FCC 47 CFR PART 15 SUBPART E

CLASS II PERMISSIVE CHANGE
(5.2 GHz, 5.3 GHz and 5.6 GHz BAND TEST REPORT)

FOR

802.11a/g/n/ac 3X3 WLAN + Bluetooth PCI-E Custom Combination Card

MODEL NUMBER: BCM943602BAED

FCC ID: QDS-BRCM1088

REPORT NUMBER: 15U21486-E2 Revision A

ISSUE DATE: AUGUST 24, 2015

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	08/11/15	Initial Issue	H. Mustapha
--	8/24/15	Updated section 5.4	H. Mustapha

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	BROADCOM CORPORATION 190 MATHILDA PLACE SUNNYVALE, CA 94086, U.S.A.
EUT DESCRIPTION:	802.11a/g/n/ac 3X3 WLAN + Bluetooth PCI-E Custom Combination Card
MODEL:	BCM943602BAED
SERIAL NUMBER:	Conducted: P103 S/N: 0169 Radiated: P103 S/N: 0027
DATE TESTED:	MARCH 17, 2015 – MAY 22, 2015

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.

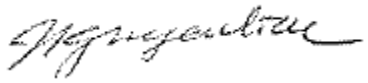
Approved & Released For
UL Verification Services Inc. By:

Huda Mustapha

HUDA MUSTAPHA
PROJECT LEAD
UL Verification Services Inc.

FRANK IBRAHIM
PROGRAM MANAGER
UL Verification Services Inc.

Tested By:



LIEU NGUYEN
EMC ENGINEER
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96, FCC KDB 789033 D01 v01r04 and ANSI C63.10-2009.

3. FACILITIES AND ACCREDITATION

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

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

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.52 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.94 dB
Radiated Disturbance, 1 to 6 GHz	± 3.86 dB
Radiated Disturbance, 6 to 18 GHz	± 4.23 dB
Radiated Disturbance, 18 to 26 GHz	± 5.30 dB
Radiated Disturbance, 26 to 40 GHz	± 5.23 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11a/g/n/ac 3X3 WLAN + Bluetooth PCI-E Custom Combination Card.

The radio module is manufactured by Broadcom.

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	19.08	N/A	N/A	19.08	80.91
5190 - 5230	802.11n HT40	19.10	N/A	N/A	19.10	81.28
5210	802.11ac VHT80	12.54	N/A	N/A	12.54	17.95
5.2 GHz band, 3TX						
5180 - 5240	802.11n HT20 CDD	16.36	16.32	16.10	21.03	126.844
5180 - 5240	802.11n HT20 STBC	19.10	18.90	18.97	23.76	237.794
5180 - 5240	802.11n HT20 TxBF	14.05	14.77	14.62	19.26	84.375
5190 - 5230	802.11n HT40 CDD	18.70	18.98	18.20	23.41	219.268
5190 - 5230	802.11n HT40 TxBF	14.12	14.60	14.19	19.08	80.905
5210	802.11ac VHT80 CDD	10.61	10.82	10.90	15.55	35.889
5210	802.11ac VHT80 TxBF	10.74	10.71	10.31	15.36	34.374

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	18.90	N/A	N/A	18.90	77.62
5270 - 5310	802.11n HT40	14.09	N/A	N/A	14.09	25.64
5290	802.11ac VHT80	12.48	N/A	N/A	12.48	17.70
5.3 GHz band, 3TX						
5260 - 5320	802.11n HT20 CDD	17.15	17.55	17.10	22.04	160.05
5260 - 5320	802.11n HT20 STBC	18.45	18.57	18.65	23.33	215.21
5260 - 5320	802.11n HT20 TxBF	14.00	14.15	13.90	18.79	75.67
5270 - 5310	802.11n HT40 CDD	18.90	18.78	18.52	23.51	224.26
5270 - 5310	802.11n HT40 TxBF	14.15	14.20	13.98	18.88	77.31
5290	802.11ac VHT80 CDD	9.28	9.30	9.64	14.18	26.19
5290	802.11ac VHT80 TxBF	11.55	11.51	10.84	16.08	40.58

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	18.52	N/A	N/A	18.52	71.12
5510-5670	802.11n HT40	17.55	N/A	N/A	17.55	56.89
5530	802.11ac VHT80	18.64	N/A	N/A	18.64	73.11
5.6 GHz band, 2TX						
5500-5700	802.11n HT20 CDD	13.10	13.05	13.20	17.89	61.49
5500-5700	802.11n HT20 STBC	18.40	18.45	18.40	23.19	208.35
5500-5700	802.11n HT20 TxBF	13.15	14.00	13.56	18.36	68.47
5510-5670	802.11n HT40 CDD	18.90	18.45	18.90	23.53	225.23
5510-5670	802.11n HT40 TxBF	13.90	14.27	14.05	18.85	76.69
5530	802.11ac VHT80 CDD	16.16	16.61	16.72	21.27	134.11
5530	802.11ac VHT80 TxBF	13.90	14.05	14.00	18.75	75.08

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, 3TX (Channels overlapping UNII-2C and UNII-3)						
5720 (Whole signal)	802.11n HT20 CDD	18.98	18.80	18.75	23.62	229.92
5720 (Whole signal)	802.11n HT20 STBC	18.87	18.90	19.00	23.69	234.15
5720 (Whole signal)	802.11n HT20 TxBF	18.98	18.80	18.75	23.62	229.92
5710 (Whole signal)	802.11n HT40 CDD	18.90	19.05	18.95	23.74	236.50
5710 (Whole signal)	802.11n HT40 TxBF	18.90	19.05	18.95	23.74	236.50
5690 (Whole signal)	802.11ac VHT80 CDD	18.10	17.96	17.80	22.73	187.34
5690 (Whole signal)	802.11ac VHT80 TxBF	18.10	17.96	17.80	22.73	187.34

List of test reduction (Non Beam-Forming modes)

Antenna Port Testing		
Band	**Mode**	**Covered by**
5 GHz bands	802.11a Legacy 1TX	802.11n HT20 CDD 3TX
5 GHz bands	802.11a CDD 2TX	802.11n HT20 CDD 3TX
5 GHz bands	802.11a CDD 3TX	802.11n HT20 CDD 3TX
5 GHz bands	802.11n HT20 CDD/SDM/STBC 2TX	802.11n HT20 CDD 3TX
5 GHz bands	802.11n HT40 1TX	802.11n HT40 CDD 3TX
5 GHz bands	802.11n HT40 CDD/SDM/STBC 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 1TX	802.11ac VHT80 CDD 3TX
5 GHz bands	802.11ac VHT80 CDD/SDM/STBC 2TX	802.11ac VHT80 CDD 3TX
5 GHz bands	802.11ac VHT80 STBC 3TX	802.11ac VHT80 CDD 3TX

Radiated Testing		
Band	**Mode**	**Covered by**
5 GHz bands	802.11a Legacy 1TX (Harmonics)	802.11n HT20 CDD 3TX (Harmonics)
5 GHz bands	802.11a CDD 2TX	802.11n HT20 CDD 3TX
5 GHz bands	802.11a CDD 3TX	802.11n HT20 CDD 3TX
5 GHz bands	802.11n HT20 CDD/SDM/STBC 2TX	802.11n HT20 CDD 3TX
5 GHz bands	802.11n HT40 1TX (Harmonics)	802.11n HT40 CDD 3TX (Harmonics)
5 GHz bands	802.11n HT40 STBC 3TX	802.11n HT40 CDD 3TX
5 GHz bands	802.11ac VHT80 1TX (Harmonics)	802.11ac VHT80 CDD 3TX (Harmonics)
5 GHz bands	802.11ac VHT80 CDD/SDM/STBC 2TX	802.11ac VHT80 CDD 3TX
5 GHz bands	802.11ac VHT80 STBC 3TX	802.11ac VHT80 CDD 3TX

List of test reduction (Beam-Forming modes)

Antenna Port Testing		
Band	**Mode**	**Covered by**
5 GHz bands	802.11n HT40 BF 2Tx	802.11n HT40 BF 3Tx
5 GHz bands	802.11ac VHT80 BF 2Tx	802.11ac VHT80 BF 3Tx

Radiated Testing		
Band	**Mode**	**Covered by**
5 GHz bands	802.11a BF 2TX	802.11n HT20 BF 3Tx
5 GHz bands	802.11a BF 3TX	802.11n HT20 BF 3Tx
5 GHz bands	802.11n HT20 BF 2Tx	802.11n HT20 BF 3Tx
5 GHz bands	802.11n HT40 BF 2Tx	802.11n HT40 BF 3Tx
5 GHz bands	802.11ac VHT80 BF 2Tx	802.11ac VHT80 BF 3Tx

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The EUT utilizes the following antenna:

No.	Antenna Manufacturer	Antenna Type	Model	Peak gain@ 5150-5250MHz	Peak gain@ 5250-5350MHz	Peak gain@ 5470-5725MHz	Peak gain@ 5725 - 5850MHz
1	MagLayers	802.11abgn WLAN, Bluetooth Antenna	PCA-4077-25GC1-A1-RT	5.85	5.85	6.21	6.21

5.4. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The purpose of this C2PC is to test the device described under section 5.1 of this report in accordance with part 15.247 Old Rules for the 5.8 GHz band. This resulted in removing the 5.8 GHz section from the UNII report. All data in this report (5.2GHz, 5.3 GHz and 5.6 GHz bands) were leveraged from original report 15U20284-E3A, as the EUT's firmware and hardware remained unchanged.

5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Broadcom, rev.7.35.201.0.

The test utility software used during testing was Broadcom, rev. 7.15RC163.2 (r518356 WLTEST).

5.6. WORST-CASE CONFIGURATION AND MODE

The EUT was tested as an external module installed in a test jig board connected to a host Laptop PC.

X,Y,Z investigation was performed and Y orientation was found to be worst-case, therefore, all final radiated emissions was performed using Y orientation. See setup photos section for details.

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.

Worst-case chains as provided by the client were:

For SISO modes:
- 5 GHz band: chain 0 (connector J0) connected to any antenna, as all three antennas have equal antenna gain.

For 2 TX modes:
- 5 HGz band: chain 0 (connector J0) connected to any antenna and chain 1 (connector J1) connected to any antenna, as all three antennas have equal antenna gain.

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

802.11b mode: 1 Mbps
802.11g mode: 6 Mbps
802.11a mode: 6 Mbps
802.11n HT20 mode: MCS0
802.11n HT40 mode: MCS0
802.11ac VHT80 mode: MCS0

For TxBF mode conducted testing, the bandwidth and duty cycle data were shared with CDD mode; the TxBF mode radiated portion has its own duty cycle.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Lenovo	Lenovo G560	CBO6427681	N/A
AC / DC Adapter	Lenovo	ADP-65KHB	N/A	N/A
Laptop	DELL	Latitude E6400	7WCBYH1	N/A
AC / DC Adapter	DELL	DA90PM111	N/A	N/A

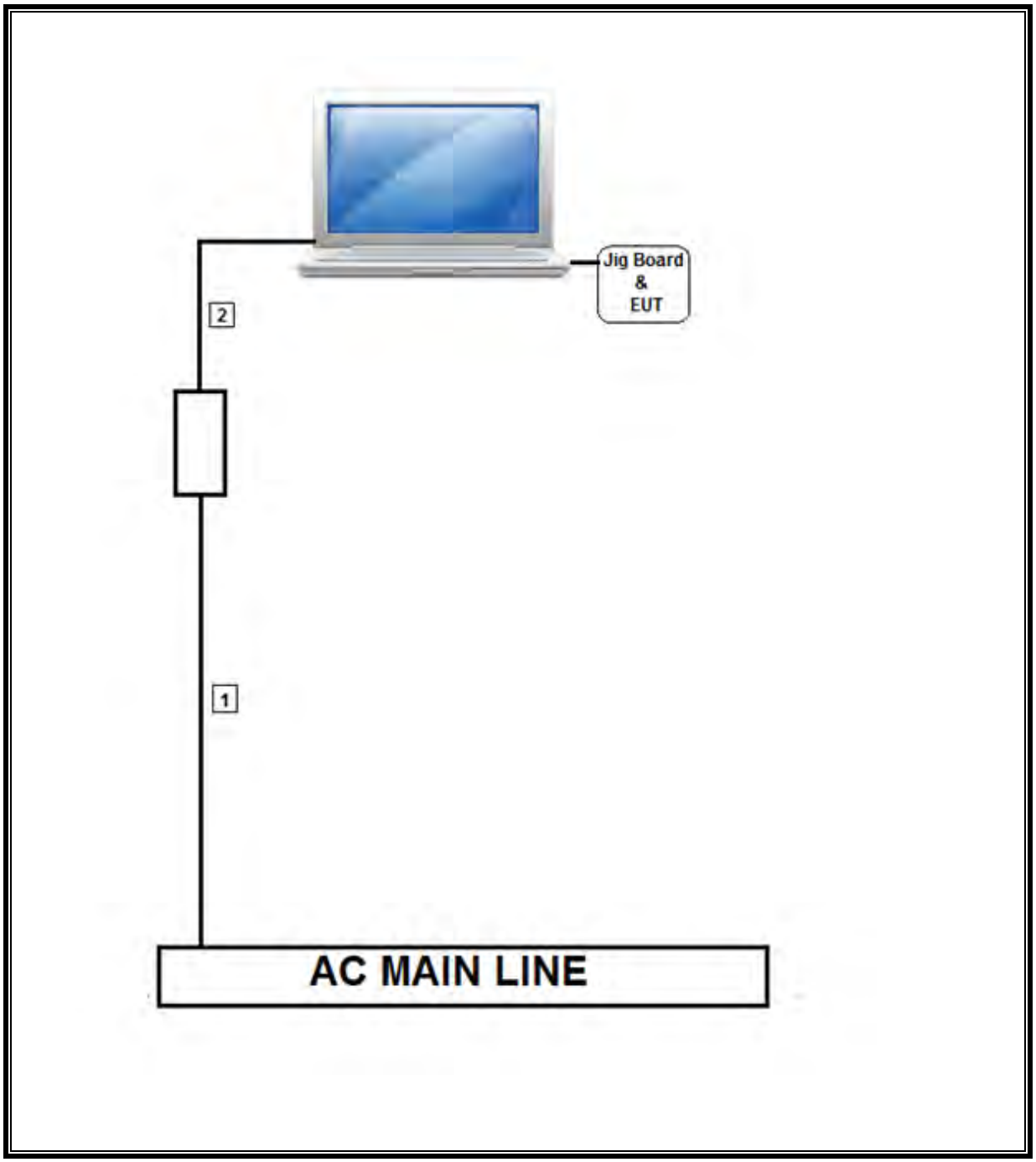
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	US115V	Un-Shielded	1	
2	DC	1	19.5 Vdc	Un-Shielded	1.5	

TEST SETUP

The EUT is connected to a host laptop via PCIE card. Test software exercised the EUT.

SETUP DIAGRAM FOR TESTS



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 No.**	**Cal Date**	**Cal Due**
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014		
Line Conducted Software	UL	UL EMC	Ver 9.5, May 17, 2012		
Bilog Antenna 30-1000MHz	Sunol	JB1	136	09/10/14	09/10/15
Horn Antenna 1-18GHz	ETS	3117	345	03/03/15	03/03/16
Horn Antenna 18-26GHz	ARA	MWH-1826	89	12/17/14	12/17/15
Preamp 10kHz-1000MHz	Sonoma	310	300	11/01/14	11/01/15
Preamp 1-8GHz	Miteq	AMF-4D-01000800-30-29P	782	11/18/14	11/18/15
Preamp 1-18GHz	Miteq	AFS42-00101800-25-2-42	492	08/09/14	08/09/15
Preamp 1-26.5GHz	Agilent	8449B	404	04/13/15	04/03/16
Spectrum Analyzer 3kHz - 44GHz	Agilent	N9030A	908	09/05/14	09/05/15
Spectrum Analyzer 9kHz - 40GHz	HP	8564E	106	08/06/14	08/06/15
Coaxial Switchbox	Agilent	SP6T	927	09/15/14	09/15/15
3GHz HPF	Micro-Tronics	HPM17543	486	11/18/14	11/18/15
EMI Test Receiver	Rohde & Schwarz	ECSI 7	212	08/14/14	08/14/15
Spectrum Analzer 3Hz to 44GHz	Agilent	E4440A	123	10/28/14	10/28/15
Power Meter	Agilent	N1911A	377	06/30/14	06/30/15
Power Sensor	Agilent	E9327A	117	03/09/15	03/09/16
Antenna, Horn 26.5 to 40GHz	ARA	MWH-2640/B	C00891	11/14/14	11/14/15
Amplifier, 26 - 40GHz	Miteq	NSP4000-SP2	88	9/3/2014	9/3/2015
EMI Test Receiver, 9KHz to 7GHz	Rohde & Schwarz	ESCI 7	284	09/16/14	09/16/15
LISN for Conducted Emission	FCC	50/250-25-2	24	01/16/15	01/16/16

7. MEASUREMENT METHODS

On Time and Duty Cycle: KDB 789033 D01 v01r04, Section B.

26 dB Emission BW: KDB 789033 D01 v01r04, Section C.

99% Occupied BW: KDB 789033 D01 v01r04, Section D.

Conducted Output Power: KDB 789033 D01 v01r04, Section E.3.b (Method PM-G), and KDB 662911 D01 v02r01.

Power Spectral Density: KDB 789033 D01 v01r04, Section F, and KDB 662911 D01 v02r01.

Unwanted emissions in restricted bands: KDB 789033 D01 v01r04, Section H.

Unwanted emissions in non-restricted bands: KDB 789033 D01 v01r04, Section H.

AC Power Line Conducted Emissions: ANSI C63.10-2009, Section 6.2.

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

ON TIME AND DUTY CYCLE RESULTS

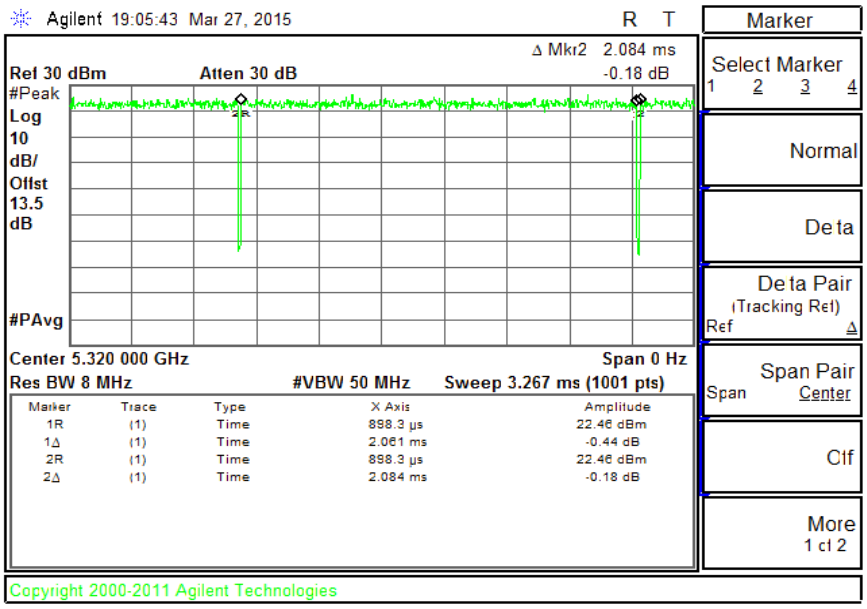
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
5GHz Band						
802.11a 1TX	2.061	2.084	0.989	98.90%	0.00	0.010
802.11n HT20 CDD 3TX	1.917	1.938	0.989	98.92%	0.00	0.010
802.11n HT20 STBC 3TX	1.926	1.946	0.990	98.97%	0.00	0.010
802.11n HT20 BF 3TX	24.000	27.880	0.861	86.08%	0.65	0.042
802.11n HT40 CDD 3TX	0.9440	0.9640	0.979	97.93%	0.09	1.059
802.11n HT40 BF 3TX	5.660	6.840	0.827	82.75%	0.82	0.177
802.11ac VHT80 CDD 3TX	0.4590	0.4780	0.960	96.03%	0.18	2.179
802.11ac VHT80 BF 3TX	2.7500	3.7500	0.733	73.33%	1.35	0.364

Note: CDD mode was also used for conducted BF testing. DCCF for BF was only used for radiated testing.

8.2. DUTY CYCLE PLOTS

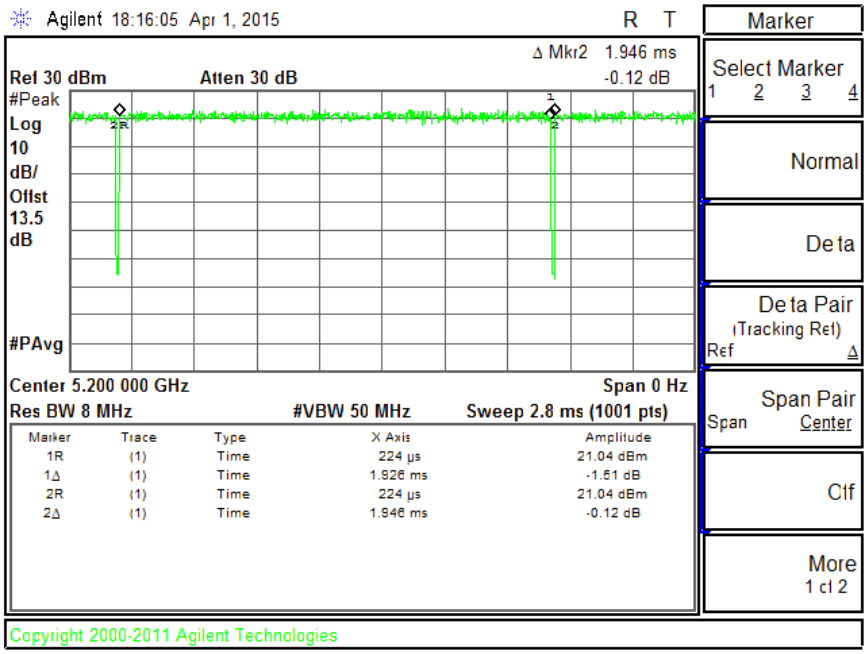
5 GHz BANDS

DUTY CYCLE 802.11a Mode



DUTY CYCLE 802.11n HT20 CDD 3TX MODE

DUTY CYCLE 802.11n HT20 STBC MODE



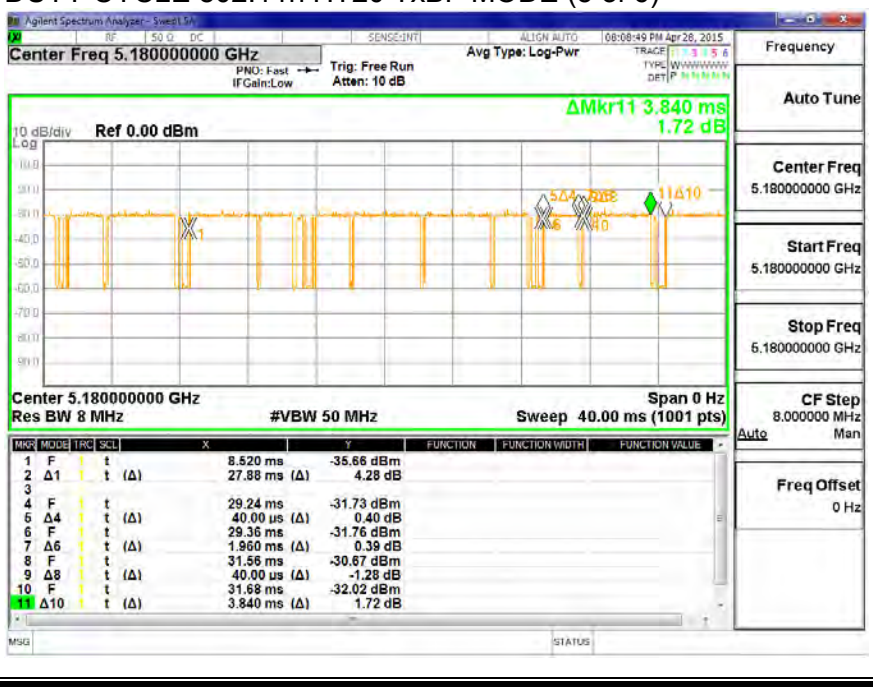
DUTY CYCLE 802.11n HT20 TxBF MODE (1 of 6)

DUTY CYCLE 802.11n HT20 TxBF MODE (2 of 6)

DUTY CYCLE 802.11n HT20 TxBF MODE (3 of 6)

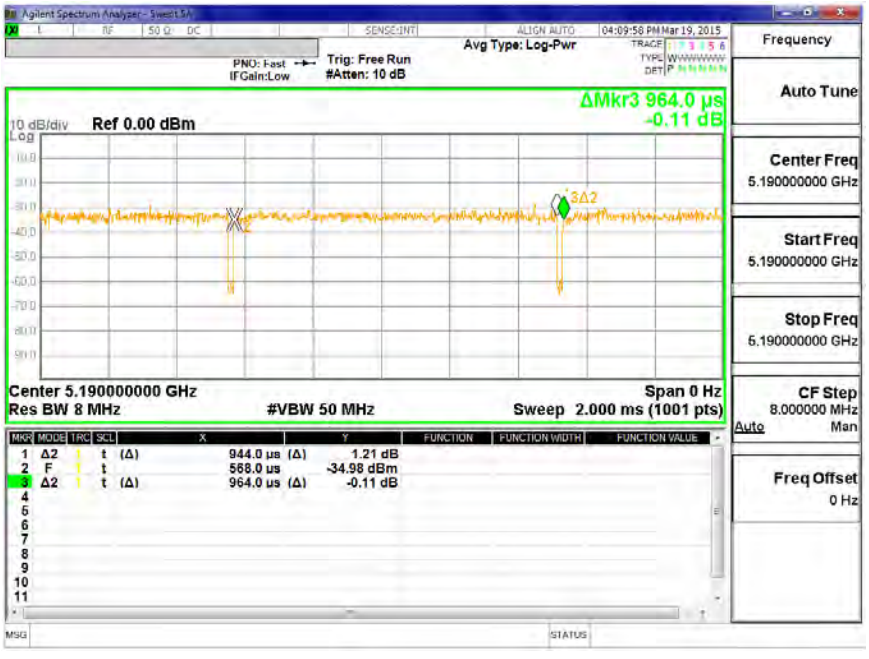
DUTY CYCLE 802.11n HT20 TxBF MODE (4 of 6)

DUTY CYCLE 802.11n HT20 TxBF MODE (5 of 6)



DUTY CYCLE 802.11n HT20 TxBF MODE (6 of 6)

DUTY CYCLE 802.11n HT40 CDD 3TX MODE



DUTY CYCLE 802.11n HT40 TxBF MODE (1 OF 2)

DUTY CYCLE 802.11n HT40 TxBF MODE (2 OF 2)

DUTY CYCLE 802.11ac VHT80 CDD 3TX MODE

DUTY CYCLE 802.11ac VHT80 TxBF MODE (1 OF 2)

DUTY CYCLE 802.11ac VHT80 TxBF MODE (2 OF 2)

8.3. 802.11a LEGACY 1TX MODE IN THE 5.2 GHz BAND

8.3.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

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

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

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

DIRECTIONAL ANTENNA GAIN

This is SISO mode, AG is the highest (worst-case) = 5.85 dBi

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5180	5.85	24.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	19.08	19.08	24.00	-4.92

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.

8.4. 802.11n HT20 CDD 3Tx MODE IN THE 5.2 GHz BAND

8.4.1. 26 dB BANDWIDTH

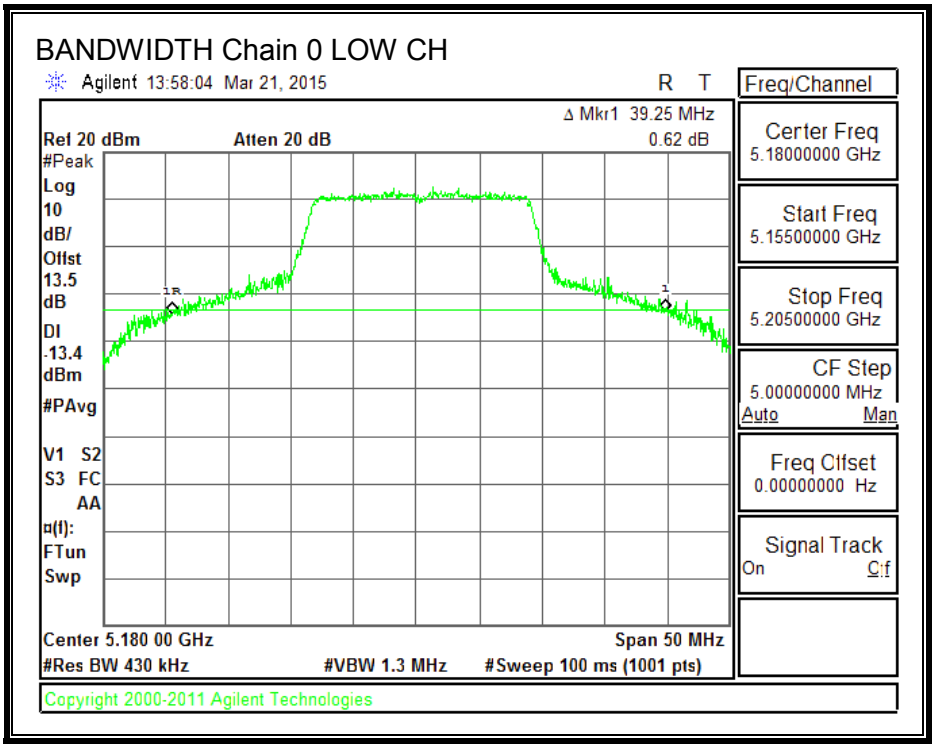
LIMITS

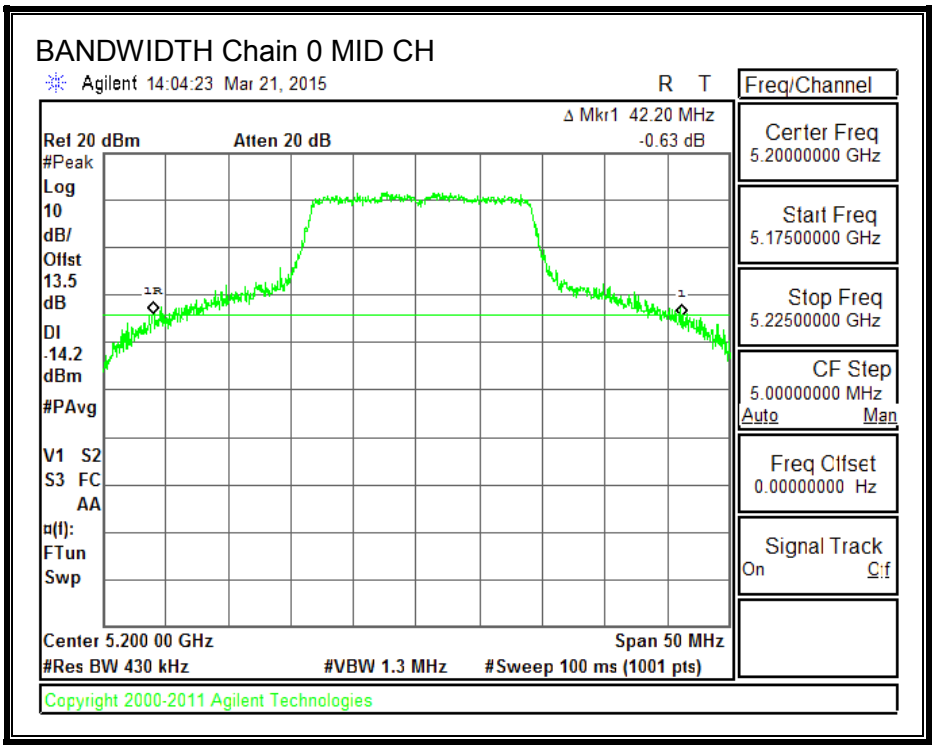
None; for reporting purposes only.

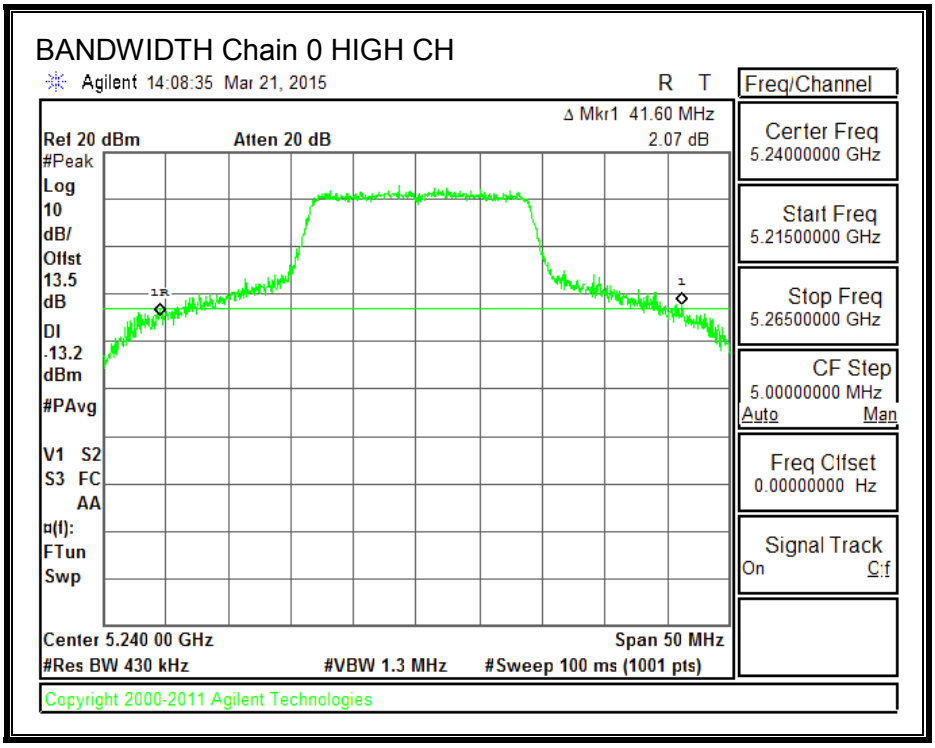
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5180	39.25	40.55	42.85
Mid	5200	42.20	41.10	41.30
High	5240	41.60	41.60	42.35

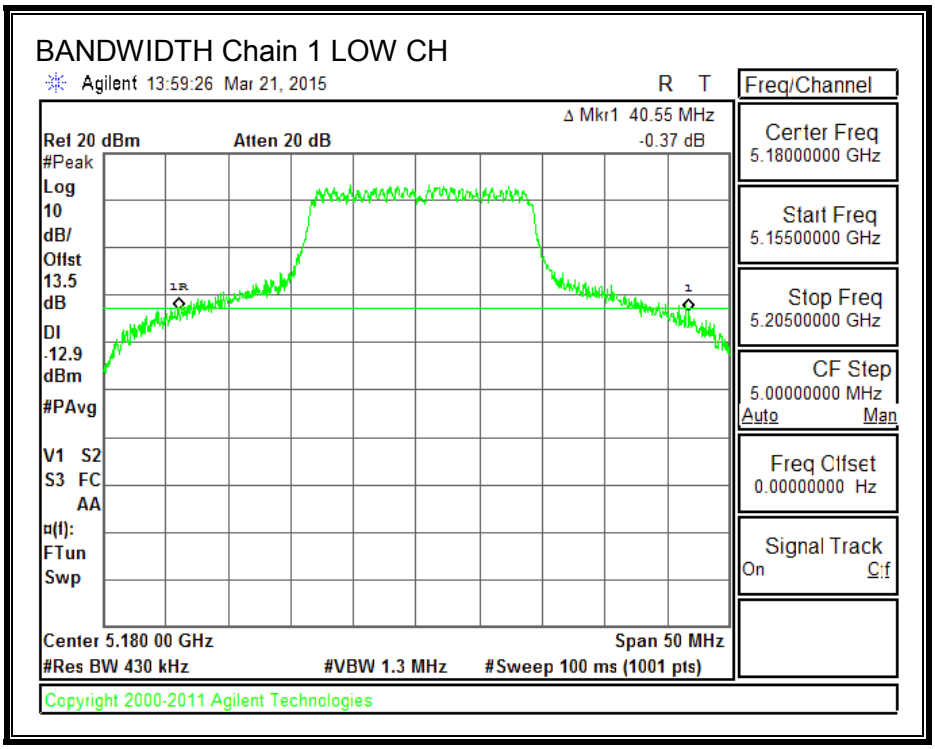
26 dB BANDWIDTH, Chain 0

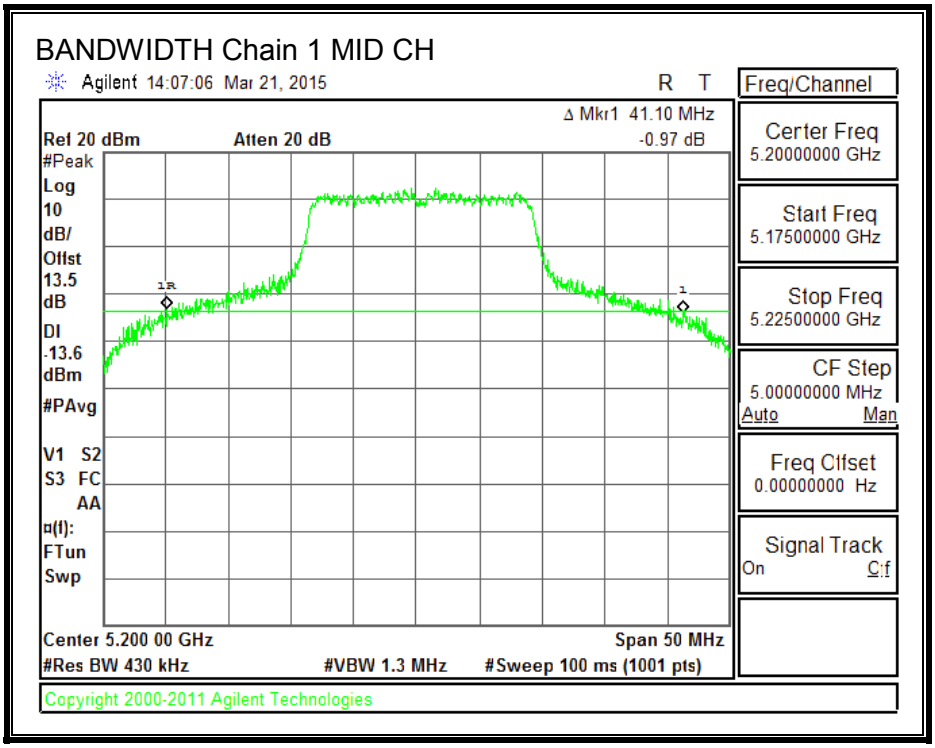


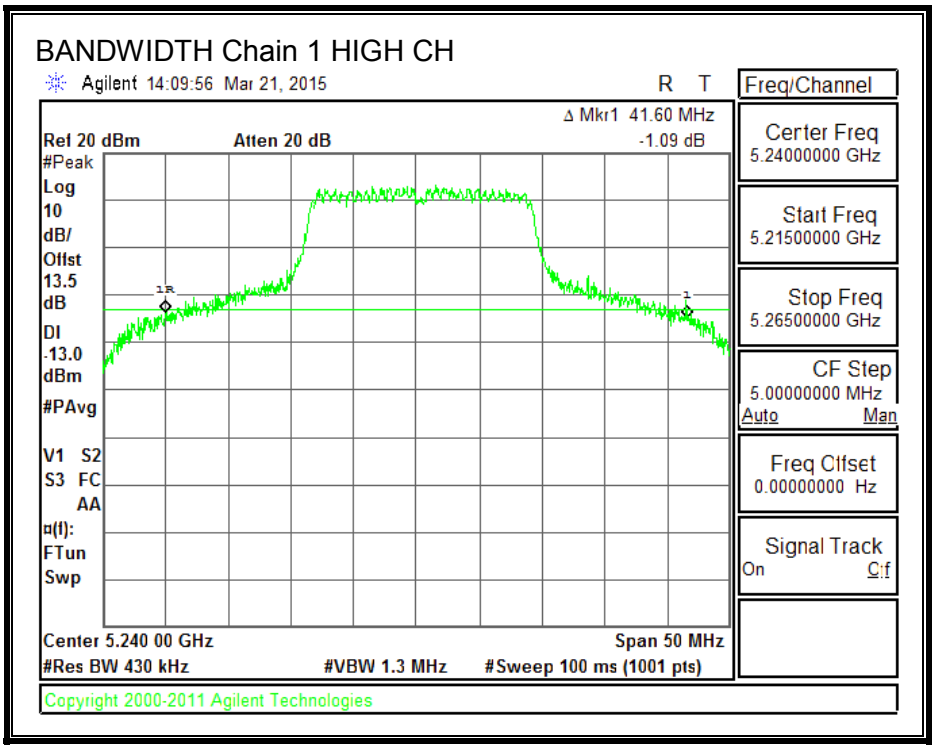




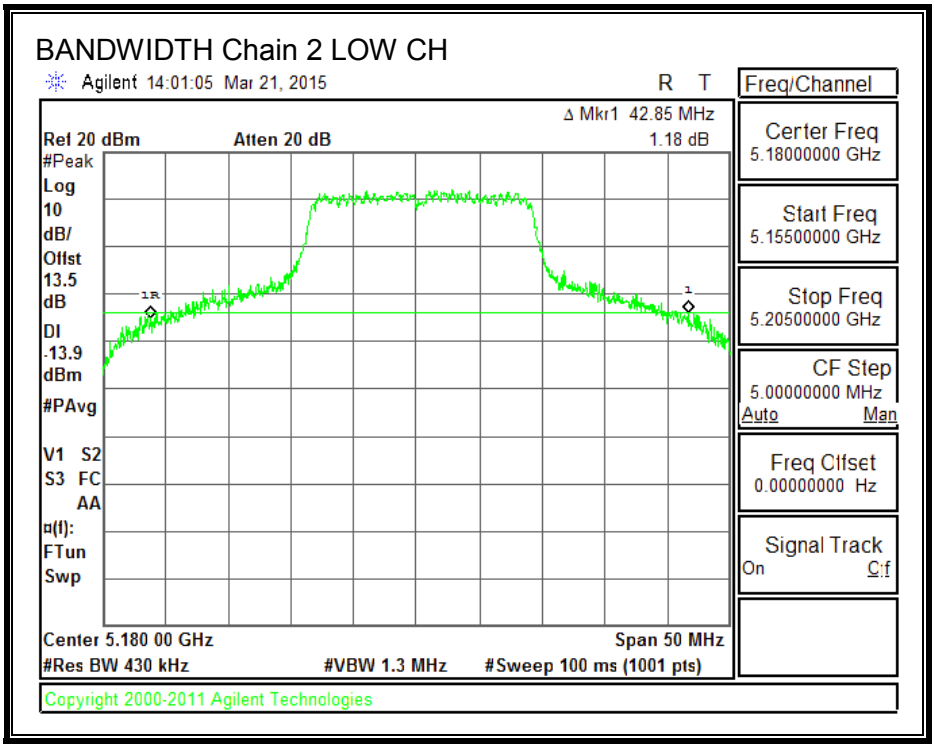
26 dB BANDWIDTH, Chain 1

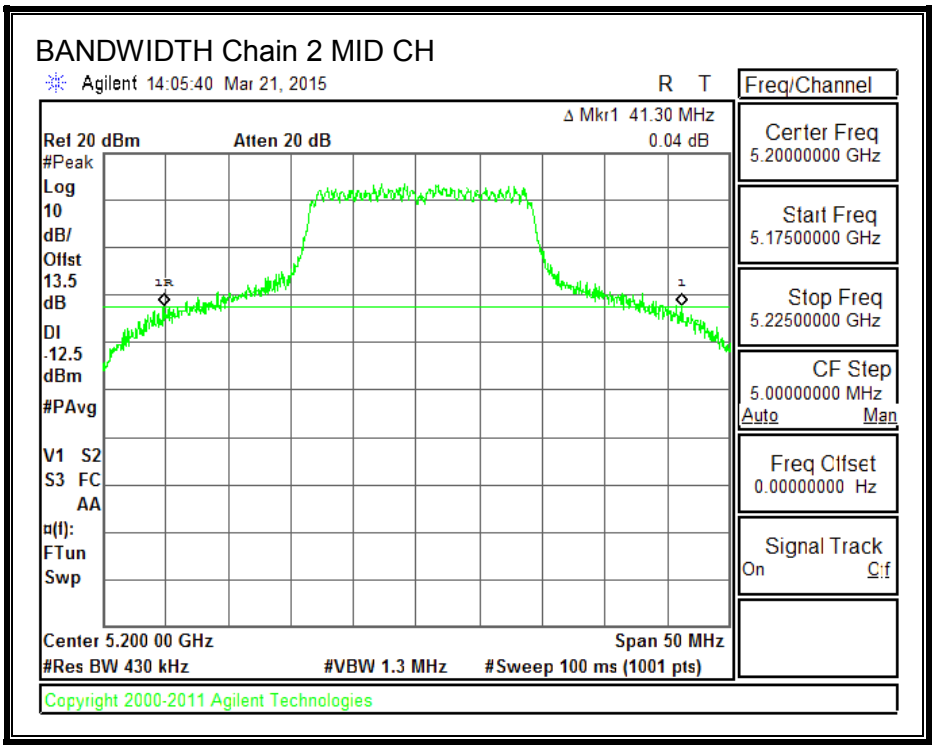


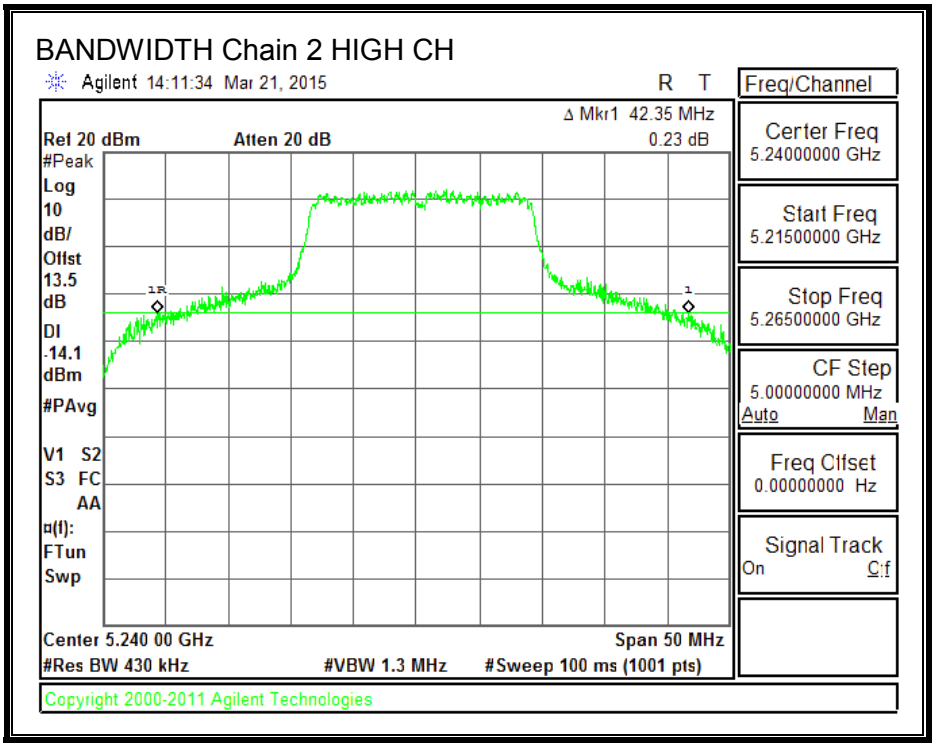




26 dB BANDWIDTH, Chain 2







8.4.2. 99% BANDWIDTH

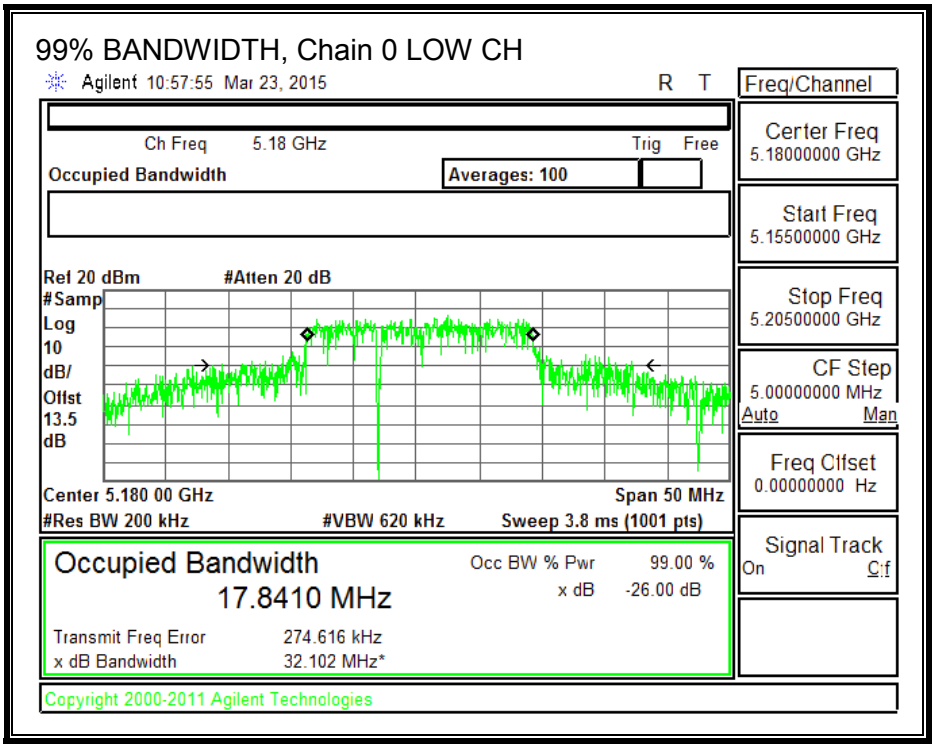
LIMITS

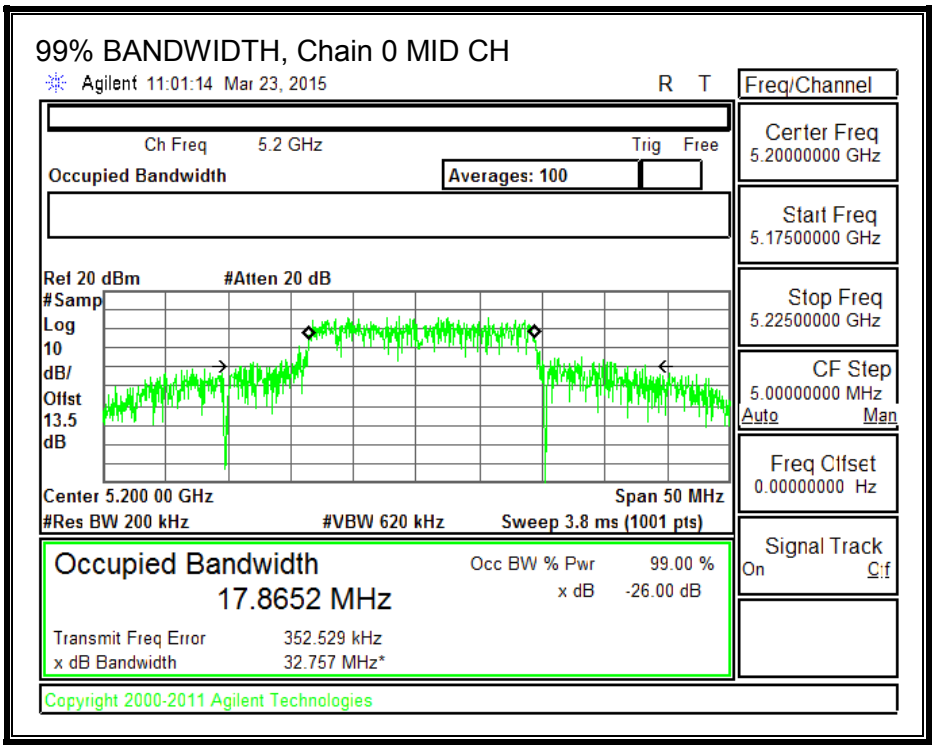
None; for reporting purposes only.

