



**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: BCM94331CD

**FCC ID: QDS-BRCM1064
IC: 4324A-BRCM1064**

REPORT NUMBER: 12U14227-2, Revision B

ISSUE DATE: JUNE 08, 2012

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	05/31/12	Initial Issue	F. Ibrahim
A	06/07/12	Revised section 5.5	F. Ibrahim
B	06/08/12	Revised section 5.3	F. Ibrahim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: BROADCOM CORPORATION
90 MATHILDA PLACE
SUNNYVALE, CA 94086, U.S.A.

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

MODEL: BCM94331CD

SERIAL NUMBER: C8Y2104004NDRJVE4, C8Y210600VWDRJVEM, and C8Y210600ZTDRJVEC (DFS) (P508)

DATE TESTED: APRIL 09 - MAY 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 FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96, FCC KDB 789033, ANSI C63.4-2003, 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/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 conducted output power as follows:

5.2GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.2 GHz band, 1TX			
5180 - 5240	802.11a	15.401	34.682
5190 - 5230	802.11n HT40	16.939	49.420
5.2 GHz band, 2TX			
5180 - 5240	802.11n HT20 STBC MCS0	15.703	37.179
5.2 GHz band, 3TX			
5180 - 5240	802.11n HT20 STBC MCS0	15.670	36.898
5.2 GHz band, 3TX			
5190-5230	802.11n HT20 STBC MCS0	16.884	48.798

5.3 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.3 GHz band, 1TX			
5260 - 5320	802.11a	19.910	97.949
5270 - 5310	802.11n HT40	20.525	112.850
5.3 GHz band, 3TX			
5260 - 5320	802.11n HT20 CDD MCS0	20.478	111.635
5260 - 5320	802.11n HT20 SDM MCS21	22.247	167.764
5.3 GHz band, 3TX			
5270 - 5310	802.11n HT40 CDD MCS0	21.854	153.250
5270 - 5310	802.11n HT40 SDM MCS21	22.066	160.916

5.6 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.6 GHz band, 1TX			
5500-5700	802.11a	19.145	82.130
5510-5670	802.11n HT40	19.033	80.039
5.6 GHz band, 3TX			
5500-5700	802.11n HT20 CDD MCS0	20.477	111.609
5500-5700	802.11n HT20 SDM MCS21	22.170	164.816
5.6 GHz band, 3TX			
5510-5670	802.11n HT40 CDD MCS0	21.465	140.120
5510-5670	802.11n HT40 SDM MCS21	22.740	187.932

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

FCC/IC/NCC FMA - BCM94331CD, X33 FCC ID: QDS-BRCM1064 IC ID: 4324A-BRCM1064									
No.	Antenna Manufacturer	Antenna Type	Model	Peak gain @ 2412, 2422, 2432MHz, (BT)	Peak gain @ 2412, 2422, 2432MHz, (WLAN)	Peak gain (5150-5250MHz) @5200MHz	Peak gain (5250-5350MHz) @5320MHz	Peak gain (5470-5725MHz) @5500, 5700MHz	Peak gain (5725-5850MHz) @5785, 5805MHz
1	Amphenol/Tyco	802.11abgn WLAN Antenna	WF2 (604-3076)	NA	4.32	4.83	5.53	5.53	4.86
1	Amphenol/Tyco	802.11abgn WLAN Antenna	WF3 (604-3075)	NA	4.77	2.84	1.34	2.68	1.95
1	Amphenol/Tyco	802.11abgn WLAN Antenna	WF4 (604-3074)	NA	3.72	1.18	1.96	1.26	3.09
1	Amphenol/Tyco	BT Antenna	WF1 (604-3073)	4.8					

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Broadcom, rev. 5.106.98.65. The test utility software used during testing was BCM Internal, rev. 5.106.RC98.65.

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, as provided by the client, were 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 mode were made at MCS0.

All final tests in the 802.11n 20 MHz SDM mode were made at MCS21.

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

All final tests in the 802.11n 40 MHz SDM mode were made at MCS21.

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.

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.

For the modes where CH2 and CH10 were tested for output power, all other test items at CH1 and CH11 were performed with the higher power level between CH1 and CH2, and between CH10 and CH11 as worst-case scenario.

For all modes with single chain, chain 1 was selected per the software provided by the client.

802.11a mode bandedges for Ch. 36, 64, 100, and 140 were all performed. Harmonics were covered at same 802.11a legacy powers, but using the HT20 3Tx CDD mode.

HT40 SISO 1Tx Ch. 38, 62, 102, and 134 bandedges were all performed. Harmonics were covered at the same HT40 SISO 1Tx power, but using the HT40 3Tx CDD mode.

HT20 3Tx power for bandedges are much lower for CDD and SDM, but harmonics were performed legacy or SISO 1Tx power levels using the HT20 3Tx CDD mode.

HT40 3Tx power for bandedges are much lower for CDD and SDM, but harmonics were performed legacy or SISO 1Tx power levels using the HT40 3Tx CDD mode.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	G560	CBU4495773	DoC
Laptop	H-P	dv6000	CNF6463KP7	DoC
AC Adapter	Lenovo	ADP-65KH B	11S36001646ZZ10011FKEZ	DoC
AC Adapter	H-P	PA-1650-02H	592C40CRGUBR9B	DoC
Adapter Board	Catalyst	MINI2EXP	JUAN 02	N/A
Adapter Board	Catalyst	MINI2EXP	BRCM 2011-05	N/A
Adapter Board	Broadcom	BCM94331CSMFG	1458923	N/A
Adapter Board	Broadcom	BCM94331CSMFG	1458963	N/A

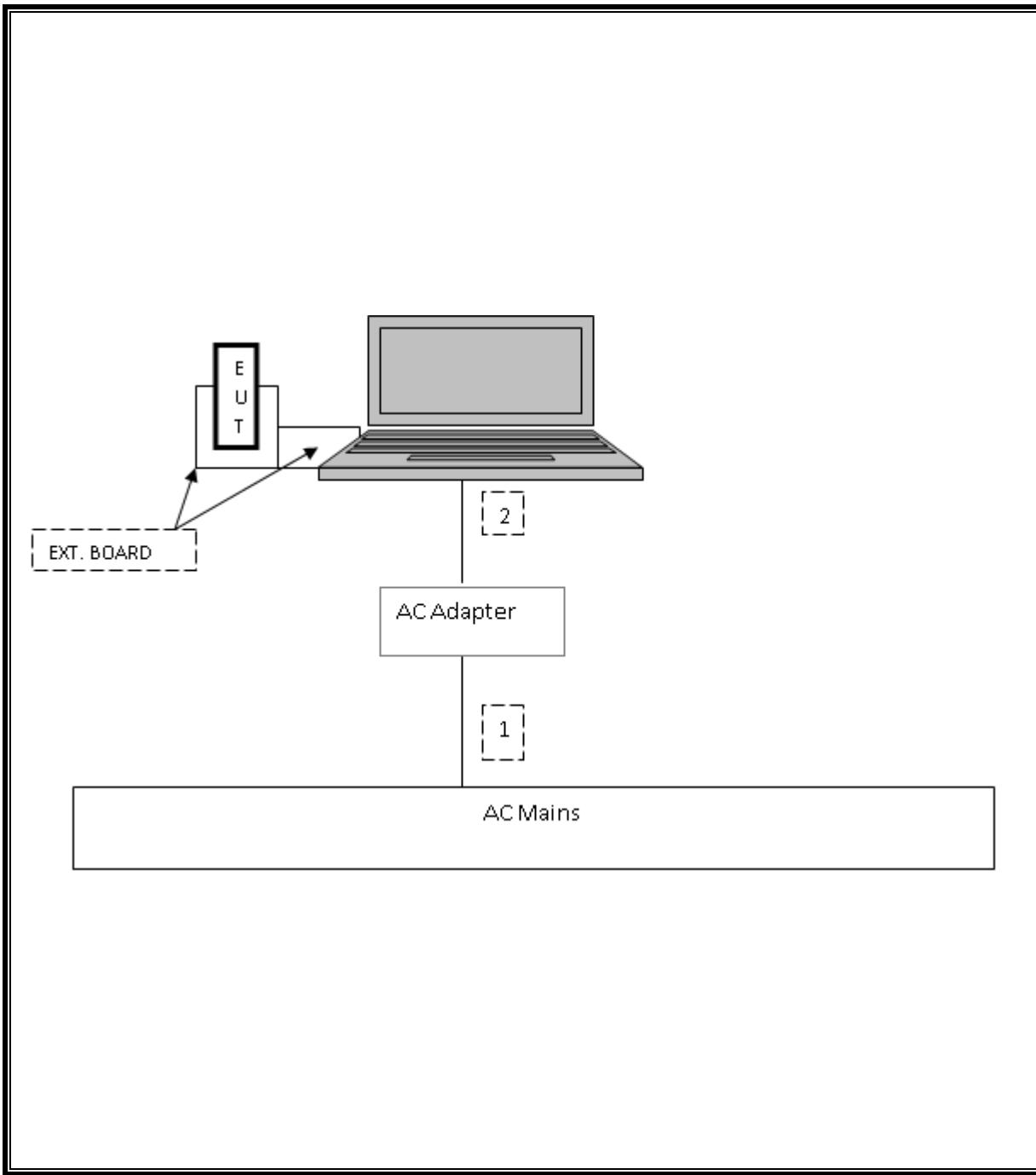
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US 115V	Un-Shielded	1m	NA
2	DC	1	DC	Un-Shielded	1.8m	Ferrite at laptop's end
1	AC	1	US 115V	Un-Shielded	1.8m	NA
2	DC	1	DC	Un-Shielded	1.75m	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	C01069	12/15/11	12/15/12	
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	09/02/11	09/02/12	
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00996	05/04/11	05/04/12	
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	03/22/12	03/22/13	
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	02/16/12	02/16/13	
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01176	08/04/11	08/04/12	
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	07/06/11	07/06/12	
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/19/11	08/19/13	
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/11	12/13/12	
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/11	12/13/12	
Antenna, Horn, 18 GHz	EMCO	3115	C00783	06/29/11	06/29/12	
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	
Antenna, Horn, 40 GHz	ARA	MWH-2640/B	C00981	06/14/11	06/14/12	
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1		02/07/12	02/07/13	
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07/12/11	07/12/12	
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	07/18/11	07/18/12	
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/02/11	08/02/12	
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	11/11/11	11/11/12	
LISN, 30 MHz	FCC	50/250-25-2	C00626	12/13/11	12/13/12	

7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

7.1.1. 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)
802.11a 20 MHz	2.0750	2.0900	0.993	99.3%	0.03	0.482
802.11n HT20 CDD	1.9200	1.9350	0.992	99.2%	0.03	0.521
802.11n HT20 SDM	0.6850	1.1450	0.598	59.8%	2.23	1.460
802.11n HT20 STBC	11.4900	11.7000	0.982	98.2%	0.08	0.087
802.11n HT40 SISO	0.9367	0.9533	0.983	98.3%	0.08	1.068
802.11n HT40 CDD	0.9333	0.9500	0.982	98.2%	0.08	1.071
802.11n HT40 SDM	0.4534	0.8067	0.562	56.2%	2.50	2.206
802.11n HT40 STBC	0.9390	0.9570	0.981	98.1%	0.08	1.065

7.1.2. MEASUREMENT METHOD FOR POWER AND PPSD

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

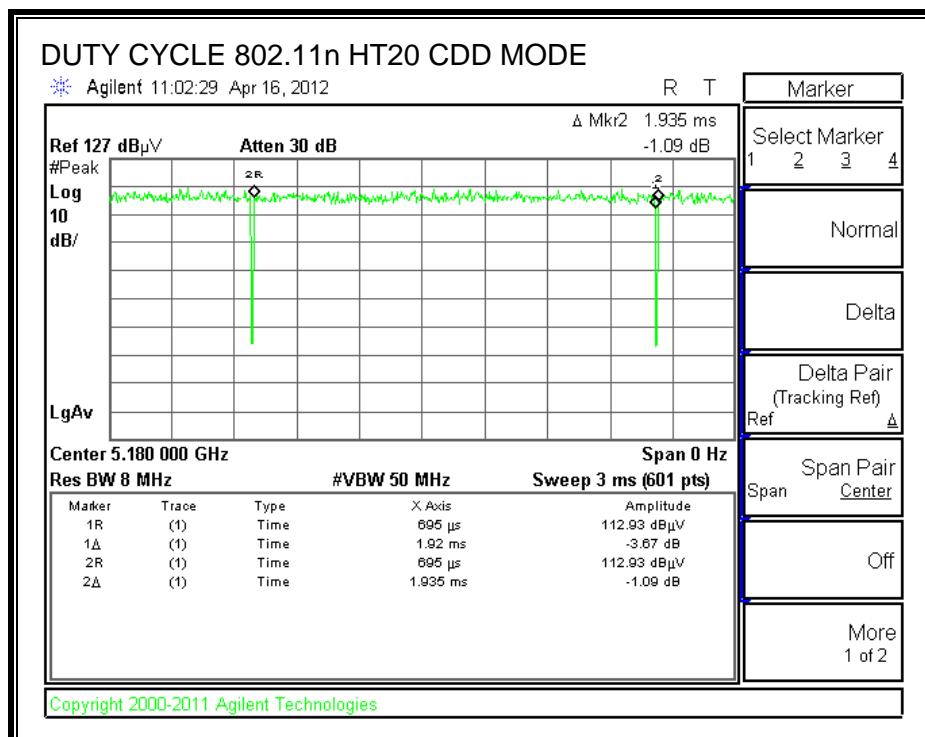
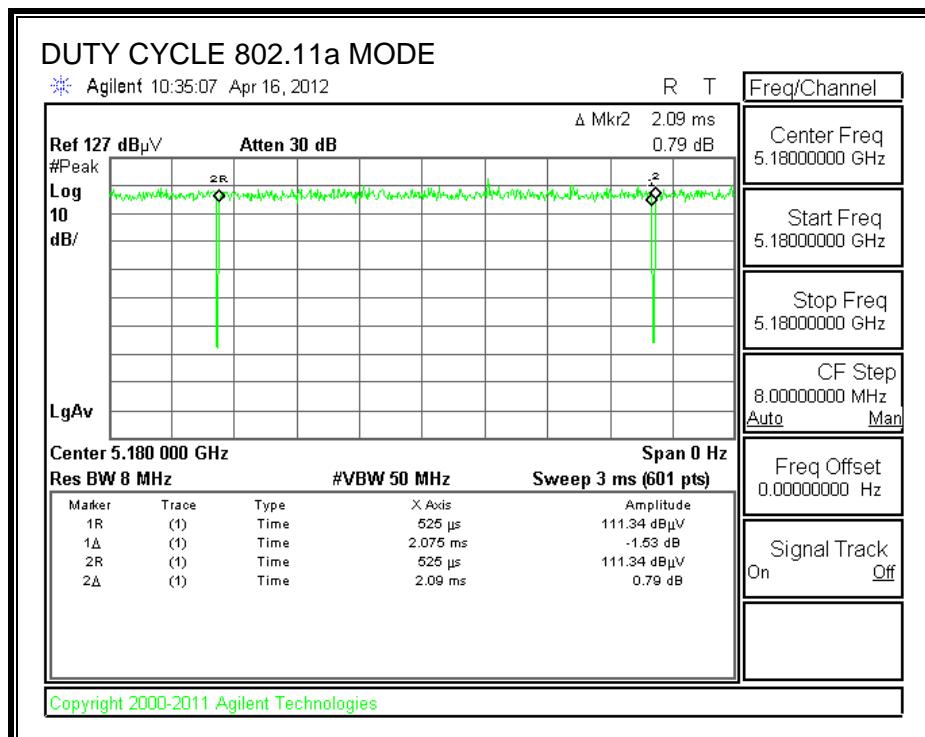
When Duty Cycle is less than 98% and consistent, KDB 789033 Method SA-2 is used.

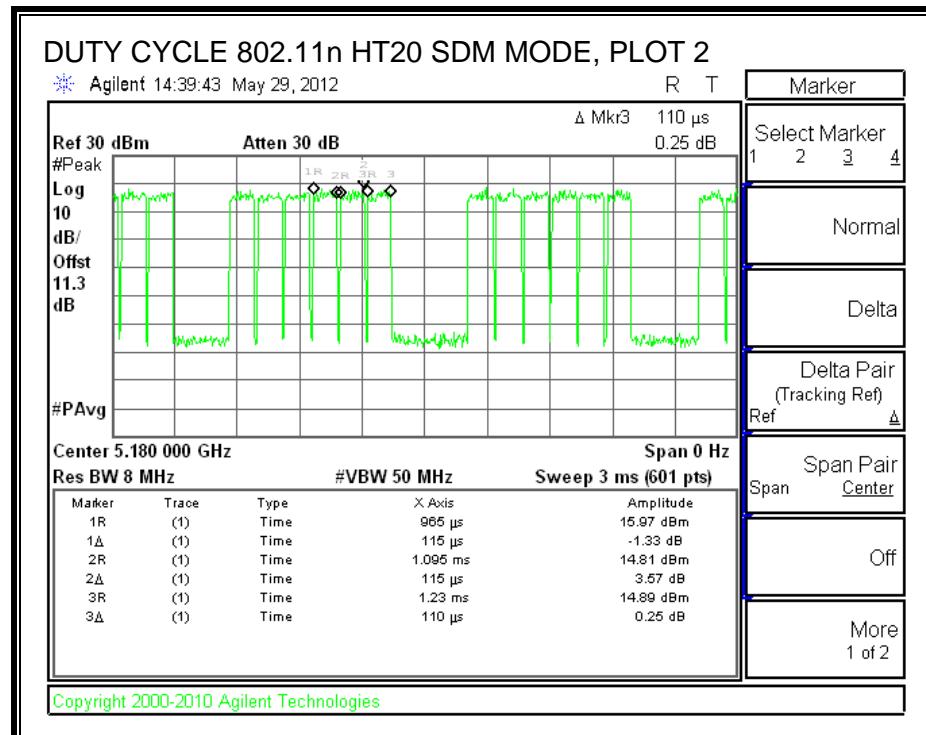
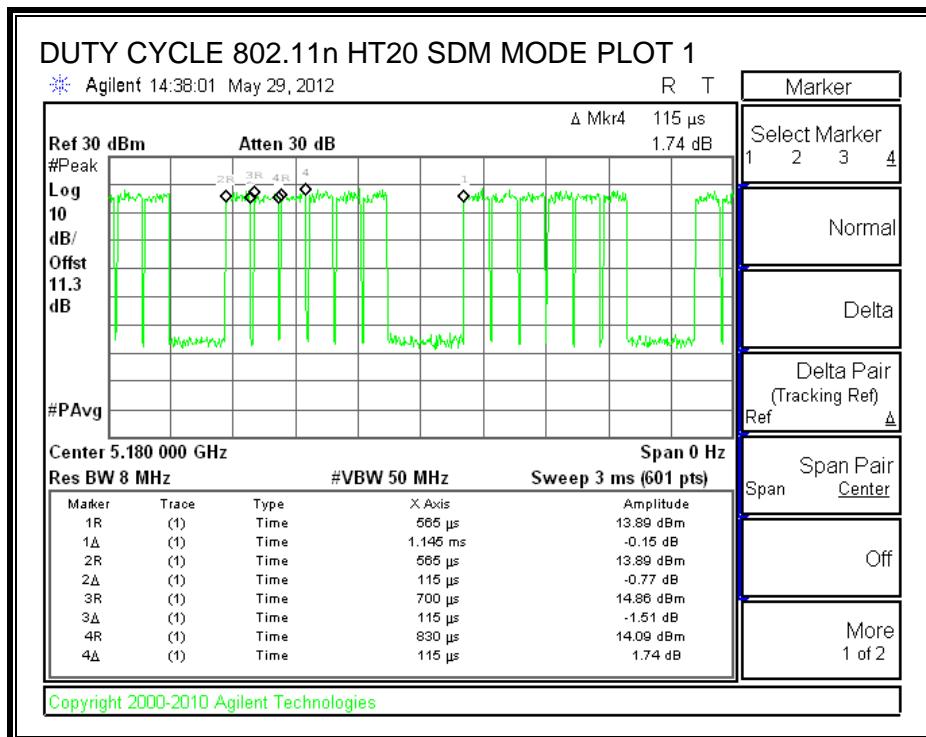
7.1.3. MEASUREMENT METHOD FOR AVG SPURIOUS EMISSIONS ABOVE 1 GHz

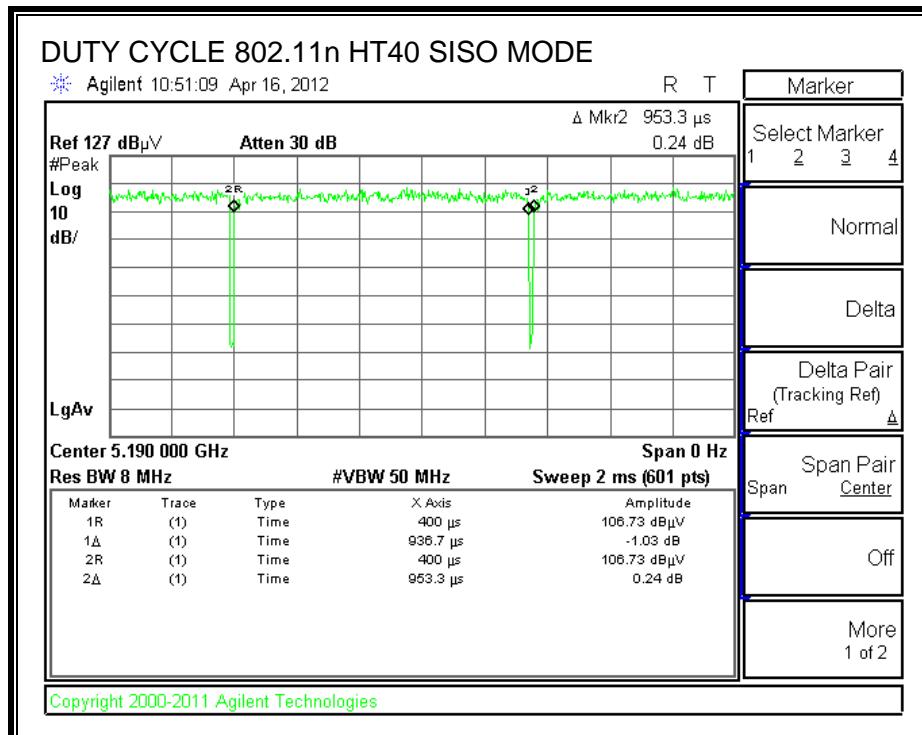
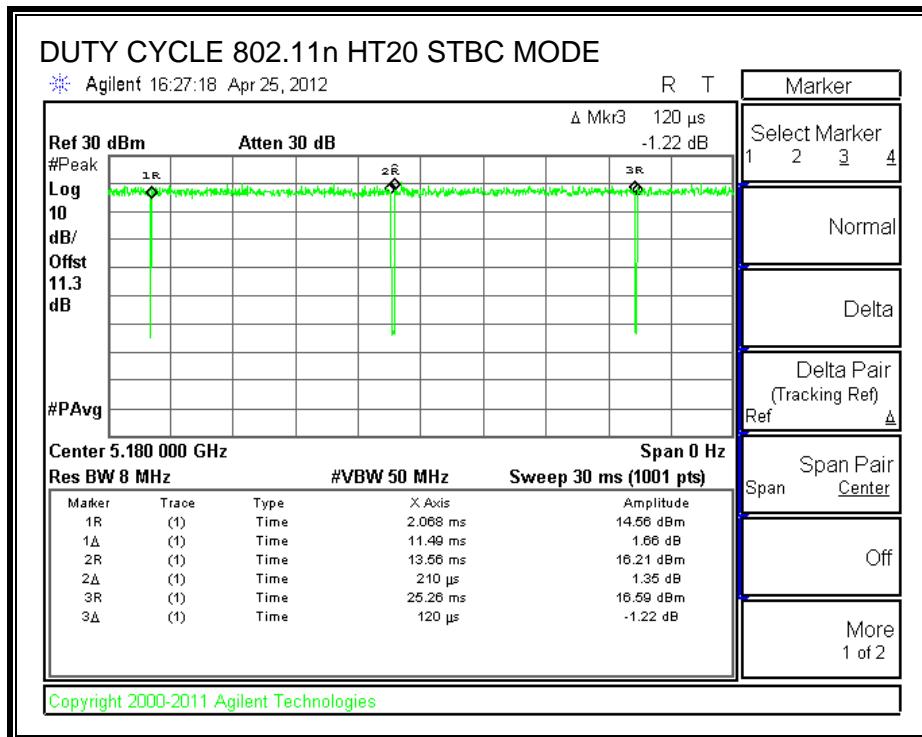
When Duty Cycle is greater than or equal to 98%, KDB 789033 Method VB with Power RMS Averaging is used.

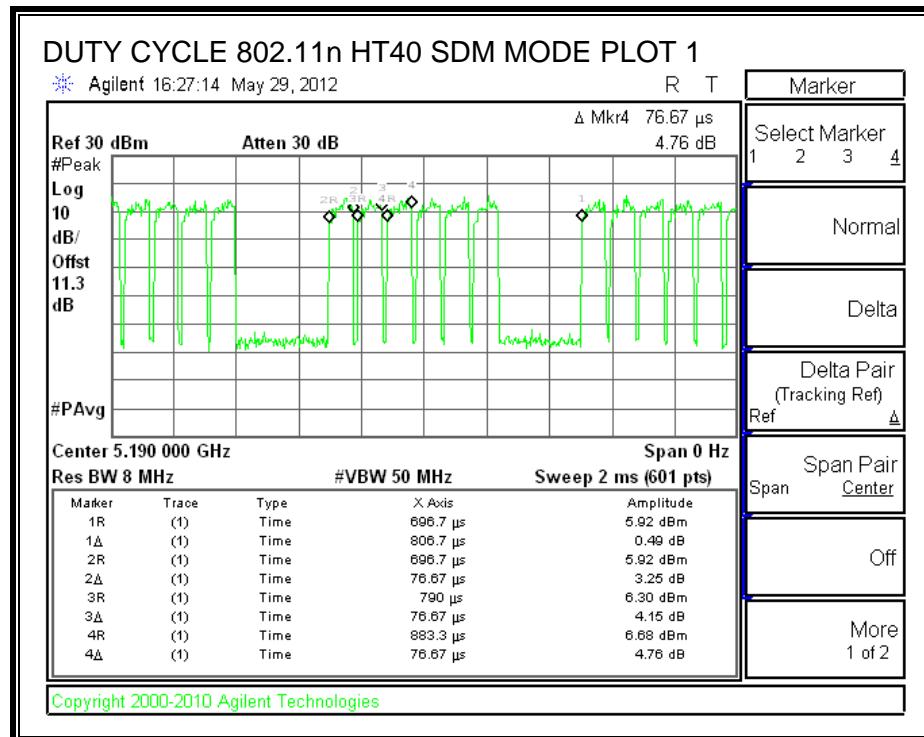
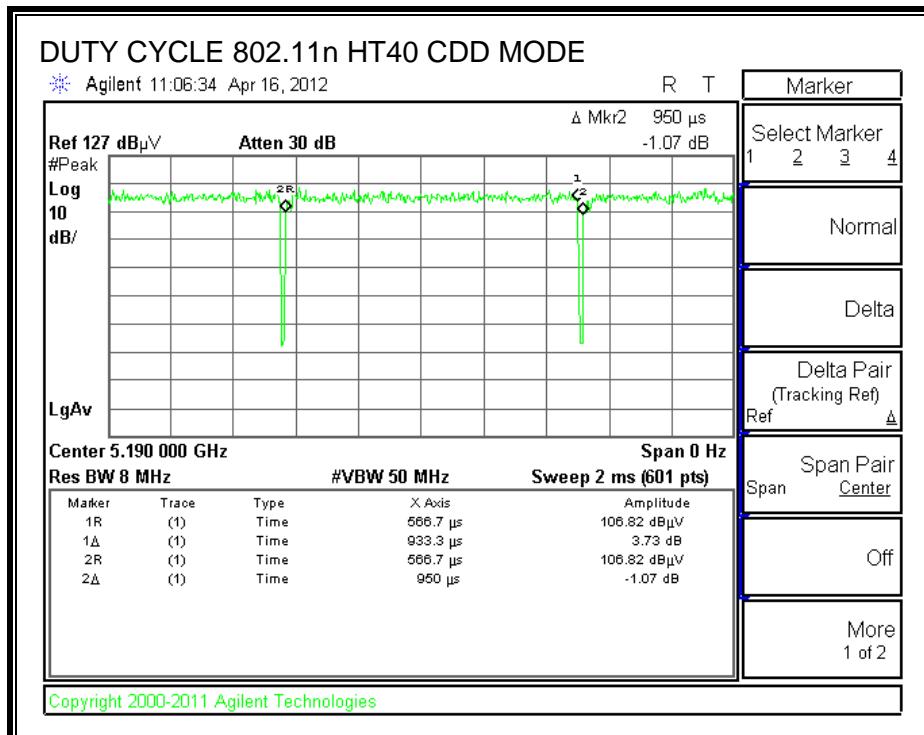
When Duty Cycle is less than 98% and consistent, KDB 789033 Method VB with Power RMS Averaging is used.

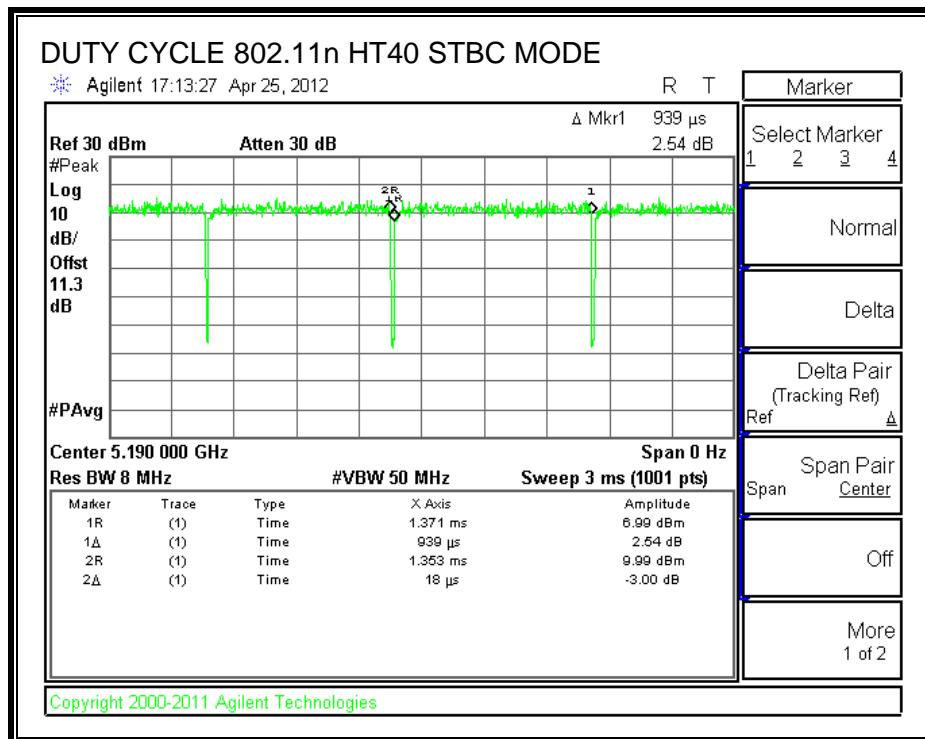
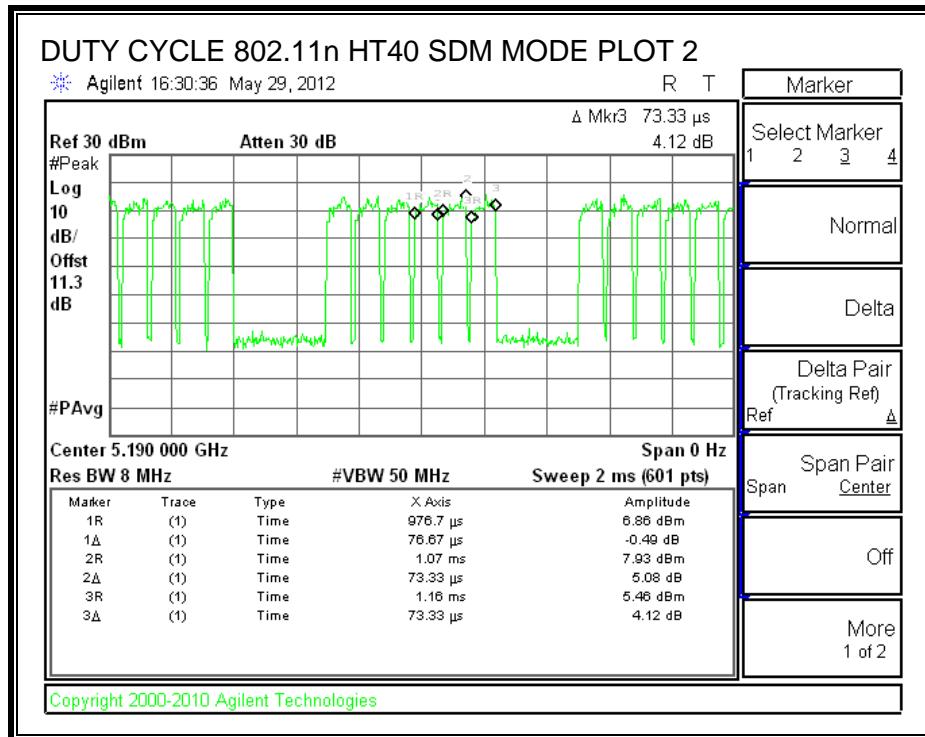
7.1.4. DUTY CYCLE PLOTS











8. ANTENNA PORT TEST RESULTS

8.1. 802.11a, Legacy, 1TX, 5.2 GHz BAND

8.1.1. 26 dB BANDWIDTH

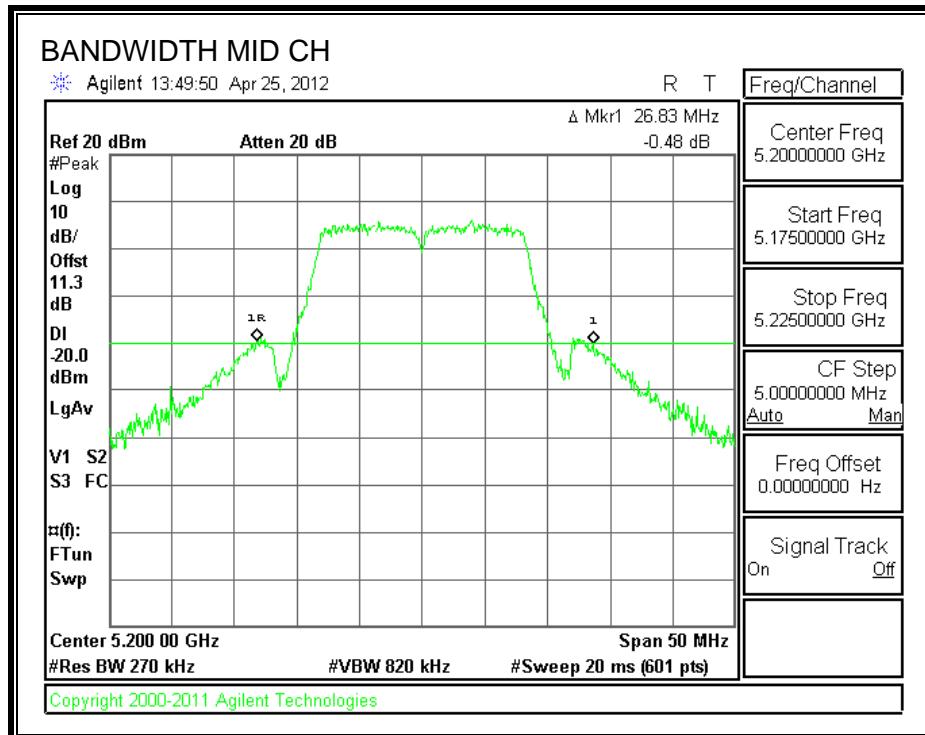
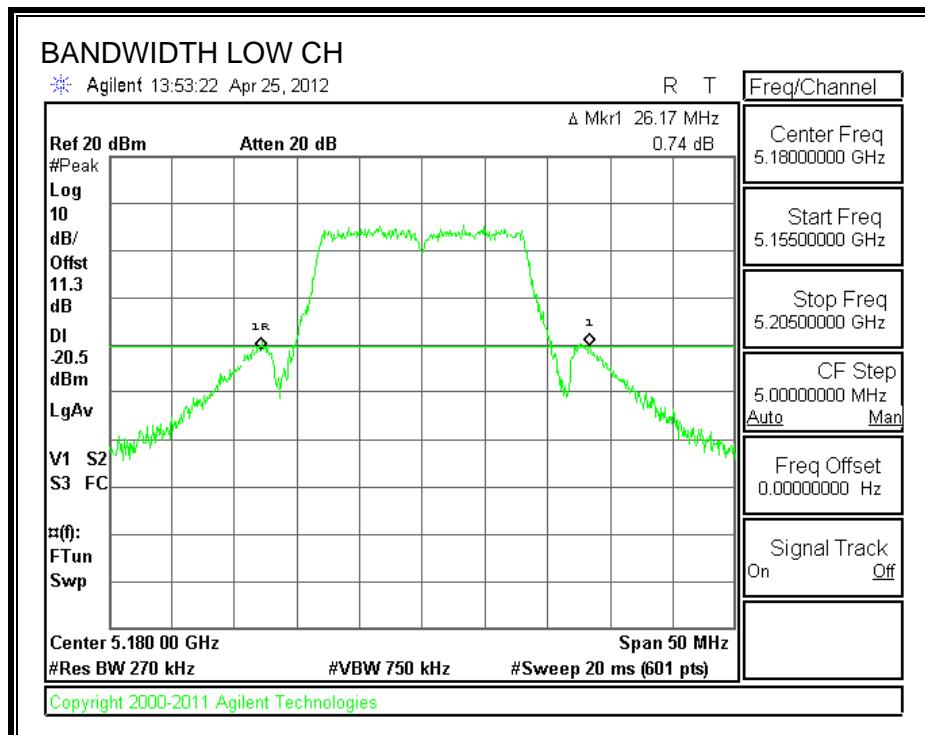
LIMITS

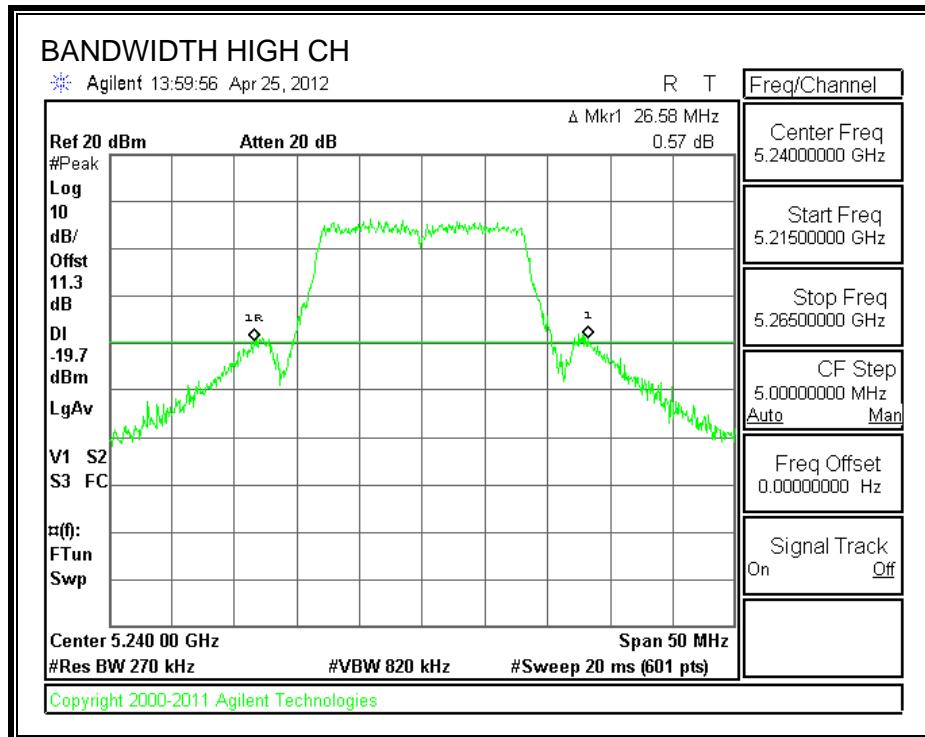
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	26.17
Mid	5200	26.83
High	5240	26.58

26 dB BANDWIDTH





8.1.2. 99% BANDWIDTH

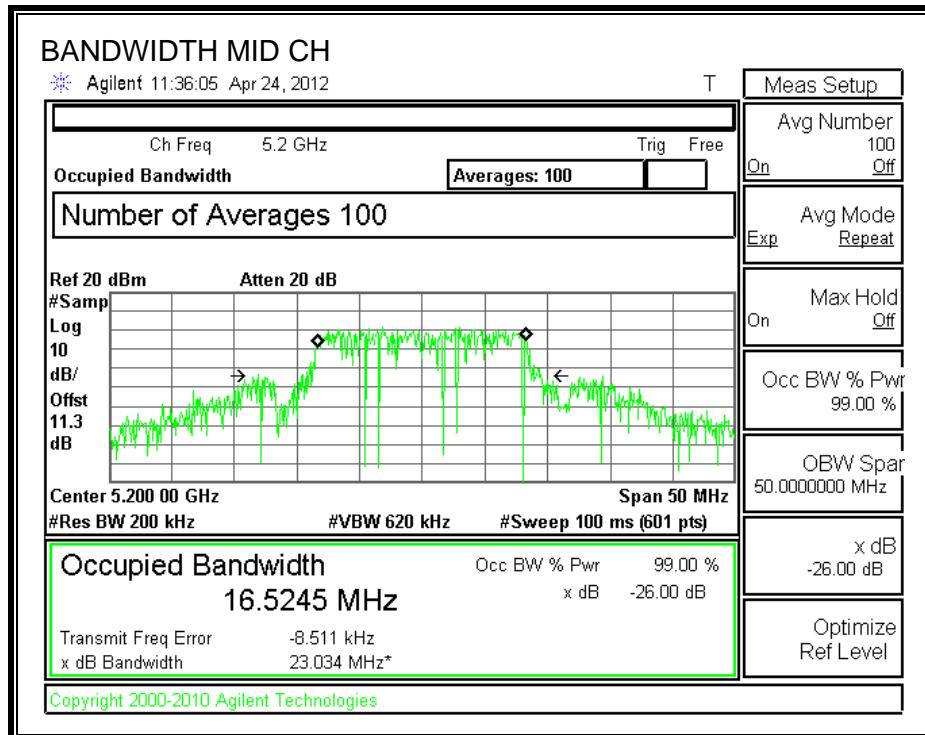
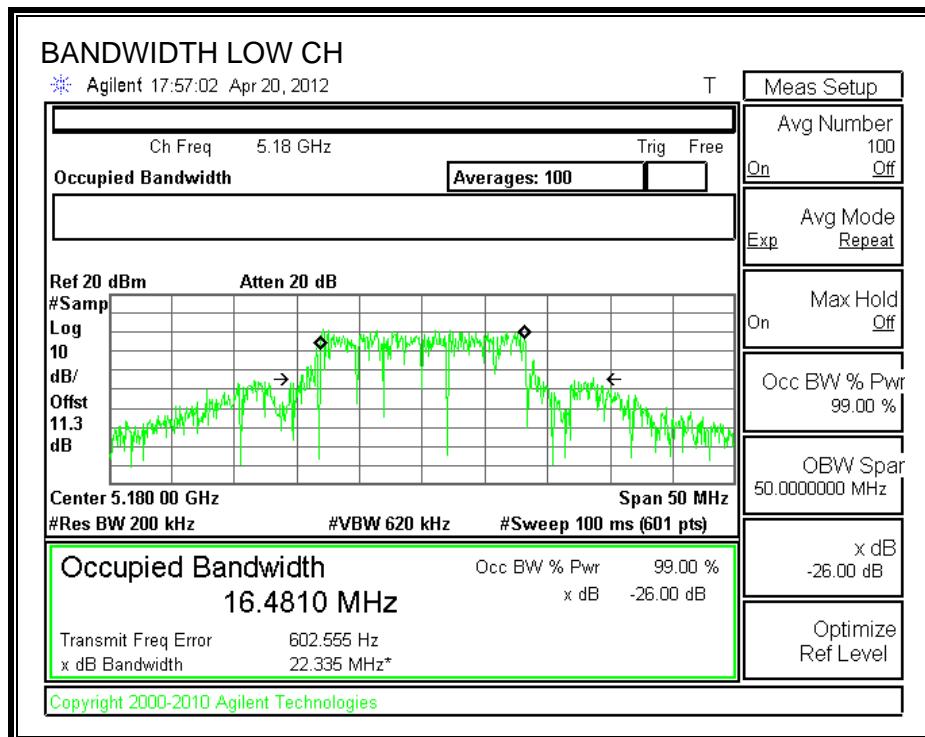
LIMITS

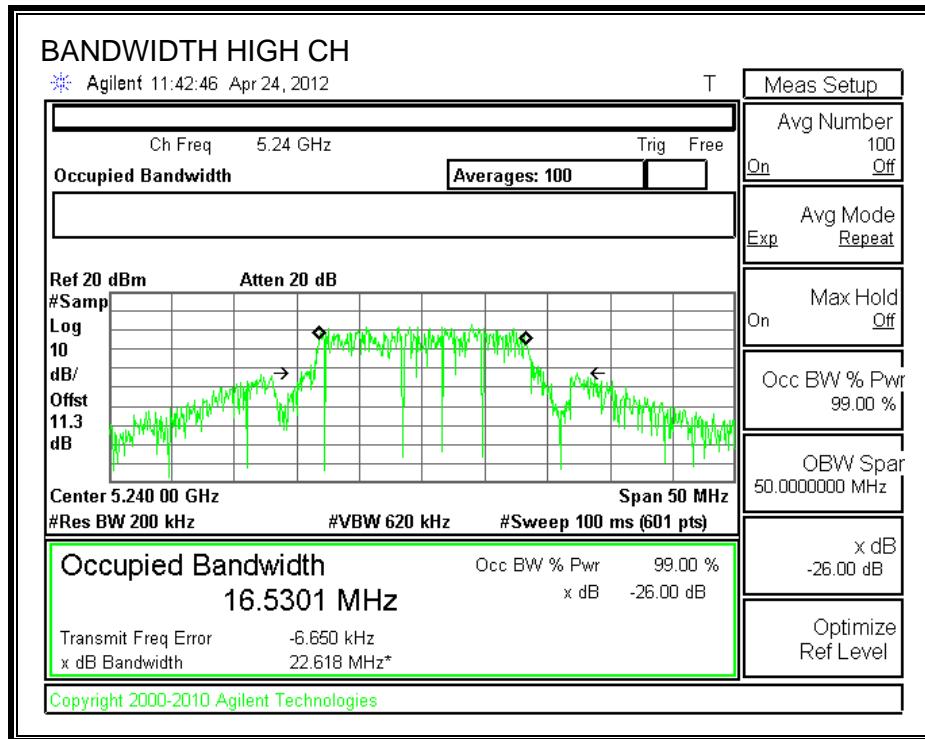
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.4810
Mid	5200	16.5245
High	5240	16.5301

99% BANDWIDTH





8.1.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the band 5.15–5.25 GHz, 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. In addition, 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 maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5180	17	26.17	18.18	4.83	17.00	4.00
Mid	5200	17	26.83	18.29	4.83	17.00	4.00
High	5240	17	26.58	18.25	4.83	17.00	4.00

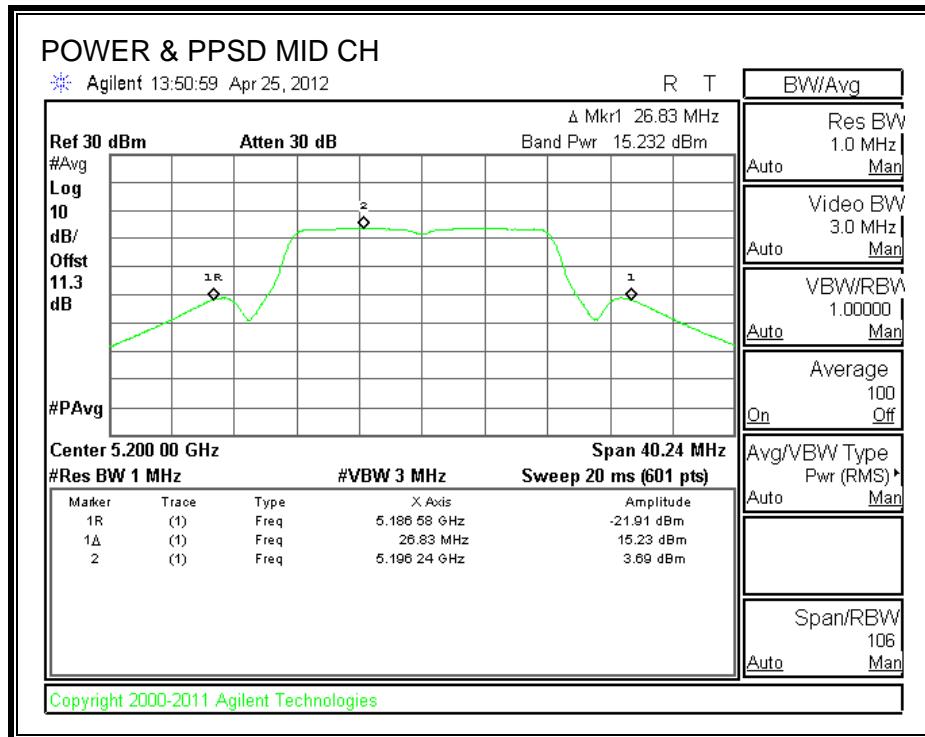
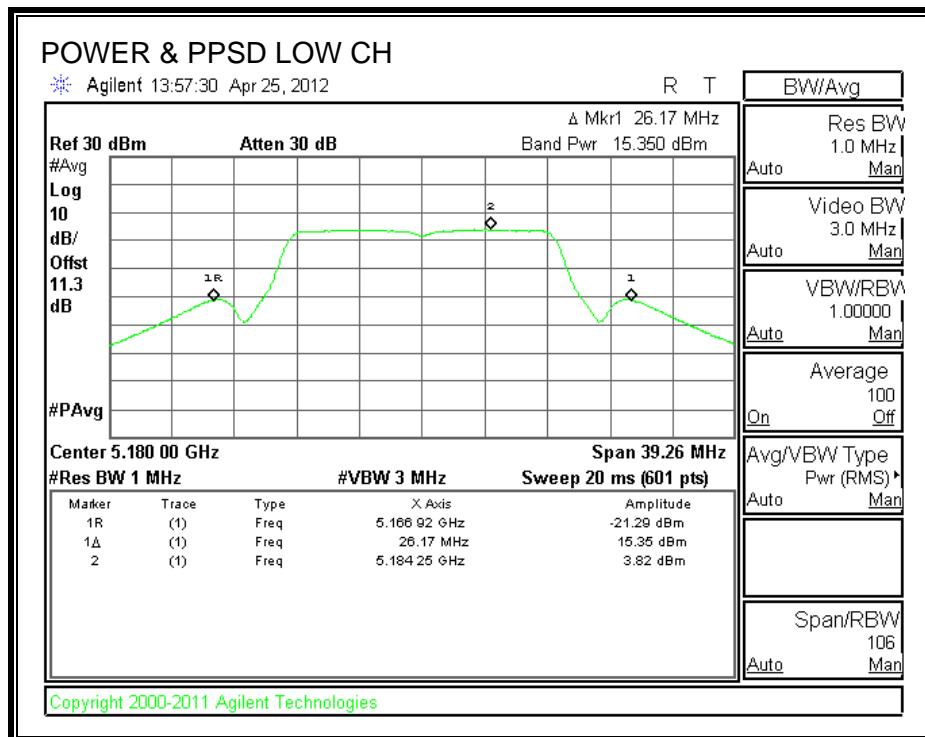
Output Power Results

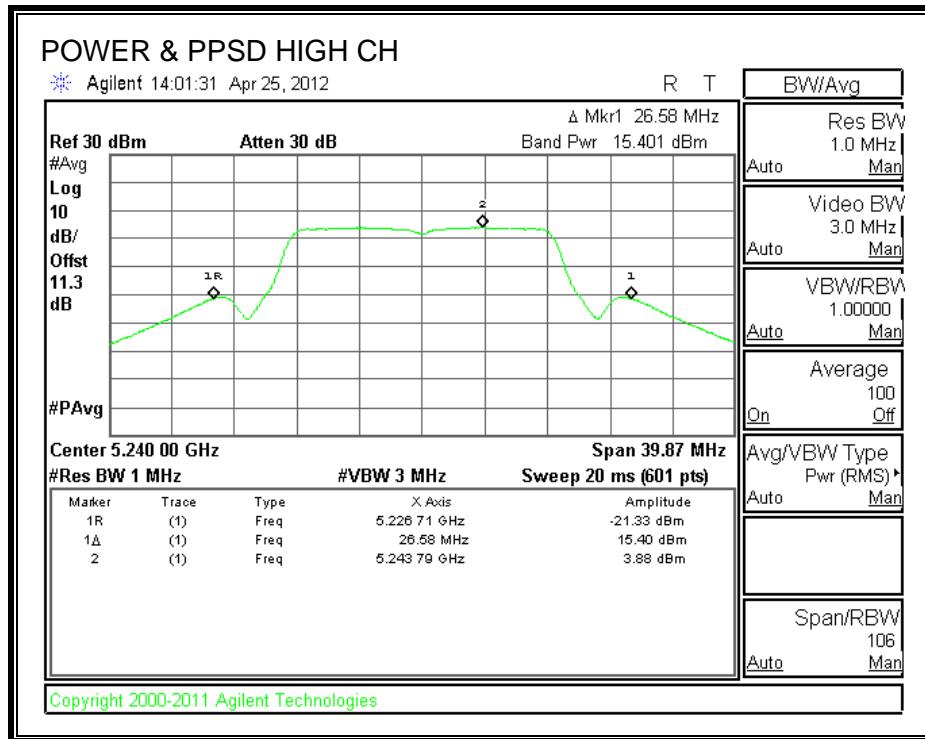
Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	15.350	15.350	17.00	-1.650
Mid	5200	15.232	15.232	17.00	-1.768
High	5240	15.401	15.401	17.00	-1.599

PPSD Results

Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	3.82	3.82	4.00	-0.18
Mid	5200	3.69	3.69	4.00	-0.31
High	5240	3.88	3.88	4.00	-0.12

OUTPUT POWER AND PPSD





8.1.4. PEAK EXCURSION

LIMITS

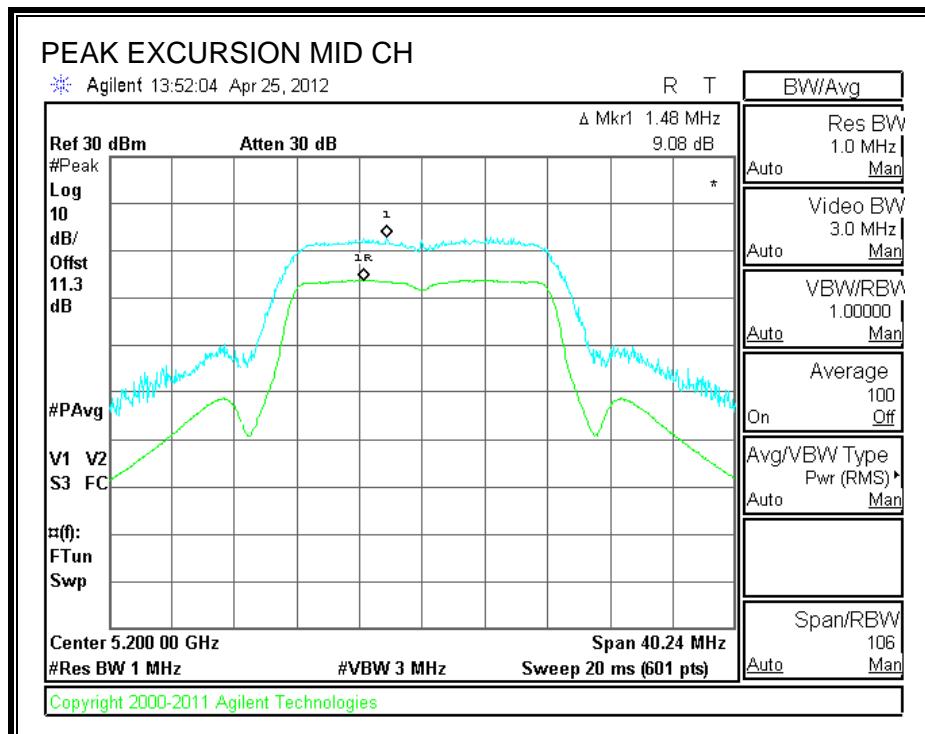
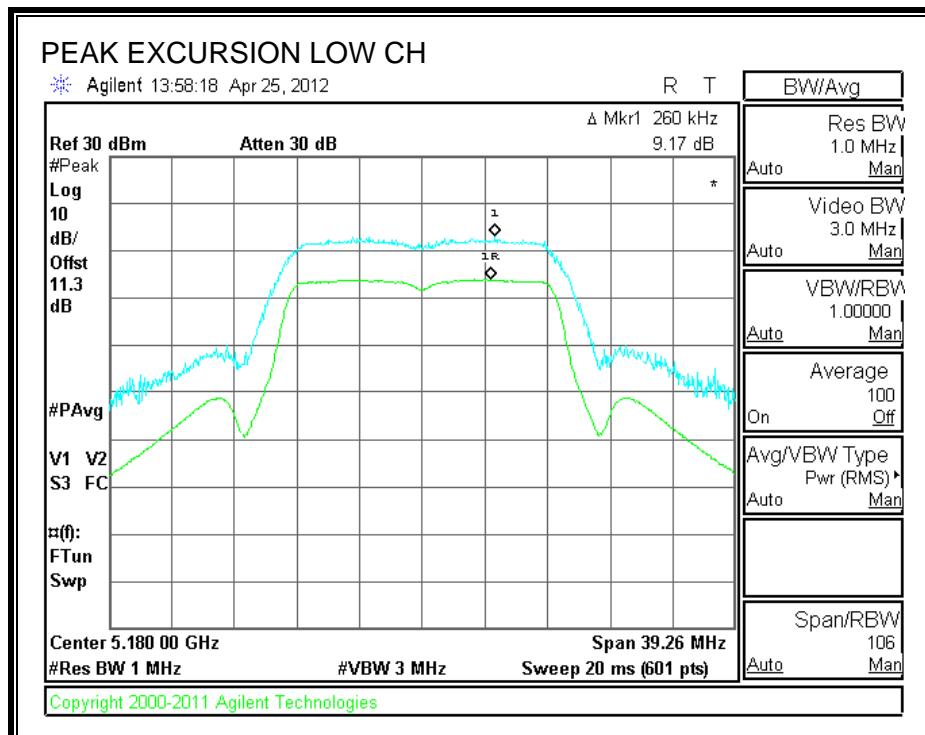
FCC §15.407 (a) (6)

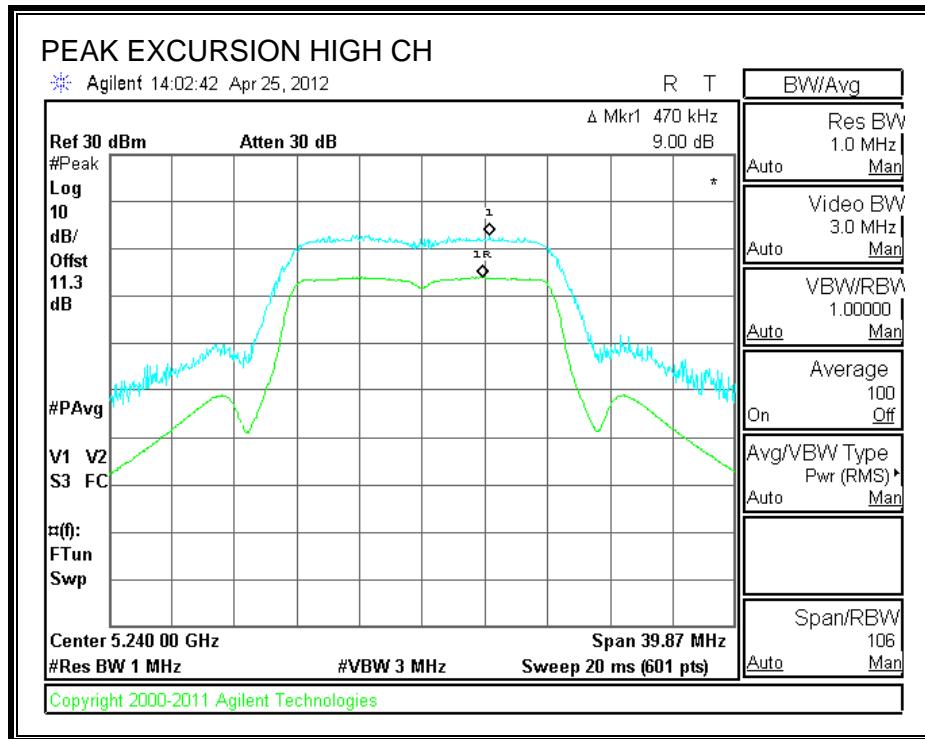
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	9.17	13	-3.8
Mid	5200	9.08	13	-3.9
High	5240	9.00	13	-4.0

PEAK EXCURSION





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8.2. 802.11n HT20, STBC MCS0, 2TX, 5.2 GHz BAND

8.2.1. 26 dB BANDWIDTH

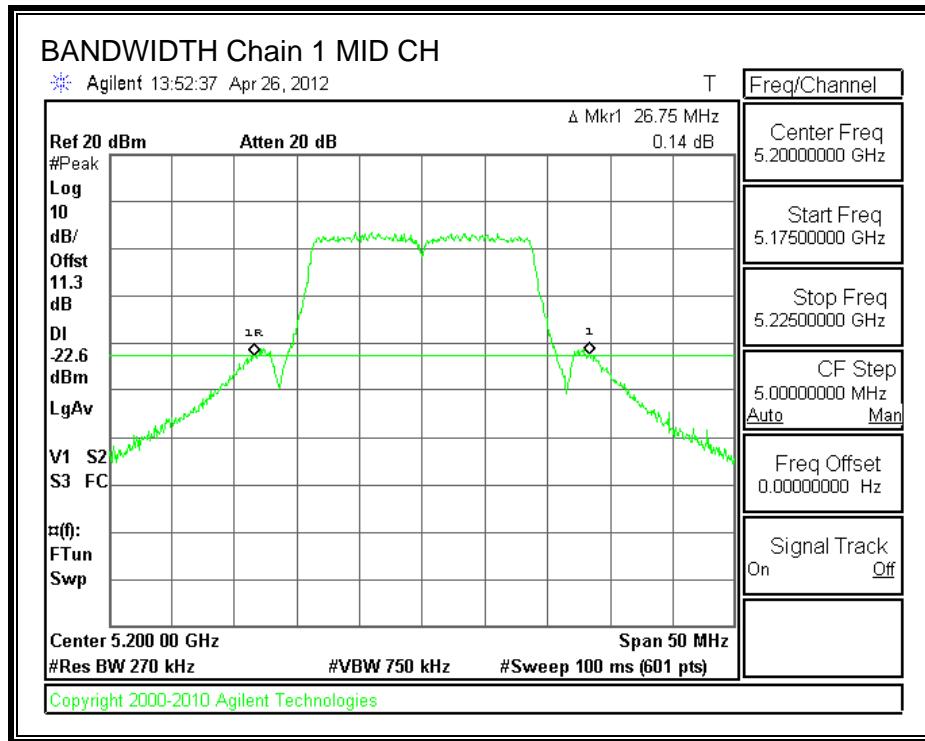
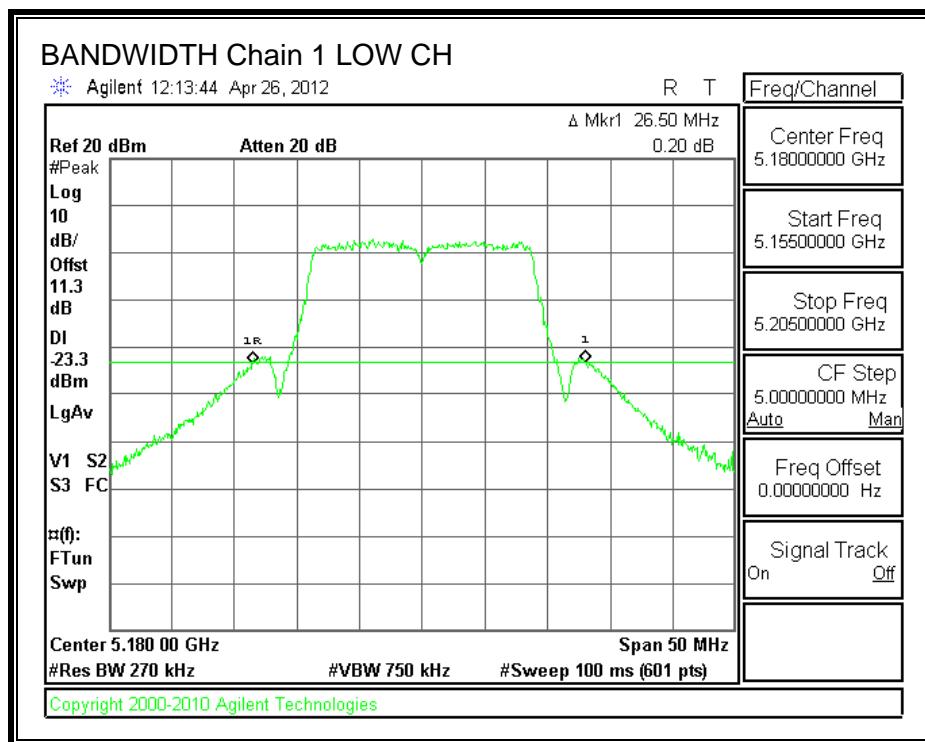
LIMITS

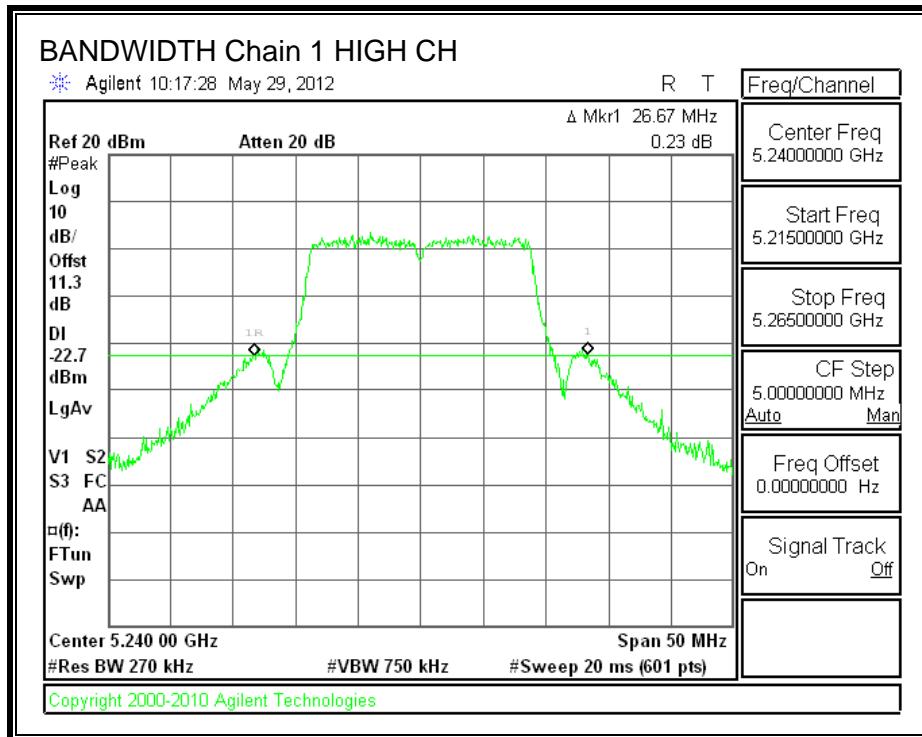
None; for reporting purposes only.

RESULTS

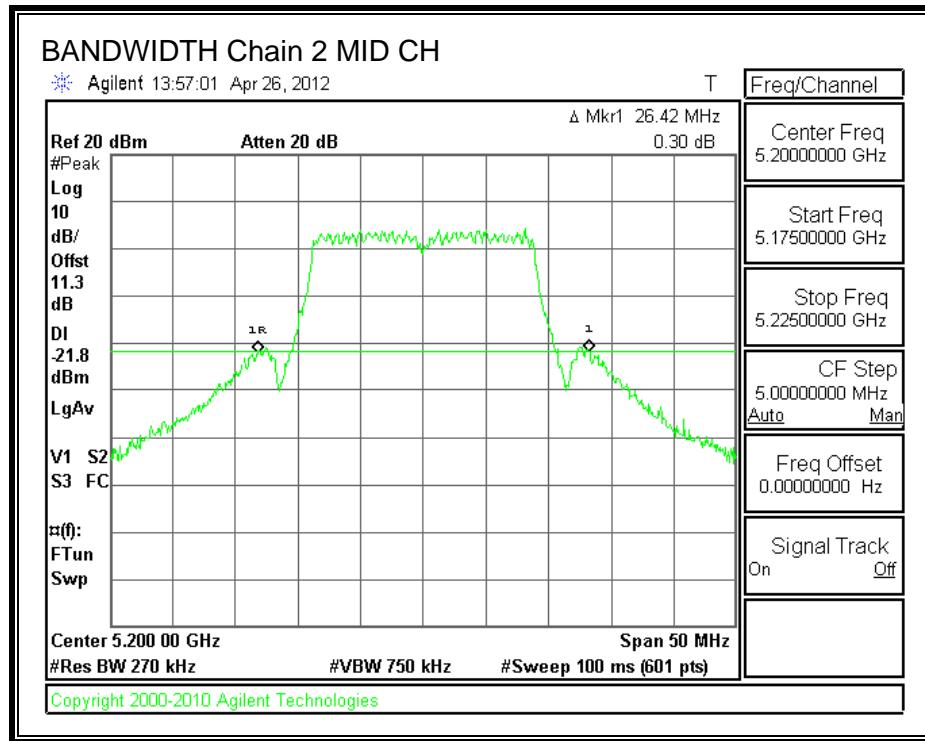
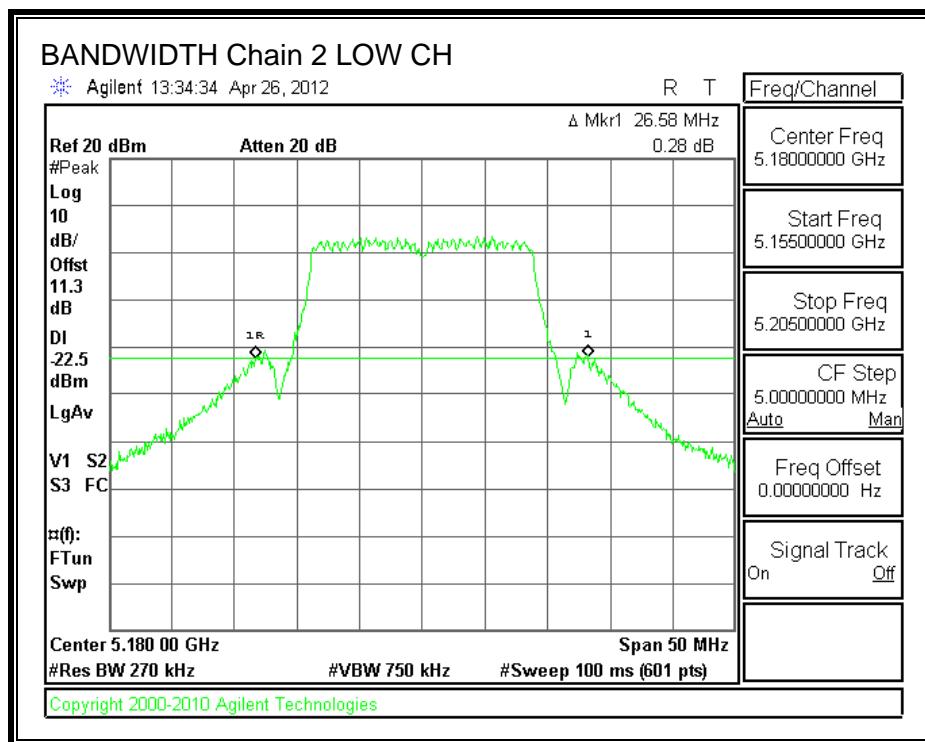
Channel	Frequency (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)
Low	5180	26.50	26.58
Mid	5200	26.75	26.42
High	5240	26.67	25.75

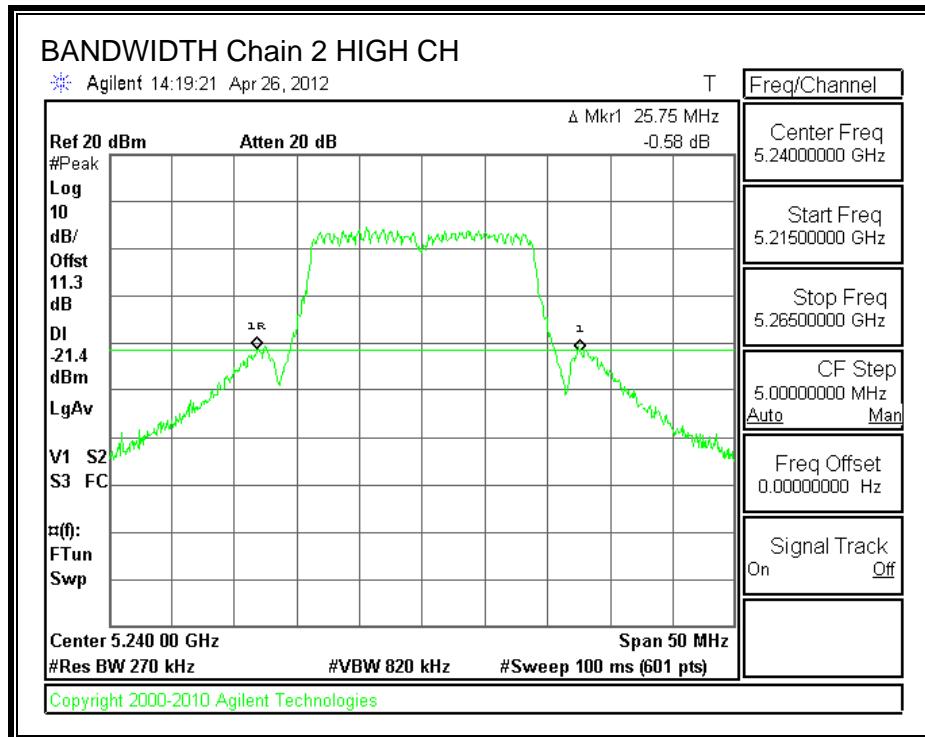
26 dB BANDWIDTH, Chain 1





26 dB BANDWIDTH, Chain 2





8.2.2. 99% BANDWIDTH

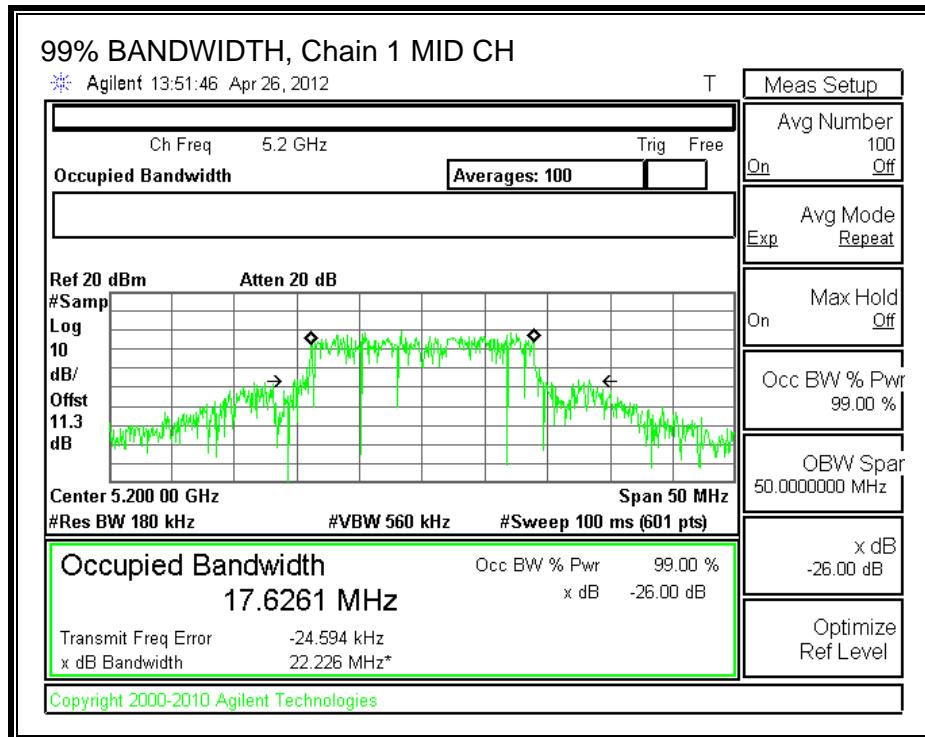
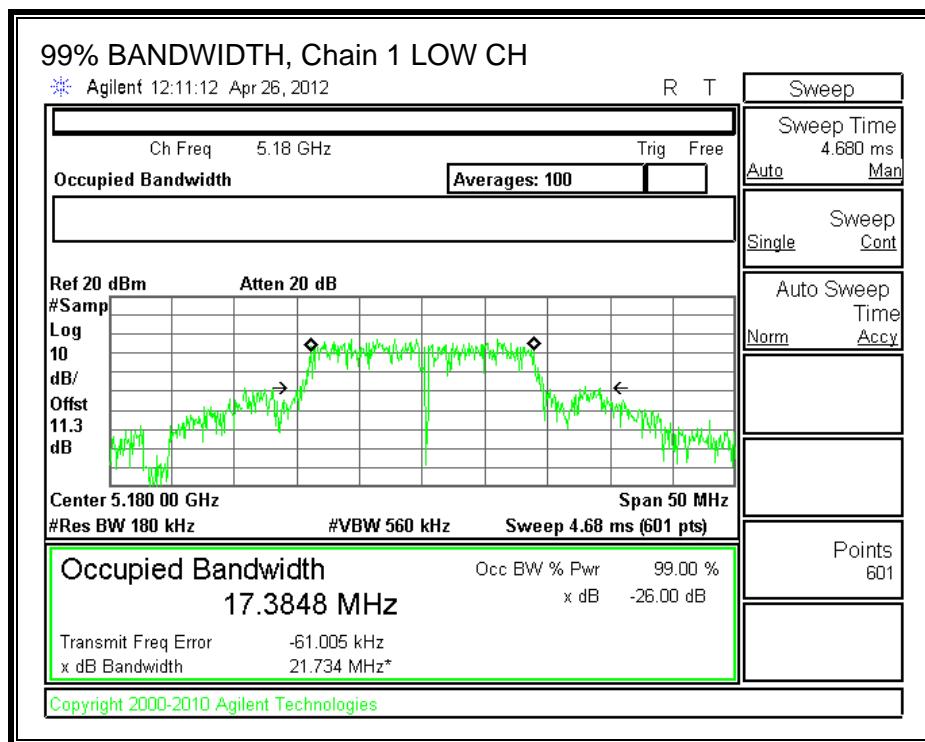
LIMITS

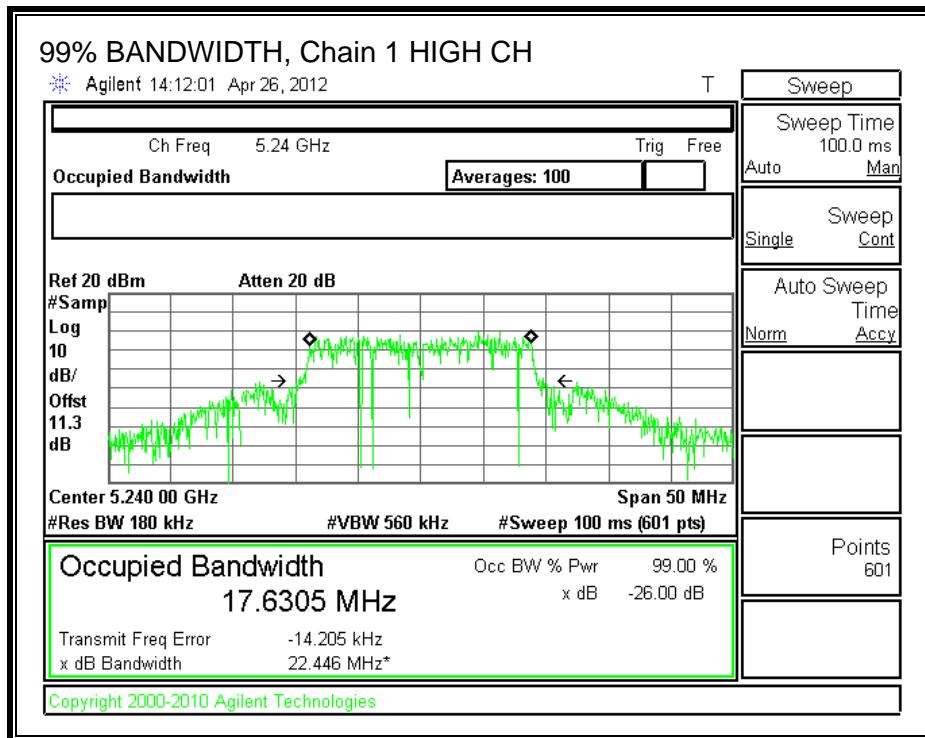
None; for reporting purposes only.

RESULTS

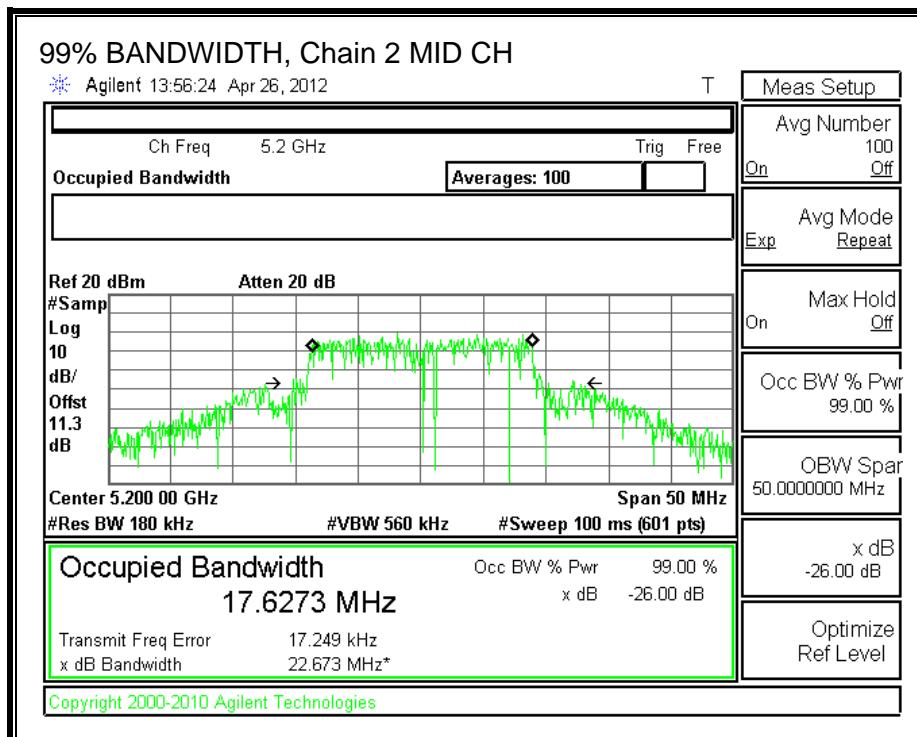
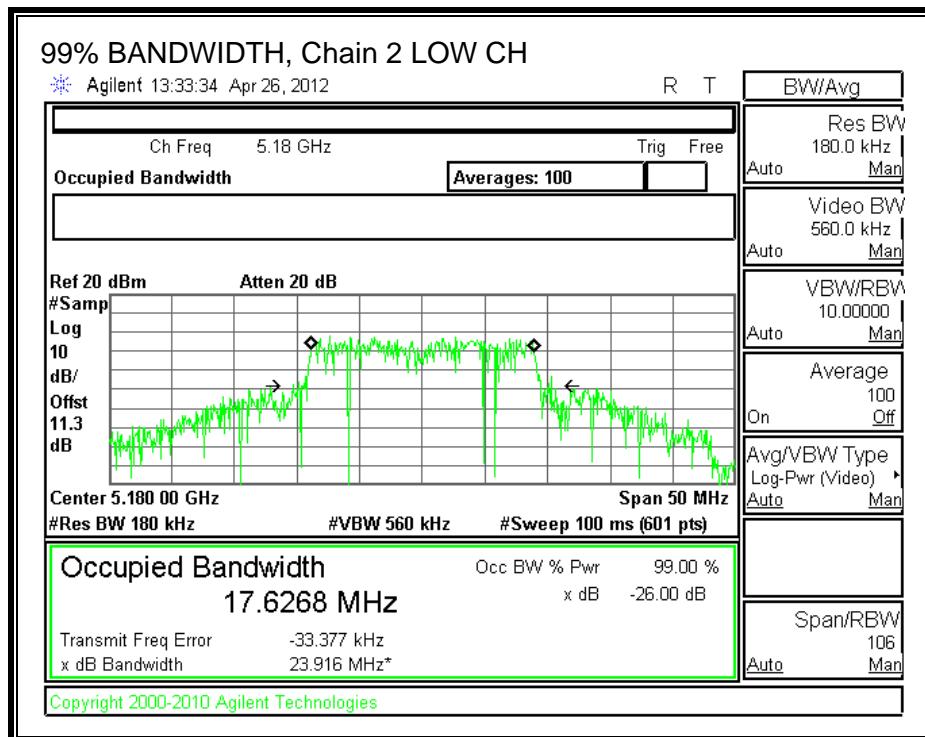
Channel	Frequency (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)
Low	5180	17.3848	17.6268
Mid	5200	17.6261	17.6273
High	5240	17.6305	17.6488

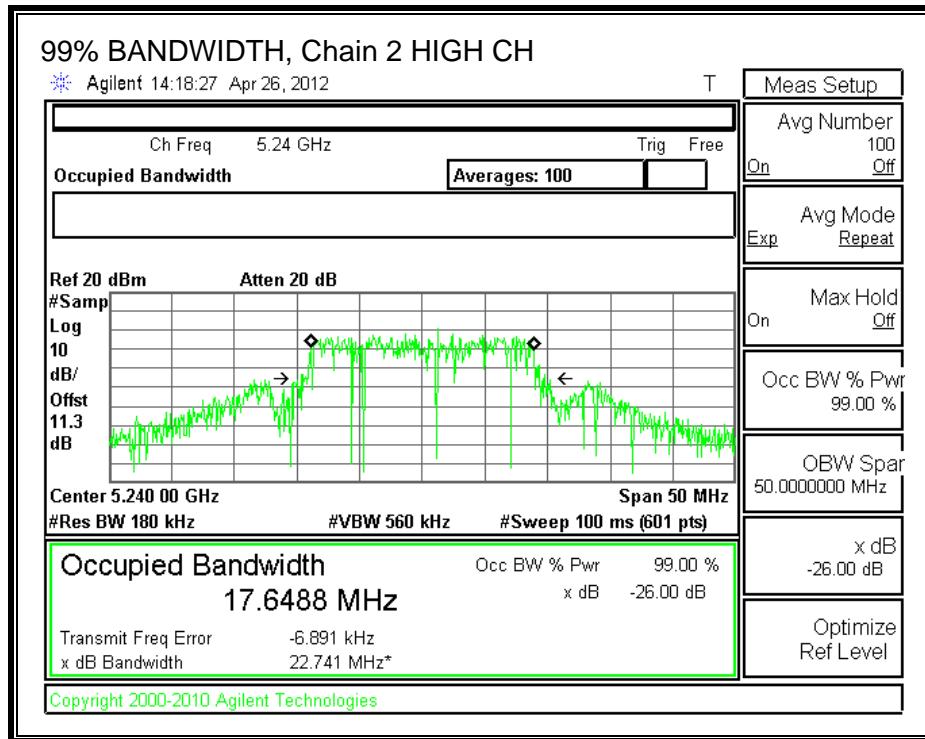
99% BANDWIDTH, Chain 1





99% BANDWIDTH, Chain 2





8.2.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the band 5.15–5.25 GHz, 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. In addition, 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 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

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

Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
4.83	2.84	3.95

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5180	17	26.50	18.23	3.95	17.00	4.00
Mid	5200	17	26.42	18.22	3.95	17.00	4.00
High	5240	17	25.75	18.11	3.95	17.00	4.00

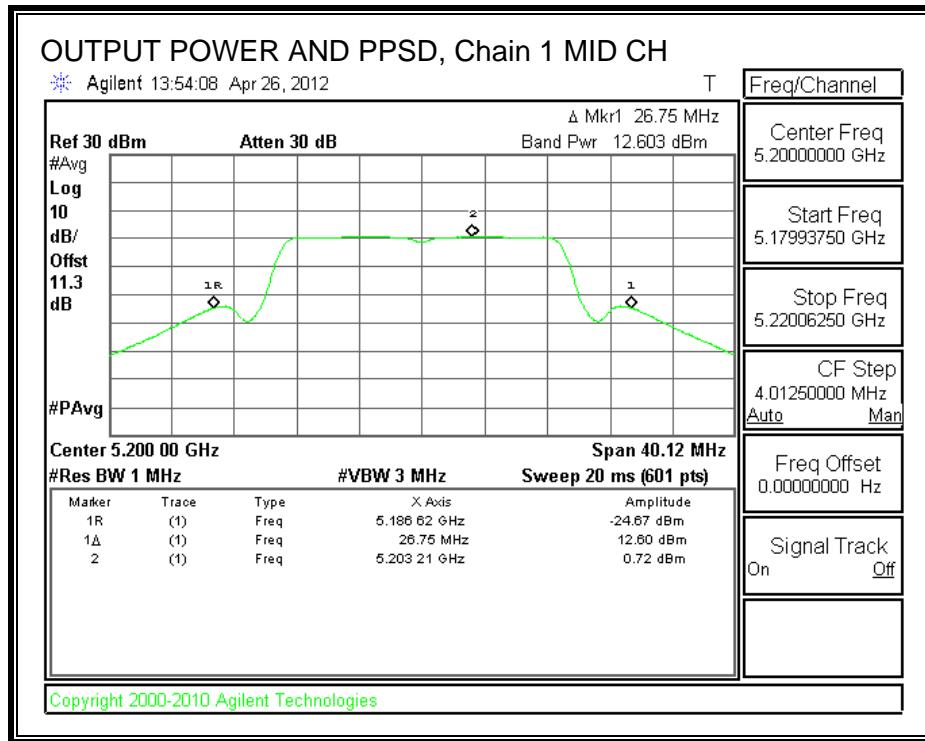
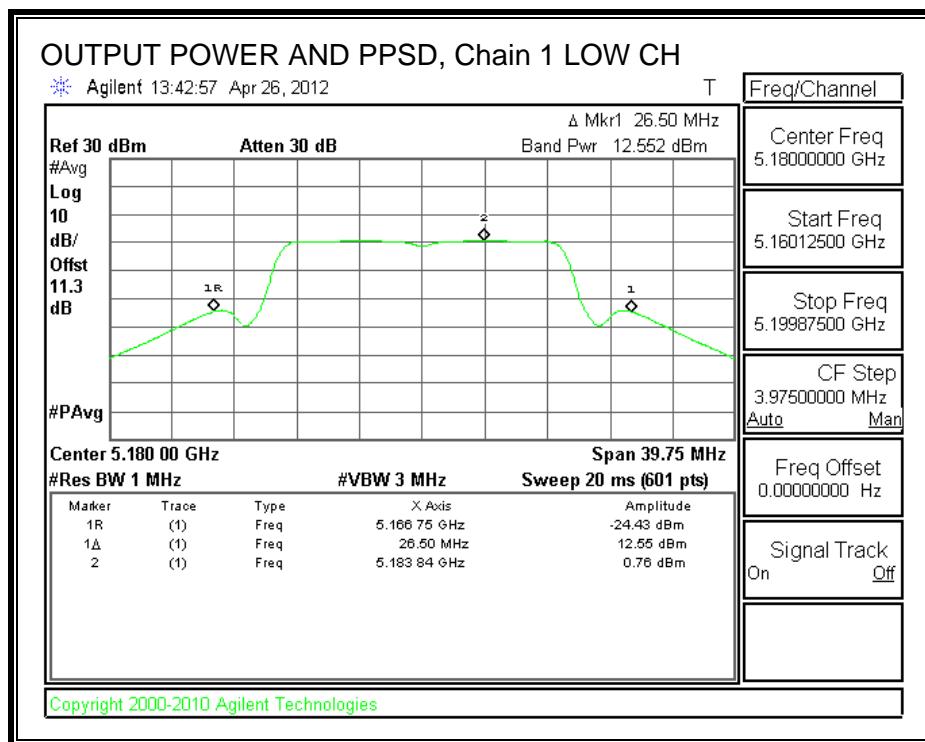
Output Power Results

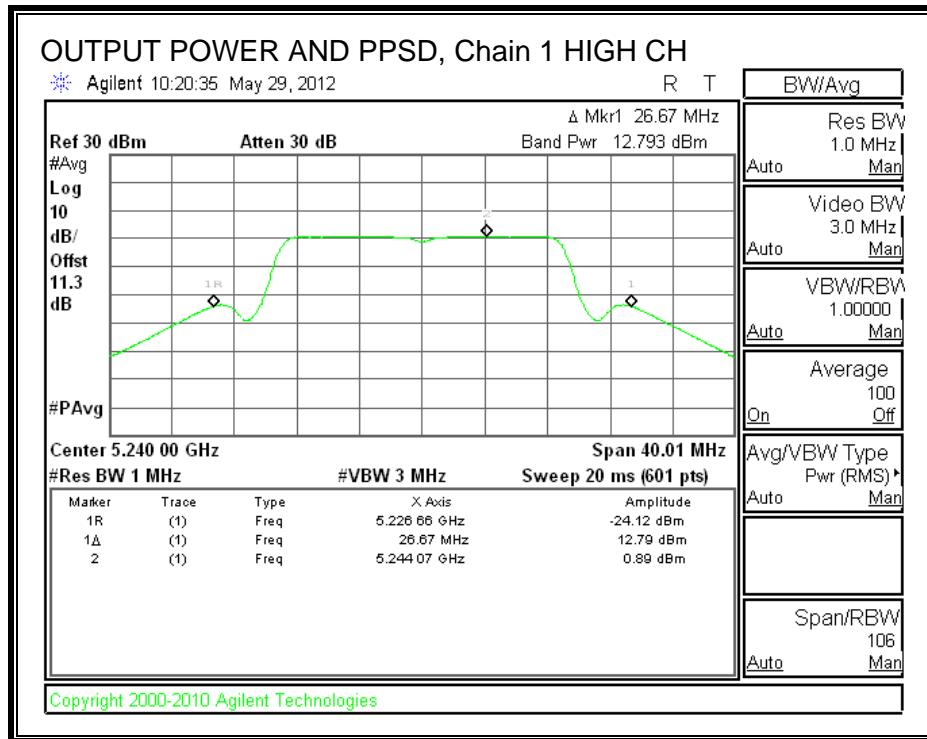
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	12.552	12.560	15.566	17.00	-1.434
Mid	5200	12.603	12.456	15.540	17.00	-1.460
High	5240	12.793	12.590	15.703	17.00	-1.297

PPSD Results

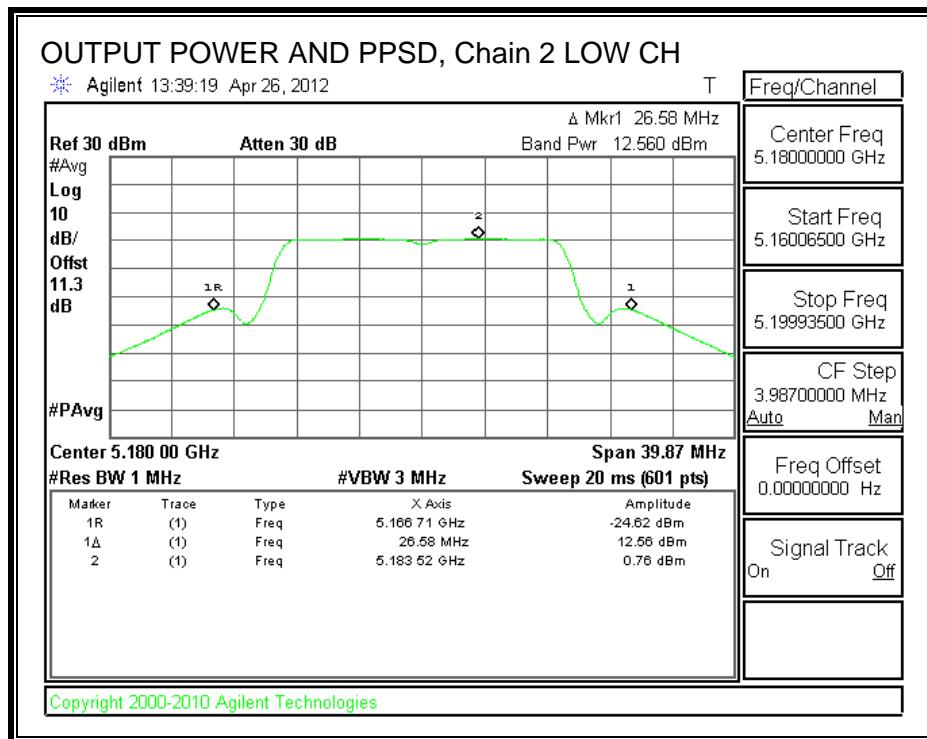
Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	0.76	0.76	3.77	4.00	-0.23
Mid	5200	0.72	0.68	3.71	4.00	-0.29
High	5240	0.89	0.82	3.87	4.00	-0.13

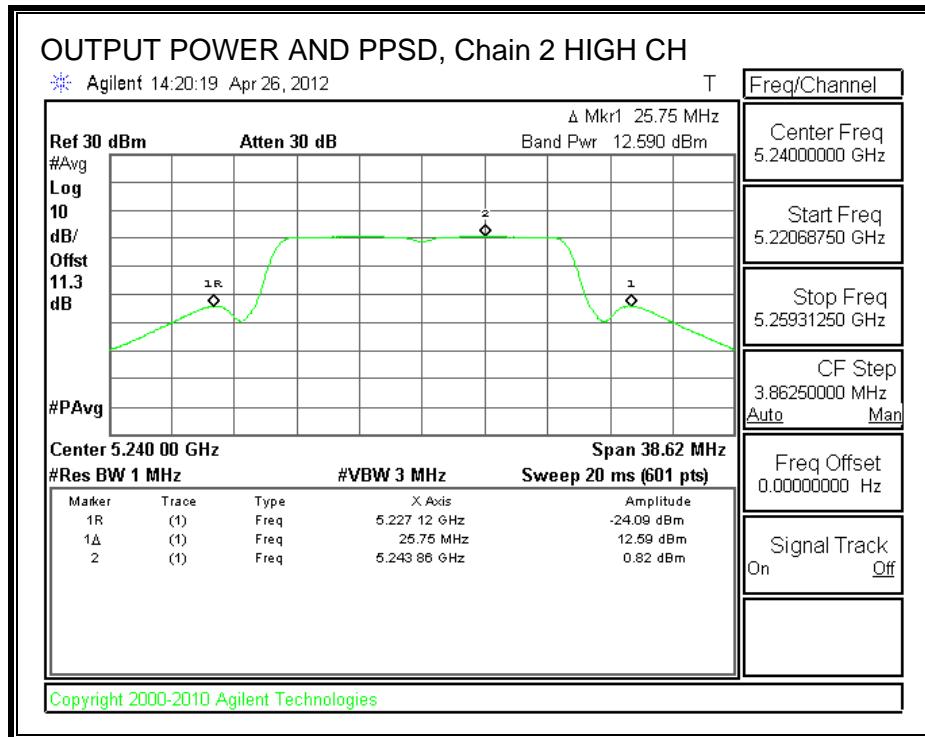
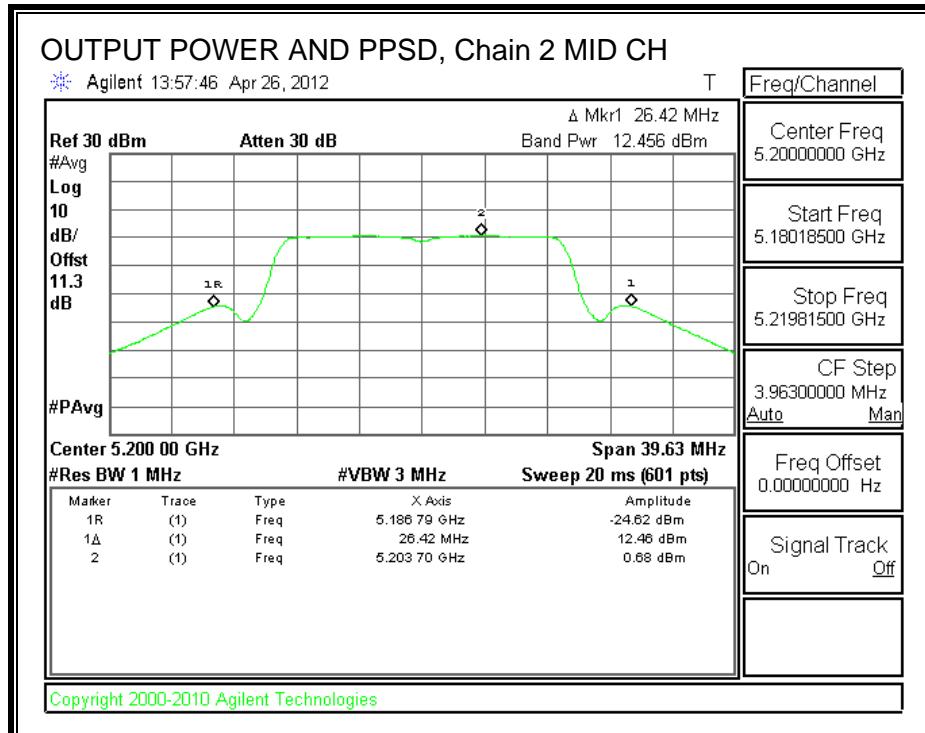
OUTPUT POWER AND PPSD, Chain 1





OUTPUT POWER AND PPSD, Chain 2





8.2.4. PEAK EXCURSION

LIMITS

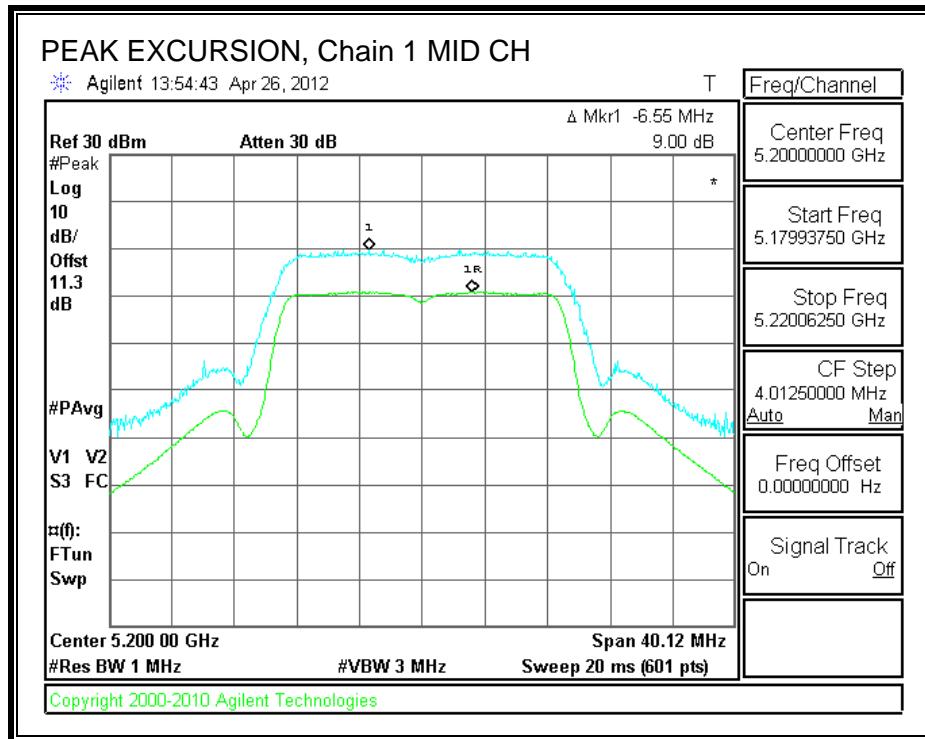
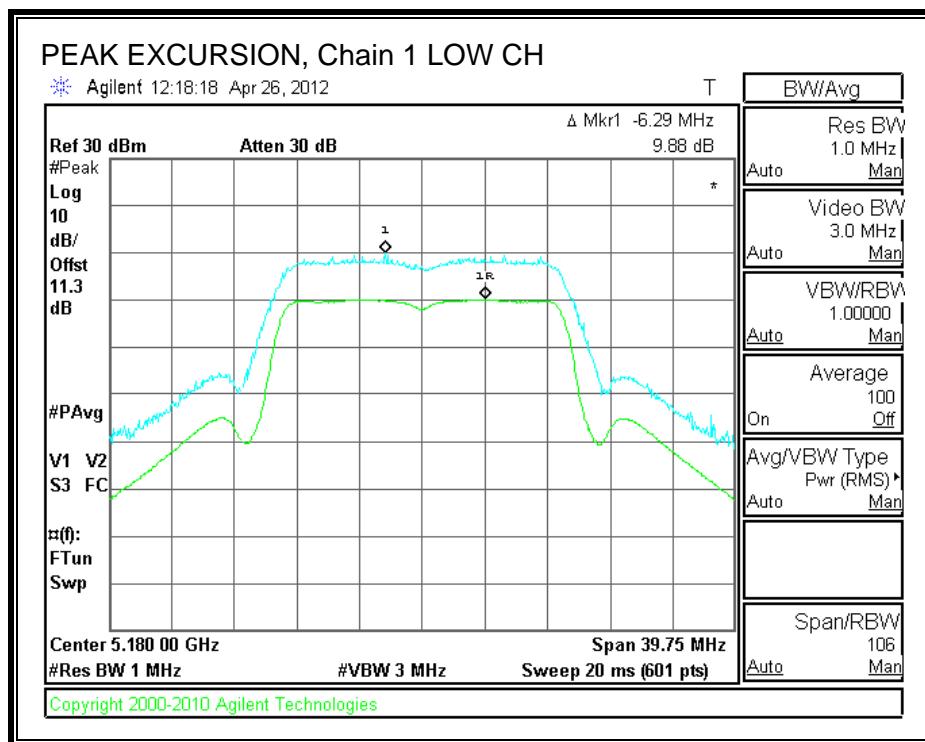
FCC §15.407 (a) (6)

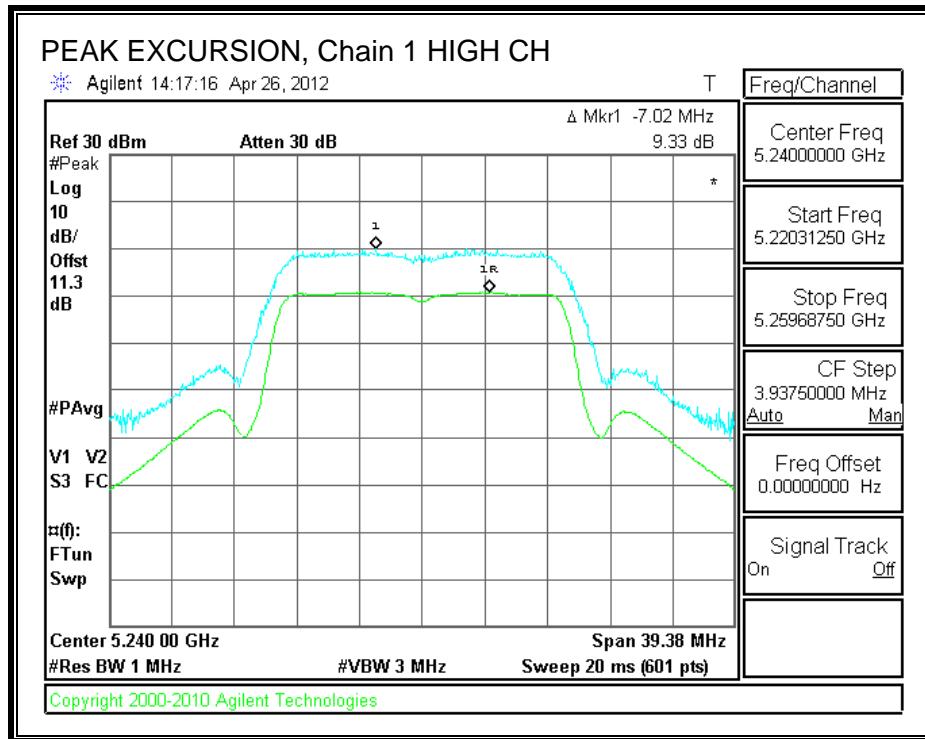
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

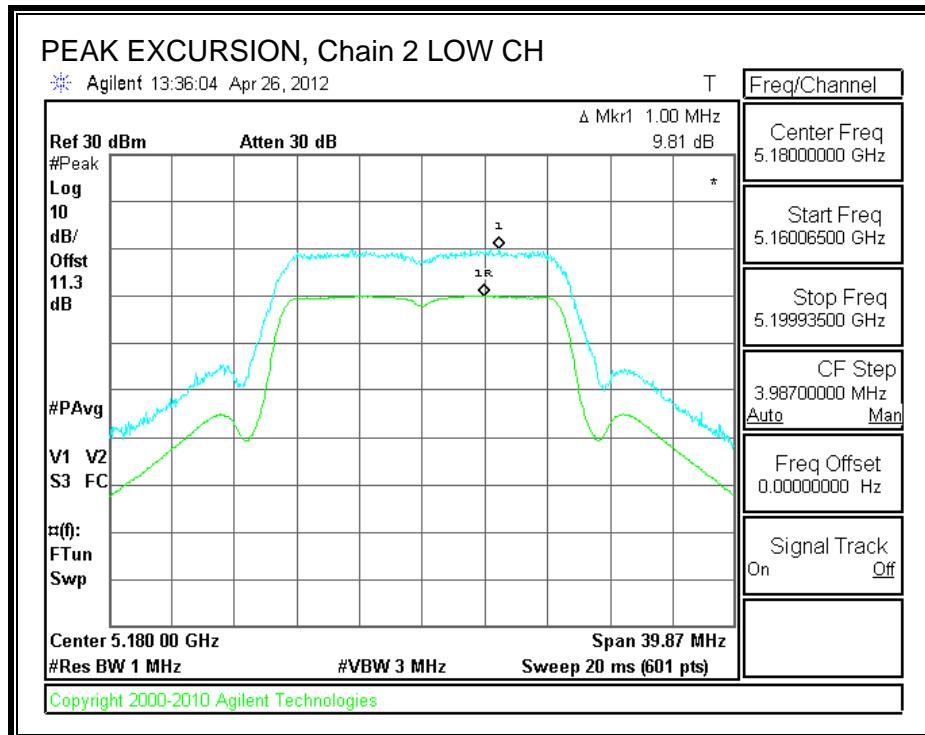
Channel	Frequency (MHz)	Pk Exc Chain 1 (dB)	Pk Exc Chain 2 (dB)	Limit (dB)	Worst-Case Margin (dB)
Low	5180	9.88	9.81	13	-3.1
Mid	5200	9.00	10.49	13	-2.5
High	5240	9.33	10.52	13	-2.5

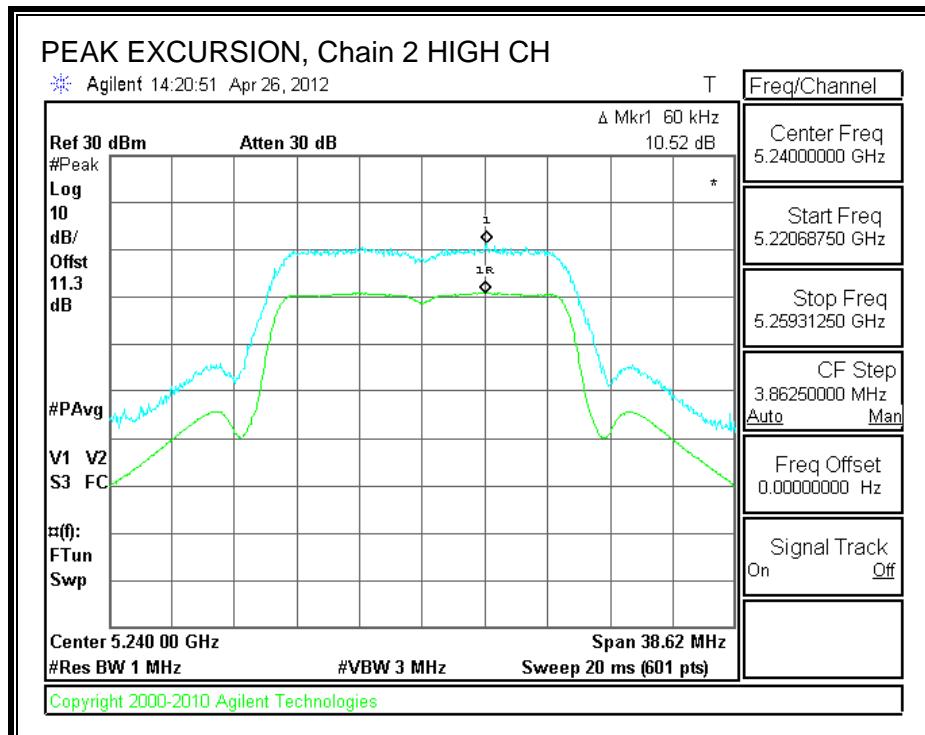
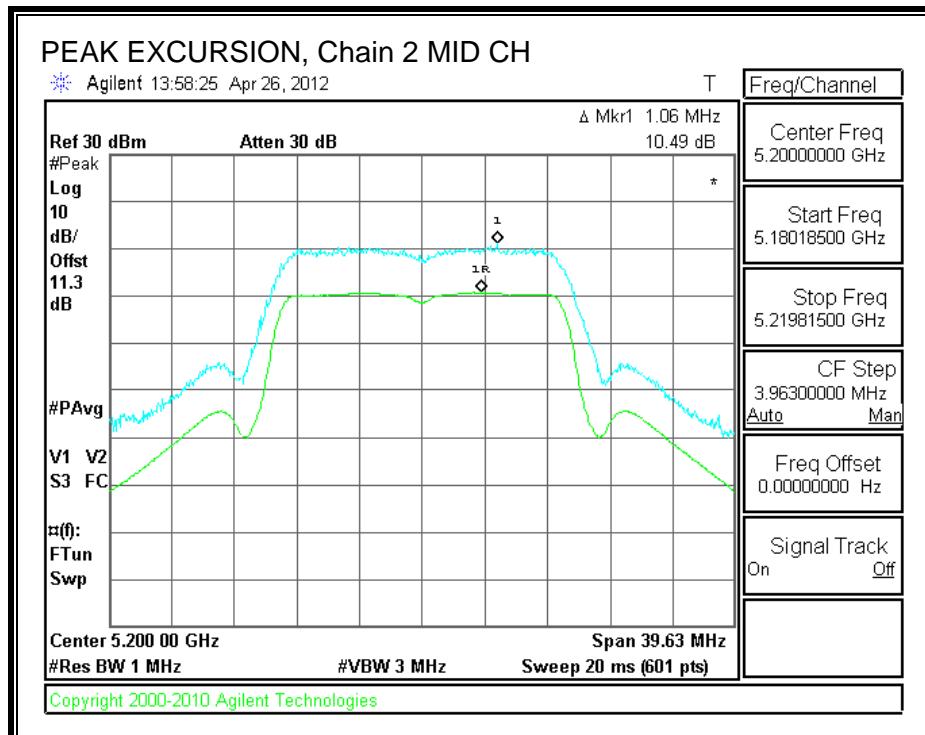
PEAK EXCURSION, Chain 1





PEAK EXCURSION, Chain 2





8.3. 802.11n HT20, STBC MCS0, 3TX, 5.2 GHz BAND

8.3.1. 26 dB BANDWIDTH

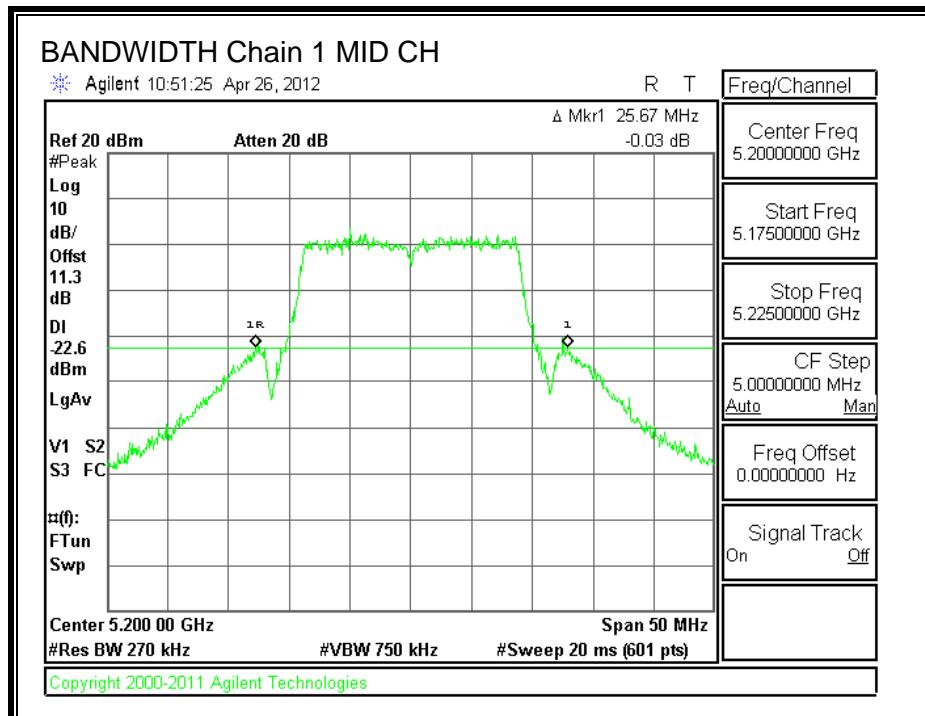
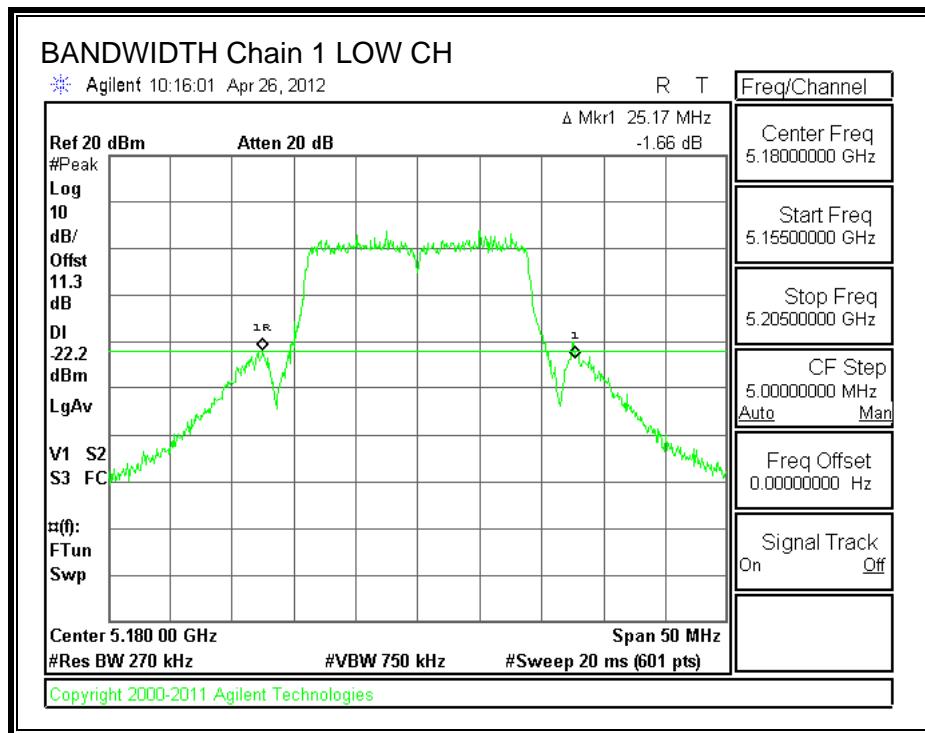
LIMITS

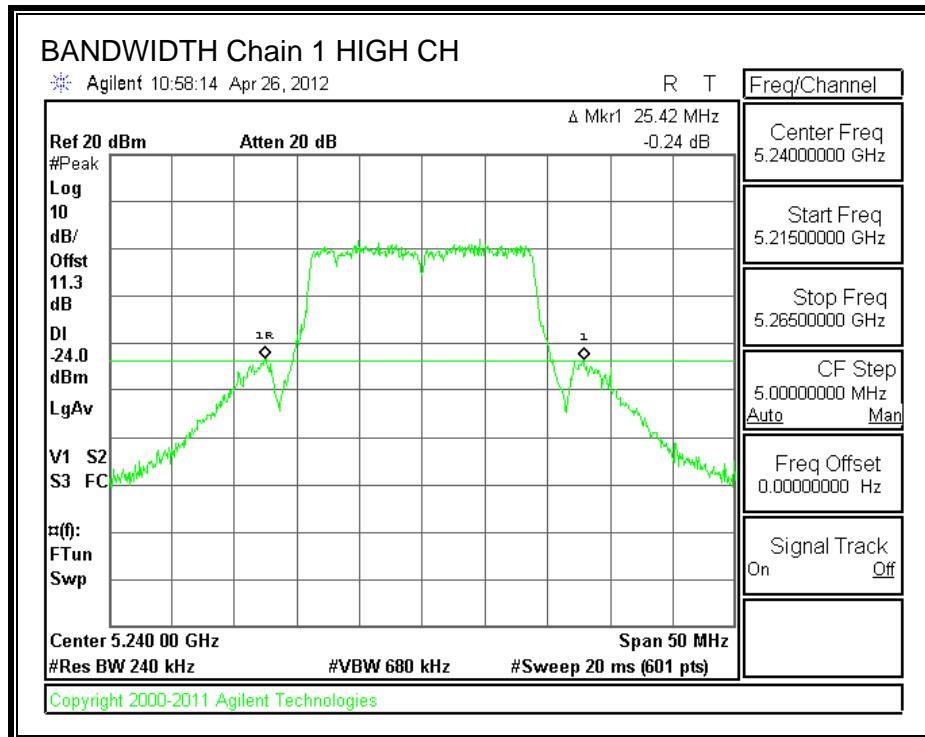
None; for reporting purposes only.

