APv3.9.1(122815),43574, Chamber A Start Freq Ref 20 dBm *Atten 30 dB Stop Freq *Samp Stop Freq 5.16000000 GHz Log CF Step 4.0000000 GHz 11.2 Center 5.180 00 GHz Span 40 MHz *Res BW 330 kHz *VBW 1 MHz Sweep 1.132 ms (1000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 16.5913 MHz x dB -26.00 dB | BANDWIDTH LOW CH | Freq/Channel |
|--|----------------------|-----------------------------------|
| APv3.9.1(122815),43574, Chamber A 5.1600000 GHz Ref 20 dBm *Atten 30 dB *Samp Stop Freq Log 5.2000000 GHz 10 CF Step 4B/ 0 0ffst 0 11.2 0 dB 0 0 center 5.180 00 GHz Span 40 MHz *Res BW 330 kHz *VBW 1 MHz Sweep 1.132 ms (1000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 16.5913 MHz x dB -26.00 dB | | |
| *Samp Stop Freq Log Stop Freq 10 Image: Stop Freq 0dB/ Image: Stop Freq 0ffst Image: Stop Freq 11.2 Image: Stop Freq dB Image: Stop Freq Center 5.180 00 GHz Span 40 MHz *Res BW 330 kHz *VBW 1 MHz Sweep 1.132 ms (1000 pts) Occupied Bandwidth Occ BW % Pwr 99.00 % 16.5913 MHz × dB -26.00 dB | | |
| Offst Operation Operation Operation 4.00000000 MHz 11.2 dB dB <td>*Samp Log 10</td> <td>5.20000000 GHz</td> | *Samp Log 10 | 5.20000000 GHz |
| Center 5.180 00 GHz Span 40 MHz 0.00000000 Hz *Res BW 330 kHz *VBW 1 MHz Sweep 1.132 ms (1000 pts) Signal Track Occupied Bandwidth Occ BW % Pwr 99.00 % Signal Track 16.5913 MHz × dB -26.00 dB Image: Complex of the second | Offst WWWWWWWWWWWWWW | 4.00000000 MHz <u>Auto</u> Man |
| Uccupied Bandwidth Occ BW % Pwr 99.00 % On Off 16.5913 MHz × dB -26.00 dB | | 0.00000000 Hz |
| | | |
| x dB Bandwidth 22.885 MHz* | | |



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| BANDWIDTH HIGH CH | | | | |
|---|---|--|--|--|
| ₩ Agilent 13:34:00 Jan 15, 2016 L | Freq/Channel | | | |
| Ch Freq 5.24 GHz Trig Free Occupied Bandwidth Averages: 20 | Center Freq 5.24000000 GHz | | | |
| APv3.9.1(122815),43574, Chamber A | Start Freq 5.22000000 GHz | | | |
| Ref 20 dBm #Atten 30 dB #Samp | Stop Freq 5.26000000 GHz | | | |
| dB/ Offst 11.2 | CF Step 4.00000000 MHz <u>Auto</u> Man | | | |
| dB Image: Center 5.240 00 GHz Span 40 MHz #Res BW 330 kHz #VBW 1 MHz Sweep 1.132 ms (1000 pts) | FreqOffset 0.00000000 Hz | | | |
| #Res BW 330 kHz #VBW 1 MHz Sweep 1.132 ms (1000 pts) Signal Track Occupied Bandwidth Occ BW % Pwr 99.00 % On Off 16.5954 MHz × dB -26.00 dB Image: Comparison of the second | | | | |
| Transmit Freq Error-50.285 kHzx dB Bandwidth21.347 MHz* | | | | |
| Copyright 2000–2010 Agilent Technologies | | | | |

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9.2.3. OUTPUT POWER AND PSD

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-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.

DIRECTIONAL ANTENNA GAIN

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

RESULTS

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Antenna Gain and Limits

| Channel | Frequency | Directional | Directional | Power | PSD |
|---------|-----------|-------------|-------------|-------|-------|
| | | Gain | Gain | Limit | Limit |
| | | for Power | for PSD | | |
| | (MHz) | (dBi) | (dBi) | (dBm) | (dBm) |
| Low | 5180 | 3.96 | 3.96 | 24.00 | 11.00 |
| Mid | 5200 | 3.96 | 3.96 | 24.00 | 11.00 |
| High | 5240 | 3.96 | 3.96 | 24.00 | 11.00 |

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

Output Power Results

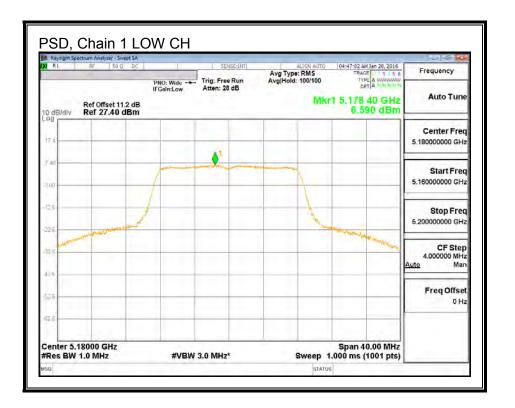
| Channel | Frequency | Chain 1 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5180 | 17.00 | 17.00 | 24.00 | -7.00 |
| Mid | 5200 | 16.90 | 16.90 | 24.00 | -7.10 |
| High | 5240 | 17.08 | 17.08 | 24.00 | -6.92 |

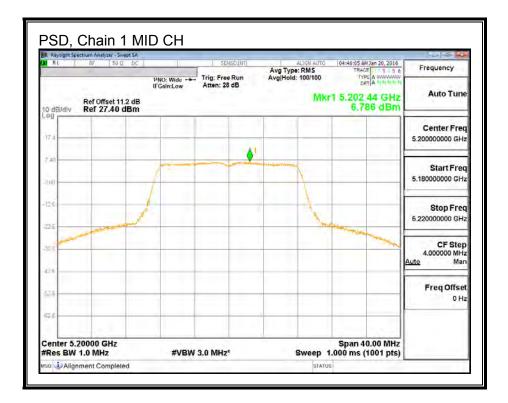
PSD Results

| Channel | Frequency | Chain 1 | Total | PSD | PSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5180 | 6.590 | 6.590 | 11.00 | -4.41 |
| Mid | 5200 | 6.786 | 6.786 | 11.00 | -4.21 |
| High | 5240 | 6.468 | 6.468 | 11.00 | -4.53 |

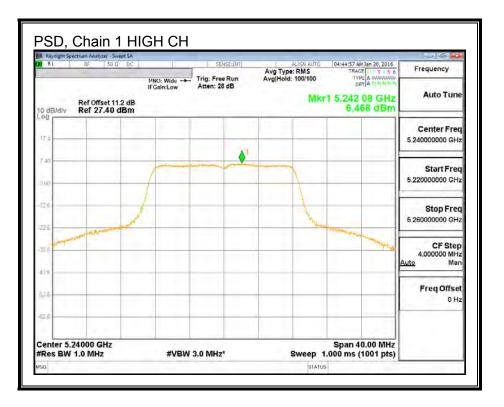
<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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9.3. 802.11n HT20 SISO MODE IN THE 5.2 GHz BAND

9.3.1. 26 dB BANDWIDTH

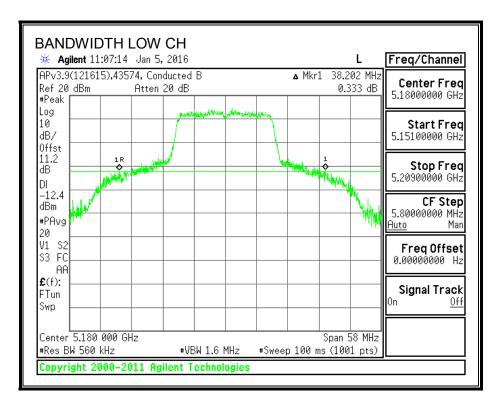
LIMITS

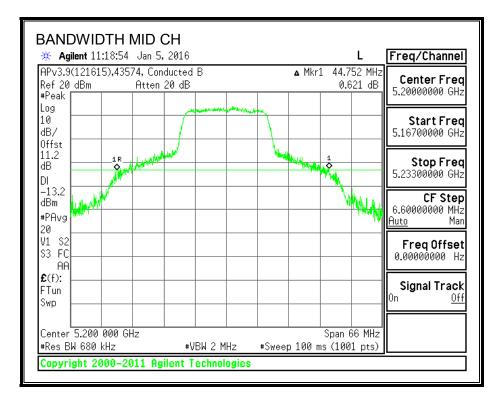
None; for reporting purposes only.

RESULTS

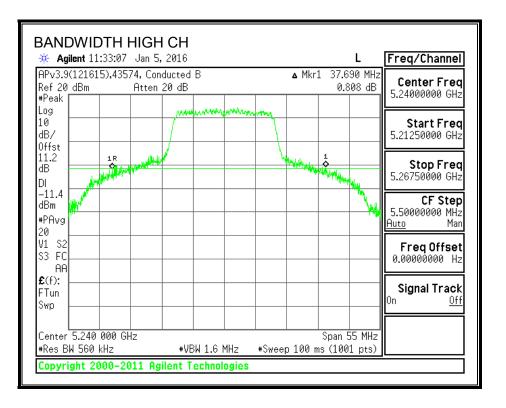
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5180 | 38.202 |
| Mid | 5200 | 44.752 |
| High | 5240 | 37.690 |

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9.3.2. 99% BANDWIDTH

LIMITS

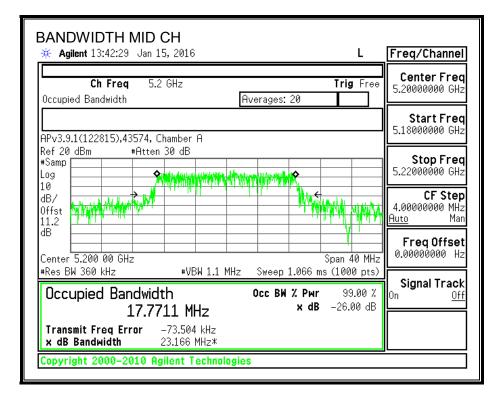
None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5180 | 17.7780 |
| Mid | 5200 | 17.7711 |
| High | 5240 | 17.7659 |

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| BANDWIDTH LOW C Agilent 13:38:47 Jan 15, 2 | | | L | Freq/Channel |
|---|---------------------------------------|--|-------------|---|
| Ch Freq 5.18 GF Occupied Bandwidth | _ | lverages: 20 | Trig Free | Center Freq 5.18000000 GHz |
| APv3.9.1(122815),43574, Cham | | | | Start Freq 5.16000000 GHz |
| Ref 20 dBm #Atten 30 #Samp Log 10 | dB | | | Stop Freq 5.20000000 GHz |
| dB/ Offst | | | WY HULPHA | CF Step 4.00000000 MHz <u>Auto</u> Man |
| dB | | | ipan 40 MHz | Freq Offset 0.00000000 Hz |
| *Res BW 360 kHz Occupied Bandwidth | | Sweep 1.066 ms Occ BW % Pwr × dB | | Signal Track ^{On <u>Off</u>} |
| | 0 MHZ 7.067 kHz 915 MHz≭ | | 20100 48 | |
| Copyright 2000-2010 Agile | nt Technologie | S | | |



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| BANDWIDTH HIGH CH | Freq/Channel |
|--|---|
| Ch Freq 5.24 GHz Trig Free Occupied Bandwidth Averages: 20 | Center Freq 5.24000000 GHz |
| APv3.9.1(122815),43574, Chamber A | Start Freq 5.22000000 GHz |
| Ref 20 dBm #Atten 30 dB #Samp Log 10 | Stop Freq 5.26000000 GHz |
| dB/ Offst 11.2 | CF Step 4.00000000 MHz <u>Auto</u> Man |
| dB Image: Center 5.240 00 GHz Span 40 MHz #Res BW 360 kHz #VBW 1.1 MHz Sweep 1.066 ms (1000 pts) | FreqOffset 0.00000000 Hz |
| | Signal Track ^{On <u>Off</u>} |
| Transmit Freq Error-48.756 kHzx dB Bandwidth22.573 MHz* | |
| Copyright 2000–2010 Agilent Technologies | |

9.3.3. OUTPUT POWER AND PSD

<u>LIMITS</u>

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-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.

DIRECTIONAL ANTENNA GAIN

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

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Antenna Gain and Limits

| Channel | Frequency | Directional | Directional | Power | PSD |
|---------|-----------|-------------|-------------|-------|-------|
| | | Gain | Gain | Limit | Limit |
| | | for Power | for PSD | | |
| | (MHz) | (dBi) | (dBi) | (dBm) | (dBm) |
| Low | 5180 | 3.96 | 3.96 | 24.00 | 11.00 |
| Mid | 5200 | 3.96 | 3.96 | 24.00 | 11.00 |
| High | 5240 | 3.96 | 3.96 | 24.00 | 11.00 |

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

Output Power Results

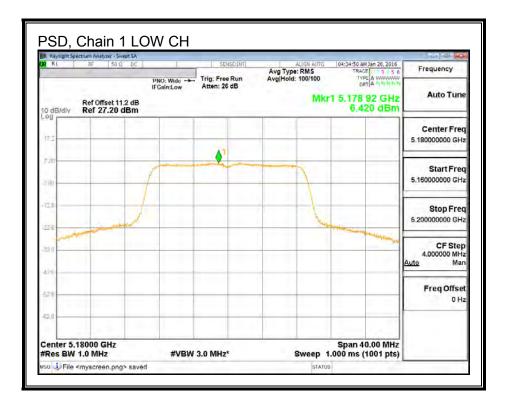
| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5180 | 16.97 | 16.97 | 24.00 | -7.03 |
| Mid | 5200 | 16.93 | 16.93 | 24.00 | -7.07 |
| High | 5240 | 16.89 | 16.89 | 24.00 | -7.11 |

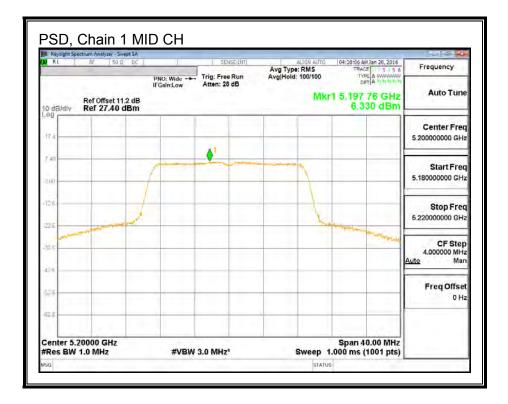
PSD Results

| Channel | Frequency | Chain 0 | Total | PSD | PSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5180 | 6.420 | 6.420 | 11.00 | -4.58 |
| Mid | 5200 | 6.330 | 6.330 | 11.00 | -4.67 |
| High | 5240 | 6.137 | 6.137 | 11.00 | -4.86 |

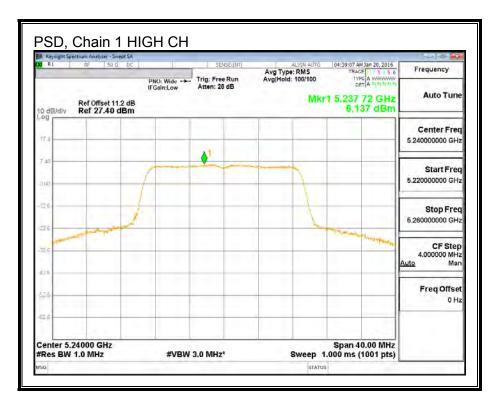
<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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9.4. 802.11n HT20 CDD 3TX MODE IN THE 5.2 GHz BAND

9.4.1. 26 dB BANDWIDTH

LIMITS

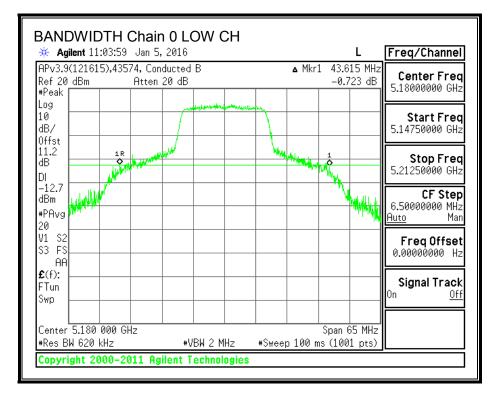
None; for reporting purposes only.

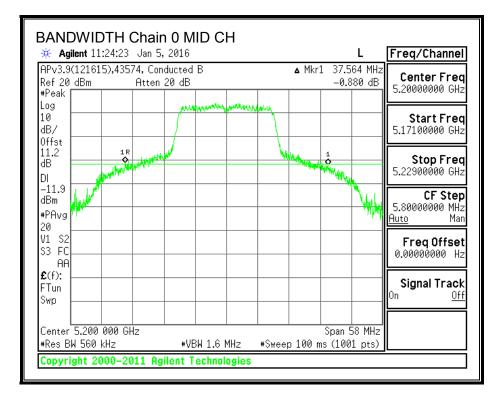
RESULTS

| Channel | Frequency | 26 dB BW | 26 dB BW | 26 dB BW |
|---------|-----------|----------|----------|----------|
| | | Chain 0 | Chain 1 | Chain 2 |
| | (MHz) | (MHz) | (MHz) | (MHz) |
| Low | 5180 | 43.615 | 38.202 | 33.050 |
| Mid | 5200 | 37.564 | 44.752 | 36.750 |
| High | 5240 | 45.092 | 37.690 | 35.460 |

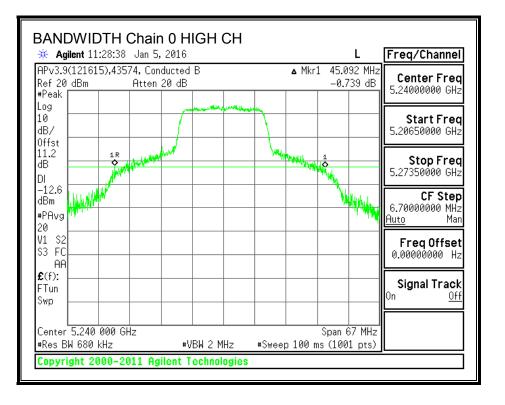
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26 dB BANDWIDTH, Chain 0

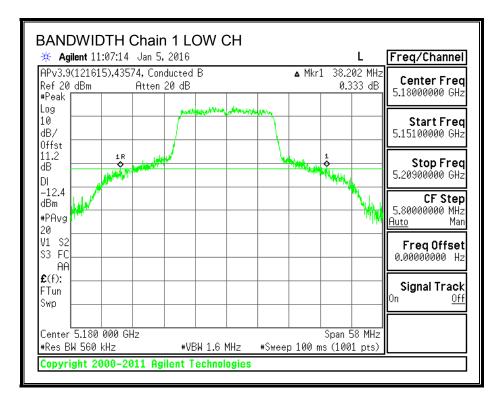




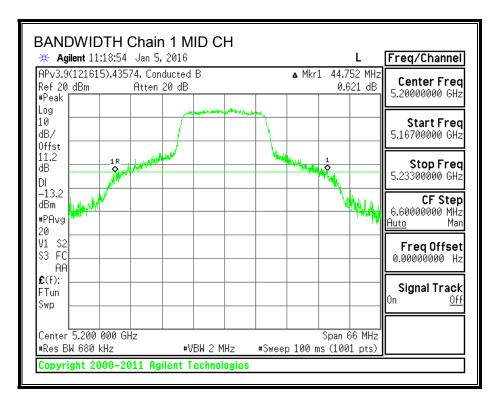
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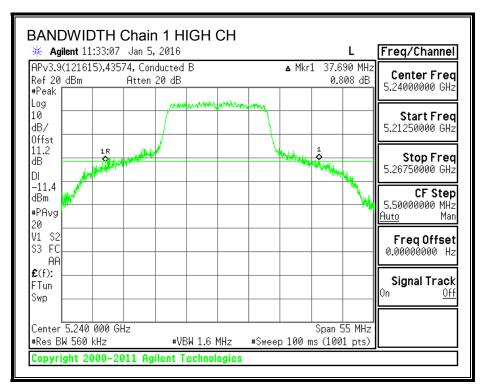


26 dB BANDWIDTH, Chain 1

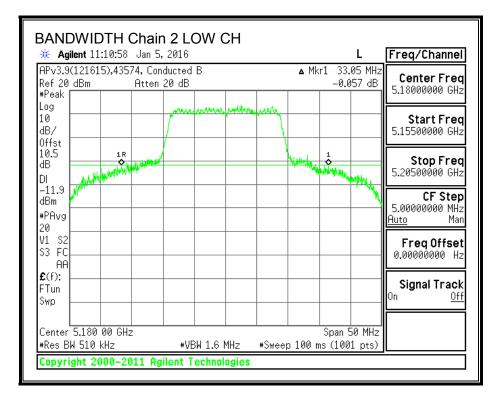


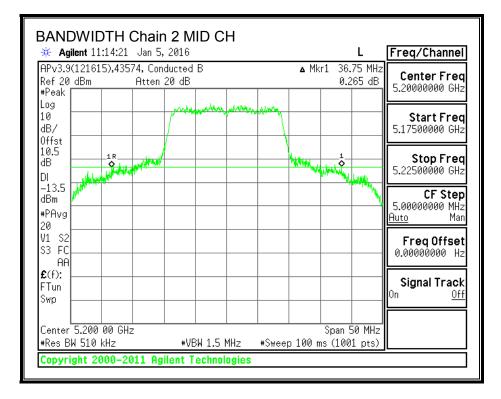
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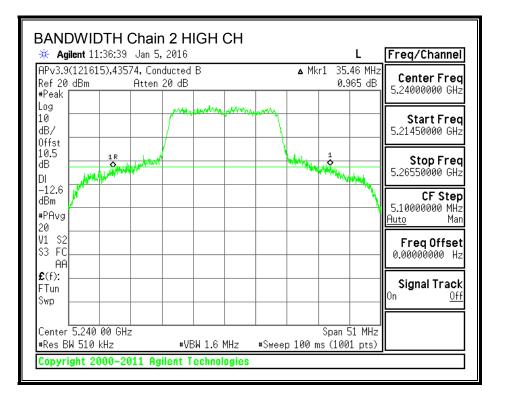


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9.4.2. 99% BANDWIDTH

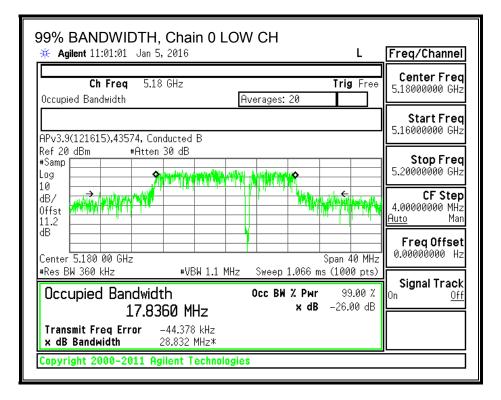
<u>LIMITS</u>

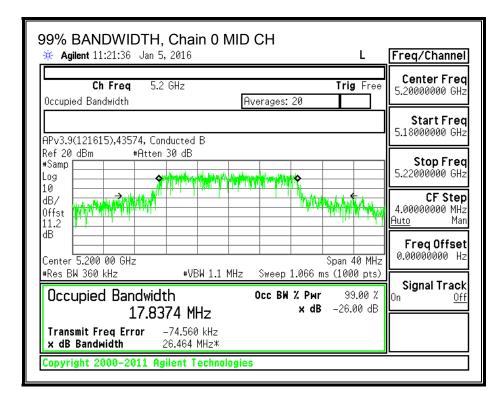
None; for reporting purposes only.

