



FCC 47 CFR PART 15 SUBPART E & INDUSTRY CANADA RSS-210

for

Tablet Computer

Model: A1401

Brand: ACER

Test Report Number:

C140429Z02-T

Issued Date: May 26, 2014

Issued for

Acer Incorporated

**8F, 88, Sec 1, Xintai 5th Rd. Xizhi, New Taipei City 221 Taiwan,
R.O.C**

Issued by:

Compliance Certification Services (Shenzhen) Inc.

No.10-1 Mingkeda Logistics park, No.18, Huanguan South Rd.,

Guan Lan Town, Baoan District, Shenzhen, China

TEL: 86-755-28055000

FAX: 86-755-28055221



Note: This report shall not be reproduced except in full, without the written approval of Compliance Certification Services Inc. This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document. The client should not use it to claim product endorsement by TAF, A2LA, NVLAP, NIST or any government agencies. The TEST RESULTS in the report only apply to the tested sample.



Revision History

Rev.	Issue No.	Revisions	Effect Page	Revised By
00	C140429Z02-T	Initial Issue	ALL	Sabrina Wang



TABLE OF CONTENTS

1. TEST CERTIFICATION 4

2. EUT DESCRIPTION 5

3. TEST METHODOLOGY 8

 3.1 EUT CONFIGURATION 8

 3.2 EUT EXERCISE 8

 3.3 GENERAL TEST PROCEDURES 8

 3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS 9

 3.5 DESCRIPTION OF TEST MODES 10

4. SETUP OF EQUIPMENT UNDER TEST 12

 4.1 DESCRIPTION OF SUPPORT UNITS 12

 4.2 CONFIGURATION OF SYSTEM UNDER TEST 12

5. FACILITIES AND ACCREDITATIONS 13

 5.1 FACILITIES 13

 5.2 EQUIPMENT 13

 5.3 ACCREDITATIONS 13

 5.4 LABORATORY ACCREDITATIONS AND LISTING 14

 5.5 MEASUREMENT UNCERTAINTY 14

6. APPLICABLE RULES 15

7. FCC PART 15 REQUIREMENTS & RSS 210 REQUIREMENTS 24

 7.1 99% BANDWIDTH 24

 7.2 26dB EMISSION BANDWIDTH 64

 7.3 MAXIMUM CONDUCTED OUTPUT POWER 104

 7.4 BAND EDGES MEASUREMENT 112

 7.5 PEAK POWER SPECTAL DENSITY 137

 7.6 PEAK EXCURSION 177

 7.7 RADIATED UNDESIRABLE EMISSION 217

 7.8 CONDUCTED UNDESIRABLE EMISSION 284

 7.9 POWERLINE CONDUCTED EMISSIONS S 321

 7.10 FREQUENCY STABILITY 324



1. TEST CERTIFICATION

Product	Tablet Computer
Model	A1401
Brand	ACER
Tested	April 29~May 25, 2014
Applicant	Acer Incorporated 8F, 88, Sec 1, Xintai 5th Rd. Xizhi, New Taipei City 221 Taiwan, R.O.C
Manufacturer	Acer Incorporated 8F, 88, Sec 1, Xintai 5th Rd. Xizhi, New Taipei City 221 Taiwan, R.O.C

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart E & Industry Canada RSS-210 Issue 8 December, 2010	No non-compliance noted

We hereby certify that:

Compliance Certification Services Inc. tested the above equipment. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in **ANSI C63.4: 2009** and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.407 and Industry Canada RSS-210 Issue 8.

The TEST RESULTS of this report relate only to the tested sample identified in this report.

Approved by:

Reviewed by:

Sunday Hu
Supervisor of EMC Dept.
Compliance Certification Service Inc.

Ruby Zhang
Supervisor of Report Dept.
Compliance Certification Service Inc.



2. EUT DESCRIPTION

Product	Tablet Computer	
Model Number	A1401	
Brand	ACER	
Model Discrepancy	N/A	
Serial Number	C140429Z02-T	
Received Date	April 29, 2014	
Power Supply	DC5.35V Supply by the adapter	
Adapter Manufacturer / Model No.	Adapter 1: Chicony / W12-010N3A I/P: 100-240Vac, 50/60Hz, 0.3A O/P: 5.35Vdc, 2.0A Adapter 2: Delta / ADP-10HW A I/P: 100-240Vac, 50/60Hz, 0.4A max O/P: 5.35Vdc, 2.0A	
Frequency Range	UNII Band I: IEEE 802.11a, 802.11n HT20 : 5180MHz ~ 5240MHz; UNII Band II IEEE 802.11a, 802.11n HT20 : 5260MHz ~ 5320MHz UNII Band III IEEE 802.11a, 802.11n HT20 : 5500MHz ~ 5700MHz UNII Band IV IEEE 802.11a, 802.11n HT20 : 5745MHz ~ 5805MHz	
Transmit Power	UNII Band I: IEEE 802.11a mode: 12.74dBm (Antenna 0) IEEE 802.11a mode: 12.36dBm (Antenna 1) IEEE 802.11n HT 20 MHz mode: 15.77dBm (Combine with Antenna 0 and Antenna 1) SISO: IEEE 802.11n HT 20 MHz mode: 10.74dBm (Antenna 0) IEEE 802.11n HT 20 MHz mode: 10.64dBm (Antenna 1) UNII Band II IEEE 802.11a mode: 12.61dBm (Antenna 0) IEEE 802.11a mode: 12.32dBm (Antenna 1) IEEE 802.11n HT 20 MHz mode: 15.62dBm (Combine with Antenna 0 and Antenna 1) SISO: IEEE 802.11n HT 20 MHz mode: 10.42dBm (Antenna 0) IEEE 802.11n HT 20 MHz mode: 10.67dBm (Antenna 1) UNII Band III IEEE 802.11a mode: 12.97dBm (Antenna 0) IEEE 802.11a mode: 12.95dBm (Antenna 1) IEEE 802.11n HT 20 MHz mode: 16.32dBm (Combine with Antenna 0 and Antenna 1) SISO: IEEE 802.11n HT 20 MHz mode: 10.75dBm (Antenna 0) IEEE 802.11n HT 20 MHz mode: 11.02dBm (Antenna 1) UNII Band IV IEEE 802.11a mode: 10.80dBm (Antenna 0) IEEE 802.11a mode: 11.39dBm (Antenna 1) IEEE 802.11n HT 20 MHz mode: 15.06dBm (Combine with Antenna 0 and Antenna 1)	



	SISO: IEEE 802.11n HT 20 MHz mode: 9.16dBm (Antenna 0) IEEE 802.11n HT 20 MHz mode: 10.44dBm (Antenna 1)
Modulation Technique	OFDM (QPSK, BPSK, 16-QAM, 64-QAM)
Transmit Data Rate	IEEE 802.11a mode: 54, 48, 36, 24, 18, 12, 9, 6 Mbps IEEE 802.11n HT 20 MHz: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps)
Number of Channels	UNII Band I: IEEE 802.11a, 802.11n HT20 : 4 Channels UNII Band II IEEE 802.11a, 802.11n HT20 : 4 Channels UNII Band III IEEE 802.11a, 802.11n HT20 : 8 Channels UNII Band IV IEEE 802.11a, 802.11n HT20 : 4 Channels
Antenna Specification	PCB Antenna 0 with 3.0dBi gain (Max) PCB Antenna 1 with 2.5dBi gain (Max)
Channels Spacing	IEEE 802.11a, 802.11n HT20 : 20MHz
Temperature Range	0°C ~ 35°C
Hardware Version	V1.0
Software Version	4.4.2

Note: 1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.



Operation Frequency:

UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII)	
CHANNEL	MHz
36	5180
40	5200
44	5220
48	5240
52	5260
56	5280
60	5300
64	5320
100	5500
104	5520
108	5540
112	5560
116	5580
132	5660
136	5680
140	5700
149	5745
153	5765
157	5785
161	5805

Remark: The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.



3. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2009 Radiated testing was performed at an antenna to EUT distance 3 meters.

The tests documented in this report were performed in accordance with ANSI C63.4: 2009 and FCC CFR 47 Part 15.207, 15.209 and 15.407, RSS-GEN Issue 2, and RSS-210 Issue 8.

Radio testing was performed according to KDB DA 02-2138, KDB 789033 D01, KDB 905462 D05;

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed for RF field strength measurement to meet the Commissions requirement, and is operated in a manner intended to generate the maximum emission in a continuous normal application.

3.2 EUT EXERCISE

The EUT is operated in the engineering mode to fix the TX frequency for the purposes of measurement.

According to its specifications, the EUT must comply with the requirements of Section 15.407 under the FCC Rules Part 15 Subpart E.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is positioned at 0.8 m above the ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4, the conducted emission from the EUT is measured in the frequency range between 0.15 MHz and 30MHz, using the CISPR Quasi-Peak detector mode.

Radiated Emissions

The EUT is placed on the turntable, which is 0.8 m above the ground plane. The turntable is then rotated for 360 degrees to determine the proper orientation for the maximum emission level. The EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission level. And, each emission is to be maximized by changing the horizontal and vertical polarization of the receiving antenna. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4: 2003.



3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



3.5 DESCRIPTION OF TEST MODES

The EUT is a 2x2 configuration spatial MIMO (2TX & 2RX) without beam forming function. The 2x2 configuration is implemented with two outside TX & RX Antennas (Antenna 0 and Antenna 1).

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only.

UNII Band I:

IEEE 802.11a for 5180 ~ 5240MHz:

Channel Low (5180MHz), Channel Mid (5220MHz) and Channel High (5240MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz for 5180 ~ 5240MHz:

Channel Low (5180MHz), Channel Mid (5220MHz) and Channel High (5240MHz) with 13Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz SISO for 5180 ~ 5240MHz:

Channel Low (5180MHz), Channel Mid (5220MHz) and Channel High (5240MHz) with 13Mbps data rate were chosen for full testing.

UNII Band II:

IEEE 802.11a for 5260 ~ 5320MHz:

Channel Low (5260MHz), Channel Mid (5280MHz) and Channel High (5320MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz for 5260 ~ 5320MHz:

Channel Low (5260MHz), Channel Mid (5280MHz) and Channel High (5320MHz) with 13Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz SISO for 5260 ~ 5320MHz:

Channel Low (5260MHz), Channel Mid (5280MHz) and Channel High (5320MHz) with 13Mbps data rate were chosen for full testing.



UNII Band III:

IEEE 802.11a for 5500 ~ 5700MHz:

Channel Low (5500MHz), Channel Mid (5580MHz) and Channel High (5700MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz for 5500 ~ 5700MHz:

Channel Low (5500MHz), Channel Mid (5580MHz) and Channel High (5700MHz) with 13Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz SISO for 5500 ~ 5700MHz:

Channel Low (5500MHz), Channel Mid (5580MHz) and Channel High (5700MHz) with 13Mbps data rate were chosen for full testing.

UNII Band IV:

IEEE 802.11a for 5745 ~ 5805MHz:

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5805MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz for 5745 ~ 5805MHz:

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5805MHz) with 13Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz SISO for 5745 ~ 5805MHz:

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5805MHz) with 13Mbps data rate were chosen for full testing.



4. SETUP OF EQUIPMENT UNDER TEST

4.1 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Model No.	Serial No.	FCC ID	Brand	Data Cable	Power Cord
1	PC	OPTIPLEX780	C7X53X	N/A	DELL	N/A	Unshielded 1.80m
2	Monitor	S2440LB	CN0N5XDC74261 31EOGZQ	N/A	DELL	Unshielded 1.20m	Unshielded 1.80m
3	Printer	D1668	CN9CKCB2RG	N/A	HP	Unshielded 1.50m	Unshielded 1.50m
4	Modem	DU562M	DU562MSG.B1	N/A	N/A	Unshielded 1.50m	N/A
5	Mouse	MS111-P	J1101ANN	N/A	DELL	Unshielded 1.80m	N/A
6	Keyboard	KB212-B	CNOK6KPN71616	N/A	DELL	Unshielded 1.80m	N/A
7	TF Card	N/A	N/A	N/A	Kingston	N/A	N/A
8	Earphone	N/A	N/A	N/A	N/A	Unshielded 2.00m	N/A
9	Notebook	B475	WB04861612	N/A	LENOVO	N/A	Unshielded 1.80m

Note:

Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.2 CONFIGURATION OF SYSTEM UNDER TEST

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at **No.10-1 Mingkeda Logistics park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China**

The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA	A2LA
China	CNAS

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

USA	FCC
Japan	VCCI(C-3478, R-3135, T-652, G-624)
Canada	INDUSTRY CANADA
Taiwan	BSMI

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsrf.com>



5.4 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 0824-01 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, IC 2324G-1 for 3M Semi Anechoic Chamber A, 2324G-2 for 3M Semi Anechoic Chamber B.

5.5 MEASUREMENT UNCERTAINTY

Parameter	Uncertainty
RF frequency	+/-1 * 10 ⁻⁵
RF power conducted	+/- 1,5 dB
RF power radiated	+/- 6 dB
Spurious emissions, conducted	+/- 3 dB
Spurious emissions, radiated	+/- 6 dB
Humidity	+/- 5 %
Temperature	+/- 1°C
Time	+/-10 %

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



6. APPLICABLE RULES

RSS-210 §2 General Certification Requirements and Specifications

RSS-210 §2.1 RSS-Gen Compliance

In addition to RSS-210, the requirements in RSS-Gen, *General Requirements and Information for the Certification of Radio Apparatus*, must be met.

RSS-210 §2.2 Emissions Falling Within Restricted Frequency Bands

Category I licence-exempt equipment is required to comply with the provisions in RSS-Gen with respect to emissions falling within restricted frequency bands. These restricted frequency bands are listed in RSS-Gen.

RSS-210 §2.3 Receivers

Category I equipment receivers for use with transmitters subject to RSS-210 must comply with the applicable requirements set out in RSS-Gen and be certified under RSS-210. Category II equipment receivers for use with transmitters subject to RSS-210 are exempt from certification, but are subject to compliance with RSS-Gen and RSS-310.

RSS-210 §2.5 General Field Strength Limits

RSS-Gen includes the general field strength limits of unwanted emissions, where applicable, for transmitters and receivers operating in accordance with the provisions specified in this standard. Unwanted emissions of transmitters and receivers are permitted to fall within the restricted bands listed in RSS-Gen, and including the TV bands, but fundamental emissions are prohibited in the restricted bands.

RSS-210 §2.5.1 Transmitters with Wanted Emissions that are Within the General Field Strength Limits

Whether or not their operation is addressed by published RSS standards, transmitters whose wanted and unwanted emissions are within the general field strength limits shown in RSS-Gen, they may operate in any of the frequency bands, other than the restricted bands listed in RSS-Gen and including the TV bands, and shall be certified under RSS-210. Under no conditions may the level of any unwanted emissions exceed the level of the fundamental emission.

Note: Devices operating below 490 kHz in which all emissions are at least 40 dB below the limit listed in RSS-Gen (*General Field Strength Limits for Transmitters at Frequencies below 30 MHz*) are Category II devices and are subject to RSS-310.



RSS-210 §2.7 Tables

RSS-210 §Annex 8: Frequency Hopping and Digital Modulation Systems Operating in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz Bands

This section applies to systems that employ frequency hopping (FH) and digital modulation technology in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands. Systems in these bands may employ frequency hopping, digital modulation and or a combination (hybrid) of both techniques.

A frequency hopping system that synchronizes with another or several other systems (to avoid frequency collision among them) via off-air sensing or via connecting cables is not hopping randomly and therefore is not in compliance with RSS-210.

RSS-210 §A8.1 Frequency Hopping Systems

Frequency hopping systems are spread spectrum systems in which the carrier is modulated with coded information in a conventional manner causing a conventional spreading of the RF energy about the carrier frequency. The frequency of the carrier is not fixed but changes at fixed intervals under the direction of a coded sequence.

Frequency hopping systems are not required to employ all available hopping frequencies during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream.

Incorporation of intelligence into a frequency hopping system that enables it to recognize other users of the band and to avoid occupied frequencies is permitted, provided that the frequency hopping system does it individually, and independently chooses or adapts its hopset. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

The following applies to frequency hopping systems in each of the three bands.

(a) The bandwidth of a frequency hopping channel is the 20 dB emission bandwidth, measured with the hopping stopped. The system RF bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The hopset shall be such that the near term distribution of frequencies appears random, with sequential hops randomly distributed in both direction and magnitude of change in the hopset while the long term distribution appears evenly distributed.



(b) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 0.125 W. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(d) Frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 hopping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Transmissions on particular hopping frequencies may be avoided or suppressed provided that a minimum of 15 hopping channels are used.

RSS-210 §A8.2 Digital Modulation Systems

These include systems employing digital modulation techniques resulting in spectral characteristics similar to direct sequence systems. The following applies to all three bands.

RSS-210 §A8.4 Transmitter Output Power and e.i.r.p. Requirements

(4) For systems employing digital modulation techniques operating in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands, the maximum peak conducted power shall not exceed 1 W. Except as provided in Section A8.4(5), the e.i.r.p. shall not exceed 4 W.

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power (see RSS-Gen)

(5) Point-to-point systems in the bands 2400-2483.5 MHz and 5725-5850 MHz are permitted to have an e.i.r.p. higher than 4 W, provided that the higher e.i.r.p. is achieved by employing higher gain directional antennas and not higher transmitter output powers. Point-to-multipoint systems, omni-directional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding 4 W e.i.r.p. However, remote stations of point-to-multipoint systems shall be allowed to operate at greater than 4 W e.i.r.p, under the same conditions as for point-to- point systems.

Note: "Fixed, point-to-point operation", excludes point-to-multipoint systems, omnidirectional applications and multiple co-located transmitters transmitting the same information.



RSS-210 §A8.5 Out-of-band Emissions

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required.

RSS-Gen §2 General Information

RSS-Gen §2.1.2 Category II Equipment

Category II equipment comprises radio devices where a standard has been prescribed but for which a TAC is not required, that is, equipment certification by Industry Canada or a Certification Body (CB) is not required (certification exempt), pursuant to subsection 4(3) of the Radiocommunication Act. The manufacturer or importer shall nevertheless ensure that the standards are complied with. A test report shall be available on request and the device shall be properly labelled.

RSS-Gen §2.2 Receivers

Receivers that are used for radiocommunication other than broadcasting are defined as Category I equipment or Category II equipment, subject to compliance with applicable Industry Canada standards.

Receivers shall be capable of operation only with transmitters for which RSSs are published. Receivers are classified as described in sections 2.2.1 and 2.2.2.

RSS-Gen §2.2.1 Category I Equipment Receivers

A receiver is classified as Category I equipment if it meets one of the following conditions:

- (a) a stand-alone receiver (see Note 1, below), which operates on any frequency in the band 30-960 MHz, and is used for the reception of signals in that frequency band from a transmitter classified as Category I equipment;
- (b) a Citizen's Band (CB) receiver (26.96-27.410 MHz);
- (c) a scanner receiver.

Note 1: A *stand-alone receiver* is defined as any receiver that is not permanently combined together with a transmitter in a single case (transceiver), in which it functions as the receiver component of the transceiver.

Receivers classified as Category I equipment shall comply with the limits for receiver spurious emissions set out in RSS-Gen; however, equipment certification is granted under the applicable RSS standard along with the associated transmitter classified as Category I equipment. Scanner receivers are covered under their own specific RSS.

RSS-Gen §2.2.2 Category II Equipment Receivers

A receiver is classified as Category II equipment if it does not meet any of the conditions of Section 2.2.1.

Category II receivers shall comply with the applicable testing, labelling and user manual requirements in RSS-310.



RSS-Gen §5.6 Exposure of Humans to RF Fields

Category I and Category II equipment shall comply with the applicable requirements of RSS-102.

RSS-Gen §6 Receiver Spurious Emission Standard

Receivers shall comply with the limits of spurious emissions set out in this section, measured over the frequency range determined in accordance with Section 4.10.

RSS-Gen §6.1 Radiated Limits

Radiated spurious emission measurements shall be performed with the receiver antenna connected to the receiver antenna terminals.

Spurious emissions from receivers shall not exceed the radiated limits shown in the table below:

RSS-Gen Table 2 - Spurious Emission Limits for Receivers

Frequency (MHz)	Field Strength microvolts/m at 3 metres
30-88	100
88-216	150
216-960	200
Above 960	500

*Measurements for compliance with limits in the above table may be performed at distances other than 3 metres, in accordance with Section 7.2.7.



RSS- Gen Table 3: Restricted Frequency Bands ^(Note)

MHz	MHz	MHz	MHz	GHz
0.090-0.110	8.37625-8.38675	--	1718.8-1722.2	9.0-9.2
--	8.41425-8.41475	156.52475-156.52525	2200-2300	9.3-9.5
2.1735-2.1905	12.29-12.293	156.7-156.9	2310-2390	10.6-12.7
3.020-3.026	12.51975-12.52025	--	--	13.25-13.4
4.125-4.128	12.57675-12.57725	--	2655-2900	14.47-14.5
4.17725-4.17775	13.36-13.41	240-285	3260-3267	15.35-16.2
4.20725-4.20775	16.42-16.423	322-335.4	3332-3339	17.7-21.4
5.677-5.683	16.69475-16.69525	399.9-410	3345.8-3358	22.01-23.12
6.215-6.218	16.80425-16.80475	608-614	3500-4400	23.6-24.0
6.26775-6.26825	25.5-25.67	960-1427	4500-5150	31.2-31.8
6.31175-6.31225	37.5-38.25	1435-1626.5	5350-5460	36.43-36.5
8.291-8.294	73-74.6; 74.8-75.2	1645.5-1646.5	7250-7750	Above 38.6
8.362-8.366	108-138	1660-1710	8025-8500	

Note: Certain frequency bands listed in Table 2 and above 38.6 GHz are designated for low-power licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard as well as RSS-310.

