

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

# **TEST REPORT**

For

## 802.11n 2x2 PCIe Minicard transceiver

Model: AR5B93

**Trade Name: Atheros** 

Issued to

Atheros Communications, Inc. 5480 Great America Parkway Santa Clara CA 95054

Issued by

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# 1. TEST RESULT CERTIFICATION

	A PDI ICARI E STANDA PDS			
Date of Test:	December 03 ~ 22, 2008			
Model:	AR5B93			
Trade Name:	Atheros			
Equipment Under Test:	802.11n 2x2 PCIe Minicard transceiver			
Applicant:	Atheros Communications, Inc. 5480 Great America Parkway Santa Clara CA 95054			

APPLICABLE STANDARDS				
STANDARD	TEST RESULT			
FCC 47 CFR Part 15 Subpart C				
&	No non-compliance noted			
INDUSTRY CANADA RSS-210				

## We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. 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: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247 and Industry Canada RSS-210.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Jason Chang Team Leader Compliance Certification Services Inc.

Reviewed by:

Alan Fan U Team Leader Compliance Certification Services Inc.



# 2. EUT DESCRIPTION

Product	802.11n 2x2 PCIe Minicard transceiver
Trade Name	Atheros
Model Number	AR5B93
Model Discrepancy	N/A
Power Supply	Powered by host device
Frequency Range	IEEE 802.11b: 2412 ~ 2462 MHz IEEE 802.11g: 2412 ~ 2462 MHz draft 802.11n Standard-20 MHz: 2412 ~ 2462 MHz draft 802.11n Wide -40 MHz: 2422 ~ 2452 MHz
Transmit Power	IEEE 802.11b: 19.158 dBm ( 82.389 mW ) IEEE 802.11g: 25.31 dBm ( 339.625 mW ) draft 802.11n Standard-20 MHz: 24.95 dBm ( 312.608 mW ) draft 802.11n Wide -40 MHz: 25.85 dBm ( 384.592 mW )
Modulation Technique	IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mpbs) IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mpbs) draft 802.11n Standard-20 MHz Channel mode: 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) draft 802.11n Wide-40 MHz Channel mode: OFDM (13.5, 15, 27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150, 162, 180, 216, 240, 243, 270, 300 Mbps)
Number of Channels	IEEE 802.11b/g mode: 11 Channels draft 802.11n Standard-20 MHz Channel mode: 11 Channels draft 802.11n Wide-40 MHz Channel mode: 7 Channels
Antenna Specification	<ol> <li>PIFA Antenna / Gain: 3.62 dBi</li> <li>Dipole Antenna / Gain: 3.2 dBi</li> </ol>

Remark:

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

2. This submittal(s) (test report) is intended for FCC ID: <u>PPD-AR5B93</u> filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.



# 3. TEST METHODOLOGY

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

## 3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

## 3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

The tests documented in this report were performed in accordance with IC RSS-210, IC RSS-Gen, IC RSS-102, and ANSI C63.4.

## 3.3 GENERAL TEST PROCEDURES

#### **Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

#### **Radiated Emissions**

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. 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.



## 3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
10.495 - 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		

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

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> 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.

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## 3.5 DESCRIPTION OF TEST MODES

The EUT is an 802.11n 2x2 PCIe Minicard transceiver.

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

All final tests in the 802.11b mode were made at 1 Mb/s.

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

All final tests in the 802.11n HT20 mode were made at 6.5Mbps.

All final tests in the 802.11n HT40 mode were made at 13.5Mbps

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.



# 4. INSTRUMENT CALIBRATION

## 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

## 4.2 MEASUREMENT EQUIPMENT USED

#### **Equipment Used for Emissions Measurement**

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

Conducted Emissions Test Site						
Name of Equipment Manufactu		Model	Serial Number	<b>Calibration Due</b>		
SPECTRUM ANALYZER	R & S	FSEK30	835253/002	10/25/2009		
SPECTRUM ANALYZER	AGILENT	E4446A	MY43360132	06/24/2009		

	3M Semi Anechoic Chamber					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due		
SPECTRUM ANALYZER	AGILENT	E4446A	MY46180323	05/21/2009		
EMI TEST RECEIVER	R & S	ESCI	100211	10/16/2009		
<b>BILOG ANTENNA</b>	SCHWARZBECK	VNLB	9168	09/18/2009		
HORN ANTENNA	ETS LINDGREN	3117	00078732	05/13/2009		
PRE-AMPLIFIER	EM	EM30265	07032612	05/22/2009		
Band Reject FILTER	Micro-Tronics	BRM50702-01	021	N.C.R.		
RF COAXIAL CABLE	HUBERSUHNER	SUCOFLEX 104PEA	SN31350	07/21/2009		
Test S/W	LABVIEW (V 6.1)					

**Remark:** 1. The measurement uncertainty is less than +/- 3.2dB (30MHz ~ 1GHz), +/- 3.2dB (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.

2. N.C.R = No Calibration Request.

Powerline Conducted Emissions Test Site						
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due		
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-465	08/14/2009		
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-473	10/13/2009		
TEST RECEIVER	R & S	ESHS30	838550/003	01/23/2009		
PULSE LIMIT	R & S	ESH3-Z2	100117	09/24/2009		
N TYPE COAXIAL CABLE	BELDEN	8268 M17/164	003	09/14/2009		

*Remark:* The measurement uncertainty is less than +/- 2.1dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.



# 5. FACILITIES AND ACCREDITATIONS

## **5.1 FACILITIES**

All measurement facilities used to collect the measurement data are located at

- Rm.258, Bldg.17, NO.195, Sec. 4, Chung Hsing Rd., Chu-Tung Chen. Hsin-Chu, Taiwan 310 R.O.C.
- NO. 989-1 Wen Shan Rd., Shang Shan Village, Qionglin Shiang Hsinchu County 30741, Taiwan, R.O.C

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 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 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by Taiwan Accreditation Foundation for the specific scope of accreditation under Lab Code: 0240 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by TAF or any agency of the Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: 90585 and 90584).



## 5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	<b>FC</b> 90585, 90584
		3/10 meter Open Area Test Sites to perform conducted/radiated measurements	<b>VCCI</b> R-1229/1189 C-1250/1294
Taiwan	wan         TAF         FCC Method-47 CFR Part 15 Subpart C,D,E CISPR 11, FCC METHOD-47 CFR Part 18, EN 55011, CNS 13803, CISPR 13, CNS 13439, FCC Method-47 CFR Part 15 Subpart B, CISPR 14-1, EN 55014-1, CNS 13783-1, EN 55015, CNS 14115, CISPR 22, EN 55022, VCCI CNS 13438, EN 61000-4-2/3/4/5/6/8/11		Testing Laboratory 0240
Laiwan BNMI		CNS 13803, CNS 13438, CNS 13439, CNS 13783-1, CNS 14115	SL2-IS-E-0002 SL2-IN-E-0002 SL2-A1-E-0002 SL2-R1-E-0002 SL2-R2-E-0002 SL2-L1-E-0002
Canada	Industry Canada	RSS-GEN Issue 2	Canada IC 4417-1, IC-4417-2

\* No part of this report may be used to claim or imply product endorsement by TAF or any agency of the US Government.



# 6. SETUP OF EQUIPMENT UNDER TEST

## 6.1 SETUP CONFIGURATION OF EUT

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

## 6.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Notebook PC	IBM	2672 (X31)	9985H9M	WLAN: ANO20030400LEG Bluetooth: ANO20020100MTN	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2.	Test kit	N/A	N/A	N/A	N/A	N/A	N/A
3.	Super a/g 108Mbps Wireless Lan Router (Remote)	PLANEX	BLW-04SA G	40DDA0421	SJ9-BLW54SAG	N/A	Unshielded, 1.8m

#### Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

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

# 7. APPLICABLE RULES FOR INDUSTRY CANADA RSS-210

#### **RSS-210 §2 General Certification Requirements and Specifications**

#### RSS-210 §2.1 Frequency Stability

When the carrier frequency stability is not specified, it need not be tested, provided that the carrier frequency is chosen such that the fundamental modulation products (meaning the nominal bandwidth) lie totally within the bands listed in Tables 2, 3, 4 and 5 and do not fall into any restricted band listed in Table 1. Due account shall be taken of carrier frequency drift as a result of aging, temperature, humidity, and supply voltage variations when using frequencies near the band edges.

#### **RSS-210 §2.2 Restricted Bands and Unwanted Emission Frequencies**

Restricted bands, identified in Table 1, are designated primarily for safety-of-life services (distress calling and certain aeronautical bands), certain satellite downlinks, radio astronomy, and some government uses. Except where otherwise indicated, the following restrictions apply: (a) Fundamental components of modulation of LPDs shall not fall within the restricted bands of Table 1.

(b) Unwanted emissions falling into restricted bands of Table 1 shall meet Tables 2 and 3 limits. It should also be noted that unwanted emissions falling in non-restricted bands do not need to be suppressed to a level lower than the Table 2 and 3 limits.

(c) Unwanted emissions not falling within restricted frequency bands may also use the limits specified in the applicable annex.

#### RSS-210 §2.3 Licence-exempt Receivers

Category I licence-exempt receivers are required to have their spurious emissions comply with Section 7.2.3 of RSS-Gen.

#### **RSS-210 §2.6 General Field Strength Limits**

Table 2 and 3 list the permissible levels of unwanted emissions of transmitters and receivers. However, transmitters with field strengths that do not exceed the limits in these tables may also operate in these frequency bands, other than the restricted bands of Table 1 and the TV bands (i.e. unwanted emissions of transmitters and receivers are permitted to fall into Table 1 and TV frequencies but intentional emissions are prohibited). See the note of Table 2 for further details.



#### RSS-210 §2.7 Tables

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	

#### **<u>RSS-210 Table 1: Restricted Frequency Bands</u>** (Note)

*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.

#### <u>RSS-210 Table 2: General Field Strength Limits for Transmitters and Receivers at</u> <u>Frequencies Above 30 MHz</u><sup>(Note)</sup>

Frequency	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)		
(MHz)	Transmitters	Receivers	
30-88	100 (3 nW)	100 (3 nW)	
88-216	150 (6.8 nW)	150 (6.8 nW)	
216-960	200 (12 nW)	200 (12 nW)	
Above 960	500 (75 nW)	500 (75 nW)	

*Note:* Transmitting devices are not permitted in Table 1 bands or in TV bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, and 614-806 MHz). Prohibition of operation in TV bands does not apply to momentary devices, or to medical telemetry devices in the band 174-216 MHz, and to perimeter protection systems in the bands 54-72 and 76-88 MHz. The perimeter protection devices are to meet Table 3 field strengths limits.



#### <u>RSS-210 Table 3: General Field Strength Limits for Transmitters at Frequencies Below 30</u> <u>MHz (Transmit)</u>

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.

#### <u>RSS-210 §Annex 8: Frequency Hopping and Digital Modulation Systems Operating in the</u> <u>902-928 MHz</u>, 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 §A8.2 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**

Unless otherwise indicated, radiocommunications equipment is subject to licensing pursuant to subsection 4(1) of the *Radiocommunication Act*.

#### **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

Radiocommunication receivers are defined as Category I equipment or Category II equipment by the characteristics outlined below.

#### **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) is a stand-alone receiver that is tunable to any frequency in the band 30-960 MHz;
- (b) is a receiver that is associated with Category I transmitters; or
- (c) is a scanner receiver.

Except for scanner receivers, which have their own RSSs, Category I receivers shall comply with the limits for receiver spurious emissions set out in Section 6 of this RSS-Gen, and shall be certified under the RSS applicable to the transmitter type with which the receiver is associated or designed to operate (NOT under RSS-Gen).

#### **RSS-Gen §2.2.2 Category II Equipment Receivers**

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

#### RSS-Gen §2.2.3 Licence-exempt Receivers

Paging receivers, "receive-only" earth stations operating with satellites approved by Industry Canada, and stand-alone receivers which are exempted from licensing, can be classified as either Category I or Category II. These receivers shall comply with the requirements of RSS-210 or RSS-310, respectively.



#### RSS-Gen §2.3 Licence-exempt Low-power Radiocommunication Devices (LPDs)

Licence-exempt low-power radiocommunication devices are devices which have intentional and unwanted emissions of very low signal levels such that they can co-exist with licensed radio services. LPDs are required to operate on a **"no-interference no-protection"** basis (i.e. they may not cause radio interference and cannot claim protection from interference). The requirements for LPDs are generally described in Section 7.

#### **RSS-Gen §5.5 Exposure of Humans to RF Fields**

Before equipment certification is granted, the applicable requirements of RSS-102 shall be met.

#### **RSS-Gen §6 Receiver Spurious Emission Standard**

The following receiver spurious emission limits shall be complied with: (a) If a radiated measurement is made, all spurious emissions shall comply with the limits of Table 1.

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

#### **RSS-Gen Table 1 - Spurious Emission Limits for Receivers**

(b) If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2 nanowatts per any 4 kHz spurious frequency in the band 30-1000 MHz, or 5 nanowatts above 1 GHz.

#### RSS-Gen §7.1.4 Transmitter Antenna

A transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified 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 certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. 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. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in RSS-210 or RSS-310 for devices of RF output powers of 10 milliwatts or less. For devices of output powers greater than 10 milliwatts, except devices subject to 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) or RSS-210 Annex 9 (Local Area Network Devices), the total antenna gain shall be added to the measured RF output power before using the specified power limits. For devices subject to RSS-210 Annex 8 (Frequency Hopping and Digital Modulation Systems 0, the antenna gain shall be added to the measured RF output power before using the specified power limits. For devices subject to RSS-210 Annex 8 or Annex 9, the antenna gain shall not be added.



#### RSS-Gen §7.2.2 Transmitter and Receiver AC Power Lines Conducted Emission Limits

Except when the requirements applicable to a given device state otherwise, for any licence-exempt radiocommunication device equipped to operate from the public utility AC power supply, either directly or indirectly, the radio frequency voltage that is 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 Table 2. The tighter limit applies at the frequency range boundaries.

#### **RSS-Gen Table 2 – AC Power Lines Conducted Emission Limits**

Frequency Range	Conducted limit (dBµV)		
(MHz)	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



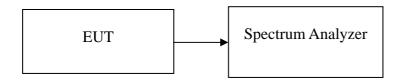
# 8. FCC PART 15.247 REQUIREMENTS & RSS-210 REQUIREMENTS

## 8.1 99% **BANDWIDTH**

## **LIMIT**

None; for reporting purposes only.

### **TEST CONFIGURATION**



### TEST PROCEDURE

1. The spectrum shall be set as follows :

Span : The minimum span to fully display the emission and approximately 20dB below peak level.

RBW : The set to 1% to 3% of the approximate emission width.

- 2. Compute the combined power of all signal responses contained in the trace by covering all the data points.
- 3. For 99% occupied BW, place the markers at the frequency at which 0.5% of the power lies to the right of the right marker and 0.5% of the power lies to the left of the left marker.
- 4. The 99% BW is the bandwidth between the right and left markers.



## TEST DATA

#### Test mode: IEEE 802.11b mode

Channel	Channel Frequency (MHz)	99% Occupied power bandwidth (MHz)	
		Chain 0	Chain 1
Low	2412	15.599	15.816
Middle	2437	15.800	15.785
High	2462	15.743	15.899

Remark:

1. At finial test to get the worst-case emission at 1 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

#### Test mode: IEEE 802.11g mode

Channel	Channel Frequency (MHz)	99% Occupied power bandwidth (MHz)	
		Chain 0	Chain 1
Low	2412	16.651	16.466
Middle	2437	16.606	16.454
High	2462	16.619	16.556

Remark:

1. At finial test to get the worst-case emission at 6 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



Channel	Channel Frequency (MHz)	99% Occupied power bandwidth (MHz)	
		Chain 0	Chain 1
Low	2412	17.734	17.839
Middle	2437	17.763	17.827
High	2462	17.758	17.796

Remark:

1. At finial test to get the worst-case emission at 6.5 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

Channel	Channel Frequency (MHz)	99% Occupied power bandwidth (MHz)	
		Chain 0	Chain 1
Low	2422	36.305	36.400
Middle	2437	36.405	36.319
High	2452	36.415	36.302

#### Test mode: draft 802.11n Standard-40 MHz Channel mode

Remark:

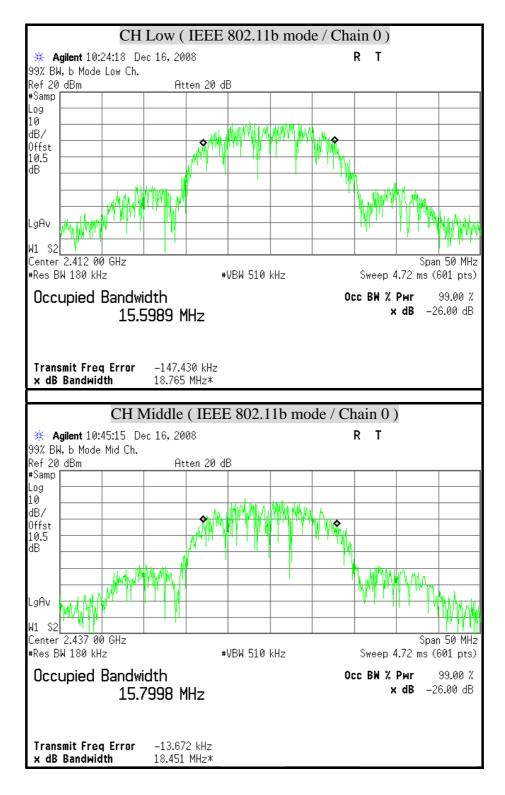
1. At finial test to get the worst-case emission at 13.5 Mbps.

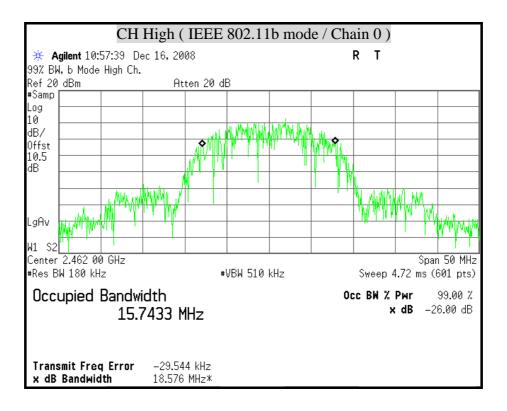
2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

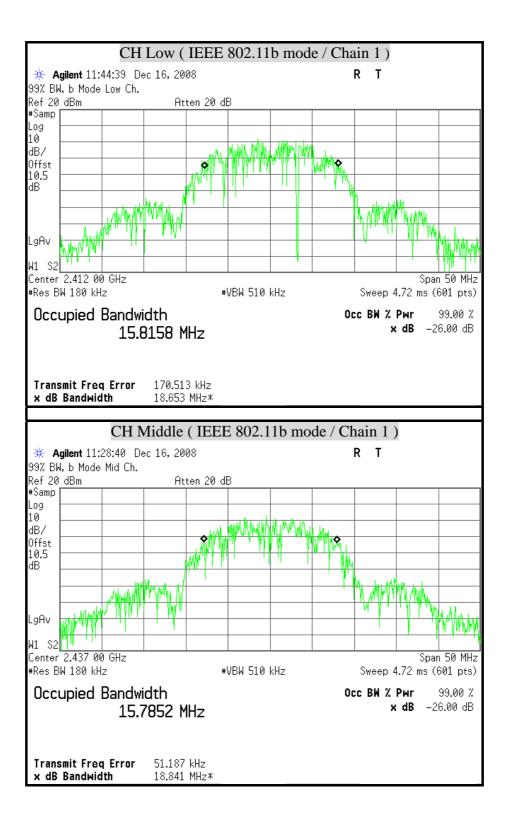


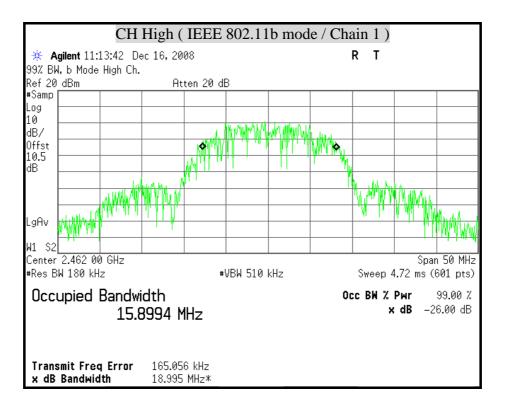
## TEST PLOT

#### 99% BANDWIDTH ( IEEE 802.11b mode)





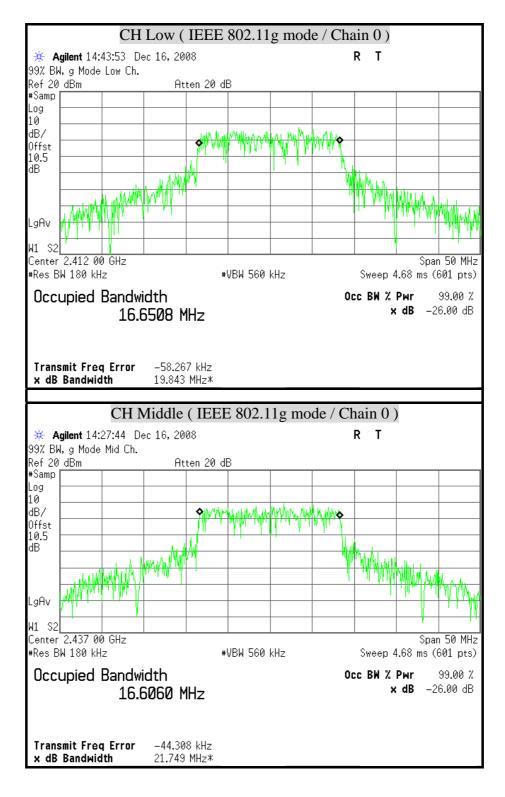


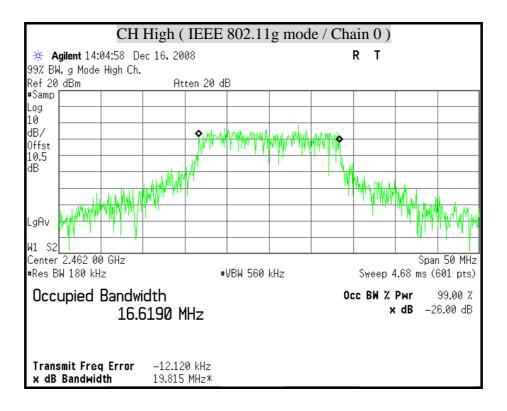


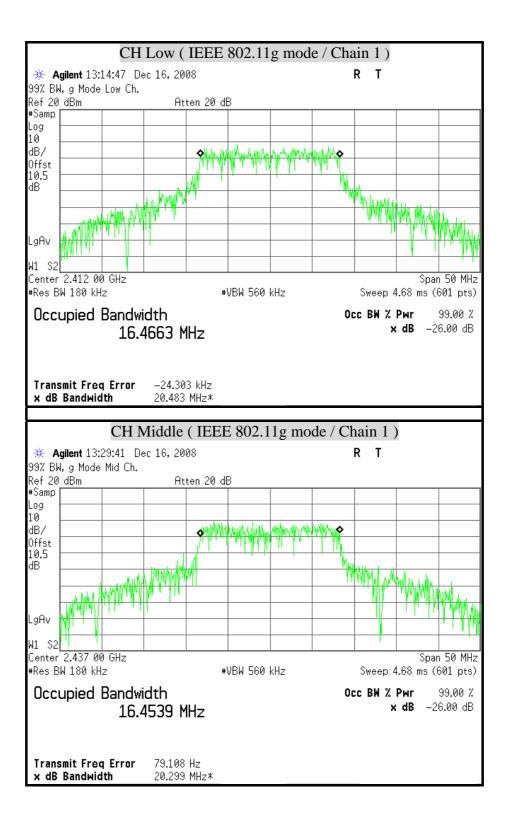
Page 24

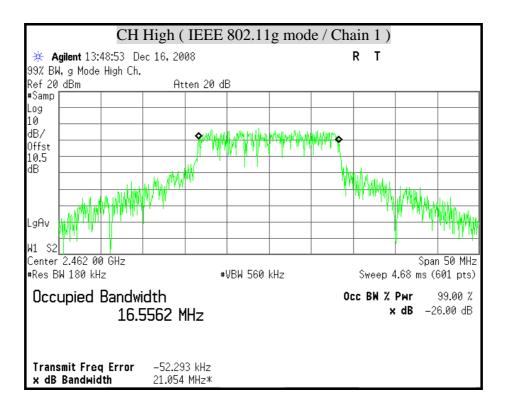


#### 99% BANDWIDTH ( IEEE 802.11g mode)



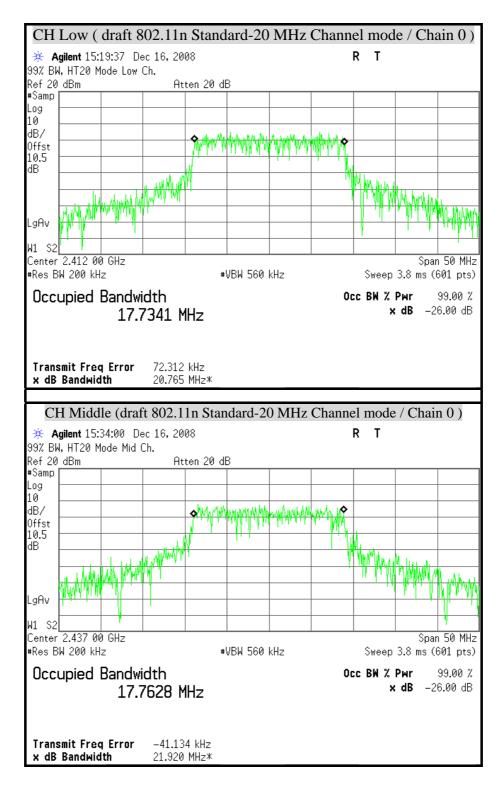


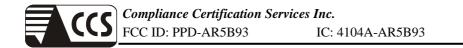


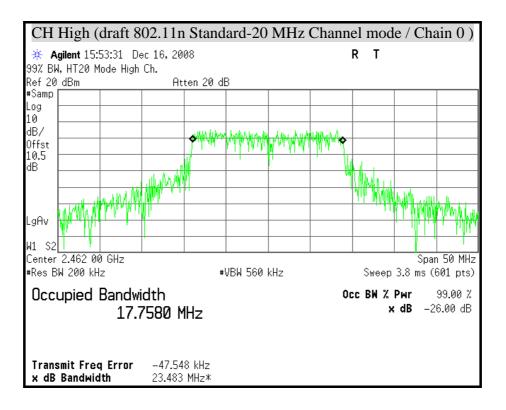




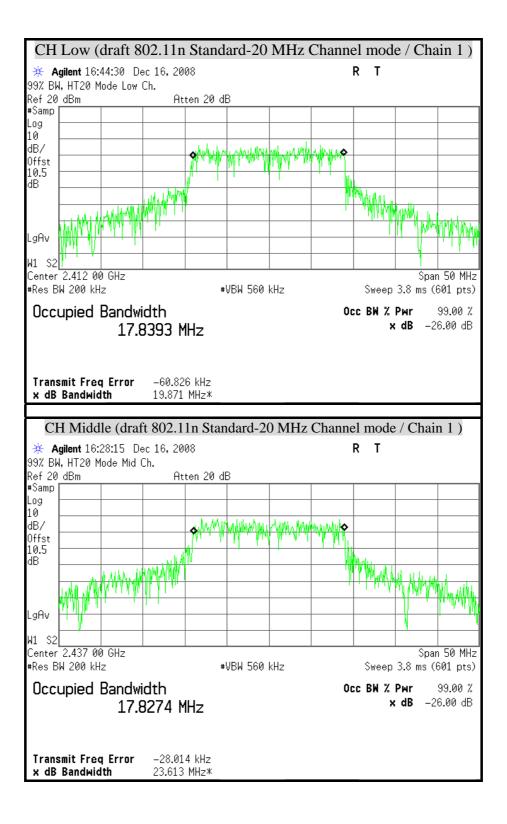
#### 99% BANDWIDTH ( draft 802.11n Standard-20 MHz Channel mode )



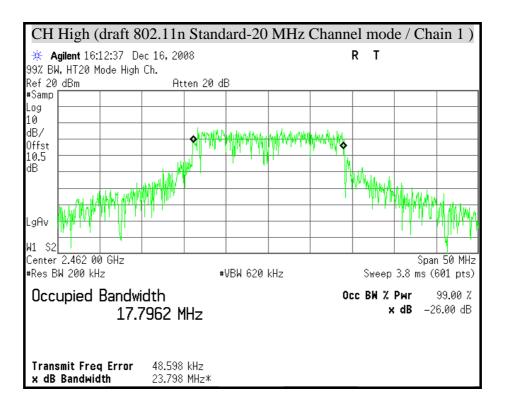






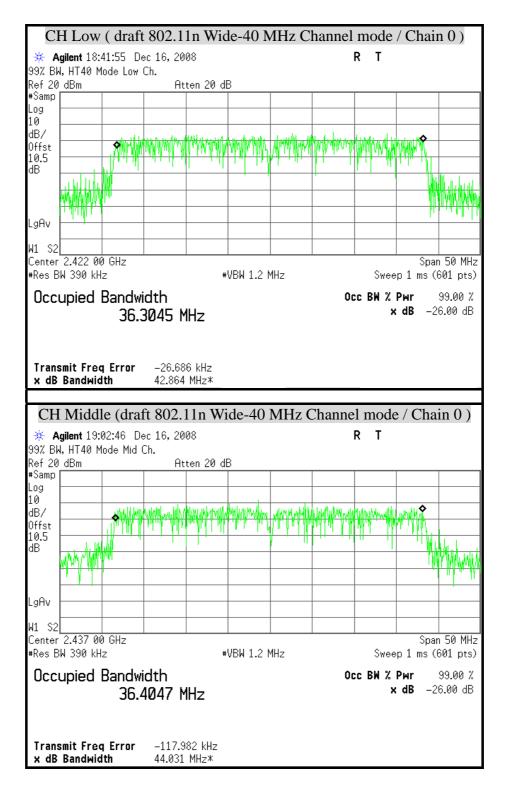




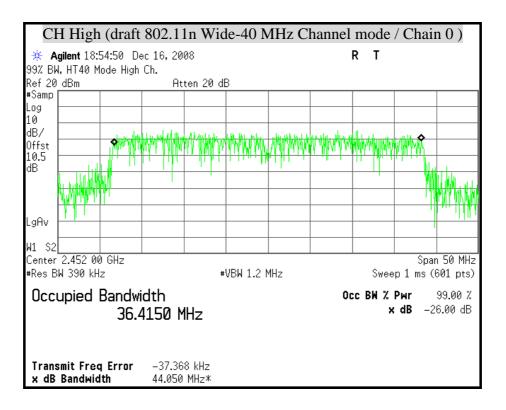




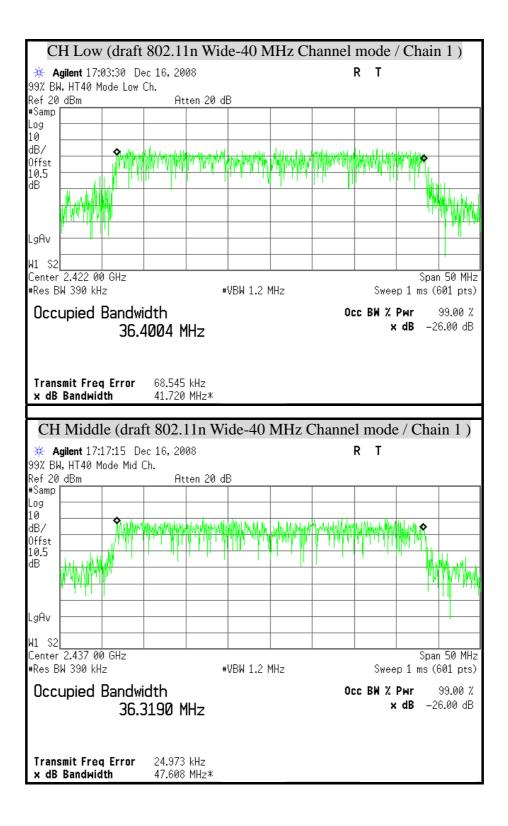
#### 99% BANDWIDTH ( draft 802.11n Wide-40 MHz Channel mode )



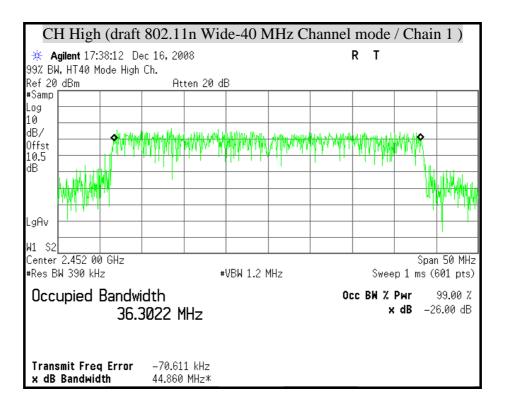












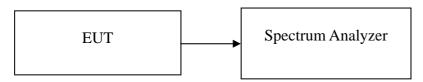


# 8.2 6DB BANDWIDTH

# LIMIT

According to 15.247(a)(2) & RSS-210 8A8.2(1), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

## **TEST CONFIGURATION**



### **TEST PROCEDURE**

The transmitter output was connected to a spectrum analyzer. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

### TEST RESULTS

No non-compliance noted



## TEST DATA

Channel	Channel Frequency		ndwidth Hz)	Minimum Limit	Result	
	(MHz)	Chain 0	Chain 1	(kHz)		
Low	2412	10083.333	13000.000	500	PASS	
Middle	2437	12083.333	12166.667	500	PASS	
High	2462	11166.667	10166.667	500	PASS	

## Test mode: IEEE 802.11b mode

#### Remark:

1. At finial test to get the worst-case emission at 1 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

## Test mode: IEEE 802.11g mode

Channel	Channel Frequency		ndwidth Hz)	Minimum Limit	Result	
	(MHz)	Chain 0	Chain 1	(kHz)		
Low	2412	16500.000	16333.333	500	PASS	
Middle	2437	16416.667	16500.000	500	PASS	
High	2462	16583.333	16500.000	500	PASS	

Remark:

1. At finial test to get the worst-case emission at 6 Mbps.



Channel	Channel Frequency		ndwidth Hz)	Minimum Limit	Result
	(MHz)	Chain 0	Chain 1	(kHz)	
Low	2412	17833.333	17833.333	500	PASS
Middle	2437	17500.000	17833.333	500	PASS
High	2462	17750.000	17666.667	500	PASS

#### Test mode: draft 802.11n Standard-20 MHz Channel mode

Remark:

1. At finial test to get the worst-case emission at 6.5 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

Channel	Channel Frequency		ndwidth Hz)	Minimum Limit	Result
	(MHz)	Chain 0	Chain 1	(kHz)	
Low	2422	36333.333	36416.667	500	PASS
Middle	2437	36166.667	36416.667	500	PASS
High	2452	36333.333	36333.333	500	PASS

#### Test mode: draft 802.11n Wide-40 MHz Channel mode

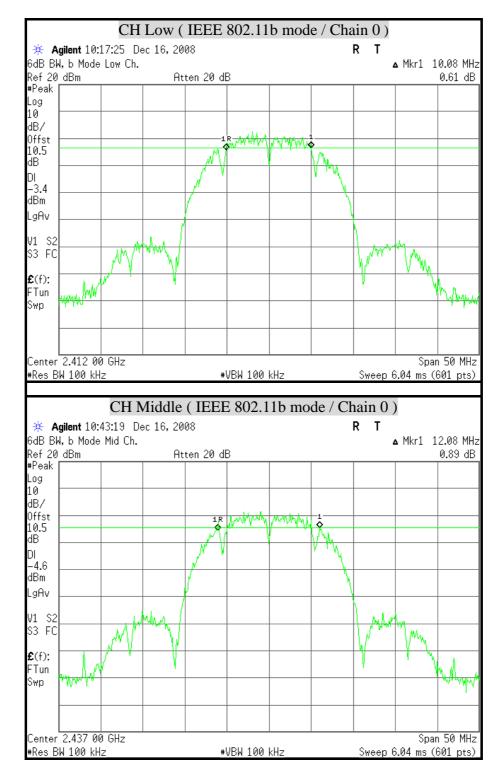
Remark:

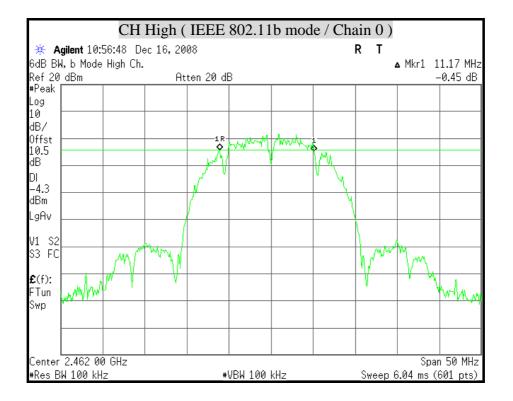
1. At finial test to get the worst-case emission at 13.5 Mbps.