<u>RESULTS</u>

| Channel | Frequency | 99% BW | 99% BW | 99% BW | |
|---------|-----------|---------|---------|---------|--|
| | | Chain 0 | Chain 1 | Chain 2 | |
| | (MHz) | (MHz) | (MHz) | (MHz) | |
| Low | 5180 | 17.8360 | 17.8026 | 17.7214 | |
| Mid | 5200 | 17.8374 | 17.8717 | 17.7634 | |
| High | 5240 | 17.8720 | 17.8320 | 17.7147 | |

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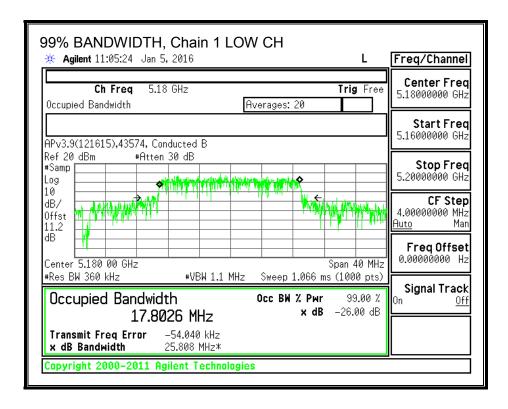




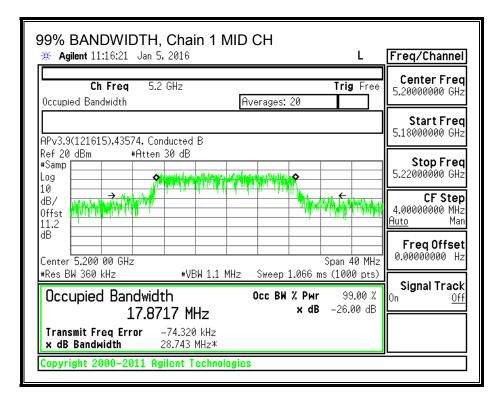
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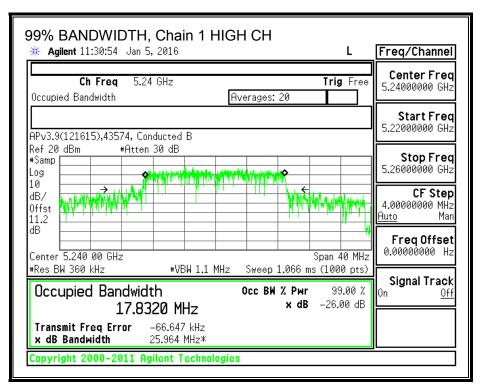
| 99% BANDWIDTH, Chain 0 HIGH CH | |
|---|---|
| Agilent 11:26:55 Jan 5, 2016 L | Freq/Channel |
| Ch Freq 5.24 GHz Trig Free Occupied Bandwidth Averages: 20 | Center Freq 5.24000000 GHz |
| | Start Freq 5.22000000 GHz |
| Ref 20 dBm #Atten 30 dB #Samp Log 10 | Stop Freq 5.26000000 GHz |
| dB/ Offst | CF Step 4.00000000 MHz <u>Auto</u> Man |
| dB | FreqOffset 0.00000000 Hz |
| #Res BW 360 kHz #VBW 1.1 MHz Sweep 1.066 ms (1000 pts) Occupied Bandwidth Occ BW % Рыг 99.00 % 17.8720 MHz × dB -26.00 dB | Signal Track On <u>Off</u> |
| Transmit Freq Error -107.803 kHz x dB Bandwidth 30.559 MHz* | |
| Copyright 2000–2011 Agilent Technologies | |

99% BANDWIDTH, Chain 1

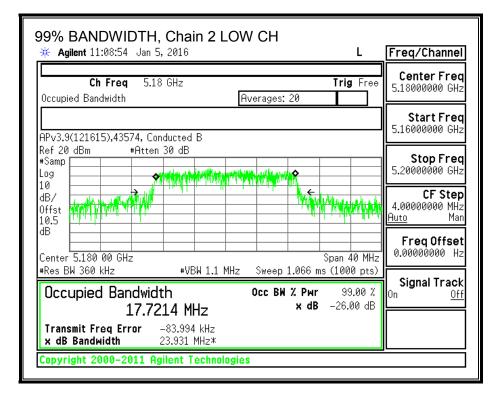


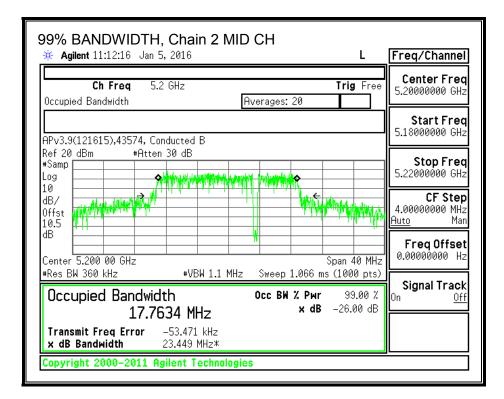
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| 99% BANDWIDTH, Chain 2 HIGH CH | Freq/Channel |
|---|---|
| Ch Freq 5.24 GHz Trig Free Occupied Bandwidth Averages: 20 | Center Freq 5.24000000 GHz |
| APv3.9(121615),43574, Conducted B | Start Freq 5.22000000 GHz |
| Ref 20 dBm #Atten 30 dB #Samp Log 10 | Stop Freq 5.26000000 GHz |
| dB/ Offst 10.5 | CF Step 4.00000000 MHz <u>Auto</u> Man |
| dB Span 40 MHz Center 5.240 00 GHz Span 40 MHz #Res BW 360 kHz #VBW 1.1 MHz Sweep 1.066 ms (1000 pts) | FreqOffset 0.00000000 Hz |
| | Signal Track ^{On <u>Off</u>} |
| Transmit Freq Error -106.082 kHz x dB Bandwidth 22.775 MHz* | |
| Copyright 2000–2011 Agilent Technologies | |

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9.4.3. OUTPUT POWER AND PSD

<u>LIMITS</u>

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-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.

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

| Chain 0 | Chain 1 | Chain 2 | Uncorrelated Chains |
|---------|---------|---------|----------------------------|
| Antenna | Antenna | Antenna | Directional |
| Gain | Gain | Gain | Gain |
| (dBi) | (dBi) | (dBi) | (dBi) |
| 4.45 | 3.96 | 2.90 | 3.82 |

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

| Chain 0 | Chain 1 | Chain 2 | Correlated Chains |
|---------|---------|---------|--------------------------|
| Antenna | Antenna | Antenna | Directional |
| Gain | Gain | Gain | Gain |
| (dBi) | (dBi) | (dBi) | (dBi) |
| 4.45 | 3.96 | 2.90 | 8.57 |

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Antenna Gain and Limits

| Channel | Frequency | Directional | Directional | Power | PSD |
|---------|-----------|-------------|-------------|-------|-------|
| | | Gain | Gain | Limit | Limit |
| | | for Power | for PSD | | |
| | (MHz) | (dBi) | (dBi) | (dBm) | (dBm) |
| Low | 5180 | 3.82 | 8.57 | 24.00 | 8.43 |
| Mid | 5200 | 3.82 | 8.57 | 24.00 | 8.43 |
| High | 5240 | 3.82 | 8.57 | 24.00 | 8.43 |

0.00

Duty Cycle CF (dB)

Included in Calculations of Corr'd PSD

Output Power Results

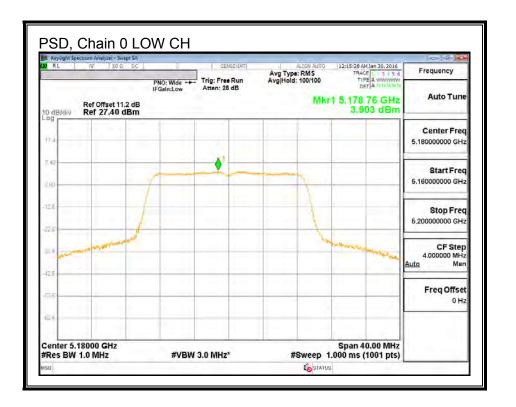
| Channel | Frequency | Chain 0 | Chain 1 | Chain 2 | Total | Power | Power |
|---------|-----------|---------|---------|---------|--------|-------|--------|
| | | Meas | Meas | Meas | Corr'd | Limit | Margin |
| | | Power | Power | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5180 | 15.20 | 14.54 | 14.74 | 19.61 | 24.00 | -4.39 |
| Mid | 5200 | 15.20 | 14.58 | 14.50 | 19.54 | 24.00 | -4.46 |
| High | 5240 | 15.17 | 14.70 | 14.80 | 19.67 | 24.00 | -4.33 |

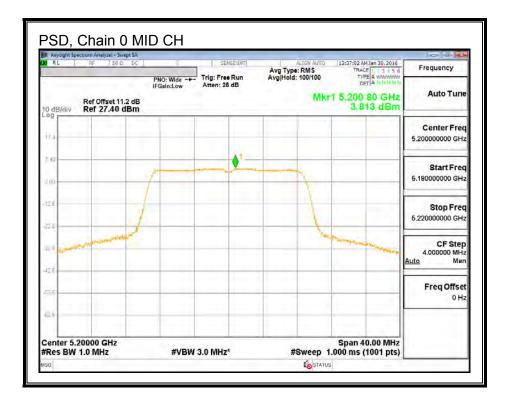
PSD Results

| Channel | Frequency | Chain 0 | Chain 1 | Chain 2 | Total | PSD | PSD |
|---------|-----------|---------|---------|---------|--------|-------|--------|
| | | Meas | Meas | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5180 | 3.903 | 3.103 | 3.009 | 8.128 | 8.43 | -0.30 |
| Mid | 5200 | 3.813 | 3.296 | 3.322 | 8.255 | 8.43 | -0.18 |
| High | 5240 | 3.940 | 3.536 | 3.396 | 8.401 | 8.43 | -0.03 |

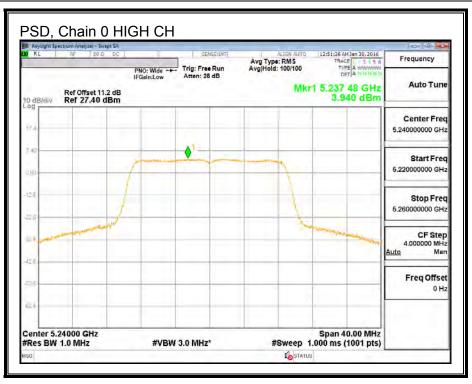
<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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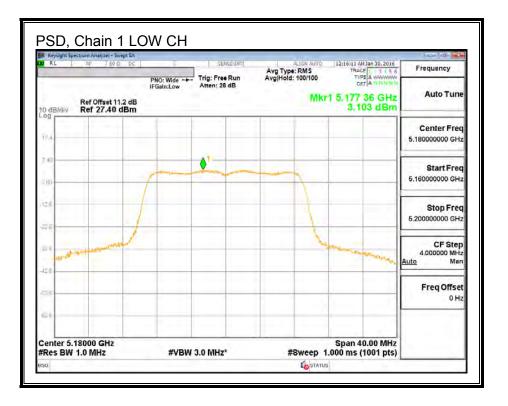




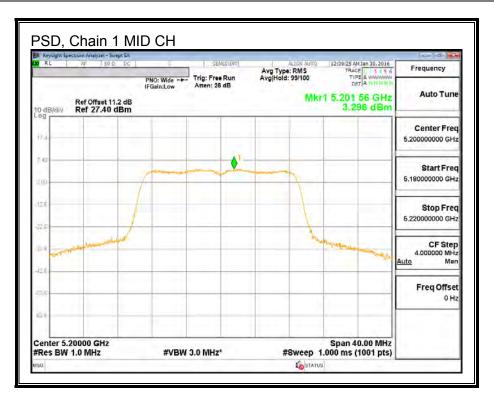
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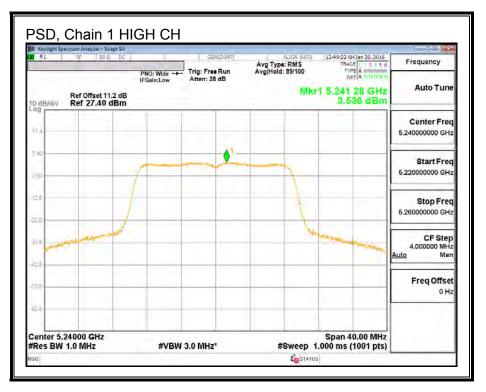


PSD, Chain 1

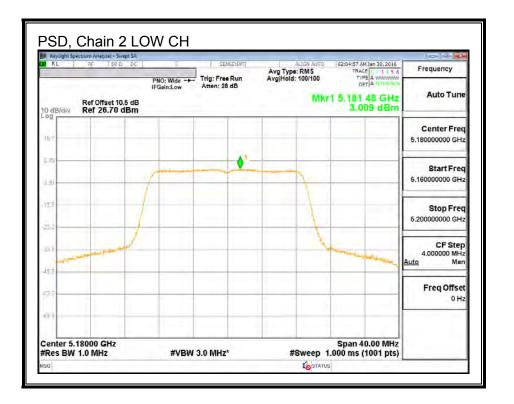


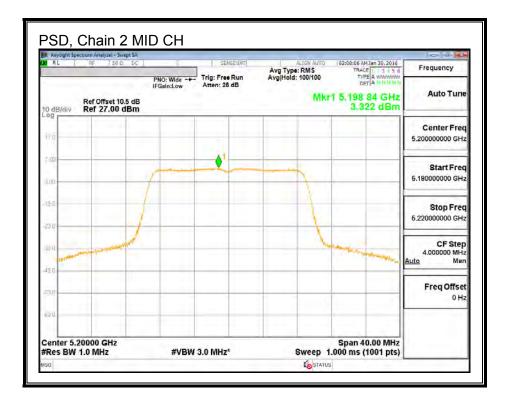
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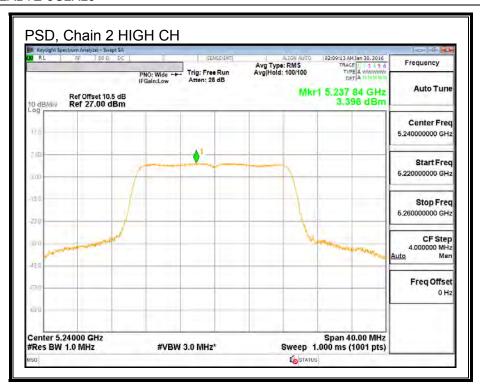


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9.5. 802.11n HT40 SISO MODE IN THE 5.2 GHz BAND

9.5.1. 26 dB BANDWIDTH

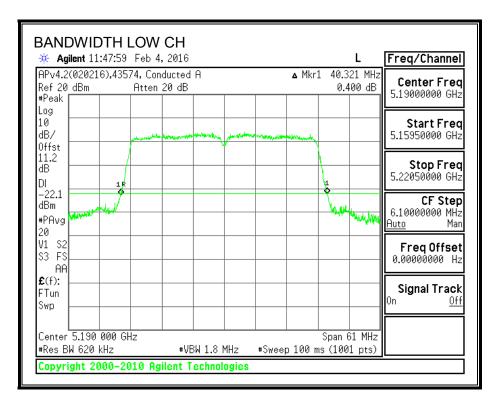
LIMITS

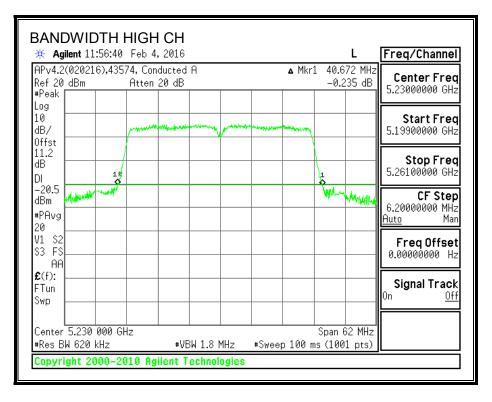
None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5190 | 40.321 |
| High | 5230 | 40.672 |

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9.5.2. 99% BANDWIDTH

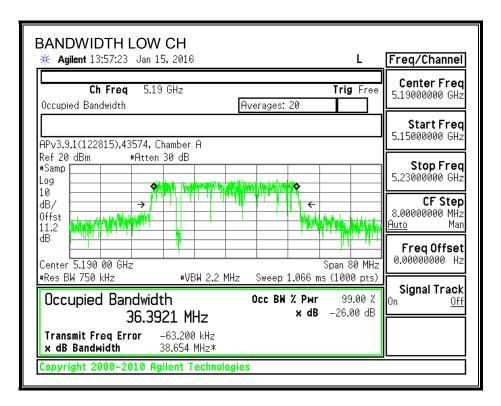
<u>LIMITS</u>

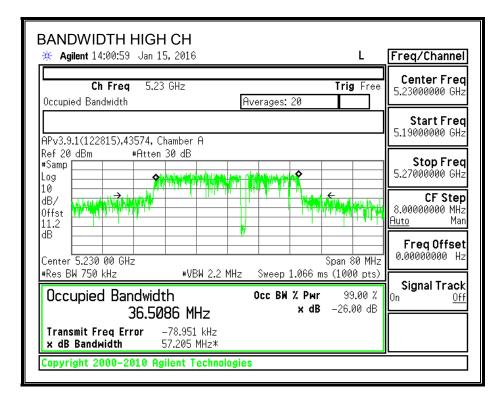
None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5190 | 36.3921 |
| High | 5230 | 36.5086 |

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9.5.3. OUTPUT POWER AND PSD

<u>LIMITS</u>

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-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.

DIRECTIONAL ANTENNA GAIN

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

RESULTS

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Antenna Gain and Limits

| Channel | Frequency | Directional | Directional | Power | PSD |
|---------|-----------|-------------|-------------|-------|-------|
| | | Gain | Gain | Limit | Limit |
| | | for Power | for PSD | | |
| | (MHz) | (dBi) | (dBi) | (dBm) | (dBm) |
| | | | | | |
| Low | 5190 | 4.45 | 4.45 | 24.00 | 11.00 |

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

Output Power Results

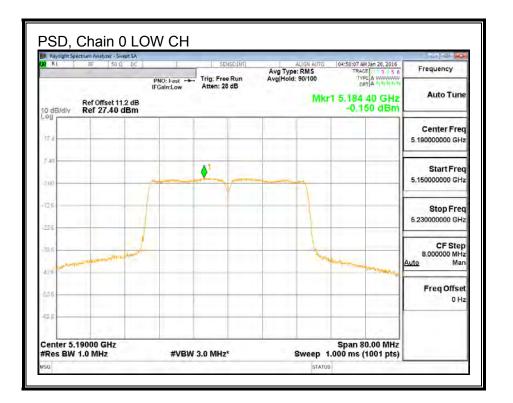
| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5190 | 13.48 | 13.48 | 24.00 | -10.52 |
| - | | | | | |

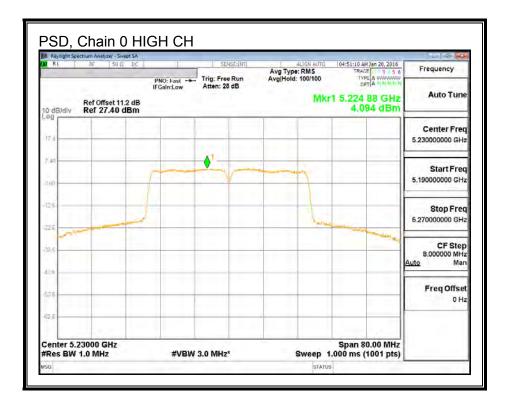
PSD Results

| Channel | Frequency | Chain 0 | Total | PSD | PSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| | · · · | • • | · · · | | |
| Low | 5190 | -0.150 | -0.150 | 11.00 | -11.15 |

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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9.6. 802.11n HT40 CDD 3TX MODE IN THE 5.2 GHz BAND

9.6.1. 26 dB BANDWIDTH

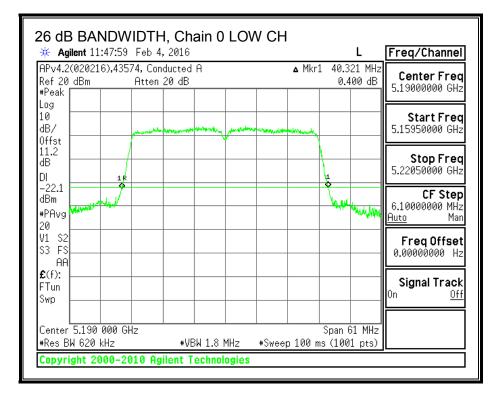
LIMITS

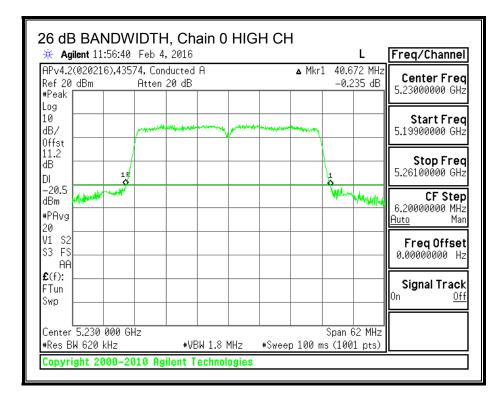
None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB BW | 26 dB BW | 26 dB BW |
|---------|-----------|----------|----------|----------|
| | | Chain 0 | Chain 1 | Chain 2 |
| | (MHz) | (MHz) | (MHz) | (MHz) |
| Low | 5190 | 40.321 | 39.840 | 39.780 |
| High | 5230 | 40.672 | 39.720 | 39.840 |

