



**FCC CFR47 PART 15 SUBPART E
INDUSTRY CANADA RSS-210 ISSUE 7**

CERTIFICATION TEST REPORT

**FOR
802.11ag/Draft 802.11n WLAN PCI-E Mini Card**

**MODEL NUMBER: BCM94322USA
FCC ID: QDS-BRCM1038
IC: 4324A-BRCM1038**

**REPORT NUMBER: 08U11756-2B
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Revision History

Rev.	Issue Date	Revisions	Revised By
--	July 9, 2008	Initial Issue	Sunny Shih
A	July 9, 2008	Removed standard description "NCC LOW POWER 0002 (LP0002)" from cover page and page 8.	A. Zaffar
B	July 11, 2008	Clarified antenna combinations used for test purposes, clarified DFS test results, added TPC description.	Sunny Shih

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: 802.11ag / Draft 802n WLAN PCI-E MINI CARD

MODEL: BCM94322USA

SERIAL NUMBER: 973 (P405)

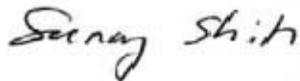
DATE TESTED: JUNE 06 - JULY 7, 2008

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart E	Pass
INDUSTRY CANADA RSS-210 Issue 7 Annex 9	Pass
INDUSTRY CANADA RSS-GEN Issue 2	Pass

Compliance Certification Services, Inc. (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 CCS based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

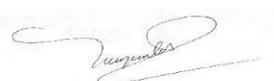
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:



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Tested By:



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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC MO&O 06-96, RSS-GEN Issue 2, and RSS-210 Issue 7.

3. FACILITIES AND ACCREDITATION

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

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. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11ag/Draft 802.11n Wireless LAN transceiver card and manufactured by Broadcom. Model number is BCM94322USA.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

5150 to 5250 MHz Authorized Band

Frequency Range (MHz)	Mode	Peak Power Chain 0 (dBm)	Peak Power Chain 1 (dBm)	Total Peak Power (dBm)	Output Power (mW)
5180 - 5240	802.11a Legacy			14.23	26.49
5180 - 5240	802.11n 20MHz SISO	Covered by the worst case 802.11a Legacy testing			
5180 - 5240	802.11a CDD Mode	Covered by the worst case 802.11n 20 MHz CDD			
5180 - 5240	802.11n 20MHz CDD	9.43	9.69	12.57	18.08
5190 - 5230	802.11n 40MHz SISO			16.57	45.39
5190 - 5230	802.11n 40MHz CDD	12.25	12.26	15.27	33.61

5250 - 5350 MHz Authorized Band

Frequency Range (MHz)	Mode	Peak Power Chain 0 (dBm)	Peak Power Chain 1 (dBm)	Total Peak Power (dBm)	Output Power (mW)
5260 - 5320	802.11a Legacy			17.86	61.09
5260 - 5320	802.11n 20MHz SISO	Covered by the worst case 802.11a Legacy testing			
5260 - 5320	802.11a CDD Mode	Covered by the worst case 802.11n 20 MHz CDD			
5270 - 5310	802.11n 40MHz SISO			17.29	53.58

Power with Antenna Array Gain up to 6.72 dBi

5260 - 5320	802.11n 20MHz CDD	16.29	16.10	19.21	83.30
5270 - 5310	802.11n 40MHz CDD	15.42	15.76	18.60	72.50

Power with Antenna Array Gain up to 7.84 dBi

5260 - 5320	802.11n 20MHz CDD	15.27	15.22	18.26	66.92
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5470 - 5725 MHz Authorized Band

Frequency Range (MHz)	Mode	Peak Power Chain 0 (dBm)	Peak Power Chain 1 (dBm)	Total Peak Power (dBm)	Output Power (mW)
5500 - 5700	802.11a Legacy			17.38	54.70
5500 - 5700	802.11n 20MHz SISO	Covered by the worst case 802.11a Legacy testing			
5500 - 5700	802.11a CDD Mode	Covered by the worst case 802.11n 20 MHz CDD			
5510 - 5670	802.11n 40MHz SISO			18.35	68.39

Power with Antenna Array Gain up to 5.83 dBi

5500 - 5700	802.11n 20MHz CDD	16.70	16.71	19.72	93.65
5510 - 5670	802.11n 40MHz CDD	17.43	18.53	21.03	126.62

Power with Antenna Array Gain up to 8.80 dBi

5500 - 5700	802.11n 20MHz CDD	14.27	14.16	17.23	52.79
5510 - 5670	802.11n 40MHz CDD	16.65	17.52	20.12	102.73

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes with two different types of antenna, with the maximum gain as table below

Antenna Manufacturer	Antenna Type	Model	Peak gain (dBi) @ 5150MHz	Peak gain (dBi) @ 5350MHz	Peak gain (dBi) @ 5470MHz	Peak gain (dBi) @ 5700MHz
Tyco	PIFA	M97PIFA	5.35	6.42	7.48	7.45
Foxconn	PIFA	WDAN-HQAT80-03-DF	2.99	2.99	2.01	2.19
Tyco	Slot antenna	M97SLTAP1	0.63	2.28	2.99	2.47
Tyco	Slot antenna	K5SLT	4.11	4.32	3.50	3.36

Antennas combinations for all 2x2 (CCD) modes test

(Low Slot ant gain + Hi PIFA ant gain & Hi Slot ant gain + Low PIFA ant gain)

Frequency Band	Antennas combination	SLOT Antenna Gain	PIFA Antenna gain	10^(Ant Main/10)	10^(Ant Aux/10)	10^(ant main/10)+10^(ant aux/10)	10*log[10^(ant main/10)+10^(ant aux/10)] (dBm)
5.2 GHz	SLOT Low / PIFA Hi	0.63	5.35	1.156	3.428	4.584	6.61
	SLOT Hi / PIFA Low	4.11	2.99	2.576	1.991	4.567	6.60
5.3 GHz	SLOT Low / PIFA Hi	2.28	6.42	1.690	4.385	6.076	7.84
	SLOT Hi / PIFA Low	4.32	2.99	2.704	1.991	4.695	6.72
5.5 GHz	SLOT Low / PIFA Hi	2.99	7.48	1.991	5.598	7.588	8.80
	SLOT Hi / PIFA Low	3.50	2.01	2.239	1.589	3.827	5.83

The highest gains of each type of antennas for all legacy/SISO modes test

Band	SLOT Ant Gain	PIFA Ant Gain
5.2 GHz	4.11	5.35
5.3 GHz	4.32	6.42
5.5 GHz	3.50	7.48

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was BCMWL5, rev. 4.170.83.0.

The test utility software used during testing was wl_tool, rev. 4.170. RC83.0.

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case data rate for each mode is determined to be as follows, based on preliminary tests of the chipset utilized in this radio.

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

All final tests in the 802.11n HT20 mode were made at MCS0.

All final tests in the 802.11n HT40 mode were made at MCS0 & MCS15

For radiated emissions below 1 GHz the worst-case configuration is determined to be the mode and channel with the highest output power.

Radiated emissions tests were performed with the following antenna configurations:

All legacy/SISO modes were measured with the highest gain for each type of antenna (PIFA and Slot).

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

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT & PERIPHERALS

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Monitor	LG	Microline 186	512MXAY0A752	DoC
Keyboard	Microsoft	KC-0405	7.6198E+12	DoC
Mouse	Dell	OYH958	HC6450C2BP9	DoC
Desktop	Dell	DCNE	FR17YD1	DoC

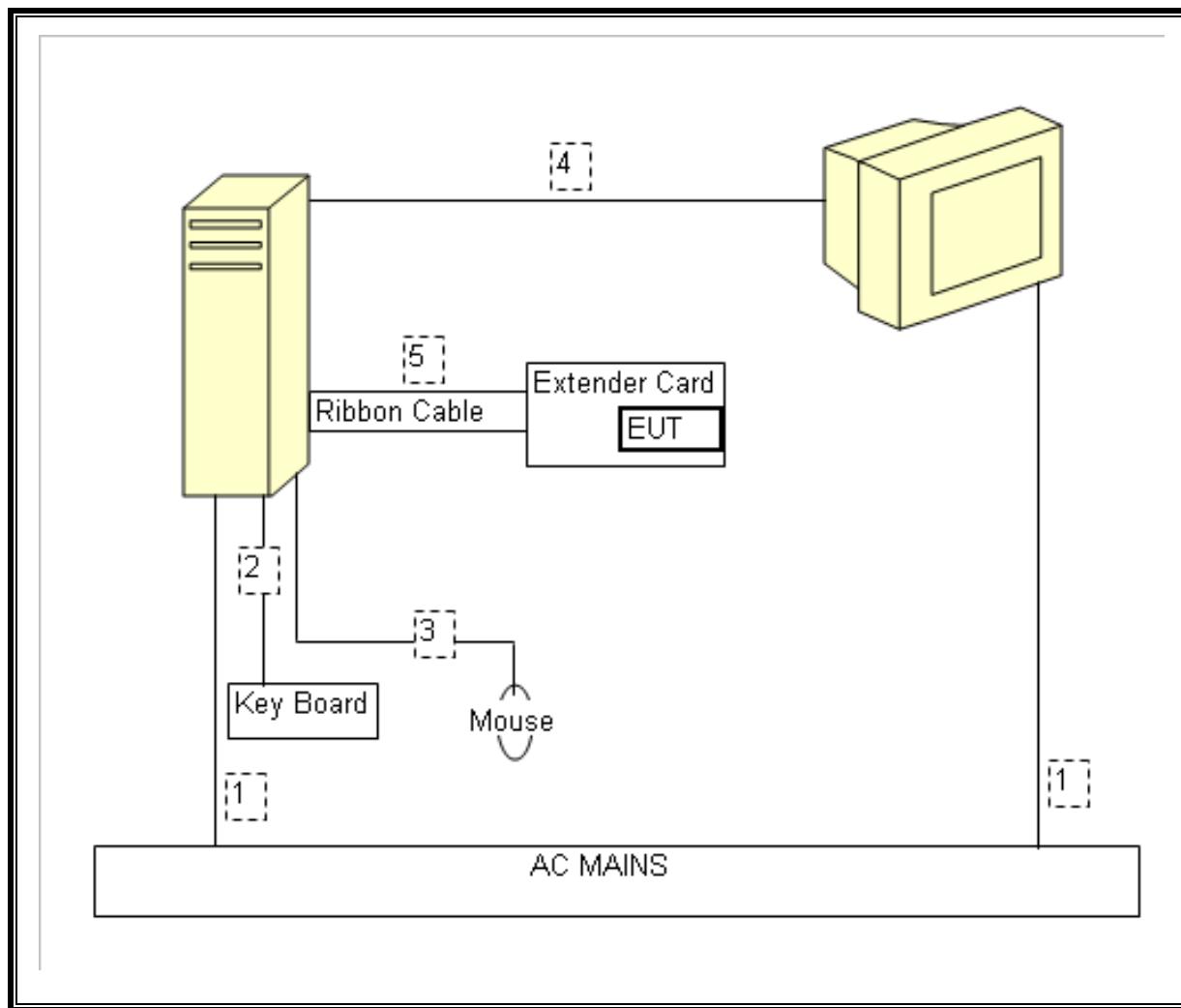
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	2	US 115V	Un-shielded	2m	N/A
2	USB Key Board	1	USB	Shielded	1m	N/A
3	USB Mouse	1	USB	Shielded	1m	N/A
4	Video	1	DB15	Shielded	1m	N/A
5	Ribbon Cable	1	Ribbon Cable	Un-shielded	0.4m	N/A

TEST SETUP

The EUT is installed in a host desktop computer via a ribbon cable & an express card to Mini PCI-E adapter boards during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST					
Description	Manufacturer	Model	Asset	Cal Date	Cal Due
EMI Receiver, 2.9 GHz	Agilent / HP	8542E	C00957	2/6/2008	6/12/2009
RF Filter Section, 2.9 GHz	Agilent / HP	85420E	C00958	2/6/2008	6/12/2009
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	5/9/2007	5/9/2009
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	10/25/2007	10/25/2008
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	N02481	10/25/2007	10/25/2008
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	10/16/2007	1/27/2009
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	5/2/2006	8/7/2008
Antenna, Horn, 18 GHz	ETS	3117	C01006	4/15/2008	4/15/09
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	8/3/2007	8/3/08
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	10/13/2007	10/13/08
Peak Power Meter	Agilent / HP	E4416A	C00963	02/14/07	12/02/08
Peak / Average Power Sensor	Agilent	E9327A	C00964	02/14/07	12/02/08
Antenna, Horn 26 ~ 40 GHz	ARA	MWH-2640/B	C01009	4/13/2008	4/13/2009
7.6 GHz High Pass Filter	Micro Tronics	HPM13350	N/A	N/A	N/A
5.75 - 5.8 Reject Filter	Micro Tronics	BRC13192	N/A	N/A	N/A

7. ANTENNA PORT TEST RESULTS FOR 5.15–5.25 GHZ BAND

7.1. 802.11a MODE

7.1.1. 26 dB and 99% BANDWIDTH

LIMITS

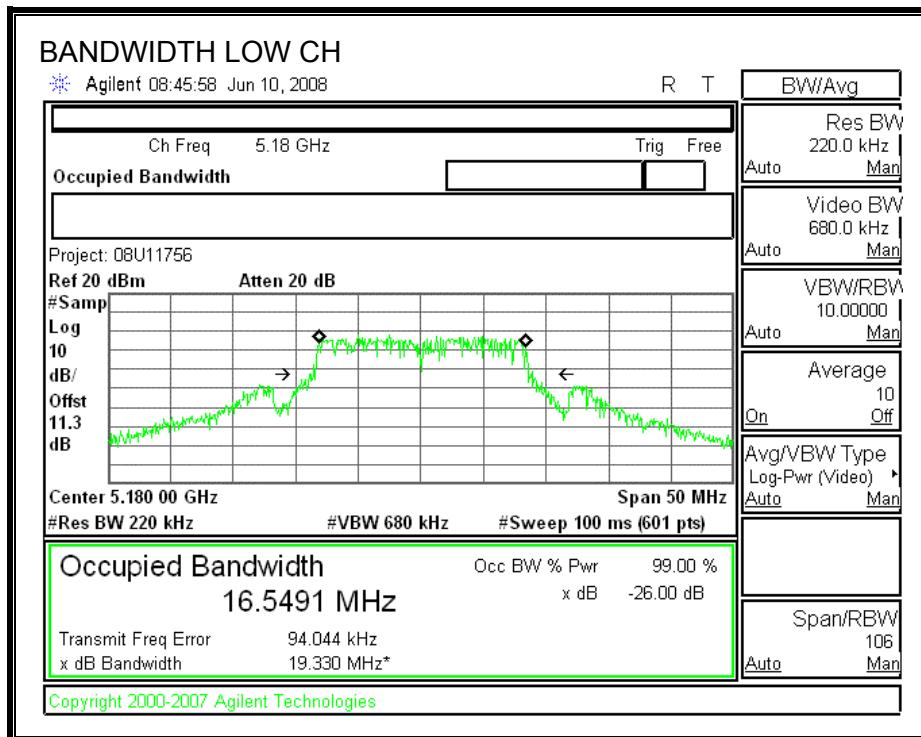
None; for reporting purposes only.

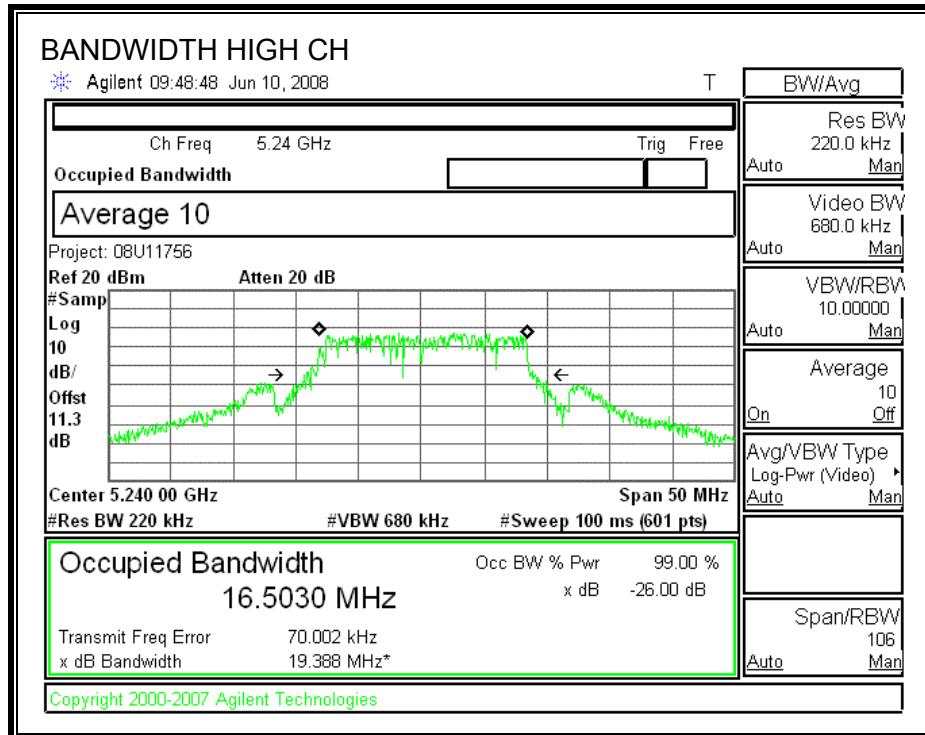
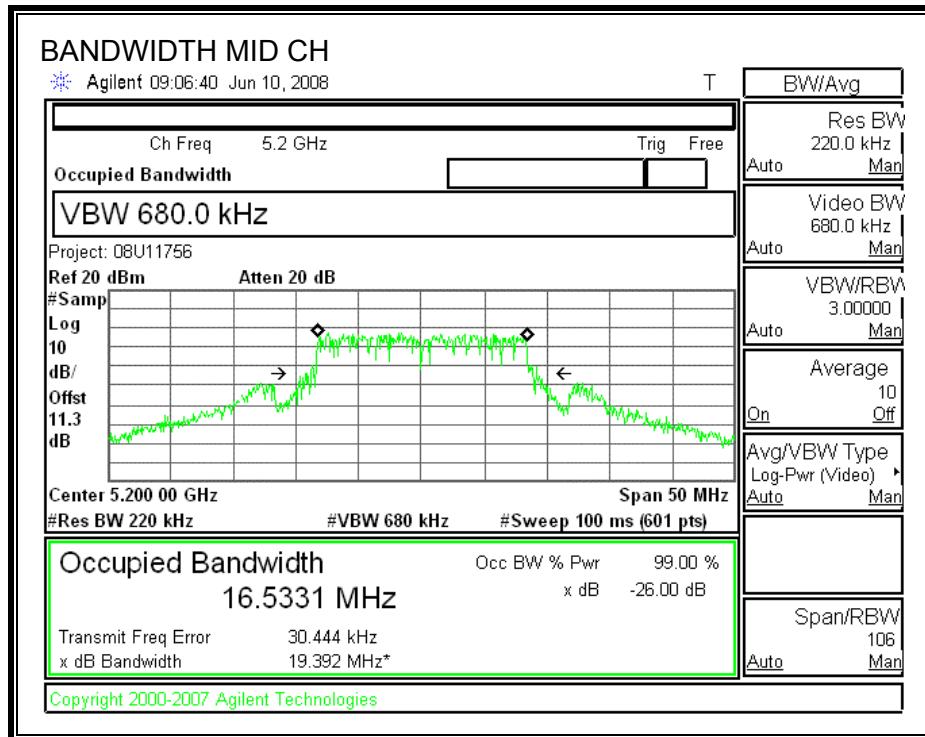
TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	19.330	16.5491
Middle	5200	19.392	16.5331
High	5240	19.388	16.5030





7.1.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1) & IC RSS-210 A9.2 (1)

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

The maximum antenna gain is 5.35 dBi

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

RESULTS

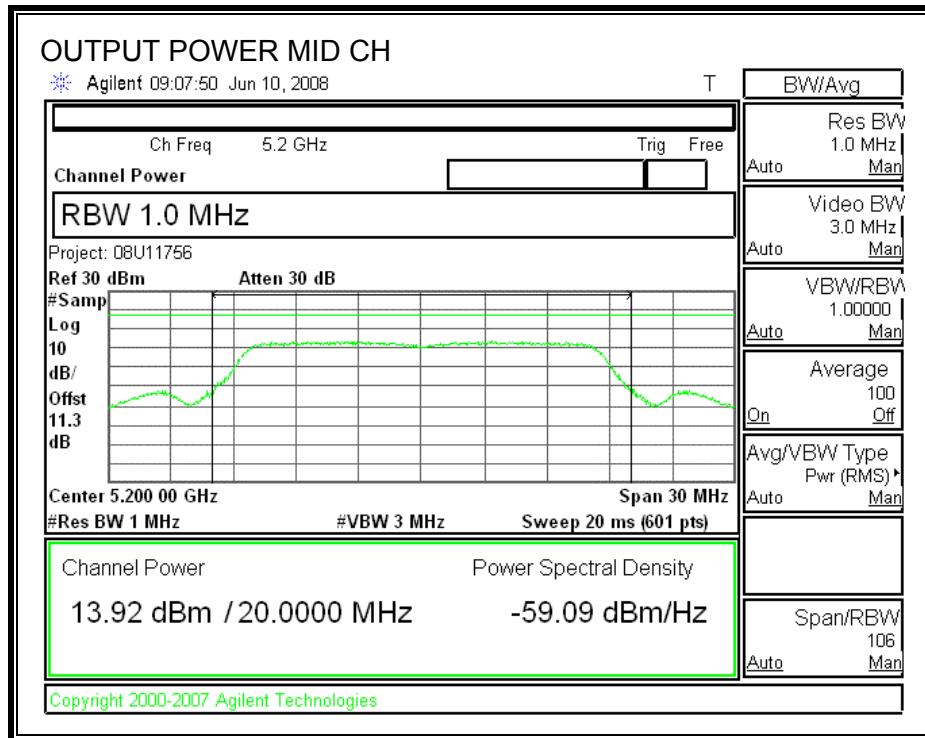
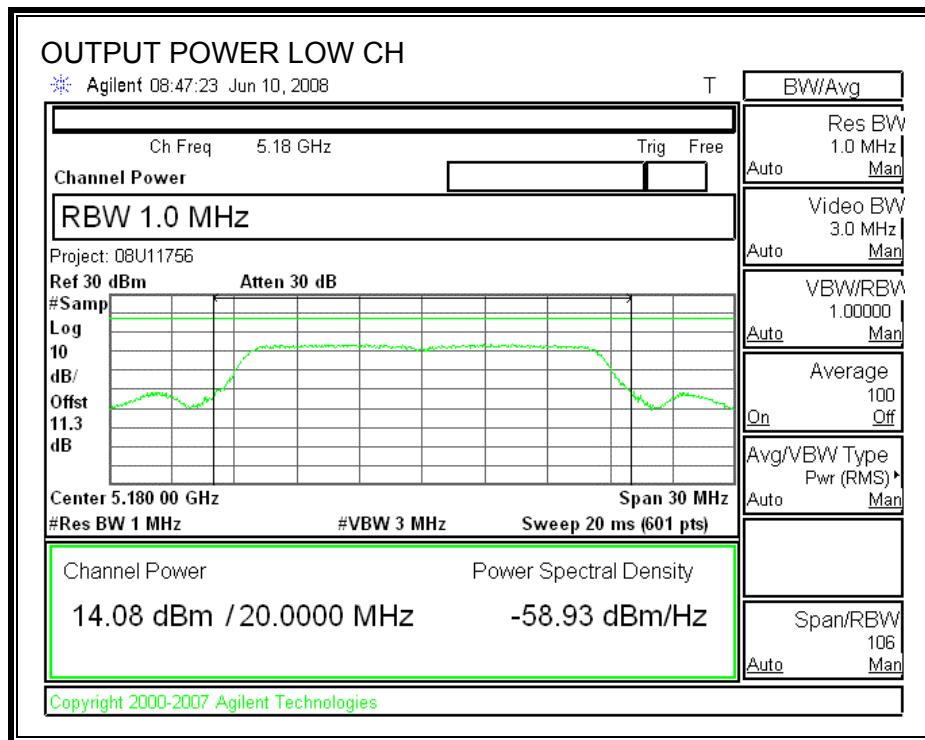
Limit

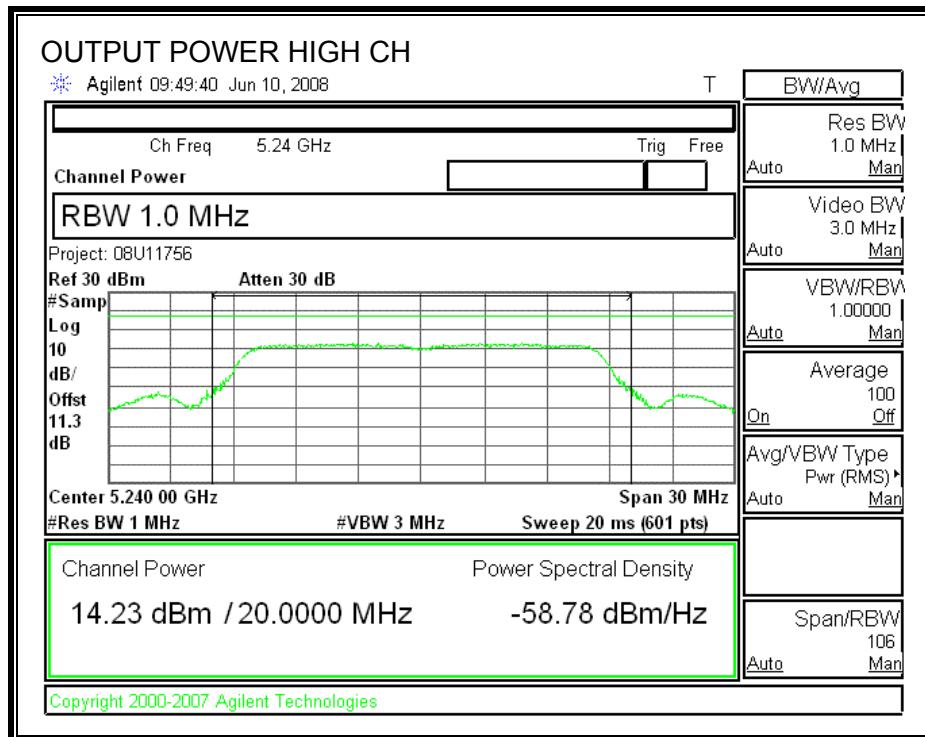
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5180	17	19.330	16.86	5.35	16.86
Mid	5200	17	19.392	16.88	5.35	16.88
High	5240	17	19.388	16.88	5.35	16.88

Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5180	14.08	16.86	-2.78
Mid	5200	13.92	16.88	-2.96
High	5240	14.23	16.88	-2.65

OUTPUT POWER





7.1.3. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (1) & IC RSS-210 A9.2 (1)

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

The maximum antenna gain is 5.35 dBi, therefore the limit is 4 dBm.