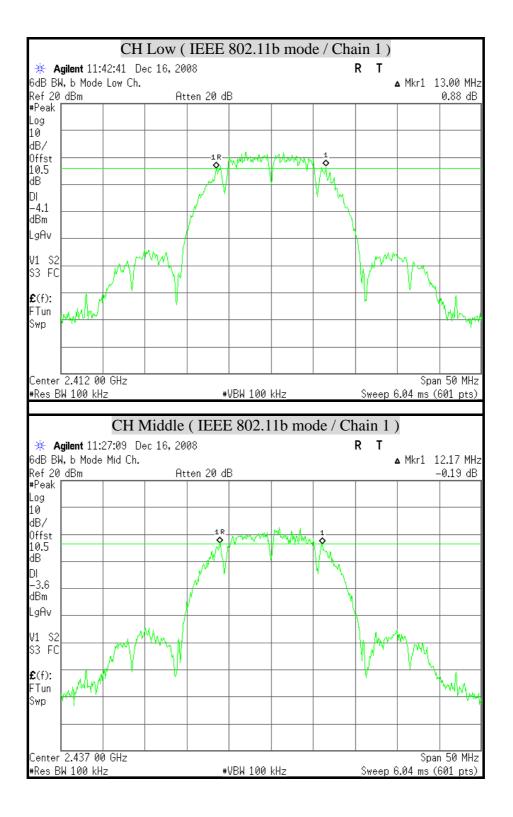


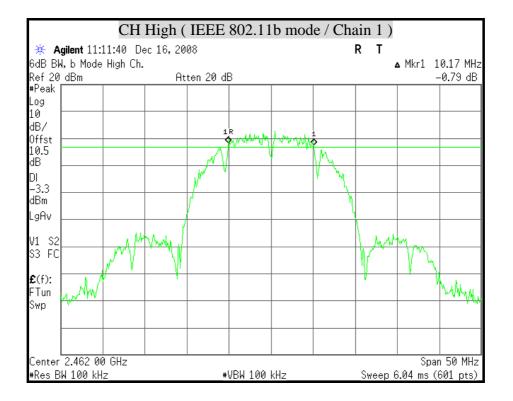
## TEST PLOT

### 6dB BANDWIDTH ( IEEE 802.11b mode)



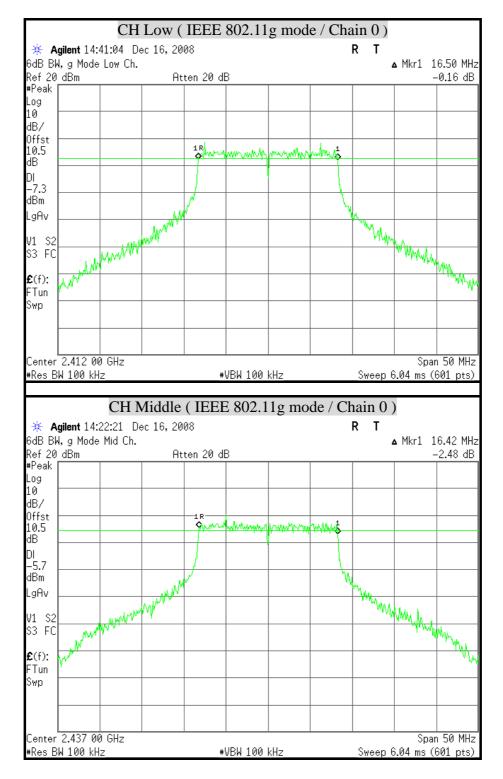


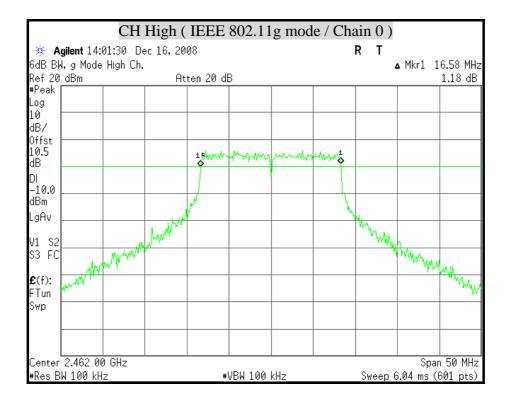


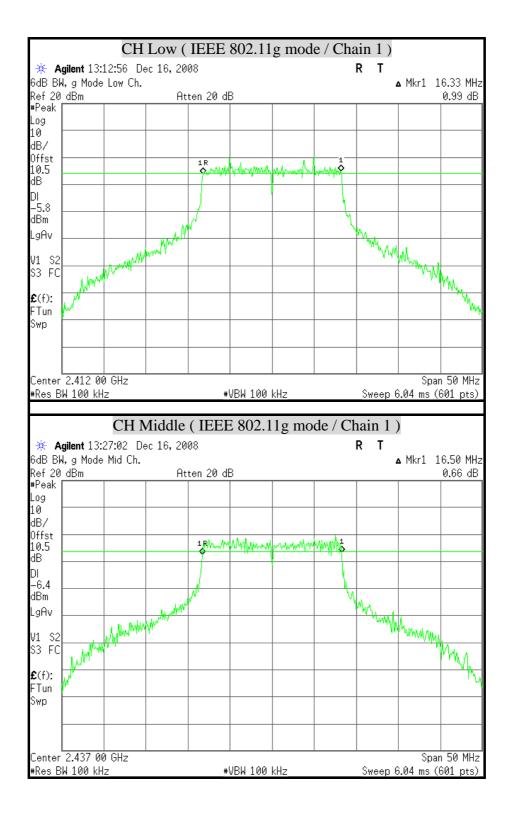


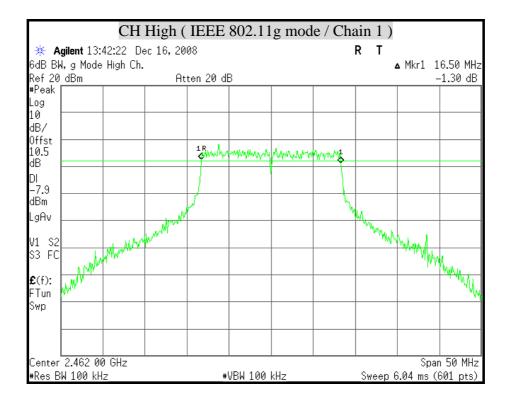


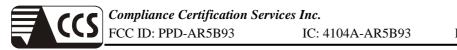
### 6dB BANDWIDTH ( IEEE 802.11g mode)



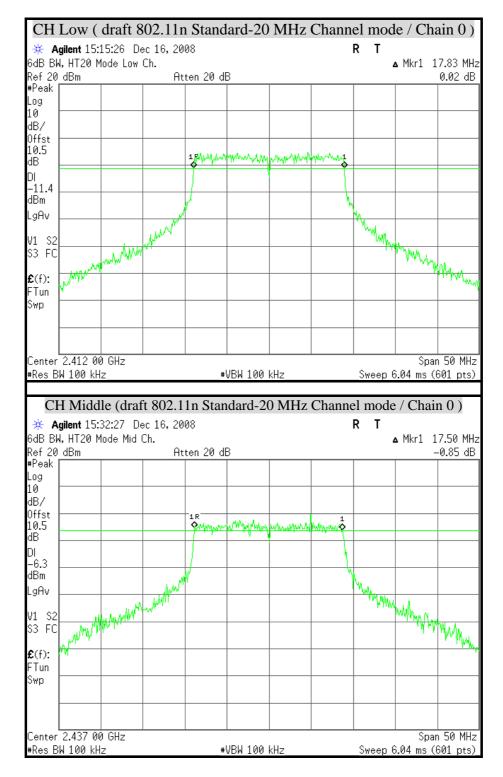


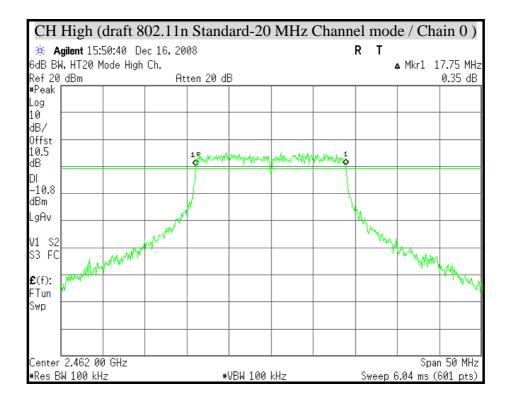


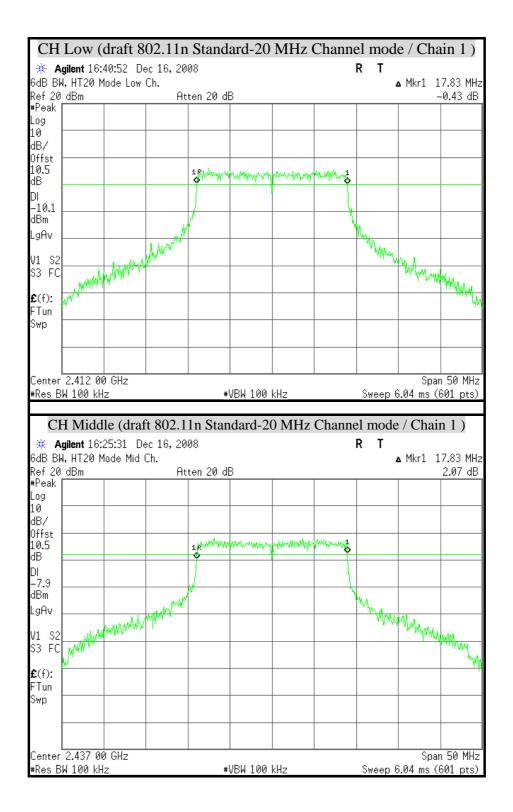


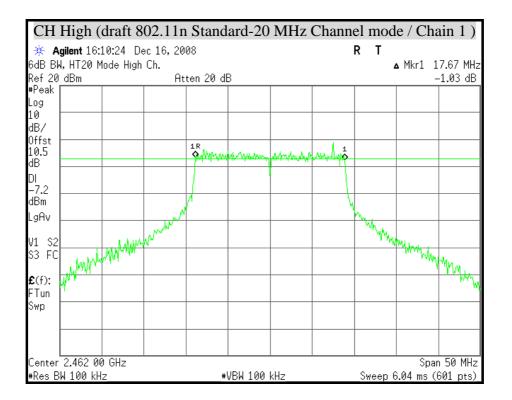


### 6dB BANDWIDTH ( draft 802.11n Standard-20 MHz Channel mode )



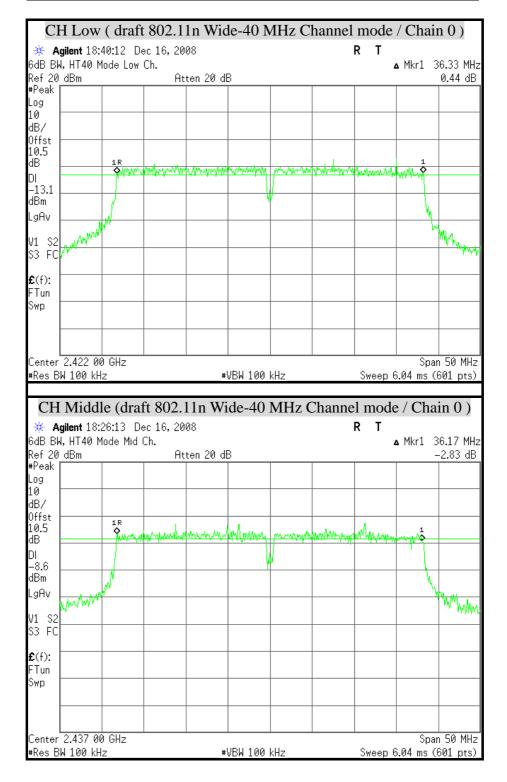


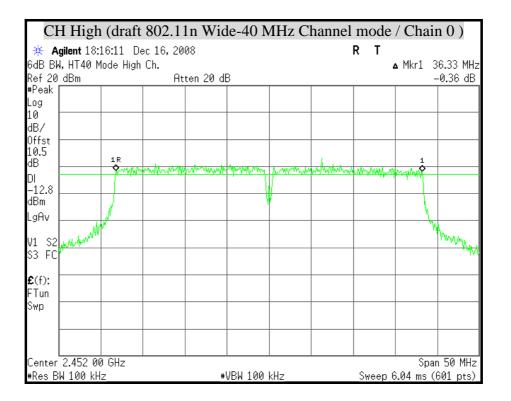


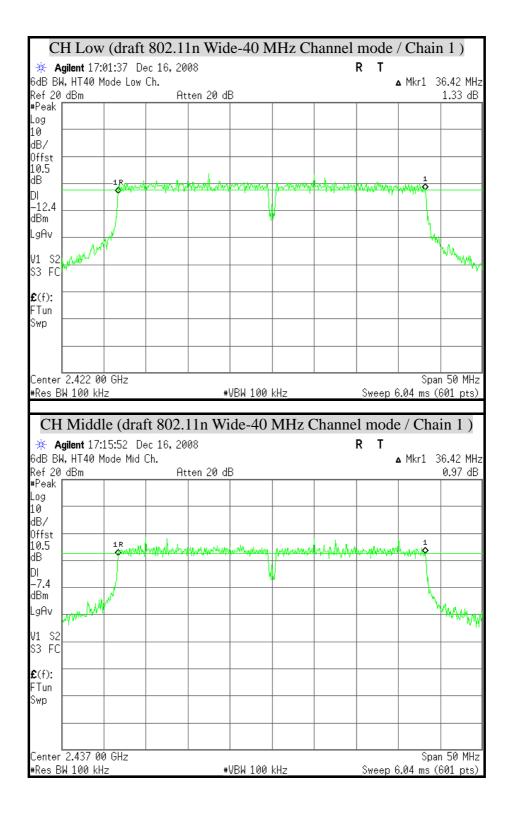


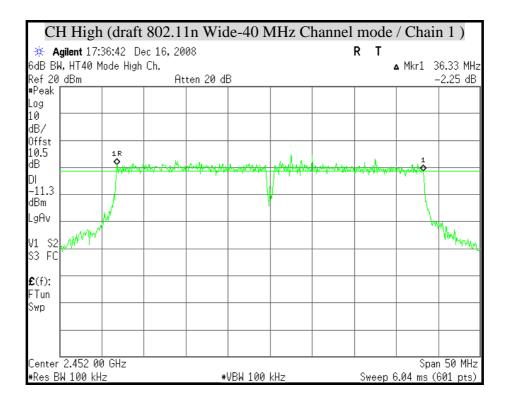


#### 6dB BANDWIDTH ( draft 802.11n Wide-40 MHz Channel mode )











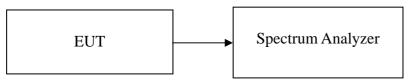
# 8.3 PEAK POWER

## **LIMIT**

The maximum peak output power of the intentional radiator shall not exceed the following:

- 1. According to §15.247(b)(3) & RSS-210 §A8.4(4), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.
- 2. According to \$15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

## **TEST CONFIGURATION**



## TEST PROCEDURE

1. The spectrum shall be set as follows : Span : 1.5 times channel integration bandwidth.

RBW : 1MHz VBW : 3MHz Detector : Peak Sweep : Single trace

- 2. Compute the combined power of all signal responses contained in the trace by covering all the data points.
- 3. For 99% occupied BW, place the markers at the frequency at which 0.5% of the power lies to the right of the right marker and 0.5% of the power lies to the left of the left marker.
- 4. The peak output power is the channel power integrated over 99% bandwidth.

# TEST RESULTS

No non-compliance noted



## TEST DATA

Total peak power calculation formula: 10 log (10<sup>^</sup> (Chain 0 Power / 10) + 10<sup>^</sup> (Chain1 Power / 10)

The maximum antenna gain is 3.62 dBi, therefore the limit is 30 dBm. In the legacy mode, the effective antenna gain is  $3.62 + 10 \times \text{Log}(2) = 6.63$  dBi.

Channel	Channel Frequency	Peak Power (dBm)		Peak Power (W)		Peak Power	Peak Power	Peak Power	Result
	(MHz)	Chain 0	Chain 1	Chain 0	Chain 1	Total (dBm)	Total (W)	Limit (W)	Kesult
Low	2412	15.99	16.28	0.040	0.042	19.148	0.082	0.865	PASS
Middle	2437	15.87	16.41	0.039	0.044	19.159	0.082	0.865	PASS
High	2462	15.75	16.37	0.038	0.043	19.081	0.08	0.865	PASS

#### Test mode: IEEE 802.11b mode

Remark:

1. At finial test to get the worst-case emission at 1 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

Channel	Channel Frequency	Peak Power (dBm)		Peak Power (W)		Peak Power	Peak Power	Peak Power	Result
	(MHz)	Chain 0	Chain 1	Chain 0	Chain 1	Total (dBm)	Total (W)	Limit (W)	Kesuit
Low	2412	18.63	20.01	0.073	0.100	22.38	0.173	0.865	PASS
Middle	2437	22.20	22.40	0.166	0.174	25.31	0.340	0.865	PASS
High	2462	18.31	19.74	0.068	0.094	22.09	0.162	0.865	PASS

#### Test mode: IEEE 802.11g mode

Remark:

1. At finial test to get the worst-case emission at 6 Mbps.



Channel	Channel Frequency	Peak Power (dBm)		Peak Power (W)		Peak Power	Peak Power	Peak Power	Result
	(MHz)	Chain 0	Chain 1	Chain 0	Chain 1	Total (dBm)	Total (W)	Limit (W)	Kesuit
Low	2412	17.60	18.58	0.060	0.070	21.13	0.13	0.865	PASS
Middle	2437	22.13	21.75	0.163	0.150	24.95	0.31	0.865	PASS
High	2462	17.89	18.63	0.060	0.070	21.29	0.13	0.865	PASS

#### Test mode: draft 802.11n Standard-20 MHz Channel mode

Remark:

1. At finial test to get the worst-case emission at 6.5 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

Channel	Channel Frequency	Peak Power (dBm)		Peak Power (W)		Peak Power	Peak Power	Peak Power	Result
	(MHz)	Chain 0	Chain 1	Chain 0	Chain 1	Total (dBm)	Total (W)	Limit (W)	Kesult
Low	2422	16.45	17.34	0.040	0.050	19.93	0.10	0.865	PASS
Middle	2437	22.74	22.93	0.188	0.196	25.85	0.39	0.865	PASS
High	2452	16.86	18.05	0.050	0.060	20.51	0.11	0.865	PASS

#### Test mode: draft 802.11n Wide-40 MHz Channel mode

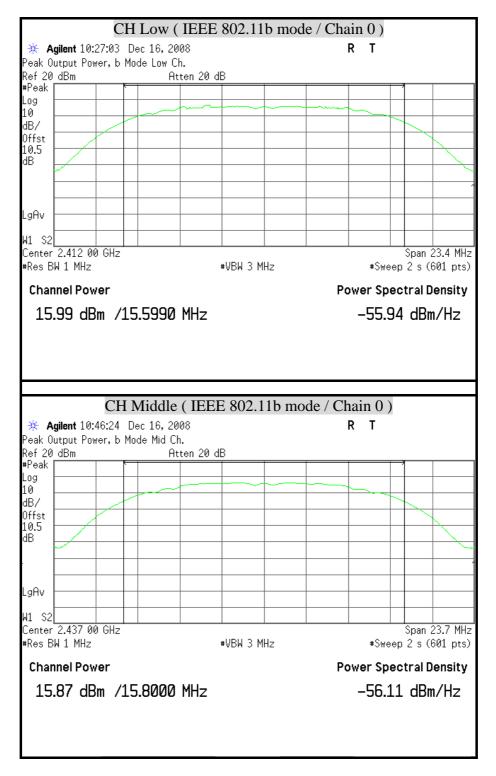
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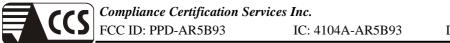
1. At finial test to get the worst-case emission at 13.5 Mbps.

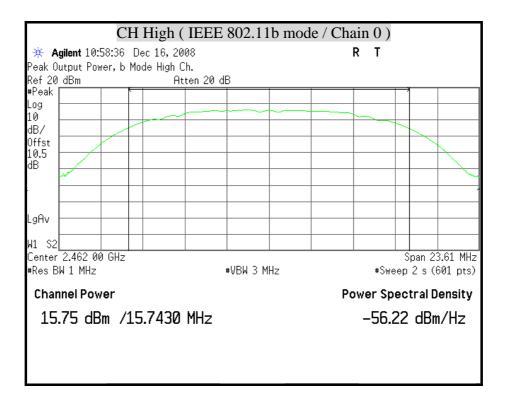


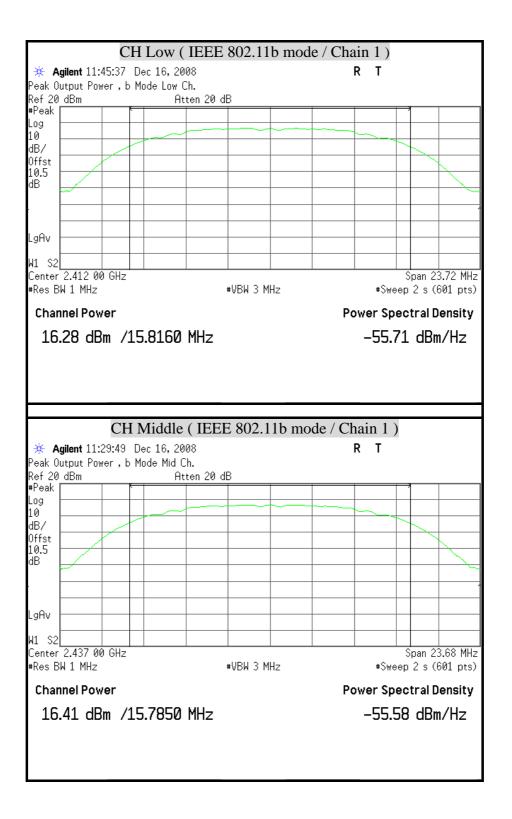
## TEST PLOT

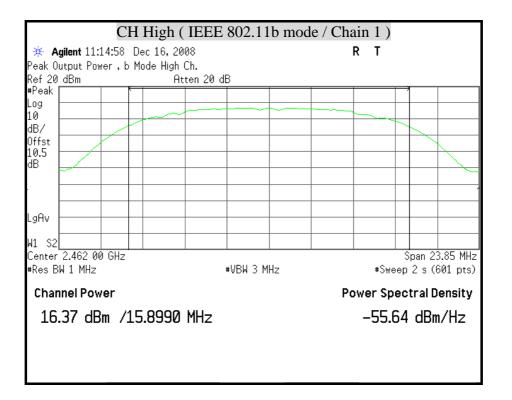
## PEAK POWER ( IEEE 802.11b mode)





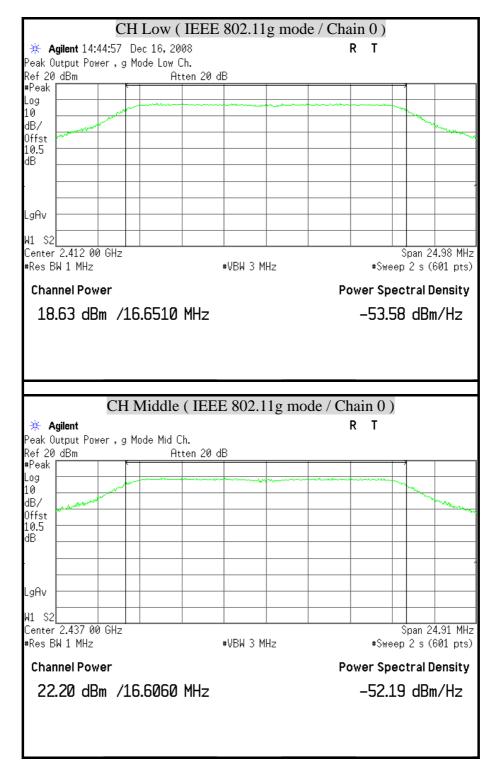


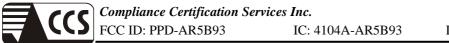


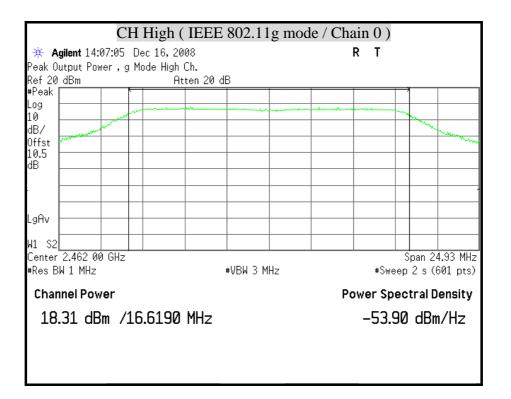


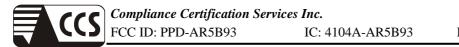


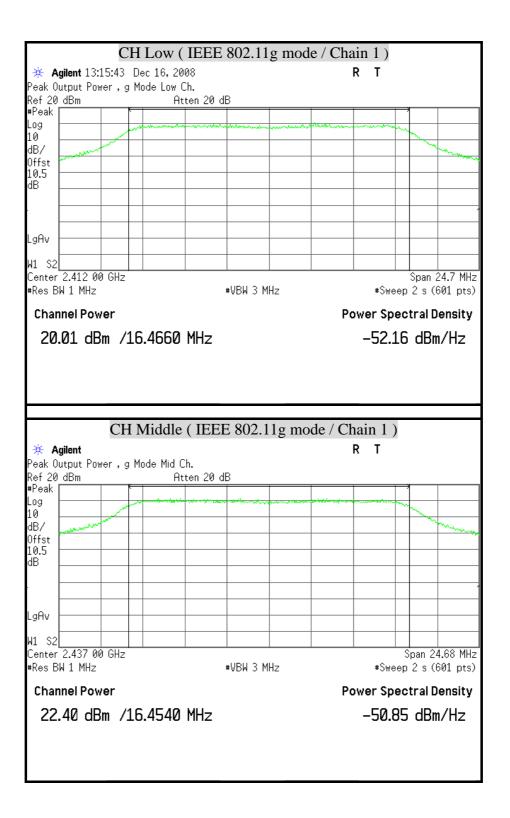
## PEAK POWER ( IEEE 802.11g mode)

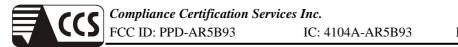


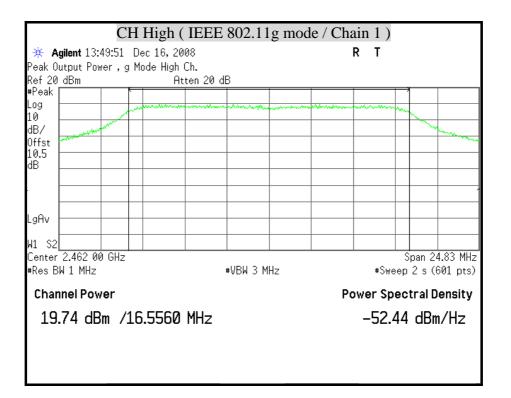


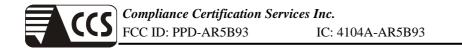




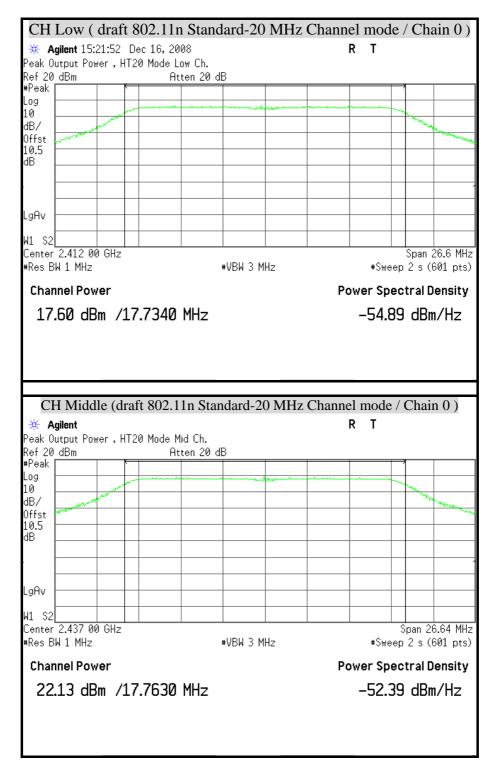




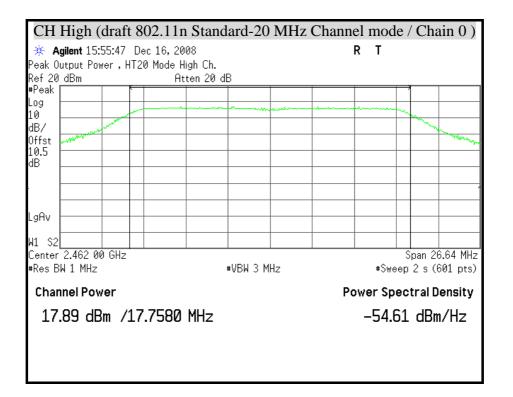


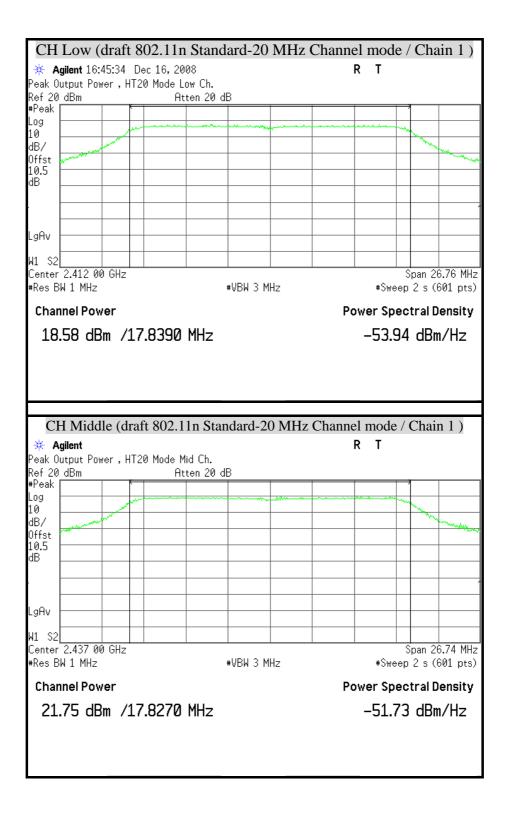


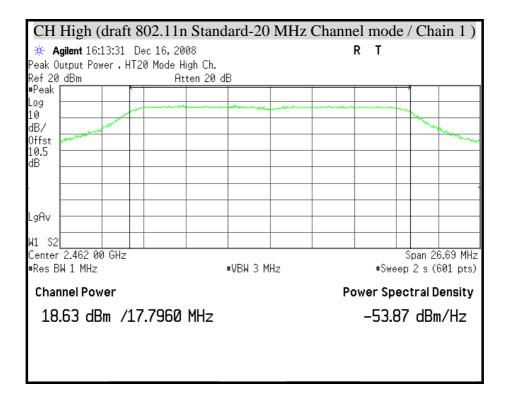
## PEAK POWER ( draft 802.11n Standard-20 MHz Channel mode )



