



**FCC CFR47 PART 15 SUBPART E
INDUSTRY CANADA RSS-210 ISSUE 8**

CERTIFICATION TEST REPORT

FOR

802.11a/b/g/n WLAN + Bluetooth PCI-E Custom Combination Card

MODEL NUMBER: BCM94331CSAX

**FCC ID: QDS-BRCM1062
IC: 4324A-BRCM1062**

REPORT NUMBER: 11U14154-7

ISSUE DATE: JANUARY 31, 2012

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NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	01/31/12	Initial Issue	F. Ibrahim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE, CA 94086, USA

EUT DESCRIPTION: 802.11a/b/g/n WLAN + Bluetooth PCI-E Custom
Combination Card

MODEL: BCM94331CSAX

SERIAL NUMBER: C861475004JDNP60X, C86139600XCDNP60J,
C86145004BDNP60

DATE TESTED: DECEMBER 28, 2011- JANUARY 30, 2012

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart E	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 9	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

Compliance Certification Services (UL CCS) 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 CCS 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS 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.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

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

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

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

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/b/g/n WLAN + Bluetooth PCI-E Custom Combination Card.

The radio module is manufactured by Broadcom.

5.2. MAXIMUM OUTPUT POWER

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

5.2GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.2 GHz band, 1x3			
5180 - 5240	802.11a	15.29	33.81
5190 - 5230	802.11n HT40	16.42	43.85
5.2 GHz band, 2x3 HT20 MODE			
5180 - 5240	STBC MCS0	14.87	30.69
5.2 GHz band, 3x3 HT20 MODE			
5180 - 5240	STBC MCS0	14.94	31.19
5180 - 5240	SDM MCS21	15.03	31.84
5.2 GHz band, 2x3 HT40 MODE			
5190-5230	CDD MCS0	13.63	23.07
5.2 GHz band, 3x3 HT40 MODE			
5190-5230	STBC MCS0	16.51	44.77
5190-5230	SDM MCS21	16.53	44.98

5.3 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.3 GHz band, 1x3			
5260 - 5320	802.11a	19.55	90.16
5270 - 5310	802.11n HT40	18.63	72.95
5.3 GHz band, 3x3 HT20 MODE			
5260 - 5320	CDD MCS0	18.57	71.94
5260 - 5320	SDM MCS21	21.92	155.60
5.3 GHz band, 3x3 HT40 MODE			
5270 - 5310	CDD MCS0	19.94	98.63
5270 - 5310	SDM MCS21	23.13	205.59

5.6 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.6 GHz band, 1x3			
5500-5700	802.11a	19.10	81.28
5510-5670	802.11n HT40	19.66	92.47
5.6 GHz band, 3x3 HT20 MODE			
5500-5700	CDD MCS0	18.60	72.44
5500-5700	SDM MCS21	21.89	154.53
5.6 GHz band, 3x3 HT40 MODE			
5510-5670	CDD MCS0	19.57	90.57
5510-5670	SDM MCS21	23.51	224.39

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

FCC/IC/NCC FMA - BCM94331CSAX FCC ID: QDS-BRCM1062 IC ID: 4324A-BRCM1062								
No.	Antenna Manufacturer	Antenna Type	Model	Peak gain @ 2412, 2422, 2432MHz,	Peak gain (5150-5250MHz)	Peak gain (5250-5350MHz) @5320MHz	Peak gain (5470-5725MHz) @5500,	Peak gain (5725-5850MHz) @5785,
1	Amphenol/Molex	802.11abgn WLAN Antenna	604-2961 Wi-Fi1	1.42	5.94	5.05	4.07	3.52
1	Amphenol/Molex	802.11abgn WLAN/BT Antenna	604-2961 Wi-Fi2 & Bluetooth	4.97	6.41	6.56	6.39	6.01
1	Amphenol/Molex	802.11abgn WLAN Antenna	604-2961 Wi-Fi3	3.93	2.38	3.01	4.09	3.59
			Composite 2x2	7.49	9.19	8.88	8.40	7.976724045
			Composite 3x3	8.45	10.01	9.88	9.76	9.31

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Broadcom, rev. 5.106.98.42.
 The test utility software used during testing was BCM Internal, rev. 5.106.RC98.42.

5.5. 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.

Worst-Case data rates were utilized from preliminary testing of the Chipset, worst-case data rates used during the testing are as follows:

For 5GHz Band:

All final tests in the 802.11a Legacy mode were made at 6 Mb/s.

All final tests in the 802.11n 20 MHz CDD/SDM mode were made at MCS0.

All final tests in the 802.11n 40 MHz CDD/SDM mode were made at MCS0.

Worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was the mode and channel with the highest output power.

For radiated band edge measurements preliminary testing showed that the worst case was vertical polarization, so final measurements were performed with vertical polarization.

All legacy modes were measured with the highest gain for each type of antenna.

All MIMO modes were measured with the highest combination of gains for each type of antenna. Note that this combination of antennas will not be implemented in the end product. This combination was selected for testing purposes only, to accommodate the highest gain of each antenna type in one single test configuration. The combined gain of this test configuration is higher than any combined gain that will be implemented in the end product.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	G560	CBU4495773	DoC
Laptop	Lenovo	G560	CBU4473193	DoC
Laptop	Apple	MacBook Air	C02GT12HDJYD	DoC
AC Adapter	Lenovo	ADP-65KH B	11S36001646ZZ1000AD9Y1	DoC
AC Adapter	Lenovo	PA-1650-56LC	11S36001651ZZ40008B9YU	DoC
AC Adapter	Apple	A1374	N/A	DoC
Adapter Board	Catalyst	MINI2EXP	BRCM 2011-03	N/A
Adapter Board	Catalyst	MINI2EXP	BRCM 2011-04	N/A
Adapter Board	Broadcom	BCM94331CSMFG	1458923	N/A
Adapter Board	Broadcom	BCM94331CSMFG	1458963	N/A

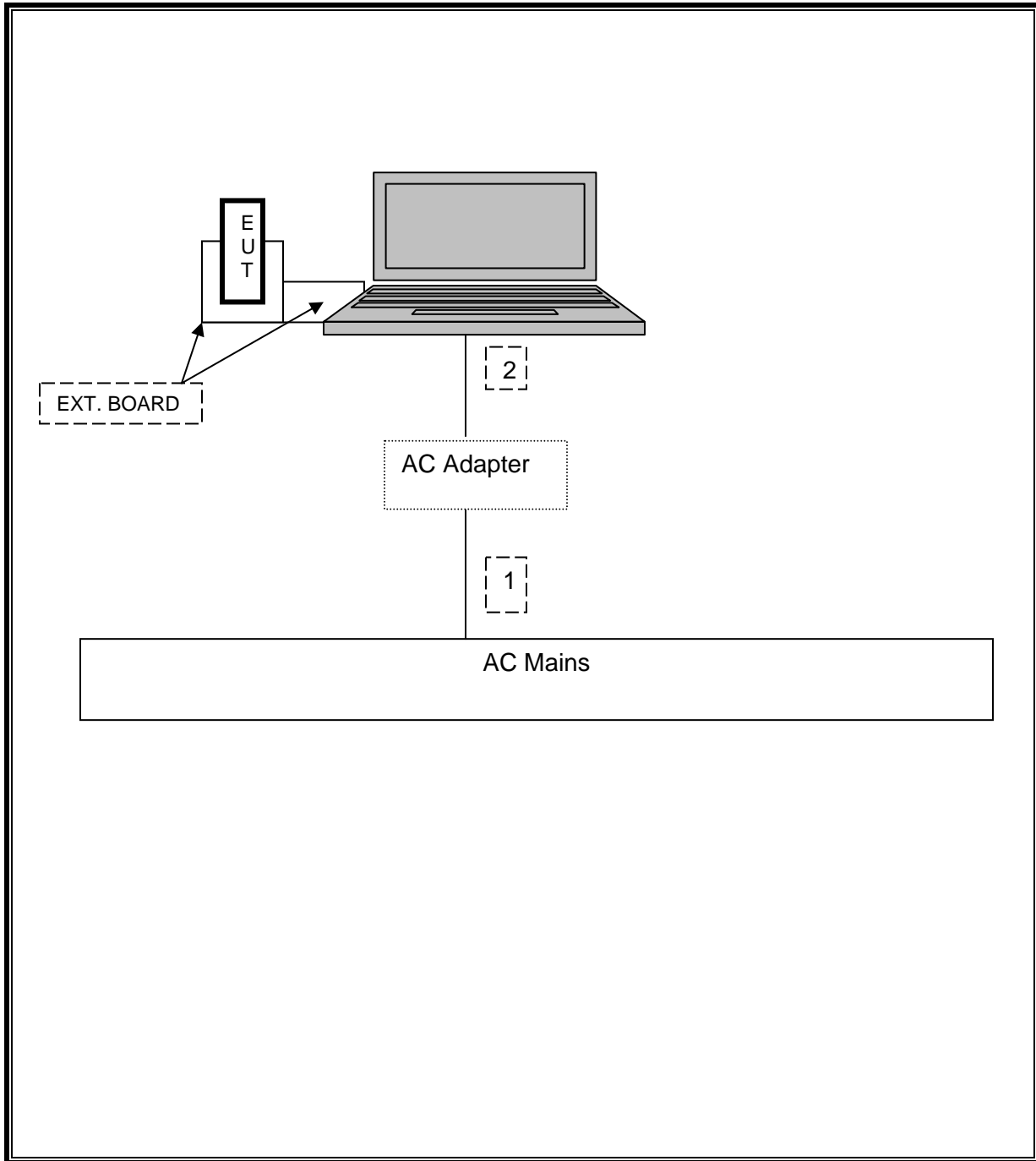
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US 115V	Un-Shielded	1.5m	NA
2	DC	1	DC	Un-Shielded	1.5m	Ferrite at laptop's end

TEST SETUP

The EUT is attached to a jig board which is installed in the PCMCIA slot of a host laptop computer during the tests. Test software exercised the radio card.

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	Asset	Cal Date	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	09/02/11	09/02/12
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	07/06/11	07/06/12
P-Series single channel Power Meter	Agilent / HP	N1911A		08/04/11	08/04/12
Peak / Average Power Sensor	Agilent / HP	E9323A		08/04/11	08/04/12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	07/16/11	07/16/12
Antenna, Horn, 18 GHz	EMCO	3115	C00872	09/20/11	09/20/12
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	07/28/11	07/28/12
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	01/27/11	01/27/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	07/18/11	07/18/12
Antenna, Horn, 40 GHz	ARA	MWH-2640/B	C00981	06/14/11	06/14/12
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/02/11	08/02/12
LISN, 30 MHz	FCC	50/250-25-2	C00626	12/13/11	12/13/12

7. ANTENNA PORT TEST RESULTS

7.1. DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

7.1.1. DUTY CYCLE AND ON TIME RESULTS

Mode	ON Time B (usec)	OFF Time (usec)	Period (usec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (Hz)
802.11a 20 MHz	1925	150	2075	0.928	92.8%	0.33	519
802.11n HT20 CDD MCS0	1908	25	1933	0.987	98.7%	0.06	524
802.11n HT20 STBC MCS0	1767	200	1967	0.898	89.8%	0.47	566
802.11n HT20 SDM MCS21	106	25	132	0.808	80.8%	0.93	9,398
11n HT40 SISO	873	15	888	0.983	98.3%	0.07	1,145
802.11n HT40 STBC MCS0	833	292	1125	0.741	74.1%	1.30	1,200
802.11n HT40 SDM MCS21	63	323	387	0.164	16.4%	7.86	15,790

7.1.2. MEASUREMENT METHOD FOR POWER AND PPSD

The Duty Cycle is greater than or equal to 98% therefore KDB 789033 Method SA-1 is used.

The Duty Cycle is greater than or equal to 98% therefore KDB 789033 Method SA-1 Alternative is used.

The Duty Cycle is less than 98% and consistent therefore KDB 789033 Method SA-2 is used.

The Duty Cycle is less than 98% and consistent therefore KDB 789033 Method SA-2 Alternative is used.

The Duty Cycle is less than 98% and not consistent therefore KDB 789033 Method SA-3 Alternative with Power RMS Averaging is used.

7.1.3. MEASUREMENT METHOD FOR AVG EMISSIONS ABOVE 1 GHz

The Duty Cycle is greater than or equal to 98%, KDB 789033 Method AD with Power RMS Averaging is used.

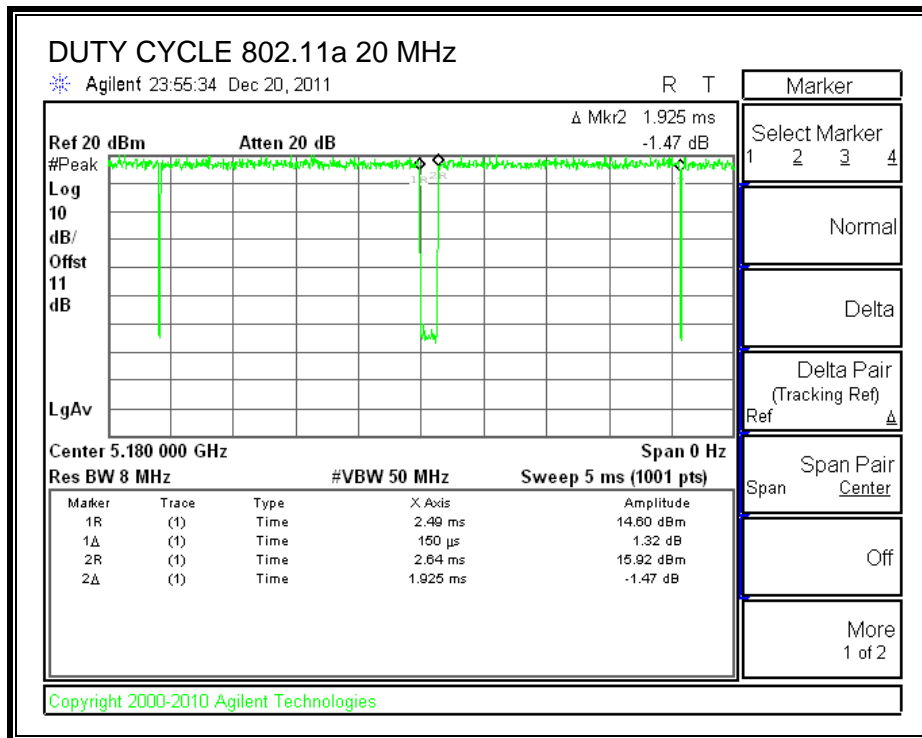
The Duty Cycle is greater than or equal to 98%, KDB 789033 Method VB with Power RMS Averaging is used.

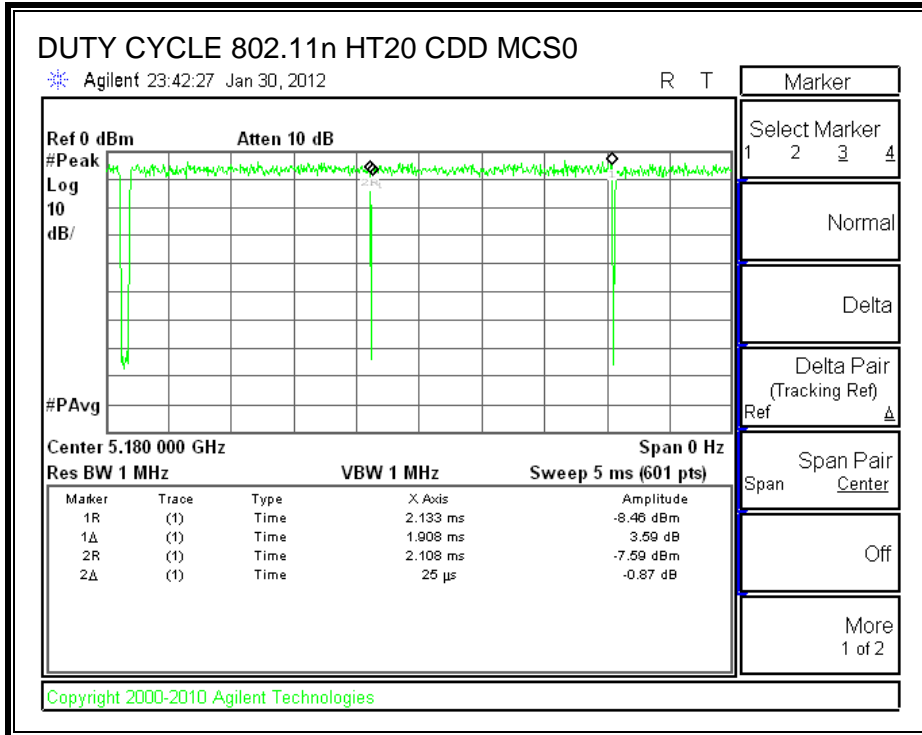
The Duty Cycle is less than 98% and consistent, KDB 789033 Method AD with Power RMS Averaging and duty cycle correction is used.

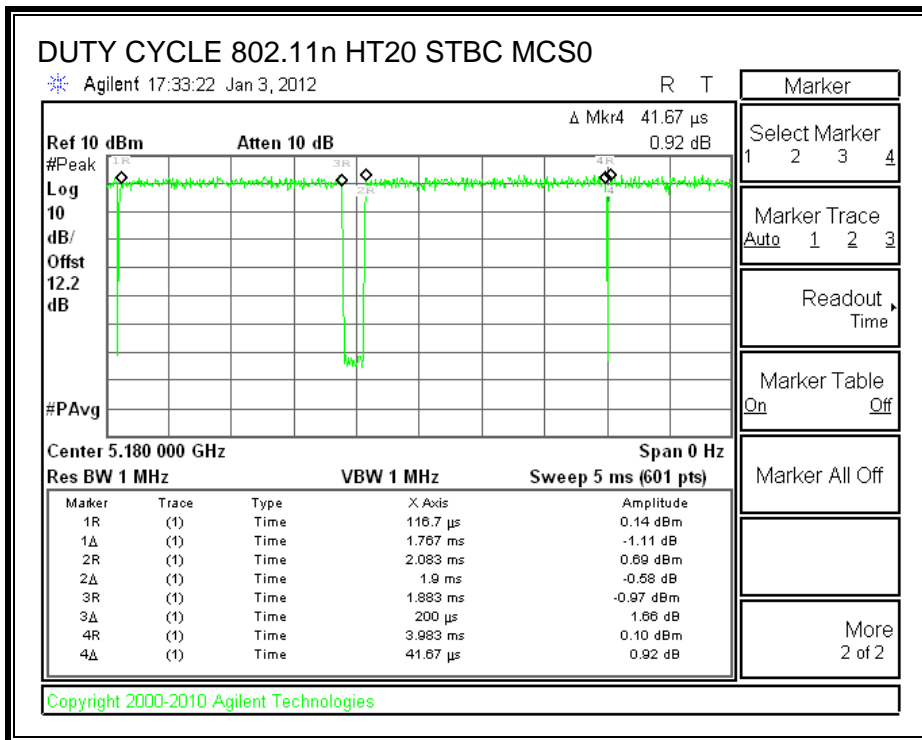
The Duty Cycle is less than 98% and consistent, KDB 789033 Method VB with Power RMS Averaging is used.

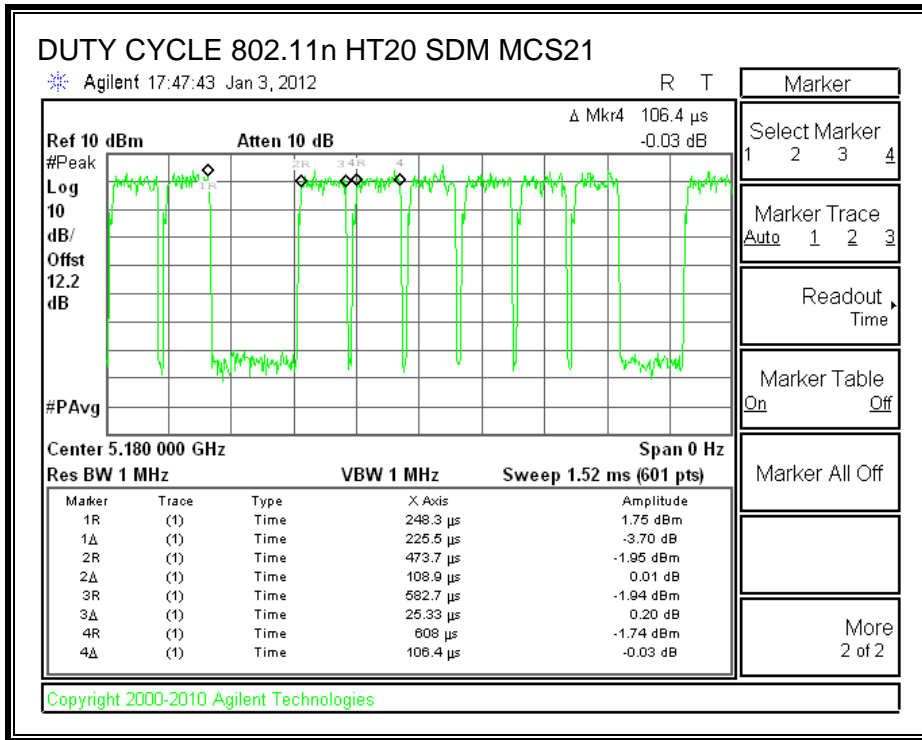
The Duty Cycle is less than 98% and not consistent therefore KDB 789033 Method VB with Power RMS Averaging is used.

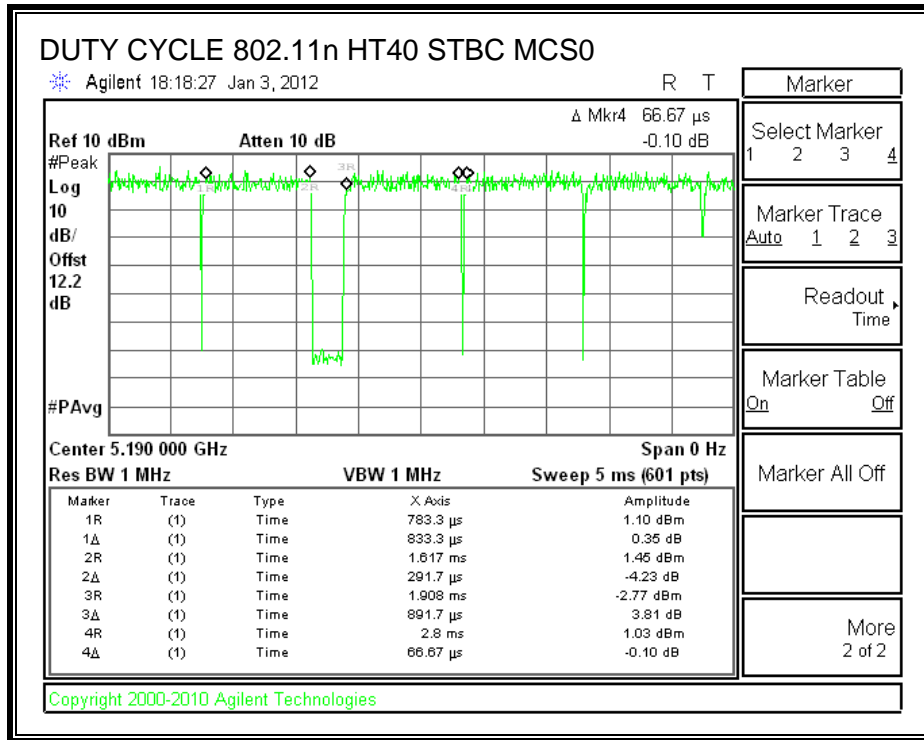
7.1.4. DUTY CYCLE PLOTS

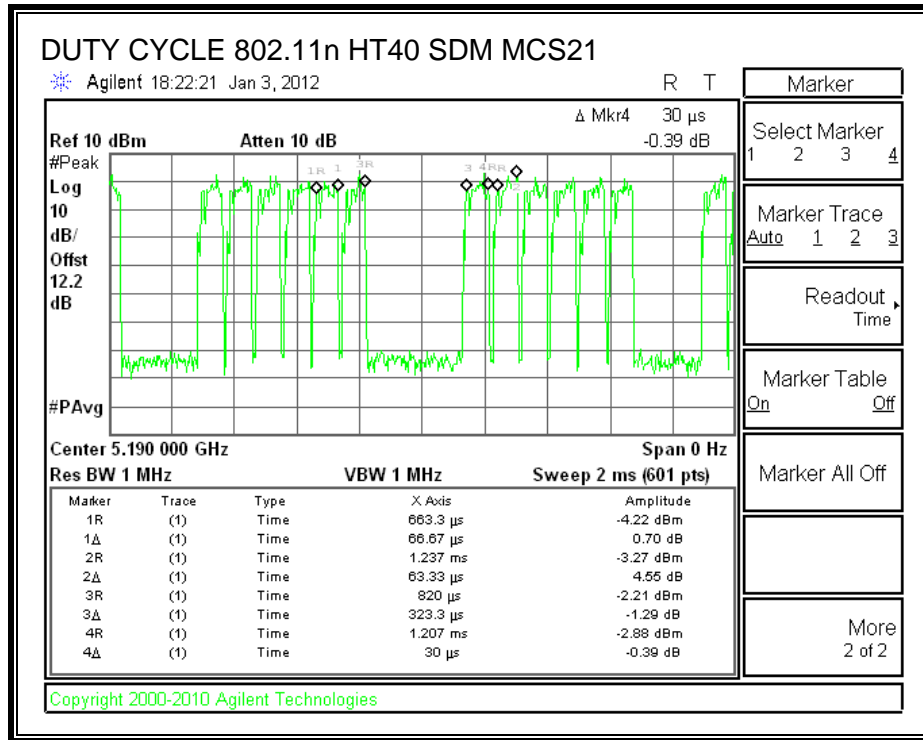












7.2. 802.11a 20MHz 1TX MODE IN THE 5.2 GHz BAND

7.2.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

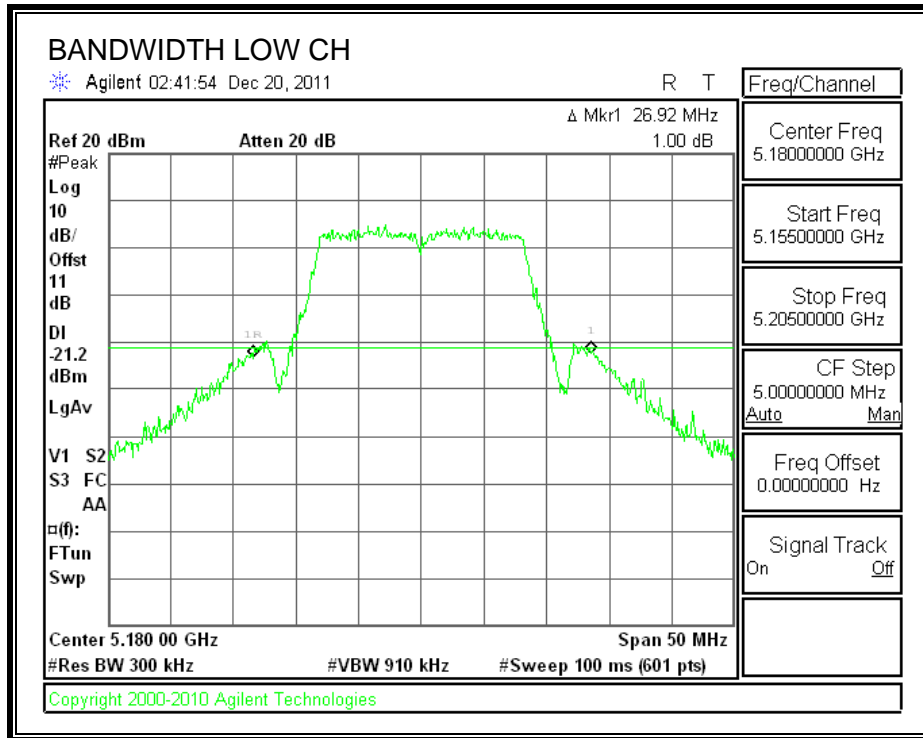
TEST PROCEDURE

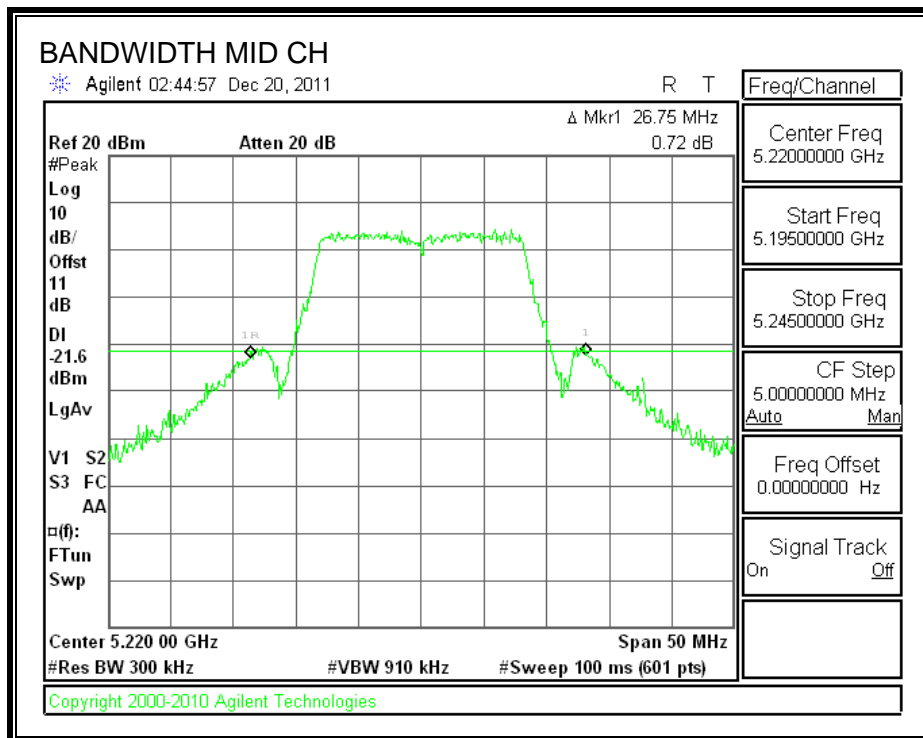
Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

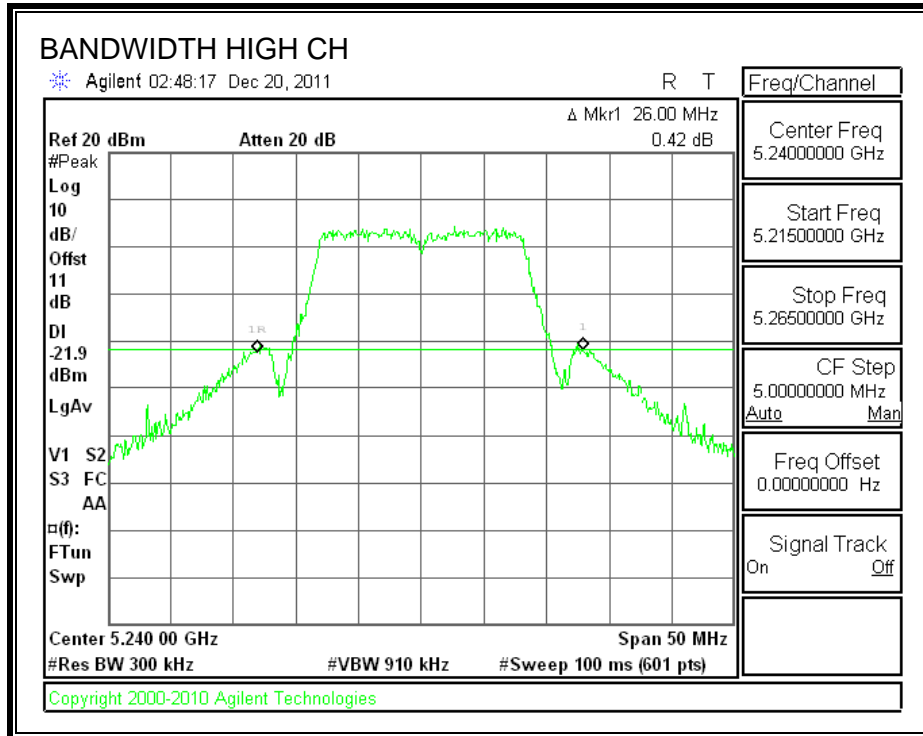
RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	26.92	16.5817
Middle	5220	26.75	16.5335
High	5240	26.00	16.5639

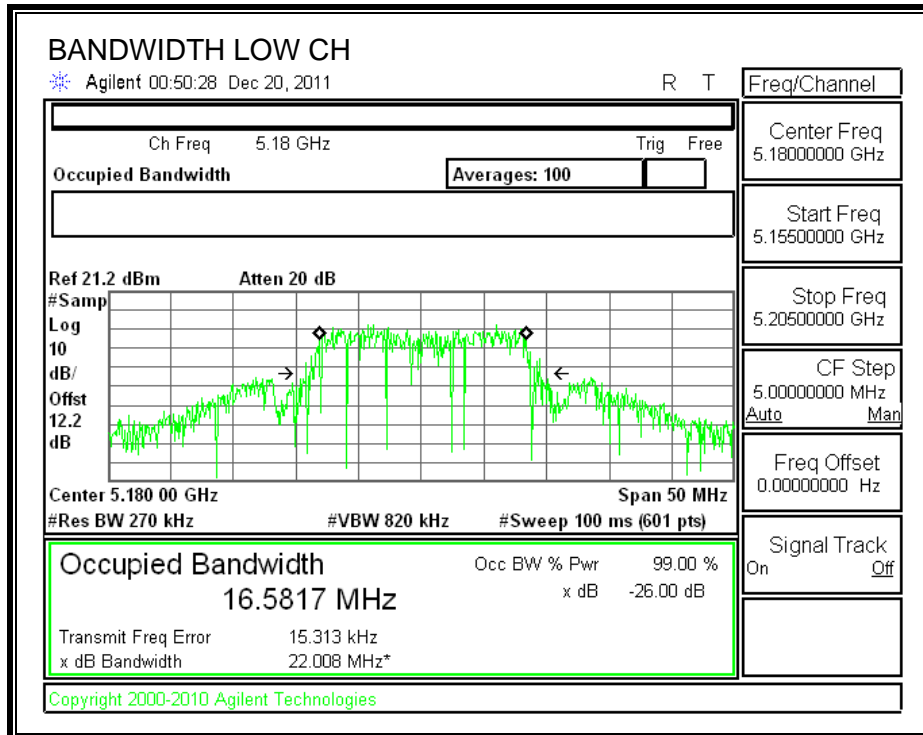
26 dB BANDWIDTH

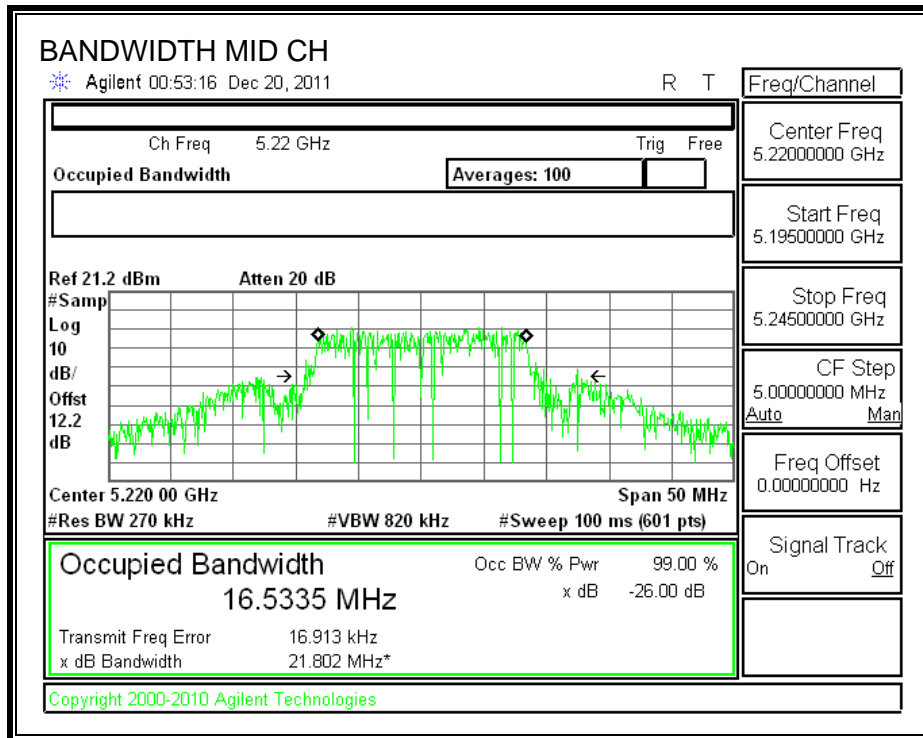


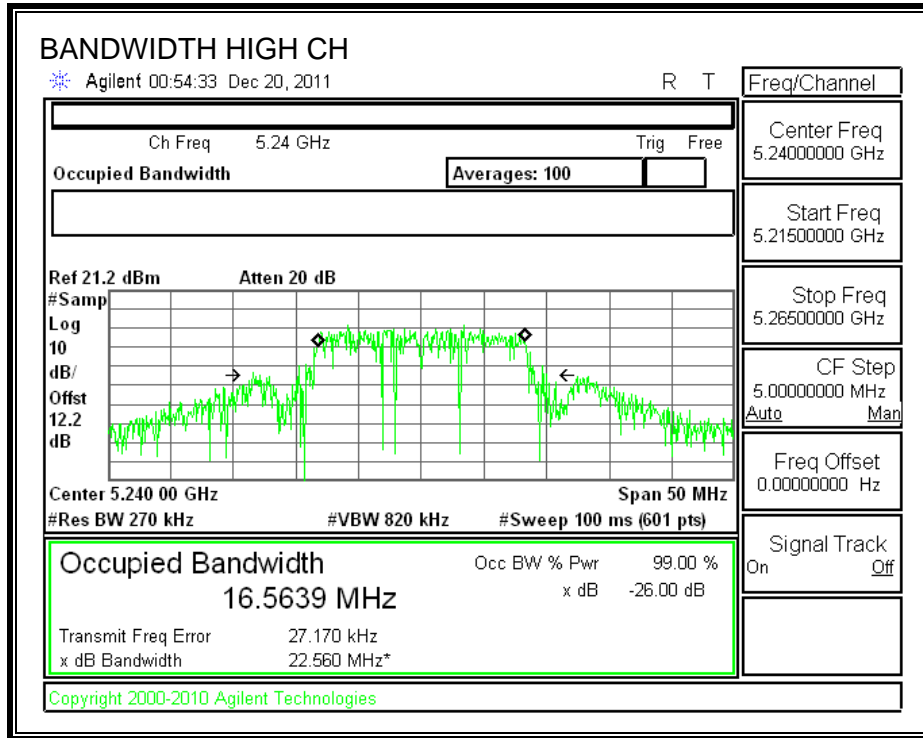




99% BANDWIDTH







7.2.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

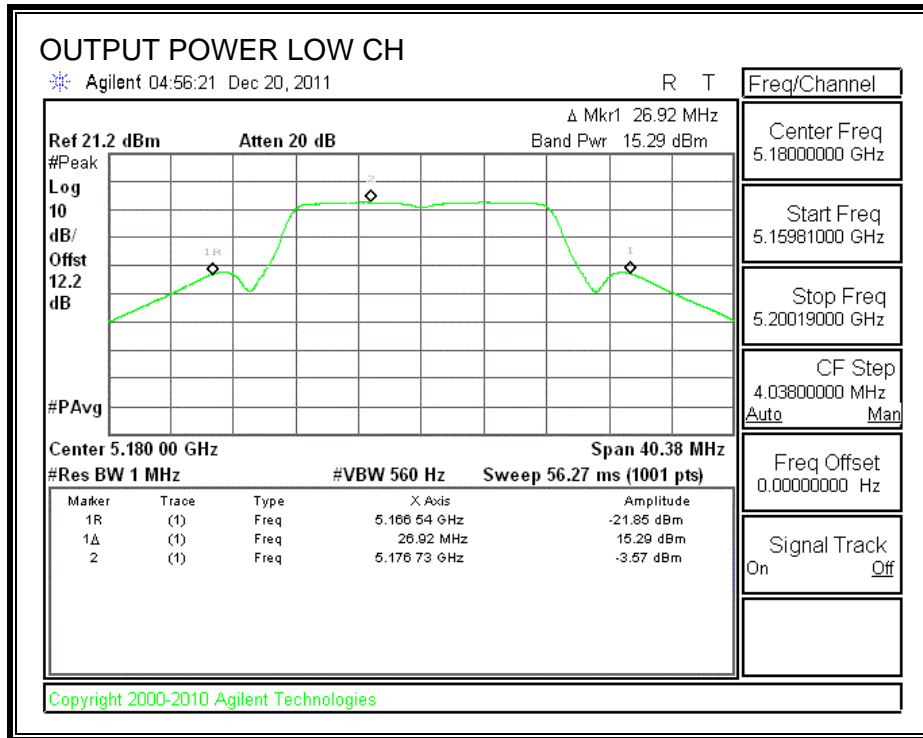
Limit

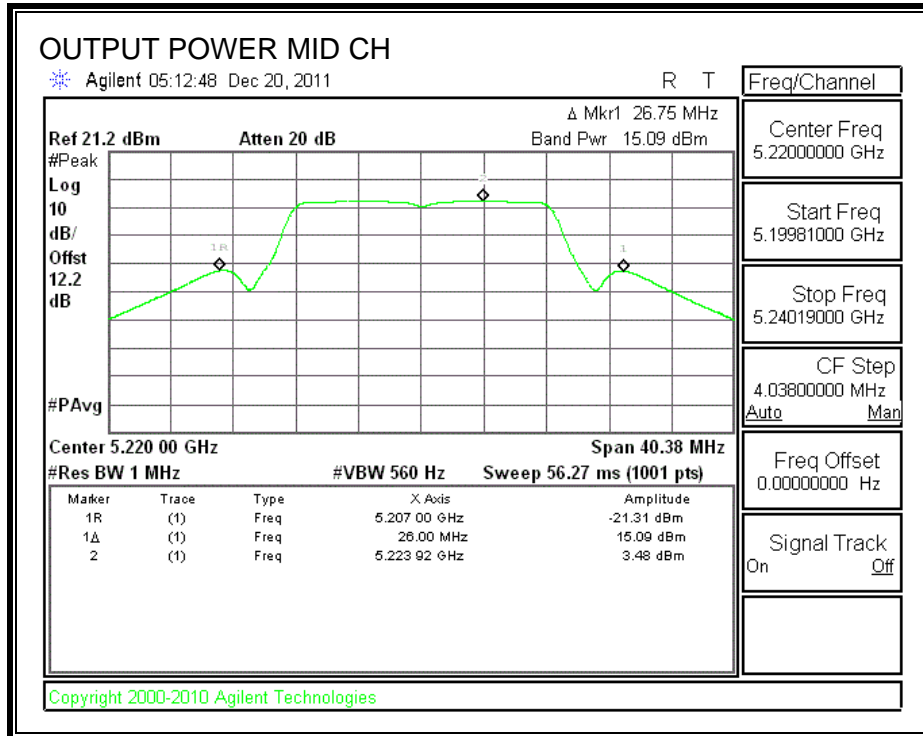
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5180	17	26.92	18.30	6.41	16.59
Mid	5220	17	26.75	18.27	6.41	16.59
High	5240	17	26.00	18.15	6.41	16.59

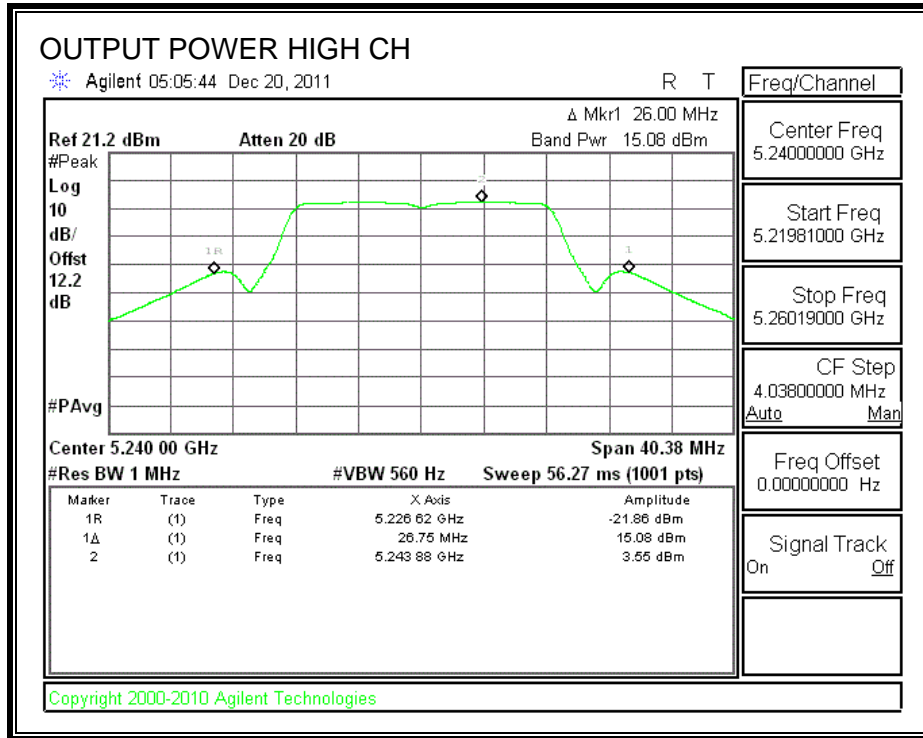
Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5180	15.29	16.59	-1.30
Mid	5220	15.09	16.59	-1.50
High	5240	15.08	16.59	-1.51

OUTPUT POWER







7.2.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 12.2 dB (including 10 dB pad and 2.2 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Power (dBm)
Low	5180	14.42
Middle	5220	14.23
High	5240	14.17

7.2.4. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the peak power spectral density shall not exceed 4 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

The maximum antenna gain is 6.41 dBi, therefore the limit is 3.59 dBm.