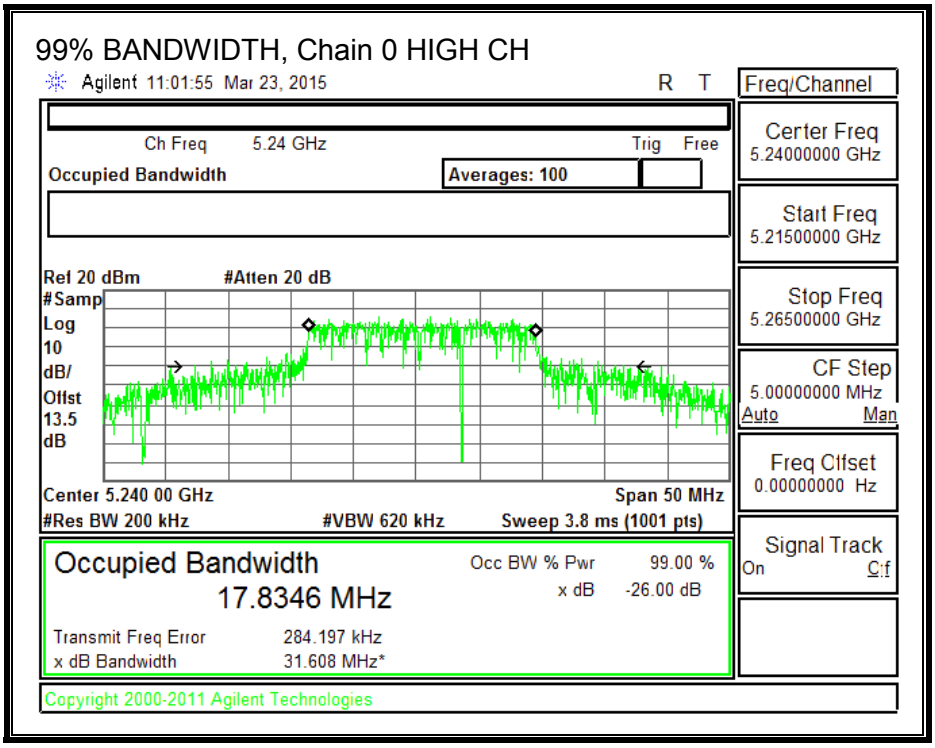
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5180	17.8410	17.8151	17.9016
Mid	5200	17.8652	17.8372	17.9418
High	5240	17.8346	17.8706	17.9110

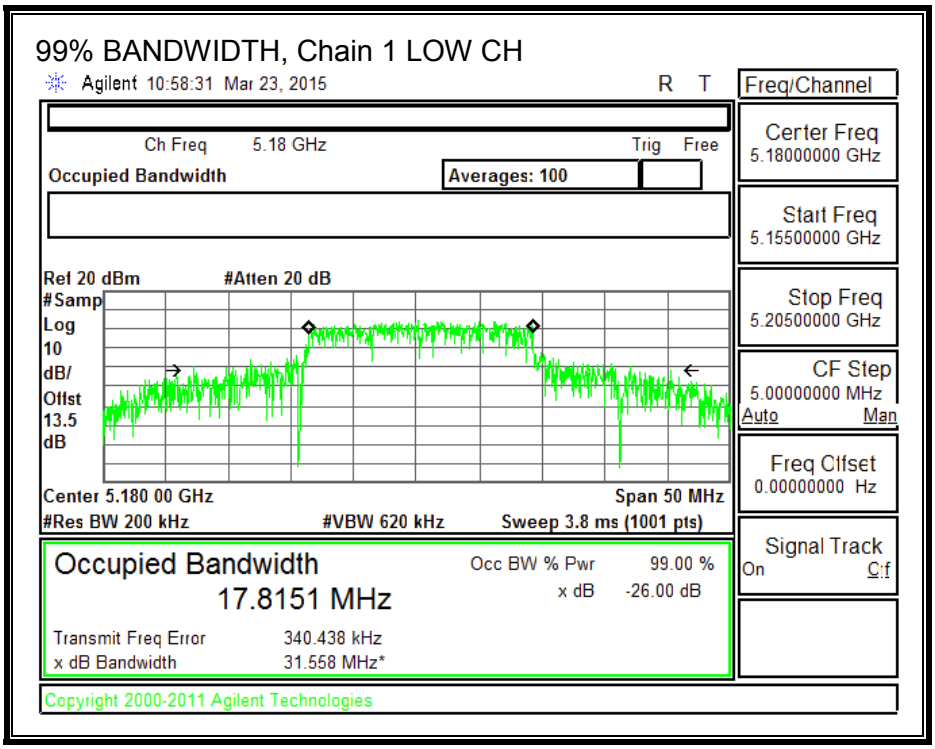
99% BANDWIDTH, Chain 0

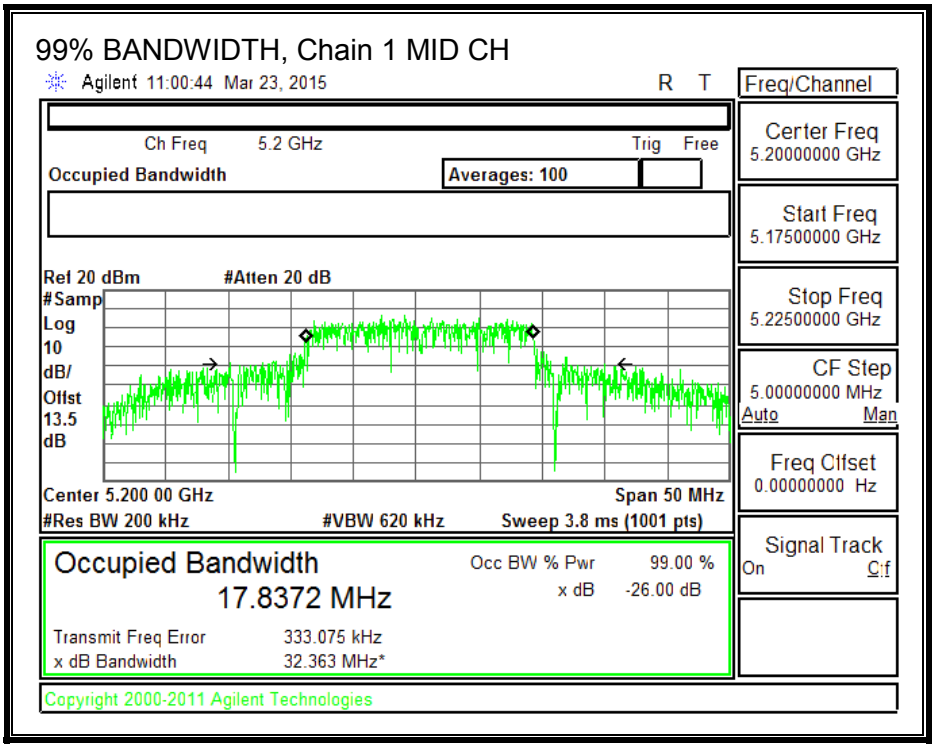


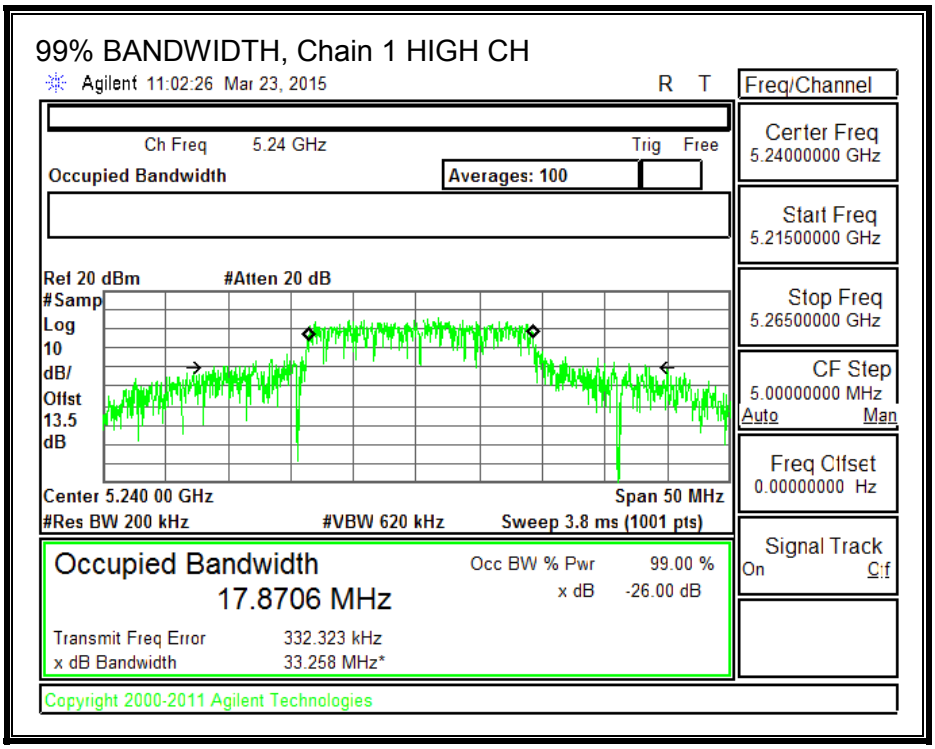




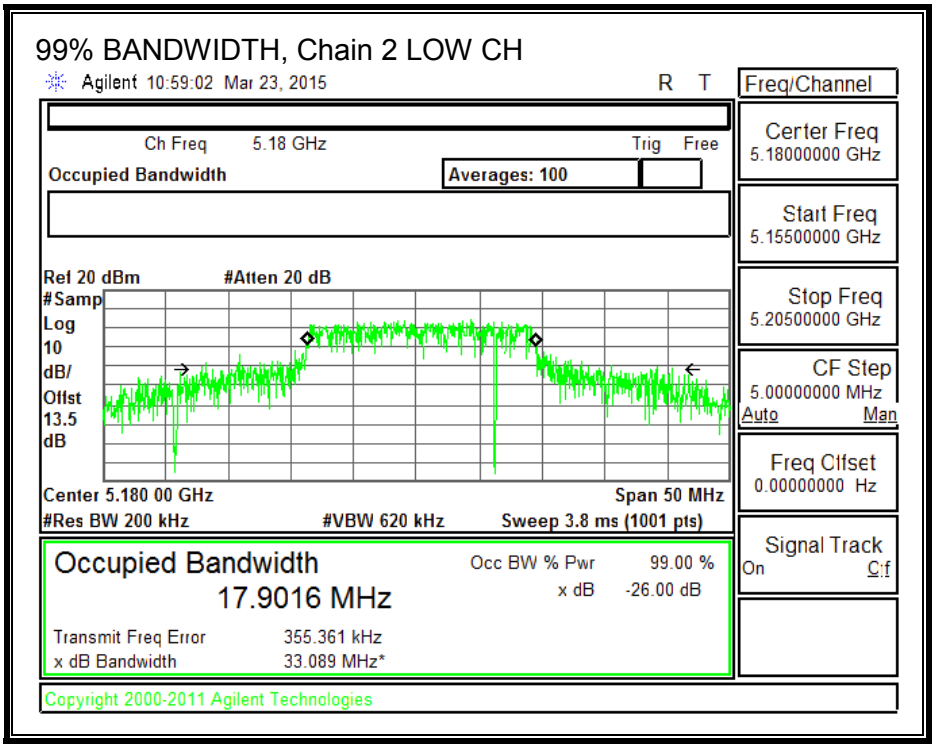
99% BANDWIDTH, Chain 1

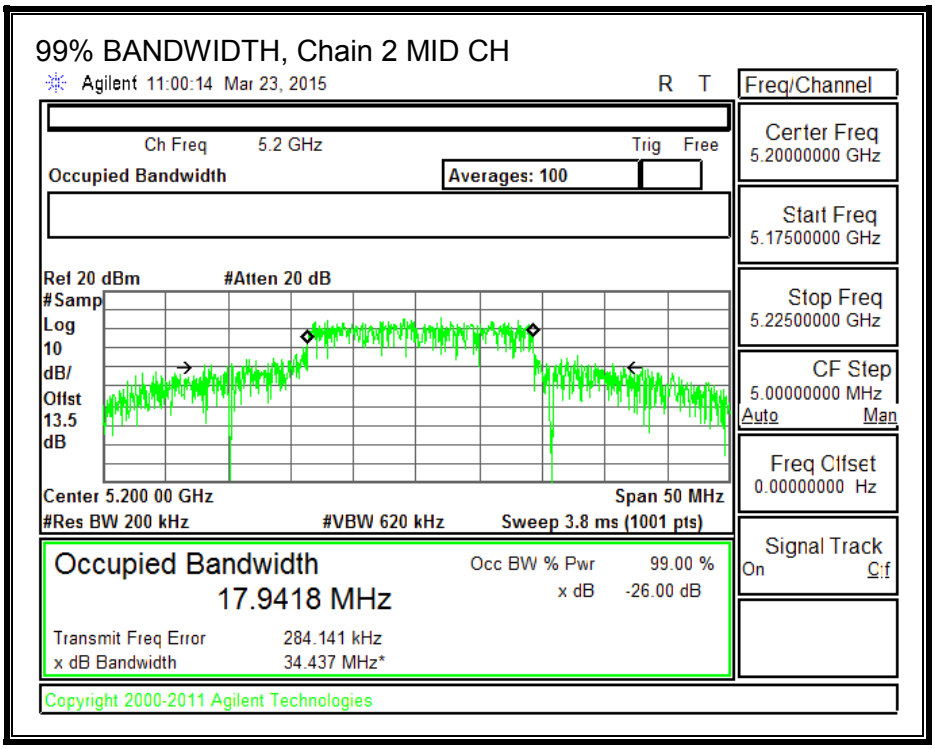


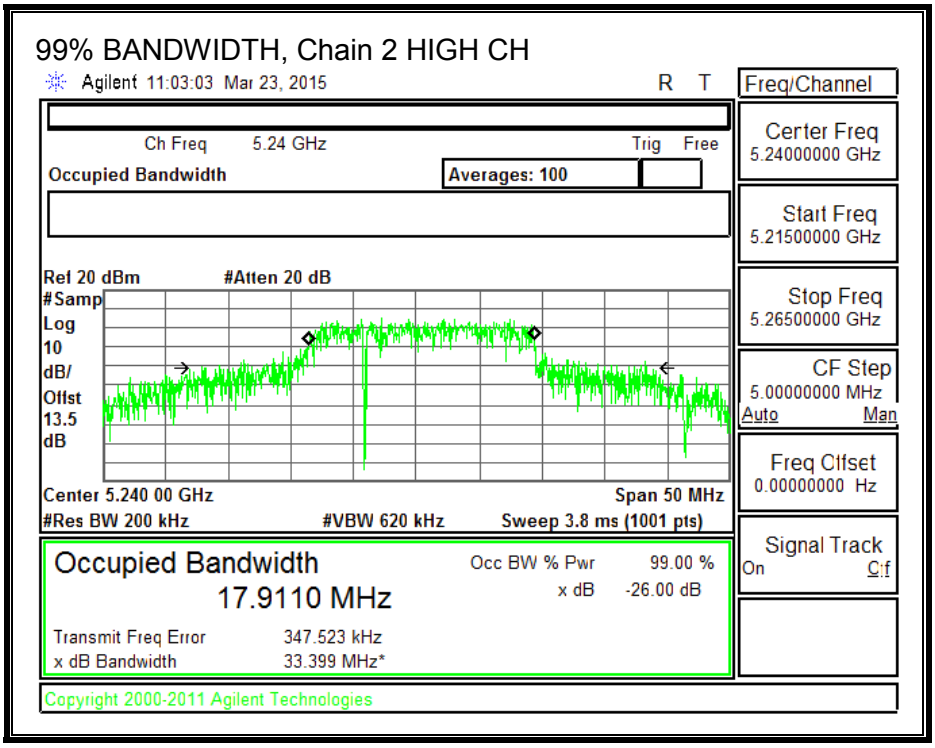




99% BANDWIDTH, Chain 2







8.4.3. 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 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 the same for each chain. The directional gain is equal to the antenna gain, 5.85 dBi.

For PSD the TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (3 chains) (dB)	Correlated Chains Directional Gain (dBi)
5.85	4.77	10.62

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5180	5.85	10.62	24.00	6.38
Mid	5200	5.85	10.62	24.00	6.38
High	5240	5.85	10.62	24.00	6.38

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

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	16.25	16.35	16.15	21.02	24.00	-2.98
Mid	5200	16.36	16.32	16.10	21.03	24.00	-2.97
High	5240	16.02	16.17	15.90	20.80	24.00	-3.20

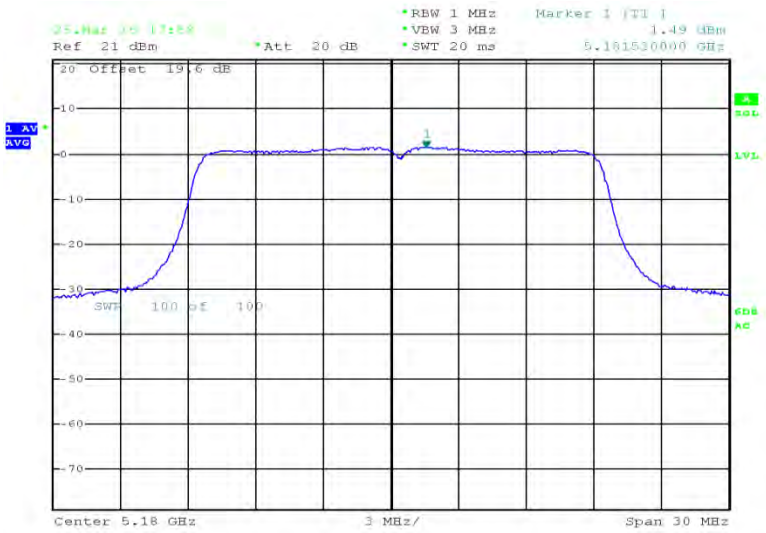
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	1.49	1.96	1.17	6.32	6.38	-0.06
Mid	5200	1.56	1.96	1.15	6.34	6.38	-0.04
High	5240	1.12	1.73	0.73	5.98	6.38	-0.40

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.

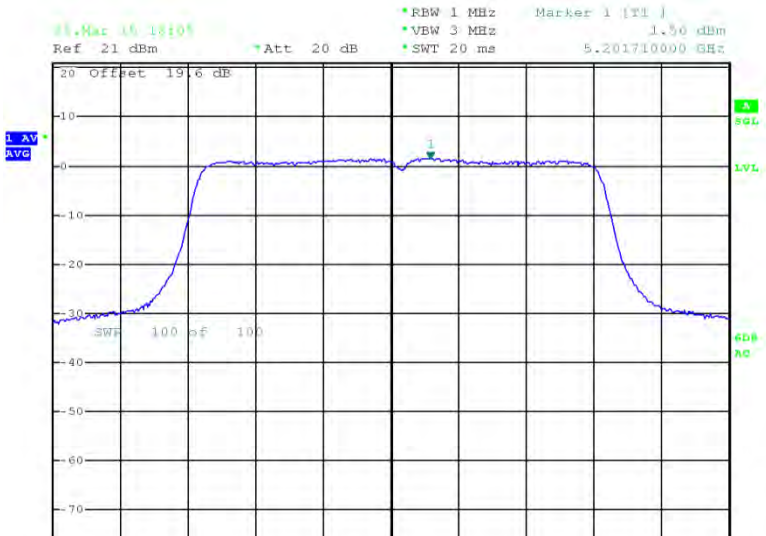
PSD, Chain 0

PSD, Chain 0 LOW CH



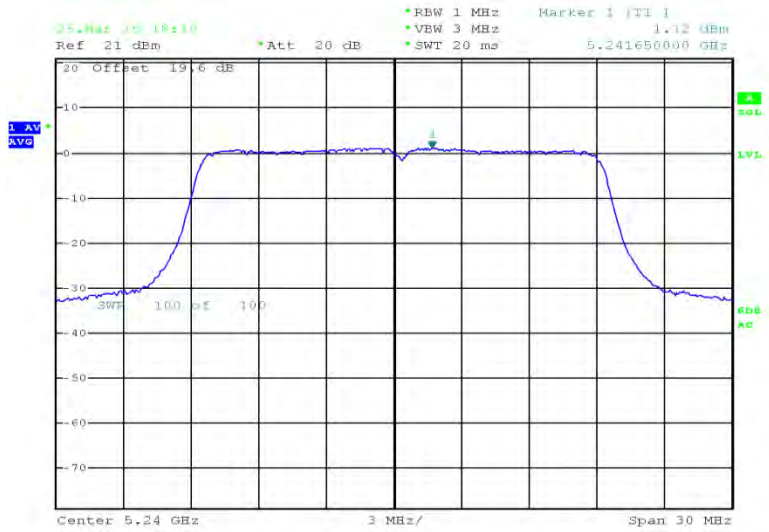
Date: 25.MAR.2015 17:58:13

PSD, Chain 0 MID CH



Date: 25.MAR.2015 18:05:16

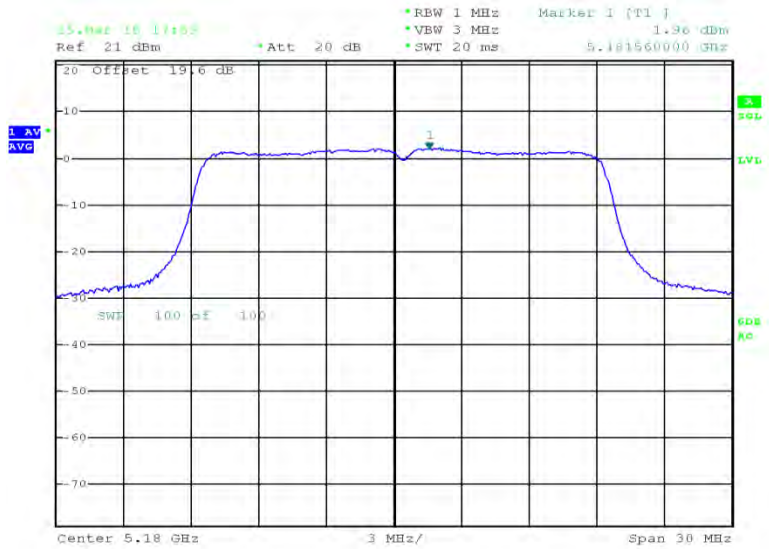
PSD, Chain 0 HIGH CH



Date: 25.MAR.2015 18:10:34

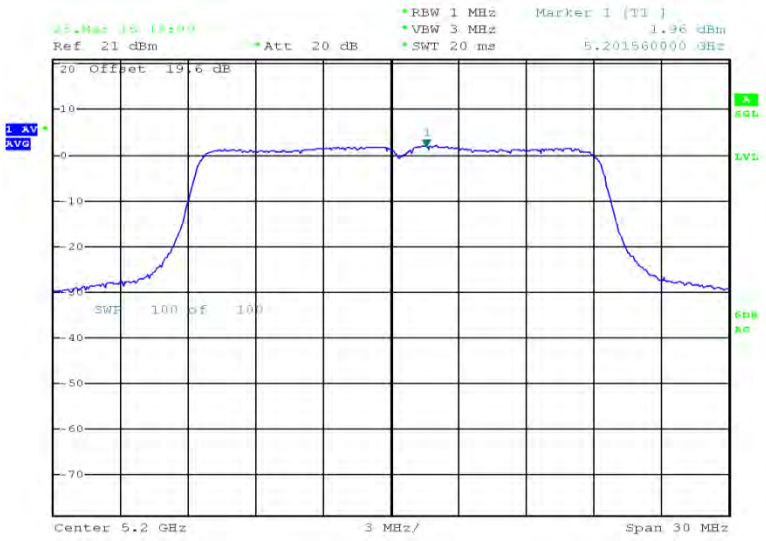
PSD, Chain 1

PSD, Chain 1 LOW CH

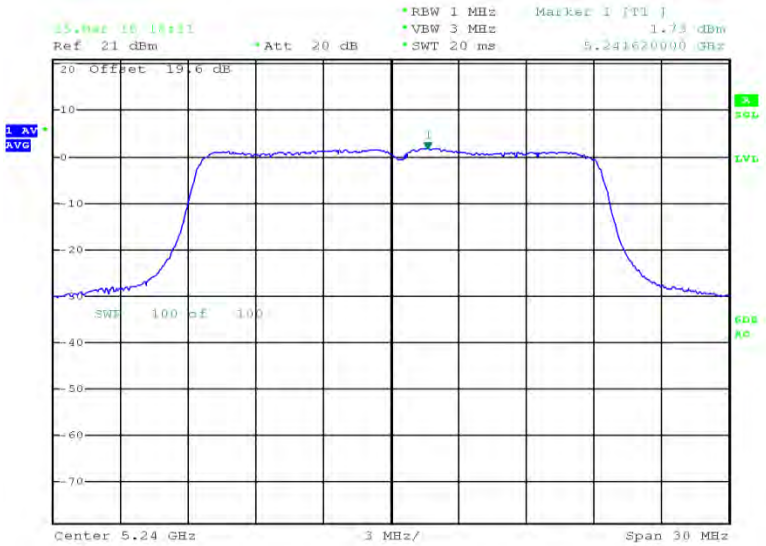


Date: 25.MAR.2015 17:59:41

PSD, Chain 1 MID CH

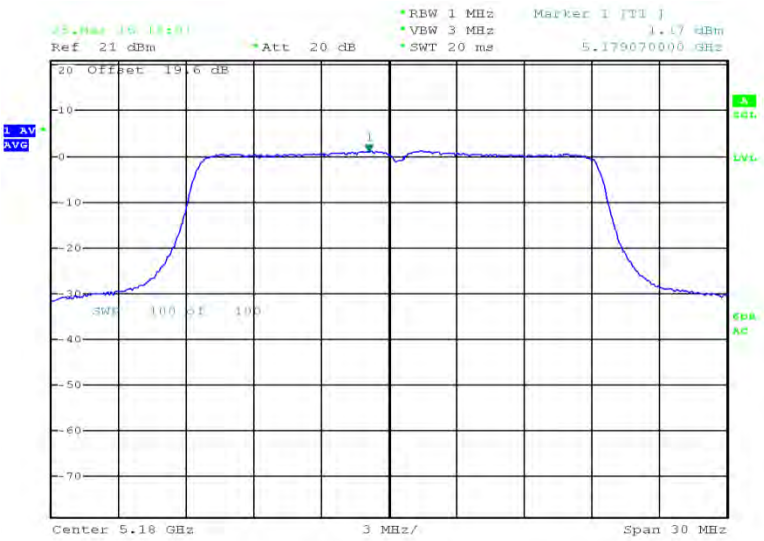


PSD, Chain 1 HIGH CH



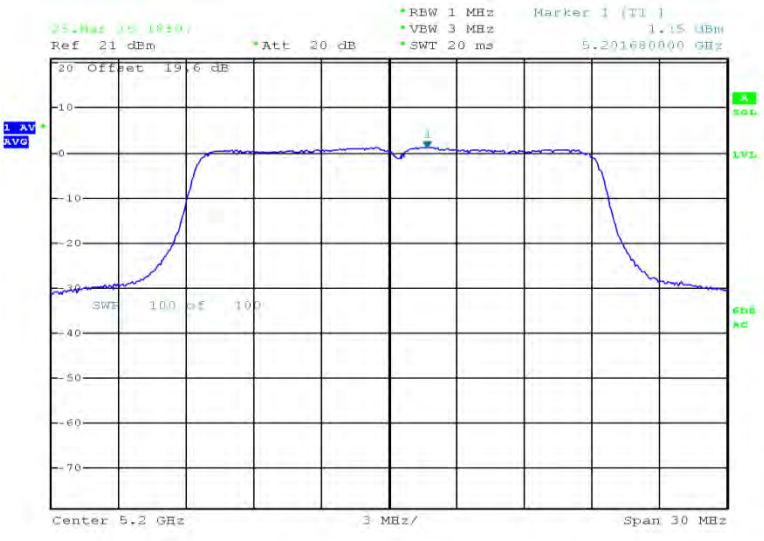
PSD, Chain 2

PSD, Chain 2 LOW CH



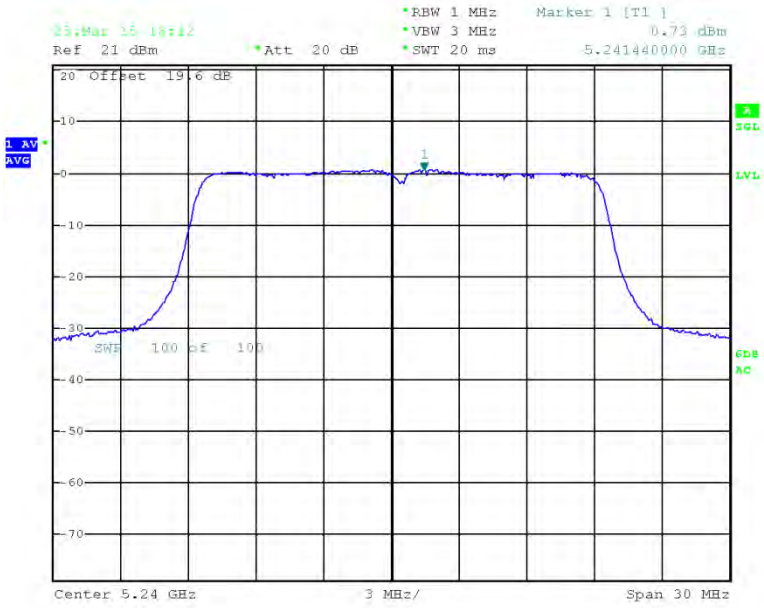
Date: 25.MAR.2015 18:01:23

PSD, Chain 2 MID CH



Date: 25.MAR.2015 18:07:39

PSD, Chain 2 HIGH CH



Date: 25.MAR.2015 18:12:46

8.5. 802.11n HT20 STBC 3Tx MODE IN THE 5.2 GHz BAND

8.5.1. 26 dB BANDWIDTH

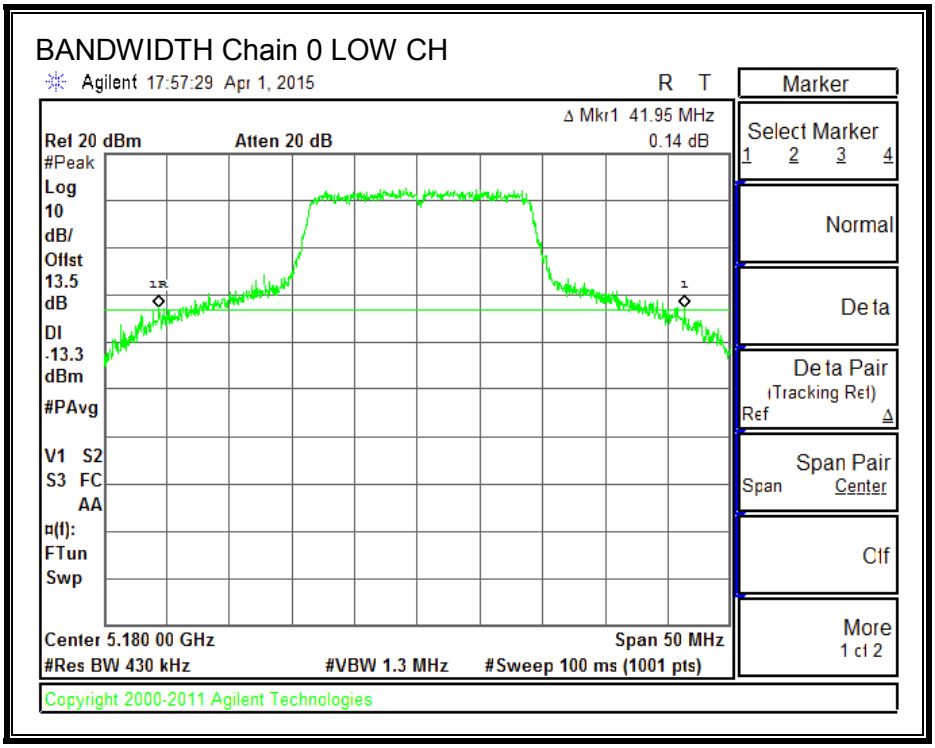
LIMITS

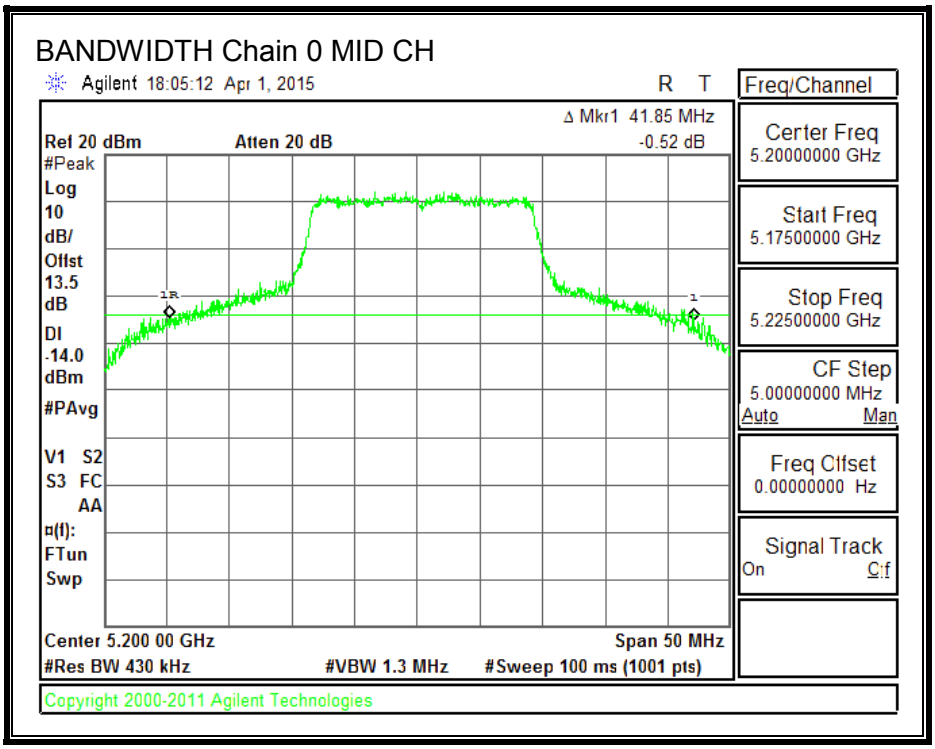
None; for reporting purposes only.

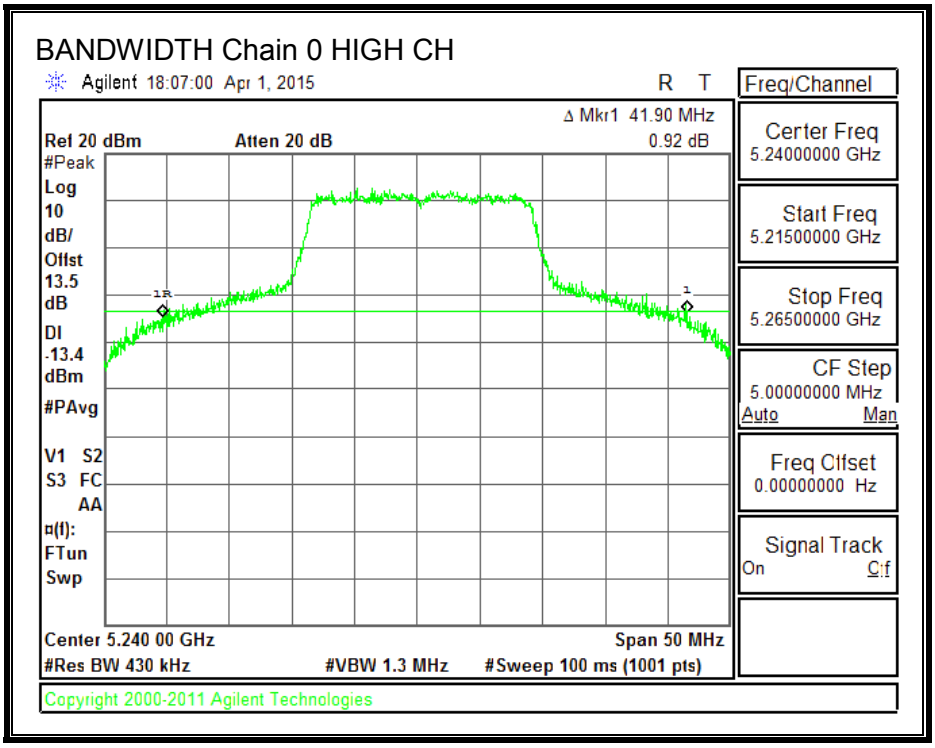
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5180	41.95	38.05	38.65
Mid	5200	41.85	39.55	43.55
High	5240	41.90	39.75	38.25

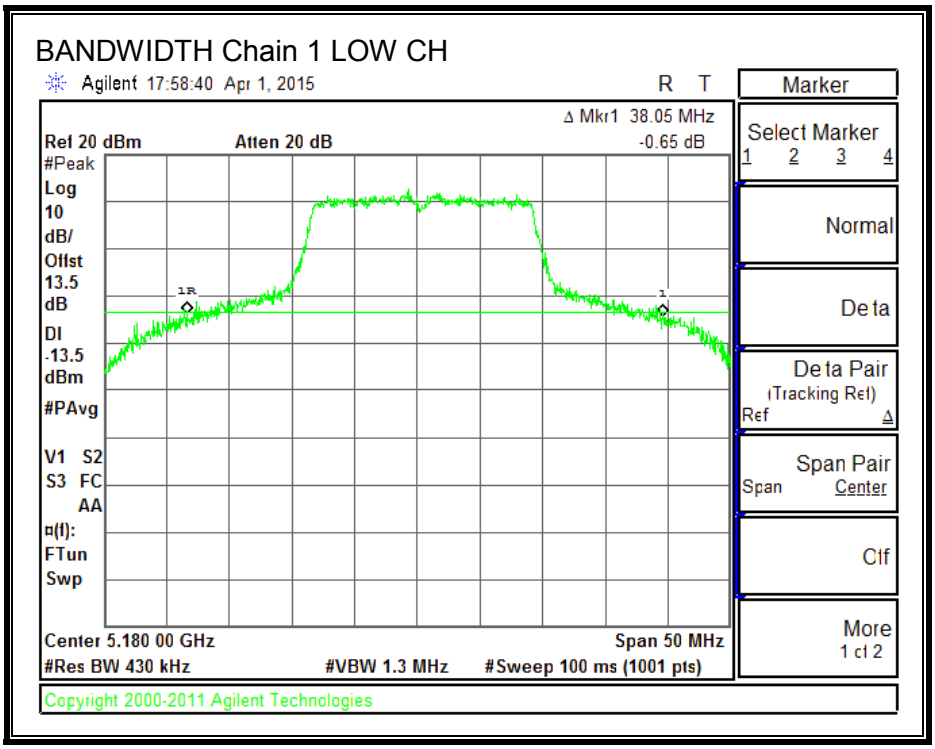
26 dB BANDWIDTH, Chain 0



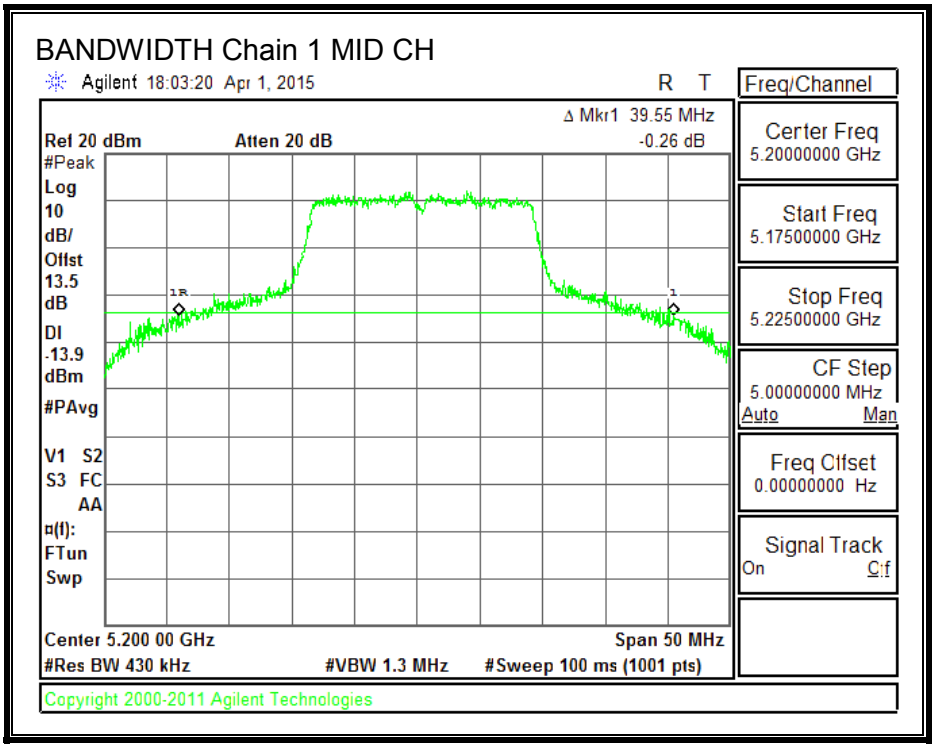




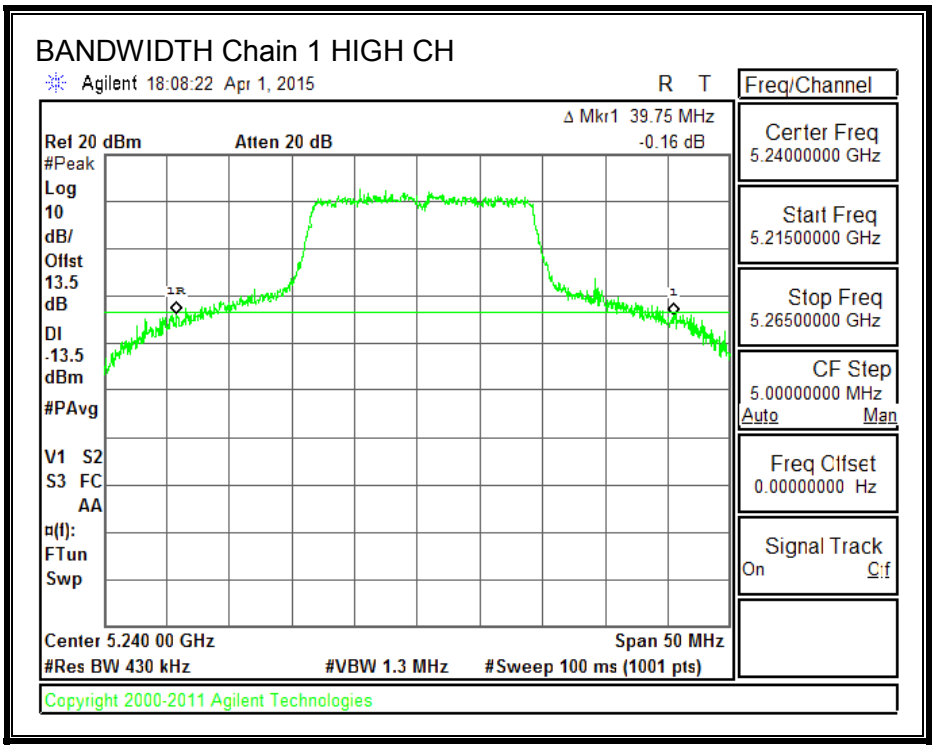
26 dB BANDWIDTH, Chain 1



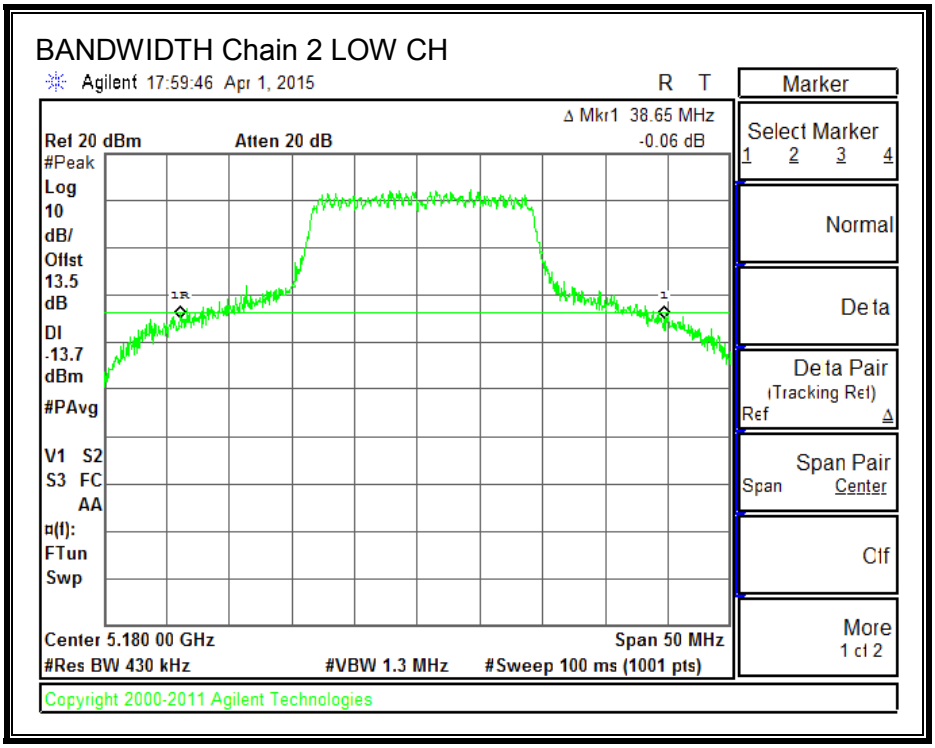
BANDWIDTH Chain 1 MID CH

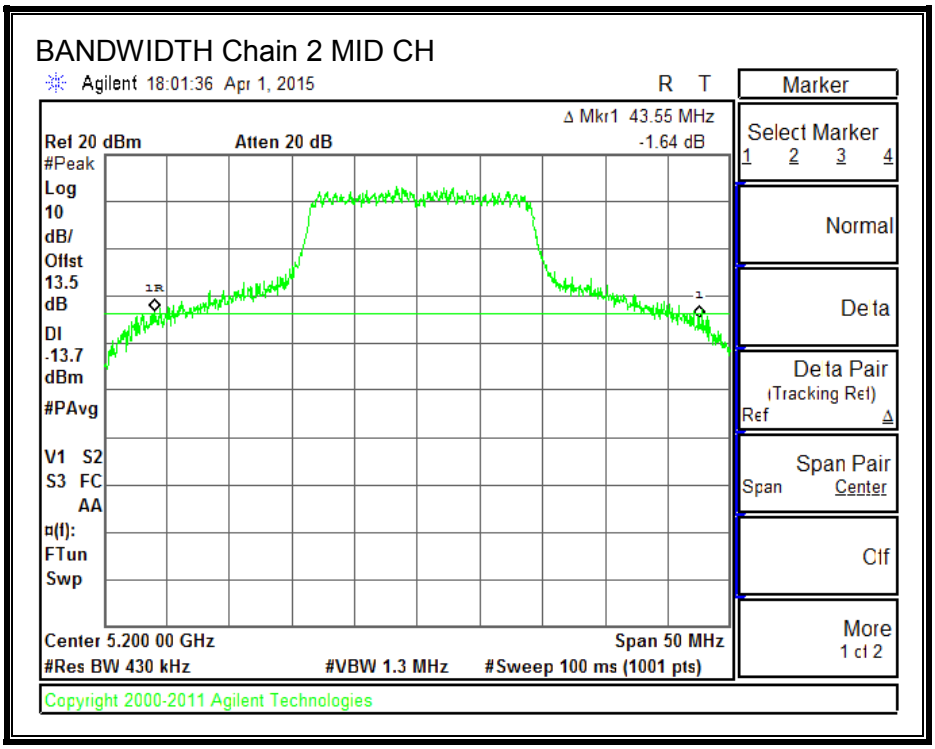


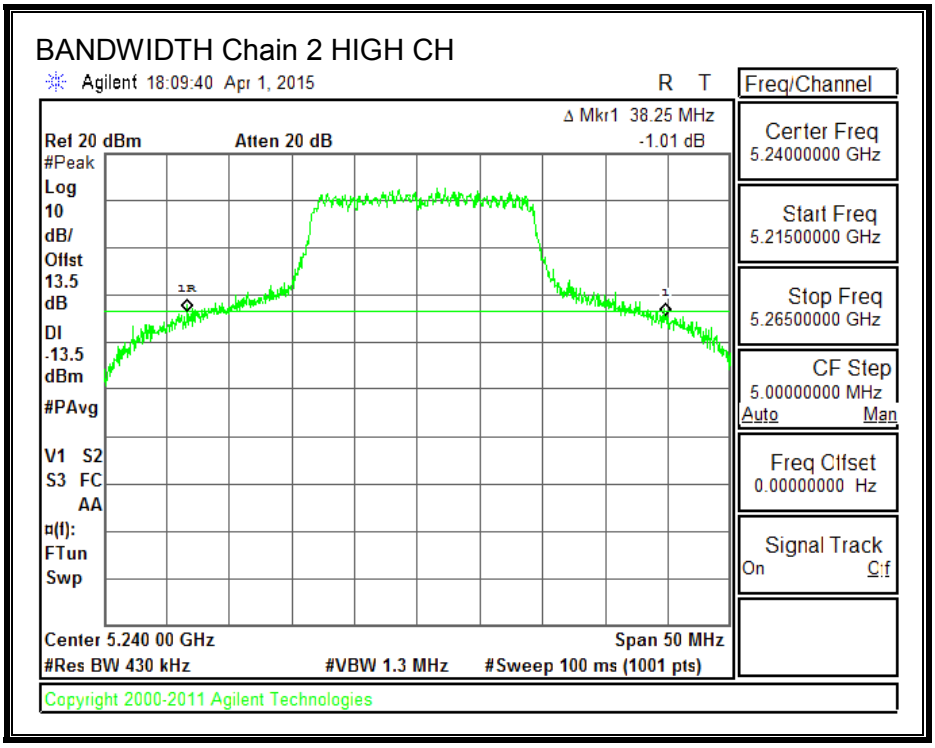
BANDWIDTH Chain 1 HIGH CH



26 dB BANDWIDTH, Chain 2







8.5.2. 99% BANDWIDTH

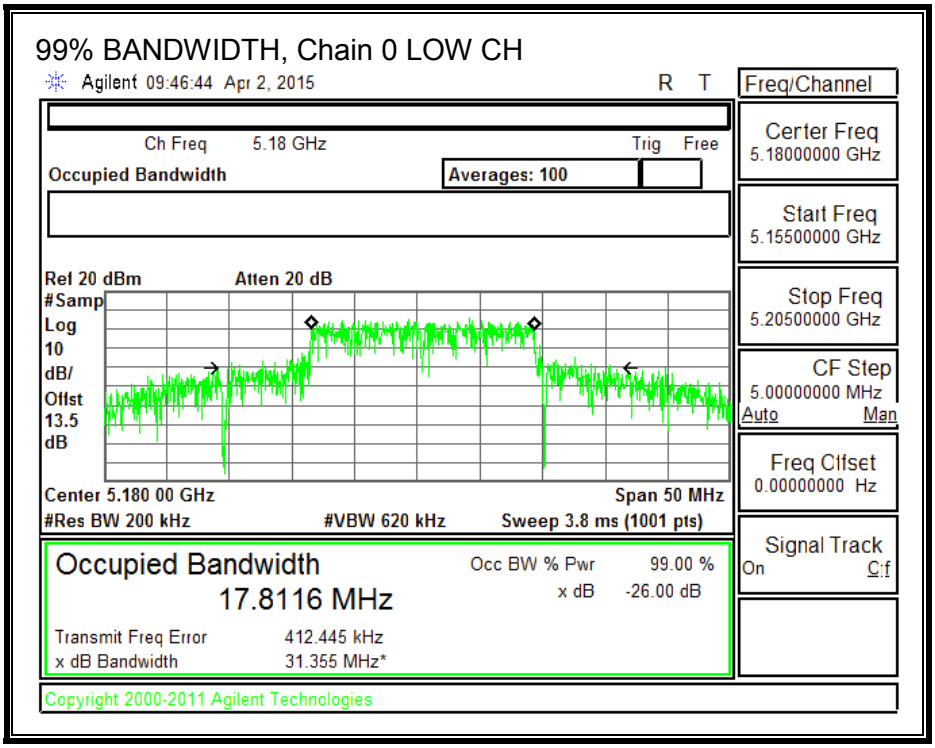
LIMITS

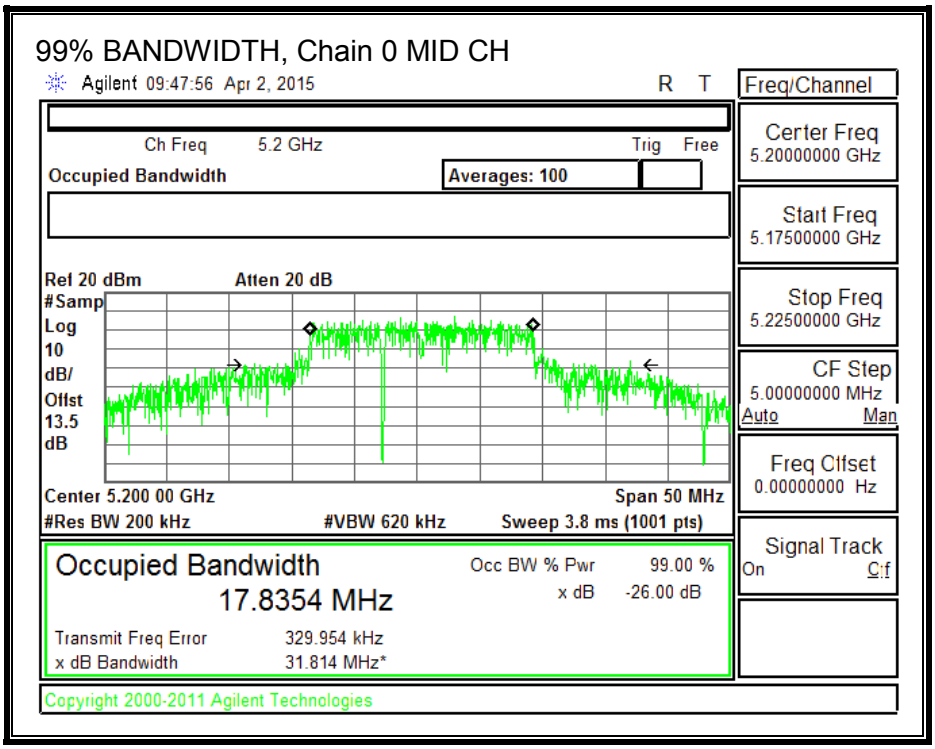
None; for reporting purposes only.