Rev. 00

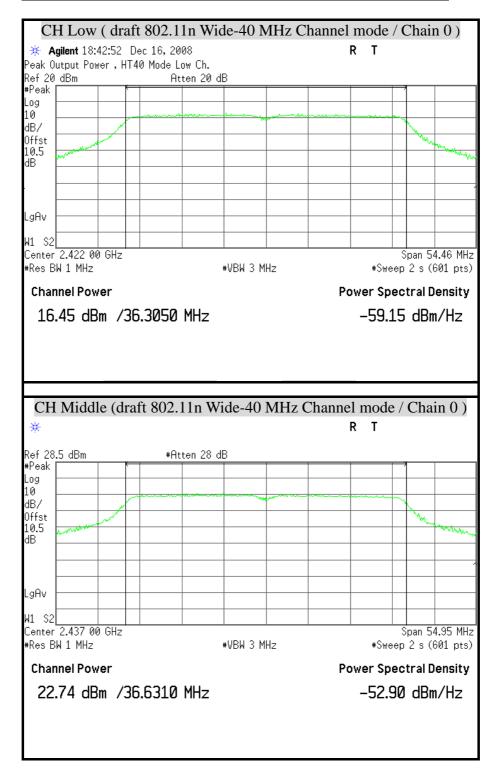


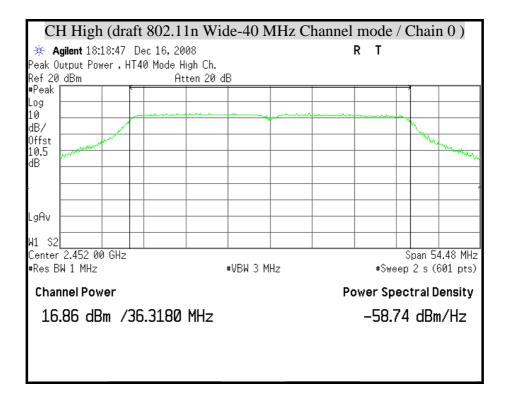


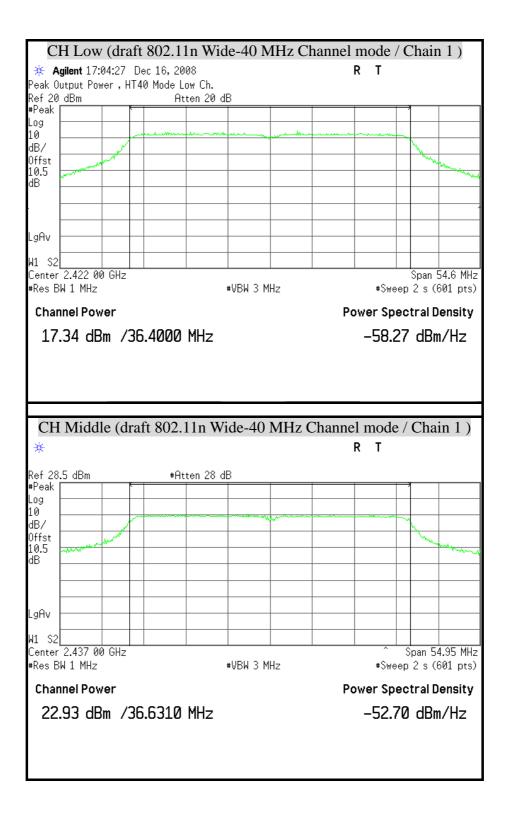


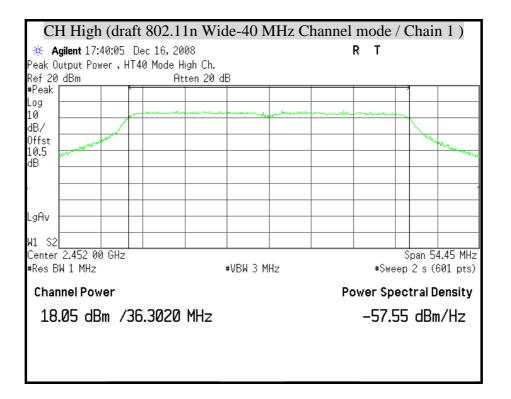


#### PEAK POWER ( draft 802.11n Wide-40 MHz Channel mode )









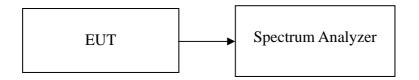


# **8.4 AVERAGE POWER**

### **LIMIT**

None; for reporting purposes only.

### **TEST CONFIGURATION**



### **TEST PROCEDURE**

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the average power detection.

#### TEST RESULTS

No non-compliance noted



# TEST DATA

Total avg power calculation formula:

10 log (10<sup>^</sup> (Chain 0 Power / 10) + 10<sup>^</sup> (Chain1 Power / 10)).

Channel	Channel Frequency (MHz)	AVG Power (dBm)		AVG Power (W)		AVG Power	AVG Power
		Chain 0	Chain 1	Chain 0	Chain 1	Total (dBm)	Total (W)
Low	2412	14.12	13.54	0.03	0.02	16.85	0.05
Middle	2437	13.11	13.61	0.02	0.02	16.38	0.04
High	2462	12.86	13.52	0.02	0.02	16.21	0.04

### Test mode: IEEE 802.11b mode

Remark:

1. At finial test to get the worst-case emission at 1 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

Channel	Channel Frequency (MHz)	AVG Power (dBm)		AVG Power (W)		AVG Power	AVG Power
		Chain 0	Chain 1	Chain 0	Chain 1	Total (dBm)	Total (W)
Low	2412	11.12	11.44	0.01	0.01	14.29	0.03
Middle	2437	14.35	13.89	0.03	0.02	17.14	0.05
High	2462	10.61	11.30	0.01	0.01	13.98	0.03

#### Test mode: IEEE 802.11g mode

Remark:

1. At finial test to get the worst-case emission at 6 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



Channel	Channel Frequency (MHz)	AVG Power (dBm)		AVG Power (W)		AVG Power	AVG Power
		Chain 0	Chain 1	Chain 0	Chain 1	Total (dBm)	Total (W)
Low	2412	9.66	10.51	0.01	0.01	13.12	0.02
Middle	2437	14.34	13.81	0.03	0.02	17.09	0.05
High	2462	9.88	10.53	0.01	0.01	13.23	0.02

### Test mode: draft 802.11n Standard-20 MHz Channel mode

Remark:

1. At finial test to get the worst-case emission at 6.5 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

Channel	Channel Frequency (MHz)	AVG Power (dBm)		AVG Power (W)		AVG Power	AVG Power
		Chain 0	Chain 1	Chain 0	Chain 1	Total (dBm)	Total (W)
Low	2422	8.36	9.17	0.01	0.01	11.79	0.02
Middle	2437	14.68	14.99	0.29	0.32	17.85	0.04
High	2452	8.65	9.62	0.01	0.01	12.17	0.02

#### Test mode: draft 802.11n Wide-40 MHz Channel mode

Remark:

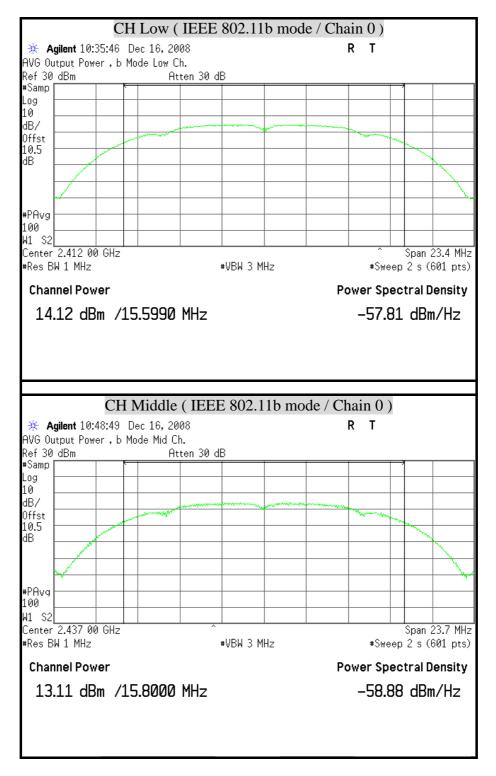
1. At finial test to get the worst-case emission at 13.5 Mbps.

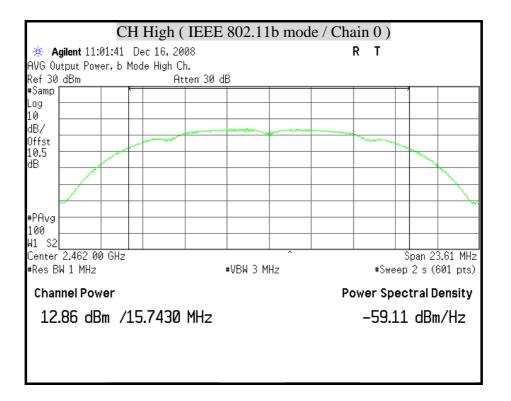
2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

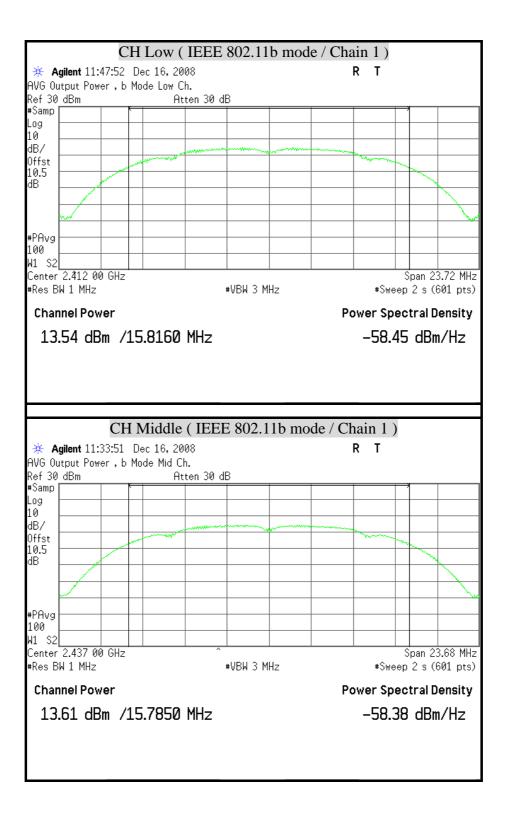


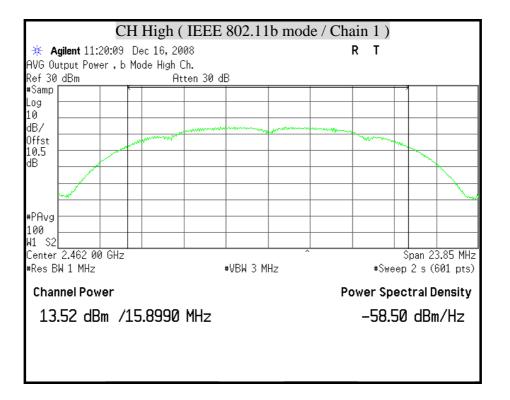
## **TEST PLOT**

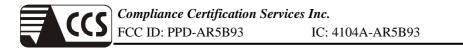
### AVG POWER ( IEEE 802.11b mode)



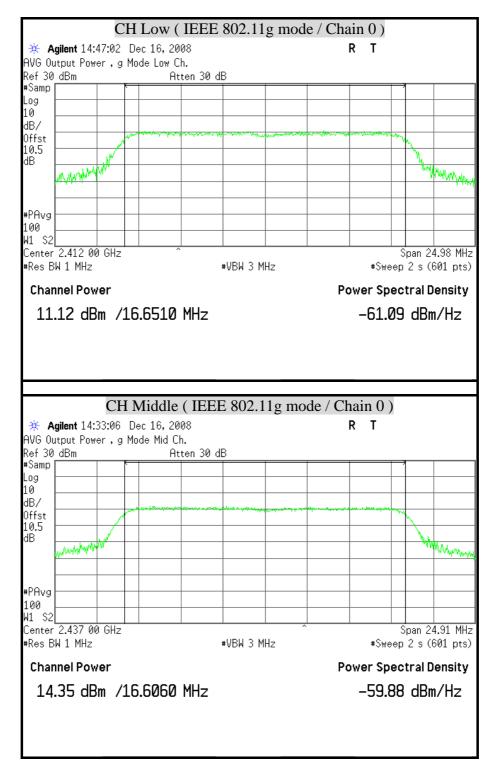


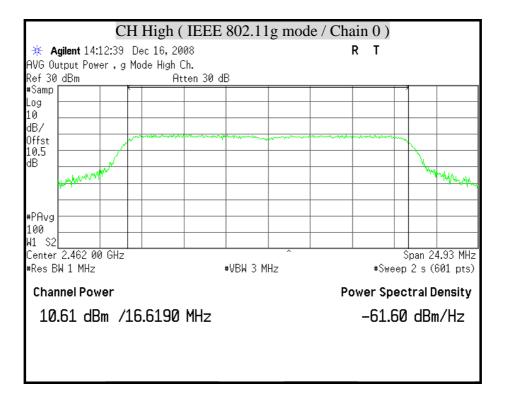


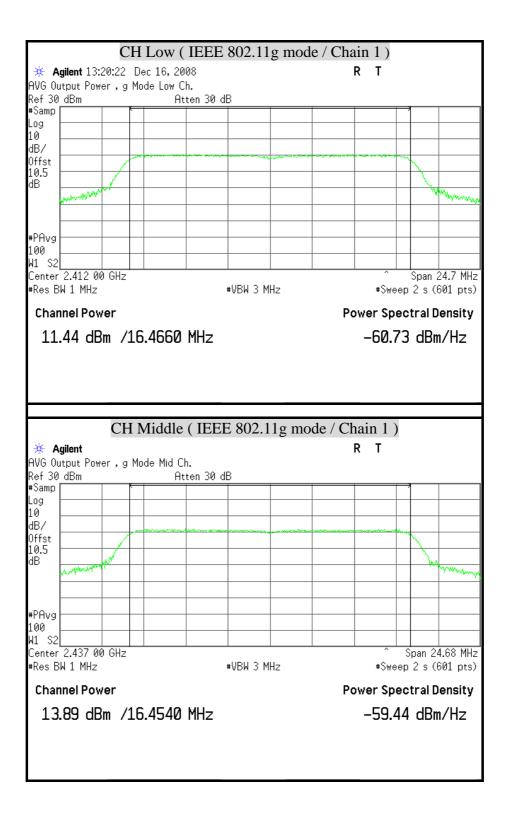


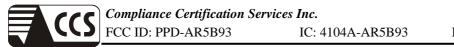


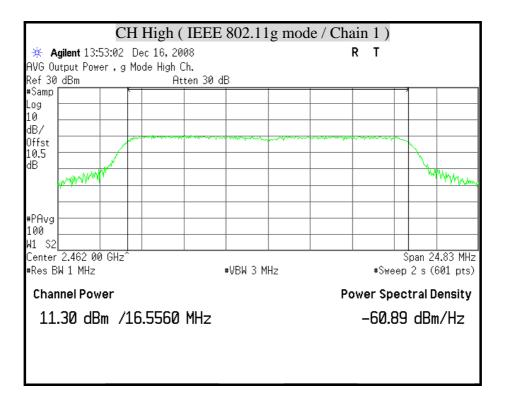
### AVG POWER ( IEEE 802.11g mode)

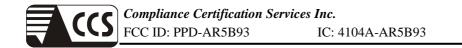




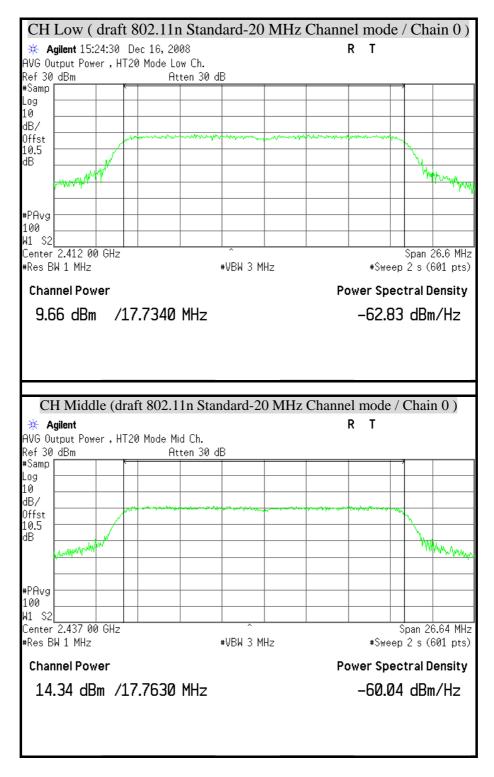


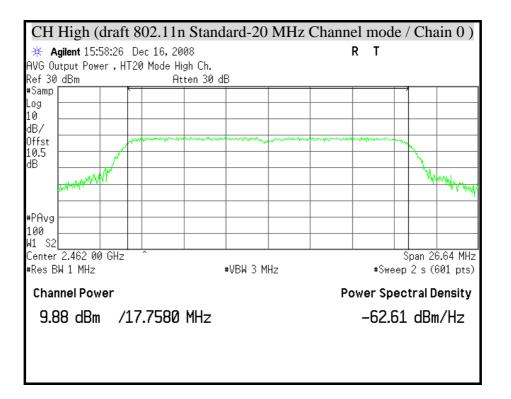


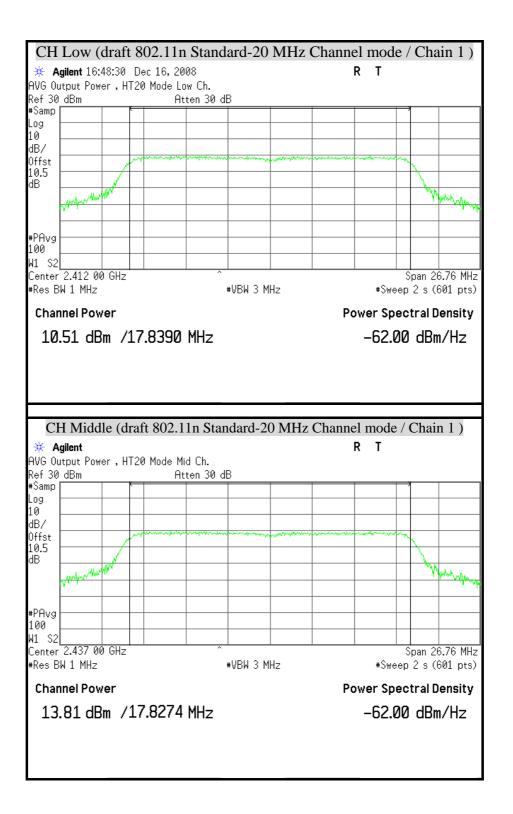


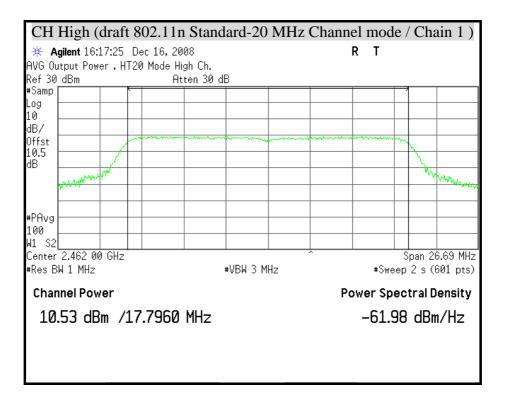


### AVG POWER ( draft 802.11n Standard-20 MHz Channel mode )



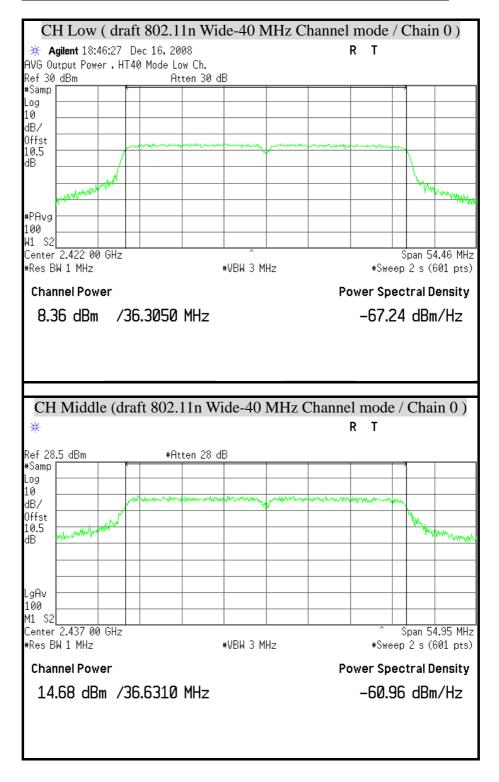


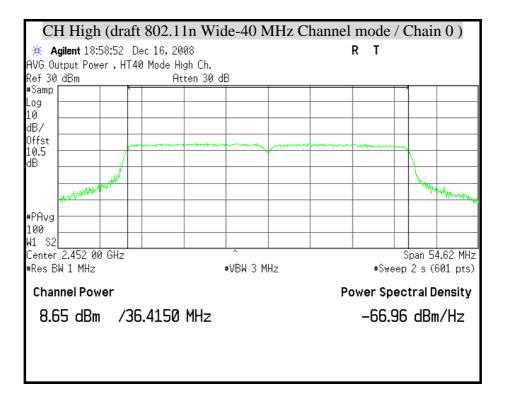


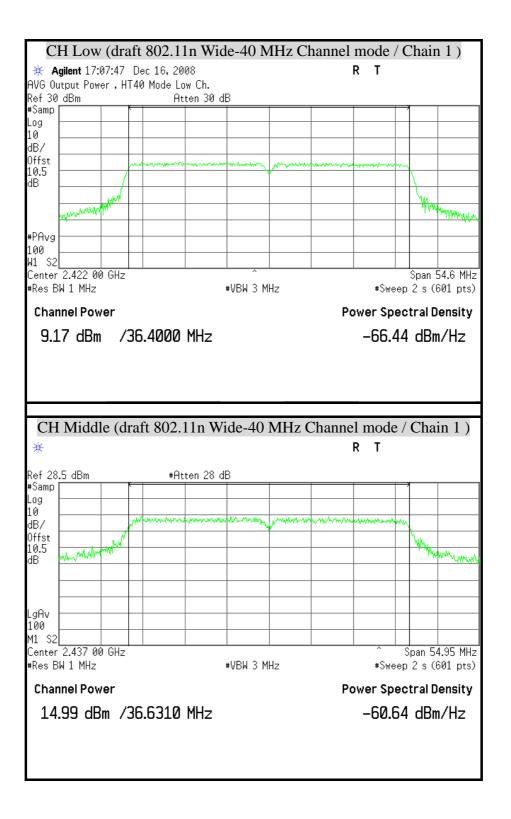


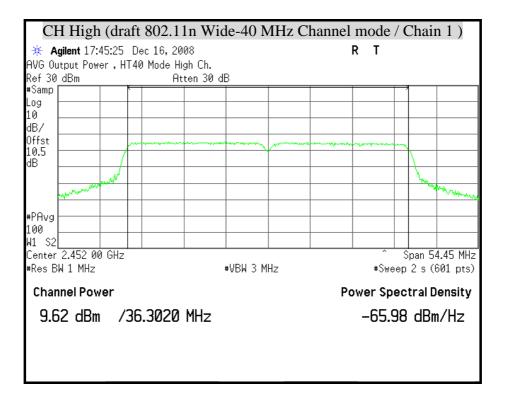


#### PEAK POWER ( draft 802.11n Wide-40 MHz Channel mode )









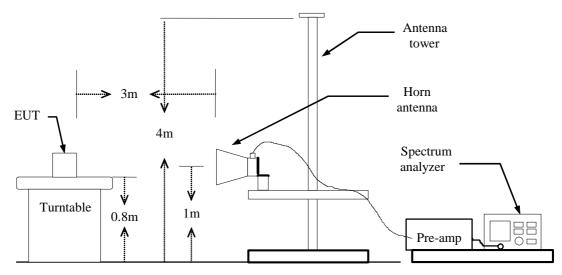


# 8.5 BAND EDGES MEASUREMENT

## LIMIT

According to §15.247(d) & RSS-210 §A8.5, in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator 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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

### **TEST CONFIGURATION**



# TEST PROCEDURE

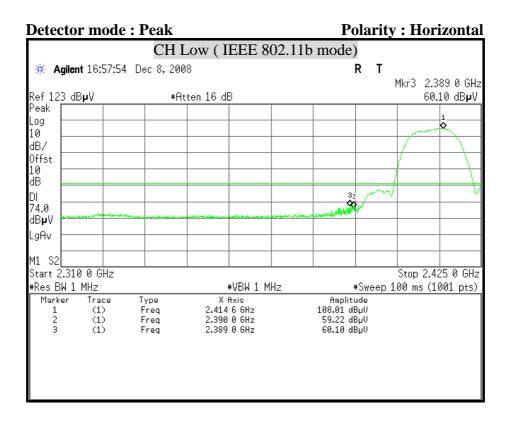
- 1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
- 4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
  - (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
  - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
- 5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

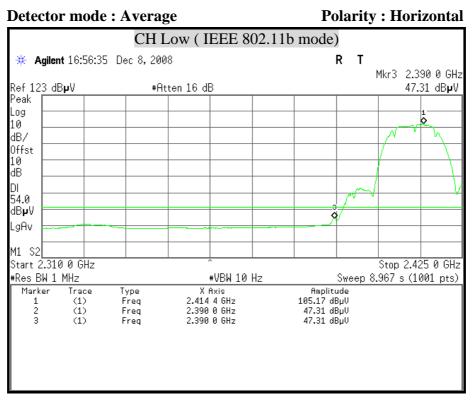
### TEST RESULTS

Refer to attach spectrum analyzer data chart.