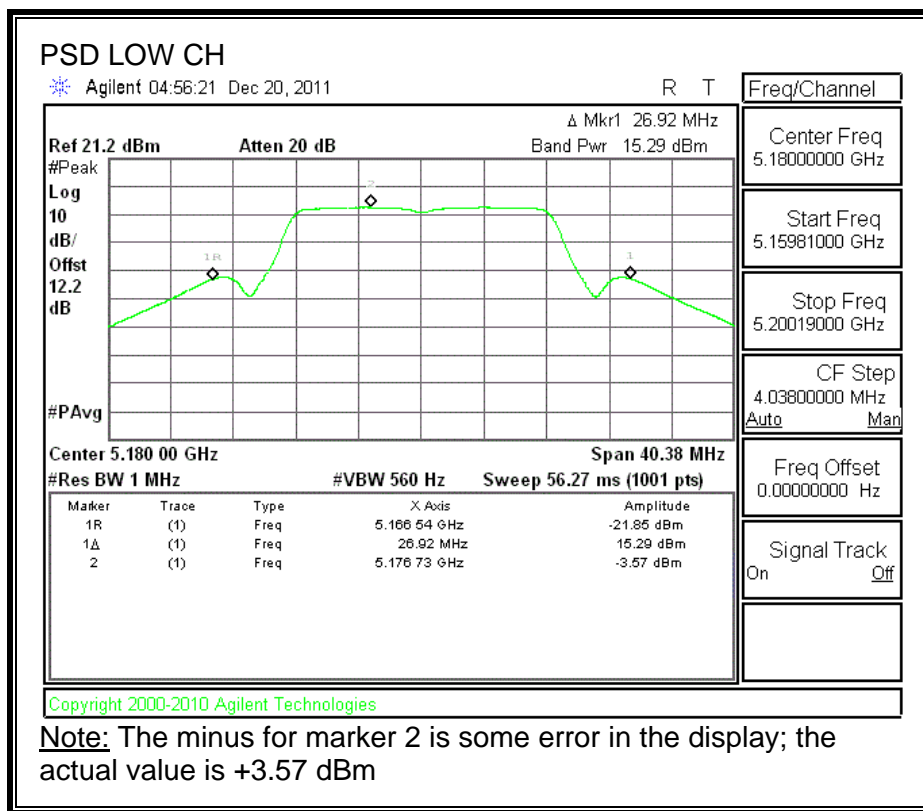
TEST PROCEDURE

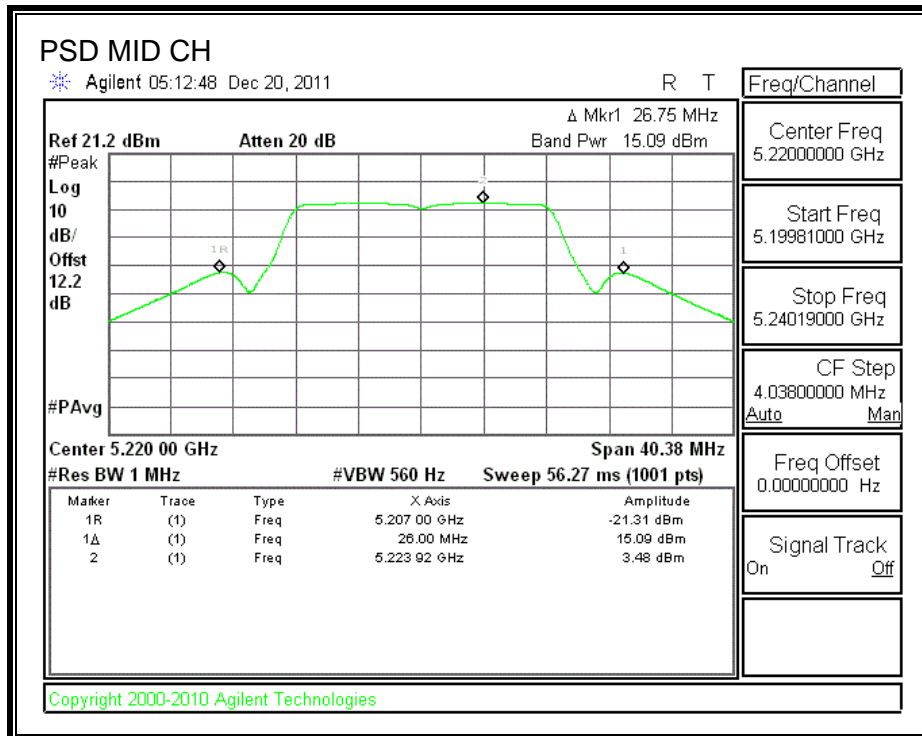
Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

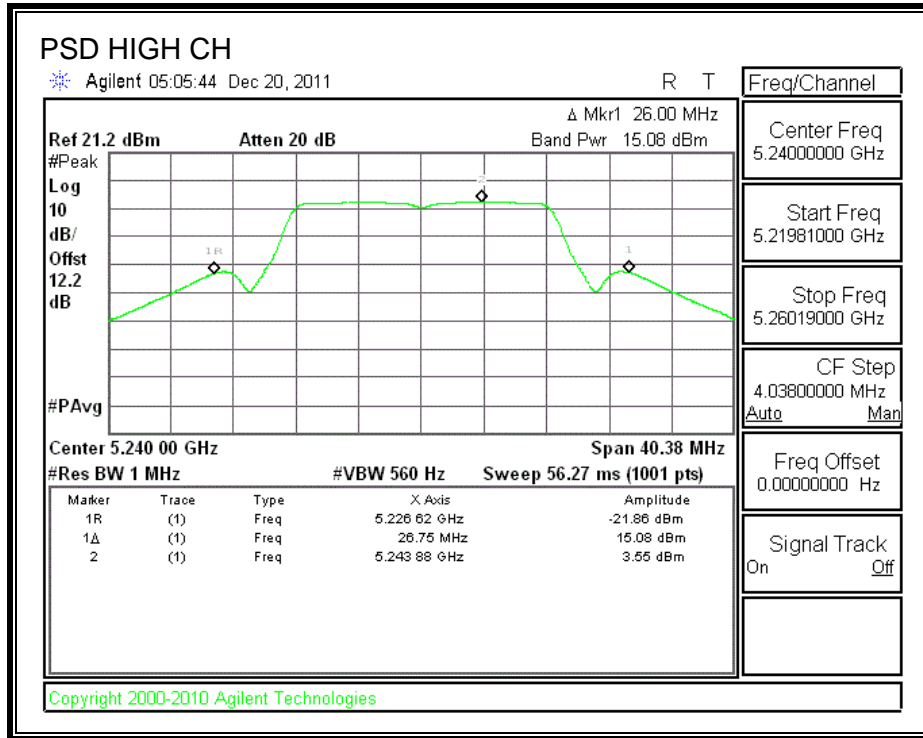
RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5180	3.57	3.59	-0.02
Middle	5220	3.48	3.59	-0.11
High	5240	3.55	3.59	-0.04

POWER SPECTRAL DENSITY







7.2.5. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

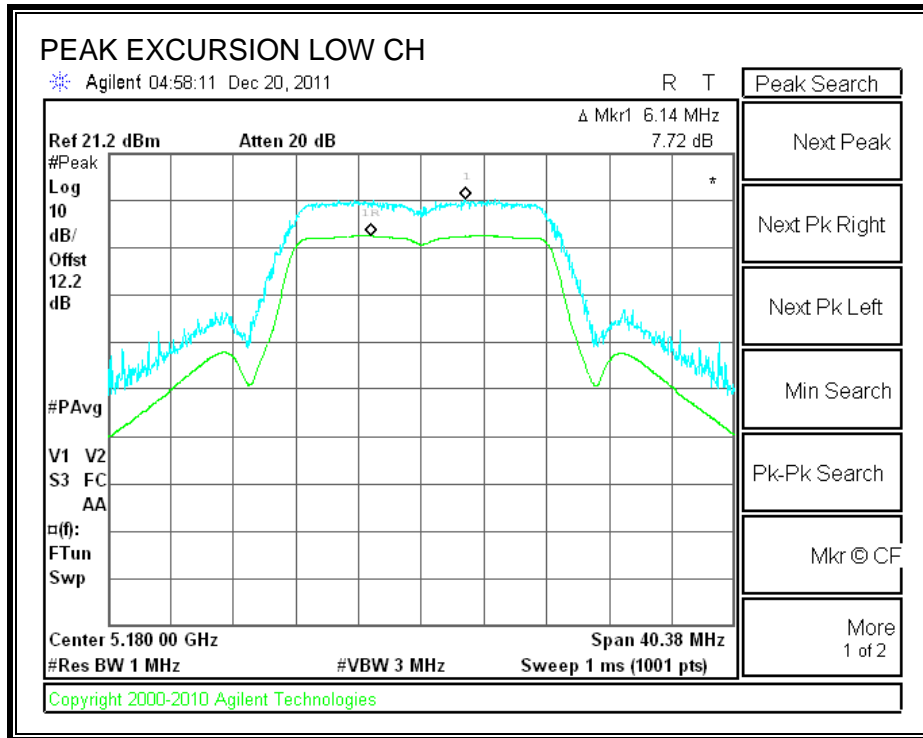
TEST PROCEDURE

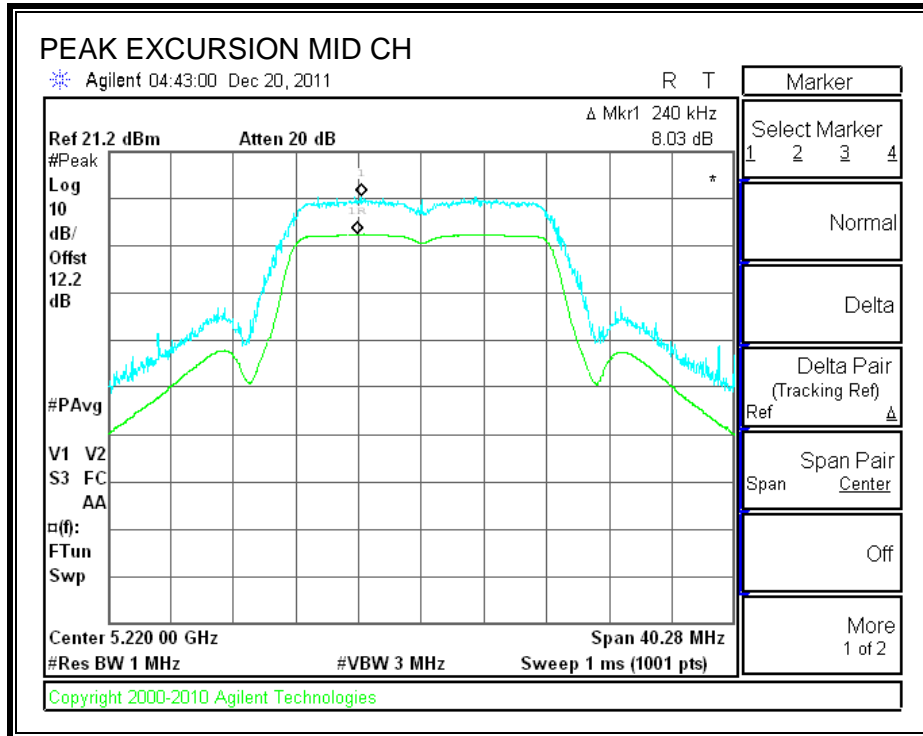
Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

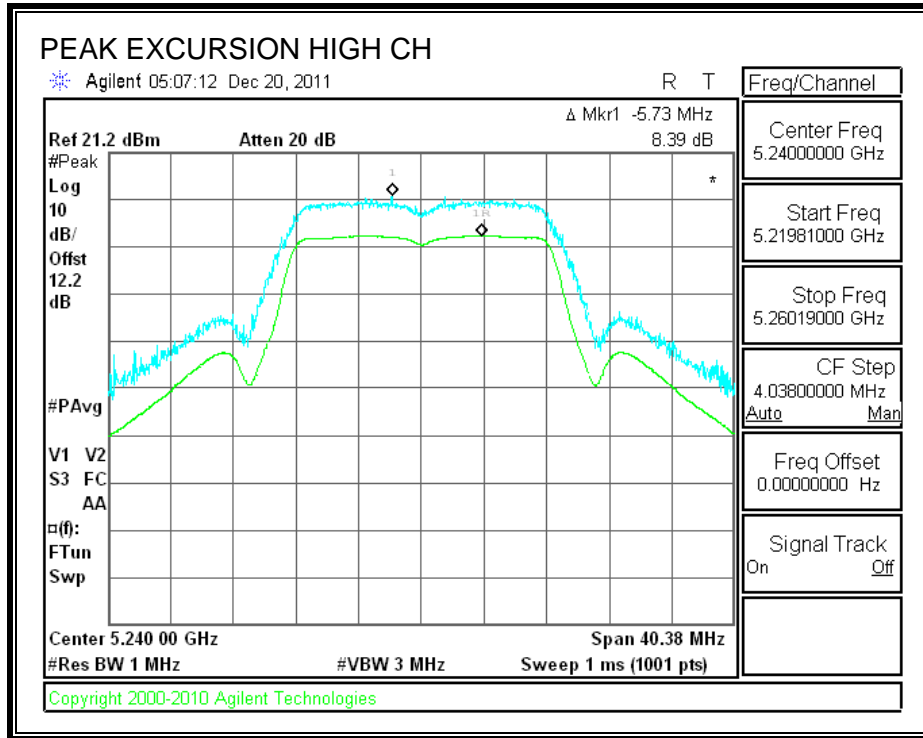
RESULTS

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	7.72	13	-5.28
Middle	5220	8.03	13	-4.97
High	5240	8.39	13	-4.61

PEAK EXCURSION







7.3. 802.11n HT40 1TX MODE IN THE 5.2 GHz BAND

7.3.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

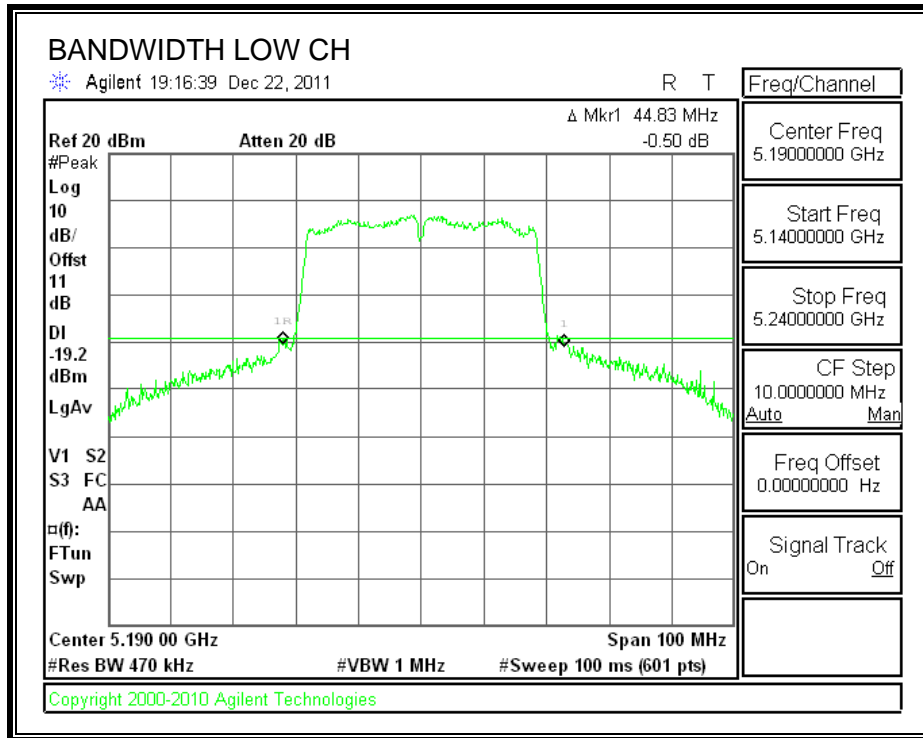
TEST PROCEDURE

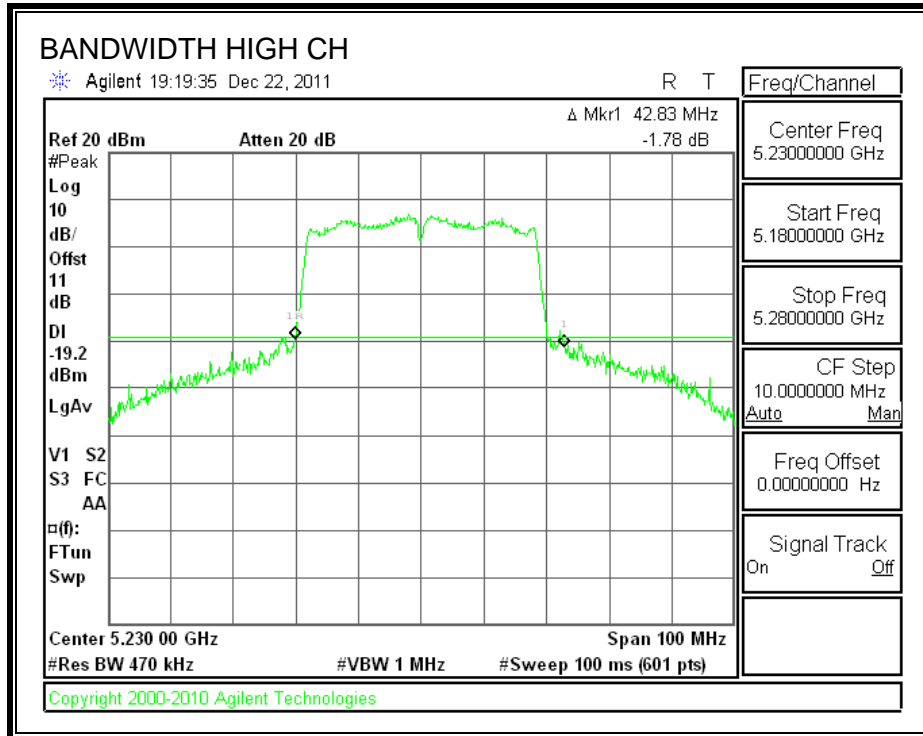
Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

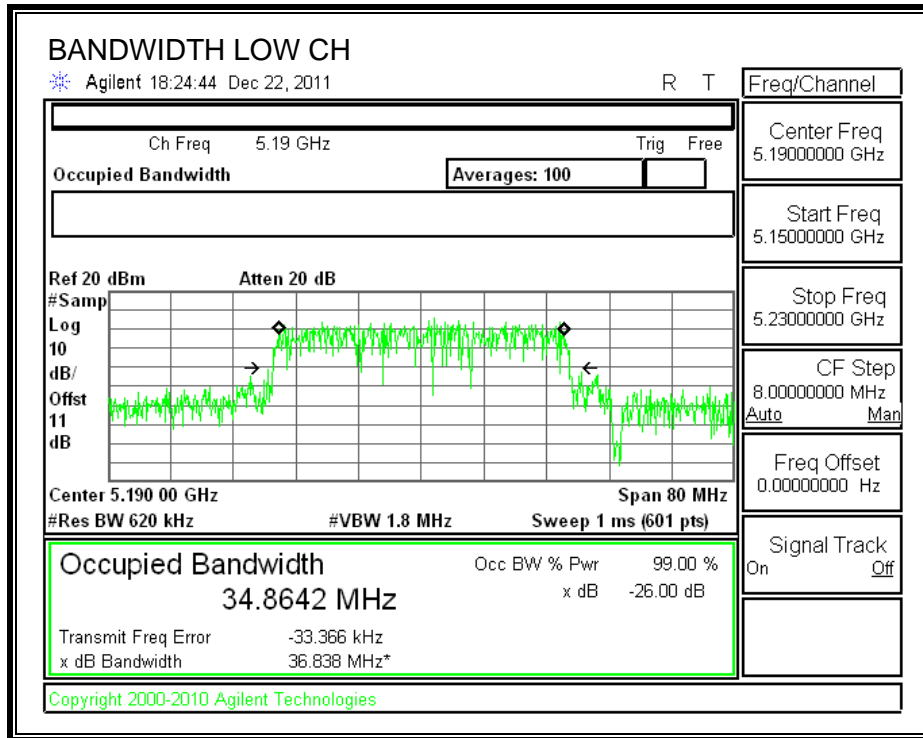
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	44.83	34.8642
High	5230	42.83	34.9157

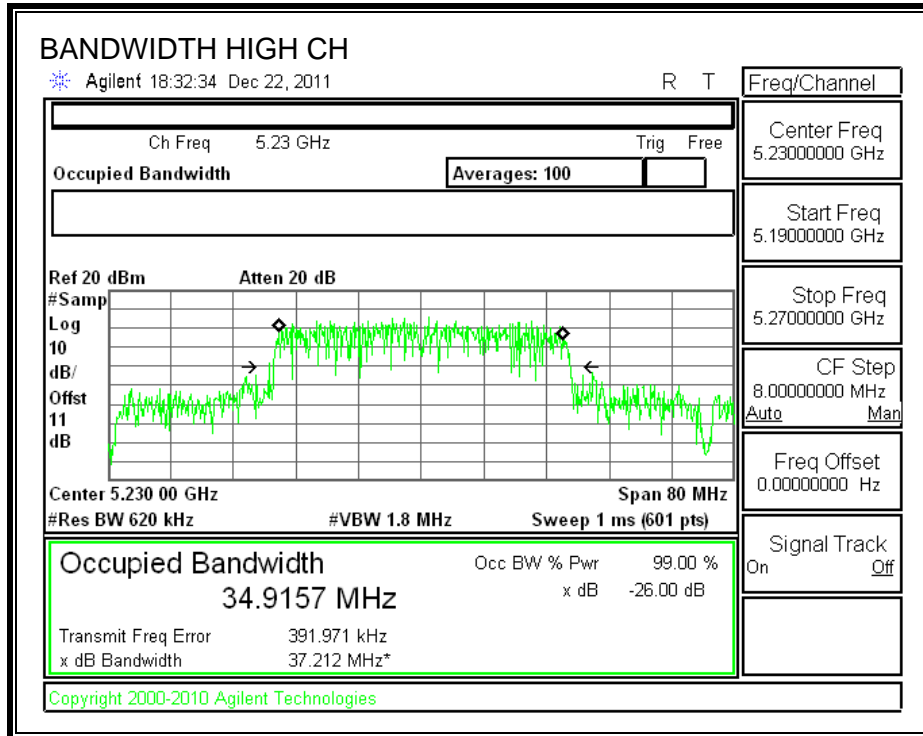
26 dB BANDWIDTH





99% BANDWIDTH





7.3.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

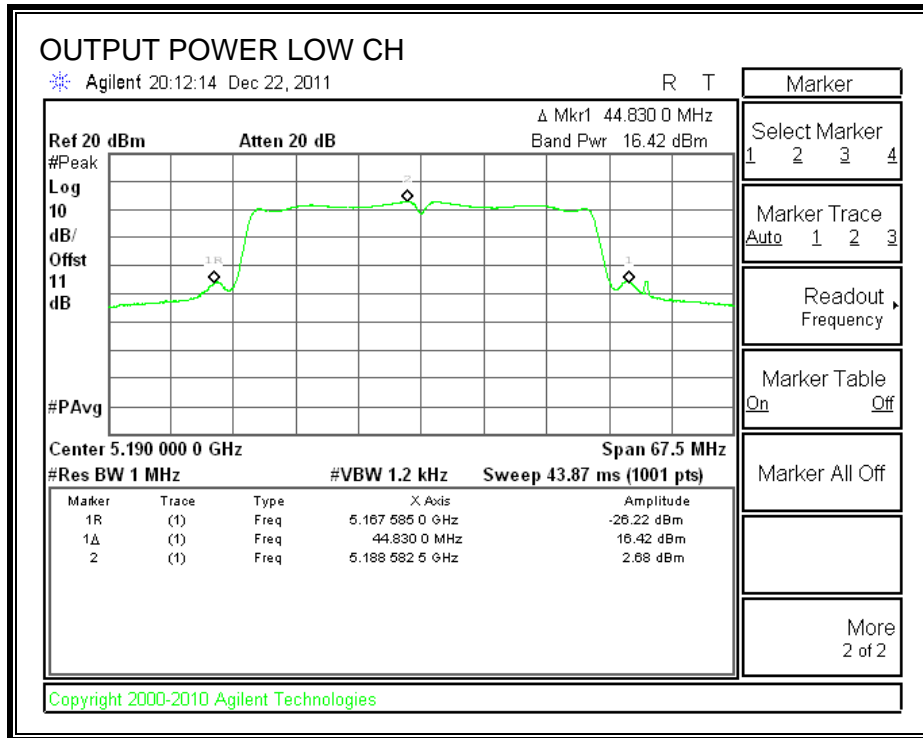
Limit

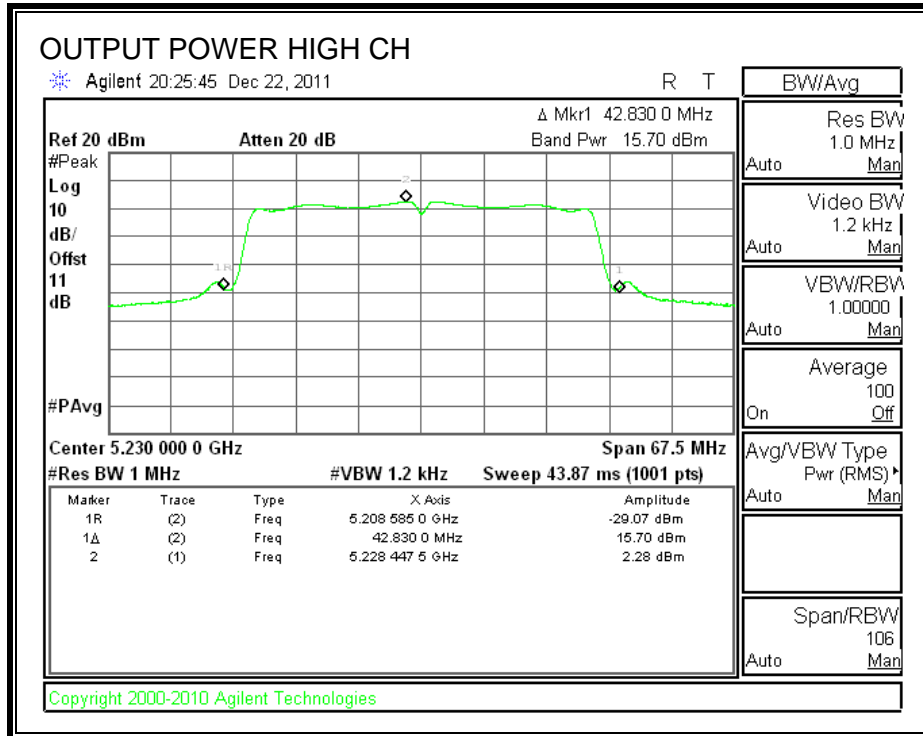
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5190	17	44.83	20.52	6.41	16.59
High	5230	17	42.83	20.32	6.41	16.59

Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5180	16.42	16.59	-0.17
High	5240	15.70	16.59	-0.89

OUTPUT POWER





7.3.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 12.2 dB (including 10 dB pad and 2.2 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Power (dBm)
Low	5190	15.69
High	5230	15.52

7.3.4. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the peak power spectral density shall not exceed 4 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

The maximum antenna gain is 6.41 dBi, therefore the limit is 3.59 dBm.

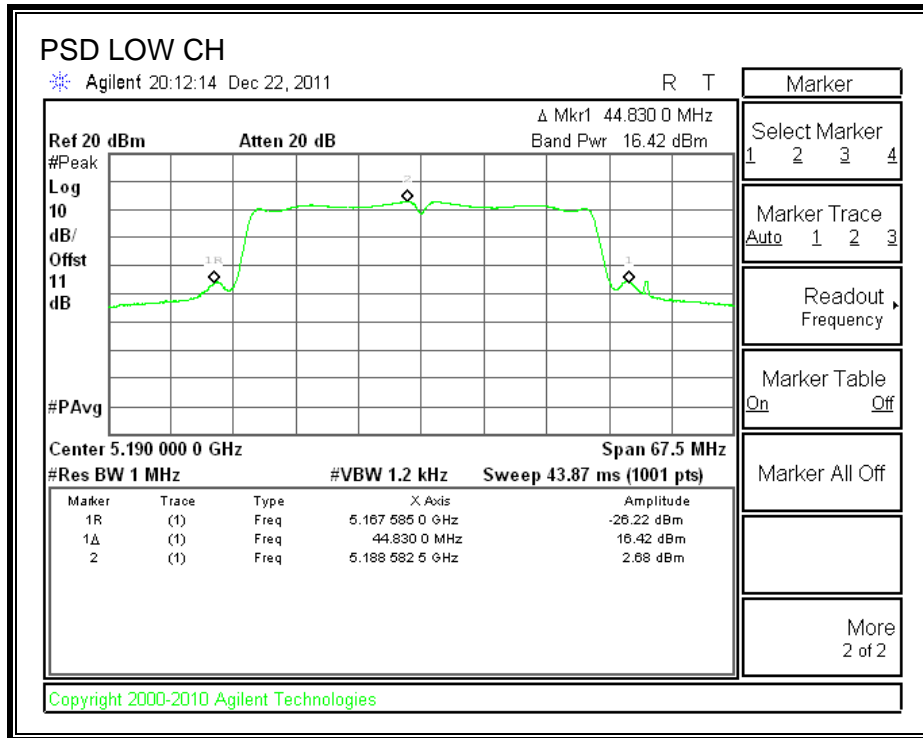
TEST PROCEDURE

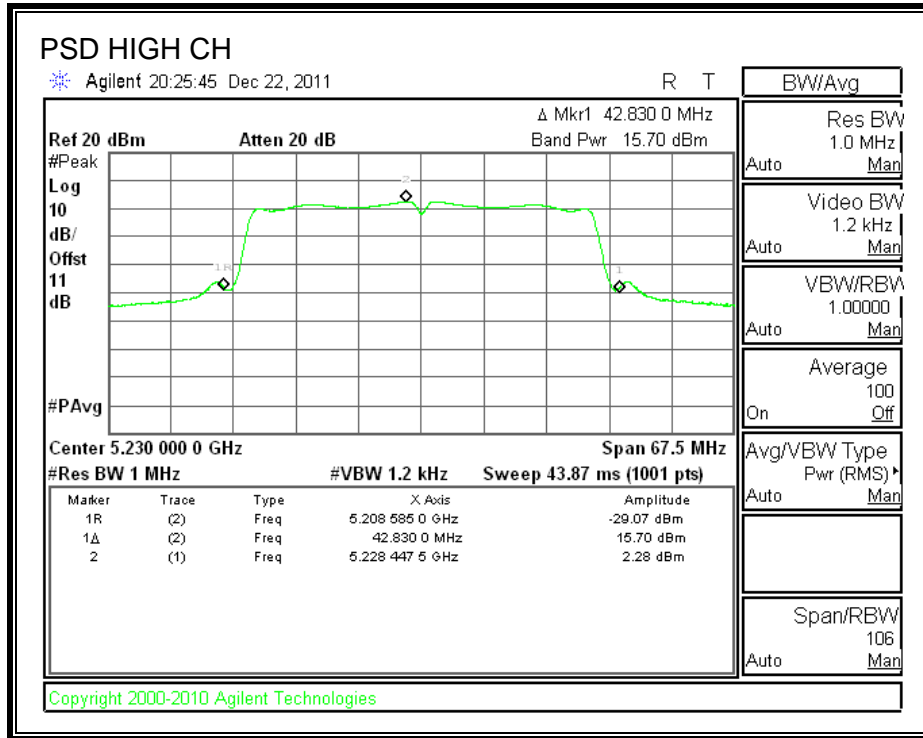
Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5190	2.68	3.59	-0.91
High	5230	2.28	3.59	-1.31

POWER SPECTRAL DENSITY





7.3.5. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

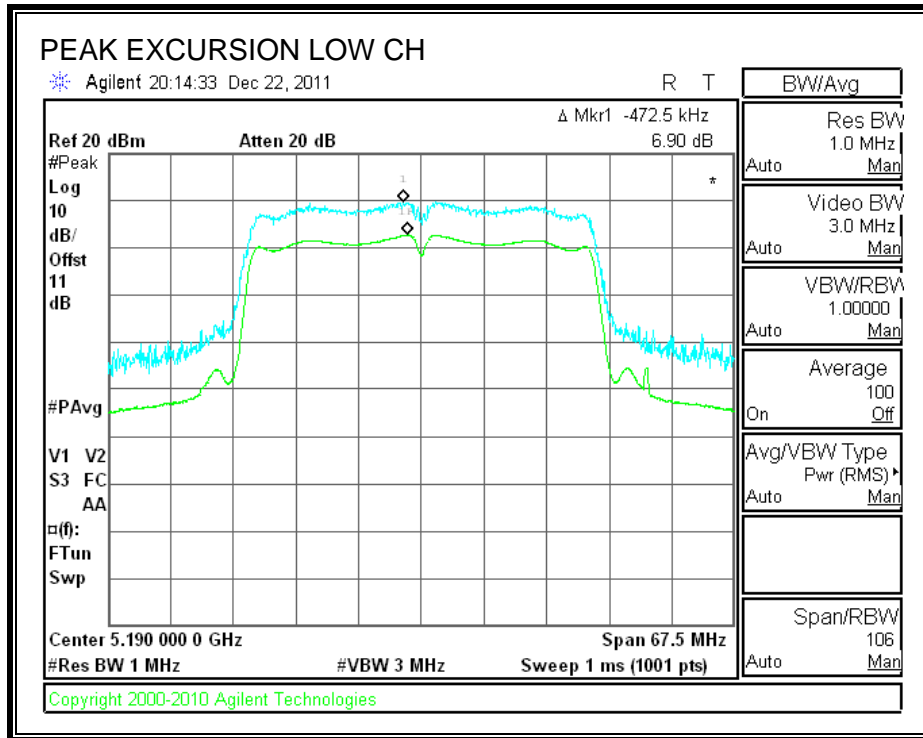
TEST PROCEDURE

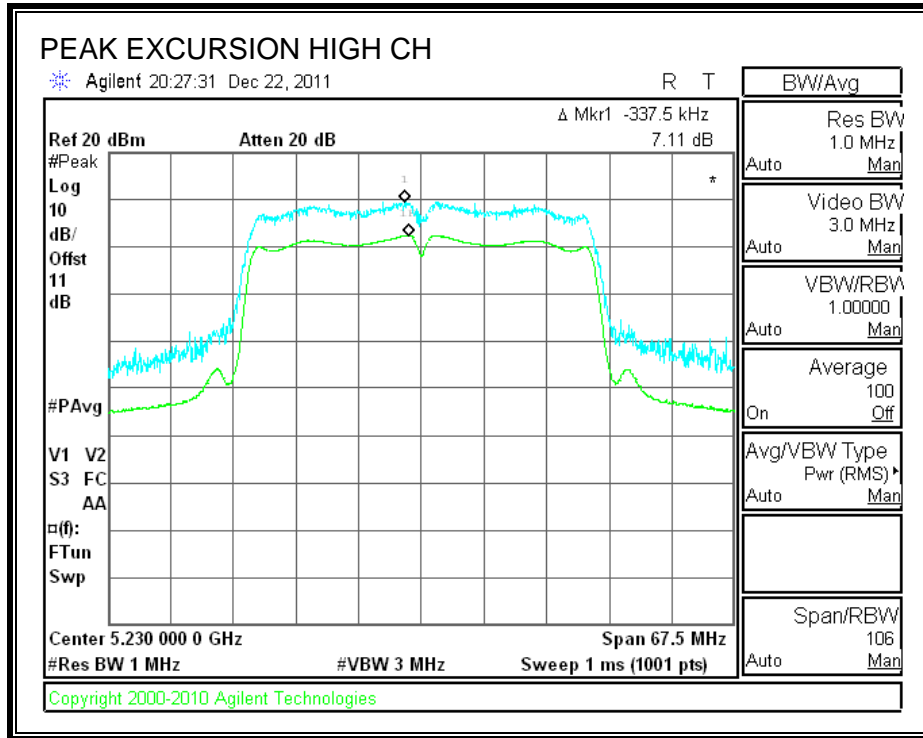
Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	6.90	13	-6.10
High	5230	7.11	13	-5.89

PEAK EXCURSION





7.4. 802.11n HT20 2TX MODE IN THE 5.2GHZ BAND, STBC MCS0

7.4.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

CHAIN 1

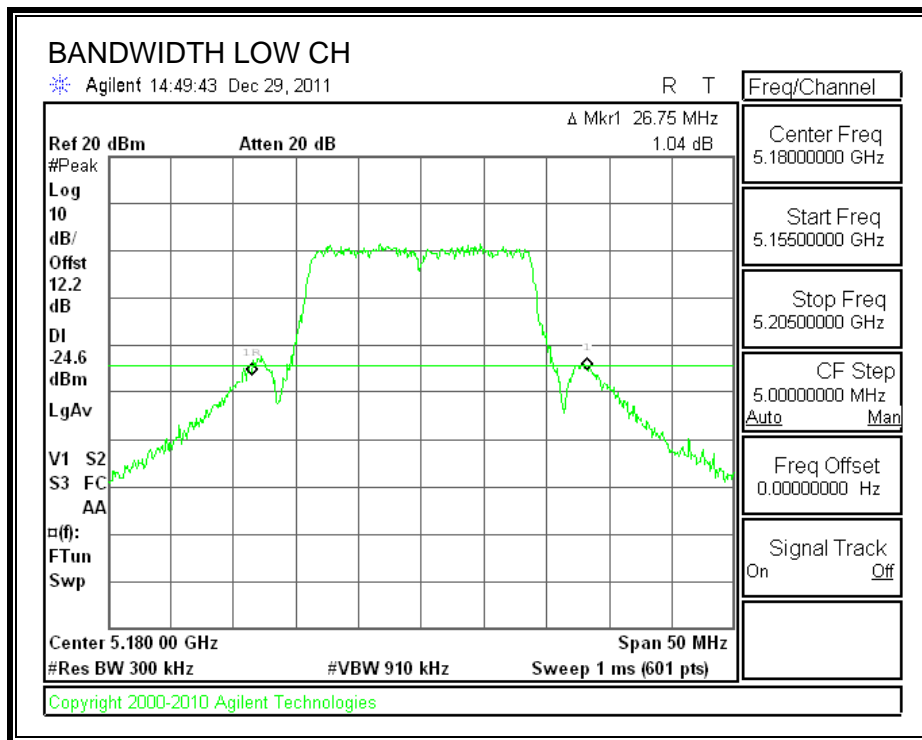
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	26.75	17.8278
Middle	5200	27.42	17.8477
High	5240	26.17	17.8326

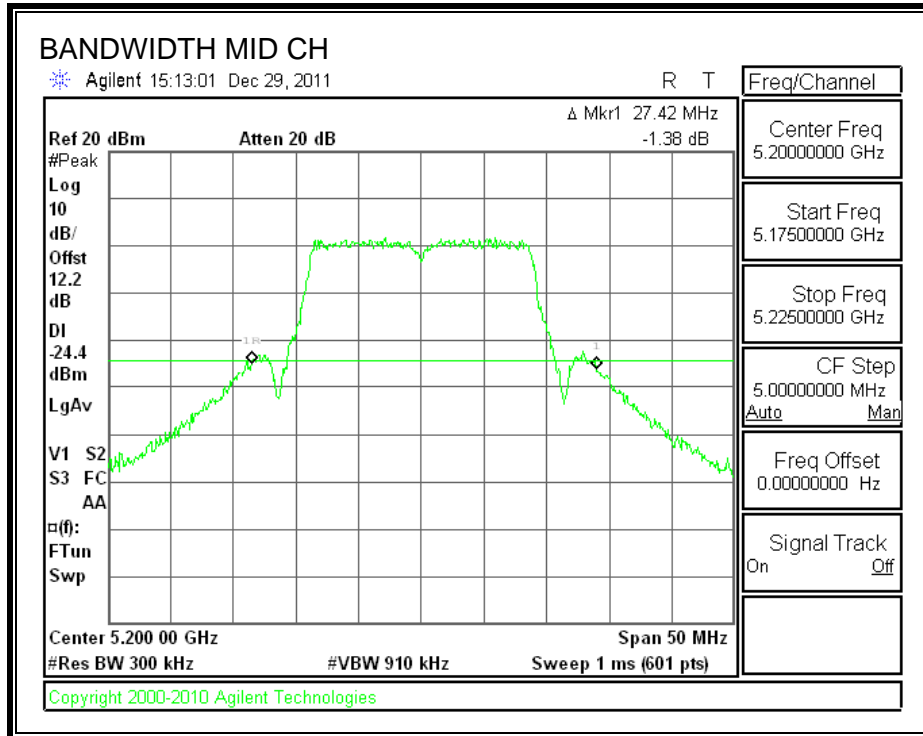
CHAIN 2

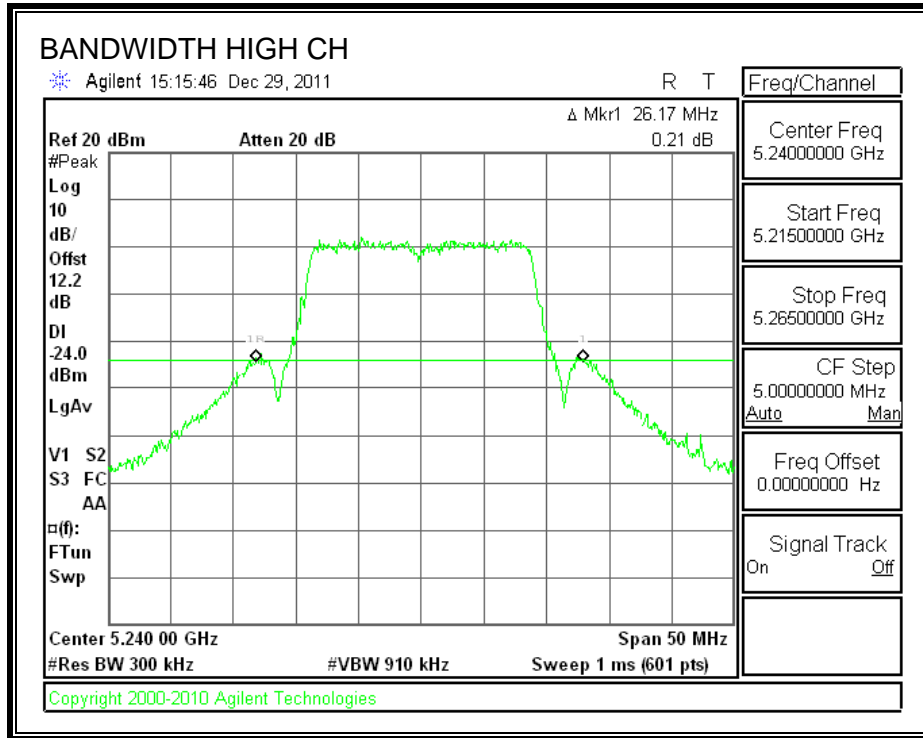
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	26.67	17.8238
Middle	5200	27.08	17.8266
High	5240	26.50	17.8430