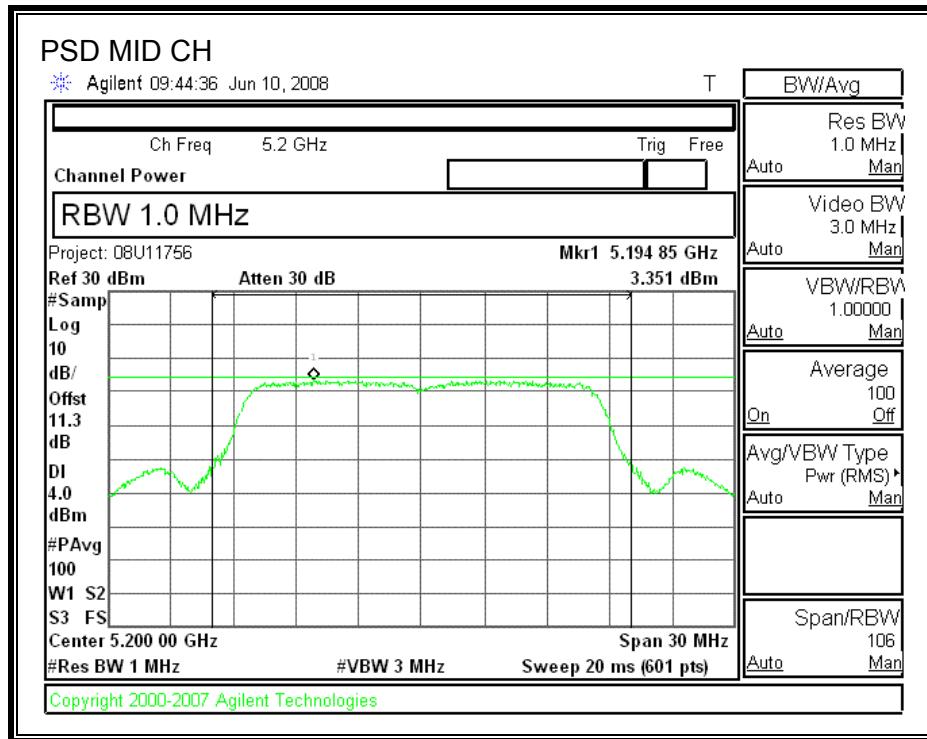
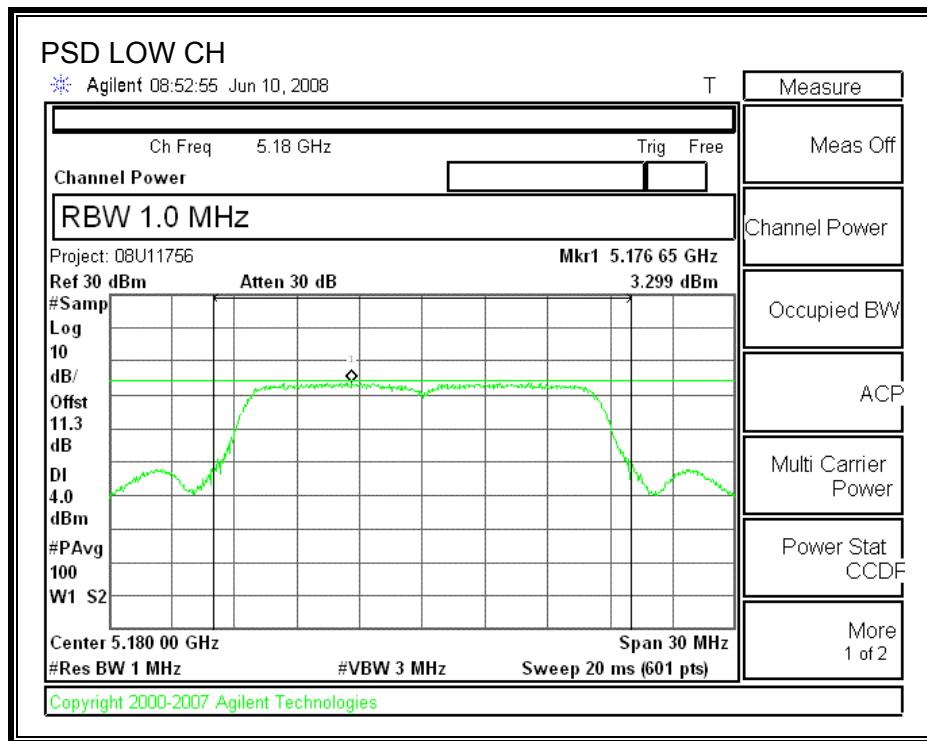
TEST PROCEDURE

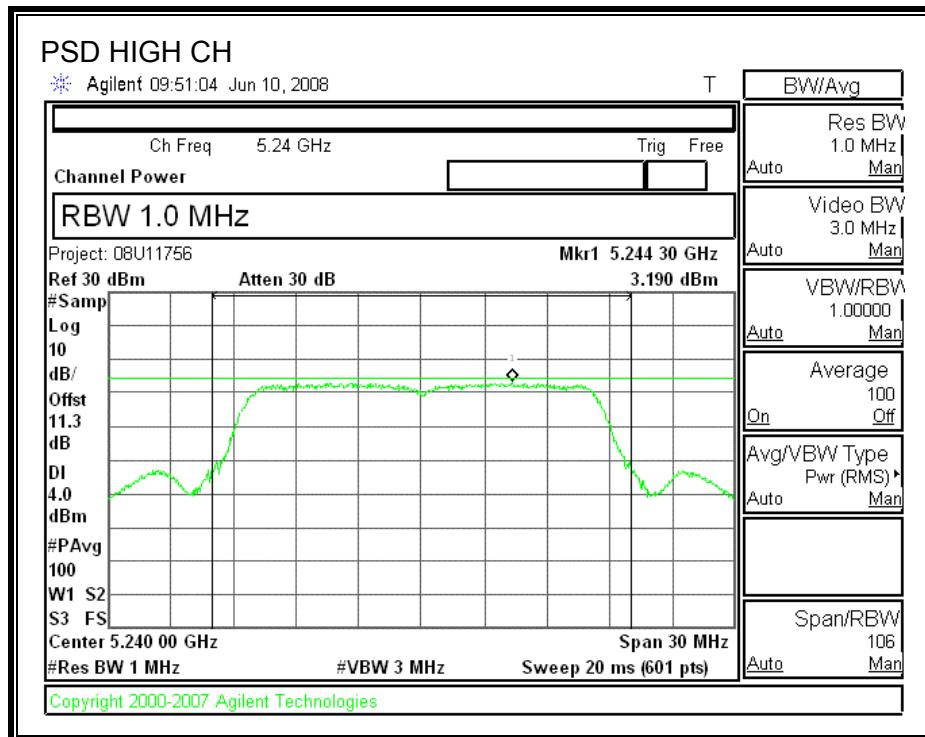
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5180	3.299	4.00	-0.70
Middle	5200	3.351	4.00	-0.65
High	5240	3.190	4.00	-0.81

POWER SPECTRAL DENSITY





7.1.4. 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

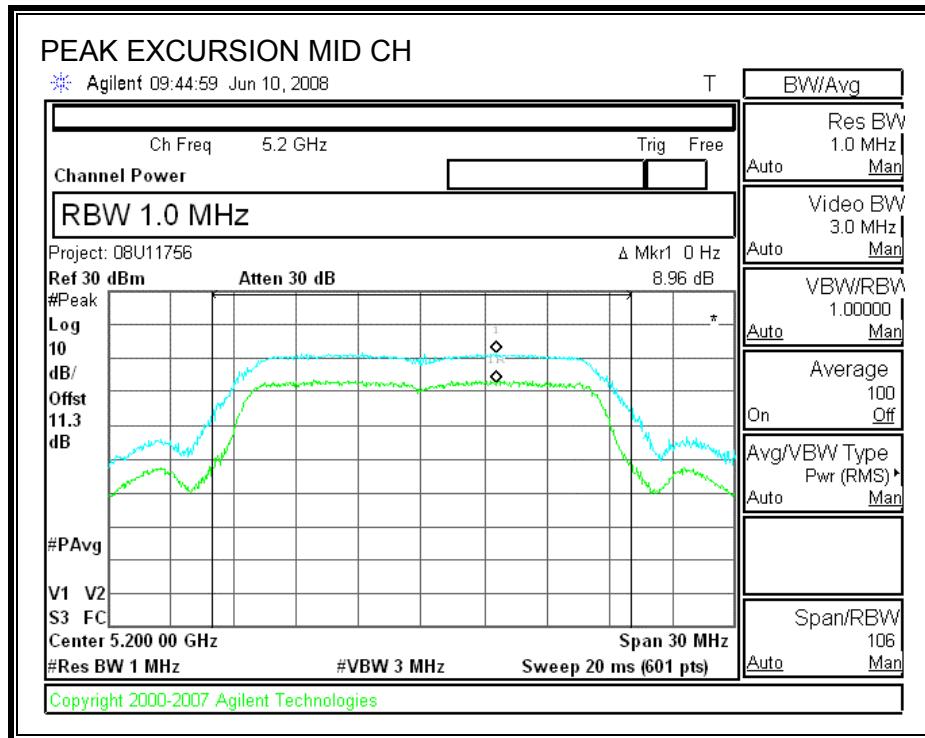
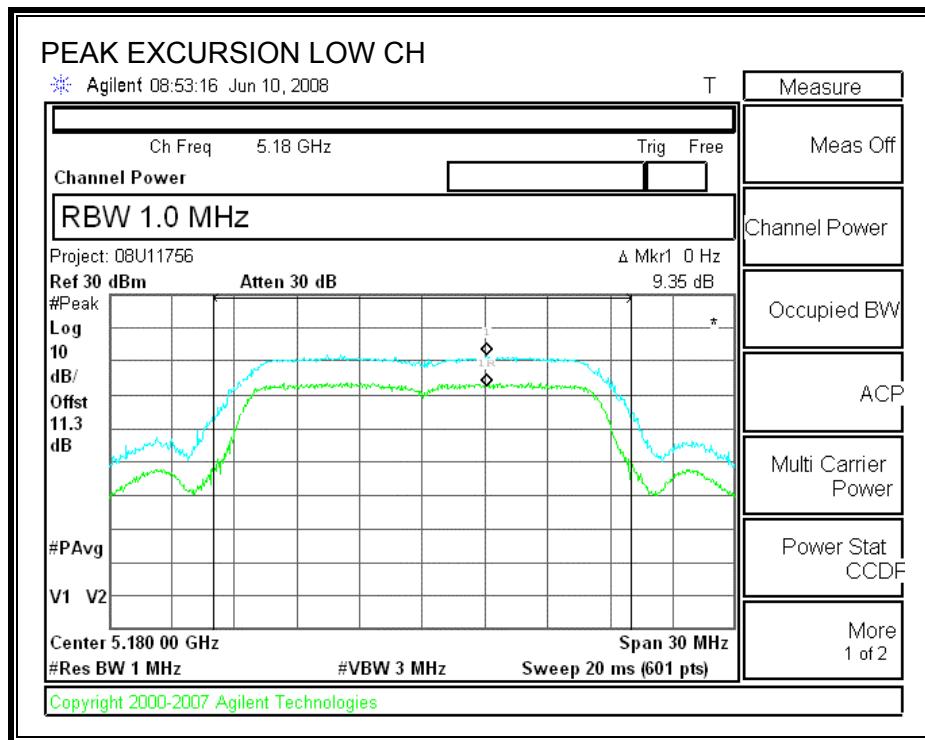
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

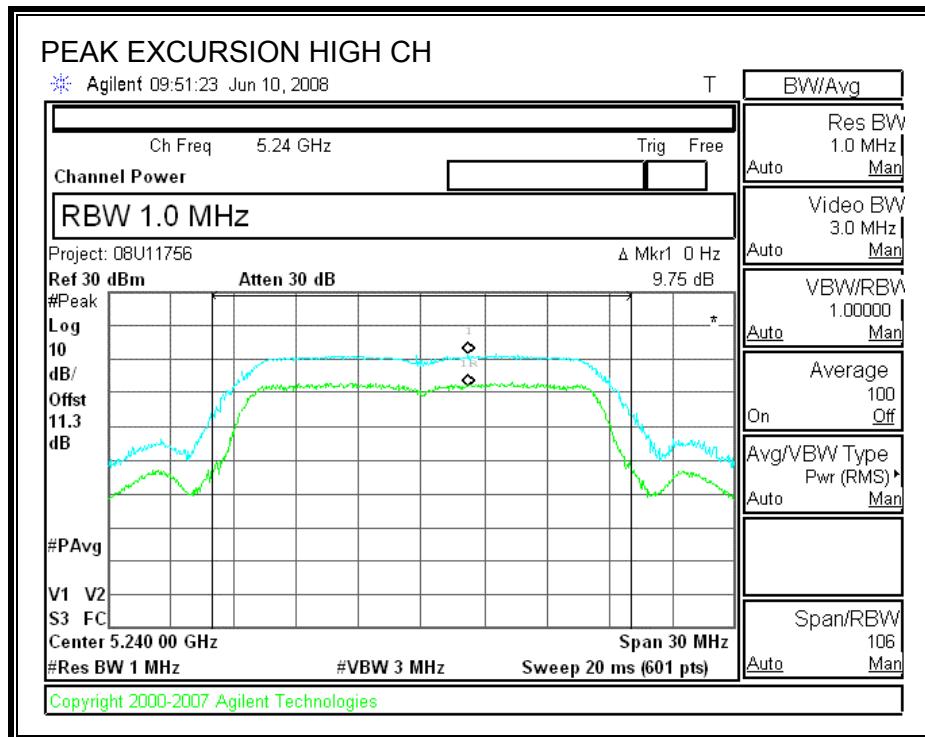
Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

RESULTS

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	9.35	13	-3.65
Middle	5200	8.96	13	-4.04
High	5240	9.75	13	-3.25

PEAK EXCURSION





7.1.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (1) & IC RSS-210 A9.3 (1)

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm / MHz.

Limit line = -27 - EUT Antenna Gain

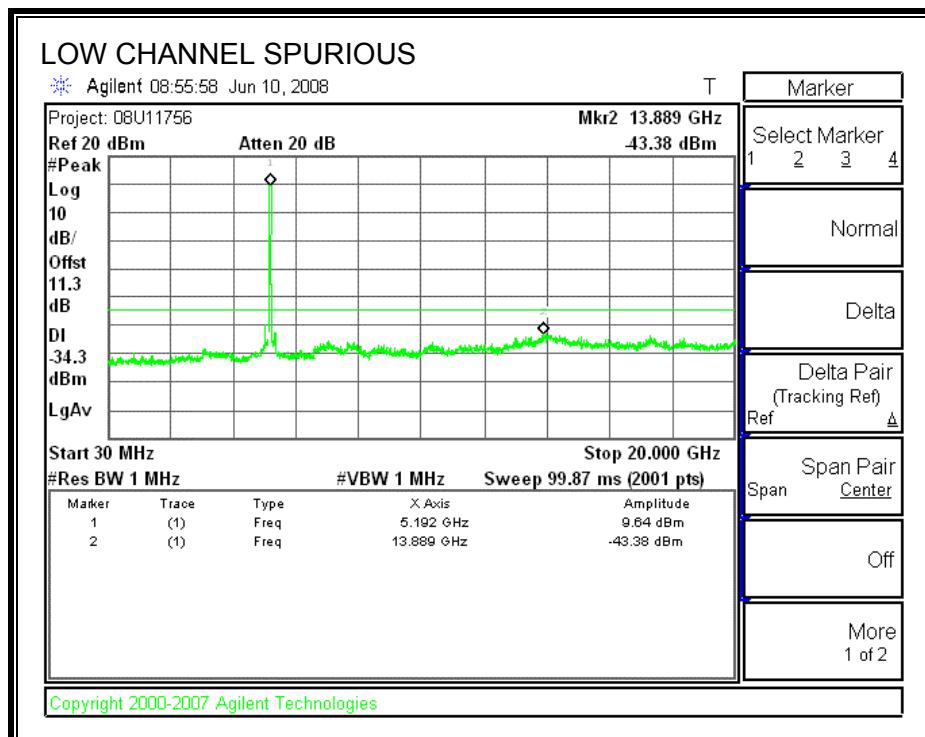
TEST PROCEDURE

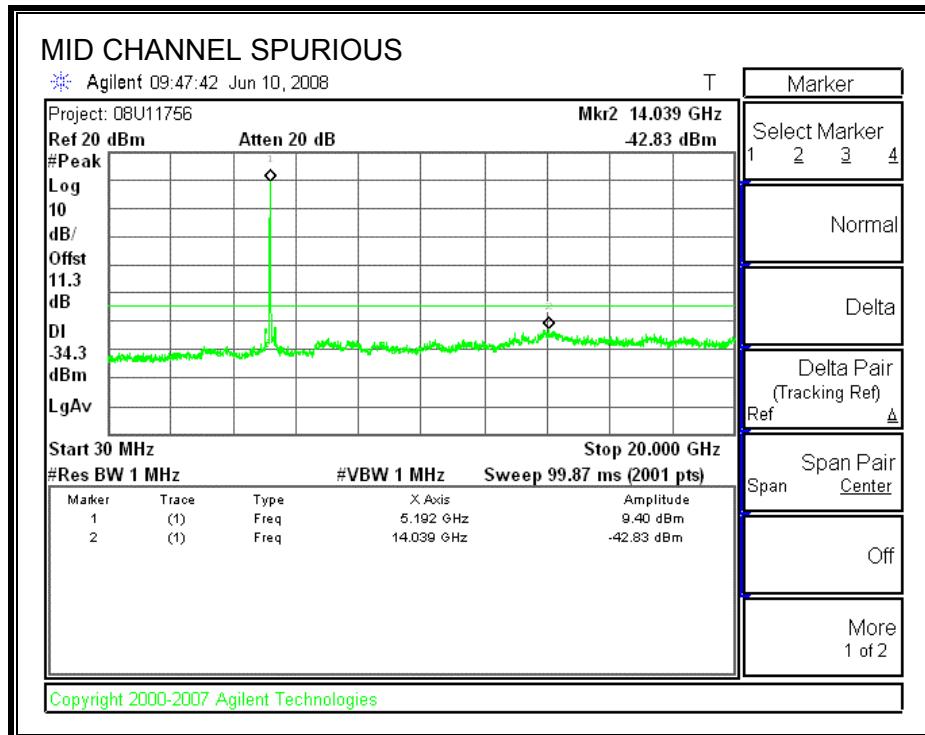
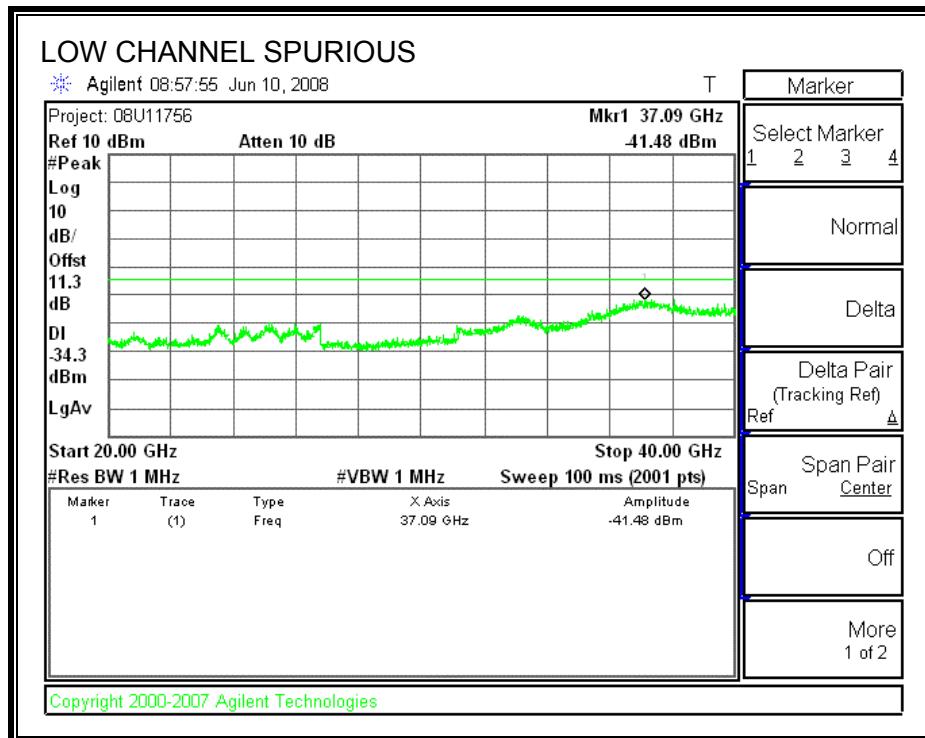
Conducted RF measurements of the transmitter output are made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

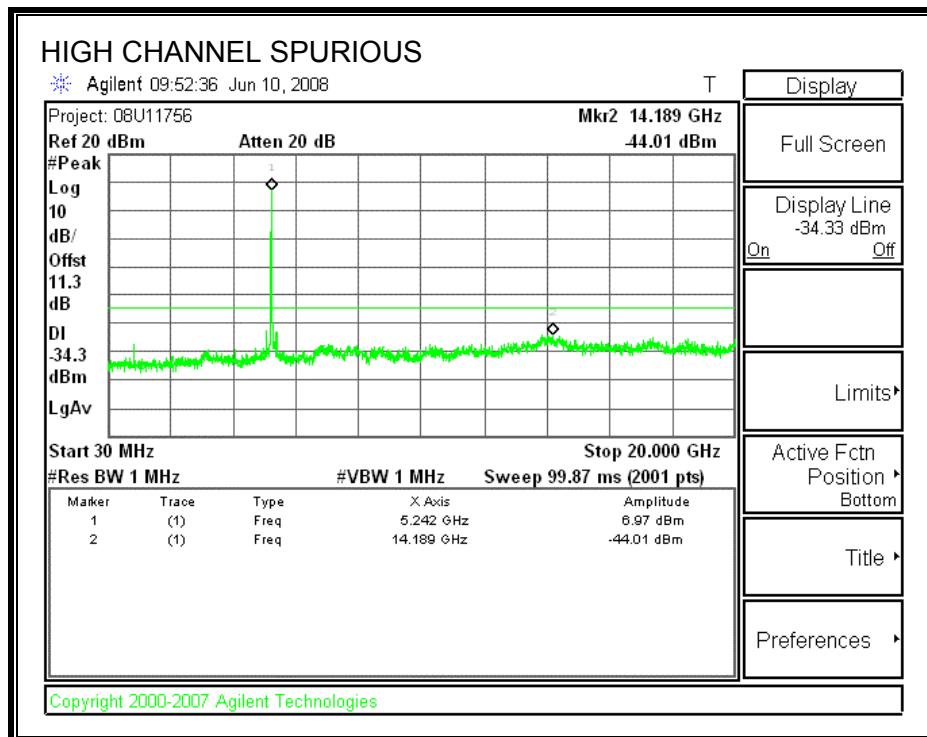
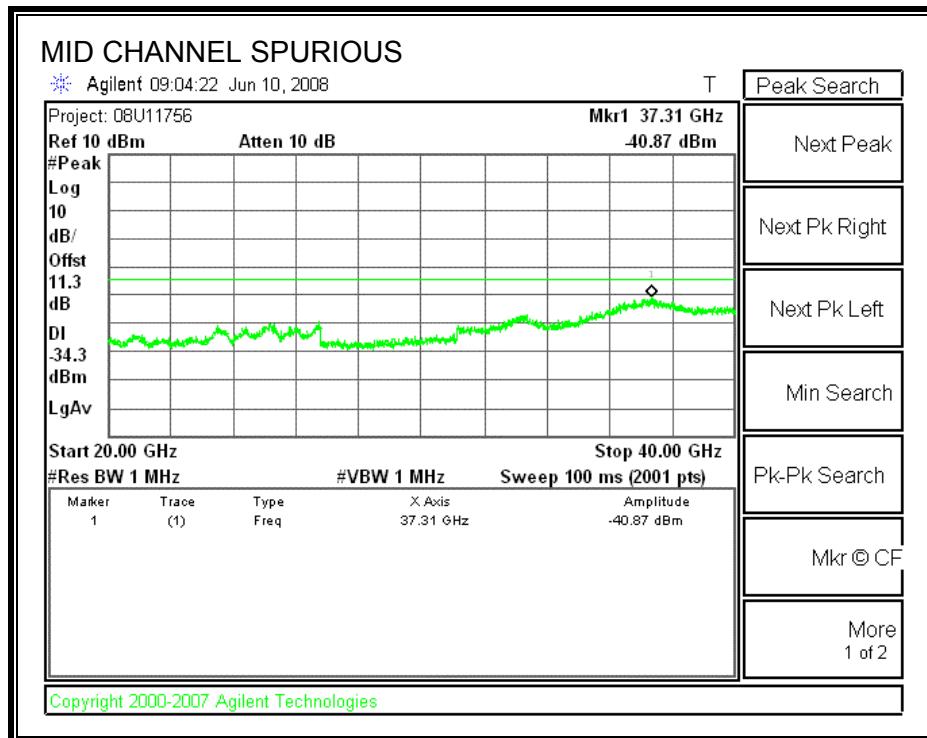
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to the average EIRP limit, adjusted for the maximum antenna gain. If necessary, additional average detection measurements are made.

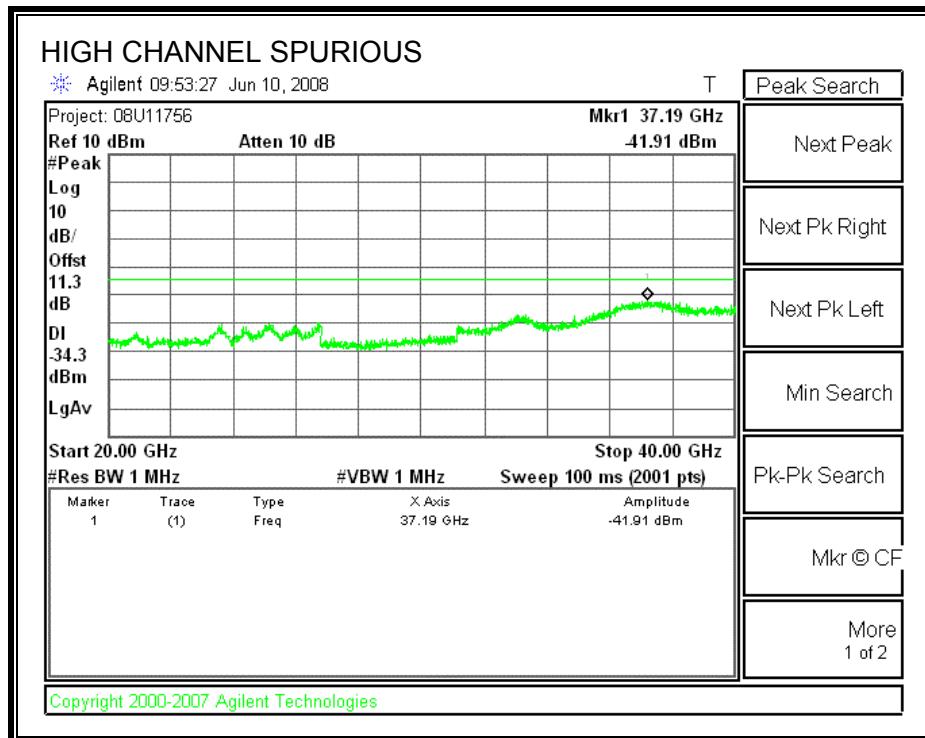
Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

RESULTS









7.2. 802.11n HT20 MODE

7.2.1. 26 dB and 99% BANDWIDTH

LIMITS

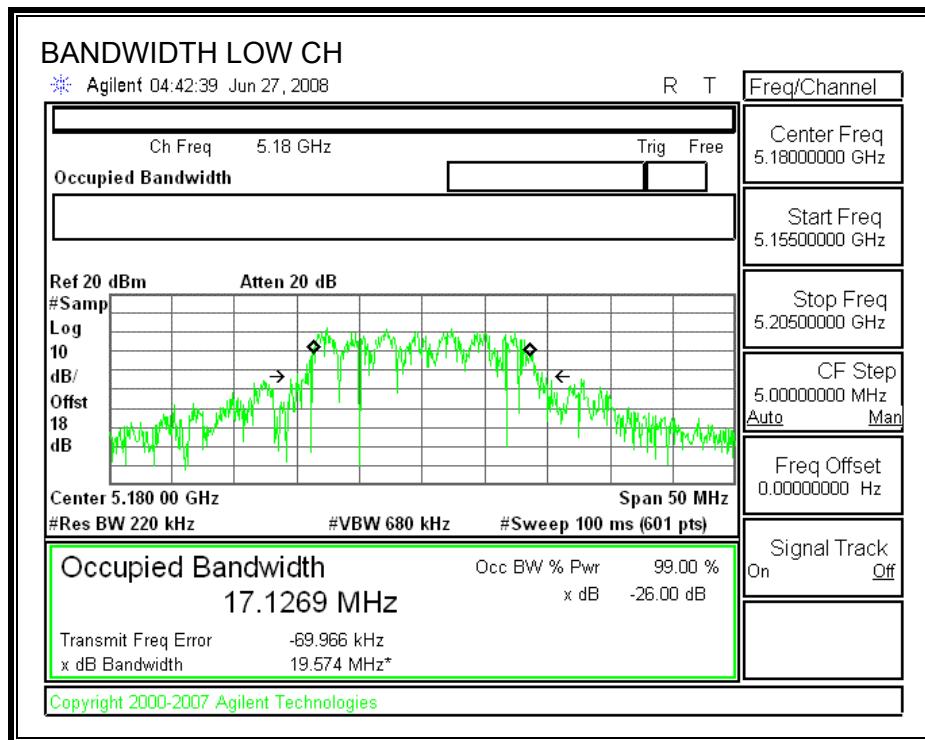
None; for reporting purposes only.

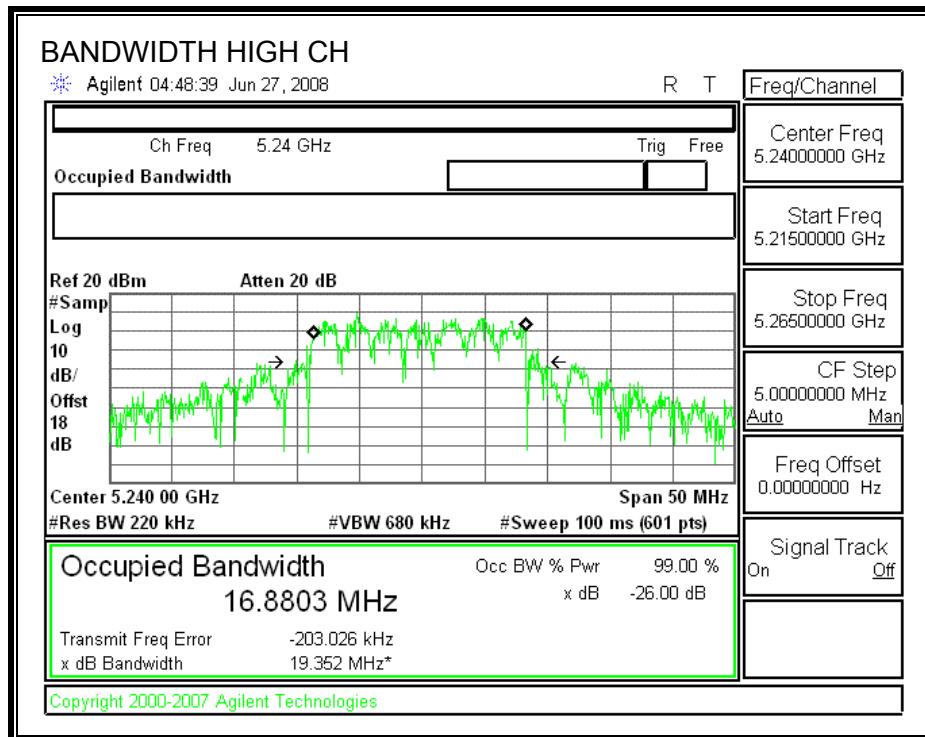
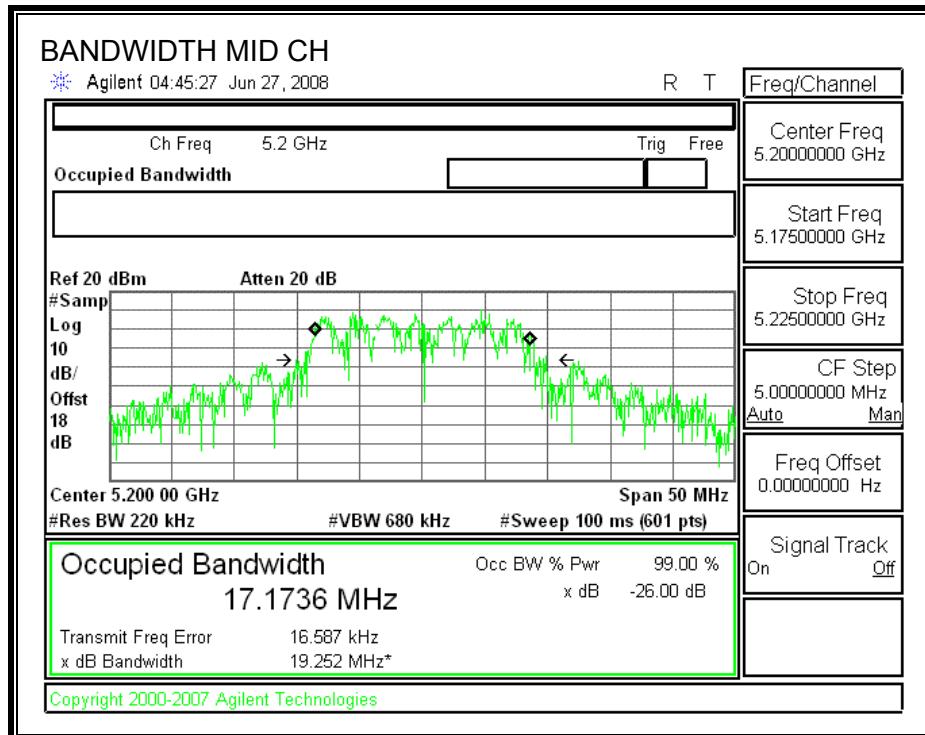
TEST PROCEDURE

The transmitter outputs are connected to the spectrum analyzer. The RBW is set to 1% to 3% of the measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	19.574	17.1269
Middle	5200	19.252	17.1736
High	5240	19.352	16.8803





7.2.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1); IC RSS-210 A9.2 (1)

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

- Composite Antenna Gains:
 - X9 PIFA (5.35 dBi) plus X9 Slot (0.63 dBi) = 6.61 dBi
 - Foxconn PIFA (2.99 dBi) plus X 9 Slot (4.11 dBi) = 6.60 dBi