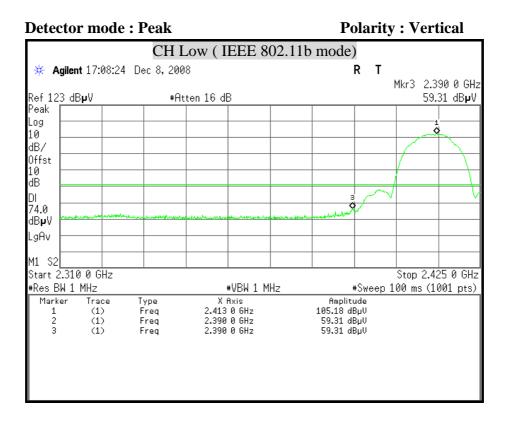


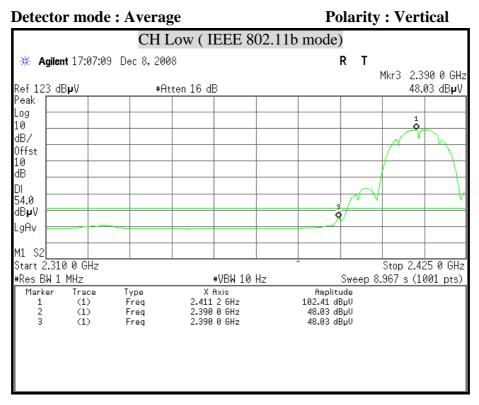
# **PIFA ANTENNA**



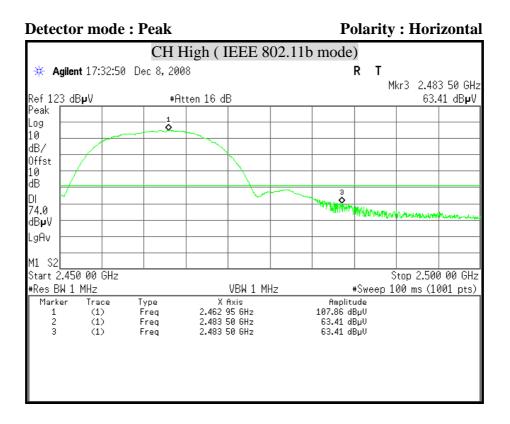


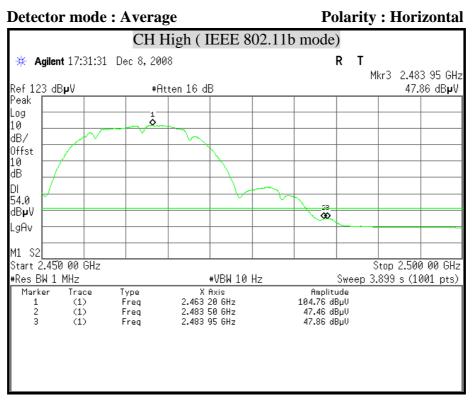




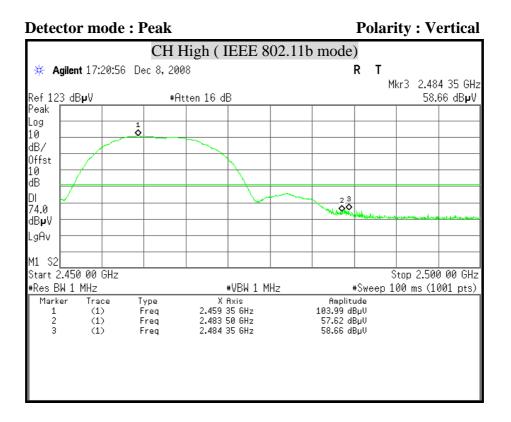


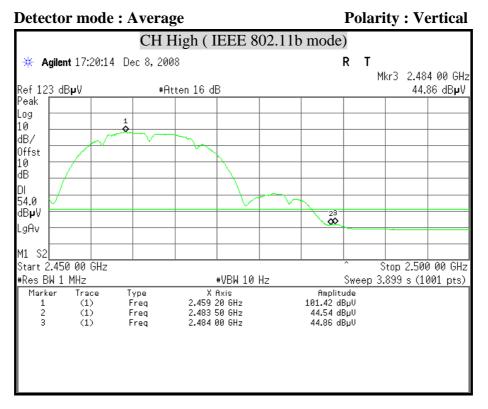




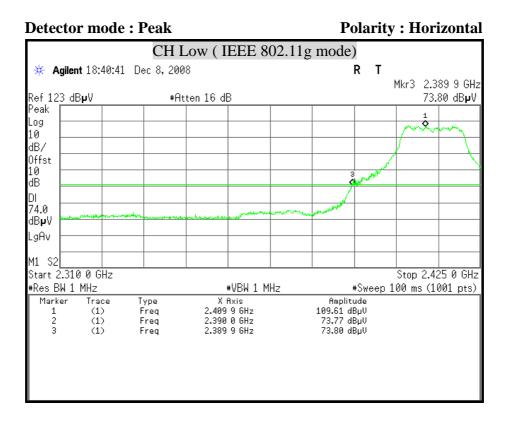


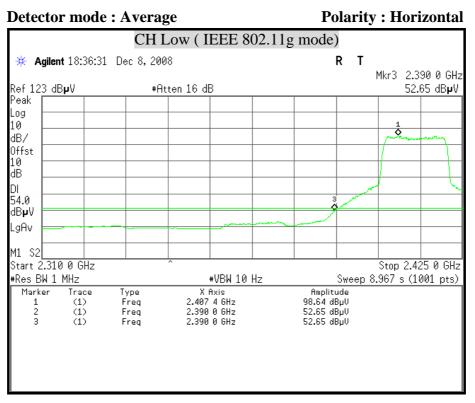




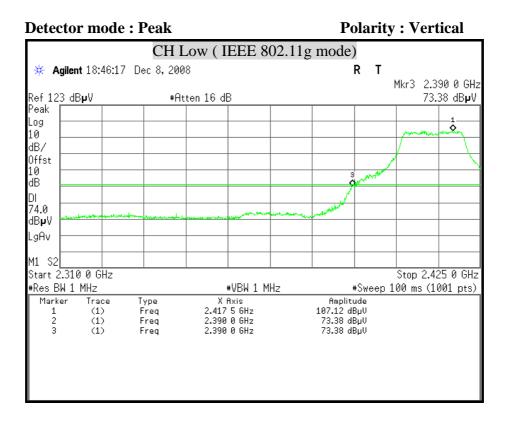


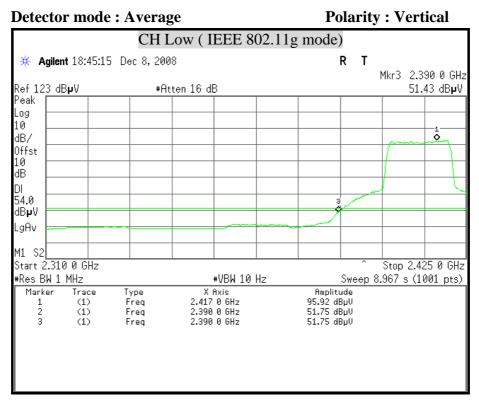




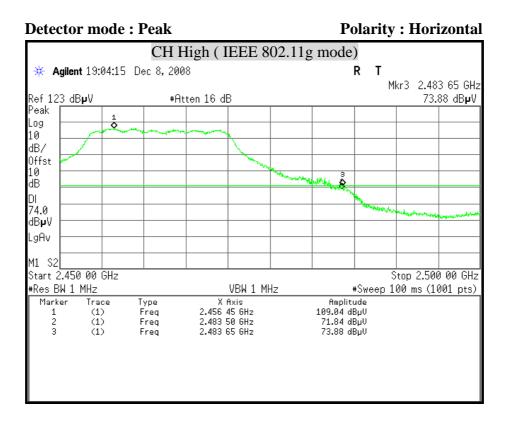


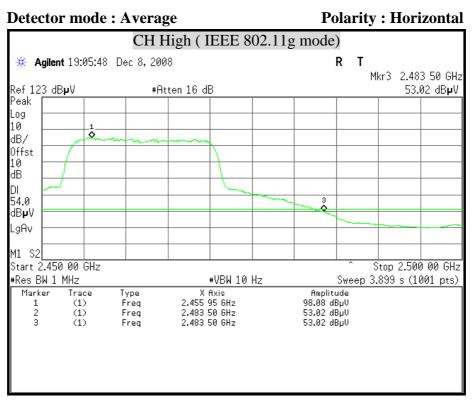




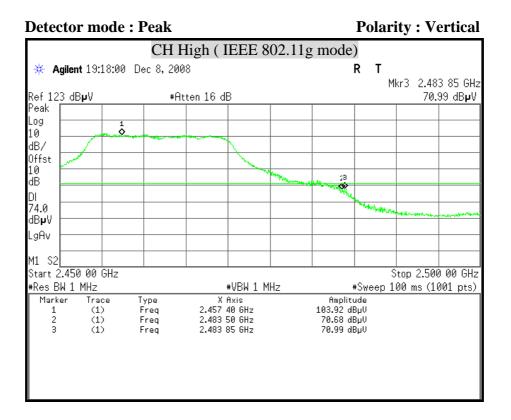


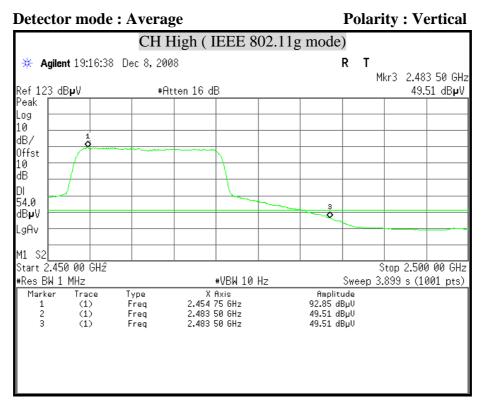




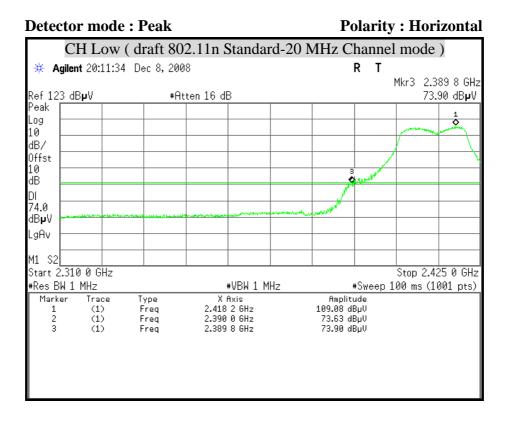


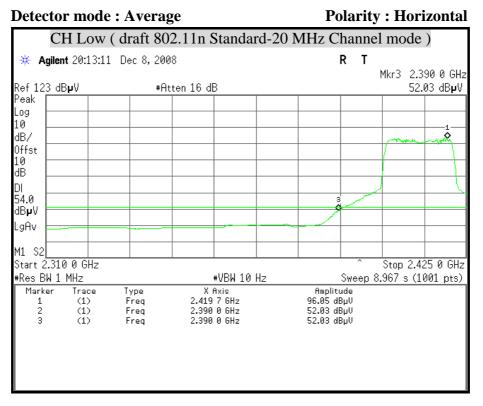




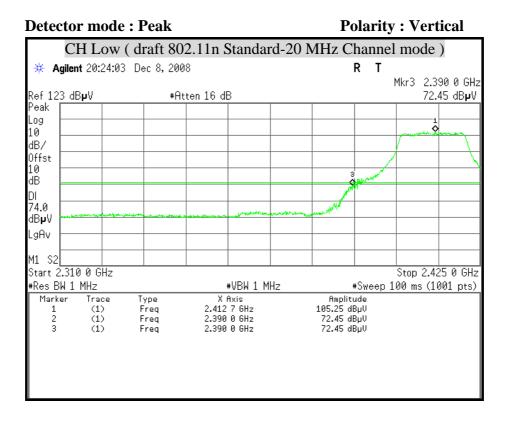


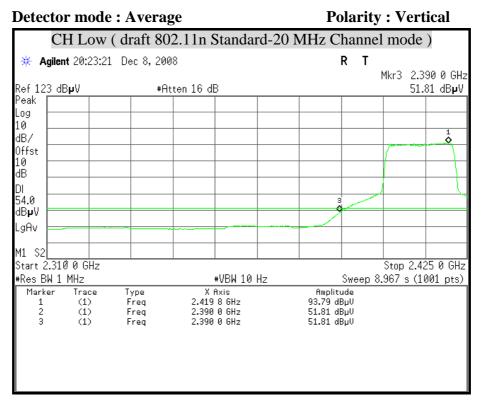




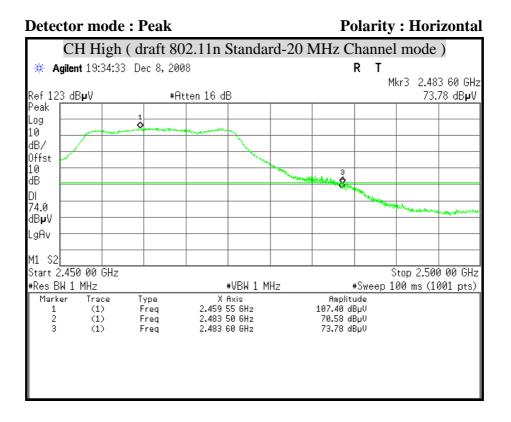


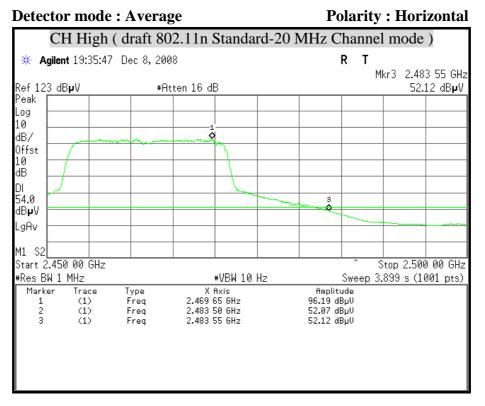




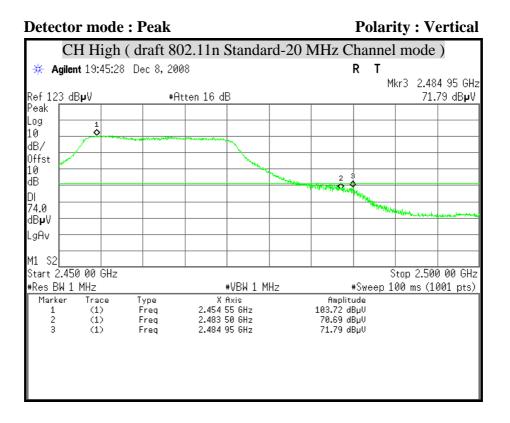


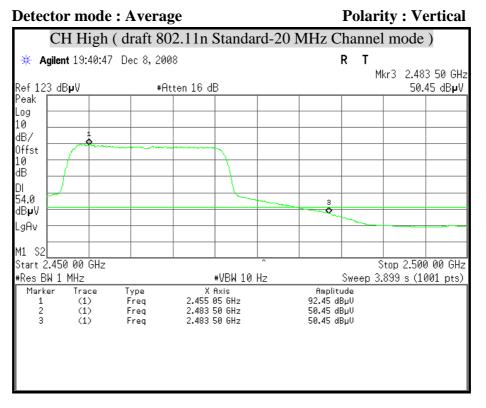




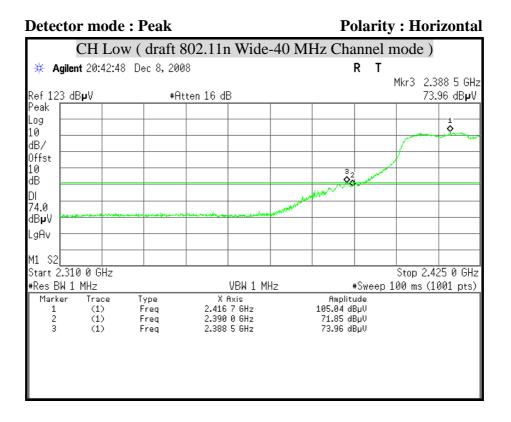


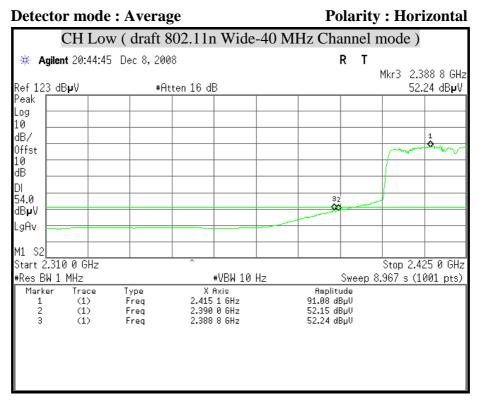




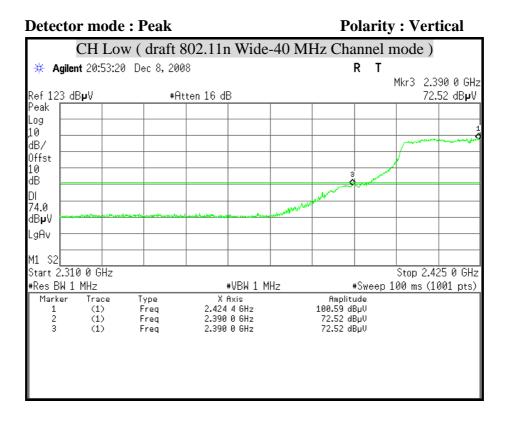


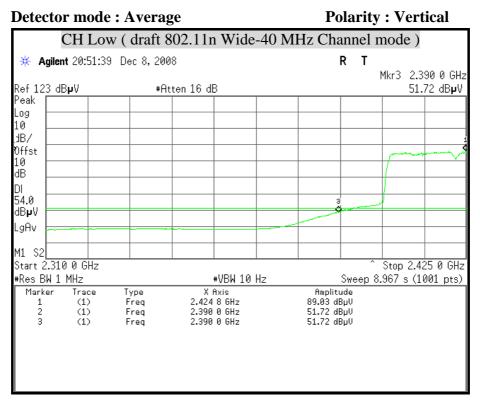




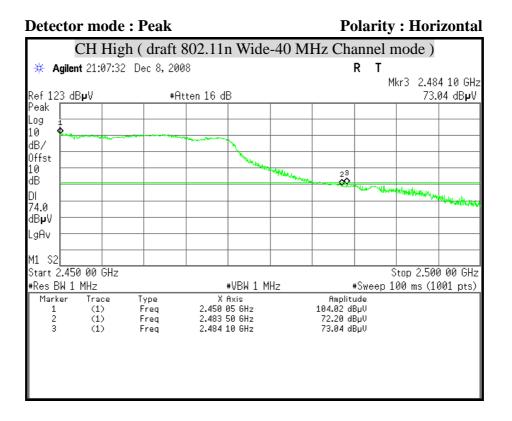


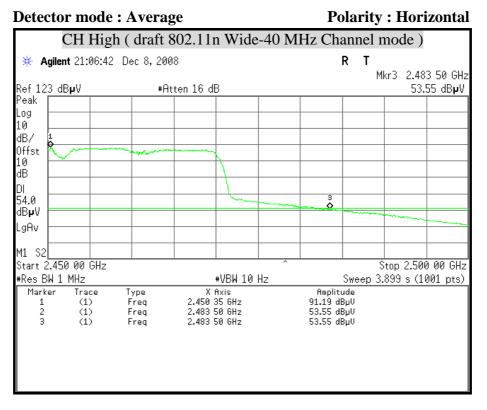




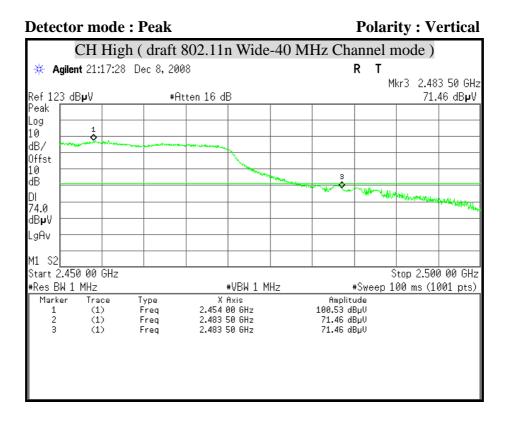


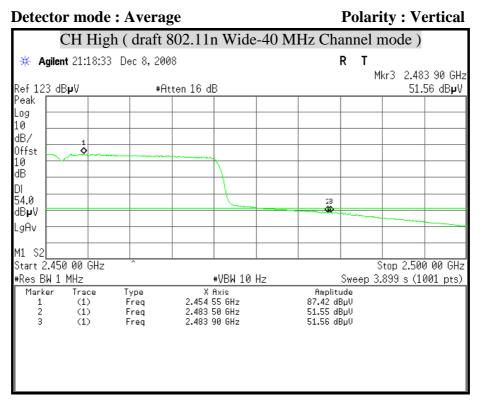






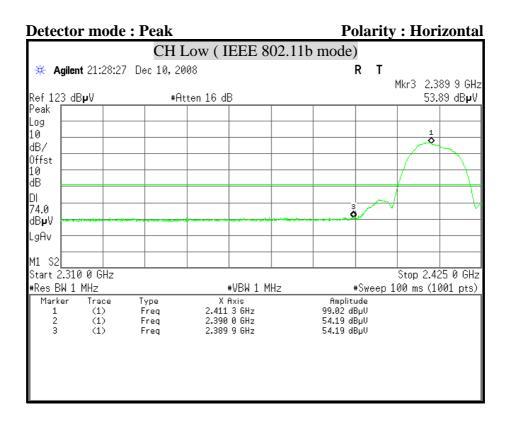






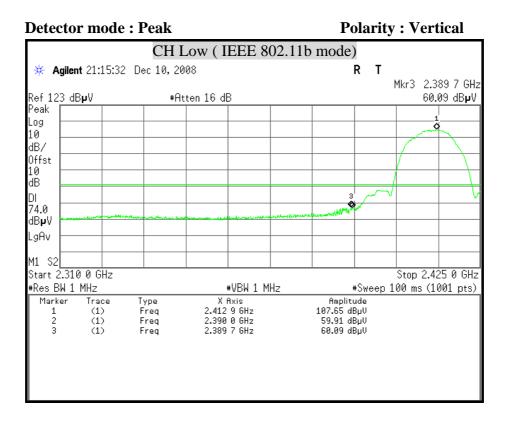


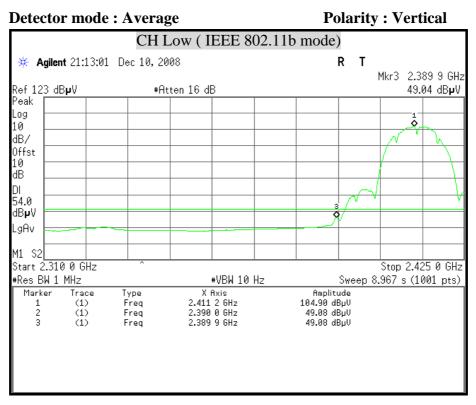
# **DIPOLE ANTENNA**



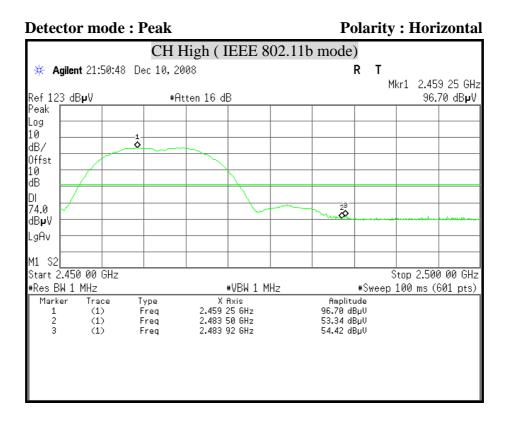
Detec	tor mode	: Avera	ge	<b>Polarity : Horizontal</b>
		CH	Low ( IEEE 802.1	1b mode)
₩ A(	<b>gilent</b> 21:26:53	Dec 10, 2	008	RT
Ref 123	3 dB <b>µ</b> V	#A	tten 16 dB	Mkr3 2.389 9 GHz 42.25 dBµV
Peak   Log				
10				1
dB/				
Offst 10				
10 dB				
DI 54.0				
54.0 dB <b>µ</b> V ∣				
LgAv				
M1 S2 Start 2	.310 0 GHz			
	√1 MHz		₩VBW 10 Hz	Sweep 8.967 s (1001 pts)
Marke 1 2 3	er Trace (1) (1) (1) (1)	Type Freq Freq Freq	X Axis 2.411 3 GHz 2.390 0 GHz 2.389 9 GHz	Amplitude 96.63 dBµV 42.26 dBµV 42.29 dBµV

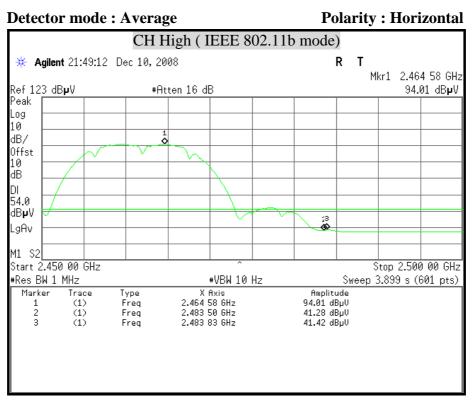




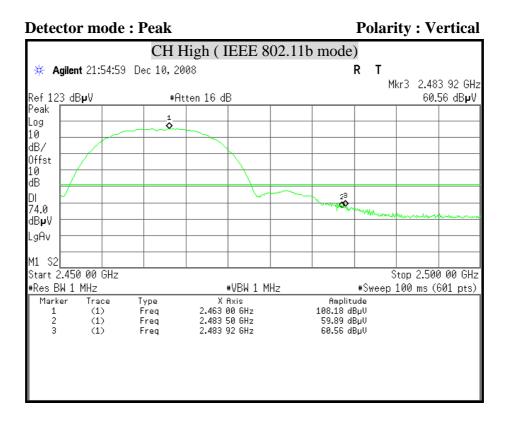


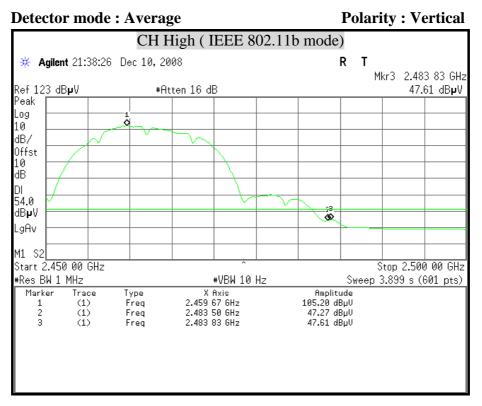




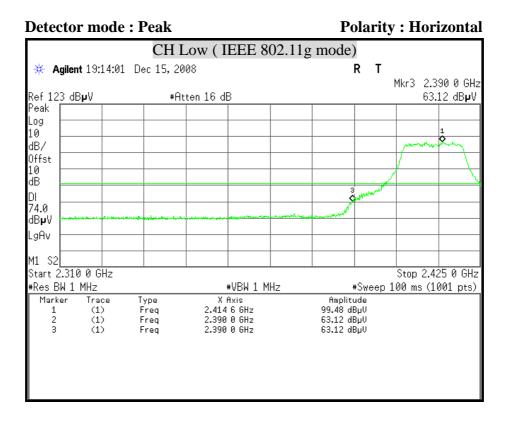


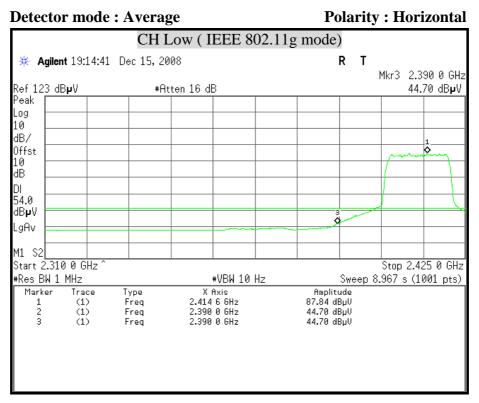




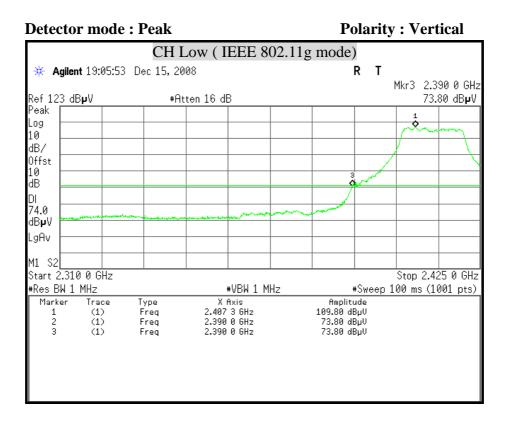


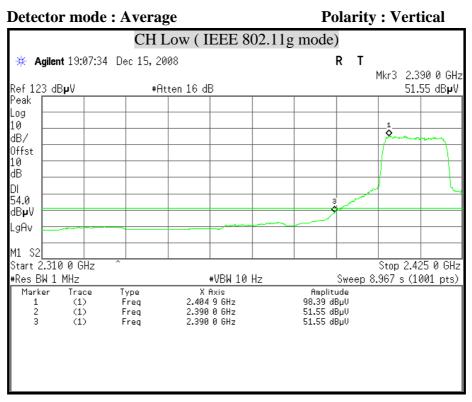




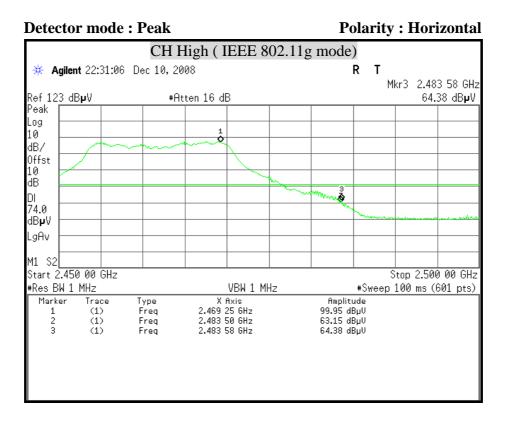


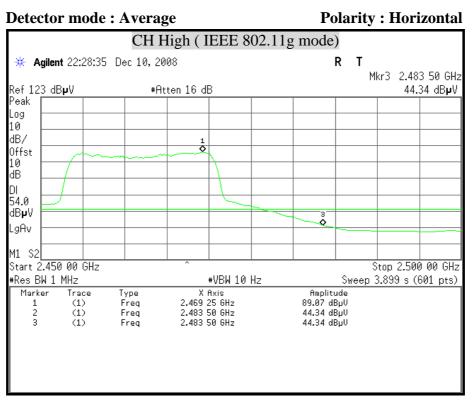




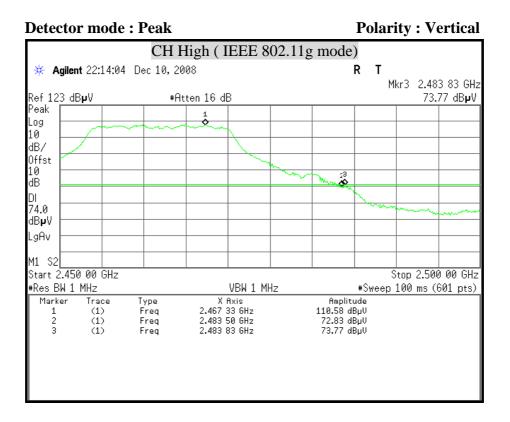


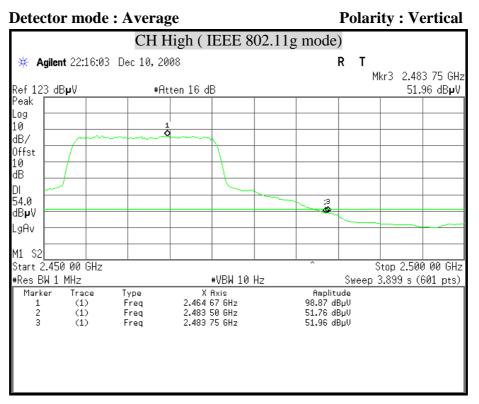




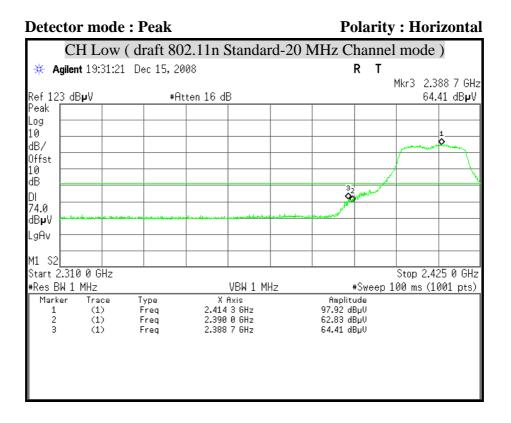


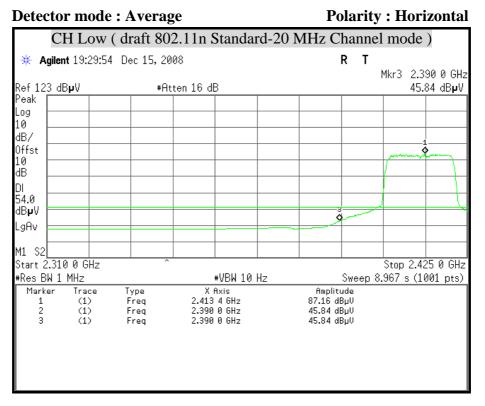




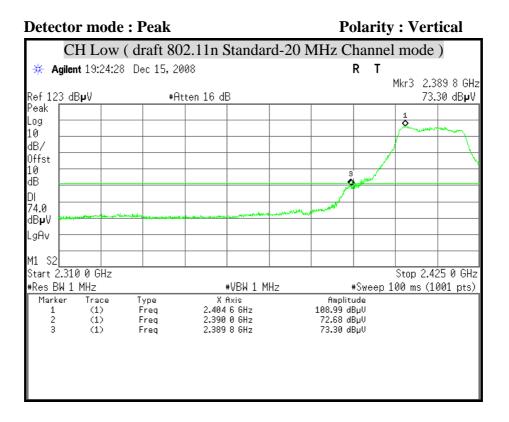


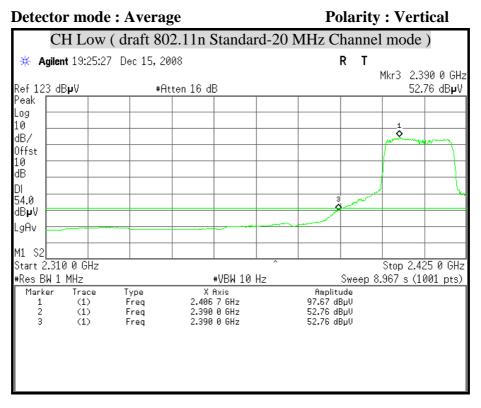




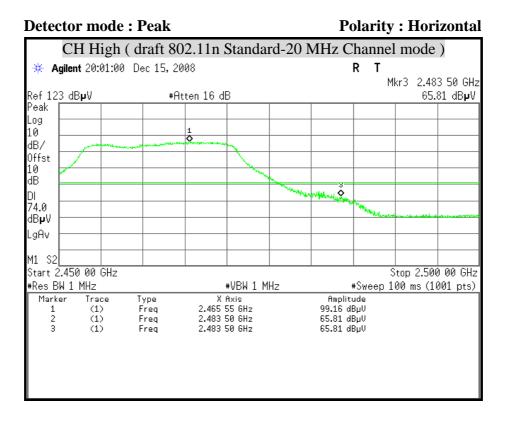


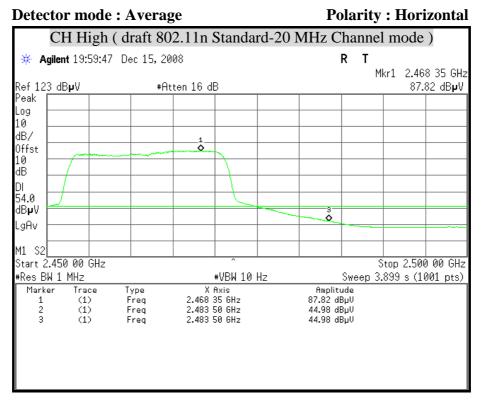




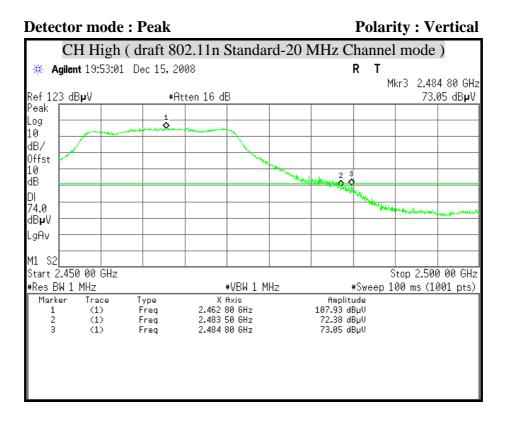


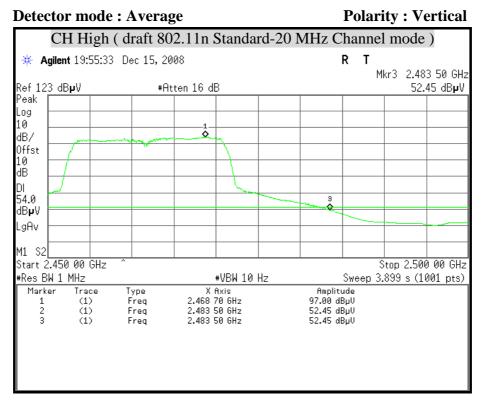




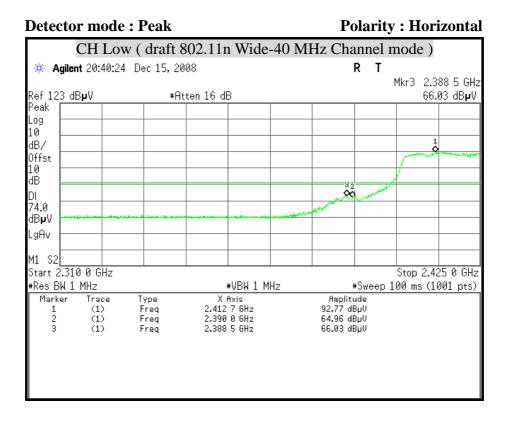


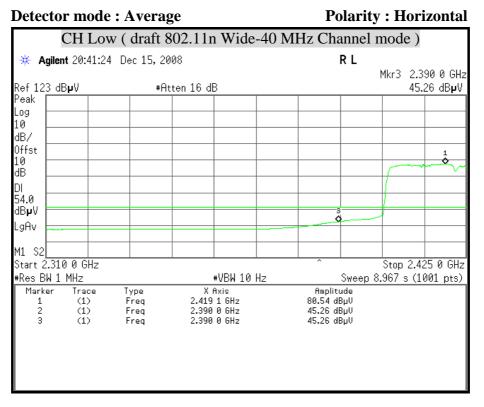




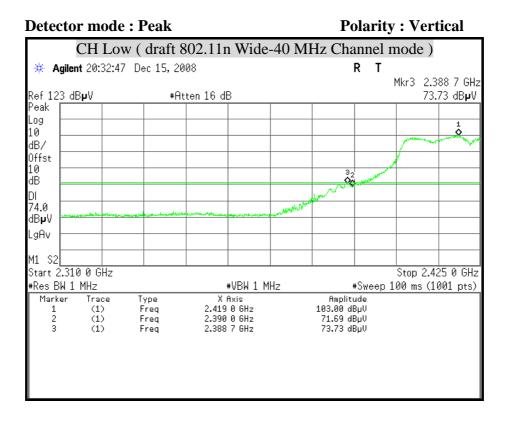


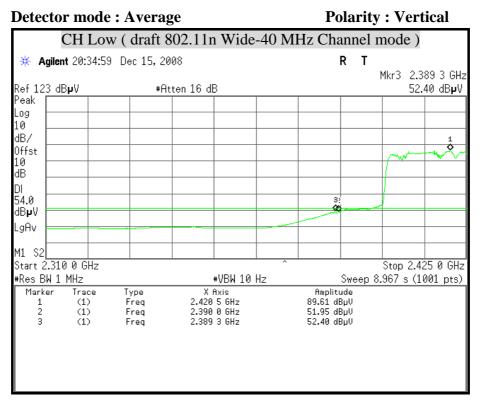




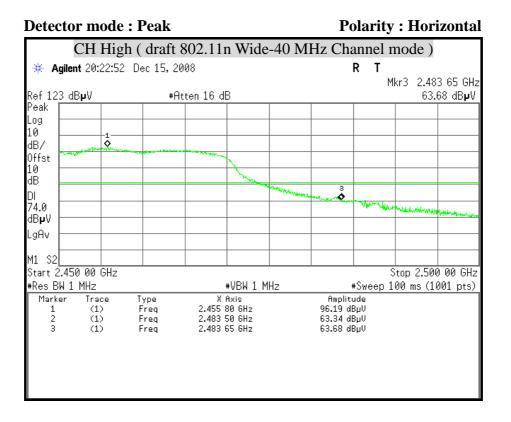


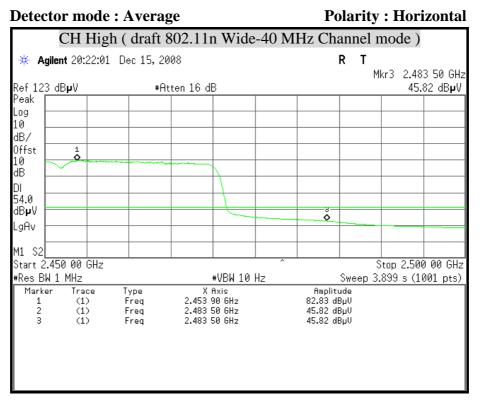




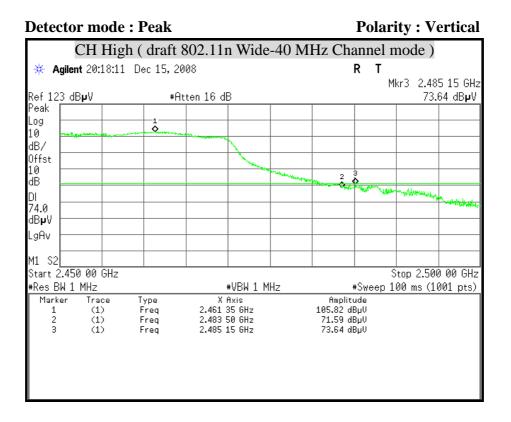


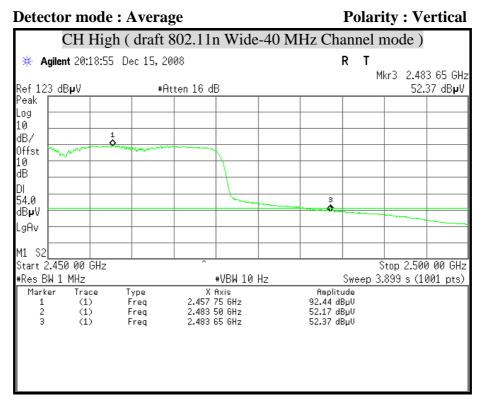














# 8.6 PEAK POWER SPECTRAL DENSITY

# **LIMIT**

- 1. According to \$15.247(e) & RSS-210 \$A8.2, for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
- 2. According to \$15.247(f) & RSS-210 \$A8.3, the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

# TEST SETUP



Combined mode



# TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using RBW = 3KHz and VBW RBW, set sweep time = span / 3KHz.

The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span / 3KHz for a full response of the mixer in the spectrum analyzer.