CHAIN 1

26 dB BANDWIDTH

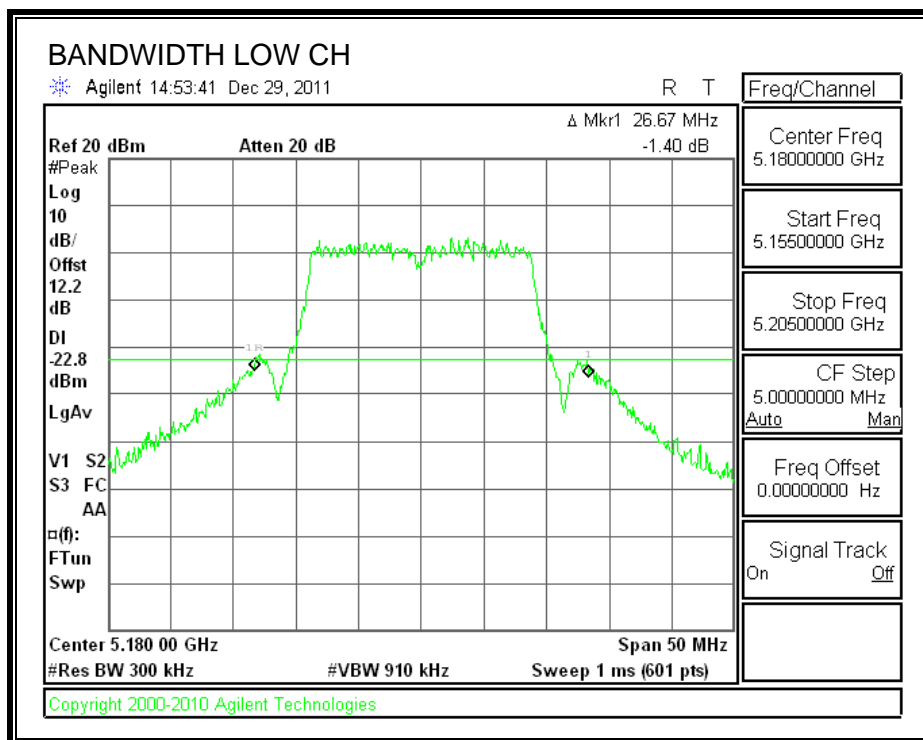


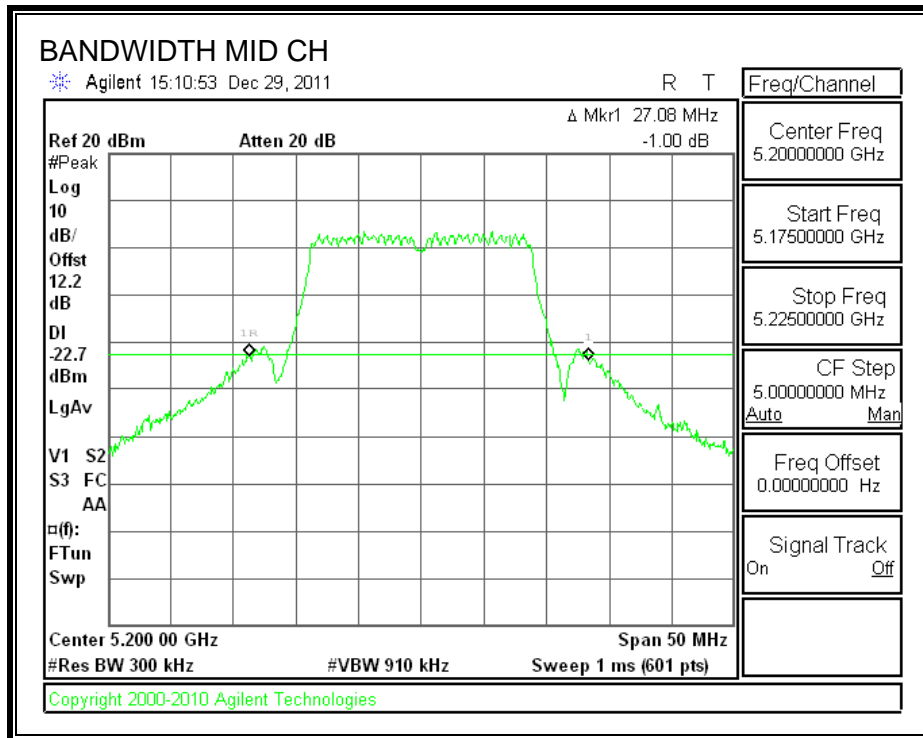


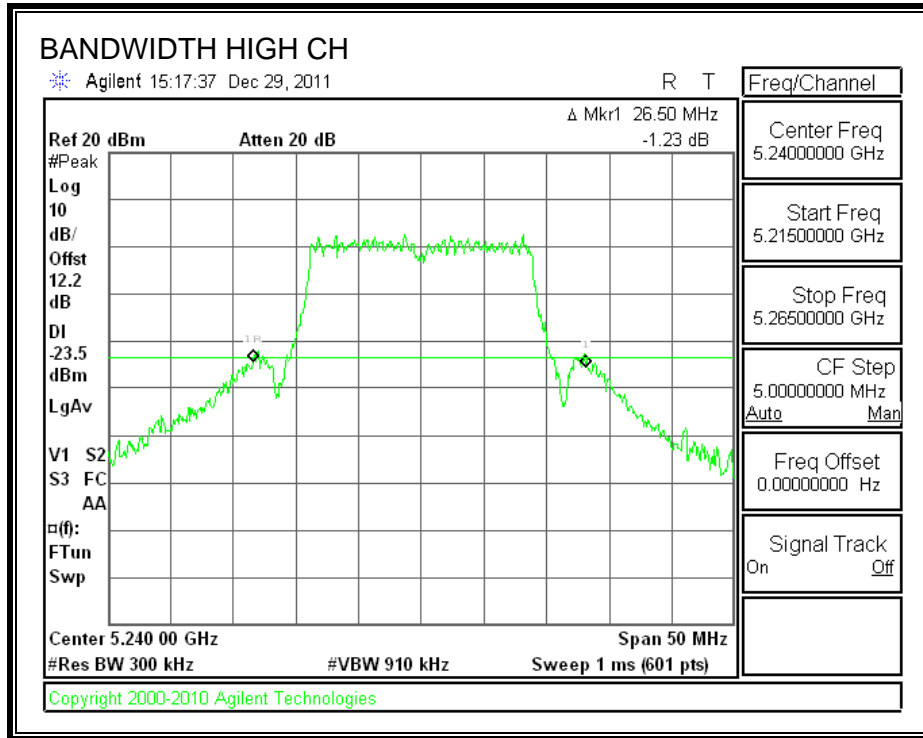


CHAIN 2

26 dB BANDWIDTH

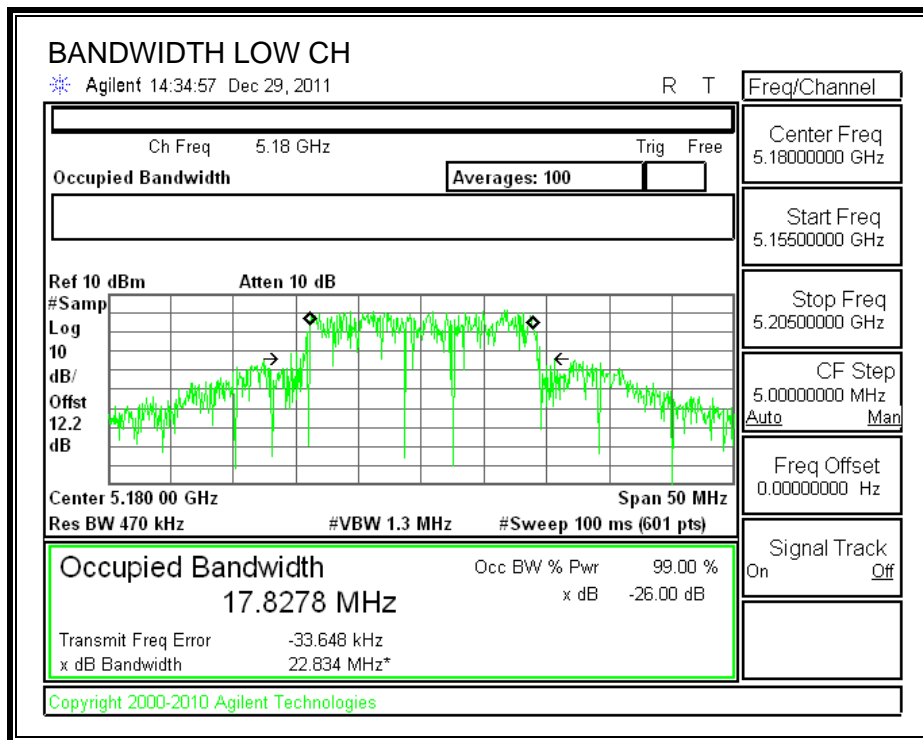


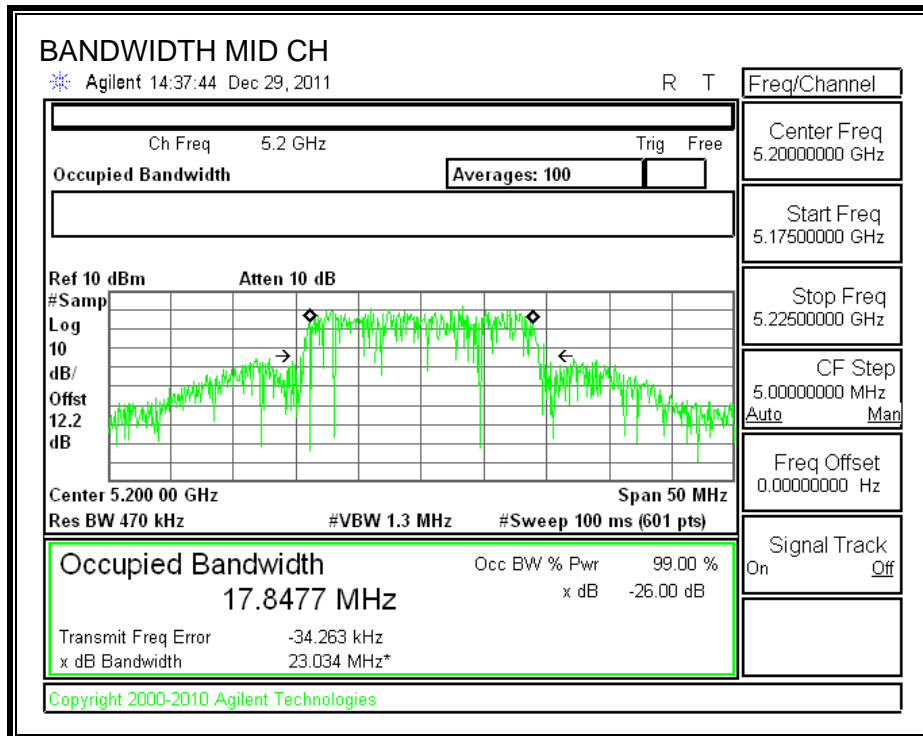


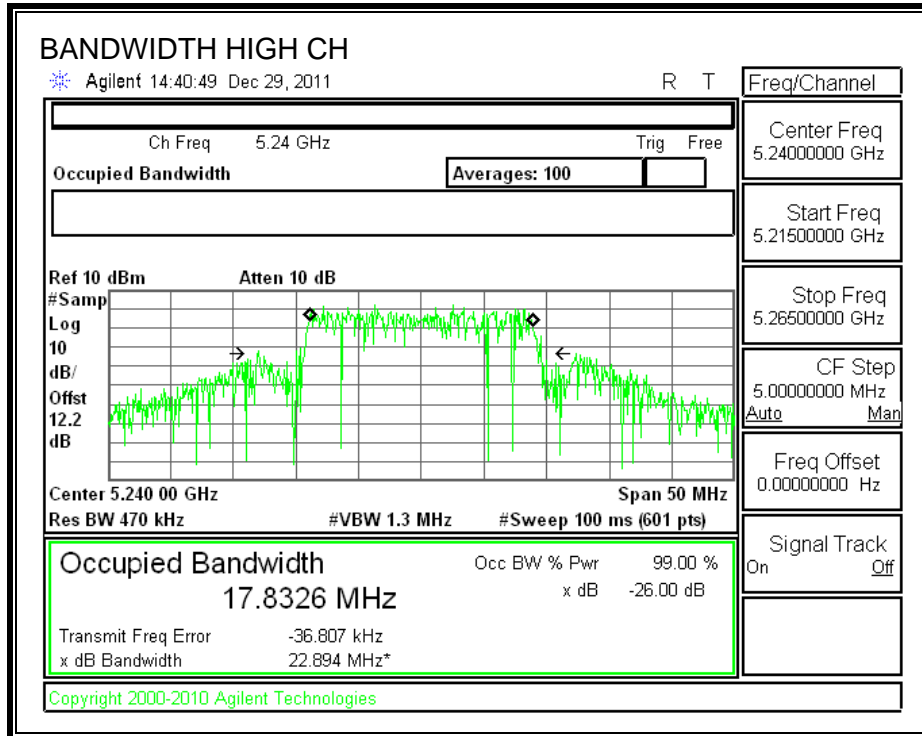


CHAIN 1

99% BANDWIDTH

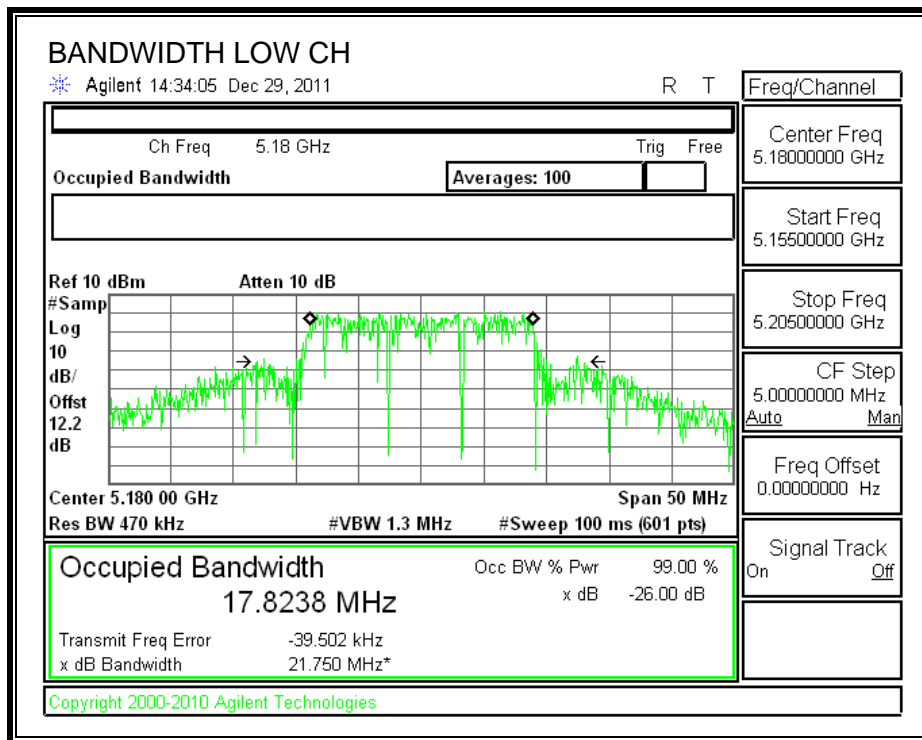


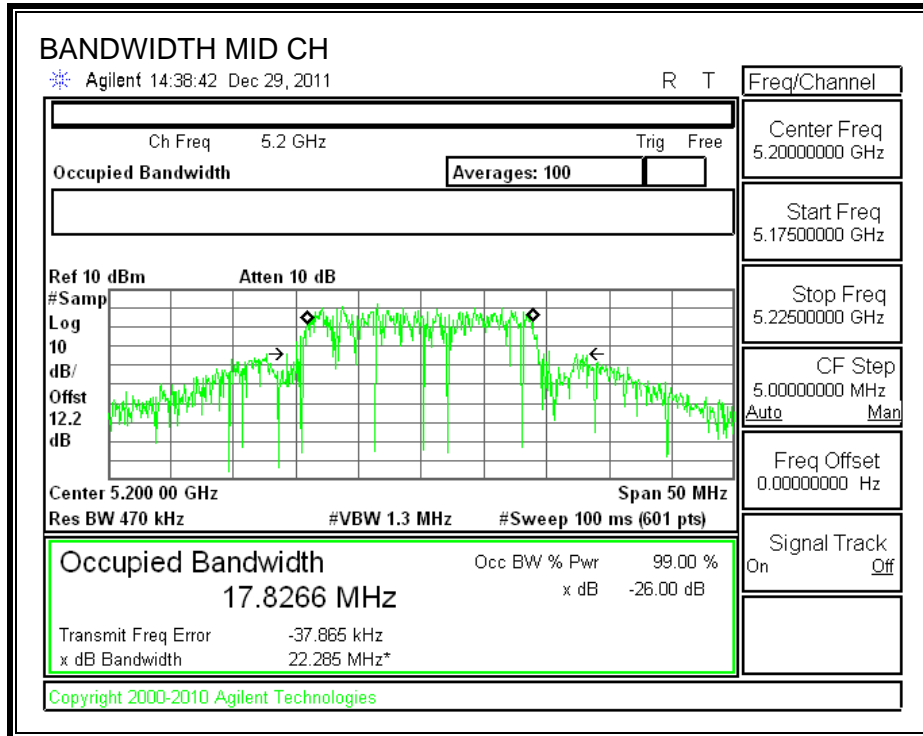


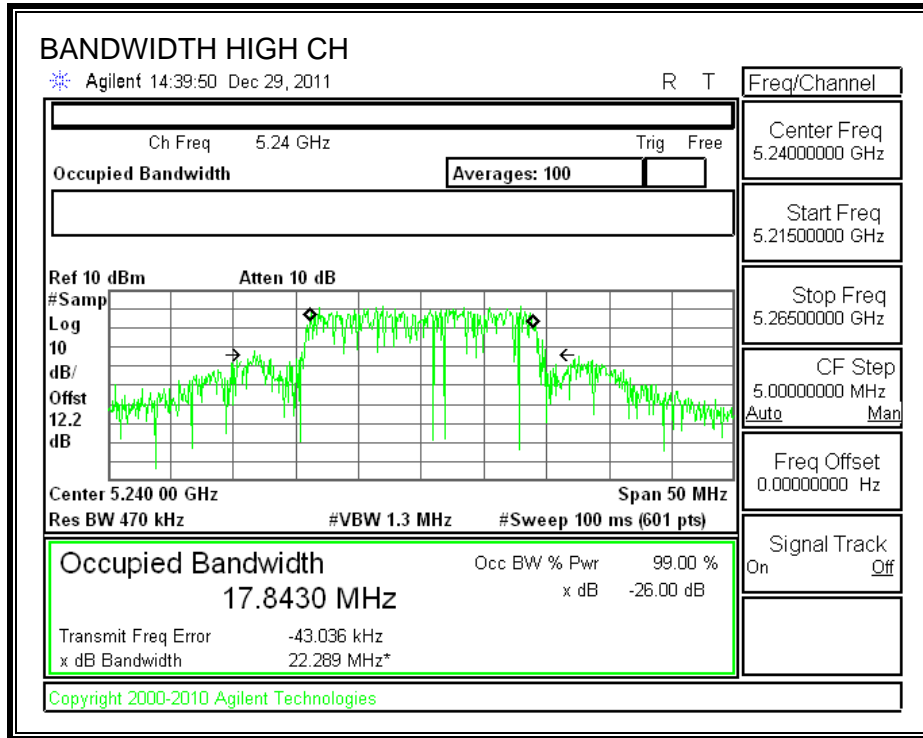


CHAIN 2

99% BANDWIDTH







7.4.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

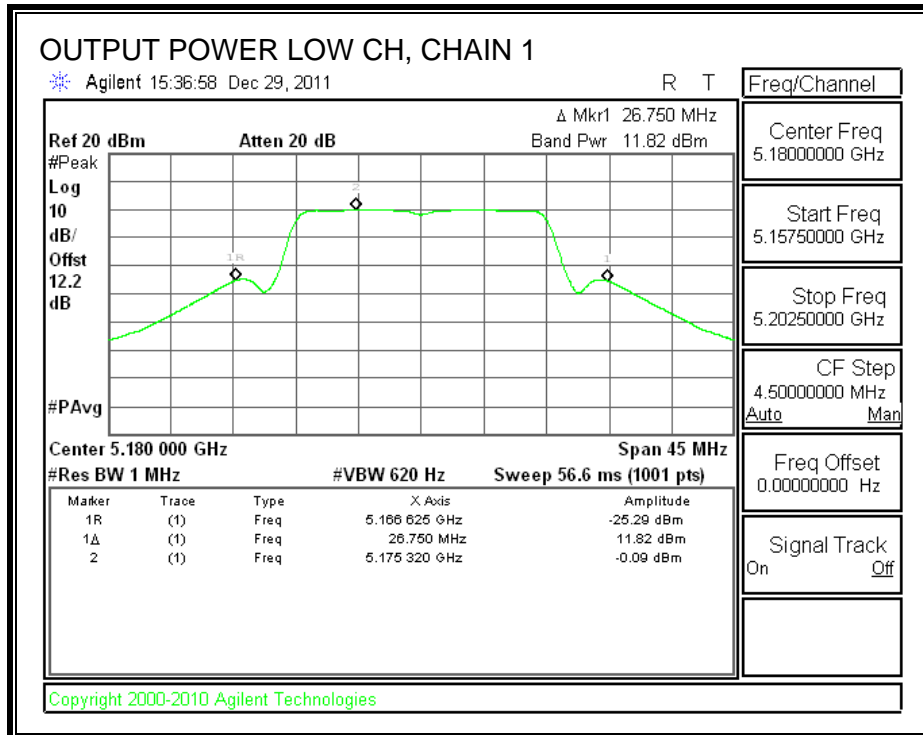
Limit

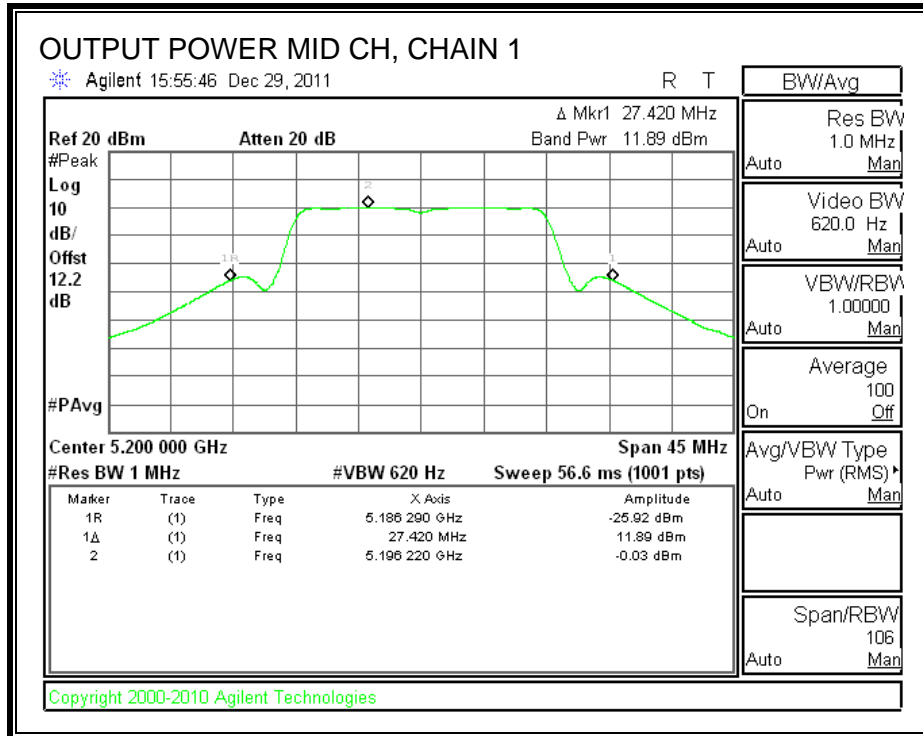
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5180	17	26.67	18.26	6.41	16.59
Mid	5200	17	27.08	18.33	6.41	16.59
High	5240	17	26.17	18.18	6.41	16.59

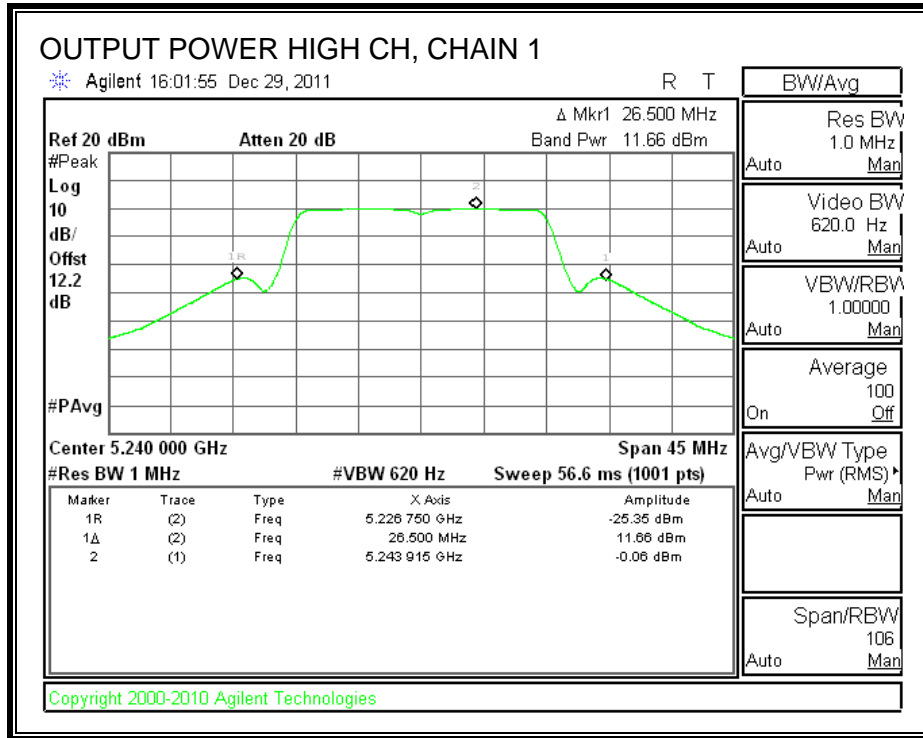
Individual Chain Results

Channel	Frequency (MHz)	Chain 1 Power (dBm)	Chain 2 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	5180	11.82	11.72	14.78	16.59	-1.81
Mid	5200	11.89	11.64	14.78	16.59	-1.81
High	5240	11.66	12.06	14.87	16.59	-1.72

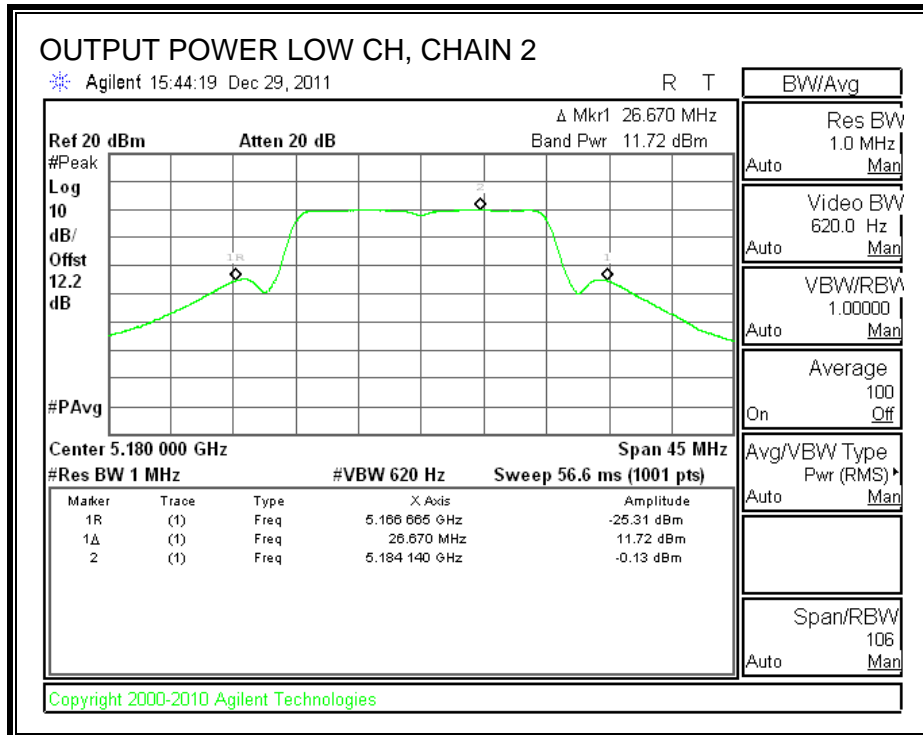
CHAIN 1 OUTPUT POWER

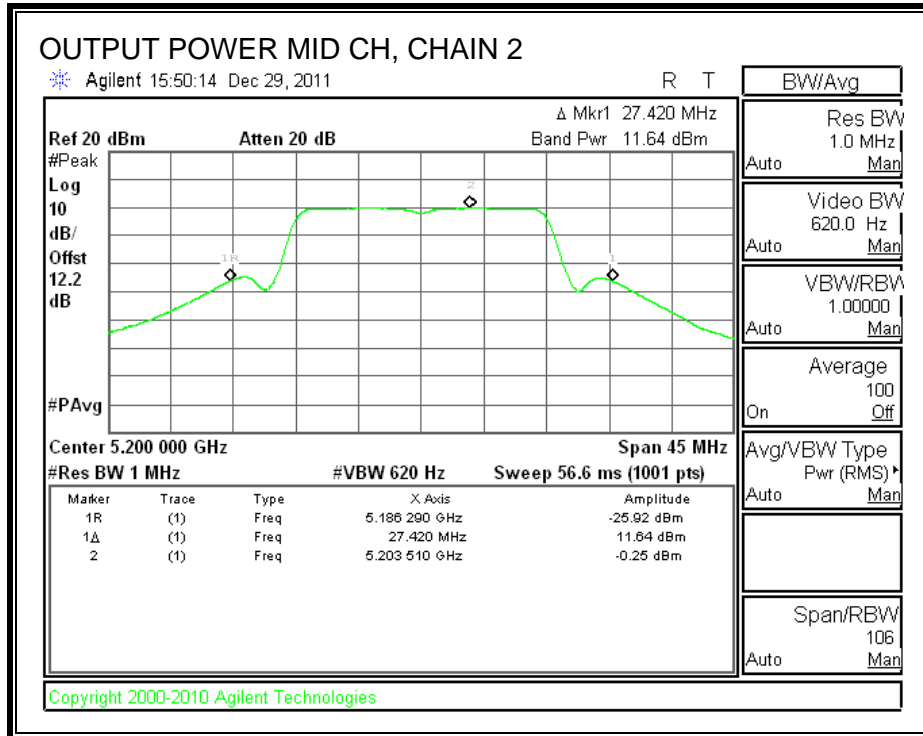


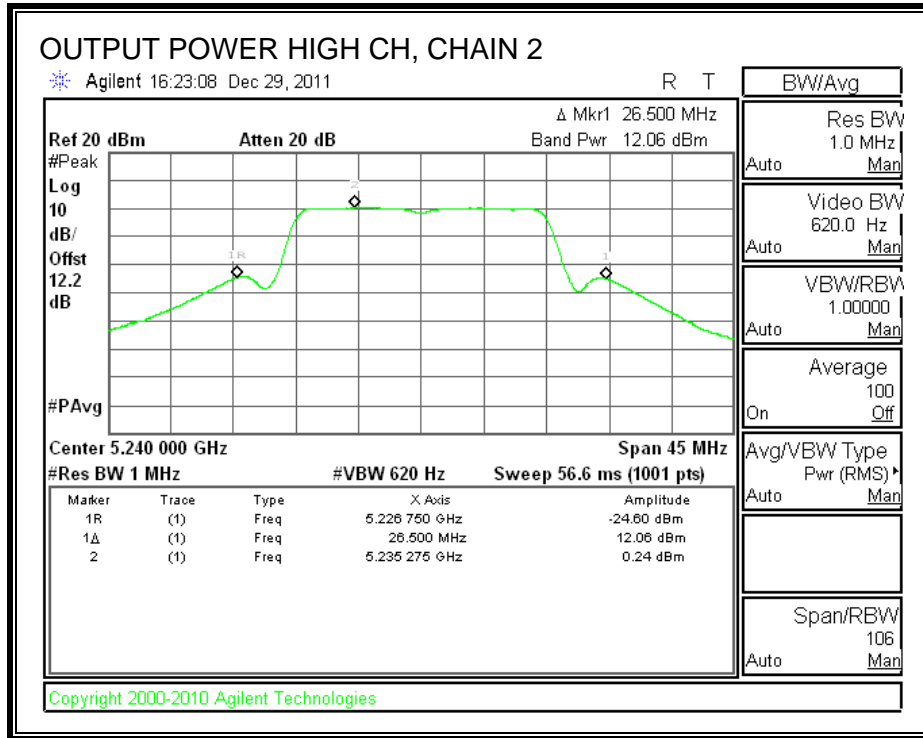




CHAIN 2 OUTPUT POWER







7.4.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 12.2 dB (including 10 dB pad and 2.2 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Chain 1 Power (dBm)	Chain 2 Power (dBm)	Total Power (dBm)
Low	5180	11.14	11.33	14.25
Middle	5200	11.15	10.67	13.93
High	5240	11.21	10.71	13.98

7.4.4. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the peak power spectral density shall not exceed 4 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

The maximum antenna gain is 6.41 dBi, therefore the limit is 3.59 dBm.

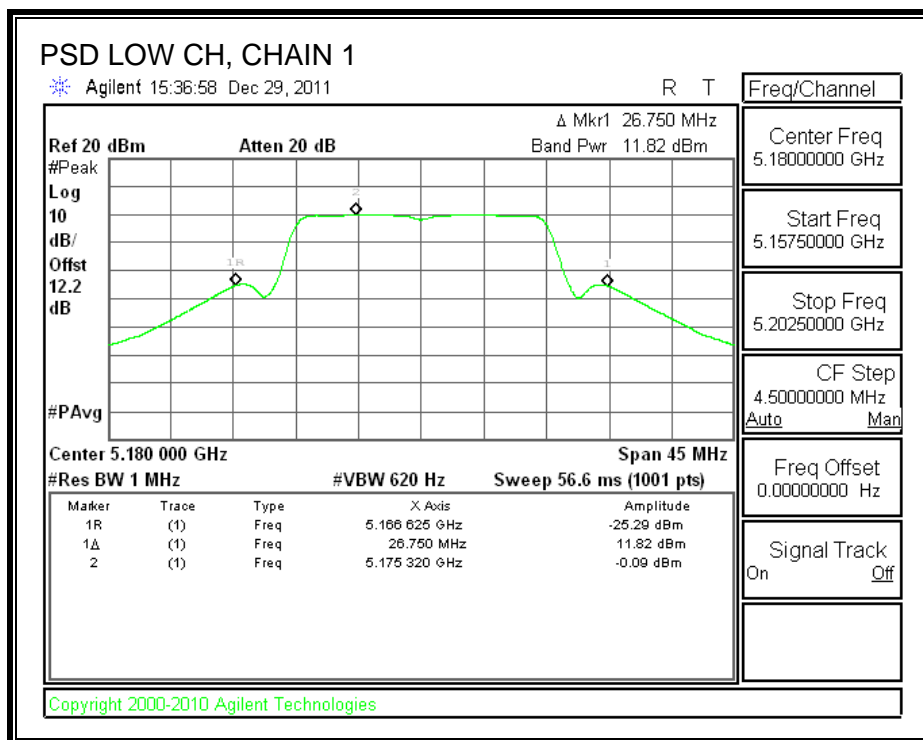
TEST PROCEDURE

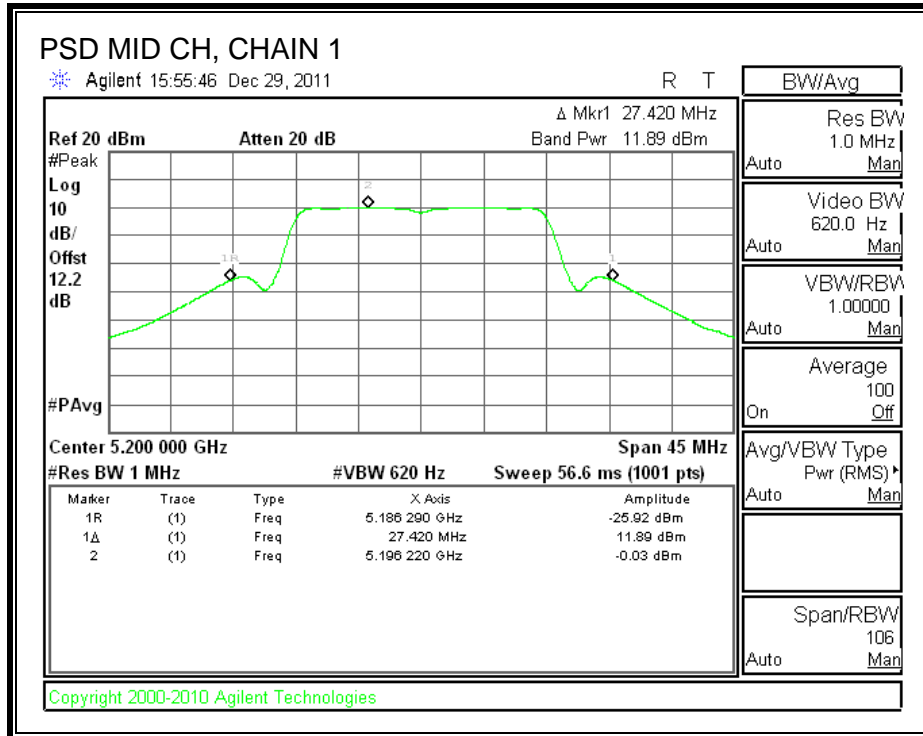
Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

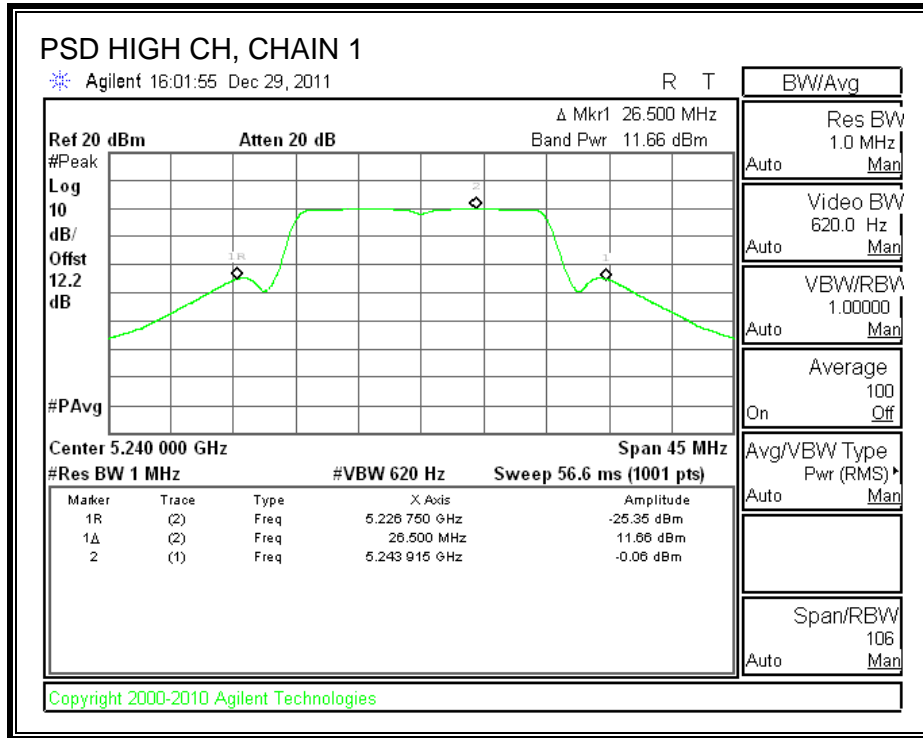
RESULTS

Channel	Frequency (MHz)	Chain 1 PPSD (dBm)	Chain 2 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5180	-0.09	-0.13	2.90	3.59	-0.69
Middle	5200	-0.03	-0.25	2.87	3.59	-0.72
High	5240	-0.06	0.24	3.10	3.59	-0.49

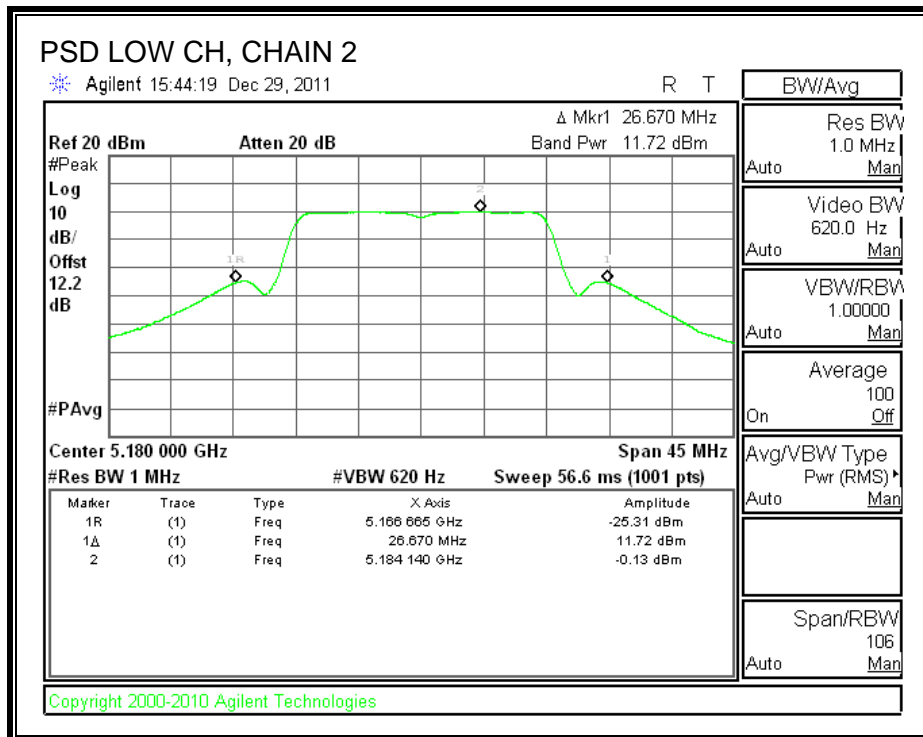
CHAIN 1 POWER SPECTRAL DENSITY

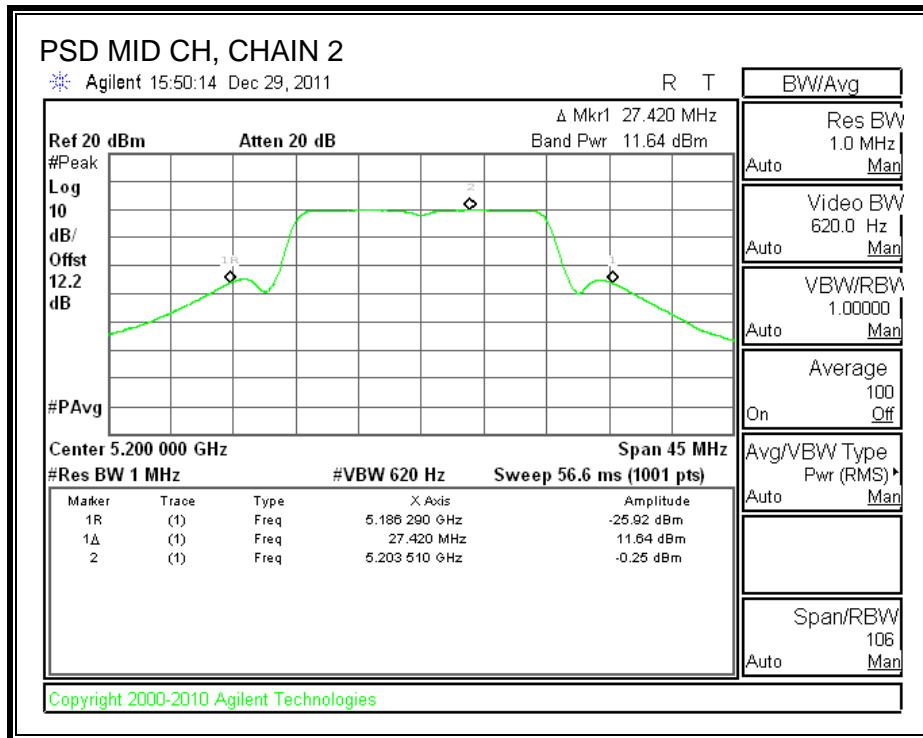


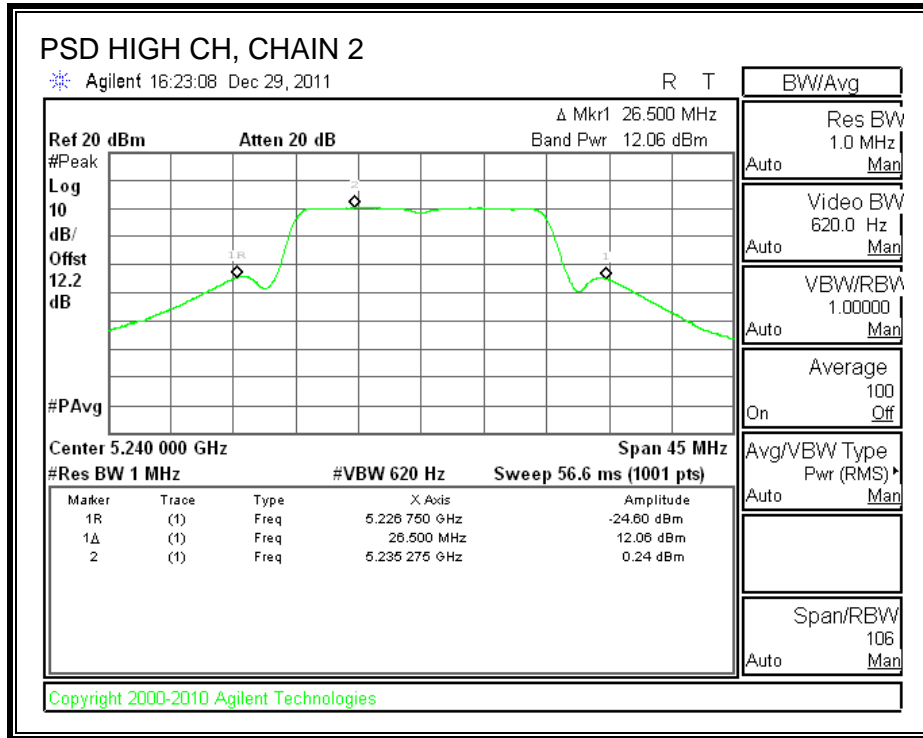




CHAIN 2 POWER SPECTRAL DENSITY







7.4.5. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

CHAIN 1

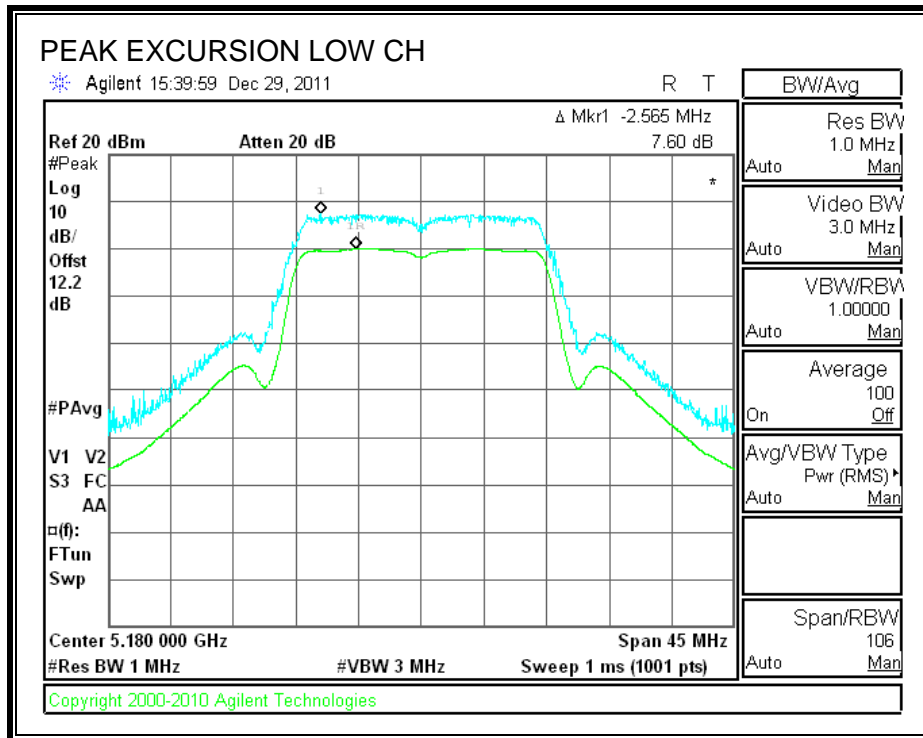
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	7.60	13	-5.40
Middle	5200	7.14	13	-5.86
High	5240	7.60	13	-5.40