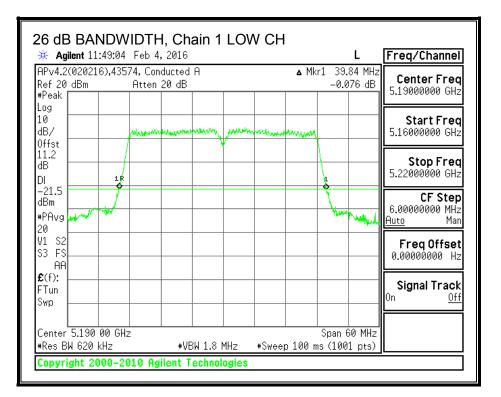
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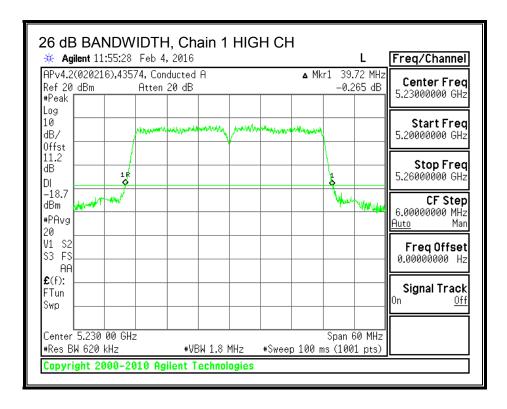




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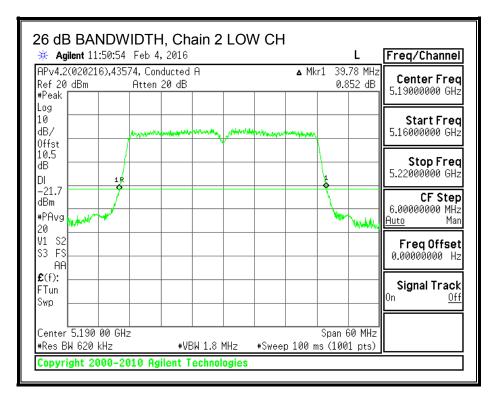
26 dB BANDWIDTH, Chain 1

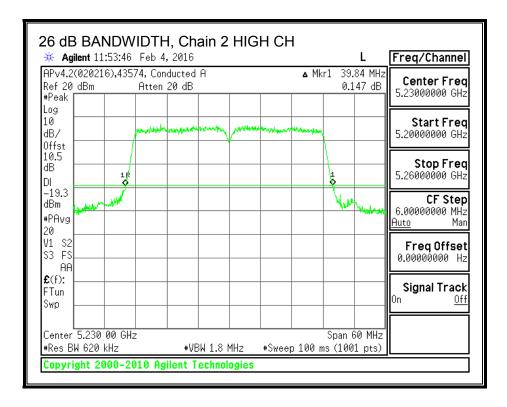




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26 dB BANDWIDTH, Chain 2





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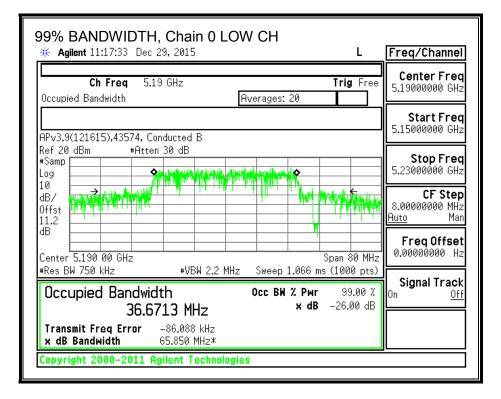
9.6.2. 99% BANDWIDTH

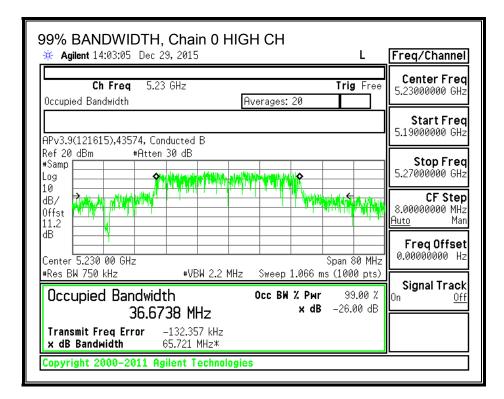
<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

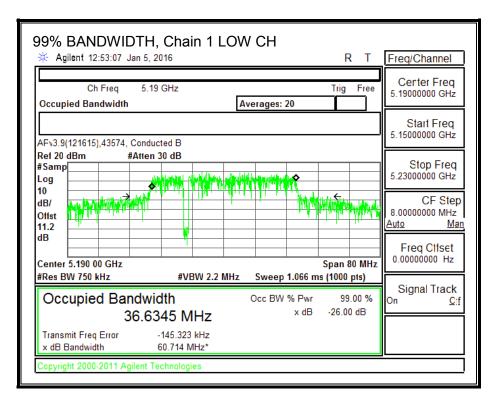
| Channel | Frequency | 99% BW | 99% BW | 99% BW |
|---------|-----------|---------|---------|---------|
| | | Chain 0 | Chain 1 | Chain 2 |
| | (MHz) | (MHz) | (MHz) | (MHz) |
| Low | 5190 | 36.6713 | 36.6345 | 36.4328 |
| High | 5230 | 36.6738 | 36.6015 | 36.5725 |

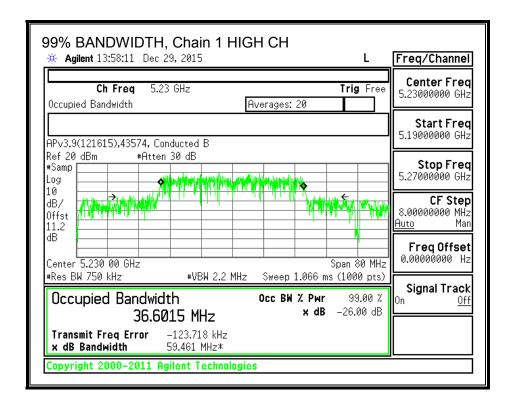




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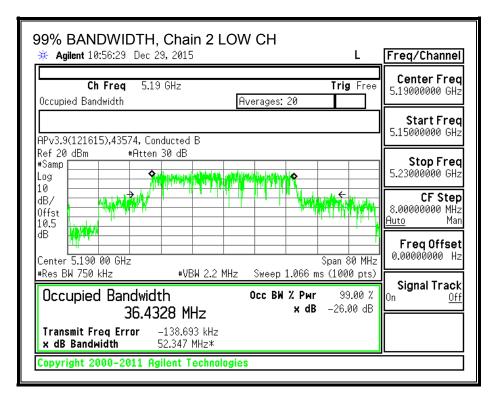
99% BANDWIDTH, Chain 1

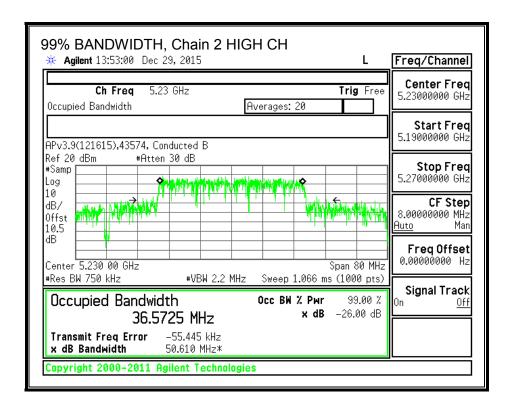




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99% BANDWIDTH, Chain 2





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9.6.3. OUTPUT POWER AND PSD

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-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.

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

| Chain 0 | Chain 1 | Chain 2 | Uncorrelated Chains |
|---------|---------|---------|----------------------------|
| Antenna | Antenna | Antenna | Directional |
| Gain | Gain | Gain | Gain |
| (dBi) | (dBi) | (dBi) | (dBi) |
| 4.45 | 3.96 | 2.90 | 3.82 |

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

| Chain 0 | Chain 1 | Chain 2 | Correlated Chains |
|---------|---------|---------|--------------------------|
| Antenna | Antenna | Antenna | Directional |
| Gain | Gain | Gain | Gain |
| (dBi) | (dBi) | (dBi) | (dBi) |
| 4.45 | 3.96 | 2.90 | 8.57 |

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Antenna Gain and Limits

| Channel | Frequency | Directional | Directional | Power | PSD |
|---------|-----------|-------------|-------------|-------|-------|
| | | Gain | Gain | Limit | Limit |
| | | for Power | for PSD | | |
| | (MHz) | (dBi) | (dBi) | (dBm) | (dBm) |
| Low | 5190 | 3.82 | 8.57 | 24.00 | 8.43 |
| High | 5230 | 3.82 | 8.57 | 24.00 | 8.43 |

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

Output Power Results

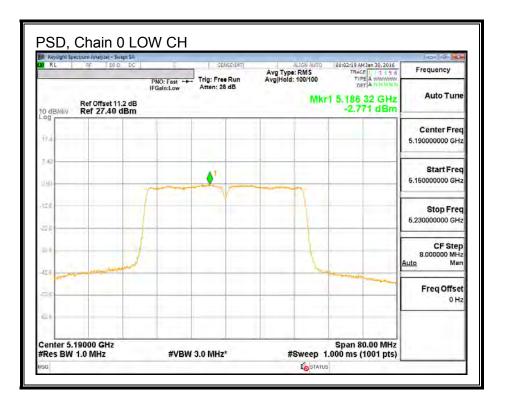
| Channel | Frequency | Chain 0 | Chain 1 | Chain 2 | Total | Power | Power |
|---------|-----------|---------|---------|---------|---------|-------|--------|
| | | Meas | Meas | Meas | Corr'd | Limit | Margin |
| | | Power | Power | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dB) |
| | (| (abiii) | (abiii) | (abiii) | (abiii) | (412) | (4-) |
| Low | 5190 | 11.26 | 10.52 | 10.70 | 15.61 | 24.00 | -8.39 |

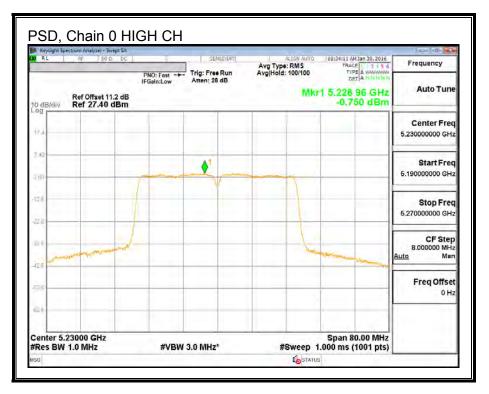
PSD Results

| Channel | Frequency | Chain 0 | Chain 1 | Chain 2 | Total | PSD | PSD |
|---------|-----------|---------|---------|---------|---------|-------|--------|
| | | Meas | Meas | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dB) |
| | (11112) | (abiii) | (abiii) | (abiii) | (abiii) | (| (4.2) |
| Low | 5190 | -2.771 | -3.601 | -3.455 | 1.51 | 8.43 | -6.92 |

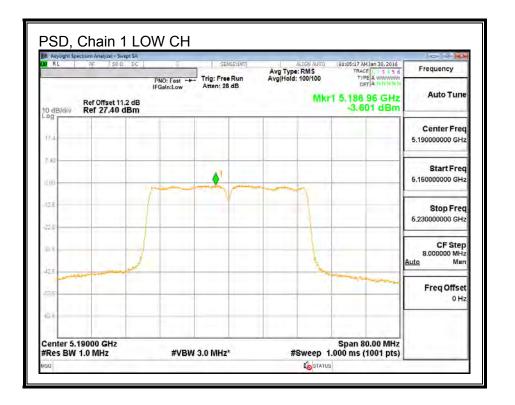
<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

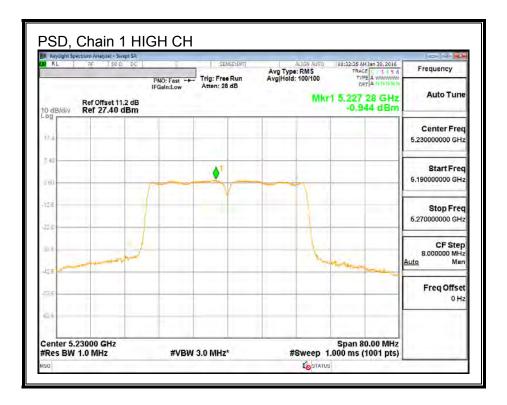
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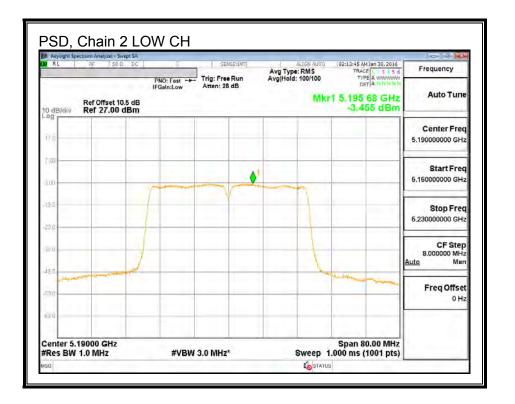


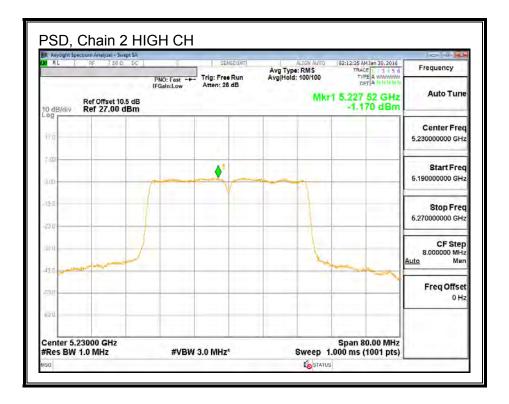
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9.7. 802.11ac VHT80 CDD 3TX MODE IN THE 5.2 GHz BAND

9.7.1. 26 dB BANDWIDTH

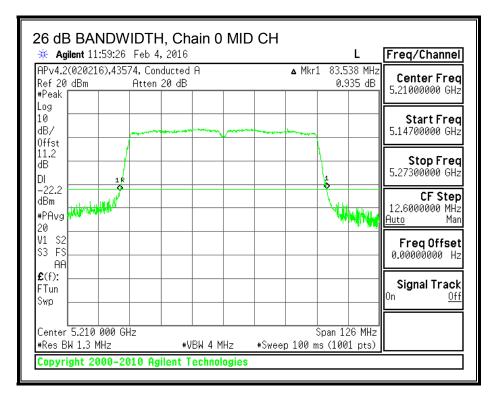
LIMITS

None; for reporting purposes only.

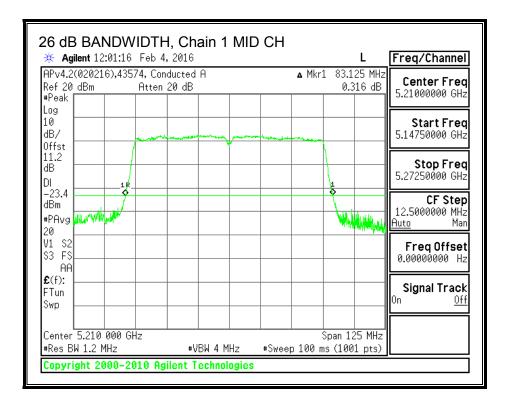
RESULTS

| Channel | Frequency | 26 dB BW | 26 dB BW | 26 dB BW |
|---------|-----------|----------|----------|----------|
| | | Chain 0 | Chain 1 | Chain 2 |
| | (MHz) | (MHz) | (MHz) | (MHz) |
| Mid | 5210 | 83.538 | 83.125 | 82.584 |

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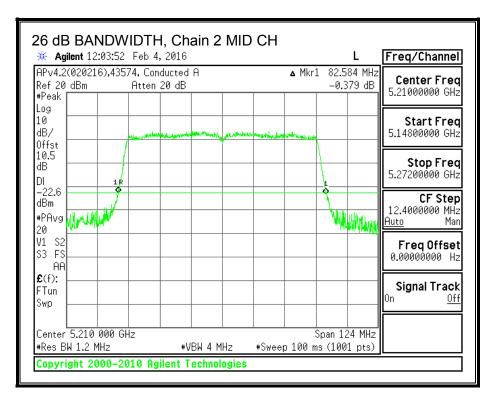


26 dB BANDWIDTH, Chain 1



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26 dB BANDWIDTH, Chain 2



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9.7.2. 99% BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

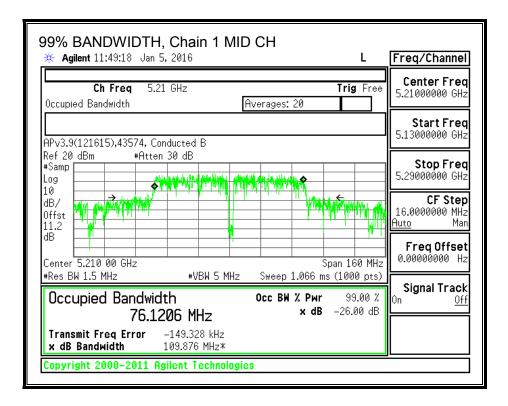
RESULTS

| Channel | Frequency | 99% BW | 99% BW | 99% BW |
|---------|-----------|---------|---------|---------|
| | | Chain 0 | Chain 1 | Chain 2 |
| | (MHz) | (MHz) | (MHz) | (MHz) |
| | · · · · · | · · · | · · · | · · / |

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| 99% BANDWIDTH | | 11D CH | RТ | Freq/Channel |
|---|------------------------------|----------------------|----------------------|--|
| Ch Freq 5.21 Occupied Bandwidth | l GHz | Averages: 20 | Trig Free | Certer Freq 5.21000000 GHz Start Freq |
| L AFv3.9(121615),43574, Condu Ref 20 dBm #Atten #Samp Log 10 dB/ → 10 dB/ → 10 dB/ ↓ 10 center 5.210 00 GHz | | | Span 160 MHz | 5.13000000 GHz Stop Freq 5.29000000 GHz CF Step 16.0000000 MHz <u>Auto Man</u> Freq Ctfset 0.0000000 Hz |
| #Res BW 1.5 MHz | #VBW 5 MI | | • | Signal Track |
| Occupied Bandwi 76.20 | dth)44 MHz | Occ BW % Pwr x dB | 99.00 % -26.00 dB | On <u>Cif</u> |
| Transmit Freq Error x dB Bandwidth | -168.976 kHz 123.864 MHz* | | | |
| Copyright 2000-2011 Agilent Te | echnologies | | | |

99% BANDWIDTH, Chain 1



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| 99% BANDWIDTH, Chain 2 MID CH <u>★ Agilent</u> 11:45:40 Jan 5, 2016 L | Freq/Channel |
|--|---|
| Ch Freq 5.21 GHz Trig Free Occupied Bandwidth Averages: 20 | Center Freq 5.21000000 GHz |
| APv3.9(121615),43574, Conducted B | Start Freq 5.13000000 GHz |
| Ref 20 dBm #Atten 30 dB #Samp Log 10 \$ | Stop Freq 5.29000000 GHz |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | CF Step 16.0000000 MHz <u>Auto</u> Man |
| dB # | Freq Offset 0.00000000 Hz |
| Image: Work is minipage Image: Work is | Signal Track ^{On <u>Off</u>} |
| Transmit Freq Error -67.782 kHz x dB Bandwidth 98.020 MHz* | |
| Copyright 2000-2011 Agilent Technologies | |

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9.7.3. OUTPUT POWER AND PSD

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-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.