The maximum antenna gain is 6.61 dBi

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

RESULTS

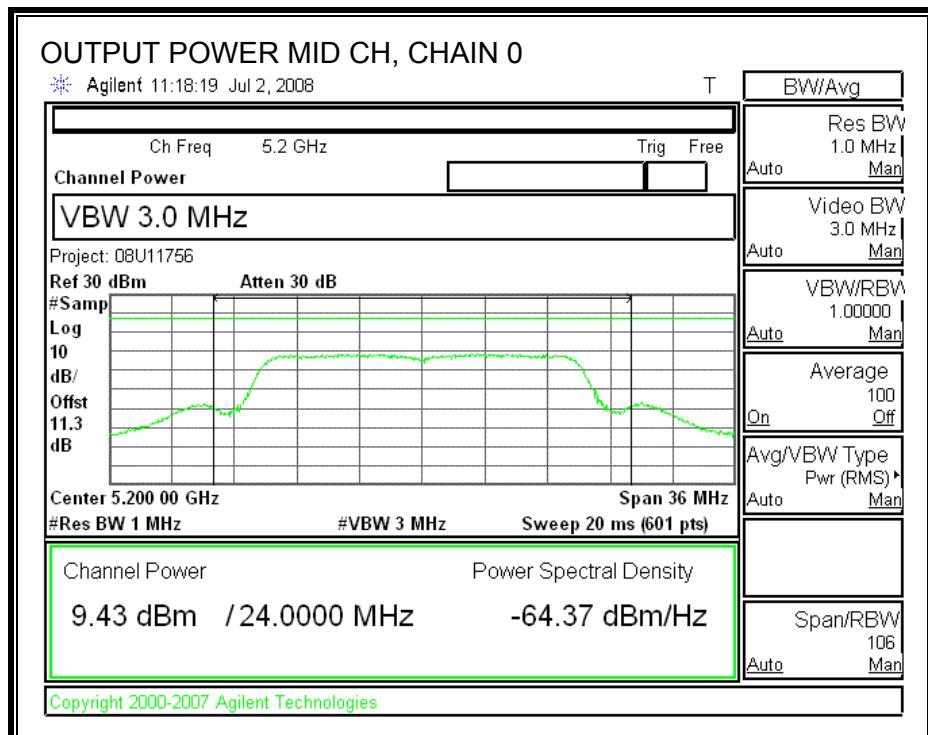
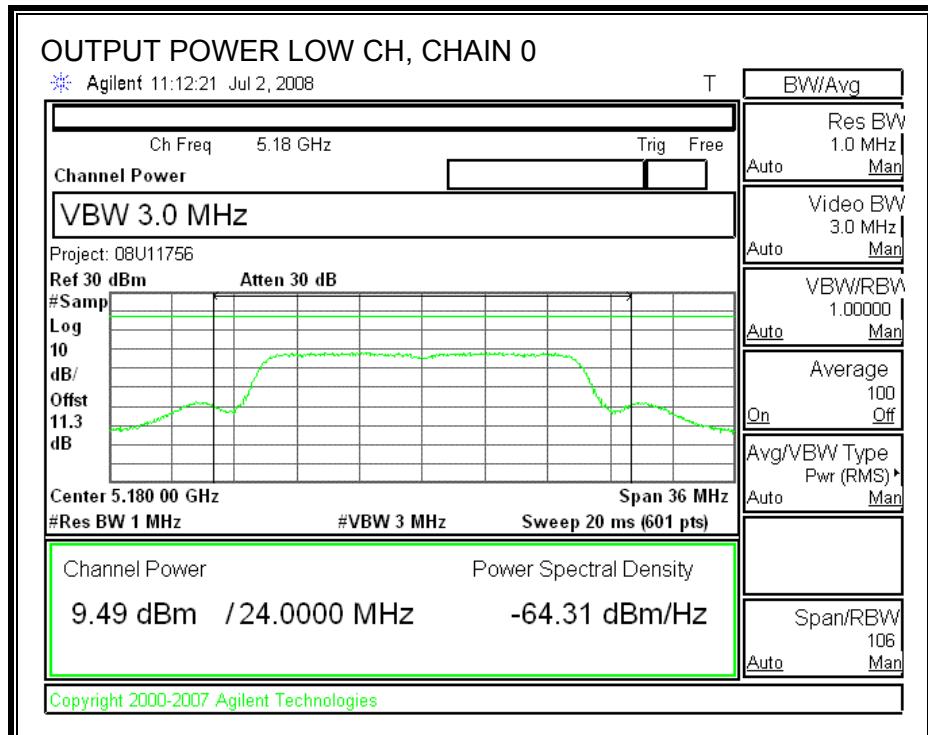
Limit

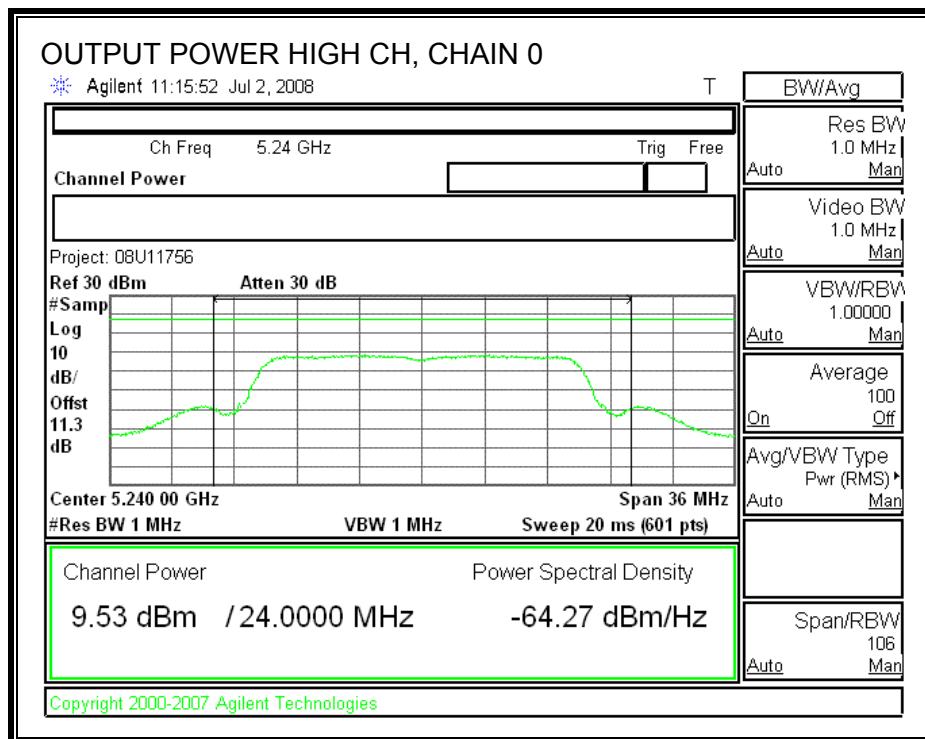
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5180	17	19.574	16.92	6.61	16.30
Mid	5200	17	19.252	16.84	6.61	16.23
High	5240	17	19.352	16.87	6.61	16.26

Individual Chain Results

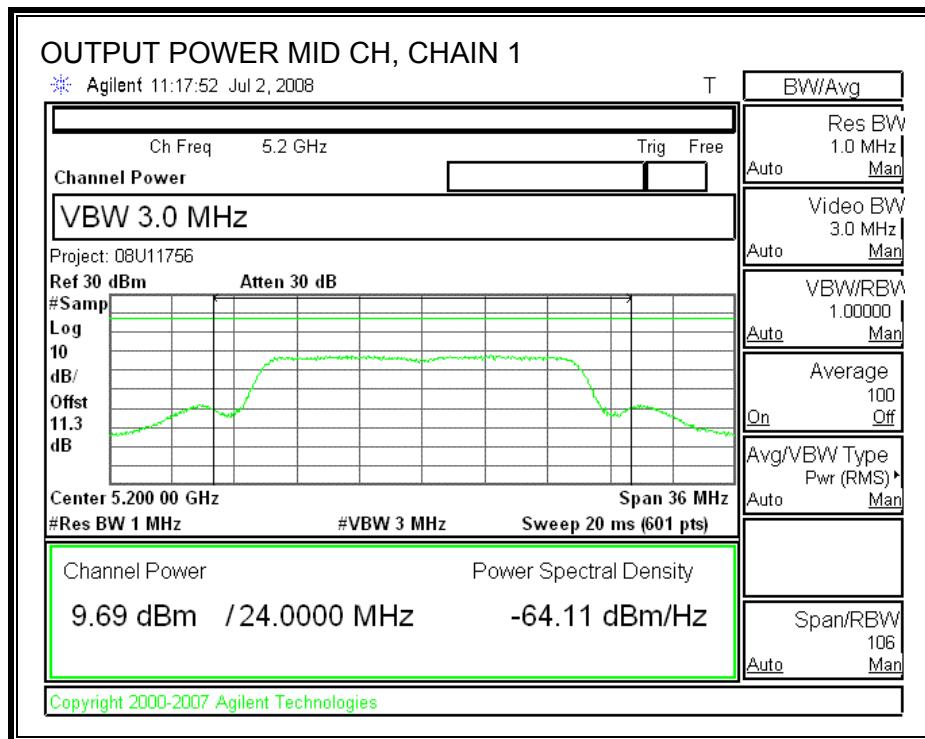
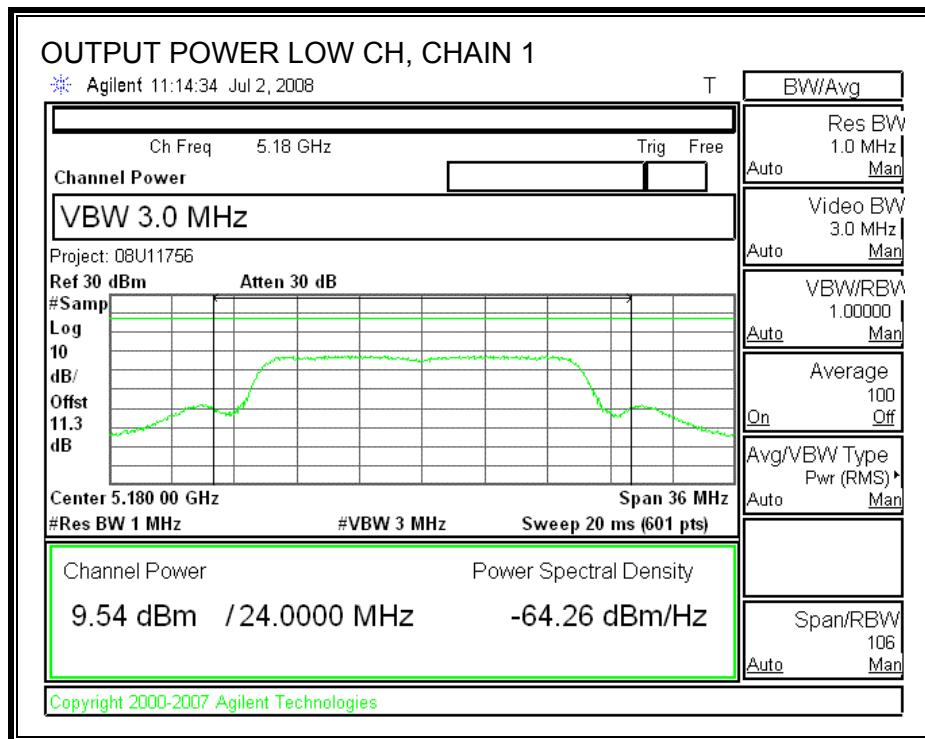
Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	5180	9.49	9.54	12.53	16.30	-3.78
Mid	5200	9.43	9.69	12.57	16.23	-3.66
High	5240	9.53	9.57	12.56	16.26	-3.69

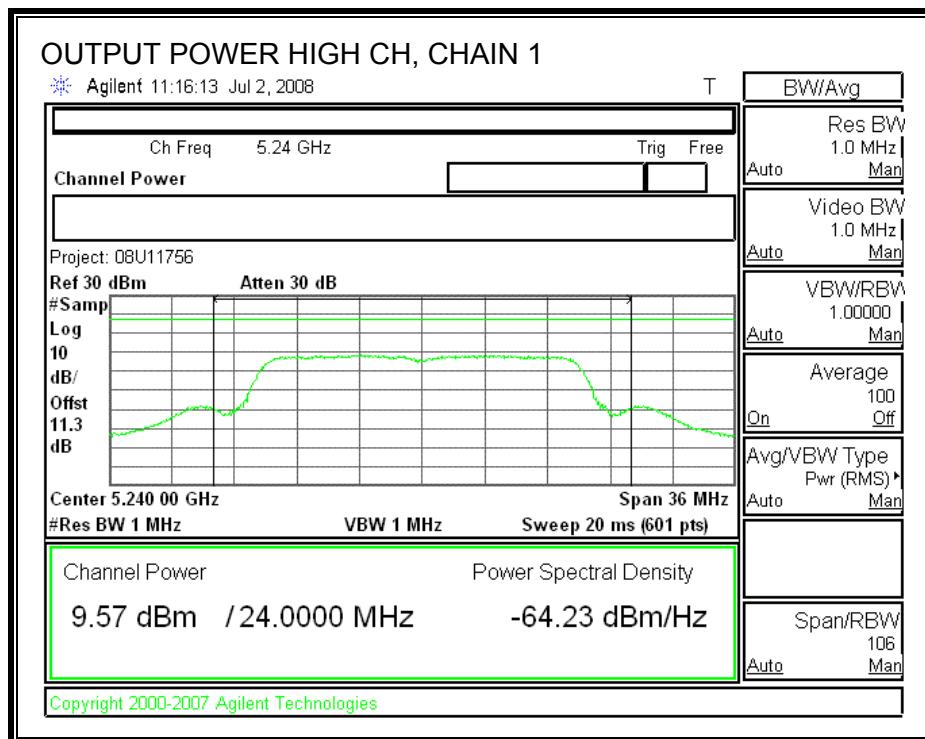
CHAIN 0 OUTPUT POWER





CHAIN 1 OUTPUT POWER





7.2.3. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (1); IC RSS-210 A9.2 (1)

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

- Composite Antenna Gains:

- X9 PIFA (5.35 dBi) plus X9 Slot (0.63 dBi) = 6.61 dBi
- Foxcom PIFA (2.99 dBi) plus X 9 Slot (4.11 dBi) = 6.60 dBi

The maximum antenna gain is 6.61 dBi, therefore the limit is 3.39 dBm.

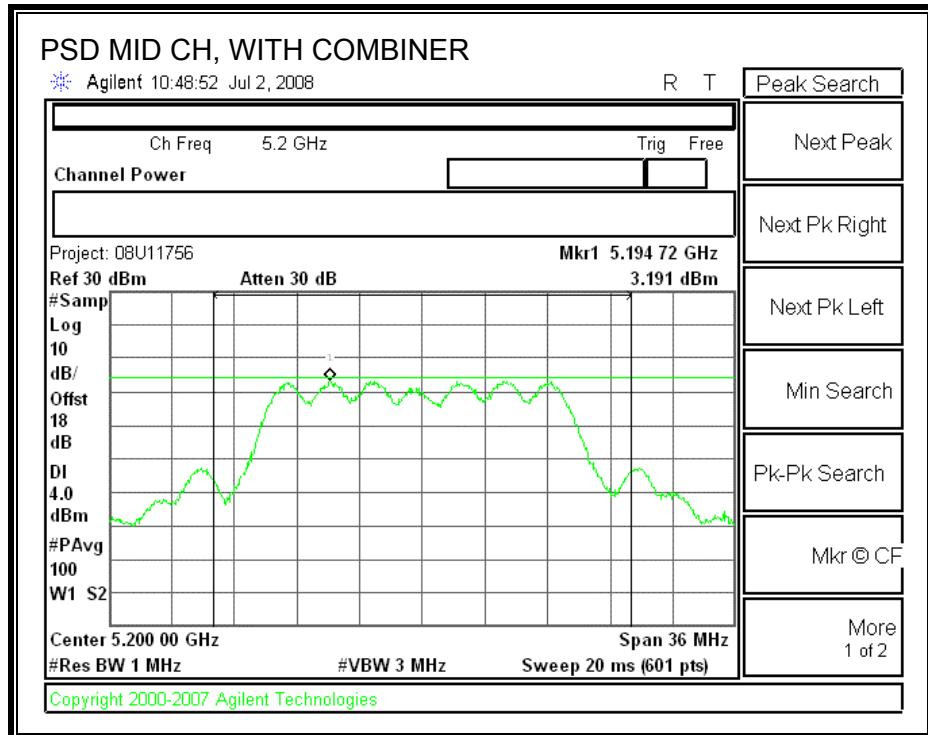
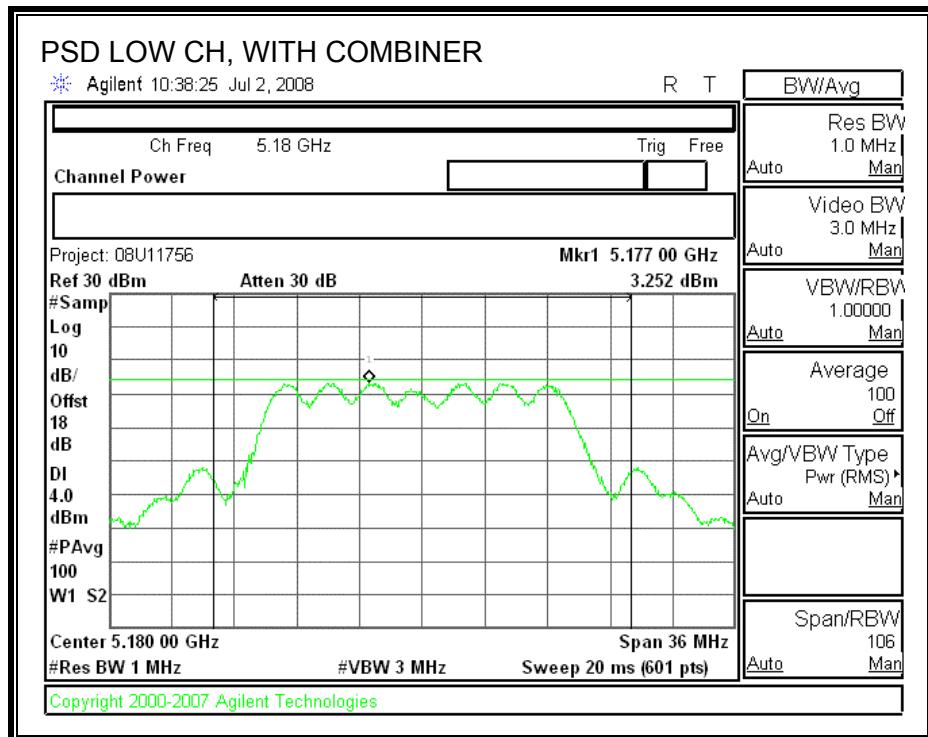
TEST PROCEDURE

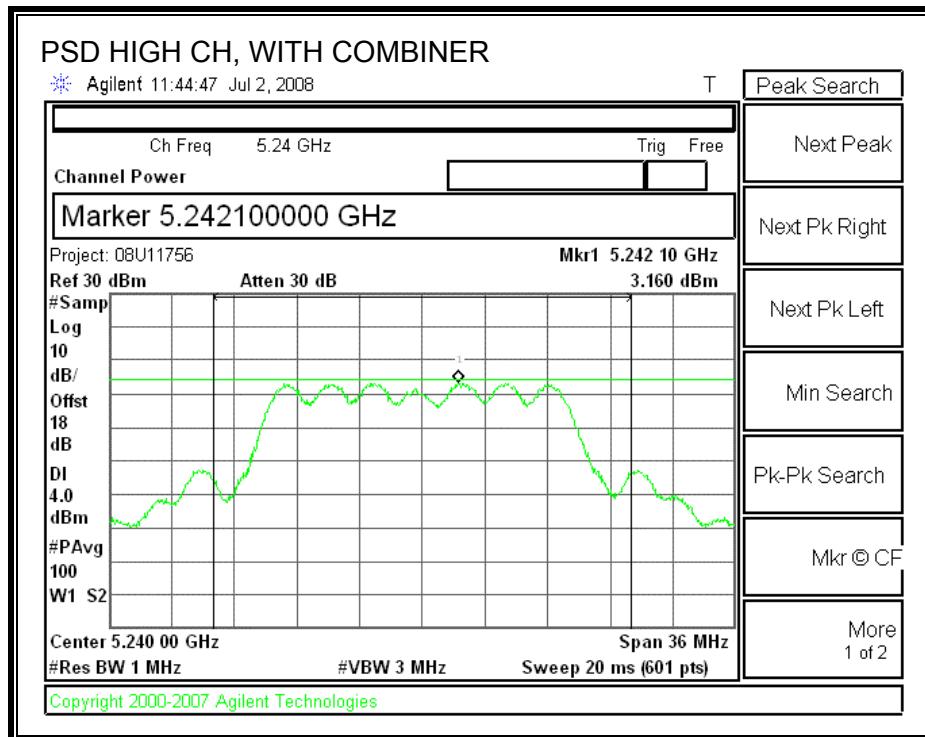
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

Channel	Frequency (MHz)	PPSD With Combiner (dBm)	Limit (dBm)	Margin (dB)
Low	5180	3.252	3.39	-0.14
Middle	5200	3.191	3.39	-0.20
High	5240	3.160	3.39	-0.23

POWER SPECTRAL DENSITY WITH COMBINER





7.2.4. 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

The transmitter outputs are connected to the spectrum analyzer.

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

RESULTS

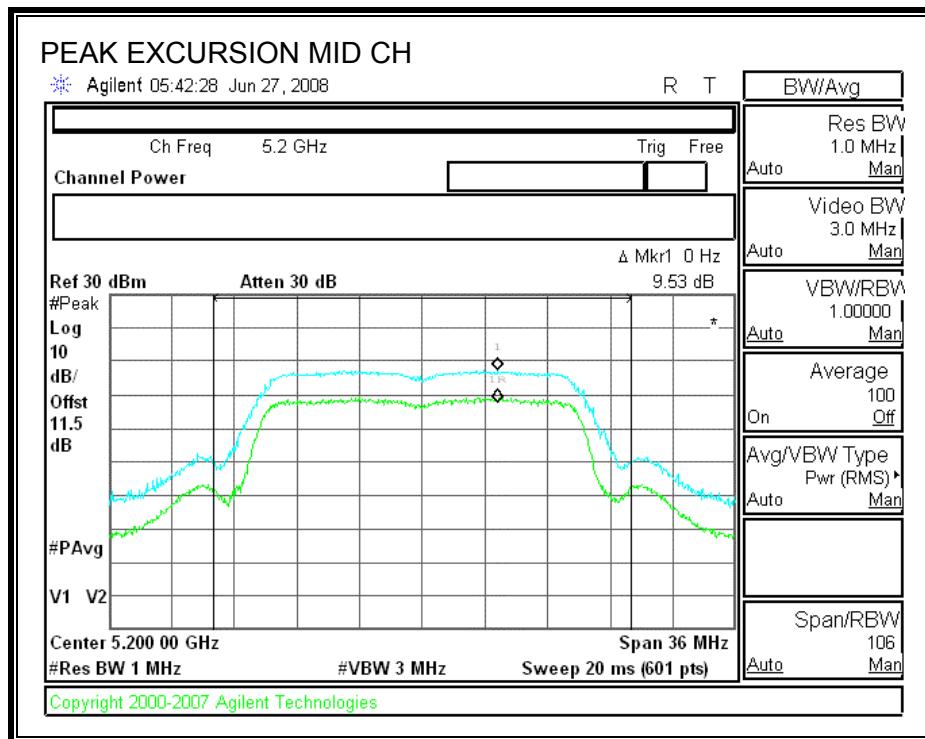
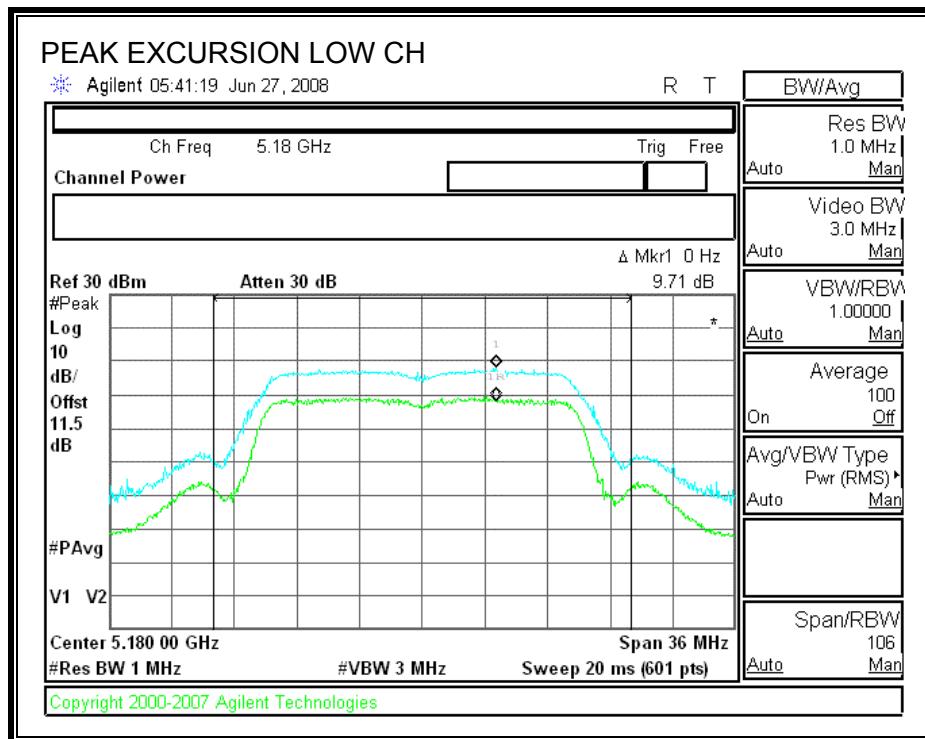
Chain 0

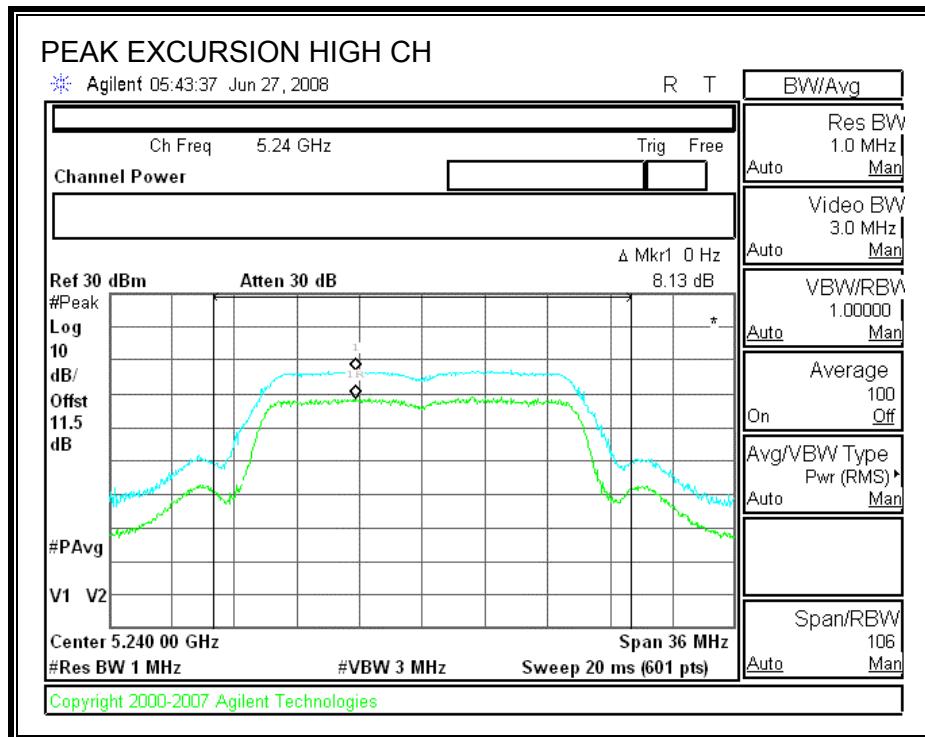
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	9.71	13	-3.29
Middle	5200	9.53	13	-3.47
High	5240	8.13	13	-4.87

Chain 1

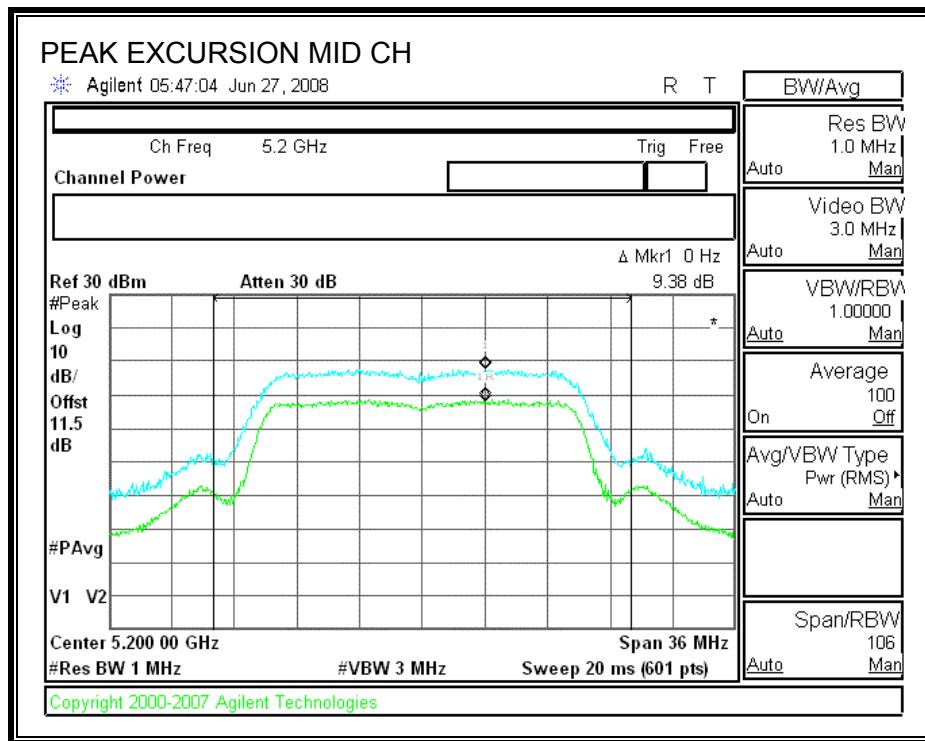
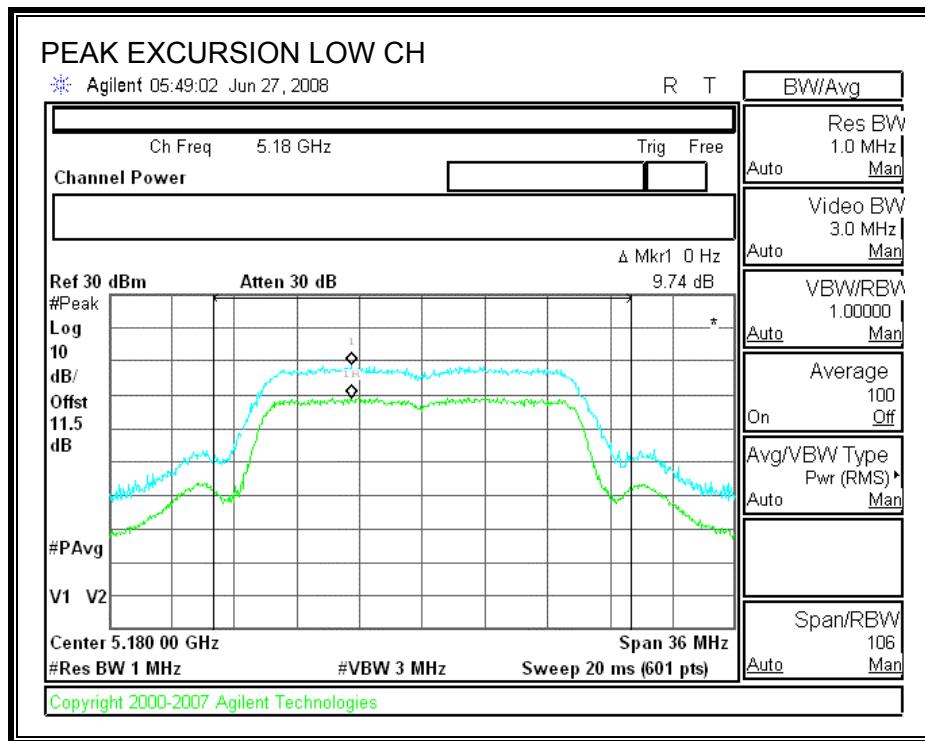
Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5180	9.74	13	-3.26
Middle	5200	9.38	13	-3.62
High	5240	9.98	13	-3.02

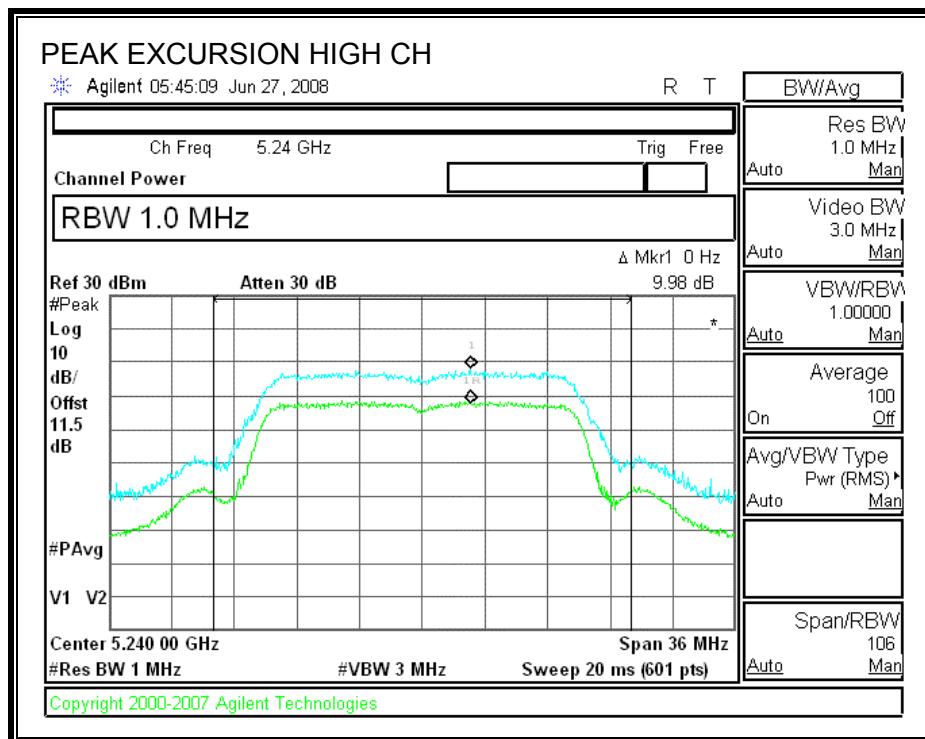
PEAK EXCURSION (CHAIN 0)





PEAK EXCURSION (CHAIN 1)





7.2.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (1); IC RSS-210 A9.3 (1)

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm / MHz.