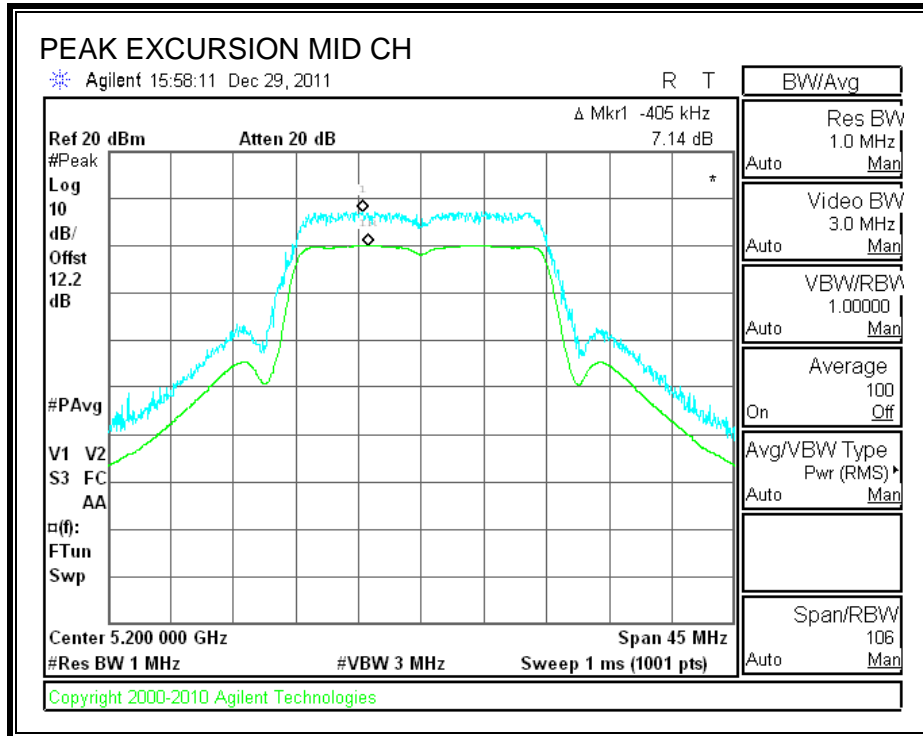
CHAIN 2

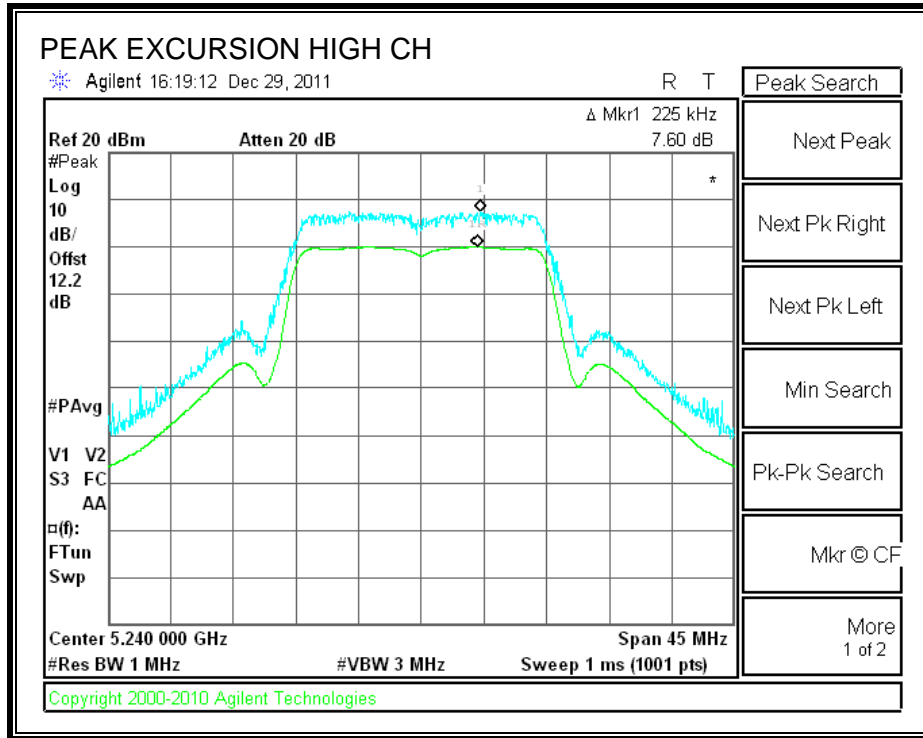
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	8.51	13	-4.49
Middle	5200	8.50	13	-4.50
High	5240	8.33	13	-4.67

CHAIN 1

PEAK EXCURSION

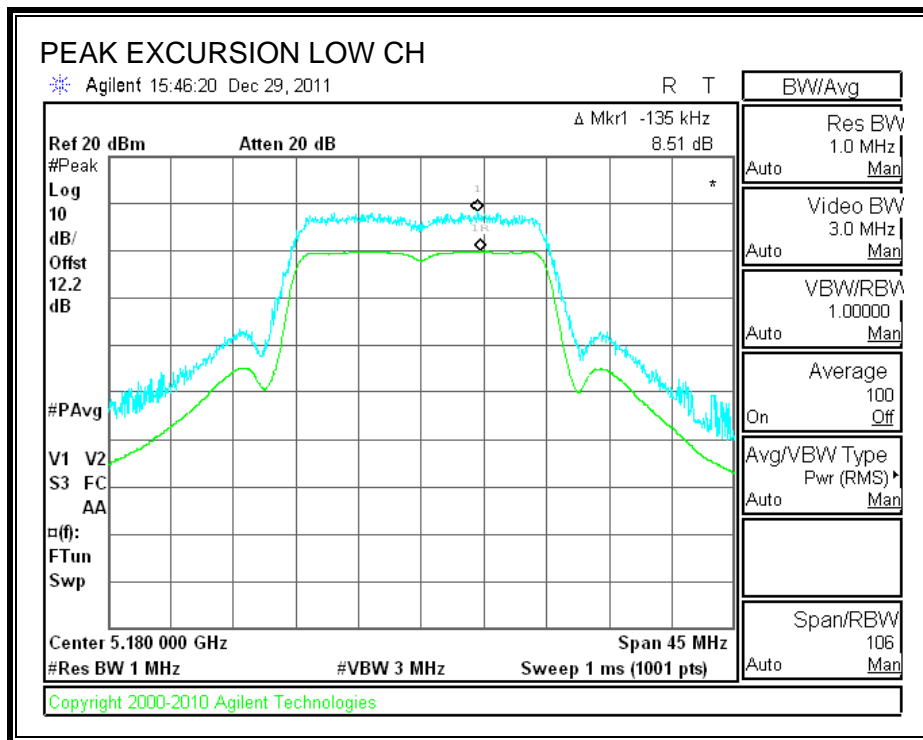


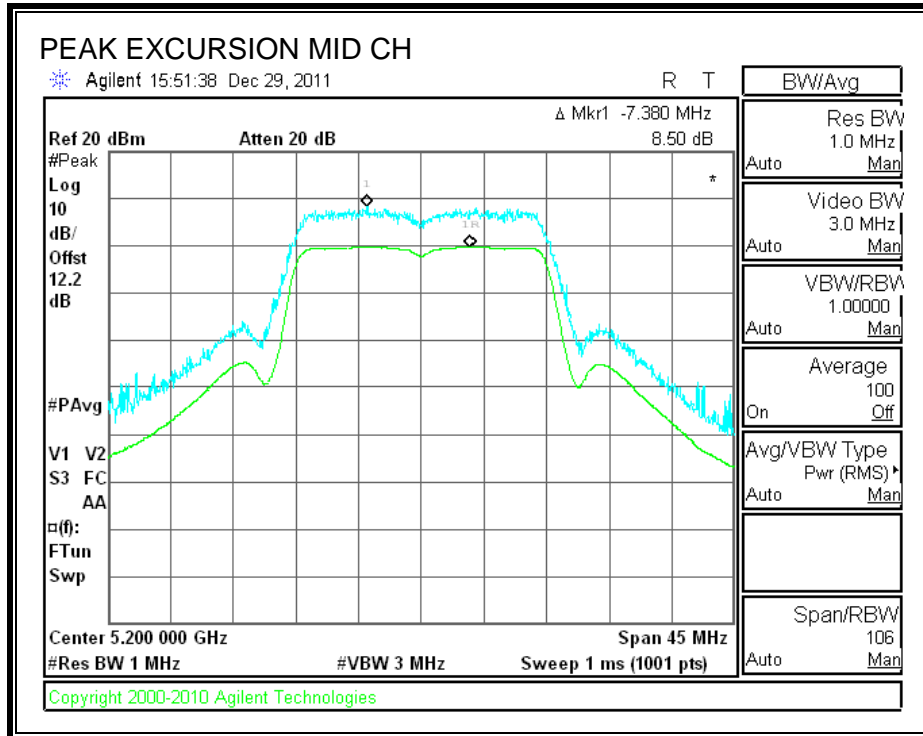


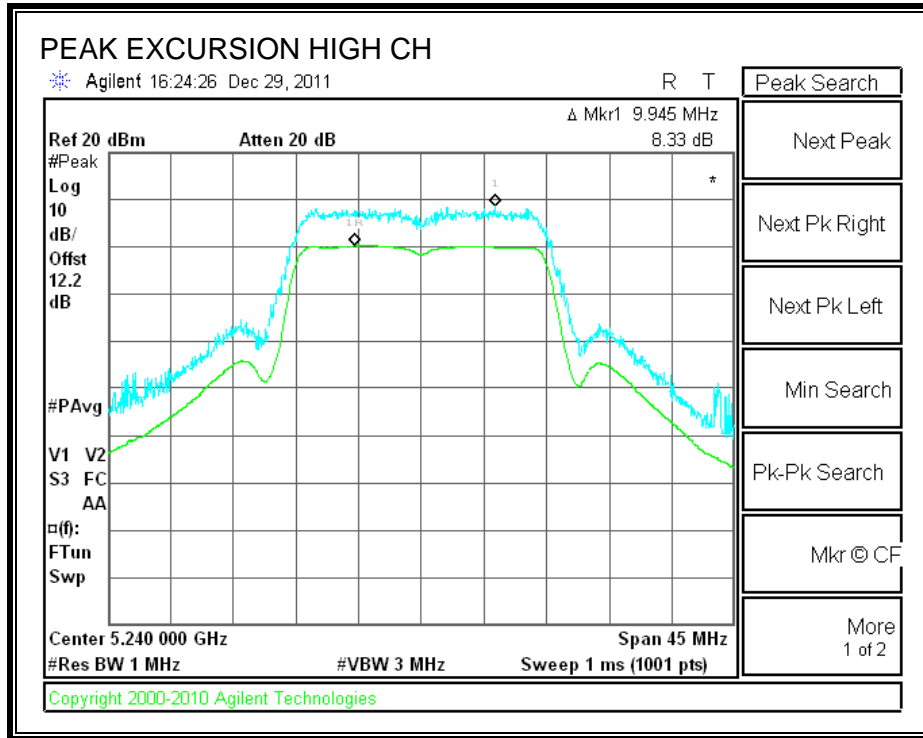


CHAIN 2

PEAK EXCURSION







7.5. 802.11n HT40 2TX MODE IN THE 5.2 GHz BAND, CDD MCS0

7.5.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

CHAIN 1

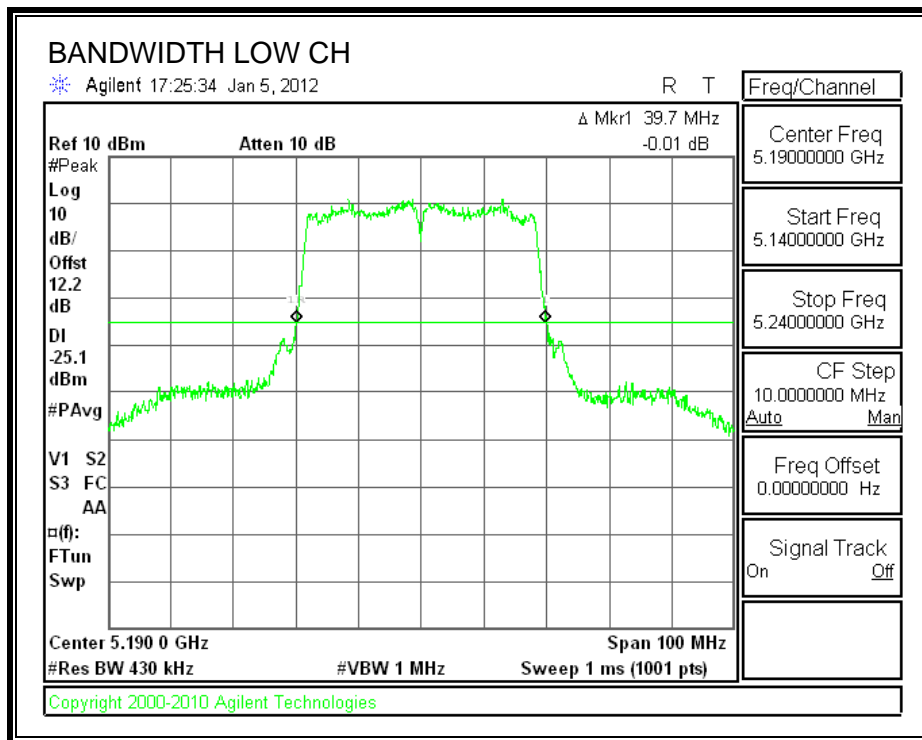
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	39.7	36.2631
High	5230	39.6	36.2664

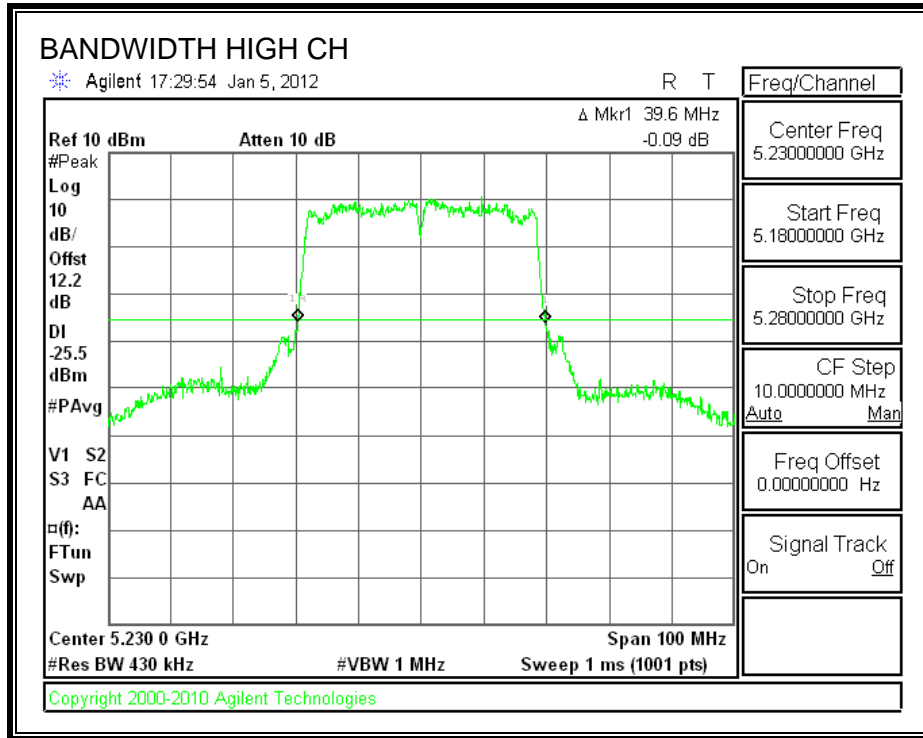
CHAIN 2

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	39.2	36.2777
High	5230	39.5	36.2508

CHAIN 1

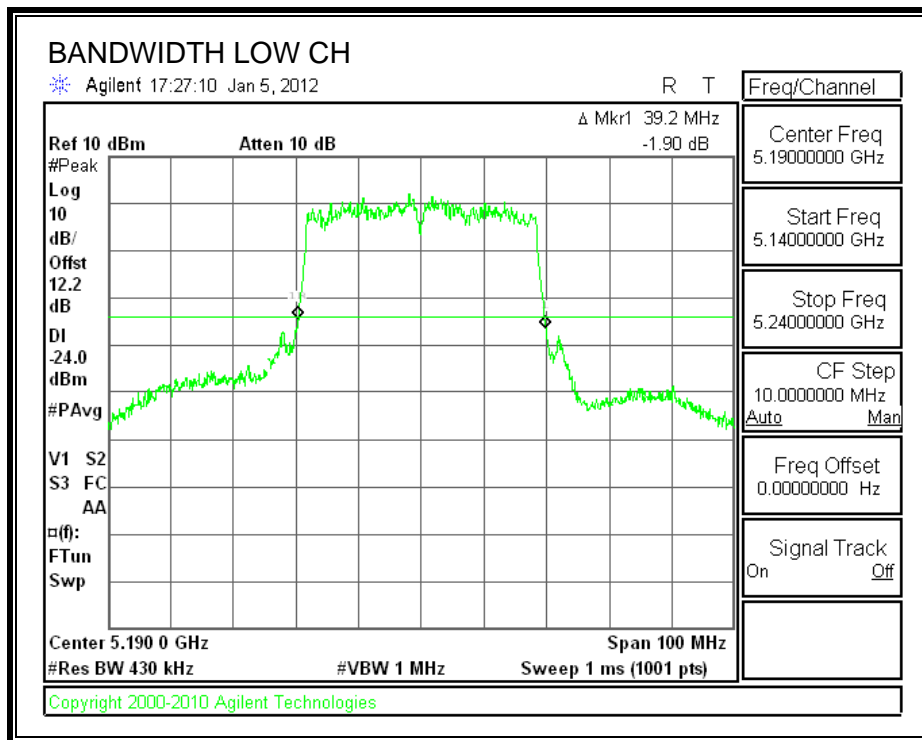
26 dB BANDWIDTH

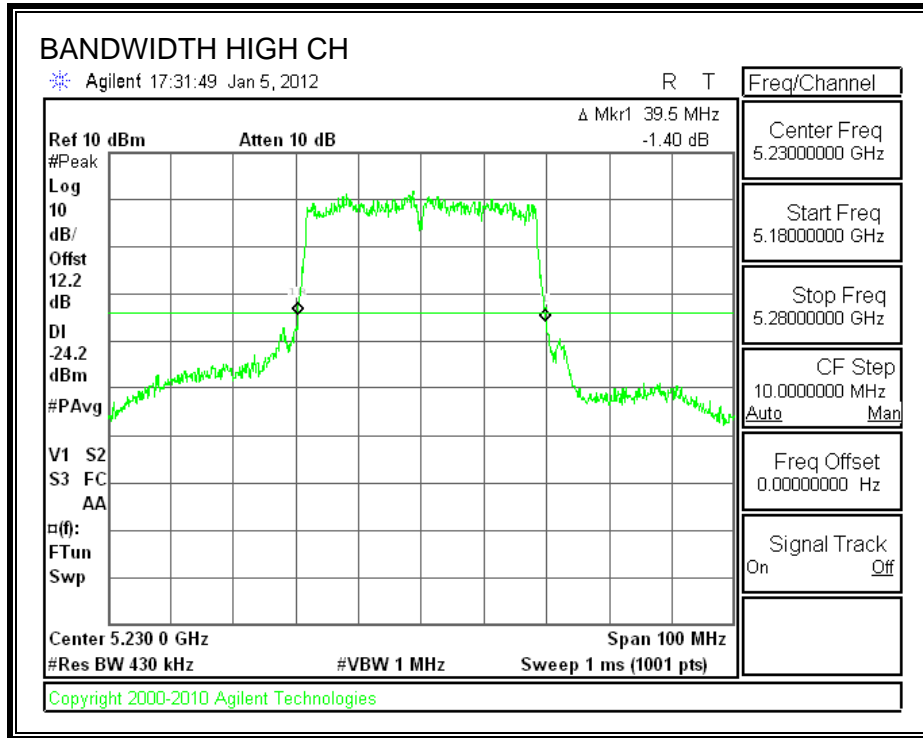




CHAIN 2

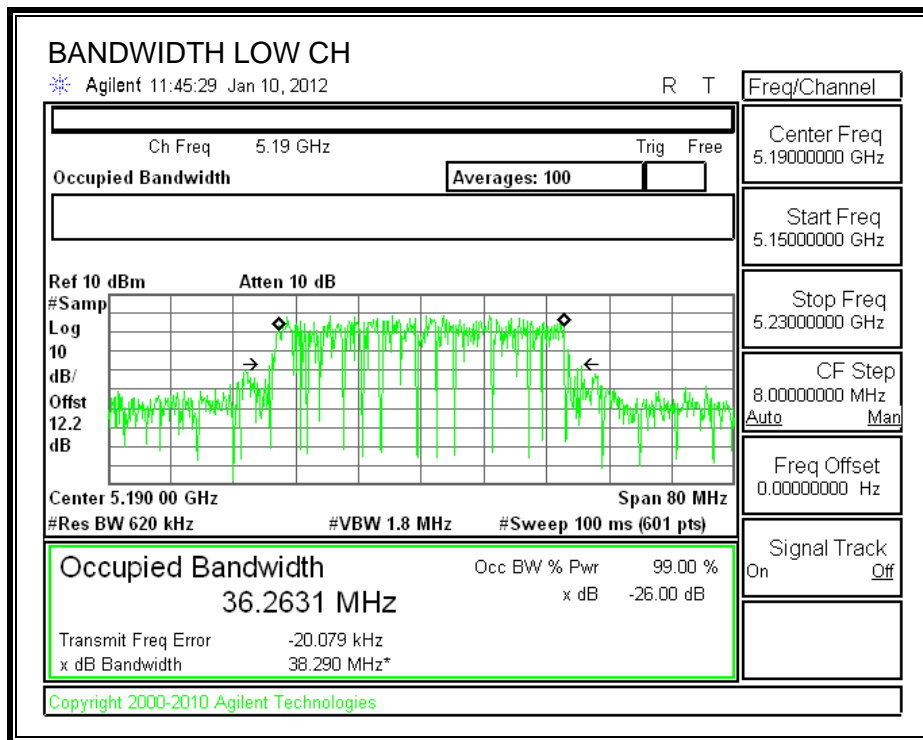
26 dB BANDWIDTH

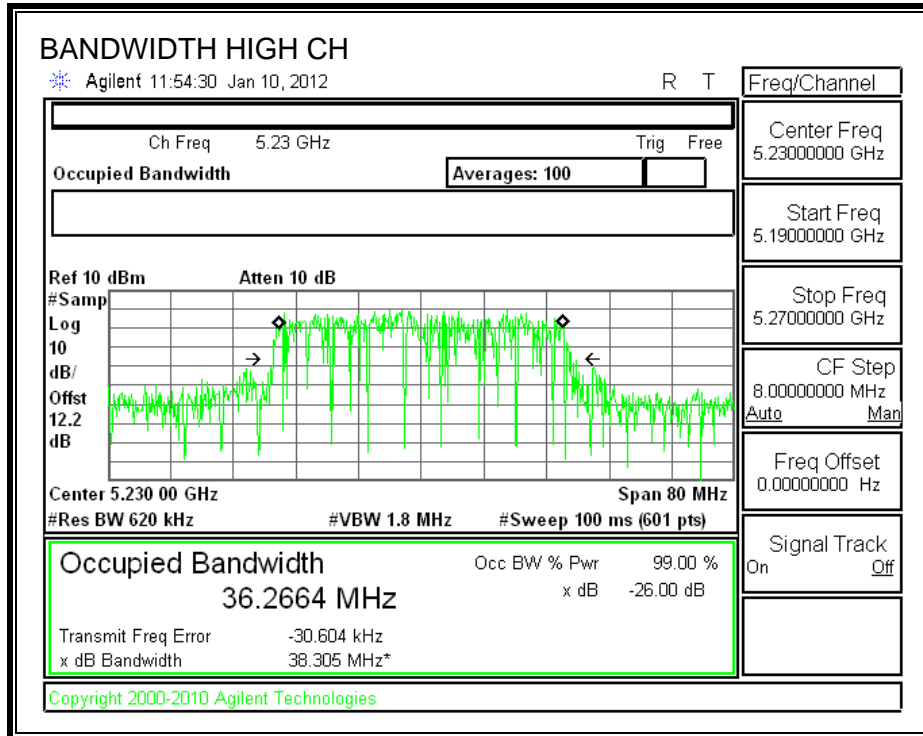




CHAIN 1

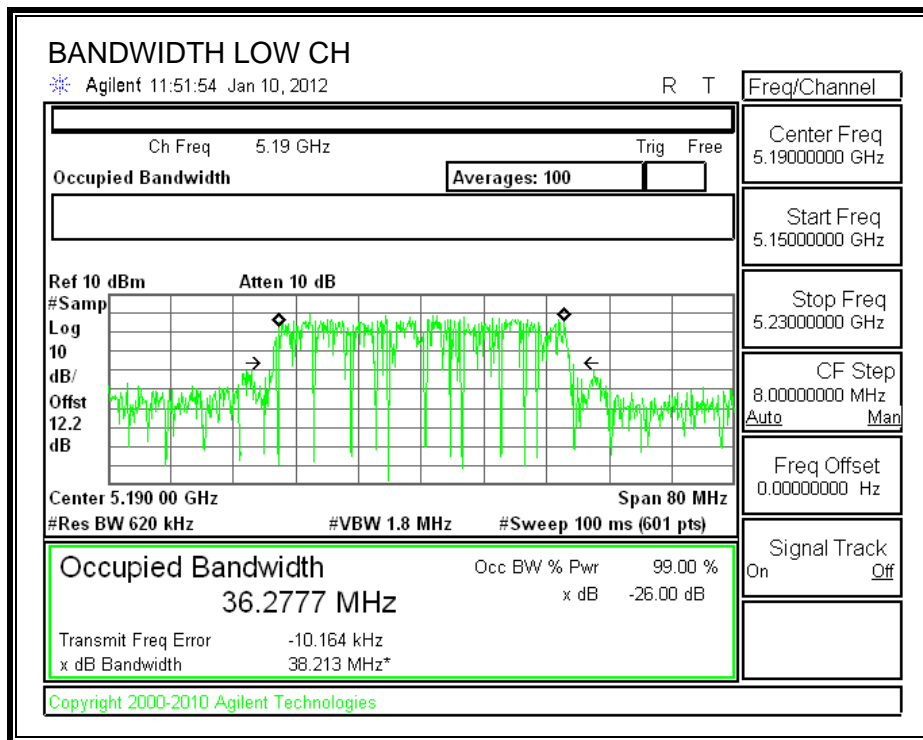
99% BANDWIDTH

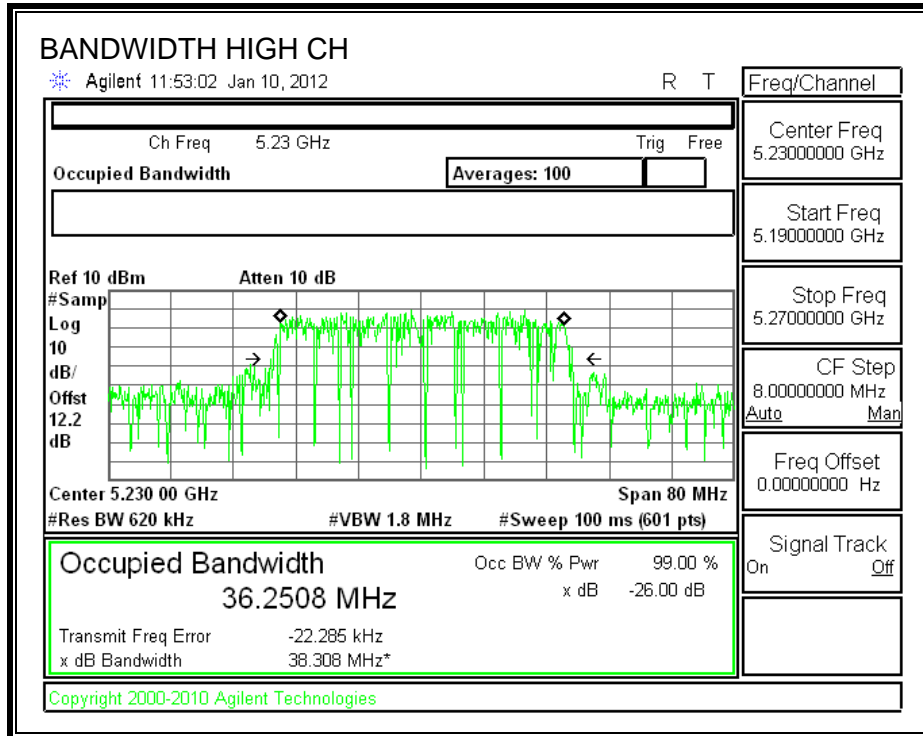




CHAIN 2

99% BANDWIDTH





7.5.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

Antenna Gain (Chain 1) (dBi)	Antenna Gain (Chain 2) (dBi)	Effective Legacy Gain (dBi)
5.94	6.41	9.19

For the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

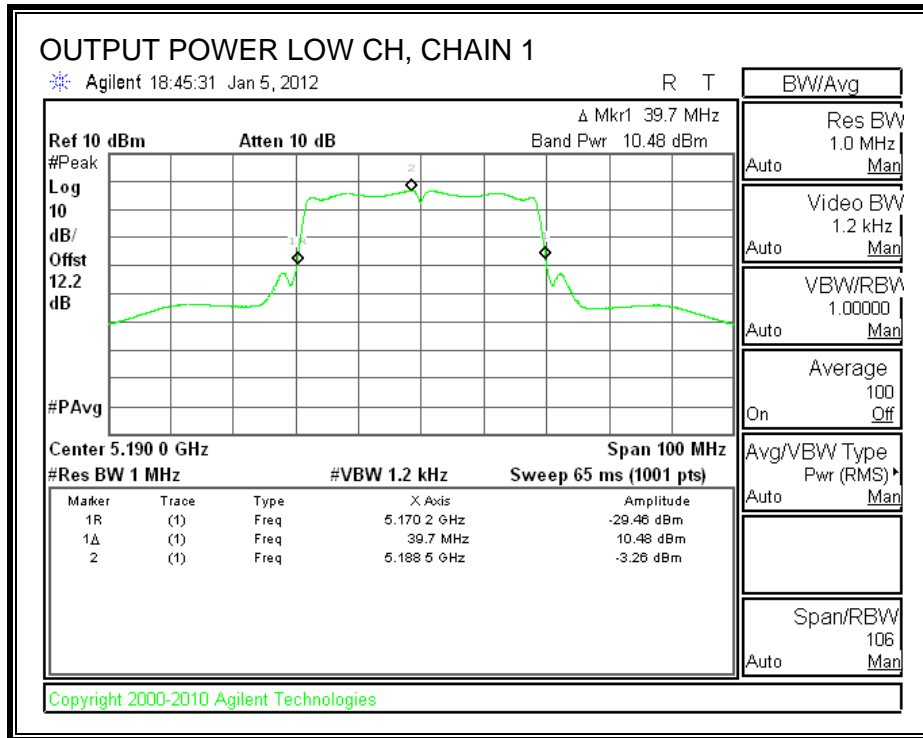
Limit

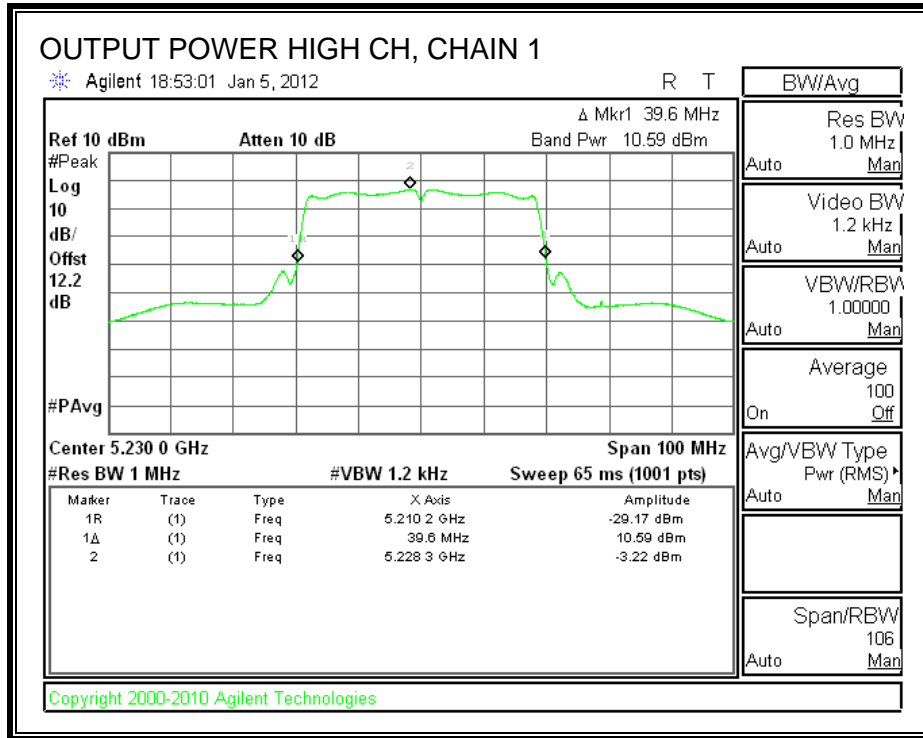
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Effective Antenna Gain (dBi)	Limit (dBm)
Low	5190	17	39.2	19.93	9.19	13.81
High	5230	17	39.5	19.97	9.19	13.81

Individual Chain Results

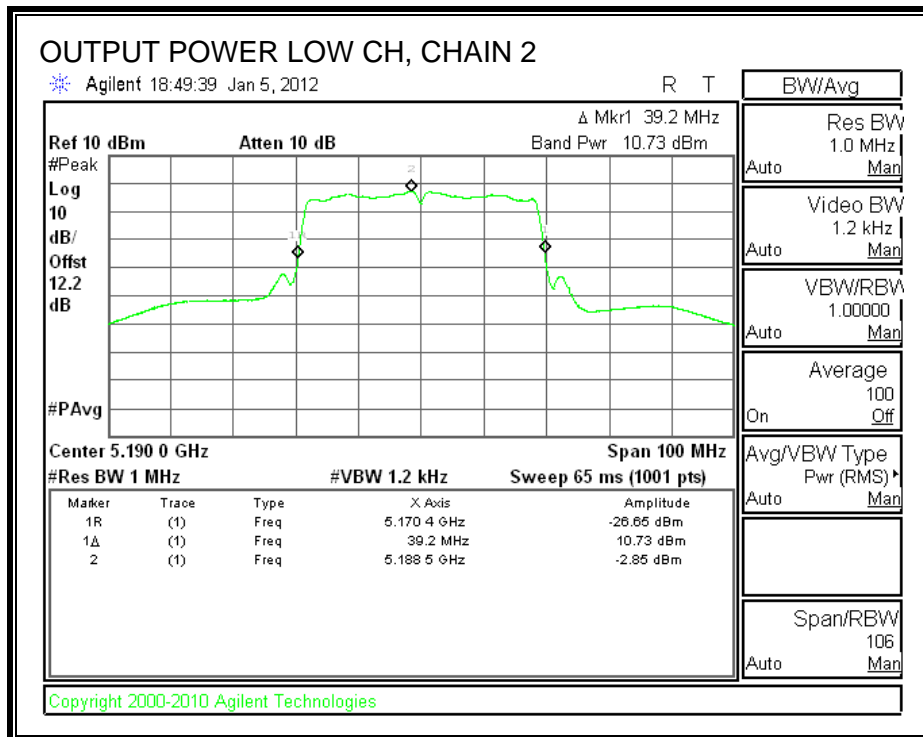
Channel	Frequency (MHz)	Chain 1 Power (dBm)	Chain 2 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	5190	10.48	10.73	13.62	13.81	-0.19
High	5230	10.59	10.64	13.63	13.81	-0.18

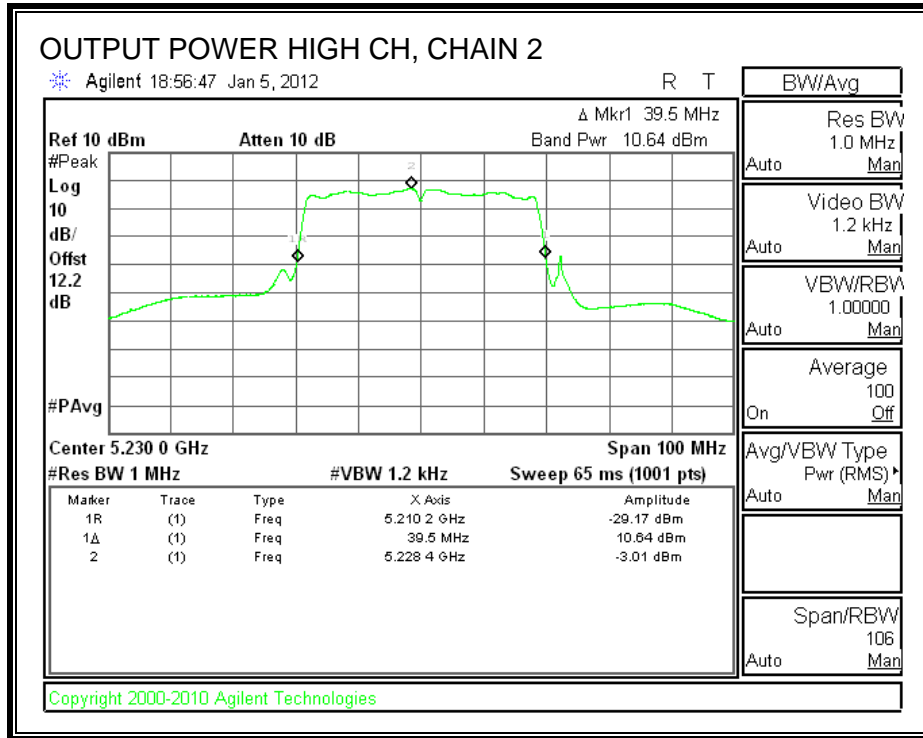
CHAIN 1 OUTPUT POWER





CHAIN 2 OUTPUT POWER





7.5.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 12.2 dB (including 10 dB pad and 2.2 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Chain 1 Power (dBm)	Chain 2 Power (dBm)	Total Power (dBm)
Low	5190	9.34	9.67	12.52
High	5230	9.23	9.53	12.39

7.5.4. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

Antenna Gain (Chain 1) (dBi)	Antenna Gain (Chain 2) (dBi)	Effective Legacy Gain (dBi)
5.94	6.41	9.19

For the 5.15-5.25 GHz band, the peak power spectral density shall not exceed 4 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

The maximum effective antenna gain is 9.19 dBi, therefore the limit is 0.81 dBm.

