



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

CERTIFICATION TEST REPORT

FOR

DUAL-BAND 802.11a/b/g/n ACCESS POINT

MODEL NUMBER: ZONEFLEX 7351

FCC ID: S9GZF7351

IC: 5912A-ZF7351

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Prepared for

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TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	6
2. TEST METHODOLOGY	7
3. FACILITIES AND ACCREDITATION	7
4. CALIBRATION AND UNCERTAINTY	7
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	<i>7</i>
4.2. <i>SAMPLE CALCULATION</i>	<i>7</i>
4.3. <i>MEASUREMENT UNCERTAINTY.....</i>	<i>7</i>
5. EQUIPMENT UNDER TEST	8
5.1. <i>DESCRIPTION OF EUT</i>	<i>8</i>
5.2. <i>MAXIMUM OUTPUT POWER.....</i>	<i>8</i>
5.3. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i>	<i>8</i>
5.4. <i>SOFTWARE AND FIRMWARE.....</i>	<i>8</i>
5.5. <i>WORST-CASE CONFIGURATION AND MODE.....</i>	<i>9</i>
5.6. <i>DESCRIPTION OF TEST SETUP.....</i>	<i>10</i>
6. TEST AND MEASUREMENT EQUIPMENT	12
7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS	13
7.1. <i>ON TIME AND DUTY CYCLE RESULTS.....</i>	<i>13</i>
7.2. <i>MEASUREMENT METHOD FOR POWER AND PPSD.....</i>	<i>13</i>
7.3. <i>MEASUREMENT METHOD FOR AVG SPURIOUS EMISSIONS ABOVE 1 GHz.....</i>	<i>13</i>
7.4. <i>DUTY CYCLE PLOTS</i>	<i>14</i>
8. ANTENNA PORT TEST RESULTS	17
8.1. <i>802.11a MODE IN THE 5.3 GHz BAND.....</i>	<i>17</i>
8.1.1. <i>26 dB and 99% BANDWIDTH.....</i>	<i>17</i>
8.1.2. <i>OUTPUT POWER AND PPSD</i>	<i>25</i>
8.1.3. <i>AVERAGE POWER.....</i>	<i>30</i>
8.1.4. <i>PEAK EXCURSION.....</i>	<i>31</i>
8.2. <i>802.11n HT20, CDD MODE IN THE 5.3 GHz BAND.....</i>	<i>36</i>
8.2.1. <i>26 dB and 99% BANDWIDTH.....</i>	<i>36</i>
8.2.2. <i>OUTPUT POWER AND PPSD</i>	<i>45</i>
8.2.3. <i>AVERAGE POWER.....</i>	<i>50</i>
8.2.4. <i>PEAK EXCURSION.....</i>	<i>51</i>
8.3. <i>802.11n HT20, SDM MODE IN THE 5.3 GHz BAND</i>	<i>56</i>
8.3.1. <i>26 dB and 99% BANDWIDTH.....</i>	<i>56</i>
8.3.2. <i>OUTPUT POWER AND PPSD</i>	<i>65</i>
8.3.3. <i>AVERAGE POWER.....</i>	<i>70</i>
8.3.4. <i>PEAK EXCURSION.....</i>	<i>71</i>

- 8.4. 802.11n HT40, CDD MODE IN THE 5.3 GHz BAND..... 76
 - 8.4.1. 26 dB and 99% BANDWIDTH..... 76
 - 8.4.2. OUTPUT POWER AND PPSD 81
 - 8.4.3. AVERAGE POWER..... 85
 - 8.4.4. PEAK EXCURSION..... 86
- 8.5. 802.11n HT40, SDM MODE IN THE 5.3 GHz BAND 89
 - 8.5.1. 26 dB AND 99% BANDWIDTH 89
 - 8.5.2. OUTPUT POWER AND PPSD 94
 - 8.5.3. AVERAGE POWER..... 98
 - 8.5.4. PEAK EXCURSION..... 99
- 8.6. 802.11a MODE IN THE 5.6 GHz BAND..... 102
 - 8.6.1. 26 dB and 99% BANDWIDTH..... 102
 - 8.6.2. OUTPUT POWER AND PPSD 110
 - 8.6.3. AVERAGE POWER..... 115
 - 8.6.4. PEAK EXCURSION..... 116
- 8.7. 802.11n HT20, CDD MODE IN THE 5.6 GHz BAND..... 121
 - 8.7.1. 26 dB and 99% BANDWIDTH..... 121
 - 8.7.2. OUTPUT POWER AND PPSD 129
 - 8.7.3. AVERAGE POWER..... 134
 - 8.7.4. PEAK EXCURSION..... 135
- 8.8. 802.11n HT20, SDM MODE IN THE 5.6 GHz BAND 140
 - 8.8.1. 26 dB and 99% BANDWIDTH..... 140
 - 8.8.2. OUTPUT POWER AND PPSD 148
 - 8.8.3. AVERAGE POWER..... 153
 - 8.8.4. PEAK EXCURSION..... 154
- 8.9. 802.11n HT40, CDD MODE IN THE 5.6 GHz BAND..... 159
 - 8.9.1. 26 dB and 99% BANDWIDTH..... 159
 - 8.9.2. OUTPUT POWER AND PPSD 166
 - 8.9.3. AVERAGE POWER..... 171
 - 8.9.4. PEAK EXCURSION..... 172
- 8.10. 802.11n HT40, SDM MODE IN THE 5.6 GHz BAND..... 176
 - 8.10.1. 26 dB and 99% BANDWIDTH..... 176
 - 8.10.2. OUTPUT POWER AND PPSD 183
 - 8.10.3. AVERAGE POWER..... 188
 - 8.10.4. PEAK EXCURSION..... 189
- 9. RADIATED TEST RESULTS..... 193**
 - 9.1. LIMITS AND PROCEDURE..... 193
 - 9.1.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND 194
 - 9.1.2. TX ABOVE 1 GHz 802.11n HT20 CDD MODE IN THE 5.3 GHz BAND 197
 - 9.1.3. TX ABOVE 1 GHz 802.11n HT20 SDM MODE IN THE 5.3 GHz BAND..... 200
 - 9.1.4. TX ABOVE 1 GHz 802.11n HT40 CDD MODE IN THE 5.3 GHz BAND 203
 - 9.1.5. TX ABOVE 1 GHz 802.11n HT40 SDM MODE IN THE 5.3 GHz BAND..... 206
 - 9.1.6. TX ABOVE 1 GHz FOR 802.11a MODE IN THE LOWER 5.6 GHz BAND 209
 - 9.1.7. TX ABOVE 1 GHz FOR 802.11n HT20 CDD MODE 5.6 GHz BAND 213
 - 9.1.8. TX ABOVE 1 GHz FOR 802.11n HT20 SDM MODE IN THE 5.6 GHz BAND 217
 - 9.1.9. TX ABOVE 1 GHz FOR 802.11n HT40 CDD MODE IN THE 5.6 221
 - 9.1.10. TX ABOVE 1 GHz FOR 802.11n HT40 SDM MODE IN THE 5.6 225

9.2. *WORST-CASE BELOW 1 GHz*.....229

10. AC POWER LINE CONDUCTED EMISSIONS232

11. DYNAMIC FREQUENCY SELECTION236

11.1. *OVERVIEW*.....236

11.1.1. *LIMITS*.....236

11.2. *TEST AND MEASUREMENT SYSTEM*239

11.3. *SETUP OF EUT*242

11.4. *DESCRIPTION OF EUT*.....243

11.5. *RESULTS FOR 20 MHz BANDWIDTH*.....244

11.5.1. *TEST CHANNEL*244

11.5.2. *RADAR WAVEFORMS AND TRAFFIC*.....244

11.5.3. *CHANNEL AVAILABILITY CHECK TIME*.....251

11.5.4. *OVERLAPPING CHANNEL TESTS*.....256

11.5.5. *MOVE AND CLOSING TIME*256

11.5.6. *DETECTION BANDWIDTH*.....262

11.5.7. *IN-SERVICE MONITORING*264

11.6. *RESULTS FOR 40 MHz BANDWIDTH*.....271

11.6.1. *TEST CHANNEL*271

11.6.2. *RADAR WAVEFORMS AND TRAFFIC*.....271

11.6.3. *CHANNEL AVAILABILITY CHECK TIME*.....278

11.6.4. *OVERLAPPING CHANNEL TESTS*.....283

11.6.5. *MOVE AND CLOSING TIME*283

11.7. *NON-OCCUPANCY PERIOD*.....289

11.7.1. *DETECTION BANDWIDTH*.....290

11.7.2. *IN-SERVICE MONITORING*292

12. SETUP PHOTOS299

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: RUCKUS WIRELESS, INC.
350 WEST JAVA DRIVE
SUNNYVALE, CA 94089, USA

EUT DESCRIPTION: DUAL-BAND 802.11a/b/g/n ACCESS POINT

MODEL: ZONEFLEX 7351

SERIAL NUMBER: 301204006396

DATE TESTED: MAY 02-DECEMBER 19, 2012

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

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

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

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2. TEST METHODOLOGY

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

3. FACILITIES AND ACCREDITATION

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11 a/b/g/n access point designed for mounting on a desktop, wall or ceiling. The EUT is powered by an external AC adapter, Ruckus P/N 740-64190-001. The radio module is manufactured by Ruckus Wireless.

5.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5260 - 5320	802.11a	22.421	174.622
5260 - 5320	802.11n HT20, CDD	22.670	184.927
5260 - 5320	802.11n HT20, SDM	22.250	167.880
5270 - 5310	802.11n HT40, CDD	20.510	112.460
5270 - 5310	802.11n HT40, SDM	20.420	110.154
5500 - 5700	802.11a	22.570	180.717
5500 - 5700	802.11n HT20, CDD	22.840	192.309
5500 - 5700	802.11n HT20, SDM	22.460	176.198
5510 - 5670	802.11n HT40, CDD	20.666	116.574
5510 - 5670	802.11n HT40, SDM	20.618	115.292

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes the following antenna:
Proprietary dual-band PCB Omni Antenna; with a maximum peak gain of 1 dBi for 2.4GHz band, and 2 dBi for 5GHz band:

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 9.3.1.5.1

The EUT driver software installed during testing was Microsoft Window Version 6.1.7601.

The test utility software used during testing was ZF7351 GD11 ART Ver. V0_9_b7_ar928xALL\ART\ bin.

5.5. WORST-CASE CONFIGURATION AND MODE

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

The fundamental of the EUT was investigated in three orthogonal orientations X, Y, Z, and X orientation was determined to be the worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

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

802.11b mode: 1 Mbps
802.11g mode: 6 Mbps
802.11a mode: 6 Mbps
802.11n HT20mode: MCS0 for CDD and MCS8 for SDM
802.11n HT40mode: MCS0 for CDD and MCS8 for SDM
.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	LENOVO	IdealPad U310	804927703	PD92200BNHU
AC/DC Adapter	LENOVO	ADP40-NH B	11S36001648ZZ6002495ZB	DoC
EUT AC Adapter	RUCKUS	HK-AD-120A 100-US	1010C	DoC

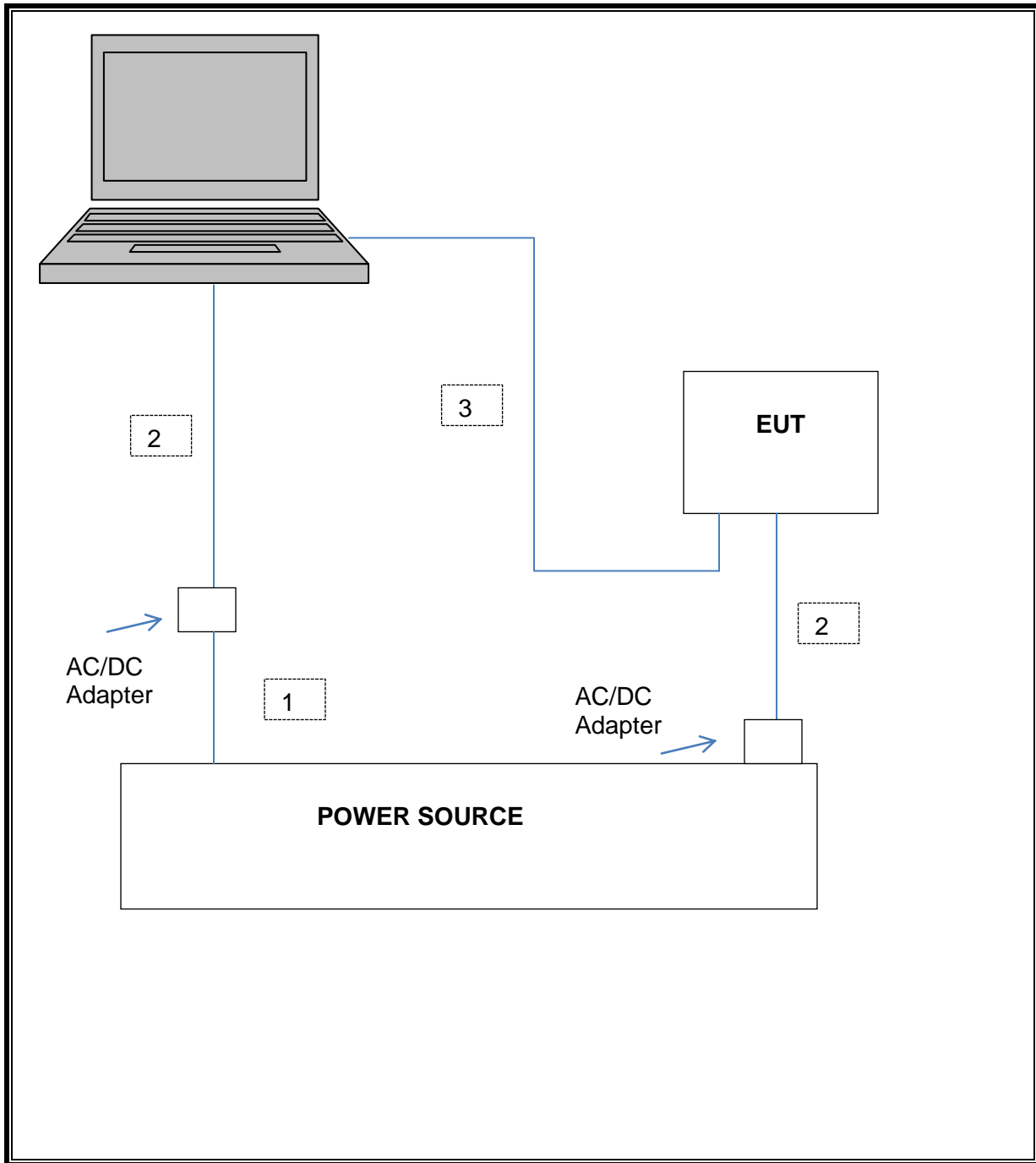
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC/DC	1	US115VAC	Unshielded	1m	N/A
2	DC	2	DC Plug	Unshielded	1.5m	N/A
3	LAN	1	RJ45	Unshielded	2m	N/A

TEST SETUP

The EUT is connected to the 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 Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/15/12
Antenna, Horn, 18 GHz	EMCO	3115	C00872	10/25/13
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	06/13/13
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01171	02/07/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	01/27/13
Peak Power Meter	Agilent / HP	8449B	NA	07/27/13
Peak and Avg Power Sensor	Agilent / HP	E9323A	NA	07/27/13
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	7/2/2013
Reject Filter, 5.15-5.35 GHz	Micro-Tronics	BRC13190	N02679	CNR
Reject Filter, 5.47-5.725 GHz	Micro-Tronics	BRC13191	N02678	CNR
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	CNR
Horn Antenna, 26 GHz	ARA	MVH-1826/B	C00980	08/06/13
Horn Antenna, 40 GHz	ARA	MVH-2640/B	C00981	06/14/13
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/02/13



7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

7.1. 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	3.1330	3.1500	0.995	99.5%	0.00	0.010
802.11n HT20, CDD	2.9080	2.9250	0.994	99.4%	0.00	0.010
802.11n HT20, SDM	2.9670	2.9920	0.992	99.2%	0.00	0.010
802.11n HT40, CDD	1.4040	1.4300	0.982	98.2%	0.00	0.010
802.11n HT40, SDM	0.7362	0.7506	0.981	98.1%	0.00	0.010

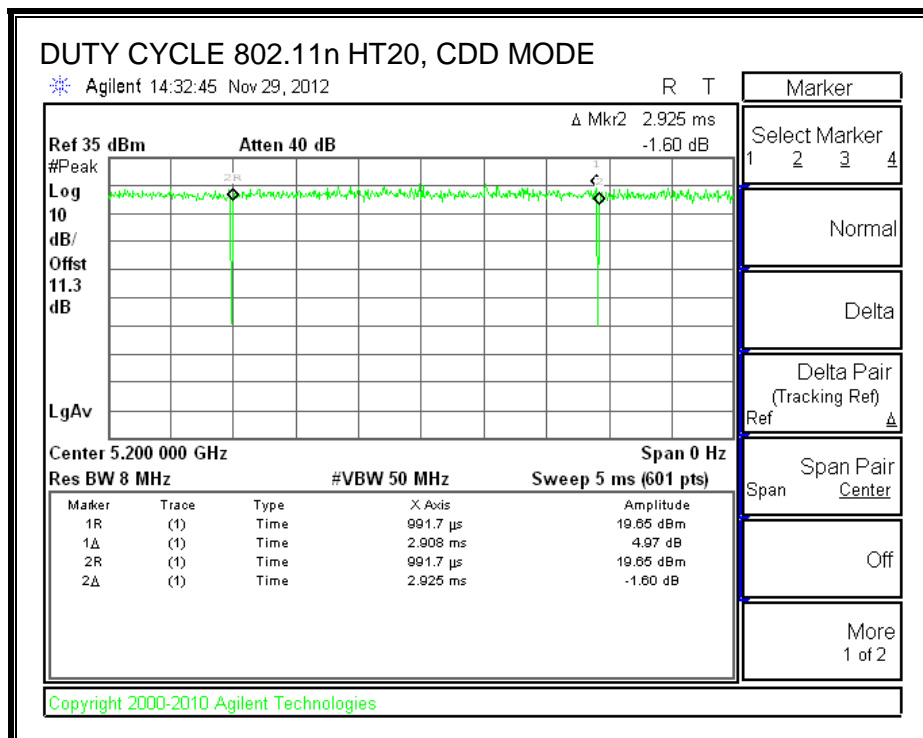
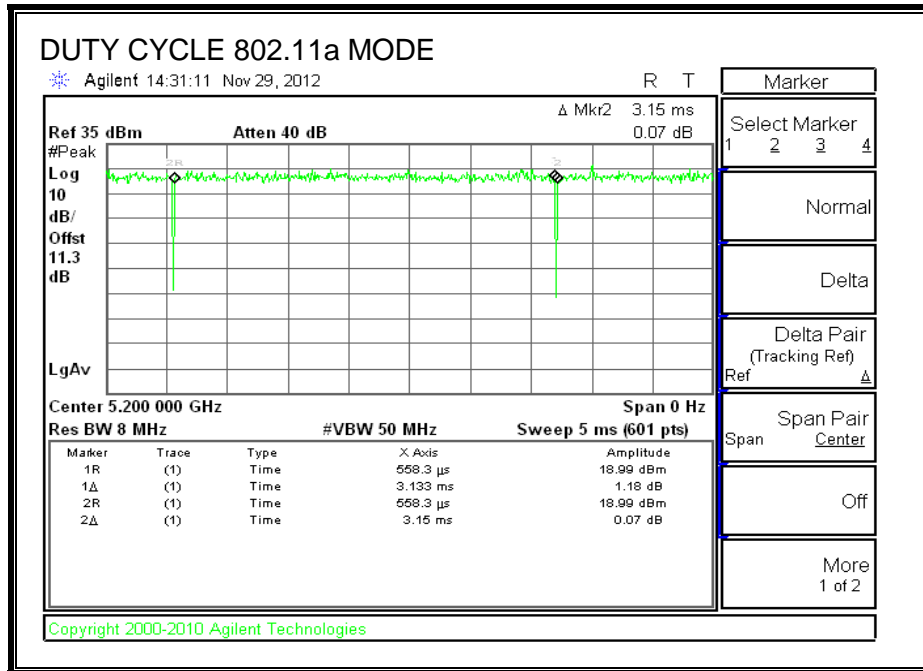
7.2. MEASUREMENT METHOD FOR POWER AND PPSD

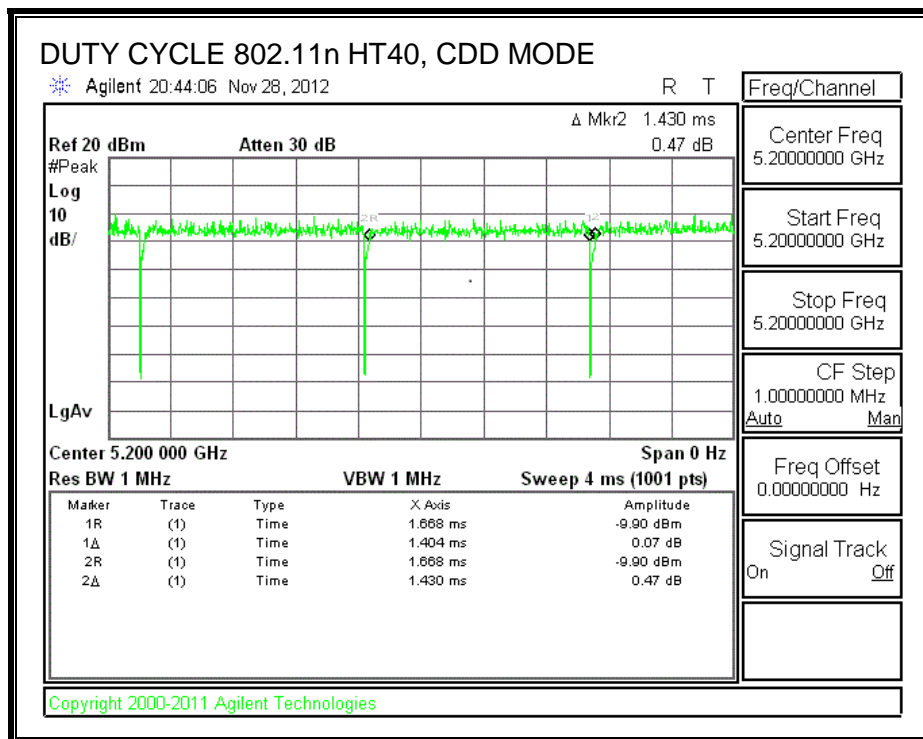
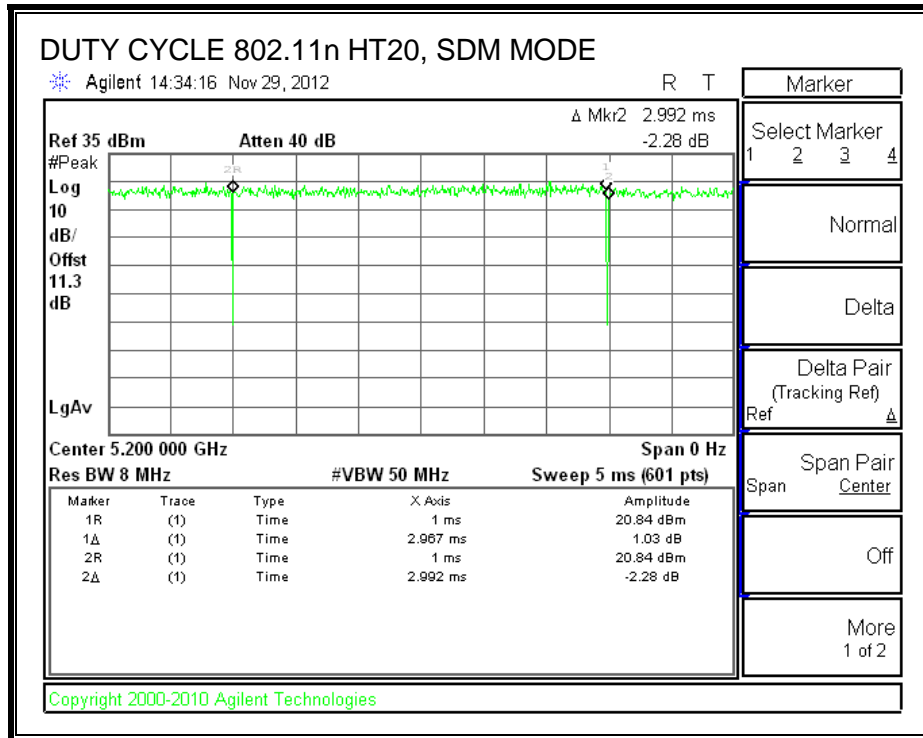
The Duty Cycle is greater than or equal to 98% therefore KDB 789033 Method SA-1 is used.

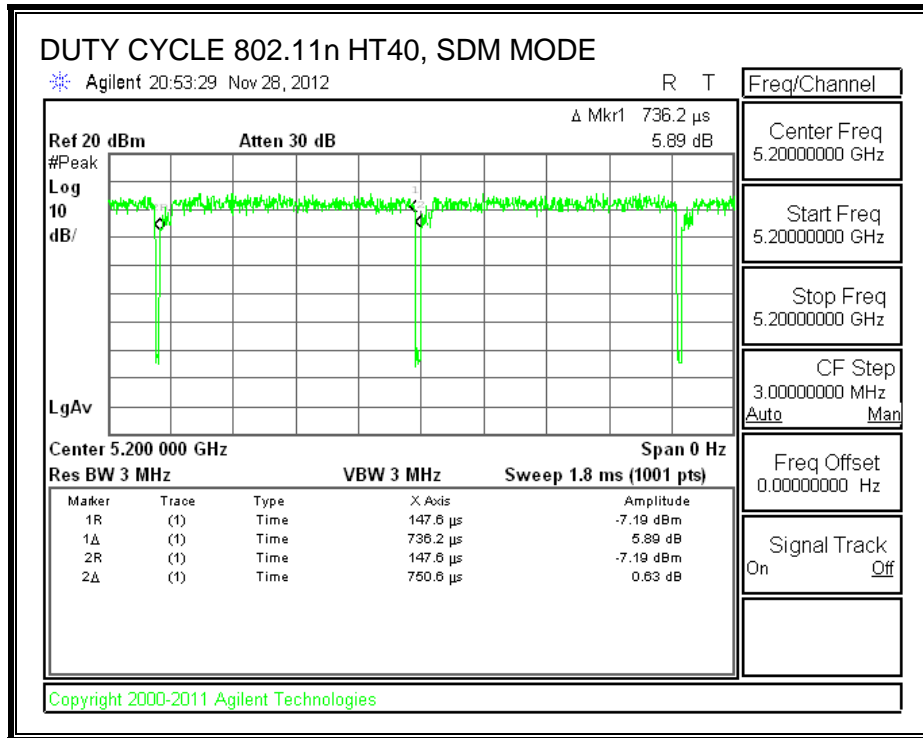
7.3. MEASUREMENT METHOD FOR AVG SPURIOUS EMISSIONS ABOVE 1 GHz

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

7.4. DUTY CYCLE PLOTS







8. ANTENNA PORT TEST RESULTS

8.1. 802.11a MODE IN THE 5.3 GHz BAND

8.1.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

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

RESULTS

CHAIN 0

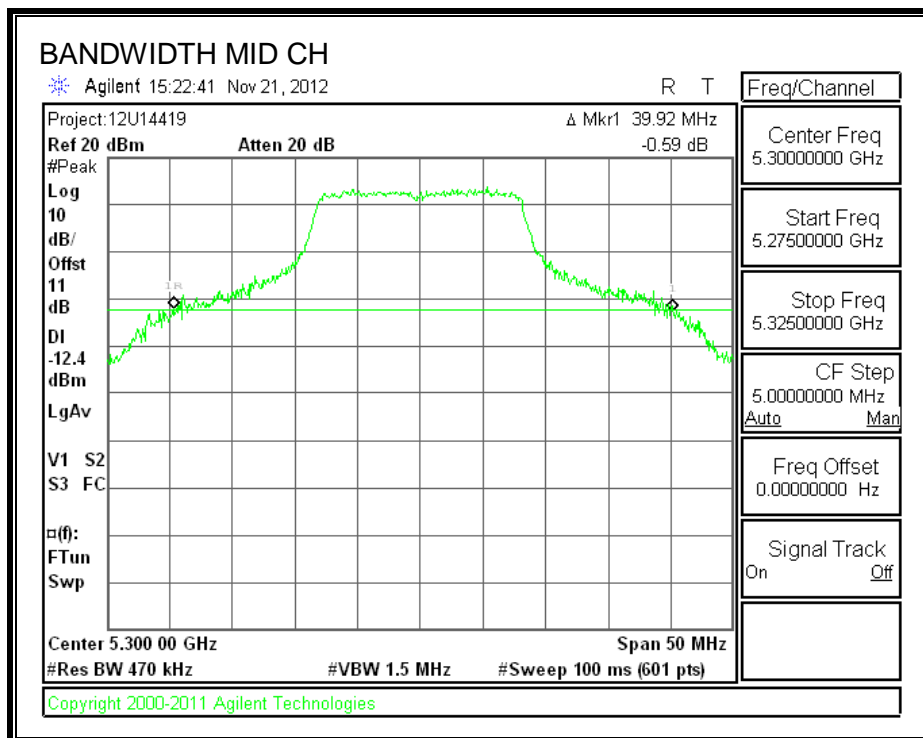
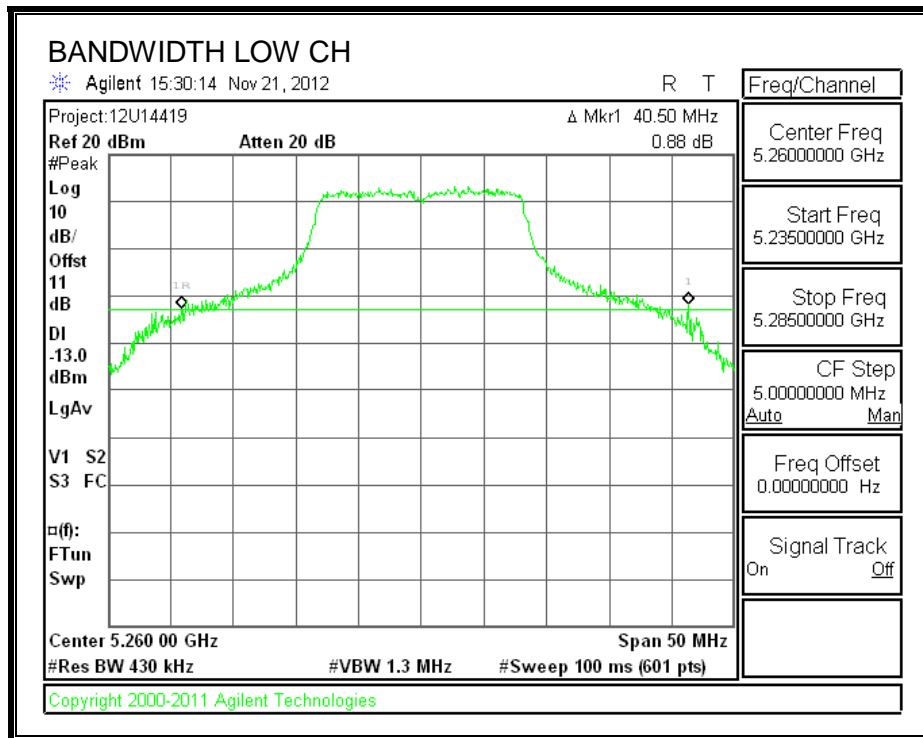
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	40.50	16.7359
Middle	5300	39.92	16.7549
High	5320	41.33	16.7745

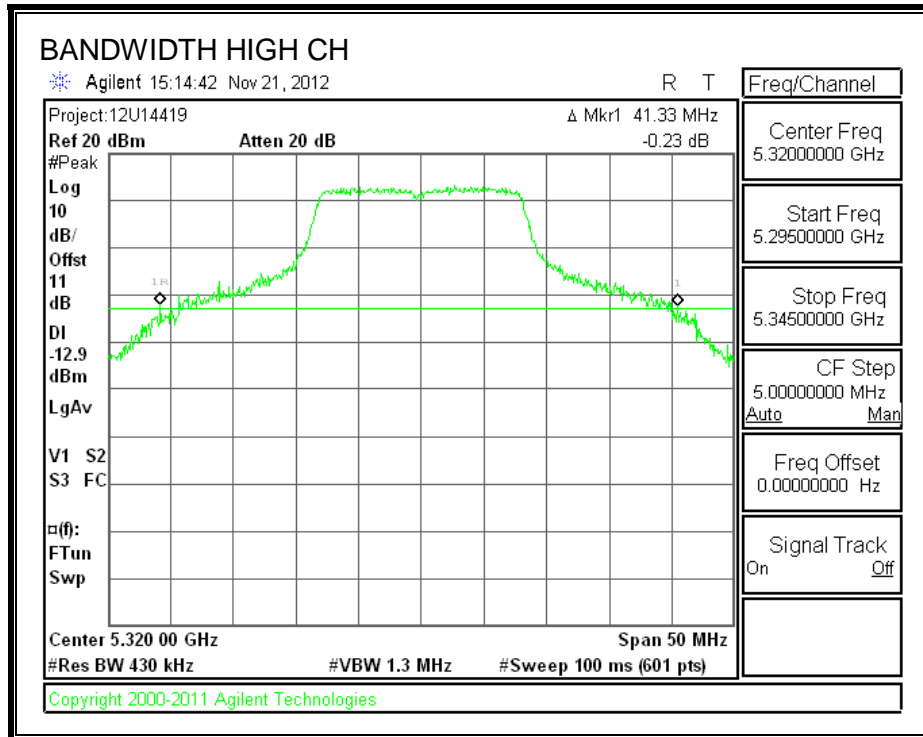
CHAIN 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	36.83	16.9160
Middle	5300	39.00	17.1013
High	5320	36.67	16.9996

CHAIN 0

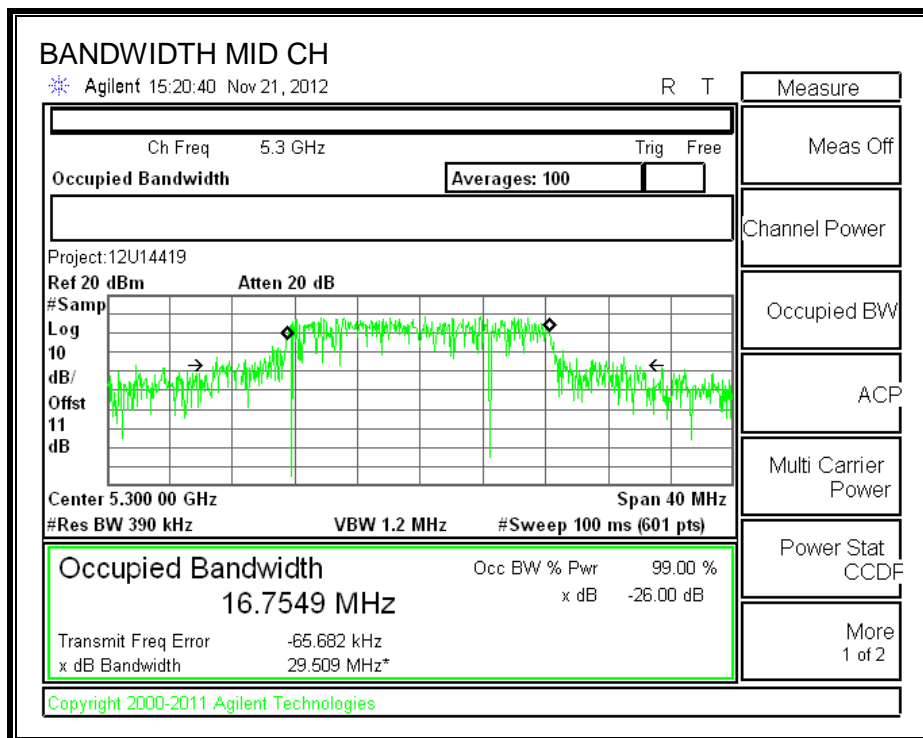
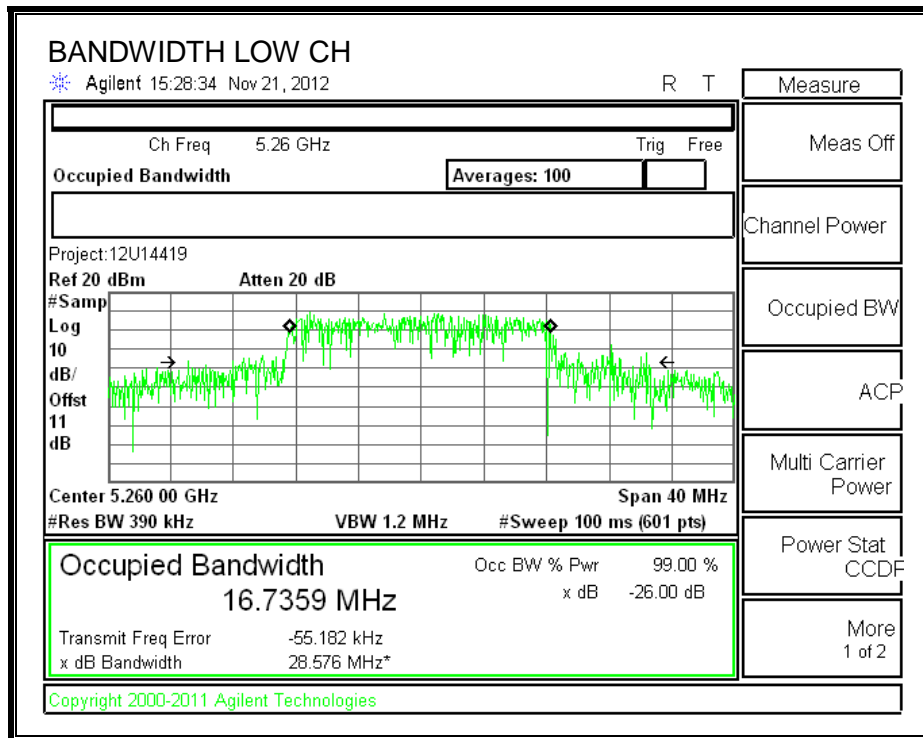
26 dB BANDWIDTH





CHAIN 0

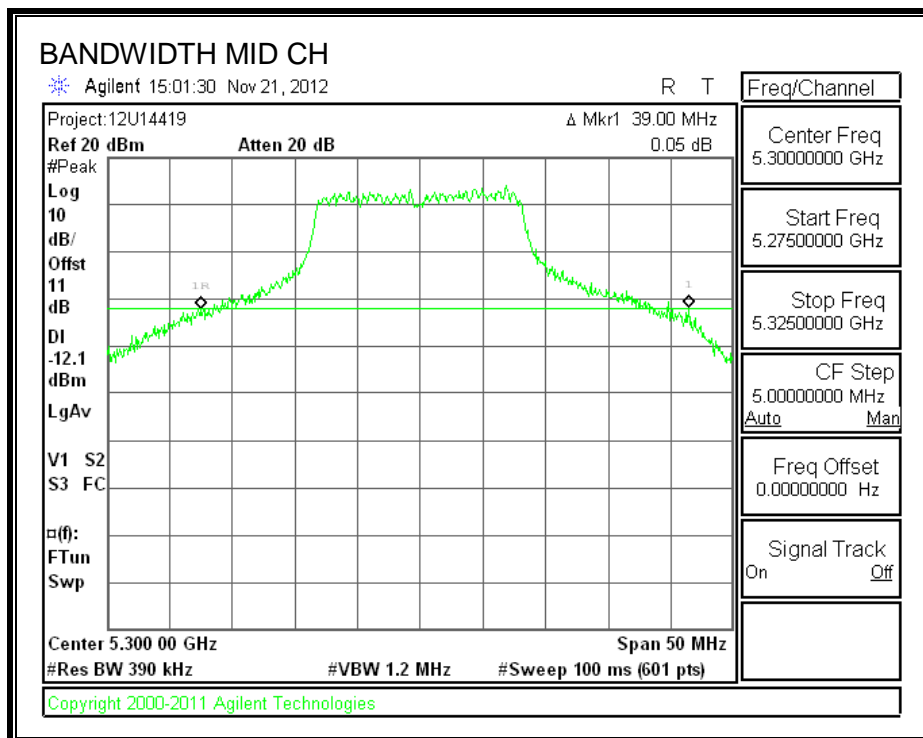
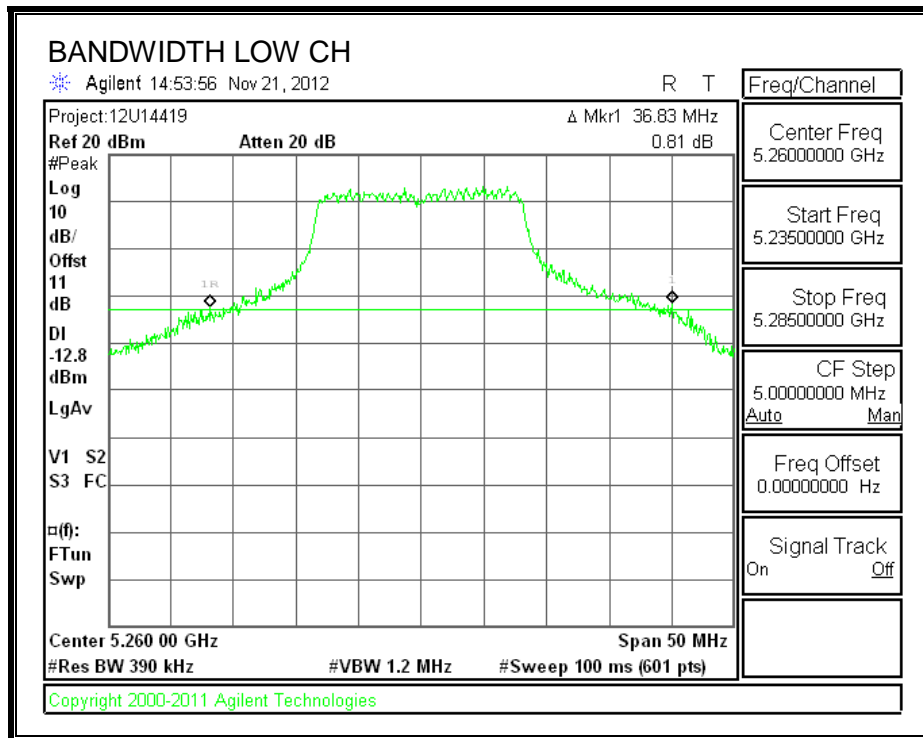
99% BANDWIDTH

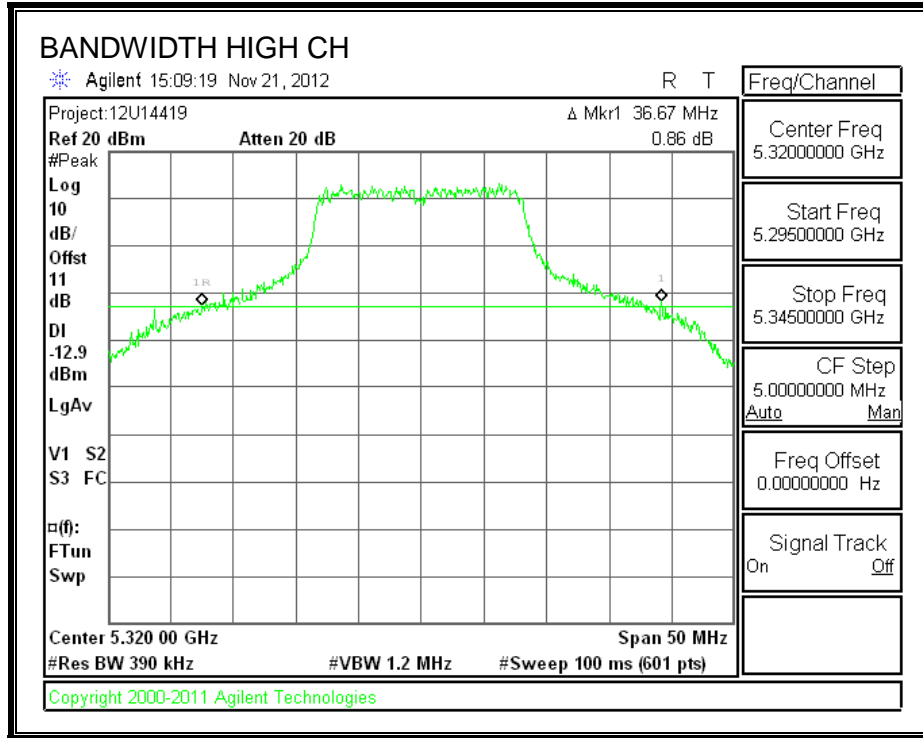




CHAIN 1

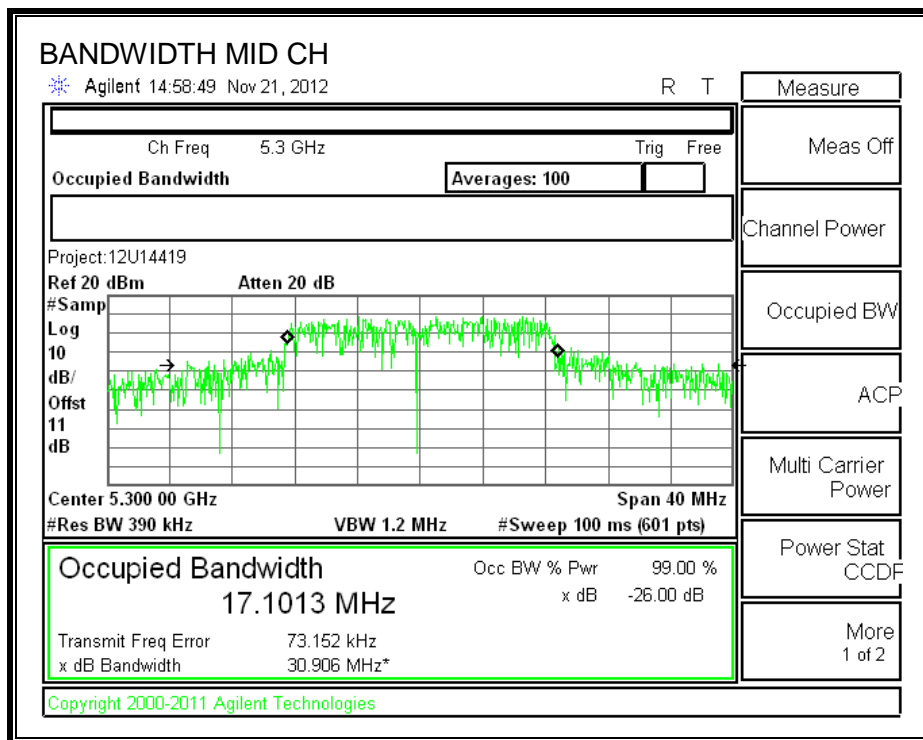
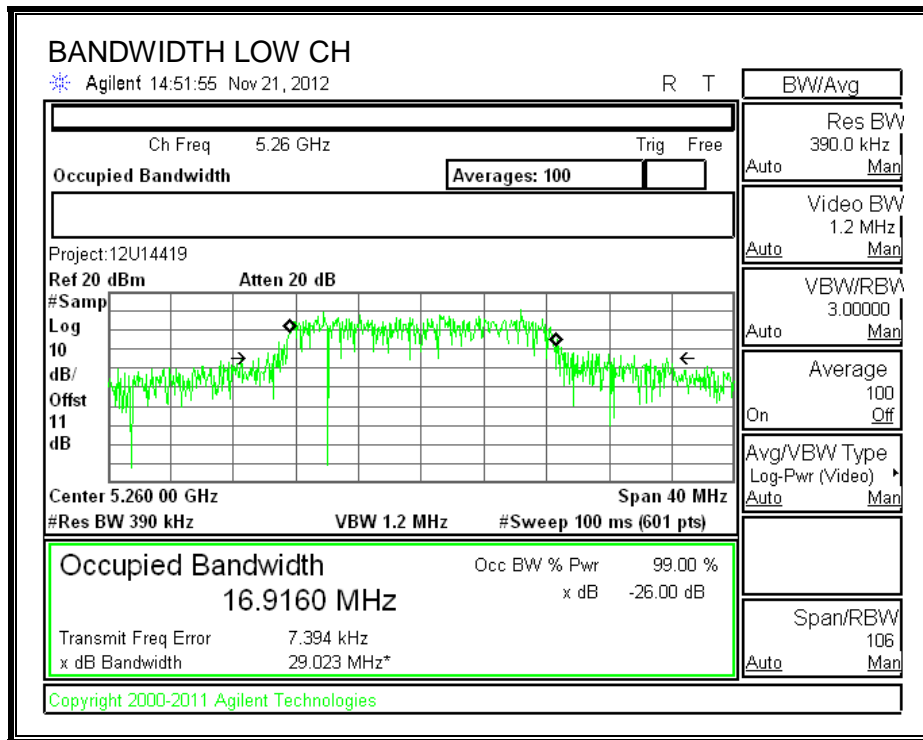
26 dB BANDWIDTH





CHAIN 1

99% BANDWIDTH



8.1.2. OUTPUT POWER AND PPSD

FCC §15.407 (a) (1)

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

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

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

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
2.00	3.01	5.01

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	36.83	16.7359	5.01
Mid	5300	39.00	16.7549	5.01
High	5320	36.67	16.7745	5.01

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	24.00	23.24	29.24	23.24	11.00	11.00	11.00
Mid	5300	24.00	23.24	29.24	23.24	11.00	11.00	11.00
High	5320	24.00	23.25	29.25	23.25	11.00	11.00	11.00

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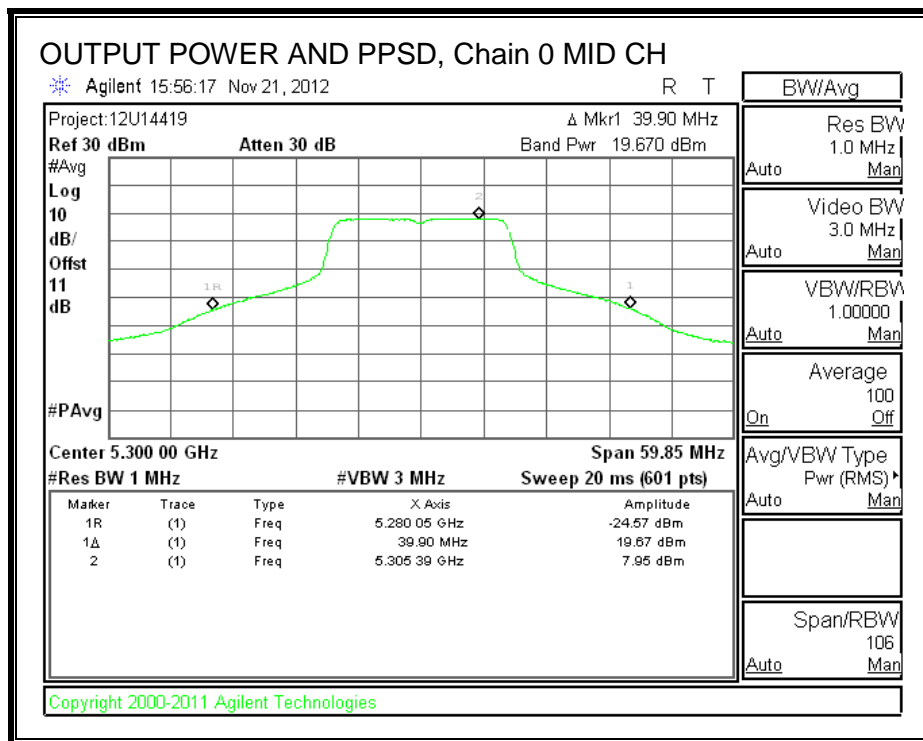
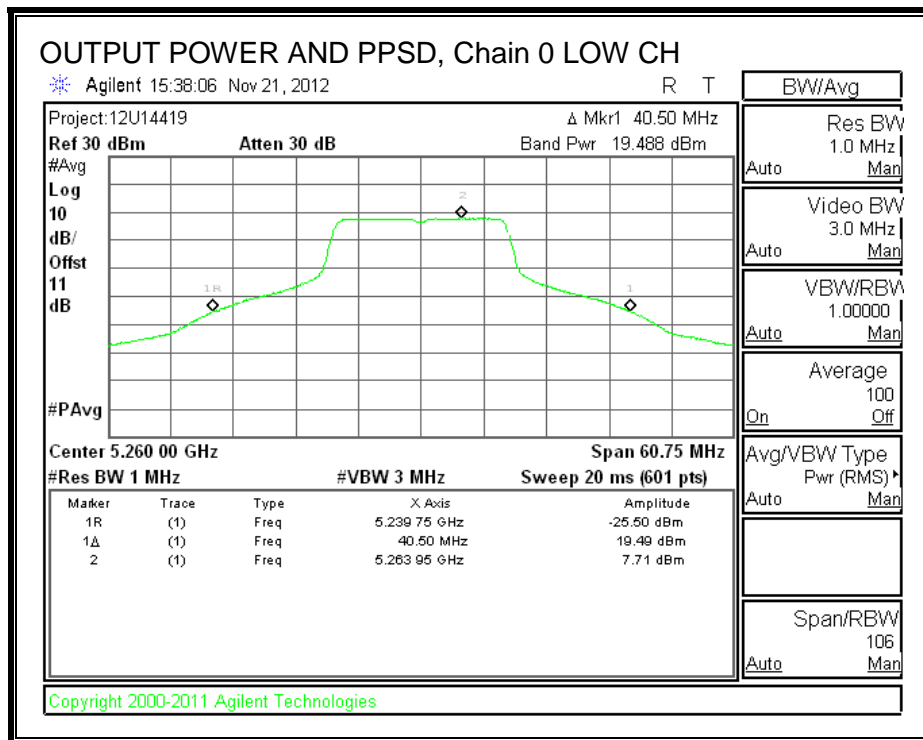
Output Power Results

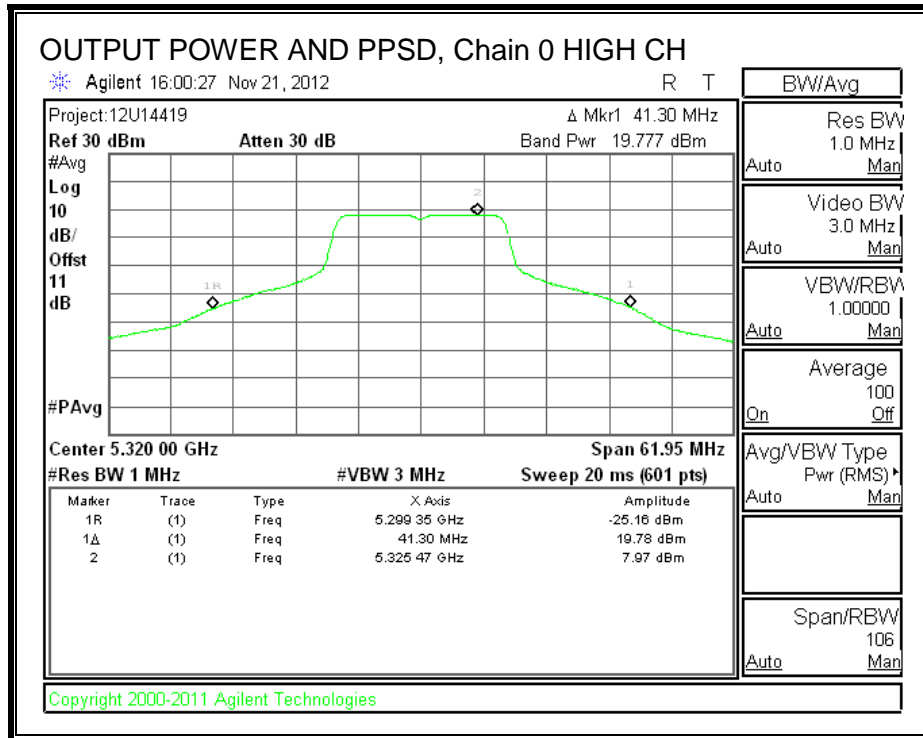
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	19.488	19.136	22.326	23.24	-0.911
Mid	5300	19.670	19.135	22.421	23.24	-0.820
High	5320	19.777	18.650	22.260	23.25	-0.986

PPSD Results

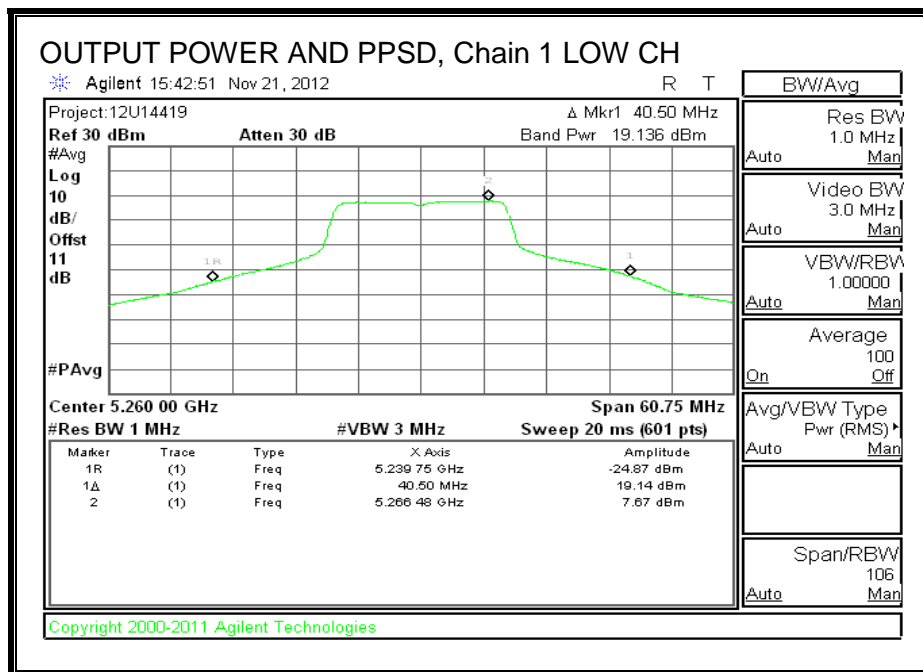
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	7.71	7.67	10.70	11.00	-0.30
Mid	5300	7.95	7.64	10.81	11.00	-0.19
High	5320	7.97	7.05	10.54	11.00	-0.46

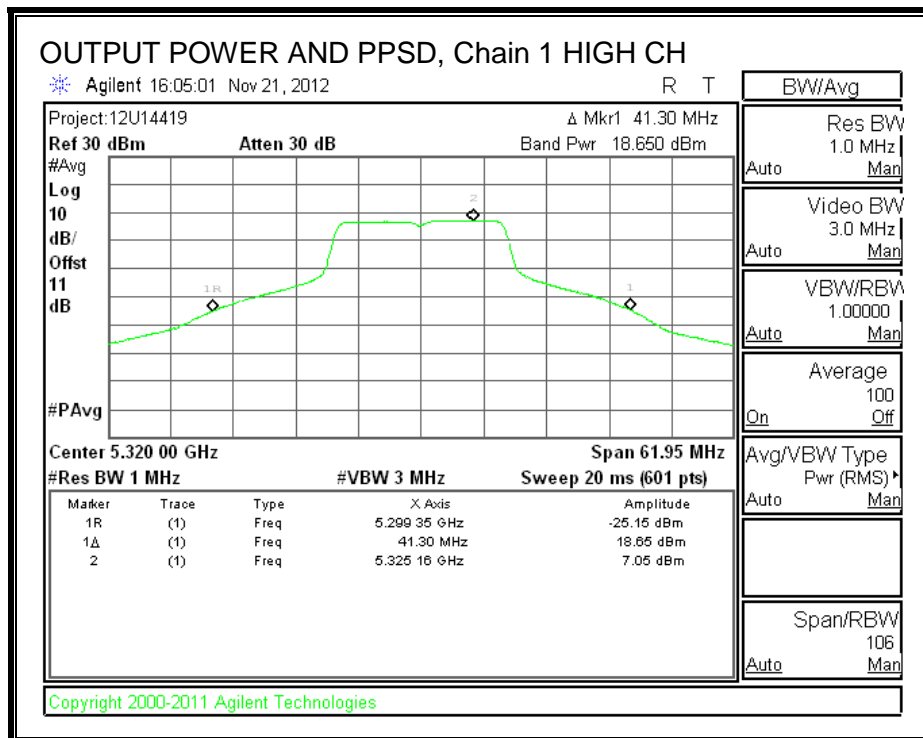
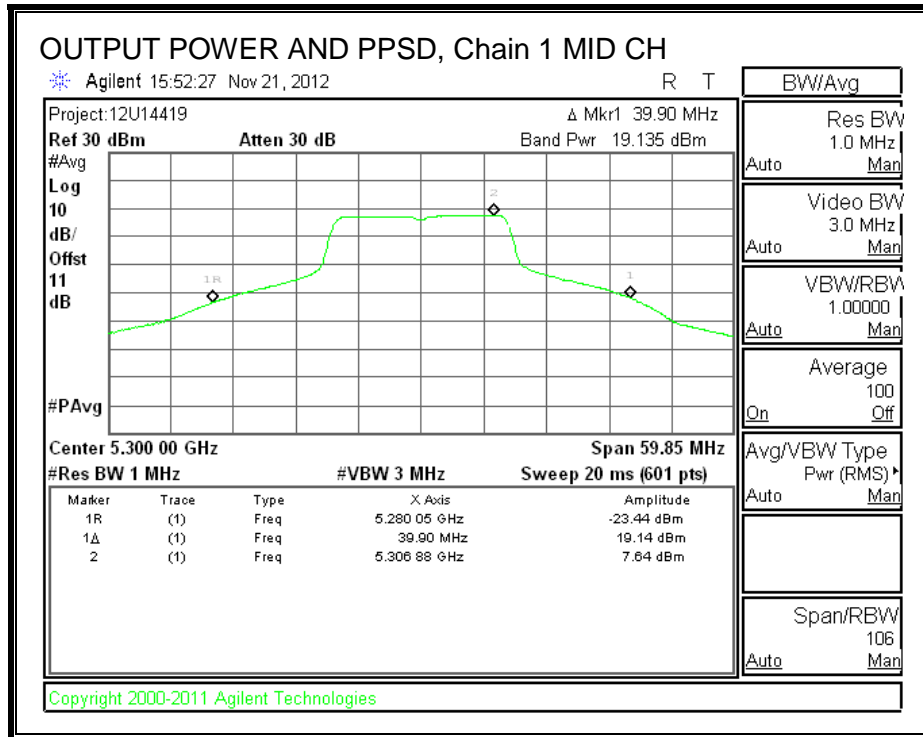
OUTPUT POWER AND PPSD, Chain 0





OUTPUT POWER AND PPSD, Chain 1





8.1.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.3 dB (including 10 dB pad and 1.3 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5260	19.43	19.10	22.28
Mid	5300	19.60	19.10	22.37
High	5320	19.75	18.60	22.22

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.

TEST PROCEDURE

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

RESULTS

CHAIN 0

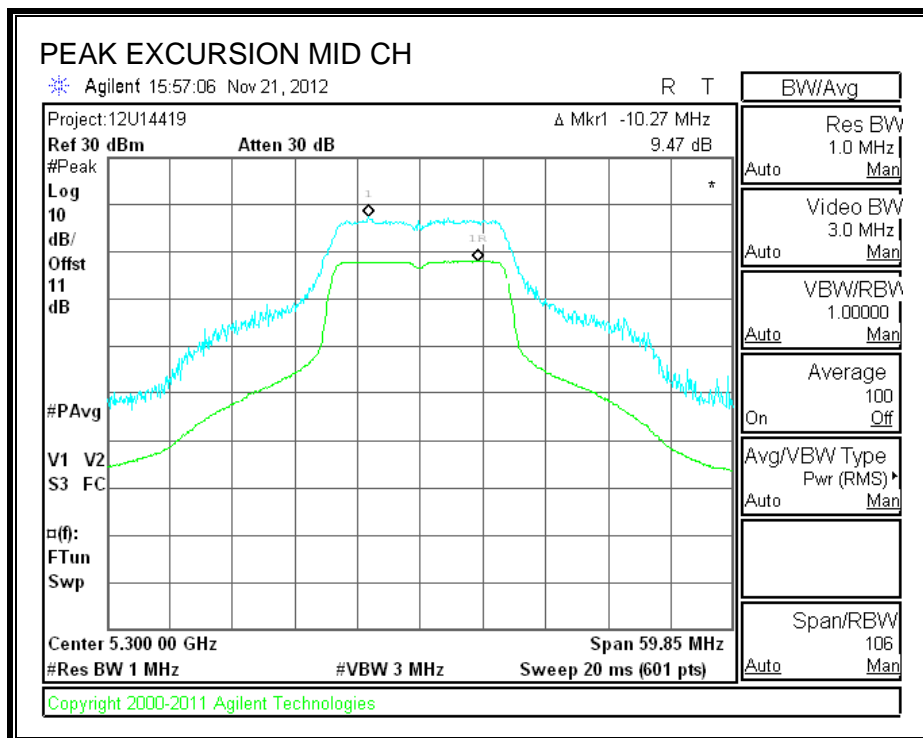
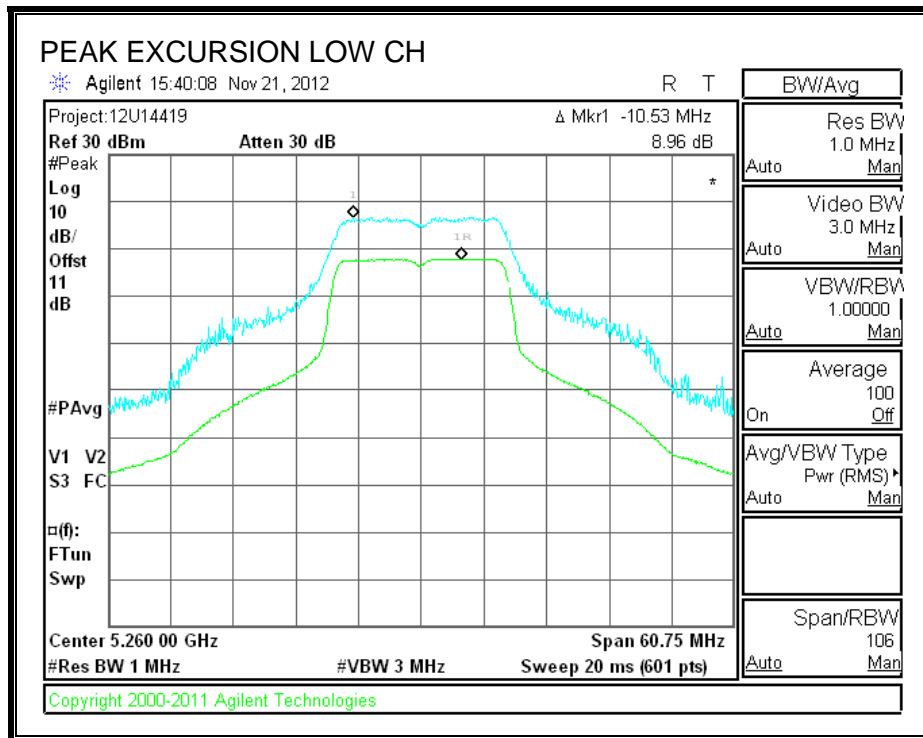
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	8.96	13	-4.04
Middle	5300	9.47	13	-3.53
High	5320	9.34	13	-3.66

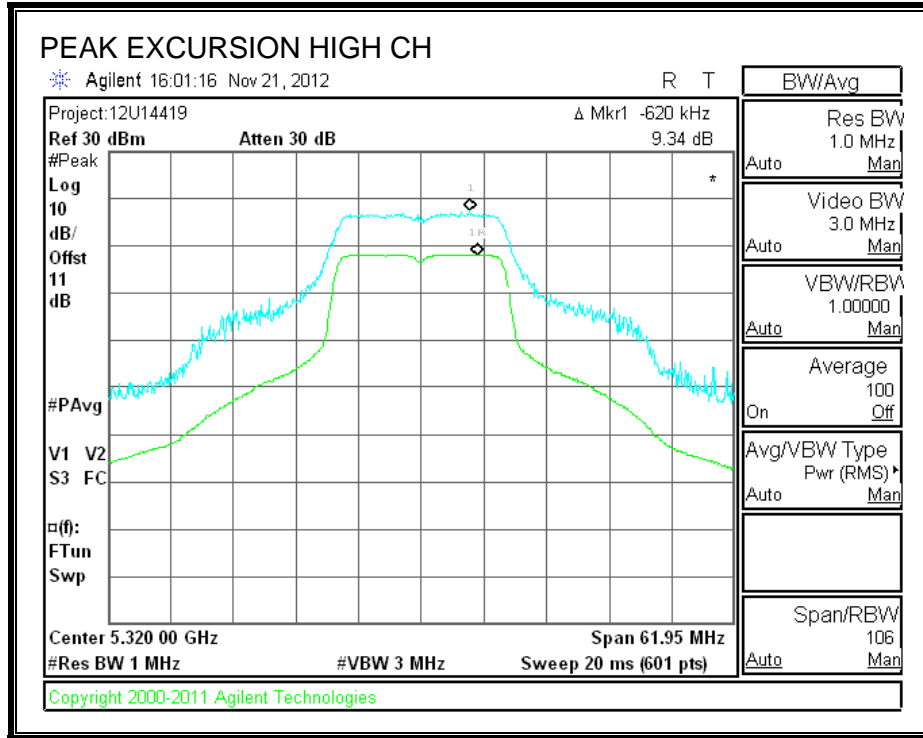
CHAIN 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	10.73	13	-2.27
Middle	5300	10.47	13	-2.53
High	5320	10.11	13	-2.89

CHAIN 0

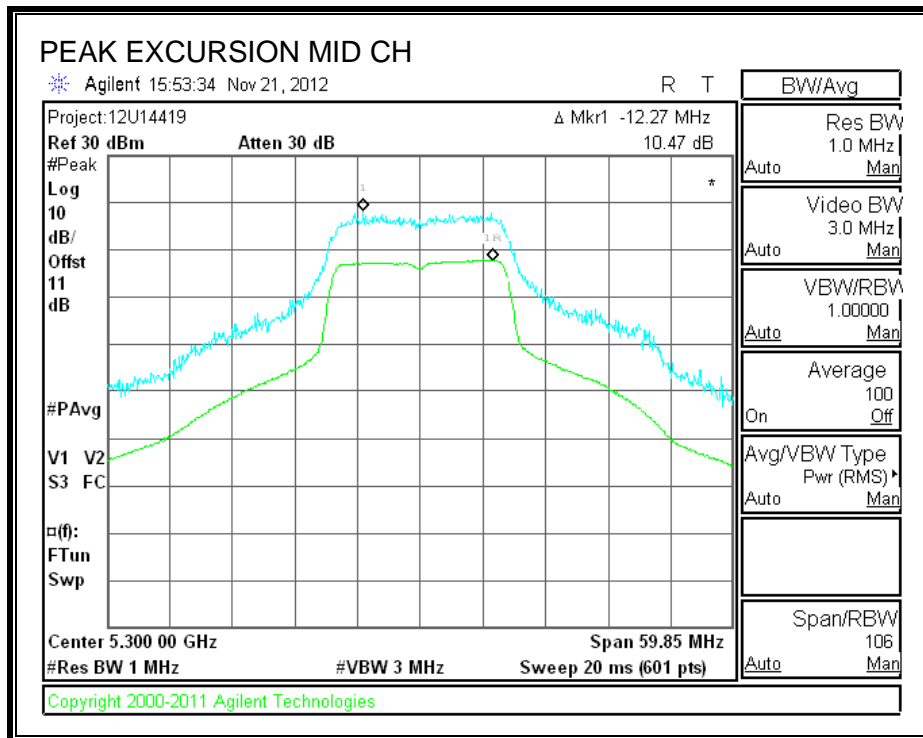
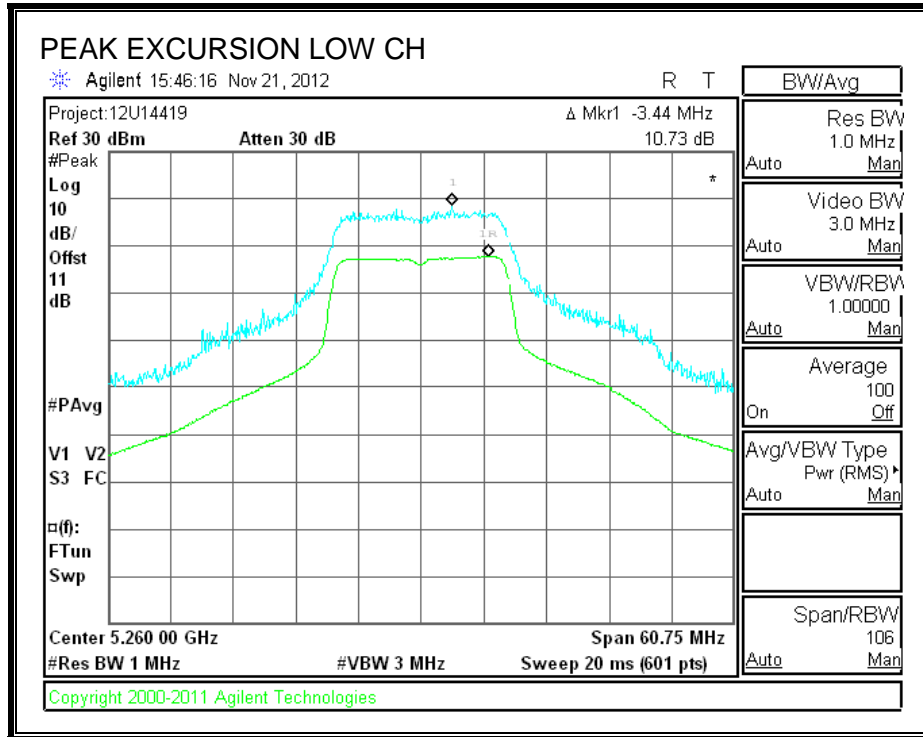
PEAK EXCURSION

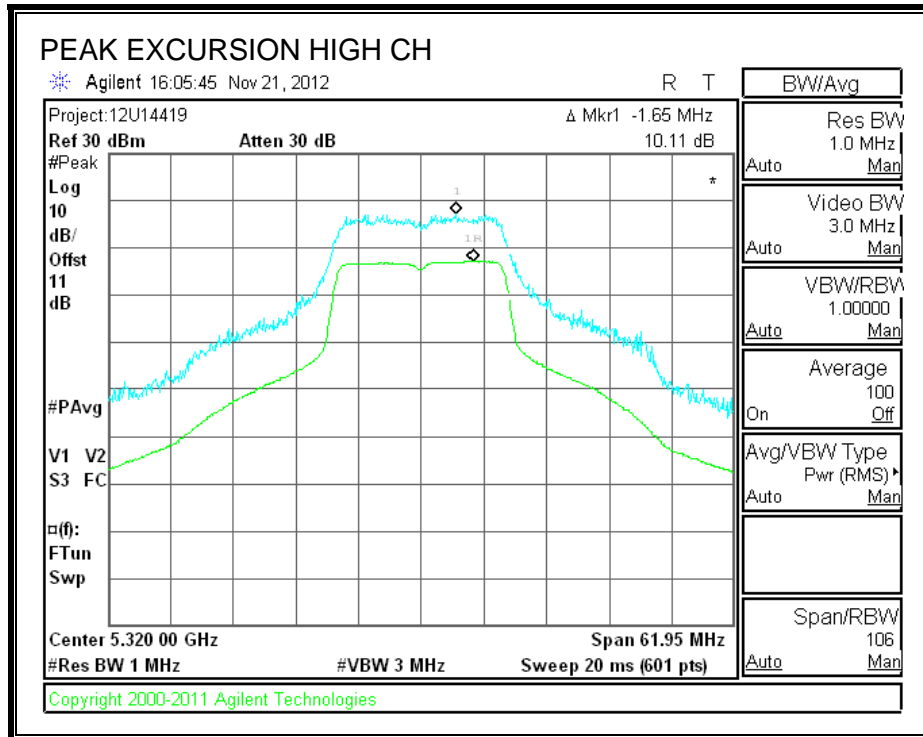




CHAIN 1

PEAK EXCURSION





8.2. 802.11n HT20, CDD MODE IN THE 5.3 GHz BAND

8.2.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

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

RESULTS

CHAIN 0

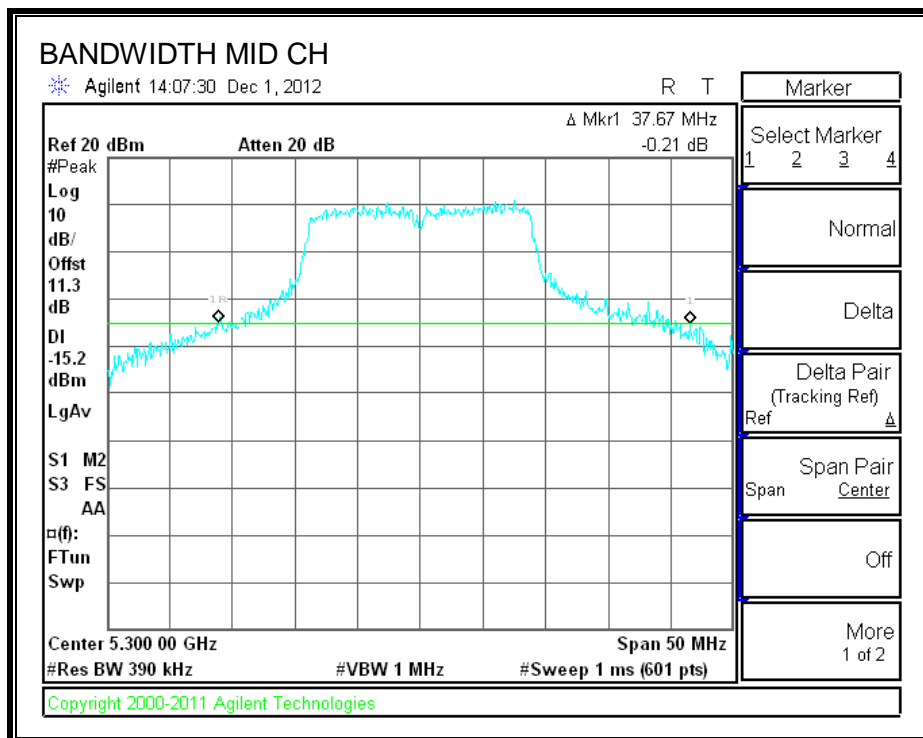
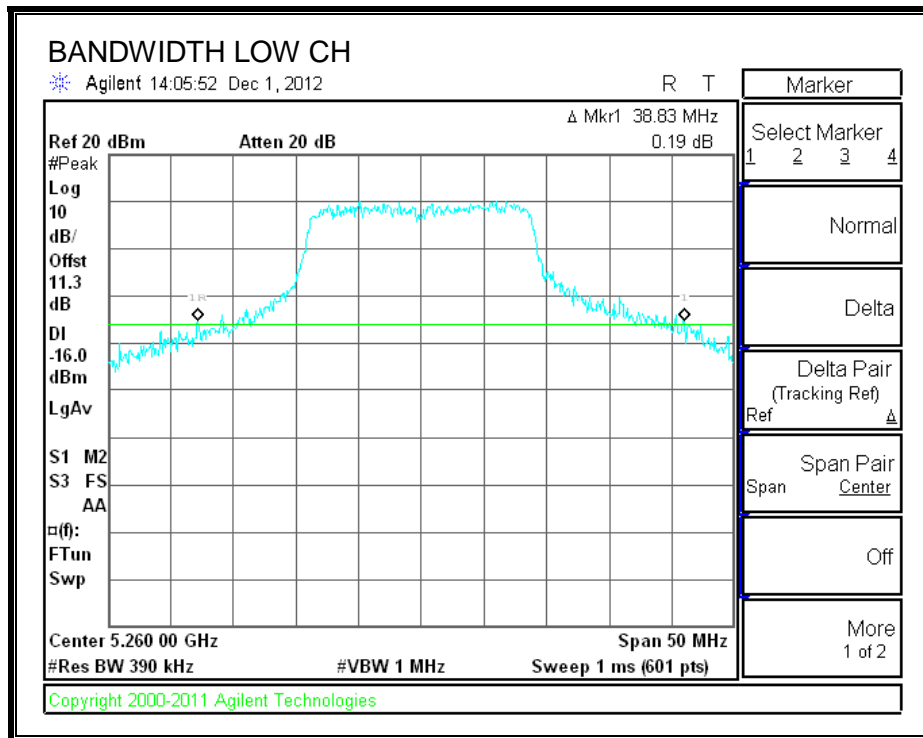
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	38.83	17.8943
Middle	5300	37.67	17.8950
High	5320	35.92	17.7789

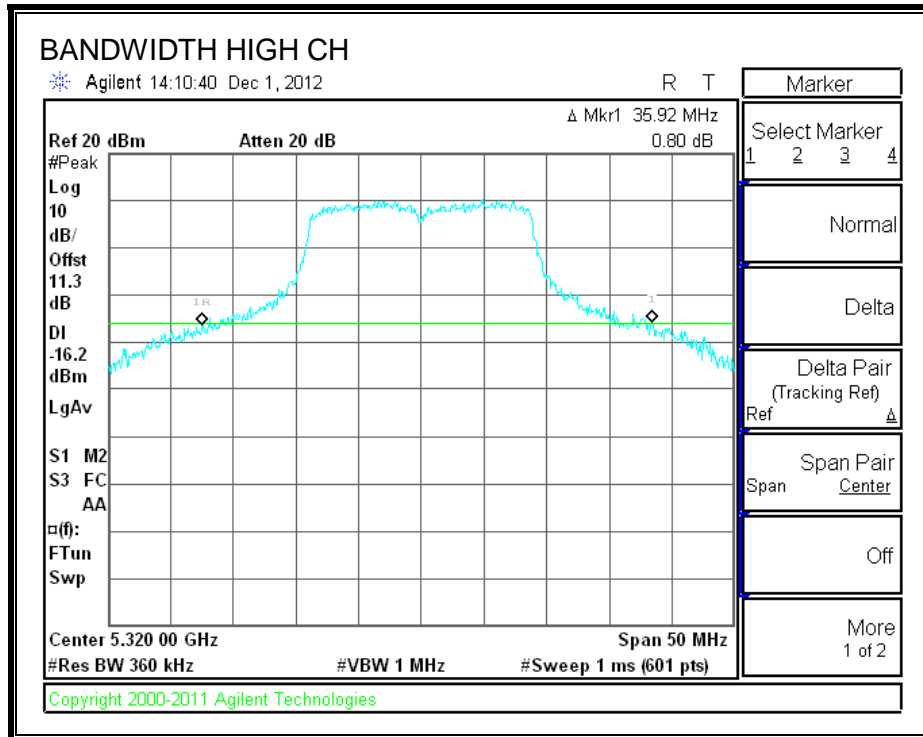
CHAIN 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	34.42	17.7062
Middle	5300	35.33	17.7875
High	5320	35.75	17.7416

CHAIN 0

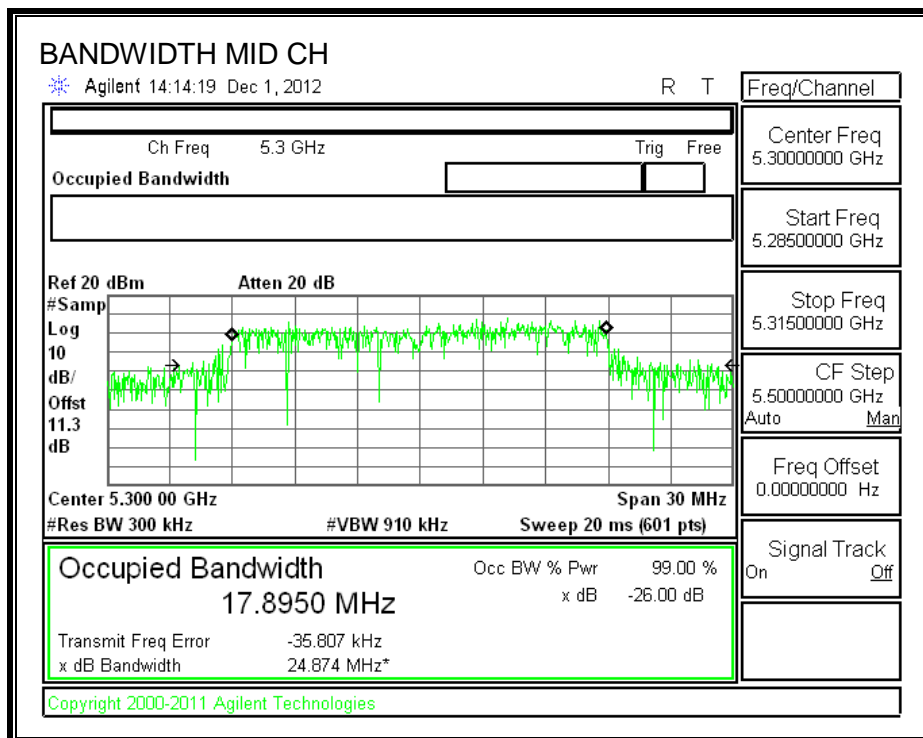
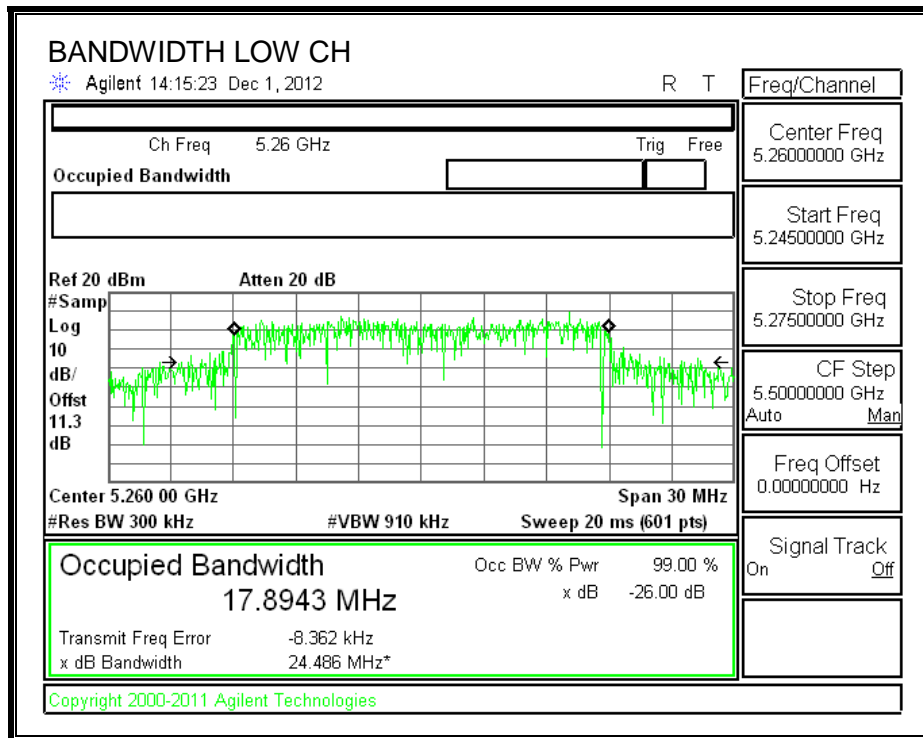
26 dB BANDWIDTH

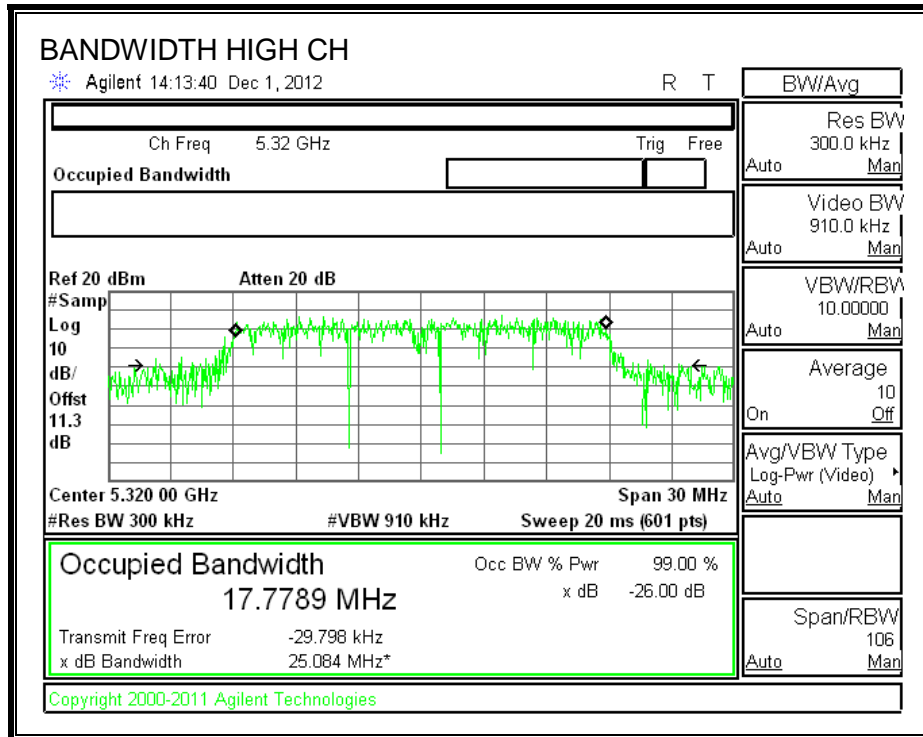




CHAIN 0

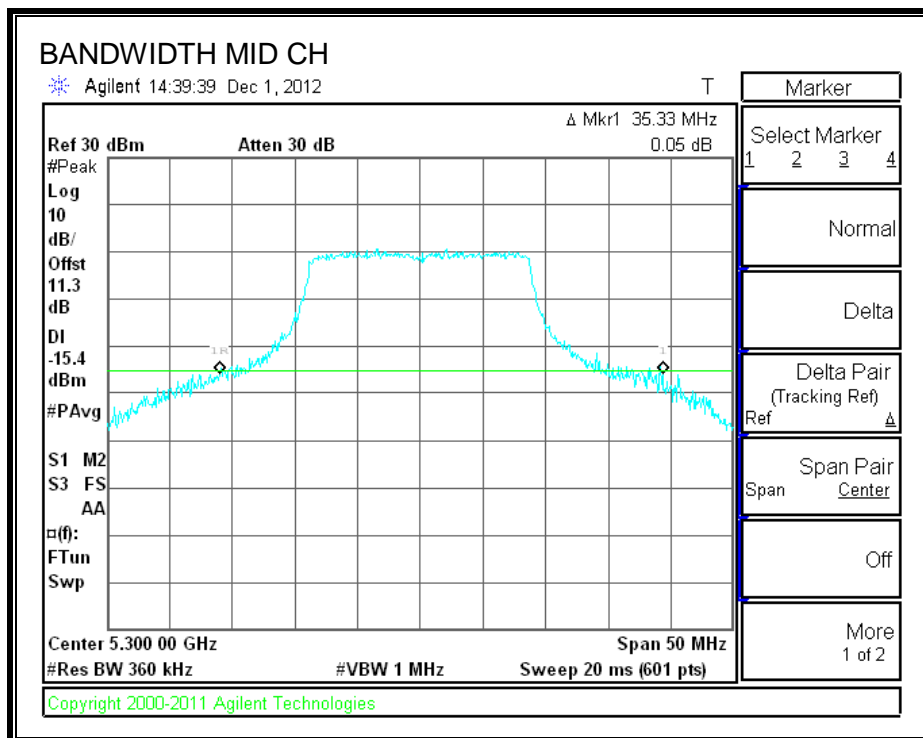
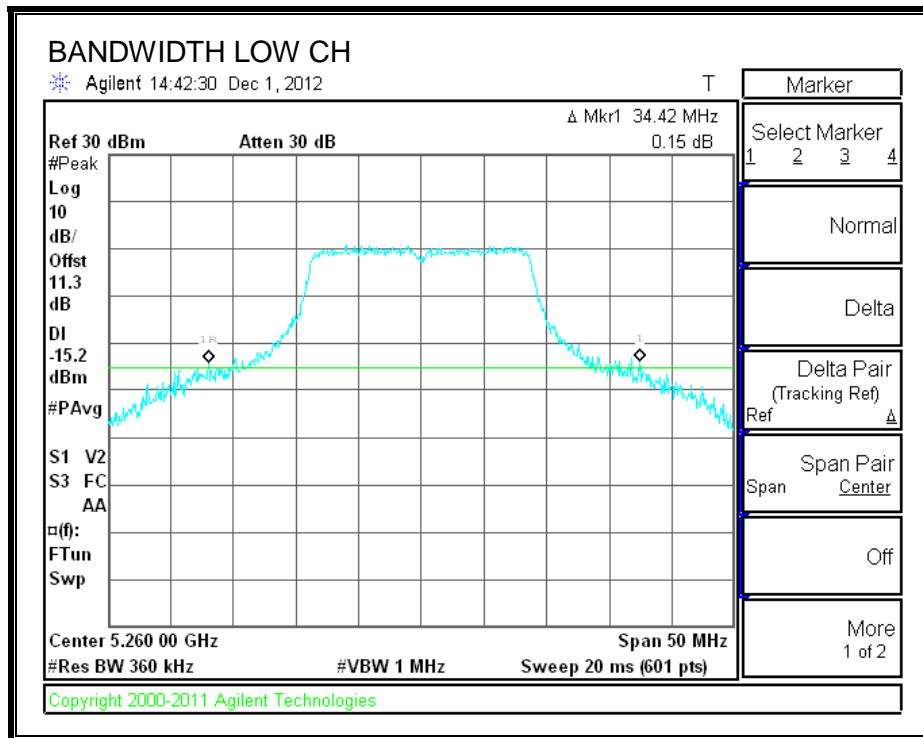
99% BANDWIDTH