RESULTS

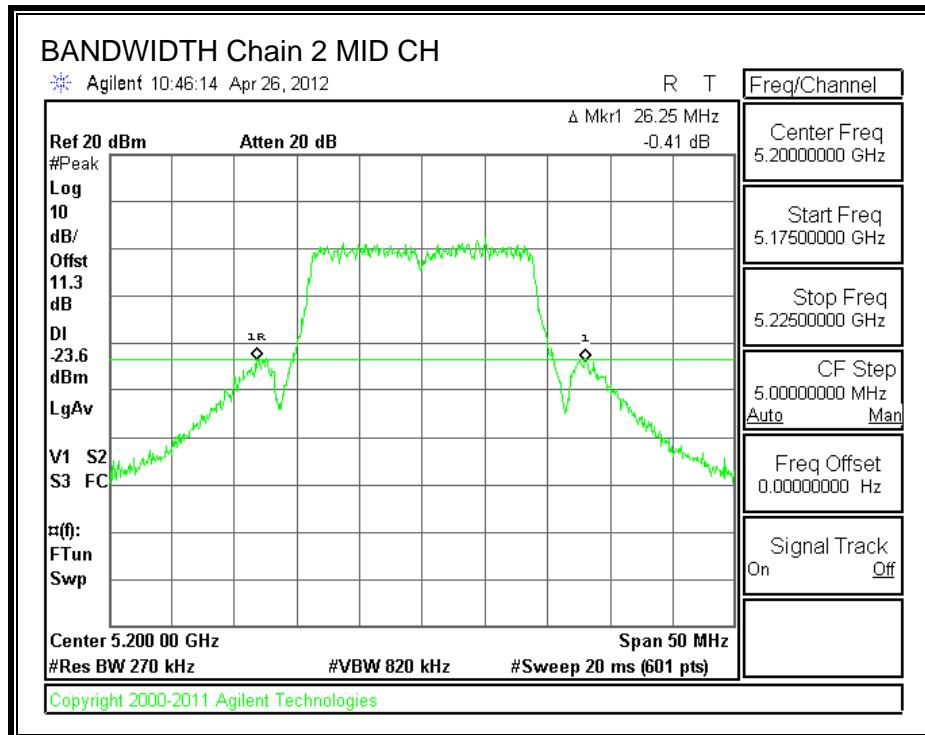
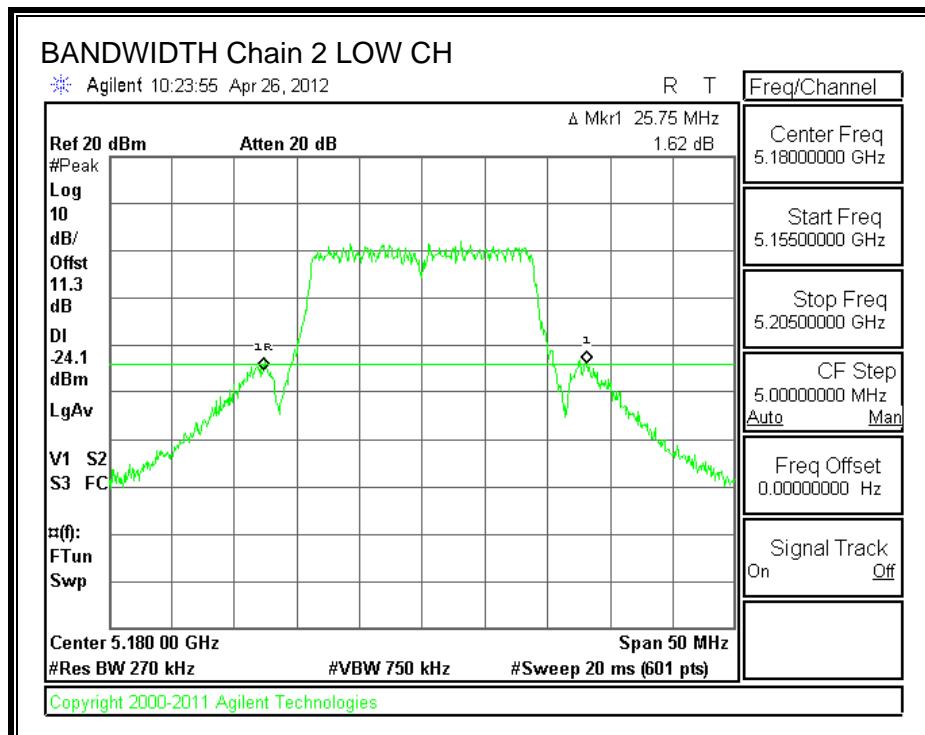
Channel	Frequency (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)	26 dB BW Chain 3 (MHz)
Low	5180	25.17	25.75	26.33
Mid	5200	25.67	26.25	20.08
High	5240	25.42	26.58	20.83

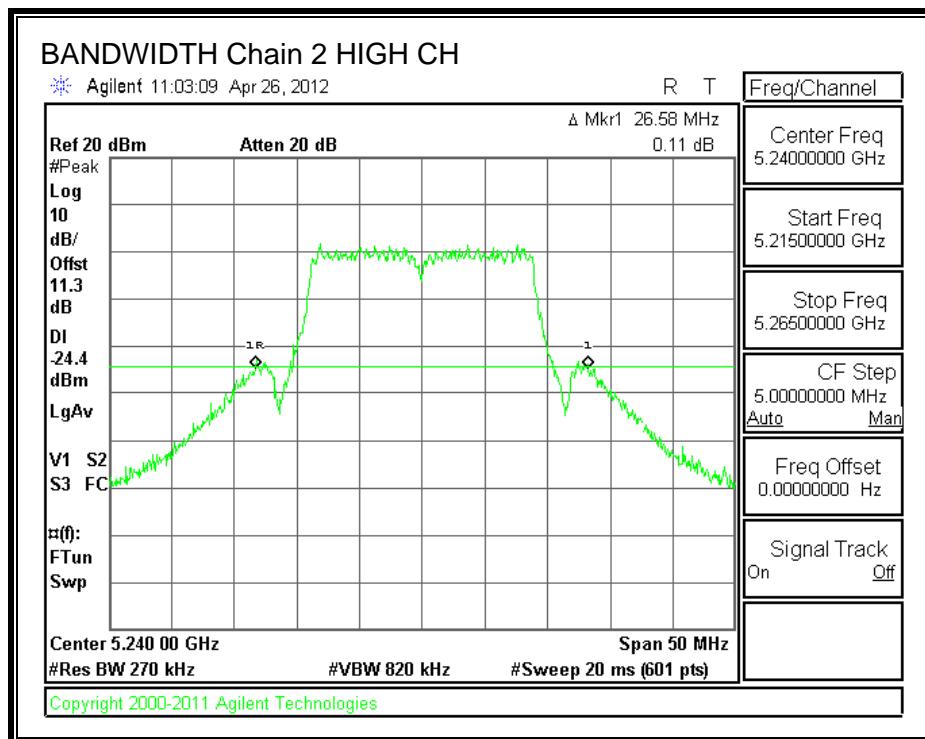
26 dB BANDWIDTH, Chain 1



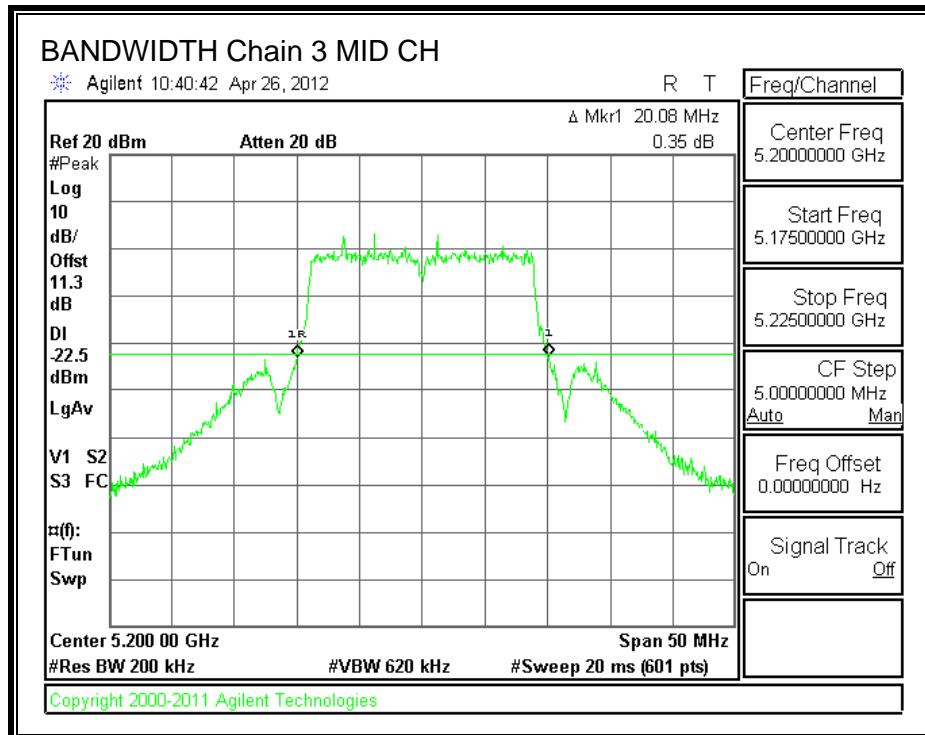
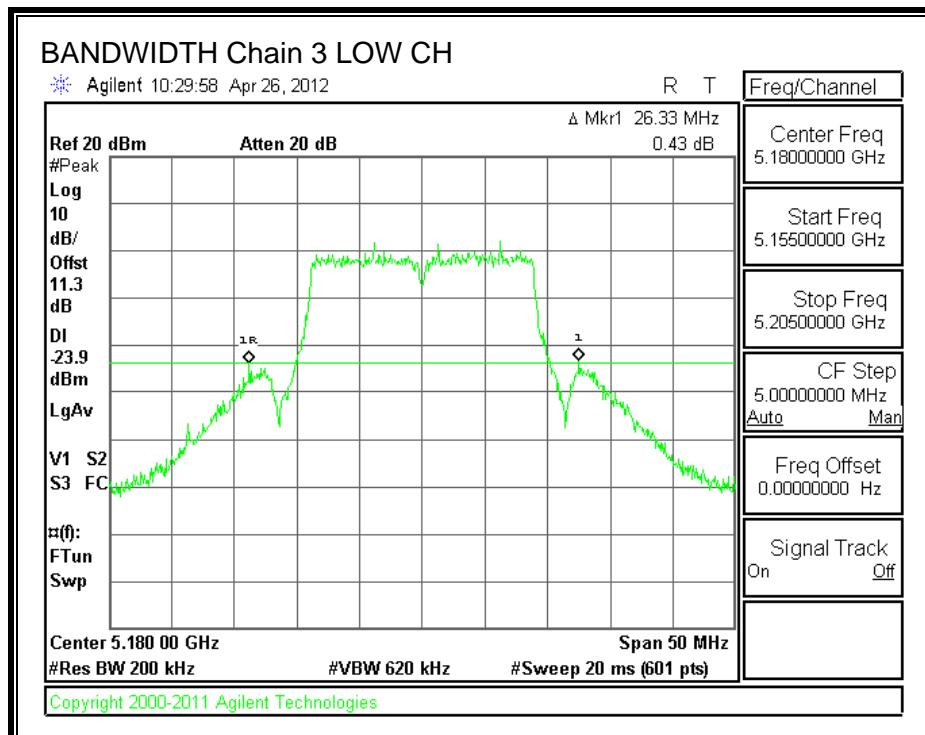


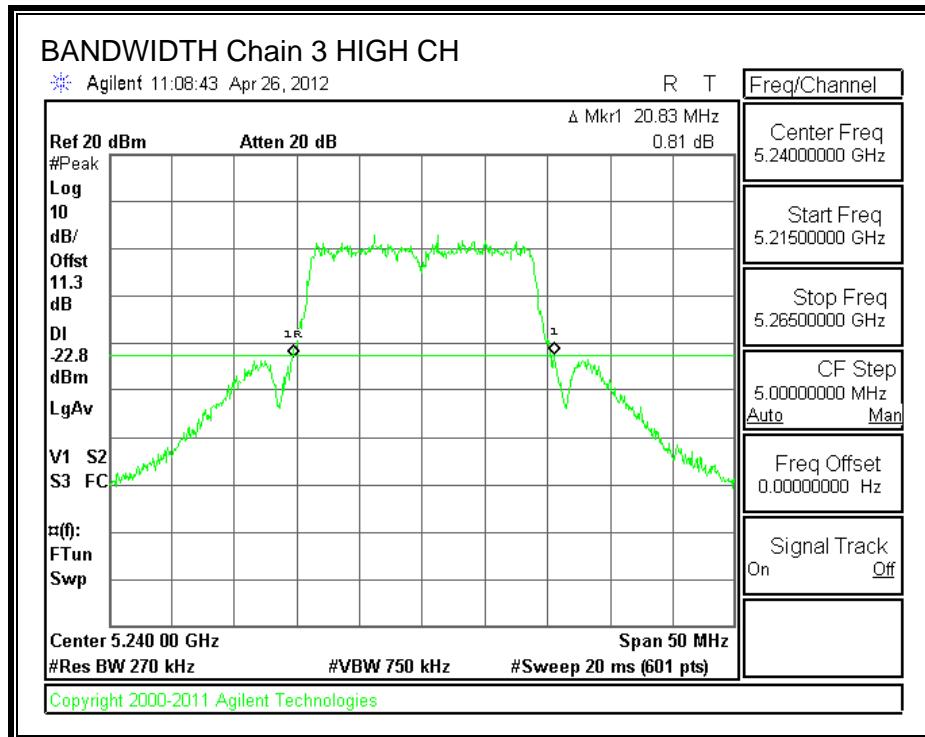
26 dB BANDWIDTH, Chain 2





26 dB BANDWIDTH, Chain 3





8.3.2. 99% BANDWIDTH

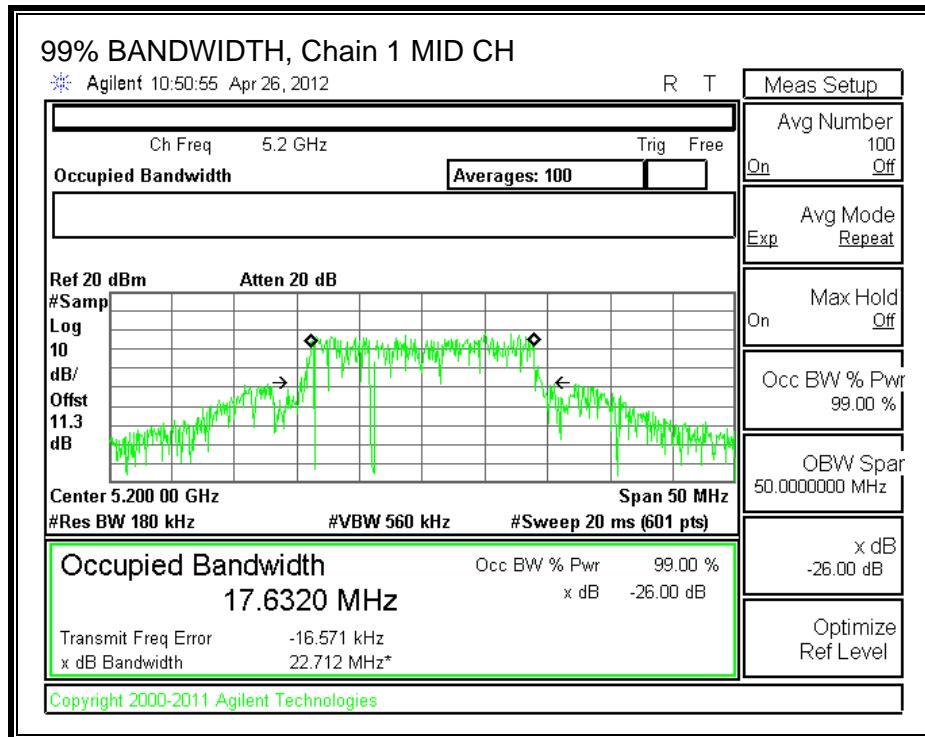
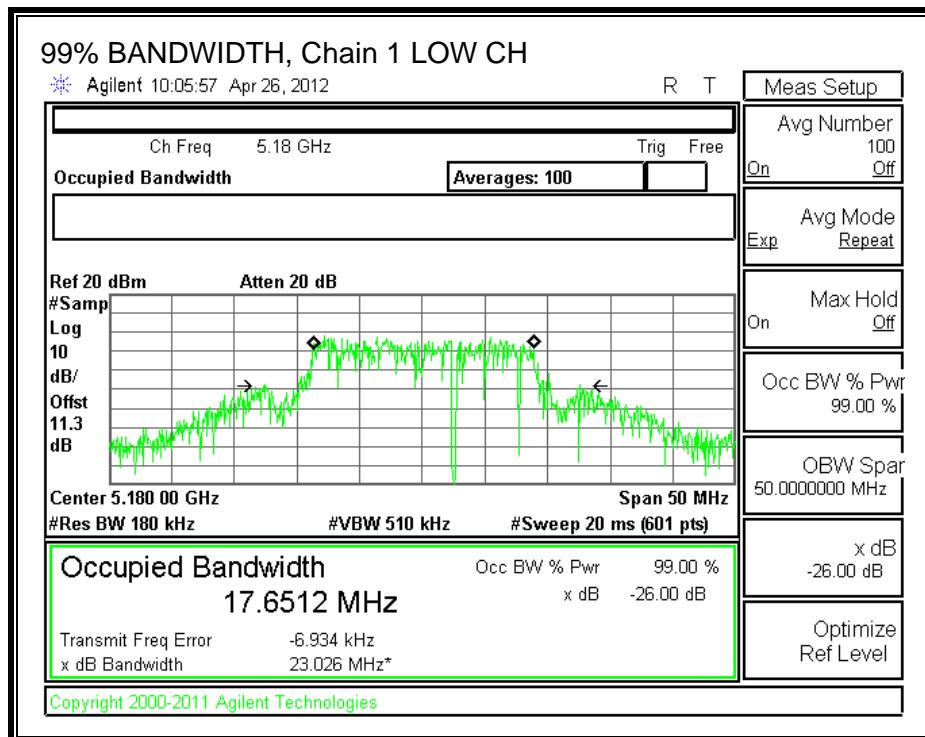
LIMITS

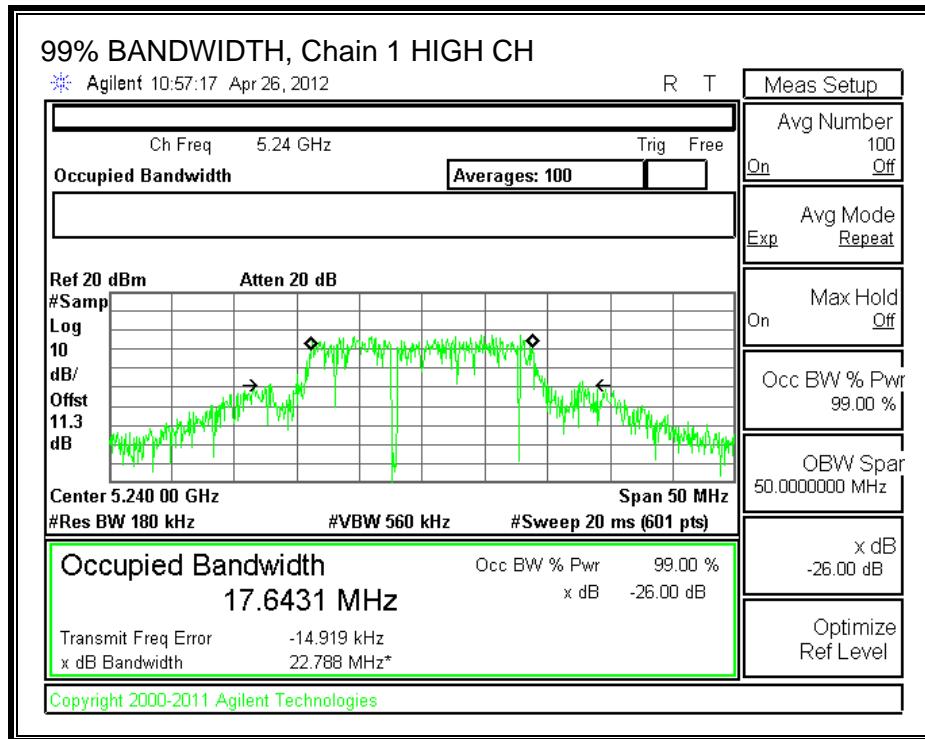
None; for reporting purposes only.

RESULTS

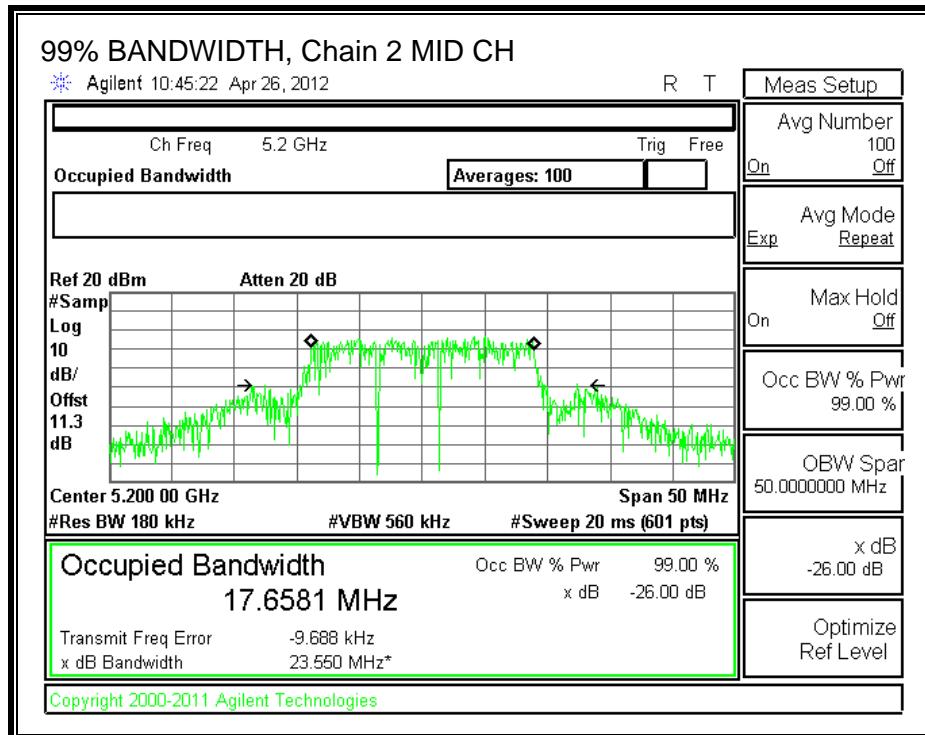
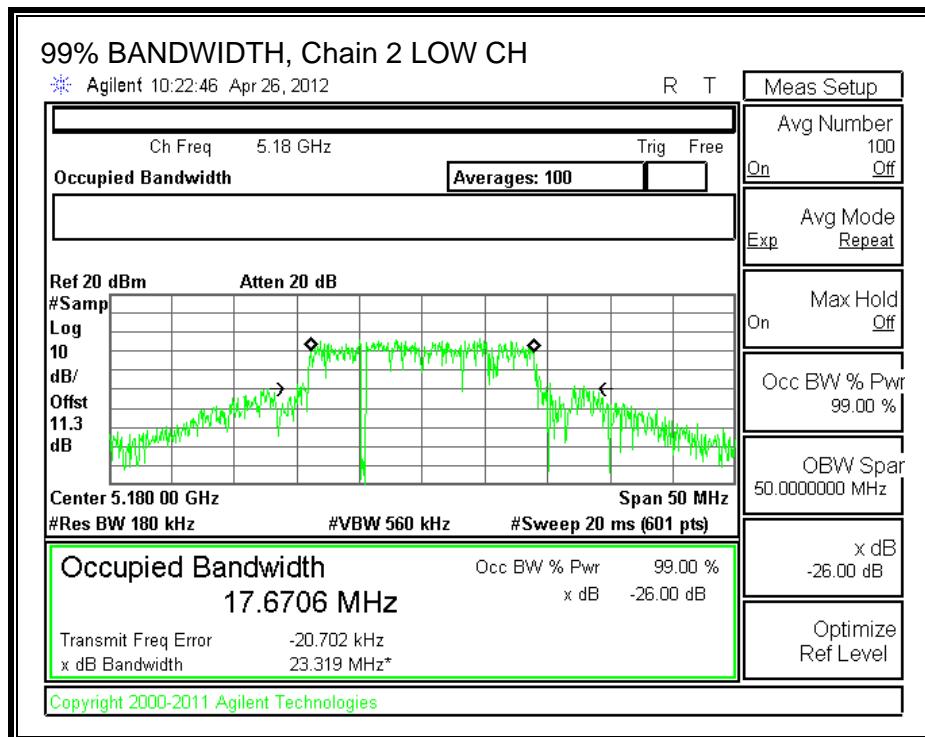
Channel	Frequency (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)	99% BW Chain 3 (MHz)
Low	5180	17.6512	17.6706	17.6119
Mid	5200	17.6320	17.6581	17.6257
High	5240	17.6431	17.6544	17.6202

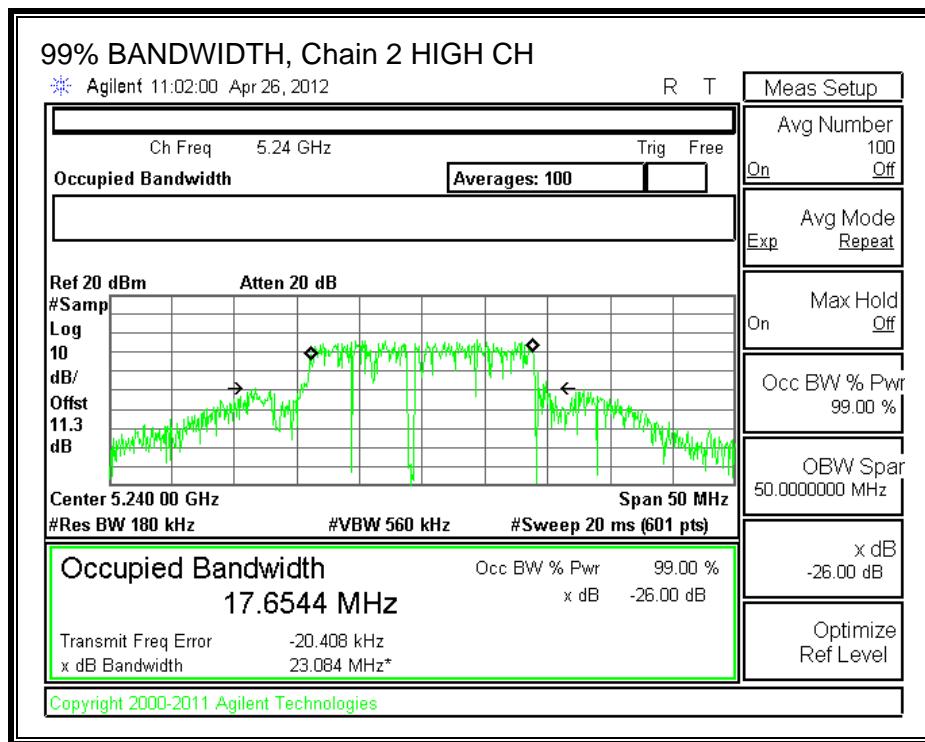
99% BANDWIDTH, Chain 1



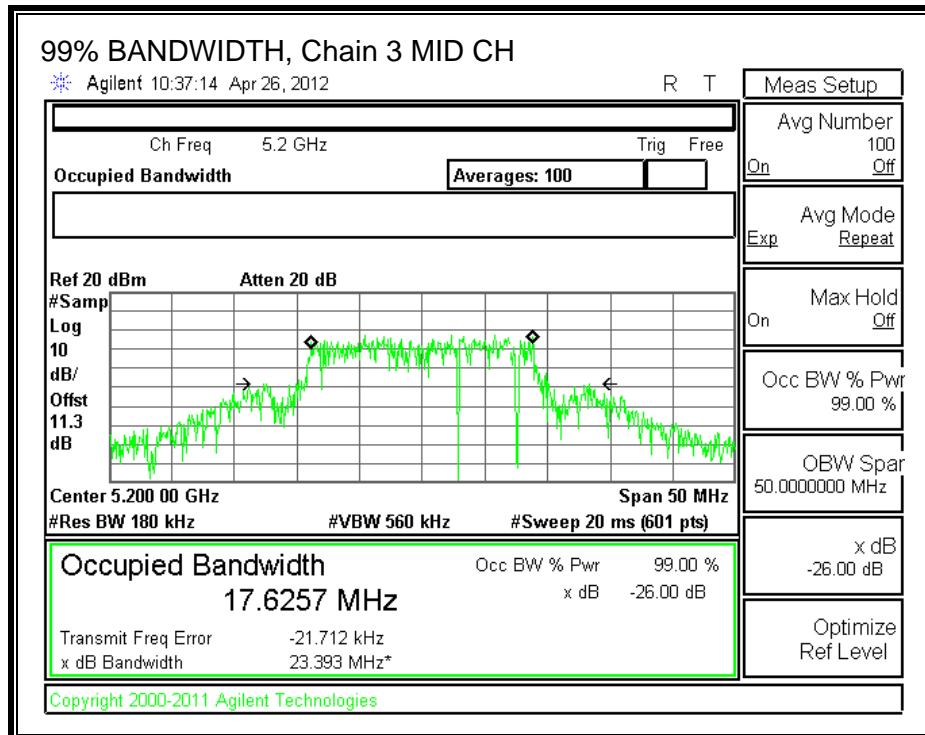
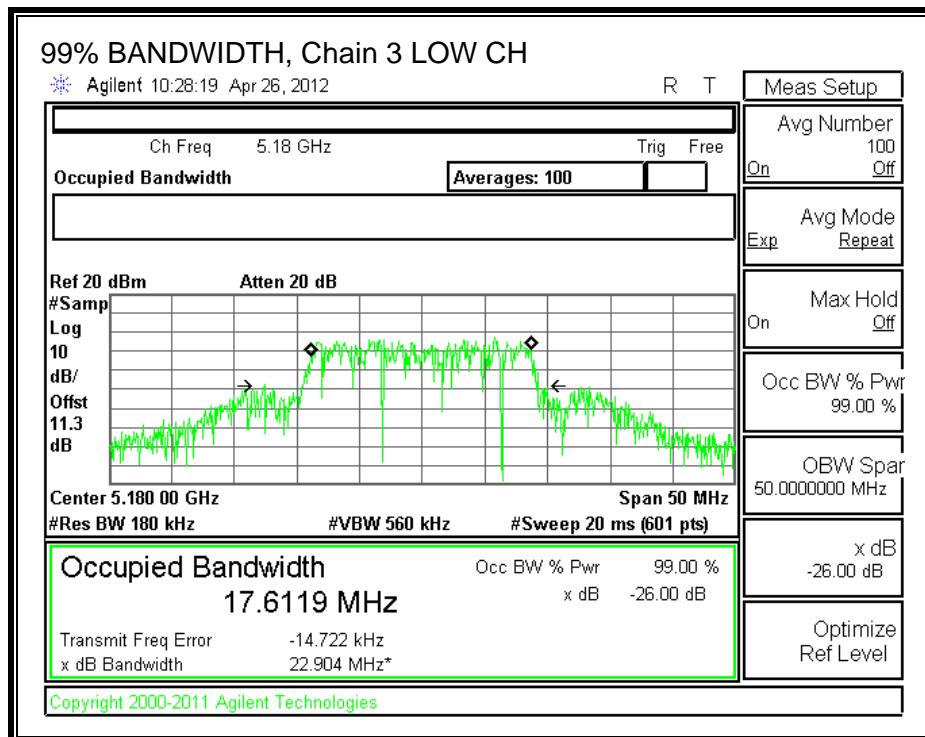


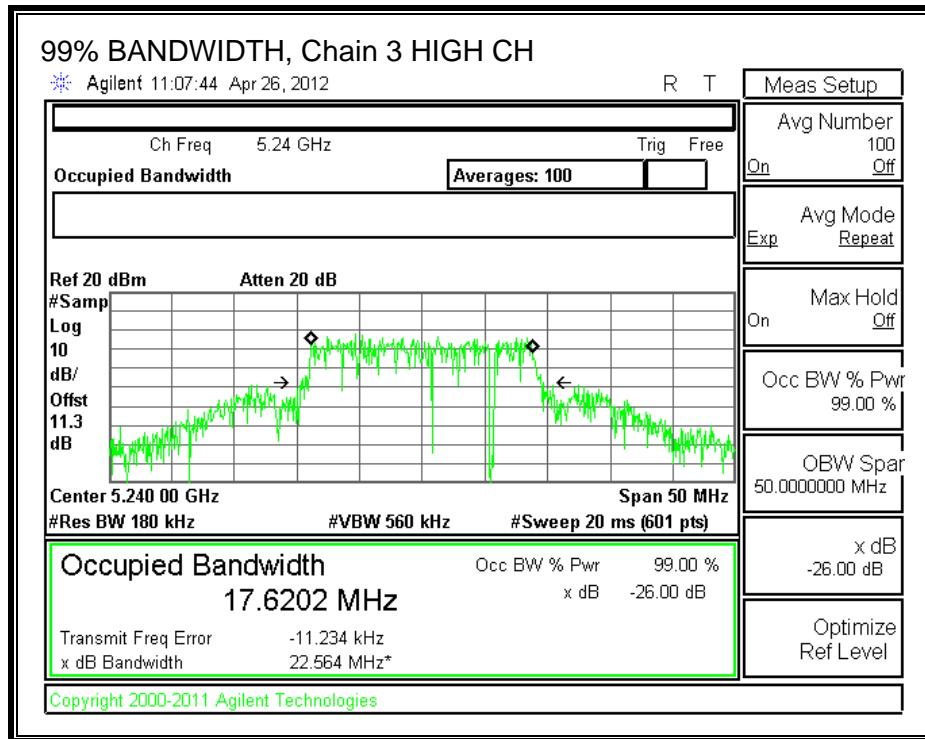
99% BANDWIDTH, Chain 2





99% BANDWIDTH, Chain 3





8.3.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the band 5.15–5.25 GHz, 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. In addition, 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 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

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

Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Chain 3 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
4.83	2.84	1.18	3.21

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5180	17	25.17	18.01	3.21	17.00	4.00
Mid	5200	17	20.08	17.03	3.21	17.00	4.00
High	5240	17	20.83	17.19	3.21	17.00	4.00

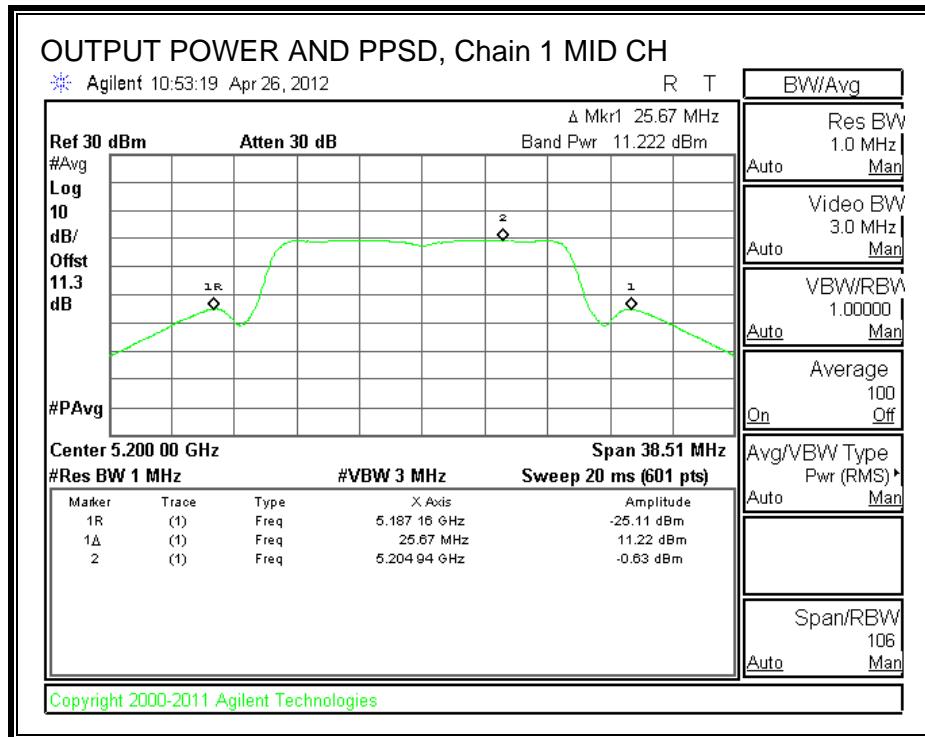
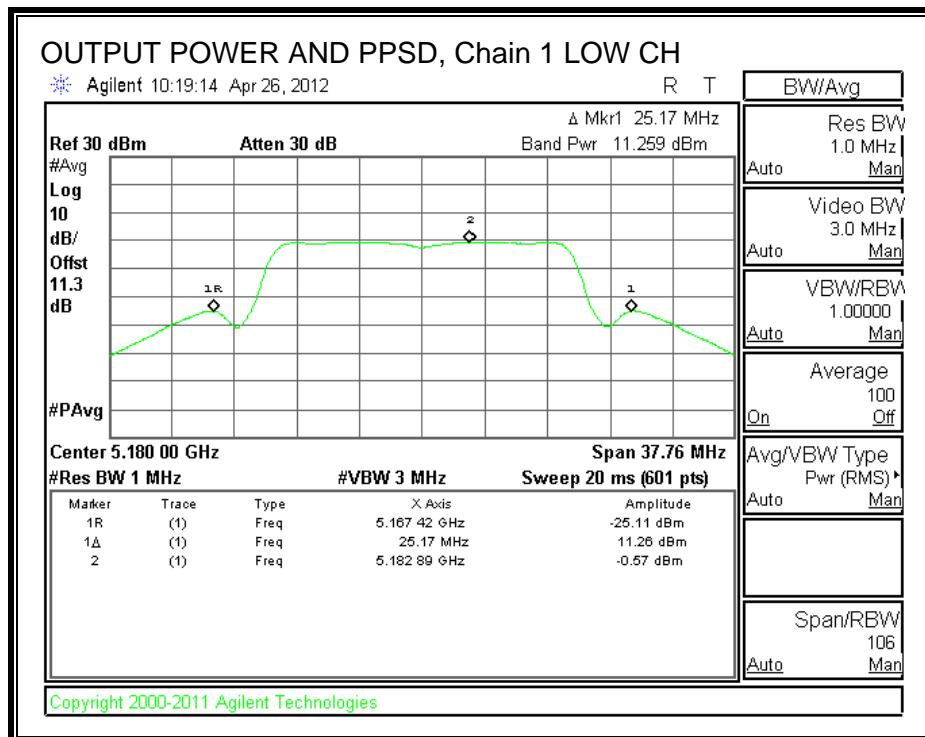
Output Power Results

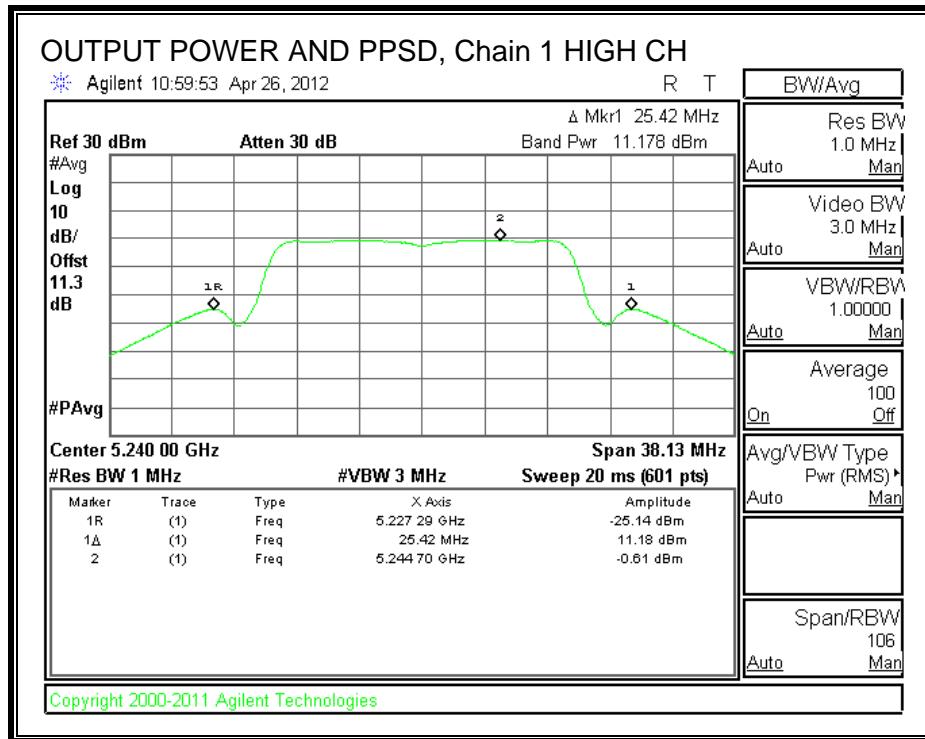
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Chain 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	11.259	10.370	10.697	15.562	17.00	-1.438
Mid	5200	11.222	10.557	10.891	15.670	17.00	-1.330
High	5240	11.178	10.607	10.877	15.665	17.00	-1.335

PPSD Results

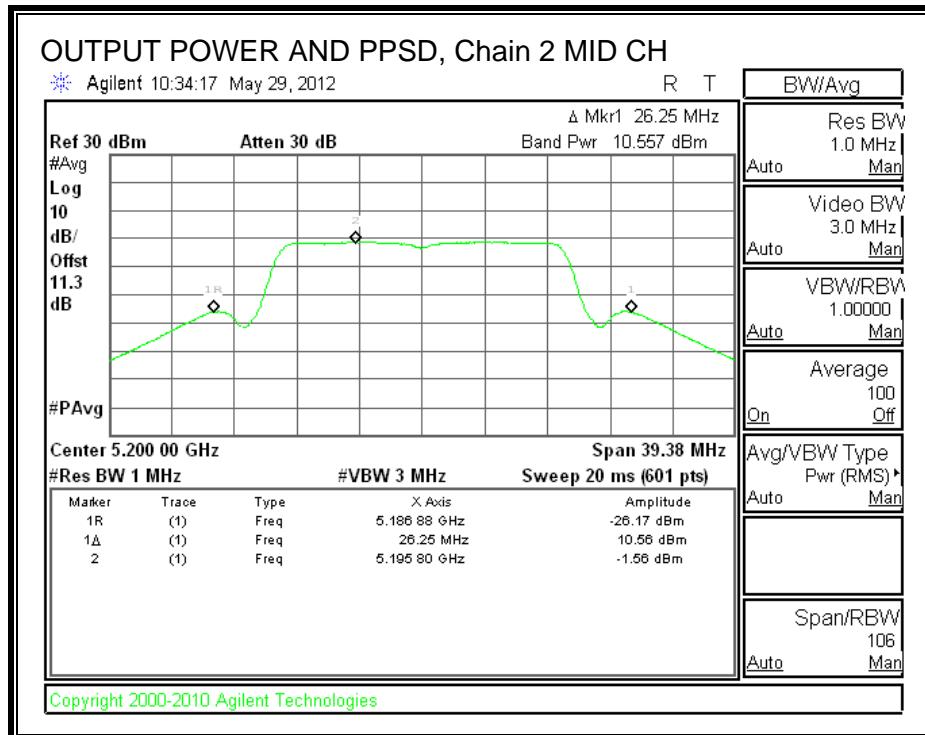
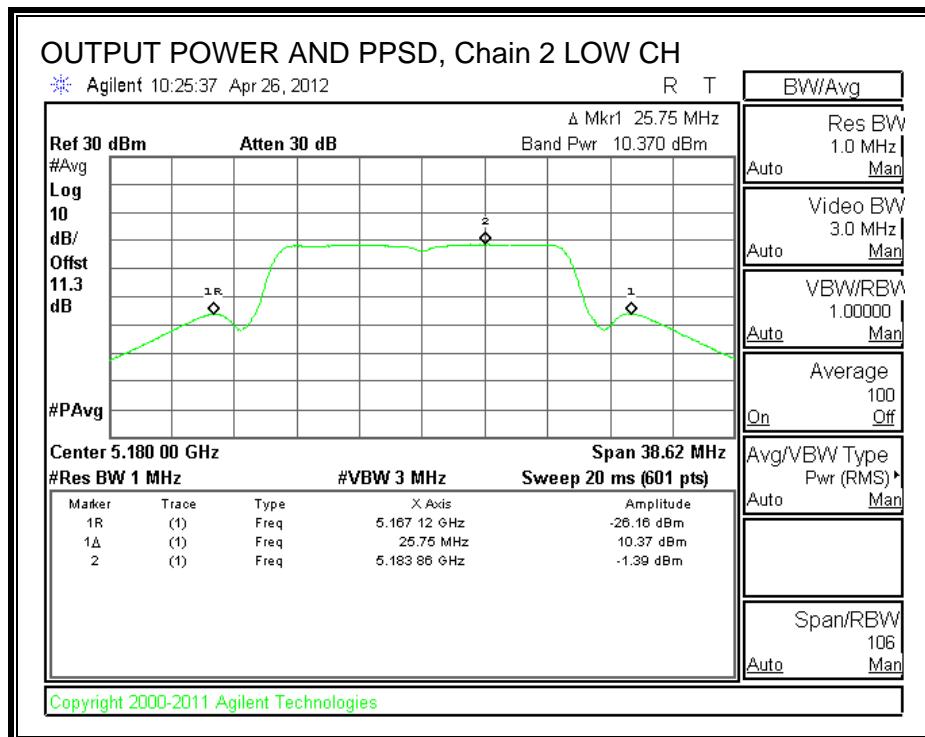
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	-0.57	-1.39	-1.04	3.78	4.00	-0.22
Mid	5200	-0.63	-1.56	-0.83	3.78	4.00	-0.22
High	5240	-0.61	-1.19	-0.82	3.90	4.00	-0.10

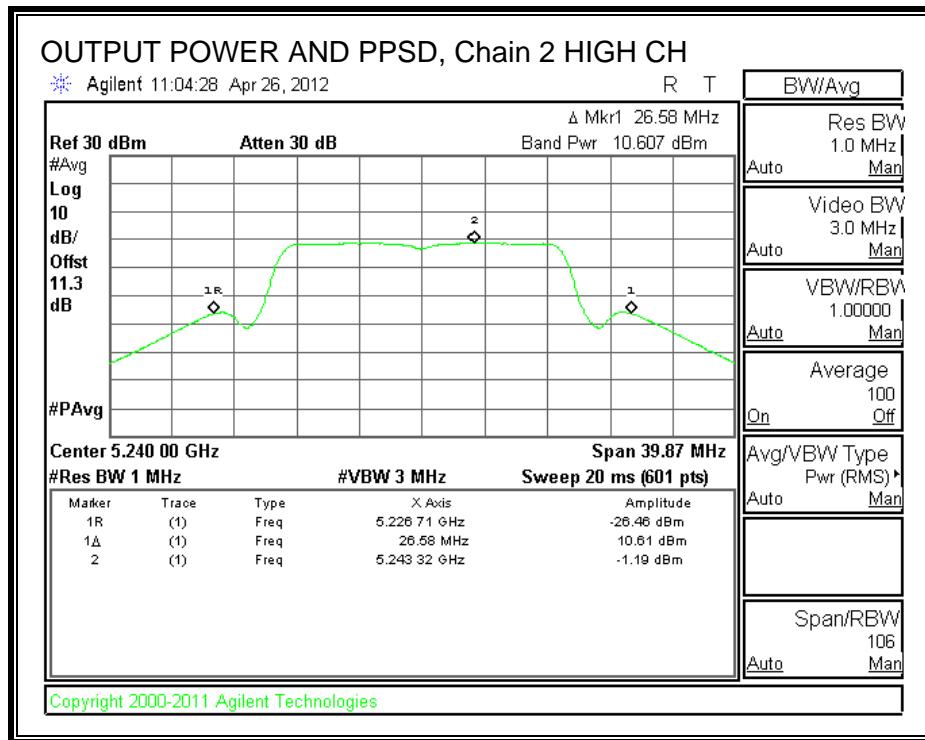
OUTPUT POWER AND PPSD, Chain 1



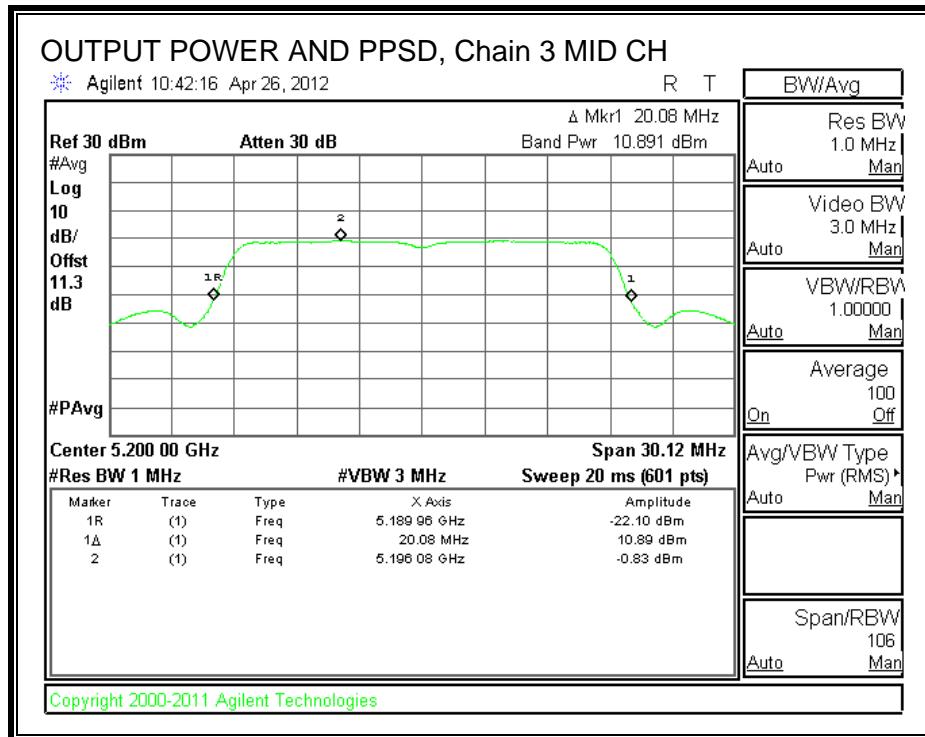
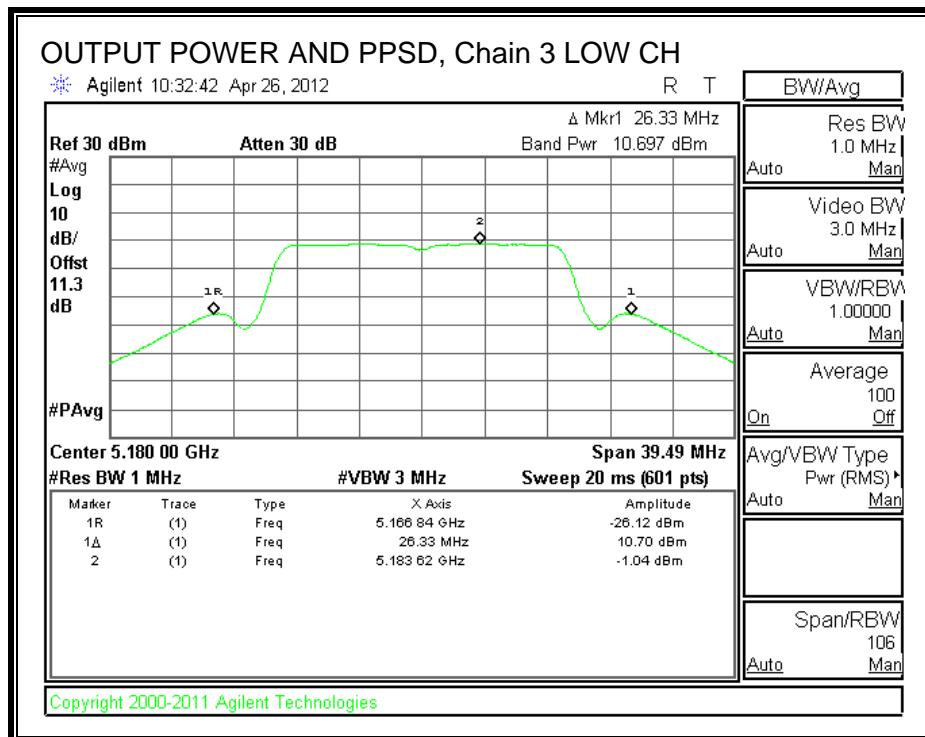


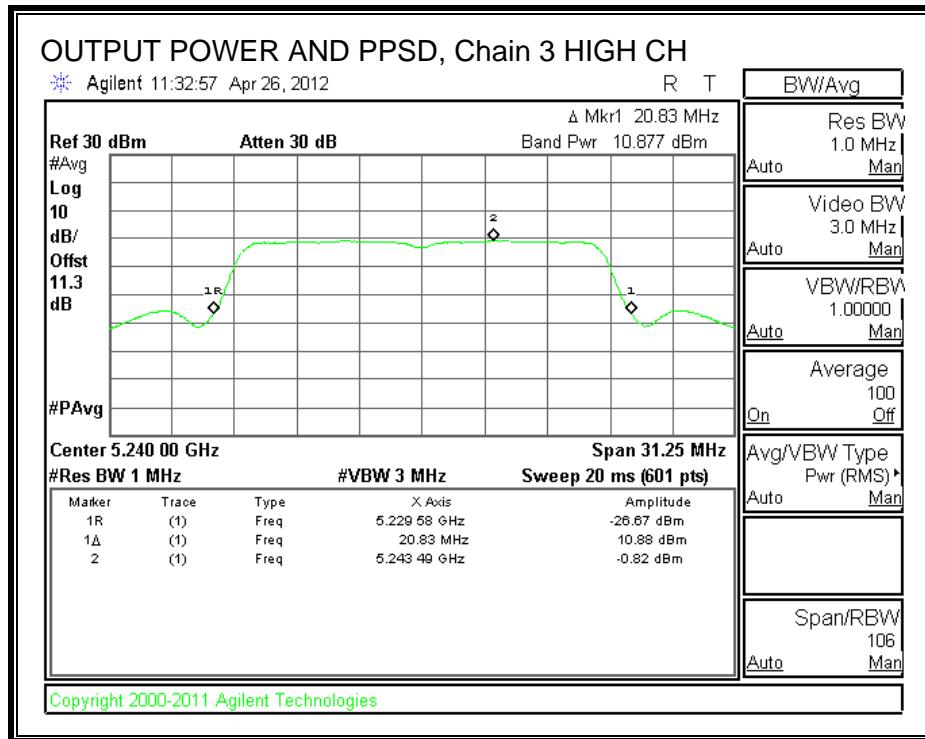
OUTPUT POWER AND PPSD, Chain 2





OUTPUT POWER AND PPSD, Chain 3





8.3.4. PEAK EXCURSION

LIMITS

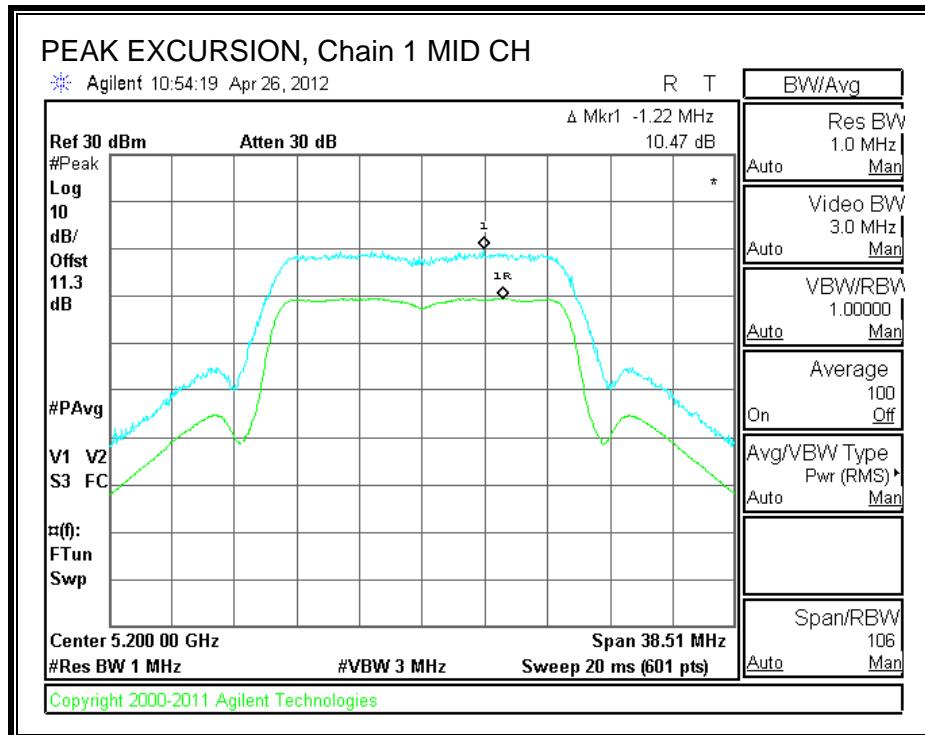
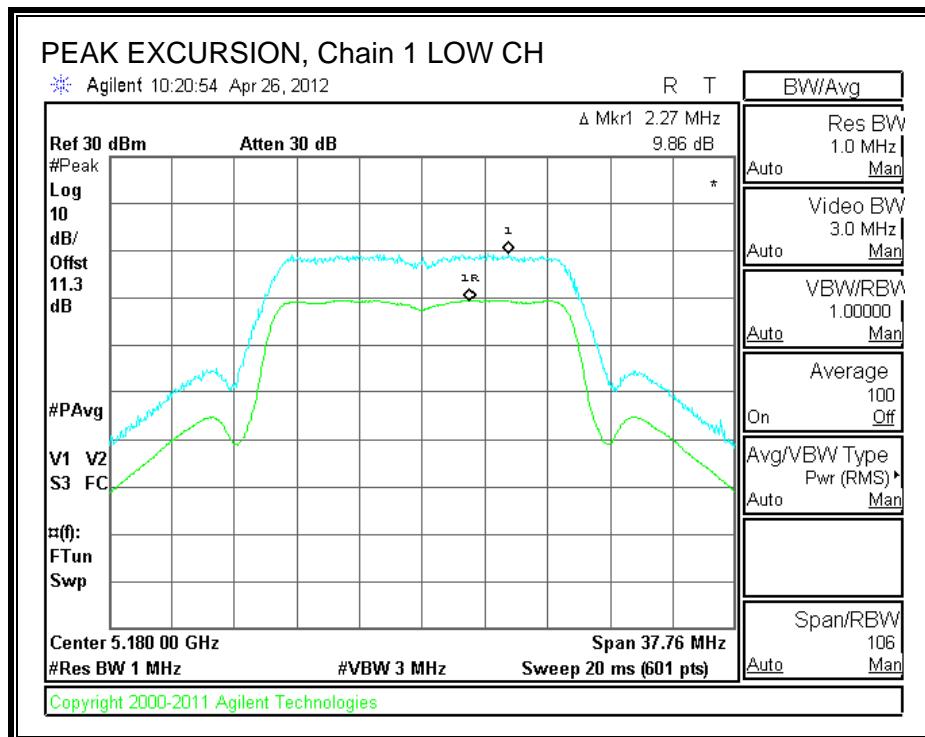
FCC §15.407 (a) (6)

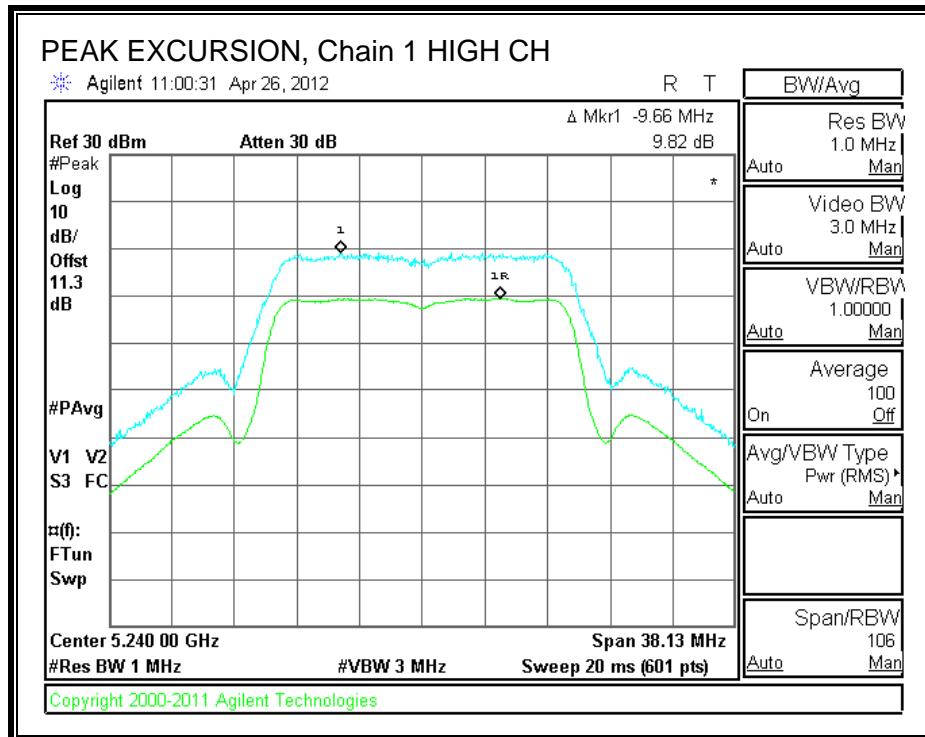
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

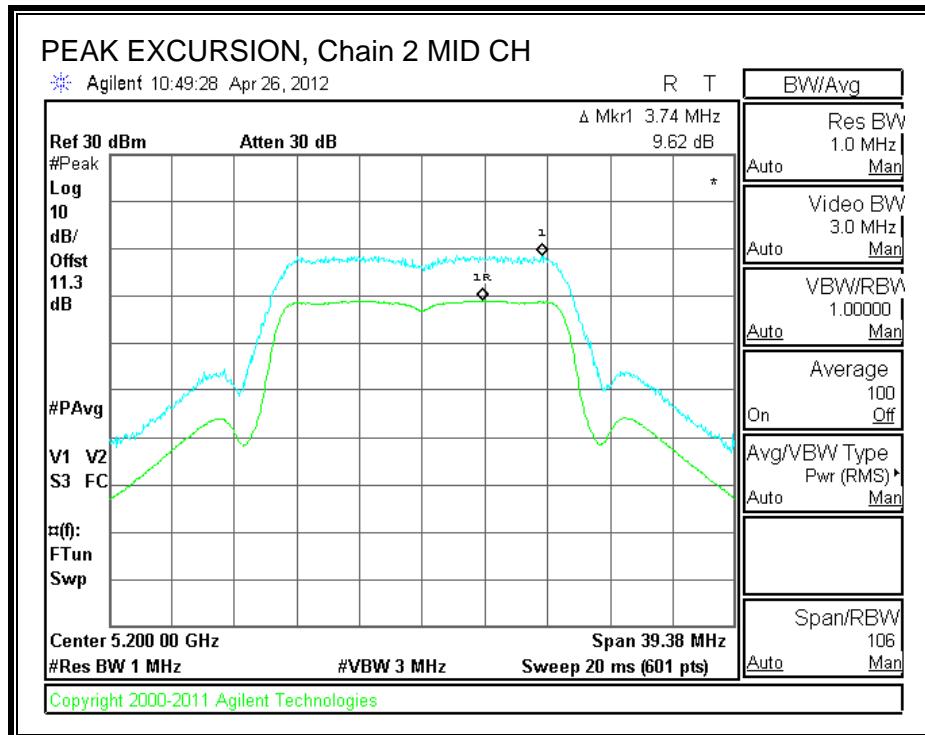
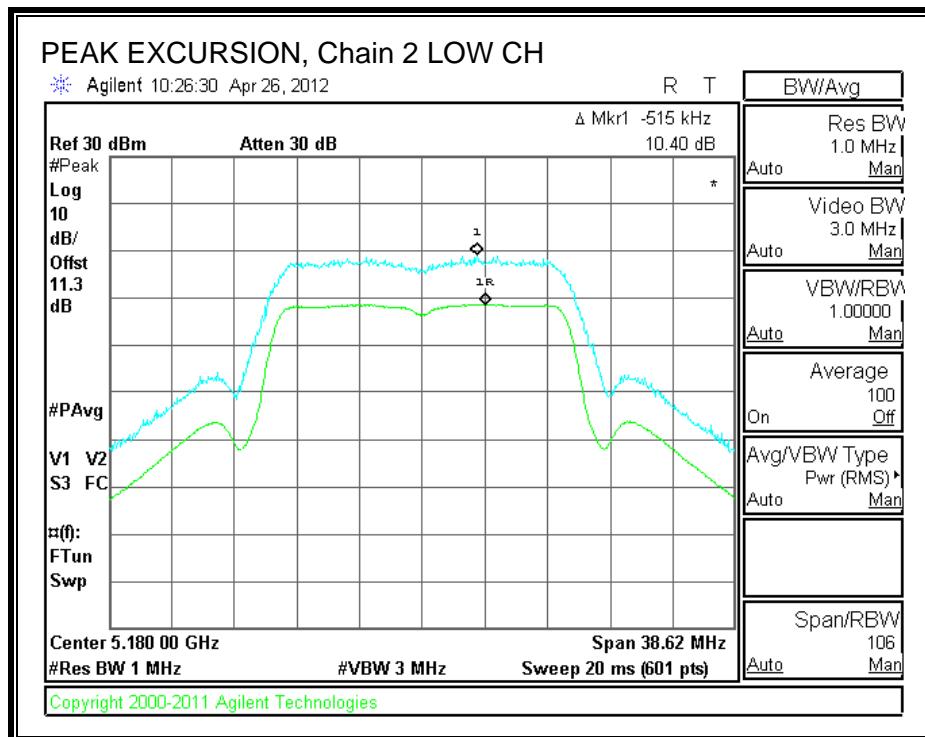
Channel	Frequency (MHz)	Pk Exc Chain 1 (dB)	Pk Exc Chain 2 (dB)	Pk Exc Chain 3 (dB)	Limit (dB)	Worst-Case Margin (dB)
Low	5180	9.86	10.40	10.10	13	-2.6
Mid	5200	10.47	9.62	10.67	13	-2.3
High	5240	9.82	9.71	10.19	13	-2.8

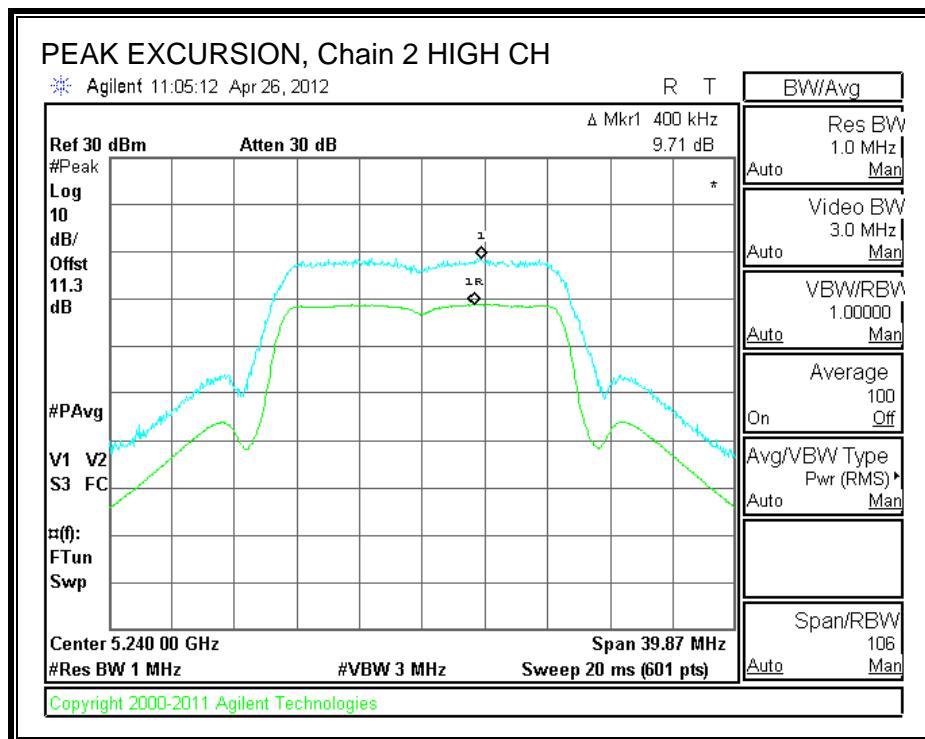
PEAK EXCURSION, Chain 1



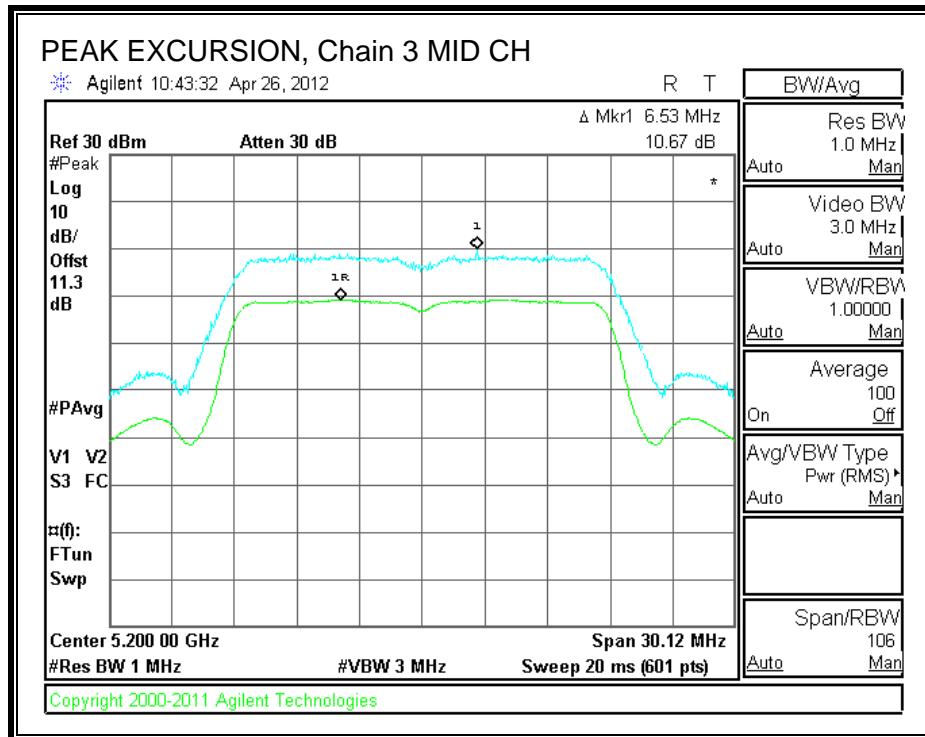
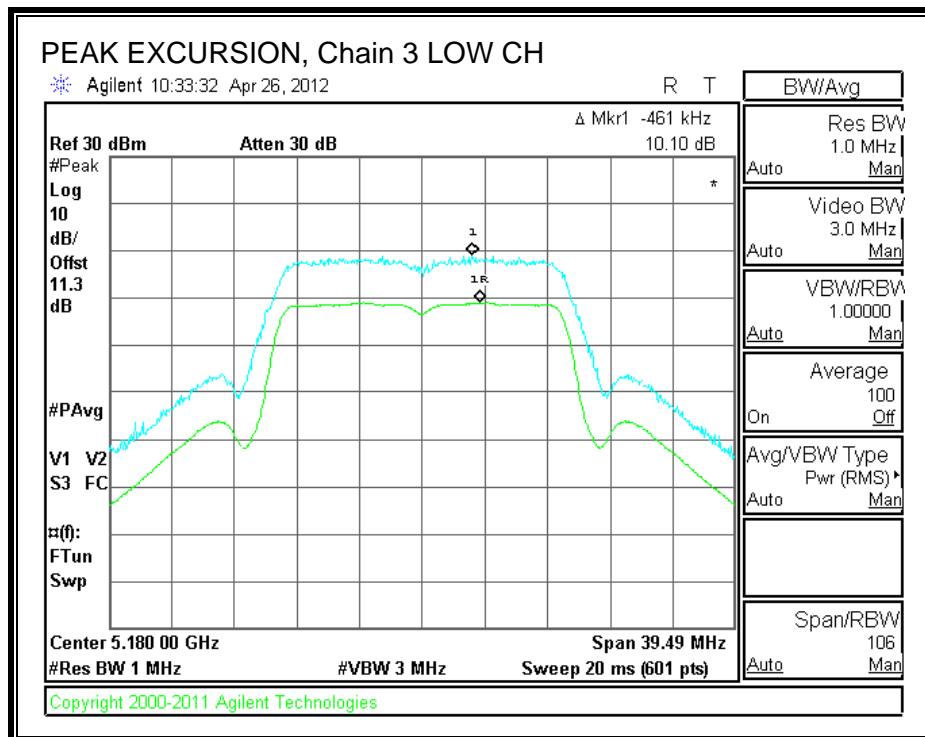


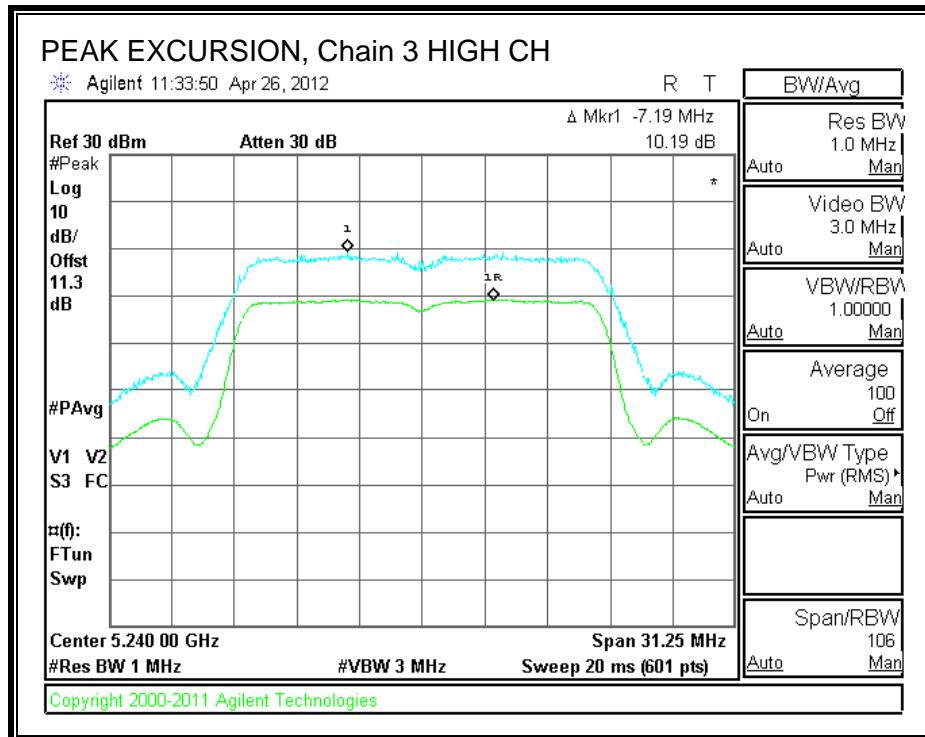
PEAK EXCURSION, Chain 2





PEAK EXCURSION, Chain 3





8.4. 802.11n HT40, 1TX, 5.2 GHz BAND

8.4.1. 26 dB BANDWIDTH

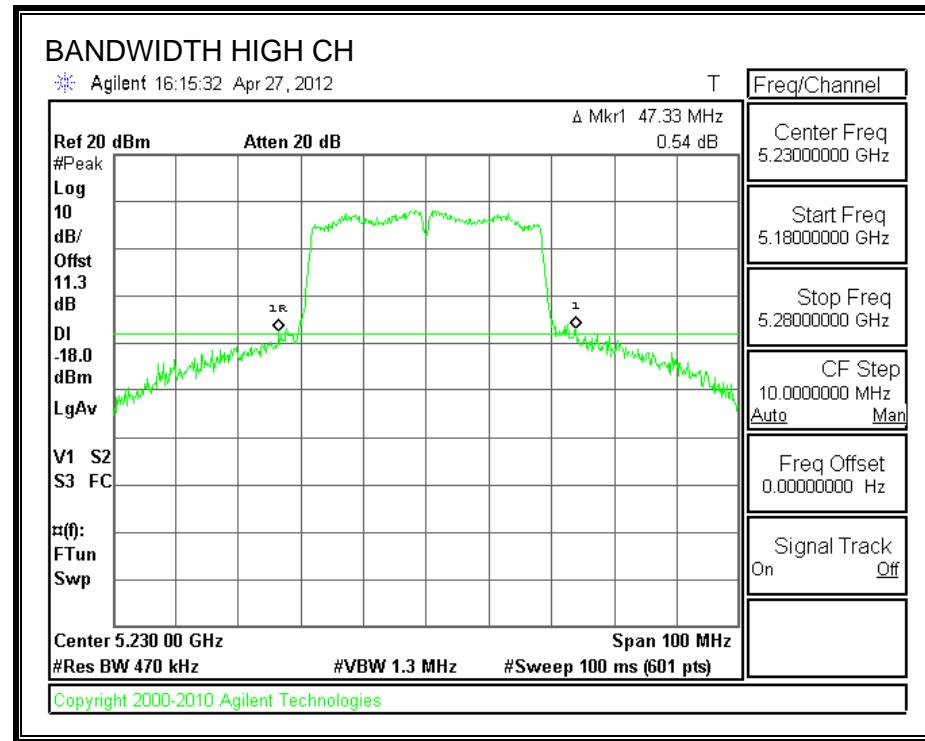
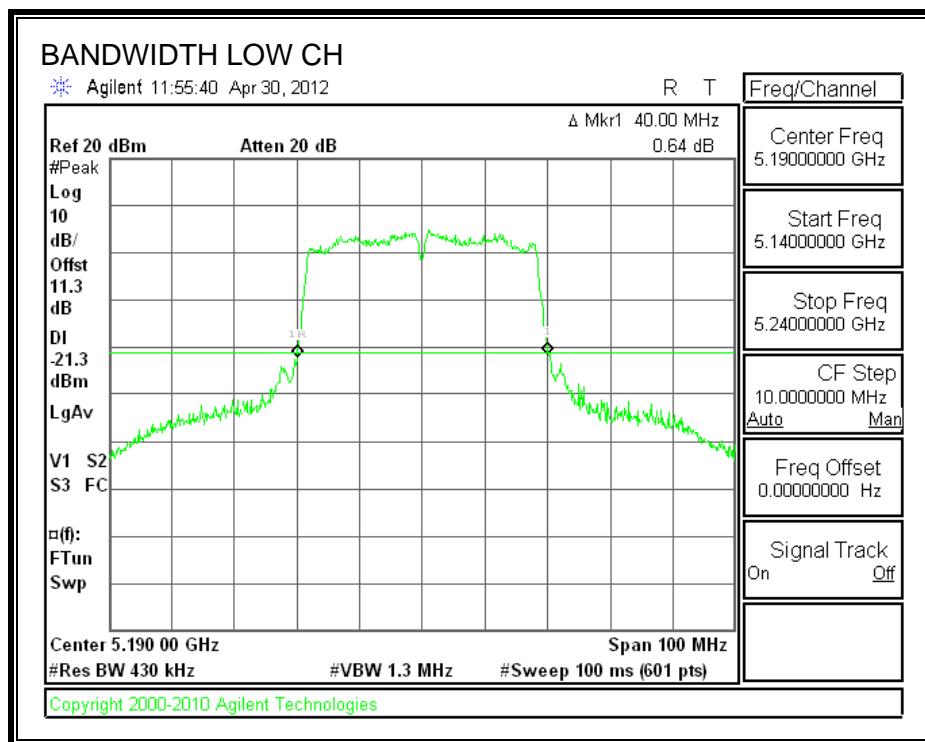
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5190	40.00
High	5230	47.33

26 dB BANDWIDTH



8.4.2. 99% BANDWIDTH

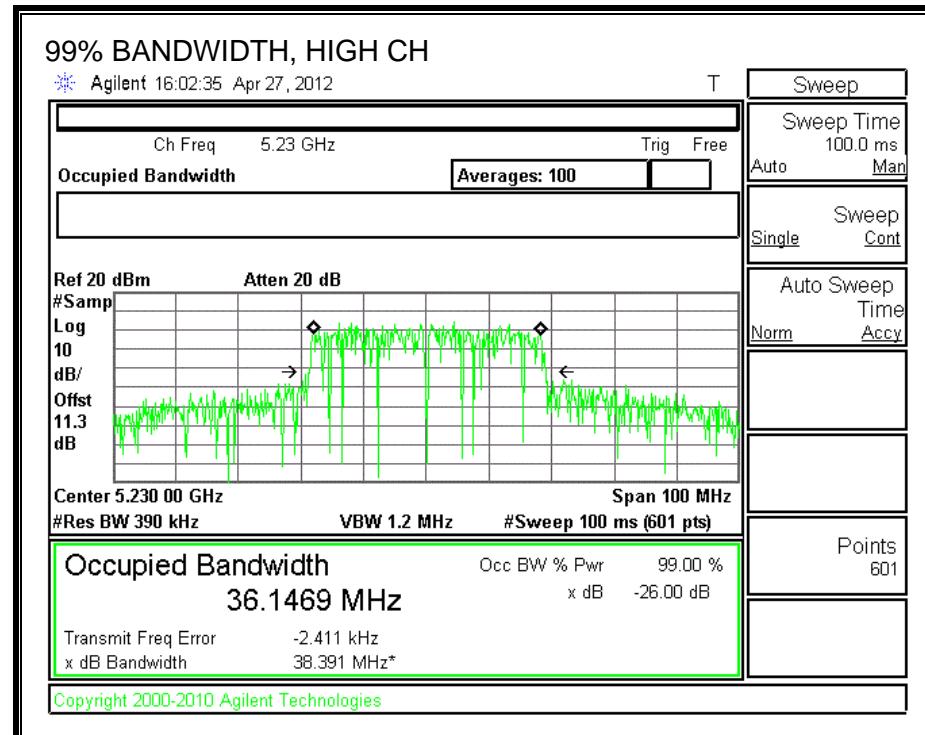
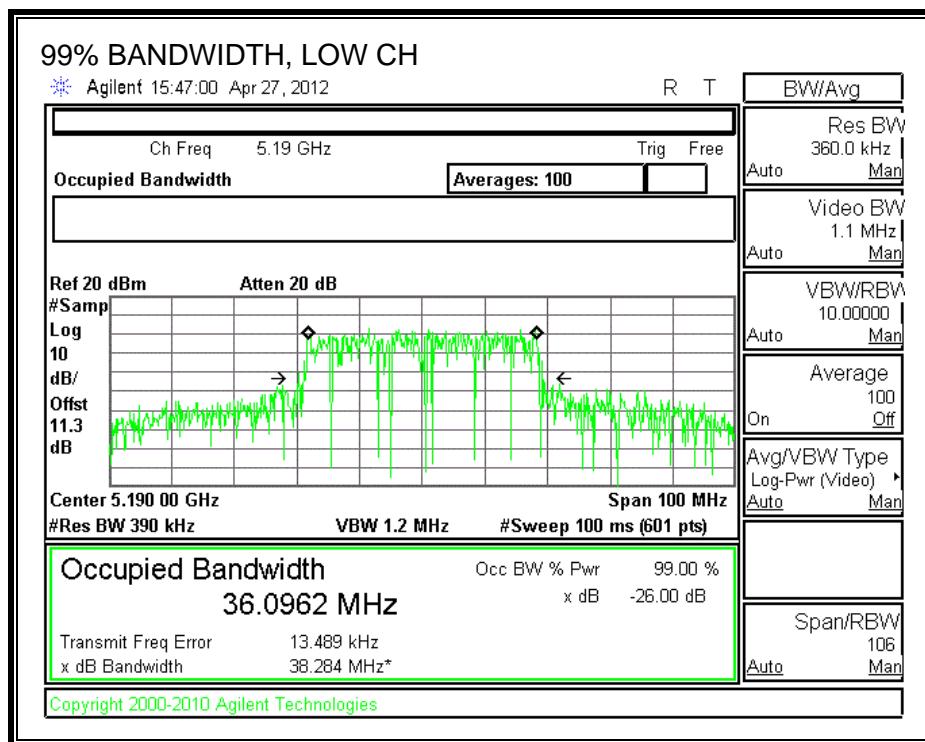
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	36.0962
High	5230	36.1469

99% BANDWIDTH



8.4.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the band 5.15–5.25 GHz, 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. In addition, 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 maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5190	17	40.00	20.02	4.83	17.00	4.00
High	5230	17	47.33	20.75	4.83	17.00	4.00

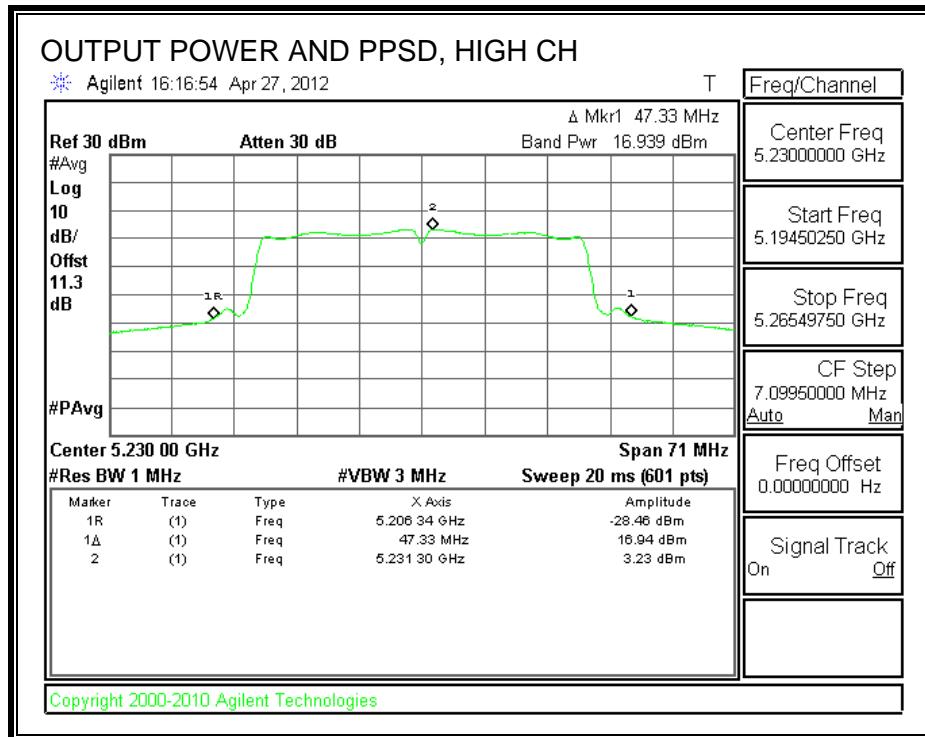
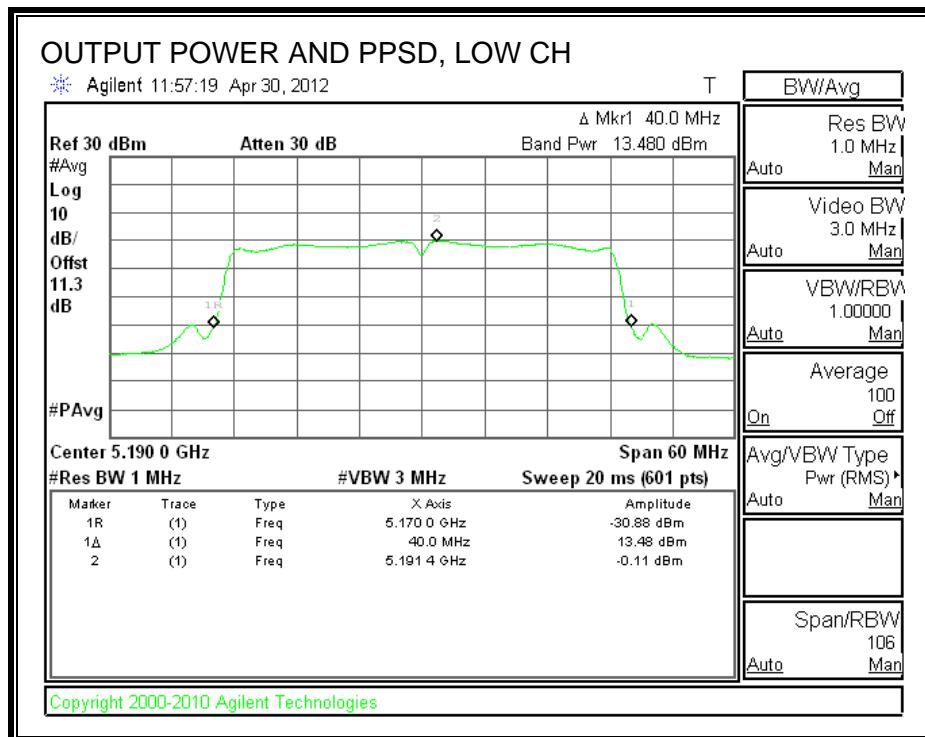
Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	13.480	13.480	17.00	-3.520
High	5230	16.939	16.939	17.00	-0.061

PPSD Results

Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	-0.11	-0.11	4.00	-4.11
High	5230	3.23	3.23	4.00	-0.77

OUTPUT POWER AND PPSD



8.4.4. PEAK EXCURSION

LIMITS

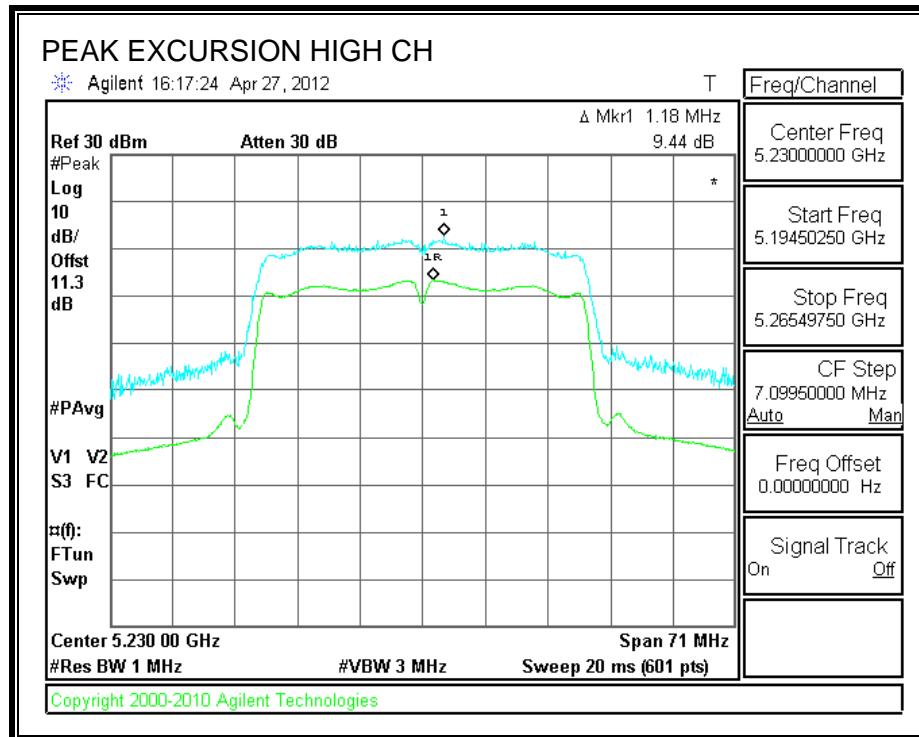
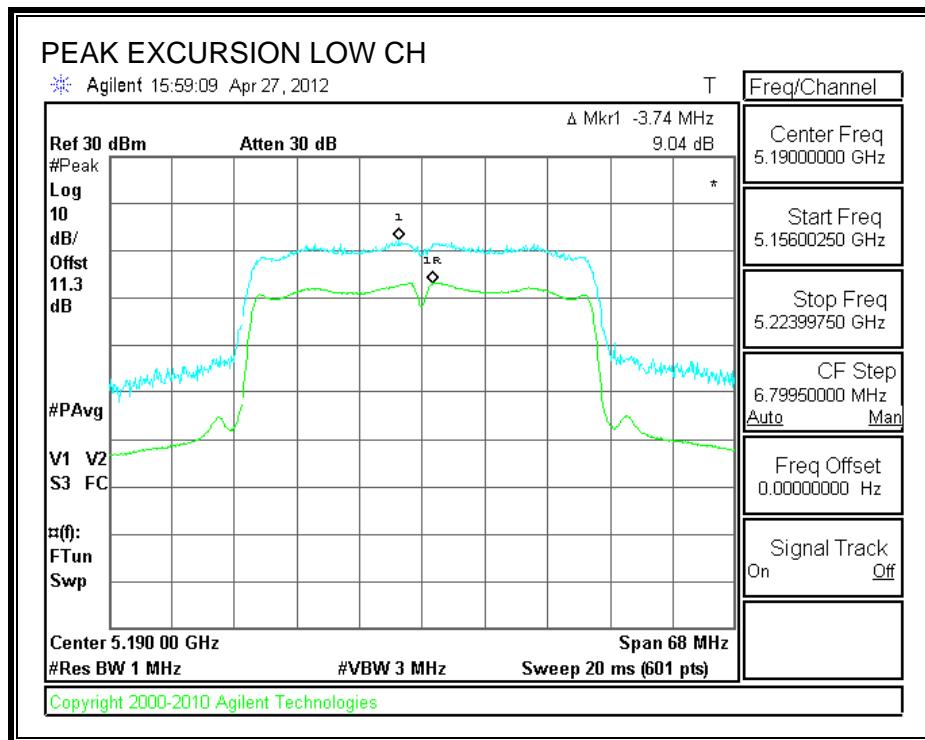
FCC §15.407 (a) (6)

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.

RESULTS

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	9.04	13	-3.96
High	5230	9.44	13	-3.56

PEAK EXCURSION



8.5. 802.11n HT40, STBC MCS0, 3TX, 5.2 GHz BAND

8.5.1. 26 dB BANDWIDTH

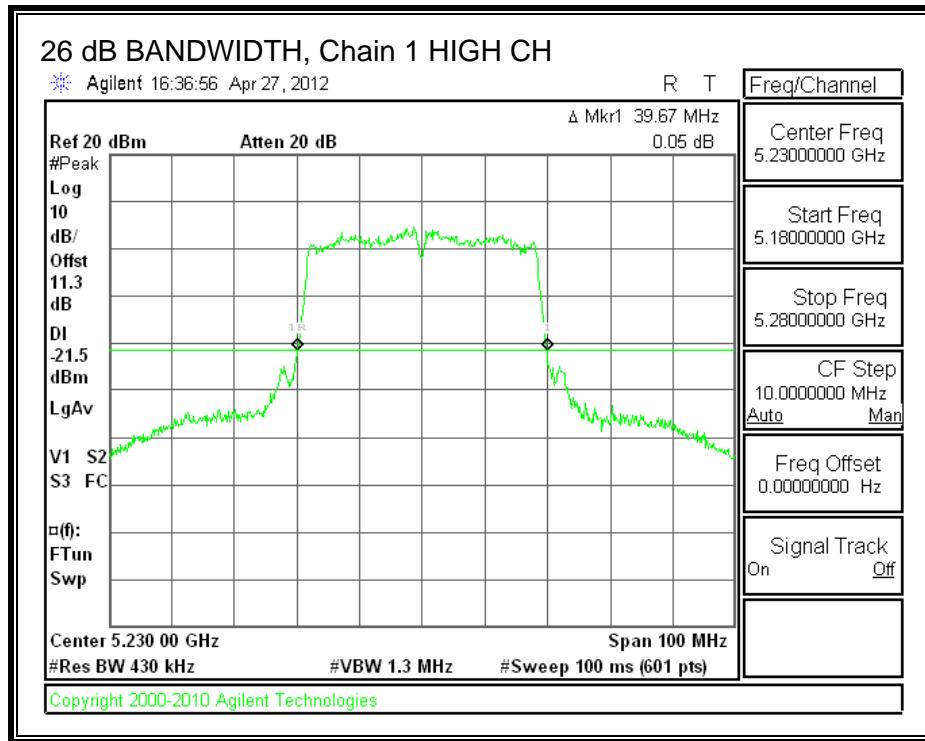
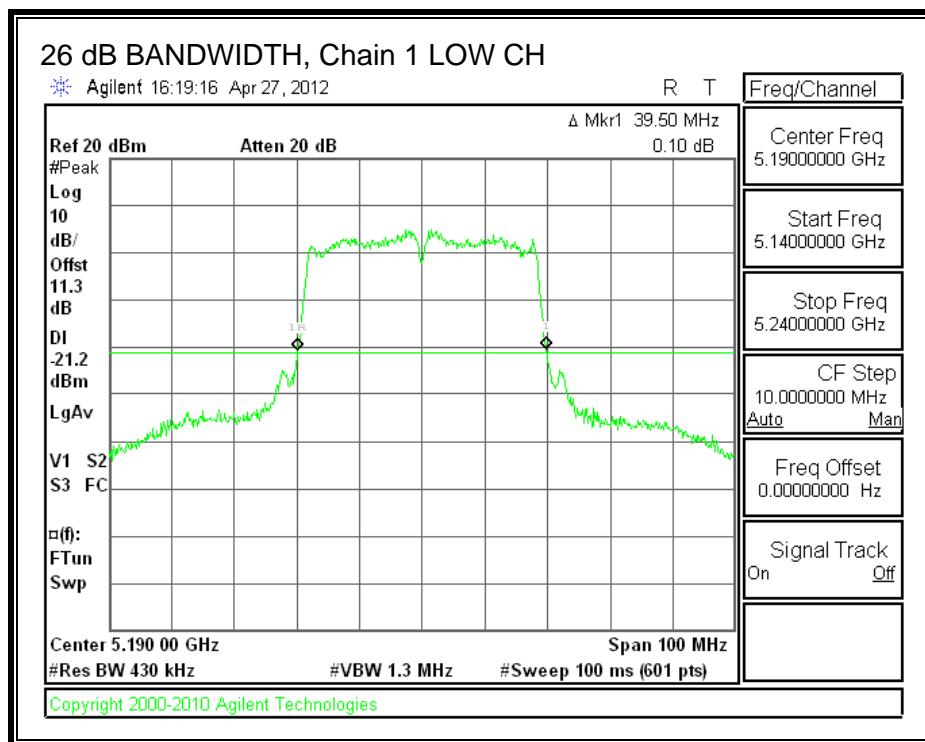
LIMITS

None; for reporting purposes only.

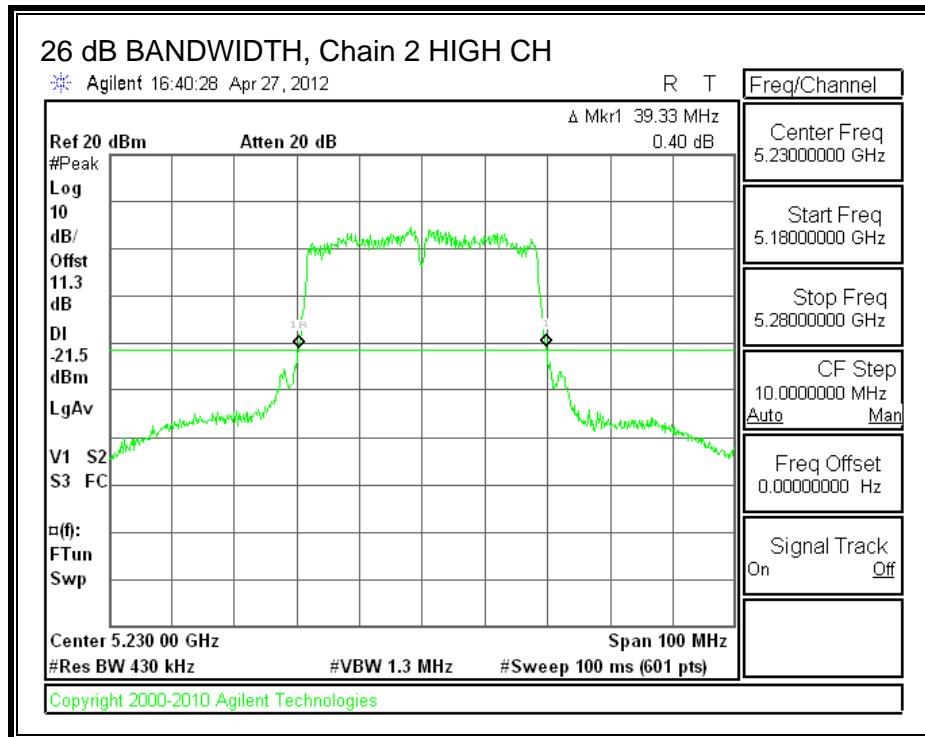
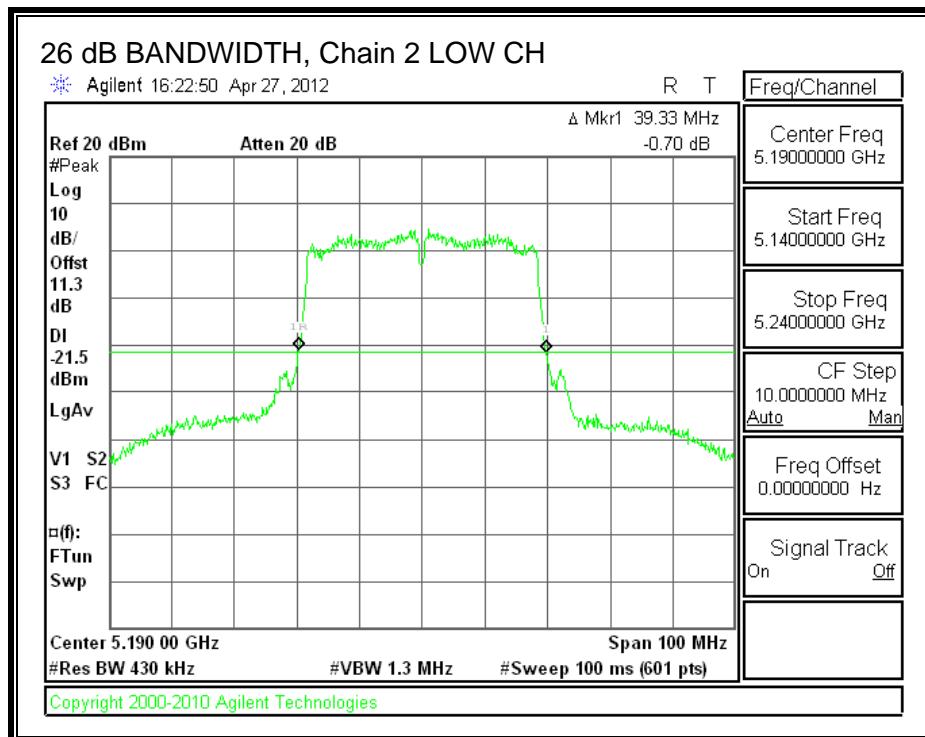
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)	26 dB BW Chain 3 (MHz)
Low	5190	39.50	39.33	39.67
High	5230	39.67	39.33	39.83

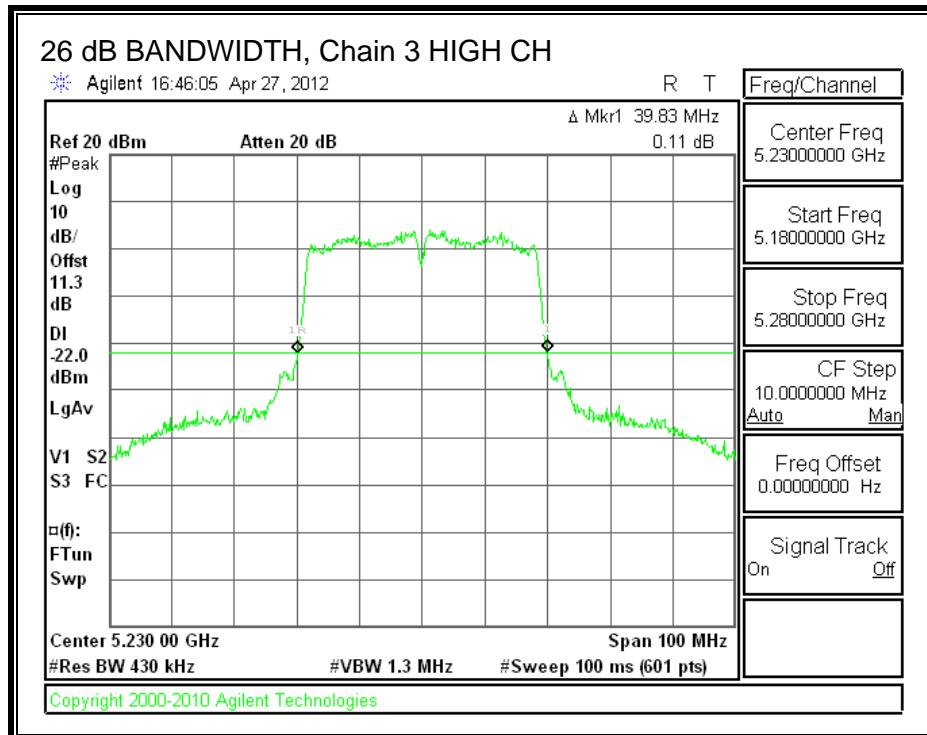
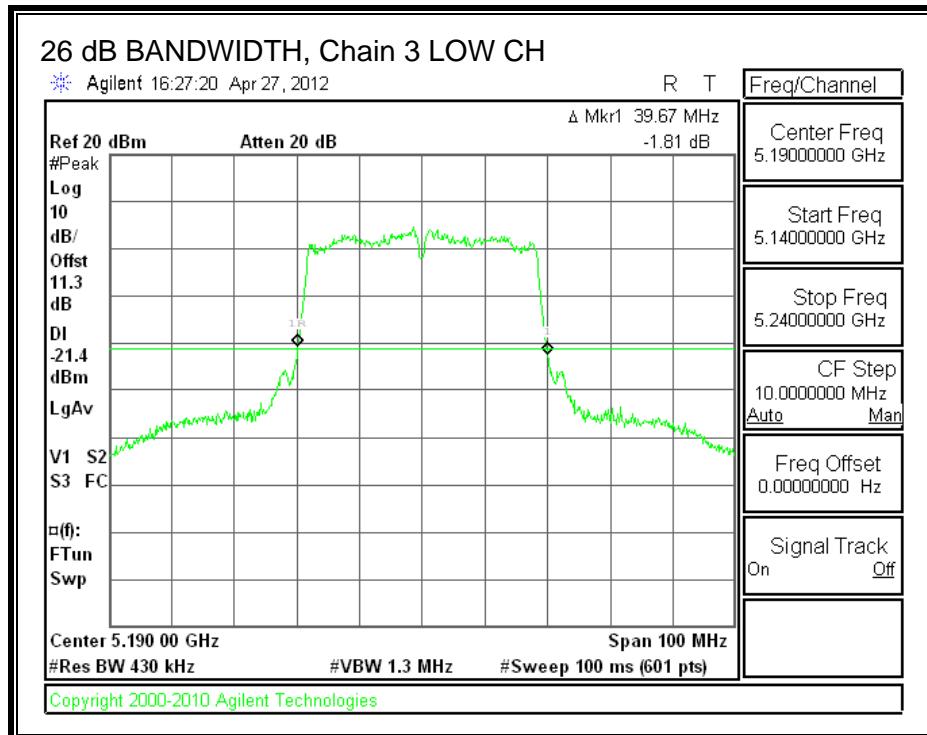
26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



26 dB BANDWIDTH, Chain 3



8.5.2. 99% BANDWIDTH

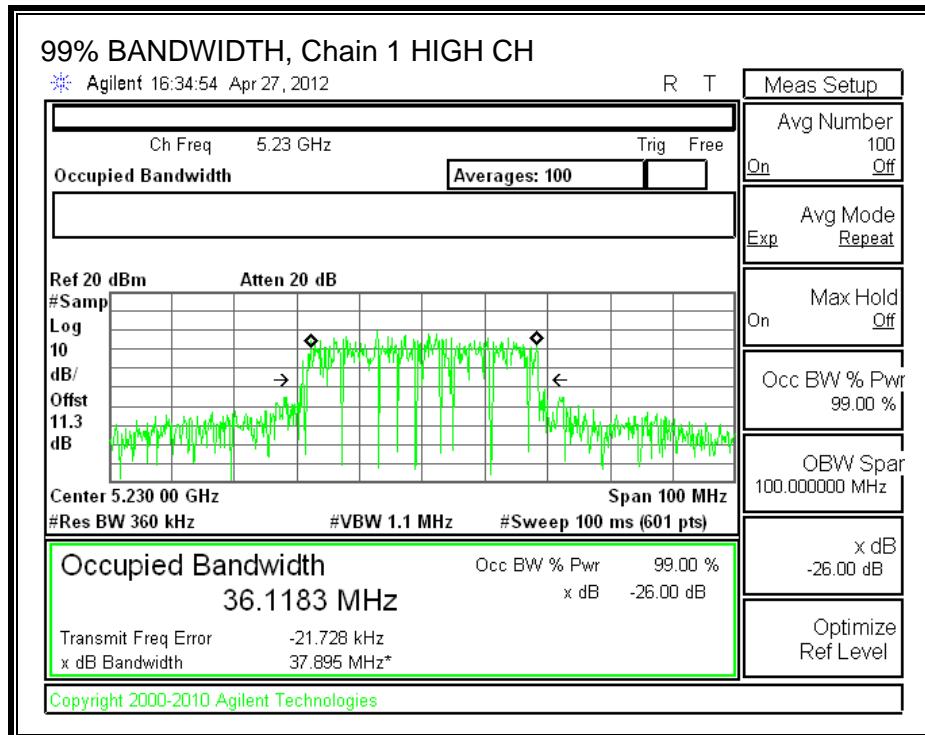
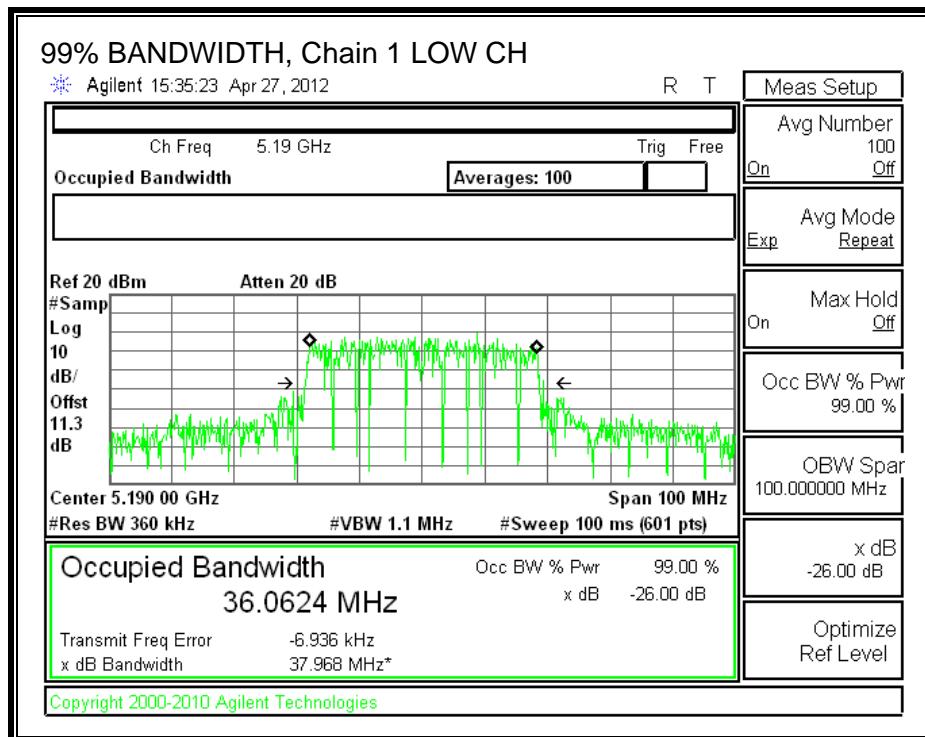
LIMITS

None; for reporting purposes only.

