FCC 47 CFR PART 15 SUBPART C AND ANSI C63.4 : 2003

TEST REPORT

For

WIRELESS N MODULE

Model : WMP-N07

Trade Name : TRENDnet

Issued for

TRENDware International, Inc.

20675 Manhanttan Place, Torrance, CA 90501, USA

Issued by

Compliance Certification Services Inc.
Hsinchu Lab.
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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	05/07/2009	Initial Issue	All Page 176	Alex Chiu

TABLE OF CONTENTS

1. TEST REPORT CERTIFICATION

Applicant ：TRENDware International, Inc.

Address ：20675 Manhanttan Place, Torrance, CA 90501, USA

Equipment Under Test ：WIRELESS N MODULE

Model ：WMP-N07

Trade Name ：TRENDnet

Tested Date ：June 29 ~ July 11, 2007 ; February 27 ~ March 26, 2009

APPLICABLE STANDARD	
STANDARD	**TEST RESULT**
FCC Part 15 Subpart C AND ANSI C63.4:2003	No non-compliance noted

Approved by:

Alex Chiu
Director

Reviewed by:

Alan Fan
Team Leader

WE HEREBY CERTIFY THAT: The measurements shown in the attachment were made in accordance with the procedures indicated, and the energy emitted by the equipment was found to be within the limits applicable. We assume full responsibility for the accuracy and completeness of these measurements and vouch for the qualifications of all persons taking them.

2. EUT DESCRIPTION

2.1 DESCRIPTION OF EUT & POWER

Product Name	WIRELESS N MODULE
Model Number	WMP-N07
Frequency Range	IEEE 802.11b/g, 802.11n HT20 : 2412MHz～2462MHz IEEE 802.11n HT40 : 2422MHz～2452MHz
Transmit Power	IEEE 802.11b : 22.71dBm IEEE 802.11g : 20.82dBm IEEE 802.11n HT20 : 20.61dBm IEEE 802.11n HT40 : 20.47dBm
Channel Spacing	IEEE 802.11b/g, 802.11n HT20/HT40 : 5MHz
Channel Number	IEEE 802.11b/g,802.11n HT20 : 11 Channels IEEE 802.11n HT40 : 7 Channels
Transmit Data Rate	IEEE 802.11b: 11, 5.5, 2, 1Mbps IEEE 802.11g : 54, 48 ,36, 24, 18, 12, 11, 9, 6Mbps IEEE 802.11n HT20: 130, 117 ,104, 78, 65, 58.5, 52, 39, 26, 19.5, 13, 6.5 Mbps IEEE 802.11n HT40: 270, 243 ,216, 162, 135, 121.5, 108, 81, 54, 40.5, 27, 13.5Mbps
Type of Modulation	IEEE 802.11b : DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g : OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20/40 : OFDM (64QAM, 16QAM, QPSK, BPSK)
Frequency Selection	by software / firmware
Antenna Type	(1) ARISTOTLE Dipole Antenna, Antenna Gain 2.5 dBi at 2.4GHz (× 3), Model:RFA-02-L4H1 (RF cable without emi core) (2) ARISTOTLE Dipole Antenna, Antenna Gain 2.5 dBi at 2.4GHz (× 3), Model:RFA-02-L4M3, Connector Type: SMA Plug Reverse (3) MY-CHANCE Dipole Antenna, Antenna Gain 2 dBi at 2.4GHz (× 3), Model:13OSRP-A, Connector Type: SMA Plug Reverse (4) WHA-YU Dipole Antenna, Antenna Gain 2 dBi at 2.4GHz (× 3), Model:C037-510734-A, Connector Type: SMA Plug Reverse (5) Dipole Antenna, Antenna Gain 2.1 dBi at 2.4GHz (× 2), Model: THW0551A/Gray, Connector Type: RP-SMA(M)

Antenna Type	(6) Dipole Antenna, Antenna Gain 2.0 dBi at 2.4GHz (× 2), Model: THW1428A/Black, Connector Type: RP-SMA(M) (7) Dipole Antenna, Antenna Gain 1.8 dBi at 2.4GHz (× 2), Model: C037-510695-A/Black, Connector Type: SMA Plug Reverse (8) Dipole Antenna, Antenna Gain 1.8 dBi at 2.4GHz (× 2), Model: C037-510825-A/White, Connector Type: SMA Plug Reverse (9) Dipole Antenna, Antenna Gain 2.24 dBi at 2.4GHz (× 2), Model: THW0157A/Black, Connector Type: RP-SMA(M) (10) Dipole Antenna, Antenna Gain 2 dBi at 2.4GHz (× 2), Model: C037-510960-A/White, Connector Type: I-PEX MHF (11) PIFA Antenna, Antenna Gain 2 dBi at 2.4GHz (× 2), Model: IFF-L005MPAX-508
Power Source	3.3 VDC (From Notebook PC, Powered From Host Device)
Note	Ralink RF Module Model : RT2820 + RT2860

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: S9ZCAMWMPN07 filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.

3. For more details, please refer to the User's manual of the EUT.

4. This report is transferred from 90227002.

3. DESCRIPTION OF TEST MODES

The EUT comes with two types for sales, the detail information please refer the table as below :

Antenna List	Type
1. Dipole Antenna, Model:RFA-02-L4H1 (worst case)	2T3R
2. Dipole Antenna, Model:RFA-02-L4M3	
3. Dipole Antenna, Model:13OSRP-A	
4. Dipole Antenna, Model:C037-510734-A	
5. Dipole Antenna, Model:THW0551A	2T2R
6. Dipole Antenna, Model:THW1428A	
7. Dipole Antenna, Model:C037-510695-A	
8. Dipole Antenna, Model:C037-510825-A	
9. Dipole Antenna, Model:THW0157A	
10. Dipole Antenna, Model:C037-510960-A	
11. PIFA Antenna, Model:IFF-L009MPAX-508 (worst case)	

After evaluated the samples, antenna 1 and antenna 11 (worst case) are chosen as representative.

The RF chipset is manufactured by Ralink Technology, Corp.

IEEE 802.11b, 802.11g, 802.11n HT20 mode

The EUT had been tested under operating condition.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	2412
Middle	2437
High	2462

IEEE 802.11b mode : 11Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11g mode : 6Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11n HT20 mode : 6.5Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11n HT40 mode

The EUT had been tested under operating condition.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	2422
Middle	2437
High	2452

IEEE 802.11n HT40 mode : 6.5Mbps data rate (worst case) were chosen for full testing.

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4:2003 and FCC CRF 47 15.207, 15.209 and 15.247.

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 C63.4:2003 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 preselectors 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 LISTINGS

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	90585, 90584
Japan	VCCI	3/10 meter Open Area Test Sites to perform conducted/radiated measurements	R-1229/1189 C-1250/1294
Taiwan	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
Taiwan	BSMI	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

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

6. CALIBRATION AND UNCERTAINTY

6.1 MEASURING INSTRUMENT CALIBRATION

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

6.2 MEASUREMENT UNCERTAINTY

The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4.

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 1000 MHz	+/- 3.2 dB
Radiated Emission, 1 to 26.5GHz	+/- 3.2 dB
Power Line Conducted Emission	+/- 2.1 dB

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

7. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Notebook PC	DELL	Latitude D610	CN-0C4708-48643-625-5565	E2K24BNHM
2	Notebook PC	HP	Compaq nx6130	CNU543274R	CNTWM3B2200BGA
3	Wireless Access Point	D-Link	DWL-7100AP	DQ6114B00002	KA22003040018-1
4	Modem	ZyXEL	Omni 56K	S1Z4107727	1880MN156K
5	Printer	HP	hp desk jet 948c	CN19S6S1XS	DoC

SETUP DIAGRAM FOR TESTS

EUT & peripherals setup diagram is shown in appendix setup photos.

EUT OPERATING CONDITION

For RF :

1. Set up all computers like the setup diagram.
2. The “Ralink QA Test Program for RT 2860 ver1.0.0.2” software was used for testing.
   The EUT driver software installed in the host support equipment during testing was RT2860 QATEST PCI WDM Driver.
   (1) **TX Mode**
   - ⇨ **Tx Data Rate:** MCS=3; LP 11Mbps Bandwidth 20 (IEEE 802.11b mode)
     MCS=0; 6Mbps Bandwidth 20 (IEEE 802.11g mode)
     MCS=0; 6.5Mbps Bandwidth 20 (IEEE 802.11n HT20 mode)
     MCS=0; 6.5Mbps Bandwidth 40 (IEEE 802.11n HT40 mode)
   - ⇨ **Power control : Dipole Antenna**
     IEEE 802.11b Channel Low (2412MHz) TX Power0 0B (only chain0 TX)
     IEEE 802.11b Channel Mid (2437MHz) TX Power0 11 (only chain0 TX)
     IEEE 802.11b Channel High (2462MHz) TX Power0 12 (only chain0 TX)
     IEEE 802.11g Channel Low (2412MHz) TX Power0 0F (only chain0 TX)
     IEEE 802.11g Channel Mid (2437MHz) TX Power0 13 (only chain0 TX)
     IEEE 802.11g Channel High (2462MHz) TX Power0 14 (only chain0 TX)
     IEEE 802.11n HT20 Channel Low (2412MHz) TX Power0 0B / TX Power1 13
     IEEE 802.11n HT20 Channel Mid (2437MHz) TX Power0 0E / TX Power1 13
     IEEE 802.11n HT20 Channel High (2462MHz) TX Power0 0F / TX Power1 14
     IEEE 802.11n HT40 Channel Low (2422MHz) TX Power0 08 / TX Power1 0F
     IEEE 802.11n HT40 Channel Mid (2437MHz) TX Power0 0E / TX Power1 13
     IEEE 802.11n HT40 Channel High (2452MHz) TX Power0 0B / TX Power1 10

⇨ **Power control : PIFA Antenna**

IEEE 802.11b Channel Low (2412MHz) TX Power0 08 (only chain0 TX)
IEEE 802.11b Channel Mid (2437MHz) TX Power0 0F (only chain0 TX)
IEEE 802.11b Channel High (2462MHz) TX Power0 11 (only chain0 TX)
IEEE 802.11g Channel Low (2412MHz) TX Power0 0C (only chain0 TX)
IEEE 802.11g Channel Mid (2437MHz) TX Power0 10 (only chain0 TX)
IEEE 802.11g Channel High (2462MHz) TX Power0 11 (only chain0 TX)
IEEE 802.11n HT20 Channel Low (2412MHz) TX Power0 08 / TX Power1 13
IEEE 802.11n HT20 Channel Mid (2437MHz) TX Power0 0B / TX Power1 13
IEEE 802.11n HT20 Channel High (2462MHz) TX Power0 0D / TX Power1 13
IEEE 802.11n HT40 Channel Low (2422MHz) TX Power0 03 / TX Power1 0E
IEEE 802.11n HT40 Channel Mid (2437MHz) TX Power0 0A / TX Power1 11
IEEE 802.11n HT40 Channel High (2452MHz) TX Power0 07 / TX Power1 0E

(2) **RX Mode**：Start RX

3. All of the function are under run.
4. Start test.

For Normal operating :

1. Set up all computers like the setup diagram.
2. All of the function are under run.
3. Notebook PC (2) ping 192.168.0.10 –t to Notebook PC (1).
4. Notebook PC (1) ping 192.168.0.20 –t to Notebook PC (2).
5. Notebook PC (1) ping 192.168.0.50 –t to Wireless Access Point (3).
6. Start test.

8. APPLICABLE LIMITS AND TEST RESULTS

8.1 6dB BANDWIDTH

LIMIT

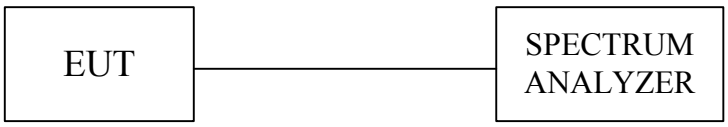
§ 15.207(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
SPECTRUM ANALYZER	ROHDE & SCHWARZ	FSEK30	835253/002	10/17/2007
SPECTRUM ANALYZER	AGILENT	E4446A	MY433601.32	03/05/2008

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

TEST SETUP



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

IEEE 802.11b MODE

Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	12150	500	PASS
Middle	2437	12200	500	PASS
High	2462	12150	500	PASS

IEEE 802.11g MODE

Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16550	500	PASS
Middle	2437	16550	500	PASS
High	2462	16550	500	PASS

IEEE 802.11n HT20 mode (Two TX)

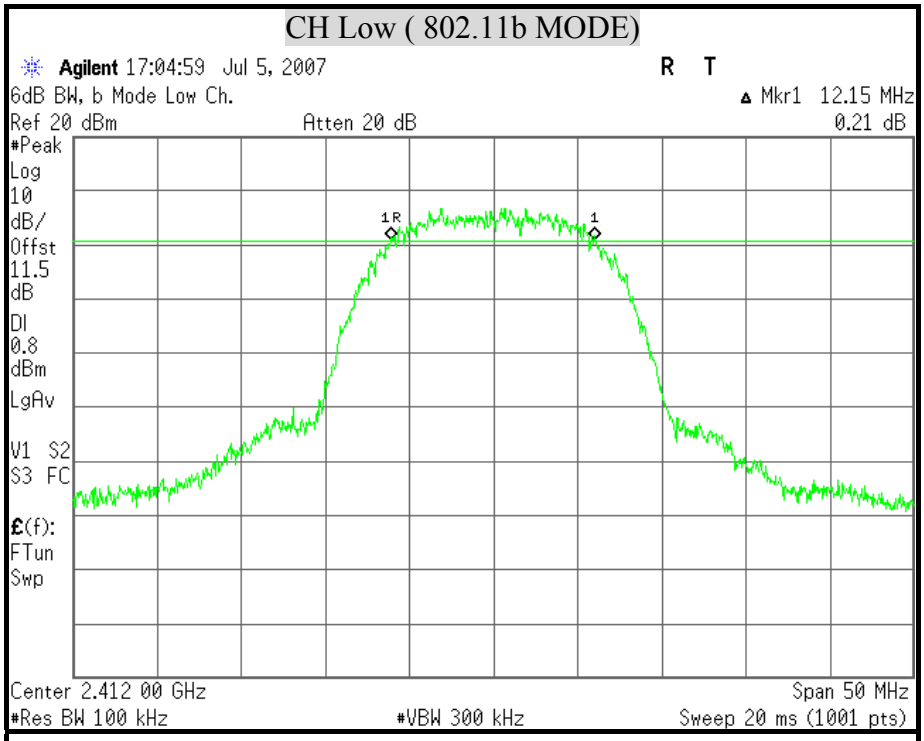
Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)		Minimum Limit (kHz)	Pass / Fail
		Chain 0	Chain 1		
Low	2412	17700	17750	500	PASS
Middle	2437	17700	17700	500	PASS
High	2462	17700	17700	500	PASS

IEEE 802.11n HT40 mode (Two TX)

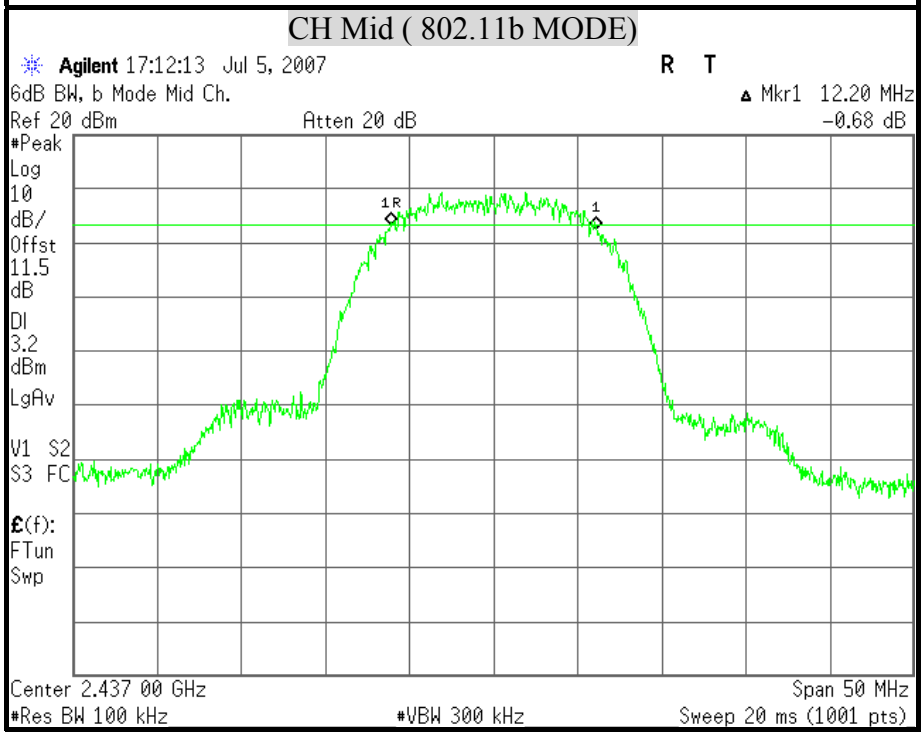
Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)		Minimum Limit (kHz)	Pass / Fail
		Chain 0	Chain 1		
Low	2422	36350	36400	500	PASS
Middle	2437	36400	36400	500	PASS
High	2452	36350	36400	500	PASS

6dB BANDWIDTH (802.11b MODE)

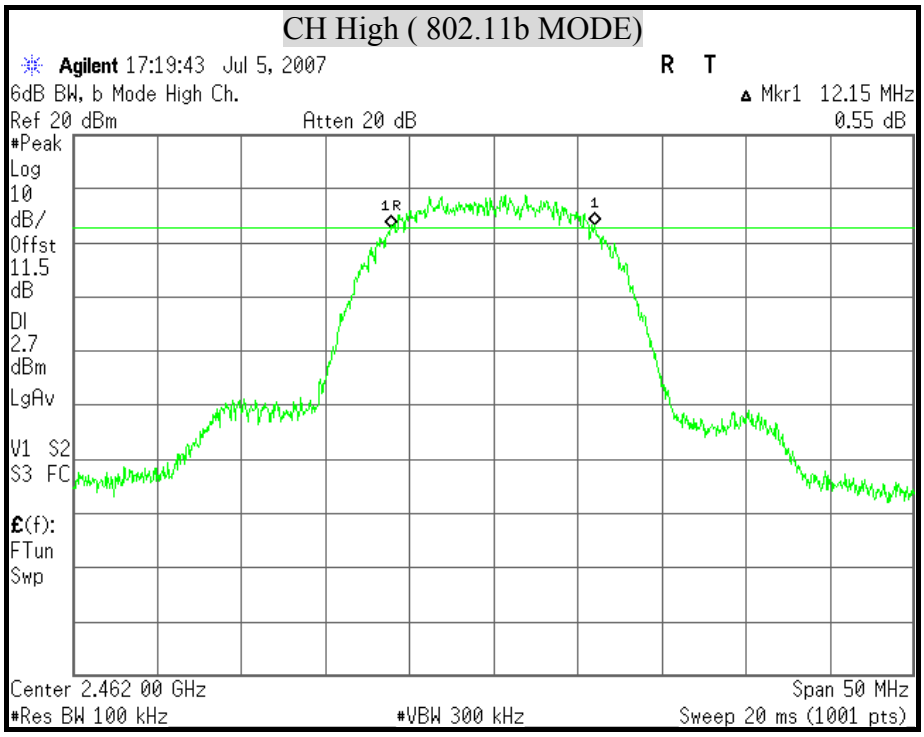
CH Low (802.11b MODE)



CH Mid (802.11b MODE)

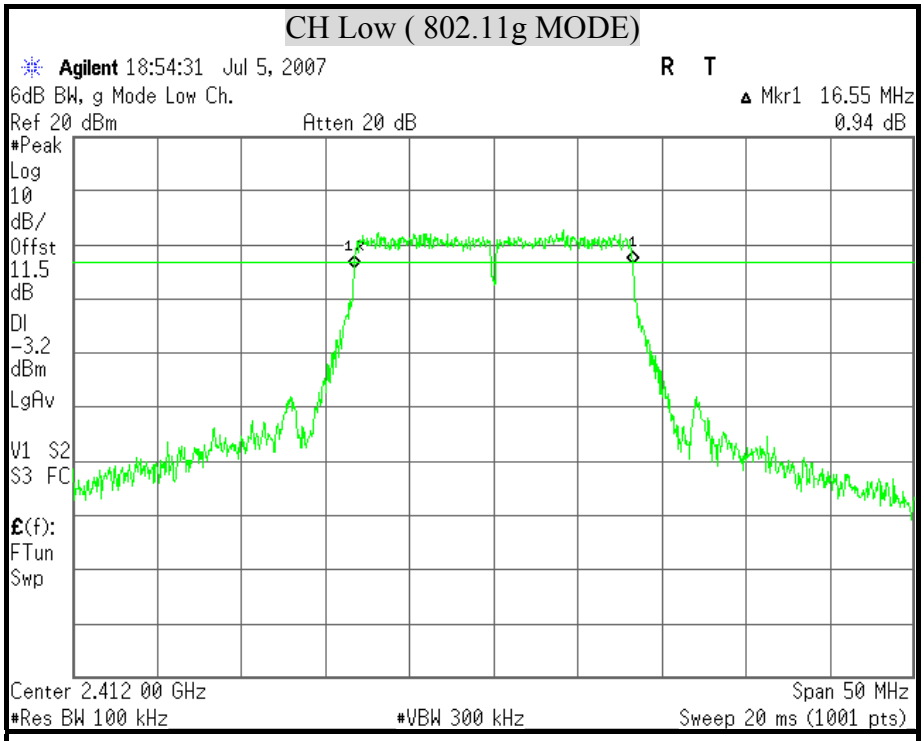


CH High (802.11b MODE)

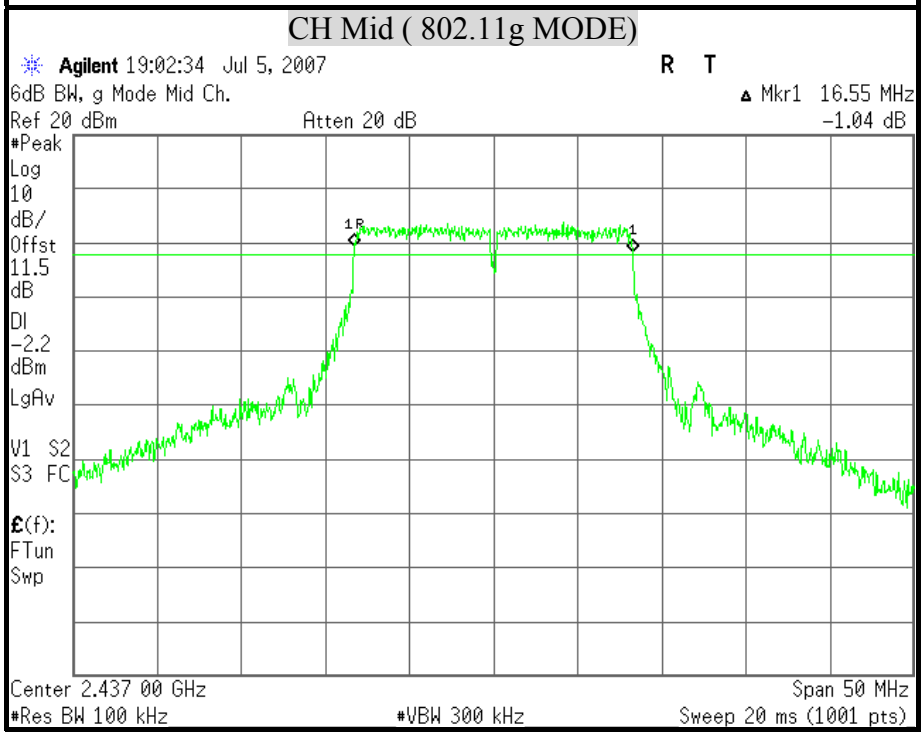


6dB BANDWIDTH (802.11g MODE)

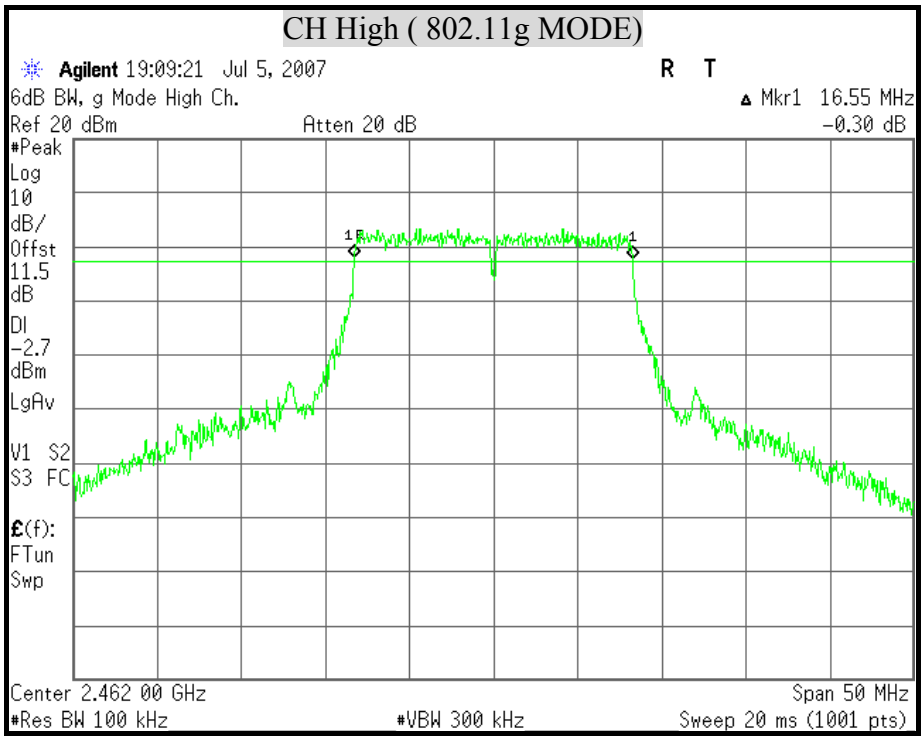
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

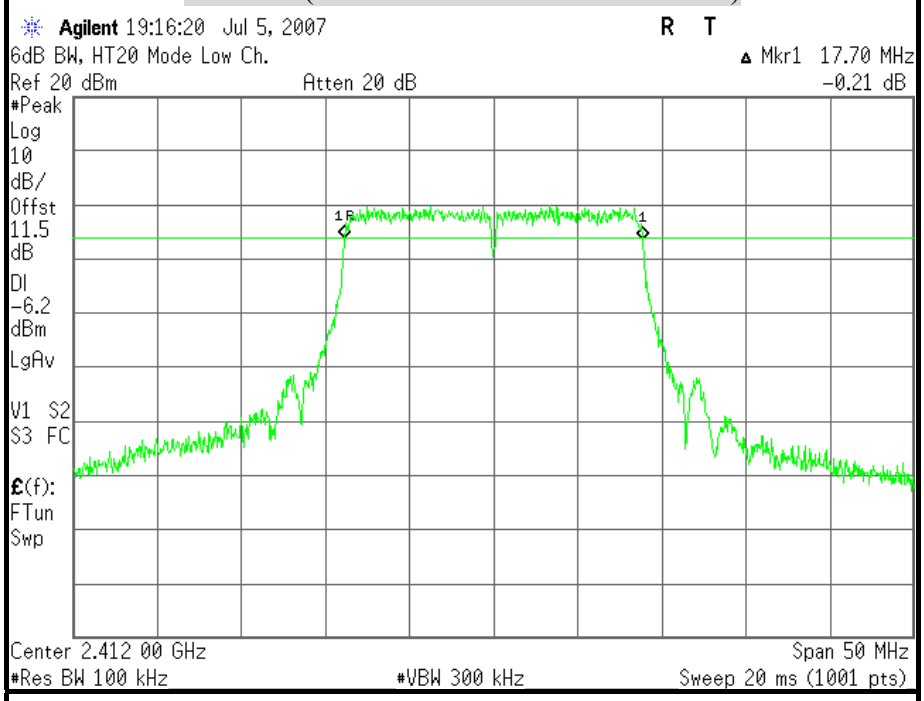


CH High (802.11g MODE)

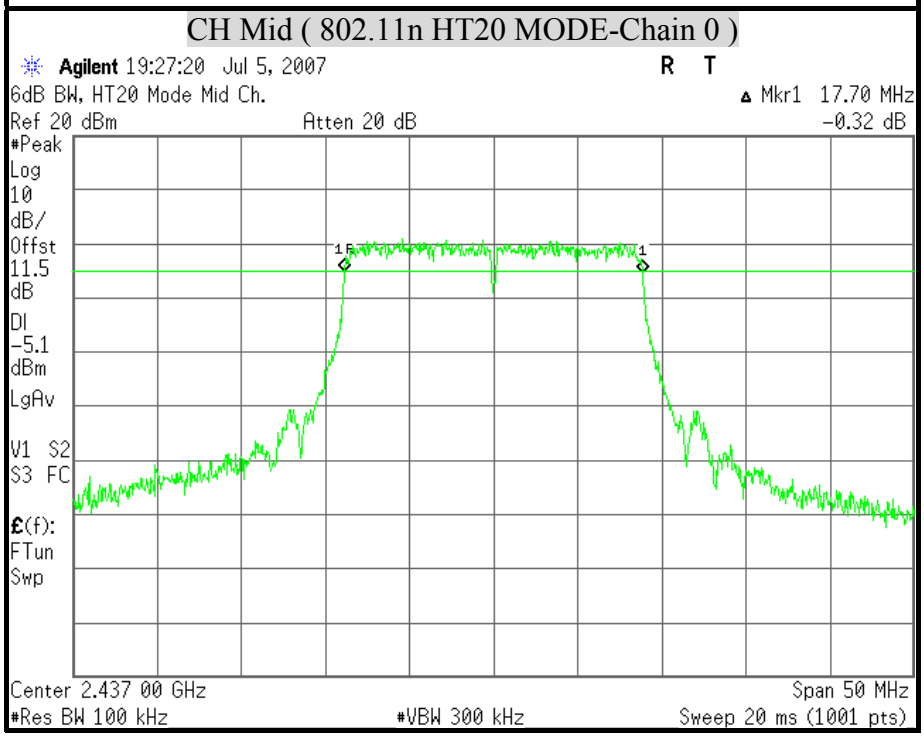


6dB BANDWIDTH (802.11n HT20 MODE)

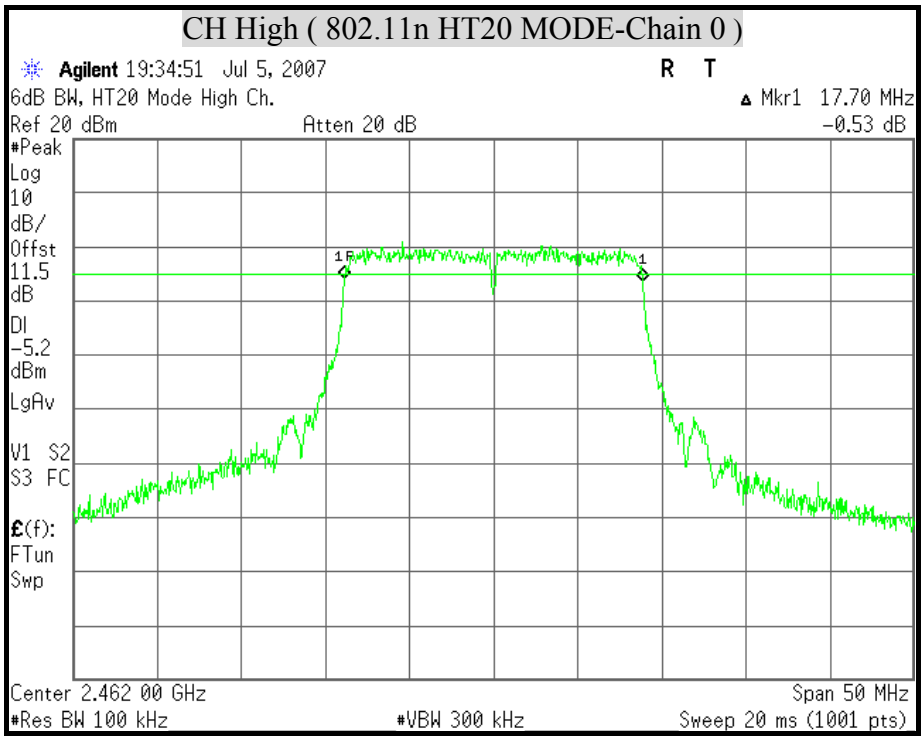
CH Low (802.11n HT20 MODE-Chain 0)



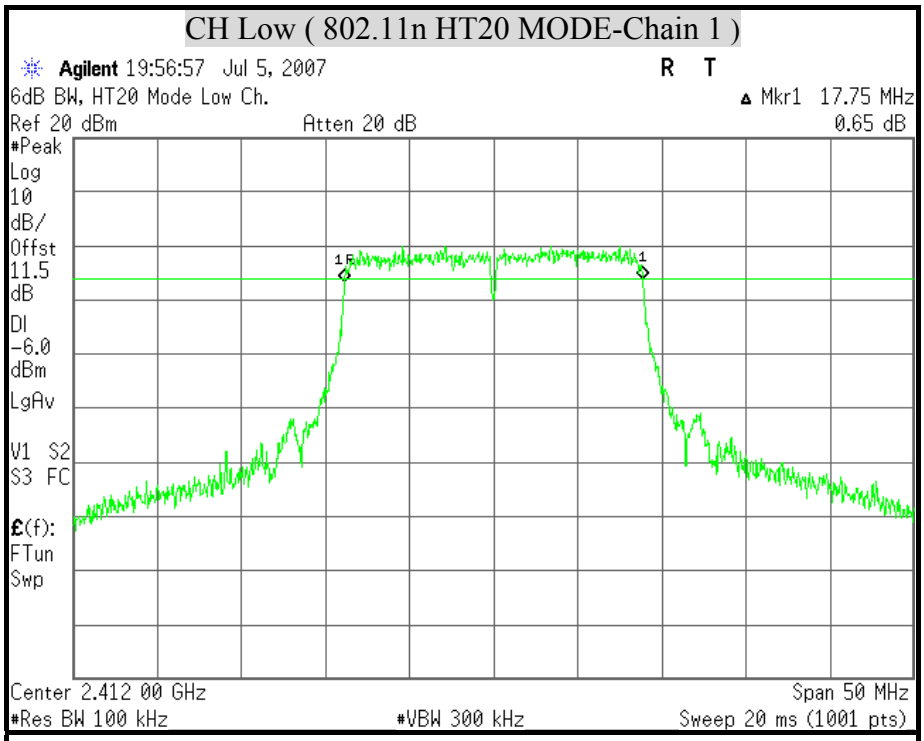
CH Mid (802.11n HT20 MODE-Chain 0)