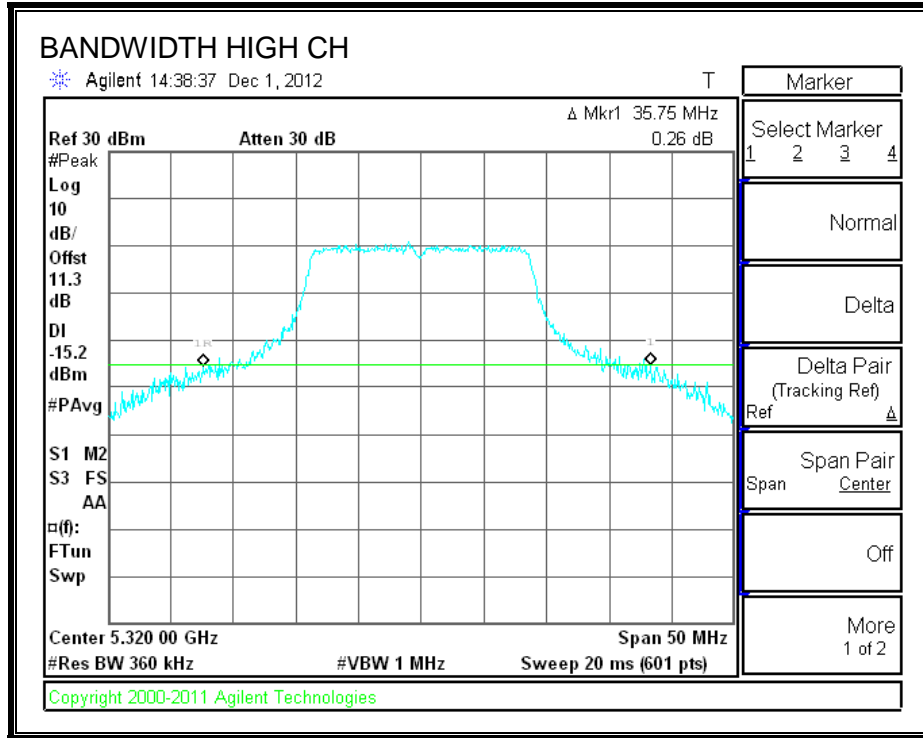




CHAIN 1

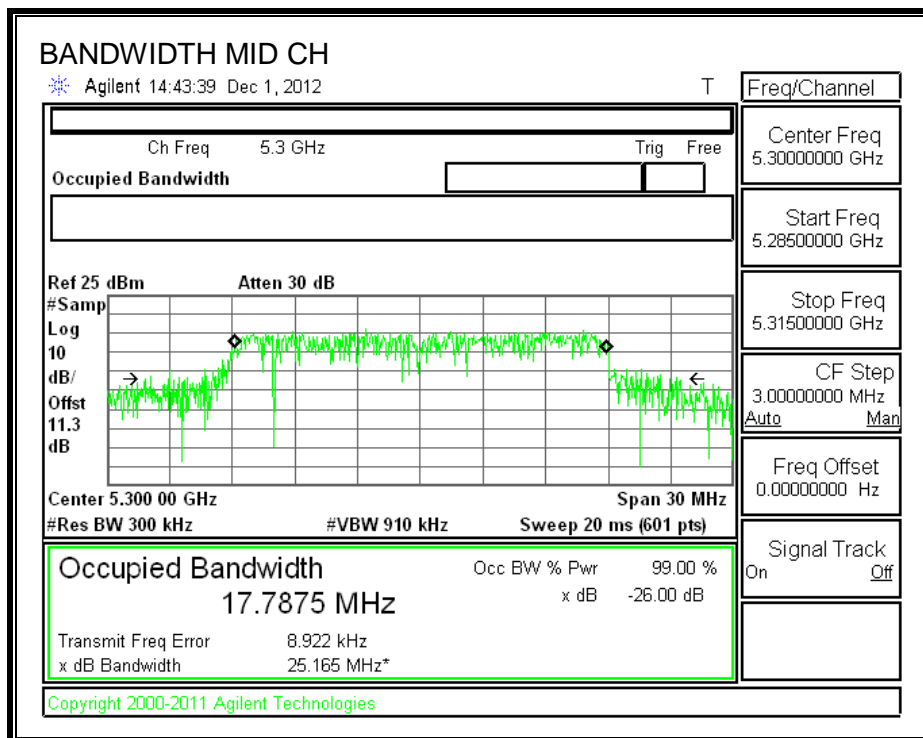
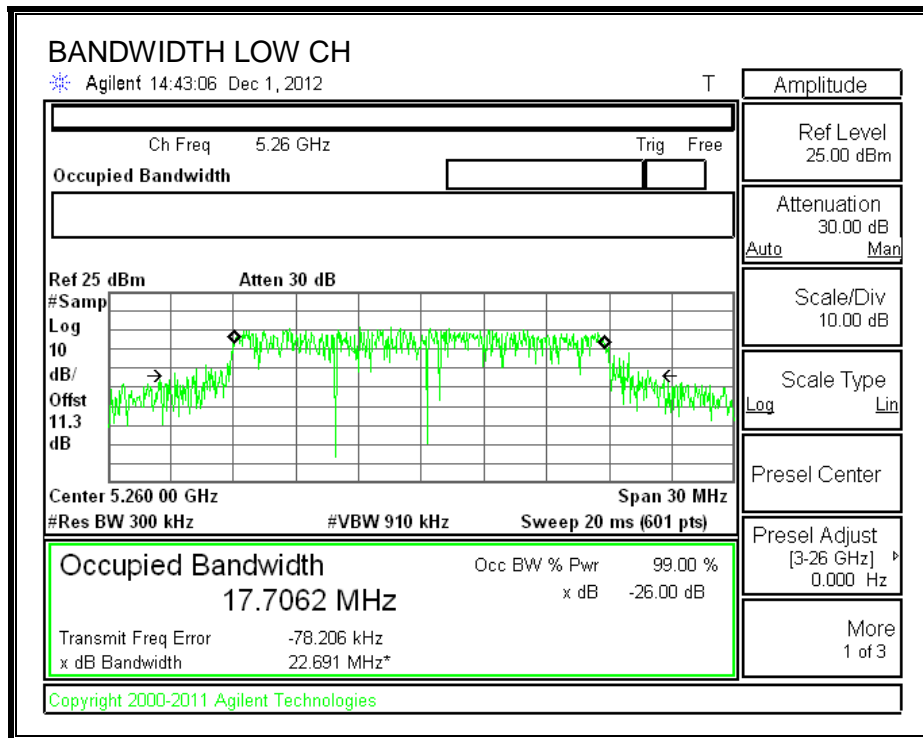
26 dB BANDWIDTH

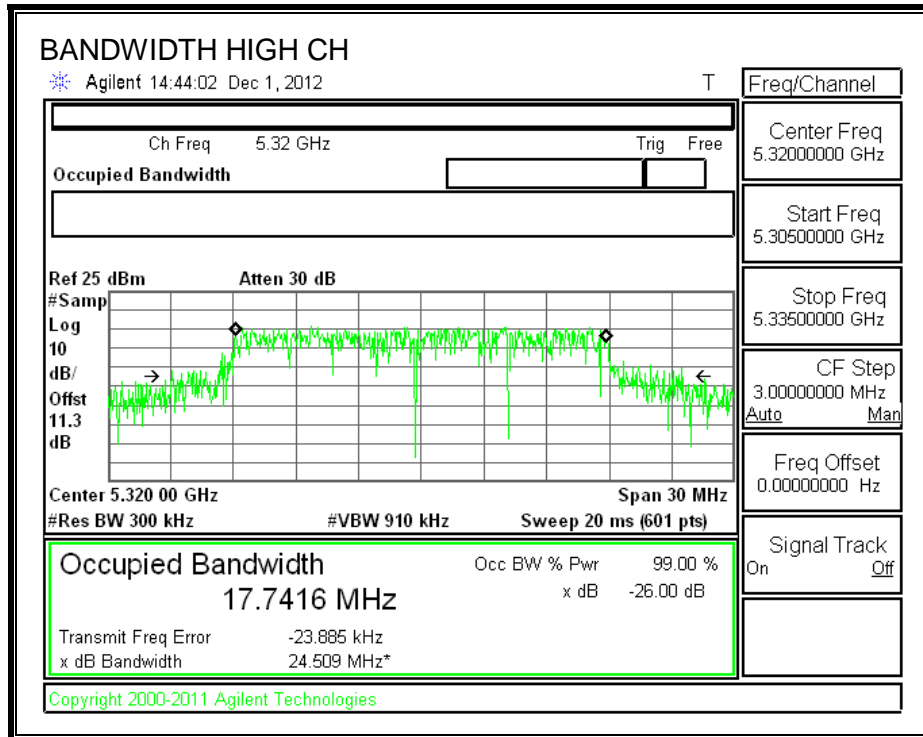




CHAIN 1

99% BANDWIDTH





8.2.2. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

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

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

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

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
2.00	3.01	5.01

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	34.42	17.7062	5.01
Mid	5300	35.33	17.7875	5.01
High	5320	35.75	17.7416	5.01

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	24.00	23.48	29.48	23.48	11.00	11.00	11.00
Mid	5300	24.00	23.50	29.50	23.50	11.00	11.00	11.00
High	5320	24.00	23.49	29.49	23.49	11.00	11.00	11.00

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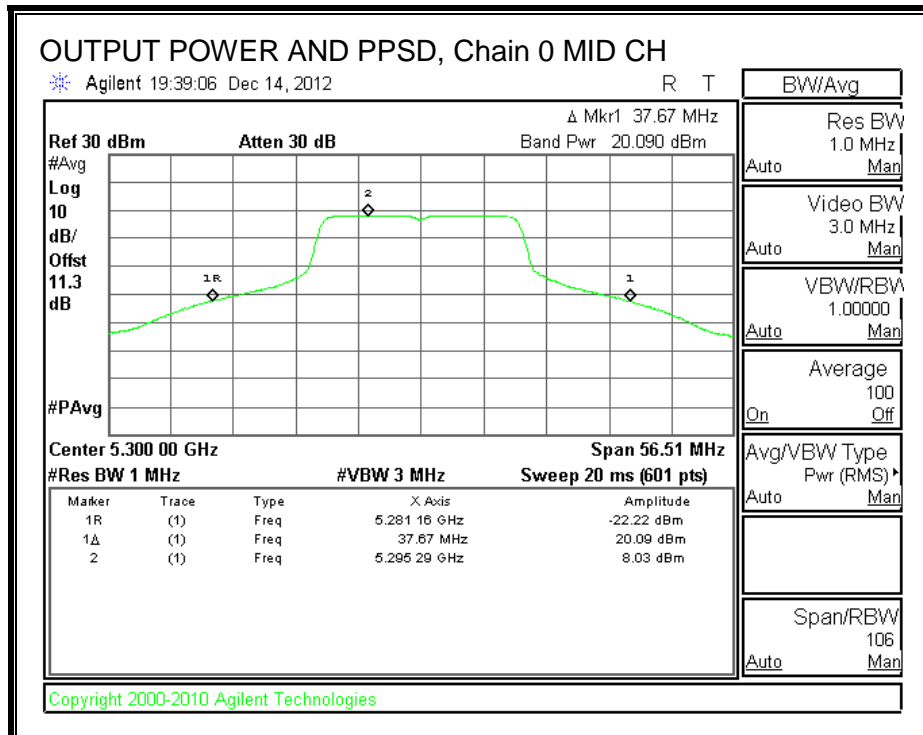
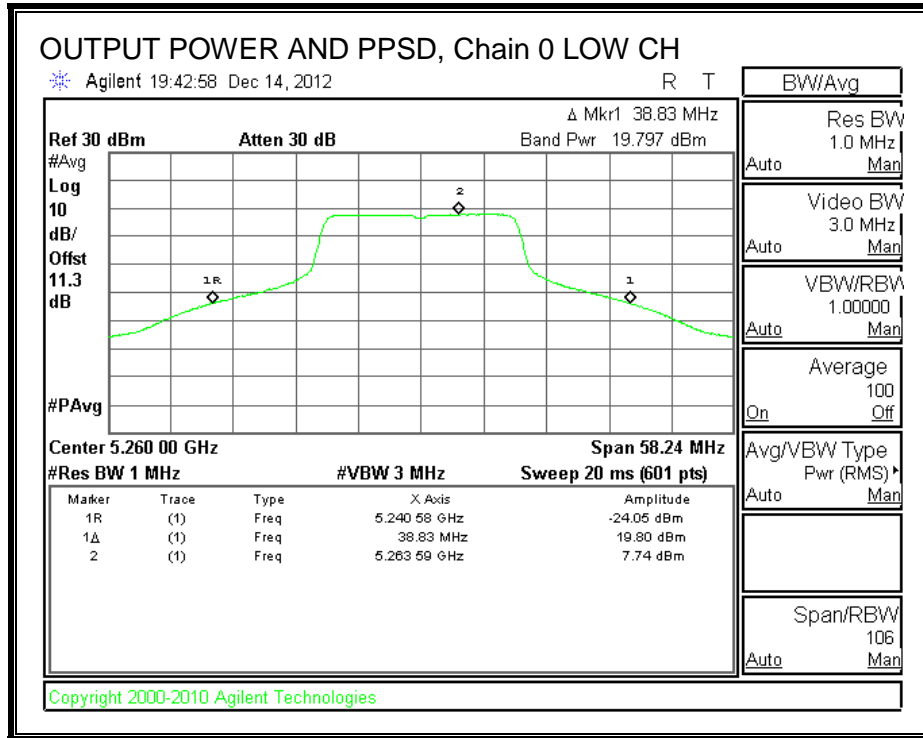
Output Power Results

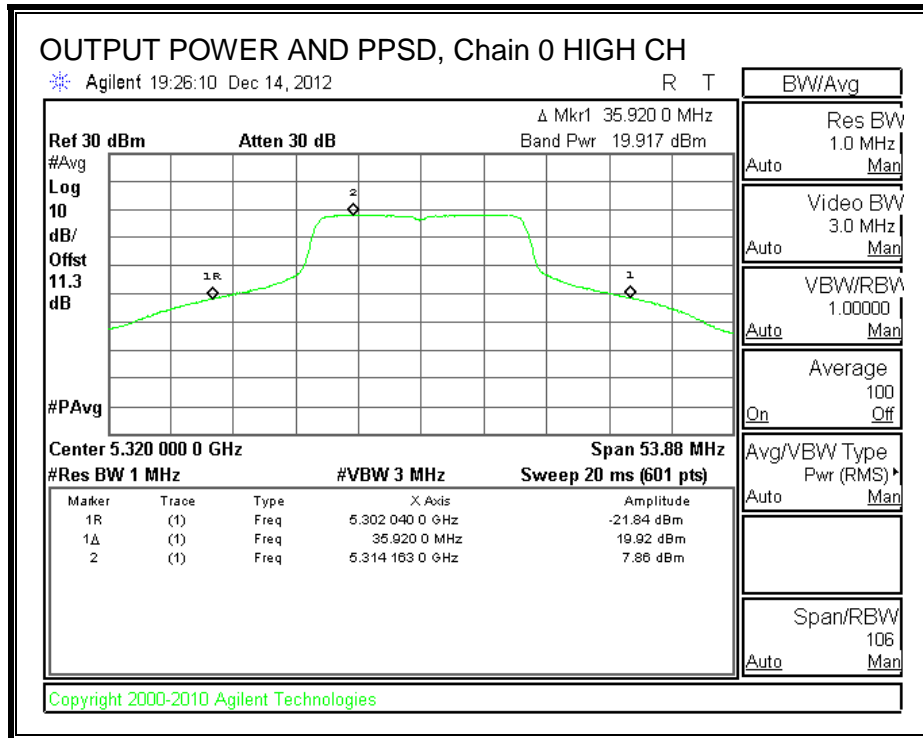
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	19.797	18.744	22.31	23.48	-1.17
Mid	5300	20.090	18.990	22.59	23.50	-0.92
High	5320	19.917	19.376	22.67	23.49	-0.82

PPSD Results

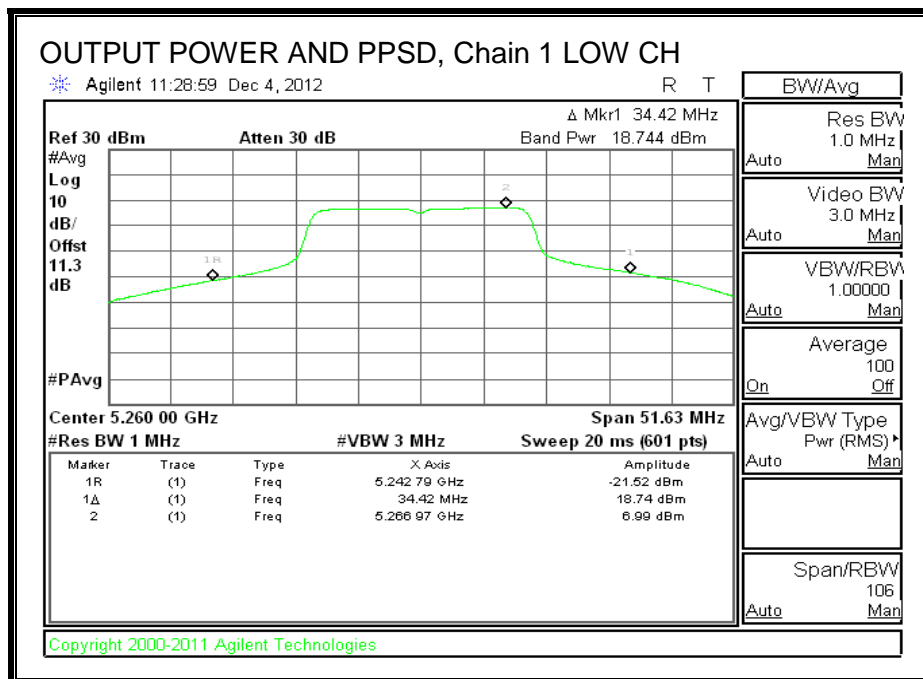
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	7.74	6.99	10.39	11.00	-0.61
Mid	5300	8.03	7.21	10.65	11.00	-0.35
High	5320	7.86	7.18	10.54	11.00	-0.46

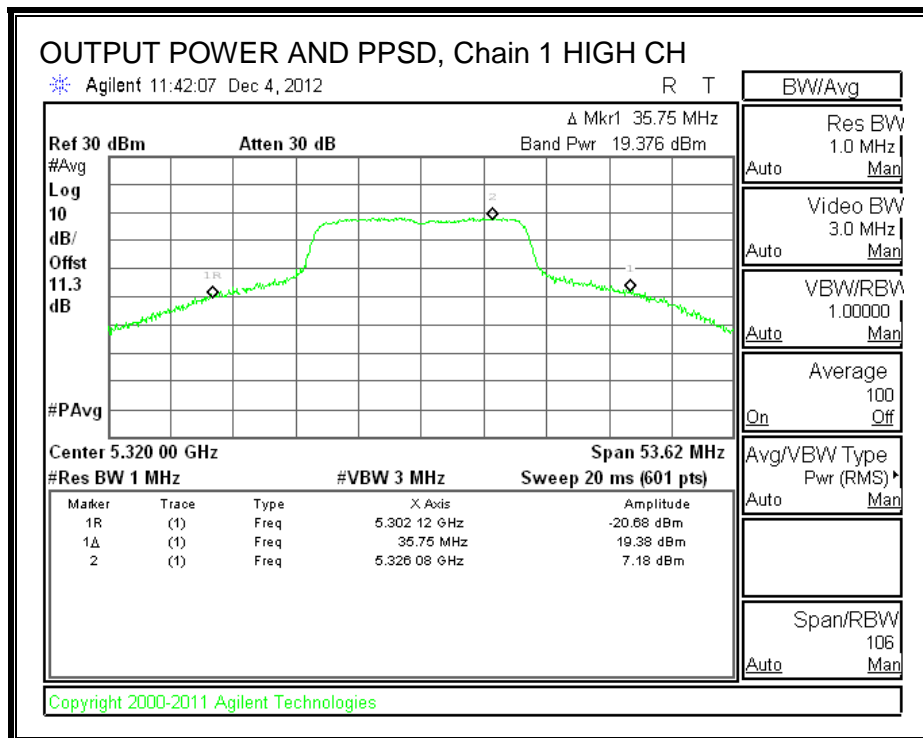
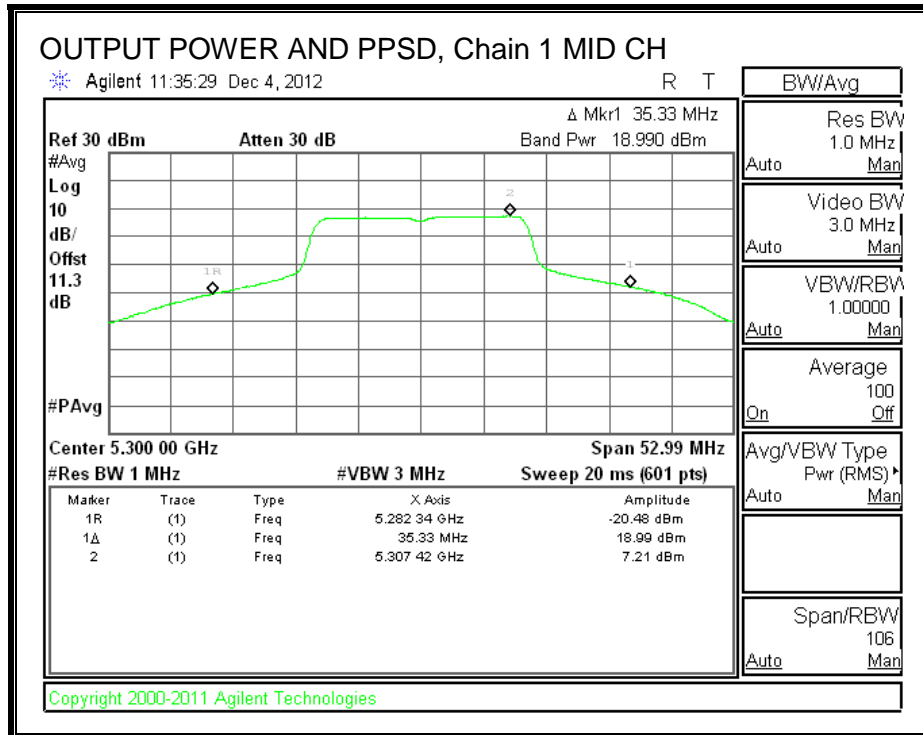
OUTPUT POWER AND PPSD, Chain 0





OUTPUT POWER AND PPSD, Chain 1





8.2.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11.3 dB (including 10 dB pad and 1.3 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Chain 1 Power (dBm)	Chain 2 Power (dBm)	Total Power (dBm)
Low	5260	19.75	18.72	22.28
Middle	5300	20.00	18.97	22.53
High	5320	19.90	19.35	22.64

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.

TEST PROCEDURE

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

RESULTS

CHAIN 0

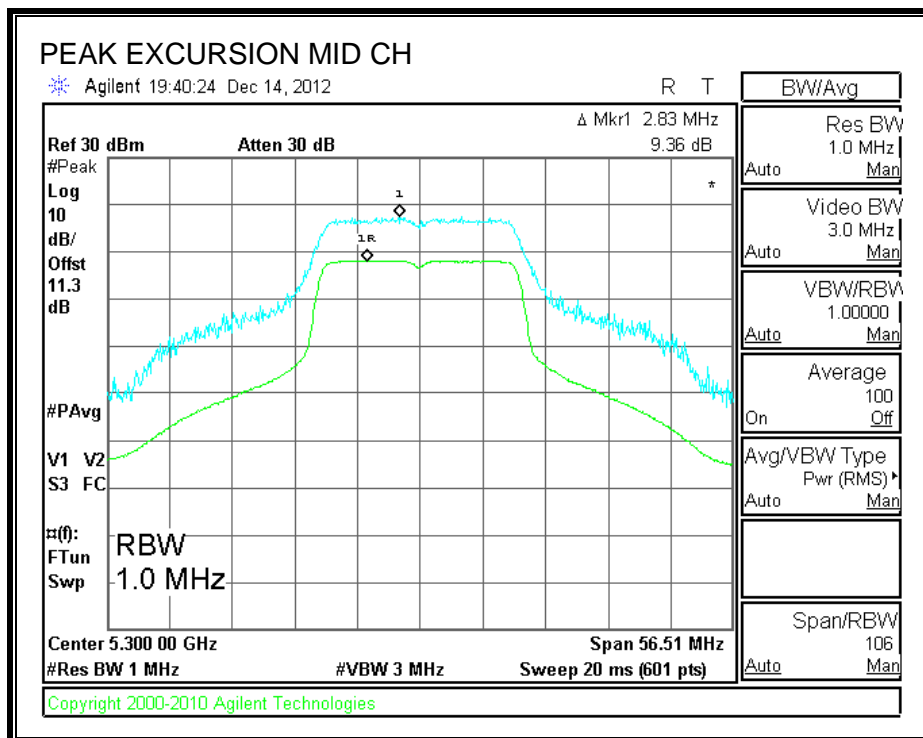
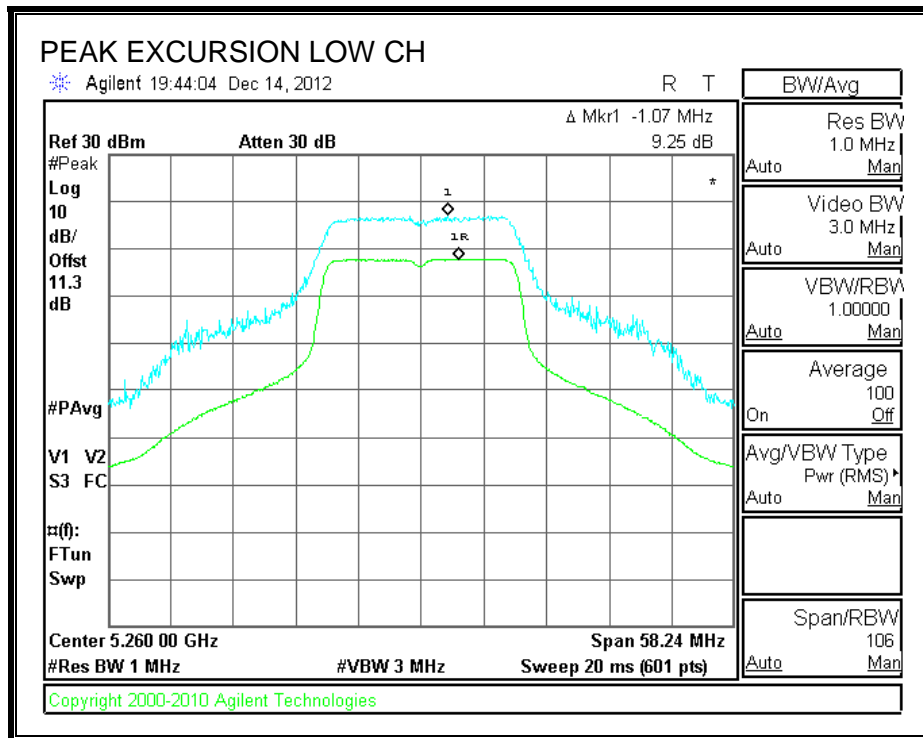
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	9.25	13	-3.75
Middle	5300	9.36	13	-3.64
High	5320	9.45	13	-3.55

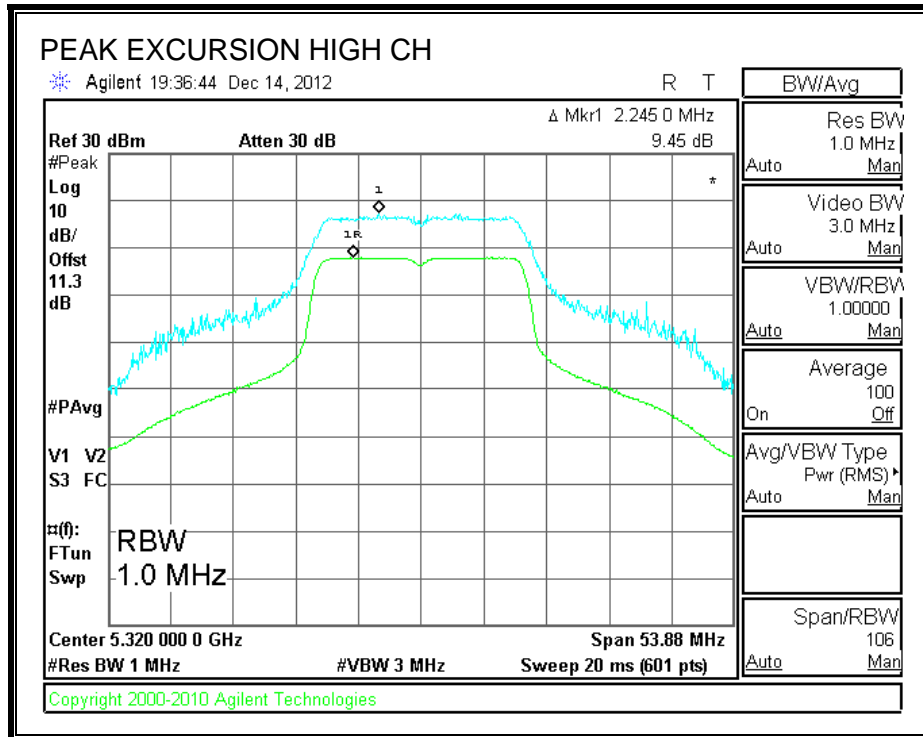
CHAIN 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	9.49	13	-3.51
Middle	5300	9.39	13	-3.61
High	5320	9.81	13	-3.19

CHAIN 0

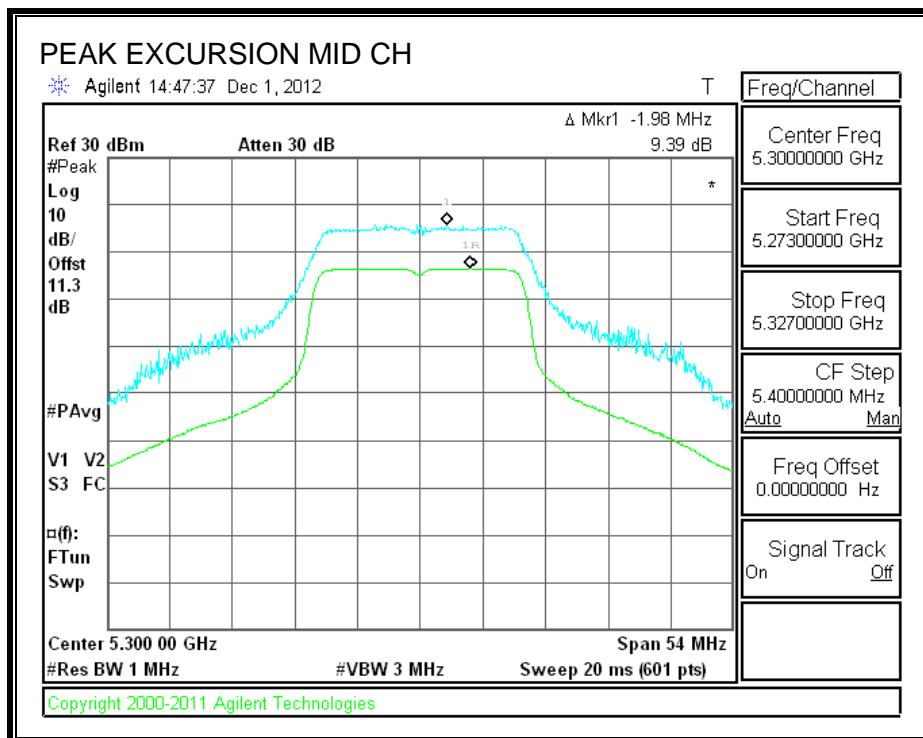
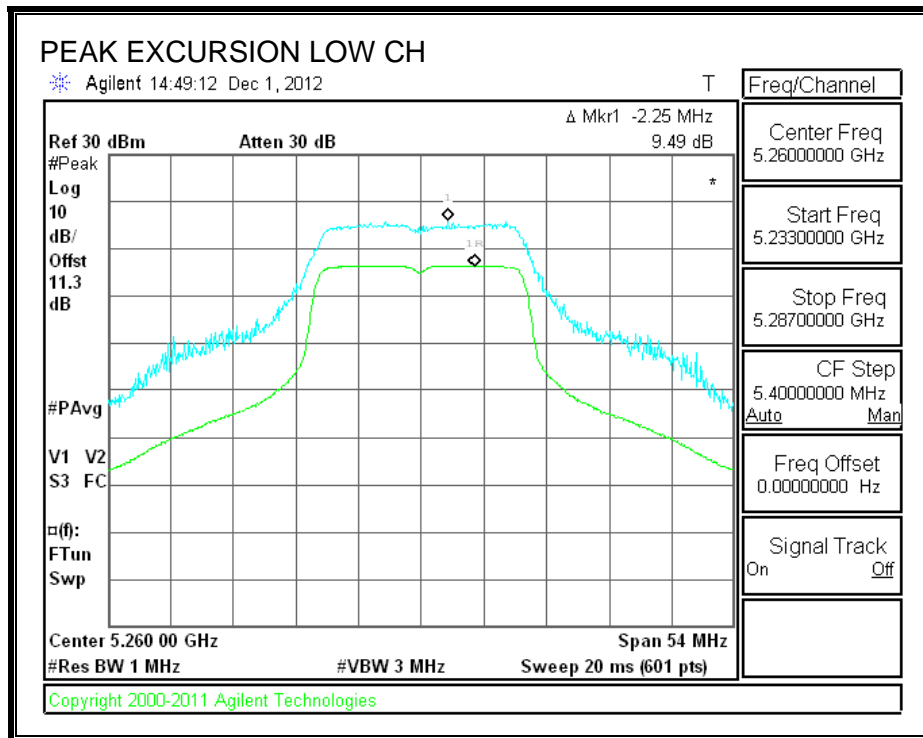
PEAK EXCURSION

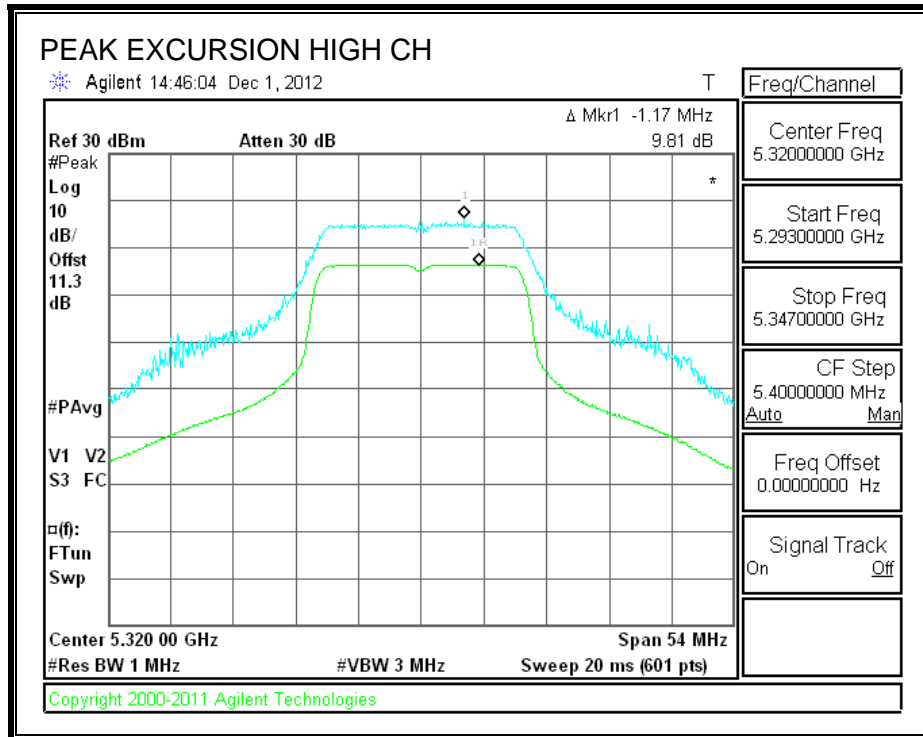




CHAIN 1

PEAK EXCURSION





8.3. 802.11n HT20, SDM MODE IN THE 5.3 GHz BAND

8.3.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

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

RESULTS

CHAIN 0

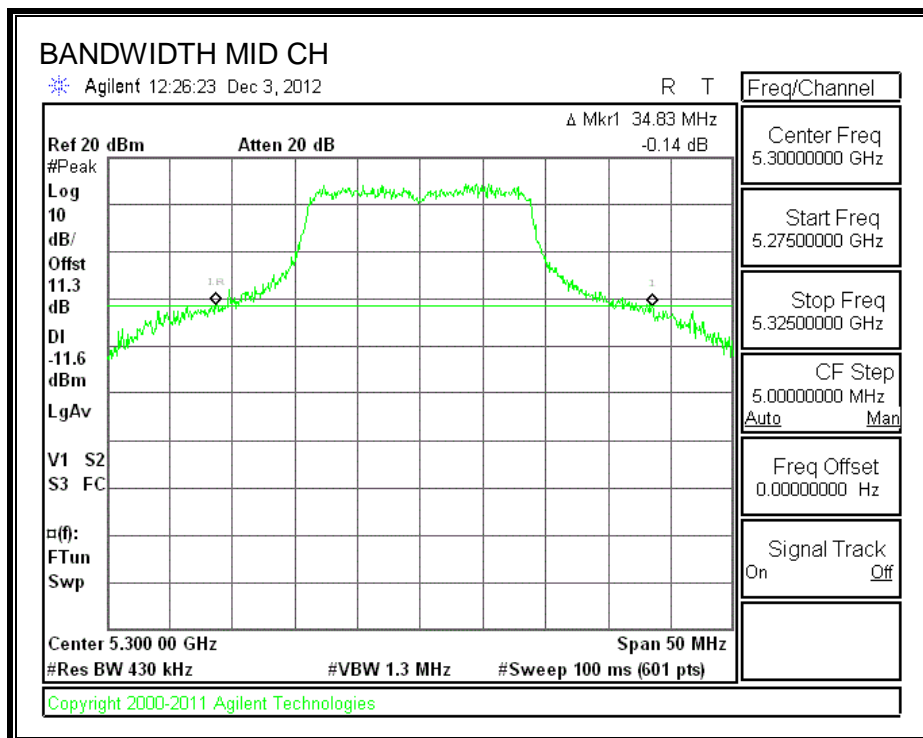
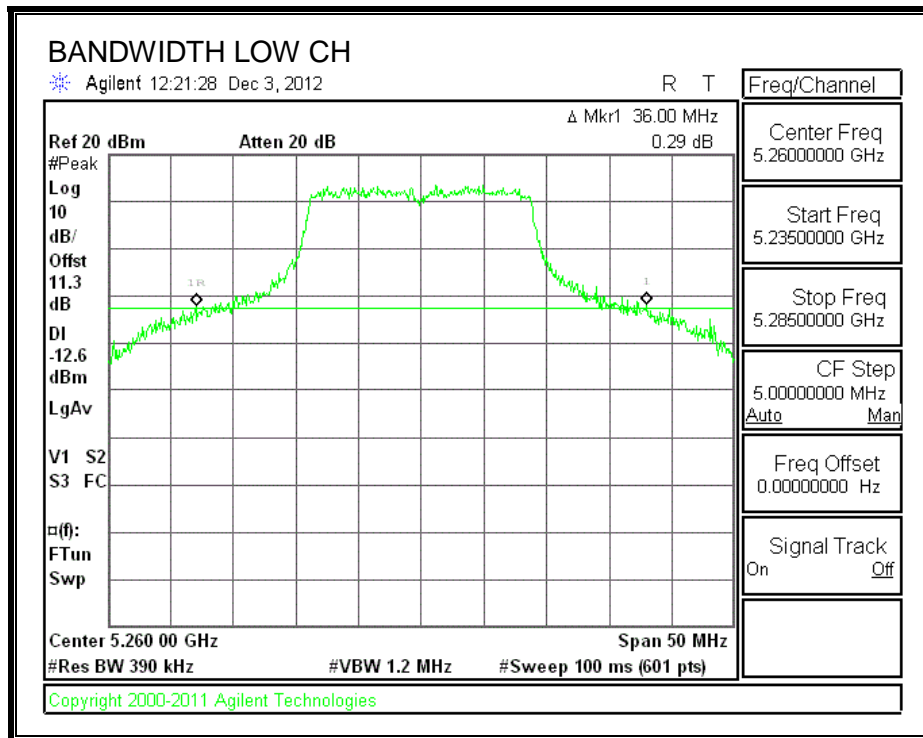
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	36.00	17.7464
Middle	5300	34.83	17.7691
High	5320	33.50	17.7208

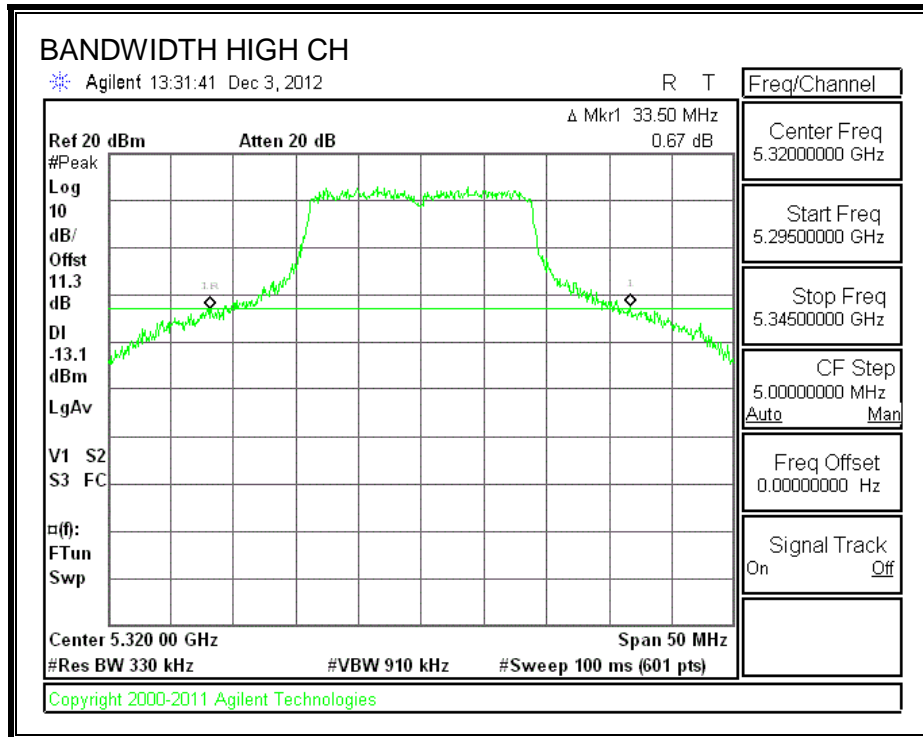
CHAIN 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	37.17	17.8621
Middle	5300	40.58	17.9381
High	5320	35.50	17.8519

CHAIN 0

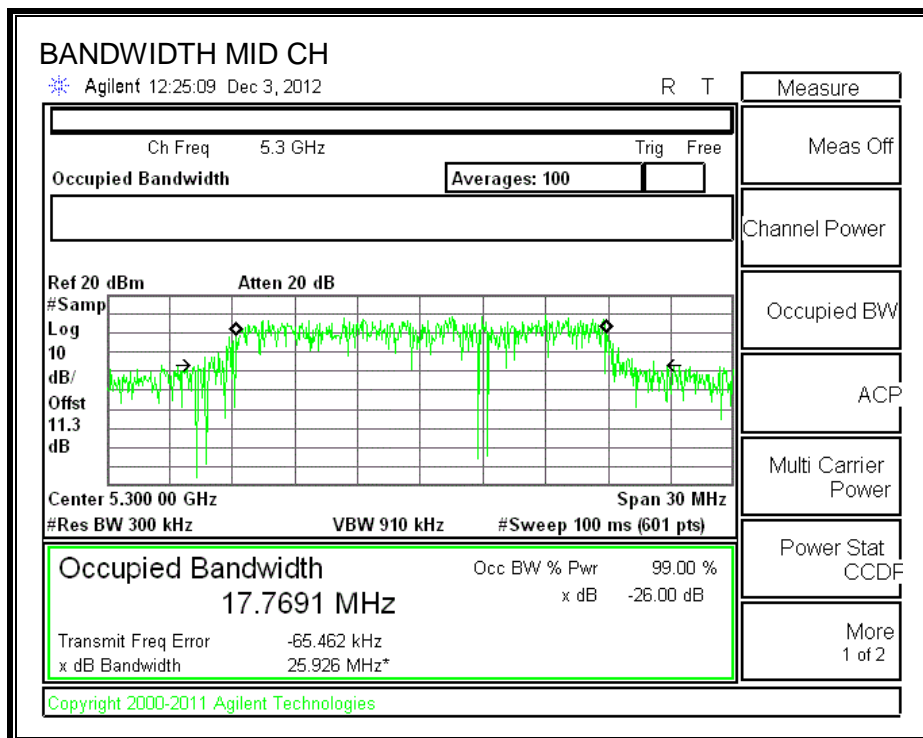
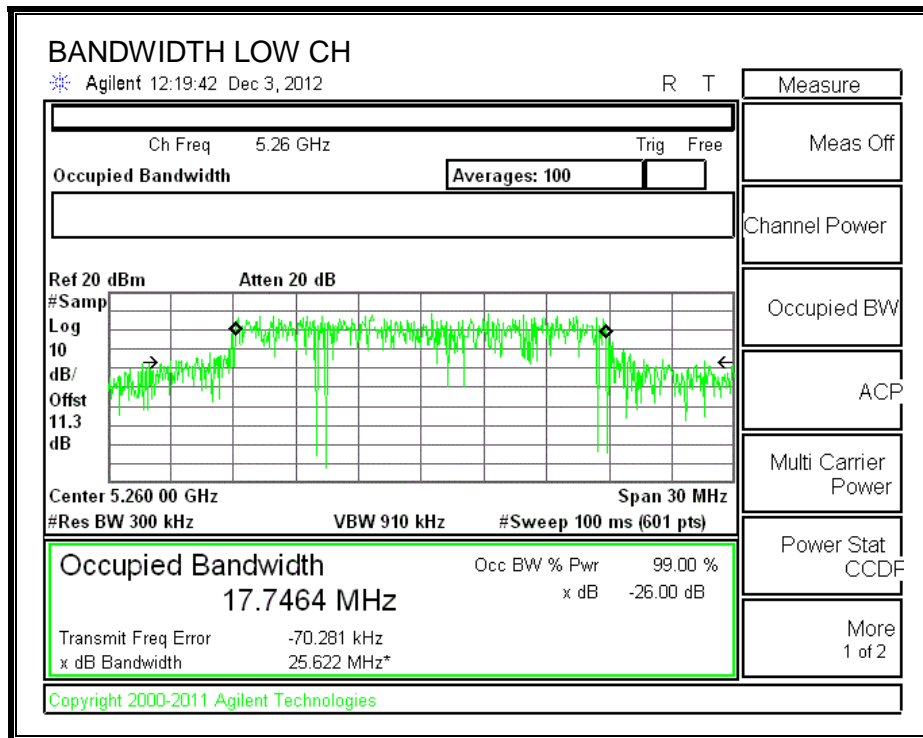
26 dB BANDWIDTH

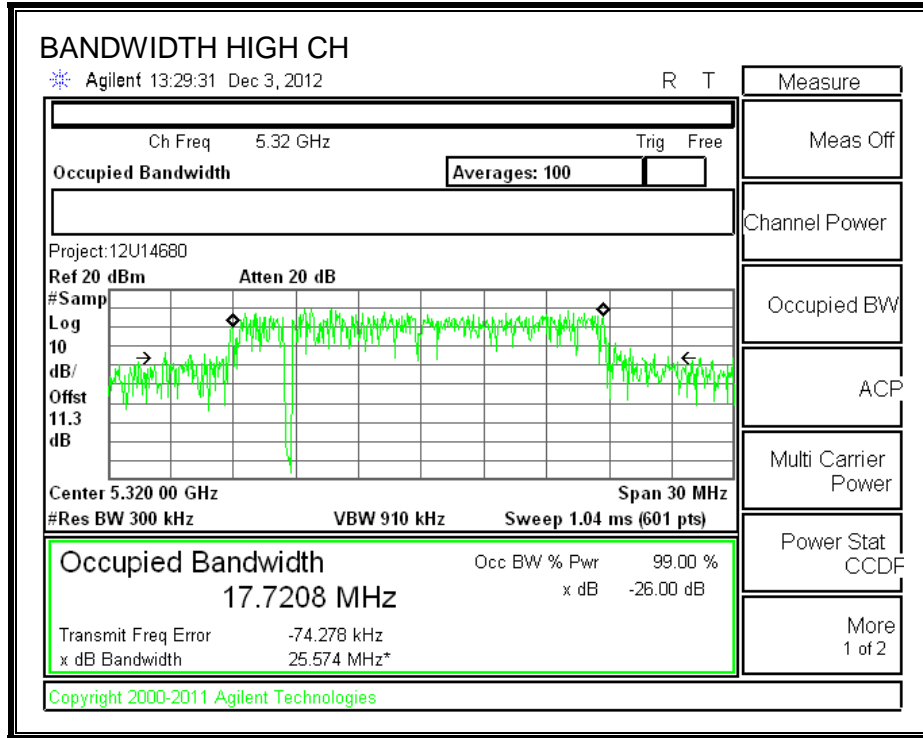




CHAIN 0

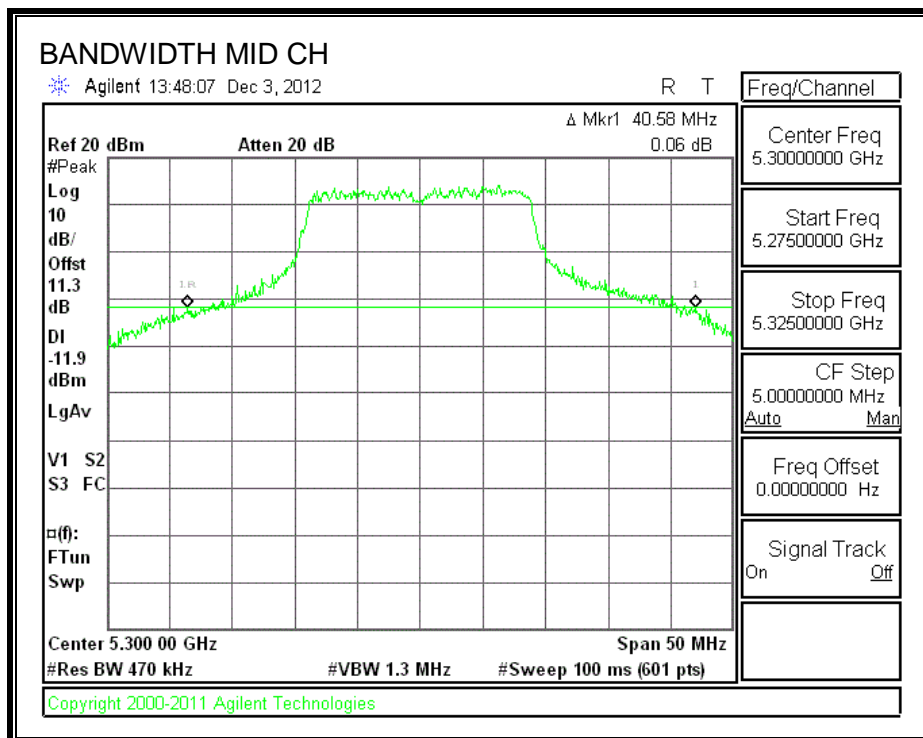
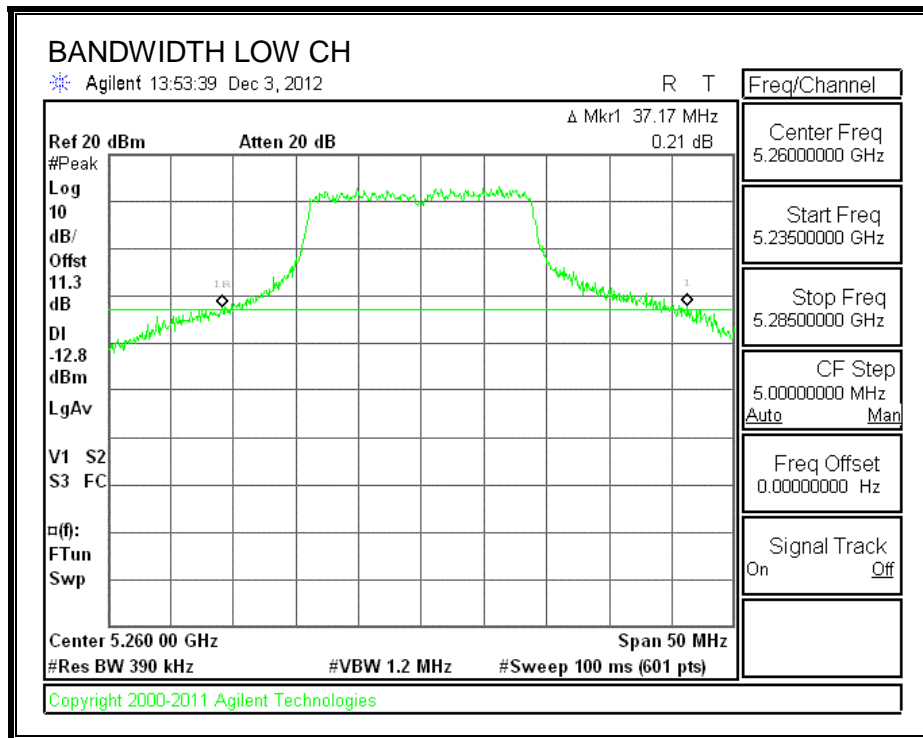
99% BANDWIDTH

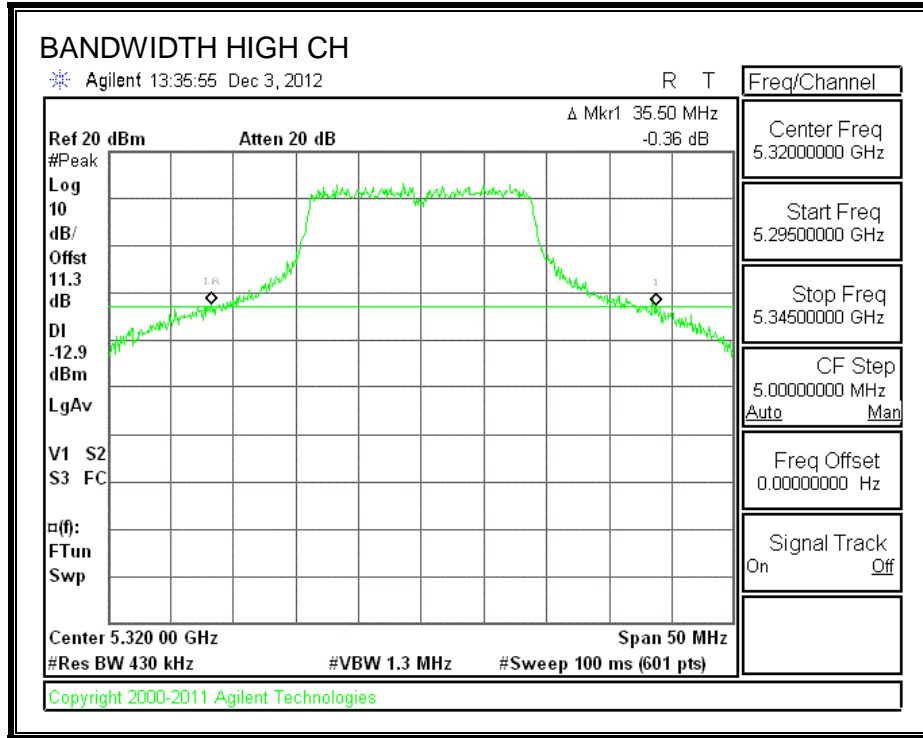




CHAIN 1

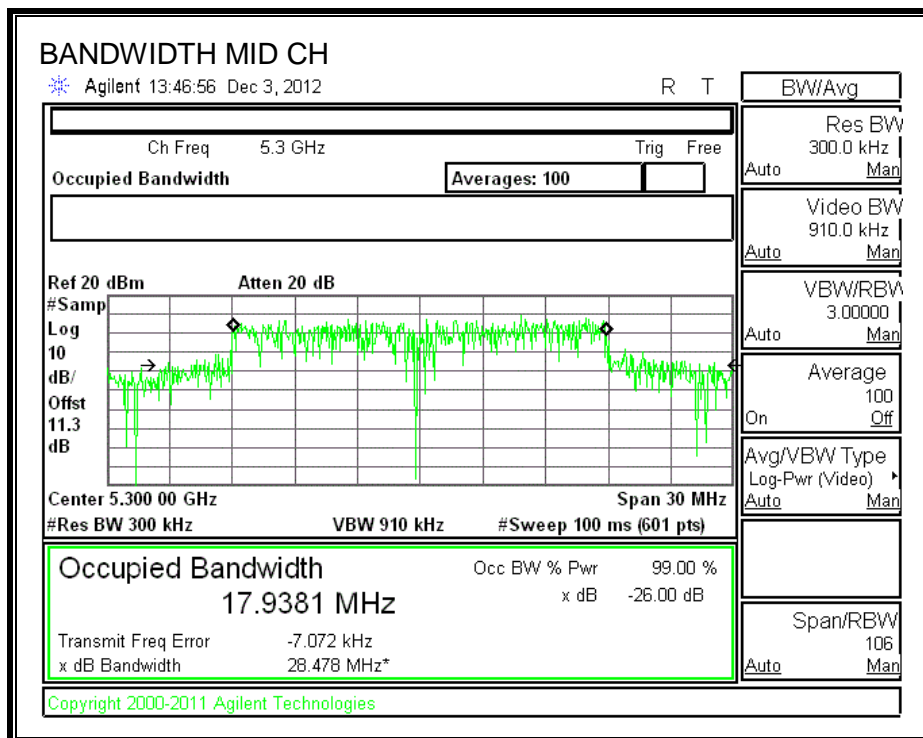
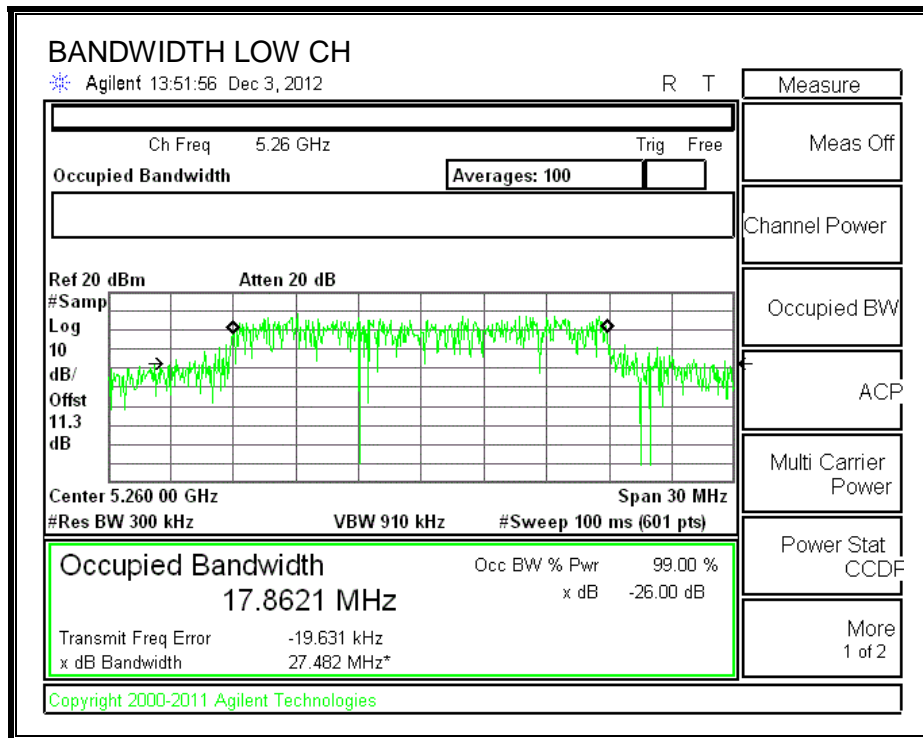
26 dB BANDWIDTH

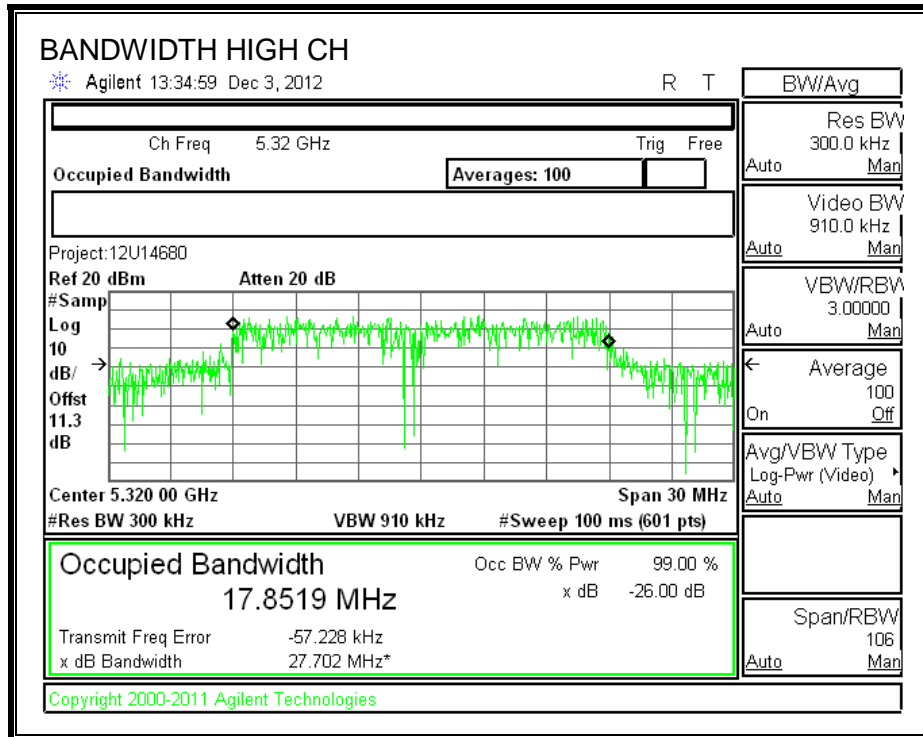




CHAIN 1

99% BANDWIDTH





8.3.2. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

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

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is 2 dBi.

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	36.00	17.7464	2.00
Mid	5300	34.83	17.7691	2.00
High	5320	33.50	17.7208	2.00

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	24.00	23.49	29.49	23.49	11.00	11.00	11.00
Mid	5300	24.00	23.50	29.50	23.50	11.00	11.00	11.00
High	5320	24.00	23.48	29.48	23.48	11.00	11.00	11.00

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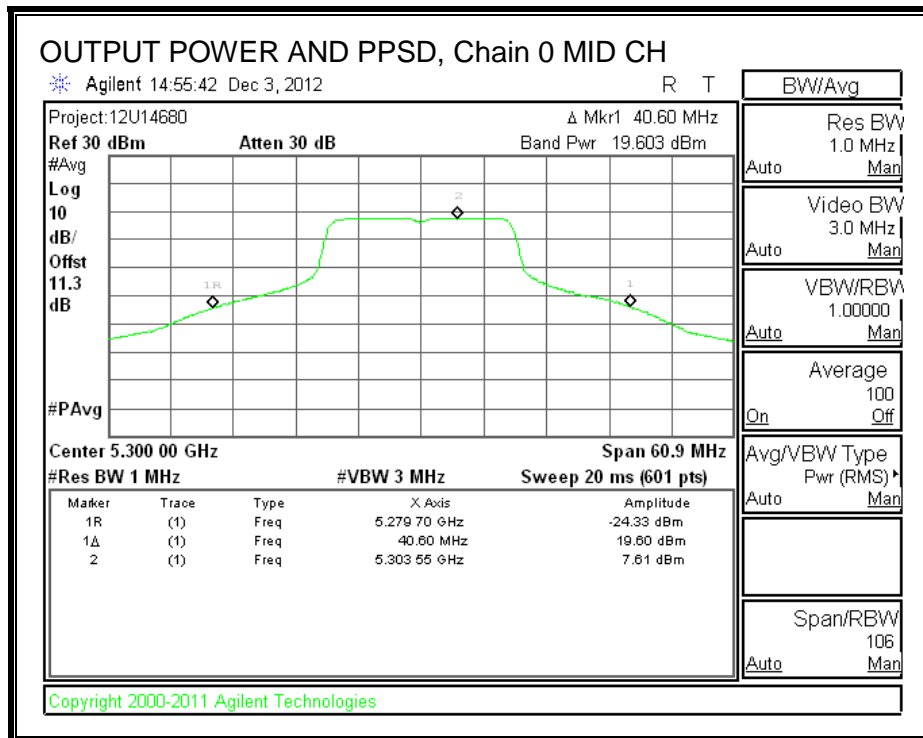
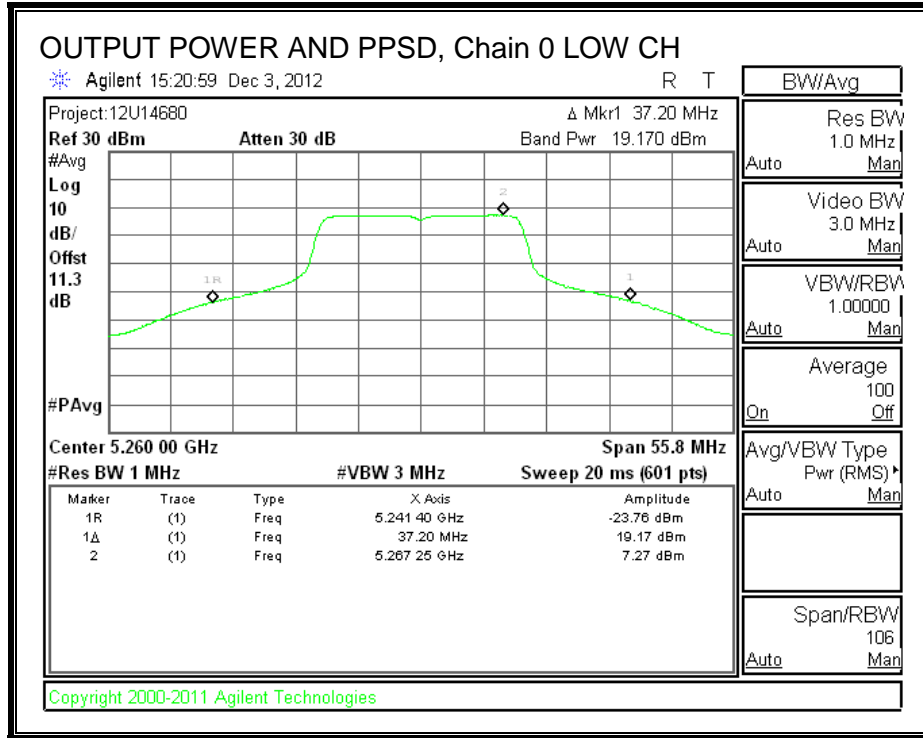
Output Power Results

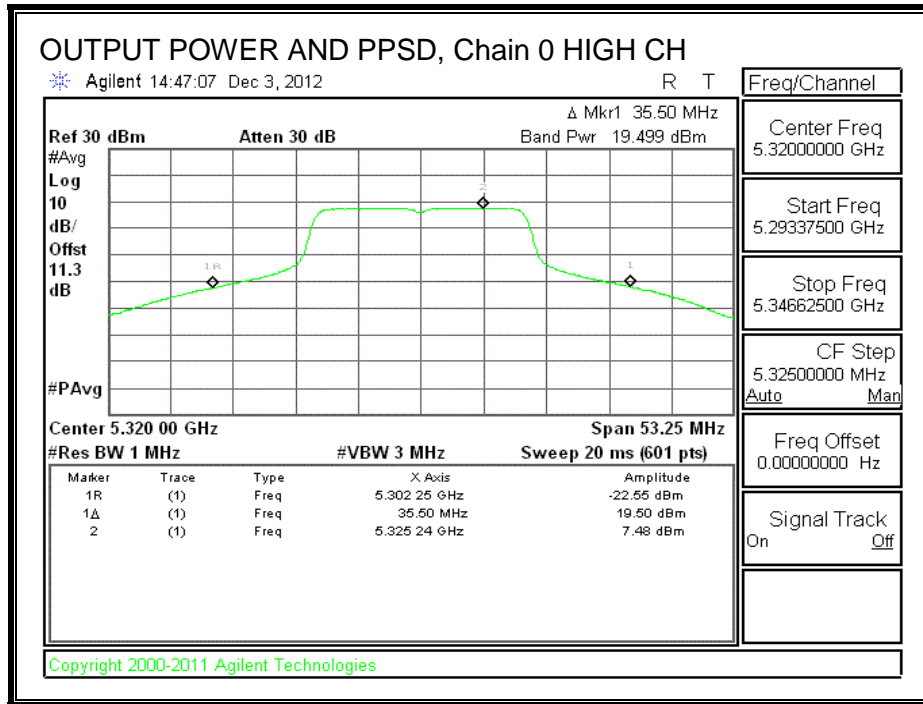
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	19.170	18.936	22.06	23.49	-1.43
Mid	5300	19.603	18.840	22.25	23.50	-1.25
High	5320	19.499	18.214	21.91	23.48	-1.57

PPSD Results

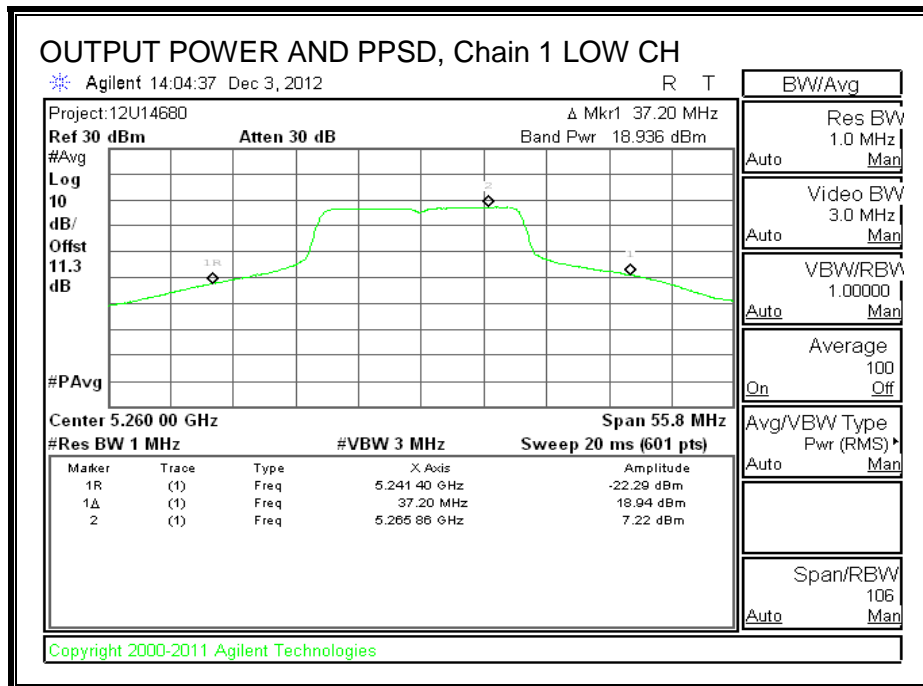
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	7.27	7.22	10.26	11.00	-0.74
Mid	5300	7.61	7.22	10.43	11.00	-0.57
High	5320	7.48	6.39	9.98	11.00	-1.02

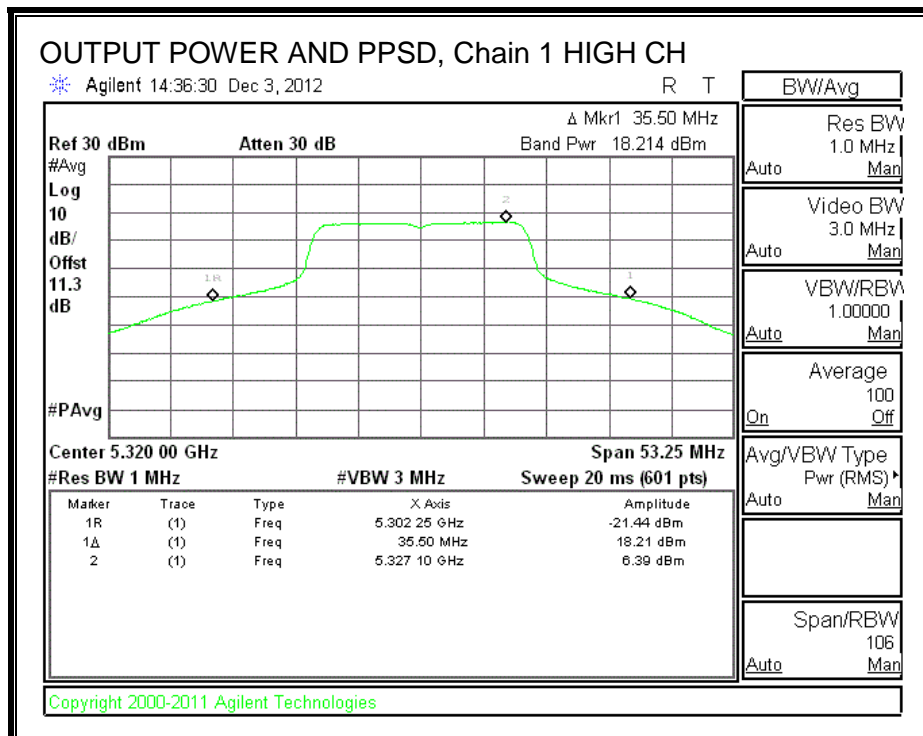
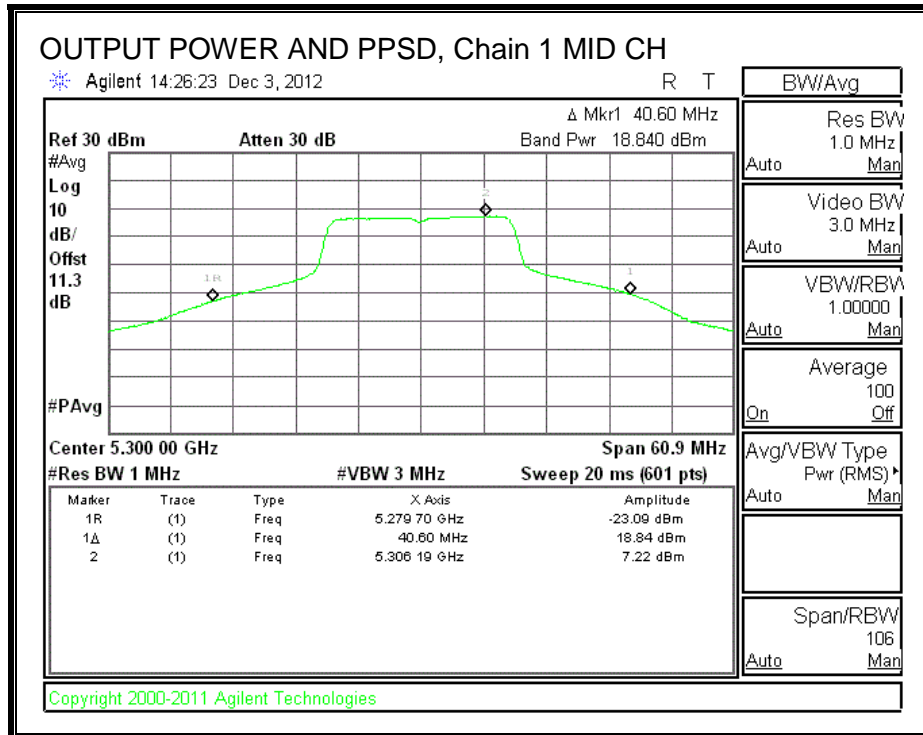
OUTPUT POWER AND PPSD, Chain 0





OUTPUT POWER AND PPSD, Chain 1





8.3.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11.3 dB (including 10 dB pad and 1.3 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Chain 1 Power (dBm)	Chain 2 Power (dBm)	Total Power (dBm)
Low	5260	19.15	18.93	22.05
Middle	5300	19.60	18.82	22.24
High	5320	19.48	18.20	21.90

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.

TEST PROCEDURE

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

RESULTS

CHAIN 0

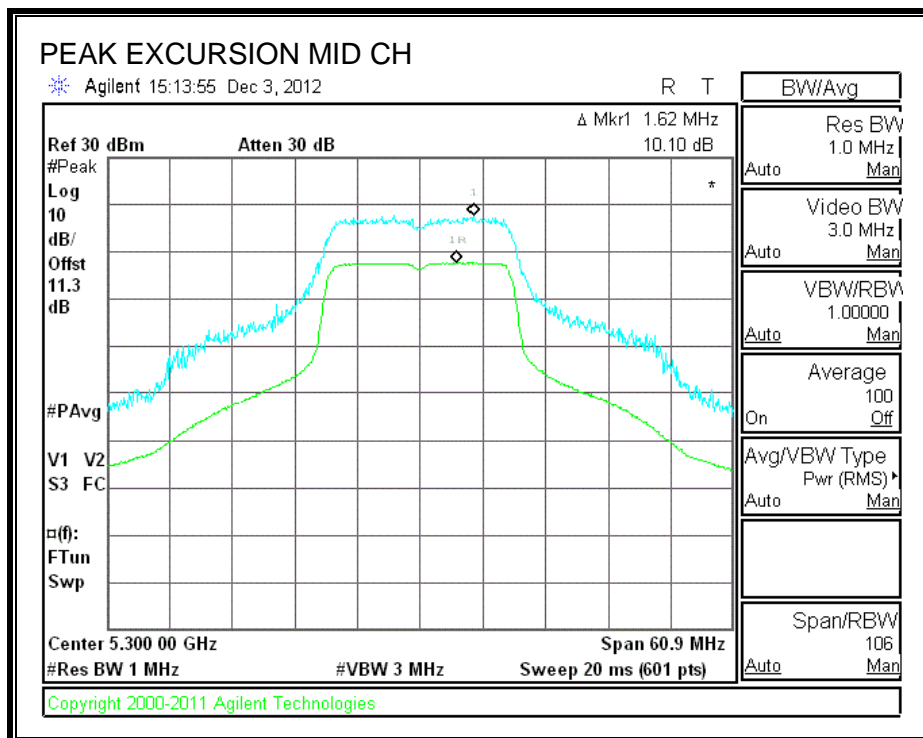
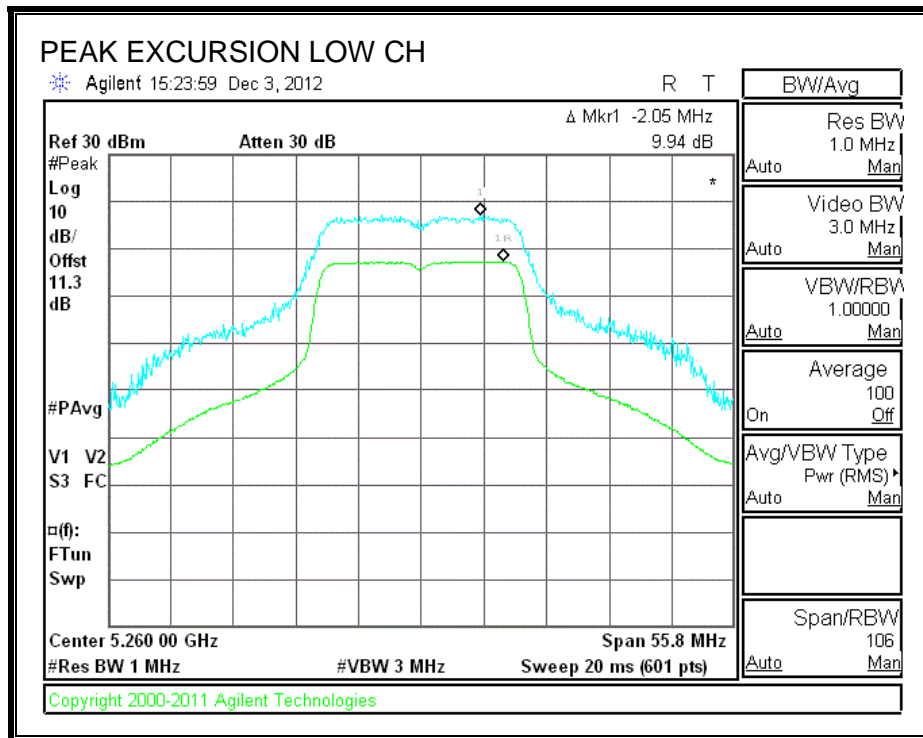
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	9.94	13	-3.06
Middle	5300	10.10	13	-2.90
High	5320	9.83	13	-3.17

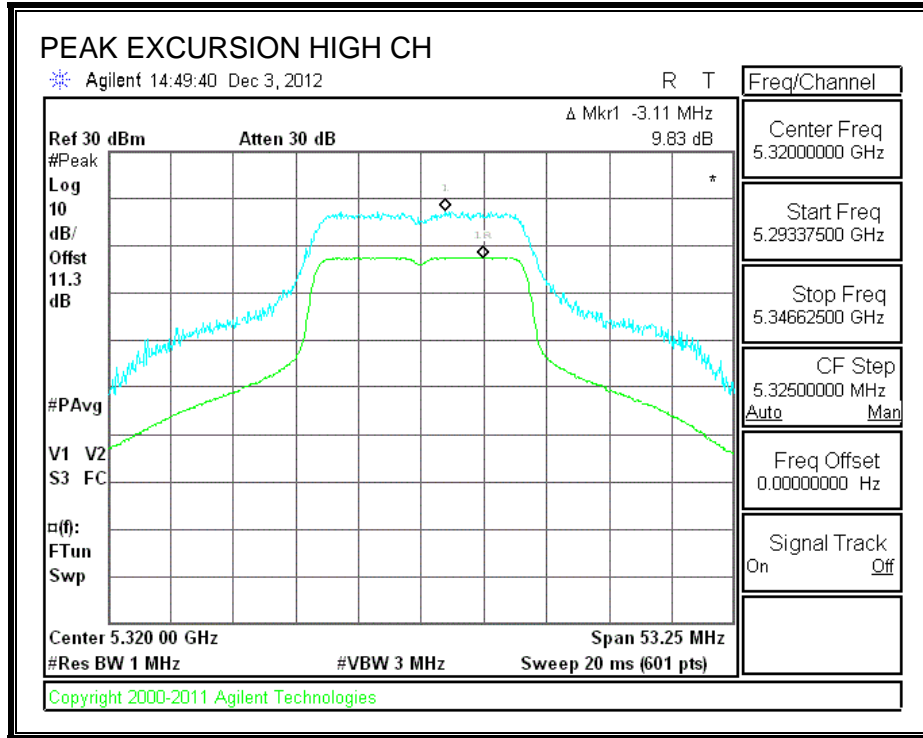
CHAIN 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	10.29	13	-2.71
Middle	5300	9.37	13	-3.63
High	5320	9.84	13	-3.16

CHAIN 0

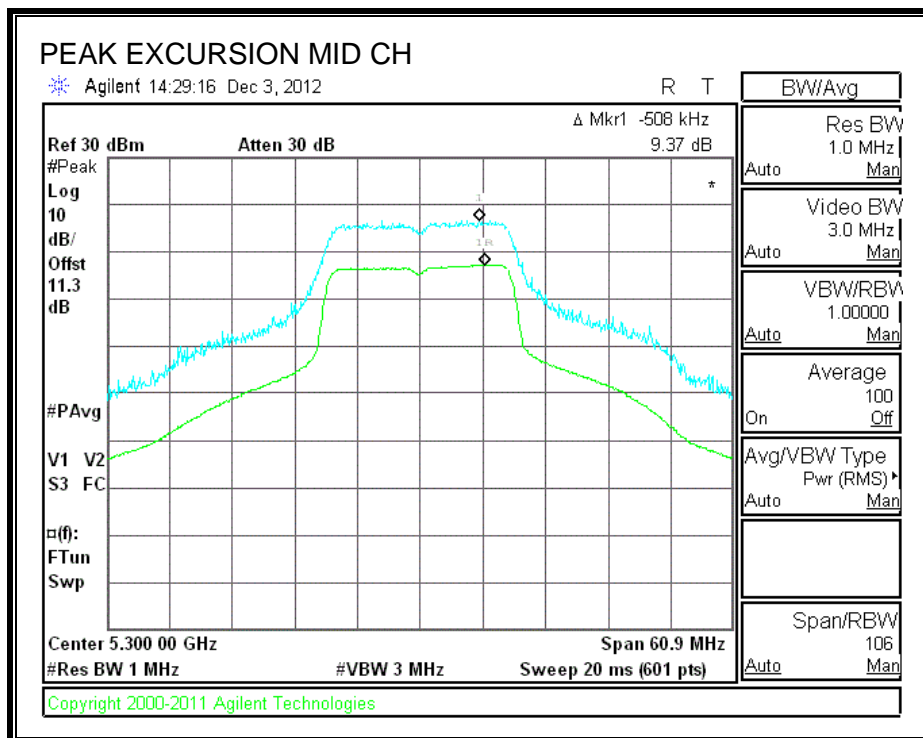
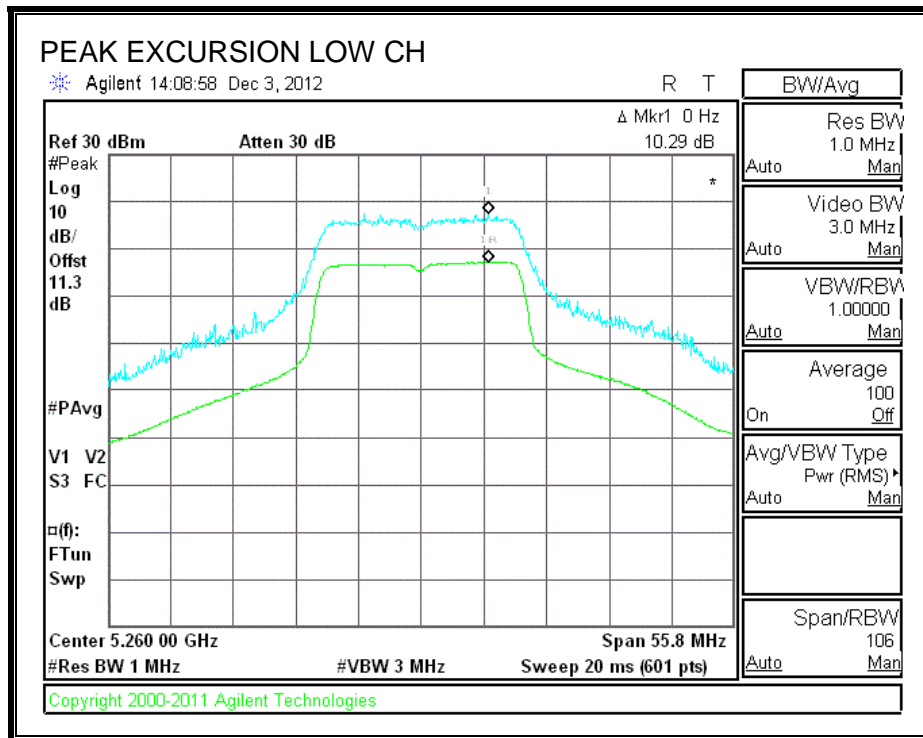
PEAK EXCURSION

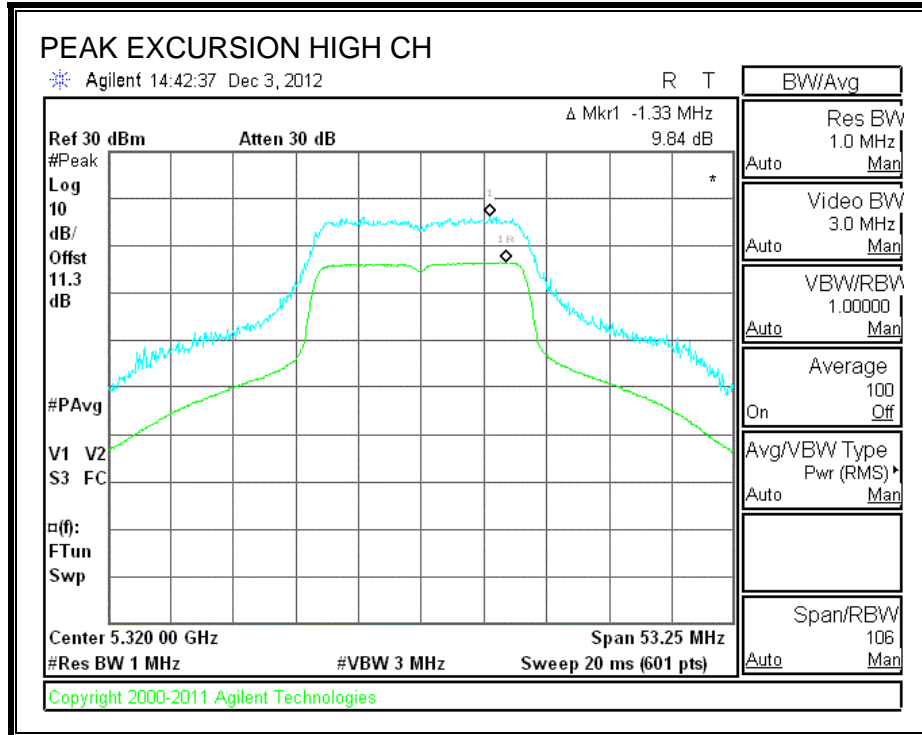




CHAIN 1

PEAK EXCURSION





8.4. 802.11n HT40, CDD MODE IN THE 5.3 GHz BAND

8.4.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

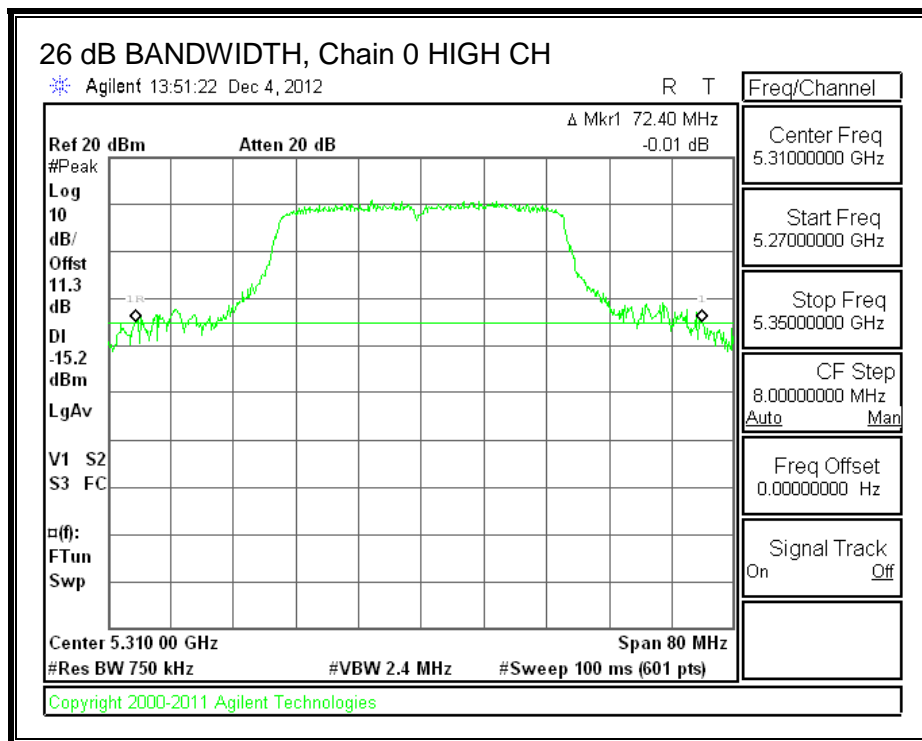
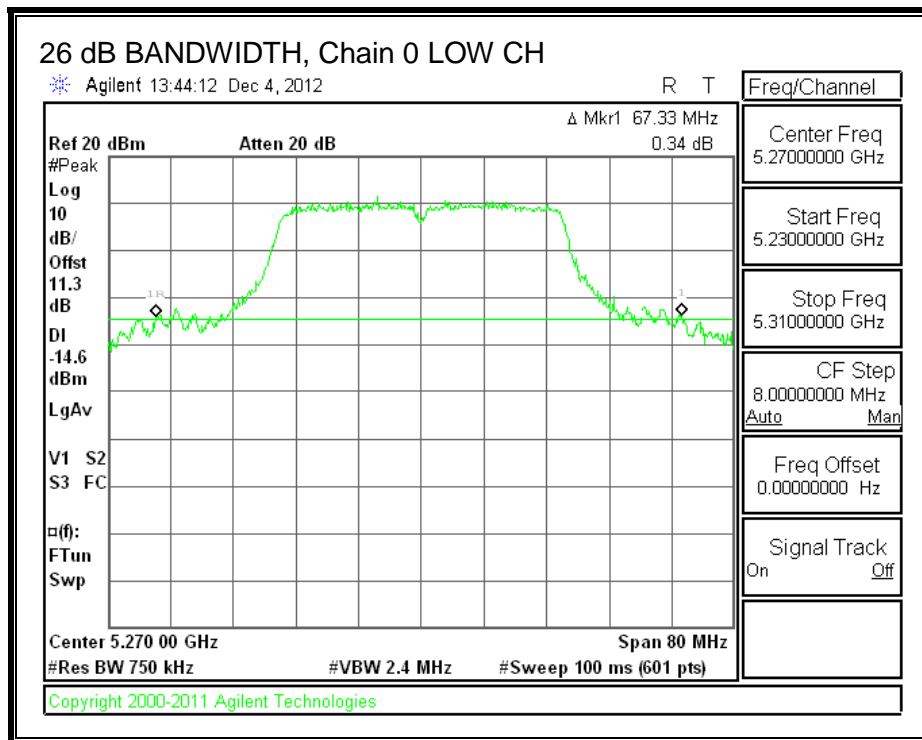
CHAIN 0

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	67.33	36.1878
High	5310	72.40	36.2391

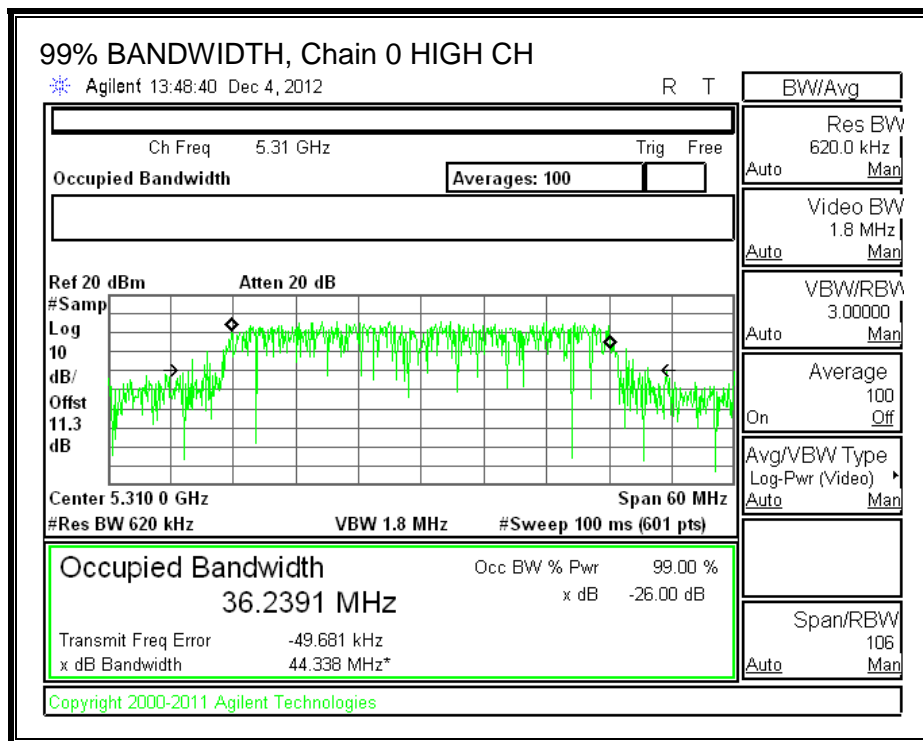
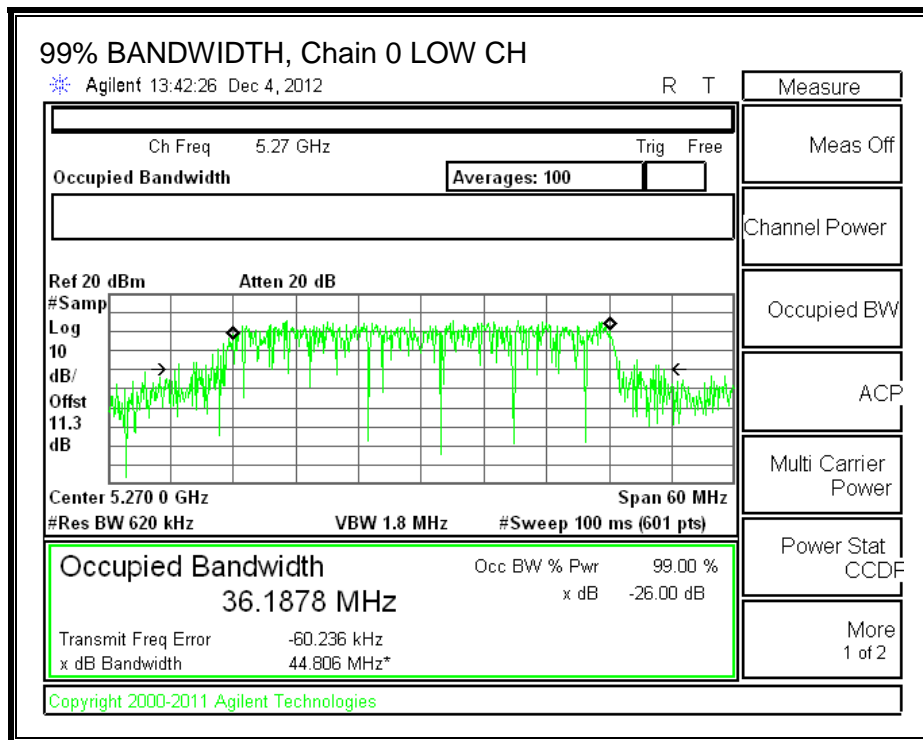
CHAIN 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	81.50	36.4578
High	5310	73.07	36.4580