RSS- Gen Table 5: General Field Strength Limits for Transmitters at Frequencies Above 30 MHz

Frequency (MHz)	Field Strength (microvolt/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960	500

Note: Transmitting devices are not permitted in Table 1 bands or, unless stated otherwise, in TV bands(54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-806 MHz).



RSS- Gen Table 6: General Field Strength Limits for Transmitters at Frequencies Below 30 MHz (Transmit)

Frequency (fundamental or spurious)	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/377F (F in Hz)	300
490-1.705 kHz	24,000/F (F in kHz)	24,000/377F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Note: The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing an average detector.



RSS-Gen §7.1.2 Transmitter Antenna

A transmitter can only be sold or operated with antennas with which it was approved. Transmitter may be approved with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest gain antenna of each combination of transmitter and antenna type for which approval is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type having equal or lesser gain as an antenna that had been successfully tested with the transmitter, will also be considered approved with the transmitter, and may be used and marketed with the transmitter. For Category I transmitters, the manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer.

For transmitters of RF output power of 10 milliwatts or less, only the portion of the antenna gain that is in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power to demonstrate compliance with the radiated power limits specified in the applicable standard. For transmitters of output power greater than 10 milliwatts, the total antenna gain shall be added to the measured RF output power to demonstrate compliance to the specified radiated power limits. User manuals for transmitters shall display the following notice in a conspicuous location:

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

The above notice may be affixed to the device instead of displayed in the user manual.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi) and required impedance for each.



RSS-Gen §7.2.4 Transmitter and Receiver AC Power Lines Conducted Emission Limits

Except when the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply, either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table below. The more stringent limit applies at the frequency range boundaries. The conducted emissions shall be measured with a 50 ohm/50 microhenry line impedance stabilization network (LISN).

RSS-Gen Table 4 – AC Power Line Conducted Emission Limits

Frequency Range (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

**Decreases with the logarithm of the frequency.*



7. FCC PART 15 REQUIREMENTS & RSS 210 REQUIREMENTS

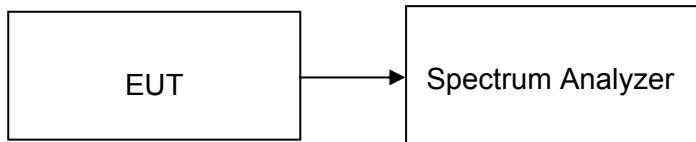
7.1 99% BANDWIDTH

7.1.1 MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015

Remark: Each piece of equipment is scheduled for calibration once a year.

7.1.2 TEST CONFIGURATION



7.1.3 TEST PROCEDURE

The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold.



7.1.4 TEST RESULTS

Test mode: IEEE 802.11a mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	Bandwidth(MHz)	
		Antenna 0	Antenna 1
Low	5180	16.4707	16.4102
Mid	5220	16.4613	16.4379
High	5240	16.4426	16.4161

Test mode: IEEE 802.11a mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	Bandwidth(MHz)	
		Antenna 0	Antenna 1
Low	5260	16.4849	16.4284
Mid	5280	16.4638	16.4087
High	5320	16.4426	16.4345

Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	Bandwidth(MHz)	
		Antenna 0	Antenna 1
Low	5500	16.4300	16.4724
Mid	5580	16.4552	16.4385
High	5700	16.4669	16.4072

Test mode: IEEE 802.11a mode / 5745 ~ 5805MHz

Channel	Frequency (MHz)	Bandwidth(MHz)	
		Antenna 0	Antenna 1
Low	5745	16.4305	16.4432
Mid	5785	16.4811	16.4223
High	5805	16.4561	16.4628



Test mode: IEEE 802.11n HT 20 MHz mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	Bandwidth(MHz)	
		Antenna 0	Antenna 1
Low	5180	17.4539	17.4739
Mid	5220	17.5028	17.4703
High	5240	17.4686	17.4819

Test mode: IEEE 802.11n HT 20 MHz mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	Bandwidth(MHz)	
		Antenna 0	Antenna 1
Low	5260	17.4923	17.4869
Mid	5280	17.4748	17.4562
High	5320	17.4709	17.4730

Test mode: IEEE 802.11n HT 20 MHz mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	Bandwidth(MHz)	
		Antenna 0	Antenna 1
Low	5500	17.4796	17.5070
Mid	5580	17.5304	17.4524
High	5700	17.5131	17.4735

Test mode: IEEE 802.11n HT 20 MHz mode / 5745 ~ 5805MHz

Channel	Frequency (MHz)	Bandwidth(MHz)	
		Antenna 0	Antenna 1
Low	5745	17.4916	17.5238
Mid	5785	17.4588	17.4620
High	5805	17.4707	17.5064



Test mode: IEEE 802.11n HT 20 MHz SISO mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	Bandwidth(MHz)	
		Antenna 0	Antenna 1
Low	5180	17.4697	17.4472
Mid	5220	17.4788	17.4822
High	5240	17.4647	17.4511

Test mode: IEEE 802.11n HT 20 MHz SISO mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	Bandwidth(MHz)	
		Antenna 0	Antenna 1
Low	5260	17.4549	17.4710
Mid	5280	17.5197	17.4627
High	5320	17.4637	17.4800

Test mode: IEEE 802.11n HT 20 MHz SISO mode / 5500 ~ 5700MHz

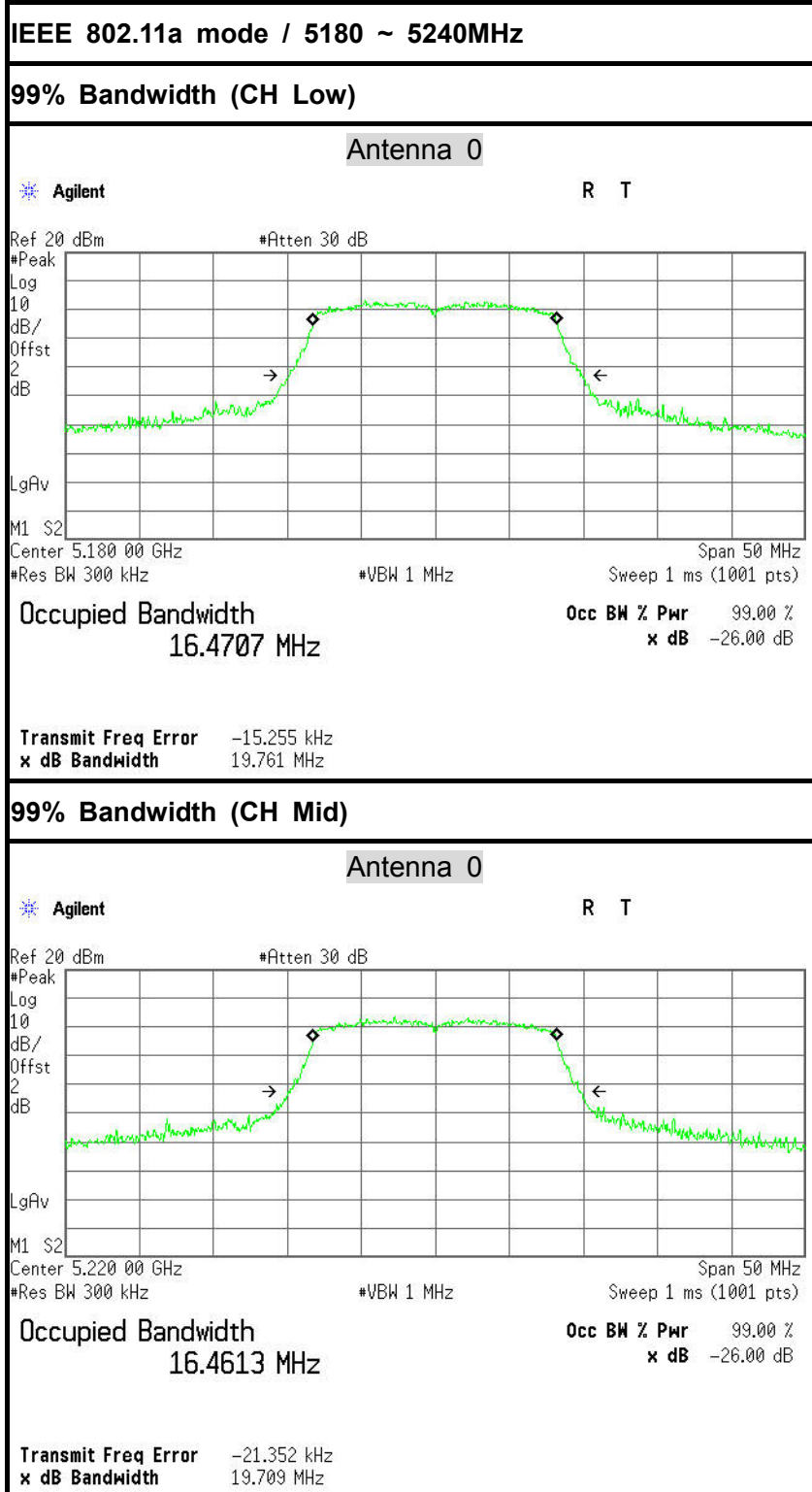
Channel	Frequency (MHz)	Bandwidth(MHz)	
		Antenna 0	Antenna 1
Low	5500	17.4211	17.4726
Mid	5580	17.4733	17.4245
High	5700	17.4794	17.4800

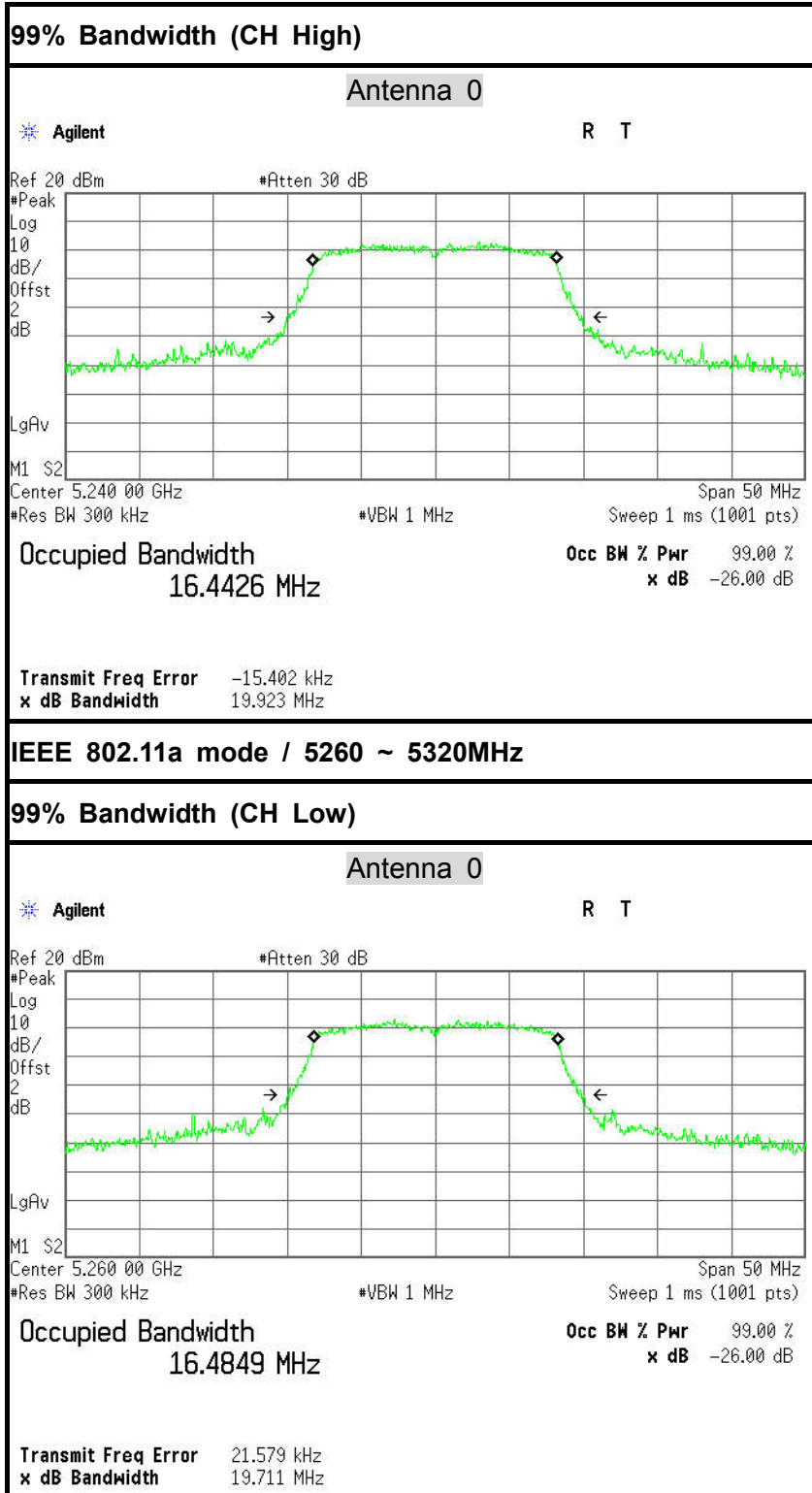
Test mode: IEEE 802.11n HT 20 MHz SISO mode / 5745 ~ 5805MHz

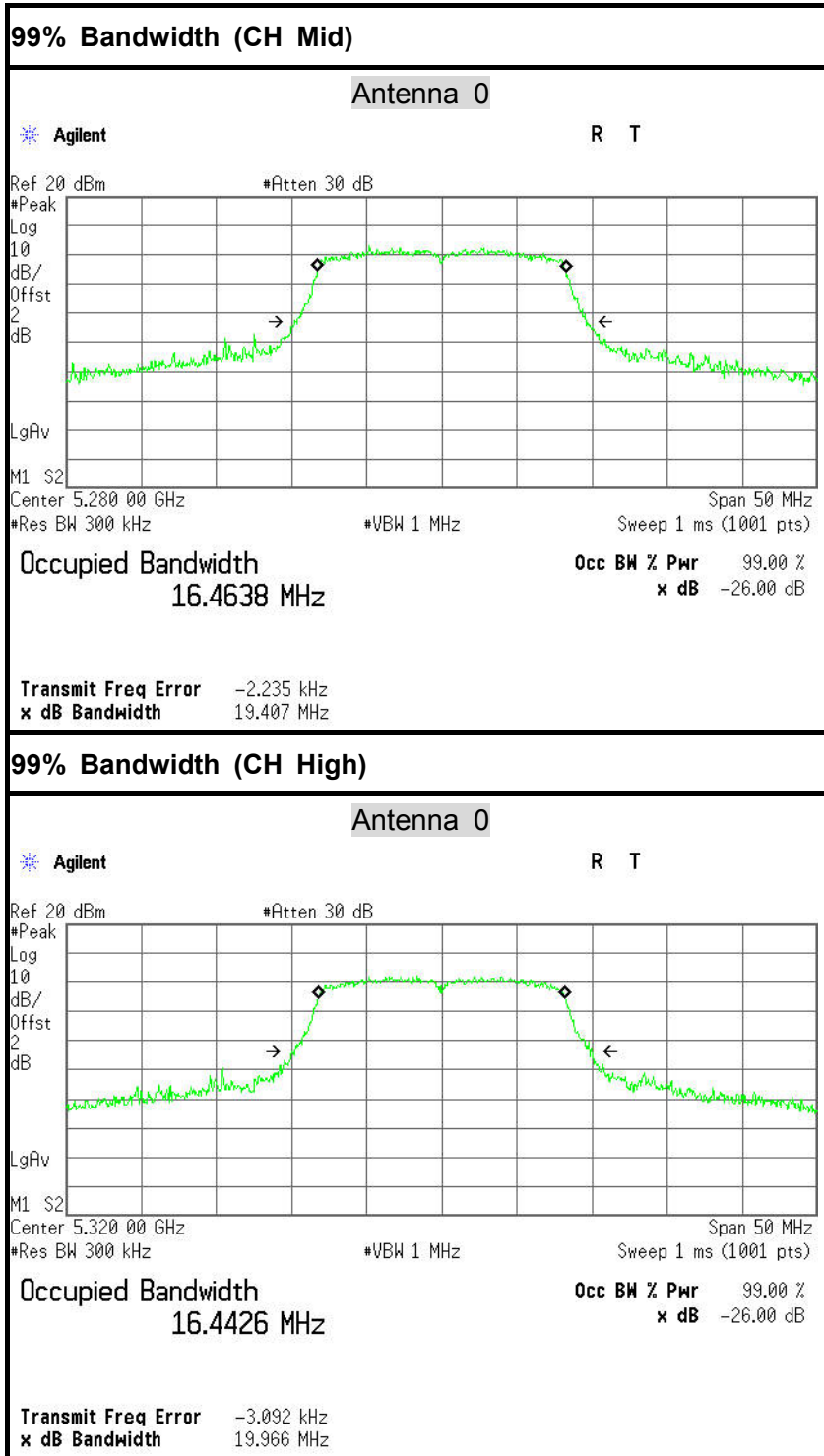
Channel	Frequency (MHz)	Bandwidth(MHz)	
		Antenna 0	Antenna 1
Low	5745	17.5044	17.4478
Mid	5785	17.5420	17.4646
High	5805	17.4829	17.4984



Test Plot



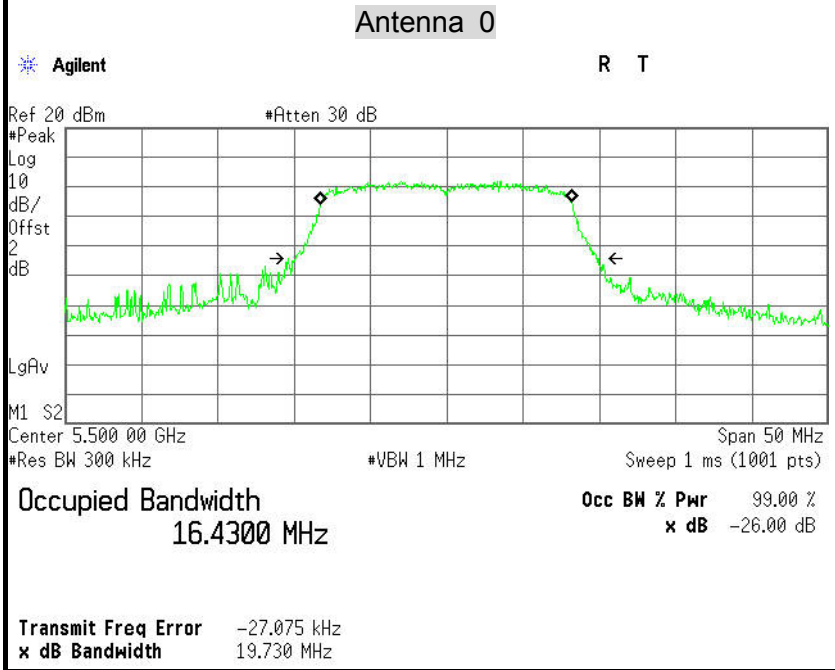




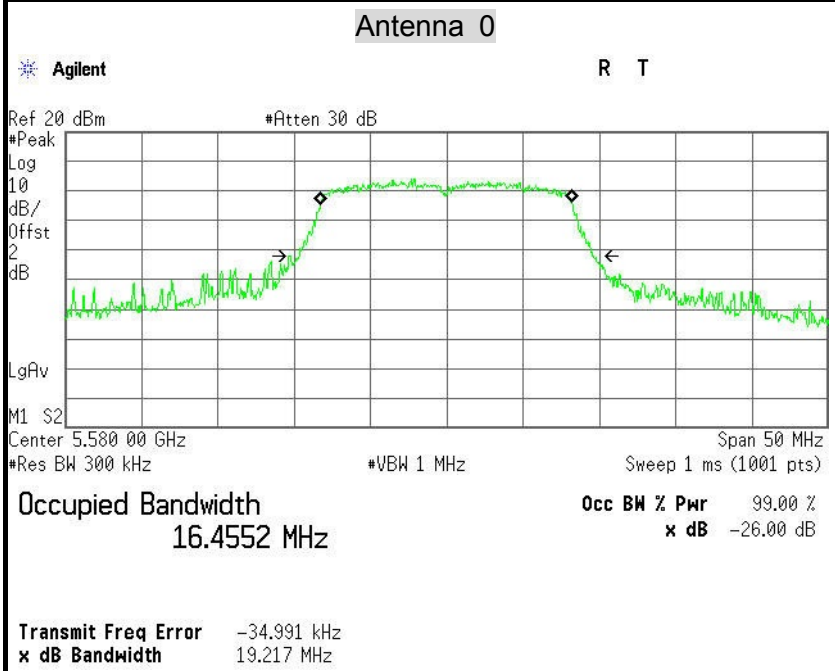


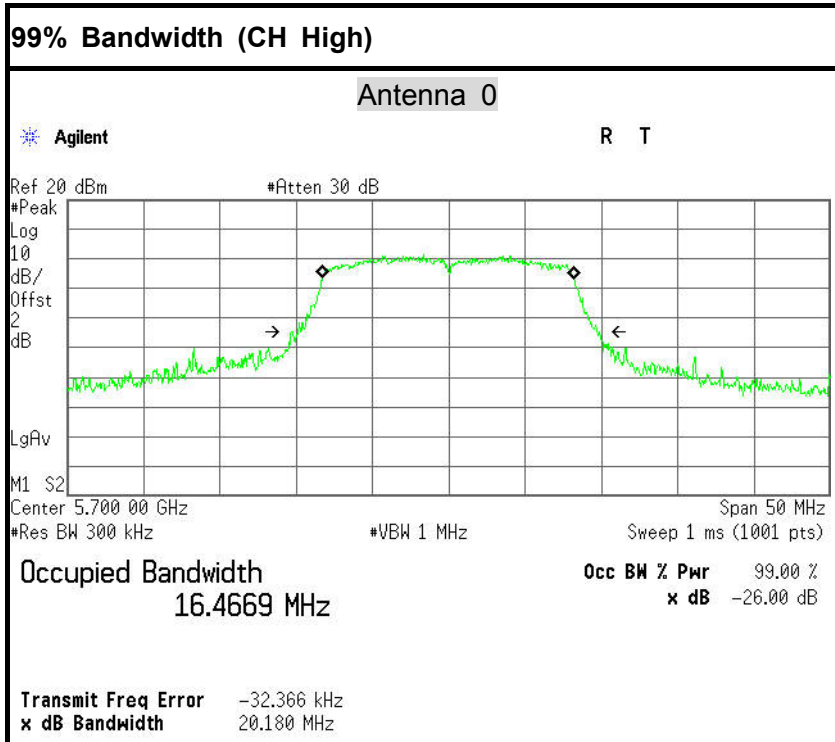
IEEE 802.11a mode / 5500 ~ 5700MHz

99% Bandwidth (CH Low)