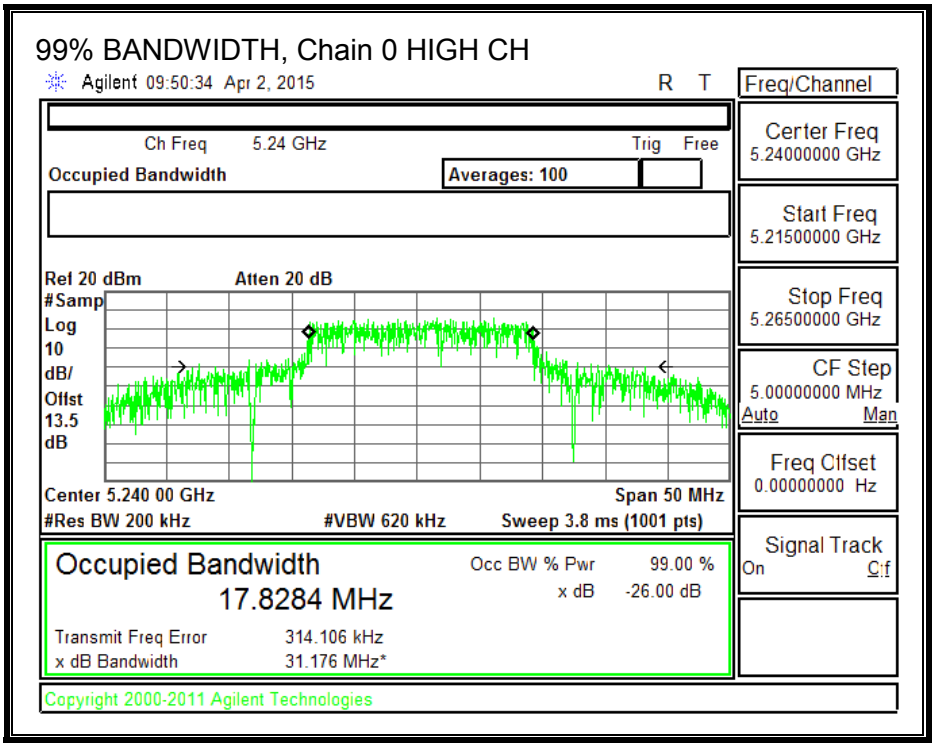
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5180	17.8116	17.7741	17.8804
Mid	5200	17.8354	17.8121	17.7960
High	5240	17.8284	17.8158	17.7823

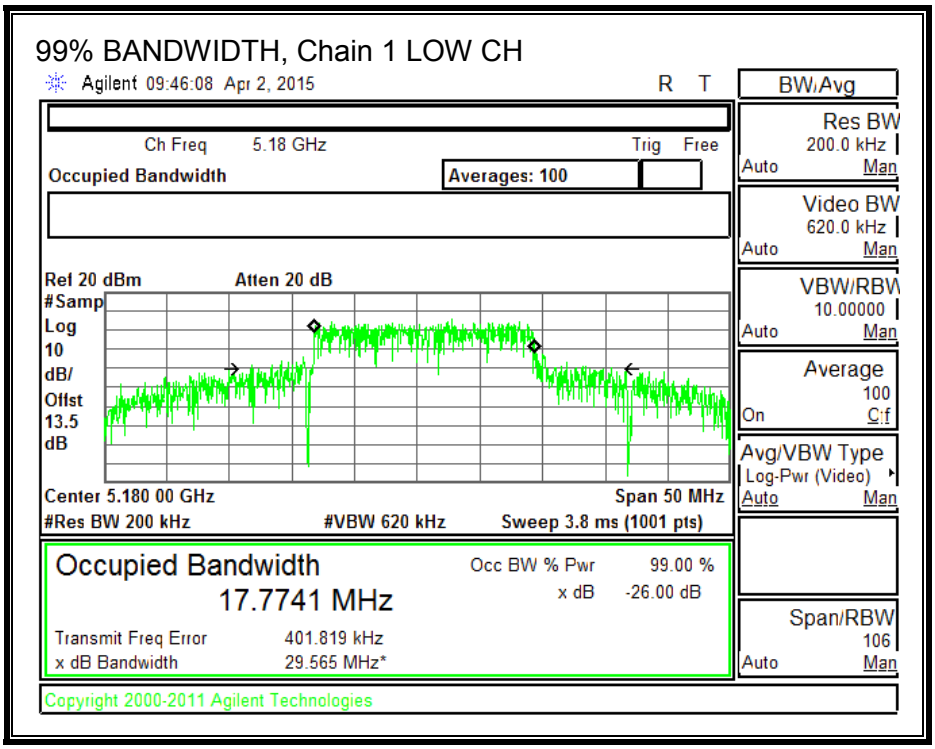
99% BANDWIDTH, Chain 0

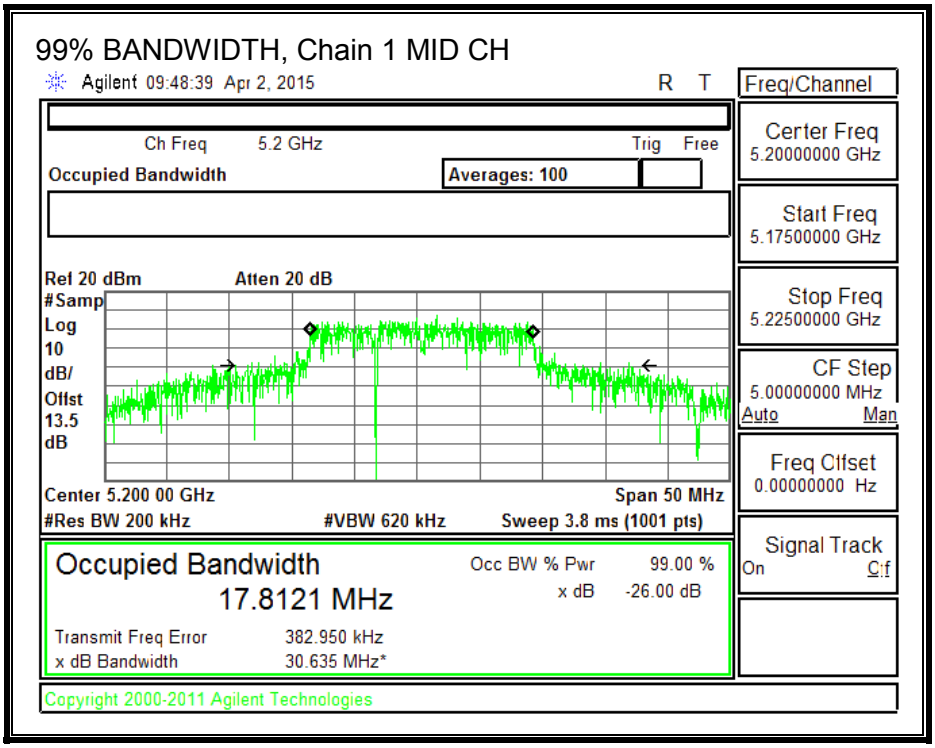


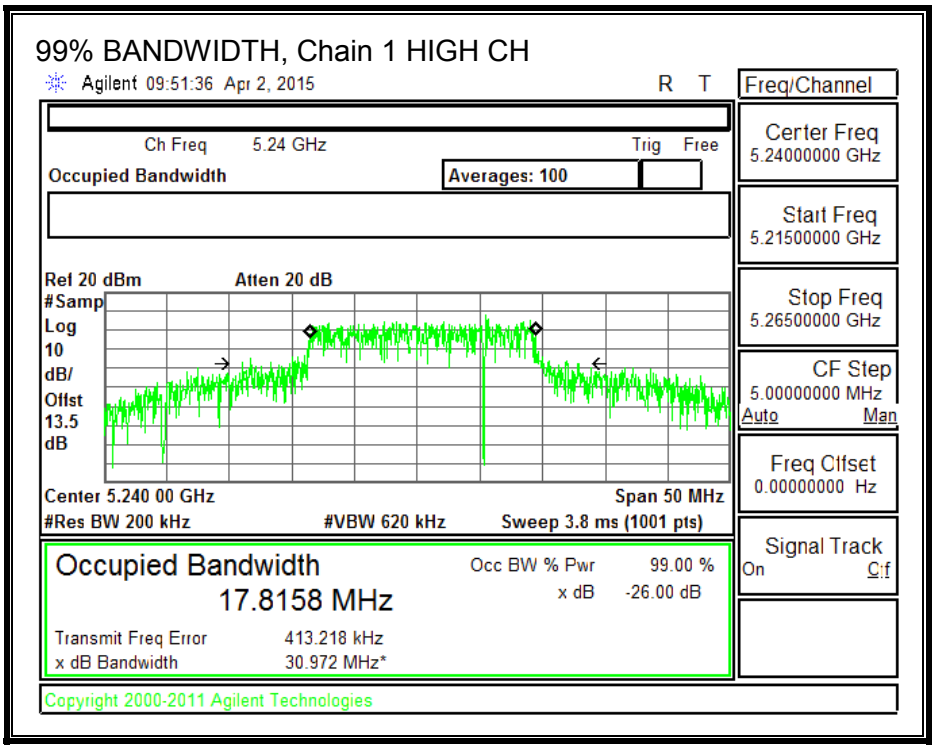




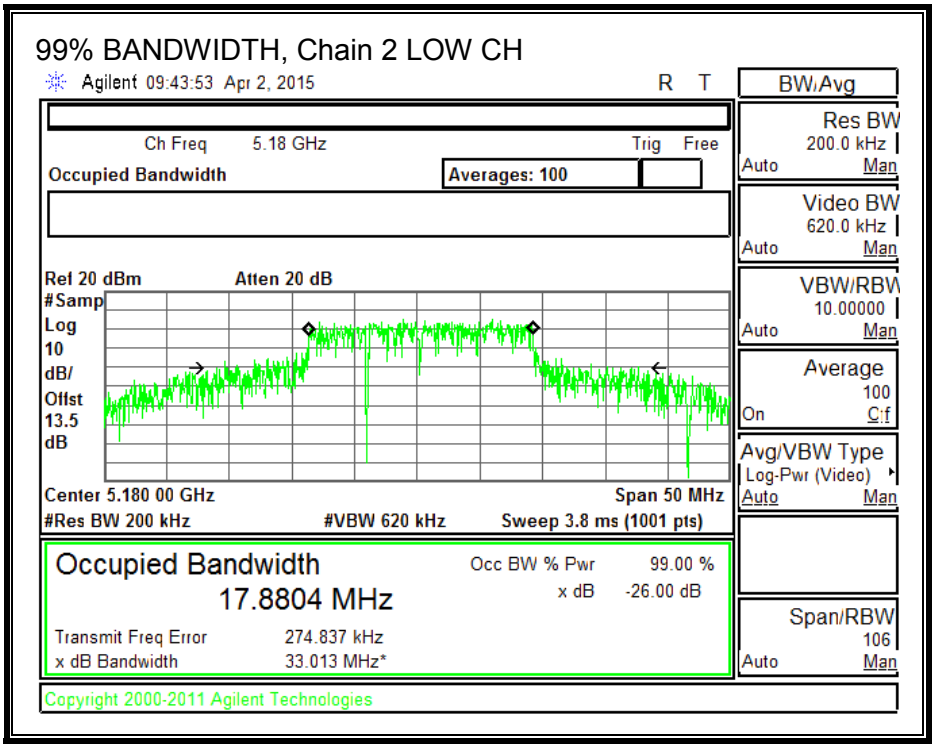
99% BANDWIDTH, Chain 1

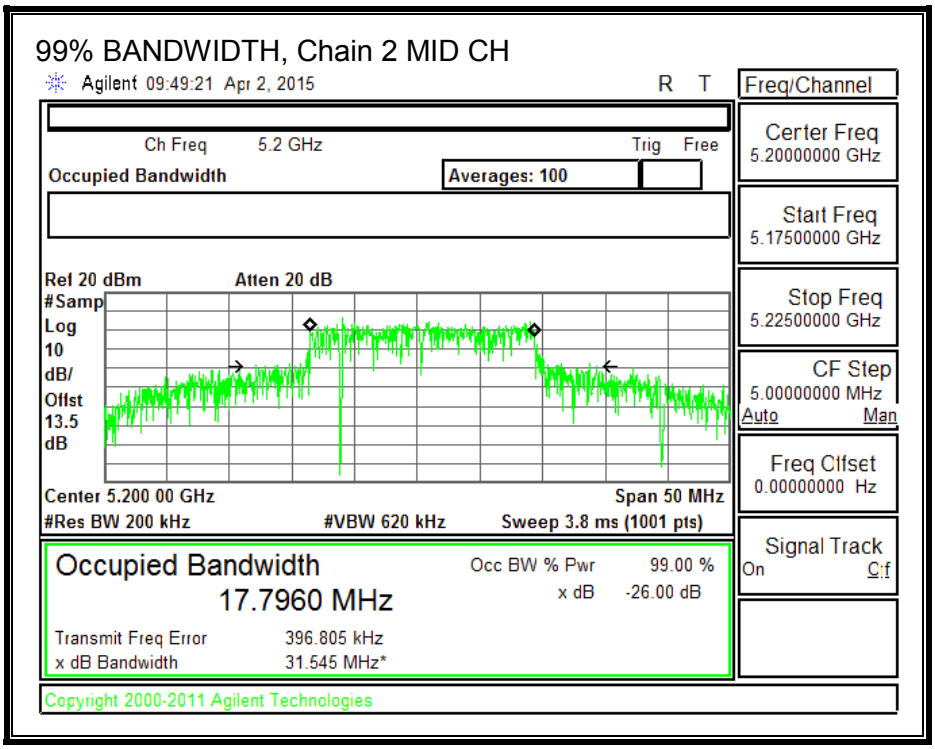


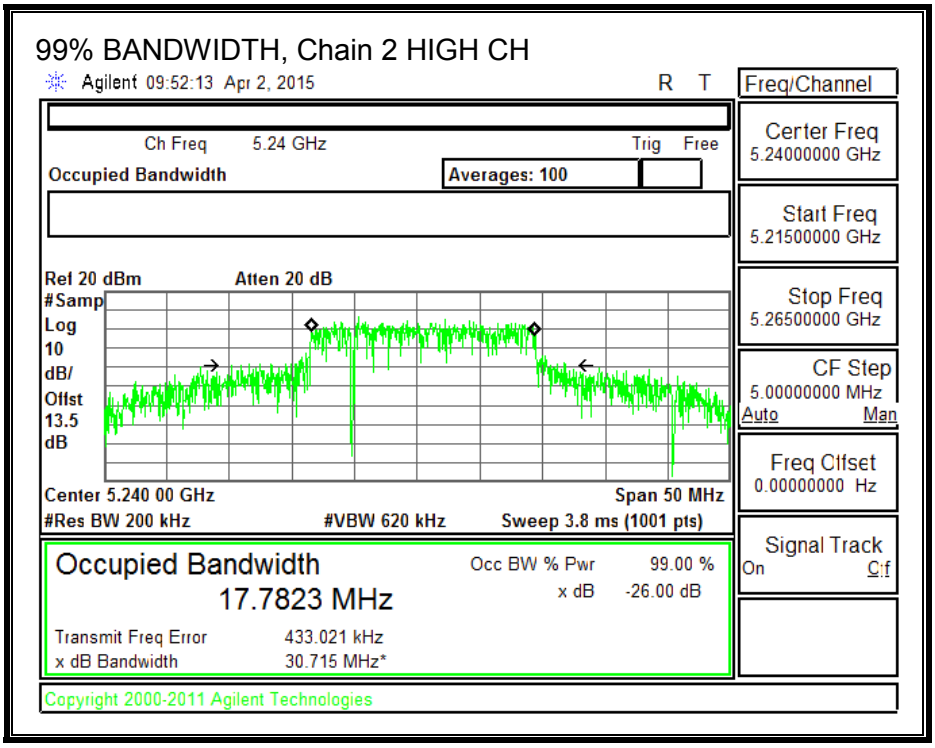




99% BANDWIDTH, Chain 2







8.5.3. 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 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 and PSD the TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is equal to the antenna gain, 5.85 dBi.

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5180	5.85	5.85	24.00	11.00
Mid	5200	5.85	5.85	24.00	11.00
High	5240	5.85	5.85	24.00	11.00

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

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	17.70	18.24	17.69	22.66	24.00	-1.34
Mid	5200	19.10	18.90	18.97	23.76	24.00	-0.24
High	5240	18.90	18.88	18.92	23.67	24.00	-0.33

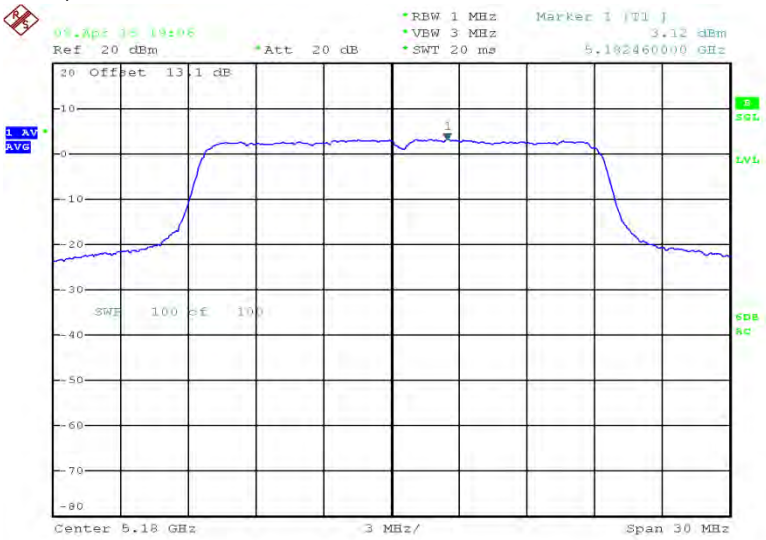
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	3.12	2.76	3.52	7.92	11.00	-3.08
Mid	5200	3.77	3.20	3.49	8.26	11.00	-2.74
High	5240	3.37	2.37	2.67	7.60	11.00	-3.40

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.

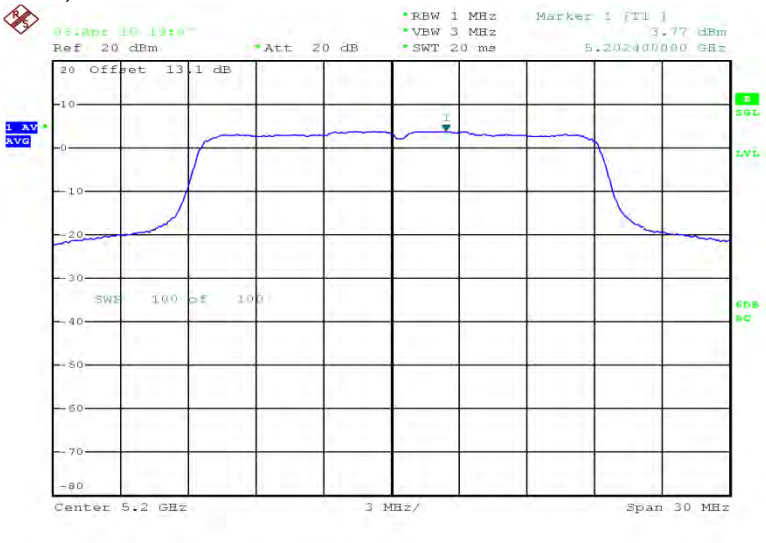
PSD, Chain 0

PSD, Chain 0 LOW CH



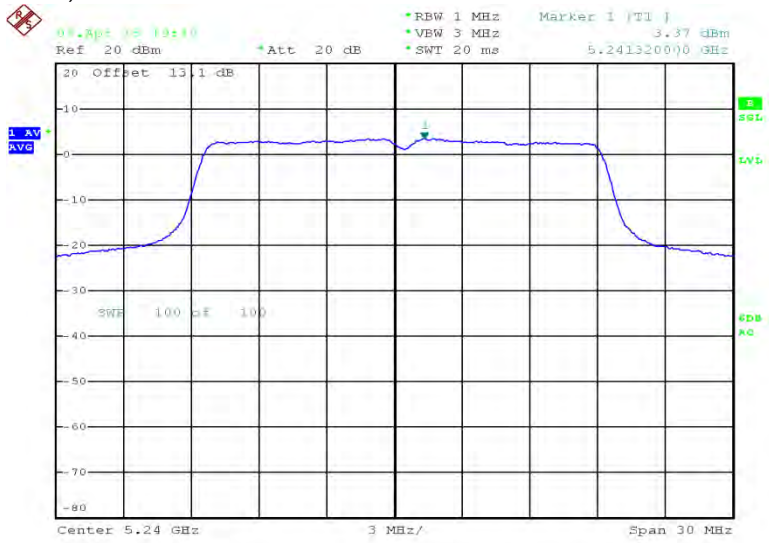
Date: 8.APR.2015 19:06:33

PSD, Chain 0 MID CH



Date: 8.APR.2015 19:07:31

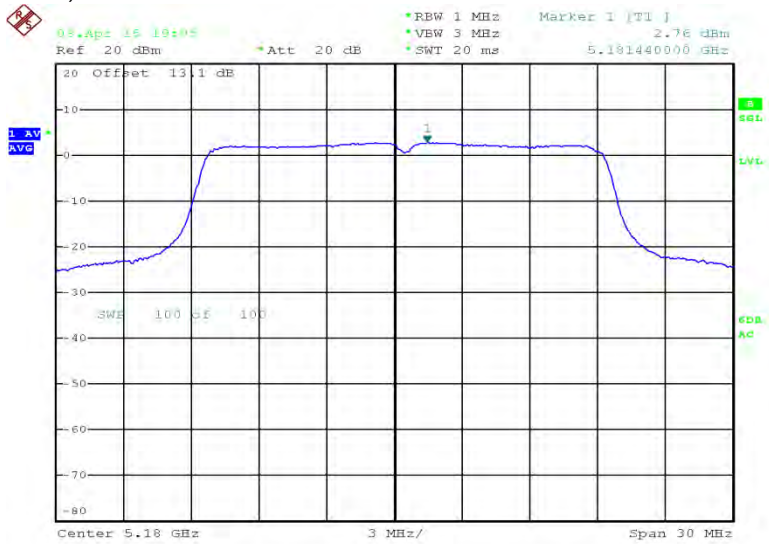
PSD, Chain 0 HIGH CH



Date: 8.APR.2015 19:10:22

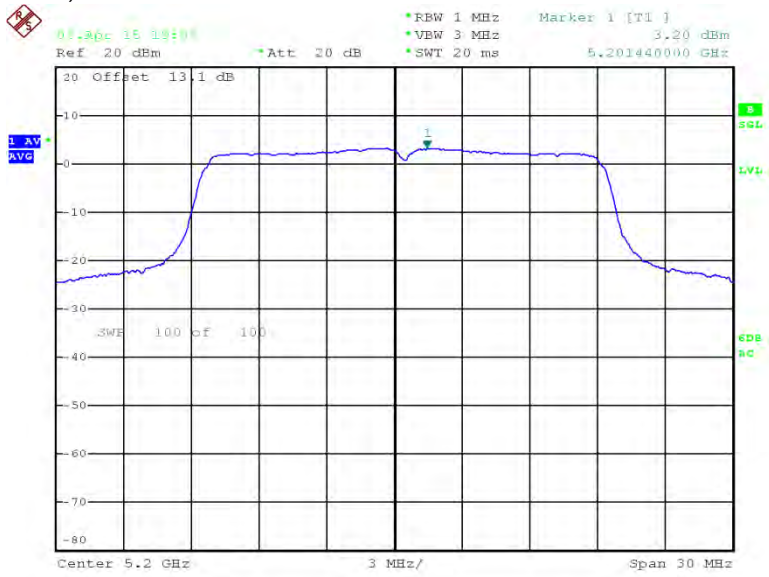
PSD, Chain 1

PSD, Chain 1 LOW CH



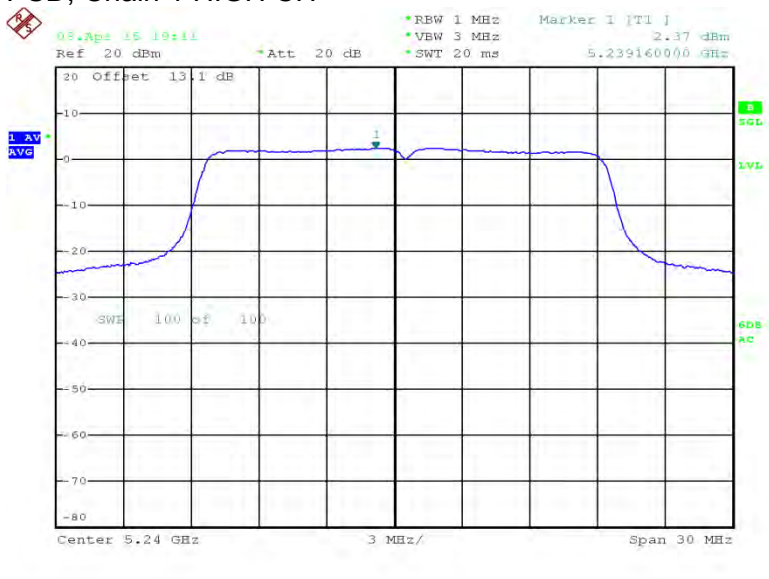
Date: 8.APR.2015 19:05:50

PSD, Chain 1 MID CH



Date: 8.APR.2015 19:08:11

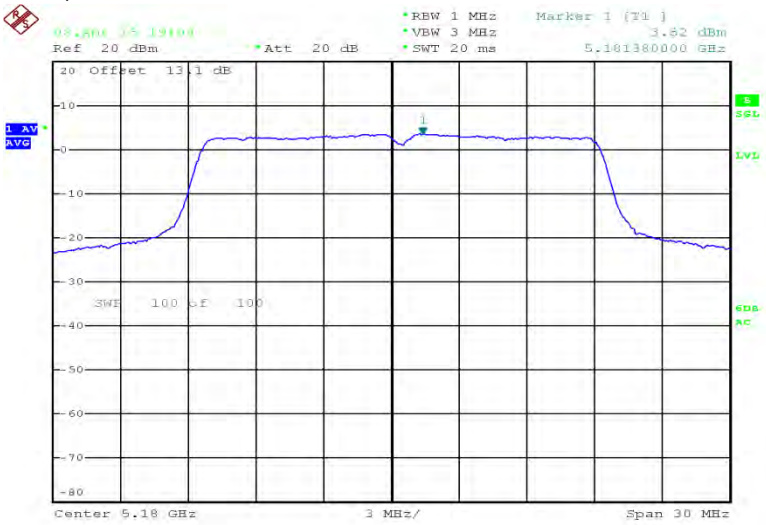
PSD, Chain 1 HIGH CH



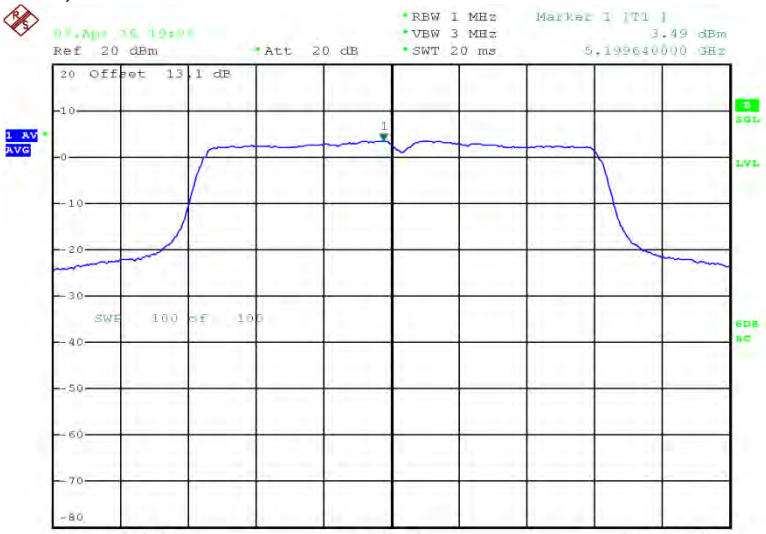
Date: 8.APR.2015 19:11:46

PSD, Chain 2

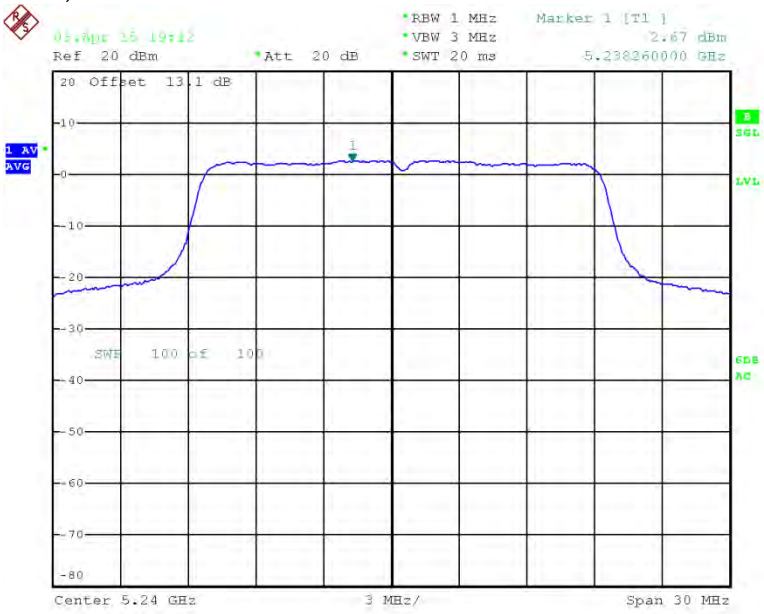
PSD, Chain 2 LOW CH



PSD, Chain 2 MID CH



PSD, Chain 2 HIGH CH



8.6. 802.11n HT20 TxBF 3Tx MODE IN THE 5.2 GHz BAND

8.6.1. 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 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 and PSD, the TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (3 chains) (dB)	Correlated Chains Directional Gain (dBi)
5.85	4.77	10.62

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5180	10.62	10.62	19.38	6.38
Mid	5200	10.62	10.62	19.38	6.38
High	5240	10.62	10.62	19.38	6.38

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

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	13.97	14.56	14.35	19.07	19.38	-0.31
Mid	5200	14.05	14.77	14.62	19.26	19.38	-0.12
High	5240	13.95	14.71	14.58	19.20	19.38	-0.18

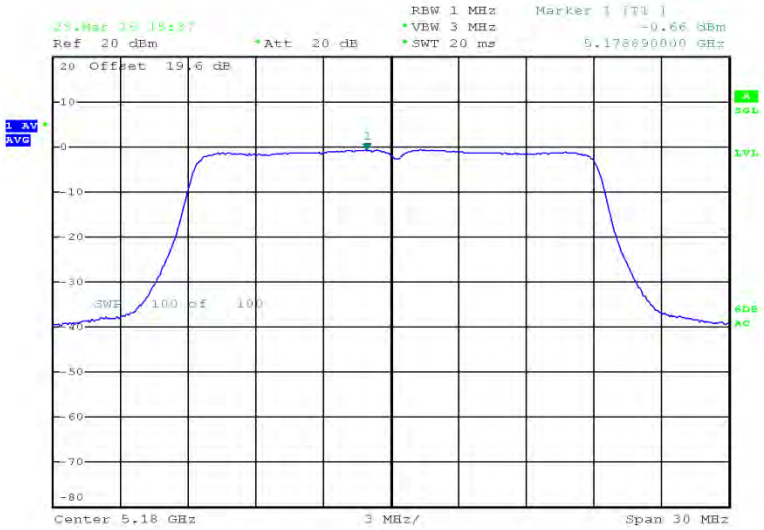
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	-0.66	0.27	-0.17	4.60	6.38	-1.78
Mid	5200	-0.31	0.59	0.34	4.99	6.38	-1.39
High	5240	-0.84	0.16	-0.08	4.54	6.38	-1.84

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.

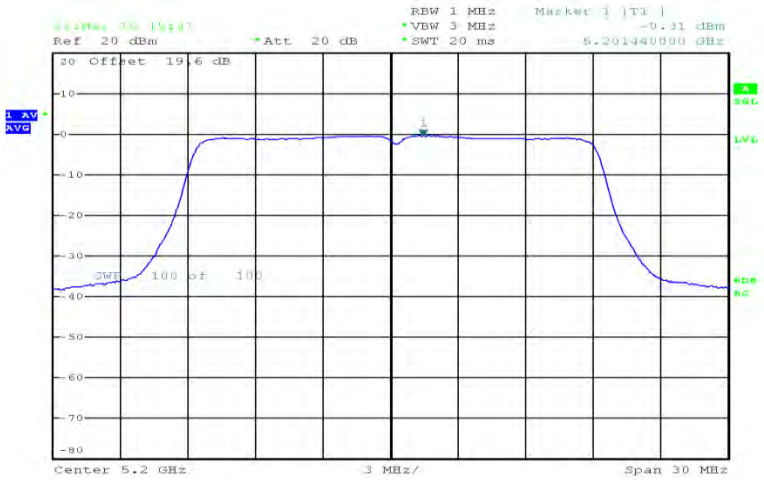
PSD, Chain 0

PSD, Chain 0 LOW CH



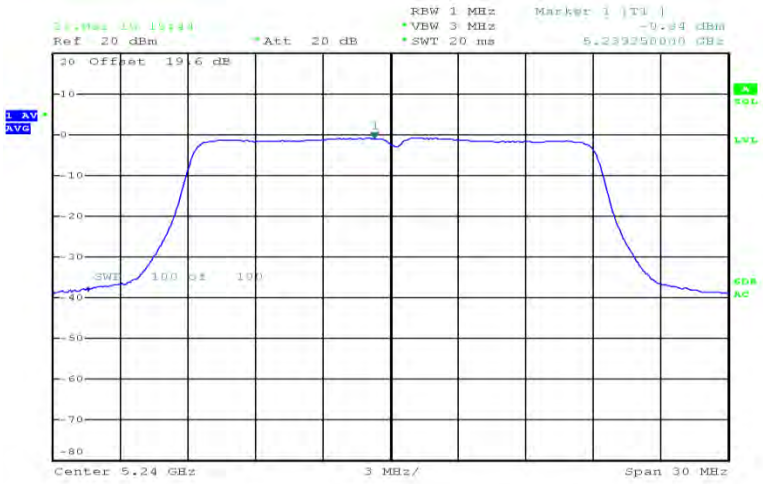
Date: 28.MAR.2015 15:37:52

PSD, Chain 0 MID CH



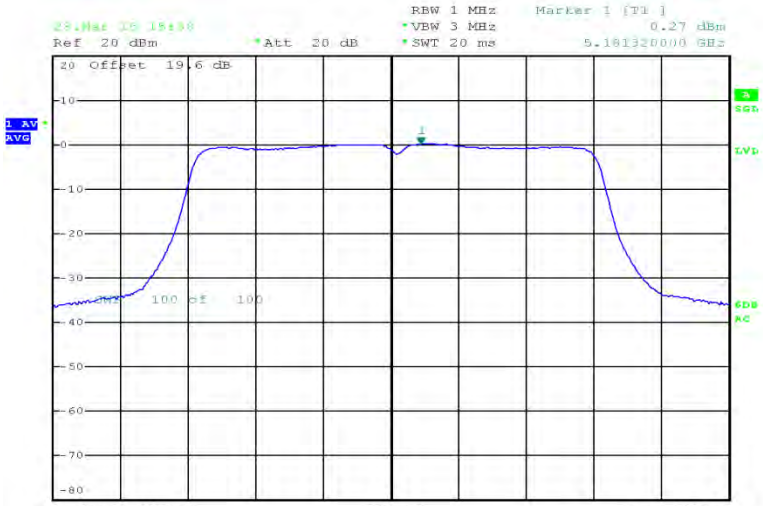
Date: 28.MAR.2015 15:41:11

PSD, Chain 0 HIGH CH

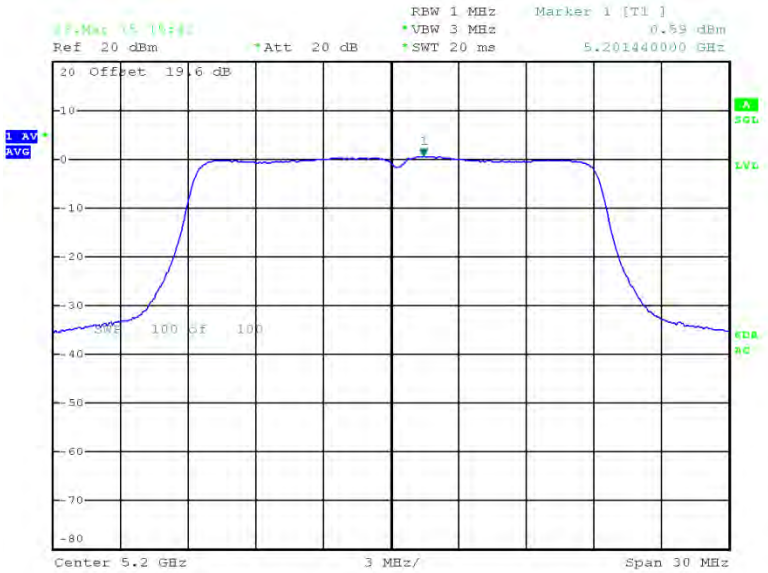


PSD, Chain 1

PSD, Chain 1 LOW CH

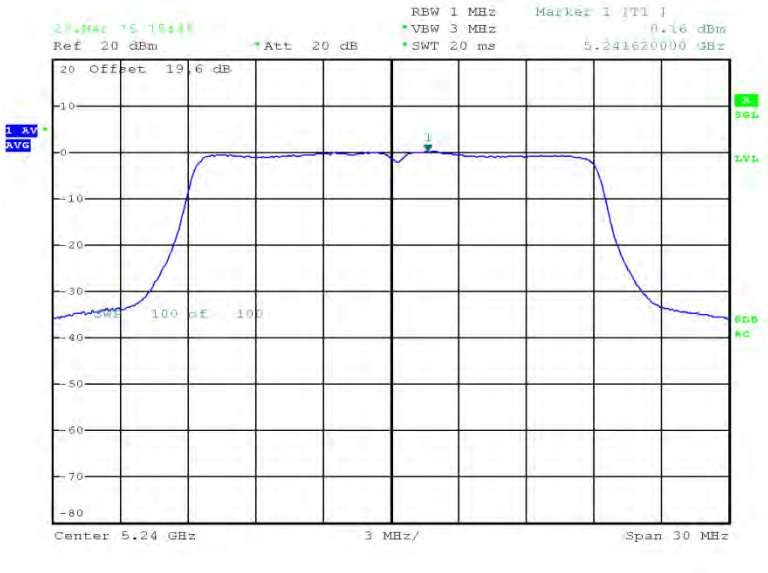


PSD, Chain 1 MID CH



Date: 28.MAR.2015 15:42:15

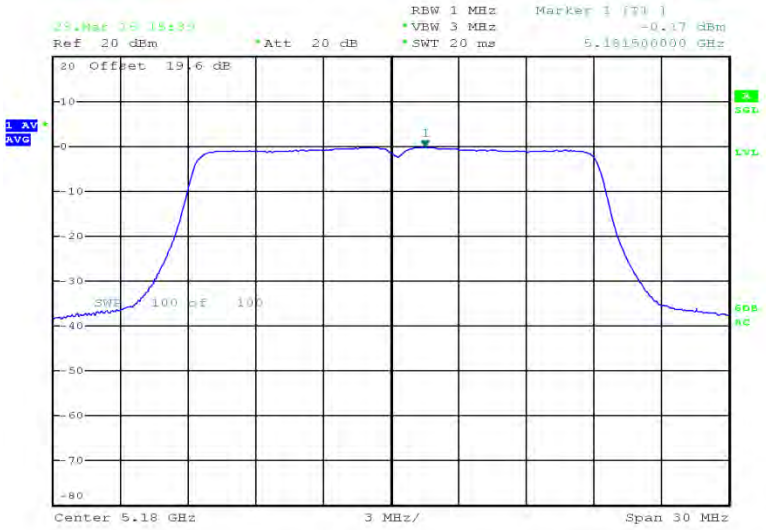
PSD, Chain 1 HIGH CH



Date: 28.MAR.2015 15:45:50

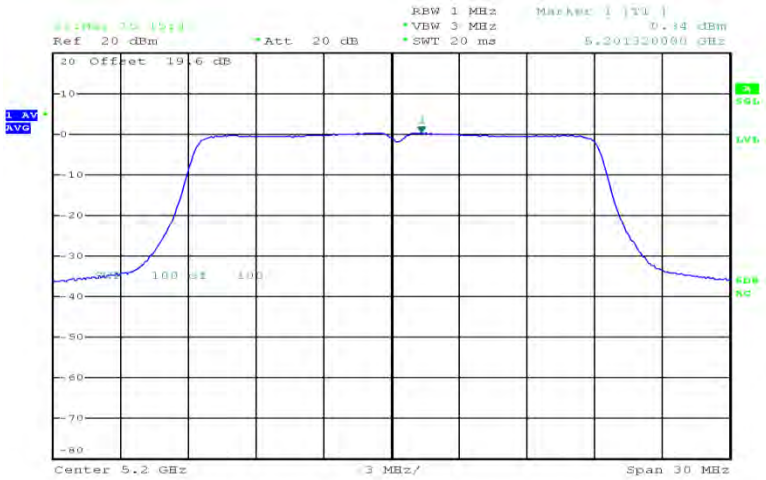
PSD, Chain 2

PSD, Chain 2 LOW CH



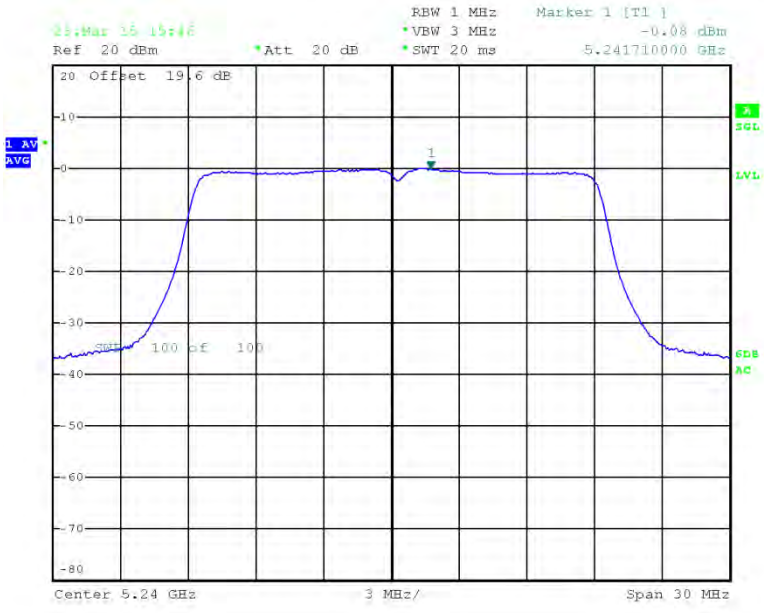
Date: 28.MAR.2015 15:39:24

PSD, Chain 2 MID CH



Date: 28.MAR.2015 15:43:06

PSD, Chain 2 HIGH CH



8.7. 802.11n HT40 1Tx MODE IN THE 5.2 GHz BAND

8.7.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

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

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

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

DIRECTIONAL ANTENNA GAIN

This is SISO mode, AG is the highest (worst-case) = 5.85 dBi

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5190	5.85	24.00
High	5230	5.85	24.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	13.12	13.12	24.00	-10.88
High	5230	19.10	19.10	24.00	-4.90

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.

8.8. 802.11n HT40 CDD 3Tx MODE IN THE 5.2 GHz BAND

8.8.1. 26 dB BANDWIDTH

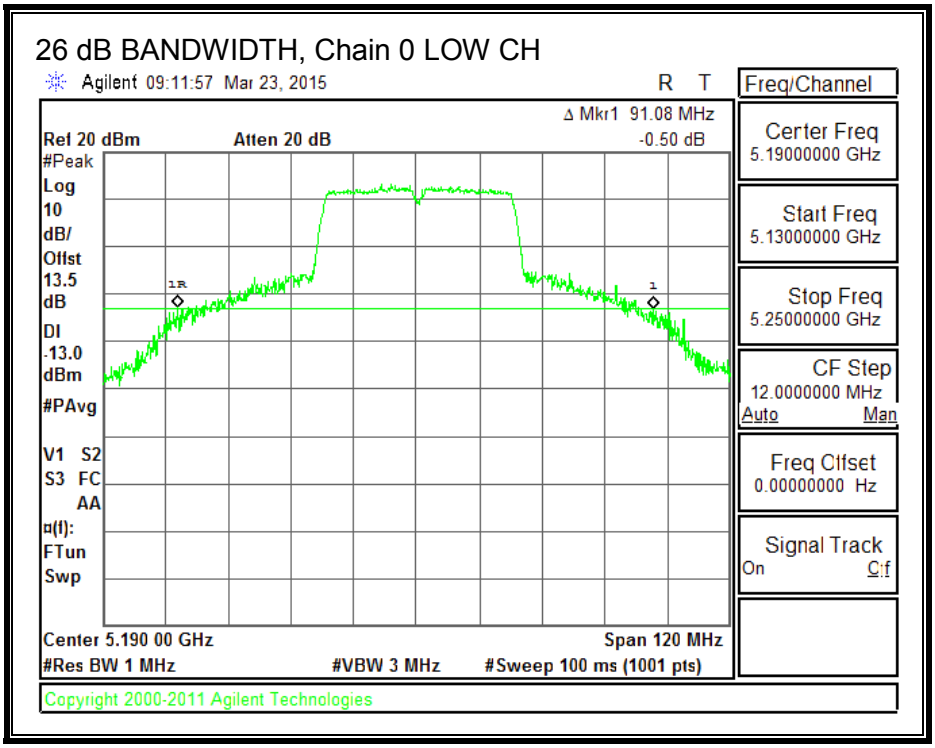
LIMITS

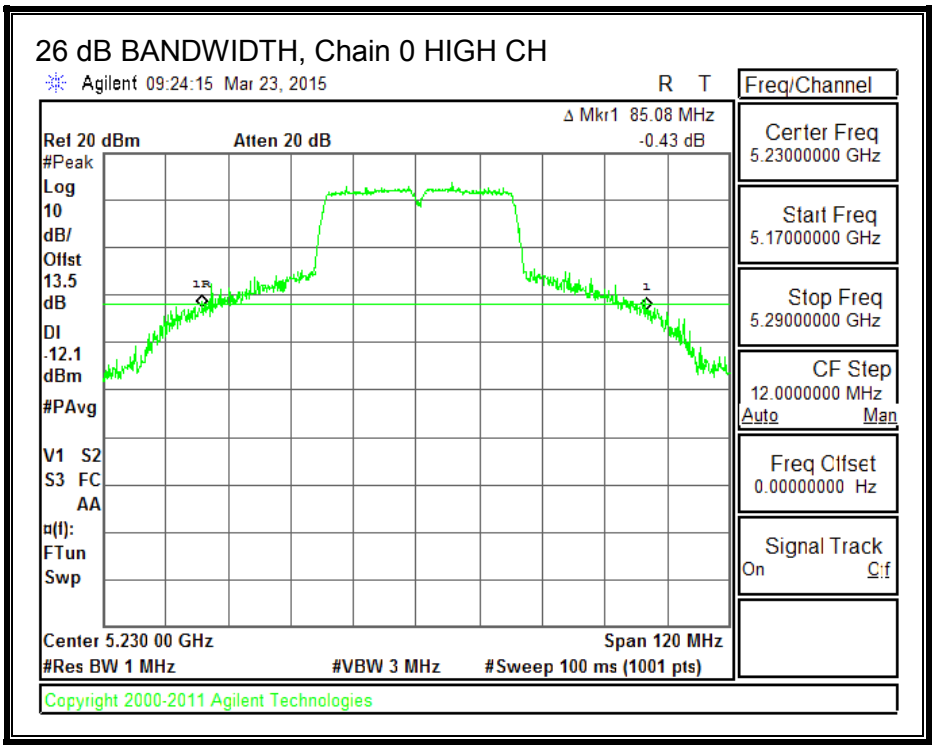
None; for reporting purposes only.

RESULTS

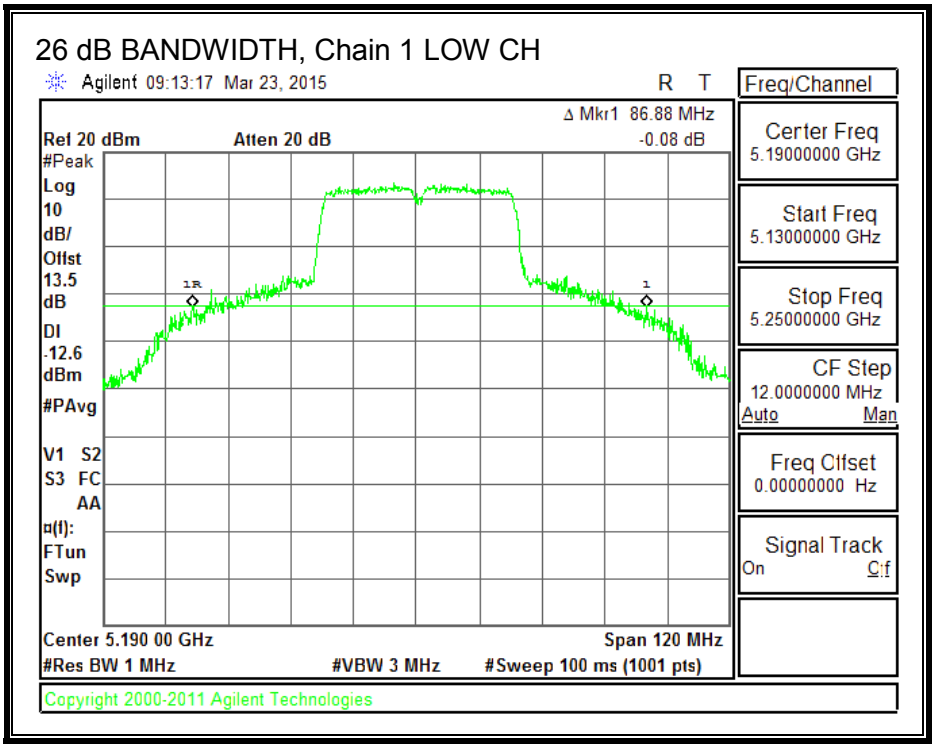
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5190	91.08	86.88	86.76
High	5230	85.08	81.84	89.04

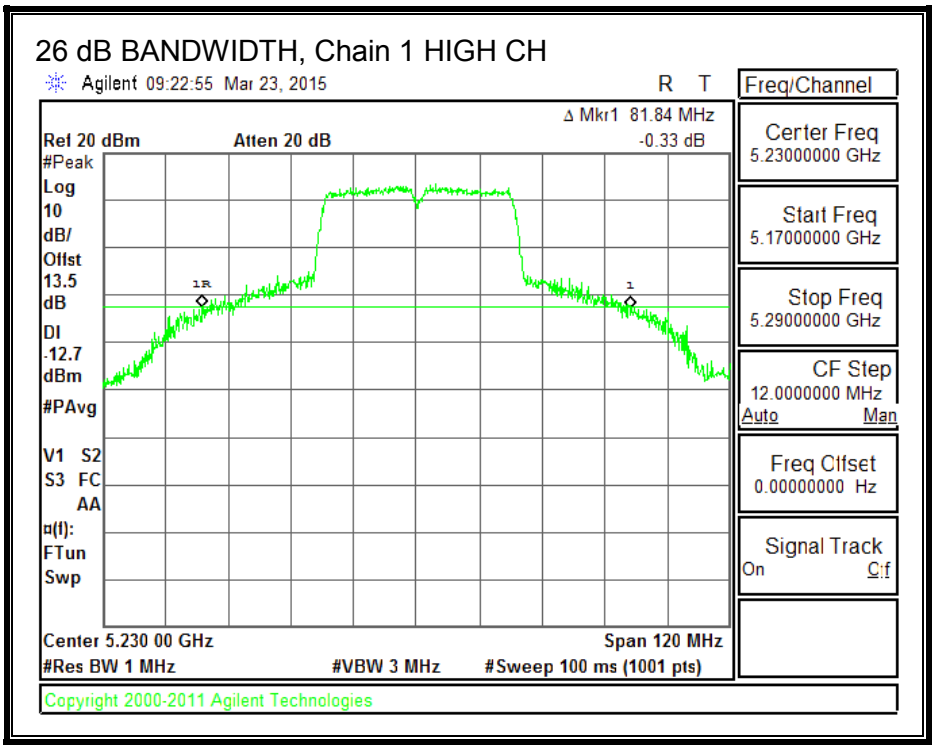
26 dB BANDWIDTH, Chain 0



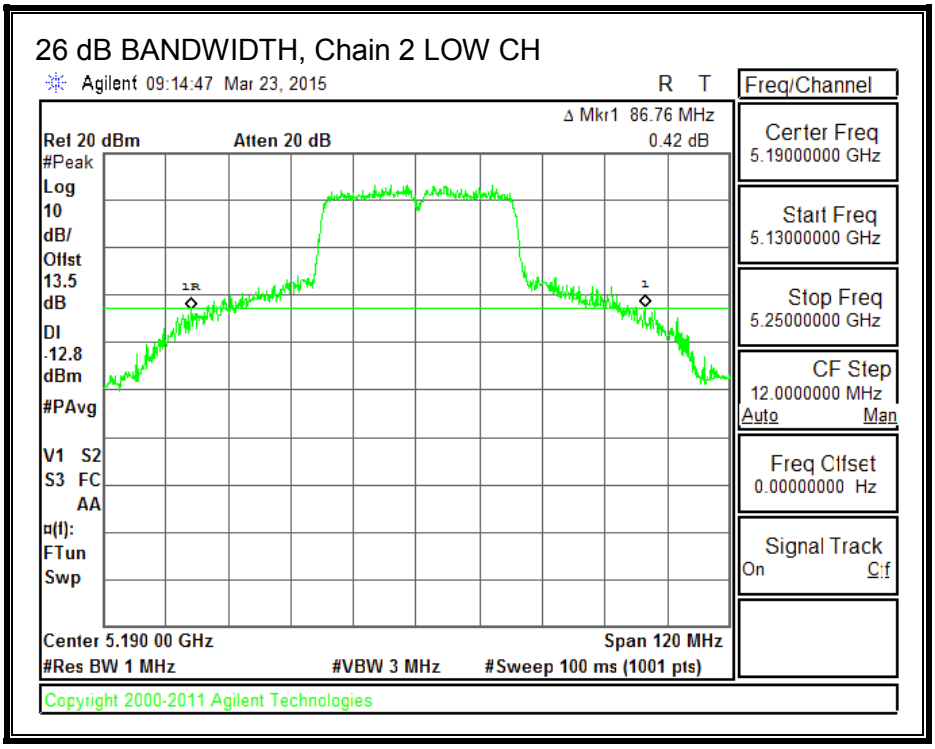


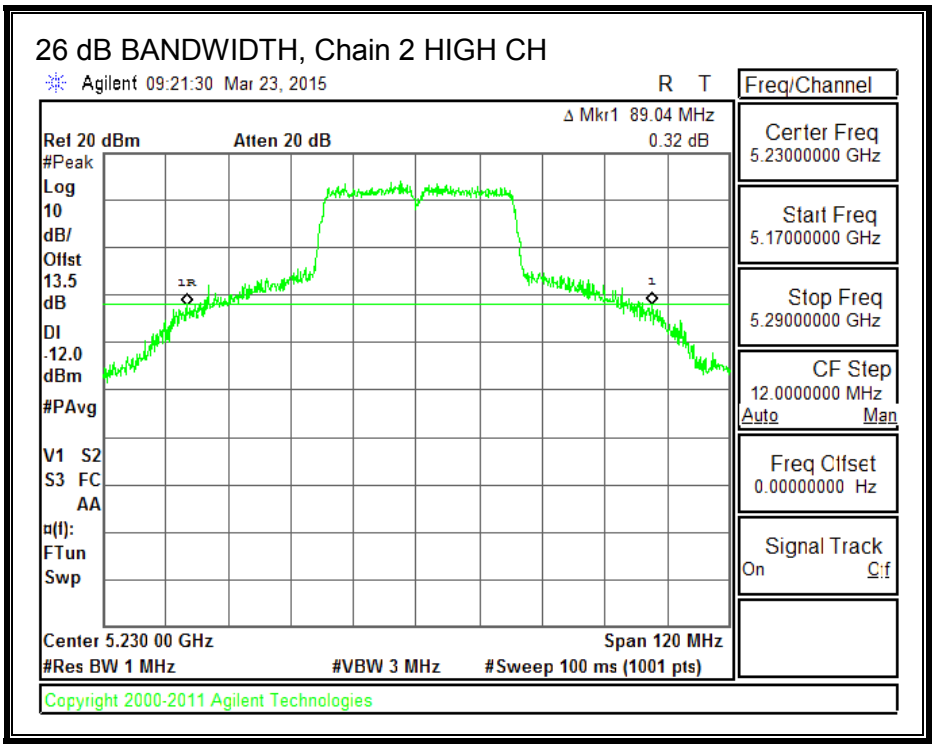
26 dB BANDWIDTH, Chain 1





26 dB BANDWIDTH, Chain 2





8.8.2. 99% BANDWIDTH

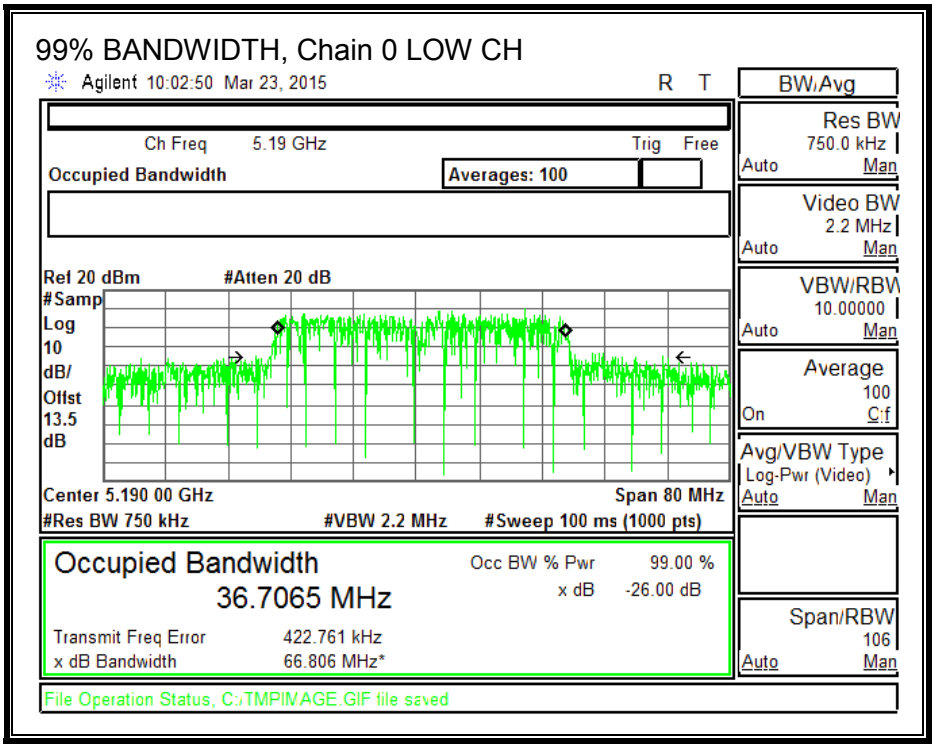
LIMITS

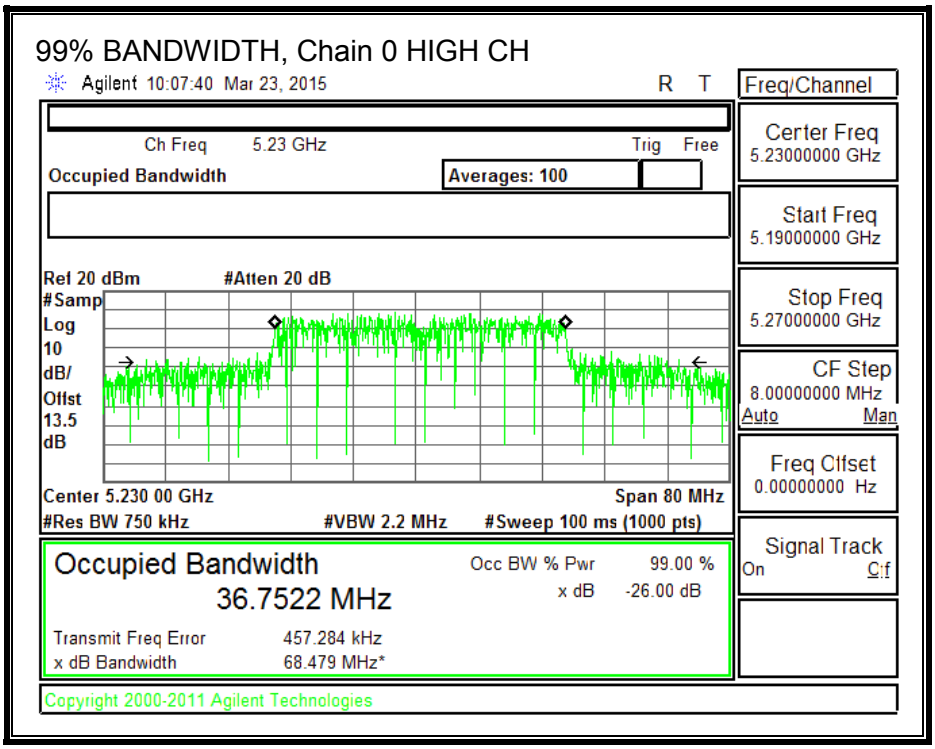
None; for reporting purposes only.