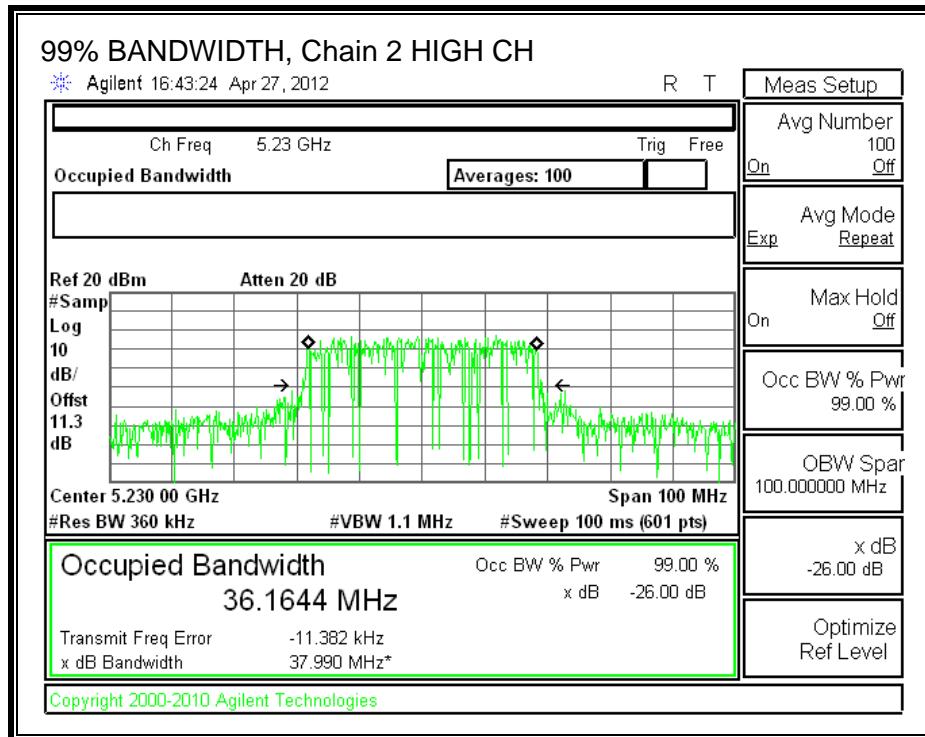
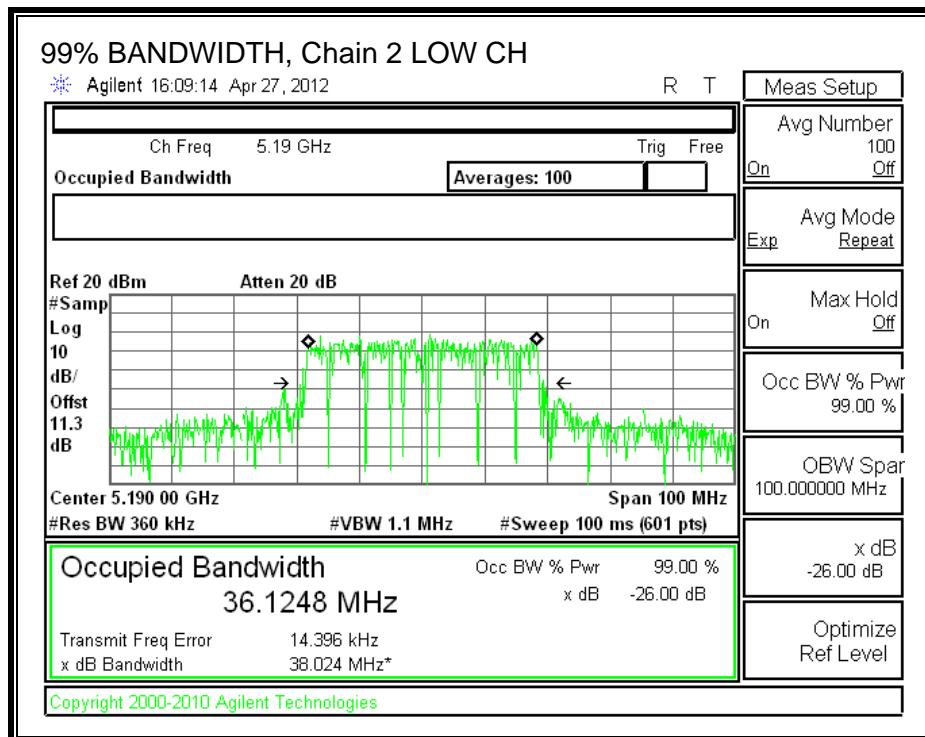
RESULTS

Channel	Frequency (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)	99% BW Chain 3 (MHz)
Low	5190	36.0624	36.1248	36.1560
High	5230	36.1183	36.1644	36.1430

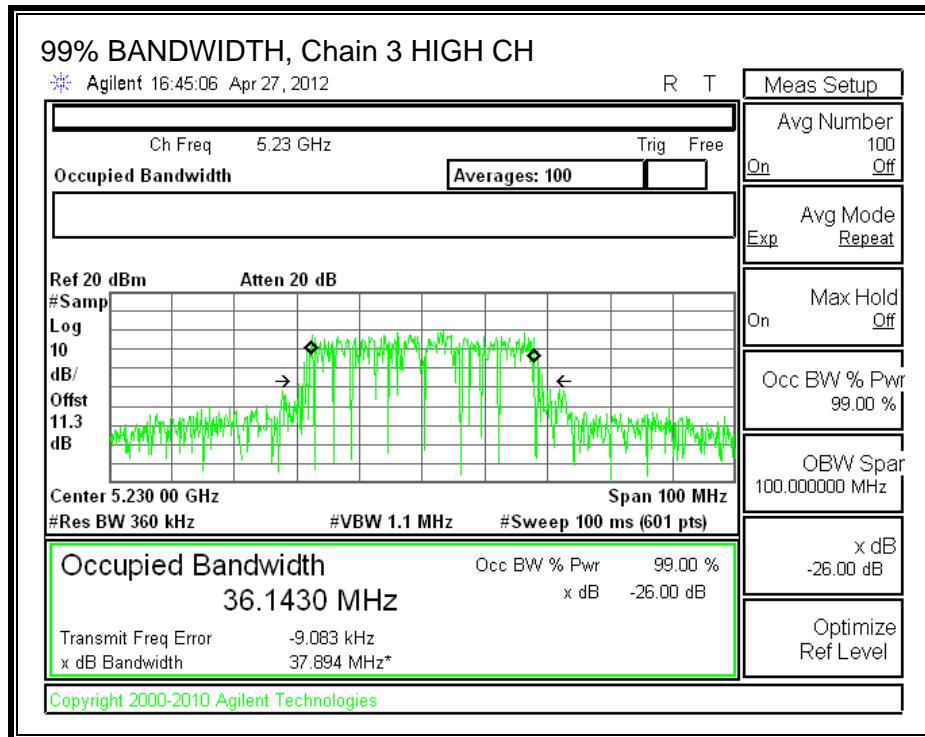
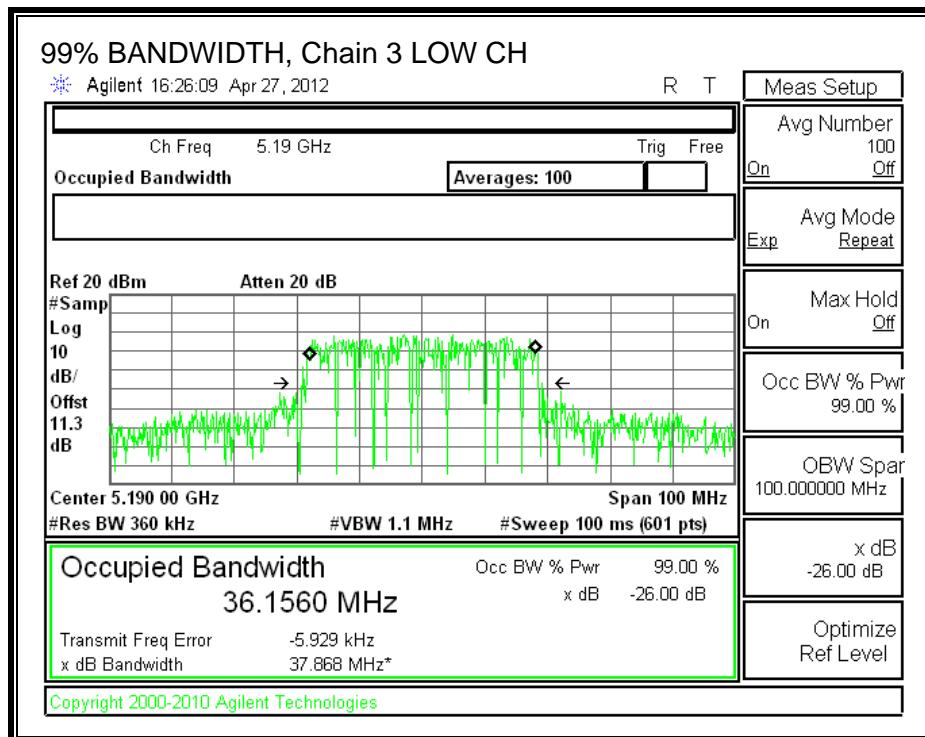
99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



99% BANDWIDTH, Chain 3



8.5.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

For the band 5.15–5.25 GHz, 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. In addition, 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 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

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

Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Chain 3 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
4.83	2.84	1.18	3.21

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5190	17	39.33	19.95	3.21	17.00	4.00
High	5230	17	39.33	19.95	3.21	17.00	4.00

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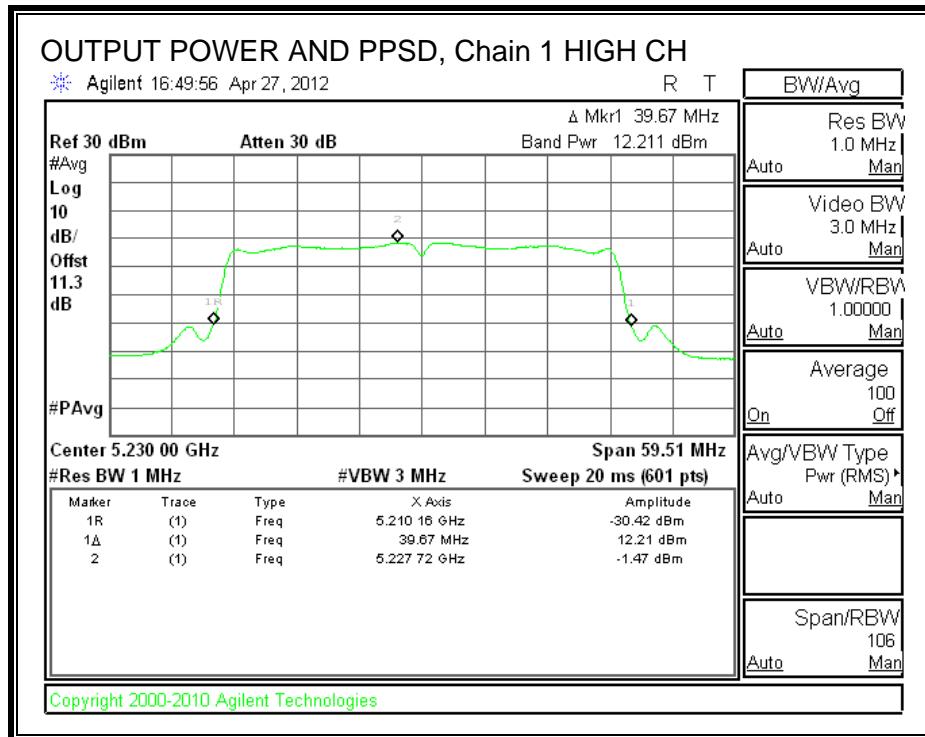
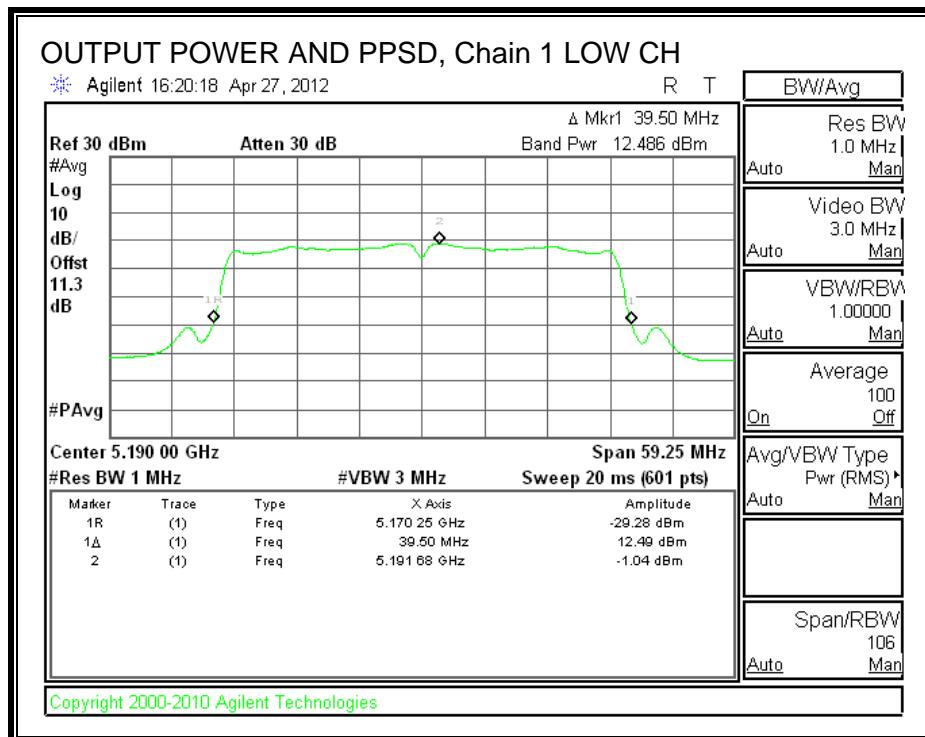
Output Power Results

Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Chain 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	12.486	11.713	12.106	16.884	17.00	-0.116
High	5230	12.211	11.828	12.110	16.824	17.00	-0.176

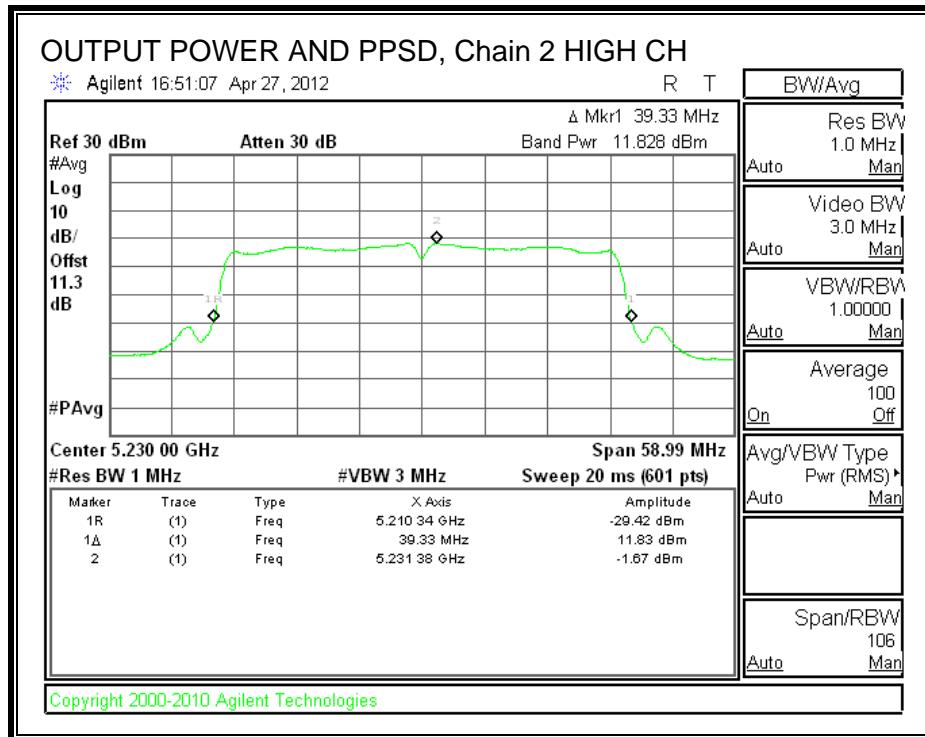
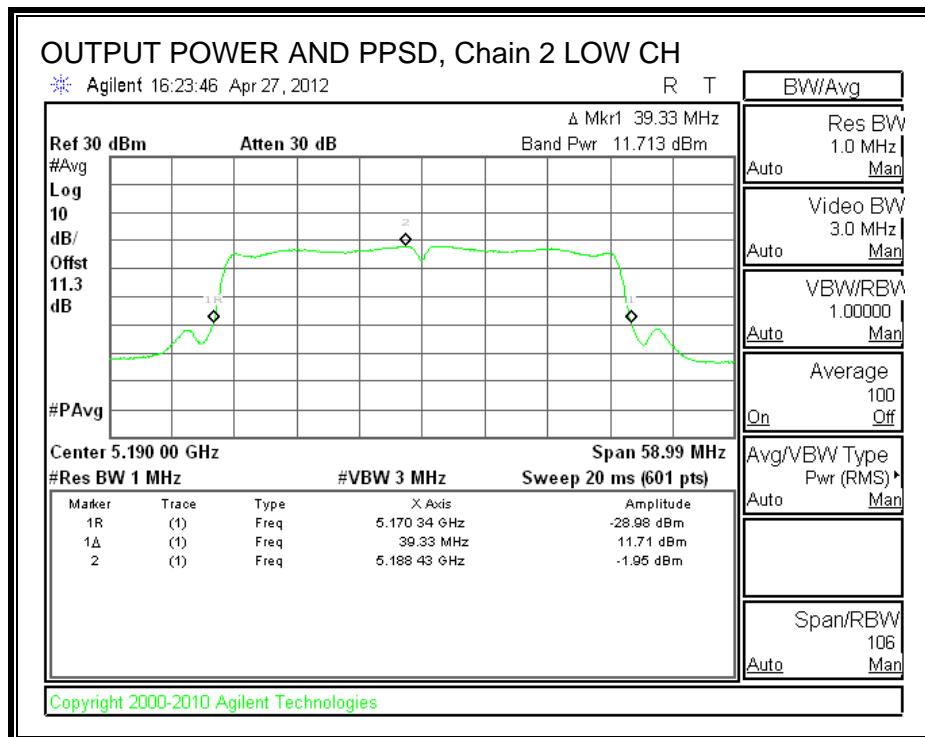
PPSD Results

Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Chain 3 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	-1.04	-1.95	-1.35	3.34	4.00	-0.66
High	5230	-1.47	-1.67	-1.39	3.26	4.00	-0.74

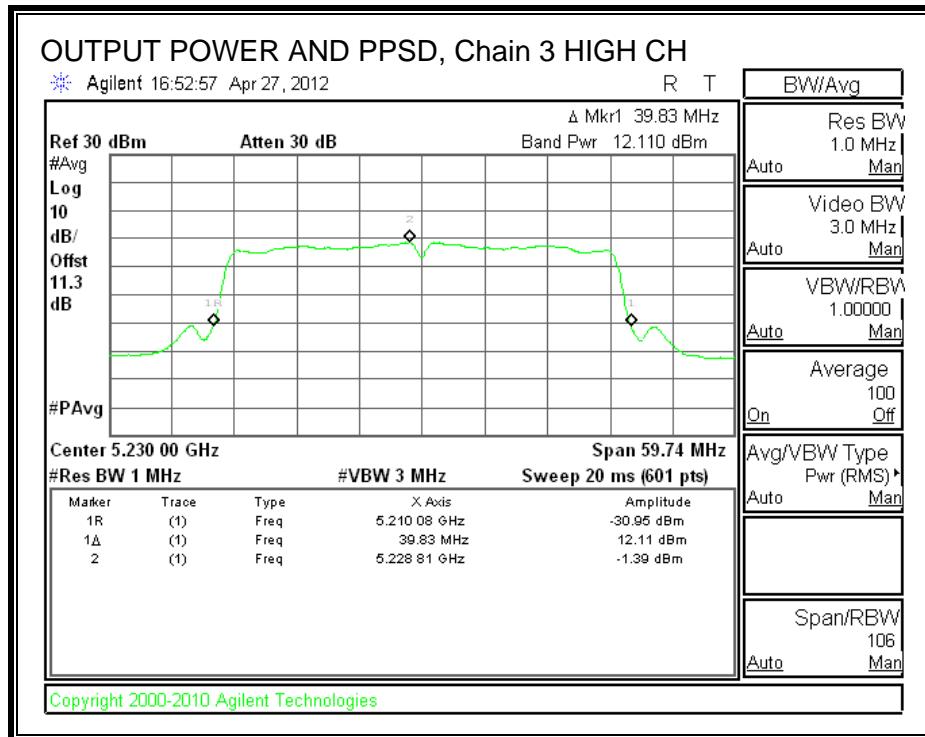
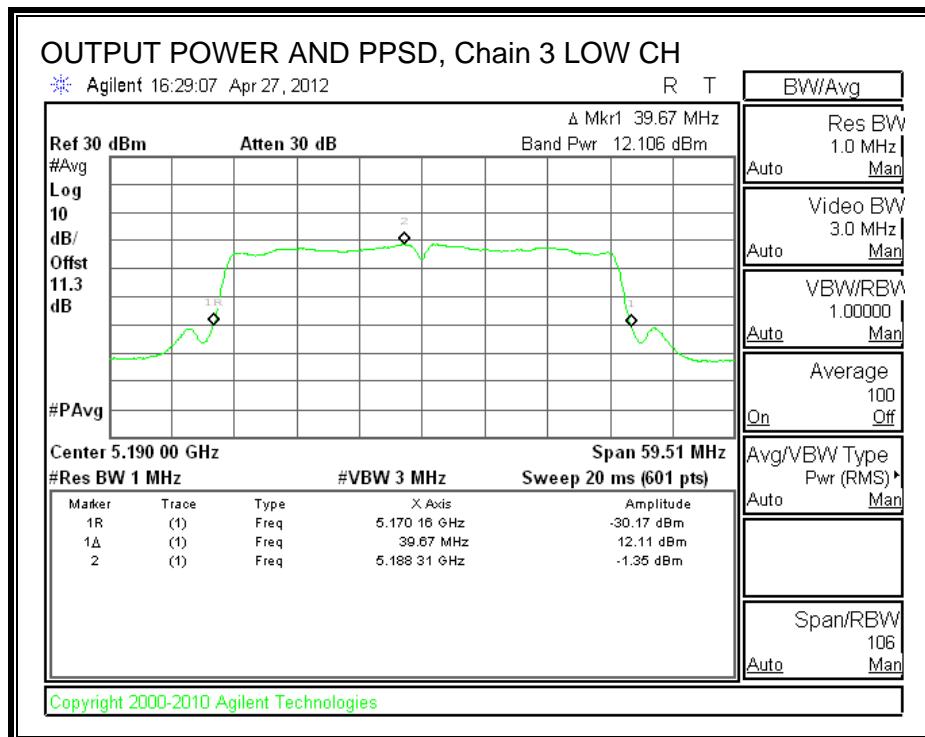
OUTPUT POWER AND PPSD, Chain 1



OUTPUT POWER AND PPSD, Chain 2



OUTPUT POWER AND PPSD, Chain 3



8.5.4. PEAK EXCURSION

LIMITS

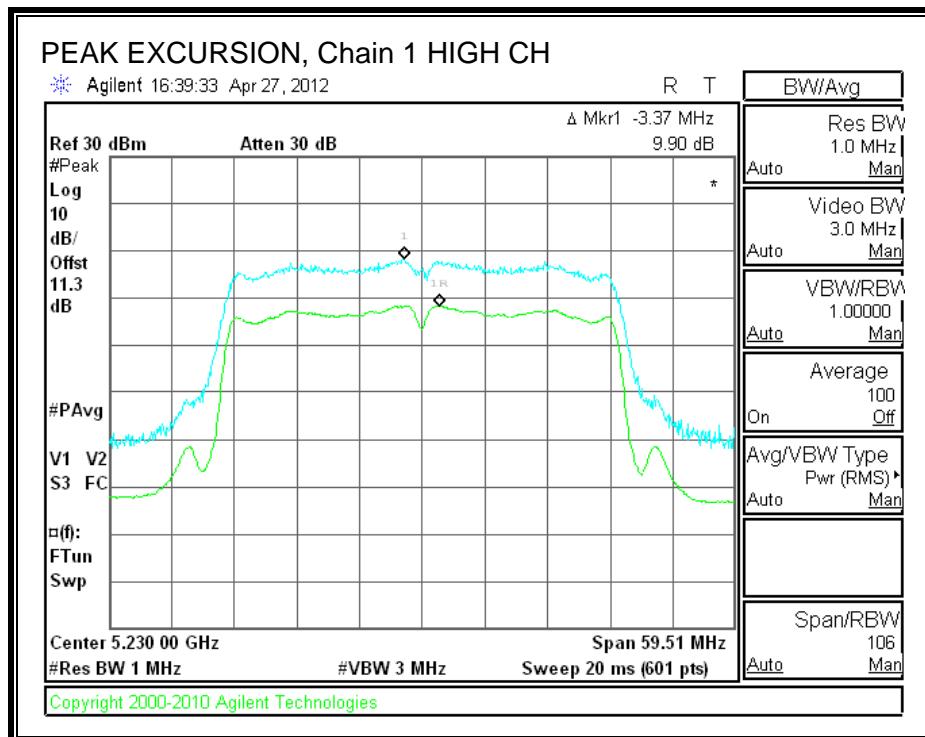
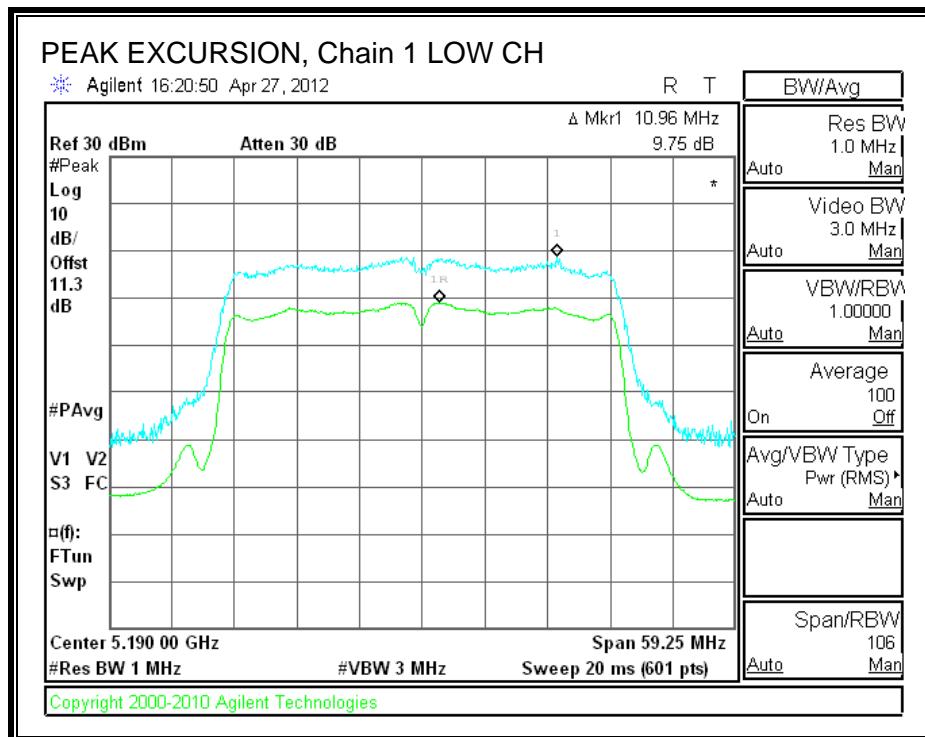
FCC §15.407 (a) (6)

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.

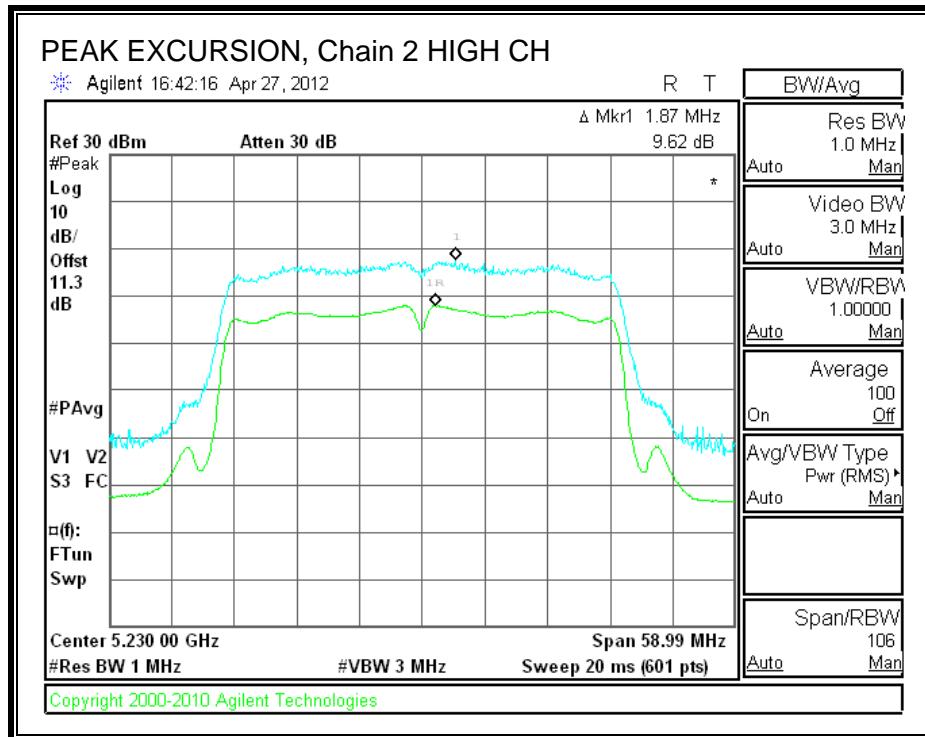
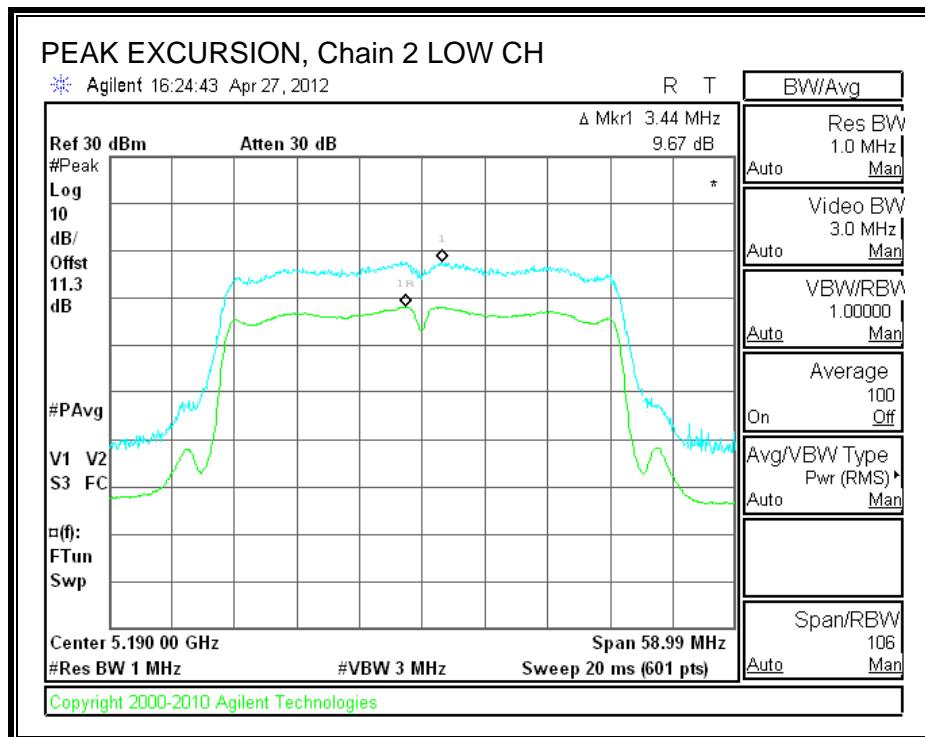
RESULTS

Channel	Frequency (MHz)	Pk Exc Chain 1 (dB)	Pk Exc Chain 2 (dB)	Pk Exc Chain 3 (dB)	Limit (dB)	Worst-Case Margin (dB)
Low	5190	9.75	9.67	9.77	13	-3.2
High	5230	9.90	9.62	10.04	13	-3.0

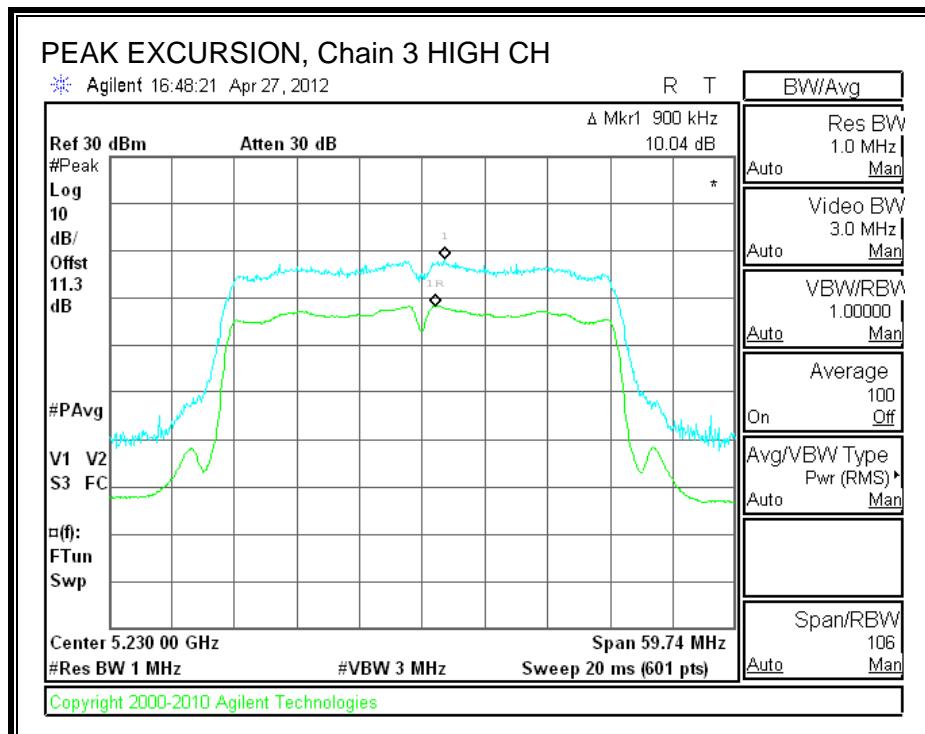
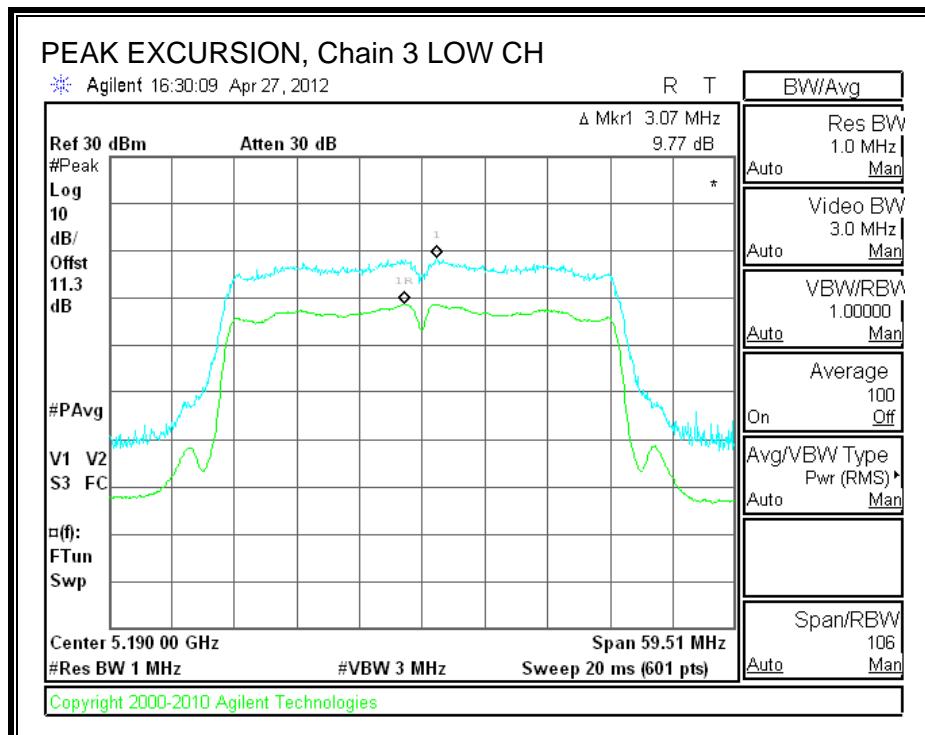
PEAK EXCURSION, Chain 1



PEAK EXCURSION, Chain 2



PEAK EXCURSION, Chain 3



8.6. 802.11a, Legacy, 1TX, 5.3 GHz BAND

8.6.1. 26dB BANDWIDTH

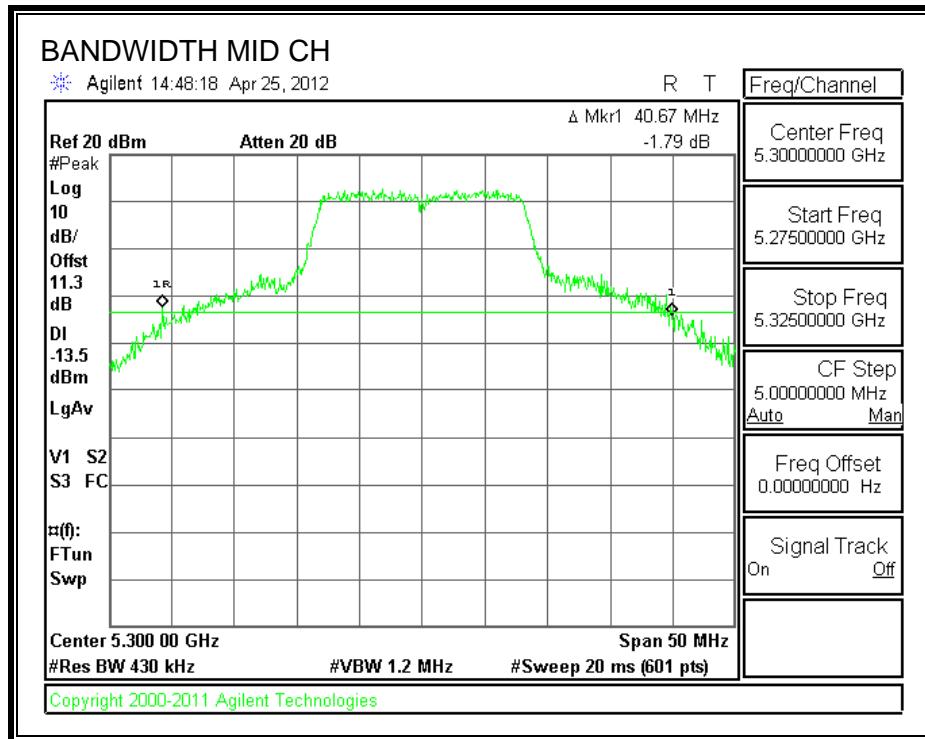
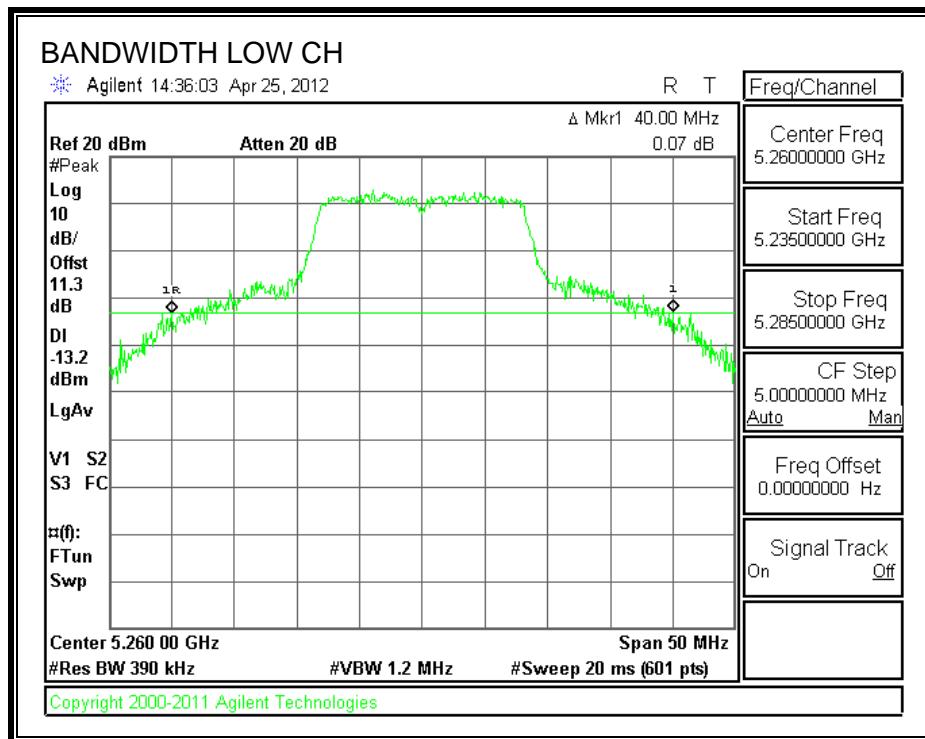
LIMITS

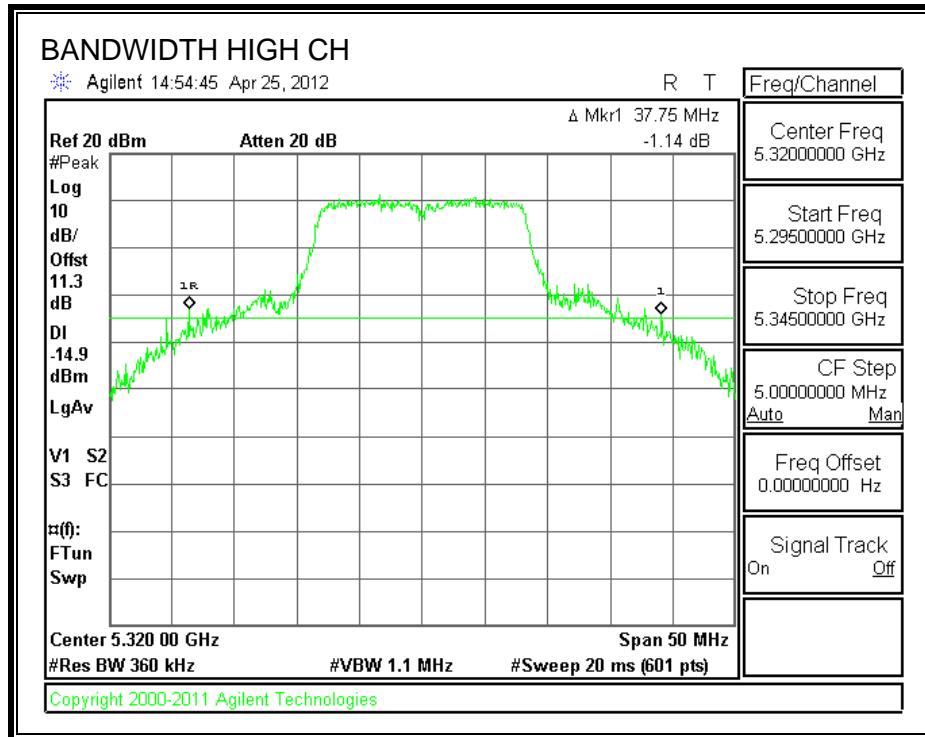
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5260	40.00
Mid	5300	40.67
High	5320	37.75

26dB BANDWIDTH





8.6.2. 99% dB BANDWIDTH

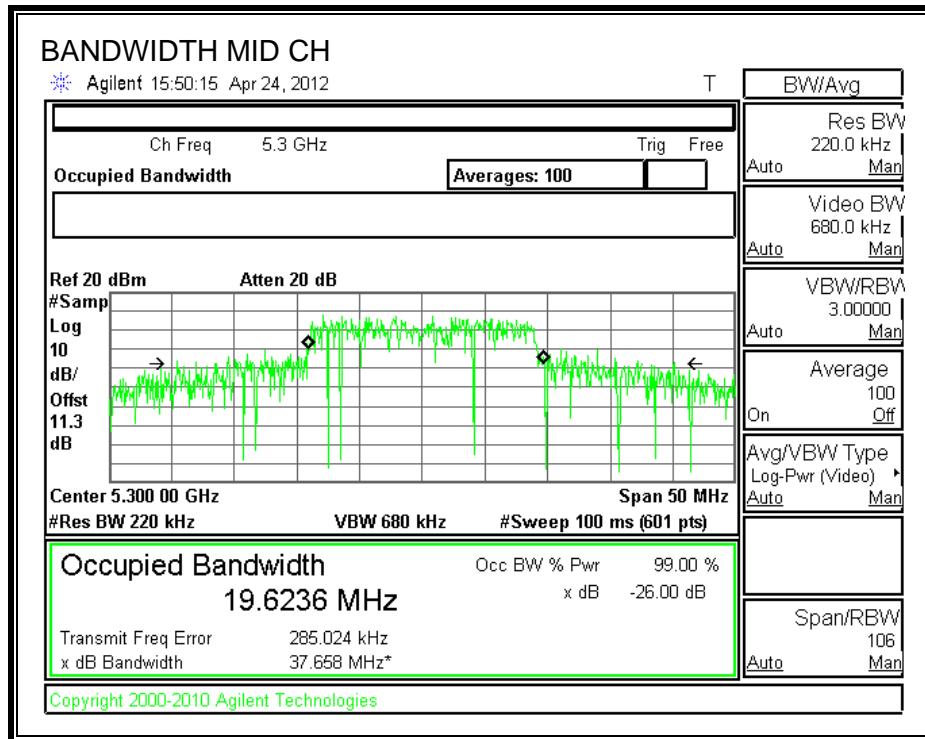
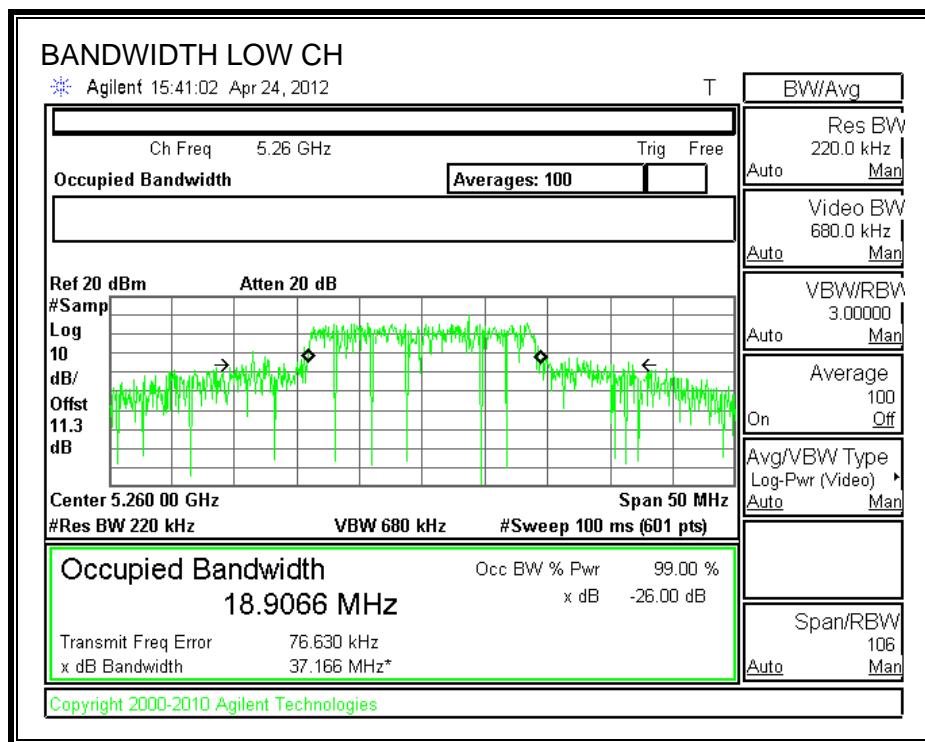
LIMITS

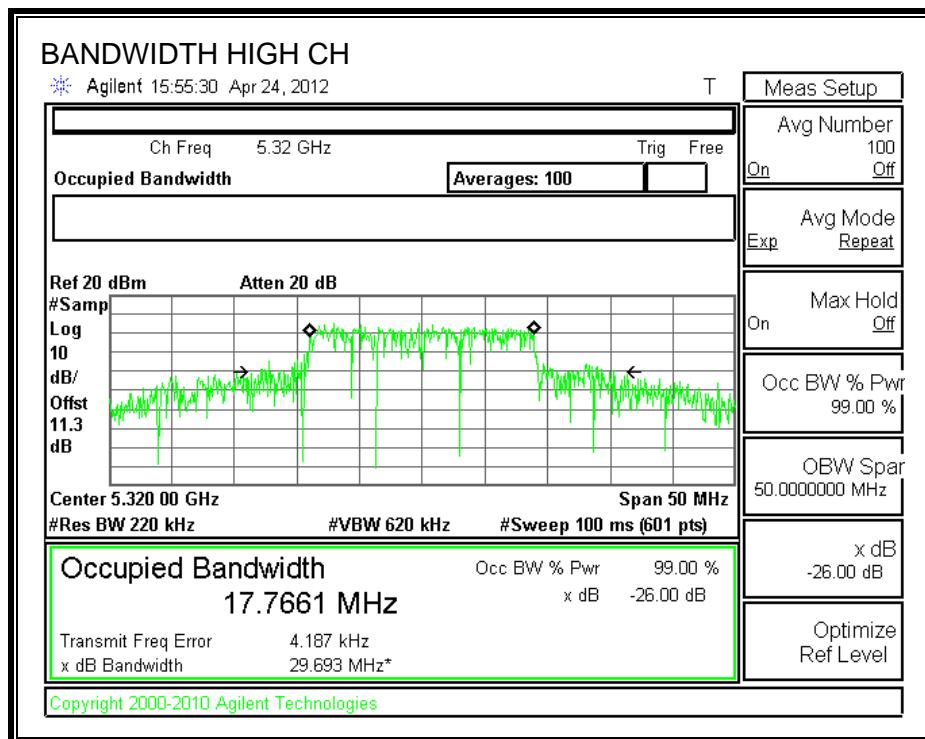
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	18.9066
Mid	5300	19.6236
High	5320	17.7661

99% BANDWIDTH





8.6.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands 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 megahertz. In addition, the peak 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 peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5260	24	40.00	27.02	5.53	24.00	11.00
Mid	5300	24	40.67	27.09	5.53	24.00	11.00
High	5320	24	37.75	26.77	5.53	24.00	11.00

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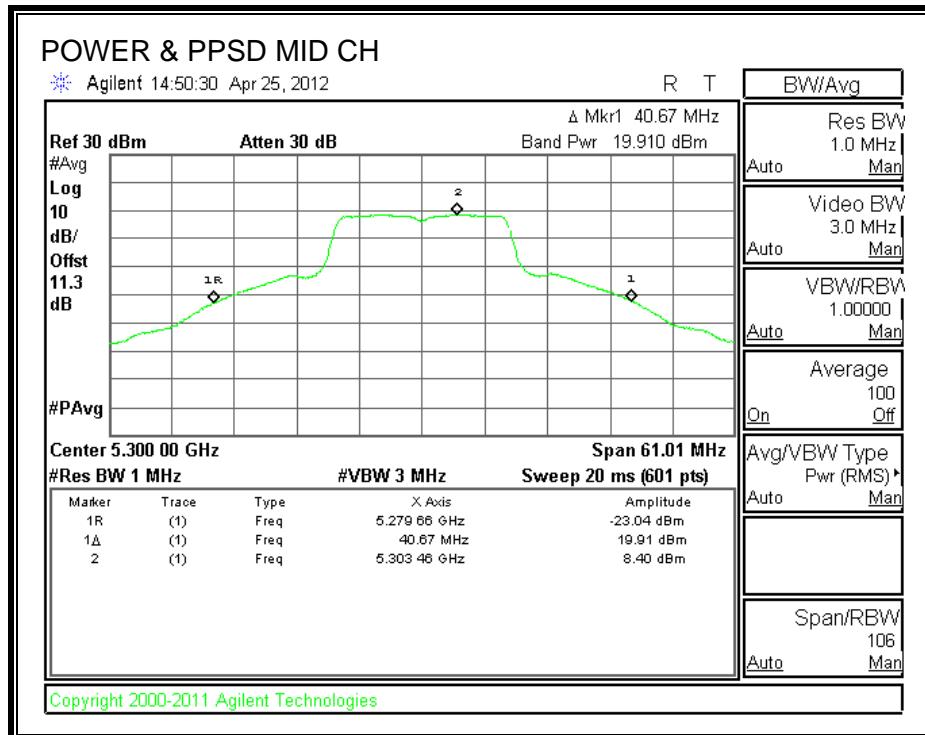
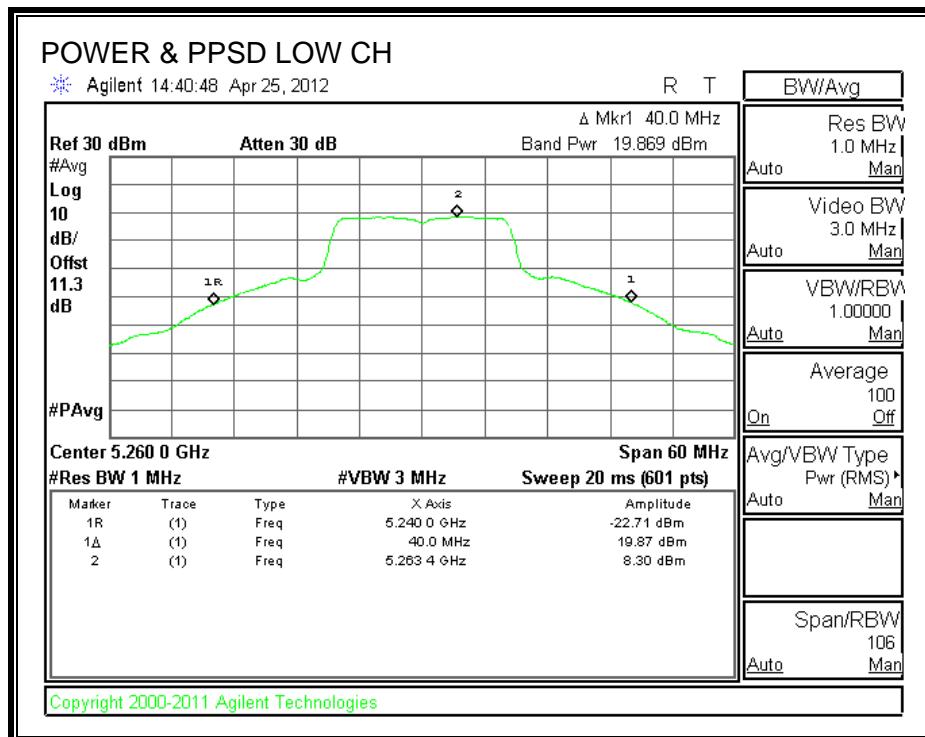
Output Power Results

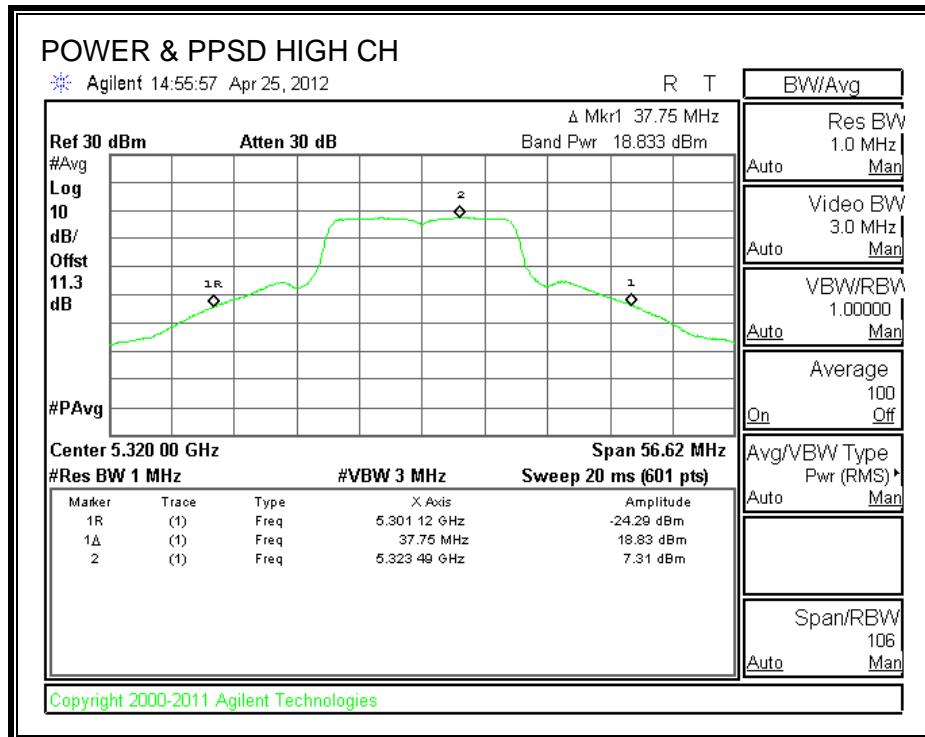
Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	19.869	19.869	24.00	-4.131
Mid	5300	19.910	19.910	24.00	-4.090
High	5320	18.833	18.833	24.00	-5.167

PPSD Results

Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	8.30	8.30	11.00	-2.70
Mid	5300	8.40	8.40	11.00	-2.60
High	5320	7.31	7.31	11.00	-3.69

OUTPUT POWER AND PPSD





8.6.4. PEAK EXCURSION

LIMITS

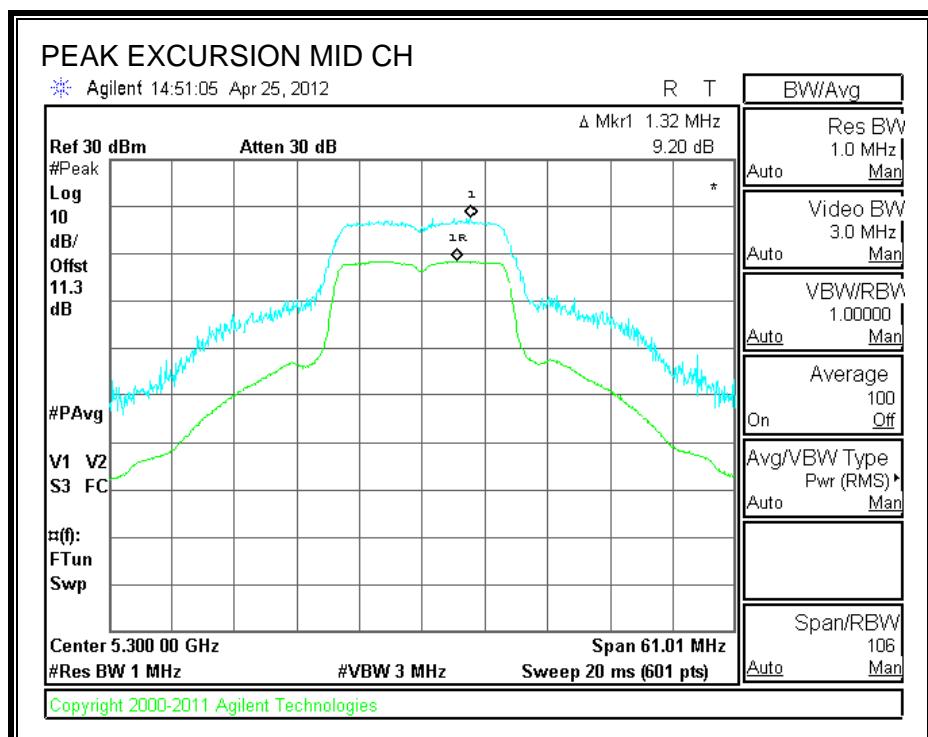
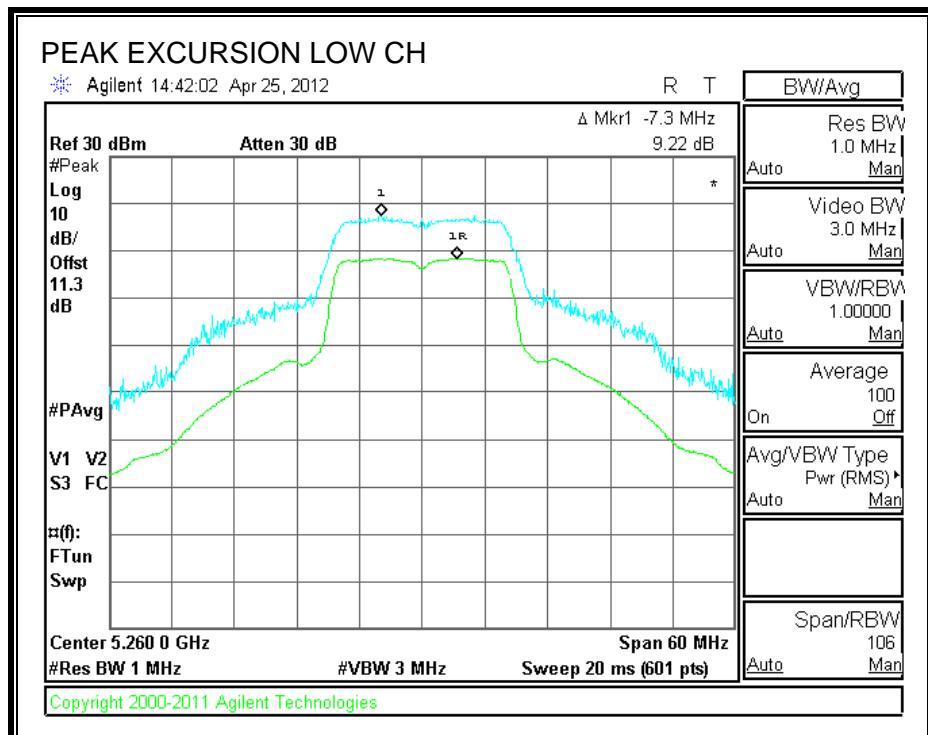
FCC §15.407 (a) (6)

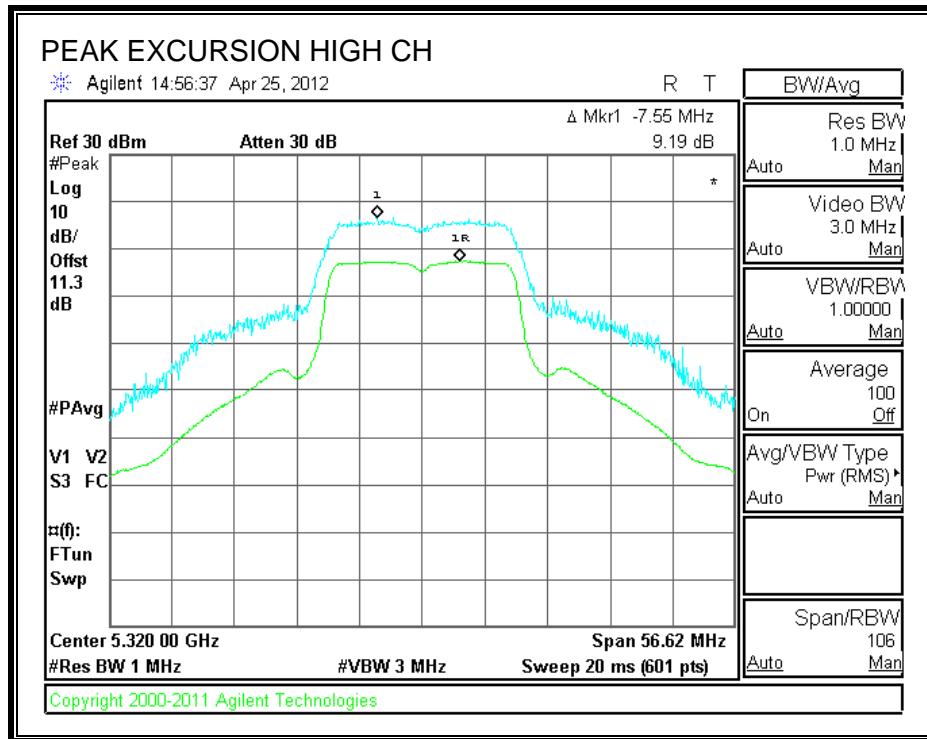
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	9.22	13	-3.8
Mid	5300	9.20	13	-3.8
High	5320	9.19	13	-3.8

PEAK EXCURSION





8.7. 802.11n HT20, CDD MCS0, 3TX, 5.3 GHz BAND

8.7.1. 26 dB BANDWIDTH

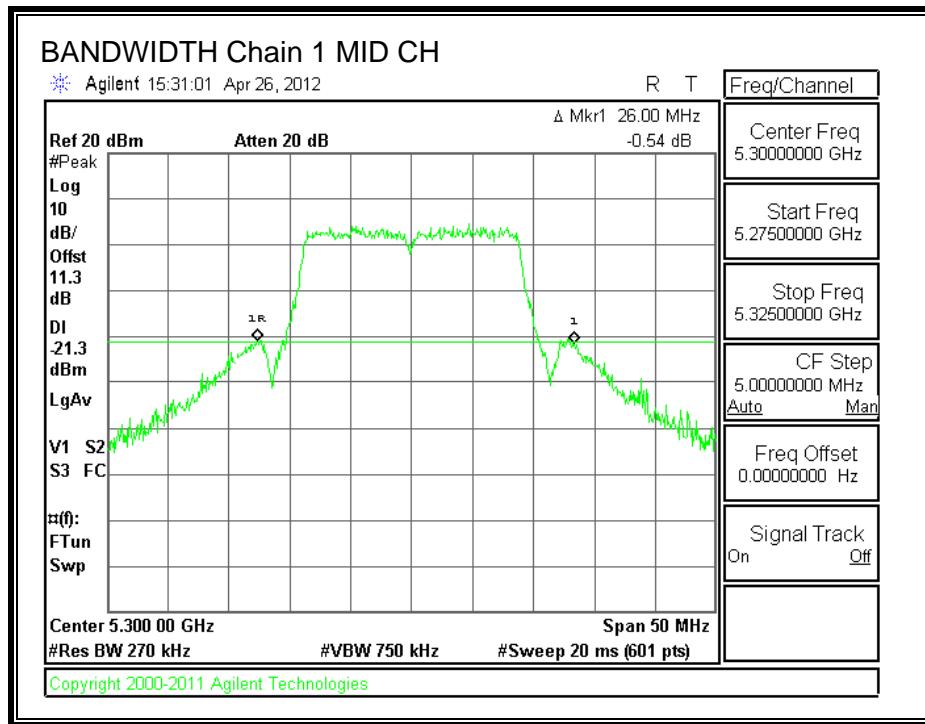
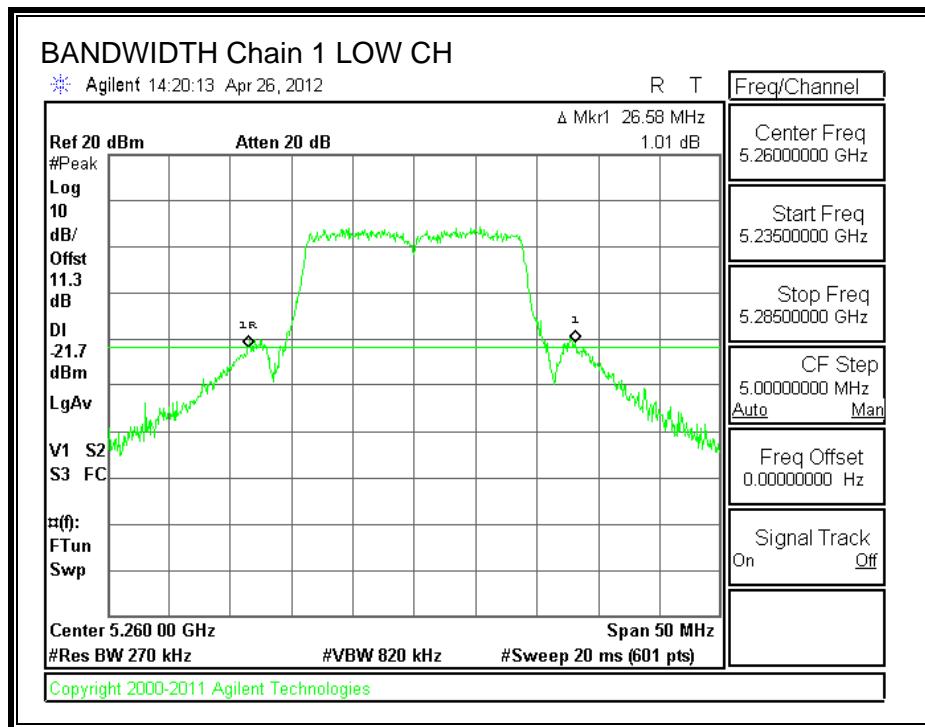
LIMITS

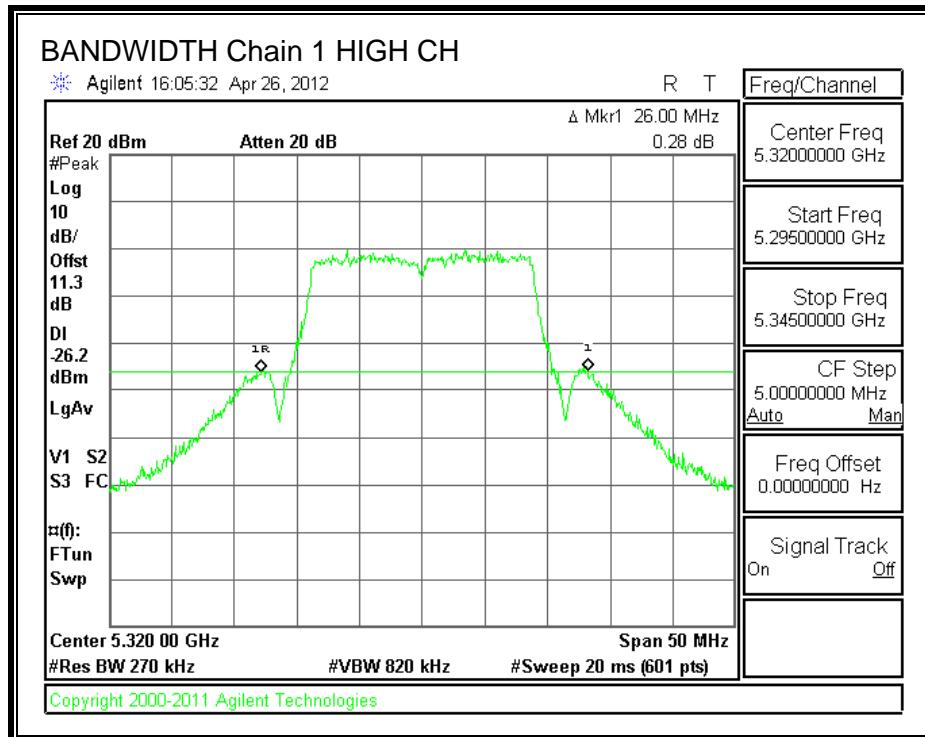
None; for reporting purposes only.

RESULTS

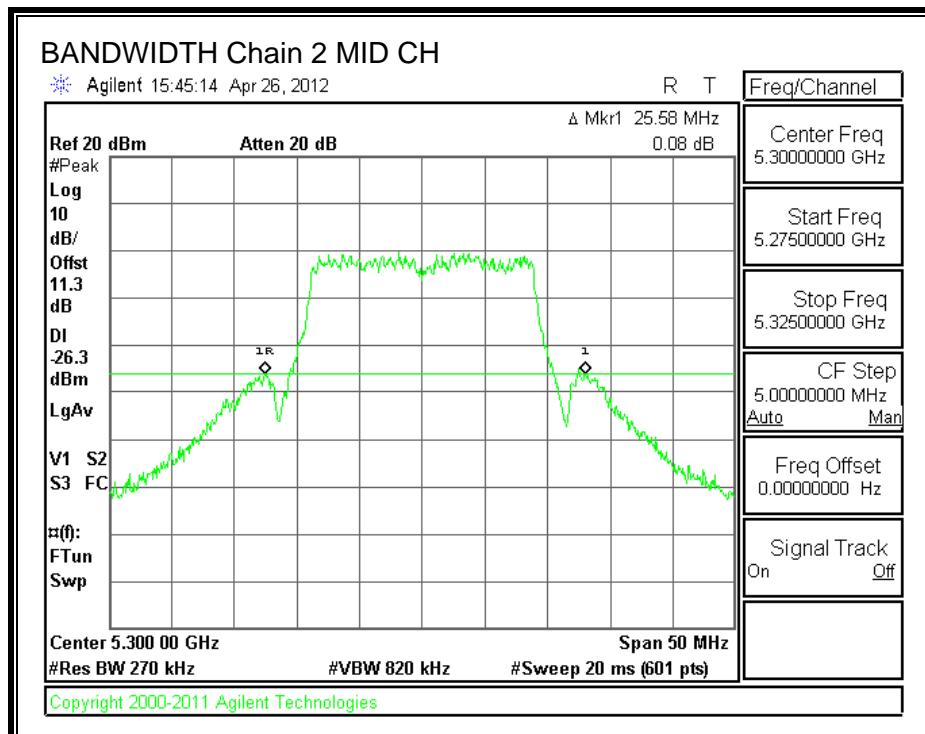
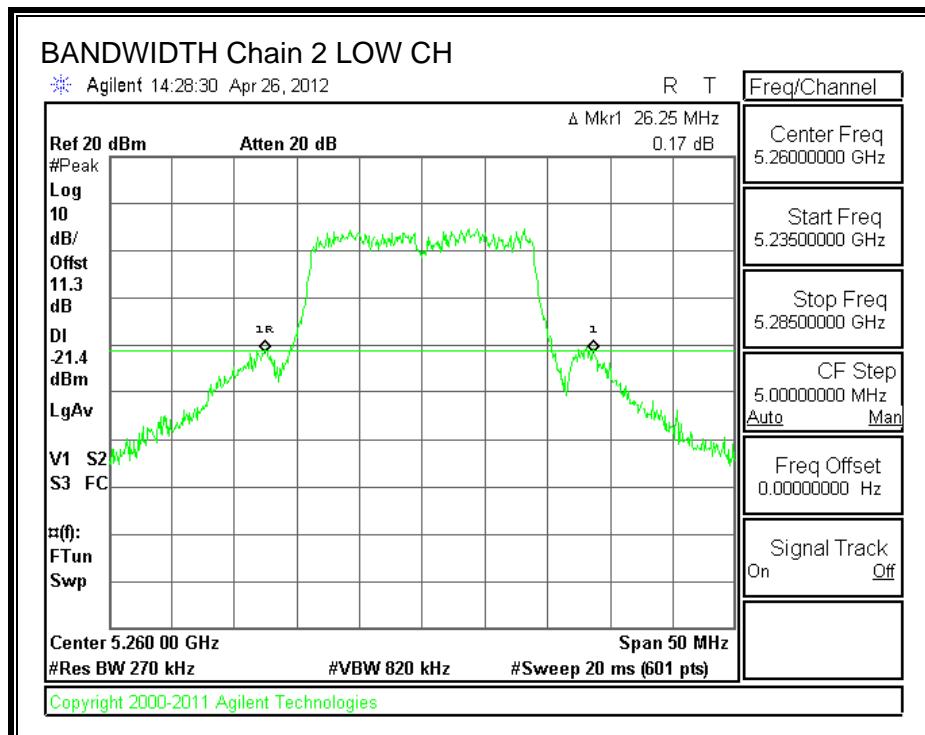
Channel	Frequency (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)	26 dB BW Chain 3 (MHz)
Low	5260	26.58	26.25	26.42
Mid	5300	26.00	25.58	26.67
High	5320	26.00	26.17	26.33

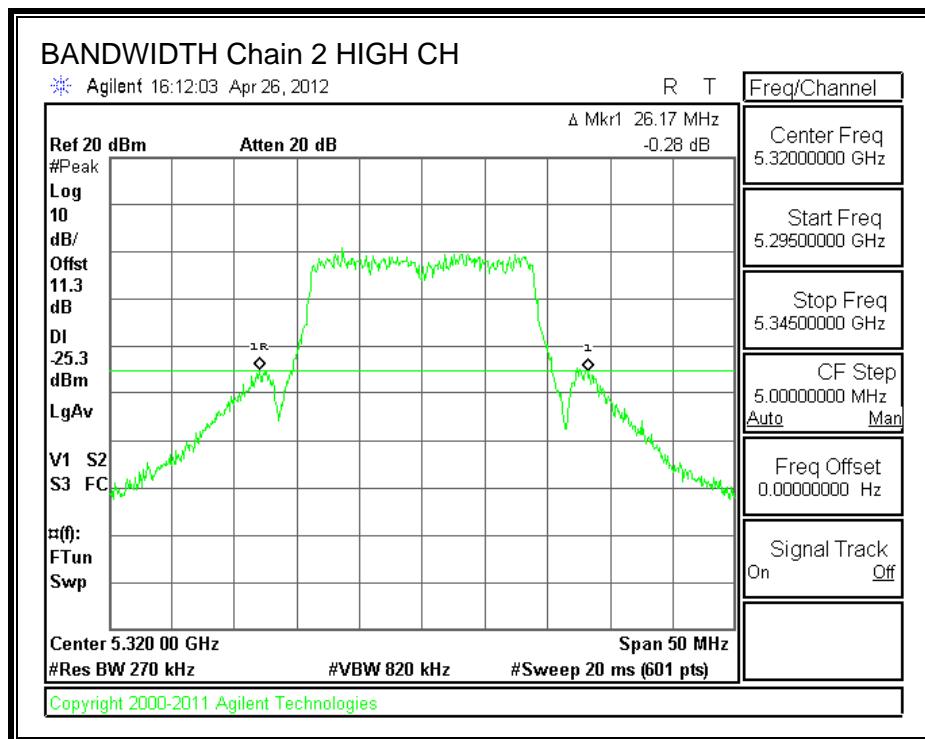
26 dB BANDWIDTH, Chain 1



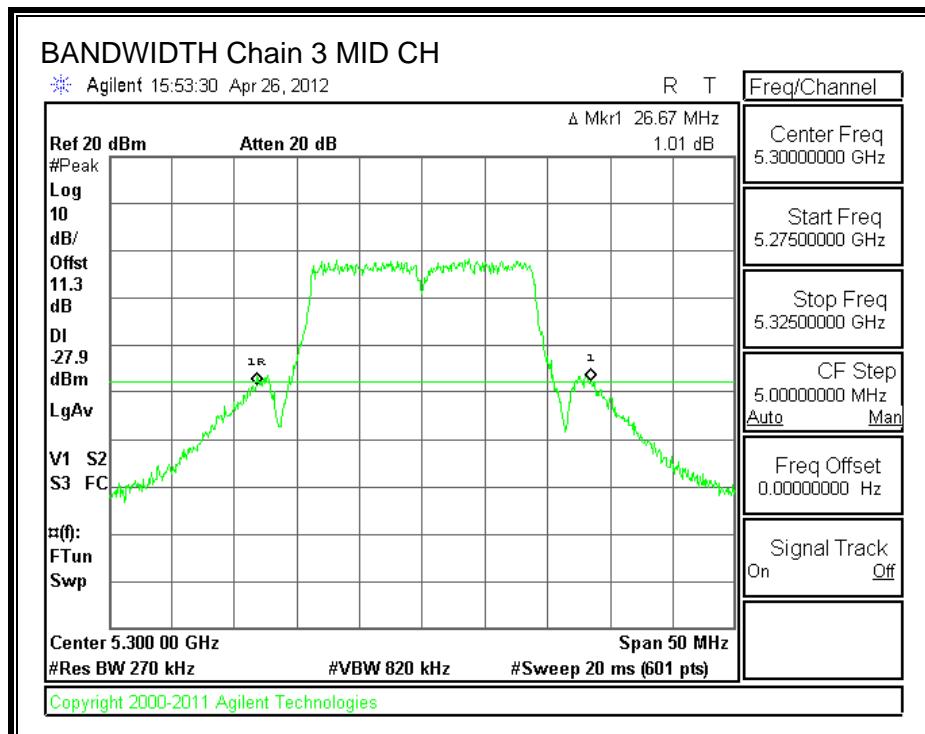
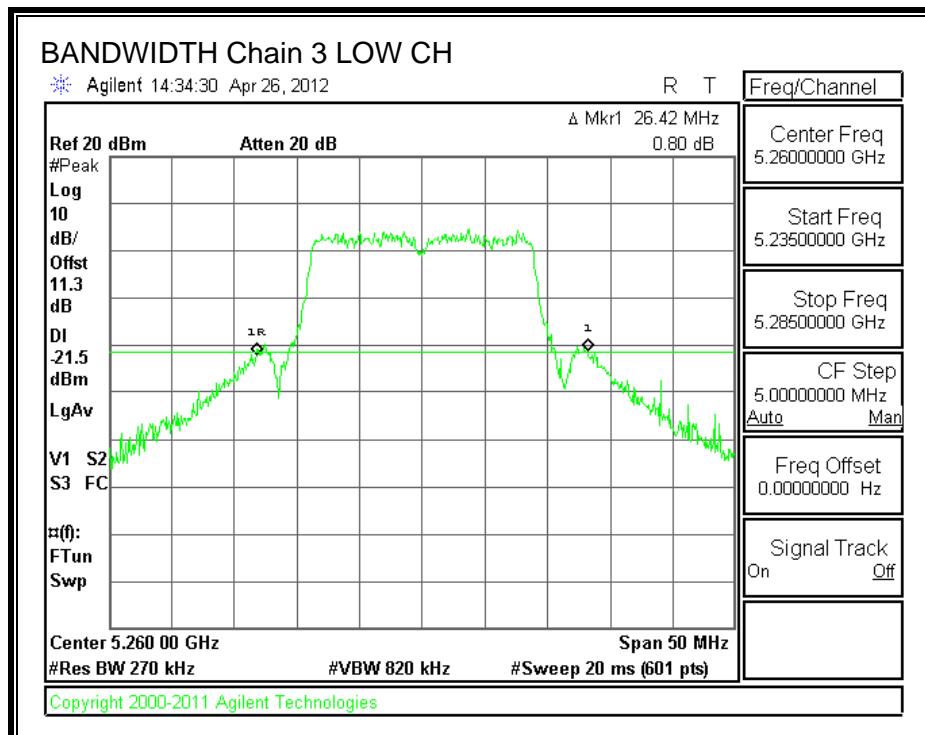


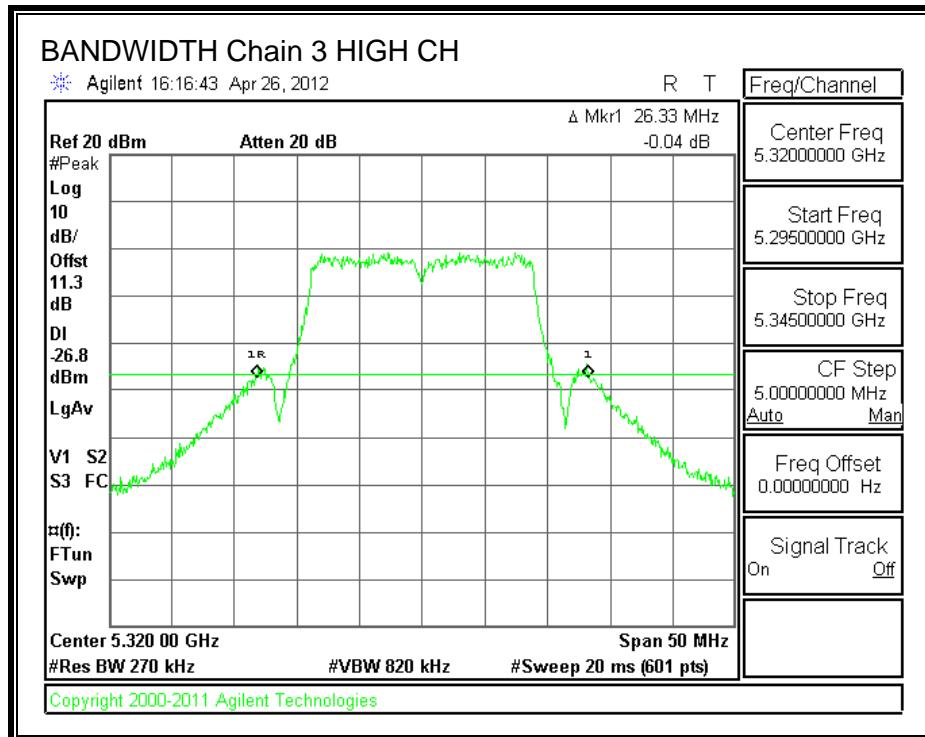
26 dB BANDWIDTH, Chain 2





26 dB BANDWIDTH, Chain 3





8.7.2. 99% BANDWIDTH

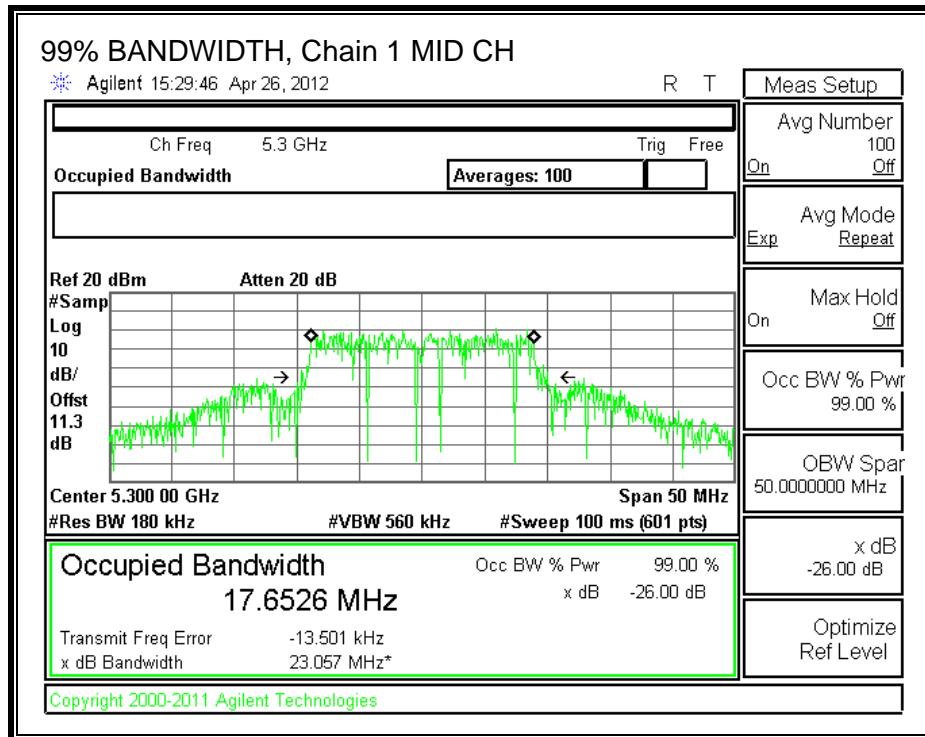
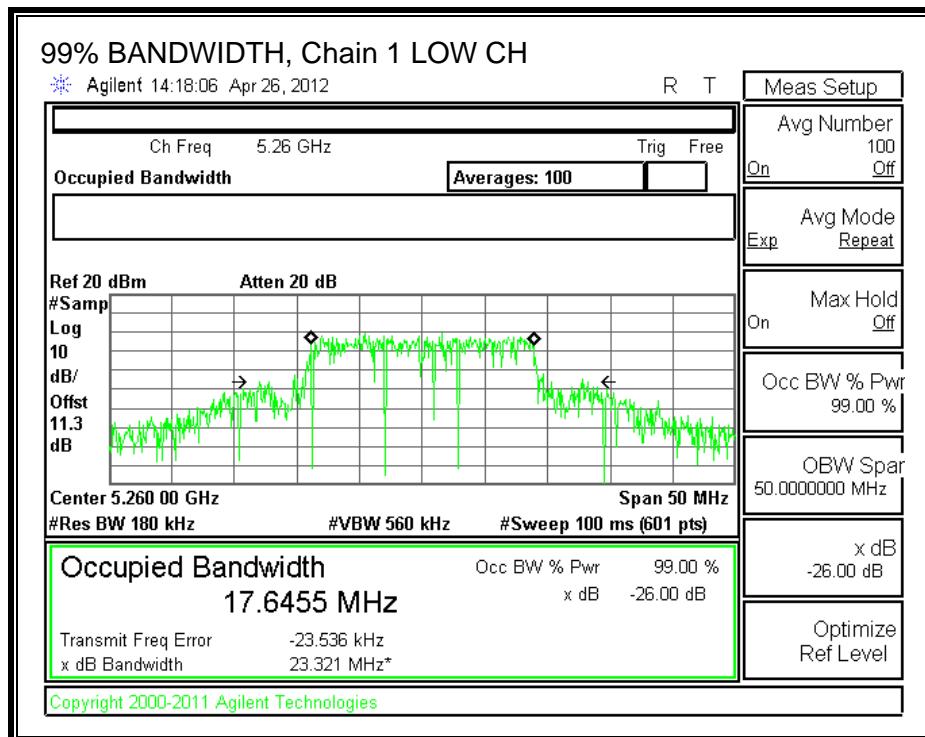
LIMITS

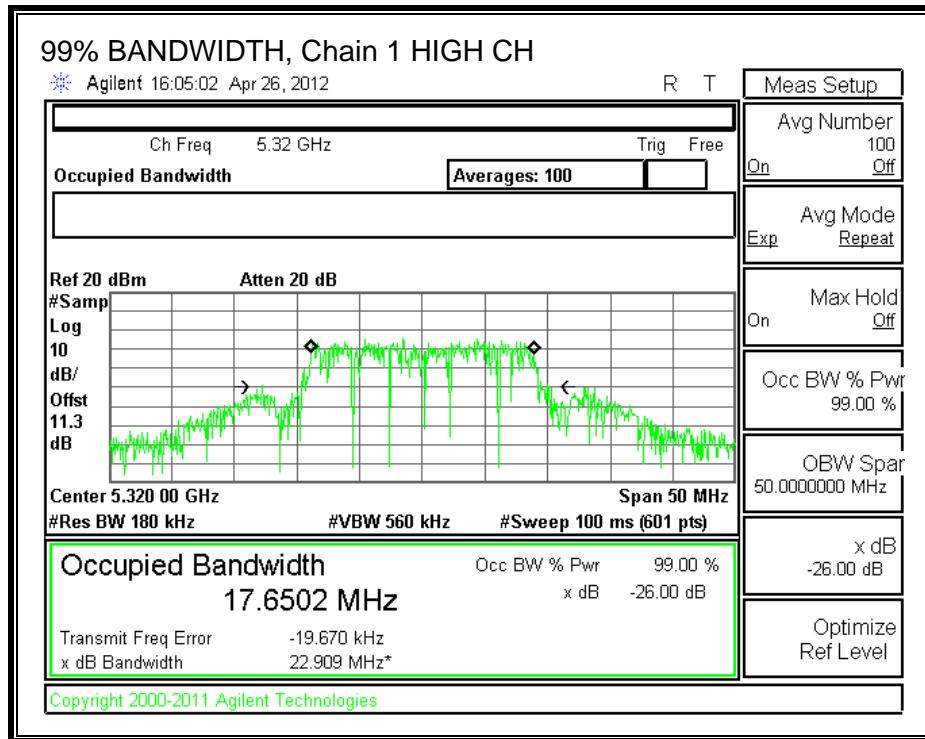
None; for reporting purposes only.

RESULTS

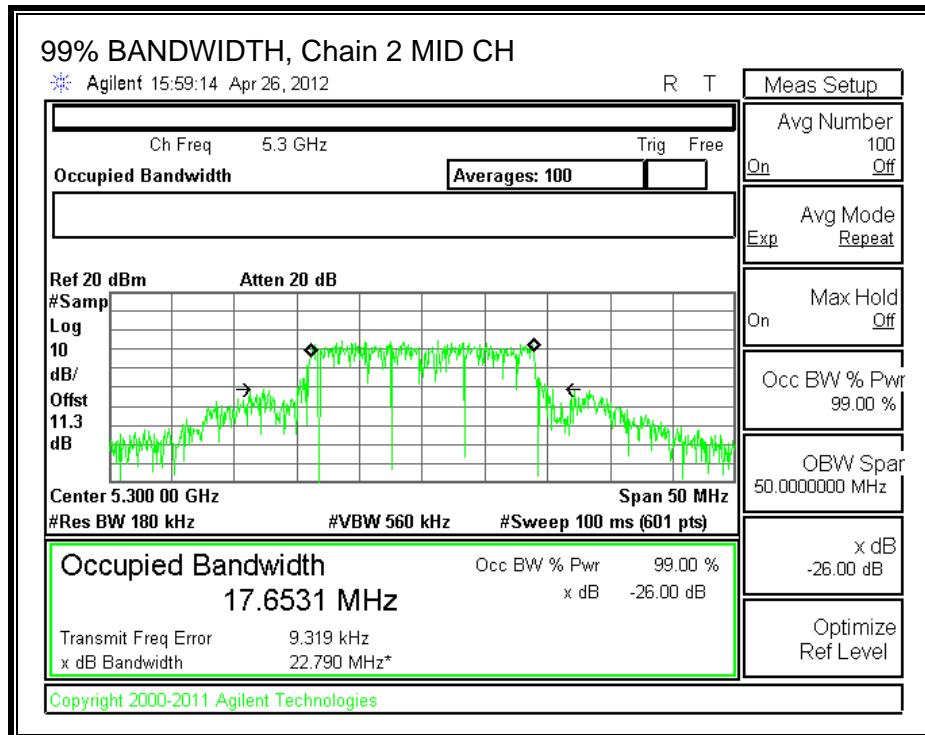
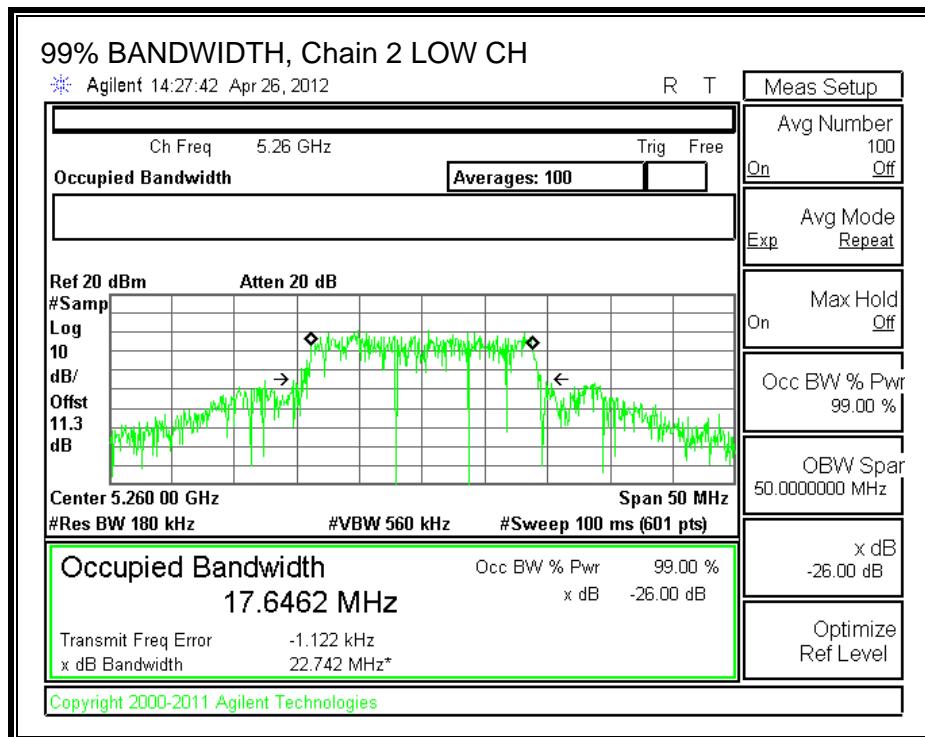
Channel	Frequency (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)	99% BW Chain 3 (MHz)
Low	5260	17.6455	17.6462	17.6635
Mid	5300	17.6526	17.6531	17.6499
High	5320	17.6502	17.6598	17.6742

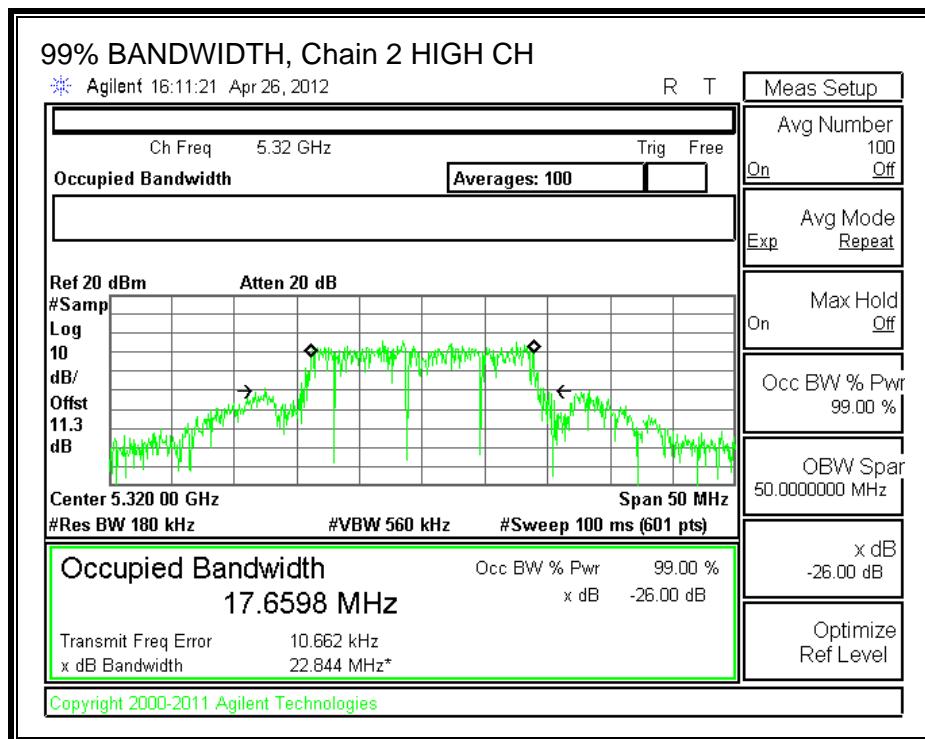
99% BANDWIDTH, Chain 1



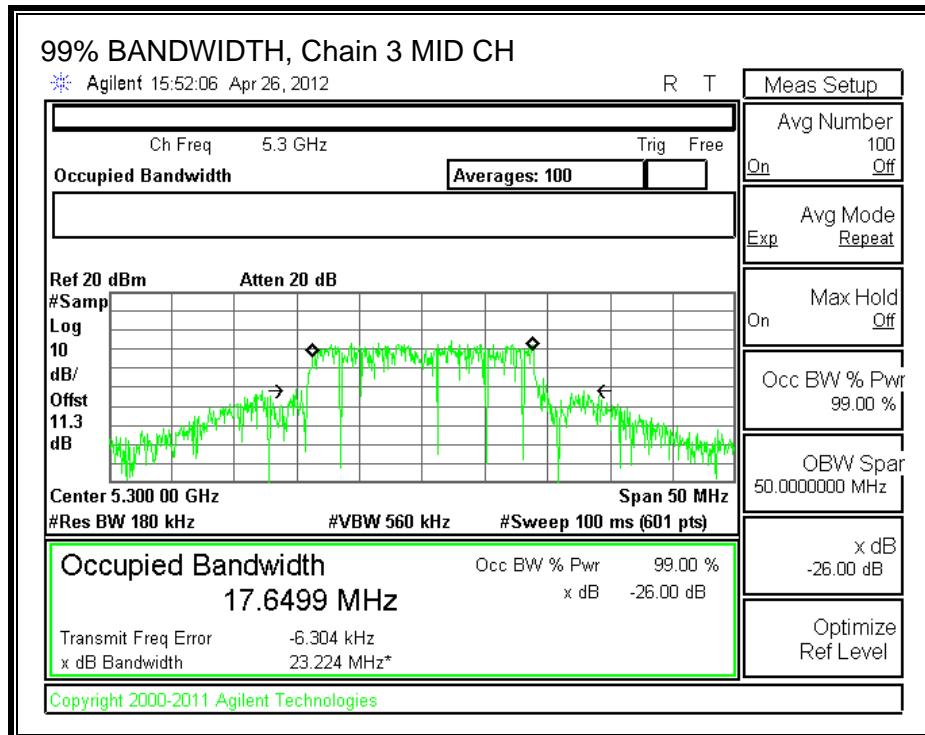
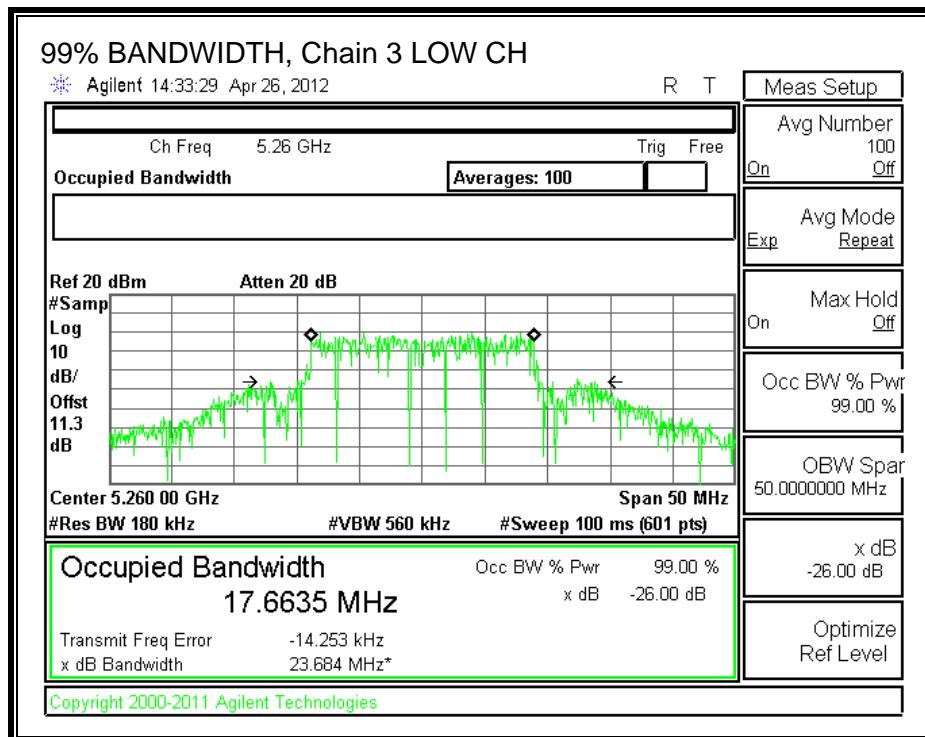


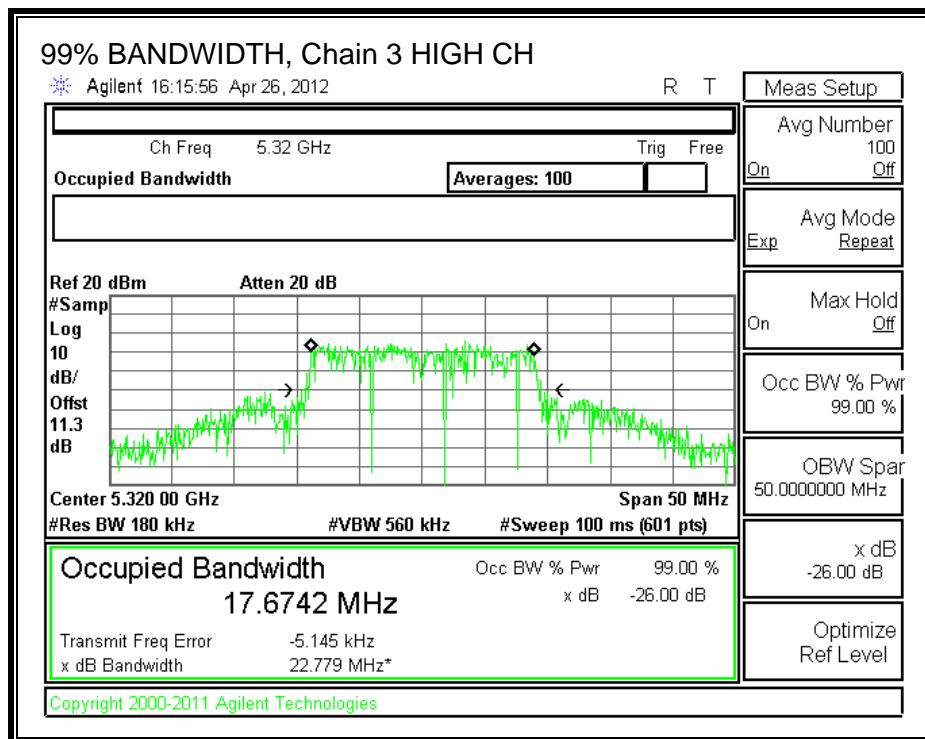
99% BANDWIDTH, Chain 2





99% BANDWIDTH, Chain 3





8.7.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak 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 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

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

Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Chain 3 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.53	1.34	1.96	7.92

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5260	24	26.25	25.19	7.92	22.08	9.08
Mid	5300	24	25.58	25.08	7.92	22.08	9.08
High	5320	24	26.00	25.15	7.92	22.08	9.08

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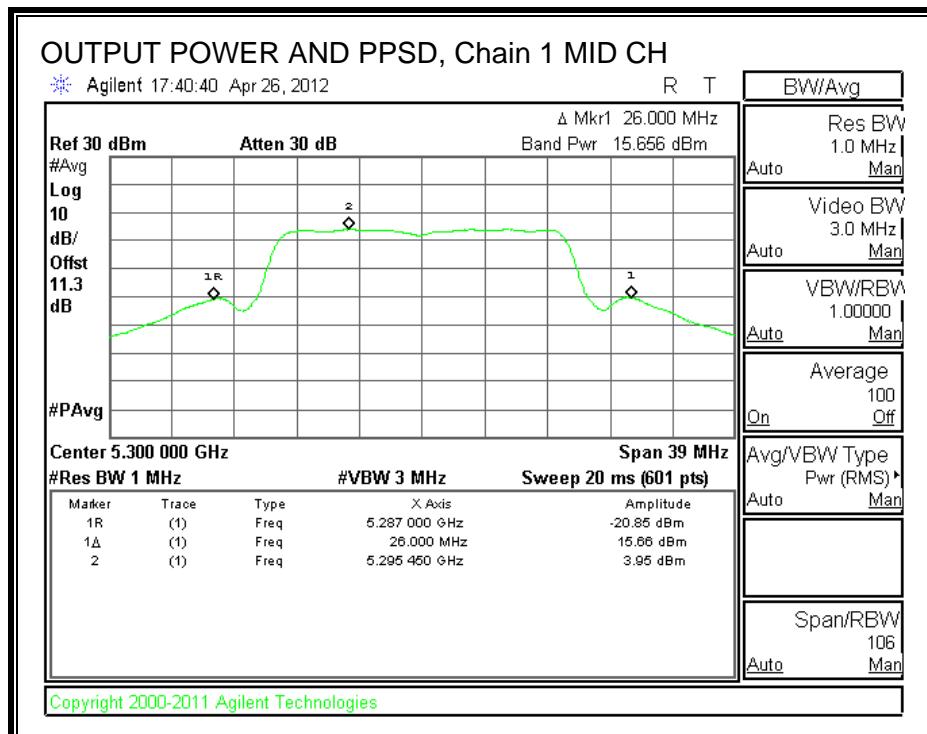
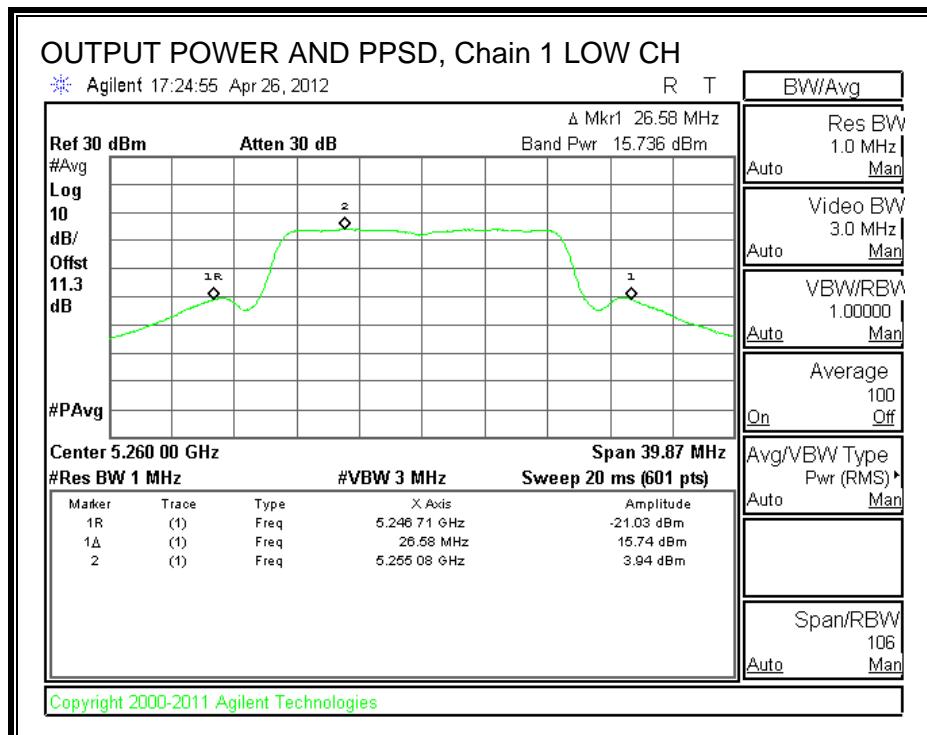
Output Power Results