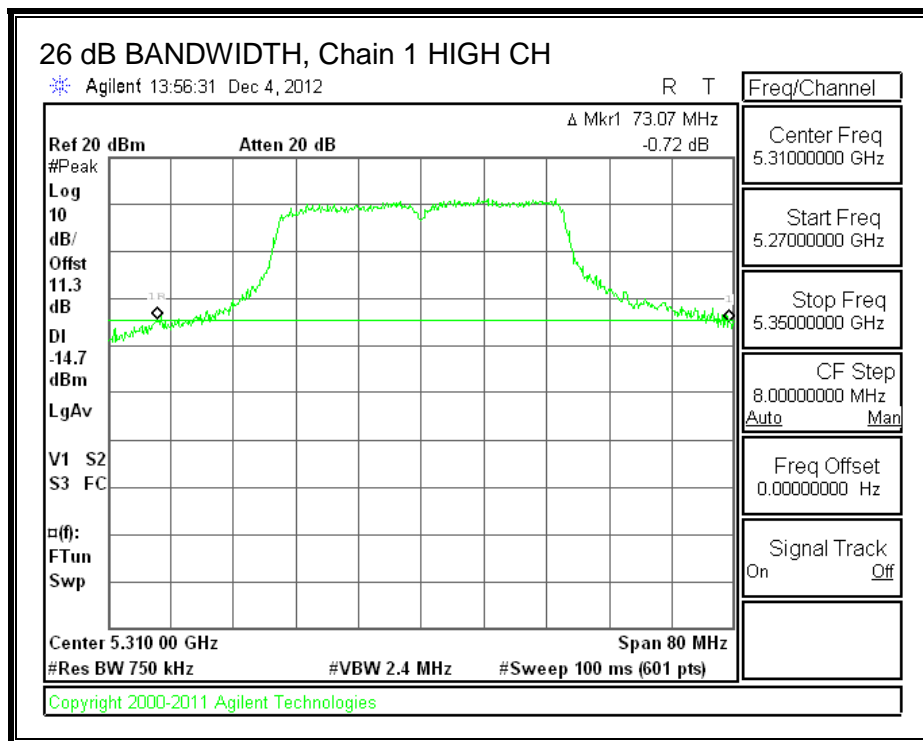
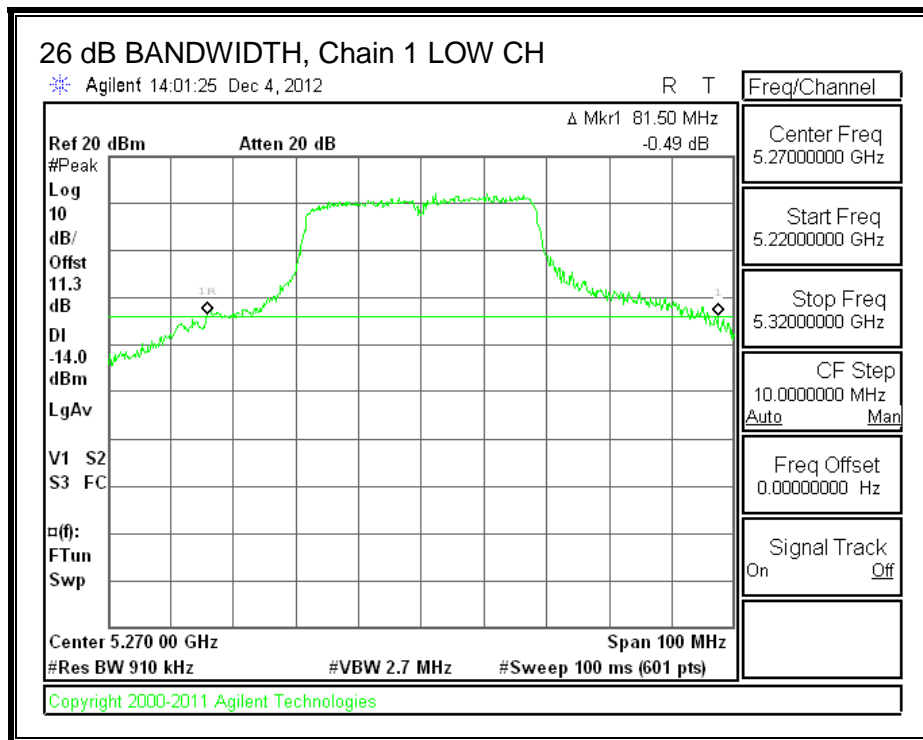
26 dB BANDWIDTH, Chain 0



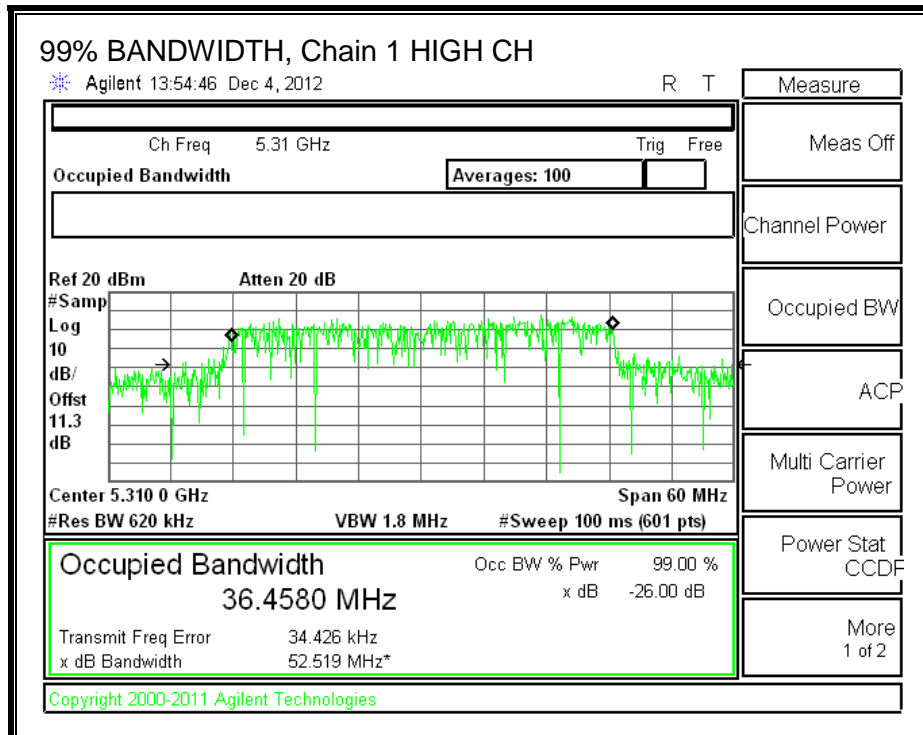
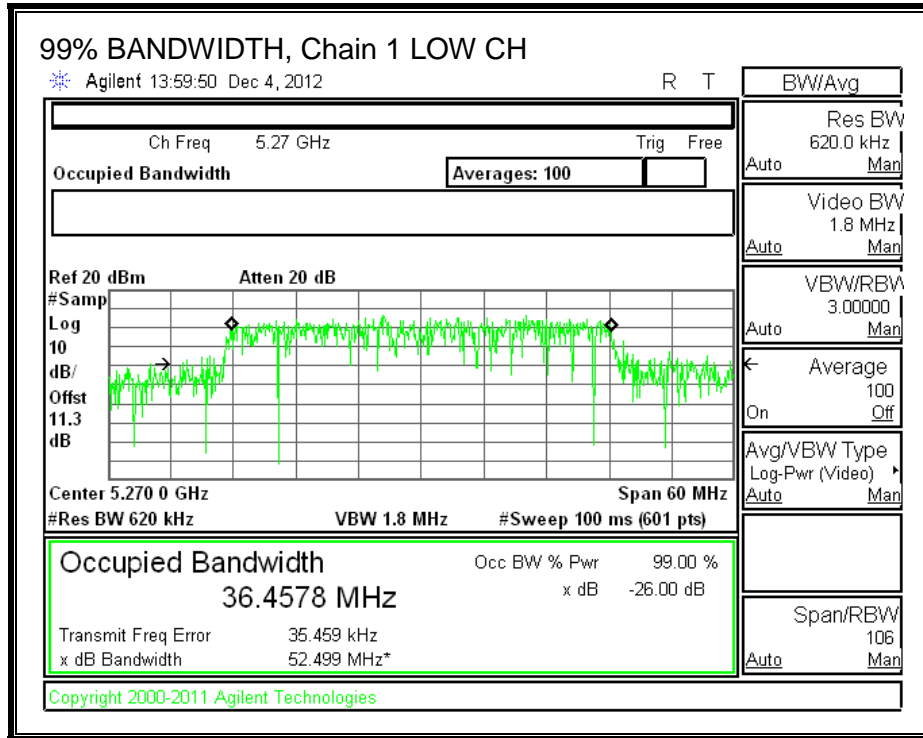
99% BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 1



8.4.2. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

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

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

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

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
2.00	3.01	5.01

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5270	67.3	36.1878	5.01
High	5310	72.0	36.2391	5.01

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5270	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5310	24.00	24.00	30.00	24.00	11.00	11.00	11.00

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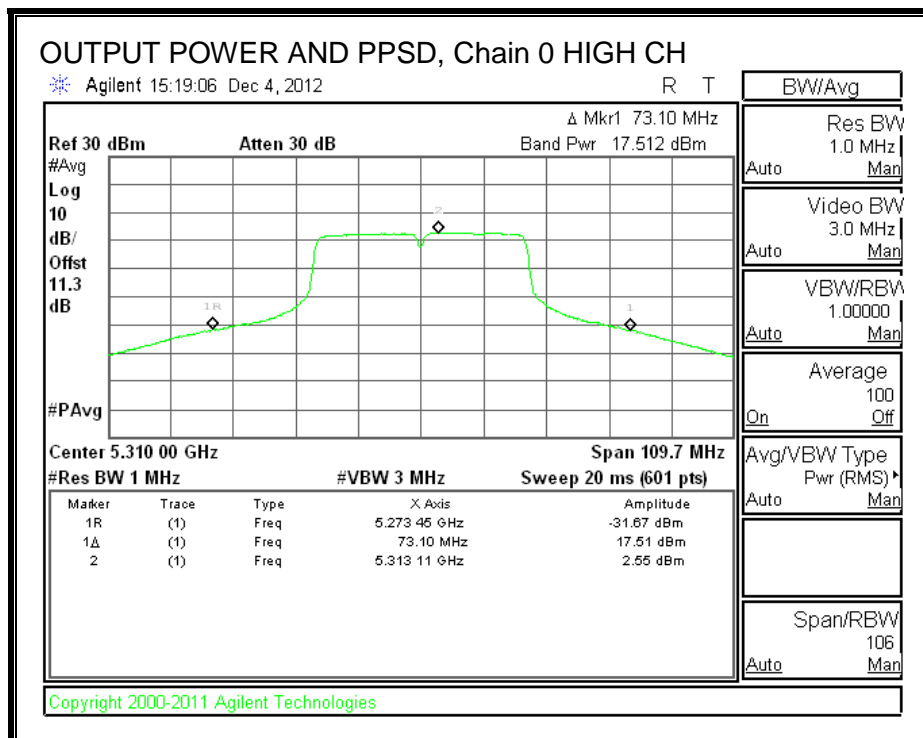
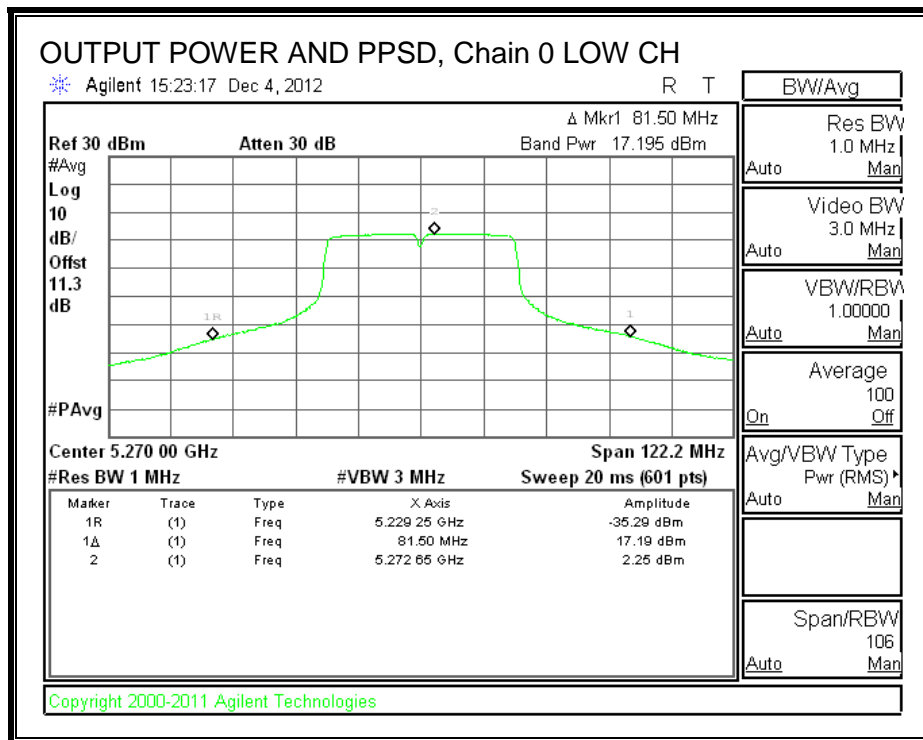
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	17.195	17.066	20.141	24.00	-3.859
High	5310	17.512	17.484	20.508	24.00	-3.492

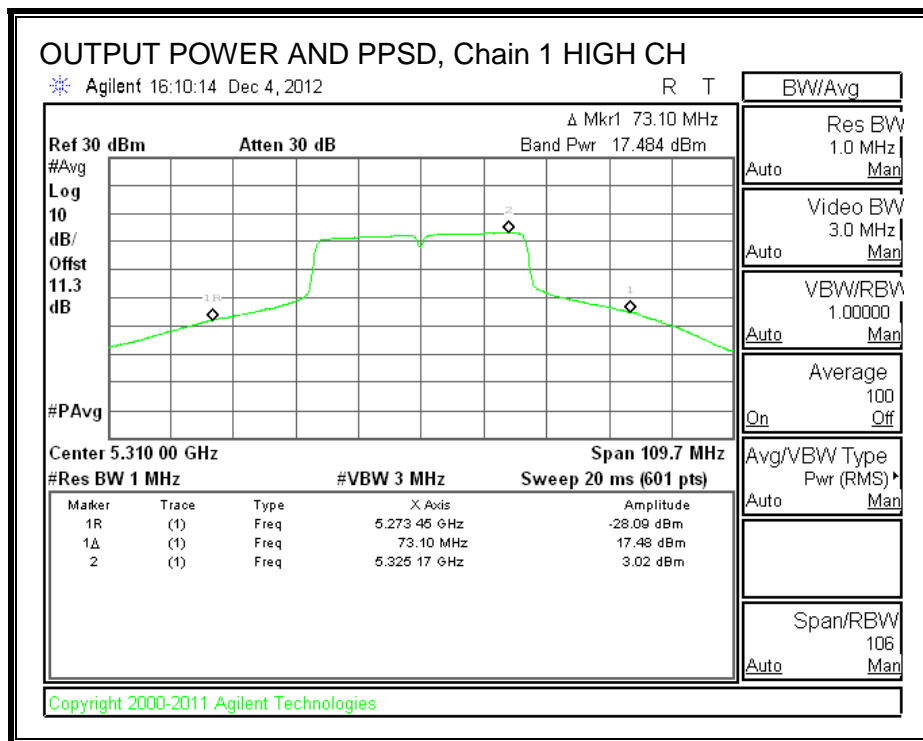
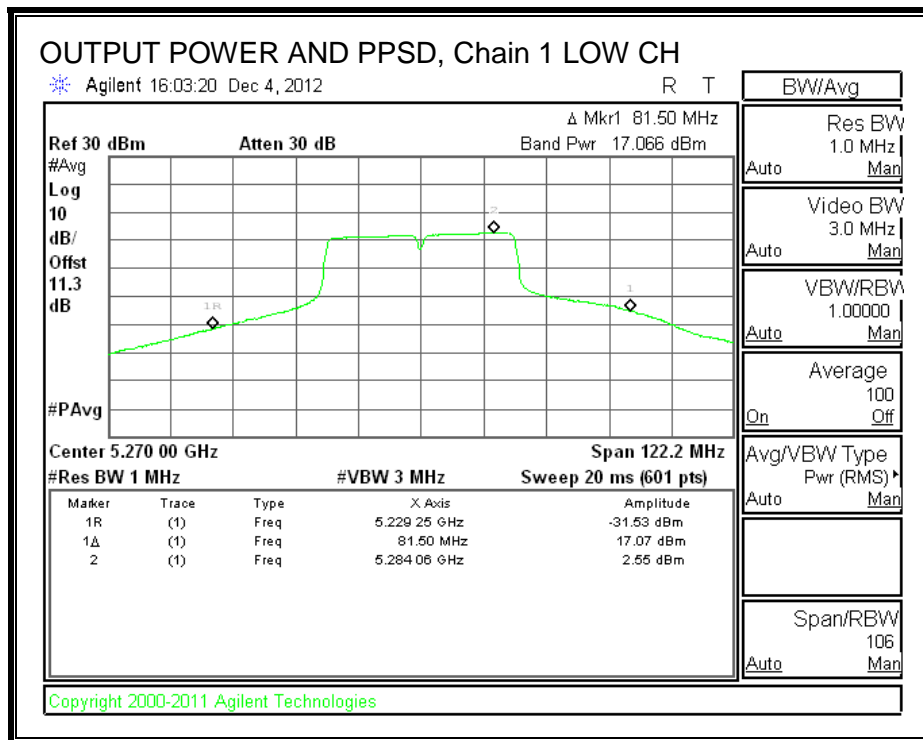
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	2.25	2.55	5.41	11.00	-5.59
High	5310	2.55	3.02	5.80	11.00	-5.20

OUTPUT POWER AND PPSD, Chain 0



OUTPUT POWER AND PPSD, Chain 1



8.4.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.3 dB (including 10 dB pad and 1.3 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5270	17.15	17.00	20.09
High	5310	17.50	17.45	20.49

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

CHAIN 0

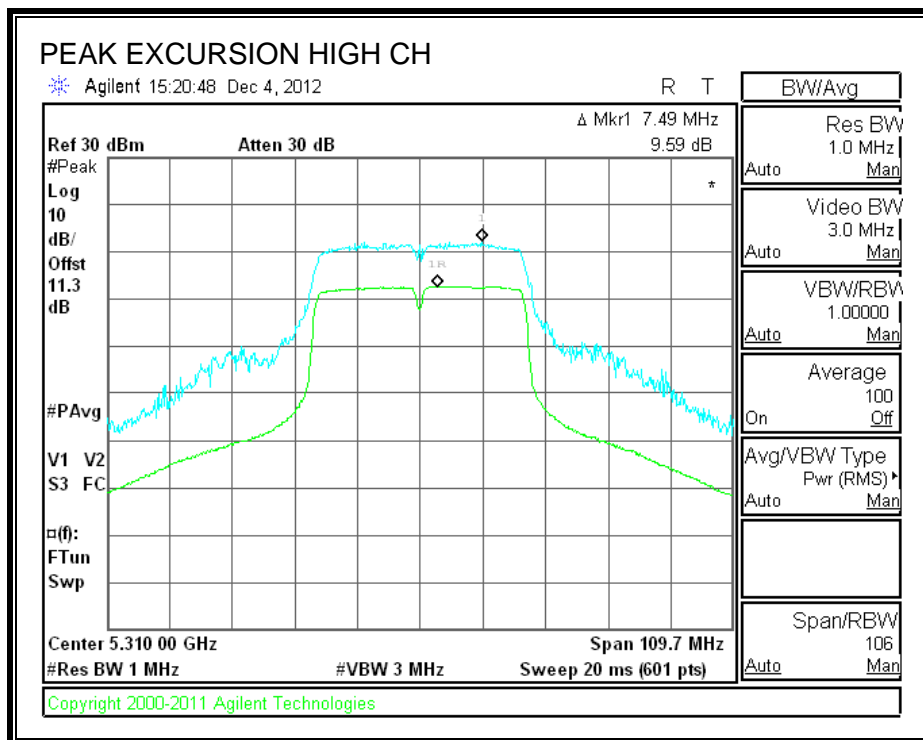
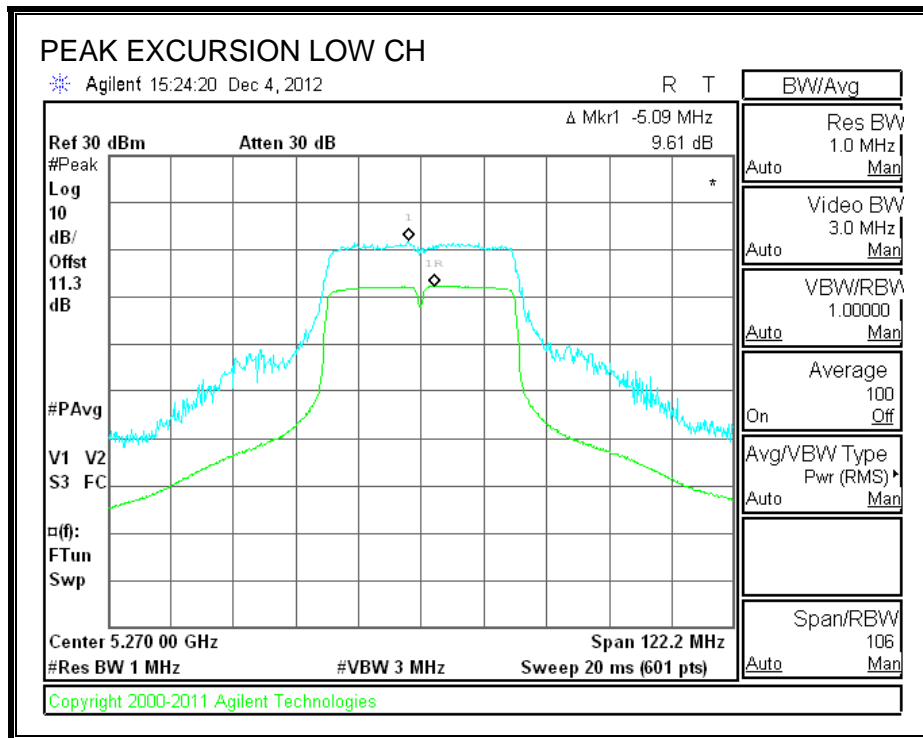
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5270	9.61	13	-3.39
High	5310	9.59	13	-3.41

CHAIN 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5270	9.69	13	-3.31
High	5310	9.80	13	-3.20

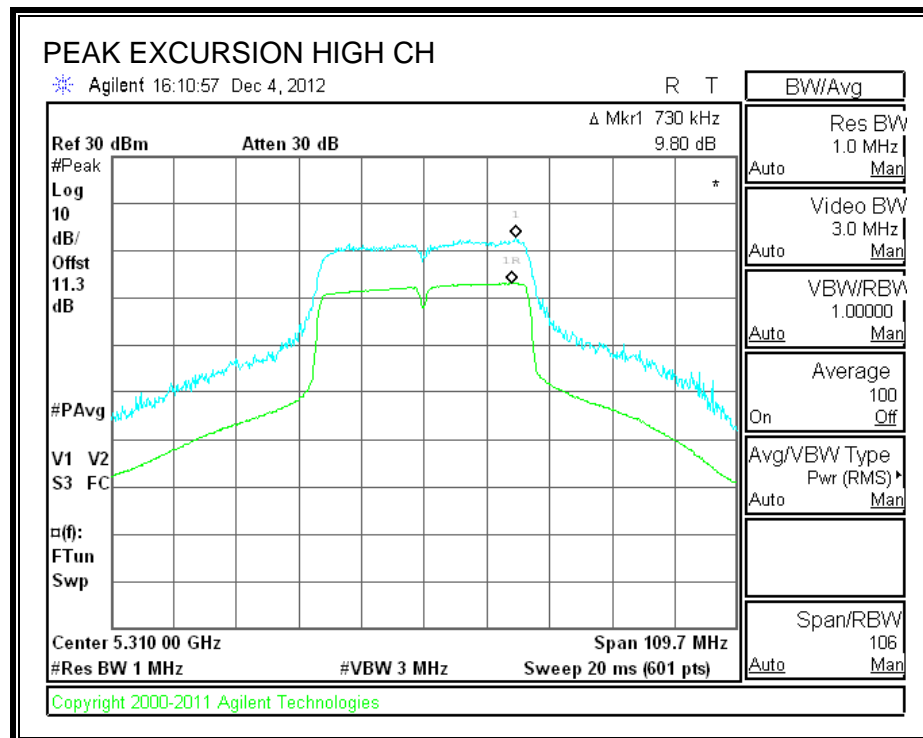
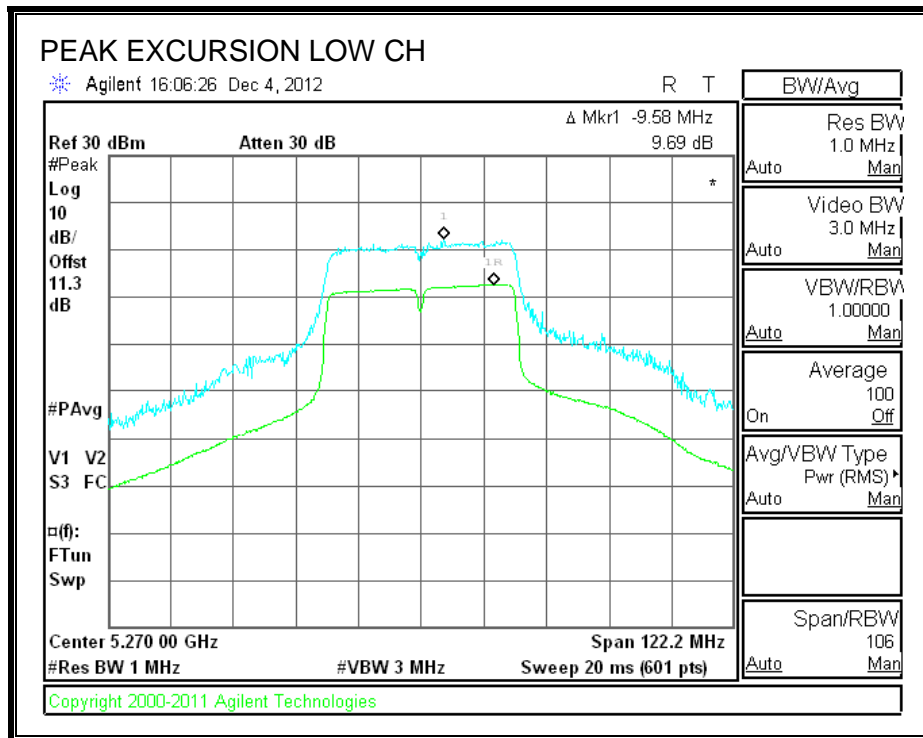
CHAIN 0

PEAK EXCURSION



CHAIN 1

PEAK EXCURSION



8.5. 802.11n HT40, SDM MODE IN THE 5.3 GHz BAND

8.5.1. 26 dB AND 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

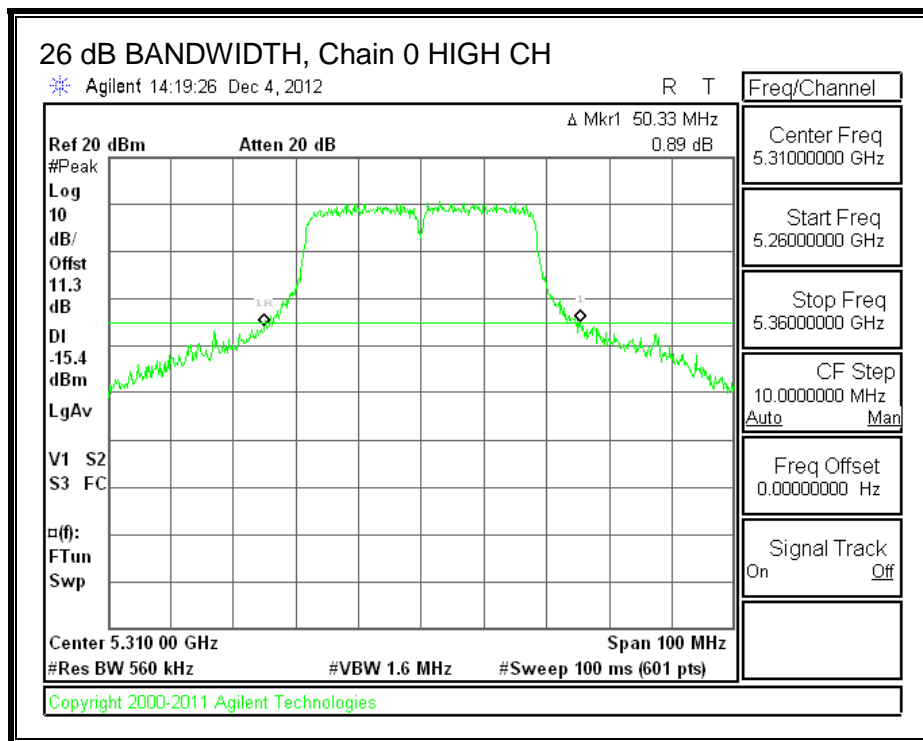
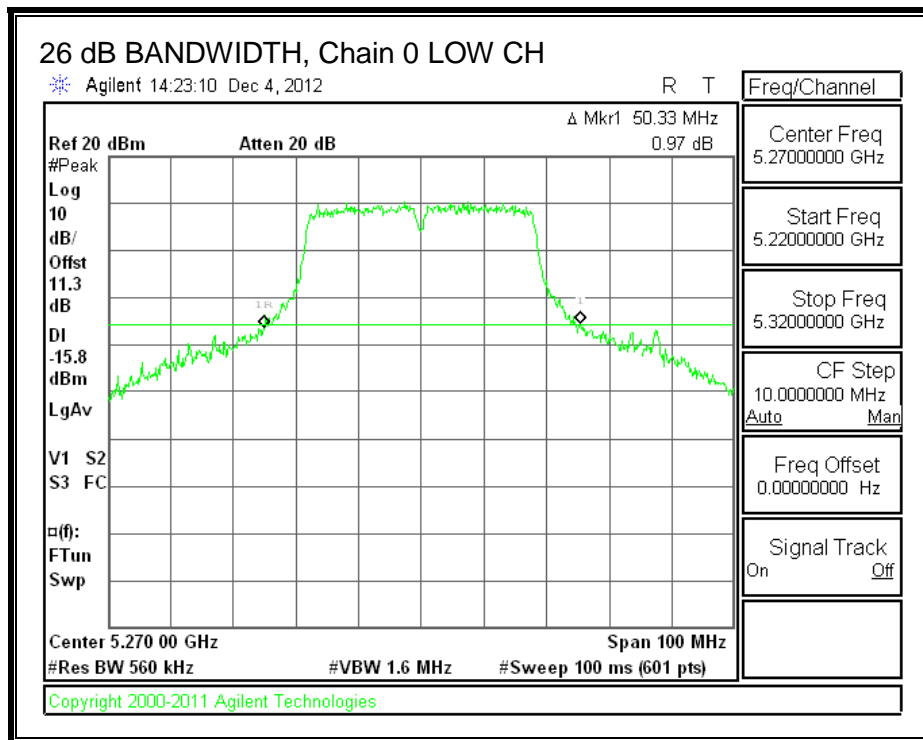
CHAIN 0

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	50.33	36.2284
High	5310	50.33	36.2214

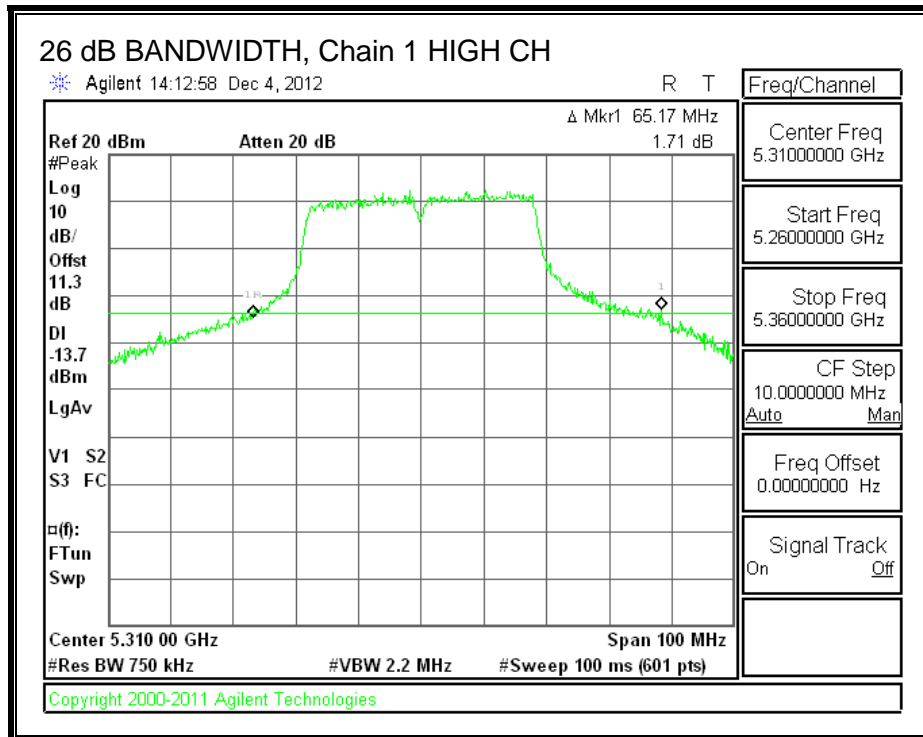
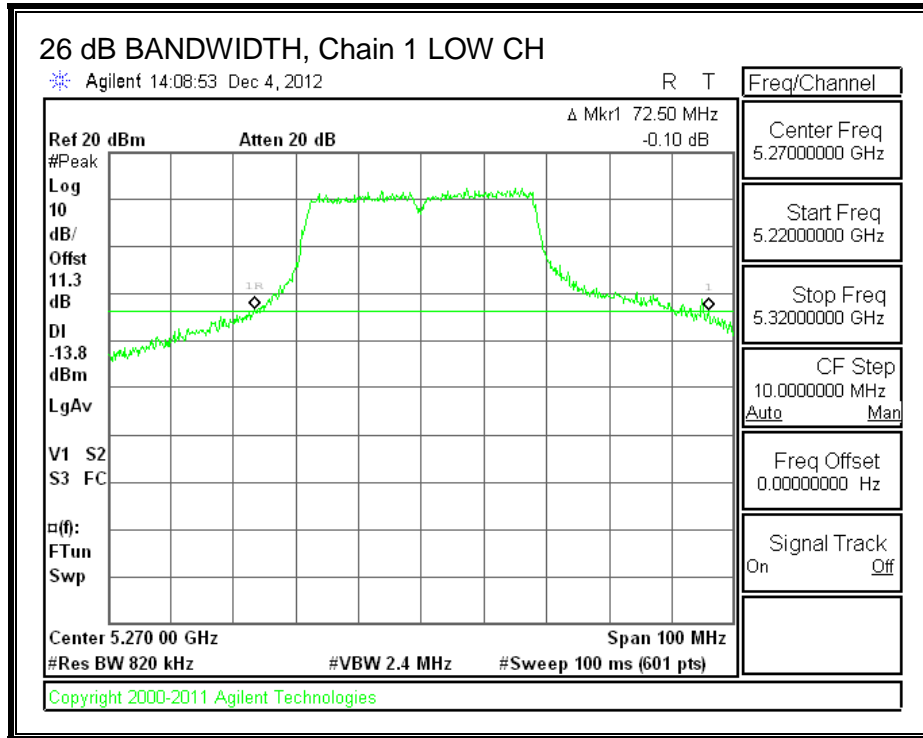
CHAIN 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	72.5	36.4548
High	5310	65.17	36.4533

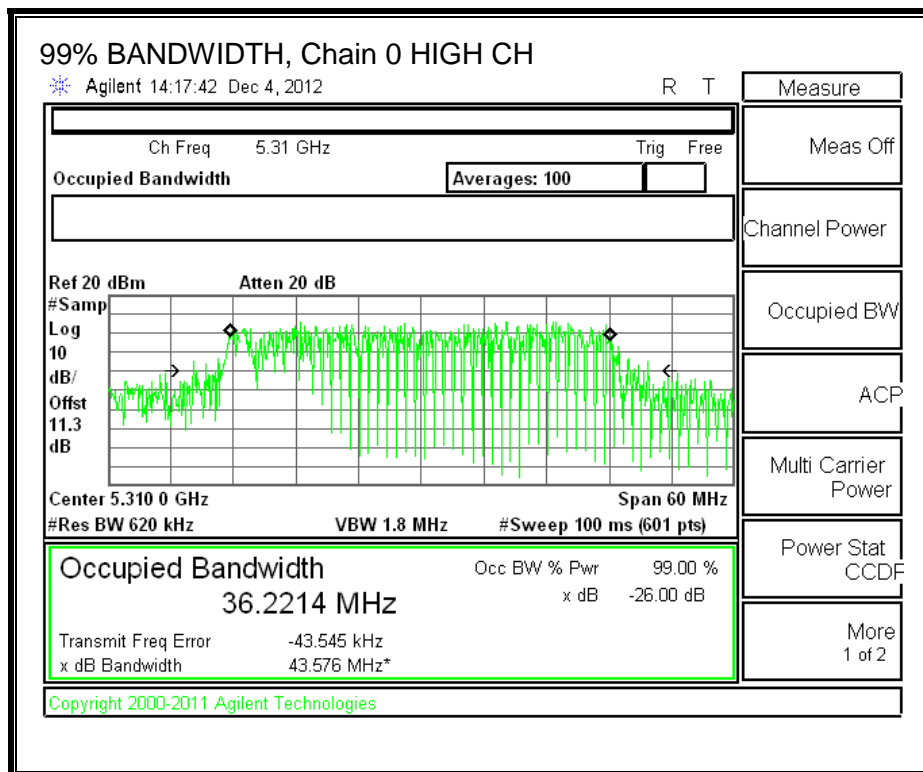
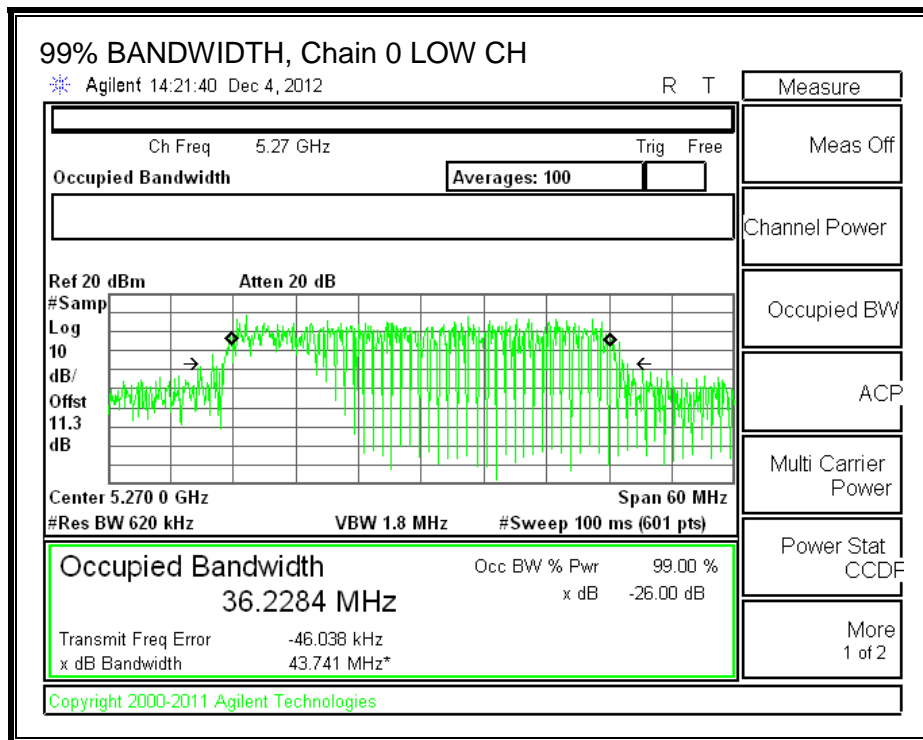
26 dB BANDWIDTH, Chain 0



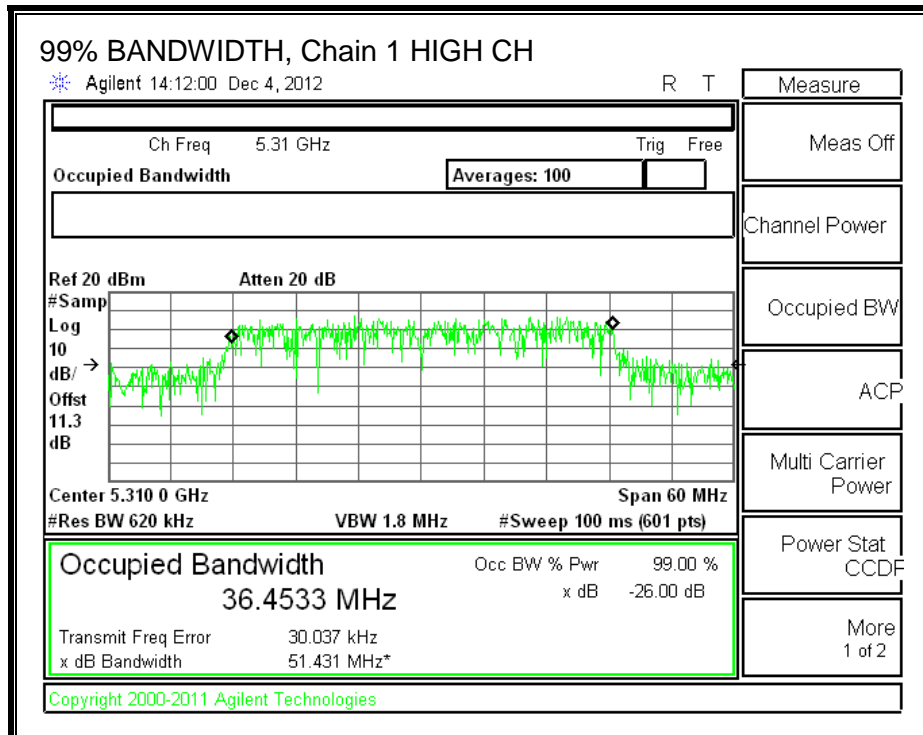
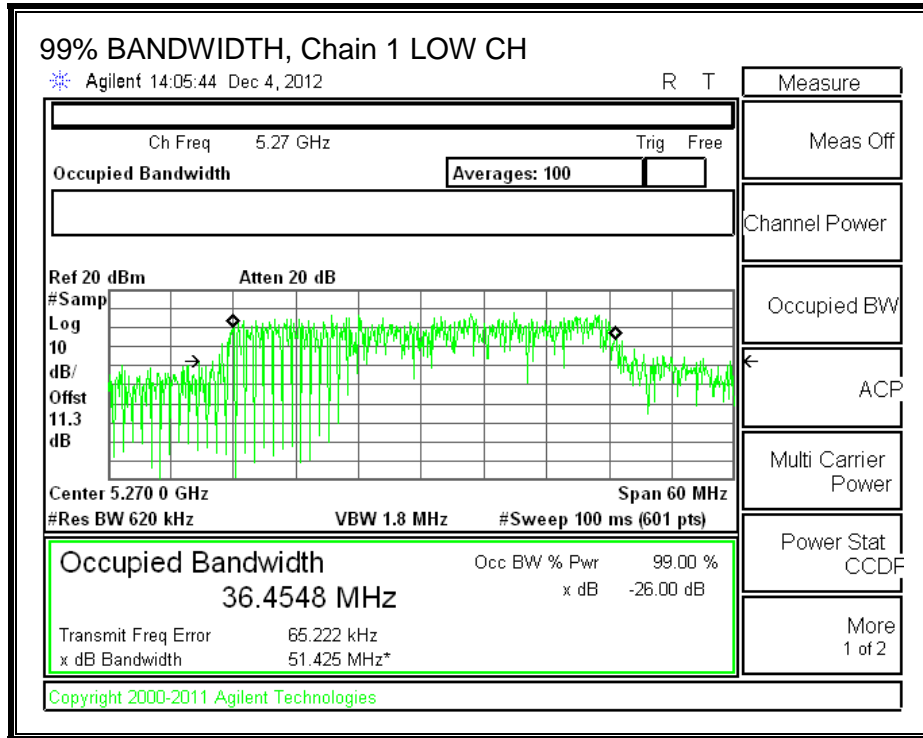
26 dB BANDWIDTH, Chain 1



99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



8.5.2. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

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

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is 2 dBi.

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5270	50.33	36.2284	2.00
High	5310	50.33	36.2214	2.00

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5270	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5310	24.00	24.00	30.00	24.00	11.00	11.00	11.00

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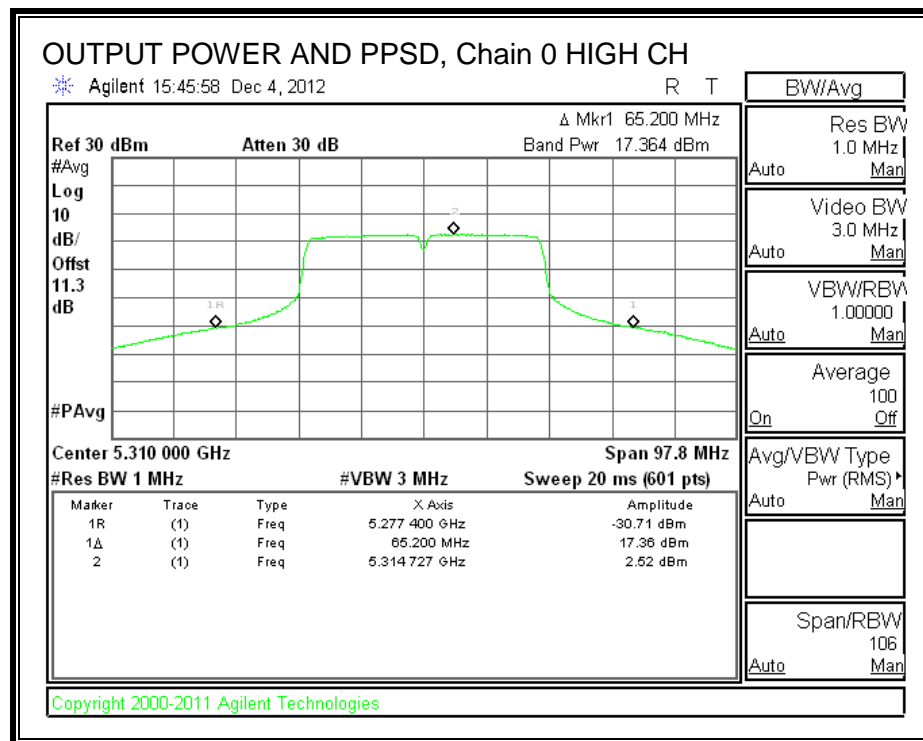
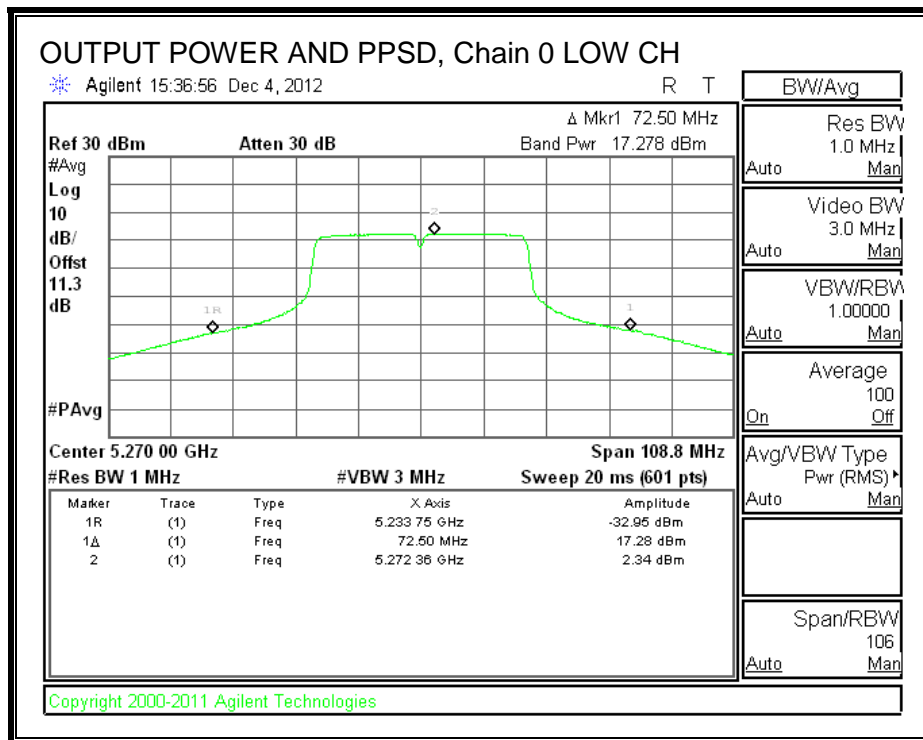
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	17.278	17.285	20.292	24.00	-3.708
High	5310	17.364	17.438	20.411	24.00	-3.589

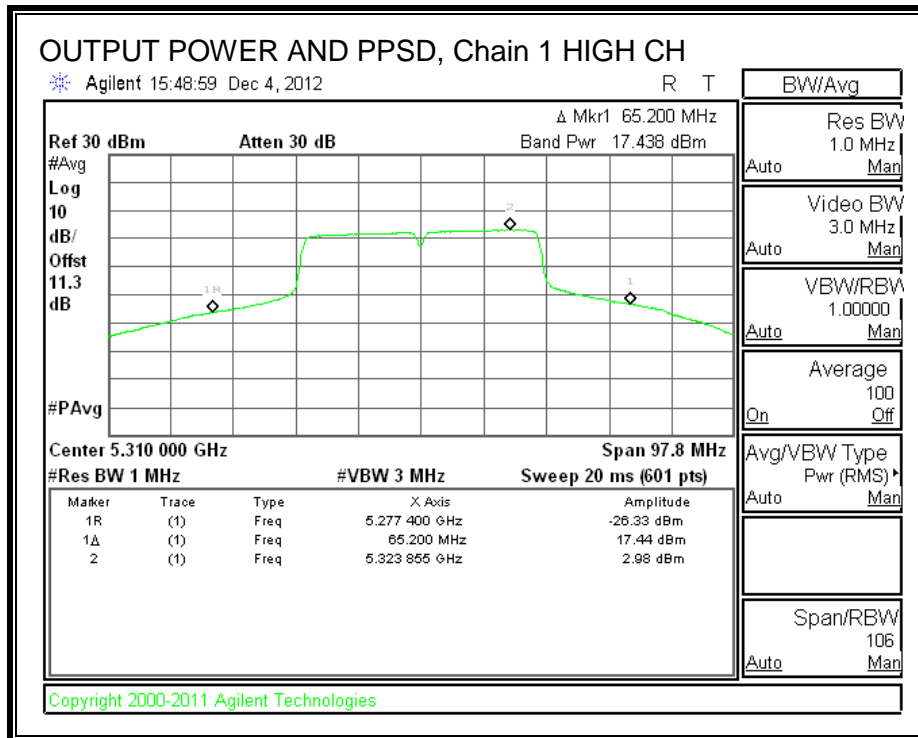
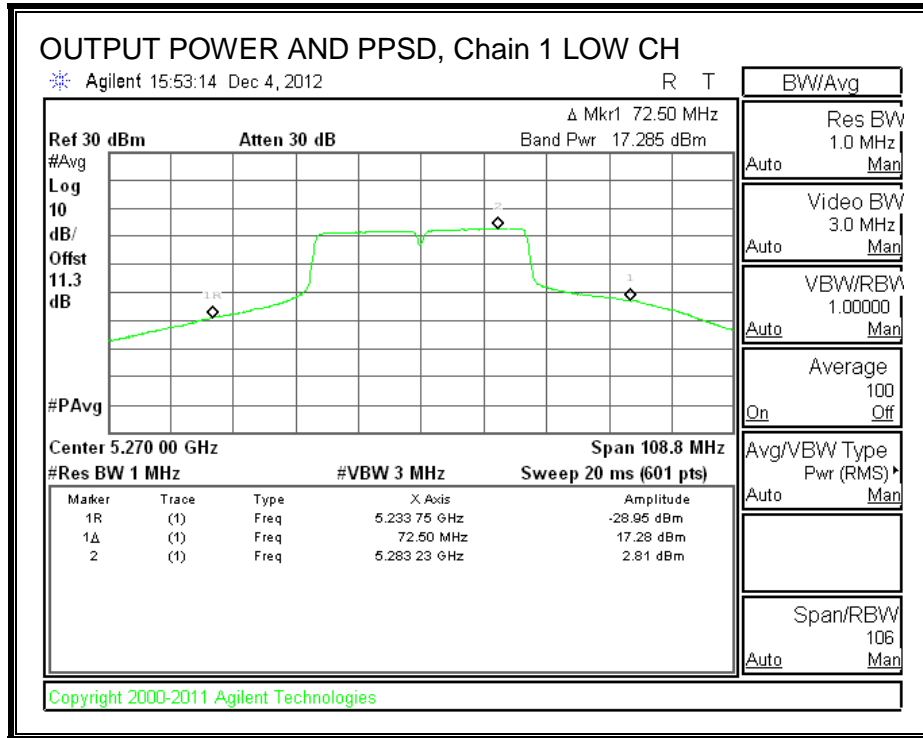
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	2.34	2.81	5.59	11.00	-5.41
High	5310	2.52	2.98	5.77	11.00	-5.23

OUTPUT POWER AND PPSD, Chain 0



OUTPUT POWER AND PPSD, Chain 1



8.5.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.3 dB (including 10 dB pad and 1.3 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5270	17.25	17.25	20.26
High	5310	17.30	17.40	20.36

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

Refer to the results of 802.11n HT20 mode in the 5.2 GHz band.

RESULTS

CHAIN 0

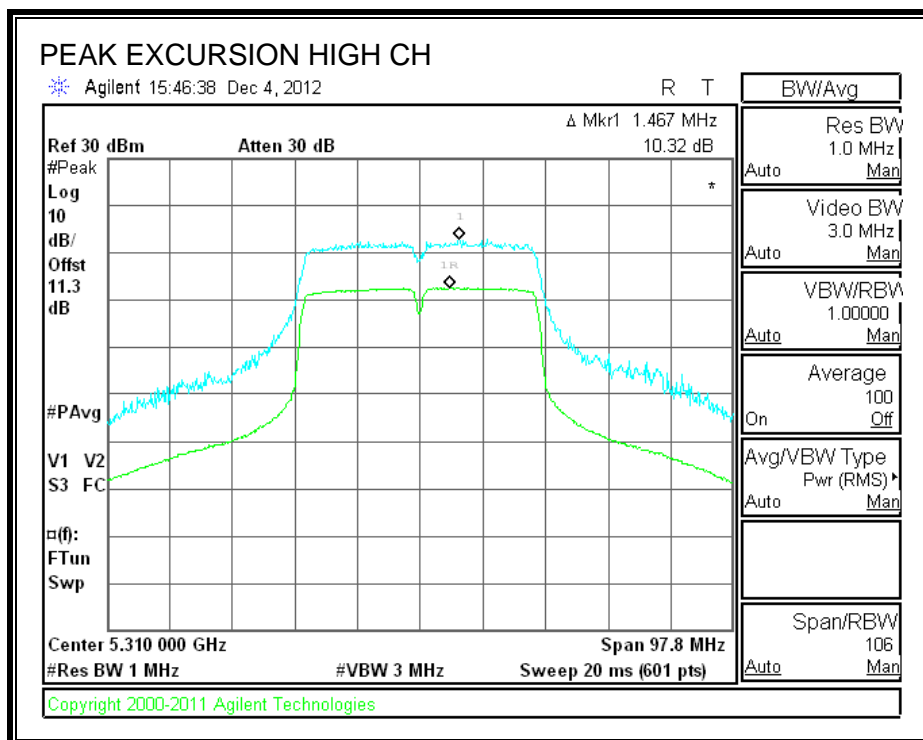
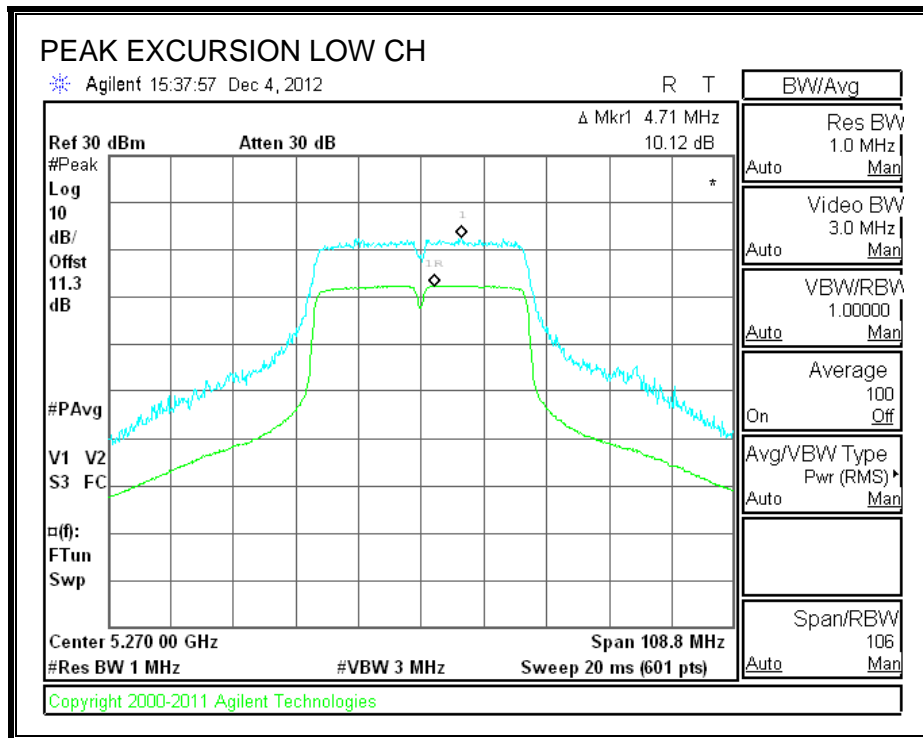
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5270	10.12	13	-2.88
High	5310	10.32	13	-2.68

CHAIN 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5270	9.90	13	-3.10
High	5310	9.51	13	-3.49

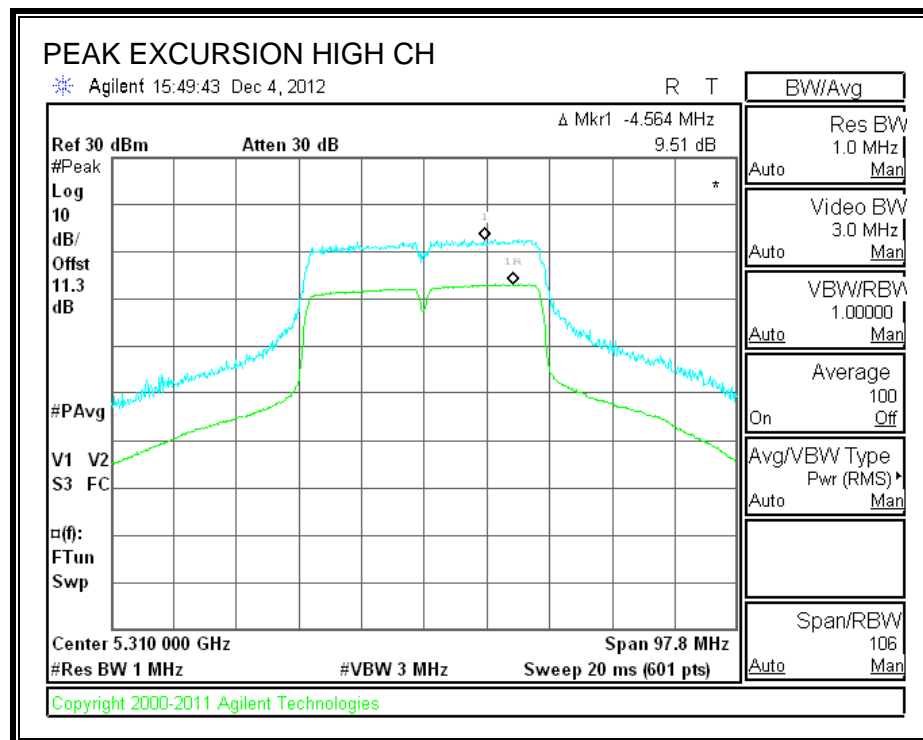
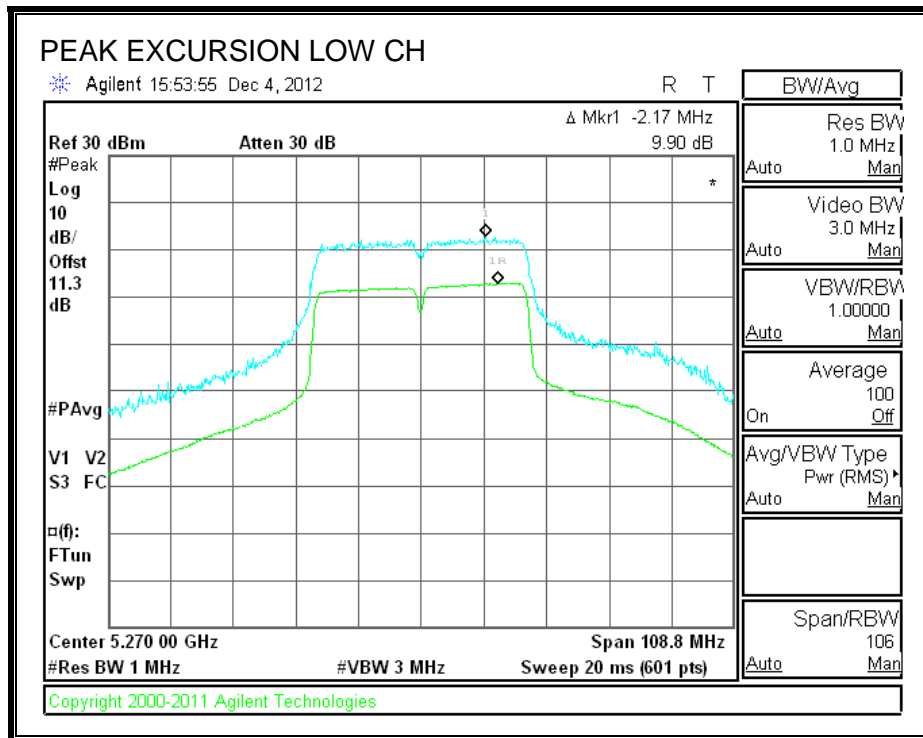
CHAIN 0

PEAK EXCURSION



CHAIN 1

PEAK EXCURSION



8.6. 802.11a MODE IN THE 5.6 GHz BAND

8.6.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

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

RESULTS

CHAIN 0

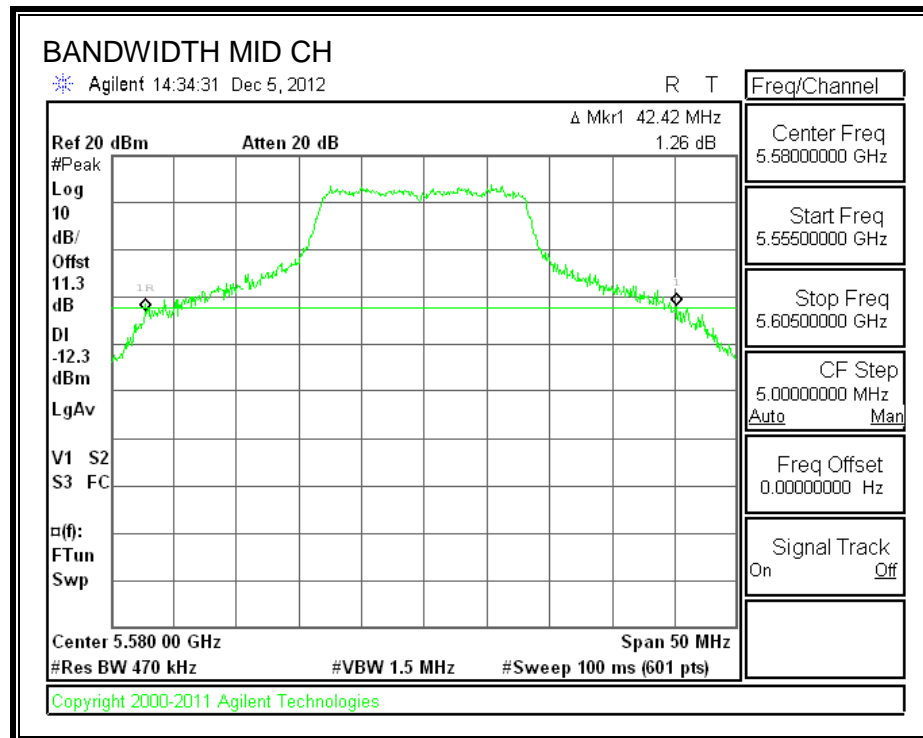
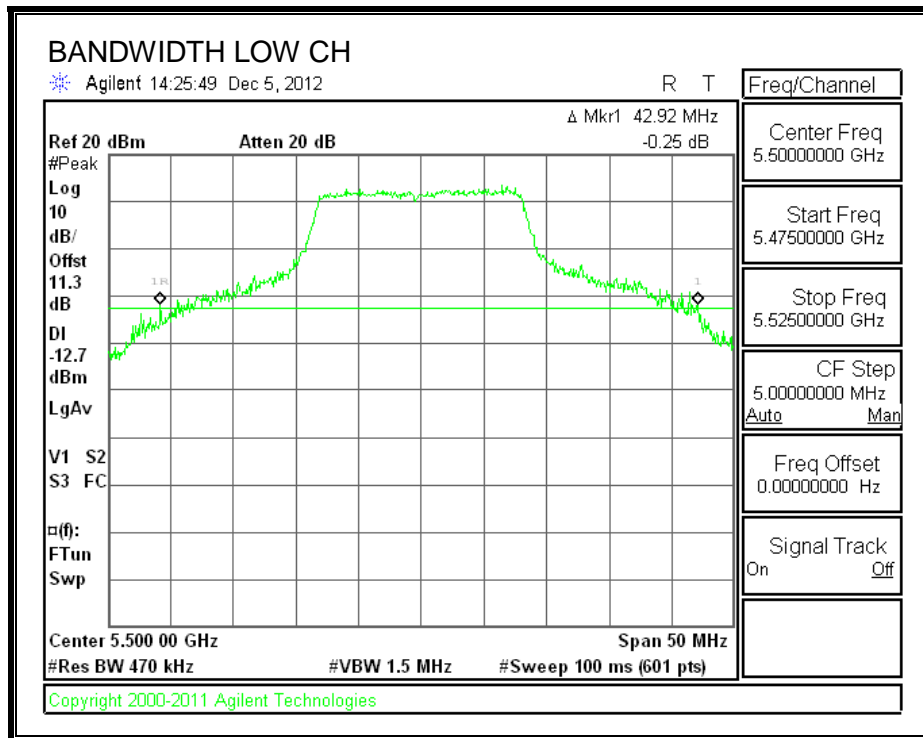
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	42.92	16.8628
Middle	5580	42.42	16.9761
High	5700	42.92	17.1556

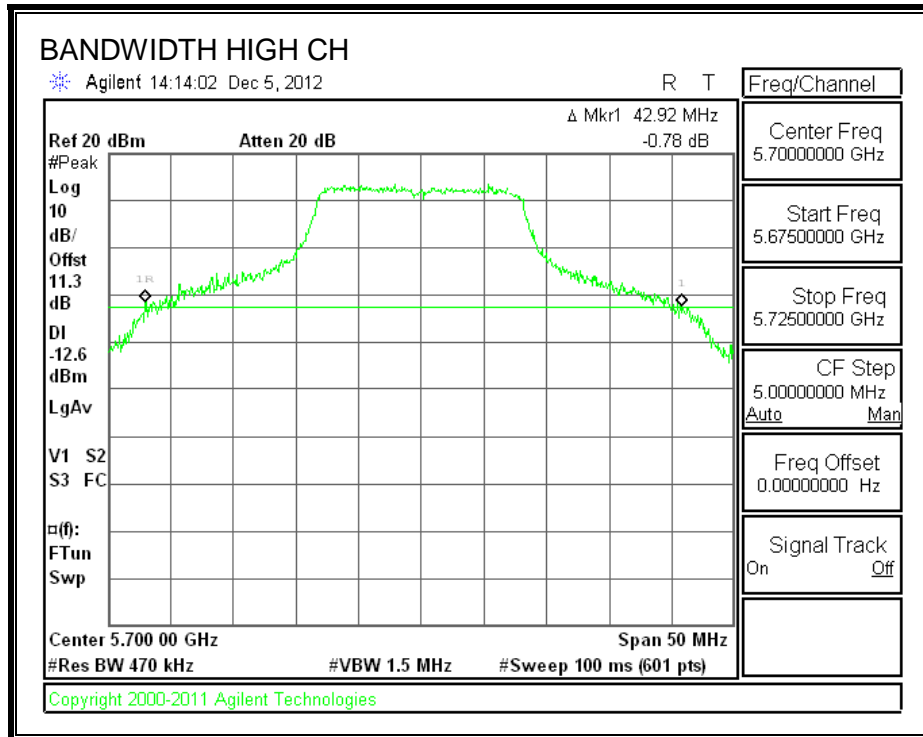
CHAIN 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	39.92	16.9153
Middle	5580	42.92	17.2055
High	5700	41.67	17.3281

CHAIN 0

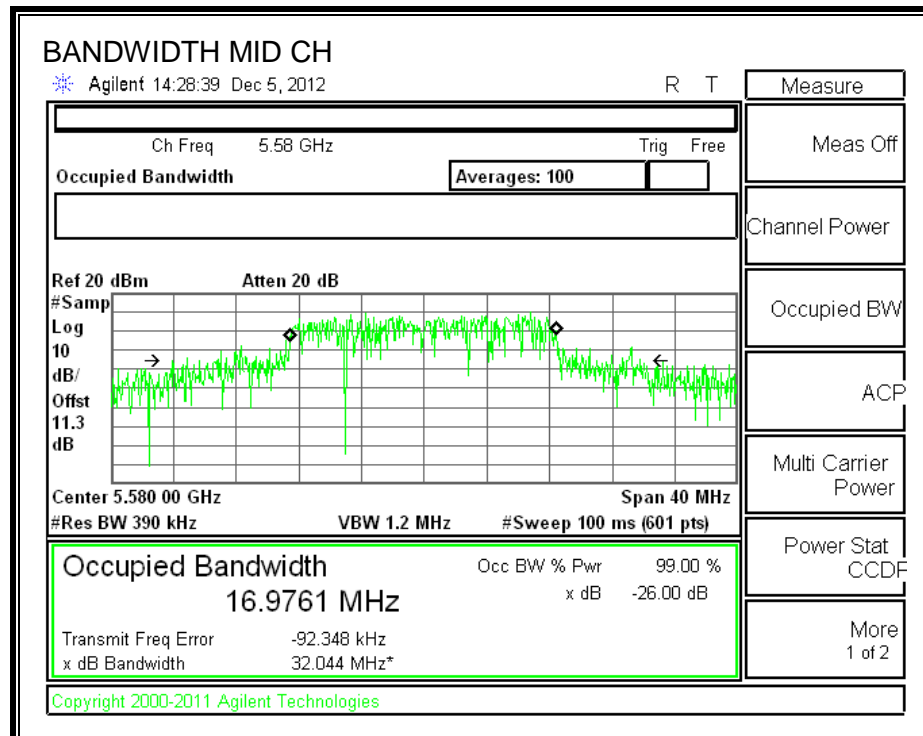
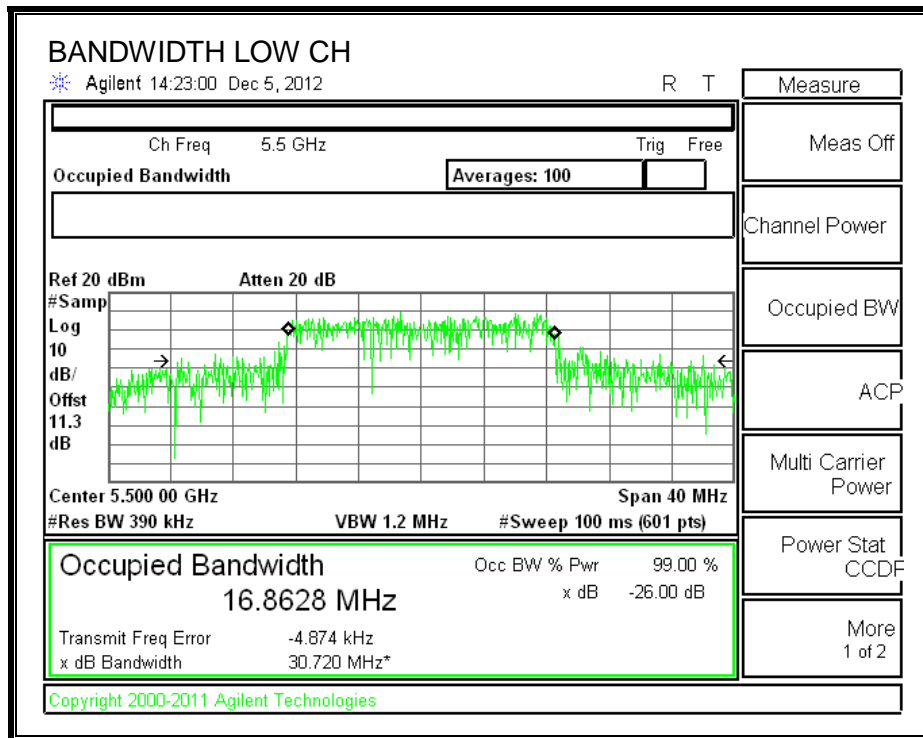
26 dB BANDWIDTH

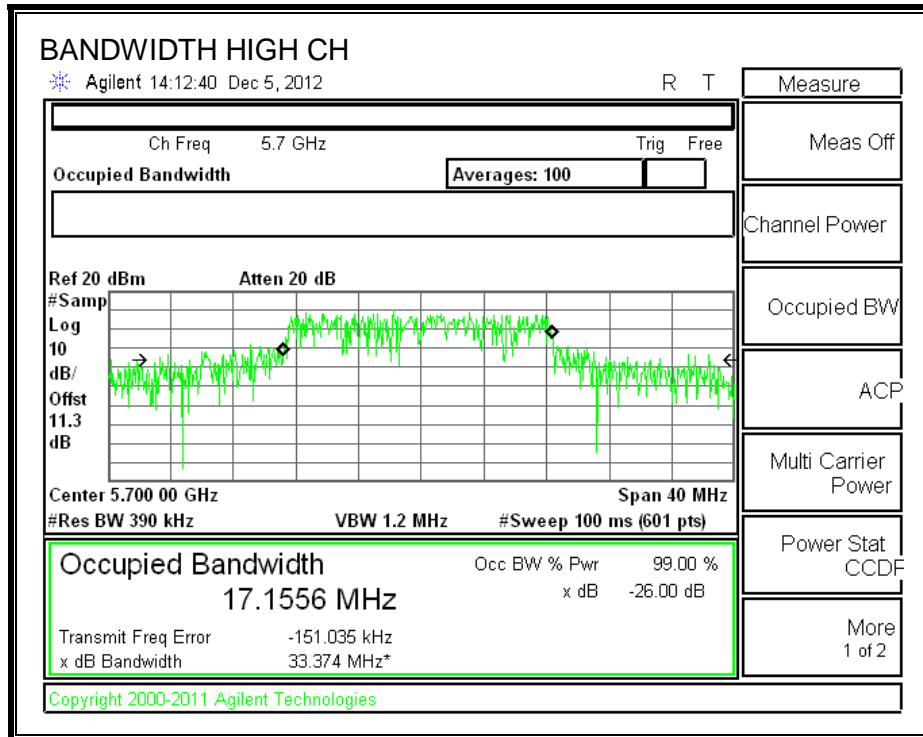




CHAIN 0

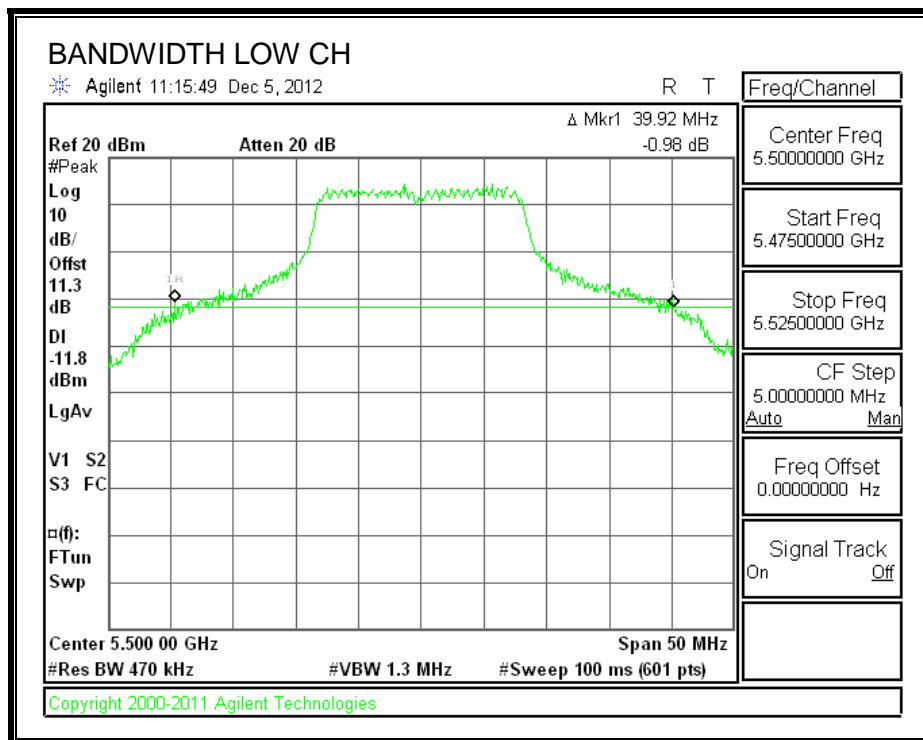
99% BANDWIDTH

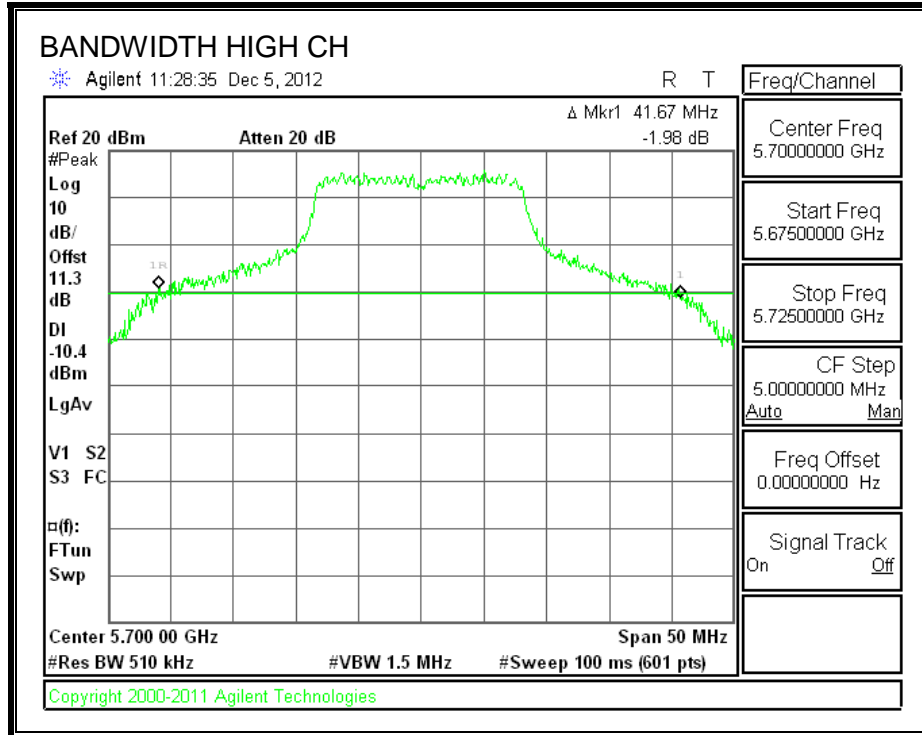
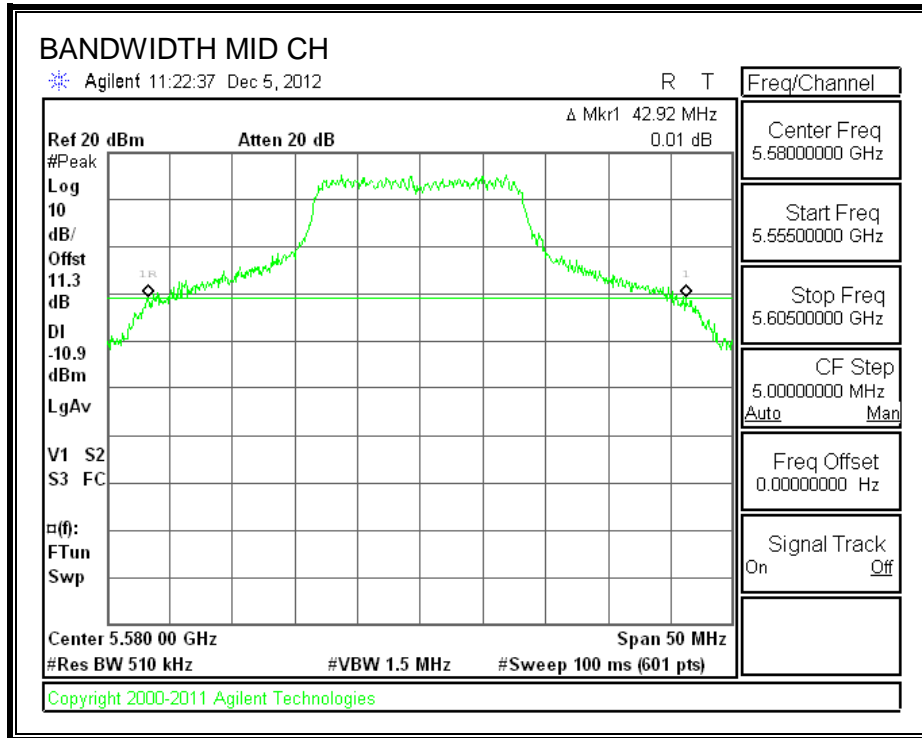




CHAIN1

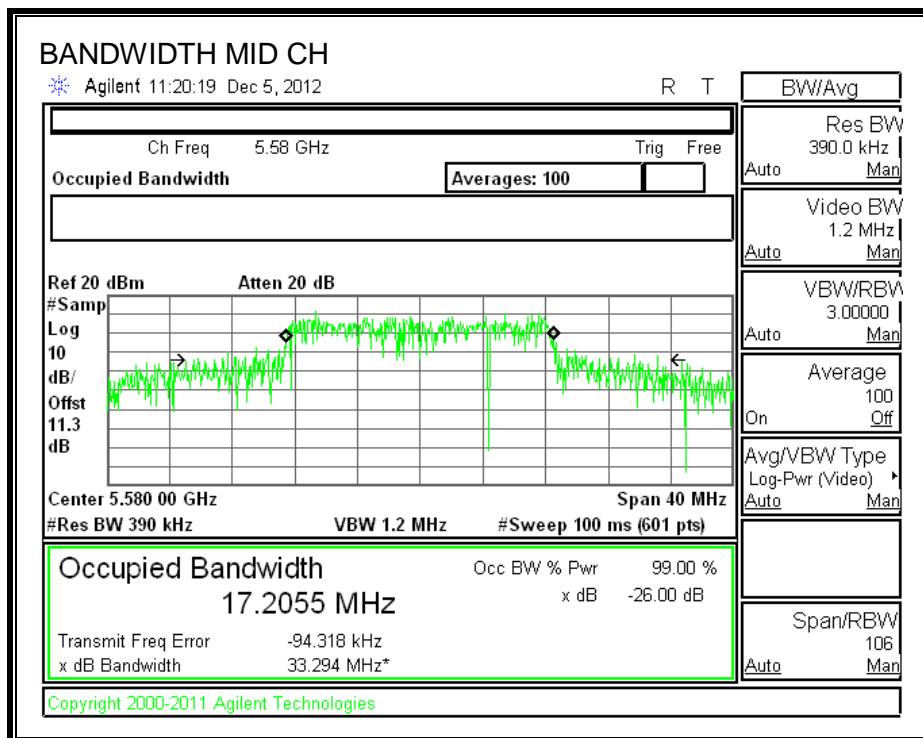
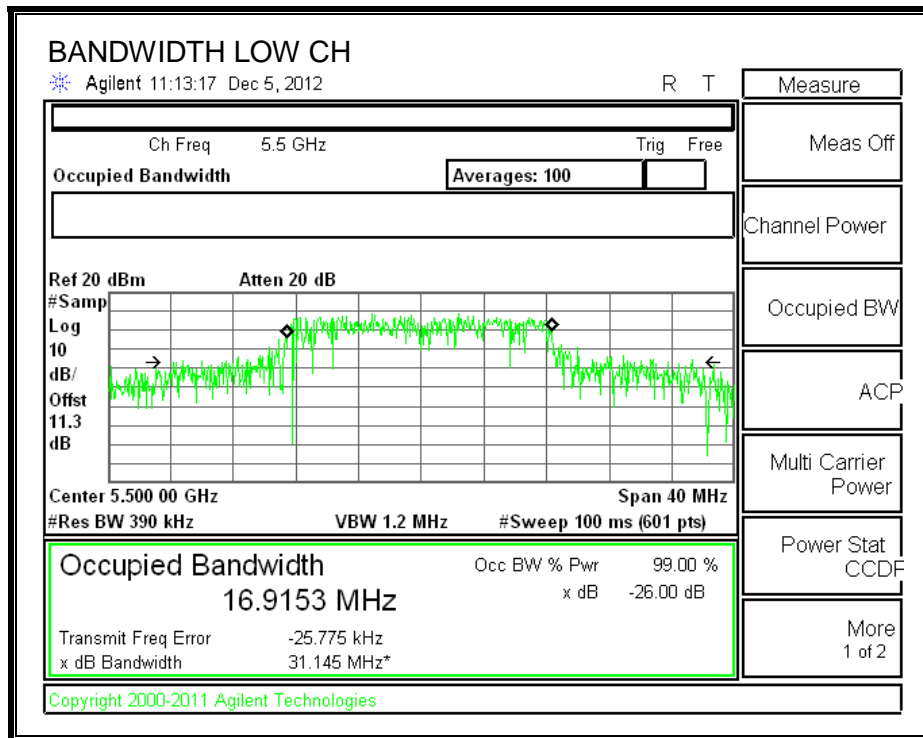
26 dB BANDWIDTH

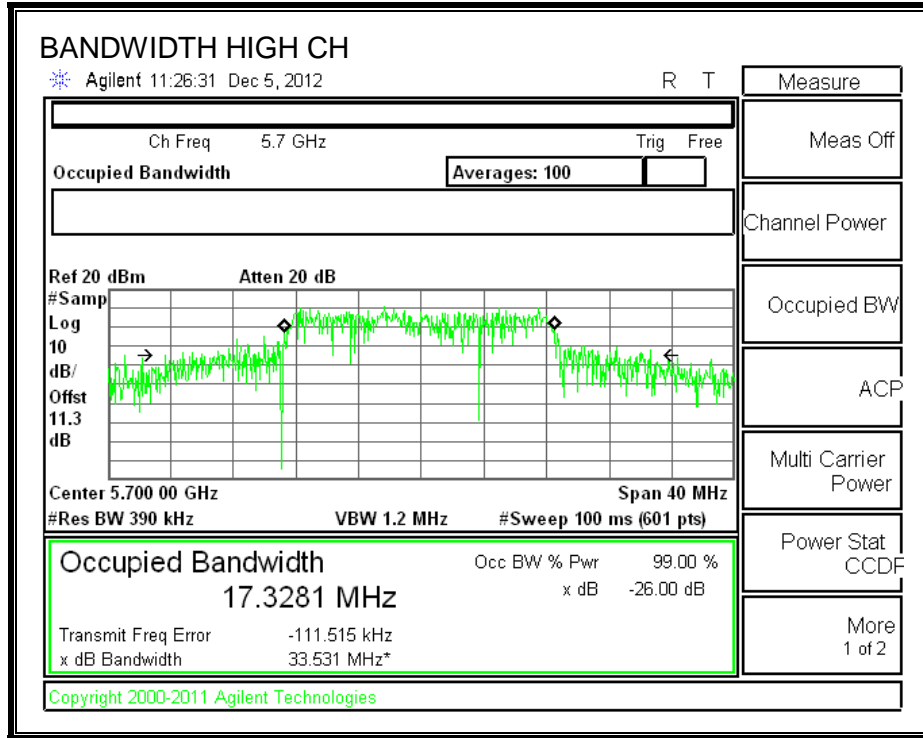




CHAIN 1

99% BANDWIDTH





8.6.2. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

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

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
2.00	3.01	5.01

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	39.92	16.8628	5.01
Mid	5580	42.42	16.9761	5.01
High	5700	41.67	17.1556	5.01

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	24.00	23.27	29.27	23.27	11.00	11.00	11.00
Mid	5580	24.00	23.30	29.30	23.30	11.00	11.00	11.00
High	5700	24.00	23.34	29.34	23.34	11.00	11.00	11.00

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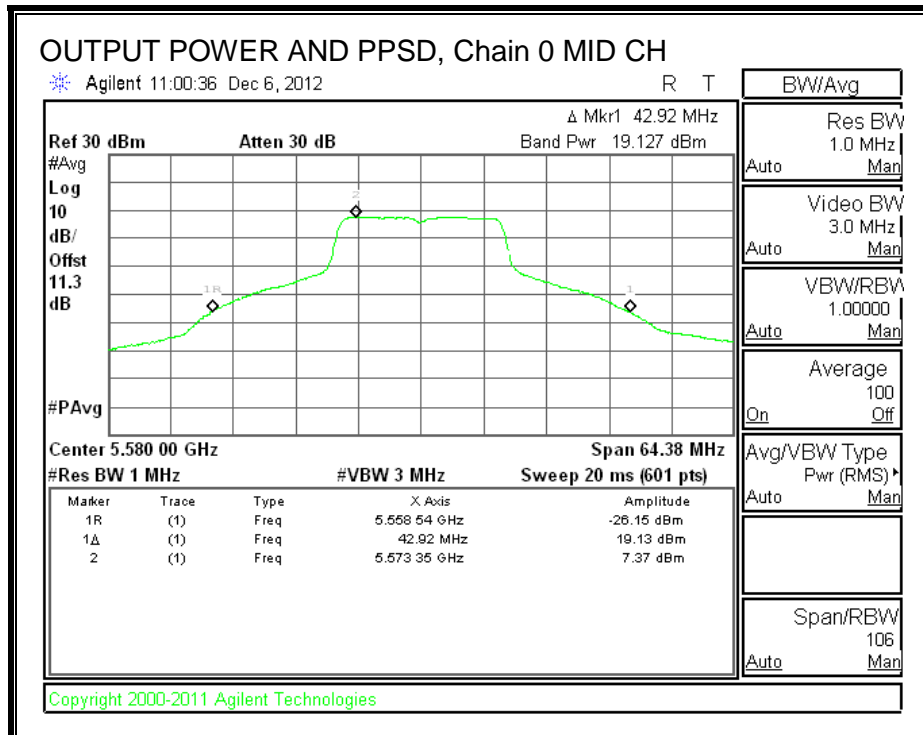
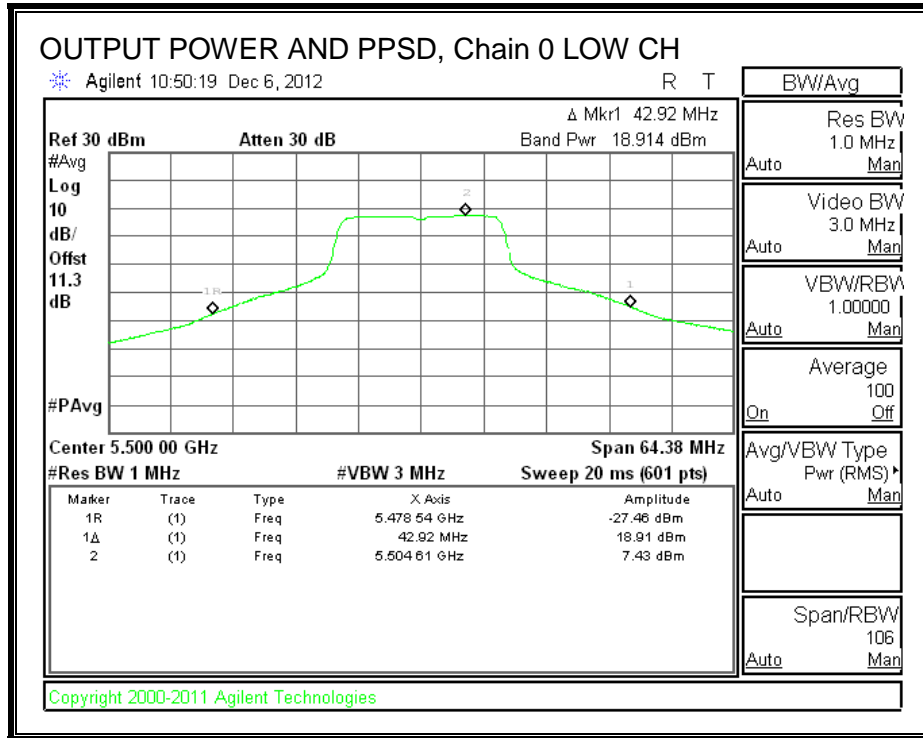
Output Power Results

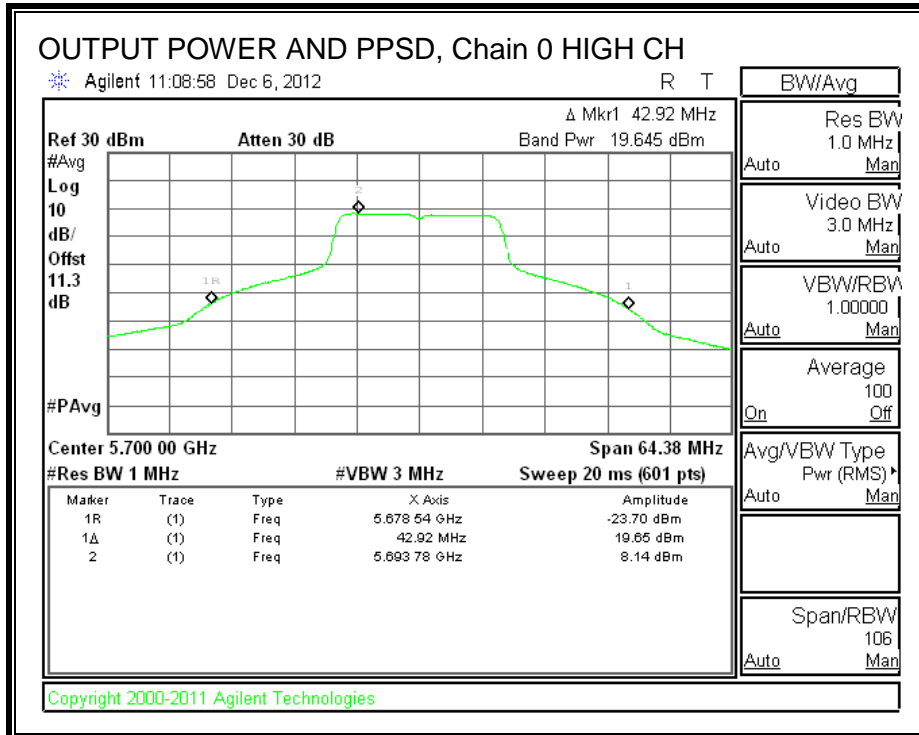
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	18.914	19.142	22.040	23.27	-1.230
Mid	5580	19.127	19.516	22.336	23.30	-0.962
High	5700	19.645	19.451	22.559	23.34	-0.785

PPSD Results

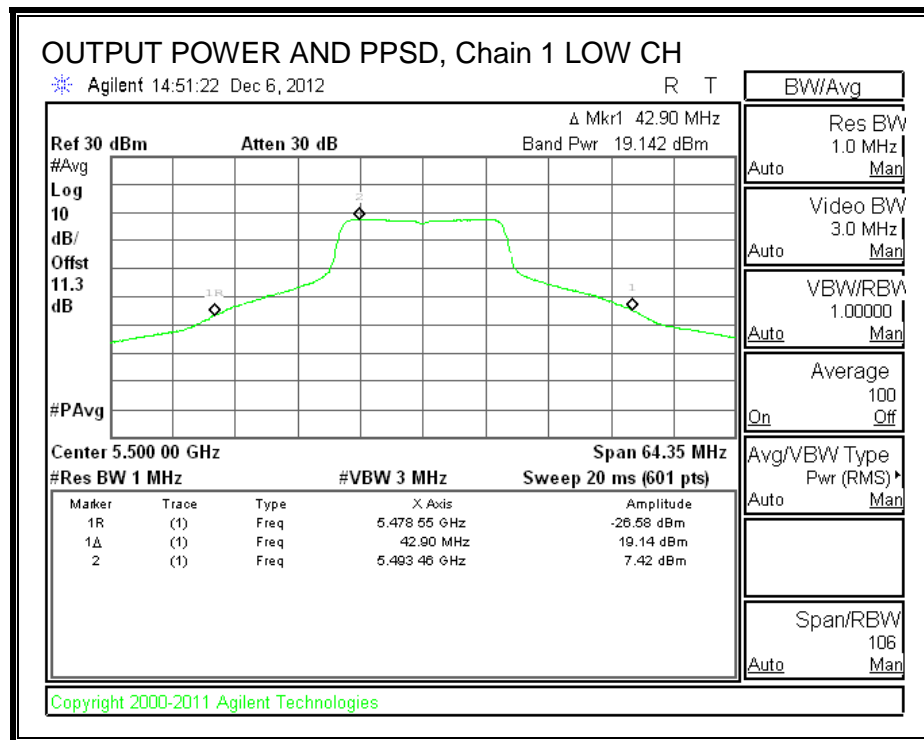
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	7.43	7.42	10.44	11.00	-0.56
Mid	5580	7.37	7.80	10.60	11.00	-0.40
High	5700	8.14	7.74	10.95	11.00	-0.05

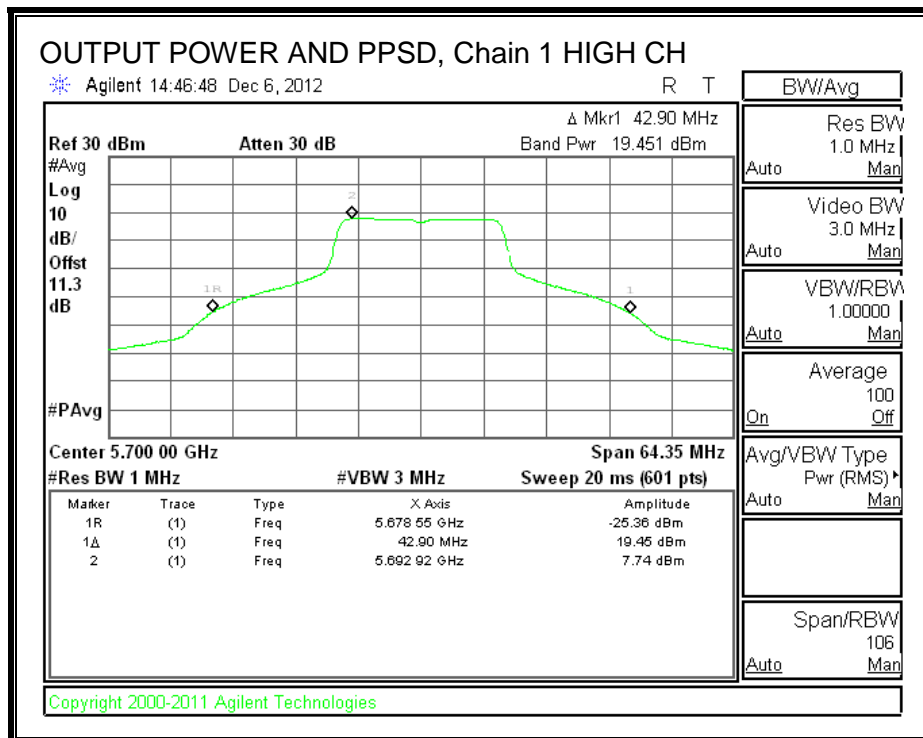
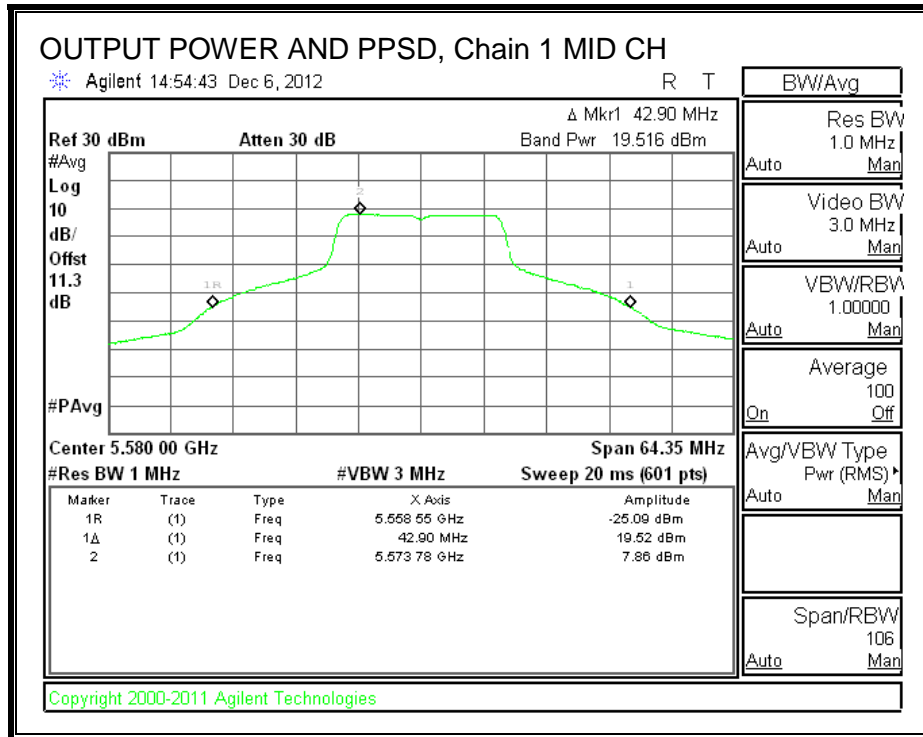
OUTPUT POWER AND PPSD, Chain 0





OUTPUT POWER AND PPSD, Chain 1





8.6.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11.4 dB (including 10 dB pad and 1.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Chain 1 Power (dBm)	Chain 2 Power (dBm)	Total Power (dBm)
Low	5500	18.90	19.10	22.01
Middle	5580	19.10	19.50	22.31
High	5700	19.60	19.43	22.53

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.