RESULTS

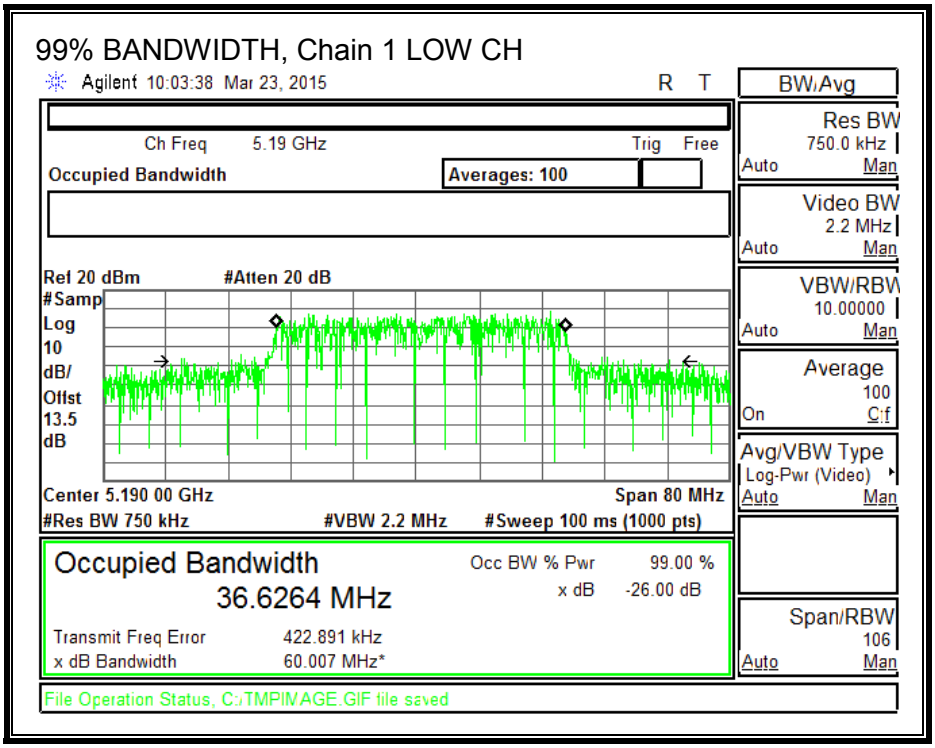
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5190	36.7065	36.6264	36.6702
High	5230	36.7522	36.6768	36.7718

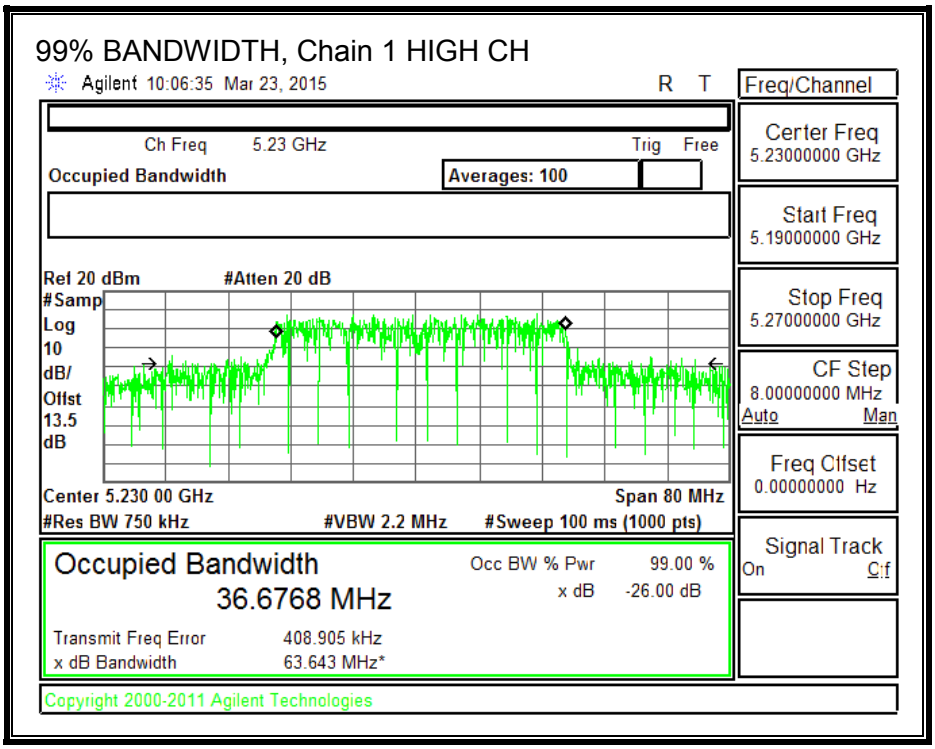
99% BANDWIDTH, Chain 0



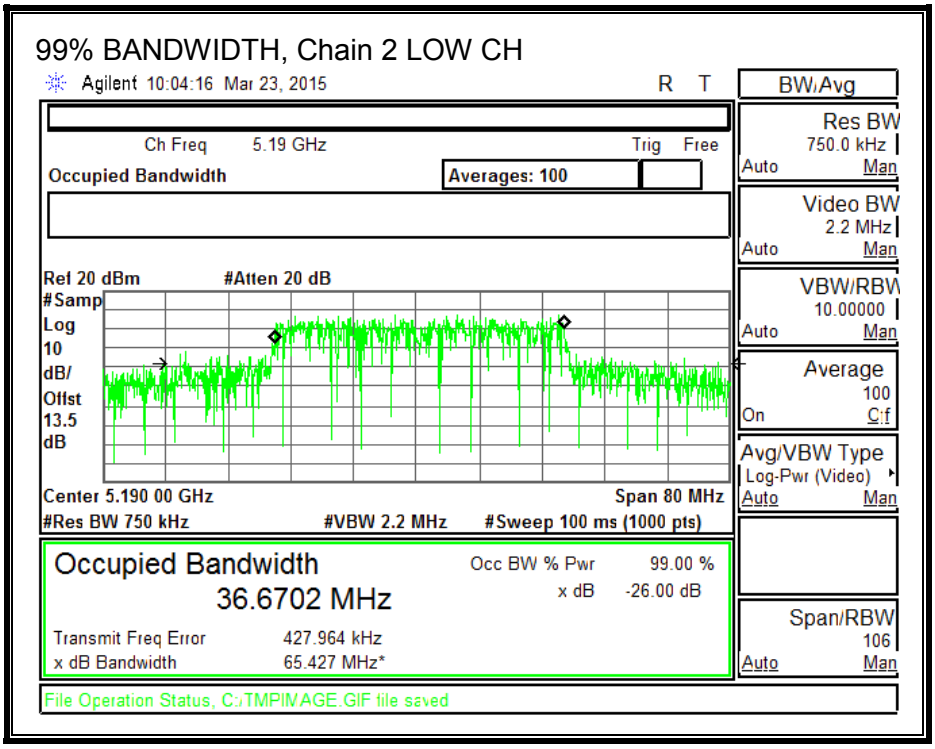


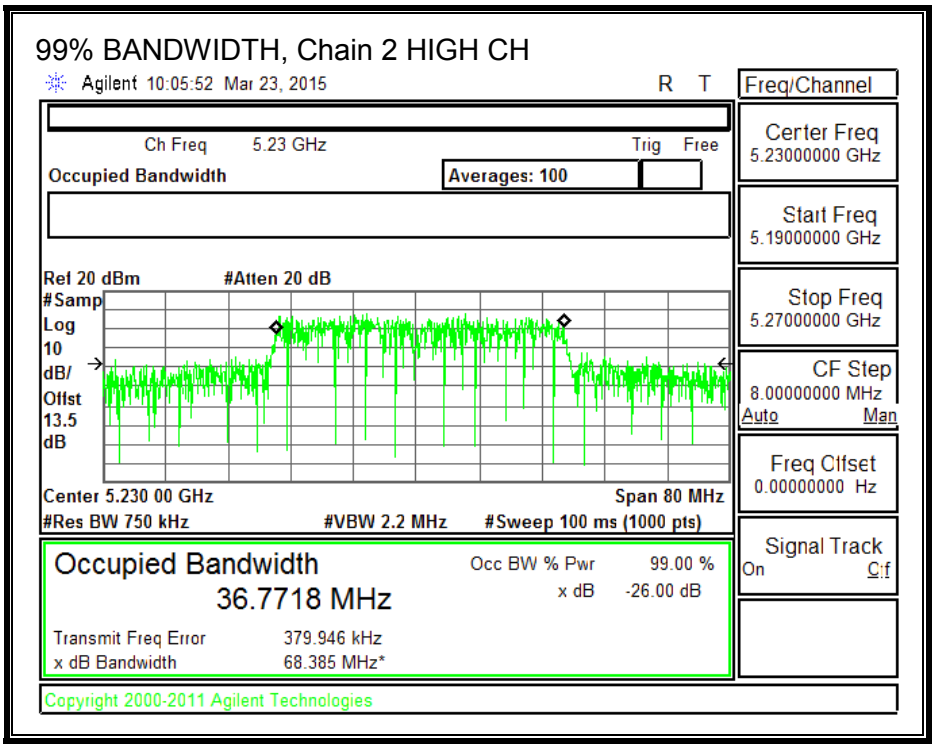
99% BANDWIDTH, Chain 1





99% BANDWIDTH, Chain 2





8.8.3. 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 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 the same for each chain. The directional gain is equal to the antenna gain, 5.85 dBi.

For PSD the TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (3 chains) (dB)	Correlated Chains Directional Gain (dBi)
5.85	4.77	10.62

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5190	5.85	10.62	24.00	6.38
High	5230	5.85	10.62	24.00	6.38

Duty Cycle CF (dB)	0.09	Included in Calculations of PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	11.70	11.90	11.85	16.59	24.00	-7.41
High	5230	18.70	18.98	18.20	23.41	24.00	-0.59

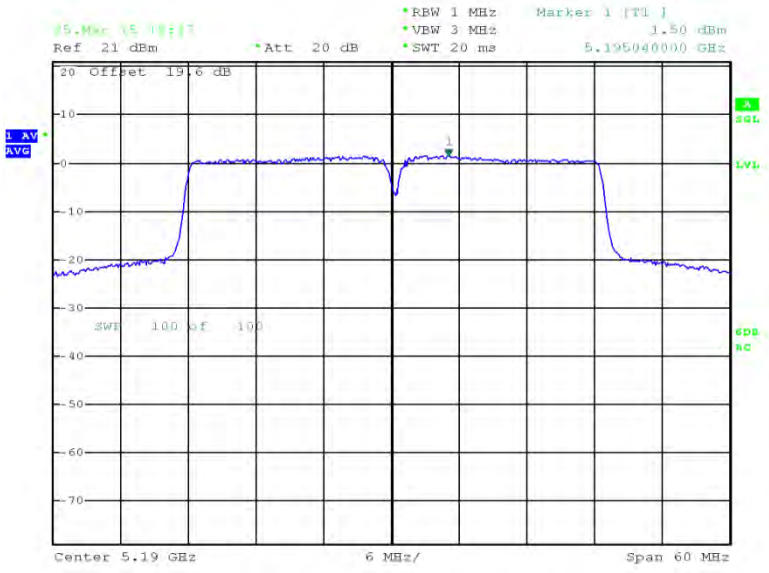
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5190	1.50	0.54	0.18	5.64	6.38	-0.74
High	5230	1.25	0.63	0.11	5.55	6.38	-0.83

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.

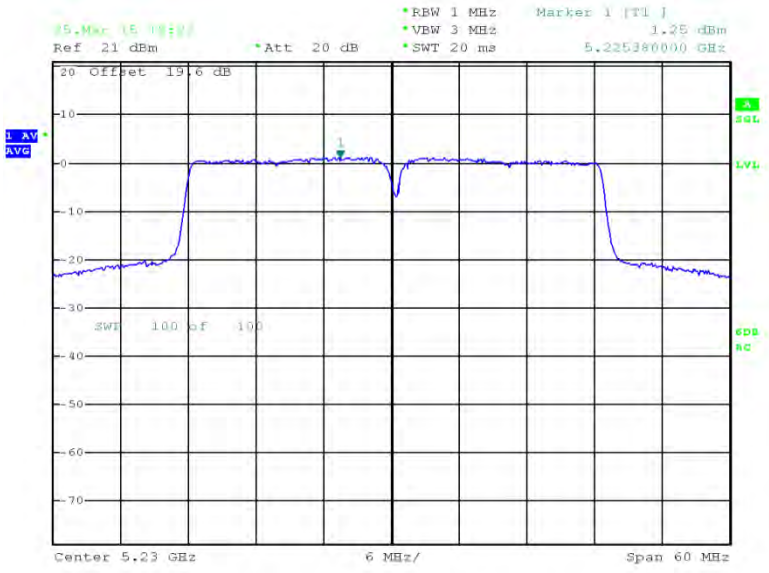
PSD, Chain 0

PSD, Chain 0 LOW CH



Date: 25.MAR.2015 18:17:47

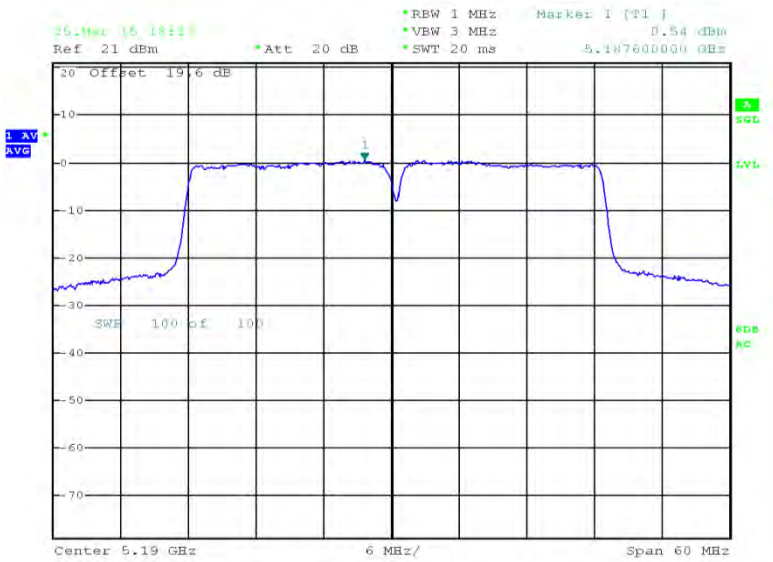
PSD, Chain 0 HIGH CH



Date: 25.MAR.2015 18:22:51

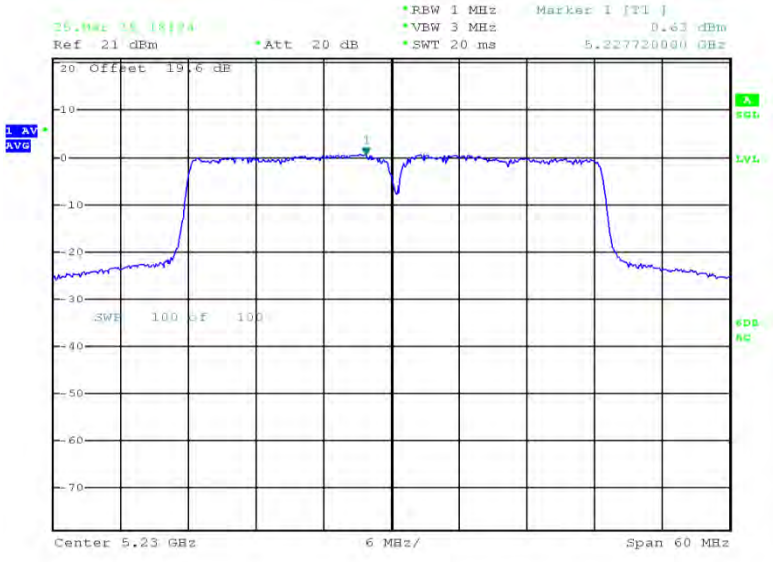
PSD, Chain 1

PSD, Chain 1 LOW CH



Date: 25.MAR.2015 18:19:00

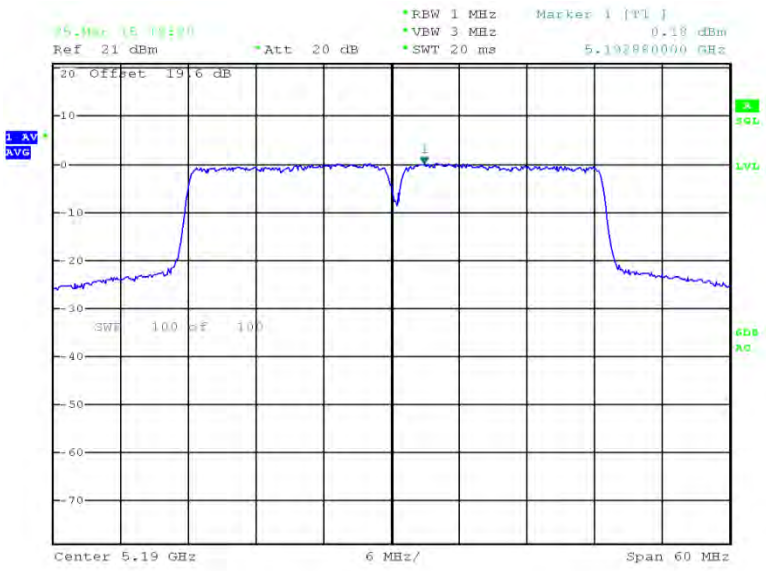
PSD, Chain 1 HIGH CH



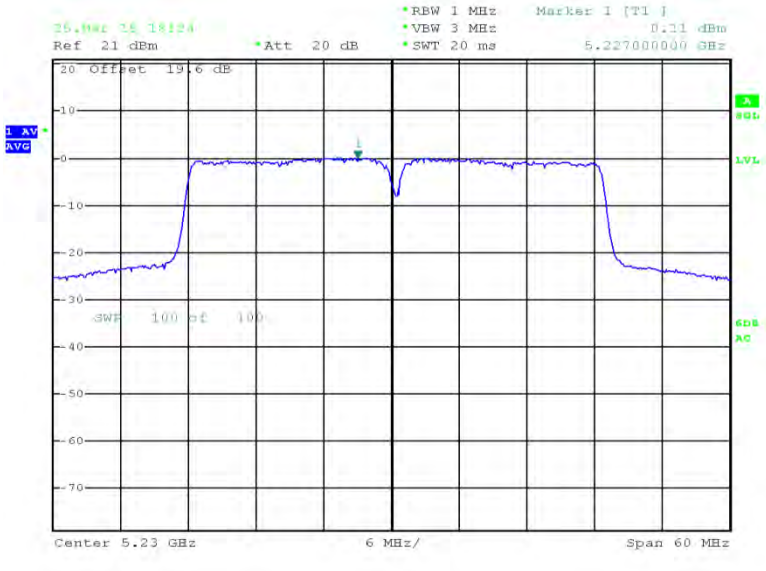
Date: 25.MAR.2015 18:24:06

PSD, Chain 2

PSD, Chain 2 LOW CH



PSD, Chain 2 HIGH CH



8.9. 802.11n HT40 TxBF 3Tx MODE IN THE 5.2 GHz BAND

8.9.1. 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 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 and PSD the TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (3 chains) (dB)	Correlated Chains Directional Gain (dBi)
5.85	4.77	10.62

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5190	10.62	10.62	19.38	6.38
High	5230	10.62	10.62	19.38	6.38

Duty Cycle CF (dB)	0.09	**Included in Calculations of PSD**

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	11.80	12.00	11.90	16.67	19.38	-2.71
High	5230	14.12	14.60	14.19	19.08	19.38	-0.30

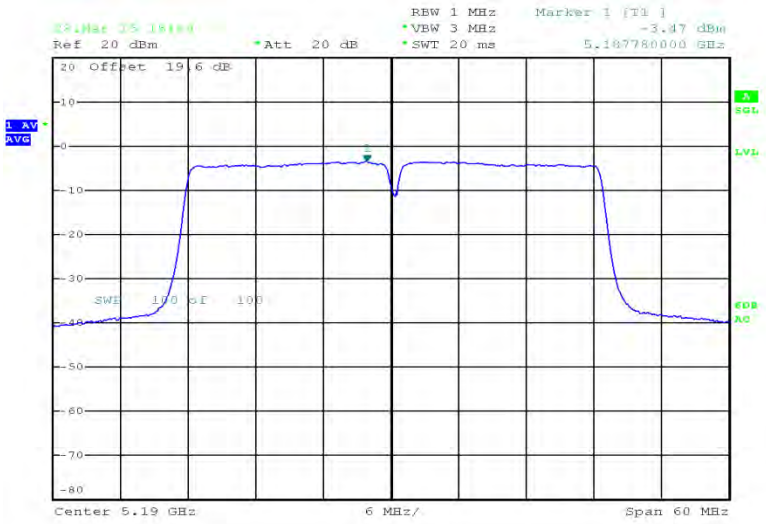
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5190	-3.47	-3.00	-3.25	1.63	6.38	-4.75
High	5230	-3.66	-3.23	-3.76	1.32	6.38	-5.06

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.

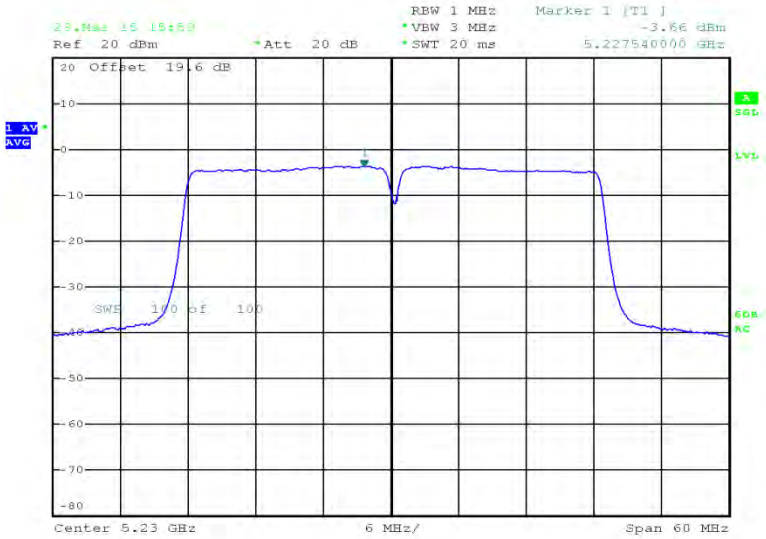
PSD, Chain 0

PSD, Chain 0 LOW CH



Date: 28.MAR.2015 15:54:53

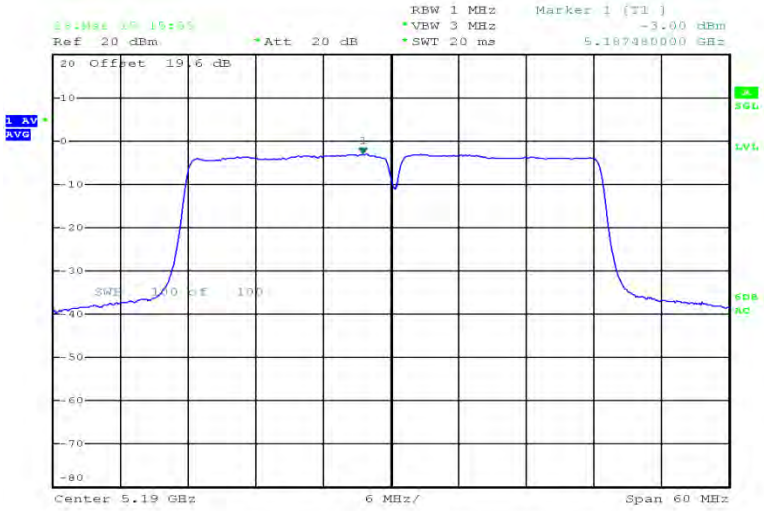
PSD, Chain 0 HIGH CH



Date: 28.MAR.2015 15:59:29

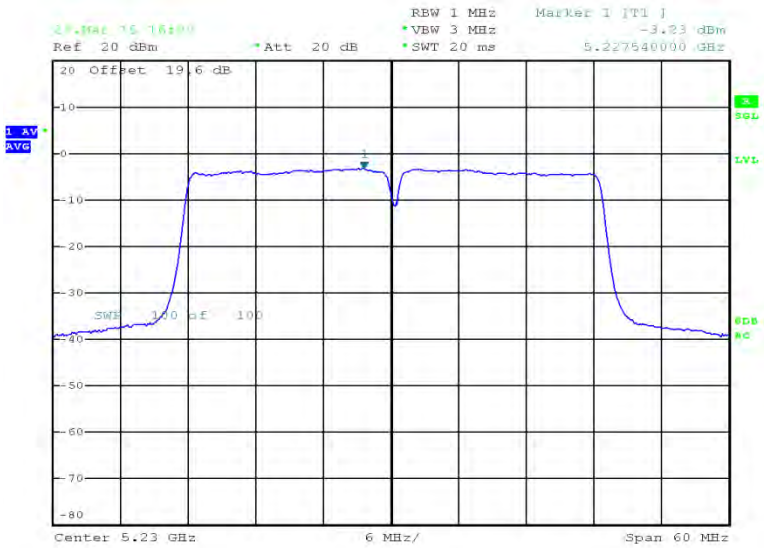
PSD, Chain 1

PSD, Chain 1 LOW CH



Date: 28.MAR.2015 15:55:28

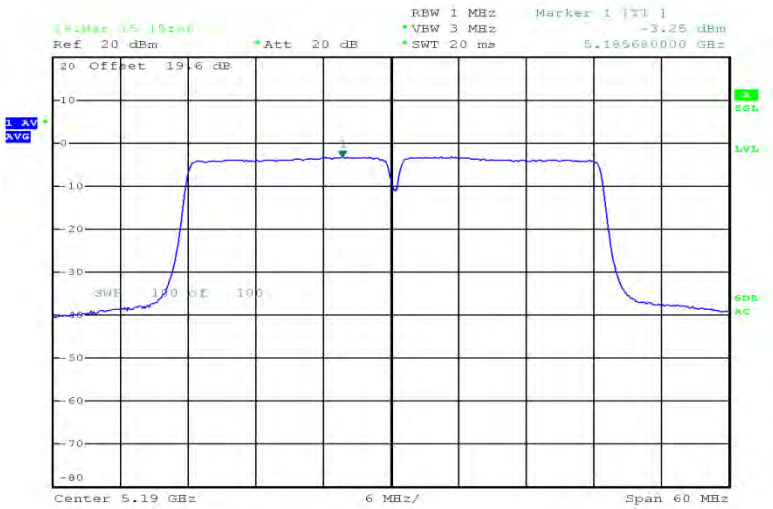
PSD, Chain 1 HIGH CH



Date: 28.MAR.2015 16:00:15

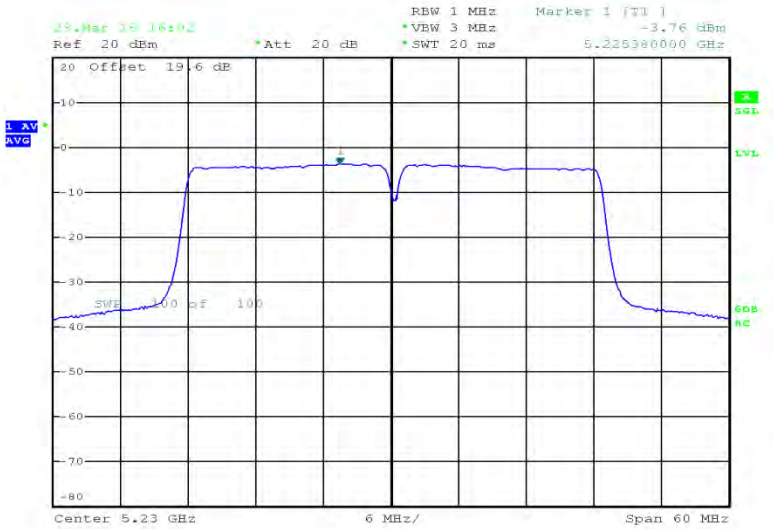
PSD, Chain 2

PSD, Chain 2 LOW CH



Date: 28.MAR.2015 15:56:22

PSD, Chain 2 HIGH CH



Date: 28.MAR.2015 16:02:55

8.10. 802.11ac VHT80 1Tx MODE IN THE 5.2 GHz BAND

8.10.1. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

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

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

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

DIRECTIONAL ANTENNA GAIN

This is SISO mode, AG is the highest (worst-case) = 5.85 dBi

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Mid	5210	5.85	24.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	12.54	12.54	24.00	-11.46

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.

8.11. 802.11ac VHT80 CDD 3Tx MODE IN THE 5.2 GHz BAND

8.11.1. 26 dB BANDWIDTH

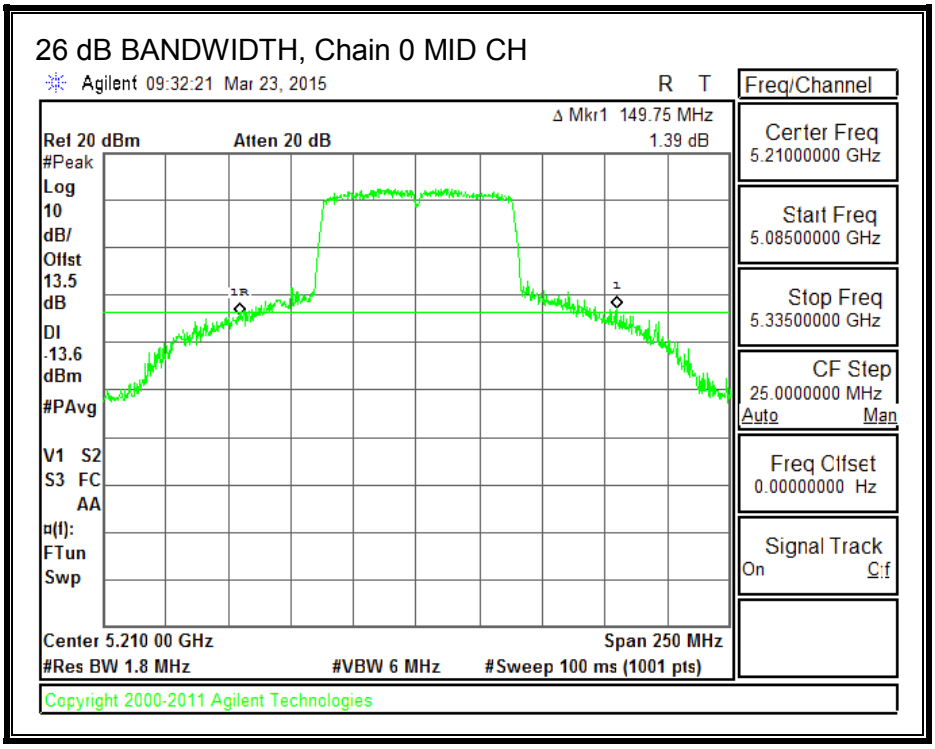
LIMITS

None; for reporting purposes only.

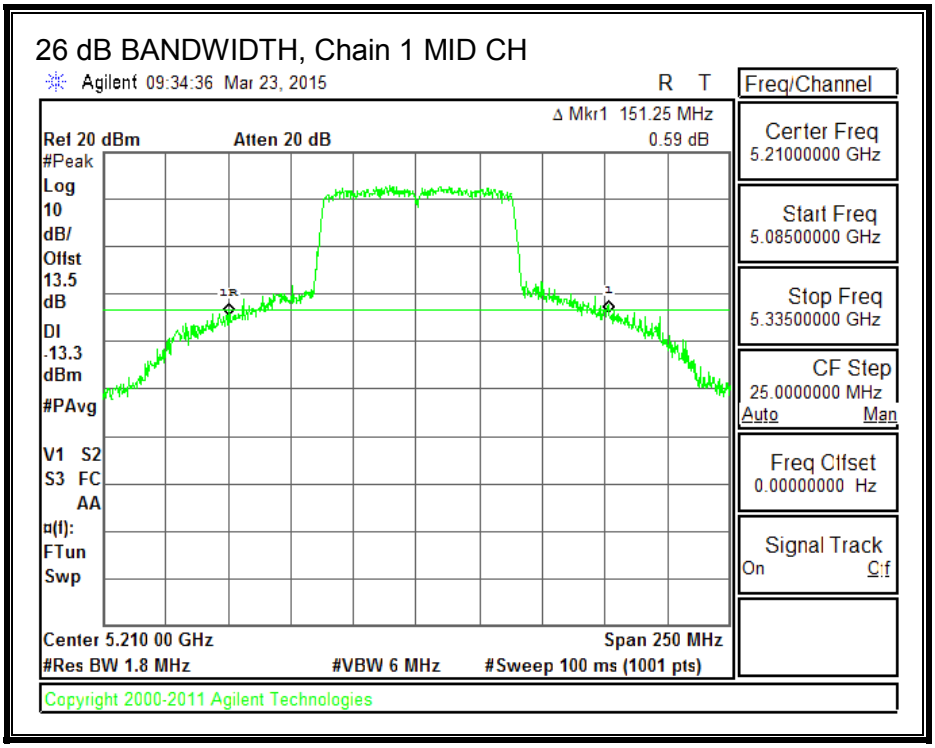
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Mid	5210	149.75	151.25	147.25

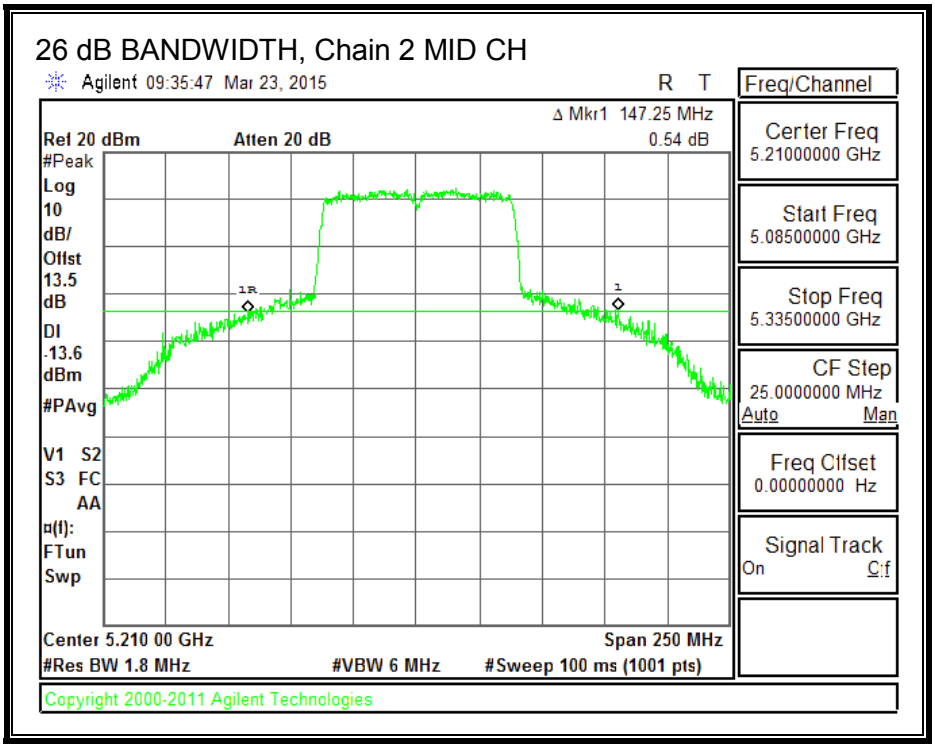
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



8.11.2. 99% BANDWIDTH

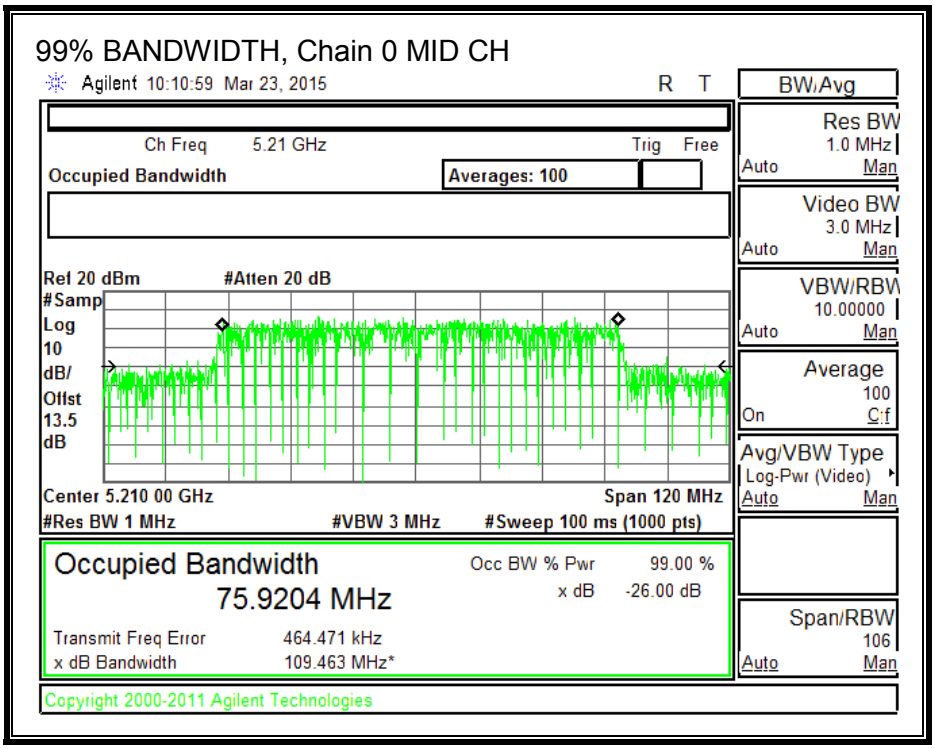
LIMITS

None; for reporting purposes only.

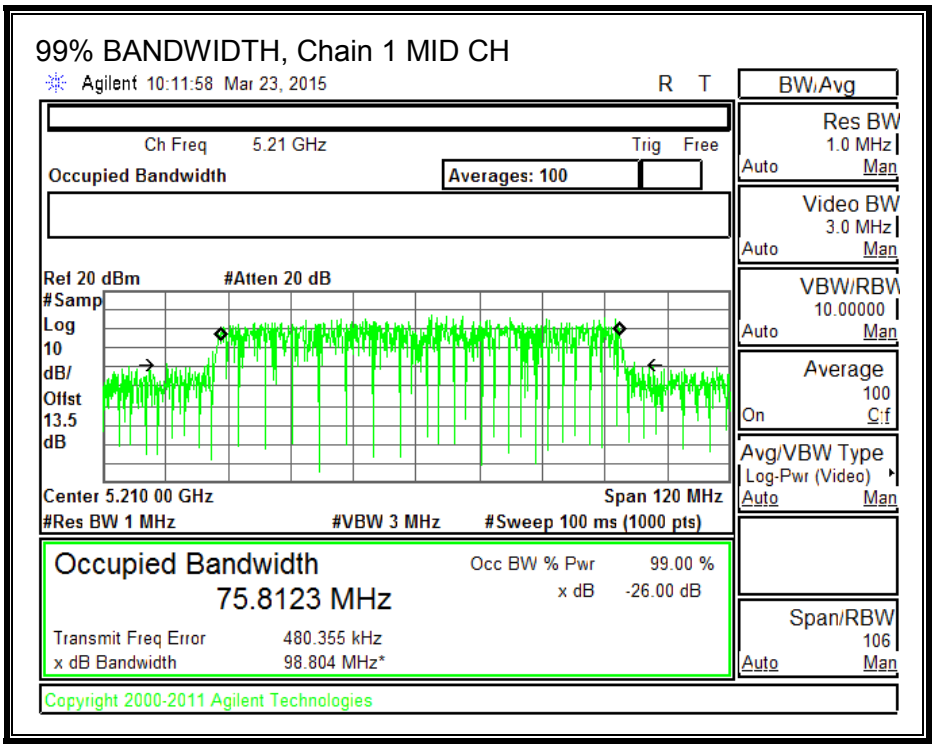
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Mid	5210	75.9204	75.8123	75.8013

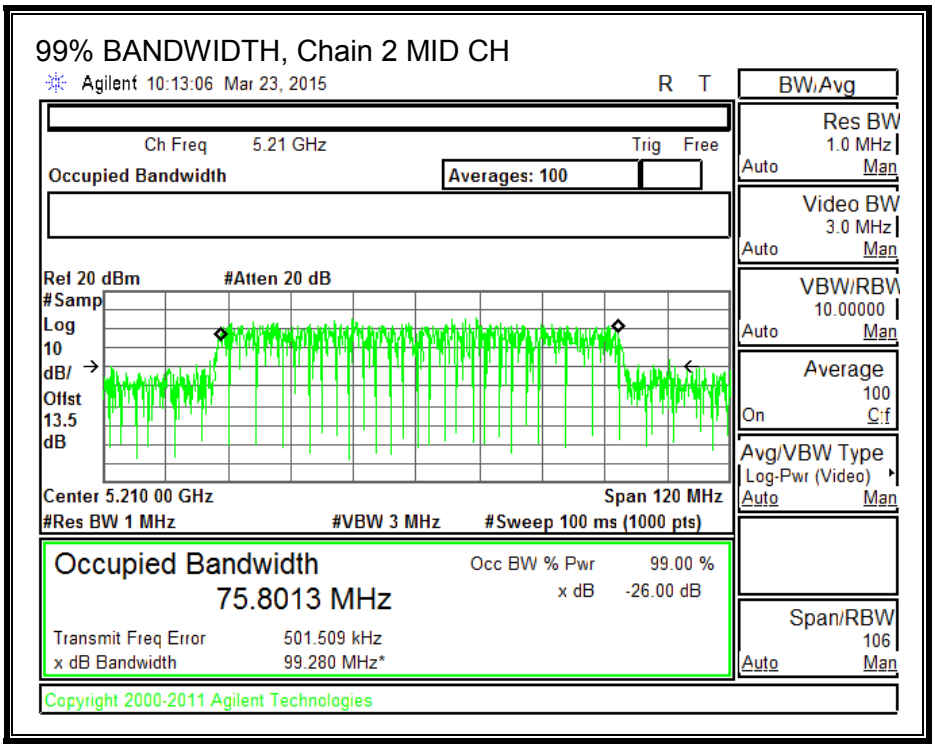
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



8.11.3. 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 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 the same for each chain. The directional gain is equal to the antenna gain, 5.85 dBi.

For PSD, the TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (3 chains) (dB)	Correlated Chains Directional Gain (dBi)
5.85	4.77	10.62

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBi)	PSD Limit (dBi)
Mid	5210	5.85	10.62	24.00	6.38

Duty Cycle CF (dB)	0.18	Included in Calculations of PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	10.61	10.82	10.90	15.55	24.00	-8.45

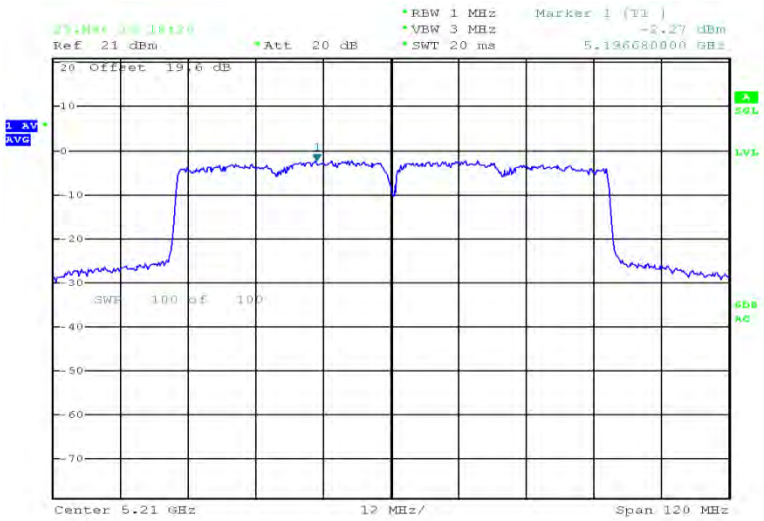
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5210	-2.27	-3.02	-4.11	1.88	6.38	-4.50

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.

PSD, Chain 0

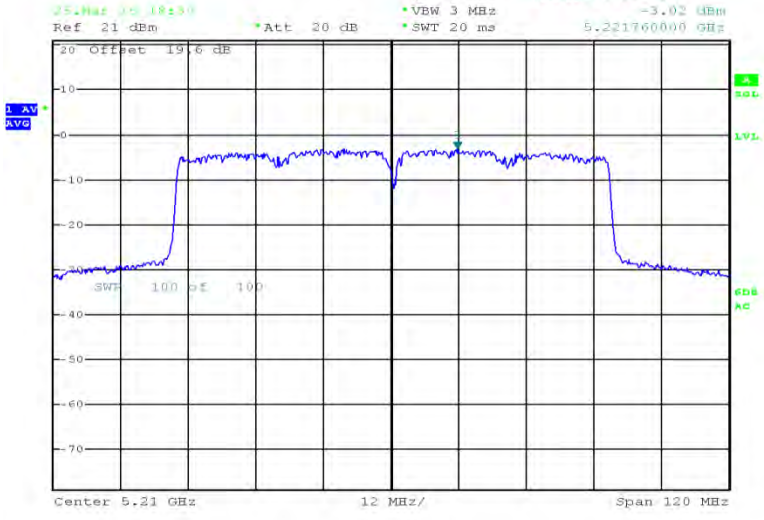
PSD, Chain 0 MID CH



Date: 25.MAR.2015 18:28:54

PSD, Chain 1

PSD, Chain 1 MID CH



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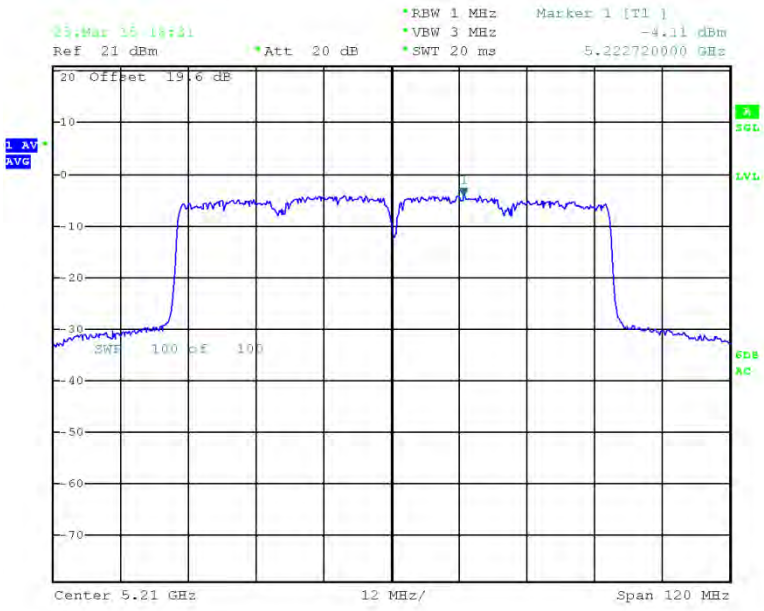
PSD, Chain 2

PSD, Chain 2 MID CH



8.12. 802.11ac VHT80 TxBF 3Tx MODE IN THE 5.2 GHz BAND

8.12.1. 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 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 and PSD, the TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (3 chains) (dB)	Correlated Chains Directional Gain (dBi)
5.85	4.77	10.62

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBi)	PSD Limit (dBi)
Mid	5210	10.62	10.62	19.38	6.38

Duty Cycle CF (dB)	0.18	Included in Calculations of PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	10.74	10.71	10.31	15.36	19.38	-4.02

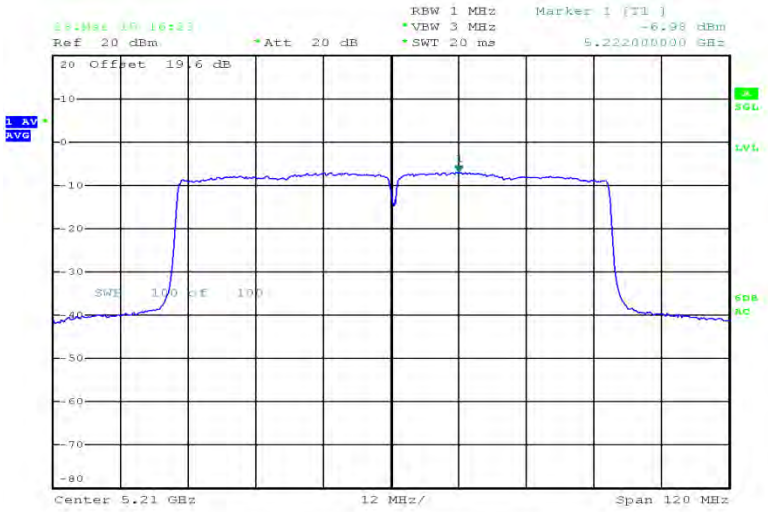
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5210	-6.98	-6.82	-6.10	-1.66	6.38	-8.04

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.

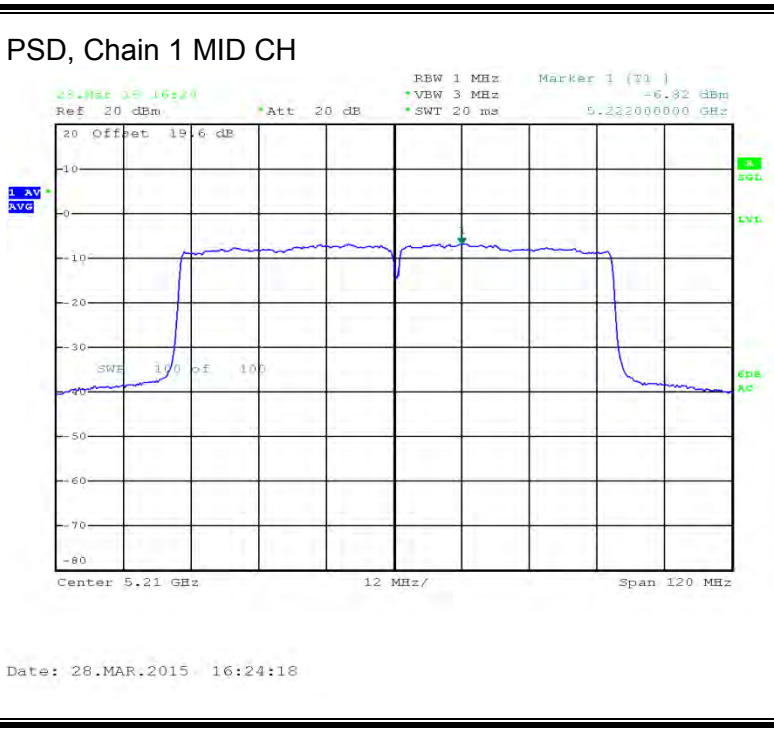
PSD, Chain 0

PSD, Chain 0 MID CH



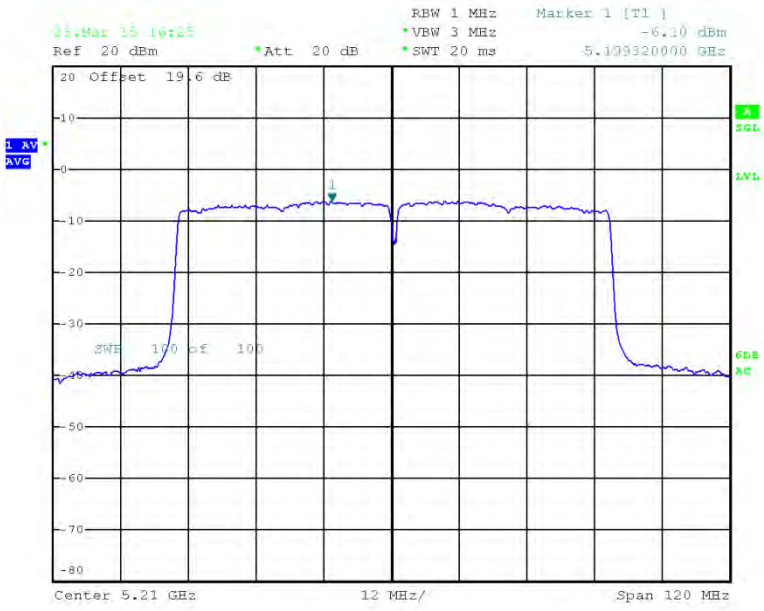
PSD, Chain 1

PSD, Chain 1 MID CH



PSD, Chain 2

PSD, Chain 2 MID CH



8.13. 802.11a LEGACY 1TX MODE IN THE 5.3 GHz BAND

8.13.1. 26 dB BANDWIDTH

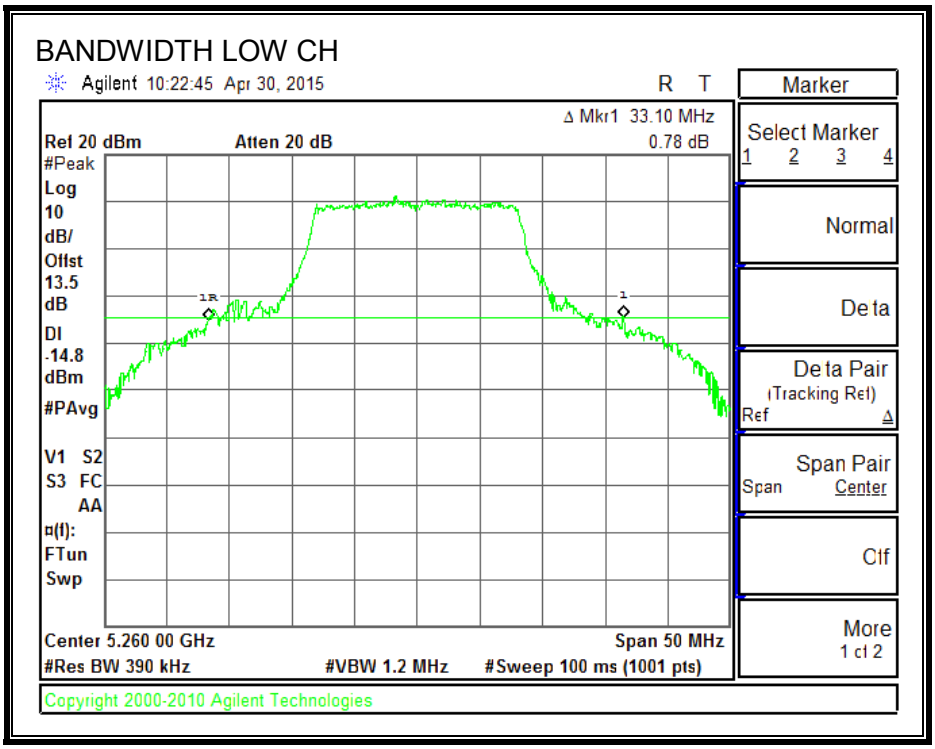
LIMITS

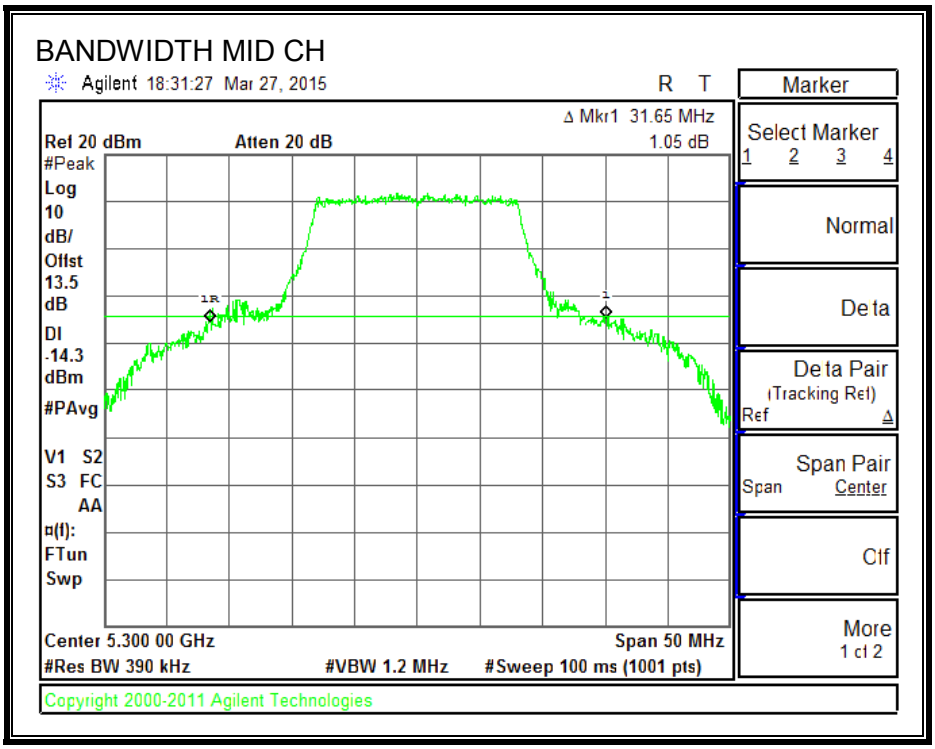
None; for reporting purposes only.