Limit line = -27 - EUT Antenna Gain

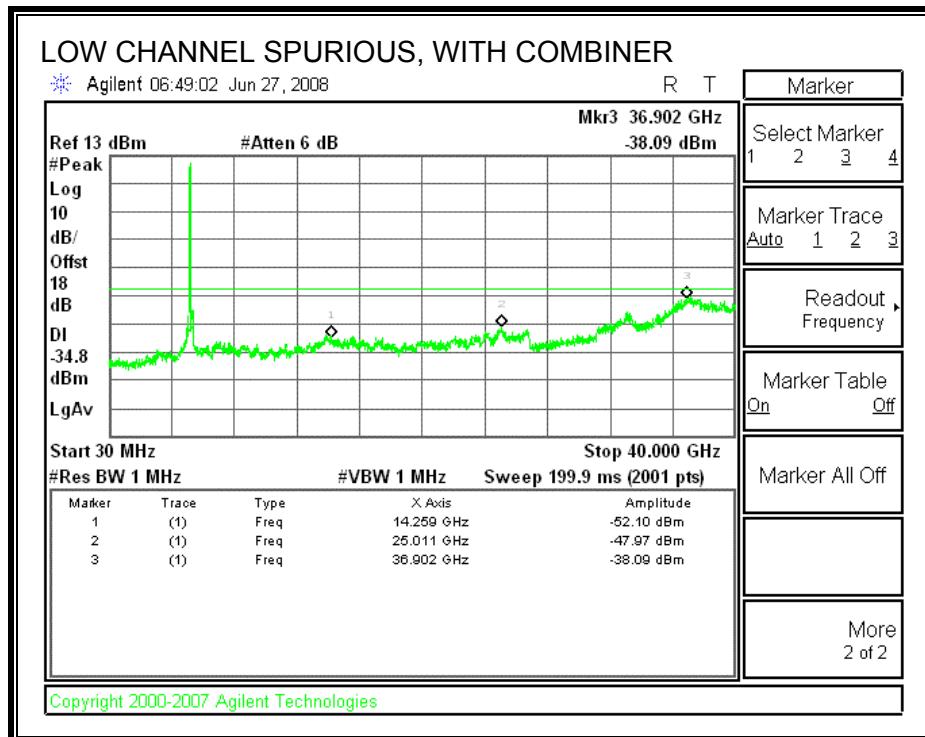
TEST PROCEDURE

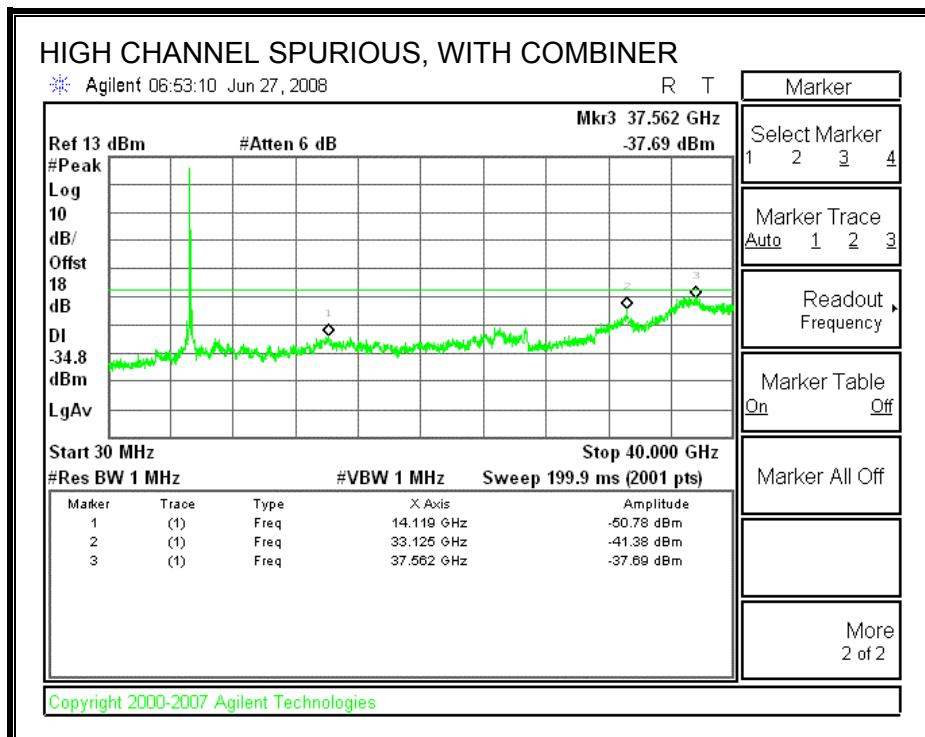
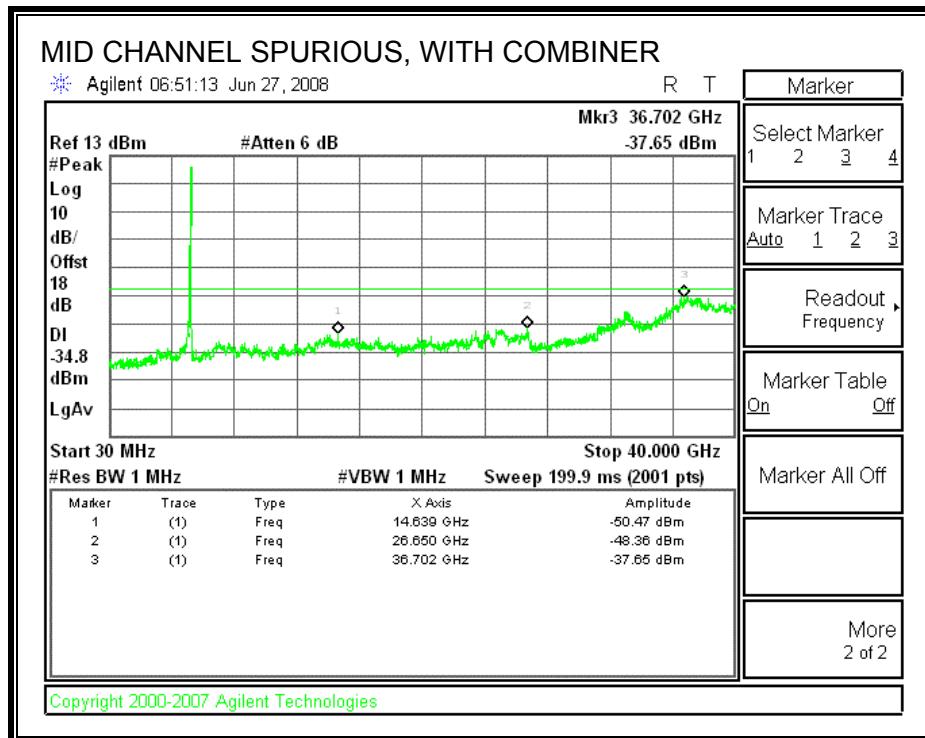
Conducted RF measurements of the transmitter output are made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to the average EIRP limit, adjusted for the maximum antenna gain. If necessary, additional average detection measurements are made.

Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

RESULTS





7.3. 802.11n HT40 SISO MODE

7.3.1. 26 dB and 99% BANDWIDTH

LIMITS

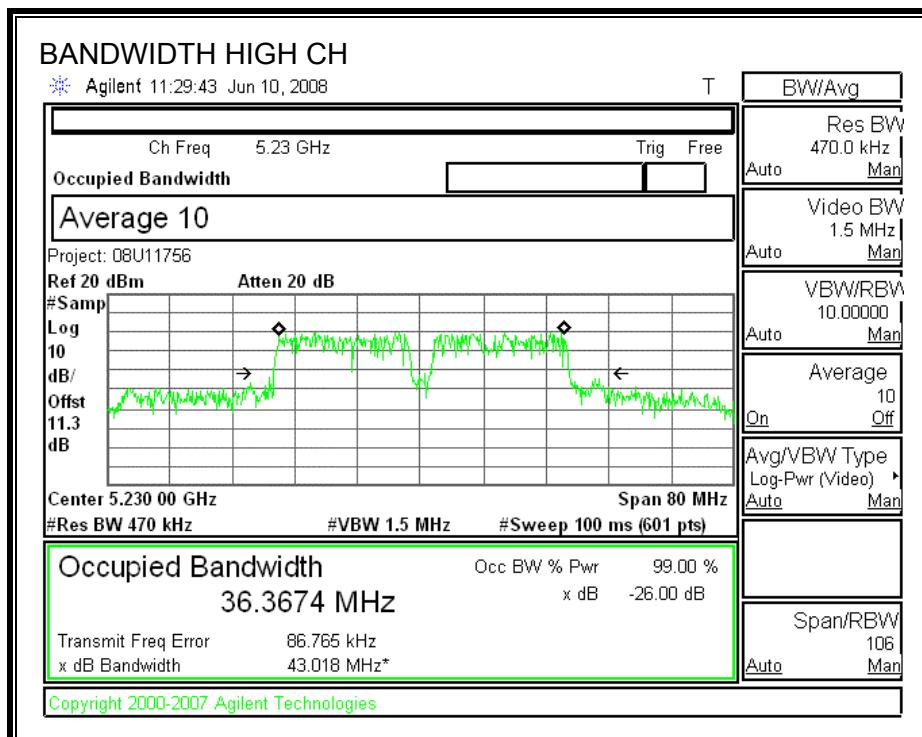
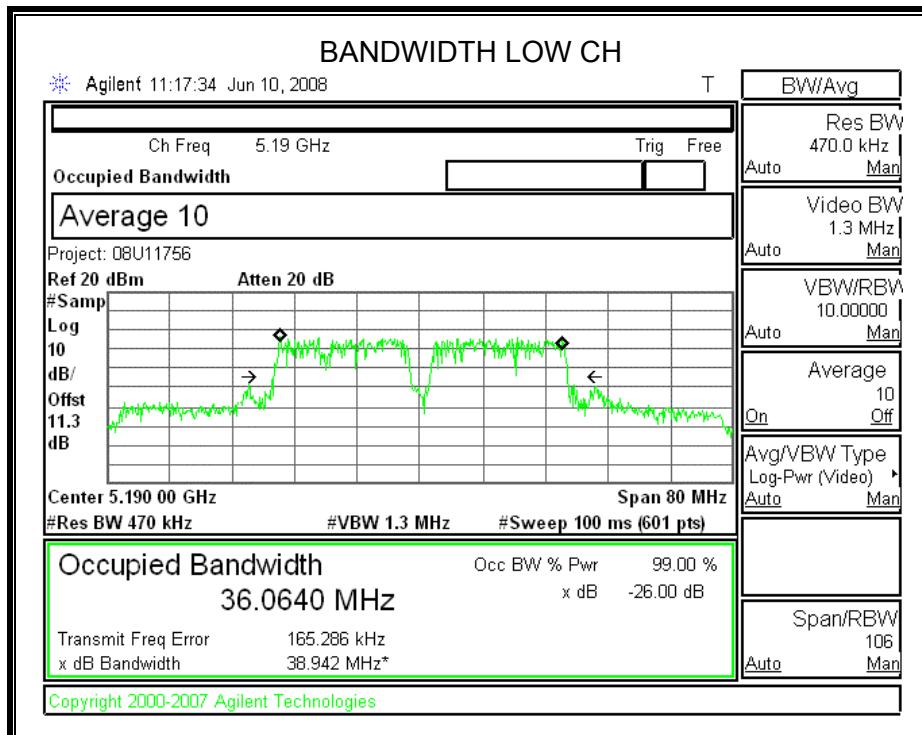
None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	38.942	36.064
High	5230	43.018	36.367



7.3.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1) & IC RSS-210 A9.2 (1)

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

The maximum antenna gain is 5.35 dBi

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

RESULTS

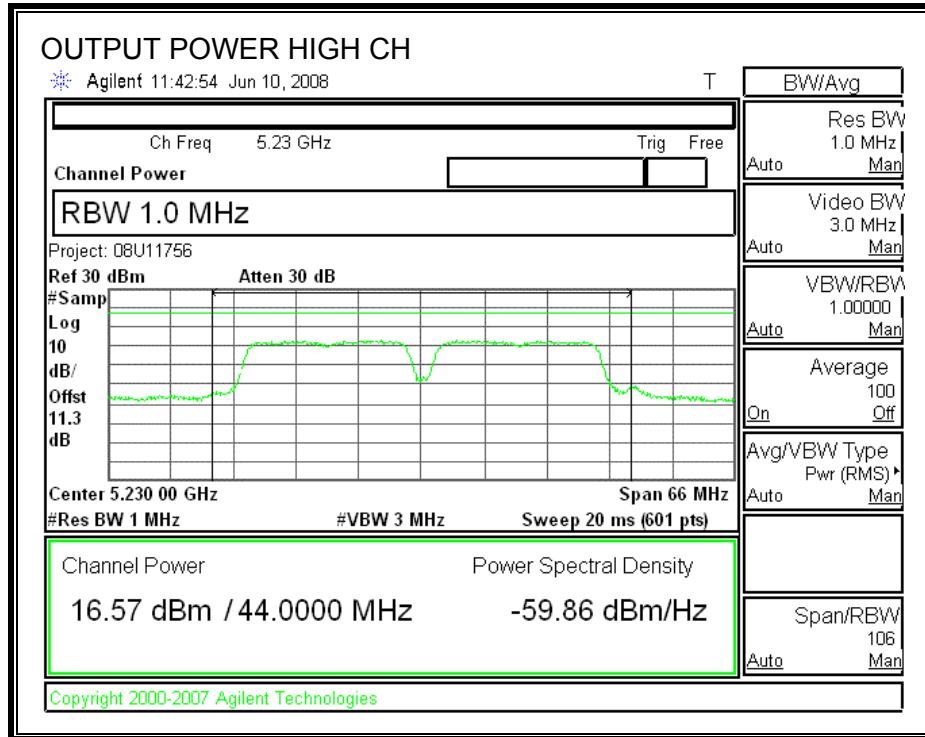
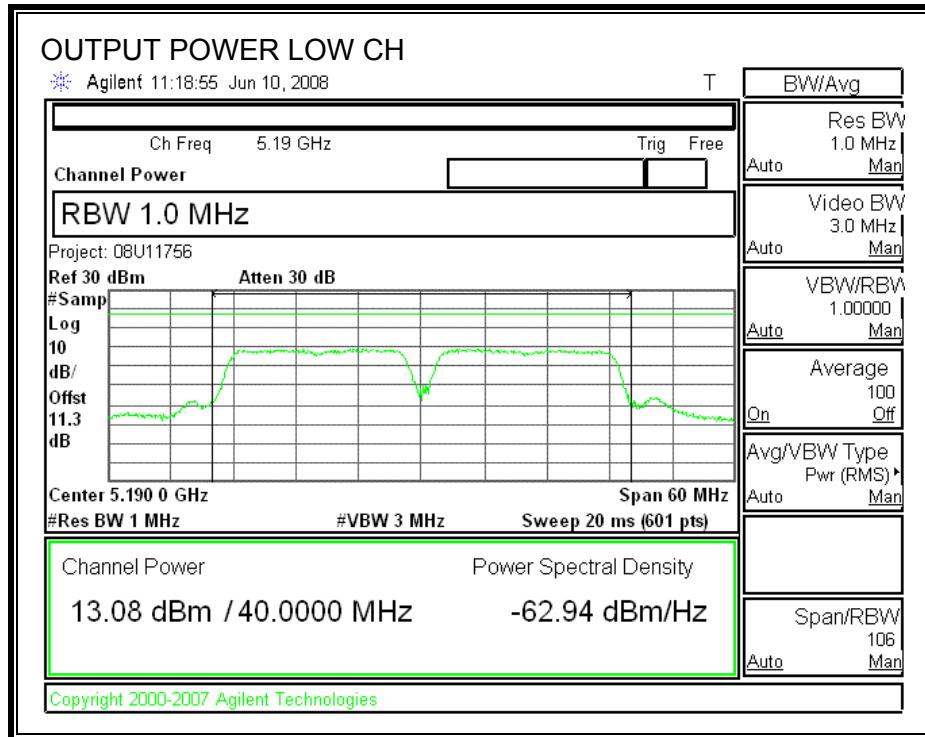
Limit

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5190	17	38.942	19.90	5.35	17.00
High	5230	17	43.018	20.34	5.35	17.00

Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5190	13.08	17.00	-3.92
High	5230	16.57	17.00	-0.43

OUTPUT POWER



7.3.3. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (1) & IC RSS-210 A9.2 (1)

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

The maximum antenna gain is 5.35 dBi, therefore the limit is 4 dBm.

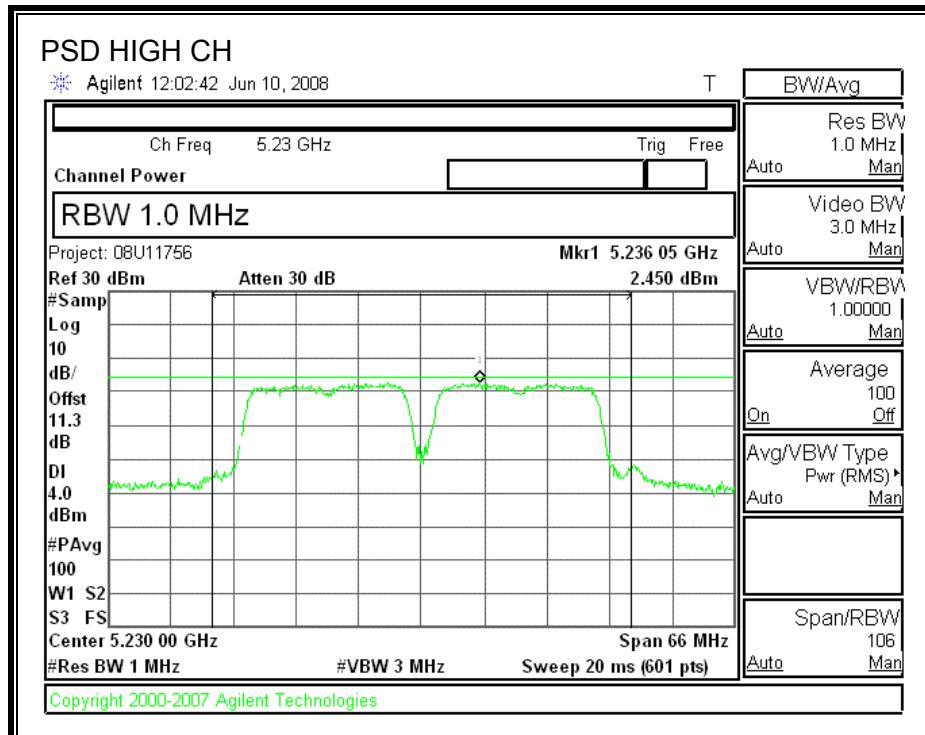
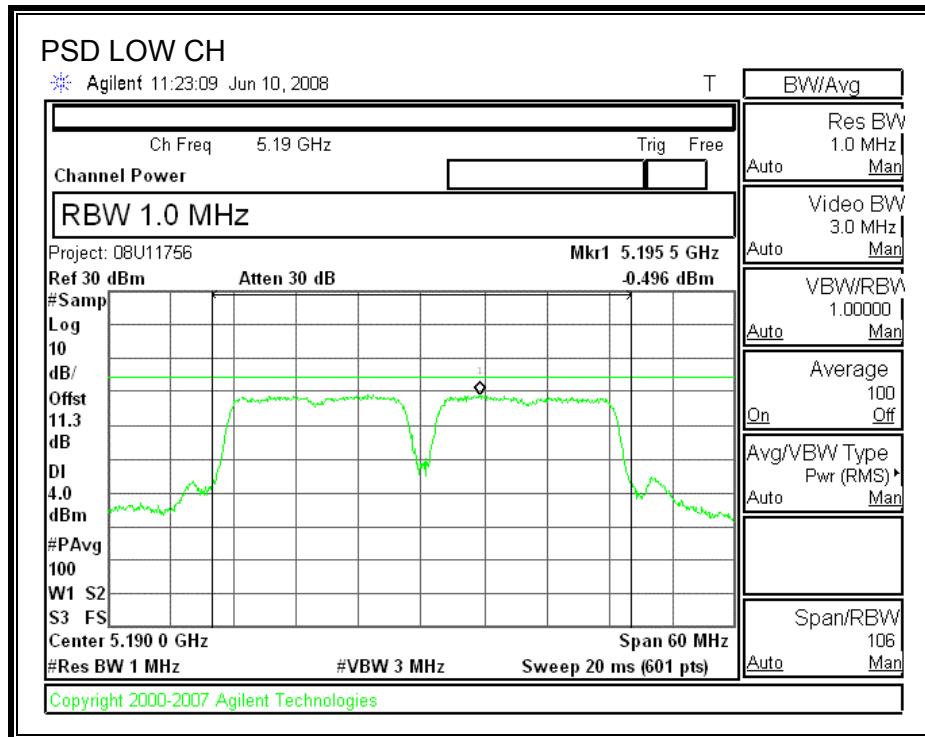
TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5190	-0.496	4.00	-4.50
High	5230	2.450	4.00	-1.55

POWER SPECTRAL DENSITY



7.3.4. 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

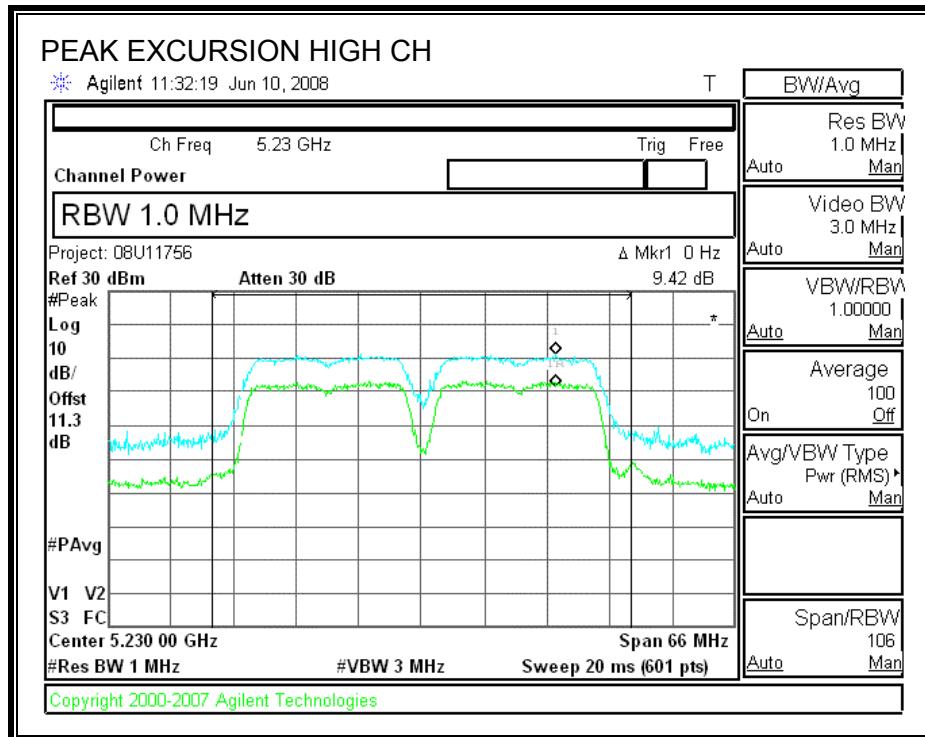
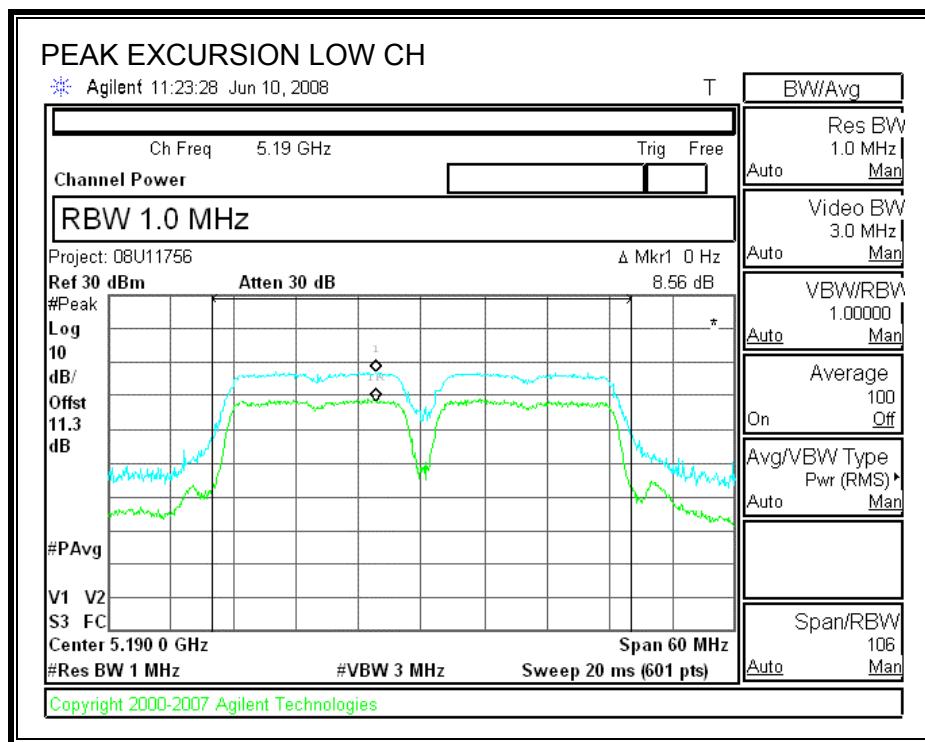
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

RESULTS

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	8.56	13	-4.44
High	5230	9.42	13	-3.58

PEAK EXCURSION



7.3.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (1) & IC RSS-210 A9.3 (1)

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm / MHz.