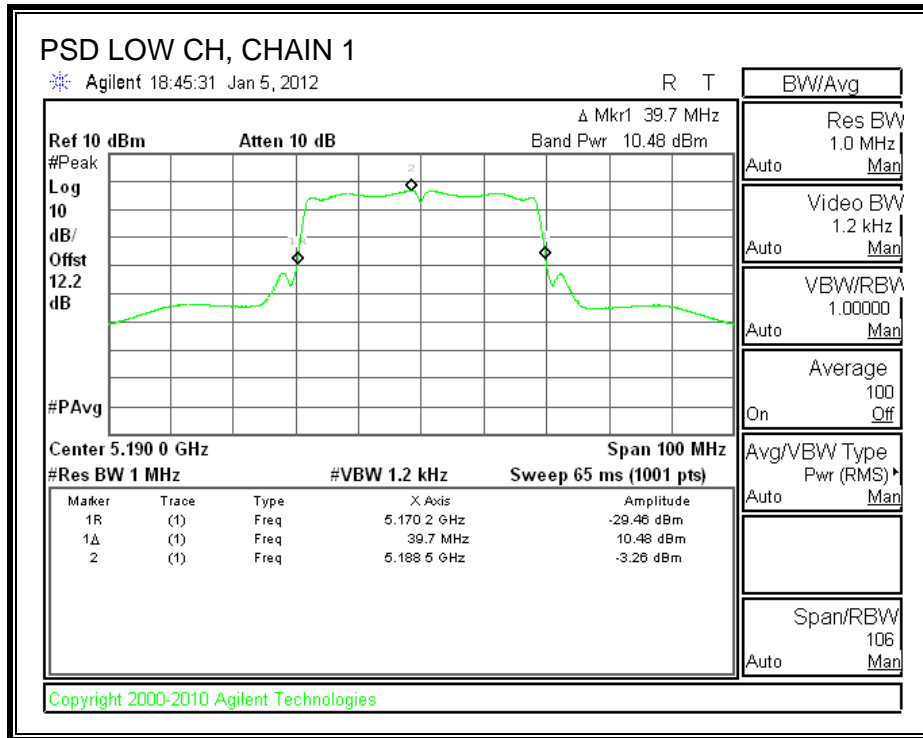
TEST PROCEDURE

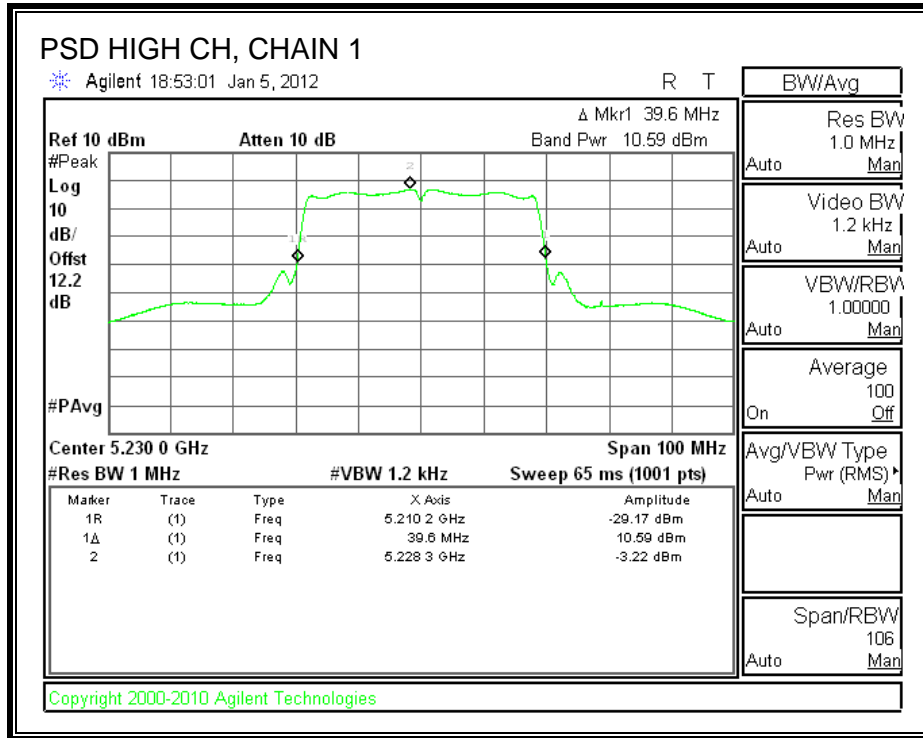
Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

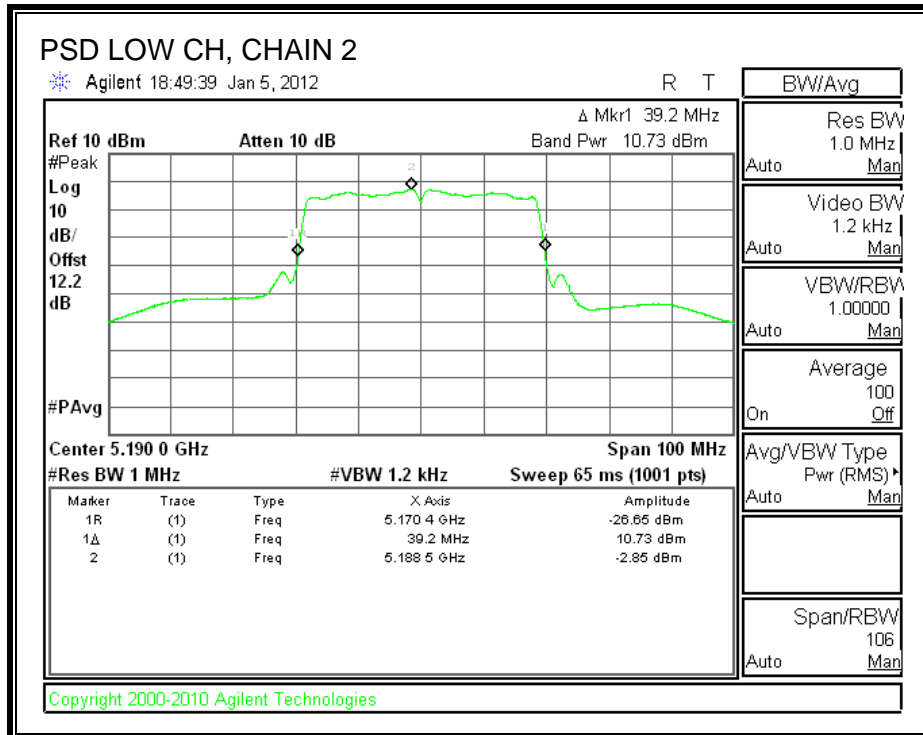
Channel	Frequency (MHz)	Chain 1 PPSD (dBm)	Chain 2 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5180	-3.26	-2.85	-0.04	0.81	-0.85
High	5240	-3.22	-3.01	-0.10	0.81	-0.91

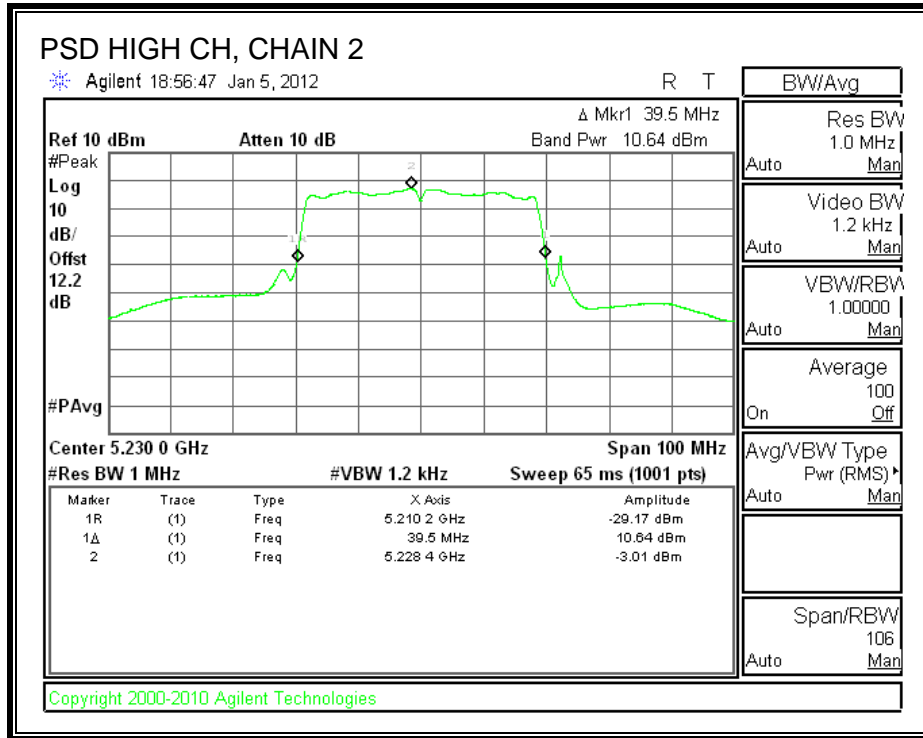
CHAIN 1 POWER SPECTRAL DENSITY





CHAIN 2 POWER SPECTRAL DENSITY





7.5.5. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

CHAIN 1

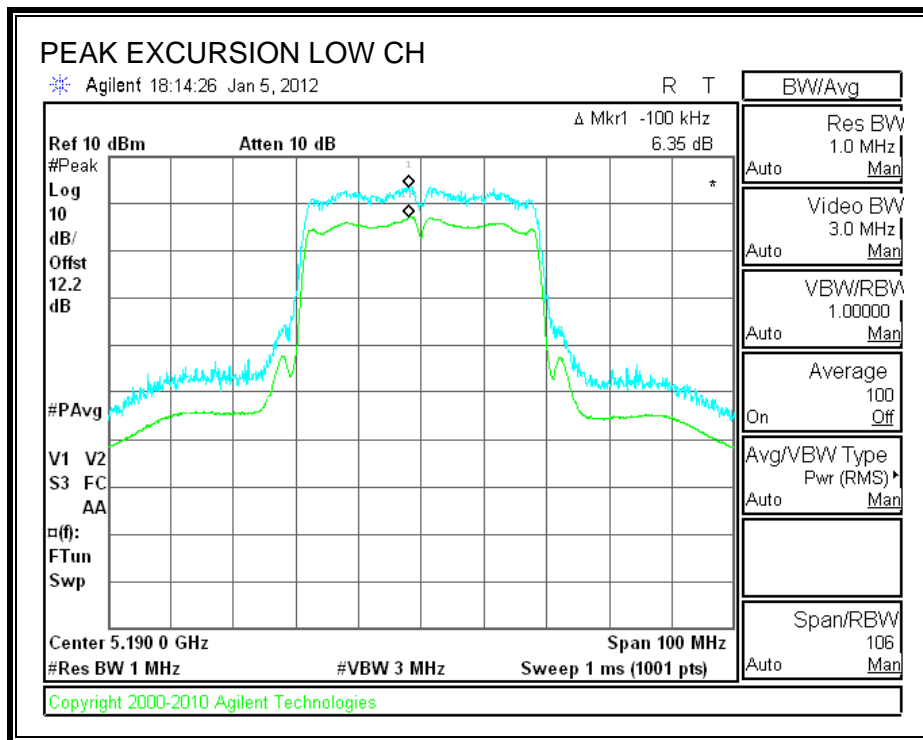
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	6.35	13	-6.65
High	5230	6.58	13	-6.42

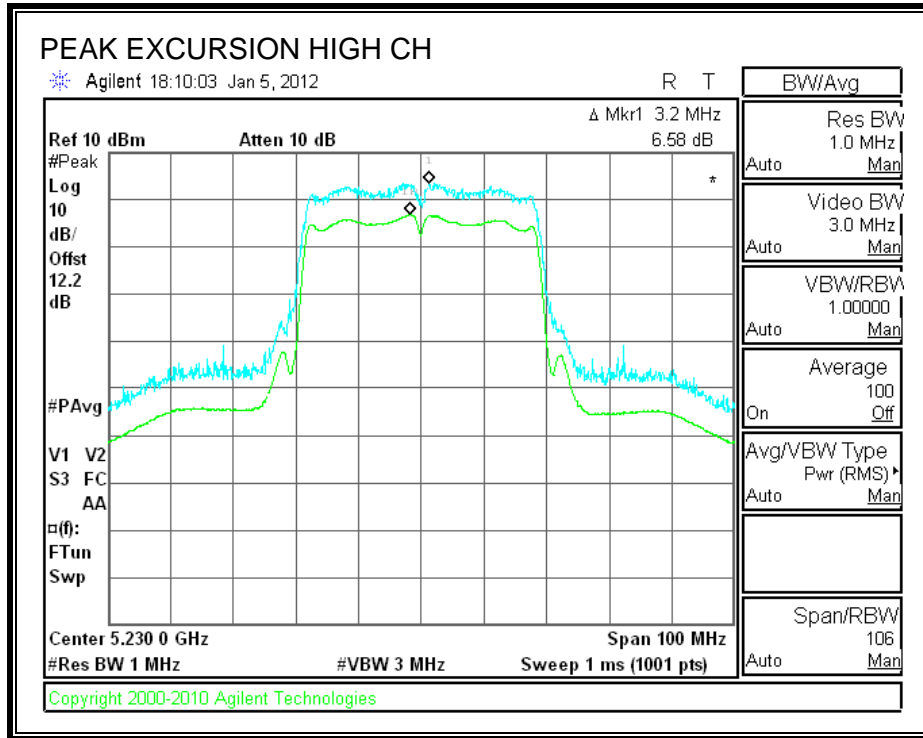
CHAIN 2

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	7.61	13	-5.39
High	5230	8.07	13	-4.93

CHAIN 1

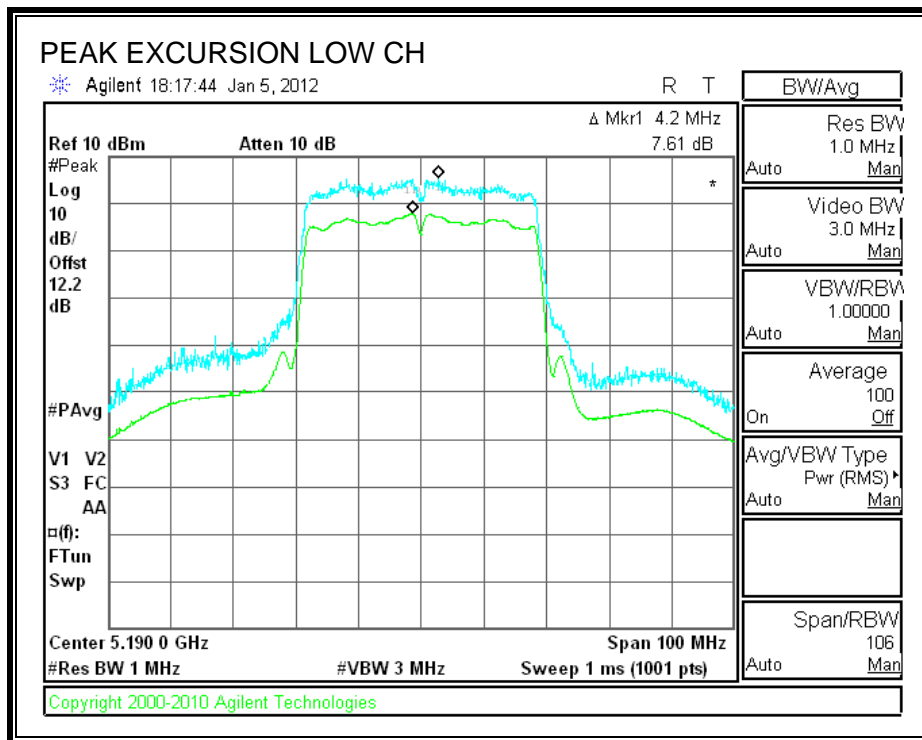
PEAK EXCURSION

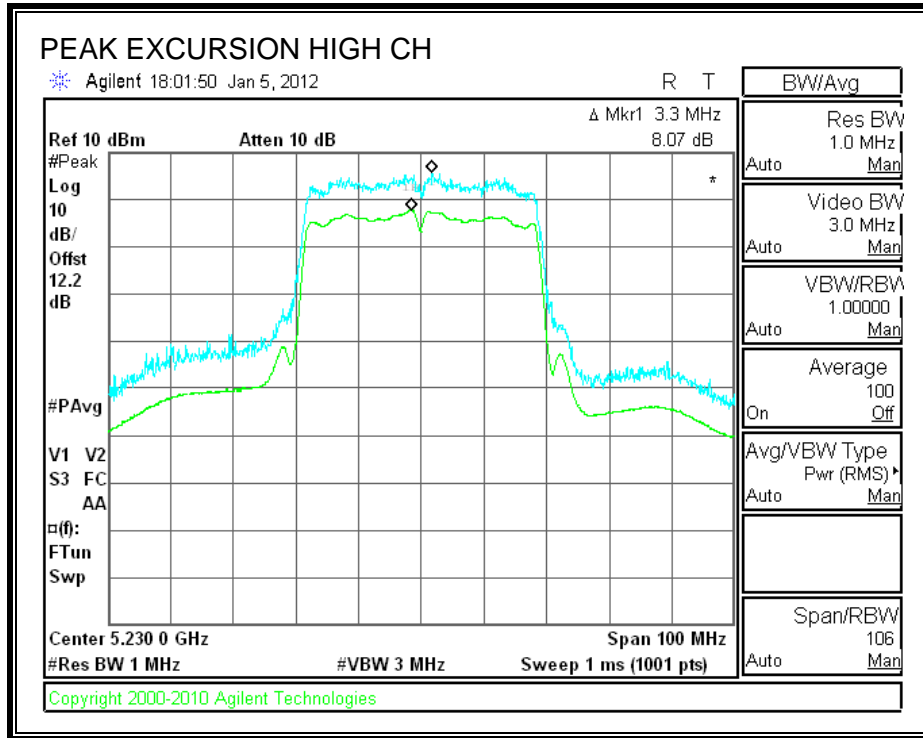




CHAIN 2

PEAK EXCURSION





7.6. 802.11n HT20 3TX MODE IN THE 5.2 GHz BAND, STBC MCS0

7.6.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

CHAIN 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	22.75	17.8289
Middle	5200	25.92	17.8704
High	5240	25.50	17.8362

CHAIN 2

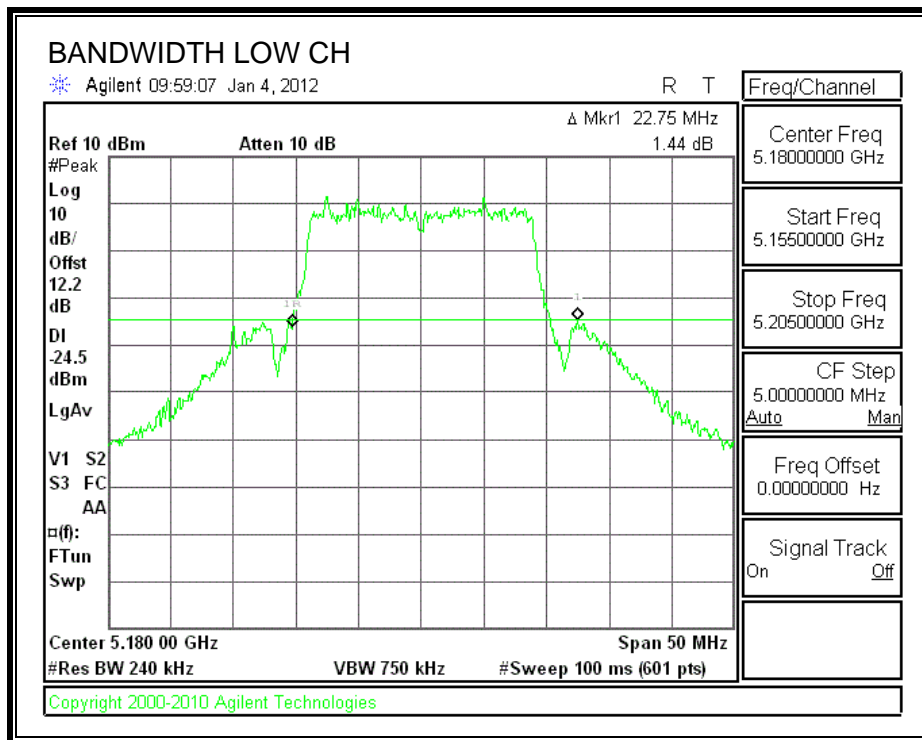
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	26.25	17.8601
Middle	5200	25.83	17.8660
High	5240	26.92	17.8626

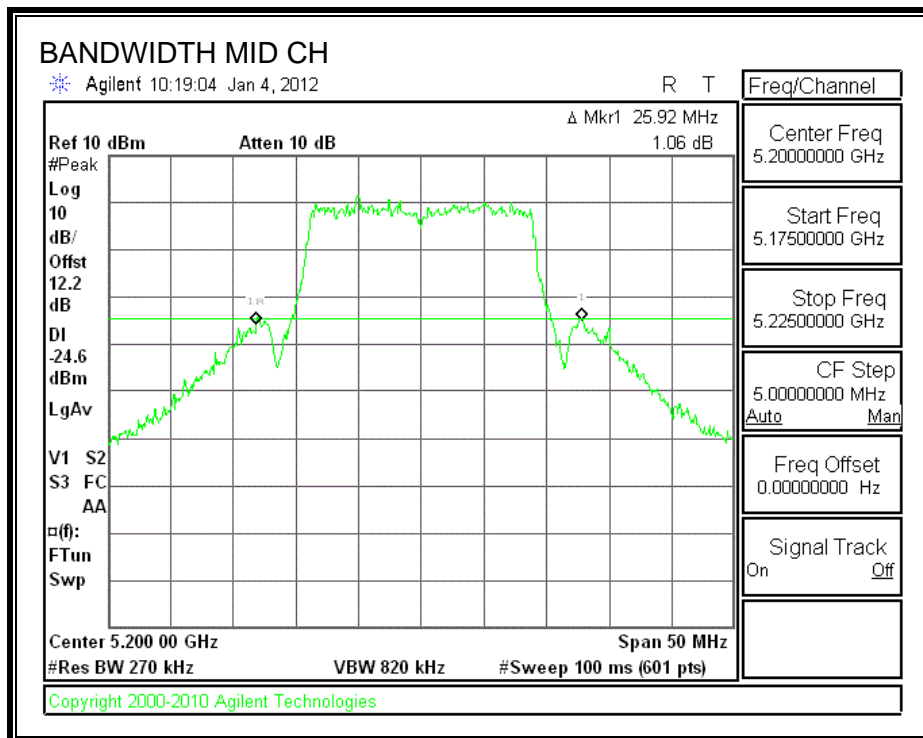
CHAIN 3

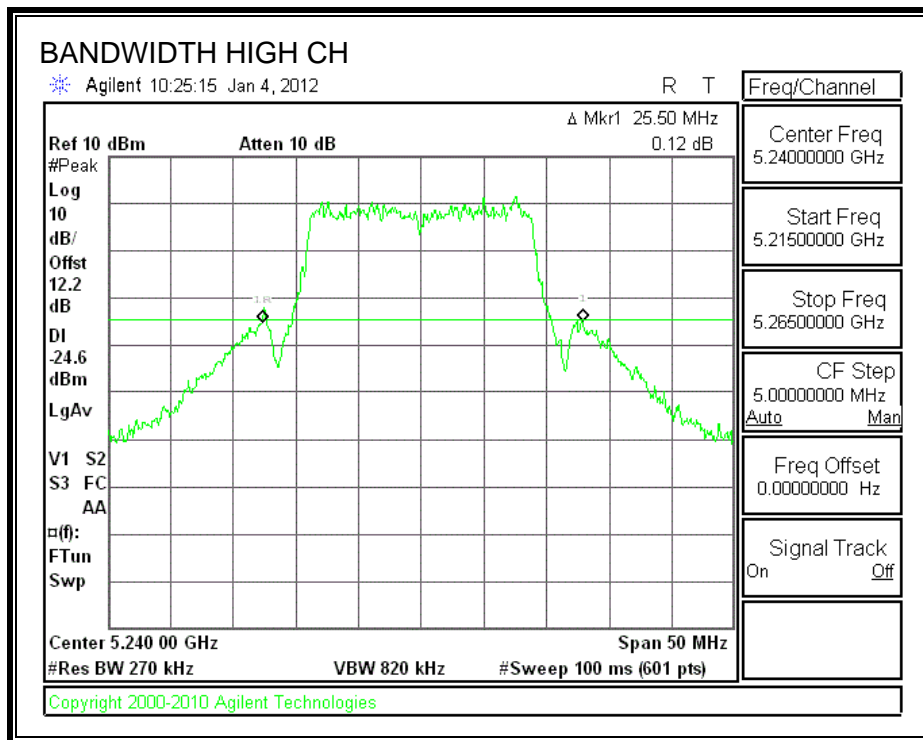
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	20.33	17.8357
Middle	5200	25.08	17.8352
High	5240	20.42	17.8466