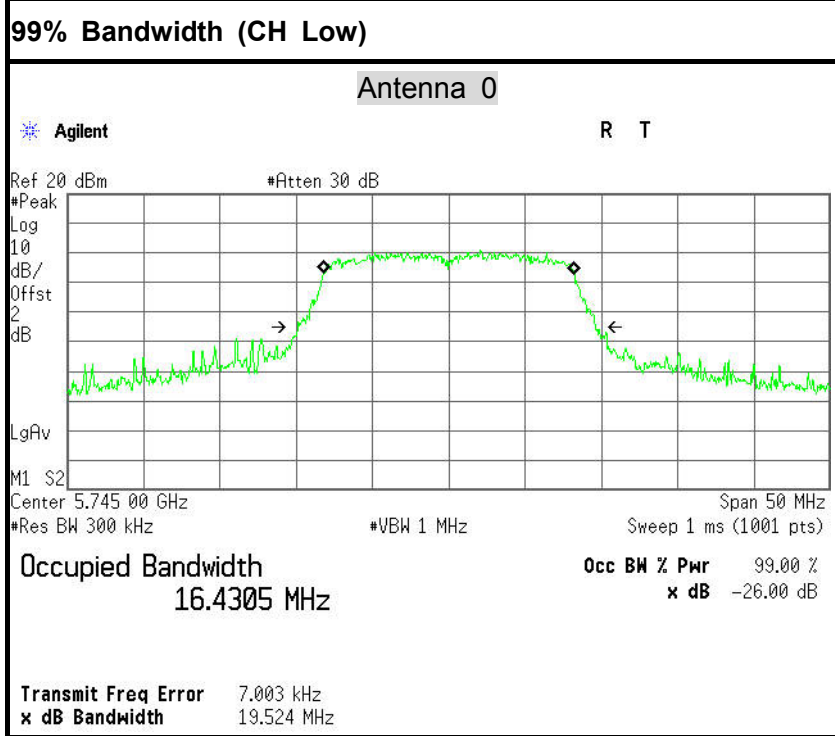


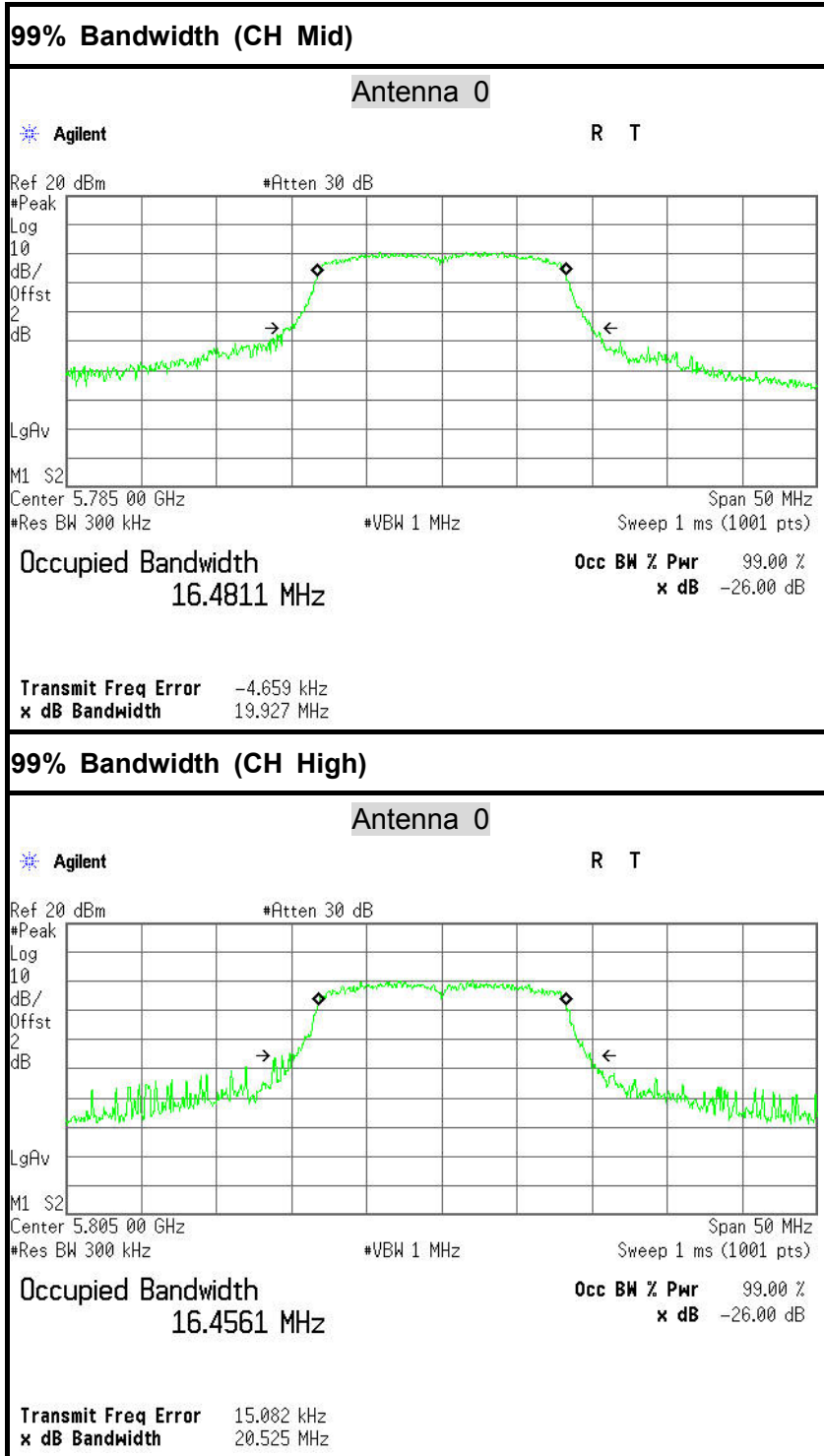
99% Bandwidth (CH Mid)





IEEE 802.11a mode / 5745 ~ 5805MHz

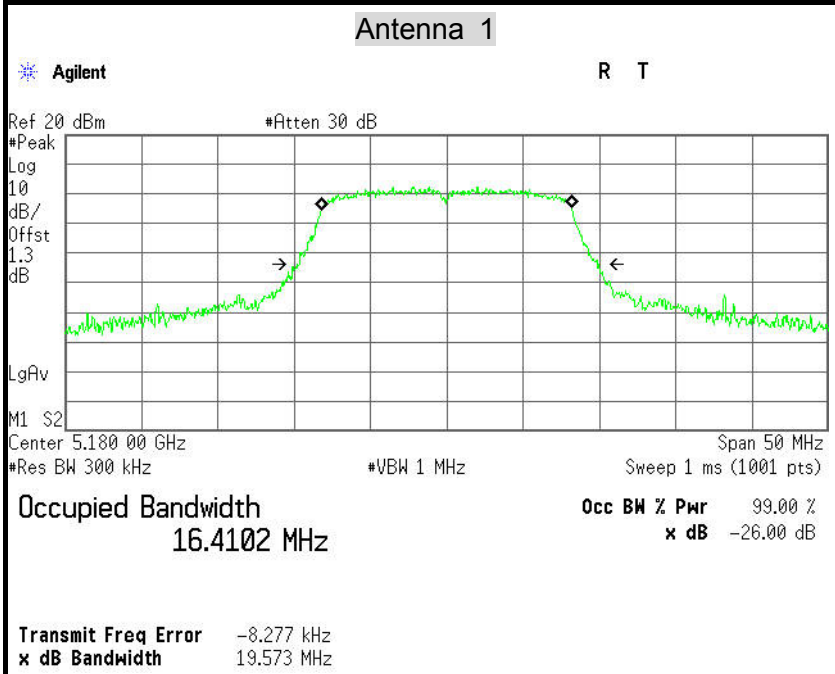




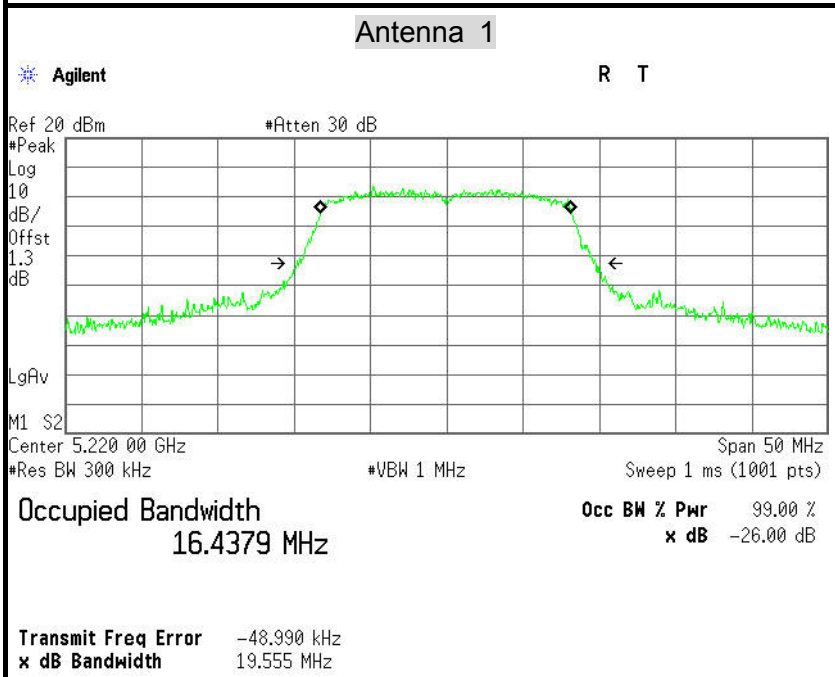


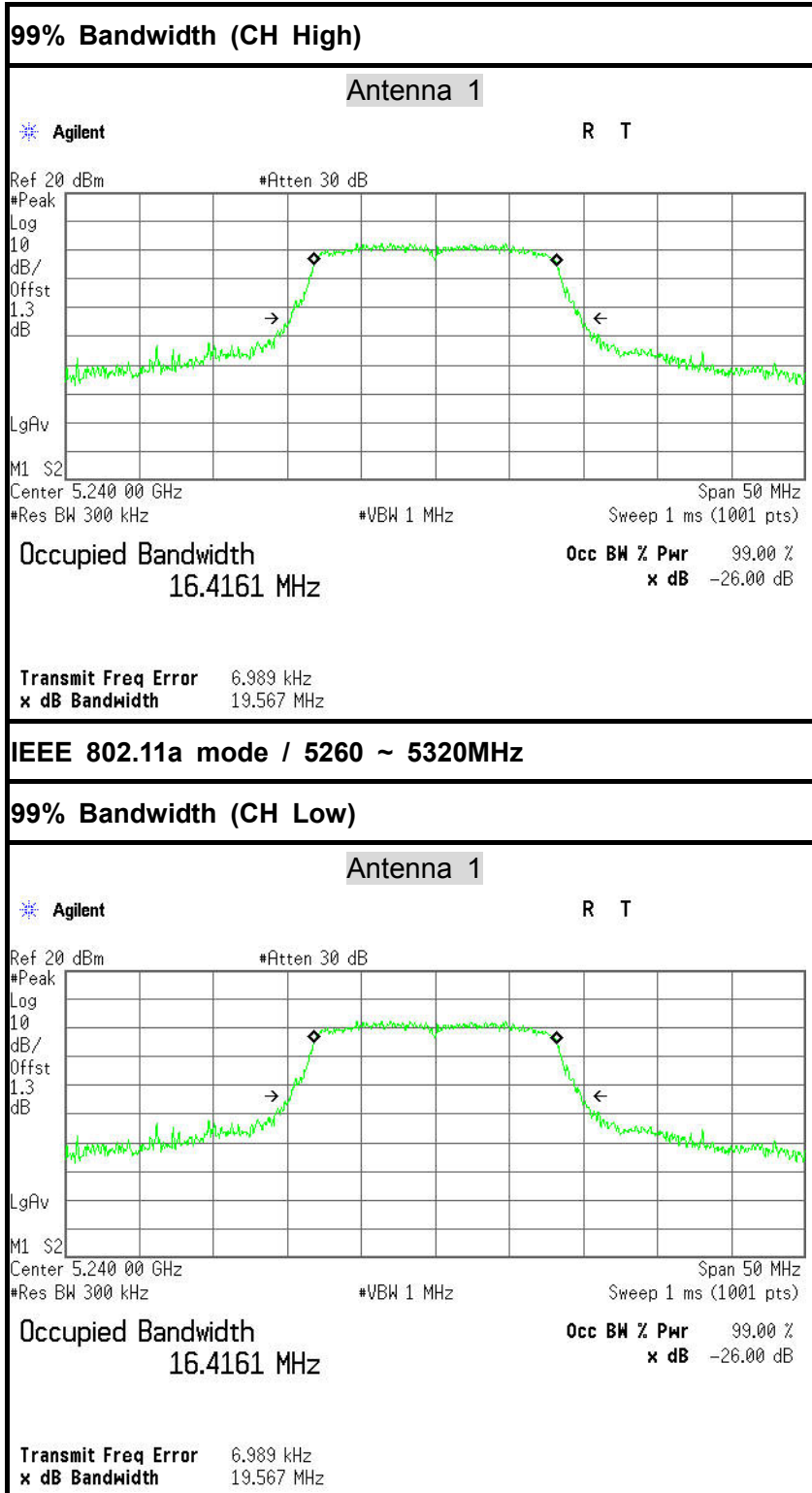
IEEE 802.11a mode / 5180 ~ 5240MHz

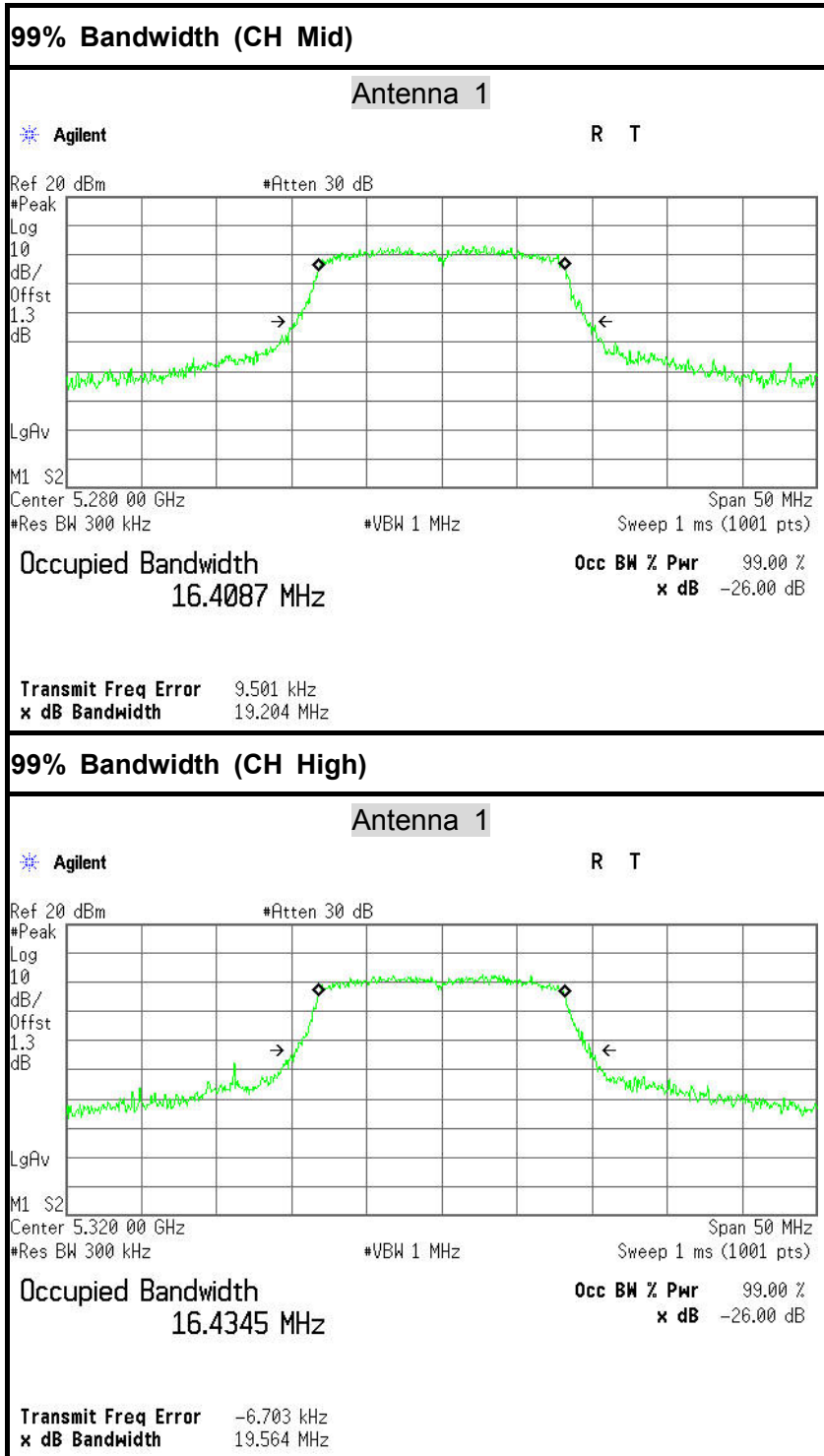
99% Bandwidth (CH Low)