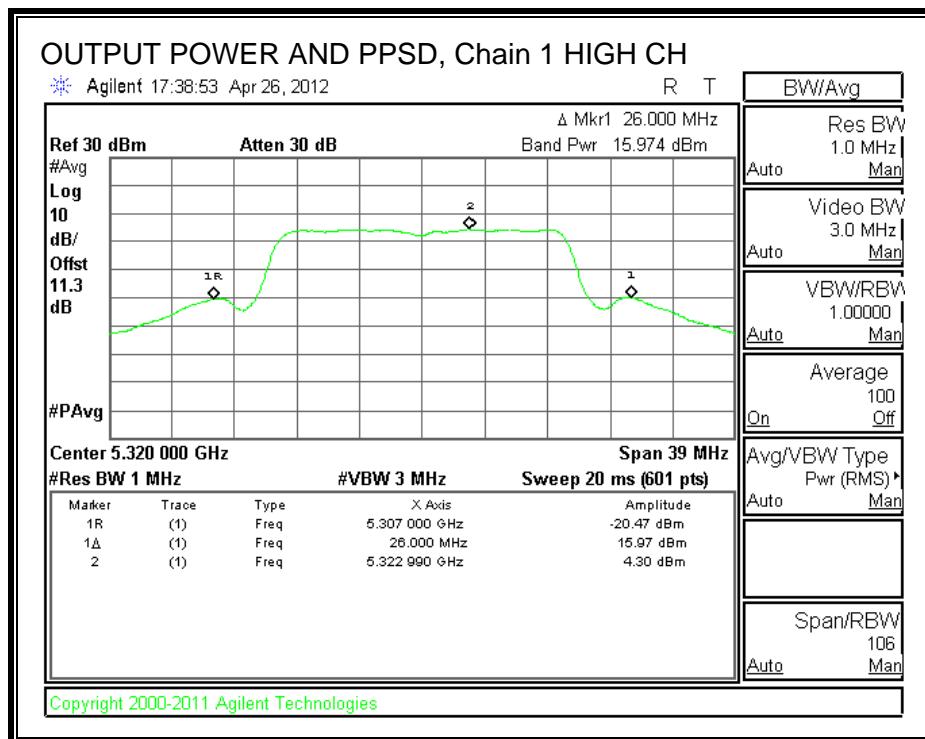
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Chain 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	15.736	15.619	15.389	20.355	22.08	-1.725
Mid	5300	15.656	15.638	15.230	20.284	22.08	-1.796
High	5320	15.974	15.859	15.254	20.478	22.08	-1.602

PPSD Results

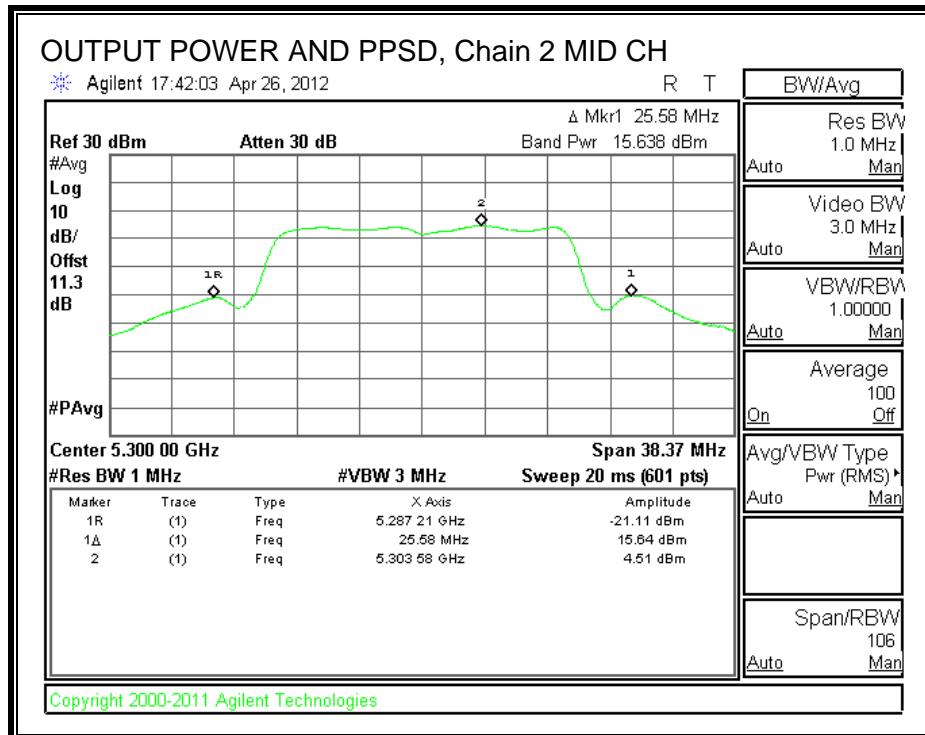
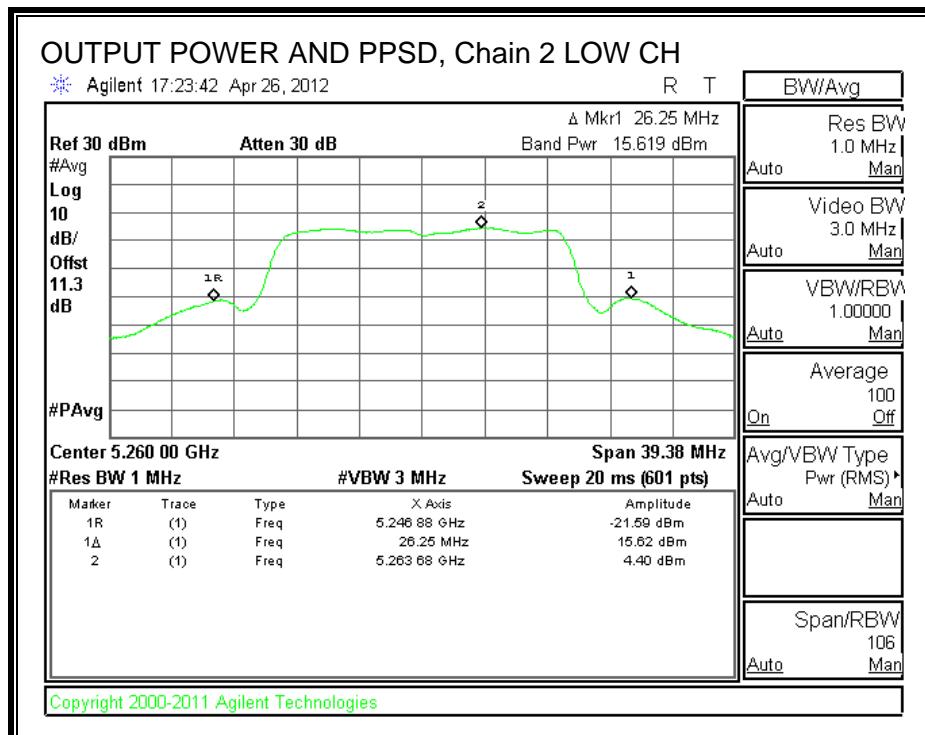
Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Chain 3 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	3.94	4.40	3.84	8.84	9.08	-0.24
Mid	5300	3.95	4.51	3.74	8.85	9.08	-0.23
High	5320	4.30	4.69	3.72	9.03	9.08	-0.05

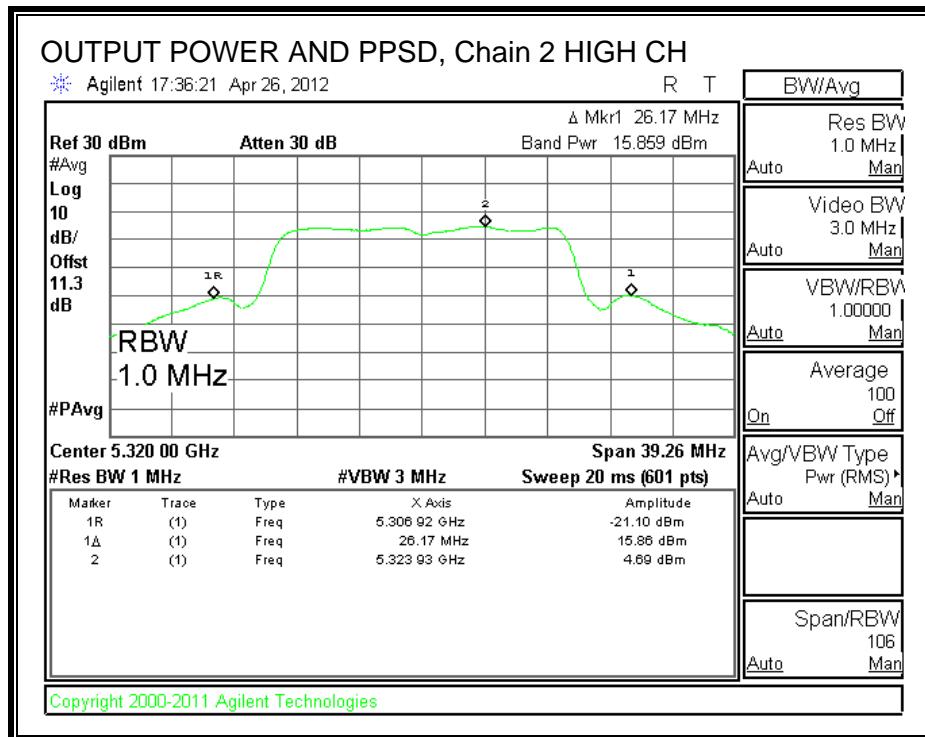
OUTPUT POWER AND PPSD, Chain 1



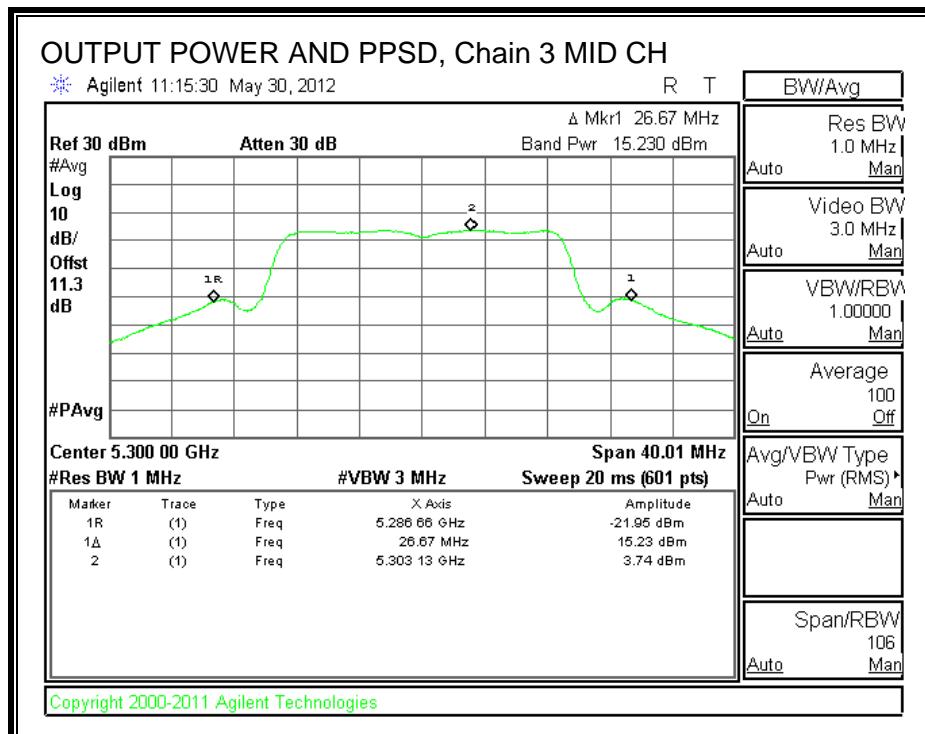
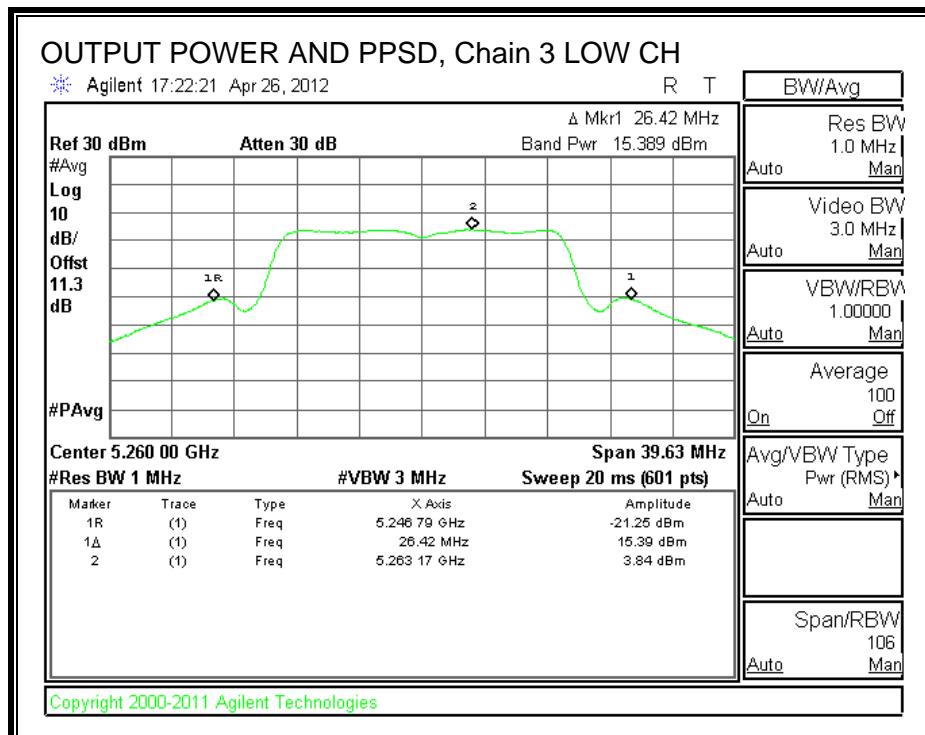


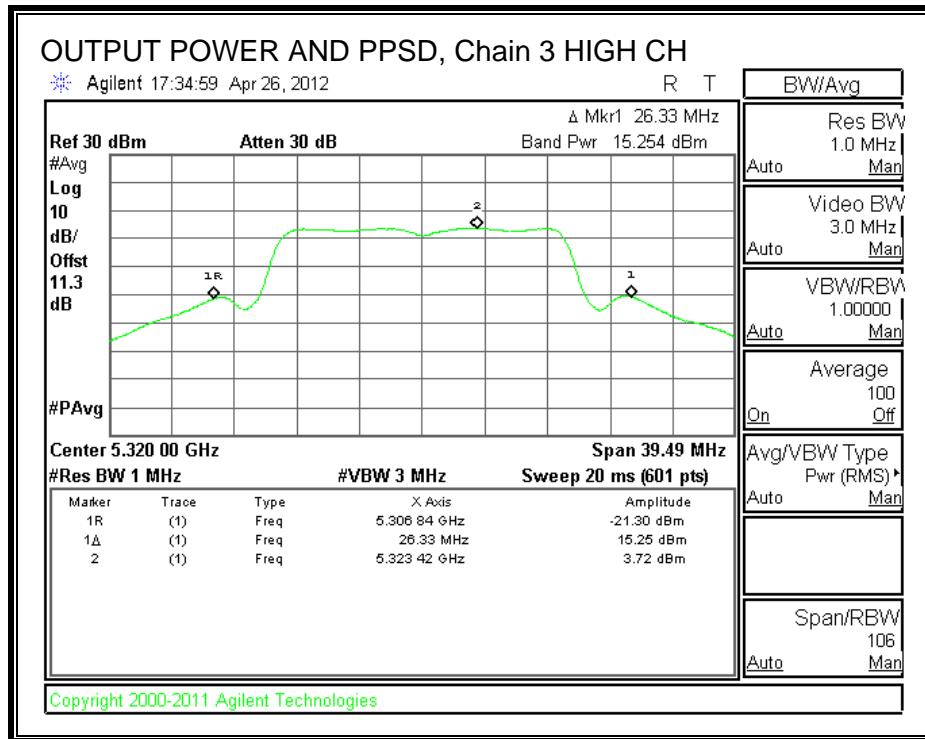
OUTPUT POWER AND PPSD, Chain 2





OUTPUT POWER AND PPSD, Chain 3





8.7.4. PEAK EXCURSION

LIMITS

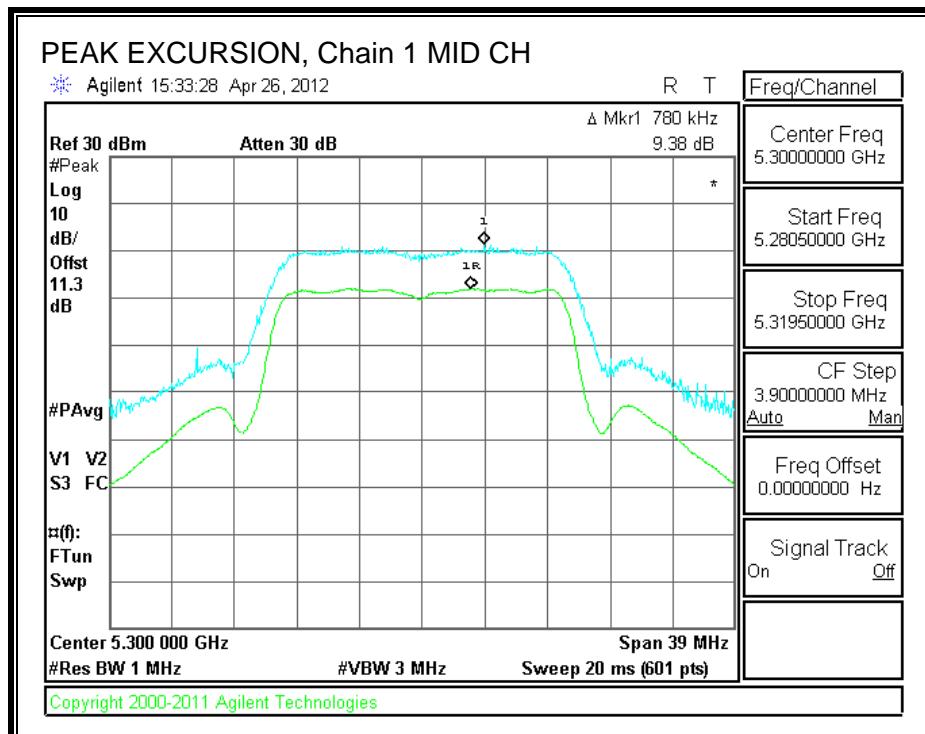
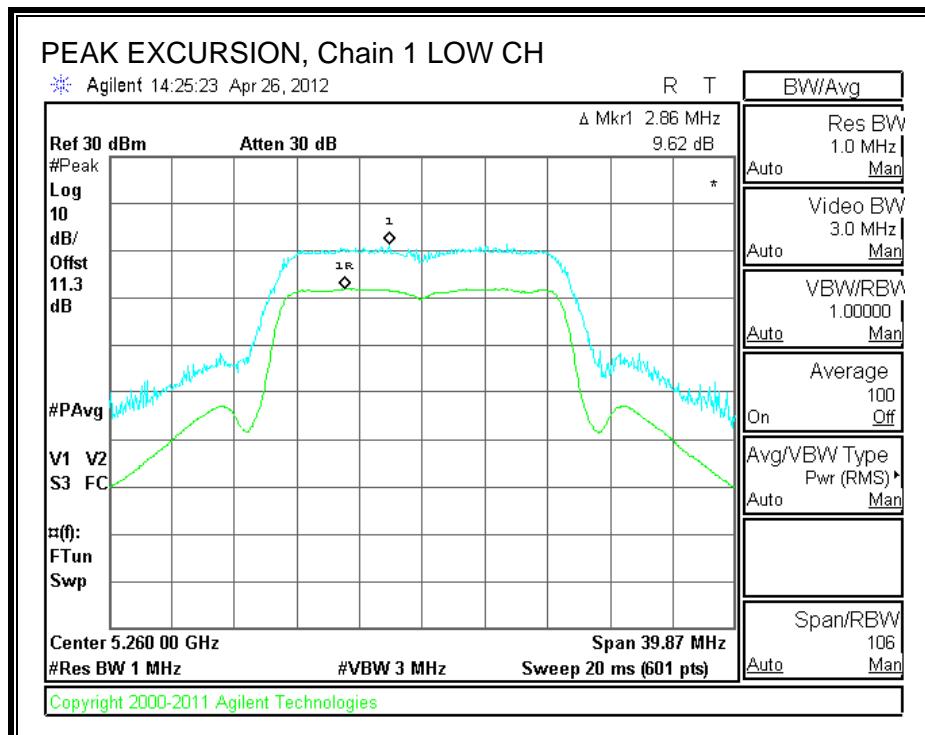
FCC §15.407 (a) (6)

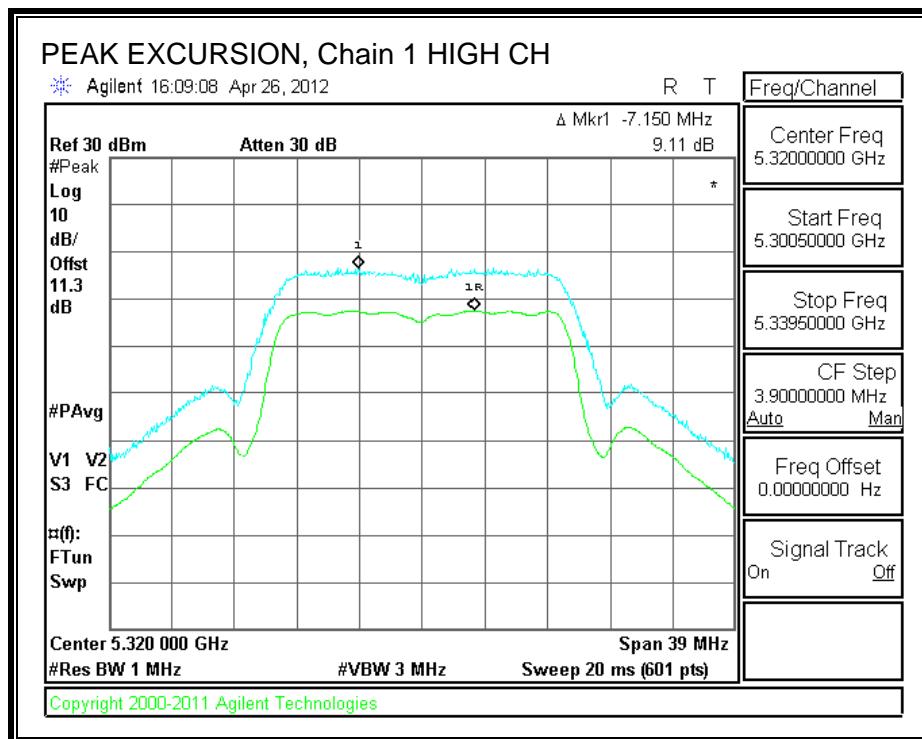
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

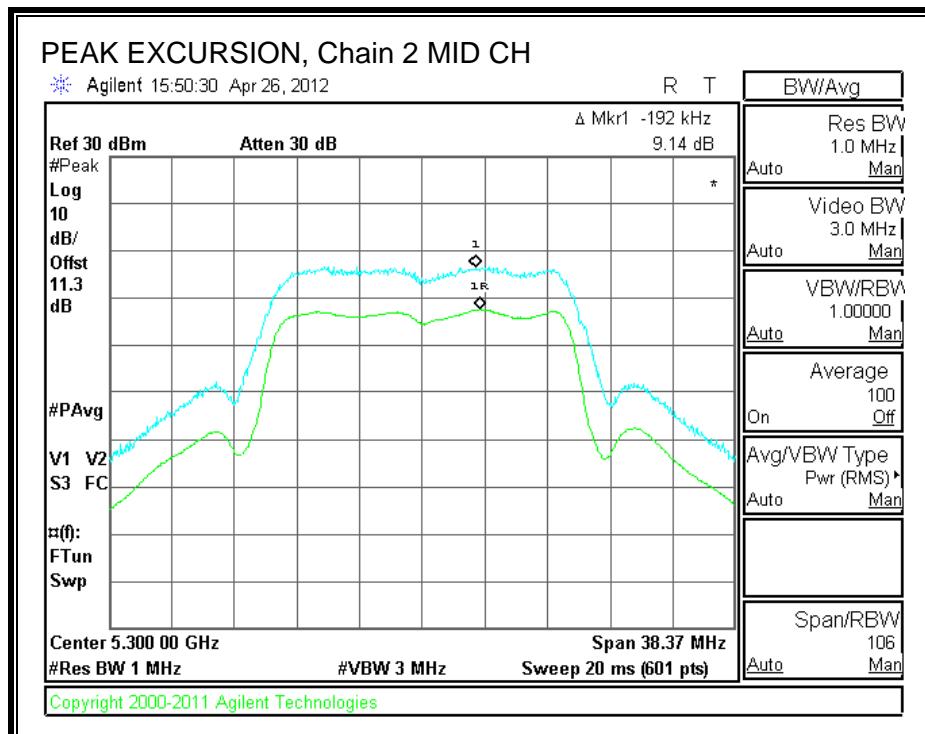
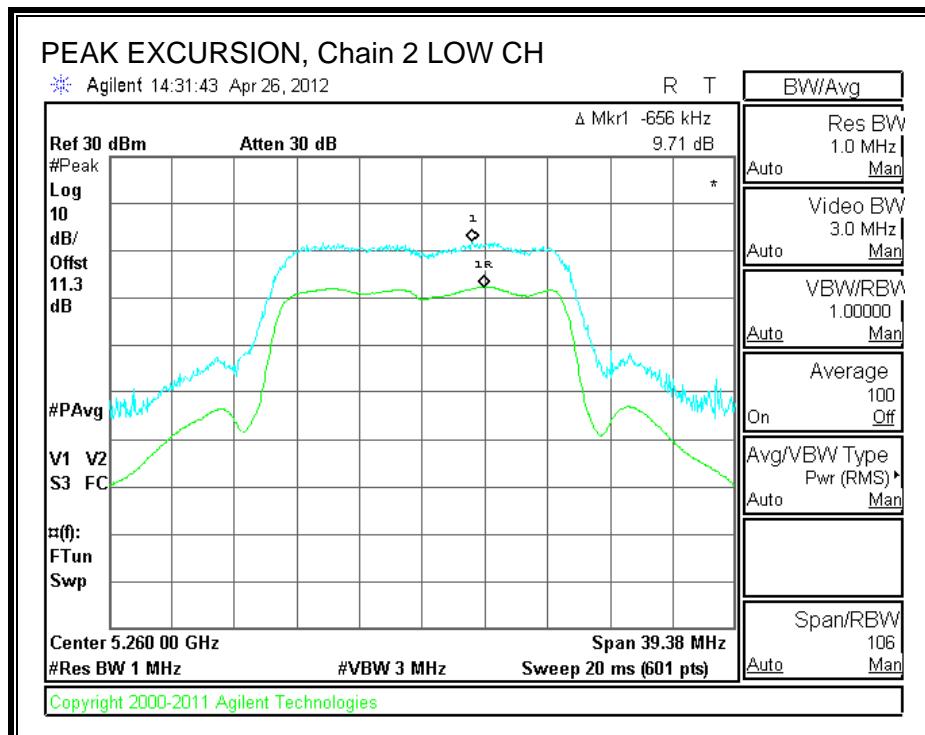
Channel	Frequency (MHz)	Pk Exc Chain 1 (dB)	Pk Exc Chain 2 (dB)	Pk Exc Chain 3 (dB)	Limit (dB)	Worst-Case Margin (dB)
Low	5260	9.62	9.71	10.30	13	-2.7
Mid	5300	9.38	9.14	10.80	13	-2.2
High	5320	9.11	9.22	10.06	13	-2.9

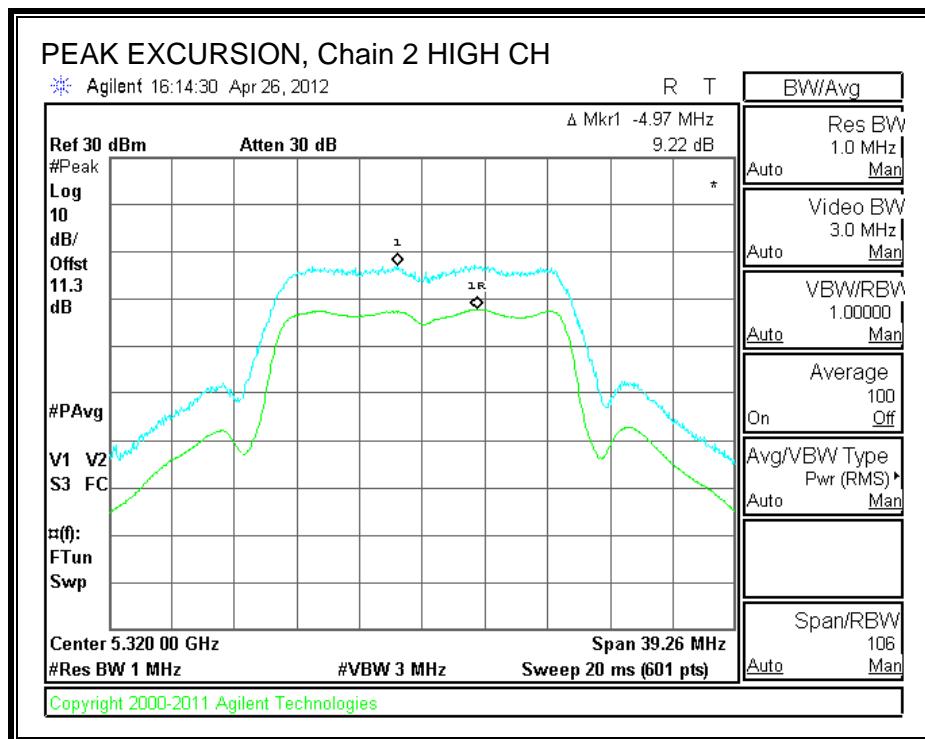
PEAK EXCURSION, Chain 1



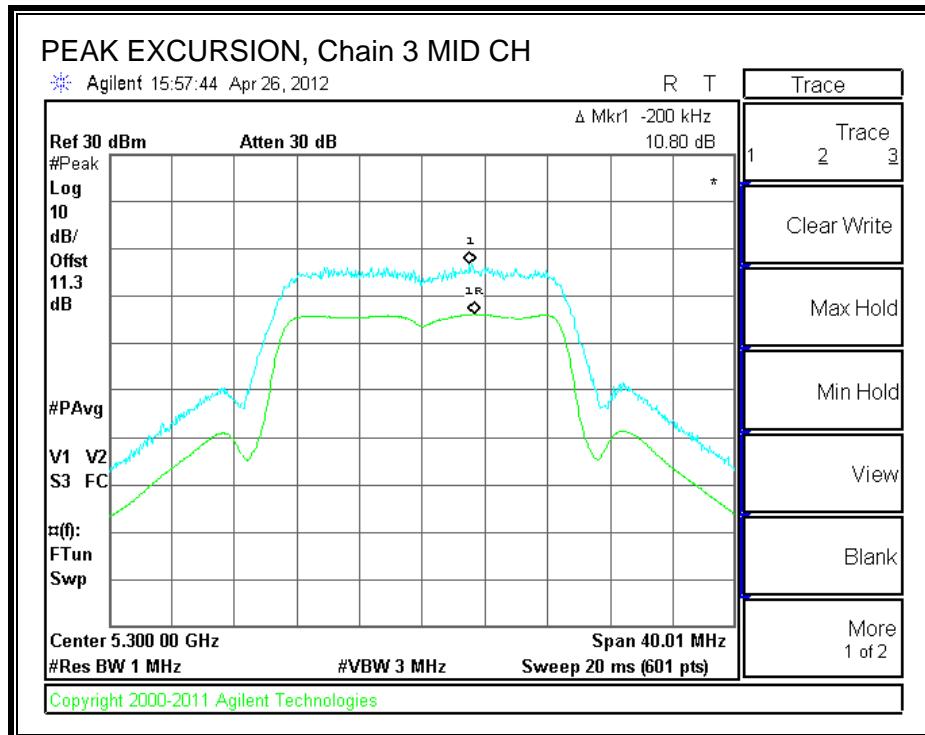
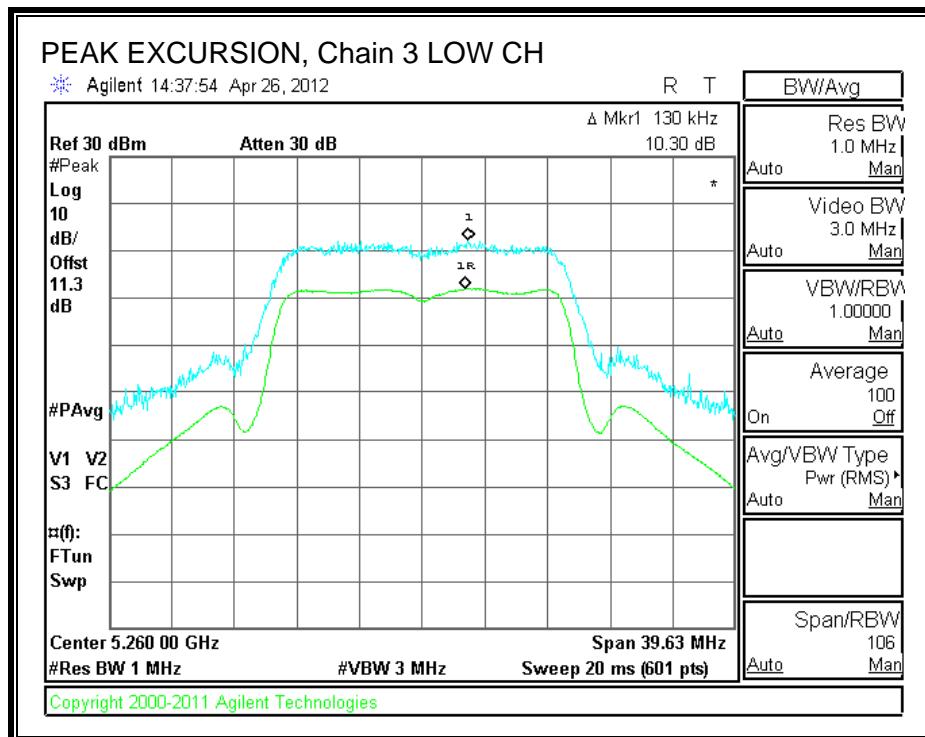


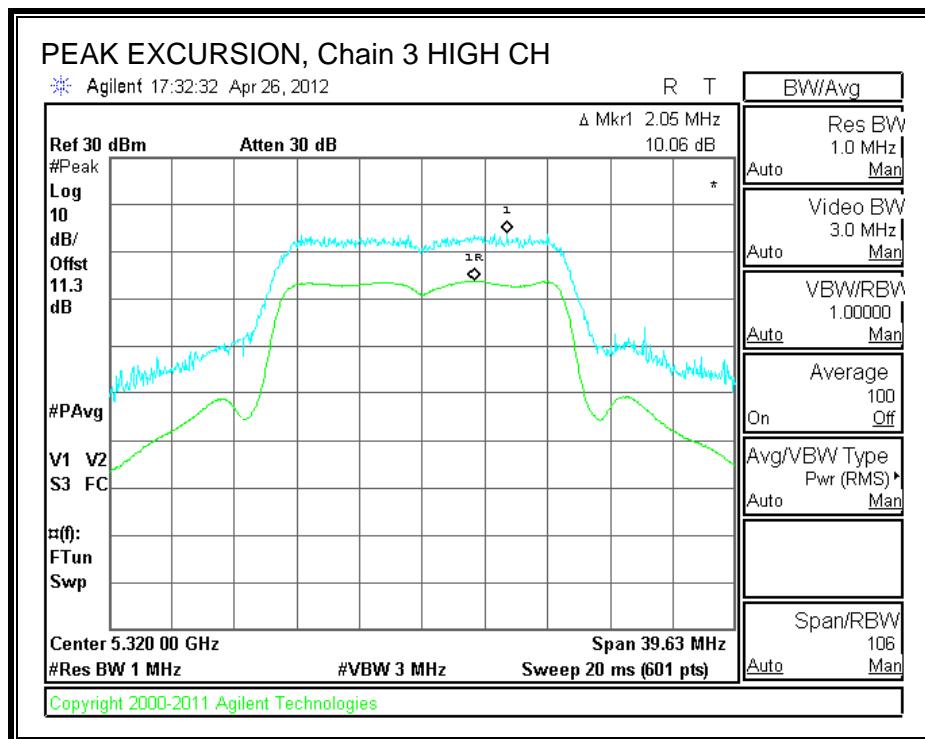
PEAK EXCURSION, Chain 2





PEAK EXCURSION, Chain 3





8.8. 802.11n HT20 SDM MCS21, 3TX, 5.3 GHz BAND

8.8.1. 26 dB BANDWIDTH

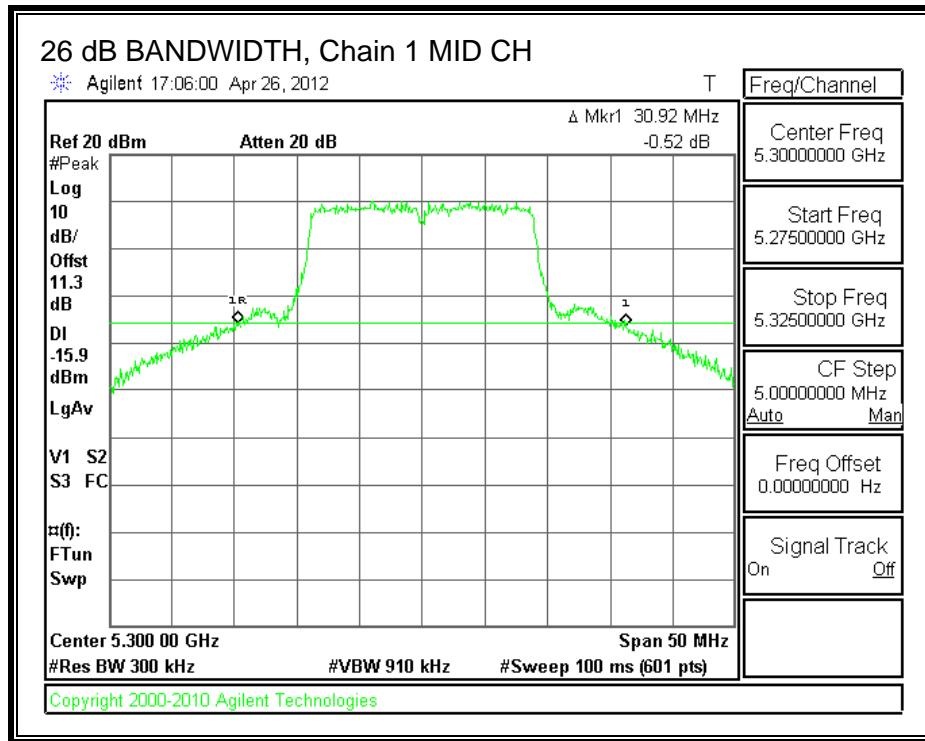
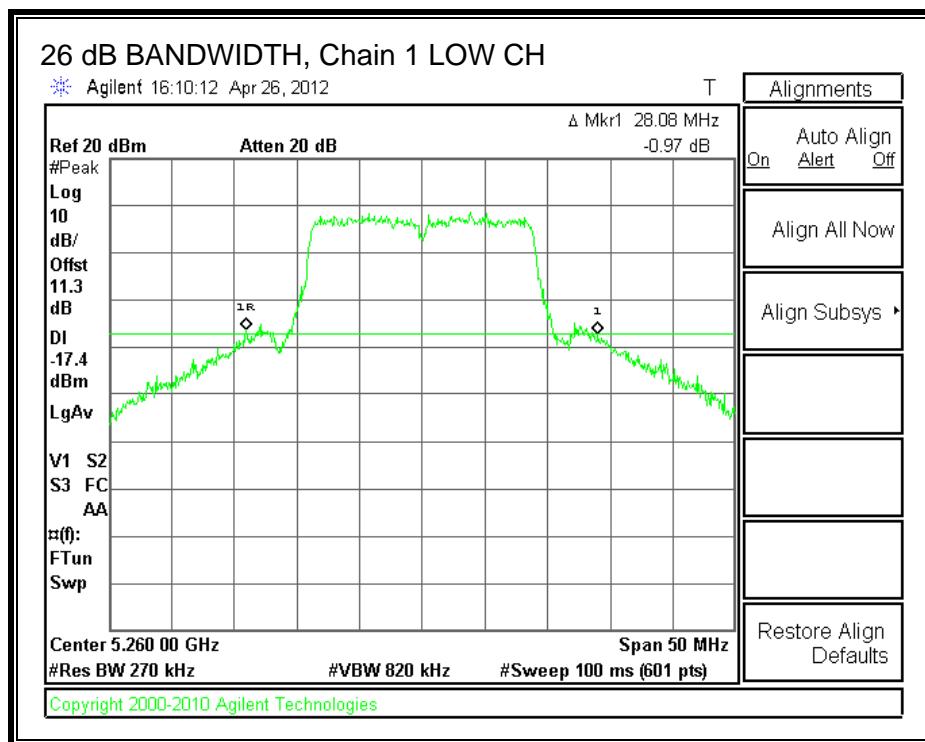
LIMITS

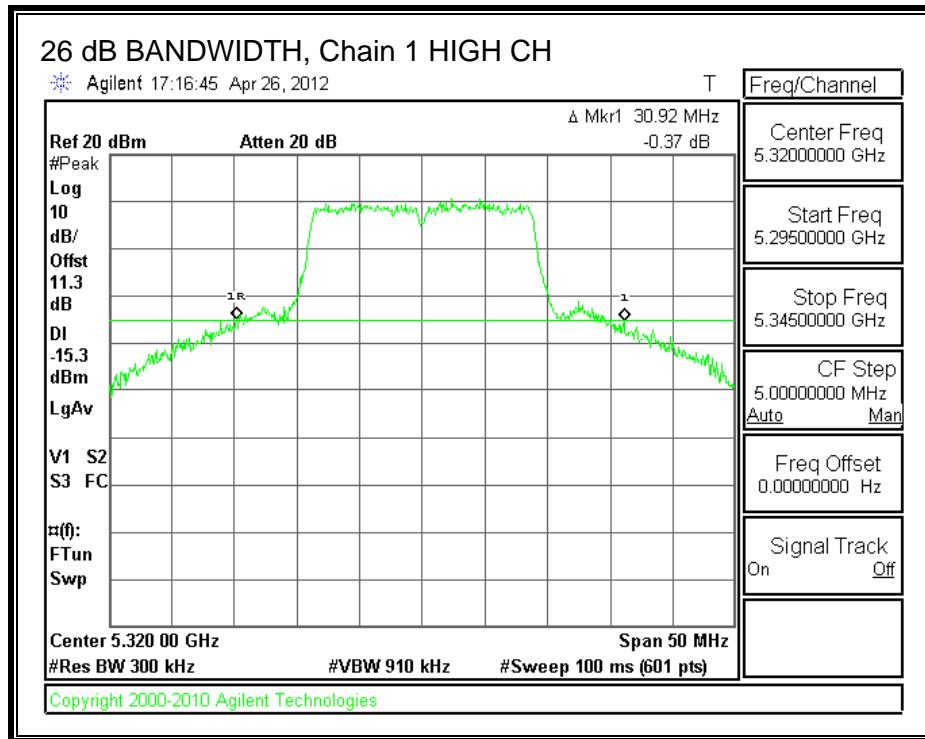
None; for reporting purposes only.

RESULTS

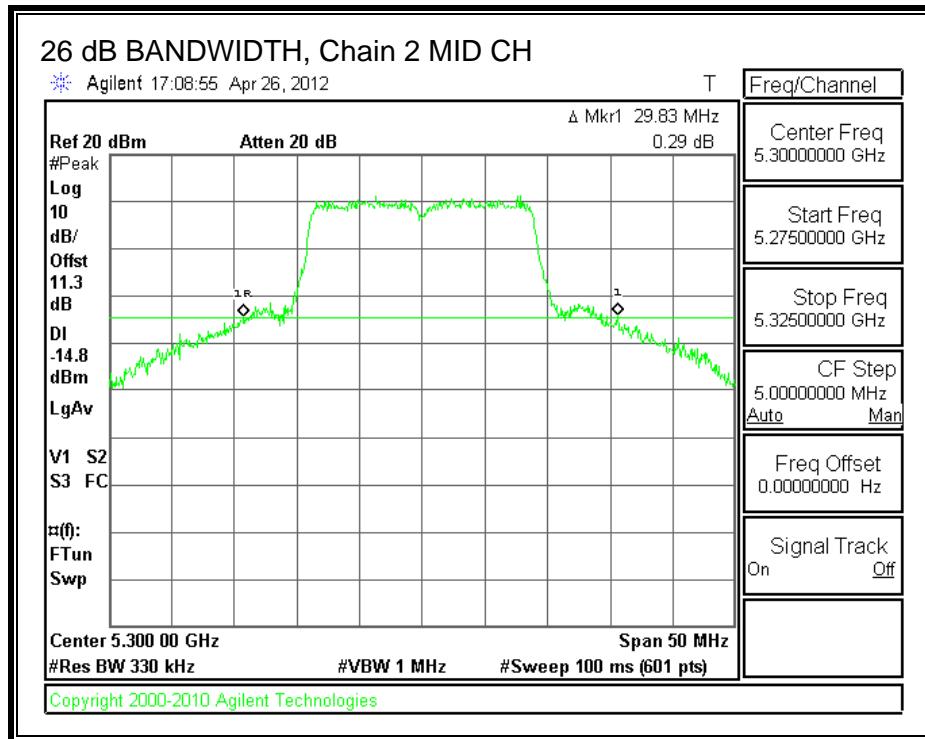
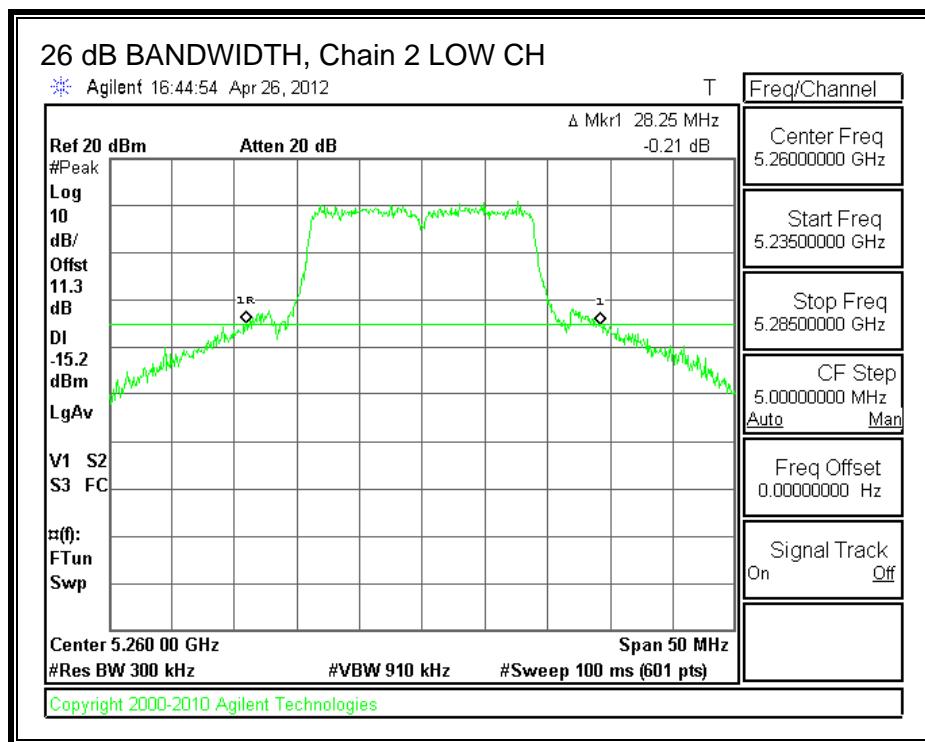
Channel	Frequency (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)	26 dB BW Chain 3 (MHz)
Low	5260	28.08	28.25	30.25
Mid	5300	30.92	29.83	29.67
High	5320	30.92	29.67	30.67

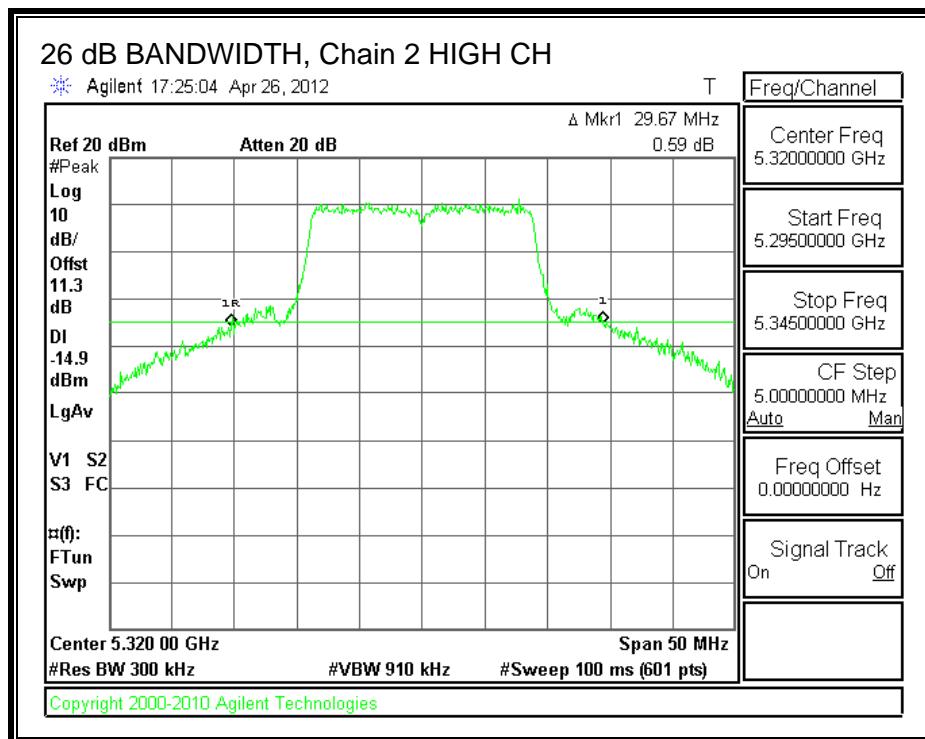
26 dB BANDWIDTH, Chain 1



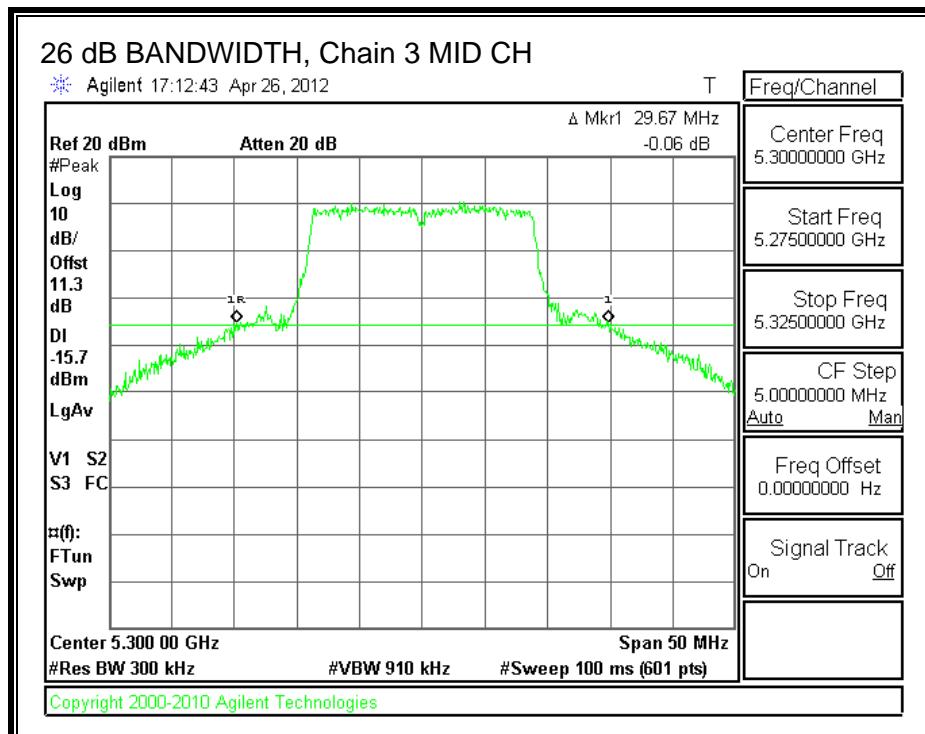
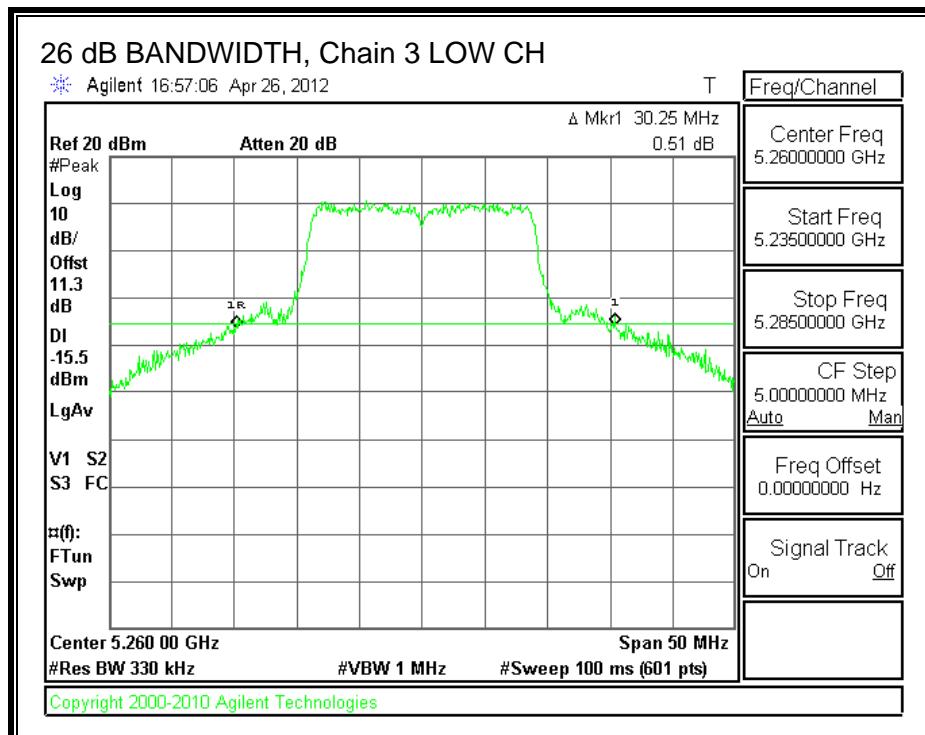


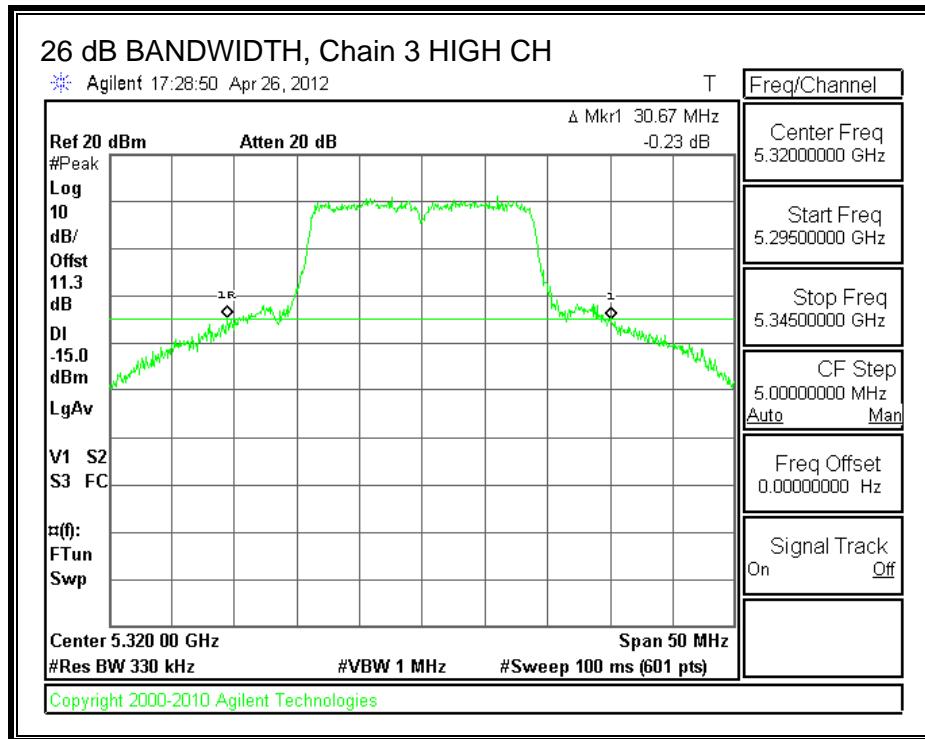
26 dB BANDWIDTH, Chain 2





26 dB BANDWIDTH, Chain 3





8.8.2. 99% BANDWIDTH

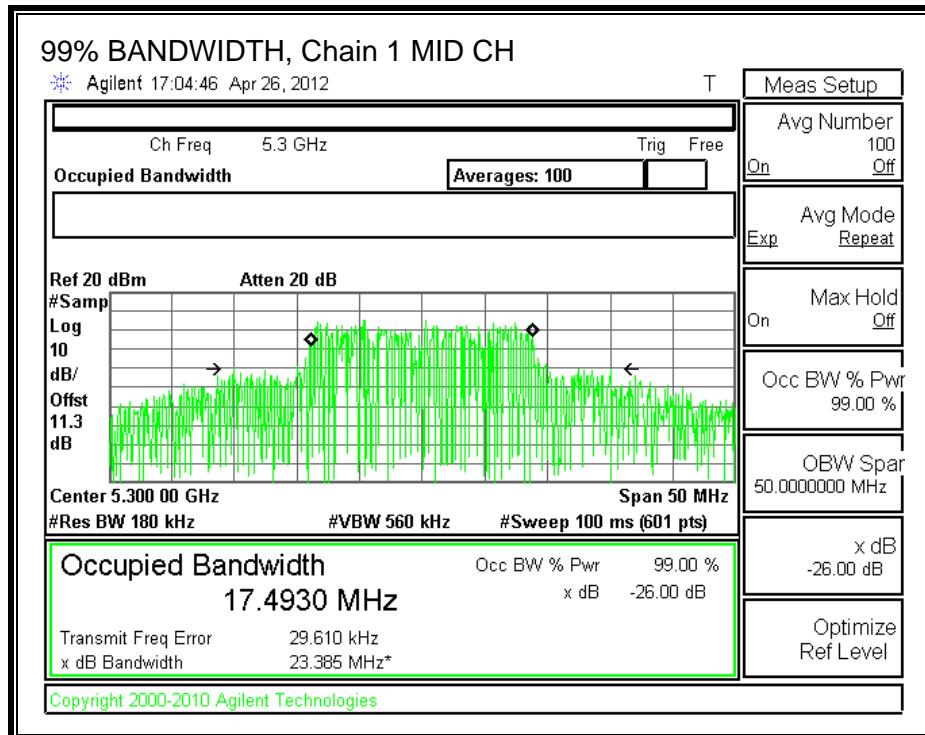
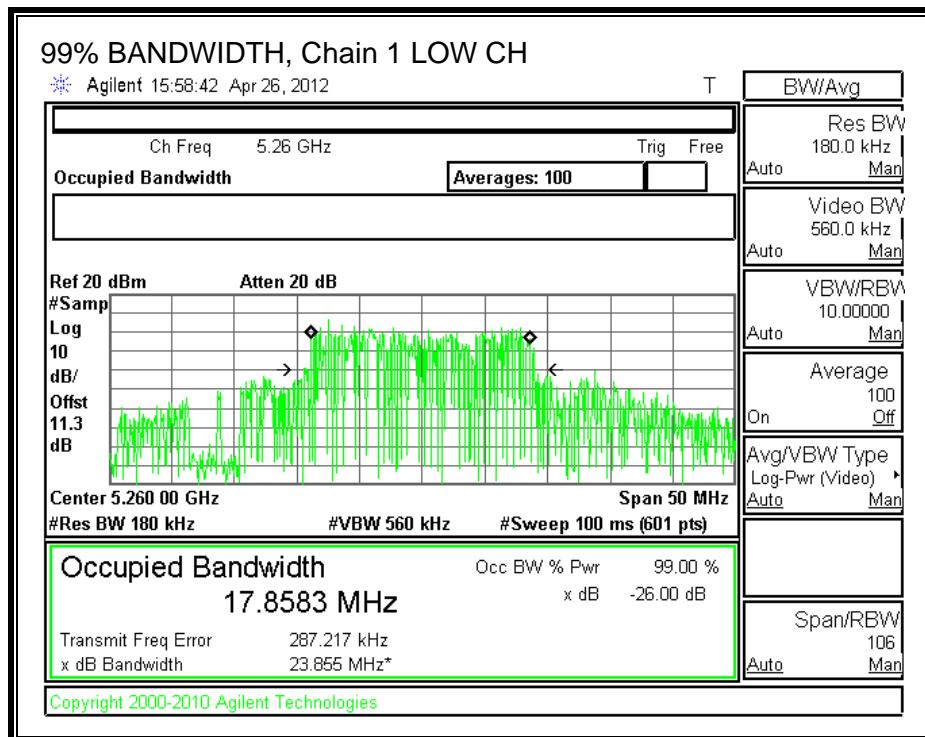
LIMITS

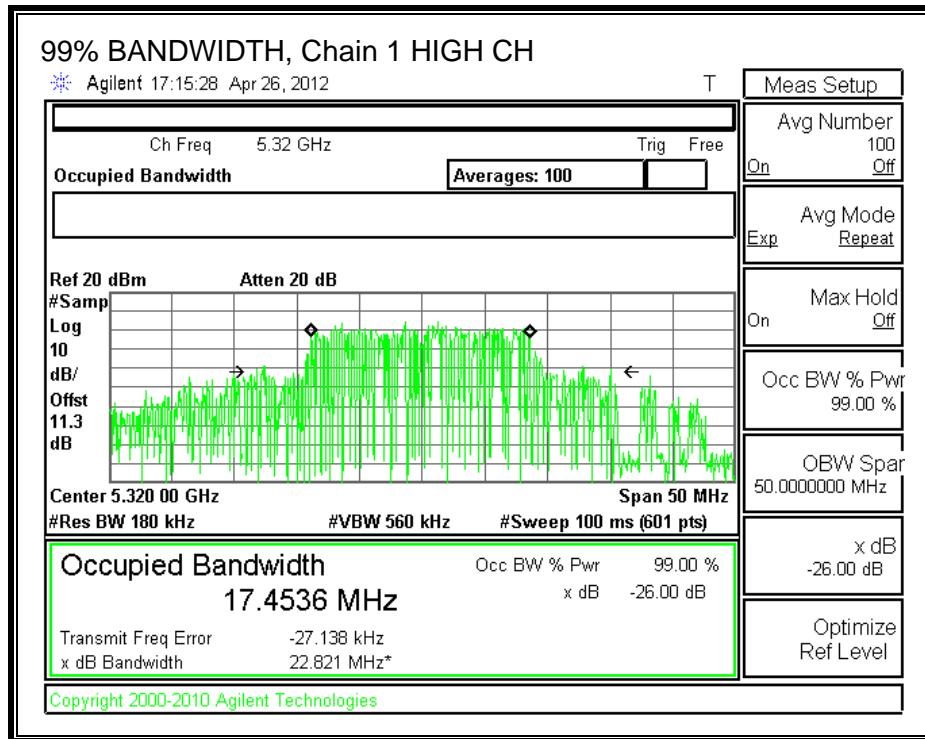
None; for reporting purposes only.

RESULTS

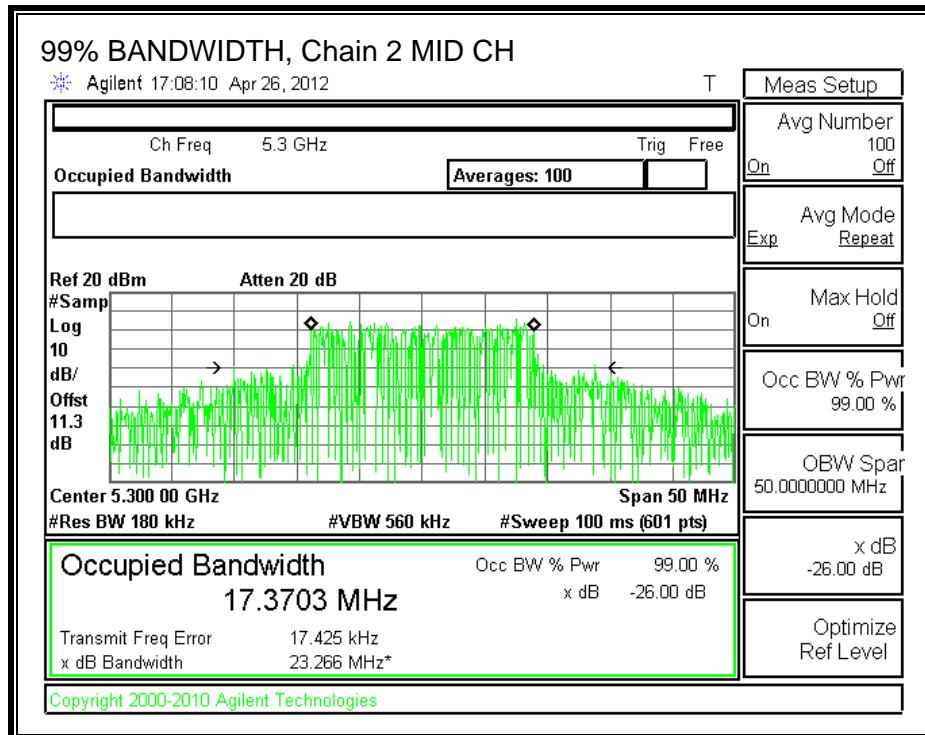
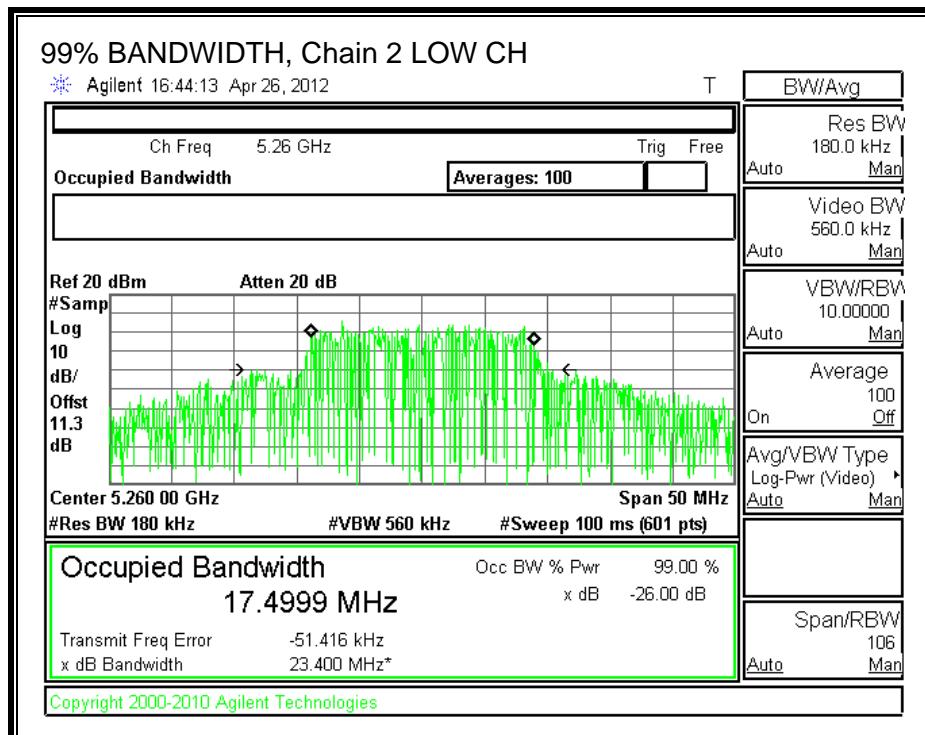
Channel	Frequency (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)	99% BW Chain 3 (MHz)
Low	5260	17.8583	17.4999	17.4393
Mid	5300	17.4930	17.3703	17.7508
High	5320	17.4536	17.5622	17.3297

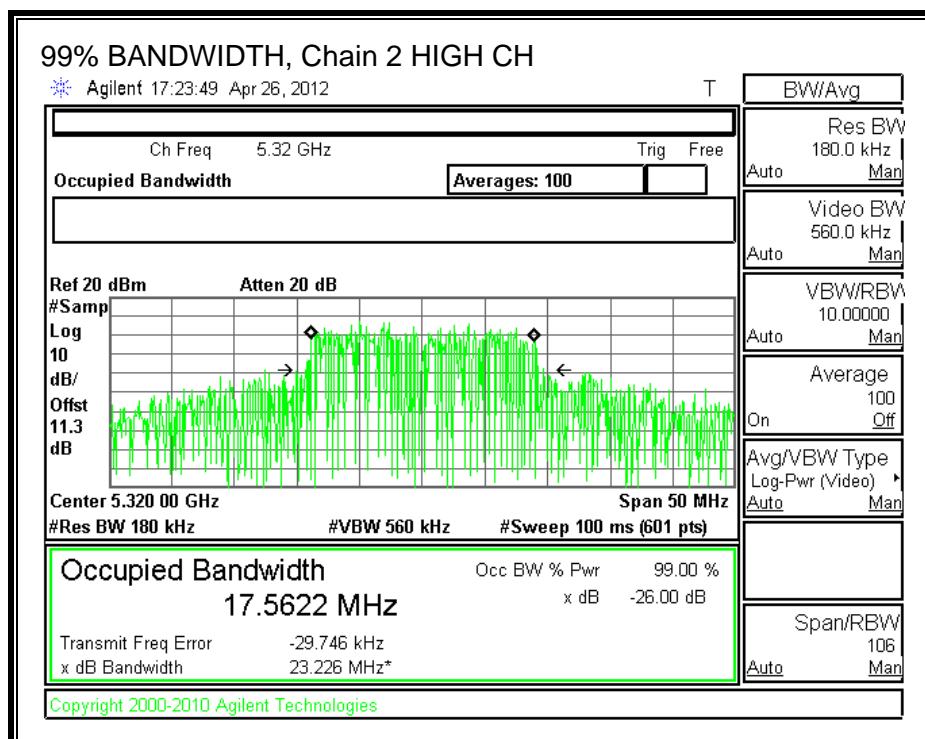
99% BANDWIDTH, Chain 1



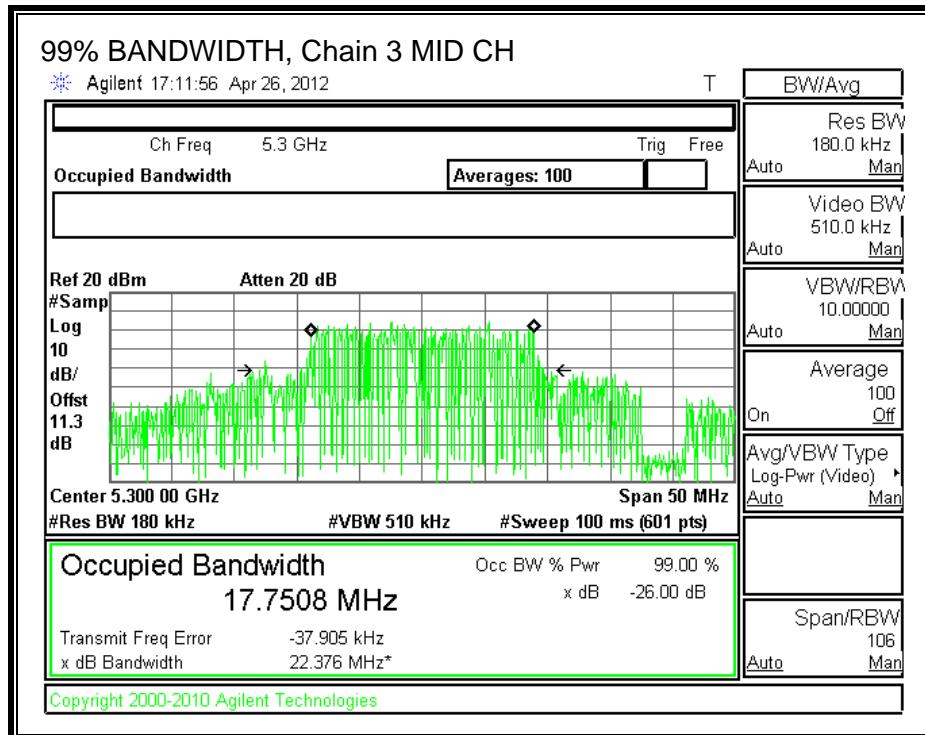
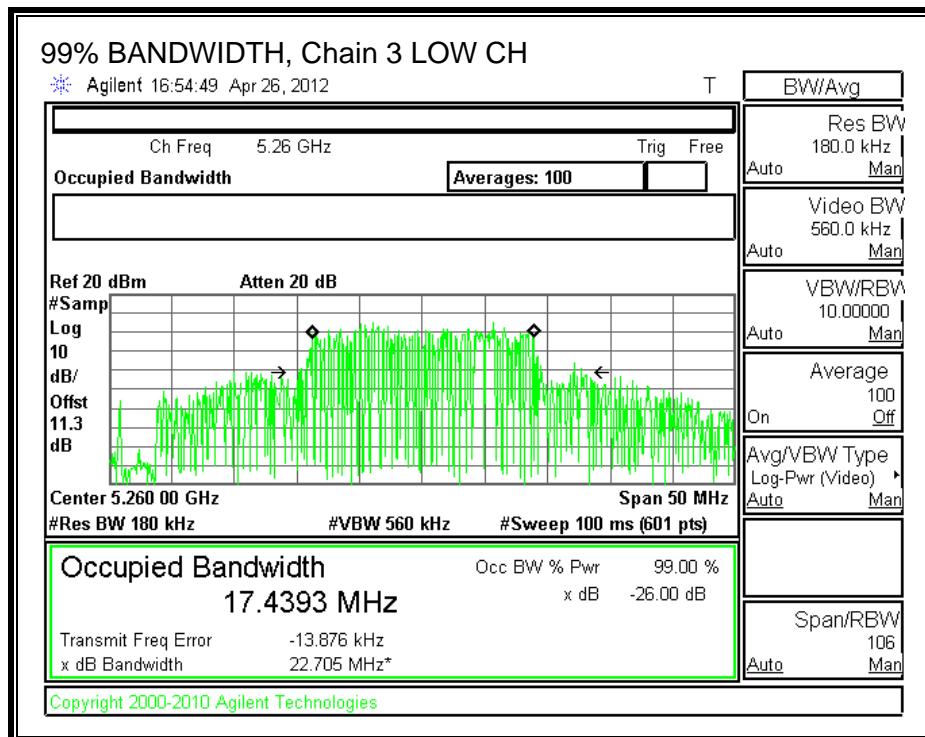


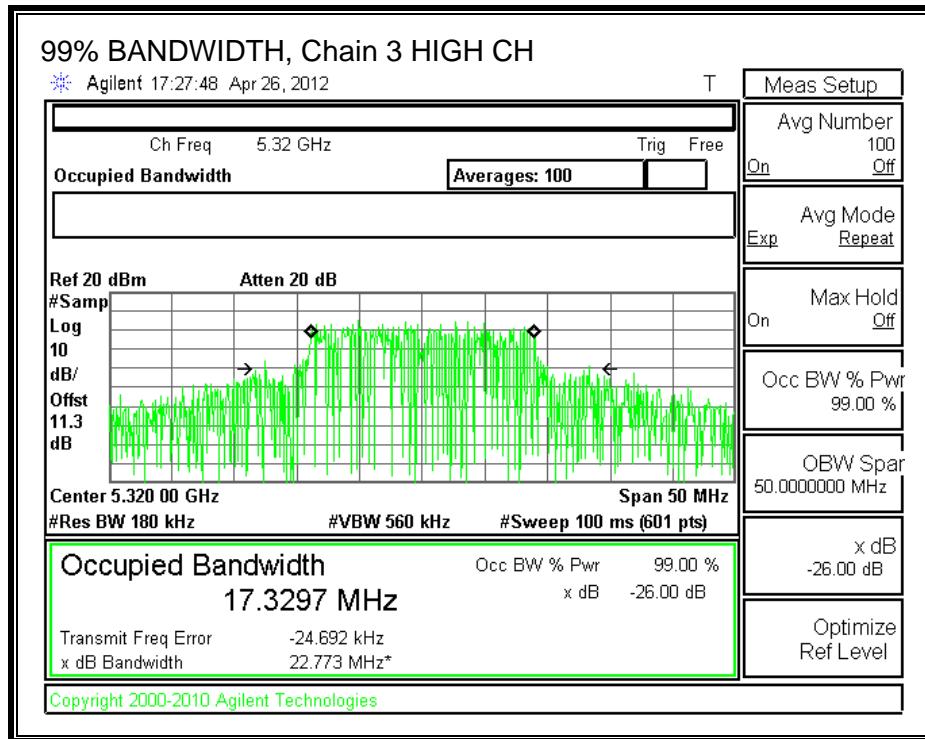
99% BANDWIDTH, Chain 2





99% BANDWIDTH, Chain 3





8.8.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak 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 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

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
5.53	1.34	1.96	3.36

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5260	24	28.08	25.48	3.36	24.00	11.00
Mid	5300	24	29.67	25.72	3.36	24.00	11.00
High	5320	24	29.67	25.72	3.36	24.00	11.00

Duty Cycle CF (dB)	2.23	Included in Calculations of Corr'd Power & PPSD
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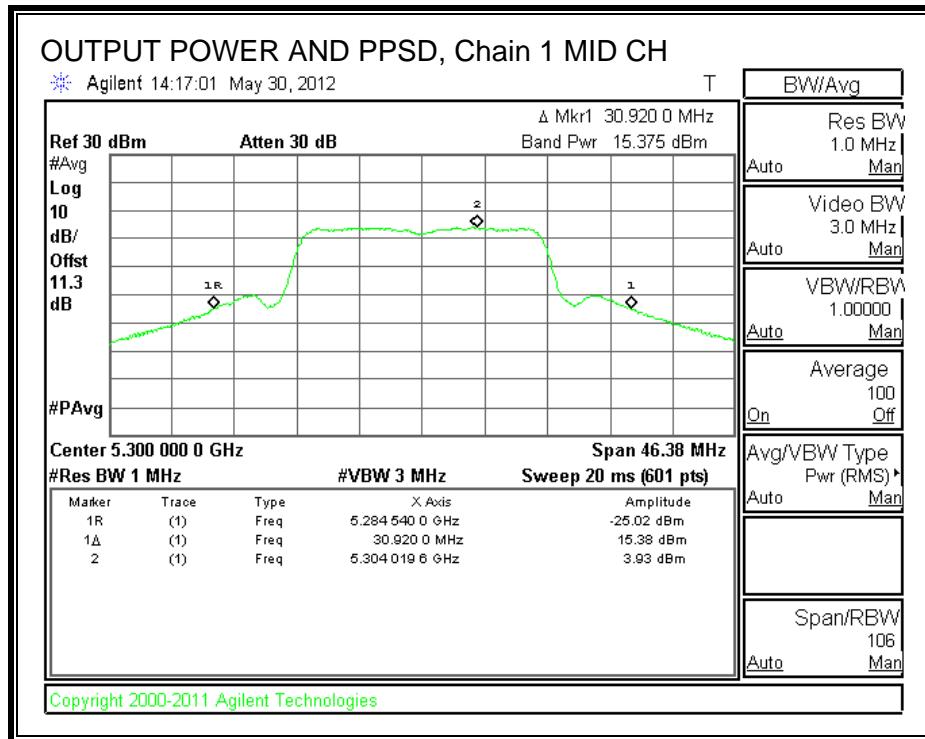
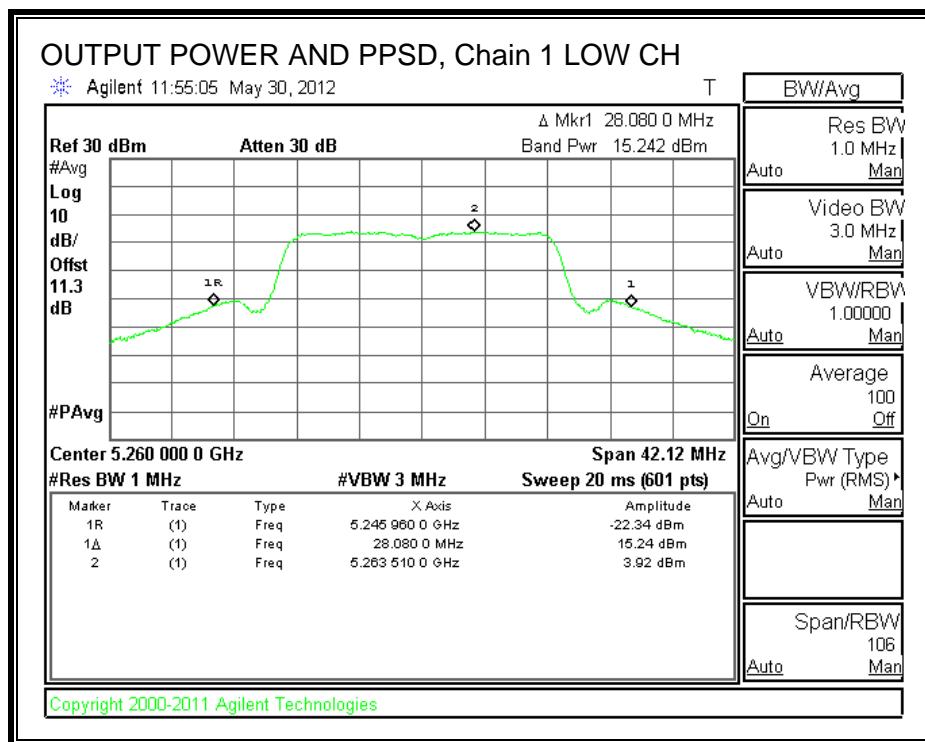
Output Power Results

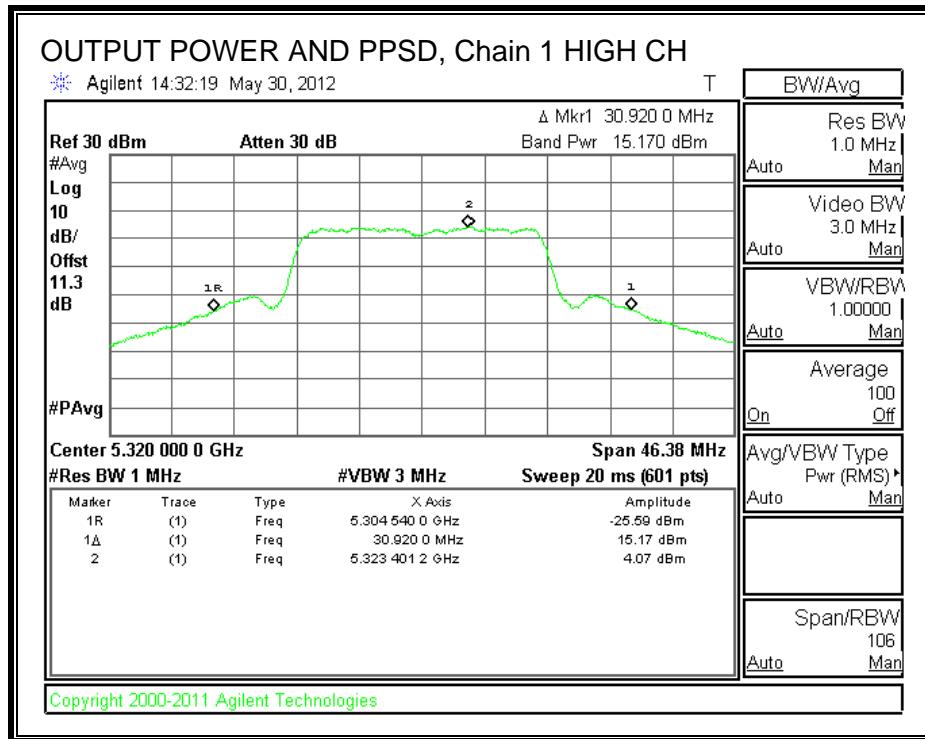
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Chain 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	15.242	14.932	14.542	21.916	24.00	-2.084
Mid	5300	15.375	15.518	14.814	22.247	24.00	-1.753
High	5320	15.170	15.055	14.833	22.023	24.00	-1.977

PPSD Results

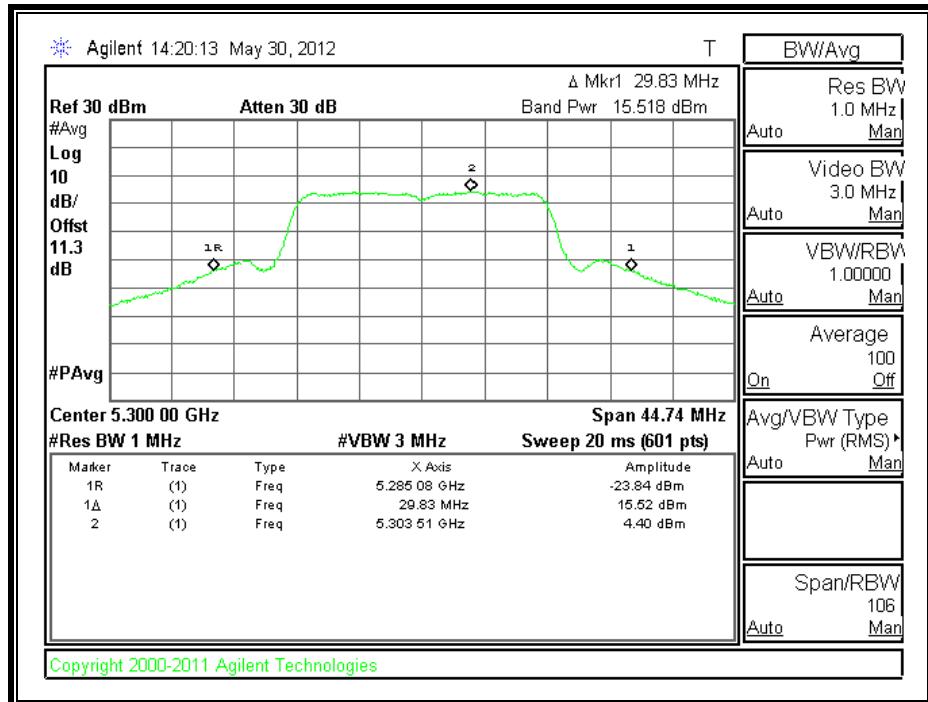
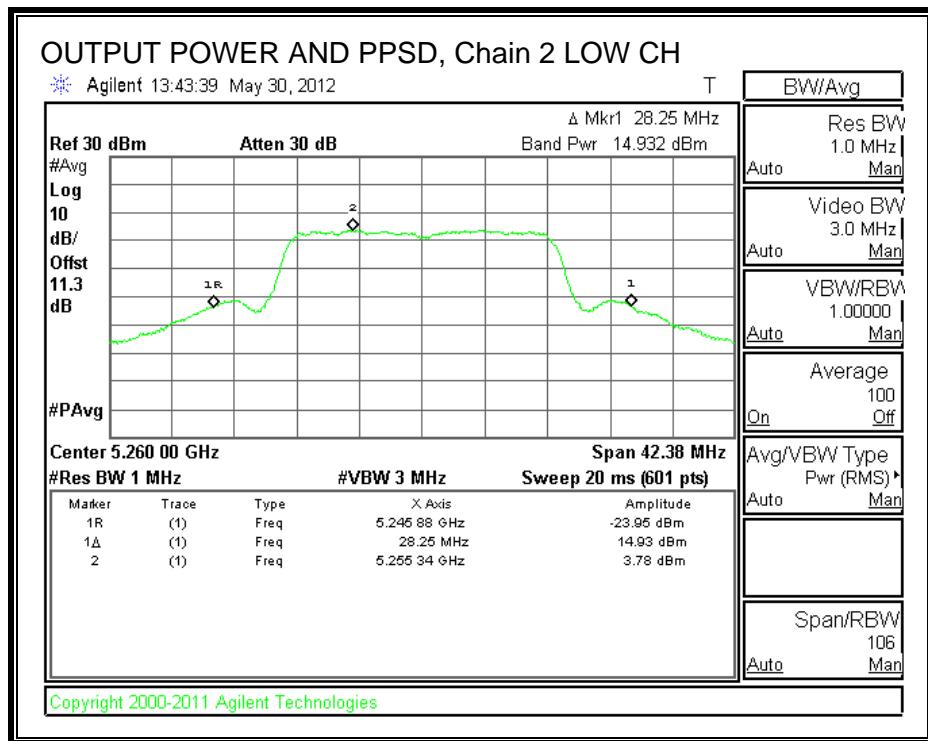
Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Chain 3 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	3.92	3.78	3.26	10.66	11.00	-0.34
Mid	5300	3.93	4.40	3.53	10.97	11.00	-0.03
High	5320	4.07	3.63	3.54	10.75	11.00	-0.25

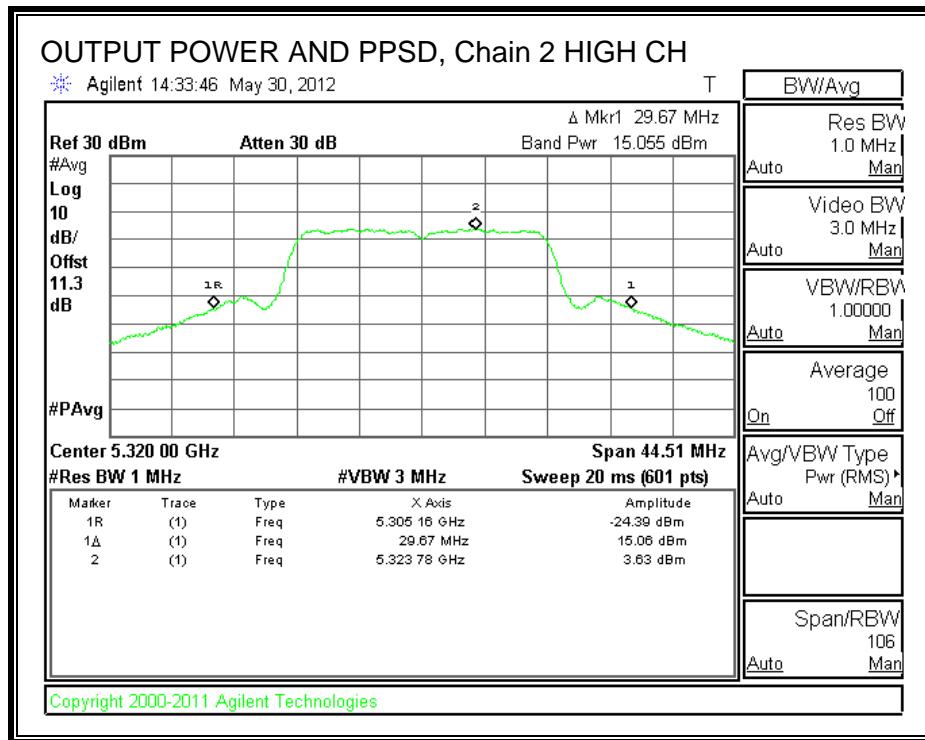
OUTPUT POWER AND PPSD, Chain 1



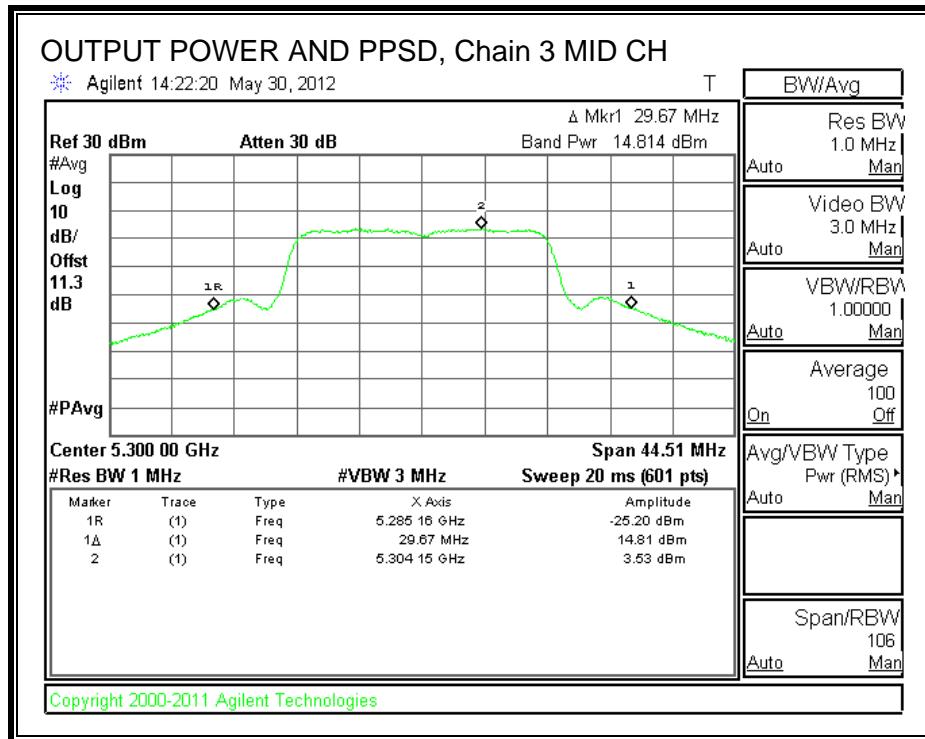
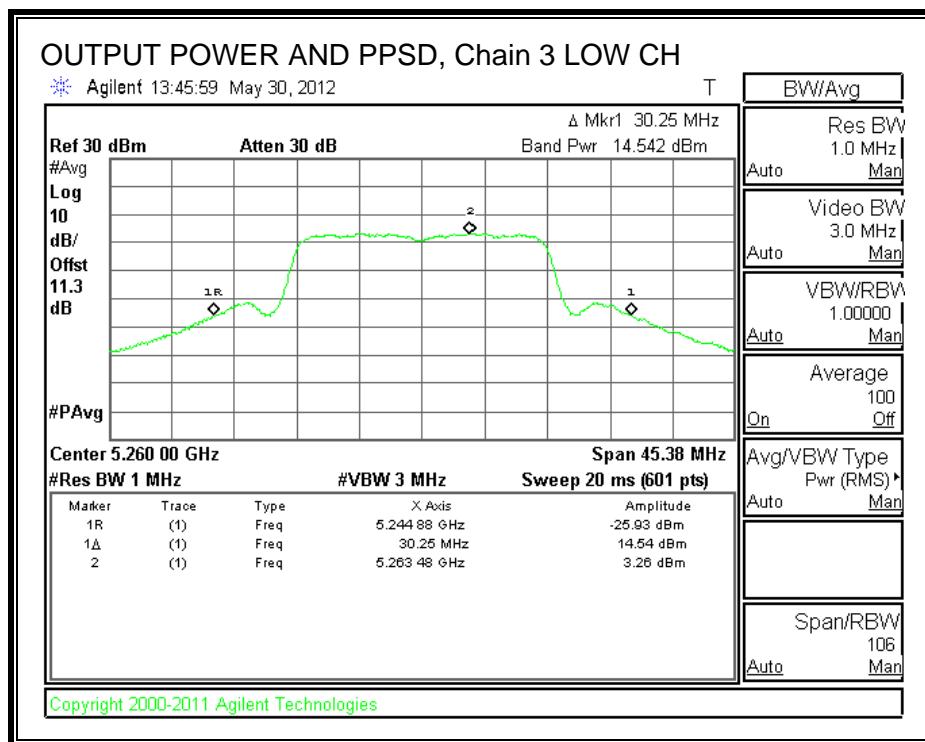


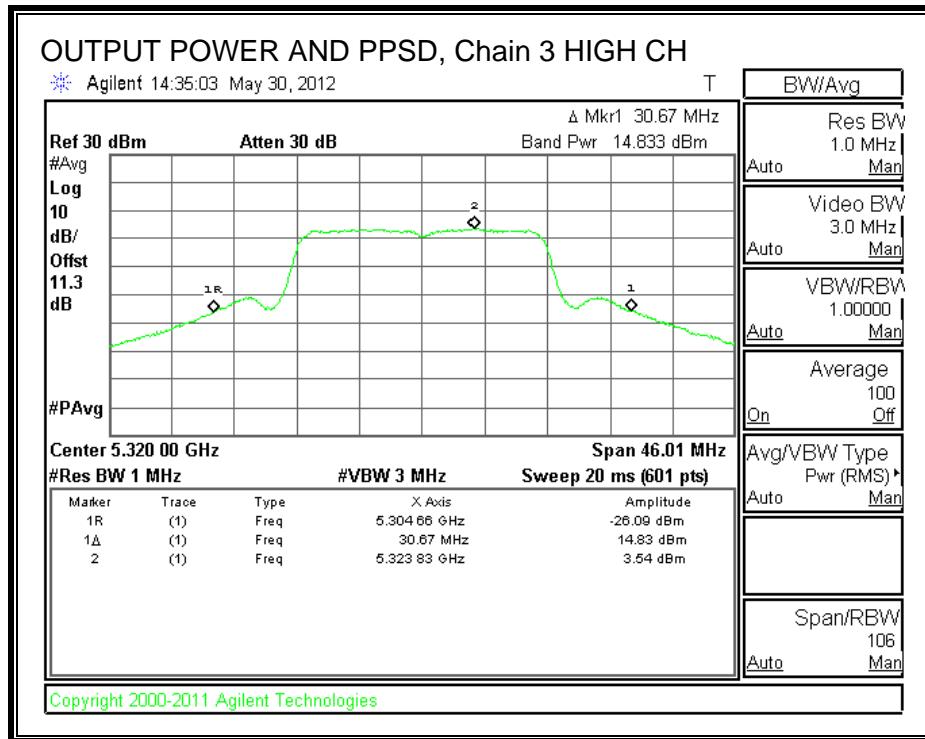
OUTPUT POWER AND PPSD, Chain 2





OUTPUT POWER AND PPSD, Chain 3





8.8.4. PEAK EXCURSION

LIMITS

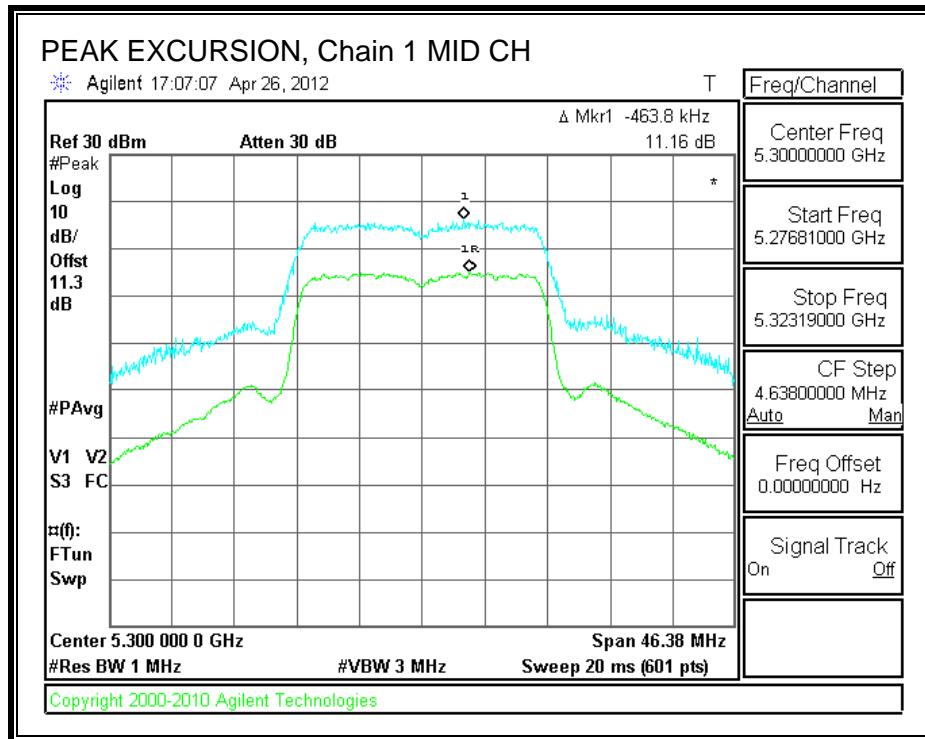
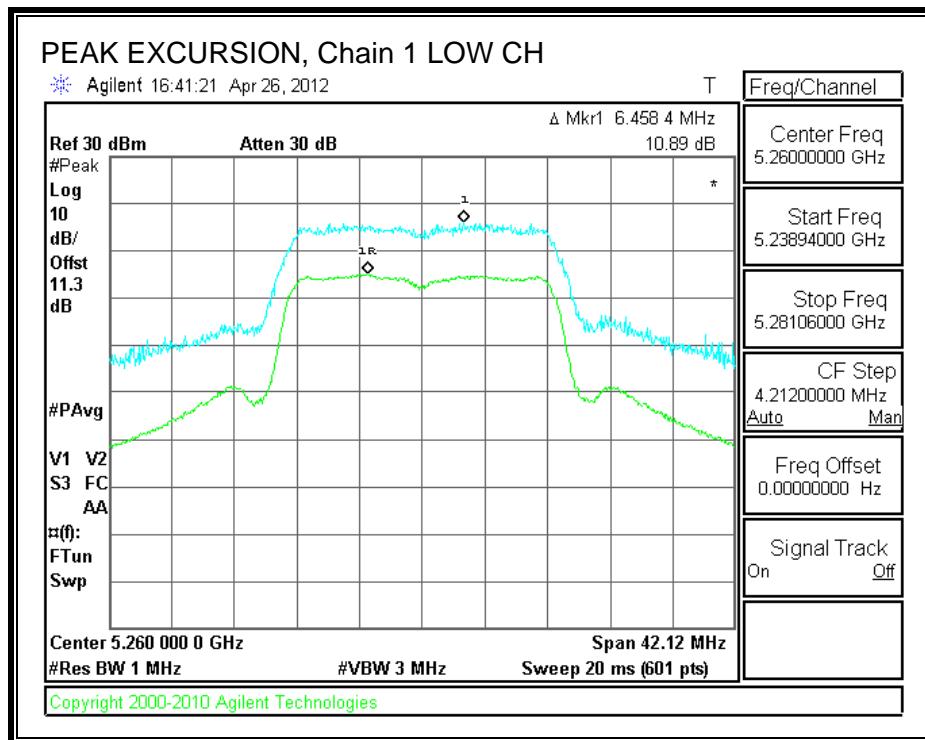
FCC §15.407 (a) (6)

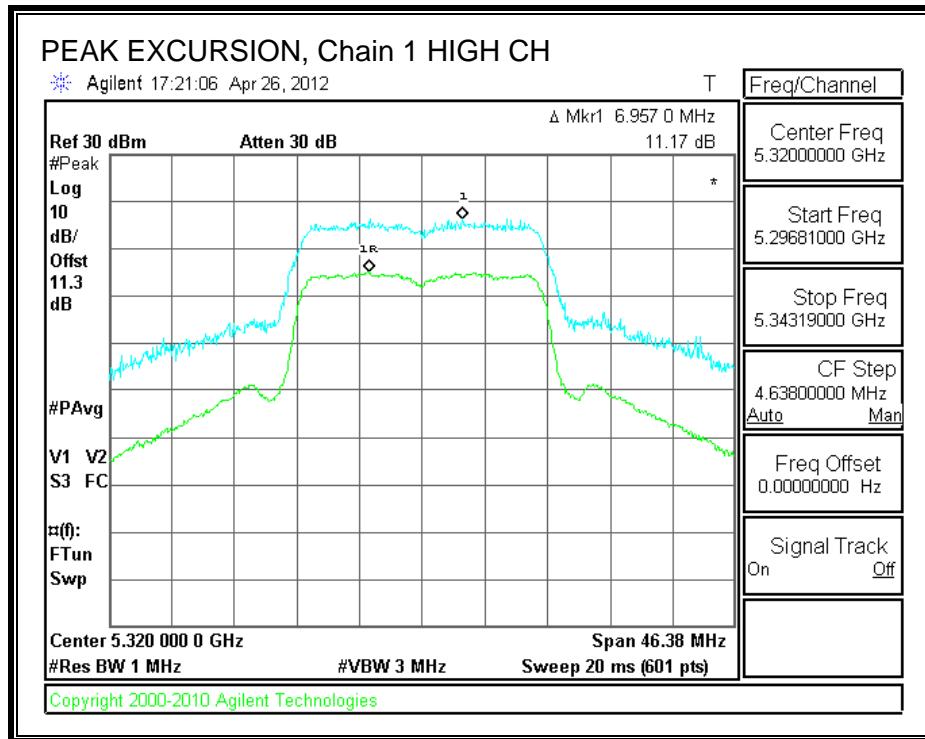
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

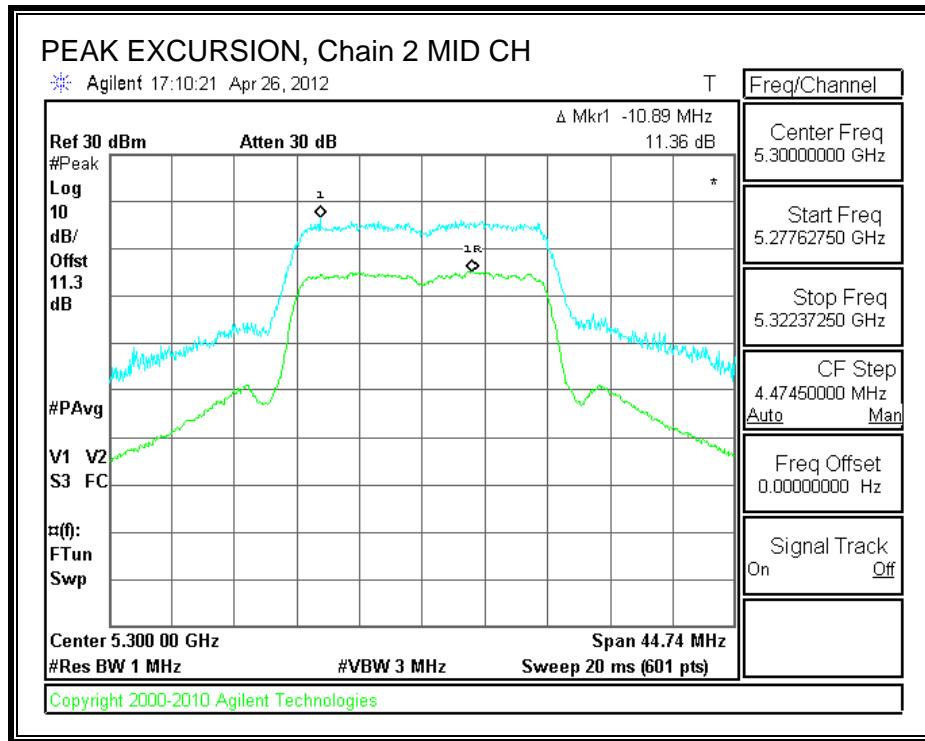
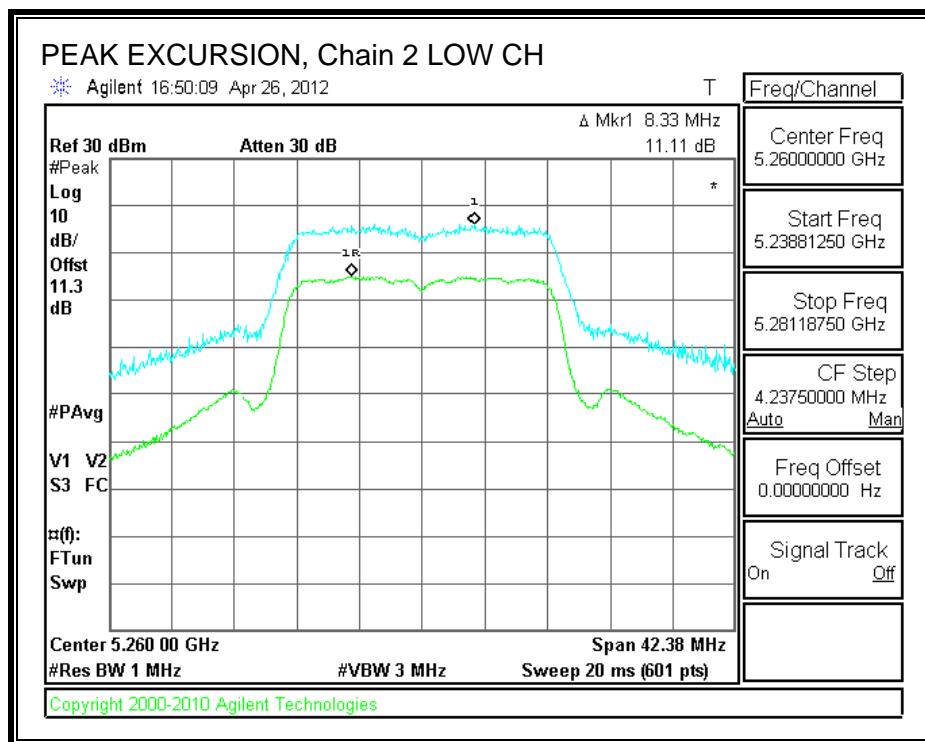
Channel	Frequency (MHz)	Pk Exc Chain 1 (dB)	Pk Exc Chain 2 (dB)	Pk Exc Chain 3 (dB)	Limit (dB)	Worst-Case Margin (dB)
Low	5260	10.89	11.11	11.15	13	-1.85
Mid	5300	11.16	11.36	11.42	13	-1.58
High	5320	11.17	11.84	10.93	13	-1.16

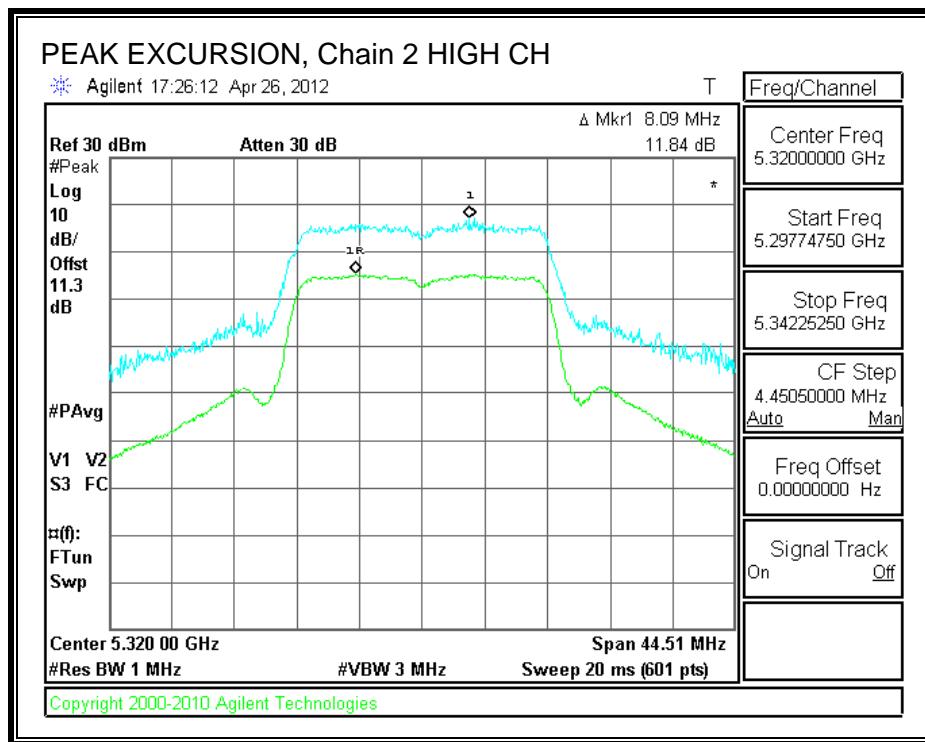
PEAK EXCURSION, Chain 1



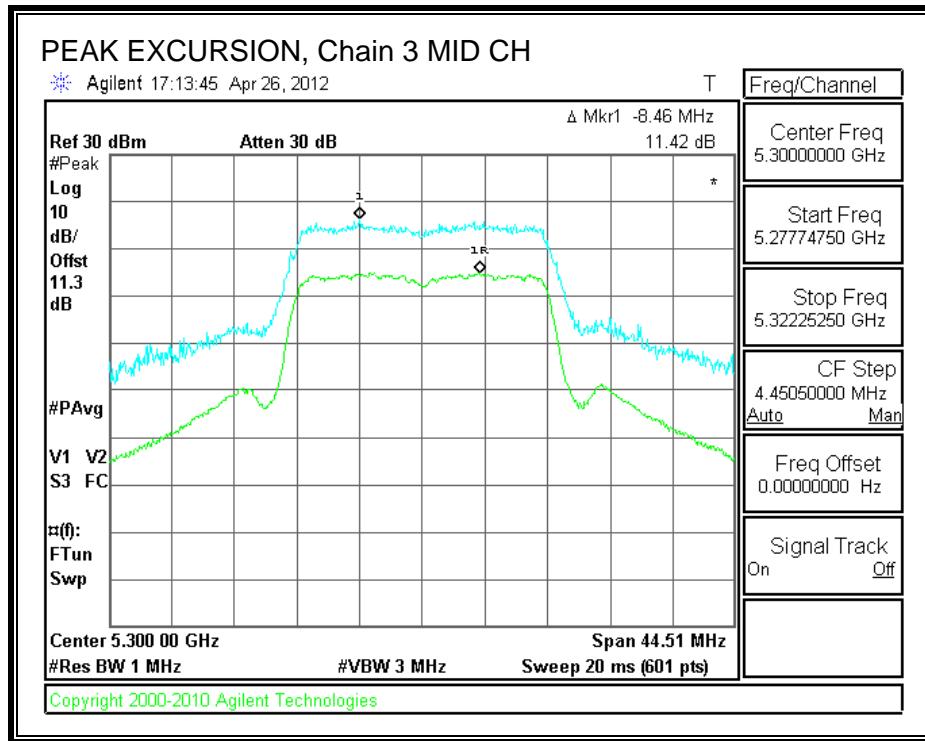
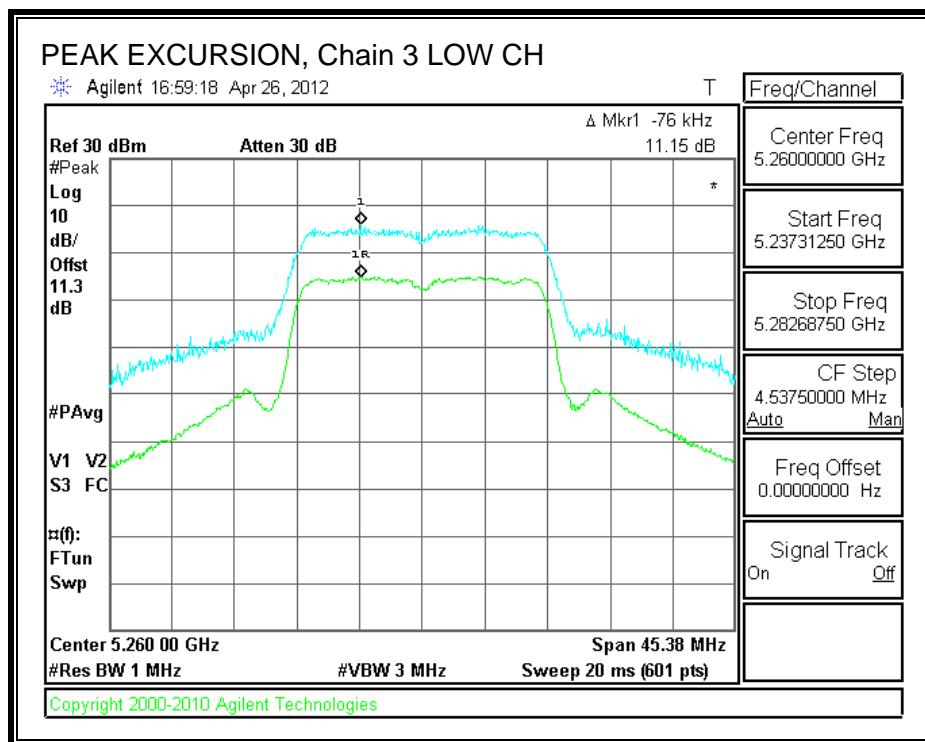