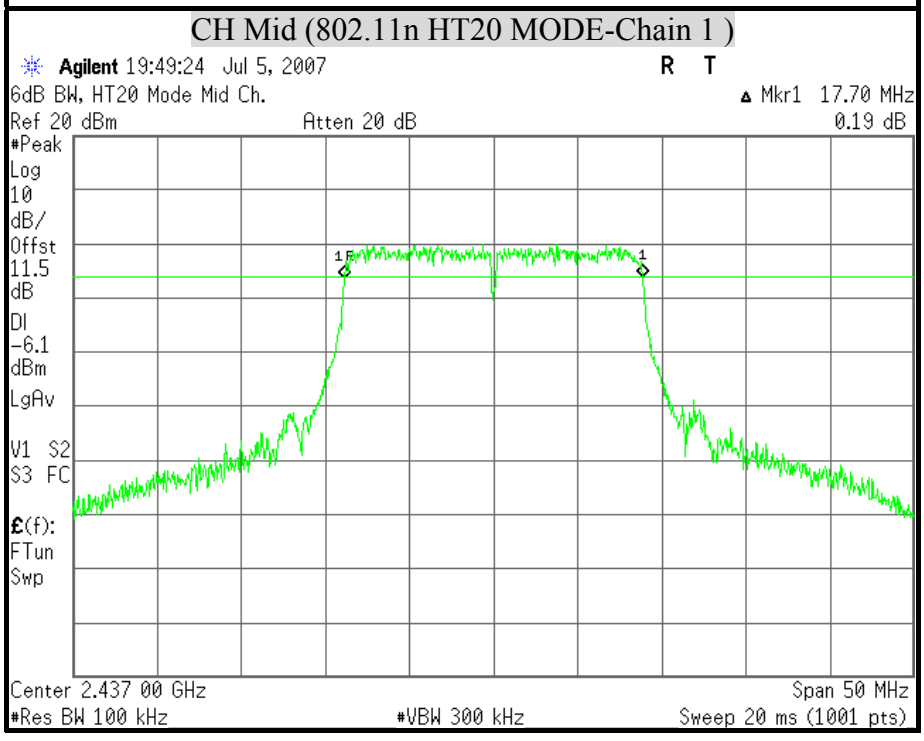
CH High (802.11n HT20 MODE-Chain 0)



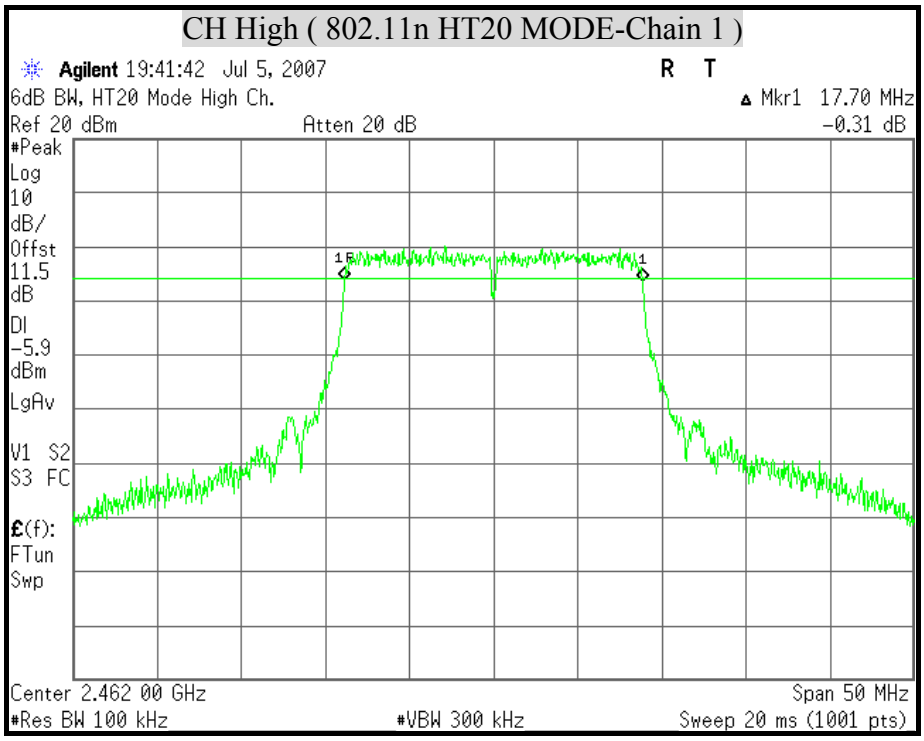
CH Low (802.11n HT20 MODE-Chain 1)



CH Mid (802.11n HT20 MODE-Chain 1)

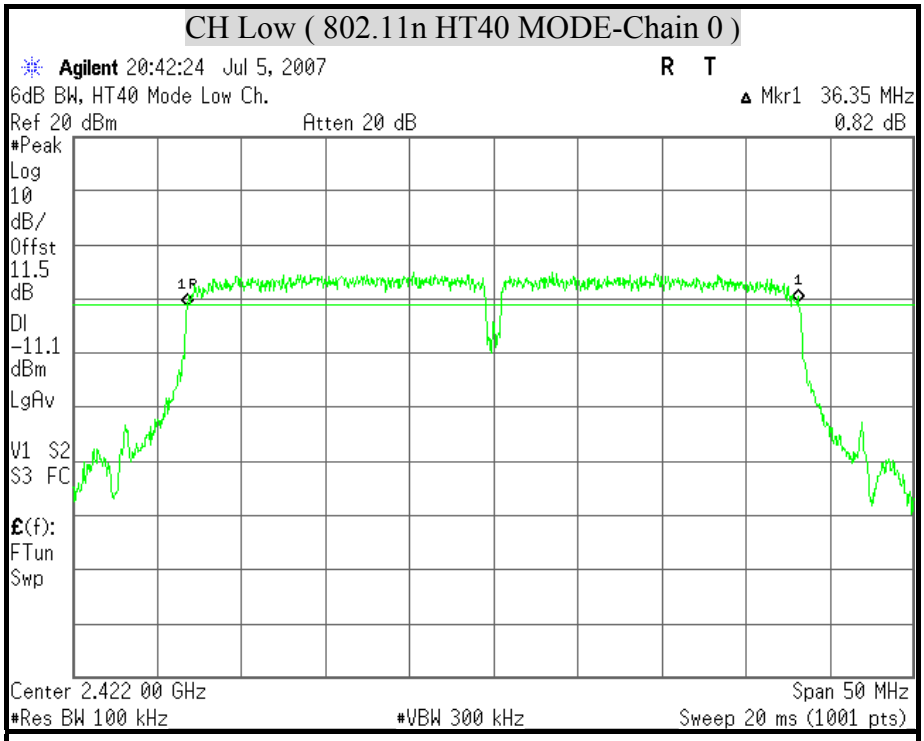


CH High (802.11n HT20 MODE-Chain 1)

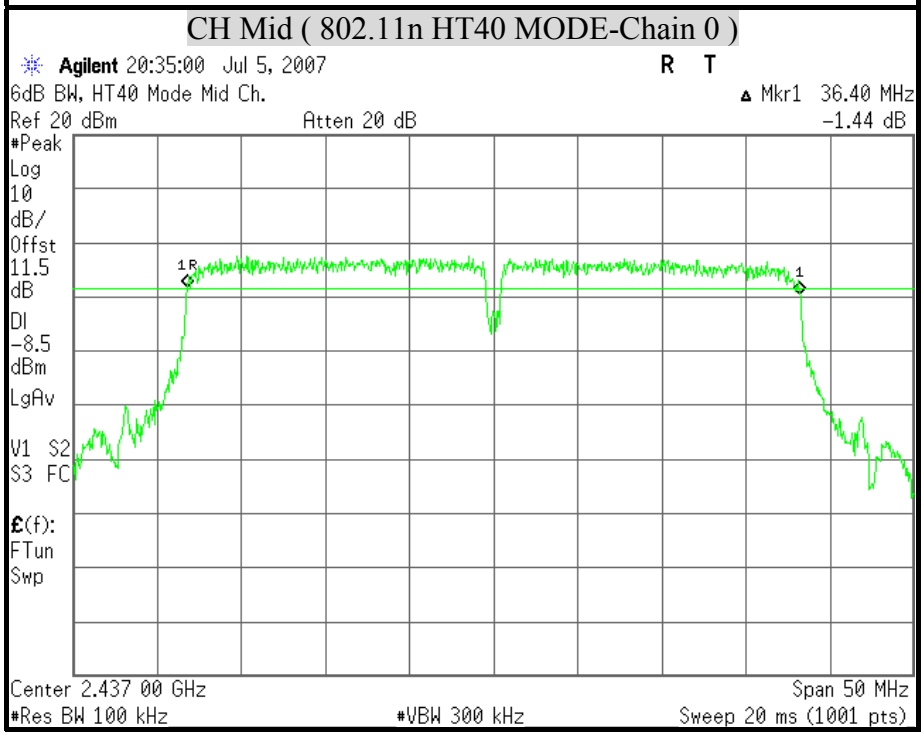


6dB BANDWIDTH (802.11n HT40 MODE)

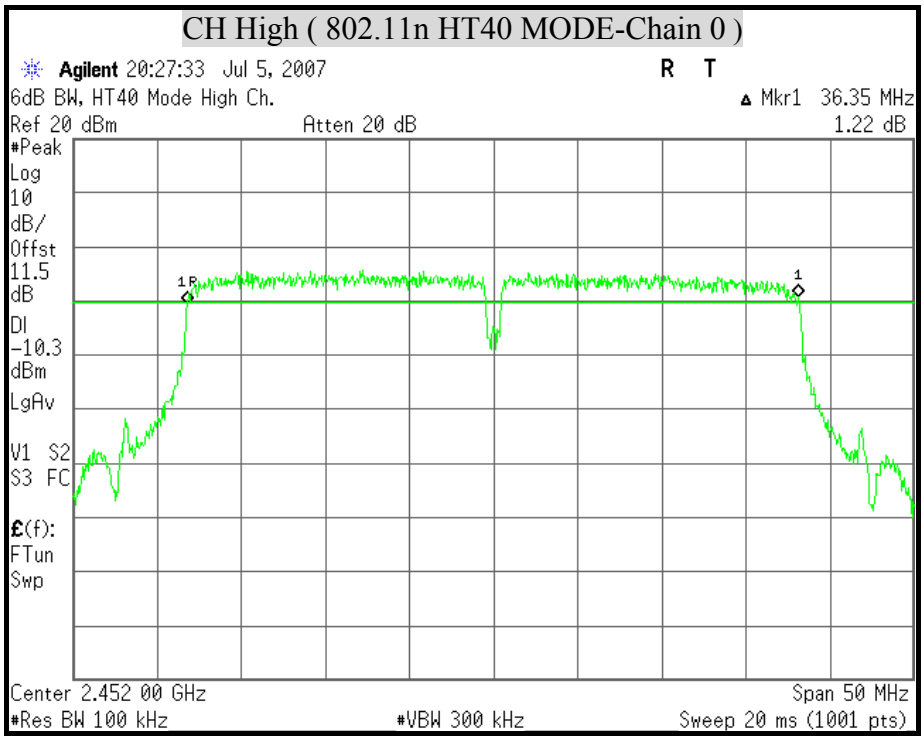
CH Low (802.11n HT40 MODE-Chain 0)



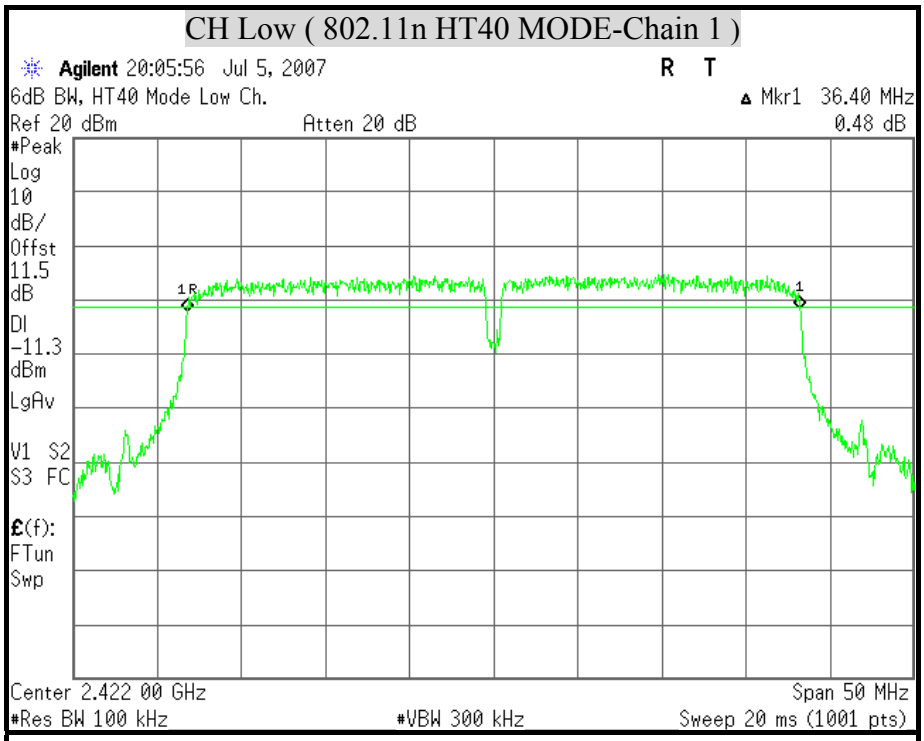
CH Mid (802.11n HT40 MODE-Chain 0)



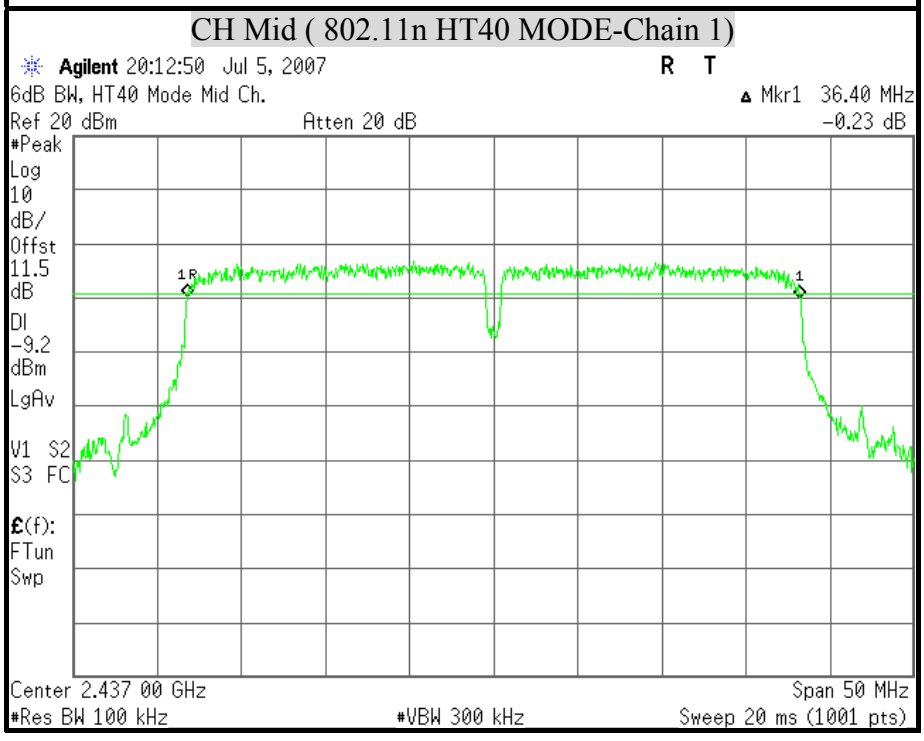
CH High (802.11n HT40 MODE-Chain 0)



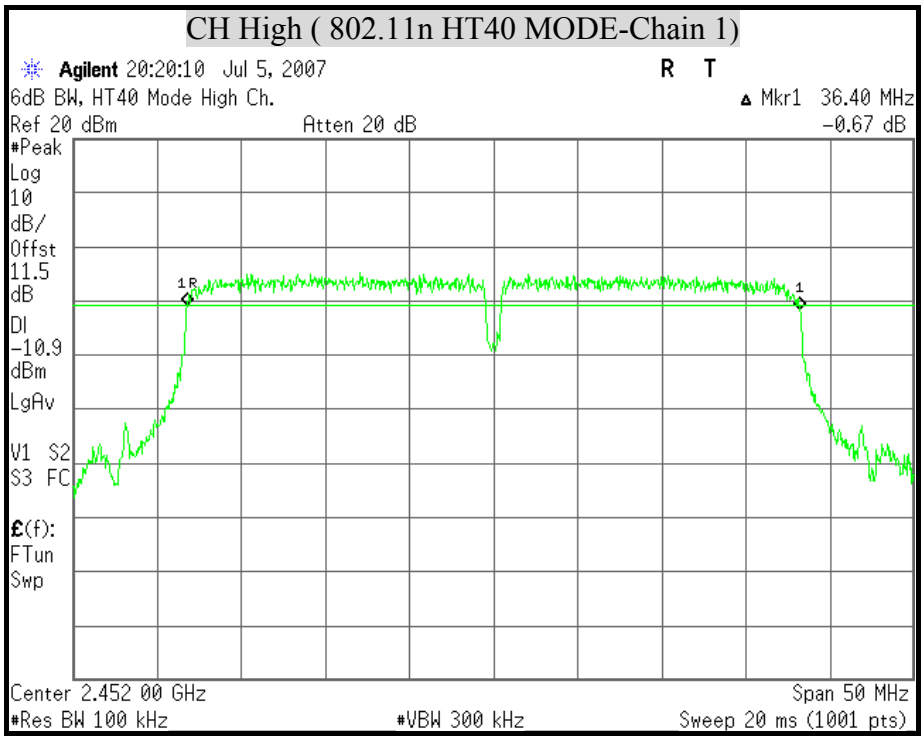
CH Low (802.11n HT40 MODE-Chain 1)



CH Mid (802.11n HT40 MODE-Chain 1)



CH High (802.11n HT40 MODE-Chain 1)



8.2 99% BANDWIDTH

LIMIT

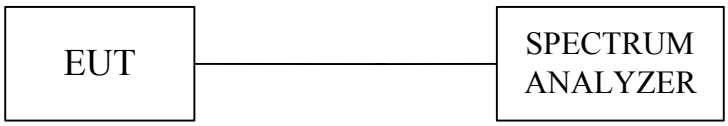
None; for reporting purposes only.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
SPECTRUM ANALYZER	AGILENT	E4446A	MY43360132	06/05/2009
SPECTRUM ANALYZER	AGILENT	E4446A	MY46180323	05/21/2009

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

TEST SETUP



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 RESULTS

No non-compliance noted

IEEE 802.11b MODE

Channel	Channel Frequency (MHz)	99% Occupied power bandwidth (MHz)
Low	2412	15.30
Middle	2437	15.23
High	2462	15.24

IEEE 802.11g MODE

Channel	Channel Frequency (MHz)	99% Occupied power bandwidth (MHz)
Low	2412.00	16.37
Middle	2437.00	16.43
High	2462.00	16.38

IEEE 802.11n HT20 mode (Two TX)

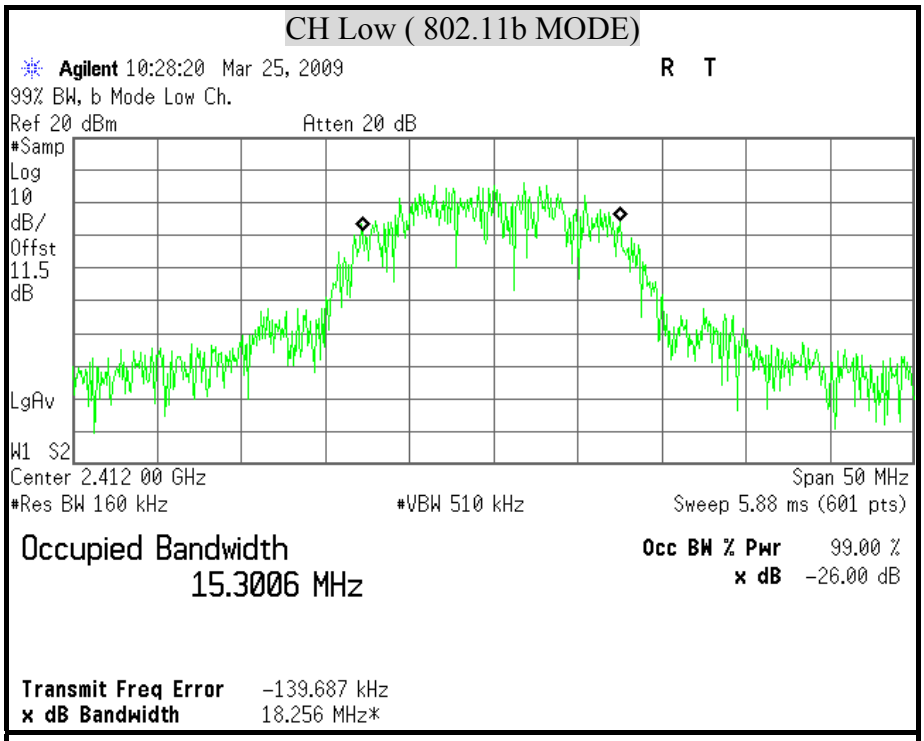
Channel	Channel Frequency (MHz)	99% Occupied power bandwidth (MHz)	
		Chain 0	Chain 1
Low	2412.00	17.57	17.56
Middle	2437.00	17.47	17.52
High	2462.00	17.46	17.52

IEEE 802.11n HT40 mode (Two TX)

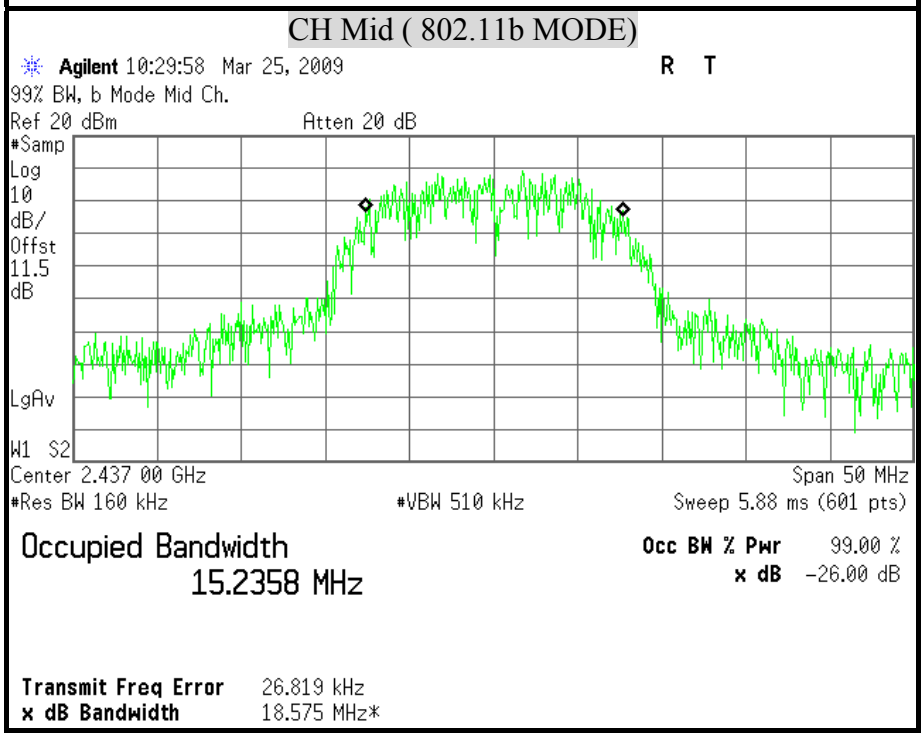
Channel	Channel Frequency (MHz)	99% Occupied power bandwidth (MHz)	
		Chain 0	Chain 1
Low	2422.00	35.72	36.01
Middle	2437.00	35.94	35.93
High	2452.00	35.83	35.83

99% BANDWIDTH (802.11b MODE)

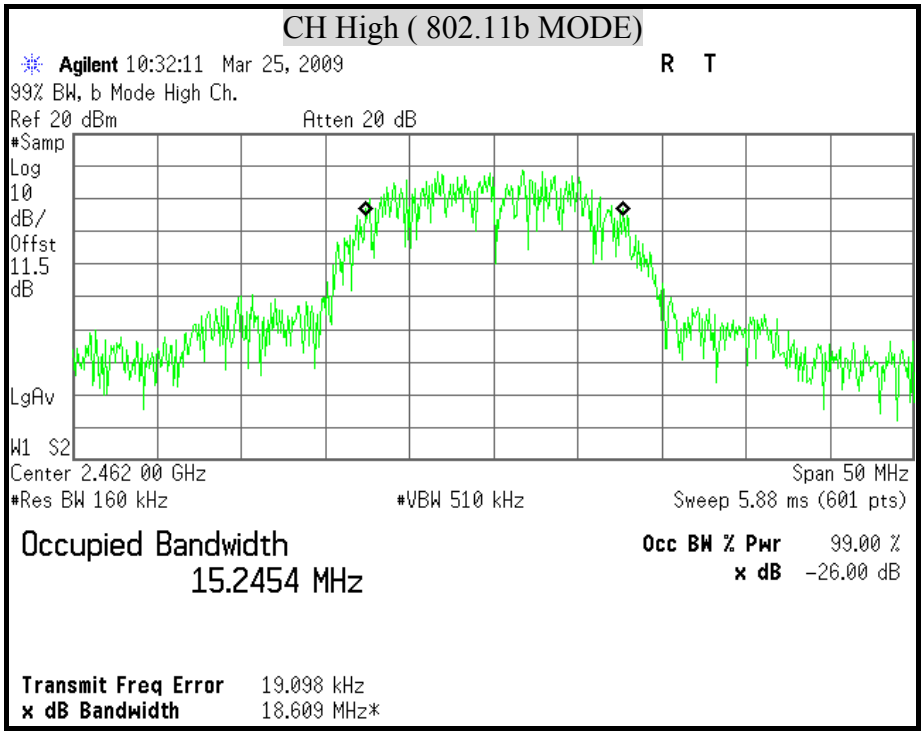
CH Low (802.11b MODE)



CH Mid (802.11b MODE)

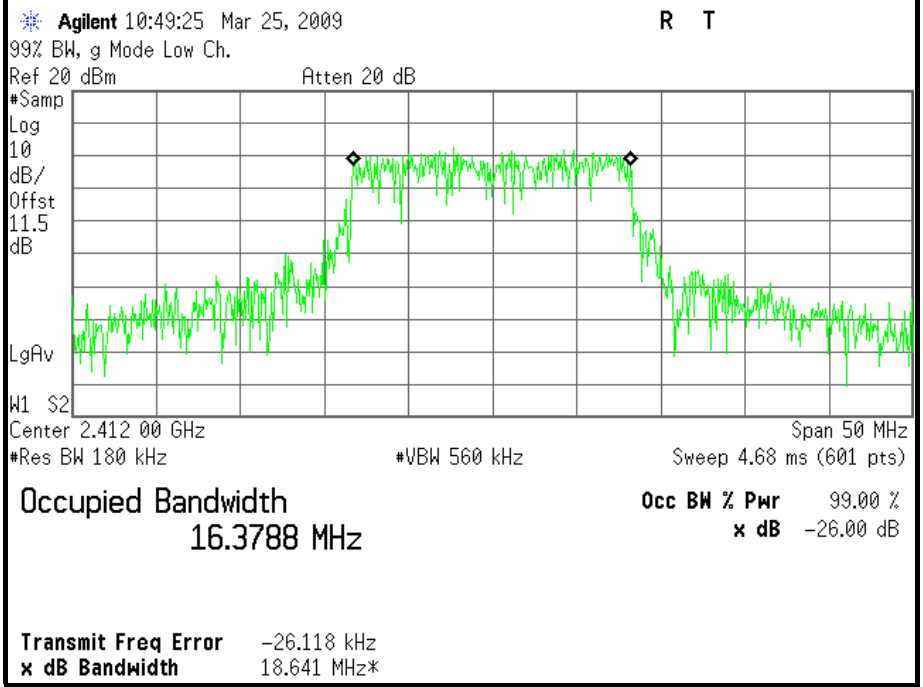


CH High (802.11b MODE)

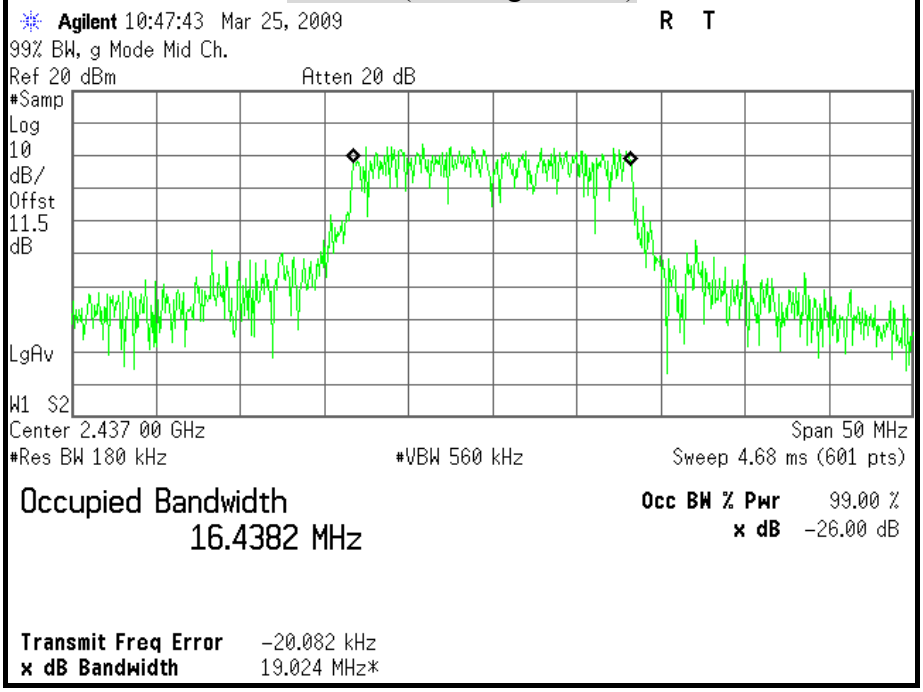


99% BANDWIDTH (802.11g MODE)

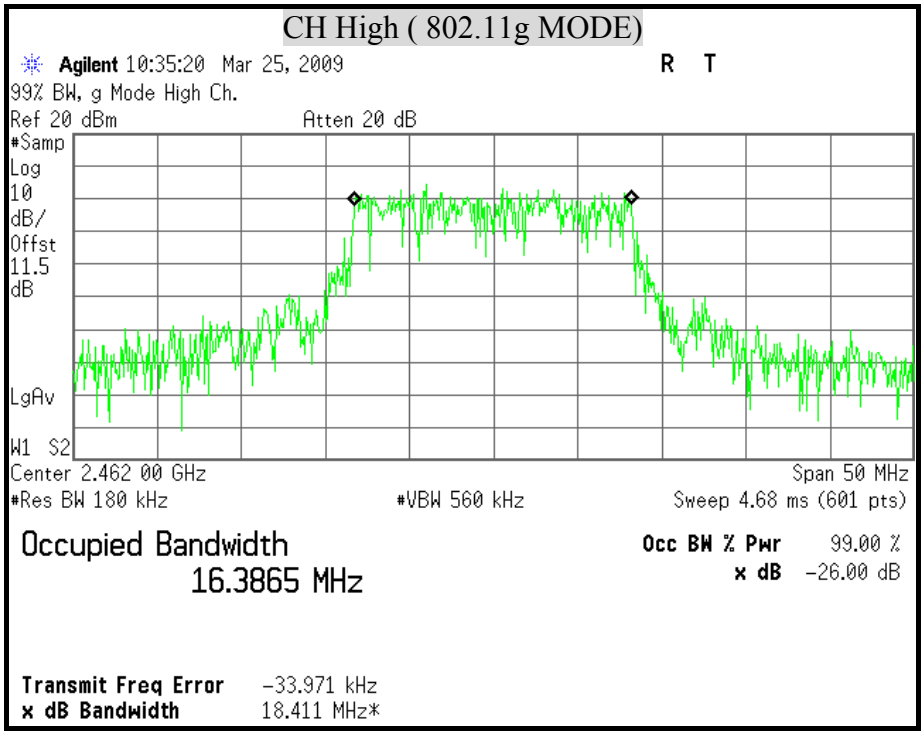
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

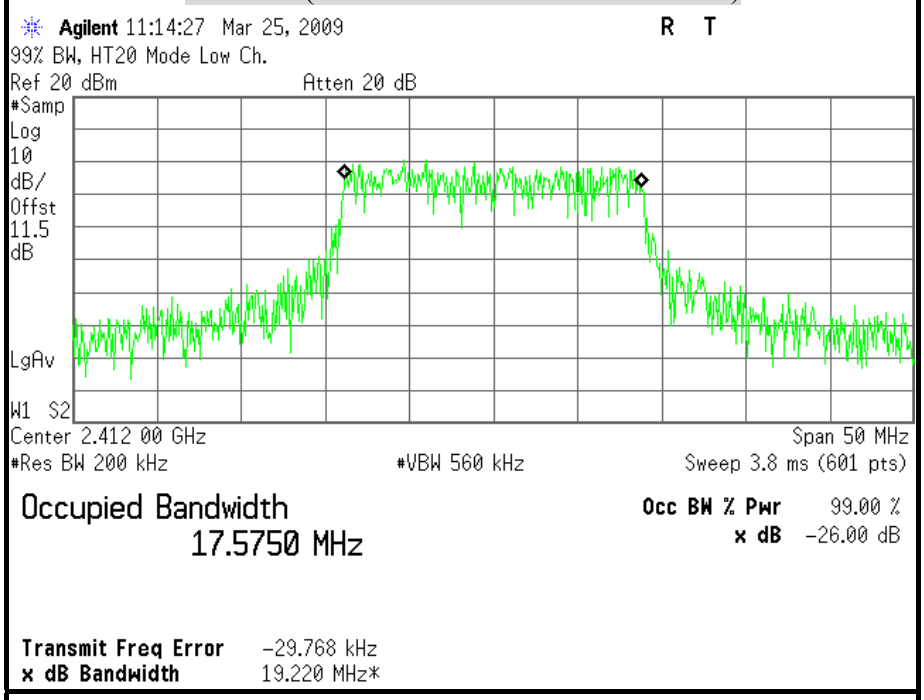


CH High (802.11g MODE)