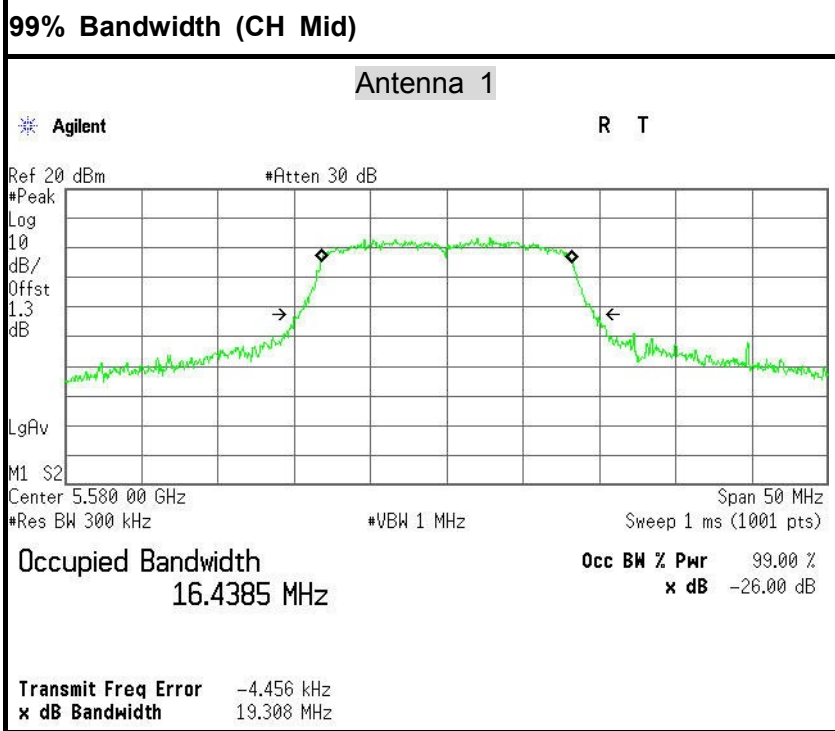
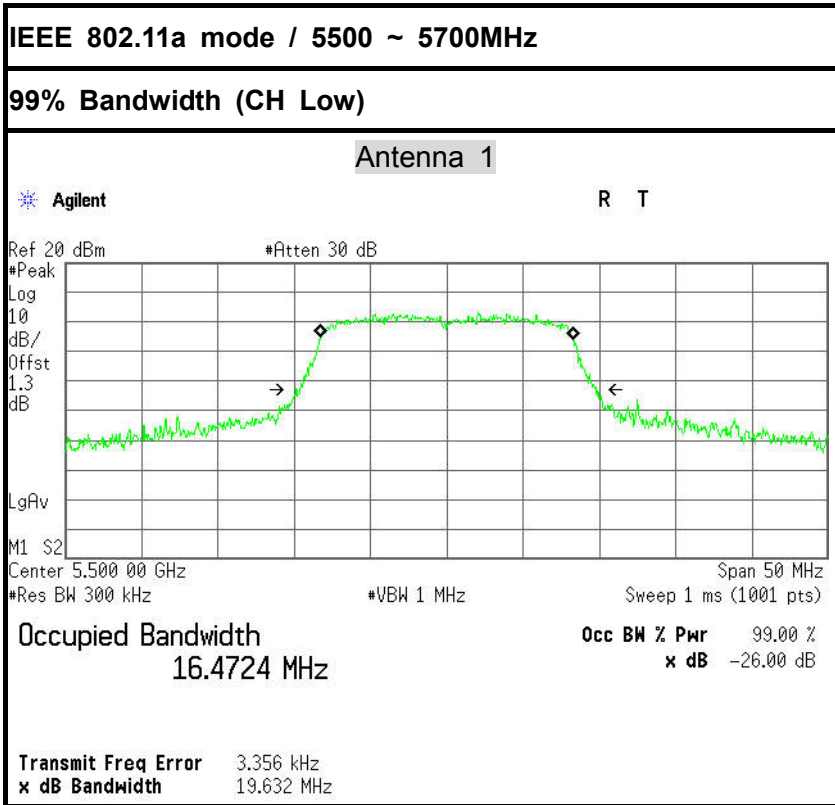


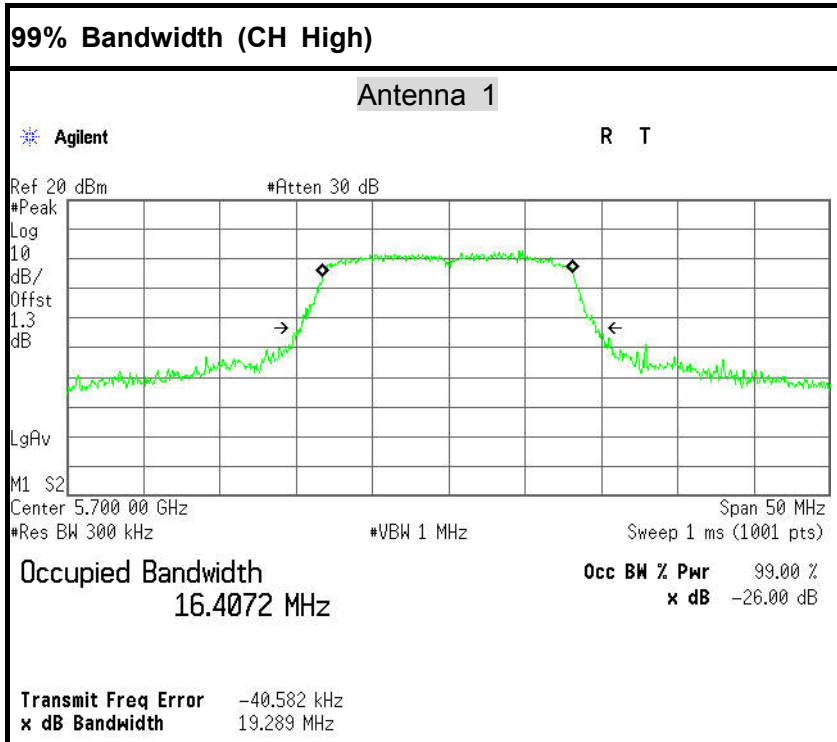
99% Bandwidth (CH Mid)



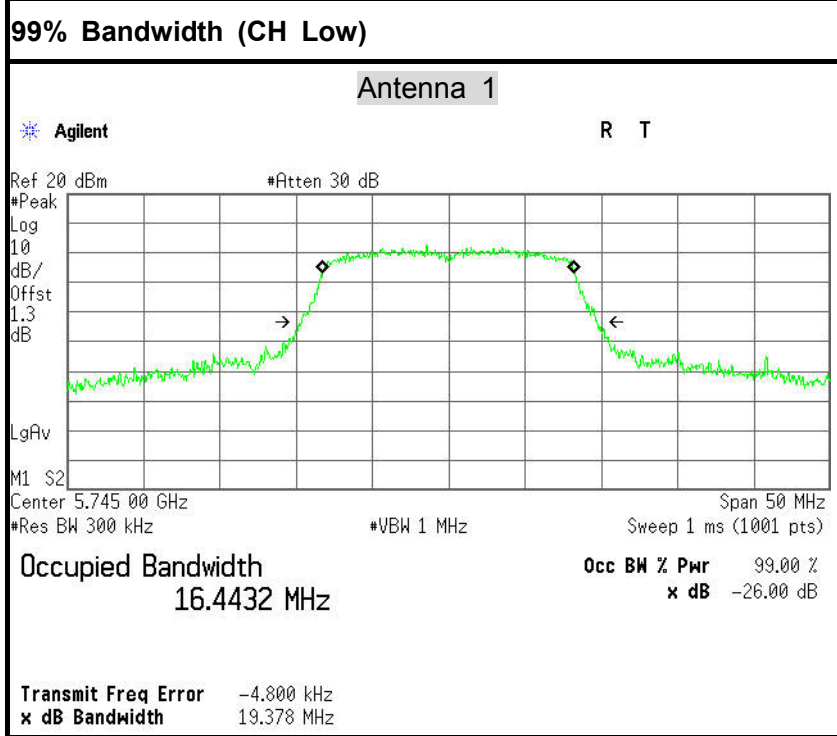


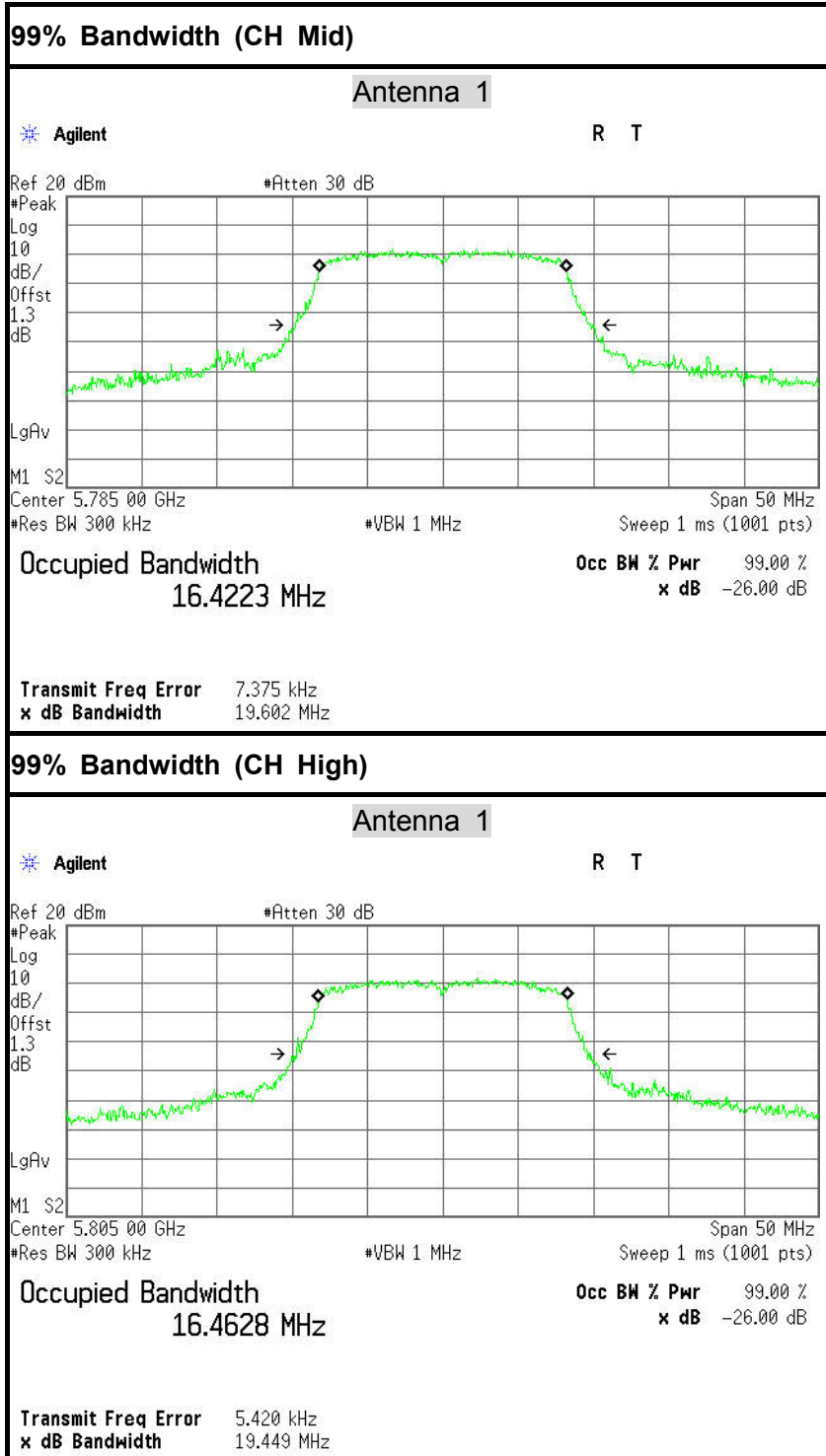






IEEE 802.11a mode / 5745 ~ 5805MHz

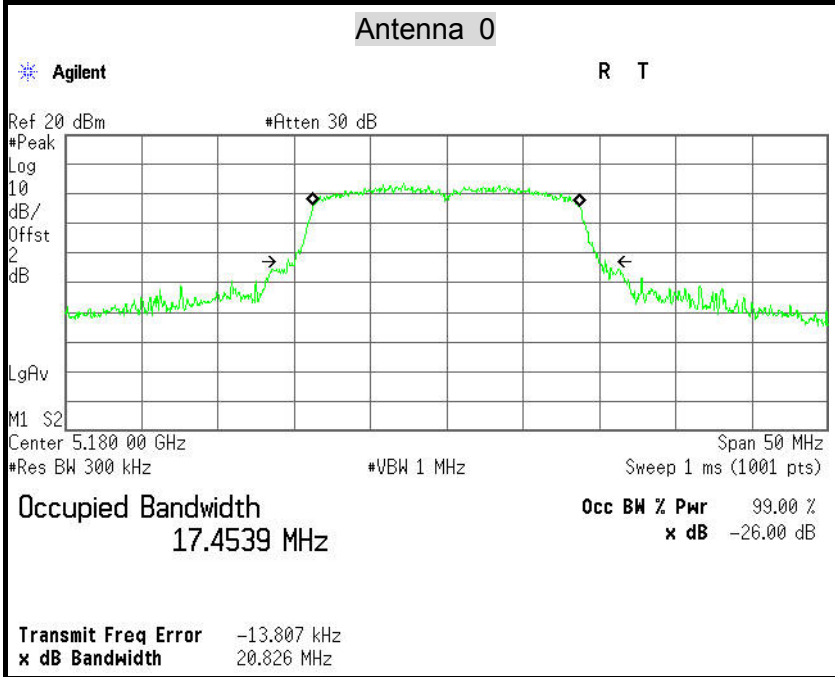




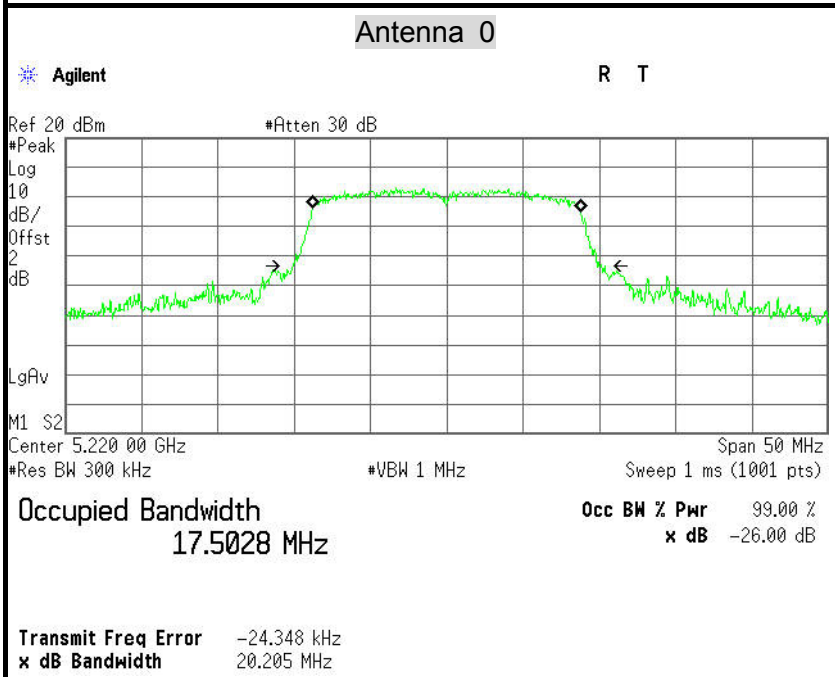


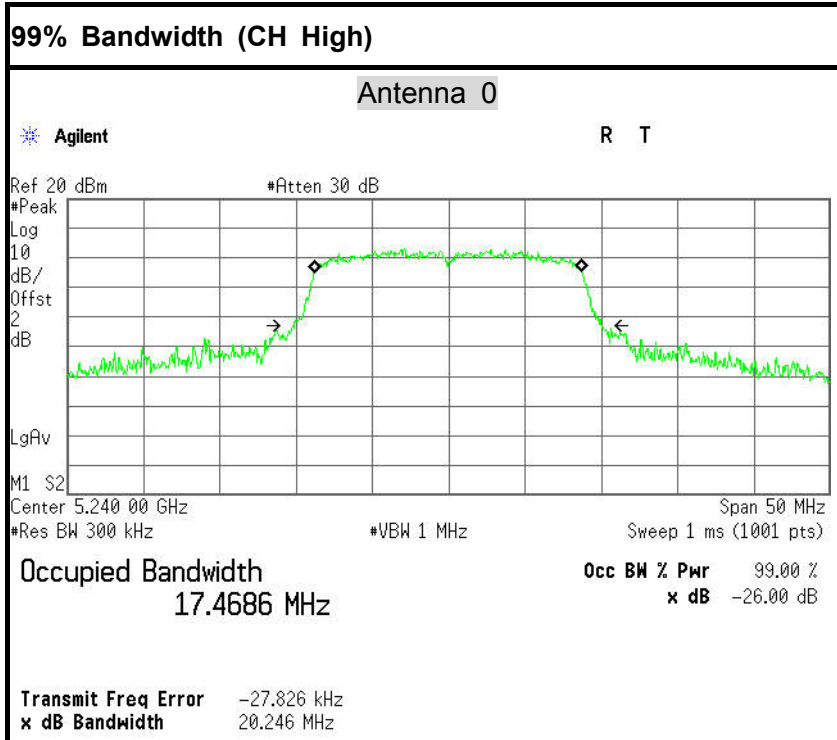
IEEE 802.11n HT 20 MHz mode / 5180 ~ 5240MHz

99% Bandwidth (CH Low)

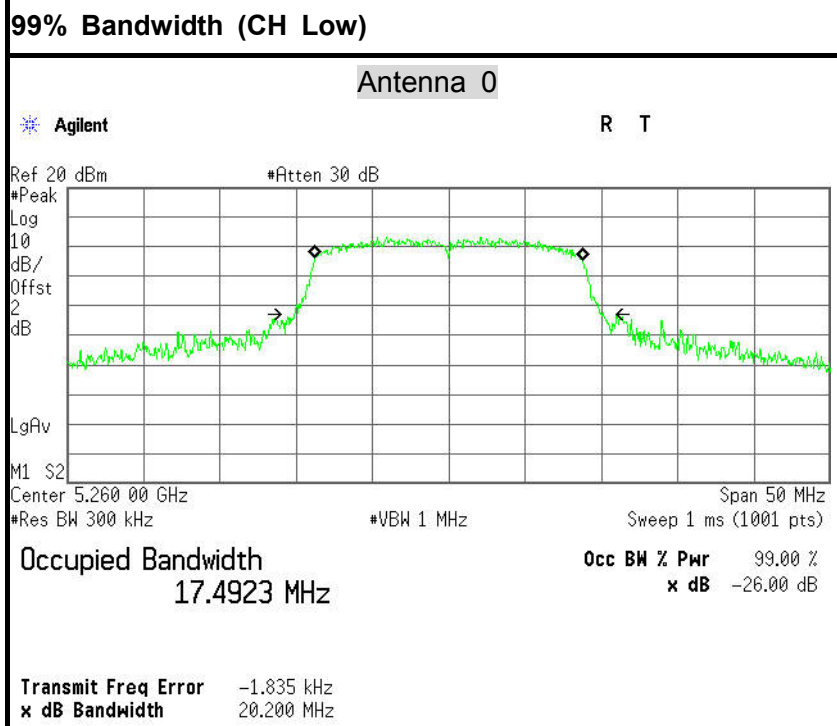


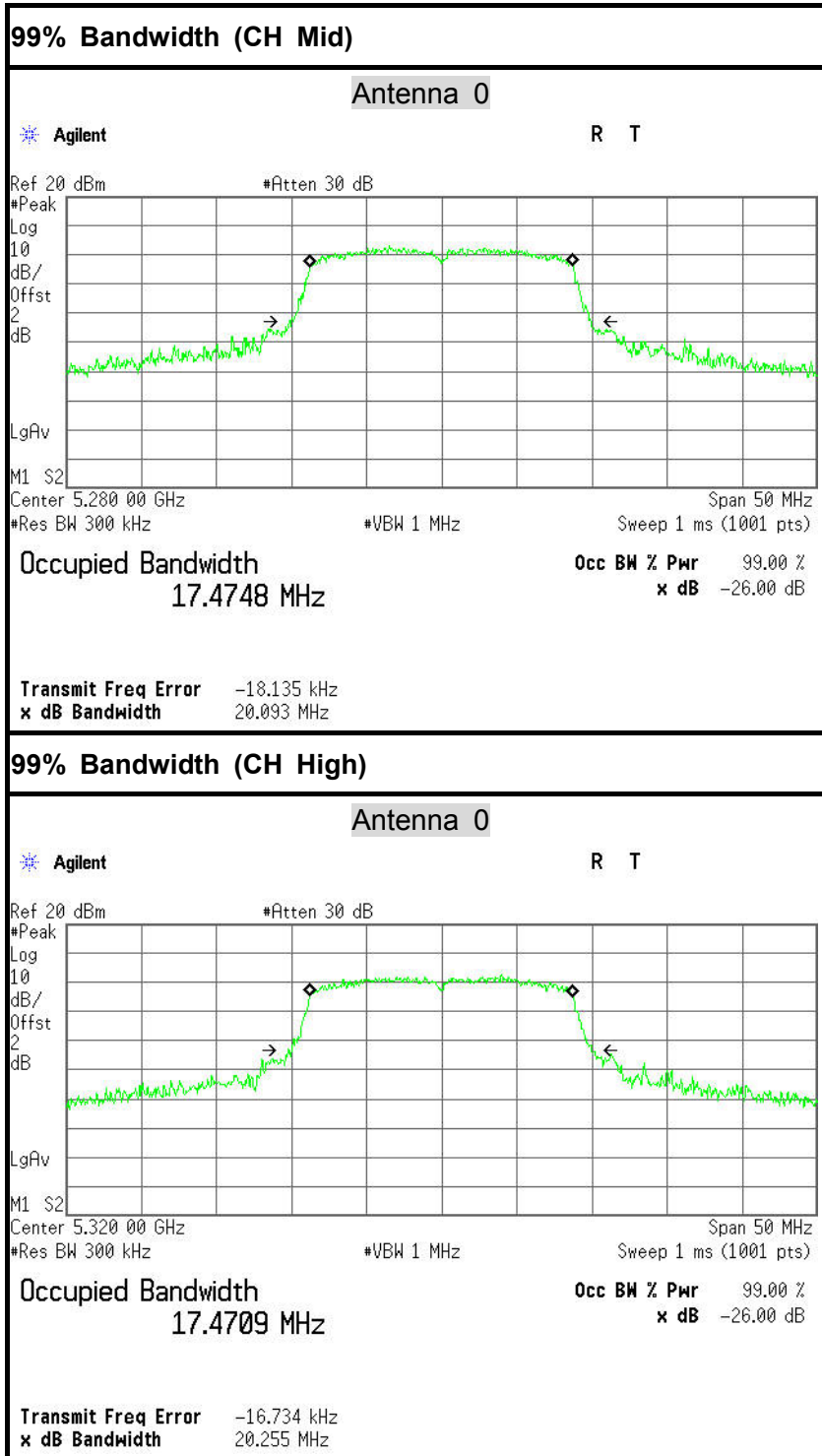
99% Bandwidth (CH Mid)