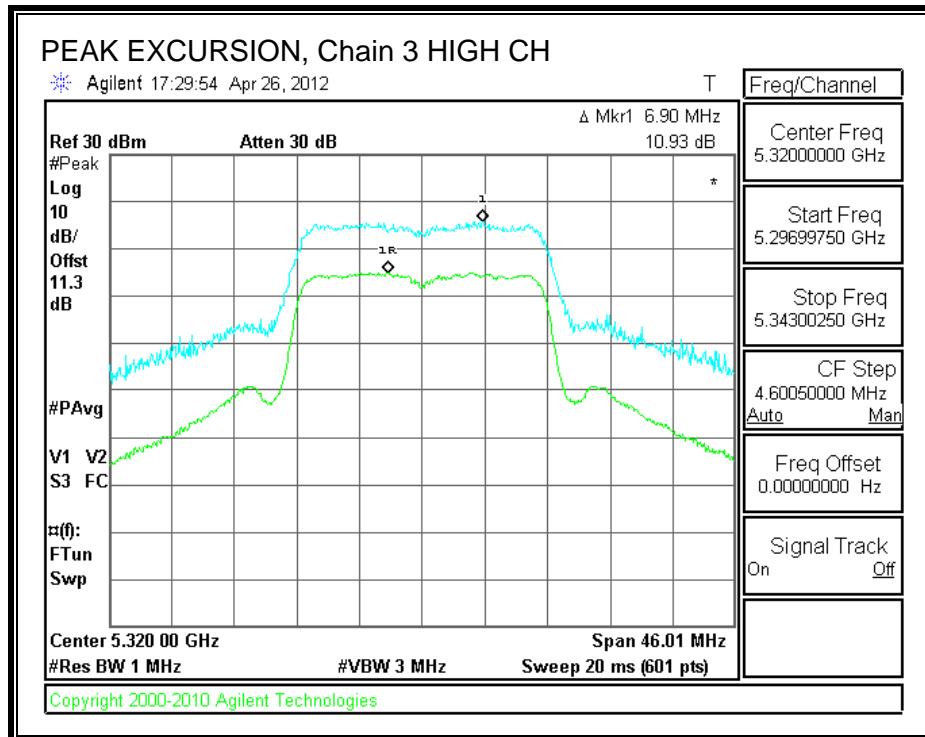
PEAK EXCURSION, Chain 2





PEAK EXCURSION, Chain 3





8.9. 802.11n HT40, 1TX, 5.3 GHz BAND

8.9.1. 26 dB BANDWIDTH

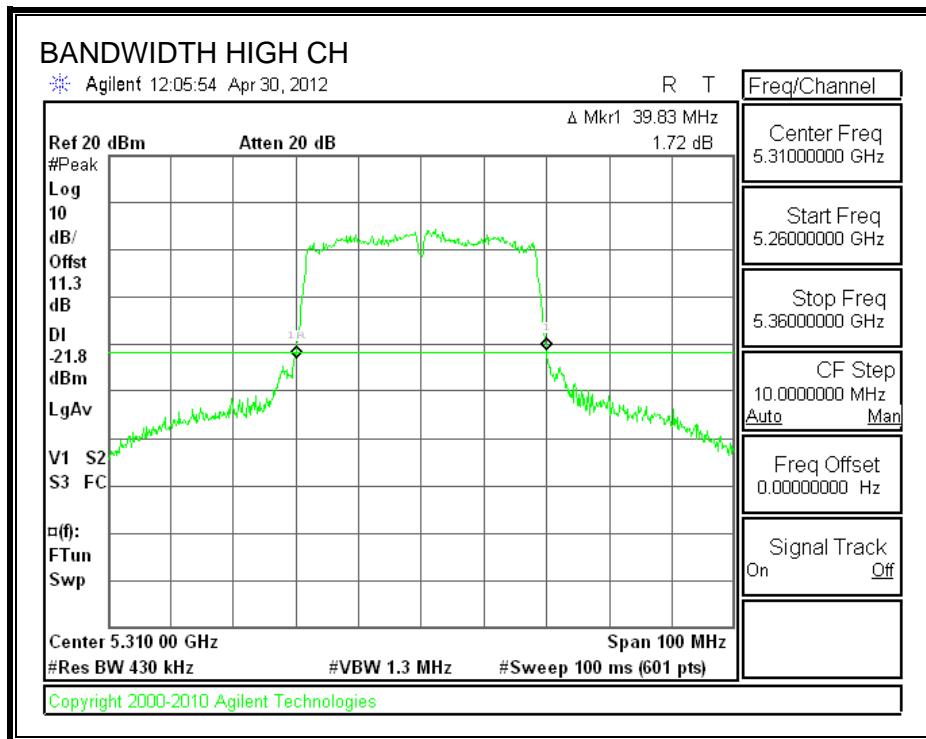
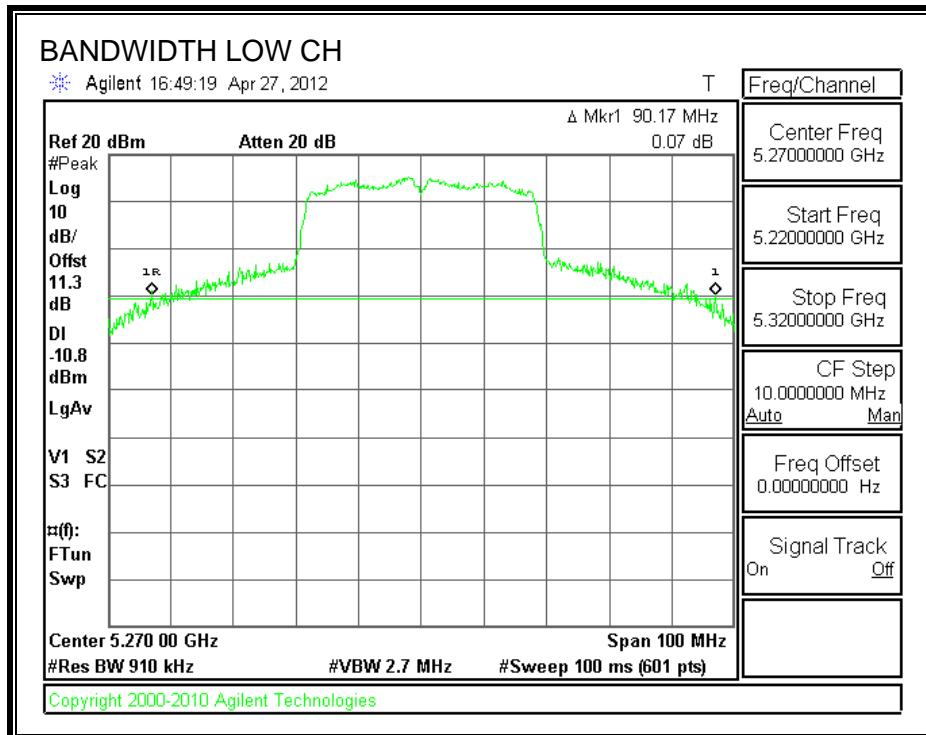
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5270	90.17
High	5310	39.83

26 dB BANDWIDTH



8.9.2. 99% BANDWIDTH

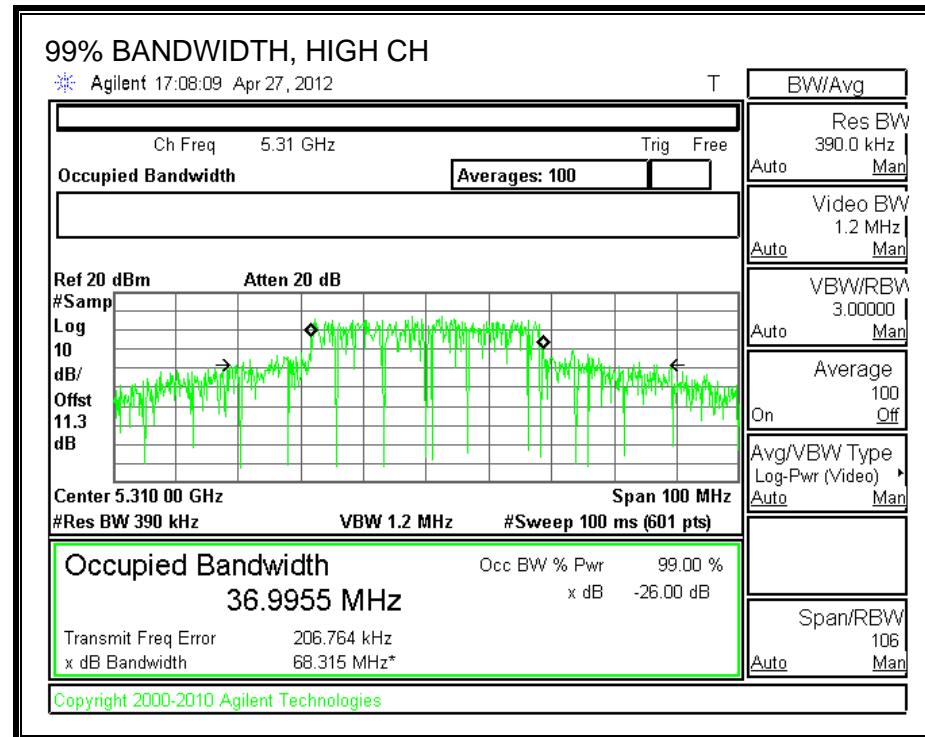
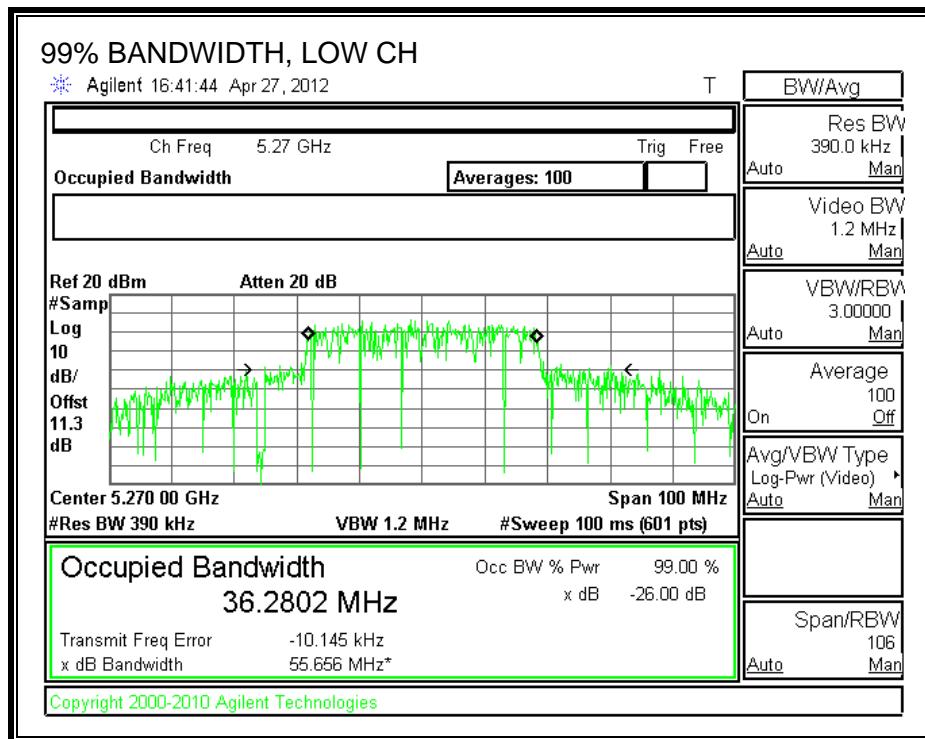
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	36.2802
High	5310	36.9955

99% BANDWIDTH



8.9.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands 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 megahertz. In addition, the peak 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 peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5270	24	90.17	30.55	5.53	24.00	11.00
High	5310	24	39.83	27.00	5.53	24.00	11.00

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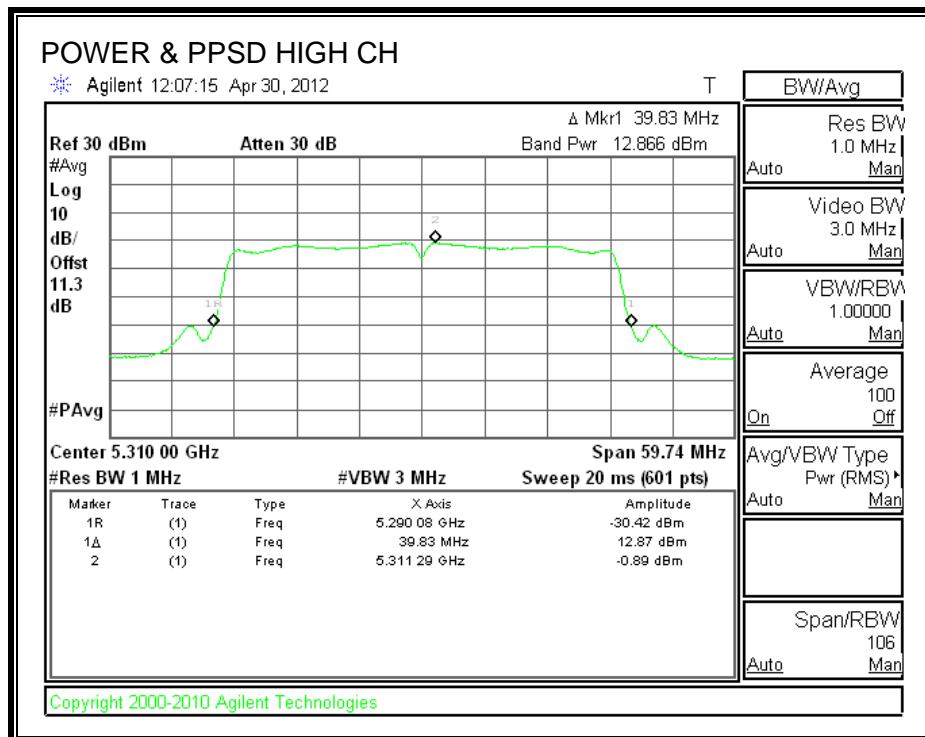
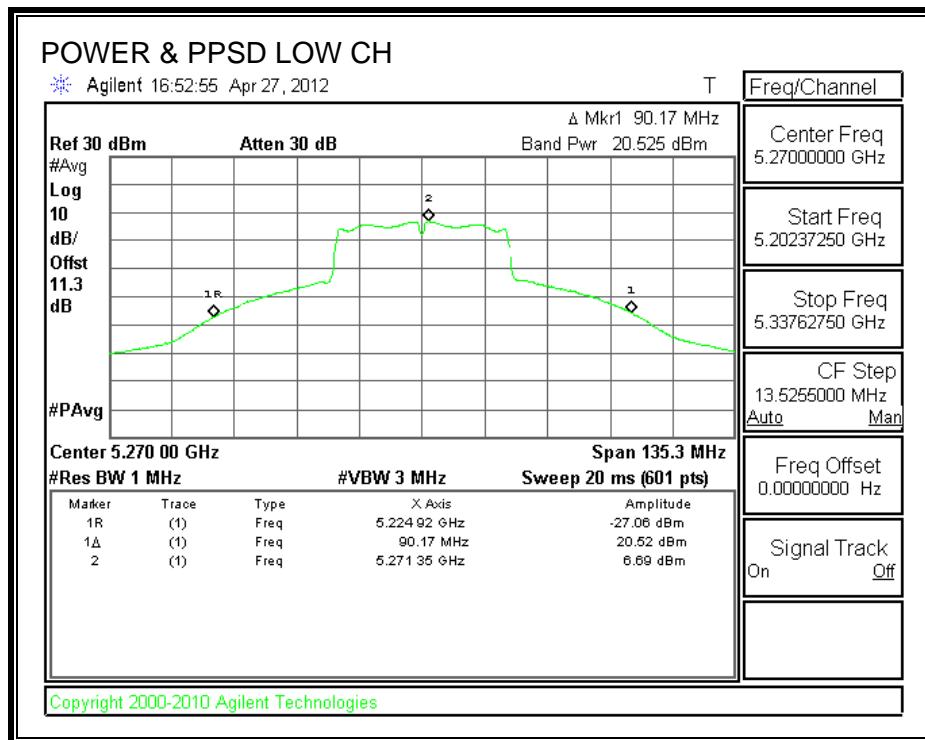
Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	20.525	20.525	24.00	-3.475
High	5310	12.866	12.866	24.00	-11.134

PPSD Results

Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	6.69	6.69	11.00	-4.31
High	5310	-0.89	-0.89	11.00	-11.89

OUTPUT POWER AND PPSD



8.9.4. PEAK EXCURSION

LIMITS

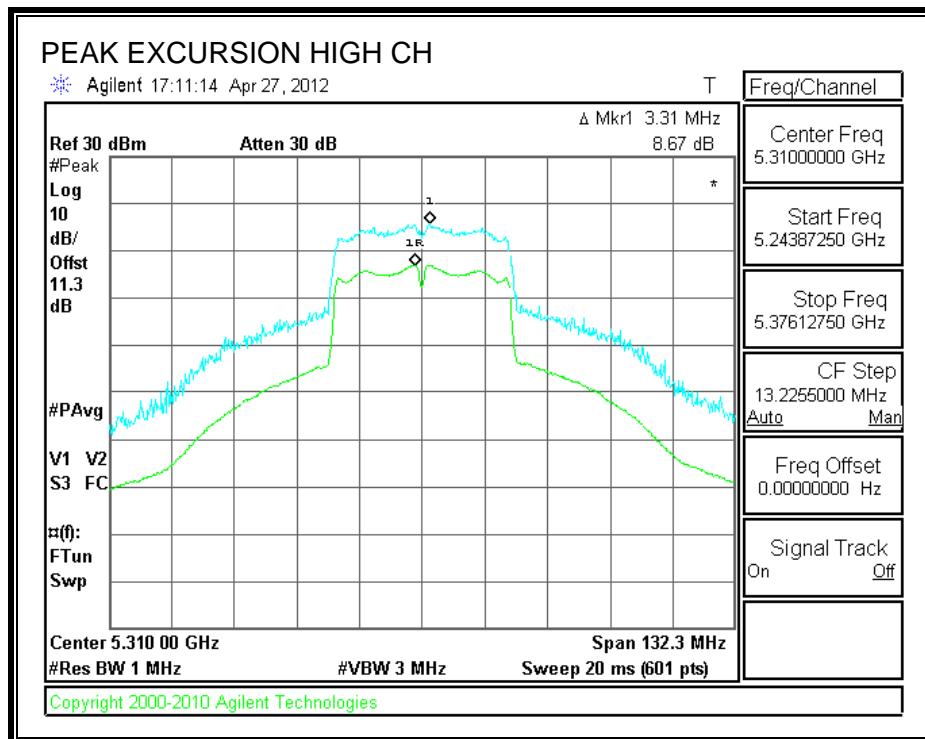
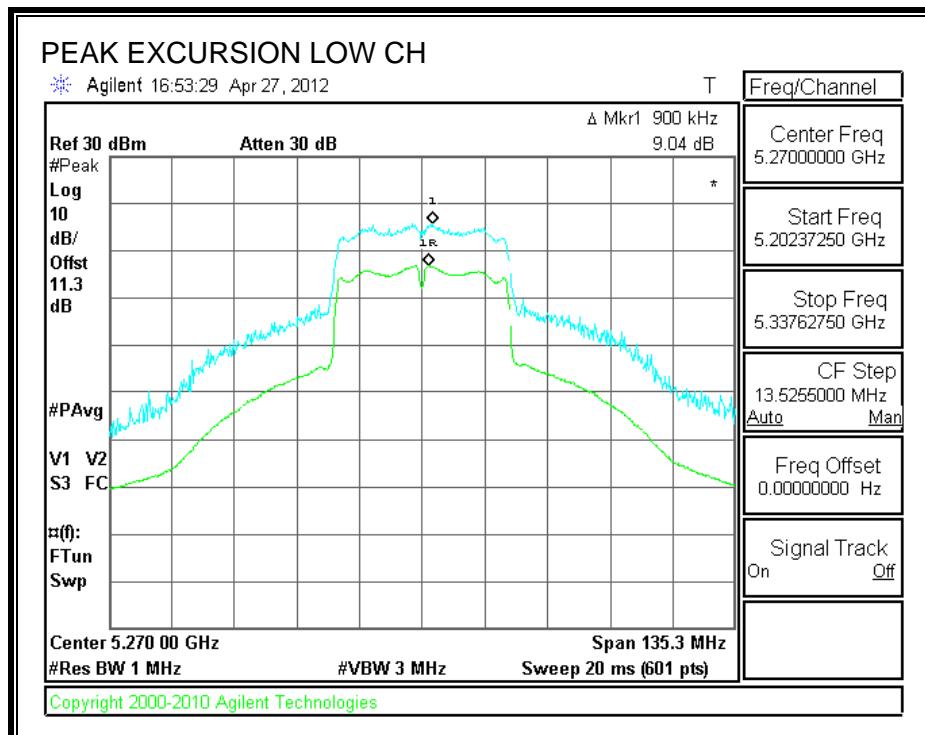
FCC §15.407 (a) (6)

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.

RESULTS

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5270	9.04	13	-3.96
High	5310	8.67	13	-4.33

PEAK EXCURSION



8.10. 802.11n HT40, CDD MCS0, 3TX, 5.3 GHz BAND

8.10.1. 26 dB BANDWIDTH

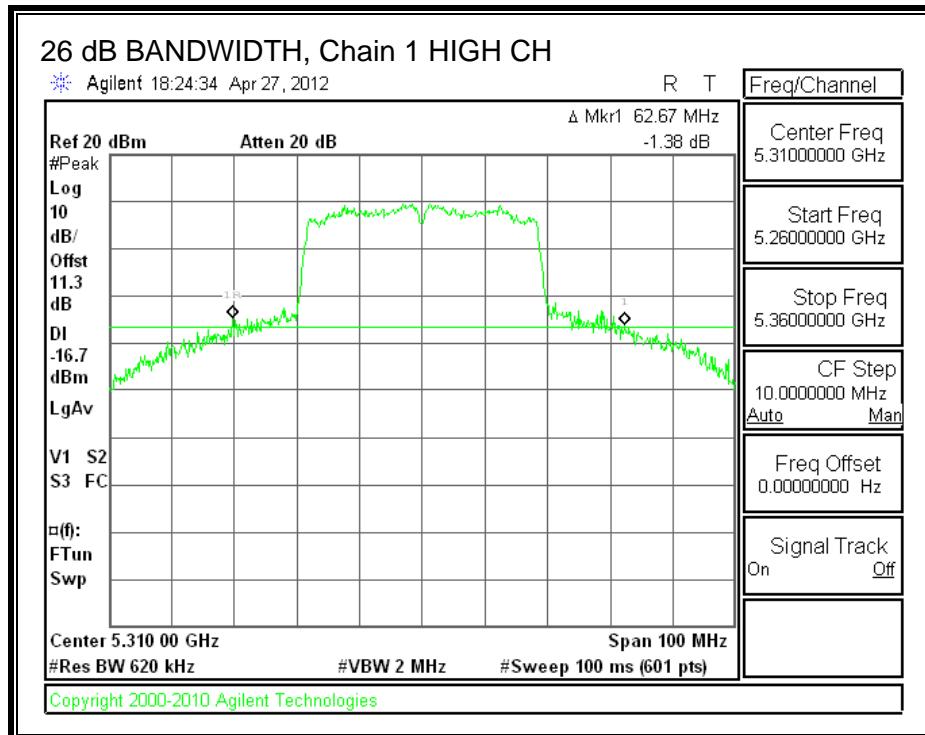
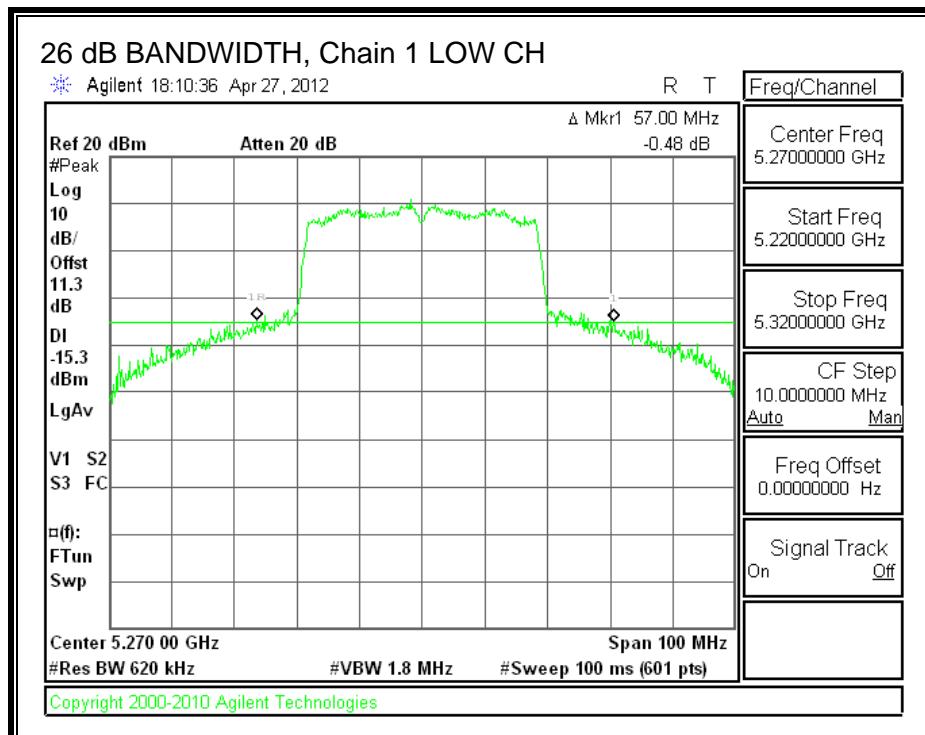
LIMITS

None; for reporting purposes only.

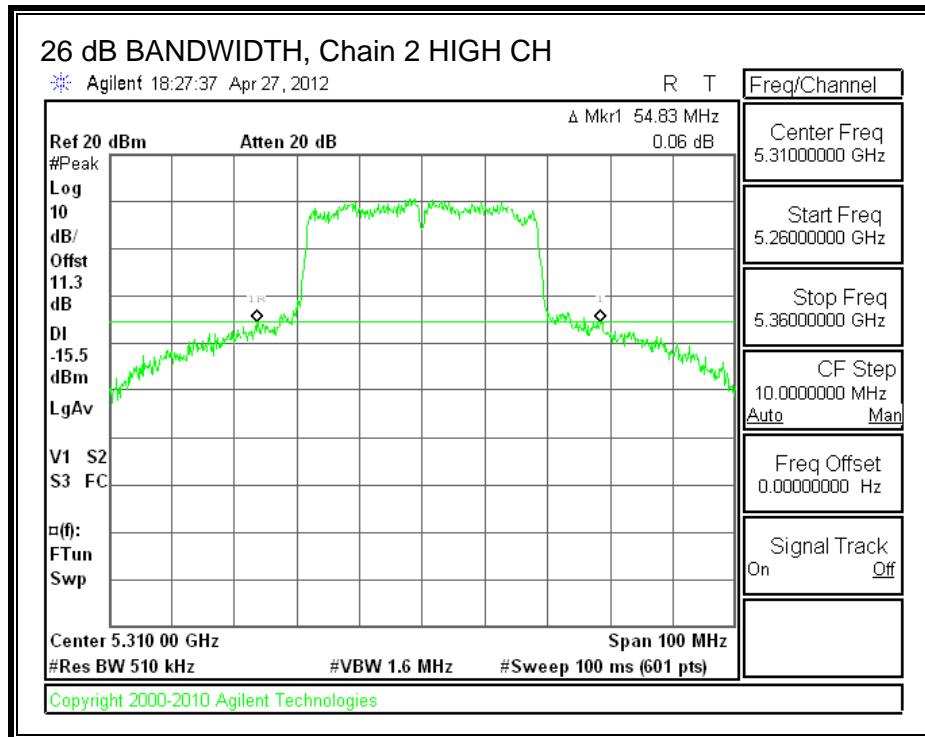
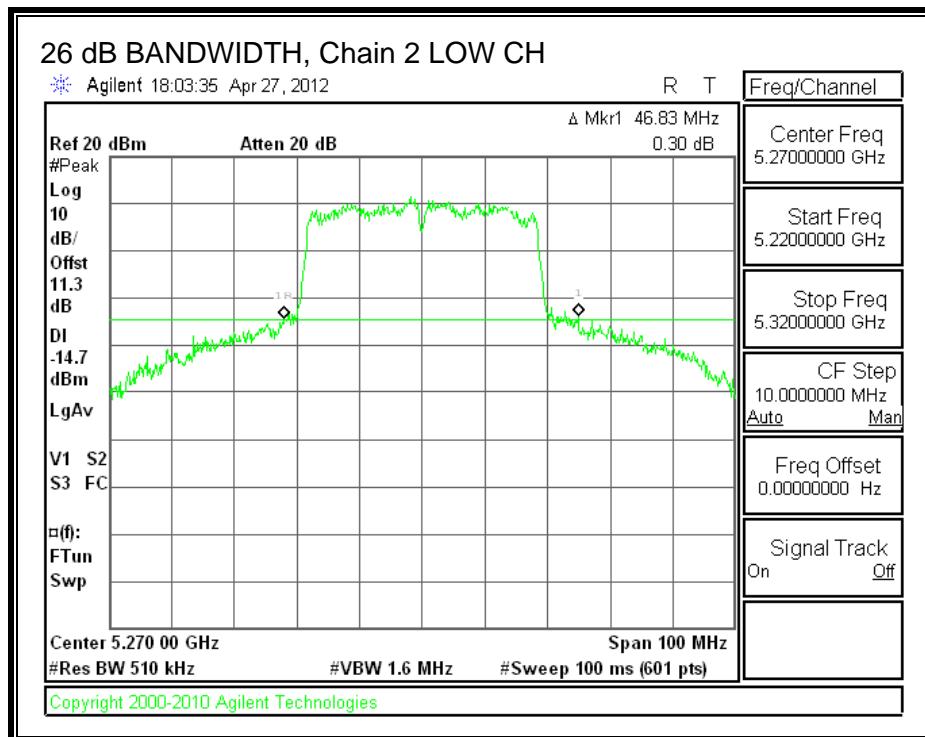
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)	26 dB BW Chain 3 (MHz)
Low	5270	57.00	46.83	50.67
High	5310	62.67	54.83	51.50

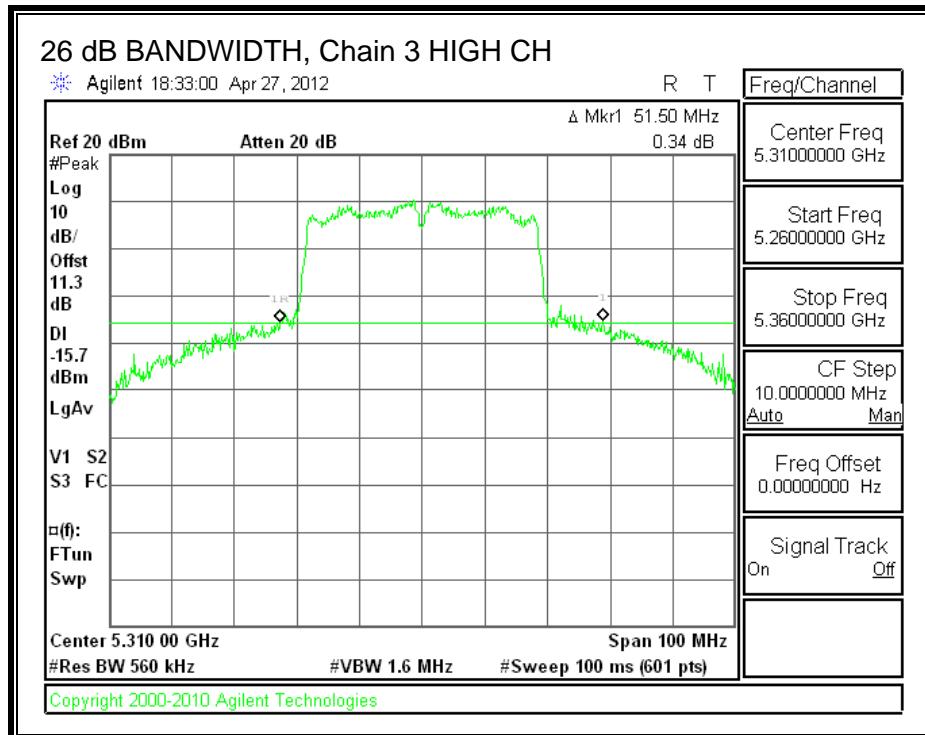
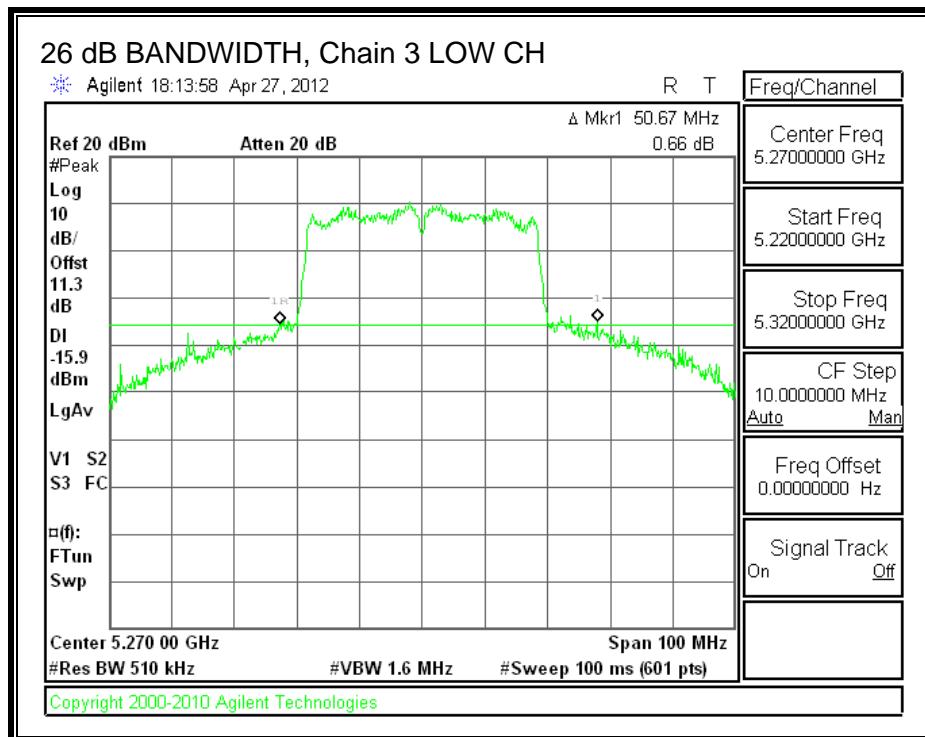
26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



26 dB BANDWIDTH, Chain 3



8.10.2. 99% BANDWIDTH

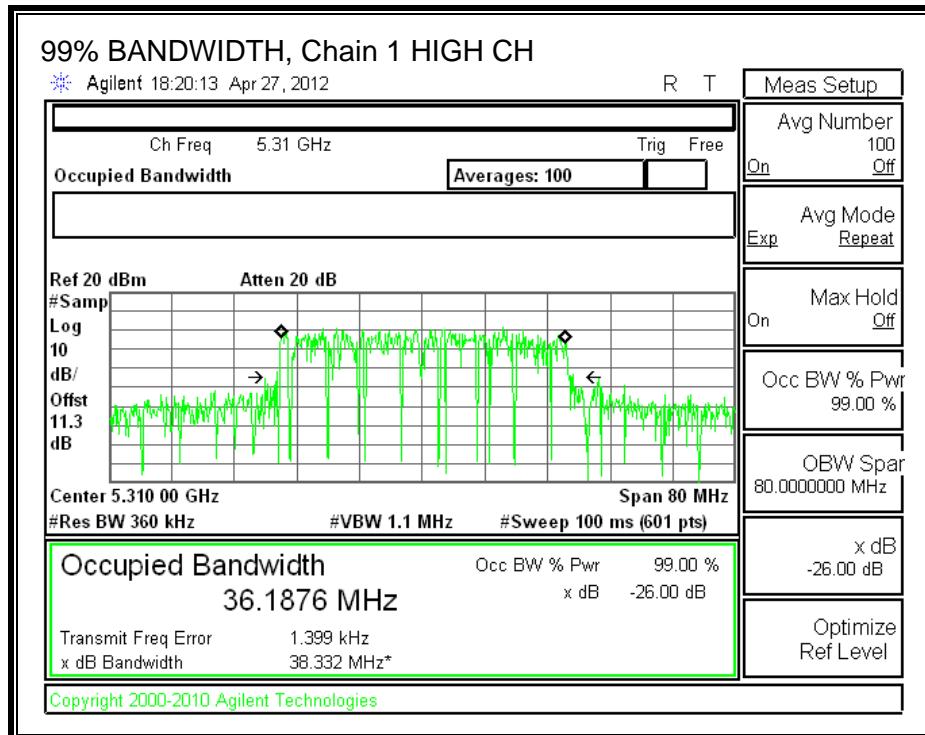
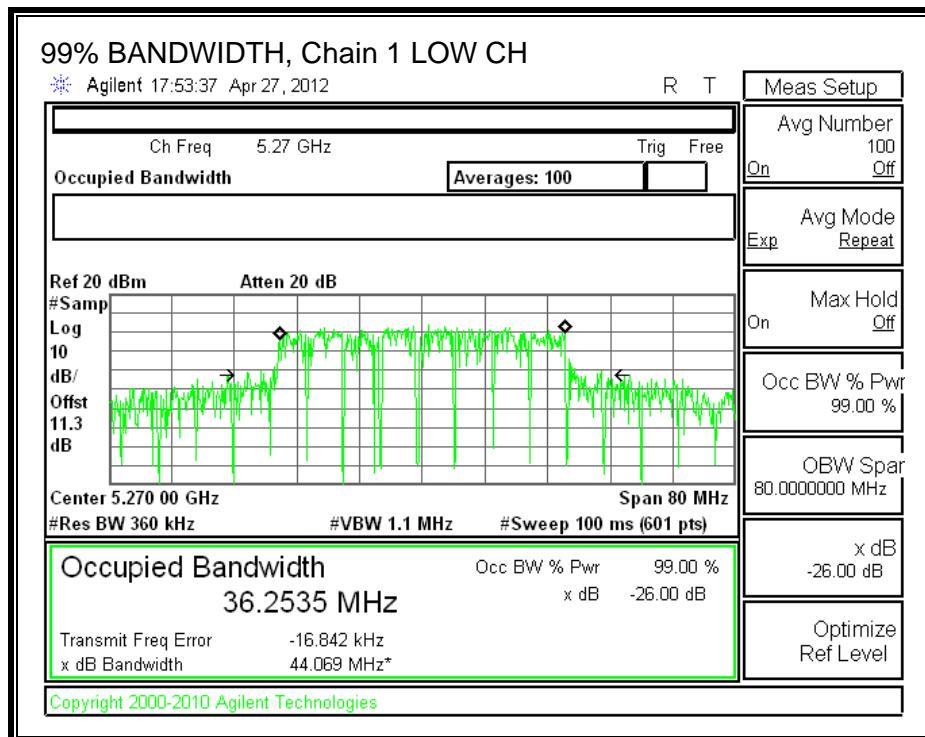
LIMITS

None; for reporting purposes only.

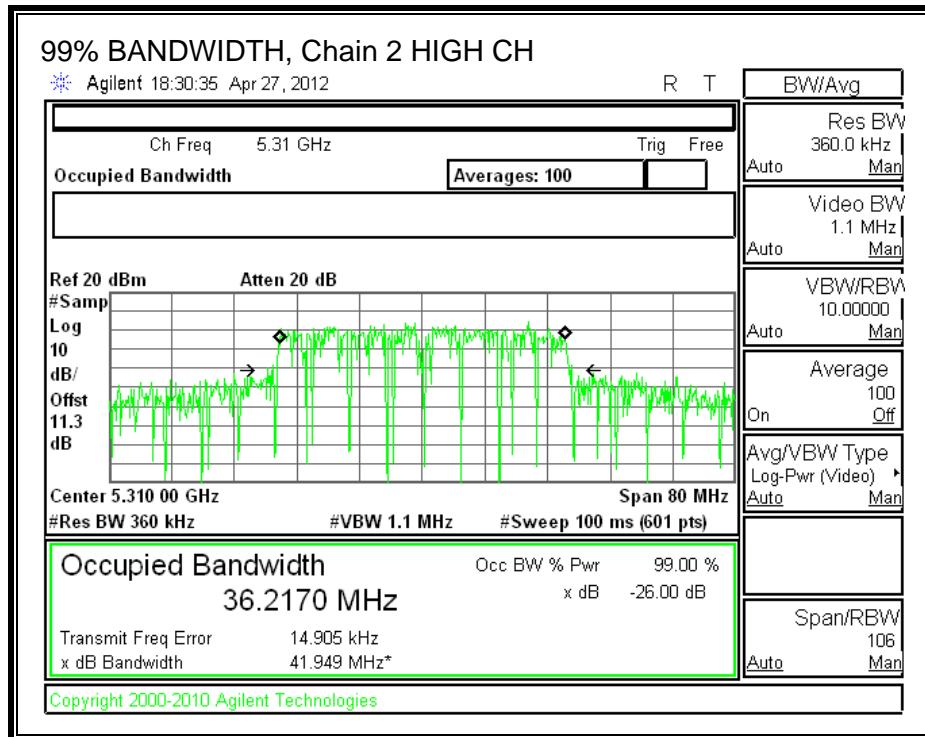
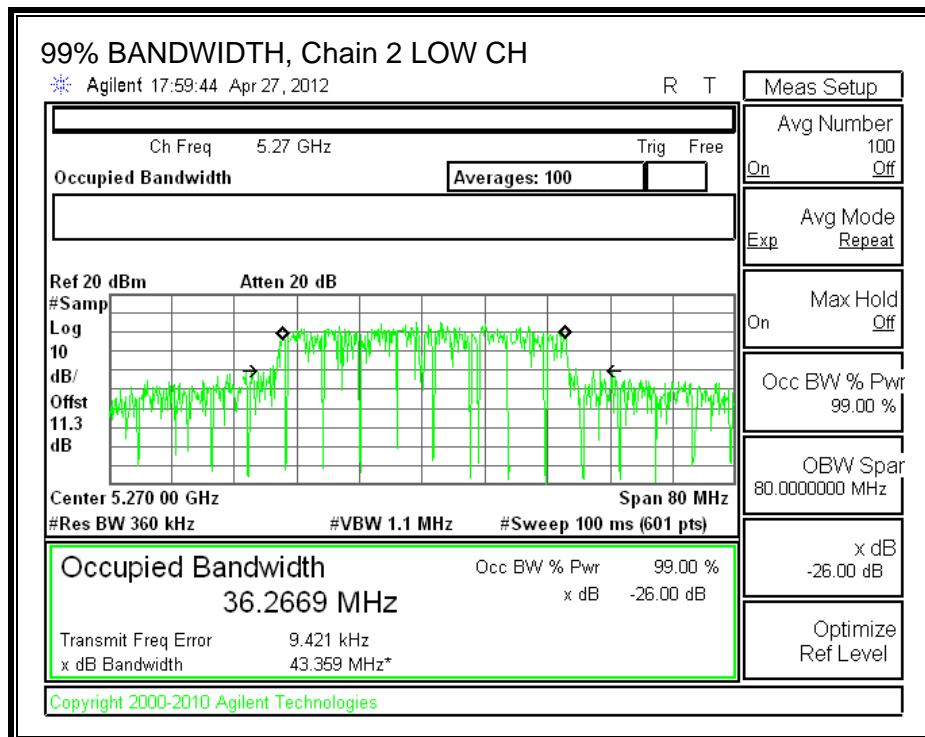
RESULTS

Channel	Frequency (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)	99% BW Chain 3 (MHz)
Low	5270	36.2535	36.2669	36.2506
High	5310	36.1876	36.2170	36.2086

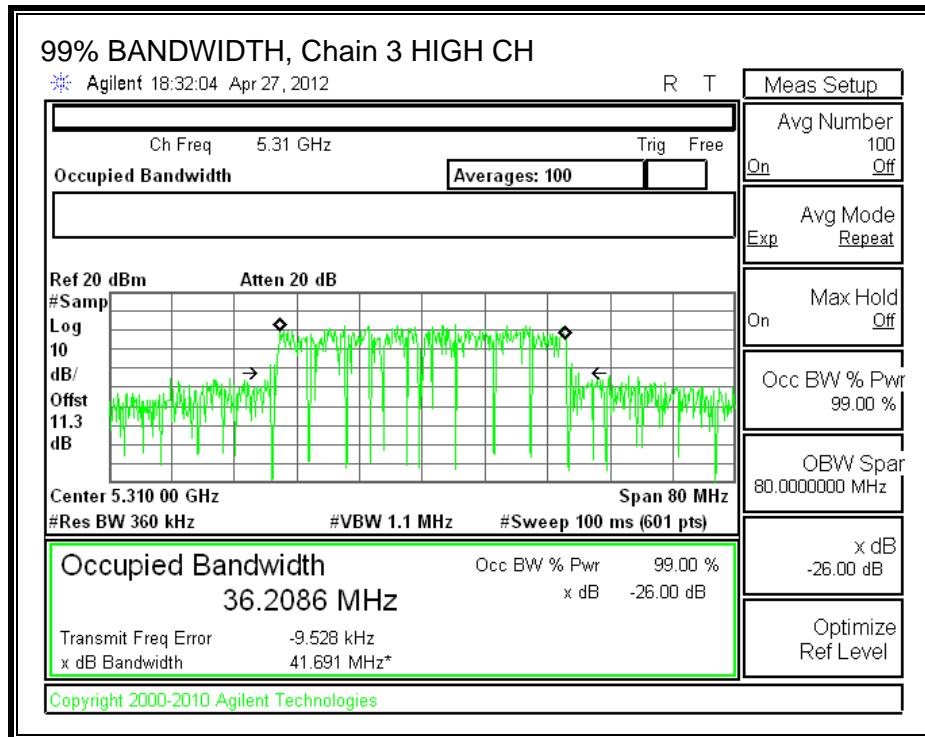
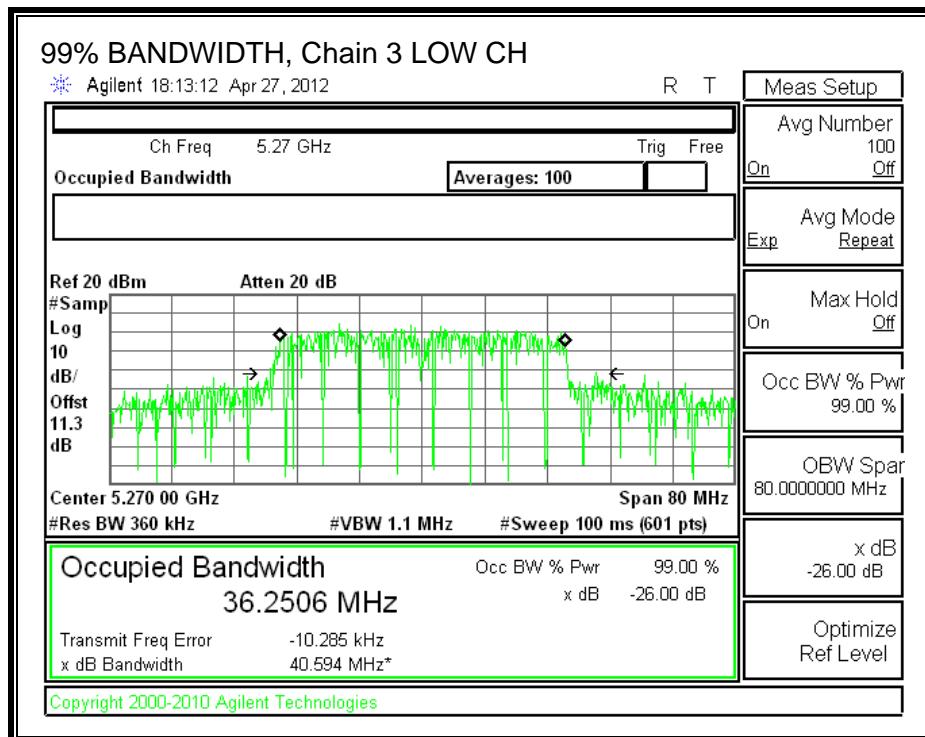
99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



99% BANDWIDTH, Chain 3



8.10.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak 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 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

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.53	1.34	1.96	7.92

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5270	24	46.83	27.71	7.92	22.08	9.08
High	5310	24	51.50	28.12	7.92	22.08	9.08

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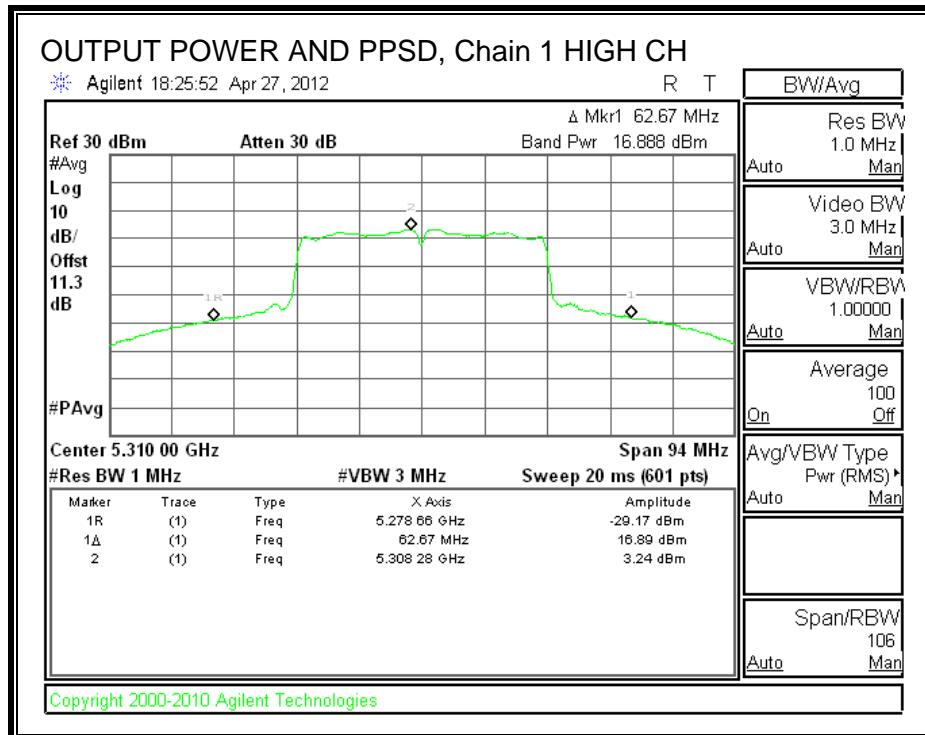
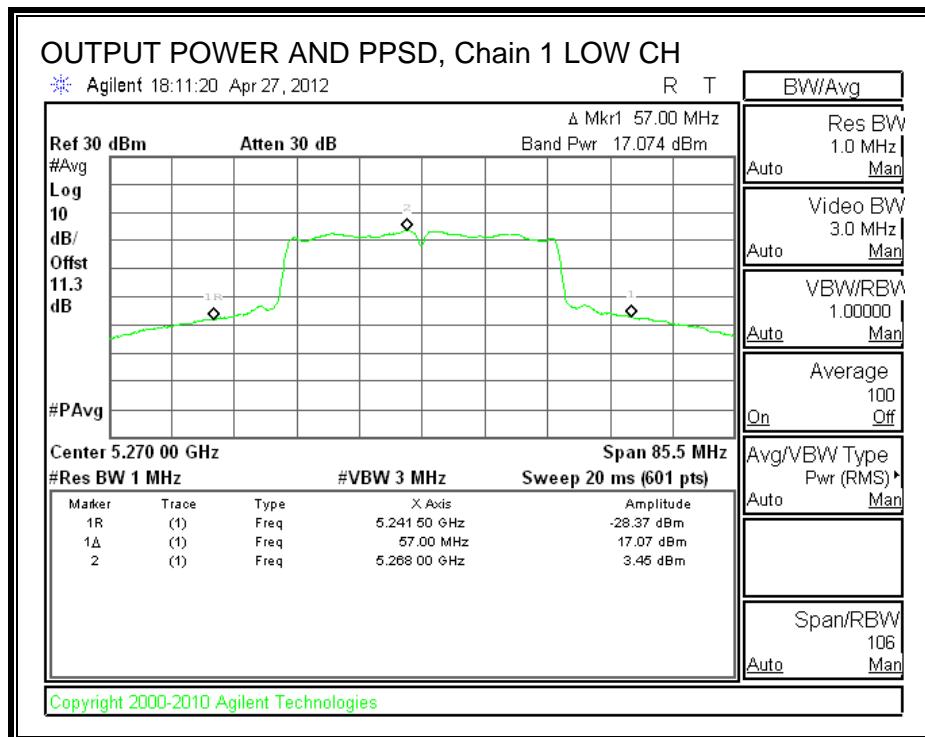
Output Power Results

Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Chain 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	17.074	17.440	16.704	21.854	22.08	-0.226
High	5310	16.888	17.174	16.619	21.671	22.08	-0.409

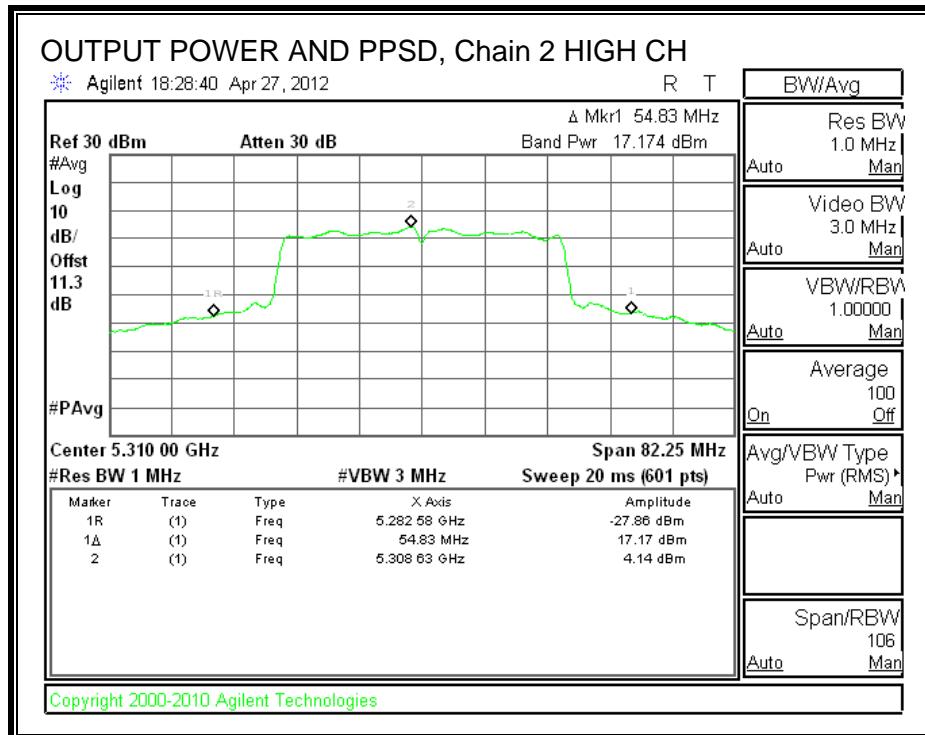
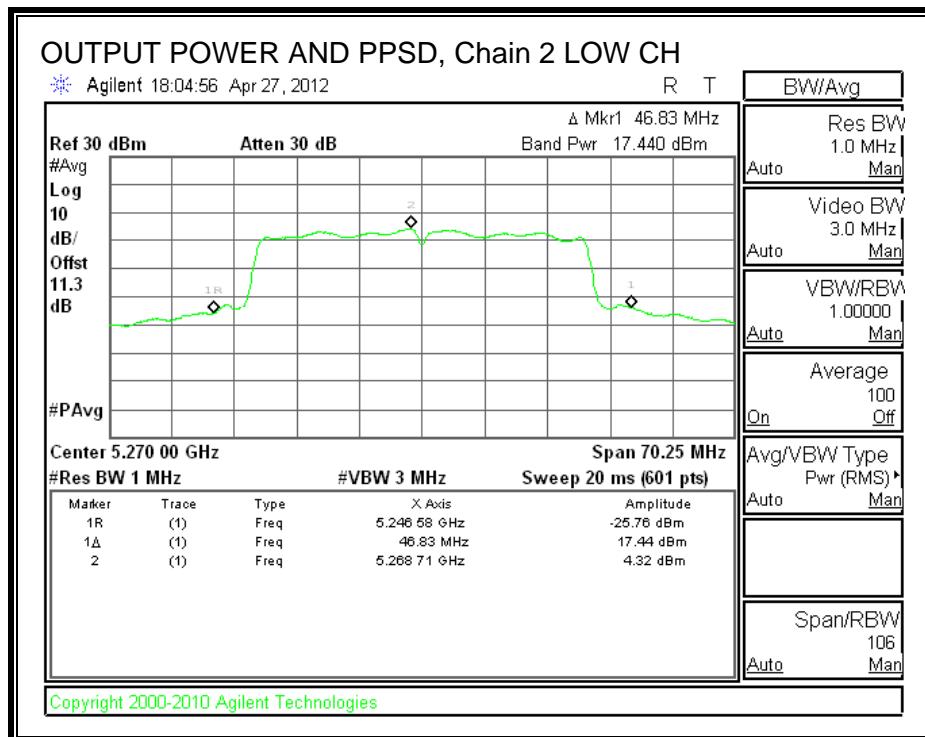
PPSD Results

Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Chain 3 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	3.45	4.32	3.31	8.49	9.08	-0.59
High	5310	3.24	4.14	3.32	8.36	9.08	-0.72

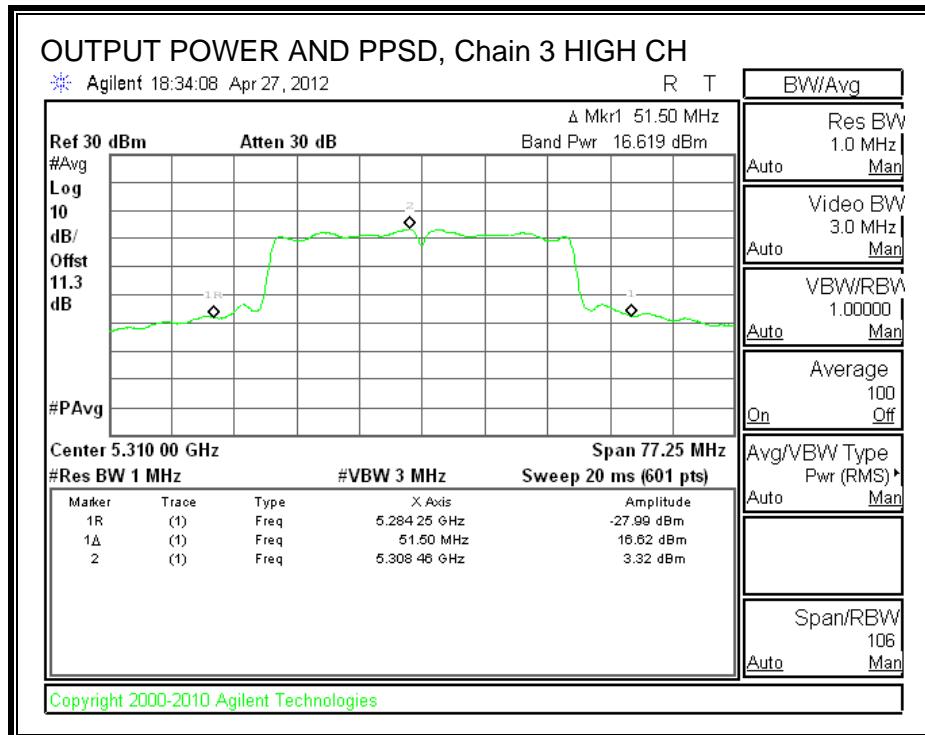
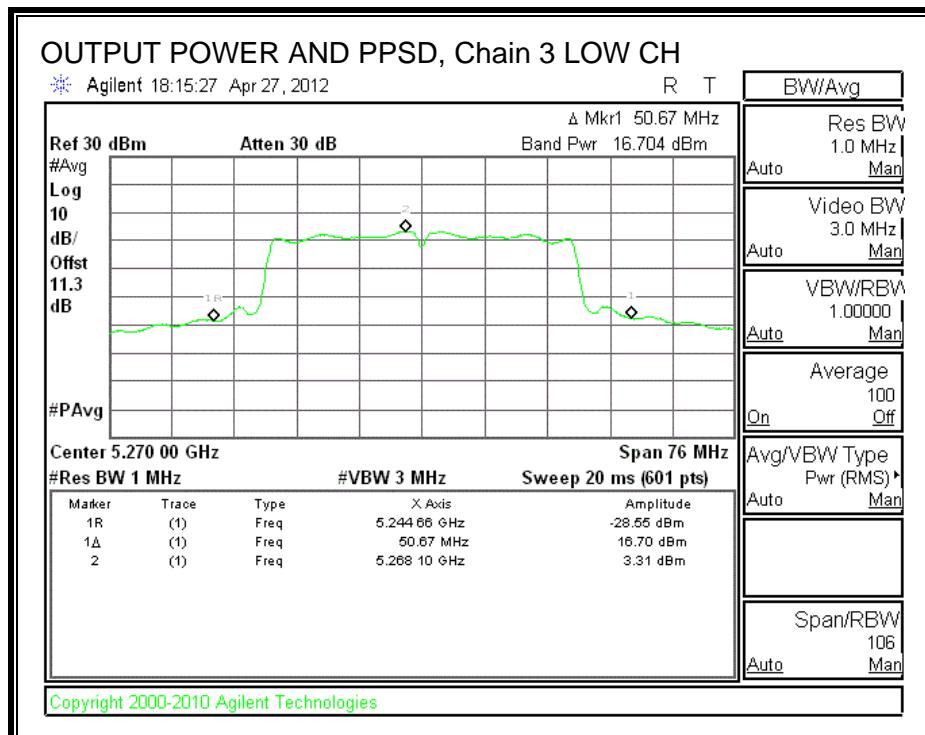
OUTPUT POWER AND PPSD, Chain 1



OUTPUT POWER AND PPSD, Chain 2



OUTPUT POWER AND PPSD, Chain 3



8.10.4. PEAK EXCURSION

LIMITS

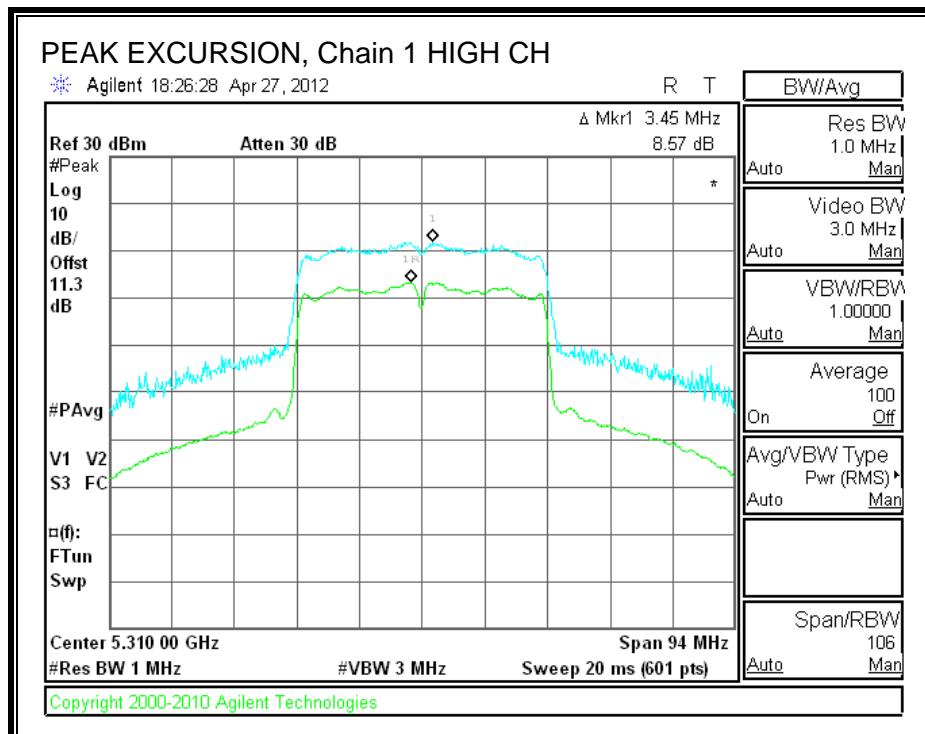
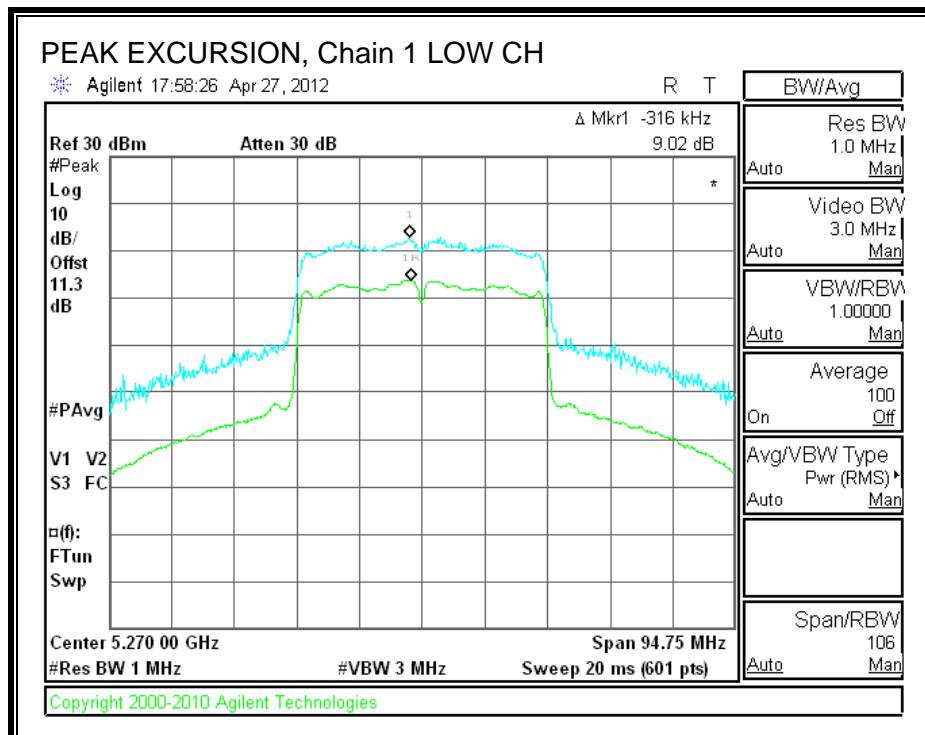
FCC §15.407 (a) (6)

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.

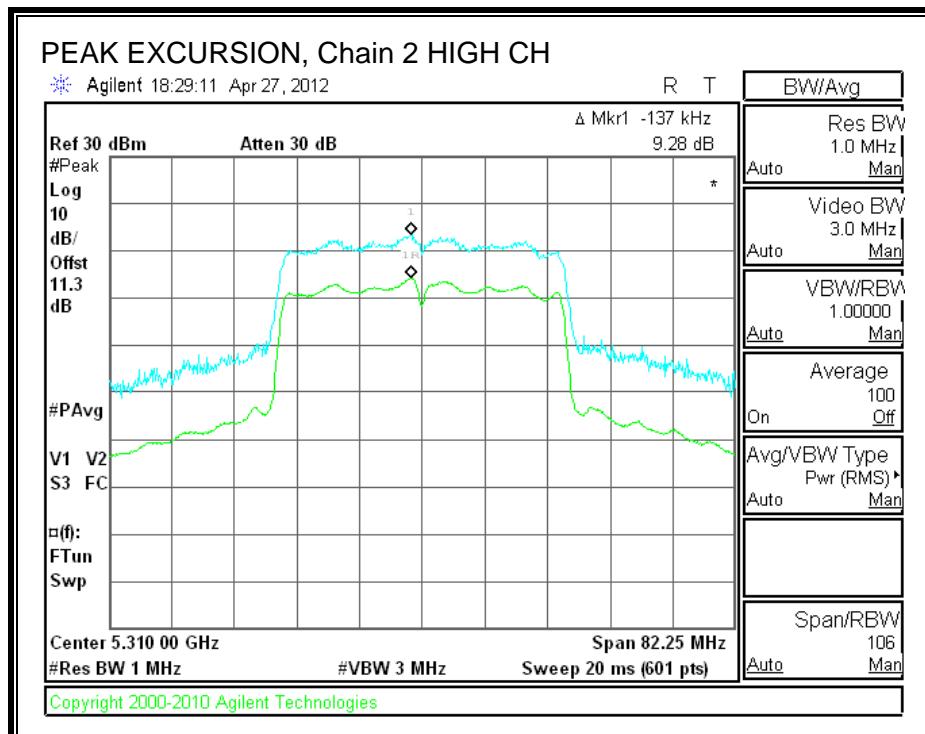
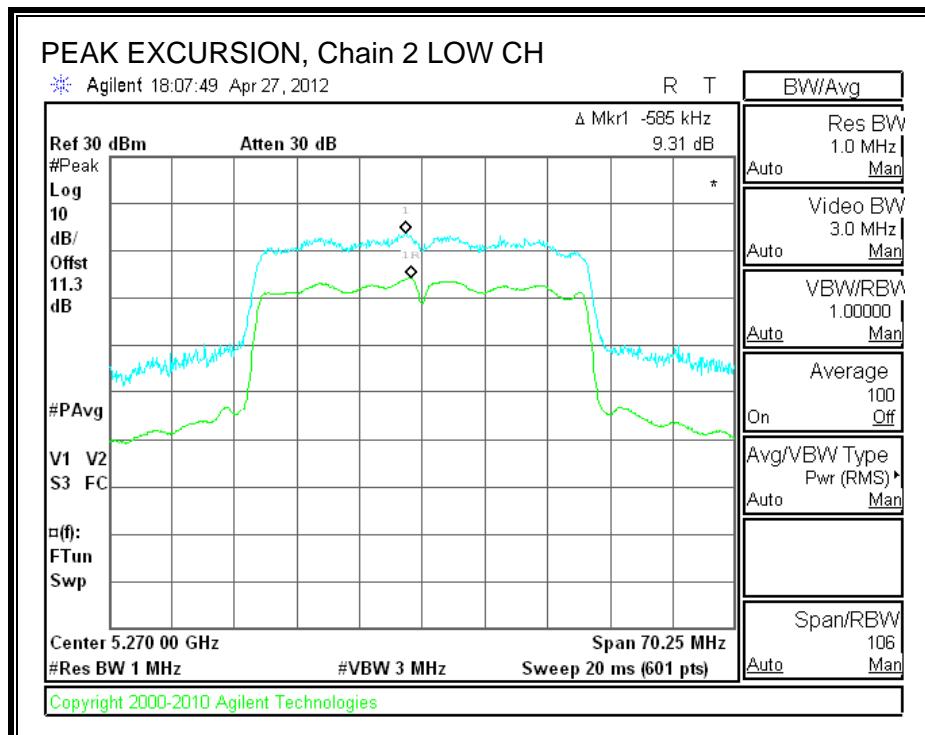
RESULTS

Channel	Frequency (MHz)	Pk Exc Chain 1 (dB)	Pk Exc Chain 2 (dB)	Pk Exc Chain 3 (dB)	Limit (dB)	Worst-Case Margin (dB)
Low	5270	9.02	9.31	9.90	13	-3.10
High	5310	8.57	9.28	10.25	13	-2.75

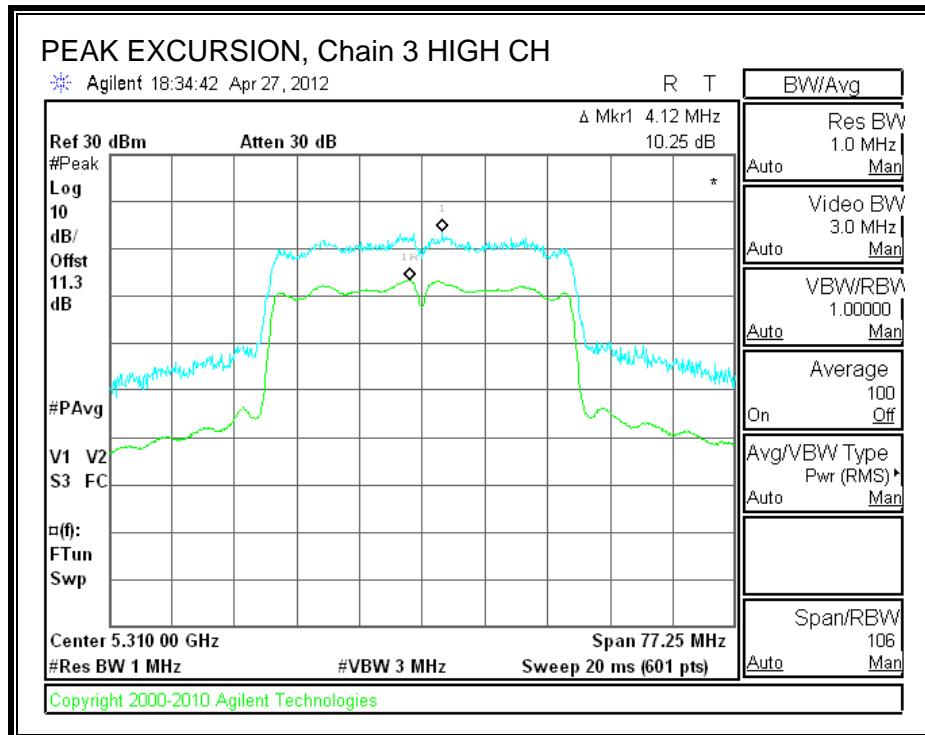
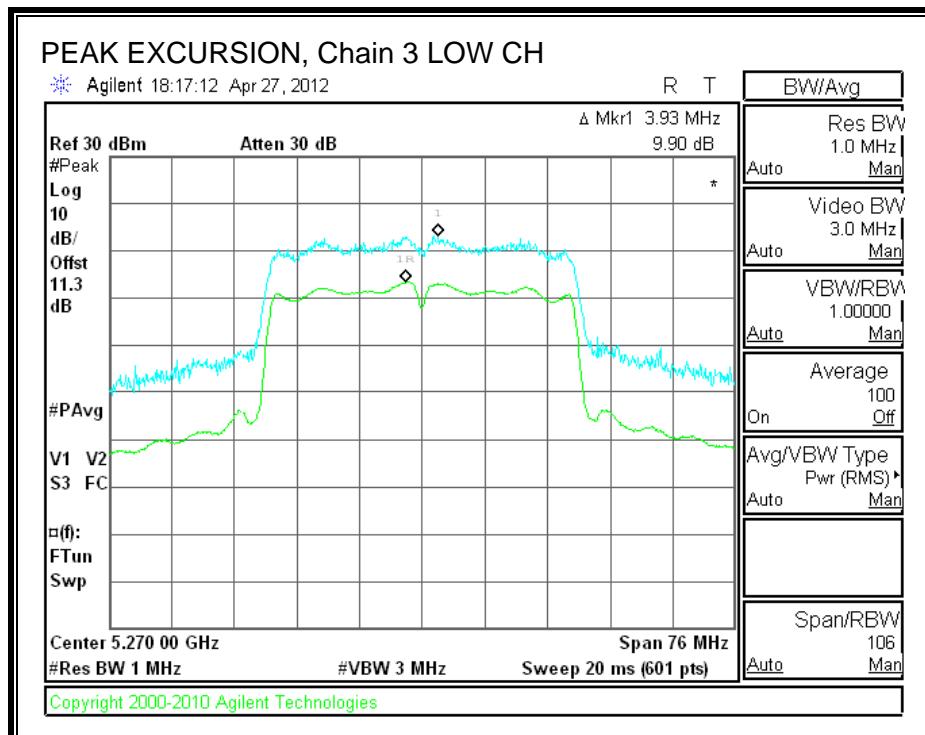
PEAK EXCURSION, Chain 1



PEAK EXCURSION, Chain 2



PEAK EXCURSION, Chain 3



8.11. 802.11n HT40, SDM MCS21, 3TX, 5.3 GHz BAND

8.11.1. 26 dB BANDWIDTH

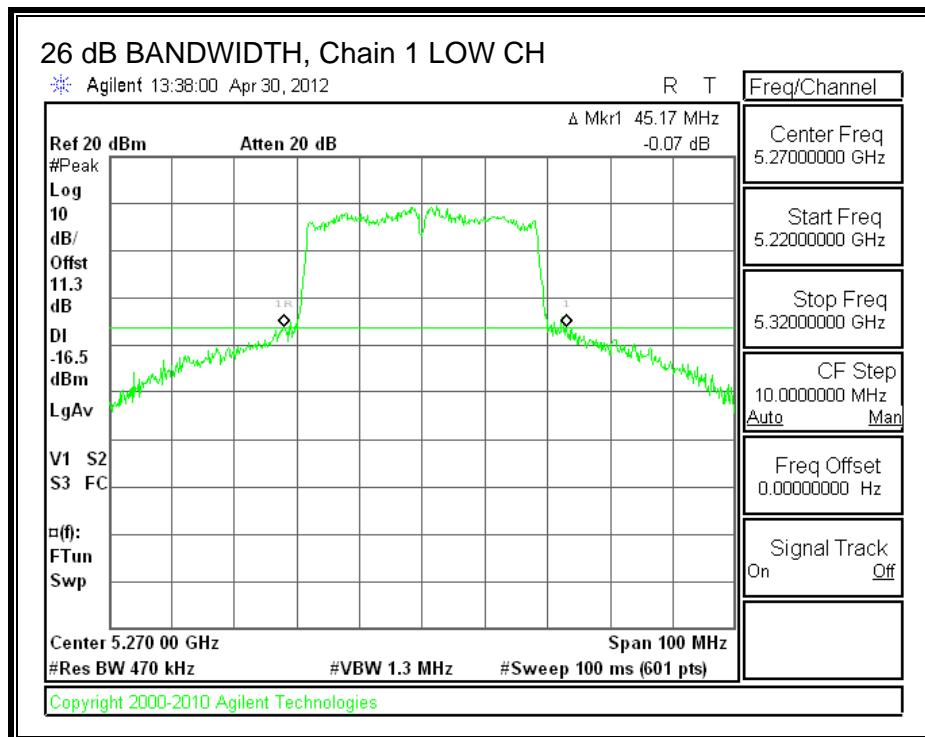
LIMITS

None; for reporting purposes only.

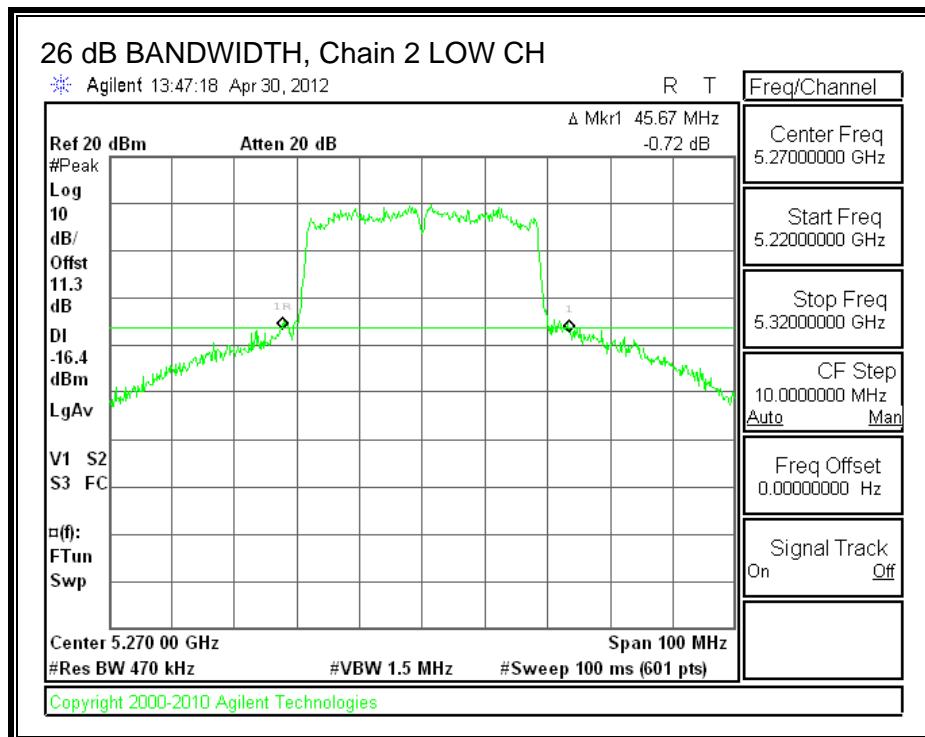
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)	26 dB BW Chain 3 (MHz)
Low	5270	45.17	45.67	42.67

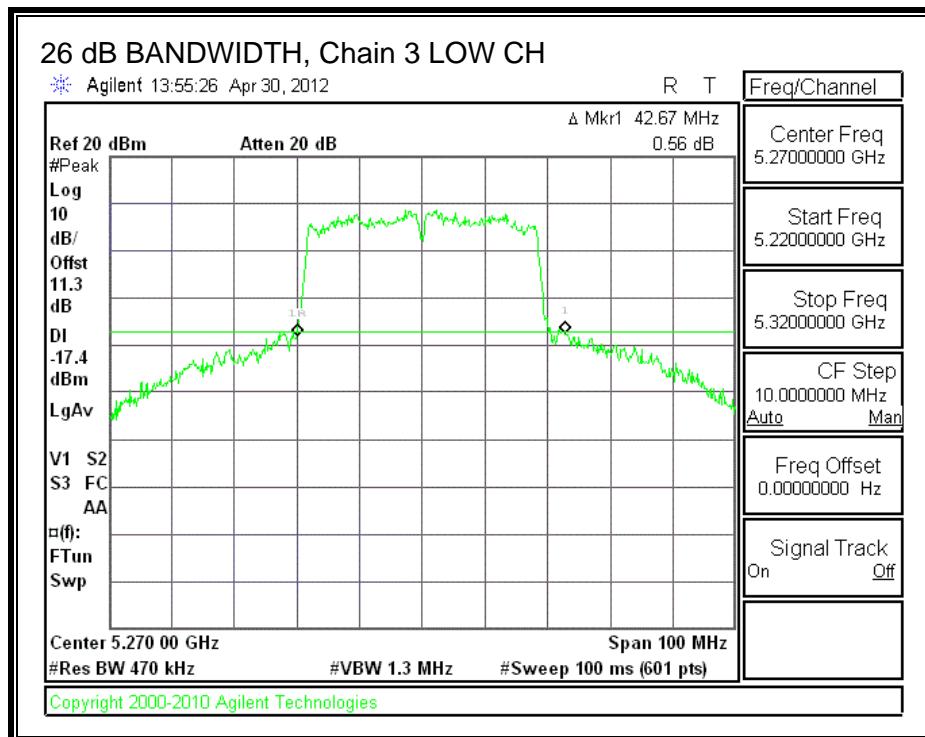
26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



26 dB BANDWIDTH, Chain 3



8.11.2. 99% BANDWIDTH

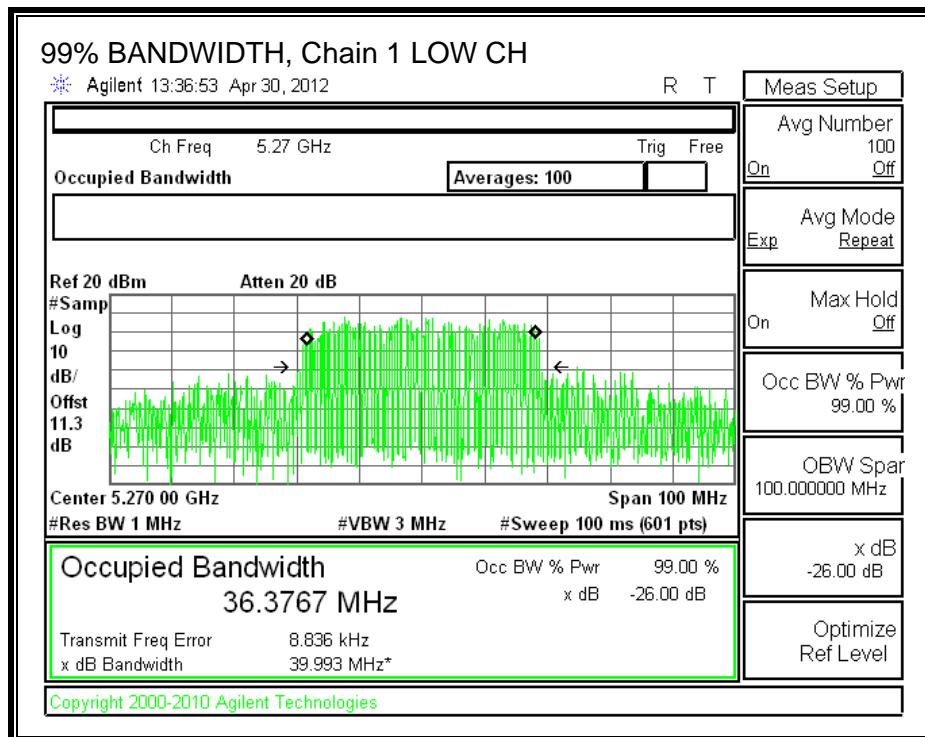
LIMITS

None; for reporting purposes only.

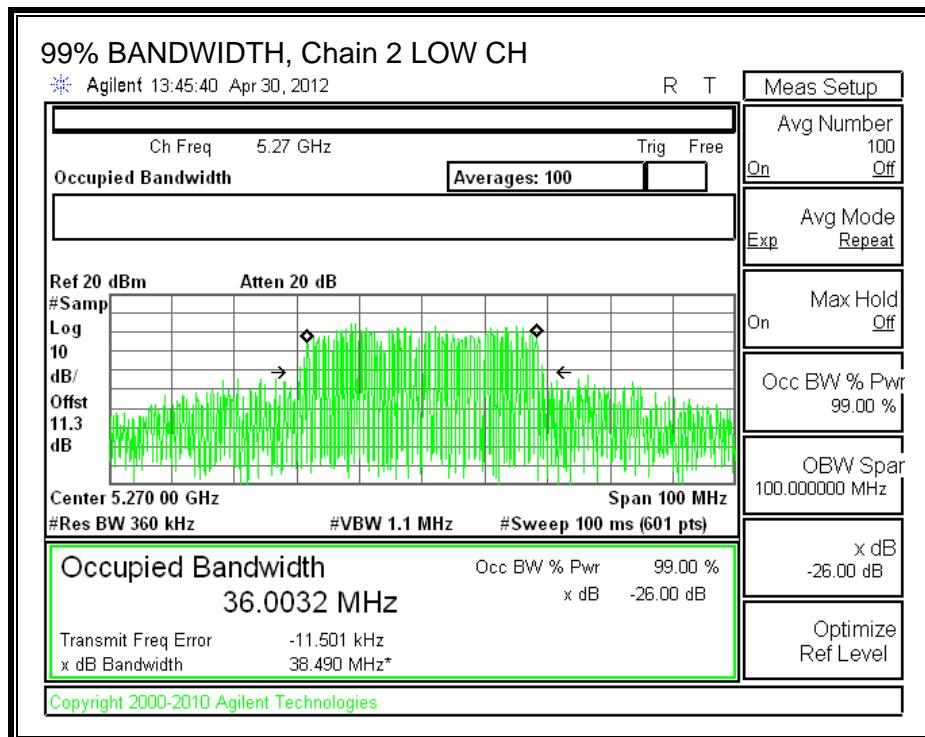
RESULTS

Channel	Frequency (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)	99% BW Chain 3 (MHz)
Low	5270	36.3767	36.0032	36.0881

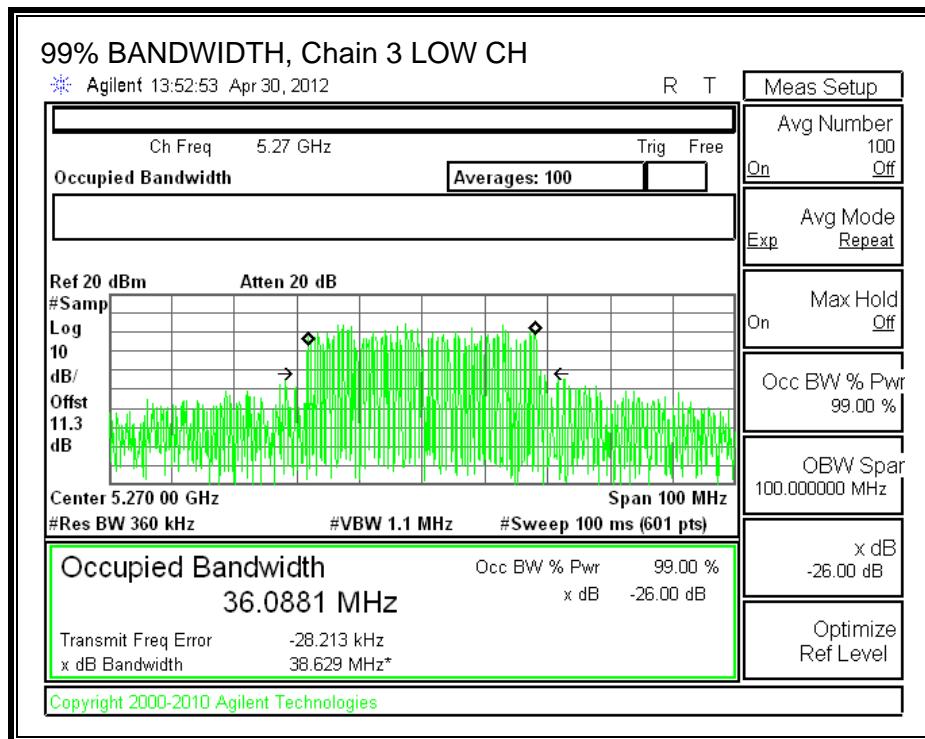
99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



99% BANDWIDTH, Chain 3



8.11.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (2)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak 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 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

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
5.53	1.34	1.96	3.36

RESULTS

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5270	24	42.67	27.30	3.36	24.00	11.00

Duty Cycle CF (dB)	2.50	Included in Calculations of Corr'd Power & PPSD
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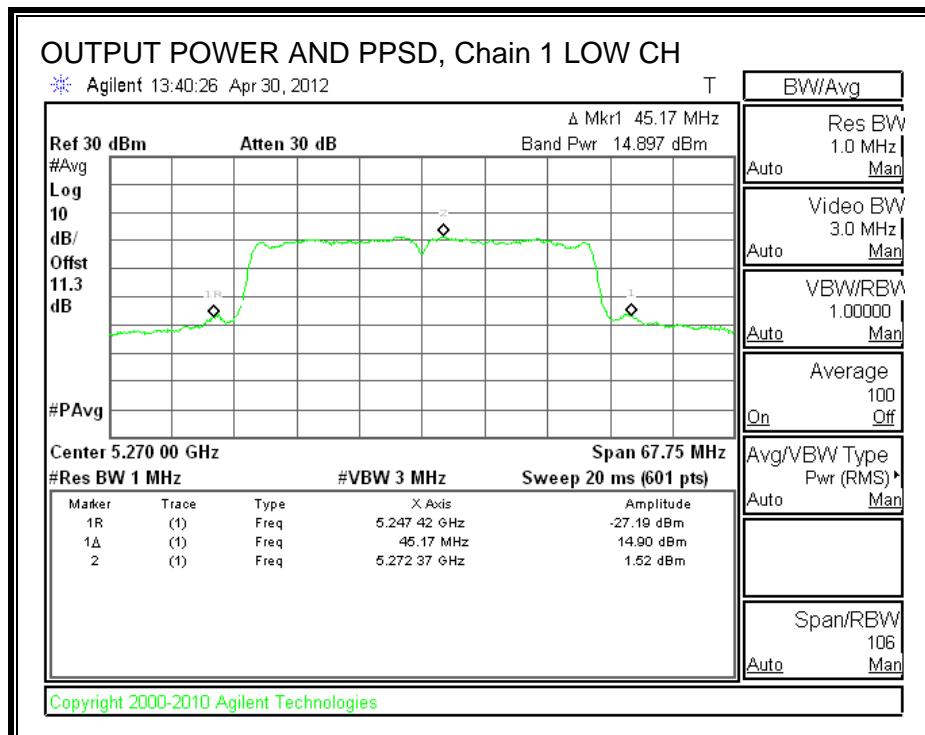
Output Power Results

Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Chain 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	14.897	15.163	14.278	22.066	24.00	-1.934

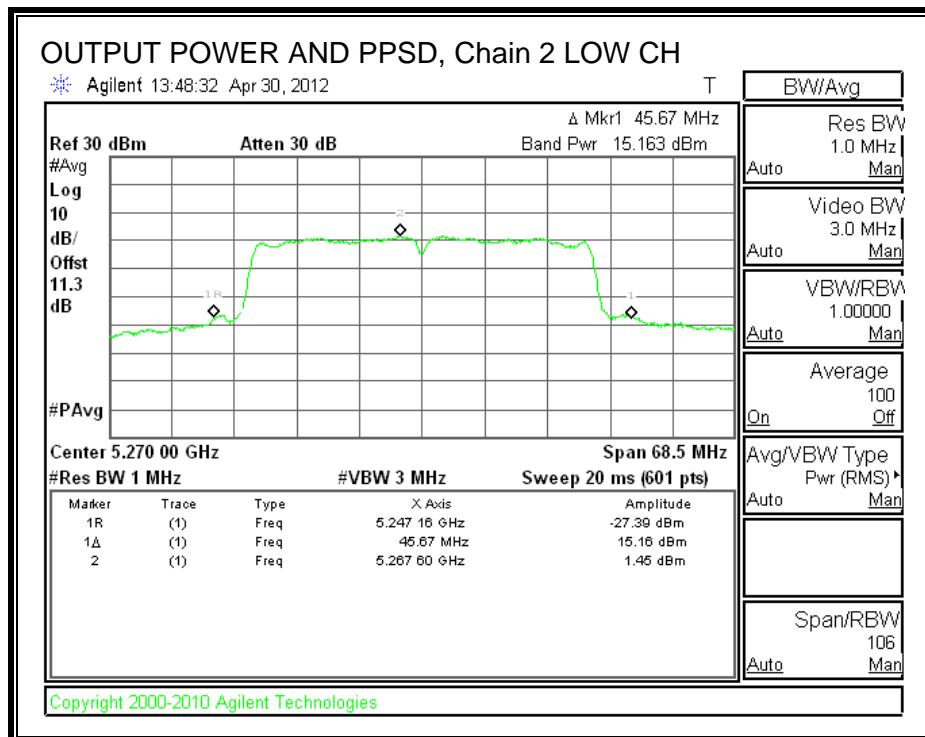
PPSD Results

Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Chain 3 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	1.52	1.45	1.25	8.68	11.00	-2.32

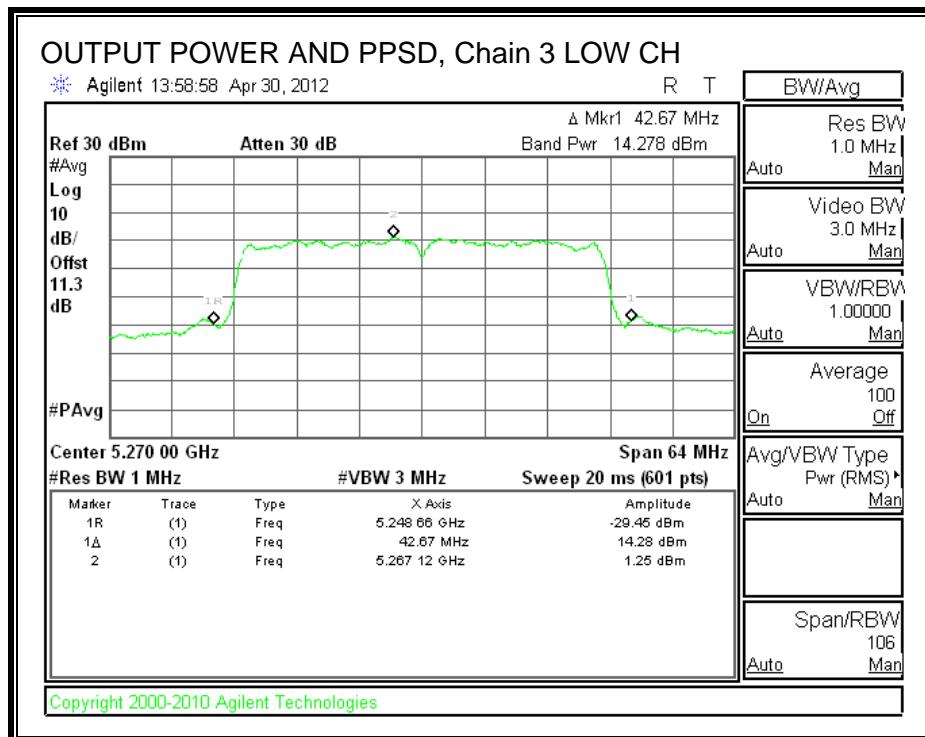
OUTPUT POWER AND PPSD, Chain 1



OUTPUT POWER AND PPSD, Chain 2



OUTPUT POWER AND PPSD, Chain 3



8.11.4. PEAK EXCURSION

LIMITS

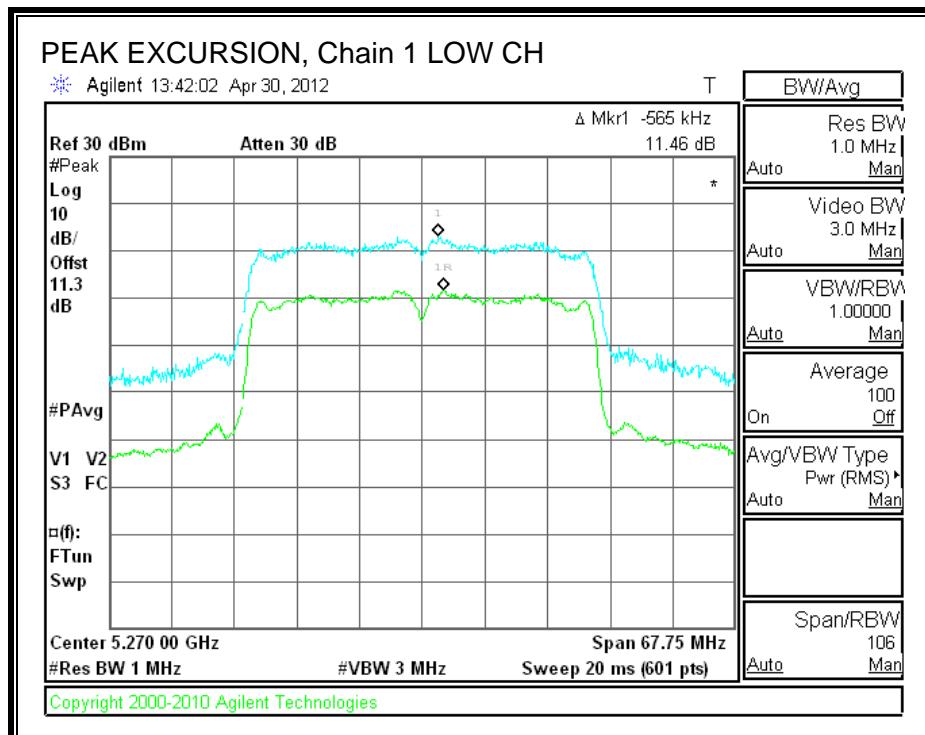
FCC §15.407 (a) (6)

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.