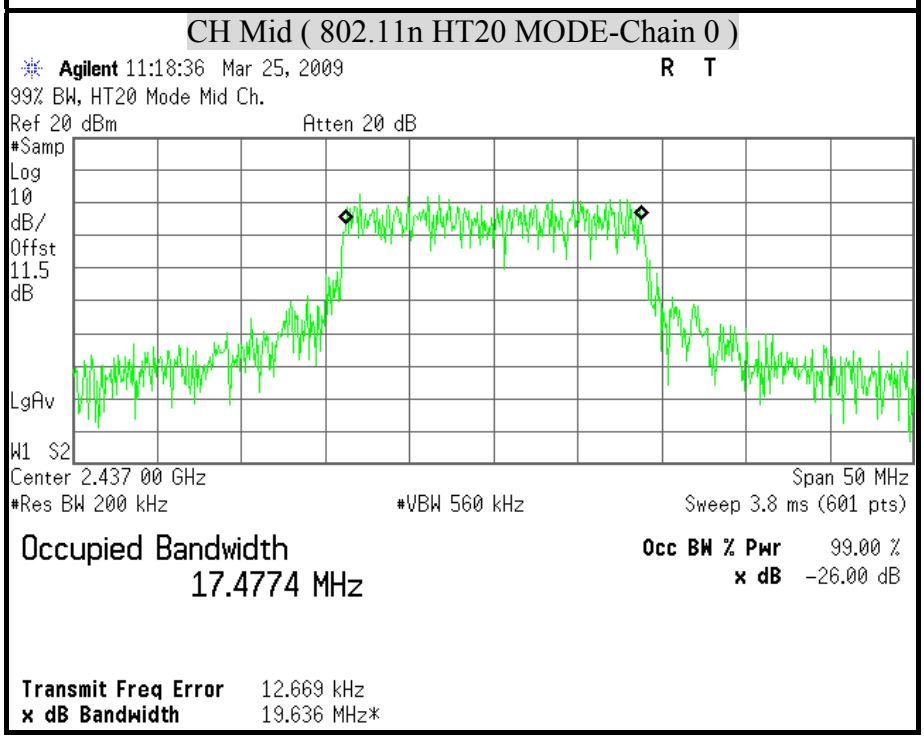


99% BANDWIDTH (802.11n HT20 MODE)

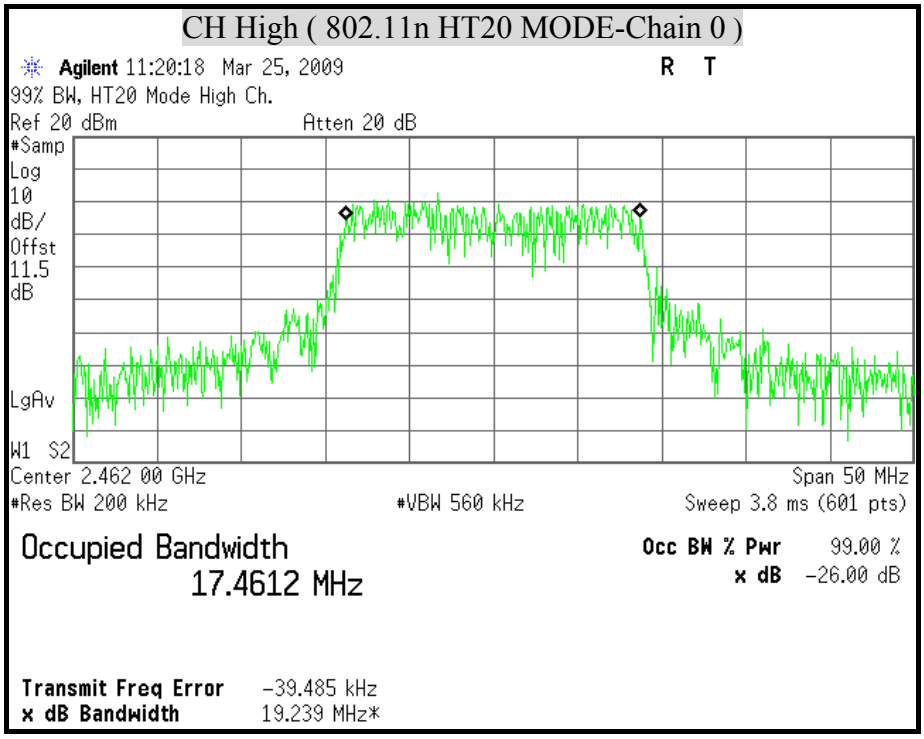
CH Low (802.11n HT20 MODE-Chain 0)



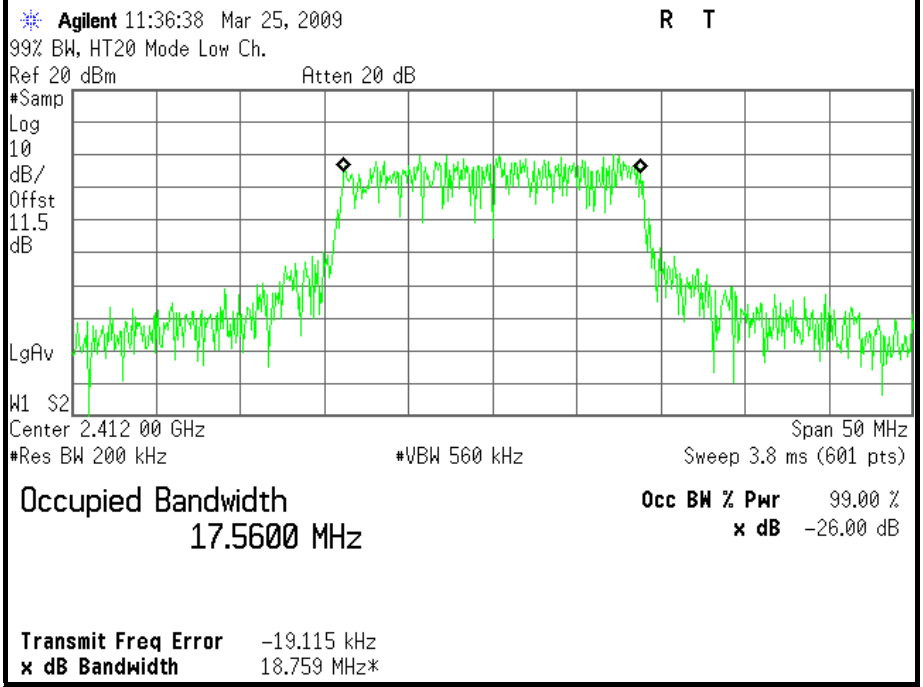
CH Mid (802.11n HT20 MODE-Chain 0)



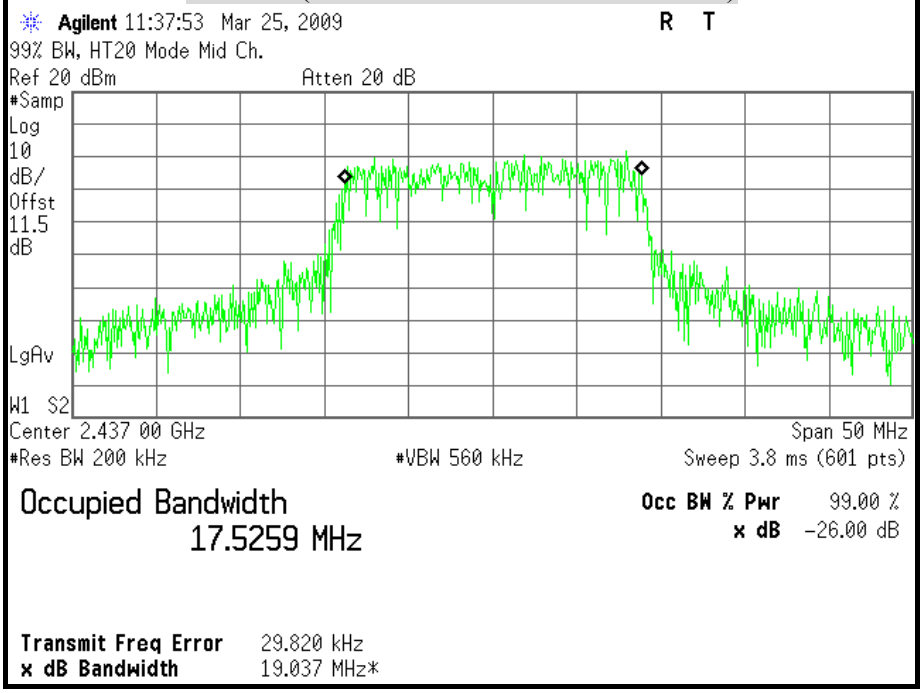
CH High (802.11n HT20 MODE-Chain 0)



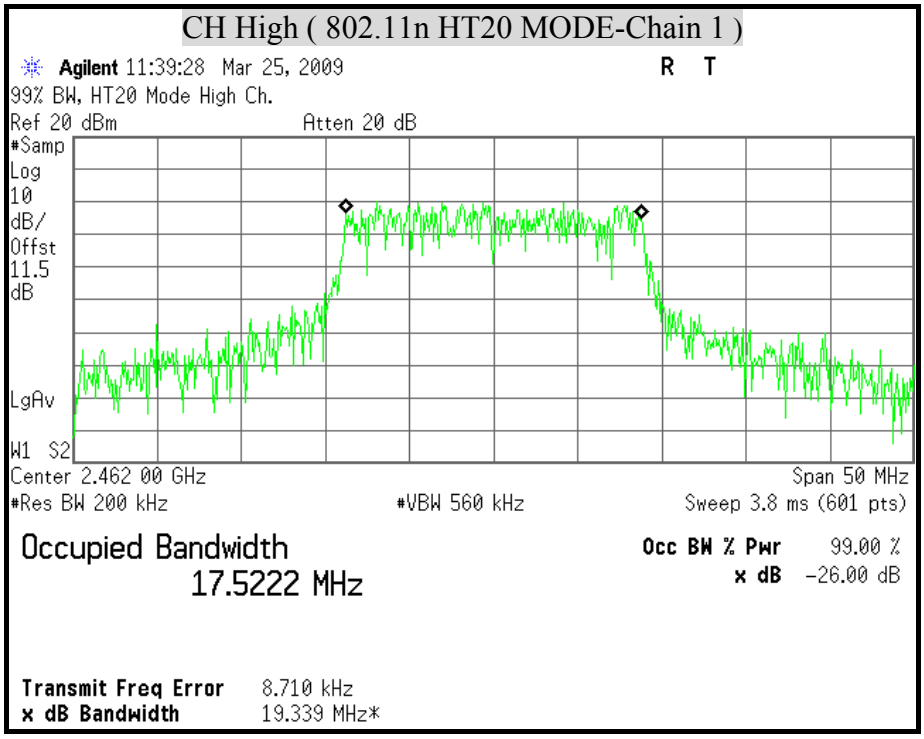
CH Low (802.11n HT20 MODE-Chain 1)



CH Mid (802.11n HT20 MODE-Chain 1)

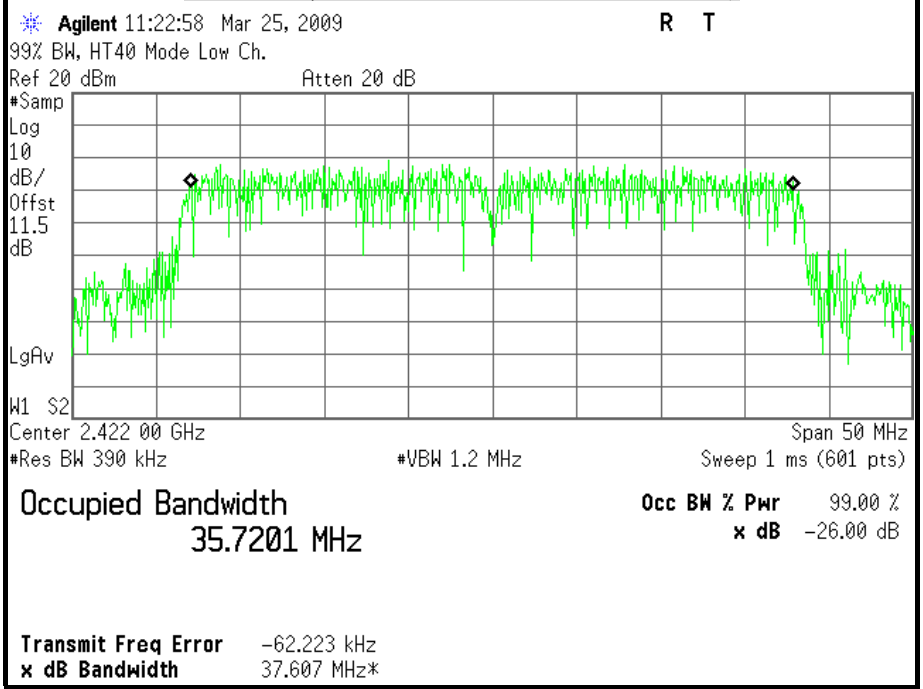


CH High (802.11n HT20 MODE-Chain 1)

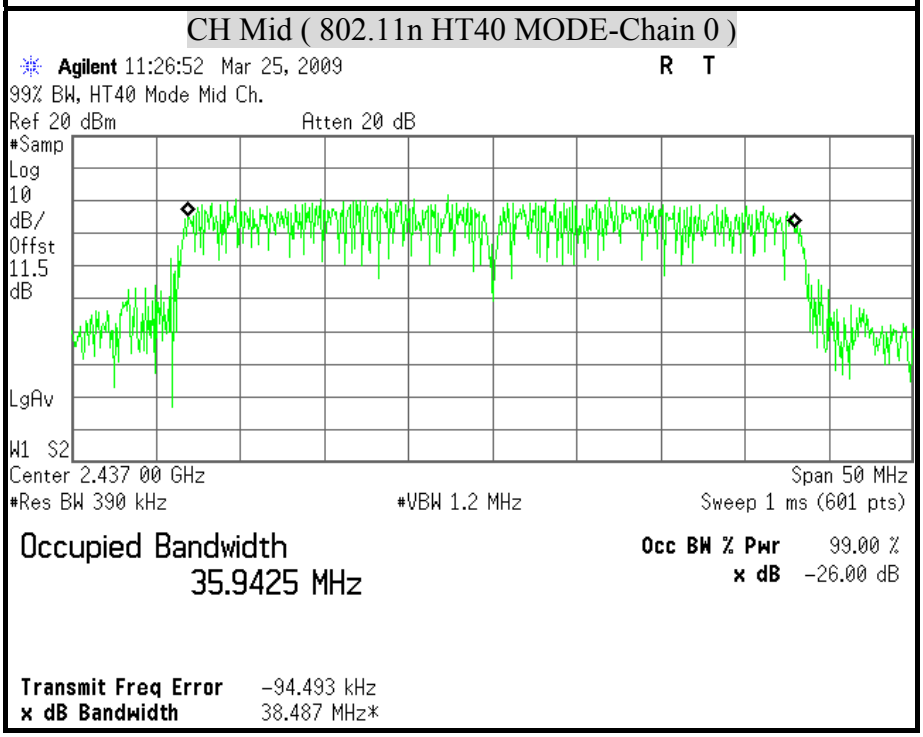


99% BANDWIDTH (802.11n HT40 MODE)

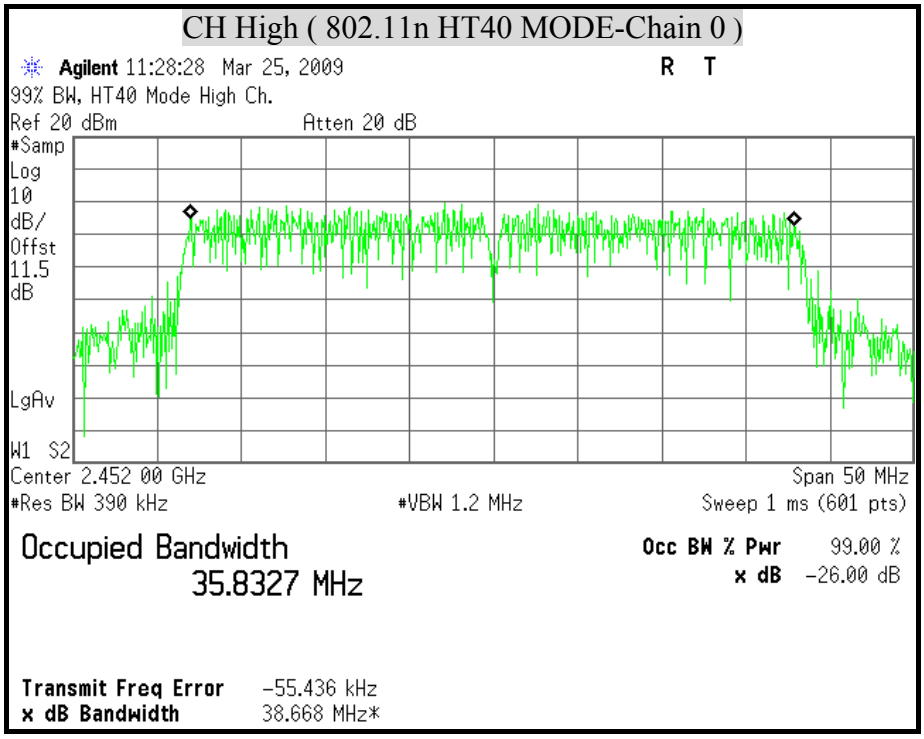
CH Low (802.11n HT40 MODE-Chain 0)



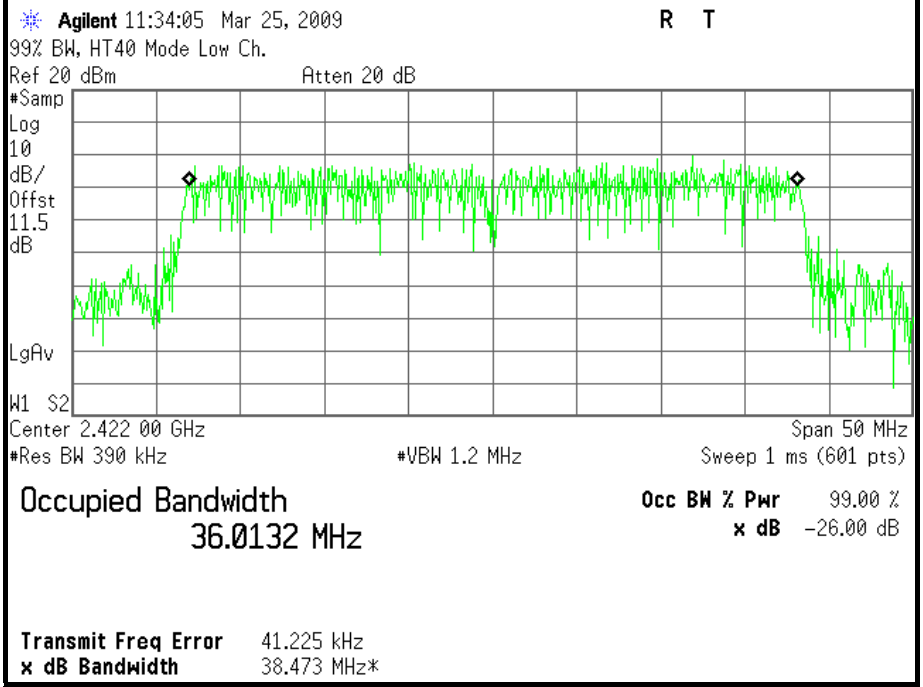
CH Mid (802.11n HT40 MODE-Chain 0)



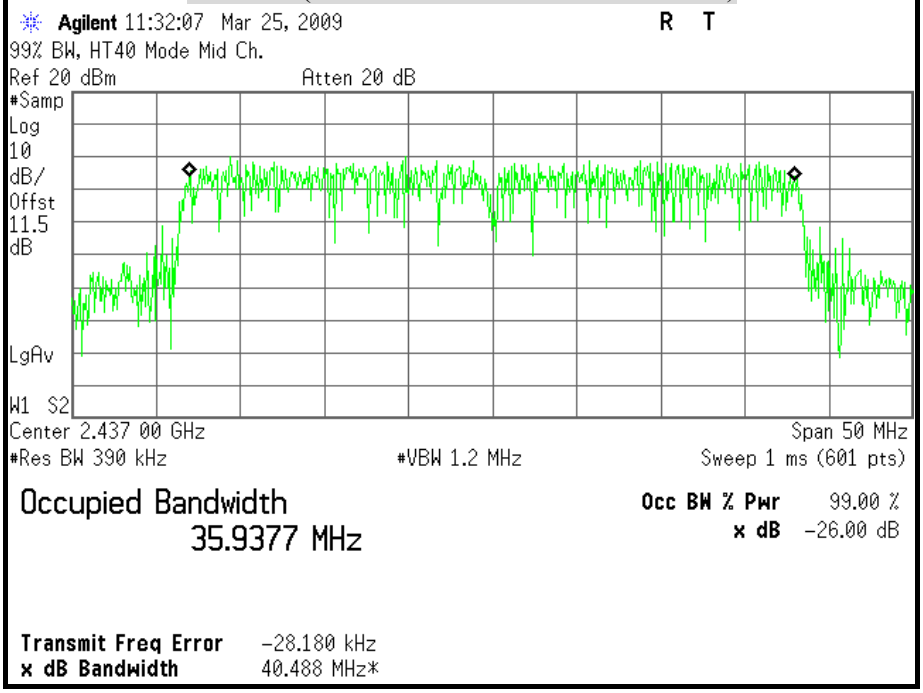
CH High (802.11n HT40 MODE-Chain 0)



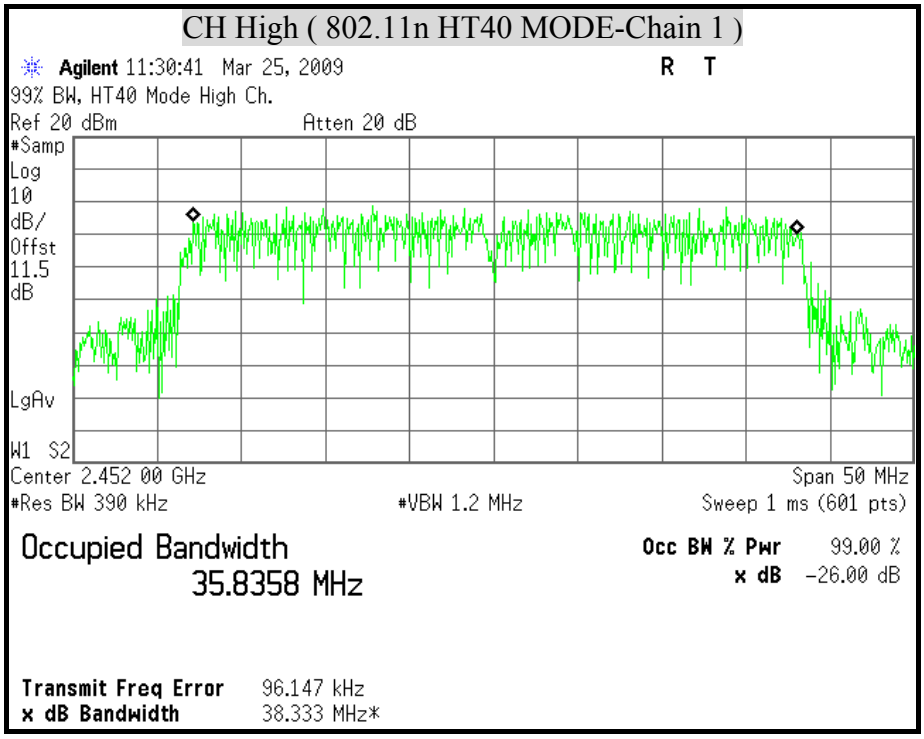
CH Low (802.11n HT40 MODE-Chain 1)



CH Mid (802.11n HT40 MODE-Chain 1)



CH High (802.11n HT40 MODE-Chain 1)



8.3 MAXIMUM PEAK OUTPUT POWER

LIMIT

§ 15.247(b) The maximum peak output power of the intentional radiator shall not exceed the following :

§ 15.247(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands : 1 watt.

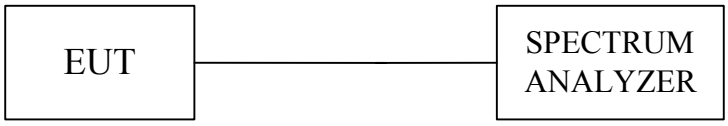
§ 15.247(b) (4) Except as shown in paragraphs (c) of this section , if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2), and (b)(3) of this section , as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
SPECTRUM ANALYZER	ROHDE & SCHWARZ	FSEK30	835253/002	10/17/2007
SPECTRUM ANALYZER	AGILENT	E4446A	MY433601.32	03/05/2008

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

TEST SETUP



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

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

The maximum antenna gain is 2.5dBi for other than fixed, point-to-point operations, therefore the limit is 30 dBm. In the legacy mode, the effective antenna gain is 2.5 + 10 x Log (2) = 5.51 dBi.

IEEE 802.11b MODE

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2412	20.56	30	PASS
Middle	2437	22.71	30	PASS
High	2462	22.44	30	PASS

Remark:

1. *At finial test to get the worst-case emission at 11Mbps.*
2. *The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*

IEEE 802.11g MODE

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2412	19.54	30	PASS
Middle	2437	20.82	30	PASS
High	2462	20.32	30	PASS

Remark:

1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*

IEEE 802.11n HT20 mode (Two TX)

Channel	Channel Frequency (MHz)	Peak Power (dBm)		Peak Power Total (dBm)	Peak Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
Low	2412	17.16	17.15	20.17	30	PASS
Middle	2437	17.91	17.26	20.61	30	PASS
High	2462	17.59	17.07	20.35	30	PASS

Remark:

1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 mode (TwoTX)

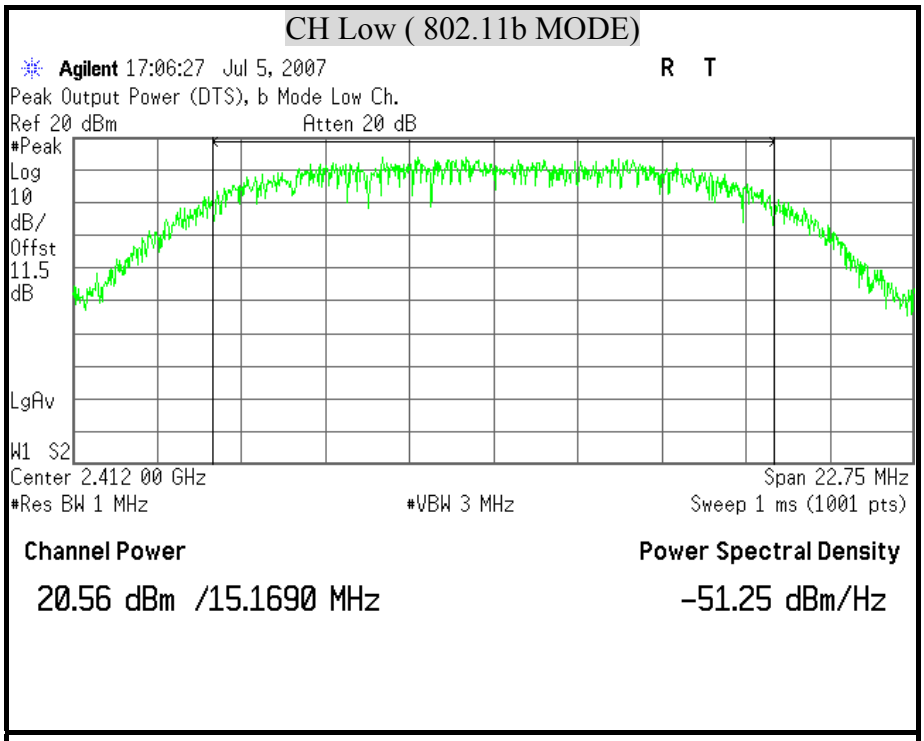
Channel	Channel Frequency (MHz)	Peak Power (dBm)		Peak Power Total (dBm)	Peak Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
Low	2422	15.21	15.01	18.12	30	PASS
Middle	2437	17.88	16.99	20.47	30	PASS
High	2452	15.99	15.40	18.72	30	PASS

Remark:

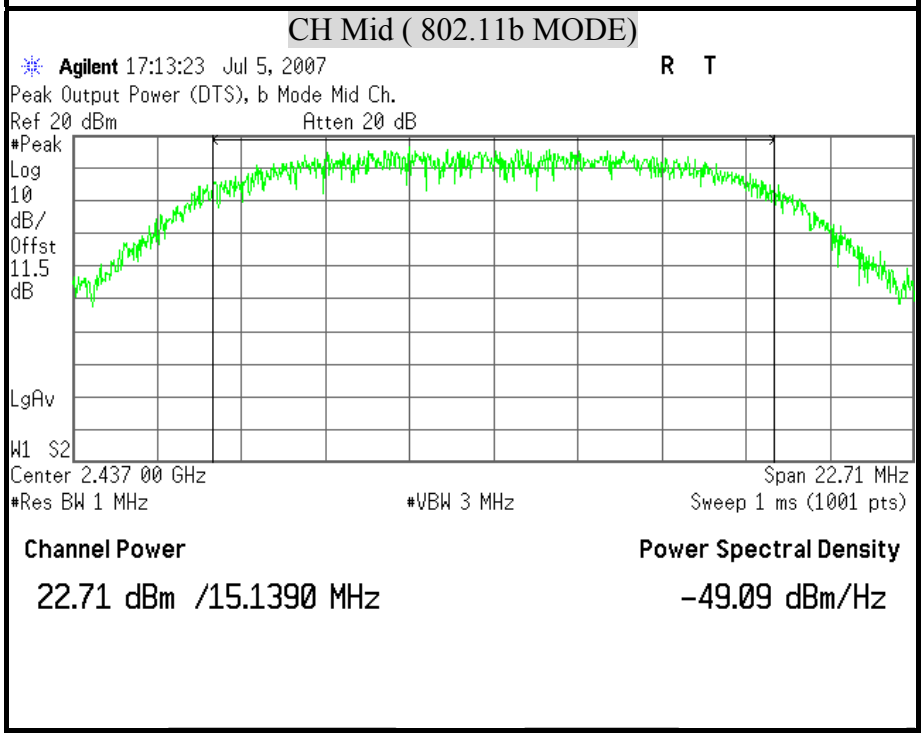
1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

MAXIMUM PEAK OUTPUT POWER (802.11b MODE)

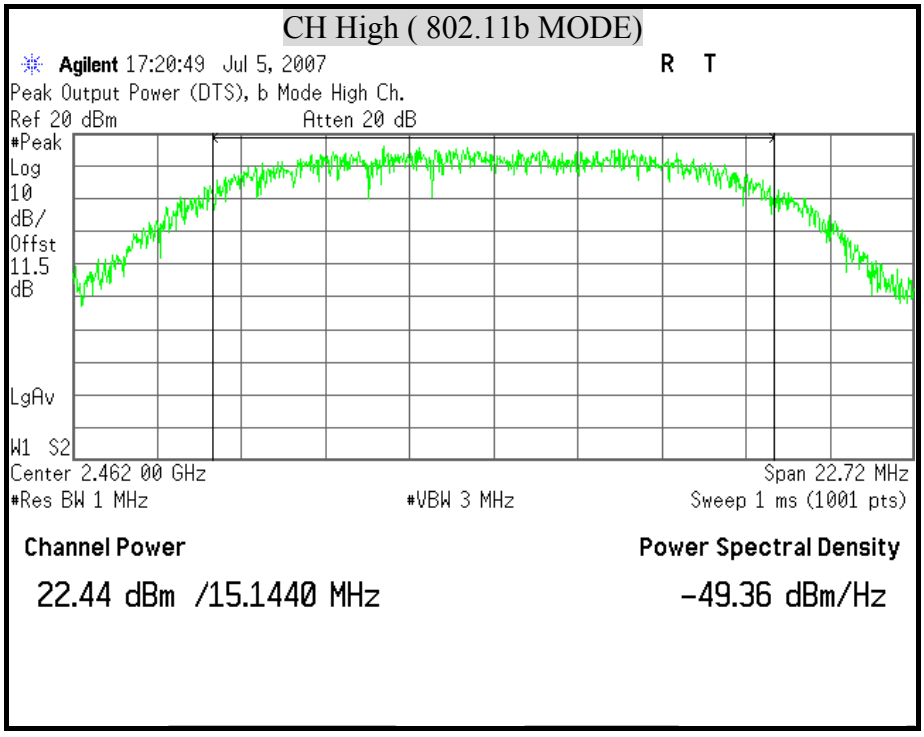
CH Low (802.11b MODE)



CH Mid (802.11b MODE)

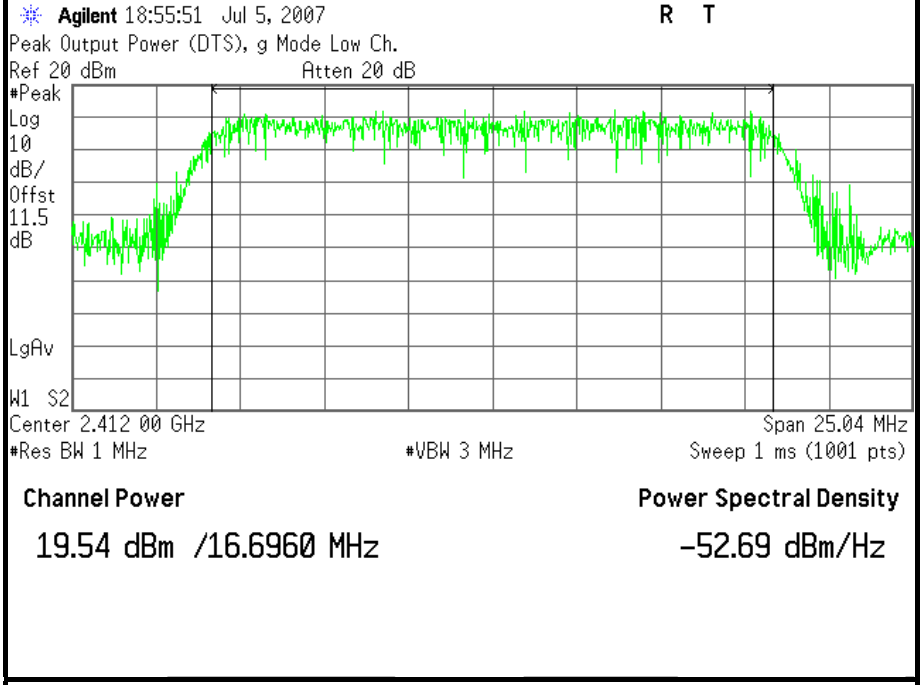


CH High (802.11b MODE)