Limit line = -27 - EUT Antenna Gain

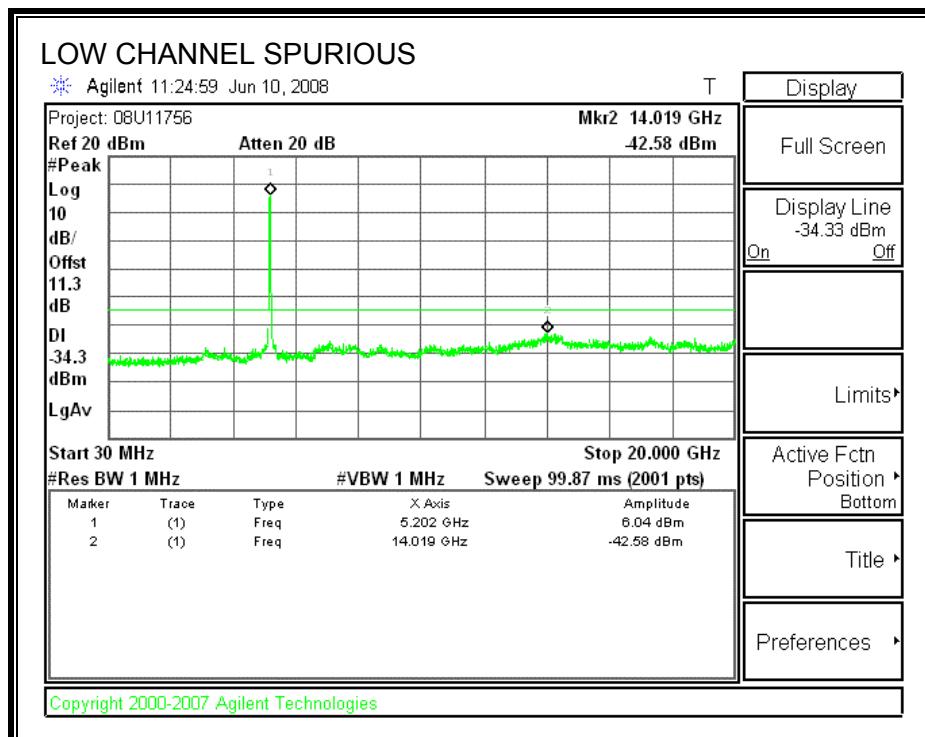
TEST PROCEDURE

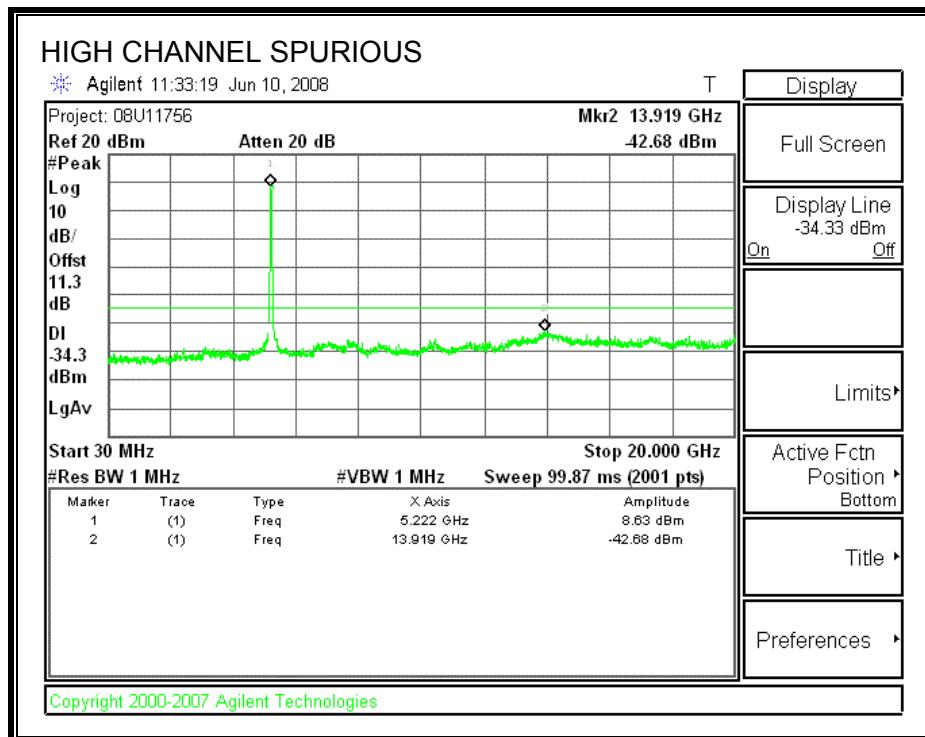
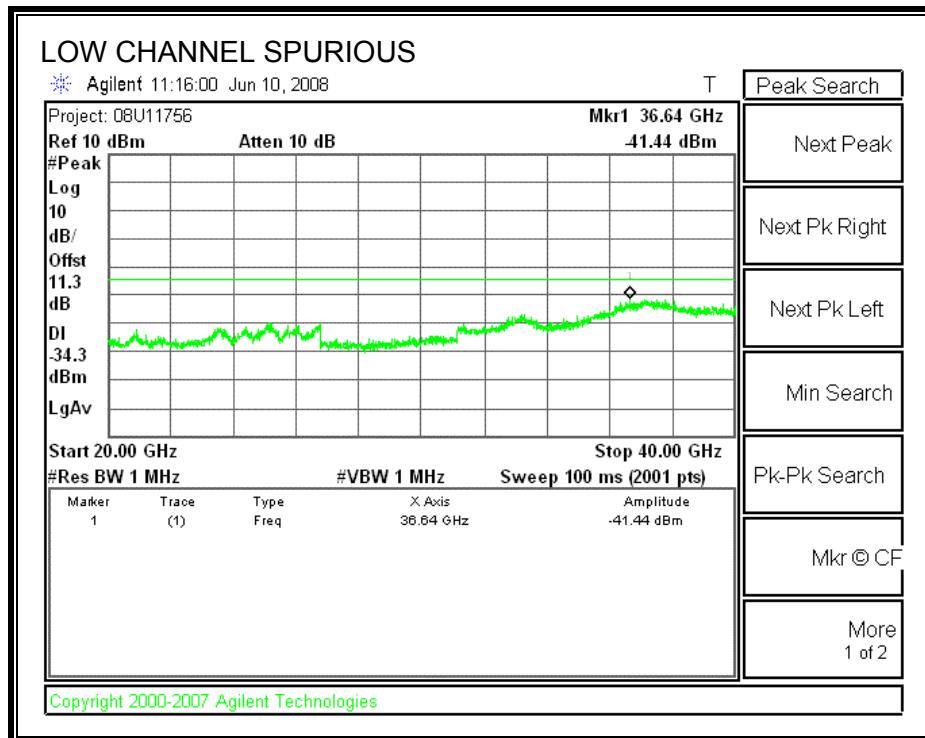
Conducted RF measurements of the transmitter output are made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

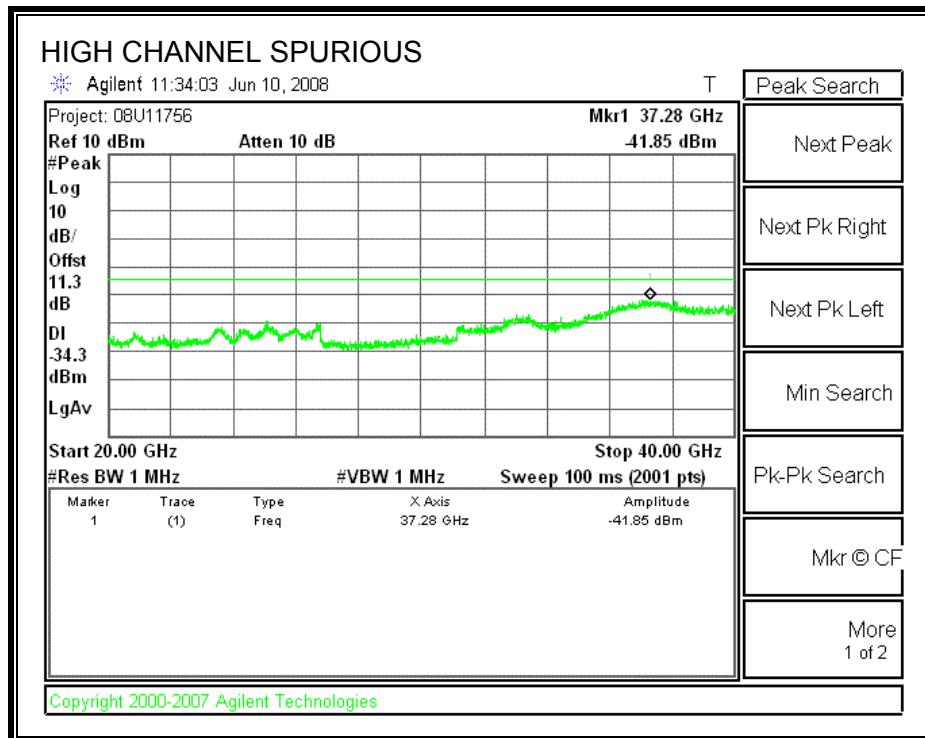
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to the average EIRP limit, adjusted for the maximum antenna gain. If necessary, additional average detection measurements are made.

Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

RESULTS







7.4. 802.11n HT40 MODE

7.4.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

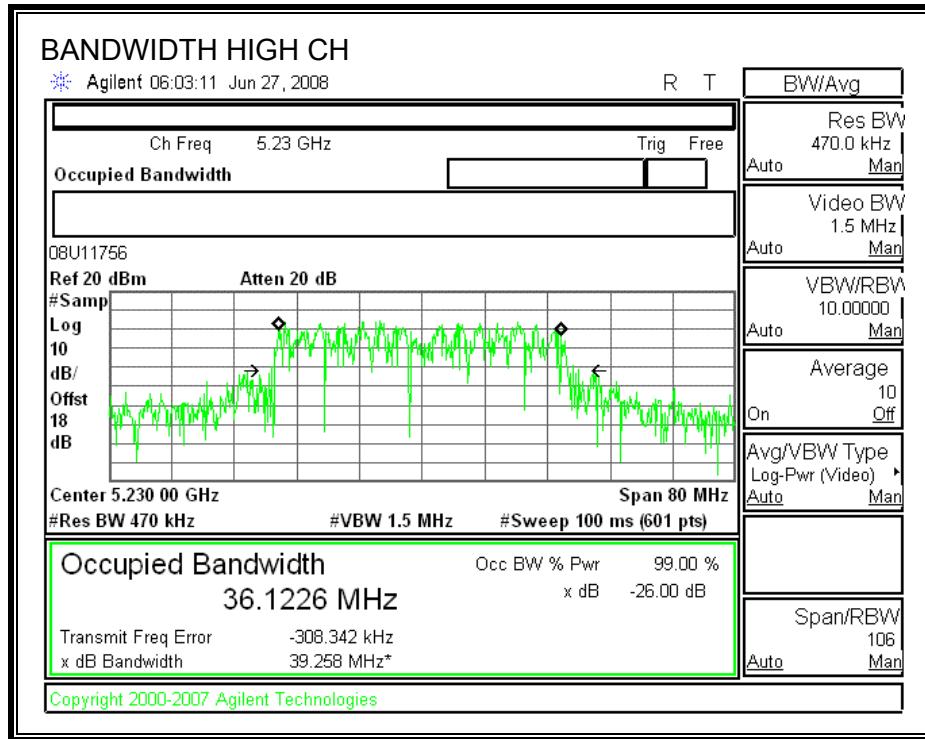
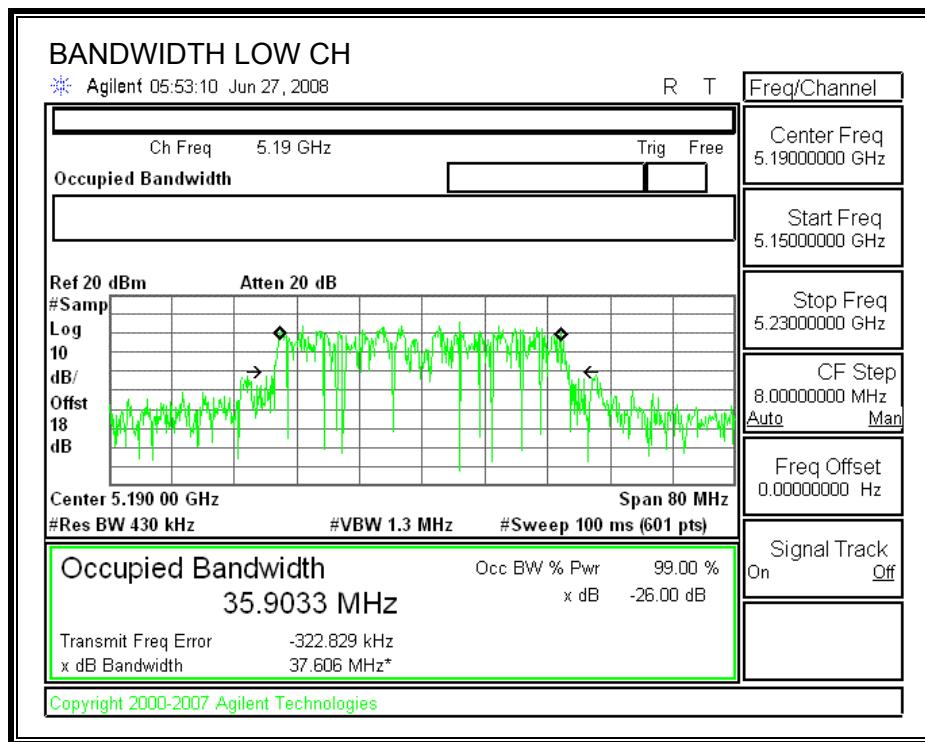
TEST PROCEDURE

The transmitter outputs are connected to the spectrum analyzer via a combiner. The RBW is set to 1% to 3% of the measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	37.606	35.9033
High	5230	39.258	36.1226

26 dB and 99% BANDWIDTH



7.4.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (1); IC RSS-210 A9.2 (1)

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

- Composite Antenna Gains:
 - X9 PIFA (5.35 dBi) plus X9 Slot (0.63 dBi) = 6.61 dBi
 - Foxconn PIFA (2.99 dBi) plus X 9 Slot (4.11 dBi) = 6.60 dBi

The maximum antenna gain is 6.61 dBi

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

RESULTS

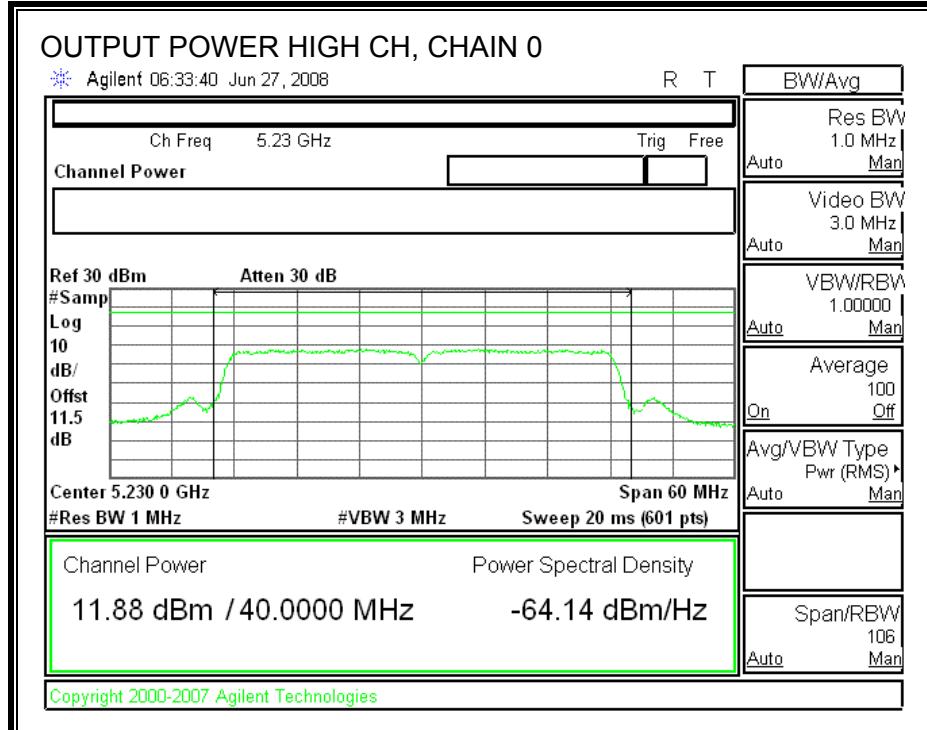
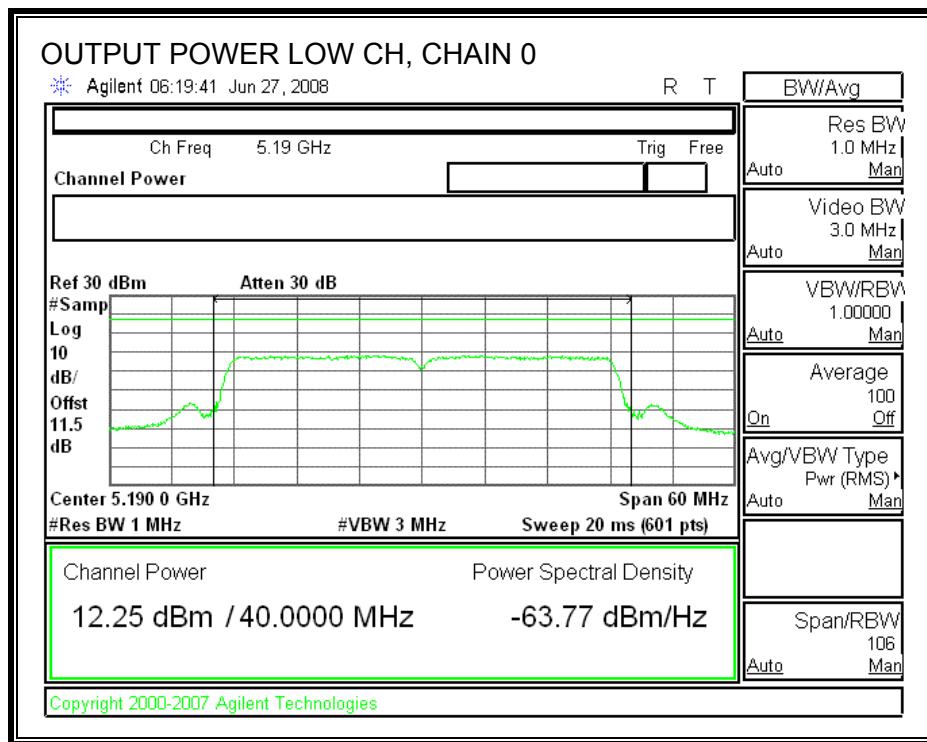
Limit

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	4 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5190	17	37.606	19.75	6.61	16.39
High	5230	17	39.258	19.94	6.61	16.39

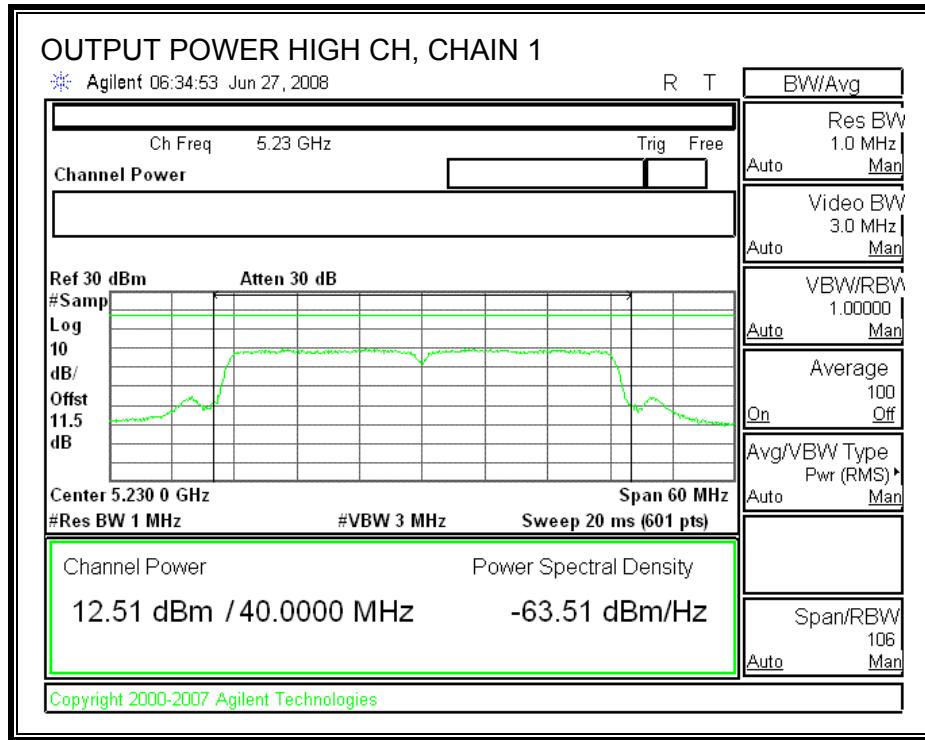
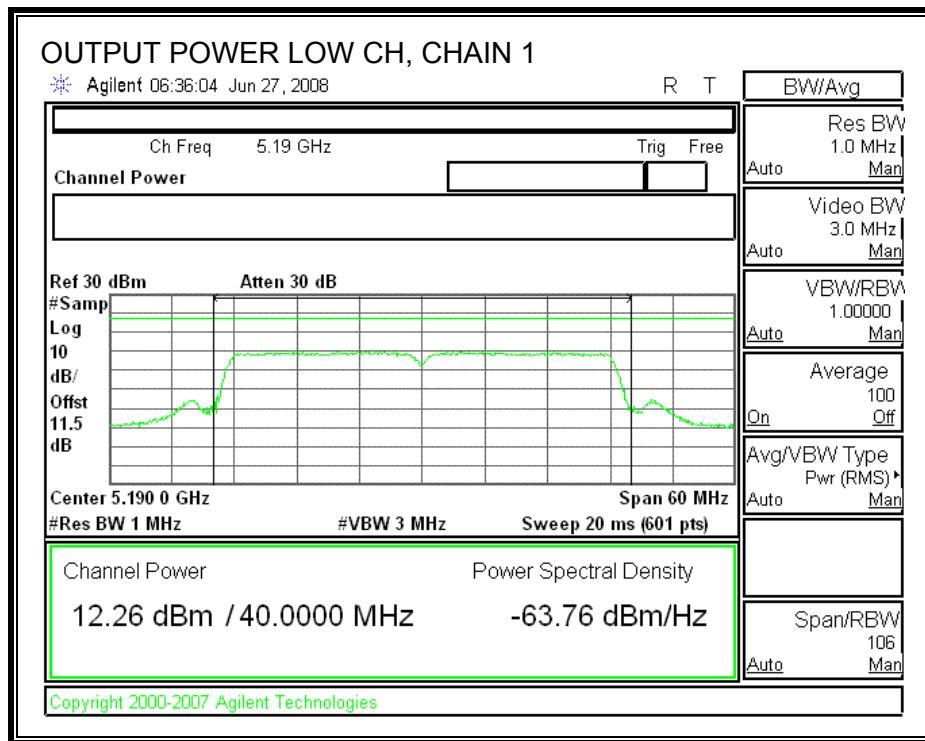
Individual Chain Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	5190	12.25	12.26	15.27	16.39	-1.12
High	5230	11.88	12.51	15.22	16.39	-1.17

CHAIN 0 OUTPUT POWER



CHAIN 1 OUTPUT POWER



7.4.3. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (1)

IC RSS-210 A9.2 (1)

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

- Composite Antenna Gains:

- X9 PIFA (5.35 dBi) plus X9 Slot (0.63 dBi) = 6.61 dBi
- Foxcom PIFA (2.99 dBi) plus X 9 Slot (4.11 dBi) = 6.60 dBi

The maximum antenna gain is 6.61 dBi, therefore the limit is 3.39 dBm.

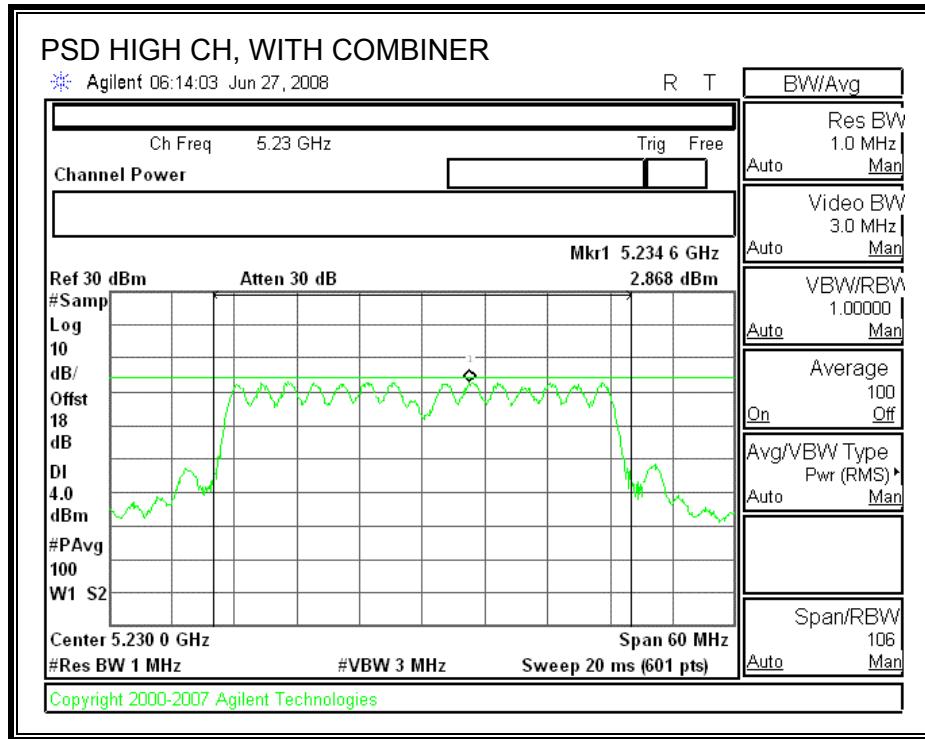
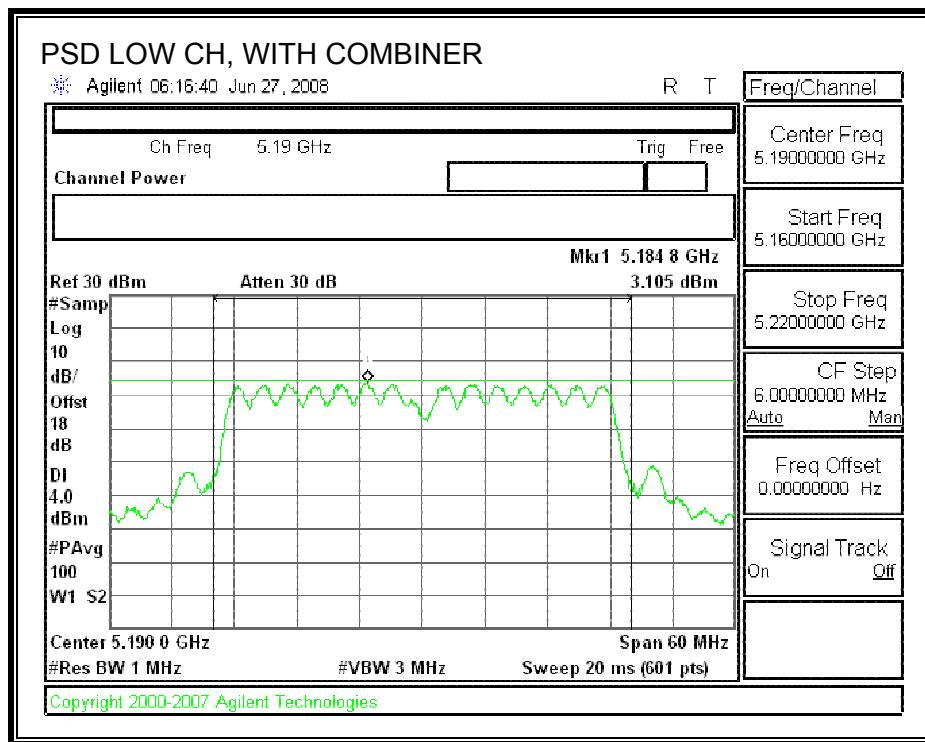
TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

Channel	Frequency (MHz)	PPSD With Combiner (dBm)	Limit (dBm)	Margin (dB)
Low	5190	3.105	3.39	-0.28
High	5230	2.868	3.39	-0.52

POWER SPECTRAL DENSITY WITH COMBINER



7.4.4. 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.

TEST PROCEDURE

The transmitter outputs are connected to the spectrum analyzer via a combiner.

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

RESULTS

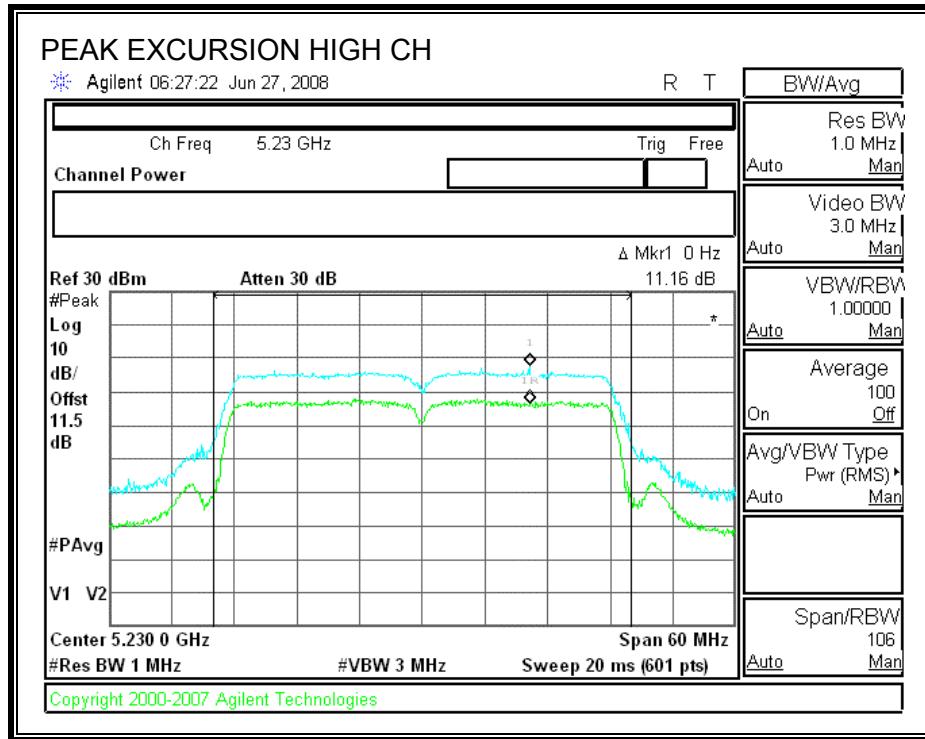
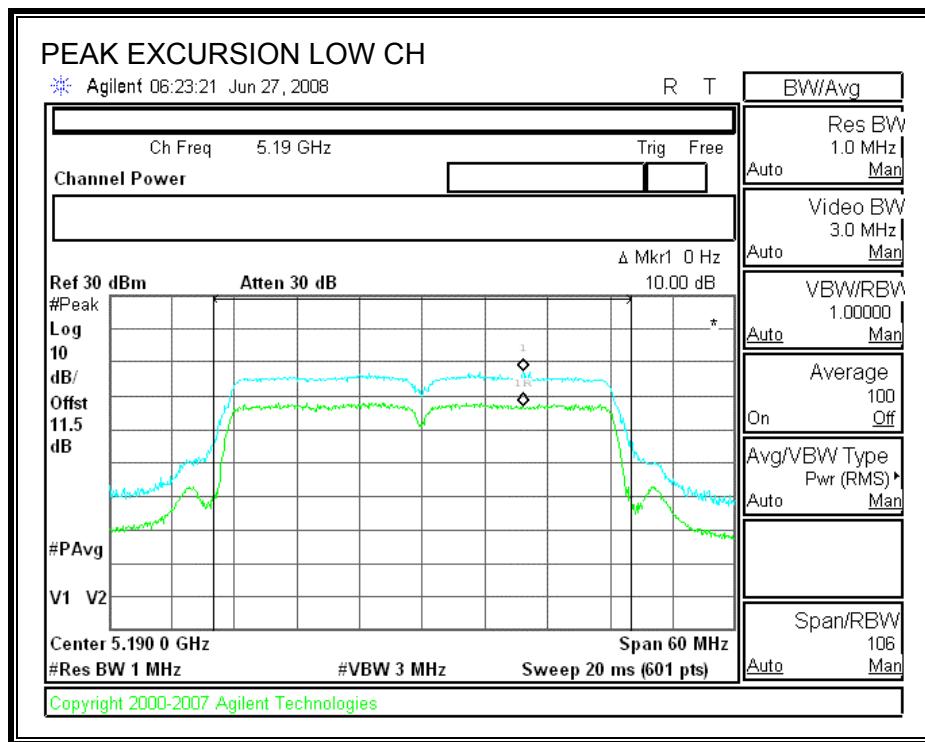
CHAIN 0

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	10.00	13	-3.00
High	5230	11.60	13	-1.40

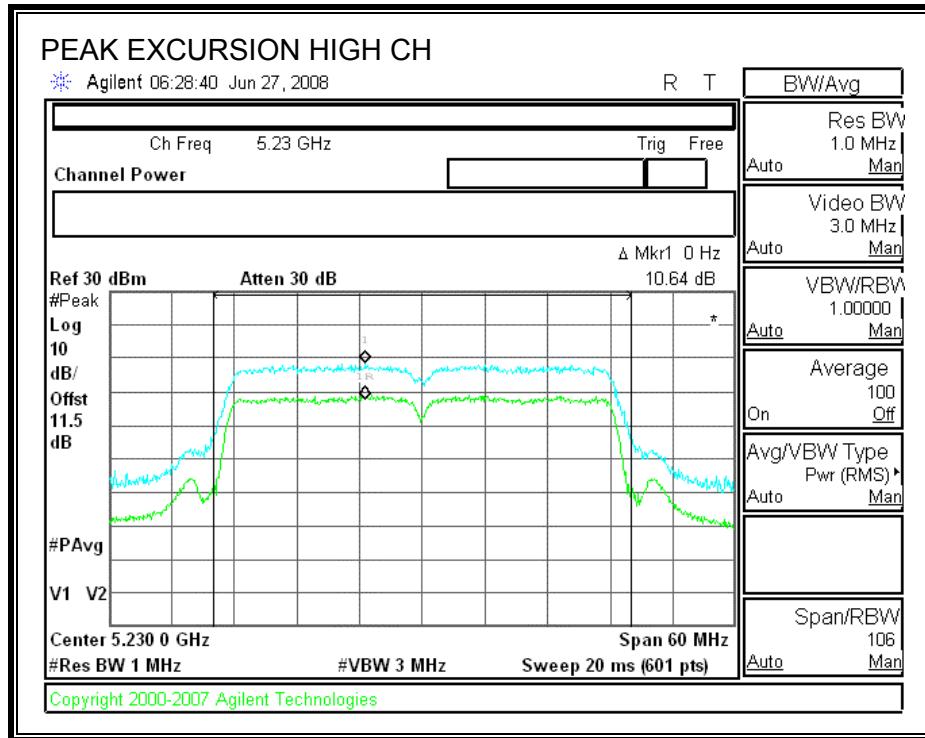
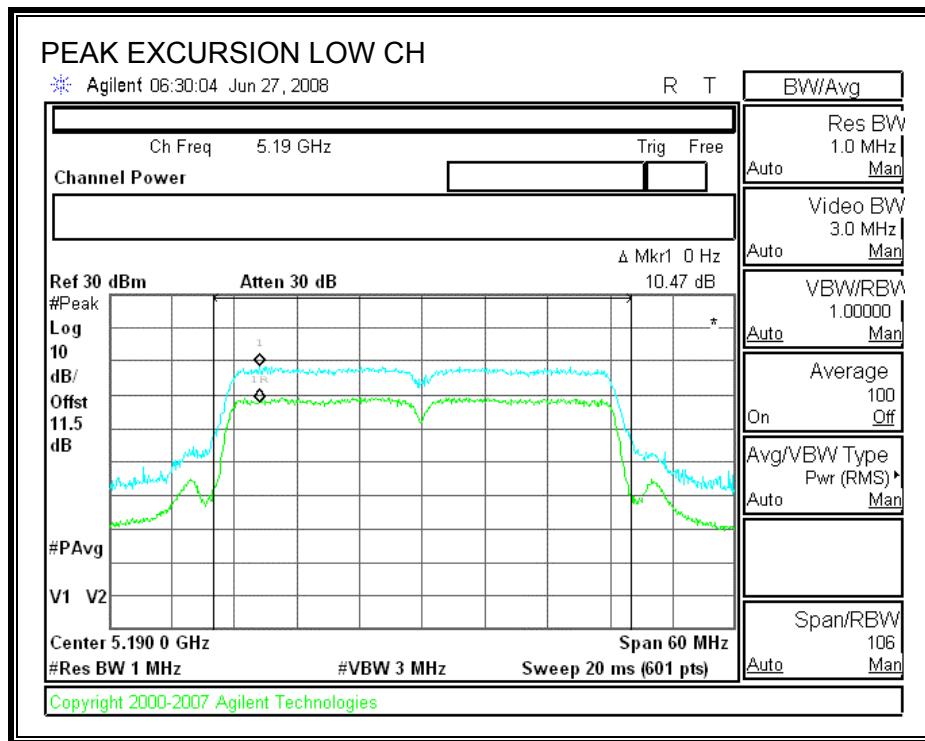
CHAIN 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5190	10.47	13	-2.53
High	5230	10.64	13	-2.36

PEAK EXCURSION (CHAIN 0)



PEAK EXCURSION (CHAIN 1)



7.4.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (1); IC RSS-210 A9.3 (1)

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm / MHz.