TEST PROCEDURE

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

RESULTS

CHAIN 0

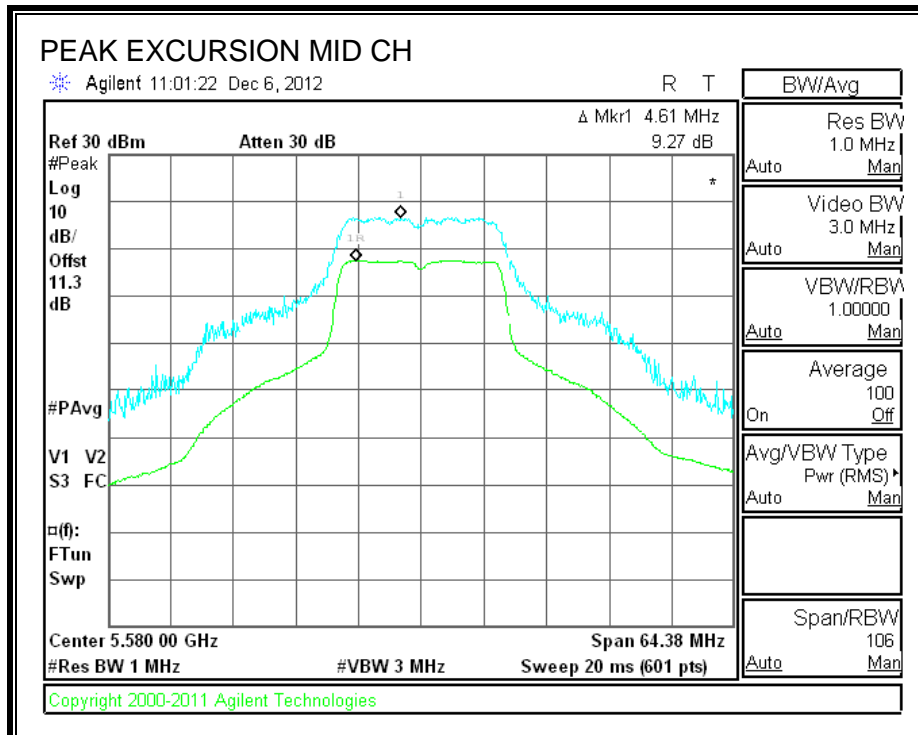
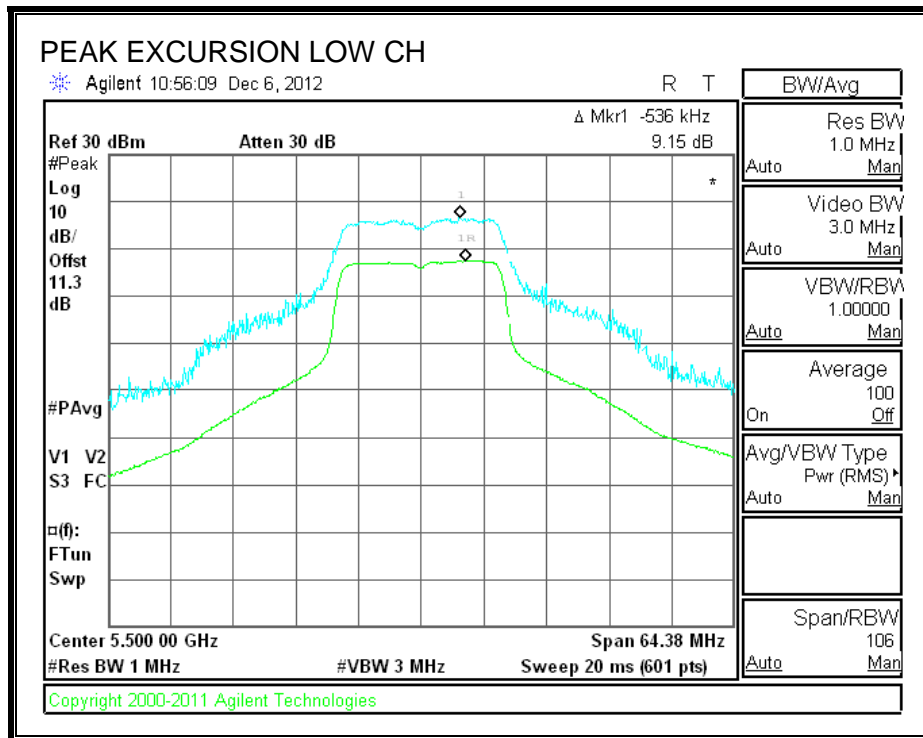
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	9.15	13	-3.85
Middle	5580	9.27	13	-3.73
High	5700	10.21	13	-2.79

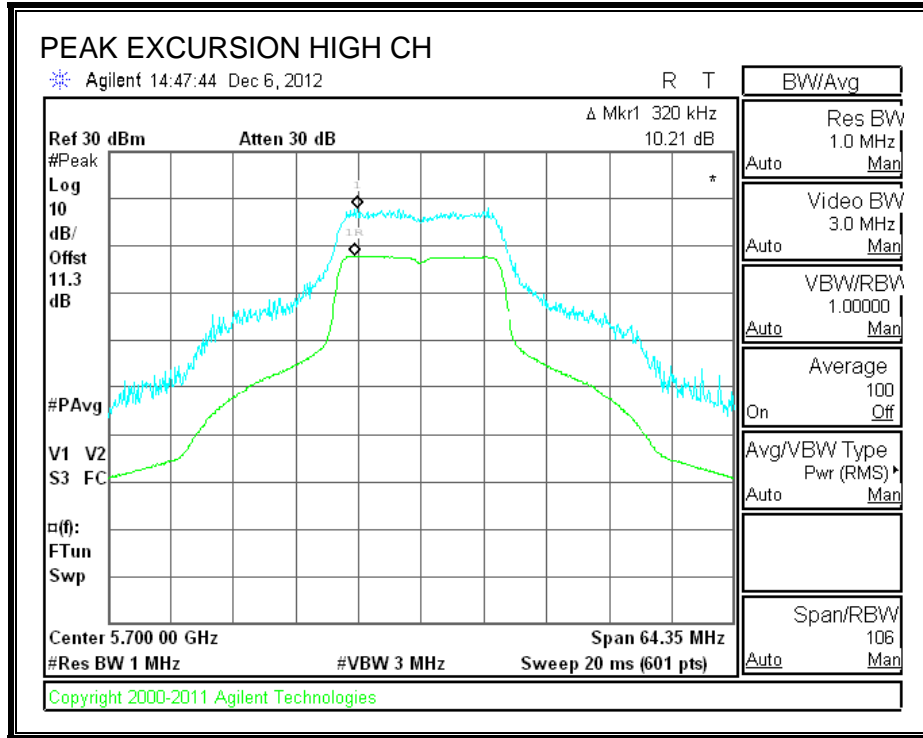
CHAIN 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	10.19	13	-2.81
Middle	5580	9.97	13	-3.03
High	5700	10.21	13	-2.79

CHAIN 0

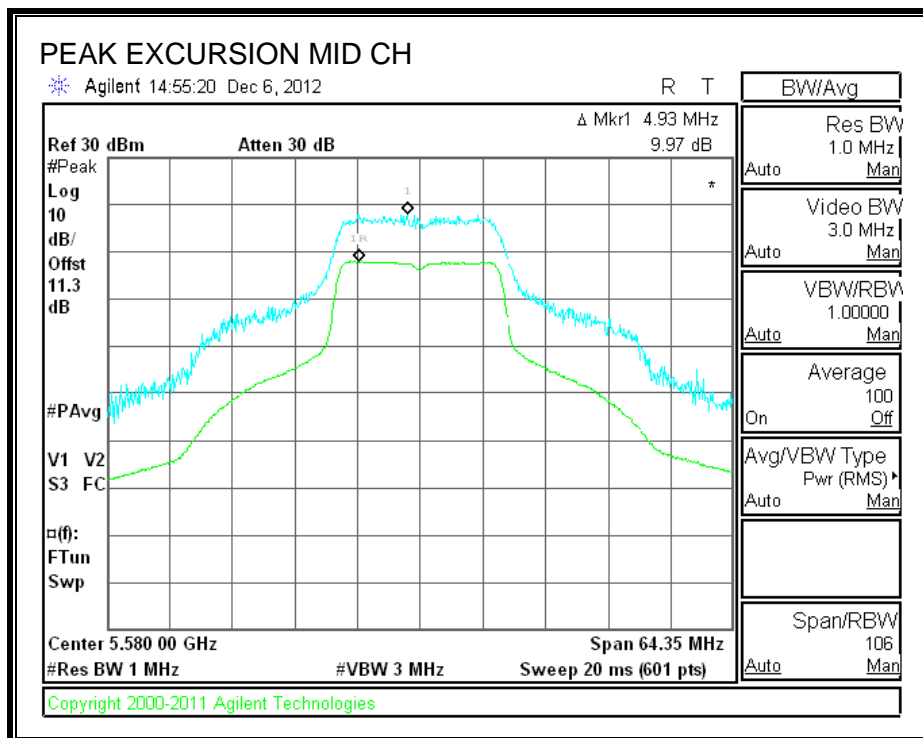
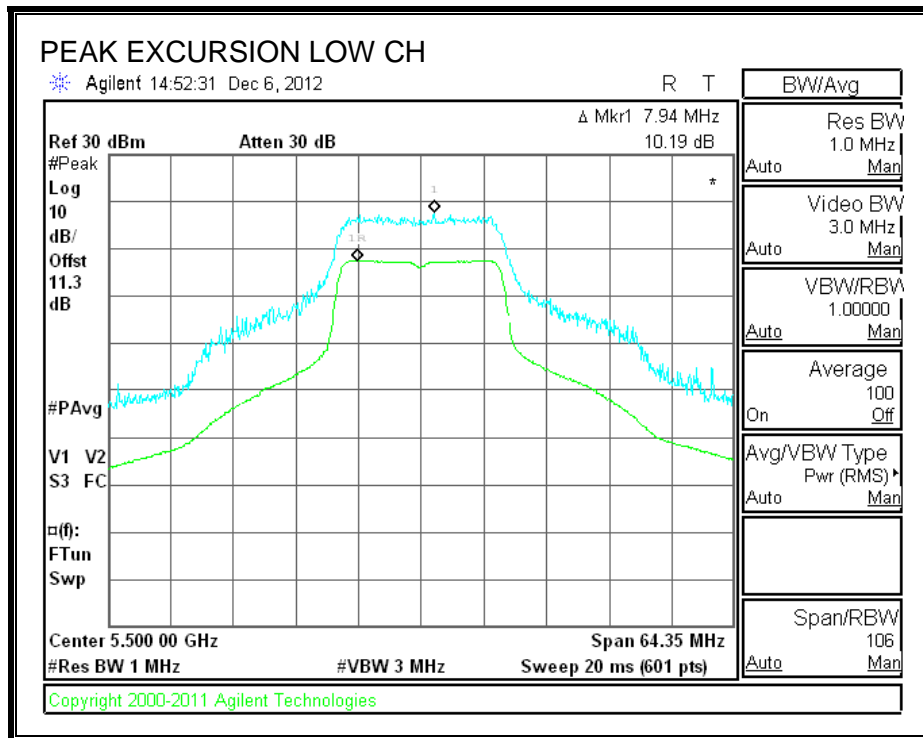
PEAK EXCURSION

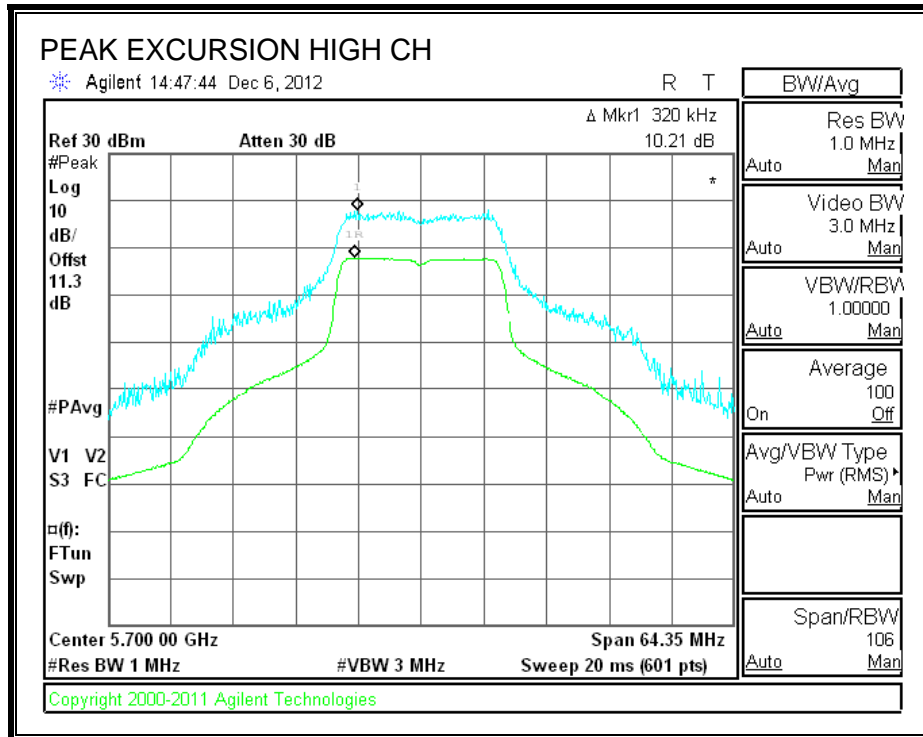




CHAIN 1

PEAK EXCURSION





8.7. 802.11n HT20, CDD MODE IN THE 5.6 GHz BAND

8.7.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

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

RESULTS

CHAIN 0

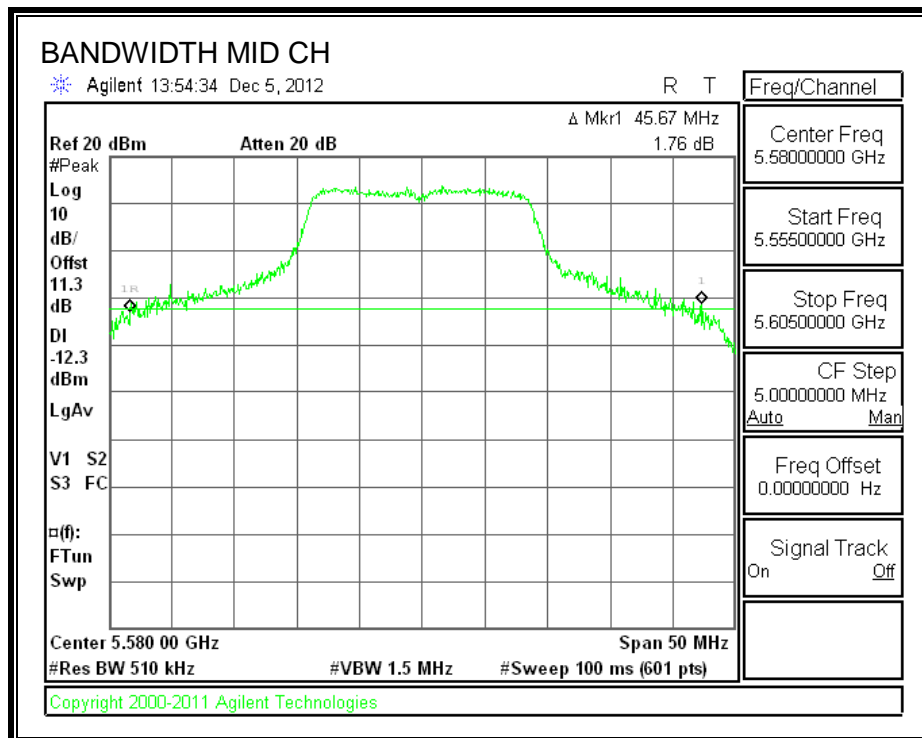
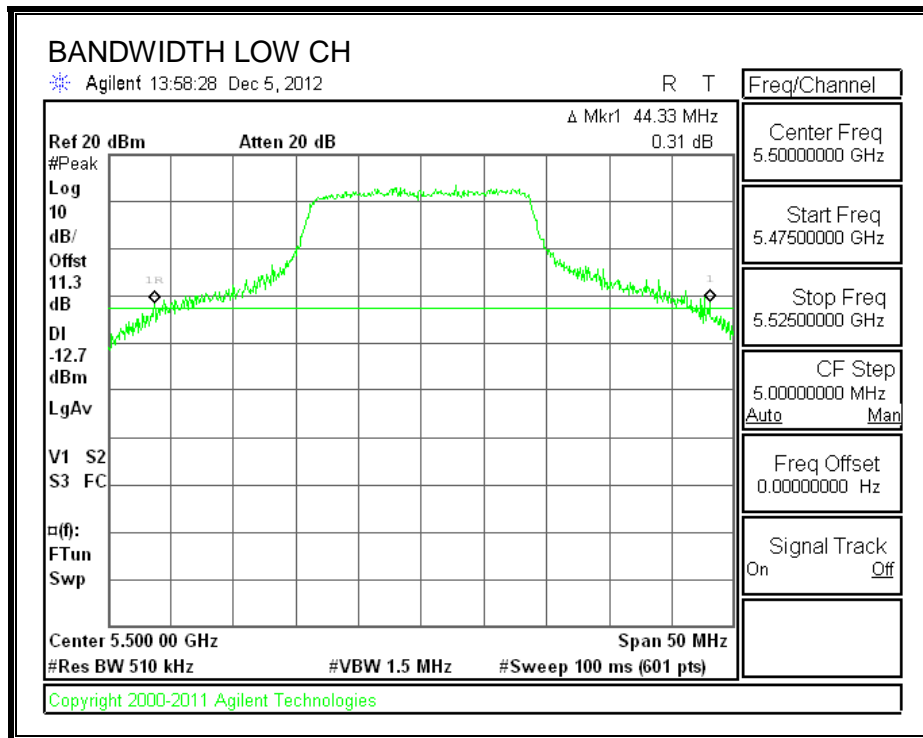
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	44.33	17.9564
Middle	5580	45.67	18.0503
High	5700	45.17	18.1924

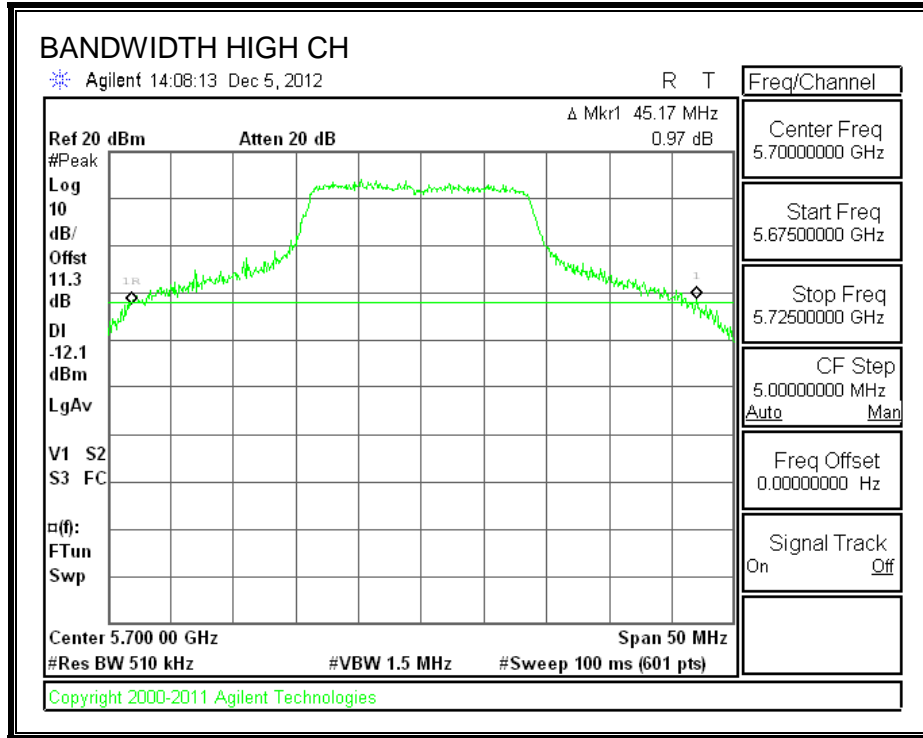
CHAIN 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	46.00	18.0748
Middle	5580	46.42	18.1857
High	5700	48.00	18.2778

CHAIN 0

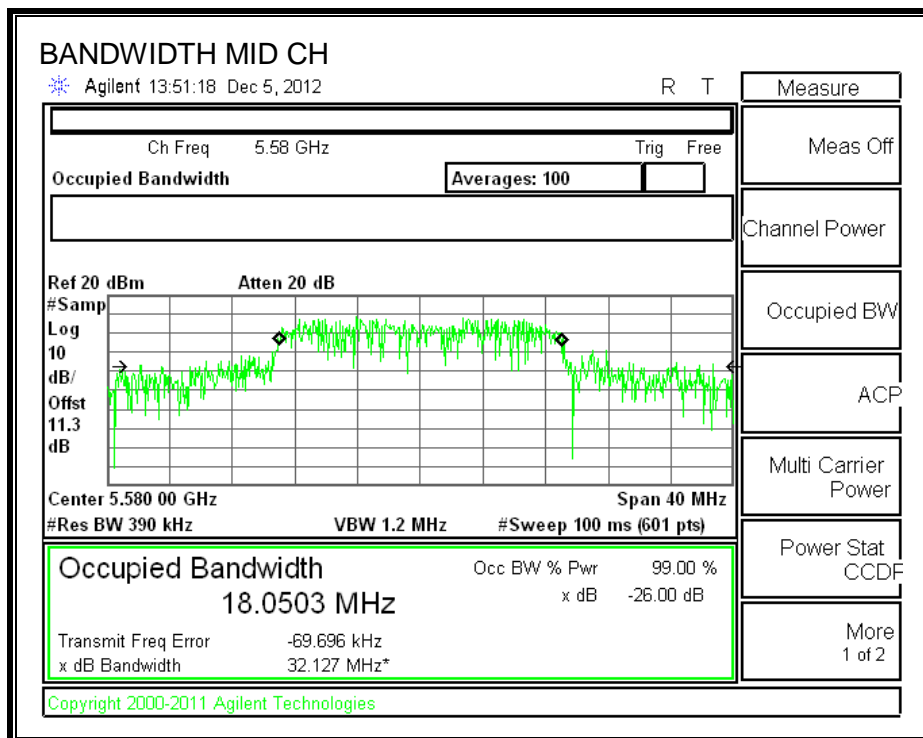
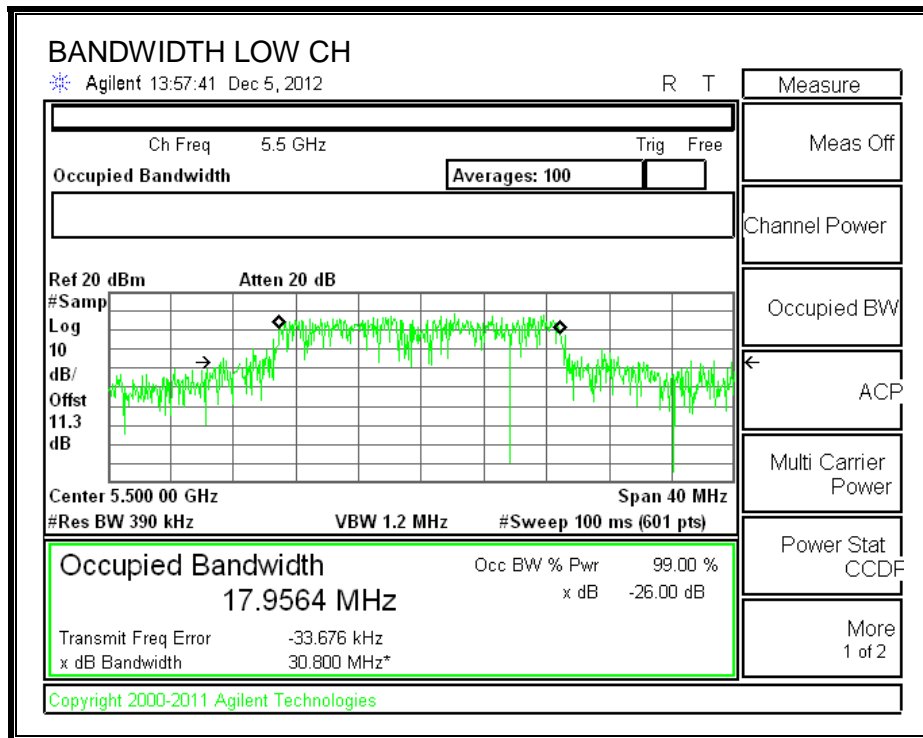
26 dB BANDWIDTH

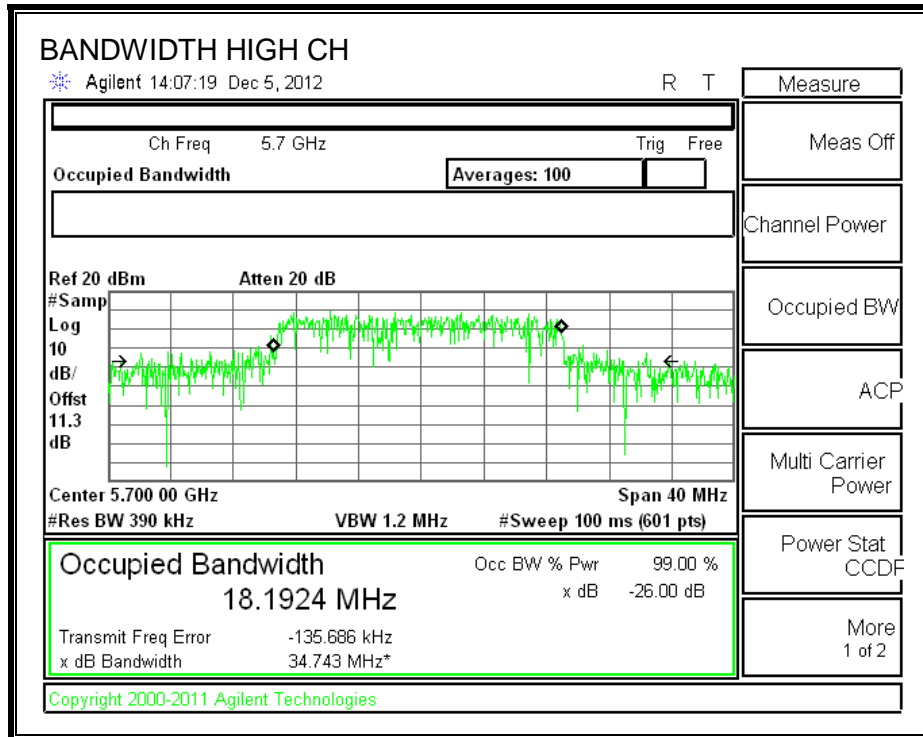




CHAIN 0

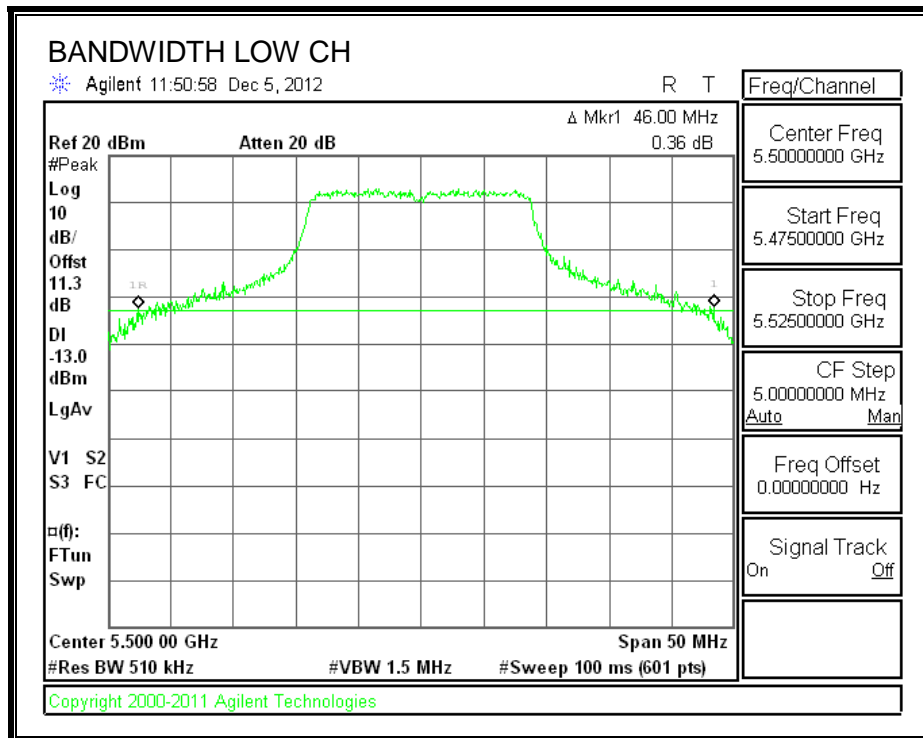
99% BANDWIDTH

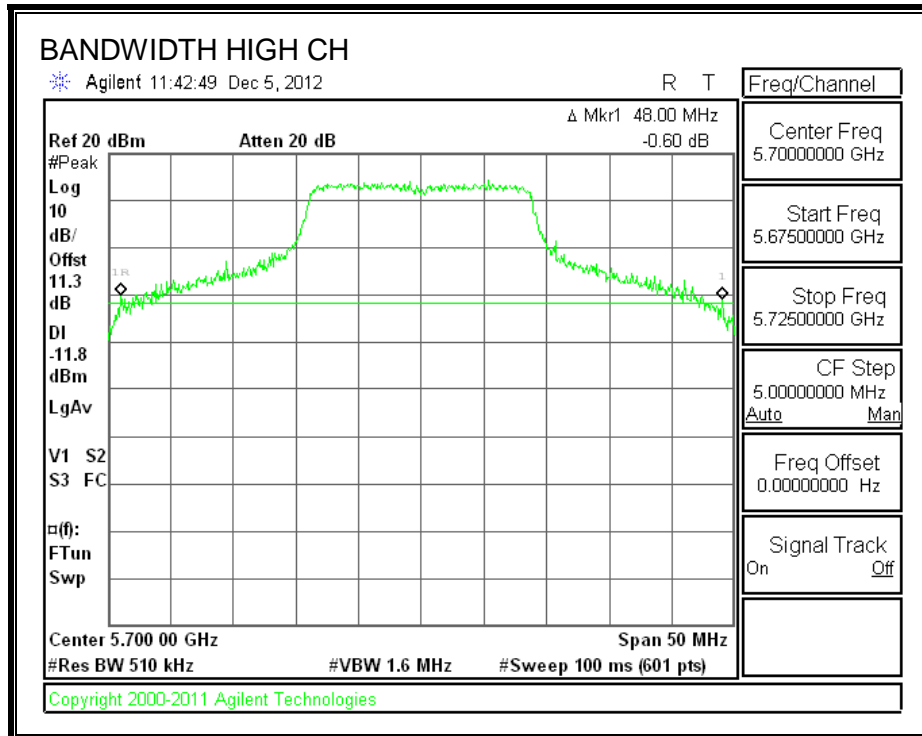
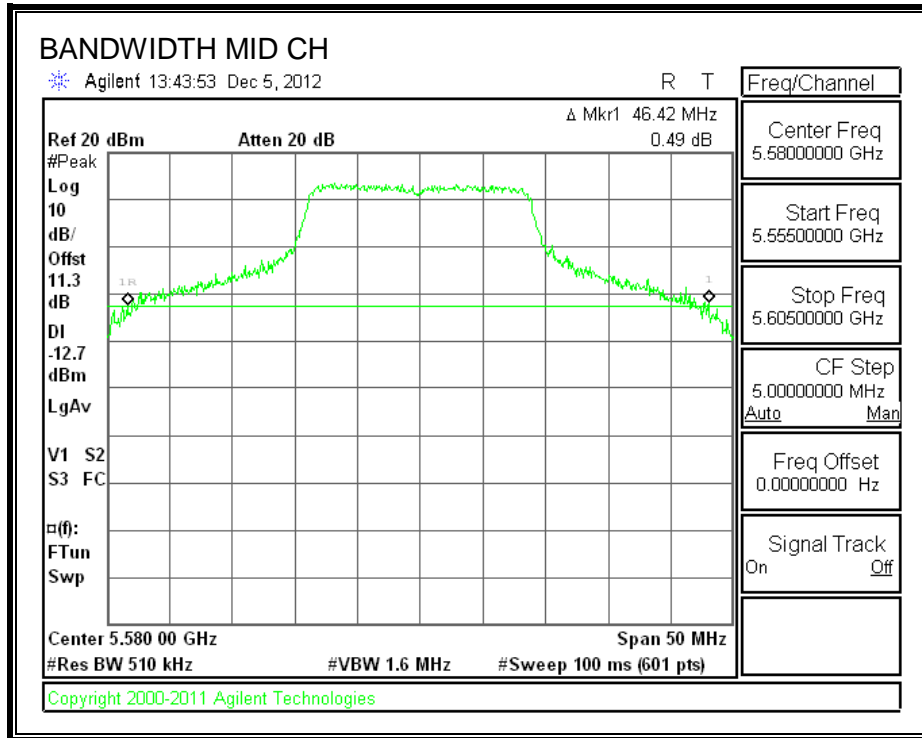




CHAIN1

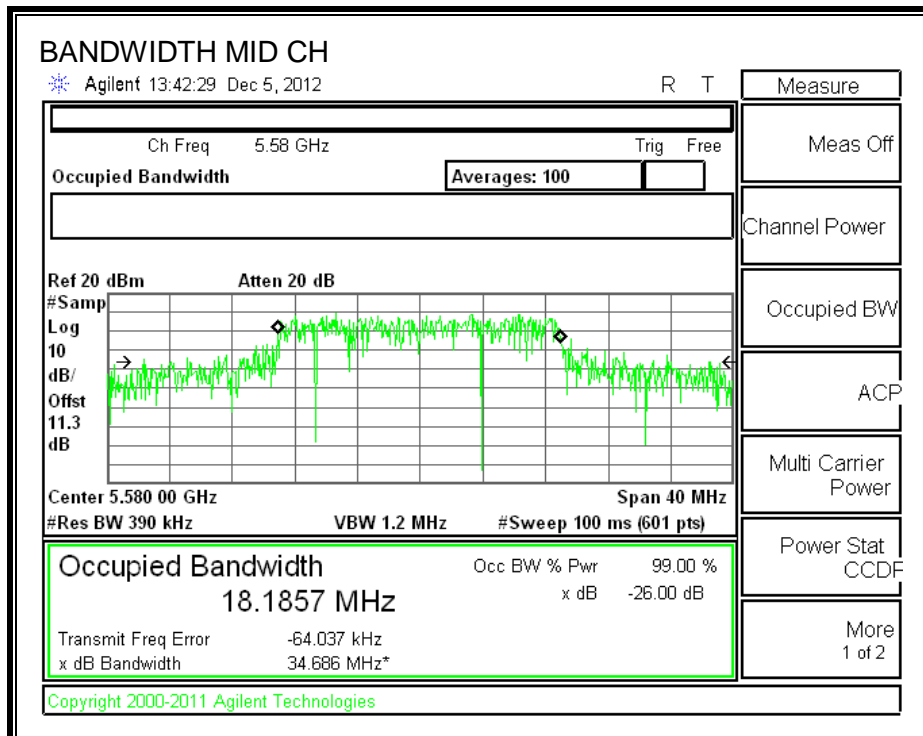
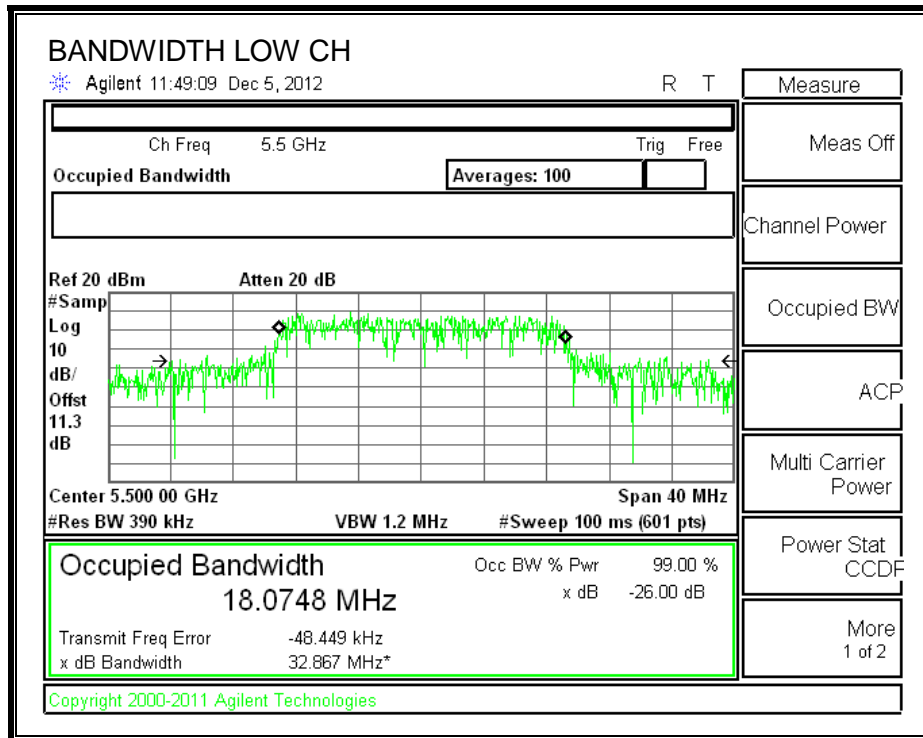
26 dB BANDWIDTH

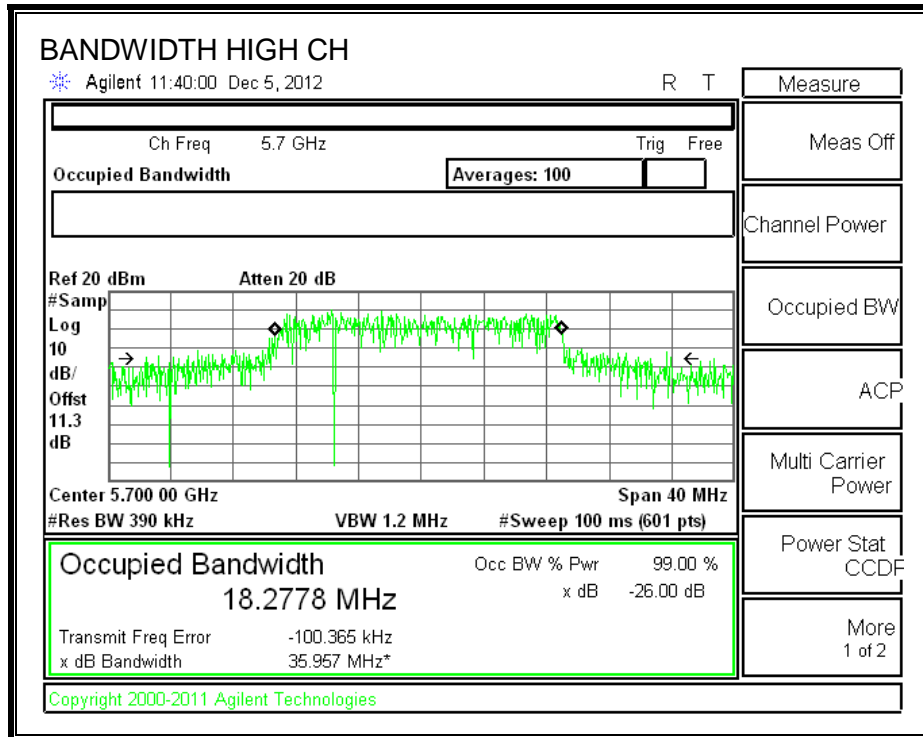




CHAIN 1

99% BANDWIDTH





8.7.2. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

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

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
2.00	3.01	5.01

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	44.33	17.9564	5.01
Mid	5580	45.67	18.0503	5.01
High	5700	45.17	18.1924	5.01

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	24.00	23.54	29.54	23.54	11.00	11.00	11.00
Mid	5580	24.00	23.56	29.56	23.56	11.00	11.00	11.00
High	5700	24.00	23.60	29.60	23.60	11.00	11.00	11.00

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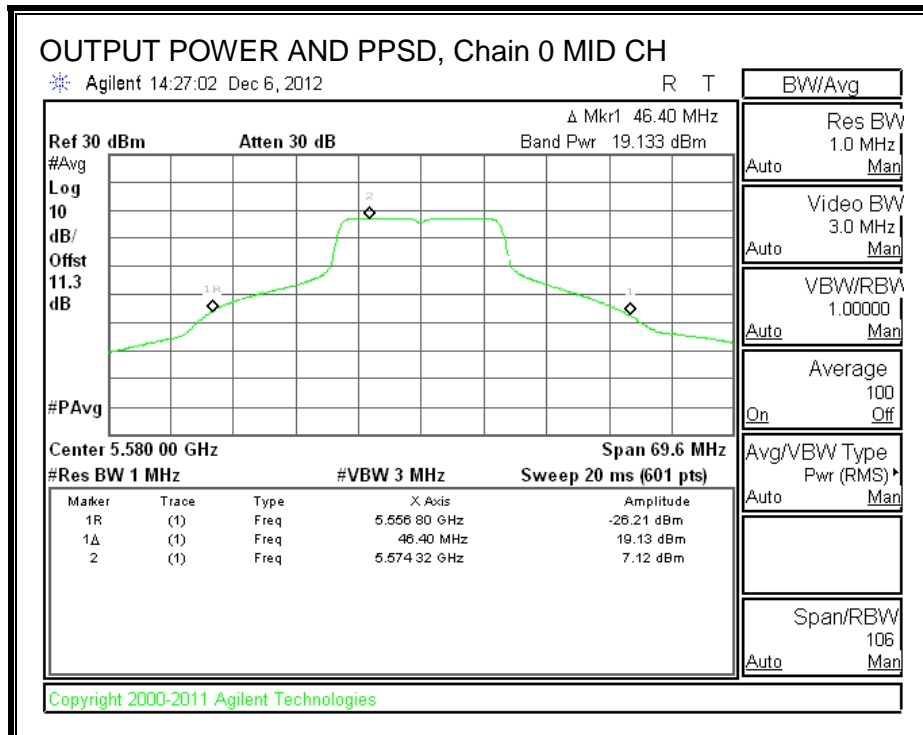
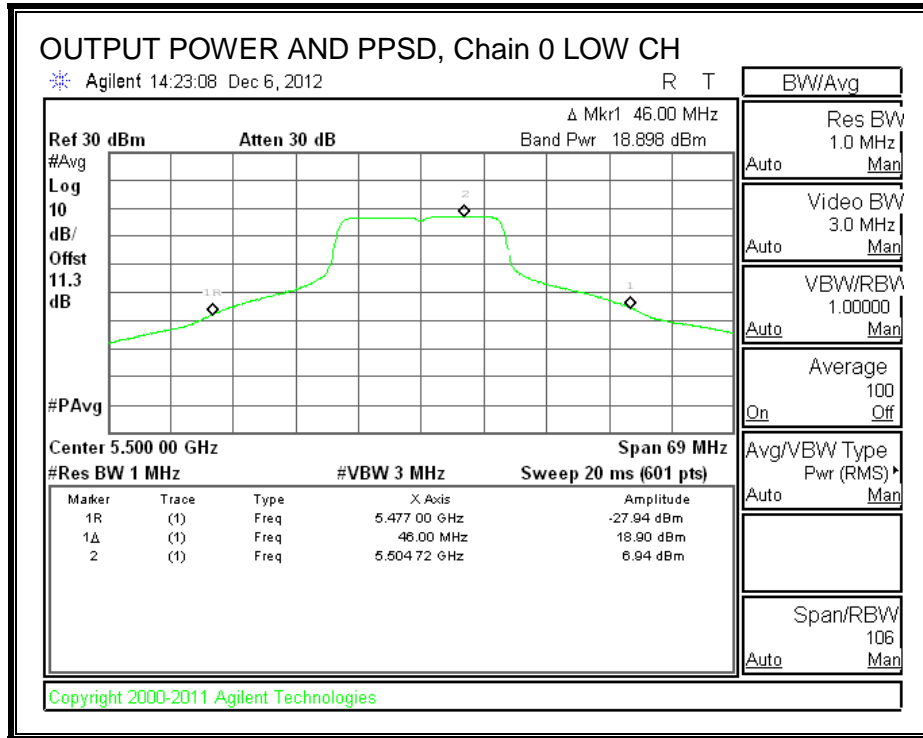
Output Power Results

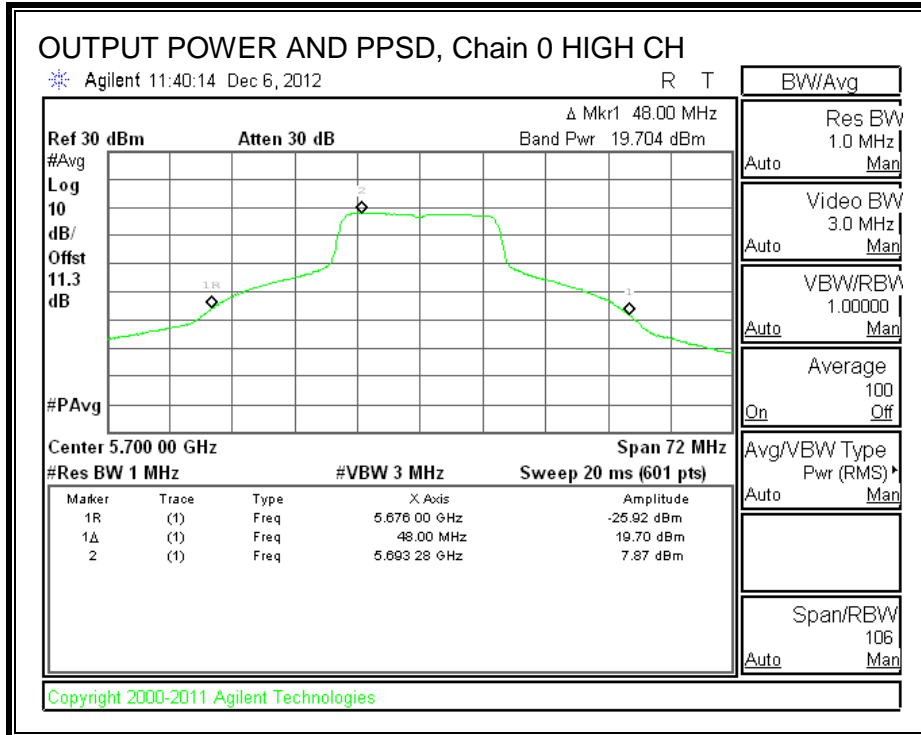
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	18.898	19.167	22.045	23.54	-1.497
Mid	5580	19.133	19.502	22.332	23.56	-1.233
High	5700	19.704	19.929	22.828	23.60	-0.771

PPSD Results

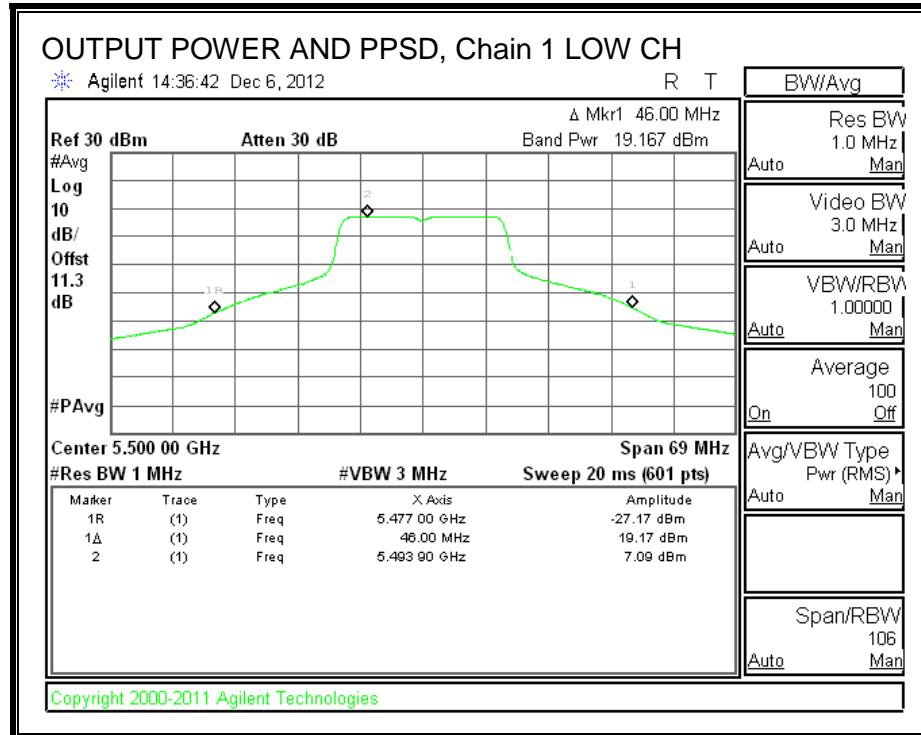
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	6.94	7.09	10.03	11.00	-0.97
Mid	5580	7.12	7.57	10.36	11.00	-0.64
High	5700	7.87	7.97	10.93	11.00	-0.07

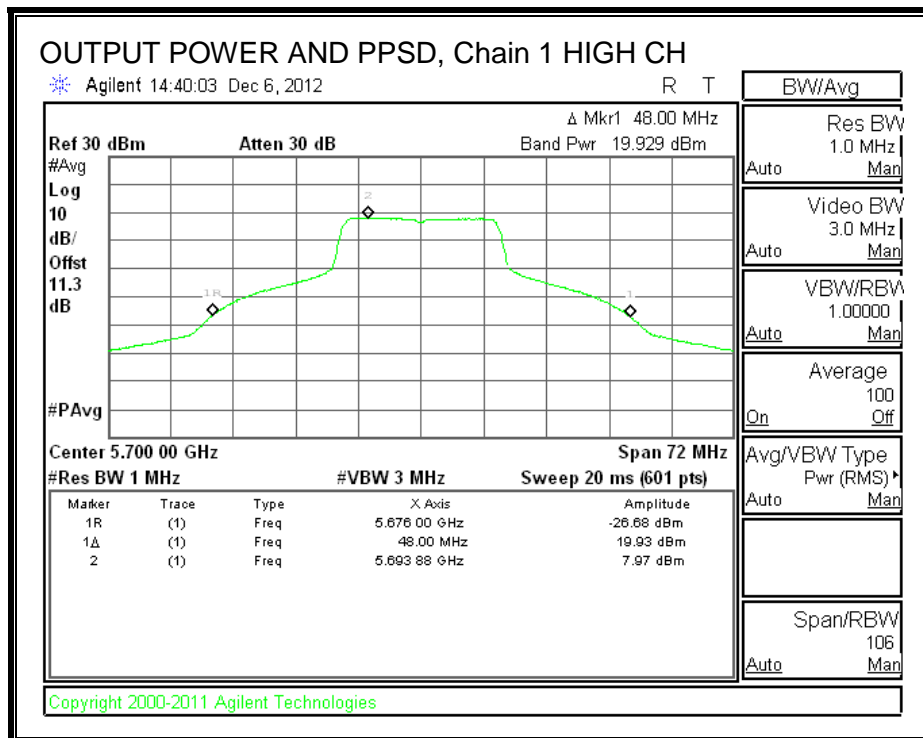
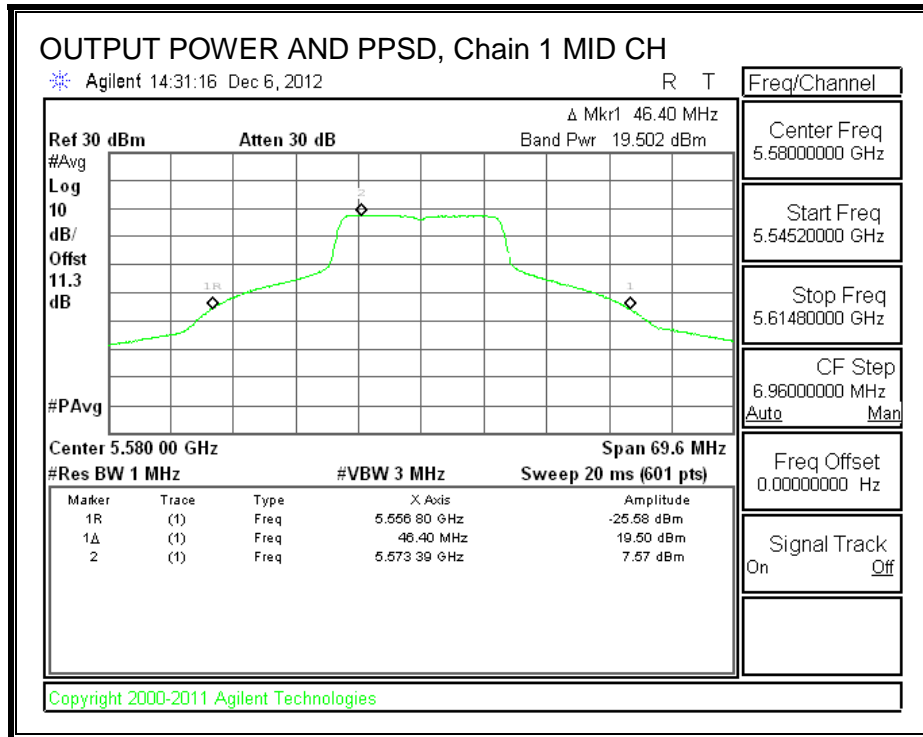
OUTPUT POWER AND PPSD, Chain 0





OUTPUT POWER AND PPSD, Chain 1





8.7.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11.4 dB (including 10 dB pad and 1.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Chain 1 Power (dBm)	Chain 2 Power (dBm)	Total Power (dBm)
Low	5500	18.85	19.15	22.01
Middle	5580	19.10	19.45	22.29
High	5700	19.70	19.90	22.81

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.

TEST PROCEDURE

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

RESULTS

CHAIN 0

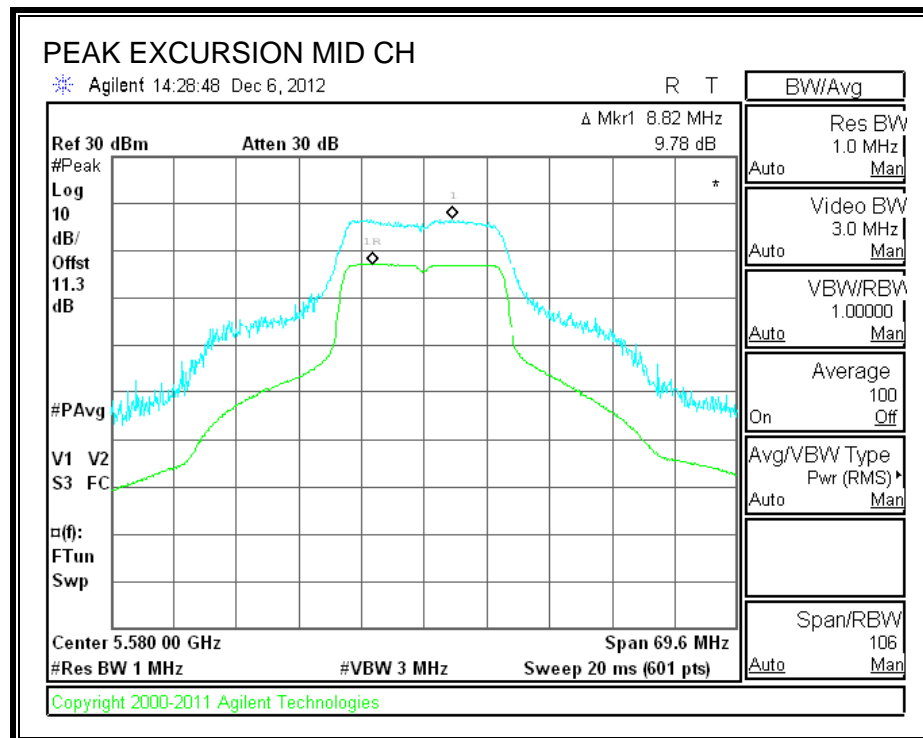
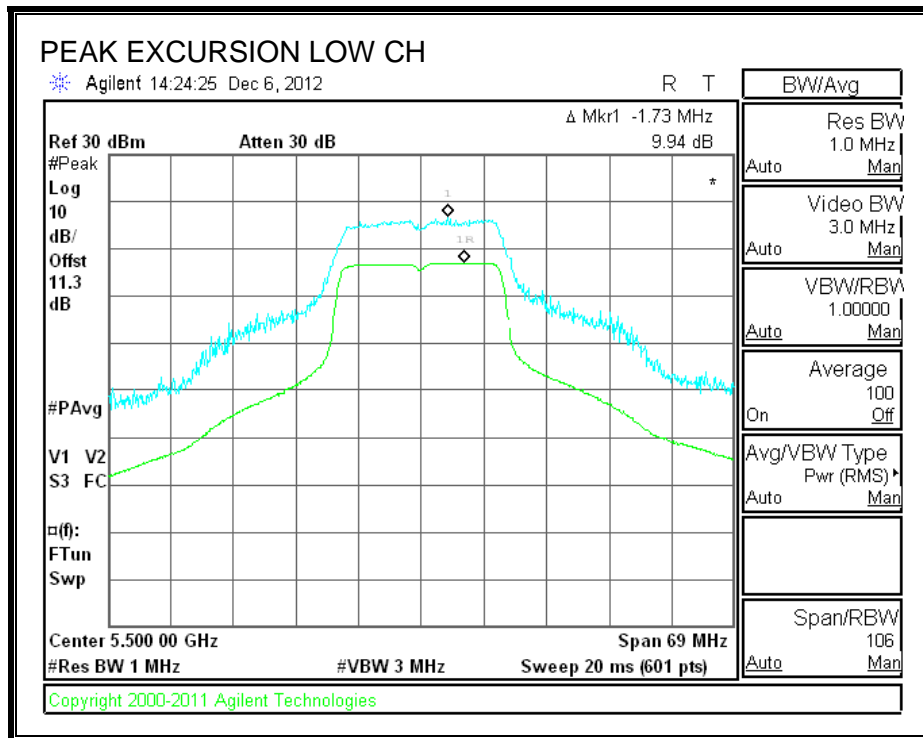
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	9.94	13	-3.06
Middle	5580	9.78	13	-3.22
High	5700	8.91	13	-4.09

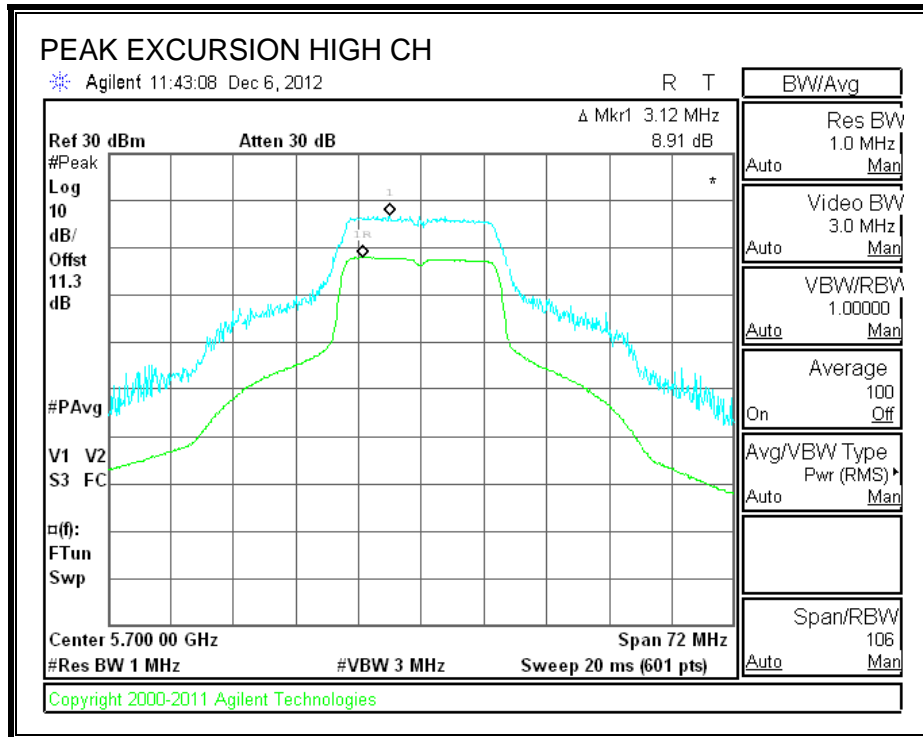
CHAIN 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	9.06	13	-3.94
Middle	5580	9.20	13	-3.80
High	5700	8.85	13	-4.15

CHAIN 0

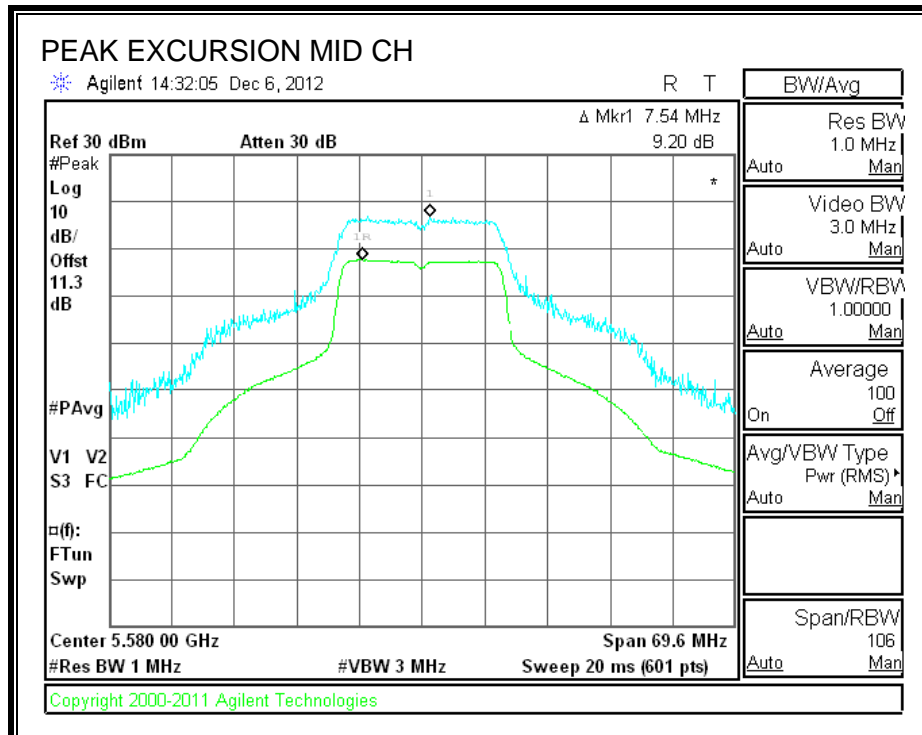
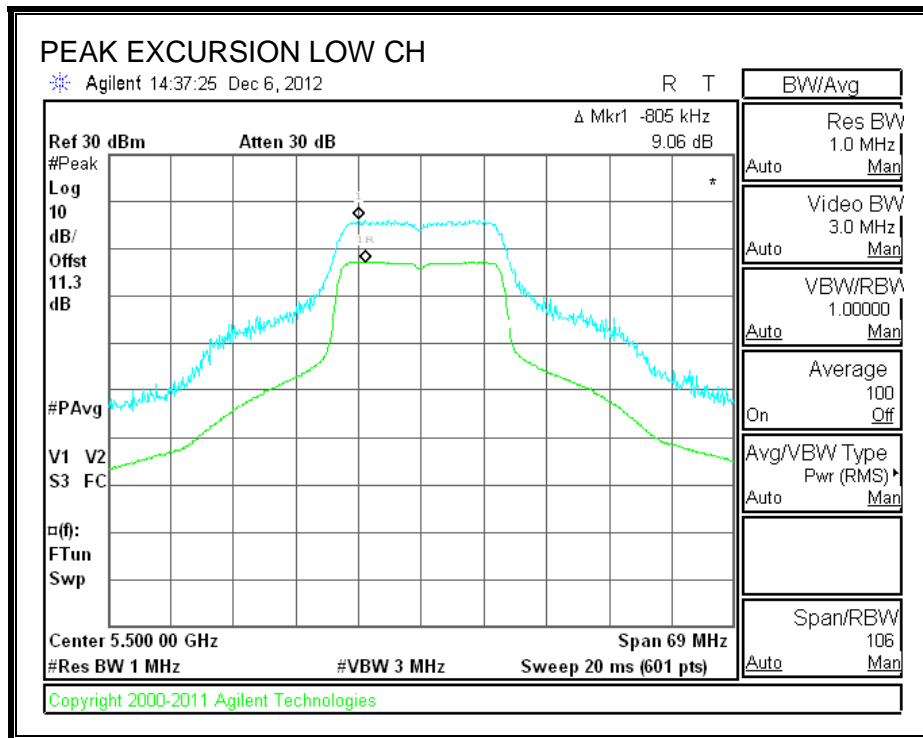
PEAK EXCURSION

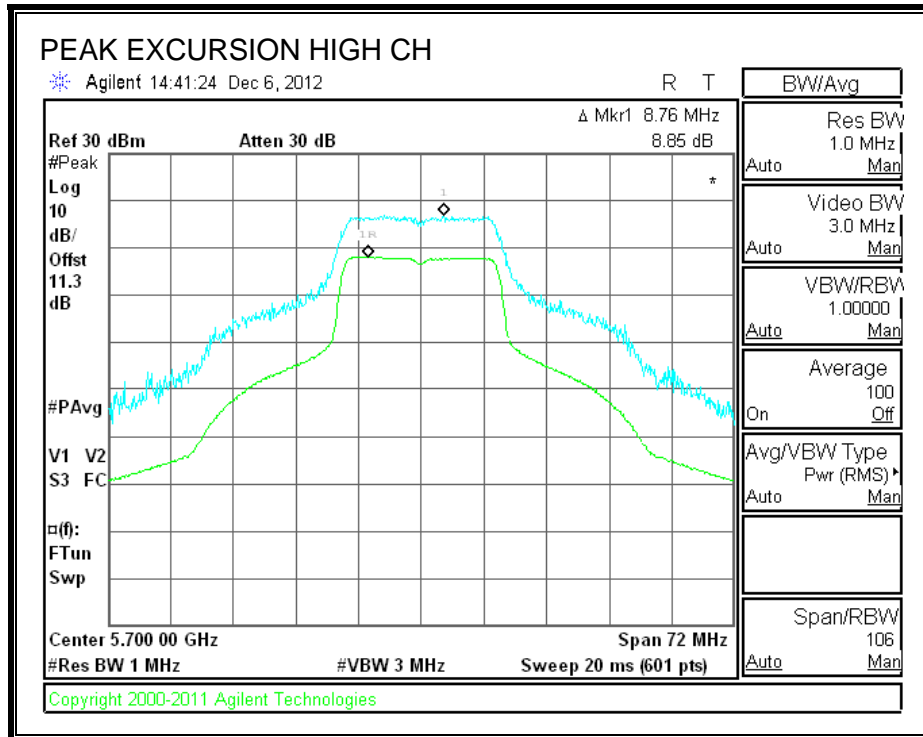




CHAIN 1

PEAK EXCURSION





8.8. 802.11n HT20, SDM MODE IN THE 5.6 GHz BAND

8.8.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

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

RESULTS

CHAIN 0

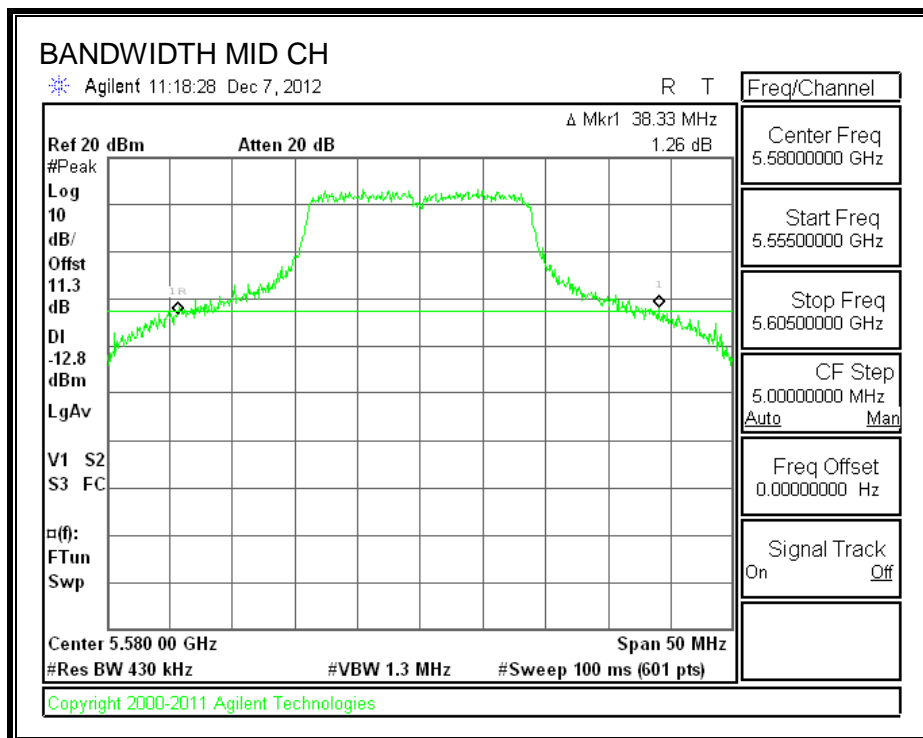
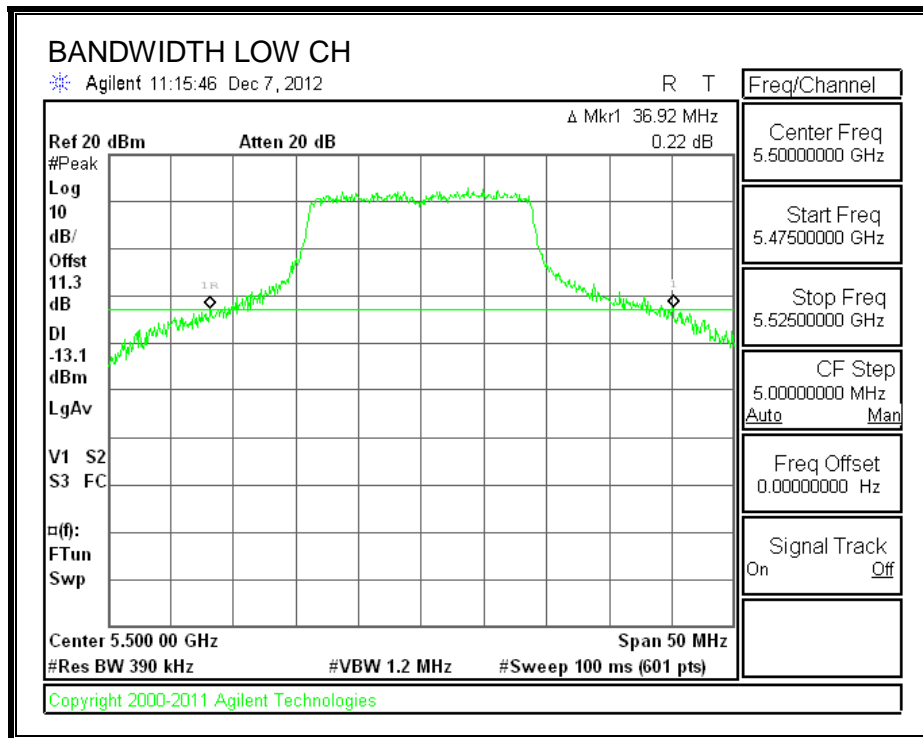
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	36.92	17.9292
Middle	5580	38.33	17.9799
High	5700	40.25	18.0103

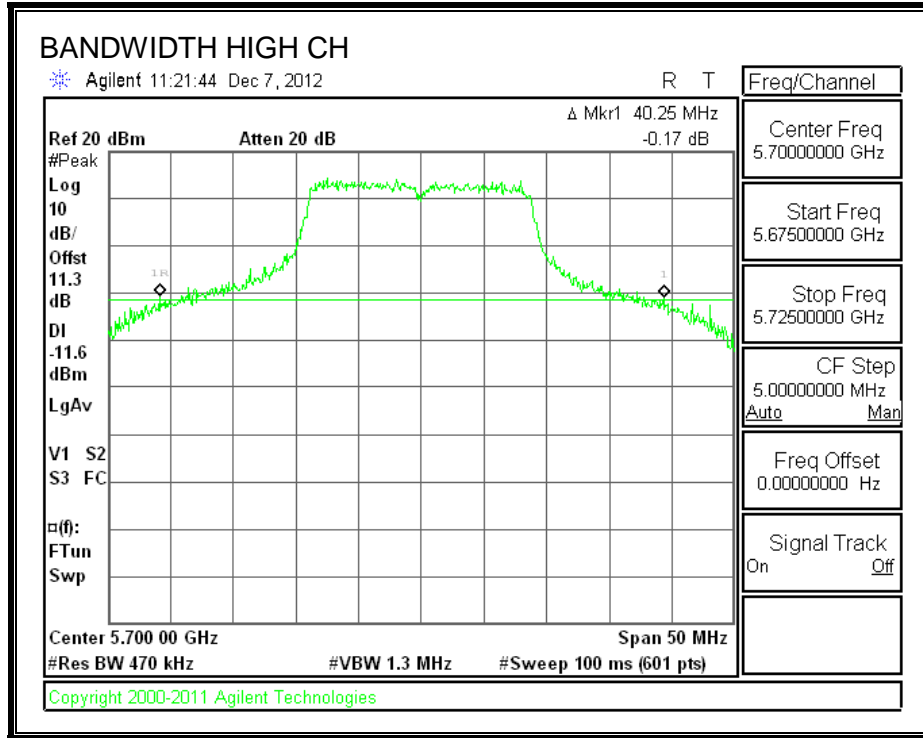
CHAIN 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	37.33	17.9258
Middle	5580	42.00	18.0139
High	5700	42.42	18.1099

CHAIN 0

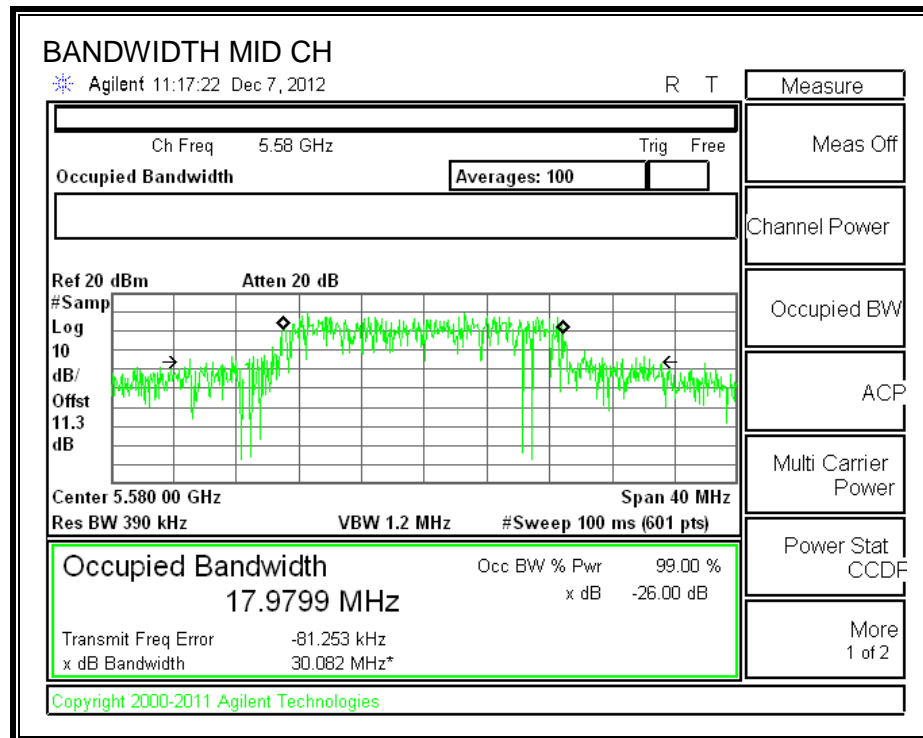
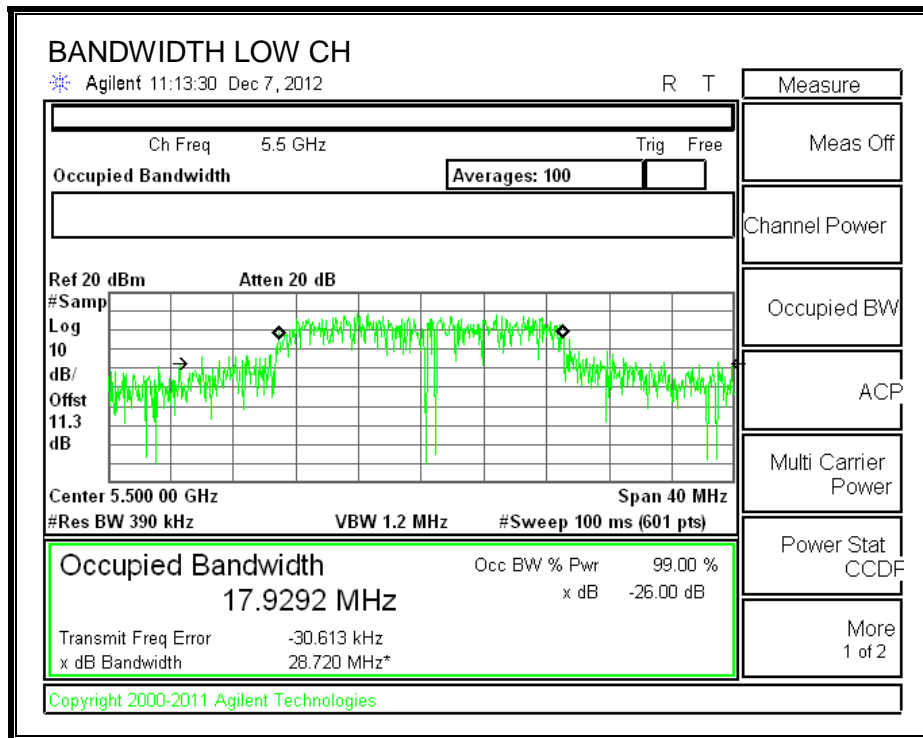
26 dB BANDWIDTH

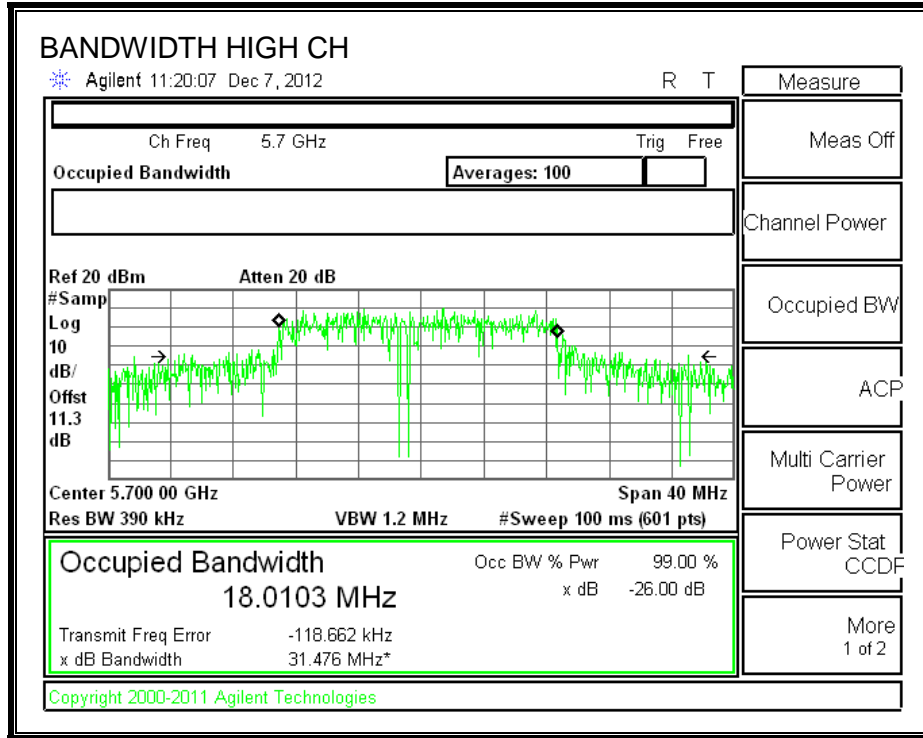




CHAIN 0

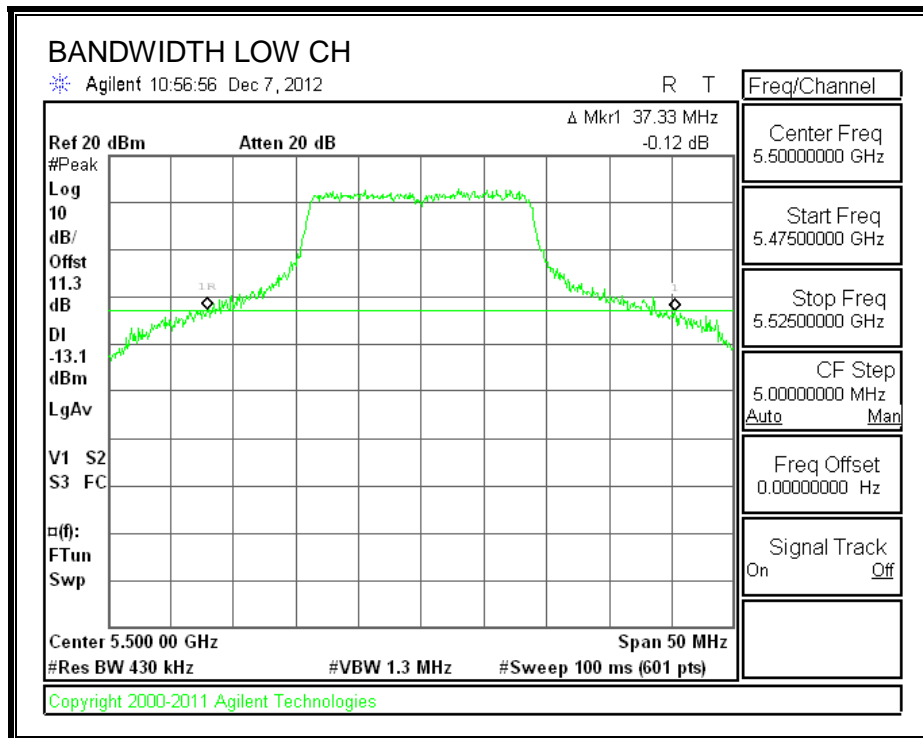
99% BANDWIDTH

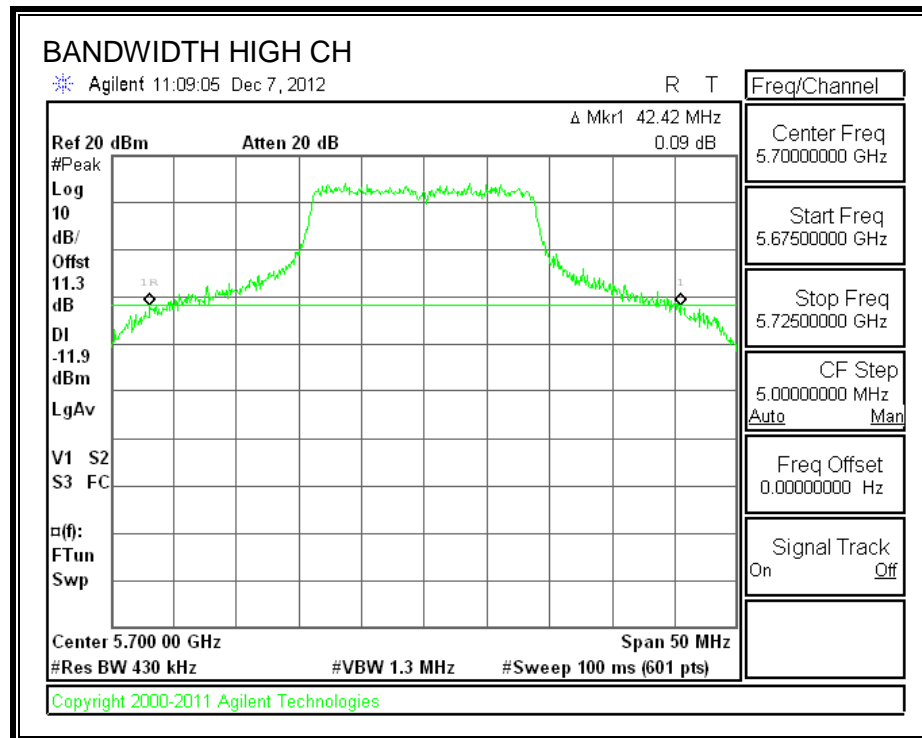
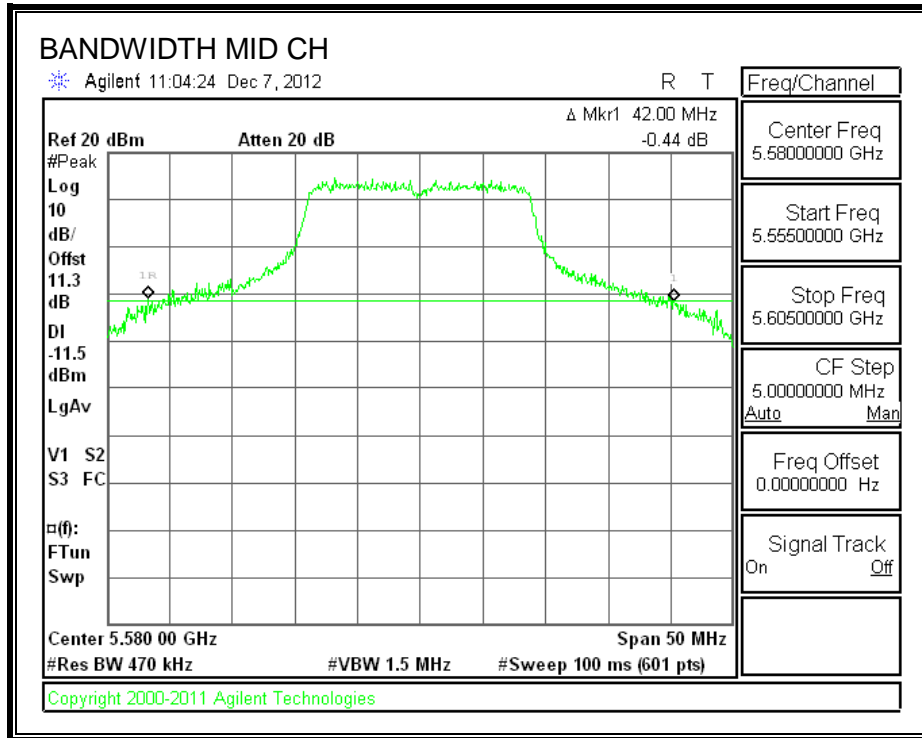




CHAIN1

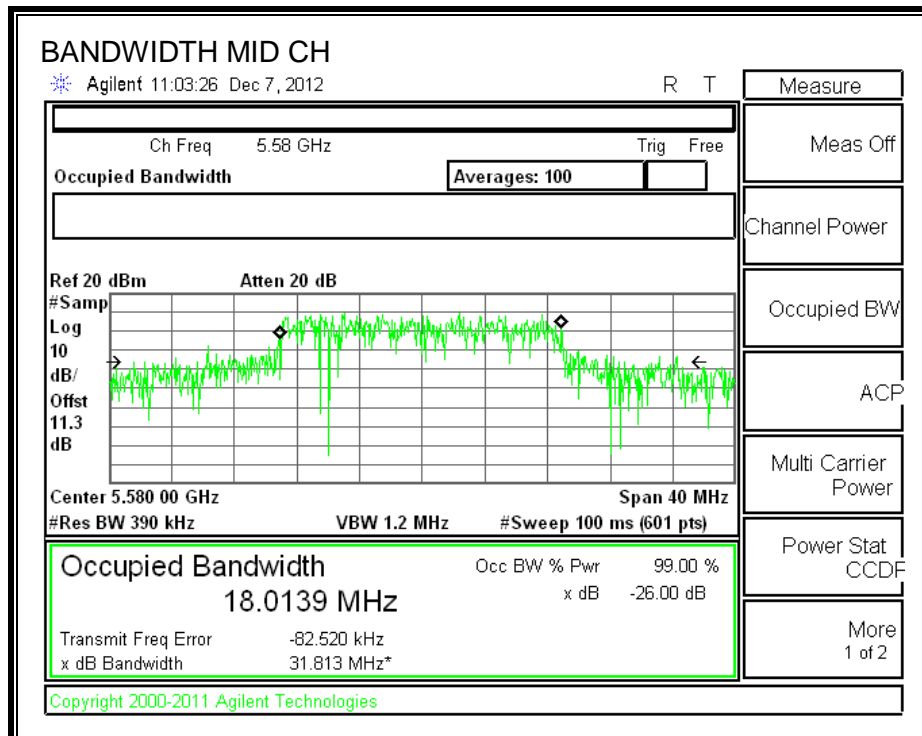
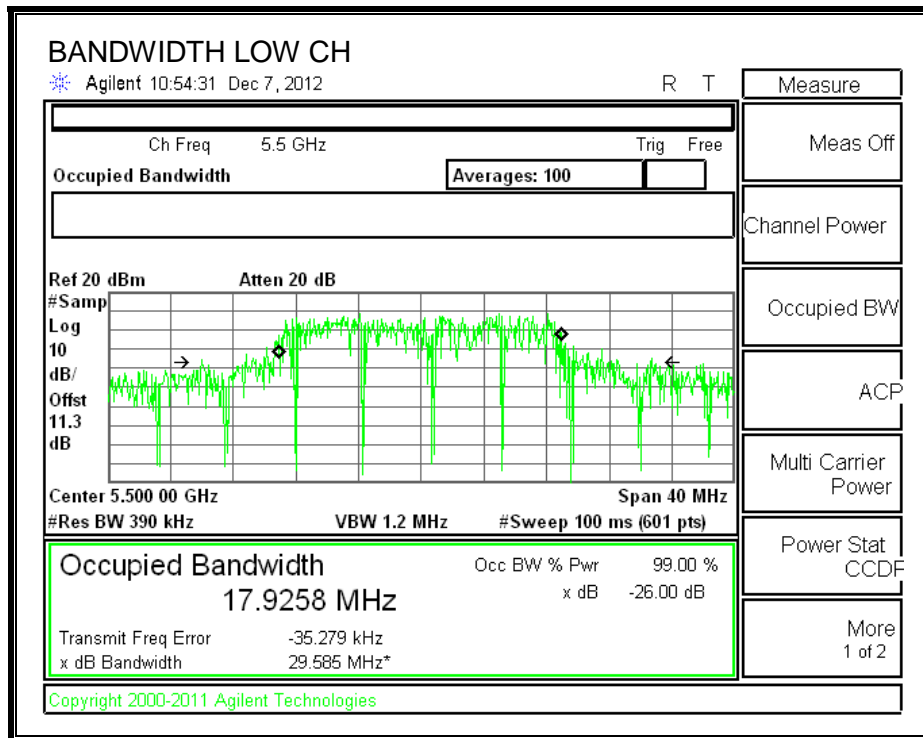
26 dB BANDWIDTH

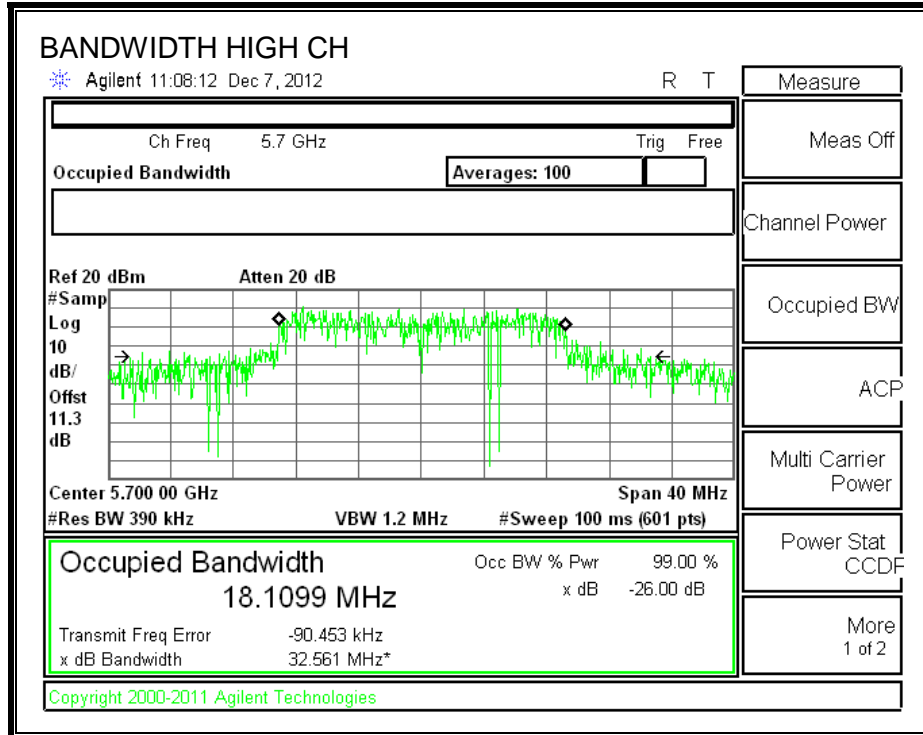




CHAIN 1

99% BANDWIDTH





8.8.2. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band 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 MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is 2 dBi.