CHAIN 1

26 dB BANDWIDTH

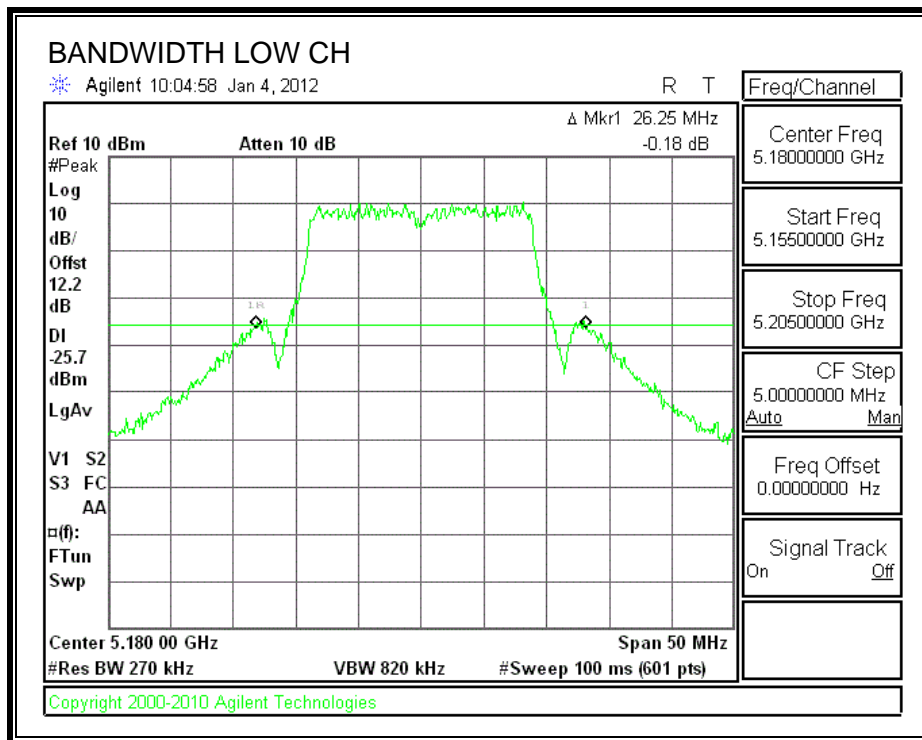


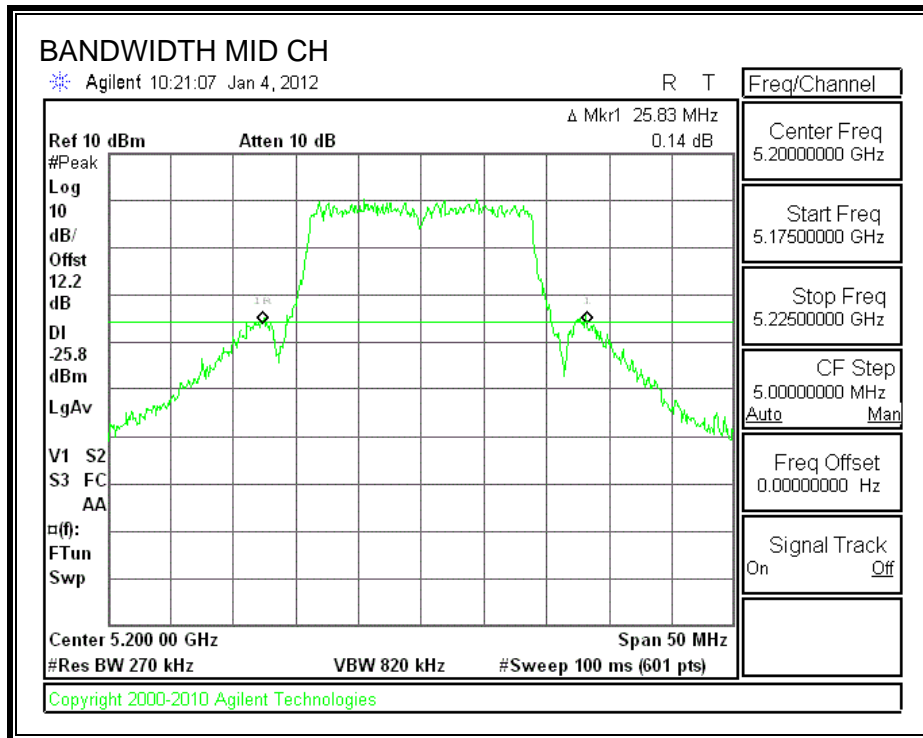


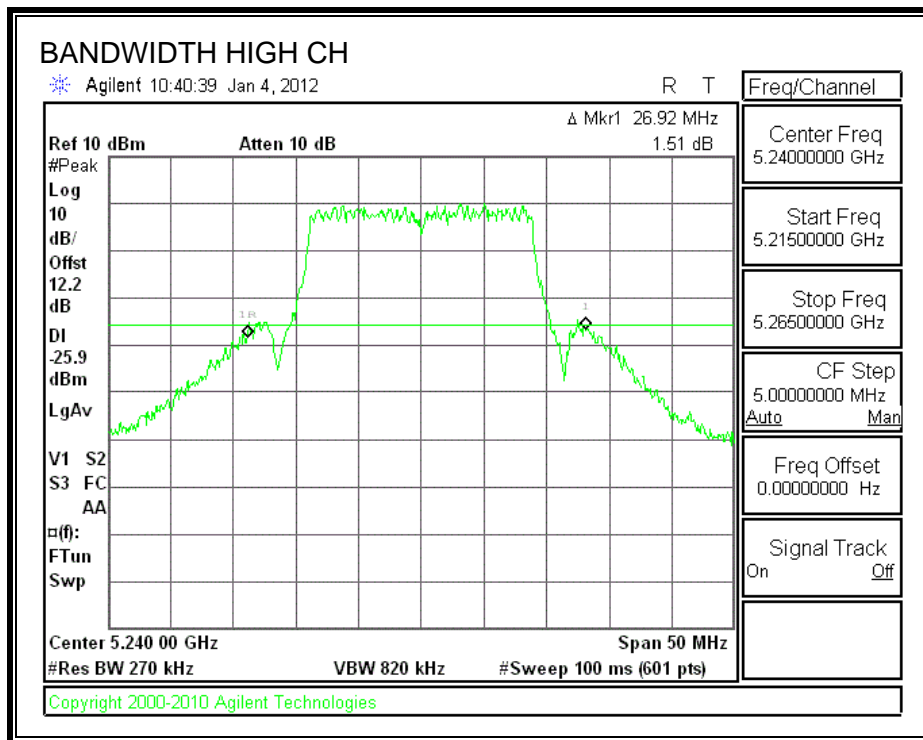


CHAIN 2

26 dB BANDWIDTH

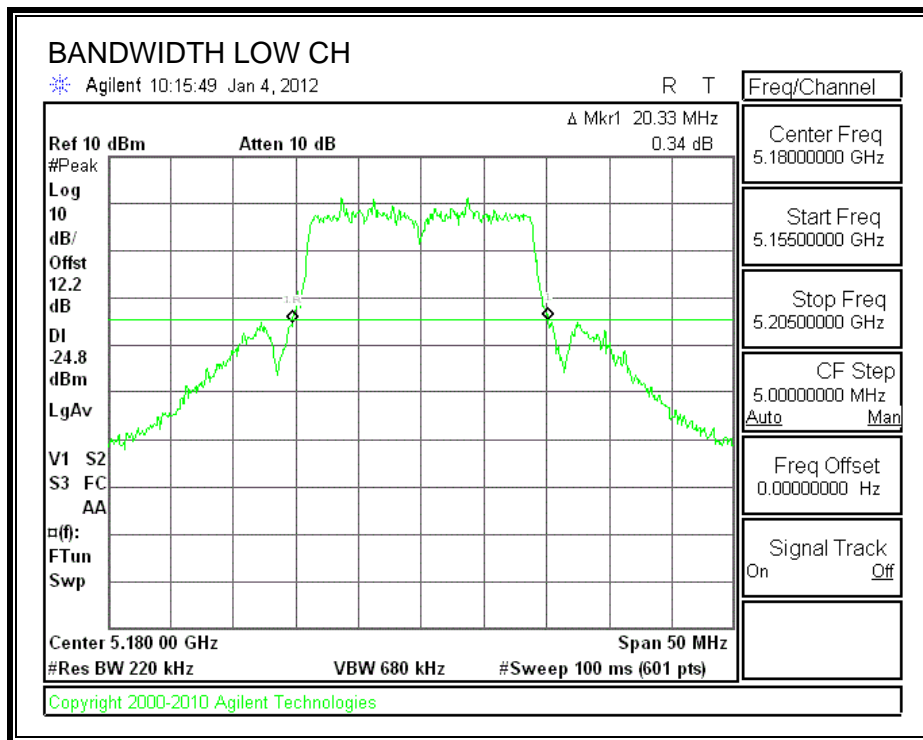


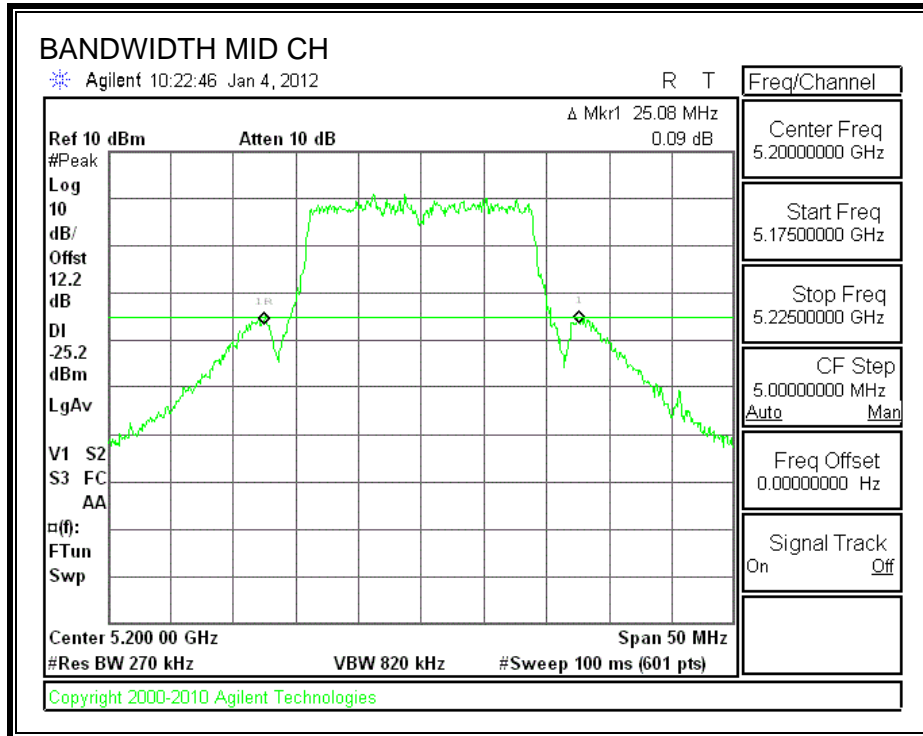


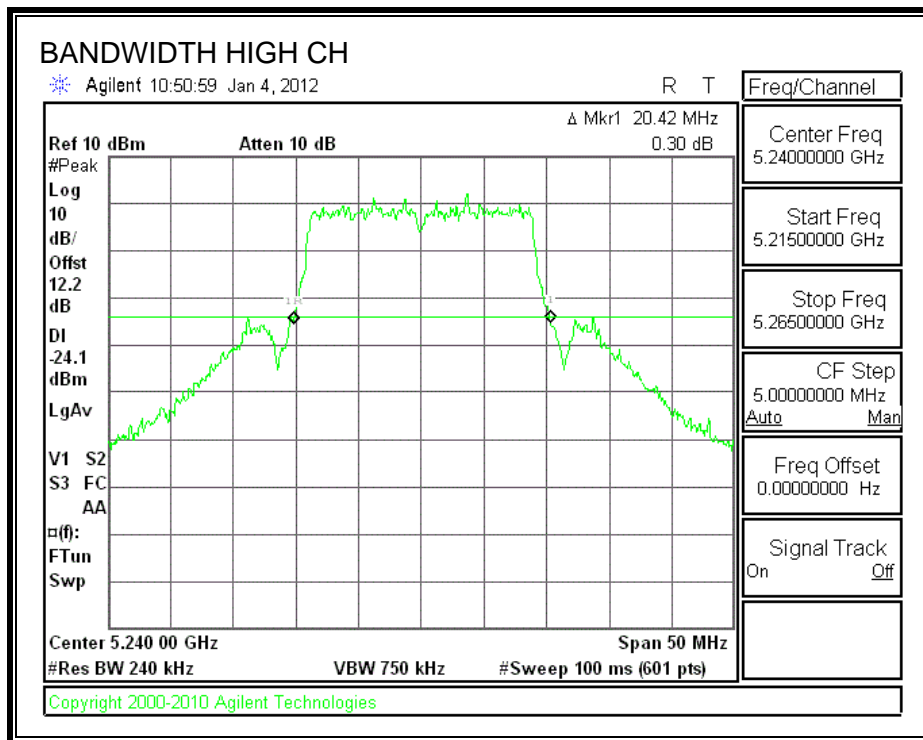


CHAIN 3

26 dB BANDWIDTH

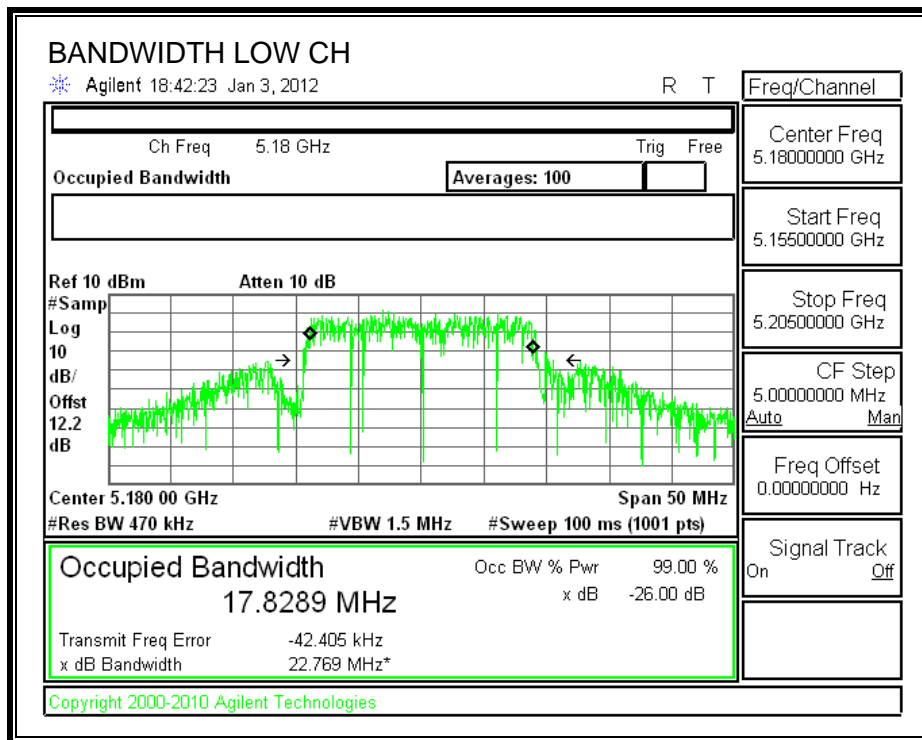


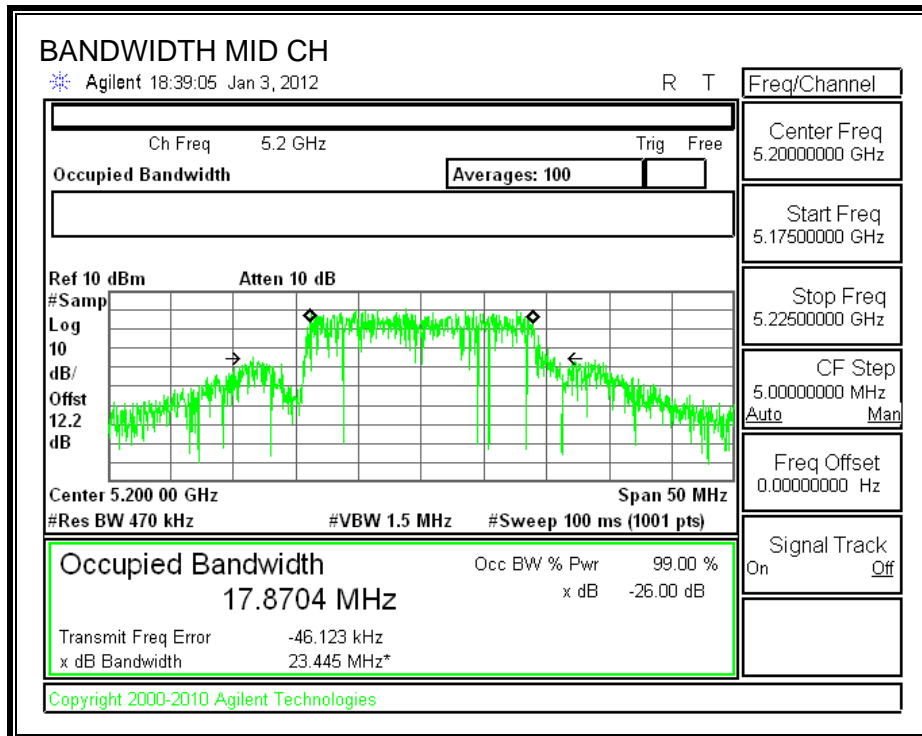


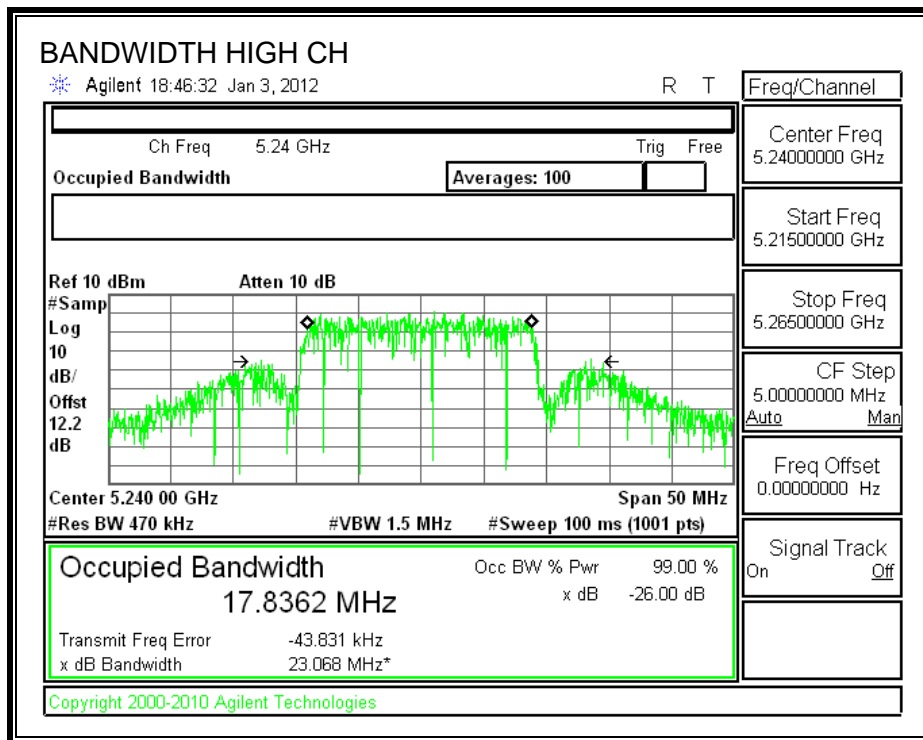


CHAIN 1

99% BANDWIDTH

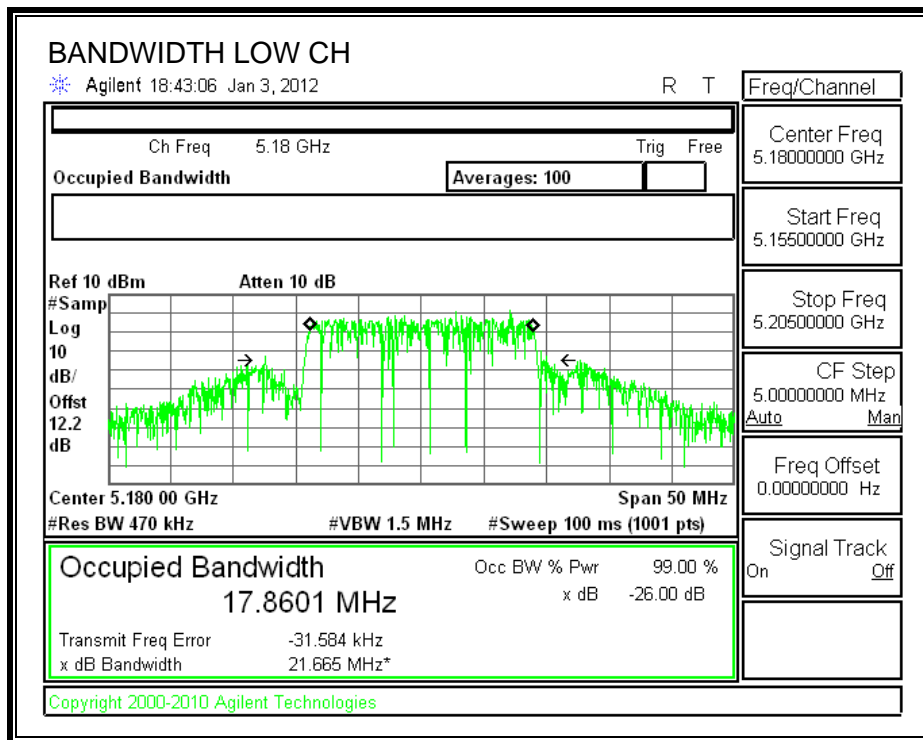


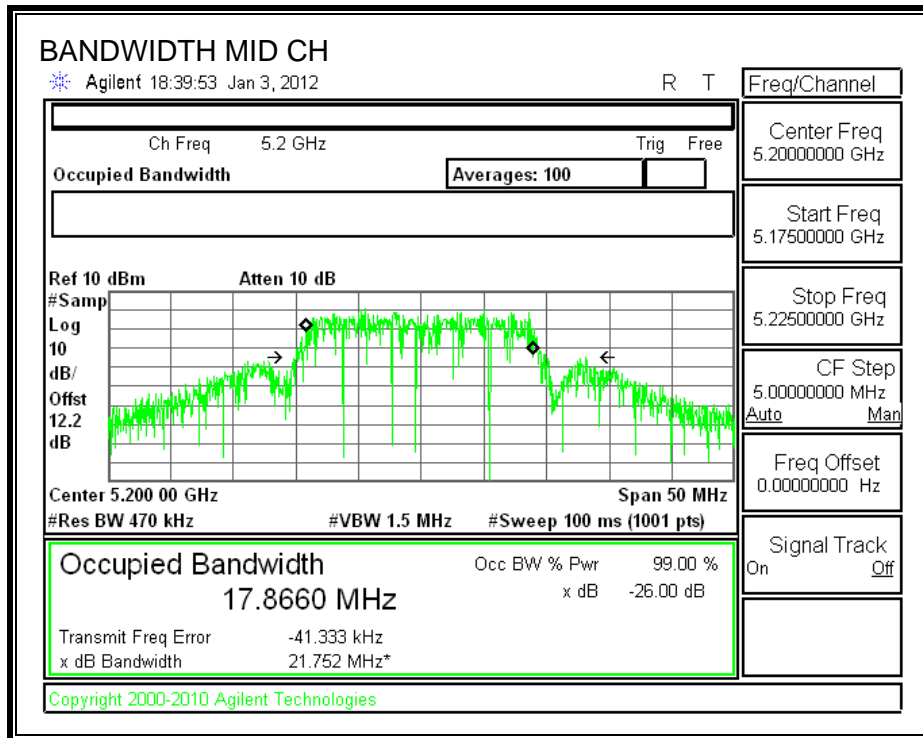


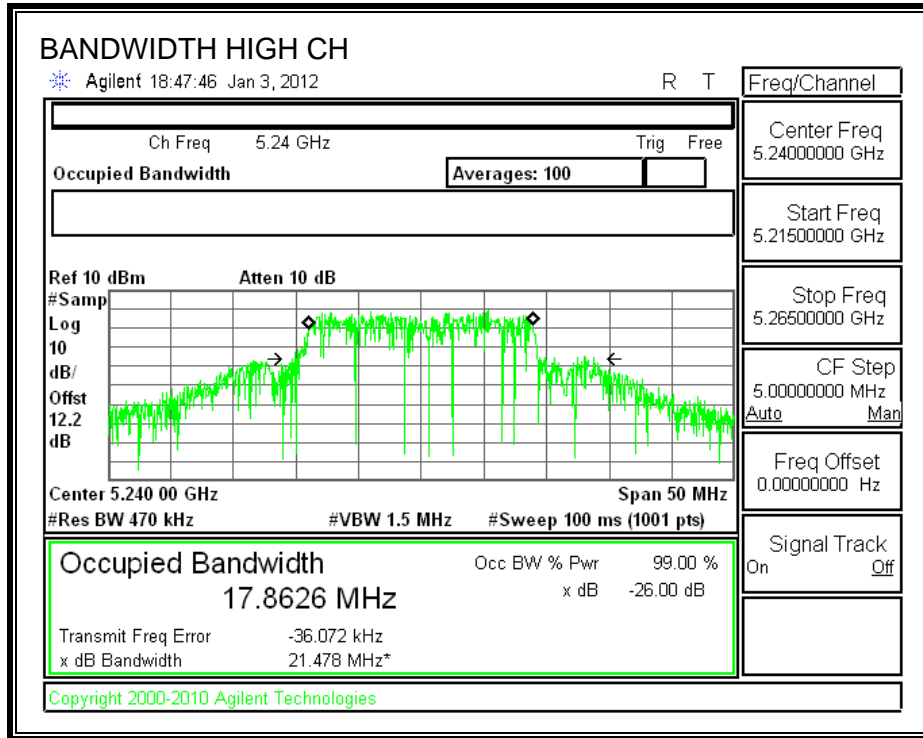


CHAIN 2

99% BANDWIDTH

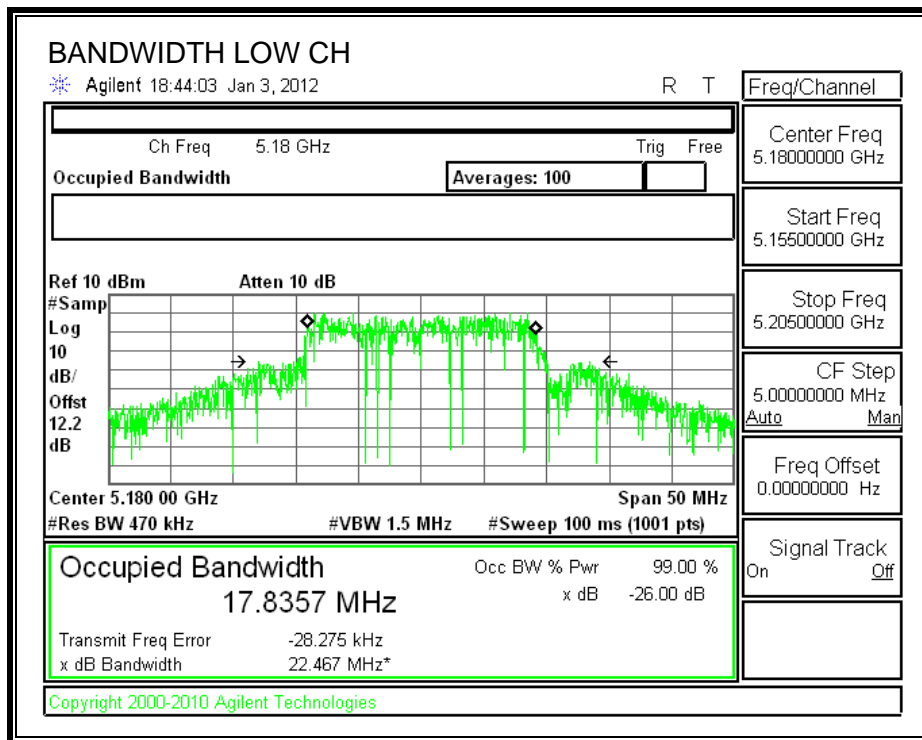


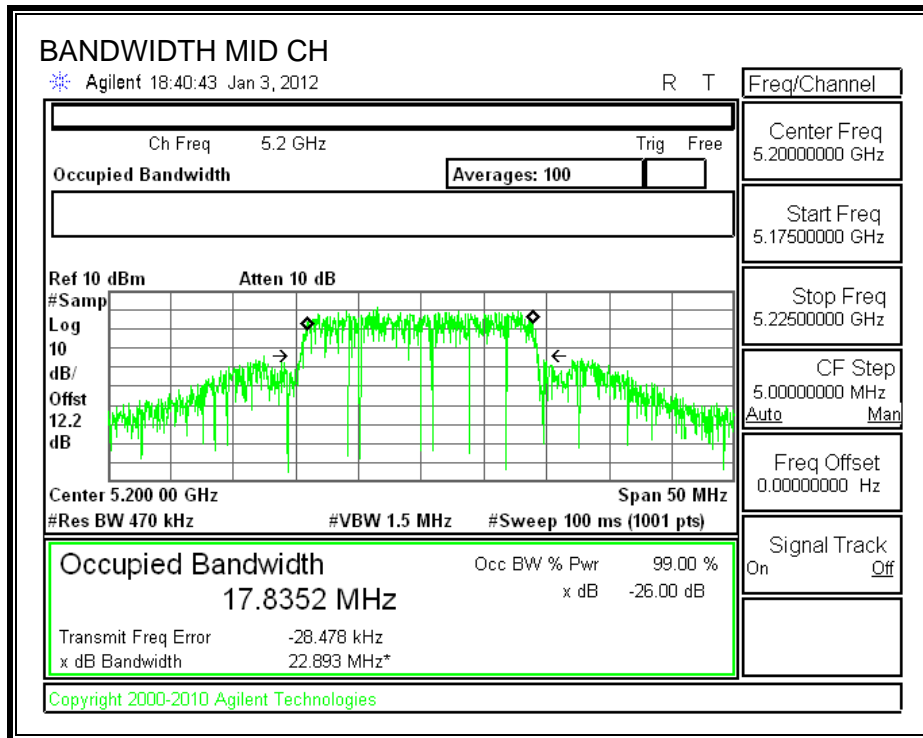


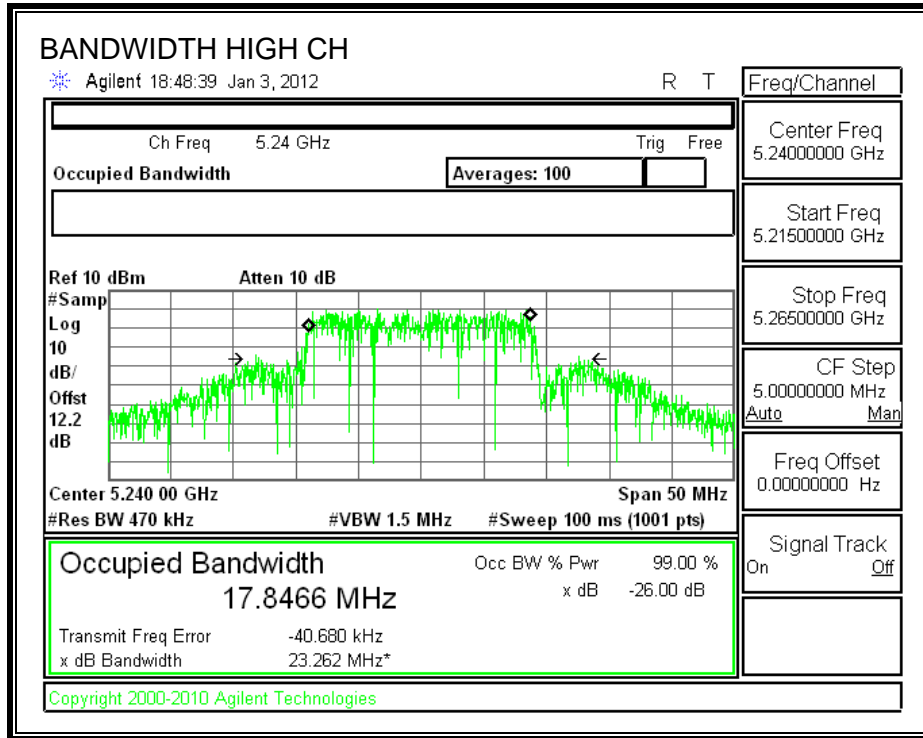


CHAIN 3

99% BANDWIDTH







7.6.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

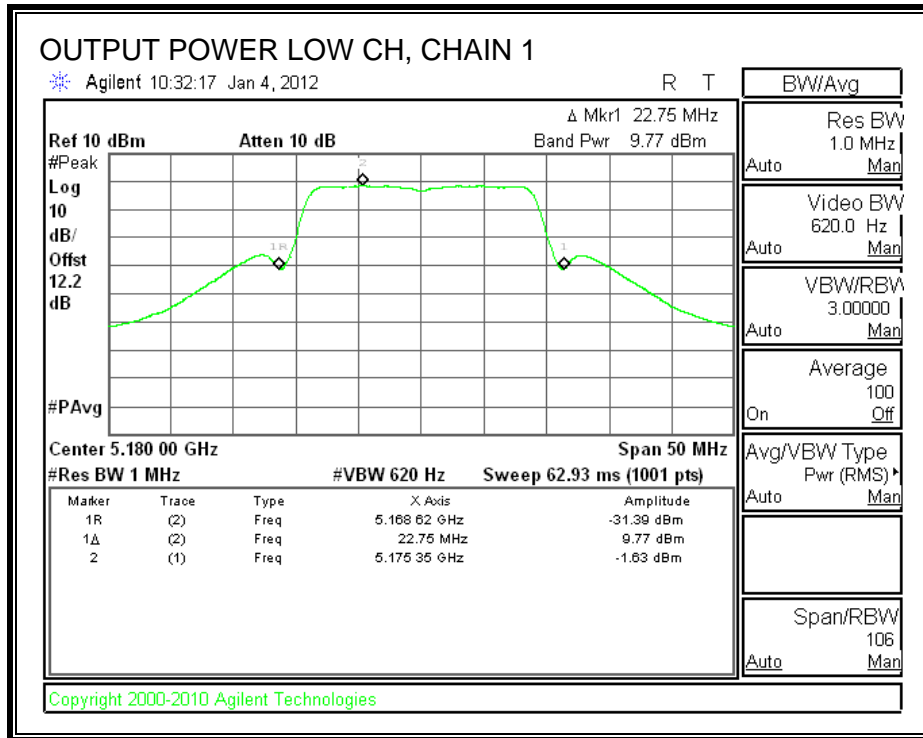
Limit

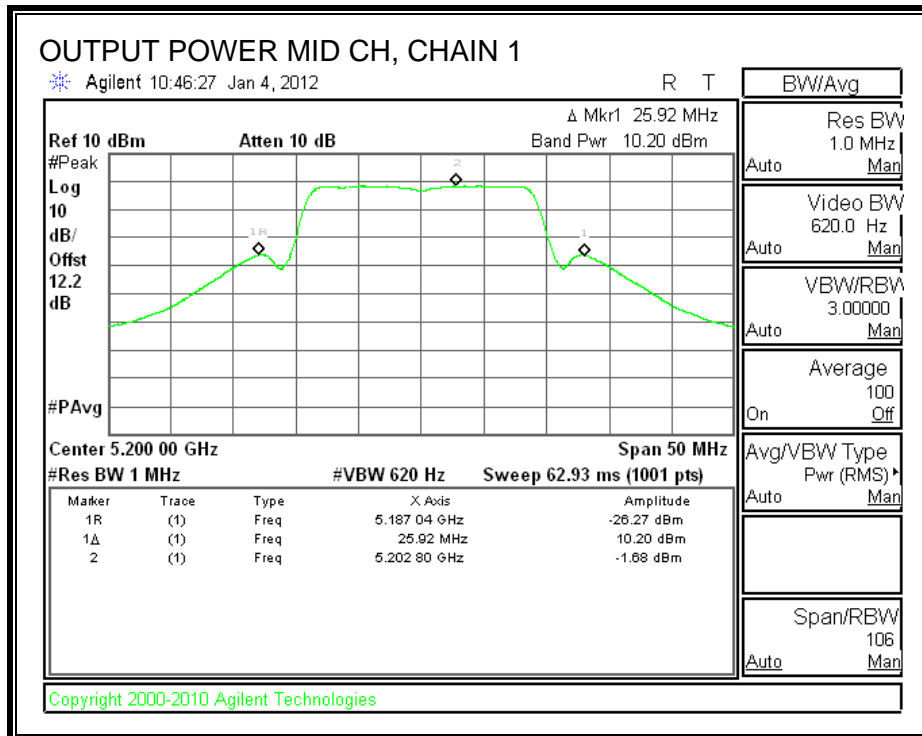
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5180	16.99	20.33	17.08	6.41	16.58
Mid	5200	16.99	25.08	17.99	6.41	16.58
High	5240	16.99	20.42	17.10	6.41	16.58

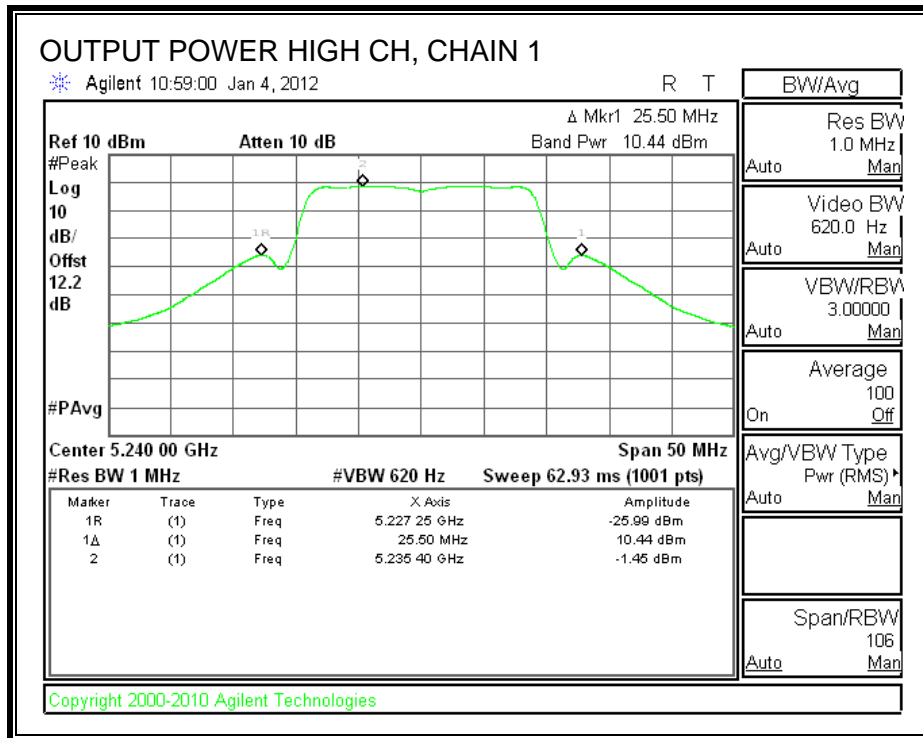
Individual Chain Results

Channel	Frequency (MHz)	Chain 1 Power (dBm)	Chain 2 Power (dBm)	Chain 3 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	5180	9.77	10.00	10.26	14.79	16.58	-1.79
Mid	5200	10.20	10.19	9.95	14.89	16.58	-1.69
High	5240	10.44	9.85	10.21	14.94	16.58	-1.64

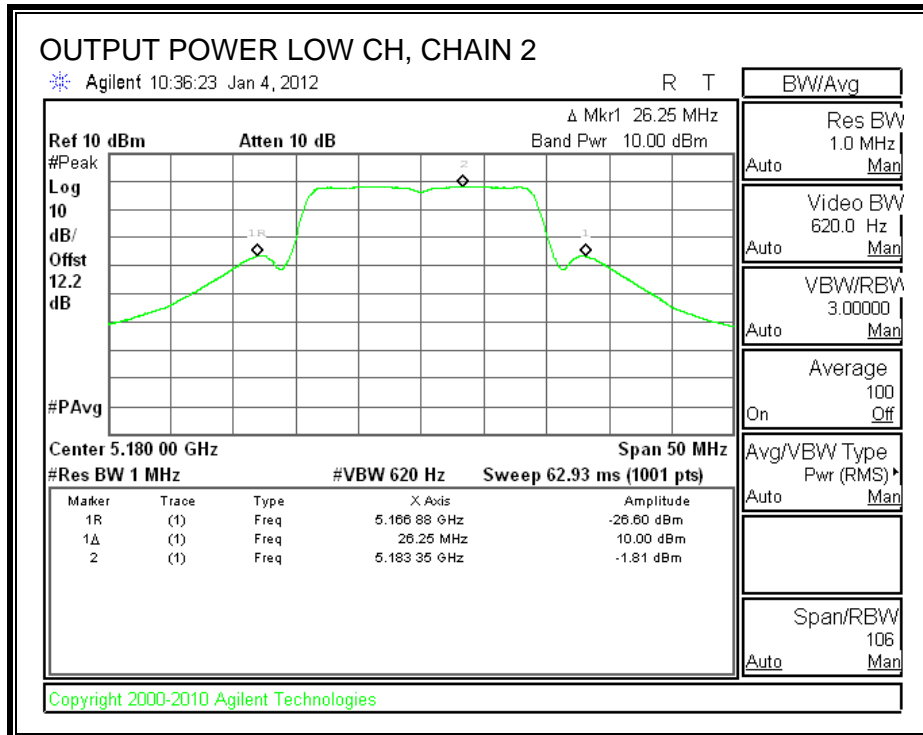
CHAIN 1 OUTPUT POWER

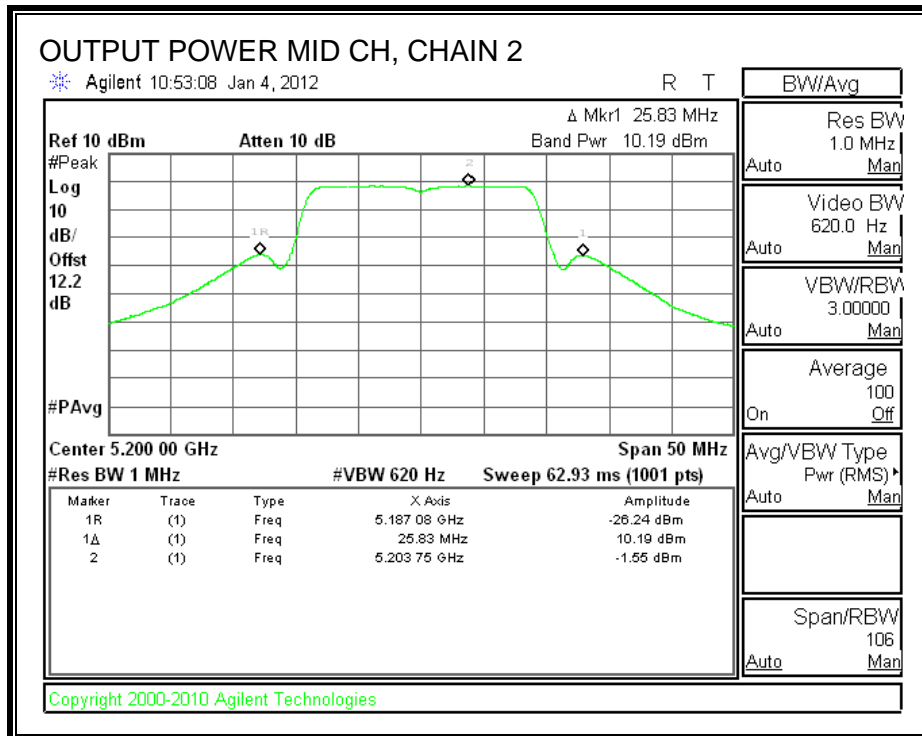


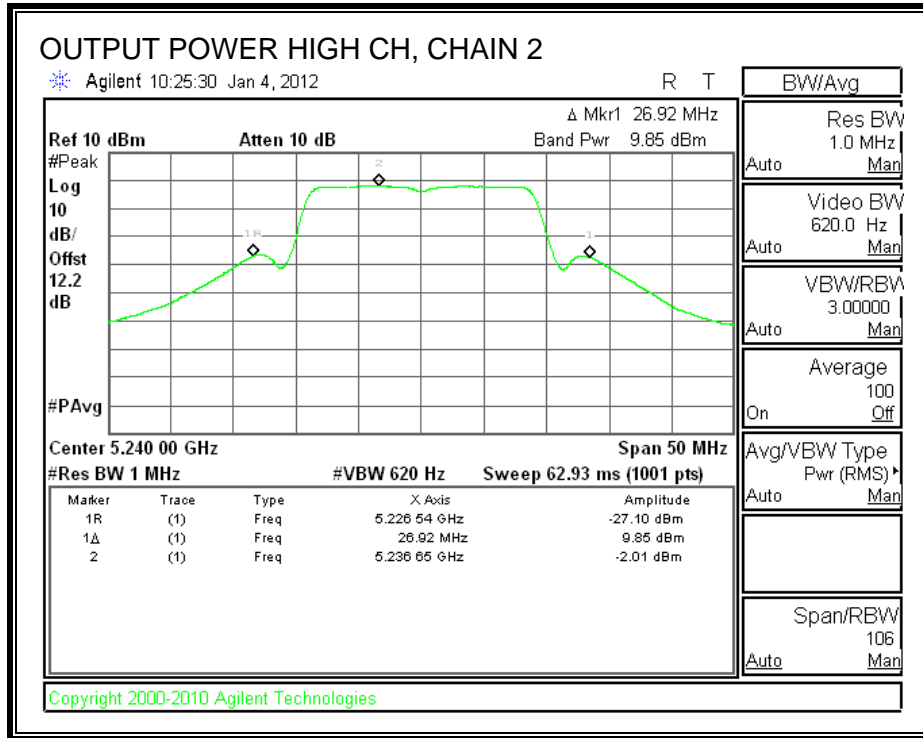




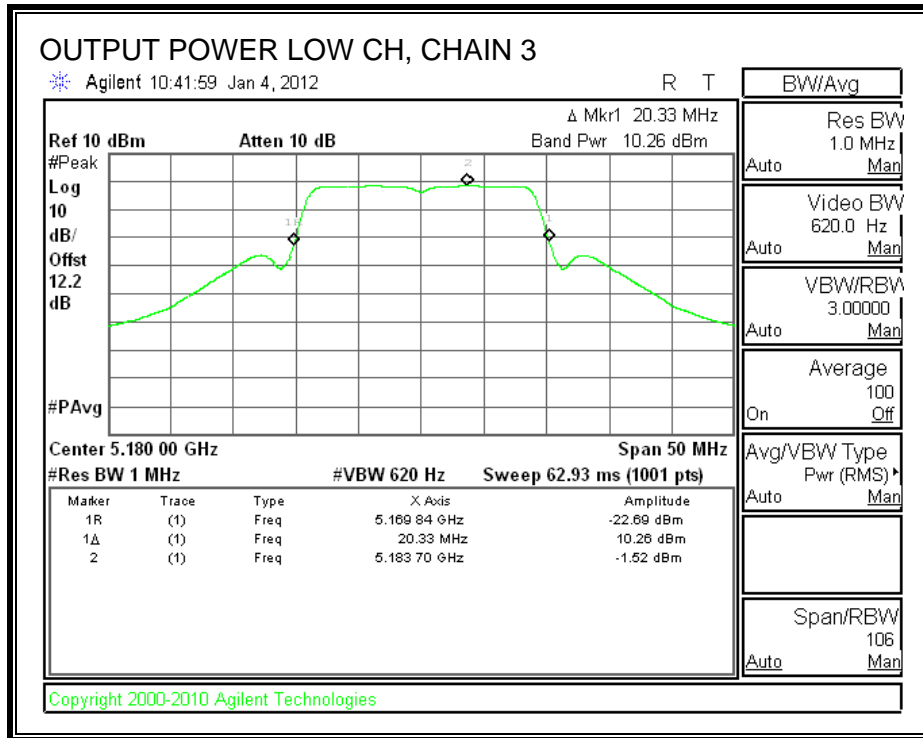
CHAIN 2 OUTPUT POWER

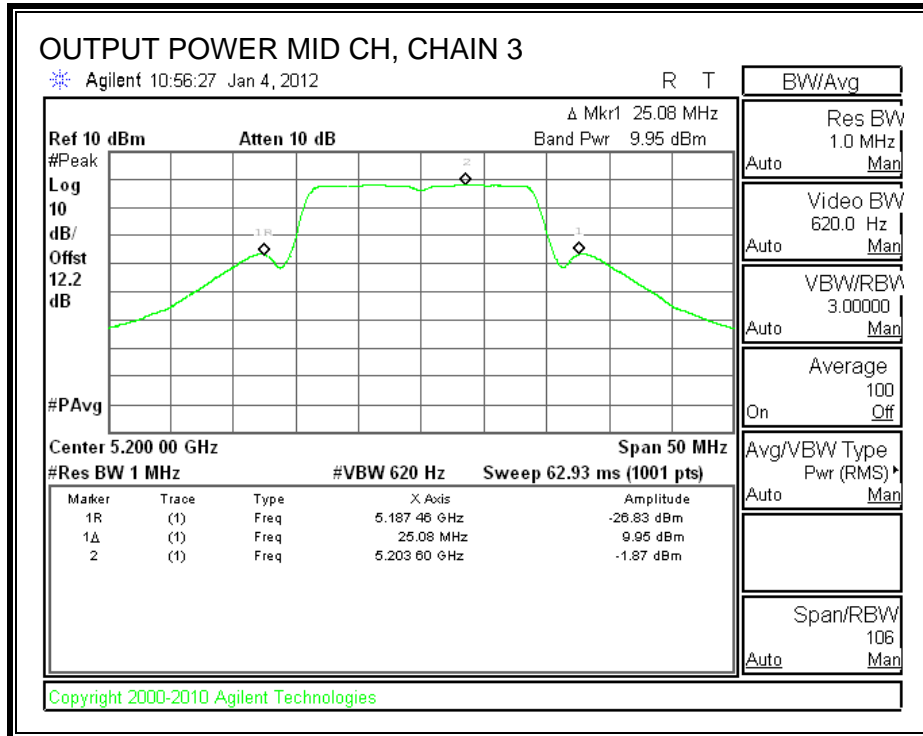


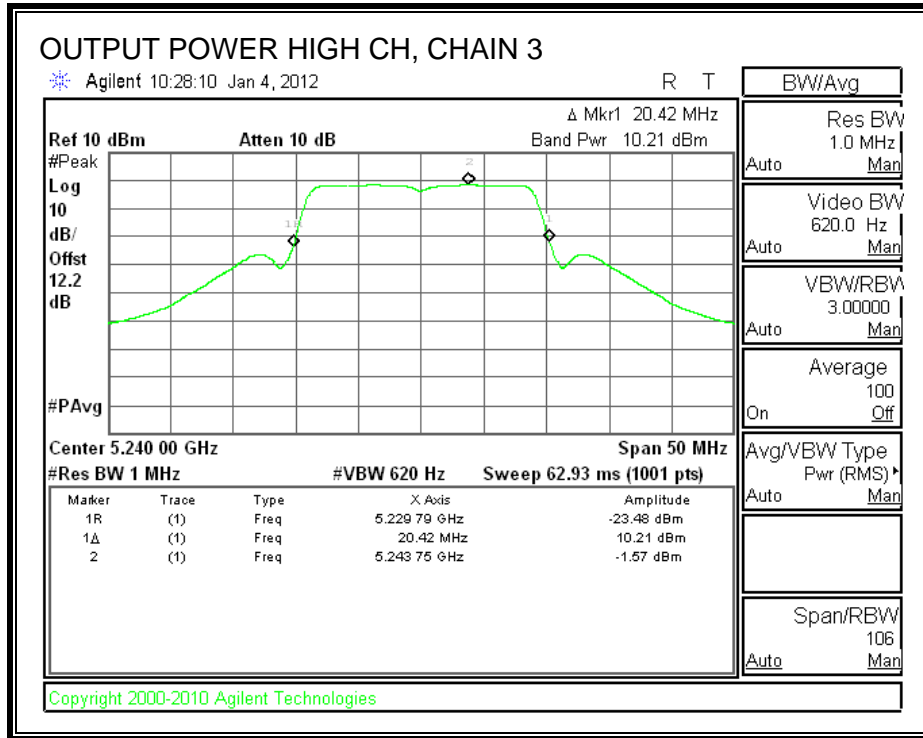




CHAIN 3 OUTPUT POWER







7.6.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 12.2 dB (including 10 dB pad and 12.2 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Chain 1 Power (dBm)	Chain 2 Power (dBm)	Chain 3 Power (dBm)	Total Power (dBm)
Low	5180	9.43	9.12	9.30	14.06
Middle	5200	9.10	8.91	9.35	13.89
High	5240	9.18	8.82	8.86	13.73

7.6.4. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the peak power spectral density shall not exceed 4 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

The maximum antenna gain is 6.41 dBi, therefore the limit is 3.59 dBm.

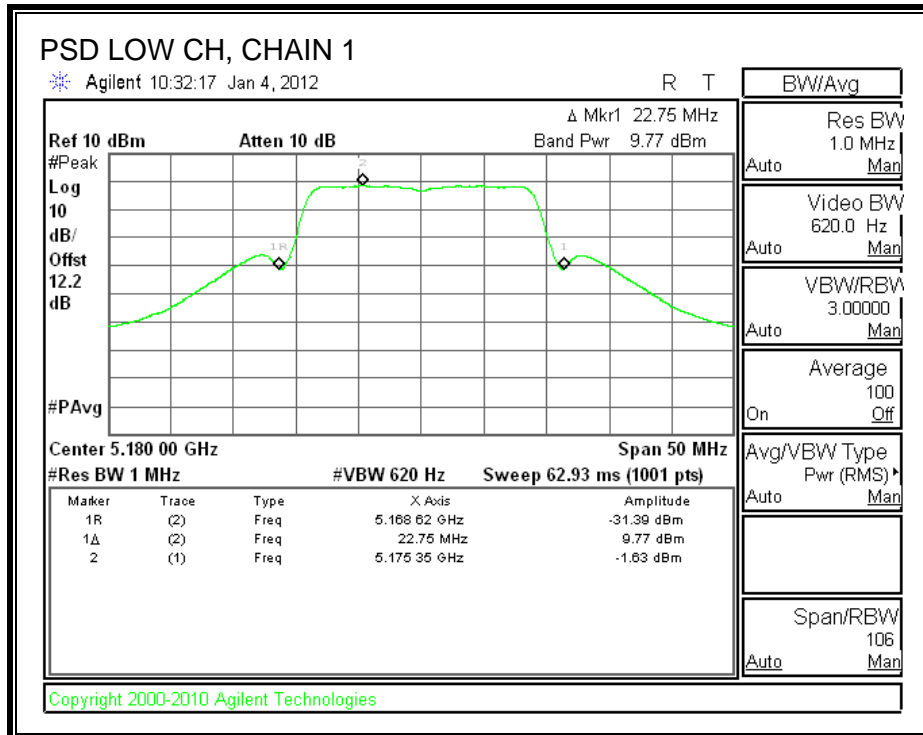
TEST PROCEDURE

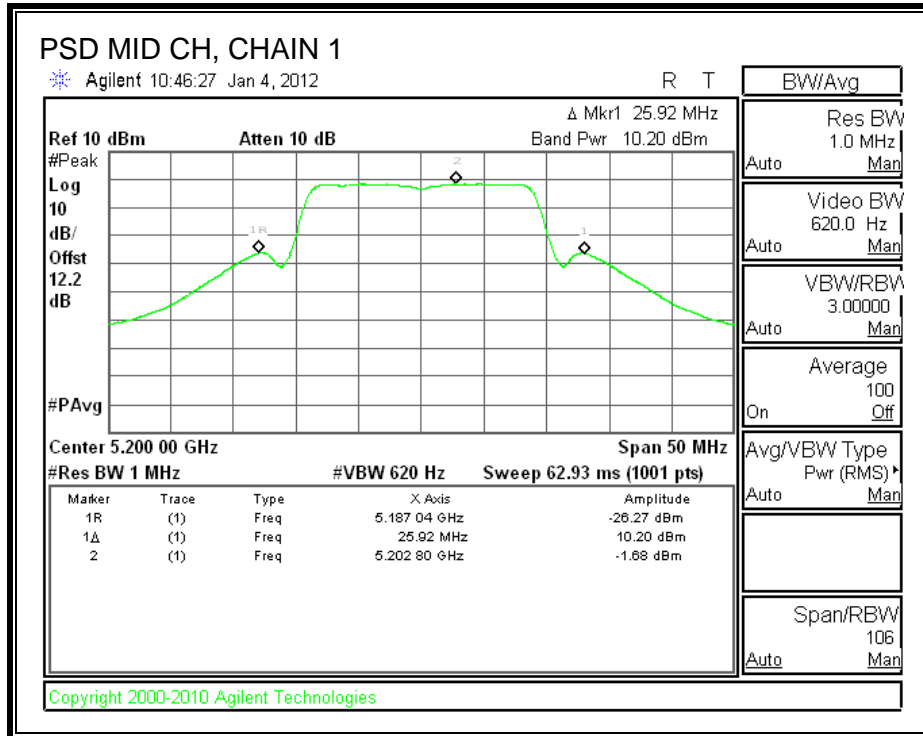
Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

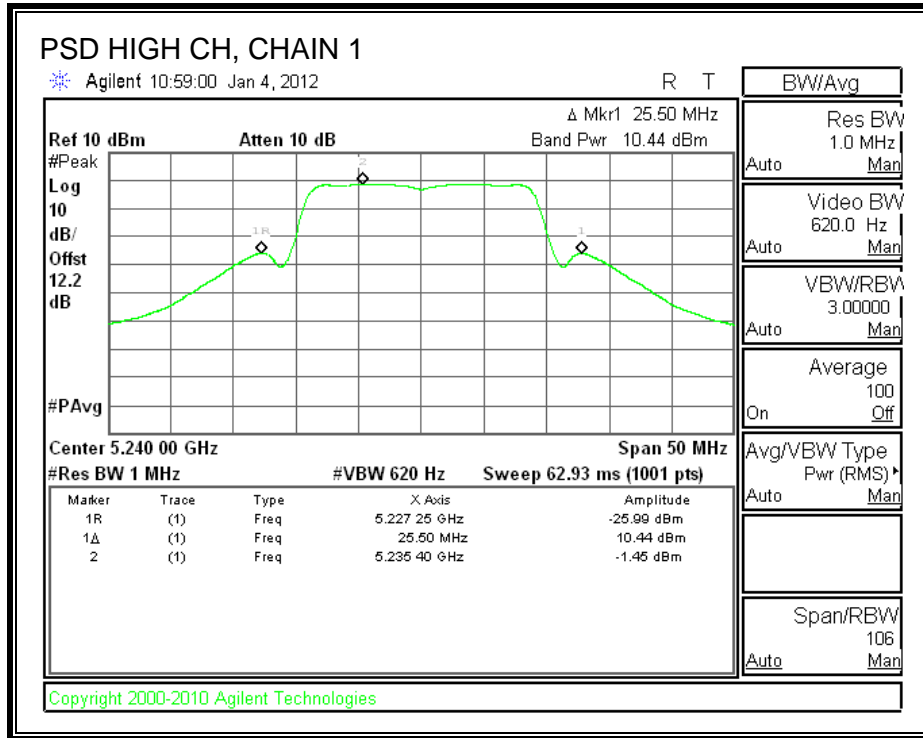
RESULTS

Channel	Frequency (MHz)	Chain 1 PPSD (dBm)	Chain 2 PPSD (dBm)	Chain 3 PPSD (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	5180	-1.63	-1.81	-1.52	3.12	3.59	-0.47
Middle	5200	-1.68	-1.55	-1.87	3.07	3.59	-0.52
High	5240	-1.45	-2.01	-1.57	3.10	3.59	-0.49

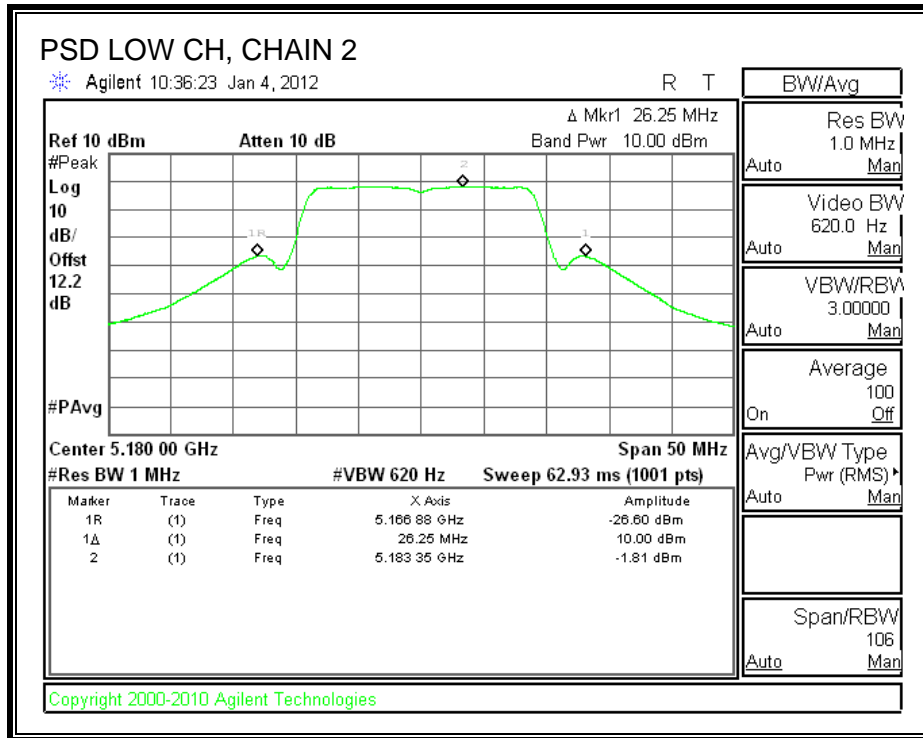
CHAIN 1 POWER SPECTRAL DENSITY

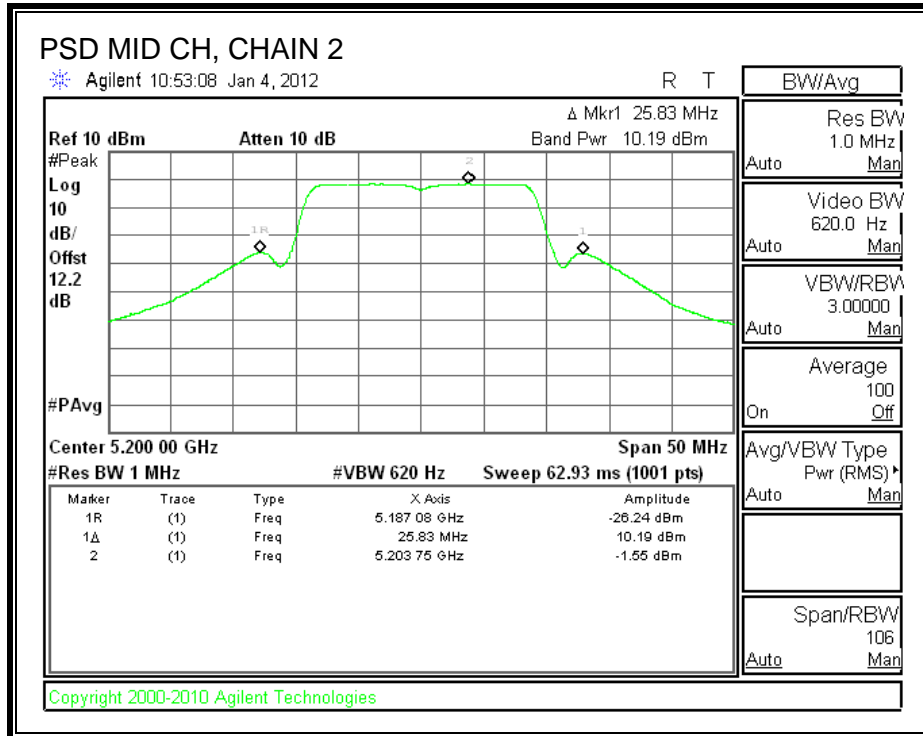


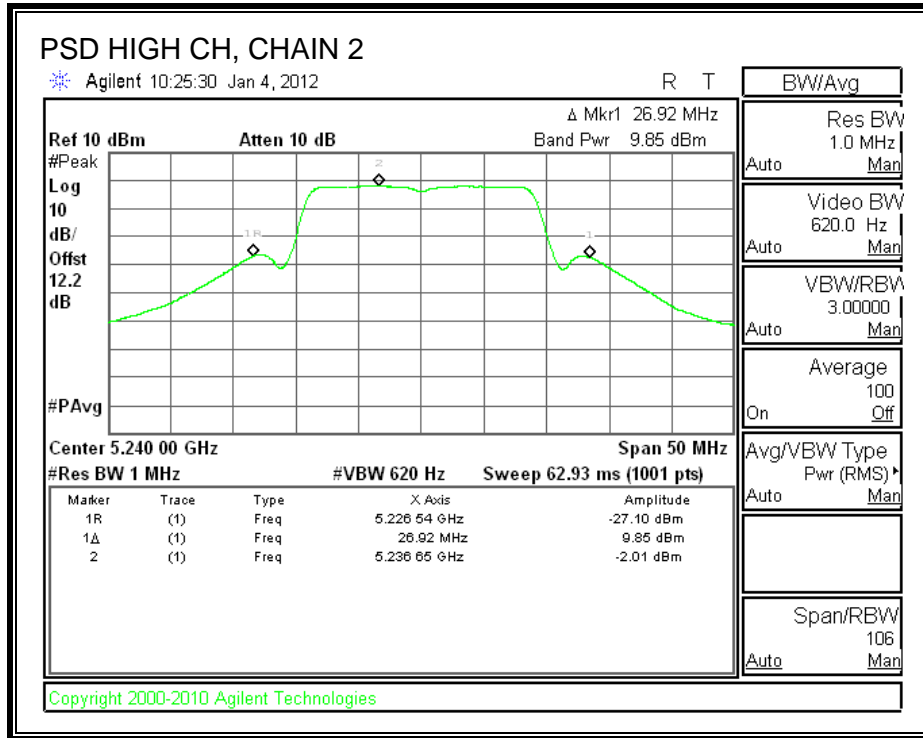




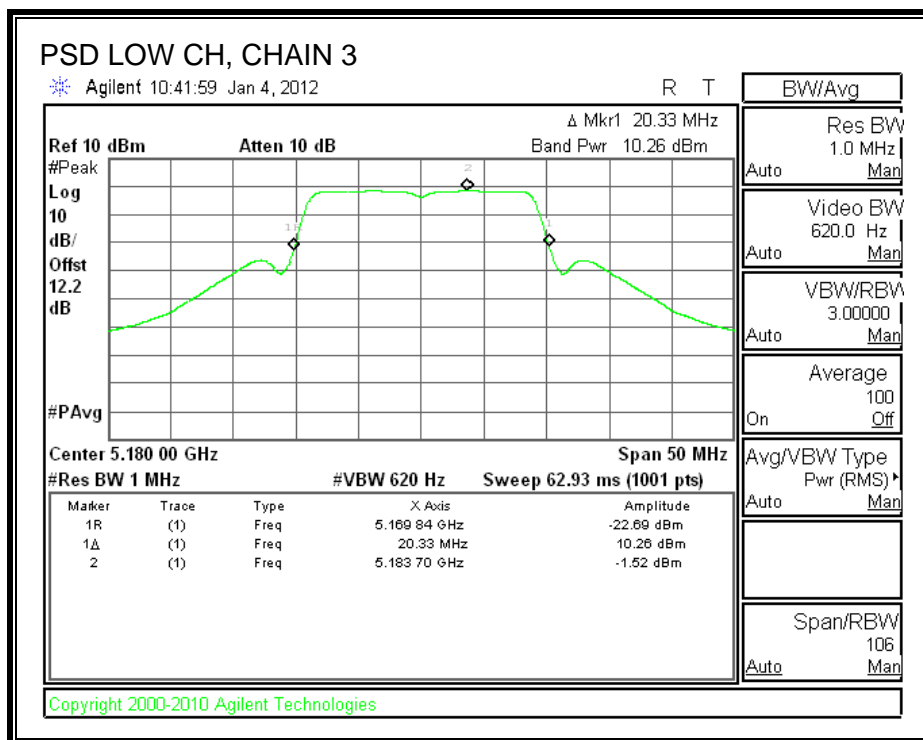
CHAIN 2 POWER SPECTRAL DENSITY

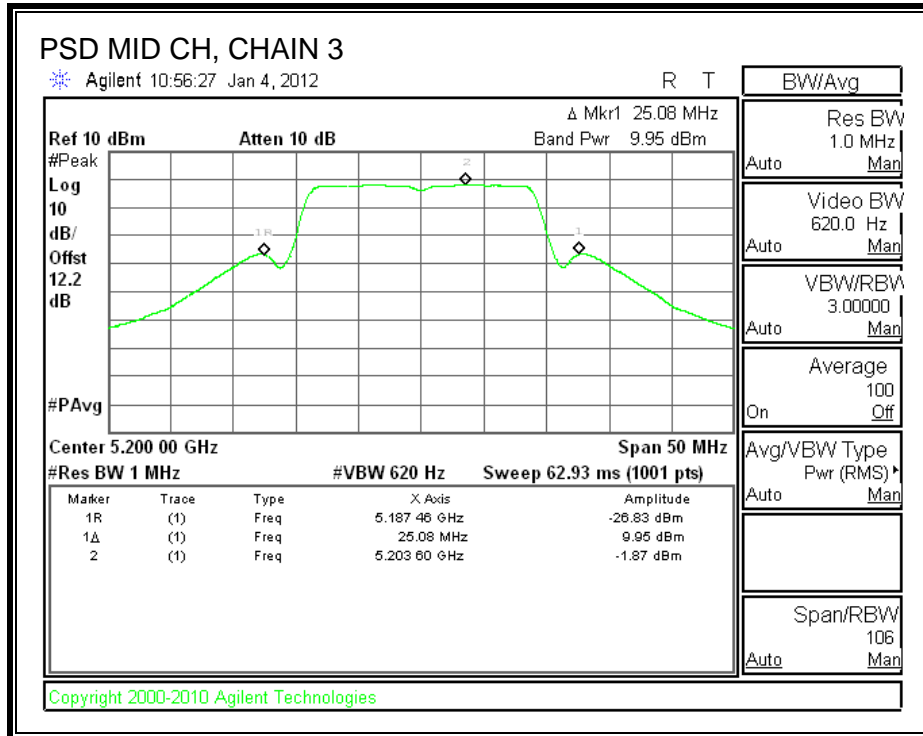


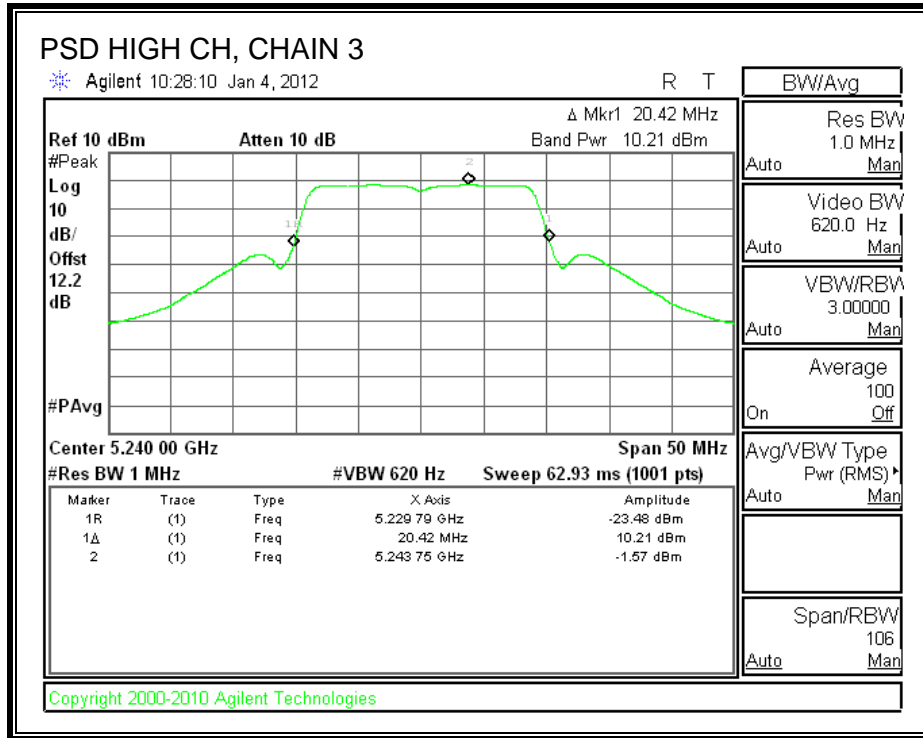




CHAIN 3 POWER SPECTRAL DENSITY







7.6.5. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

CHAIN 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	8.17	13	-4.83
Middle	5200	7.88	13	-5.12
High	5240	8.59	13	-4.41