IEEE 802.11n HT 20 MHz mode / 5260 ~ 5320MHz

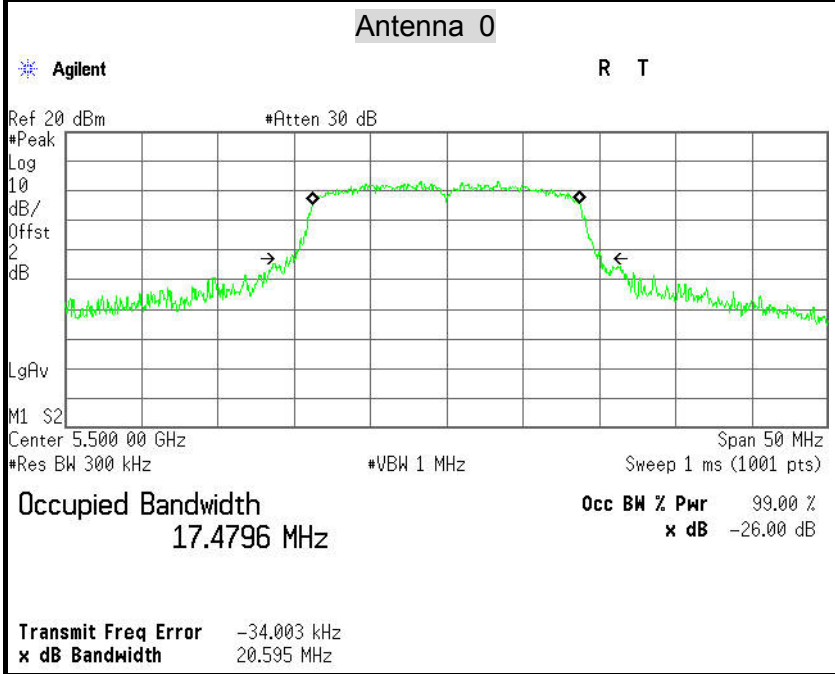




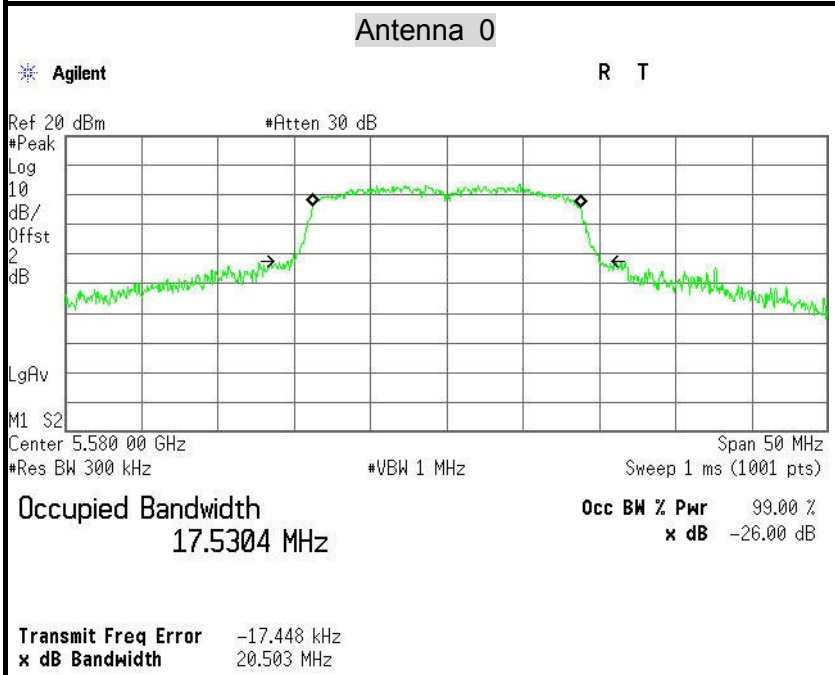


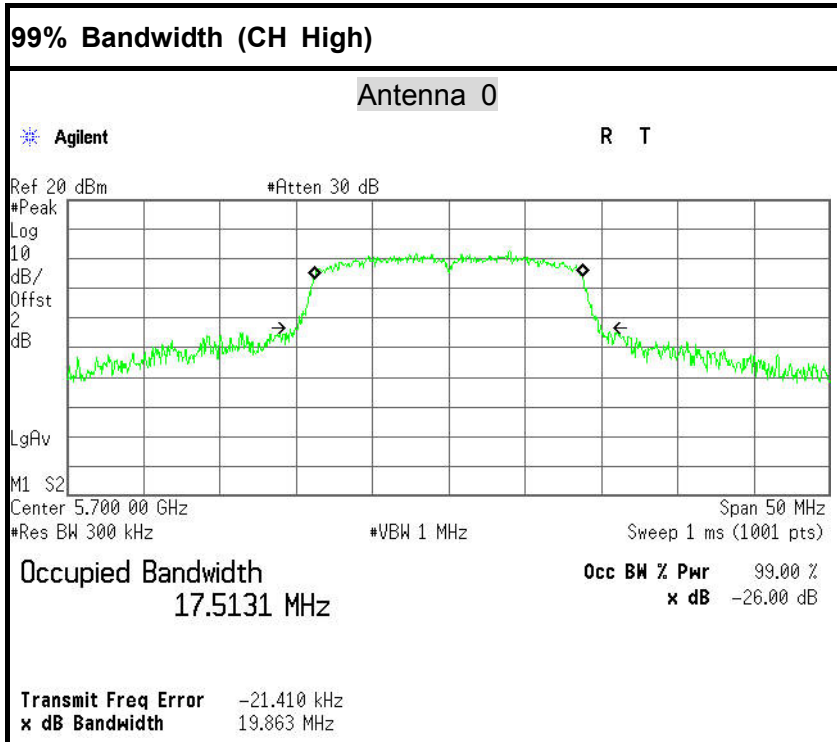
IEEE 802.11n HT 20 MHz mode / 5500 ~ 5700MHz

99% Bandwidth (CH Low)

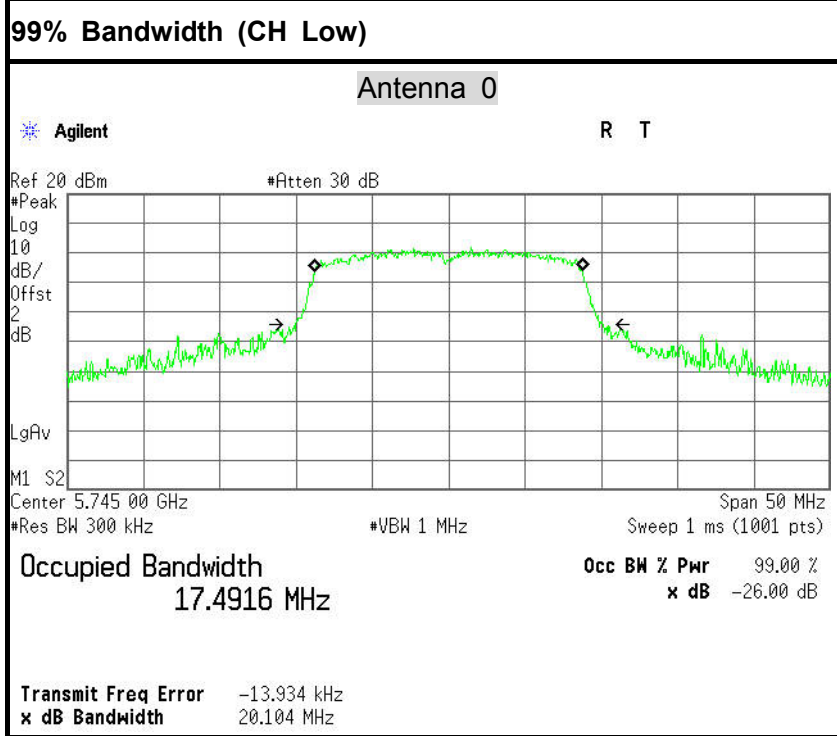


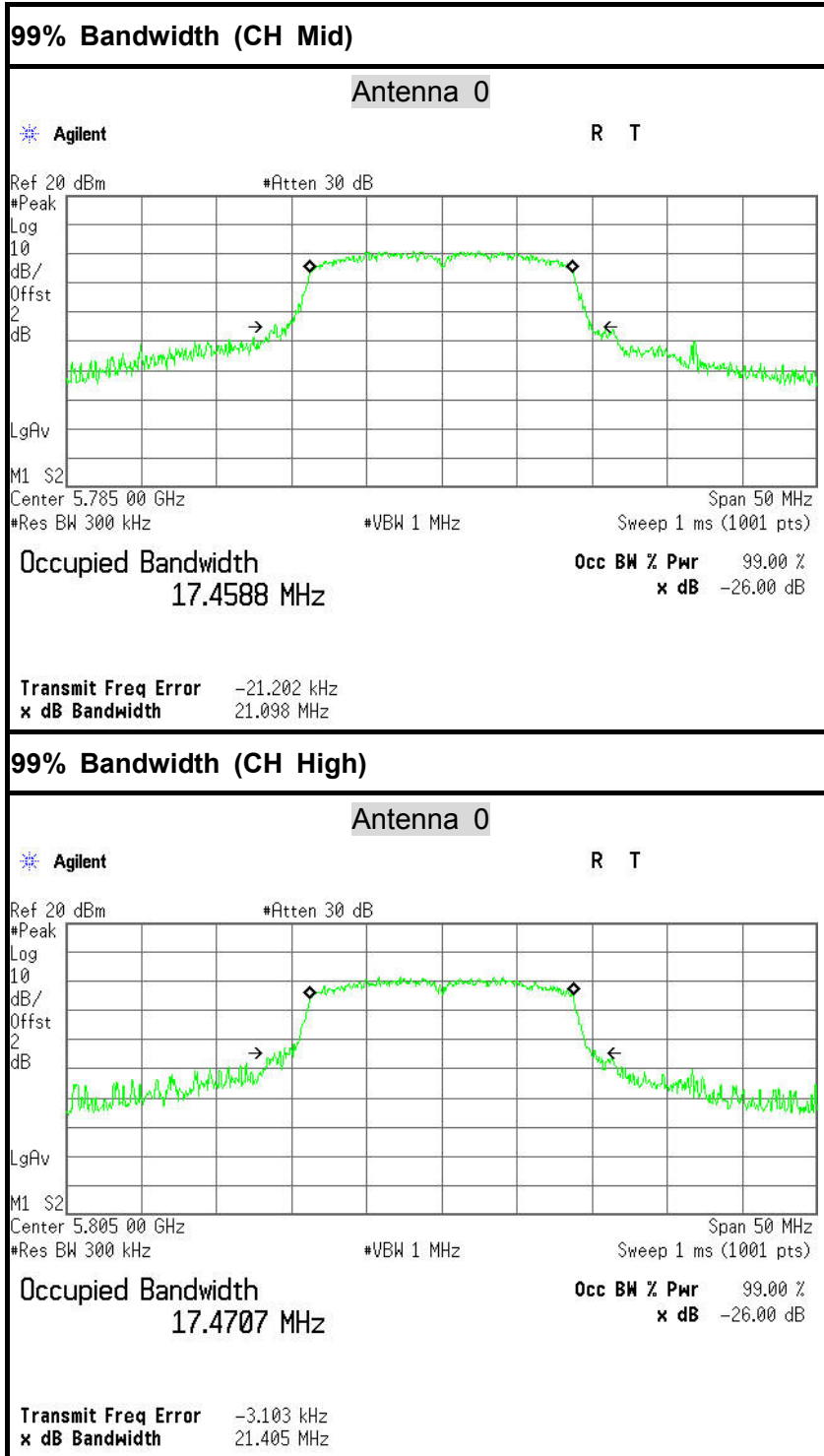
99% Bandwidth (CH Mid)





IEEE 802.11n HT 20 MHz mode / 5745 ~ 5805MHz

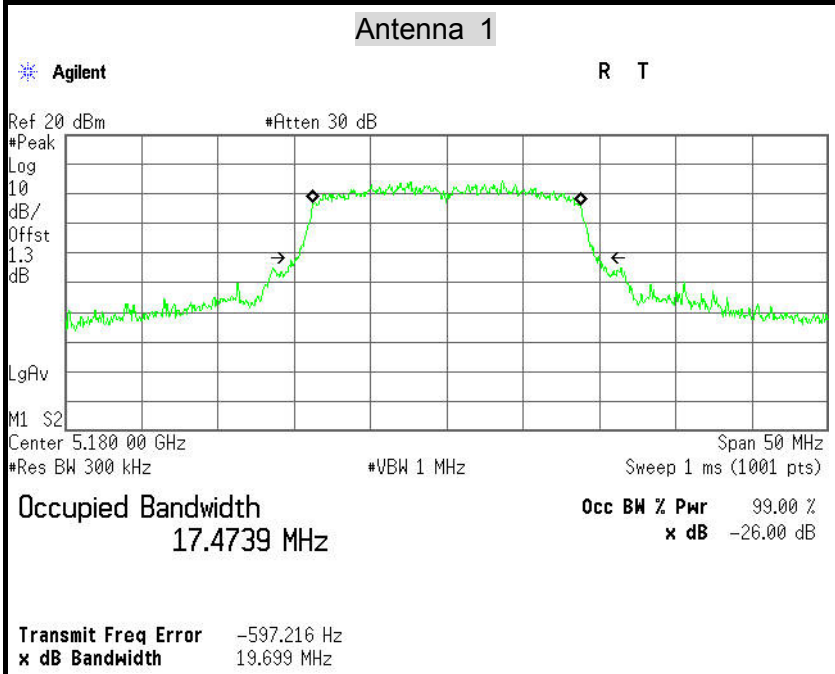




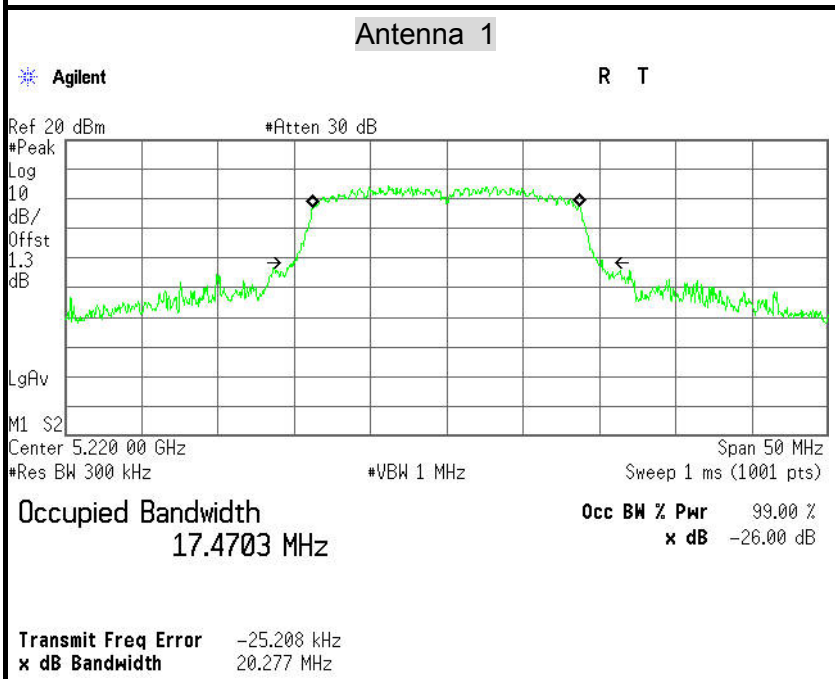


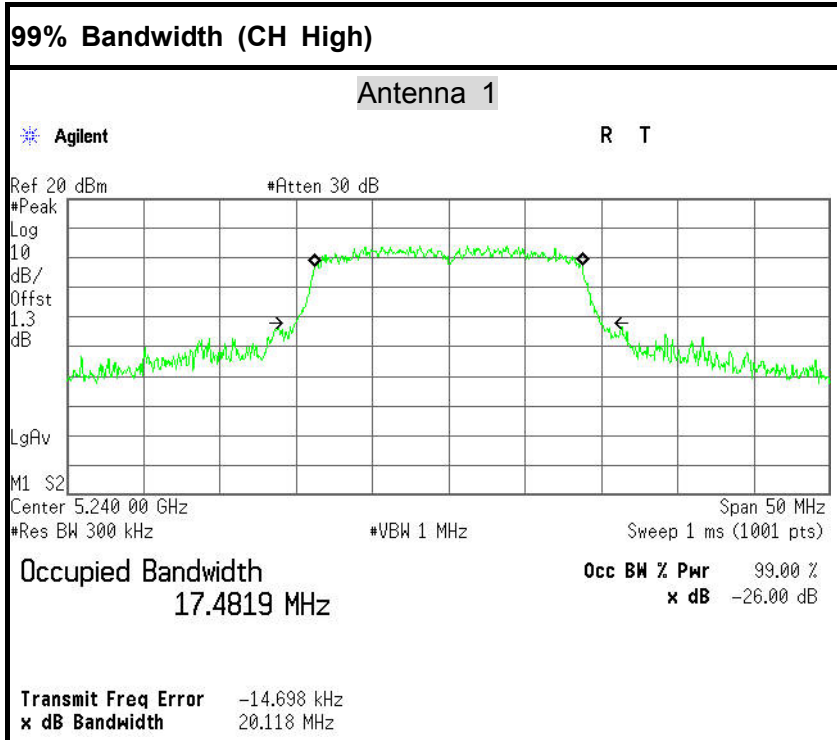
IEEE 802.11n HT 20 MHz mode / 5180 ~ 5240MHz

99% Bandwidth (CH Low)

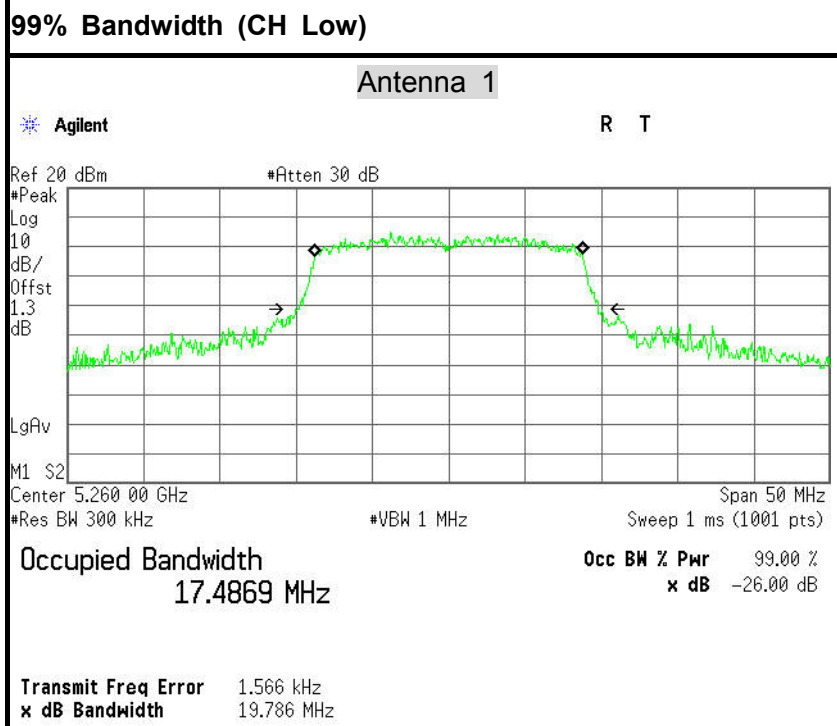


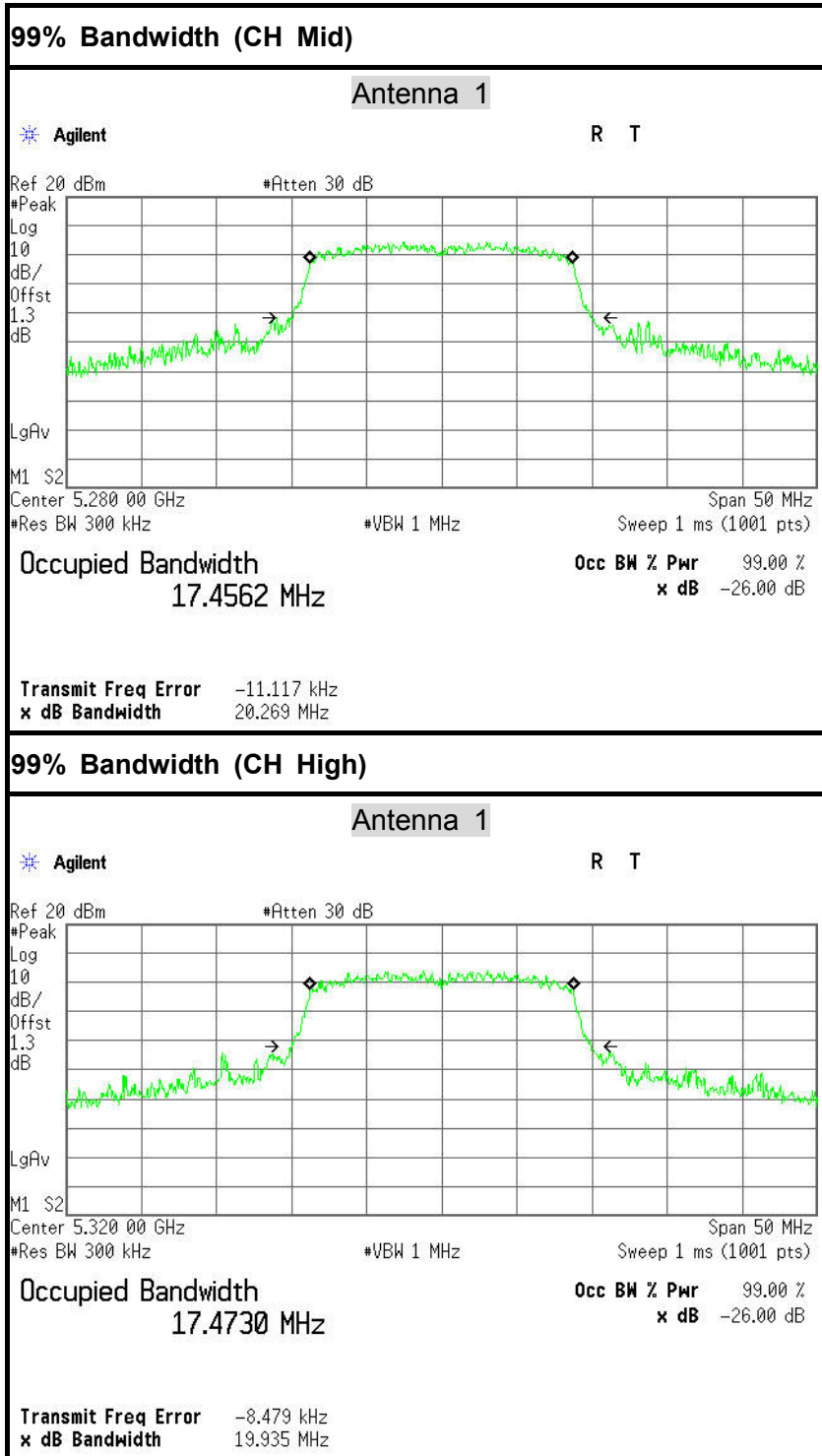
99% Bandwidth (CH Mid)