# TEST RESULTS

No non-compliance noted



# TEST DATA

Total peak power calculation formula: 10 log (10<sup>^</sup> (Chain 0 Power / 10) + 10<sup>^</sup> (Chain 1 Power / 10)).

Channel	Channel Frequency	Level in 3	F Power SKHz BW Bm)	PPSD Total	Minimum Limit	Result	
	(MHz)	Chain 0	Chain 1	(dBm)	(dBm)		
Low	2412	-9.53	-9.94	-6.72	8	PASS	
Middle	2437	-10.82	-9.63	-7.17	8	PASS	
High	2462	-11.33	-10.49	-7.88	8	PASS	

## Test mode: IEEE 802.11b mode

Remark:

1. At finial test to get the worst-case emission at 1 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

## Test mode: IEEE 802.11b Combined mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Result
Low	2412	-5.04	8	PASS
Middle	2437	-3.25	8	PASS
High	2462	-3.21	8	PASS

Remark:

1. At finial test to get the worst-case emission at 1 Mbps.

2. The cable assembly insertion loss of 14.4 dB was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

Channel	Channel Frequency	Final RF Power Level in 3KHz BW (dBm)		PPSD Total (dBm)	Minimum Limit	Result
	(MHz)	Chain 0	Chain 1	(dBm)	(dBm)	
Low	2412	-13.77	-13.23	-10.48	8	PASS
Middle	2437	-12.01	-11.82	-8.90	8	PASS
High	2462	-14.07	-13.93	-10.99	8	PASS

## Test mode: IEEE 802.11g mode

Remark:

1. At finial test to get the worst-case emission at 6 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Result
Low	2412	-7.62	8	PASS
Middle	2437	-6.87	8	PASS
High	2462	-7.25	8	PASS

# Test mode: IEEE 802.11g Combined mode

#### Remark:

1. At finial test to get the worst-case emission at 6 Mbps.

2. The cable assembly insertion loss of 14.4 dB was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

Channel	Channel Frequency	Level in 3	F Power SKHz BW Bm)	PPSD Total (dBarr)	Minimum Limit	Result
	(MHz)	Chain 0	Chain 1	(dBm)	(dBm)	
Low	2412	-15.88	-14.65	-12.21	8	PASS
Middle	2437	-12.96	-11.80	-9.33	8	PASS
High	2462	-14.73	-14.76	-11.73	8	PASS

#### Test mode: draft 802.11n Standard-20 MHz Channel mode

Remark:

1. At finial test to get the worst-case emission at 6.5 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Result
Low	2412	-8.58	8	PASS
Middle	2437	-5.96	8	PASS
High	2462	-9.41	8	PASS

## Test mode: draft 802.11n Standard-20 MHz Channel Combined mode

Remark:

1. At finial test to get the worst-case emission at 6.5 Mbps.

2. The cable assembly insertion loss of 14.4 dB was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



Channel	Frequency (dBm) Total		PPSD Total	Minimum Limit	Result	
	(MHz)	Chain 0	Chain 1	(dBm)	(dBm)	
Low	2422	-19.86	-17.97	-15.80	8	PASS
Middle	2437	-15.29	-13.54	-11.32	8	PASS
High	2452	-18.09	-17.92	-14.99	8	PASS

Remark:

1. At finial test to get the worst-case emission at 13.5 Mbps.

2. The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Result
Low	2422	-11.78	8	PASS
Middle	2437	-6.99	8	PASS
High	2452	-13.18	8	PASS

Remark:

1. At finial test to get the worst-case emission at 13.5 Mbps.

2. The cable assembly insertion loss of 14.4 dB was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



# TEST PLOT

# POWER SPECTRAL DENSITY ( IEEE 802.11b mode)

					802.11	b mod	e / Cha			
	Agilent 10:						I	RT		
	ower Spe	ctral Den						Mkr1		92 0 GHz
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Peak F	Power Spe	51:38 D	ec 16, 20 Isity, b Ma	08 ode Mid C	ìh.	1b mo		RT	2.439 7	'70 4 GHz
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Peak F Ref 20 #Peak Log 10	Power Spe dBm	51:38 D	ec 16, 20 Isity, b Ma	08 ode Mid C	ìh.	1b mo		RT	2.439 7	
Peak F Ref 20 #Peak Log 10 dB/	Power Spe dBm	51:38 D	ec 16, 20 Isity, b Ma	08 ode Mid C	ìh.	1b mo		RT	2.439 7	
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Peak F Ref 20 #Peak Log 10 dB/ 0ffst 10.5 dB	Power Spe	51:38 Den	ec 16, 20 sity, b Ma At	08 ode Mid C ten 20 d	Ch. B			R T Mkr1	2.439 7	0.82 dBm
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Peak F Ref 20 #Peak Log 10 dB/ 0ffst 10.5 dB	Power Spe	51:38 Den	ec 16, 20 sity, b Ma At	08 ode Mid C ten 20 d	Ch. B			R T Mkr1	2.439 7	0.82 dBm
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Peak P	ower Spe	ctral Den:	sity, b Ma	de High I	Ch.			Mkr1	2.460 4	91 0 GHz
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<b>ilent</b> 11: wer Spe	:37:32 D	ec 16, 20 sity, b Ma	<b>(IEEE</b> 08 ode Mid C	E <b>802.1</b> Th.			ain 1) R T	<b>)</b> 2.435	49;
<b>ilent</b> 11: wer Spe	:37:32 D	ec 16, 20 sity, b Ma	<b>(IEEE</b> 08 ode Mid C	E <b>802.1</b> Th.			ain 1) R T	<b>)</b> 2.435	49;
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<b>jilent</b> 11: wer Spe	:37:32 D	ec 16, 20 sity, b Ma	<b>(IEEE</b> 08 ode Mid C	E 802.1			ain 1 R T Mkr1	2.435	492
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<b>ilent</b> 11: wer Spe	:37:32 D	ec 16, 20 sity, b Ma	<b>(IEEE</b> 08 ode Mid C	E 802.1			ain 1 R T Mkr1	2.435	492
<b>ilent</b> 11: wer Spe	:37:32 D	ec 16, 20 sity, b Ma	<b>(IEEE</b> 08 ode Mid C	E 802.1			ain 1 R T Mkr1	2.435	492
<b>ilent</b> 11: wer Spe	:37:32 D	ec 16, 20 sity, b Ma	<b>(IEEE</b> 08 ode Mid C	E 802.1			ain 1 R T Mkr1	2.435	492
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<b>ilent</b> 11: wer Spe	:37:32 D	ec 16, 20 sity, b Ma	<b>(IEEE</b> 08 ode Mid C	E 802.1			ain 1 R T Mkr1	2.435	492
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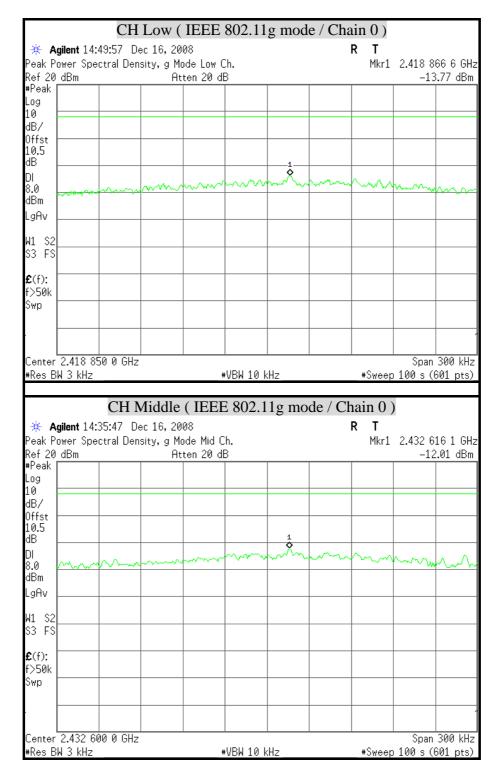
#### POWER SPECTRAL DENSITY ( IEEE 802.11b Combined mode )

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	Agilent 23:							R	Т		
Combin Ref 20	ne Spectra a dPm	al Density		Low Ch. ten 20 dl	D				Mkr1		95 5 GHz 5.04 dBm
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	Agilent 23:	24:44 De	ec 17, 20	( <b>IEEE</b> 08					ode T	)	
Combin	ne Spectra	24:44 De	ec 17, 20 , b Mode	( <b>IEEE</b> 08 Mid Ch.	802.1			m	ode T	) 2.437 4	95 2 GHz
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Combin Ref 20 #Peak Log	ne Spectra dBm	24:44 De	ec 17, 20 , b Mode	( <b>IEEE</b> 08 Mid Ch.	802.1			m	ode T	) 2.437 4	95 2 GHz
Combin Ref 20 #Peak Log 10	ne Spectra dBm	24:44 De	ec 17, 20 , b Mode	( <b>IEEE</b> 08 Mid Ch.	802.1			m	ode T	) 2.437 4	95 2 GHz
Combin Ref 20 #Peak Log 10 dB/ Offst	ne Spectra dBm	24:44 De	ec 17, 20 , b Mode	( <b>IEEE</b> 08 Mid Ch.	802.1			m	ode T	) 2.437 4	95 2 GHz
Combin Ref 20 #Peak Log 10 dB/ Offst 14.4	dBm	24:44 De	ec 17, 20 , b Mode At	( IEEE 08 Mid Ch. ten 20 dl	802.1			m	ode T	) 2.437 4	95 2 GHz
Combin Ref 20 #Peak Log 10 dB/ Offst 14.4 dB DI	dBm	24:44 Density	ec 17, 20 , b Mode At	(IEEE 08 Mid Ch. ten 20 dl	802.1			m	ode T	) 2.437 4	95 2 GHz
Combin Ref 20 #Peak 10 dB/ Offst 14.4 dB DI 8.0	dBm	24:44 Density	ec 17, 20 , b Mode At	(IEEE 08 Mid Ch. ten 20 dl	802.1			m	ode T	) 2.437 4	95 2 GHz
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Combir Ref 20 #Peak 10 dB/ 0ffst 14.4 dB DI 8.0 dBm LgAv		24:44 Density	ec 17, 20 , b Mode At	(IEEE 08 Mid Ch. ten 20 dl	802.1			m	ode T	) 2.437 4	95 2 GHz
Combir Ref 20 #Peak Log dB/ Offst 14.4 dB DI &.0 dBm LgAv W1 S2		24:44 Density	ec 17, 20 , b Mode At	(IEEE 08 Mid Ch. ten 20 dl	802.1			m	ode T	) 2.437 4	95 2 GHz
Combir Ref 20 #Peak 10 dB/ 0ffst 14.4 dB DI 8.0 dBm LgAv		24:44 Density	ec 17, 20 , b Mode At	(IEEE 08 Mid Ch. ten 20 dl	802.1			m	ode T	) 2.437 4	95 2 GHz
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Combir Ref 20 #Peak Log dB/ Offst 14.4 dB DI 8.0 dBm LgAv W1 S2 S3 FS £(f): f>50k	e Spectra dBm	24:44 Density	ec 17, 20 , b Mode At	(IEEE 08 Mid Ch. ten 20 dl	802.1			m	ode T	) 2.437 4	95 2 GHz
Combir Ref 20 #Peak Log dB/ Offst 14.4 dB DI 8.0 dBm LgAv W1 \$2 \$3 F\$ £(f):	e Spectra dBm	24:44 Density	ec 17, 20 , b Mode At	(IEEE 08 Mid Ch. ten 20 dl	802.1			m	ode T	) 2.437 4	95 2 GHz
Combir Ref 20 #Peak Log dB/ Offst 14.4 dB DI 8.0 dBm LgAv W1 S2 S3 FS £(f): f>50k	e Spectra dBm	24:44 Density	ec 17, 20 , b Mode At	(IEEE 08 Mid Ch. ten 20 dl	802.1			m	ode T	) 2.437 4	95 2 GHz
Combir Ref 20 #Peak Log dB/ 0ffst 14.4 dB dBm LgAv W1 S2 S3 FS £(f): f>50k Swp	e Spectra dBm	24:44 Density	ec 17, 20 , b Mode At	(IEEE 08 Mid Ch. ten 20 dl	802.1			m	ode T	) 2.437 4 3	95 2 GHz 3.25 dBm
Combir Ref 20 #Peak Log dB/ Offst 14.4 dB dBm LgAv W1 S2 S3 FS £(f): f>50k Swp	e Spectra dBm	24:44 Density	ec 17, 20 , b Mode At	(IEEE 08 Mid Ch. ten 20 dl	802.1	1b Cor		R	ode T Mkr1	) 2.437 4 3	95 2 GHz 3.25 dBm

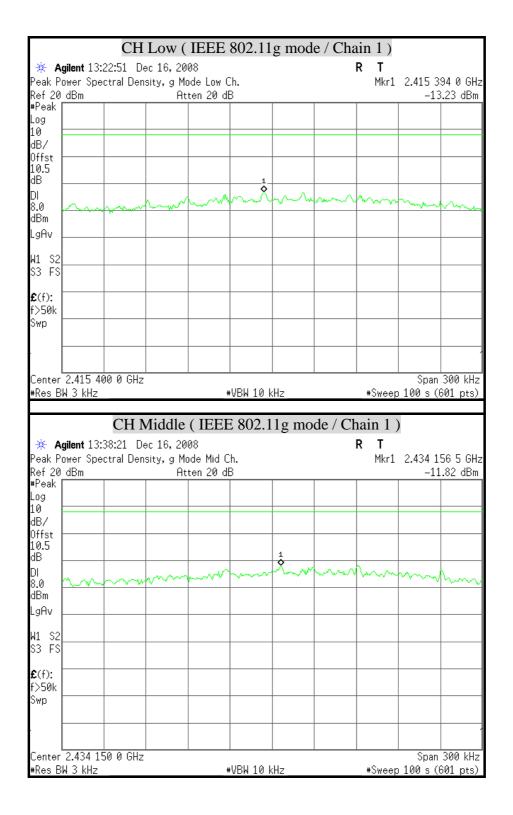
		CH I	High (	IEEE 8	802.11	b Com	bined r	node)		
	gilent 23:	30:02 De	ec 17, 20	08				RТ		
	-	al Density						Mkr1	2.462 7	72 9 GHz
Ref 20	dBm		At	ten 20 di	3				-3	.21 dBm
#Peak										
Log 10										
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f>50k										
Swp										
		50 0 GHz								300 kHz
#Res B	W 3 kHz_			#	VBW 10 k	:Hz		#Sweep	o 100 s (M	601 pts)_



#### POWER SPECTRAL DENSITY ( IEEE 802.11g mode)



		CH	High (	IEEE	802.11	g mod	e / Cha	ain 0	)	
₩ А	gilent 14:	16:45 De	ec 16, 20	08				RТ		
		ctral Den	sity, g Mo	ode High I	Ch.			Mki	r1 2.465 3	393 9 GHz
Ref 20	dBm		At	ten 20 di	3				-1.	4.07 dBm
#Peak										
Log 10										
dB/										
Offst										
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LgAv										
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S3 FS										
<b>£</b> (f):										
f>50k										
Swp										
· I										
	2.465 45	50 0 GHz								300 kHz
#Kes B	W 3 kHz			#	•VBW 10 k	(HZ		_ #Swe	ep 100 s (	601 pts)_



		CH	High (	IEEE	802.11	g mod	e / Cha	ain 1 )		
₩ А	gilent 13:	55:48 De	ec 16, 20	08				RТ		
		ctral Den:	sity, g Mo	ide High I	Ch.			Mkr1	2.468 2	49 5 GHz
Ref 20	dBm		At	ten 20 di	3				-13	.93 dBm
#Peak Loa										
Log 10										
dB/										
Offst										
10.5 JD										
dB						ـــــــــــــــــــــــــــــــــــــ				
DI 8.0		mm	mon	mm	hand	mon	mm	nom	man	
dBm	and the second									and the state of t
LgAv										
-										
W1 S2										
S3 FS										
<b>£</b> (f):										
f>50k										
Swp										
	2.468 25	50 0 GHz								300 kHz
#Res B	W 3 kHz			#	•VBW 10 k	Hz		_ #Sweep	i 100 s (P	601 pts)_



#### POWER SPECTRAL DENSITY ( IEEE 802.11g Combined mode )

	2:58:52 D		108	302.11	g Com		no R	Т	2.418 8	200
Spect dBm	ral Densit		ten 20 dl	R				MKrI		569 7.62
ubili			ten zo ui						_	1.02
										-
					1					
					8					
work	man	mm	mm		nor n		٢	JAN	marry	w
	·									
										_
	-						-			-
	1						-			+
	1	1					1			+
2.418	850 0 GHz	,							Span	30
3 kHz	CH M			•VBW 10 F E <b>802.1</b>		mbined			) 100 s (	
	CH M 3:03:10 D	<b>liddle</b> lec 17, 20	(IEEF 108					node T	) 100 s (	601
<b>ilent</b> 23	CH M	<b>liddle</b> Hec 17, 20 y, g Mode	(IEEF 108	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
<b>ilent</b> 23 Spect	CH M 3:03:10 D	<b>liddle</b> Hec 17, 20 y, g Mode	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5	601 591
ilent 23 Spect dBm	CH M	Iiddle lec 17, 20 y, g Mode At	<b>(IEEF</b> 108 Mid Ch.	E 802.1			d n	node T	2.437 5 	591
ilent 23 Spect dBm	CH M. 3:03:10 D ral Densit;	Iiddle lec 17, 20 y, g Mode At	(IEEF	E 802.1	1g Co		1 n R	Mkr1	2.437 5	591 6.87

		CH I	High (	IEEE 8	302.11	g Com	bined r	node)		
∦ А	gilent 23:	09:47 De	ec 17, 20	08				RТ		
		al Density	, g Mode	High Ch.				Mkr1	2.469 4	94 0 GHz
Ref 20	dBm		At	ten 20 di	3				-7	25 dBm/
#Peak										
Log 10										
dB/										
Offst										
14.4										
dB		an war	mann	www.A	han a che	www	-	mon		4.0
DI 8.0	1.00 mil								- and the second	Monn
o.ø dBm										
LgAv										
L 911 V										
W1 S2										
S3 FS										
A (0).										
<b>£</b> (f): f>50k										
Swp										
2110										
Center	2.469 50	00 0 GHz			1	1	1		Span	300 kHz
	W 3 kHz_			+	VBW 10 k	Hz		#Sweep	100 s (	



## POWER SPECTRAL DENSITY ( draft 802.11n Standard-20 MHz Channel mode )

CH	Low (	draft 8	302.11r	n Stand	lard-20	MHz	Channe	el mod	le / Cha	ain 0)
* ₩	gilent 15:	28:26 De	ec 16, 20	08			I	₹Т		
	al Density	y, HT20 M						Mkr1	2.419 2	04 0 GHz
Ref 20			At	ten 20 d	B				-15	.88 dBm
#Peak Loq										
Log 10										
d₿/										
Offst										
10.5 dB										
DI						1				
8.0		and another	mm	-pourse	and the stand	home	mm	an ma		
dBm	Provino.								www.w	when we are
LgAv										
W1 S2	2									
S3 FS										
<b>£</b> (f):	<u> </u>									
f>50k										
Swp										
	L									
										1
Center	2.419 20	00 0 GHz			1		11		Span	300 kHz
#Res E	3W 3 kHz			+	•VBW 10 ₩	KHz		#Sweer	) 100 s (6	601 pts)
								011000		
C	H Midd	lle (draf	ft 802.1	1n Star	dard-2	0 MHz	Channe			
	H Midd Agilent 15:				idard-20	0 MHz				
🔆 🖊 Spectr	<b>\gilent</b> 15: al Density	45:13 De	ec 16, 20	08	idard-20	0 MHz		l mode	2.437 2	n 0) 83 9 GHz
∰ A Spectr Ref 20	<b>\gilent</b> 15: al Density dBm	45:13 De	ec 16, 20 1ode Mid (	08		0 MHz		l mode	2.437 2	n 0 )
<b>₩ A</b> Spectr Ref 20 #Peak	<b>\gilent</b> 15: al Density dBm	45:13 De	ec 16, 20 1ode Mid (	08 Ch.		0 MHz		l mode	2.437 2	n 0) 83 9 GHz
∰ A Spectr Ref 20	<b>\gilent</b> 15: al Density dBm	45:13 De	ec 16, 20 1ode Mid (	08 Ch.		0 MHz		l mode	2.437 2	n 0) 83 9 GHz
∰ ₽ Spectr Ref 20 #Peak Log 10 dB/	<b>\gilent</b> 15: al Density dBm	45:13 De	ec 16, 20 1ode Mid (	08 Ch.		0 MHz		l mode	2.437 2	n 0) 83 9 GHz
∰ ₽ Spectr Ref 20 #Peak Log 10 dB/ Offst	<b>\gilent</b> 15: al Density dBm	45:13 De	ec 16, 20 1ode Mid (	08 Ch.		0 MHz		l mode	2.437 2	n 0) 83 9 GHz
₩ A Spectr Ref 20 #Peak Log 10 dB/ Offst 10.5	<b>\gilent</b> 15: al Density dBm	45:13 De	ec 16, 20 1ode Mid (	08 Ch.	B	0 MHz		l mode	2.437 2	n 0) 83 9 GHz
¥ ₽ Spectr Ref 20 #Peak Log 10 dB/ 0ffst 10.5 dB	<b>\gilent</b> 15: al Density dBm	45:13 De	ec 16, 20 1ode Mid (	08 Ch.		0 MHz		l mode	2.437 2	n 0) 83 9 GHz
★ A Spectr Ref 20 #Peak Log dB/ 0ffst 10.5 dB DI 8.0	Agilent 15: ral Density dBm	45:13 De y, HT20 M	ec 16, 20 1ode Mid (	08 Ch.	B	0 MHz		l mode	2.437 2	n 0) 83 9 GHz
★ A Spectr Ref 20 #Peak Log dB/ 0ffst 10.5 dB DI 8.0 dBm	Agilent 15: ral Density dBm	45:13 De y, HT20 M	ec 16, 20 1ode Mid (	08 Ch.	B	0 MHz		l mode	2.437 2	n 0) 83 9 GHz
★ A Spectr Ref 20 #Peak Log dB/ 0ffst 10.5 dB DI 8.0	Agilent 15: ral Density dBm	45:13 De y, HT20 M	ec 16, 20 1ode Mid (	08 Ch.	B	0 MHz		l mode	2.437 2	n 0) 83 9 GHz
<pre></pre>	Agilent 15: al Density dBm	45:13 De y, HT20 M	ec 16, 20 1ode Mid (	08 Ch.	B	0 MHz		l mode	2.437 2	n 0) 83 9 GHz
★ A Spectr Ref 20 #Peak Log dB/ 0ffst 10.5 dB DI 8.0 dBm	Agilent 15: al Density dBm	45:13 De y, HT20 M	ec 16, 20 1ode Mid (	08 Ch.	B	0 MHz		l mode	2.437 2	n 0) 83 9 GHz
<pre></pre>	Agilent 15: al Density dBm	45:13 De y, HT20 M	ec 16, 20 1ode Mid (	08 Ch.	B			l mode	2.437 2	n 0) 83 9 GHz
<pre></pre>	Agilent 15: al Density dBm	45:13 De y, HT20 M	ec 16, 20 1ode Mid (	08 Ch.	B			l mode	2.437 2	n 0) 83 9 GHz
₩         ₽           Spectr         Ref 20           #Peak         Log           10         dB/           0ffst         10.5           dB         DI           8.0         dBm           LgAv         \$\$3 FS           \$\$3 FS         \$\$\$\$(f):	Agilent 15: al Density dBm	45:13 De y, HT20 M	ec 16, 20 1ode Mid (	08 Ch.	B	0 MHz		l mode	2.437 2	n 0) 83 9 GHz
₩         ₽           Spectra         Spectra           Ref 20         #Peak           Log         10           dB/         Offst           10.5         dB           DI         8.0           dBm         LgAv           W1         S2           S3         FS           £(f):         f>50k	Agilent 15: al Density dBm	45:13 De y, HT20 M	ec 16, 20 1ode Mid (	08 Ch.	B	0 MHz		l mode	2.437 2	n 0) 83 9 GHz
₩         ₽           Spectra         Spectra           Ref 20         #Peak           Log         10           dB/         Offst           10.5         dB           DI         8.0           dBm         LgAv           W1         S2           S3         FS           £(f):         f>50k	Agilent 15: al Density dBm	45:13 De y, HT20 M	ec 16, 20 1ode Mid (	08 Ch.	B			l mode	2.437 2	n 0) 83 9 GHz
₩         ₽           Spectra         Spectra           Ref 20         #Peak           Log         10           dB/         Offst           10.5         dB           DI         8.0           dBm         LgAv           W1         S2           S3         FS           £(f):         f>50k           Swp	Agilent 15: al Density dBm	45:13 De , HT20 M	ec 16, 20 Iode Mid I At	08 Ch.	B			l mode	e / Chain 2.437 2 –12	n O ) 83 9 GHz 97 dBm
<pre></pre>	Agilent 15: al Density dBm	45:13 De , HT20 M	ec 16, 20 Iode Mid I At	08 Ch. ten 20 dl	B			l mode	e / Chain 2.437 2 –12	n O ) 83 9 GHz 97 dBm

CH	High (	draft 8	02.11n	Stand	ard-20	MHz	Channe	el mod	e / Cha	in 0)
	gilent 16:0						I	RT		
	al Density	, НТ20 М			_			Mkr1		21 9 GHz
Ref 20 #Peak	dBm		Ht	ten 20 di	3				-14	.73 dBm
Log										
10										
dB/										
Offst										
10.5 dB										
					1 Ø					
DI 8.0		m	moren	m	1. when	mmy	mmm	mon	nan an	A
dBm	man	(Jaco -								· •••0 ••••
LgAv										
W1 S2										
S3 FS										
<b>£</b> (f):										
f>50k										
Swp										
	2.458 55	60 0 GHz								300 kHz
#Res B	W 3 kHz			#	•VBW 10 k	:Hz		#Sweep	i 100 s (6	601 pts)

	:51:11 D≀ y, HT20 №						R T Mkr1	2.408 8	374
dBm	γ, ΠΙΖΟ Γ		ten 20 di	В			LIVLT		4.6
					1-				
				Language and	mm X	maria			
and when t	the second	and the	-					man	-
									-
									_
									+
	50 0 GHz							Spar	
[ Mido	lle (draf		1n Stan	WBW 10 k			el mode	2 100 s ( 2 / Chai	
<b>jilent</b> 16 I Densit	<b>ile (drai</b> :36:47 De y, HT20 M	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20			el mode R T	e / Chai 2.444 7	i <b>n</b> 772
<b>I Mida</b> j <b>ilent</b> 16	:36:47 D	ec 16, 20 1ode Mid (	1n Stan <sup>08</sup>	idard-20			el mode R T	e / Chai 2.444 7	i <b>n</b> 772
<b>I Mido</b> <b>jilent</b> 16	:36:47 D	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20			el mode R T	e / Chai 2.444 7	i <b>n</b> 772
[ <b>Midc</b> <b>ilent</b> 16   Densit	:36:47 D	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20			el mode R T	e / Chai 2.444 7	i <b>n</b> 772
[ <b>Midc</b> <b>ilent</b> 16   Densit	:36:47 D	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20			el mode R T	e / Chai 2.444 7	i <b>n</b> 772
[ <b>Mido</b> <b>ilent</b> 16	:36:47 D	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20			el mode R T	e / Chai 2.444 7	i <b>n</b> 772
[ <b>Midc</b> <b>ilent</b> 16   Densit	:36:47 D	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20	0 MHz		el mode R T	e / Chai 2.444 7	i <b>n</b> 772
[ <b>Mido</b> <b>ilent</b> 16	:36:47 D	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20	0 MHz		el mode R T	e / Chai 2.444 7	i <b>n</b> 772
<b>I Mido</b> <b>jilent</b> 16	:36:47 D y, HT20 №	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20	0 MHz		el mode R T	e / Chai 2.444 7	i <b>n</b> 772
<b>I Mido</b> <b>jilent</b> 16	:36:47 D y, HT20 №	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20	0 MHz		el mode R T	e / Chai 2.444 7	i <b>n</b> 772
[ <b>Mido</b> <b>ilent</b> 16	:36:47 D y, HT20 №	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20	0 MHz		el mode R T	e / Chai 2.444 7	i <b>n</b> 772
[ <b>Mido</b> <b>ilent</b> 16	:36:47 D y, HT20 №	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20	0 MHz		el mode R T	e / Chai 2.444 7	i <b>n</b> 772
[ <b>Midc</b> <b>ilent</b> 16   Densit	:36:47 D y, HT20 №	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20	0 MHz		el mode R T	e / Chai 2.444 7	i <b>n</b> 772
[ <b>Mido</b> <b>ilent</b> 16	:36:47 D y, HT20 №	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20	0 MHz		el mode R T	e / Chai 2.444 7	in
[ <b>Mido</b> <b>ilent</b> 16	:36:47 D y, HT20 №	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20	0 MHz		el mode R T	e / Chai 2.444 7	i <b>n</b> 772
<b>Mida</b> ilent 16 Densit	:36:47 D y, HT20 №	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20	0 MHz		el mode R T	e / Chai 2.444 7	i <b>n</b> 772
<b>Mida</b> ilent 16 Densit	:36:47 D y, HT20 №	ec 16, 20 1ode Mid (	<b>1n Star</b> 08 Ch.	idard-20	0 MHz		el mode R T	e / Chai 2.444 7	i <b>n</b> 772
Midc lent 16 Densit Bm	:36:47 D y, HT20 №	ec 16, 20 Iode Mid I At	<b>1n Star</b> 08 Ch.	idard-20	0 MHz		el mode R T	e / Chai 2.444 7	in 772 1.8