DIRECTIONAL ANTENNA GAIN

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

| Chain 0 | Chain 1 | Chain 2 | Uncorrelated Chains |
|---------|---------|---------|----------------------------|
| Antenna | Antenna | Antenna | Directional |
| Gain | Gain | Gain | Gain |
| (dBi) | (dBi) | (dBi) | (dBi) |
| 4.45 | 3.96 | 2.90 | 3.82 |

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

| Chain 0 | Chain 1 | Chain 2 | Correlated Chains |
|---------|---------|---------|--------------------------|
| Antenna | Antenna | Antenna | Directional |
| Gain | Gain | Gain | Gain |
| (dBi) | (dBi) | (dBi) | (dBi) |
| 4.45 | 3.96 | 2.90 | 8.57 |

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Antenna Gain and Limits

| Channel | Frequency | Directional | Directional | Power | PSD |
|---------|-----------|-------------|-------------|-------|-------|
| | | Gain | Gain | Limit | Limit |
| | | for Power | for PSD | | |
| | (MHz) | (dBi) | (dBi) | (dBi) | (dBi) |
| Mid | 5210 | 3.82 | 8.57 | 24.00 | 8.43 |

 Duty Cycle CF (dB)
 0.17
 Included in Calculations of Corr'd PSD

Output Power Results

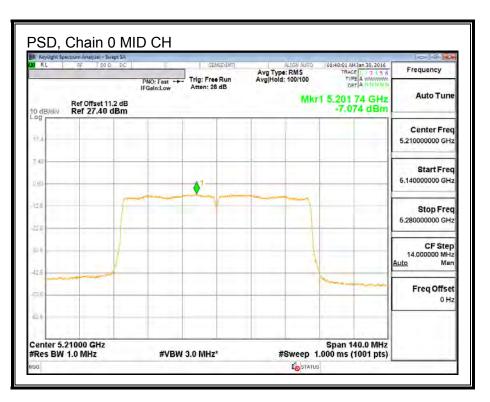
| Channel | Frequency | Chain 0 | Chain 1 | Chain 2 | Total | Power | Power |
|---------|-----------|---------|---------|---------|--------|-------|--------|
| | | Meas | Meas | Meas | Corr'd | Limit | Margin |
| | | Power | Power | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dB) |
| Mid | 5210 | 9.96 | 9.20 | 9.00 | 14.18 | 24.00 | -9.82 |

PSD Results

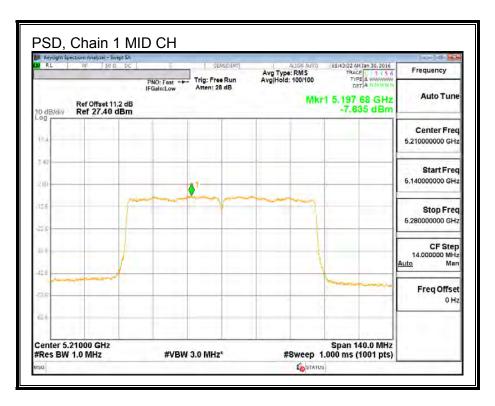
| Channel | Frequency | Chain 0 | Chain 1 | Chain 2 | Total | PSD | PSD |
|---------|-----------|---------|---------|---------|--------|-------|--------|
| | | Meas | Meas | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dB) |
| Mid | 5210 | -7.074 | -7.635 | -7.842 | -2.56 | 8.43 | -10.99 |

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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PSD, Chain 1



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| RL RL | ectrum Analyze: - Swept SA RF 50 D DC | | SENSE-UNT | ALIGN AUTO | 02:14:59 AM Jan 30, 2016 | Frequency |
|------------|--|------------|--------------------------------|------------------------------------|--------------------------------|-------------------------------------|
| - | | PNO: Fast | Trig: Free Run | Avg Type: RMS Avg Hold: 100/100 | TRACE 1 3 5 6 TYPE A WARMAN | riequency |
| 0 dB/div | Ref Offset 10.5 dB Ref 27.00 dBm | IFGain:Low | Atten: 28 dB Mkr1 5.2 -7 | | 1 5.218 12 GHz -7.842 dBm | Auto Tune |
| η <u>ά</u> | | | | | | Center Free 5.210000000 GH |
| | | | | | | Start Free 5.140000000 GH |
| 20 | T | | | | | Stop Free 5.28000000 GH |
| 13 (1) | | | | | | CF Step 14.000000 MH Auto Mat |
| 12 D. | | | | | | Freq Offse 0 H |
| ard | 21000 GHz | | | | Span 140.0 MHz | |

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9.8. 802.11a LEGACY MODE IN THE 5.3 GHz BAND

9.8.1. 26 dB BANDWIDTH

LIMITS

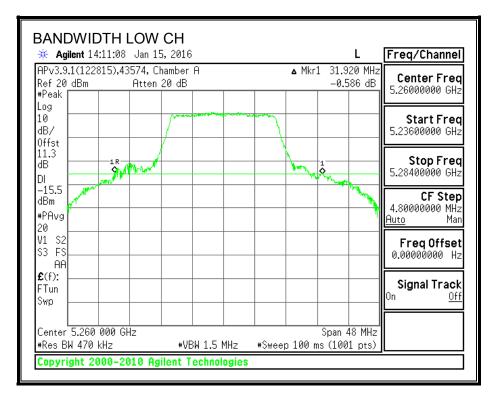
None; for reporting purposes only.

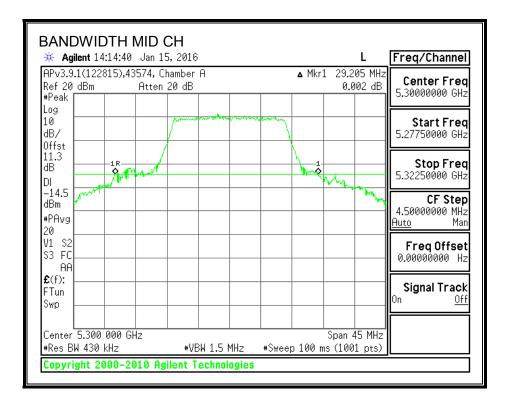
RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5260 | 31.920 |
| Mid | 5300 | 29.205 |
| High | 5320 | 32.128 |

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26 dB BANDWIDTH





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| BANDWIE | - | - | | | | | L | Freq/Channel |
|-------------------------------------|---------------|-----------------------|--|-------|---------|--------------------|-----------------|---|
| APv3.9.1(122 Ref 20 dBm #Peak | | Chamber A en 20 dB | | | ▲ Mkr: | 1 32.17 -0.2 | 28 MHz 36 dB | Center Freq 5.32000000 GHz |
| Log 10 dB/ | | | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | | | | | Start Freq 5.29600000 GHz |
| 0ffst 11.3 dB DI | 1R Or More | | | | h | 1 | | Stop Freq 5.34400000 GHz |
| -15.3 dBm #PAvg | | | | | | | لر | CF Step 4.80000000 MHz <u>Auto</u> Man |
| 20 V1 S2 S3 FC AA | | | | | | | | Freq Offset 0.00000000 Hz |
| £(f): FTun Swp | | | | | | | | Signal Track On <u>Off</u> |
| Center 5.320 #Res BW 470 | | #VBW | 1.5 MHz | #Swee | p 100 m | Span 4 1s (100: | | |
| Copyright 2 | 000-2010 | Agilent Te | chnologie | S | | | | |

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9.8.2. 99% BANDWIDTH

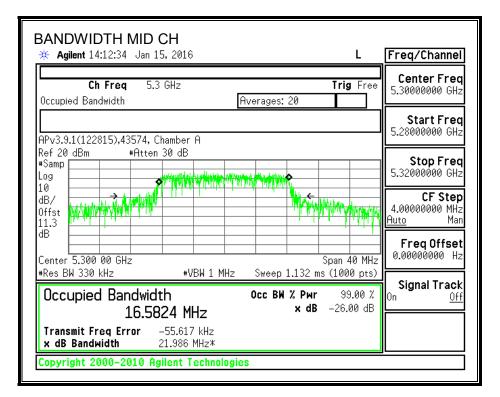
<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

| Channel Frequence | | 99% Bandwidth |
|-------------------|-------|---------------|
| | (MHz) | (MHz) |
| Low | 5260 | 16.5689 |
| Mid | 5300 | 16.5824 |
| High | 5320 | 16.5875 |

| BANDWIDTH LOW CH | | L | Freq/Channel |
|---|--------------------|----------|---|
| Ch Freq 5.26 GHz Occupied Bandwidth | Ti Averages: 20 | rig Free | Center Freq 5.26000000 GHz |
| APv3.9.1(122815),43574, Chamber A | | | Start Freq 5.24000000 GHz |
| Ref 20 dBm #Atten 30 dB #Samp Log | | | Stop Freq 5.28000000 GHz |
| 10 dB/ Offst 11.3 | | | CF Step 4.00000000 MHz <u>Auto</u> Man |
| dB / | | n 40 MHz | FreqOffset 0.00000000 Hz |
| *Res BW 330 kHz *VBW 1 Occupied Bandwidth 16.5689 MHz | | 99.00 % | Signal Track ^{On <u>Off</u>} |
| Transmit Freq Error -37.944 kHz x dB Bandwidth 22.196 MHz ^x | < | | |
| Copyright 2000–2010 Agilent Tech | lologies | | |



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| BANDWIDTH HIGH CH Agilent 14:16:43 Jan 15, 2016 | L | Freq/Channel |
|---|--|--|
| Ch Freq 5.32 GHz Occupied Bandwidth | Trig Free Averages: 20 | Center Freq 5.32000000 GHz |
| APv3.9.1(122815),43574, Chamber A | | Start Freq 5.30000000 GHz |
| Ref 20 dBm #Atten 30 dB #Samp Log 10 | | Stop Freq 5.34000000 GHz |
| dB/ Offst | | CF Step 4.0000000 MHz <u>Auto</u> Man |
| dB Center 5.320 00 GHz #Res BW 330 kHz #VBW 1 1 | Span 40 MHz MHz Sweep 1.132 ms (1000 pts) | Freq Offset 0.00000000 Hz |
| Occupied Bandwidth 16.5875 MHz | Occ BW % Pwr 99.00 % x dB -26.00 dB | Signal Track ^{On <u>Off</u>} |
| Transmit Freq Error x dB Bandwidth-52.415 kHz 21.279 MHz* | | |
| Copyright 2000–2010 Agilent Techno | logies | |

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9.8.3. OUTPUT POWER AND PSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

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Bandwidth, Antenna Gain, and Limits

| Channel | Frequency | Min | Directional | Power | PSD |
|---------|-----------|--------|-------------|-------|-------|
| | | 26 dB | Gain | Limit | Limit |
| | | BW | | | |
| | (MHz) | (MHz) | (dBi) | (dBm) | (dBm) |
| Low | 5260 | 31.920 | 3.96 | 24.00 | 11.00 |
| Mid | 5300 | 29.205 | 3.96 | 24.00 | 11.00 |
| High | 5320 | 32.128 | 3.96 | 24.00 | 11.00 |

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

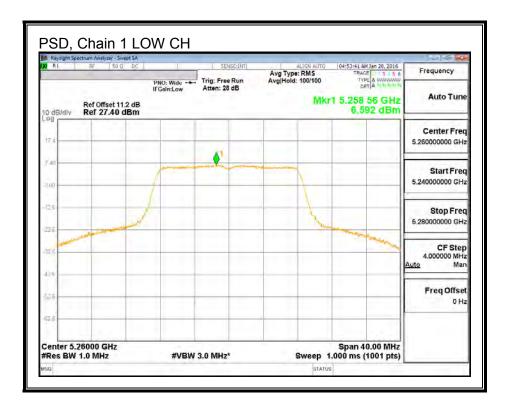
Output Power Results

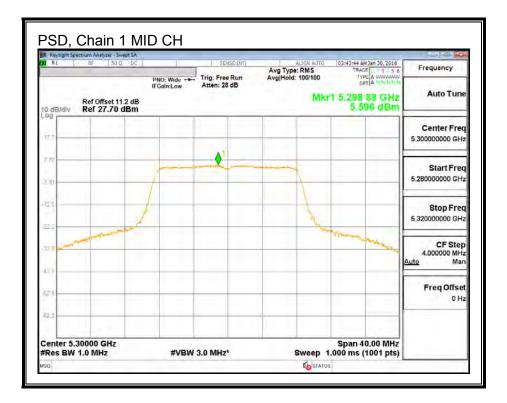
| Channel | Frequency | Chain 1 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5260 | 17.27 | 17.27 | 24.00 | -6.73 |
| Mid | 5300 | 17.30 | 17.30 | 24.00 | -6.70 |
| High | 5320 | 17.22 | 17.22 | 24.00 | -6.78 |

PSD Results

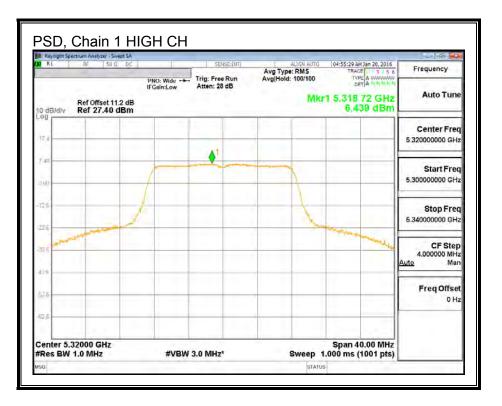
| Channel | Frequency | Chain 1 | Total | PSD | PSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5260 | 6.592 | 6.592 | 11.00 | -4.41 |
| Mid | 5300 | 5.596 | 5.596 | 11.00 | -5.40 |
| High | 5320 | 6.439 | 6.439 | 11.00 | -4.56 |

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.





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9.9. 802.11n HT20 SISO MODE IN THE 5.3 GHz BAND

9.9.1. 26 dB BANDWIDTH

LIMITS

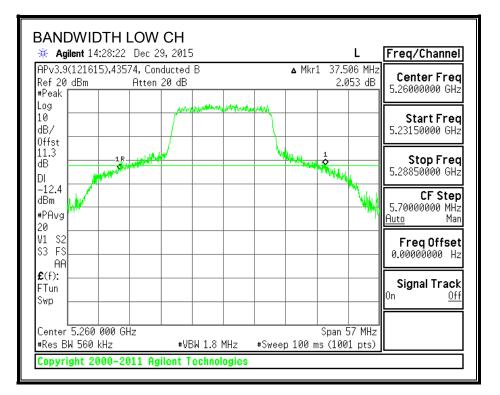
None; for reporting purposes only.

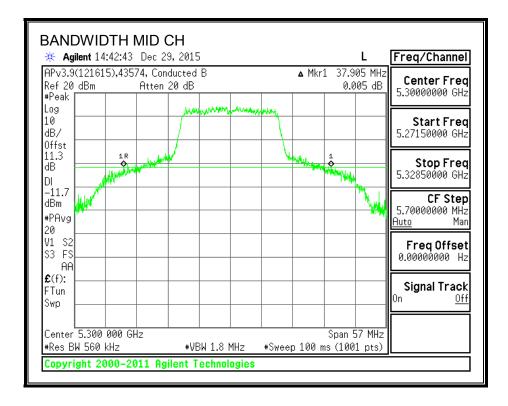
RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5260 | 37.506 |
| Mid | 5300 | 37.905 |
| High | 5320 | 38.704 |

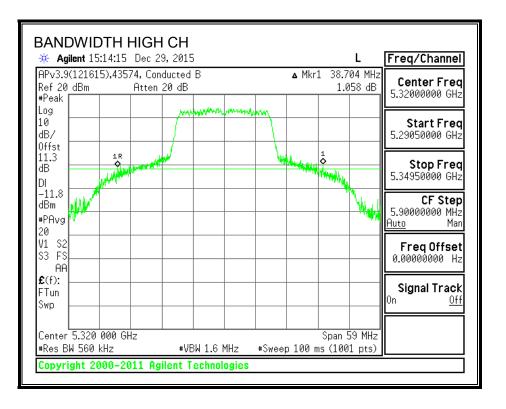
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26 dB BANDWIDTH





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9.9.2. 99% BANDWIDTH

<u>LIMITS</u>

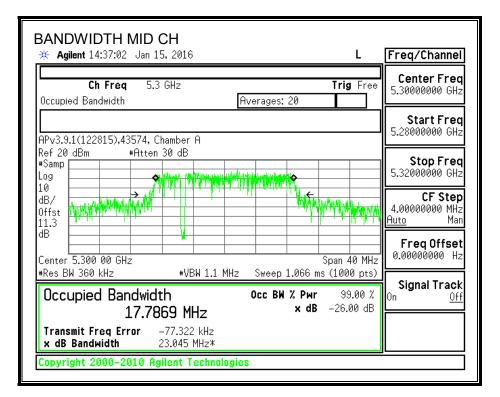
None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth | |
|---------|-----------|---------------|--|
| | (MHz) | (MHz) | |
| Low | 5260 | 17.7838 | |
| Mid | 5300 | 17.7869 | |
| High | 5320 | 17.7957 | |

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| ✤ Agilent 14:33:54 Jan 15, 2016 L | Freq/Channel | | |
|---|--|--|--|
| Ch Freq 5.26 GHz Trig Fr Occupied Bandwidth Averages: 20 | ee Center Freq 5.26000000 GHz | | |
| APv3.9.1(122815),43574, Chamber A | Start Freq 5.24000000 GHz | | |
| Ref 20 dBm #Atten 30 dB #Samp Log 10 | Stop Freq 5.28000000 GHz | | |
| dB/ offst 1.3 | CF Step 4.00000000 MHz <u>Auto</u> Man | | |
| dB Center 5.260 00 GHz Span 40 M | | | |
| •Res BW 360 kHz •VBW 1.1 MHz Sweep 1.066 ms (1000 pts) Signal Track Occupied Bandwidth Осс BW % Риг 99.00 % Signal Track On Off 17.7838 MHz × dB -26.00 dB Image: Comparison of the state of t | | | |
| Transmit Freq Error -46.778 kHz x dB Bandwidth 23.858 MHz* Copyright 2000-2010 Agilent Technologies | | | |



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| BANDWIDTH HIGH CH | | L | Freq/Channel |
|--|--|------------|---|
| Ch Freq 5.32 GHz Occupied Bandwidth | Averages: 20 | Trig Free | Center Freq 5.32000000 GHz |
| APv3.9.1(122815).43574, Chamb | | | Start Freq 5.30000000 GHz |
| Ref 20 dBm #Atten 30 d #Samp Log | | | Stop Freq 5.34000000 GHz |
| dB/ Offst 11.3 | | | CF Step 4.00000000 MHz <u>Auto</u> Man |
| dB | | pan 40 MHz | Freq Offset 0.00000000 Hz |
| *Res BW 360 kHz * Occupied Bandwidth 17.7957 | VBW 1.1 MHz Sweep 1.066 ms Occ BW % Pwr MHz × dB | | Signal Track ^{On <u>Off</u>} |
| Transmit Freq Error -44.1 | | | |
| Copyright 2000-2010 Agilent | Technologies | | |

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9.9.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

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Bandwidth, Antenna Gain, and Limits

| Channel | Frequency | Min | Directional | Power | PSD |
|---------|-----------|-------|-------------|-------|-------|
| | | 26 dB | Gain | Limit | Limit |
| | | BW | | | |
| | (MHz) | (MHz) | (dBi) | (dBm) | (dBm) |
| Low | 5260 | 39.15 | 3.96 | 24.00 | 11.00 |
| Mid | 5300 | 38.02 | 3.96 | 24.00 | 11.00 |
| High | 5320 | 38.40 | 3.96 | 24.00 | 11.00 |

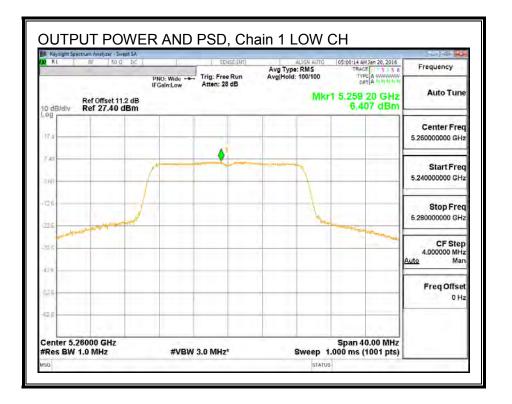
Output Power Results

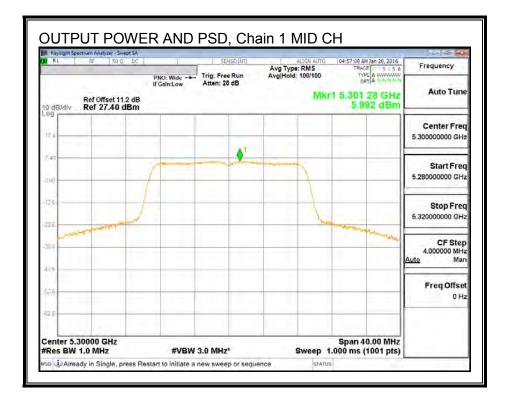
| Channel | Frequency | Chain 1 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5260 | 17.37 | 17.37 | 24.00 | -6.63 |
| Mid | 5300 | 17.25 | 17.25 | 24.00 | -6.75 |
| High | 5320 | 17.34 | 17.34 | 24.00 | -6.66 |

PSD Results

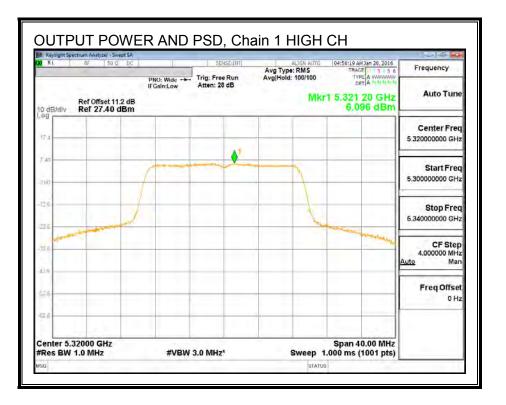
| Channel | Frequency | Chain 1 | Total | PSD | PSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5260 | 6.41 | 6.41 | 11.00 | -4.59 |
| Mid | 5300 | 5.99 | 5.99 | 11.00 | -5.01 |
| High | 5320 | 6.10 | 6.10 | 11.00 | -4.90 |

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.





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9.10. 802.11n HT20 CDD 3TX MODE IN THE 5.3 GHz BAND

9.10.1. 26 dB BANDWIDTH

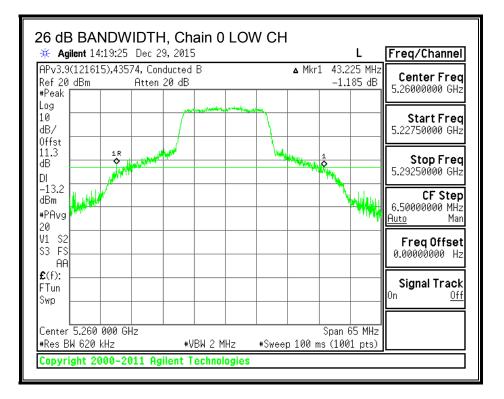
<u>LIMITS</u>

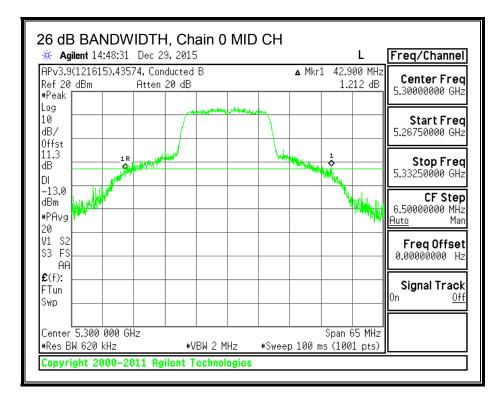
None; for reporting purposes only.