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	36.92	17.9258	2.00
Mid	5680	38.33	17.9799	2.00
High	5700	40.25	18.0103	2.00

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	24.00	23.53	29.53	23.53	11.00	11.00	11.00
Mid	5680	24.00	23.55	29.55	23.55	11.00	11.00	11.00
High	5700	24.00	23.56	29.56	23.56	11.00	11.00	11.00

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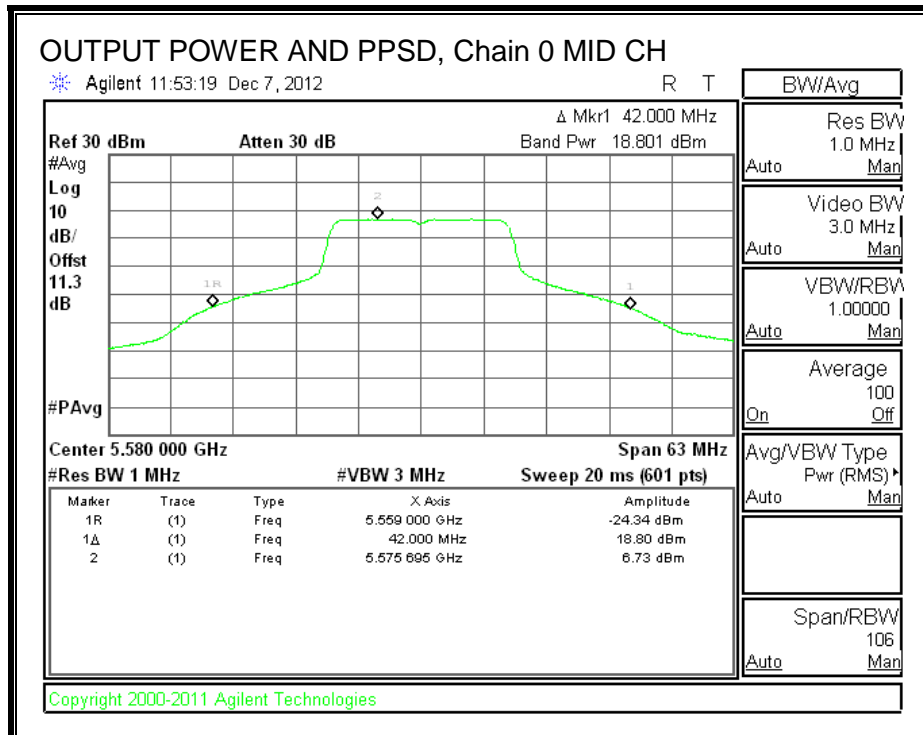
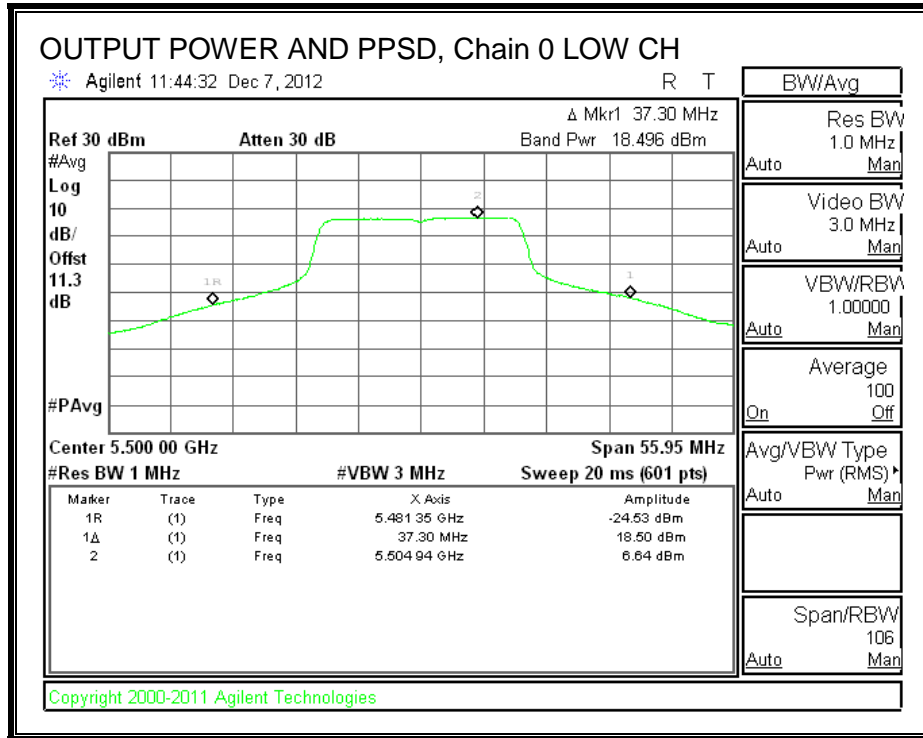
Output Power Results

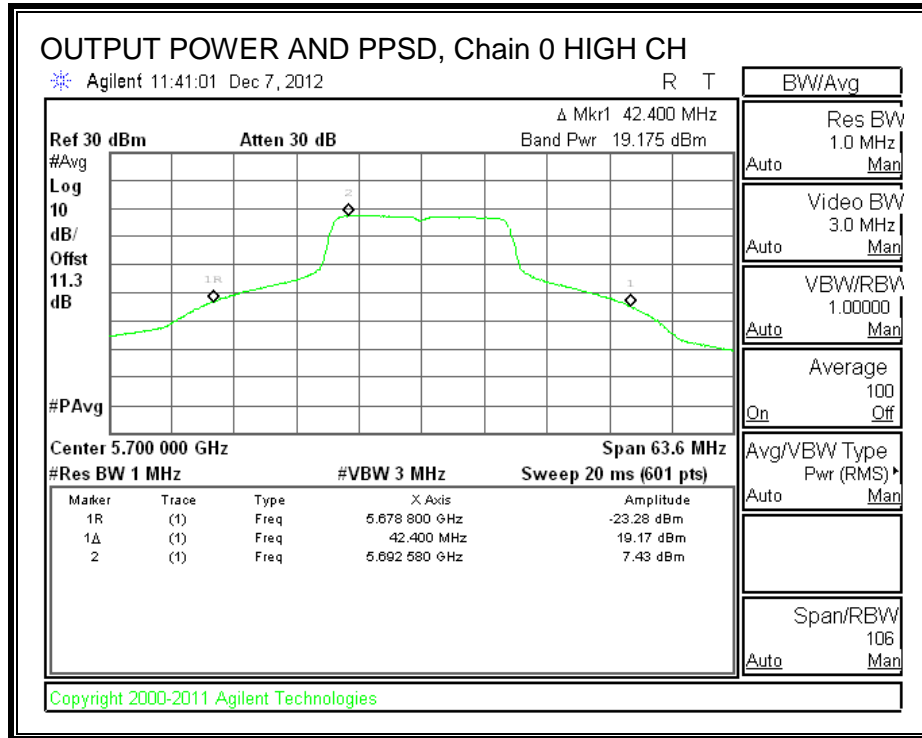
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	18.496	18.911	21.719	23.53	-1.816
Mid	5680	18.801	19.065	21.945	23.55	-1.603
High	5700	19.175	19.698	22.455	23.56	-1.101

PPSD Results

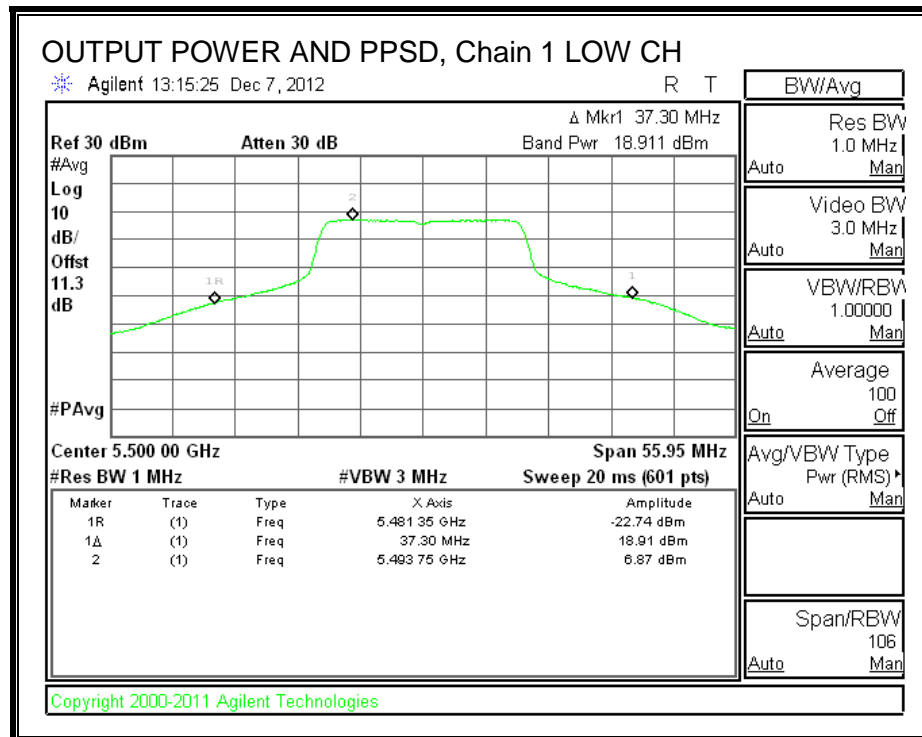
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	6.64	6.87	9.77	11.00	-1.23
Mid	5680	6.73	7.12	9.94	11.00	-1.06
High	5700	7.43	7.84	10.65	11.00	-0.35

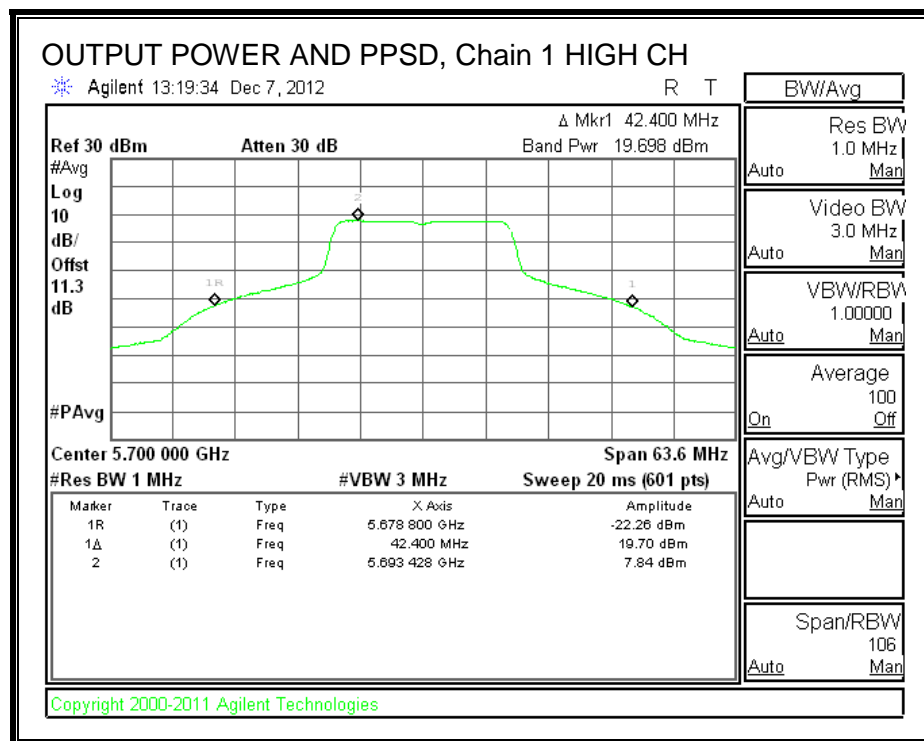
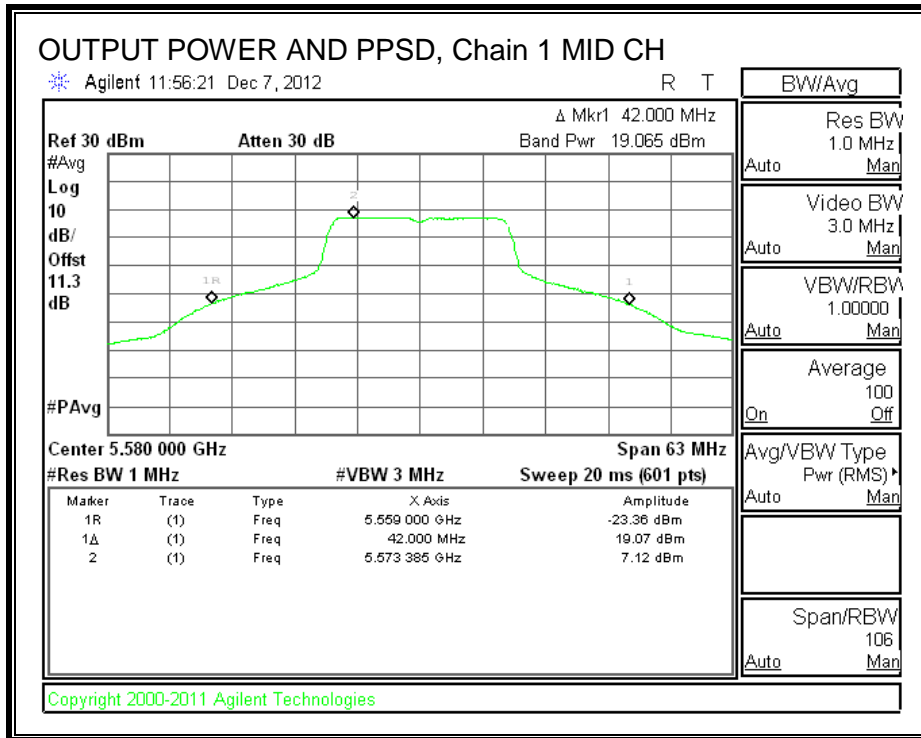
OUTPUT POWER AND PPSD, Chain 0





OUTPUT POWER AND PPSD, Chain 1





8.8.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11.4 dB (including 10 dB pad and 1.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Chain 1 Power (dBm)	Chain 2 Power (dBm)	Total Power (dBm)
Low	5500	18.45	18.90	21.69
Middle	5680	18.75	19.00	21.89
High	5700	19.10	19.70	22.42

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.

TEST PROCEDURE

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

RESULTS

CHAIN 0

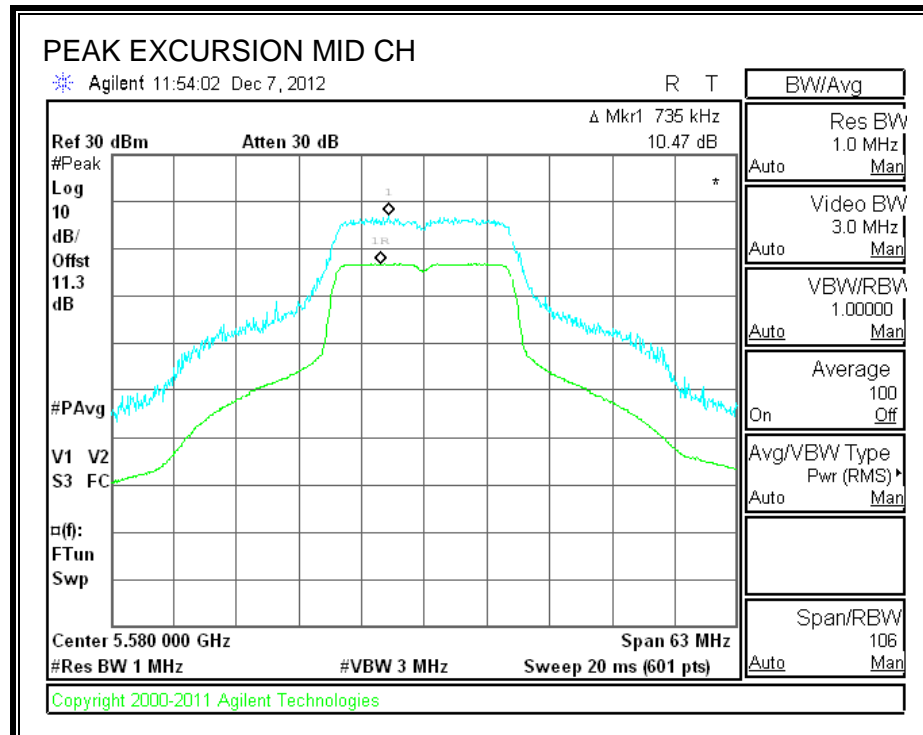
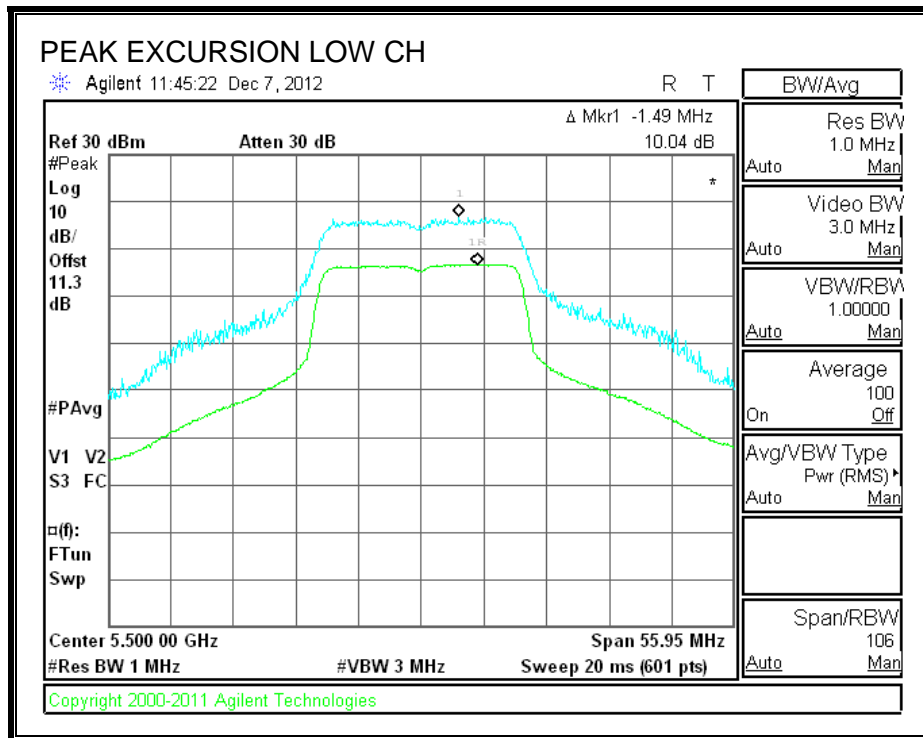
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	10.04	13	-2.96
Middle	5680	10.47	13	-2.53
High	5700	9.88	13	-3.12

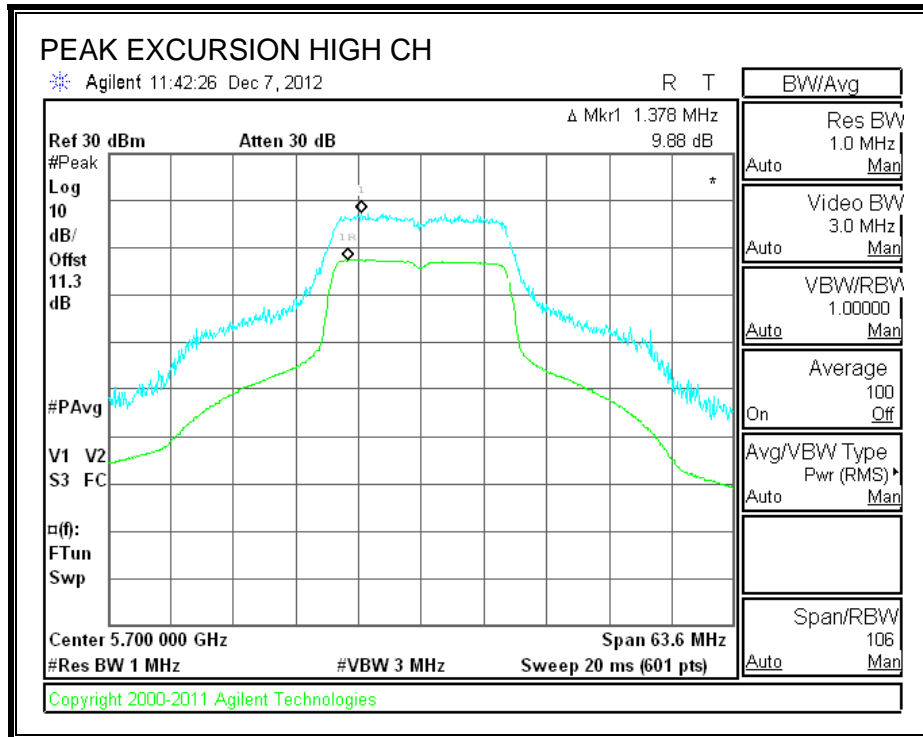
CHAIN 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5500	10.39	13	-2.61
Middle	5680	9.85	13	-3.15
High	5700	10.14	13	-2.86

CHAIN 0

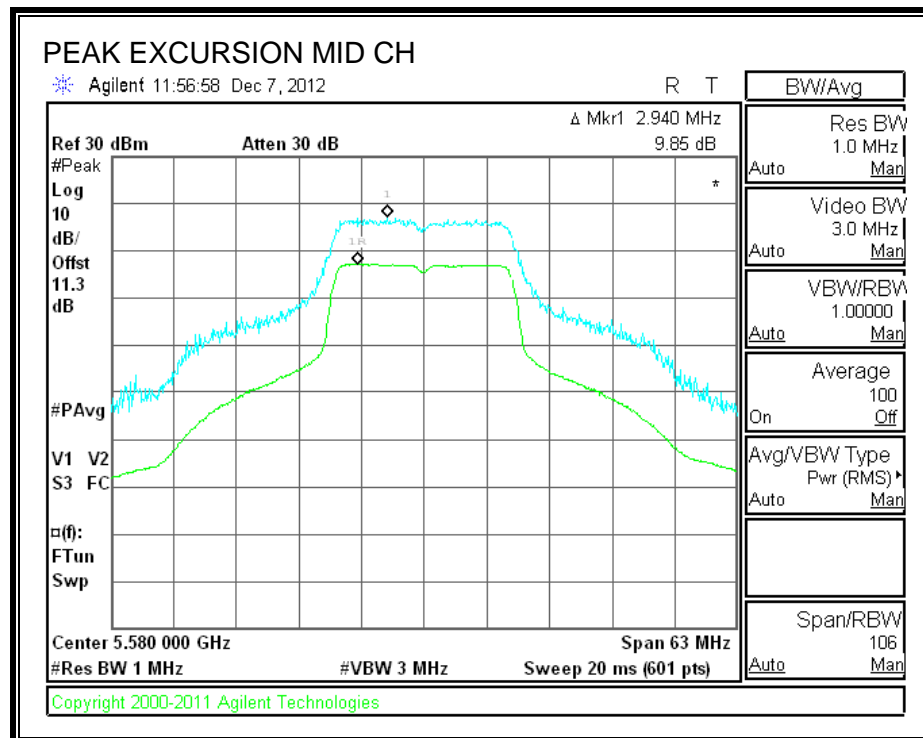
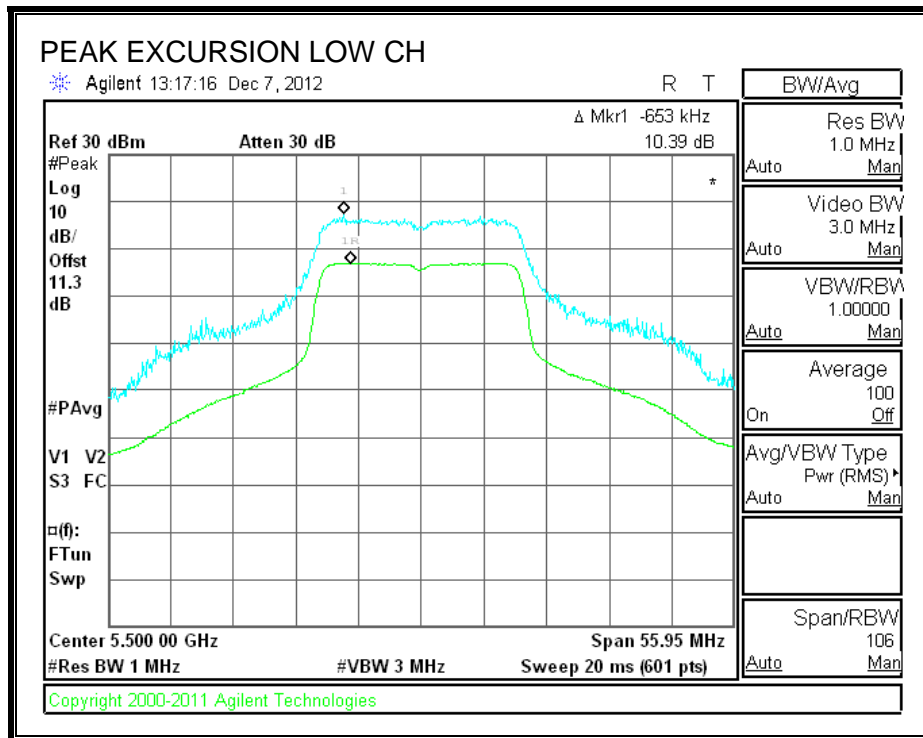
PEAK EXCURSION

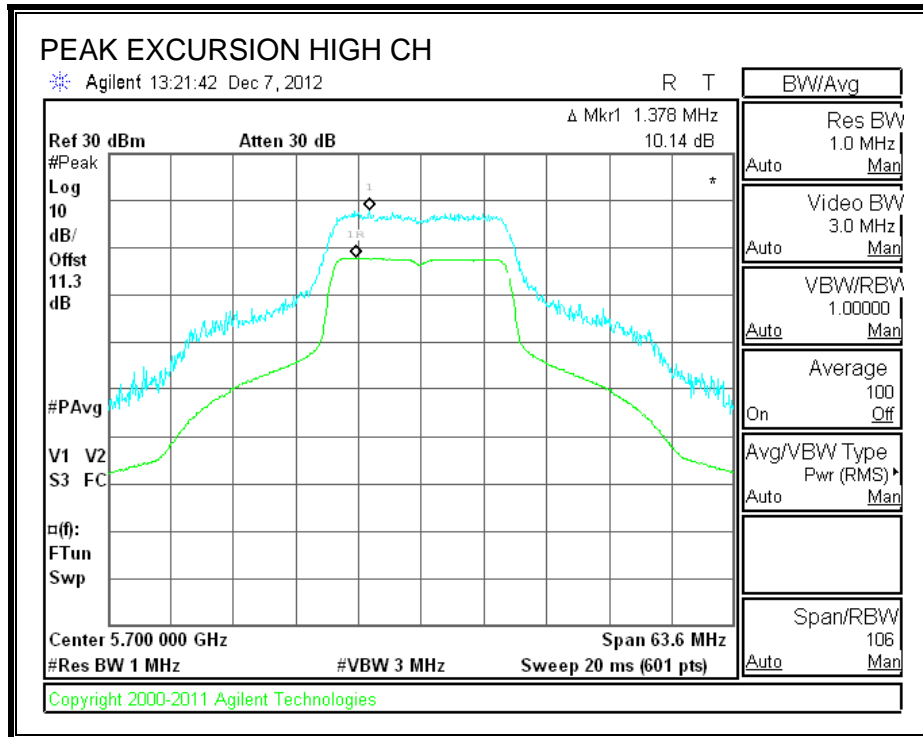




CHAIN 1

PEAK EXCURSION





8.9. 802.11n HT40, CDD MODE IN THE 5.6 GHz BAND

8.9.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

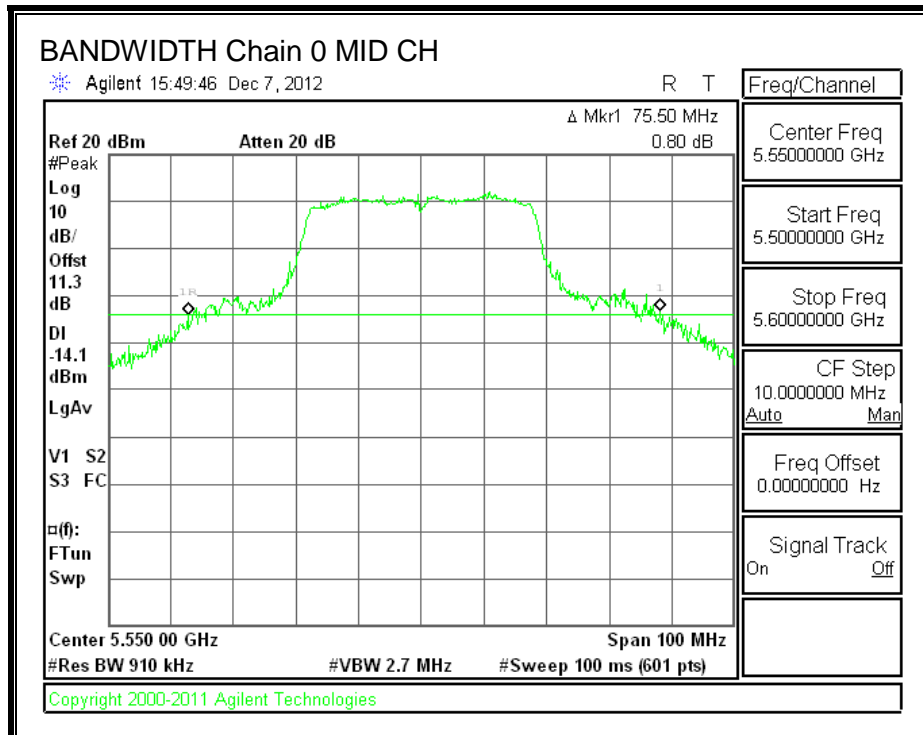
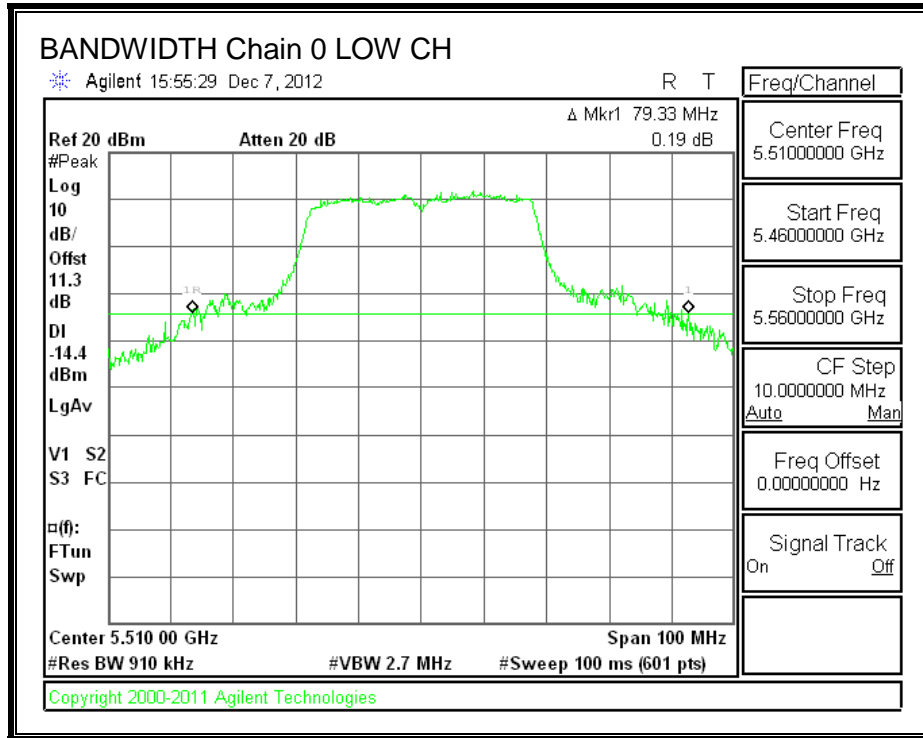
CHAIN 0

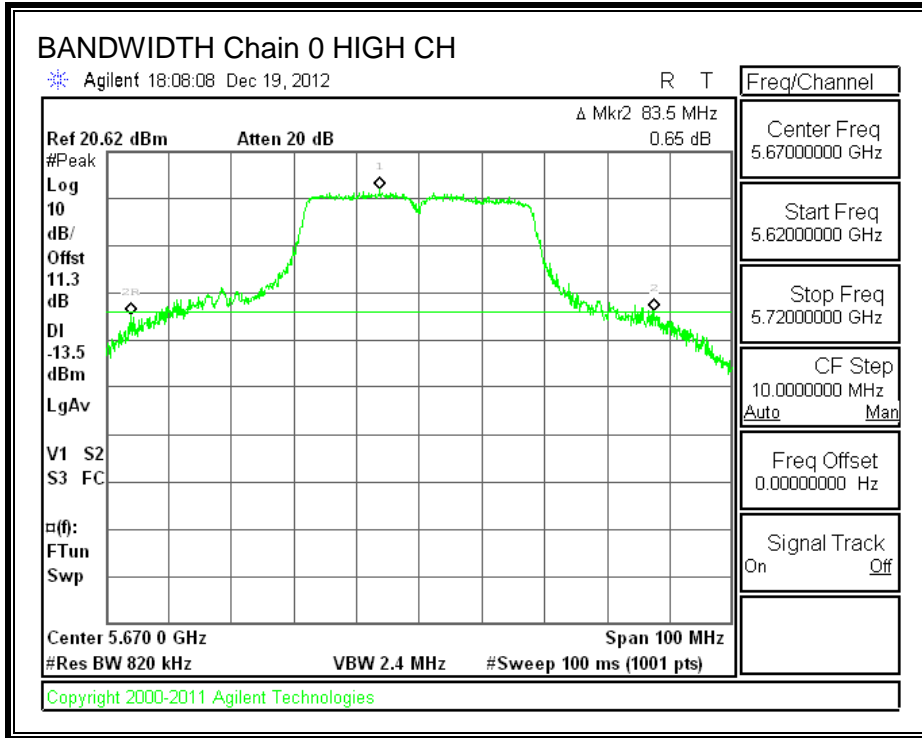
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	79.33	36.4249
Middle	5550	75.50	36.4580
High	5670	83.50	36.5067

CHAIN 1

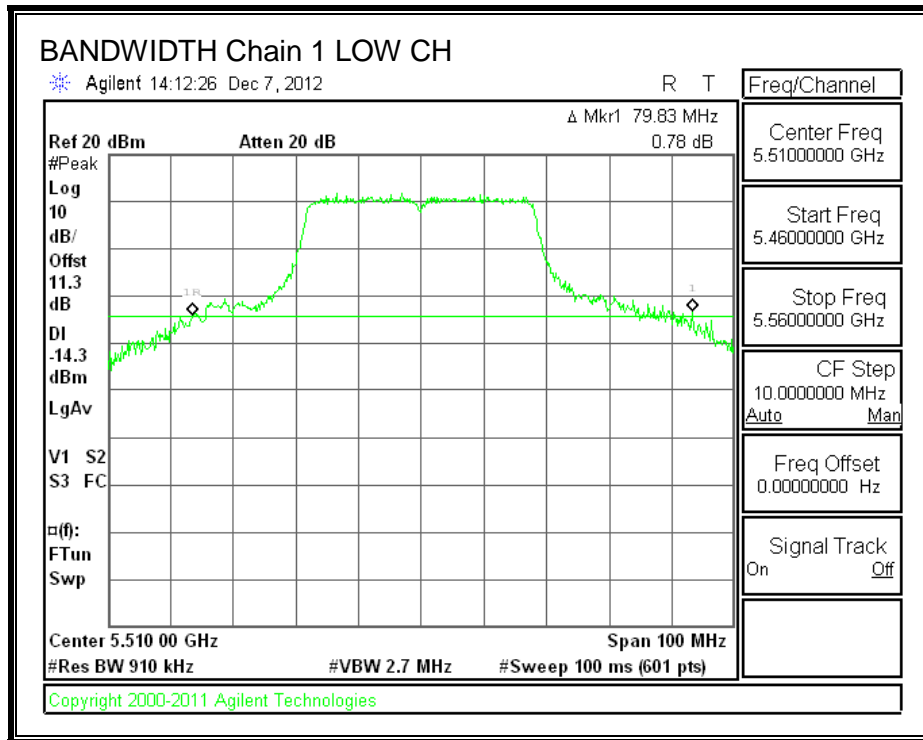
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	79.83	36.6231
Middle	5550	79.33	36.5297
High	5670	76.20	36.4697

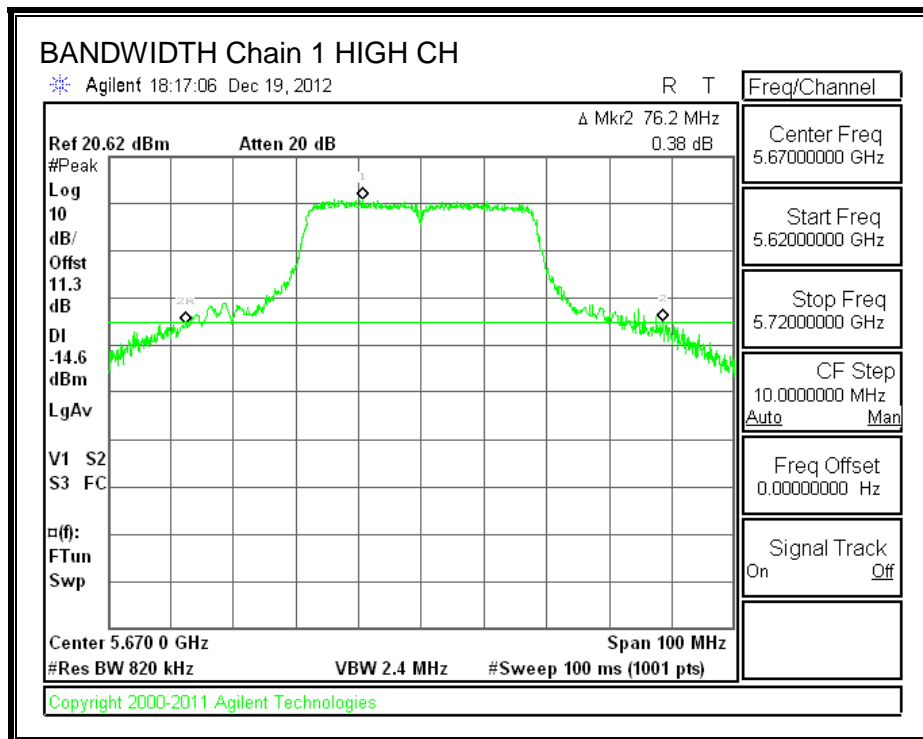
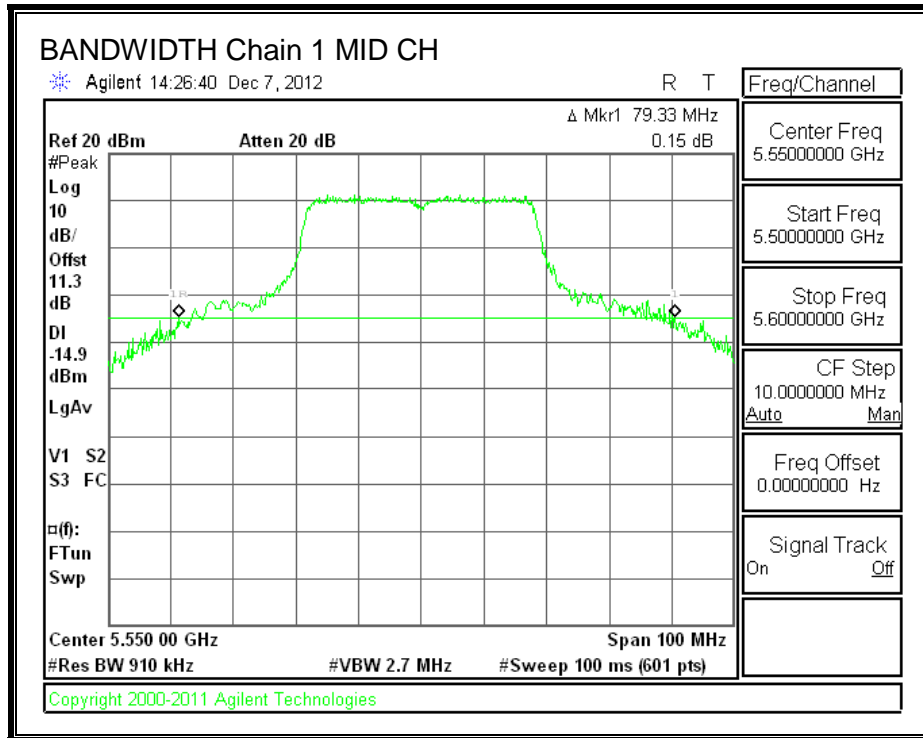
26 dB BANDWIDTH, Chain 0



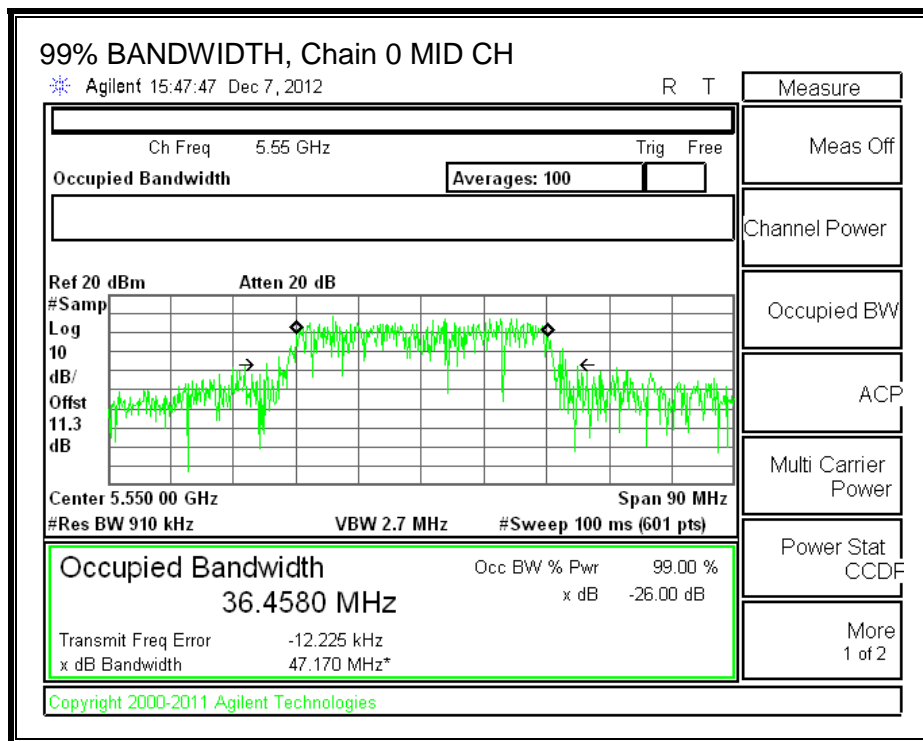
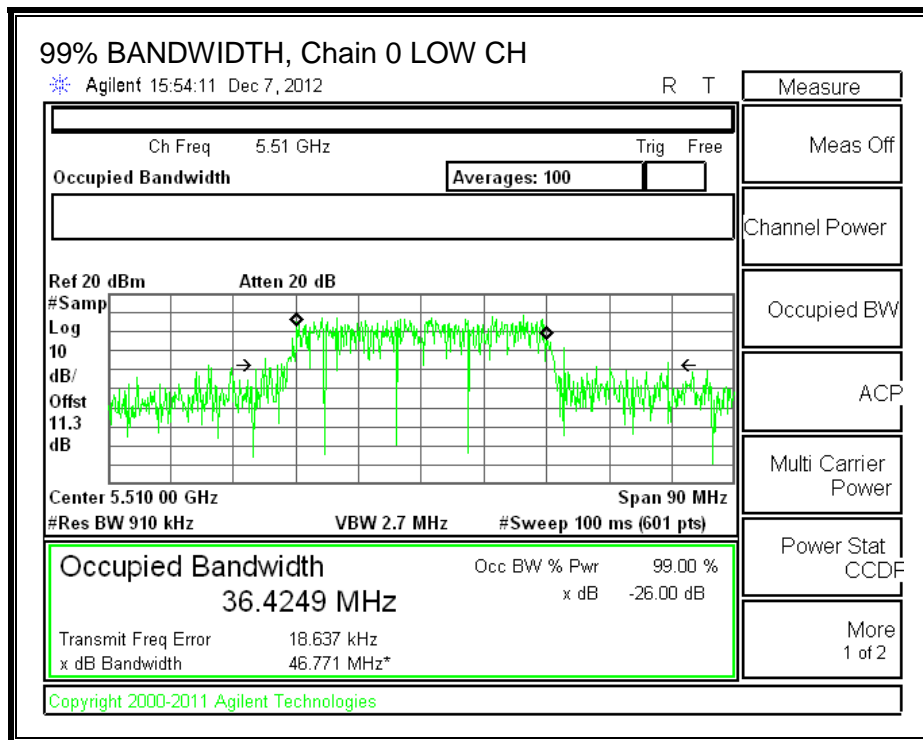


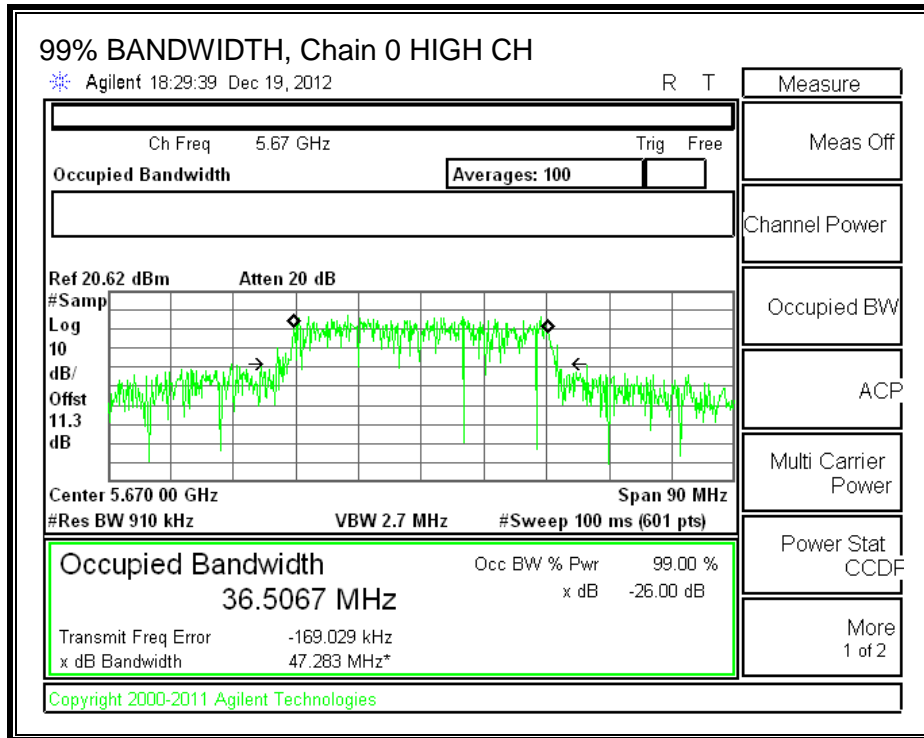
26 dB BANDWIDTH, Chain 1



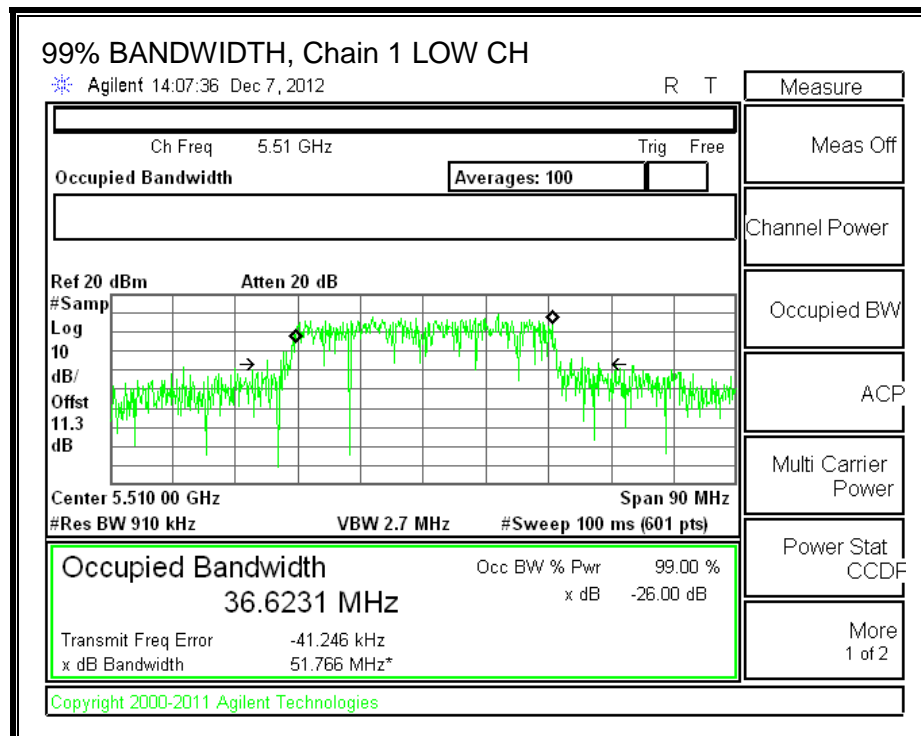


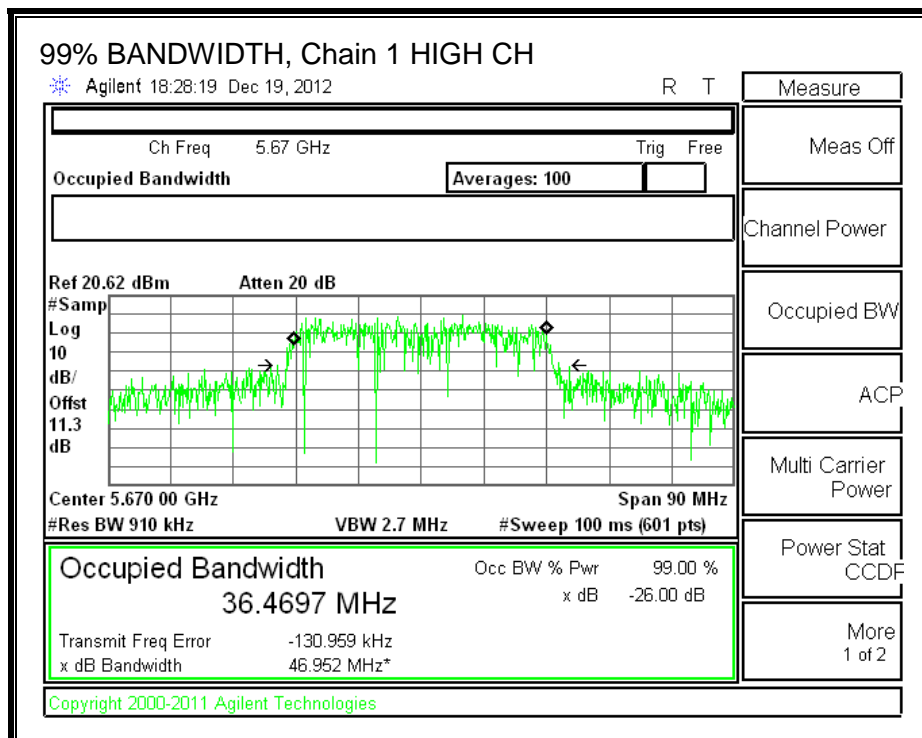
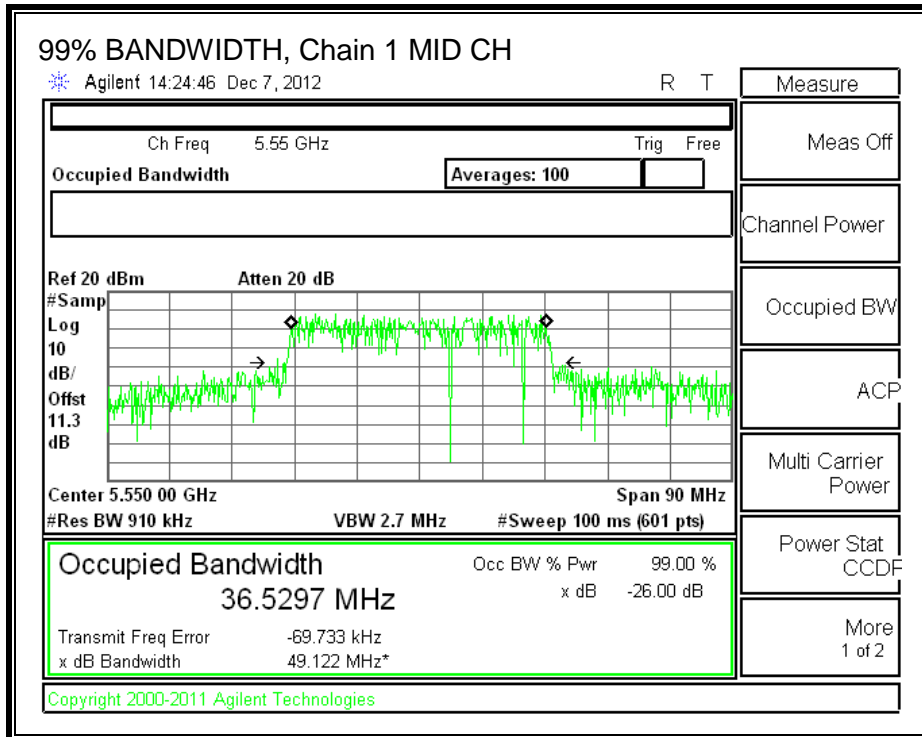
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





8.9.2. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

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

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Correlated Chains Directional Gain (dBi)
2.00	3.01	5.01

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5510	79.33	36.4249	5.01
Mid	5550	75.50	36.4580	5.01
High	5670	76.20	36.4697	5.01

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5510	24.00	24.00	30.00	24.00	11.00	11.00	11.00
Mid	5550	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5670	24.00	24.00	30.00	24.00	11.00	11.00	11.00

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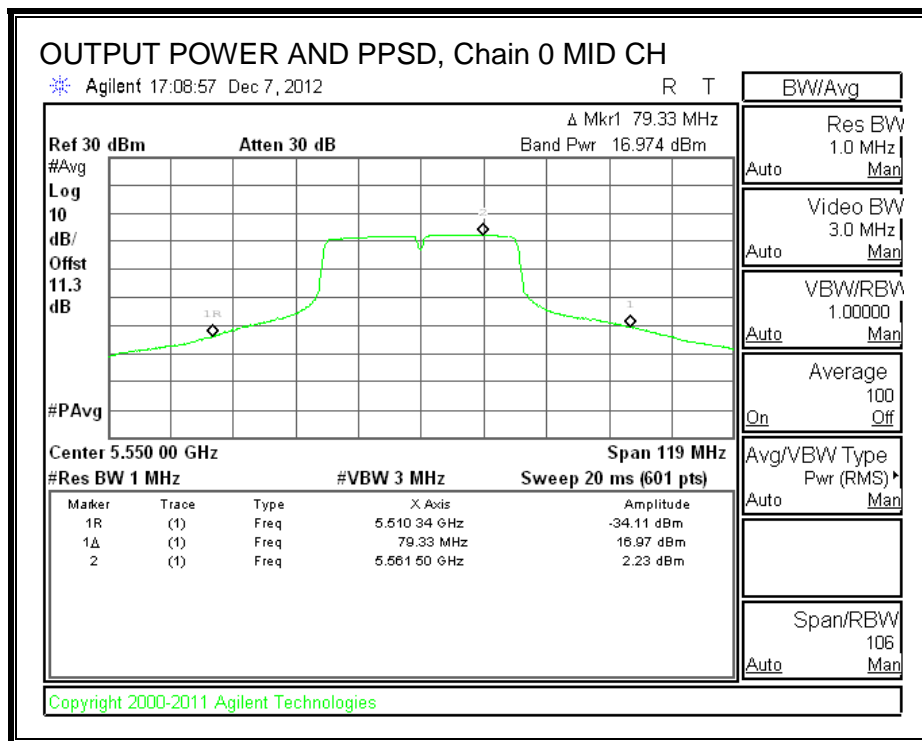
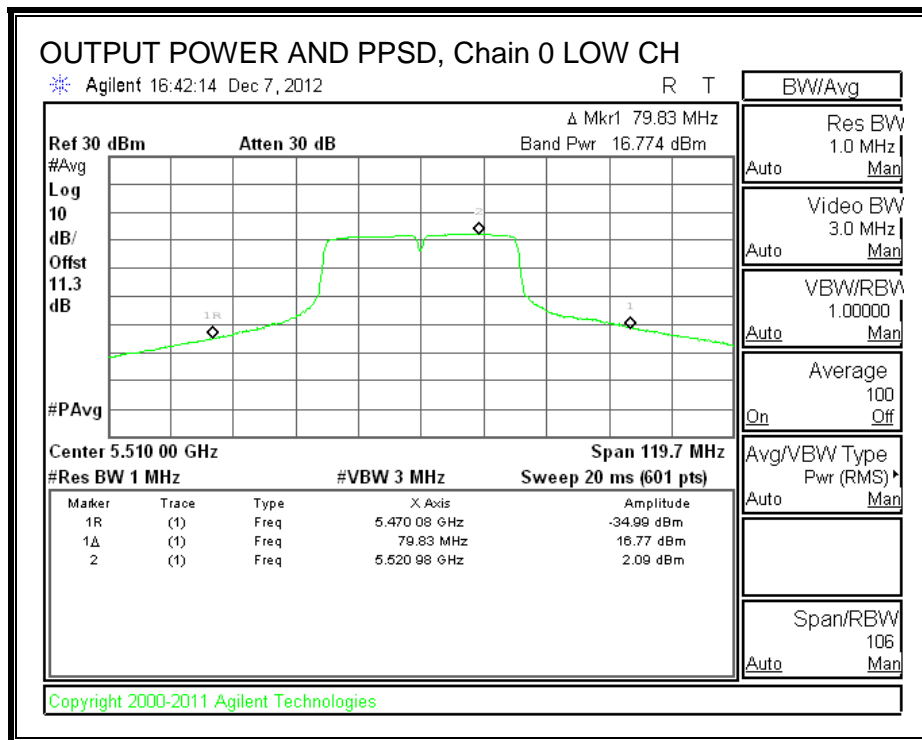
Output Power Results

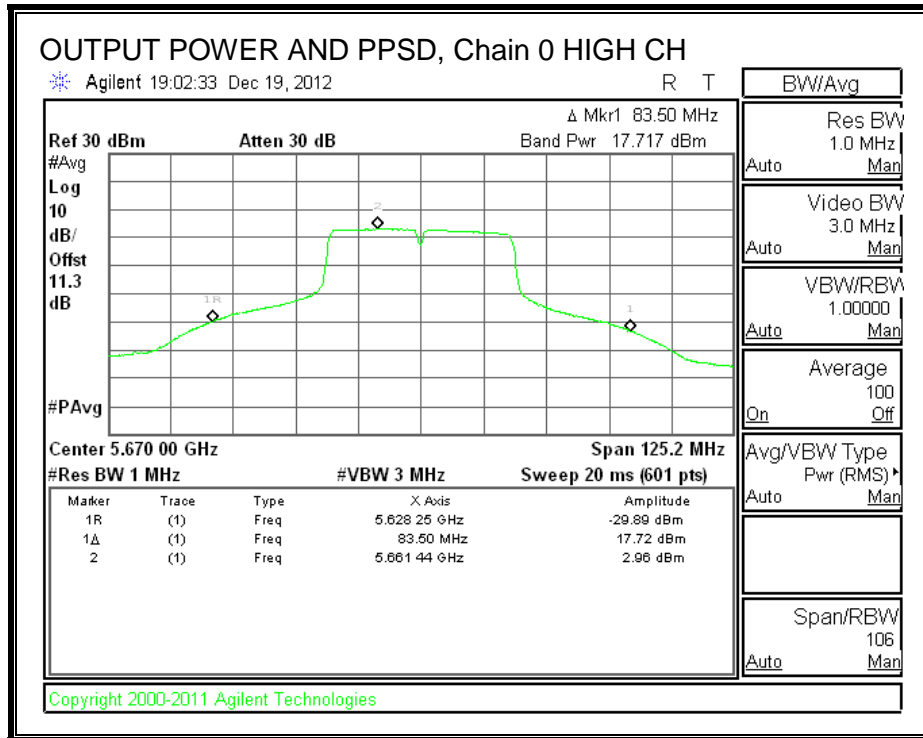
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	16.774	17.629	20.233	24.00	-3.767
Mid	5550	16.974	17.347	20.175	24.00	-3.825
High	5670	17.717	17.594	20.666	24.00	-3.334

PPSD Results

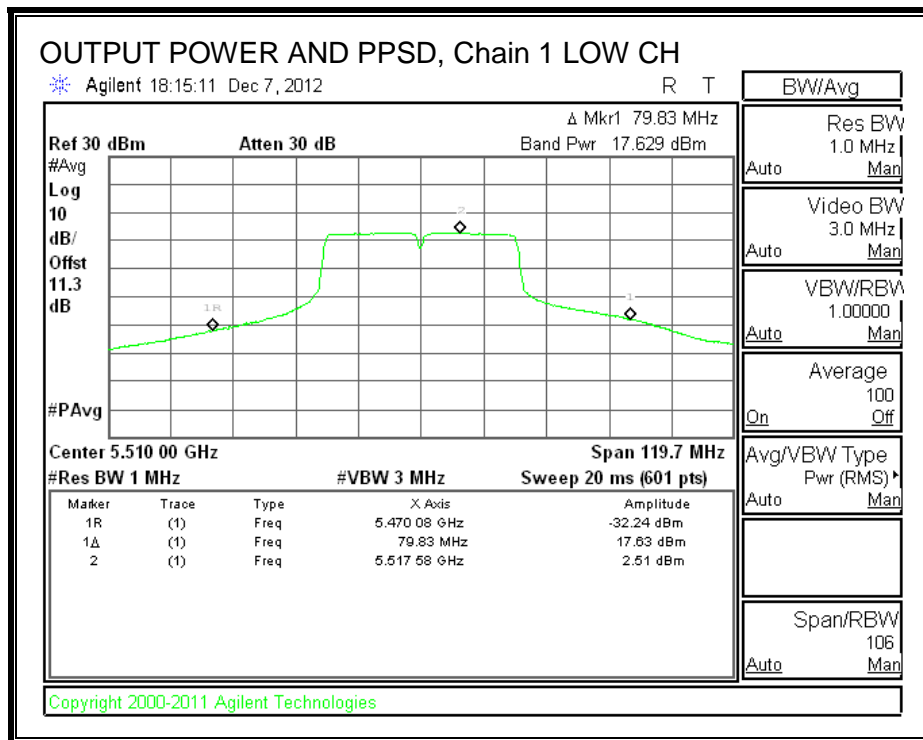
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	2.09	2.51	5.32	11.00	-5.68
Mid	5550	2.23	2.20	5.23	11.00	-5.77
High	5670	2.96	2.67	5.83	11.00	-5.17

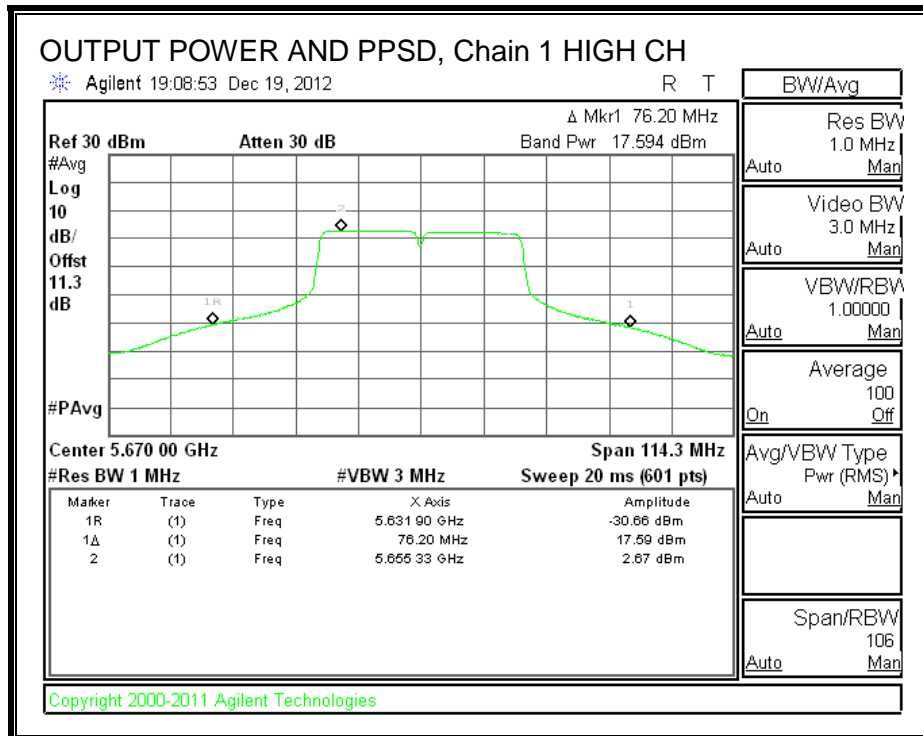
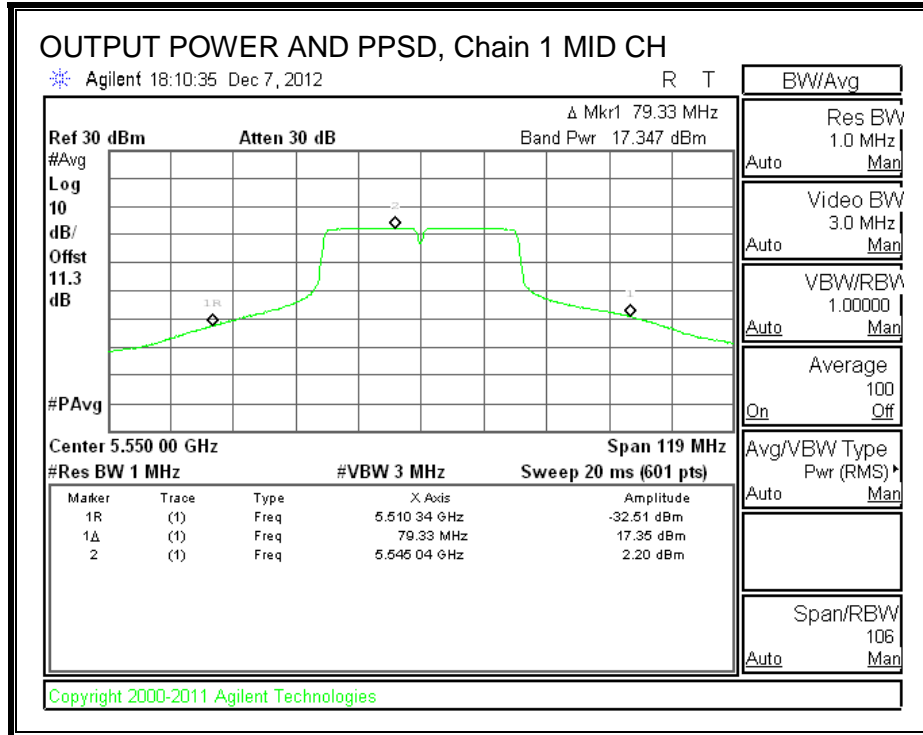
OUTPUT POWER AND PPSD, Chain 0





OUTPUT POWER AND PPSD, Chain 1





8.9.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.4dB (including 10 dB pad and 1.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5510	16.75	17.60	20.21
Mid	5550	16.95	17.30	20.14
High	5670	17.70	17.57	20.65

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

CHAIN 0

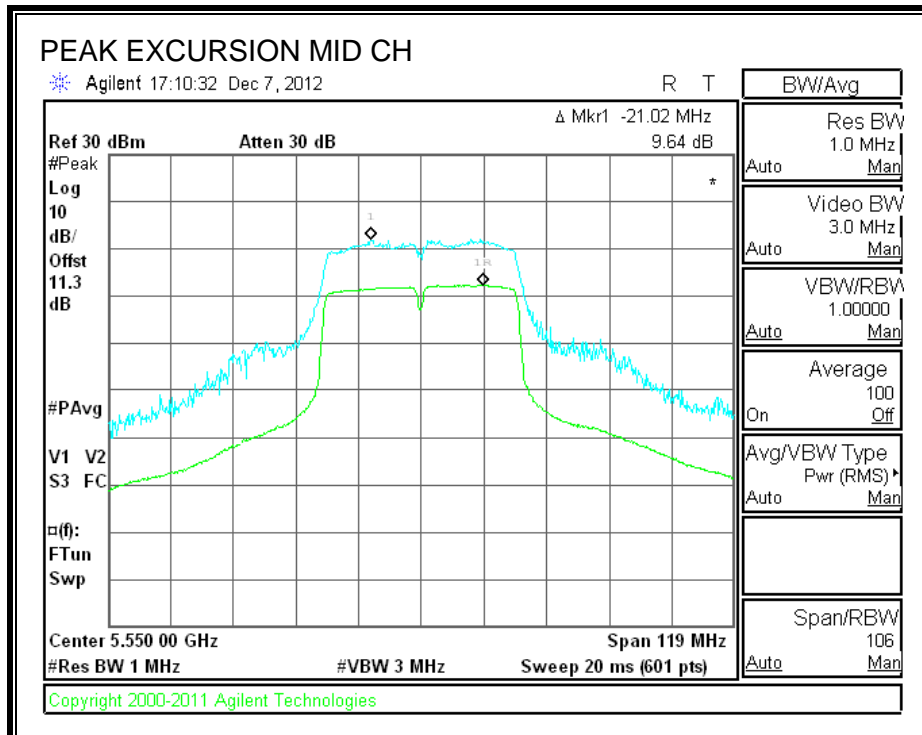
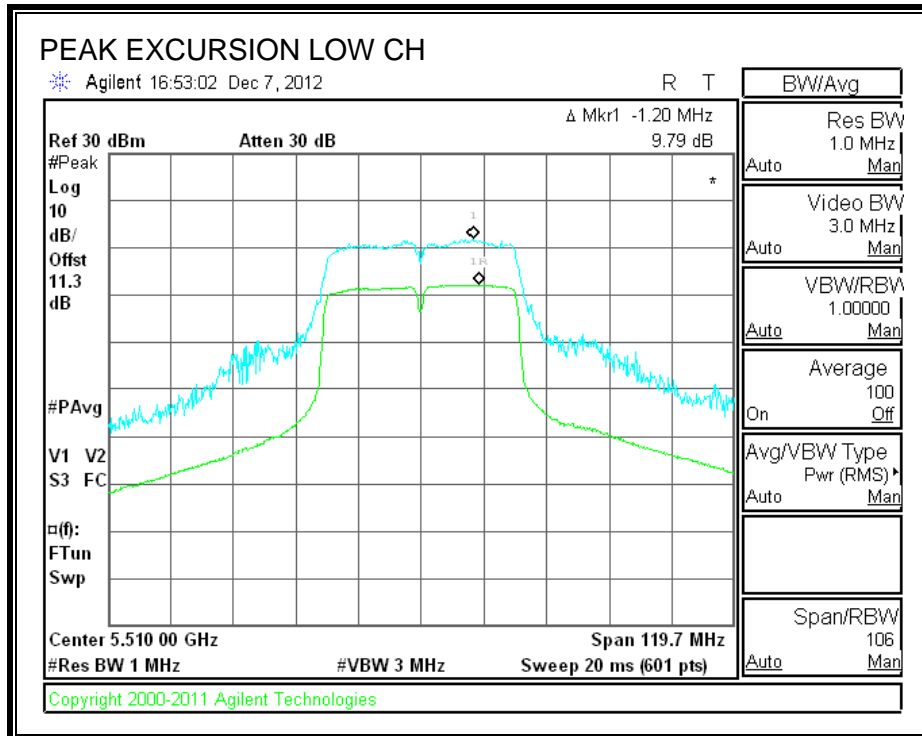
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5510	9.79	13	-3.21
Mid	5550	9.64	13	-3.36
High	5670	9.28	13	-3.72

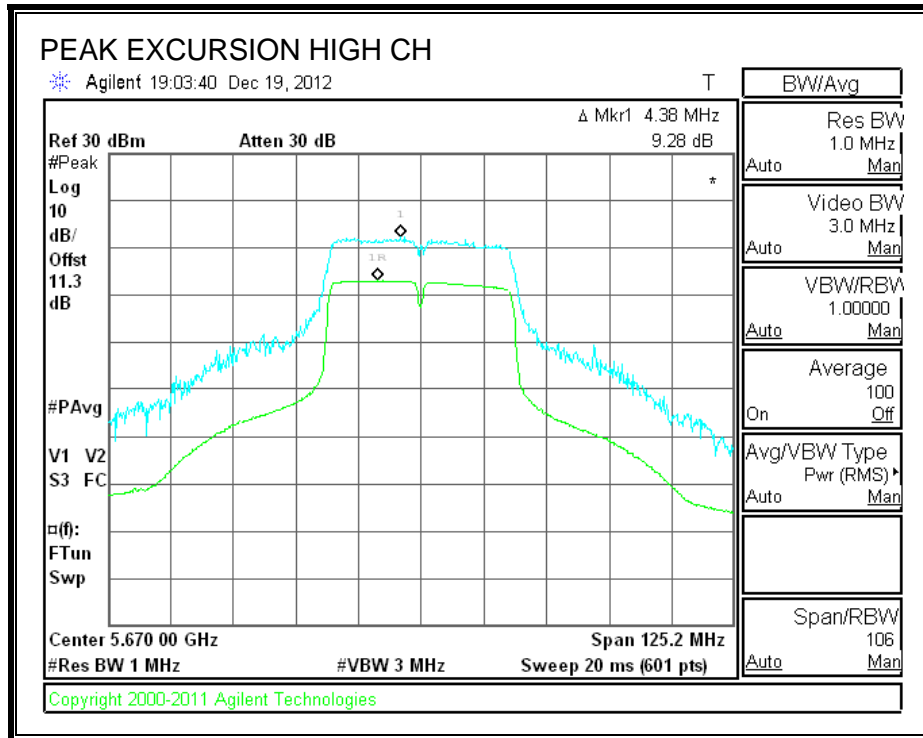
CHAIN 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5510	9.16	13	-3.84
Mid	5550	9.84	13	-3.16
High	5670	9.27	13	-3.73

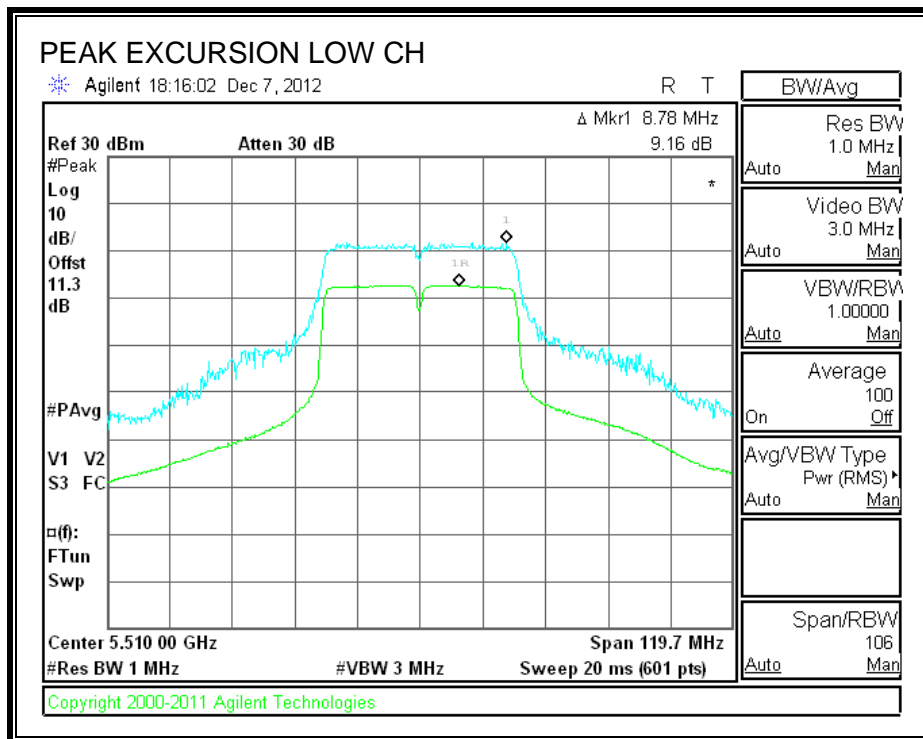
CHAIN 0

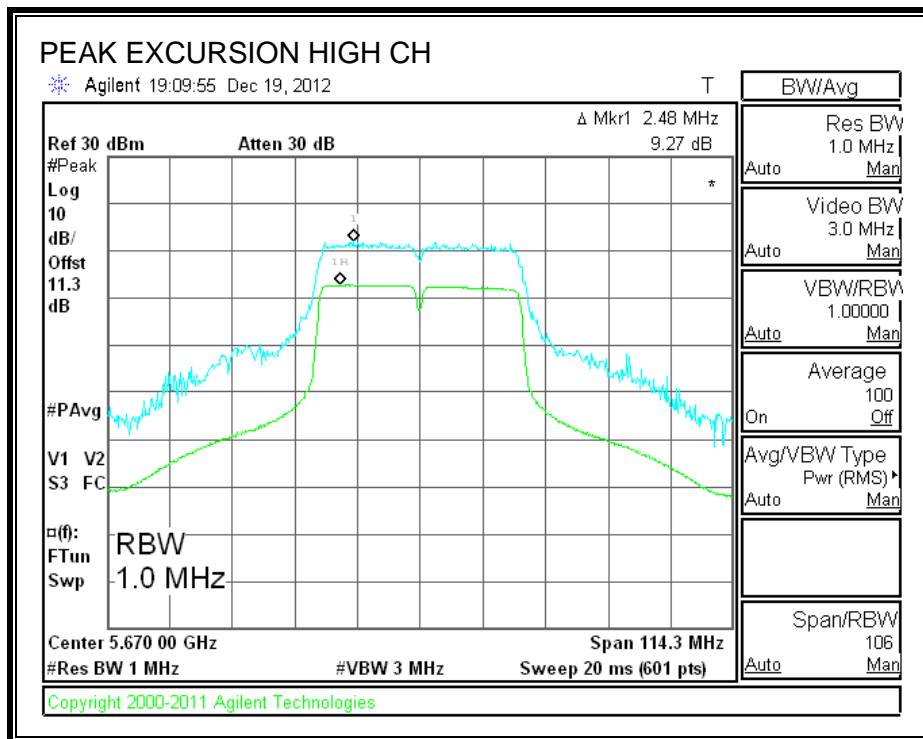
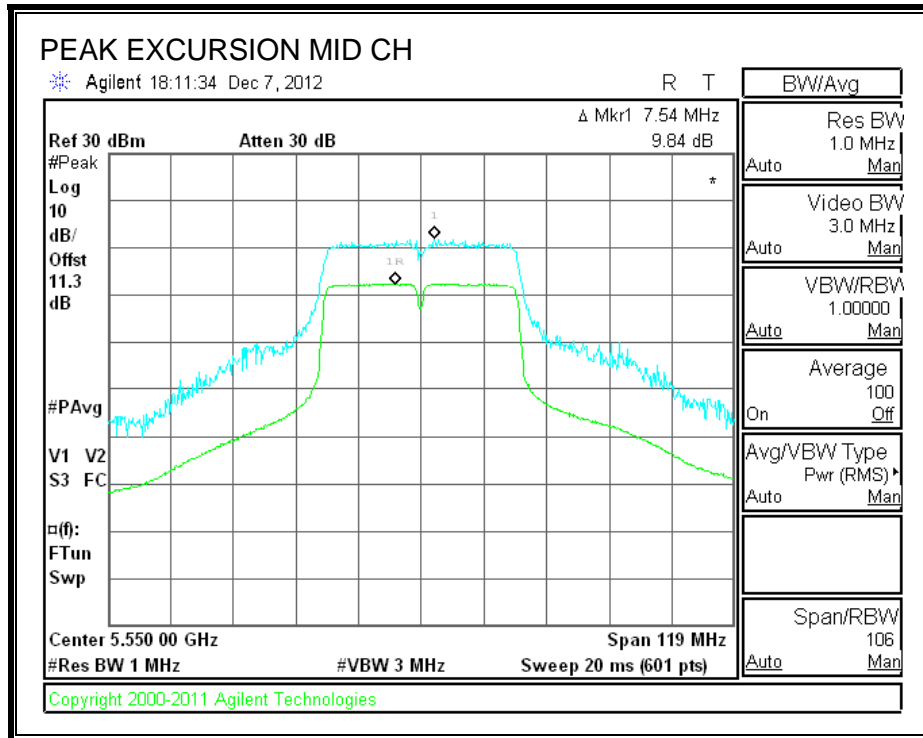
PEAK EXCURSION





CHAIN 1





8.10. 802.11n HT40, SDM MODE IN THE 5.6 GHz BAND

8.10.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

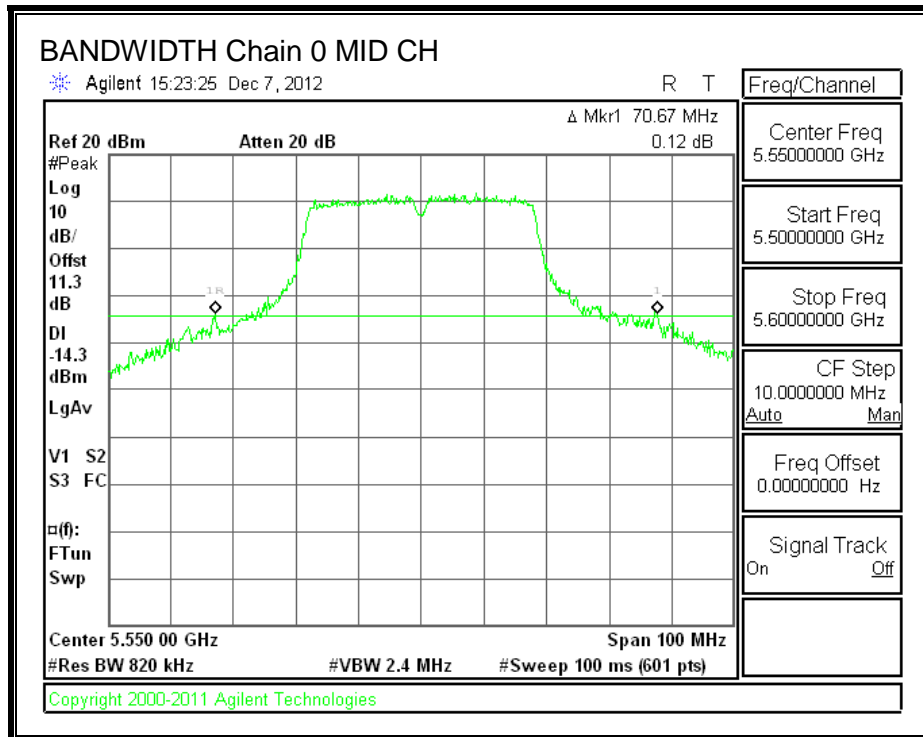
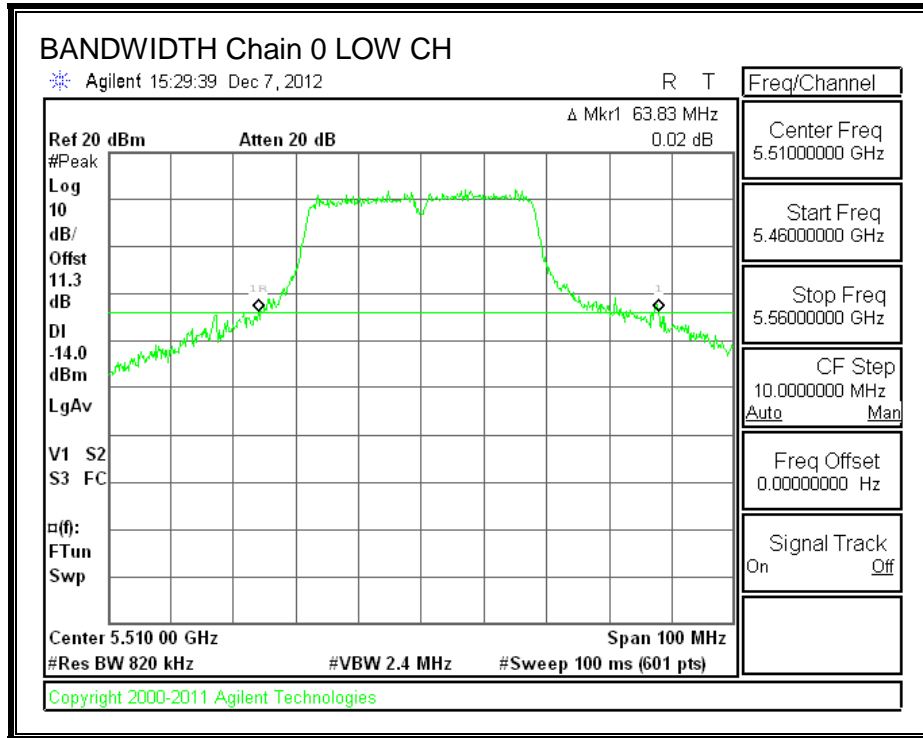
CHAIN 0

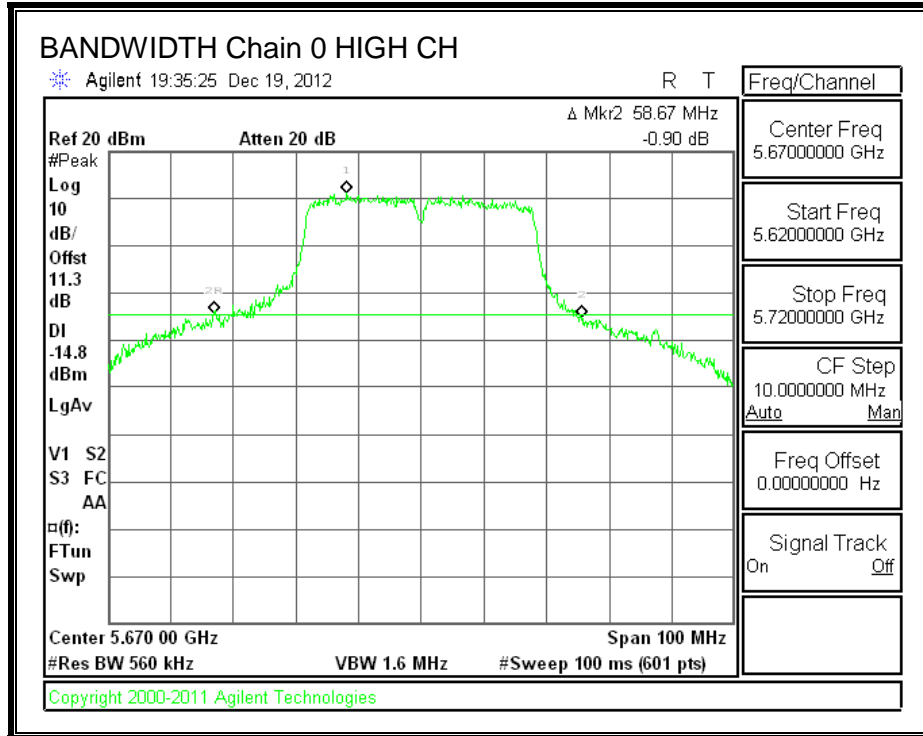
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	63.83	36.4298
Middle	5550	70.67	36.4062
High	5670	58.67	36.4682

CHAIN 1

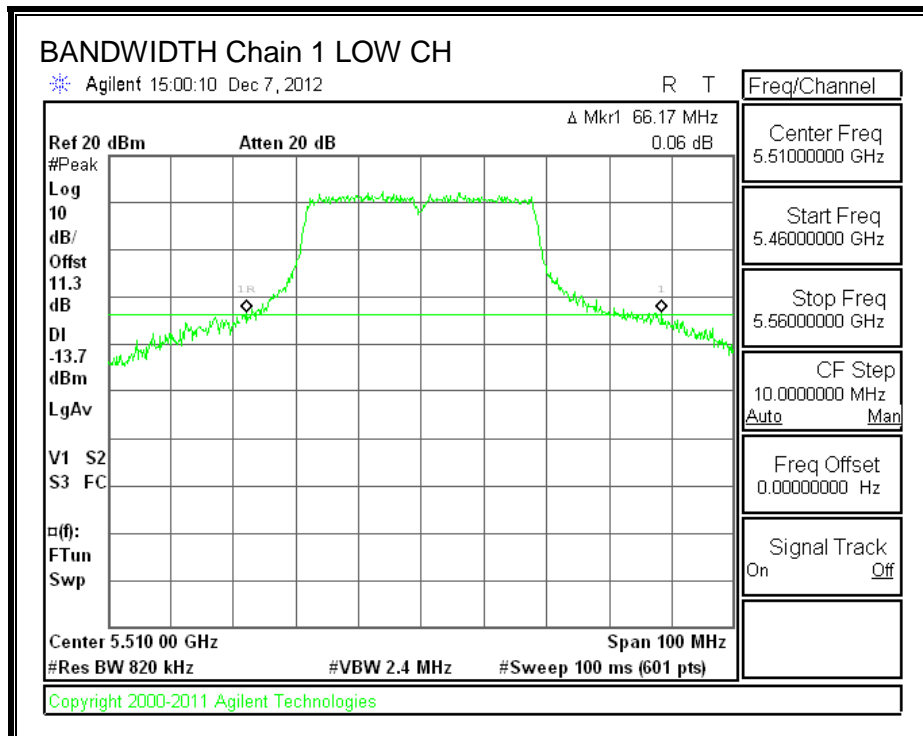
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	66.17	36.5509
Middle	5550	57.00	36.5744
High	5670	60.50	36.4791

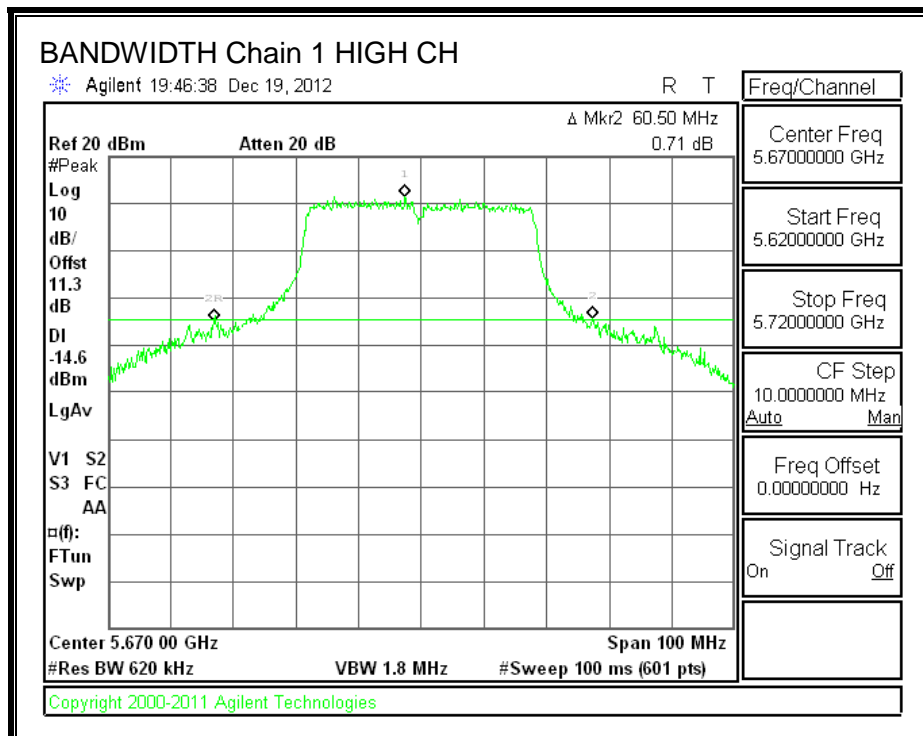
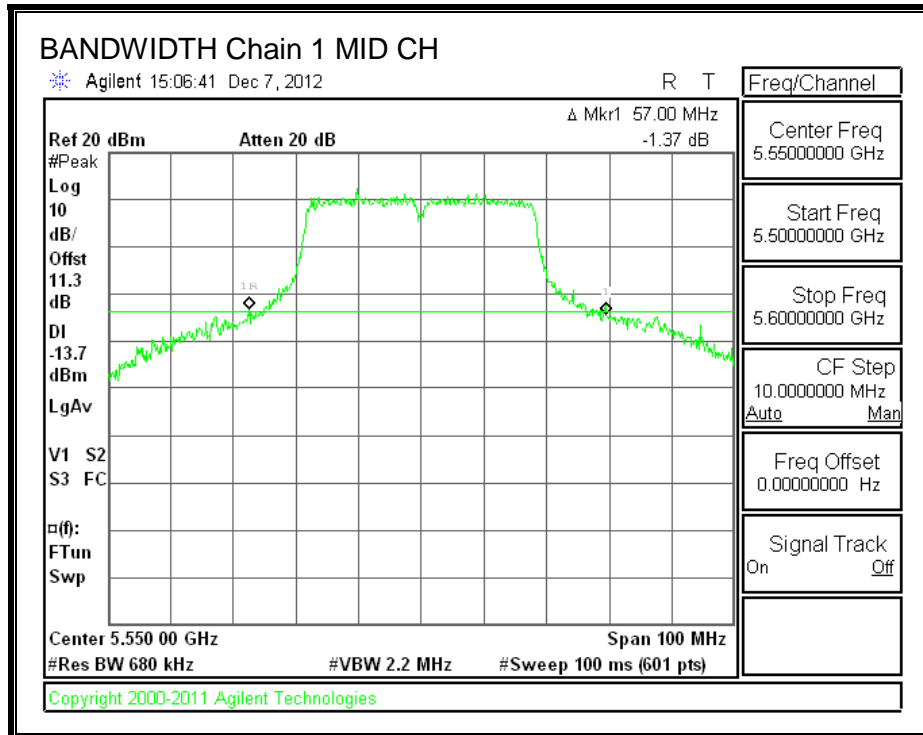
26 dB BANDWIDTH, Chain 0



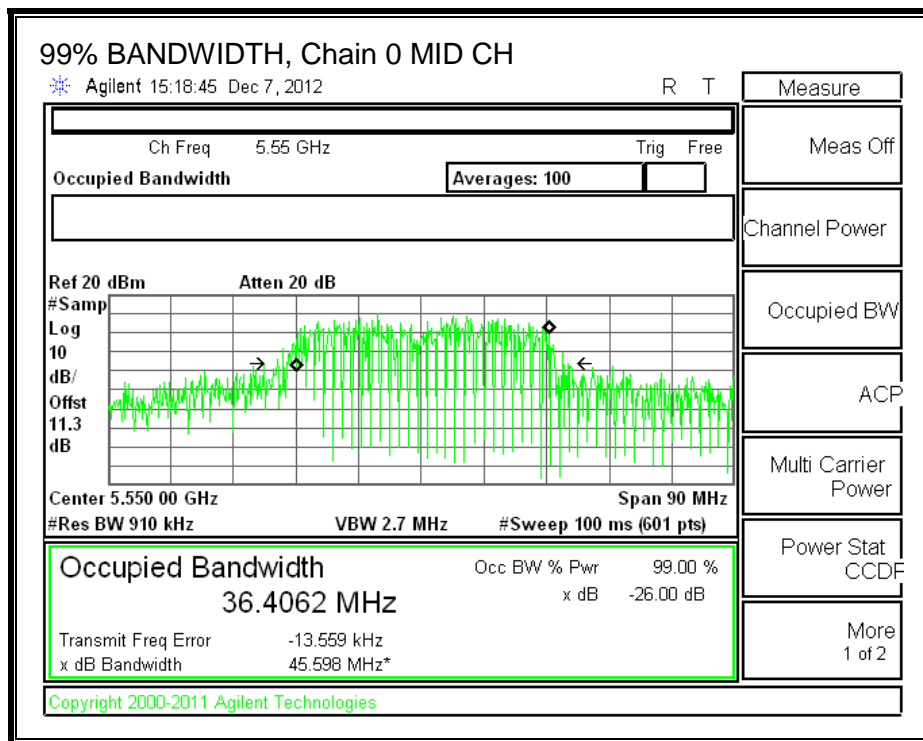
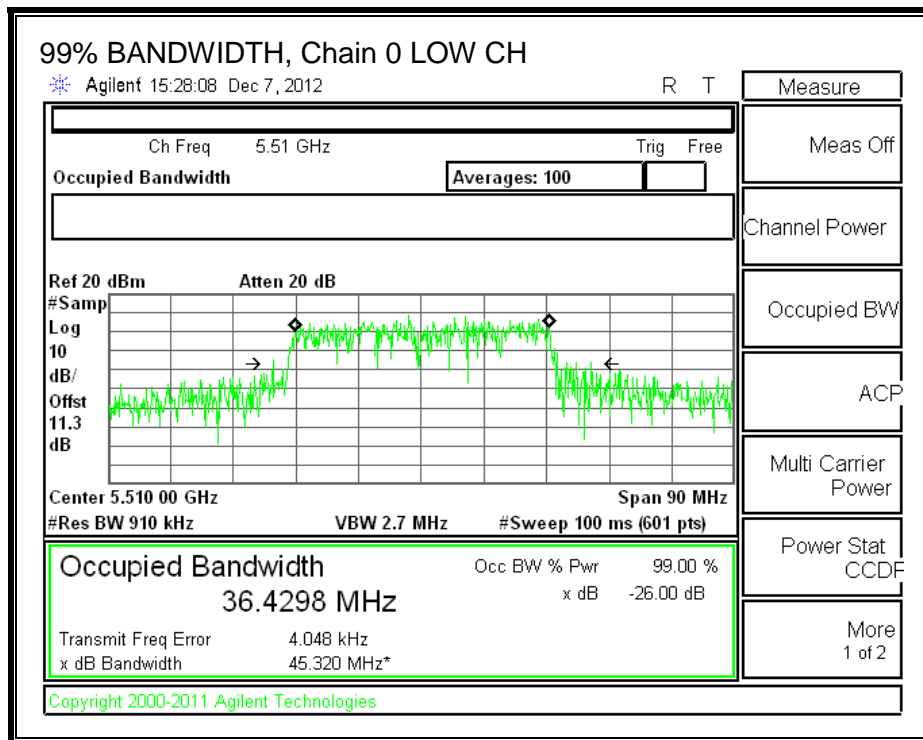


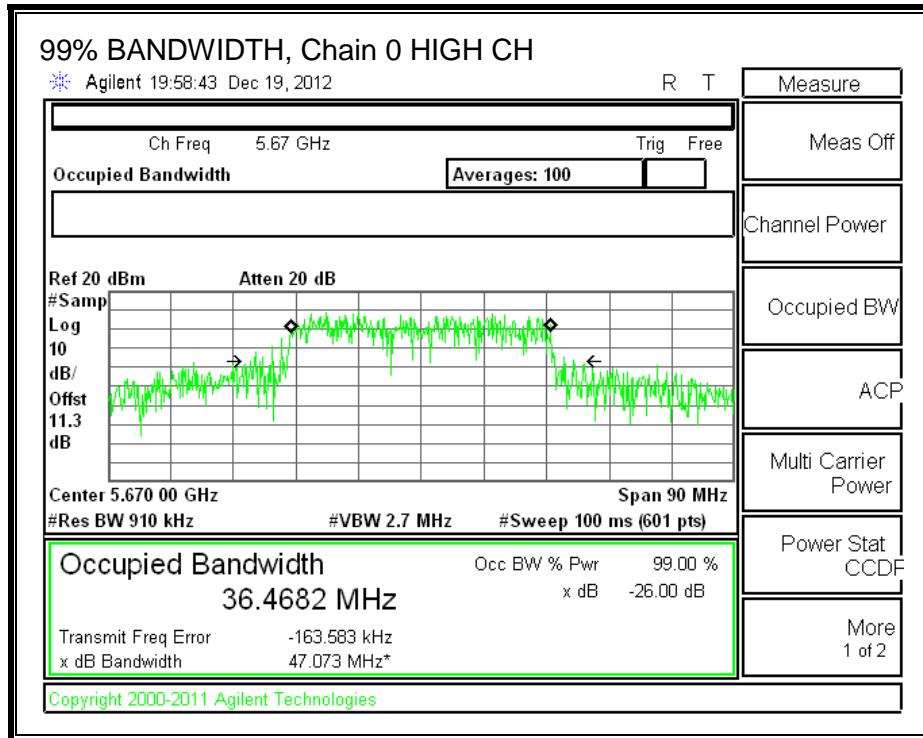
26 dB BANDWIDTH, Chain 1



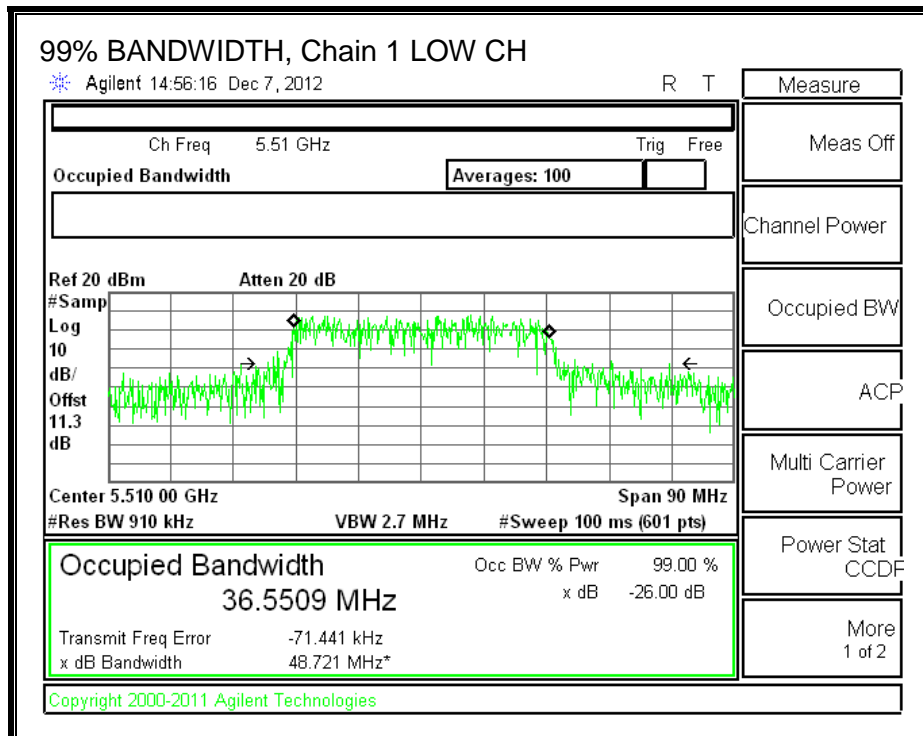


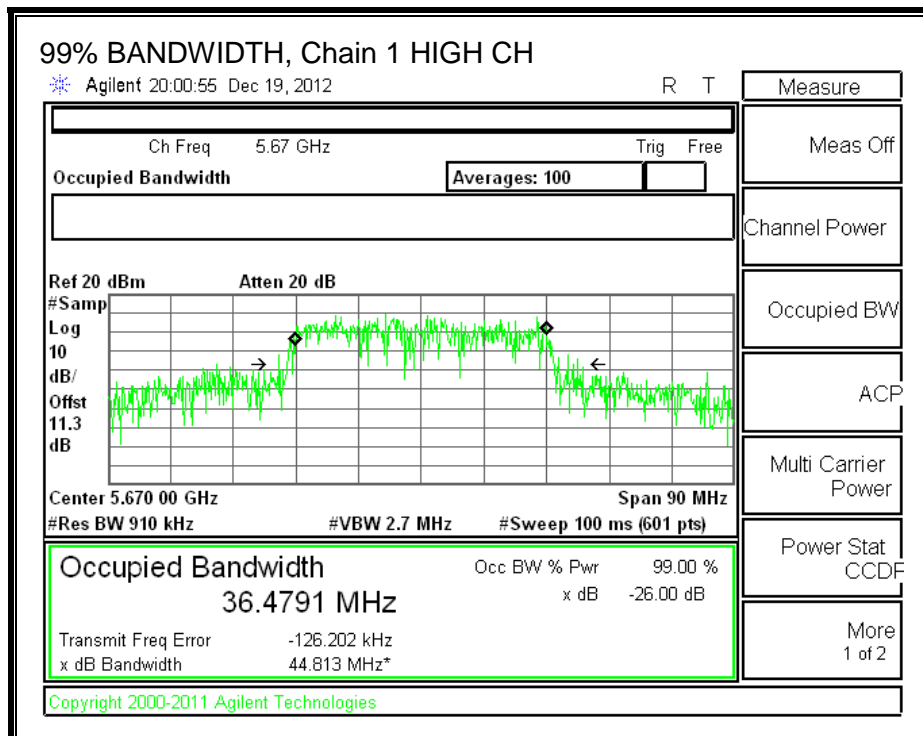
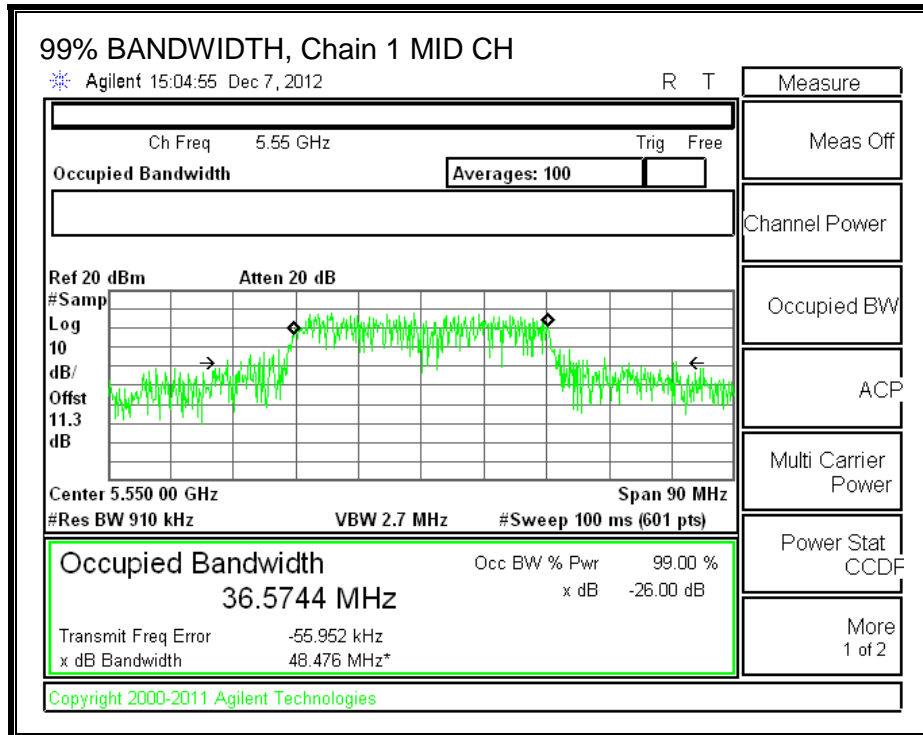
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





8.10.2. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band 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 MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

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

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is 2 dBi.