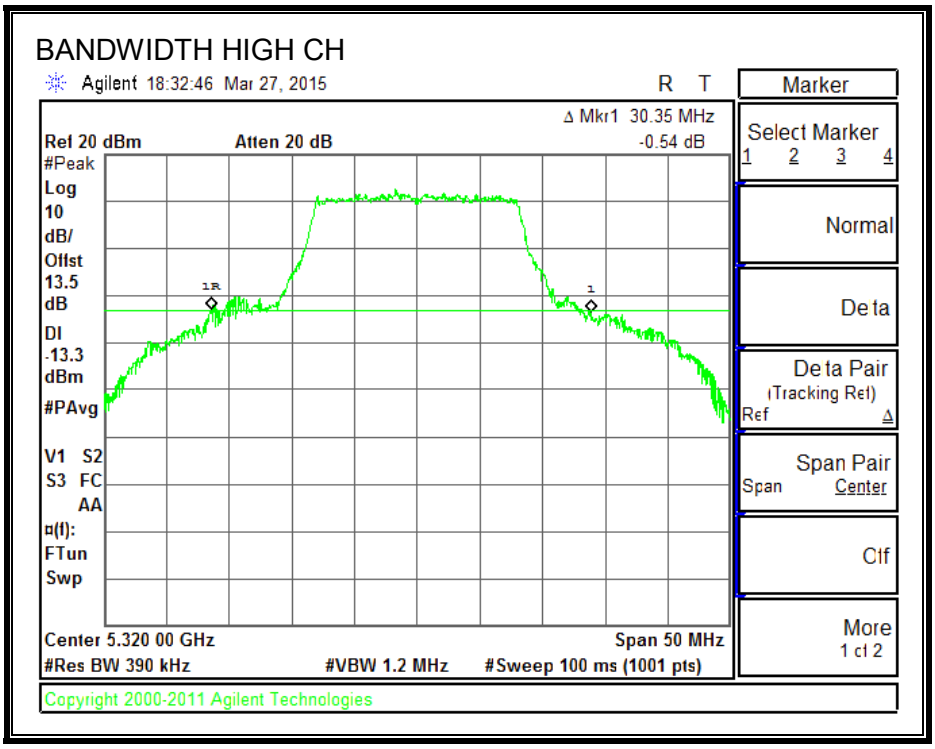
RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	33.10
Mid	5300	31.65
High	5320	30.35

26 dB BANDWIDTH







8.13.2. 99% BANDWIDTH

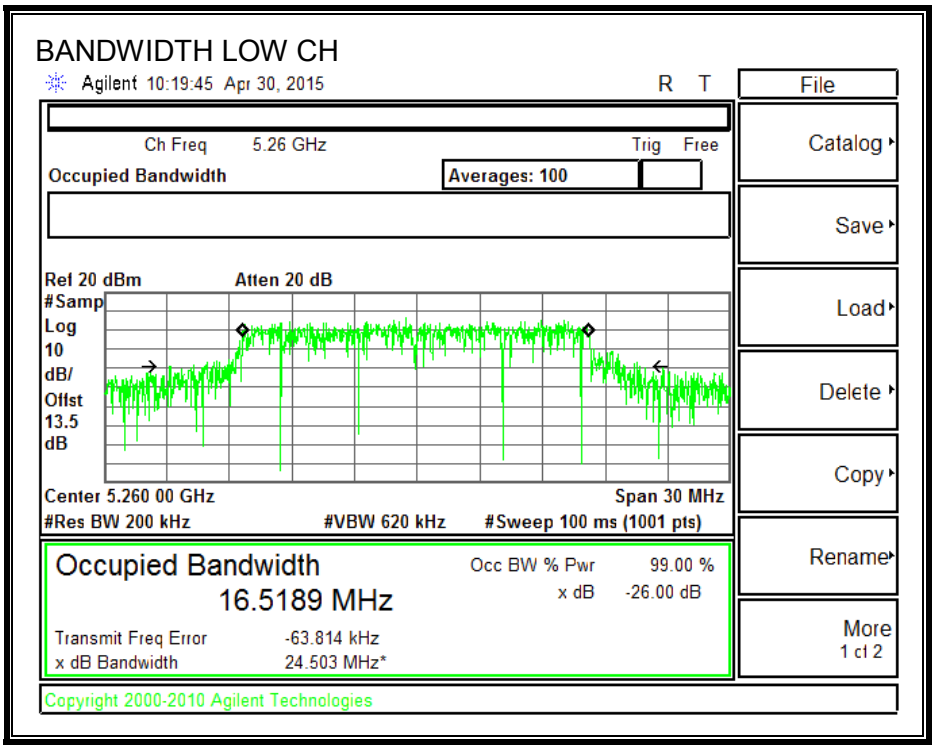
LIMITS

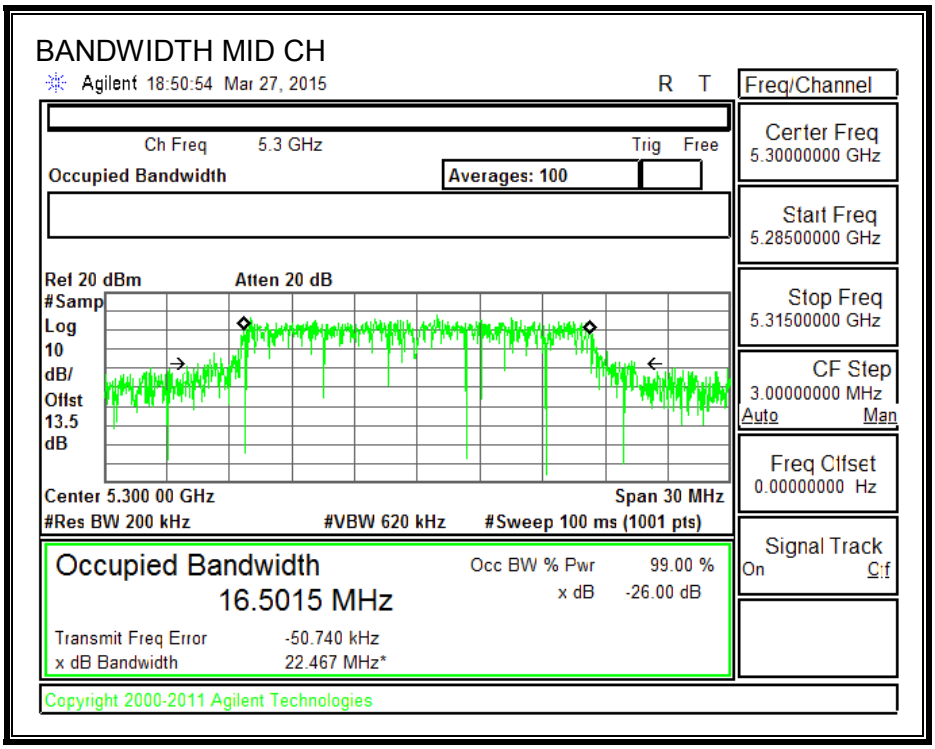
None; for reporting purposes only.

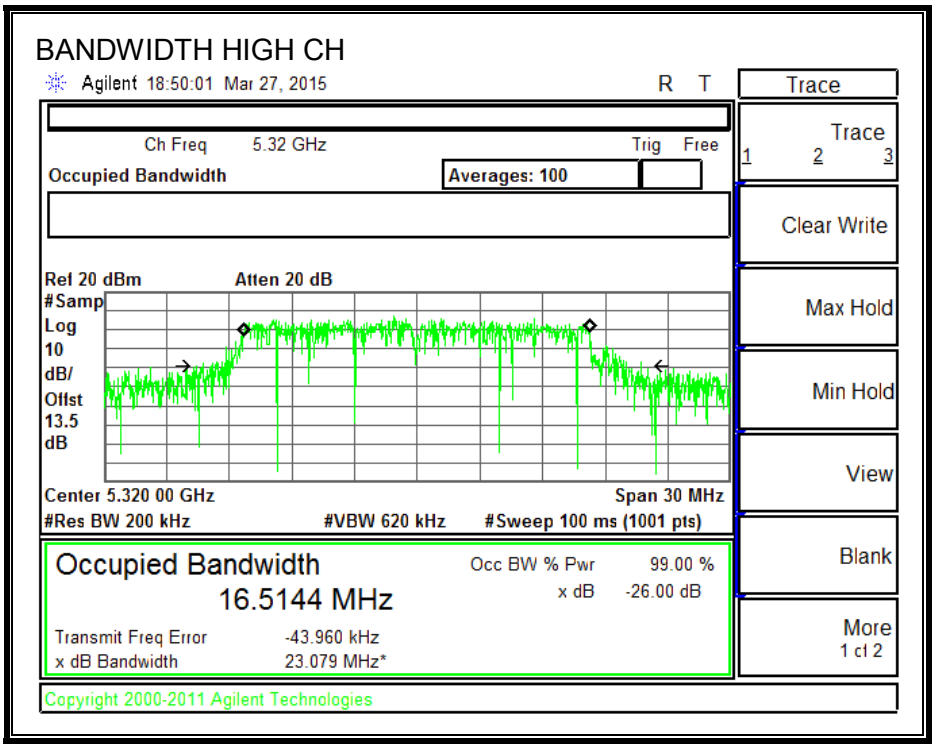
RESULTS

Channel	Frequency (MHz)	99% BW Chain 2 (MHz)
Low	5260	16.5189
Mid	5300	16.5015
High	5320	16.5144

99% BANDWIDTH







8.13.3. 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

This is SISO mode, AG is the highest (worst-case) = 5.85 dBi.

RESULTS

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	33.10	5.85	24.00	11.00
Mid	5300	31.65	5.85	24.00	11.00
High	5320	30.35	5.85	24.00	11.00

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

Output Power Results

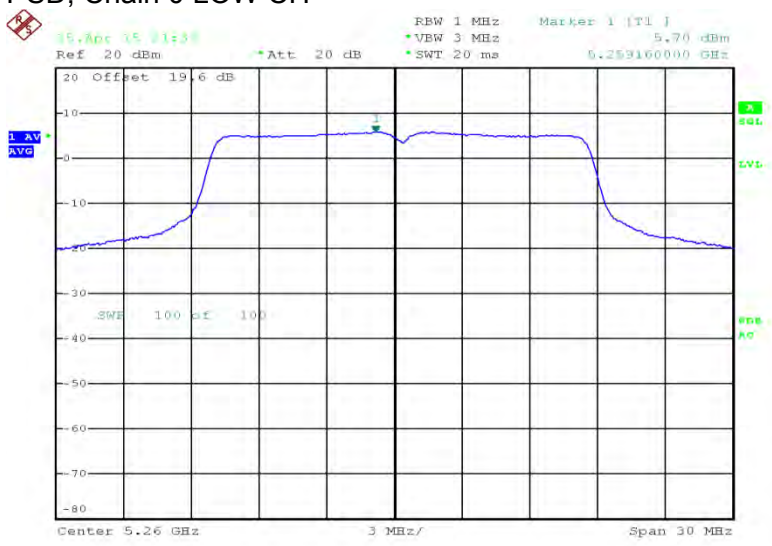
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	18.90	18.90	24.00	-5.10
Mid	5300	18.80	18.80	24.00	-5.20
High	5320	18.87	18.87	24.00	-5.13

PSD Results

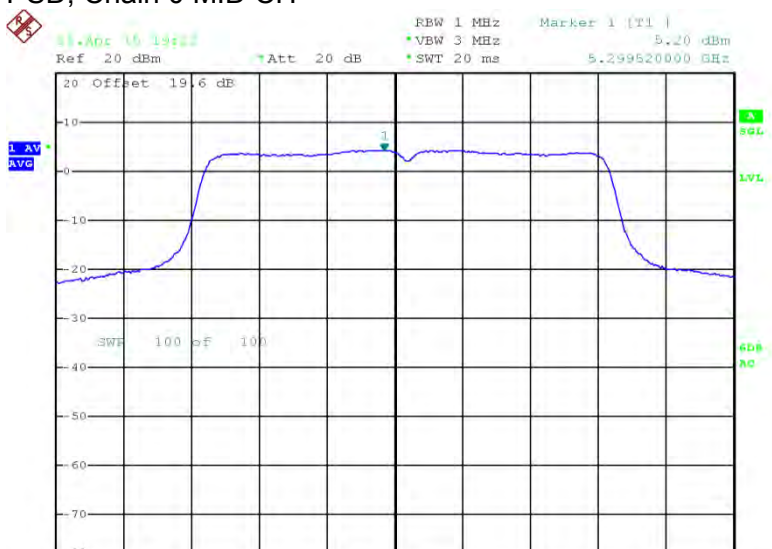
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	5.70	5.70	11.00	-5.30
Mid	5300	5.20	5.20	11.00	-5.80
High	5320	6.62	6.62	11.00	-4.38

PSD, Chain 0

PSD, Chain 0 LOW CH



PSD, Chain 0 MID CH



PSD, Chain 0 HIGH CH

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8.14. 802.11n HT20 CDD 3Tx MODE IN THE 5.3 GHz BAND

8.14.1. 26 dB BANDWIDTH

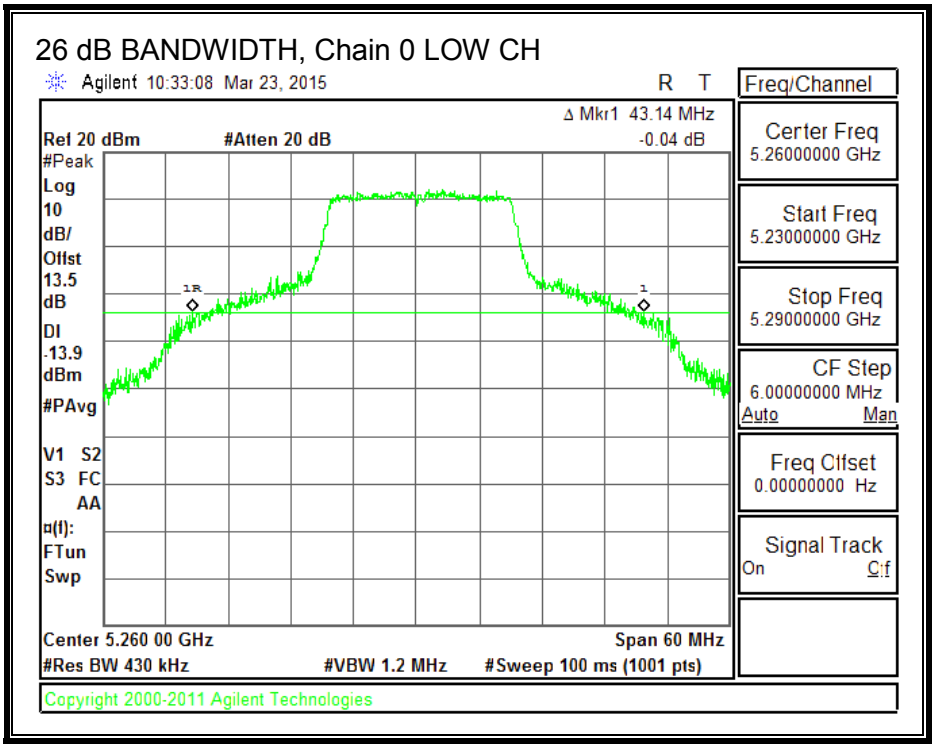
LIMITS

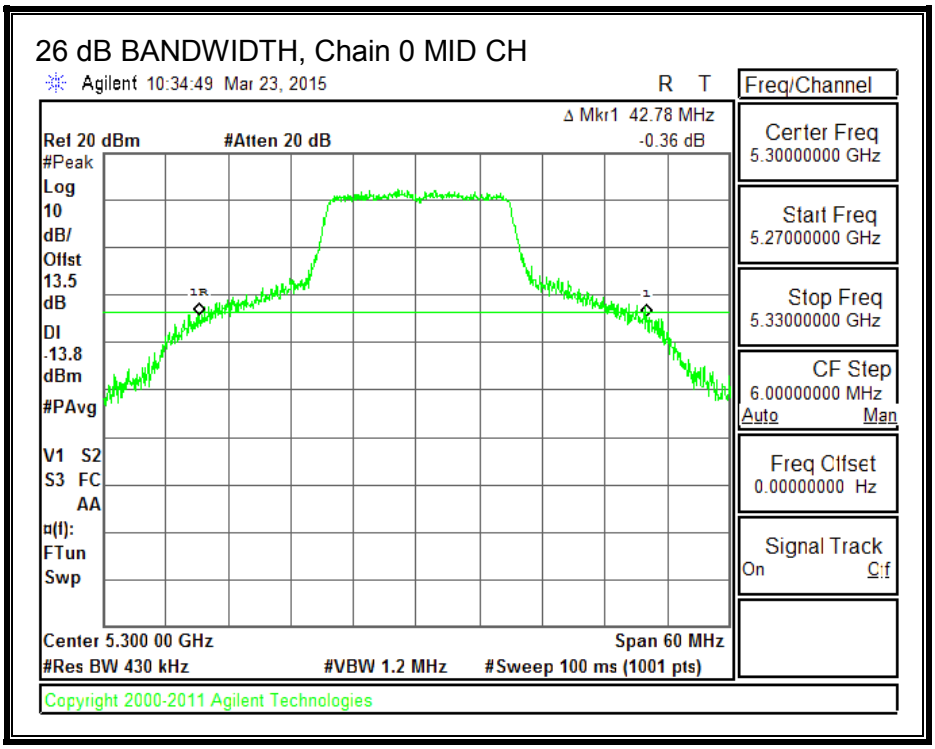
None; for reporting purposes only.

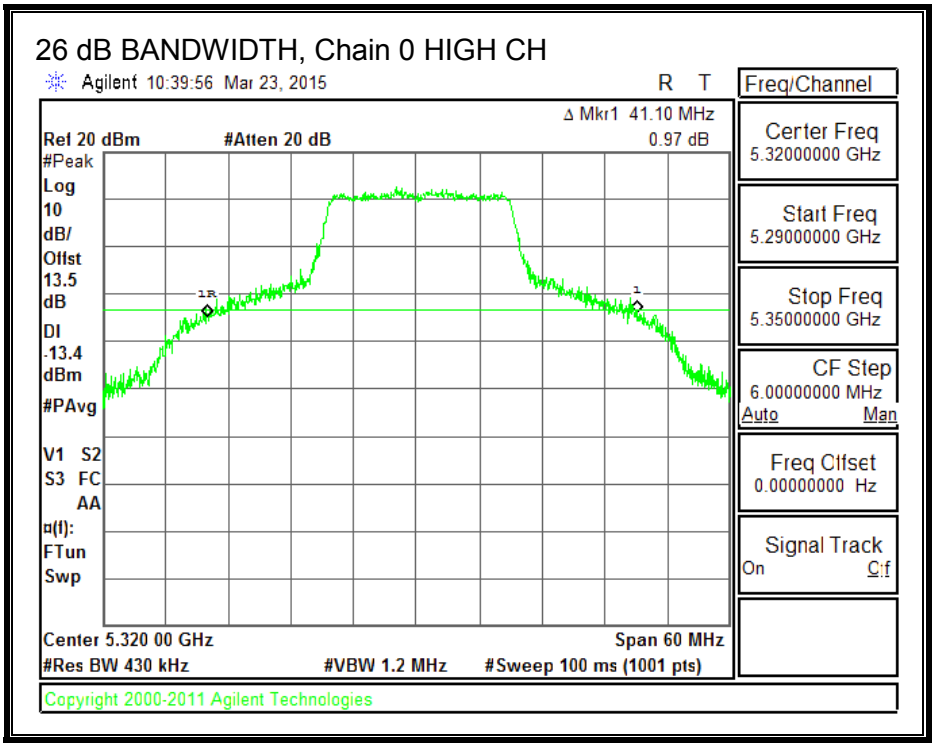
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5260	43.14	40.50	41.64
Mid	5300	42.78	41.94	41.94
High	5320	41.10	42.36	42.96

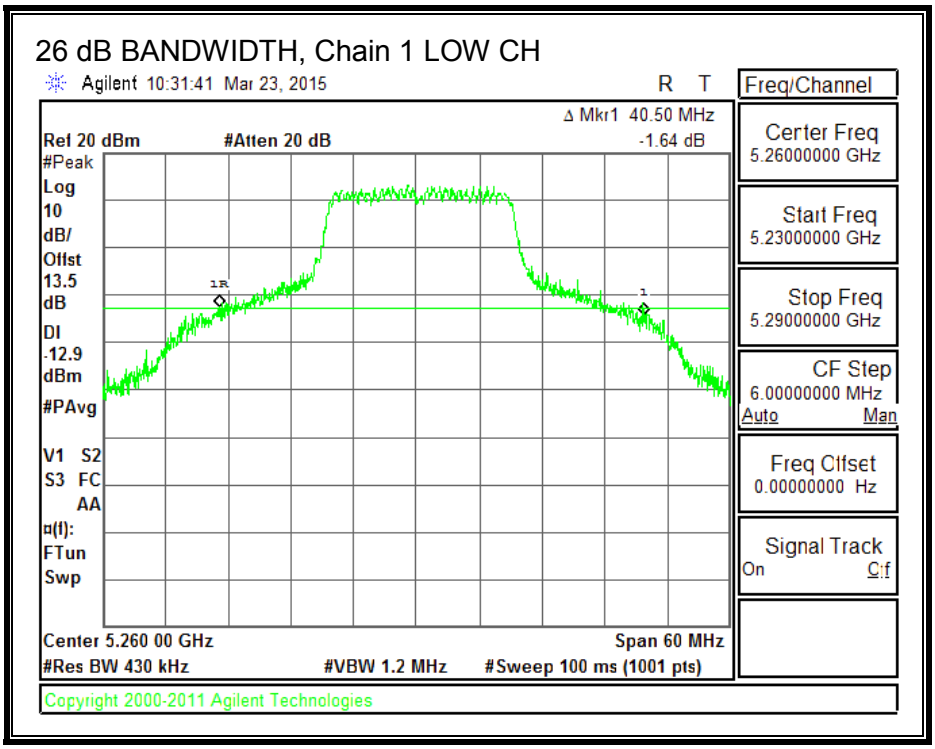
26 dB BANDWIDTH, Chain 0

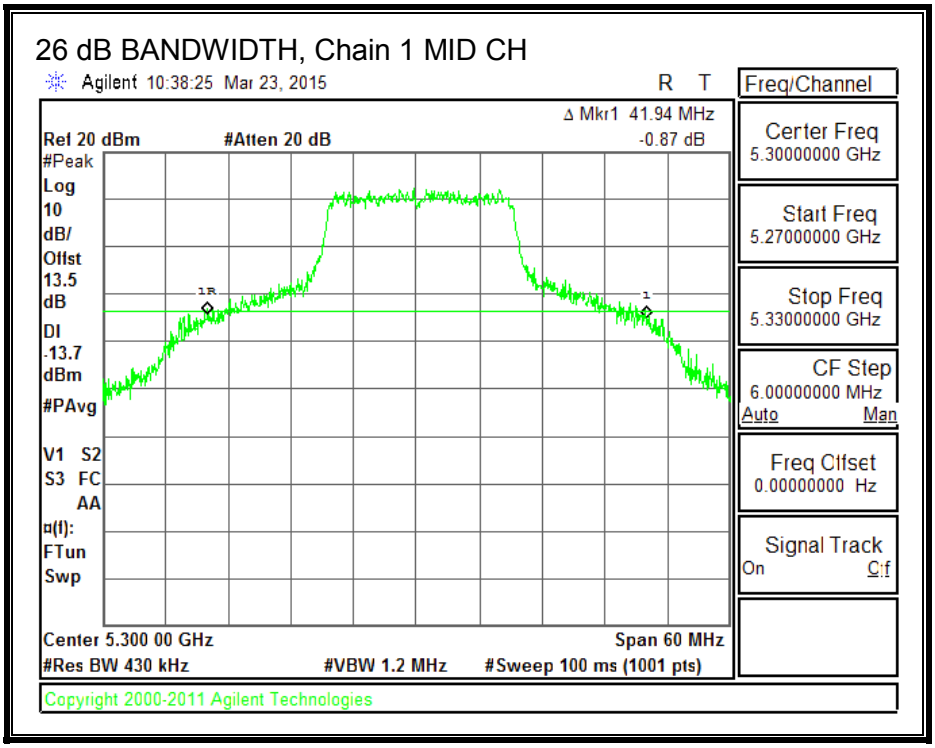


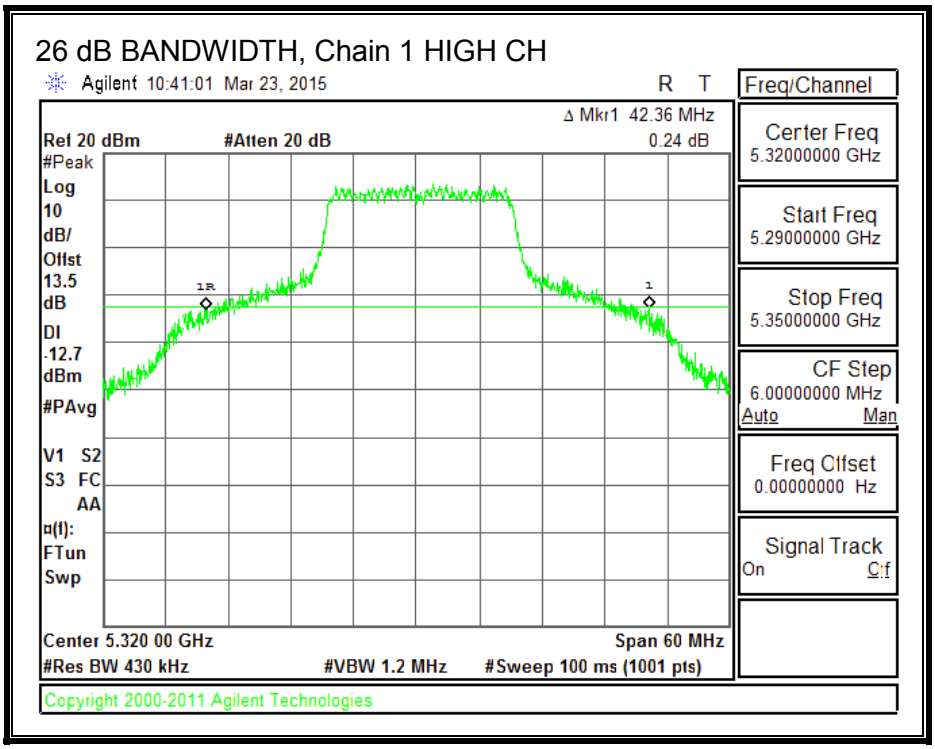




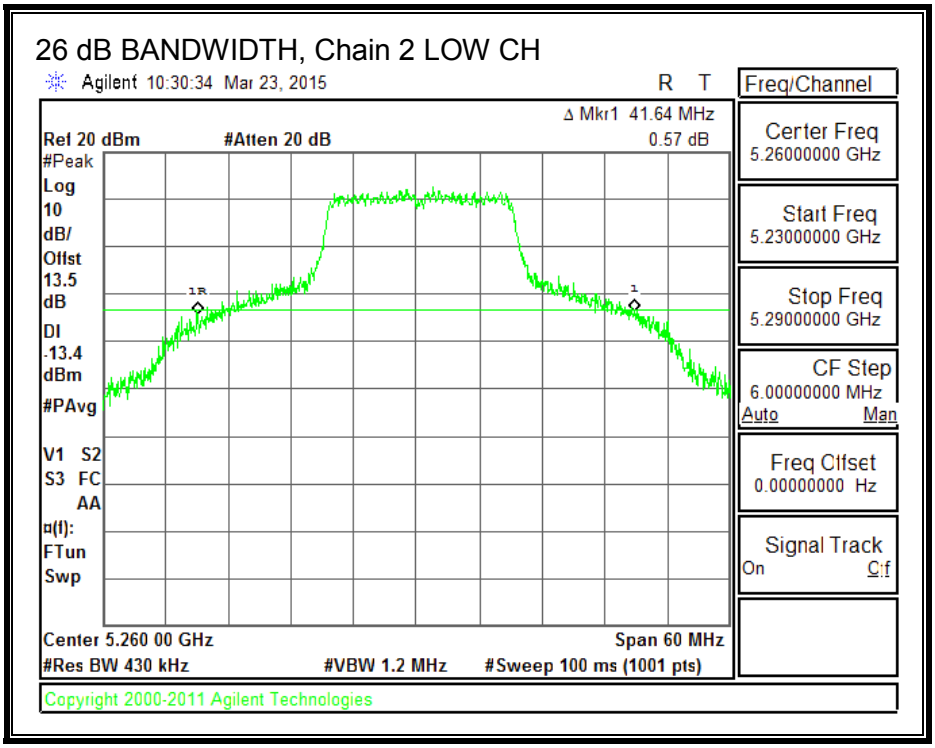
26 dB BANDWIDTH, Chain 1

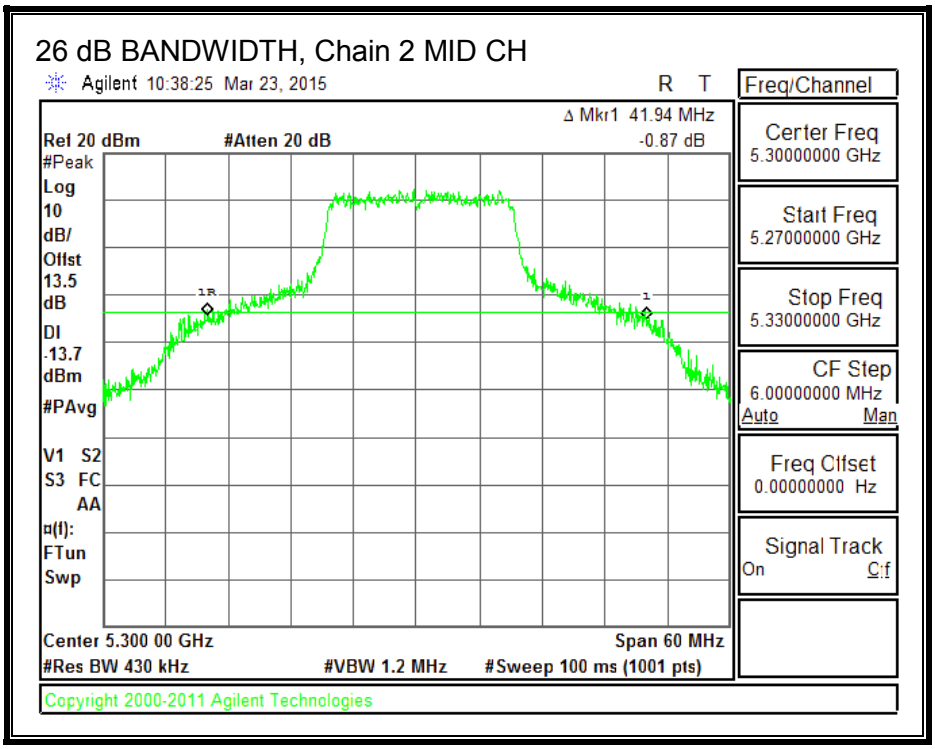


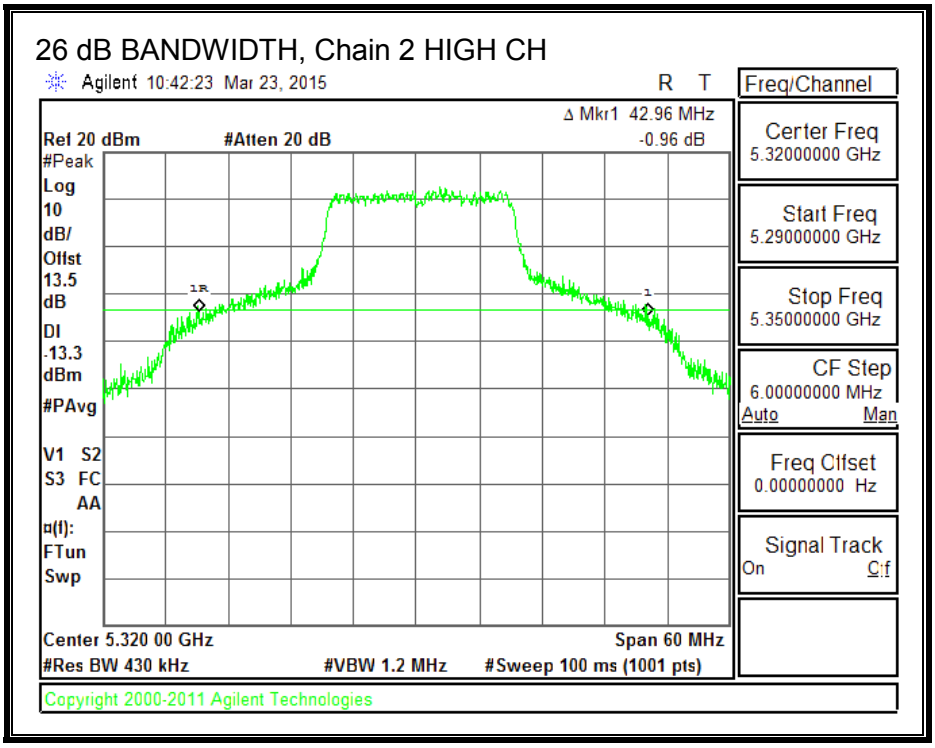




26 dB BANDWIDTH, Chain 2







8.14.2. 99% BANDWIDTH

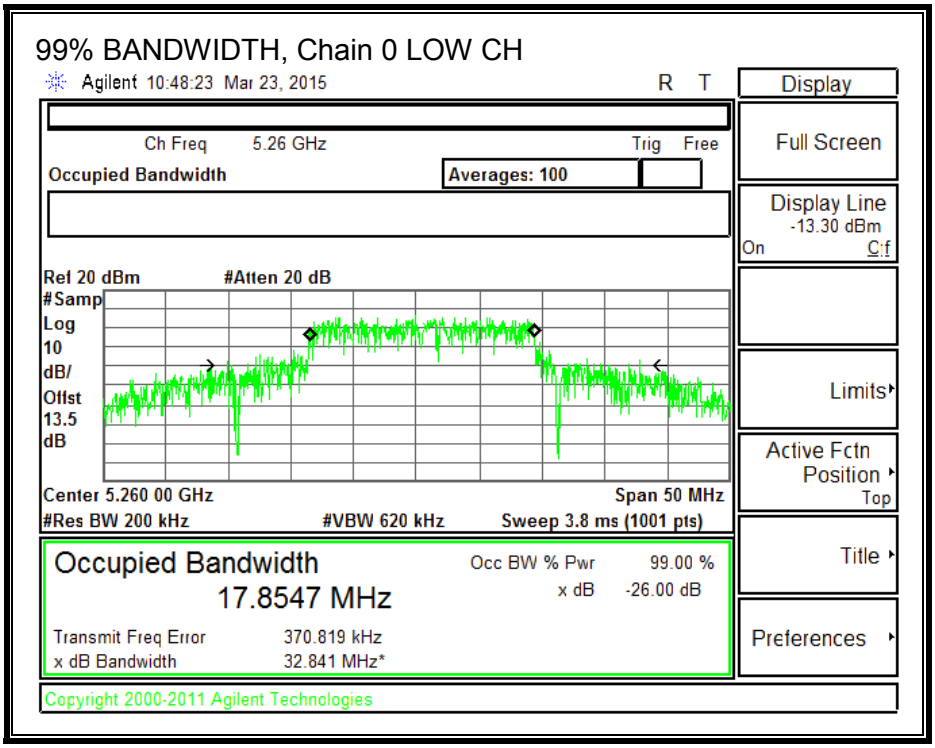
LIMITS

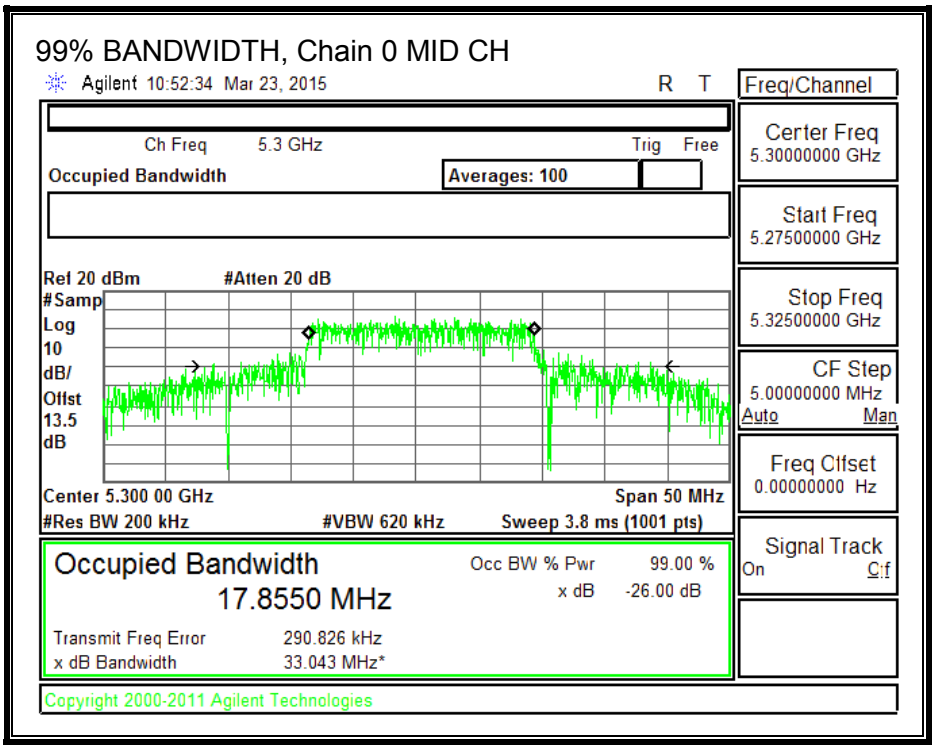
None; for reporting purposes only.

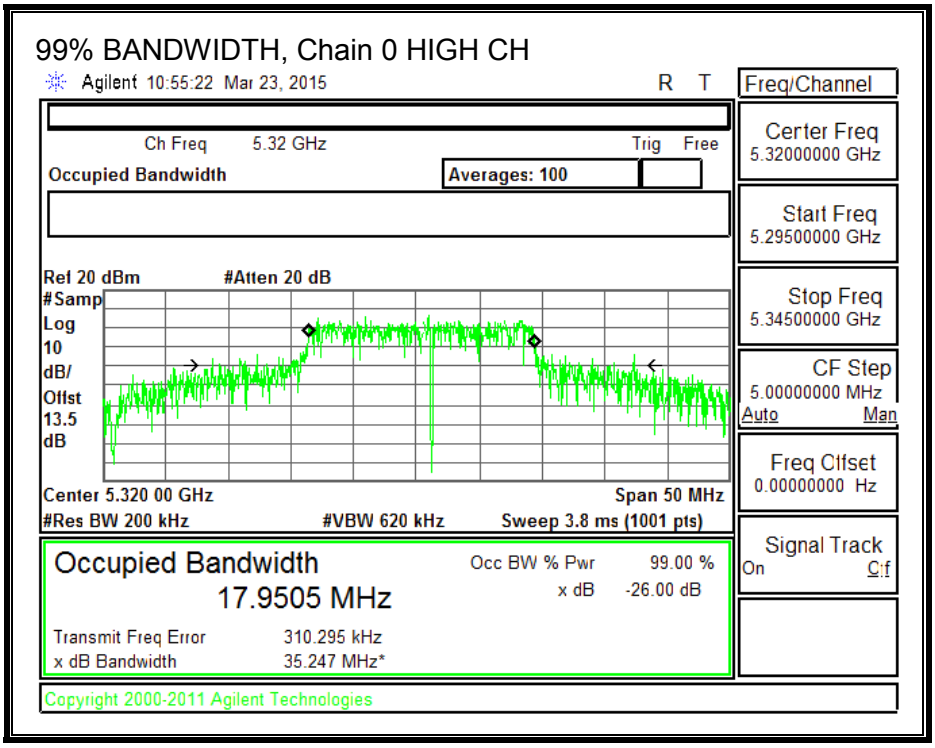
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5260	17.8547	17.8255	17.8818
Mid	5300	17.8550	17.8547	17.8935
High	5320	17.9505	17.9169	17.8791

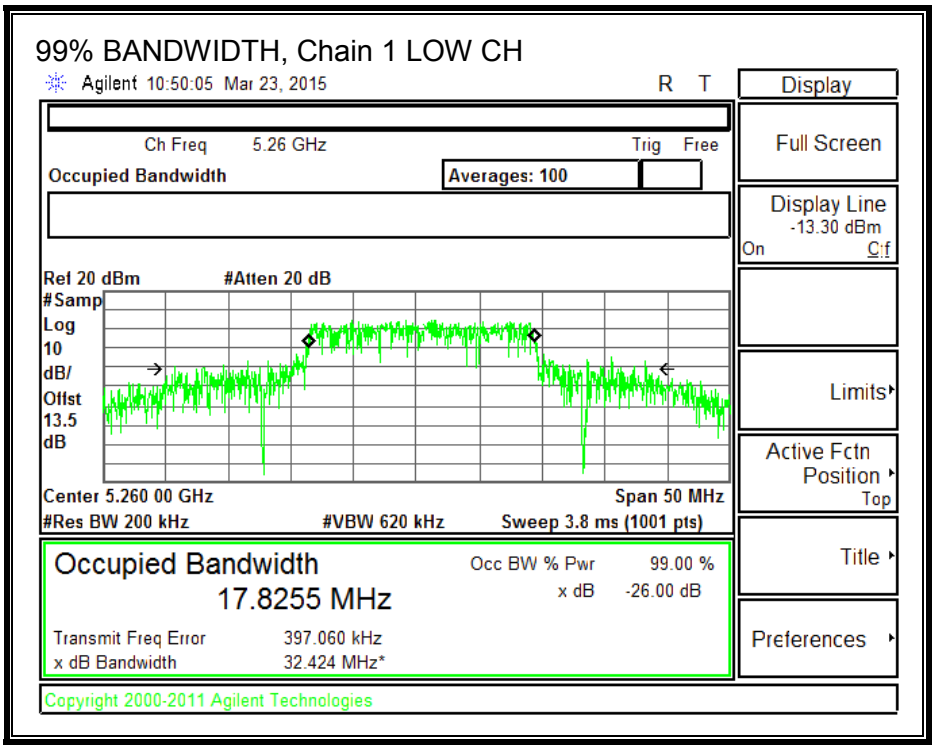
99% BANDWIDTH, Chain 0

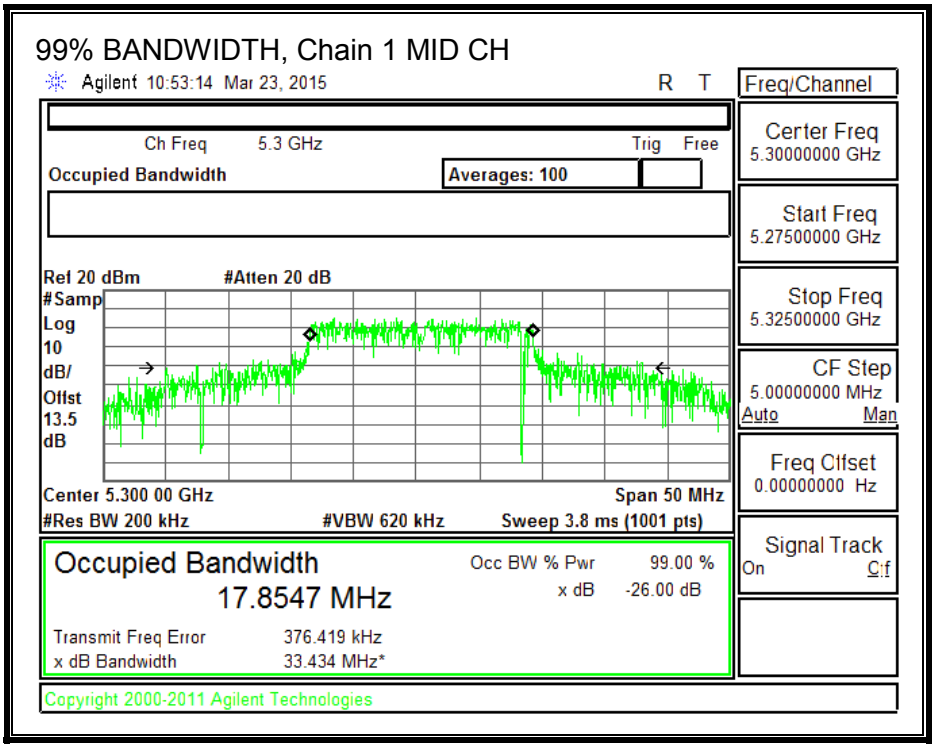


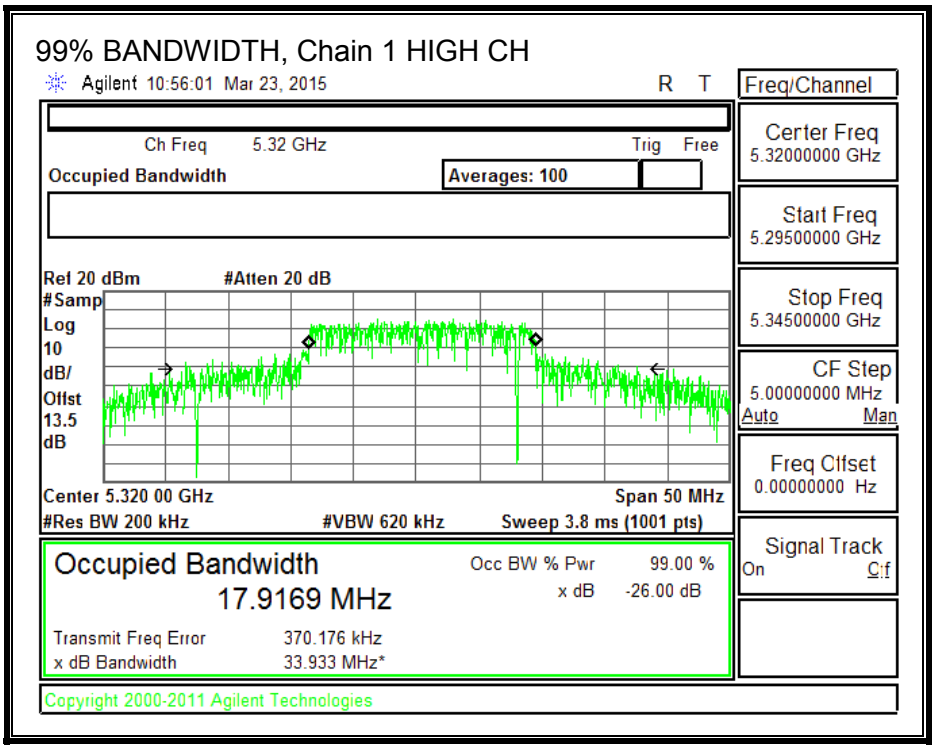




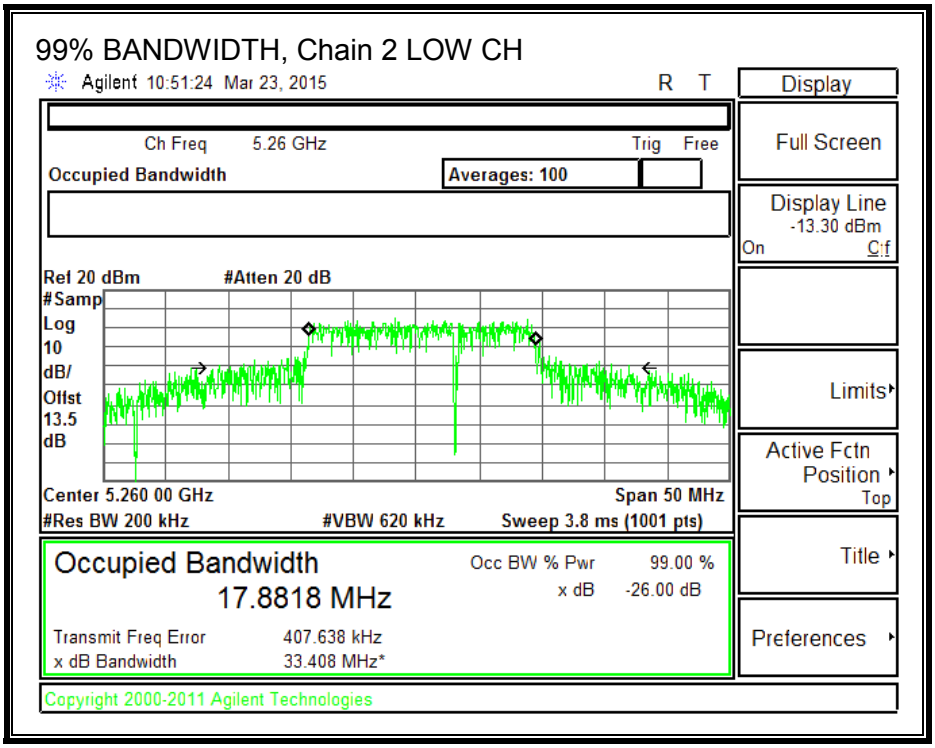
99% BANDWIDTH, Chain 1

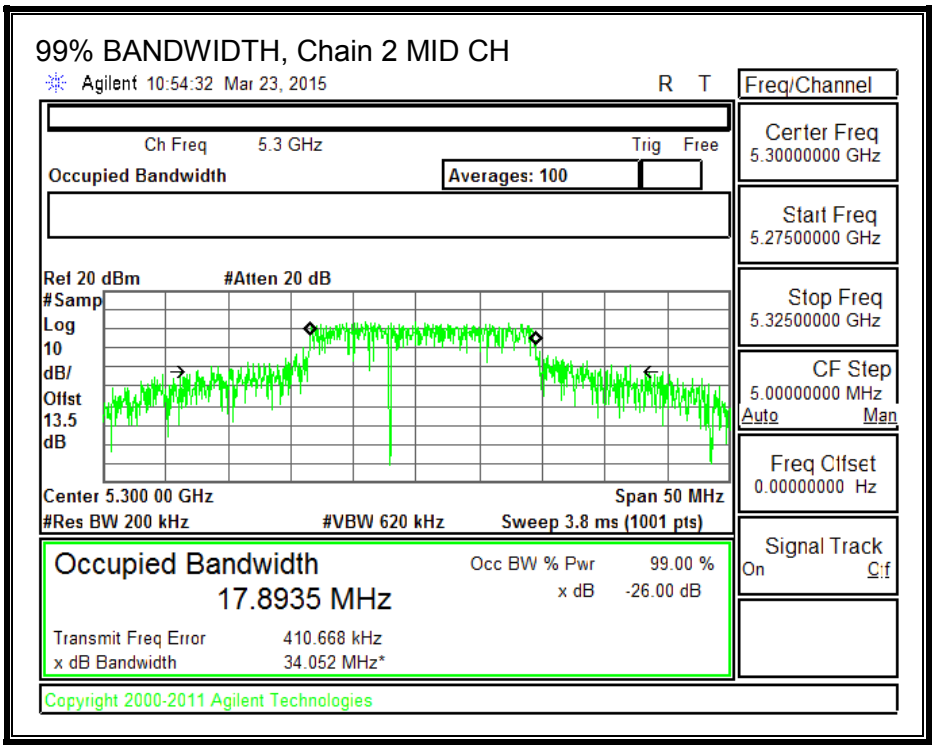


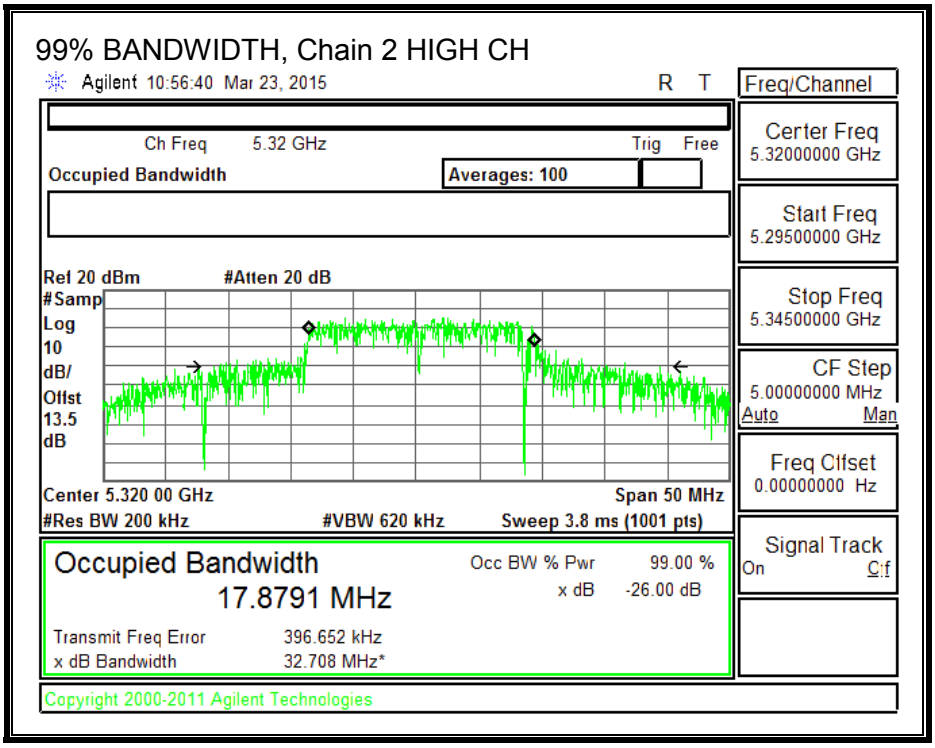




99% BANDWIDTH, Chain 2







8.14.3. 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 the same for each chain. The directional gain is equal to the antenna gain, 5.85 dBi.

For PSD, The TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (3 chains) (dB)	Correlated Chains Directional Gain (dBi)
5.85	4.77	10.62

RESULTS

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	40.50	5.85	10.62	24.00	6.38
Mid	5300	41.94	5.85	10.62	24.00	6.38
High	5320	41.10	5.85	10.62	24.00	6.38

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

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	16.98	17.44	16.95	21.90	24.00	-2.10
Mid	5300	17.25	17.50	16.98	22.02	24.00	-1.98
High	5320	17.15	17.55	17.10	22.04	24.00	-1.96

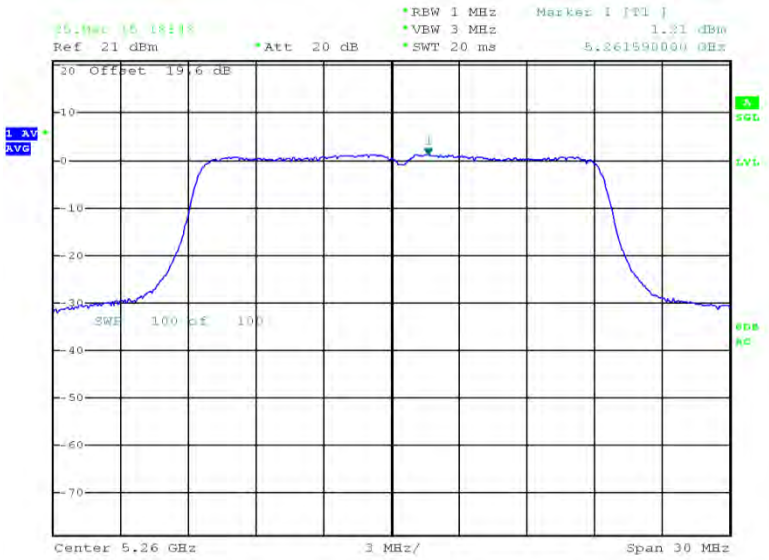
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	1.21	1.88	1.15	6.20	6.38	-0.18
Mid	5300	1.47	1.96	0.91	6.24	6.38	-0.14
High	5320	1.32	1.90	0.91	6.17	6.38	-0.21

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.