RESULTS

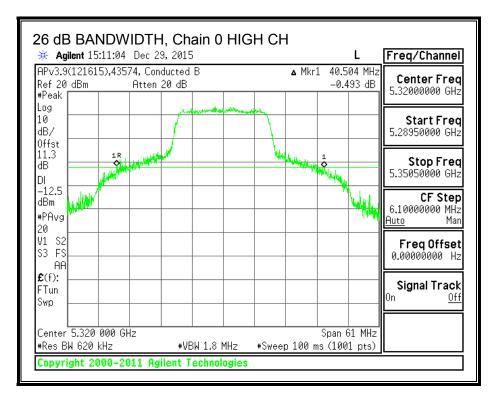
| Channel | Frequency | 26 dB BW | 26 dB BW | 26 dB BW |
|---------|-----------|----------|----------|----------|
| | | Chain 0 | Chain 1 | Chain 2 |
| | (MHz) | (MHz) | (MHz) | (MHz) |
| Low | 5260 | 43.225 | 37.506 | 31.680 |
| Mid | 5300 | 42.900 | 37.905 | 34.320 |
| High | 5320 | 40.504 | 38.704 | 36.190 |

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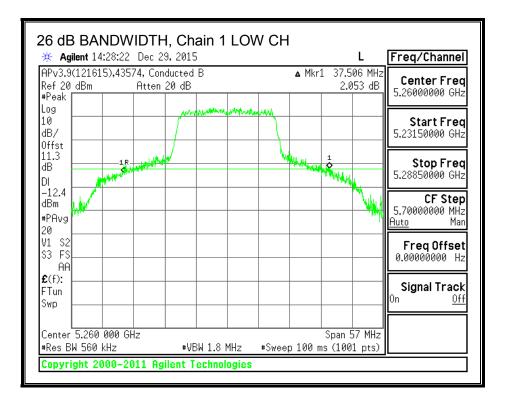




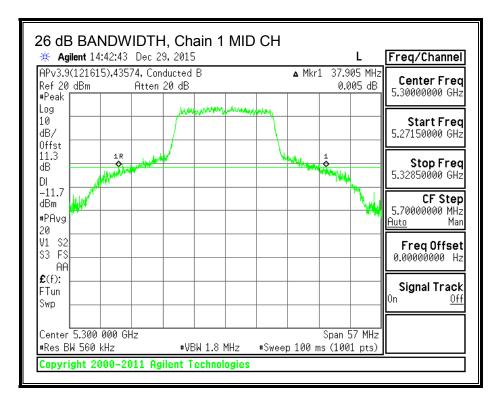
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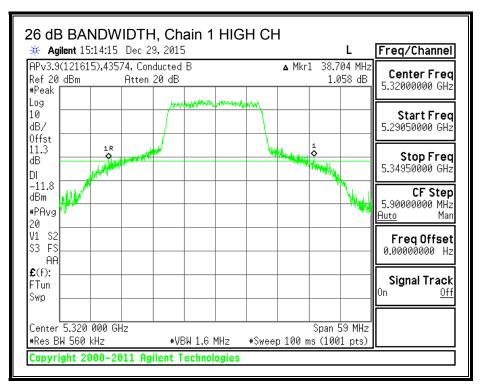


26 dB BANDWIDTH, Chain 1

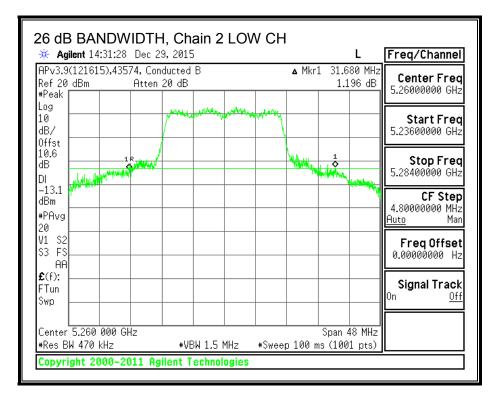


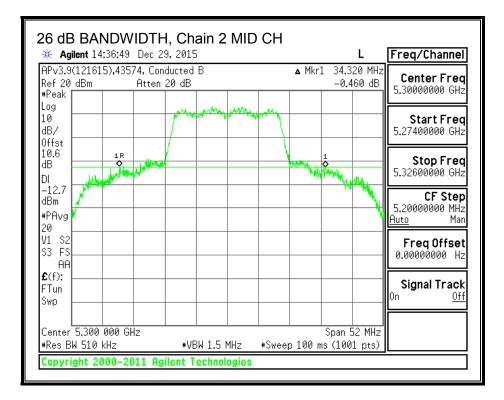
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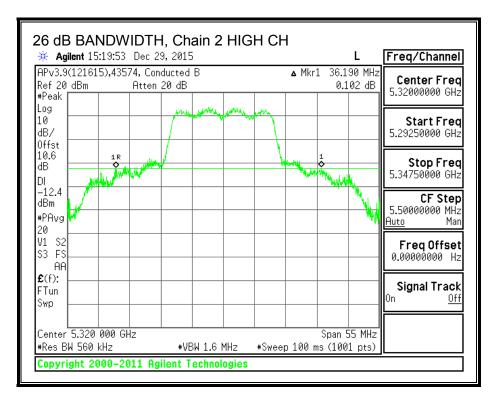


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9.10.2. 99% BANDWIDTH

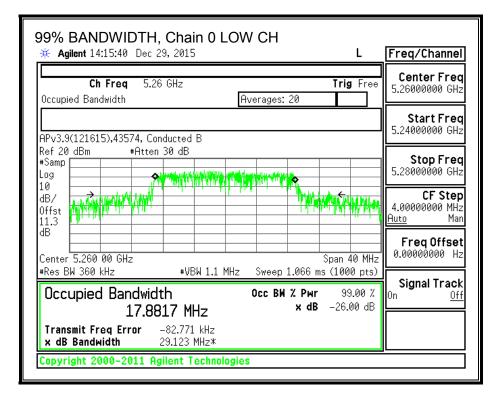
LIMITS

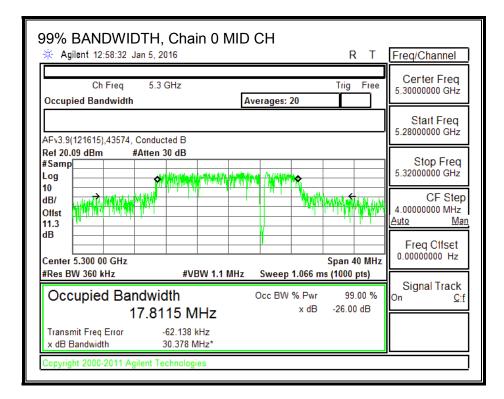
None; for reporting purposes only.

RESULTS

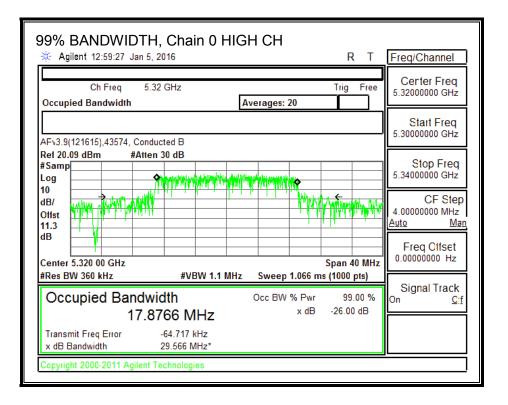
| Channel | Frequency | 99% BW | 99% BW | 99% BW |
|---------|-----------|---------|---------|---------|
| | | Chain 0 | Chain 1 | Chain 2 |
| | (MHz) | (MHz) | (MHz) | (MHz) |
| Low | 5260 | 17.8817 | 17.8710 | 17.7442 |
| Mid | 5300 | 17.8115 | 17.8227 | 17.7763 |
| High | 5320 | 17.8766 | 17.8392 | 17.8007 |

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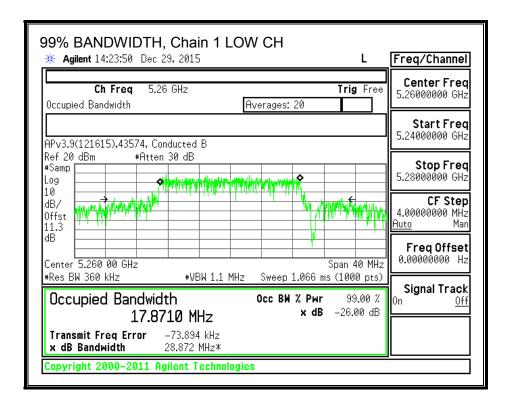




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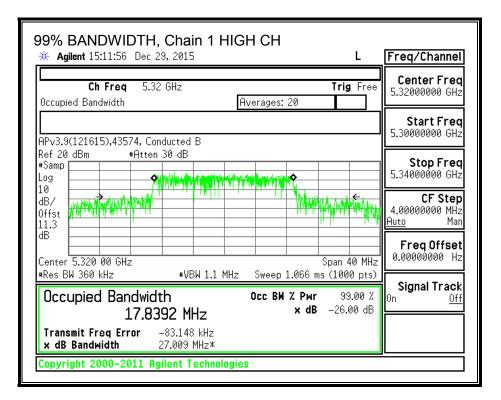


99% BANDWIDTH, Chain 1

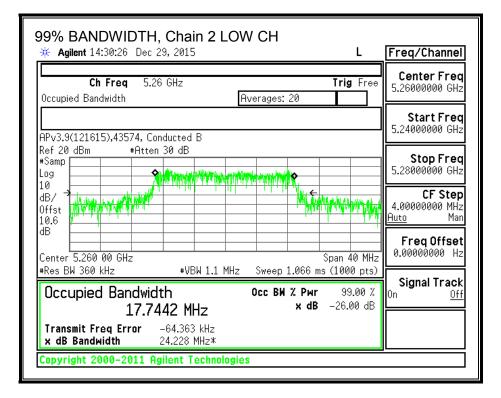


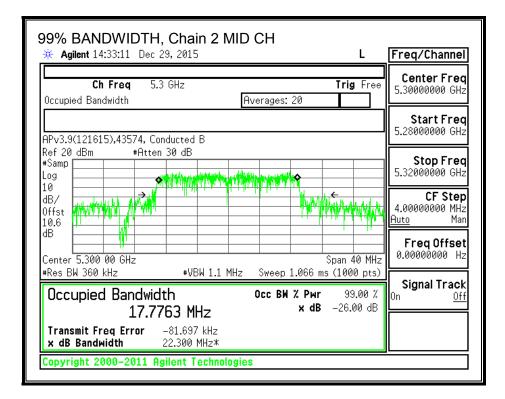
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| 99% BANDWIDTH, Chain 1 MID CH | Freq/Channel |
|---|---|
| Ch Freq 5.3 GHz Trig Free Occupied Bandwidth Averages: 20 | Center Freq 5.30000000 GHz |
| APv3.9(121615),43574, Conducted B | Start Freq 5.28000000 GHz |
| Ref 20 dBm #Atten 30 dB #Samp Log | Stop Freq 5.32000000 GHz |
| dB/ Offst 11.3 | CF Step 4.00000000 MHz <u>Auto</u> Man |
| dB Center 5.300 00 GHz Span 40 MHz | Freq Offset 0.00000000 Hz |
| #Res BW 360 kHz #VBW 1.1 MHz Sweep 1.066 ms (1000 pts) Occupied Bandwidth Occ BW % Рыг 99.00 % 17.8227 MHz × dB -26.00 dB | Signal Track ^{On <u>Off</u>} |
| L7.8227 MHZ MHZ MHZ Transmit Freq Error -97.502 kHz -97.100 MHz* | |
| Copyright 2000-2011 Agilent Technologies | · |



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| 99% BANDWIDTH, Chain 2 HIGH CH | Freg/Channel |
|---|---|
| Ch Freq 5.32 GHz Trig Free Occupied Bandwidth Averages: 20 | Center Freq 5.32000000 GHz |
| APv3.9(121615),43574, Conducted B | Start Freq 5.30000000 GHz |
| Ref 20 dBm #Atten 30 dB #Samp Log 10 | Stop Freq 5.34000000 GHz |
| dB/ Offst 10.6 | CF Step 4.00000000 MHz <u>Auto</u> Man |
| dB | FreqOffset 0.00000000 Hz |
| | Signal Track ^{On <u>Off</u>} |
| Transmit Freq Error -92.440 kHz x dB Bandwidth 24.639 MHz* | |
| Copyright 2000–2011 Agilent Technologies | |

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9.10.3. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

| Chain 0 | Chain 1 | Chain 2 | Uncorrelated Chains |
|---------|---------|---------|----------------------------|
| Antenna | Antenna | Antenna | Directional |
| Gain | Gain | Gain | Gain |
| (dBi) | (dBi) | (dBi) | (dBi) |
| 4.77 | 3.92 | 3.23 | 4.02 |

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

| Chain 0 | Chain 1 | Chain 2 | Correlated Chains |
|---------|---------|---------|--------------------------|
| Antenna | Antenna | Antenna | Directional |
| Gain | Gain | Gain | Gain |
| (dBi) | (dBi) | (dBi) | (dBi) |
| 4.77 | 3.92 | 3.23 | 8.77 |

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Bandwidth, Antenna Gain, and Limits

| Channel | Frequency | Min 26 dB BW | Directional Gain for Power | Directional Gain for PSD | Power Limit | PSD Limit |
|---------|-----------|--------------------|----------------------------------|--------------------------------|----------------|--------------|
| | (MHz) | (MHz) | (dBi) | (dBi) | (dBm) | (dBm) |
| Low | 5260 | 31.68 | 4.02 | 8.77 | 24.00 | 8.23 |
| Mid | 5300 | 34.32 | 4.02 | 8.77 | 24.00 | 8.23 |
| High | 5320 | 36.19 | 4.02 | 8.77 | 24.00 | 8.23 |

Duty Cycle CF (dB) 0.00

Included in Calculations of Corr'd PSD

Output Power Results

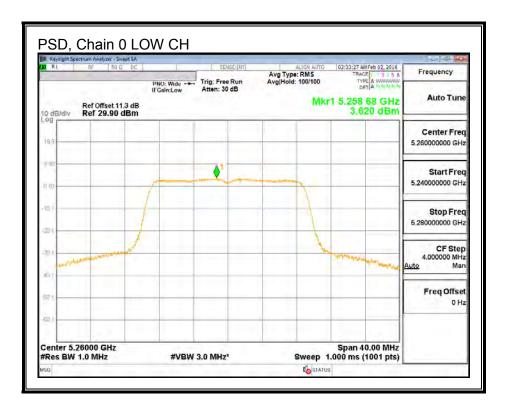
| Channel | Frequency | Chain 0 | Chain 1 | Chain 2 | Total | Power | Power |
|---------|-----------|---------|---------|---------|--------|-------|--------|
| | | Meas | Meas | Meas | Corr'd | Limit | Margin |
| | | Power | Power | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5260 | 14.53 | 14.21 | 14.00 | 19.02 | 24.00 | -4.98 |
| Mid | 5300 | 14.43 | 14.20 | 13.85 | 18.94 | 24.00 | -5.06 |
| High | 5320 | 14.50 | 14.15 | 13.83 | 18.94 | 24.00 | -5.06 |

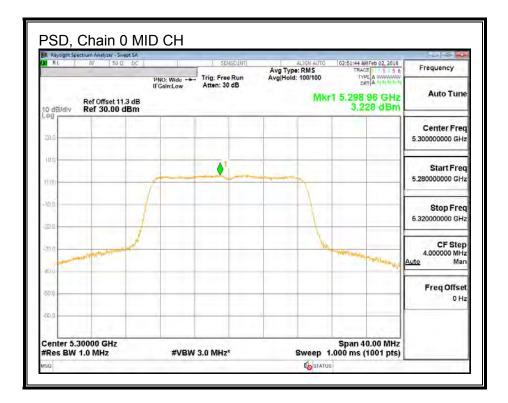
PPSD Results

| Channel | Frequency | Chain 0 | Chain 1 | Chain 2 | Total | PSD | PSD |
|---------|-----------|---------|---------|---------|--------|-------|--------|
| | | Meas | Meas | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5260 | 3.620 | 2.932 | 3.063 | 7.987 | 8.23 | -0.24 |
| Mid | 5300 | 3.228 | 2.954 | 2.228 | 7.595 | 8.23 | -0.64 |
| High | 5320 | 3.161 | 2.791 | 2.484 | 7.592 | 8.23 | -0.64 |

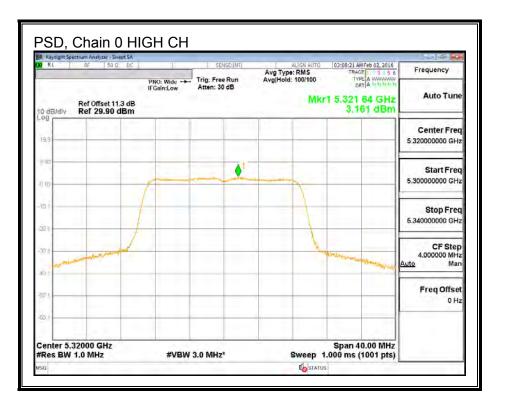
<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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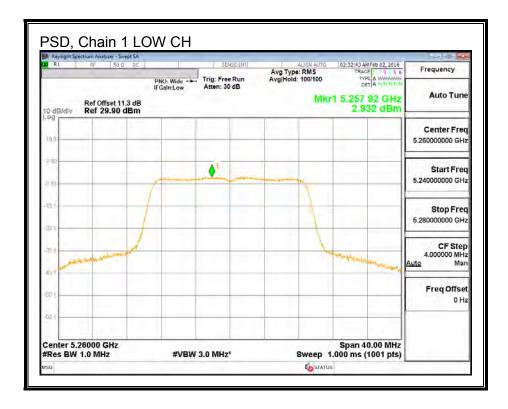




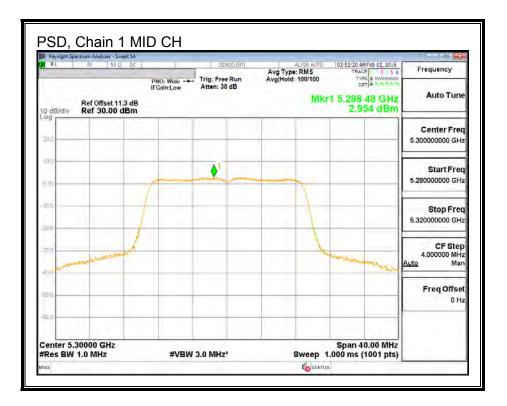
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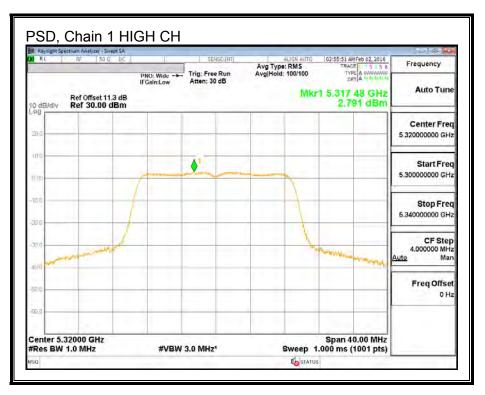


PSD, Chain 1

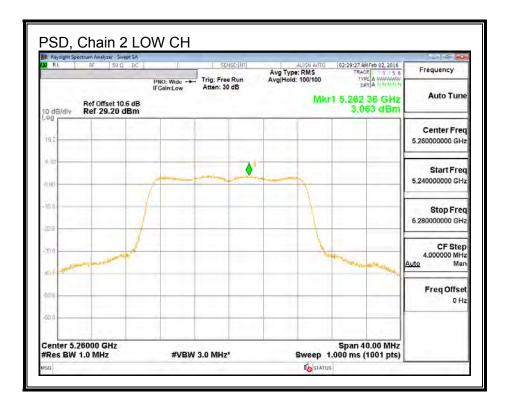


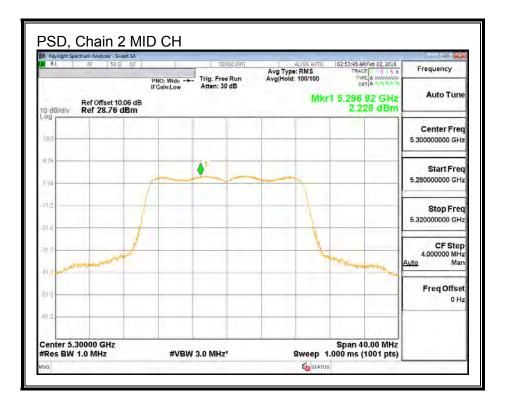
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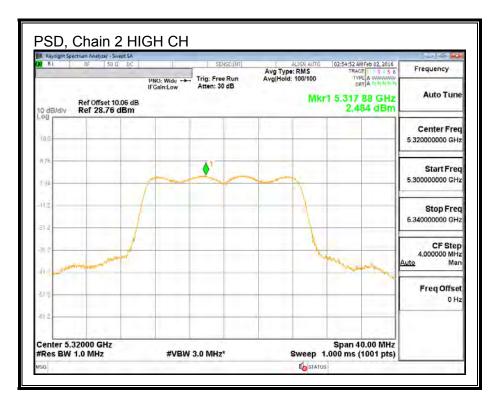


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9.11. 802.11n HT40 SISO MODE IN THE 5.3 GHz BAND

9.11.1. 26 dB BANDWIDTH

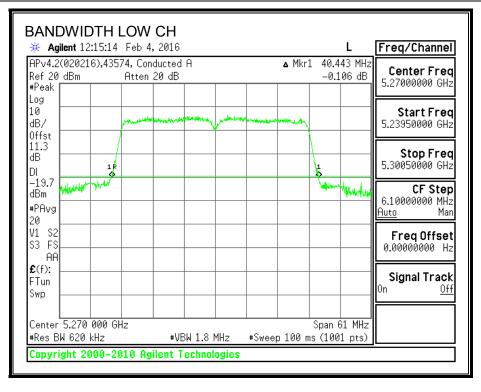
LIMITS

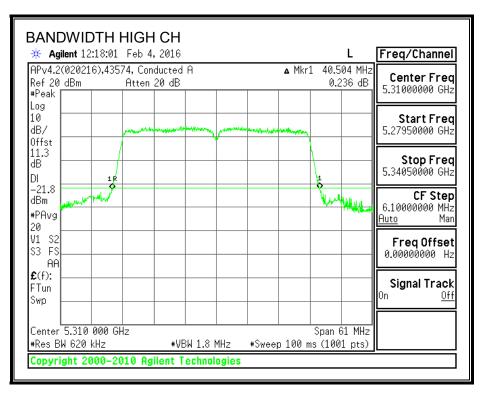
None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5270 | 40.443 |
| High | 5310 | 40.504 |