CHAIN 2

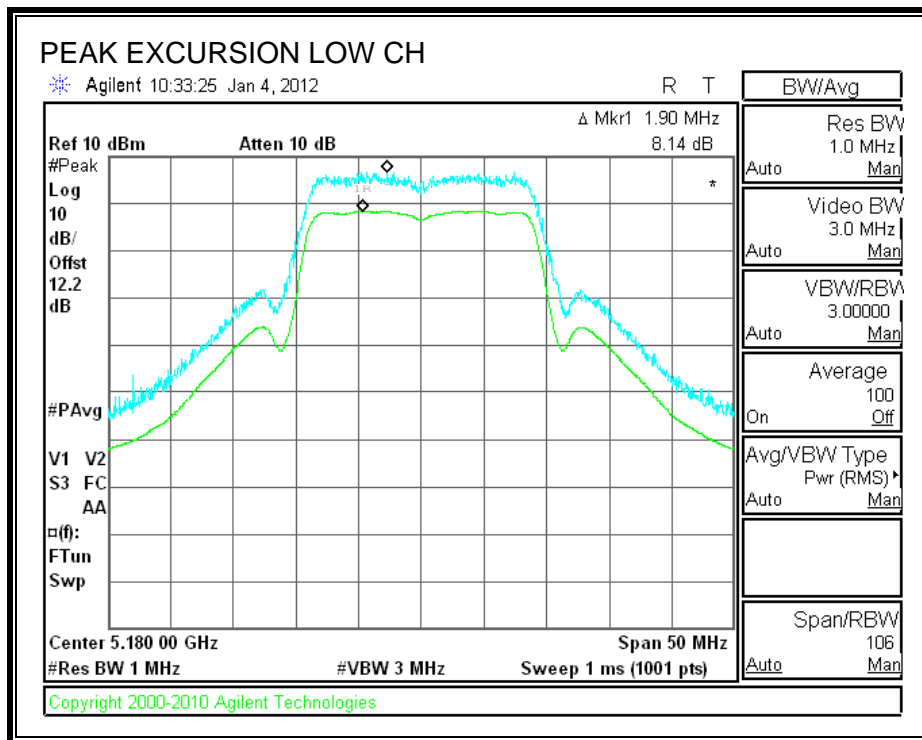
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	8.17	13	-4.83
Middle	5200	7.88	13	-5.12
High	5240	8.59	13	-4.41

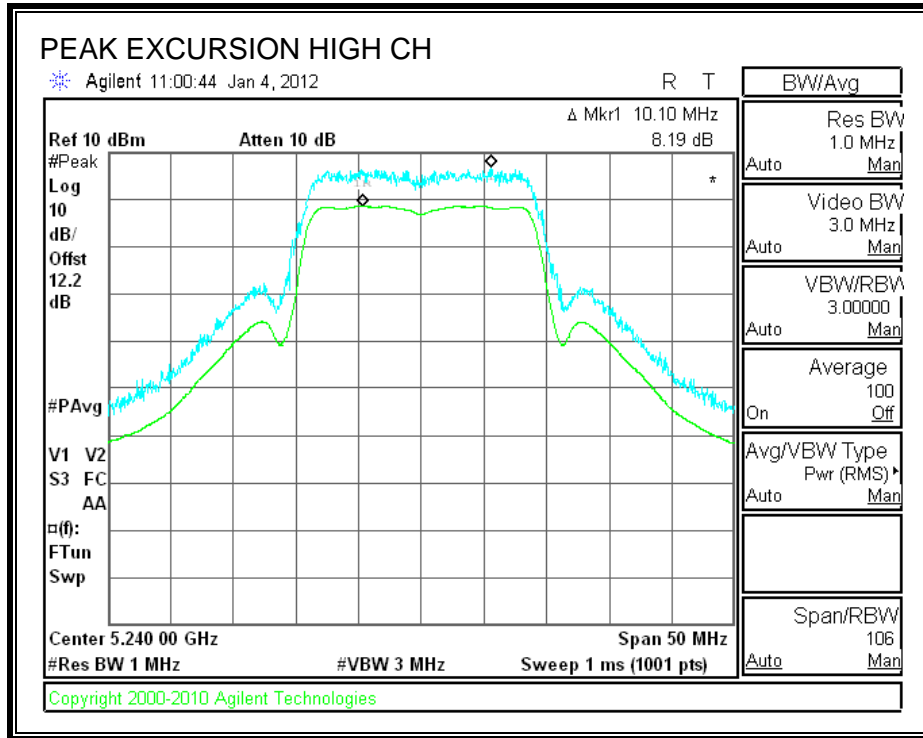
CHAIN 3

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	8.90	13	-4.10
Middle	5200	8.19	13	-4.81
High	5240	8.24	13	-4.76

CHAIN 1

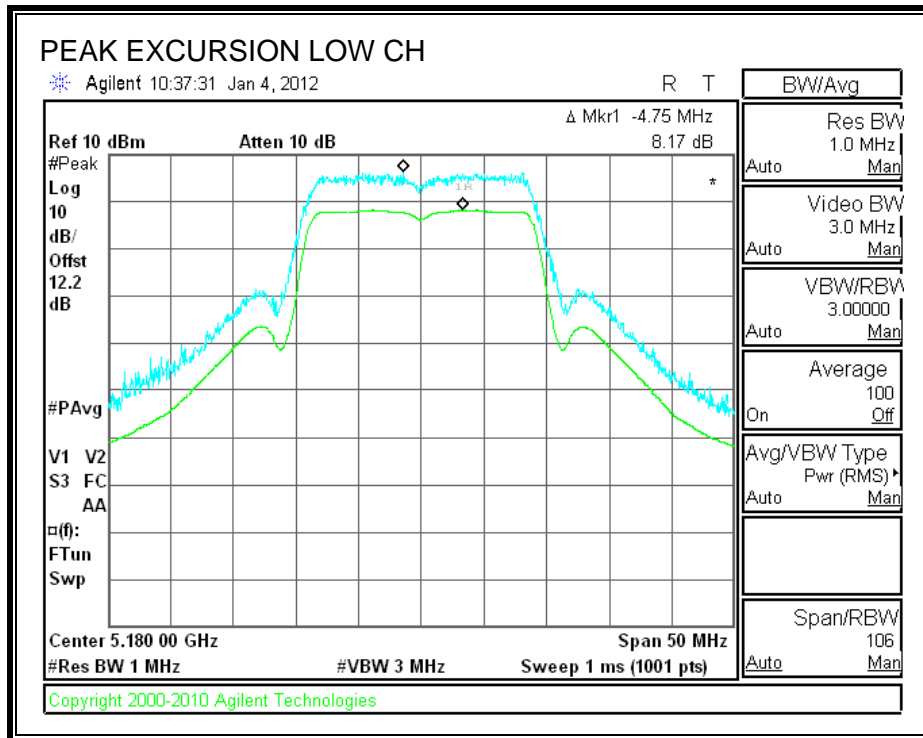
PEAK EXCURSION





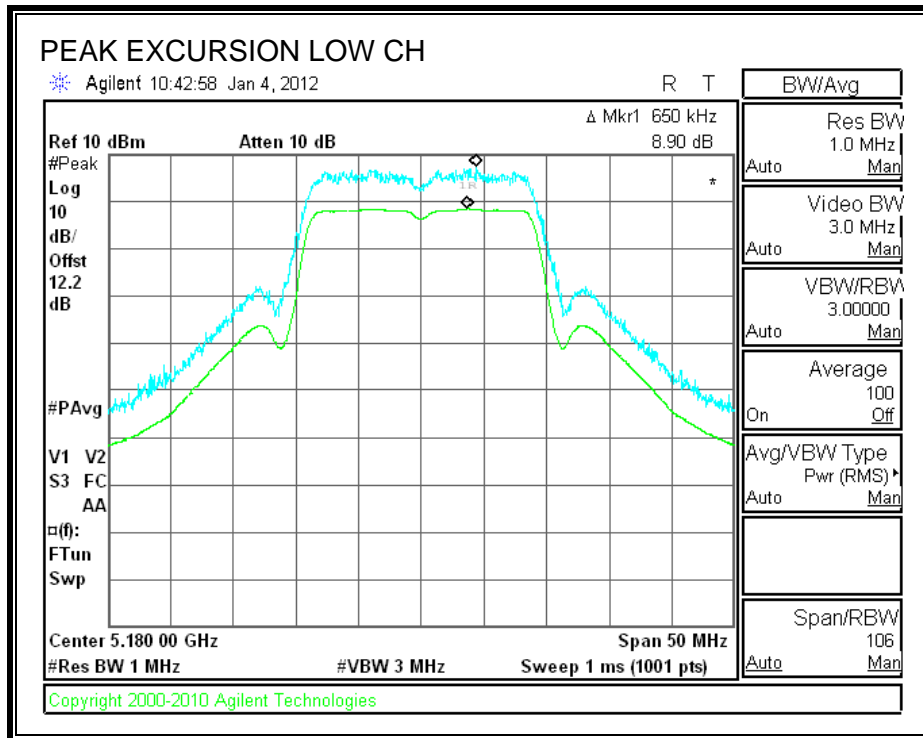
CHAIN 2

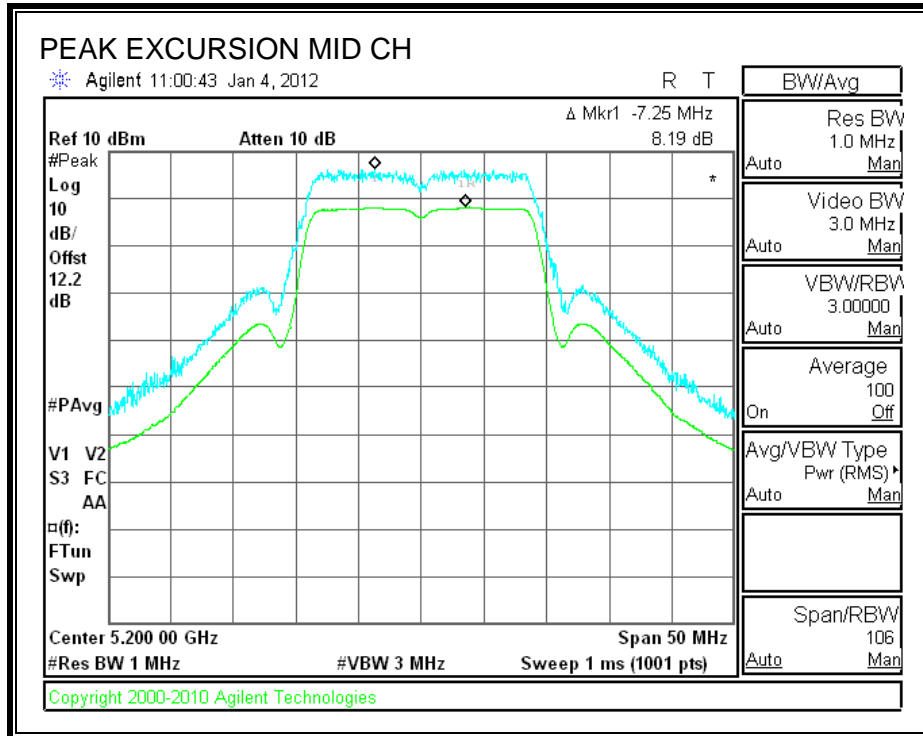
PEAK EXCURSION

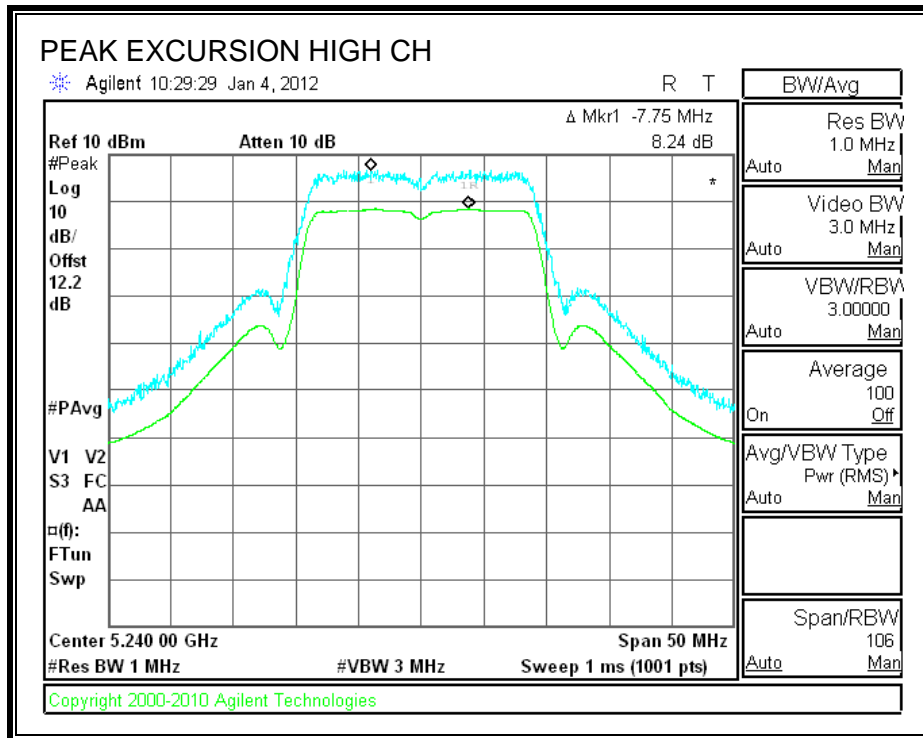


CHAIN 3

PEAK EXCURSION







7.7. 802.11n HT20 3TX MODE IN THE 5.2 GHz BAND, SDM MCS21

7.7.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

CHAIN 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	25.20	17.7651
Middle	5200	25.65	17.7754
High	5240	26.05	17.7819

CHAIN 2

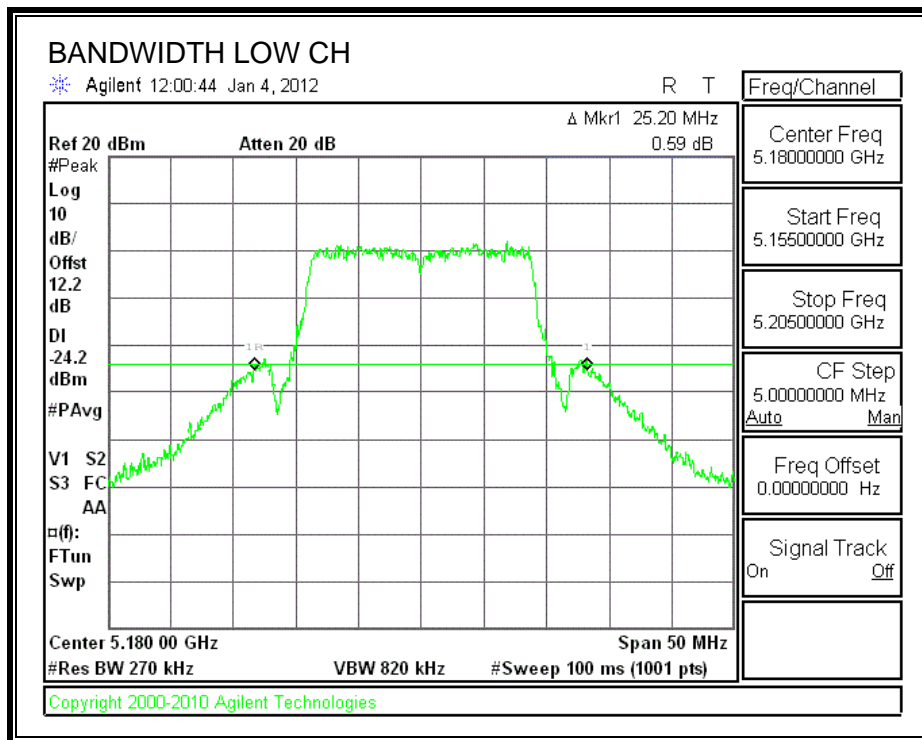
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	25.20	17.8115
Middle	5200	26.90	17.8234
High	5240	25.85	17.8409

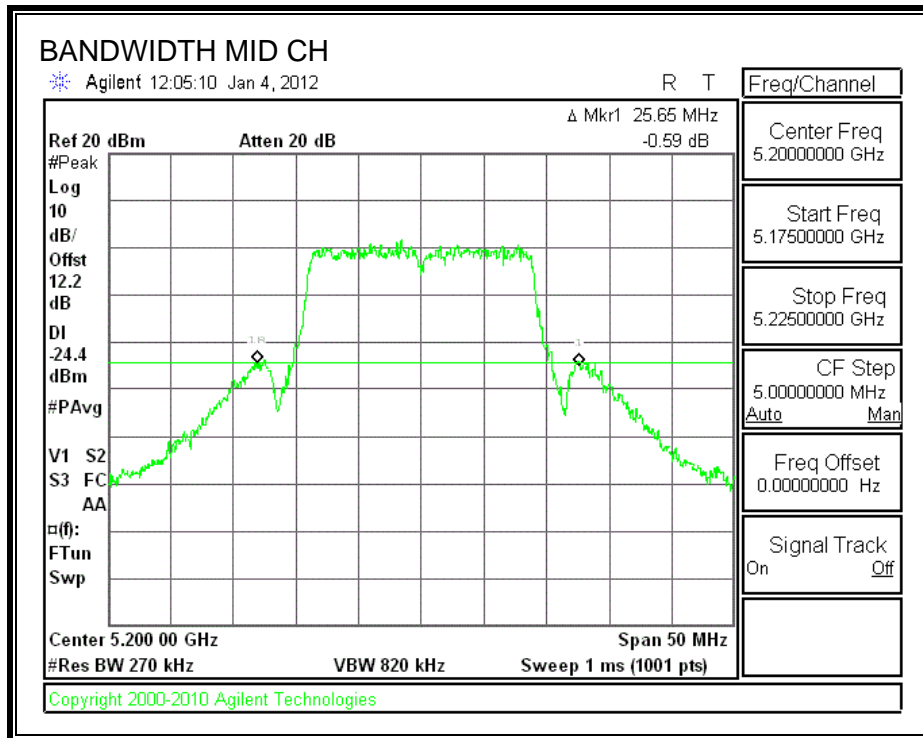
CHAIN 3

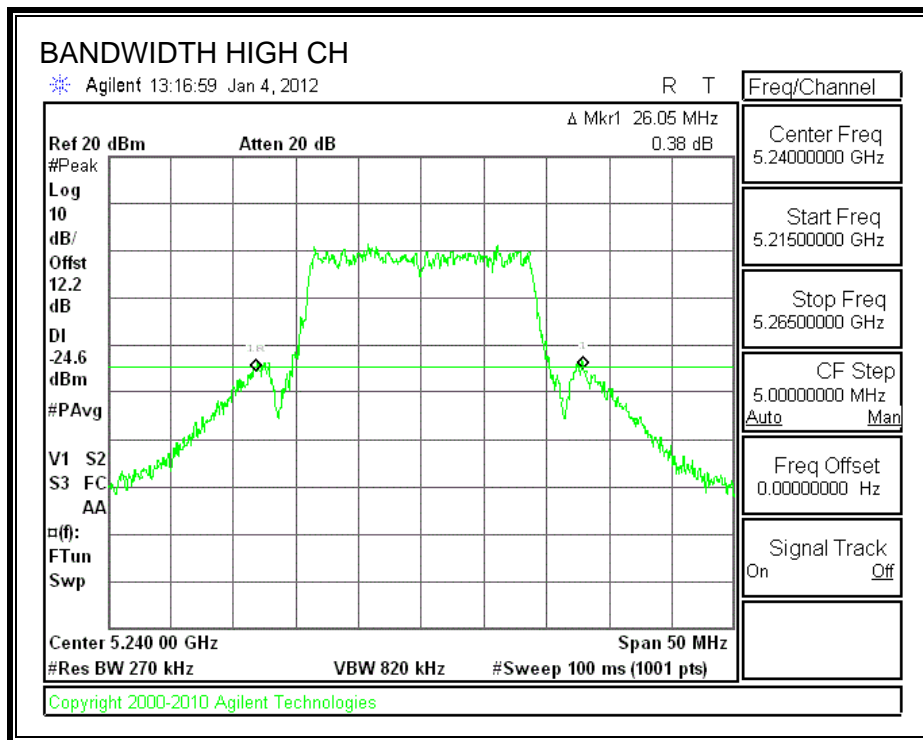
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	26.50	17.7604
Middle	5200	25.60	17.8147
High	5240	26.40	17.7852