PSD, Chain 0

PSD, Chain 0 LOW CH



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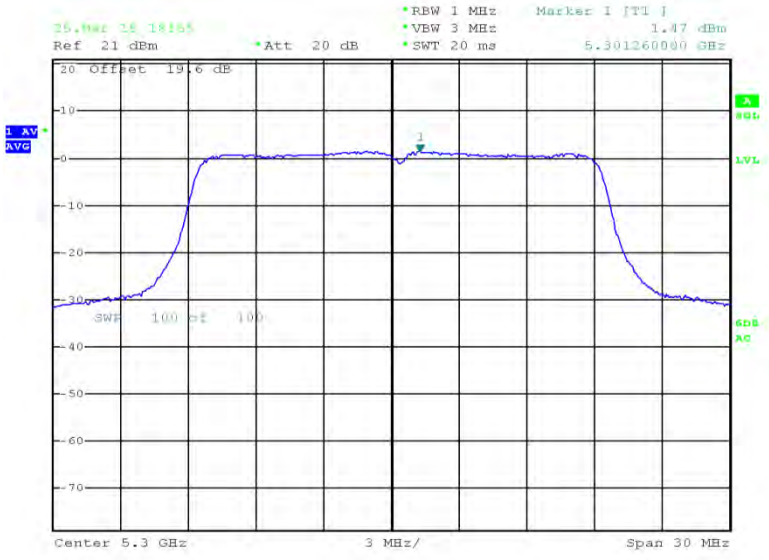
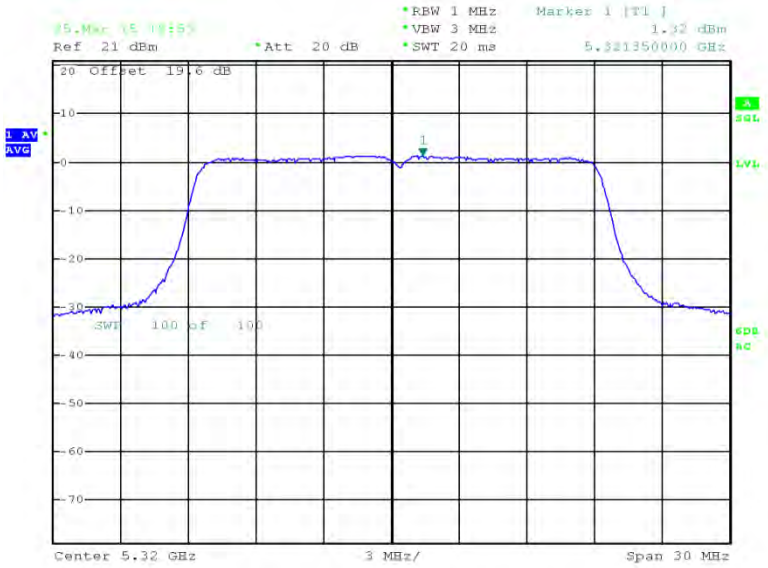
PSD, Chain 0 MID CH



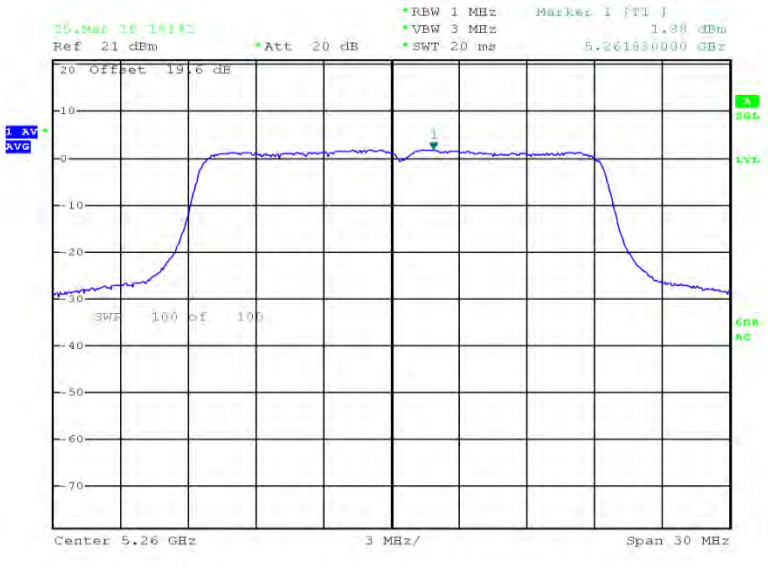
Date: 25.MAR.2015 18:55:40

PSD, Chain 0 HIGH CH

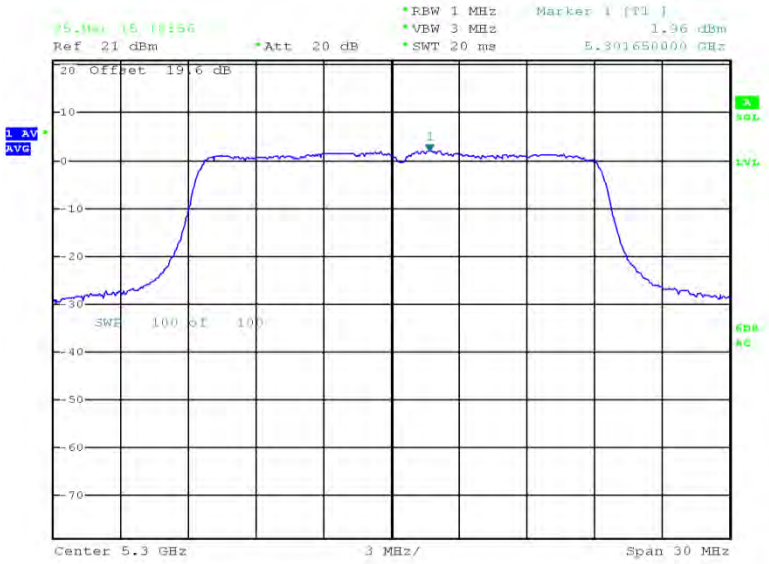


PSD, Chain 1

PSD, Chain 1 LOW CH

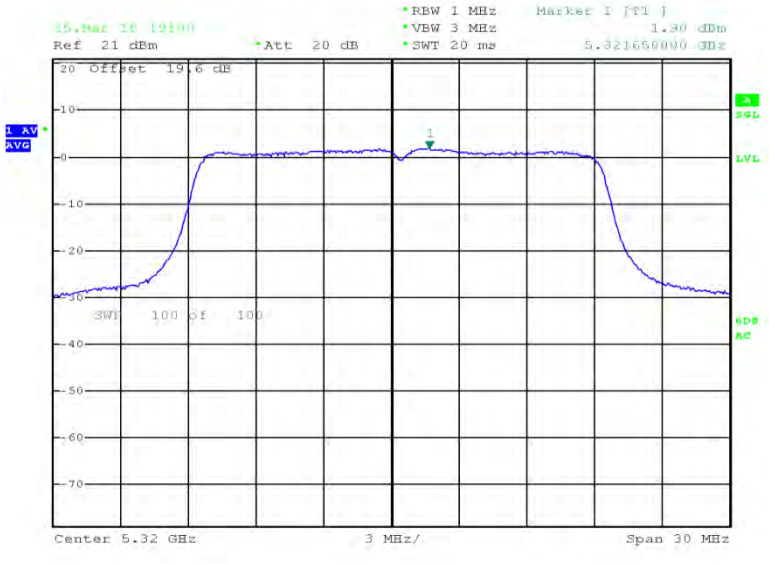


PSD, Chain 1 MID CH



Date: 25.MAR.2015 18:56:43

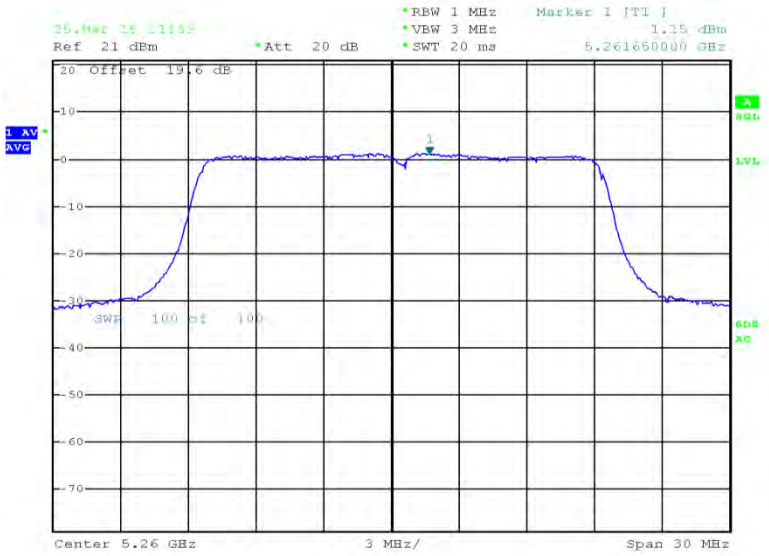
PSD, Chain 1 HIGH CH



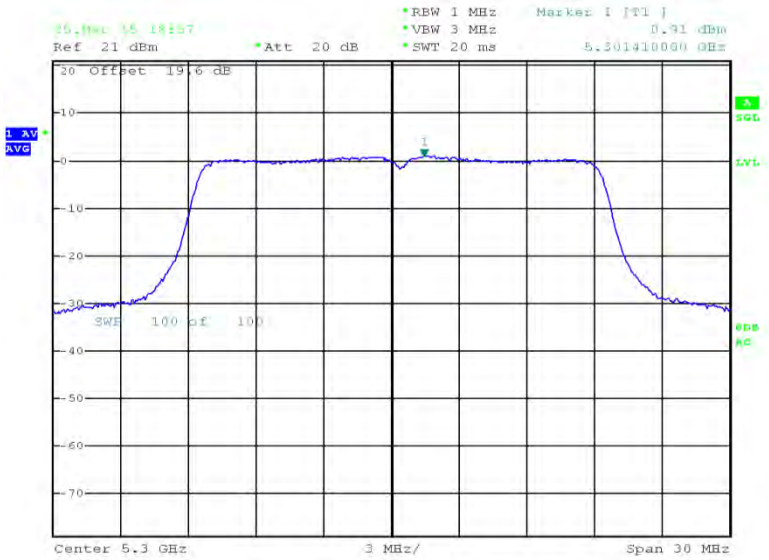
Date: 25.MAR.2015 19:00:42

PSD, Chain 2

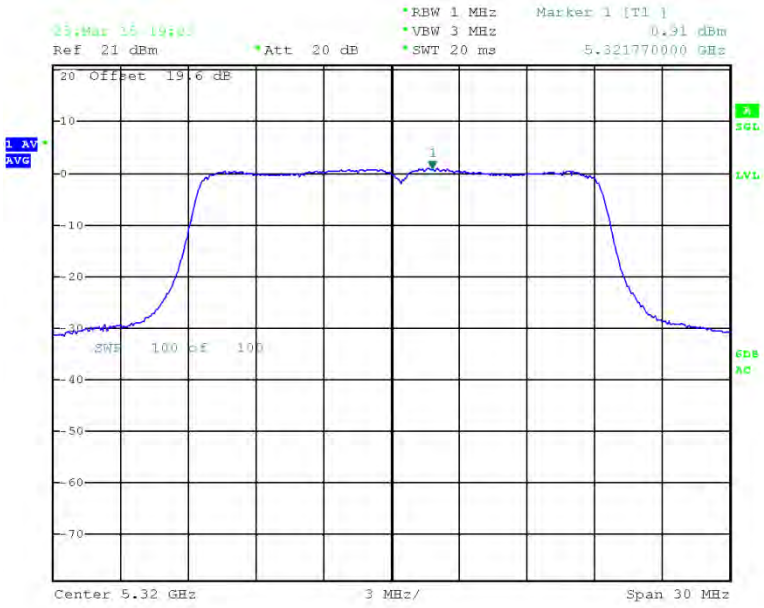
PSD, Chain 2 LOW CH



PSD, Chain 2 MID CH



PSD, Chain 2 HIGH CH



Date: 25.MAR.2015 19:03:04

8.15. 802.11n HT20 STBC 3Tx MODE IN THE 5.3 GHz BAND

8.15.1. 26 dB BANDWIDTH

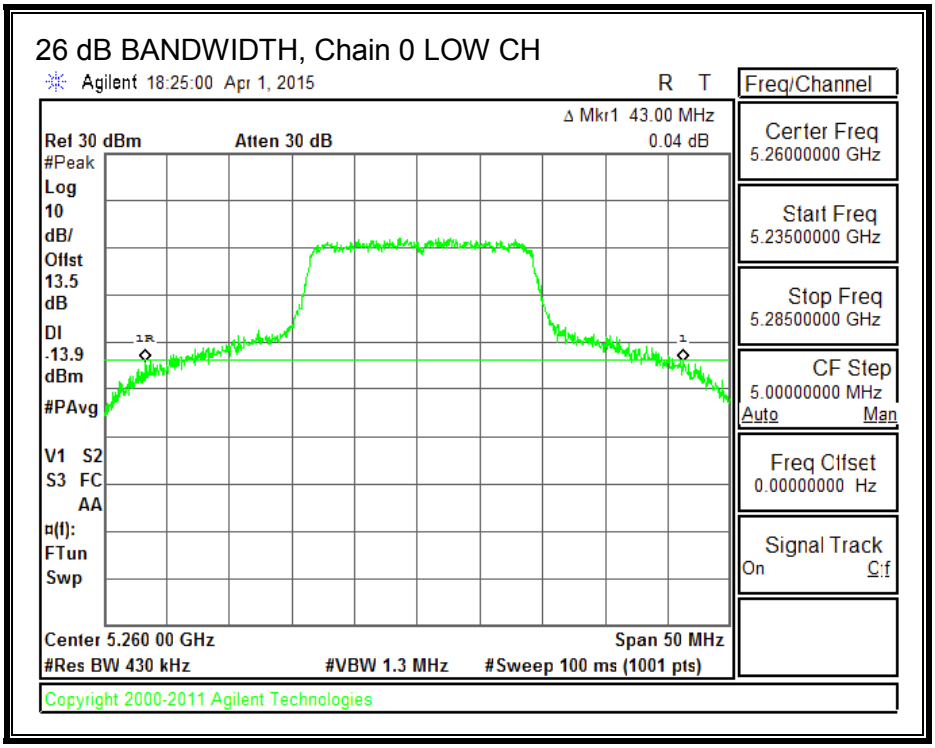
LIMITS

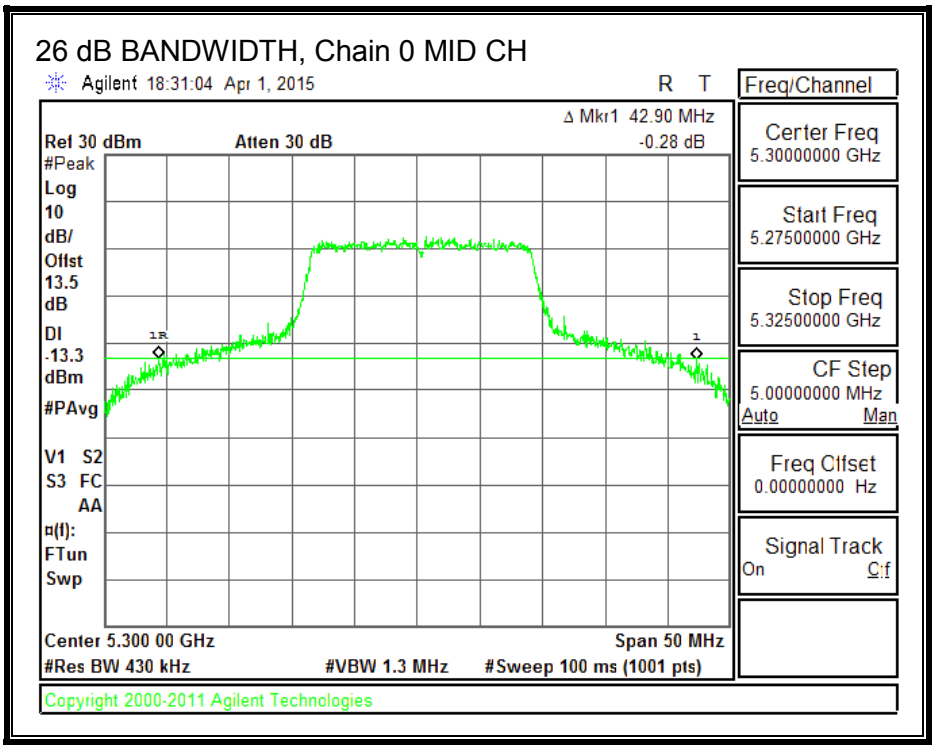
None; for reporting purposes only.

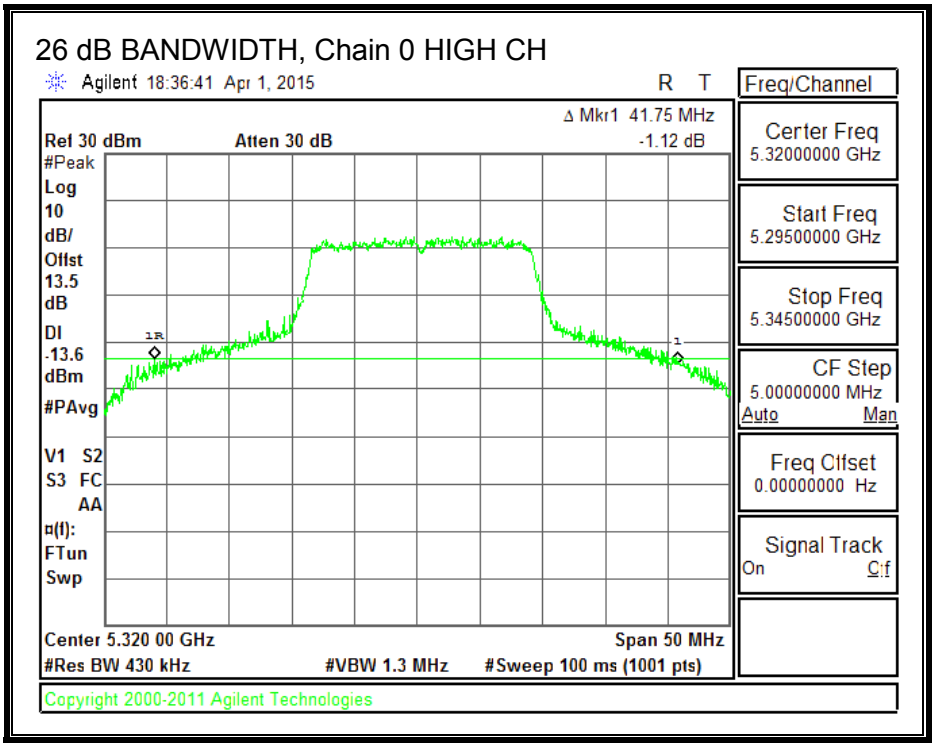
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5260	43.00	40.65	40.10
Mid	5300	42.90	38.35	41.45
High	5320	41.75	39.10	41.30

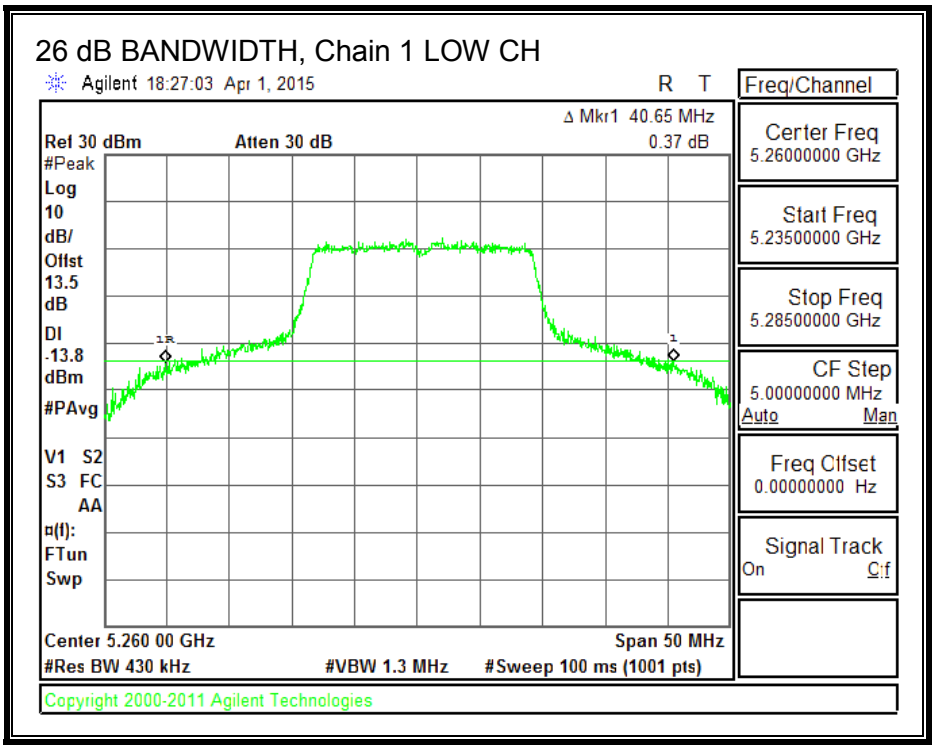
26 dB BANDWIDTH, Chain 0

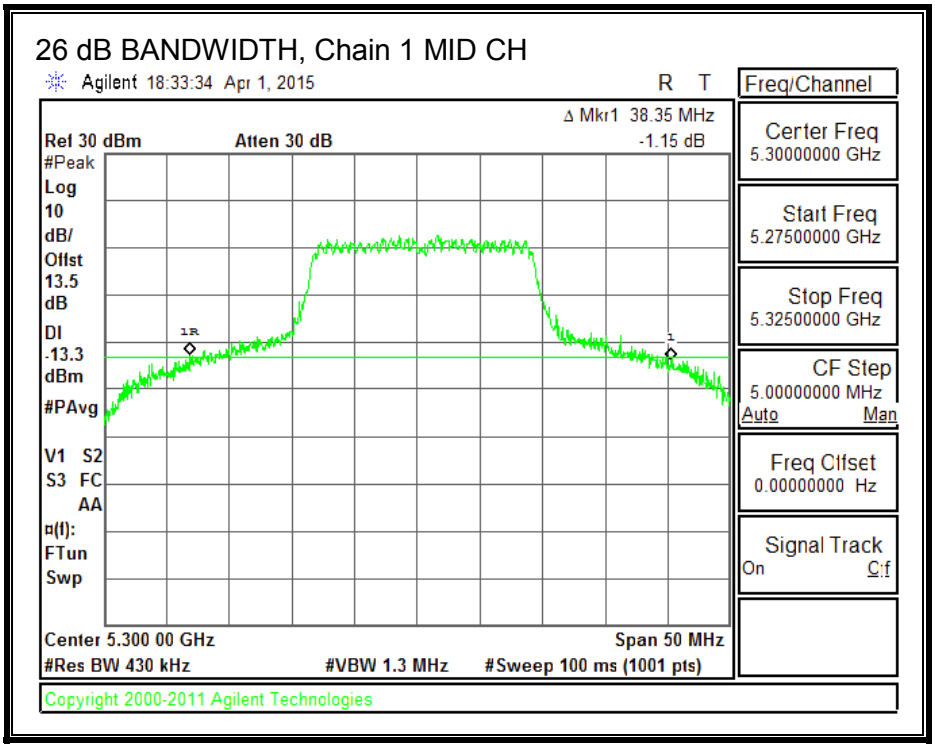


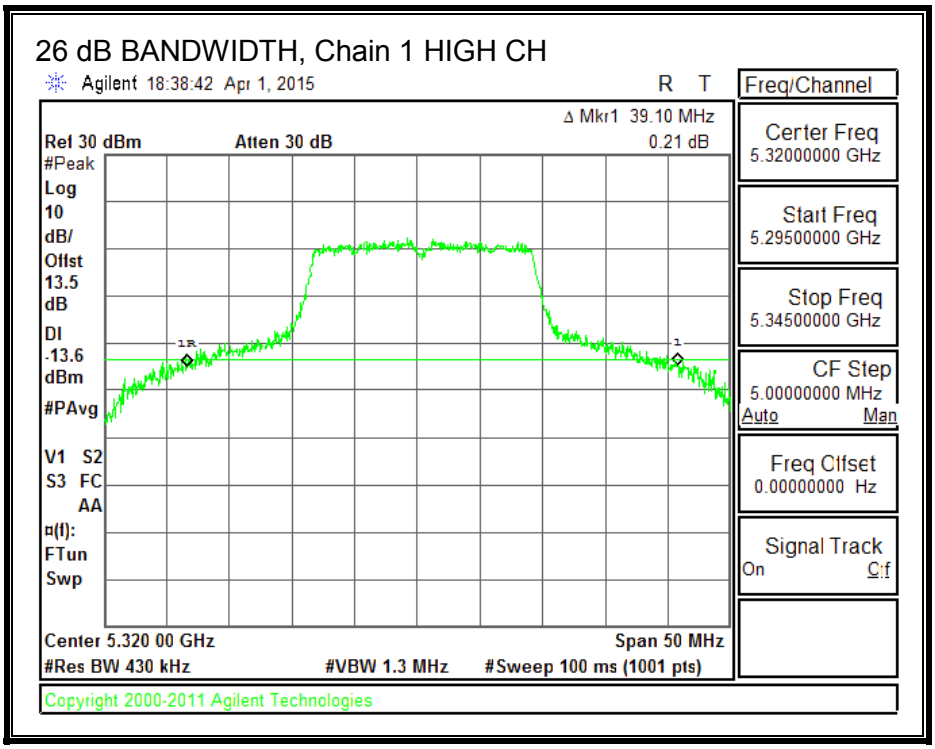




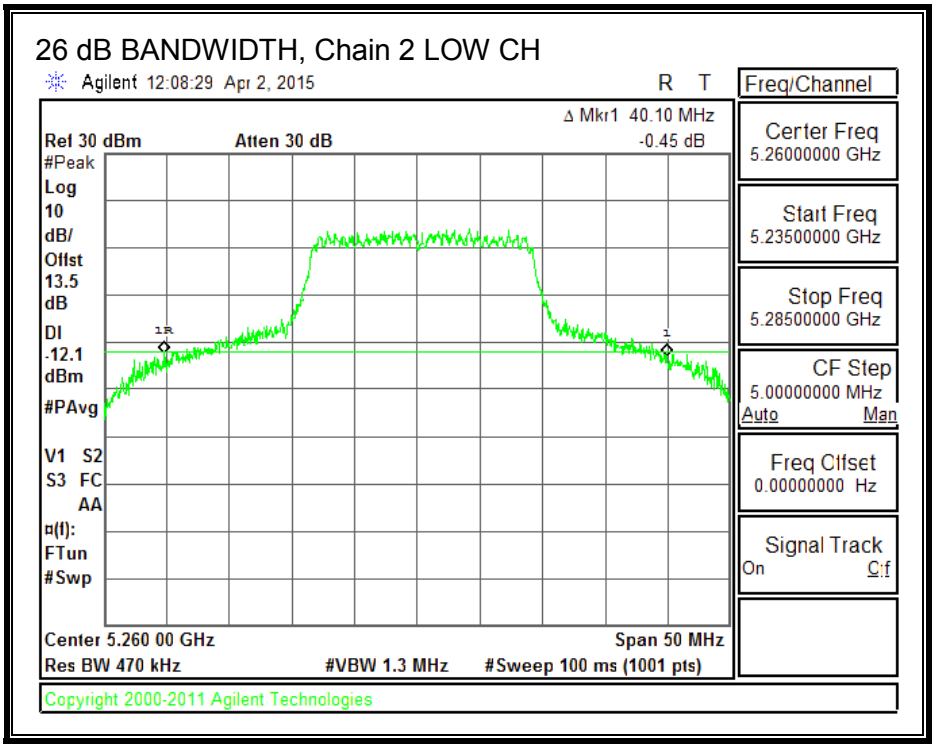
26 dB BANDWIDTH, Chain 1

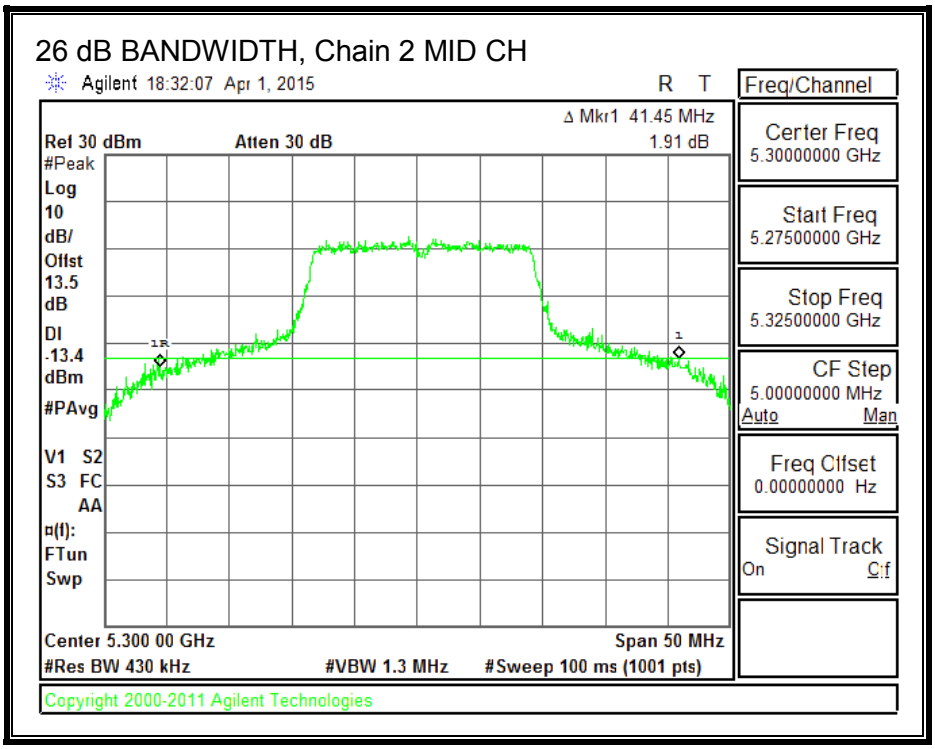


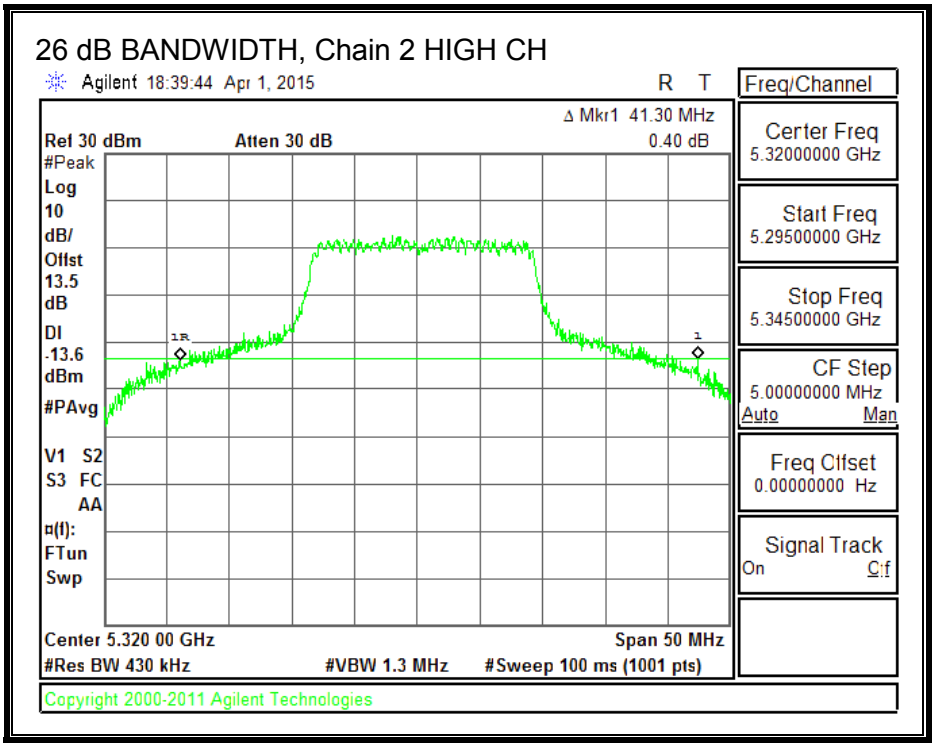




26 dB BANDWIDTH, Chain 2







8.15.2. 99% BANDWIDTH

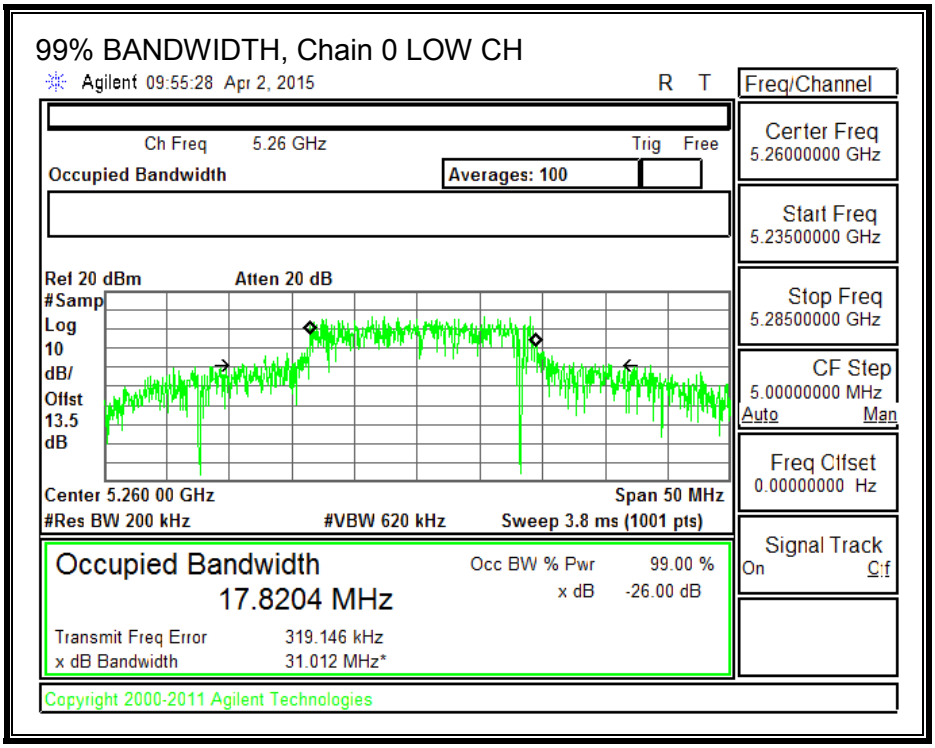
LIMITS

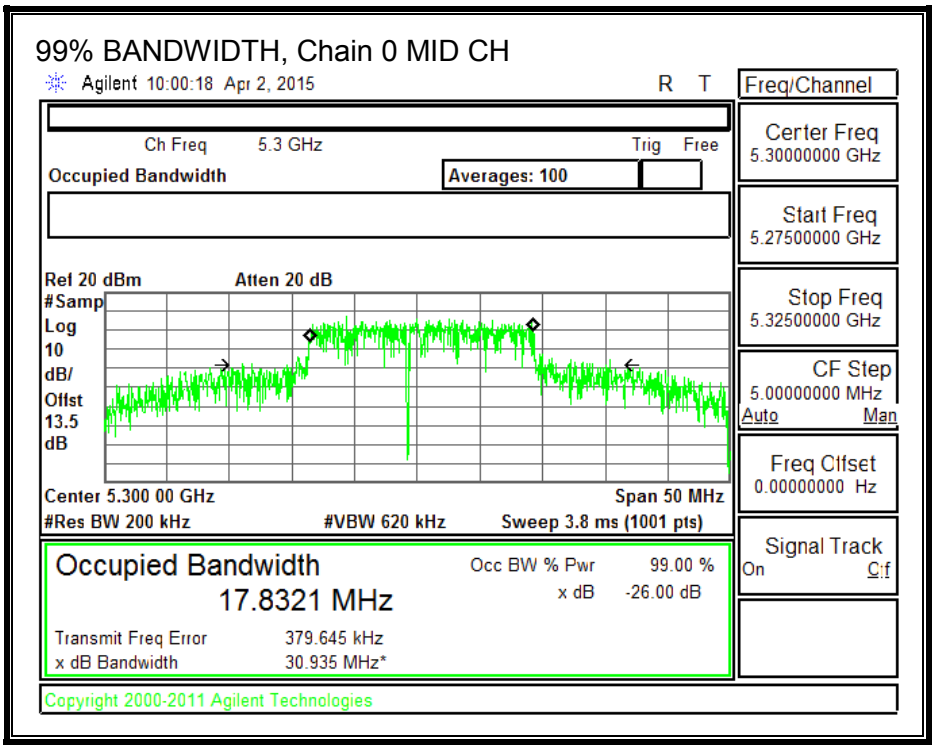
None; for reporting purposes only.

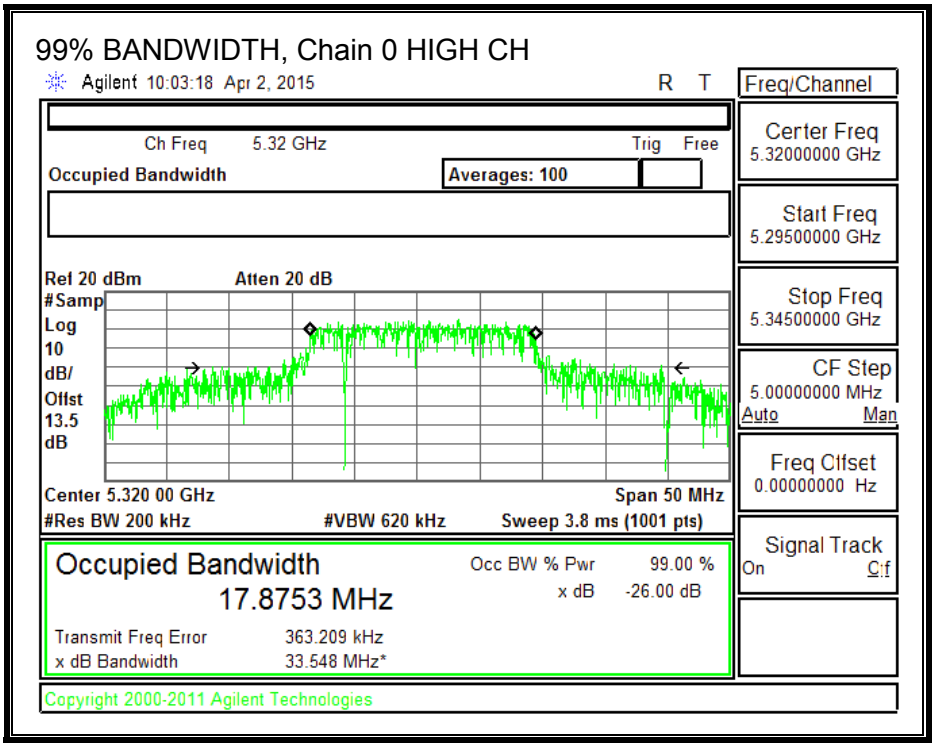
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5260	17.8204	17.8204	17.8094
Mid	5300	17.8321	17.8238	17.8062
High	5320	17.8753	17.8632	17.9112

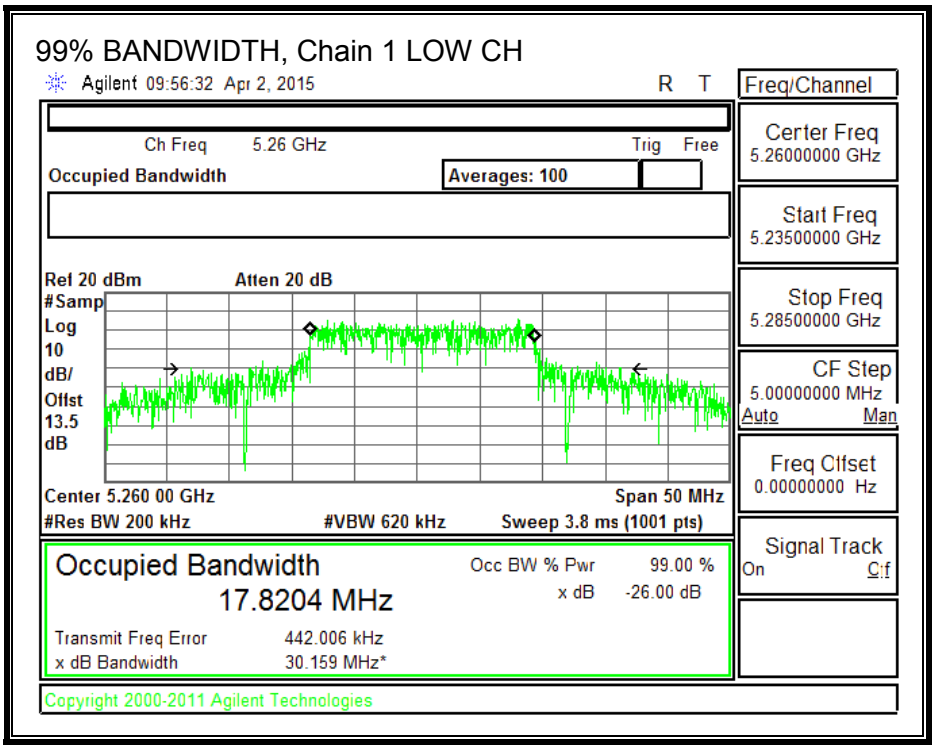
99% BANDWIDTH, Chain 0

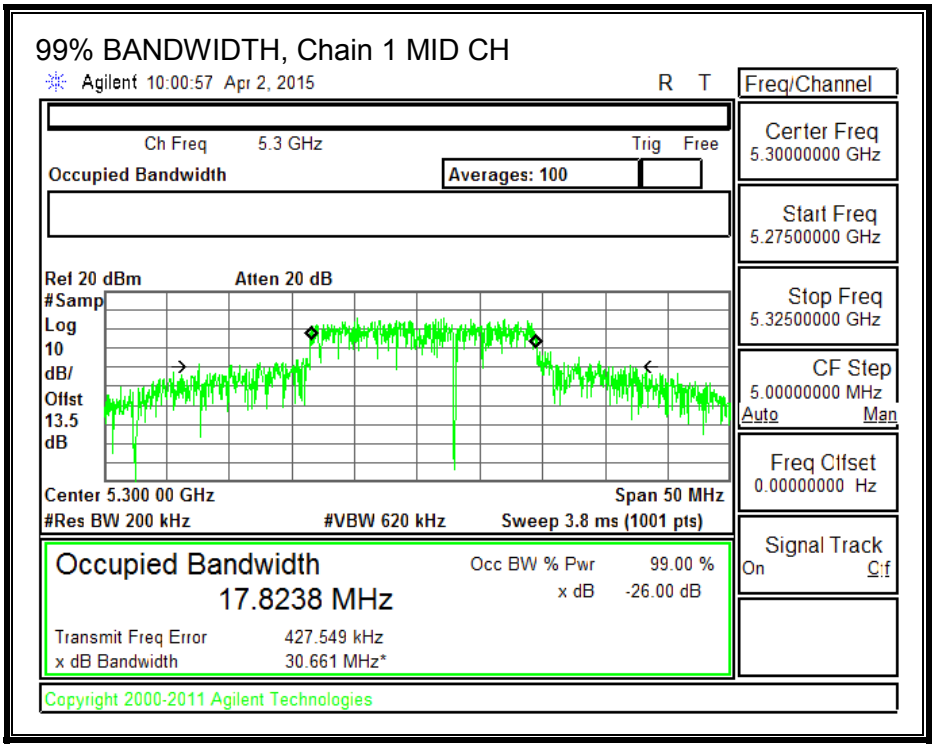


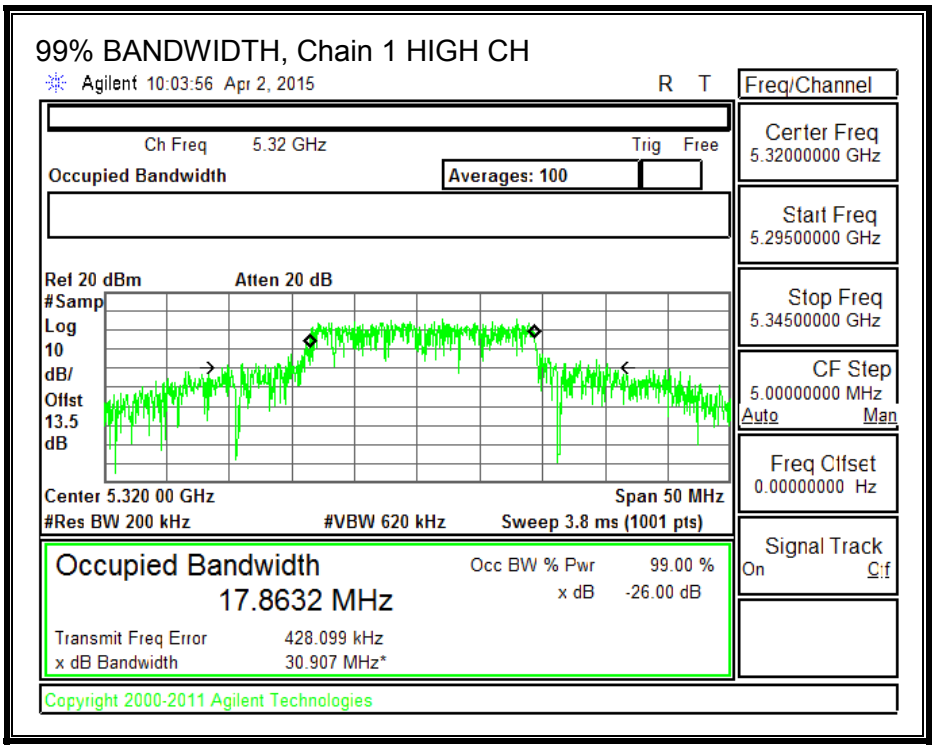




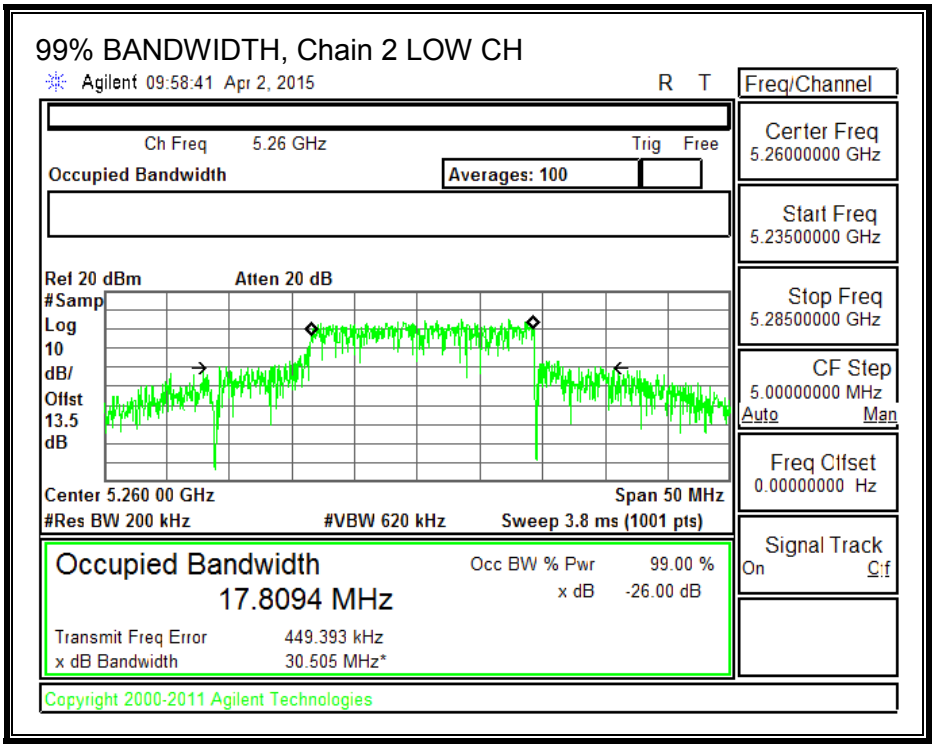
99% BANDWIDTH, Chain 1

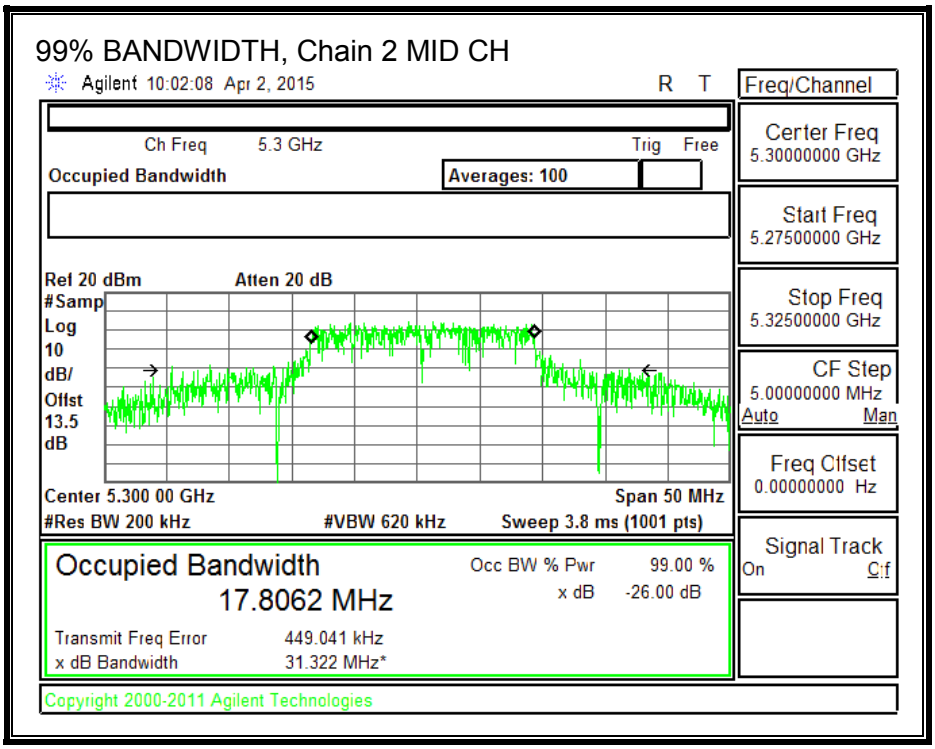


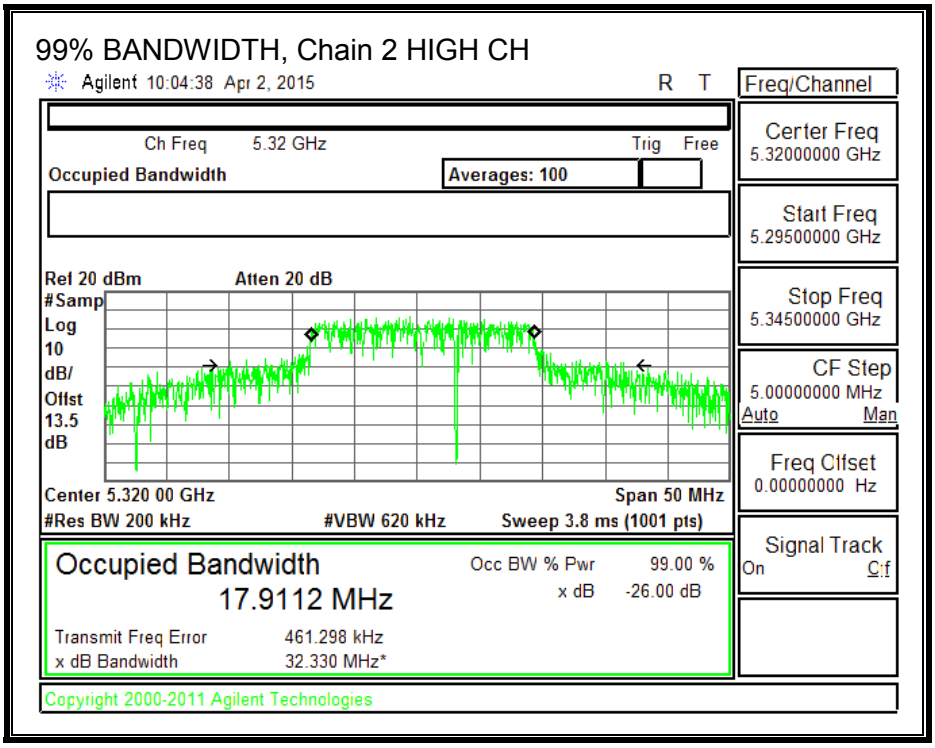




99% BANDWIDTH, Chain 2







8.15.3. 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 and PSD, the TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is equal to the antenna gain, 5.85 dBi.

RESULTS

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	40.10	5.85	5.85	24.00	11.00
Mid	5300	38.35	5.85	5.85	24.00	11.00
High	5320	39.10	5.85	5.85	24.00	11.00

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

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	18.30	18.40	18.45	23.15	24.00	-0.85
Mid	5300	18.45	18.57	18.65	23.33	24.00	-0.67
High	5320	17.48	17.63	17.65	22.36	24.00	-1.64

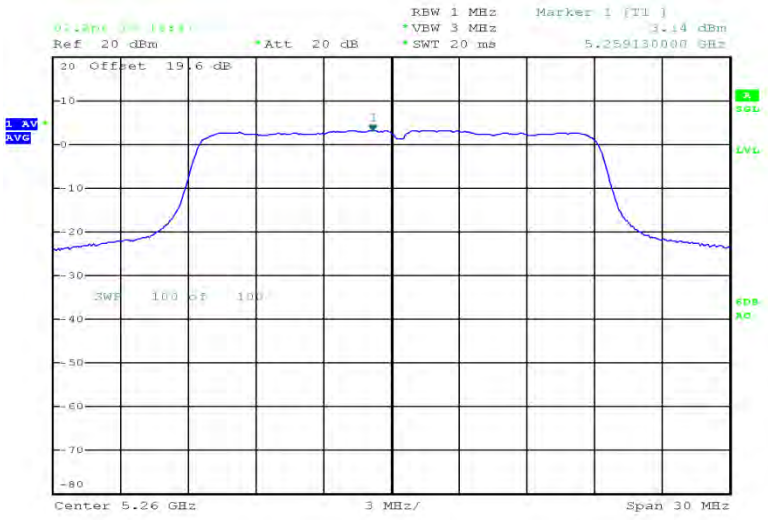
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	3.14	3.51	3.52	8.16	11.00	-2.84
Mid	5300	3.25	3.73	3.56	8.29	11.00	-2.71
High	5320	3.14	3.64	3.58	8.23	11.00	-2.77

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.