Limit line = -27 - EUT Antenna Gain

TEST PROCEDURE

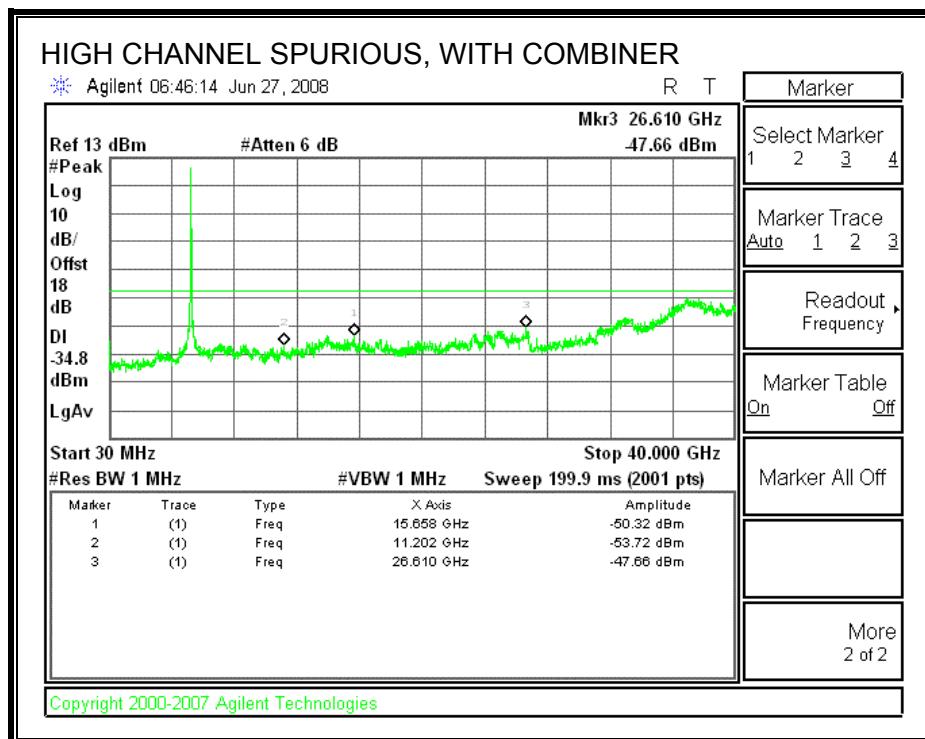
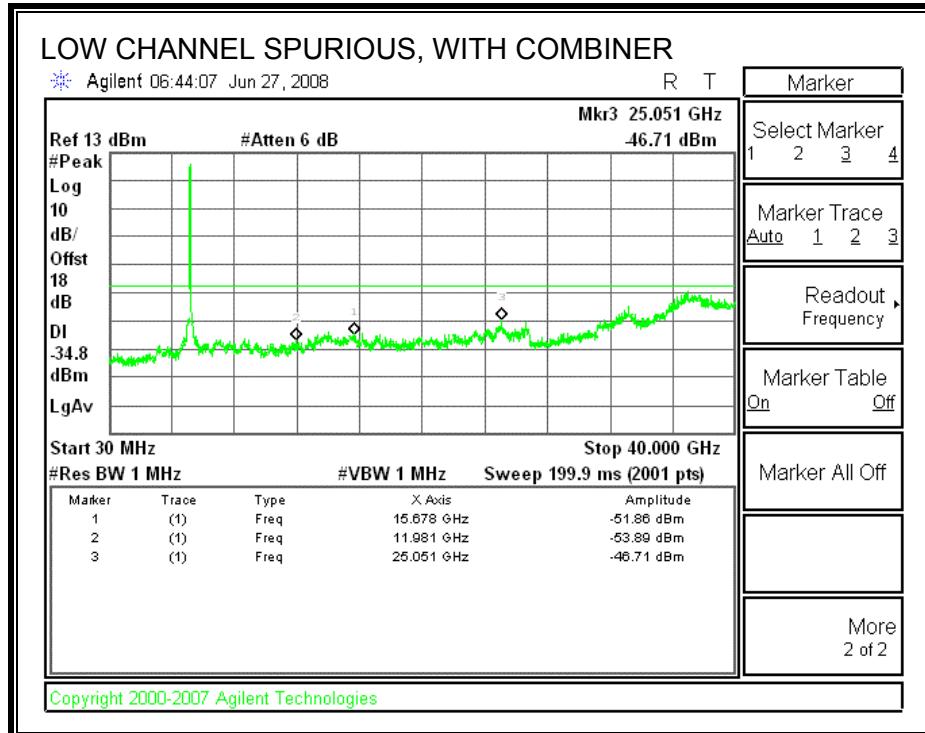
Conducted RF measurements of the transmitter output are made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to the average EIRP limit, adjusted for the maximum antenna gain. If necessary, additional average detection measurements are made.

Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

RESULTS

SPURIOUS EMISSIONS WITH COMBINER



8. ANTENNA PORT TEST RESULTS FOR 5.25–5.35 GHZ BAND

8.1. 802.11a MODE

8.1.1. 26 dB and 99% BANDWIDTH

LIMITS

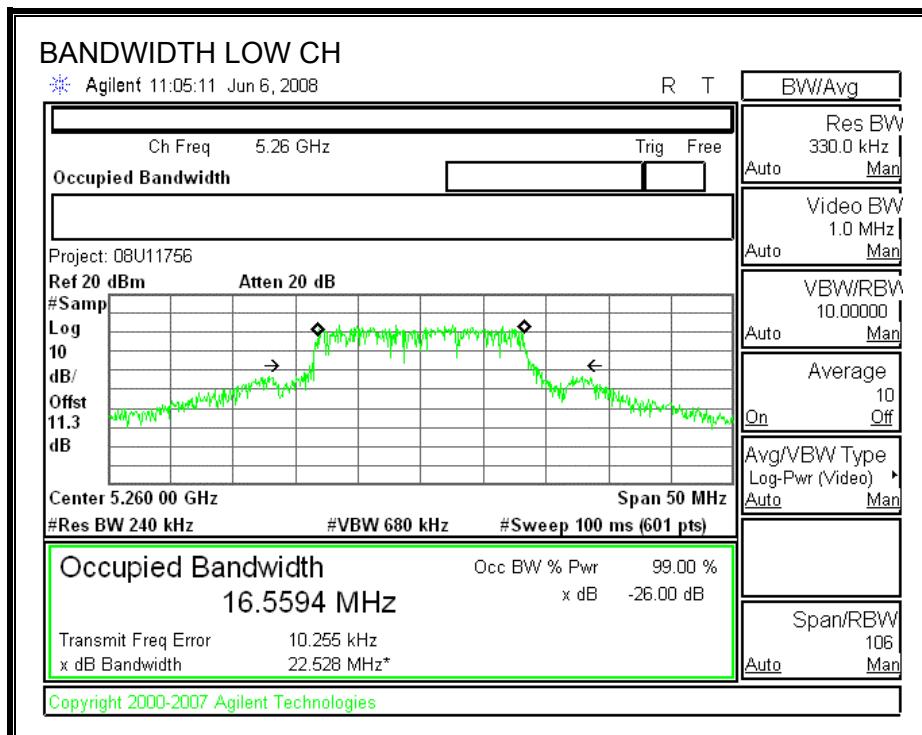
None; for reporting purposes only.

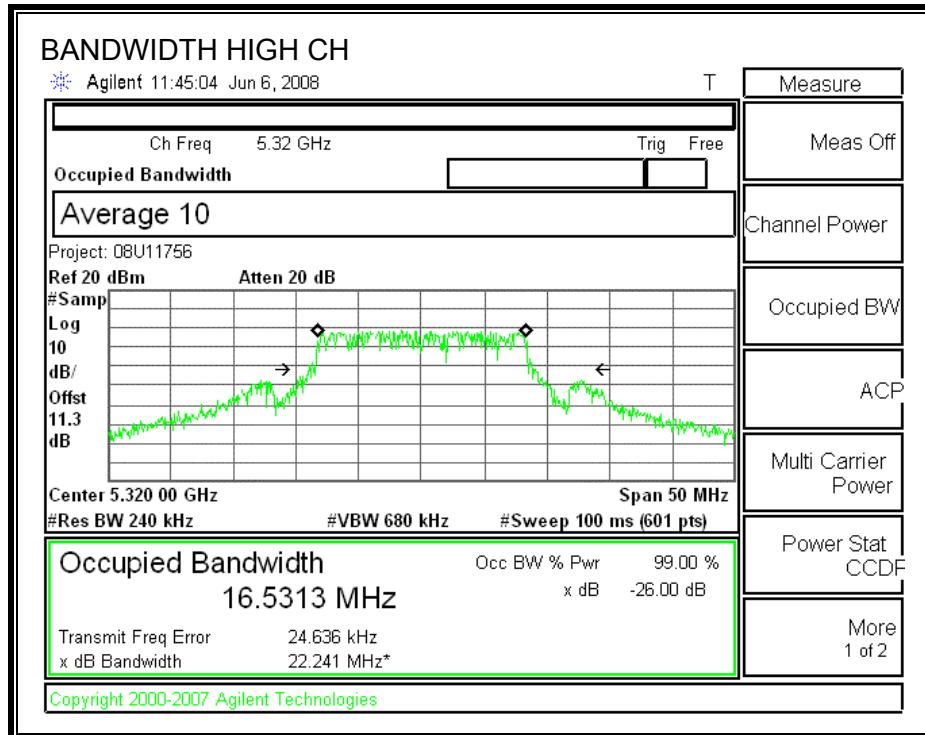
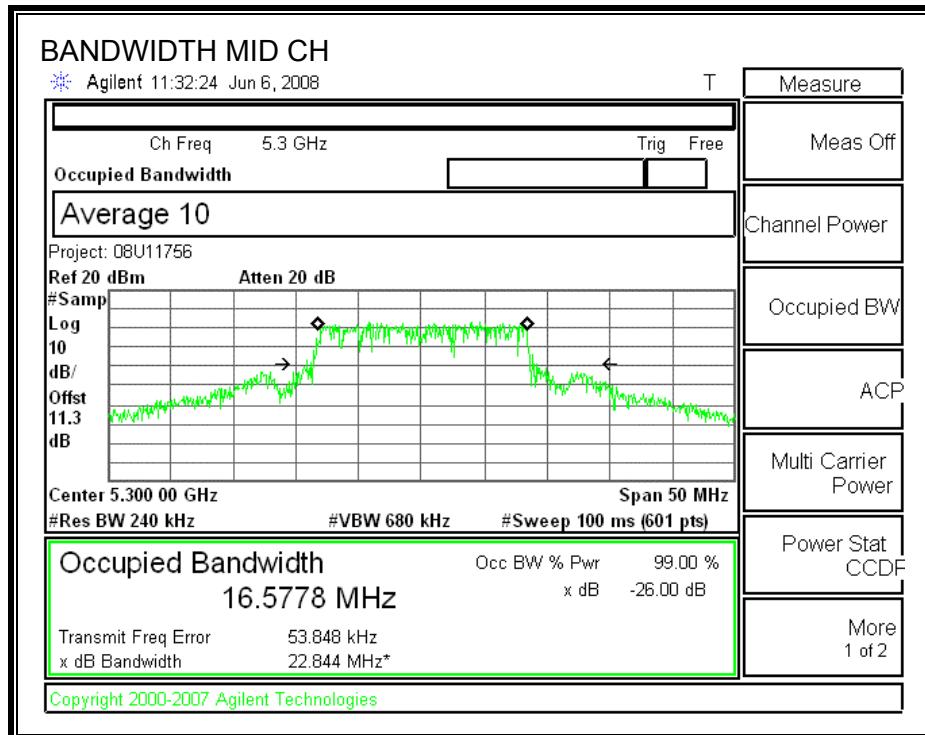
TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	22.528	16.5594
Middle	5300	22.844	16.5778
High	5320	22.241	16.5313





8.1.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2); IC RSS-210 A9.2 (2)

For the 5.25-5.35 GHz band, 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. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is 6.42 dBi

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

RESULTS

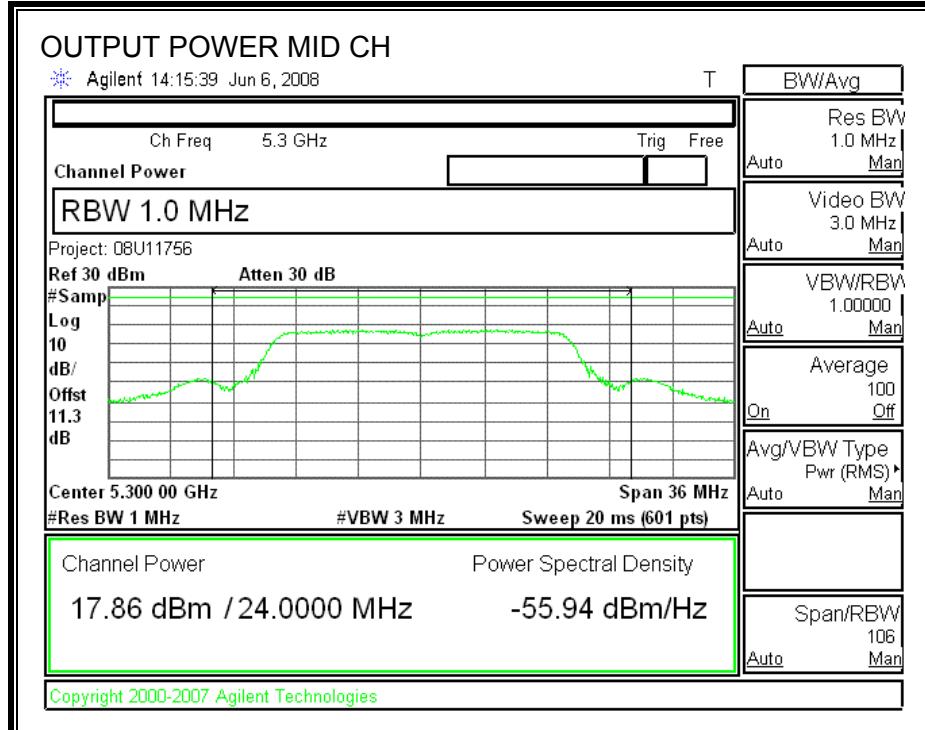
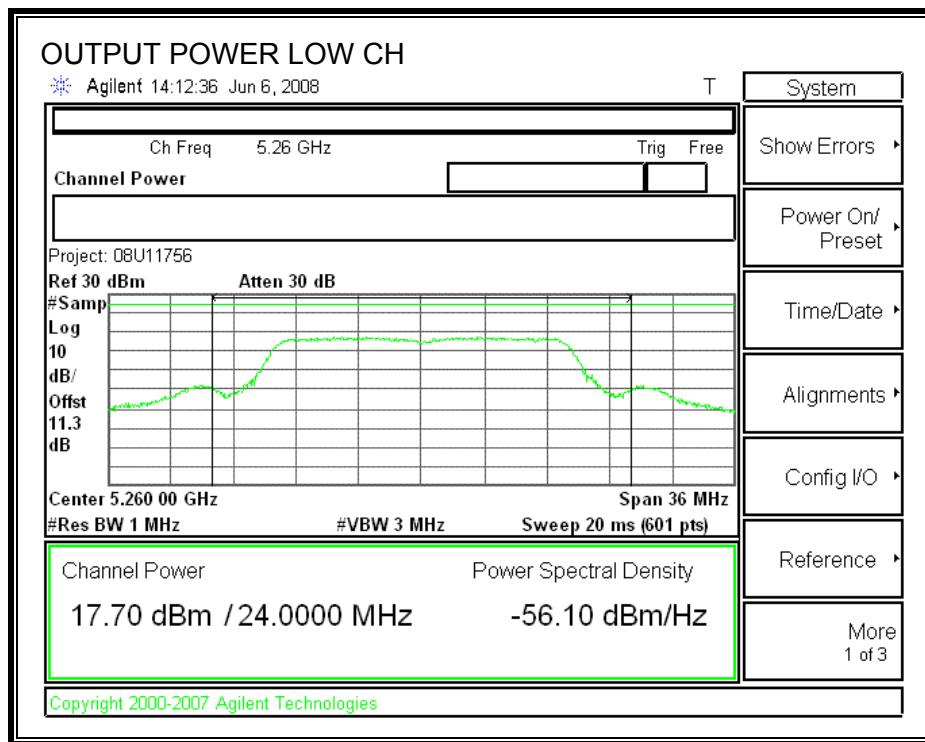
Limit

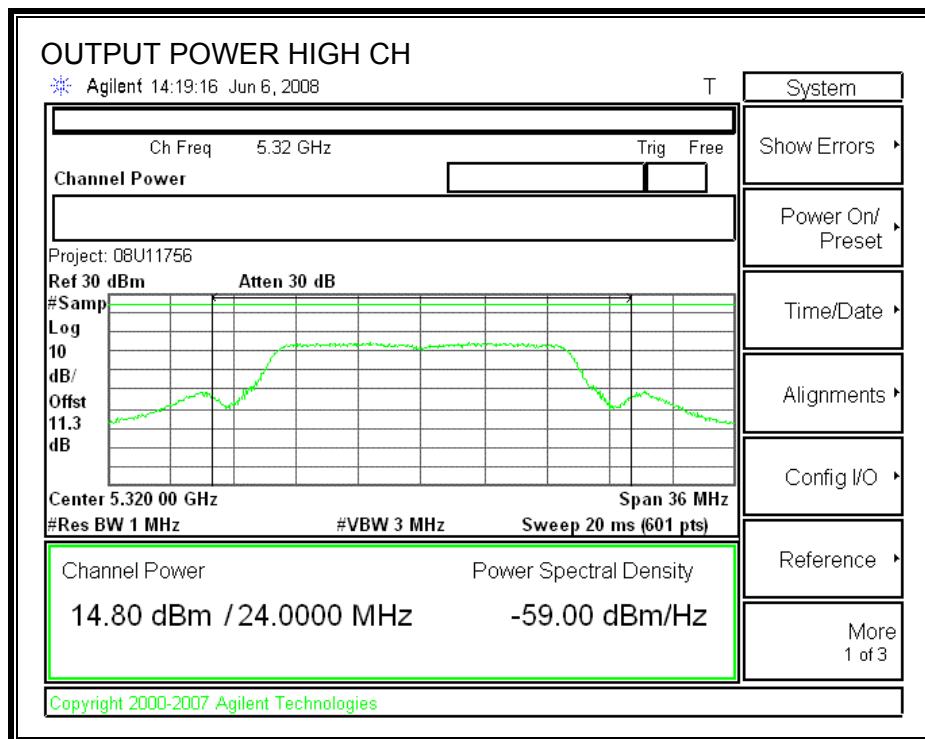
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5260	24	22.528	24.53	6.42	23.58
Mid	5300	24	22.844	24.59	6.42	23.58
High	5320	24	22.241	24.47	6.42	23.58

Results

Channel	Frequency (MHz)	Power (dBm)	Limit (dBm)	Margin (dB)
Low	5260	17.70	23.58	-5.88
Mid	5300	17.86	23.58	-5.72
High	5320	14.80	23.58	-8.78

OUTPUT POWER





8.1.3. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (2); IC RSS-210 A9.2 (2)

For the 5.25–5.35 GHz band, 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 peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is 6.42 dBi, therefore the limit is 10.58 dBm.

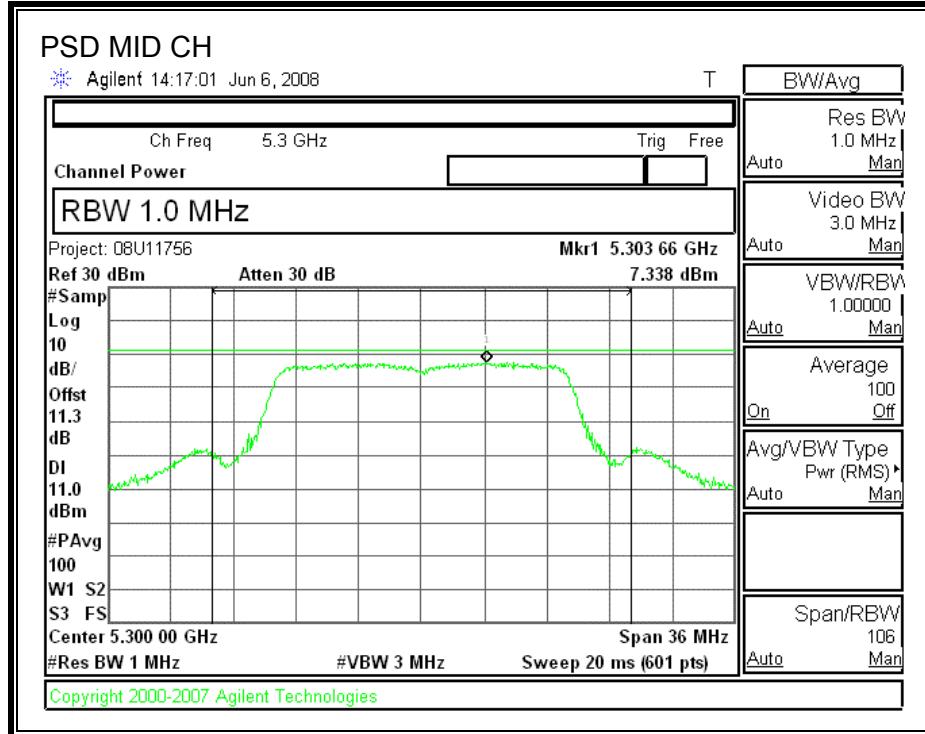
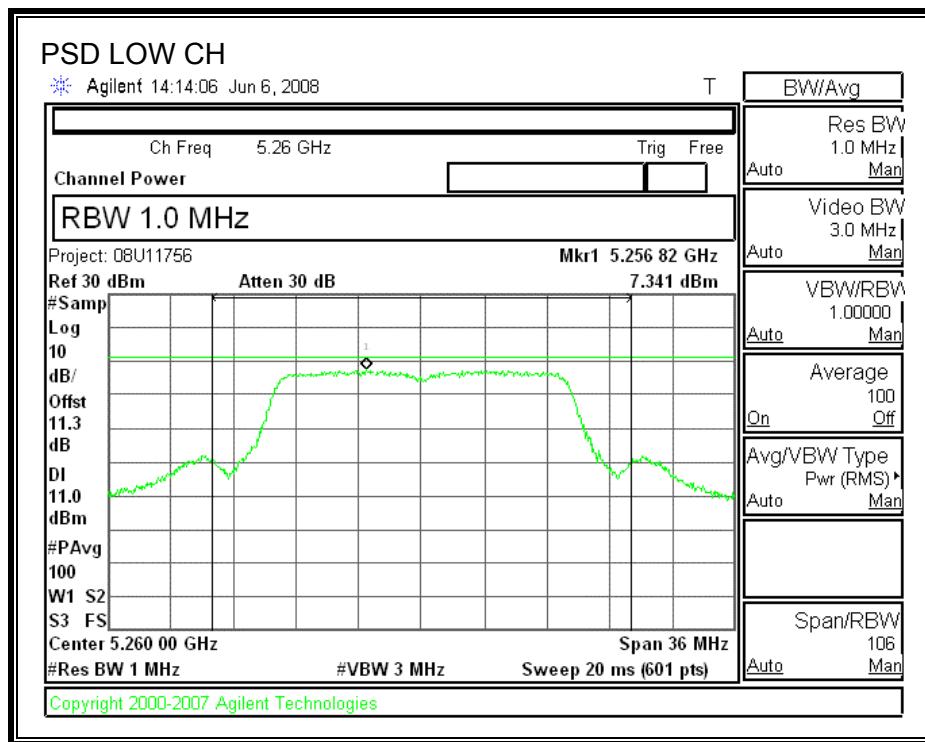
TEST PROCEDURE

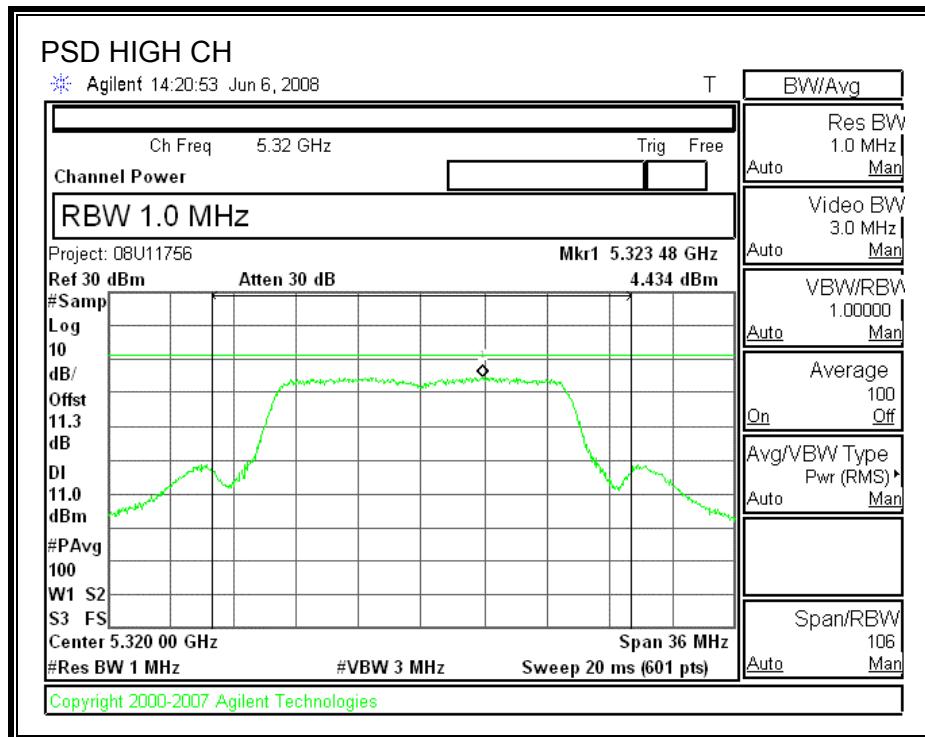
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5260	7.341	10.58	-3.24
Middle	5300	7.338	10.58	-3.24
High	5320	4.434	10.58	-6.15

POWER SPECTRAL DENSITY





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

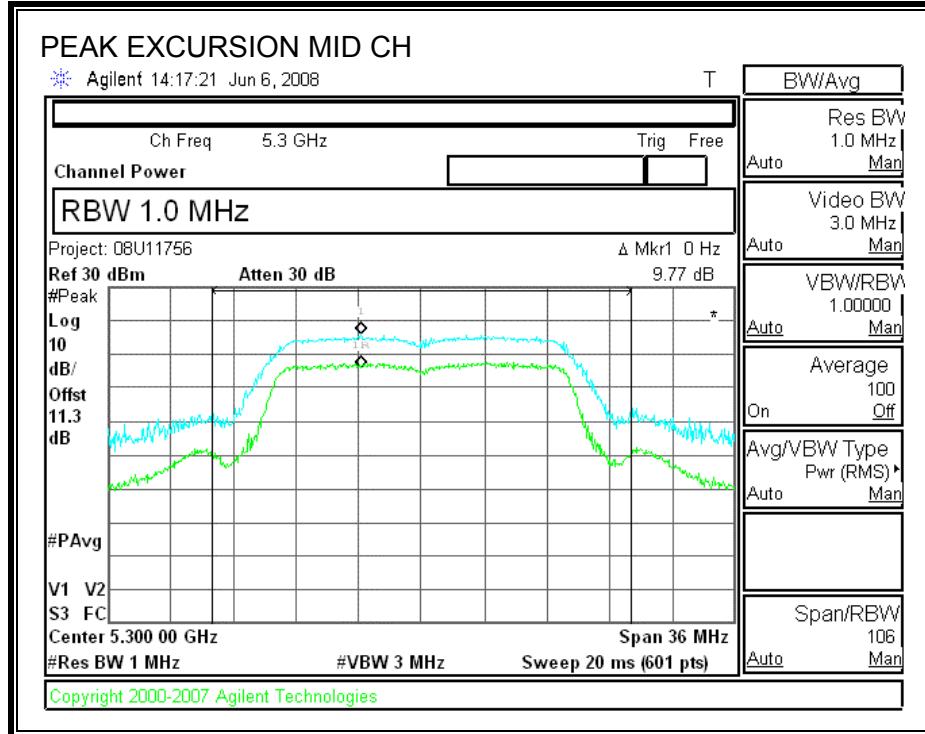
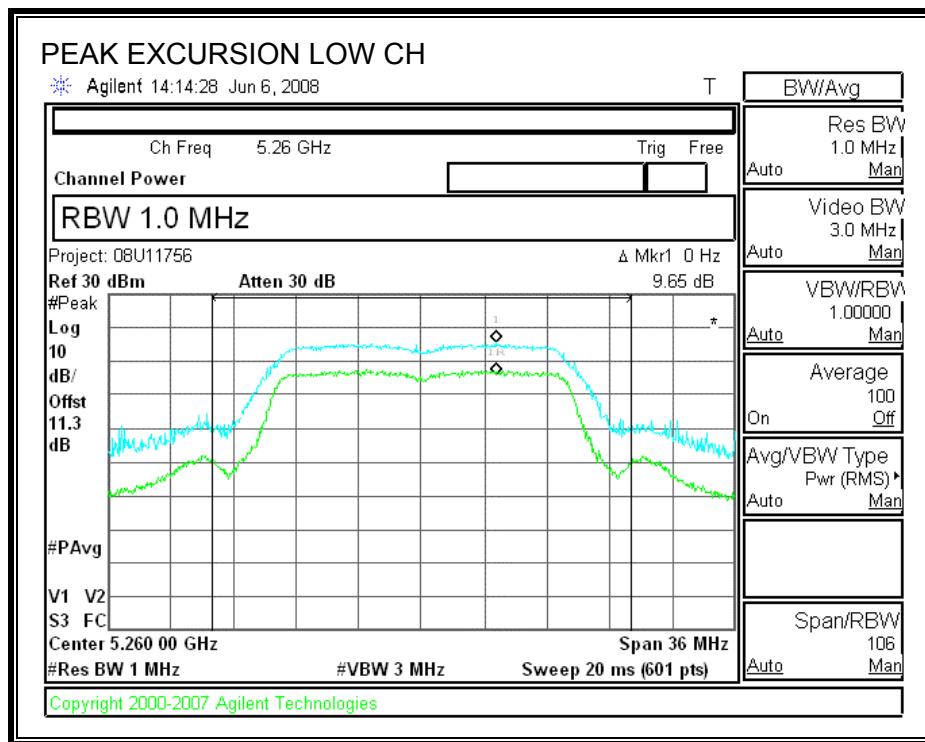
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