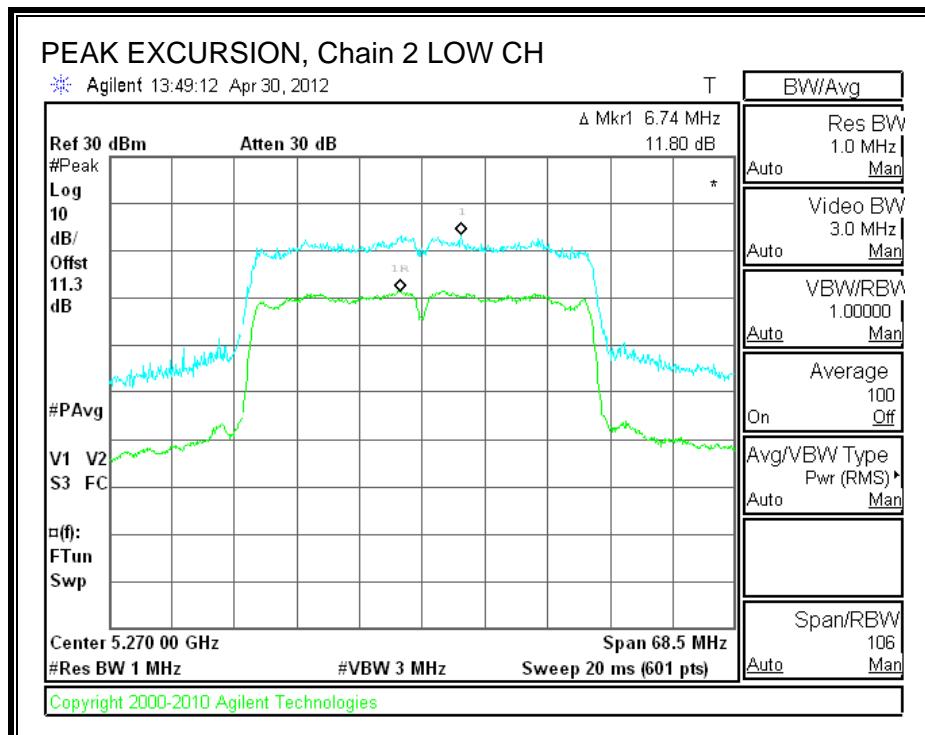
RESULTS

Channel	Frequency (MHz)	Pk Exc Chain 1 (dB)	Pk Exc Chain 2 (dB)	Pk Exc Chain 3 (dB)	Limit (dB)	Worst-Case Margin (dB)
Low	5270	11.46	11.80	10.81	13	-1.20

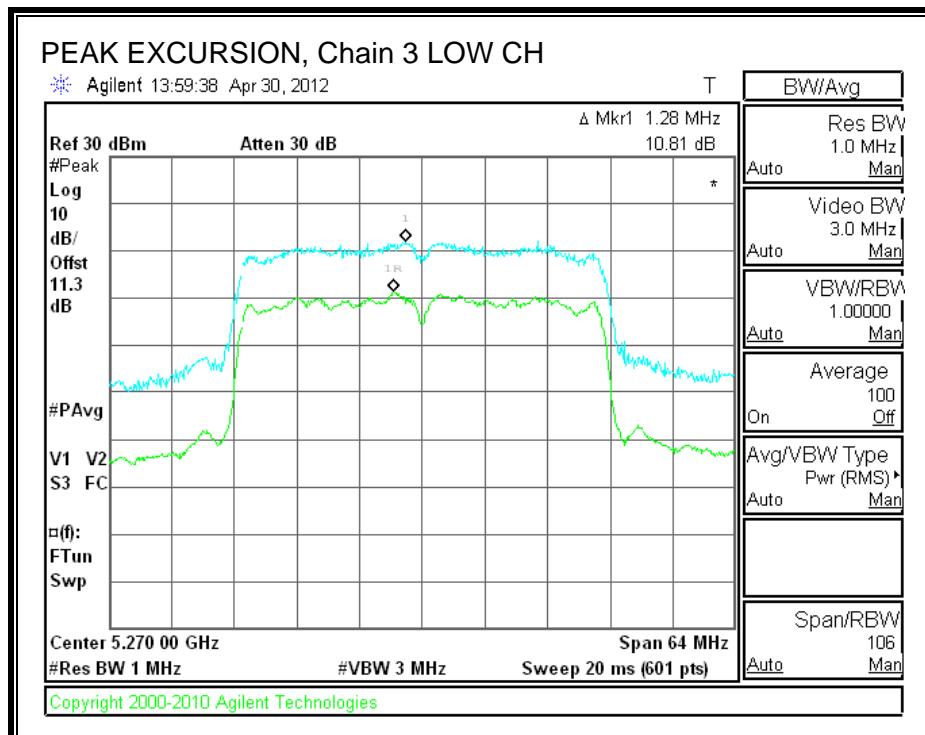
PEAK EXCURSION, Chain 1



PEAK EXCURSION, Chain 2



PEAK EXCURSION, Chain 3



8.12. 802.11a, Legacy, 1TX, 5.6 GHz BAND

8.12.1. 26 dB BANDWIDTH

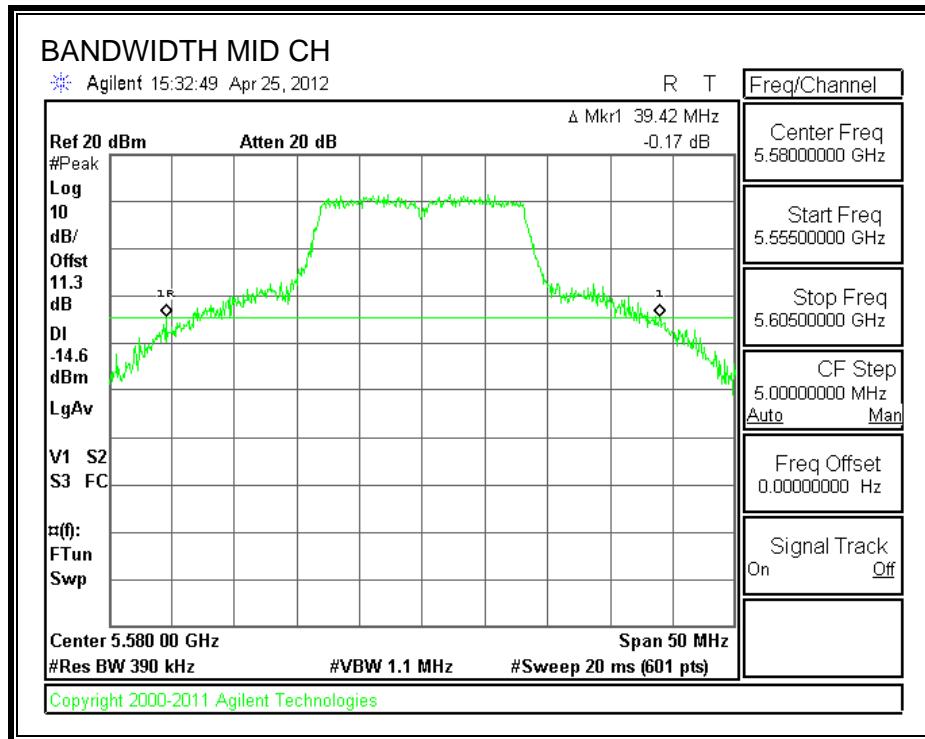
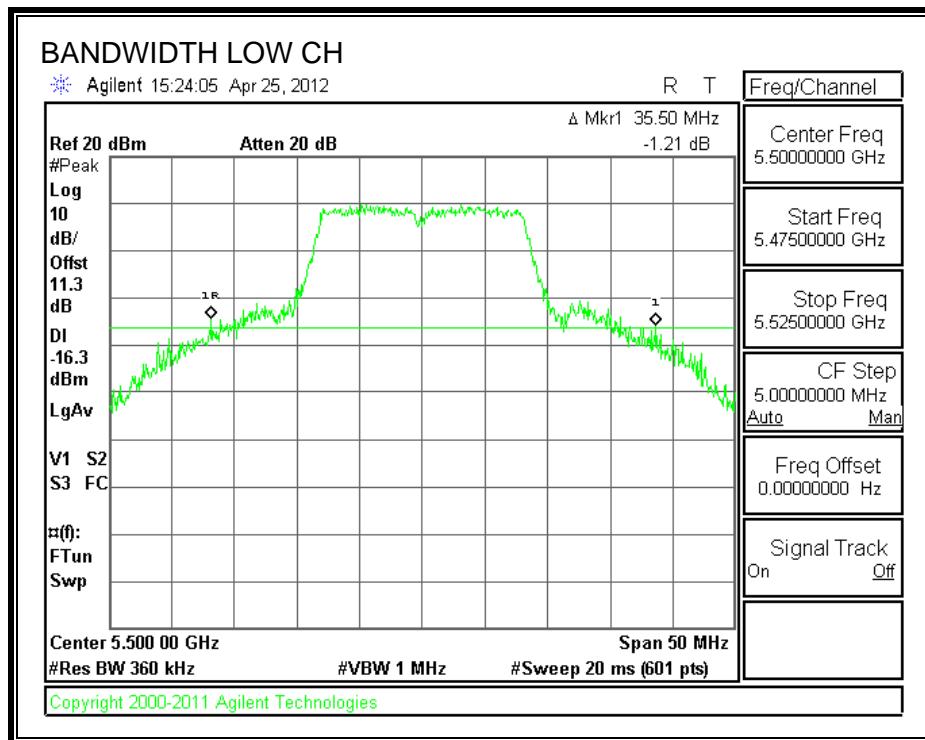
LIMITS

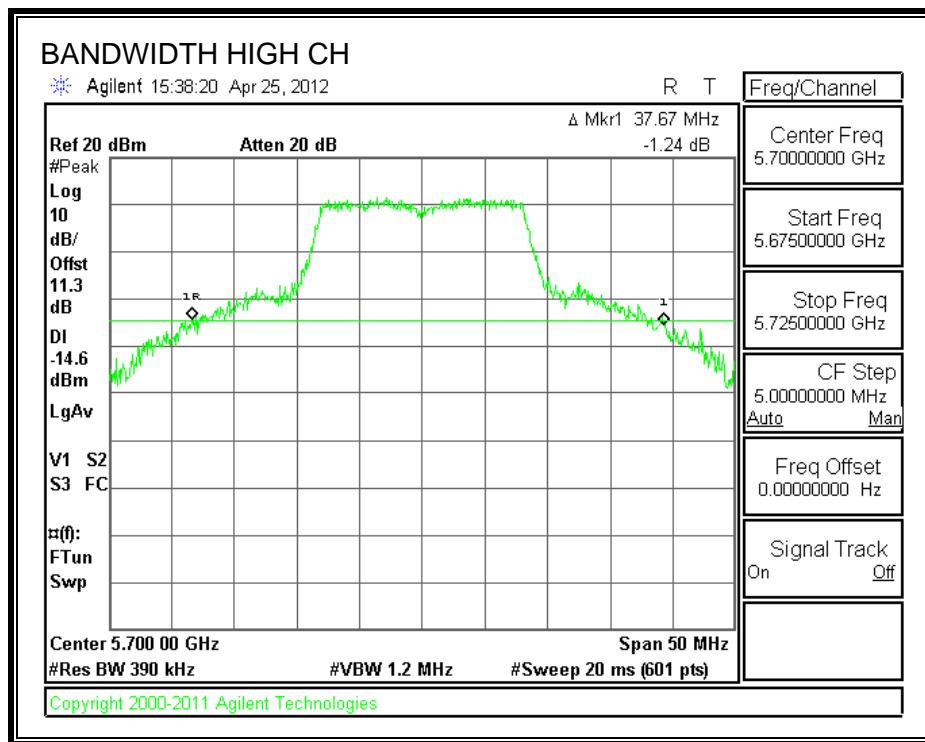
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	35.50
Mid	5580	39.42
High	5700	37.67

26 dB BANDWIDTH





8.12.2. 99% BANDWIDTH

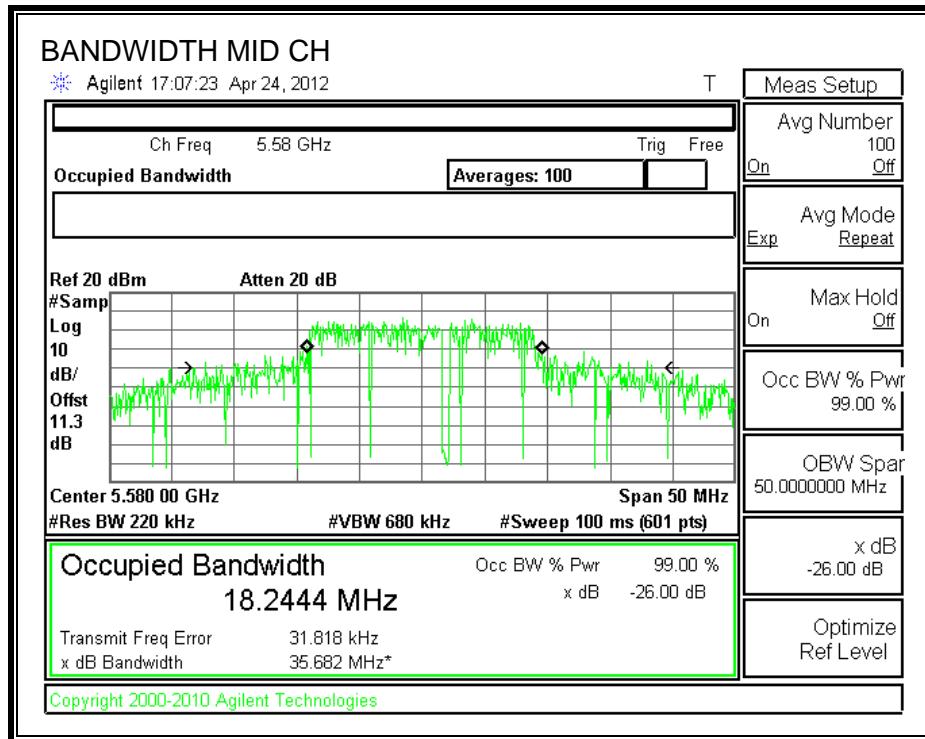
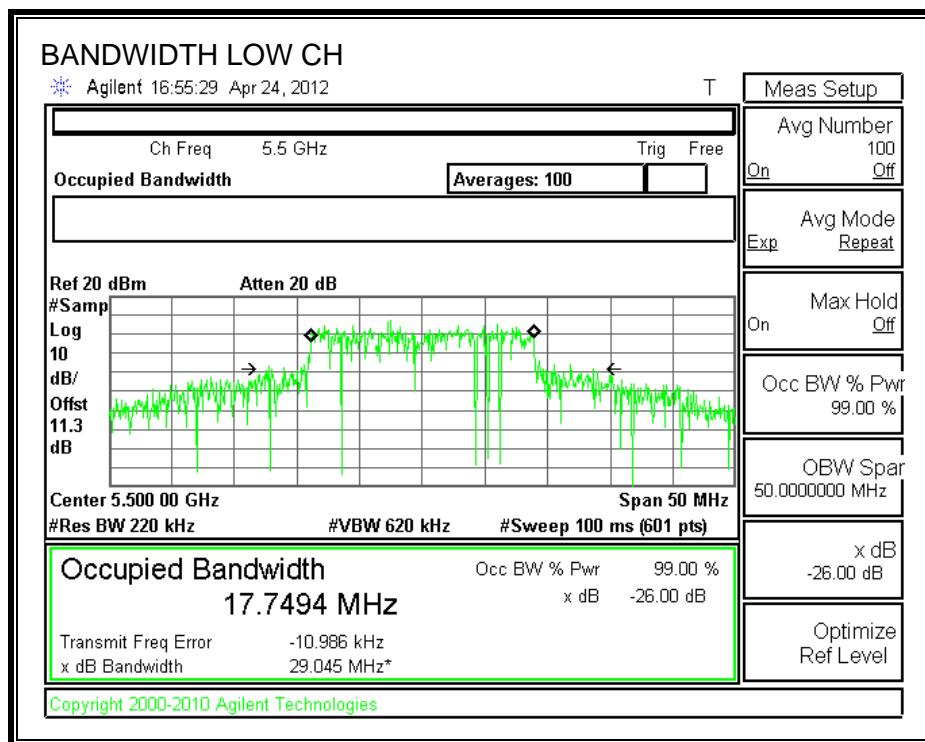
LIMITS

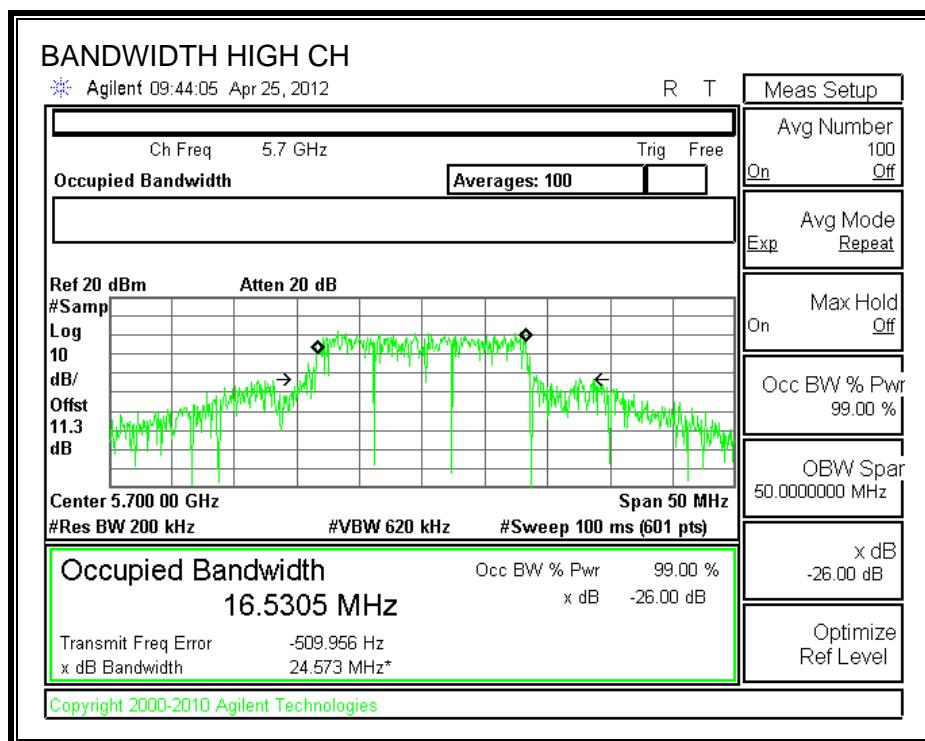
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	17.7494
Mid	5580	18.2444
High	5700	16.5305

99% BANDWIDTH





8.12.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (3)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak 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 peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5500	24	35.50	26.50	5.53	24.00	11.00
Mid	5580	24	39.42	26.96	5.53	24.00	11.00
High	5700	24	37.67	26.76	5.53	24.00	11.00

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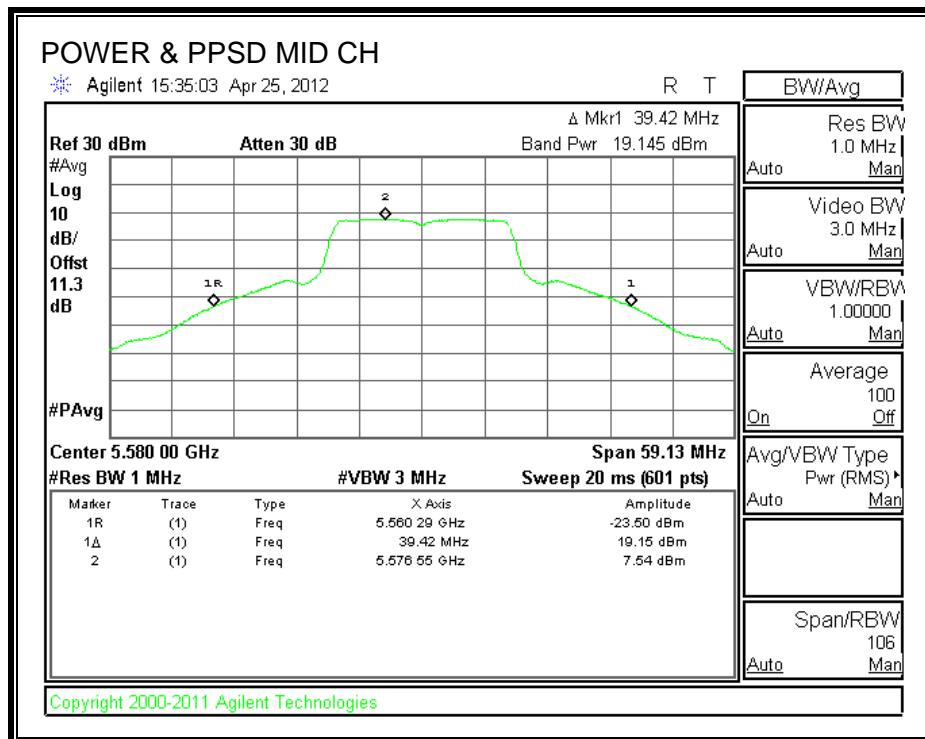
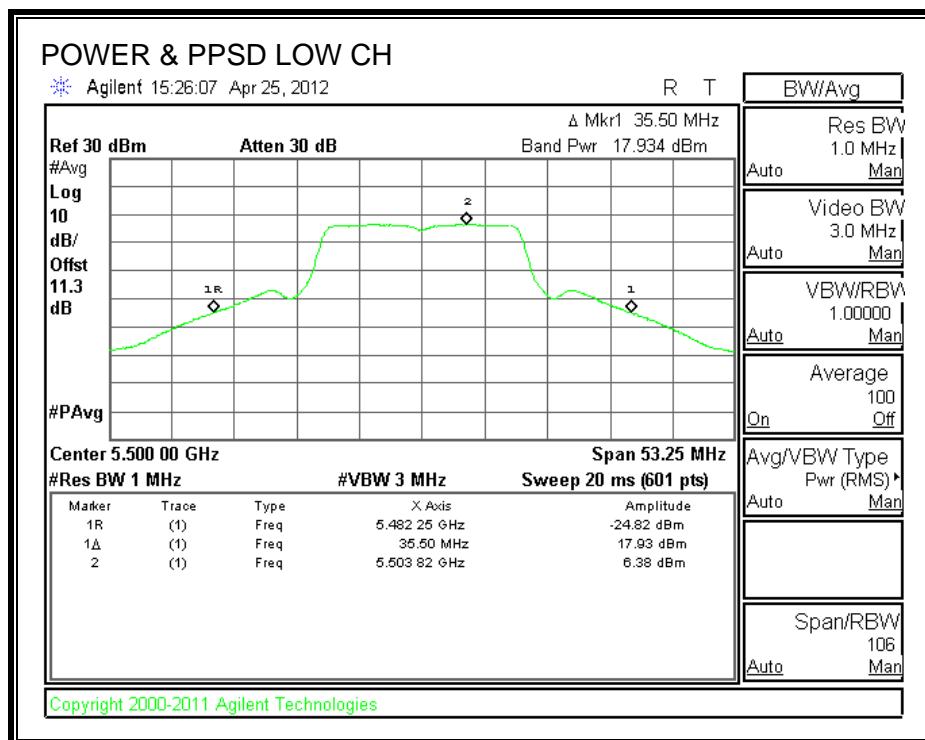
Output Power Results

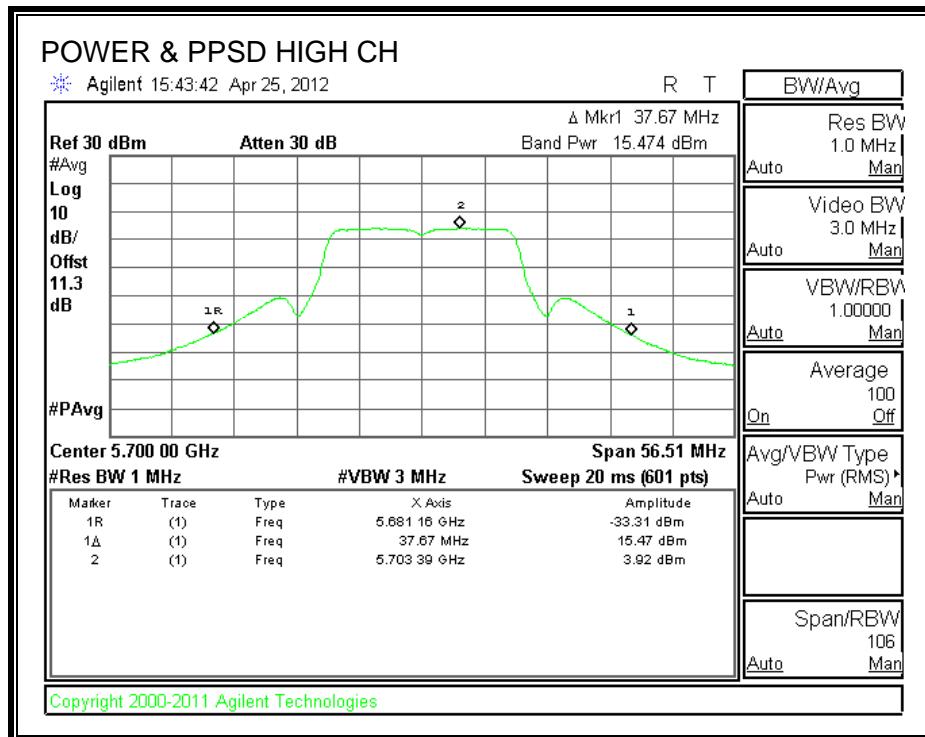
Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	17.934	17.934	24.00	-6.066
Mid	5580	19.145	19.145	24.00	-4.855
High	5700	15.474	15.474	24.00	-8.526

PPSD Results

Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	6.38	6.38	11.00	-4.62
Mid	5580	7.54	7.54	11.00	-3.46
High	5700	3.92	3.92	11.00	-7.08

OUTPUT POWER AND PPSD





8.12.4. PEAK EXCURSION

LIMITS

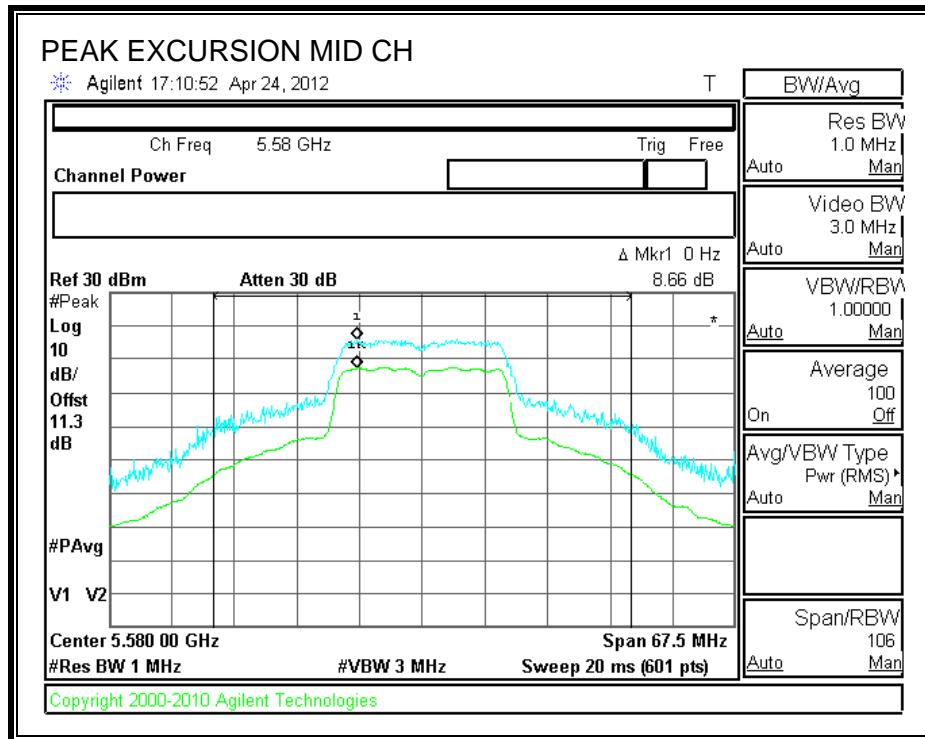
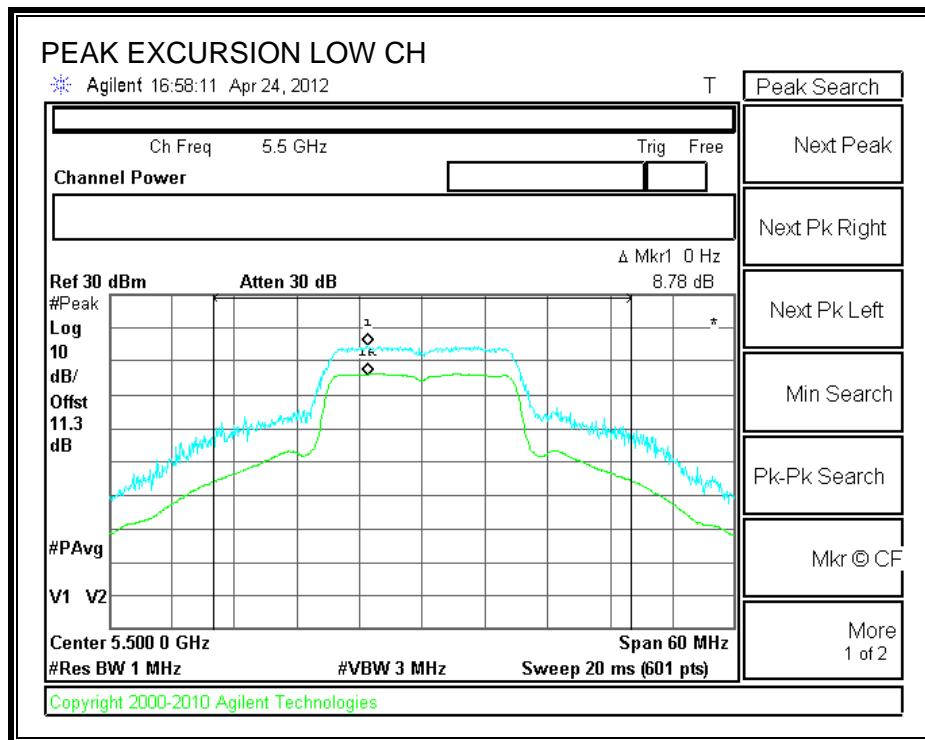
FCC §15.407 (a) (6)

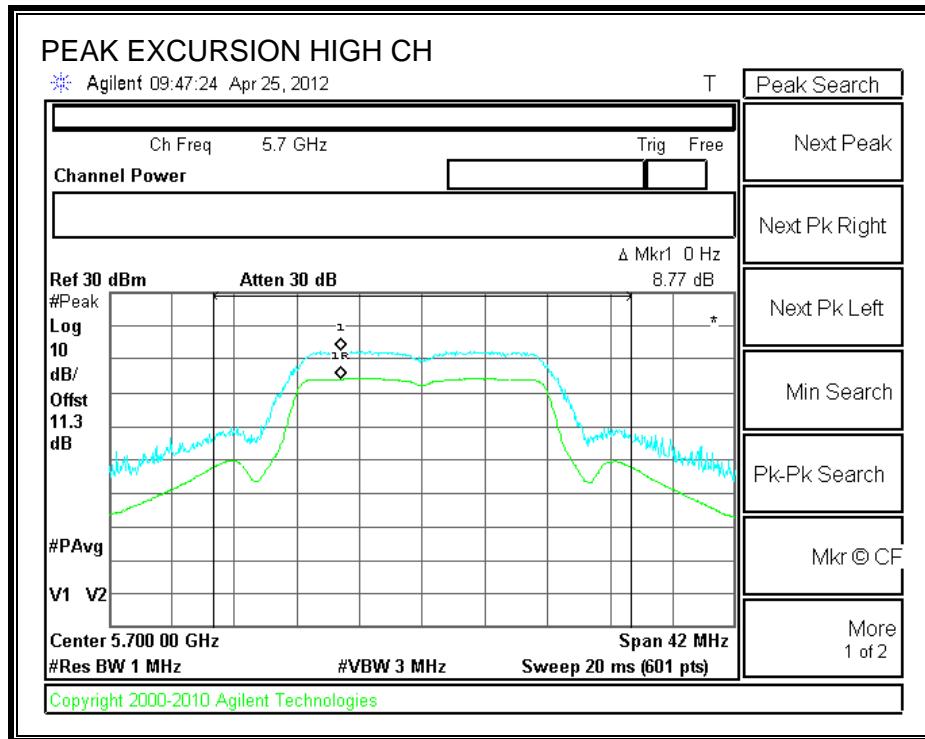
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	8.78	13	-4.2
Mid	5580	8.66	13	-4.3
High	5700	8.77	13	-4.2

PEAK EXCURSION





8.13. 802.11n HT20, CDD MCS0, 3TX, 5.6 GHz BAND

8.13.1. 26 dB BANDWIDTH

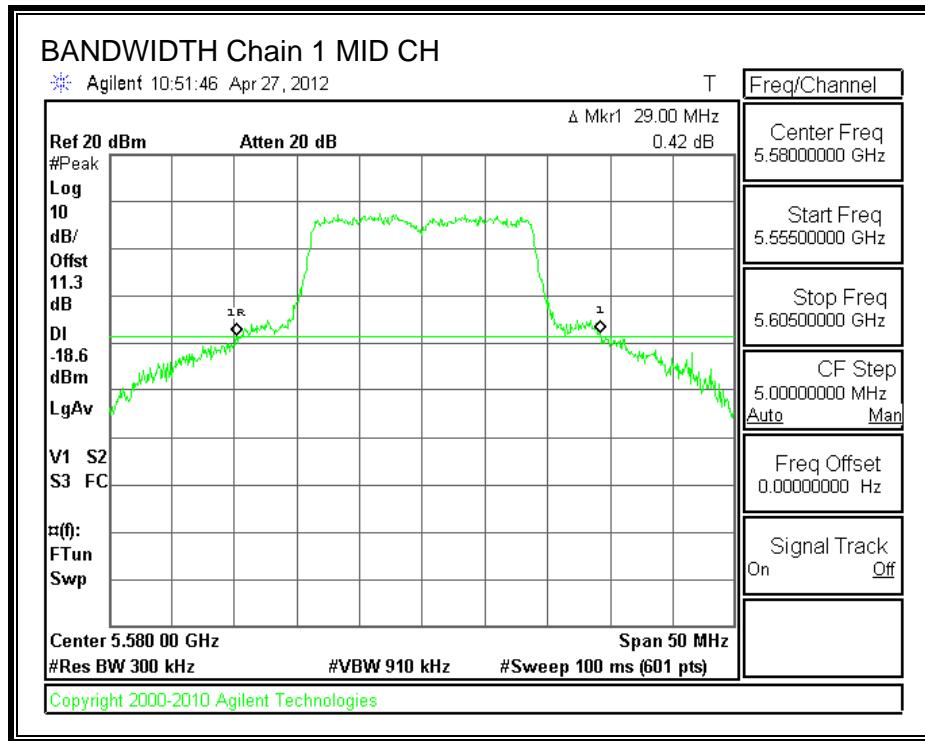
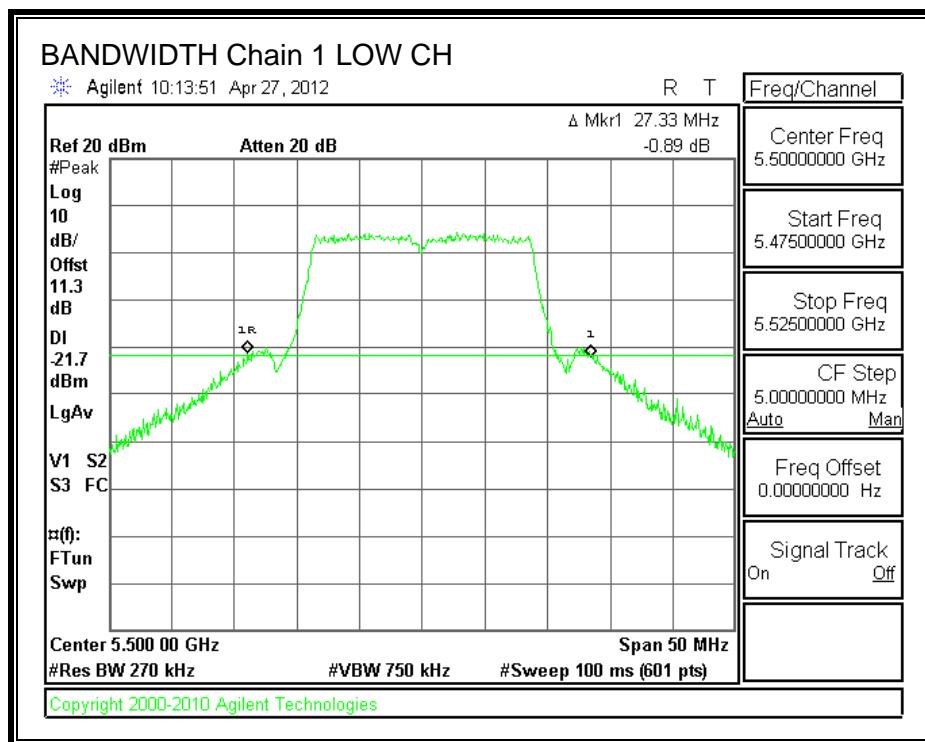
LIMITS

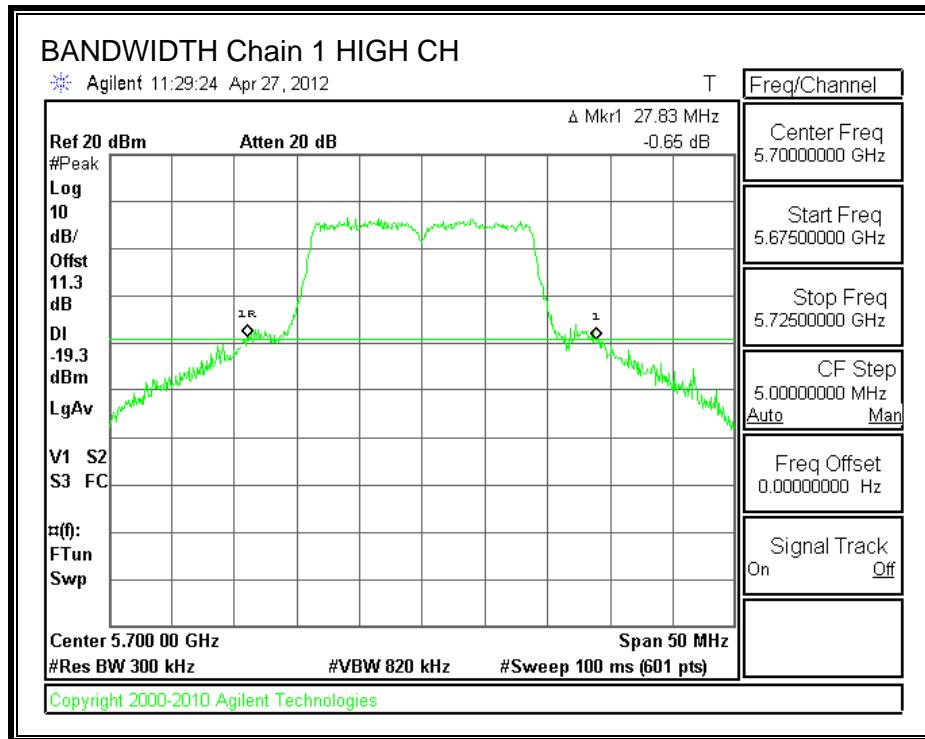
None; for reporting purposes only.

RESULTS

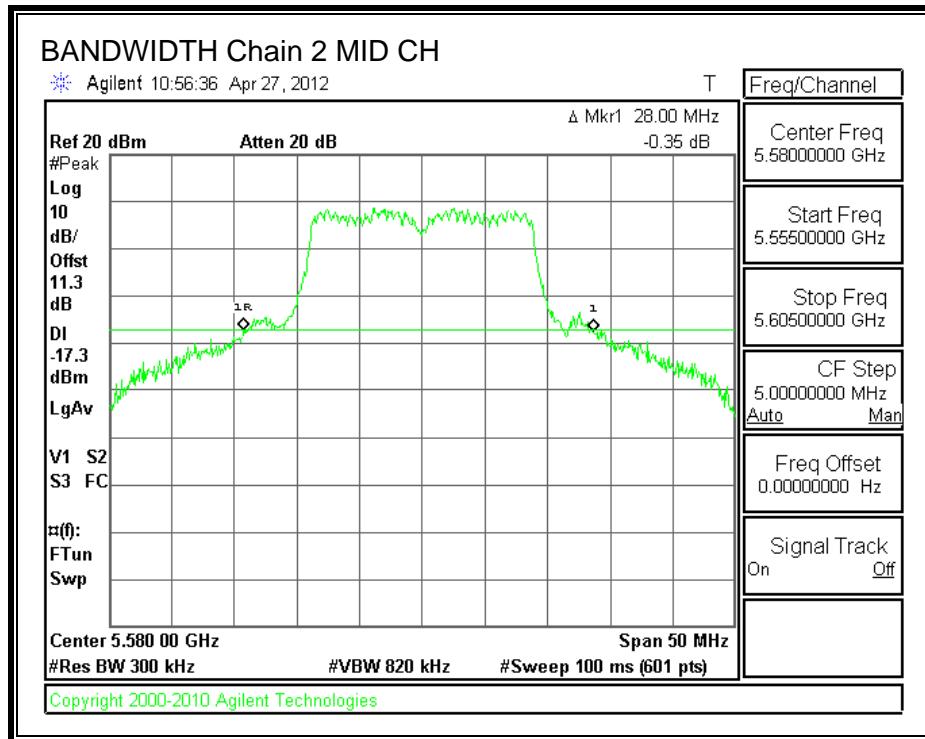
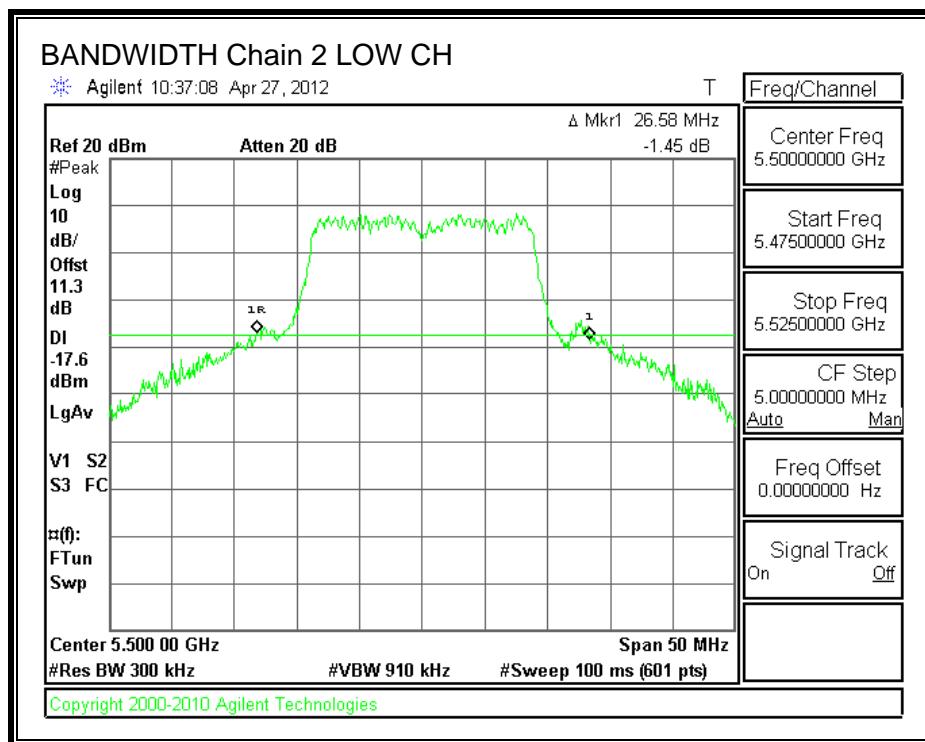
Channel	Frequency (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)	26 dB BW Chain 3 (MHz)
Low	5500	27.33	26.58	28.25
Mid	5580	29.00	28.00	29.00
High	5700	27.83	27.58	29.17

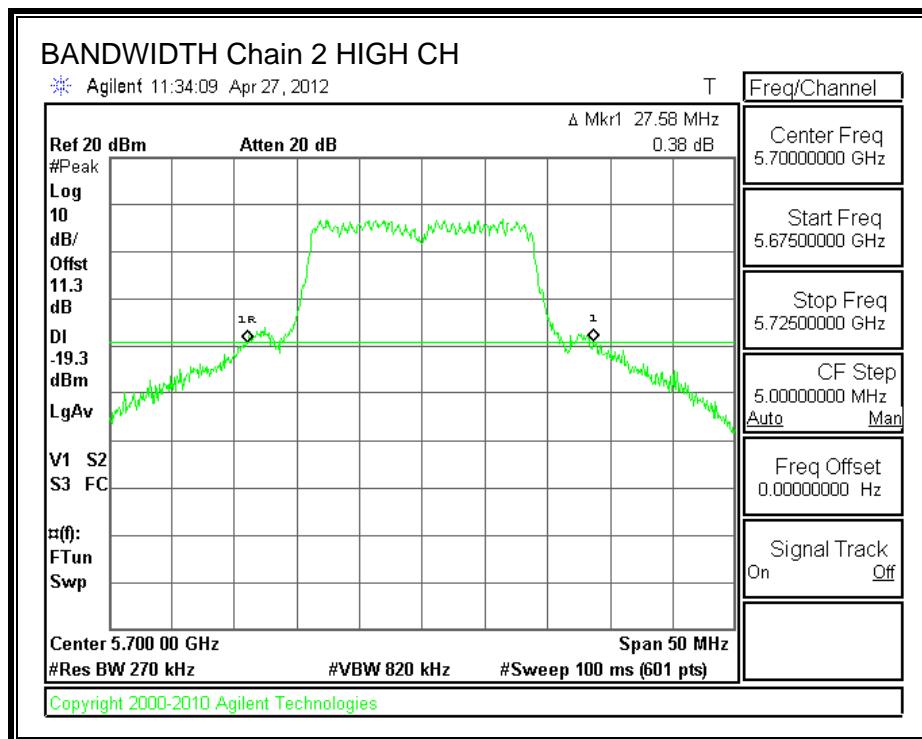
26 dB BANDWIDTH, Chain 1



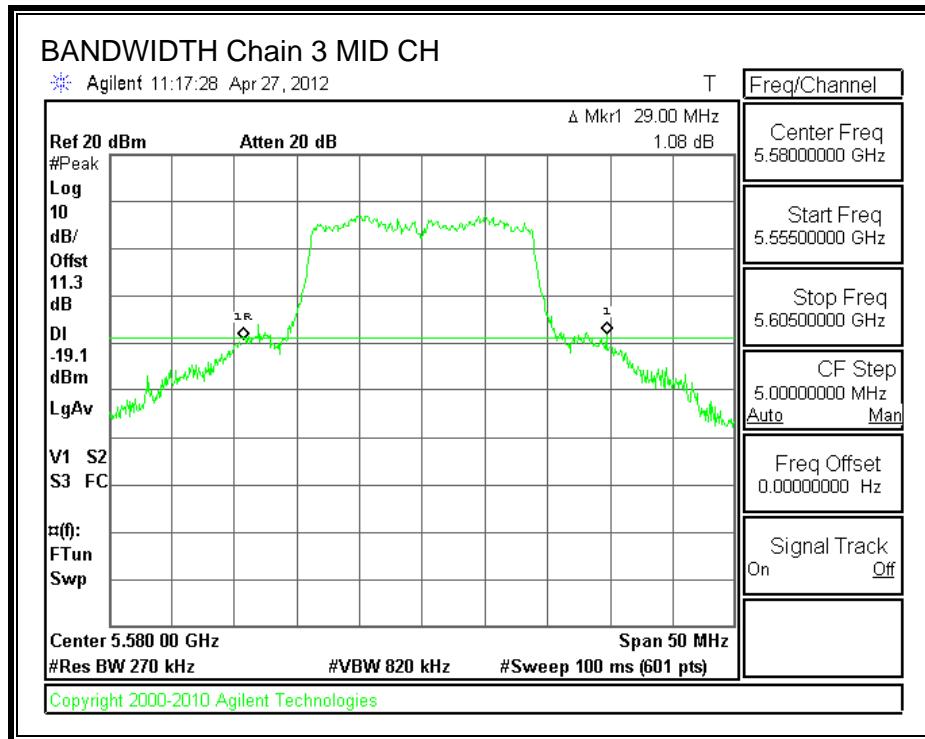
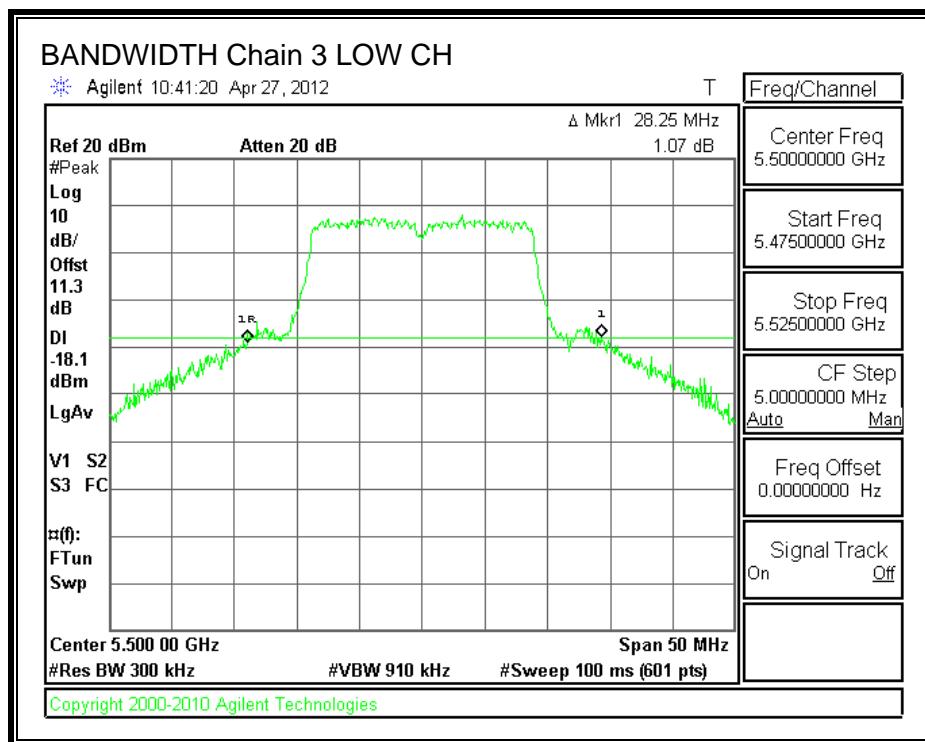


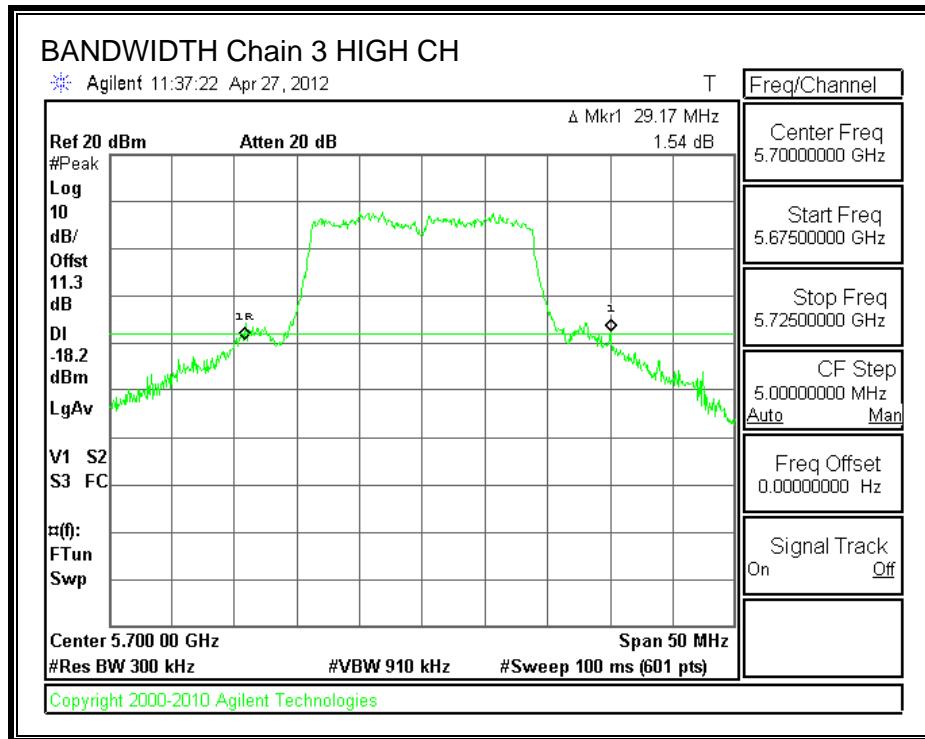
26 dB BANDWIDTH, Chain 2





26 dB BANDWIDTH, Chain 3





8.13.2. 99% BANDWIDTH

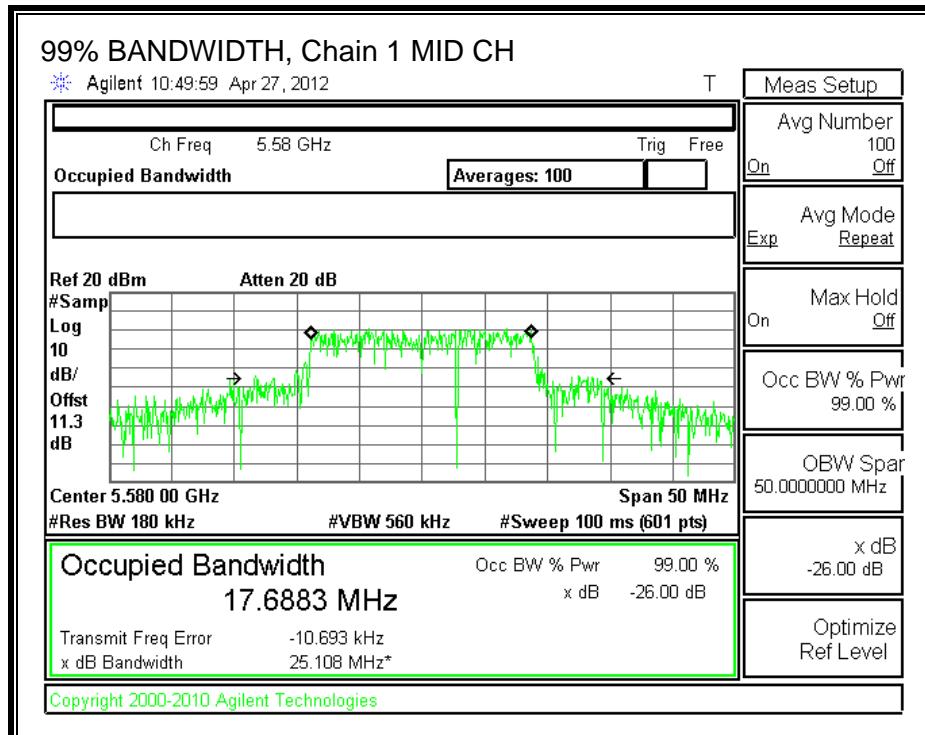
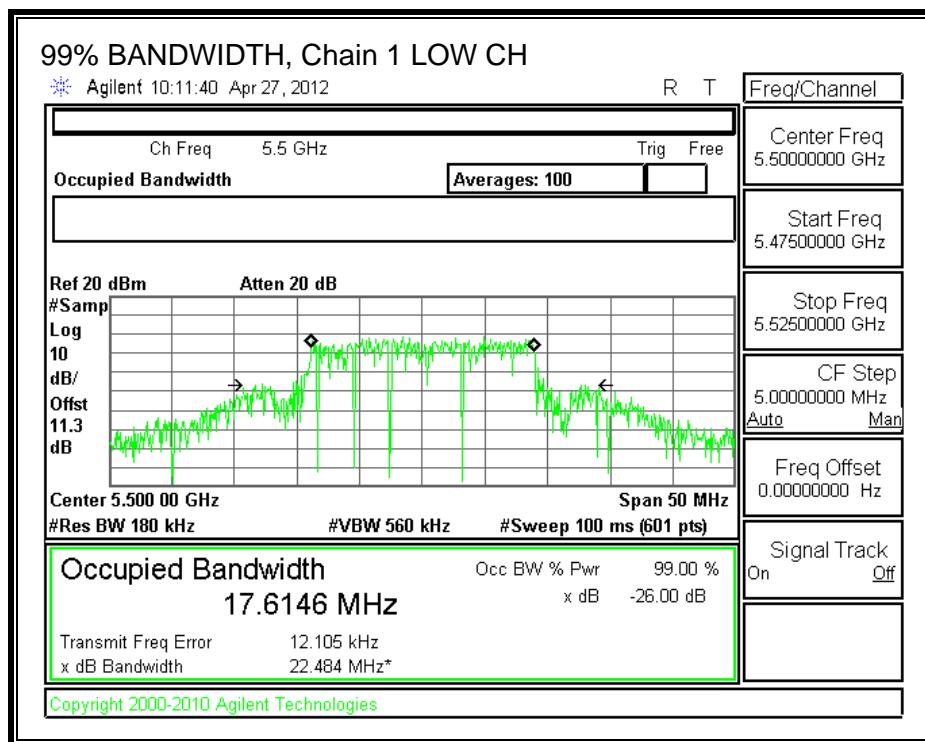
LIMITS

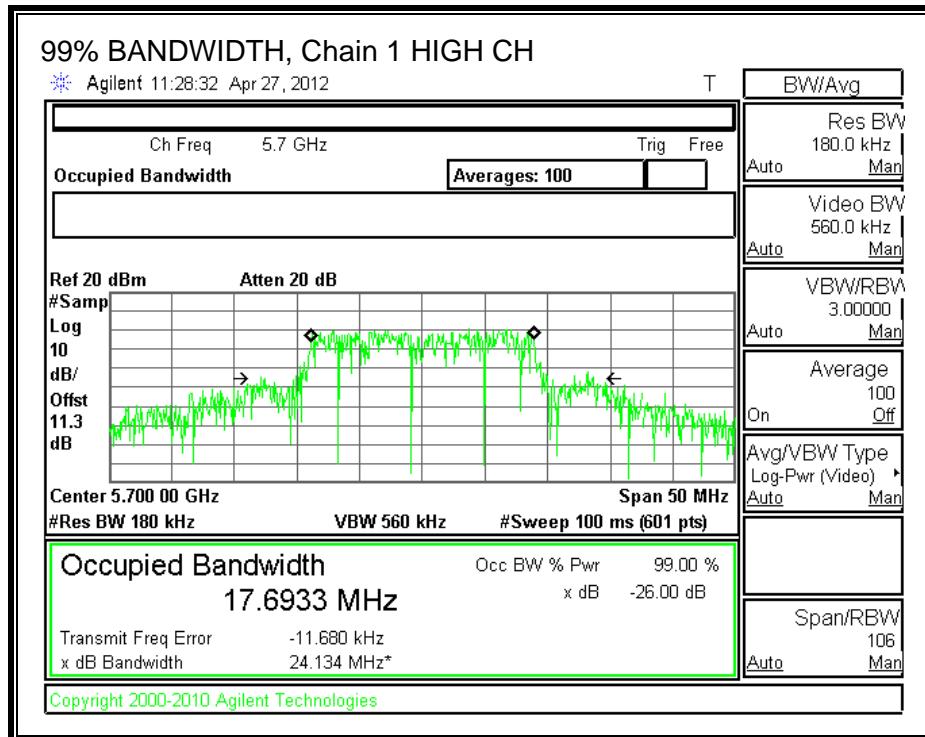
None; for reporting purposes only.

RESULTS

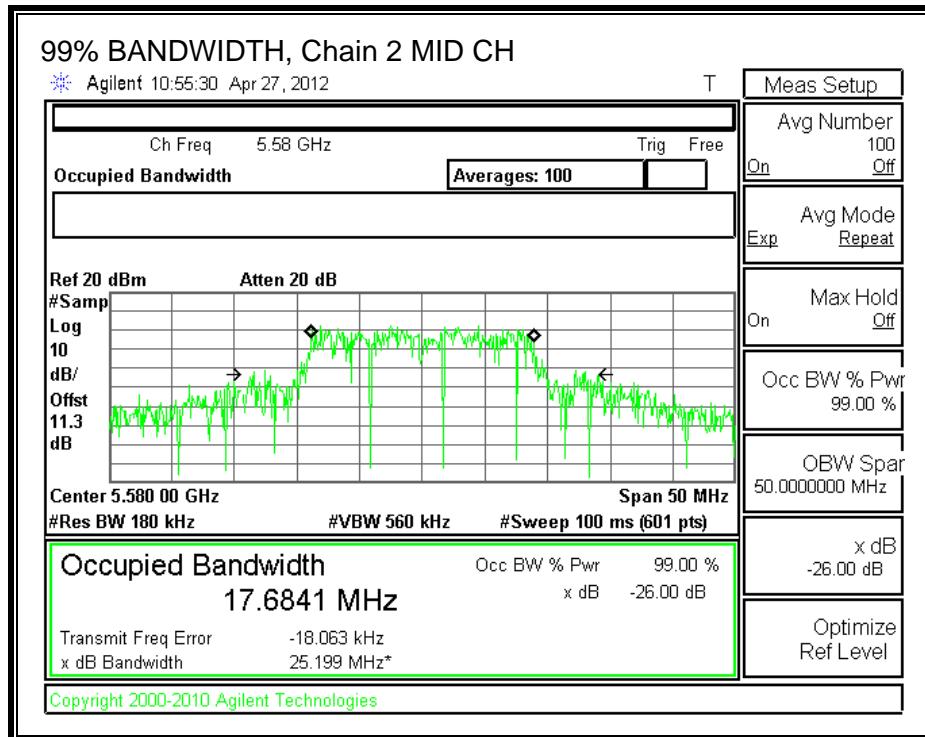
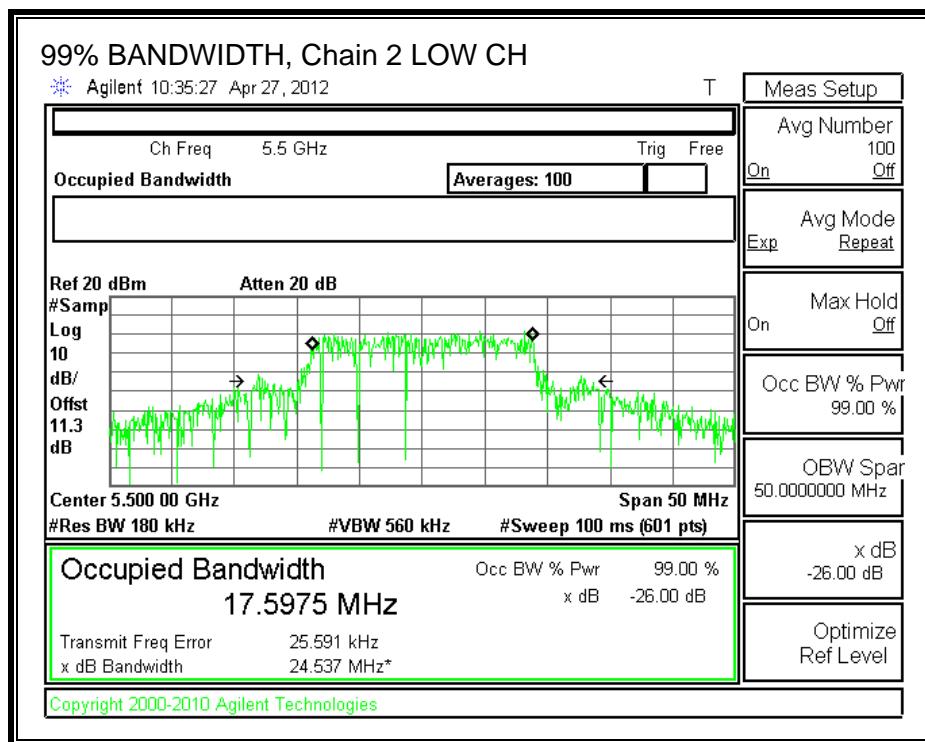
Channel	Frequency (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)	99% BW Chain 3 (MHz)
Low	5500	17.6146	17.5975	17.6731
Mid	5580	17.6883	17.6841	17.6619
High	5700	17.6933	17.6427	17.6506

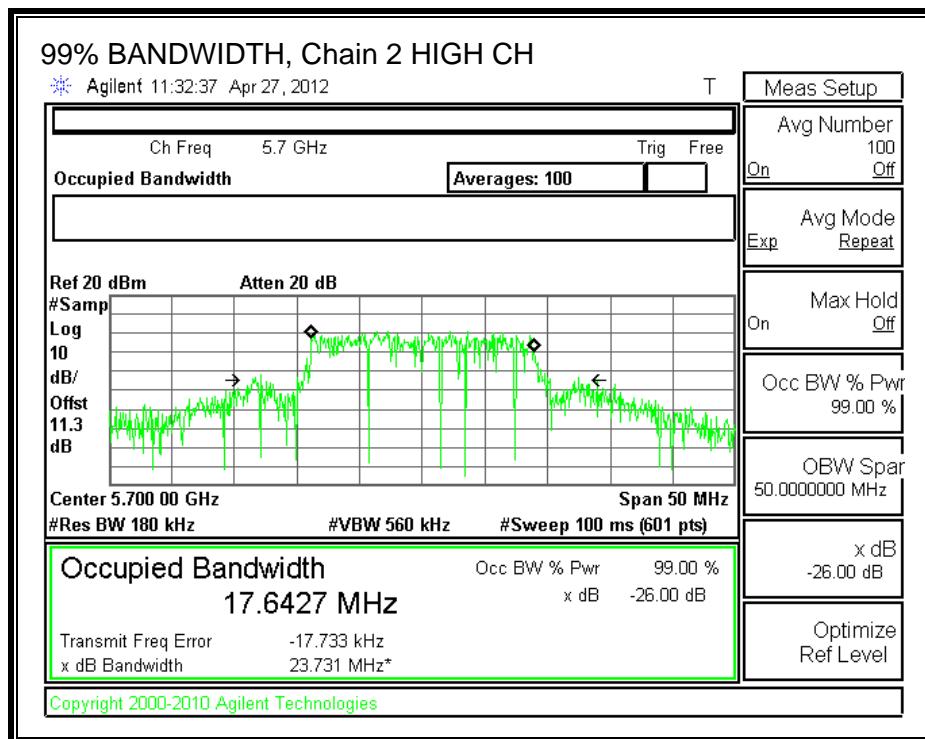
99% BANDWIDTH, Chain 1



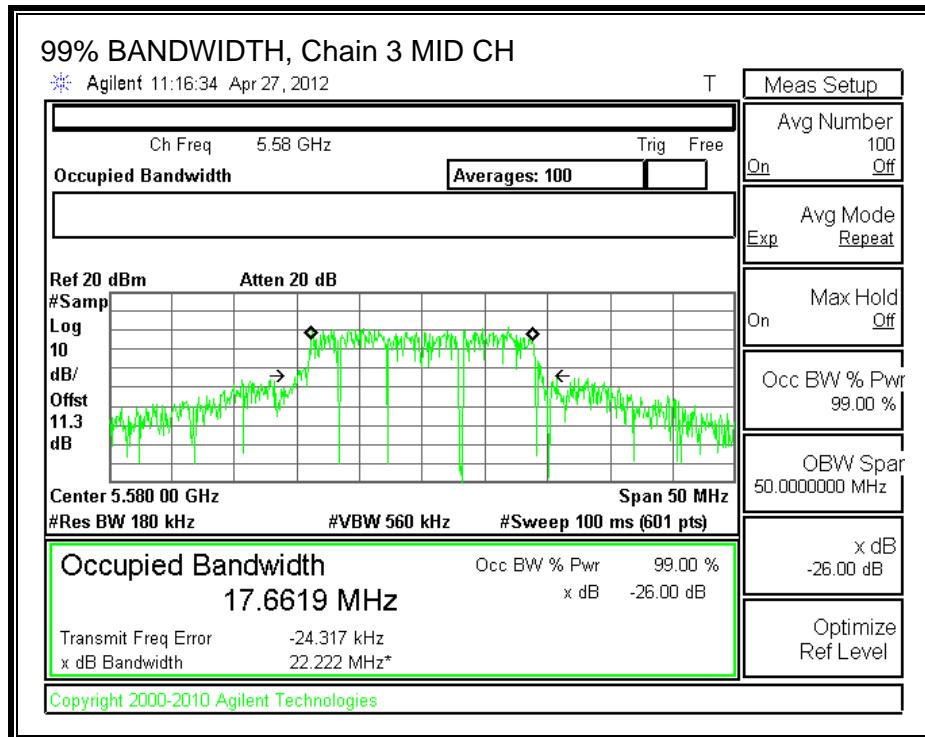
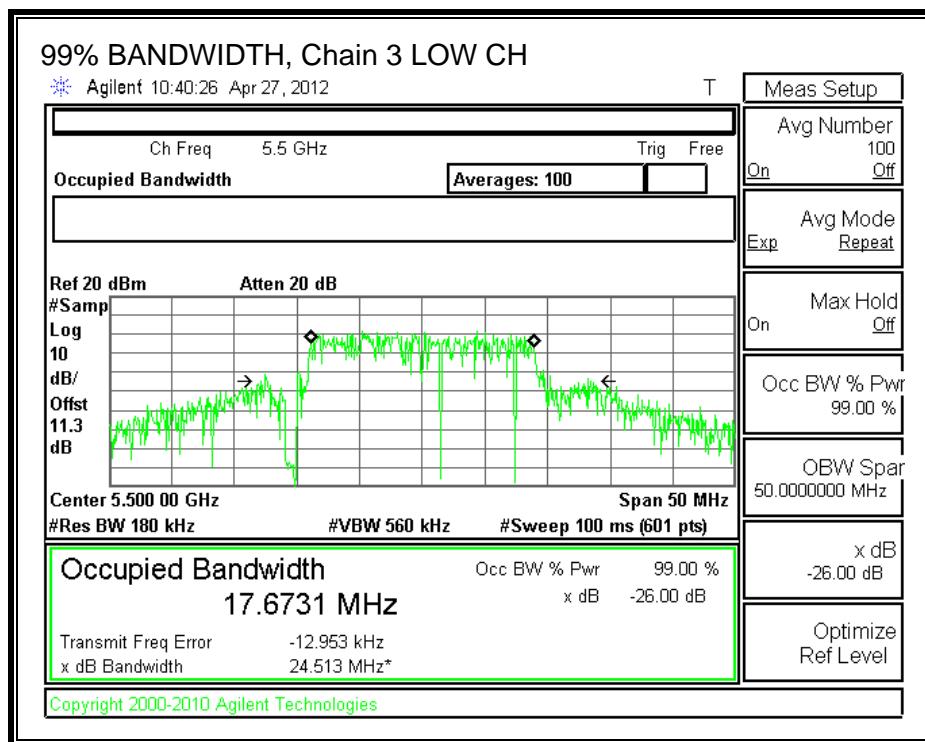


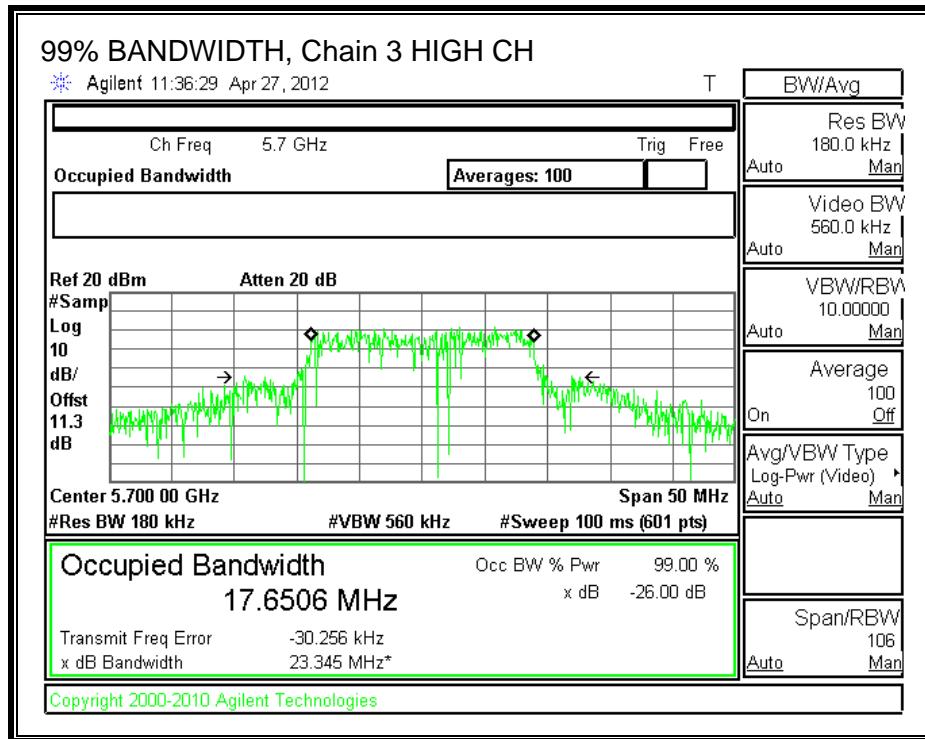
99% BANDWIDTH, Chain 2





99% BANDWIDTH, Chain 3





8.13.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (3)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak 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 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

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.53	2.68	1.26	8.11

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5500	24	26.58	25.25	8.11	21.89	8.89
Mid	5580	24	28.00	25.47	8.11	21.89	8.89
High	5700	24	27.58	25.41	8.11	21.89	8.89

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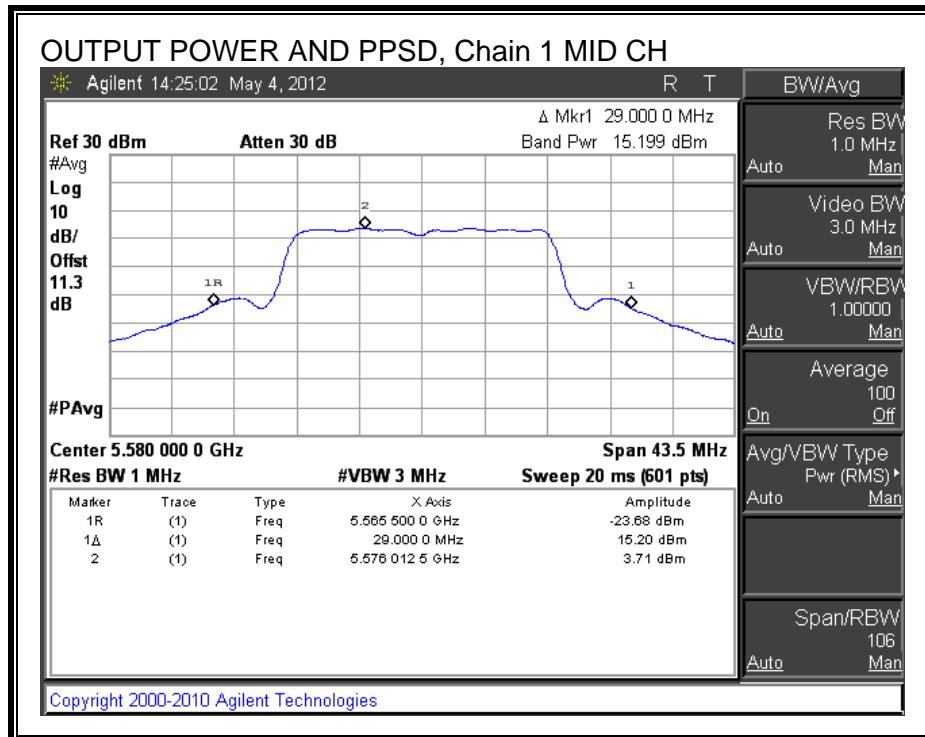
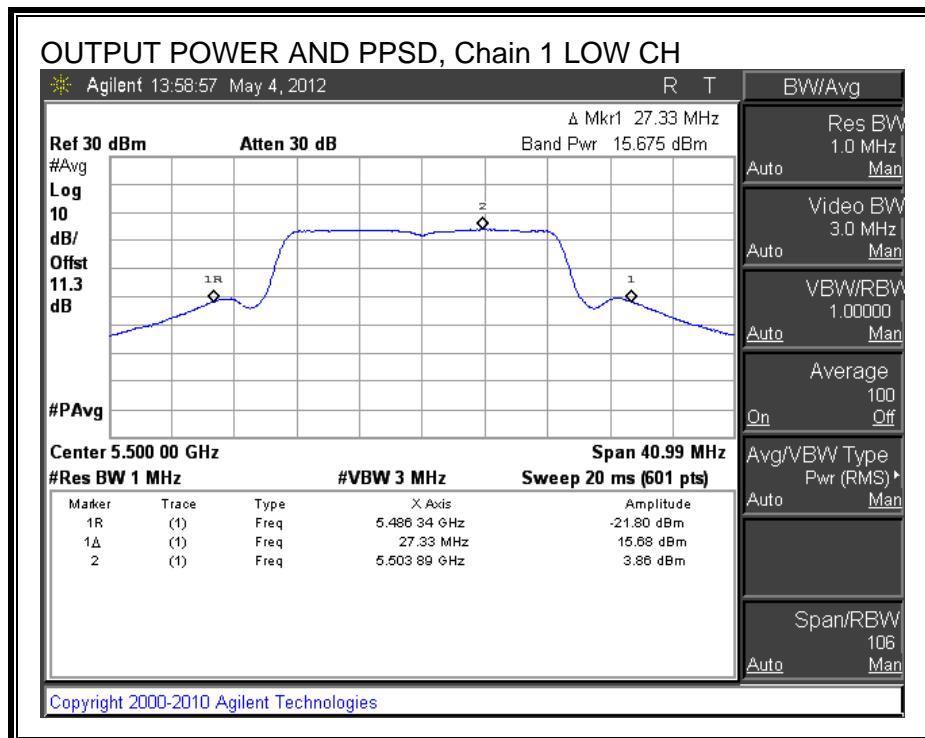
Output Power Results

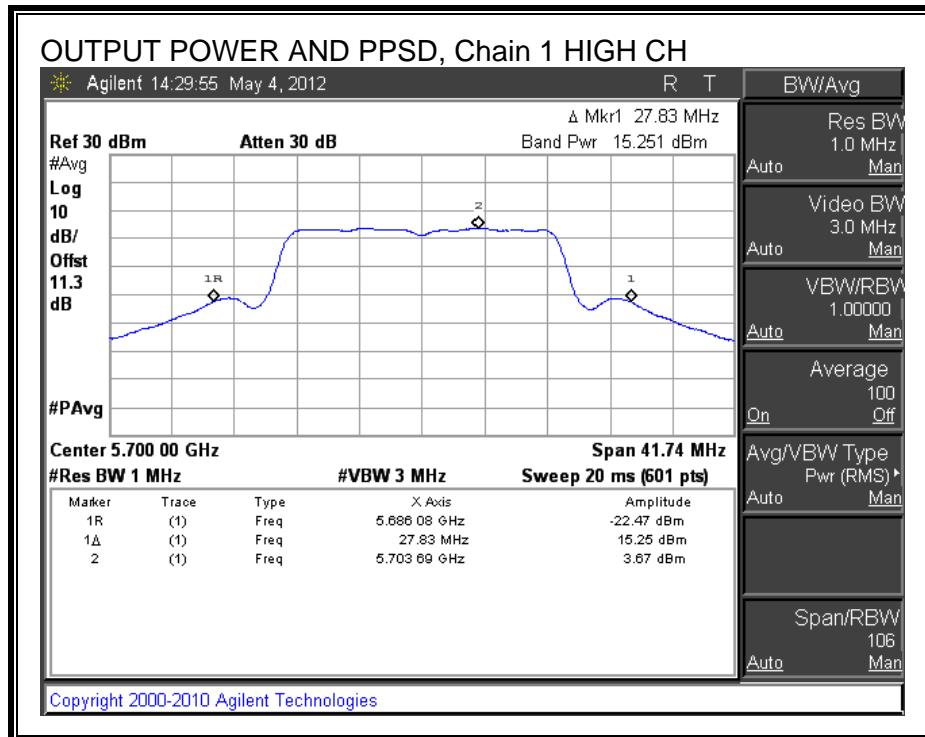
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Chain 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	15.675	15.874	15.562	20.477	21.89	-1.413
Mid	5580	15.199	15.298	15.092	19.968	21.89	-1.922
High	5700	15.251	15.362	14.926	19.955	21.89	-1.935

PPSD Results

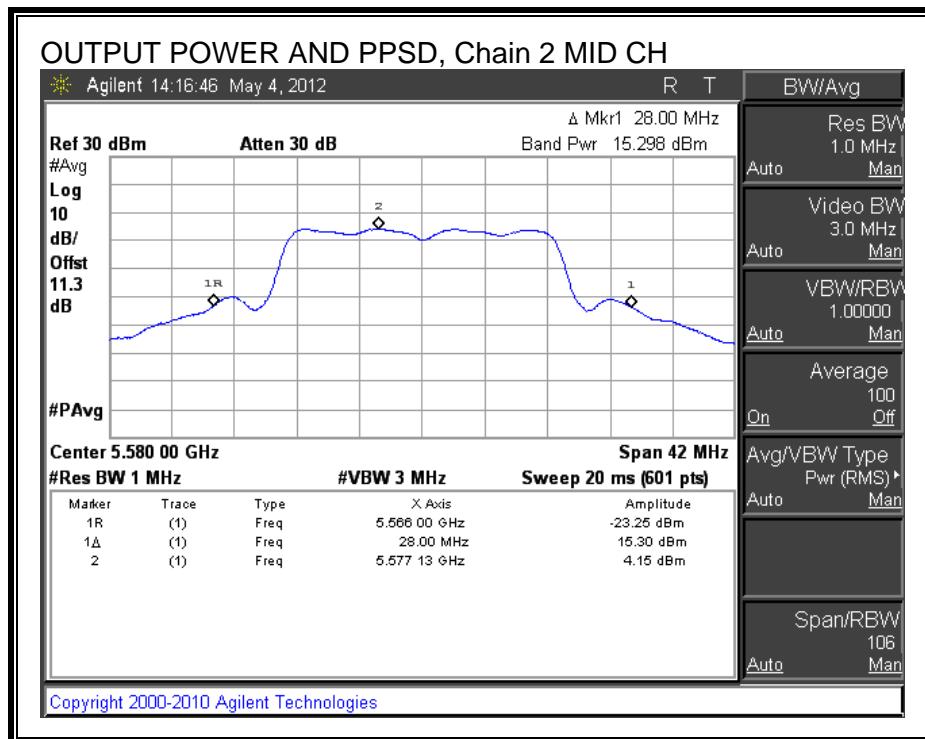
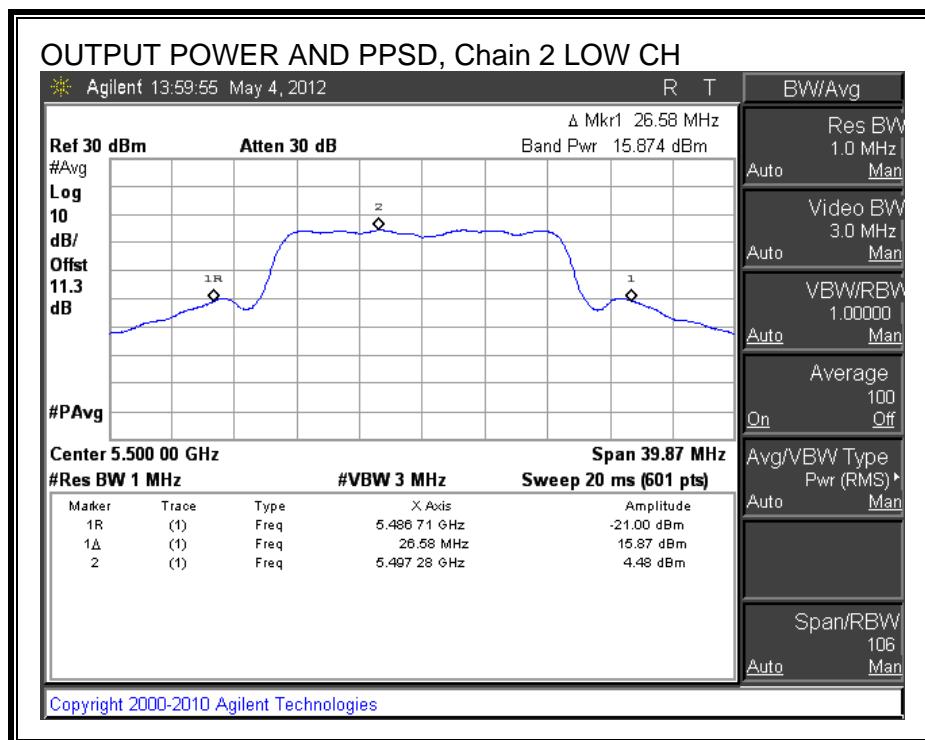
Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Chain 3 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	3.86	4.48	3.82	8.84	8.89	-0.05
Mid	5580	3.71	4.15	4.19	8.79	8.89	-0.10
High	5700	3.67	4.02	3.79	8.60	8.89	-0.29

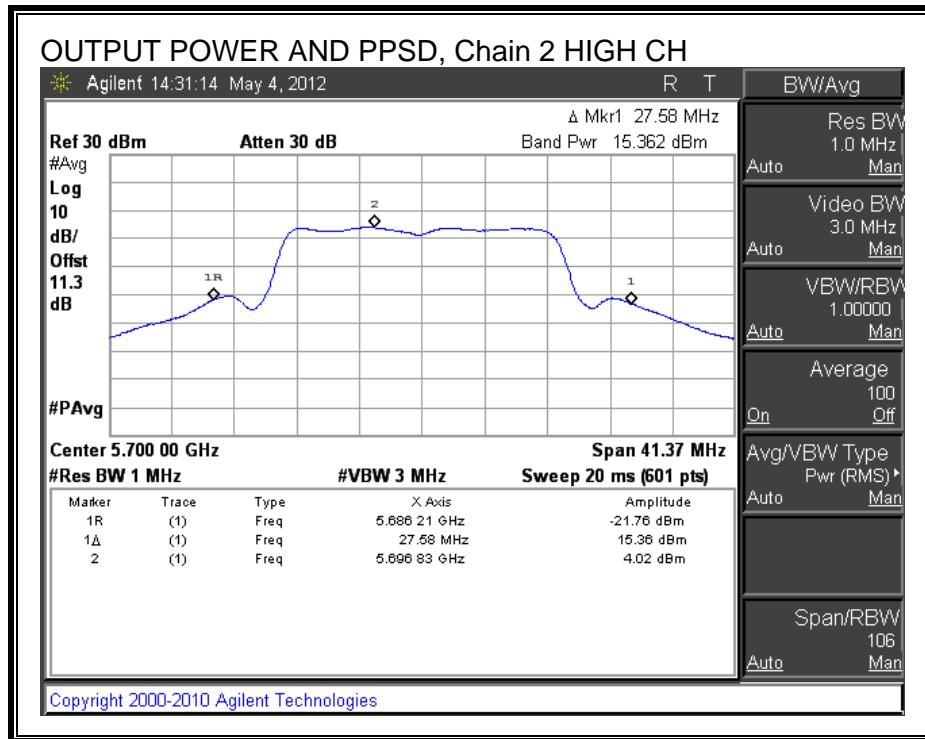
OUTPUT POWER AND PPSD, Chain 1



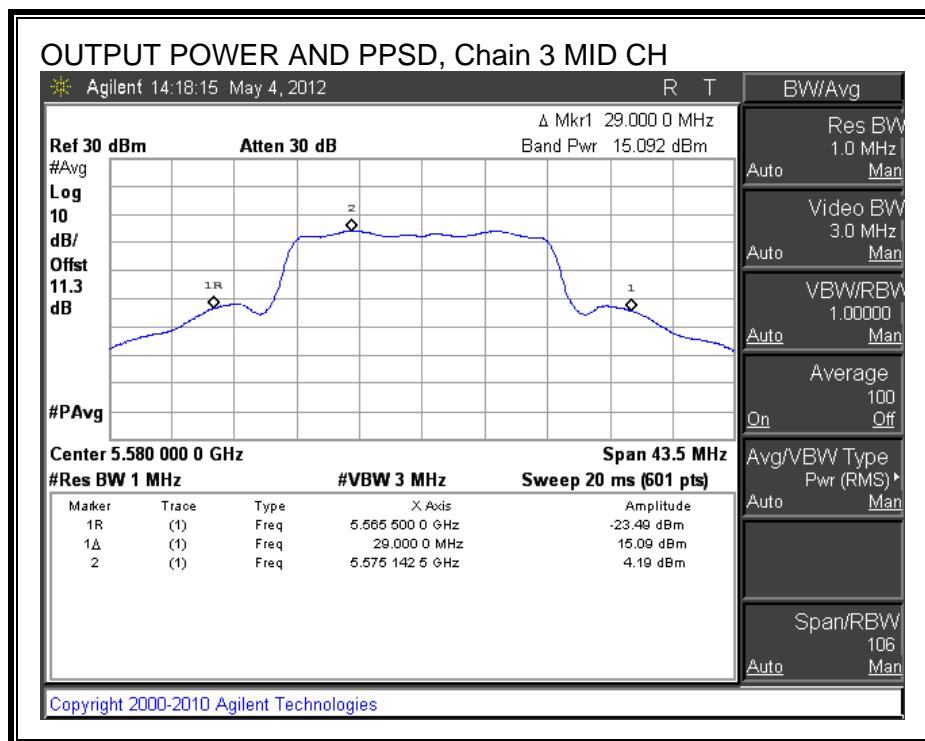
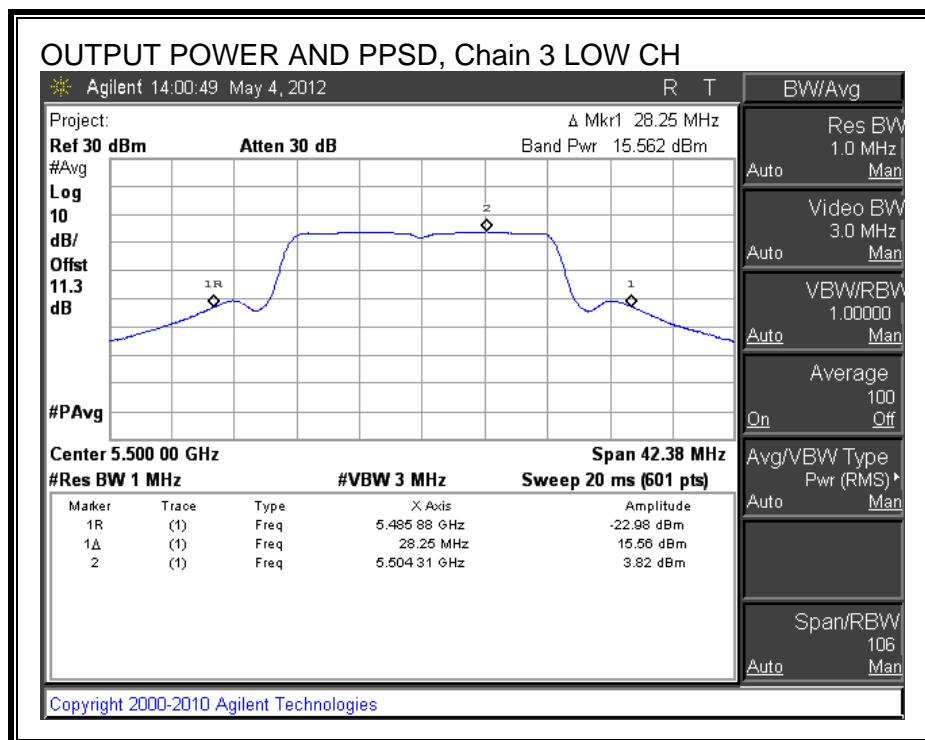


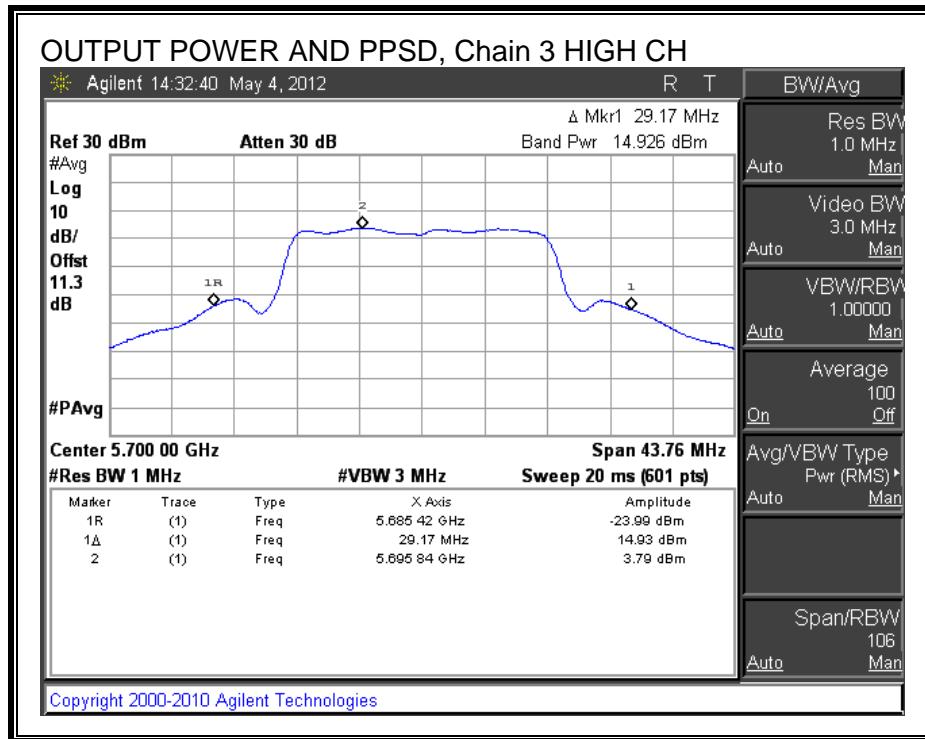
OUTPUT POWER AND PPSD, Chain 2





OUTPUT POWER AND PPSD, Chain 3





8.13.4. PEAK EXCURSION

LIMITS

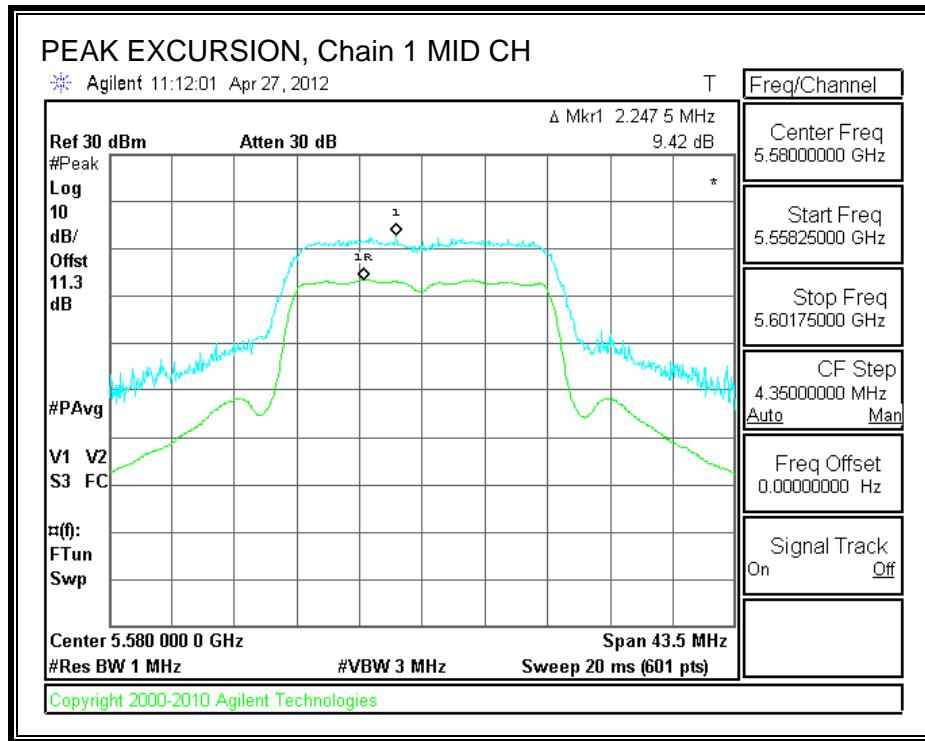
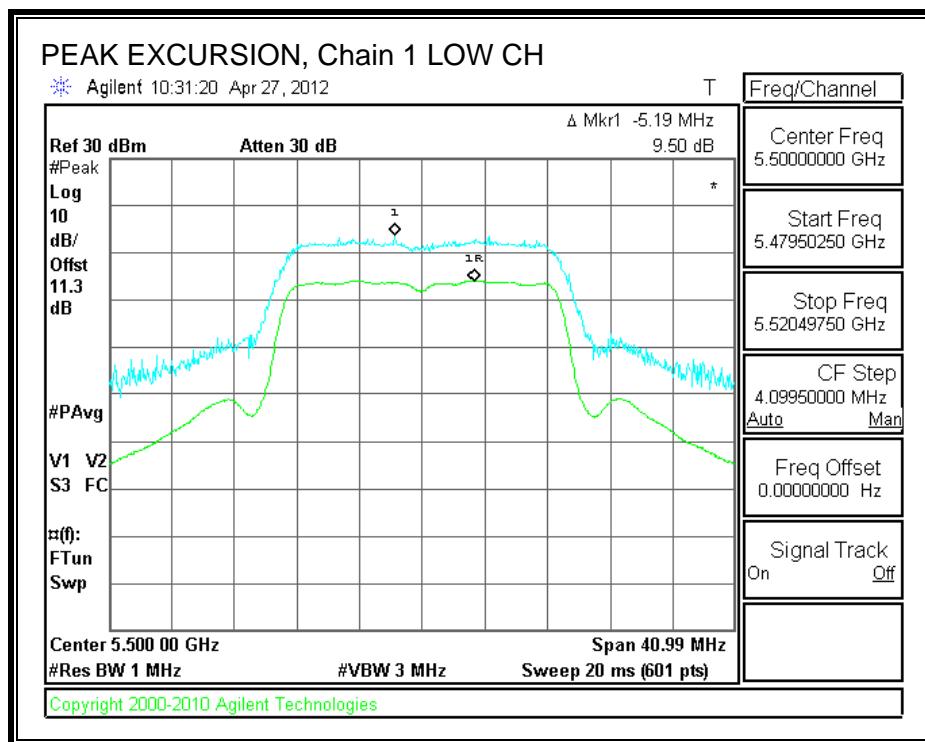
FCC §15.407 (a) (6)

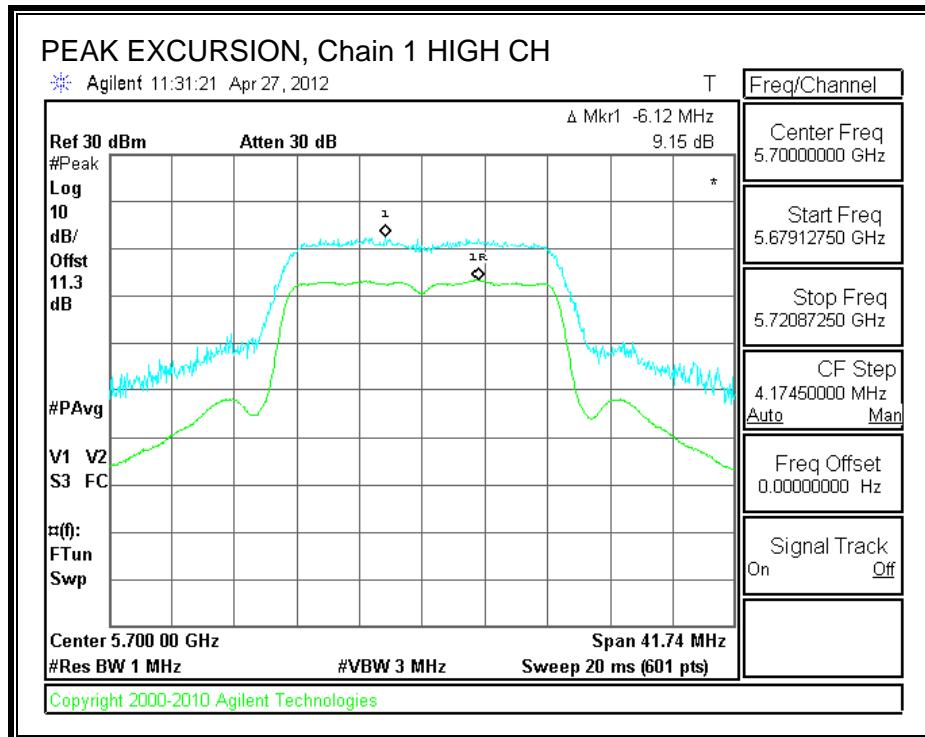
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

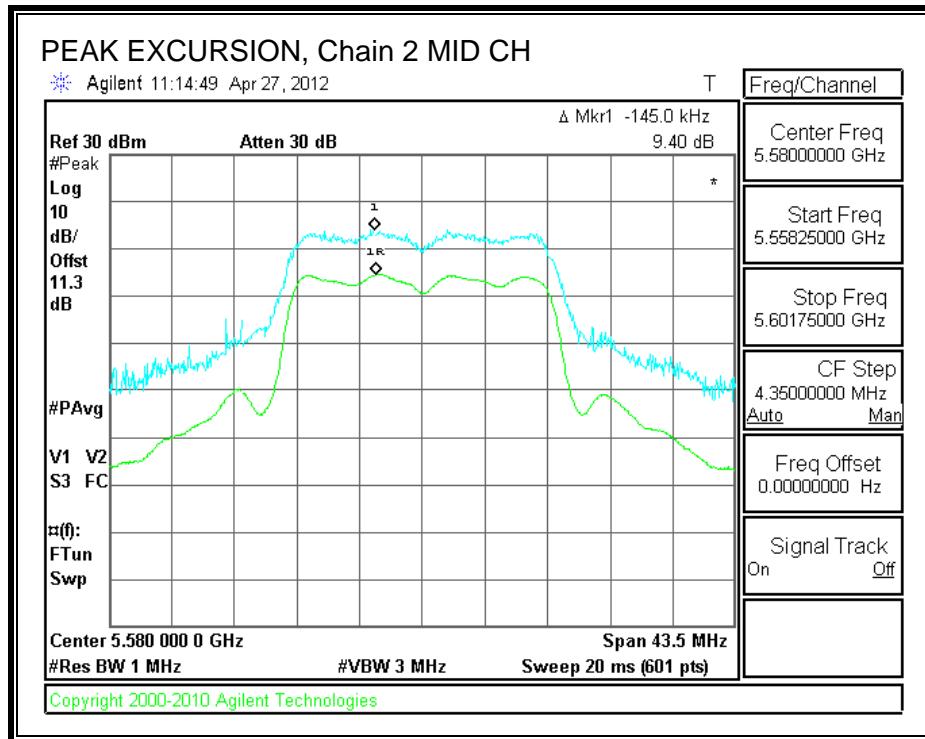
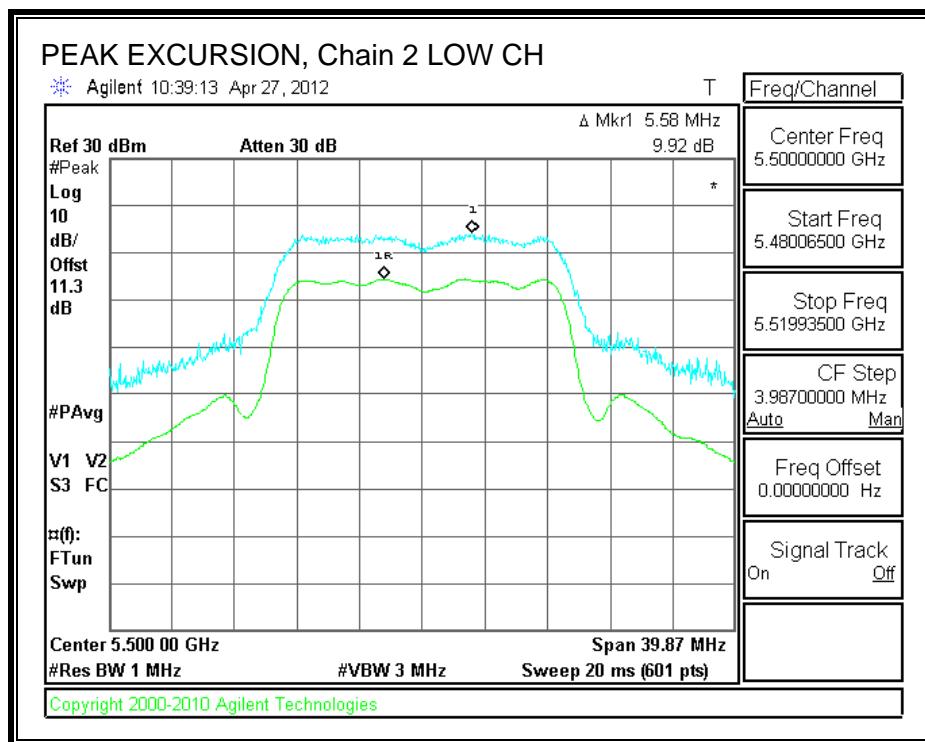
Channel	Frequency (MHz)	Pk Exc Chain 1 (dB)	Pk Exc Chain 2 (dB)	Pk Exc Chain 3 (dB)	Limit (dB)	Worst-Case Margin (dB)
Low	5500	9.50	9.92	11.13	13	-1.87
Mid	5580	9.42	9.40	10.05	13	-2.95
High	5700	9.15	9.54	9.99	13	-3.01

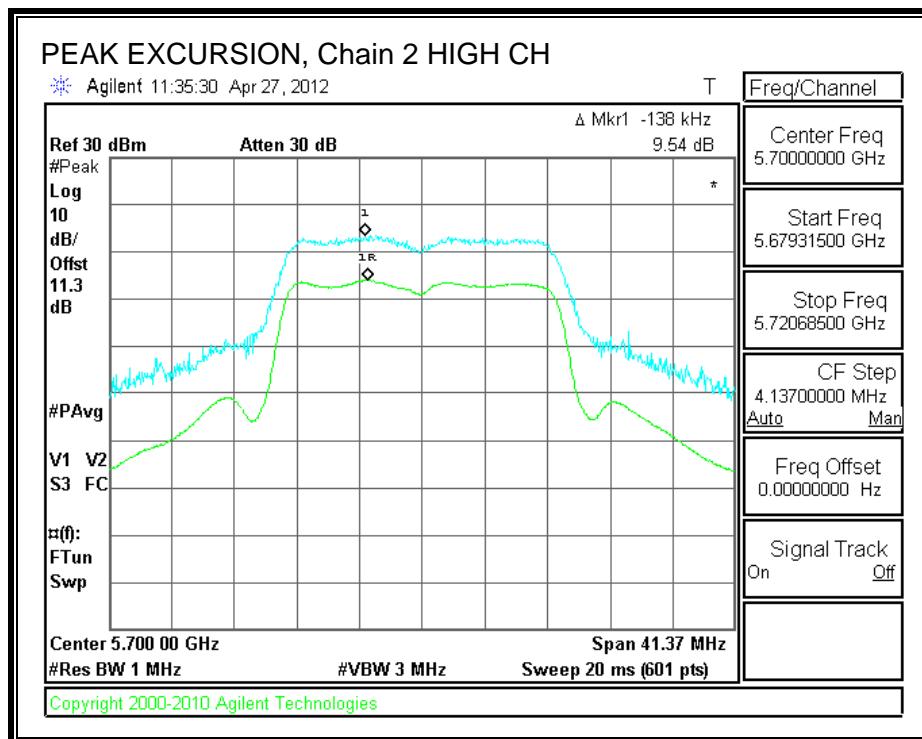
PEAK EXCURSION, Chain 1



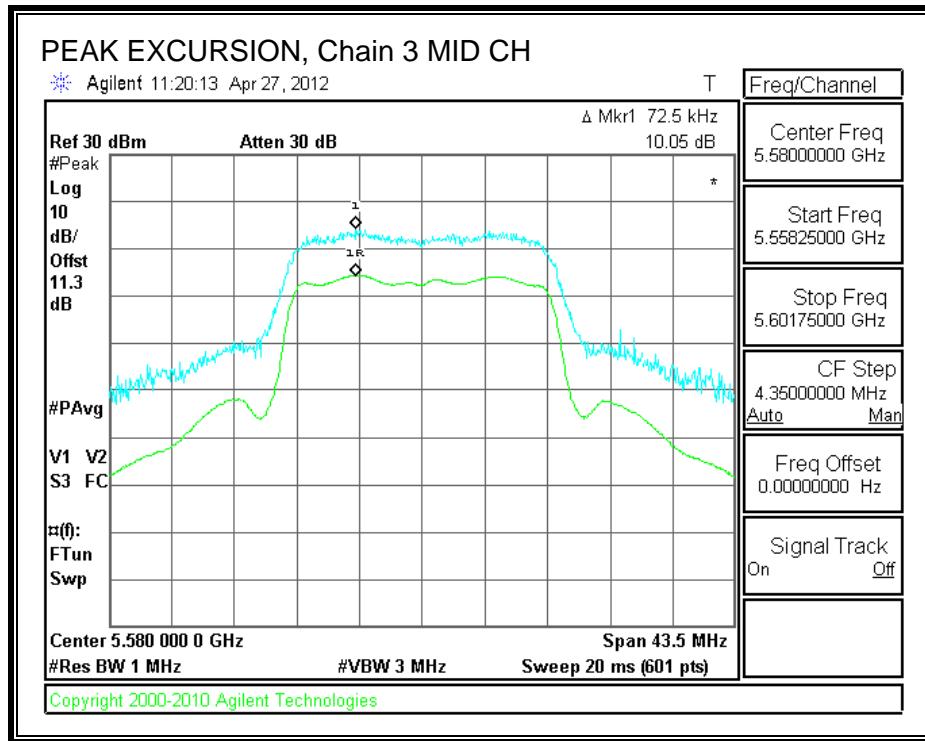
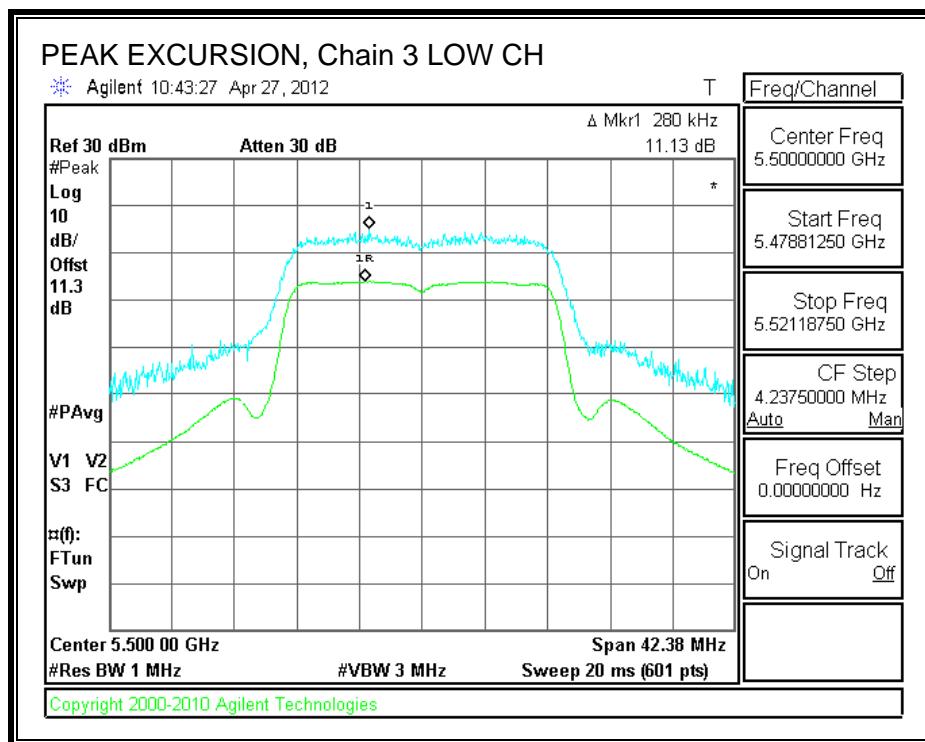


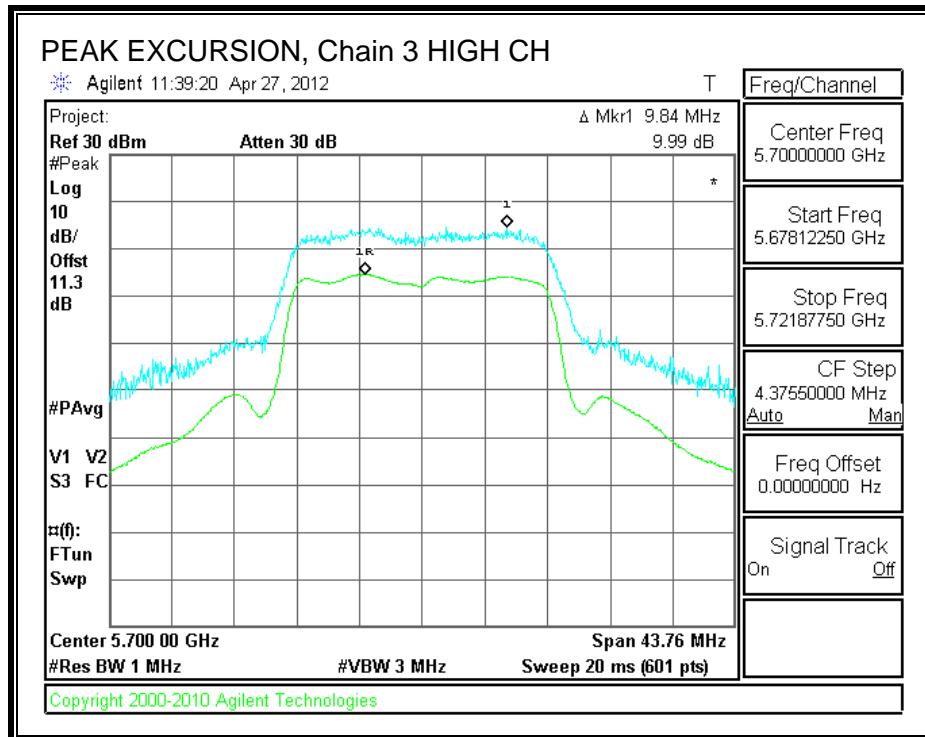
PEAK EXCURSION, Chain 2





PEAK EXCURSION, Chain 3





8.14. 802.11n HT20, SDM MCS21, 3TX, 5.6 GHz BAND

8.14.1. 26 dB BANDWIDTH

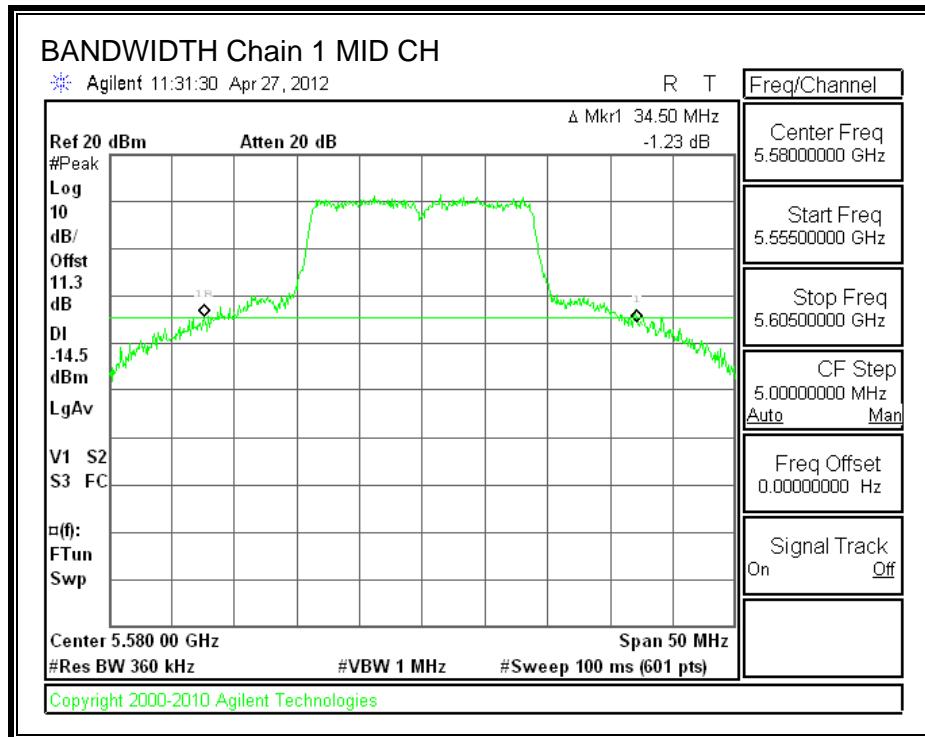
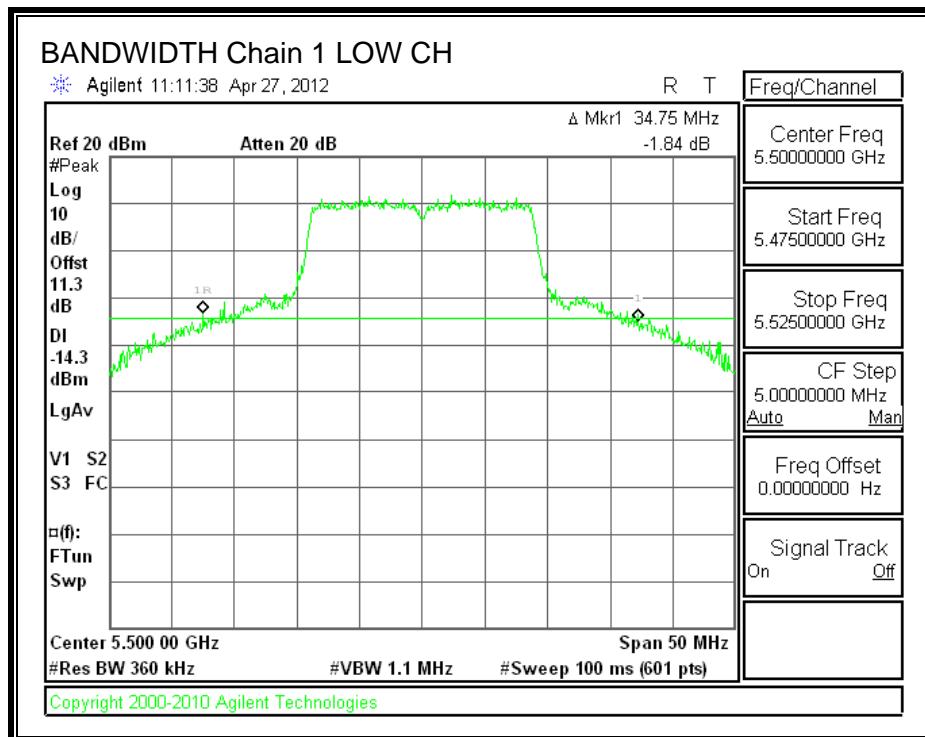
LIMITS

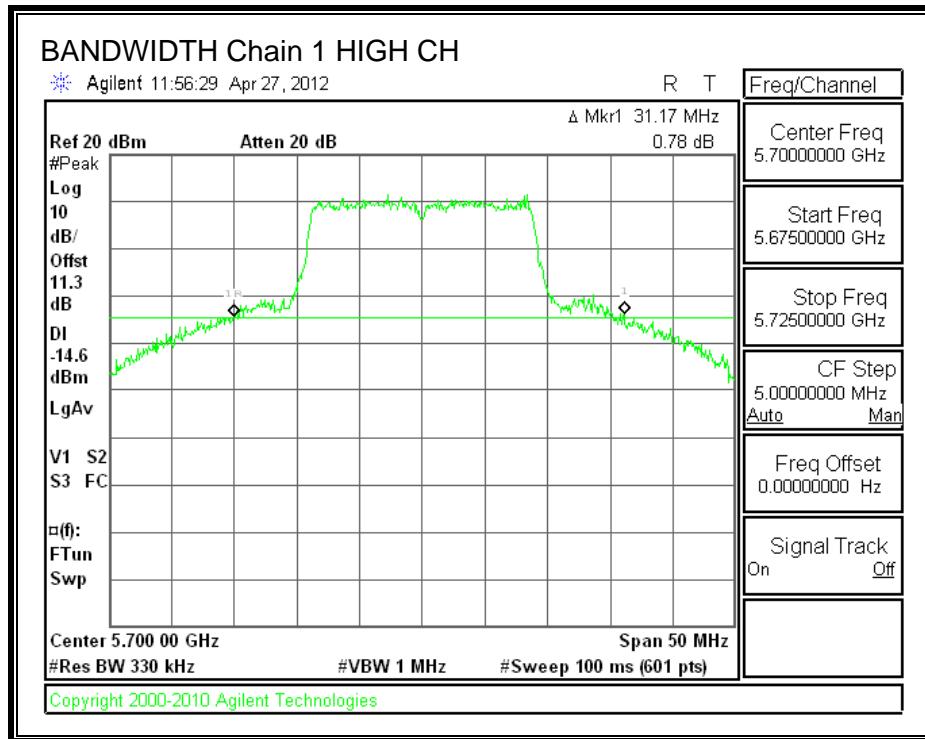
None; for reporting purposes only.