CH	High (	draft 8	02.11n	Stand	ard-20	MHz	Channe	el mod	e / Cha	ain 1)
	al Density	21:47 De 4, HT20 M	ode High		В		I	<b>R T</b> Mkr1		49 0 GHz .76 dBm
#Peak∣ Log 10 dB∕										
0ffst 10.5 dB DI 8.0			w1.~~~~	an ya wa		-	www	mikana		~~~~
dBm LgAv W1 S2									1	
S3 FS <b>£</b> (f): f>50k										
Swp										
	2.457 95 W 3 kHz	50 0 GHz		#	⊧VBW 10 k	: :Hz	11	#Sweep	Span 100 s (1	300 kHz 601 pts)



#### POWER SPECTRAL DENSITY ( draft 802.11n Standard-20 MHz Channel Combined mode )

CH	Low (	draft 80	02.11n	Standa	ard-20	MHz (	Channe	l Com	bined 1	node)
	<b>gilent</b> 23:						I	₹т		
	e Spectra	al Density						Mkr1		69 1 GHz
Ref 20 #Peak		1	Ht	ten 20 d	B I	1			-8	8.58 dBm
Log										
10										
dB/										
Offst 14.4						1				
dB						<u> </u>				
DI	mounder	any make	warman	mound	man	and a	a hard a start of the start of	- mar	man	month
8.0 dBm										
LgAv										
Lain										
W1 S2										
S3 FS										
<b>£</b> (f):										
f>50k										
Swp										
ŀ										
c	2.403 8								L	200.111
		50 0 GHZ							Span	300 kHz
#Ros R	211 2 1/17			+	⊎Rแ10เเ	/H-7		#Swaan	100 - ()	601 ntel
#Res B	3W 3 kHz_			ŧ	•VBW 10 k	(Hz		#Sweep	) 100 s ((	∂01 pts)_
		le (drafi	t 802.11				Channel			
CH	I Middl			In Stan			Channel	Comb		
CH * A	H Middl Agilent 23:	42:18 De	ec 17, 20	In Stan	dard-20			Comb	ined m	ode)
CH * A Combin Ref 20	<b>H Middl</b> Agilent 23: De Spectra D dBm	42:18 De	ec 17, 20 , HT20 M	In Stan	dard-20 Ch.			Comb	ined m	
CH ** A Combin Ref 20 #Peak	<b>H Middl</b> Agilent 23: De Spectra D dBm	42:18 De	ec 17, 20 , HT20 M	<b>1 n Stan</b> 08 Iode Mid (	dard-20 Ch.			Comb	ined m	ode) 41 0 GHz
CH ** A Combin Ref 20 #Peak Log	<b>H Middl</b> Agilent 23: De Spectra D dBm	42:18 De	ec 17, 20 , HT20 M	<b>1 n Stan</b> 08 Iode Mid (	dard-20 Ch.			Comb	ined m	ode) 41 0 GHz
CH ** A Combin Ref 20 #Peak	<b>H Middl</b> Agilent 23: De Spectra D dBm	42:18 De	ec 17, 20 , HT20 M	<b>1 n Stan</b> 08 Iode Mid (	dard-20 Ch.			Comb	ined m	ode) 41 0 GHz
CH & A Combin Ref 20 #Peak Log 10 dB/ Offst	<b>H Middl</b> Agilent 23: De Spectra D dBm	42:18 De	ec 17, 20 , HT20 M	<b>1 n Stan</b> 08 Iode Mid (	dard-20			Comb	ined m	ode) 41 0 GHz
CF	H Middl Agilent 23: De Spectra D dBm	42:18 Density	ec 17, 20 , HT20 M	<b>1 n Stan</b> 08 Iode Mid (	dard-20 Ch. B			Comb	ined m	ode) 41 0 GHz
CF ☆ A Combin Ref 20 #Peak Log 10 dB/ Offst 14.4 dB	<b>H Middl</b> Agilent 23: De Spectra D dBm	42:18 Density	ec 17, 20 , HT20 M	In Stan 08 lode Mid ( ten 20 d	dard-20			Comb	ined m	ode) 41 0 GHz
CH A Combin Ref 20 #Peak Log 10 dB/ Offst 14.4 dB DI 8.0	H Middl Agilent 23: De Spectra D dBm	42:18 Density	ec 17, 20 , HT20 M	In Stan 08 lode Mid ( ten 20 d	dard-20			Comb	ined m	ode) 41 0 GHz
CF Combin Ref 20 #Peak Log 10 dB/ Offst 14.4 dB DI 8.0 dBm	H Middl Agilent 23: De Spectra D dBm	42:18 Density	ec 17, 20 , HT20 M	In Stan 08 lode Mid ( ten 20 d	dard-20			Comb	ined m	ode) 41 0 GHz
CH A Combin Ref 20 #Peak Log 10 dB/ Offst 14.4 dB DI 8.0	H Middl Agilent 23: De Spectra D dBm	42:18 Density	ec 17, 20 , HT20 M	In Stan 08 lode Mid ( ten 20 d	dard-20			Comb	ined m	ode) 41 0 GHz
CF ** A Combin Ref 20 #Peak Log 10 dB/ Offst 14.4 dB DI 8.0 dBm LgAv W1 S2	H Middl Agilent 23: De Spectra D dBm	42:18 Density	ec 17, 20 , HT20 M	In Stan 08 lode Mid ( ten 20 d	dard-20			Comb	ined m	ode) 41 0 GHz
CF Combin Ref 20 #Peak Log 10 dB/ Offst 14.4 dB DI 8.0 dBm	H Middl Agilent 23: De Spectra D dBm	42:18 Density	ec 17, 20 , HT20 M	In Stan 08 lode Mid ( ten 20 d	dard-20			Comb	ined m	ode) 41 0 GHz
CF	H Middl Agilent 23: De Spectra D dBm	42:18 Density	ec 17, 20 , HT20 M	In Stan 08 lode Mid ( ten 20 d	dard-20			Comb	ined m	ode) 41 0 GHz
CF	H Middl Agilent 23: De Spectra D dBm	42:18 Density	ec 17, 20 , HT20 M	In Stan 08 lode Mid ( ten 20 d	dard-20			Comb	ined m	ode) 41 0 GHz
CF	H Middl Agilent 23: De Spectra D dBm	42:18 Density	ec 17, 20 , HT20 M	In Stan 08 lode Mid ( ten 20 d	dard-20			Comb	ined m	ode) 41 0 GHz
CF	H Middl Agilent 23: De Spectra D dBm	42:18 Density	ec 17, 20 , HT20 M	In Stan 08 lode Mid ( ten 20 d	dard-20			Comb	ined m	ode) 41 0 GHz
CF	H Middl Agilent 23: De Spectra D dBm	42:18 Density	ec 17, 20 , HT20 M	In Stan 08 lode Mid ( ten 20 d	dard-20			Comb	ined m	ode) 41 0 GHz
CF ☆ A Combin Ref 20 #Peak Log 10 dB/ 0ffst 14.4 dB DI 8.0 dBm LgAv W1 S2 S3 FS £(f): f>50k Swp	H Middl Agilent 23: D dBm	42:18 Density	ec 17, 20 , HT20 M At	In Stan 08 lode Mid ( ten 20 d	dard-20			Comb	2.435 7 	ode ) 41 0 GHz 5.96 dBm
Cf	H Middl Agilent 23: De Spectra D dBm	42:18 Density	ec 17, 20 , HT20 M At	In Stan 08 ode Mid ( ten 20 dl	dard-20			Comb	2.435 7 	ode ) 41 0 GHz 5.96 dBm

CH I	High (d	lraft 80	)2.11n	Standa	ard-20	MHz (	Channe	l Com	bined 1	node)
	gilent 23:							RТ		
	e Spectra	al Density		-				Mkr1		22 9 GHz
Ref 20 #Peak	dBm		Ht	ten 20 d	8				-9	.41 dBm
₩reak Log										
10 10										
d₿/										
Offst										
14.4					1					
dB	a callo	NWMAN	www.wheelaw	montenant	The work when	m w	m			ald h
DI 8.0	A Martine .						- marine	Willington	william	white we want
dBm										
LgAv										
29110										
W1 S2										
S3 FS										
A (0)										
<b>£</b> (f): f>50k										
тировк Swp										
νıp										
Center	2.454 85	50 0 GHz	1		1	1	1	1	Span	300 kHz
	W 3 kHz			+	∙VBW 10 k	Hz			) 100 s (	



### POWER SPECTRAL DENSITY ( draft 802.11n Wide-40 MHz Channel mode )

CI	H Low	(draft	802.1	1n Wic	le-40 N	/Hz C	hannel	mode	/ Chair	n 0 )
	gilent 18:						I	RТ		
Spectr Ref 20	al Density	/,HT40 M		Ch. ten 20 dl	D			Mkr1		66 1 GHz 3.86 dBm
#Peak									-13	
Log										
10 dB/										
Offst										
10.5 dB										
DI						1				
8.0 dBm		0		mm	mm	wh	mm	man	me me Ma	
LgAv	m	mum								m
-										
W1 S2 S3 FS										
<b>£</b> (f): f>50k										
тировк Swp										
·										1
Center	2.433 85	 50 0 GHz							Snan	300 kHz
		00 0 0.1.E			⊧VBW 10 k			~		
#Res B	3W 3 kHz			+	EVDM TO R	KHZ		_ #Sweep	o 100 s (M	oor pts/_
		e ( dra	ft 802.				Channe			
CH * A	<b>Middl</b>	35:43 De	əc 16, 20	11n W 08				el mode R T	e / Cha	uin 0)
CH * A Spectr	Middl Agilent 18: al Density	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40			el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH <b>** A</b> Spectr Ref 20 <b>*</b> Peak	<b>Middl</b> Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	11n W 08	ide-40			el mode R T	e / Cha 2.428 8	uin 0)
CH ** A Spectr Ref 20 *Peak Log	<b>Middl</b> Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40			el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH <b>** A</b> Spectr Ref 20 <b>*</b> Peak	<b>Middl</b> Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40			el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH Spectr Ref 20 #Peak Log 10 dB/ Offst	<b>Middl</b> Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40			el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH * A Spectr Ref 20 *Peak Log 10 dB/	<b>Middl</b> Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40	MHz (		el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH * A Spectr Ref 20 *Peak Log 10 dB/ Offst 10.5 dB DI	<b>Middl</b> Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40			el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH Spectr Ref 20 #Peak Log 10 dB/ Offst 10.5 dB	<b>Middl</b> Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40	MHz (		el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH Spectr Ref 20 #Peak Log dB/ Offst 10.5 dB DI 8.0	<b>Middl</b> Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40	MHz (		el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH Spectr Ref 20 #Peak Log 10 dB/ 0ffst 10.5 dB DI 8.0 dBm LgAv	Middl Agilent 18: ral Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40	MHz (		el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH Spectr Ref 20 #Peak Log 10 dB/ Offst 10.5 dB DI 8.0 dBm LgAv ₩1 \$2	Middl Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40	MHz (		el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH Spectr Ref 20 #Peak Log 10 dB/ 0ffst 10.5 dB DI 8.0 dBm LgAv ₩1 \$2 \$3 F\$	Middl Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40	MHz (		el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH	Middl Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40	MHz (		el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH Spectr Ref 20 #Peak Log 10 dB/ 0ffst 10.5 dB DI 8.0 dBm LgAv ₩1 \$2 \$3 F\$	Middl Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40	MHz (		el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH	Middl Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40	MHz (		el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH	Middl Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40	MHz (		el mode R T	e / Cha 2.428 8	u <b>in 0 )</b> 66 6 GHz
CH Spectr Ref 20 #Peak Log 10 dB/ Offst 10.5 dB DI 8.0 dBm LgAv ₩1 S2 S3 FS £(f): f>50k Swp	Middl Agilent 18: al Density dBm	35:43 De	ec 16, 20 lode Mid (	<b>11n W</b> 08 Ch.	ide-40	MHz (		el mode R T	e / Cha 2.428 8 -15	u <b>in 0 )</b> 66 6 GHz

CH	I High	(draft	802.1	1n Wie	le-40 N	MHz C	hannel	mode	/ Chai	n 0 )
ж А	gilent 18:	22 <b>:</b> 58 De	ec 16, 20	08				RТ		
Spectr	al Density	/,HT40 M	lode High	Ch.				Mkr1	2.454 7	41 0 GHz
Ref 20	dBm		At	ten 20 di	3				-18	3.09 dBm
#Peak										
Log 10										
dB/										
Offst										
10.5										
dB										
DI 8.0										
dBm	man		a	mon	month	m	man	na	$\sim\sim\sim$	monom
LgAv		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~								
_										
W1 S2										
S3 FS										
<b>£</b> (f):										
f>50k										
Swp										
·										
	2.454 75	50 0 GHz						<u>^</u>		300 kHz
#Kes B	W 3 kHz			#	VBW 10 k	(Hz		_ #Sweep	) 100 s (	501 pts)_



	v ( draf			ie-40 N	AHz C			/ Chai	n I
		ec 16, 20					R T	0 411 0	
Densit dBm	у, нт40 г	Mode Low	un. ten 20 d	D			MKLT	2.411 3	566 3 7.97
JDIII			ten ze u I					-1	1.37
									-
			1						
	ļ.,		Å	-					
m	have	1	000.00				mun	mon	m
									-
									-
		ļ							<u> </u>
		1	1	1					1
2 / 1 1 /								Snon	200
3 kHz	00 0 GHz			*VBW 10 F		<u> </u>		Span 100 s (	601
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	ide-40			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>111</b> 191 (
3 kHz Midd ilent 17:	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	11n W	ide-40			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>111</b> 191 (
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	ide-40			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 ain
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	ide-40			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>tin</b> 191 (
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	ide-40			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 ain
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	ide-40			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>tin</b> 191 (
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	B			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>tin</b> 191 (
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	B			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 11n
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	B			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>111</b> 191 (
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	B			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>tin</b> 191 (
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	B			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>111</b> 191 (
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	B			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>111</b> 191 (
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	B			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>111</b> 191 (
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	B			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>tin</b> 191 (
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	B			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>tin</b> 191 (
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	B			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>tin</b> 191 (
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	B			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>tin</b> 191 (
<u>3 kHz</u> Midd ilent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	B			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 <b>tin</b> 191 (
<u>3 kHz</u> Midd lent 17: Densit	<b>le ( dra</b> :30:39 D	u <b>ft 802.</b> ec 16, 20 Mode Mid I	<b>11n W</b> 108 Ch.	B			el mode R T	<u>100 s (</u> e / Cha 2.435 s	601 ain
<u>3 kHz</u> Midd ilent 17: Densit dBm	le ( dra :30:39 D y, HT40 t	uft 802. ec 16, 20 Mode Mid At	<b>11n W</b> 108 Ch.	B			el mode R T	2.435 9 -1:	601 11n 3.54
<u>3 kHz</u> Midd ilent 17: Densit dBm	<b>le ( dra</b> :30:39 D	uft 802. ec 16, 20 Mode Mid At	11n W 108 Ch. :ten 20 d	B			el mode R T Mkr1	<u>100 s (</u> e / Cha 2.435 s	601 110 991 3.54

CH	I High	(draft	802.1	1n Wie	de-40 N	MHz C	hannel	mode	/ Chai	n 1 )
ж А	gilent 17:	49:07 De	ec 16, 20	08			I	₹Т		
Spectr	al Density	, HT40 M	lode High	Ch.				Mkr1	2.443 8	66 6 GHz
Ref 20	dBm		At	ten 20 d	3				-17	7.92 dBm
#Peak										
Log 10										
dB/										
0ffst										
10.5										
dB										
DI 8.0										
8.0 dBm	A. A. d	- ALANA	m	$\sim \sim \sim \sim$	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	ward and a second	m m	m	home	
LgAv	~~~~	Mon webst								· · · · · · · · · · · · · · · · · · ·
Lain										
W1 S2										
S3 FS										
• / 0										
<b>£</b> (f): f>50k										
тирик Swp										
Jub										
Center	2.443 85	50 0 GHz			1	1	11		Span	300 kHz
	W 3 kHz			+	VBW 10 k	(Hz		_ #Sweep	o 100 s (	



### POWER SPECTRAL DENSITY ( draft 802.11n Wide-40 MHz Channel Combined mode )

CH	Low	(draft	802.11	n Wid	e-40 M	IHz Ch	nannel	Combi	ned me	ode)
	gilent 23:							RТ		
	e Spectra	l Density						Mkr1	2.412 2	
Ref 20 #Peak	dBm		At	ten 20 di	В		1		-11	.78 dBm
+reak Log										
10										
dB/										
Offst 14.4										
dB		1 <b>◊</b>								
DI	mon	Mr	mound	any work	Whatm	m Amaria	mmy			4
8.0 dBm							Leaf free Californ	nation and the	- hours	www.w
LgAv										
LALIA										
W1 S2										
S3 FS										
<b>£</b> (f):										
f>50k										
Swp										
·										4
										300 kHz
Compan	0.410.25									
	2.412 35 W 3 kHz	50 0 GHz			ŧVBW 10 k	Hz		#Sweer		
	2.412 35 W 3 kHz	50 0 GHz		+	⊧VBW 10 k	:Hz		_#Sweep	5pan 100 s (1	
#Res B	W 3 kHz_		t 802.1				hanne		o 100 s (	601 pts)_
*Res B	W 3 kHz Middle	e ( draf		l 1n Wi				l Coml	o 100 s (	601 pts)_
<pre>#Res B</pre> CH <pre> CH </pre>	W 3 kHz Middle gilent 00:0	e ( draf 00:44 De	ec 18, 20	l <mark>1n Wi</mark> 08	de-40 ]			l Coml R T	bined r	601 pts)_
<pre>#Res B CH</pre>	W 3 kHz Middle gilent 00:0	e ( draf 00:44 De	ec 18, 20 , HT40 M	l <mark>1n Wi</mark> 08	<b>de-40</b> ] Ch.			l Coml R T	bined n 2.435 4	601 pts)_
<pre>#Res B CH</pre>	W 3 kHz Middle gilent 00:0	e ( draf 00:44 De	ec 18, 20 , HT40 M	l <b>1n Wi</b> 08 ode Mid (	<b>de-40</b> ] Ch.			l Coml R T	bined n 2.435 4	601 pts) node ) 93 1 GHz
<pre>#Res B CH Combin Ref 20 #Peak Log</pre>	W 3 kHz Middle gilent 00:0	e ( draf 00:44 De	ec 18, 20 , HT40 M	l <b>1n Wi</b> 08 ode Mid (	<b>de-40</b> ] Ch.			l Coml R T	bined n 2.435 4	601 pts) node ) 93 1 GHz
<pre>#Res B CH</pre>	W 3 kHz Middle gilent 00:0	e ( draf 00:44 De	ec 18, 20 , HT40 M	l <b>1n Wi</b> 08 ode Mid (	<b>de-40</b> ] Ch.			l Coml R T	bined n 2.435 4	601 pts) node ) 93 1 GHz
■Res B CH Combin Ref 20 #Peak Log 10 dB/ Offst	W 3 kHz Middle gilent 00:0	e ( draf 00:44 De	ec 18, 20 , HT40 M	l <b>1n Wi</b> 08 ode Mid (	<b>de-40</b> ] Ch.			l Coml R T	2.435 4	601 pts) node ) 93 1 GHz
<pre>#Res B CH Combin Ref 20 #Peak Log 10 dB/ 0ffst 14.4</pre>	Middle Middle gilent 00:( e Spectra dBm	e ( draf 00:44 De I Density	ec 18, 20 , HT40 M At	1 <b>n Wi</b> 08 ode Mid ( ten 20 d	de-40 ] Ch. B	MHz C		l Coml R T	bined n 2.435 4	601 pts) node ) 93 1 GHz
<pre>#Res B CH Combin Ref 20 #Peak Log 10 dB/ 0ffst 14.4 dB</pre>	Middle Middle gilent 00:( e Spectra dBm	e ( draf 00:44 De I Density	ec 18, 20 , HT40 M At	1 <b>n Wi</b> 08 ode Mid ( ten 20 d	de-40 ] Ch. B	MHz C		l Coml R T	2.435 4 -6	601 pts) node ) 93 1 GHz
★Res B CH Combin Ref 20 #Peak Log 10 dB/ Offst 14.4 dB DI 8.0	Middle Middle gilent 00:( e Spectra dBm	e ( draf 00:44 De I Density	ec 18, 20 , HT40 M At	1 <b>n Wi</b> 08 ode Mid ( ten 20 d	<b>de-40</b> ] Ch.	MHz C		l Coml R T	2.435 4 -6	601 pts) node ) 93 1 GHz
■Res B CH Combin Ref 20 #Peak Log 10 dB/ Offst 14.4 dB DI 8.0 dBm	Middle Middle gilent 00:( e Spectra dBm	e ( draf 00:44 De I Density	ec 18, 20 , HT40 M At	1 <b>n Wi</b> 08 ode Mid ( ten 20 d	de-40 ] Ch. B	MHz C		l Coml R T	2.435 4 -6	601 pts) node ) 93 1 GHz
★Res B CH Combin Ref 20 #Peak Log 10 dB/ Offst 14.4 dB DI 8.0	Middle Middle gilent 00:( e Spectra dBm	e ( draf 00:44 De I Density	ec 18, 20 , HT40 M At	1 <b>n Wi</b> 08 ode Mid ( ten 20 d	de-40 ] Ch. B	MHz C		l Coml R T	2.435 4 -6	601 pts) node ) 93 1 GHz
■Res B CH Combin Ref 20 #Peak Log 10 dB/ 0ffst 14.4 dB DI 8.0 dBm LgAv	W 3 kHz Middle gilent 00:0 e Spectra dBm	e ( draf 00:44 De I Density	ec 18, 20 , HT40 M At	1 <b>n Wi</b> 08 ode Mid ( ten 20 d	de-40 ] Ch. B	MHz C		l Coml R T	2.435 4 -6	601 pts) node ) 93 1 GHz
■Res B CH Combin Ref 20 #Peak Log 10 dB/ Offst 14.4 dB DI 8.0 dBm	W 3 kHz Middle gilent 00:0 e Spectra dBm	e ( draf 00:44 De I Density	ec 18, 20 , HT40 M At	1 <b>n Wi</b> 08 ode Mid ( ten 20 d	de-40 ] Ch. B	MHz C		l Coml R T	2.435 4 -6	601 pts) node ) 93 1 GHz
<b>Hess B</b> CH Combin Ref 20 #Peak Log 10 dB/ 0ffst 14.4 dB DI 8.0 dBm LgAv W1 \$2 \$3 F\$	W 3 kHz Middle gilent 00:0 e Spectra dBm	e ( draf 00:44 De I Density	ec 18, 20 , HT40 M At	1 <b>n Wi</b> 08 ode Mid ( ten 20 d	de-40 ] Ch. B	MHz C		l Coml R T	2.435 4 -6	601 pts) node ) 93 1 GHz
#Res B CH Combin Ref 20 #Peak Log 10 dB/ 0ffst 14.4 dB DI 8.0 dBm LgAv W1 \$2 \$3 F\$ £(f):	W 3 kHz Middle gilent 00:0 e Spectra dBm	e ( draf 00:44 De I Density	ec 18, 20 , HT40 M At	1 <b>n Wi</b> 08 ode Mid ( ten 20 d	de-40 ] Ch. B	MHz C		l Coml R T	2.435 4 -6	601 pts) node ) 93 1 GHz
■Res B CH Combin Ref 20 #Peak Log 10 dB/ 0ffst 14.4 dB DI 8.0 dBm LgAv W1 \$2 \$3 F\$ £(f): f>50k	W 3 kHz Middle gilent 00:0 e Spectra dBm	e ( draf 00:44 De I Density	ec 18, 20 , HT40 M At	1 <b>n Wi</b> 08 ode Mid ( ten 20 d	de-40 ] Ch. B	MHz C		l Coml R T	2.435 4 -6	601 pts) node ) 93 1 GHz
#Res B CH Combin Ref 20 #Peak Log 10 dB/ 0ffst 14.4 dB DI 8.0 dBm LgAv W1 \$2 \$3 F\$ £(f):	W 3 kHz Middle gilent 00:0 e Spectra dBm	e ( draf 00:44 De I Density	ec 18, 20 , HT40 M At	1 <b>n Wi</b> 08 ode Mid ( ten 20 d	de-40 ] Ch. B	MHz C		l Coml R T	2.435 4 -6	601 pts) node ) 93 1 GHz
■Res B CH Combin Ref 20 #Peak Log 10 dB/ 0ffst 14.4 dB DI 8.0 dBm LgAv W1 \$2 \$3 F\$ £(f): f>50k	W 3 kHz Middle gilent 00:0 e Spectra dBm	e ( draf 00:44 De I Density	ec 18, 20 , HT40 M At	1 <b>n Wi</b> 08 ode Mid ( ten 20 d	de-40 ] Ch. B	MHz C		l Coml R T	2.435 4 -6	601 pts) node ) 93 1 GHz
#Res B CH Combin Ref 20 #Peak Log 10 dB/ 0ffst 14.4 dB DI 8.0 dBm LgAv W1 \$2 \$3 F\$ £(f): f>50k Swp	W 3 kHz Middle gilent 00:0 e Spectra dBm	e ( draf 00:44 De Il Density	ec 18, 20 , HT40 M At	1 <b>n Wi</b> 08 ode Mid ( ten 20 d	de-40 ] Ch. B	MHz C		l Coml R T	100 s (1	501 pts) node ) 93 1 GHz 5.99 dBm
<pre>#Res B CH % A Combin Ref 20 #Peak Log 10 dB/ 0ffst 14.4 dB dBm LgAv W1 S2 S3 FS £(f): f&gt;50k Swp Center</pre>	W 3 kHz Middle gilent 00:0 e Spectra dBm	e ( draf 00:44 De Il Density	ec 18, 20 , HT40 M At	1 <b>1 n Wi</b> 08 ode Mid ( ten 20 dl	de-40 ] Ch. B	MHz C		I Coml R T Mkr1	100 s (1	501 pts) node ) 93 1 GHz 5.99 dBm

CH High (draft 802.11n Wide-40 MHz Channel Combined mod	de)
★ Agilent 00:05:47 Dec 18, 2008	
Combine Spectral Density, HT40 Mode High Ch. Mkr1 2.441 032	4 GHz
Ref 20 dBm Atten 20 dB -13.18	8 dBm
*Peak	
Log 10	
dB/	
Offst	
14.4 dB	
DI 8.0 manute manufer and	myrnyn
dBm	
LgAv	
W1 S2 S3 FS	
£(f):	
f>50k	
Swp	
	1
Center 2.441 050 0 GHz Span 30	20 FH-2
#Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601	



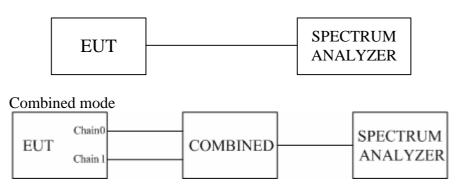
# 8.7 SPURIOUS EMISSIONS

## 8.7.1 Conducted Measurement

## **LIMIT**

According to \$15.247(d) & RSS-210 \$A8.5, in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator 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. In addition, radiated emissions which fall in the restricted bands, as defined in \$15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

### TEST SETUP



### TEST PROCEDURE

Conducted RF measurements of the transmitter output were 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 100 kHz. The video bandwidth is set to 100 kHz.

Measurements are made over the 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

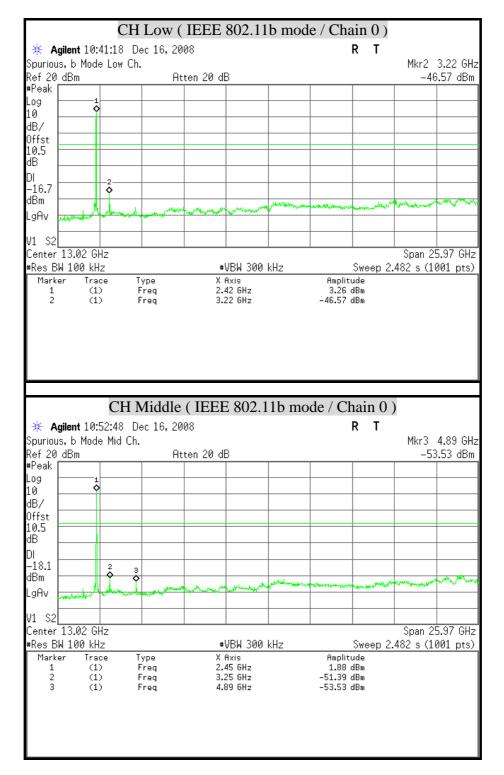
### TEST RESULTS

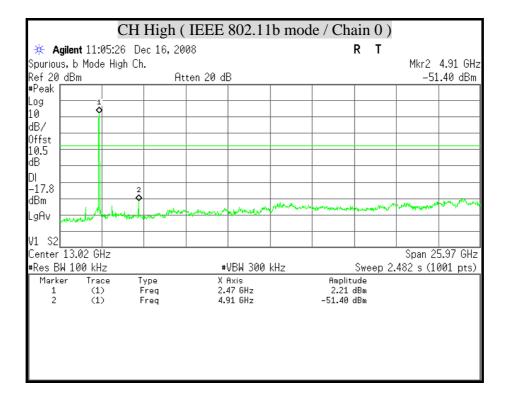
No non-compliance noted

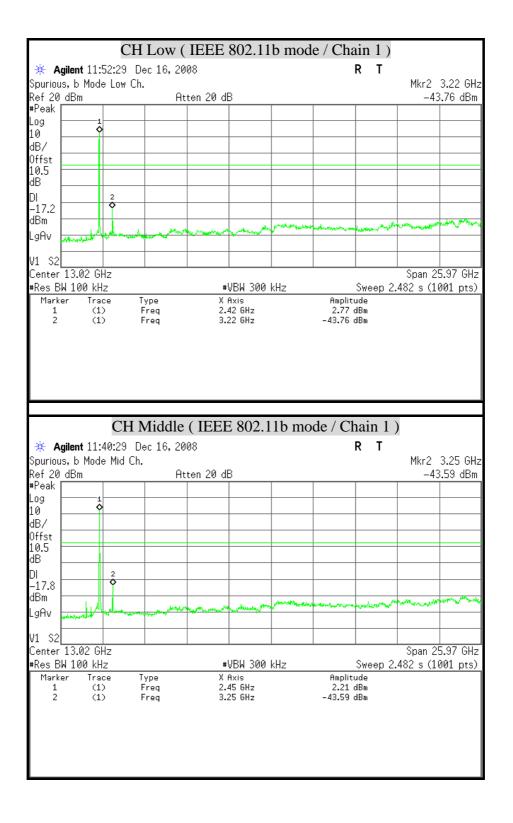


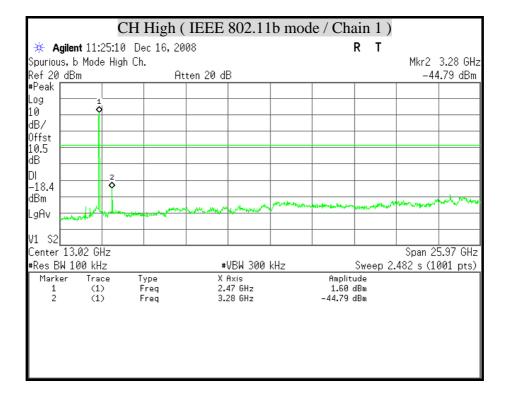
## **TEST PLOT**

#### SPURIOUS EMISSIONS (IEEE 802.11b mode)



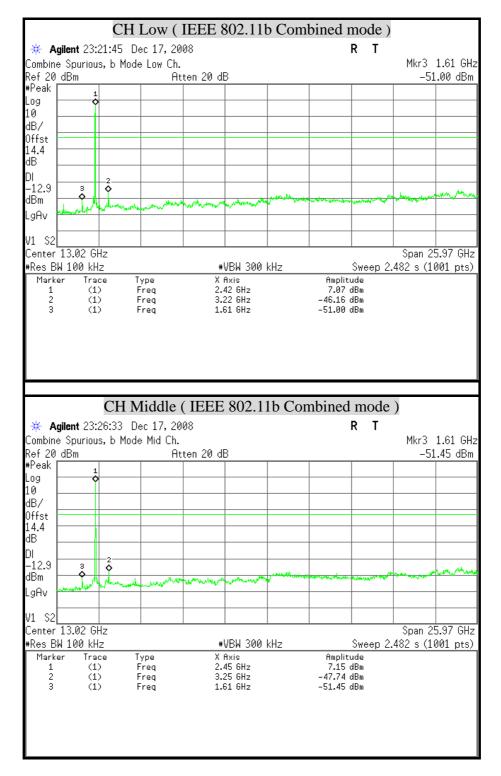


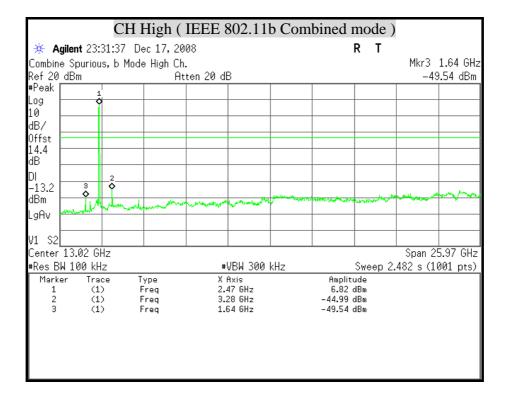






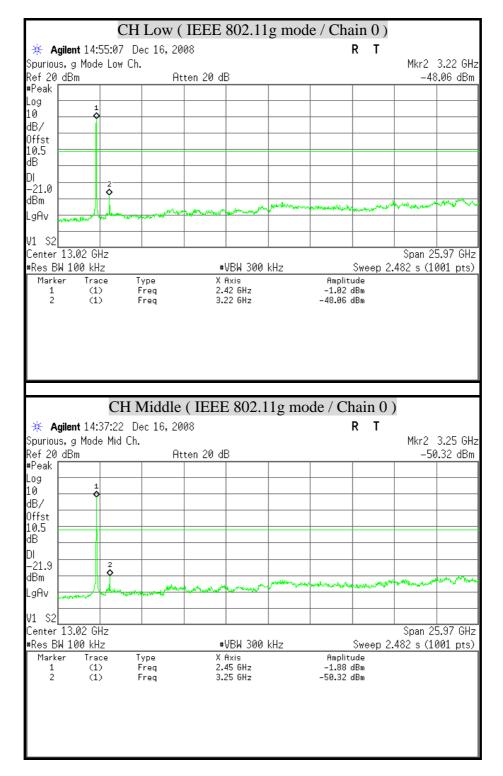
#### POWER SPECTRAL DENSITY ( IEEE 802.11b Combined mode )