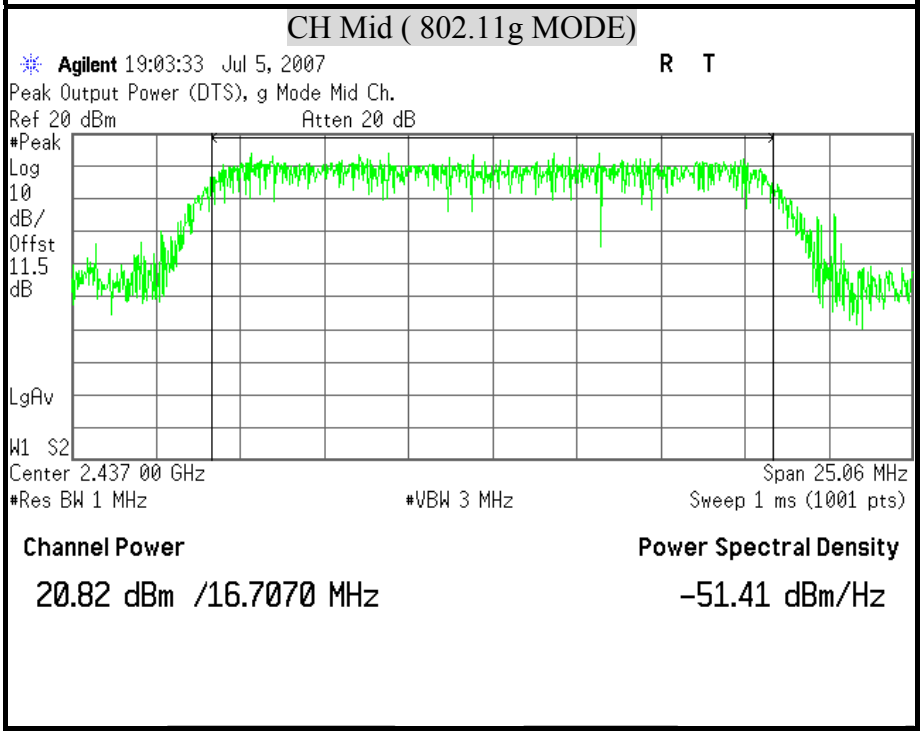


MAXIMUM PEAK OUTPUT POWER (802.11g MODE)

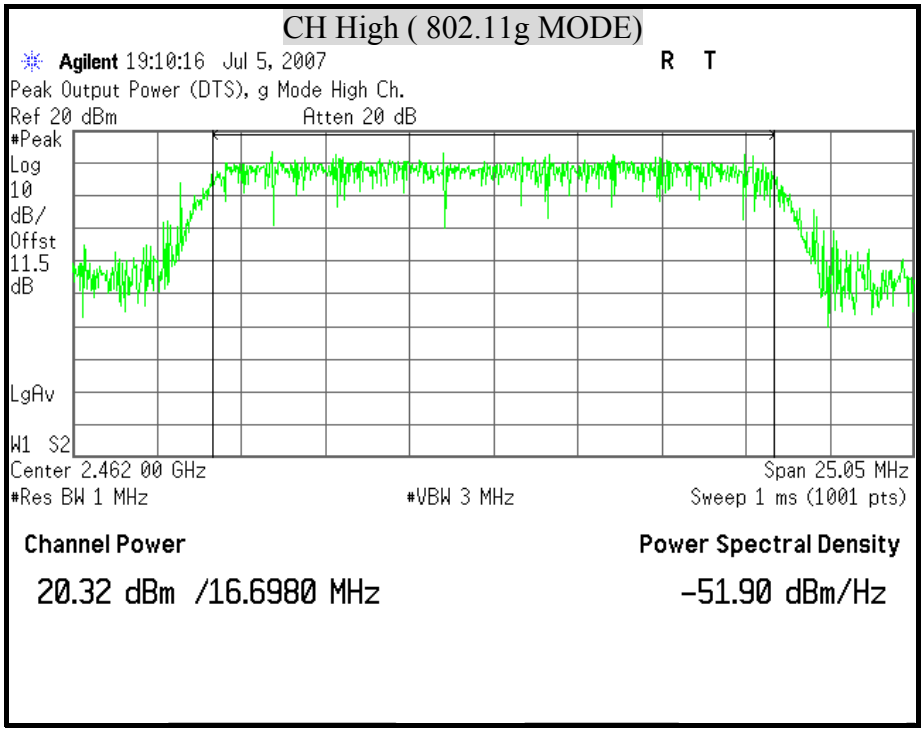
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

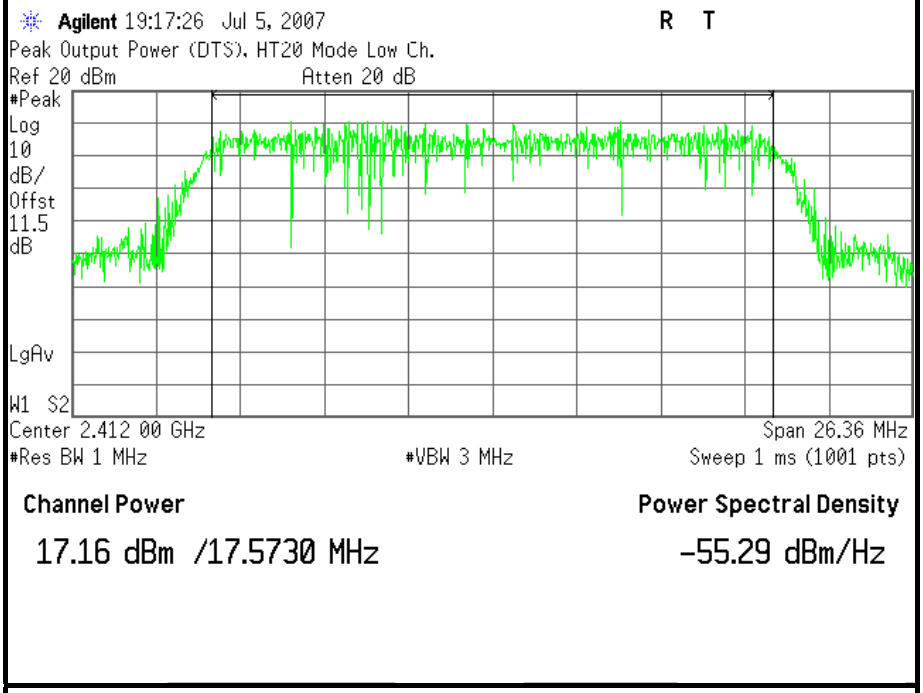


CH High (802.11g MODE)

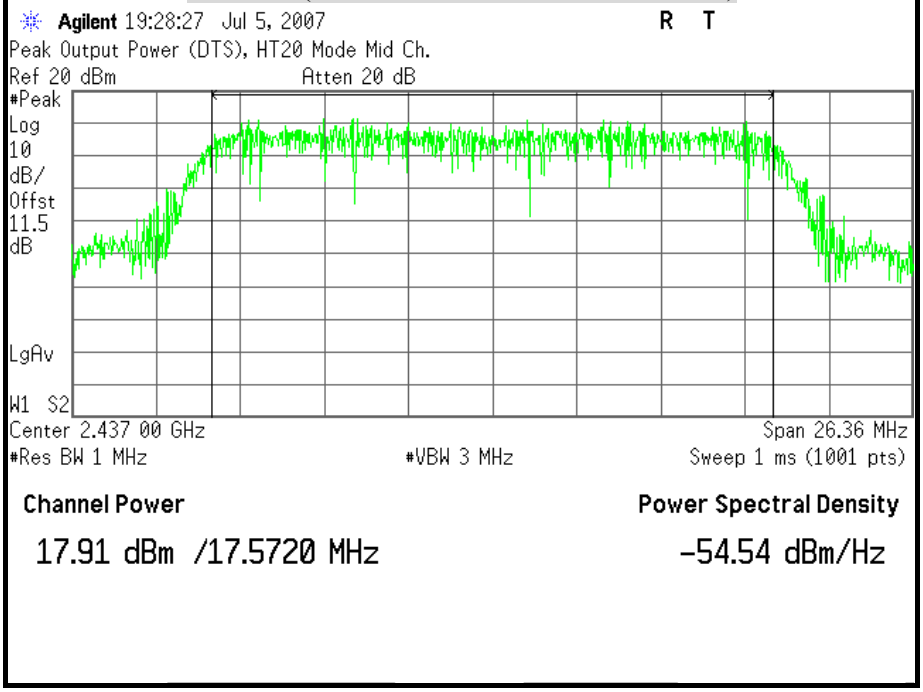


MAXIMUM PEAK OUTPUT POWER (802.11n HT20 MODE)

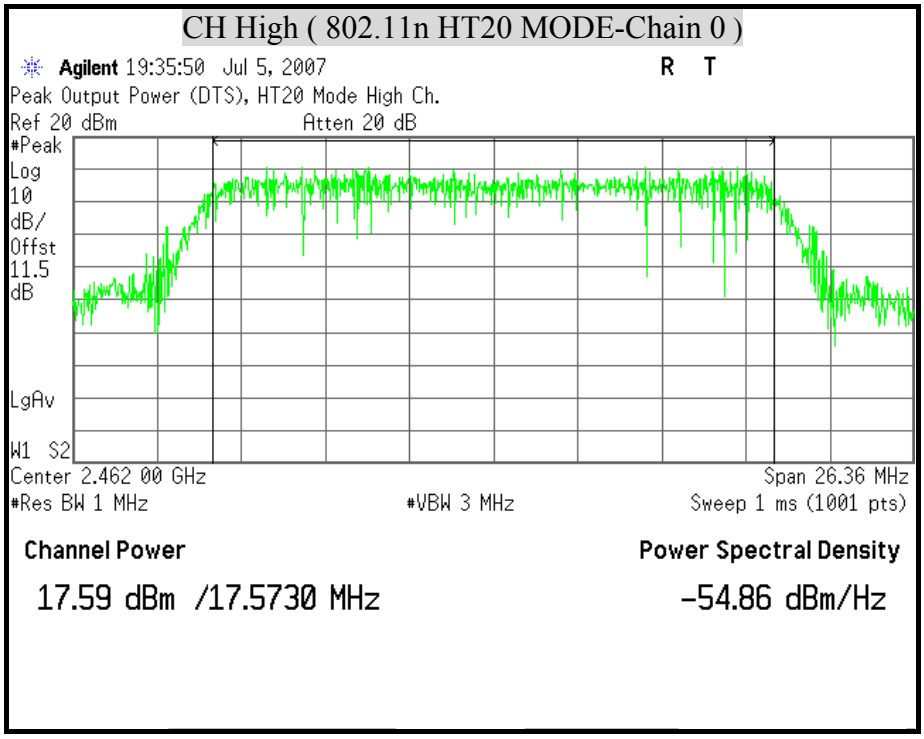
CH Low (802.11n HT20 MODE-Chain 0)



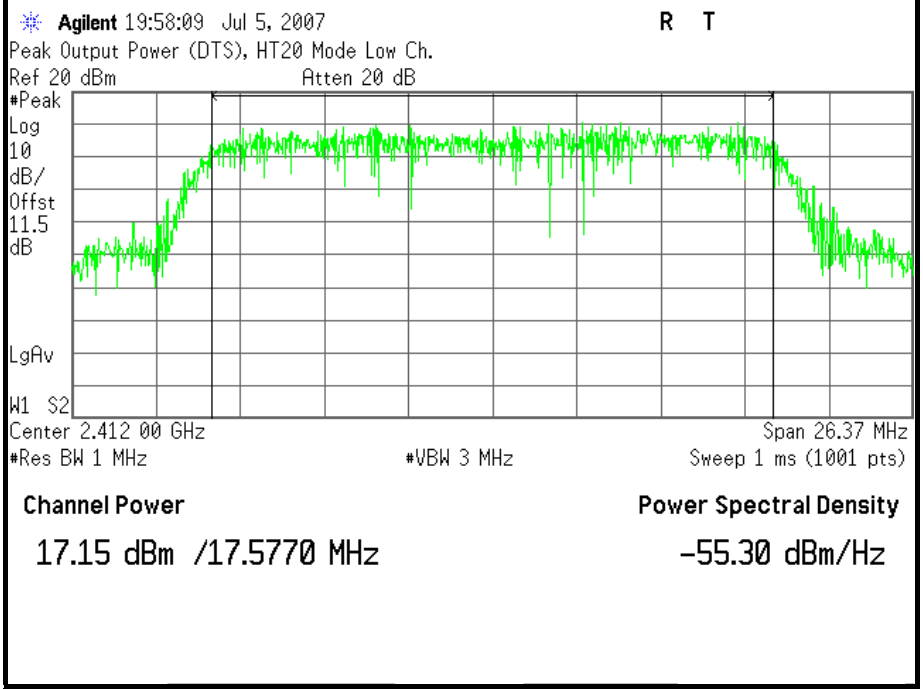
CH Mid (802.11n HT20 MODE-Chain 0)



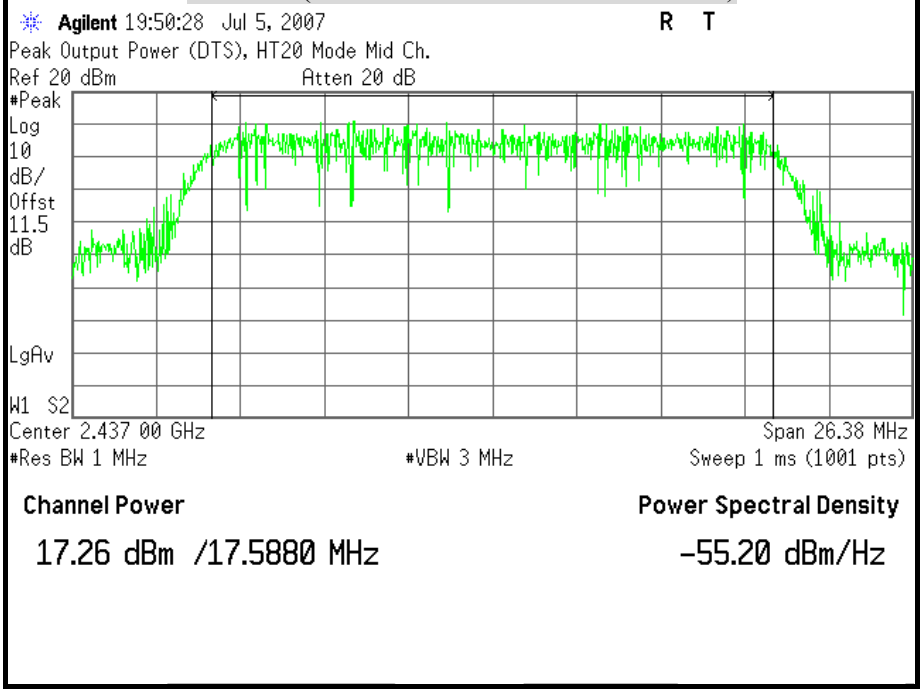
CH High (802.11n HT20 MODE-Chain 0)



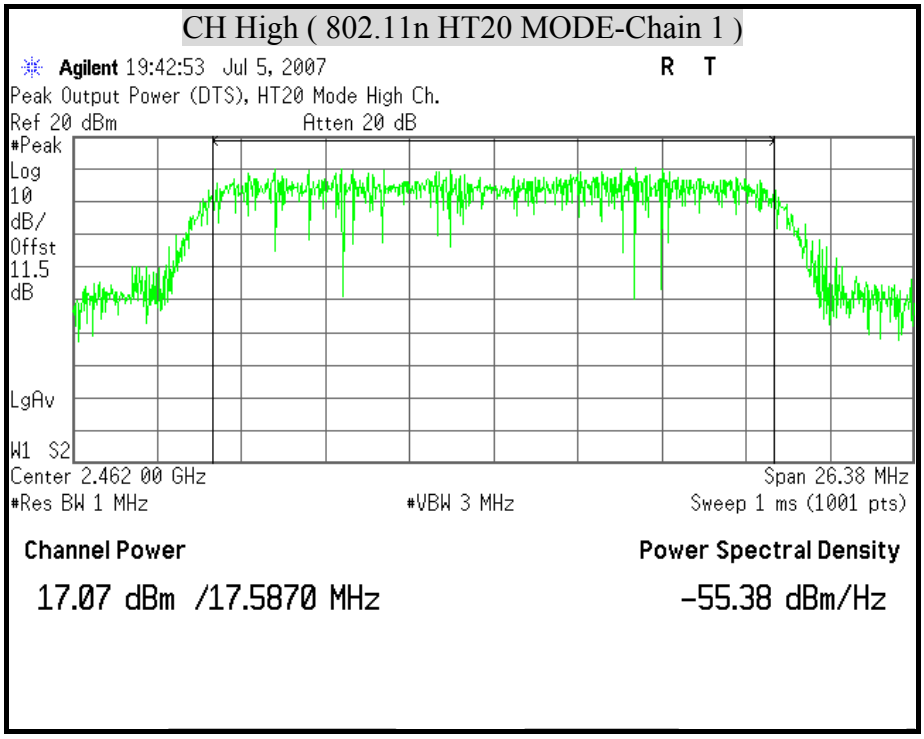
CH Low (802.11n HT20 MODE-Chain 1)



CH Mid (802.11n HT20 MODE-Chain 1)

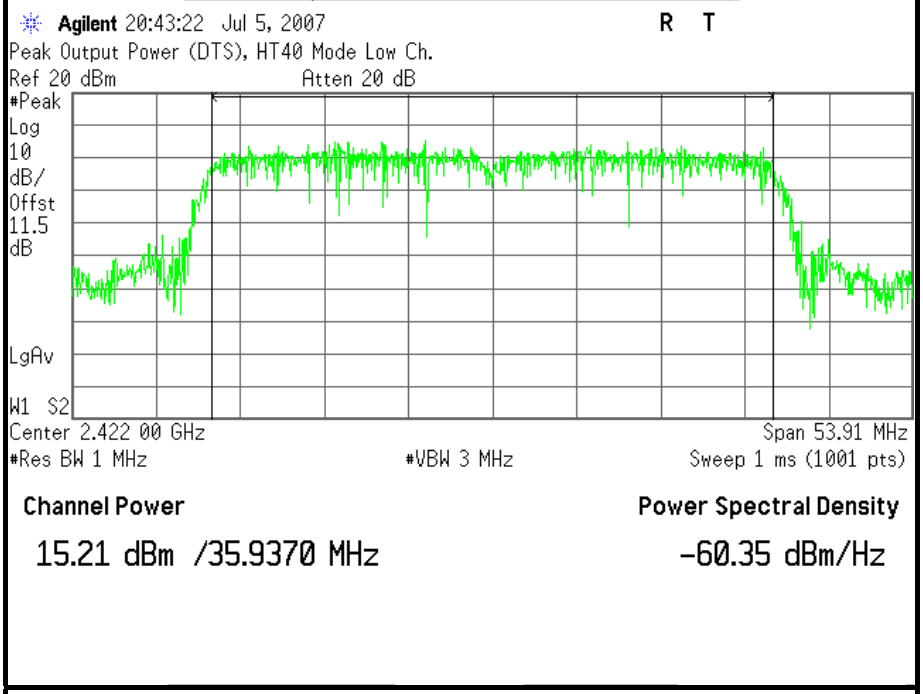


CH High (802.11n HT20 MODE-Chain 1)

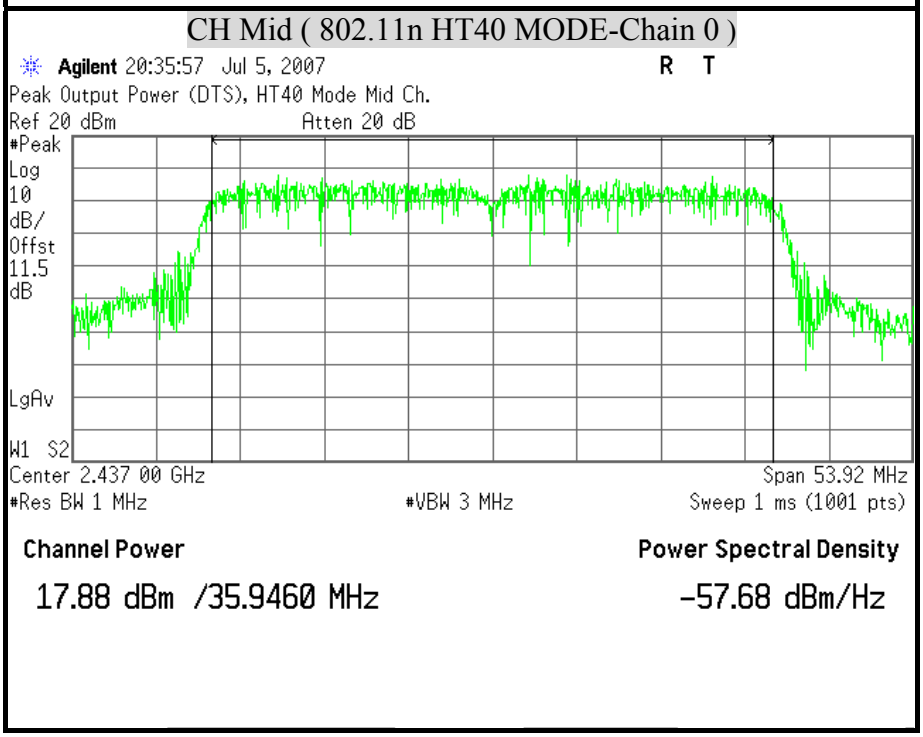


MAXIMUM PEAK OUTPUT POWER (802.11n HT40 MODE)

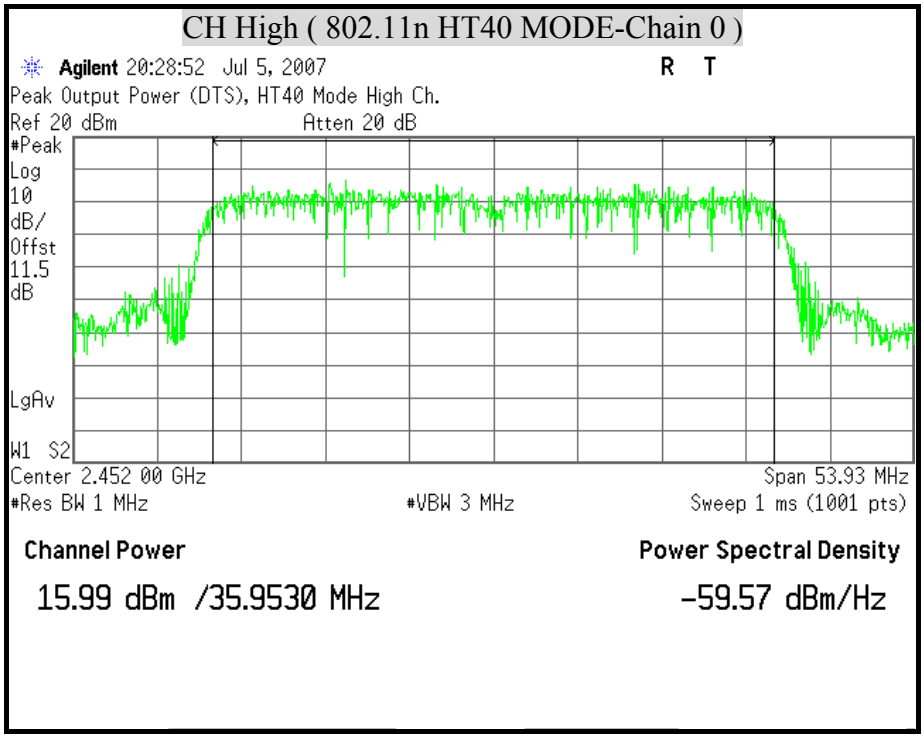
CH Low (802.11n HT40 MODE-Chain 0)



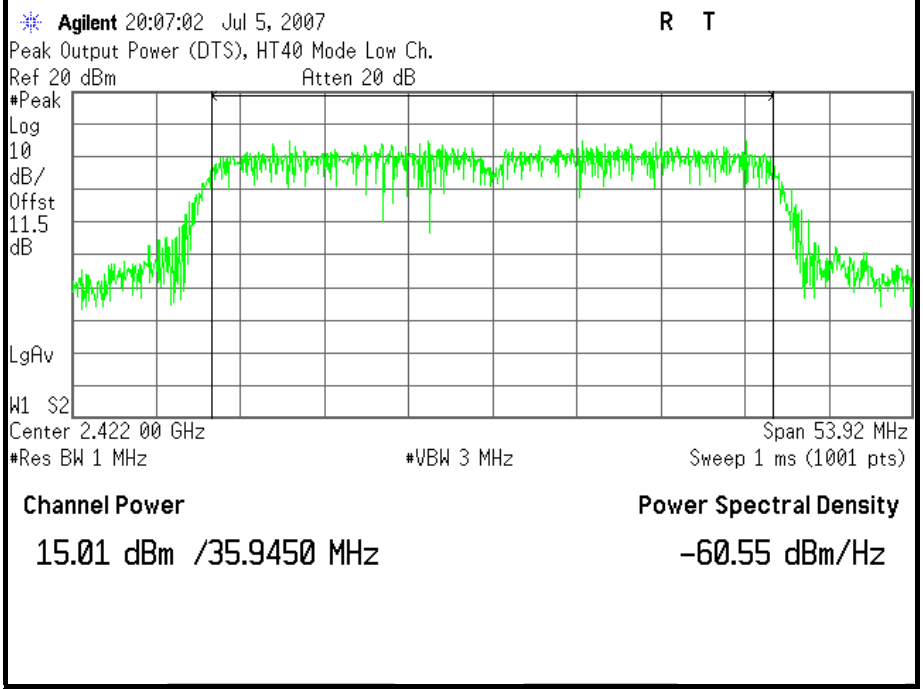
CH Mid (802.11n HT40 MODE-Chain 0)



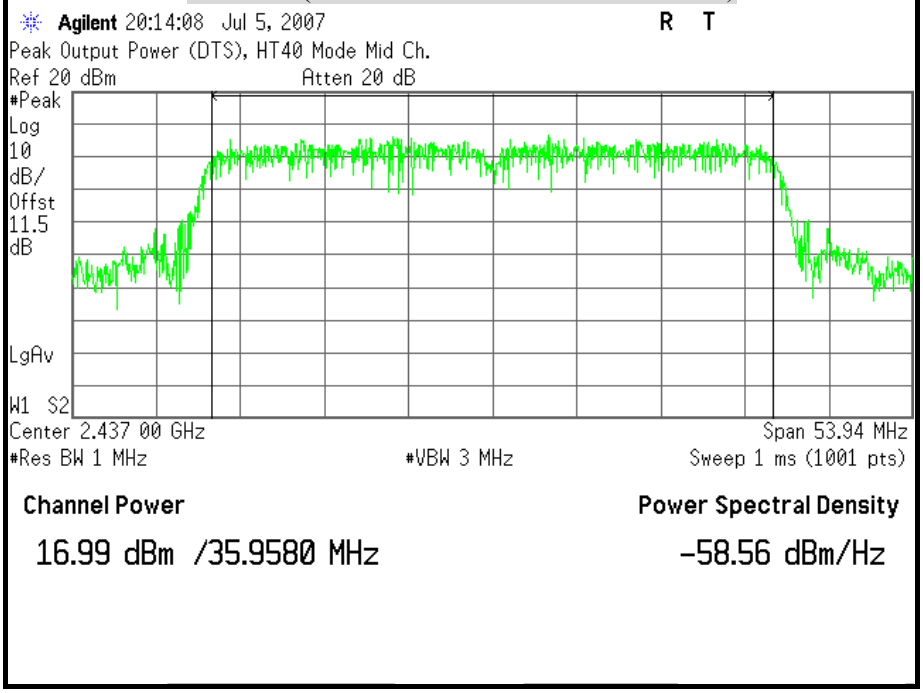
CH High (802.11n HT40 MODE-Chain 0)



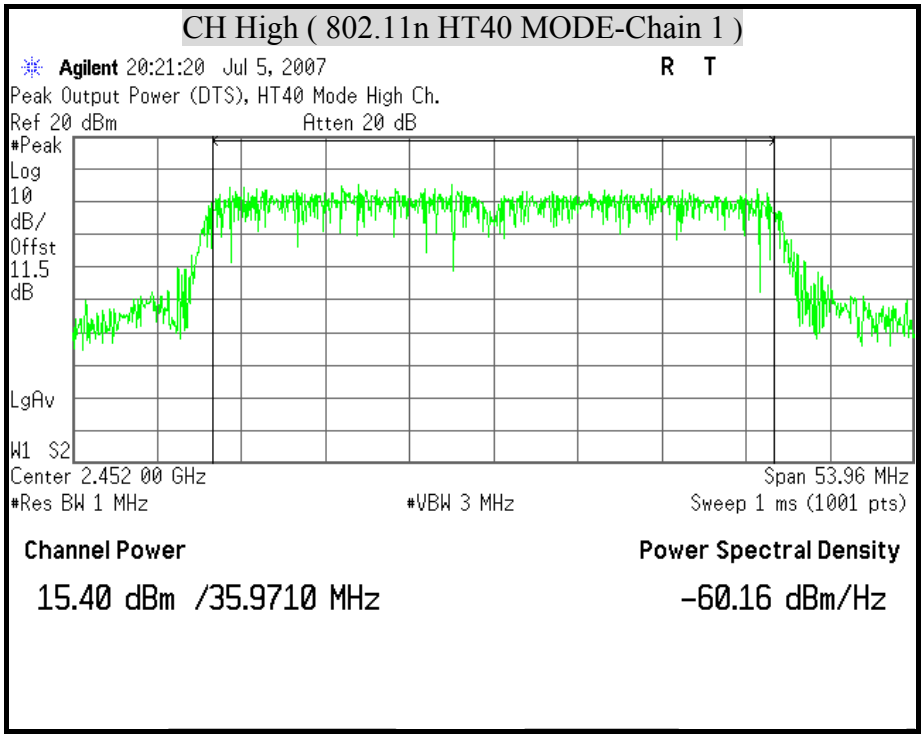
CH Low (802.11n HT40 MODE-Chain 1)



CH Mid (802.11n HT40 MODE-Chain 1)



CH High (802.11n HT40 MODE-Chain 1)



8.4 MAXIMUM PERMISSIBLE EXPOSURE

According to FCC 1.1310 : The criteria listed in the following table shall be used to evaluate theenvironment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time
(A) Limits for Occupational / Control Exposures				
300-1,500	--	--	F/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
300-1,500	--	--	F/1500	6
1,500-100,000	--	--	1	30

CALCULATIONS

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:

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

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$

Where d = *Distance in cm*

P = *Power in mW*

G = *Numeric antenna gain*

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

LIMIT

Power Density Limit, S=1.0mW/cm^2

TEST RESULTS

No non-compliance noted

Mode	Minimum separation distance (cm)	Output Power (dBm)	Numeric antenna gain (dB)	Power Density Limit (mW/cm^2)	Power Density at 20cm (mW/cm^2)
IEEE 802.11b	20.0	22.71	1.78	1.00	0.066028
IEEE 802.11g	20.0	20.82	1.78	1.00	0.042730
IEEE 802.11n HT20	20.0	20.61	1.78	1.00	0.040713
IEEE 802.11n HT40	20.0	20.47	1.78	1.00	0.039421

Remark: *For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.*

8.5 AVERAGE POWER

LIMIT

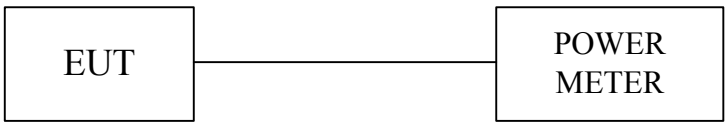
None; for reporting purposes only.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
POWER METER	ANRITSU	ML2487A MAL2491A	6K00001783 030982	03/06/2008

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

TEST SETUP



TEST PROCEDURE

The transmitter output is connected to a power meter.

TEST RESULTS

No non-compliance noted

Total average power calculation formula:
10 log (10^ (Chain 0 Power / 10) + 10^ (Chain1 Power / 10)).

IEEE 802.11b MODE

Channel	Channel Frequency (MHz)	Average Power Output (dBm)
Low	2412	18.36
Middle	2437	20.62
High	2462	20.06

Remark:

1. At finial test to get the worst-case emission at 11Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g MODE

Channel	Channel Frequency (MHz)	Average Power Output (dBm)
Low	2412	16.79
Middle	2437	18.20
High	2462	17.61

Remark:

1. At finial test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT20 MODE (Two TX)

Channel	Channel Frequency (MHz)	Average Power (dBm)		Average Power (dBm)
		Chain 0	Chain 0	
Low	2412	14.71	14.64	17.69
Middle	2437	15.33	14.94	18.15
High	2462	15.12	14.72	17.93

Remark:

1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 MODE (Two TX)

Channel	Channel Frequency (MHz)	Average Power (dBm)		Average Power (dBm)
		Chain 0	Chain 0	
Low	2422	12.43	12.26	15.36
Middle	2437	15.23	14.43	17.86
High	2452	13.05	12.75	15.91

Remark:

1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

8.6 POWER SPECTRAL DENSITY

LIMIT

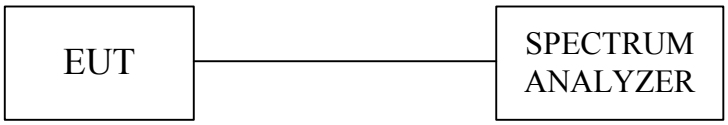
§ 15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
SPECTRUM ANALYZER	ROHDE & SCHWARZ	FSEK30	835253/002	10/17/2007
SPECTRUM ANALYZER	AGILENT	E4446A	MY433601.32	03/05/2008

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

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

Total power spectral density calculation formula:
10 log (10^ (Chain 0 PPSD / 10) + 10^ (Chain1 PPSD / 10)).