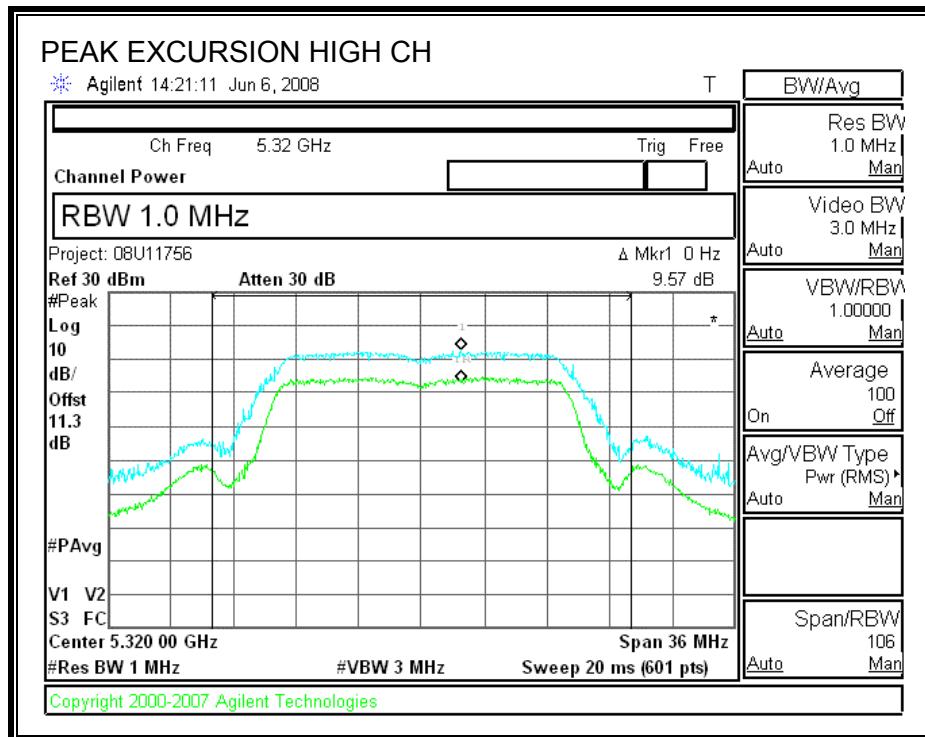
Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

RESULTS

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	9.65	13	-3.35
Middle	5300	9.77	13	-3.23
High	5320	9.57	13	-3.43

PEAK EXCURSION





8.1.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.407 (b) (2); IC RSS-210 A9.3 (2)

For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.25-5.35 GHz band shall not exceed an EIRP of -27 dBm / MHz.

Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.

Limit line = -27 - EUT Antenna Gain

TEST PROCEDURE

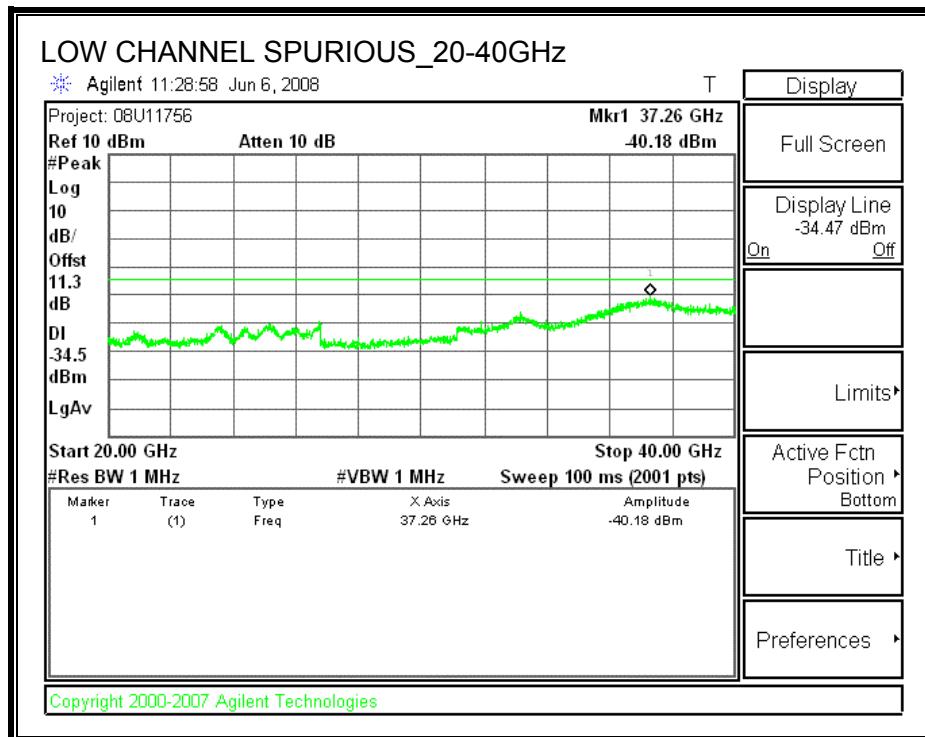
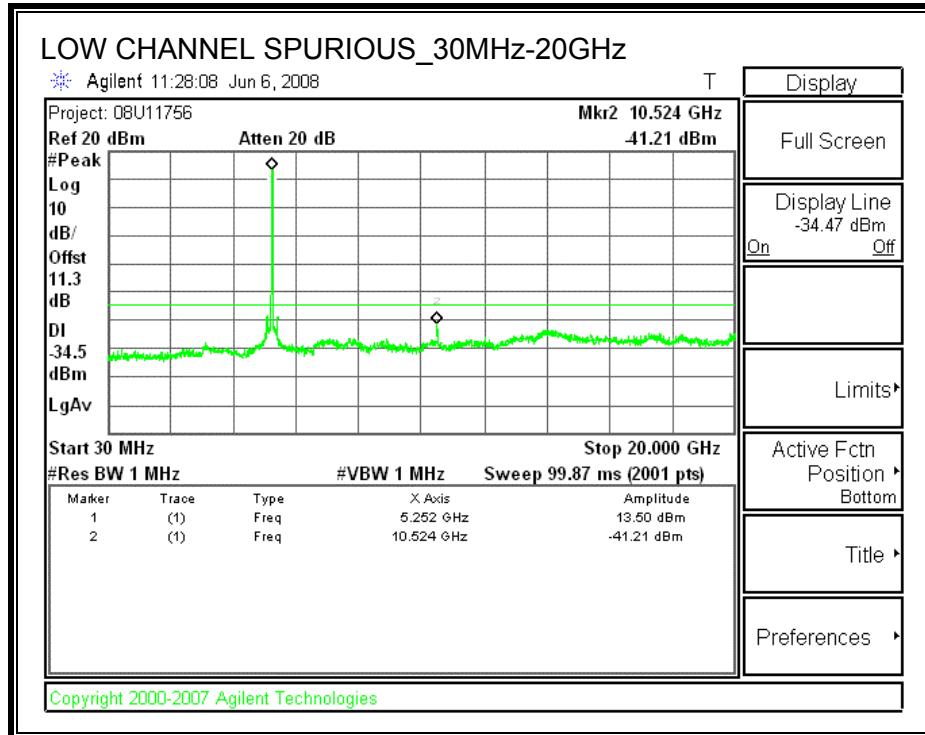
Conducted RF measurements of the transmitter output are made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

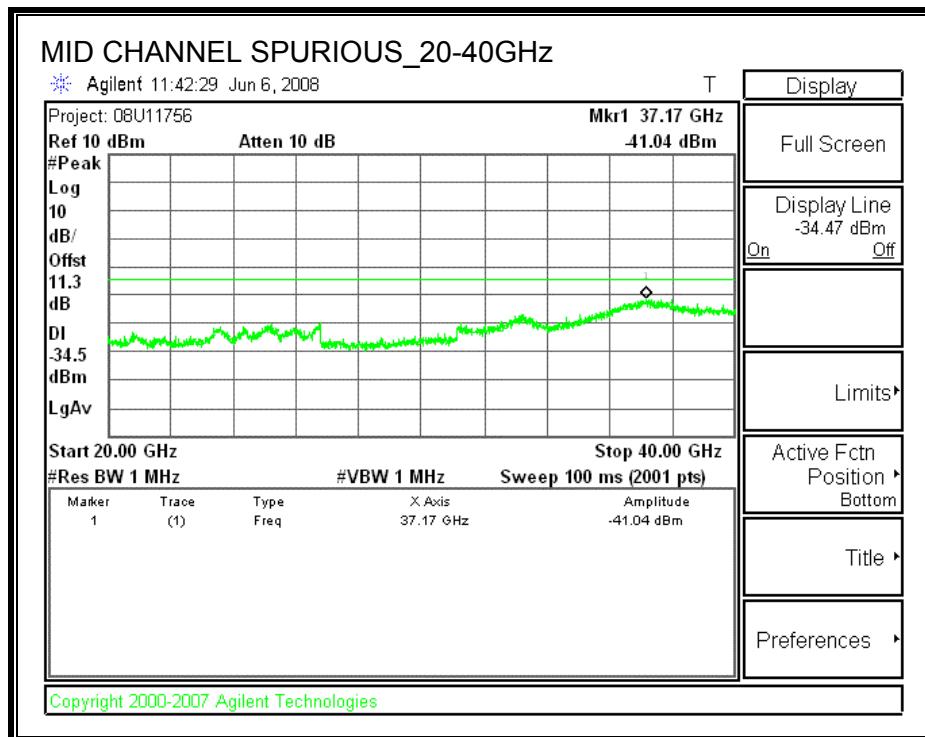
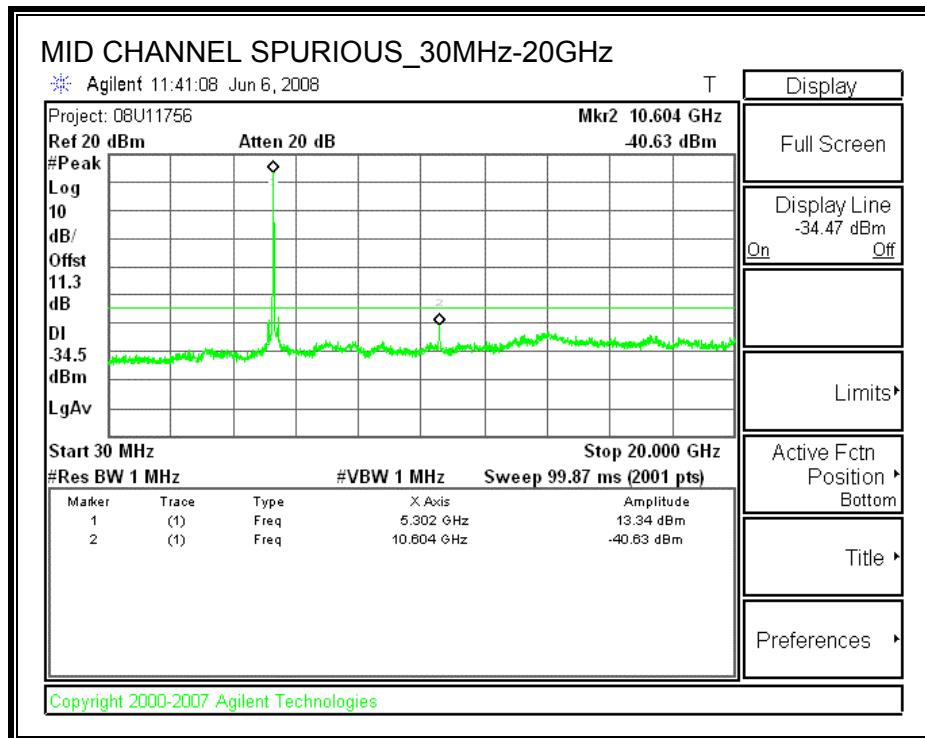
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to the average EIRP limit, adjusted for the maximum antenna gain. If necessary, additional average detection measurements are made.

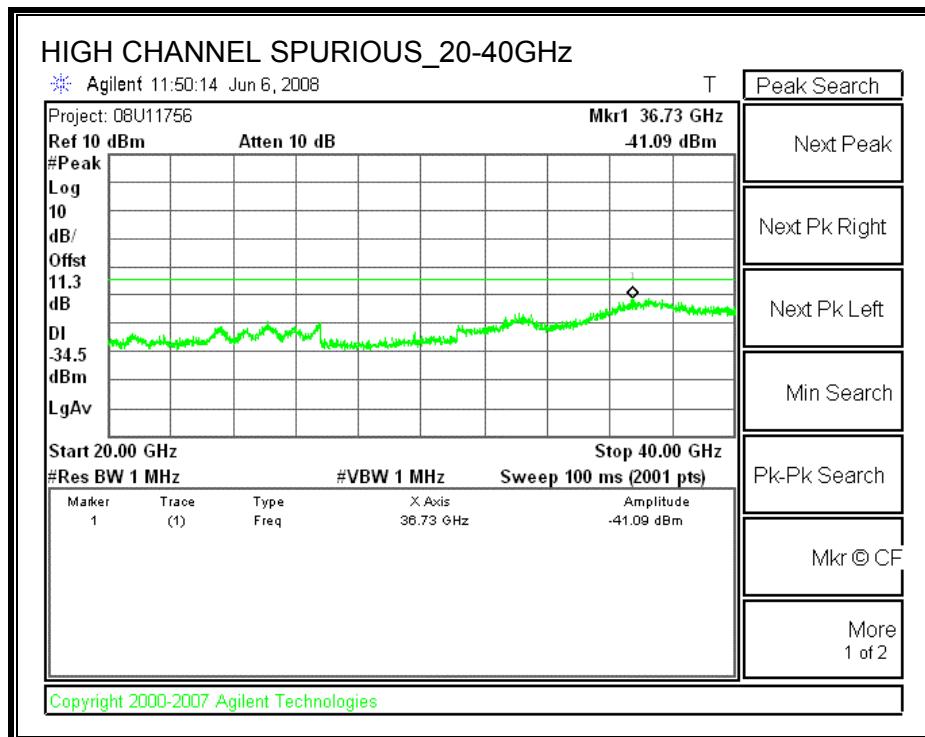
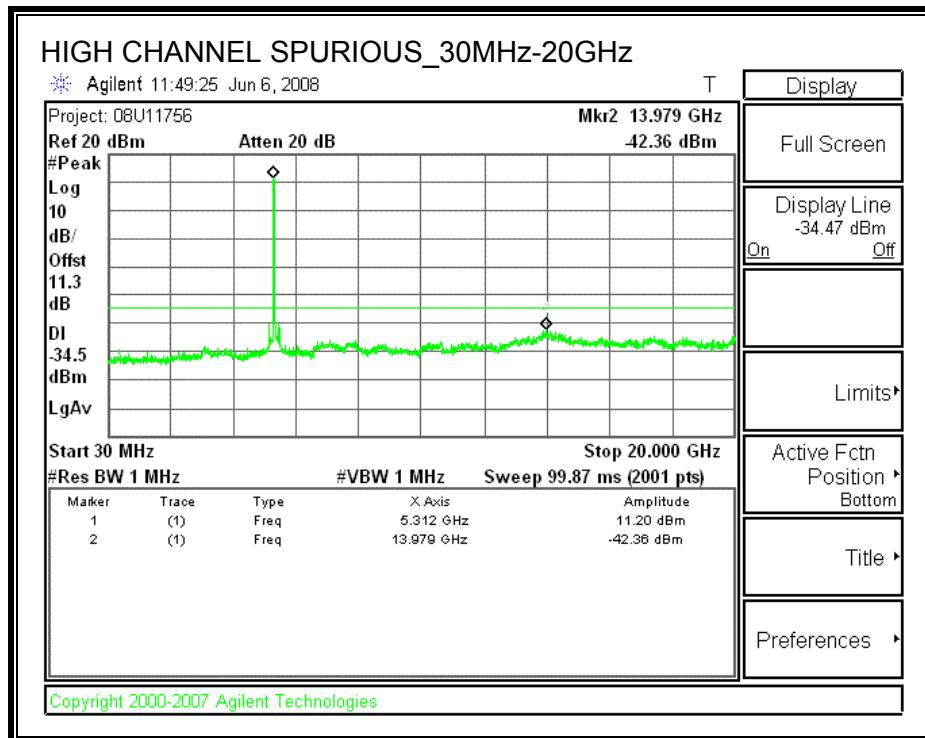
Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

RESULTS

SPURIOUS EMISSIONS







8.2. 802.11n HT20 MODE

8.2.1. 26 dB and 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

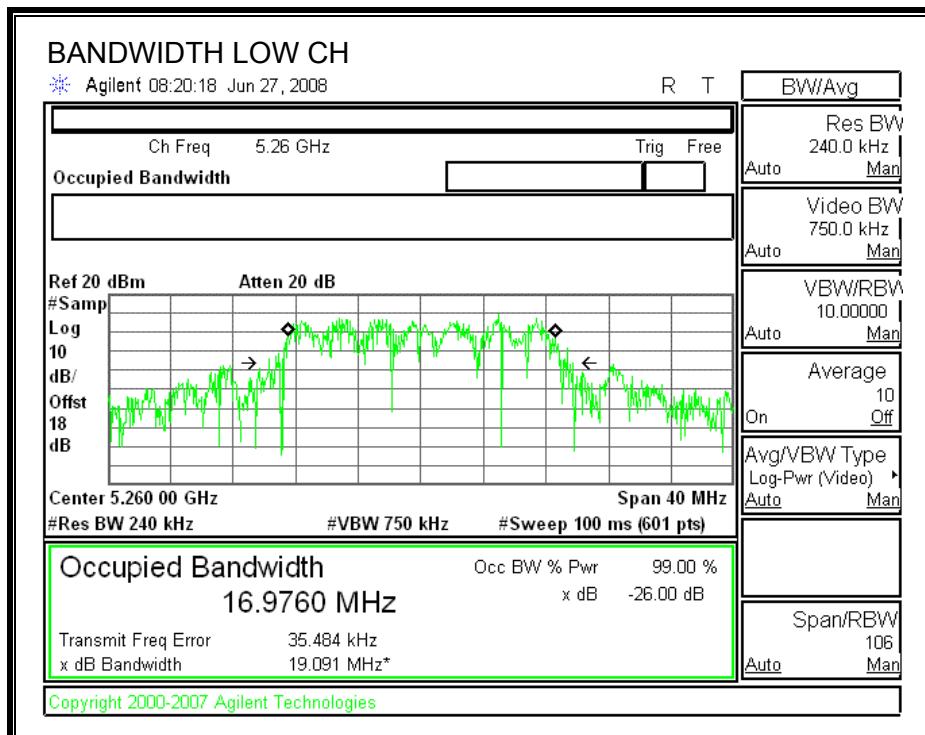
TEST PROCEDURE

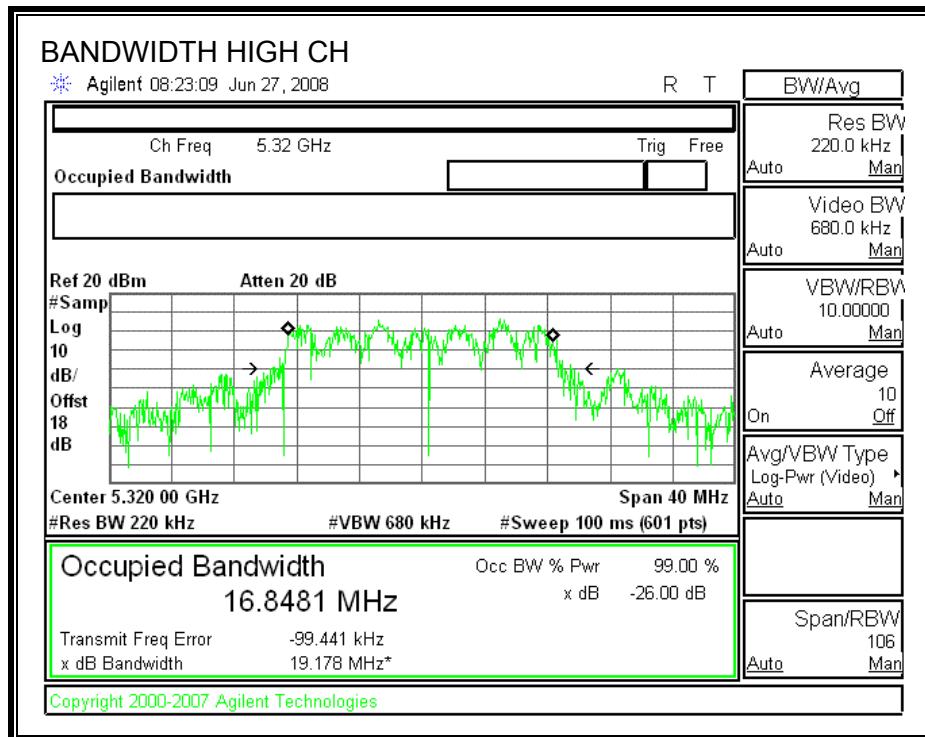
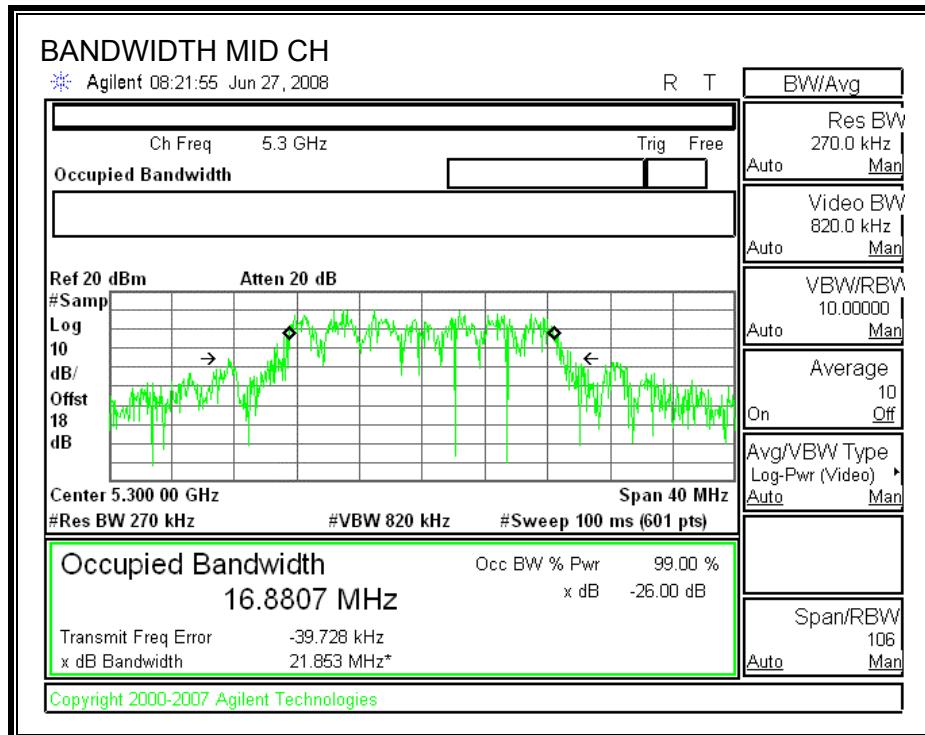
The transmitter outputs are connected to the spectrum analyzer. The RBW is set to 1% to 3% of the measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	19.091	16.976
Middle	5300	21.853	16.8807
High	5320	19.178	16.8481

26 dB and 99% BANDWIDTH





8.2.2. OUTPUT POWER

LIMITS

FCC §15.407 (a) (2); IC RSS-210 A9.2 (2)

For the 5.25-5.35 GHz band, 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. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

RESULTS

Antenna Combination:

Foxconn PIFA WDAN-HQAT80-03-DF (2.99 dBi) plus X 9 Slot K5SLT (4.32 dBi) = 6.72 dBi

Limit

Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5260	24	19.091	23.81	6.72	23.09
Mid	5300	24	21.853	24.40	6.72	23.28
High	5320	24	19.178	23.83	6.72	23.11

Individual Chain Results

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	5260	16.29	16.10	19.21	23.09	-3.89
Mid	5300	16.22	16.03	19.14	23.28	-4.15

Note: The high channel at 13dBm meets the spec of highest & lowest antenna gain combinations. Data in the table above only shows the low & mid channels; see table below for high channel.

Antenna Combination:

Tyco PIFA M97PFTAP2 (6.42 dBi) plus Tyco Slot M97SLTAP1 (2.28 dBi) = 7.84 dBi

Limit

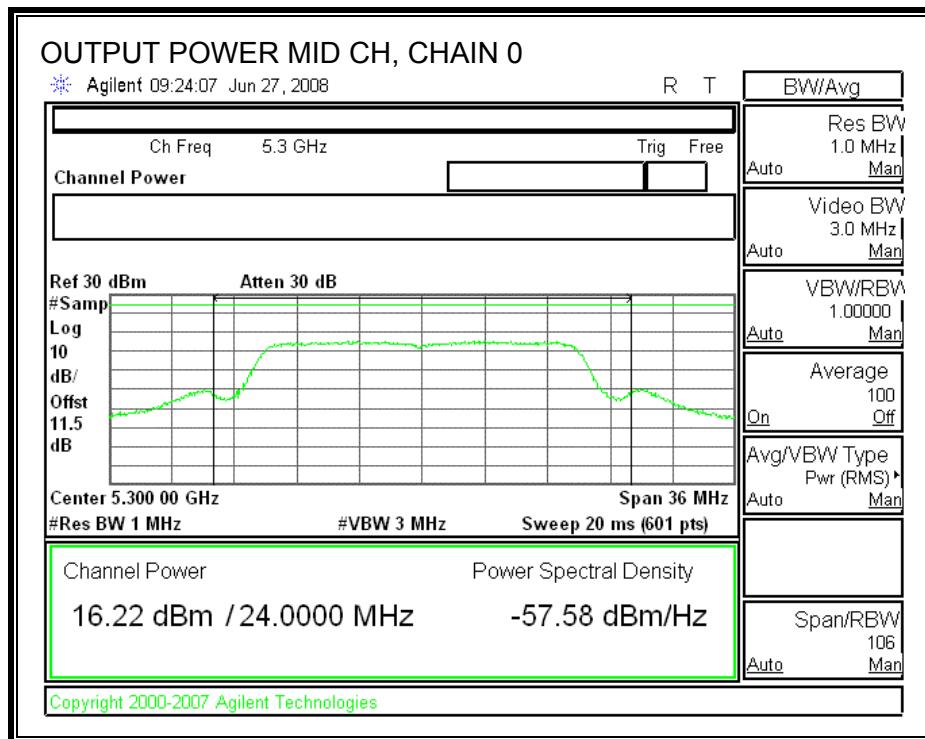
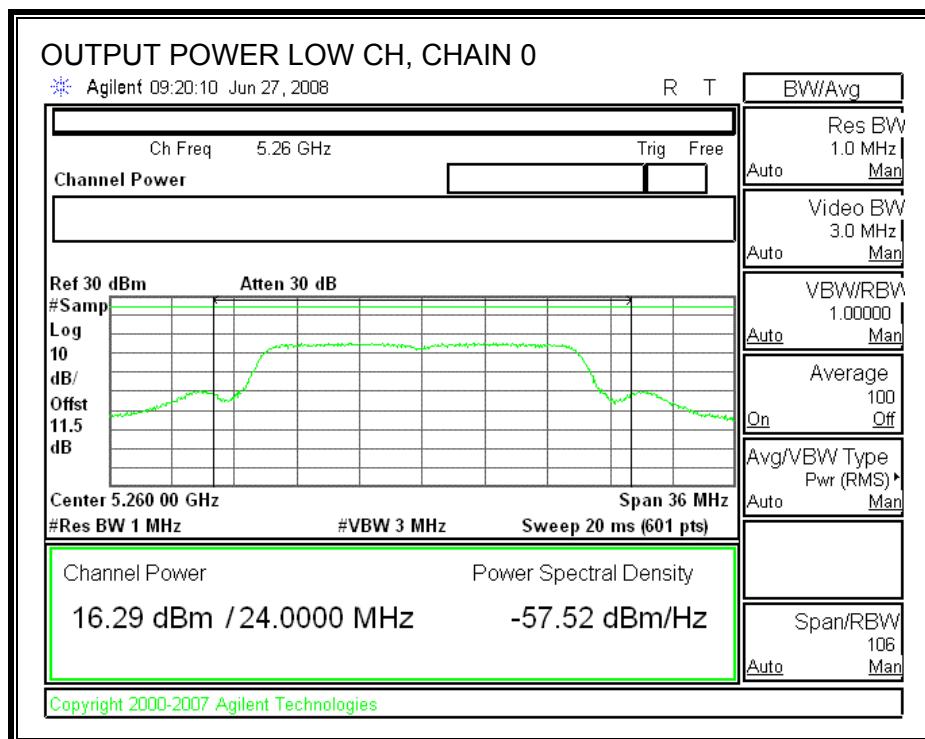
Channel	Frequency (MHz)	Fixed Limit (dBm)	B (MHz)	11 + 10 Log B Limit (dBm)	Antenna Gain (dBi)	Limit (dBm)
Low	5260	24	19.091	23.81	7.84	21.97
Mid	5300	24	21.853	24.40	7.84	22.16
High	5320	24	19.178	23.83	7.84	21.99