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9.11.2. 99% BANDWIDTH

LIMITS

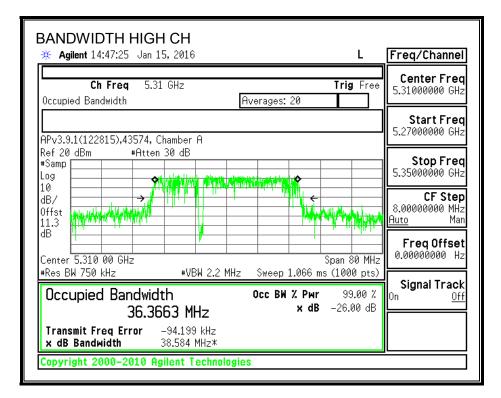
None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5270 | 36.5537 |
| High | 5310 | 36.3663 |

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| BANDWIDTH LOW CH | L | Freq/Channel |
|---|------------------------------|--|
| Ch Freq 5.27 GHz Occupied Bandwidth Averages: 20 | Trig Free | Center Freq 5.27000000 GHz |
| APv3.9.1(122815),43574, Chamber A Ref 20 dBm #Atten 30 dB | | Start Freq 5.23000000 GHz |
| *Samp Log 10 | | Stop Freq 5.31000000 GHz CF Step |
| dB/ Offst 11.3 dB | | 8.00000000 MHz <u>Auto</u> Man |
| Center 5.270 00 GHz #Res BW 750 kHz #VBW 2.2 MHz Sweep 1.066 r | Span 80 MHz ns (1000 pts) | Freq Offset 0.00000000 Hz |
| Occupied Bandwidth Occ BW % Pwr 36.5537 MHz × dB | 99.00 % -26.00 dB | Signal Track ^{On <u>Off</u>} |
| Transmit Freq Error -68.279 kHz x dB Bandwidth 56.585 MHz* Copyright 2000-2010 Agilent Technologies | | |



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9.11.3. OUTPUT POWER AND PSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

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Bandwidth, Antenna Gain, and Limits

| Channel | Frequency | Min | Directional | Power | PSD |
|---------|-----------|--------|-------------|-------|-------|
| | | 26 dB | Gain | Limit | Limit |
| | | BW | | | |
| | (MHz) | (MHz) | (dBi) | (dBm) | (dBm) |
| Low | 5270 | 40.443 | 4.77 | 24.00 | 11.00 |
| High | 5310 | 40.504 | 4.77 | 24.00 | 11.00 |

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

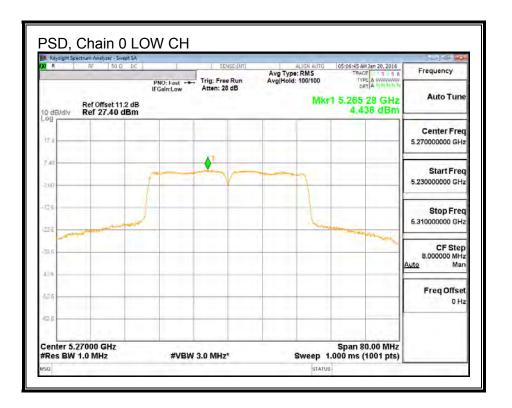
Output Power Results

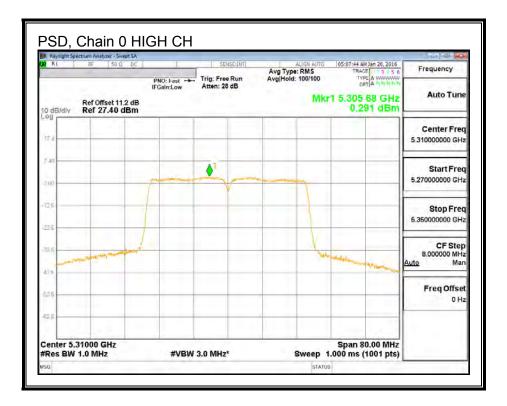
| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|----------------------|-----------------------|----------------|----------------|---------------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | | | | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | (MHz) 5270 | (dBm) 18.00 | (dBm) 18.00 | (dBm) 24.00 | (dB) -6.00 |

PSD Results

| Channel | Frequency | Chain 0 | Total | PSD | PSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5270 | 4.438 | 4.438 | 11.00 | -6.56 |
| High | 5310 | 0.291 | 0.291 | 11.00 | -10.71 |

<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.





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9.12. 802.11n HT40 CDD 3TX MODE IN THE 5.3 GHz BAND

9.12.1. 26 dB BANDWIDTH

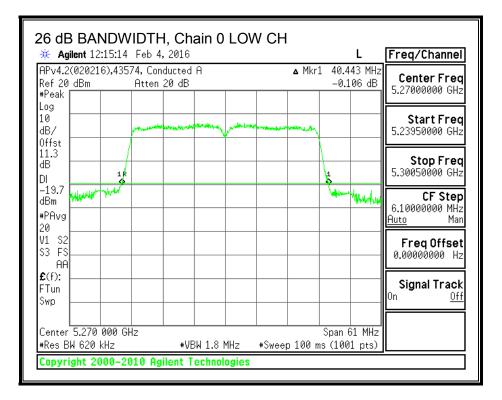
<u>LIMITS</u>

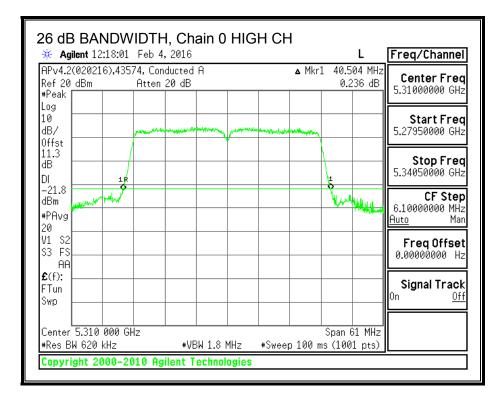
None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB BW | 26 dB BW | 26 dB BW |
|---------|-----------|----------|----------|----------|
| | | Chain 0 | Chain 1 | Chain 2 |
| | (MHz) | (MHz) | (MHz) | (MHz) |
| Low | 5270 | 40.443 | 39.840 | 39.780 |
| High | 5310 | 40.504 | 39.900 | 39.980 |

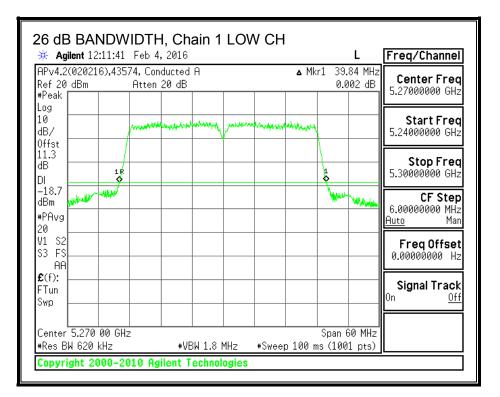
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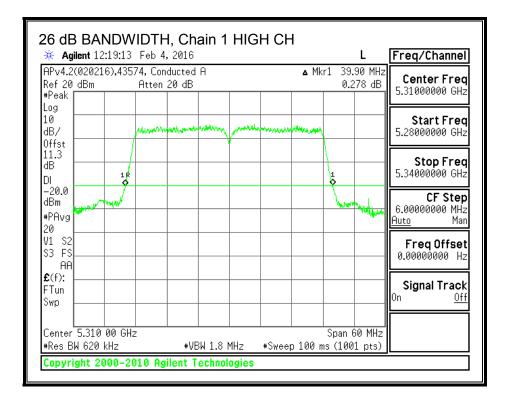




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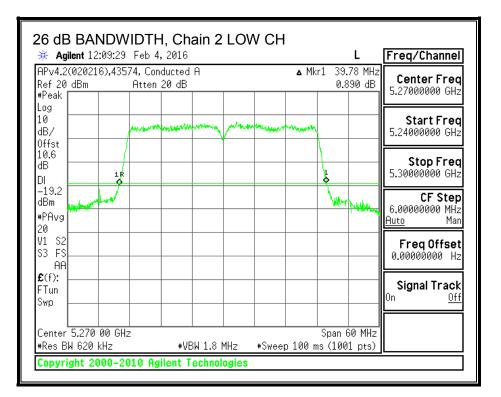
26 dB BANDWIDTH, Chain 1

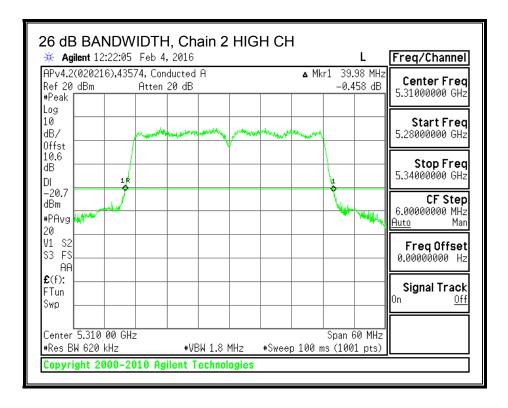




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26 dB BANDWIDTH, Chain 2





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9.12.2. 99% BANDWIDTH

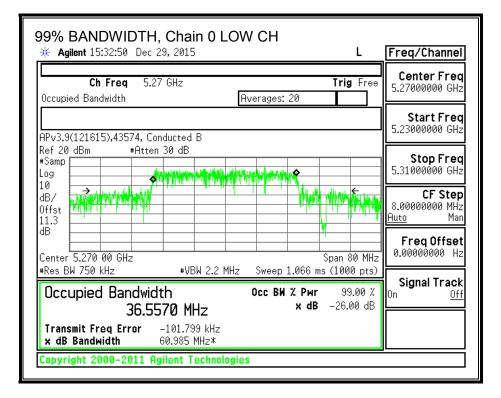
LIMITS

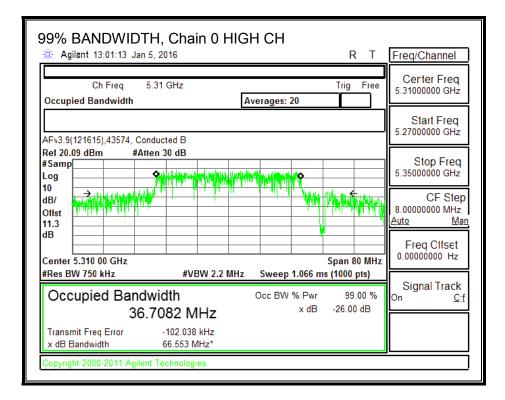
None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% BW | 99% BW | 99% BW |
|---------|-----------|---------|---------|---------|
| | | Chain 0 | Chain 1 | Chain 2 |
| | (MHz) | (MHz) | (MHz) | (MHz) |
| Low | 5270 | 36.5570 | 36.7266 | 36.6061 |
| High | 5310 | 36.7082 | 36.6296 | 36.6556 |

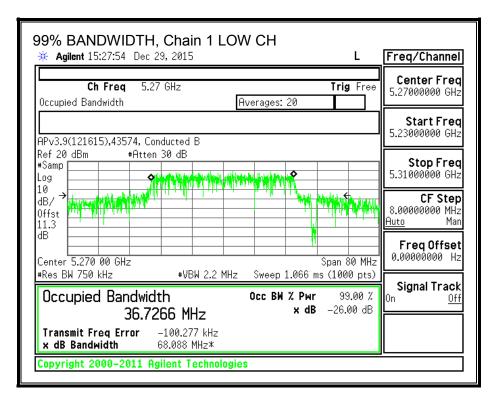
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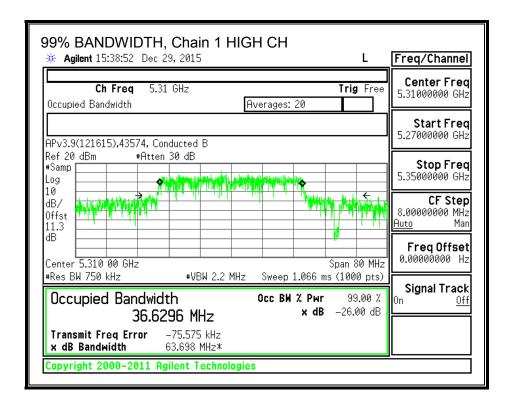




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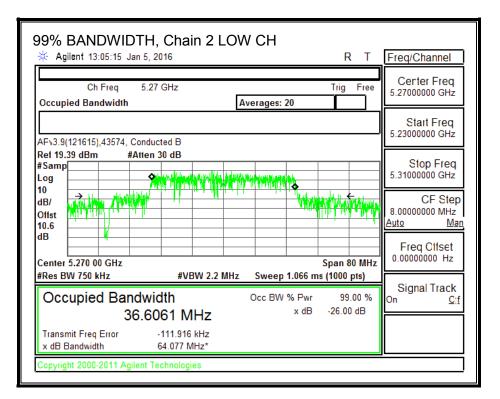
99% BANDWIDTH, Chain 1

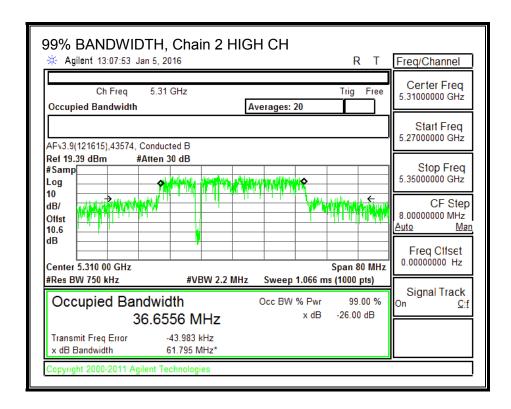




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99% BANDWIDTH, Chain 2





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9.12.3. OUTPUT POWER AND PSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

| Chain 0 | Chain 1 | Chain 2 | Uncorrelated Chains |
|---------|---------|---------|----------------------------|
| Antenna | Antenna | Antenna | Directional |
| Gain | Gain | Gain | Gain |
| (dBi) | (dBi) | (dBi) | (dBi) |
| 4.77 | 3.92 | 3.23 | 4.02 |

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

| Chain 0 | Chain 1 | Chain 2 | Correlated Chains |
|---------|---------|---------|--------------------------|
| Antenna | Antenna | Antenna | Directional |
| Gain | Gain | Gain | Gain |
| (dBi) | (dBi) | (dBi) | (dBi) |
| 4.77 | 3.92 | 3.23 | 8.77 |

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Bandwidth, Antenna Gain, and Limits

| Channel | Frequency | Min | Directional | Directional | Power | PSD |
|---------|-----------|--------|-------------|-------------|-------|-------|
| | | 26 dB | Gain | Gain | Limit | Limit |
| | | BW | for Power | for PSD | | |
| | | | | | | |
| | (MHz) | (MHz) | (dBi) | (dBi) | (dBm) | (dBm) |
| Low | 5270 | 39.780 | 4.02 | 8.77 | 24.00 | 8.23 |
| High | 5310 | 39.900 | 4.02 | 8.77 | 24.00 | 8.23 |

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

Output Power Results

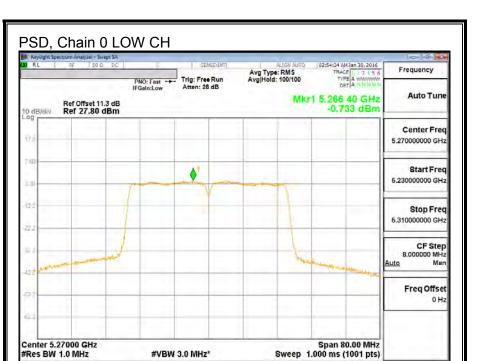
| Channel | Frequency | Chain 0 | Chain 1 | Chain 2 | Total | Power | Power |
|---------|-----------|---------|---------|---------|--------|-------|--------|
| | | Meas | Meas | Meas | Corr'd | Limit | Margin |
| | | Power | Power | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5270 | 13.45 | 13.02 | 12.81 | 17.87 | 24.00 | -6.13 |
| High | 5310 | 11.84 | 11.61 | 11.10 | 16.30 | 24.00 | -7.70 |

PSD Results

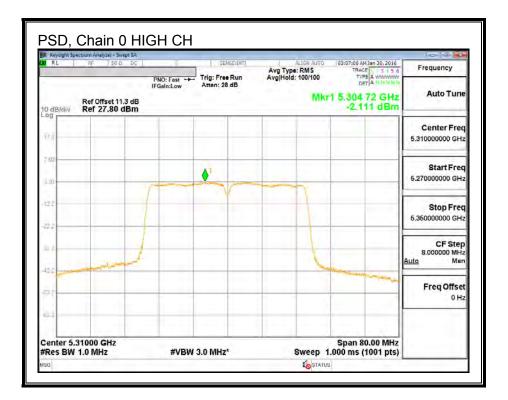
| Channel | Frequency | Chain 0 | Chain 1 | Chain 2 | Total | PSD | PSD |
|---------|-----------|---------|---------|---------|--------|-------|--------|
| | | Meas | Meas | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5270 | -0.733 | -1.060 | -5.389 | 2.83 | 8.23 | -5.40 |
| High | 5310 | -2.111 | -2.633 | -2.643 | 2.32 | 8.23 | -5.91 |

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

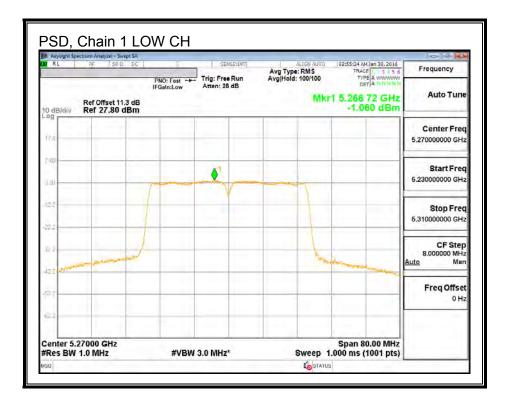
30

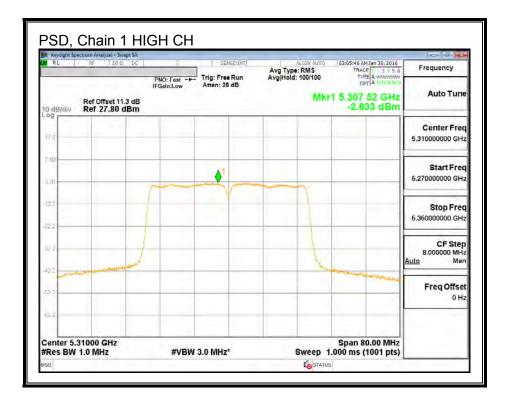


Te STATUS

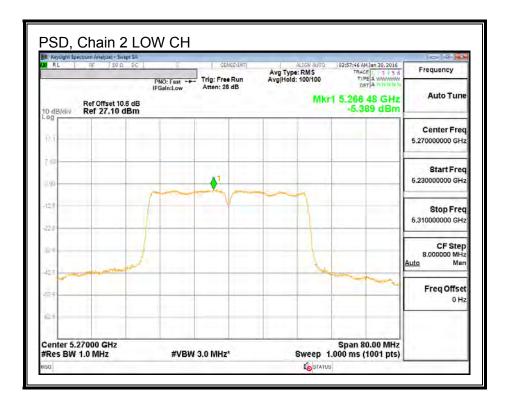


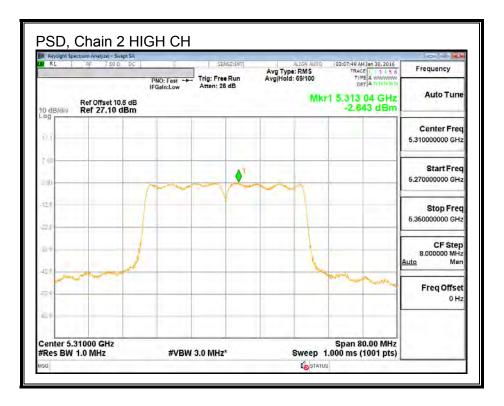
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9.13. 802.11ac VHT80 CDD 3TX MODE IN THE 5.3 GHz BAND

9.13.1. 26 dB BANDWIDTH

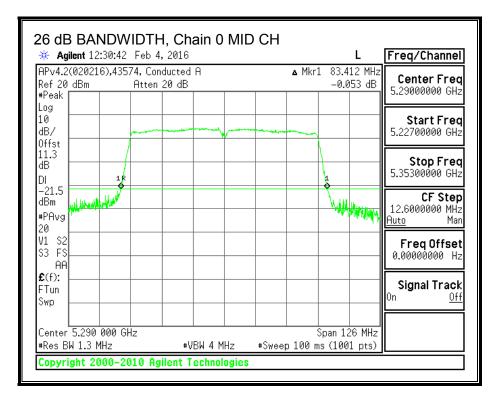
LIMITS

None; for reporting purposes only.