IEEE 802.11b MODE

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Maxmum Limit (dBm)	Pass / Fail
Low	2412	-6.39	8	PASS
Middle	2437	-4.18	8	PASS
High	2462	-4.59	8	PASS

Remark:

1. *At finial test to get the worst-case emission at 11Mbps.*
2. *The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*

IEEE 802.11g MODE

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Maxmum Limit (dBm)	Pass / Fail
Low	2412	-12.48	8	PASS
Middle	2437	-11.02	8	PASS
High	2462	-11.52	8	PASS

Remark:

1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*

IEEE 802.11n HT20 MODE (Two TX)

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)		PPSD Total (dBm)	Maxmum Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
Low	2412	-13.21	-13.55	-10.37	8	PASS
Middle	2437	-12.42	-13.03	-9.70	8	PASS
High	2462	-13.08	-13.27	-10.16	8	PASS

Remark:

1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT20 Combined MODE (Two TX)

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Maxmum Limit (dBm)	Pass / Fail
Low	2412	-8.19	8	PASS
Middle	2437	-7.76	8	PASS
High	2462	-8.29	8	PASS

Remark:

1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 15.5 dB (including 10 dB pad and 5.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 MODE (Two TX)

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)		PPSD Total (dBm)	Maxmum Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
Low	2422	-18.18	-19.11	-15.61	8	PASS
Middle	2437	-15.95	-15.84	-12.88	8	PASS
High	2452	-17.11	-17.39	-14.24	8	PASS

Remark:

1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 Combined MODE (Two TX)

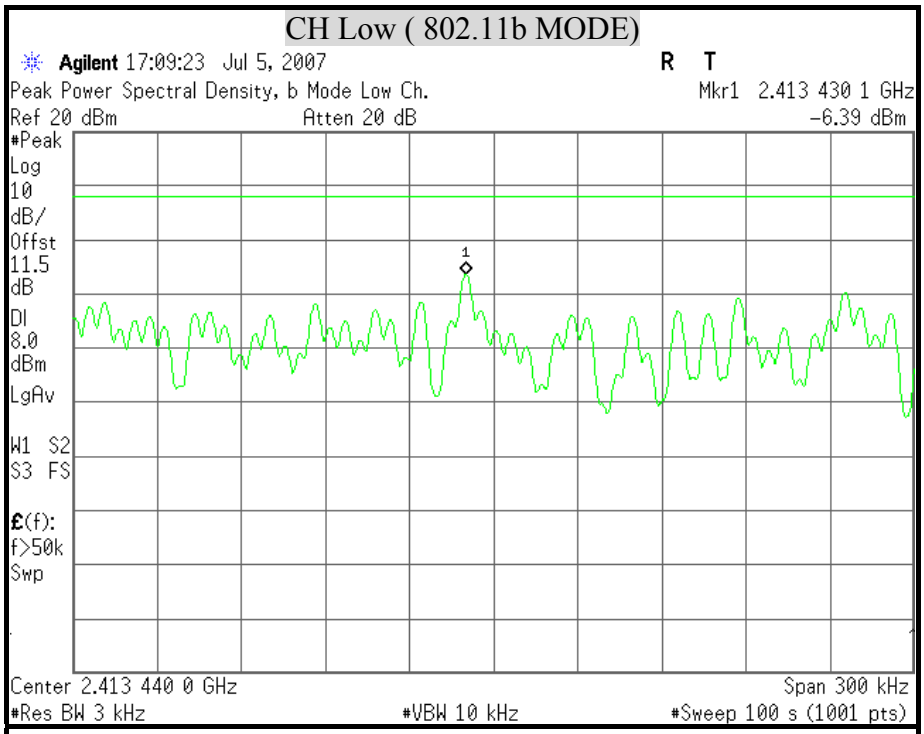
Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Maxmum Limit (dBm)	Pass / Fail
Low	2422	-12.19	8	PASS
Middle	2437	-8.62	8	PASS
High	2452	-10.65	8	PASS

Remark:

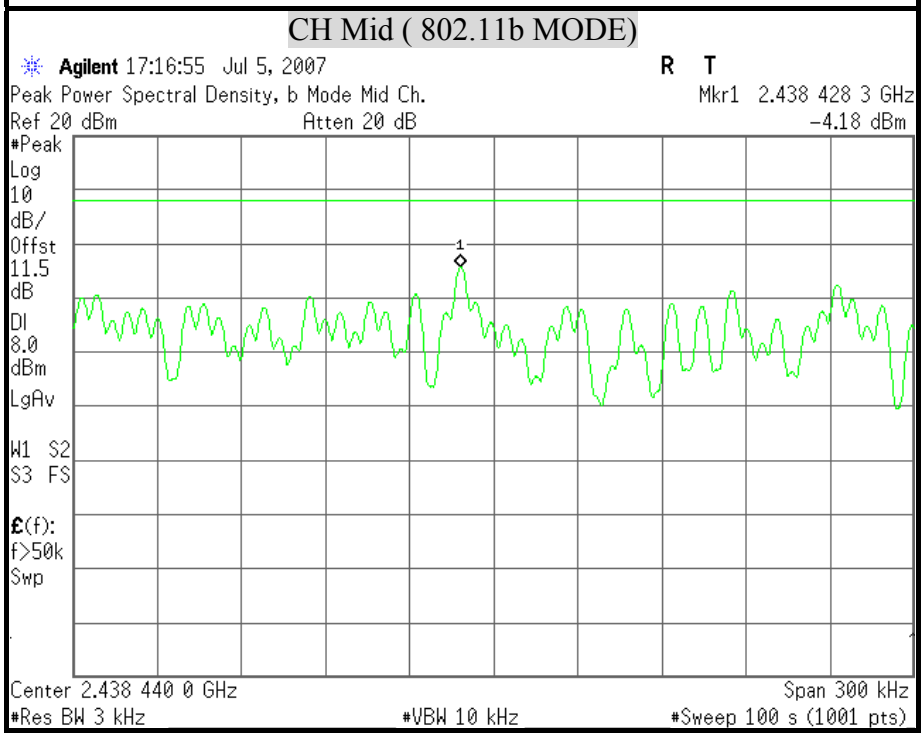
1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 15.5 dB (including 10 dB pad and 5.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

POWER SPECTRAL DENSITY (IEEE 802.11b MODE)

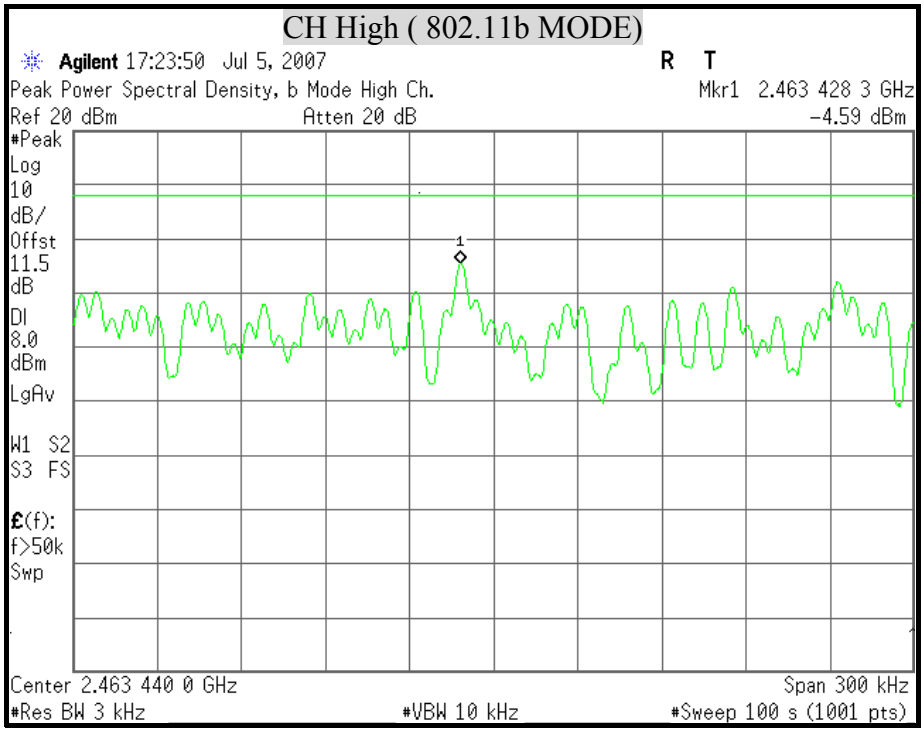
CH Low (802.11b MODE)



CH Mid (802.11b MODE)

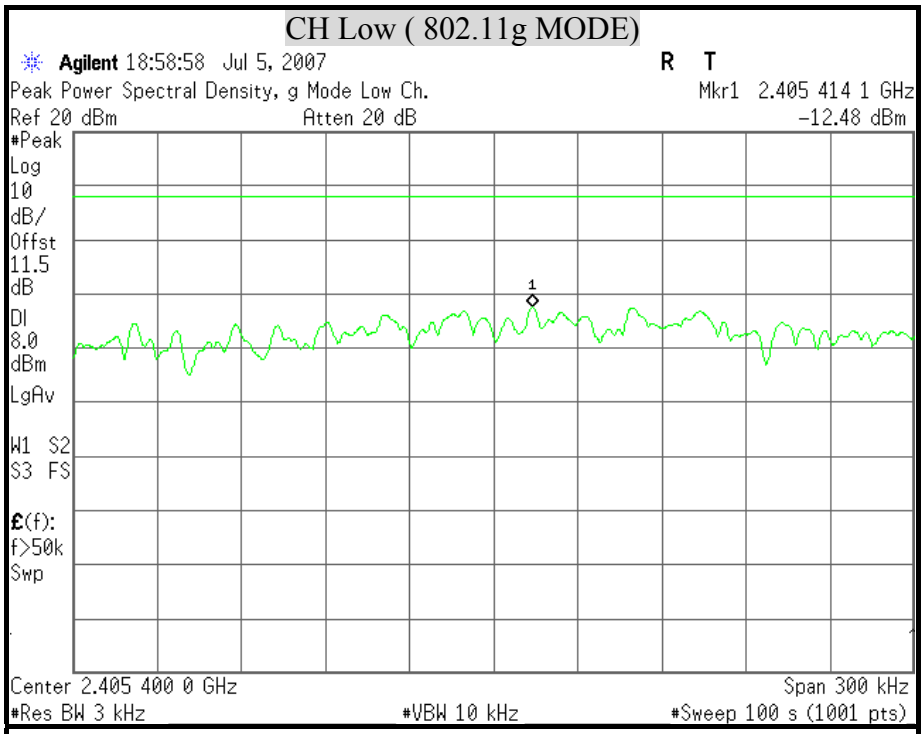


CH High (802.11b MODE)

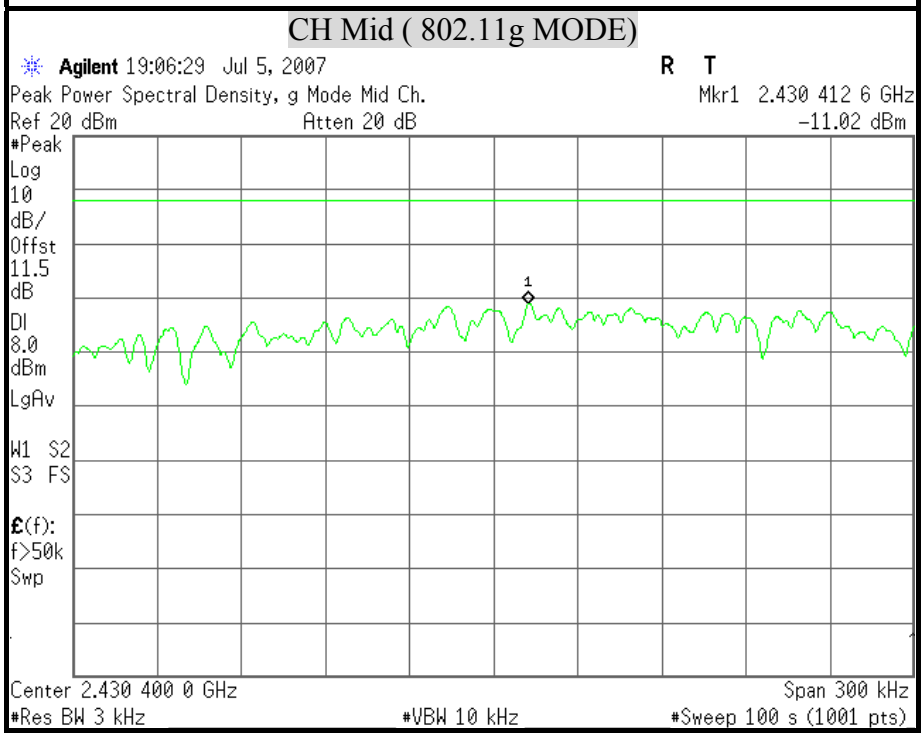


POWER SPECTRAL DENSITY (IEEE 802.11g MODE)

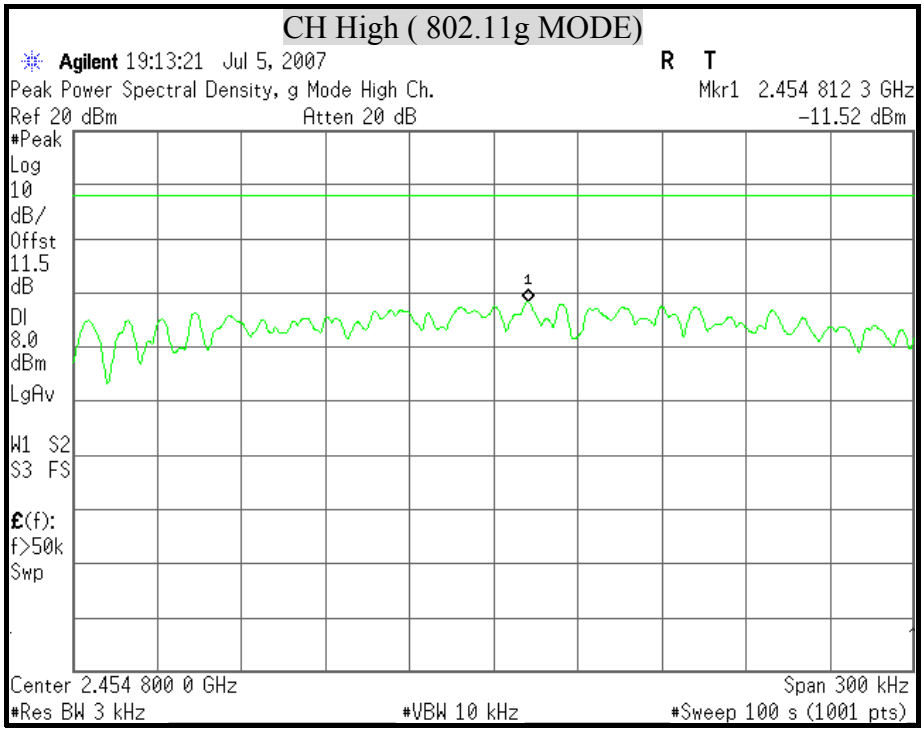
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

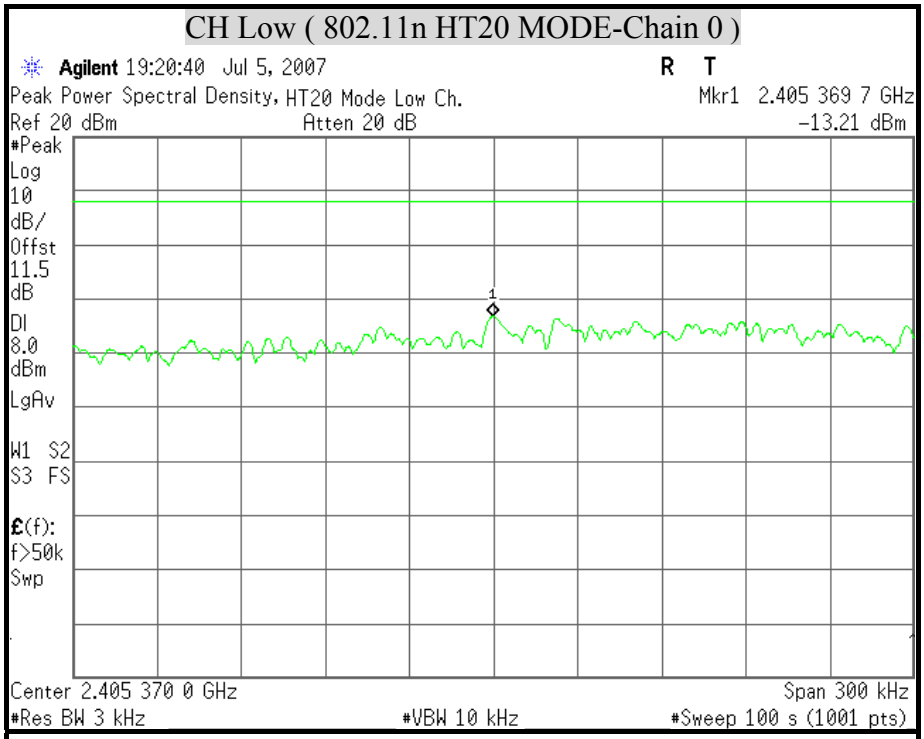


CH High (802.11g MODE)

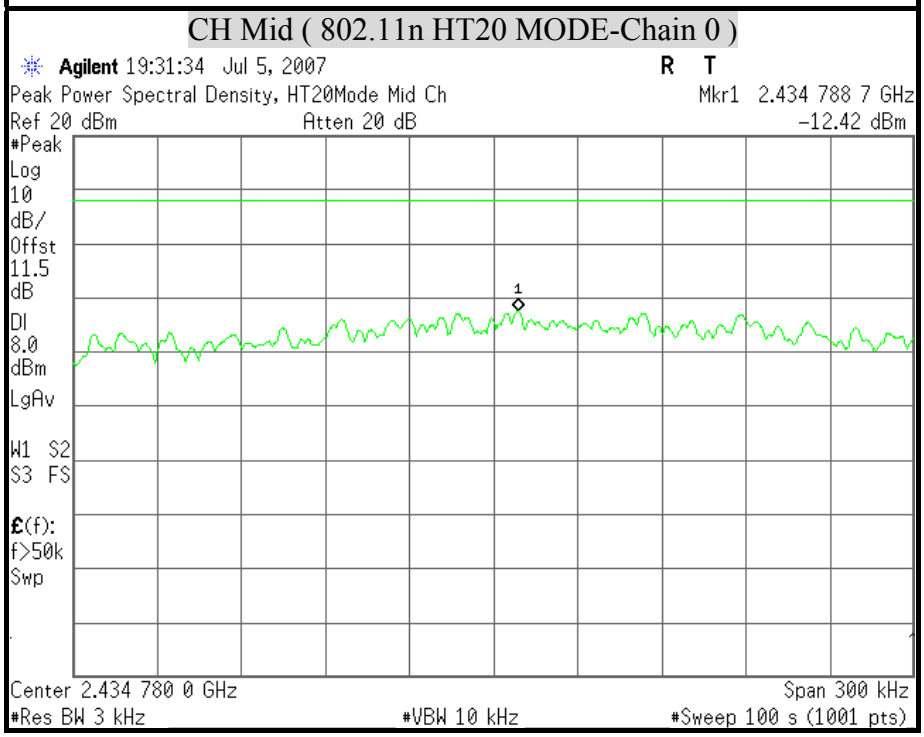


POWER SPECTRAL DENSITY (802.11n HT20 MODE)

CH Low (802.11n HT20 MODE-Chain 0)



CH Mid (802.11n HT20 MODE-Chain 0)



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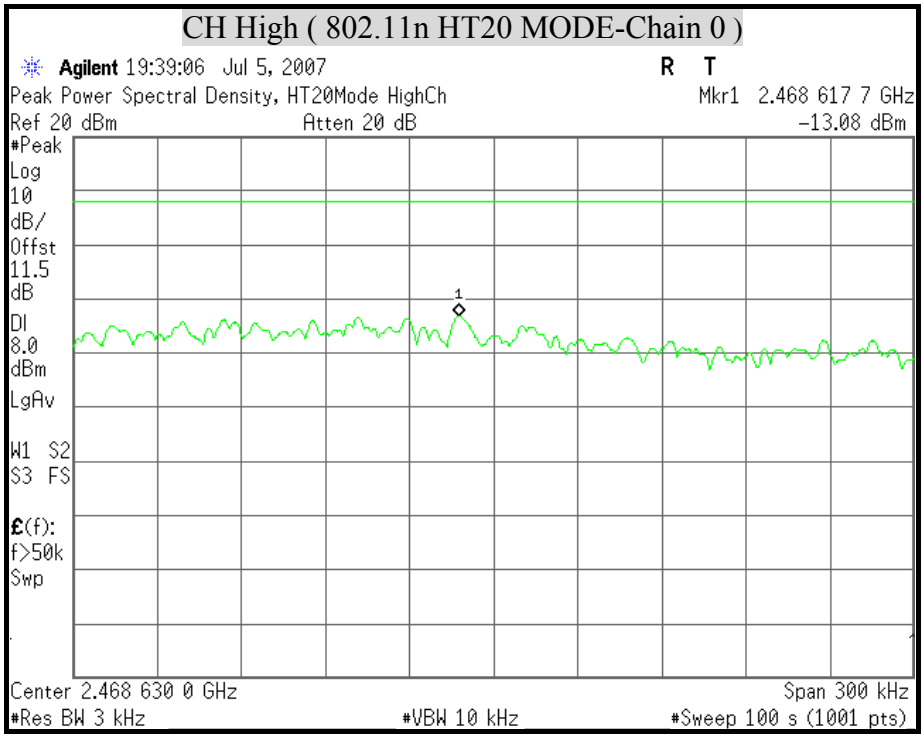
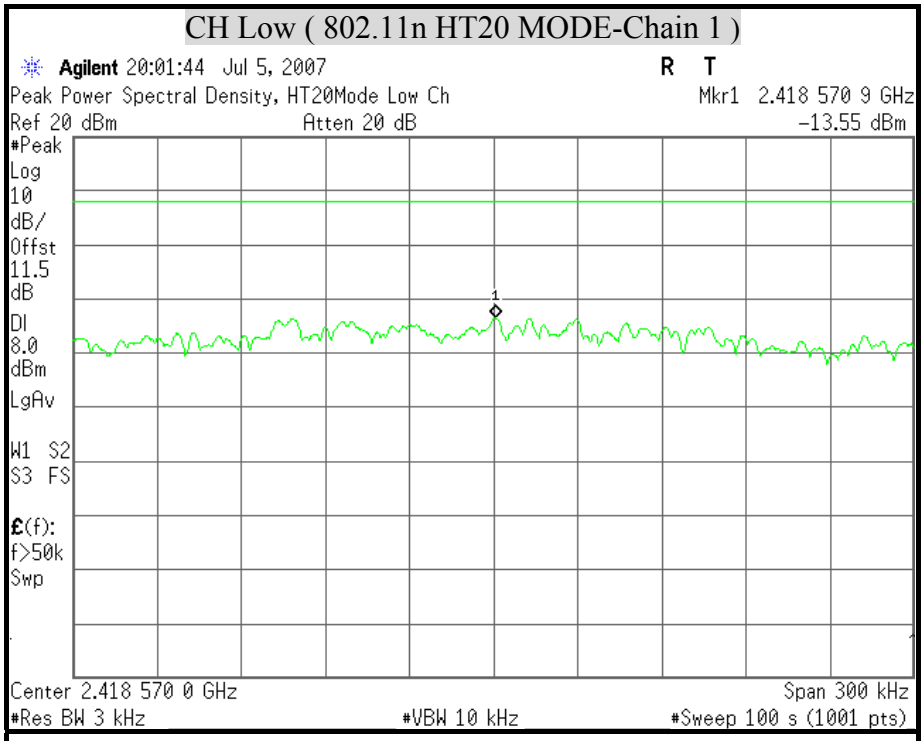
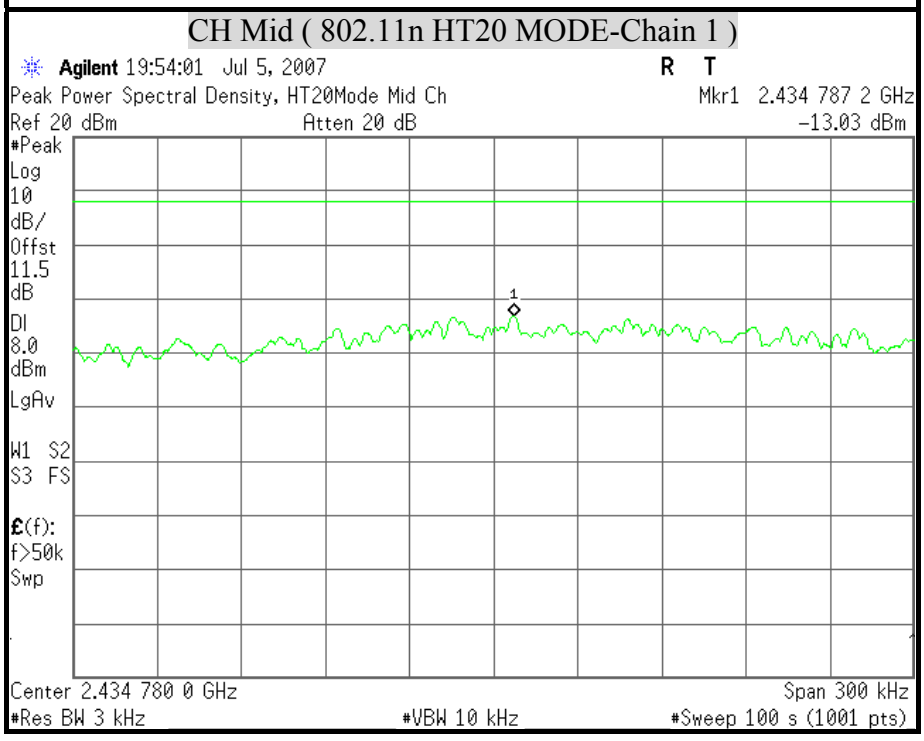


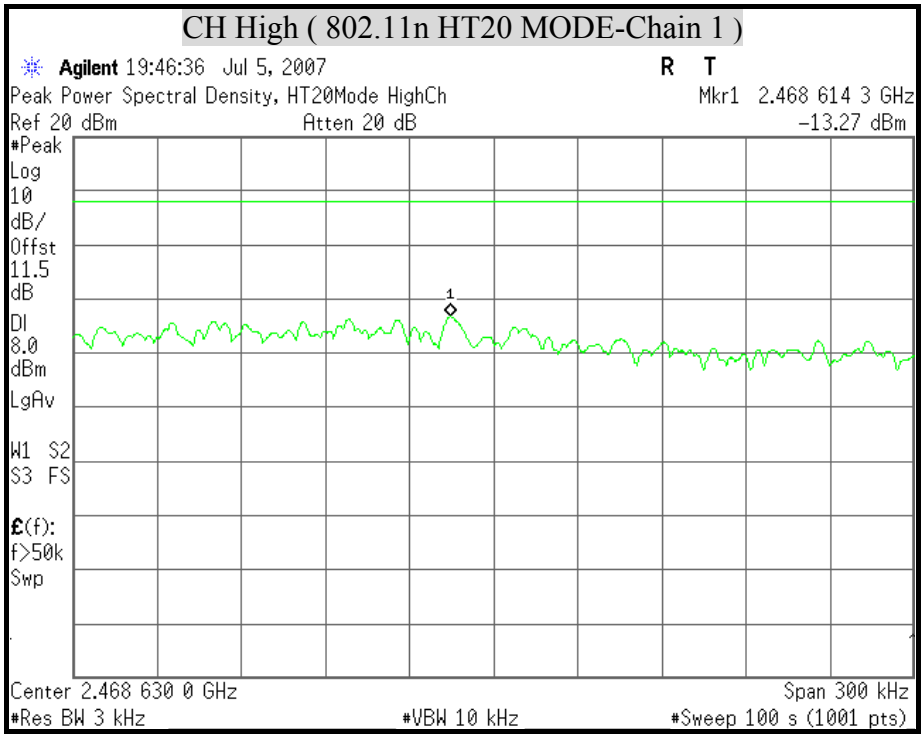
CH Low (802.11n HT20 MODE-Chain 1)



CH Mid (802.11n HT20 MODE-Chain 1)

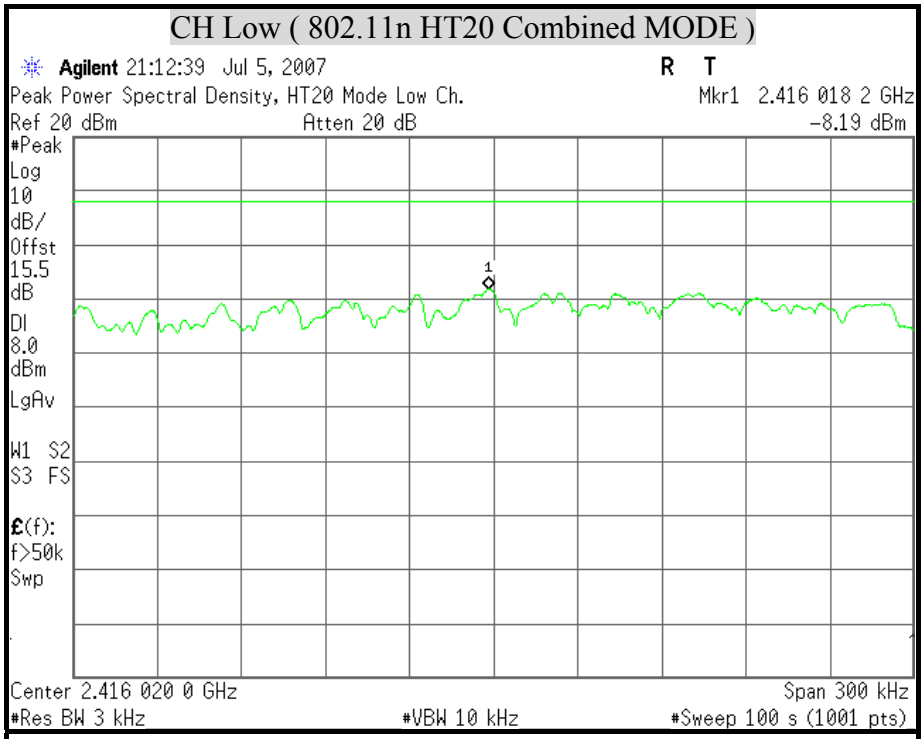


CH High (802.11n HT20 MODE-Chain 1)

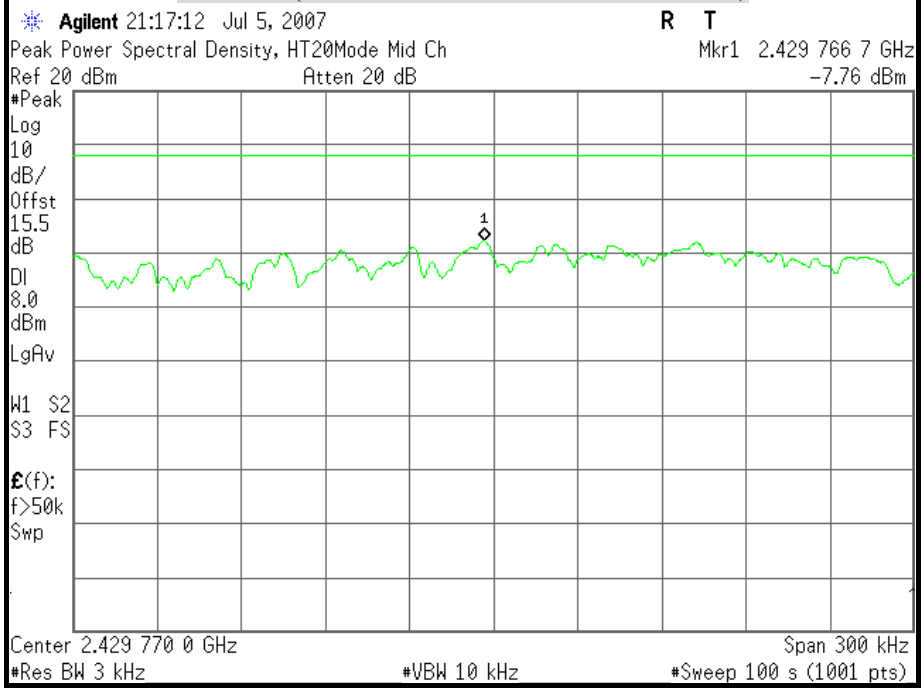


POWER SPECTRAL DENSITY (802.11n HT20 Combined MODE)

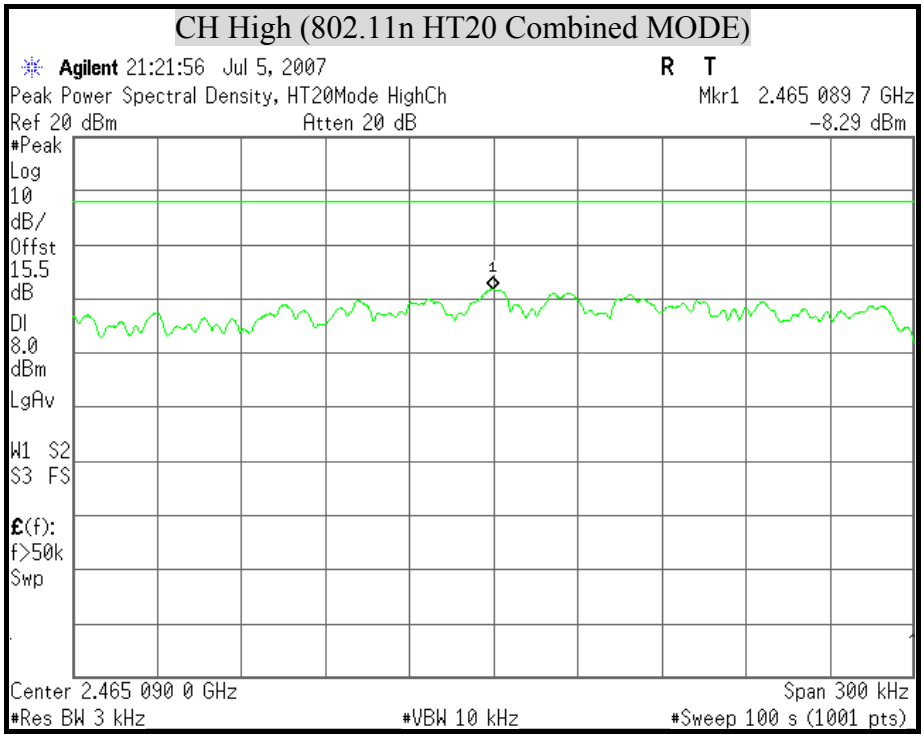
CH Low (802.11n HT20 Combined MODE)



CH Mid (802.11n HT20 Combined MODE)