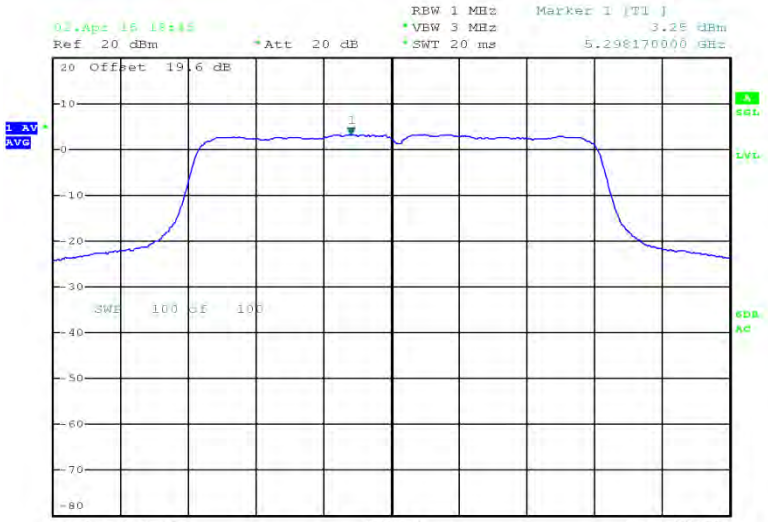
PSD, Chain 0

PSD, Chain 0 LOW CH



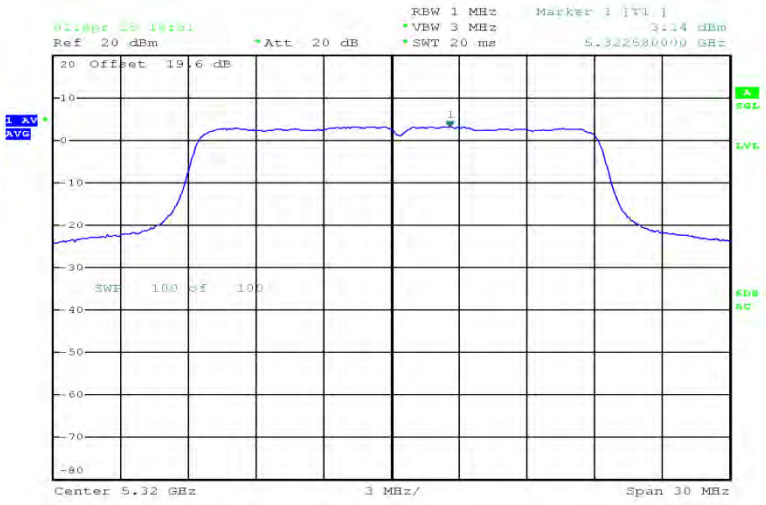
Date: 2.APR.2015 18:41:30

PSD, Chain 0 MID CH



Date: 2.APR.2015 18:45:27

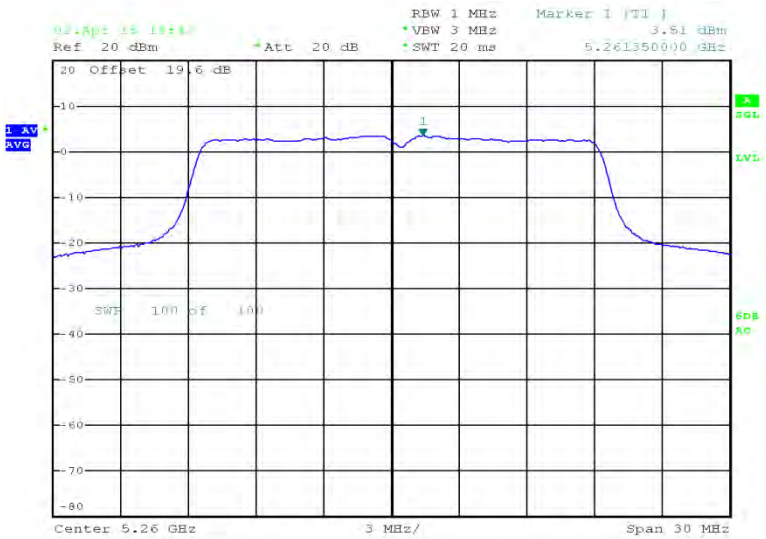
PSD, Chain 0 HIGH CH



Date: 2.APR.2015 18:51:05

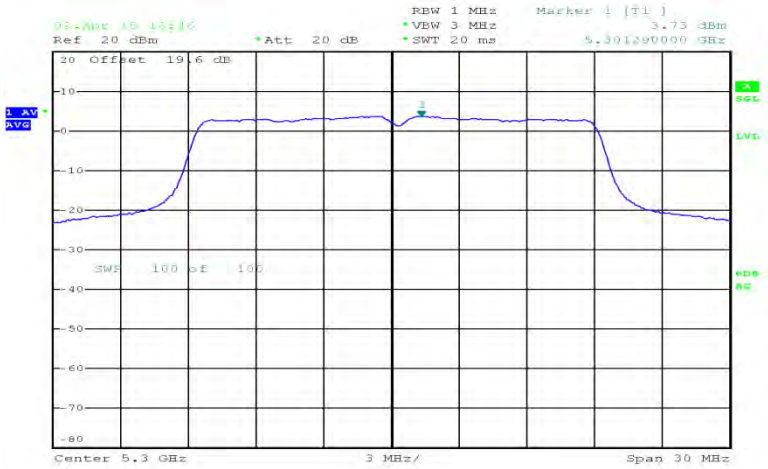
PSD, Chain 1

PSD, Chain 1 LOW CH



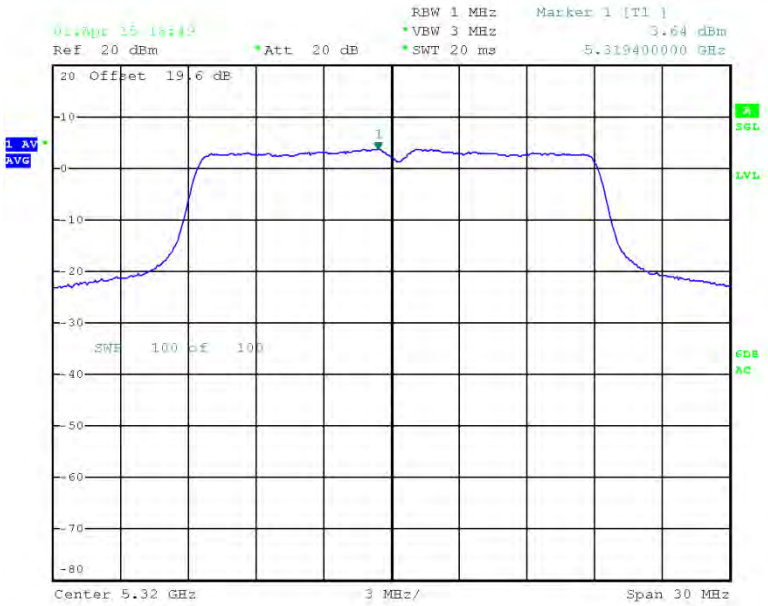
Date: 2.APR.2015 18:42:09

PSD, Chain 1 MID CH



Date: 2.APR.2015 18:46:25

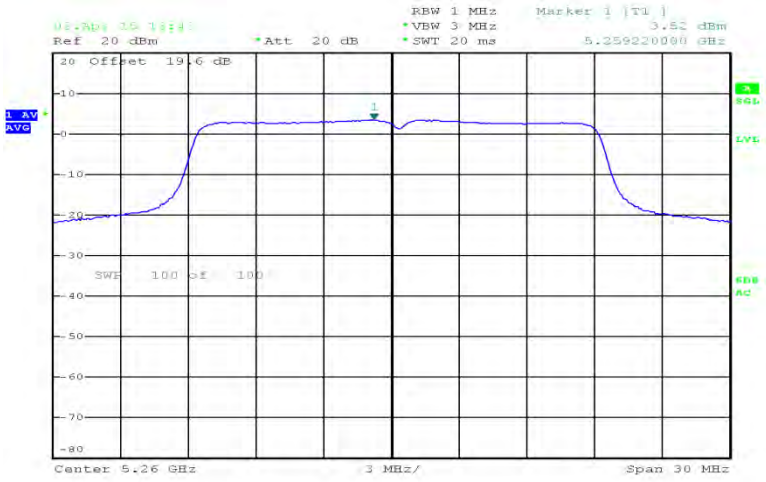
PSD, Chain 1 HIGH CH



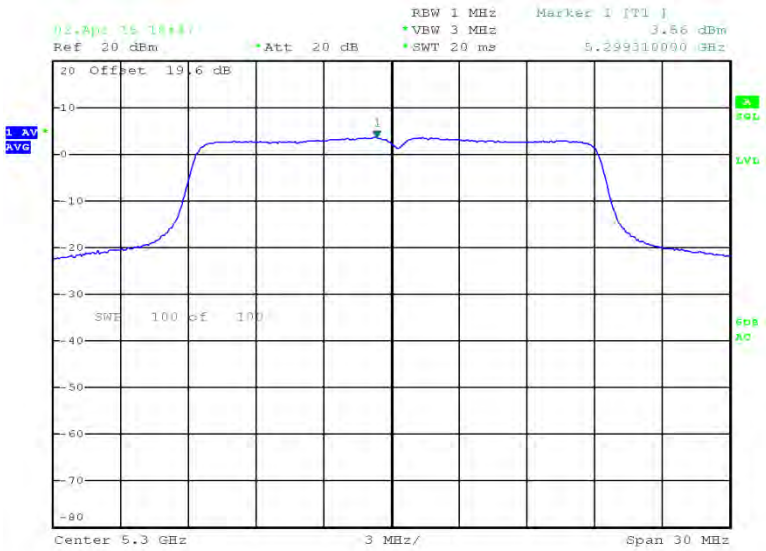
Date: 2.APR.2015 18:49:36

PSD, Chain 2

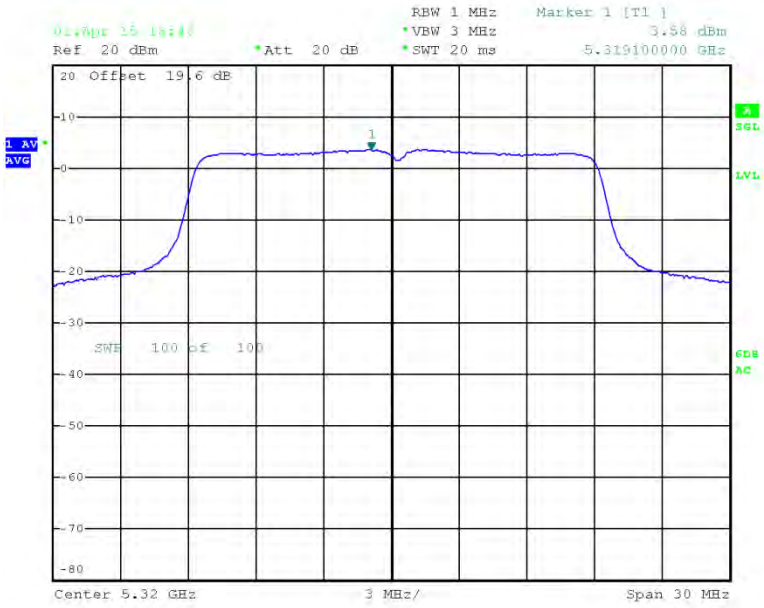
PSD, Chain 2 LOW CH



PSD, Chain 2 MID CH



PSD, Chain 2 HIGH CH



Date: 2.APR.2015 18:48:30

8.16. 802.11n HT20 TxBF 3Tx MODE IN THE 5.3 GHz BAND

8.16.1. 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 and PSD, The TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (3 chains) (dB)	Correlated Chains Directional Gain (dBi)
5.85	4.77	10.62

RESULTS

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	40.50	10.62	10.62	19.38	6.38
Mid	5300	41.94	10.62	10.62	19.38	6.38
High	5320	41.10	10.62	10.62	19.38	6.38

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

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.00	14.15	13.90	18.79	19.38	-0.59
Mid	5300	14.10	13.90	13.95	18.76	19.38	-0.62
High	5320	13.98	14.00	13.90	18.73	19.38	-0.65

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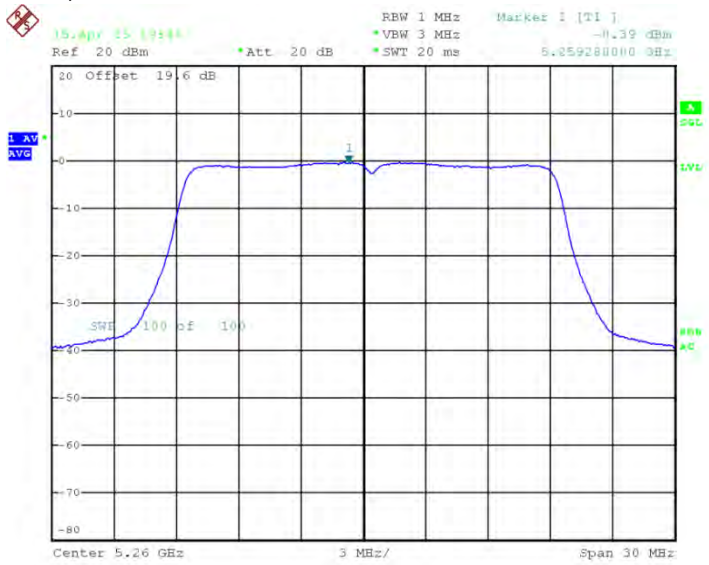
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	-0.39	-0.41	-0.84	4.23	6.38	-2.15
Mid	5300	-0.49	-0.73	-1.10	4.01	6.38	-2.37
High	5320	-0.33	-0.47	-0.94	4.20	6.38	-2.18

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.

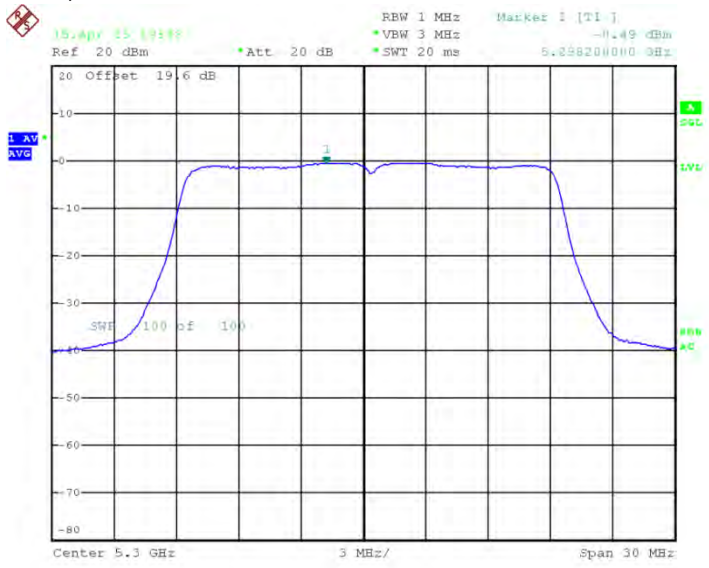
PSD, Chain 0

PSD, Chain 0 LOW CH



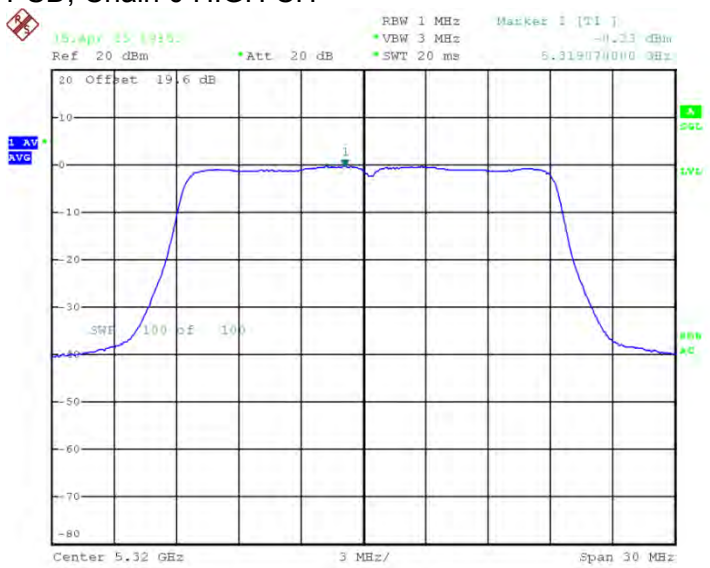
Date: 15.APR.2015 19:44:30

PSD, Chain 0 MID CH



Date: 15.APR.2015 19:48:29

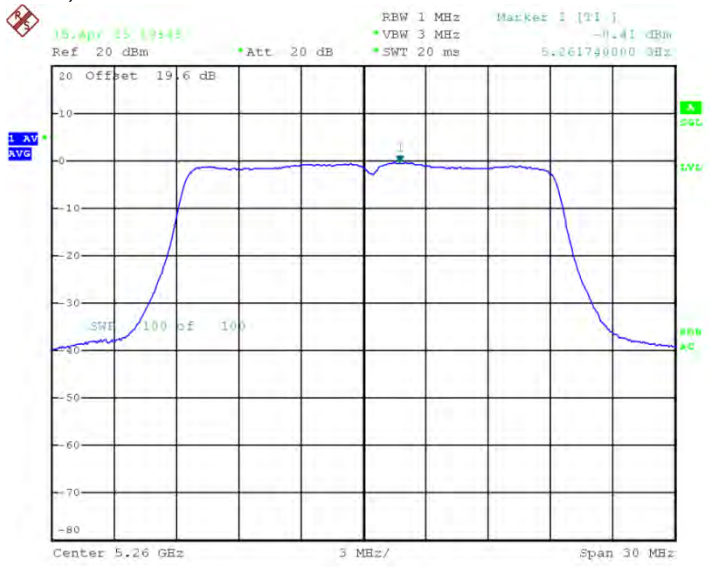
PSD, Chain 0 HIGH CH



Date: 15.APR.2015 19:53:09

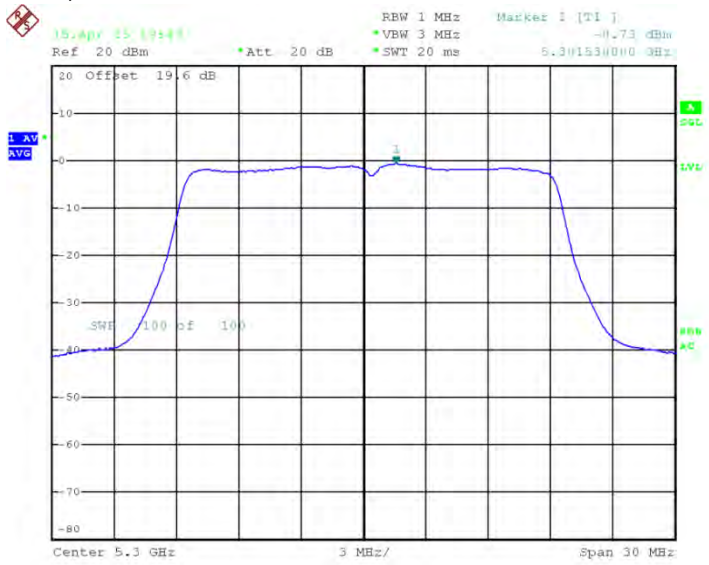
PSD, Chain 1

PSD, Chain 1 LOW CH



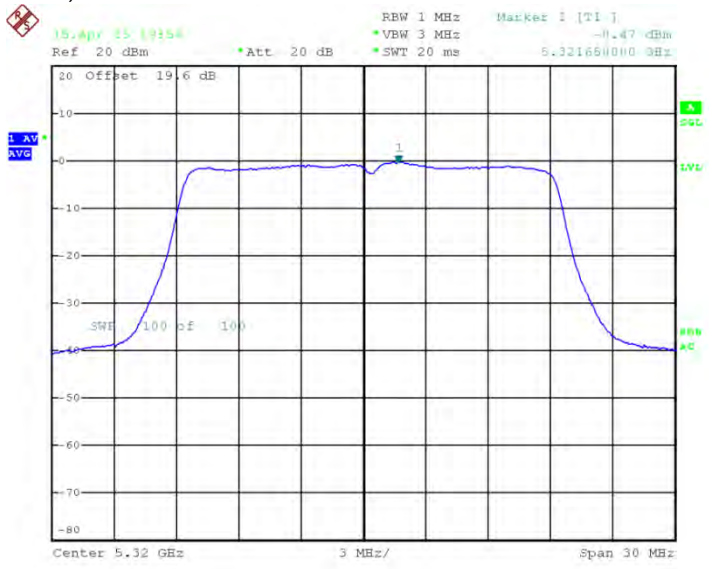
Date: 15.APR.2015 19:45:41

PSD, Chain 1 MID CH



Date: 15.APR.2015 19:49:32

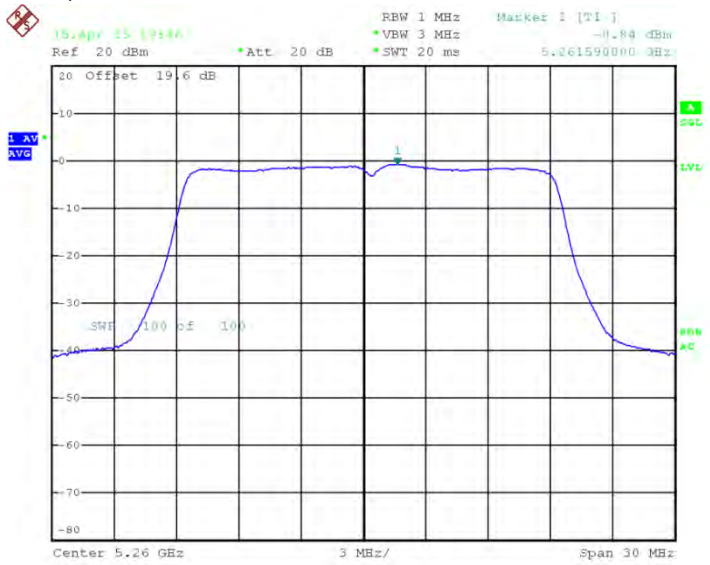
PSD, Chain 1 HIGH CH



Date: 15.APR.2015 19:54:21

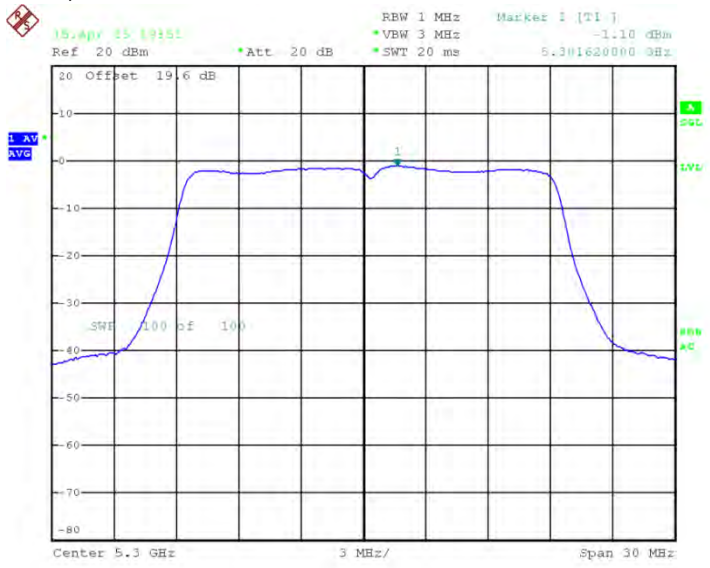
PSD, Chain 2

PSD, Chain 2 LOW CH



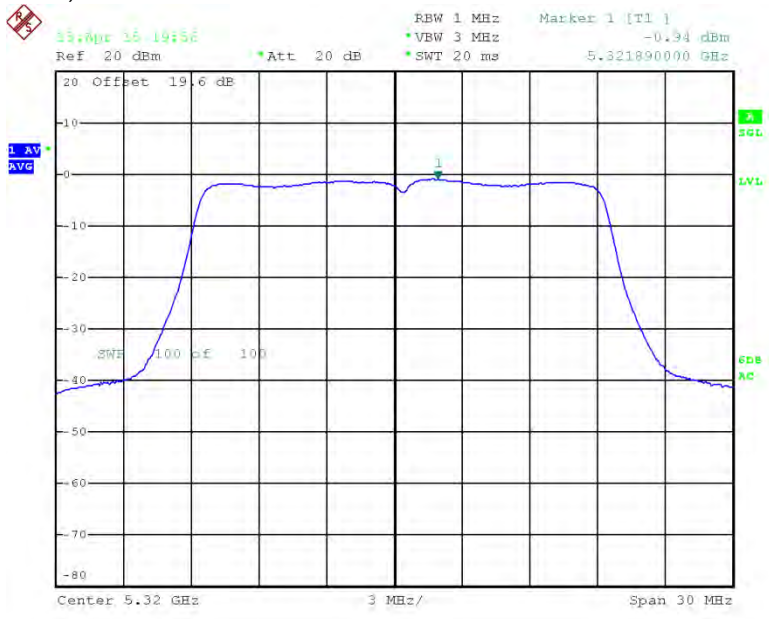
Date: 15.APR.2015 19:46:23

PSD, Chain 2 MID CH



Date: 15.APR.2015 19:51:34

PSD, Chain 2 HIGH CH



8.17. 802.11n HT40 1Tx MODE IN THE 5.3 GHz BAND

8.17.1. OUTPUT POWER

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

This is SISO mode, AG is the highest (worst-case) = 5.85 dBi.

RESULTS

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm)
High	5310	96.36	5.85	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
High	5310	14.09	14.09	24.00	-9.91

Note: for Chain 0, 26dB & 99% data & plots, see section 11n HT40 CDD 3TX MODE IN THE 5.3 GHz BAND

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.

8.18. 802.11n HT40 CDD 3Tx MODE IN THE 5.3 GHz BAND

8.18.1. 26 dB BANDWIDTH

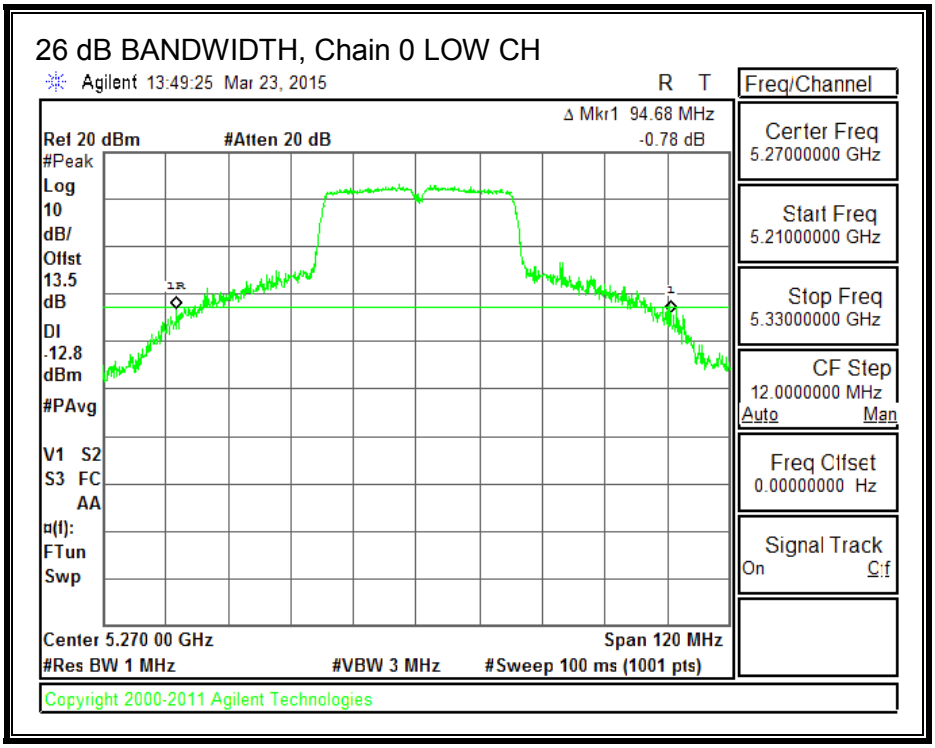
LIMITS

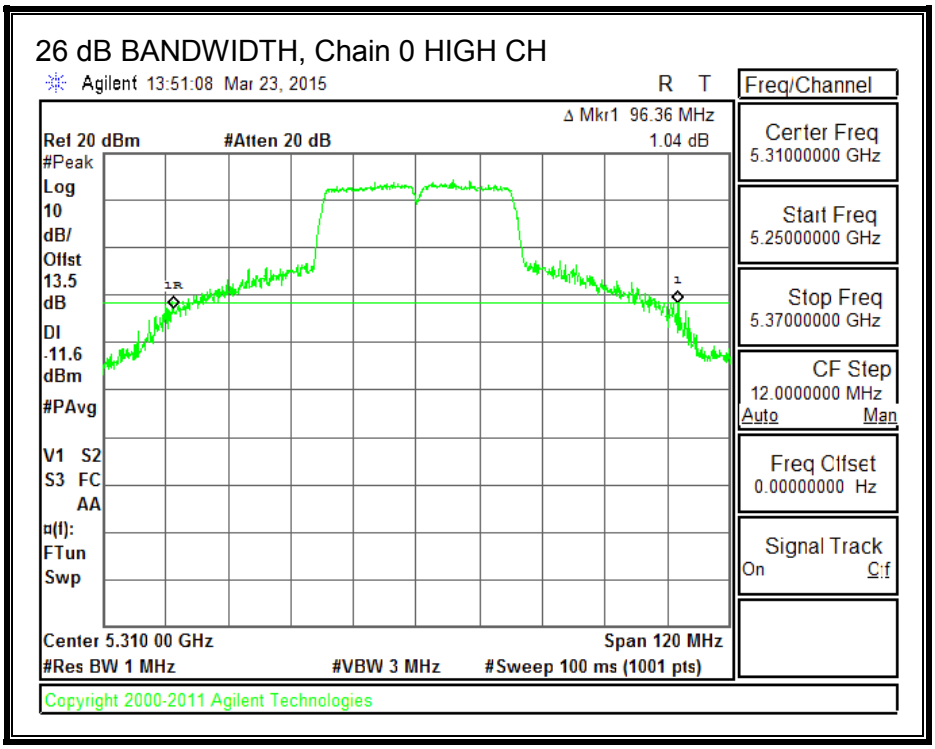
None; for reporting purposes only.

RESULTS

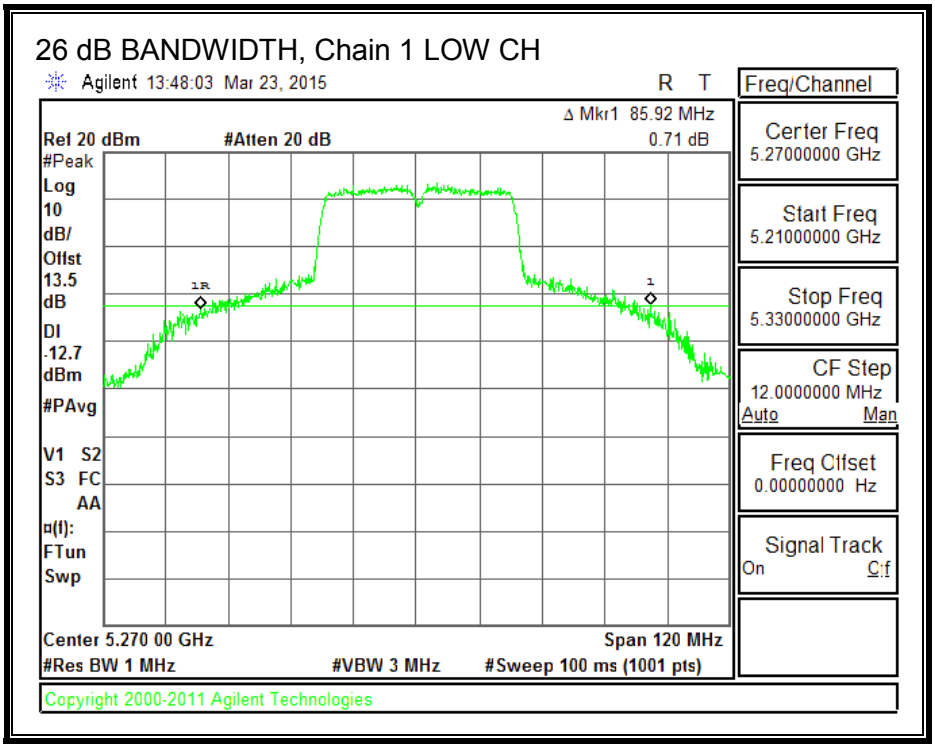
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5270	94.68	85.92	84.84
High	5310	96.36	86.76	84.60

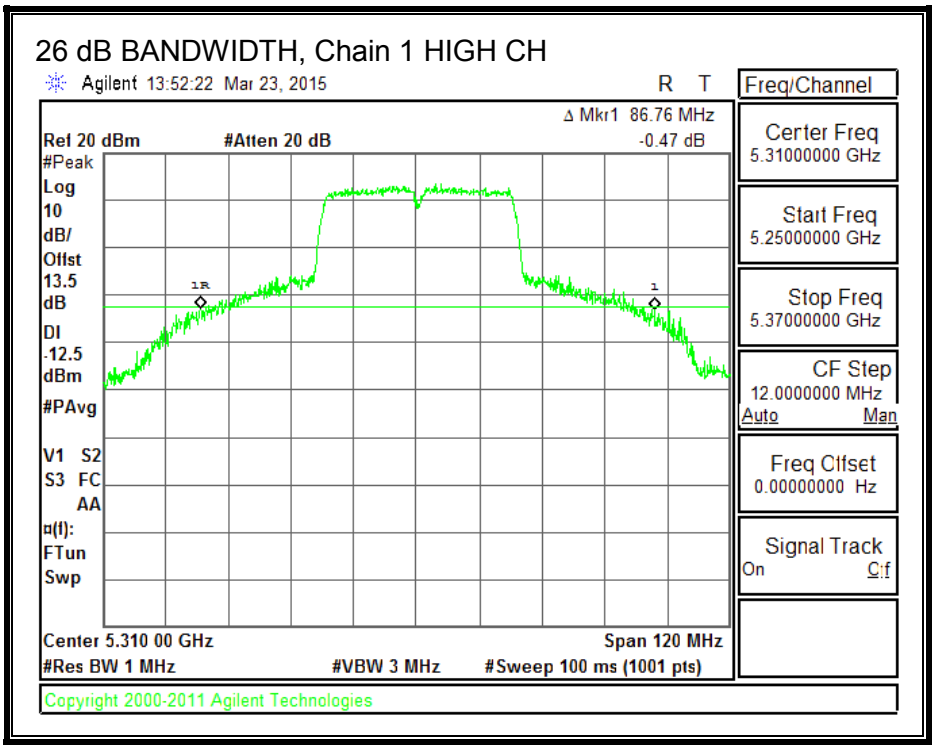
26 dB BANDWIDTH, Chain 0



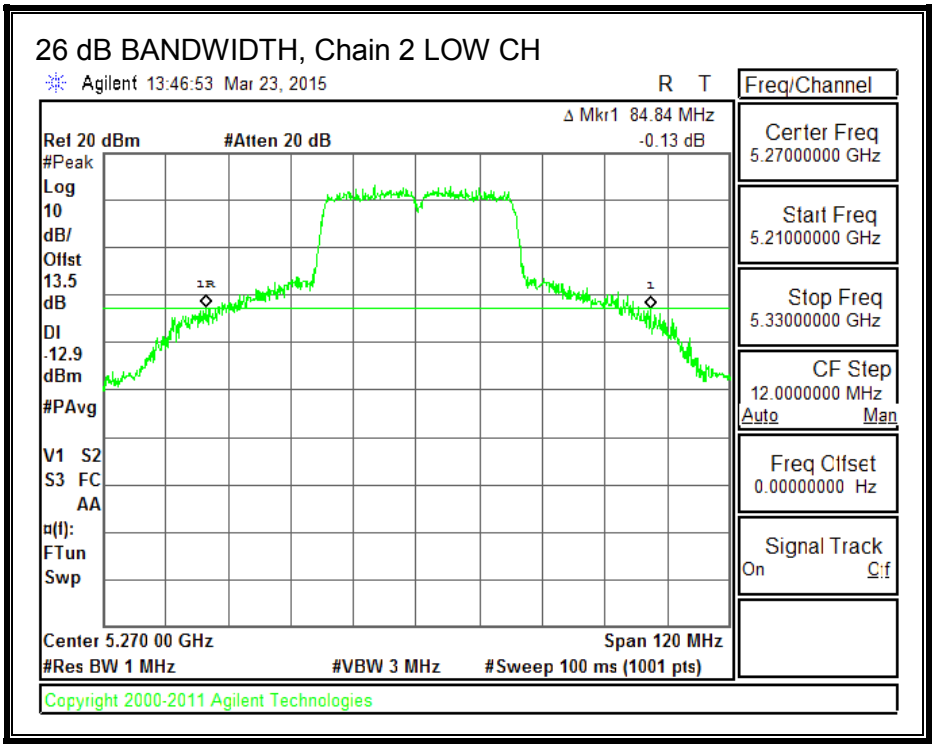


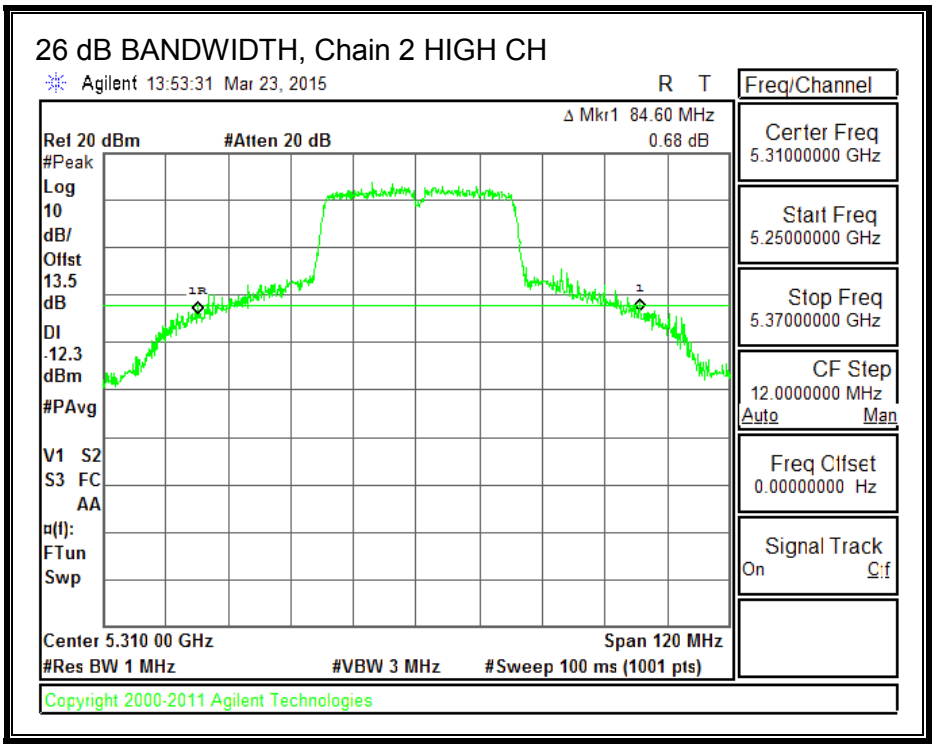
26 dB BANDWIDTH, Chain 1





26 dB BANDWIDTH, Chain 2





8.18.2. 99% BANDWIDTH

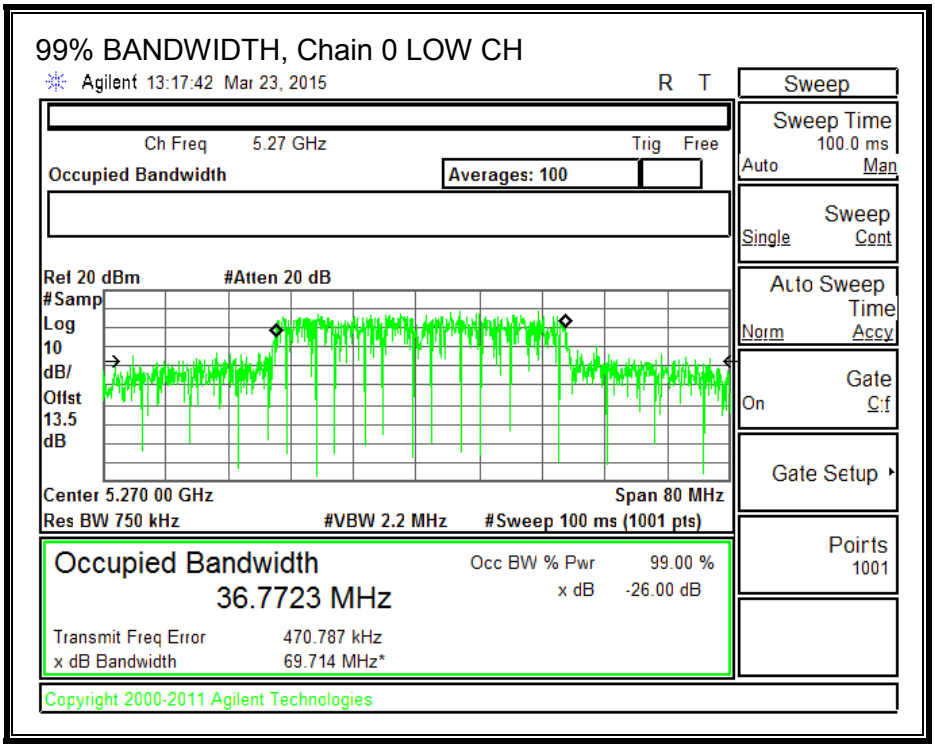
LIMITS

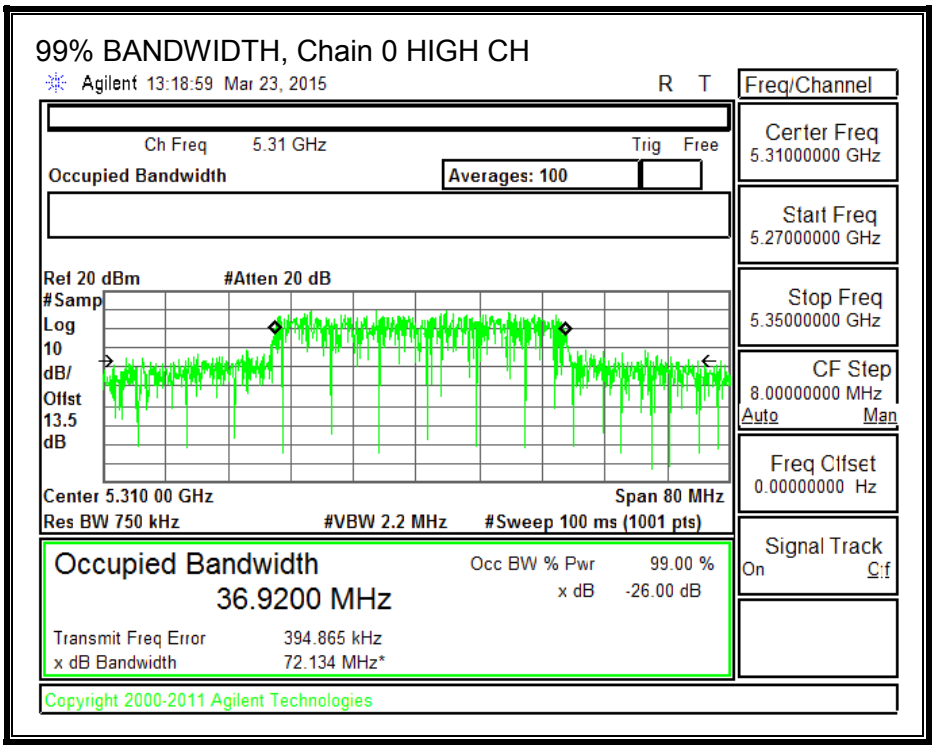
None; for reporting purposes only.

RESULTS

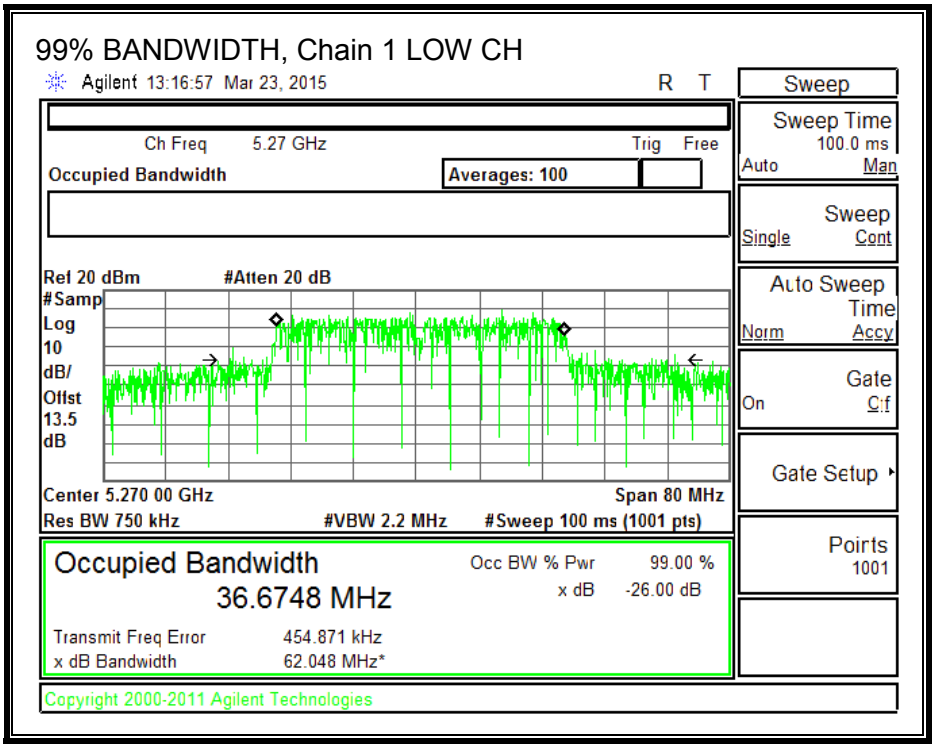
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5270	36.7723	36.6748	36.7241
High	5310	36.9200	36.6773	36.6473

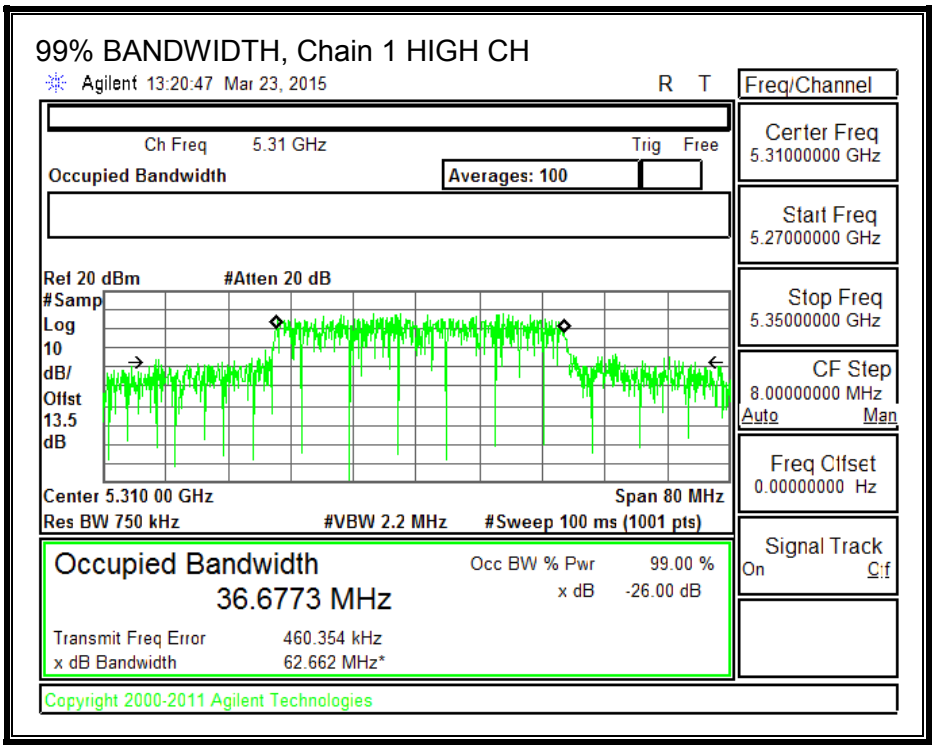
99% BANDWIDTH, Chain 0



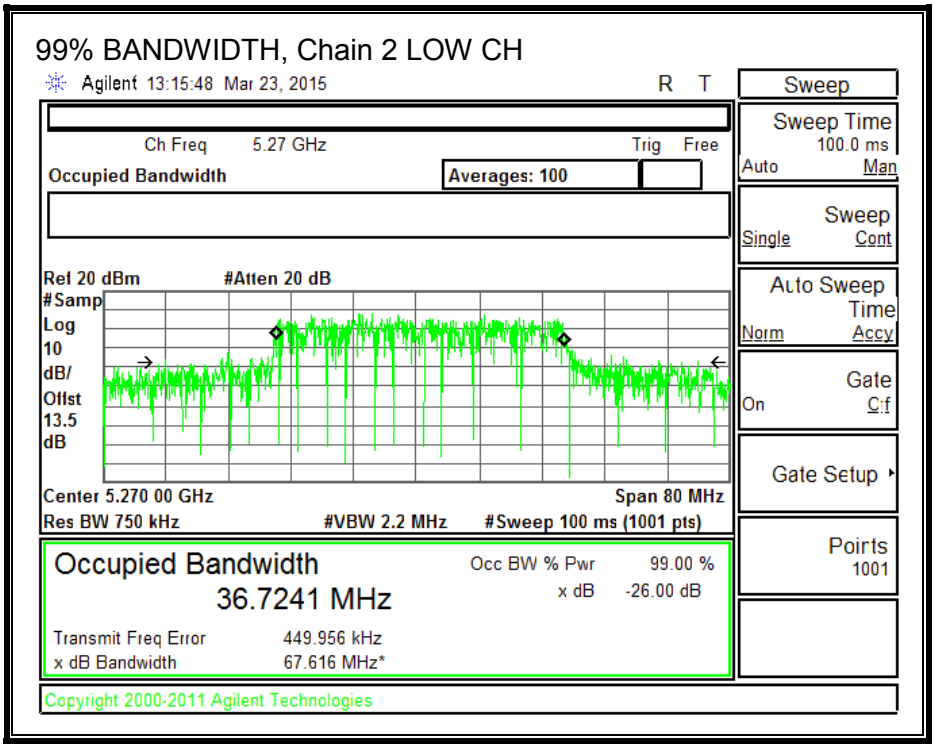


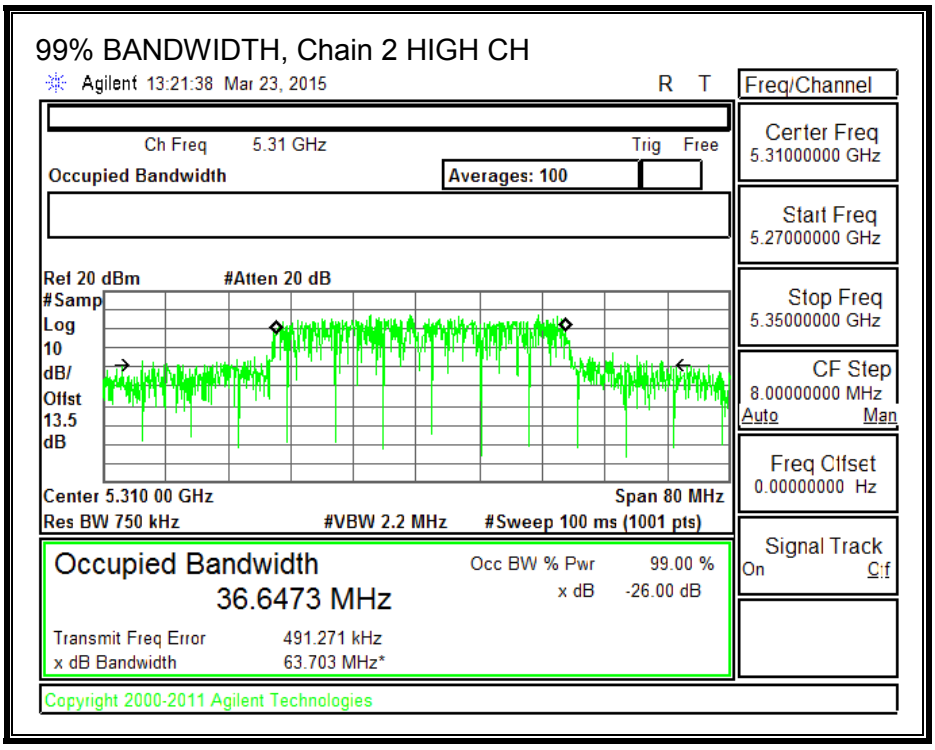
99% BANDWIDTH, Chain 1





99% BANDWIDTH, Chain 2





8.18.3. 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 the same for each chain. The directional gain is equal to the antenna gain, 5.85 dBi.

For PSD, the TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (3 chains) (dB)	Correlated Chains Directional Gain (dBi)
5.85	4.77	10.62

RESULTS

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5270	84.84	5.85	10.62	24.00	6.38
High	5310	84.60	5.85	10.62	24.00	6.38

Duty Cycle CF (dB)	0.09	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	18.90	18.78	18.52	23.51	24.00	-0.49
High	5310	10.52	11.03	10.87	15.58	24.00	-8.42

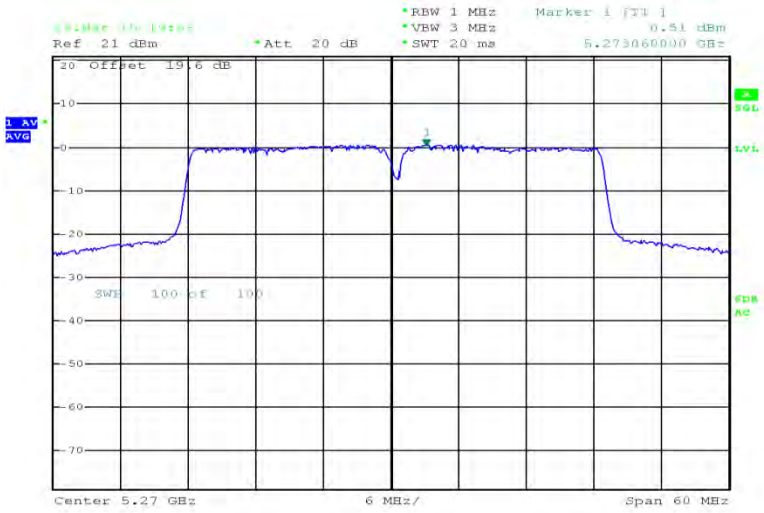
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5270	0.51	0.01	-0.46	4.90	6.38	-1.48
High	5310	0.89	0.13	-0.32	5.12	6.38	-1.26

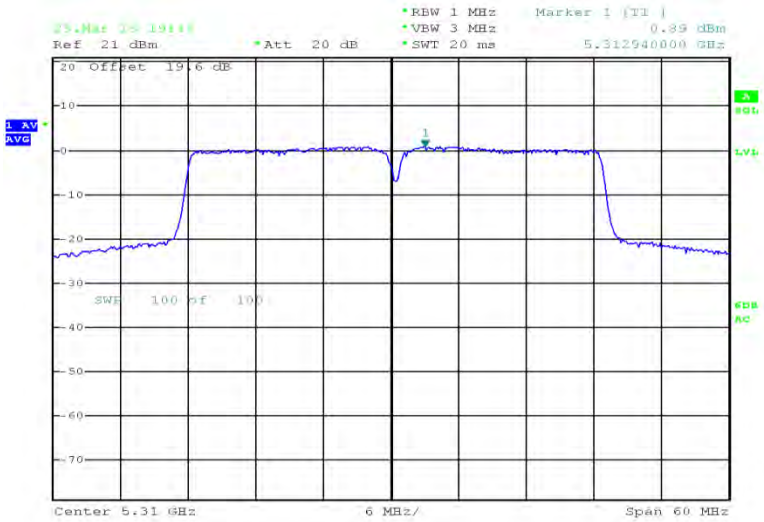
Note: the power readings above were measured with gated method, and the measurement was taken only during the ON time. No duty cycle correction was necessary.

PSD, Chain 0

PSD, Chain 0 LOW CH

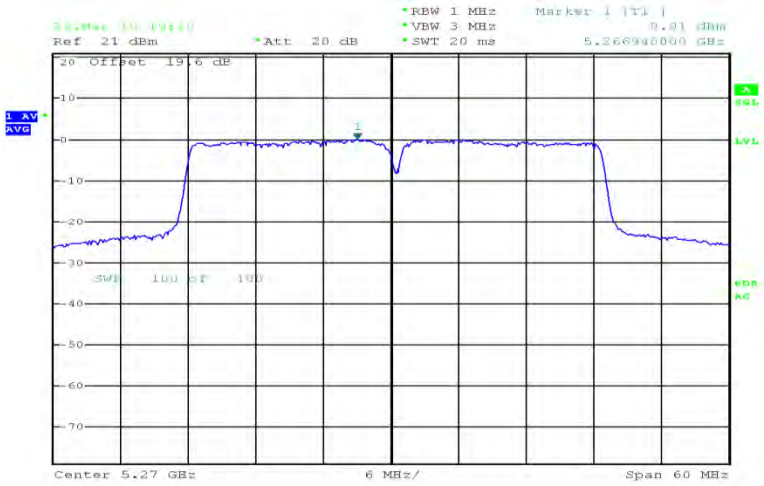


PSD, Chain 0 HIGH CH



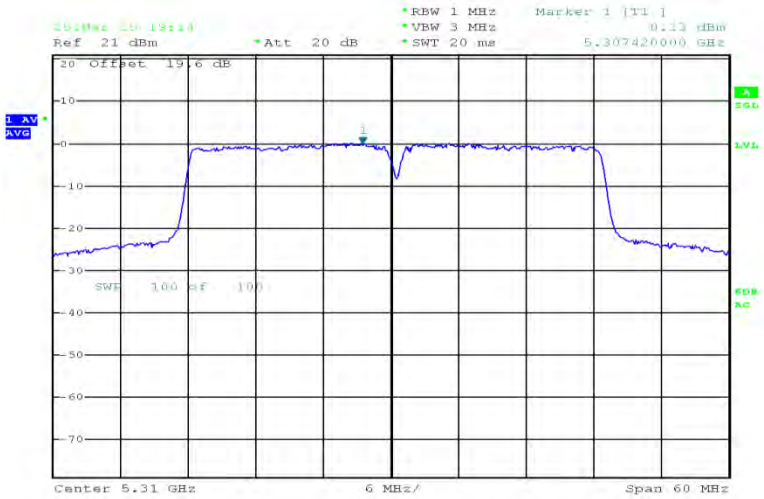
PSD, Chain 1

PSD, Chain 1 LOW CH



Date: 25.MAR.2015 19:10:15

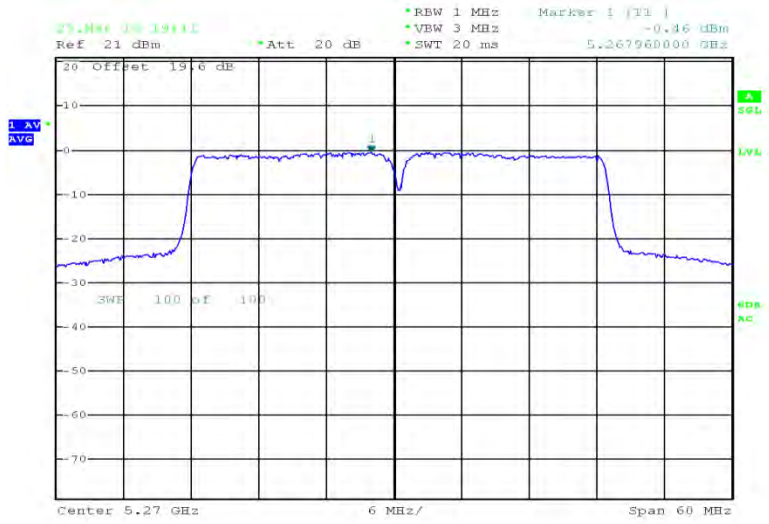
PSD, Chain 1 HIGH CH



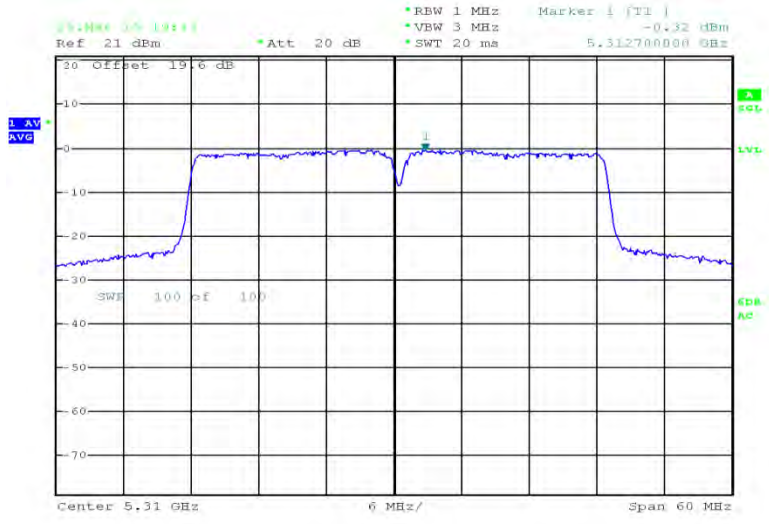
Date: 25.MAR.2015 19:14:22

PSD, Chain 2

PSD, Chain 2 LOW CH



PSD, Chain 2 HIGH CH



8.19. 802.11n HT40 TxBF 3Tx MODE IN THE 5.3 GHz BAND

8.19.1. 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 and PSD, the TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (3 chains) (dB)	Correlated Chains Directional Gain (dBi)
5.85	4.77	10.62

RESULTS

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5270	84.84	10.62	10.62	19.38	6.38
High	5310	84.60	10.62	10.62	19.38	6.38

Duty Cycle CF (dB)	0.09	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	14.15	14.20	13.98	18.88	19.38	-0.50
High	5310	10.37	10.25	9.75	14.90	19.38	-4.48

PSD Results

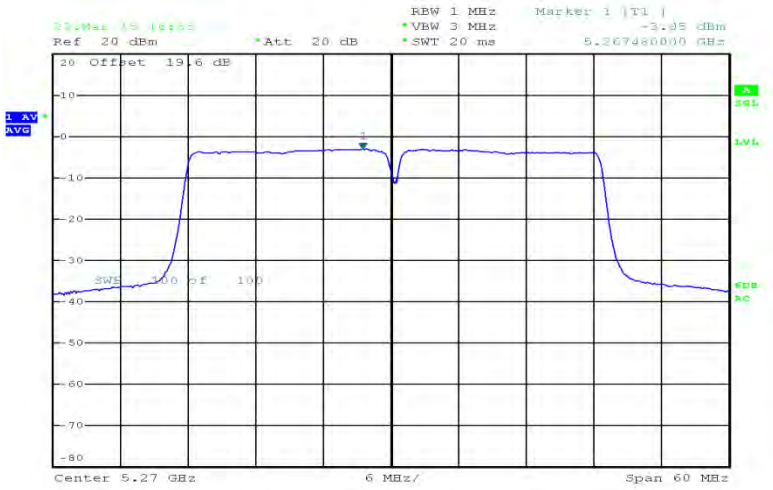
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5270	-3.05	-2.76	-3.03	1.92	6.38	-4.46
High	5310	-2.79	-2.61	-2.81	2.13	6.38	-4.25

Note: for Chains 0, 1 and 2, 26dB and 99% data and plots, see section 11n HT40 CDD 3TX MODE IN THE 5.3 GHz BAND

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.