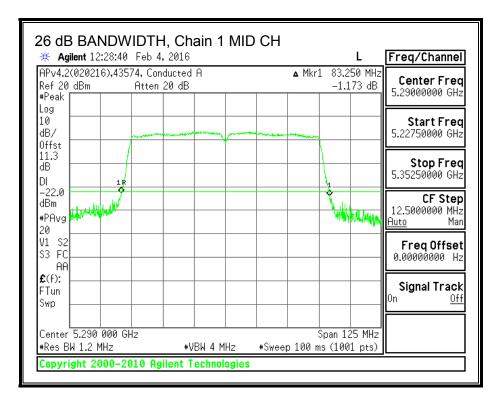
RESULTS

| Channel | Frequency | 26 dB BW | 26 dB BW | 26 dB BW |
|---------|-----------|----------|----------|----------|
| | | Chain 0 | Chain 1 | Chain 2 |
| | (MHz) | (MHz) | (MHz) | (MHz) |
| Mid | 5290 | 83.412 | 83.250 | 82.460 |

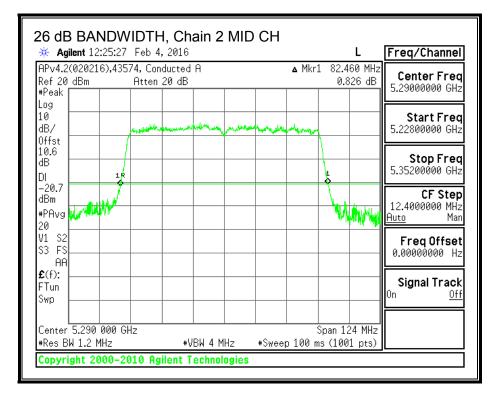
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26 dB BANDWIDTH, Chain 1



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9.13.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

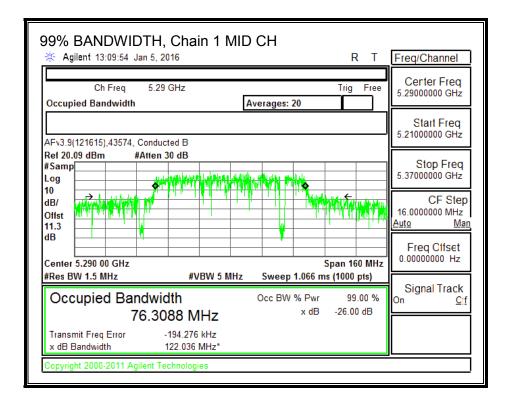
RESULTS

| Channel | Frequency | 99% BW | 99% BW | 99% BW |
|---------|-----------|---------|---------|---------|
| | | Chain 0 | Chain 1 | Chain 2 |
| | (MHz) | (MHz) | (MHz) | (MHz) |
| Mid | 5290 | 76.0253 | 76.3088 | 76.1194 |

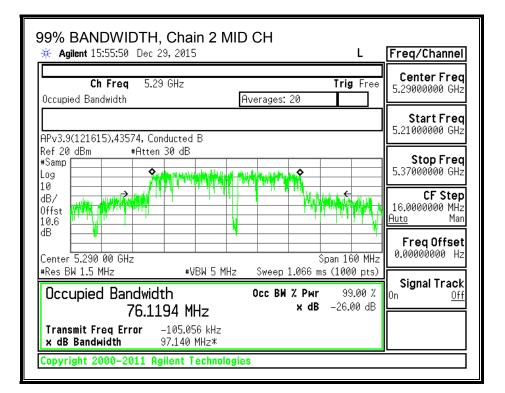
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| • | 29 GHz | 0 | Trig Free | Center Fred 5.29000000 GHz |
|--|--------------|--|----------------------|-------------------------------|
| Occupied Bandwidth | | Averages: 20 | | Start Fred |
| D2 0/10101EX 42E74 C | anduated D | | | 5.21000000 GHz |
| ₩ν3.9(121615),43574, C Ref 20 dBm | in 30 dB | | | L |
| Samp | | | | Stop Fred |
| .0g | | the state of the second se | | 5.37000000 GHz |
| · | | A CONTRACTOR OF A | 4.€ | CF Ster |
| dB/ | | | Within a Autora Mill | 16.0000000 MHz |
| 1.3 | | | | <u>Auto</u> Mar |
| яв <mark>– – –</mark> | | | μ μ | Freq Offset |
| | | | | 0.00000000 Hz |
| Center 5.290 00 GHz #Res BW 1.5 MHz | ∗VBW 5 MH | | Span 160 MHz | |
| | | 2 Jweep 1.000 I | 113 (1000 pt3) | Signal Track |
| Occupied Bandwi | dth | Occ BW % Pwr | | 0n <u>0f</u> |
| 76.0 | 253 MHz | x dB | –26.00 dB | |
| Transmit Freg Error | –146.170 kHz | | | |
| x dB Bandwidth | 97.207 MHz* | | | |

99% BANDWIDTH, Chain 1



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9.13.3. OUTPUT POWER AND PSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

| Chain 0 | Chain 1 | Chain 2 | Uncorrelated Chains |
|---------|---------|---------|----------------------------|
| Antenna | Antenna | Antenna | Directional |
| Gain | Gain | Gain | Gain |
| (dBi) | (dBi) | (dBi) | (dBi) |
| 4.77 | 3.92 | 3.23 | 4.02 |

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

| Chain 0 | Chain 1 | Chain 2 | Correlated Chains |
|---------|---------|---------|--------------------------|
| Antenna | Antenna | Antenna | Directional |
| Gain | Gain | Gain | Gain |
| (dBi) | (dBi) | (dBi) | (dBi) |
| 4.77 | 3.92 | 3.23 | 8.77 |

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Bandwidth, Antenna Gain, and Limits

| Channel | Frequency | Min | Directional | Directional | Power | PSD |
|---------|-----------|-------|-------------|-------------|-------|-------|
| | | 26 dB | Gain | Gain | Limit | Limit |
| | | BW | for Power | for PSD | | |
| | (MHz) | (MHz) | (dBi) | (dBi) | (dBm) | (dBm) |
| Mid | 5290 | 82.46 | 4.02 | 8.77 | 24.00 | 8.23 |

 Duty Cycle CF (dB)
 0.17
 Included in Calculations of Corr'd PSD

Output Power Results

| Channel | Frequency | Chain 0 | Chain 1 | Chain 2 | Total | Power | Power |
|---------|-----------|---------|---------|---------|--------|-------|--------|
| | | Meas | Meas | Meas | Corr'd | Limit | Margin |
| | | Power | Power | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dB) |
| Mid | 5290 | 11.74 | 11.07 | 11.01 | 16.06 | 24.00 | -7.94 |

PSD Results

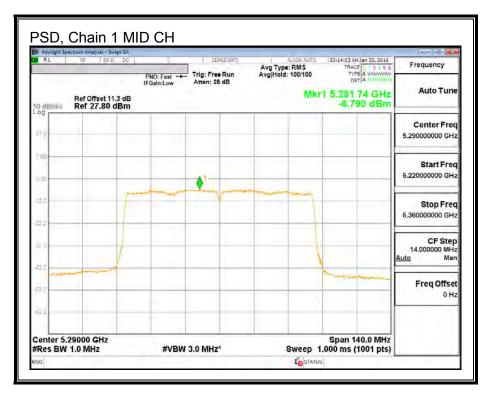
| Channel | Frequency | Chain 0 | Chain 1 | Chain 2 | Total | PSD | PSD |
|---------|-----------|---------|---------|---------|--------|-------|--------|
| | | Meas | Meas | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dB) |
| Mid | 5290 | -6.363 | -6.790 | -6.797 | -1.70 | 8.23 | -9.93 |

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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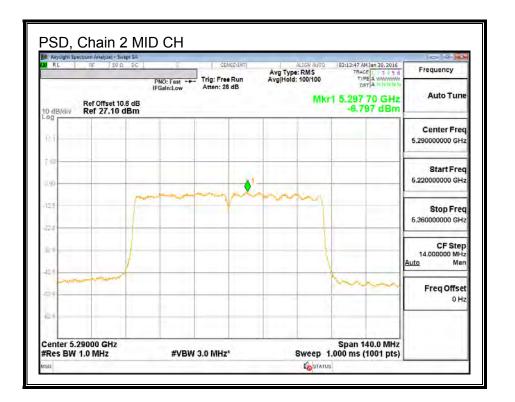
| Keysight Spectrum An W RL AF | 50 D DC | NO: Fast | I SENSENNT | Aug Type: RMS Avg Hold: 100/10 | 00 03:15:26 AM Jan 30, 2 TRACE 1 3 TO TYPE A WWW DET A HIM | 5 6 Frequency |
|---------------------------------|-----------------------------|----------|--------------|-----------------------------------|---|--------------------------------------|
| | iffset 11.3 dB 27.80 dBm | Gain:Low | Atten: 28 dB | 0 | Akr1 5.276 56 G -8.363 dE | Hz Auto Tune |
| i)á | | | | | | Center Freq 5,290000000 GHz |
| 7.00 | | | | | | Start Freq 5.220000000 GHz |
| -12.2 | 1 | | 7 | | | Stop Freq 5,36000000 GHz |
| 10 P | | | | | | CF Step 14.000000 MHz Auto Man |
| -122 | | | | | hannel | Freq Offset 0 Hz |
| Center 5.29000 #Res BW 1.0 M | | | 3.0 MHz* | | Span 140.0 M p 1.000 ms (1001 p | IHz |

PSD, Chain 1



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9.14. 802.11a LEGACY MODE IN THE 5.6 GHz BAND

9.14.1. 26 dB BANDWIDTH

LIMITS

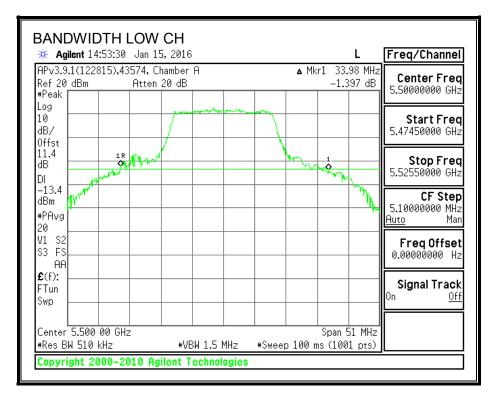
None; for reporting purposes only.

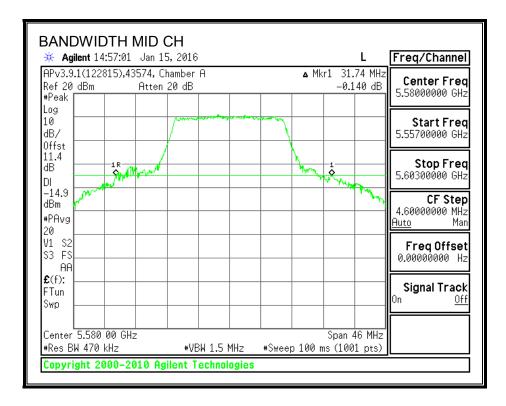
RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5500 | 33.98 |
| Mid | 5580 | 31.74 |
| High | 5700 | 31.70 |
| 144 | 5720 | 32.05 |

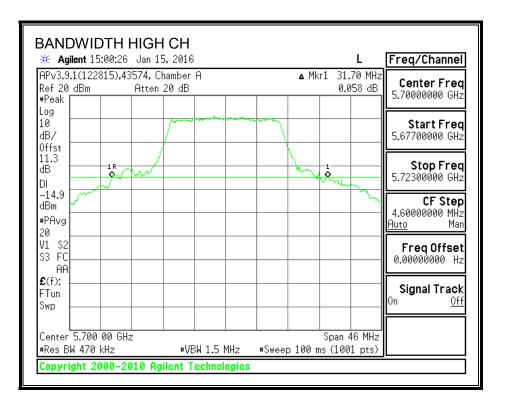
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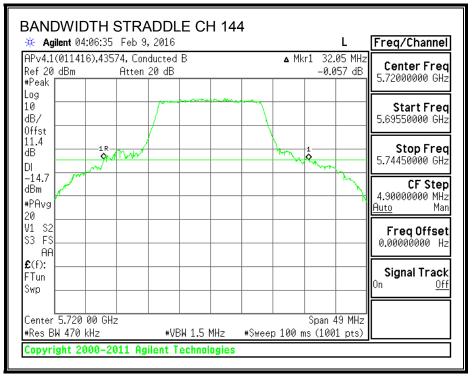
26 dB BANDWIDTH





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9.14.2. 99% BANDWIDTH

DATE: 3/16/2016

LIMITS

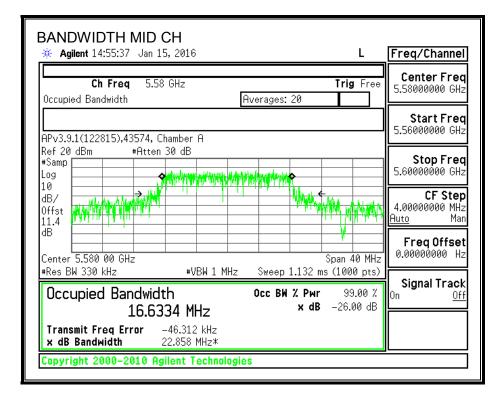
None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5500 | 16.6547 |
| Mid | 5580 | 16.6334 |
| High | 5700 | 16.5229 |
| 144 | 5720 | 16.3984 |

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| BANDWIDTH LOW CH | Fre | q/Channel | | | |
|--|--------------------|---|--|--|--|
| Ch Freq 5.5 GHz Trig F Occupied Bandwidth Averages: 20 | | enter Freq 0000000 GHz | | | |
| APv3.9.1(122815),43574, Chamber A Ref 20 dBm #Atten 30 dB | 5.4 | Start Freq 8000000 GHz | | | |
| *Samp Log 10 | 5.5 | Stop Freq 2000000 GHz | | | |
| dB/ Offst 11.4 dB | 4.0 <u>Auto</u> | CF Step 0000000 MHz <u>0</u> Man | | | |
| Center 5.500 00 GHz Span 40 #Res BW 330 kHz #VBW 1 MHz Sweep 1.132 ms (1000 p | MHz 0.0 | Freq Offset 10000000 Hz | | | |
| Occupied Bandwidth Осс ВМ % Рыг 99.00 % 16.6547 MHz × dB -26.00 dB | | | | | |
| Transmit Freq Error -51.111 kHz x dB Bandwidth 25.704 MHz* | | | | | |
| Copyright 2000-2010 Agilent Technologies | | | | | |



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| BANDWIDTH HIGH CH | L | Freq/Channel |
|--|--|---|
| Ch Freq 5.7 GHz Occupied Bandwidth | Trig Free Averages: 20 | Center Freq 5.70000000 GHz |
| APv3.9.1(122815),43574, Chamber A | | Start Freq 5.68000000 GHz |
| Ref 20 dBm #Atten 30 dB #Samp Log 10 | | Stop Freq 5.72000000 GHz |
| dB/ Offst 11.3 | | CF Step 4.00000000 MHz <u>Auto</u> Man |
| dB Center 5.700 00 GHz #Res BW 330 kHz #VBW 1 1 | Span 40 MHz MHz Sweep 1.132 ms (1000 pts) | Freq Offset 0.00000000 Hz |
| Occupied Bandwidth 16.5229 MHz | Осс ВИ % Рыг 99.00 % х dB -26.00 dB | Signal Track ^{On <u>Off</u>} |
| Transmit Freq Error -63.143 kHz x dB Bandwidth 22.583 MHz* | | |
| Copyright 2000-2010 Agilent Techno | logies | |

| BANDWIDTH STRADDLE * Agilent 04:04:31 Feb 9, 2016 | CH 144 | L | Freq/Channel |
|--|---|-------------|---|
| Ch Freq 5.72 GHz Occupied Bandwidth | Averages: 20 | Trig Free | Center Freq 5.72000000 GHz |
| APv4.1(011416),43574, Conducted B | | | Start Freq 5.70000000 GHz |
| Ref 20 dBm #Atten 30 dB #Samp Log | | | Stop Freq 5.74000000 GHz |
| dB/ Offst martine 100 million | | | CF Step 4.00000000 MHz <u>Auto</u> Man |
| dB | | Span 40 MHz | FreqOffset 0.00000000 Hz |
| *Res BW 330 kHz *VBW Occupied Bandwidth 16,3984 MHz | 1 MHz Sweep 1.132 m Occ BW % Pwr x dB | | Signal Track ^{On <u>Off</u>} |
| LO.3304 MHZ Transmit Freq Error 88.465 kHz x dB Bandwidth 23.049 MHz | * | | |
| Copyright 2000–2011 Agilent Tech | nologies | | |

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9.14.3. OUTPUT POWER AND PSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

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Bandwidth, Antenna Gain, and Limits

| Channel | Frequency | Min | Directional | Power | PSD |
|---------|-----------|-------|-------------|-------|-------|
| | | 26 dB | Gain | Limit | Limit |
| | | BW | | | |
| | (MHz) | (MHz) | (dBi) | (dBm) | (dBm) |
| Low | 5500 | 33.98 | 3.46 | 24.00 | 11.00 |
| Mid | 5580 | 31.74 | 3.46 | 24.00 | 11.00 |
| High | 5700 | 31.70 | 3.46 | 24.00 | 11.00 |

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

Output Power Results

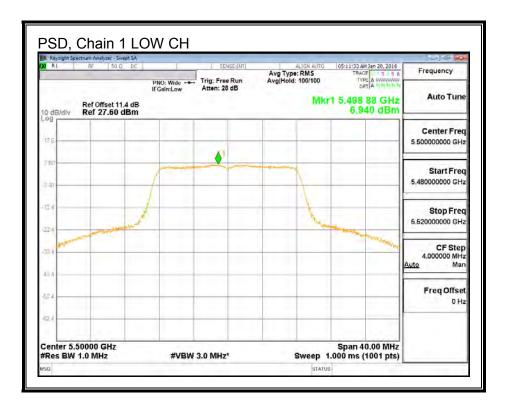
| Channel | Frequency | Chain 1 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5500 | 17.60 | 17.60 | 24.00 | -6.40 |
| Mid | 5580 | 17.87 | 17.87 | 24.00 | -6.13 |
| High | 5700 | 17.48 | 17.48 | 24.00 | -6.52 |

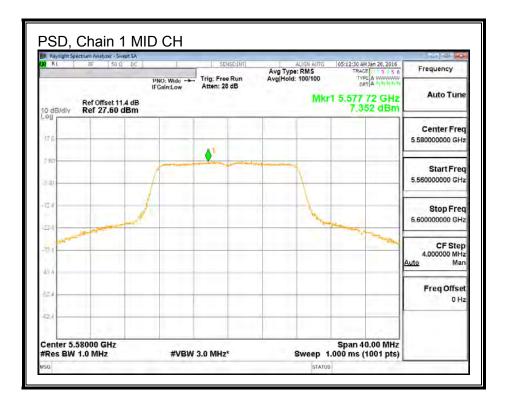
PSD Results

| Channel | Frequency | Chain 1 | Total | PSD | PSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5500 | 6.940 | 6.940 | 11.00 | -4.06 |
| Mid | 5580 | 7.352 | 7.352 | 11.00 | -3.65 |
| High | 5700 | 6.739 | 6.739 | 11.00 | -4.26 |

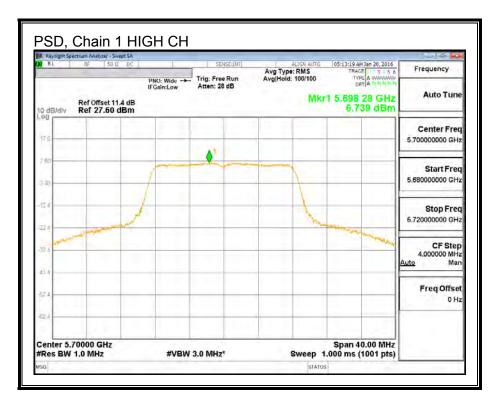
<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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Bandwidth, Antenna Gain, and Limits

| Channel | Frequency | Min | Directional | Directional | Power | PSD |
|---------|-----------|-------|-------------|-------------|-------|-------|
| | | 26 dB | Gain | Gain | Limit | Limit |
| | | BW | for Power | for PSD | | |
| | (MHz) | (MHz) | (dBi) | (dBi) | (dBm) | (dBm) |
| 144 | 5720 | 21.02 | 3.46 | 3.46 | 24.00 | 11.00 |

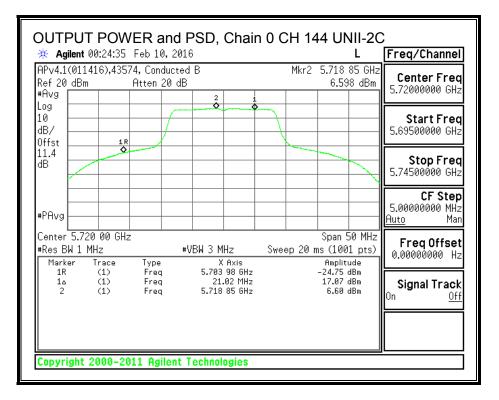
| Duty Cycle CF (dB) | 0.00 | Included in Calculations of Corr'd Power & PSD |
|--------------------|------|--|
|--------------------|------|--|

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| 144 | 5720 | 17.07 | 17.07 | 24.00 | -6.93 |

PSD Results

| Channel | Frequency | Chain 0 | Total | PSD | PSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| 144 | 5720 | 6.598 | 6.598 | 11.00 | -4.40 |



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

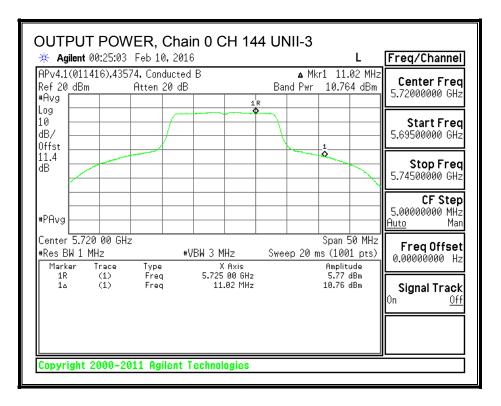
Output Power Results

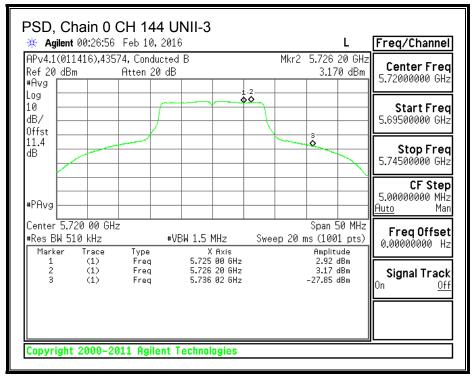
| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| 144 | 5720 | 10.764 | 10.764 | 30.00 | -19.24 |

PSD Results

| Channel | Frequency | Chain 0 | Total | PSD | PSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| 144 | 5720 | 3.170 | 3.170 | 30.00 | -26.83 |

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9.14.4. AVERAGE OUTPUT POWER (WHOLE FUNDAMENTAL)

<u>LIMITS</u>

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

Output Power Results

| Channel | Frequency | Chain 1 | Total |
|---------|-----------|---------|--------|
| | | Meas | Corr'd |
| | | Power | Power |
| | (MHz) | (dBm) | (dBm) |
| 144 | 5720 | 17.91 | 17.91 |

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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9.15. 802.11n HT20 SISO MODE IN THE 5.6 GHz BAND

9.15.1. 26 dB BANDWIDTH

<u>LIMITS</u>

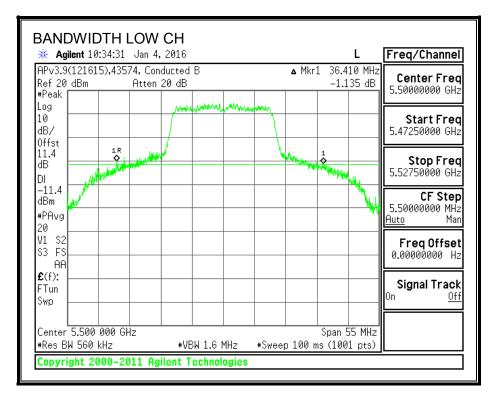
None; for reporting purposes only.