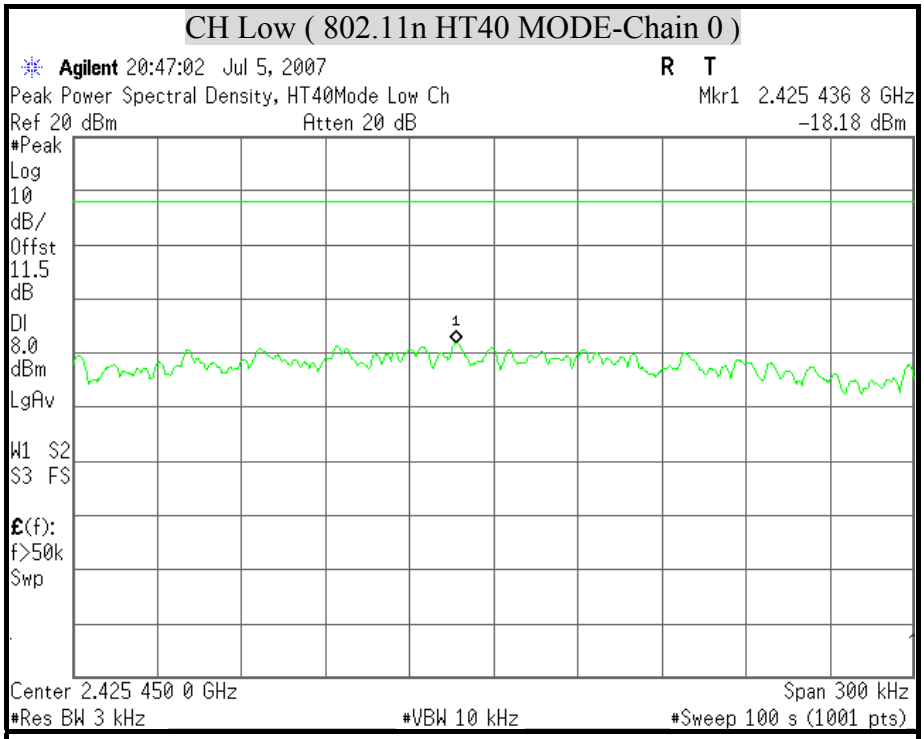


CH High (802.11n HT20 Combined MODE)

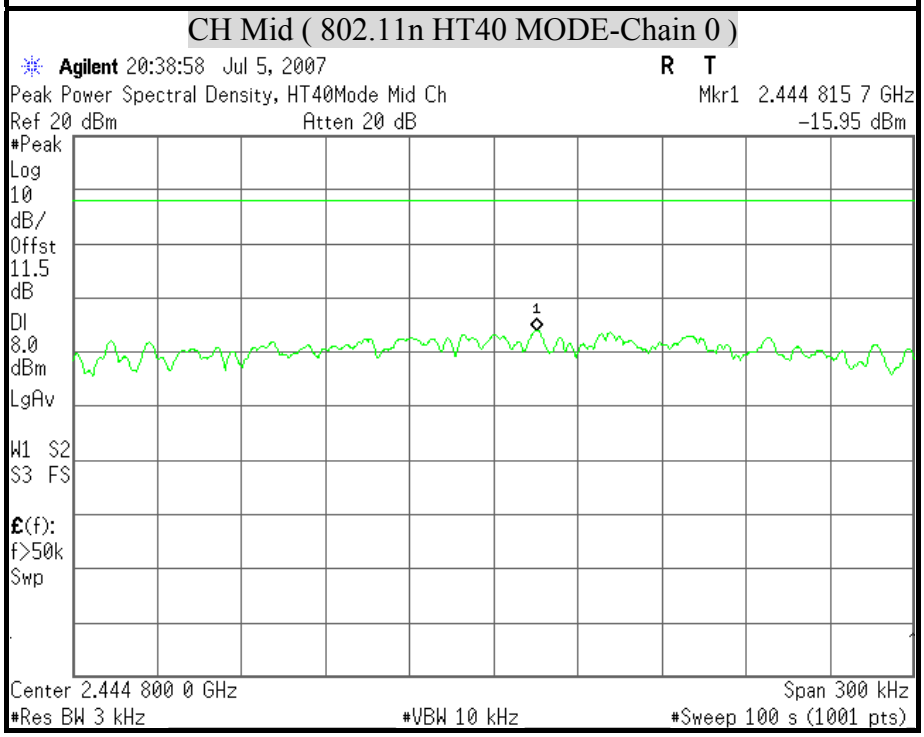


POWER SPECTRAL DENSITY (802.11n HT40 MODE)

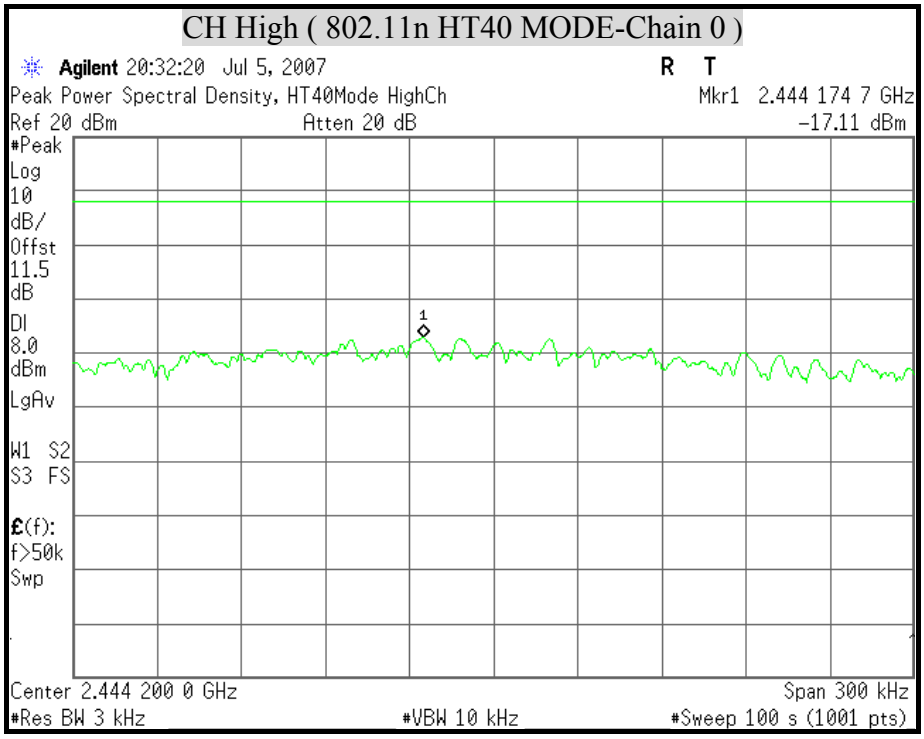
CH Low (802.11n HT40 MODE-Chain 0)



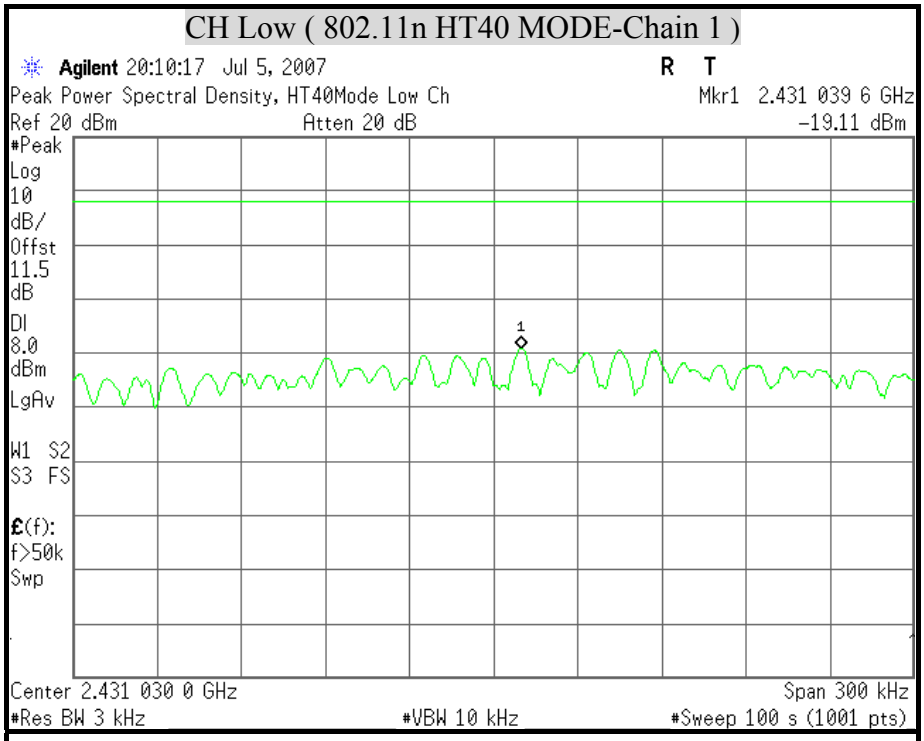
CH Mid (802.11n HT40 MODE-Chain 0)



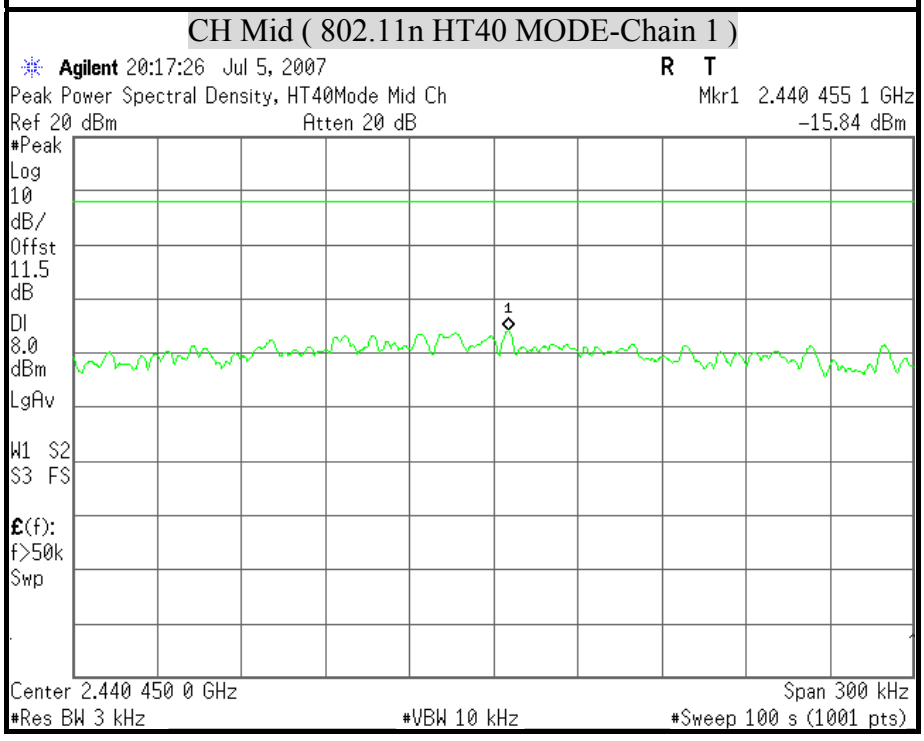
CH High (802.11n HT40 MODE-Chain 0)



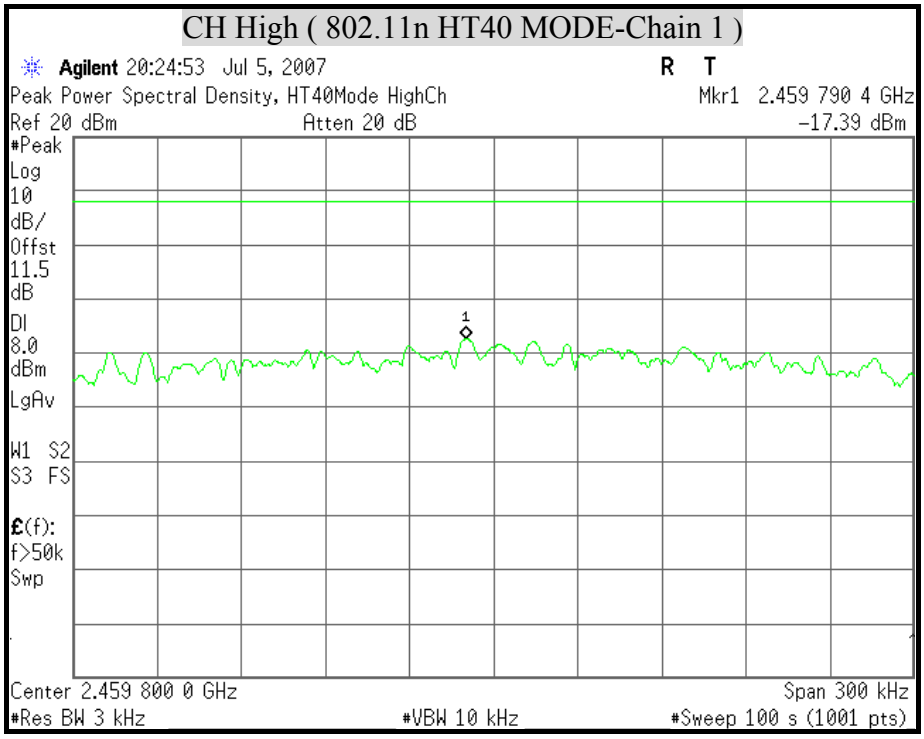
CH Low (802.11n HT40 MODE-Chain 1)



CH Mid (802.11n HT40 MODE-Chain 1)

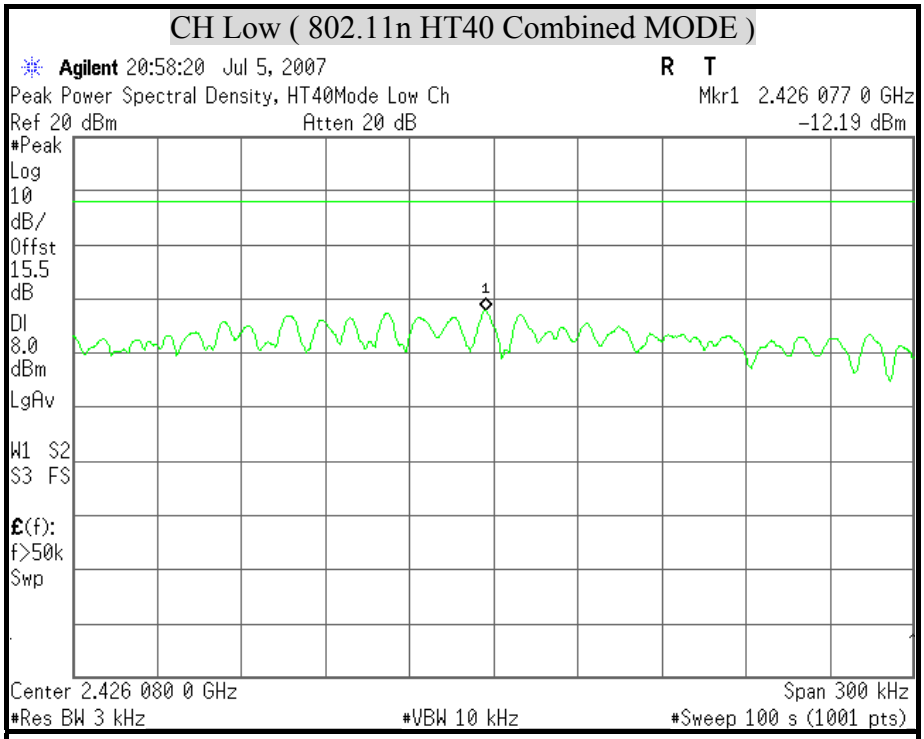


CH High (802.11n HT40 MODE-Chain 1)

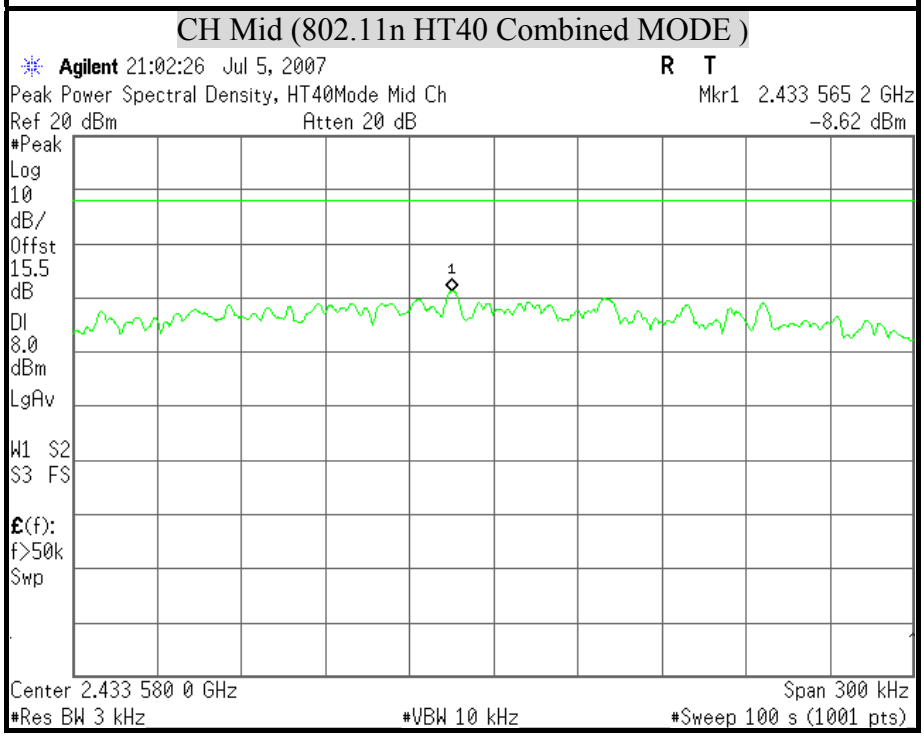


POWER SPECTRAL DENSITY (802.11n HT40 Combined MODE)

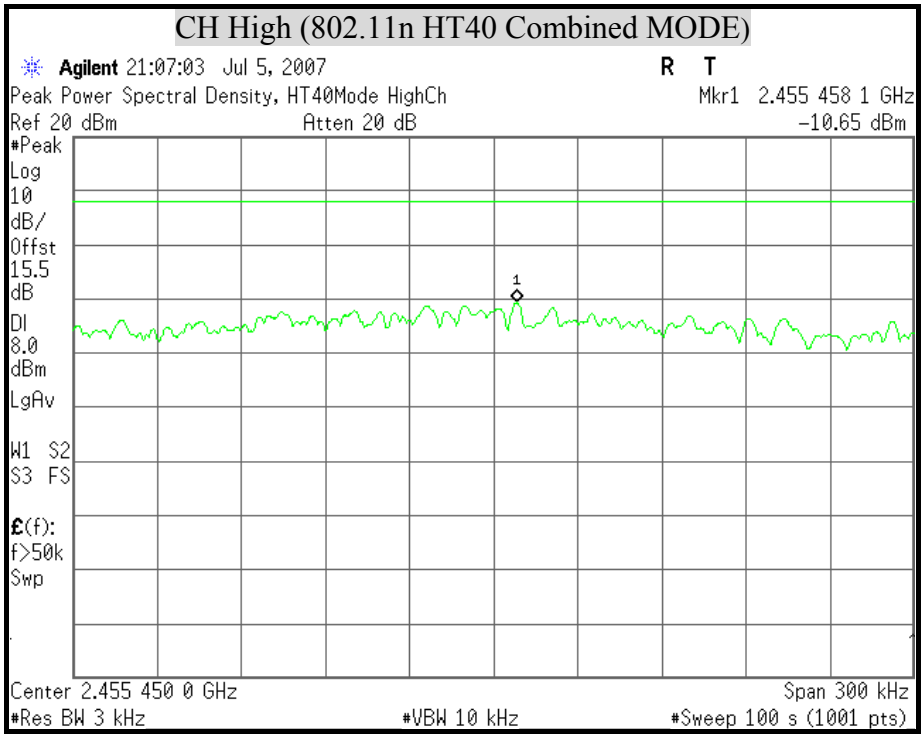
CH Low (802.11n HT40 Combined MODE)



CH Mid (802.11n HT40 Combined MODE)



CH High (802.11n HT40 Combined MODE)



8.7 CONDUCTED SPURIOUS EMISSION

LIMITS

§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is 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 and that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. 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 § 15.205(c)).

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

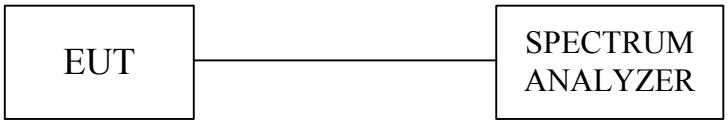
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
SPECTRUM ANALYZER	ROHDE & SCHWARZ	FSEK30	835253/002	10/17/2007
SPECTRUM ANALYZER	AGILENT	E4446A	MY433601.32	03/05/2008

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

TEST SETUP



Combined mode

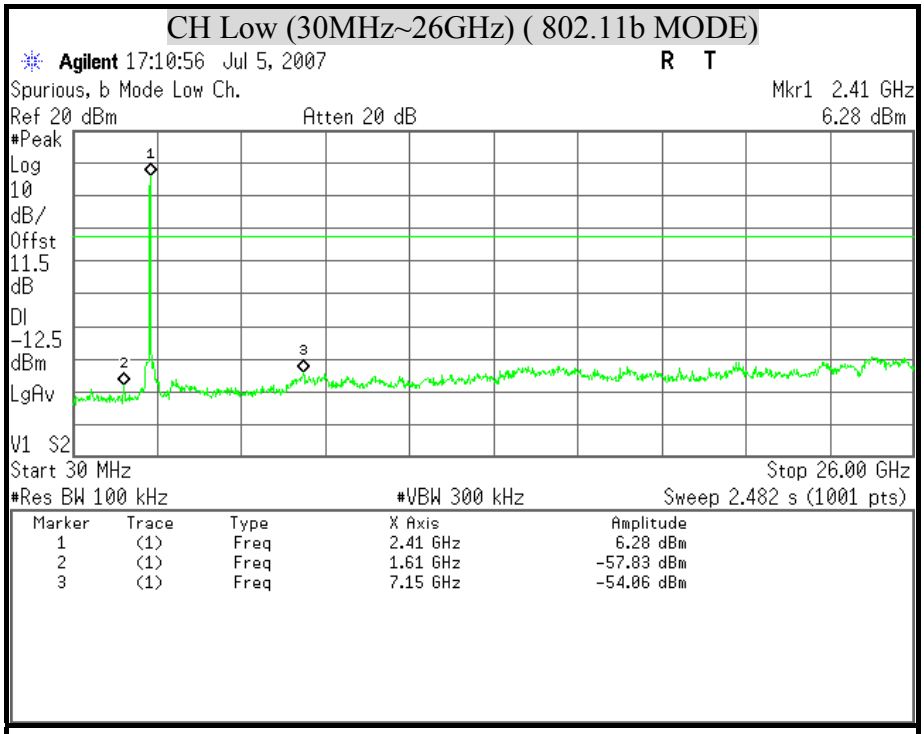
TEST RESULTS

No non-compliance noted

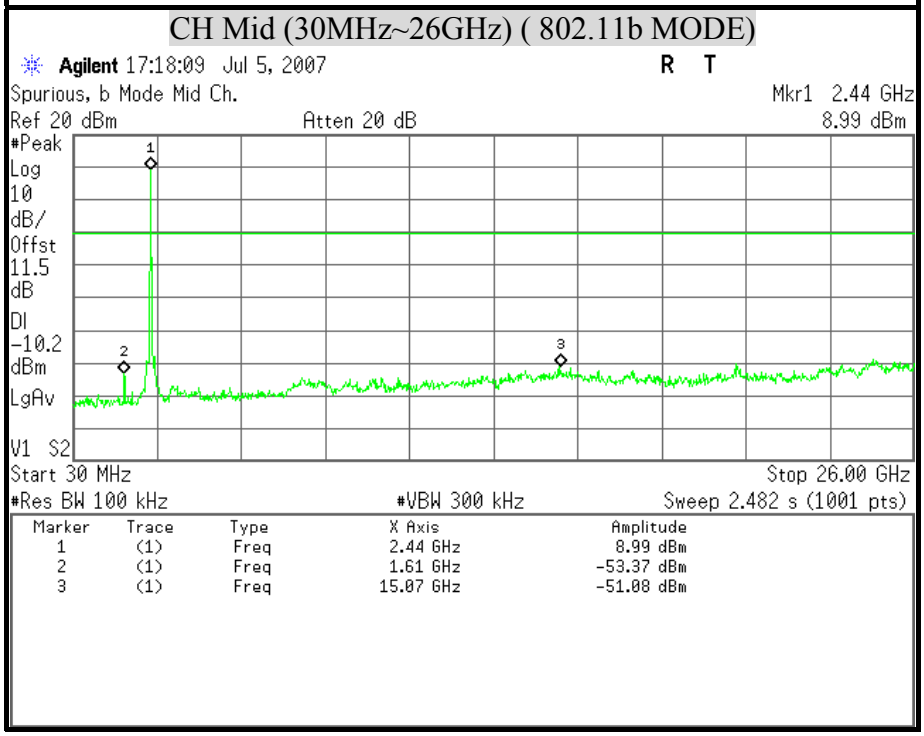
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(IEEE 802.11b MODE)

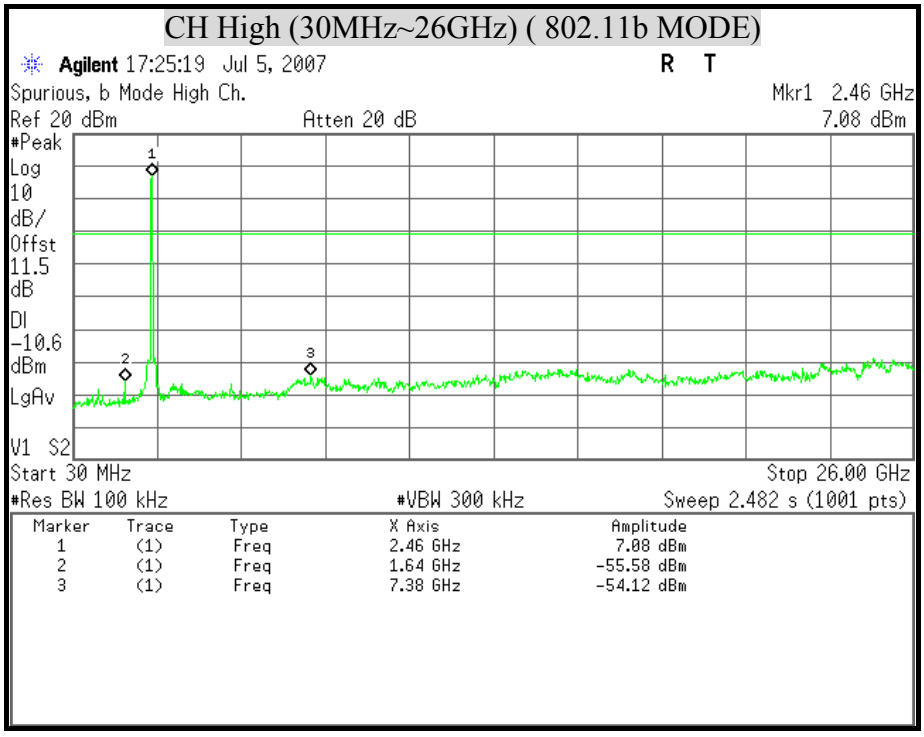
CH Low (30MHz~26GHz) (802.11b MODE)



CH Mid (30MHz~26GHz) (802.11b MODE)



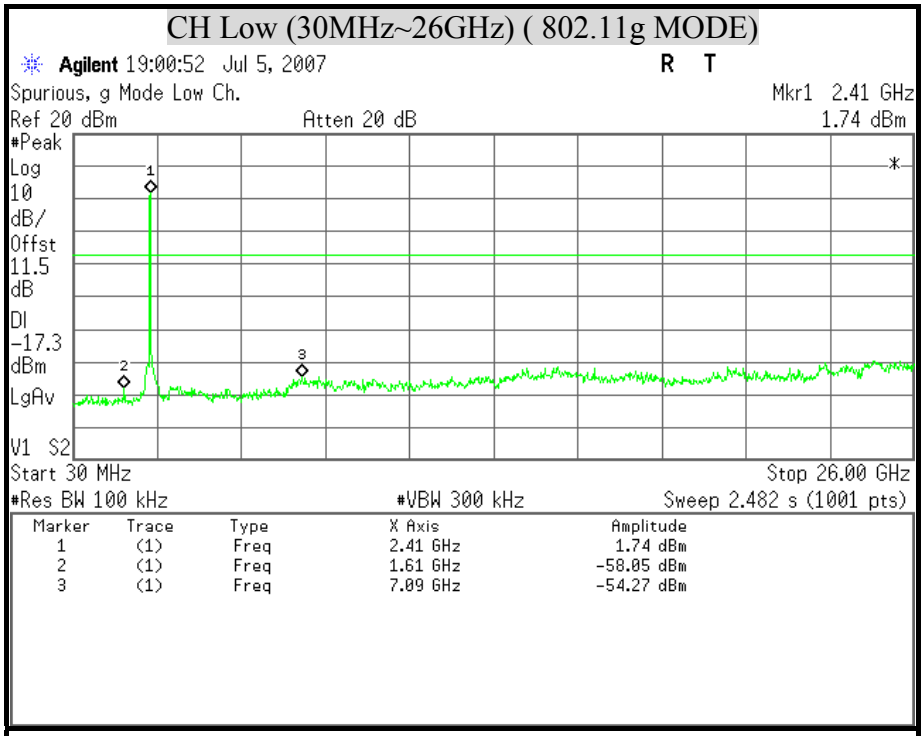
CH High (30MHz~26GHz) (802.11b MODE)



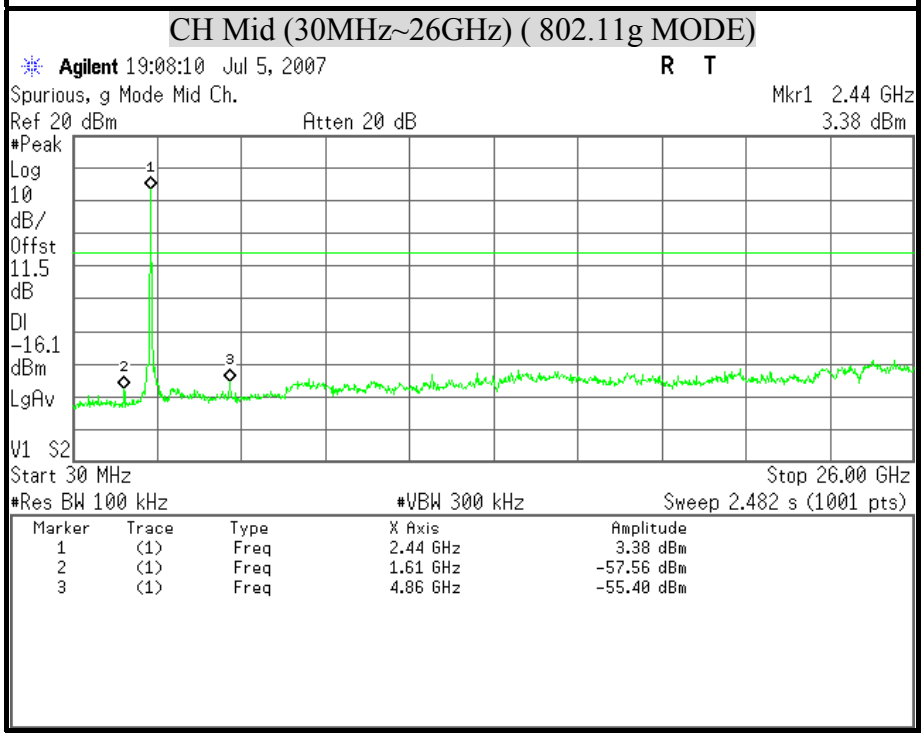
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(802.11g MODE)

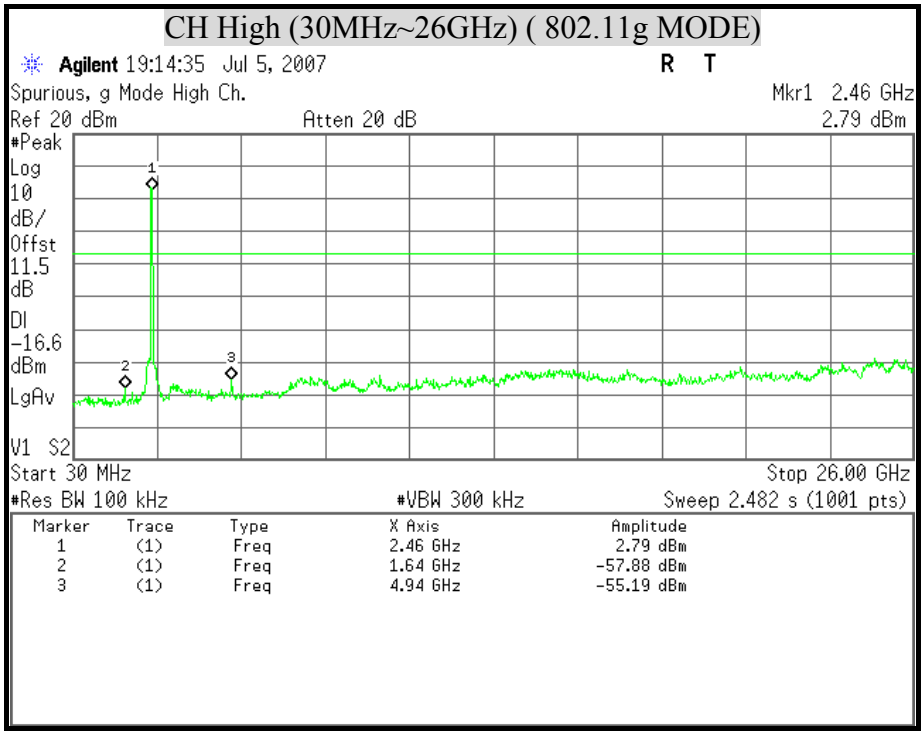
CH Low (30MHz~26GHz) (802.11g MODE)



CH Mid (30MHz~26GHz) (802.11g MODE)



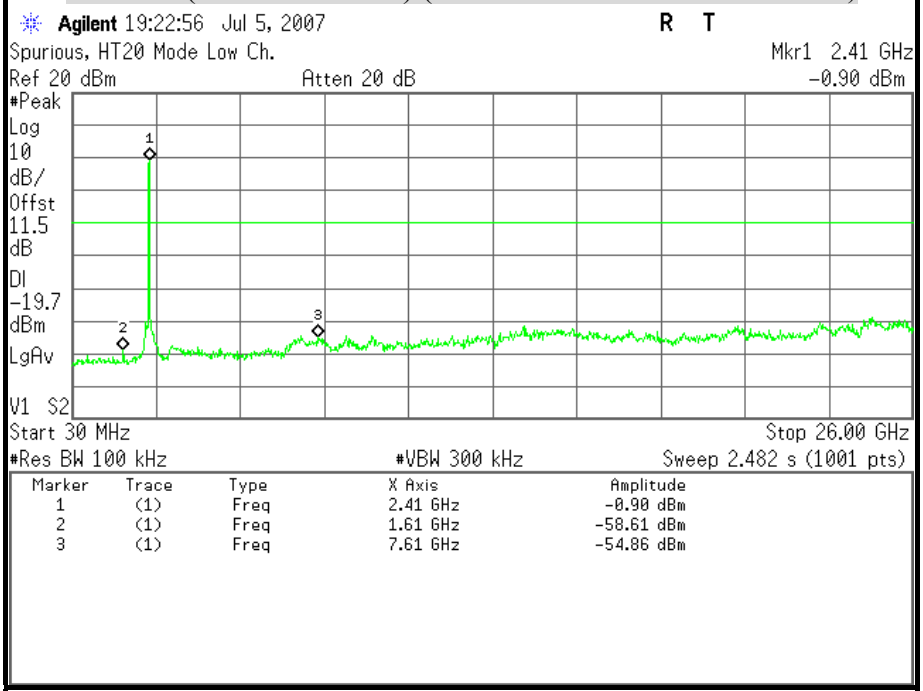
CH High (30MHz~26GHz) (802.11g MODE)



OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

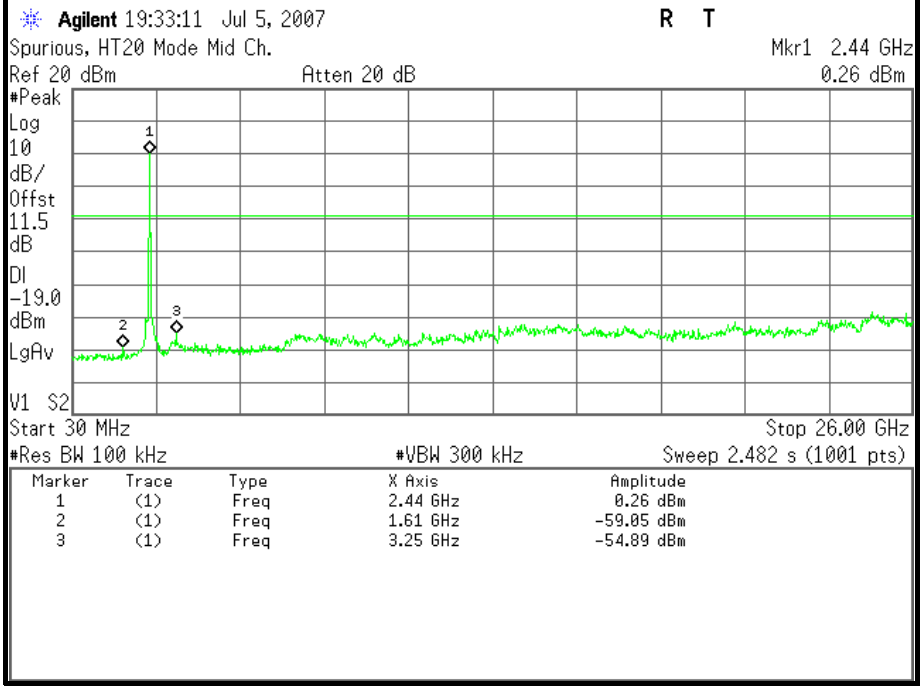
(802.11n HT20 MODE)

CH Low (30MHz~26GHz) (802.11n HT20 MODE-Chain 0)



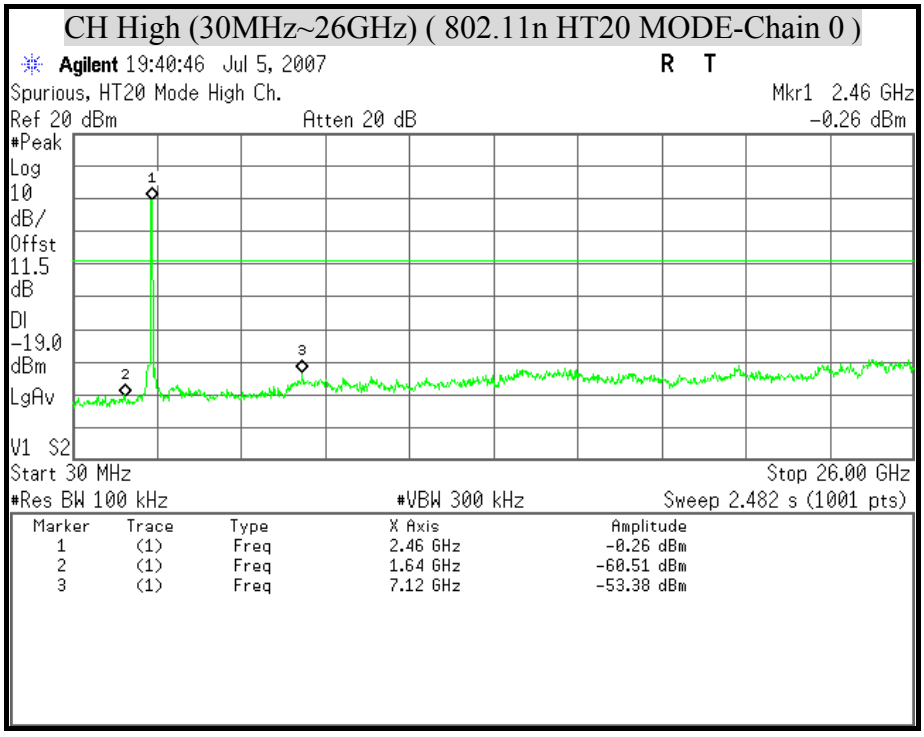
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.41 GHz	-0.90 dBm
2	(1)	Freq	1.61 GHz	-58.61 dBm
3	(1)	Freq	7.61 GHz	-54.86 dBm

CH Mid (30MHz~26GHz) (802.11n HT20 MODE-Chain 0)

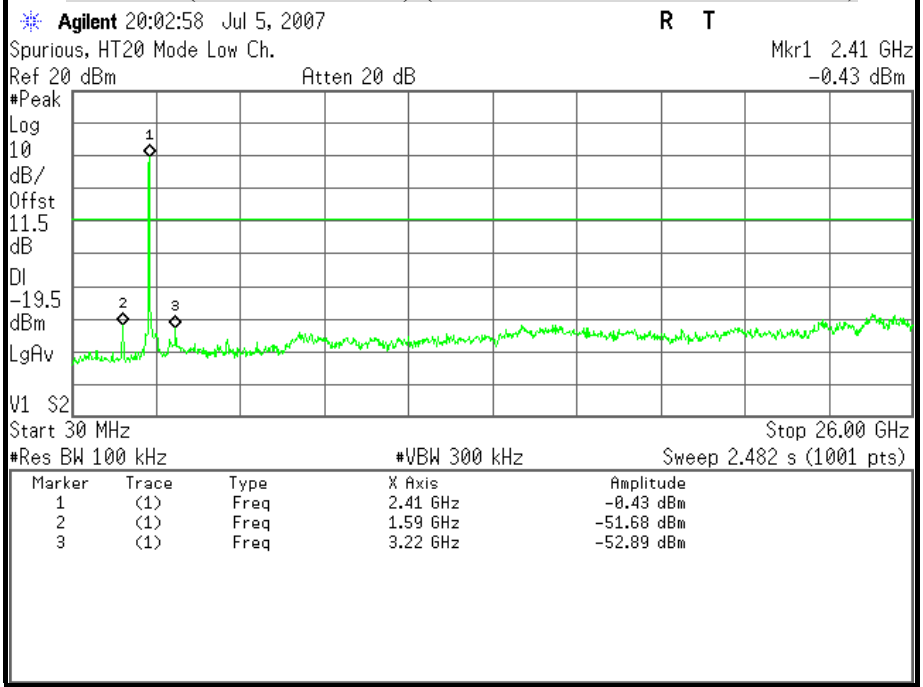


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.44 GHz	0.26 dBm
2	(1)	Freq	1.61 GHz	-59.05 dBm
3	(1)	Freq	3.25 GHz	-54.89 dBm

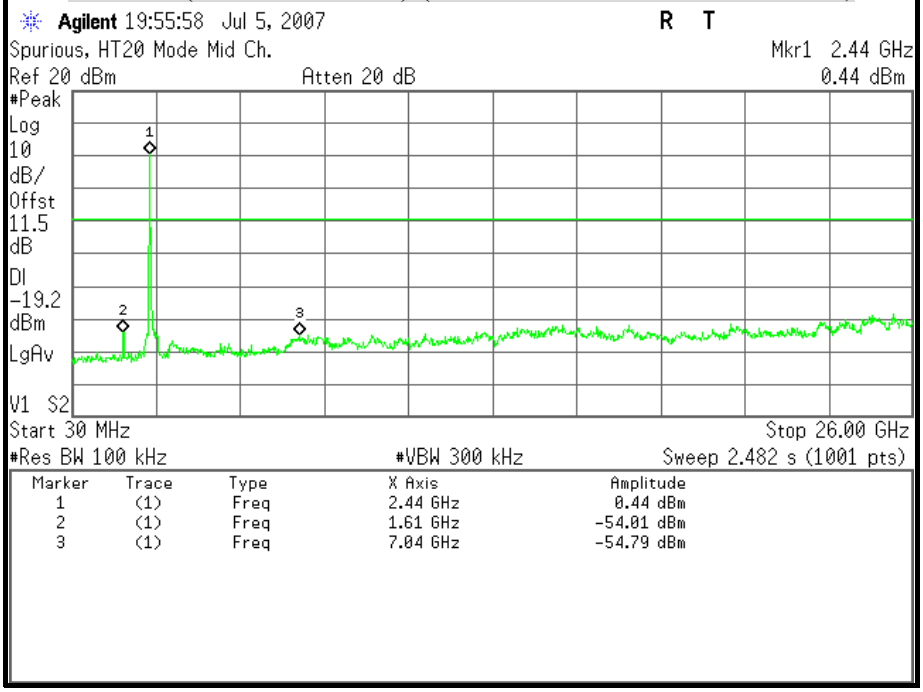
CH High (30MHz~26GHz) (802.11n HT20 MODE-Chain 0)



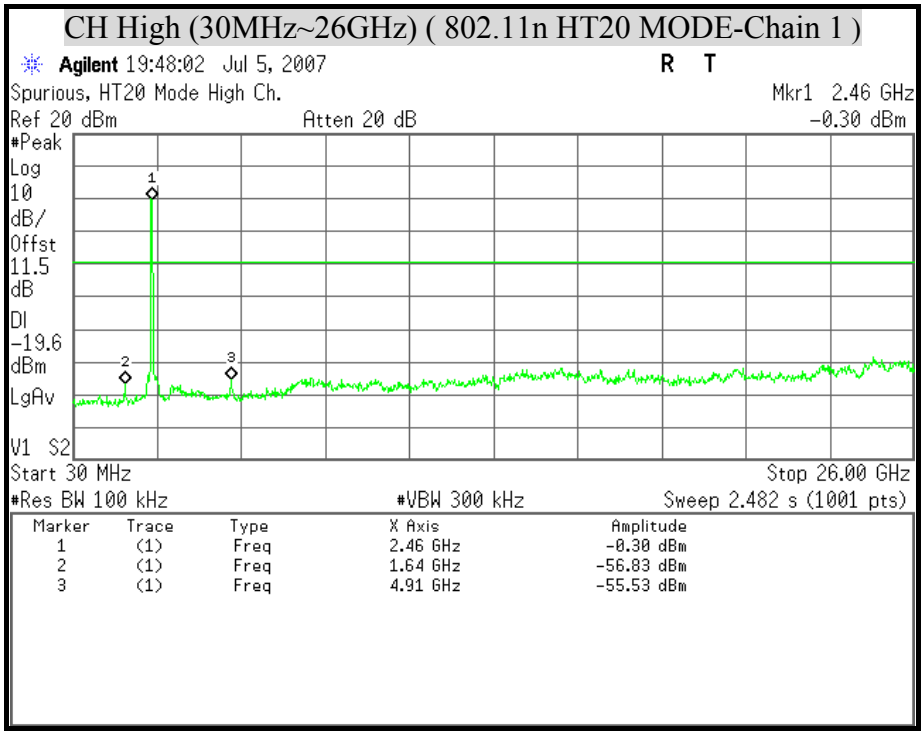
CH Low (30MHz~26GHz) (802.11n HT20 MODE-Chain 1)



CH Mid (30MHz~26GHz) (802.11n HT20 MODE-Chain 1)



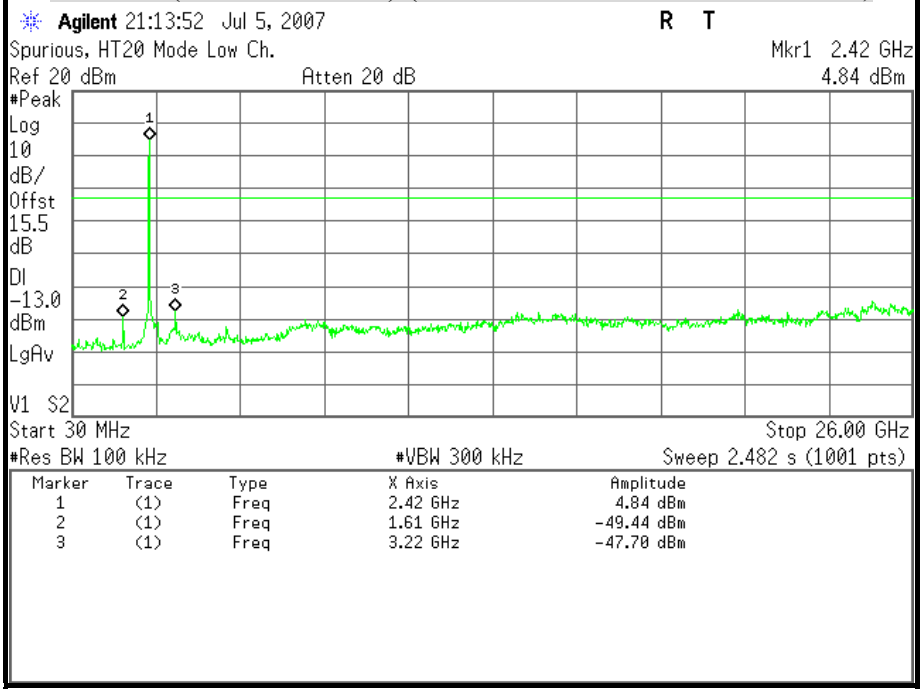
CH High (30MHz~26GHz) (802.11n HT20 MODE-Chain 1)



OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

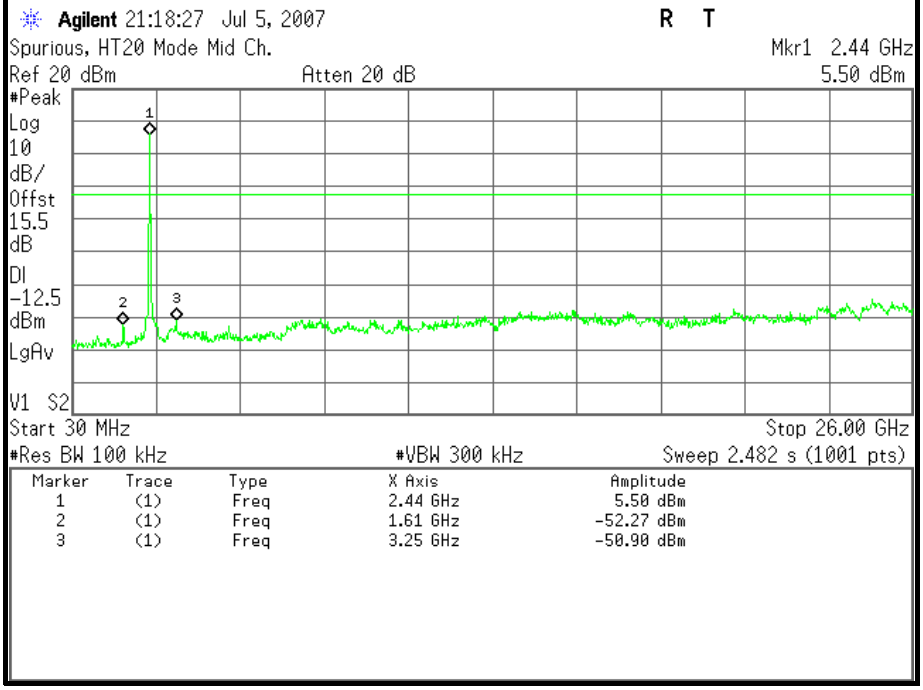
(802.11n HT20 Combined MODE)

CH Low (30MHz~26GHz) (802.11n HT20 Combined MODE)



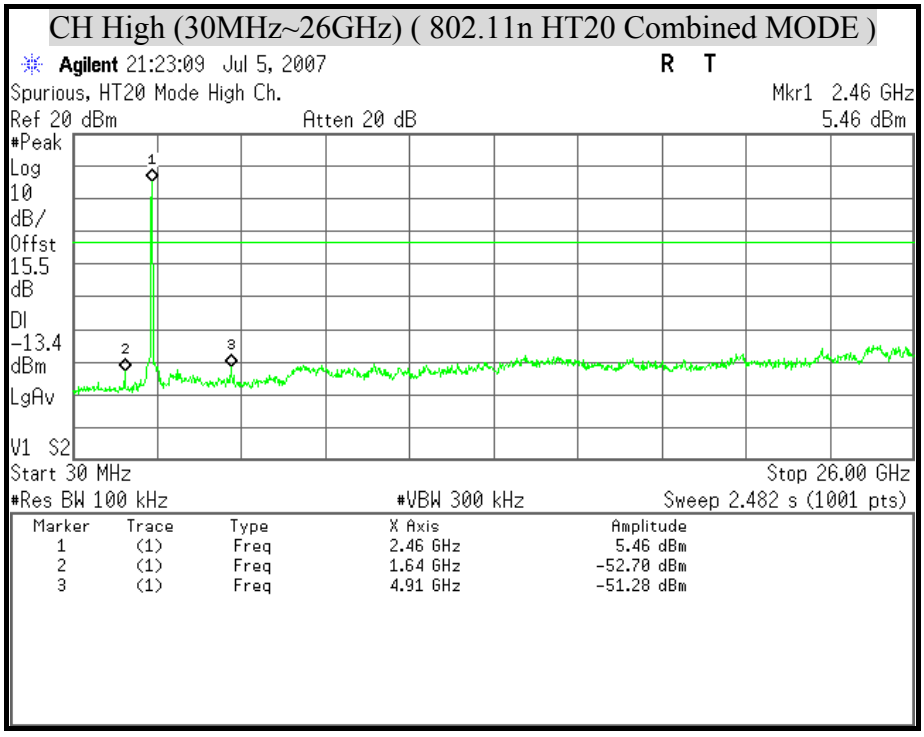
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.42 GHz	4.84 dBm
2	(1)	Freq	1.61 GHz	-49.44 dBm
3	(1)	Freq	3.22 GHz	-47.70 dBm

CH Mid (30MHz~26GHz) (802.11n HT20 Combined MODE)



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.44 GHz	5.50 dBm
2	(1)	Freq	1.61 GHz	-52.27 dBm
3	(1)	Freq	3.25 GHz	-50.90 dBm

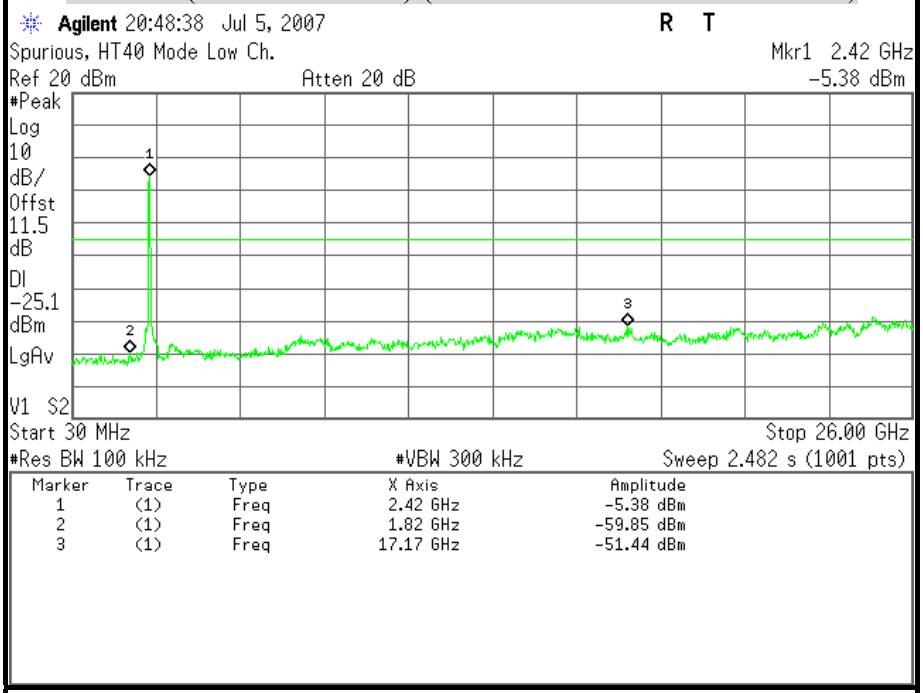
CH High (30MHz~26GHz) (802.11n HT20 Combined MODE)



OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

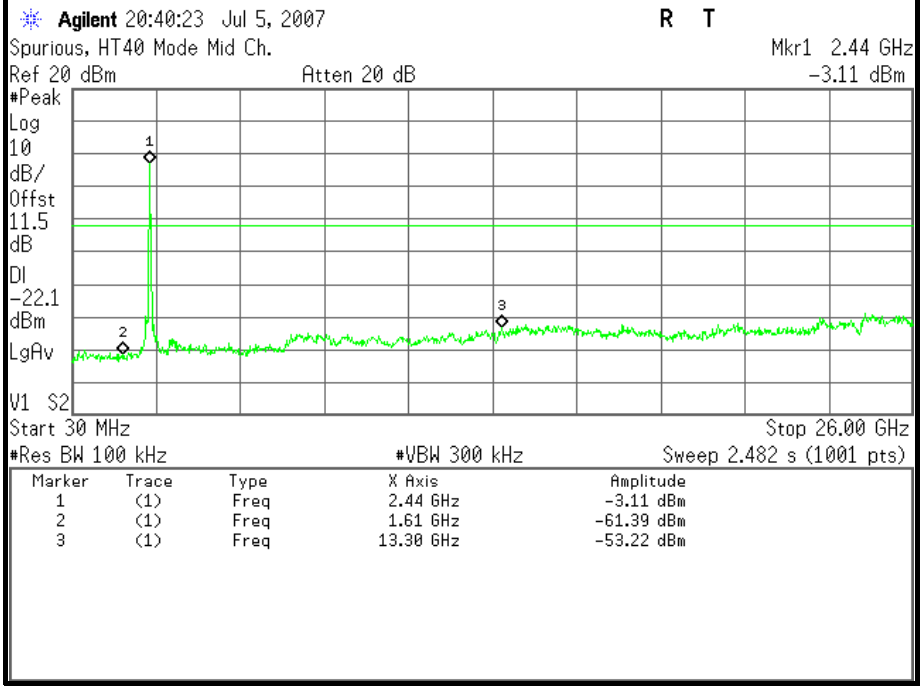
(802.11n HT40 MODE)

CH Low (30MHz~26GHz) (802.11n HT40 MODE-Chain 0)



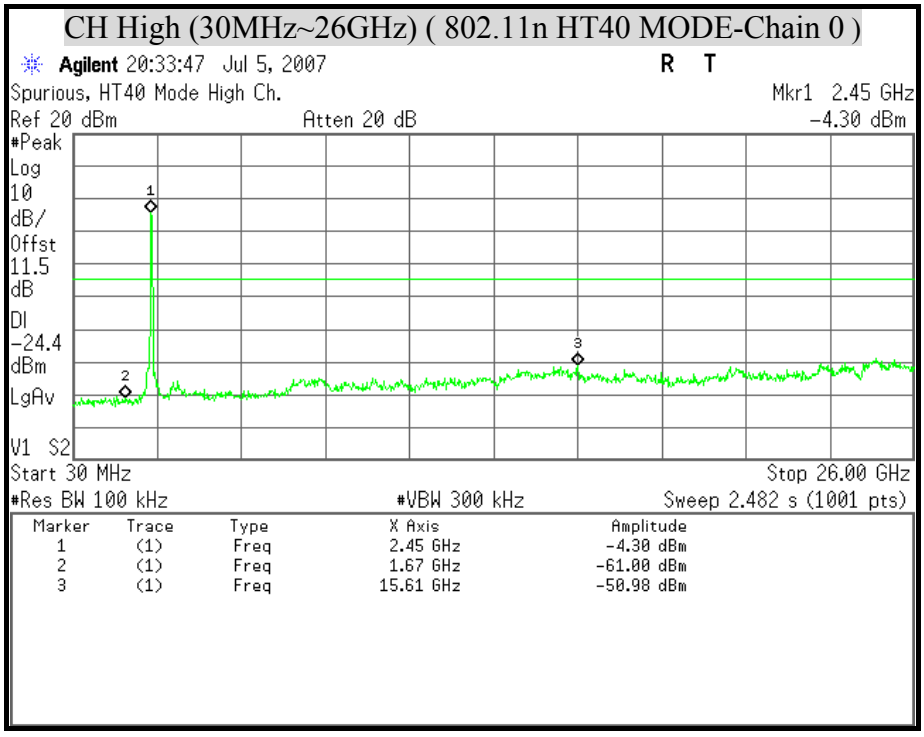
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.42 GHz	-5.38 dBm
2	(1)	Freq	1.82 GHz	-59.85 dBm
3	(1)	Freq	17.17 GHz	-51.44 dBm

CH Mid (30MHz~26GHz) (802.11n HT40 MODE-Chain 0)

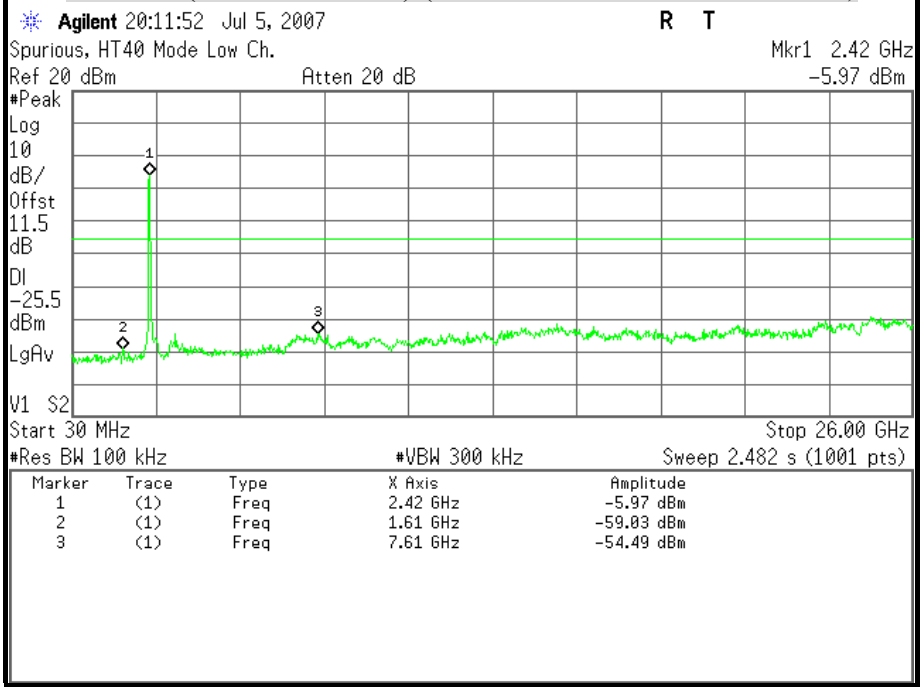


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.44 GHz	-3.11 dBm
2	(1)	Freq	1.61 GHz	-61.39 dBm
3	(1)	Freq	13.30 GHz	-53.22 dBm

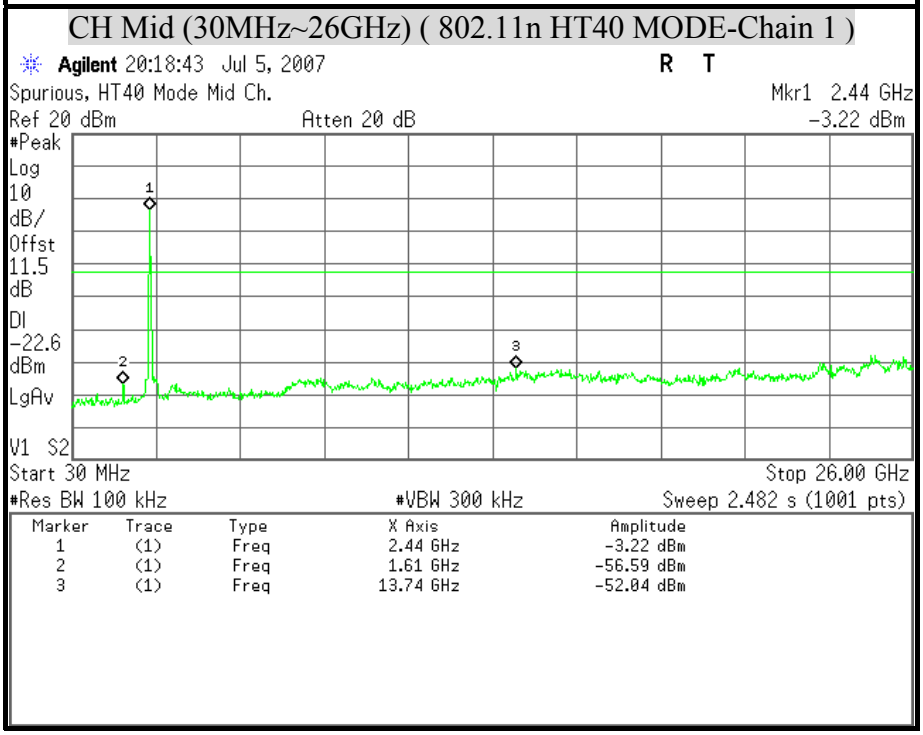
CH High (30MHz~26GHz) (802.11n HT40 MODE-Chain 0)



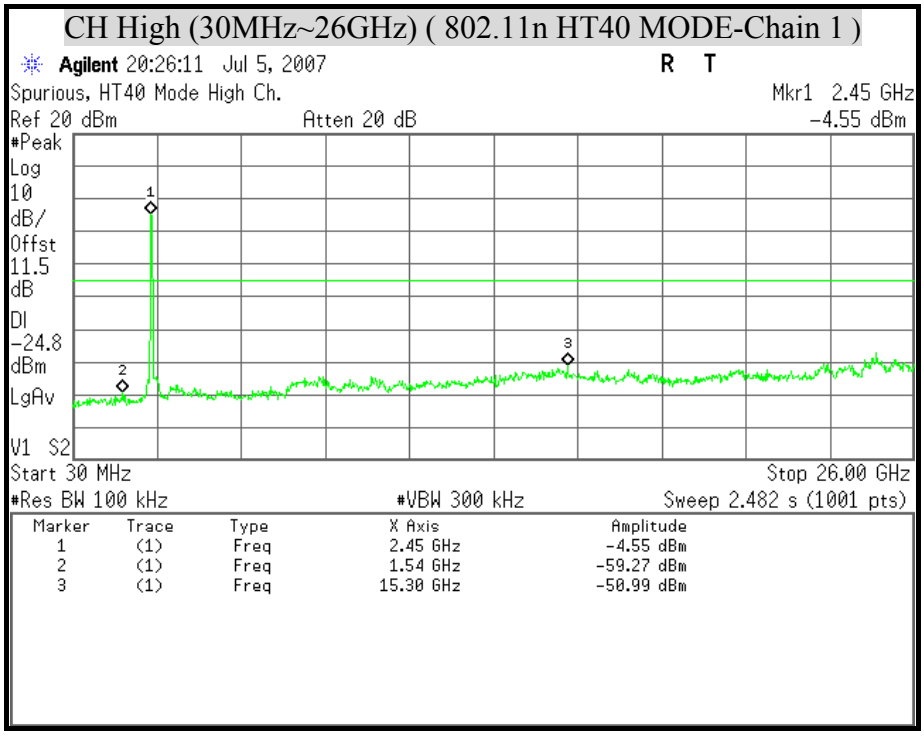
CH Low (30MHz~26GHz) (802.11n HT40 MODE-Chain 1)



CH Mid (30MHz~26GHz) (802.11n HT40 MODE-Chain 1)



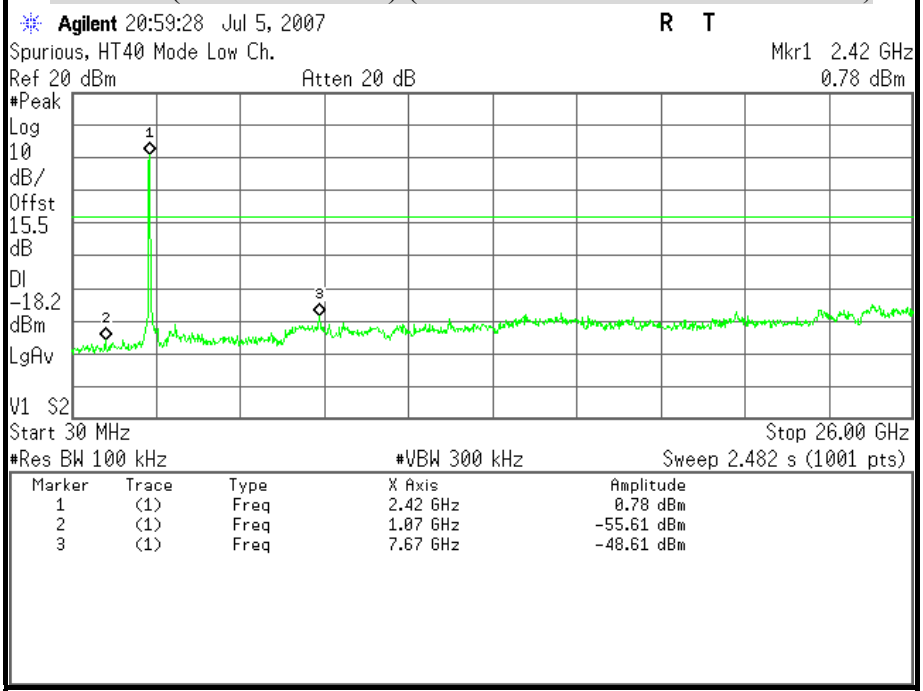
CH High (30MHz~26GHz) (802.11n HT40 MODE-Chain 1)



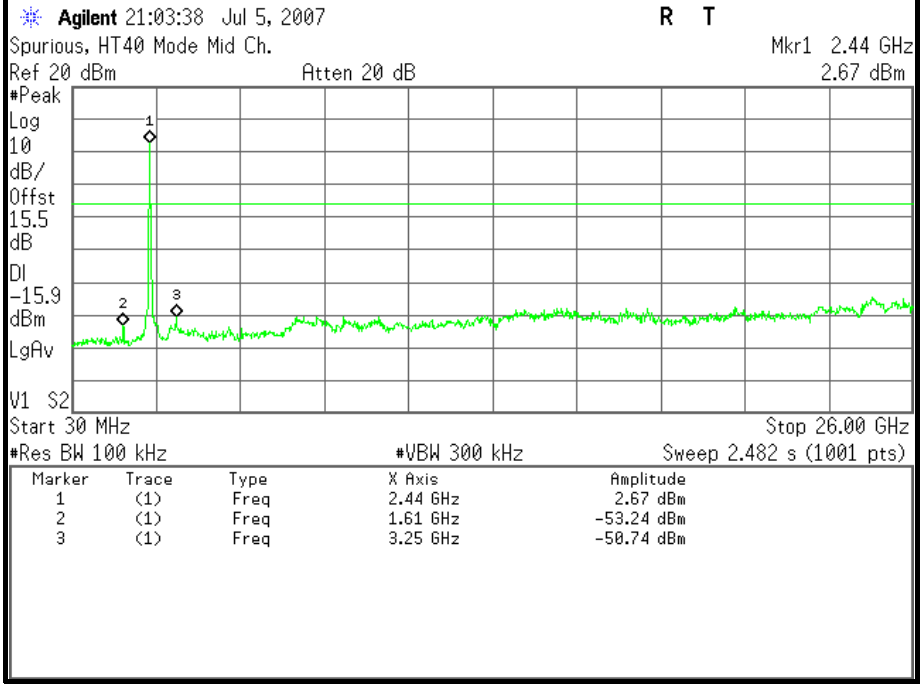
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(802.11n HT40 Combined MODE)

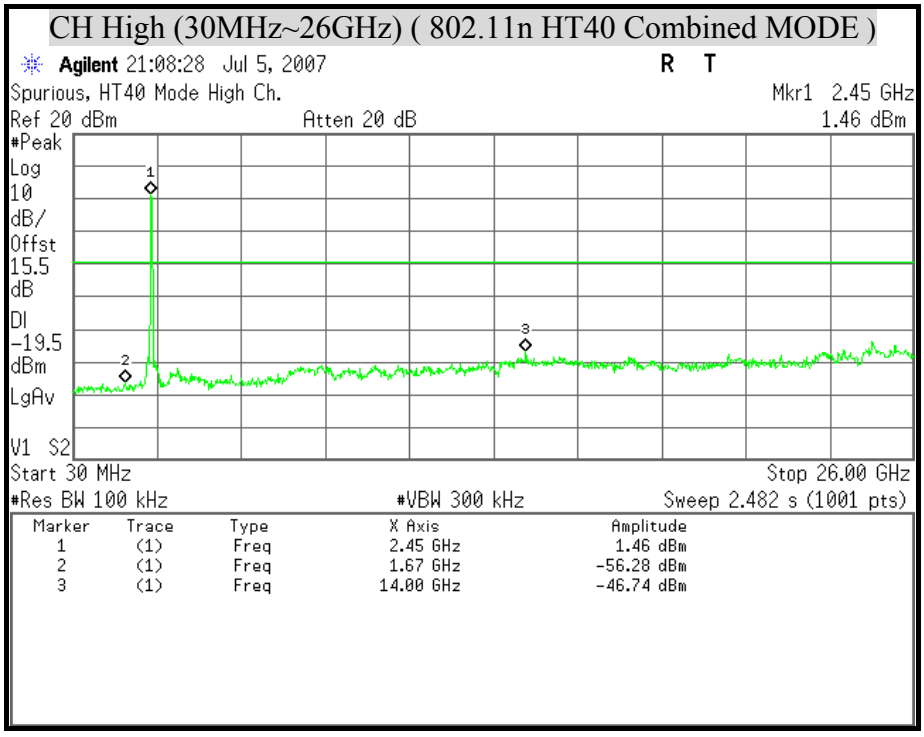
CH Low (30MHz~26GHz) (802.11n HT40 Combined MODE)



CH Mid (30MHz~26GHz) (802.11n HT40 Combined MODE)



CH High (30MHz~26GHz) (802.11n HT40 Combined MODE)



8.8 RADIATED EMISSIONS

8.8.1 TRANSMITTER RADIATED SUPURIOUS EMSSIONS

LIMITS

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

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 -1710	10.6 -12.7
6.26775 - 6.26825	108 -121.94	1718.8 - 1722.2	13.25 -13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 – 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 -16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3338	36.43 - 36.5
12.57675 - 12.57725	322 -335.4	3600 - 4400	([2])
13.36 - 13.41			

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

[2] Above 38.6

§ 15.205 (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 is 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.