RESULTS

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5510	63.83	36.4298	2.00
Mid	5550	57.00	36.4062	2.00
High	5670	58.67	36.4682	2.00

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5510	24.00	24.00	30.00	24.00	11.00	11.00	11.00
Mid	5550	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5670	24.00	24.00	30.00	24.00	11.00	11.00	11.00

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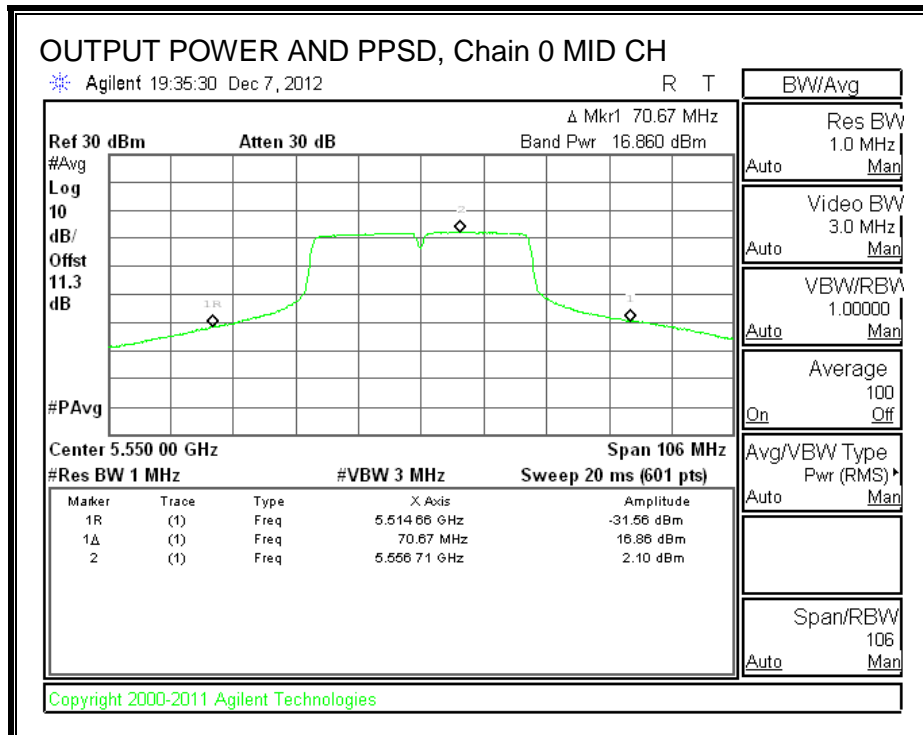
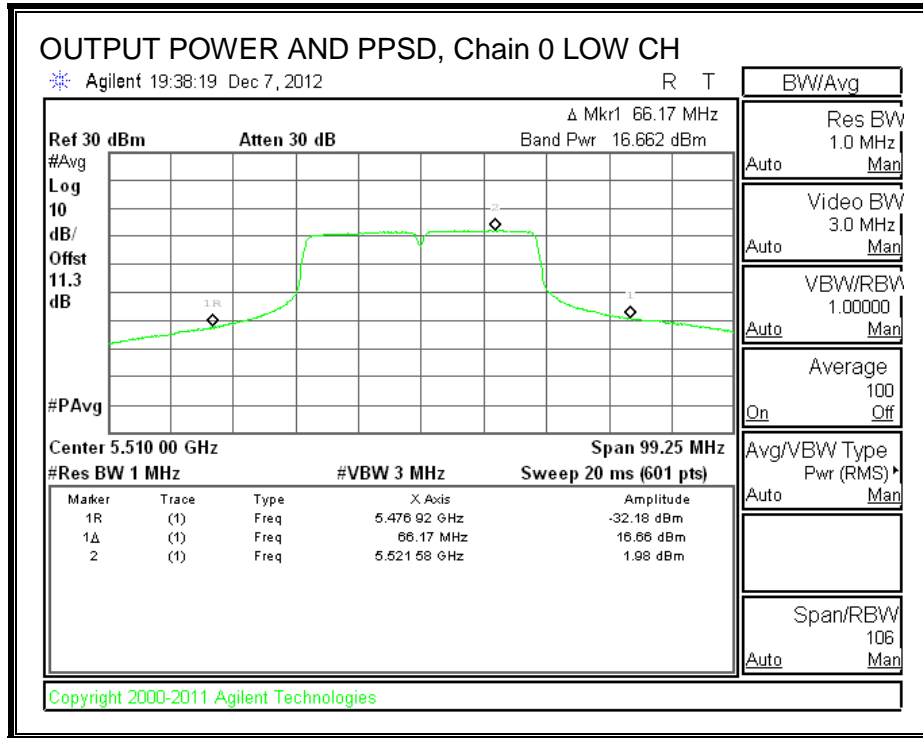
Output Power Results

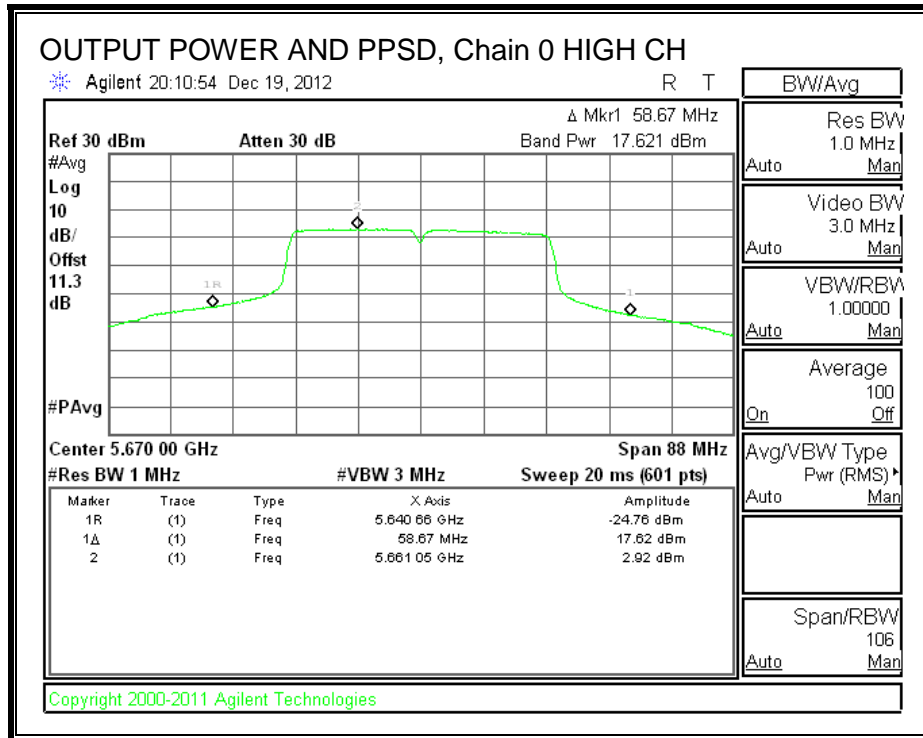
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	16.662	17.689	20.216	24.00	-3.784
Mid	5550	16.860	17.206	20.047	24.00	-3.953
High	5670	17.621	17.594	20.618	24.00	-3.382

PPSD Results

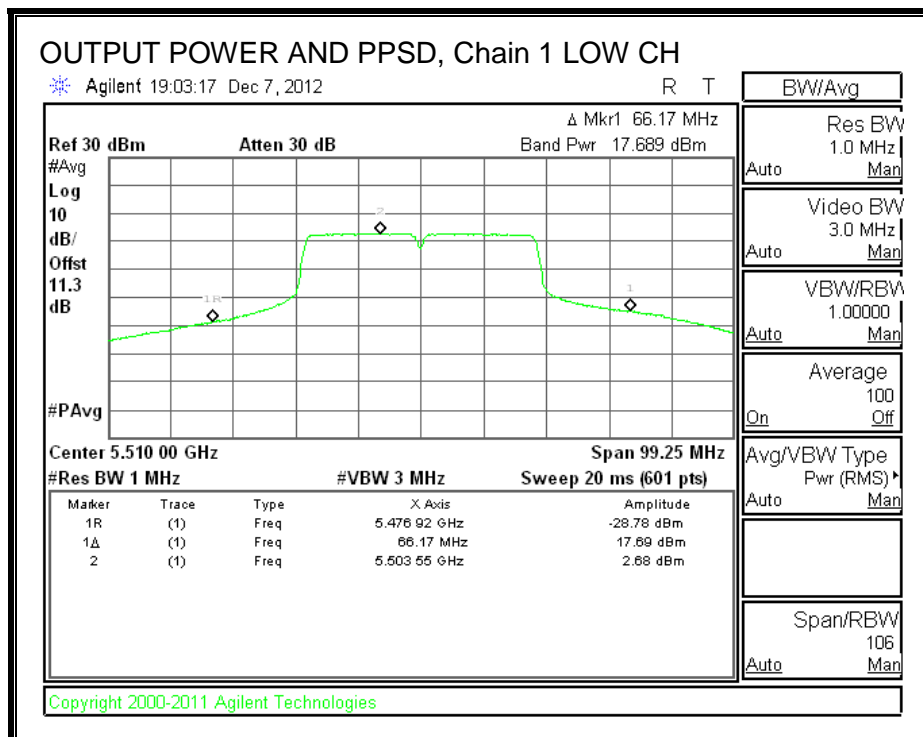
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	1.98	2.68	5.35	11.00	-5.65
Mid	5550	2.10	2.16	5.14	11.00	-5.86
High	5670	2.92	2.86	5.90	11.00	-5.10

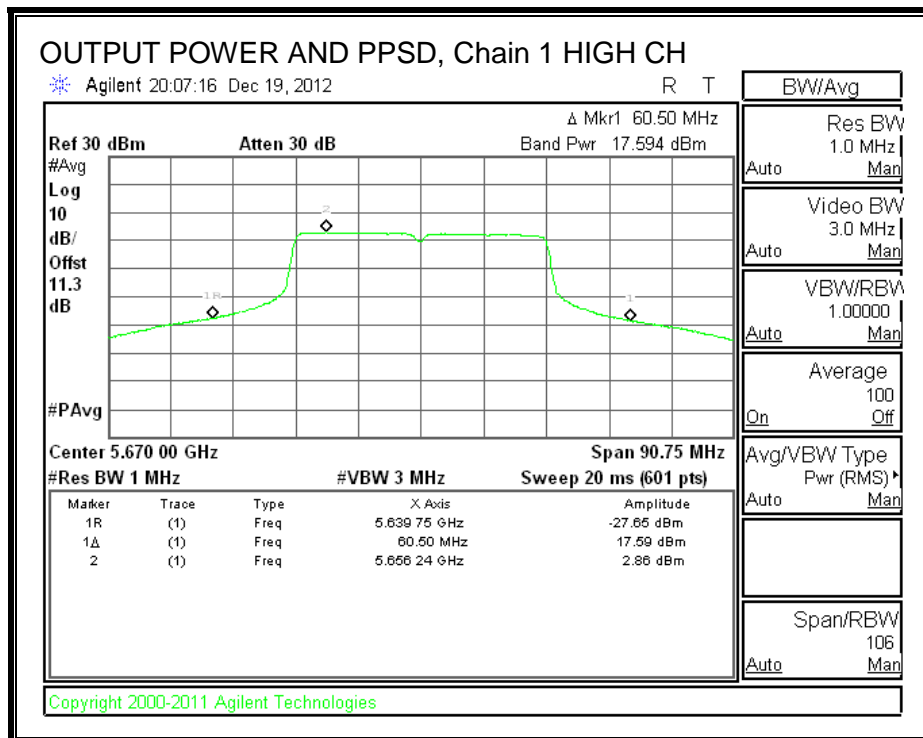
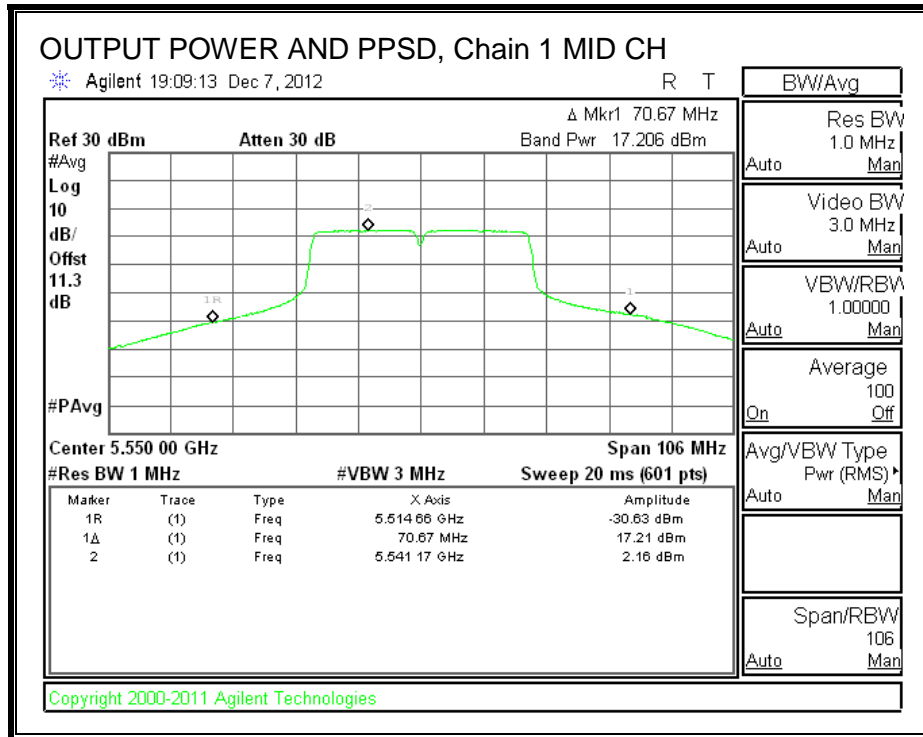
OUTPUT POWER AND PPSD, Chain 0





OUTPUT POWER AND PPSD, Chain 1





8.10.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.4 dB (including 10 dB pad and 1.4 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Average Power Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	5510	16.65	17.65	20.19
Mid	5550	16.80	17.20	20.01
High	5670	17.60	17.57	20.60

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

CHAIN 0

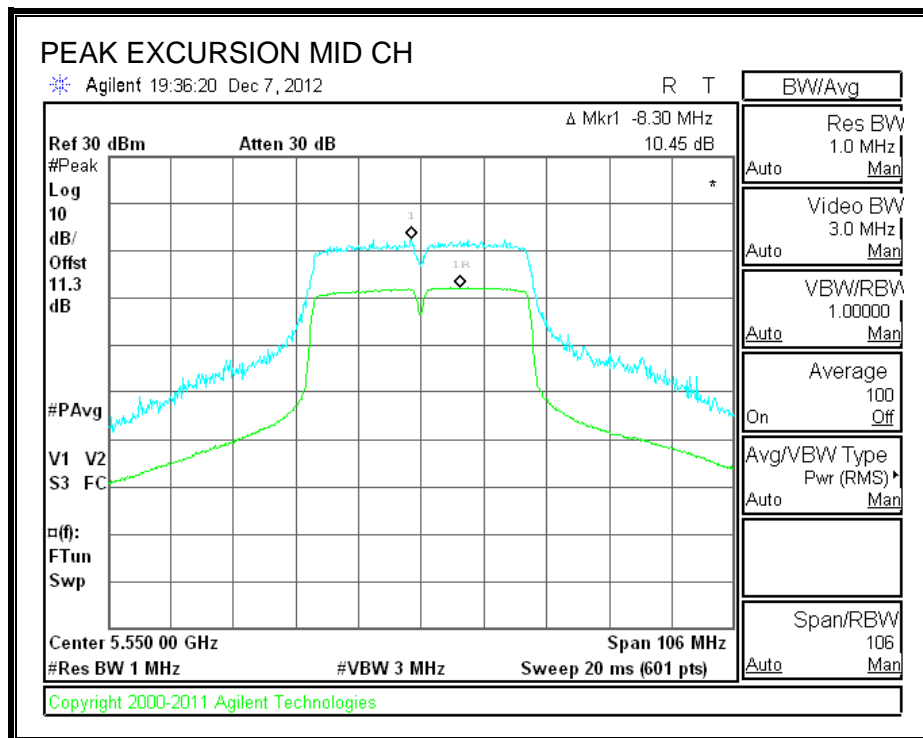
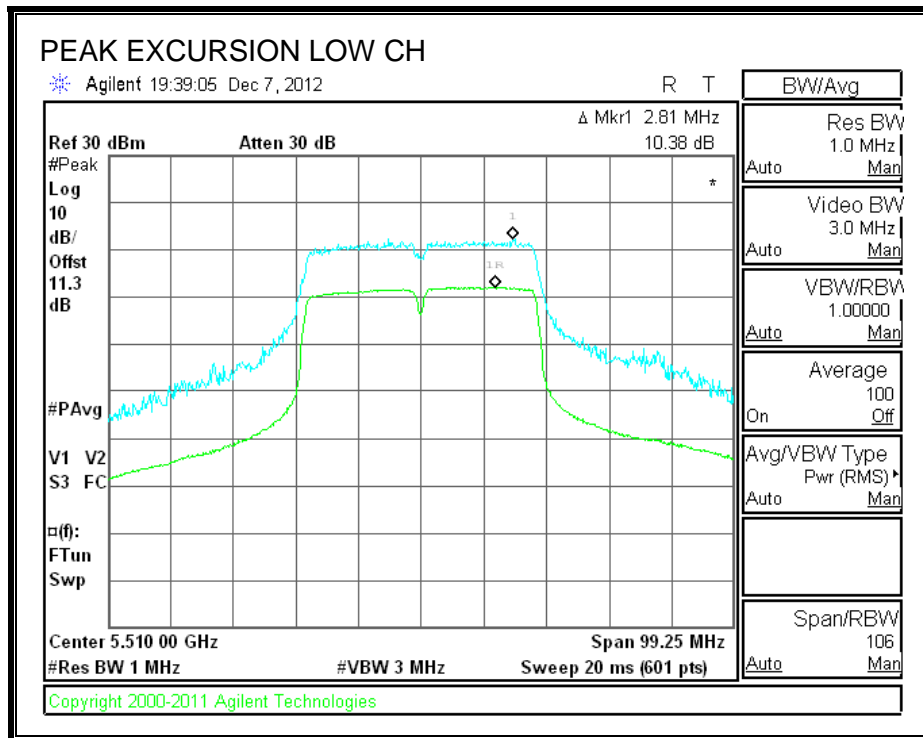
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5510	10.38	13	-2.62
Mid	5550	10.45	13	-2.55
High	5670	10.06	13	-2.94

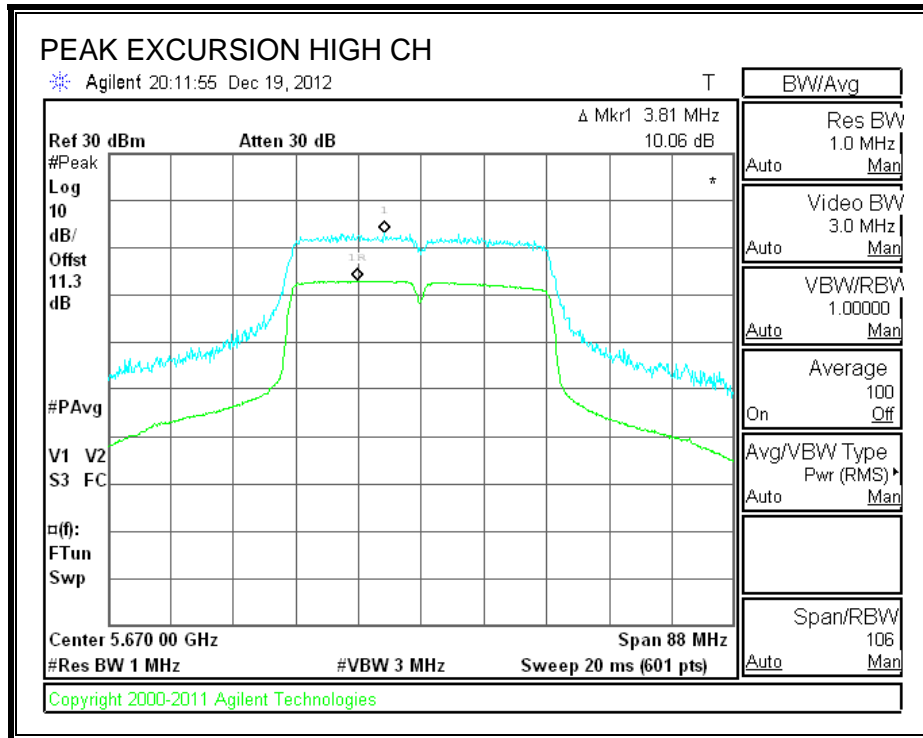
CHAIN 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5510	9.96	13	-3.04
Mid	5550	11.19	13	-1.81
High	5670	9.86	13	-3.14

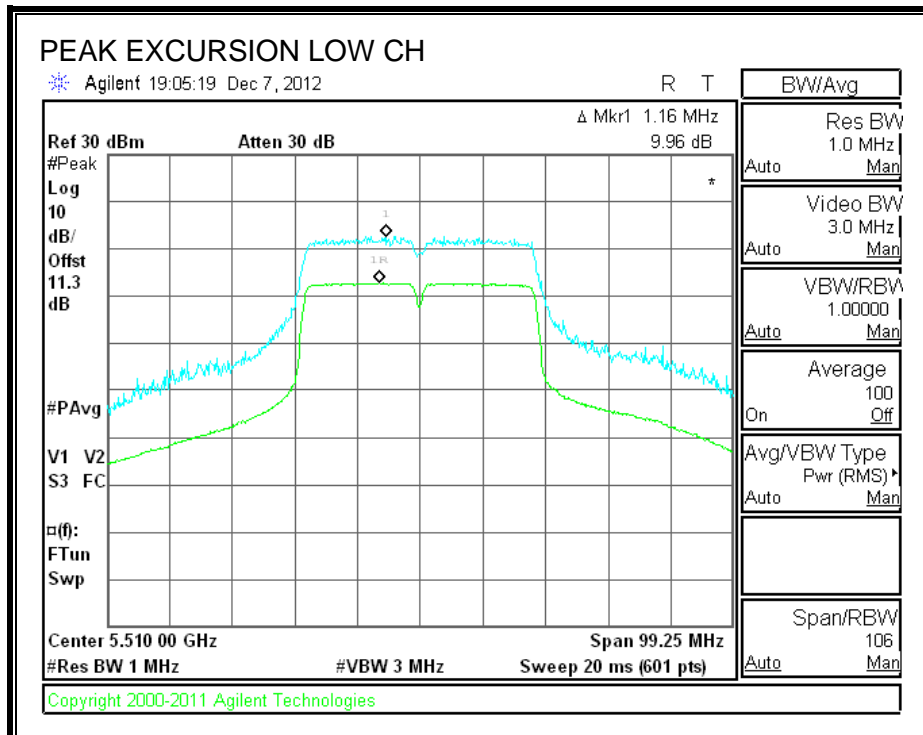
CHAIN 0

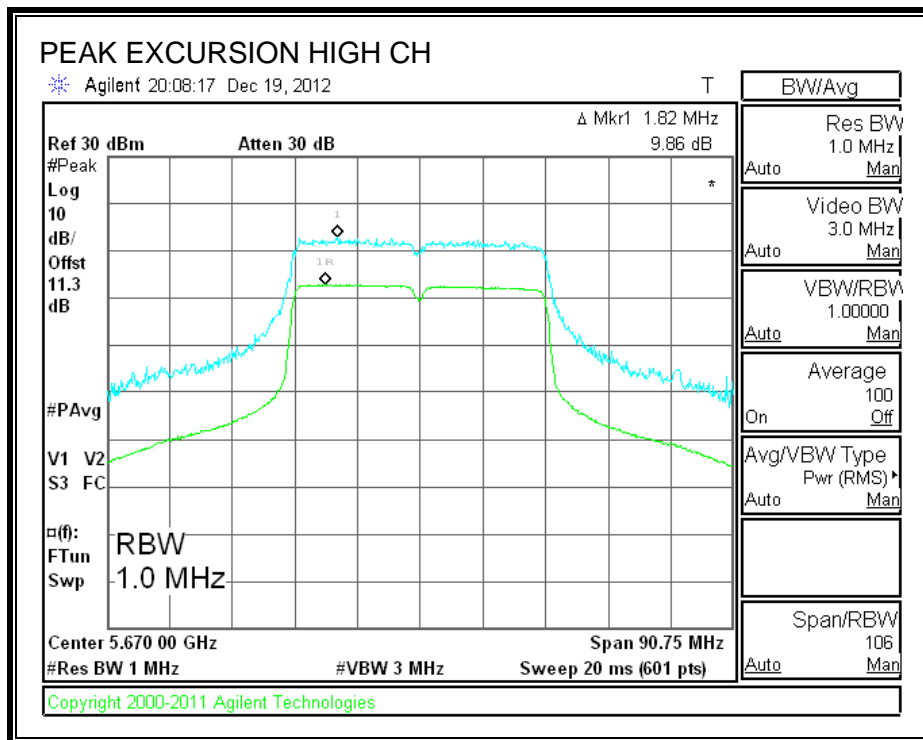
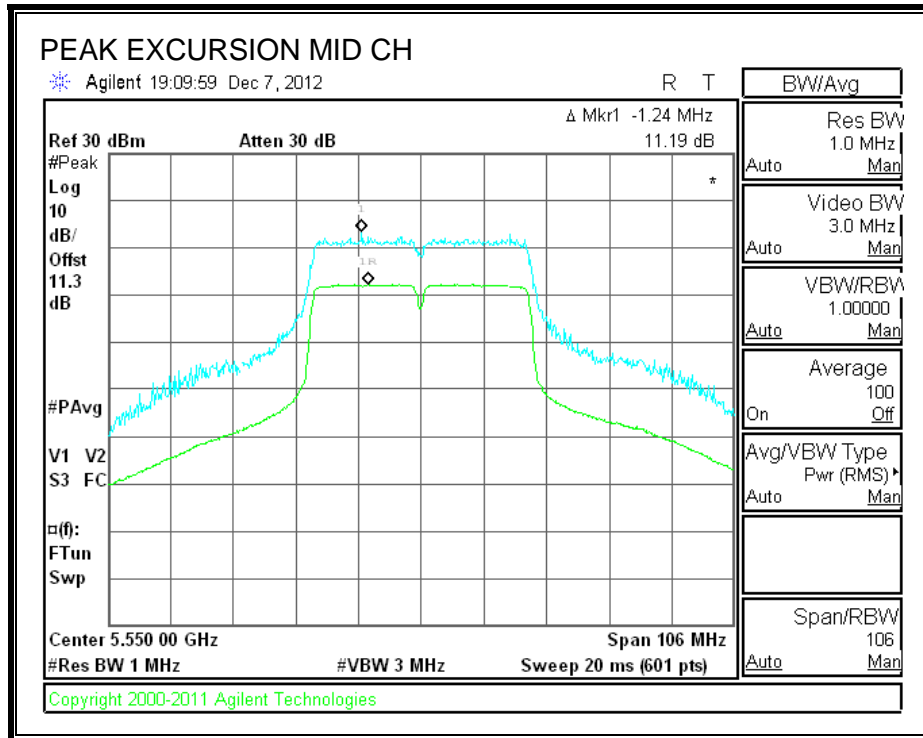
PEAK EXCURSION





CHAIN 1





9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

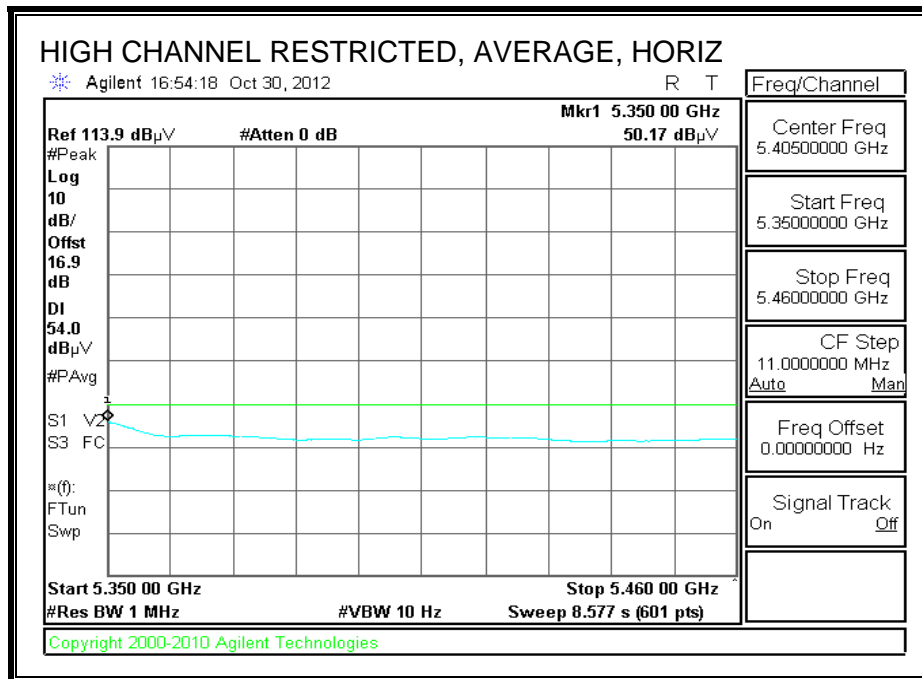
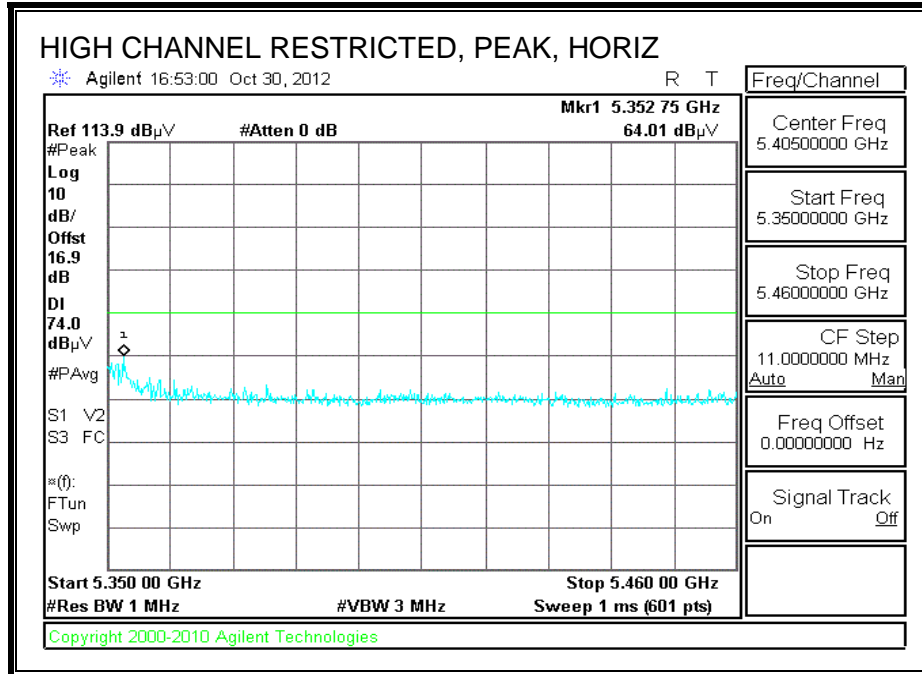
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 3 MHz for peak measurements and 3 kHz for average measurements.

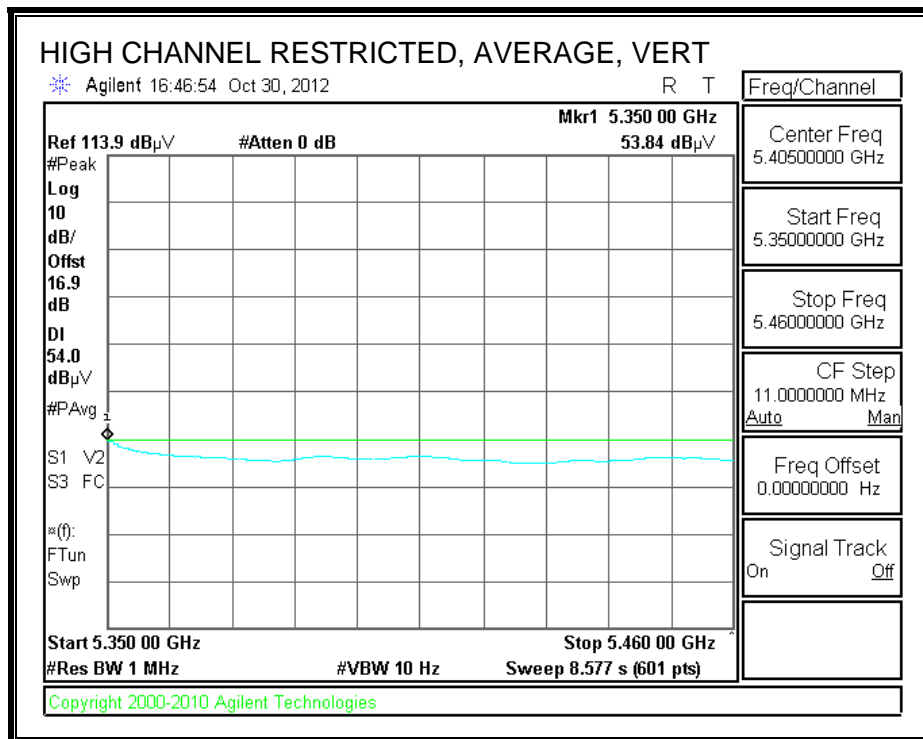
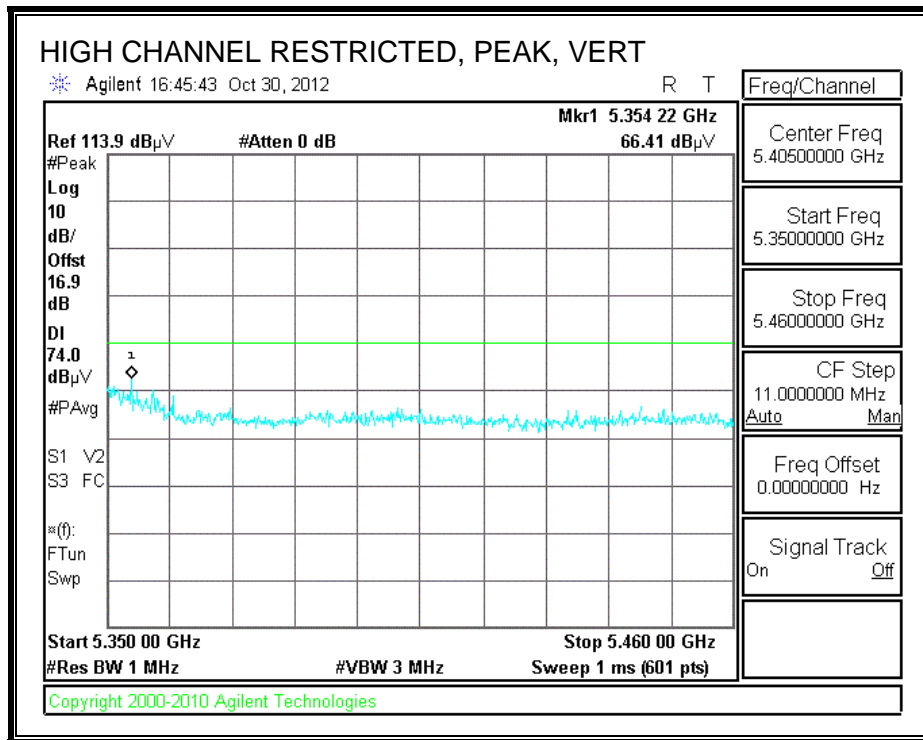
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

9.1.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)



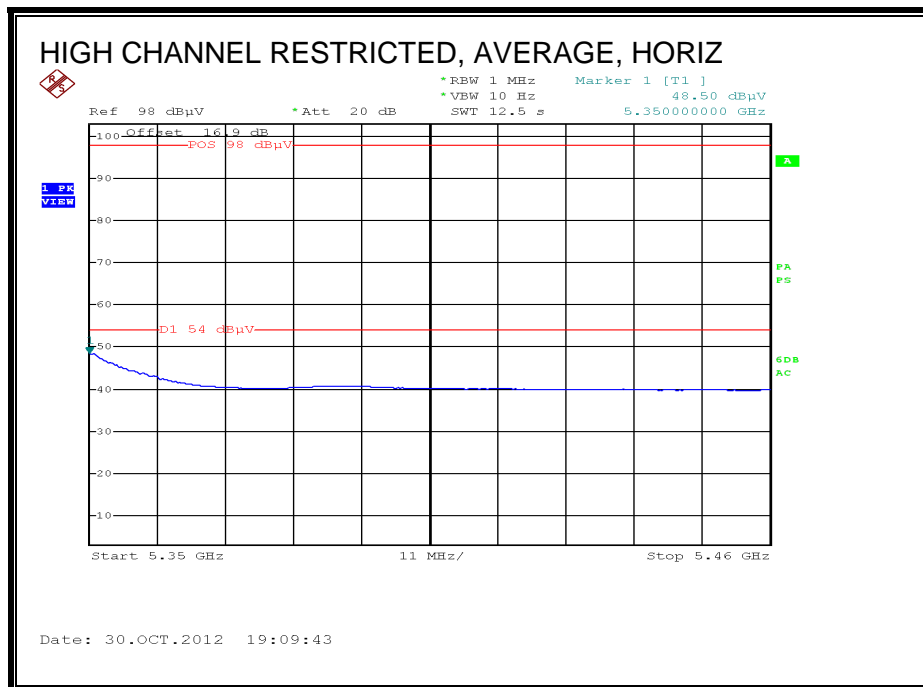
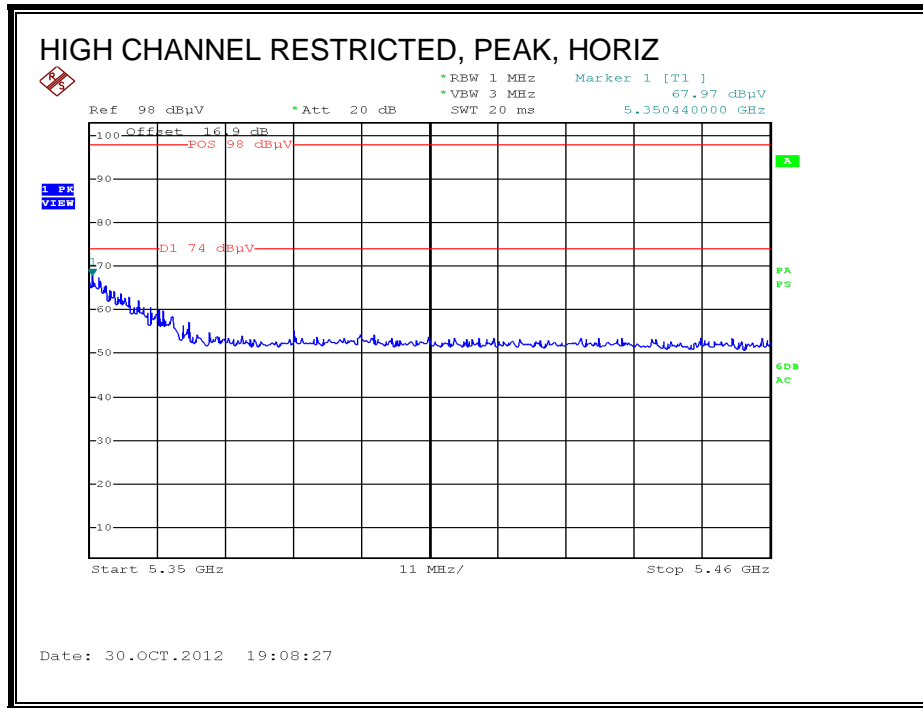


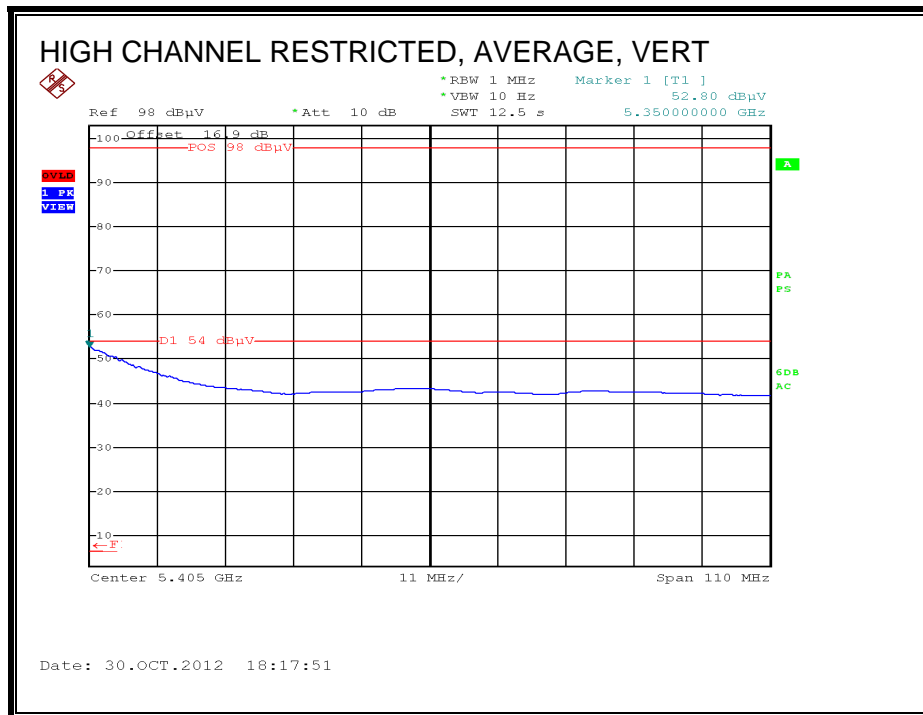
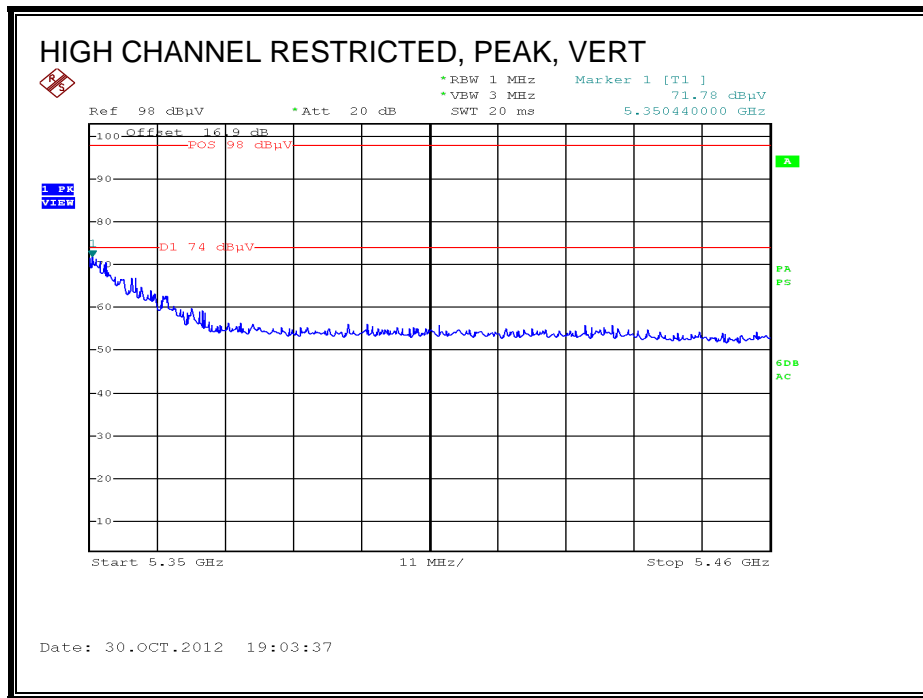
HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement																
Compliance Certification Services, Fremont 3m Chamber																
Company:		Ruckus														
Project #:		12U14419														
Date:		10/24/2012														
Test Engineer:		D. Garcia/ S.Aguilar														
Configuration:		Standalone with remote laptop control														
Mode:		11a														
Test Equipment:																
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit				
T60; S/N: 2238 @3m			T34 HP 8449B			T88 Miteq 26-40GHz			T39; ARA 18-26GHz; S/N:1013			FCC 15.205				
Hi Frequency Cables																
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Peak Measurements RBW=VBW=1MHz/3MHz	
3' cable 22807700			12' cable 22807600			20' cable 22807500						R_001			Average Measurements RBW=1MHz ; VBW=10Hz	
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)	
Low Channel: 5260 MHz																
15.780	3.0	34.9	21.7	38.2	13.1	-31.9	0.0	0.0	54.3	41.1	74	54	-19.7	-12.9	H	
15.780	3.0	35.5	22.3	38.2	13.1	-31.9	0.0	0.0	54.9	41.7	74	54	-19.1	-12.3	V	
Mid Channel : 5300																
10.600	3.0	52.1	37.1	38.4	9.9	-32.5	0.0	0.0	68.0	53.0	74	54	-6.0	-1.0	V	
10.600	3.0	45.2	29.8	38.4	9.9	-32.5	0.0	0.0	61.0	45.6	74	54	-13.0	-8.4	H	
15.900	3.0	35.5	24.2	37.8	13.2	-31.8	0.0	0.0	54.5	43.3	74	54	-19.5	-10.7	H	
15.900	3.0	39.0	26.7	37.8	13.2	-31.8	0.0	0.0	58.1	45.8	74	54	-15.9	-8.2	V	
21.200	3.0	35.3	24.7	33.1	15.7	-32.5	0.0	0.0	51.5	40.9	74	54	-22.5	-13.1	H	
21.200	3.0	41.2	29.9	33.1	15.7	-32.5	0.0	0.0	57.4	46.1	74	54	-16.6	-7.9	V	
High Channel: 5320 MHz																
10.640	3.0	50.9	36.8	38.4	10.0	-32.5	0.0	0.0	66.8	52.6	74	54	-7.2	-1.4	V	
10.640	3.0	46.1	32.2	38.4	10.0	-32.5	0.0	0.0	62.0	48.1	74	54	-12.0	-5.9	H	
15.960	3.0	36.5	24.2	37.6	13.2	-31.8	0.0	0.0	55.4	43.1	74	54	-18.6	-10.9	V	
15.960	3.0	33.4	21.5	37.6	13.2	-31.8	0.0	0.0	52.4	40.4	74	54	-21.6	-13.6	H	
Rev. 11.10.11 Note: No other emissions above the noise floor.																
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit			
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit			
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit			
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit			
CL	Cable Loss					HPF	High Pass Filter									

9.1.2. TX ABOVE 1 GHz 802.11n HT20 CDD MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 3m Chamber

Company: Ruckus
Project #: 12U14419
Date: 10/25/2012
Test Engineer: S.Aguilar
Configuration: Standalone with remote laptop control
Mode: 11n, CDD, MCS0

Test Equipment:

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B	T88 Miteq 26-40GHz	T39; ARA 18-26GHz; S/N:1013	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz/3MHz Average Measurements RBW=1MHz ; VBW=10Hz
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001	

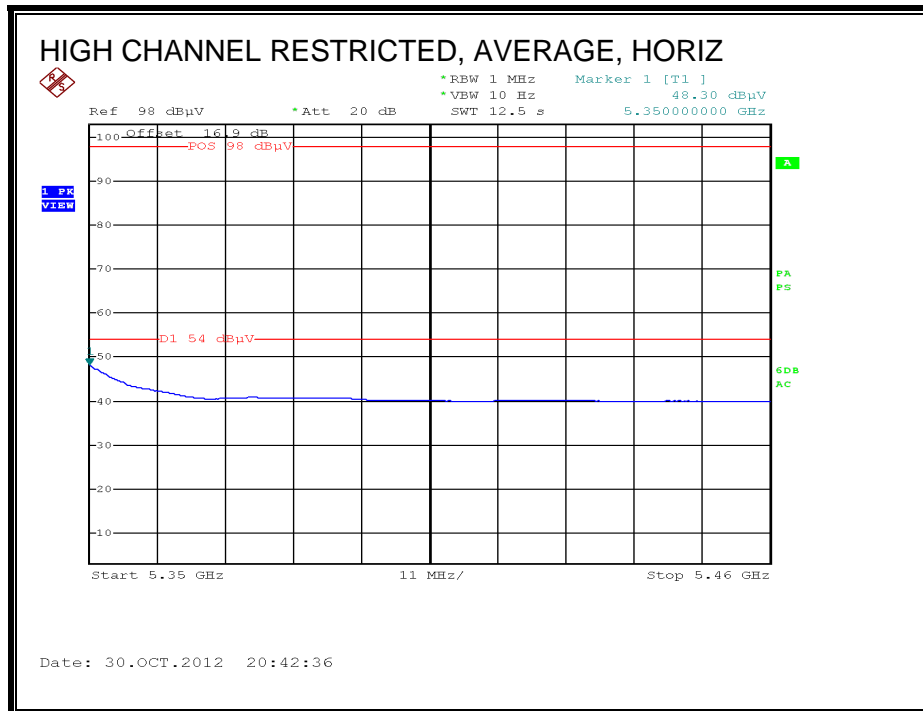
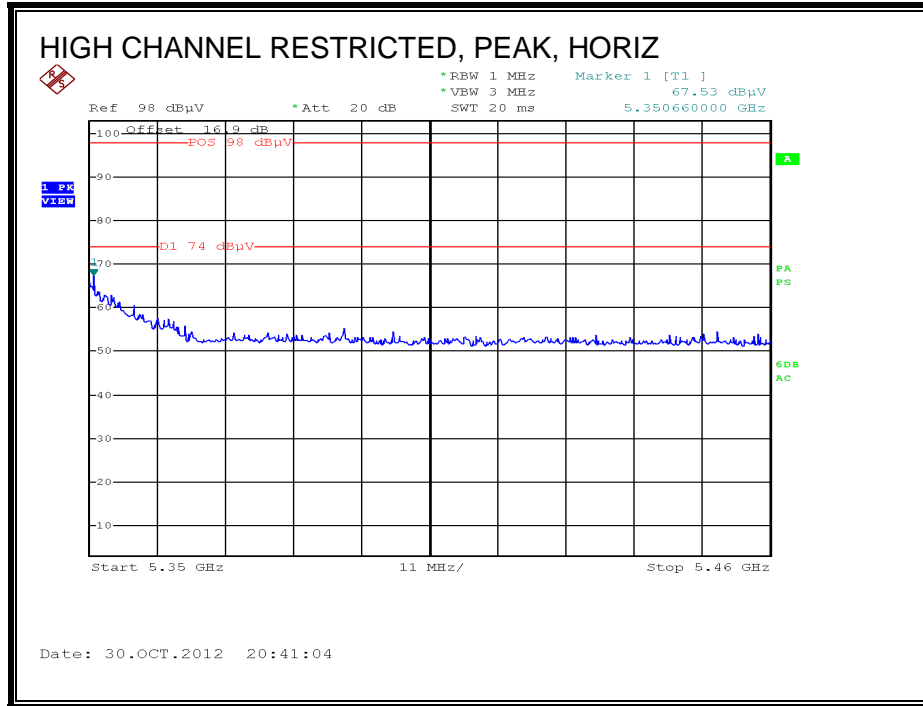
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5260 MHz															
15.780	3.0	34.47	23.59	38.2	13.1	-31.9	0.0	0.0	53.9	43.0	74	54	-20.1	-11.0	H
15.780	3.0	34.69	24.28	38.2	13.1	-31.9	0.0	0.0	54.1	43.7	74	54	-19.9	-10.3	V
Mid Channel : 5300															
10.600	3.0	45.96	33.08	38.4	9.9	-32.5	0.0	0.0	61.8	48.9	74	54	-12.2	-5.1	H
10.600	3.0	52.39	37.52	38.4	9.9	-32.5	0.0	0.0	68.2	53.3	74	54	-5.8	-0.7	V
15.900	3.0	35.57	24.61	37.8	13.2	-31.8	0.0	0.0	54.7	43.7	74	54	-19.3	-10.3	H
15.900	3.0	39.48	28.09	37.8	13.2	-31.8	0.0	0.0	58.6	47.2	74	54	-15.4	-6.8	V
High Channel: 5320 MHz															
10.640	3.0	45.34	32.67	38.4	10.0	-32.5	0.0	0.0	61.2	48.6	74	54	-12.8	-5.4	H
15.960	3.0	36.56	24.71	37.6	13.2	-31.8	0.0	0.0	55.5	43.6	74	54	-18.5	-10.4	H
10.640	3.0	52.81	37.68	38.4	10.0	-32.5	0.0	0.0	68.7	53.6	74	54	-5.3	-0.4	V
15.960	3.0	40.67	28.46	37.6	13.2	-31.8	0.0	0.0	59.6	47.4	74	54	-14.4	-6.6	V

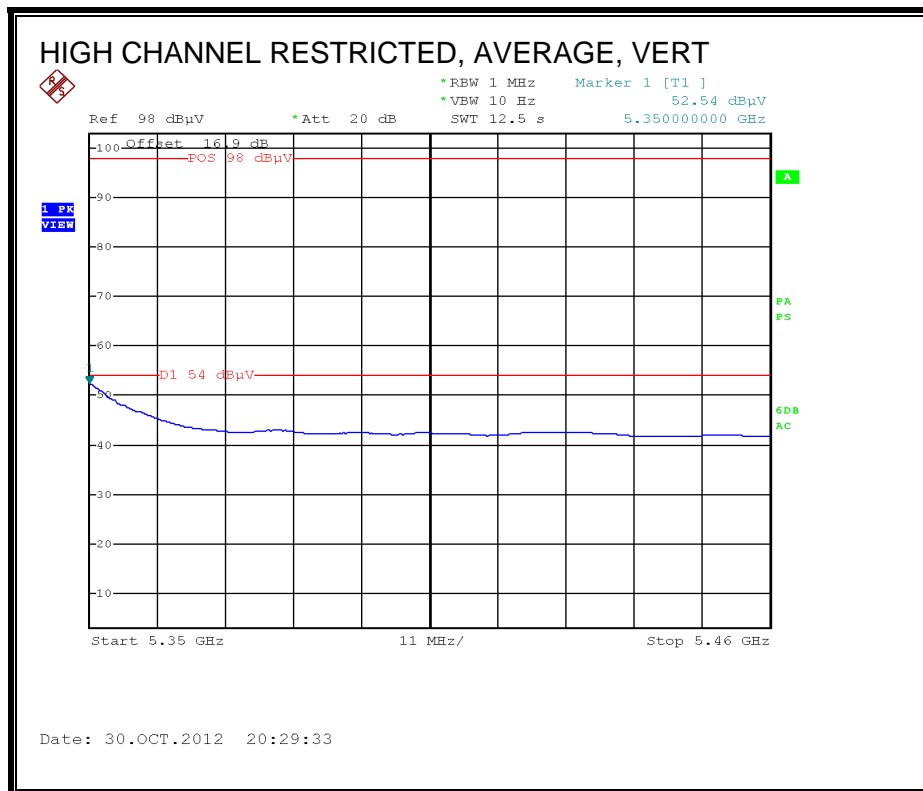
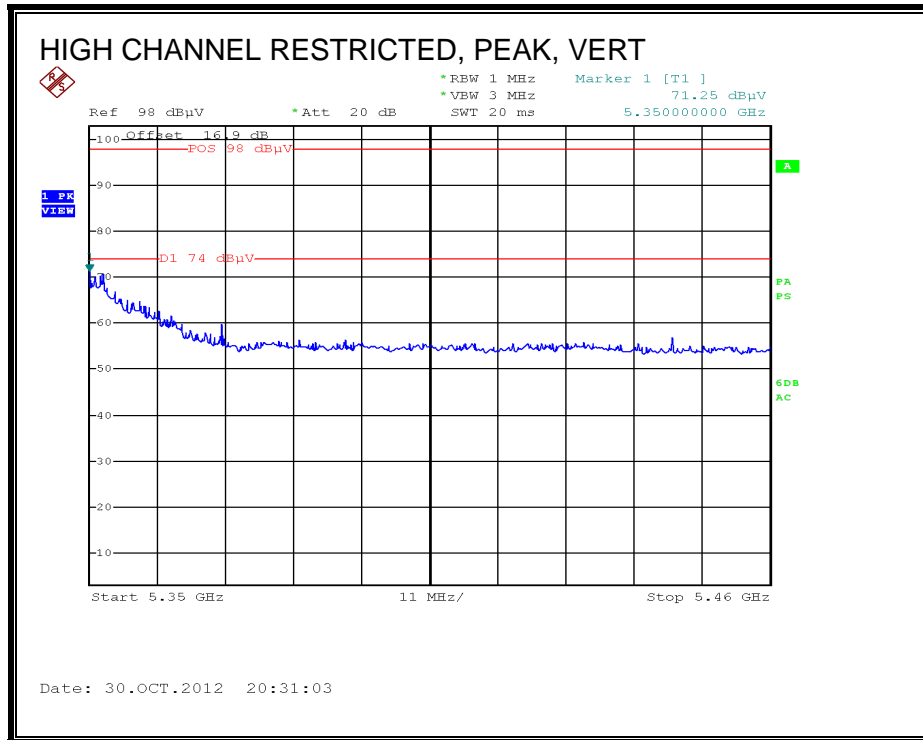
Rev. 11.10.11 Note: No other emissions above the noise floor.

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

9.1.3. TX ABOVE 1 GHz 802.11n HT20 SDM MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 3m Chamber

Company: Ruckus
Project #: 12U14419
Date: 10/25/2012
Test Engineer: S.Aguilar
Configuration: Standalone with remote laptop control
Mode: 11n, HT20, MCS8

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B	T88 Miteq 26-40GHz	T39; ARA 18-26GHz; S/N:1013	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz/3MHz Average Measurements RBW=1MHz ; VBW=10Hz
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001	

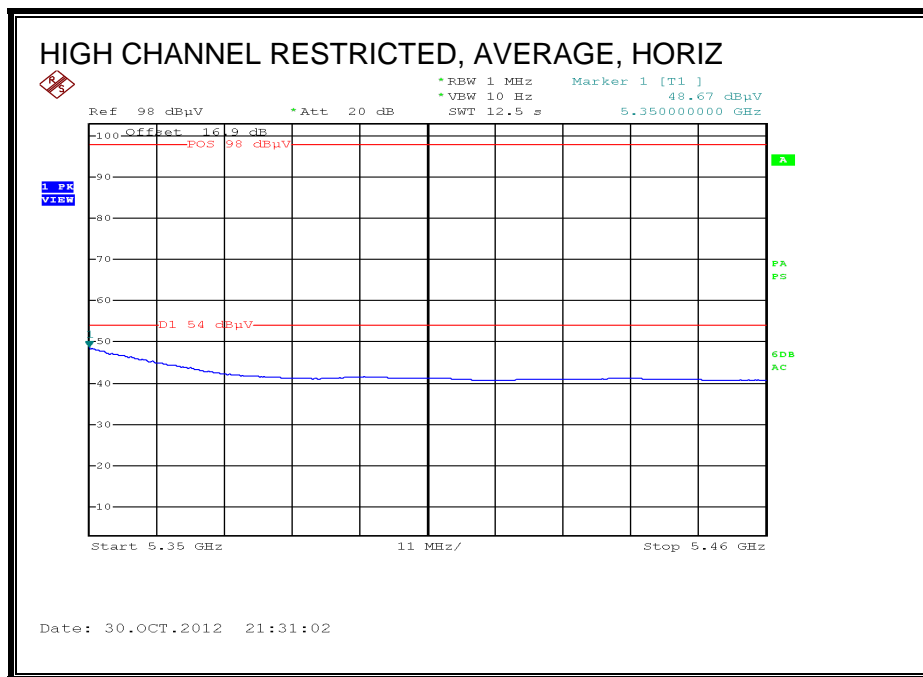
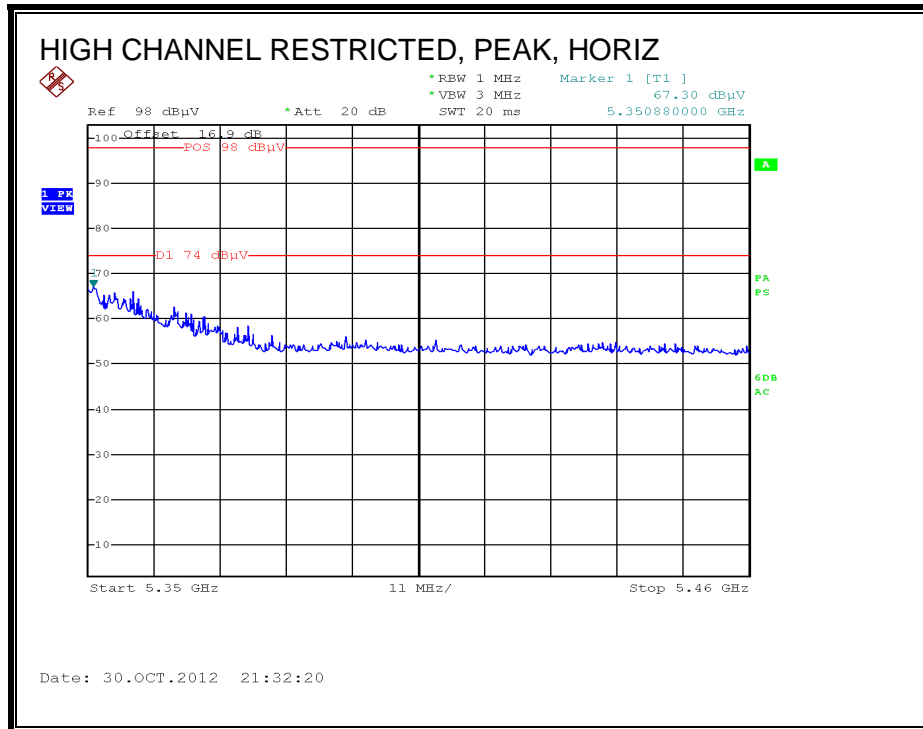
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5260 MHz															
15.780	3.0	34.47	23.80	38.2	13.1	-31.9	0.0	0.0	53.9	43.2	74	54	-20.1	-10.8	H
15.780	3.0	35.05	23.89	38.2	13.1	-31.9	0.0	0.0	54.5	43.3	74	54	-19.5	-10.7	V
Mid Channel : 5300 MHz															
10.600	3.0	46.54	31.52	38.4	9.9	-32.5	0.0	0.0	62.4	47.3	74	54	-11.6	-6.7	H
10.600	3.0	51.65	37.82	38.4	9.9	-32.5	0.0	0.0	67.5	53.6	74	54	-6.5	-0.4	V
15.900	3.0	35.17	23.91	37.8	13.2	-31.8	0.0	0.0	54.3	43.0	74	54	-19.7	-11.0	H
15.900	3.0	39.39	27.76	37.8	13.2	-31.8	0.0	0.0	58.5	46.9	74	54	-15.5	-7.1	V
High Channel: 5320 MHz															
10.640	3.0	45.88	33.29	38.4	10.0	-32.5	0.0	0.0	61.8	49.2	74	54	-12.2	-4.8	H
10.640	3.0	51.24	37.66	38.4	10.0	-32.5	0.0	0.0	67.1	53.5	74	54	-6.9	-0.5	V
15.960	3.0	34.95	24.16	37.6	13.2	-31.8	0.0	0.0	53.9	43.1	74	54	-20.1	-10.9	H
15.960	3.0	39.03	27.39	37.6	13.2	-31.8	0.0	0.0	58.0	46.3	74	54	-16.0	-7.7	V

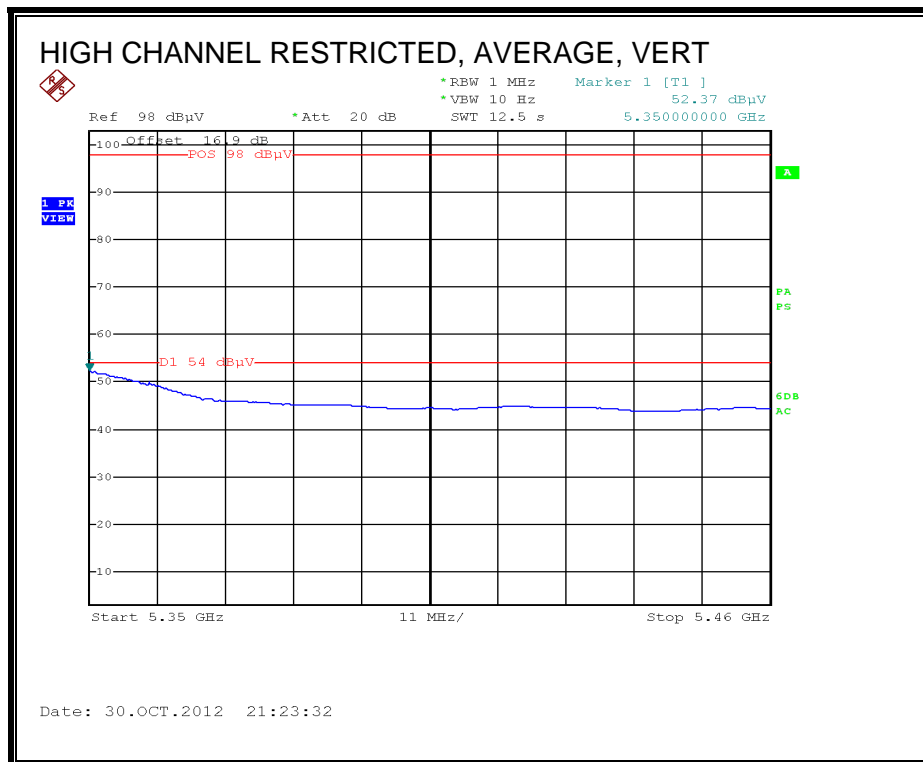
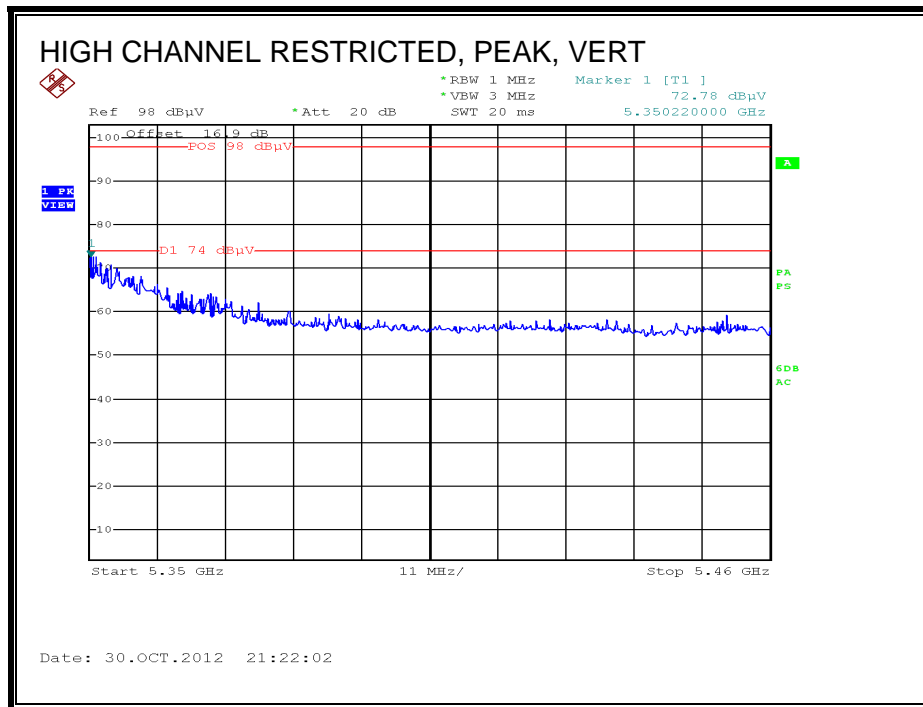
Rev. 11.10.11 Note: No other emissions above noise floor.