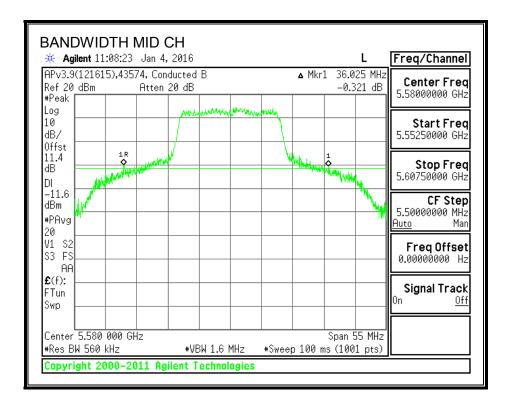
RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5500 | 36.410 |
| Mid | 5580 | 36.025 |
| High | 5700 | 37.184 |
| 144 | 5720 | 29.570 |

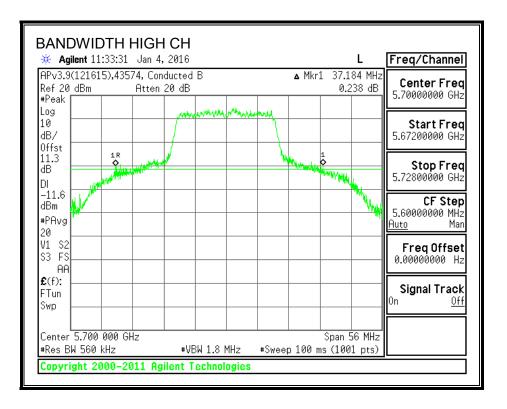
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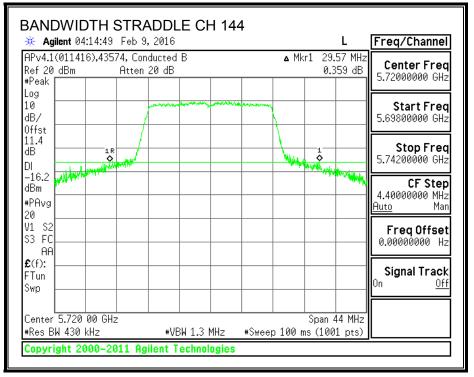
26 dB BANDWIDTH





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9.15.2. 99% BANDWIDTH

DATE: 3/16/2016

LIMITS

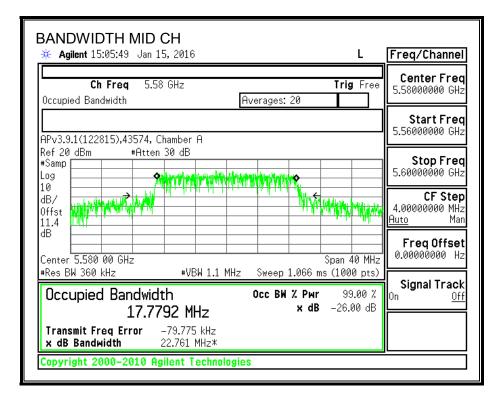
None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5500 | 17.8024 |
| Mid | 5580 | 17.7792 |
| High | 5700 | 17.7800 |
| 144 | 5720 | 17.7551 |

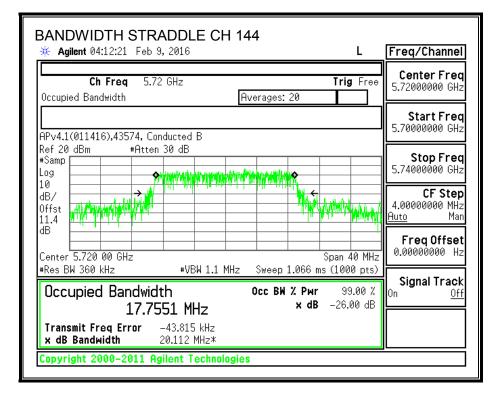
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| BANDWIDTH LOW CH * Agilent 15:02:13 Jan 15, 2016 L | Freq/Channel |
|---|--|
| Ch Freq 5.5 GHz Trig Fr Occupied Bandwidth Averages: 20 | ree Center Freq 5.50000000 GHz |
| APv3.9.1(122815),43574, Chamber A | Start Freq 5.48000000 GHz |
| Ref 20 dBm #Atten 30 dB #Samp Log 10 | Stop Freq 5.52000000 GHz |
| dB/ Offst 11.4 | CF Step 4.00000000 MHz <u>Auto</u> Man |
| dB Center 5.500 00 GHz Span 40 M | |
| *Res BW 360 kHz *VBW 1.1 MHz Sweep 1.066 ms (1000 p Occupied Bandwidth 0cc BW % Pwr 99.00 17.8024 MHz × dB -26.00 c | Signal Track |
| Transmit Freq Error -48.195 kHz x dB Bandwidth 24.186 MHz* | |
| Copyright 2000–2010 Agilent Technologies | |



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| BANDWIDTH HIGH CH * Agilent 15:12:13 Jan 15, 2016 L | Freq/Channel |
|---|---|
| Ch Freq 5.7 GHz Trig Free Occupied Bandwidth Averages: 20 | Center Freq 5.70000000 GHz |
| APv3.9.1(122815),43574, Chamber A Ref 20 dBm #Atten 30 dB | Start Freq 5.68000000 GHz |
| *Samp Log 10 | Stop Freq 5.72000000 GHz |
| dB/ Offst 11.3 dB | CF Step 4.00000000 MHz <u>Auto</u> Man |
| Center 5.700 00 GHz Span 40 MHz #Res BW 360 kHz #VBW 1.1 MHz Sweep 1.066 ms (1000 pts) | Freq Offset 0.00000000 Hz |
| Occupied Bandwidth Осс ВИ % Рыг 99.00 % 17.7800 MHz × dB -26.00 dB | Signal Track ^{On <u>Off</u>} |
| Transmit Freq Error -53.968 kHz x dB Bandwidth 20.517 MHz* Copyright 2000-2010 Agilent Technologies | |



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9.15.3. OUTPUT POWER AND PSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

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Bandwidth, Antenna Gain, and Limits

| Channel | Frequency | Min | Directional | Power | PSD |
|---------|-----------|-------|-------------|-------|-------|
| | | 26 dB | Gain | Limit | Limit |
| | | BW | | | |
| | (MHz) | (MHz) | (dBi) | (dBm) | (dBm) |
| Low | 5500 | 38.63 | 3.46 | 24.00 | 11.00 |
| Mid | 5580 | 39.30 | 3.46 | 24.00 | 11.00 |
| High | 5700 | 25.50 | 3.46 | 24.00 | 11.00 |

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

Output Power Results

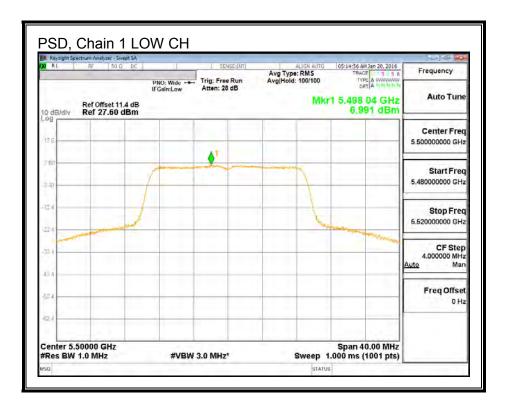
| Channel | Frequency | Chain 1 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5500 | 17.67 | 17.67 | 24.00 | -6.33 |
| Mid | 5580 | 17.97 | 17.97 | 24.00 | -6.03 |
| High | 5700 | 16.19 | 16.19 | 24.00 | -7.81 |

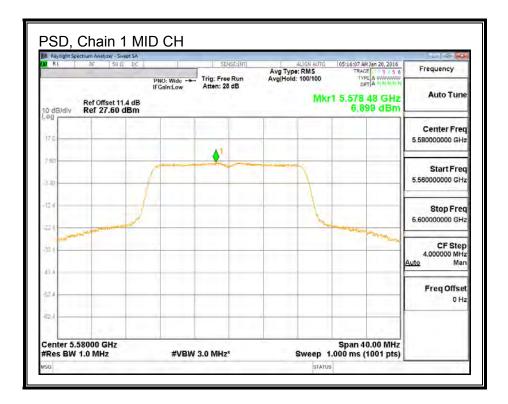
PSD Results

| Channel | Frequency | Chain 1 | Total | PSD | PSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5500 | 6.991 | 6.991 | 11.00 | -4.01 |
| Mid | 5580 | 6.899 | 6.899 | 11.00 | -4.10 |
| High | 5700 | 5.284 | 5.284 | 11.00 | -5.72 |

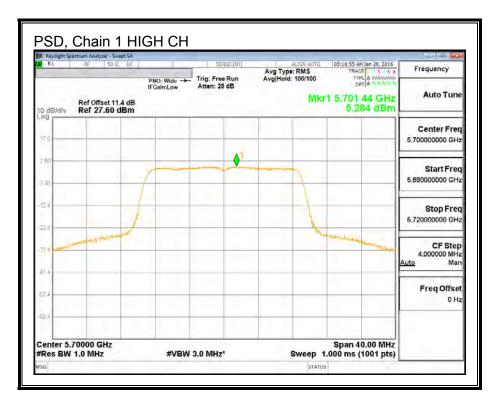
<u>Note:</u> the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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Bandwidth, Antenna Gain, and Limits

| Channel | Frequency | Min | Directional | Directional | Power | PSD |
|---------|-----------|-------|-------------|-------------|-------|-------|
| | | 26 dB | Gain | Gain | Limit | Limit |
| | | BW | for Power | for PSD | | |
| | (MHz) | (MHz) | (dBi) | (dBi) | (dBm) | (dBm) |
| 144 | 5720 | 19.78 | 3.46 | 3.46 | 23.96 | 11.00 |

| Duty Cycle CF (dB) | 0.00 | Included in Calculations of Corr'd Power & PSD |
|--------------------|------|--|
|--------------------|------|--|

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| 144 | 5720 | 16.86 | 16.86 | 23.96 | -7.10 |

PSD Results

| Channel | Frequency | Chain 0 | Total | PSD | PSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| 144 | 5720 | 6.160 | 6.160 | 11.00 | -4.84 |

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| | | - | n 0 CH 1 | 144 UNII-2 | |
|---|-------------------------------|---|------------|---|---|
| Agilent 23:48:39 | - | | | | Freq/Channel |
| APv4.1(011416),43 Ref 20 dBm #Avg | 5/4, Conducted Atten 20 dB | 2 1 | Mkr2 | 5.718 65 GHz 6.164 dBm | Center Freq 5.72000000 GHz |
| Log 10 dB/ Offst | 1R | | | | Start Freq 5.69500000 GHz |
| dB | | | | | Stop Freq 5.74500000 GHz |
| #PAvg | | | | | CF Step 5.00000000 MHz <u>Auto</u> Man |
| Center 5.720 00 GH #Res BW 1 MHz Marker Trace | | /BW 3 MHz X Axis | Sweep 20 i | Span 50 MHz ms (1001 pts) Amplitude | FreqOffset 0.00000000 Hz |
| 1R (1) 1a (1) 2 (1) | Freq Freq Freq | 5.705 22 GHz 19.78 MHz 5.718 65 GHz | | -23.41 dBm 16.86 dBm 6.16 dBm | Signal Track ^{On <u>Off</u>} |
| | 044 0 | | | | |
| Copyright 2000-2 | 11 Agilent | ecnnologies | | | |

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Antenna Gain and Limit

| Channel | Frequency | Directional | Power | PSD |
|---------|-----------|-------------|-------|-------|
| | | Gain | Limit | Limit |
| | | | | |
| | (MHz) | (dBi) | (dBm) | (dBm) |
| 144 | 5720 | 3.27 | 30.00 | 30.00 |

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

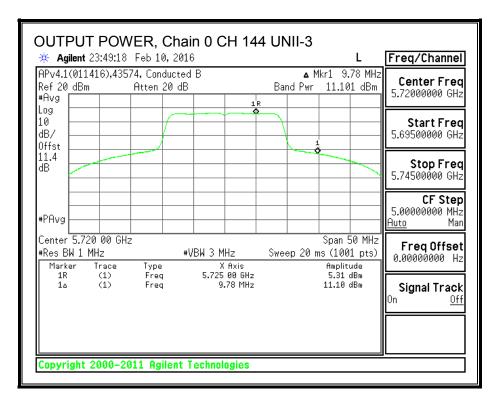
Output Power Results

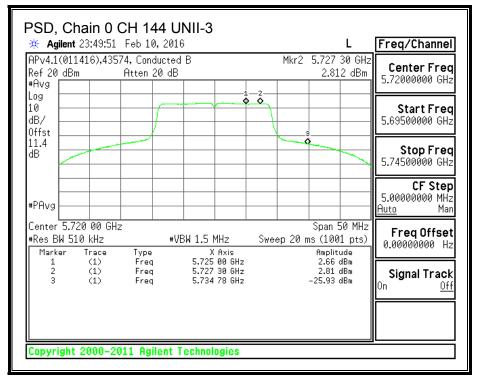
| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| 144 | 5720 | 11.100 | 11.100 | 30.00 | -18.90 |

PSD Results

| Channel | Frequency | Chain 0 | Total | PSD | PSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PSD | PSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| 144 | 5720 | 2.812 | 2.812 | 30.00 | -27.19 |

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9.15.4. AVERAGE OUTPUT POWER (WHOLE FUNDAMENTAL)

<u>LIMITS</u>

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

Output Power Results

| Channel | Frequency | Chain 1 | Total |
|---------|-----------|---------|--------|
| | | Meas | Corr'd |
| | | Power | Power |
| | (MHz) | (dBm) | (dBm) |
| 144 | 5720 | 17.89 | 17.89 |

Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

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9.16. 802.11n HT20 CDD 3TX MODE IN THE 5.6 GHz BAND

9.16.1. 26 dB BANDWIDTH

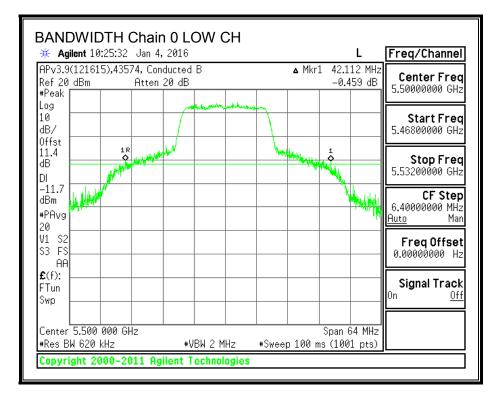
<u>LIMITS</u>

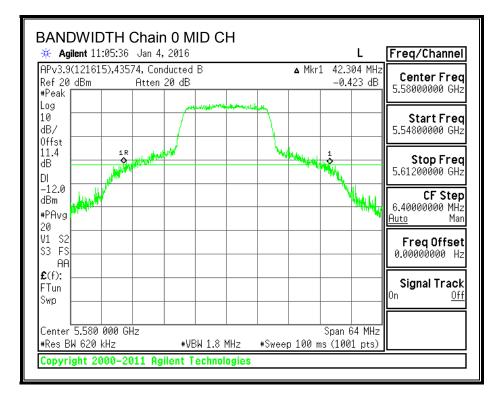
None; for reporting purposes only.

RESULTS

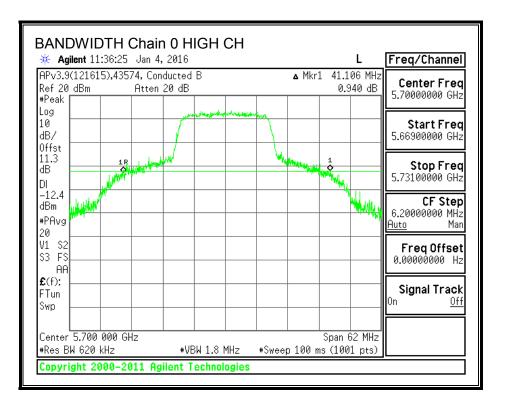
| Channel | Frequency | 26 dB BW | 26 dB BW | 26 dB BW |
|---------|-----------|----------|----------|----------|
| | | Chain 0 | Chain 1 | Chain 2 |
| | (MHz) | (MHz) | (MHz) | (MHz) |
| Low | 5500 | 42.112 | 36.410 | 35.650 |
| Mid | 5580 | 42.304 | 36.025 | 31.114 |
| High | 5700 | 41.106 | 37.184 | 31.824 |
| 144 | 5720 | 27.28 | 27.49 | 21.28 |

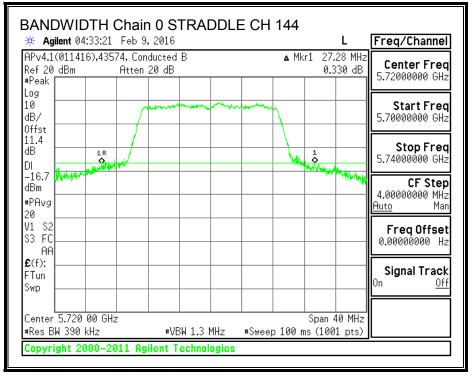
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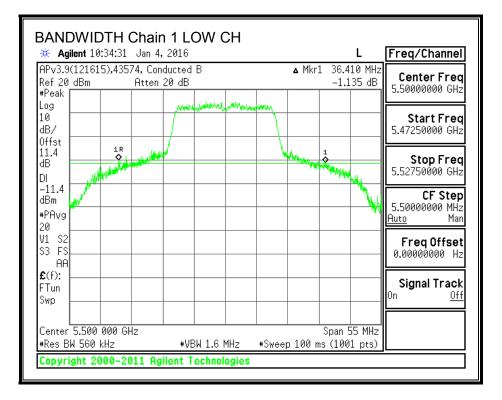


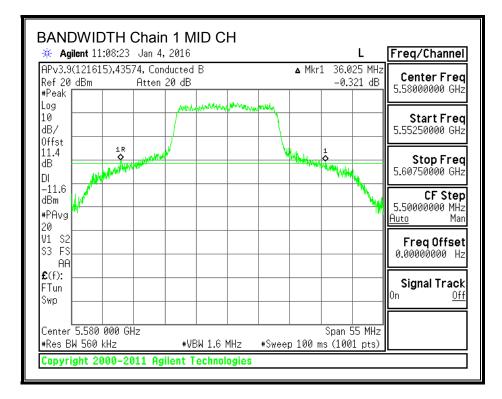
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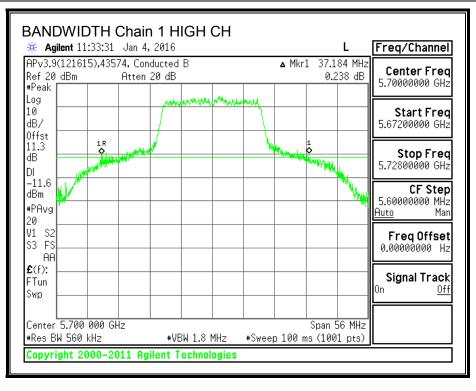


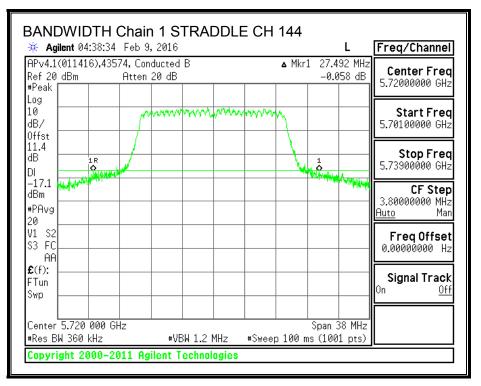
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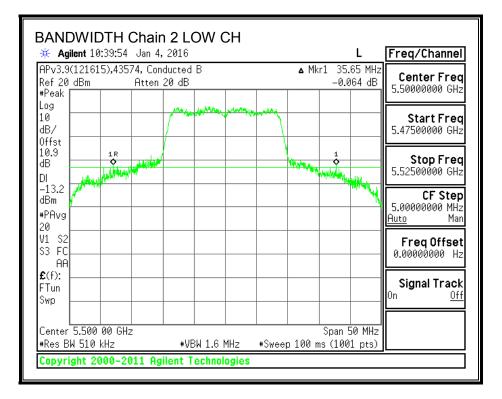


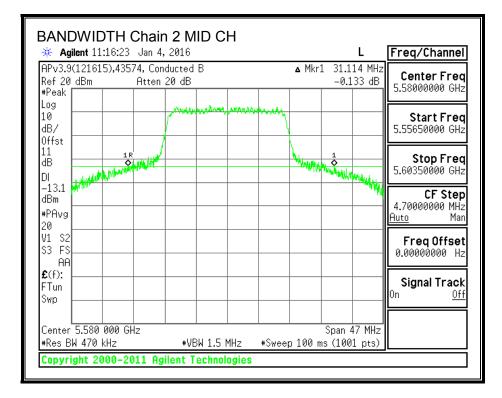
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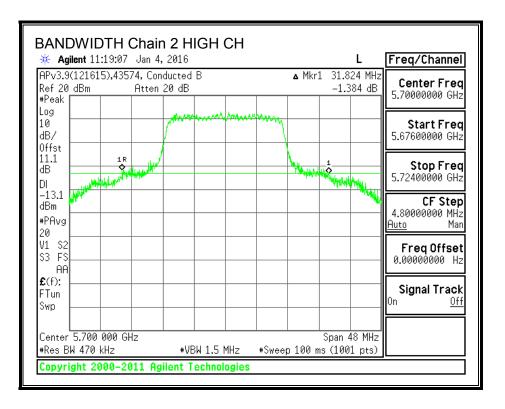


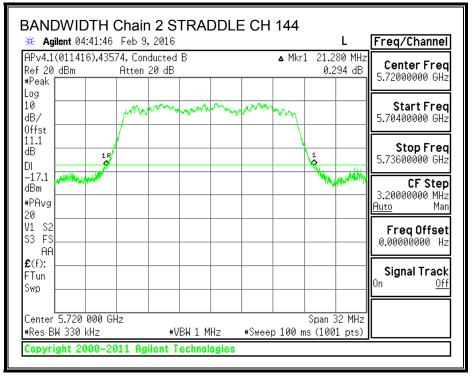
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