RESULTS

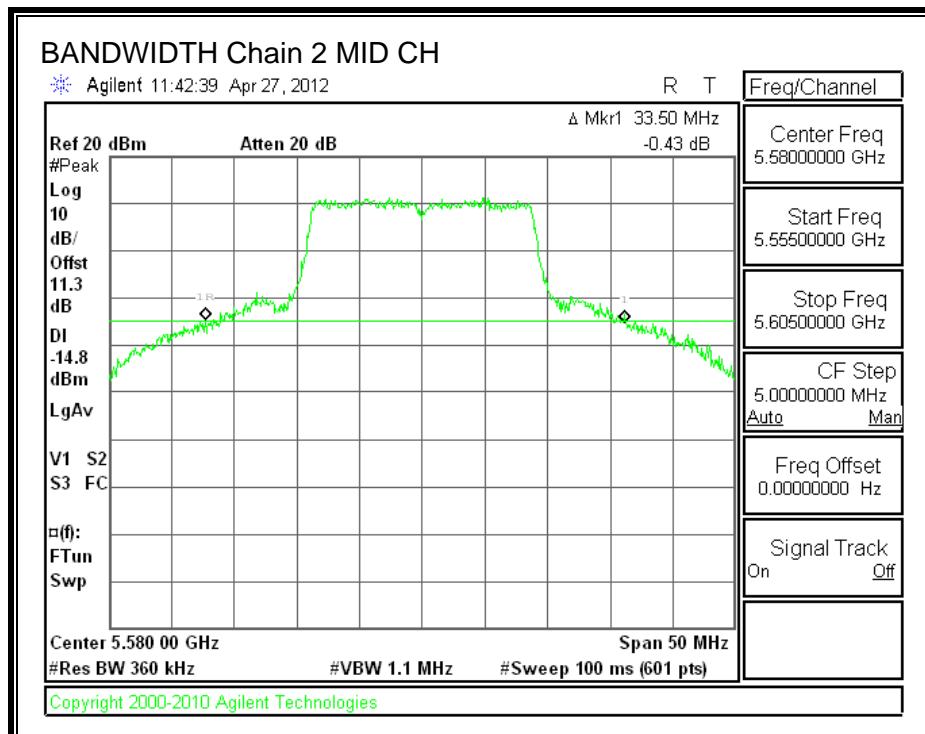
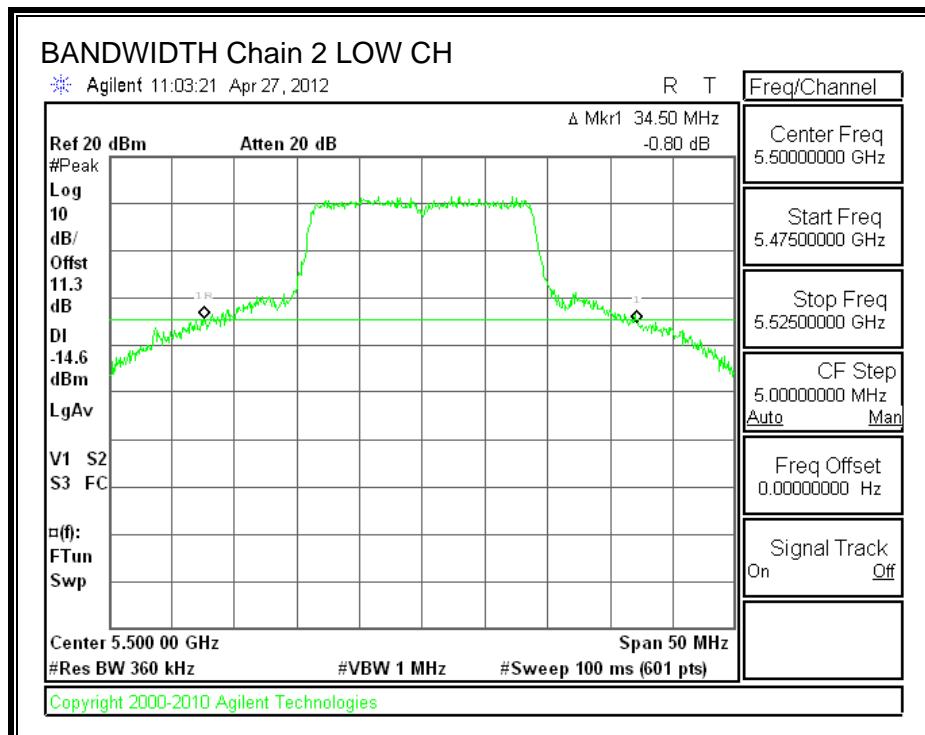
Channel	Frequency (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)	26 dB BW Chain 3 (MHz)
Low	5500	34.75	34.50	34.75
Mid	5580	34.50	33.50	32.25
High	5700	31.17	33.92	32.00

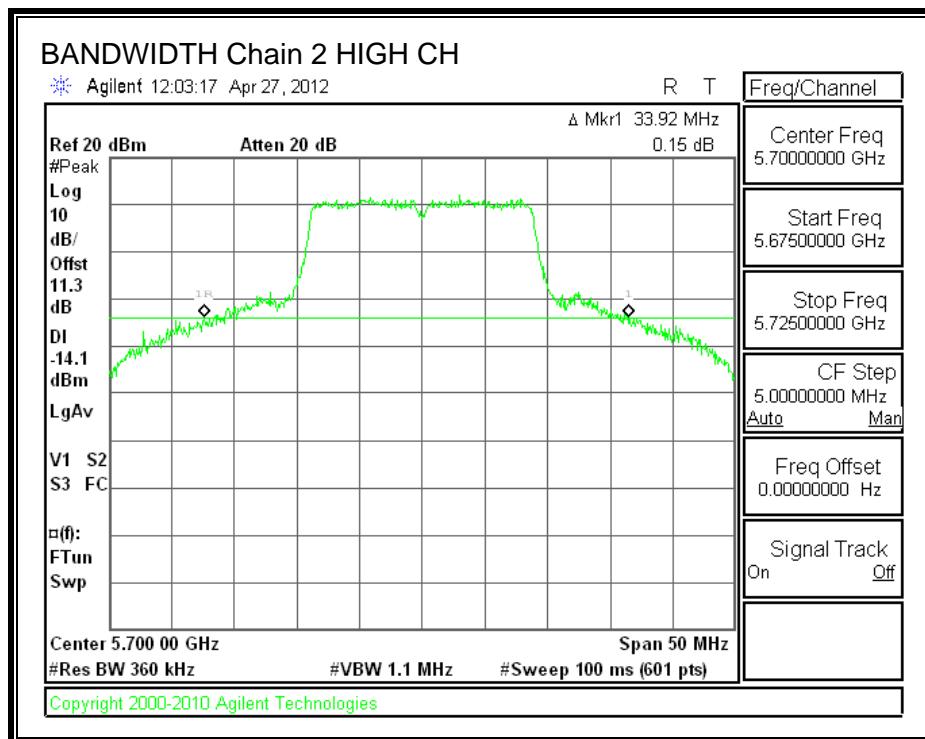
26 dB BANDWIDTH, Chain 1



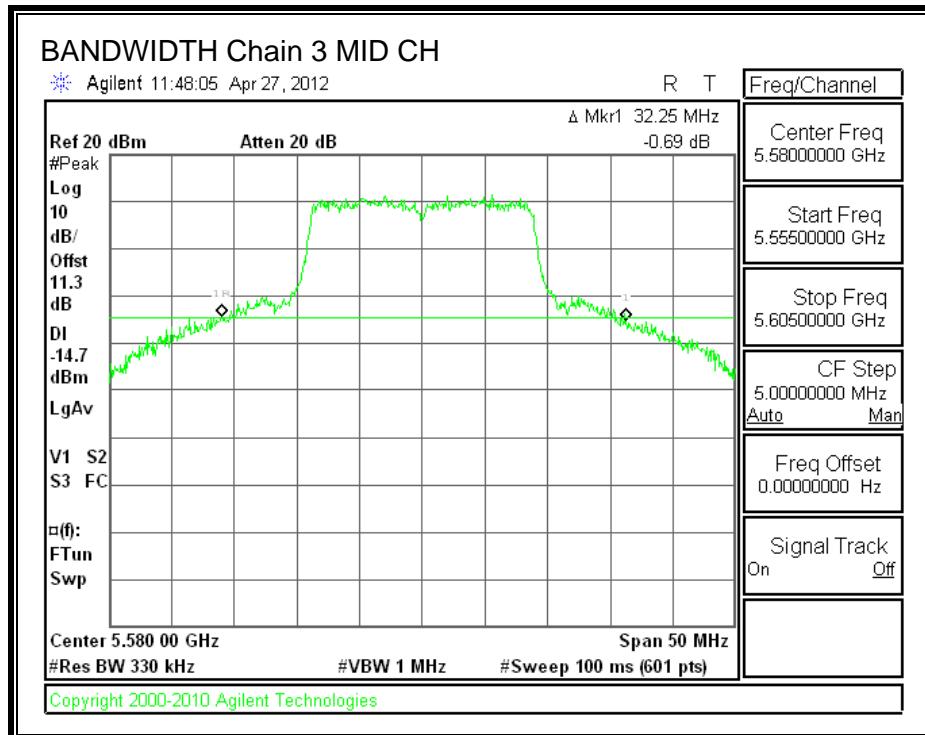
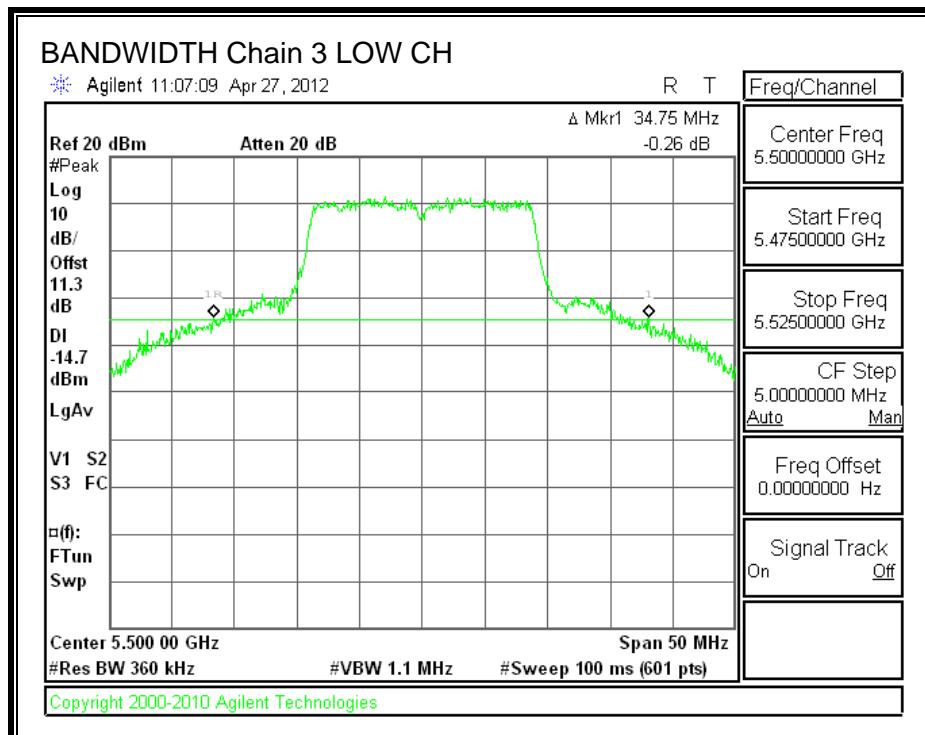


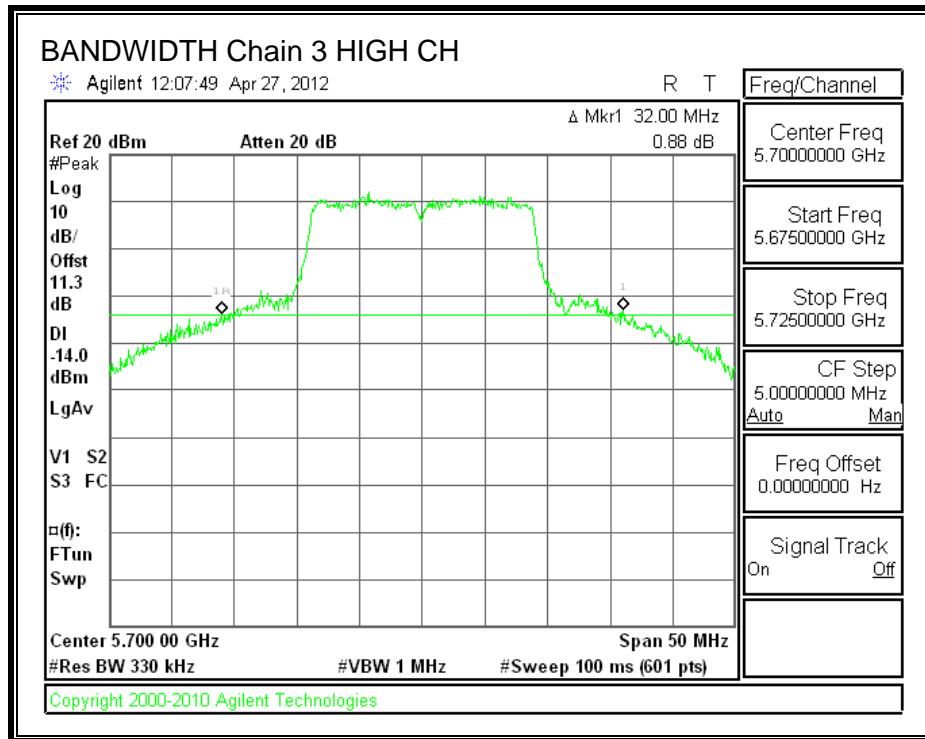
26 dB BANDWIDTH, Chain 2





26 dB BANDWIDTH, Chain 3





8.14.2. 99% BANDWIDTH

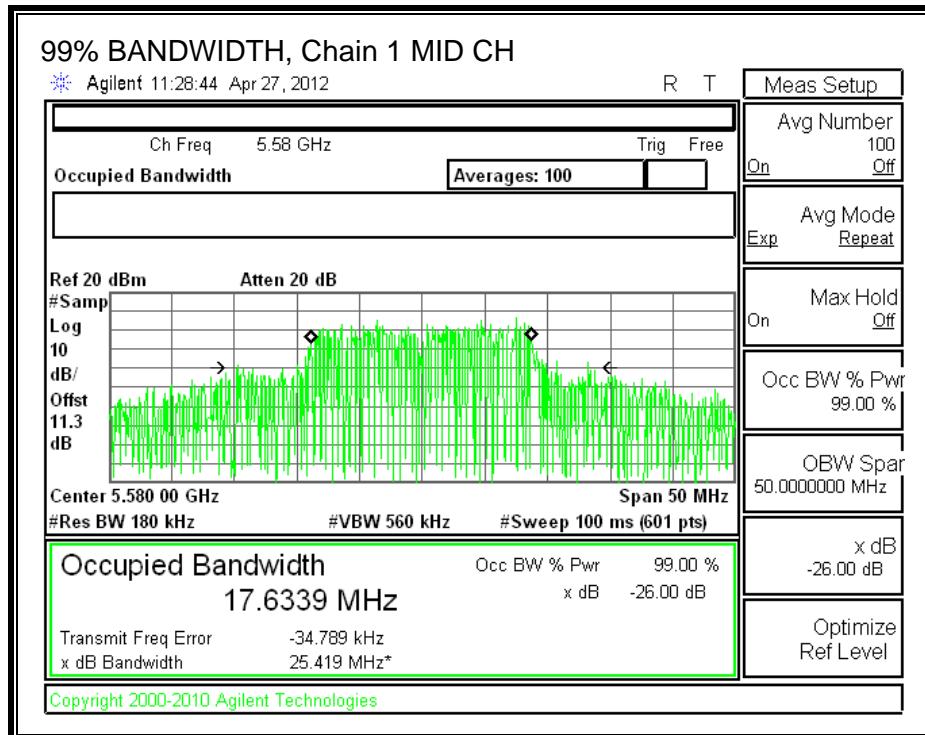
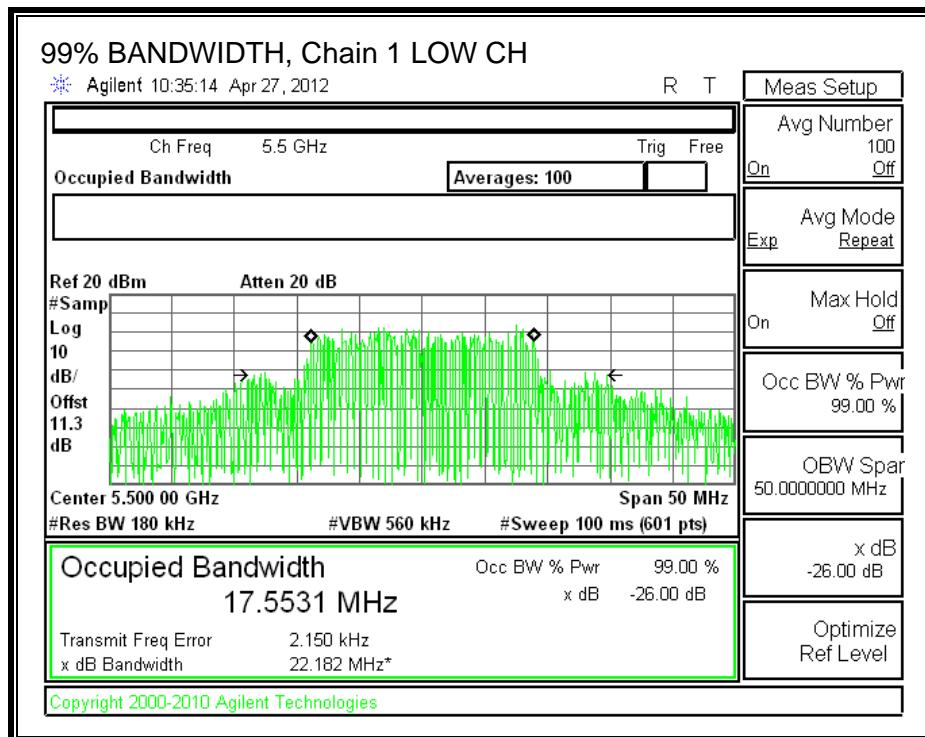
LIMITS

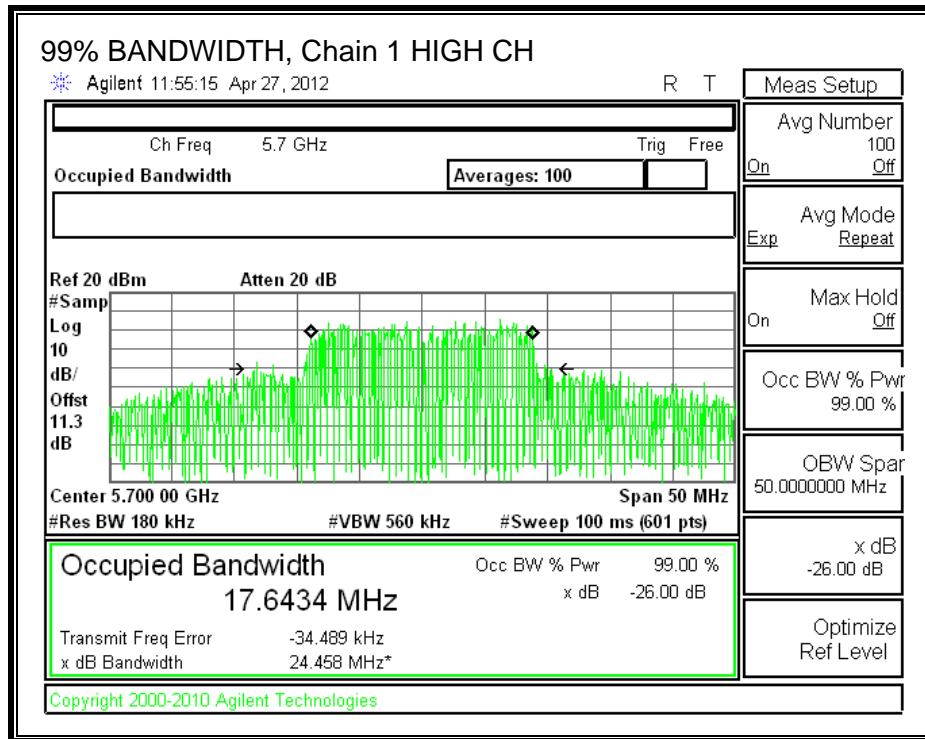
None; for reporting purposes only.

RESULTS

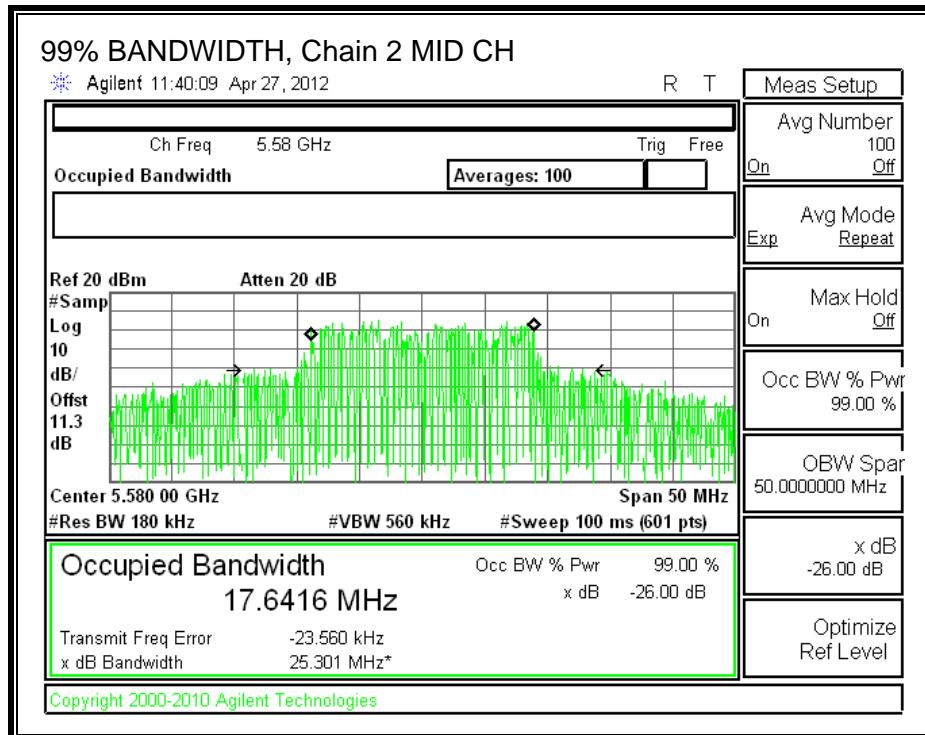
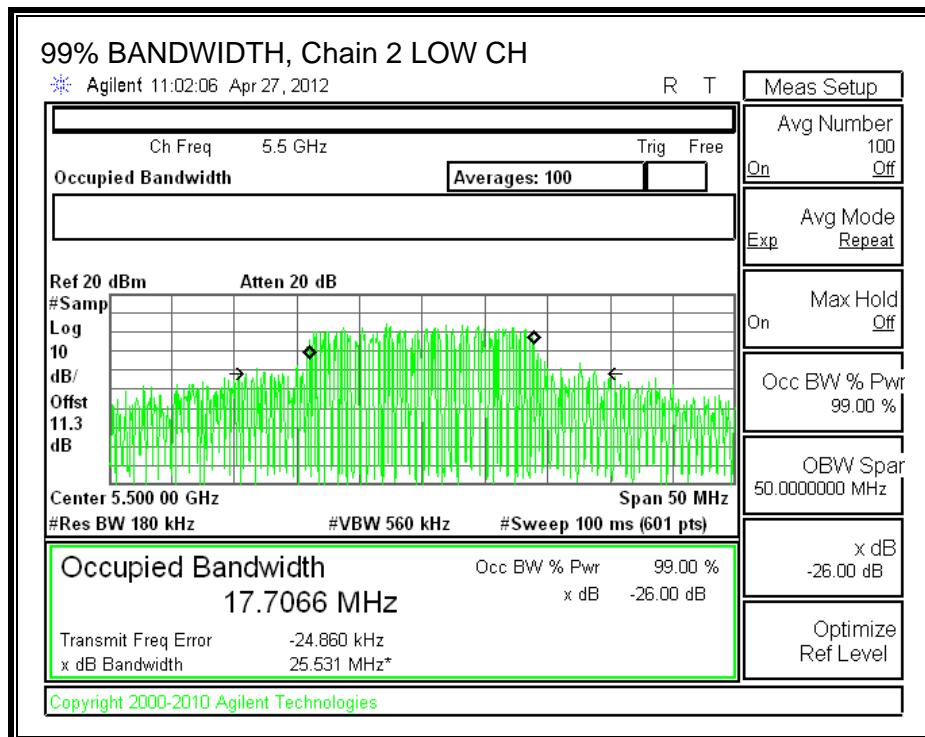
Channel	Frequency (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)	99% BW Chain 3 (MHz)
Low	5500	17.5531	17.7066	17.6718
Mid	5580	17.6339	17.6416	17.6421
High	5700	17.6434	17.6689	17.6474

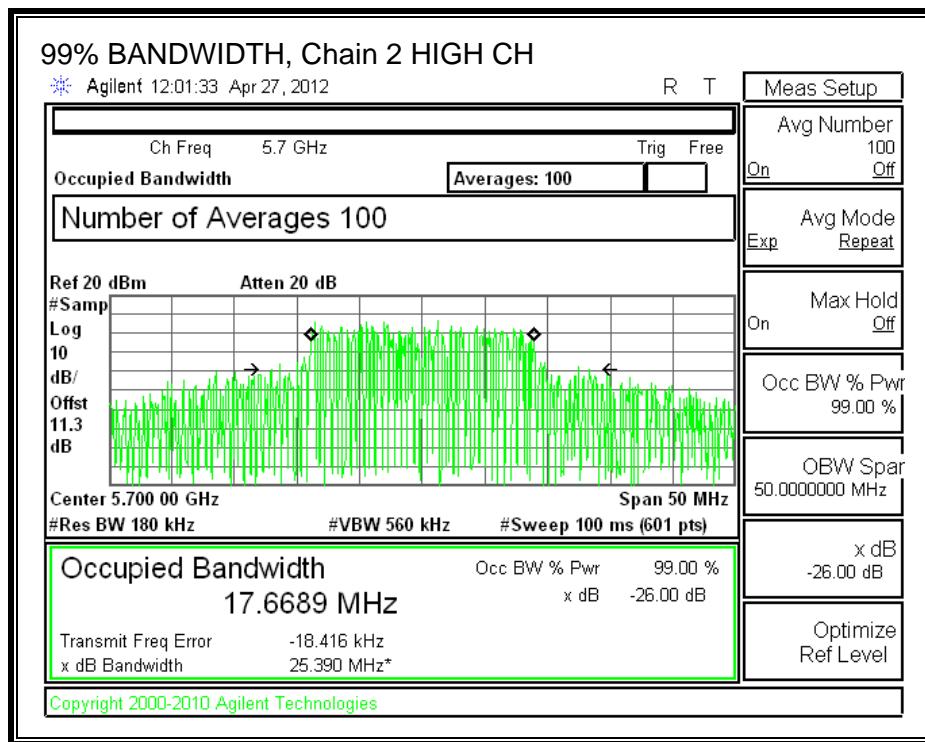
99% BANDWIDTH, Chain 1



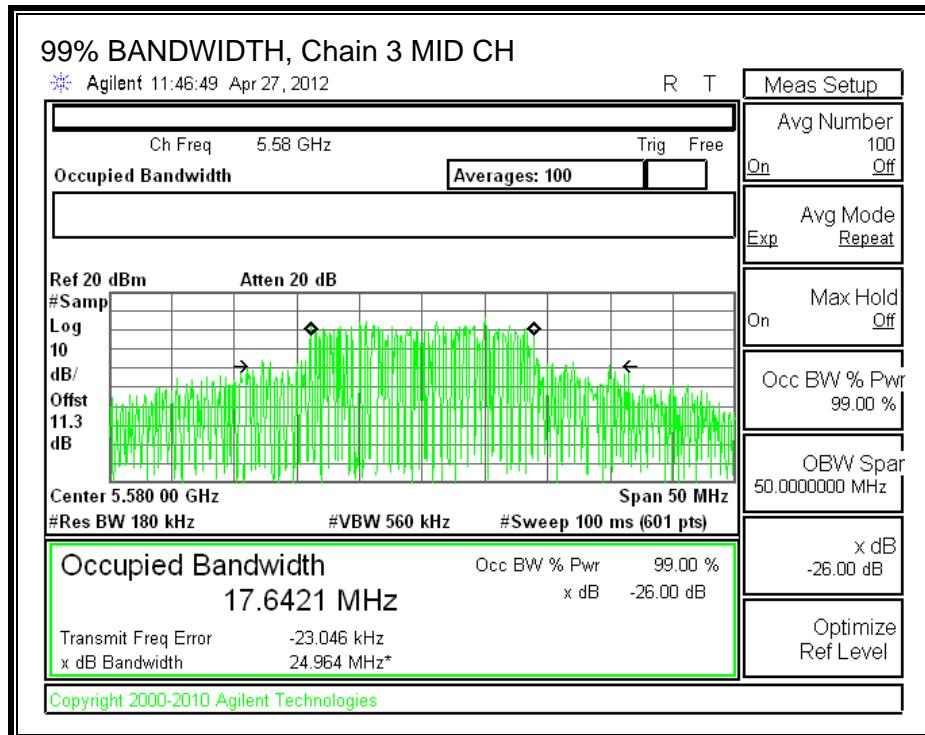
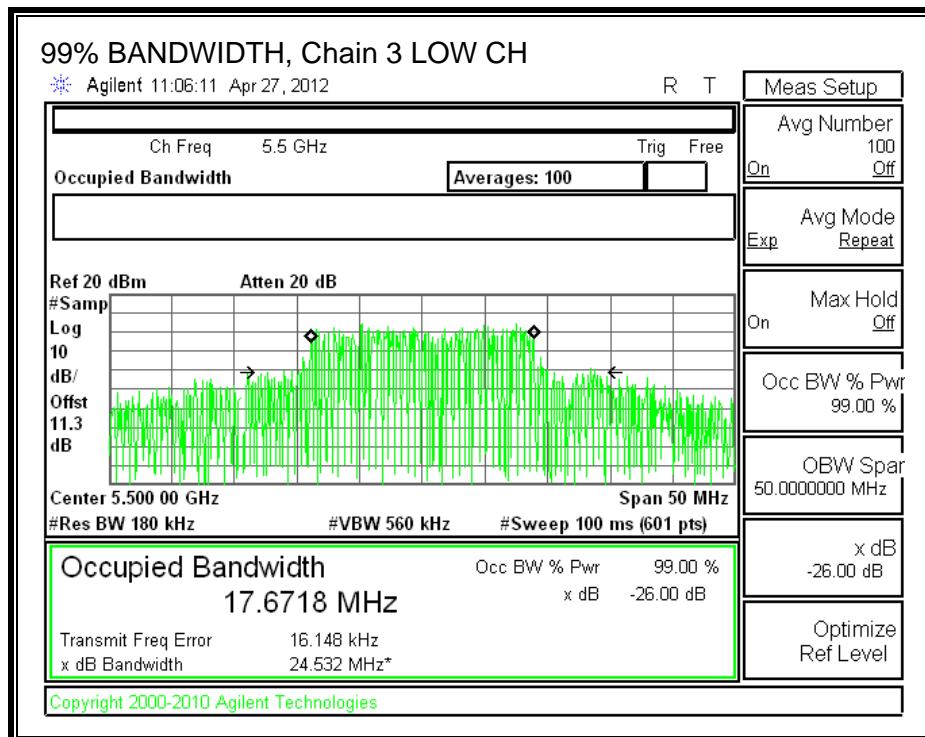


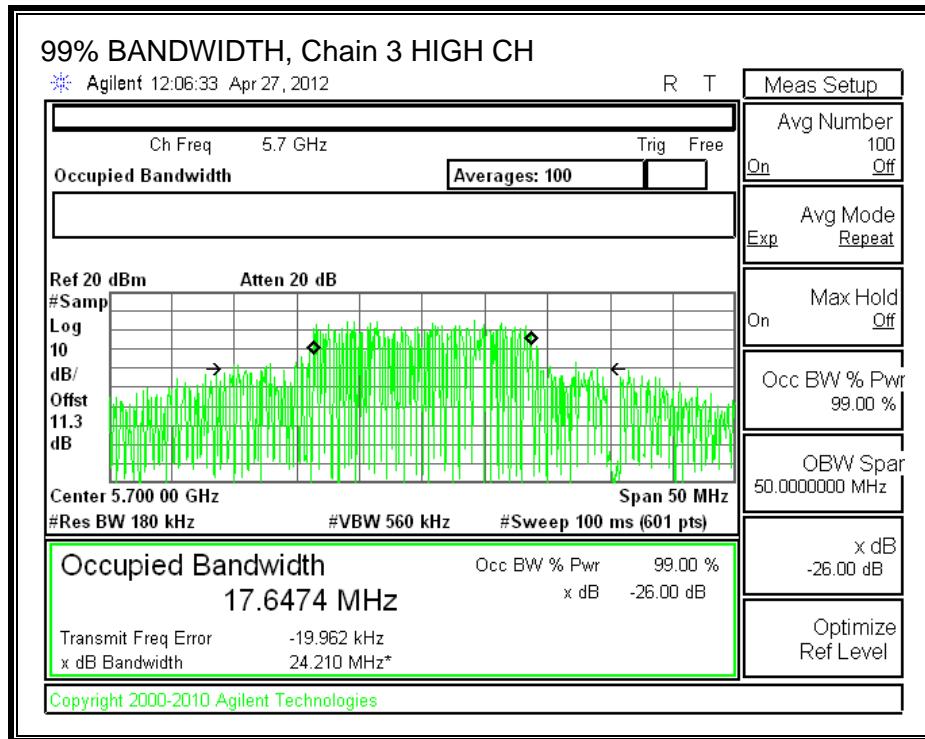
99% BANDWIDTH, Chain 2





99% BANDWIDTH, Chain 3





8.14.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (3)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak 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 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

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
5.53	2.68	1.26	3.53

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5500	24	34.50	26.38	3.53	24.00	11.00
Mid	5580	24	32.25	26.09	3.53	24.00	11.00
High	5700	24	31.17	25.94	3.53	24.00	11.00

Duty Cycle CF (dB)	2.23	Included in Calculations of Corr'd Power & PPSD
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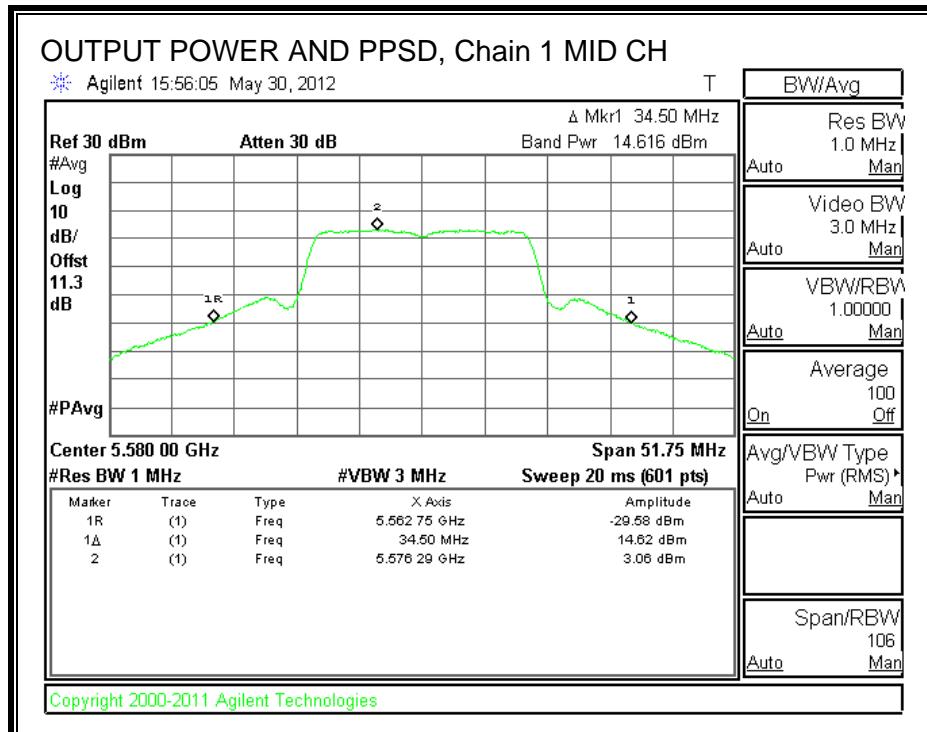
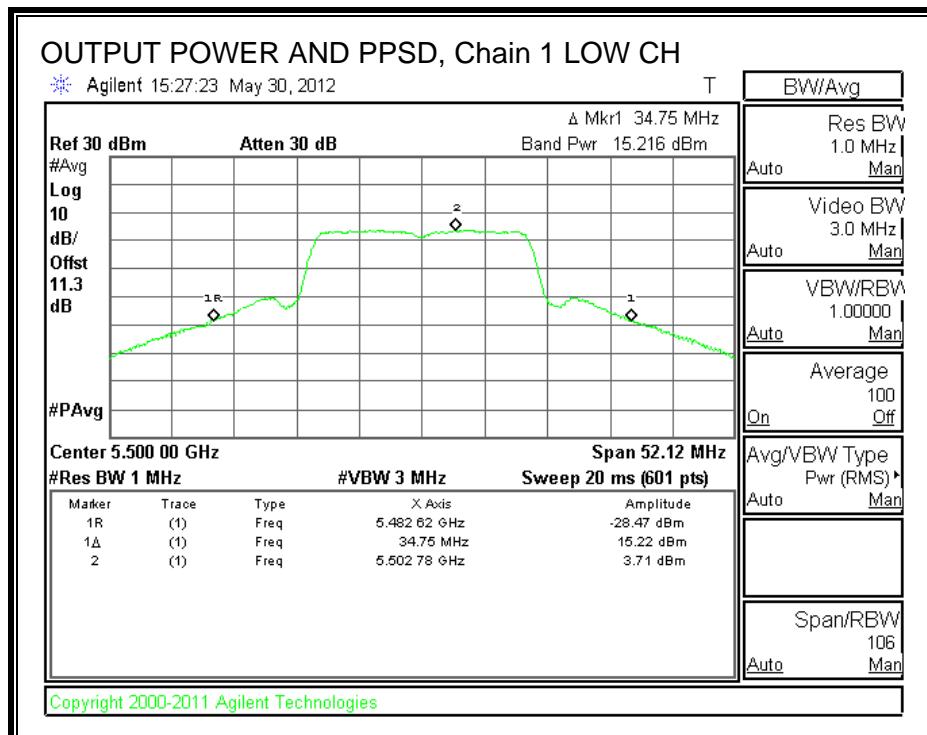
Output Power Results

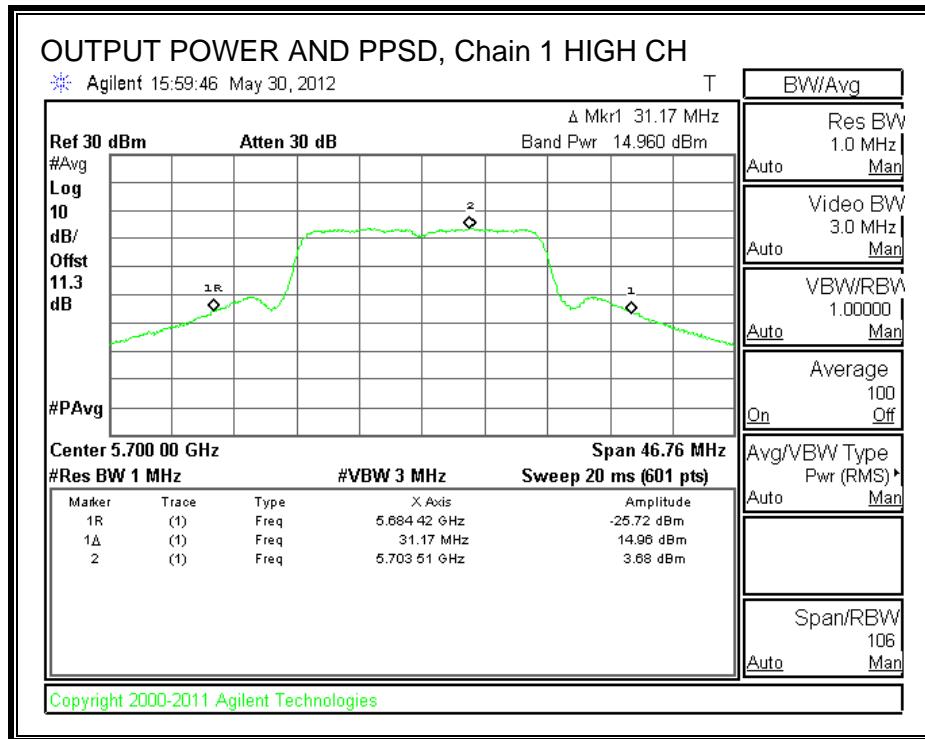
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Chain 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	15.216	15.392	14.882	22.170	24.00	-1.830
Mid	5580	14.616	15.062	15.050	21.915	24.00	-2.085
High	5700	14.960	15.171	15.032	22.056	24.00	-1.944

PPSD Results

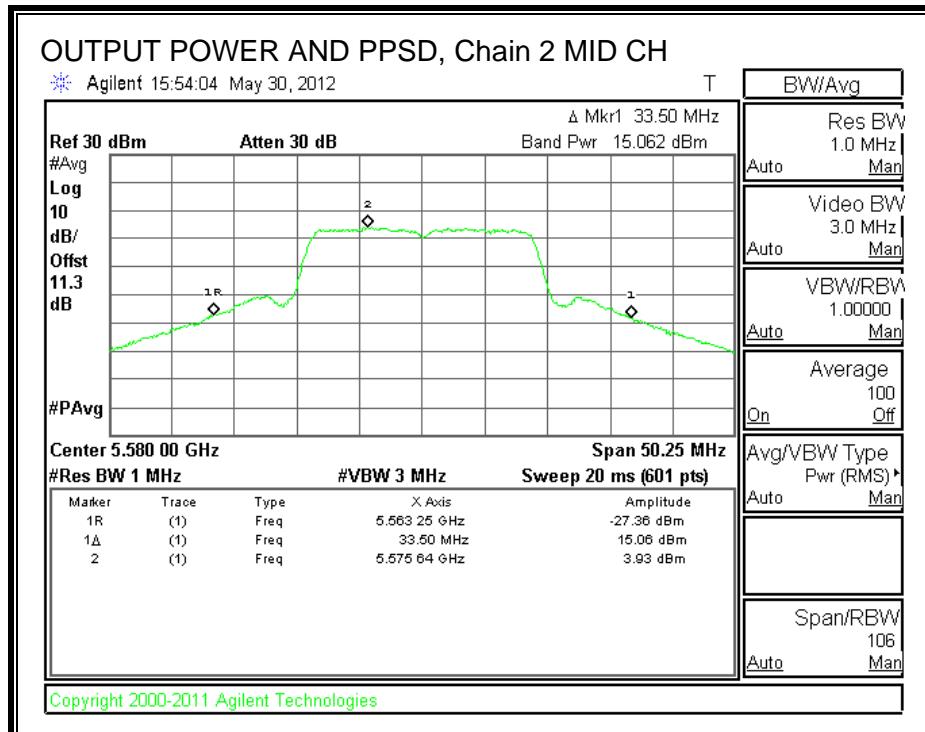
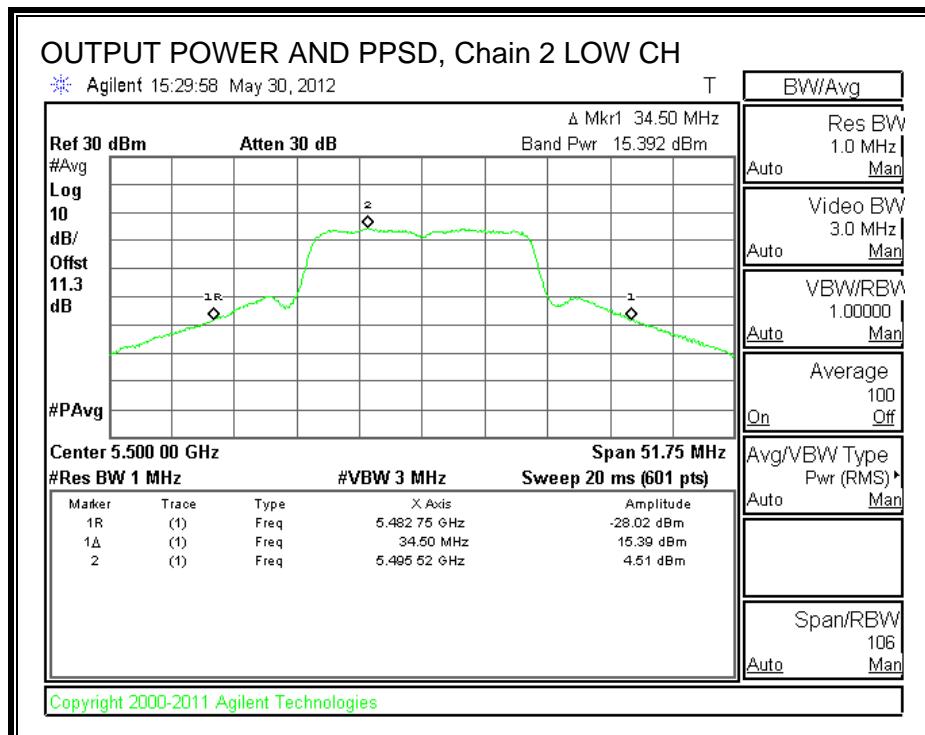
Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Chain 3 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	3.71	4.51	3.50	10.93	11.00	-0.07
Mid	5580	3.06	3.93	3.95	10.67	11.00	-0.33
High	5700	3.68	3.79	3.91	10.80	11.00	-0.20

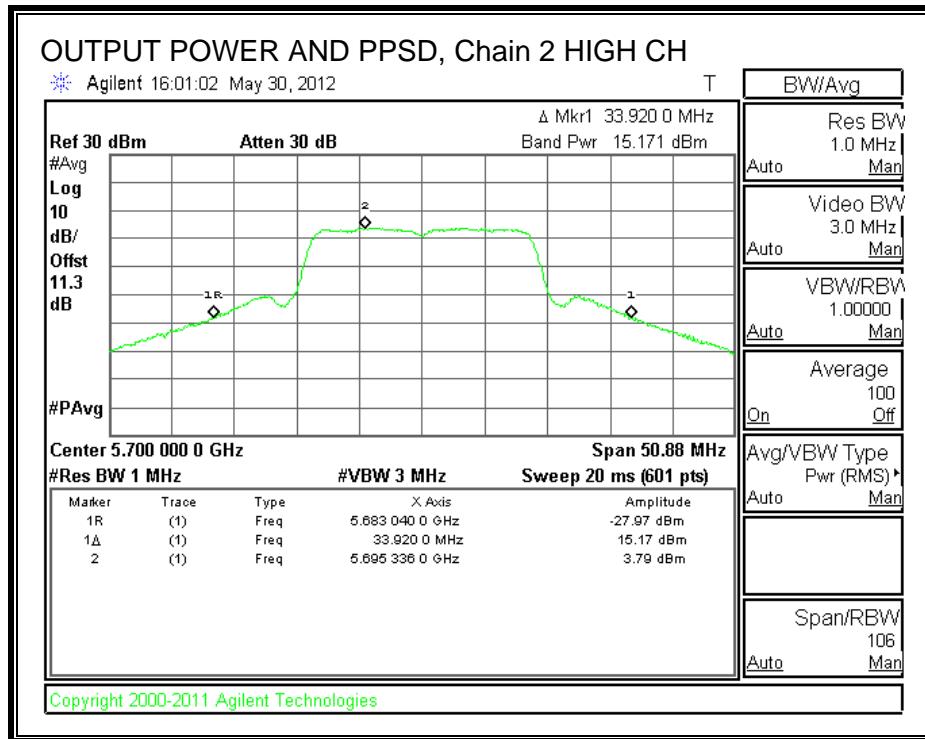
OUTPUT POWER AND PPSD, Chain 1



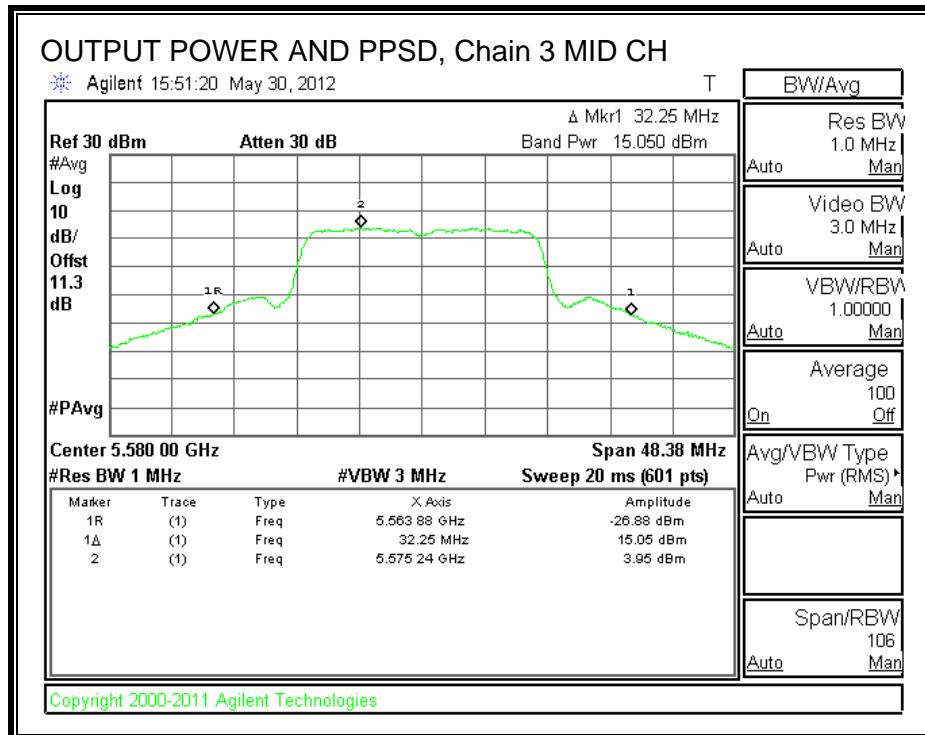
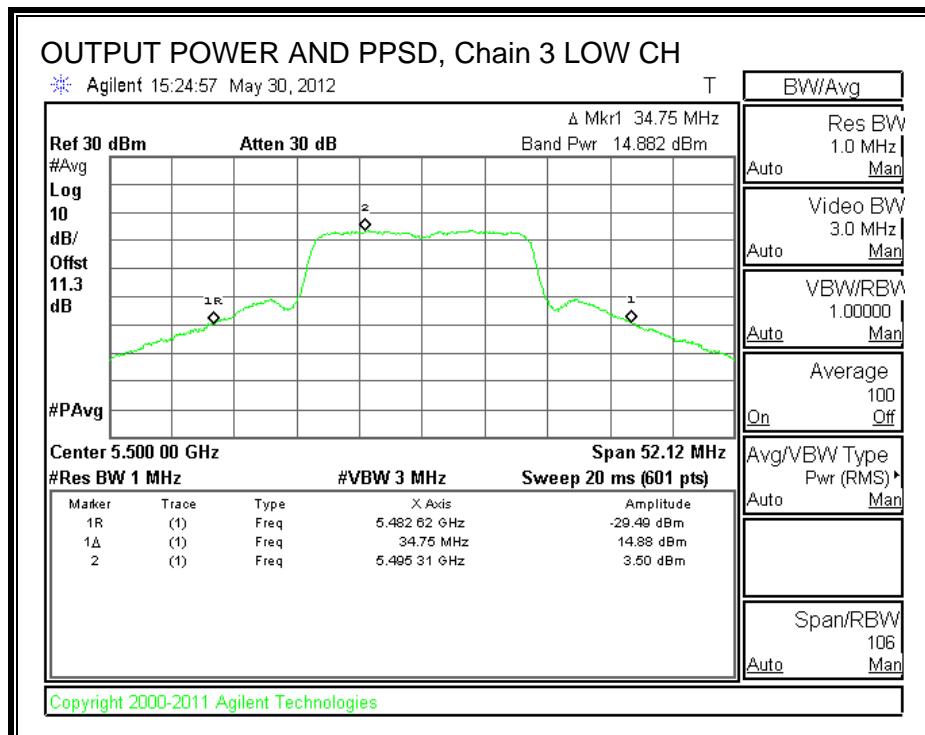


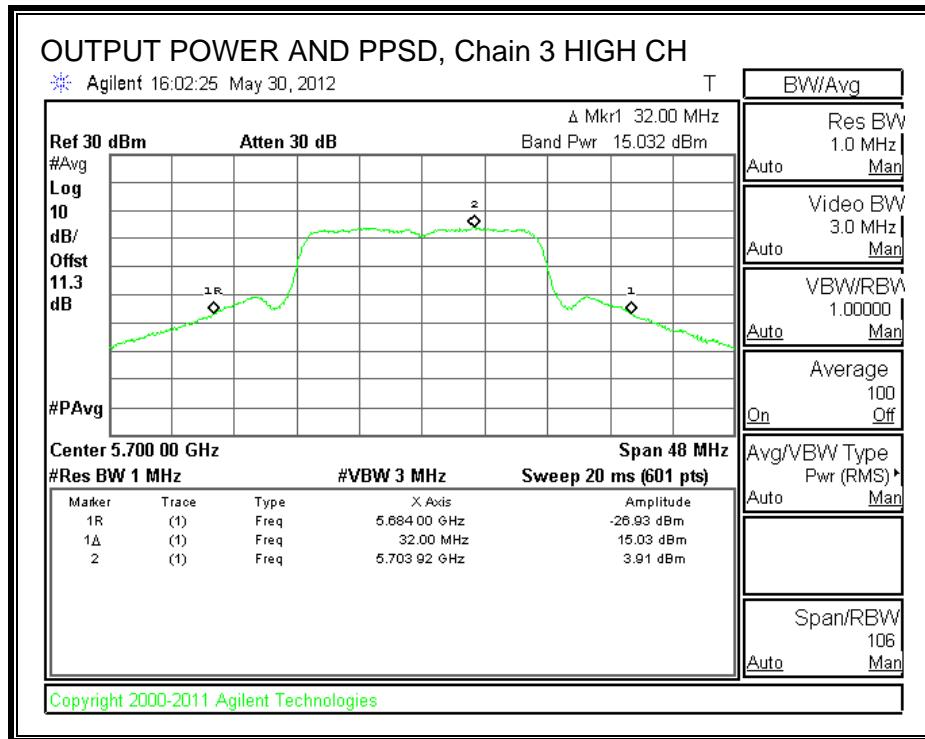
OUTPUT POWER AND PPSD, Chain 2





OUTPUT POWER AND PPSD, Chain 3





8.14.4. PEAK EXCURSION

LIMITS

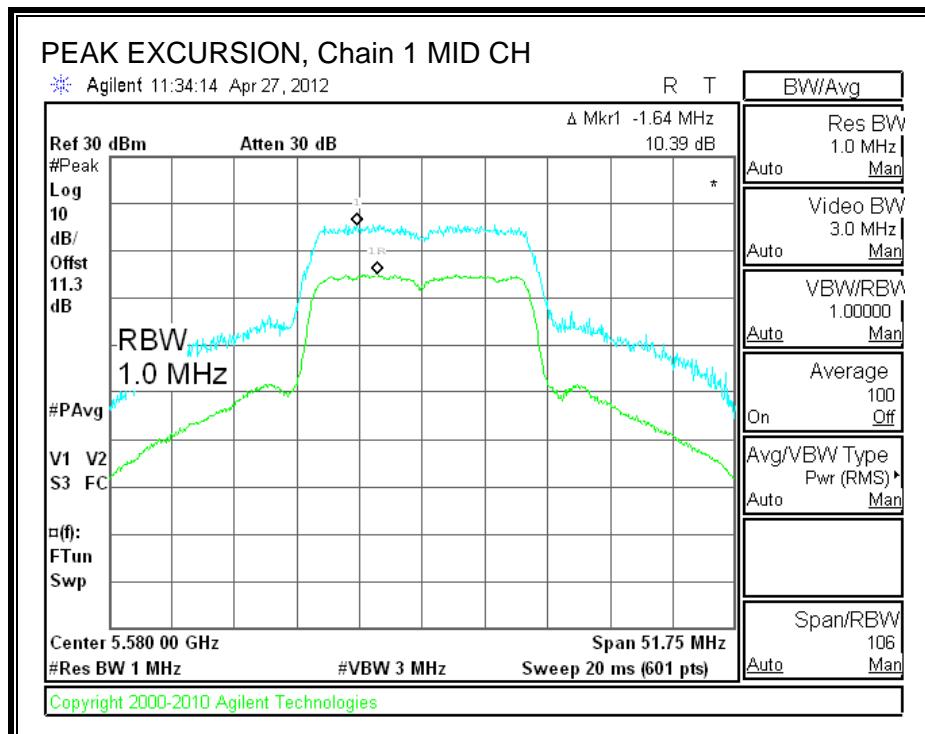
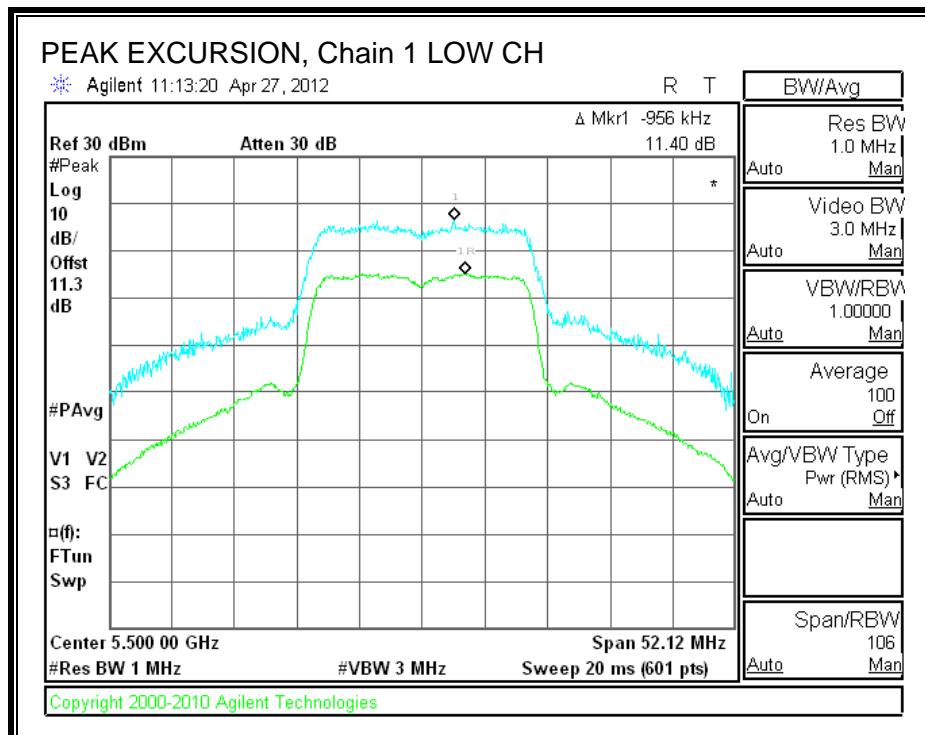
FCC §15.407 (a) (6)

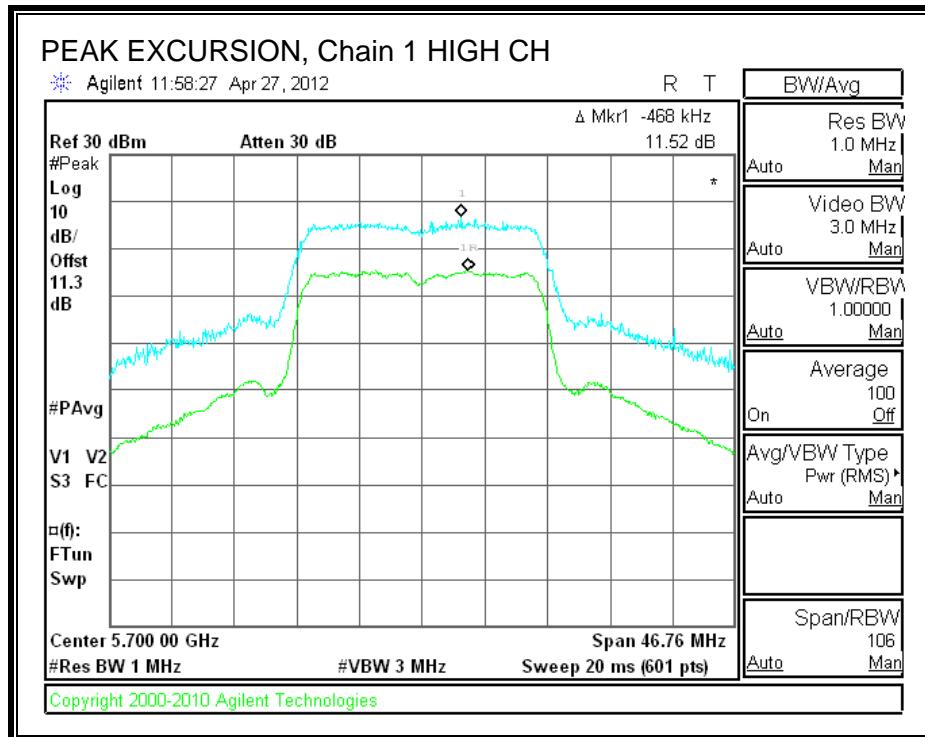
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

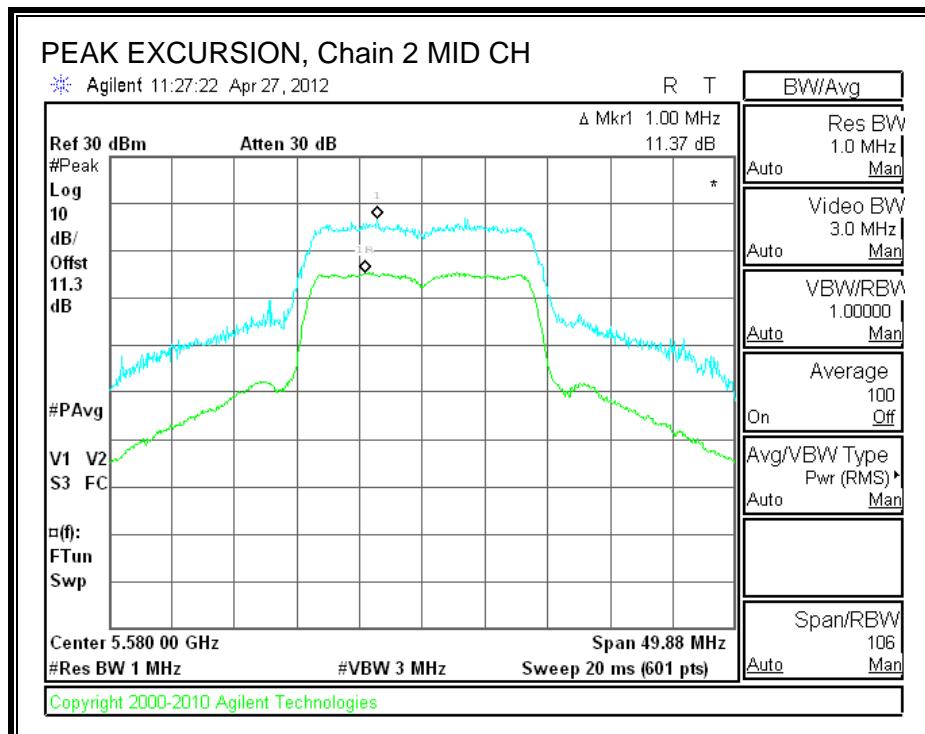
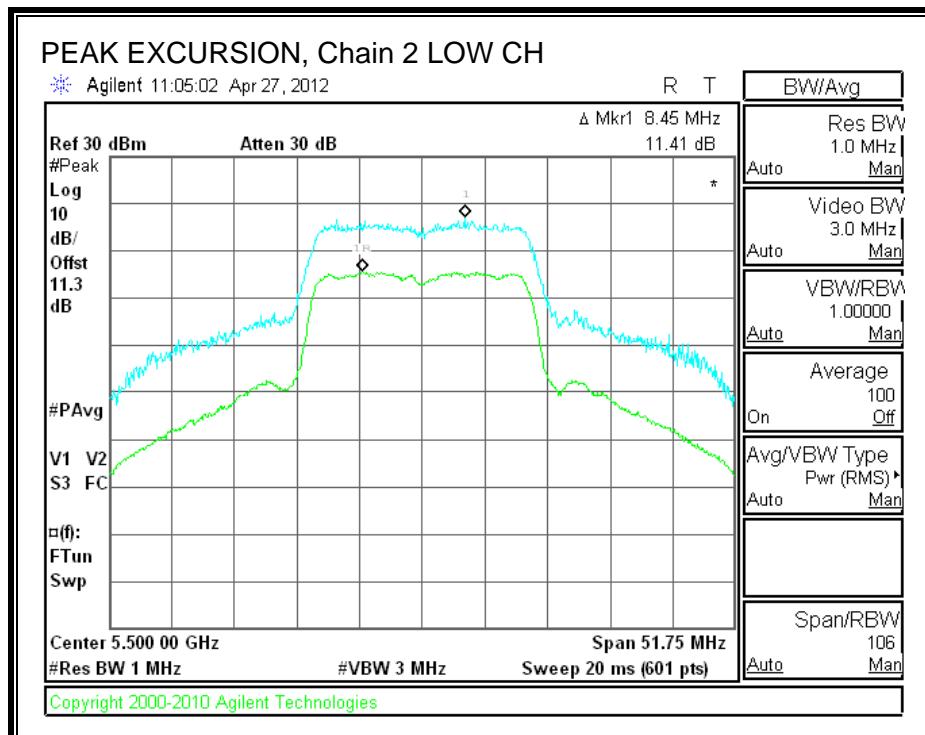
Channel	Frequency (MHz)	Pk Exc Chain 1 (dB)	Pk Exc Chain 2 (dB)	Pk Exc Chain 3 (dB)	Limit (dB)	Worst-Case Margin (dB)
Low	5500	11.40	11.41	10.43	13	-1.59
Mid	5580	10.39	11.37	11.17	13	-1.63
High	5700	11.52	10.18	10.58	13	-1.48

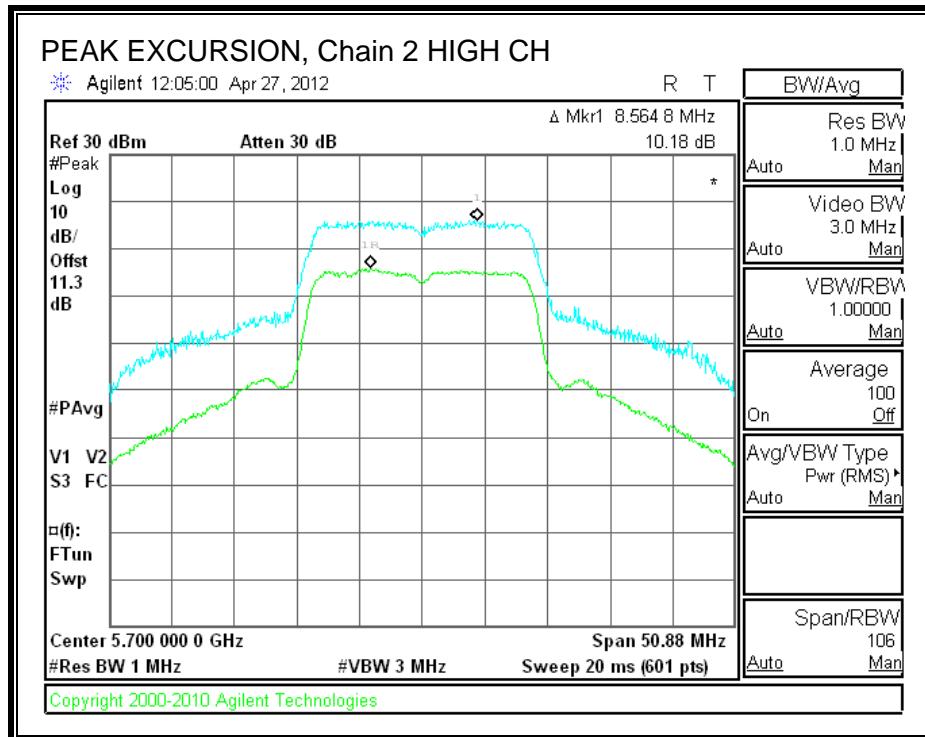
PEAK EXCURSION, Chain 1





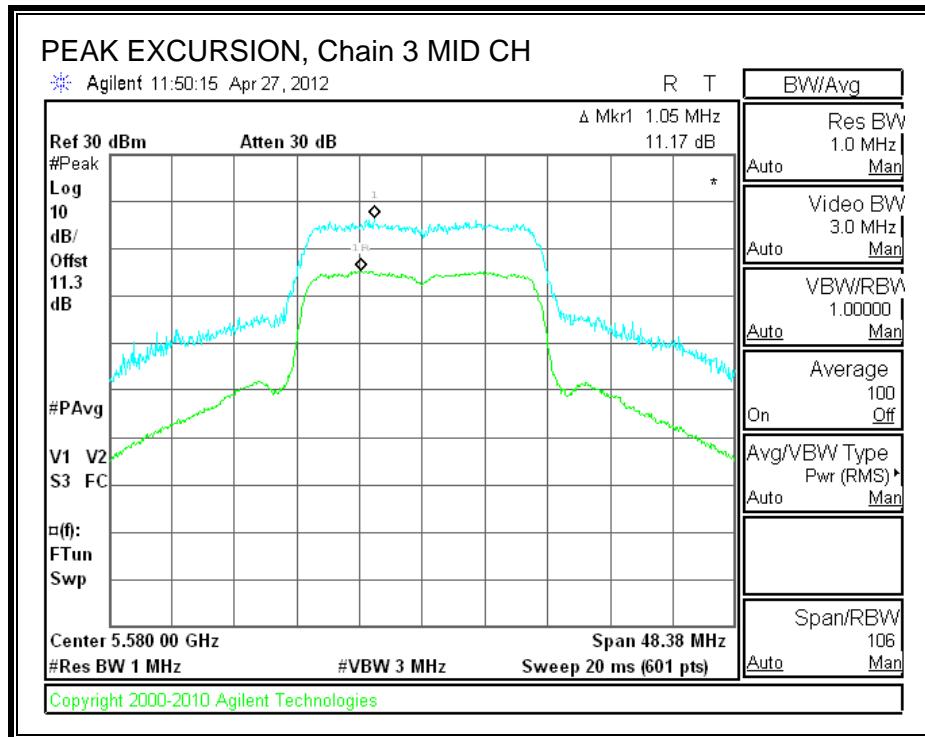
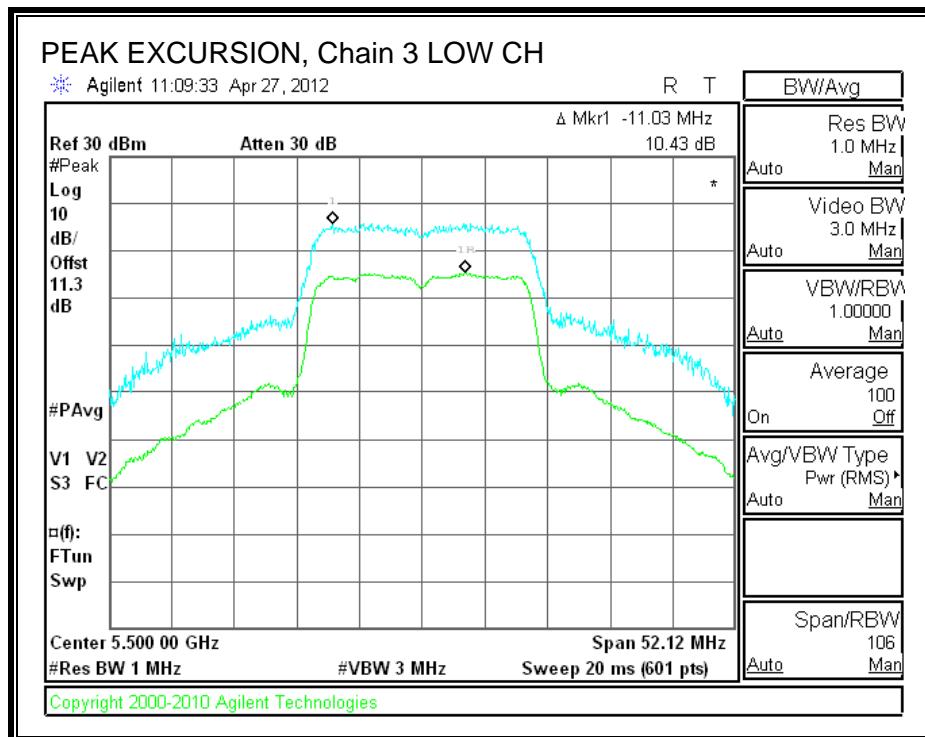
PEAK EXCURSION, Chain 2

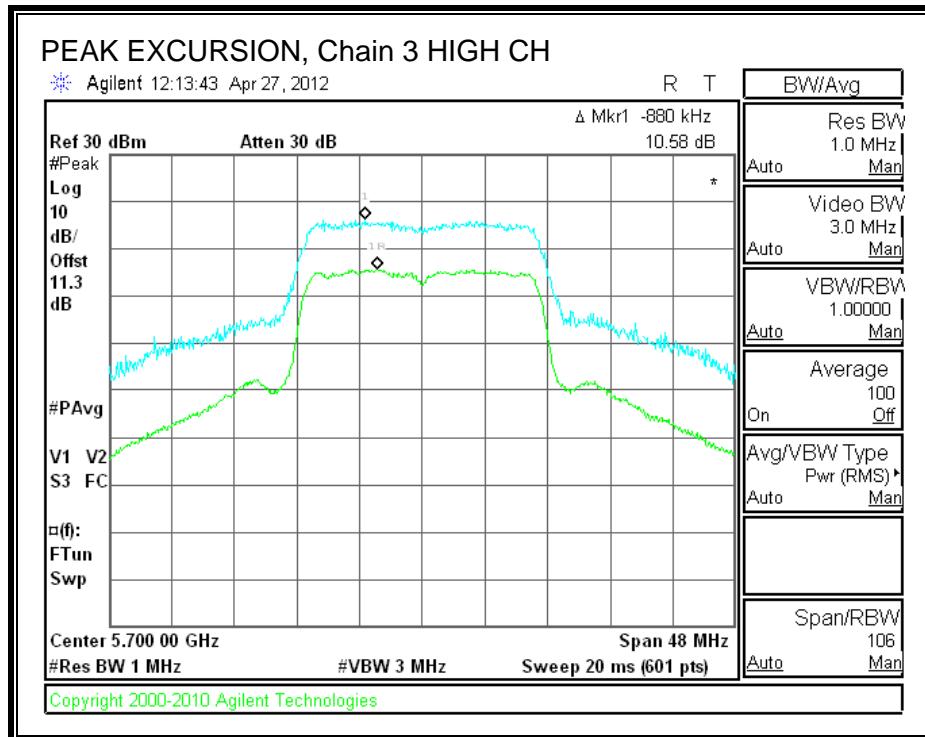




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PEAK EXCURSION, Chain 3





8.15. 802.11n HT40, 1TX, 5.6 GHz BAND

8.15.1. 26 dB BANDWIDTH

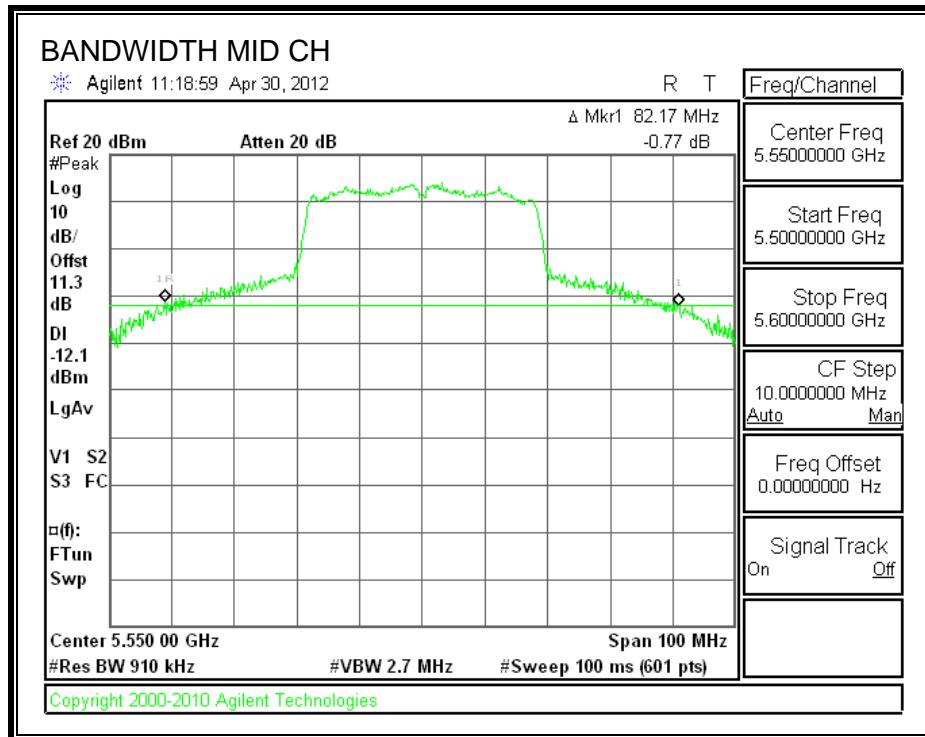
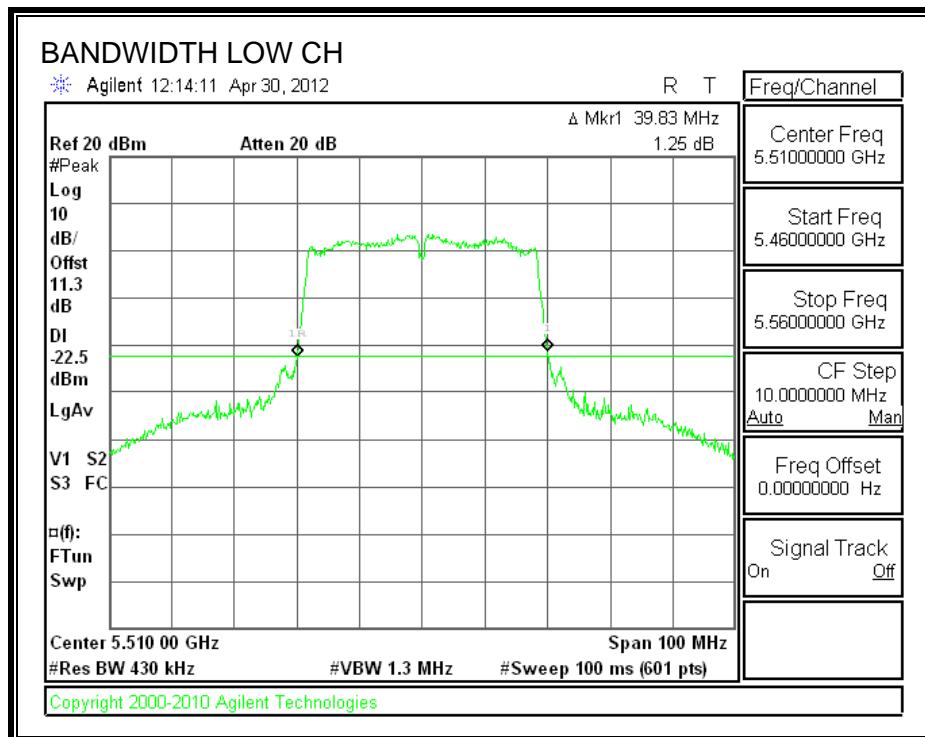
LIMITS

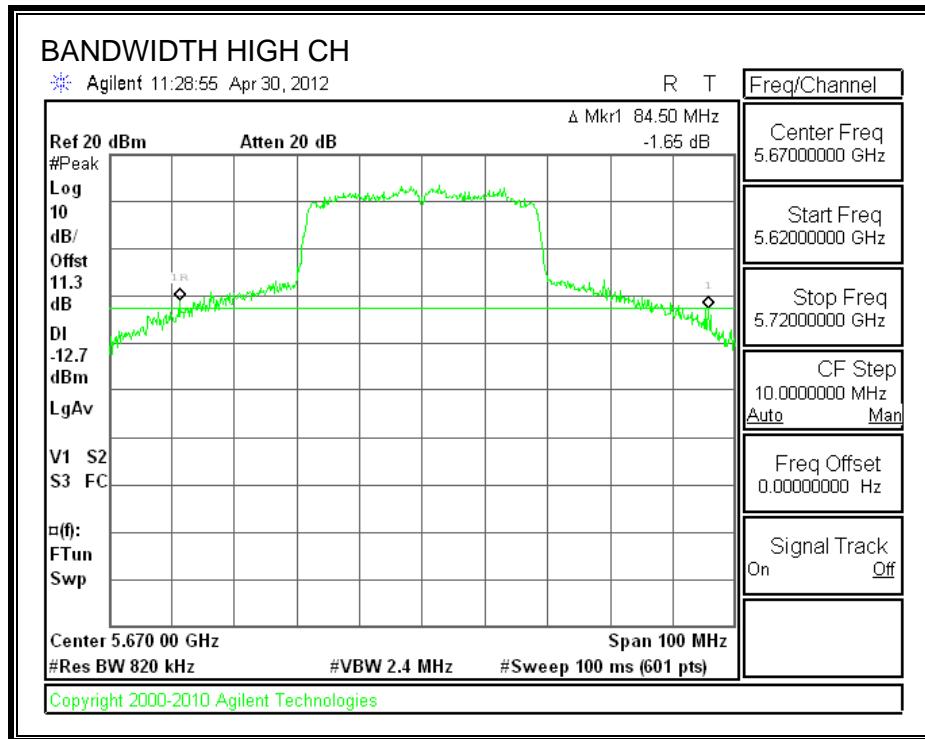
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5510	39.83
Mid	5550	82.17
High	5670	84.50

26 dB BANDWIDTH





8.15.2. 99% BANDWIDTH

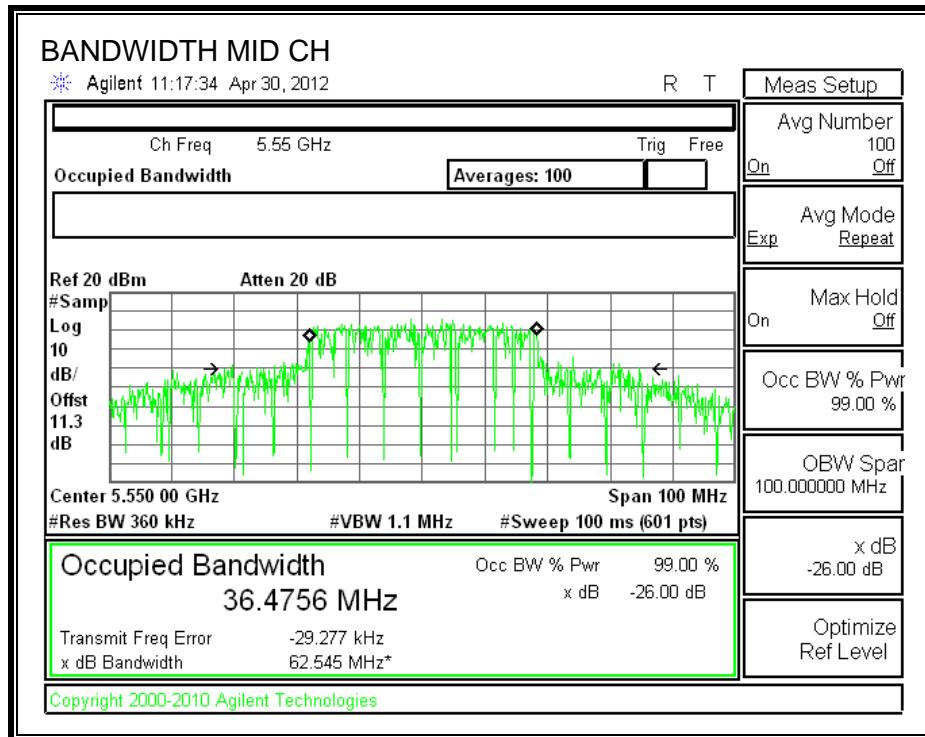
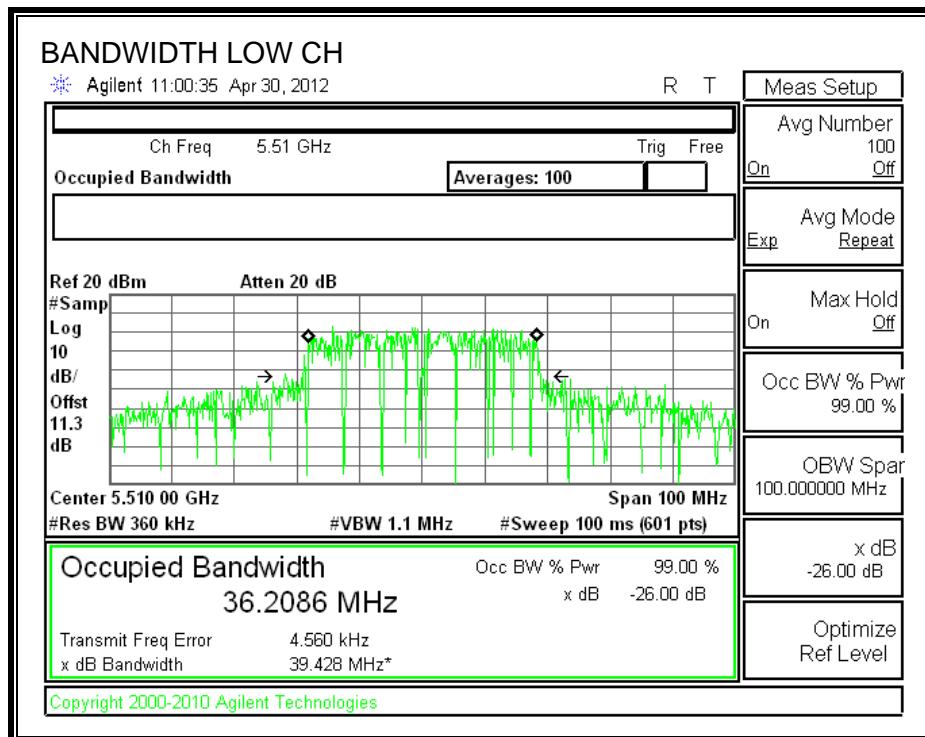
LIMITS

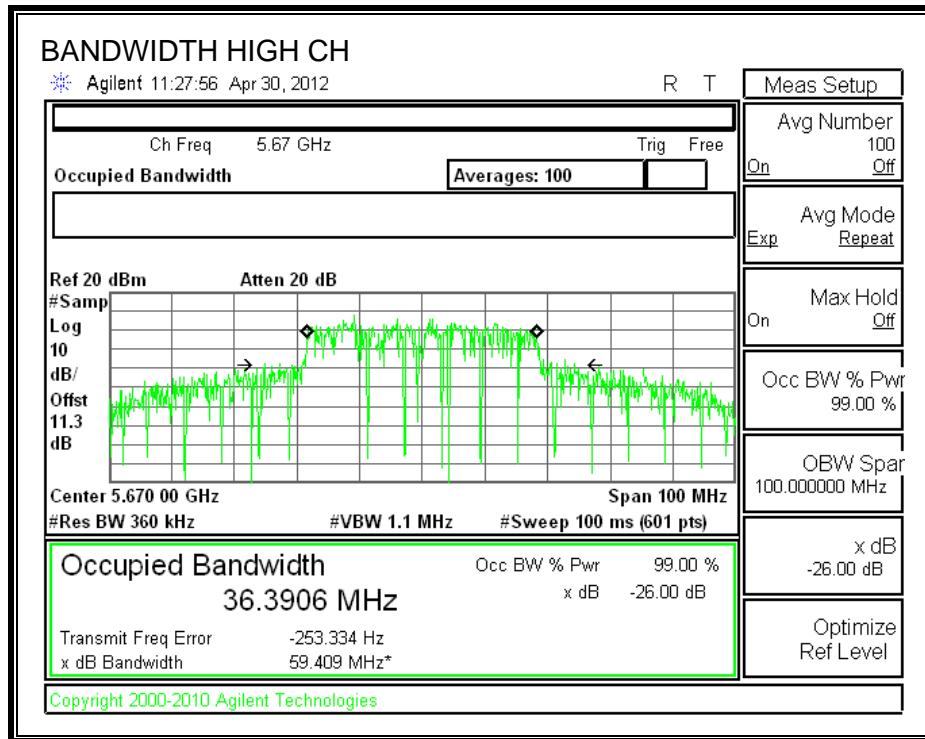
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5510	36.2086
Mid	5550	36.4756
High	5670	36.3906

99% BANDWIDTH





8.15.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (3)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak 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 peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

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

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5510	24	39.83	27.00	5.53	24.00	11.00
Mid	5550	24	82.17	30.15	5.53	24.00	11.00
High	5670	24	84.50	30.27	5.53	24.00	11.00

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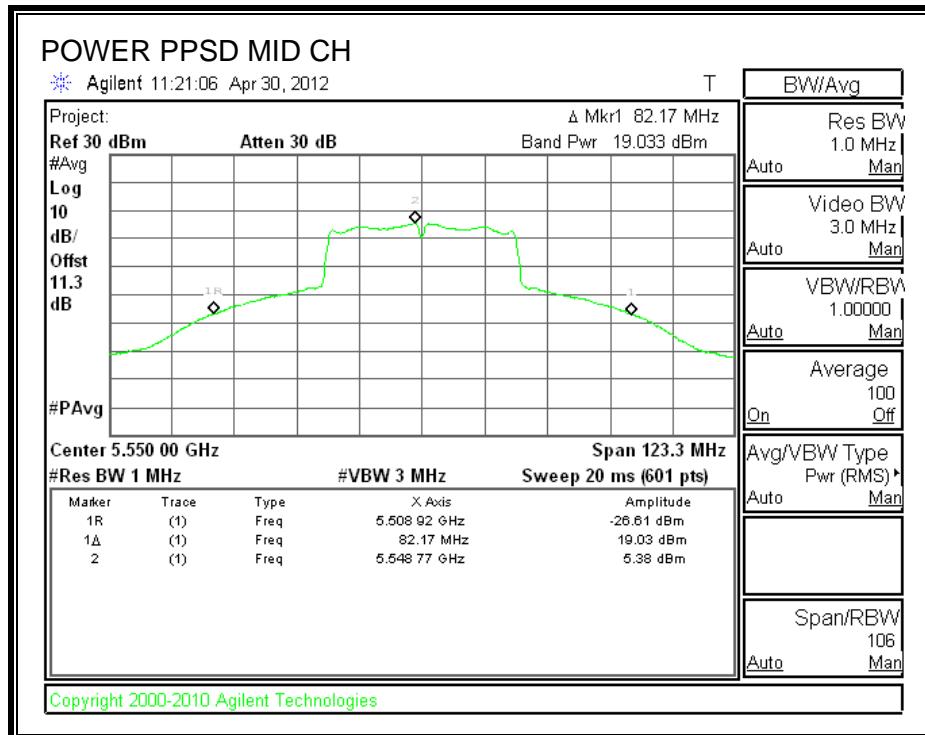
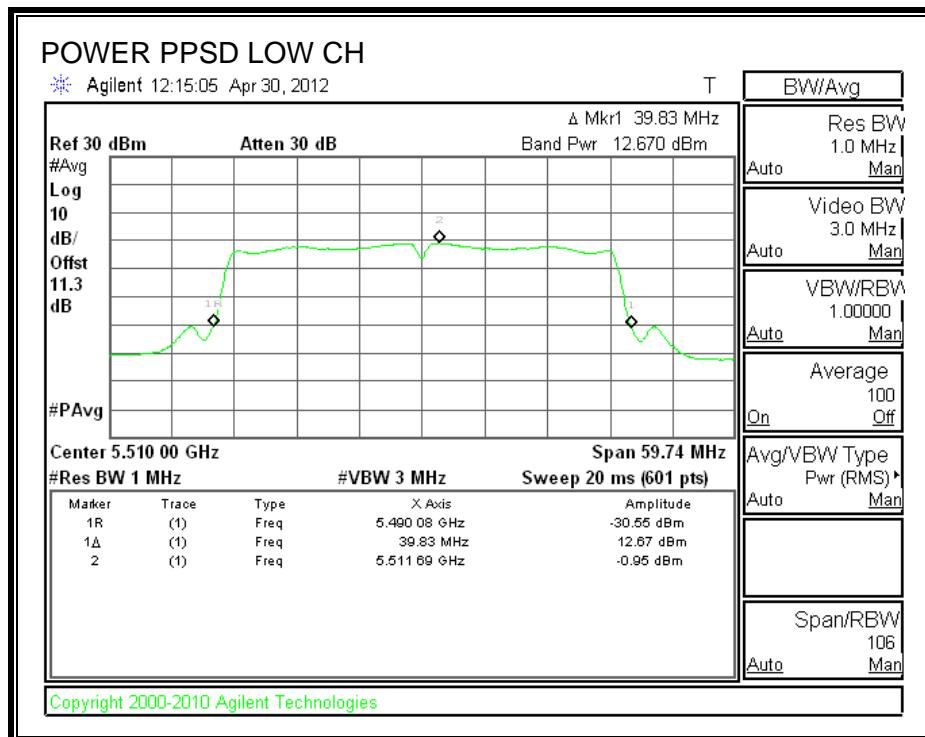
Output Power Results

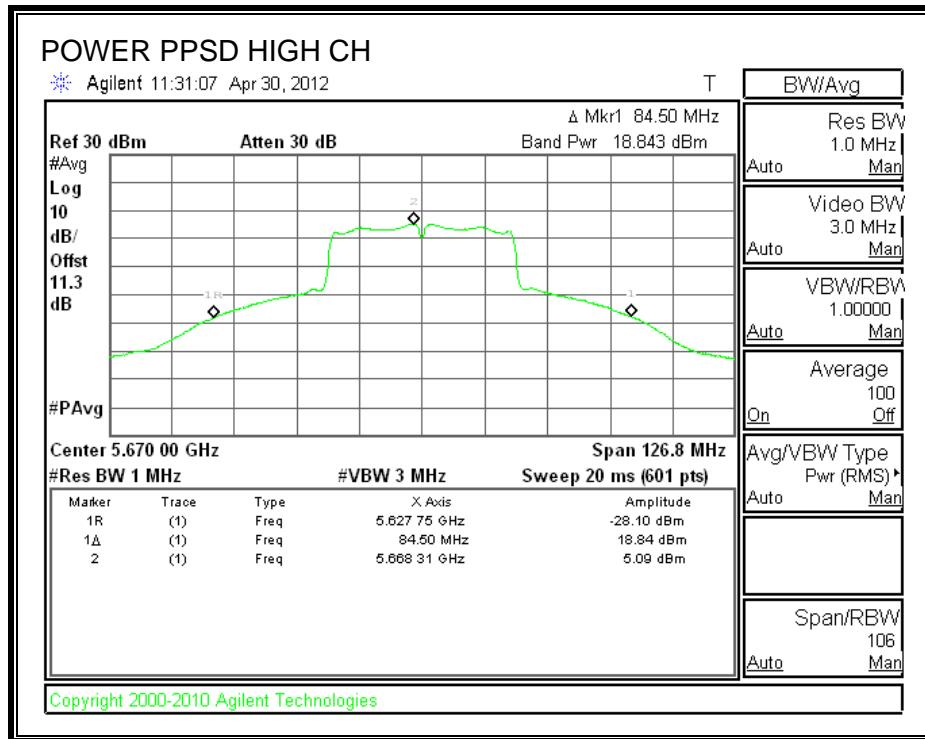
Channel	Frequency (MHz)	Meas Power (dBm)	Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	12.670	12.670	24.00	-11.330
Mid	5550	19.033	19.033	24.00	-4.967
High	5670	18.843	18.843	24.00	-5.157

PPSD Results

Channel	Frequency (MHz)	Meas PPSD (dBm)	Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	-0.95	-0.95	11.00	-11.95
Mid	5550	5.38	5.38	11.00	-5.62
High	5670	5.09	5.09	11.00	-5.91

OUTPUT POWER AND PPSD





8.15.4. PEAK EXCURSION

LIMITS

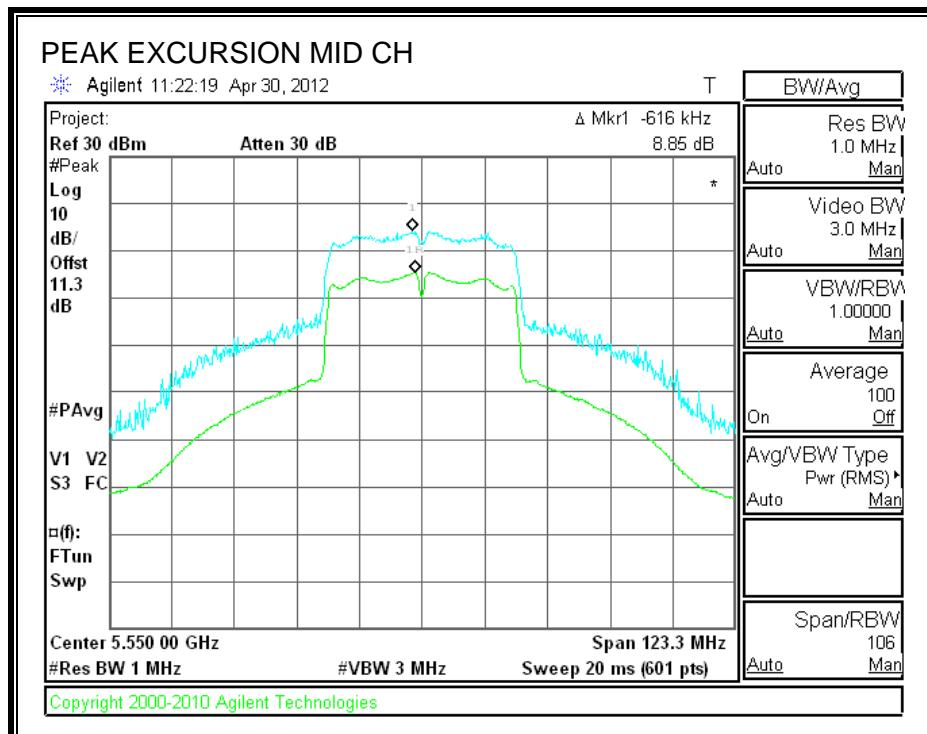
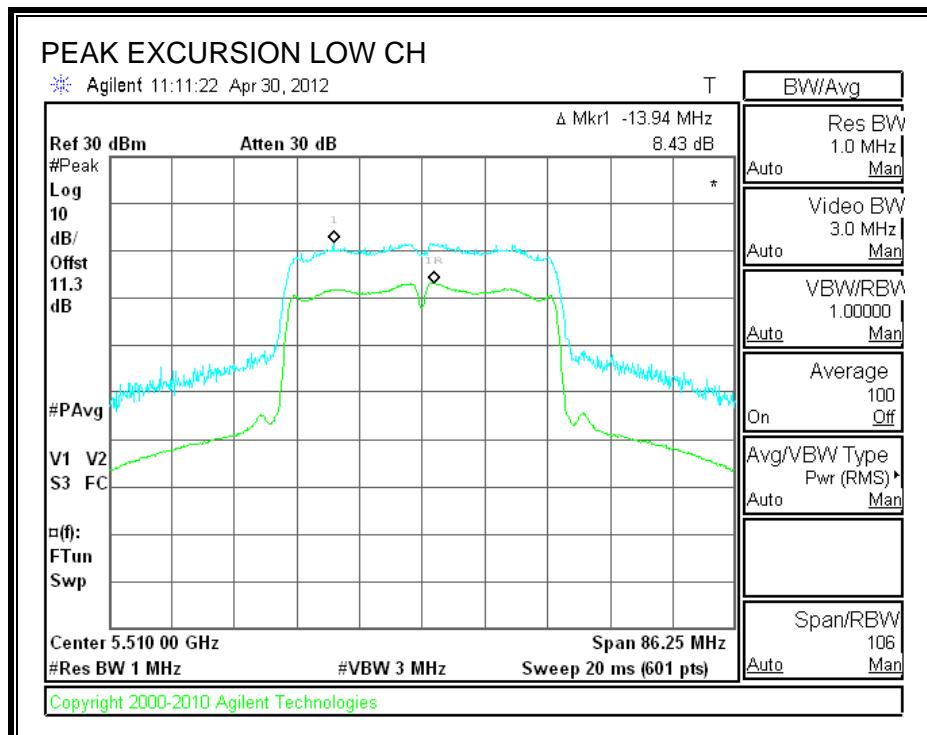
FCC §15.407 (a) (6)

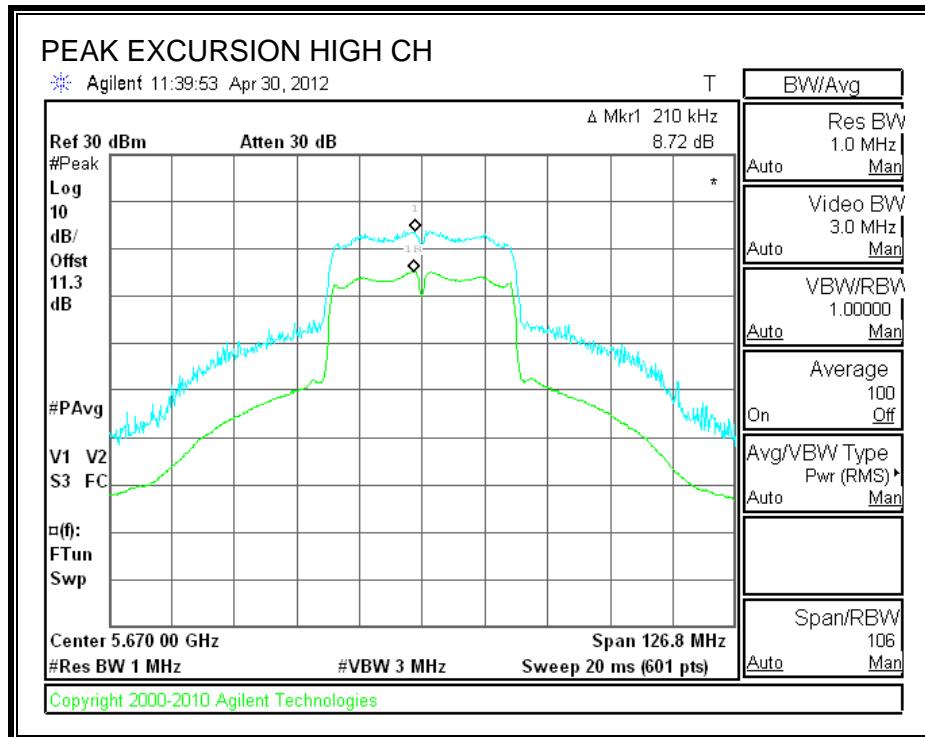
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5510	8.43	13	-4.57
Mid	5550	8.85	13	-4.15
High	5670	8.72	13	-4.28

PEAK EXCURSION





8.16. 802.11n HT40, CDD MCS0, 3TX, 5.6 GHz BAND

8.16.1. 26 dB BANDWIDTH

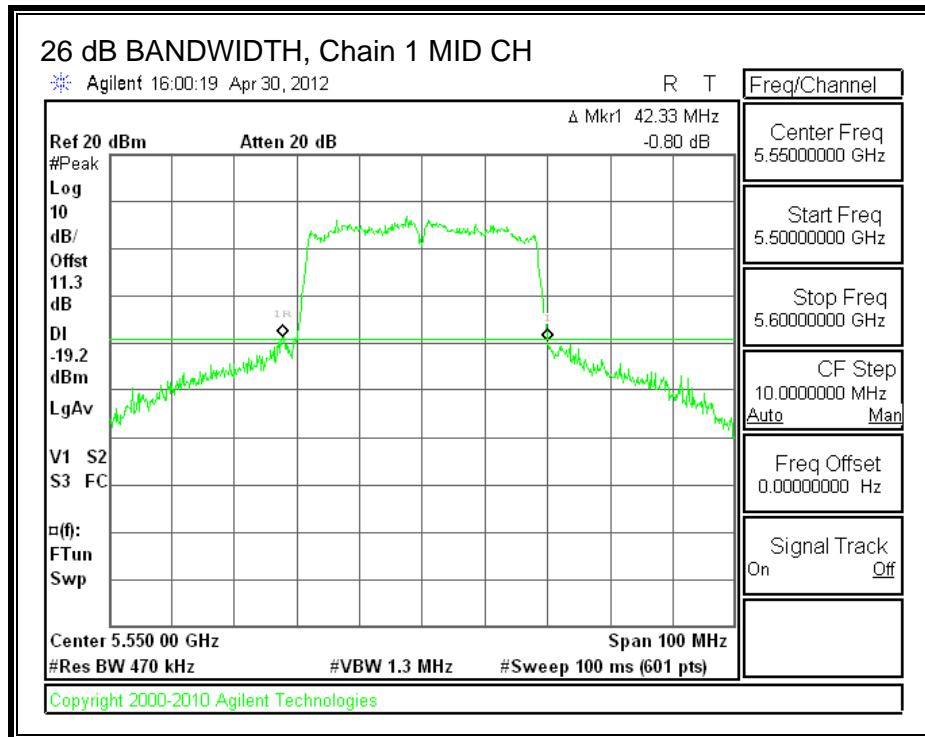
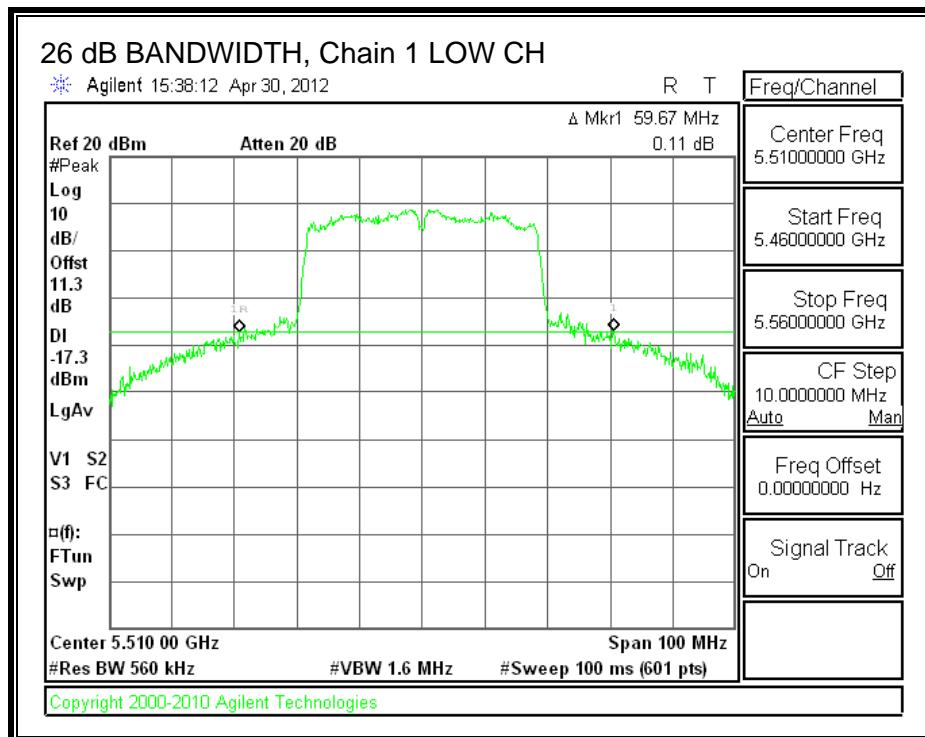
LIMITS

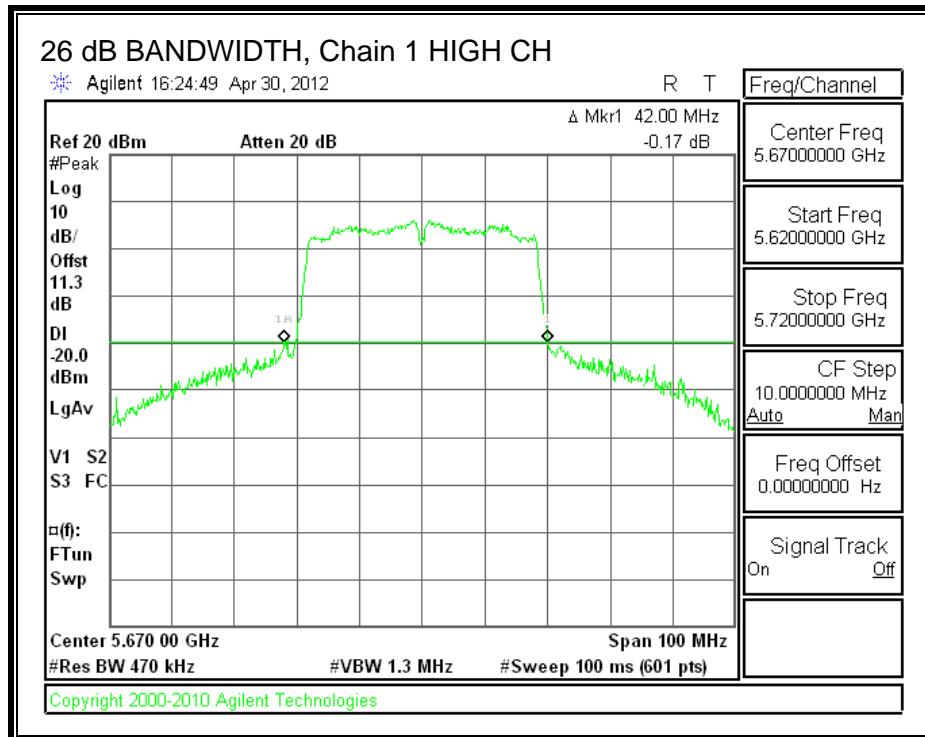
None; for reporting purposes only.

RESULTS

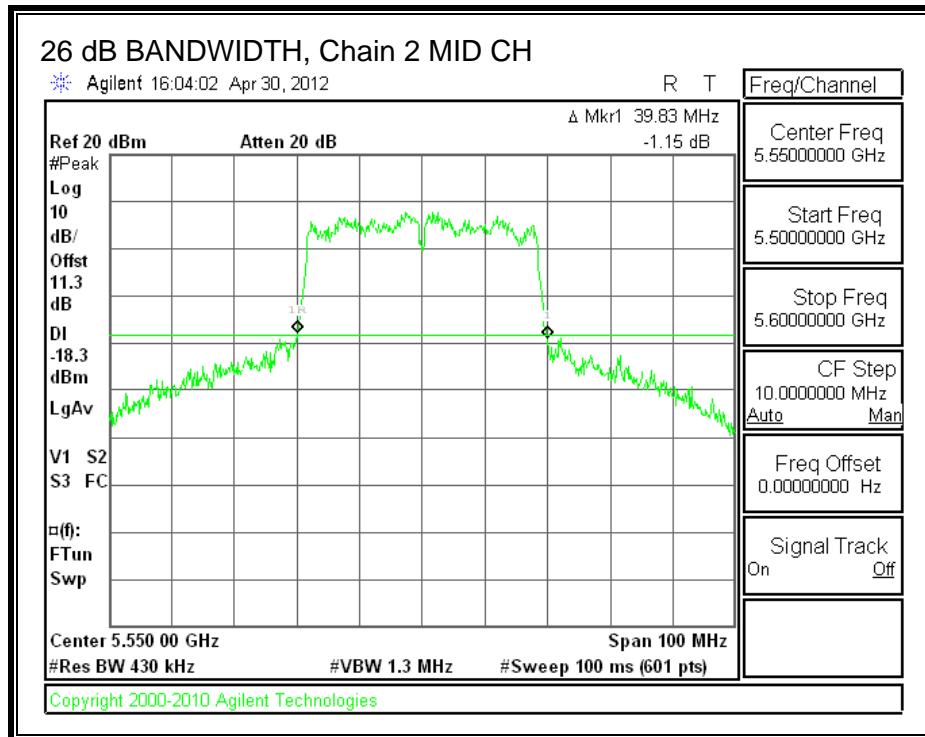
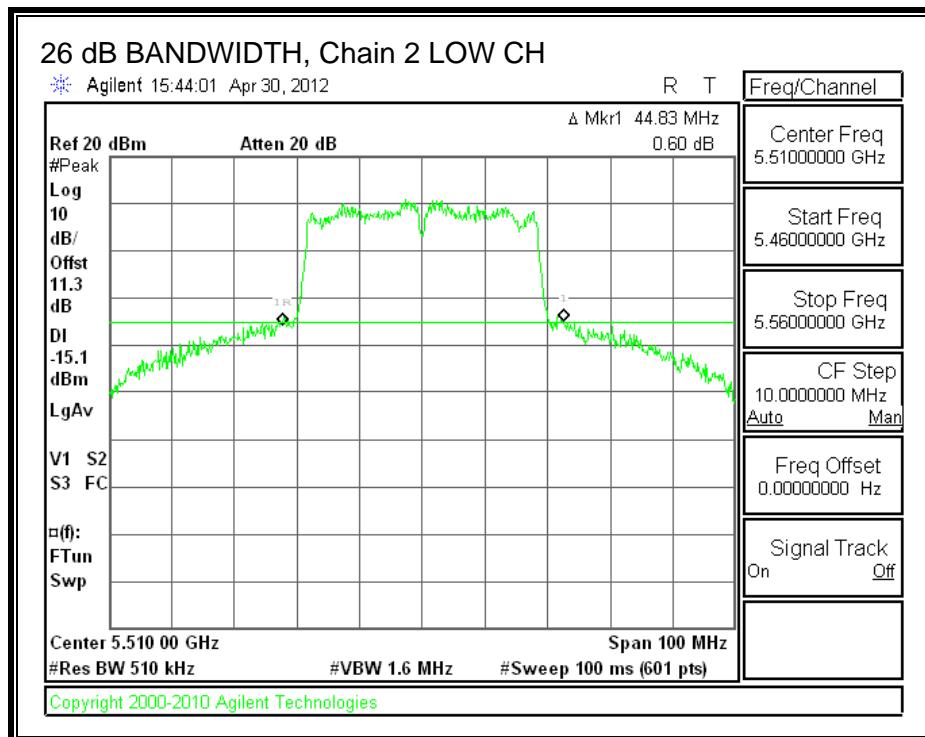
Channel	Frequency (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)	26 dB BW Chain 3 (MHz)
Low	5510	59.67	44.83	44.83
Mid	5550	42.33	39.83	39.83
High	5670	42.00	39.50	39.67

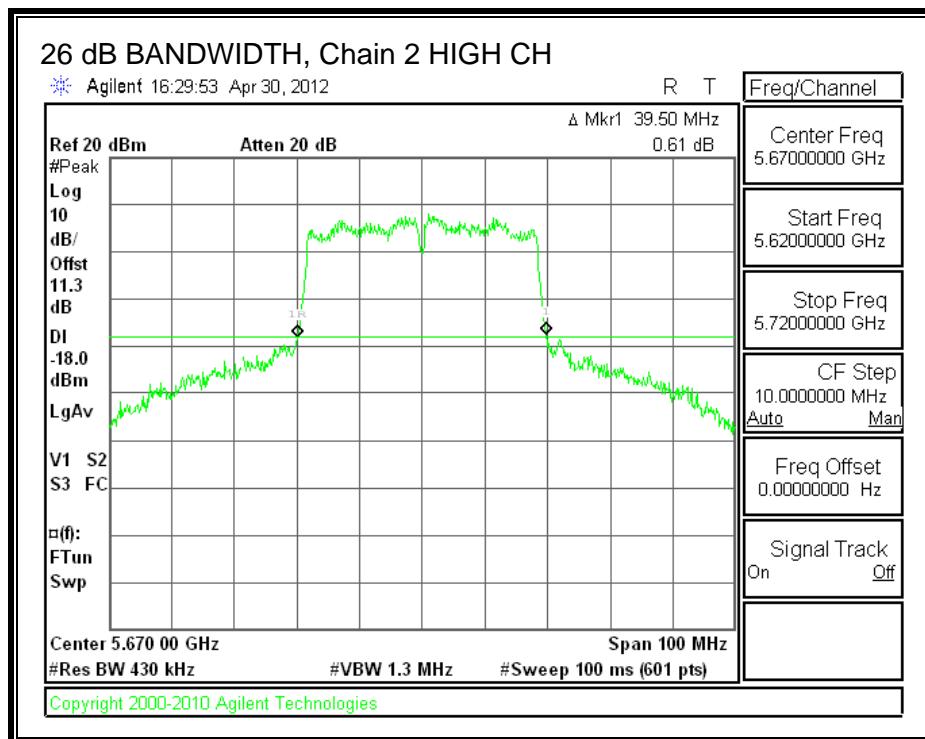
26 dB BANDWIDTH, Chain 1



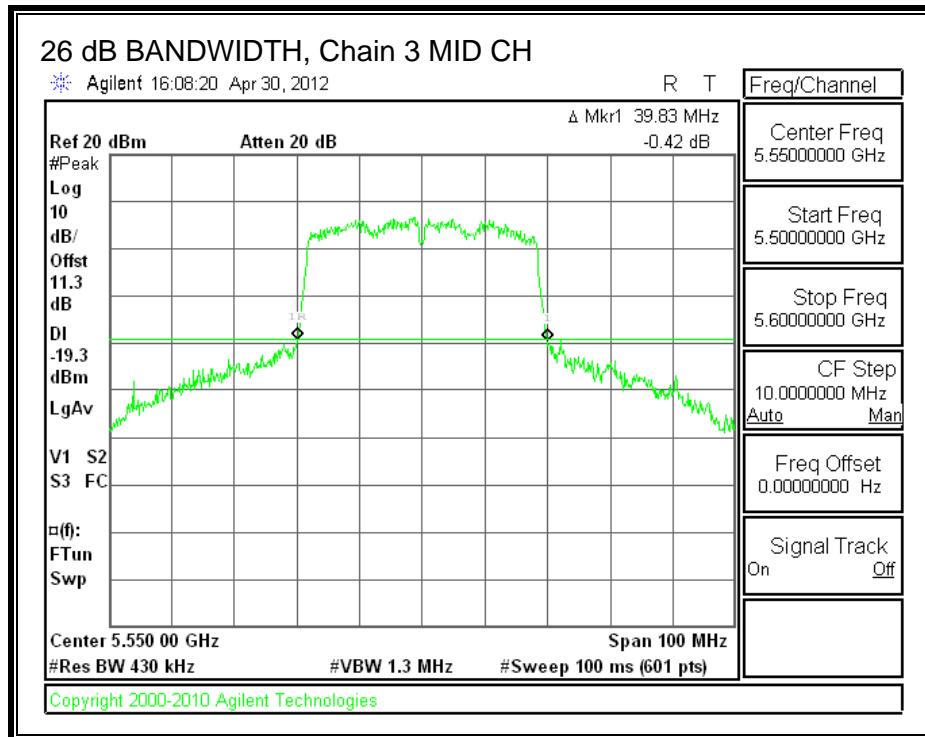
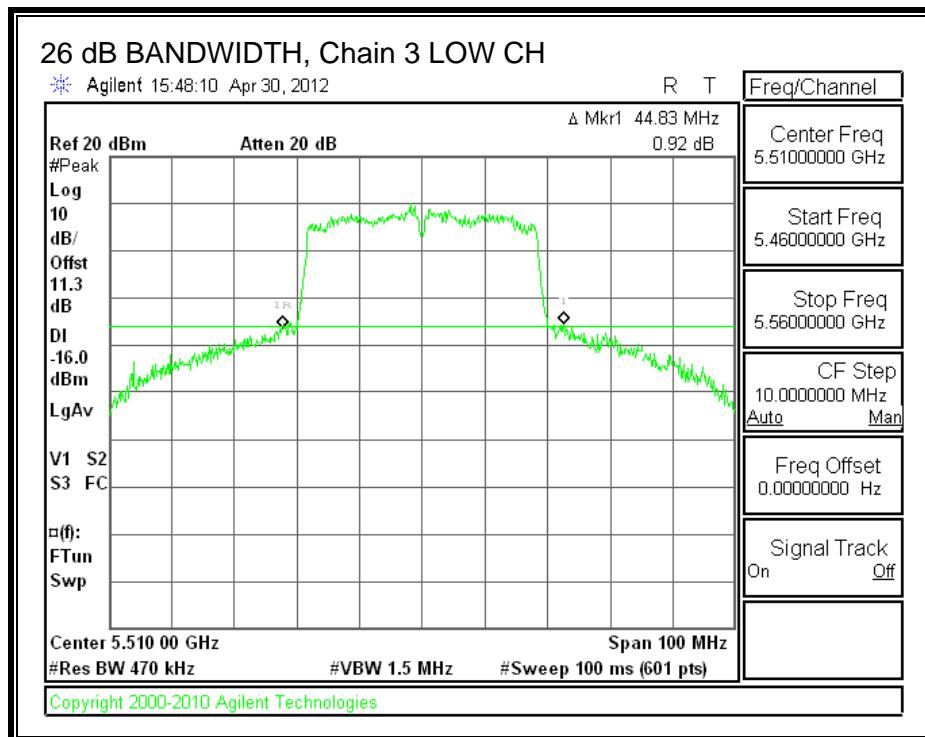


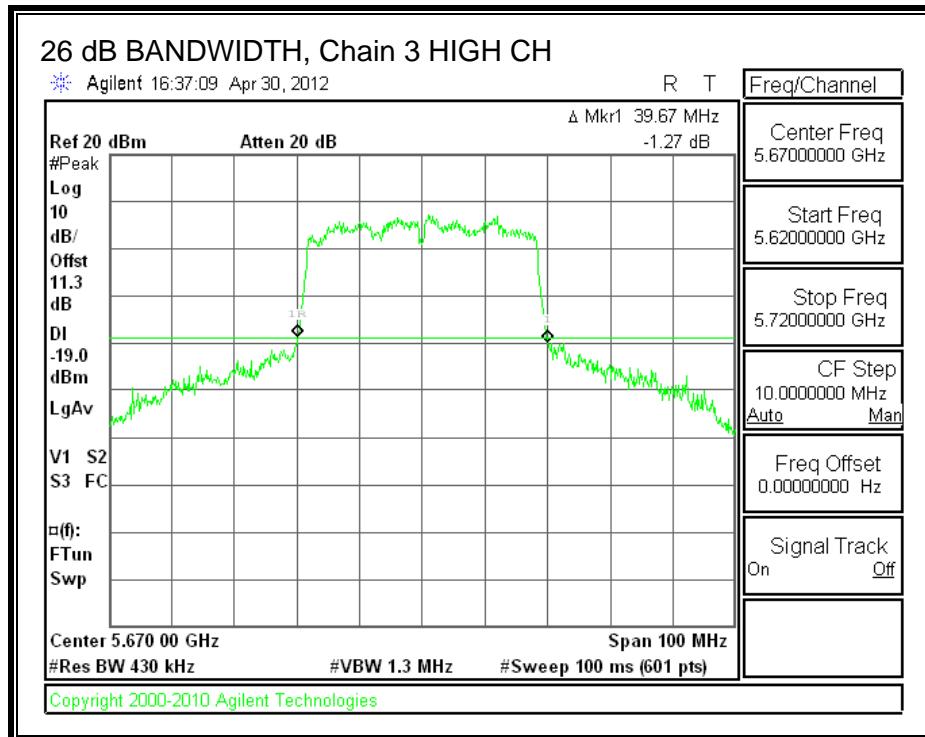
26 dB BANDWIDTH, Chain 2





26 dB BANDWIDTH, Chain 3





8.16.2. 99% BANDWIDTH

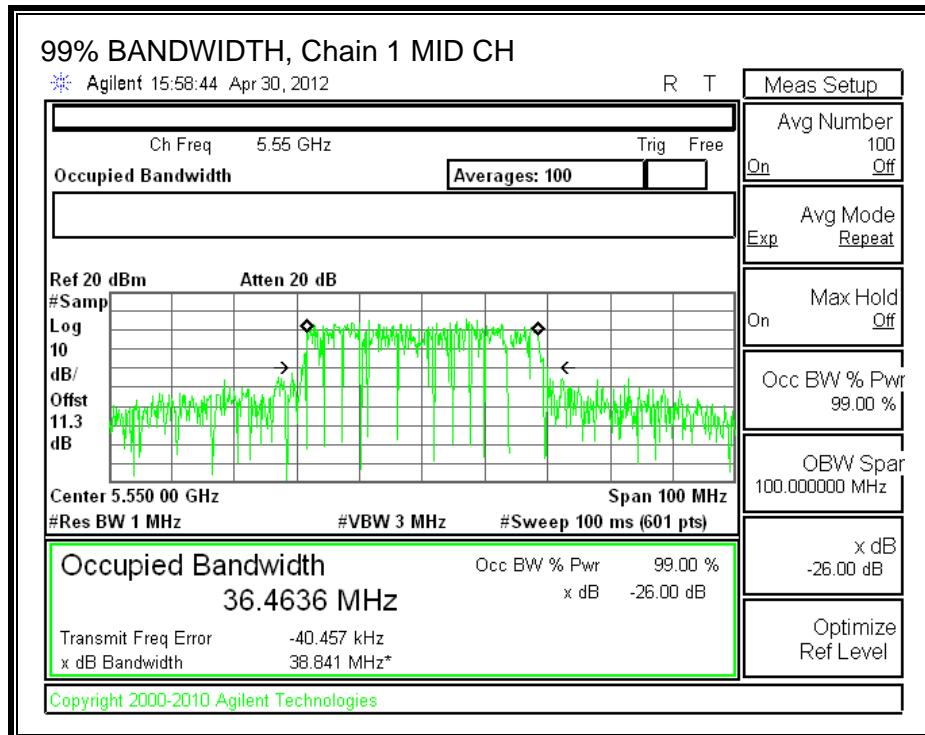
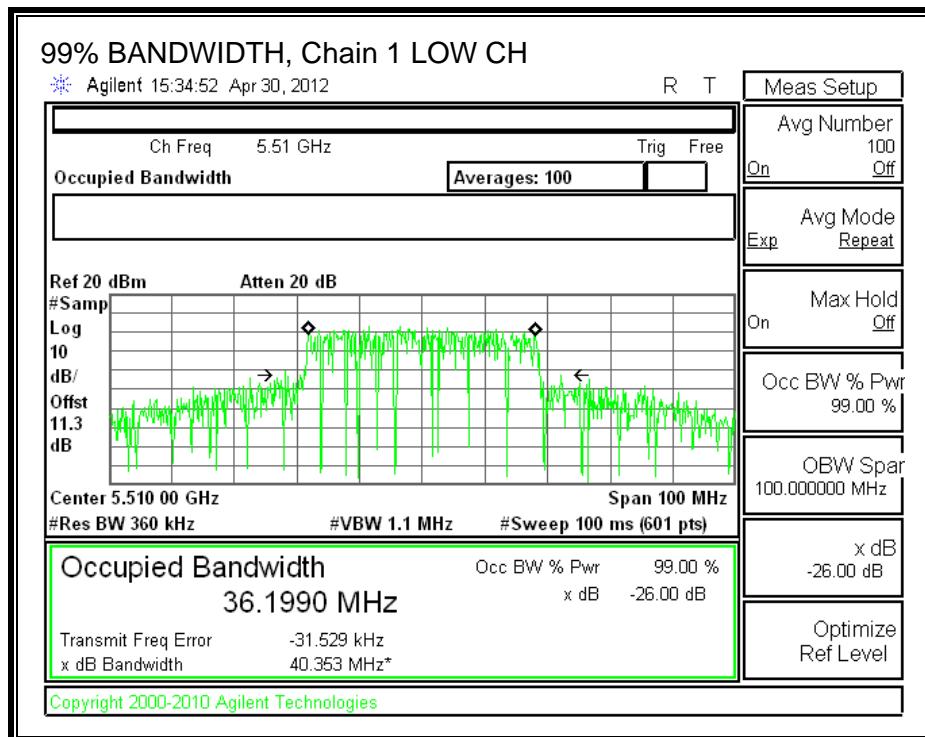
LIMITS

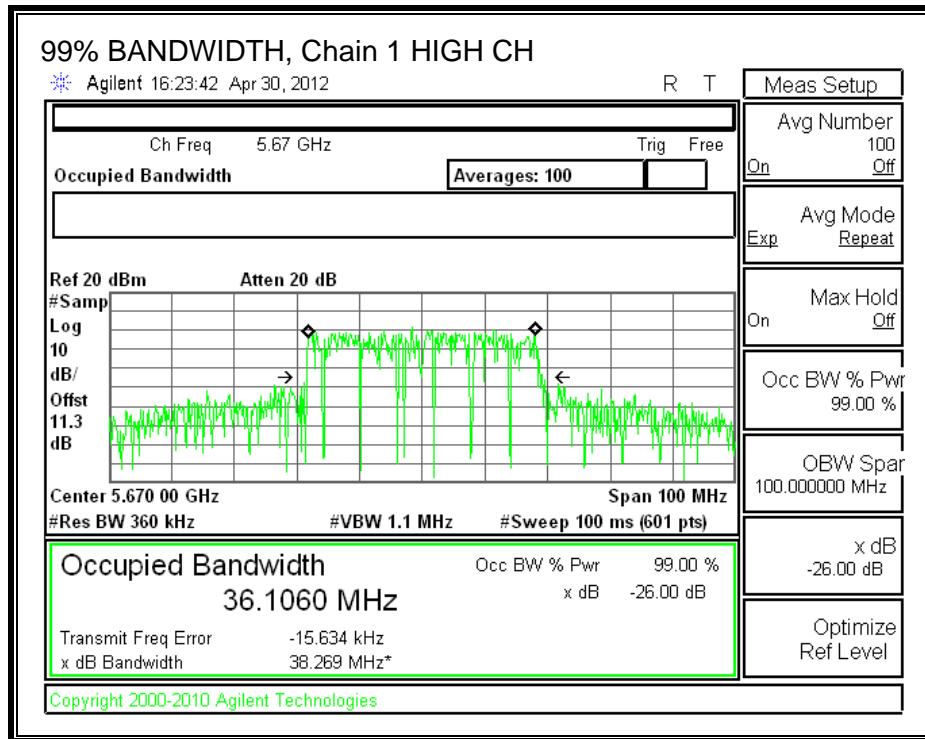
None; for reporting purposes only.