IEEE 802.11n HT 20 MHz mode / 5260 ~ 5320MHz

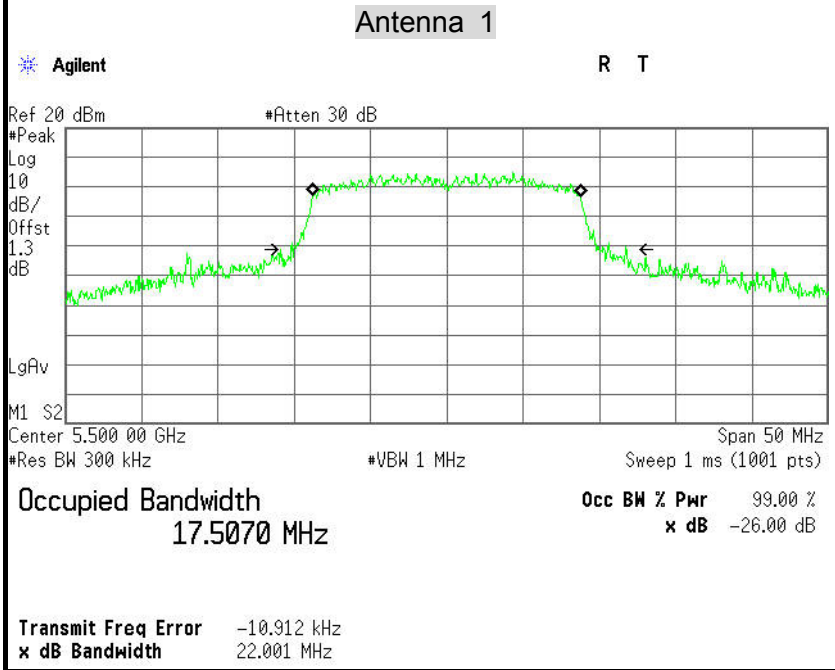




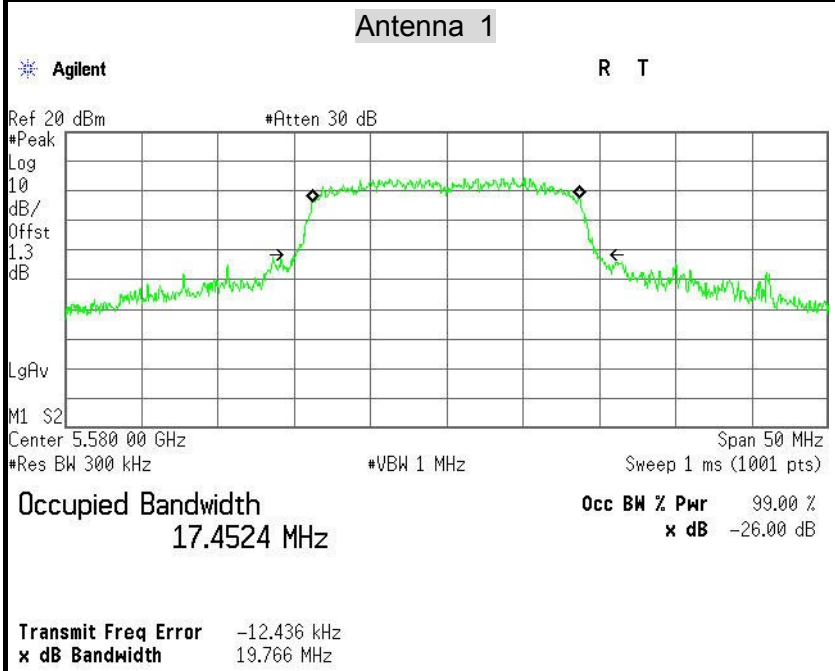


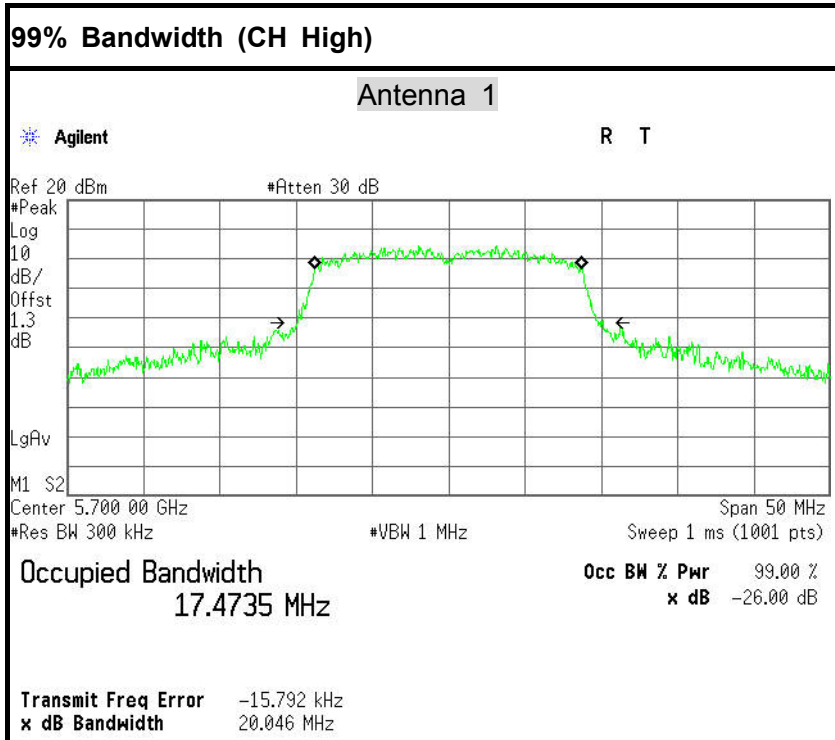
IEEE 802.11n HT 20 MHz mode / 5500 ~ 5700MHz

99% Bandwidth (CH Low)

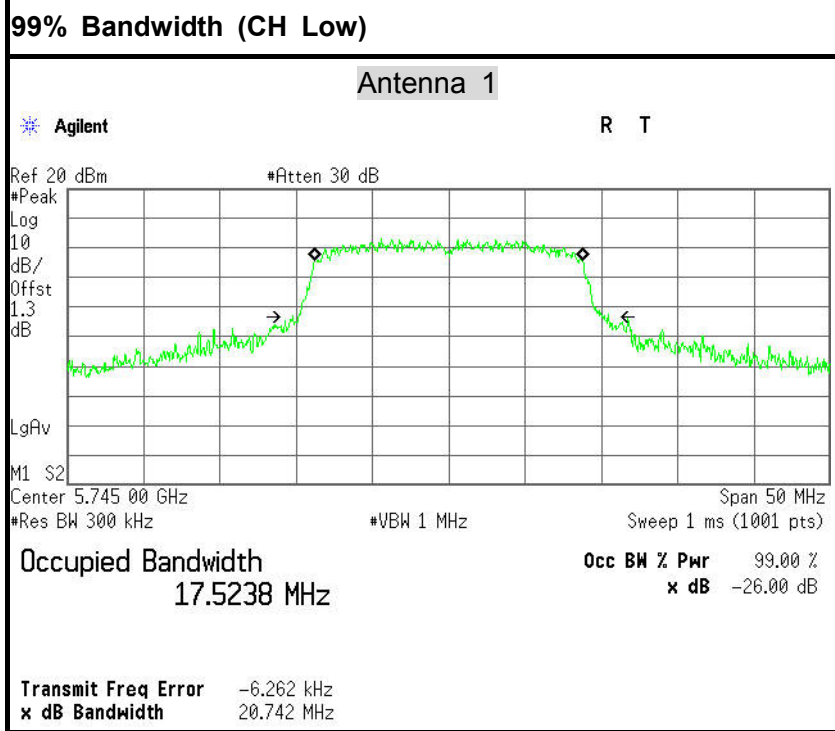


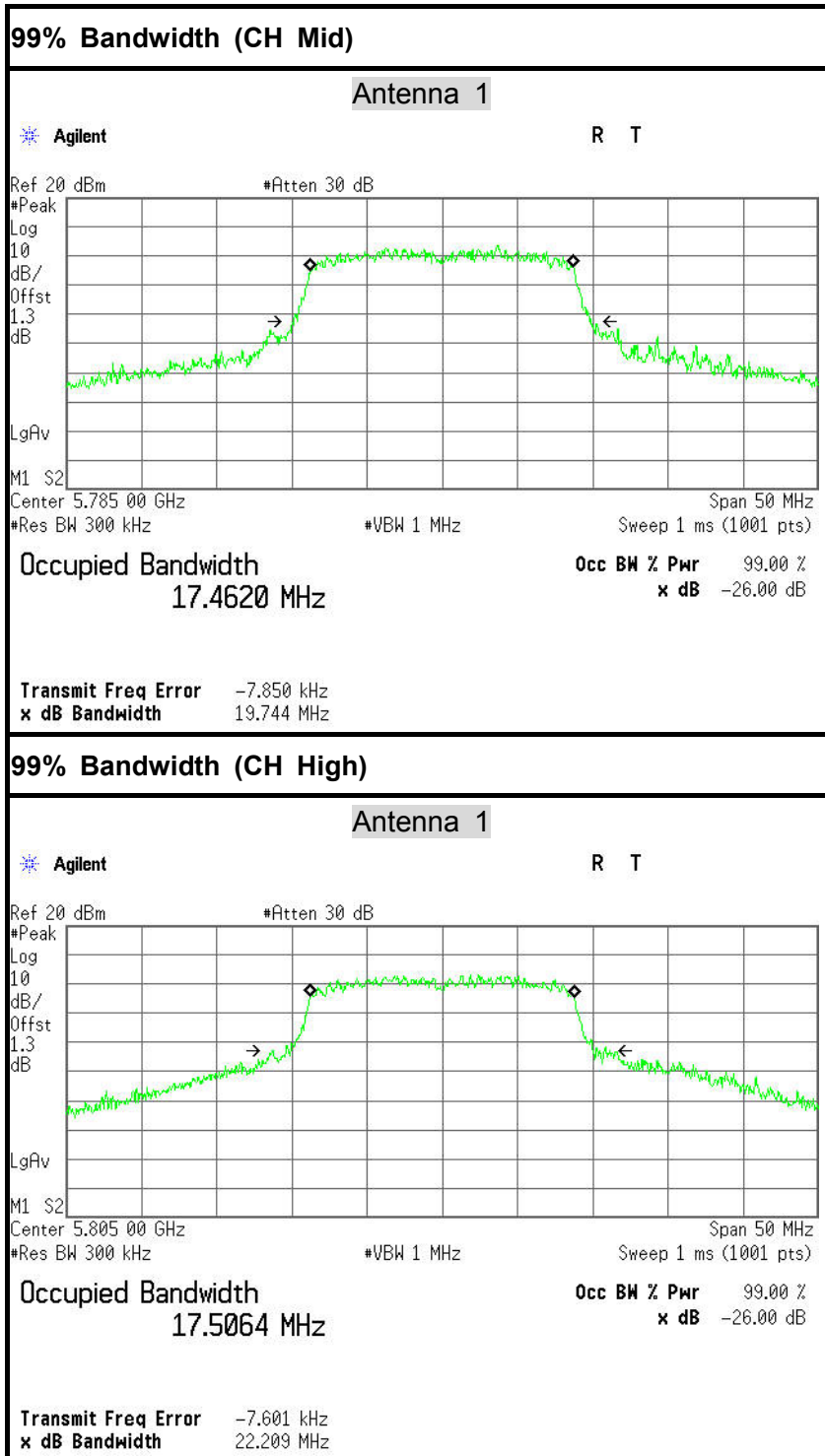
99% Bandwidth (CH Mid)





IEEE 802.11n HT 20 MHz mode / 5745 ~ 5805MHz

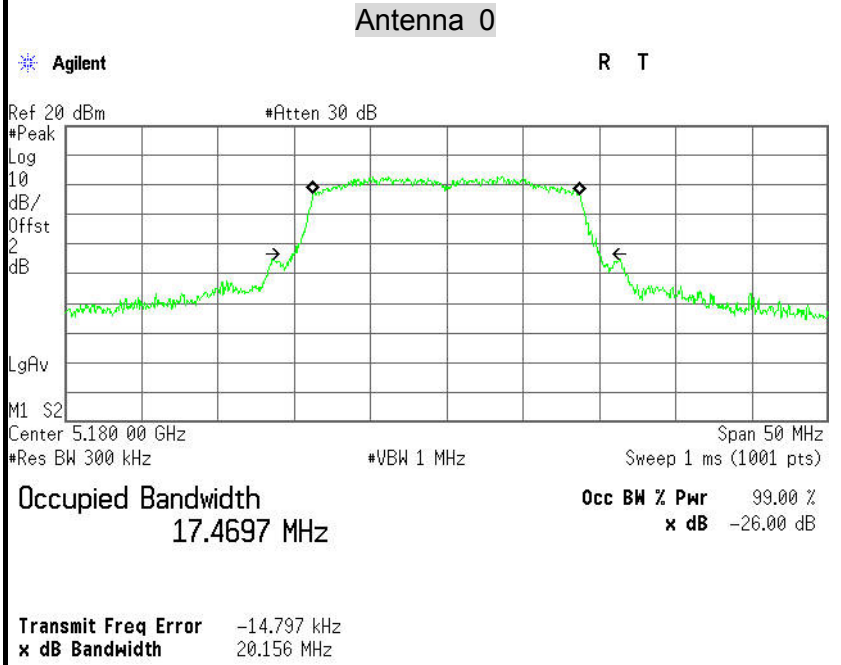




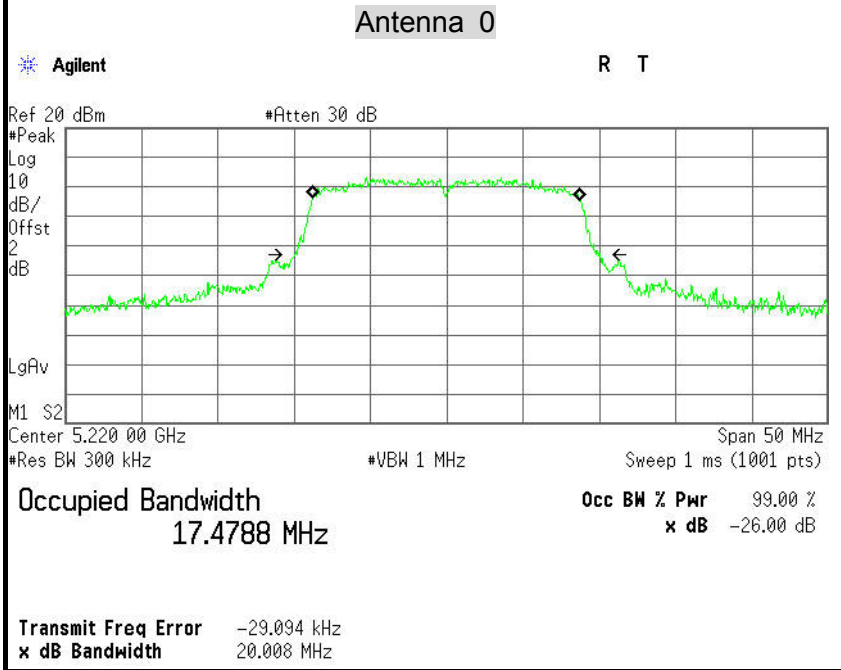


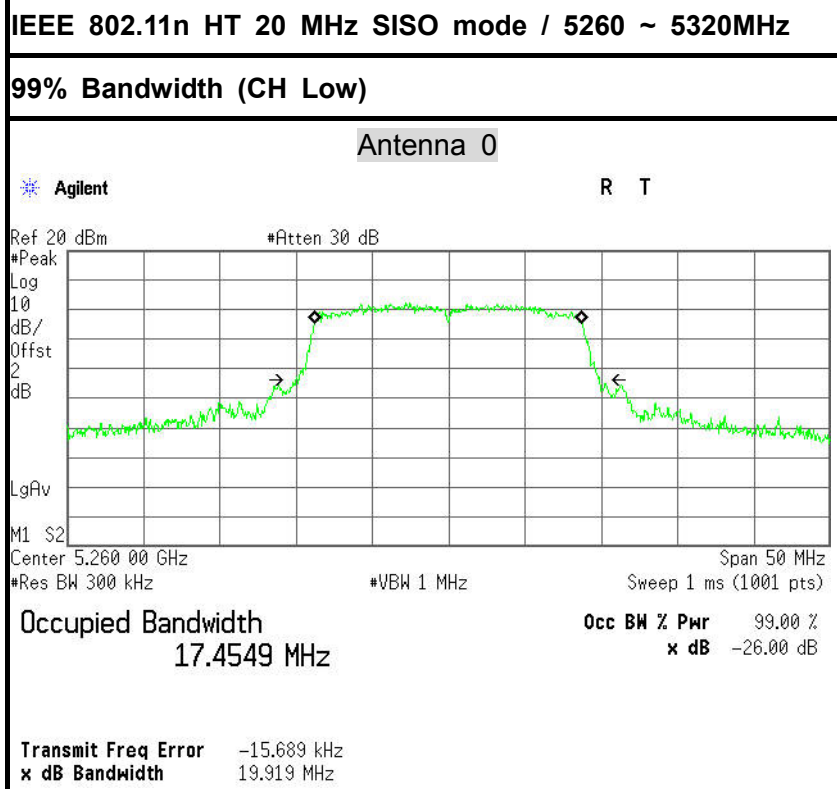
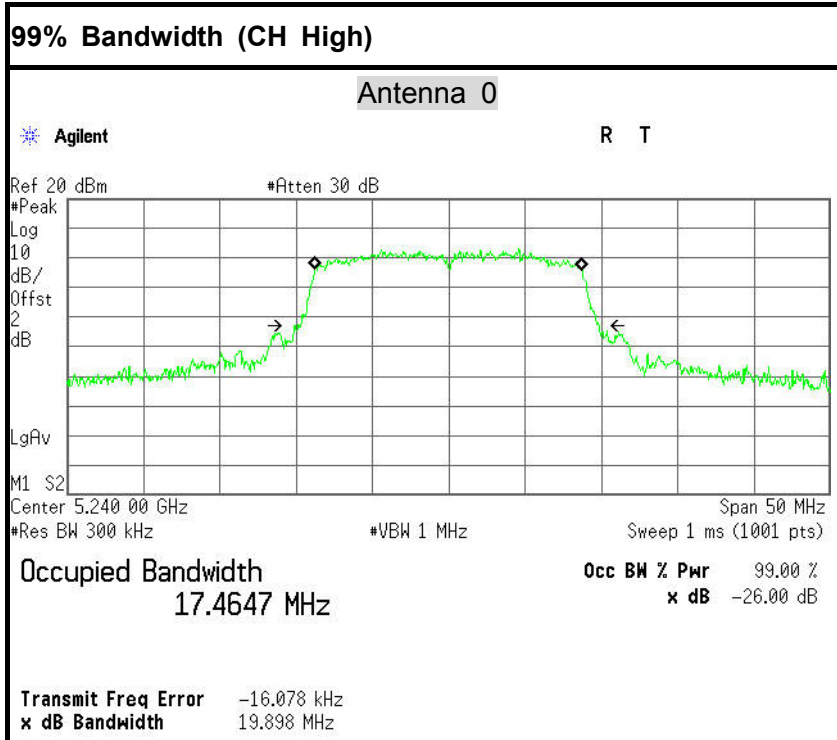
IEEE 802.11n HT 20 MHz SISO mode / 5180 ~ 5240MHz