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

9.1.4. TX ABOVE 1 GHz 802.11n HT40 CDD MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)



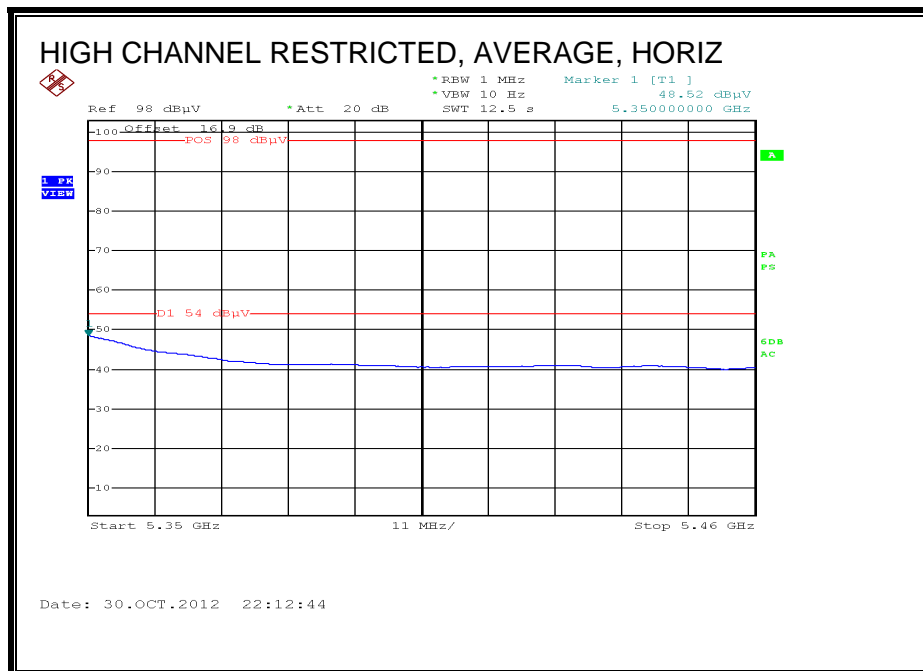
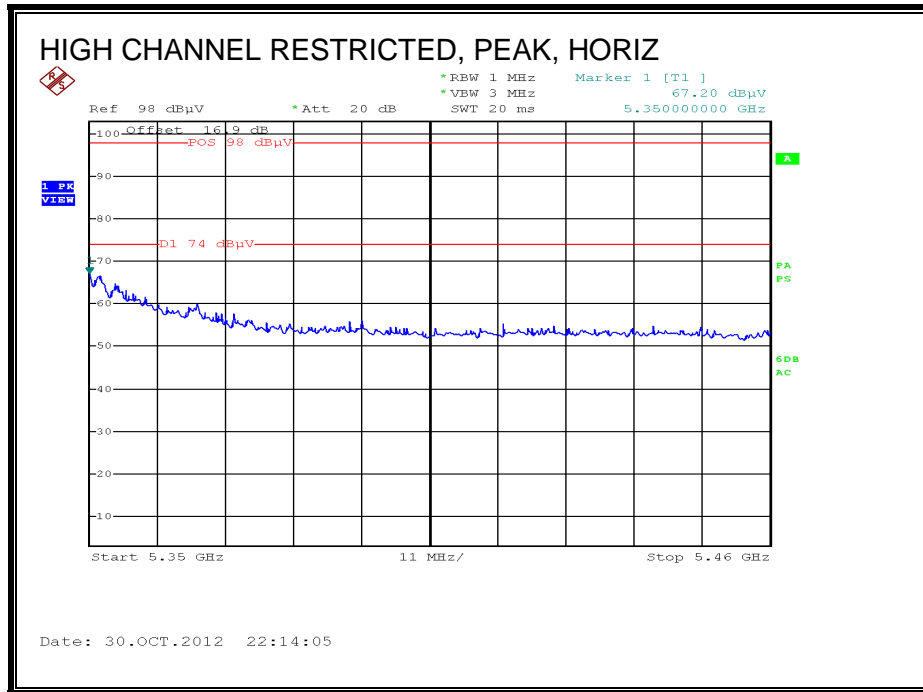


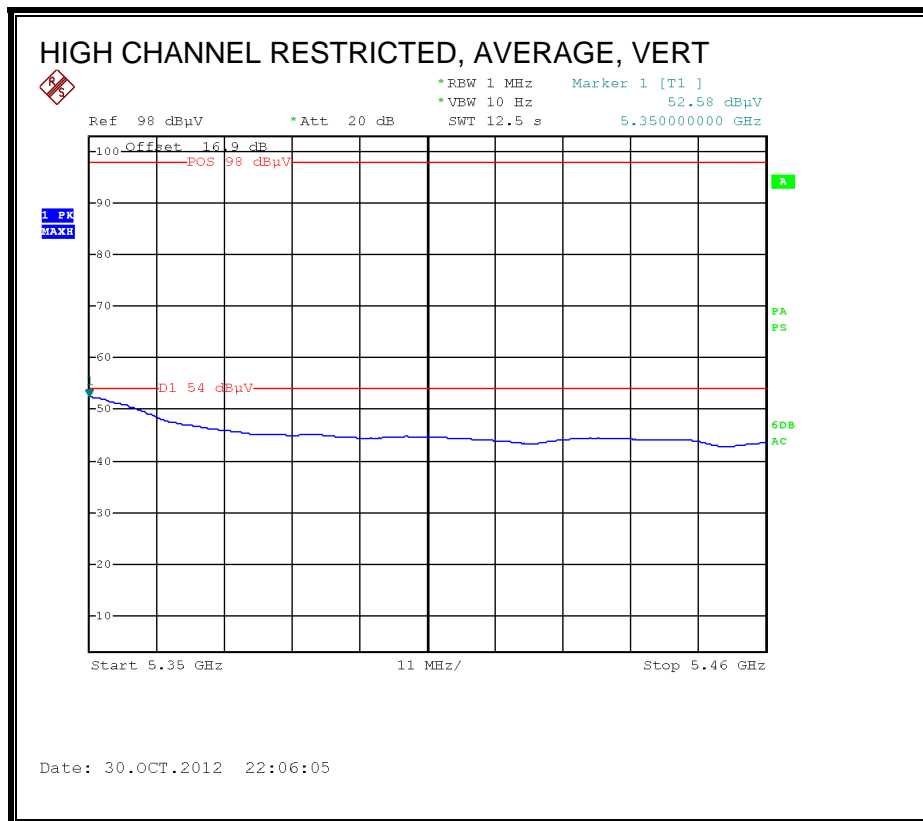
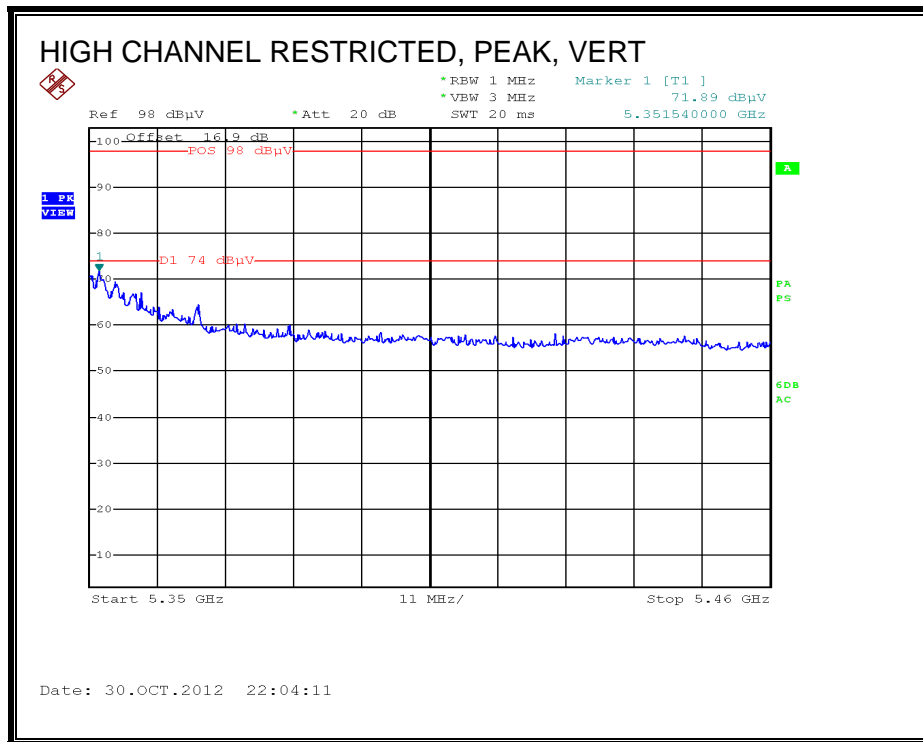
HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement																	
Compliance Certification Services, Fremont 3m Chamber																	
Company:		Ruckus															
Project #:		12U14419															
Date:		10/25/2012															
Test Engineer:		S.Aguilar															
Configuration:		Standalone with remote laptop control															
Mode:		11n, HT40 MCS0															
Test Equipment:																	
Horn 1-18GHz			Pre-amplifer 1-26GHz			Pre-amplifer 26-40GHz			Horn > 18GHz			Limit					
T60; S/N: 2238 @3m			T34 HP 8449B			T88 Miteq 26-40GHz			T39; ARA 18-26GHz; S/N:1013			FCC 15.205					
Hi Frequency Cables																	
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF		Reject Filter		Peak Measurements RBW=VBW=1MHz/3MHz Average Measurements RBW=1MHz ; VBW=10Hz				
3' cable 22807700			12' cable 22807600			20' cable 22807500					R_001						
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)		
Low Channel: 5270 MHz																	
15.810	3.0	35.38	23.77	38.1	13.1	-31.9	0.0	0.0	54.7	43.1	74	54	-19.3	-10.9	H		
15.810	3.0	35.60	24.21	38.1	13.1	-31.9	0.0	0.0	54.9	43.6	74	54	-19.1	-10.4	V		
High Channel : 5310 MHz																	
10.620	3.0	43.66	28.26	38.4	9.9	-32.5	0.0	0.0	59.5	44.1	74	54	-14.5	-9.9	H		
10.620	3.0	47.32	31.65	38.4	9.9	-32.5	0.0	0.0	63.2	47.5	74	54	-10.8	-6.5	V		
15.930	3.0	35.71	24.05	37.7	13.2	-31.8	0.0	0.0	54.7	43.1	74	54	-19.3	-10.9	H		
15.930	3.0	36.76	23.63	37.7	13.2	-31.8	0.0	0.0	55.8	42.6	74	54	-18.2	-11.4	V		
Rev. 11.10.11 Note: No other emissions above noise floor.																	
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit				
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit				
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit				
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit				
CL	Cable Loss					HPF	High Pass Filter										

9.1.5. TX ABOVE 1 GHz 802.11n HT40 SDM MODE IN THE 5.3 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL)



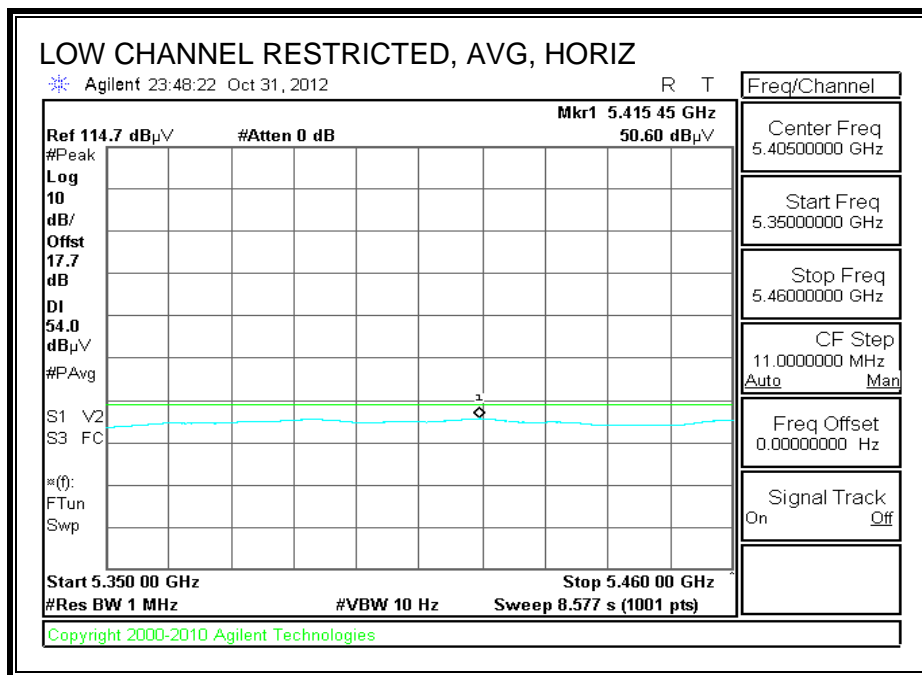
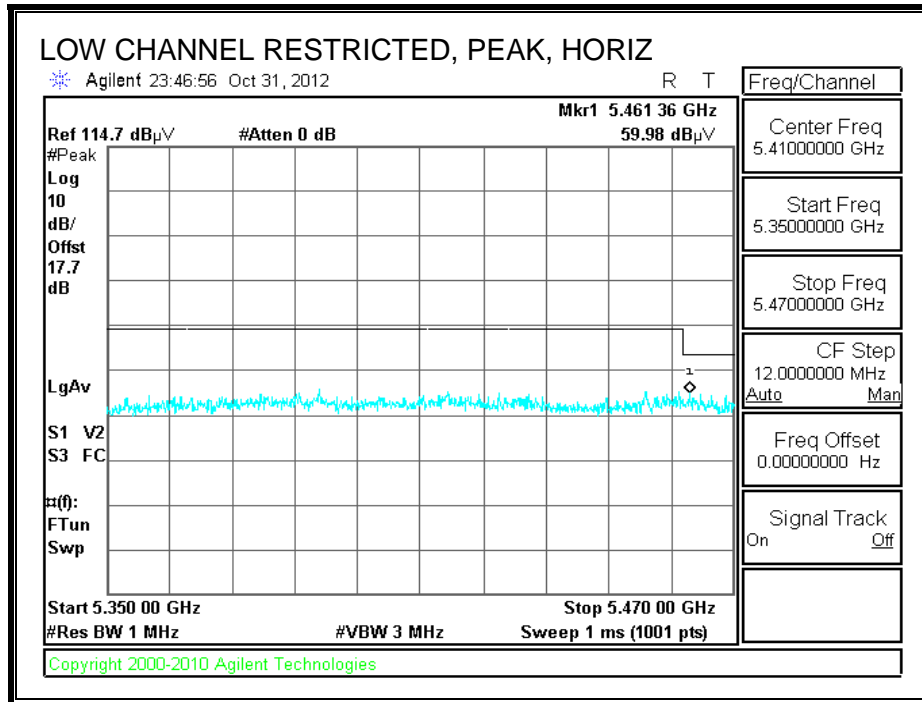


HARMONICS AND SPURIOUS EMISSIONS

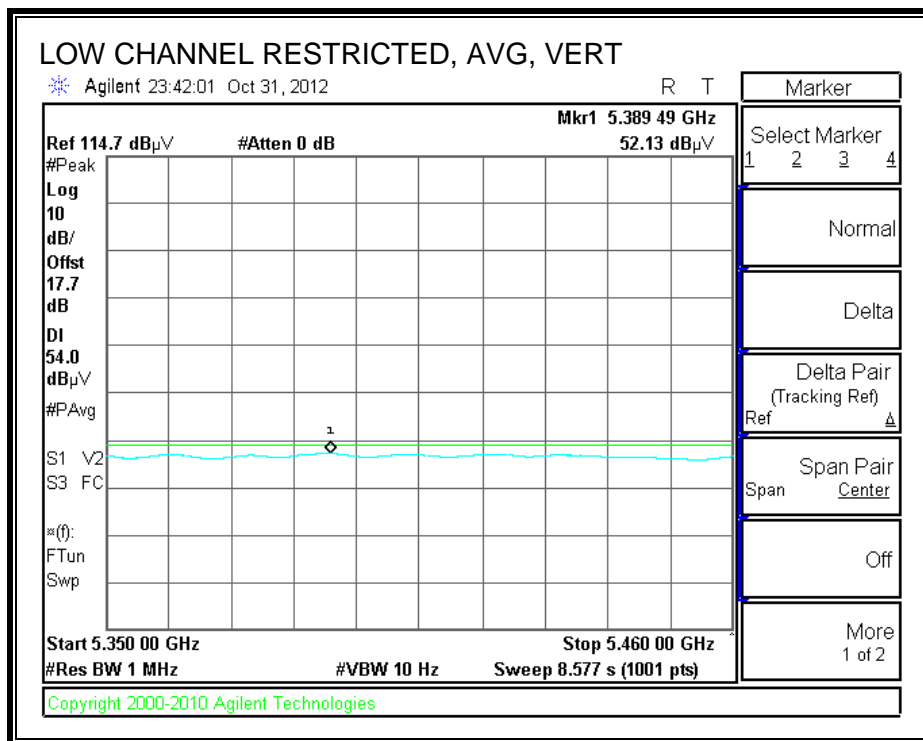
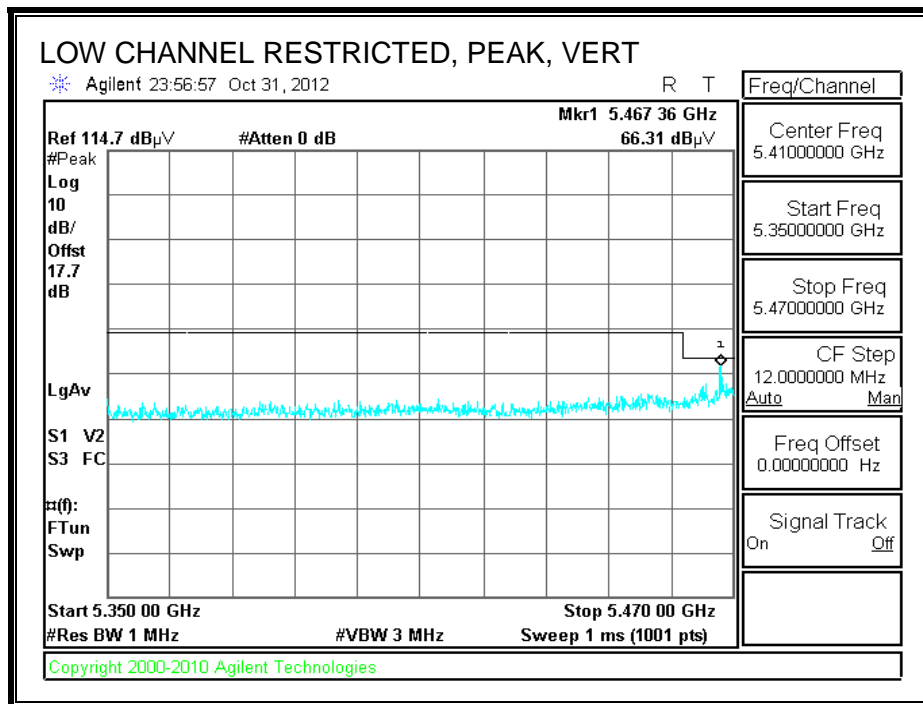
High Frequency Measurement																	
Compliance Certification Services, Fremont 3m Chamber																	
Company:		Ruckus															
Project #:		12U14419															
Date:		10/25/2012															
Test Engineer:		S.Aguilar															
Configuration:		Standalone with remote laptop control															
Mode:		11n, HT40 MCS3															
Test Equipment:																	
Horn 1-18GHz			Pre-amplifer 1-26GHz			Pre-amplifer 26-40GHz			Horn > 18GHz			Limit					
T60; S/N: 2238 @3m			T34 HP 8449B			T88 Miteq 26-40GHz			T39; ARA 18-26GHz; S/N:1013			FCC 15.205					
Hi Frequency Cables																	
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Peak Measurements RBW=VBW=1MHz/3MHz		
3' cable 22807700			12' cable 22807600			20' cable 22807500						R_001			Average Measurements RBW=1MHz ; VBW=10Hz		
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)		
Low Channel: 5270 MHz																	
15.810	3.0	34.83	23.91	38.1	13.1	-31.9	0.0	0.0	54.2	43.3	74	54	-19.8	-10.7	H		
15.810	3.0	35.38	24.52	38.1	13.1	-31.9	0.0	0.0	54.7	43.9	74	54	-19.3	-10.1	V		
High Channel : 5310 MHz																	
10.620	3.0	41.52	28.37	38.4	9.9	-32.5	0.0	0.0	57.4	44.2	74	54	-16.6	-9.8	H		
10.620	3.0	47.51	33.65	38.4	9.9	-32.5	0.0	0.0	63.4	49.5	74	54	-10.6	-4.5	V		
15.930	3.0	34.72	24.02	37.7	13.2	-31.8	0.0	0.0	53.7	43.0	74	54	-20.3	-11.0	H		
15.930	3.0	36.75	25.51	37.7	13.2	-31.8	0.0	0.0	55.8	44.5	74	54	-18.2	-9.5	V		
Rev. 11.10.11 Note: No other emissions above noise floor.																	
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit				
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit				
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit				
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit				
CL	Cable Loss					HPF	High Pass Filter										

9.1.6. TX ABOVE 1 GHz FOR 802.11a MODE IN THE LOWER 5.6 GHz BAND

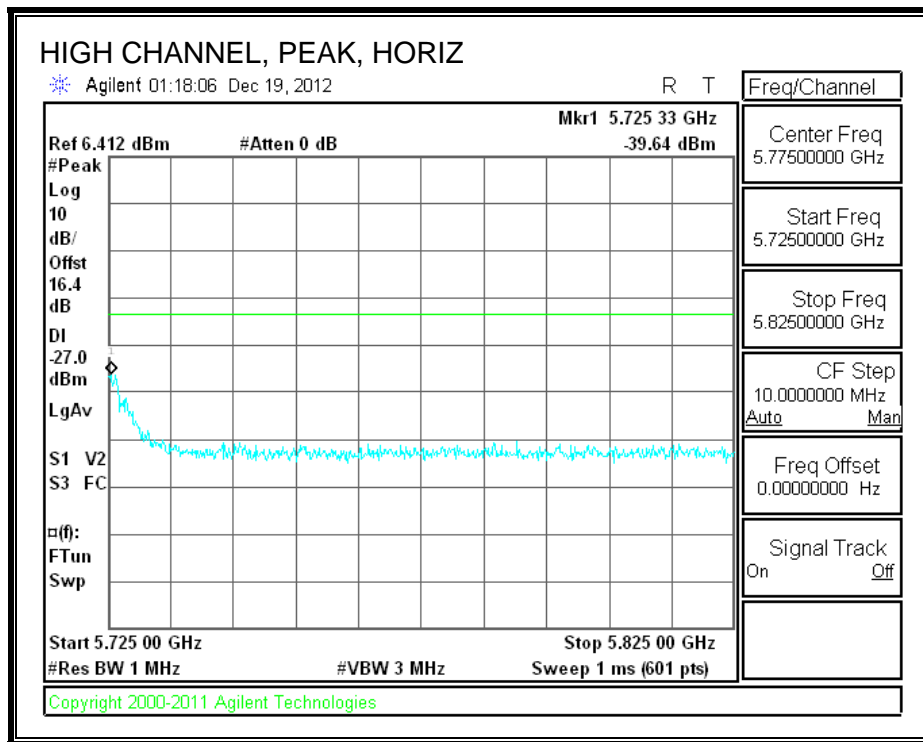
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



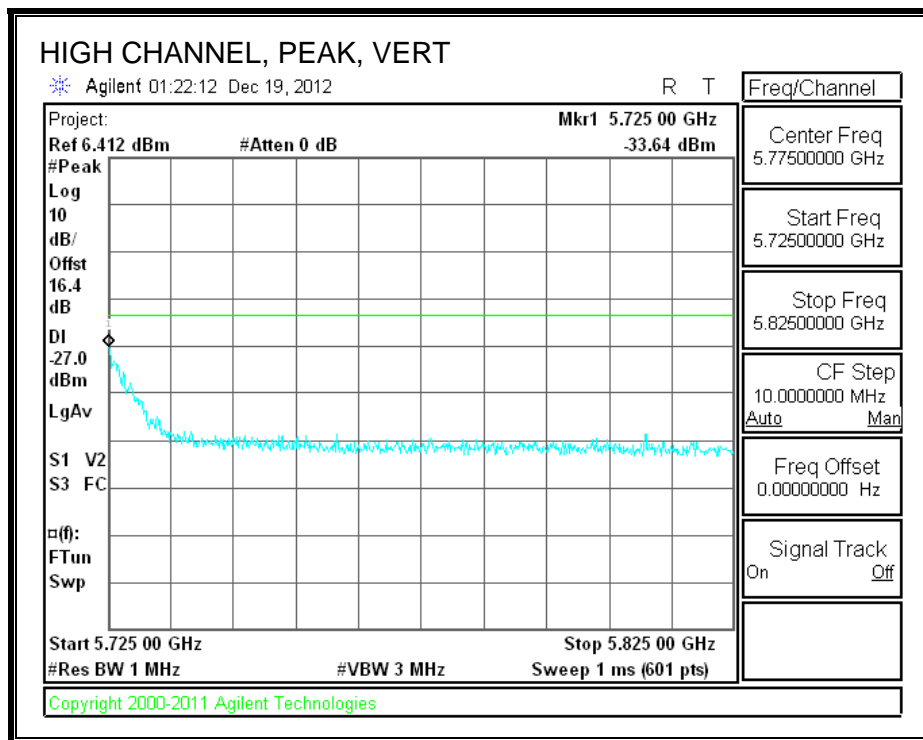
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 3m Chamber

Company: Ruckus
 Project #: 12U14419
 Date: 10/29/2012
 Test Engineer: S.Aguilar
 Configuration: Standalone with remote laptop control
 Mode: 11a, 20MHz

Test Equipment:

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B	T88 Miteq 26-40GHz	T39; ARA 18-26GHz; S/N:1013	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz/3MHz
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001	Average Measurements RBW=1MHz ; VBW=10Hz

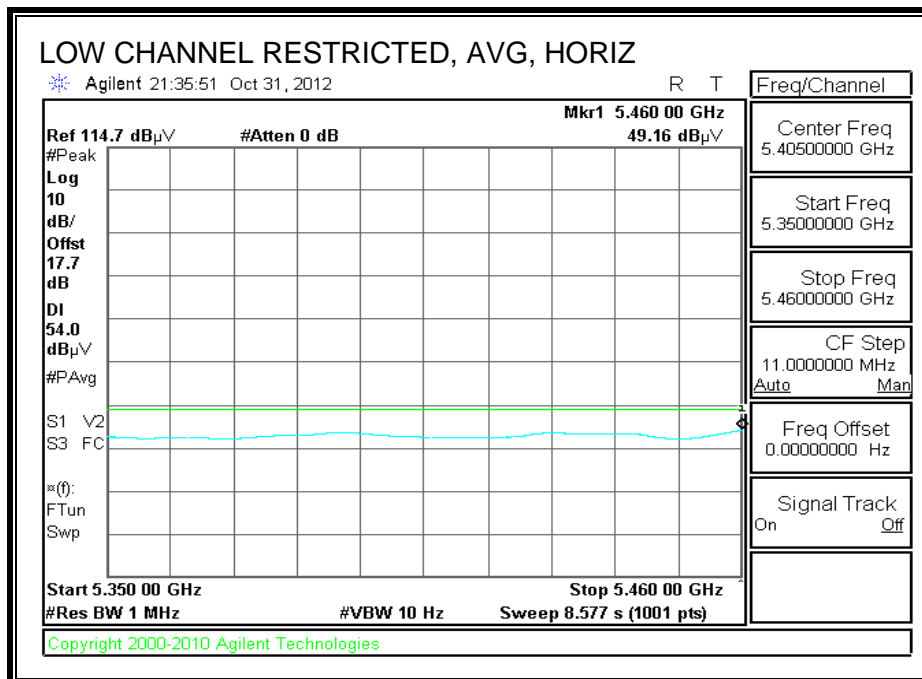
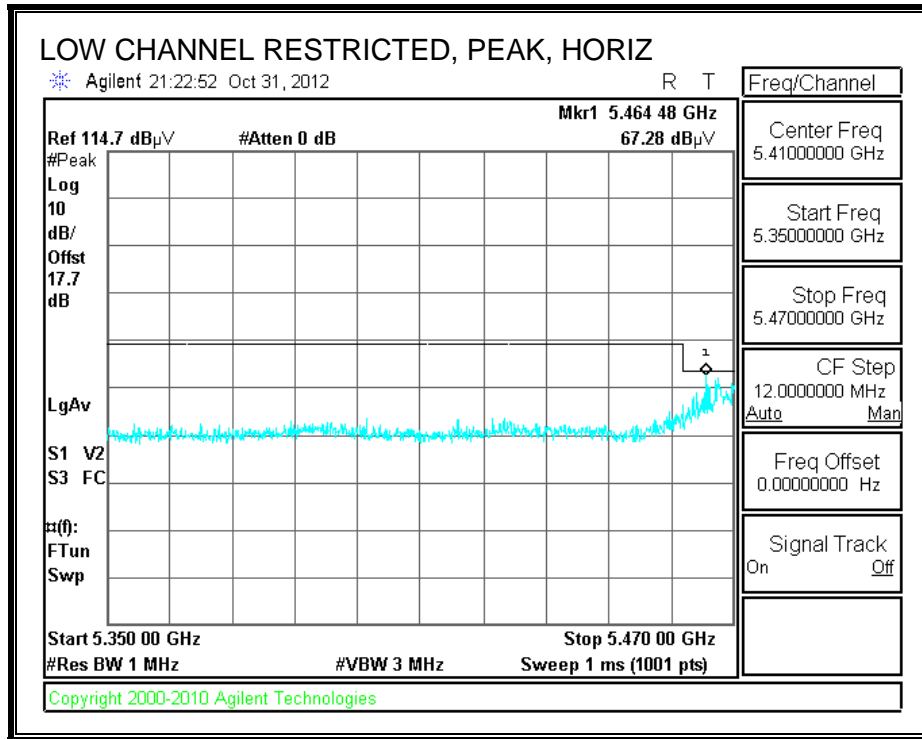
f GHz	Dist (m)	Read Plk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5500 MHz															
11.000	3.0	47.73	33.15	38.4	10.5	-32.4	0.0	0.0	64.2	49.6	74	54	-9.8	-4.4	H
11.000	3.0	51.47	36.35	38.4	10.5	-32.4	0.0	0.0	67.9	52.8	74	54	-6.1	-1.2	V
Mid Channel: 5580 MHz															
11.160	3.0	40.08	26.74	38.5	10.7	-32.4	0.0	0.0	56.9	43.6	74	54	-17.1	-10.4	H
11.160	3.0	47.74	32.86	38.5	10.7	-32.4	0.0	0.0	64.6	49.7	74	54	-9.4	-4.3	V
High Channel : 5700 MHz															
11.400	3.0	39.85	27.88	38.8	11.1	-32.4	0.0	0.0	57.3	45.3	74	54	-16.7	-8.7	H
11.400	3.0	46.44	32.22	38.8	11.1	-32.4	0.0	0.0	63.9	49.7	74	54	-10.1	-4.3	V

Rev. 11.10.11 Note: No other emissions above noise floor.

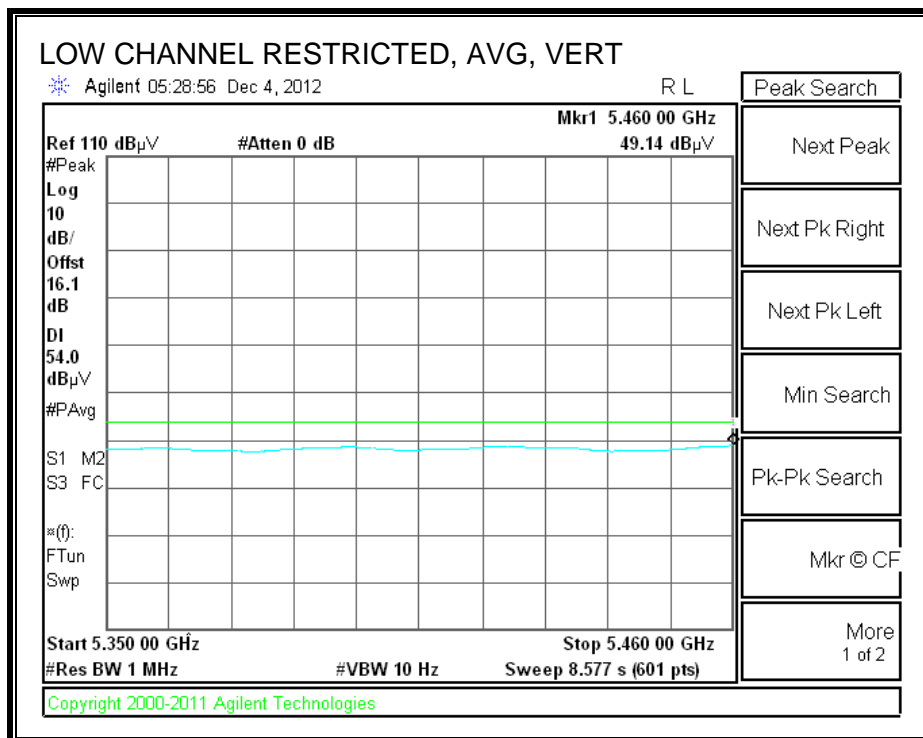
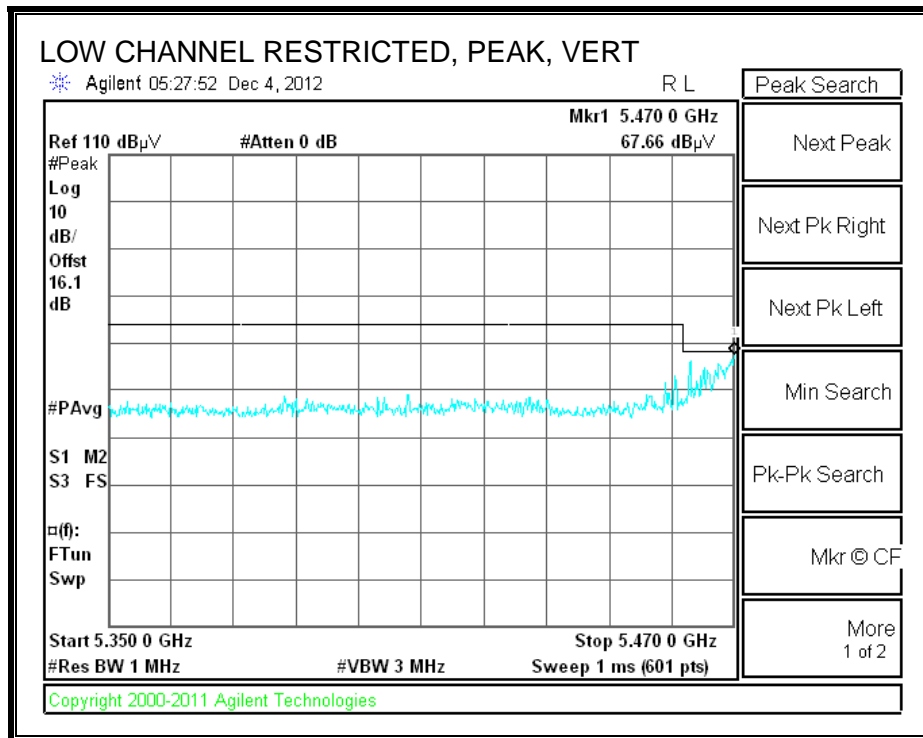
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

9.1.7. TX ABOVE 1 GHz FOR 802.11n HT20 CDD MODE 5.6 GHz BAND

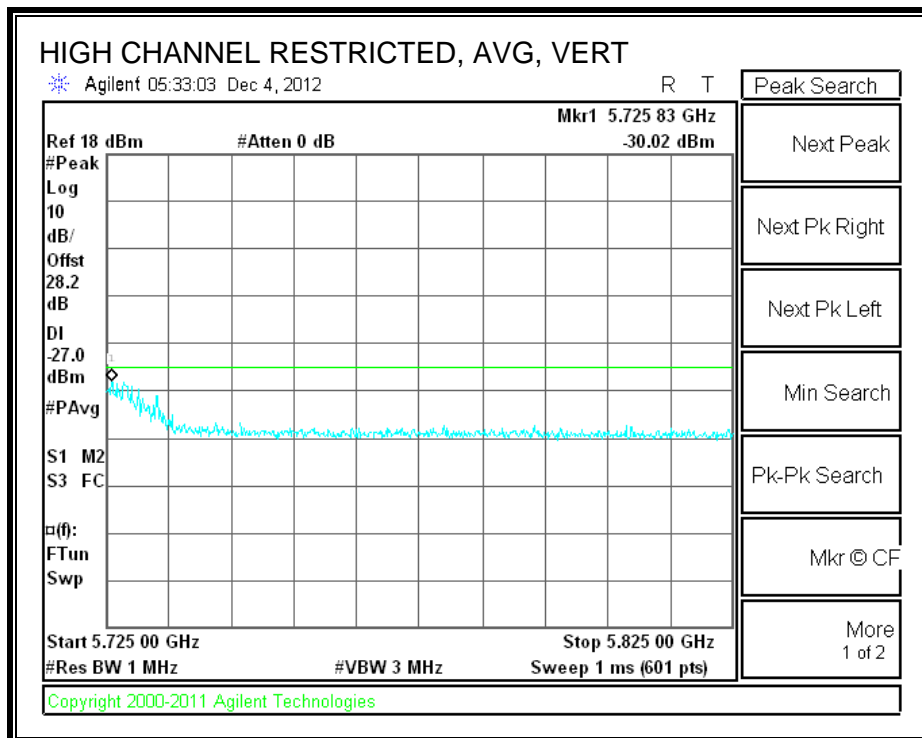
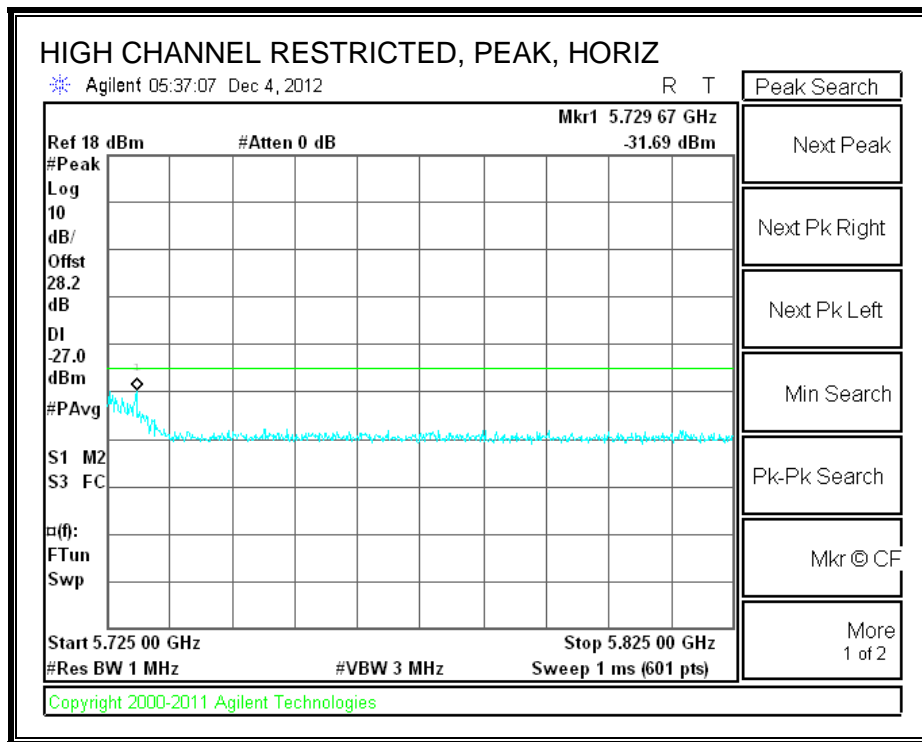
RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 3m Chamber

Company: Ruckus
 Project #: 12U14419
 Date: 10/29/2012
 Test Engineer: S.Aguilar
 Configuration: Standalone with remote laptop control
 Mode: 11n, W56, 20MHz, MCS0

Test Equipment:

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B	T88 Miteq 26.40GHz	T39; ARA 18.26GHz; S/N:1013	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz/3MHz
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001	Average Measurements RBW=1MHz ; VBW=10Hz

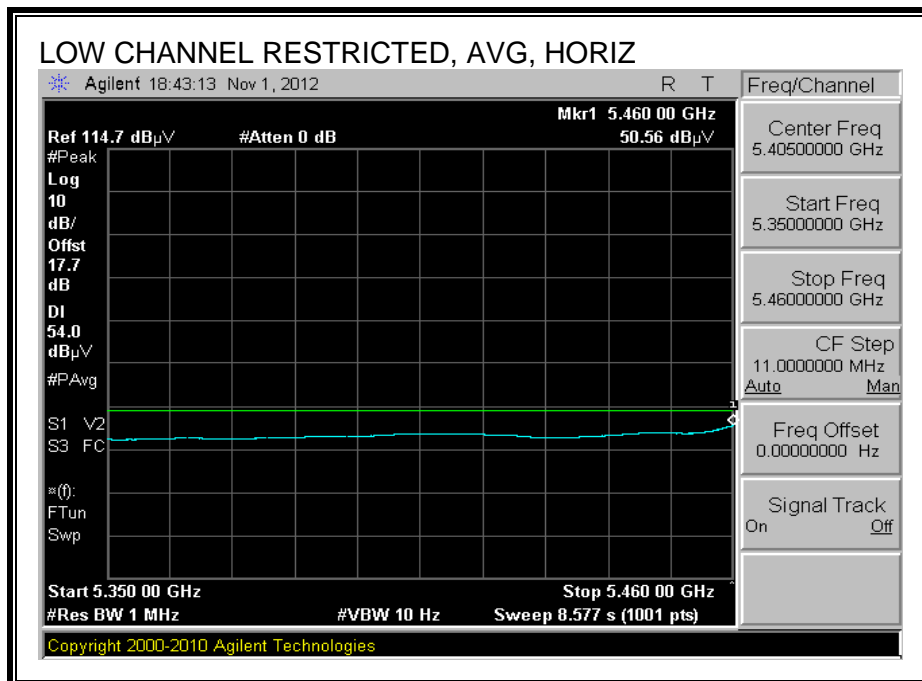
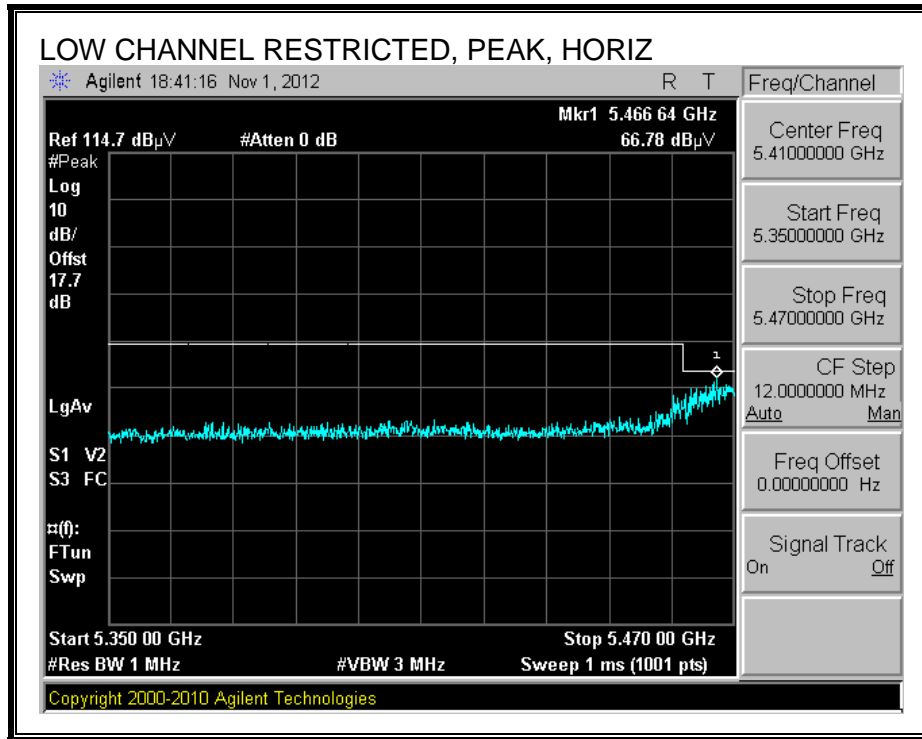
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5500 MHz															
11.000	3.0	44.20	30.17	38.4	10.5	-32.4	0.0	0.0	60.6	46.6	74	54	-13.4	-7.4	H
11.000	3.0	52.40	36.57	38.4	10.5	-32.4	0.0	0.0	68.8	53.0	74	54	-5.2	-1.0	V
Mid Channel: 5580 MHz															
11.160	3.0	40.55	26.70	38.5	10.7	-32.4	0.0	0.0	57.4	43.5	74	54	-16.6	-10.5	H
11.160	3.0	48.81	31.59	38.5	10.7	-32.4	0.0	0.0	65.7	48.4	74	54	-8.3	-5.6	V
High Channel : 5700 MHz															
11.400	3.0	39.48	27.29	38.8	11.1	-32.4	0.0	0.0	56.9	44.7	74	54	-17.1	-9.3	H
11.400	3.0	43.91	29.24	38.8	11.1	-32.4	0.0	0.0	61.4	46.7	74	54	-12.6	-7.3	V

Rev. 11.10.11 Note: No other emissions above noise floor.

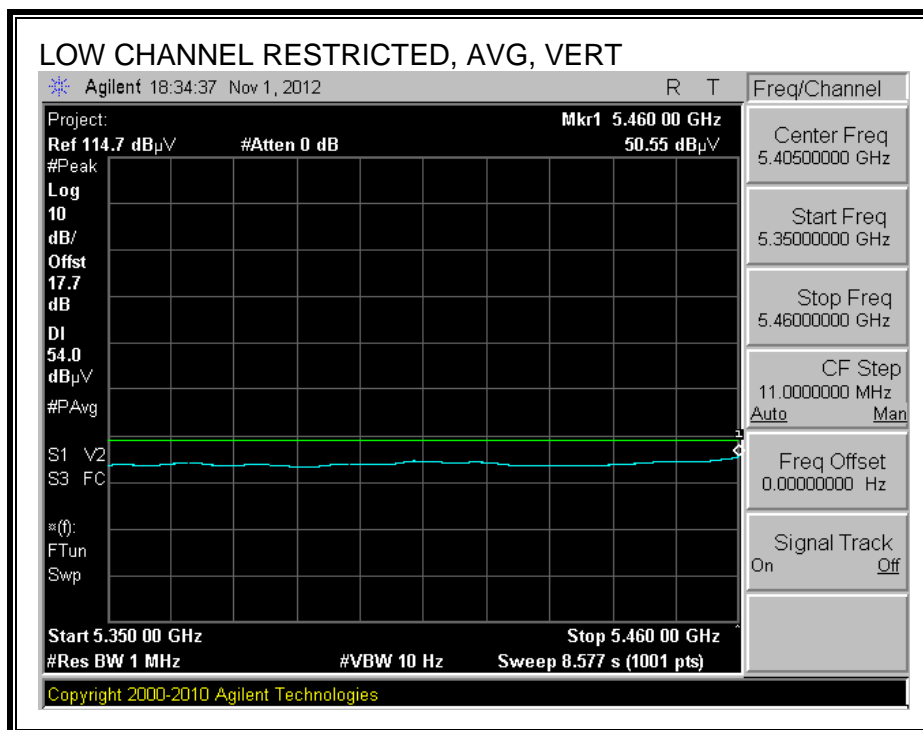
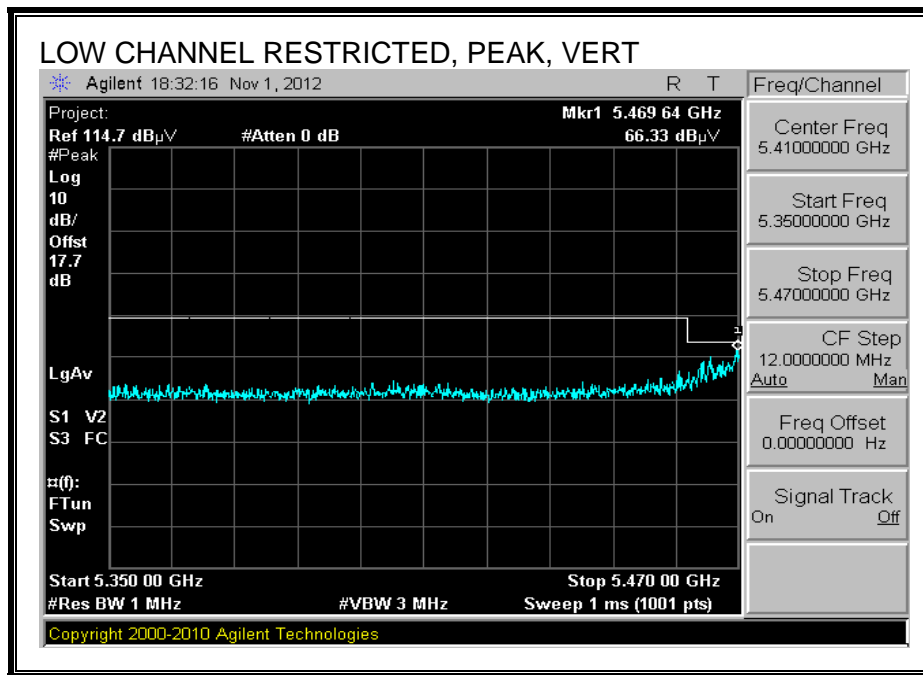
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

9.1.8. TX ABOVE 1 GHz FOR 802.11n HT20 SDM MODE IN THE 5.6 GHz BAND

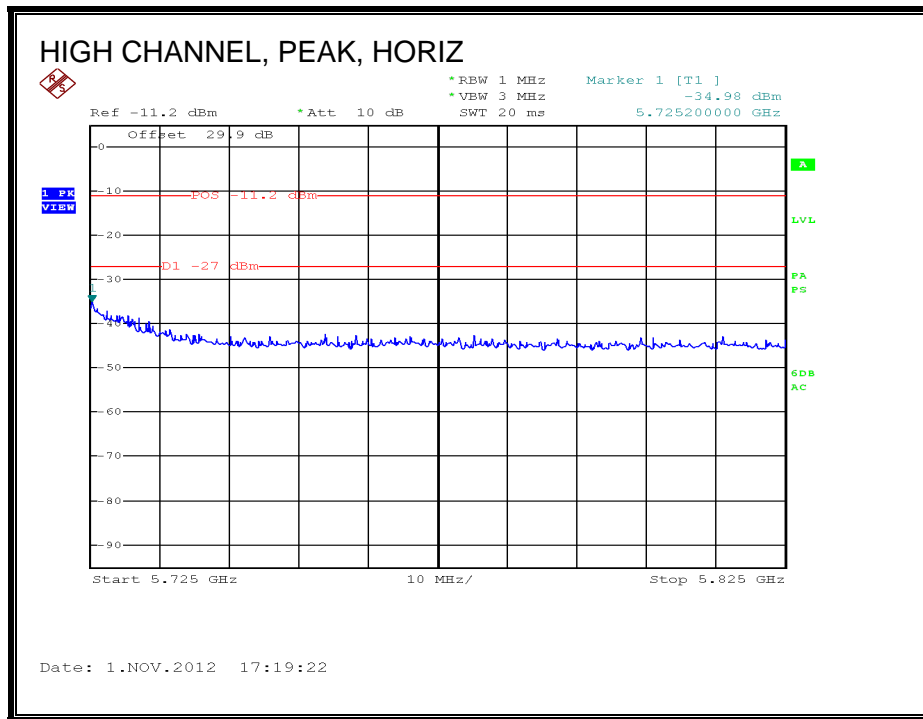
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



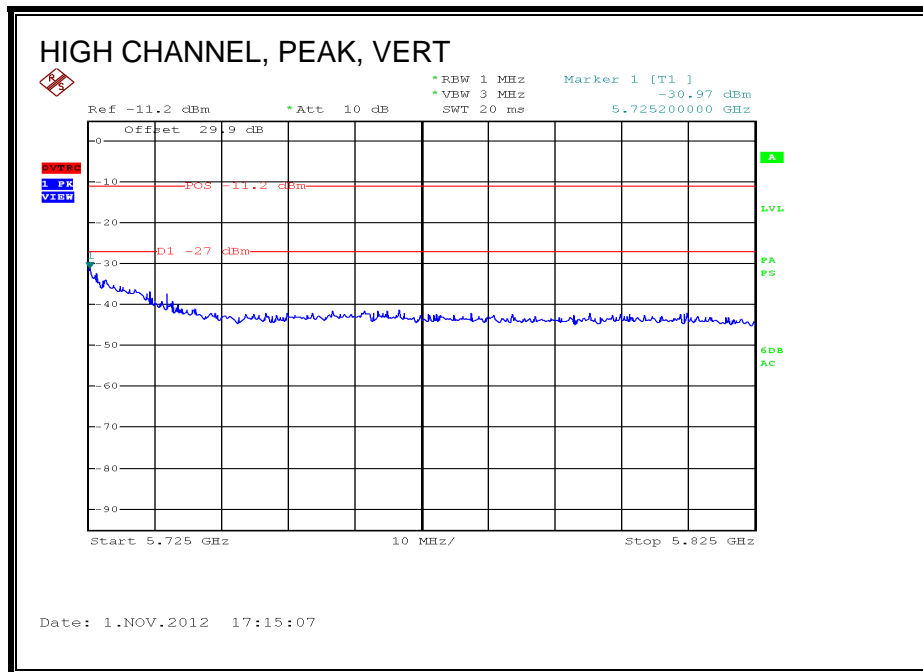
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



AUTHORIZED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



AUTHORIZED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 3m Chamber

Company: Ruckus
Project #: 12U14419
Date: 10/29/2012
Test Engineer: S.Aguilar
Configuration: Standalone with remote laptop control
Mode: 11n, SDM, 20MHz, MCS8

Test Equipment:

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B	T88 Miteq 26.40GHz	T39; ARA 18.26GHz; S/N:1013	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz/3MHz
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001	Average Measurements RBW=1MHz ; VBW=10Hz

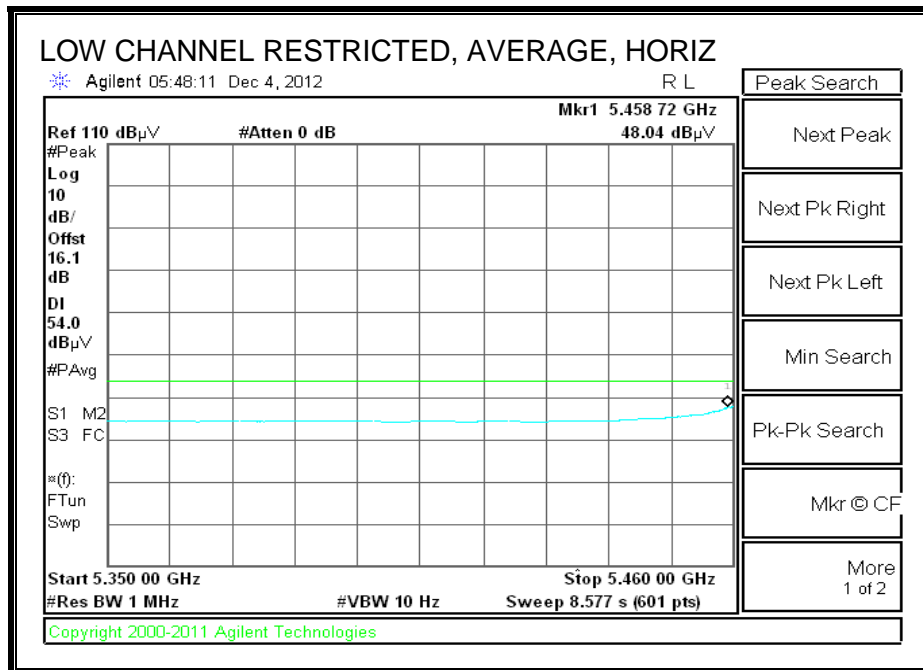
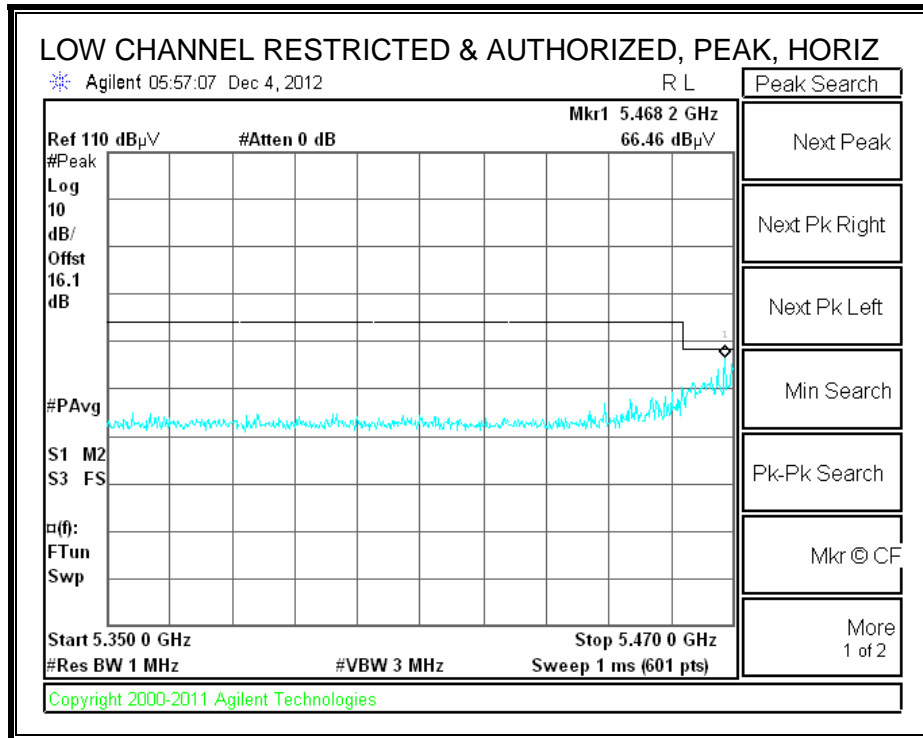
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
Low Channel: 5500 MHz															
11.000	3.0	44.43	29.82	38.4	10.5	-32.4	0.0	0.0	60.9	46.3	74	54	-13.1	-7.7	H
11.000	3.0	48.41	34.84	38.4	10.5	-32.4	0.0	0.0	64.9	51.3	74	54	-9.1	-2.7	V
Mid Channel: 5580 MHz															
11.160	3.0	38.98	26.17	38.5	10.7	-32.4	0.0	0.0	55.8	43.0	74	54	-18.2	-11.0	H
11.160	3.0	46.77	31.57	38.5	10.7	-32.4	0.0	0.0	63.6	48.4	74	54	-10.4	-5.6	V
High Channel : 5700 MHz															
11.400	3.0	35.49	24.38	38.8	11.1	-32.4	0.0	0.0	52.9	41.8	74	54	-21.1	-12.2	H
11.400	3.0	42.80	29.17	38.8	11.1	-32.4	0.0	0.0	60.3	46.6	74	54	-13.7	-7.4	V

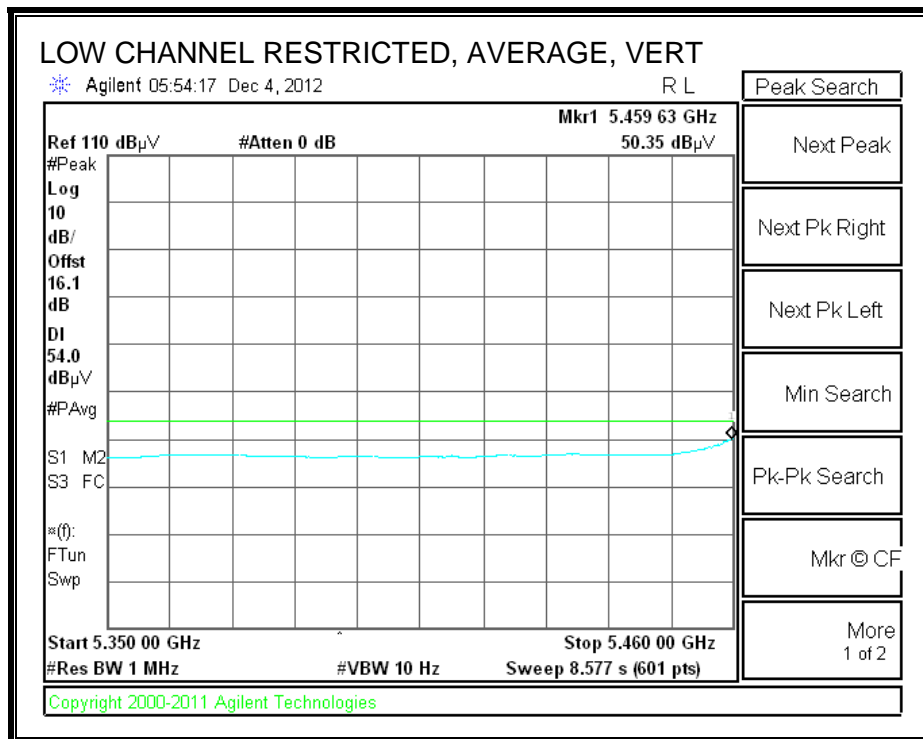
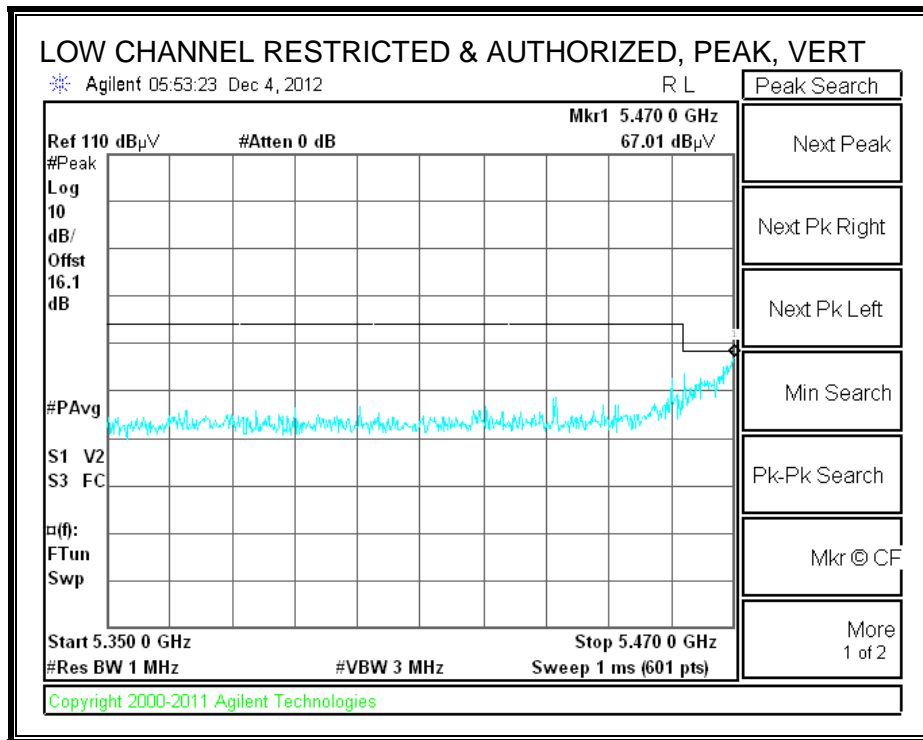
Rev. 11.10.11 Note: No other emissions above noise floor.

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

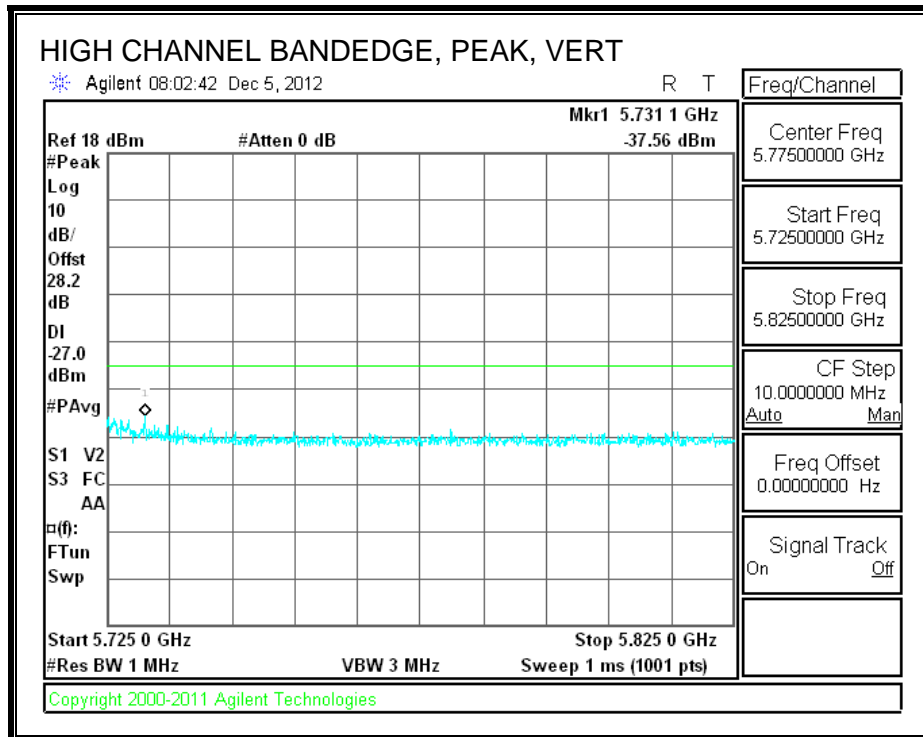
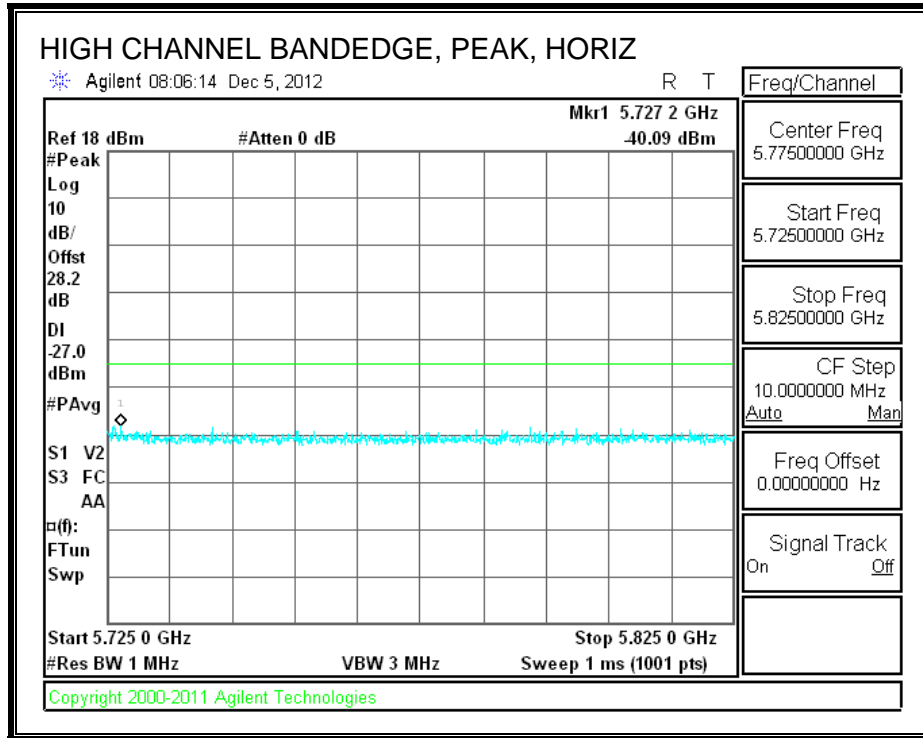
9.1.9. TX ABOVE 1 GHz FOR 802.11n HT40 CDD MODE IN THE 5.6

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)





AUTHORIZED BANDEDGE (HIGH CHANNEL)



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 3m Chamber

Company: Ruckus
Project #: 12U14419
Date: 10/29/2012
Test Engineer: S.Aguilar
Configuration: Standalone with remote laptop control
Mode: 11n, CDD, 40MHz, MCS0

Test Equipment:

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B	T88 Miteq 26.40GHz	T39; ARA 18.26GHz; S/N:1013	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz/3MHz
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001	Average Measurements RBW=1MHz ; VBW=10Hz

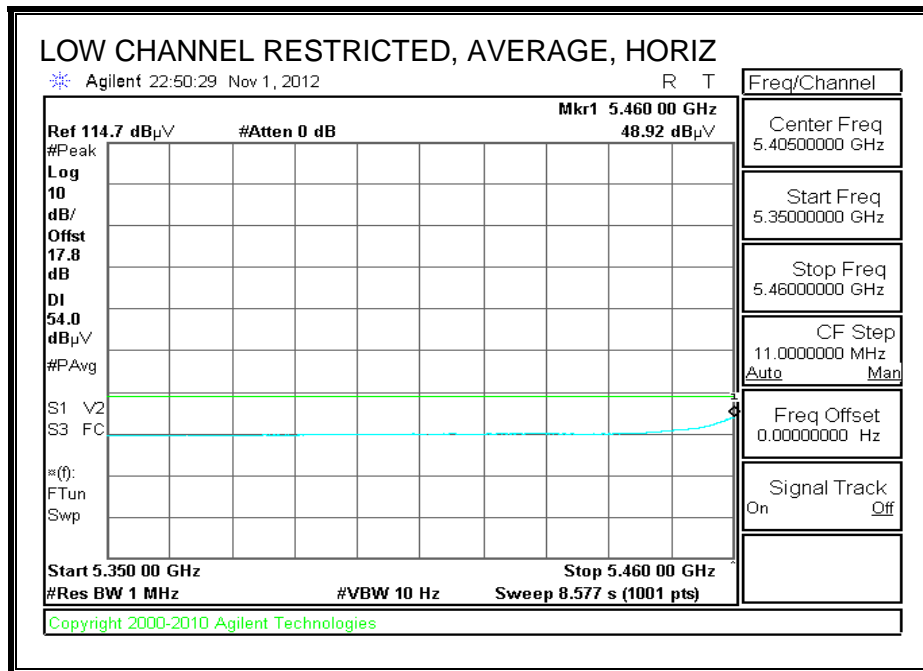
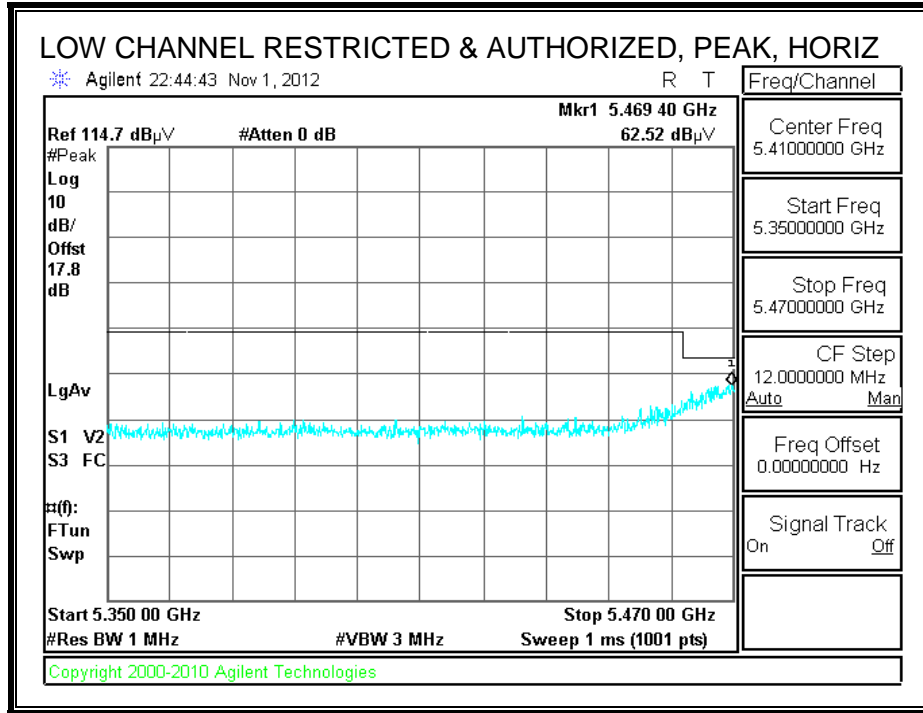
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5510 MHz															
11.020	3.0	41.30	25.50	38.4	10.5	-32.4	0.0	0.0	57.8	42.0	74	54	-16.2	-12.0	H
11.020	3.0	47.88	29.99	38.4	10.5	-32.4	0.0	0.0	64.4	46.5	74	54	-9.6	-7.5	V
Mid Channel: 5550 MHz															
11.100	3.0	37.61	24.91	38.5	10.6	-32.4	0.0	0.0	54.3	41.6	74	54	-19.7	-12.4	H
11.100	3.0	45.23	28.57	38.5	10.6	-32.4	0.0	0.0	61.9	45.3	74	54	-12.1	-8.7	V
High Channel: 5670 MHz															
11.340	3.0	34.78	23.95	38.7	11.0	-32.4	0.0	0.0	52.1	41.3	74	54	-21.9	-12.7	H
11.340	3.0	40.46	25.93	38.7	11.0	-32.4	0.0	0.0	57.8	43.2	74	54	-16.2	-10.8	V

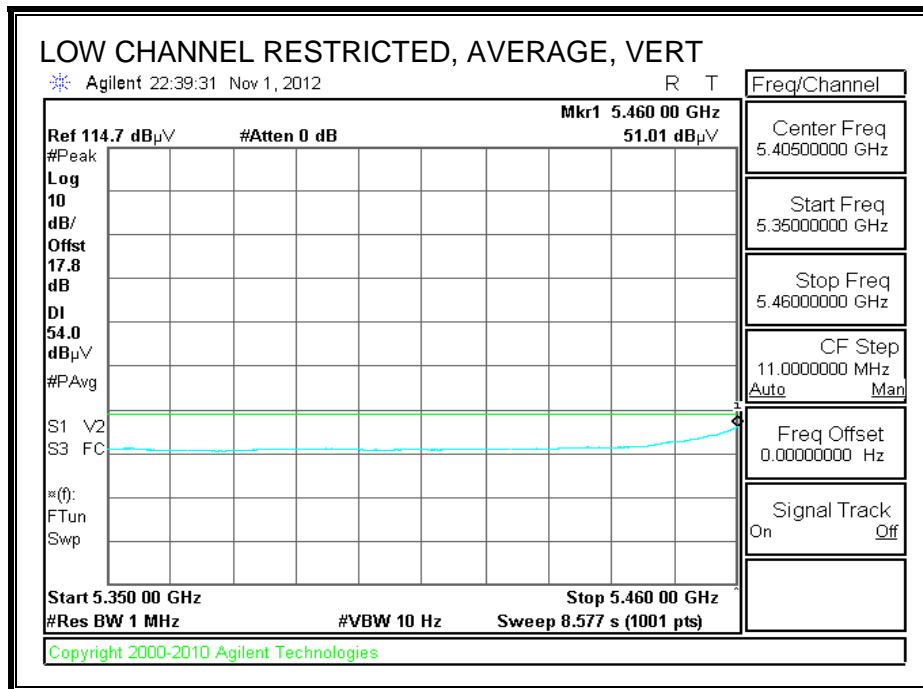
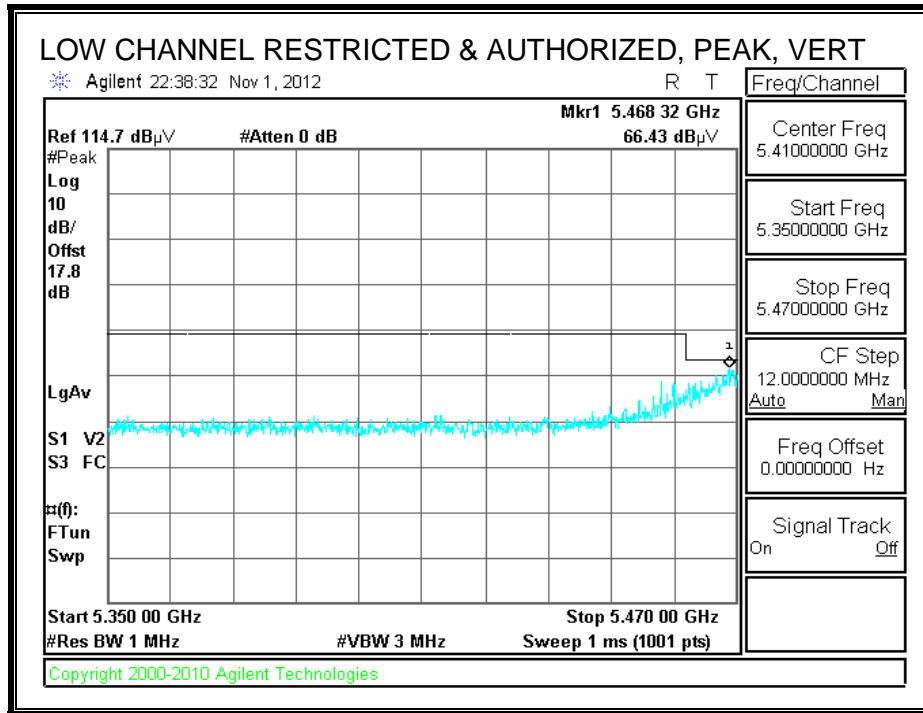
Rev. 11.10.11 Note: No other emissions above noise floor.

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

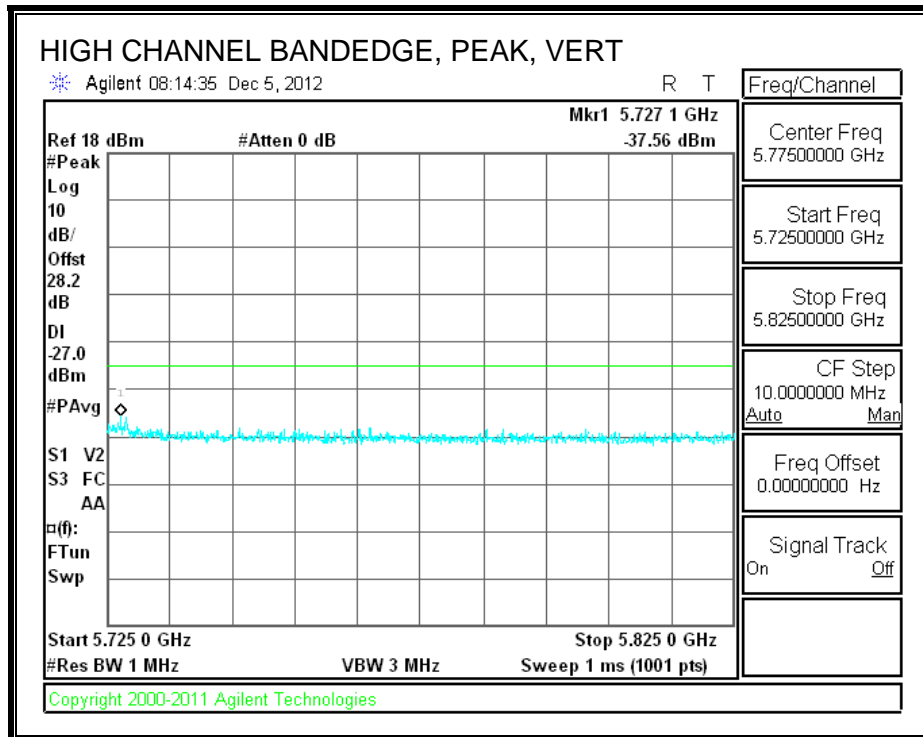
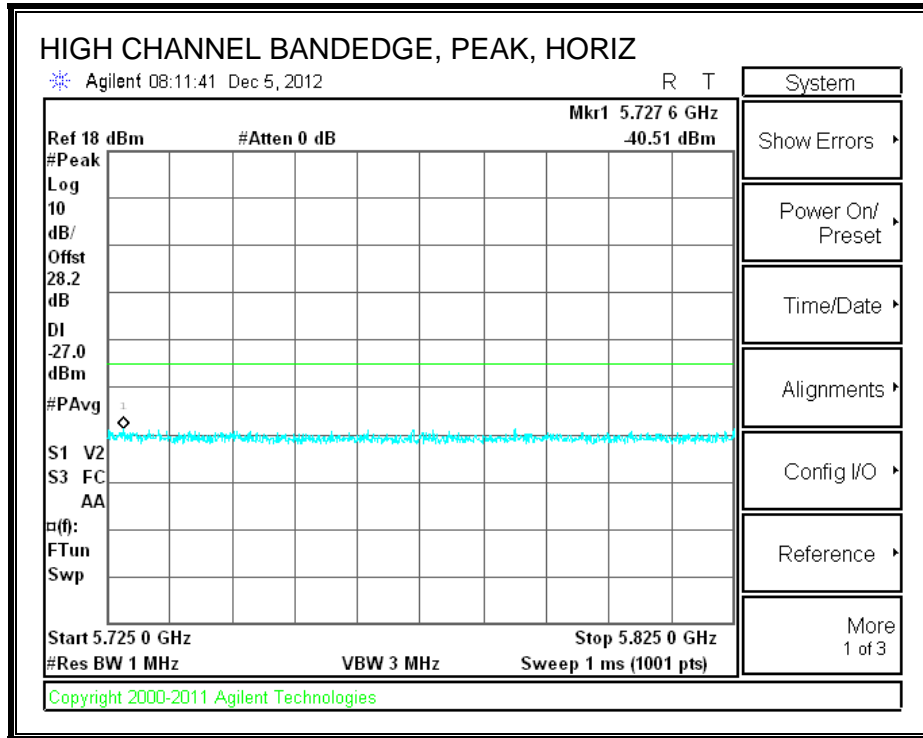
9.1.10. TX ABOVE 1 GHz FOR 802.11n HT40 SDM MODE IN THE 5.6

RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)





AUTHORIZED BANDEDGE (HIGH CHANNEL)



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 3m Chamber

Company: Ruckus
Project #: 12U14419
Date: 10/29/2012
Test Engineer: S.Aguilar
Configuration: Standalone with remote laptop control
Mode: 11n, SDM, 40MHz, MCS8

Test Equipment:

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B	T88 Miteq 26.40GHz	T39; ARA 18.26GHz; S/N:1013	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz/3MHz
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001	Average Measurements RBW=1MHz ; VBW=10Hz

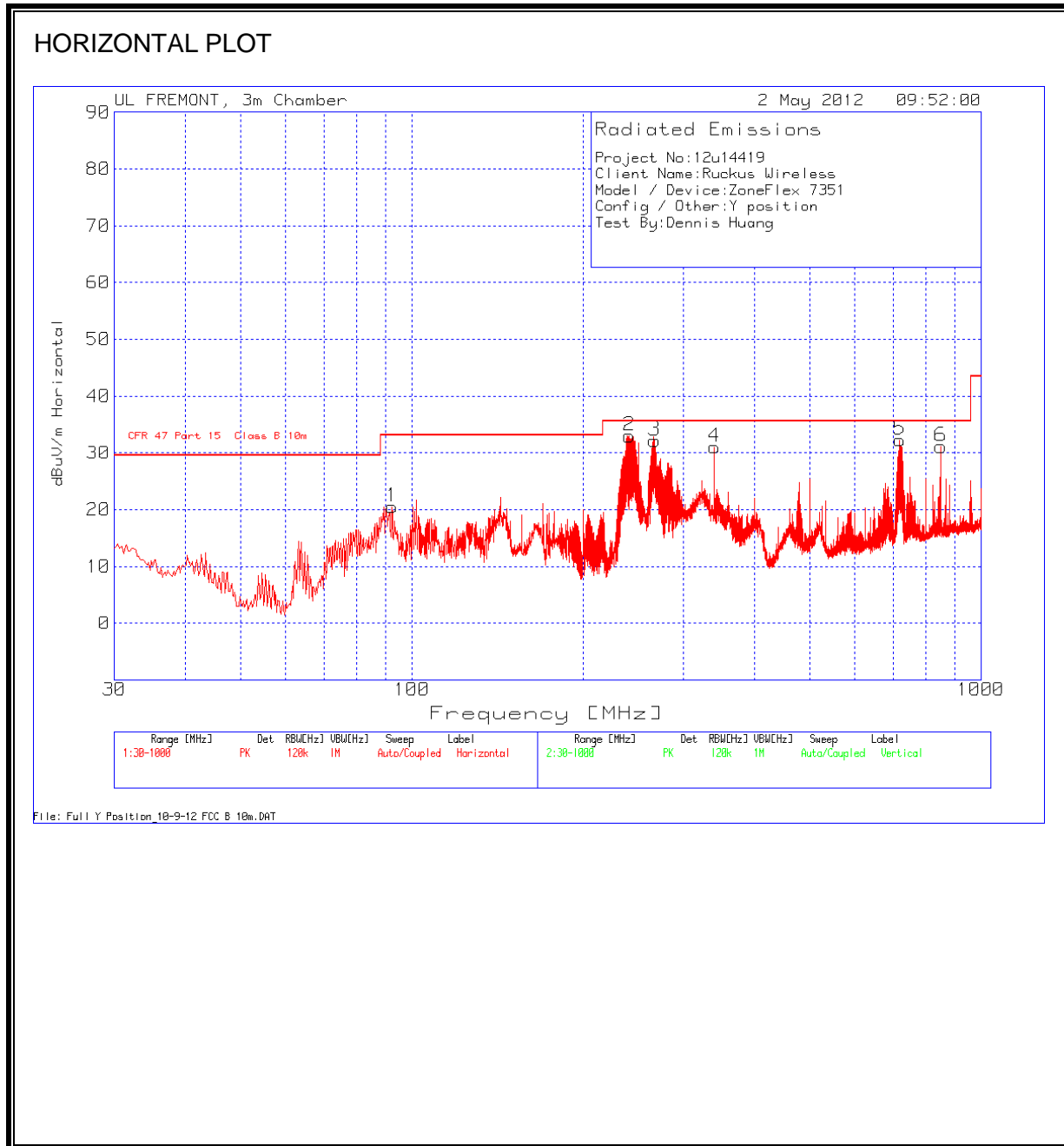
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Ftr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 5510 MHz															
11.020	3.0	36.96	25.55	38.4	10.5	-32.4	0.0	0.0	53.5	42.0	74	54	-20.5	-12.0	H
11.020	3.0	43.60	30.20	38.4	10.5	-32.4	0.0	0.0	60.1	46.7	74	54	-13.9	-7.3	V
Mid Channel: 5550 MHz															
11.100	3.0	35.63	24.49	38.5	10.6	-32.4	0.0	0.0	52.3	41.2	74	54	-21.7	-12.8	H
11.100	3.0	36.78	25.59	38.5	10.6	-32.4	0.0	0.0	53.5	42.3	74	54	-20.5	-11.7	V
High Channel: 5670 MHz															
11.340	3.0	34.25	23.82	38.7	11.0	-32.4	0.0	0.0	51.6	41.1	74	54	-22.4	-12.9	H
11.340	3.0	34.76	23.79	38.7	11.0	-32.4	0.0	0.0	52.1	41.1	74	54	-21.9	-12.9	V

Rev. 11.10.11

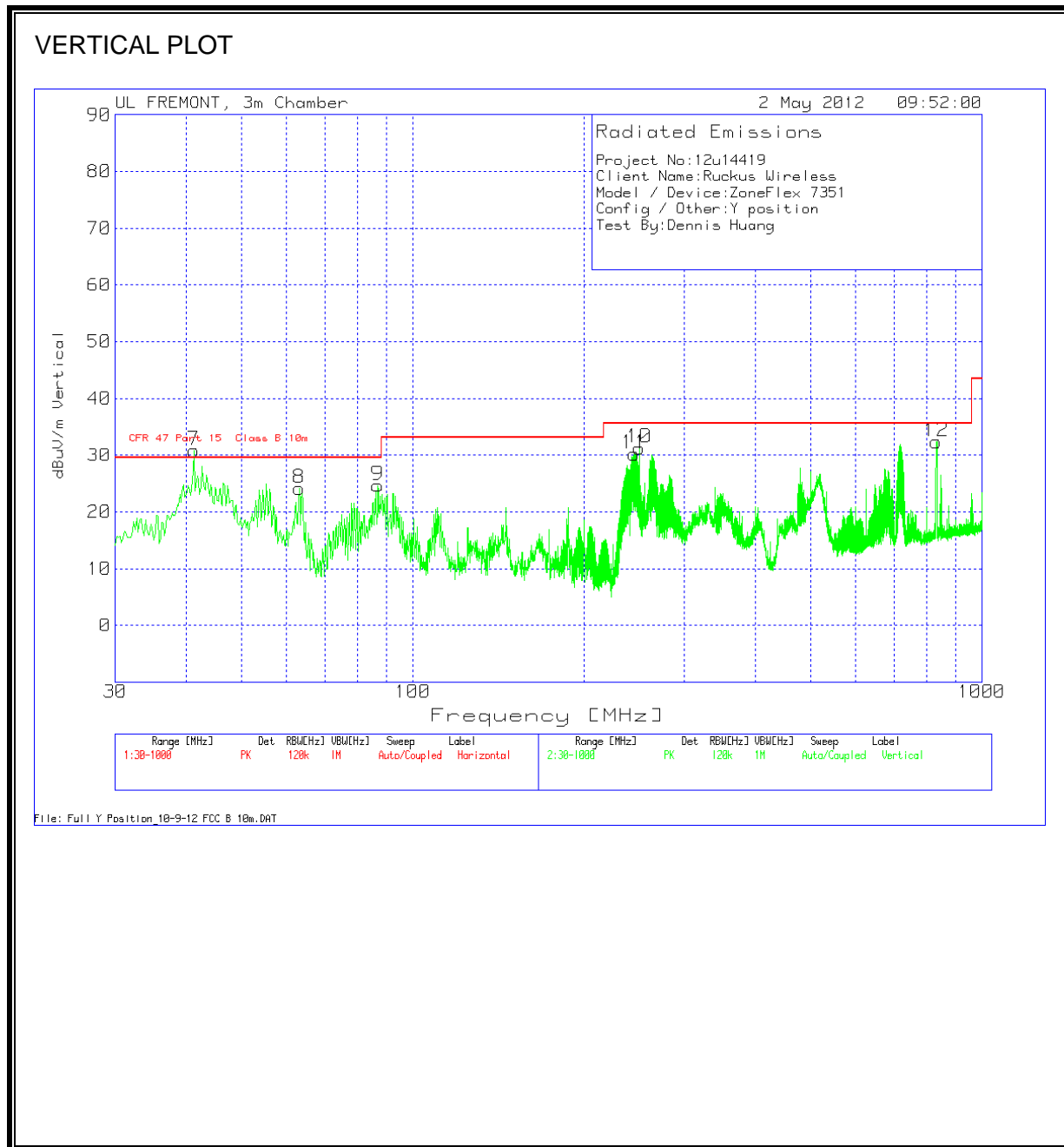
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

9.2. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)



SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)



HORIZONTAL AND VERTICAL DATA

Project No:12u14419										
Client Name:Ruckus Wireless										
Model / Device:ZoneFlex 7351										
Config / Other:Y position										
Test By:Dennis Huang										
Test Frequency MHz	Meter Reading dB(μV)	Detector	Pre Amp Factor dB	Antenna Factor dB/m	3m to 10m Conversion dB	Corrected dB(μV/m)	Class B limit dB(μV/m)	Margin dB	Height cm	Polarity
92.2242	49.92	PK	-27	8.1	-10.5	20.52	33.1	-12.58	200	Horz
240.9033	58.08	PK	-26	11.4	-10.5	32.98	35.6	-2.62	100	Horz
266.8785	55.57	PK	-25.8	12.9	-10.5	32.17	35.6	-3.43	100	Horz
339.958	53.41	PK	-25.6	13.7	-10.5	31.01	35.6	-4.59	100	Horz
720.0879	46.07	PK	-23.3	20	-10.5	32.27	35.6	-3.33	100	Horz
850.1579	43.3	PK	-23.2	21.5	-10.5	31.1	35.6	-4.5	100	Horz
42.61	49.04	QP	-27.4	12.1	-10.5	23.24	29.6	-6.36	113	Vert
63.1475	54.28	PK	-27.2	7.6	-10.5	24.18	29.6	-5.42	100	Vert
86.7966	54.8	PK	-27	7.4	-10.5	24.7	29.6	-4.9	100	Vert
250.014	56.15	PK	-25.9	11.5	-10.5	31.25	35.6	-4.35	100	Vert
244.7802	55.23	PK	-26	11.5	-10.5	30.23	35.6	-5.37	100	Vert
831.7426	44.74	PK	-23.1	21.2	-10.5	32.34	35.6	-3.26	300	Vert

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

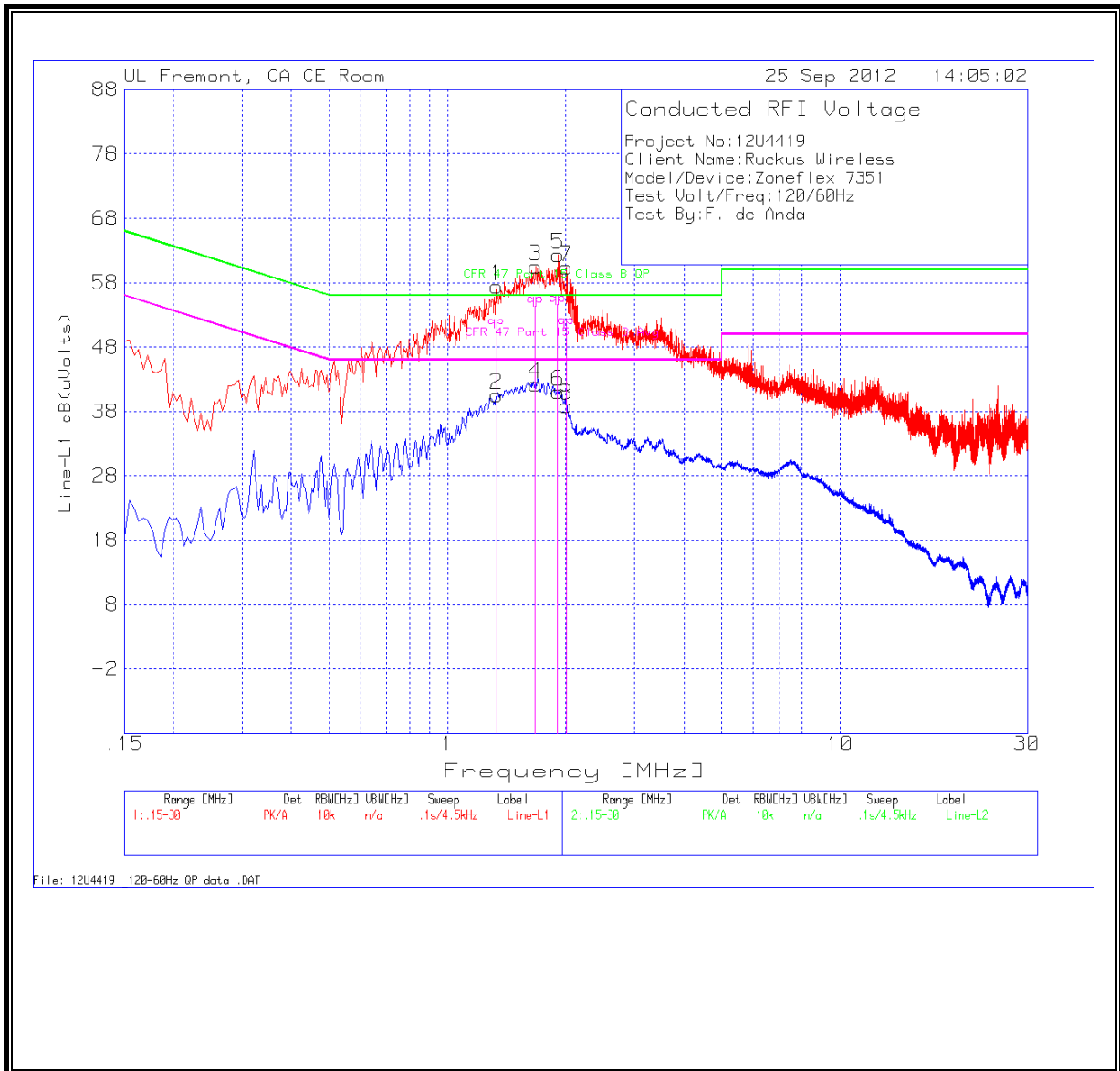
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

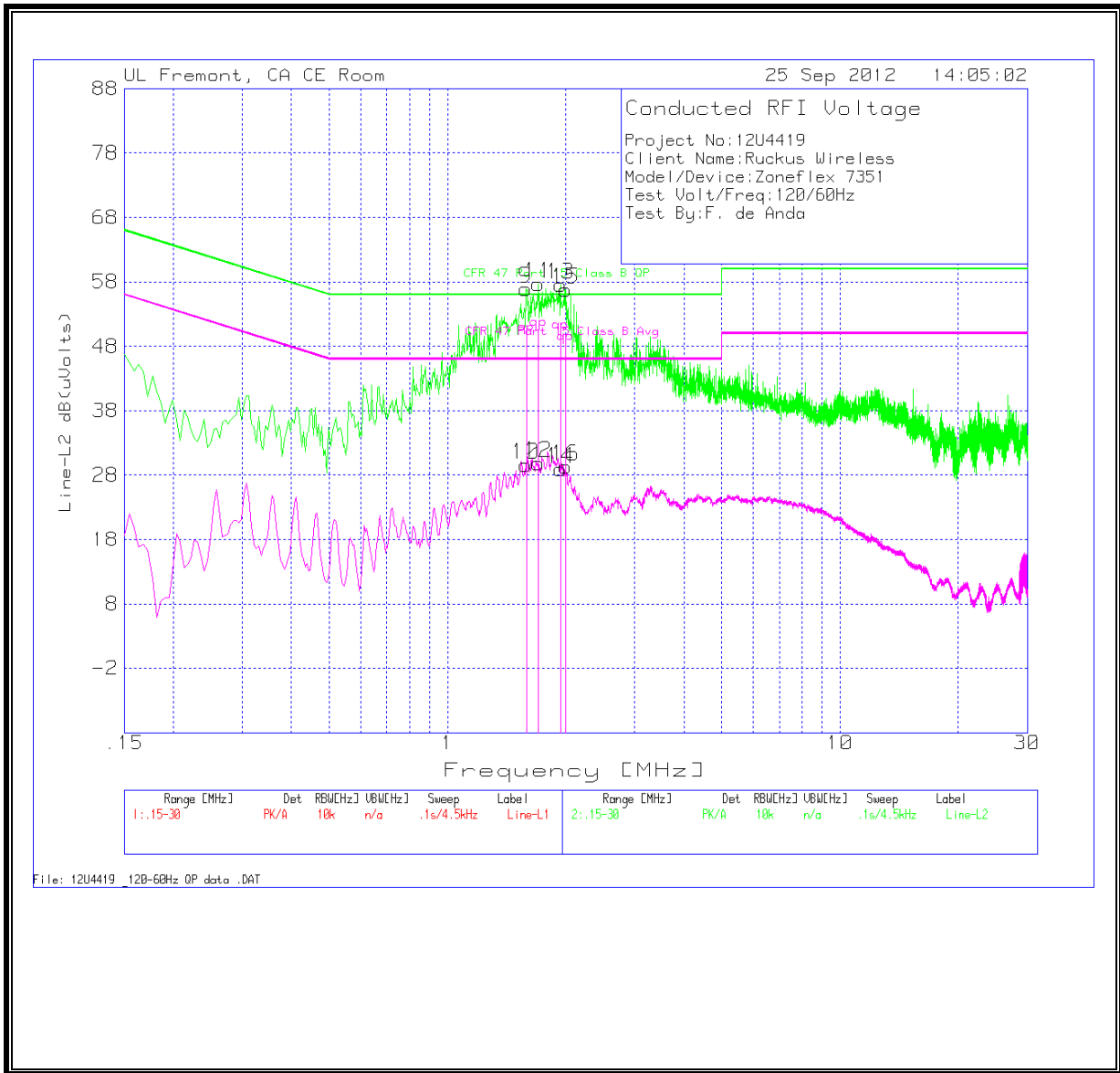
6 WORST EMISSIONS

Project No:12U4419									
Client Name:Ruckus Wireless									
Model/Device:Zoneflex 7351									
Test Volt/Freq:120/60Hz									
Test By:F. de Anda									
Frequency MHz	Reading dB(μV)	Detector	T24 LISN dB	Cables dB	Corrected dB(μV)	Class B QP Limit dB(μV)	QP Margin dB	Class B Av Limit dB(μV)	Av Margin dB
Line-L1									
1.3325	50.78	QP	0.1	0.1	50.98	56	-5.02	--	--
1.3335	40.4	Av	0.1	0.1	40.6	--	--	46	-5.4
1.6735	54.16	QP	0.1	0.1	54.36	56	-1.64	--	--
1.6755	42.08	Av	0.1	0.1	42.28	--	--	46	-3.72
1.9085	54.35	QP	0.1	0.1	54.55	56	-1.45	--	--
1.9095	40.82	Av	0.1	0.1	41.02	--	--	46	-4.98
2.0075	50.88	QP	0.1	0.1	51.08	56	-4.92	--	--
2.0085	38.68	Av	0.1	0.1	38.88	--	--	46	-7.12
Line-L2									
1.5885	49.75	QP	0.1	0.1	49.95	56	-6.05	--	--
1.5855	29.43	Av	0.1	0.1	29.63	--	--	46	-16.37
1.7055	50.46	QP	0.1	0.1	50.66	56	-5.34	--	--
1.7025	29.7	Av	0.1	0.1	29.9	--	--	46	-16.1
1.937	50.06	QP	0.1	0.1	50.26	56	-5.74	--	--
1.941	28.7	Av	0.1	0.1	28.9	--	--	46	-17.1
1.995	48.24	QP	0.1	0.1	48.44	56	-7.56	--	--
1.995	29.15	Av	0.1	0.1	29.35	--	--	46	-16.65

LINE 1 RESULT



LINE 2 RESULTS



11. DYNAMIC FREQUENCY SELECTION

11.1. OVERVIEW

11.1.1. LIMITS

INDUSTRY CANADA

IC RSS-210 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-210 Issue 7 A9.4 (b) (ii) **Channel Availability Check Time:** ...

Additional requirements for the band 5600-5650 MHz: Until further notice, devices subject to this Section shall not be capable of transmitting in the band 5600-5650 MHz, so that Environment Canada weather radars operating in this band are protected.

RSS-210 Issue 7 A9.4 (b) (iv) **Channel closing time:** the maximum channel closing time is 260 ms.

FCC

§15.407 (h) and FCC 06-96 APPENDIX "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION".

Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client (with radar detection)
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client (without DFS)	Client (with DFS)
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes

Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	Value (see note)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.	

Table 4: DFS Response requirement values

Parameter	Value
<i>Non-occupancy period</i>	30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds
<i>Channel Closing Transmission Time</i>	200 milliseconds + approx. 60 milliseconds over remaining 10 second period

The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:
 For the Short pulse radar Test Signals this instant is the end of the *Burst*.
 For the Frequency Hopping radar Test Signal, this instant is the end of the last radar burst generated.
 For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.
 The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate channel changes (an aggregate of approximately 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (Microseconds)	PRI (Microseconds)	Pulses	Minimum Percentage of Successful Detection	Minimum Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Table 6 – Long Pulse Radar Test Signal

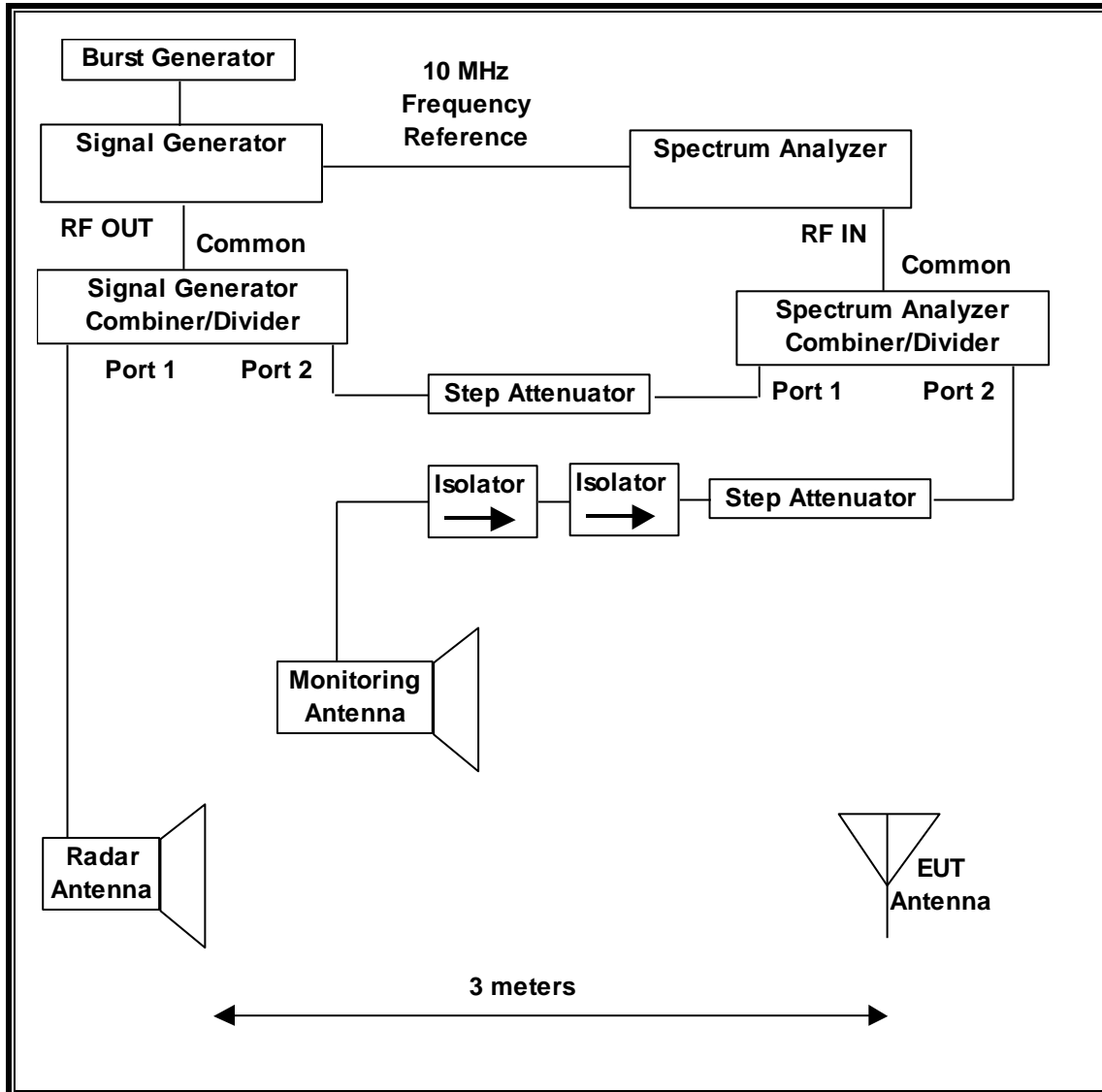
Radar Waveform	Bursts	Pulses per Burst	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Minimum Percentage of Successful Detection	Minimum Trials
5	8-20	1-3	50-100	5-20	1000-2000	80%	30

Table 7 – Frequency Hopping Radar Test Signal

Radar Waveform	Pulse Width (µsec)	PRI (µsec)	Burst Length (ms)	Pulses per Hop	Hopping Rate (kHz)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	300	9	.333	70%	30

11.2. TEST AND MEASUREMENT SYSTEM

RADIATED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from F_L to F_H for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

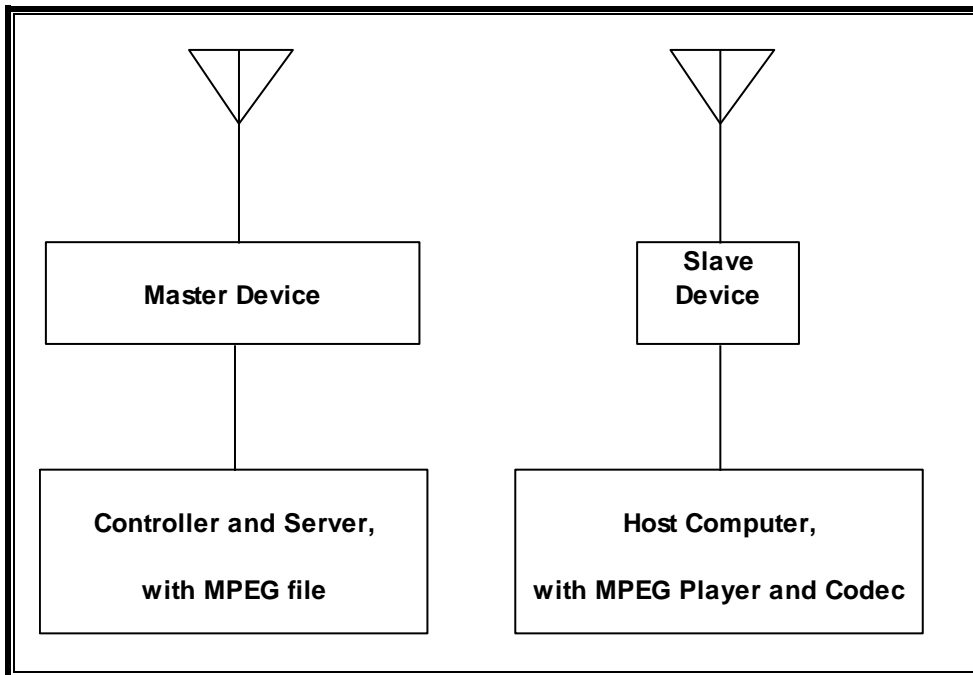
TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset Number	Cal Due
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/18/13
Vector Signal Generator, 20GHz	Agilent / HP	E8267C	C01066	11/17/12
Arbitrary Waveform Generator	Agilent / HP	33220A	C01146	09/25/13

11.3. SETUP OF EUT

RADIATED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter (EUT)	Ruckus Wireless	ADS-18C-12N 12018GPCU	4T5P4K	DoC
Notebook PC (Controller/Server)	Dell	PP18L	24863465053	DoC
AC Adapter (Controller PC)	Lite On Technology	LA65NS0-00	CN-0DF263-71615- 941-1194	DoC
Notebook PC (Host)	Apple	MacBook Pro A1286	C02GM3MKDV7N	DoC
AC Adapter (Host PC)	Samsung Electronics	A1344	RR1340BU8AL3A	DoC
802.11a/n Multi-Media Adapter (Slave Radio)	Ruckus Wireless	VF7111	02292	S9GVF7XX1
AC Adapter (Slave)	Ruckus Wireless	DSA-12R-12AUS 120120	01031	DoC

11.4. DESCRIPTION OF EUT

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges, excluding operation in the 5600 to 5650 MHz band.