RESULTS

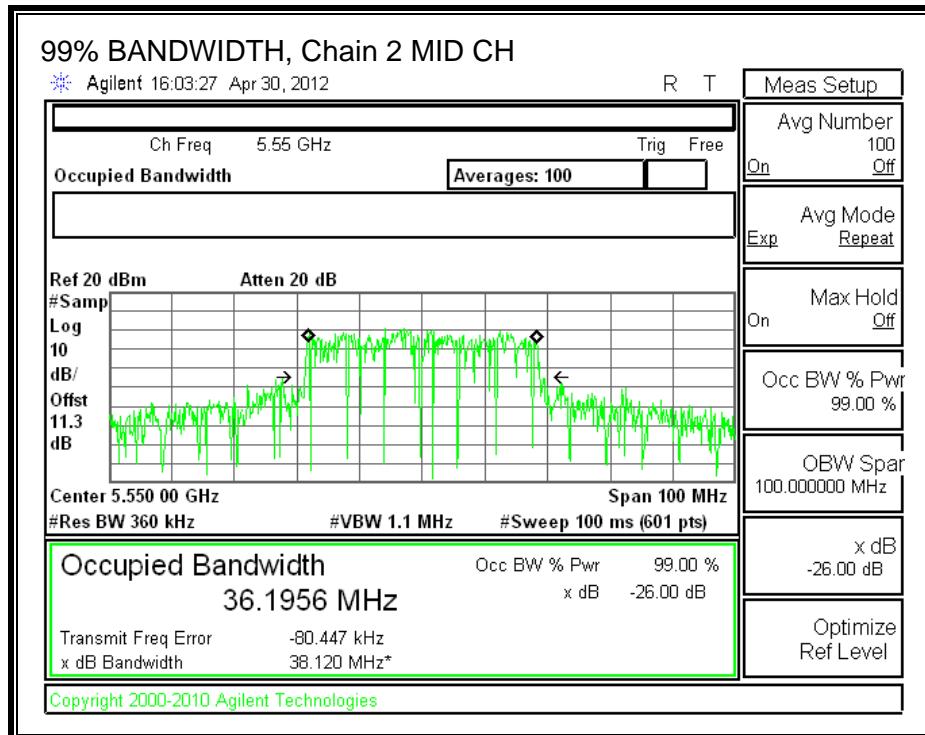
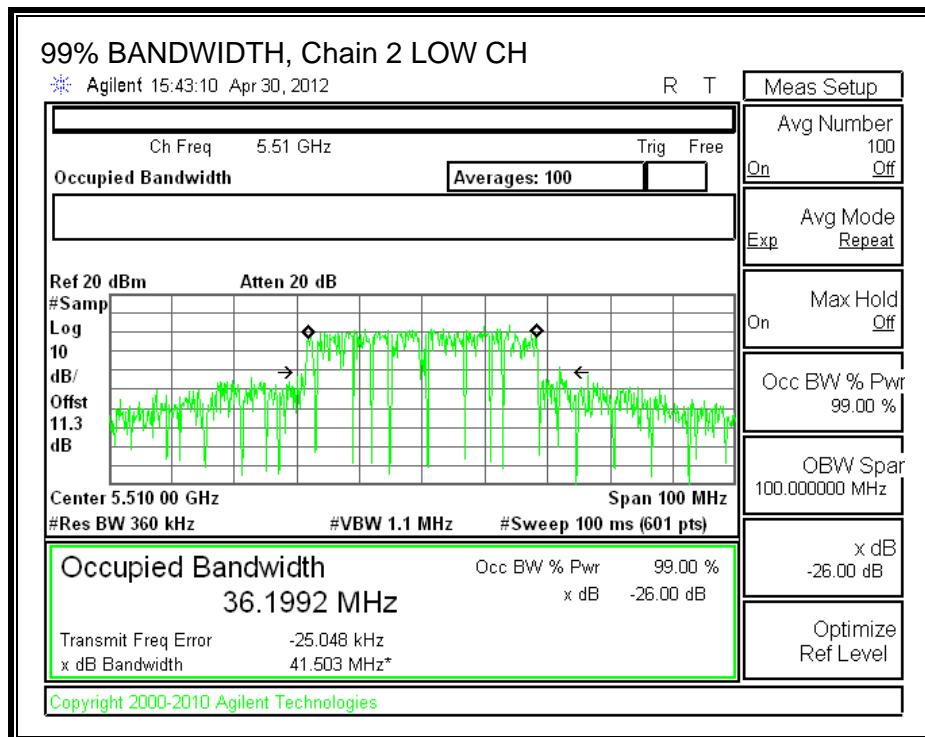
Channel	Frequency (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)	99% BW Chain 3 (MHz)
Low	5510	36.1990	36.1992	36.1737
Mid	5550	36.4636	36.1956	36.0438
High	5670	36.1060	36.2107	36.0797

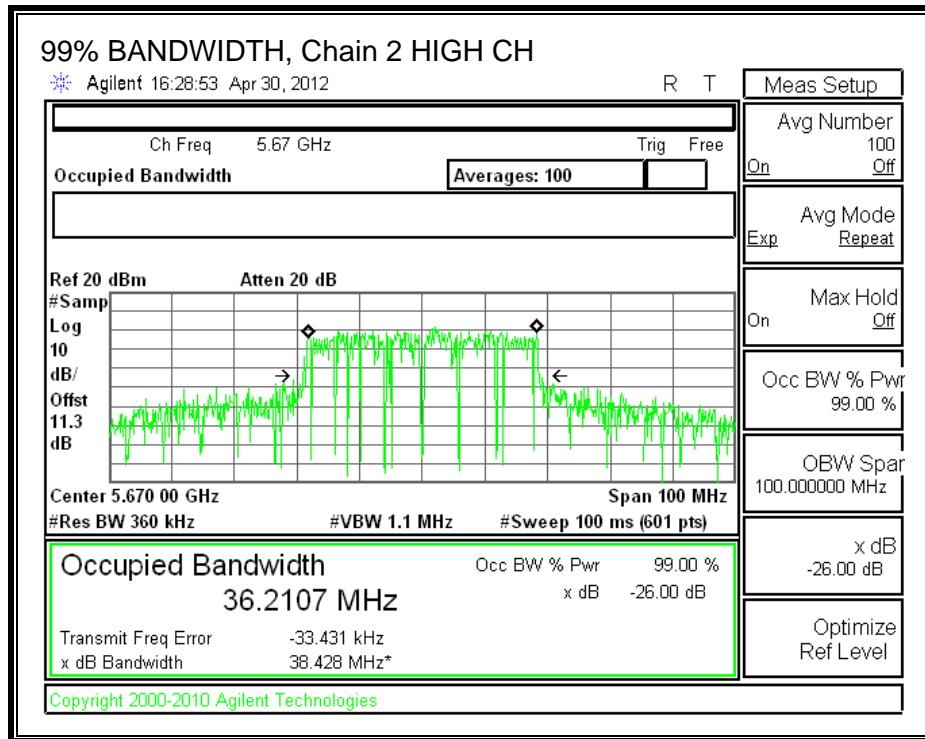
99% BANDWIDTH, Chain 1



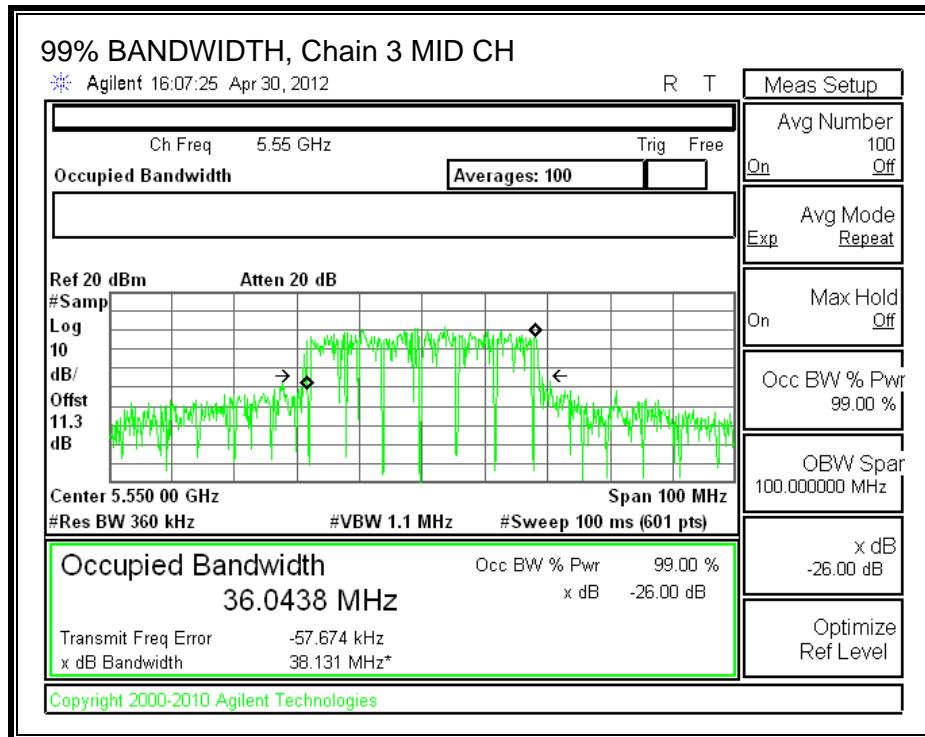
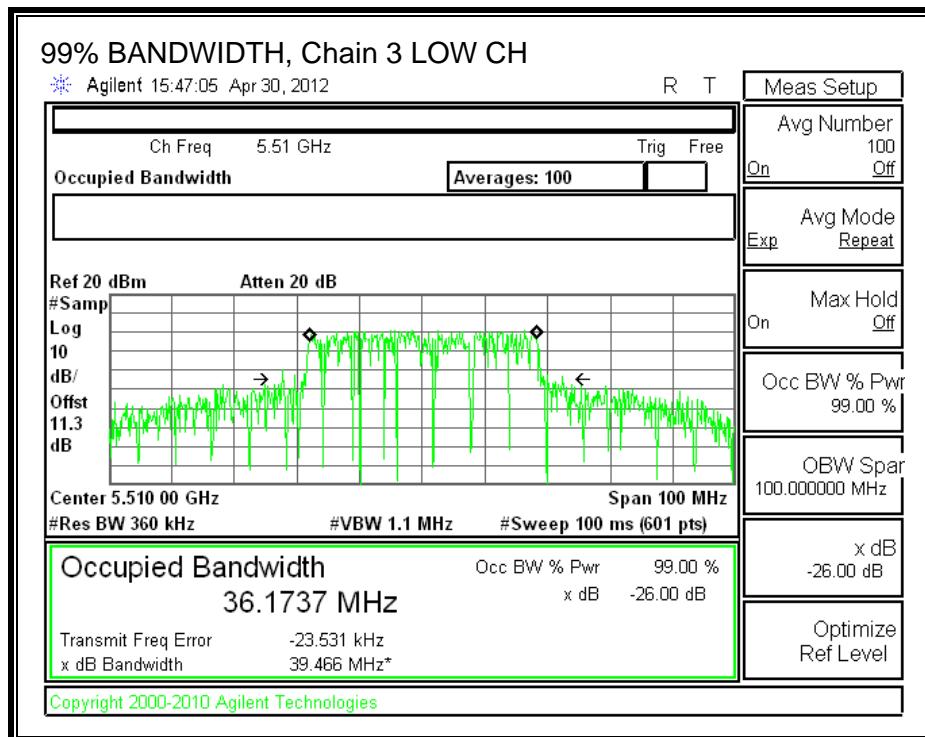


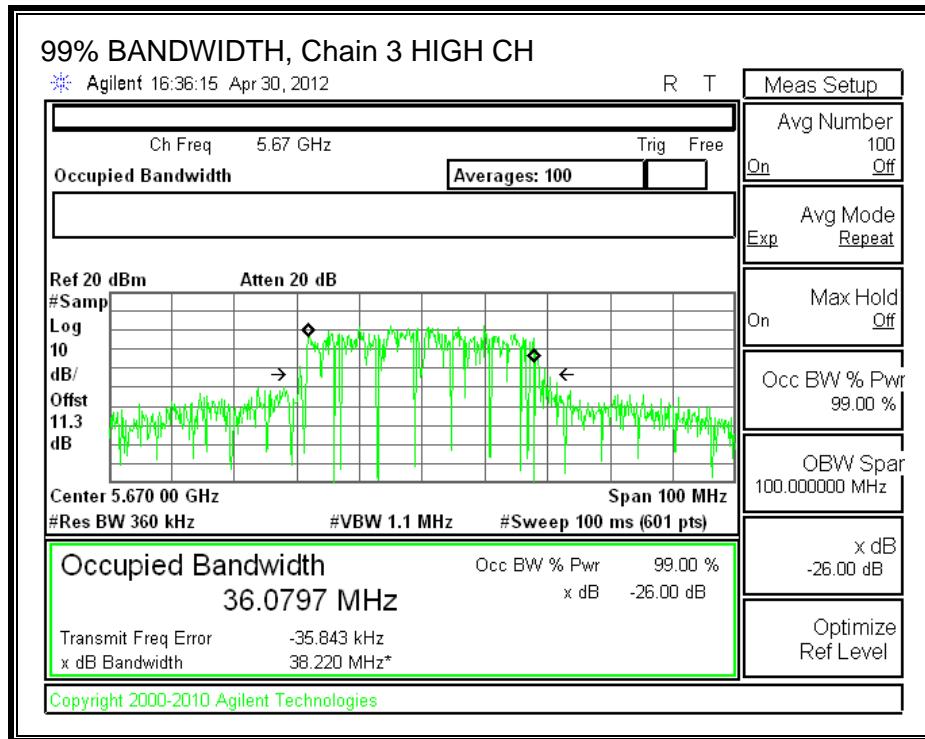
99% BANDWIDTH, Chain 2





99% BANDWIDTH, Chain 3





8.16.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (3)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak 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 peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.53	2.68	1.26	8.11

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Low	5510	24	59.67	28.76	8.11	21.89	8.89
Mid	5550	24	39.83	27.00	8.11	21.89	8.89
High	5670	24	39.50	26.97	8.11	21.89	8.89

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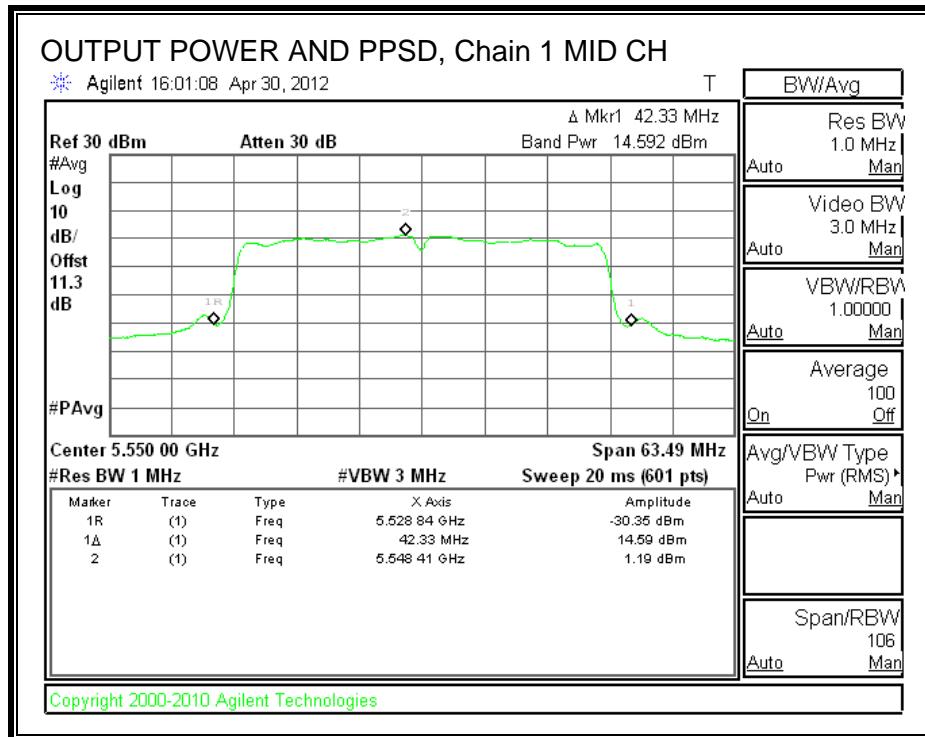
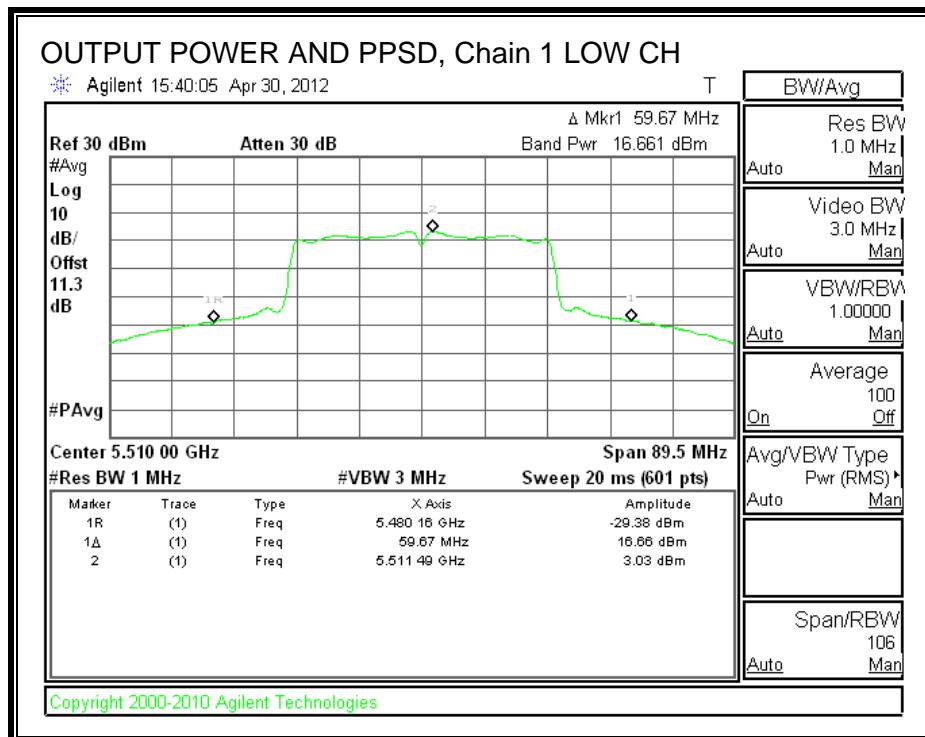
Output Power Results

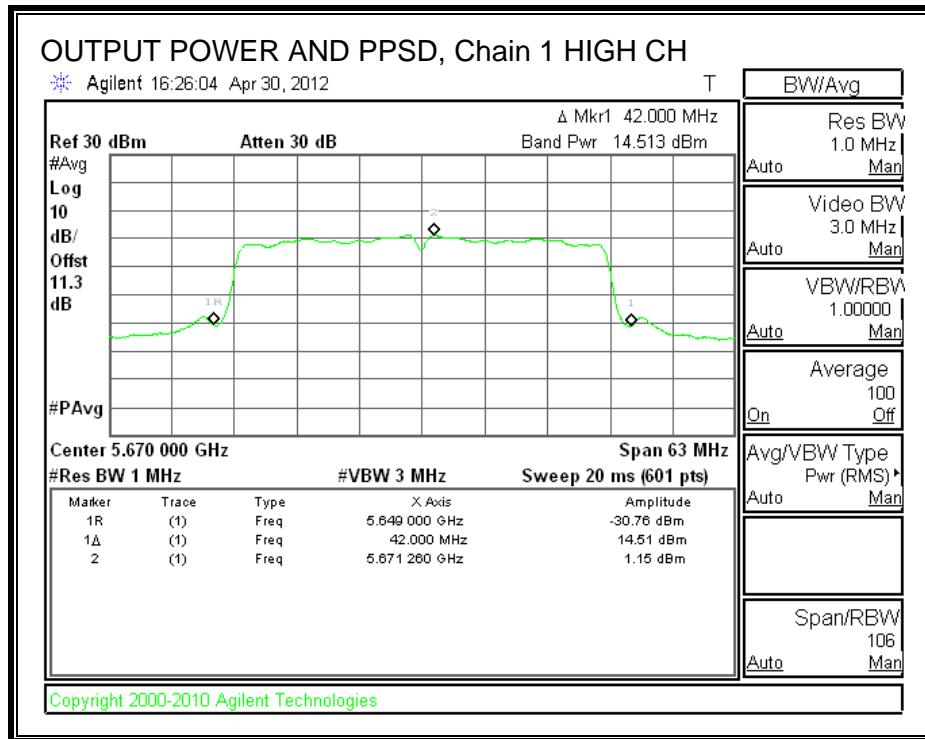
Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Chain 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	16.661	16.910	16.499	21.465	21.89	-0.425
Mid	5550	14.592	14.731	14.714	19.451	21.89	-2.439
High	5670	14.513	14.886	14.686	19.469	21.89	-2.421

PPSD Results

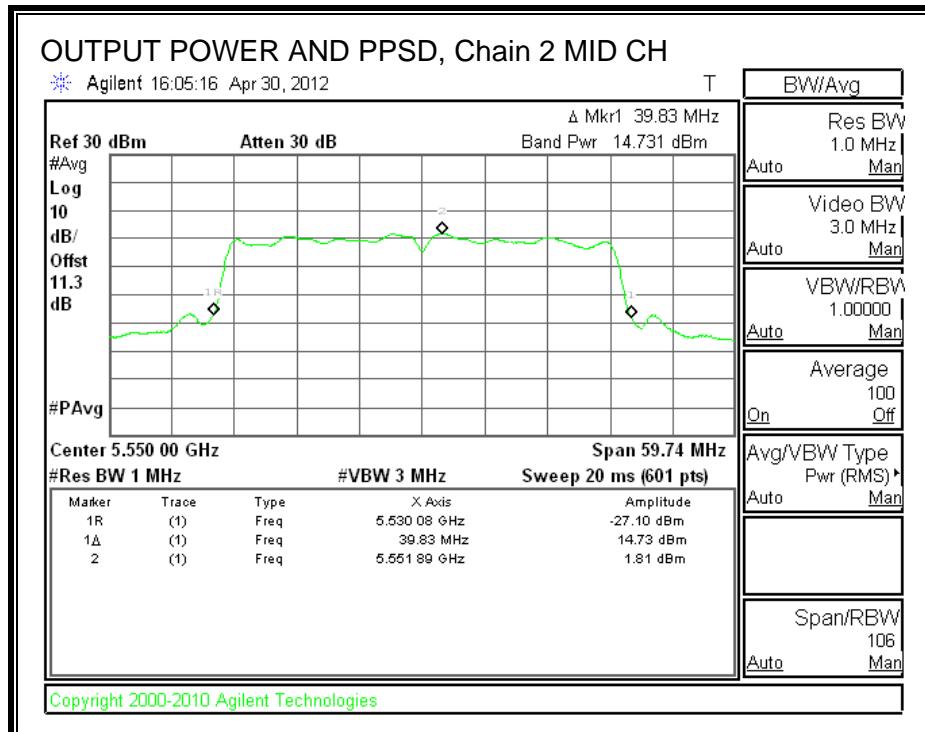
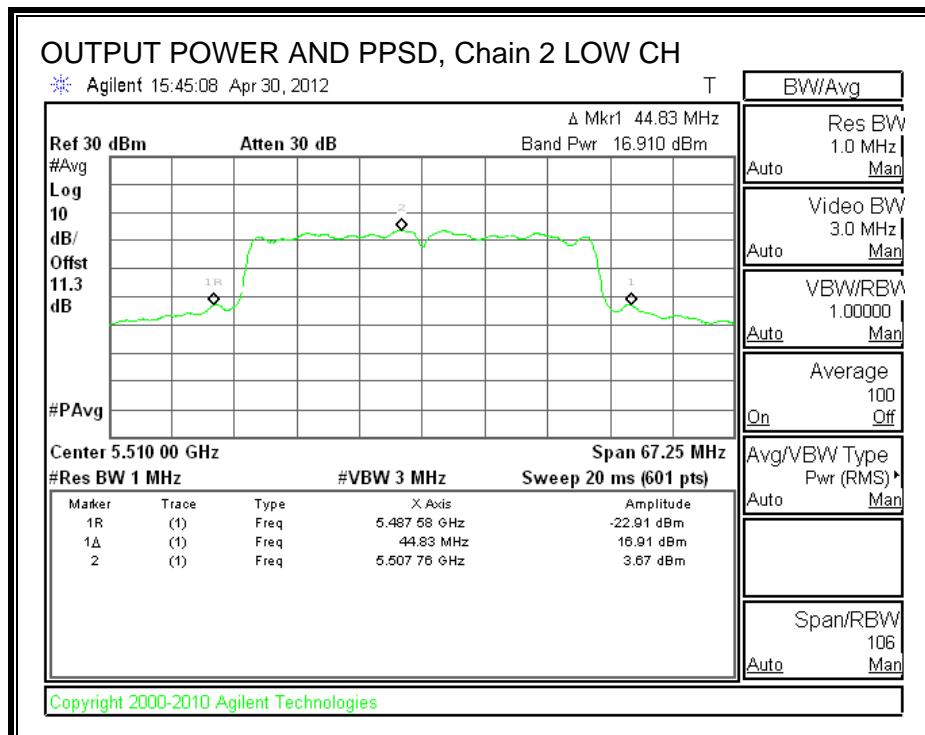
Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Chain 3 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	3.03	3.67	2.83	7.96	8.89	-0.93
Mid	5550	1.19	1.81	1.08	6.14	8.89	-2.75
High	5670	1.15	1.48	1.73	6.23	8.89	-2.66

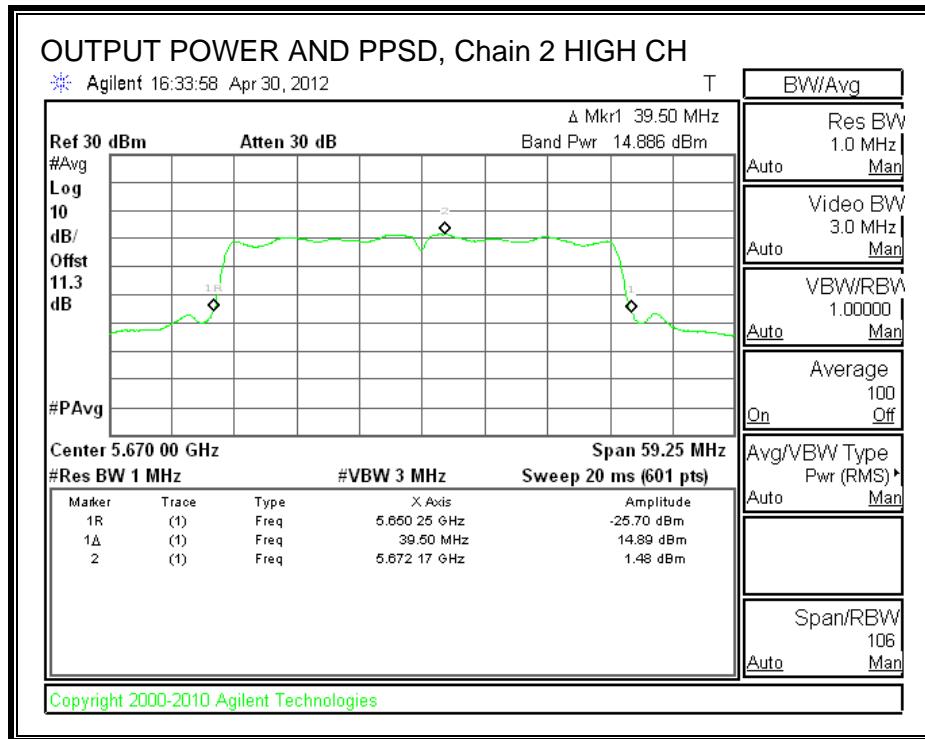
OUTPUT POWER AND PPSD, Chain 1



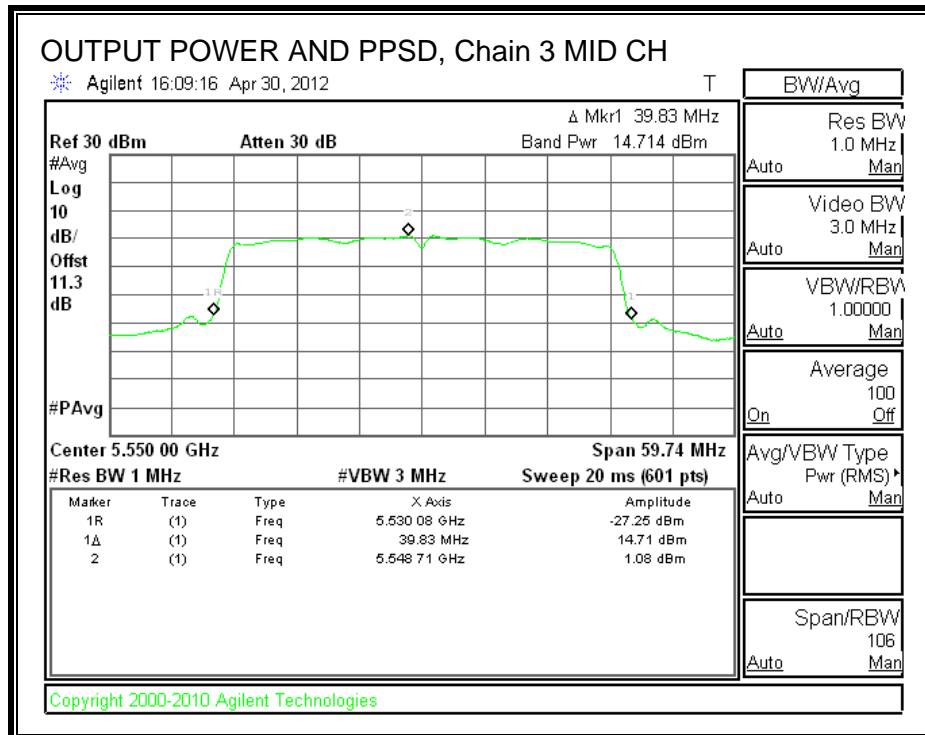
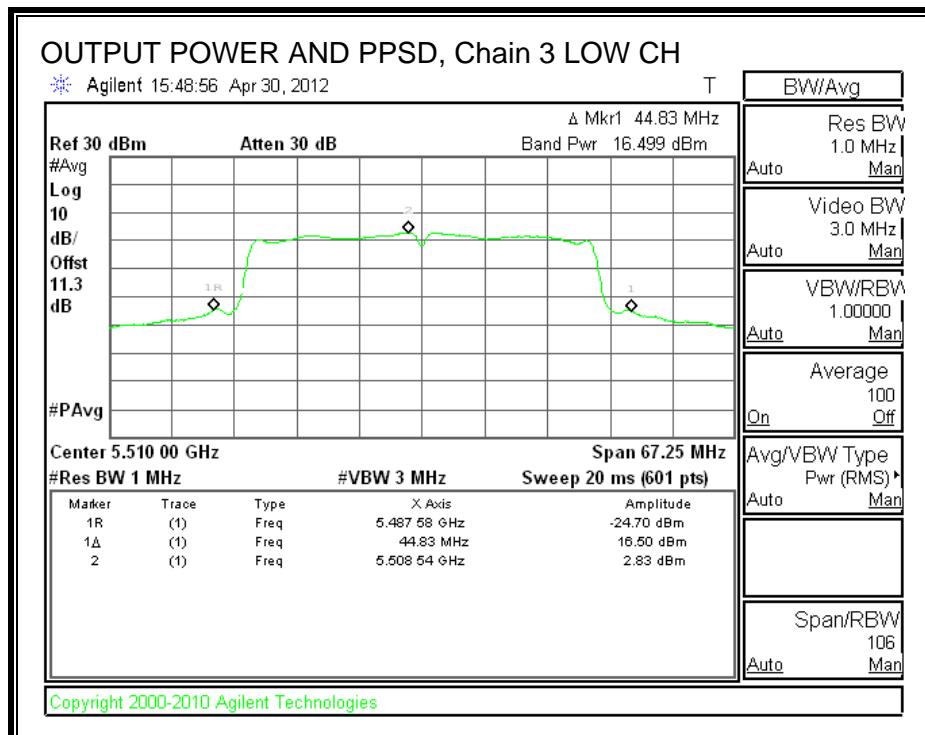


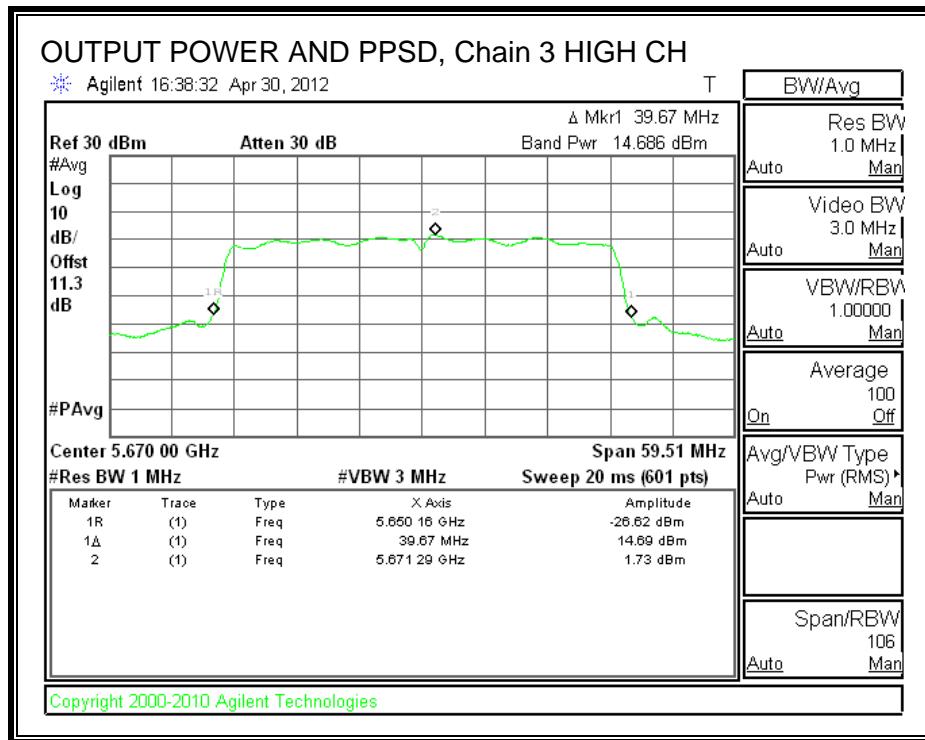
OUTPUT POWER AND PPSD, Chain 2





OUTPUT POWER AND PPSD, Chain 3





8.16.4. PEAK EXCURSION

LIMITS

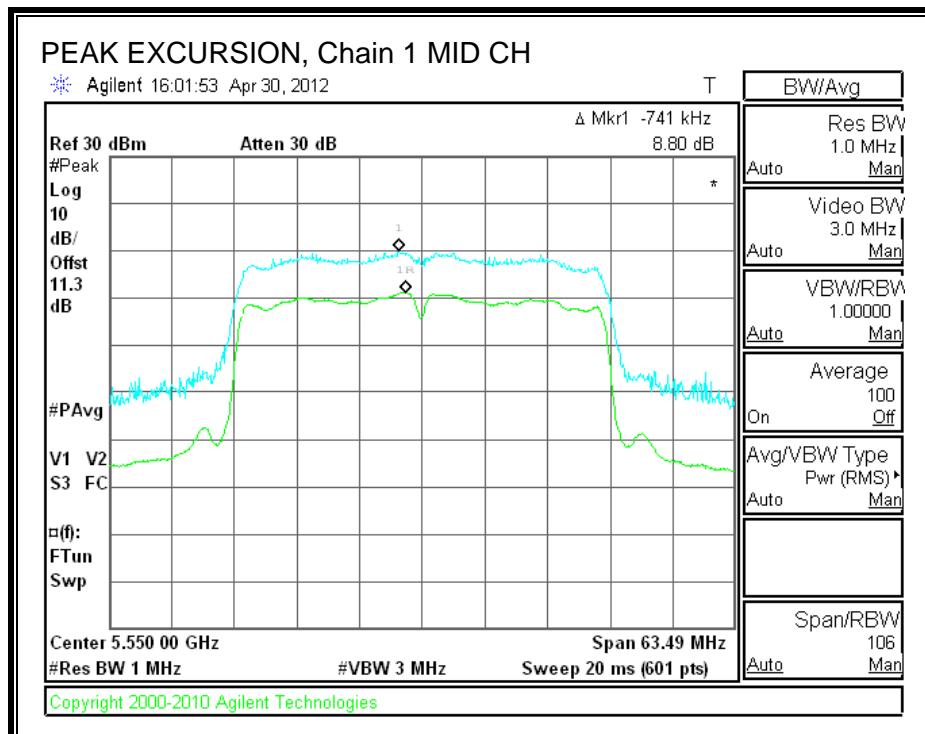
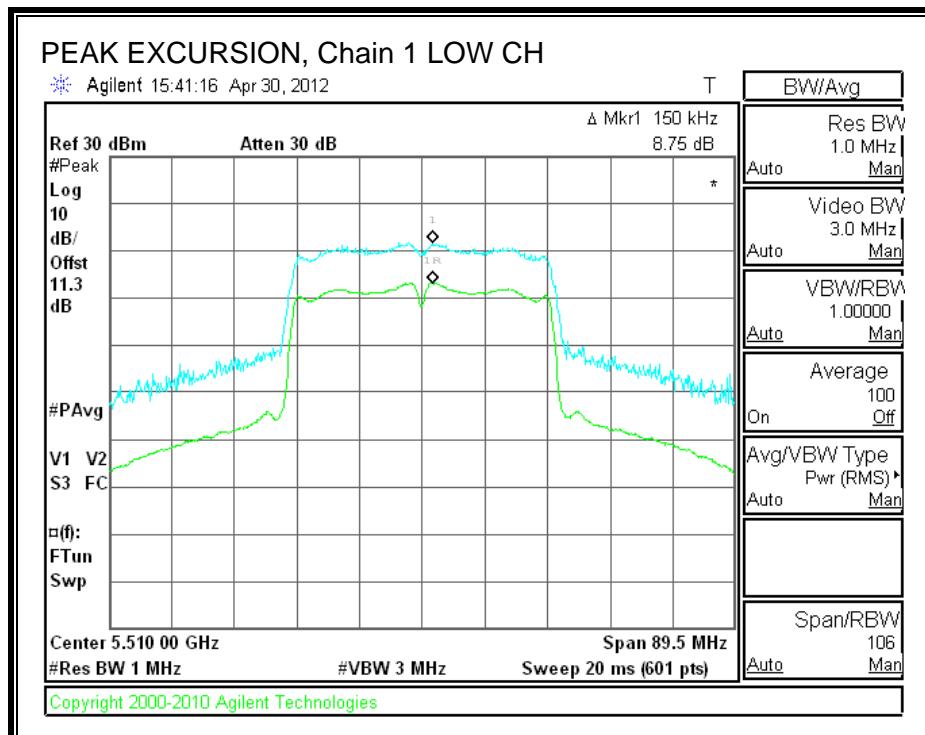
FCC §15.407 (a) (6)

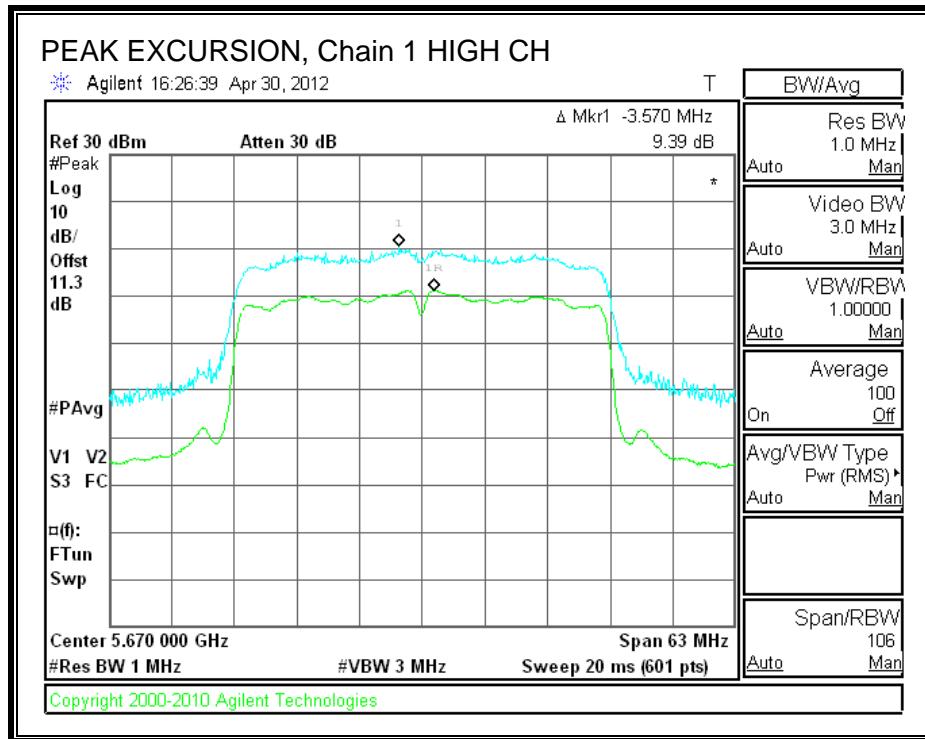
The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

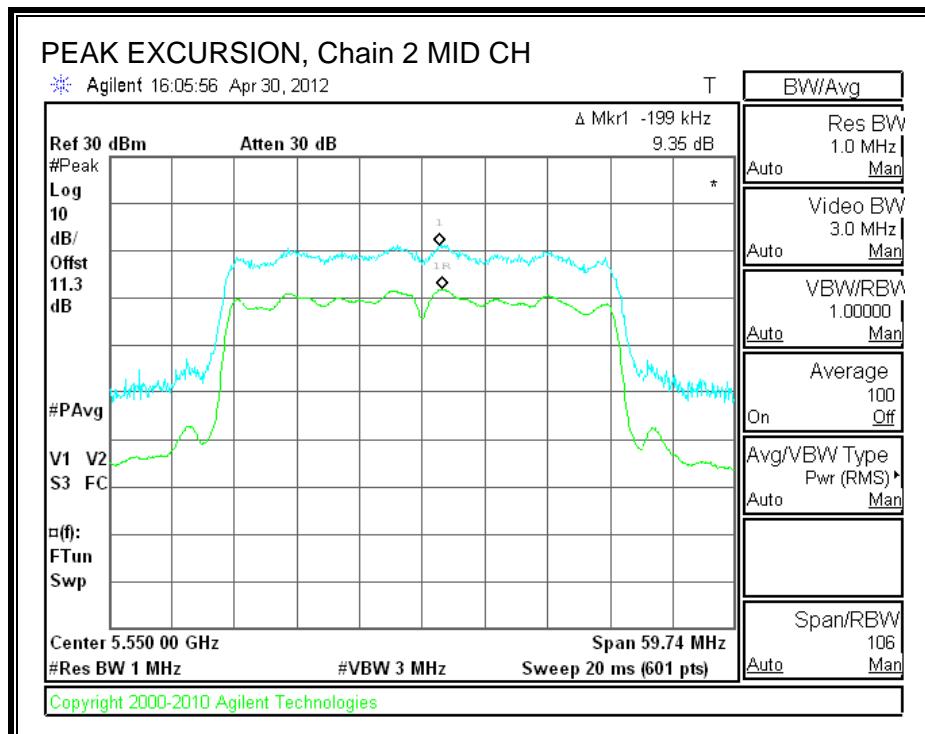
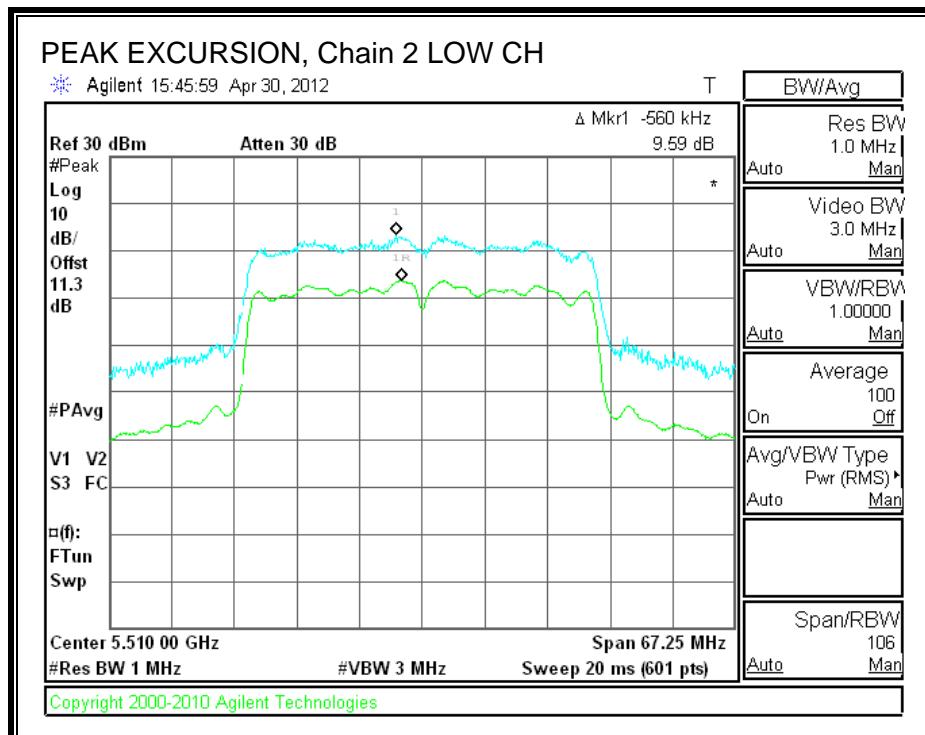
Channel	Frequency (MHz)	Pk Exc Chain 1 (dB)	Pk Exc Chain 2 (dB)	Pk Exc Chain 3 (dB)	Limit (dB)	Worst-Case Margin (dB)
Low	5510	8.75	9.59	10.30	13	-2.70
Mid	5550	8.80	9.35	10.18	13	-2.82
High	5670	9.39	9.66	9.28	13	-3.34

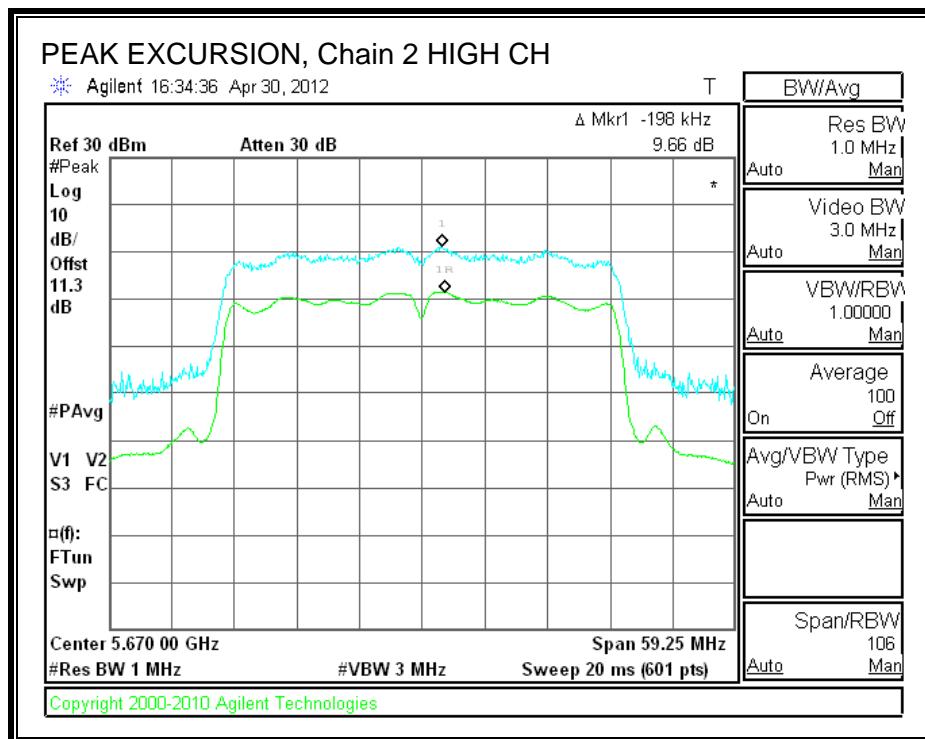
PEAK EXCURSION, Chain 1



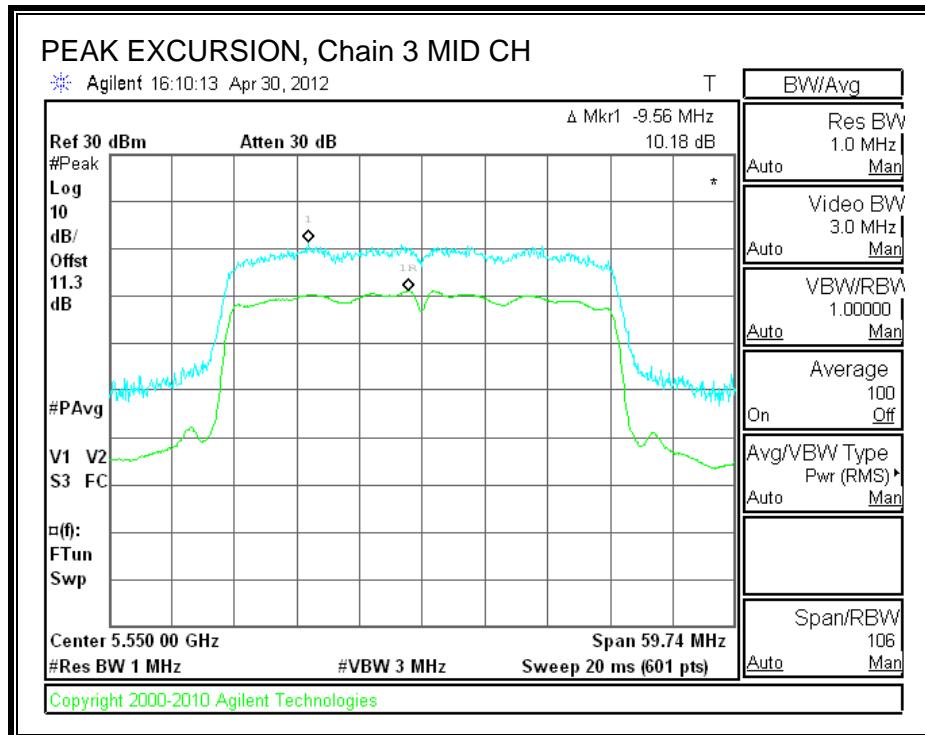
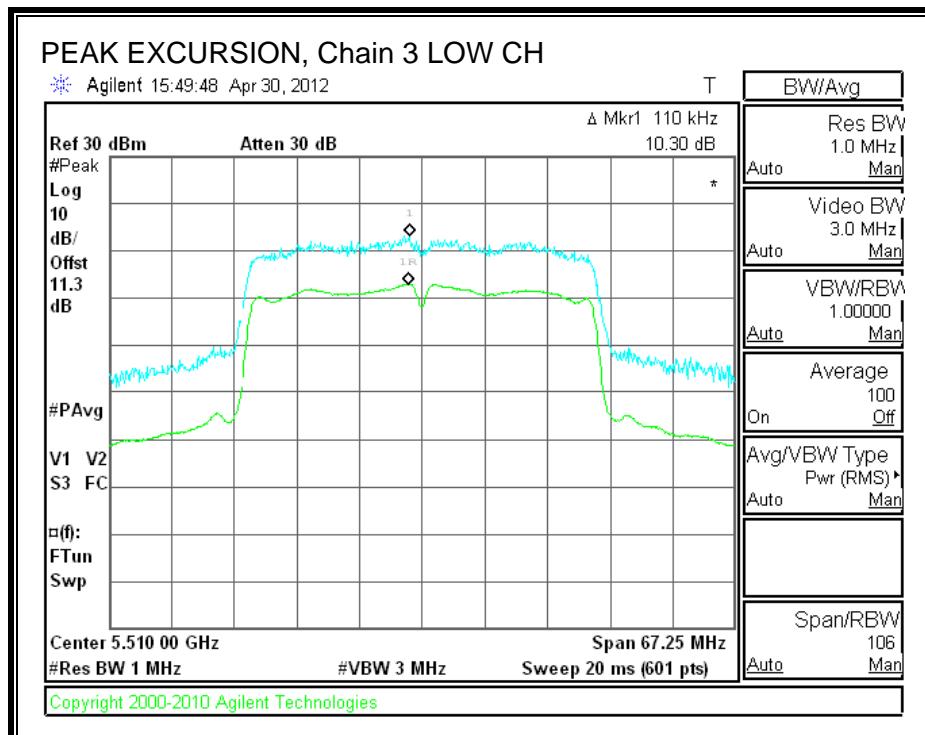


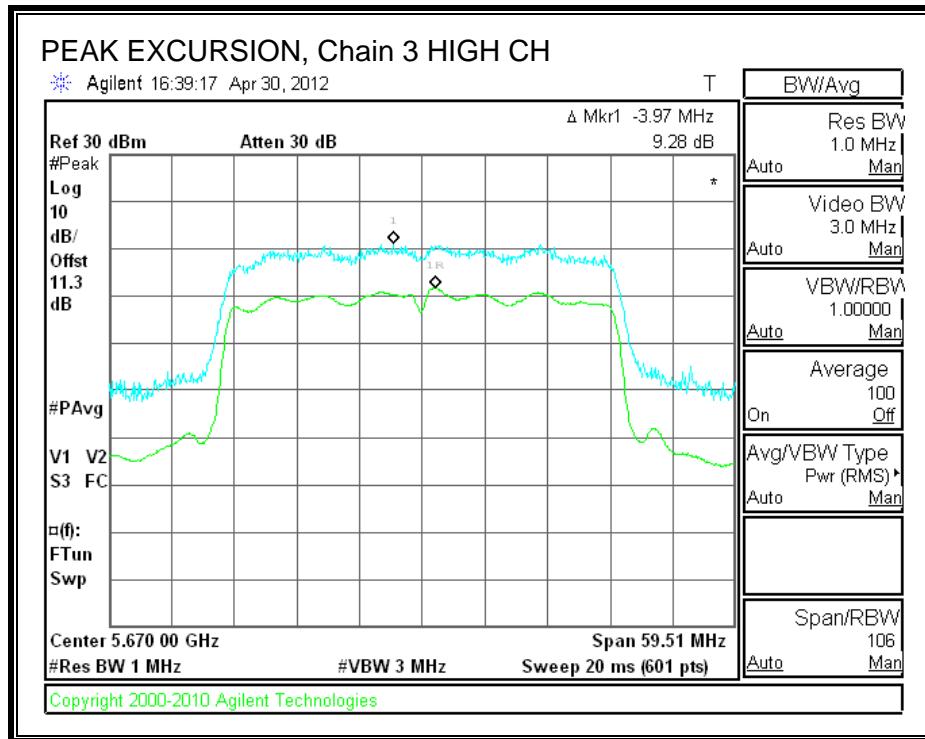
PEAK EXCURSION, Chain 2





PEAK EXCURSION, Chain 3





8.17. 802.11n HT40, SDM MCS21, 3TX, 5.6 GHz BAND

8.17.1. 26 dB BANDWIDTH

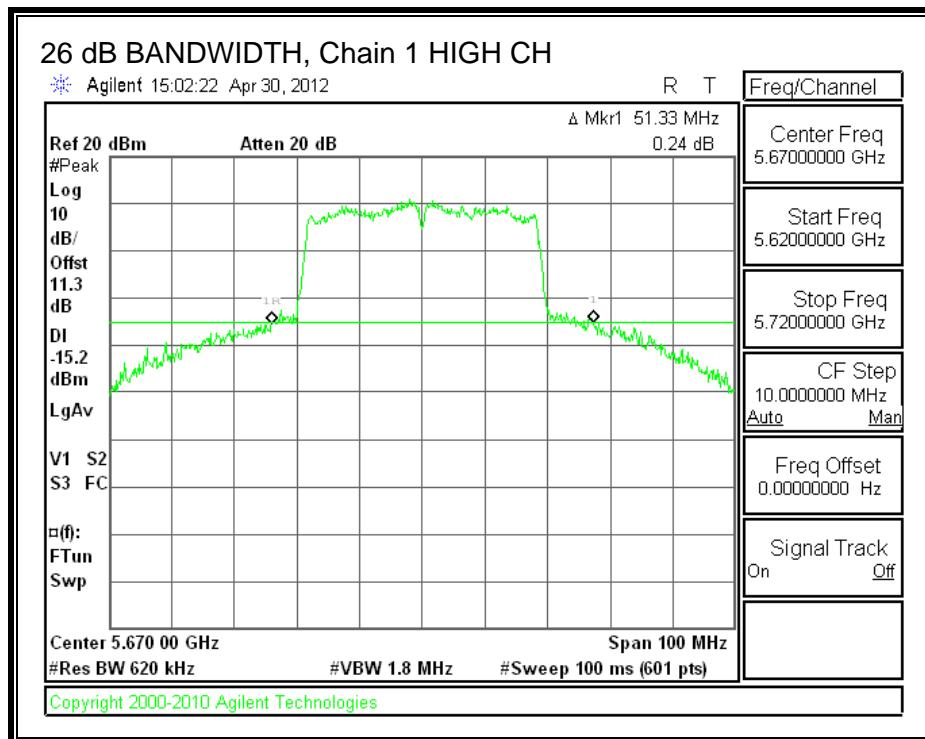
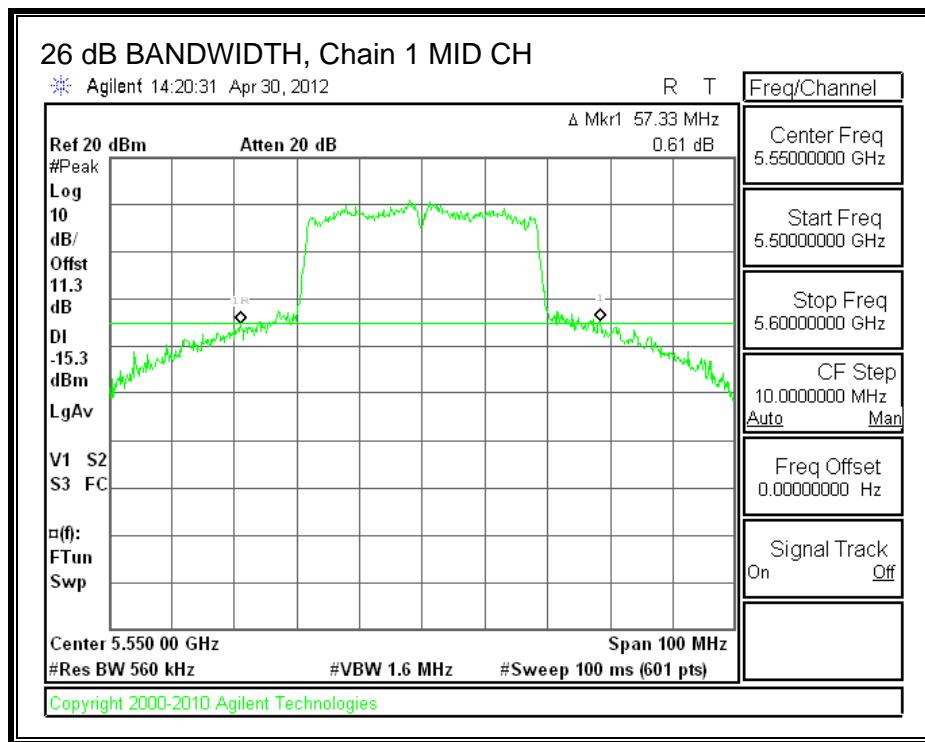
LIMITS

None; for reporting purposes only.

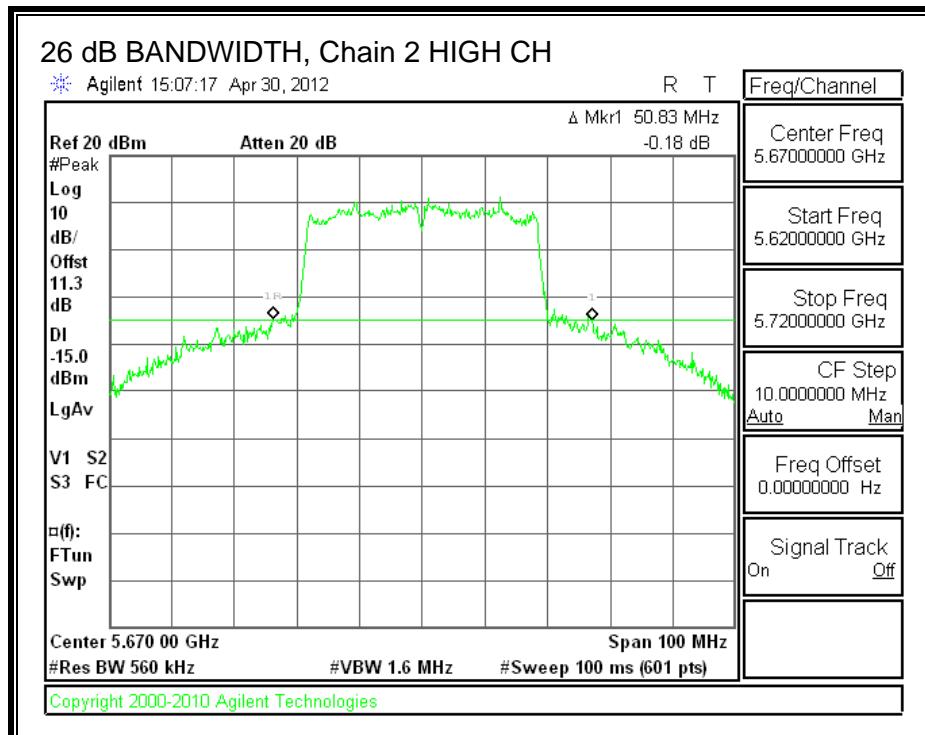
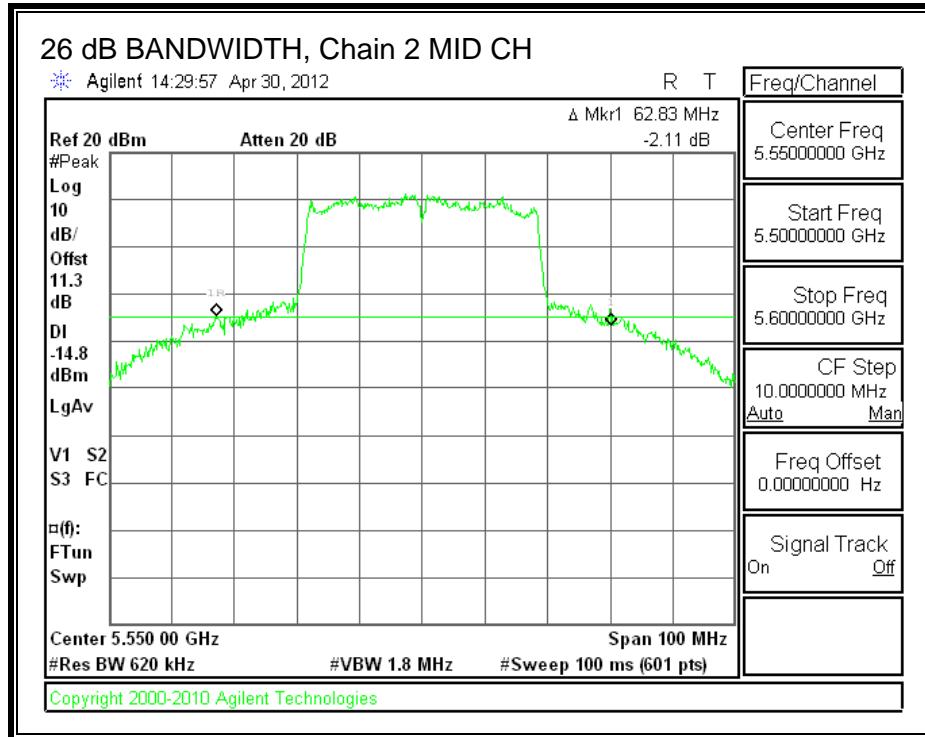
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 1 (MHz)	26 dB BW Chain 2 (MHz)	26 dB BW Chain 3 (MHz)
Mid	5550	57.33	62.83	57.33
High	5670	51.33	50.83	49.83

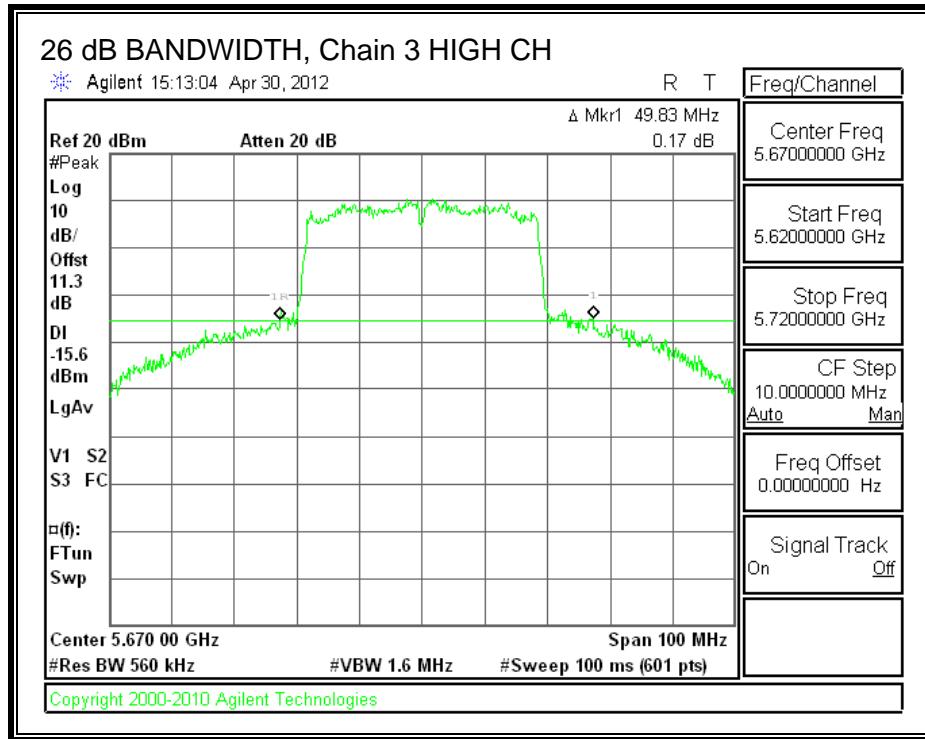
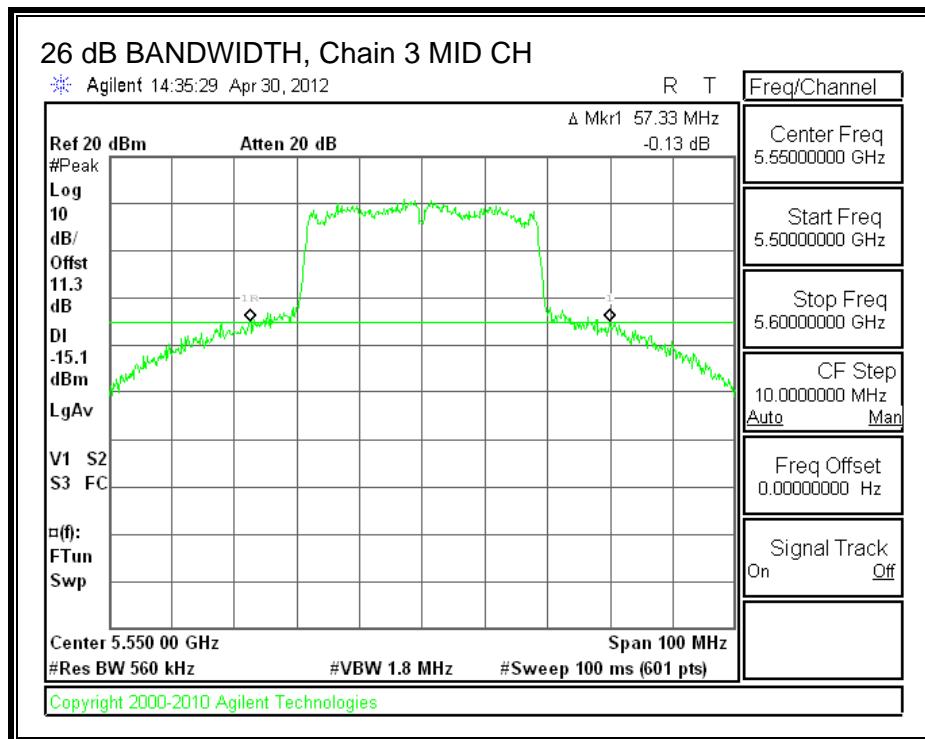
26 dB BANDWIDTH, Chain 1



26 dB BANDWIDTH, Chain 2



26 dB BANDWIDTH, Chain 3



8.17.2. 99% BANDWIDTH

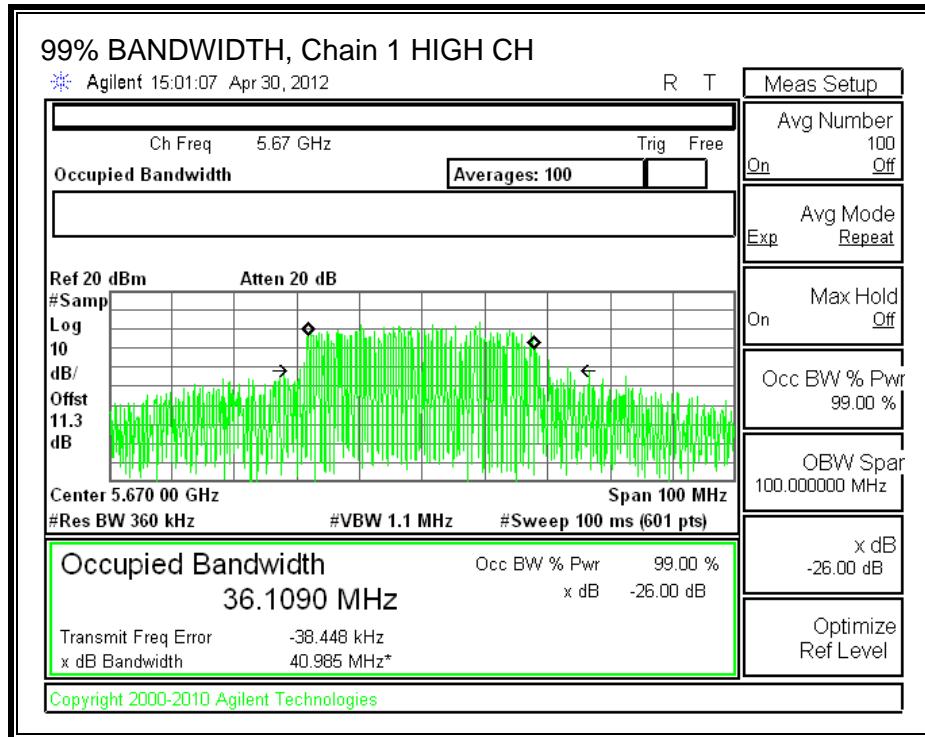
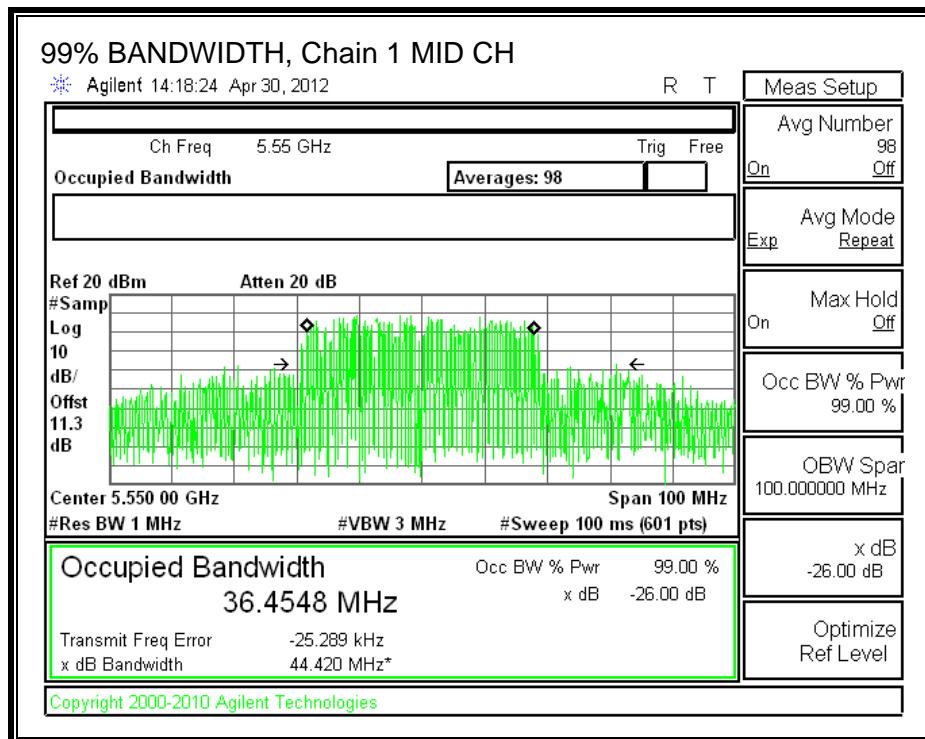
LIMITS

None; for reporting purposes only.

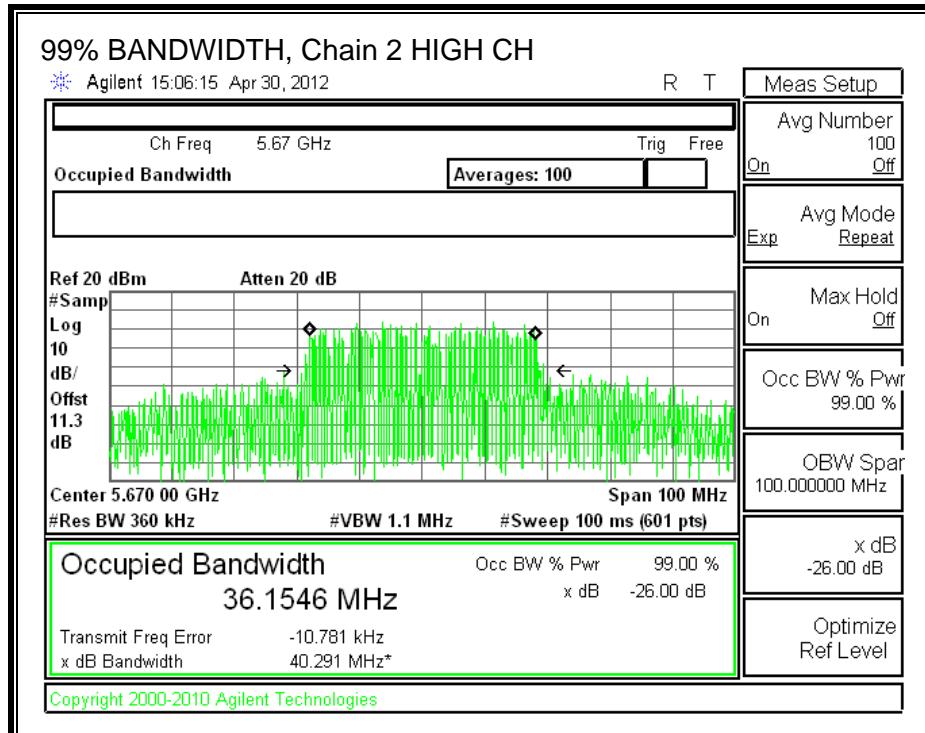
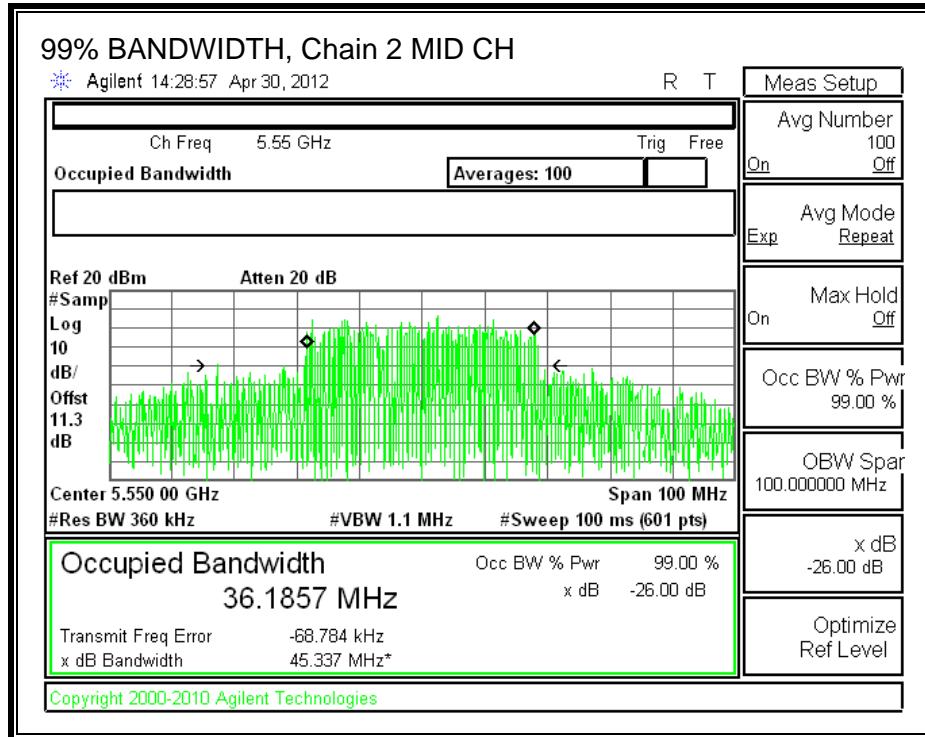
RESULTS

Channel	Frequency (MHz)	99% BW Chain 1 (MHz)	99% BW Chain 2 (MHz)	99% BW Chain 3 (MHz)
Mid	5550	36.4548	36.1857	36.1004
High	5670	36.1090	36.1546	35.9987

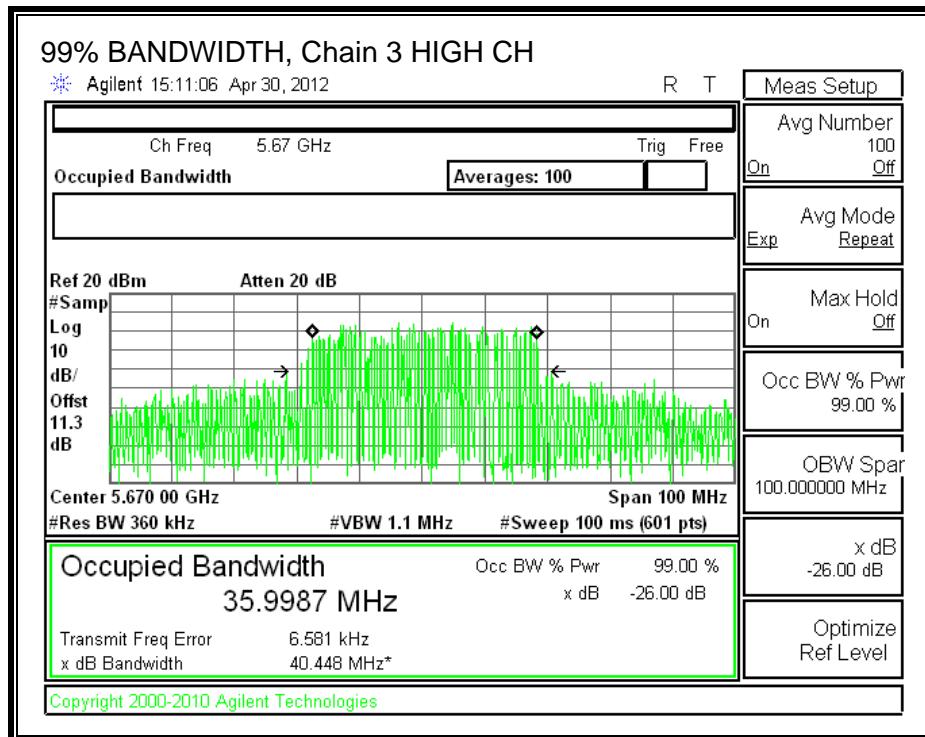
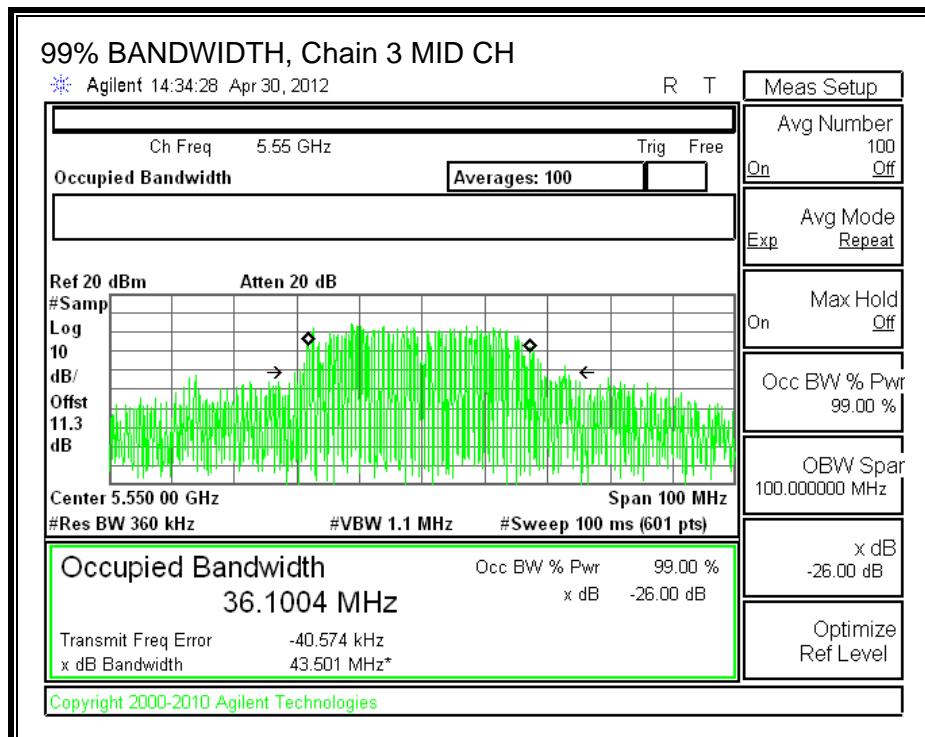
99% BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 2



99% BANDWIDTH, Chain 3



8.17.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

IC RSS-210 A9.2 (3)

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak 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 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

The TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is equal to the antenna gain.

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
5.53	2.68	1.26	3.53

RESULTS

Limits

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Directional Gain (dBi)	Power Limit (dBm)	PPSD Limit (dBm)
Mid	5550	24	57.33	28.58	3.53	24.00	11.00
High	5670	24	49.83	27.97	3.53	24.00	11.00

Duty Cycle CF (dB)	2.50	Included in Calculations of Corr'd Power & PPSD
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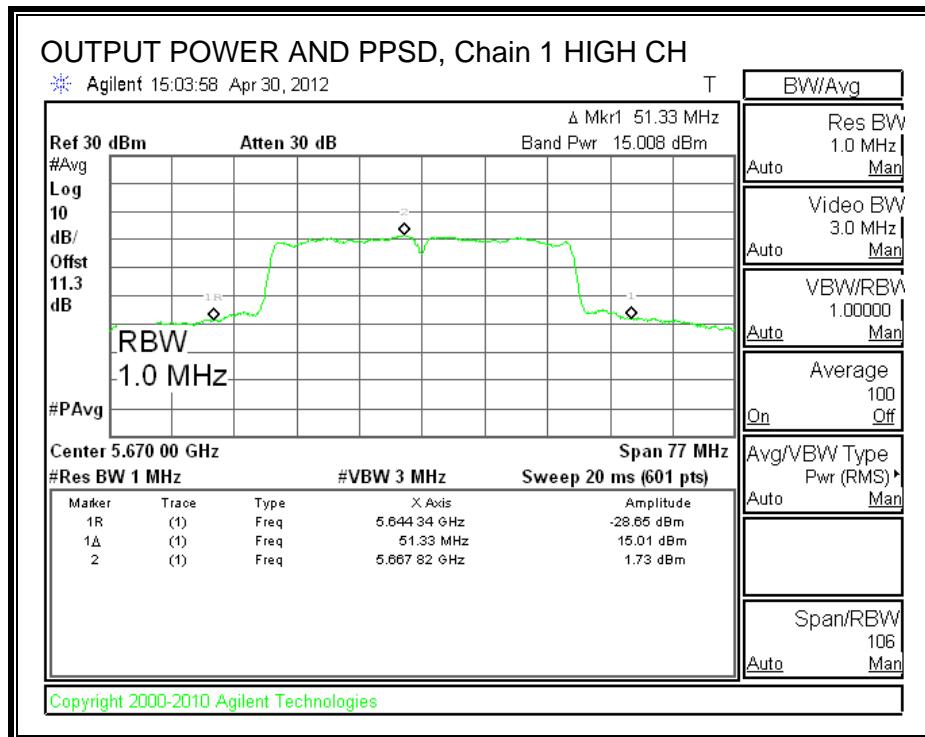
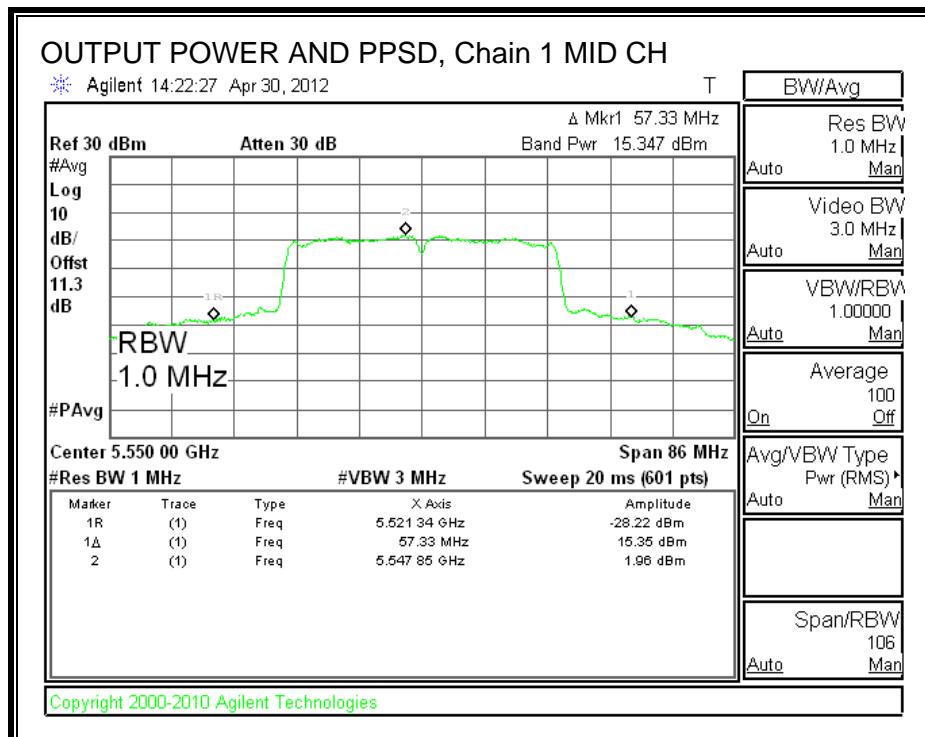
Output Power Results

Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Chain 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5550	15.347	15.599	15.456	22.740	24.00	-1.260
High	5670	15.008	15.002	14.969	22.264	24.00	-1.736

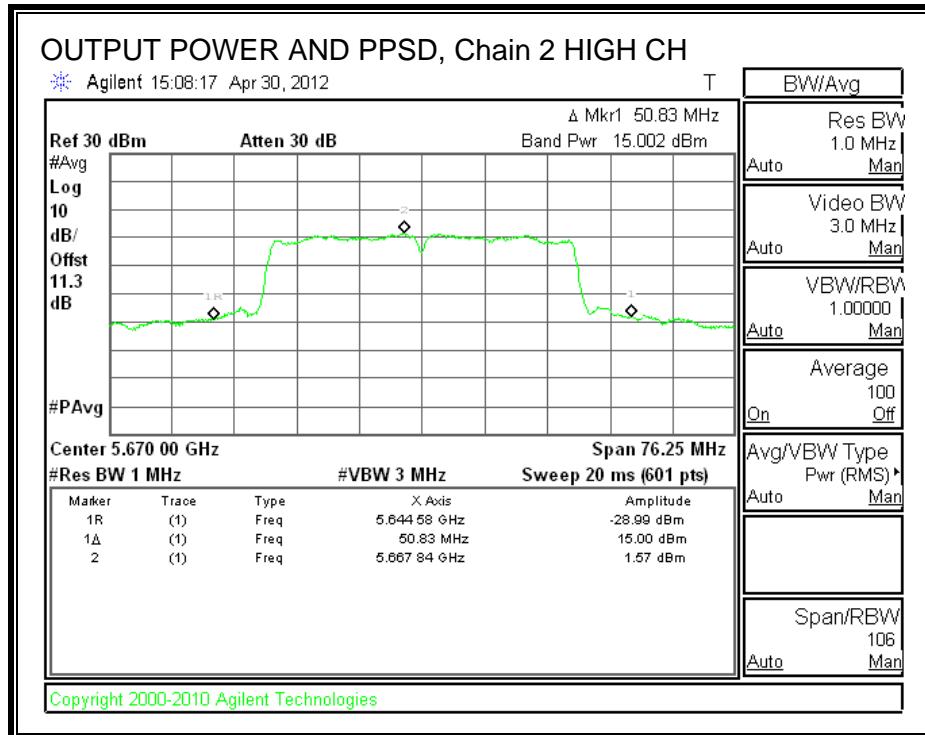
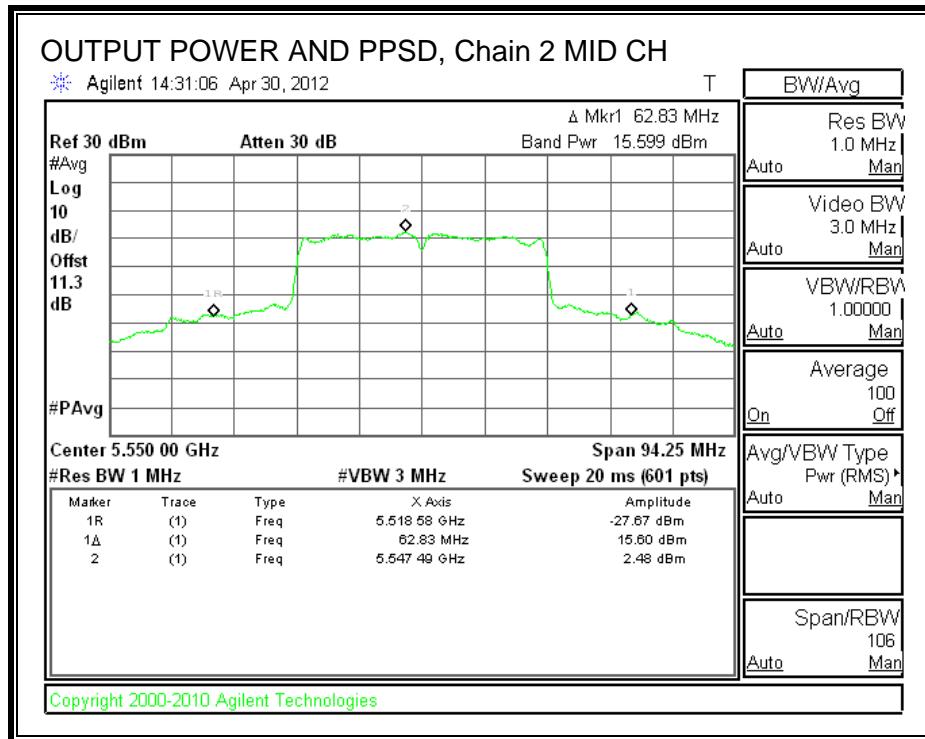
PPSD Results

Channel	Frequency (MHz)	Chain 1 Meas PPSD (dBm)	Chain 2 Meas PPSD (dBm)	Chain 3 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Mid	5550	1.96	2.48	2.06	9.44	11.00	-1.56
High	5670	1.73	1.57	1.13	8.76	11.00	-2.24

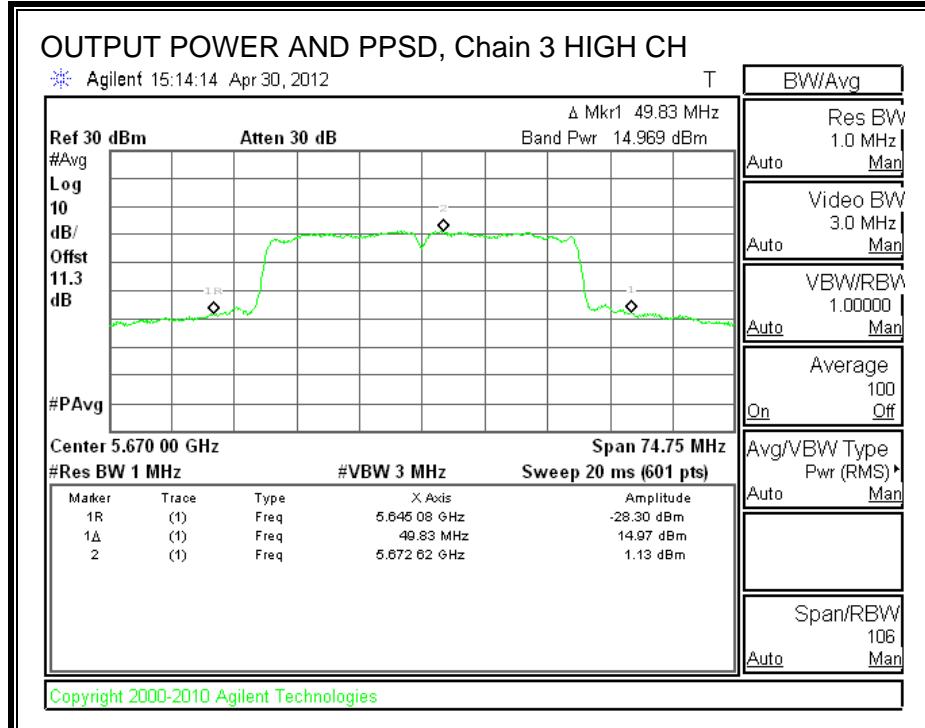
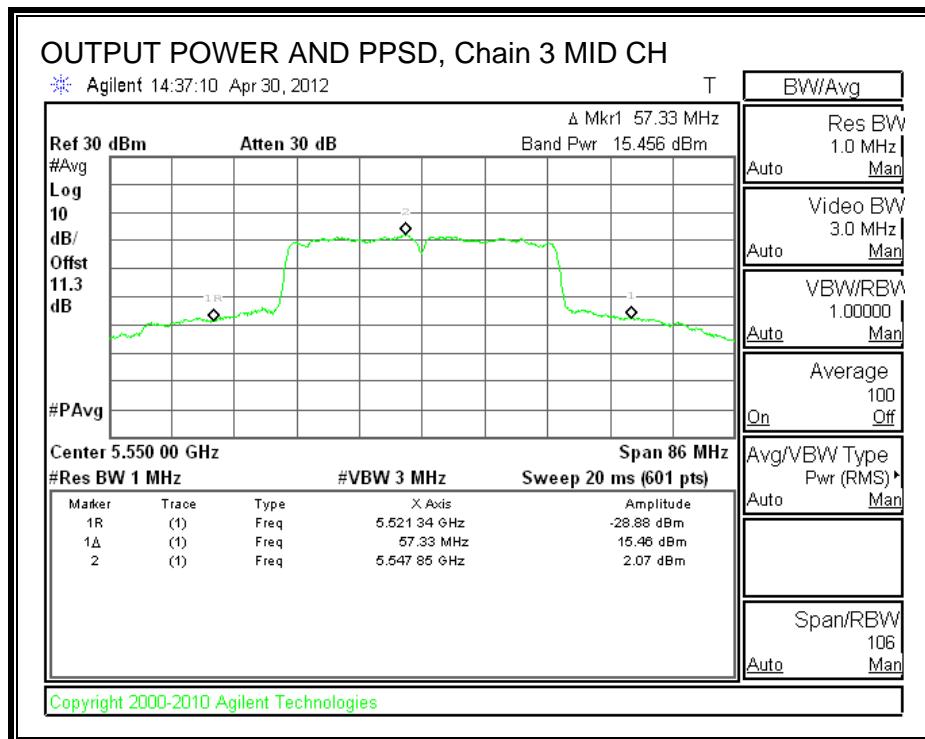
OUTPUT POWER AND PPSD, Chain 1



OUTPUT POWER AND PPSD, Chain 2



OUTPUT POWER AND PPSD, Chain 3



8.17.4. PEAK EXCURSION

LIMITS

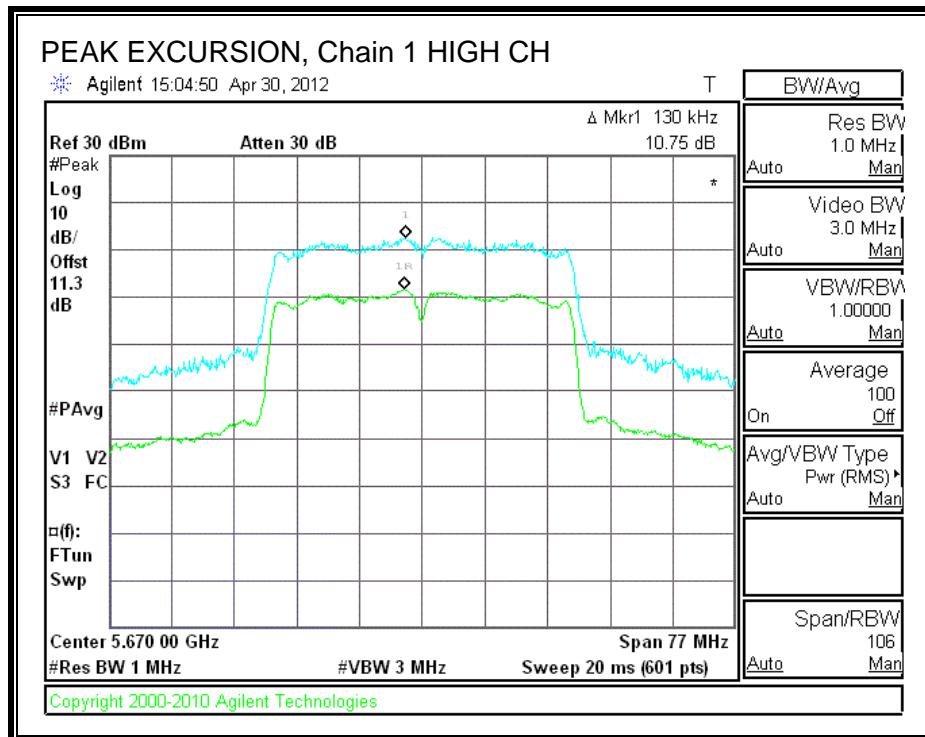
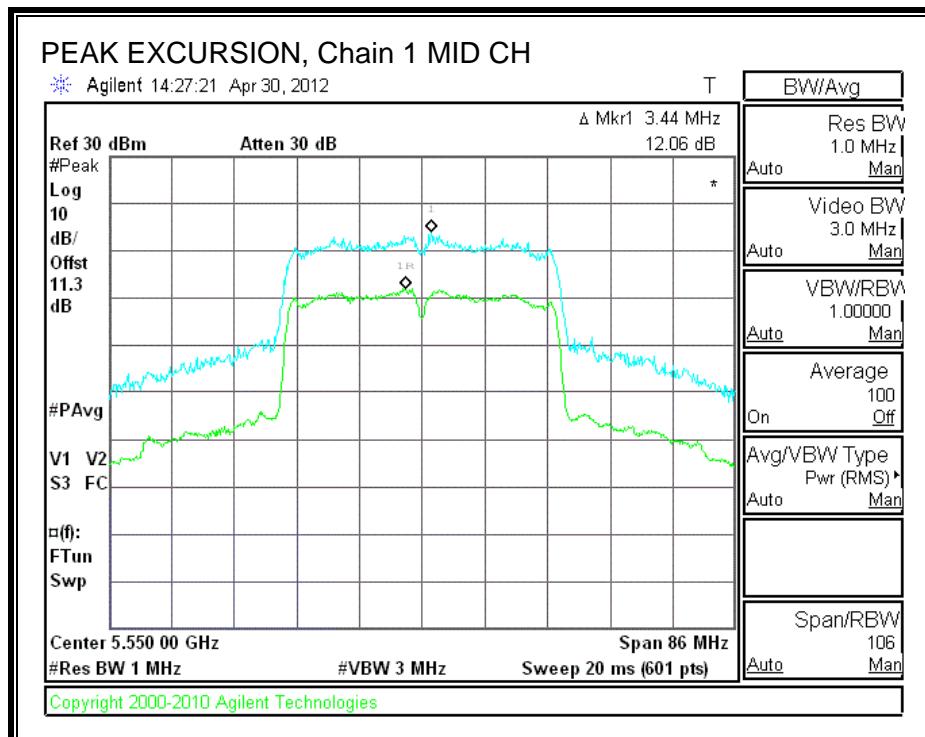
FCC §15.407 (a) (6)

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.

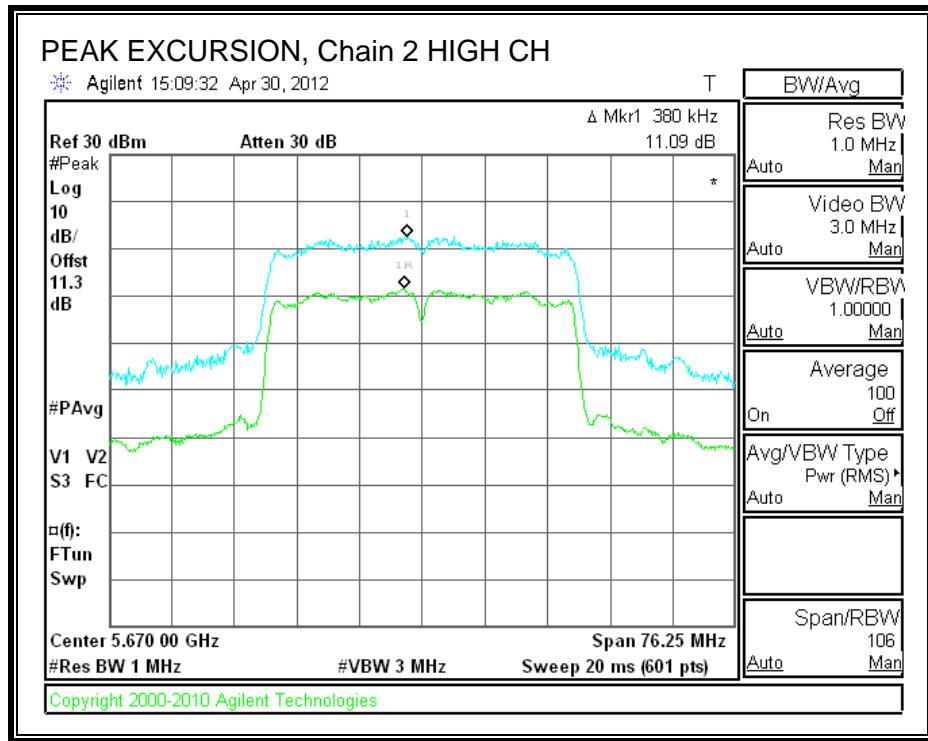
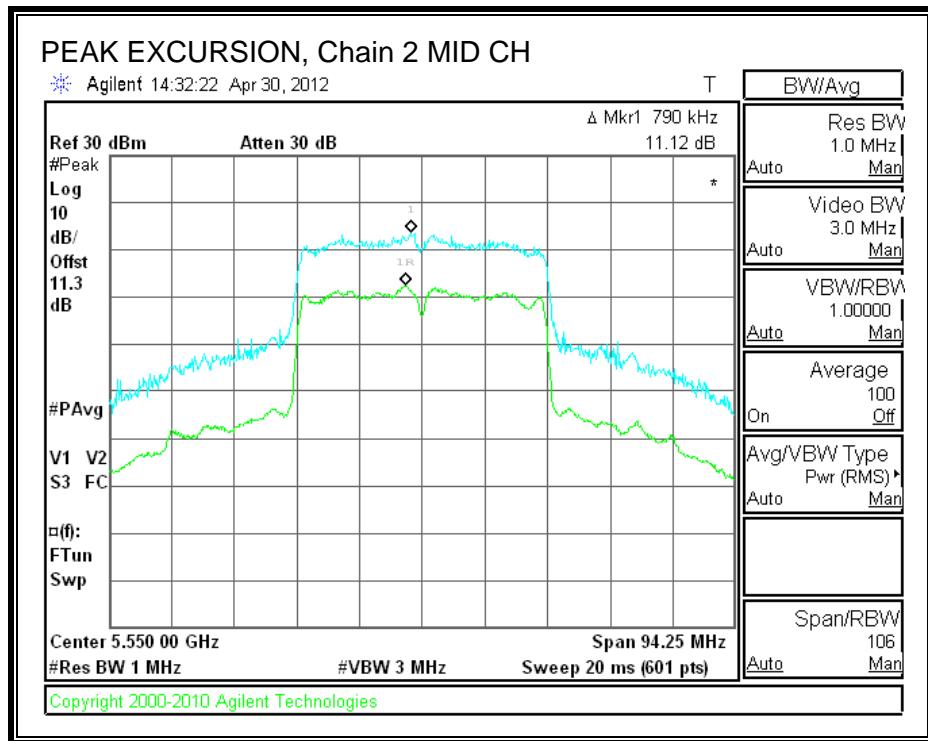
RESULTS

Channel	Frequency (MHz)	Pk Exc Chain 1 (dB)	Pk Exc Chain 2 (dB)	Pk Exc Chain 3 (dB)	Limit (dB)	Worst-Case Margin (dB)
Mid	5550	12.06	11.12	11.51	13	-0.94
High	5670	10.75	11.09	11.73	13	-1.27

PEAK EXCURSION, Chain 1



PEAK EXCURSION, Chain 2



PEAK EXCURSION, Chain 3