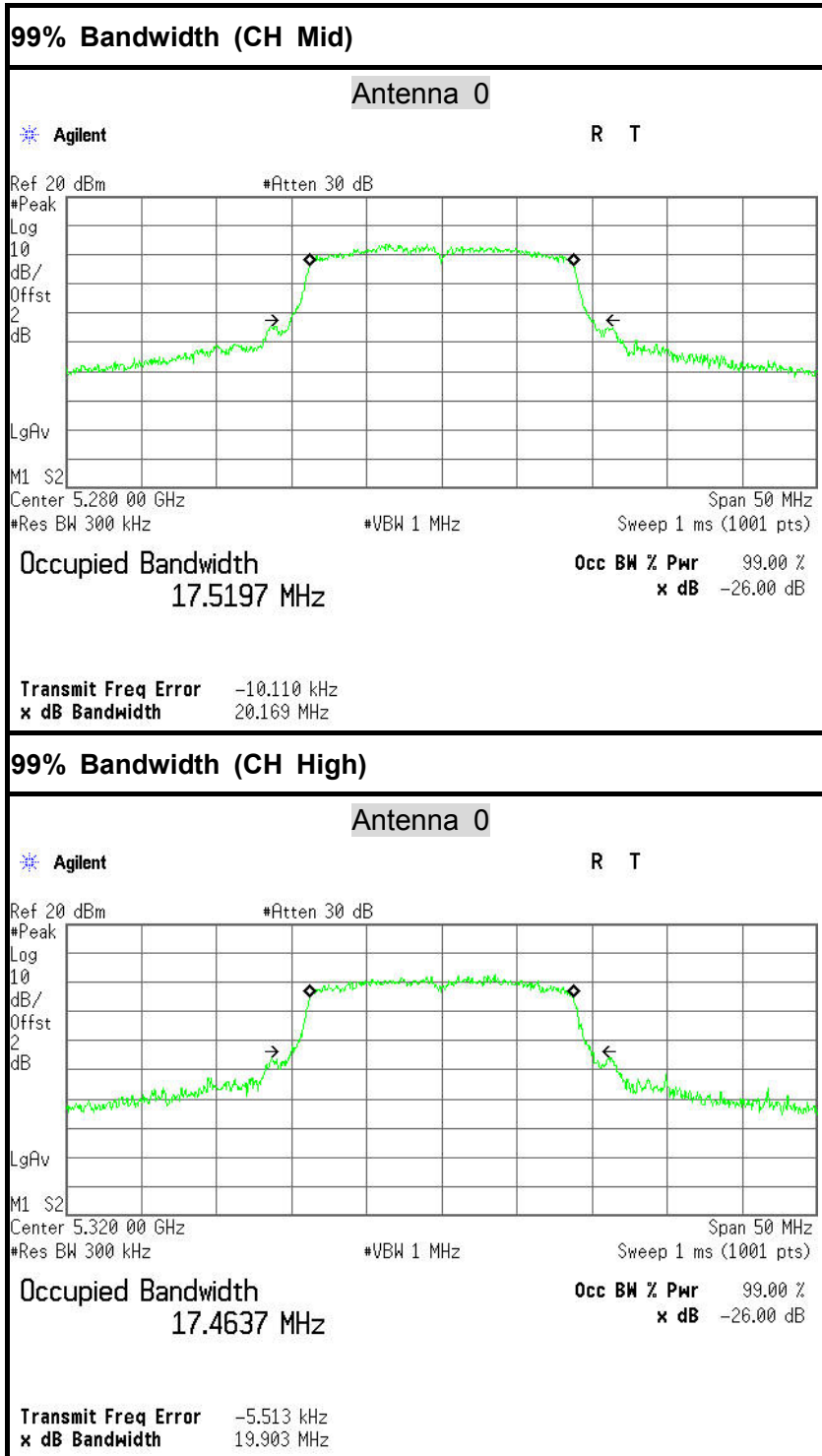
99% Bandwidth (CH Low)



99% Bandwidth (CH Mid)



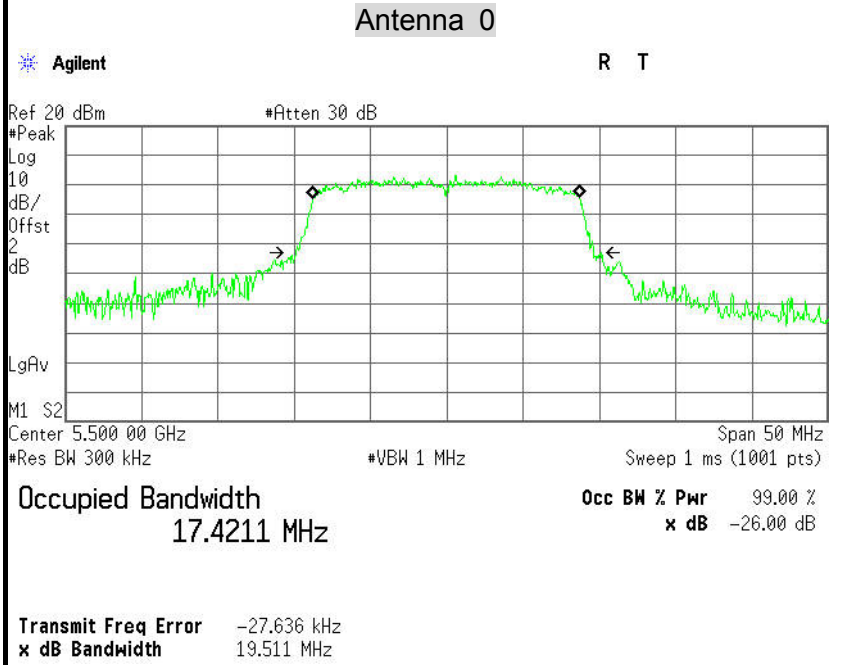




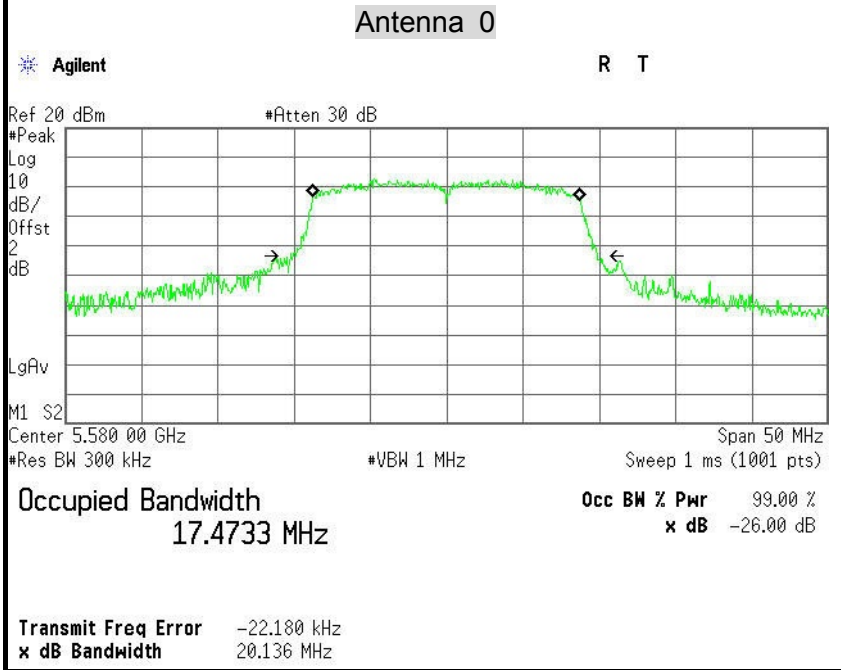


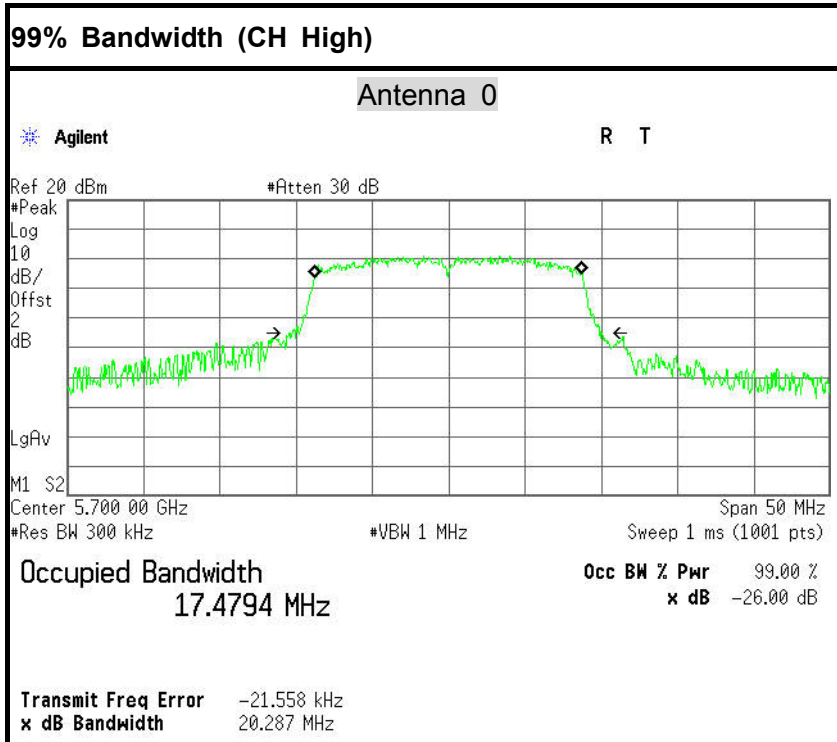
IEEE 802.11n HT 20 MHz SISO mode / 5500 ~ 5700MHz

99% Bandwidth (CH Low)

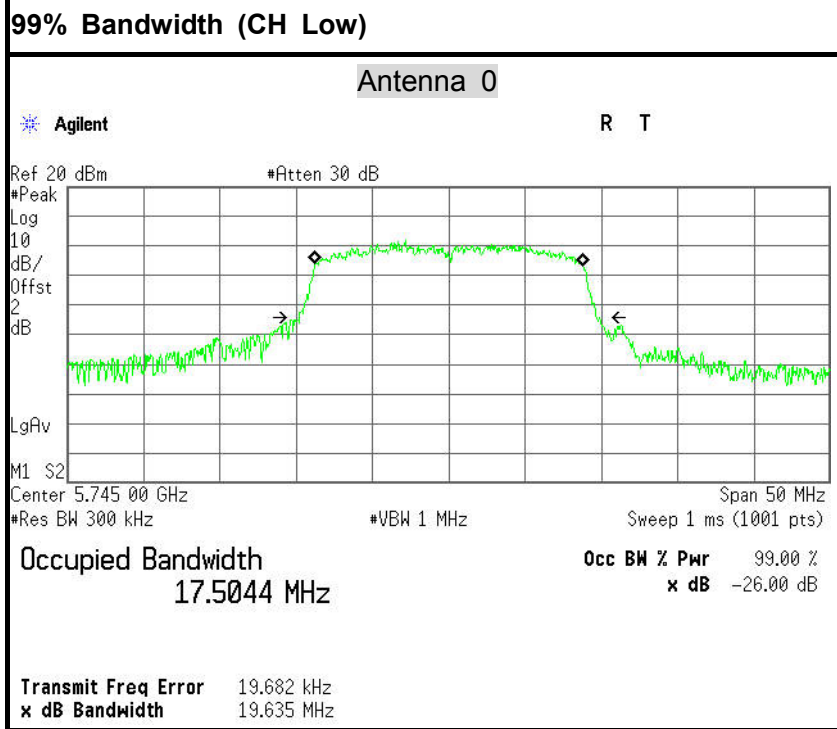


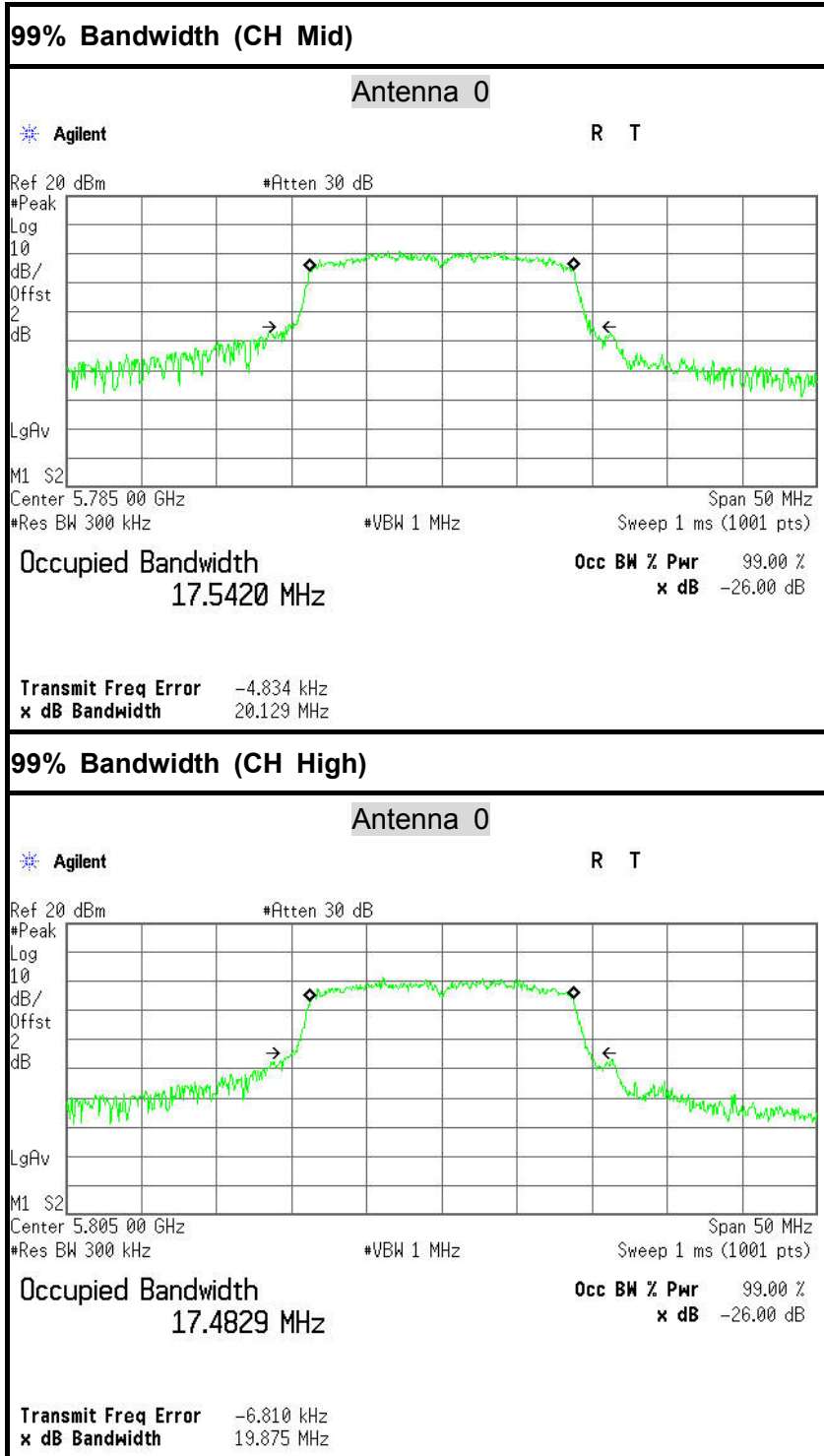
99% Bandwidth (CH Mid)





IEEE 802.11n HT 20 MHz SISO mode / 5745 ~ 5805MHz

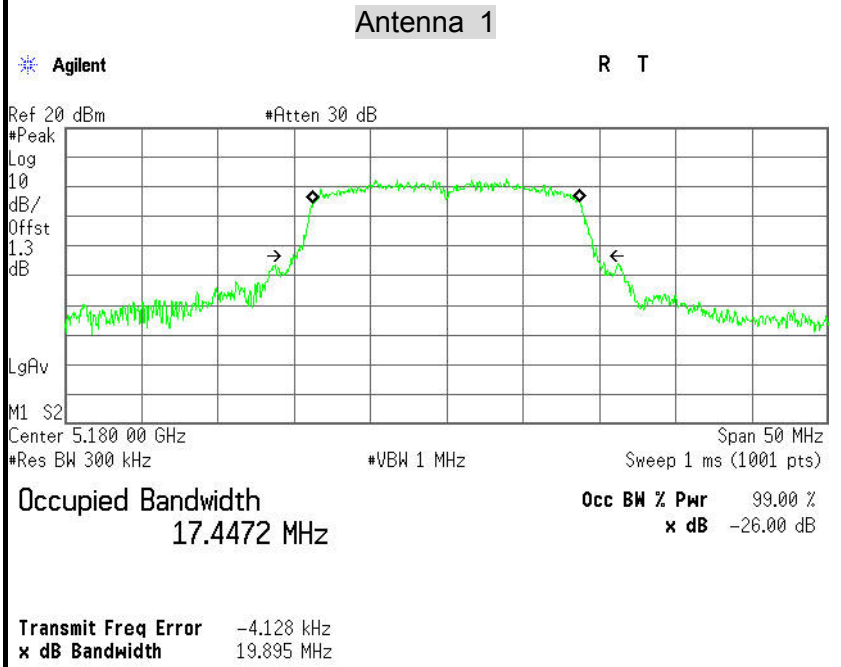




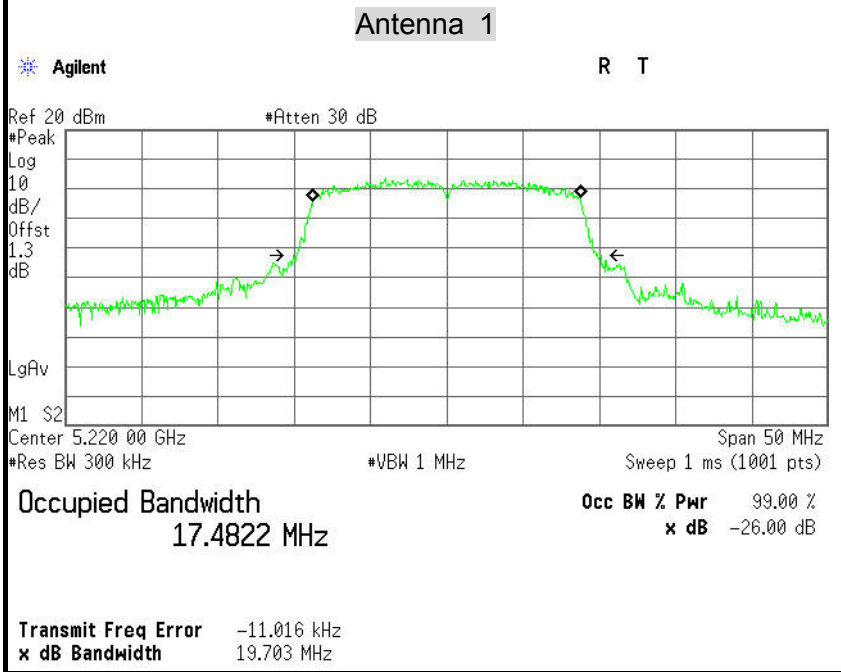


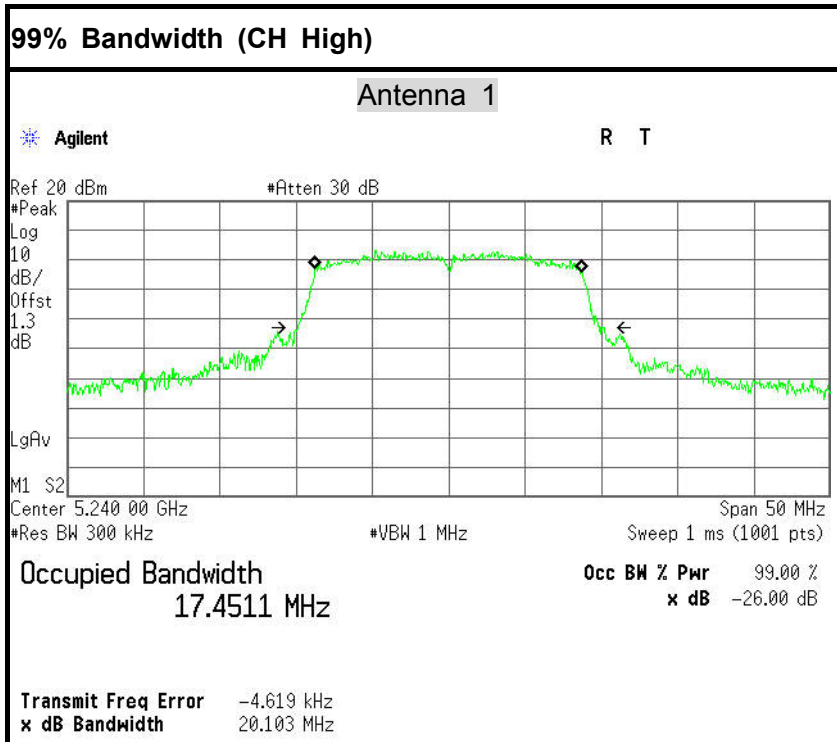
IEEE 802.11n HT 20 MHz SISO mode / 5180 ~ 5240MHz