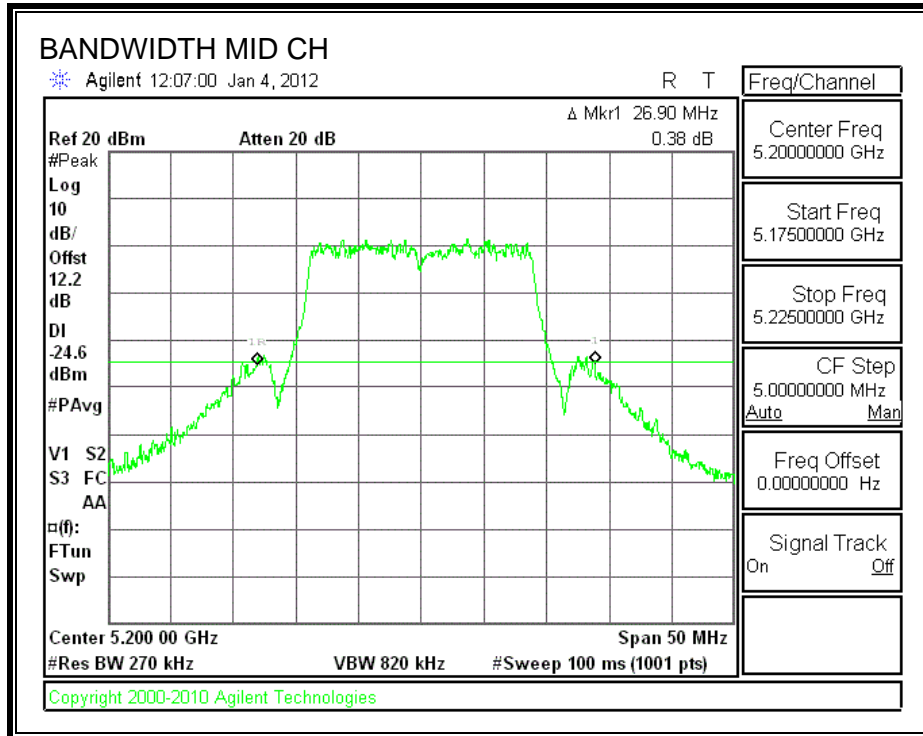
CHAIN 1

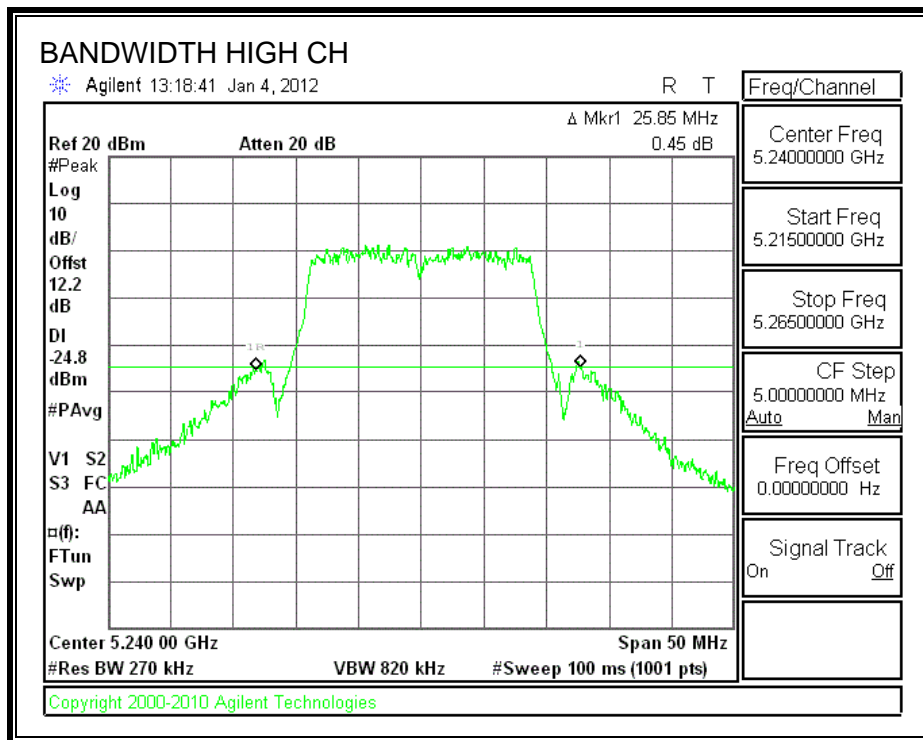
26 dB BANDWIDTH





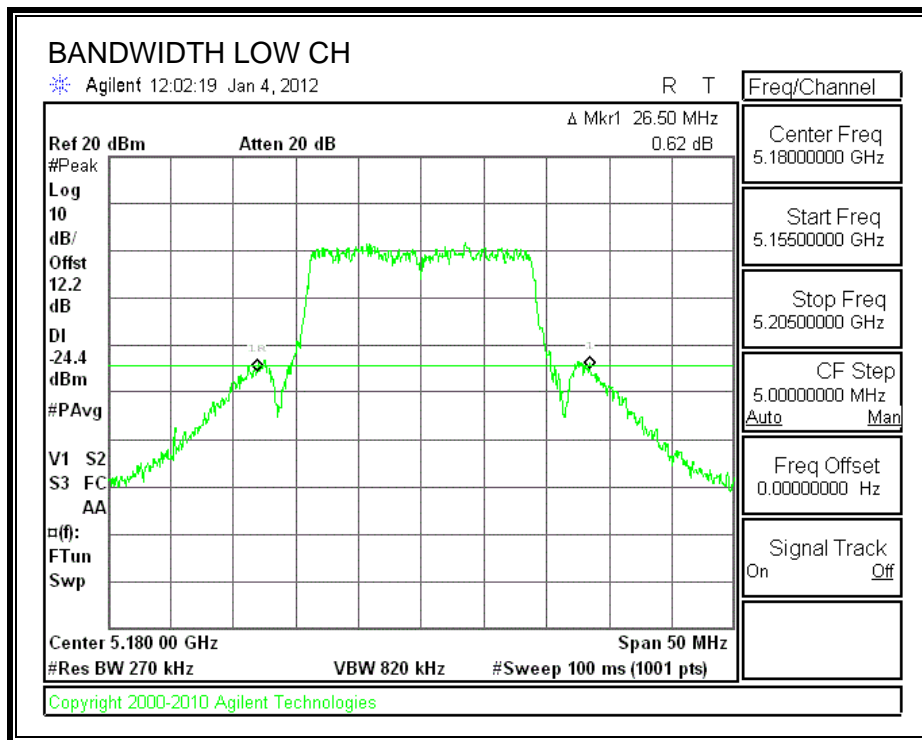


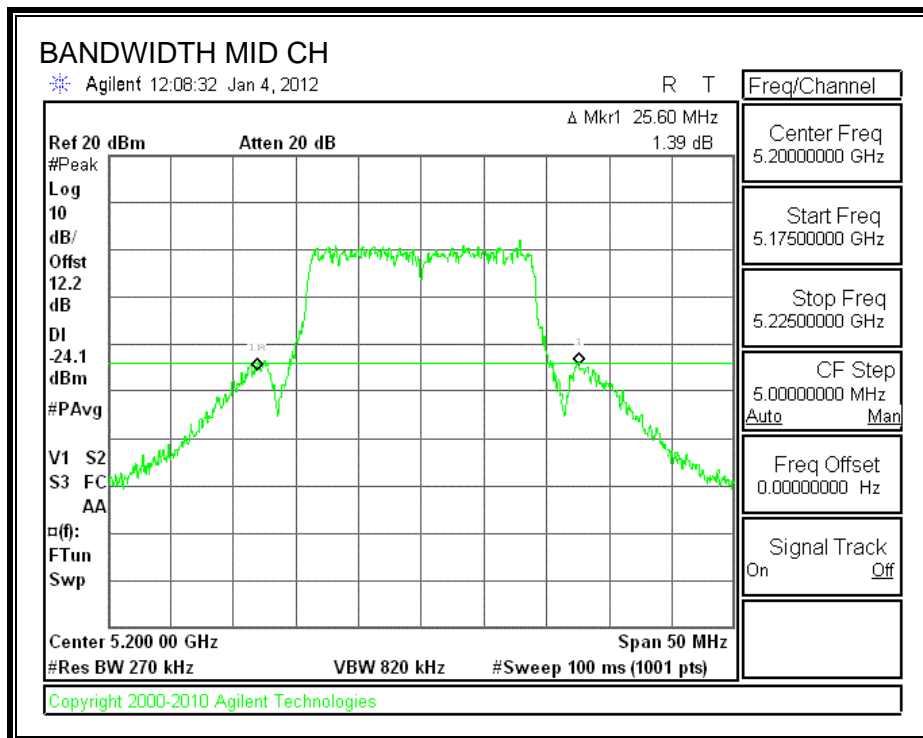


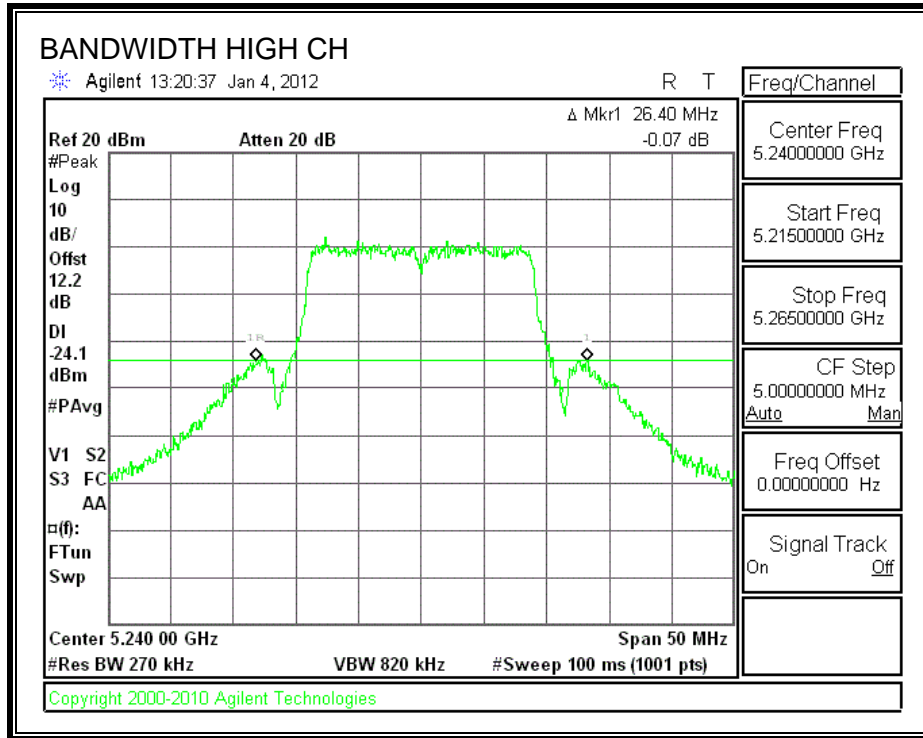


CHAIN 3

26 dB BANDWIDTH

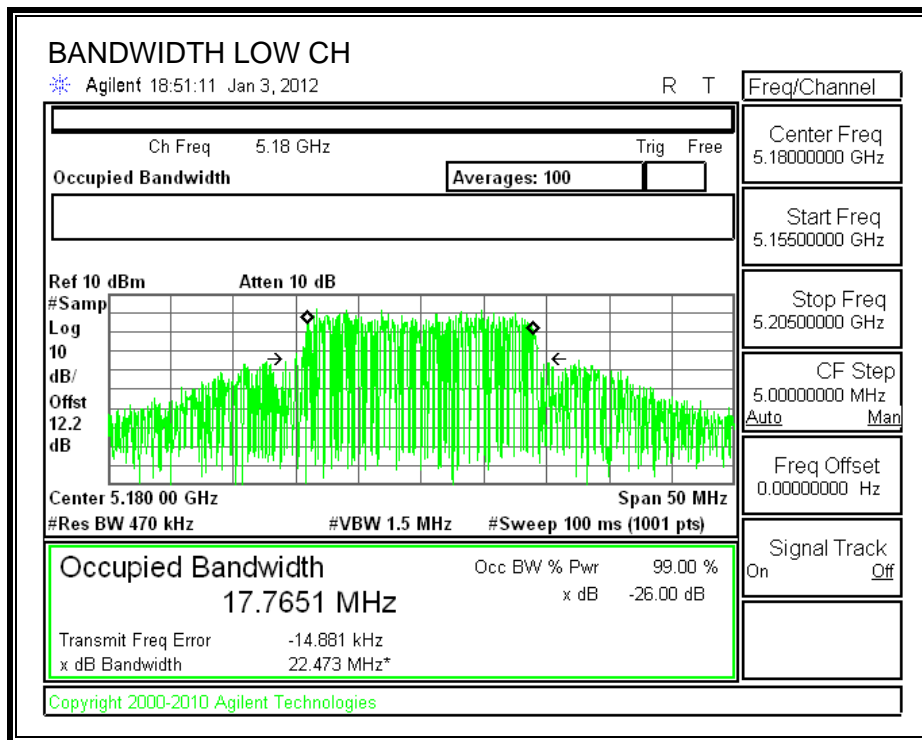


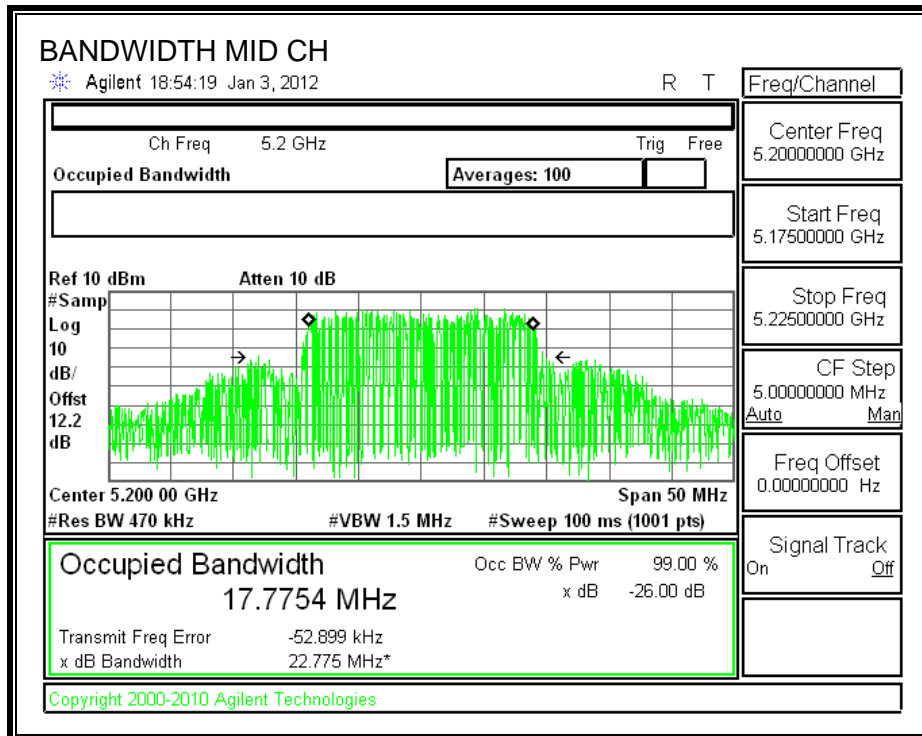


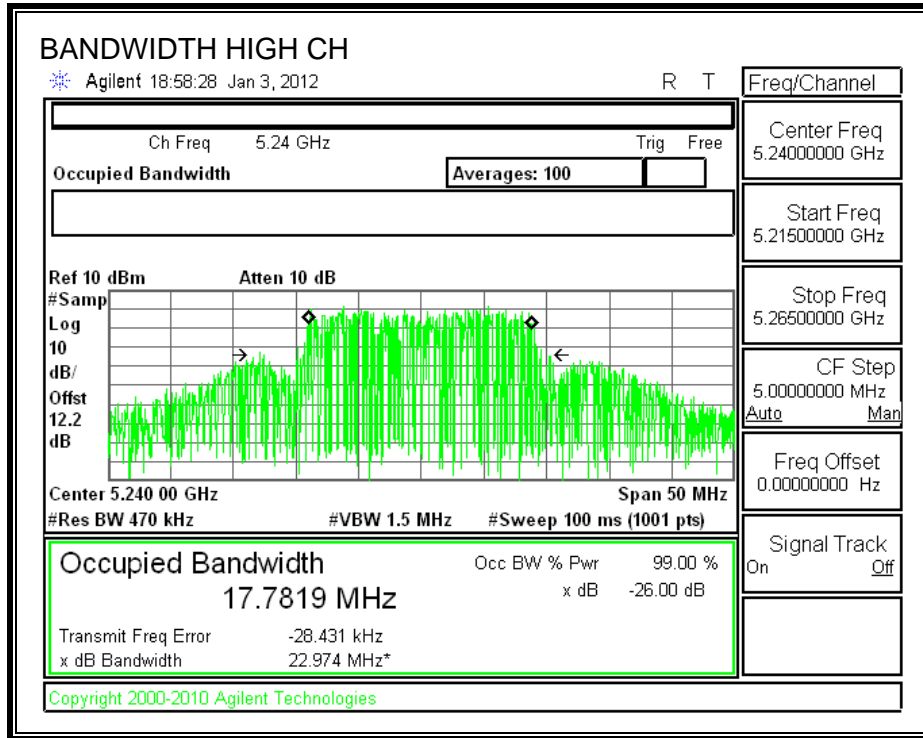


CHAIN 1

99% BANDWIDTH

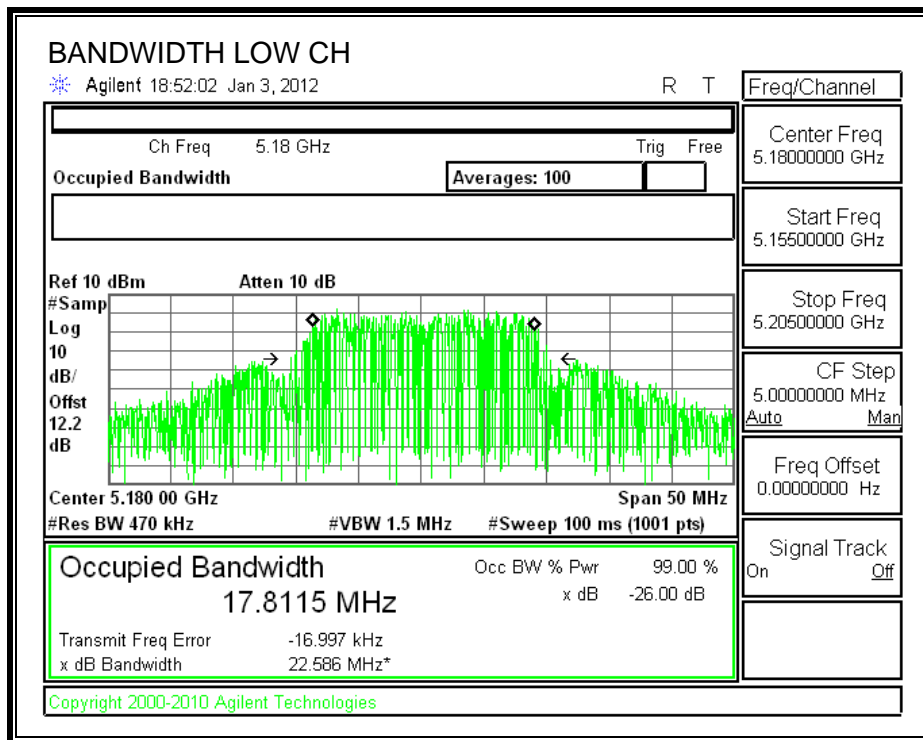


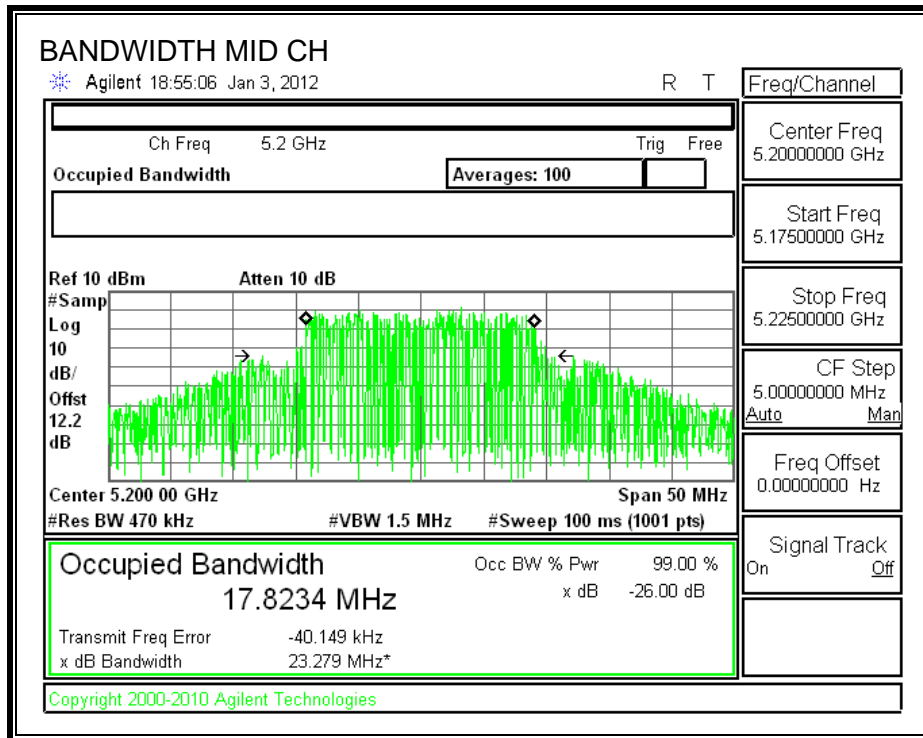


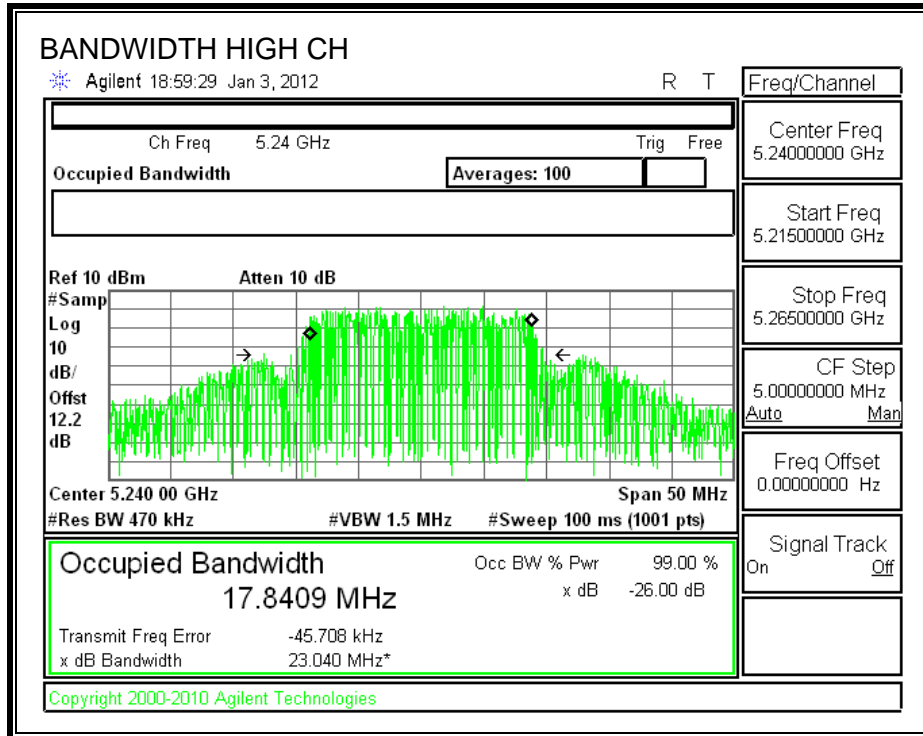


CHAIN 2

99% BANDWIDTH

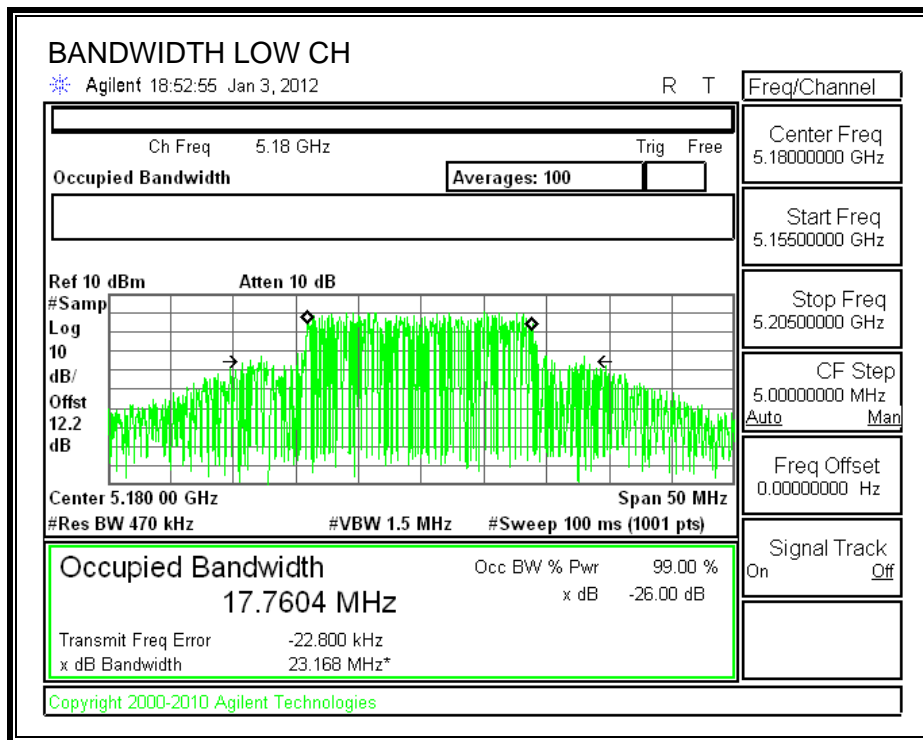


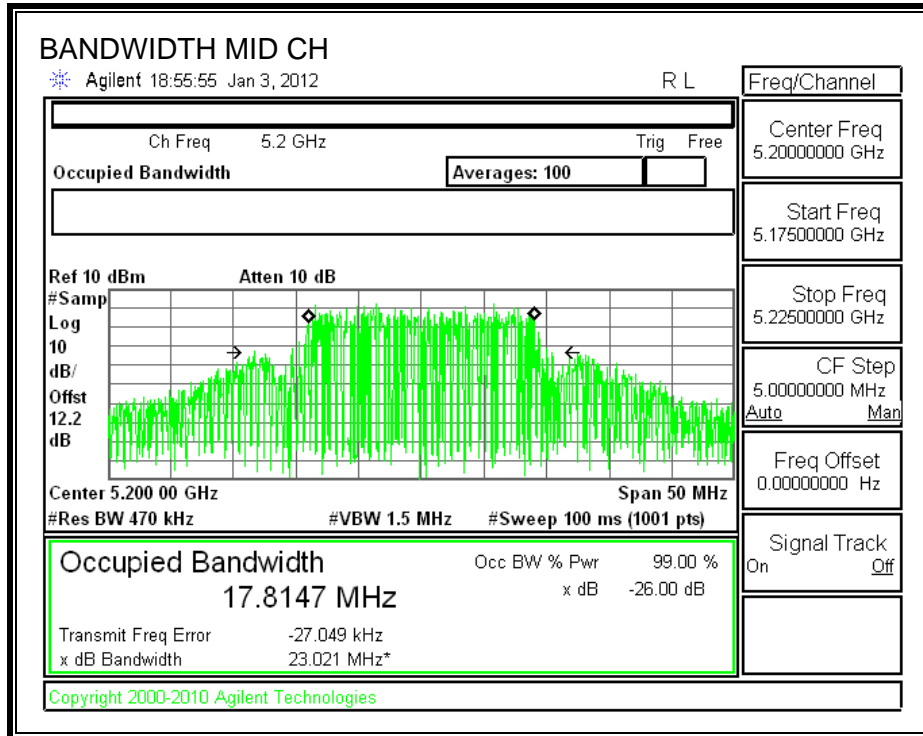


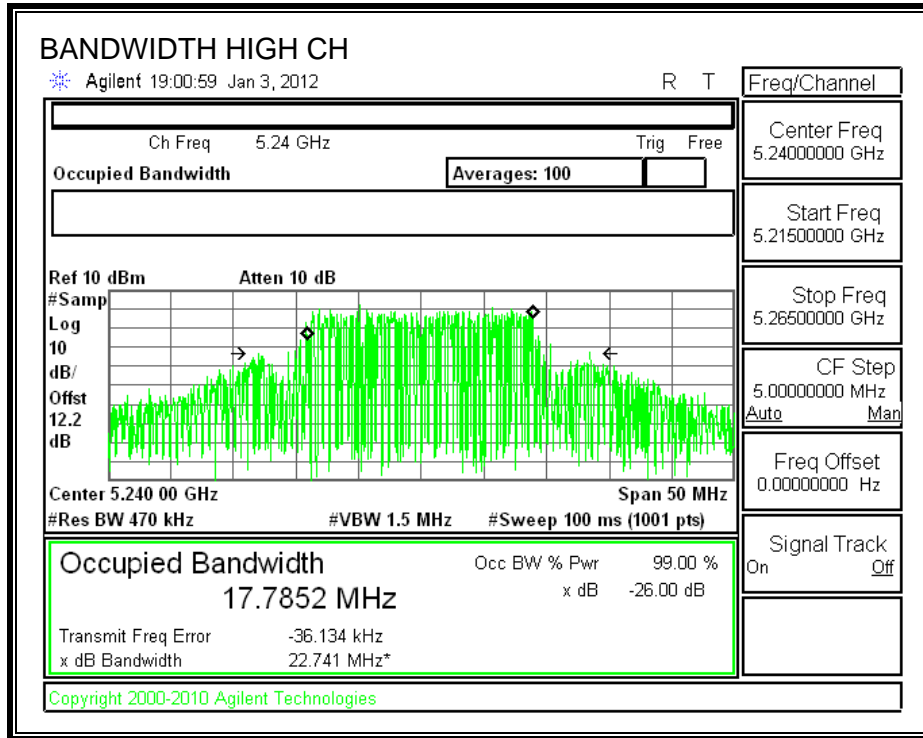


CHAIN 3

99% BANDWIDTH







7.7.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

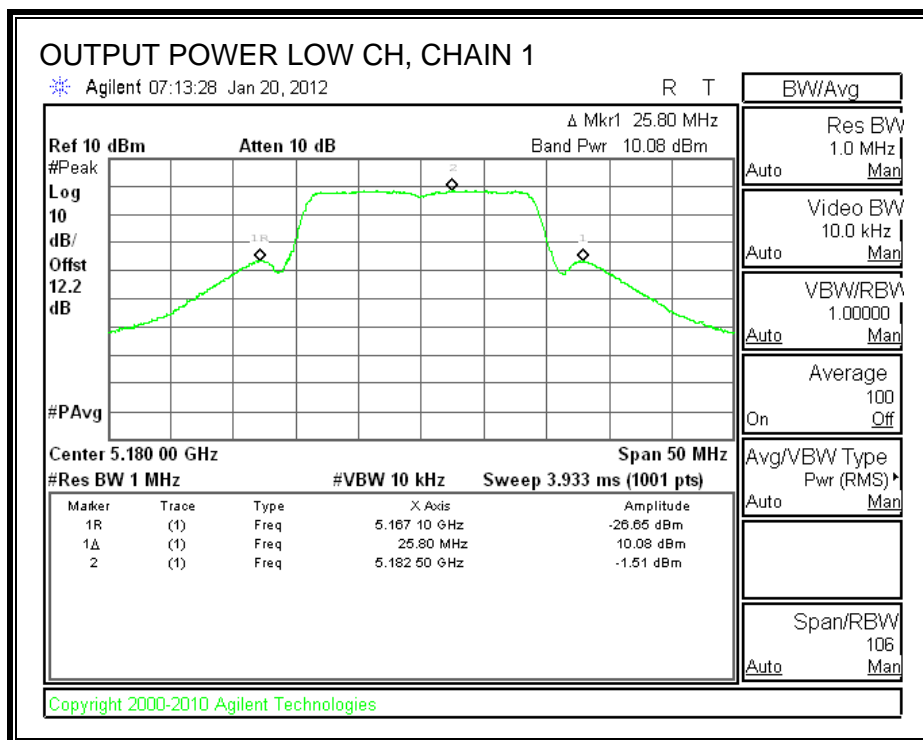
Limit

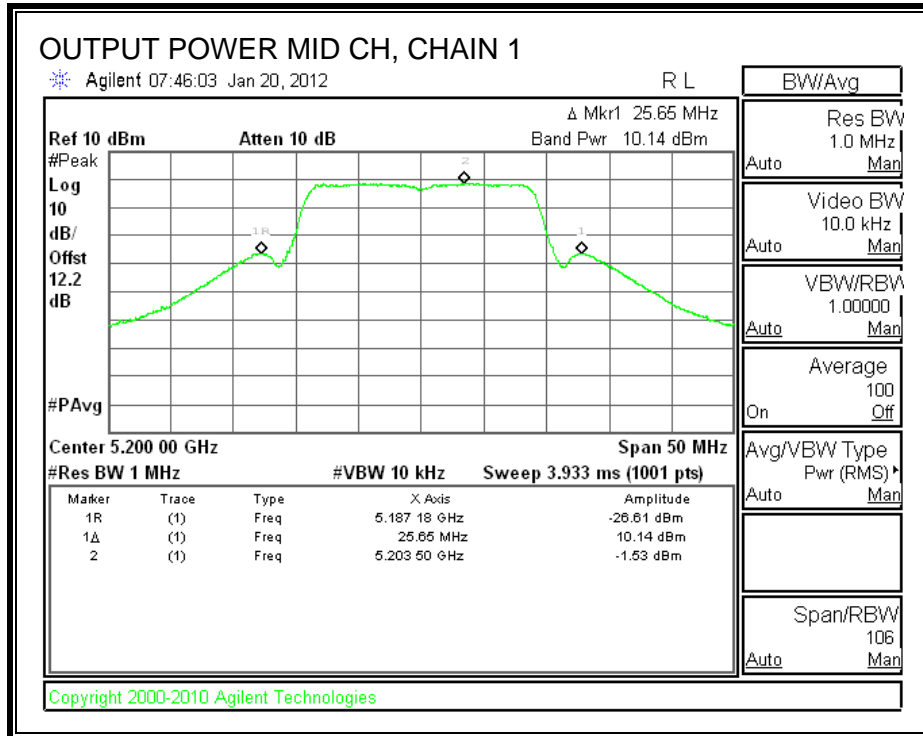
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5180	16.99	25.20	18.01	6.41	16.58
Mid	5200	16.99	25.6	18.08	6.41	16.58
High	5240	16.99	25.85	18.12	6.41	16.58

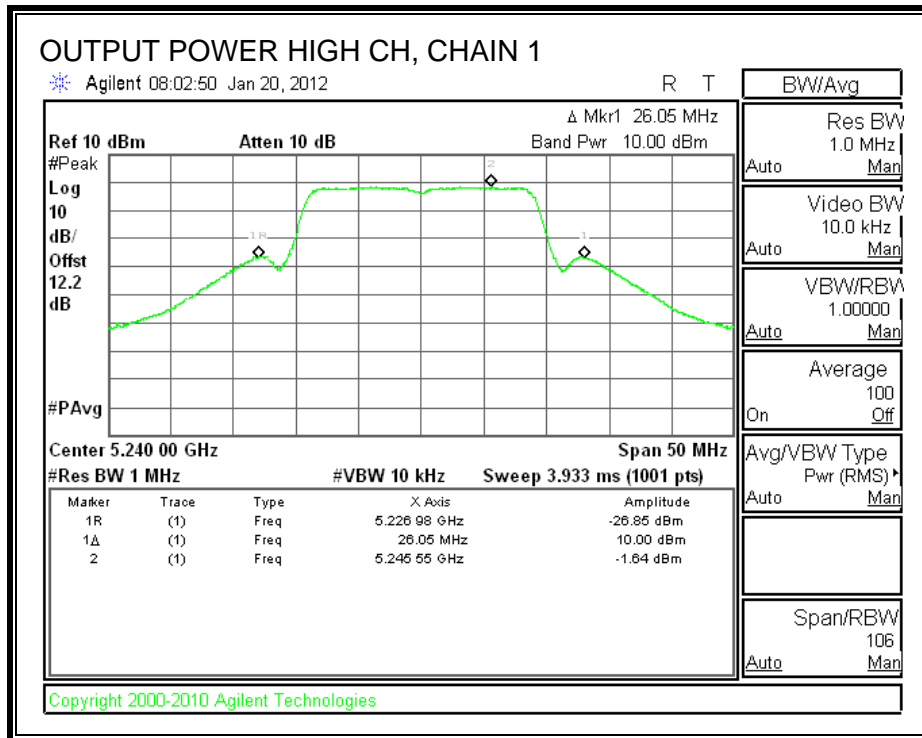
Individual Chain Results

Channel	Frequency (MHz)	Chain 1 Power (dBm)	Chain 2 Power (dBm)	Chain 3 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	5180	10.08	10.55	9.98	14.98	16.58	-1.60
Mid	5200	10.14	10.76	9.84	15.03	16.58	-1.55
High	5240	10.00	10.26	9.33	14.65	16.58	-1.93

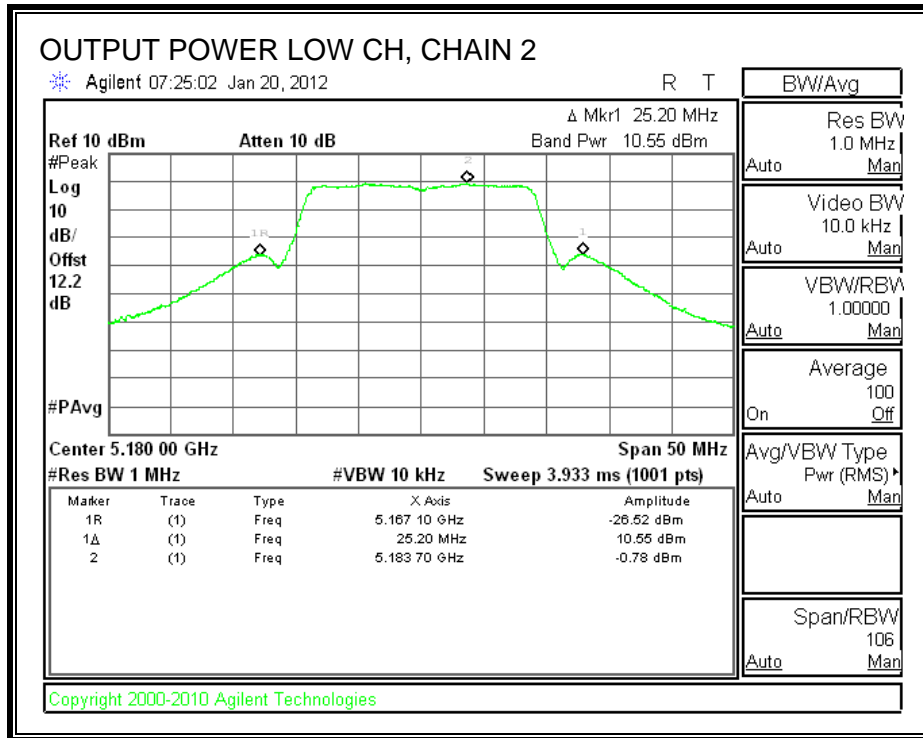
CHAIN 1 OUTPUT POWER

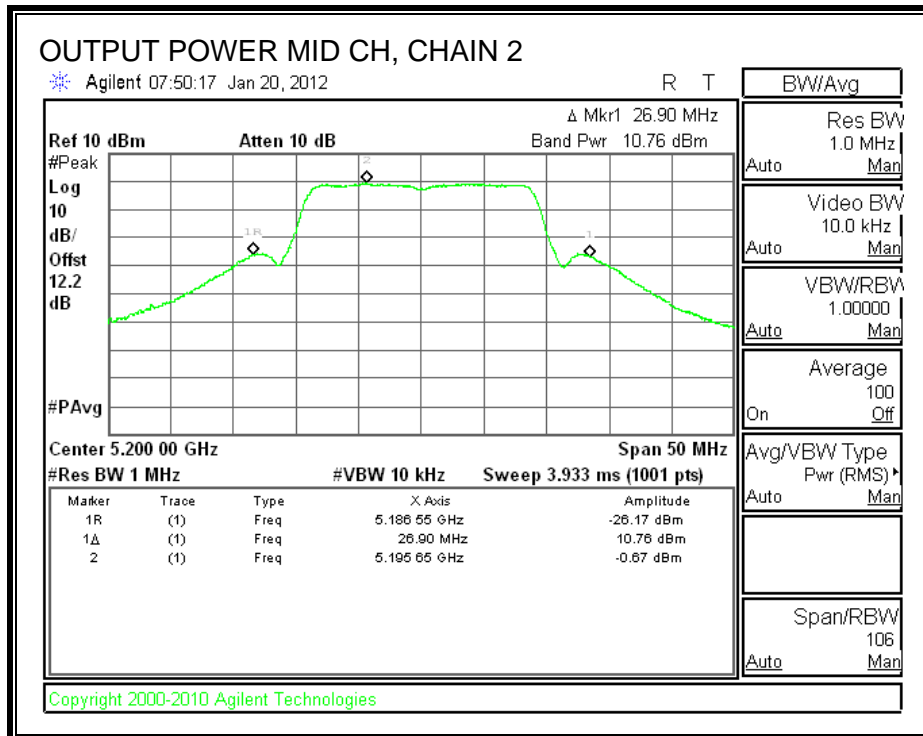


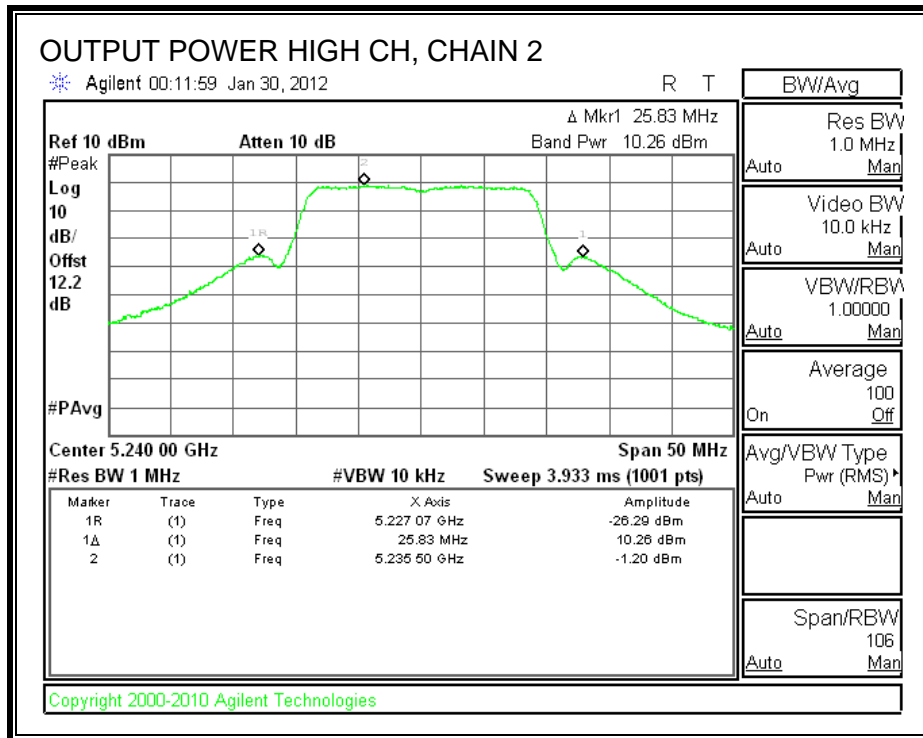




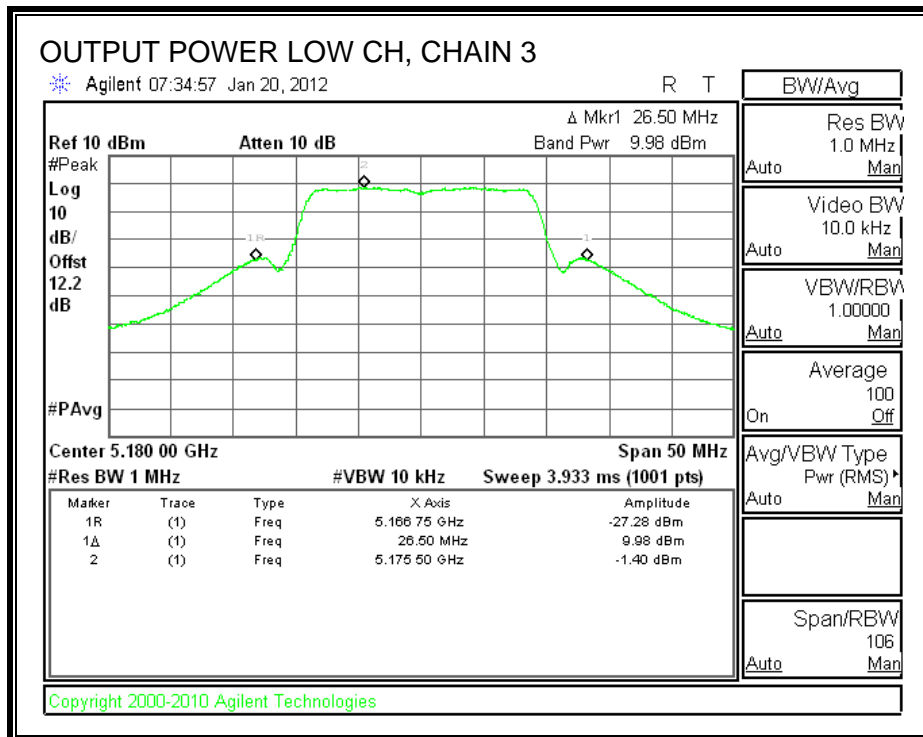
CHAIN 2 OUTPUT POWER

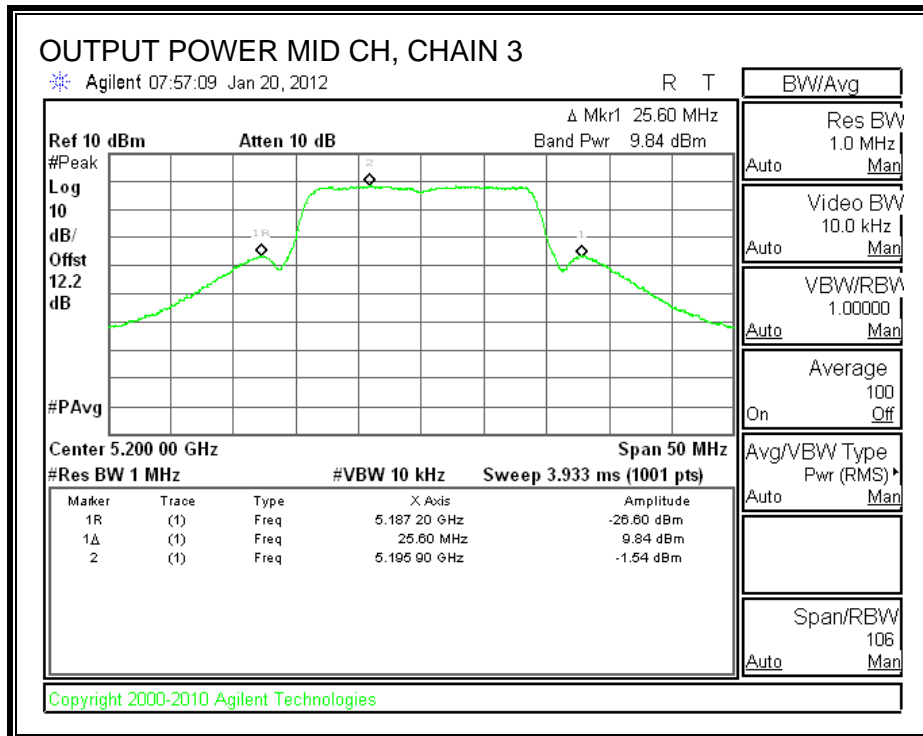


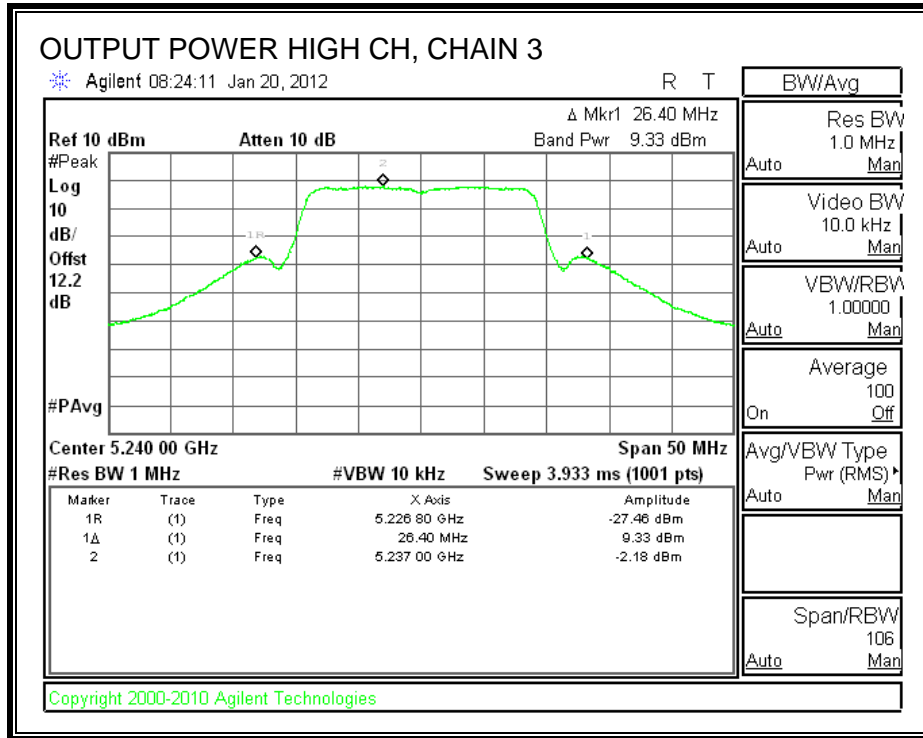




CHAIN 3 OUTPUT POWER







7.7.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 12.2 dB (including 10 dB pad and 2.2 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Chain 1 Power (dBm)	Chain 2 Power (dBm)	Chain 3 Power (dBm)	Total Power (dBm)
Low	5180	8.03	8.61	8.00	12.99
Middle	5200	8.14	8.50	8.05	13.01
High	5240	7.86	7.98	6.94	12.39

7.7.4. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the 5.15-5.25 GHz band, the peak power spectral density shall not exceed 4 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit 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.

The maximum antenna gain is 6.41 dBi, therefore the limit is 3.59 dBm.

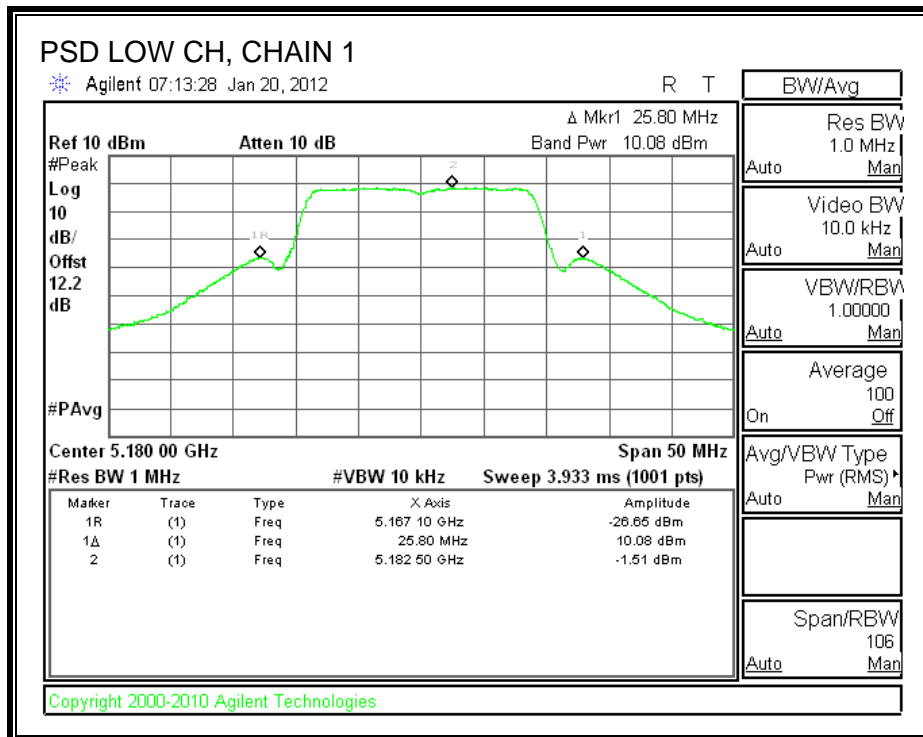
TEST PROCEDURE

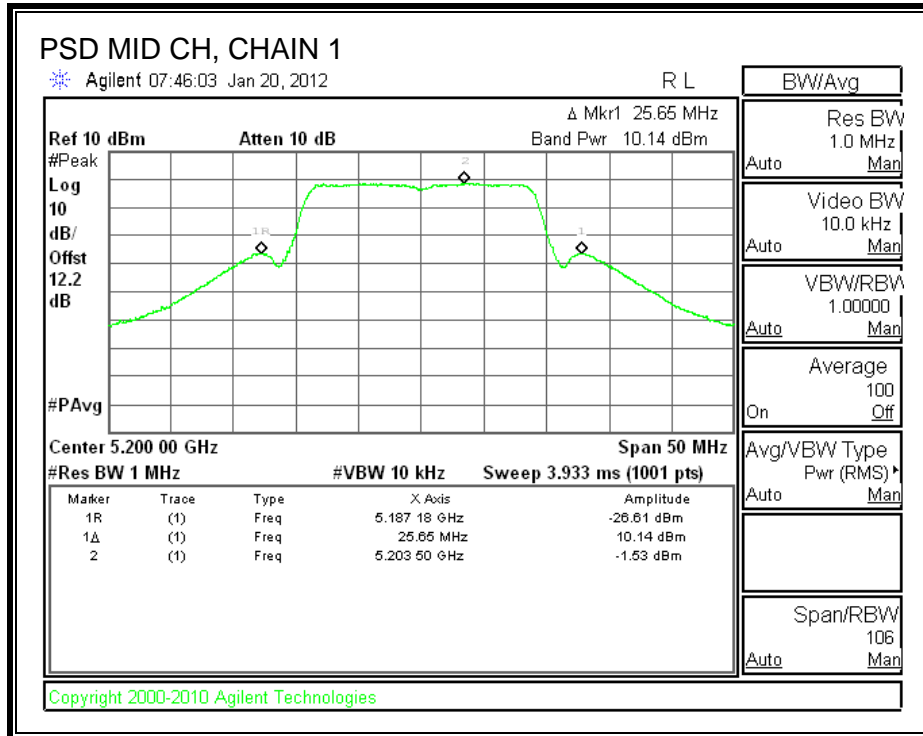
Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

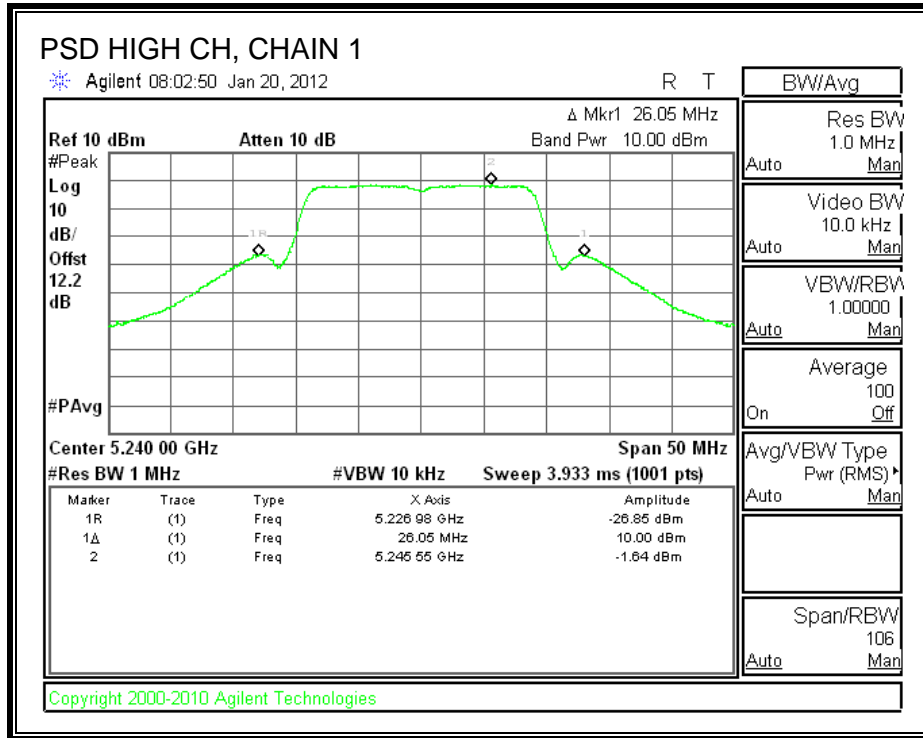
RESULTS

Channel	Frequency (MHz)	Chain 1 PPSD (dBm)	Chain 2 PPSD (dBm)	Chain 3 PPSD (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	5180	-1.51	-0.78	-1.40	3.55	3.59	-0.04
Middle	5200	-1.53	-0.67	-1.54	3.54	3.59	-0.05
High	5240	-1.64	-1.20	-2.18	3.12	3.59	-0.47

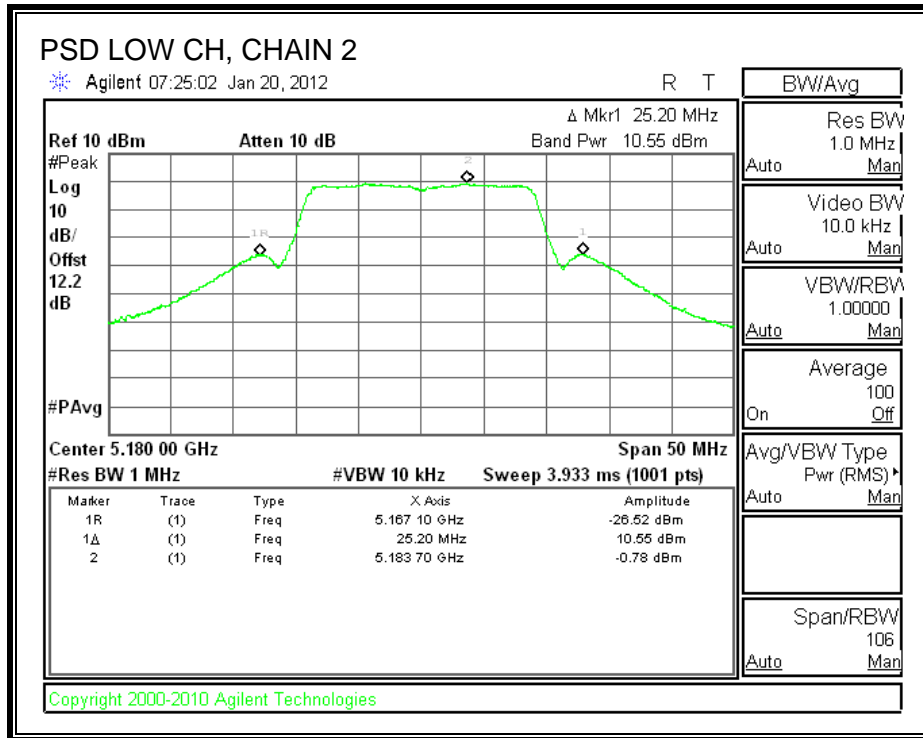
CHAIN 1 POWER SPECTRAL DENSITY

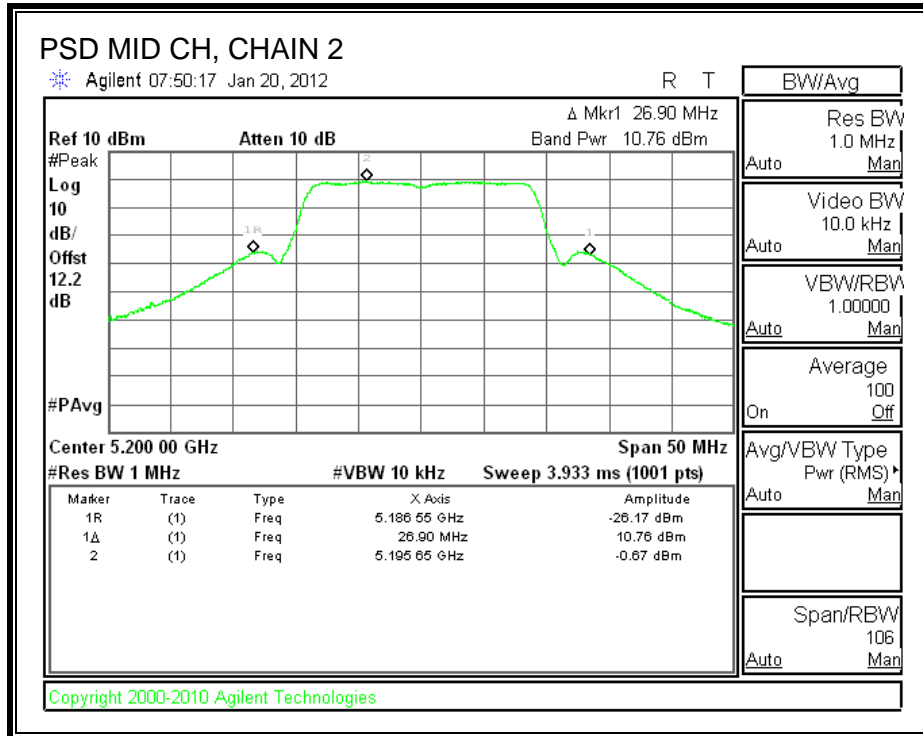


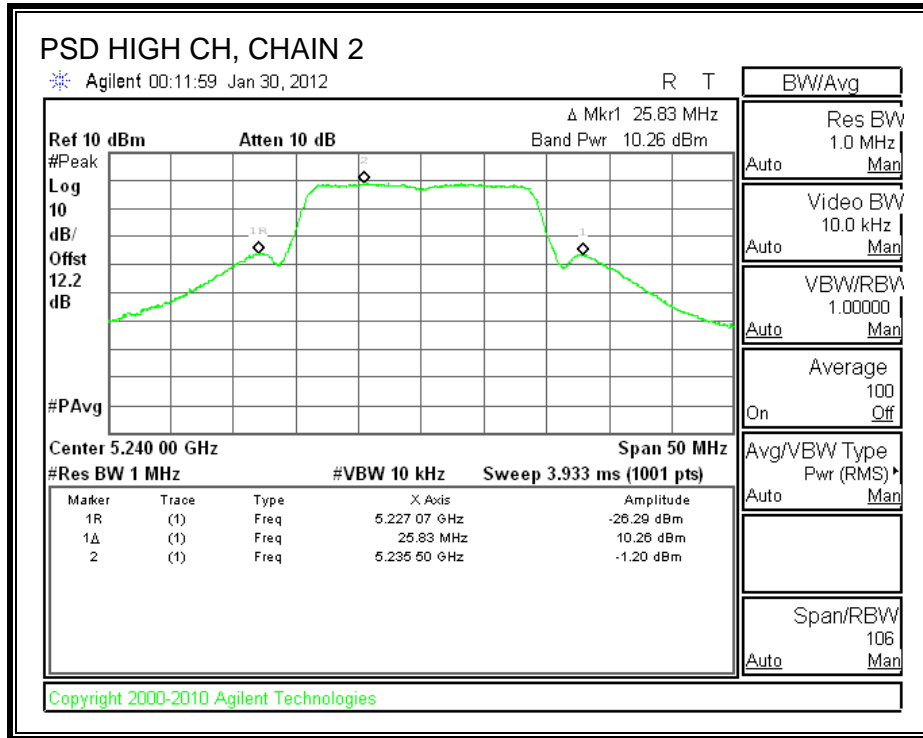




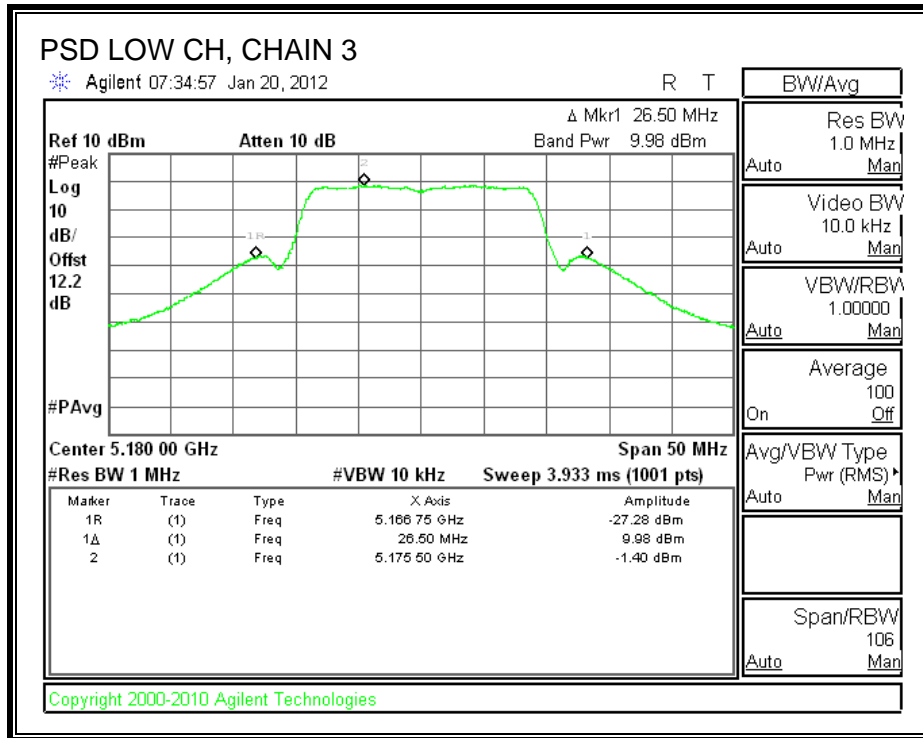
CHAIN 2 POWER SPECTRAL DENSITY

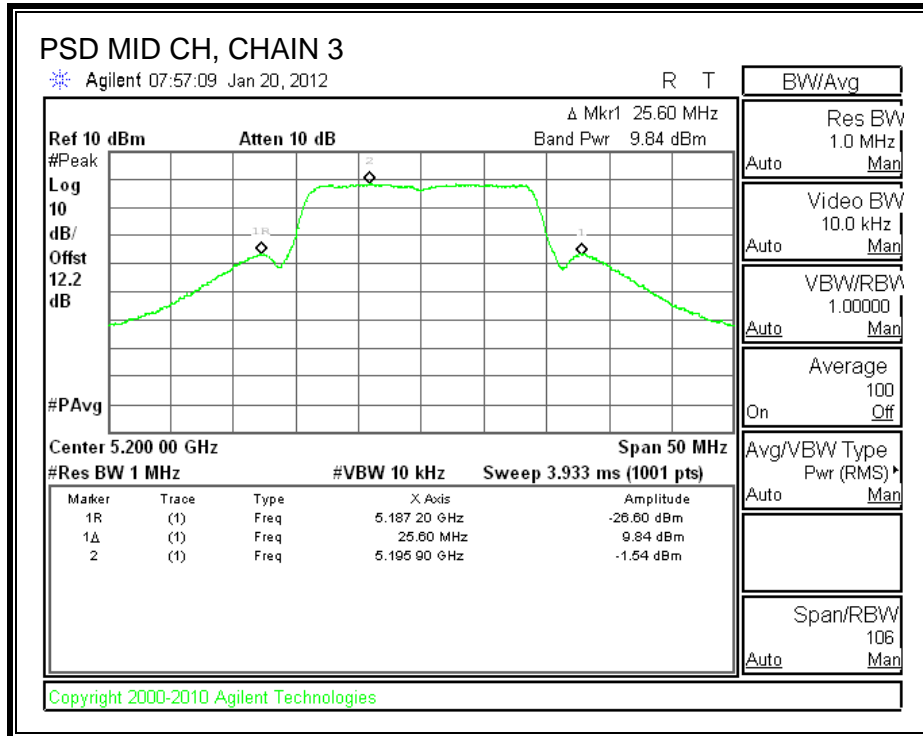


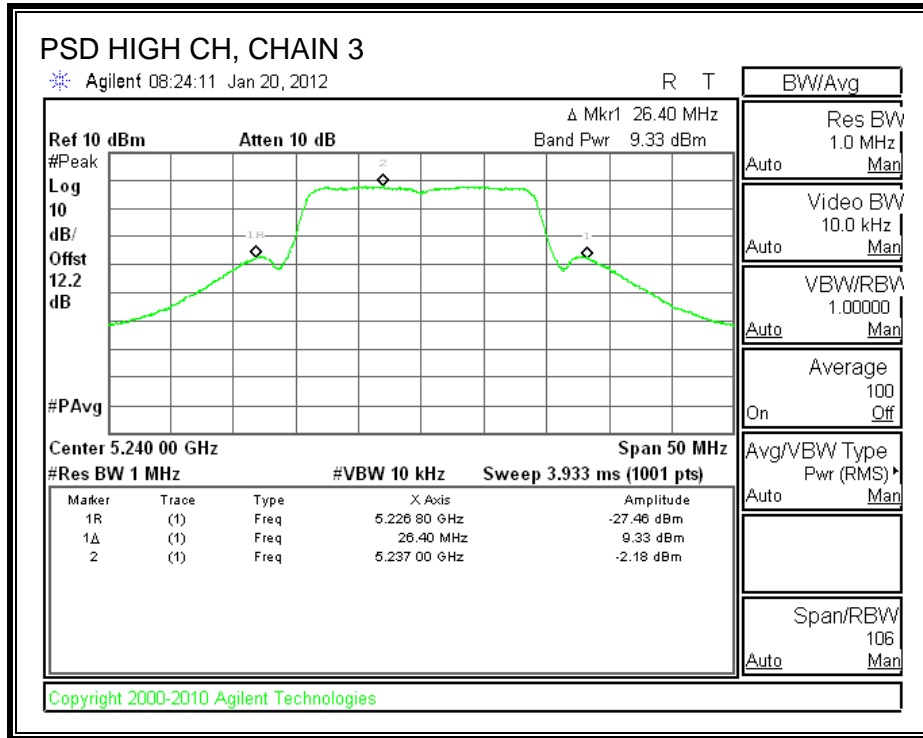




CHAIN 3 POWER SPECTRAL DENSITY







7.7.5. PEAK EXCURSION

LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

TEST PROCEDURE

Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, dated 10/25/2011.

RESULTS

CHAIN 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	7.21	13	-5.79
Middle	5200	6.89	13	-6.11
High	5240	6.39	13	-6.61

CHAIN 2

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	6.79	13	-6.21
Middle	5200	8.64	13	-4.36
High	5240	6.89	13	-6.11

CHAIN 3

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	6.37	13	-6.63
Middle	5200	6.65	13	-6.35
High	5240	6.39	13	-6.61

CHAIN 1

PEAK EXCURSION