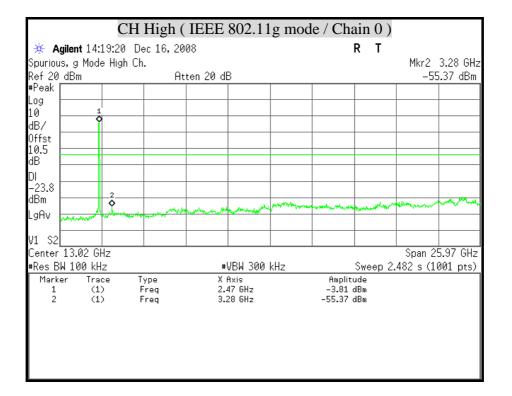


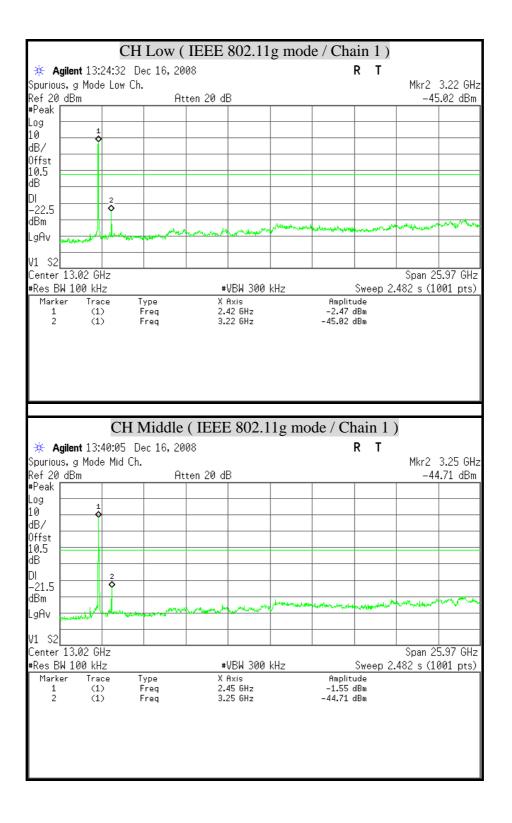


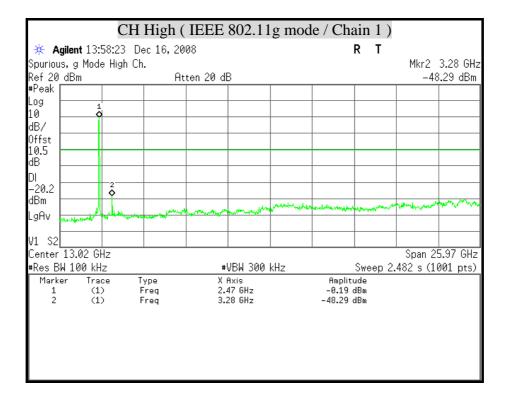


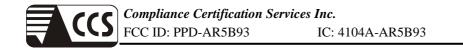
#### POWER SPECTRAL DENSITY ( IEEE 802.11g mode)



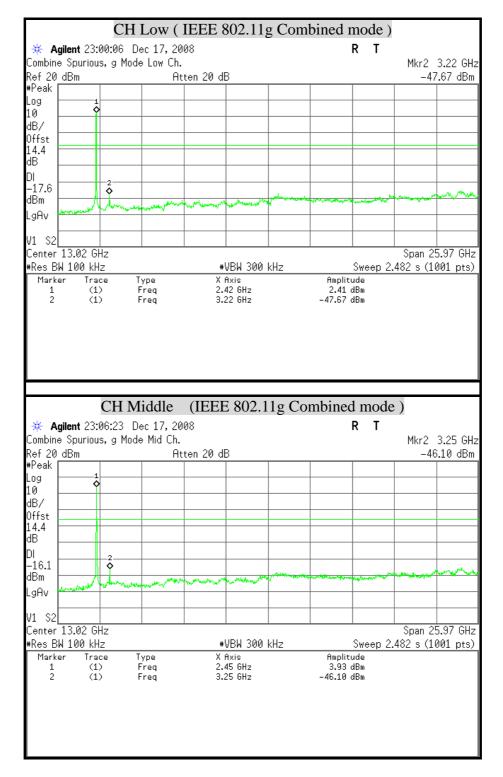


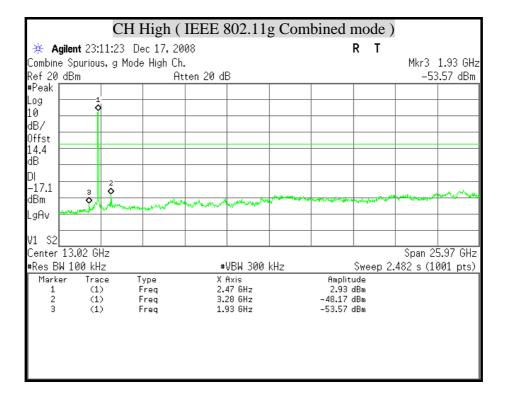






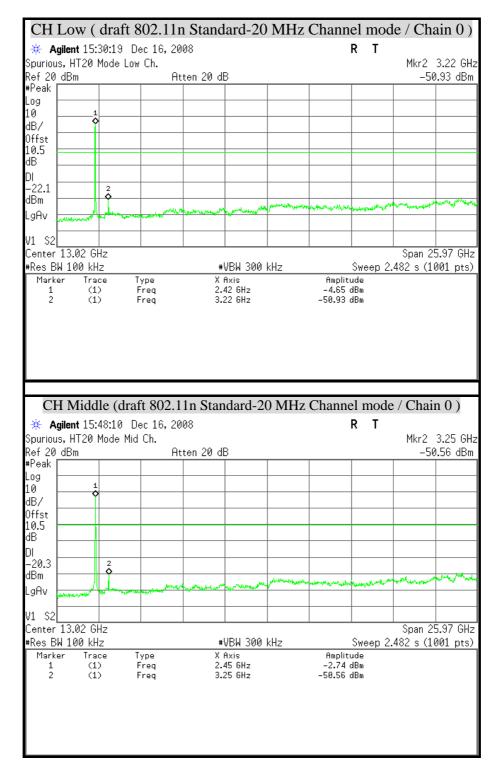
#### POWER SPECTRAL DENSITY ( IEEE 802.11g Combined mode )



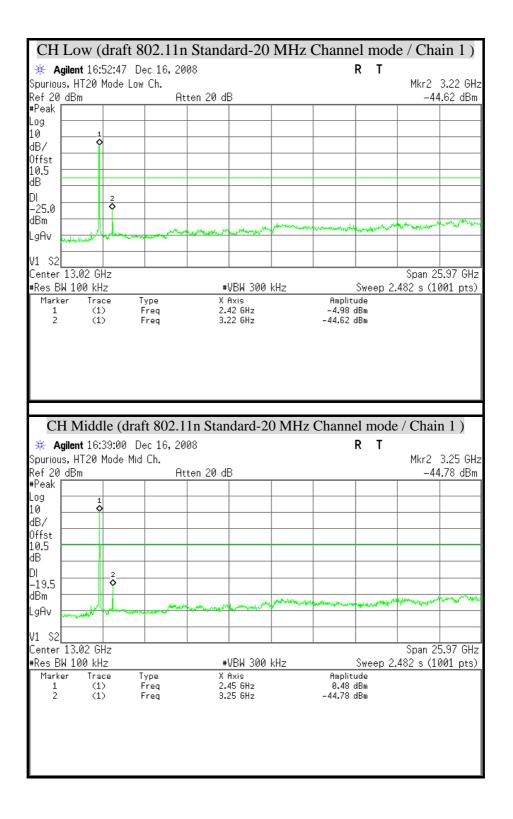


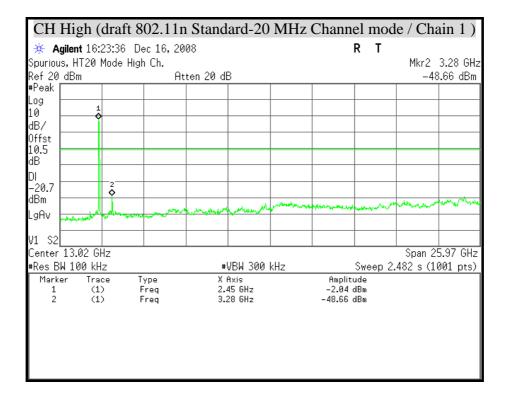


#### POWER SPECTRAL DENSITY ( draft 802.11n Standard-20 MHz Channel mode )



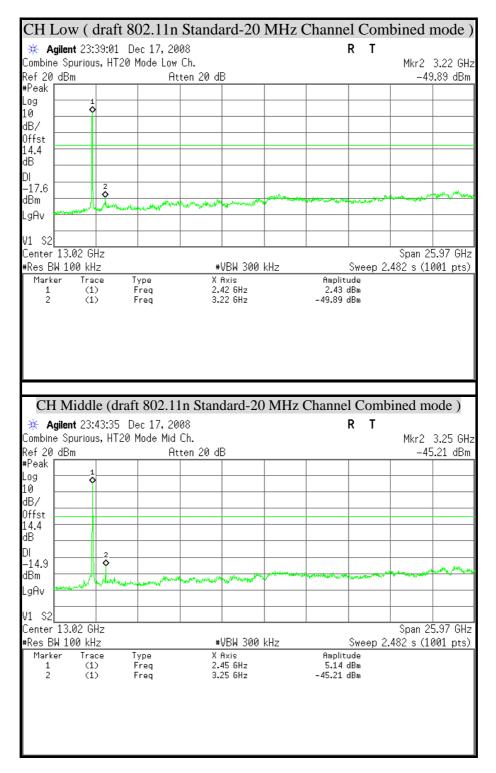
CH Hi	igh (drat	ft 802.111	n Stand	ard-20	MHz	Chann	el mo	de / Ch	ain 0 )
🔆 Agile	nt 16:06:57	, Dec 16, 20	108				RΤ		
	HT20 Mode	High Ch.							13.72 GHz
Ref 20 dB	3m	At	ten 20 di	B				-5	1.13 dBm
#Peak Log									
10	1								
dB/	Î								
Offst 🗌									
10.5 📃									
-23.0					3				
dBm ⊢					- Australian	a surface and sha	المحرب والمسالي	Mumphismus	monthema
LgAv 🔔	where the stars	www.wergeneraliste	the south and the south	a production and a second	· ····	and a second second			
V1 S2 Center 13	02 64-							Snan 2	25.97 GHz
#Res BW 1			#	VBW 300	kHz		Sween 2	2.482 s (1	
Marker	Trace	Туре		Axis		Amplit			
1	(1)	Freq		47 GHz 28 GHz		-3.08			
2 3	(1) (1)	Freq Freq		28 6HZ 72 GHz		-55.68			
		·							

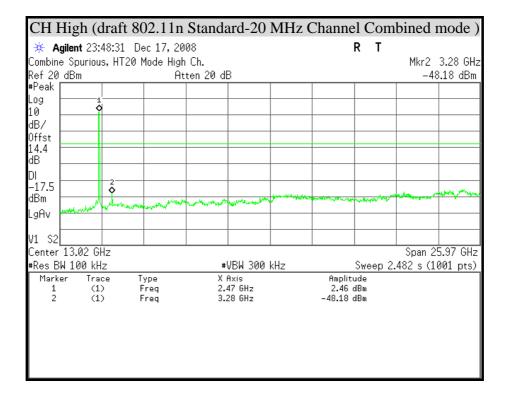






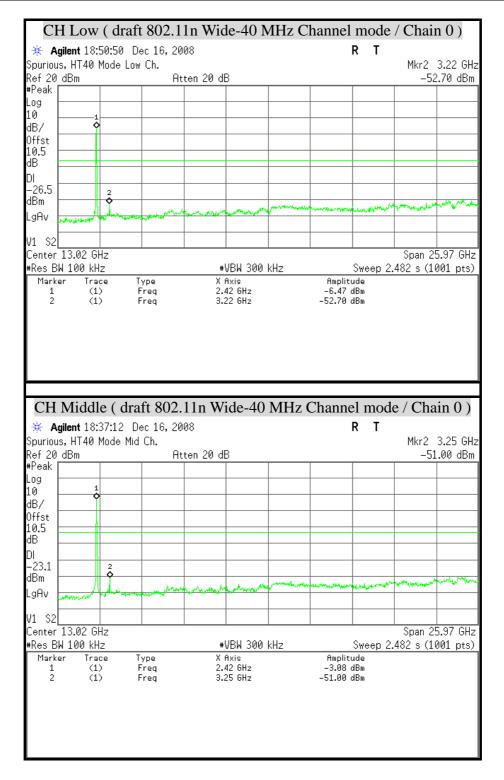
#### POWER SPECTRAL DENSITY ( draft 802.11n Standard-20 MHz Channel Combined mode )

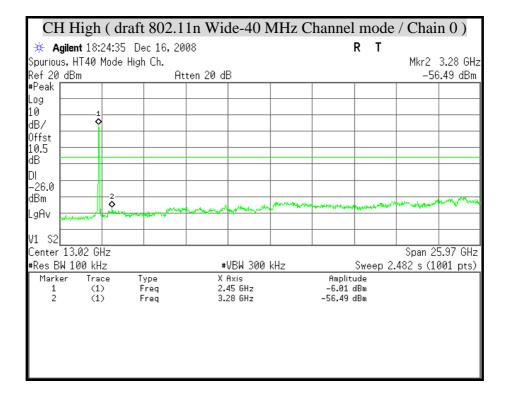




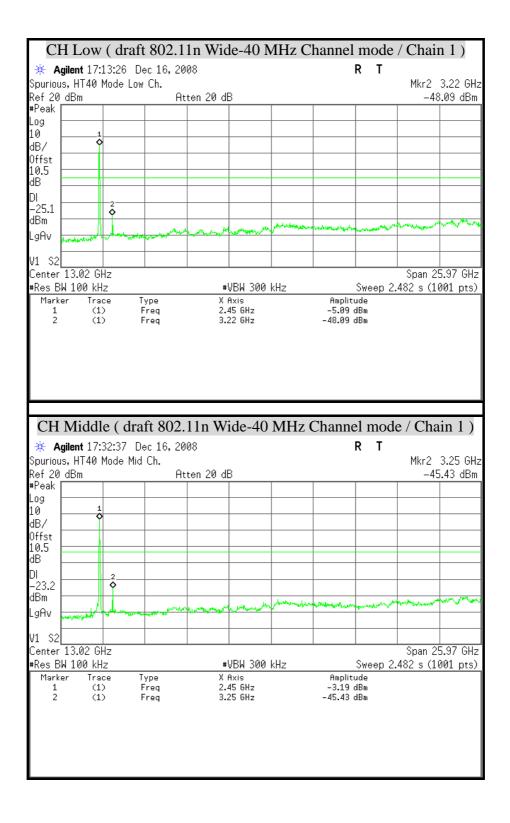


#### POWER SPECTRAL DENSITY ( draft 802.11n Wide-40 MHz Channel mode )

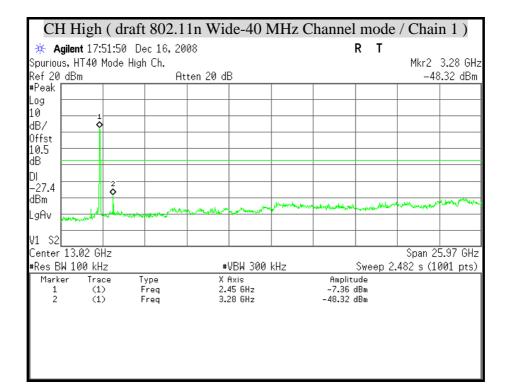




CCS

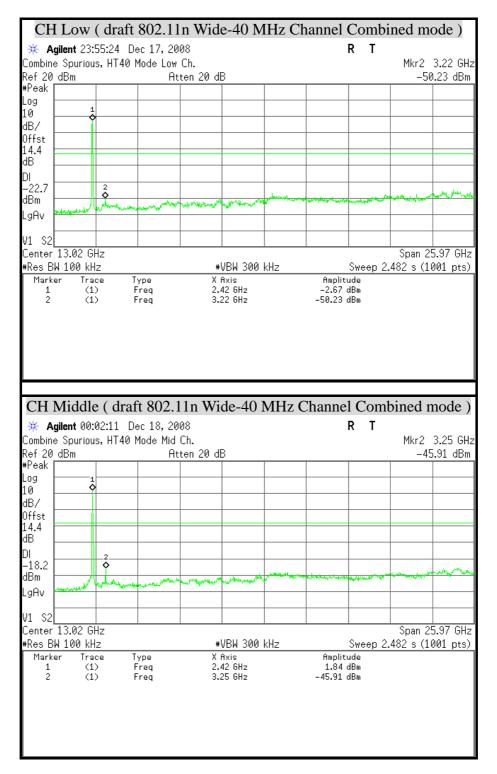


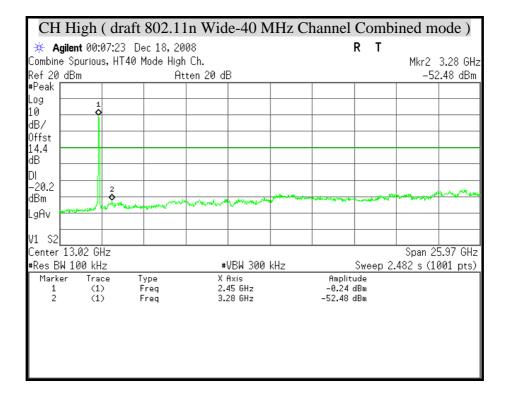






### POWER SPECTRAL DENSITY ( draft 802.11n Wide-40 MHz Channel Combined mode )







## 8.8 RADIATED EMISSIONS

# **LIMIT**

1. According to §15.205, 209(a) & RSS-210 Clause 2.6 (Transmitter) and IC RSS-GEN Clause 6 (Receiver), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

**Remark:** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

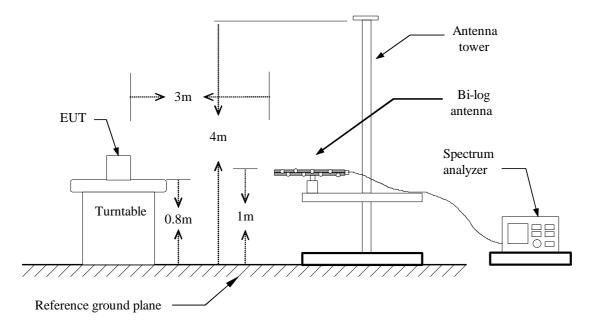
2. In the emission table above, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength (µV/m at 3-meter)	Field Strength (dBµV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

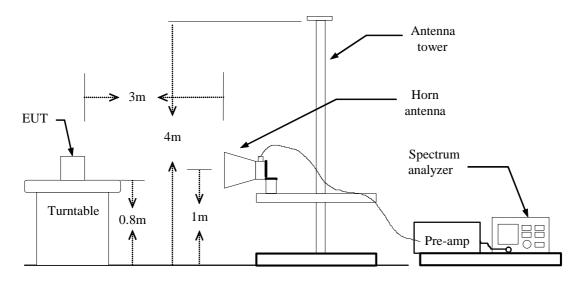


### **Test Configuration**

### Below 1 GHz



### Above 1 GHz





# **TEST PROCEDURE**

- 1. The EUT is placed on a turntable, which is 0.8m above ground plane.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 6. Set the spectrum analyzer in the following setting as:

Below 1GHz:

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz:

(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

7. Repeat above procedures until the measurements for all frequencies are complete.



#### Below 1GHz

**Operation Mode:** Normal Link

**Temperature:** 22.3°C

Humidity: 53% RH

Test Date:December 19, 2008Tested by:Rueyyan LinPolarity:Hor. / Ver.

	Horizontal									
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark				
88.20	67.96	-36.34	31.61	43.50	-11.89	Peak				
99.84	78.60	-36.22	42.38	43.50	-1.12	QP				
254.07	62.81	-30.07	32.74	46.00	-13.26	Peak				
298.69	62.45	-28.00	34.45	46.00	-11.55	Peak				
398.60	50.80	-26.96	23.84	46.00	-22.16	Peak				
666.32	53.98	-22.40	31.58	46.00	-14.42	Peak				
999.03	61.65	-18.25	43.40	54.00	-10.60	Peak				

	Vertical									
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark				
99.84	71.99	-36.22	35.77	43.50	-7.73	Peak				
175.50	62.17	-31.80	30.37	43.50	-13.13	Peak				
254.07	57.78	-30.07	27.71	46.00	-18.29	Peak				
298.69	53.94	-28.00	25.94	46.00	-20.06	Peak				
497.54	47.68	-25.21	22.48	46.00	-23.52	Peak				
665.35	51.19	-22.42	28.77	46.00	-17.23	Peak				
999.03	63.76	-18.25	45.51	54.00	-8.49	Peak				

#### Remark:

- 1. Measuring frequencies from 30 MHz to the 1GHz.
- 2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.
- 3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
- 4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 5. Margin(dB) = Result(dBuV/m) Limit(dBuV/m).



# **PIFA ANTENNA**

### Above 1 GHz

**Operation Mode:** TX / IEEE 802.11b / CH Low

**Temperature:** 19.3°C

**Humidity:** 61 % RH Test Date: December 09, 2008

Tested by: Gundam Lin

Polarity: Hor. / Ver.

				ntal				
Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
64.86		-13.94	50.92		74.00	54.00	-3.08	Peak
116.96	114.12	-8.95	108.01	105.17				Carrier
65.63	63.97	-7.79	57.84	56.18	88.01	85.17	-30.17	20dBc Peak Fundamental
57.76	53.75	-4.56	53.20	49.19	74.00	54.00	-0.80	Peak
48.06	36.56	6.40	54.46	42.96	74.00	54.00	-11.04	AVG
46.10	34.22	11.78	57.87	46.00	74.00	54.00	-8.00	AVG
			Verti	cal				
Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
80.32	58.61	-14.73	65.59	43.88	74.00	54.00	-10.12	AVG
	(dBµV) 64.86 116.96 65.63 57.76 48.06 46.10 Reading-PK (dBµV)	(dBμV)         (dBμV)           64.86            116.96         114.12           65.63         63.97           57.76         53.75           48.06         36.56           46.10         34.22           Reading-PK (dBμV)	(dB $\mu$ V)         (dB $\mu$ V)         Factor (dB/m)           64.86          -13.94           116.96         114.12         -8.95           65.63         63.97         -7.79           57.76         53.75         -4.56           48.06         36.56         6.40           46.10         34.22         11.78           Reading-PK (dB $\mu$ V)         Reading-AV (dB $\mu$ V)	(dB $\mu$ V)         (dB $\mu$ V)         Factor (dB/m)         (dB $\mu$ V/m)           64.86          -13.94         50.92           116.96         114.12         -8.95         108.01           65.63         63.97         -7.79         57.84           57.76         53.75         -4.56         53.20           48.06         36.56         6.40         54.46           46.10         34.22         11.78         57.87           Vertic           Keading-AV (dB $\mu$ V)         Correction Factor (dB/m)         Result-PK (dB $\mu$ V/m)	(dB $\mu$ V)(dB $\mu$ V)Hactor (dB/m)(dB $\mu$ V/m)(dB $\mu$ V/m)64.8613.9450.92116.96114.12-8.95108.01105.1765.6363.97-7.7957.8456.1857.7653.75-4.5653.2049.1948.0636.566.4054.4642.9646.1034.2211.7857.8746.00VerticalReading-PK (dB $\mu$ V)Reading-AV (dB $\mu$ V)Correction Factor (dB/m)Result-PK (dB $\mu$ V/m)Result-AV (dB $\mu$ V/m)	(dB $\mu$ V)(dB $\mu$ V)(dB $\mu$ V)(dB $\mu$ V/m)(dB $\mu$ V/m)(dB $\mu$ V/m)(dB $\mu$ V/m)64.8613.9450.9274.00116.96114.12-8.95108.01105.1765.6363.97-7.7957.8456.1888.0157.7653.75-4.5653.2049.1974.0048.0636.566.4054.4642.9674.0046.1034.2211.7857.8746.0074.00VerticalReading-PK (dB $\mu$ V)Correction Factor (dB $\mu$ W)Result-PK (dB $\mu$ V/m)Limit-PK (dB $\mu$ V/m)	(dB $\mu$ V)(dB $\mu$ V)Pactor (dB/m)(dB $\mu$ V/m)(dB $\mu$ V/m)(dB $\mu$ V/m)(dB $\mu$ V/m)(dB $\mu$ V/m)(dB $\mu$ V/m)64.8613.9450.9274.0054.00116.96114.12-8.95108.01105.1765.6363.97-7.7957.8456.1888.0185.1757.7653.75-4.5653.2049.1974.0054.0048.0636.566.4054.4642.9674.0054.0046.1034.2211.7857.8746.0074.0054.00VerticalReading-PK (dB $\mu$ V)Correction Factor (dB/m)Result-PK (dB $\mu$ V/m)Limit-PK (dB $\mu$ V/m)Limit-AV (dB $\mu$ V/m)	$\begin{array}{c c c c c c c c c c c c c c c c c c c $

11220.00	47.24	
4822.50	60.37	58.02
3217.50	63.72	61.67

71.15

114.25

68.79

Remark:

1328.00

2414.00

2490.00

Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency. 1.

57.20

105.31

59.93

55.93

55.81

51.88

39.83

---

46.61

53.88

53.46

----

74.00

---

74.00

74.00

74.00

74.00

54.00

---

54.00

54.00

54.00

54.00

-14.17

---

-7.39

-0.12

-0.54

-2.12

Radiated emissions measured in frequency above 1000MHz were made with an instrument using 2. peak/average detector mode.

3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

- Data of measurement within this frequency range shown "---" in the table above means the reading of 4. emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

6. Margin (dB) = Remark result (dBuV/m) - Average limit (dBuV/m).

-13.95

-8.94

-8.86

-7.79

-4.56

4.64

53.78

----

55.47

AVG

Carrier

AVG

AVG

AVG

Peak



Operation Mode: TX / IEEE 802.11b / CH Mid

**Temperature:** 19.3°C

Humidity: 61 % RH

Test Date: December 09, 2008 Tested by: Gundam Lin Polarity: Hor. / Ver.

	Horizontal								
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	65.48		-14.73	50.75		74.00	54.00	-3.25	Peak
1330.00	64.91		-13.95	50.96		74.00	54.00	-3.04	Peak
2436.00	117.88		-8.92	108.96					Carrier
3247.50	63.11	61.17	-7.75	55.36	53.42	74.00	54.00	-0.58	AVG
4875.00	57.62	52.35	-4.42	53.20	47.93	74.00	54.00	-0.80	Peak
6457.50	51.30		-2.23	49.07		74.00	54.00	-4.93	Peak
9337.50	48.88		2.20	51.08		74.00	54.00	-2.92	Peak
				Verti	cal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	80.52	58.50	-14.73	65.79	43.77	74.00	54.00	-10.23	AVG
1328.00	72.05	55.23	-13.95	58.10	41.28	74.00	54.00	-12.72	AVG
2434.00	114.60	112.39	-8.92	105.68	103.47				Carrier
2498.00	67.23	54.36	-8.85	58.38	45.51	74.00	54.00	-8.49	AVG
3247.50	65.82	64.51	-7.75	58.07	56.76	85.68	83.47	-27.61	20dBc Peak Fundamental
4875.00	59.92	57.05	-4.42	55.50	52.63	74.00	54.00	-1.37	AVG
11355.00	47.13		5.18	52.32		74.00	54.00	-1.68	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

*3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.* 

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** TX / IEEE 802.11b / CH High

**Temperature:** 19.3°C

Humidity: 61 % RH

Test Date: December 09, 2008 Tested by: Gundam Lin Polarity: Hor. / Ver.

				Horizo	ntal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	70.92	53.62	-14.73	56.19	38.89	74.00	54.00	-15.11	AVG
1330.00	68.25	53.55	-13.95	54.30	39.60	74.00	54.00	-14.40	AVG
2464.00	114.12	111.45	-8.89	105.23	102.56				Carrier
3285.00	61.23	59.00	-7.69	53.54	51.31	74.00	54.00	-0.46	Peak
4927.50	57.40	53.39	-4.29	53.11	49.10	74.00	54.00	-0.89	Peak
11662.50	48.22	35.61	6.11	54.33	41.72	74.00	54.00	-12.28	AVG
				Verti	cal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	80.01	57.96	-14.73	65.28	43.23	74.00	54.00	-10.77	AVG
1330.00	72.31	54.69	-13.95	58.36	40.74	74.00	54.00	-13.26	AVG
1664.00	68.72	52.65	-12.19	56.53	40.46	74.00	54.00	-13.54	AVG
2462.00	114.42	111.21	-8.89	105.53	102.32				Carrier
3285.00	64.22	62.65	-7.69	56.53	54.96	85.53	82.32	-29.00	20dBc Peak Fundamenta
4927.50	60.58	57.78	-4.29	56.29	53.49	74.00	54.00	-0.51	AVG

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** TX / IEEE 802.11g / CH Low

**Temperature:** 19.3°C

Humidity: 61 % RH

Test Date: December 09, 2008 Tested by: Gundam Lin Polarity: Hor. / Ver.

				Horizo	ntal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1332.00	64.93		-13.94	50.99		74.00	54.00	-3.01	Peak
2418.00	115.56	112.11	-8.94	106.62	103.17				Carrier
3217.50	67.18	65.86	-7.79	59.39	58.07	86.62	83.17	-27.23	20dBc Peak Fundamental
4815.00	53.32		-4.58	48.74		74.00	54.00	-5.26	Peak
9720.00	48.76		2.62	51.38		74.00	54.00	-2.62	Peak
				Verti	cal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	79.86	57.63	-14.73	65.13	42.90	74.00	54.00	-11.10	AVG
1328.00	70.81	54.97	-13.95	56.86	41.02	74.00	54.00	-12.98	AVG
2418.00	114.98	111.55	-8.94	106.04	102.61				Carrier
2498.00	66.71	54.82	-8.85	57.86	45.97	74.00	54.00	-8.03	AVG
3217.50	65.18	63.65	-7.79	57.39	55.86	86.04	82.61	-28.65	20dBc Peak Fundamental
4830.00	55.15		-4.54	50.61		74.00	54.00	-3.39	Peak
7237.50	51.05		-0.89	50.16		74.00	54.00	-3.84	Peak
11107.50	48.41		4.18	52.60		74.00	54.00	-1.40	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

*3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.* 

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** TX / IEEE 802.11g / CH Mid

**Temperature:** 19.3°C

Humidity: 61 % RH

Test Date: December 09, 2008 Tested by: Gundam Lin Polarity: Hor. / Ver.