The EUT is a Master Device.

The highest power level within these bands is 24.62 dBm EIRP in the 5250-5350 MHz band and 24.84 dBm EIRP in the 5470-5725 MHz band.

The only antenna assembly utilized with the EUT has a gain of 2 dBi.

Two identical antennas are utilized to meet the diversity and MIMO operational requirements.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is $-64 + 1 = -63$ dBm.

The calibrated radiated DFS Detection Threshold level is set to -64 dBm. The tested level is lower than the required level hence it provides margin to the limit.

The EUT uses two transmitter/receiver chains, each connected to an antenna to perform radiated tests.

The Slave device associated with the EUT during these tests does not have radar detection capability.

WLAN traffic is generated by streaming the video file TestFile.mp2 "6 ½ Magic Hours" from the Master to the Slave in full motion video mode using VLC 1.1.4 media player.

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm).

The EUT utilizes the 802.11a/n architecture. Two nominal channel bandwidths are implemented: 20 MHz and 40 MHz.

The software installed in the access point is 9.6.0 revision 79.

UNIFORM CHANNEL SPREADING

See Manufacturer's Attestation.

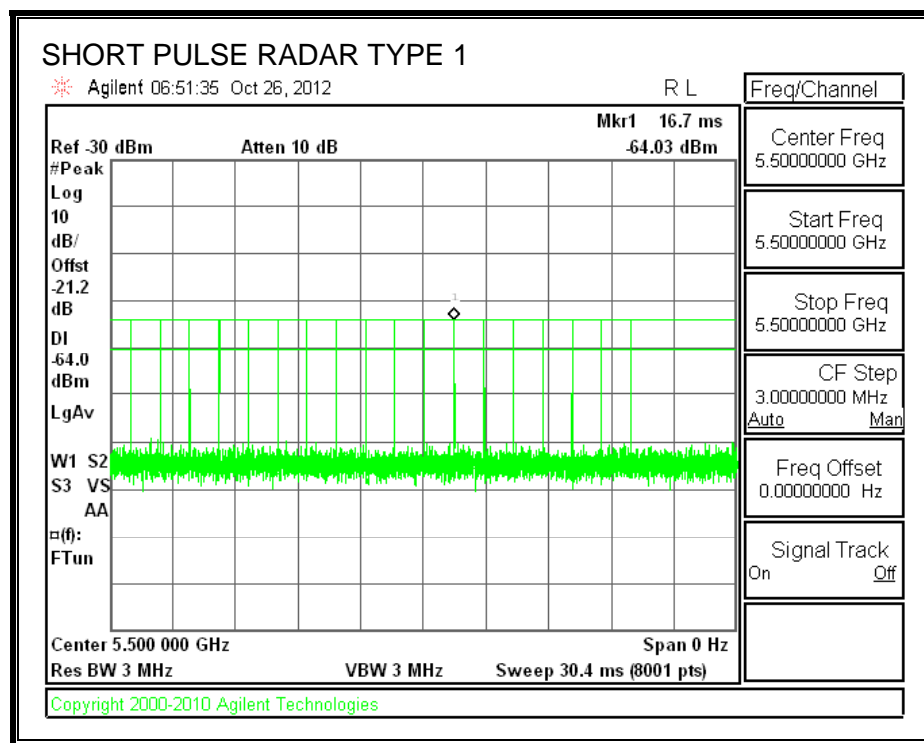
11.5. RESULTS FOR 20 MHz BANDWIDTH

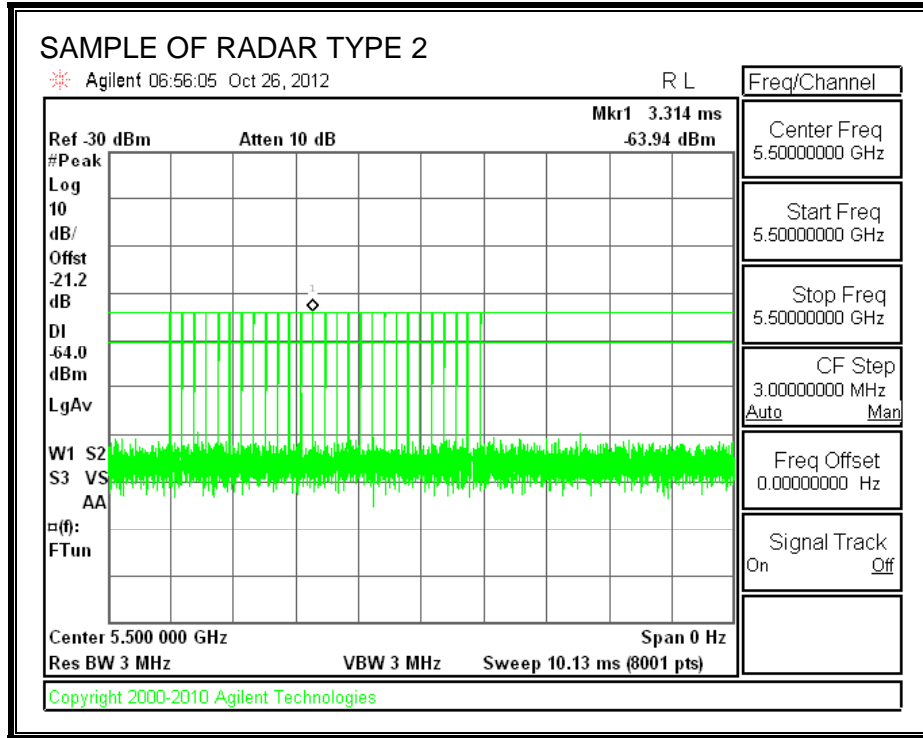
11.5.1. TEST CHANNEL

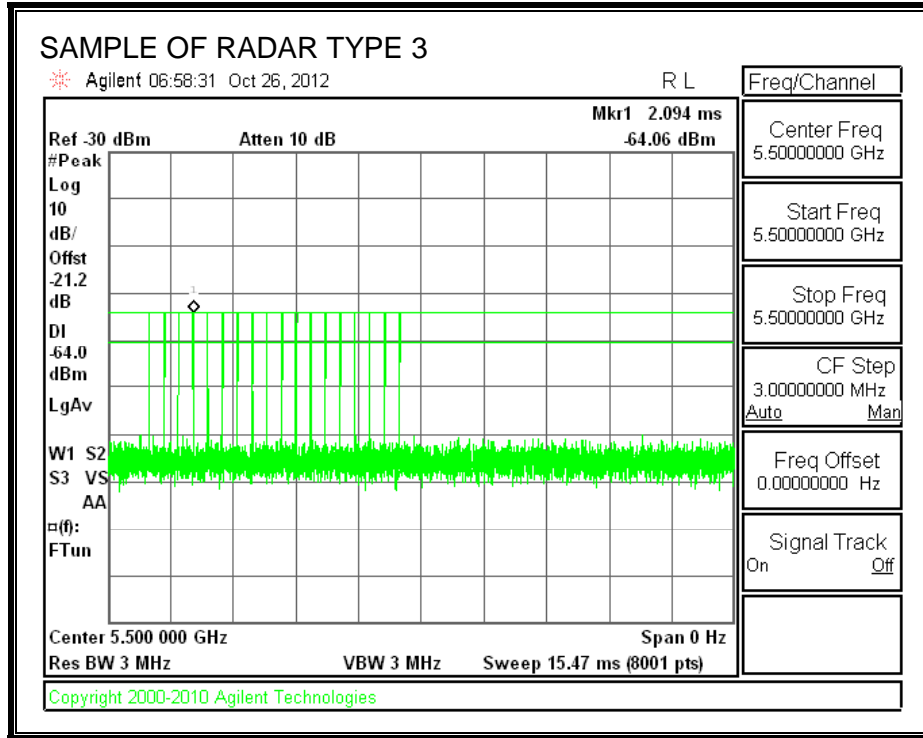
All tests were performed at a channel center frequency of 5500 MHz.

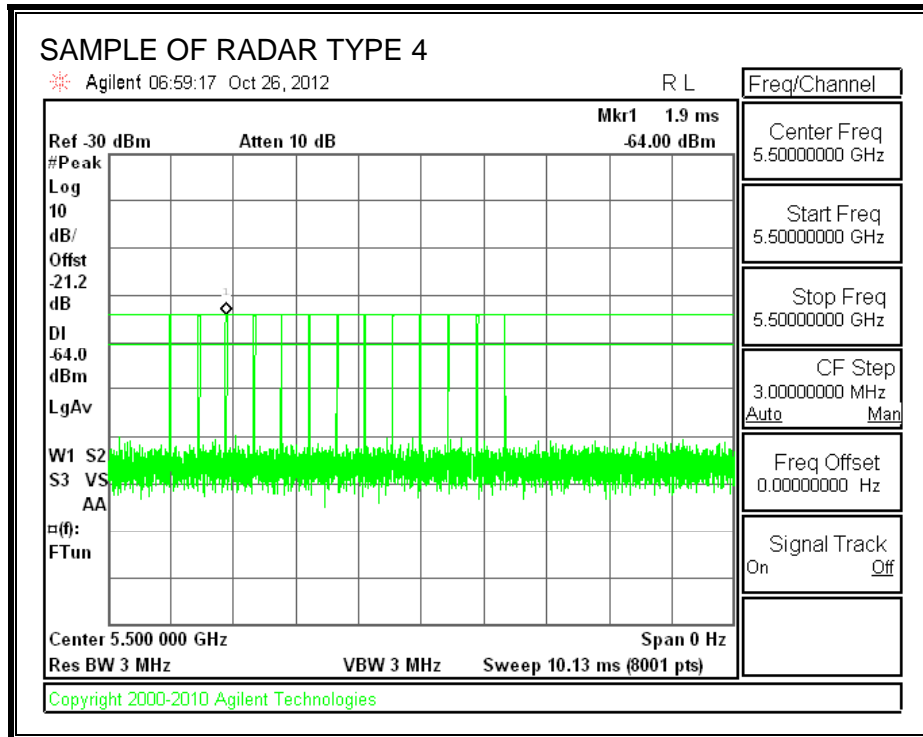
11.5.2. RADAR WAVEFORMS AND TRAFFIC

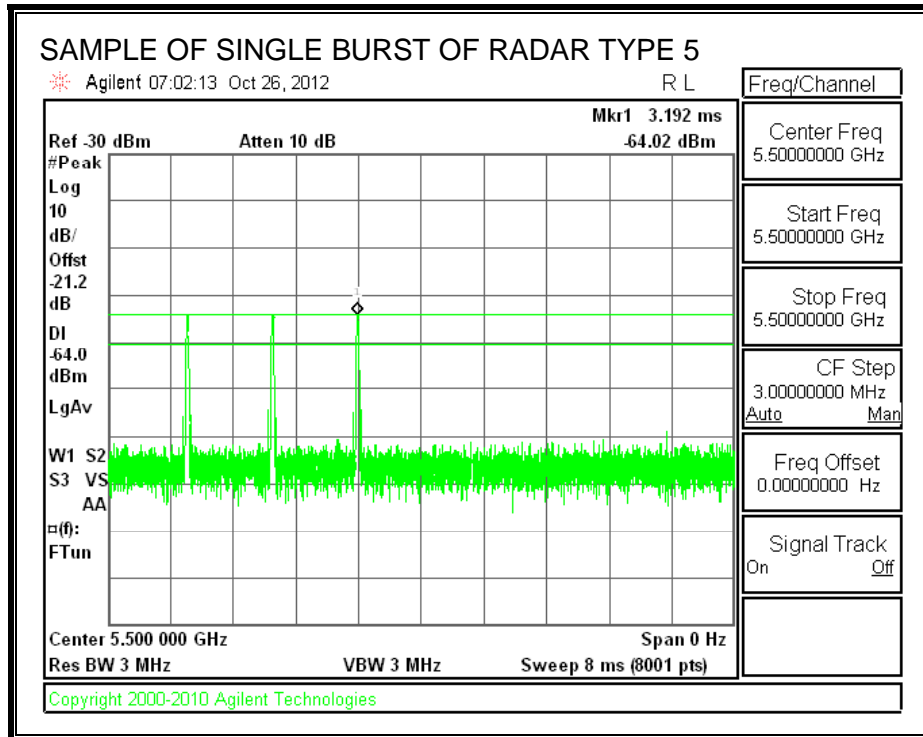
RADAR WAVEFORMS

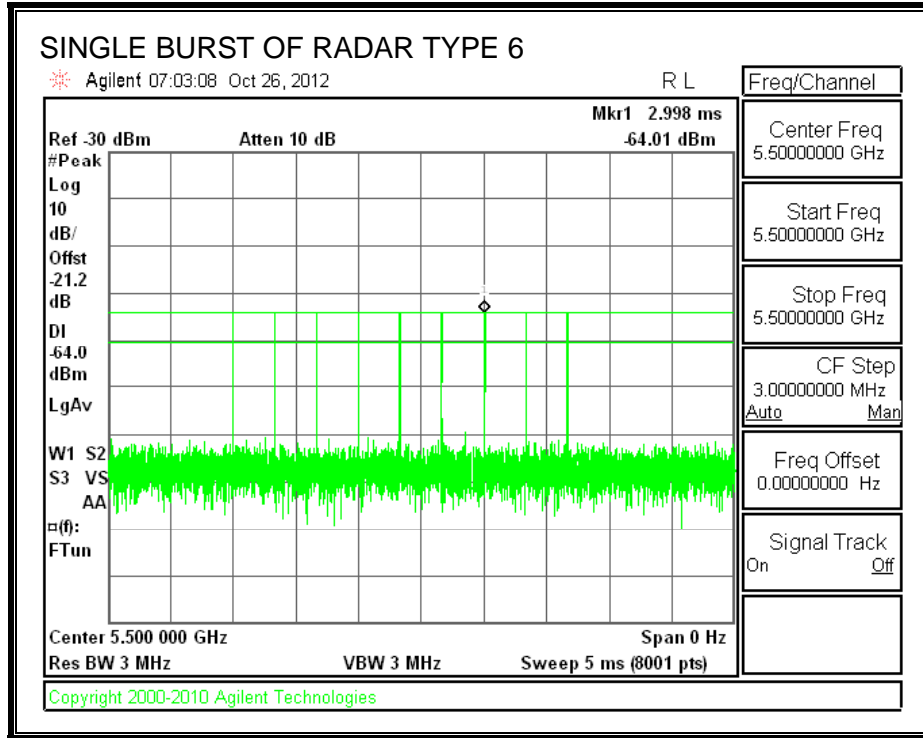




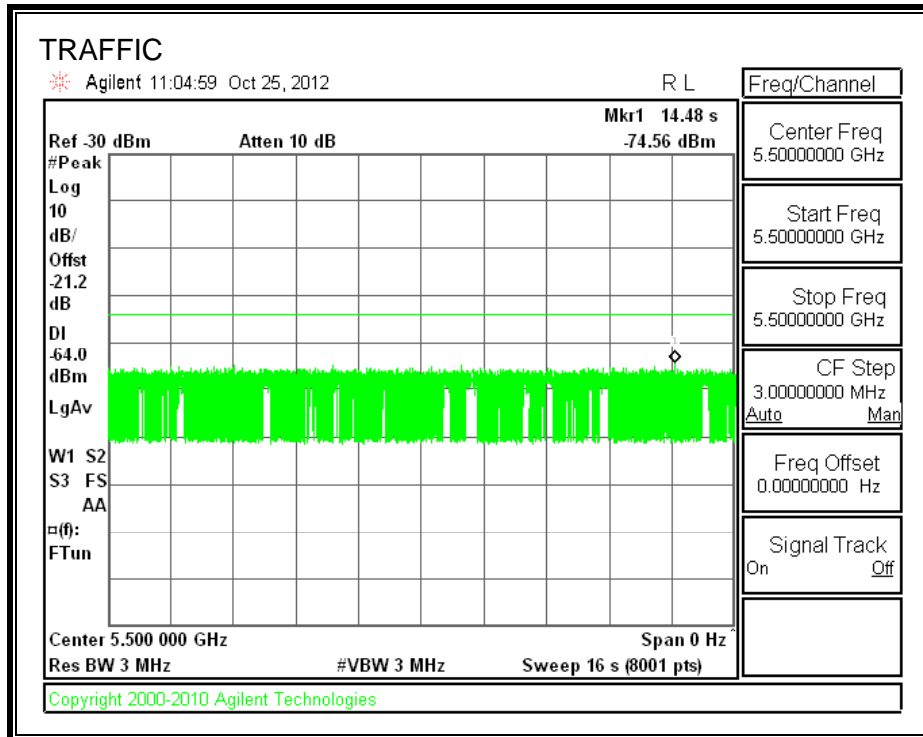








TRAFFIC



11.5.3. CHANNEL AVAILABILITY CHECK TIME

PROCEDURE TO DETERMINE INITIAL POWER-UP CYCLE TIME

A link was established on channel then the EUT was rebooted. The time from the cessation of traffic to the re-initialization of traffic was measured as the time required for the EUT to complete the total power-up cycle. The time to complete the initial power-up period is 60 seconds less than this total power-up time.

PROCEDURE FOR TIMING OF RADAR BURST

With a link established on channel, the EUT was rebooted. A radar signal was triggered within 0 to 6 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

The Non-Occupancy list was cleared. With a link established on channel, the EUT was rebooted. A radar signal was triggered within 54 to 60 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

QUANTITATIVE RESULTS

No Radar Triggered

Timing of Reboot (sec)	Timing of Start of Traffic (sec)	Total Power-up Cycle Time (sec)	Initial Power-up Cycle Time (sec)
30.94	123.6	92.7	32.7

Radar Near Beginning of CAC

Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
30.34	64.8	34.4	1.8

Radar Near End of CAC

Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
30.45	122.0	91.6	58.9

QUALITATIVE RESULTS

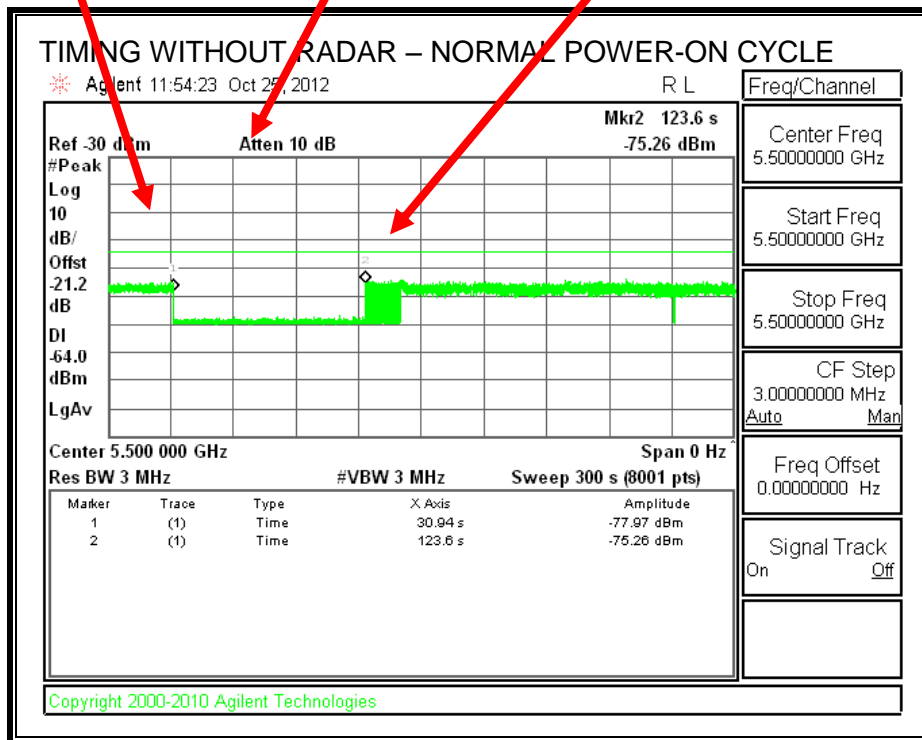
Timing of Radar Burst	Display on Control Computer	Spectrum Analyzer Display
No Radar Triggered	EUT marks Channel as active	Transmissions begin on channel after completion of the initial power-up cycle and the CAC
Within 0 to 6 second window	EUT indicates radar detected	No transmissions on channel
Within 54 to 60 second window	EUT indicates radar detected	No transmissions on channel

TIMING WITHOUT RADAR DURING CAC

AP is rebooted
 Traffic ceases
 Start of Initial Power-up cycle

End of Initial Power-up cycle
 Start of CAC

End of CAC
 Traffic is Initiated



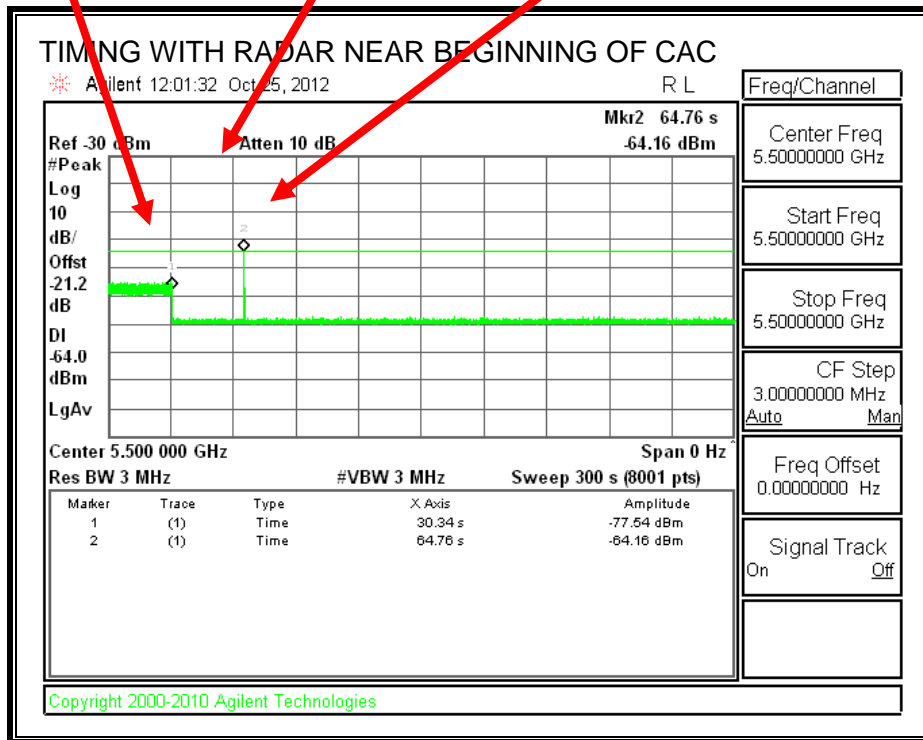
Transmissions begin on channel after completion of the initial power-up cycle and the CAC.

TIMING WITH RADAR NEAR BEGINNING OF CAC

AP is rebooted
 Traffic ceases
 Start of Initial Power-up cycle

End of Initial Power-up cycle
 Start of CAC

Radar Signal Applied



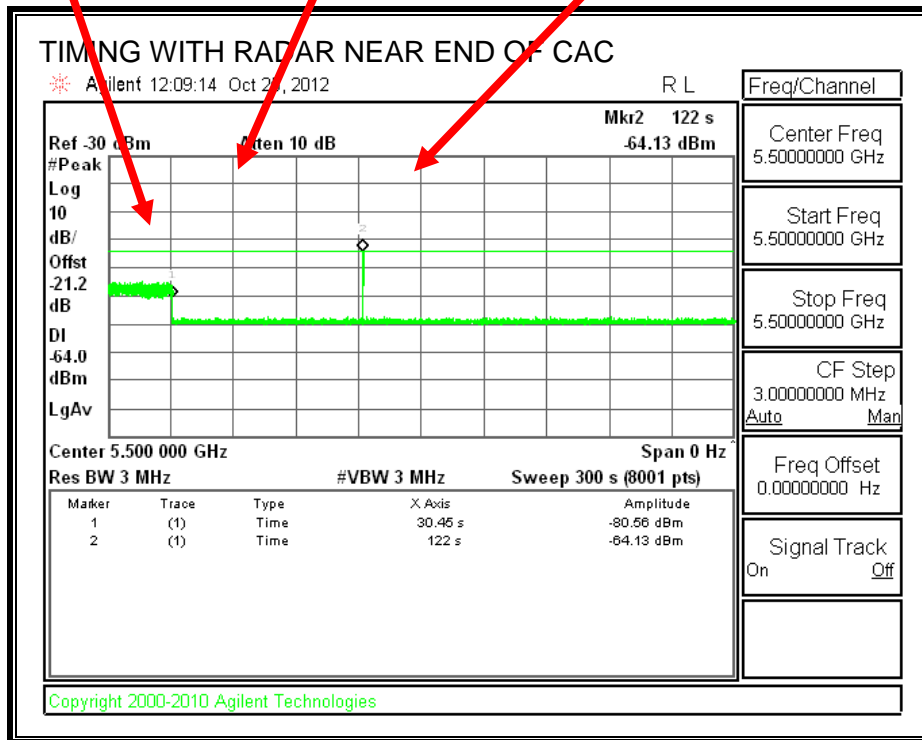
No EUT transmissions were observed after the radar signal.

TIMING WITH RADAR NEAR END OF CAC

AP is rebooted
 Traffic ceases
 Start of Initial Power-up cycle

End of Initial Power-up cycle
 Start of CAC

Radar Signal Applied



No EUT transmissions were observed after the radar signal.

11.5.4. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.5.5. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

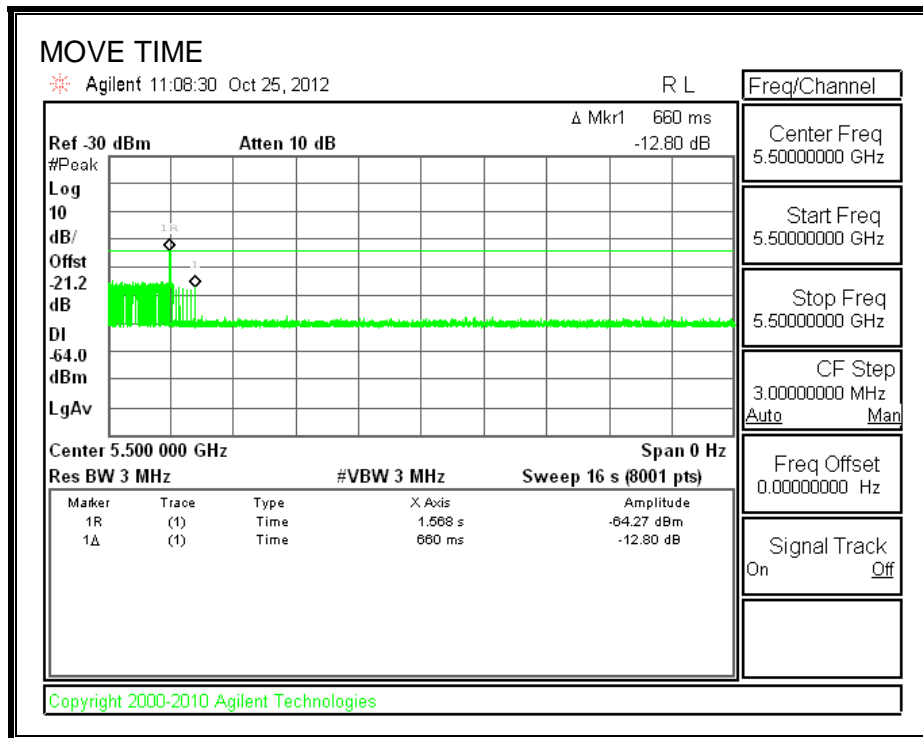
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

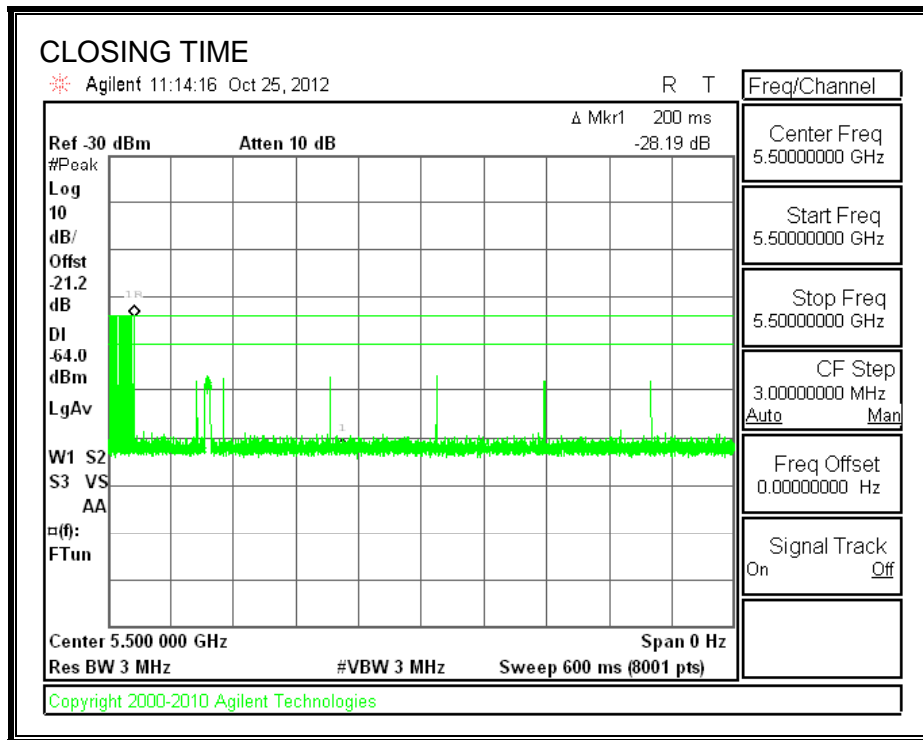
Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	0.600	10

Agency	Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
FCC	12.0	60
IC	24.0	260

MOVE TIME

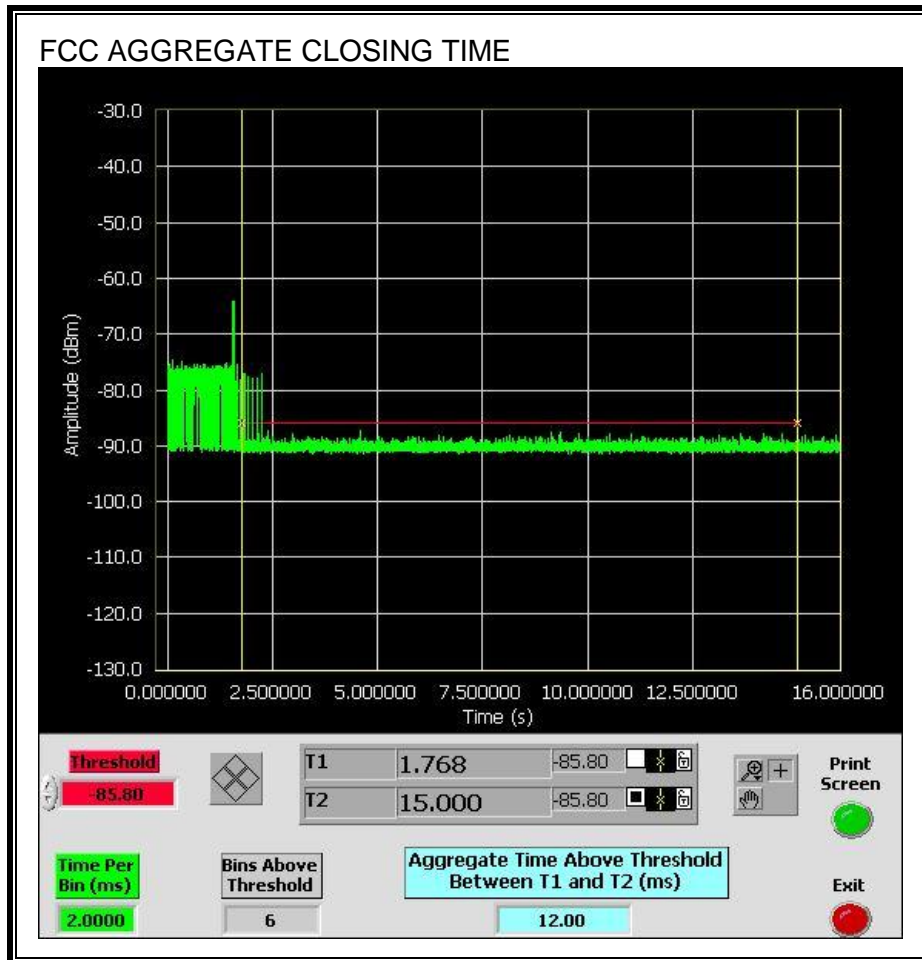


CHANNEL CLOSING TIME

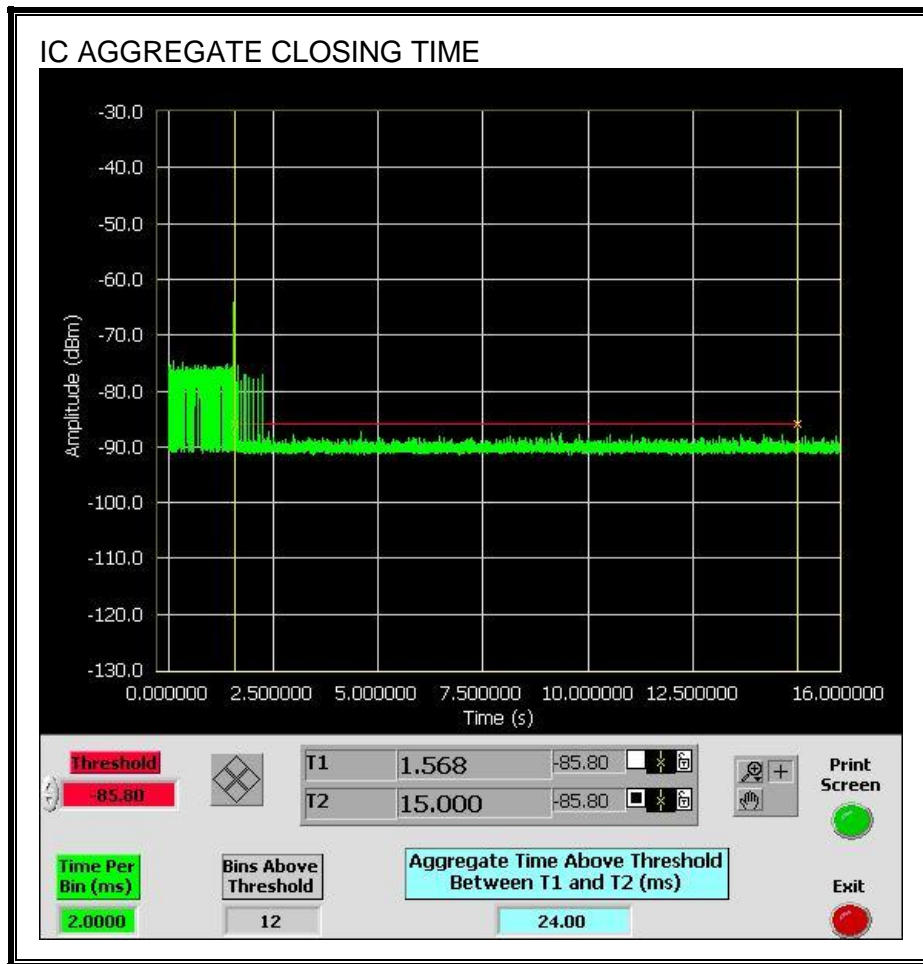


AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the FCC aggregate monitoring period.

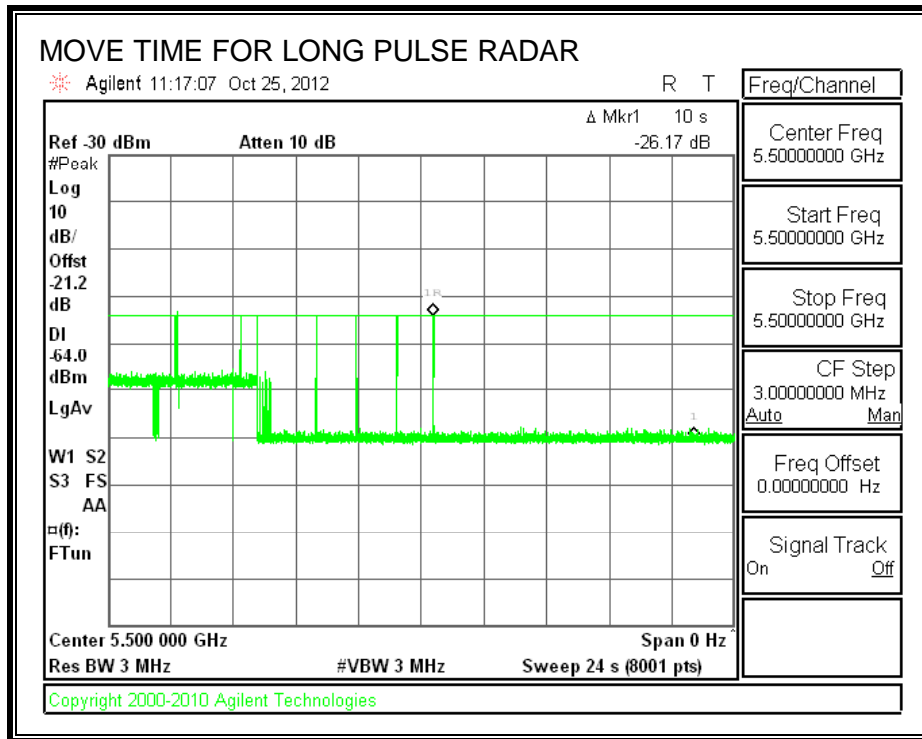


Only intermittent transmissions are observed during the IC aggregate monitoring period.



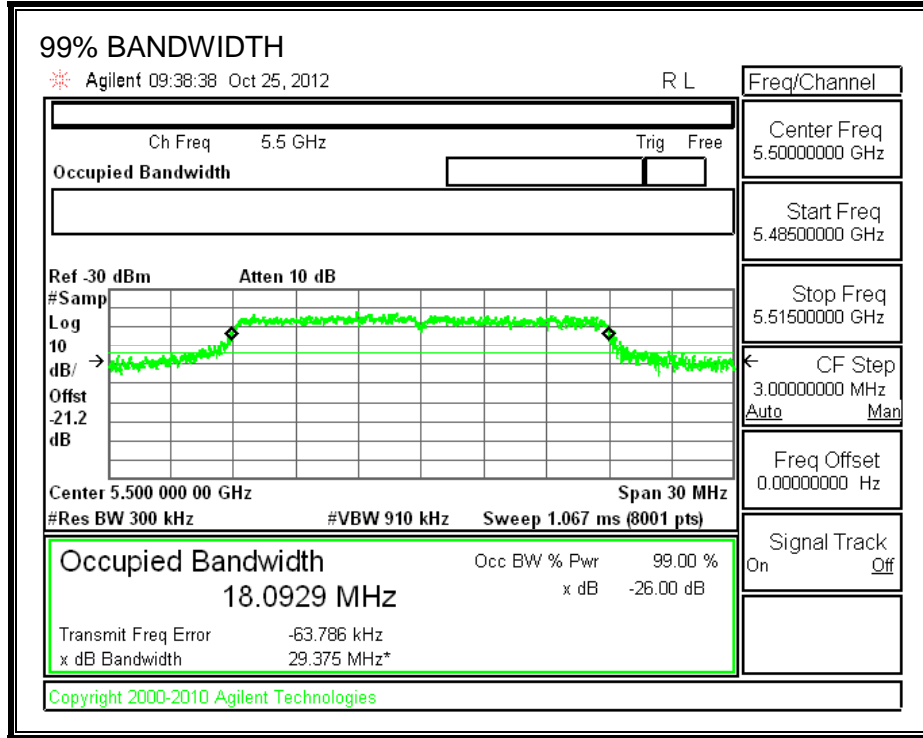
LONG PULSE CHANNEL MOVE TIME

The traffic ceases prior to 10 seconds after the end of the radar waveform.



11.5.6. DETECTION BANDWIDTH

REFERENCE PLOT OF 99% POWER BANDWIDTH



RESULTS

FL	FH	Detection Bandwidth	99% Power Bandwidth	Ratio of Detection BW to 99% Power BW	Minimum Limit
(MHz)	(MHz)	(MHz)	(MHz)	(%)	(%)
5492	5508	16	18.093	88.4	80

DETECTION BANDWIDTH PROBABILITY

Detection Bandwidth Test Results				
FCC Type 1 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst				
Frequency (MHz)	Number of Trials	Number Detected	Detection (%)	Mark
5492	10	10	100	FL
5493	10	10	100	
5494	10	10	100	
5495	10	10	100	
5496	10	10	100	
5497	10	10	100	
5498	10	10	100	
5499	10	10	100	
5500	10	10	100	
5501	10	10	100	
5502	10	10	100	
5503	10	10	100	
5504	10	10	100	
5505	10	9	90	
5506	10	9	90	
5507	10	10	100	
5508	10	10	100	FH

11.5.7. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary				
Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail
FCC Short Pulse Type 1	30	100.00	60	Pass
FCC Short Pulse Type 2	30	100.00	60	Pass
FCC Short Pulse Type 3	30	100.00	60	Pass
FCC Short Pulse Type 4	30	96.67	60	Pass
Aggregate		99.17	80	Pass
FCC Long Pulse Type 5	30	100.00	80	Pass
FCC Hopping Type 6	34	100.00	70	Pass

TYPE 1 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 1	
1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst	
Trial	Successful Detection (Yes/No)
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
11	Yes
12	Yes
13	Yes
14	Yes
15	Yes
16	Yes
17	Yes
18	Yes
19	Yes
20	Yes
21	Yes
22	Yes
23	Yes
24	Yes
25	Yes
26	Yes
27	Yes
28	Yes
29	Yes
30	Yes

TYPE 2 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 2				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
2001	2.3	193.00	27	Yes
2002	3.5	193.00	27	Yes
2003	1.2	196.00	24	Yes
2004	1	166.00	29	Yes
2005	4.5	207.00	27	Yes
2006	1	208.00	29	Yes
2007	4.8	173.00	29	Yes
2008	3.2	228.00	29	Yes
2009	4.3	174.00	29	Yes
2010	4.8	227.00	29	Yes
2011	3.8	208.00	26	Yes
2012	4.8	221.00	27	Yes
2013	4.3	166.00	23	Yes
2014	4.8	219.00	28	Yes
2015	4.2	159.00	23	Yes
2016	4	178.00	23	Yes
2017	2.4	190.00	25	Yes
2018	4.2	182.00	24	Yes
2019	1.9	177.00	24	Yes
2020	1.9	193.00	25	Yes
2021	3.6	191.00	27	Yes
2022	3.1	163.00	23	Yes
2023	3.8	200.00	25	Yes
2024	2.6	207.00	24	Yes
2025	4.4	168.00	29	Yes
2026	2.1	192.00	28	Yes
2027	1.4	224.00	23	Yes
2028	1.6	161.00	27	Yes
2029	3.1	179.00	28	Yes
2030	4.7	169.00	29	Yes

TYPE 3 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 3				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
3001	6.7	364.00	18	Yes
3002	7	349.00	17	Yes
3003	6	436.00	16	Yes
3004	9.9	488.00	18	Yes
3005	9.8	452.00	17	Yes
3006	6.9	376.00	18	Yes
3007	5.3	321.00	16	Yes
3008	7	383.00	16	Yes
3009	6	459.00	17	Yes
3010	7.5	318.00	17	Yes
3011	7.9	257.00	17	Yes
3012	5.5	260.00	18	Yes
3013	5.9	491.00	17	Yes
3014	5	391.00	16	Yes
3015	6.5	308.00	16	Yes
3016	5	472.00	18	Yes
3017	8.4	454.00	16	Yes
3018	8.6	260.00	18	Yes
3019	7.1	402.00	17	Yes
3020	7.2	477.00	17	Yes
3021	7.6	435.00	17	Yes
3022	8	361.00	16	Yes
3023	7.4	353.00	16	Yes
3024	5.1	364.00	18	Yes
3025	9.1	282.00	18	Yes
3026	8.1	369.00	18	Yes
3027	9.7	307.00	18	Yes
3028	9.9	442.00	16	Yes
3029	6.3	383	18	Yes
3030	9.7	396	17	Yes

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
4001	17.4	450.00	13	Yes
4002	13.7	339.00	15	Yes
4003	14.7	269.00	13	Yes
4004	12.2	321.00	13	Yes
4005	12.5	366.00	15	Yes
4006	19.1	264.00	14	Yes
4007	17.1	474.00	12	Yes
4008	17.8	483.00	13	Yes
4009	12.4	382.00	13	Yes
4010	17.2	319.00	15	Yes
4011	14.3	352.00	13	Yes
4012	14.2	379.00	12	Yes
4013	15.9	333.00	16	Yes
4014	15.5	477.00	12	Yes
4015	16.3	312.00	15	Yes
4016	18.2	282.00	12	Yes
4017	12	334.00	13	Yes
4018	19.2	315.00	15	Yes
4019	18.1	441.00	12	Yes
4020	12	463.00	15	Yes
4021	17.6	391.00	13	Yes
4022	16.6	261.00	15	Yes
4023	12.3	475.00	15	Yes
4024	13.7	419.00	15	Yes
4025	11.2	350.00	13	Yes
4026	13.3	408.00	14	Yes
4027	16.4	412.00	12	Yes
4028	16.9	483.00	16	No
4029	18.8	372.00	16	Yes
4030	17.2	274.00	15	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5	
Trial	Successful Detection (Yes/No)
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
11	Yes
12	Yes
13	Yes
14	Yes
15	Yes
16	Yes
17	Yes
18	Yes
19	Yes
20	Yes
21	Yes
22	Yes
23	Yes
24	Yes
25	Yes
26	Yes
27	Yes
28	Yes
29	Yes
30	Yes

Note: The Type 5 randomized parameters are shown in a separate document.

TYPE 6 DETECTION PROBABILITY

Data Sheet for FCC Hopping Radar Type 6				
1 us Pulse Width, 333 us PRI, 9 Pulses per Burst, 1 Burst per Hop				
NTIA August 2005 Hopping Sequence				
Trial	Starting Index Within Sequence	Signal Generator Frequency (MHz)	Hops within Detection BW	Successful Detection (Yes/No)
1	31	5492	5	Yes
2	506	5493	4	Yes
3	981	5494	4	Yes
4	1456	5495	5	Yes
5	1931	5496	7	Yes
6	2406	5497	6	Yes
7	2881	5498	4	Yes
8	3356	5499	4	Yes
9	3831	5500	4	Yes
10	4306	5501	5	Yes
11	4781	5502	5	Yes
12	5256	5503	4	Yes
13	5731	5504	3	Yes
14	6206	5505	5	Yes
15	6681	5506	4	Yes
16	7156	5507	4	Yes
17	7631	5508	7	Yes
18	8106	5492	1	Yes
19	8581	5493	3	Yes
20	9056	5494	3	Yes
21	9531	5495	5	Yes
22	10006	5496	3	Yes
23	10481	5497	1	Yes
24	10956	5498	5	Yes
25	11431	5499	3	Yes
26	11906	5500	5	Yes
27	12381	5501	3	Yes
28	12856	5502	3	Yes
29	13331	5503	4	Yes
30	13806	5504	1	Yes
31	14281	5505	3	Yes
32	14756	5506	3	Yes
33	15231	5507	4	Yes
34	15706	5508	4	Yes

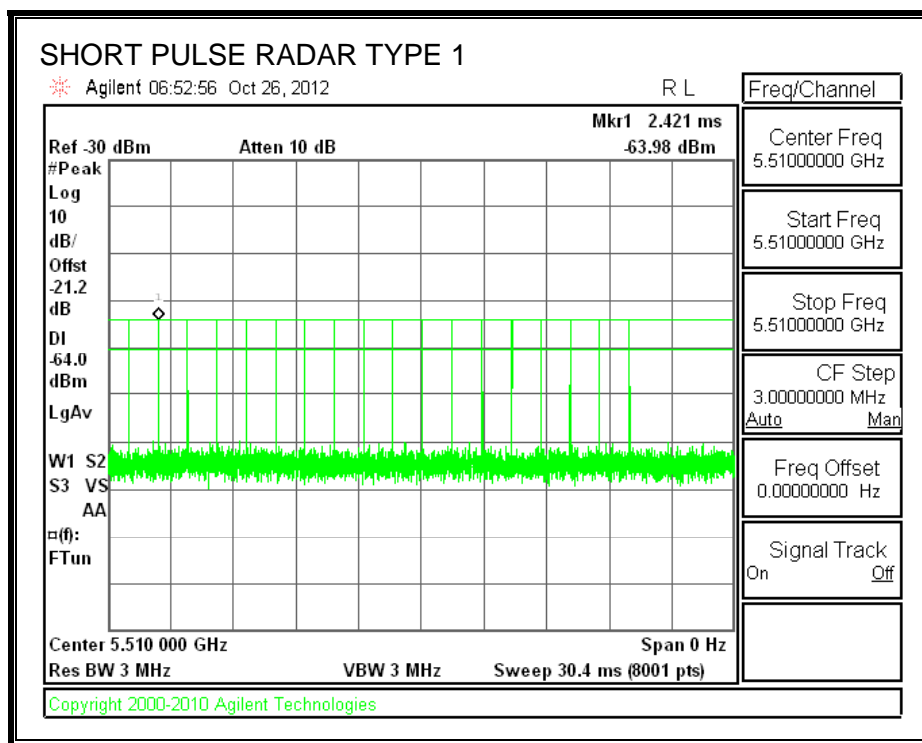
11.6. RESULTS FOR 40 MHz BANDWIDTH

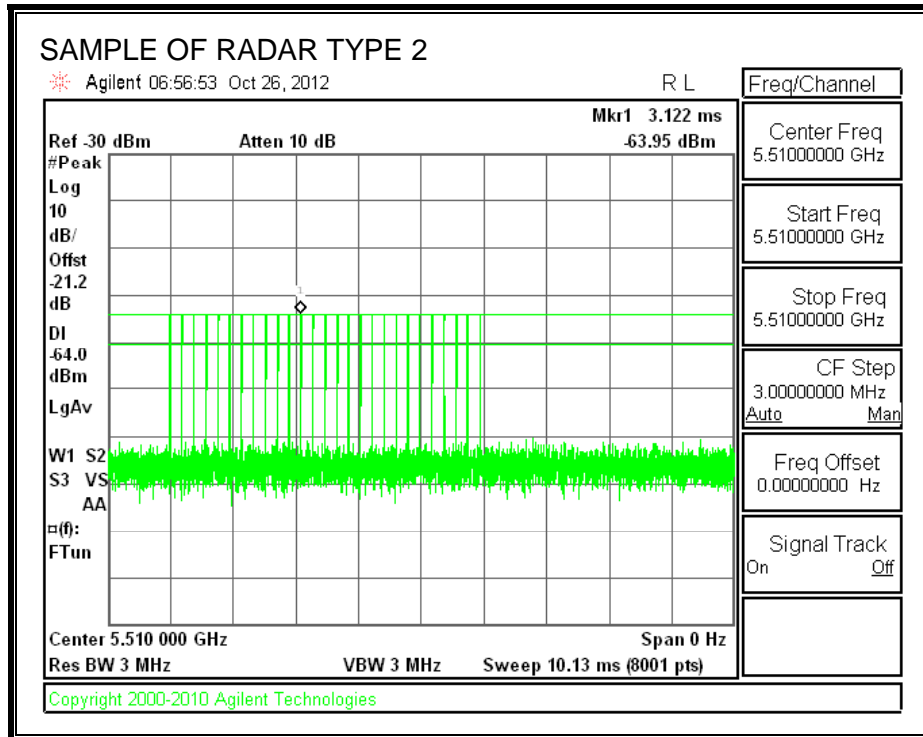
11.6.1. TEST CHANNEL

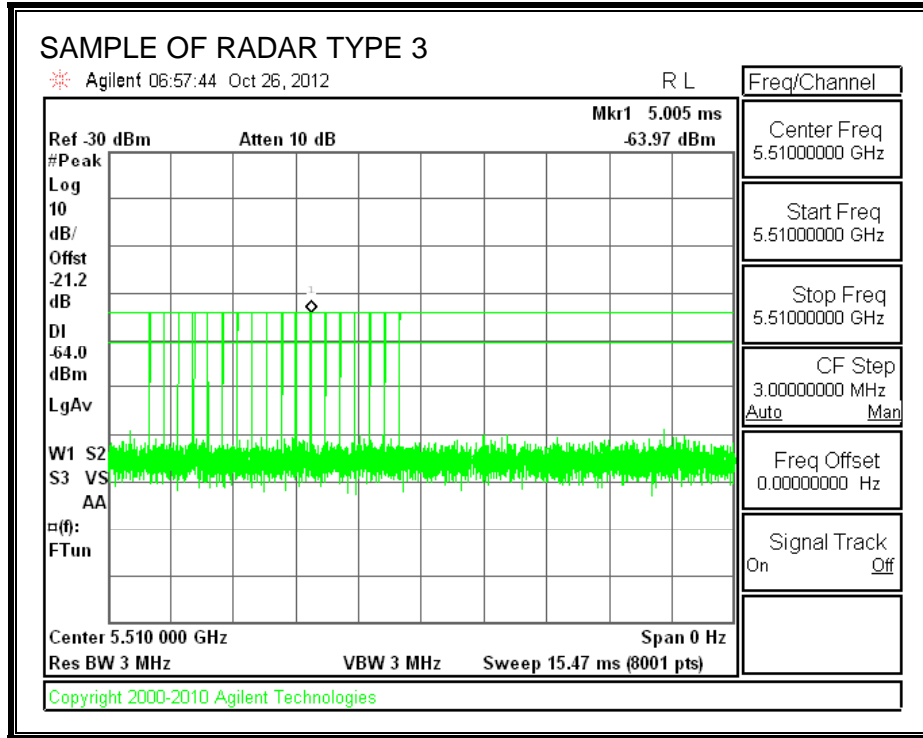
All tests were performed at a channel center frequency of 5510 MHz.

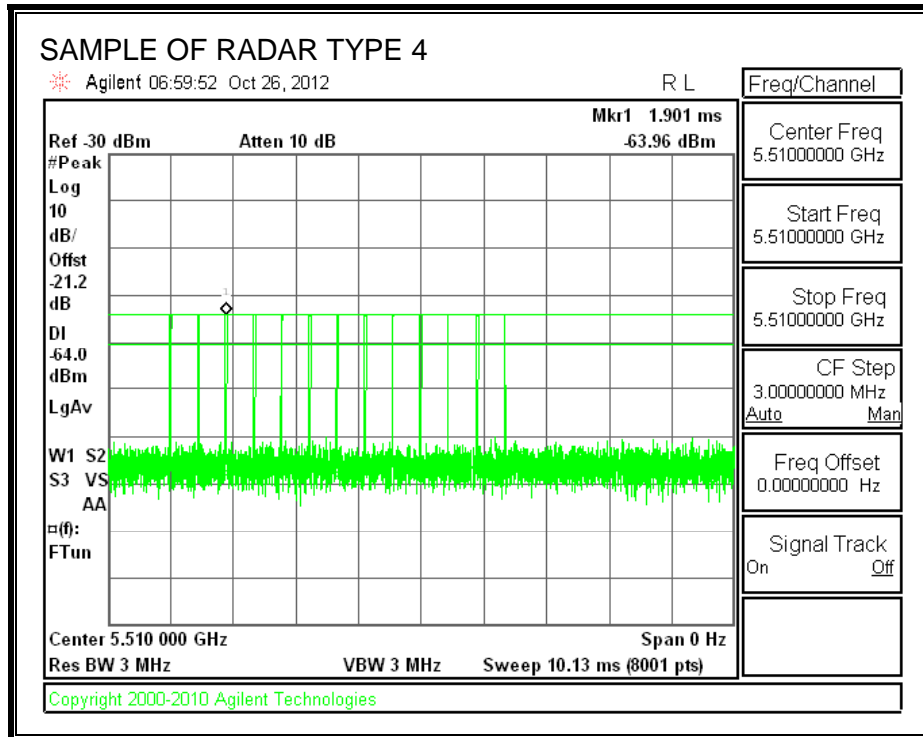
11.6.2. RADAR WAVEFORMS AND TRAFFIC

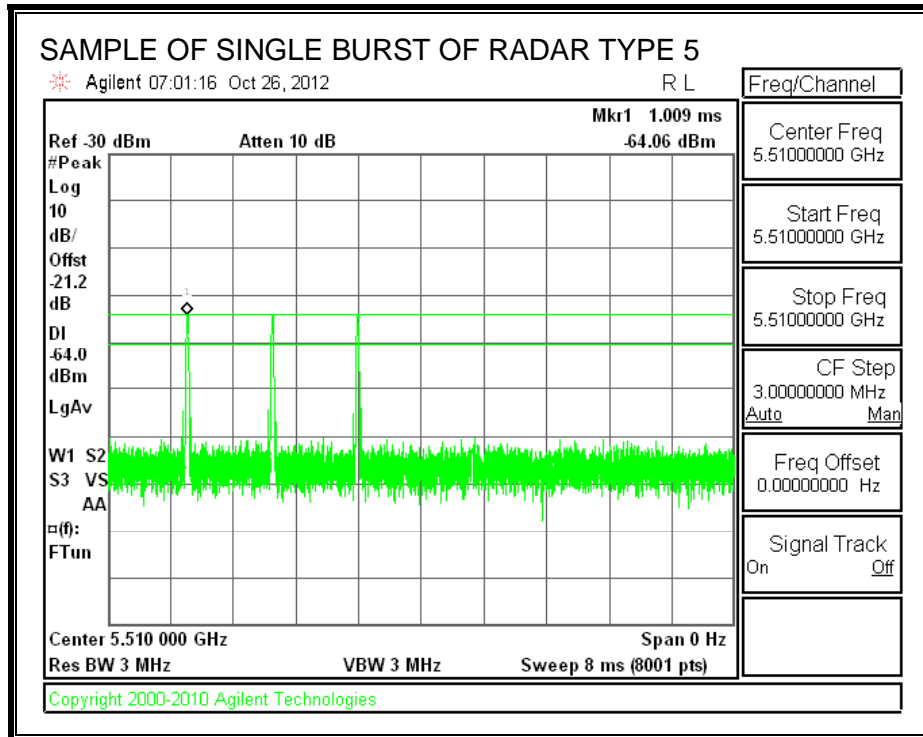
RADAR WAVEFORMS

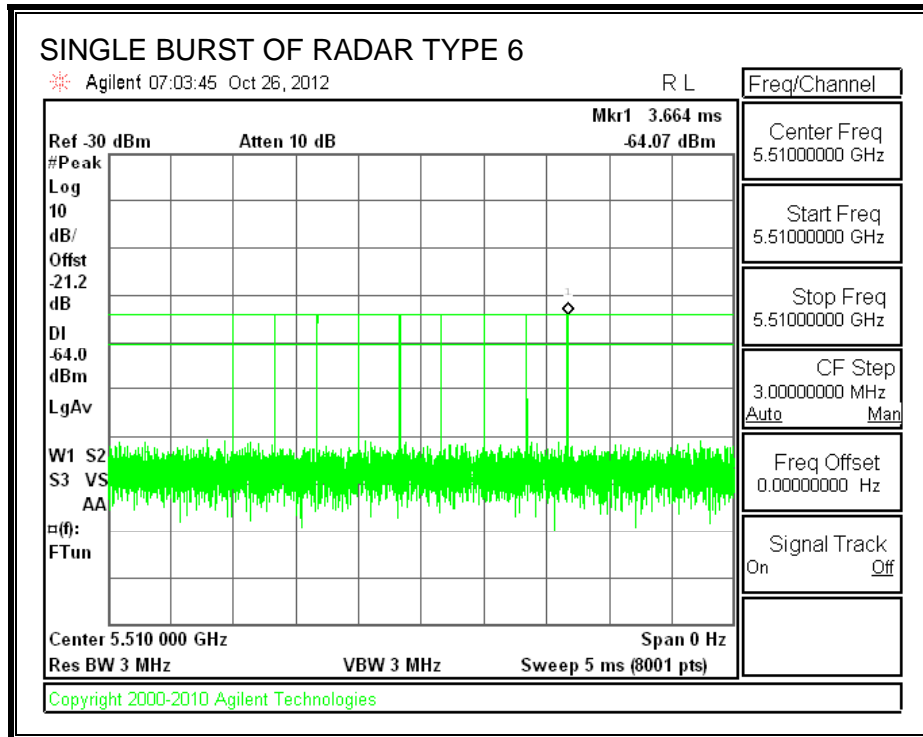




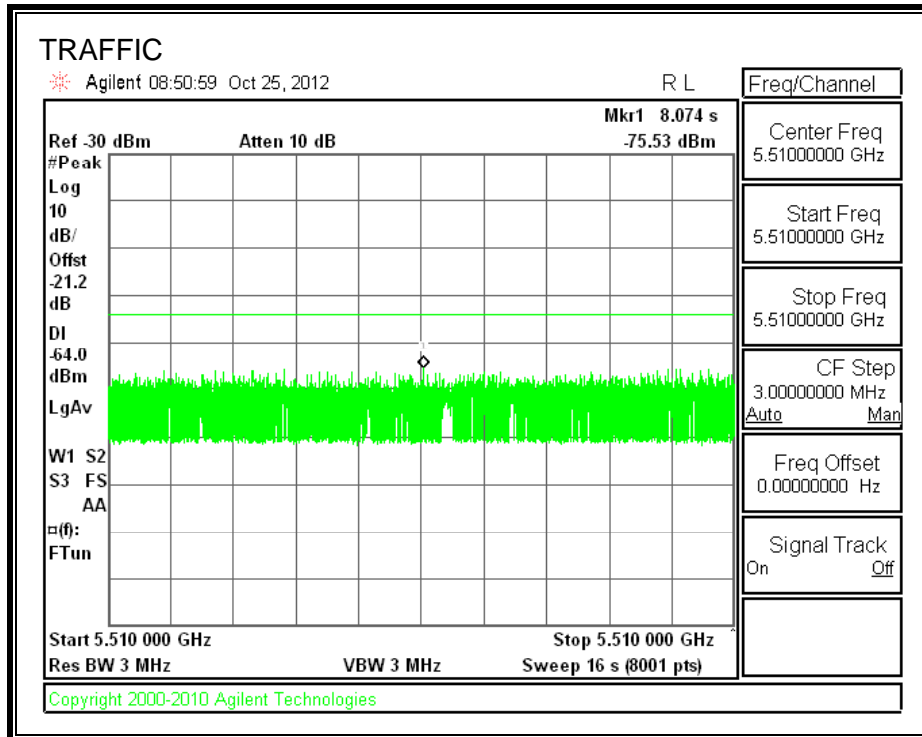








TRAFFIC



11.6.3. CHANNEL AVAILABILITY CHECK TIME

PROCEDURE TO DETERMINE INITIAL POWER-UP CYCLE TIME

A link was established on channel then the EUT was rebooted. The time from the cessation of traffic to the re-initialization of traffic was measured as the time required for the EUT to complete the total power-up cycle. The time to complete the initial power-up period is 60 seconds less than this total power-up time.

PROCEDURE FOR TIMING OF RADAR BURST

With a link established on channel, the EUT was rebooted. A radar signal was triggered within 0 to 6 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

The Non-Occupancy list was cleared. With a link established on channel, the EUT was rebooted. A radar signal was triggered within 54 to 60 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

QUANTITATIVE RESULTS

No Radar Triggered

Timing of Reboot (sec)	Timing of Start of Traffic (sec)	Total Power-up Cycle Time (sec)	Initial Power-up Cycle Time (sec)
29.59	125.4	95.8	35.8

Radar Near Beginning of CAC

Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
30.19	66.5	36.3	0.5

Radar Near End of CAC

Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
30.07	124.9	94.8	59.0

QUALITATIVE RESULTS

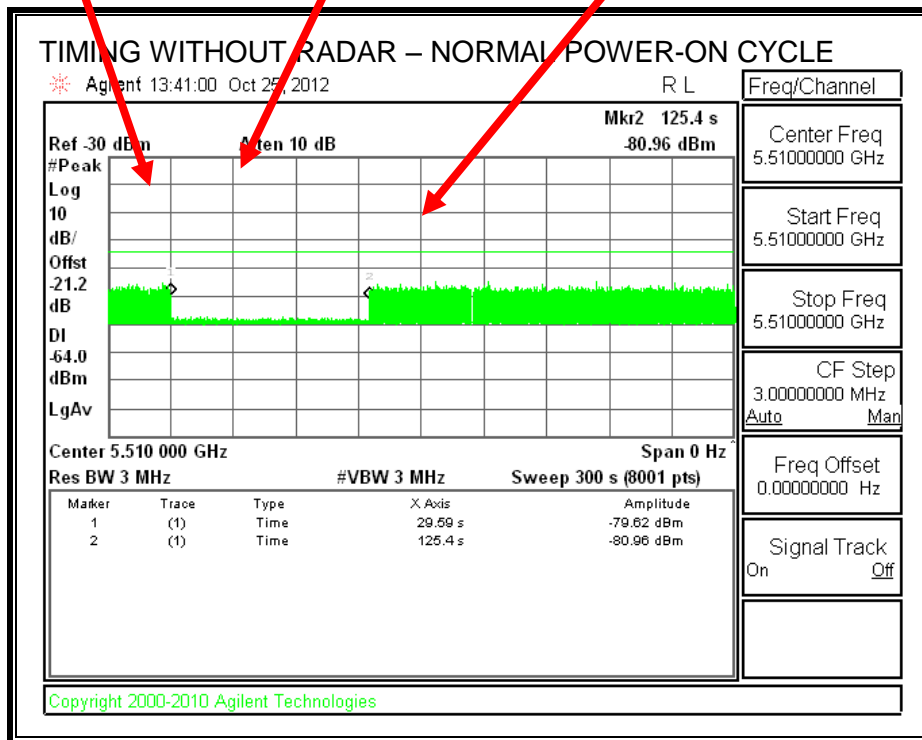
Timing of Radar Burst	Display on Control Computer	Spectrum Analyzer Display
No Radar Triggered	EUT marks Channel as active	Transmissions begin on channel after completion of the initial power-up cycle and the CAC
Within 0 to 6 second window	EUT indicates radar detected	No transmissions on channel
Within 54 to 60 second window	EUT indicates radar detected	No transmissions on channel

TIMING WITHOUT RADAR DURING CAC

AP is rebooted
 Traffic ceases
 Start of Initial Power-up cycle

End of Initial Power-up cycle
 Start of CAC

End of CAC
 Traffic is Initiated



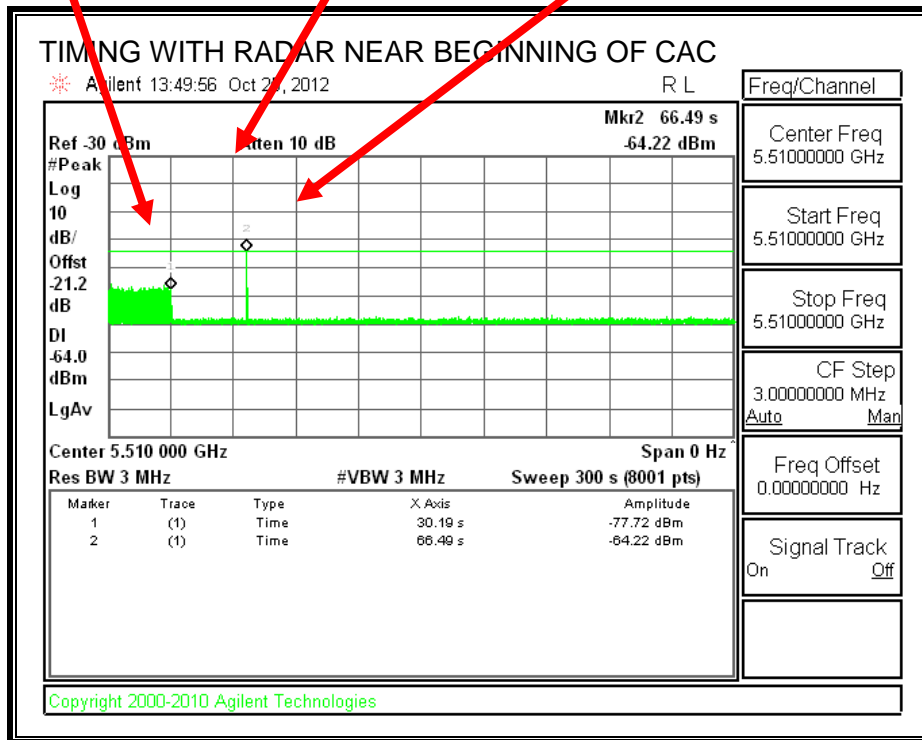
Transmissions begin on channel after completion of the initial power-up cycle and the CAC.

TIMING WITH RADAR NEAR BEGINNING OF CAC

AP is rebooted
 Traffic ceases
 Start of Initial Power-up cycle

End of Initial Power-up cycle
 Start of CAC

Radar Signal Applied



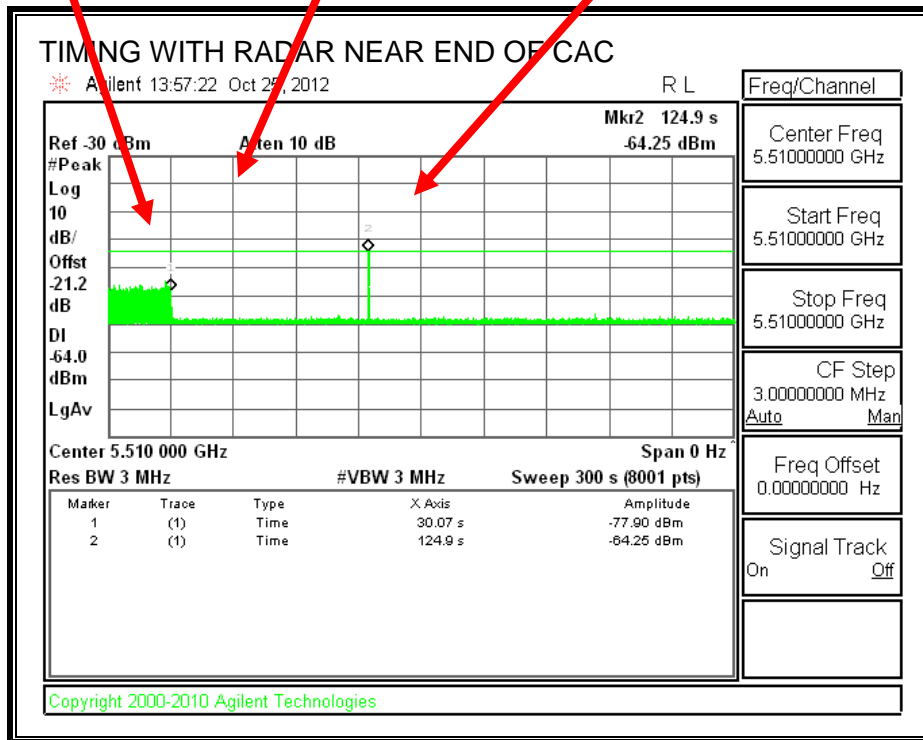
No EUT transmissions were observed after the radar signal.

TIMING WITH RADAR NEAR END OF CAC

AP is rebooted
 Traffic ceases
 Start of Initial Power-up cycle

End of Initial Power-up cycle
 Start of CAC

Radar Signal Applied



No EUT transmissions were observed after the radar signal.

11.6.4. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.6.5. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

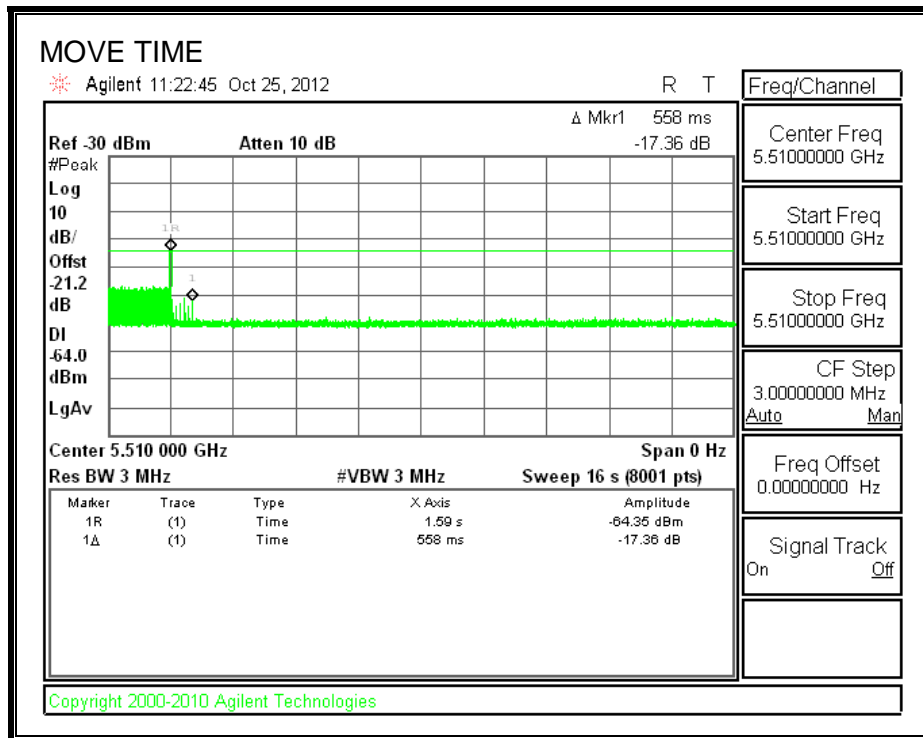
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

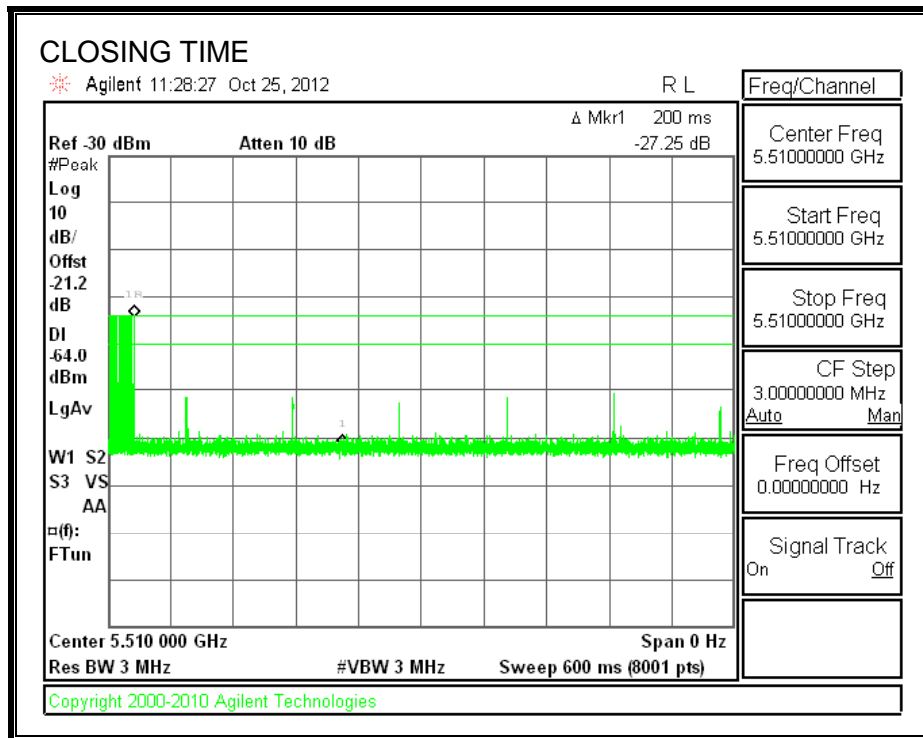
Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	0.558	10

Agency	Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
FCC	10.0	60
IC	14.0	260

MOVE TIME

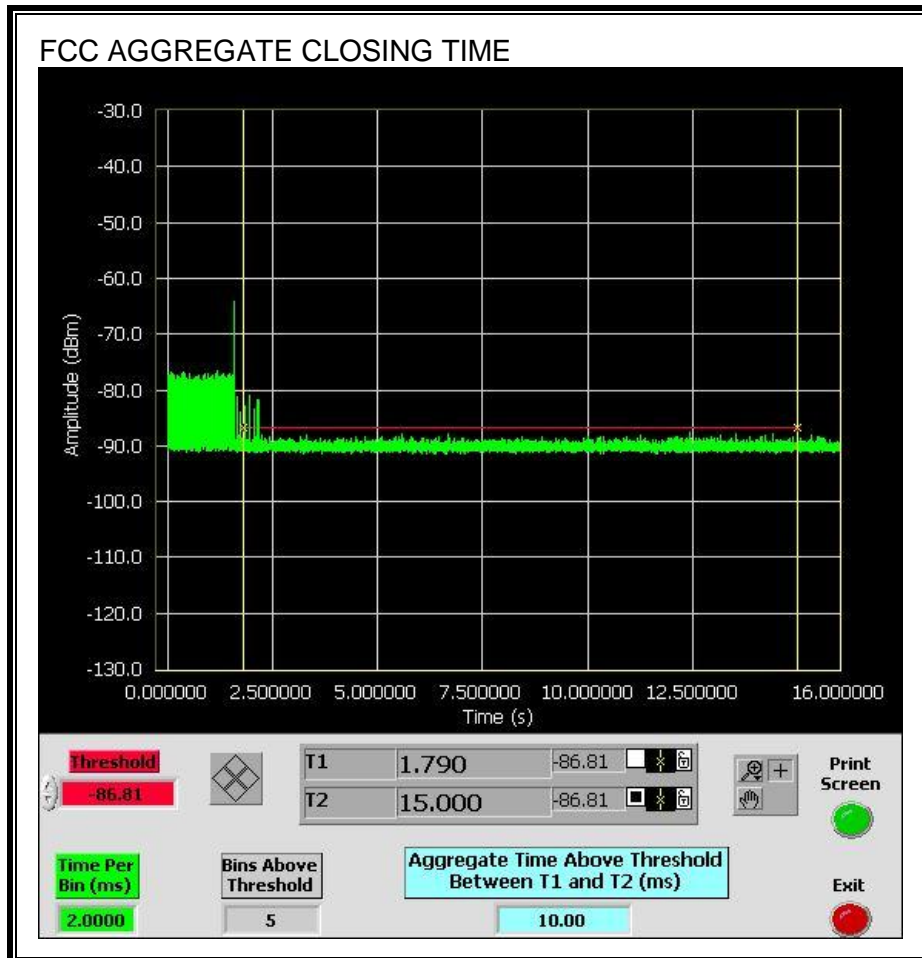


CHANNEL CLOSING TIME

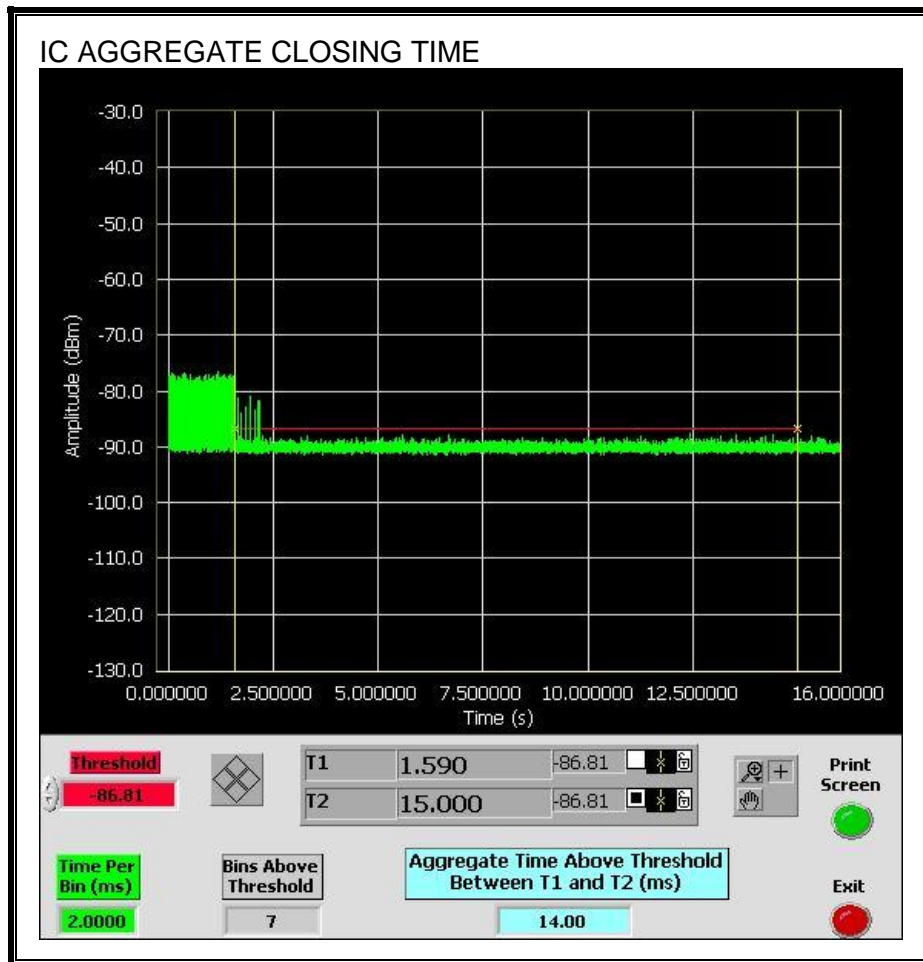


AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the FCC aggregate monitoring period.

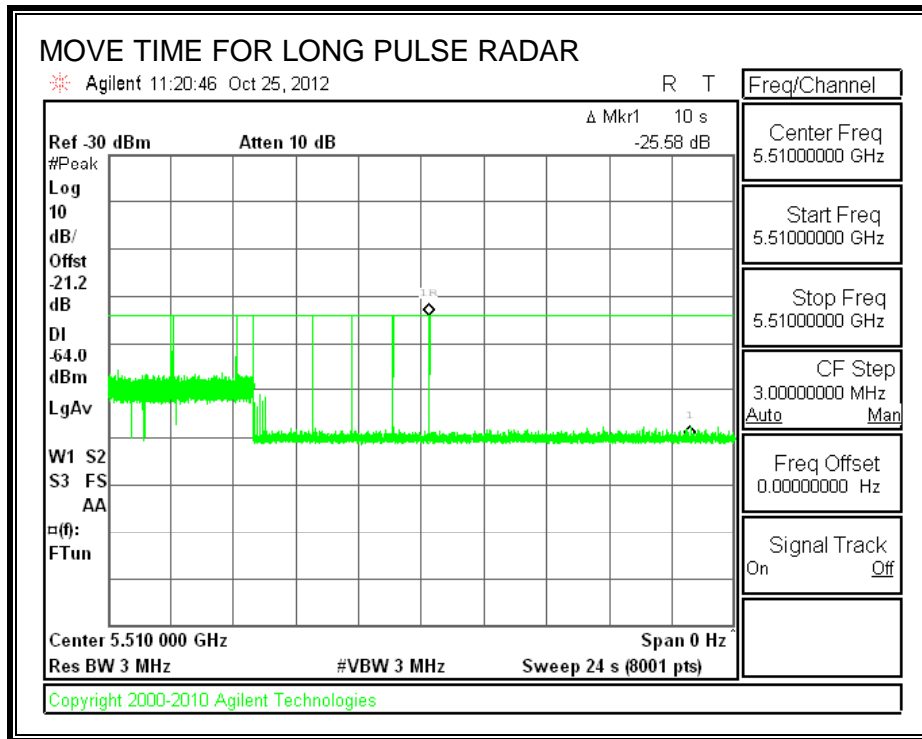


Only intermittent transmissions are observed during the IC aggregate monitoring period.



LONG PULSE CHANNEL MOVE TIME

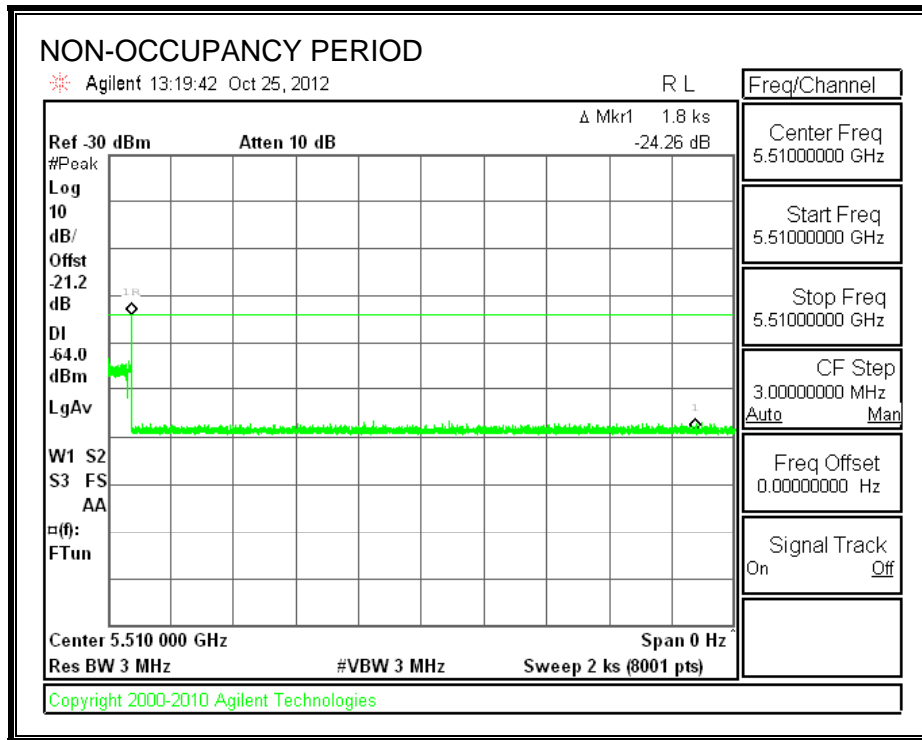
The traffic ceases prior to 10 seconds after the end of the radar waveform.



11.7. NON-OCCUPANCY PERIOD

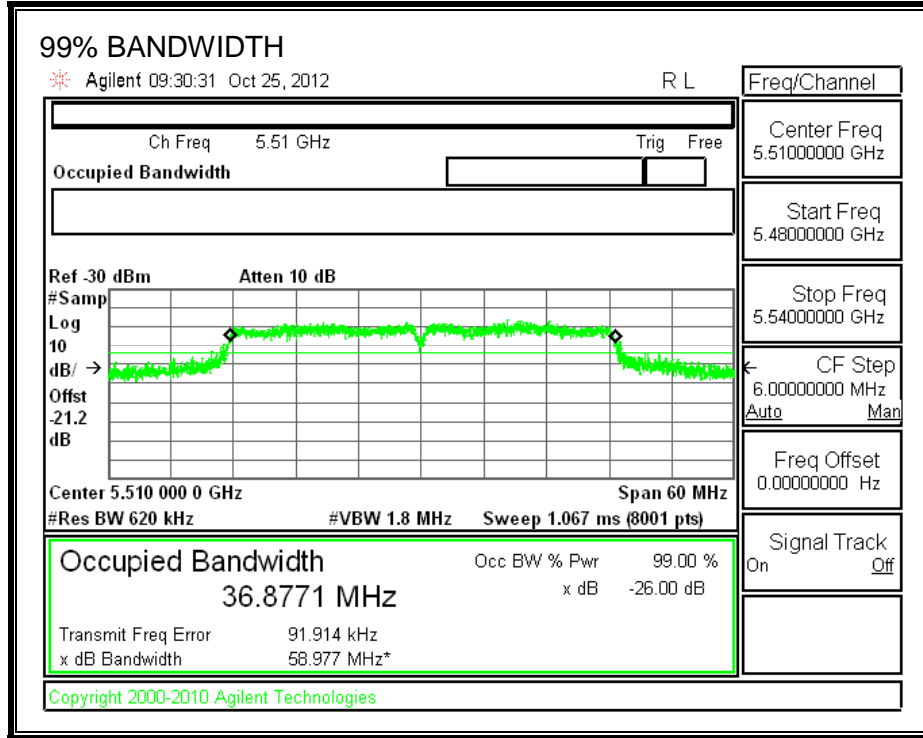
RESULTS

No EUT transmissions were observed on the test channel during the 30 minute observation time.



11.7.1. DETECTION BANDWIDTH

REFERENCE PLOT OF 99% POWER BANDWIDTH



RESULTS

FL	FH	Detection Bandwidth	99% Power Bandwidth	Ratio of Detection BW to 99% Power BW	Minimum Limit
(MHz)	(MHz)	(MHz)	(MHz)	(%)	(%)
5492	5528	36	36.877	97.6	80

DETECTION BANDWIDTH PROBABILITY

Detection Bandwidth Test Results				
FCC Type 1 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst				
Frequency (MHz)	Number of Trials	Number Detected	Detection (%)	Mark
5492	10	10	100	FL
5493	10	10	100	
5494	10	10	100	
5495	10	10	100	
5496	10	9	90	
5497	10	10	100	
5498	10	10	100	
5499	10	10	100	
5500	10	10	100	
5501	10	10	100	
5502	10	10	100	
5503	10	10	100	
5504	10	9	90	
5505	10	9	90	
5506	10	10	100	
5507	10	10	100	
5508	10	10	100	
5509	10	10	100	
5510	10	10	100	
5511	10	10	100	
5512	10	9	90	
5513	10	9	90	
5514	10	10	100	
5515	10	10	100	
5516	10	10	100	
5517	10	10	100	
5518	10	10	100	
5519	10	10	100	
5520	10	10	100	
5521	10	9	90	
5522	10	10	100	
5523	10	10	100	
5524	10	9	90	
5525	10	10	100	
5526	10	9	90	
5527	10	10	100	
5528	10	10	100	FH

11.7.2. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary				
Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail
FCC Short Pulse Type 1	30	100.00	60	Pass
FCC Short Pulse Type 2	30	96.67	60	Pass
FCC Short Pulse Type 3	30	96.67	60	Pass
FCC Short Pulse Type 4	30	100.00	60	Pass
Aggregate		98.33	80	Pass
FCC Long Pulse Type 5	30	100.00	80	Pass
FCC Hopping Type 6	37	100.00	70	Pass

TYPE 1 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 1	
1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst	
Trial	Successful Detection (Yes/No)
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
11	Yes
12	Yes
13	Yes
14	Yes
15	Yes
16	Yes
17	Yes
18	Yes
19	Yes
20	Yes
21	Yes
22	Yes
23	Yes
24	Yes
25	Yes
26	Yes
27	Yes
28	Yes
29	Yes
30	Yes

TYPE 2 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 2				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
2001	2.3	193.00	27	Yes
2002	3.5	193.00	27	Yes
2003	1.2	196.00	24	Yes
2004	1	166.00	29	Yes
2005	4.5	207.00	27	Yes
2006	1	208.00	29	Yes
2007	4.8	173.00	29	Yes
2008	3.2	228.00	29	Yes
2009	4.3	174.00	29	Yes
2010	4.8	227.00	29	Yes
2011	3.8	208.00	26	Yes
2012	4.8	221.00	27	Yes
2013	4.3	166.00	23	Yes
2014	4.8	219.00	28	Yes
2015	4.2	159.00	23	Yes
2016	4	178.00	23	Yes
2017	2.4	190.00	25	Yes
2018	4.2	182.00	24	Yes
2019	1.9	177.00	24	Yes
2020	1.9	193.00	25	Yes
2021	3.6	191.00	27	No
2022	3.1	163.00	23	Yes
2023	3.8	200.00	25	Yes
2024	2.6	207.00	24	Yes
2025	4.4	168.00	29	Yes
2026	2.1	192.00	28	Yes
2027	1.4	224.00	23	Yes
2028	1.6	161.00	27	Yes
2029	3.1	179.00	28	Yes
2030	4.7	169.00	29	Yes

TYPE 3 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 3				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
3001	6.7	364.00	18	Yes
3002	7	349.00	17	Yes
3003	6	436.00	16	Yes
3004	9.9	488.00	18	Yes
3005	9.8	452.00	17	Yes
3006	6.9	376.00	18	Yes
3007	5.3	321.00	16	Yes
3008	7	383.00	16	Yes
3009	6	459.00	17	Yes
3010	7.5	318.00	17	Yes
3011	7.9	257.00	17	Yes
3012	5.5	260.00	18	Yes
3013	5.9	491.00	17	Yes
3014	5	391.00	16	Yes
3015	6.5	308.00	16	Yes
3016	5	472.00	18	Yes
3017	8.4	454.00	16	Yes
3018	8.6	260.00	18	Yes
3019	7.1	402.00	17	Yes
3020	7.2	477.00	17	No
3021	7.6	435.00	17	Yes
3022	8	361.00	16	Yes
3023	7.4	353.00	16	Yes
3024	5.1	364.00	18	Yes
3025	9.1	282.00	18	Yes
3026	8.1	369.00	18	Yes
3027	9.7	307.00	18	Yes
3028	9.9	442.00	16	Yes
3029	6.3	383	18	Yes
3030	9.7	396	17	Yes

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
4001	17.4	450.00	13	Yes
4002	13.7	339.00	15	Yes
4003	14.7	269.00	13	Yes
4004	12.2	321.00	13	Yes
4005	12.5	366.00	15	Yes
4006	19.1	264.00	14	Yes
4007	17.1	474.00	12	Yes
4008	17.8	483.00	13	Yes
4009	12.4	382.00	13	Yes
4010	17.2	319.00	15	Yes
4011	14.3	352.00	13	Yes
4012	14.2	379.00	12	Yes
4013	15.9	333.00	16	Yes
4014	15.5	477.00	12	Yes
4015	16.3	312.00	15	Yes
4016	18.2	282.00	12	Yes
4017	12	334.00	13	Yes
4018	19.2	315.00	15	Yes
4019	18.1	441.00	12	Yes
4020	12	463.00	15	Yes
4021	17.6	391.00	13	Yes
4022	16.6	261.00	15	Yes
4023	12.3	475.00	15	Yes
4024	13.7	419.00	15	Yes
4025	11.2	350.00	13	Yes
4026	13.3	408.00	14	Yes
4027	16.4	412.00	12	Yes
4028	16.9	483.00	16	Yes
4029	18.8	372.00	16	Yes
4030	17.2	274.00	15	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5	
Trial	Successful Detection (Yes/No)
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
11	Yes
12	Yes
13	Yes
14	Yes
15	Yes
16	Yes
17	Yes
18	Yes
19	Yes
20	Yes
21	Yes
22	Yes
23	Yes
24	Yes
25	Yes
26	Yes
27	Yes
28	Yes
29	Yes
30	Yes

Note: The Type 5 randomized parameters are shown in a separate document.

TYPE 6 DETECTION PROBABILITY

Data Sheet for FCC Hopping Radar Type 6				
1 us Pulse Width, 333 us PRI, 9 Pulses per Burst, 1 Burst per Hop				
NTIA August 2005 Hopping Sequence				
Trial	Starting Index Within Sequence	Signal Generator Frequency (MHz)	Hops within Detection BW	Successful Detection (Yes/No)
1	51	5492	9	Yes
2	526	5493	4	Yes
3	1001	5494	6	Yes
4	1476	5495	11	Yes
5	1951	5496	15	Yes
6	2426	5497	7	Yes
7	2901	5498	7	Yes
8	3376	5499	8	Yes
9	3851	5500	10	Yes
10	4326	5501	7	Yes
11	4801	5502	9	Yes
12	5276	5503	8	Yes
13	5751	5504	7	Yes
14	6226	5505	11	Yes
15	6701	5506	7	Yes
16	7176	5507	9	Yes
17	7651	5508	9	Yes
18	8126	5509	5	Yes
19	8601	5510	6	Yes
20	9076	5511	10	Yes
21	9551	5512	8	Yes
22	10026	5513	8	Yes
23	10501	5514	6	Yes
24	10976	5515	7	Yes
25	11451	5516	8	Yes
26	11926	5517	10	Yes
27	12401	5518	8	Yes
28	12876	5519	9	Yes
29	13351	5520	14	Yes
30	13826	5521	6	Yes
31	14301	5522	8	Yes
32	14776	5523	6	Yes
33	15251	5524	10	Yes
34	15726	5525	9	Yes
35	16201	5526	11	Yes
36	16676	5527	3	Yes
37	17151	5528	9	Yes