Individual Chain Results

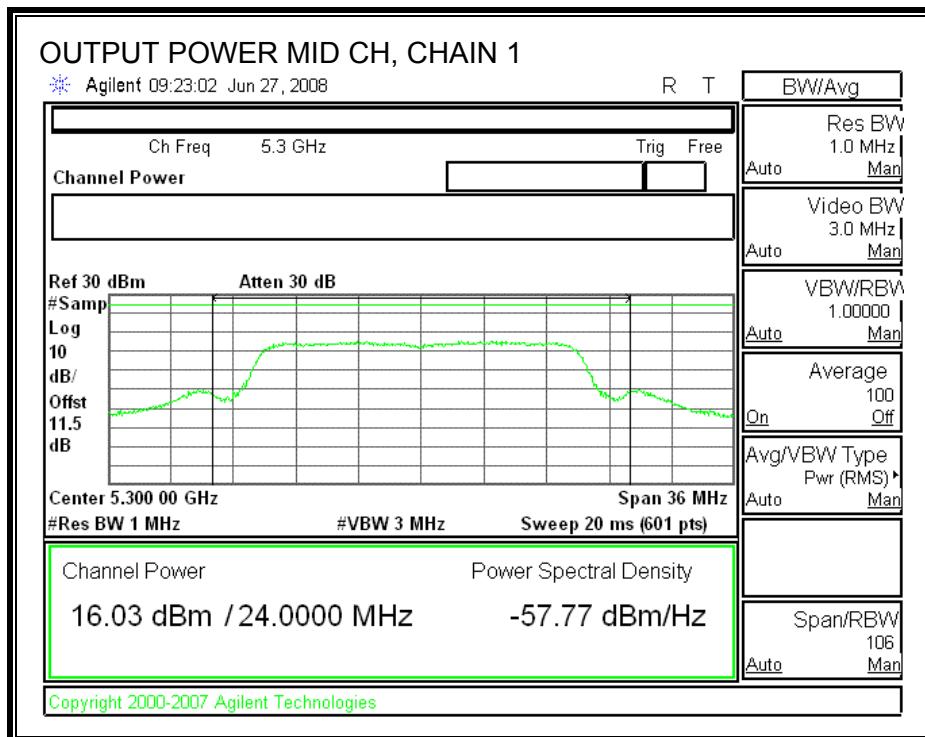
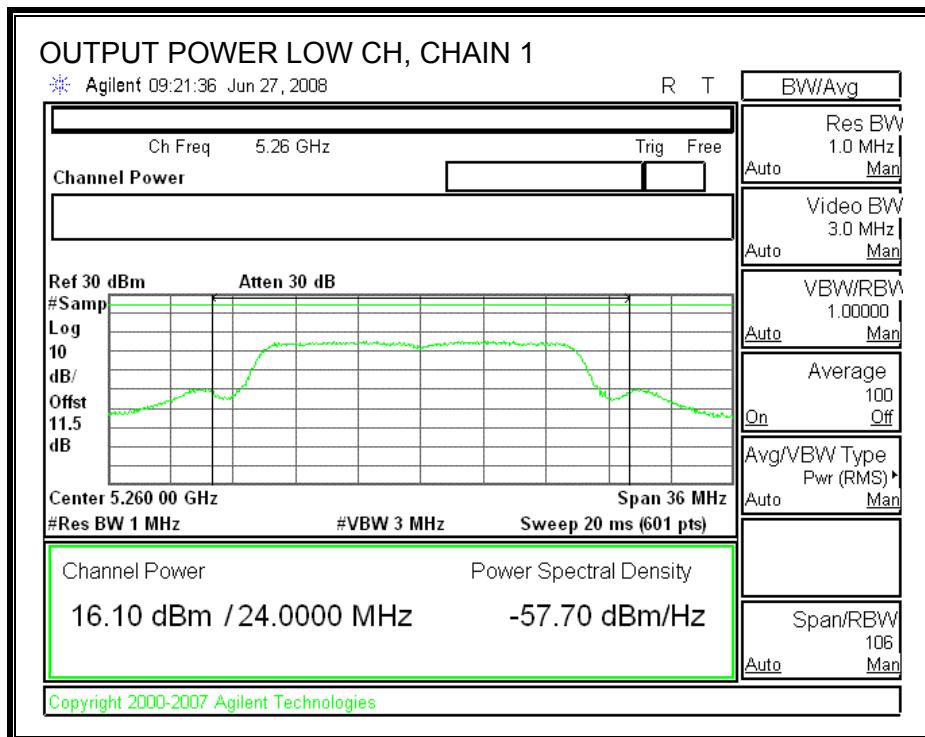
Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	5260	15.02	15.07	18.06	21.97	-3.92
Mid	5300	15.27	15.22	18.26	22.16	-3.91
High	5320	13.38	13.30	16.35	21.99	-5.64

Antenna Combination: Low PIFA / Hi Slot = 6.72 dBi

CHAIN 0 OUTPUT POWER

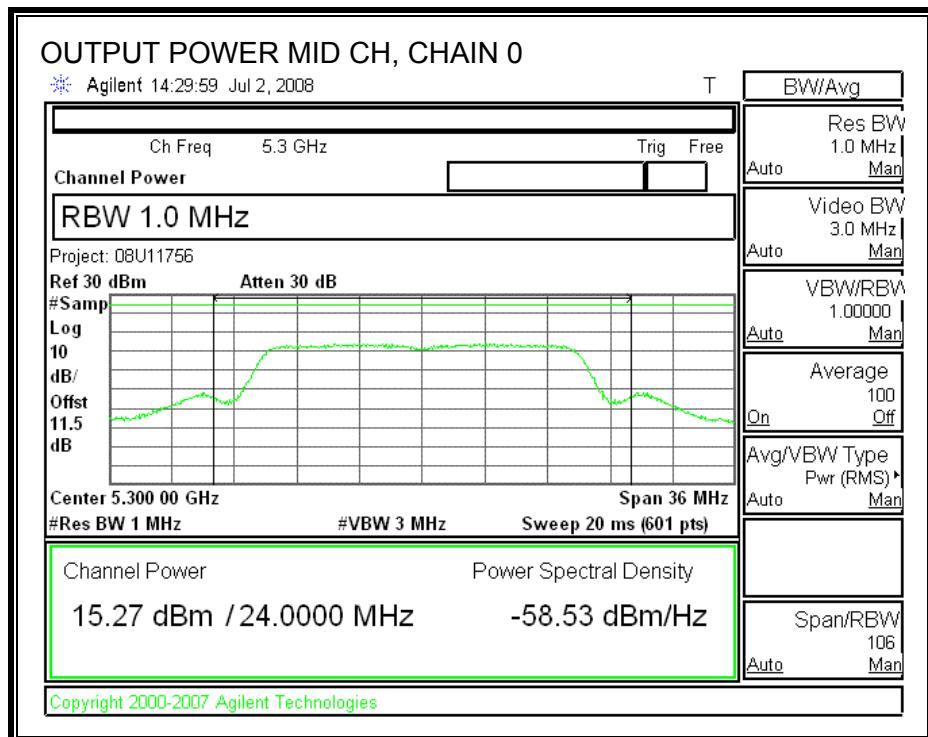
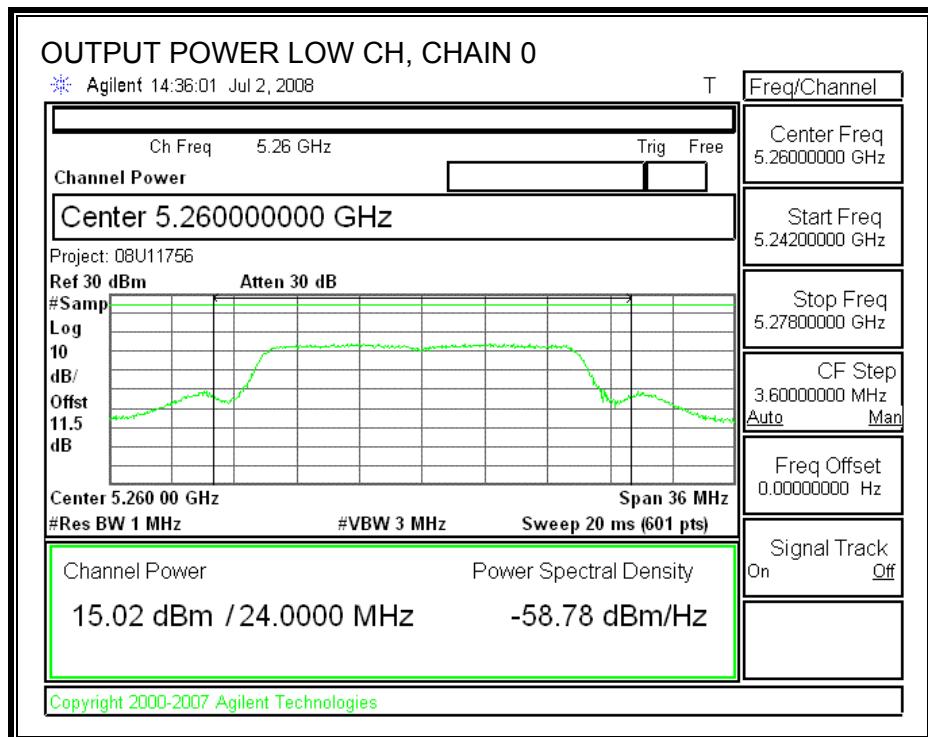


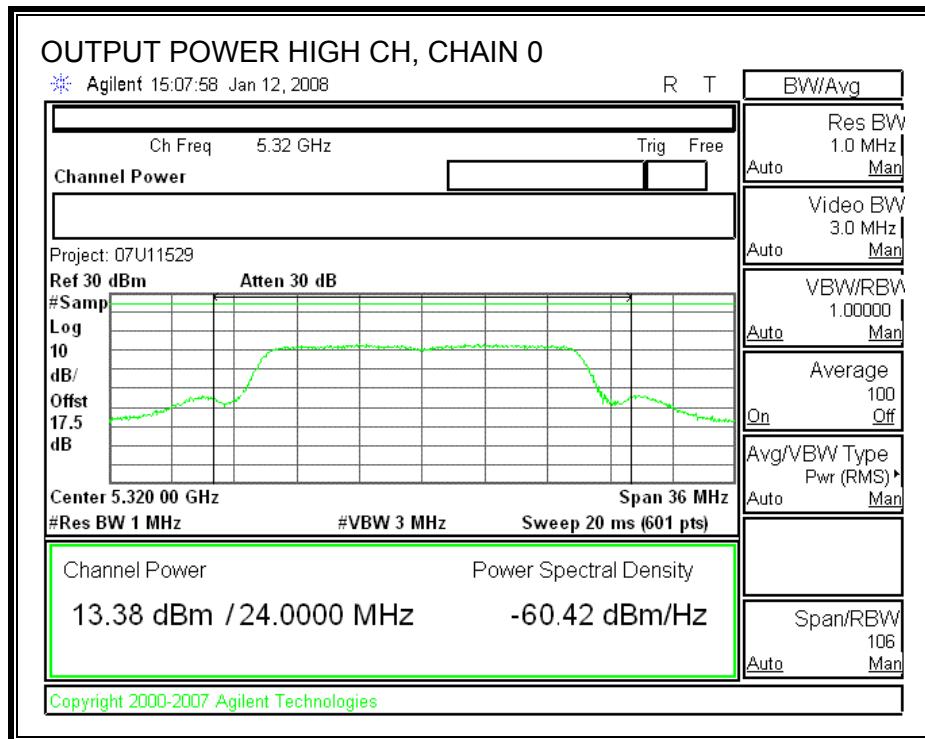
CHAIN 1 - OUTPUT POWER



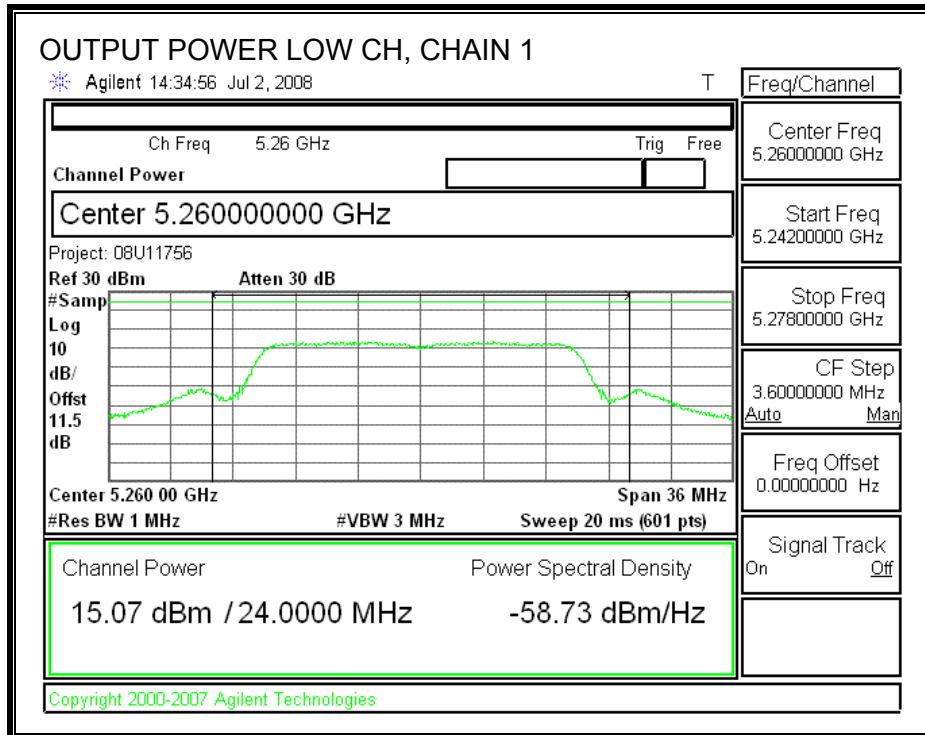
Antenna Combination: Hi PIFA / Low Slot = 7.84 dBi

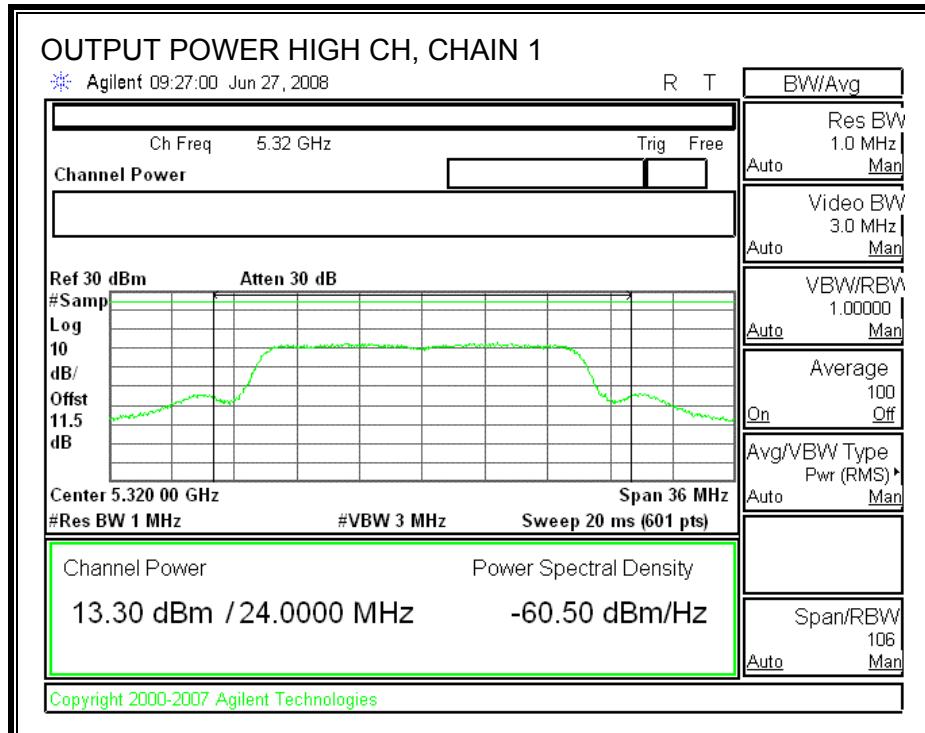
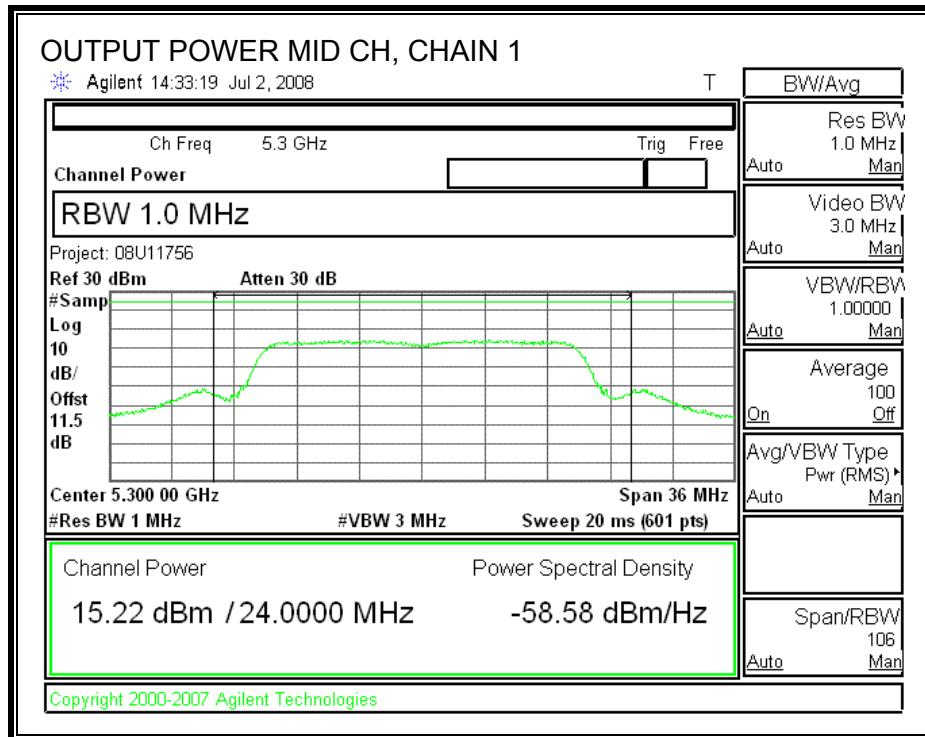
CHAIN 0 OUTPUT POWER





CHAIN 1 - OUTPUT POWER





8.2.3. PEAK POWER SPECTRAL DENSITY

LIMITS

FCC §15.407 (a) (2); IC RSS-210 A9.2 (2)

For the 5.25-5.35 GHz band, 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 peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is 6.72 dBi, therefore the limit is 10.28 dBm.

The maximum antenna gain is 7.84 dBi, therefore the limit is 9.16 dBm.

TEST PROCEDURE

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002. PPSD method #2 was used.

RESULTS

Antenna Combination: Low PIFA / Hi Slot = 6.72dBi

Foxconn PIFA WDAN-HQAT80-03-DF (2.99 dBi) plus X 9 Slot K5SLT (4.32 dBi) = 6.72 dBi

Channel	Frequency (MHz)	PPSD With Combiner (dBm)	Limit (dBm)	Margin (dB)
Low	5260	10.240	10.28	-0.04
Middle	5300	10.148	10.28	-0.13

Note: The high channel at 13dBm meets the spec of highest & lowest antenna gain combinations. Data in the table above only shows the low & mid channels; see table below for high channel.

RESULTS

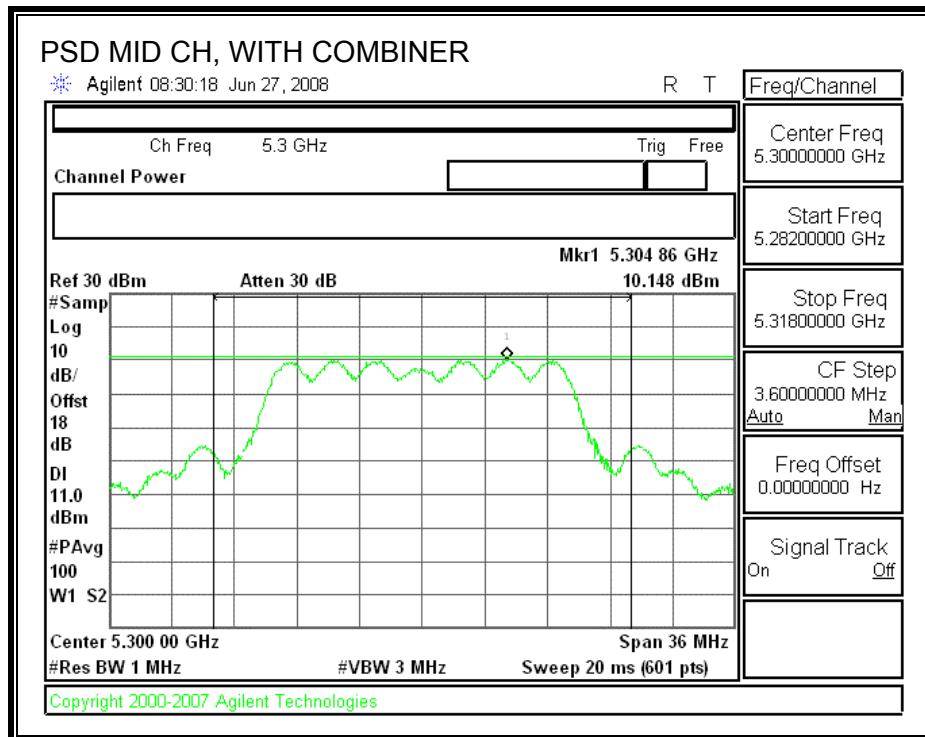
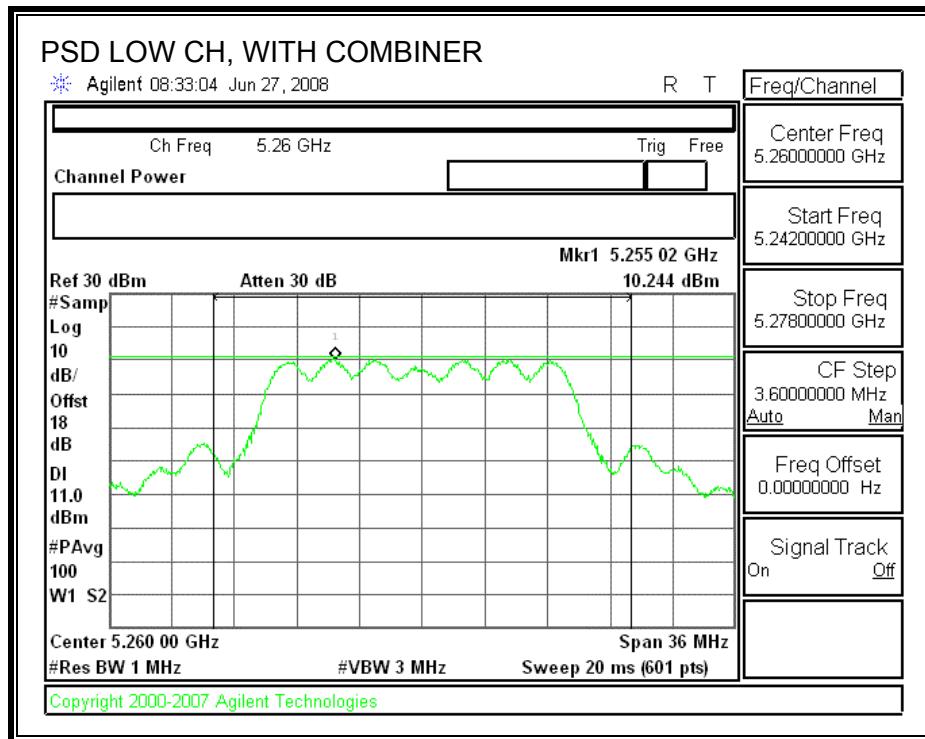
Antenna Combination: Hi PIFA / Low Slot = 7.84dBi

Tyco PIFA M97PFTAP2 (6.42 dBi) plus Tyco Slot M97SLTAP1 (2.28 dBi) = 7.84 dBi

Channel	Frequency (MHz)	PPSD With Combiner (dBm)	Limit (dBm)	Margin (dB)
Low	5260	8.970	9.16	-0.19
Middle	5300	8.900	9.16	-0.26
High	5320	6.950	9.16	-2.21

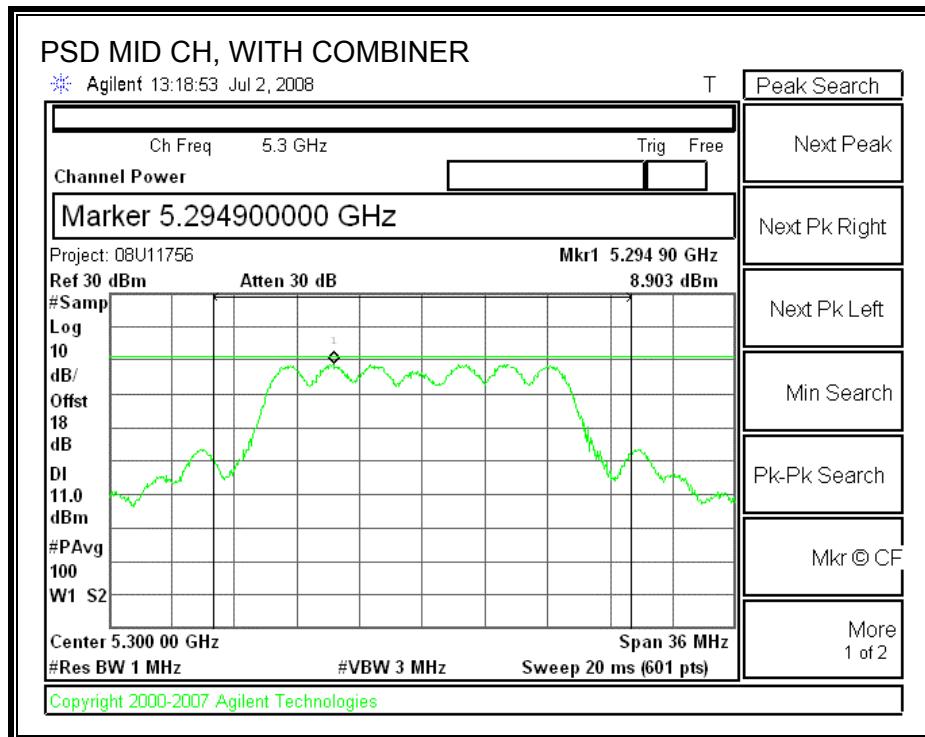
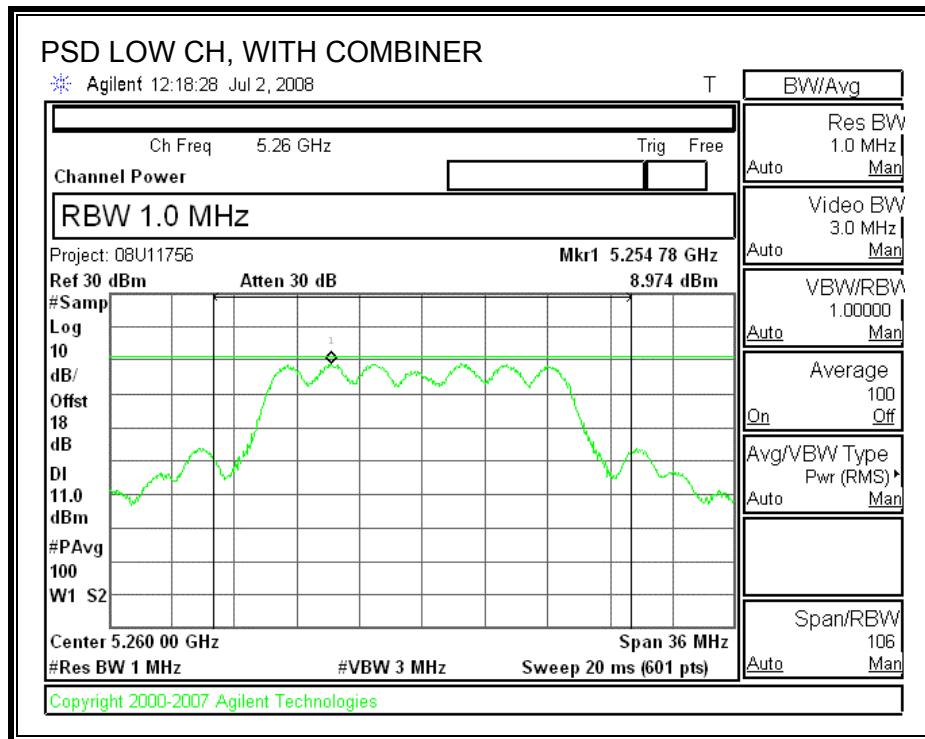
Antenna Combination: Low PIFA / Hi Slot = 6.72dBi

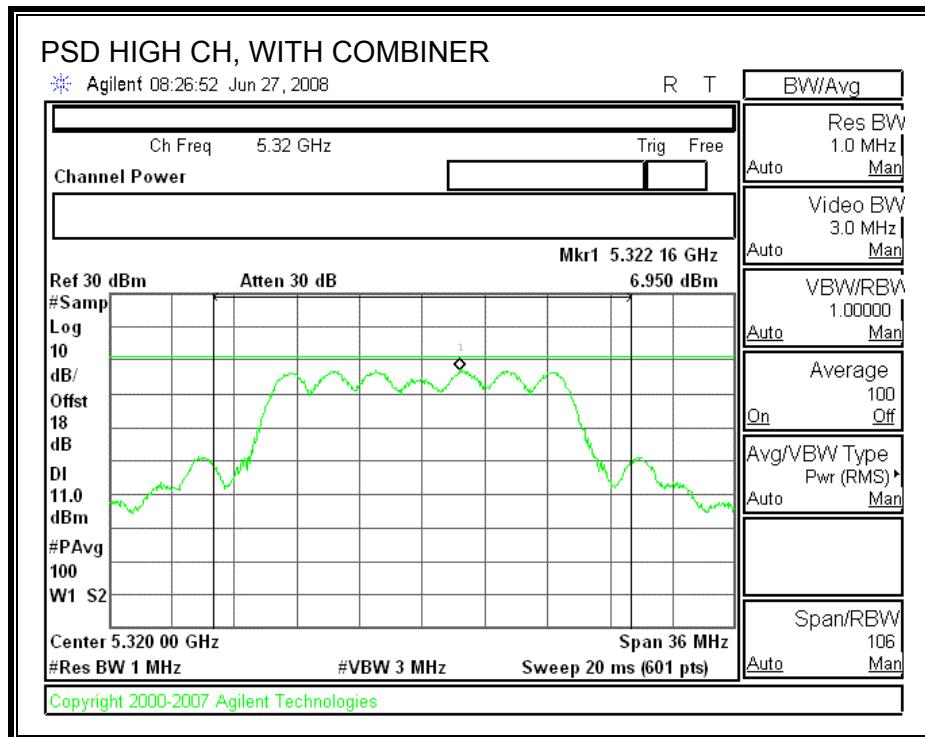
POWER SPECTRAL DENSITY WITH COMBINER



Antenna Combination: Hi PIFA / Low Slot = 7.84 dBi

POWER SPECTRAL DENSITY WITH COMBINER





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

The transmitter outputs are connected to the spectrum analyzer.

The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

Since Method # 1 was used for peak power measurements, Method # 1 settings are used for the second PPSD trace.

RESULTS

Chain 0

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	8.95	13	-4.05
Middle	5300	9.11	13	-3.89
High	5320	10.53	13	-2.47

Chain 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)
Low	5260	10.30	13	-2.70
Middle	5300	8.92	13	-4.08
High	5320	9.62	13	-3.38

PEAK EXCURSION (CHAIN 0)