				Horizo	ntal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1332.00	64.96		-13.94	51.02		74.00	54.00	-2.98	Peak
3255.00	62.62	59.73	-7.74	54.88	51.99	74.00	54.00	-2.01	AVG
4875.00	62.67	48.14	-4.42	58.25	43.72	74.00	54.00	-10.28	AVG
7755.00	50.01		-0.14	49.87		74.00	54.00	-4.13	Peak
	Vertical								
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	80.28	58.76	-14.73	65.55	44.03	74.00	54.00	-9.97	AVG
1332.00	71.36	55.18	-13.94	57.42	41.24	74.00	54.00	-12.76	AVG
1950.00	66.22	52.21	-9.82	56.40	42.39	74.00	54.00	-11.61	AVG
2394.00	66.52	54.78	-8.97	57.55	45.81	74.00	54.00	-8.19	AVG
2430.00	115.23	112.74	-8.93	106.30	103.81				Carrier
2496.00	67.81	54.86	-8.85	58.96	46.01	74.00	54.00	-7.99	AVG
3255.00	60.84	57.18	-7.74	53.10	49.44	74.00	54.00	-0.90	Peak
4875.00	61.07	46.71	-4.42	56.65	42.29	74.00	54.00	-11.71	AVG
7305.00	59.24	42.97	-0.84	58.40	42.13	74.00	54.00	-11.87	AVG

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

*3.* Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

- 4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** TX / IEEE 802.11g / CH High

**Temperature:** 19.3°C

Humidity: 61 % RH

Test Date: December 09, 2008 Tested by: Gundam Lin Polarity: Hor. / Ver.

Horizontal									
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	70.22	54.67	-14.73	55.49	39.94	74.00	54.00	-14.06	AVG
1332.00	65.17		-13.94	51.22		74.00	54.00	-2.78	Peak
3142.50	52.92		-7.90	45.02		74.00	54.00	-8.98	Peak
3285.00	61.81	59.59	-7.69	54.12	51.90	74.00	54.00	-2.10	AVG
4920.00	52.33		-4.31	48.02		74.00	54.00	-5.98	Peak
7500.00	50.36		-0.70	49.66		74.00	54.00	-4.34	Peak
	• •	• •			<u>.</u>	• •	·		
Vertical									
				Verti	cal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	<b>Verti</b> Result-PK (dBµV/m)	cal Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
	U	0	Factor	Result-PK	Result-AV			0	Remark
(MHz)	(dBµV)	(dBµV)	Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	$(dB\mu V/m)$	$(dB\mu V/m)$	(dB)	
(MHz) 1000.00	(dBµV) 80.12	(dBµV) 58.46	Factor (dB/m) -14.73	Result-PK (dBµV/m) 65.39	Result-AV (dBµV/m) 43.73	(dBµV/m) 74.00	(dBµV/m) 54.00	(dB) -10.27	AVG
(MHz) 1000.00 1332.00	(dBµV) 80.12 72.23	(dBµV) 58.46 55.52	Factor (dB/m) -14.73 -13.94	Result-PK (dBµV/m) 65.39 58.29	Result-AV (dBµV/m) 43.73 41.58	(dBµV/m) 74.00 74.00	(dBµV/m) 54.00 54.00	(dB) -10.27 -12.42	AVG AVG
(MHz) 1000.00 1332.00 1662.00	(dBµV) 80.12 72.23 71.29	(dBµV) 58.46 55.52 54.73	Factor (dB/m) -14.73 -13.94 -12.21	Result-PK (dBµV/m) 65.39 58.29 59.08	Result-AV (dBµV/m) 43.73 41.58 42.52	(dBµV/m) 74.00 74.00 74.00	(dBµV/m) 54.00 54.00 54.00	(dB) -10.27 -12.42 -11.48	AVG AVG AVG
(MHz) 1000.00 1332.00 1662.00 3285.00	(dBµV) 80.12 72.23 71.29 63.59	(dBµV) 58.46 55.52 54.73	Factor (dB/m) -14.73 -13.94 -12.21 -7.69	Result-PK (dBµV/m) 65.39 58.29 59.08 55.90	Result-AV (dBµV/m) 43.73 41.58 42.52 53.86	(dBµV/m) 74.00 74.00 74.00 74.00	(dBµV/m) 54.00 54.00 54.00 54.00	(dB) -10.27 -12.42 -11.48 -0.14	AVG AVG AVG AVG

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



<b>Operation Mode:</b>	TX / draft 802.11n Standard-20 MHz Channel mode / CH Low	Test D
Temperature:	19.3°C	Tested

61 % RH

Humidity:

Test Date: December 09, 2008

Tested by: Gundam Lin

Polarity: Hor. / Ver.

Horizontal									
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1330.00	70.89	54.63	-13.95	56.94	40.68	74.00	54.00	-13.32	AVG
2418.00	116.44	113.68	-8.94	107.50	104.74				Carrier
3217.50	67.20	65.77	-7.79	59.41	57.98	87.50	84.74	-28.09	20dBc Peak Fundamental
4815.00	52.54		-4.58	47.96		74.00	54.00	-6.04	Peak
6570.00	51.08		-2.03	49.05		74.00	54.00	-4.95	Peak
16965.00	47.27	34.23	11.93	59.20	46.16	74.00	54.00	-7.84	AVG
				Verti	cal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	80.12	57.89	-14.73	65.39	43.16	74.00	54.00	-10.84	AVG
1330.00	70.70	55.30	-13.95	56.75	41.35	74.00	54.00	-12.65	AVG
2420.00	115.71	112.56	-8.94	106.77	103.62				Carrier
3217.50	65.29	63.53	-7.79	57.50	55.74	86.77	83.62	-29.27	20dBc Peak Fundamental

9232.50 *Remark:* 

4822.50

6030.00

55.37

51.56

49.14

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

50.82

48.86

51.27

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

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74.00

74.00

74.00

-3.18

-5.14

-2.73

Peak

Peak

Peak

54.00

54.00

54.00

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

6. Margin (dB) = Remark result (dBuV/m) - Average limit (dBuV/m).

-4.56

-2.69

2.14

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<b>Operation Mode:</b>	TX / draft 802.11n Standard-20 MHz Channel mode / CH Mid	Test Date:	December 09, 2008
Temperature:	19.3°C	Tested by:	Gundam Lin
Humidity:	61 % RH	<b>Polarity:</b>	Hor. / Ver.

				Horizo	ontal					
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark	
1332.00	65.63		-13.94	51.69		74.00	54.00	-2.31	Peak	
3255.00	61.58	58.49	-7.74	53.84	50.75	74.00	54.00	-0.16	Peak	
4875.00	62.24	46.99	-4.42	57.82	42.57	74.00	54.00	-11.43	AVG	
				Verti	cal					
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark	
1000.00	80.31	58.12	-14.73	65.58	43.39	74.00	54.00	-10.61	AVG	
1330.00	70.60	54.67	-13.95	56.65	40.72	74.00	54.00	-13.28	AVG	
2436.00	115.80	112.31	-8.92	106.88	-103.39				Carrier	
3255.00	60.59	56.88	-7.74	52.85	49.14	74.00	54.00	-1.15	Peak	
4875.00	61.87	46.81	-4.42	57.45	42.39	74.00	54.00	-11.61	AVG	
7305.00	58.77	42.47	-0.84	57.93	41.63	74.00	54.00	-12.37	AVG	

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



<b>Operation Mode:</b>	TX / draft 802.11n Standard-20 MHz Channel mode / CH High	Test
Temperature:	19.3°C	Teste

61 % RH

Test Date: December 09, 2008

Tested by: Gundam Lin

Humidity:

Polarity: Hor. / Ver.

				Horizo	ntal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	71.38	56.82	-14.73	56.65	42.09	74.00	54.00	-11.91	AVG
1332.00	70.57	55.02	-13.94	56.63	41.08	74.00	54.00	-12.92	AVG
2462.00	114.83		-8.89	105.94		74.00	54.00	51.94	*Peak
3285.00	61.23	58.82	-7.69	53.54	51.13	74.00	54.00	-0.46	Peak
4920.00	52.93		-4.31	48.62		74.00	54.00	-5.38	Peak
11647.50	48.33	36.21	6.08	54.41	42.29	74.00	54.00	-11.71	AVG
	1		I	I	1	L.	I		
				Verti	cal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	80.03	58.31	-14.73	65.30	43.58	74.00	54.00	-10.42	AVG
1330.00	71.49	55.75	-13.95	57.54	41.80	74.00	54.00	-12.20	AVG
1662.00	69.12	54.87	-12.21	56.91	42.66	74.00	54.00	-11.34	AVG
2460.00	114.88	111.34	-8.89	105.99	102.45				Carrier
3285.00	64.29	62.40	-7.69	56.60	54.71	85.99	82.45	-29.39	20dBc Peak Fundamenta
4920.00	55.73		-4.31	51.42		74.00	54.00	-2.58	Peak
7380.00	51.25		-0.79	50.46		74.00	54.00	-3.54	Peak

10380.00 *Remark:*  49.43

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

52.70

- 2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
- *3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*

74.00

54.00

-1.30

Peak

- 4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 6. Margin(dB) = Remark result(dBuV/m) Average limit(dBuV/m).

3.27

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<b>Operation Mode:</b>	TX / draft 802.11n Wide-40 MHz Channel mode	Test Date:
Operation Mode:	/ CH Low	Test Dates

Yest Date: December 09, 2008

**Temperature:** 19.3°C

Humidity: 61 % RH

Tested by: Gundam Lin

Polarity: Hor. / Ver.

				Horizo	ntal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1332.00	65.81		-13.94	51.87		74.00	54.00	-2.13	Peak
2432.00	114.47	111.21	-8.92	105.54	102.29				Carrier
3232.50	67.08	65.12	-7.77	59.31	57.35	85.54	82.29	-26.23	20dBc Peak Fundamental
4845.00	52.38		-4.50	47.88		74.00	54.00	-6.12	Peak
5572.50	52.09		-3.21	48.88		74.00	54.00	-5.12	Peak
				Verti	cal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	80.45	57.73	-14.73	65.72	43.00	74.00	54.00	-11.00	AVG
1332.00	71.00	55.49	-13.94	57.06	41.55	74.00	54.00	-12.45	AVG
1666.00	69.17	54.57	-12.17	57.00	42.40	74.00	54.00	-11.60	AVG
2426.00	113.33	110.83	-8.93	104.39	101.90				Carrier
3232.50	64.99	63.65	-7.77	57.22	55.88	84.39	81.90	-27.17	20dBc Peak Fundamental

5782.50 *Remark:* 

4845.00

54.26

52.08

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

49.76

49.11

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

*3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.* 

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---

74.00

74.00

54.00

54.00

-4.24

-4.89

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

6. Margin (dB) = Remark result (dBuV/m) - Average limit (dBuV/m).

-4.50

-2.97

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Fundamental

Peak

Peak



<b>Operation Mode:</b>	TX / draft 802.11n Wide-40 MHz Channel mode / CH Mid	Test Date:	]
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December 09, 2008

**Temperature:** 19.3°C

**Humidity:** 61 % RH

Tested by: Gundam Lin **Polarity:** Hor. / Ver.

	Horizontal												
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark				
1000.00	70.87	56.47	-14.73	56.14	41.74	74.00	54.00	-12.26	AVG				
1328.00	65.08		-13.95	51.12		74.00	54.00	-2.88	Peak				
2342.00	66.96	53.37	-9.03	57.93	44.34	74.00	54.00	-9.66	AVG				
3255.00	62.21	58.67	-7.74	54.47	50.93	74.00	54.00	-3.07	AVG				
4875.00	60.69	45.97	-4.42	56.27	41.55	74.00	54.00	-12.45	AVG				
				Verti	cal								
Frequency	Deading DV		Correction										
(MHz)	(dBµV)	Reading-AV (dBµV)	Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark				
(MHz) 1000.00			Factor					-	Remark AVG				
· · /	(dBµV)	(dBµV)	Factor (dB/m)	$(dB\mu V/m)$	$(dB\mu V/m)$	(dBµV/m)	$(dB\mu V/m)$	(dB)					
1000.00	(dBµV) 80.31	(dBµV) 58.38	Factor (dB/m) -14.73	(dBµV/m) 65.58	(dBµV/m) 43.65	(dBµV/m) 74.00	(dBµV/m) 54.00	(dB) -10.35	AVG				
1000.00 1328.00	(dBµV) 80.31 70.90	(dBµV) 58.38 55.86	Factor (dB/m) -14.73 -13.95	(dBµV/m) 65.58 56.95	(dBµV/m) 43.65 41.91	(dBµV/m) 74.00 74.00	(dBµV/m) 54.00 54.00	(dB) -10.35 -12.09	AVG AVG				
1000.00 1328.00 2426.00	(dBµV) 80.31 70.90 113.86	(dBµV) 58.38 55.86 110.26	Factor (dB/m) -14.73 -13.95 -8.93	(dBµV/m) 65.58 56.95 104.92	(dBµV/m) 43.65 41.91 101.33	(dBµV/m) 74.00 74.00 	(dBµV/m) 54.00 54.00	(dB) -10.35 -12.09 	AVG AVG Carrier				

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

Data of measurement within this frequency range shown "---" in the table above means the reading of 4. emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



<b>Operation Mode:</b>	TX / draft 802.11n Wide-40 MHz Channel mode / CH High	Test Date:	December 09, 2008
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**Temperature:** 19.3°C

Humidity: 61 % RH

Tested by: Gundam Lin

Polarity: Hor. / Ver.

				Horizo	ntal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	66.26		-14.73	51.53		74.00	54.00	-2.47	Peak
1332.00	65.33		-13.94	51.38		74.00	54.00	-2.62	Peak
3270.00	61.82	59.00	-7.71	54.11	51.29	74.00	54.00	-2.71	AVG
6907.50	50.06		-1.27	48.80		74.00	54.00	-5.20	Peak
				Verti	cal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	79.88	57.26	-14.73	65.15	42.53	74.00	54.00	-11.47	AVG
1332.00	71.23	55.52	-13.94	57.29	41.58	74.00	54.00	-12.42	AVG
2464.00	112.50	109.45	-8.89	103.61	100.65				Carrier
3270.00	65.21	63.66	-7.71	57.50	55.95	83.61	80.65	-26.11	20dBc Peak Fundamental
4905.00	54.19		-4.35	49.84		74.00	54.00	-4.16	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

*3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.* 

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



# **DIPOLE ANTENNA**

**Operation Mode:** TX / IEEE 802.11b / CH Low

**Temperature:** 23°C

Humidity: 52 % RH

Test Date: December 16, 2008 Tested by: Rueyyan Lin Polarity: Hor. / Ver.

				Horizo	ntal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1216.00	70.12	58.78	-14.22	55.90	44.56	74.00	54.00	-9.44	AVG
3210.00	54.11		-7.80	46.31		74.00	54.00	-7.69	Peak
4830.00	54.57		-4.54	50.03		74.00	54.00	-3.97	Peak
				Verti	cal				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1242.00	64.93		-14.16	50.77		74.00	54.00	-3.23	Peak
3215.00	63.34	61.09	-7.79	55.55	53.30	74.00	54.00	-0.70	AVG
4825.00	62.29	58.09	-4.55	57.74	53.54	74.00	54.00	-0.46	AVG

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

*3.* Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** TX / IEEE 802.11b / CH Mid

**Temperature:** 23°C

Humidity: 52 % RH

Test Date: December 16, 2008 Tested by: Rueyyan Lin Polarity: Hor. / Ver.

	Horizontal											
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark			
1206.00	70.35	58.21	-14.24	56.11	43.97	74.00	54.00	-10.03	AVG			
2436.00	106.61		-8.92	97.69					Carrier			
3255.00	55.12		-7.74	47.38		74.00	54.00	-6.62	Peak			
4875.00	54.53		-4.42	50.10		74.00	54.00	-3.90	Peak			
10050.00	49.13		3.06	52.18		74.00	54.00	-1.82	Peak			
				Vertic	al							
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark			
1254.00	66.18		-14.13	52.05		74.00	54.00	-1.95	Peak			
3255.00	62.92	60.27	-7.74	55.18	52.53	74.00	54.00	-1.47	AVG			
4875.00	59.82	57.16	-4.42	55.40	52.74	74.00	54.00	-1.26	AVG			

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

*3.* Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** TX / IEEE 802.11b / CH High

**Temperature:** 23°C

Humidity: 52 % RH

Test Date: December 16, 2008 Tested by: Rueyyan Lin Polarity: Hor. / Ver.

	Horizontal												
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark				
1216.00	70.46	58.38	-14.22	56.24	44.16	74.00	54.00	-9.84	AVG				
3285.00	54.95		-7.69	47.25		74.00	54.00	-6.75	Peak				
4920.00	53.77		-4.31	49.46		74.00	54.00	-4.54	Peak				
9420.00	48.78		2.25	51.03		74.00	54.00	-2.97	Peak				
				Vertic	al								
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark				
1244.00	66.02		-14.15	51.87		74.00	54.00	-2.13	Peak				
3285.00	61.85	60.14	-7.69	54.16	52.45	74.00	54.00	-1.55	AVG				
4920.00	61.59	58.13	-4.31	57.28	53.82	74.00	54.00	-0.18	AVG				

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

*3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.* 

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** TX / IEEE 802.11g / CH Low

**Temperature:** 23°C

Humidity: 52 % RH

51.99

Test Date: December 16, 2008 Tested by: Rueyyan Lin Polarity: Hor. / Ver.

	Horizontal									
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark	
1216.00	70.12	58.98	-14.22	55.9	44.76	74.00	54.00	-9.24	AVG	
3210.00	52.96		-7.80	45.15		74.00	54.00	-8.85	Peak	
4935.00	50.49		-4.27	46.22		74.00	54.00	-7.78	Peak	
				Vertic	al					
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark	
1398.00	68.00		-13.79	54.22		74.00	54.00	0.22	*Peak	
3210.00	62.58	60.98	-7.80	54.78	53.18	74.00	54.00	-0.82	AVG	

4995.00 *Remark:* 

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

47.87

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

*3.* Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

74.00

54.00

-6.13

Peak

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

6. Margin(dB) = Remark result(dBuV/m) - Average limit(dBuV/m).

-4.12



**Operation Mode:** TX / IEEE 802.11g / CH Mid

**Temperature:** 23°C

Humidity: 52 % RH

Test Date: December 16, 2008 Tested by: Rueyyan Lin Polarity: Hor. / Ver.

	Horizontal									
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark	
1212.00	71.24	60.14	-14.23	57.01	45.91	74.00	54.00	-8.09	AVG	
3255.00	54.44		-7.74	46.70		74.00	54.00	-7.30	Peak	
4875.00	53.84		-4.42	49.42		74.00	54.00	-4.58	Peak	
Vertical										
Frequency	Reading-PK	Reading-AV	Correction	Result-PK	Result-AV	Limit-PK	Limit-AV	Margin	D 1	

Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1244.00	66.36		-14.15	52.20		74.00	54.00	-1.80	Peak
1918.00	62.87		-10.09	52.78		74.00	54.00	-1.22	Peak
3255.00	63.79	61.50	-7.74	56.05	53.76	74.00	54.00	-0.24	AVG
4860.00	62.03	45.41	-4.46	57.57	40.95	74.00	54.00	-13.05	AVG

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** TX / IEEE 802.11g / CH High

**Temperature:** 23°C

Humidity: 52 % RH

58.58

41.94

Test Date: December 16, 2008 Tested by: Rueyyan Lin Polarity: Hor. / Ver.

	Horizontal									
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark	
1222.00	70.32	57.86	-14.20	56.12	43.66	74.00	54.00	-10.34	AVG	
3285.00	53.03		-7.69	45.34		74.00	54.00	-8.66	Peak	
4995.00	52.00		-4.12	47.89		74.00	54.00	-6.11	Peak	
				Vertic	al					
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark	
1208.00	65.74		-14.24	51.50		74.00	54.00	-2.50	Peak	
3285.00	60.57	59.89	-7.69	52.88	52.20	74.00	54.00	-1.12	Peak	

4920.00 *Remark:* 

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

54.27

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

*3.* Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

37.63

74.00

54.00

-16.37

AVG

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

6. Margin(dB) = Remark result(dBuV/m) - Average limit(dBuV/m).

-4.31



Peak

Peak

<b>Operation Mode:</b>	TX / draft 802.11n Standard-20 MHz Channel mode / CH Low	Test Date:	December 16, 2008
Temperature:	23°C	Tested by:	Rueyyan Lin
Humidity:	52 % RH	<b>Polarity:</b>	Hor. / Ver.

Horizontal Correction Result-PK Reading-PK Reading-AV Result-AV Limit-PK Limit-AV Frequency Margin Factor Remark (MHz) (dBµV) (dBµV)  $(dB\mu V/m)$  $(dB\mu V/m)$  $(dB\mu V/m)$  $(dB\mu V/m)$ (dB)(dB/m) 1190.00 -14.28 53.96 -0.04 68.25 74.00 54.00 -------53.09 -7.80 45.28 74.00 54.00 -8.72 3210.00 ------

	Vertical									
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark	
1240.00	65.66		-14.16	51.50		74.00	54.00	-2.50	Peak	
3210.00	62.35	61.24	-7.80	54.55	53.44	74.00	54.00	-0.56	AVG	
4830.00	52.59		-4.54	48.05		74.00	54.00	-5.95	Peak	

Remark:

Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency. 1.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

Data of measurement within this frequency range shown "---" in the table above means the reading of 4. emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" 5. remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



<b>Operation Mode:</b>	TX / draft 802.11n Standard-20 MHz Channel mode / CH Mid	Test Date:	December 16, 2008
Temperature:	23°C	Tested by:	Rueyyan Lin
Humidity:	52 % RH	<b>Polarity:</b>	Hor. / Ver.

Horizontal									
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1214.00	70.31	58.62	-14.22	56.09	44.40	74.00	54.00	-9.60	AVG
3255.00	56.16		-7.74	48.43		74.00	54.00	-5.57	Peak

	Vertical									
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark	
1250.00	65.46		-14.14	51.32		74.00	54.00	-2.68	Peak	
3255.00	63.54	61.24	-7.74	55.80	53.50	74.00	54.00	-0.50	AVG	
4875.00	59.43	44.72	-4.42	55.01	40.30	74.00	54.00	-13.70	AVG	

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

4. Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



<b>Operation Mode:</b>	TX / draft 802.11n Standard-20 MHz Channel mode / CH High	Test Date: December 16, 2008
Temperature:	23°C	Tested by: Rueyyan Lin

**Humidity:** 

52 % RH

Rueyyan Lin

Hor. / Ver. **Polarity:** 

	Horizontal									
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark	
1212.00	70.39	58.25	-14.23	56.16	44.02	74.00	54.00	-9.98	AVG	
3285.00	53.03		-7.69	45.34		74.00	54.00	-8.66	Peak	
4920.00	50.97		-4.31	46.66		74.00	54.00	-7.34	Peak	
	• •	• •			<u>.</u>	<u>.</u>	<u> </u>			
				Vertic	al					
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark	
1332.00	66.83		-13.94	52.89		74.00	54.00	-1.11	Peak	
3285.00	63.52	61.13	-7.69	55.83	53.44	74.00	54.00	-0.56	AVG	
4920.00	53.69		-4.31	49.38		74.00	54.00	-4.62	Peak	

Remark:

Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency. 1.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

Data of measurement within this frequency range shown "---" in the table above means the reading of 4. emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" 5. remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Operation Mode:	TX / draft 802.11n Wide-40 MHz Channel mode / CH Low	Test Date:
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Test Date: December 16, 2008

**Temperature:** 23°C

Humidity: 52 % RH

**Tested by:** Rueyyan Lin **Polarity:** Hor. / Ver.

Horizontal Correction Result-PK Result-AV Reading-PK Reading-AV Limit-PK Limit-AV Frequency Margin Factor Remark (MHz) (dBµV) (dBµV)  $(dB\mu V/m)$  $(dB\mu V/m)$  $(dB\mu V/m)$  $(dB\mu V/m)$ (dB)(dB/m) -14.22 70.28 56.06 43.93 -10.07 AVG 1214.00 58.15 74.00 54.00 4950.00 51.54 -4.23 47.31 74.00 54.00 -------6.69 Peak

Vertical									
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1268.00	65.64		-14.10	51.55		74.00	54.00	-2.45	Peak
3225.00	57.06		-7.78	49.28		74.00	54.00	-4.72	Peak
4995.00	51.96		-4.12	47.85		74.00	54.00	-6.15	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

4. Data of measurement within this frequency range shown "----" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



Operation Mode:	TX / draft 802.11n Wide-40 MHz Channel mode / CH Mid	Test
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Cest Date: December 16, 2008

**Temperature:** 23°C

Humidity: 52 % RH

Tested by: Rueyyan Lin Polarity: Hor. / Ver.

	Horizontal								
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1212.00	70.37	58.42	-14.23	56.14	44.19	74.00	54.00	-9.81	AVG
3255.00	53.70		-7.74	45.97		74.00	54.00	-8.03	Peak
4950.00	51.08		-4.23	46.84		74.00	54.00	-7.16	Peak
				Vertic	al				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1240.00	66.37		-14.16	52.21		74.00	54.00	-1.79	Peak
3255.00	63.73	60.24	-7.74	55.99	52.50	74.00	54.00	-1.50	AVG
4890.00	60.21	45.09	-4.39	55.82	40.70	74.00	54.00	-13.30	AVG

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

*3.* Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



<b>Operation Mode:</b>	TX / draft 802.11n Wide-40 MHz Channel mode / CH High	Tes
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Cest Date: December 16, 2008

**Temperature:** 23°C

Humidity: 52 % RH

Tested by: Rueyyan Lin Polarity: Hor. / Ver.

	Horizontal								
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1208.00	70.62	58.14	-14.24	56.38	43.90	74.00	54.00	-10.10	AVG
2460.00	106.02		-8.89	97.12					Carrier
5025.00	50.83		-4.06	46.77		74.00	54.00	-7.23	Peak
				Vertic	al				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1250.00	65.50		-14.14	51.36		74.00	54.00	-2.64	Peak
3270.00	57.24		-7.71	49.53		74.00	54.00	-4.47	Peak
4980.00	50.63		-4.15	46.48		74.00	54.00	-7.52	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

*3.* Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



**Operation Mode:** RX / IEEE 802.11g / CH Mid

**Temperature:** 19.3°C

Humidity: 61 % RH

Test Date: December 09, 2008 Tested by: Gundam

Polarity: Hor. / Ver.

Horizontal									
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	58.01		-14.73	43.28		74.00	54.00	-10.72	Peak
1391.00	56.00		-13.80	42.19		74.00	54.00	-11.81	Peak
2496.00	55.79		-8.85	46.94		74.00	54.00	-7.06	Peak
5658.00	51.60		-3.11	48.49		74.00	54.00	-5.51	Peak
				Vertic	al				
Frequency (MHz)	Reading-PK (dBµV)	Reading-AV (dBµV)	Correction Factor (dB/m)	Result-PK (dBµV/m)	Result-AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-AV (dBµV/m)	Margin (dB)	Remark
1000.00	61.84		-14.73	47.11		74.00	54.00	-6.89	Peak
1331.50	58.41		-13.95	44.46		74.00	54.00	-9.54	Peak
2487.50	59.25		-8.86	50.39		74.00	54.00	-3.61	Peak
10868.50	49.15		3.65	52.80		74.00	54.00	-1.20	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.

3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

4. Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



# 8.9 POWERLINE CONDUCTED EMISSIONS

# LIMIT

According to \$15.207(a) & RSS-Gen \$7.2.2, except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dBµV)			
(191112)	Quasi-peak	Average		
0.15 to 0.50	66 to 56*	56 to 46*		
0.50 to 5	56	46		
5 to 30	60	50		

\* Decreases with the logarithm of the frequency.

# **TEST CONFIGURATION**

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

# TEST PROCEDURE

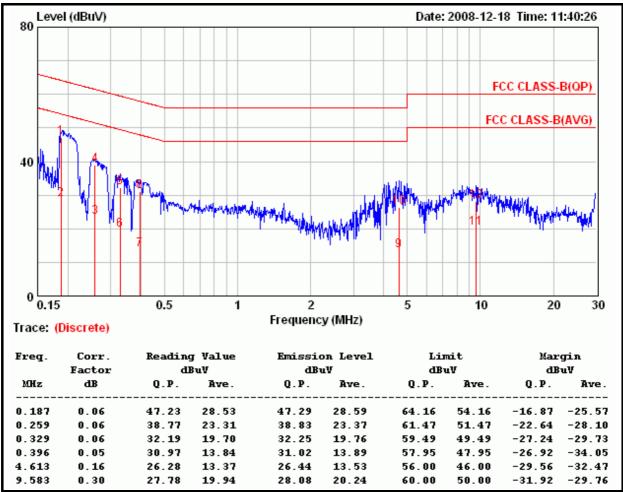
- 1. The EUT was placed on a table, which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all frequency measured were complete.



# TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

<b>Operation Mode:</b>	Normal Link	Line:	LINE
Temperature:	22°C	Test Date:	December 18, 2008
Humidity:	45% RH	Tested by:	Rueyyan Lin



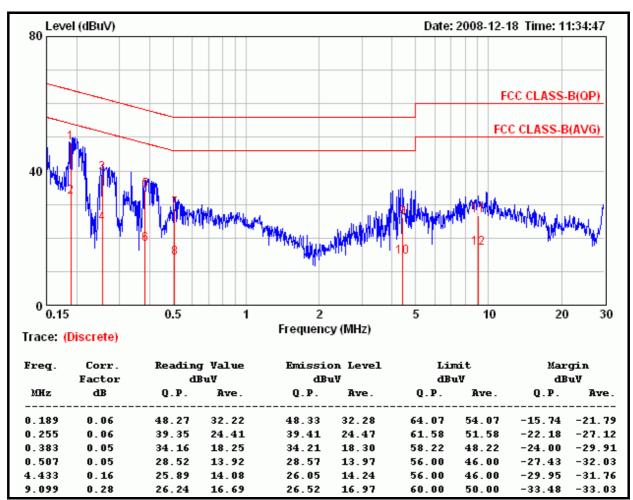
**Remark:** 

1. Correction Factor = Insertion loss + cable loss

2. Margin value = Emission level – Limit value



<b>Operation Mode:</b>	Normal Link	Line:	NEUTRAL
Temperature:	22°C	Test Date:	December 18, 2008
Humidity:	45% RH	Tested by:	Rueyyan Lin



**Remark:** 

1. Correction Factor = Insertion loss + cable loss

2. Margin value = Emission level – Limit value



# APPENDIX I RADIO FREQUENCY EXPOSURE

# LIMIT

According to \$15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See \$ 1.1307(b)(1) of this chapter.

### **EUT Specification**

EUT	802.11n 2x2 PCIe Minicard transceiver						
	WLAN: 2.412GHz ~ 2.462GHz						
Frequency band	WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz						
(Operating)	WLAN: 5.745GHz ~ 5.825GHz						
	Others						
	Portable (<20cm separation)						
Device category	Mobile (>20cm separation)						
	Others						
	Occupational/Controlled exposure ( $S = 5 \text{mW/cm}^2$ )						
<b>Exposure classification</b>	General Population/Uncontrolled exposure						
	$(S=1mW/cm^2)$						
	Single antenna						
	Multiple antennas						
Antenna diversity	Tx diversity						
	Rx diversity						
	$\square$ Tx/Rx diversity						
	IEEE 802.11b: 19.158 dBm ( 82.389 mW )						
May autout name	IEEE 802.11g: 25.31 dBm ( 339.625 mW )						
Max. output power	draft 802.11n Standard-20 MHz: 24.95 dBm ( 312.608 mW )						
	draft 802.11n Wide -40 MHz: 25.85 dBm ( 384.592 mW )						
Antonno goin (Max)	1. PIFA Antenna / Gain: 3.62 dBi (Numeric gain: 2.30)						
Antenna gain (Max)	2. Dipole Antenna / Gain: 3.2 dBi (Numeric gain: 2.09)						
	MPE Evaluation*						
Evaluation applied	SAR Evaluation						
	N/A						
n 1							

#### Remark:

1. The maximum output power is <u>25.85dBm (235.749 mW) at 2437MHz (with 3.62 numeric antenna gain.)</u>

2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.

3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm2 even if the calculation indicates that the power density would be larger.

# **TEST RESULTS**

No non-compliance noted.



### **Calculation**

Given

 $E = \frac{\sqrt{30 \times P \times G}}{d} \& S = \frac{E^2}{3770}$ Where E = Field strength in Volts / meter P = Power in Watts G = Numeric antenna gain d = Distance in meters S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770d^2}$$

Changing to units of mW and cm, using:

$$P(mW) = P(W) / 1000$$
 and  
 $d(cm) = d(m) / 100$ 

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$
 Equation 1  
Where  $d = Distance$  in  $cm$   
 $P = Power$  in  $mW$   
 $G = Numeric$  antenna gain  
 $S = Power$  density in  $mW/cm^2$ 

#### Maximum Permissible Exposure

Substituting the MPE safe distance using d = 20 cm into Equation 1:

Yields

 $S = 0.000199 \times P \times G$ 

*Where* P = Power in mW

G = Numeric antenna gain

 $S = Power density in mW/cm^2$ 

#### IEEE 802.11b mode:

EUT output power = 82.389 mW Numeric Antenna gain = 3.62

C

 $\rightarrow$  Power density = 0.037716 mW / cm<sup>2</sup>

## IEEE 802.11g mode:

EUT output power = 339.625 mW

Numeric Antenna gain = 3.62

 $\rightarrow$  Power density = 0.155499 mW / cm<sup>2</sup>

### draft 802.11n Standard-20 MHz Channel mode:

EUT output power = 312.608 mW

Numeric Antenna gain = 3.62

 $\rightarrow$  Power density = 0.143130 mW/cm<sup>2</sup>

### draft 802.11n Wide-40 MHz Channel mode:

EUT output power = 384.592 mW

Numeric Antenna gain = 3.62

 $\rightarrow$  Power density = 0.176088 mW / cm<sup>2</sup>

(For mobile or fixed location transmitters, the maximum power density is  $1.0 \text{ mW/cm}^2$  even if the calculation indicates that the power density would be larger.)