99% Bandwidth (CH Low)

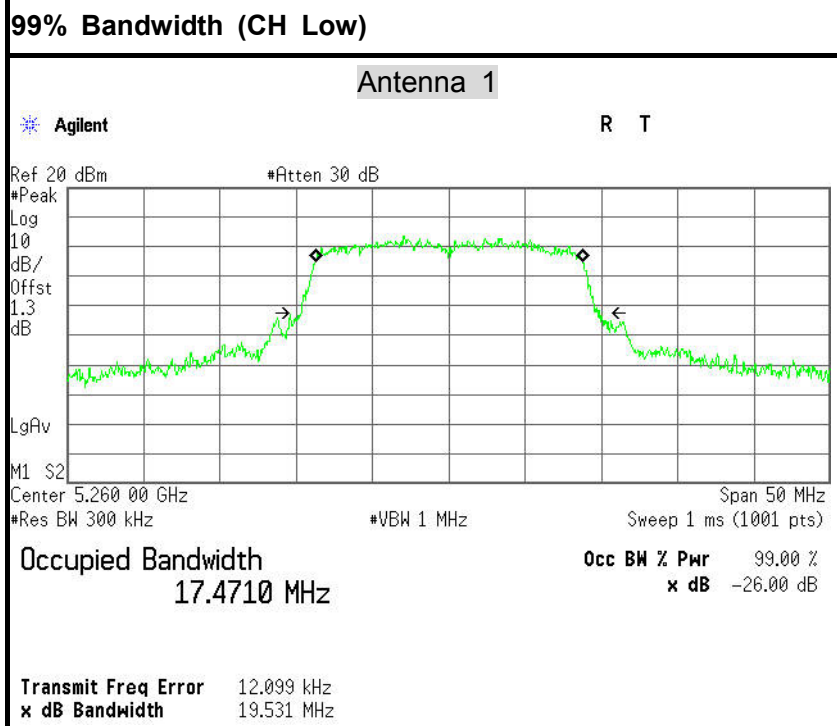


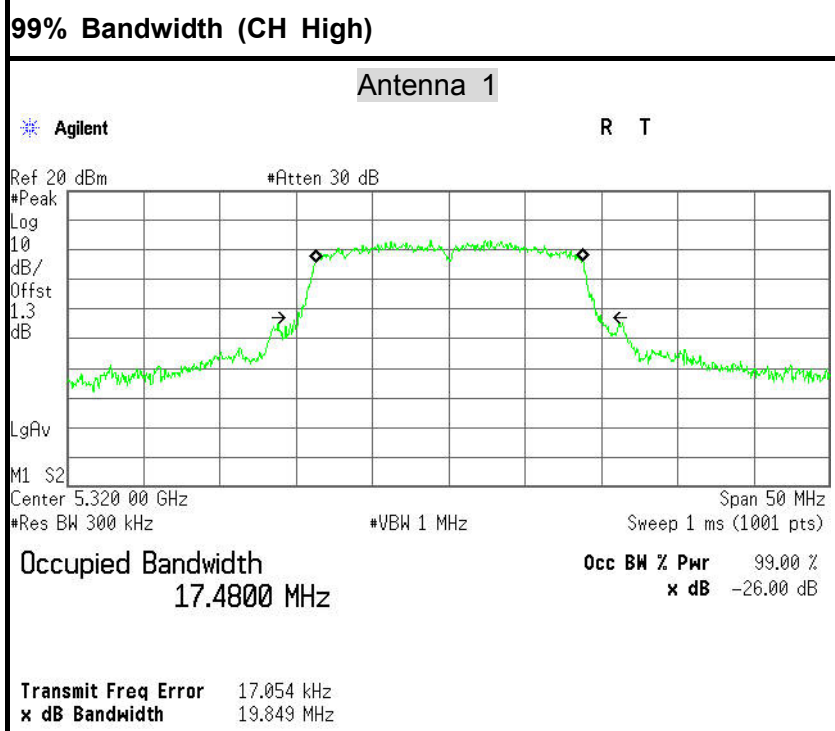
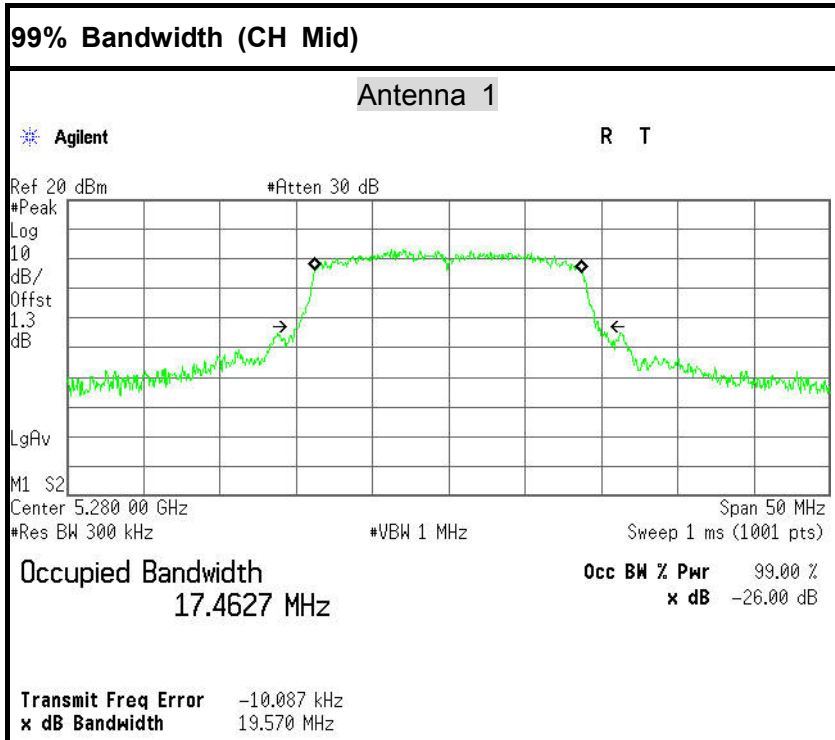
99% Bandwidth (CH Mid)





IEEE 802.11n HT 20 MHz SISO mode / 5260 ~ 5320MHz

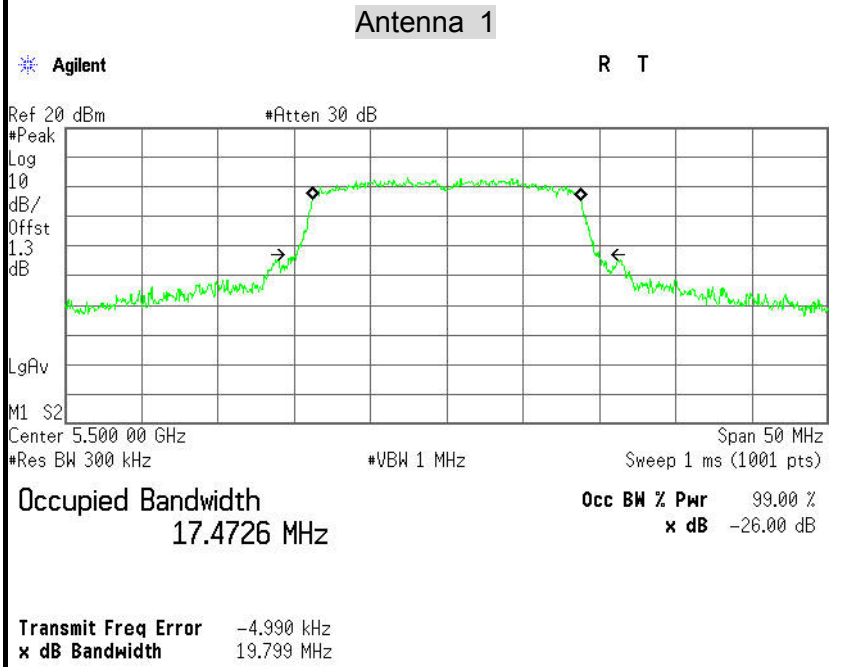




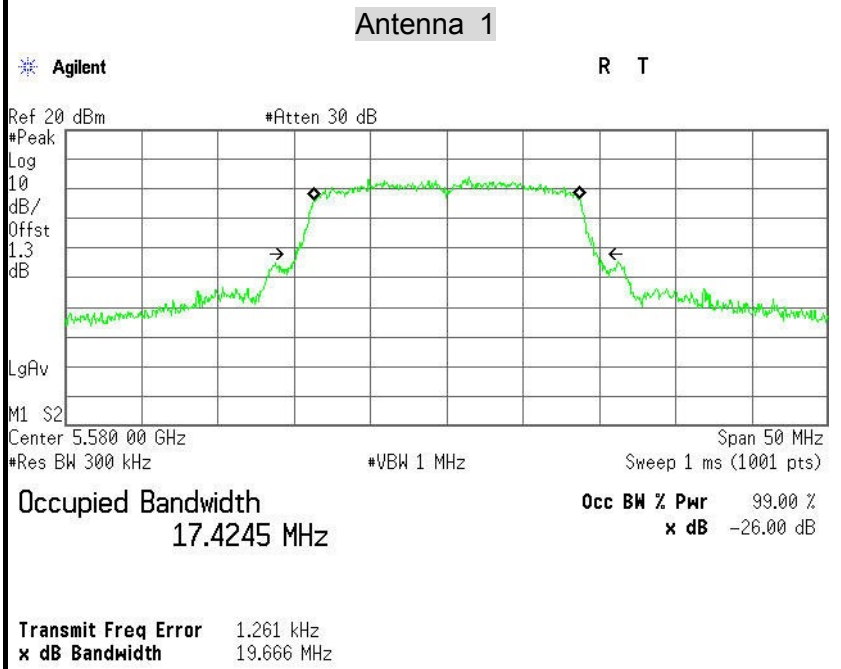


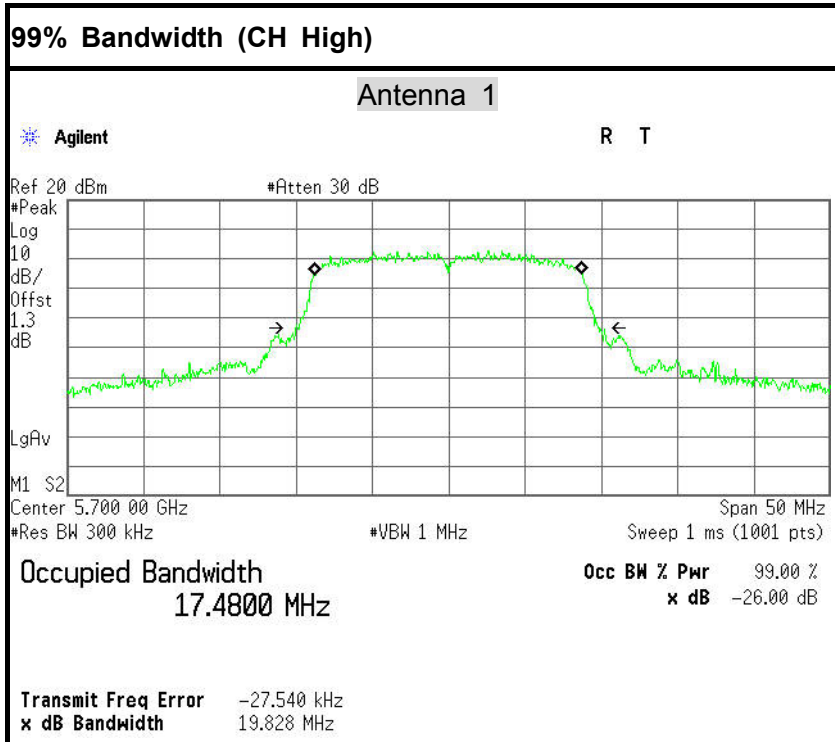
IEEE 802.11n HT 20 MHz SISO mode / 5500 ~ 5700MHz

99% Bandwidth (CH Low)

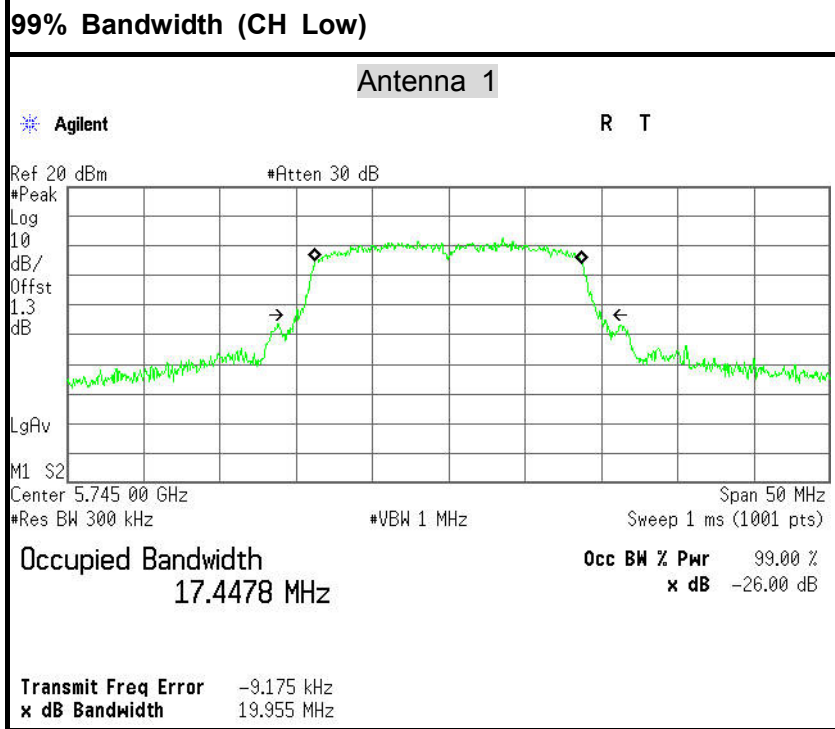


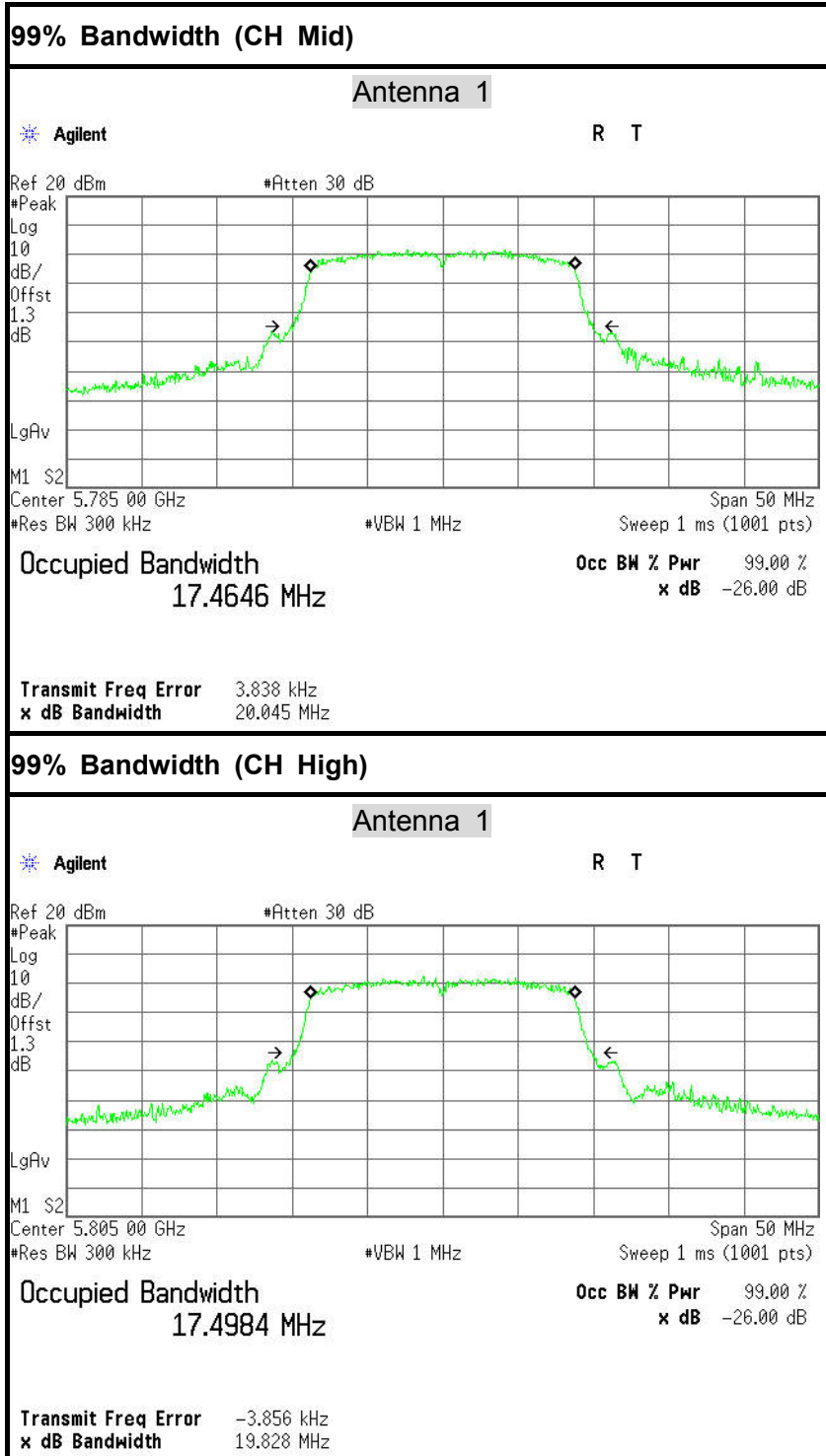
99% Bandwidth (CH Mid)





IEEE 802.11n HT 20 MHz SISO mode / 5745 ~ 5805MHz







7.2 26dB EMISSION BANDWIDTH

7.2.1 LIMIT

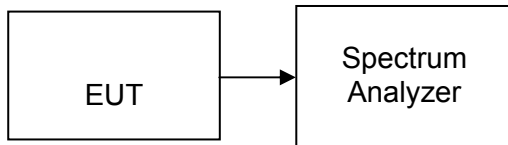
According to §15.303(c), for purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Compliance with the emissions limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

7.2.2 MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015

Remark: Each piece of equipment is scheduled for calibration once a year.

7.2.3 TEST CONFIGURATION



7.2.4 TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low-loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW > 1%EBW, VBW > RBW, Span >226dB Bandwidth, and Sweep = auto.
4. Mark the peak frequency and -26dB (upper and lower) frequency.
5. Repeat until all the rest channels were investigated.

7.2.5 TEST RESULTS

No non-compliance noted



Test Data

Test mode: IEEE 802.11a mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 0	Antenna 1
Low	5180	19.761	19.573
Mid	5220	19.709	19.555
High	5240	19.923	19.567

Test mode: IEEE 802.11a mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 0	Antenna 1
Low	5260	19.711	19.364
Mid	5280	19.407	19.204
High	5320	19.966	19.564

Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 0	Antenna 1
Low	5500	19.730	19.632
Mid	5580	19.217	19.308
High	5700	20.180	19.289

Test mode: IEEE 802.11a mode / 5745 ~ 5805MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 0	Antenna 1
Low	5745	19.524	19.378
Mid	5785	19.927	19.602
High	5805	20.525	19.449



Test mode: IEEE 802.11n HT 20 MHz mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 0	Antenna 1
Low	5180	20.826	19.699
Mid	5220	20.205	20.277
High	5240	20.246	20.118

Test mode: IEEE 802.11n HT 20 MHz mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 0	Antenna 1
Low	5260	20.200	19.786
Mid	5280	20.093	20.269
High	5320	20.255	19.935

Test mode: IEEE 802.11n HT 20 MHz mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 0	Antenna 1
Low	5500	20.595	22.001
Mid	5580	20.503	19.766
High	5700	19.863	20.046

Test mode: IEEE 802.11n HT 20 MHz mode / 5745 ~ 5805MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 0	Antenna 1
Low	5745	20.104	20.742
Mid	5785	21.098	19.744
High	5805	21.405	22.209



Test mode: IEEE 802.11n HT 20 MHz SISO mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 0	Antenna 1
Low	5180	20.156	19.895
Mid	5220	20.008	19.703
High	5240	19.898	20.103

Test mode: IEEE 802.11n HT 20 MHz SISO mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 0	Antenna 1
Low	5260	19.919	19.531
Mid	5280	20.169	19.570
High	5320	19.903	19.849

Test mode: IEEE 802.11n HT 20 MHz SISO mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 0	Antenna 1
Low	5500	19.511	19.799
Mid	5580	20.136	19.666
High	5700	20.287	19.828

Test mode: IEEE 802.11n HT 20 MHz SISO mode / 5745 ~ 5805MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 0	Antenna 1
Low	5745	19.635	19.955
Mid	5785	20.129	20.045
High	5805	19.875	19.828



Test Plot