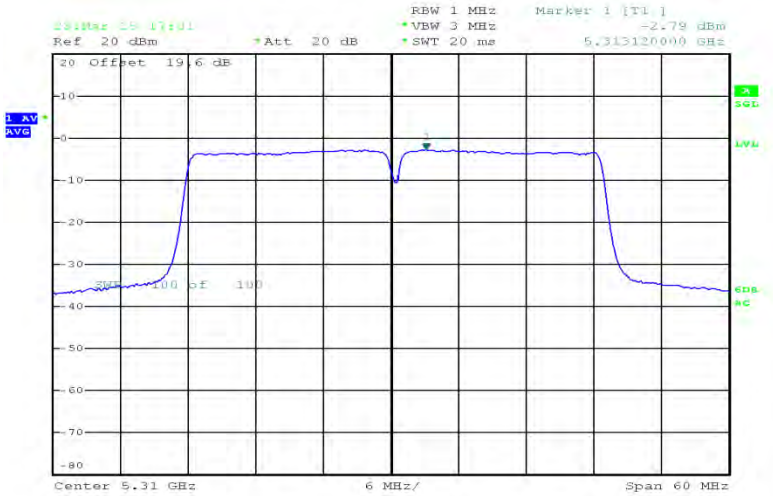
PSD, Chain 0

PSD, Chain 0 LOW CH



Date: 28.MAR.2015 16:55:17

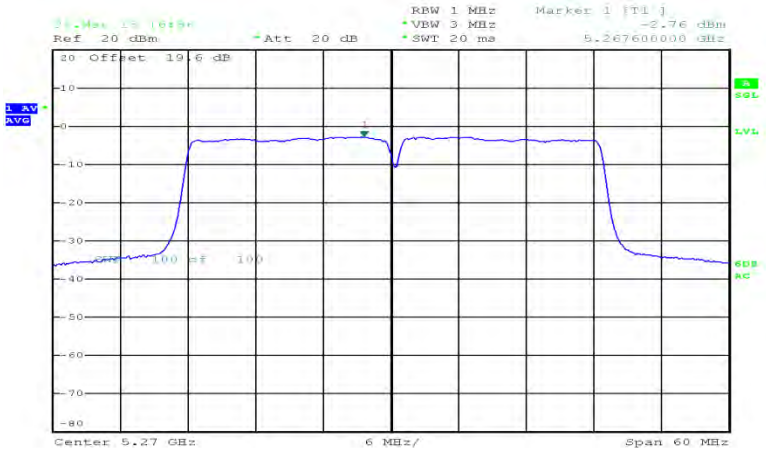
PSD, Chain 0 HIGH CH



Date: 28.MAR.2015 17:01:17

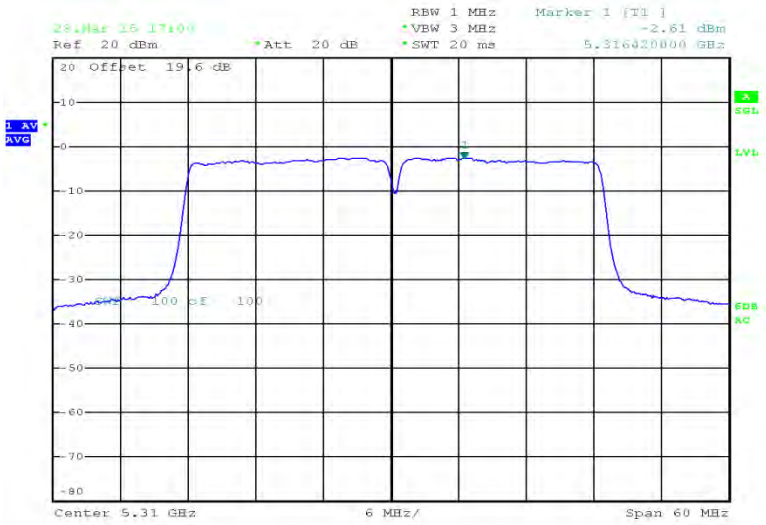
PSD, Chain 1

PSD, Chain 1 LOW CH



Date: 28.MAR.2015 16:56:55

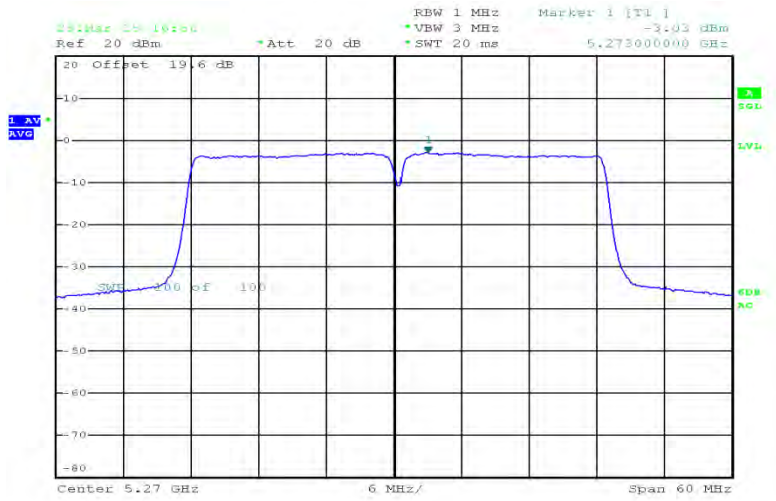
PSD, Chain 1 HIGH CH



Date: 28.MAR.2015 17:00:42

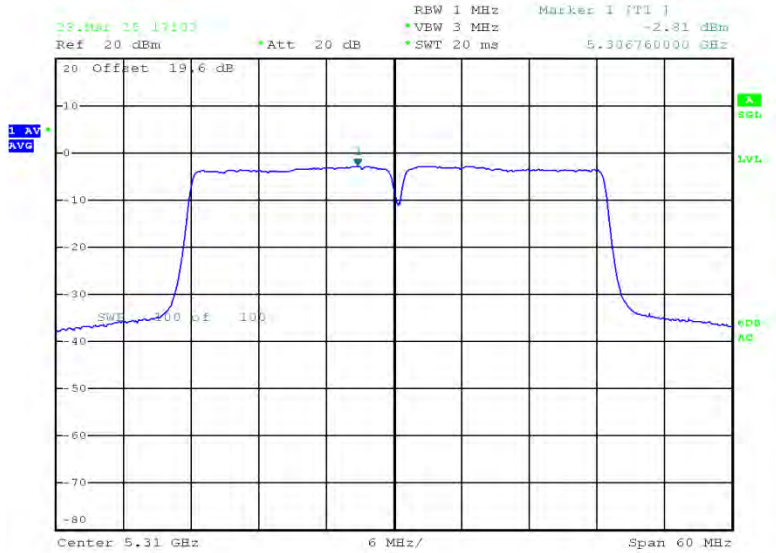
PSD, Chain 2

PSD, Chain 2 LOW CH



Date: 28.MAR.2015 16:56:16

PSD, Chain 2 HIGH CH



Date: 28.MAR.2015 17:03:02

8.20. 802.11ac VHT80 1Tx MODE IN THE 5.3 GHz BAND

8.20.1. OUTPUT POWER

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

This is SISO mode, AG is the highest (worst-case) = 5.85 dBi.

RESULTS

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Mid	5290	177.25	5.85	24.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	12.48	12.48	24.00	-11.52

Note: for Chain 0, 26dB & 99% data & plots, see section 11ac VHT80 CDD 3TX MODE IN THE 5.3 GHz BAND

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.

8.21. 802.11ac VHT80 CDD 3Tx MODE IN THE 5.3 GHz BAND

8.21.1. 26 dB BANDWIDTH

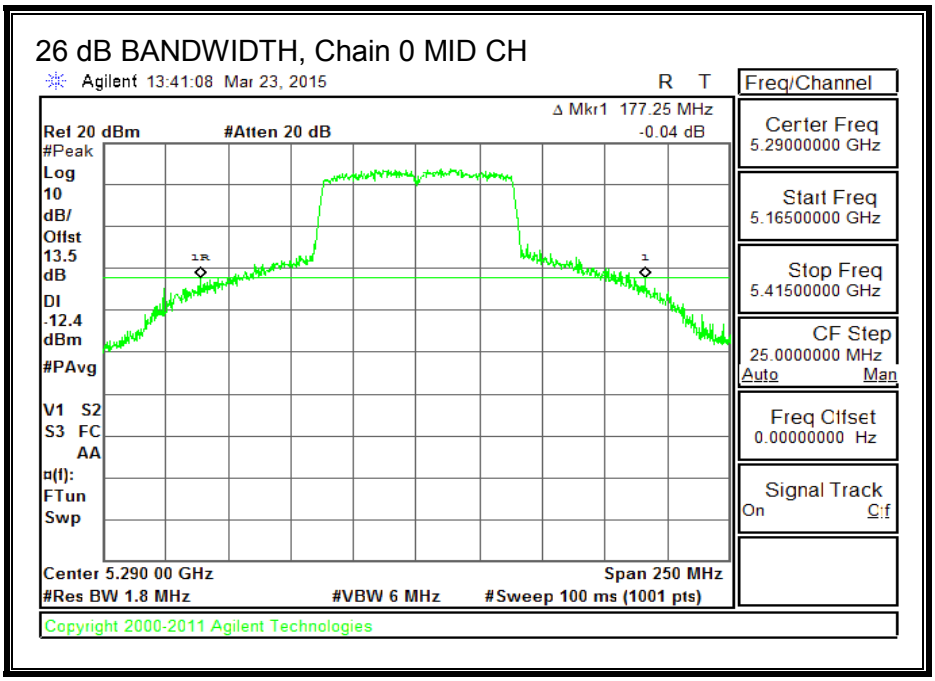
LIMITS

None; for reporting purposes only.

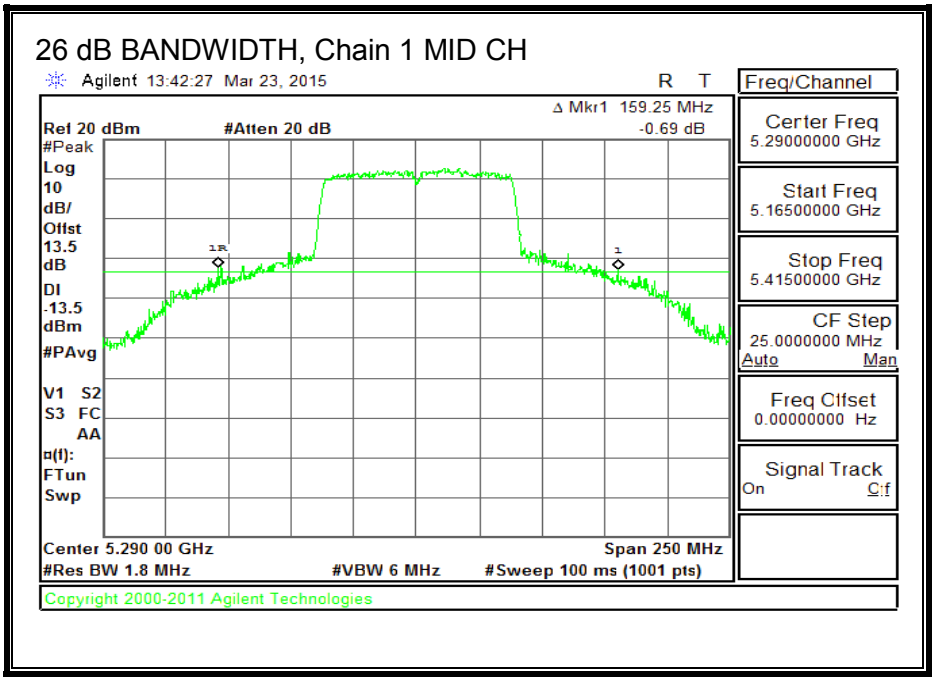
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Mid	5290	177.25	159.25	158.50

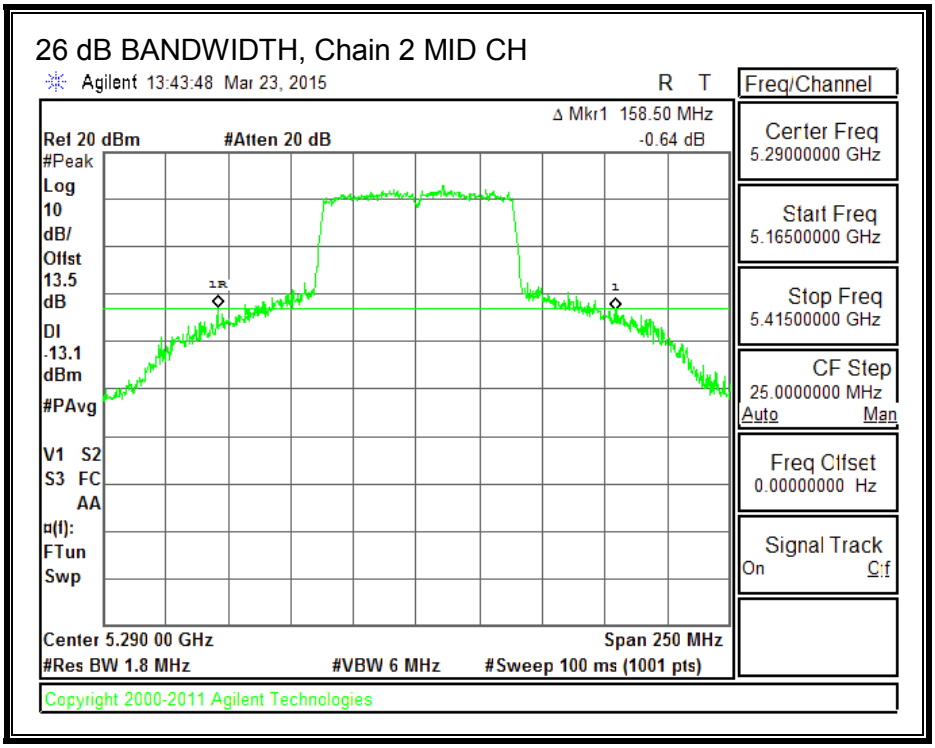
26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



8.21.2. 99% BANDWIDTH

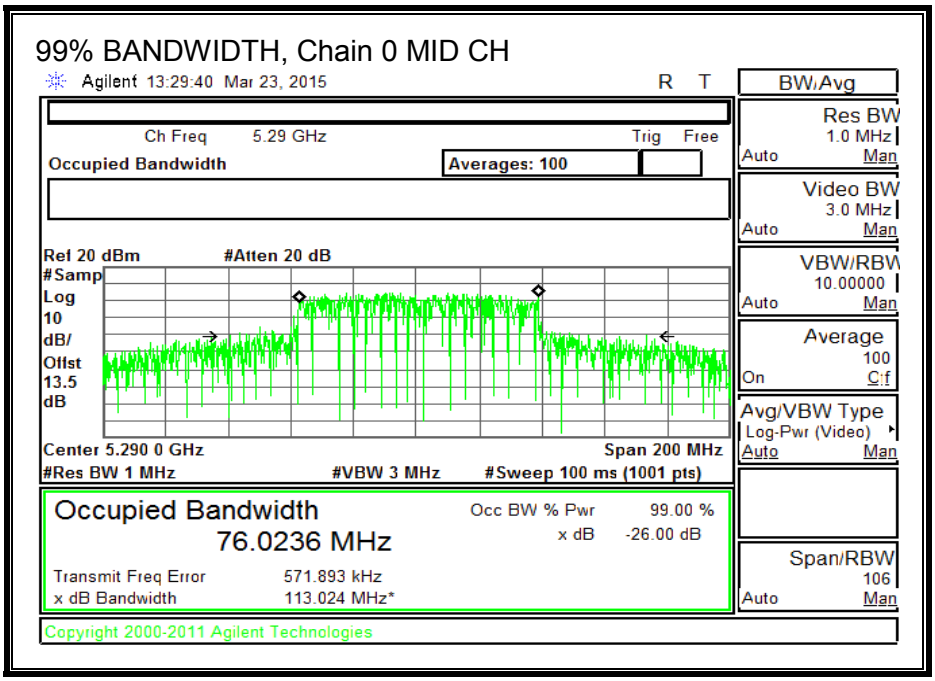
LIMITS

None; for reporting purposes only.

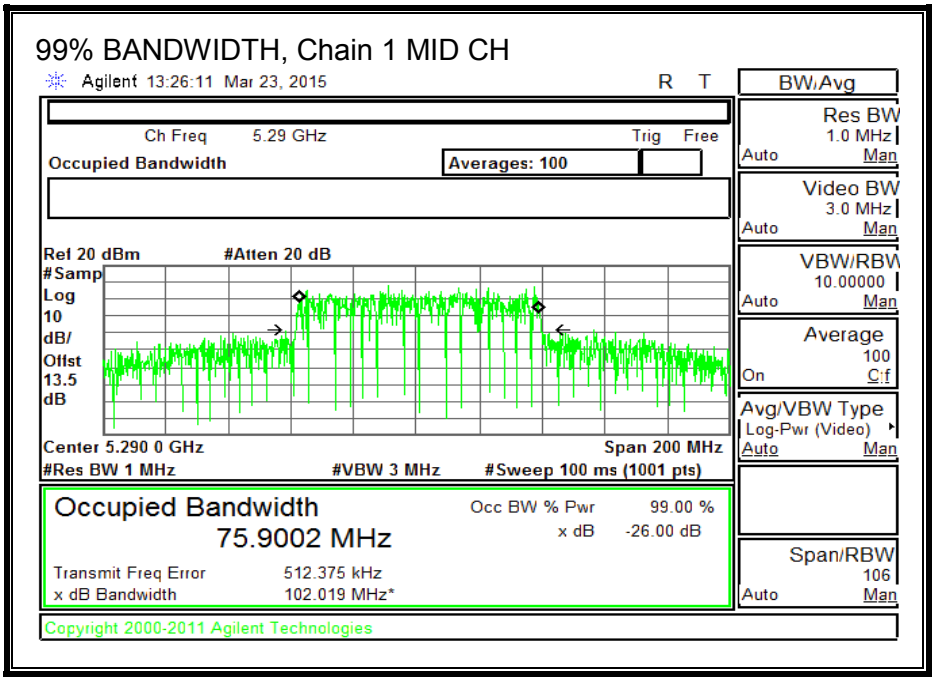
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Mid	5290	76.0236	75.9002	75.9504

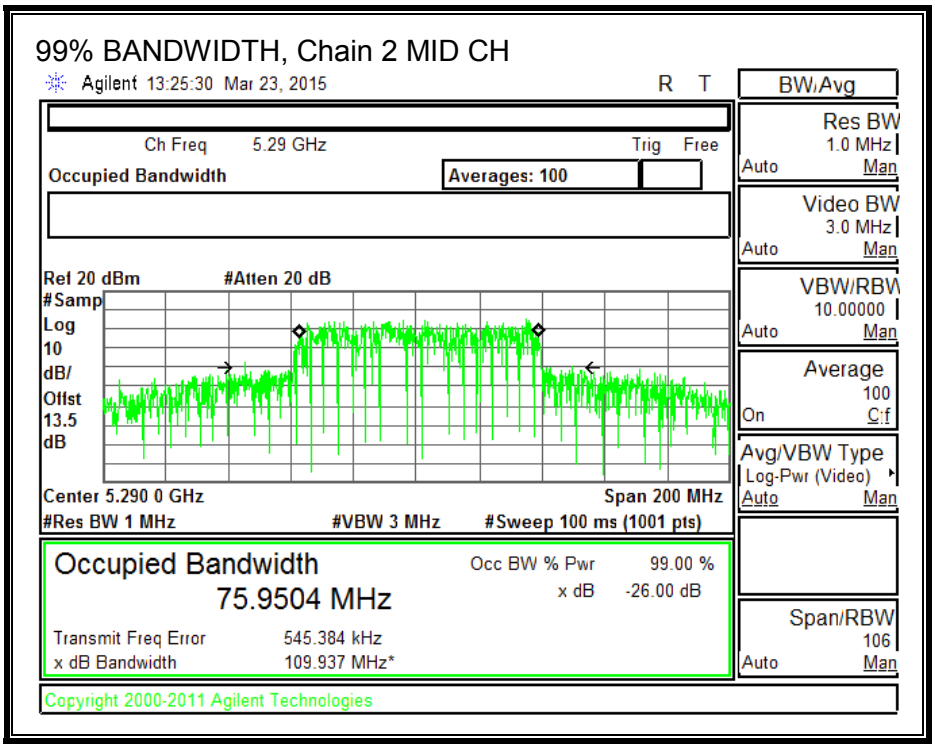
99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



8.21.3. 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 the same for each chain. The directional gain is equal to the antenna gain, 5.85 dBi.

For PSD, The TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (3 chains) (dB)	Correlated Chains Directional Gain (dBi)
5.85	4.77	10.62

RESULTS

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5290	158.50	5.85	10.62	24.00	6.38

Duty Cycle CF (dB)	0.18	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	9.28	9.30	9.64	14.18	24.00	-9.82

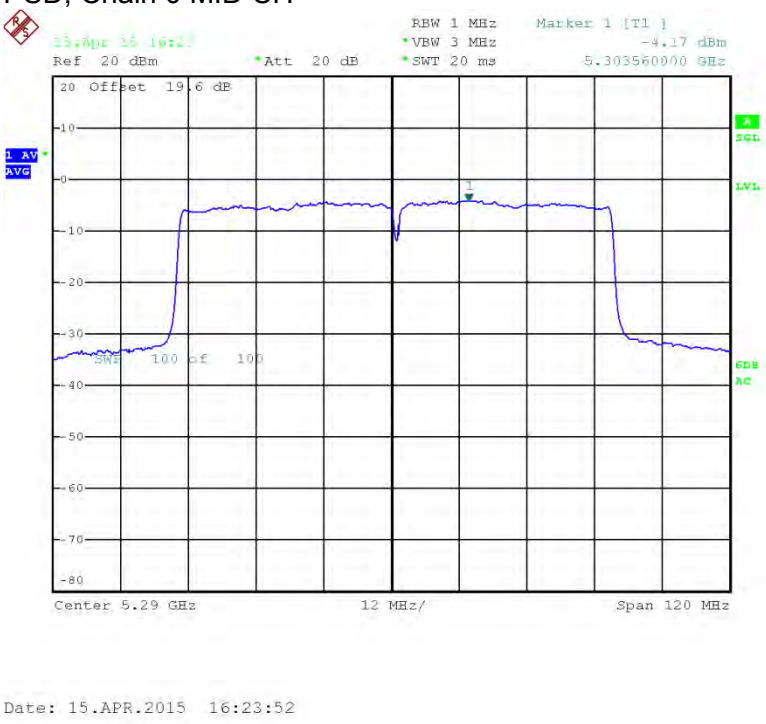
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5290	-4.17	-3.90	-4.34	0.82	6.38	-5.56

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.

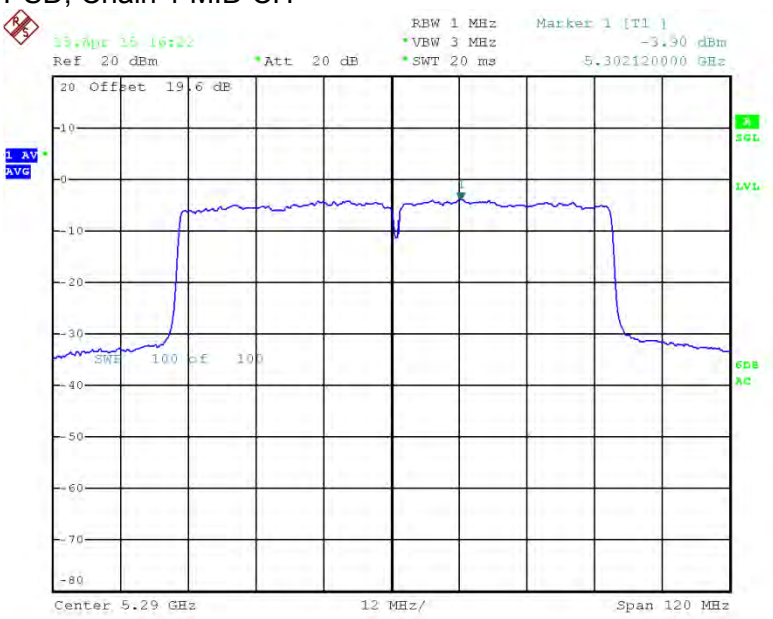
PSD, Chain 0

PSD, Chain 0 MID CH



PSD, Chain 1

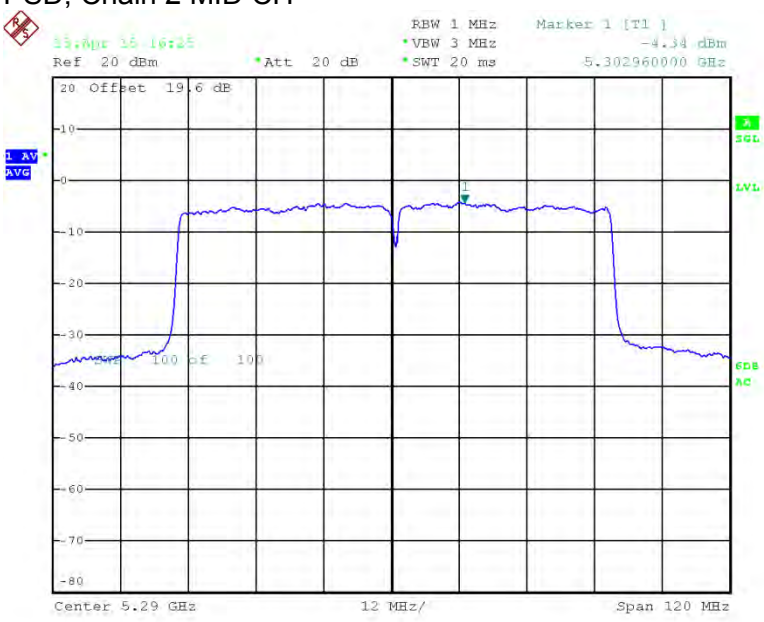
PSD, Chain 1 MID CH



Date: 15.APR.2015 16:22:27

PSD, Chain 2

PSD, Chain 2 MID CH



Date: 15.APR.2015 16:25:42

8.22. 802.11ac VHT80 TxBF 3Tx MODE IN THE 5.3 GHz BAND

8.22.1. 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 and PSD, the TX chains are correlated and the antenna gain is the same for each chain. The directional gain is:

Antenna Gain (dBi)	10 * Log (3 chains) (dB)	Correlated Chains Directional Gain (dBi)
5.85	4.77	10.62

RESULTS

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5290	158.50	10.62	10.62	19.38	6.38

Duty Cycle CF (dB)	0.18	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	11.55	11.51	10.84	16.08	19.38	-3.30

PSD Results

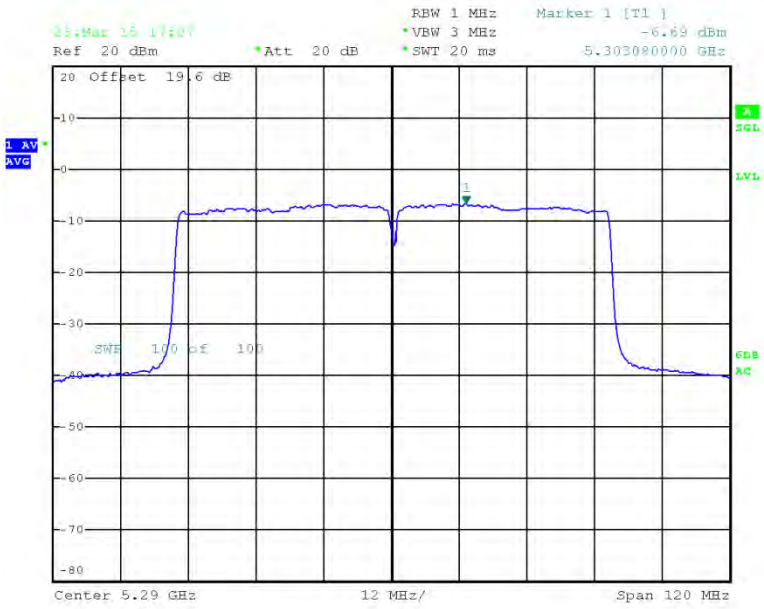
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Chain 2 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5290	-6.69	-6.08	-6.34	-1.41	6.38	-7.79

Note: for Chains 0, 1 and 2, 26dB & 99% data & plots, see section 11ac VHT80 CDD 3TX MODE IN THE 5.3 GHz BAND

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.

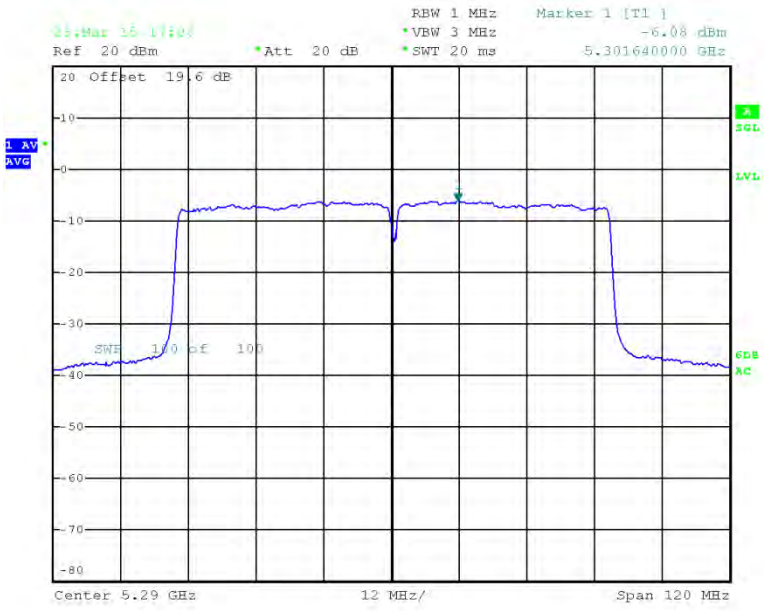
PSD, Chain 0

PSD, Chain 0 MID CH



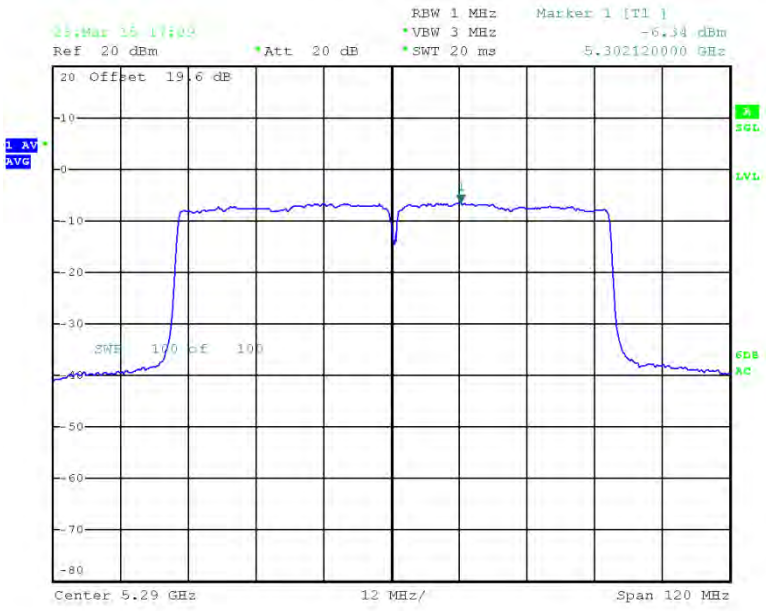
PSD, Chain 1

PSD, Chain 1 MID CH



PSD, Chain 2

PSD, Chain 2 MID CH



8.23. 802.11a LEGACY MODE IN THE 5.6 GHz BAND

8.23.1. 26 dB BANDWIDTH

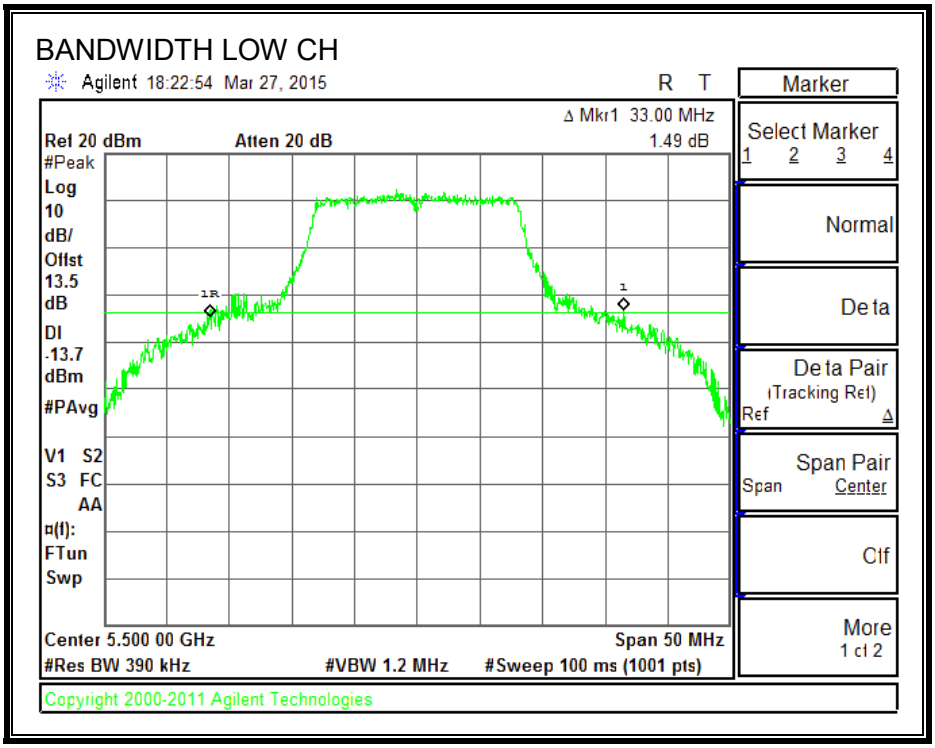
LIMITS

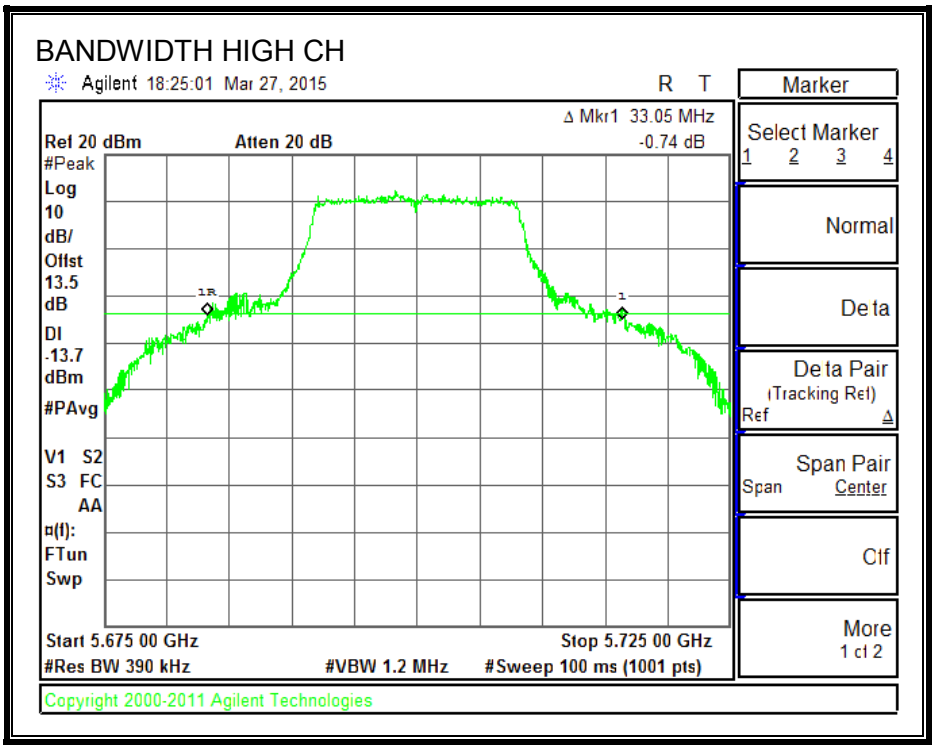
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	33.00
High	5700	33.05

26 dB BANDWIDTH





8.23.2. 99% BANDWIDTH

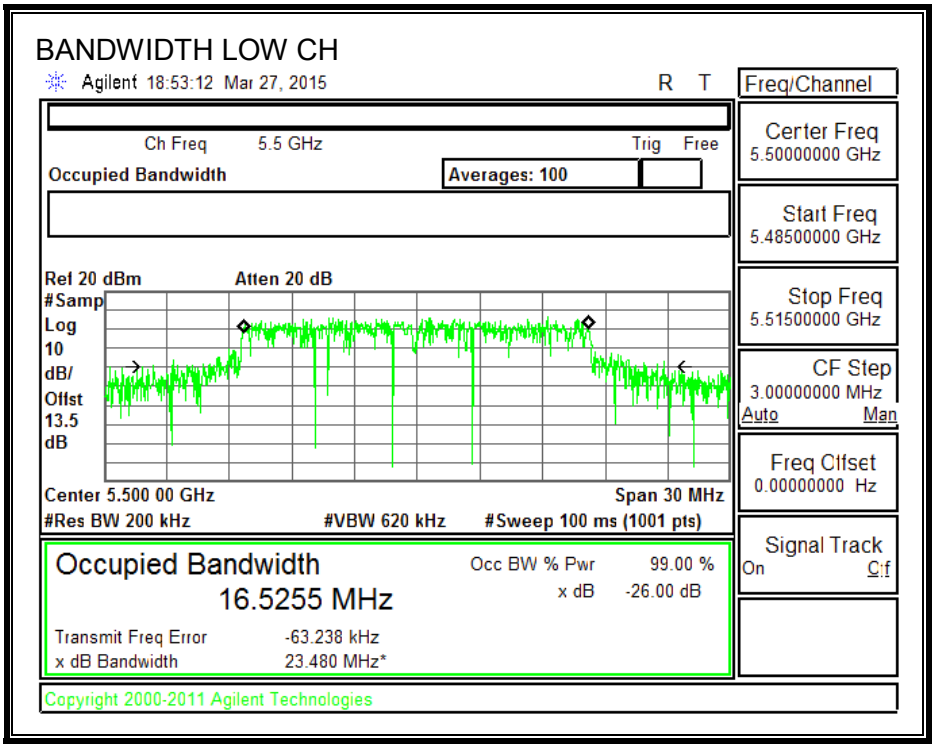
LIMITS

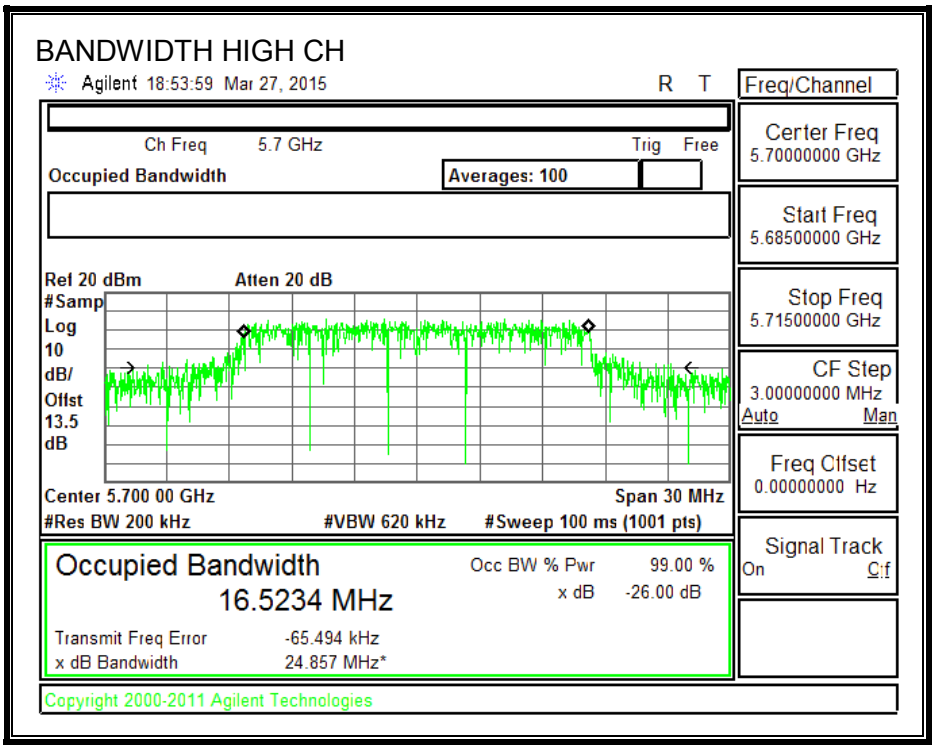
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.5255
High	5700	16.5234

99% BANDWIDTH





8.23.3. OUTPUT POWER AND PSD

LIMITS

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

This is SISO mode, AG is the highest (worst-case) = 6.21 dBi

RESULTS

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	33.00	6.21	23.79	10.79
High	5700	33.50	6.21	23.79	10.79

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

Output Power Results

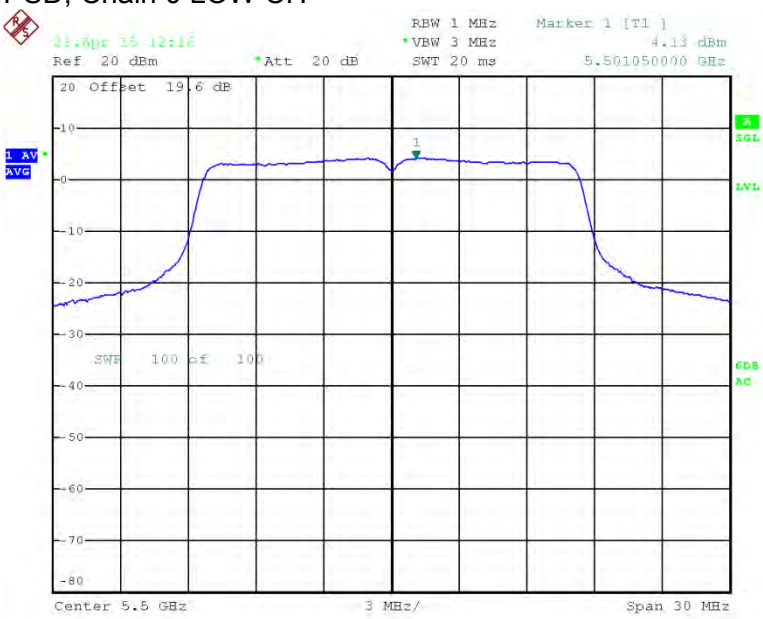
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	18.34	18.34	23.79	-5.45
High	5700	18.52	18.52	23.79	-5.27

PSD Results

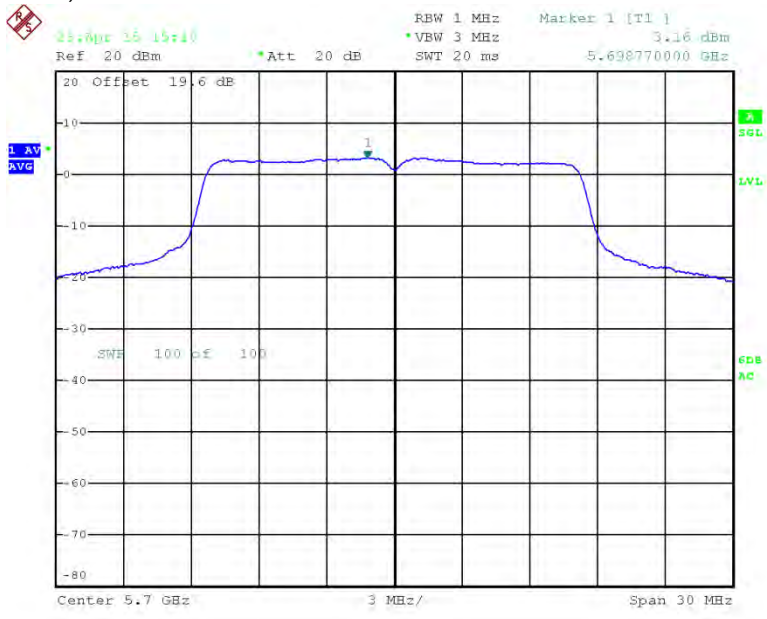
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	4.13	4.13	10.79	-6.66
High	5700	3.16	3.16	10.79	-7.63

PSD, Chain 0

PSD, Chain 0 LOW CH



PSD, Chain 0 HIGH CH



8.24. 802.11n HT20 CDD 3Tx MODE IN THE 5.6 GHz BAND

8.24.1. 26 dB BANDWIDTH

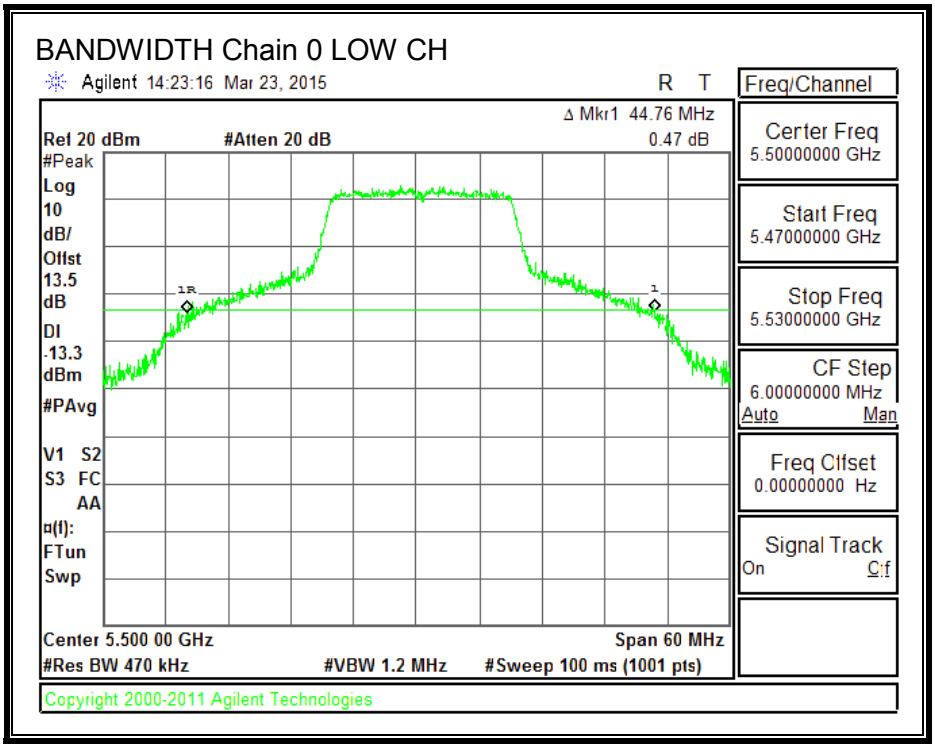
LIMITS

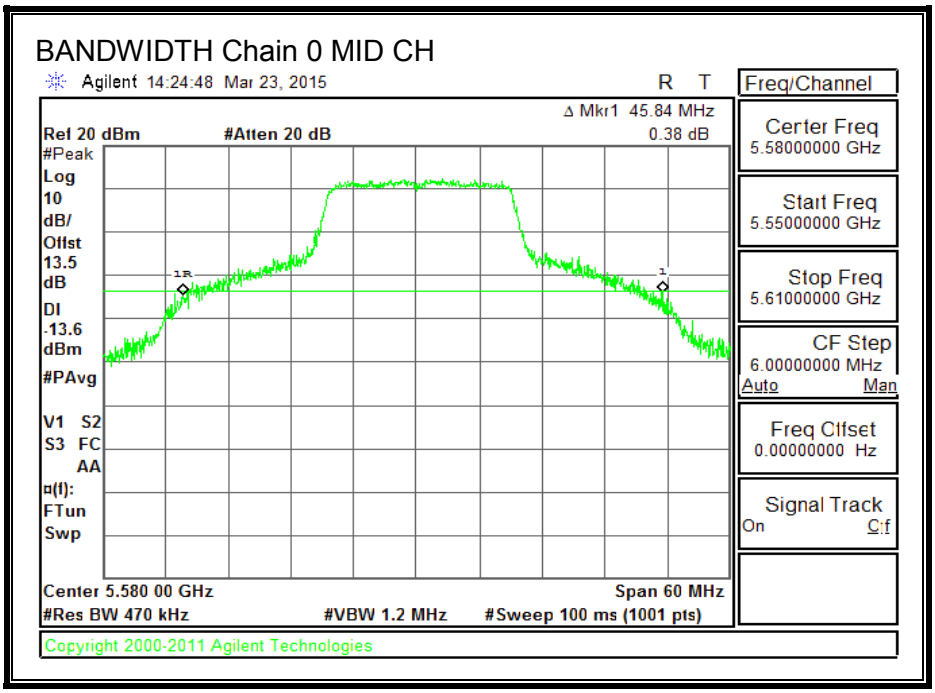
None; for reporting purposes only.

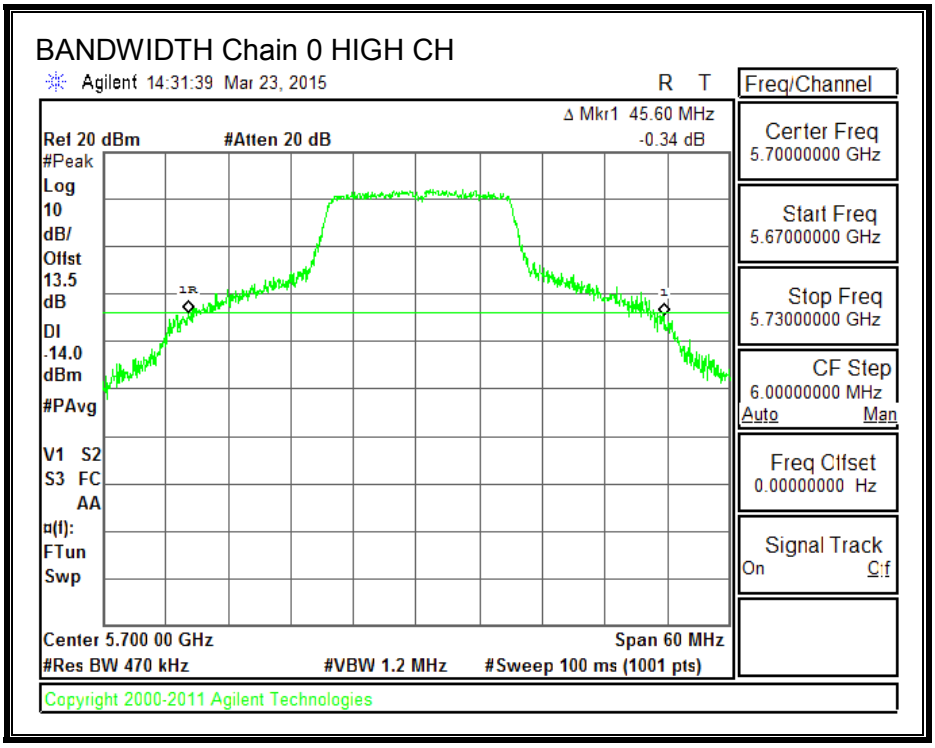
RESULTS

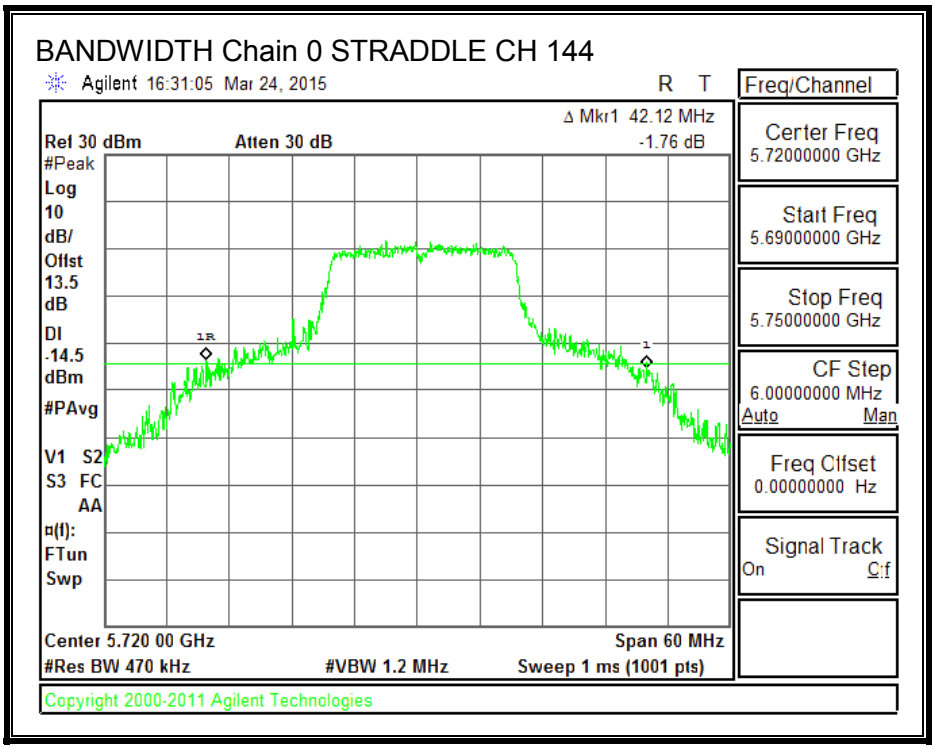
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5500	44.76	42.84	46.32
Mid	5580	45.84	45.00	45.00
High	5700	45.60	44.22	46.26
144	5720	42.12	35.34	41.34

26 dB BANDWIDTH, Chain 0









26 dB BANDWIDTH, Chain 1