§ 15.209 (a) 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 (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** 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.

§ 15.209 (b) In the emission table above, the tighter limit applies at the band edges.

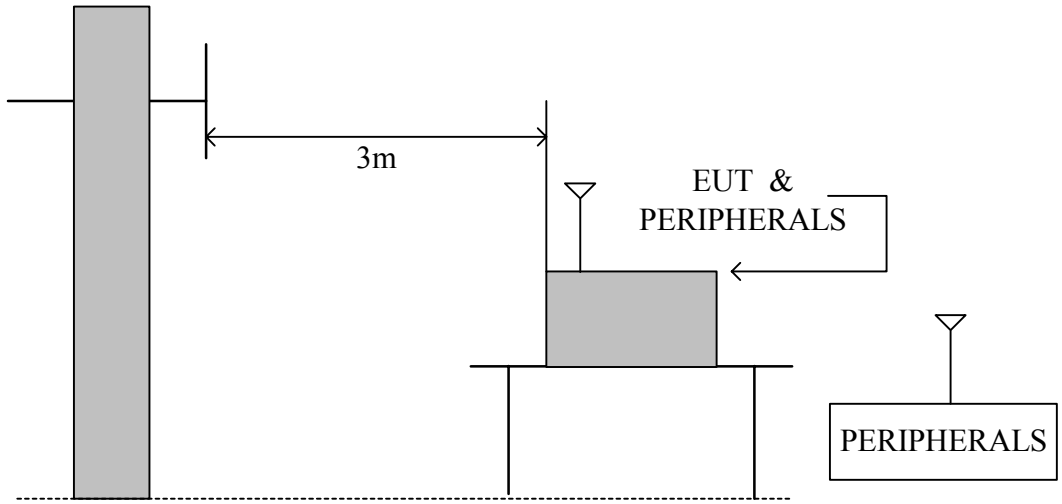
TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
SPECTRUM ANALYZER	AGILENT	E4446A	MY43360132	06/05/2009
R/S SPECTRUM ANALYZER	R & S	FSEK30	835253/002	10/18/2007
EMI TEST RECEIVER	R & S	ESCI	100221	05/20/2009
BILOG ANTENNA	SCHWARZBECK	VULB	9168_249	09/17/2009
HORN ANTENNA	ETS LINDGREN	3117	00078732	05/19/2009
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

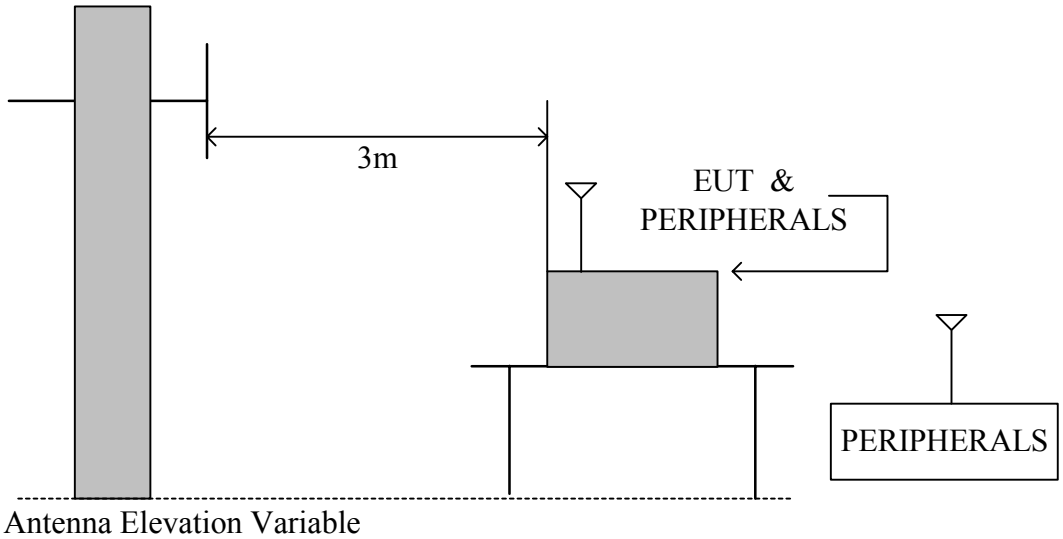
Remark: *1. Each piece of equipment is scheduled for calibration once a year.*
2. N.C.R = No Calibration Request.

TEST SETUP

The diagram below shows the test setup that is utilized to make the measurements for emission from below 1GHz.



The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.



TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. White measuring the radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. White measuring the radiated emission above 1GHz, the EUT was set 3 meters away from the interference-receiving antenna

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Note：

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.

3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

TEST RESULTS

No non-compliance noted

8.8.2 WORST-CASE RADIATED EMISSION BELOW 1 GHz

Dipole Antenna

Product Name	WIRELESS N MODULE	**Test Date**	2007/07/05
Model	WMP-N07	**Test By**	Alan Fan
Test Mode	Normal operating	**TEMP & Humidity**	37°C, 55%

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading at 3m(dBμV)		Limits (dBμV/m)	Emission Level at 3m(dBμV/m)	
			Horizontal	Vertical		Horizontal	Vertical
168.23	10.23	1.83	18.00	13.60	43.50	30.06	25.66
200.00	10.00	1.93	28.50	22.10	43.50	40.43	34.03
230.00	11.62	2.07	31.00	27.00	46.00	44.69	40.69
250.00	12.70	2.16	25.30	18.00	46.00	40.16	32.86
266.00	13.08	2.23	15.00	8.00	46.00	30.31	23.31
299.99	13.90	2.38	26.70	18.10	46.00	42.98	34.38
350.40	15.31	2.60	6.00	3.00	46.00	23.91	20.91
365.66	15.74	2.66	13.00	7.20	46.00	31.40	25.60
500.00	17.80	3.16	6.50	8.00	46.00	27.46	28.96
599.99	18.90	3.55	6.60	10.30	46.00	29.05	32.75
750.00	20.20	4.05	6.10	4.20	46.00	30.35	28.45
799.99	20.70	4.23	5.50	4.50	46.00	30.43	29.43

Remark: *Emission level (dBμV/m) =Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).*

PIFA Antenna

Product Name	WIRELESS N MODULE	**Test Date**	2009/03/10
Model Name	WMP-N07	**Test By**	Rueyyan Lin
Test Mode	Normal operating	**TEMP & Humidity**	19.3°C, 67%

Horizontal						
Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
99.84	76.25	-36.22	40.03	43.50	-3.47	Peak
199.75	73.69	-33.19	40.49	43.50	-3.01	Peak
266.68	73.30	-29.32	43.98	46.00	-2.02	QP
366.59	70.90	-27.47	43.43	46.00	-2.57	QP
433.52	59.92	-26.29	33.63	46.00	-12.37	Peak
499.48	57.23	-25.17	32.06	46.00	-13.94	Peak
599.39	62.55	-23.33	39.23	46.00	-6.77	Peak
630.43	57.19	-22.89	34.30	46.00	-11.70	Peak
666.32	55.41	-22.40	33.01	46.00	-12.99	Peak
801.15	53.66	-20.31	33.35	46.00	-12.65	Peak
901.06	51.68	-18.99	32.69	46.00	-13.31	Peak

Vertical						
Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
99.84	68.10	-36.22	31.88	43.50	-11.62	Peak
165.80	68.90	-31.00	37.90	43.50	-5.60	QP
232.73	70.60	-31.68	38.92	46.00	-7.08	QP
265.71	64.71	-29.38	35.33	46.00	-10.67	Peak
299.66	72.60	-27.97	44.63	46.00	-1.37	QP
364.65	63.60	-27.50	36.10	46.00	-9.90	QP
433.52	56.20	-26.29	29.91	46.00	-16.09	Peak
497.54	59.18	-25.21	33.97	46.00	-12.03	Peak
599.39	64.02	-23.33	40.69	46.00	-5.31	Peak

Remark:

1. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.
2. 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.
3. Margin (dB) = Remark result (dBuV/m) - Quasi-peak limit (dBuV/m).

8.8.3 TRANSMITTER RADIATED EMISSION ABOVE 1 GHz

Dipole Antenna

Product Name	WIRELESS N MODULE	**Test Date**	2007/07/04
Model	WMP-N07	**Test By**	Alan Fan
Test Mode	IEEE 802.11b TX (CH Low)	**TEMP & Humidity**	34°C, 56%

Measurement Distance at 1m Horizontal polarity

Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1607.90	55.77	27.34	3.77	36.86	9.50	0.00	40.52	74.00	-33.48	P	1.00
1607.90	41.90	27.34	3.77	36.86	9.50	0.00	26.65	54.00	-27.35	A	1.00
3215.88	48.66	30.80	5.63	36.83	9.50	0.00	38.77	74.00	-35.23	P	1.00
3215.88	40.40	30.80	5.63	36.83	9.50	0.00	30.51	54.00	-23.49	A	1.00
4824.08	51.84	34.52	6.32	36.60	9.50	0.35	46.93	74.00	-27.07	P	1.00
4824.08	37.69	34.52	6.32	36.60	9.50	0.35	32.78	54.00	-21.22	A	1.00
6432.00	50.29	36.20	7.81	36.69	9.50	0.29	48.41	74.00	-25.59	P	1.00
6432.00	44.09	36.20	7.81	36.69	9.50	0.29	42.21	54.00	-11.79	A	1.00
7232.69	47.68	39.53	8.27	36.85	9.50	0.91	50.04	74.00	-23.96	P	1.00
7232.69	34.56	39.53	8.27	36.85	9.50	0.91	36.92	54.00	-17.08	A	1.00

Measurement Distance at 1m Vertical polarity

Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1607.90	56.54	27.34	3.77	36.86	9.50	0.00	41.29	74.00	-32.71	P	1.00
1607.90	43.59	27.34	3.77	36.86	9.50	0.00	28.34	54.00	-25.66	A	1.00
3215.88	54.37	30.80	5.63	36.83	9.50	0.00	44.48	74.00	-29.52	P	1.00
3215.88	50.91	30.80	5.63	36.83	9.50	0.00	41.02	54.00	-12.98	A	1.00
4824.08	56.73	34.52	6.32	36.60	9.50	0.35	51.82	74.00	-22.18	P	1.00
4824.08	43.17	34.52	6.32	36.60	9.50	0.35	38.26	54.00	-15.74	A	1.00
6432.00	51.47	36.20	7.81	36.69	9.50	0.29	49.59	74.00	-24.41	P	1.00
6432.00	47.00	36.20	7.81	36.69	9.50	0.29	45.12	54.00	-8.88	A	1.00
7232.69	48.79	39.53	8.27	36.85	9.50	0.91	51.15	74.00	-22.85	P	1.00
7232.69	36.82	39.53	8.27	36.85	9.50	0.91	39.18	54.00	-14.82	A	1.00

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
4. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
5. The other emission levels were 20dB below the limit
6. The test limit distance is 3M limit.

Product Name	WIRELESS N MODULE	Test Date	2007/07/05
Model	WMP-N07	Test By	Alan Fan
Test Mode	IEEE 802.11b TX (CH Middle)	TEMP & Humidity	37°C, 56%

Measurement Distance at 1m Horizontal polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1624.51	59.41	27.47	3.80	36.85	9.50	0.00	44.33	74.00	-29.67	P	1.00
1624.51	47.16	27.47	3.80	36.85	9.50	0.00	32.08	54.00	-21.92	A	1.00
3249.15	50.20	30.80	5.65	36.81	9.50	0.00	40.34	74.00	-33.66	P	1.00
3249.15	42.35	30.80	5.65	36.81	9.50	0.00	32.49	54.00	-21.51	A	1.00
4873.96	56.45	34.60	6.32	36.61	9.50	0.30	51.55	74.00	-22.45	P	1.00
4873.96	43.09	34.60	6.32	36.61	9.50	0.30	38.19	54.00	-15.81	A	1.00
6498.60	51.35	36.30	7.93	36.72	9.50	0.30	49.66	74.00	-24.34	P	1.00
6498.60	45.33	36.30	7.93	36.72	9.50	0.30	43.64	54.00	-10.36	A	1.00
7306.36	49.30	39.61	8.30	36.92	9.50	0.84	51.62	74.00	-22.38	P	1.00
7306.36	37.15	39.61	8.30	36.92	9.50	0.84	39.47	54.00	-14.53	A	1.00

Measurement Distance at 1m Vertical polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1624.51	60.48	27.47	3.80	36.85	9.50	0.00	45.40	74.00	-28.60	P	1.00
1624.51	47.76	27.47	3.80	36.85	9.50	0.00	32.68	54.00	-21.32	A	1.00
3249.15	53.92	30.80	5.65	36.81	9.50	0.00	44.06	74.00	-29.94	P	1.00
3249.15	50.93	30.80	5.65	36.81	9.50	0.00	41.07	54.00	-12.93	A	1.00
4873.96	59.72	34.60	6.32	36.61	9.50	0.30	54.82	74.00	-19.18	P	1.00
4873.96	46.80	34.60	6.32	36.61	9.50	0.30	41.90	54.00	-12.10	A	1.00
6498.60	53.40	36.30	7.93	36.72	9.50	0.30	51.71	74.00	-22.29	P	1.00
6498.60	48.33	36.30	7.93	36.72	9.50	0.30	46.64	54.00	-7.36	A	1.00
7306.36	51.02	39.61	8.30	36.92	9.50	0.84	53.34	74.00	-20.66	P	1.00
7306.36	39.12	39.61	8.30	36.92	9.50	0.84	41.44	54.00	-12.56	A	1.00

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
4. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
5. The other emission levels were 20dB below the limit
6. The test limit distance is 3M limit.

Product Name	WIRELESS N MODULE	Test Date	2007/07/05
Model	WMP-N07	Test By	Alan Fan
Test Mode	IEEE 802.11b TX (CH High)	TEMP & Humidity	37°C, 56%

Measurement Distance at 1m Horizontal polarity

Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1641.69	55.78	27.61	3.82	36.84	9.50	0.00	40.87	74.00	-33.13	P	1.00
1641.69	42.69	27.61	3.82	36.84	9.50	0.00	27.78	54.00	-26.22	A	1.00
3282.60	51.79	30.80	5.67	36.80	9.50	0.00	41.96	74.00	-32.04	P	1.00
3282.60	42.70	30.80	5.67	36.80	9.50	0.00	32.87	54.00	-21.13	A	1.00
4923.97	59.70	34.68	6.32	36.62	9.50	0.25	54.82	74.00	-19.18	P	1.00
4923.97	46.59	34.68	6.32	36.62	9.50	0.25	41.71	54.00	-12.29	A	1.00
6565.50	52.40	36.69	7.96	36.70	9.50	0.41	51.26	74.00	-22.74	P	1.00
6565.50	44.21	36.69	7.96	36.70	9.50	0.41	43.07	54.00	-10.93	A	1.00
7382.53	50.38	39.68	8.33	37.01	9.50	0.77	52.65	74.00	-21.35	P	1.00
7382.53	36.55	39.68	8.33	37.01	9.50	0.77	38.82	54.00	-15.18	A	1.00

Measurement Distance at 1m Vertical polarity

Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1641.34	57.60	27.60	3.82	36.84	9.50	0.00	42.69	74.00	-31.31	P	1.00
1641.34	44.69	27.60	3.82	36.84	9.50	0.00	29.78	54.00	-24.22	A	1.00
3282.60	54.24	30.80	5.67	36.80	9.50	0.00	44.41	74.00	-29.59	P	1.00
3282.60	49.07	30.80	5.67	36.80	9.50	0.00	39.24	54.00	-14.76	A	1.00
4923.97	61.45	34.68	6.32	36.62	9.50	0.25	56.57	74.00	-17.43	P	1.00
4923.97	48.66	34.68	6.32	36.62	9.50	0.25	43.78	54.00	-10.22	A	1.00
6565.50	53.50	36.69	7.96	36.70	9.50	0.41	52.36	74.00	-21.64	P	1.00
6565.50	47.32	36.69	7.96	36.70	9.50	0.41	46.18	54.00	-7.82	A	1.00
7382.53	49.00	39.68	8.33	37.01	9.50	0.77	51.27	74.00	-22.73	P	1.00
7382.53	35.60	39.68	8.33	37.01	9.50	0.77	37.87	54.00	-16.13	A	1.00

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
4. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
5. The other emission levels were 20dB below the limit
6. The test limit distance is 3M limit.

Product Name	WIRELESS N MODULE	Test Date	2007/07/03
Model	WMP-N07	Test By	Alan Fan
Test Mode	IEEE 802.11g TX (CH Low)	TEMP & Humidity	34°C, 56%

Measurement Distance at 1m Horizontal polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1608.12	53.75	27.34	3.77	36.86	9.50	0.00	38.50	74.00	-35.50	P	1.00
1608.12	39.15	27.34	3.77	36.86	9.50	0.00	23.90	54.00	-30.10	A	1.00
3215.84	50.71	30.80	5.63	36.83	9.50	0.00	40.82	74.00	-33.18	P	1.00
3215.84	43.15	30.80	5.63	36.83	9.50	0.00	33.26	54.00	-20.74	A	1.00
4824.87	51.17	34.52	6.32	36.60	9.50	0.35	46.26	74.00	-27.74	P	1.00
4824.87	37.15	34.52	6.32	36.60	9.50	0.35	32.24	54.00	-21.76	A	1.00
6432.96	52.00	36.21	7.82	36.69	9.50	0.29	50.12	74.00	-23.88	P	1.00
6432.96	46.25	36.21	7.82	36.69	9.50	0.29	44.37	54.00	-9.63	A	1.00
7231.21	49.11	39.53	8.27	36.85	9.50	0.91	51.47	74.00	-22.53	P	1.00
7231.21	35.83	39.53	8.27	36.85	9.50	0.91	38.19	54.00	-15.81	A	1.00

Measurement Distance at 1m Vertical polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1605.73	55.67	27.32	3.77	36.87	9.50	0.00	40.40	74.00	-33.60	P	1.00
1605.73	41.42	27.32	3.77	36.87	9.50	0.00	26.15	54.00	-27.85	A	1.00
3215.84	53.58	30.80	5.63	36.83	9.50	0.00	43.69	74.00	-30.31	P	1.00
3215.84	49.22	30.80	5.63	36.83	9.50	0.00	39.33	54.00	-14.67	A	1.00
4824.87	53.36	34.52	6.32	36.60	9.50	0.35	48.45	74.00	-25.55	P	1.00
4824.87	40.00	34.52	6.32	36.60	9.50	0.35	35.09	54.00	-18.91	A	1.00
6432.96	52.02	36.21	7.82	36.69	9.50	0.29	50.14	74.00	-23.86	P	1.00
6432.96	47.00	36.21	7.82	36.69	9.50	0.29	45.12	54.00	-8.88	A	1.00
7231.21	50.81	39.53	8.27	36.85	9.50	0.91	53.17	74.00	-20.83	P	1.00
7231.21	36.91	39.53	8.27	36.85	9.50	0.91	39.27	54.00	-14.73	A	1.00

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
4. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
5. The other emission levels were 20dB below the limit
6. The test limit distance is 3M limit.

Product Name	WIRELESS N MODULE	**Test Date**	2007/07/03
Model	WMP-N07	**Test By**	Alan Fan
Test Mode	IEEE 802.11g TX (CH Middle)	**TEMP & Humidity**	34°C, 56%

Measurement Distance at 1m Horizontal polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1624.58	54.70	27.47	3.80	36.85	9.50	0.00	39.62	74.00	-34.38	P	1.00
1624.58	42.02	27.47	3.80	36.85	9.50	0.00	26.94	54.00	-27.06	A	1.00
3249.38	50.15	30.80	5.65	36.81	9.50	0.00	40.29	74.00	-33.71	P	1.00
3249.38	42.42	30.80	5.65	36.81	9.50	0.00	32.56	54.00	-21.44	A	1.00
4876.32	52.62	34.60	6.32	36.61	9.50	0.29	47.73	74.00	-26.27	P	1.00
4876.32	39.34	34.60	6.32	36.61	9.50	0.29	34.45	54.00	-19.55	A	1.00
6498.53	53.00	36.30	7.93	36.72	9.50	0.30	51.31	74.00	-22.69	P	1.00
6498.53	47.88	36.30	7.93	36.72	9.50	0.30	46.19	54.00	-7.81	A	1.00
7308.32	48.90	39.61	8.30	36.93	9.50	0.84	51.22	74.00	-22.78	P	1.00
7308.32	36.33	39.61	8.30	36.93	9.50	0.84	38.65	54.00	-15.35	A	1.00

Measurement Distance at 1m Vertical polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1624.58	56.92	27.47	3.80	36.85	9.50	0.00	41.84	74.00	-32.16	P	1.00
1624.58	43.44	27.47	3.80	36.85	9.50	0.00	28.36	54.00	-25.64	A	1.00
3249.38	55.37	30.80	5.65	36.81	9.50	0.00	45.51	74.00	-28.49	P	1.00
3249.38	51.80	30.80	5.65	36.81	9.50	0.00	41.94	54.00	-12.06	A	1.00
4876.32	57.23	34.60	6.32	36.61	9.50	0.29	52.34	74.00	-21.66	P	1.00
4876.32	43.72	34.60	6.32	36.61	9.50	0.29	38.83	54.00	-15.17	A	1.00
6498.53	54.20	36.30	7.93	36.72	9.50	0.30	52.51	74.00	-21.49	P	1.00
6498.53	50.44	36.30	7.93	36.72	9.50	0.30	48.75	54.00	-5.25	A	1.00
7308.32	53.10	39.61	8.30	36.93	9.50	0.84	55.42	74.00	-18.58	P	1.00
7308.32	38.10	39.61	8.30	36.93	9.50	0.84	40.42	54.00	-13.58	A	1.00

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
4. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
5. The other emission levels were 20dB below the limit
6. The test limit distance is 3M limit.

Product Name	WIRELESS N MODULE	Test Date	2007/07/03
Model	WMP-N07	Test By	Alan Fan
Test Mode	IEEE 802.11g TX (CH High)	TEMP & Humidity	34°C, 56%

Measurement Distance at 1m Horizontal polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1640.25	53.22	27.59	3.82	36.84	9.50	0.00	38.30	74.00	-35.70	P	1.00
1640.25	38.81	27.59	3.82	36.84	9.50	0.00	23.89	54.00	-30.11	A	1.00
3282.79	49.86	30.80	5.67	36.80	9.50	0.00	40.03	74.00	-33.97	P	1.00
3282.79	41.70	30.80	5.67	36.80	9.50	0.00	31.87	54.00	-22.13	A	1.00
4926.18	54.87	34.68	6.32	36.62	9.50	0.24	49.99	74.00	-24.01	P	1.00
4926.18	41.61	34.68	6.32	36.62	9.50	0.24	36.73	54.00	-17.27	A	1.00
6565.22	50.95	36.69	7.96	36.70	9.50	0.41	49.81	74.00	-24.19	P	1.00
6565.22	43.72	36.69	7.96	36.70	9.50	0.41	42.58	54.00	-11.42	A	1.00
7382.58	49.39	39.68	8.33	37.01	9.50	0.77	51.66	74.00	-22.34	P	1.00
7382.58	34.89	39.68	8.33	37.01	9.50	0.77	37.16	54.00	-16.84	A	1.00

Measurement Distance at 1m Vertical polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1638.94	54.91	27.58	3.82	36.84	9.50	0.00	39.97	74.00	-34.03	P	1.00
1638.94	40.41	27.58	3.82	36.84	9.50	0.00	25.47	54.00	-28.53	A	1.00
3282.79	54.23	30.80	5.67	36.80	9.50	0.00	44.40	74.00	-29.60	P	1.00
3282.79	48.52	30.80	5.67	36.80	9.50	0.00	38.69	54.00	-15.31	A	1.00
4926.18	58.89	34.68	6.32	36.62	9.50	0.24	54.01	74.00	-19.99	P	1.00
4926.18	44.23	34.68	6.32	36.62	9.50	0.24	39.35	54.00	-14.65	A	1.00
6565.22	53.90	36.69	7.96	36.70	9.50	0.41	52.76	74.00	-21.24	P	1.00
6565.22	47.10	36.69	7.96	36.70	9.50	0.41	45.96	54.00	-8.04	A	1.00
7382.58	49.60	39.68	8.33	37.01	9.50	0.77	51.87	74.00	-22.13	P	1.00
7382.58	34.89	39.68	8.33	37.01	9.50	0.77	37.16	54.00	-16.84	A	1.00

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
4. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
5. The other emission levels were 20dB below the limit
6. The test limit distance is 3M limit.

Product Name	WIRELESS N MODULE	Test Date	2007/07/03
Model	WMP-N07	Test By	Alan Fan
Test Mode	IEEE 802.11n HT20 TX (CH Low)	TEMP & Humidity	34°C, 56%

Measurement Distance at 1m Horizontal polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1609.64	59.02	27.36	3.77	36.86	9.50	0.00	43.79	74.00	-30.21	P	1.00
1609.64	42.72	27.36	3.77	36.86	9.50	0.00	27.49	54.00	-26.51	A	1.00
3215.93	49.06	30.80	5.63	36.82	9.50	0.00	39.17	74.00	-34.83	P	1.00
3215.93	40.25	30.80	5.63	36.82	9.50	0.00	30.36	54.00	-23.64	A	1.00
4822.24	49.76	34.52	6.32	36.60	9.50	0.35	44.85	74.00	-29.15	P	1.00
4822.24	35.99	34.52	6.32	36.60	9.50	0.35	31.08	54.00	-22.92	A	1.00
6431.87	49.99	36.20	7.81	36.69	9.50	0.29	48.11	74.00	-25.89	P	1.00
6431.87	43.51	36.20	7.81	36.69	9.50	0.29	41.63	54.00	-12.37	A	1.00
7236.00	48.13	39.54	8.27	36.85	9.50	0.90	50.49	74.00	-23.51	P	1.00
7236.00	34.53	39.54	8.27	36.85	9.50	0.90	36.89	54.00	-17.11	A	1.00

Measurement Distance at 1m Vertical polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1609.64	61.55	27.36	3.77	36.86	9.50	0.00	46.32	74.00	-27.68	P	1.00
1609.64	44.98	27.36	3.77	36.86	9.50	0.00	29.75	54.00	-24.25	A	1.00
3215.93	54.42	30.80	5.63	36.82	9.50	0.00	44.53	74.00	-29.47	P	1.00
3215.93	51.03	30.80	5.63	36.82	9.50	0.00	41.14	54.00	-12.86	A	1.00
4822.24	54.38	34.52	6.32	36.60	9.50	0.35	49.47	74.00	-24.53	P	1.00
4822.24	40.15	34.52	6.32	36.60	9.50	0.35	35.24	54.00	-18.76	A	1.00
6431.87	52.09	36.20	7.81	36.69	9.50	0.29	50.21	74.00	-23.79	P	1.00
6431.87	46.80	36.20	7.81	36.69	9.50	0.29	44.92	54.00	-9.08	A	1.00
7236.00	52.45	39.54	8.27	36.85	9.50	0.90	54.81	74.00	-19.19	P	1.00
7236.00	35.42	39.54	8.27	36.85	9.50	0.90	37.78	54.00	-16.22	A	1.00

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
4. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
5. The other emission levels were 20dB below the limit
6. The test limit distance is 3M limit.

Product Name	WIRELESS N MODULE	**Test Date**	2007/07/03
Model	WMP-N07	**Test By**	Alan Fan
Test Mode	IEEE 802.11n HT20 TX (CH Middle)	**TEMP & Humidity**	34°C, 56%

Measurement Distance at 1m Horizontal polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1626.25	58.63	27.48	3.80	36.85	9.50	0.00	43.57	74.00	-30.43	P	1.00
1626.25	42.46	27.48	3.80	36.85	9.50	0.00	27.40	54.00	-26.60	A	1.00
3249.34	48.83	30.80	5.65	36.81	9.50	0.00	38.97	74.00	-35.03	P	1.00
3249.34	40.06	30.80	5.65	36.81	9.50	0.00	30.20	54.00	-23.80	A	1.00
4884.51	52.24	34.62	6.32	36.61	9.50	0.29	47.35	74.00	-26.65	P	1.00
4884.51	37.62	34.62	6.32	36.61	9.50	0.29	32.73	54.00	-21.27	A	1.00
6498.78	50.16	36.30	7.93	36.72	9.50	0.30	48.47	74.00	-25.53	P	1.00
6498.78	44.27	36.30	7.93	36.72	9.50	0.30	42.58	54.00	-11.42	A	1.00
7309.41	47.95	39.61	8.30	36.93	9.50	0.84	50.26	74.00	-23.74	P	1.00
7309.41	33.86	39.61	8.30	36.93	9.50	0.84	36.17	54.00	-17.83	A	1.00

Measurement Distance at 1m Vertical polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1626.25	63.08	27.48	3.80	36.85	9.50	0.00	48.02	74.00	-25.98	P	1.00
1626.25	45.54	27.48	3.80	36.85	9.50	0.00	30.48	54.00	-23.52	A	1.00
3249.34	52.90	30.80	5.65	36.81	9.50	0.00	43.04	74.00	-30.96	P	1.00
3249.34	48.78	30.80	5.65	36.81	9.50	0.00	38.92	54.00	-15.08	A	1.00
4884.51	57.78	34.62	6.32	36.61	9.50	0.29	52.89	74.00	-21.11	P	1.00
4884.51	42.09	34.62	6.32	36.61	9.50	0.29	37.20	54.00	-16.80	A	1.00
6498.78	52.18	36.30	7.93	36.72	9.50	0.30	50.49	74.00	-23.51	P	1.00
6498.78	47.87	36.30	7.93	36.72	9.50	0.30	46.18	54.00	-7.82	A	1.00
7309.41	53.31	39.61	8.30	36.93	9.50	0.84	55.62	74.00	-18.38	P	1.00
7309.41	36.59	39.61	8.30	36.93	9.50	0.84	38.90	54.00	-15.10	A	1.00

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
4. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
5. The other emission levels were 20dB below the limit
6. The test limit distance is 3M limit.

Product Name	WIRELESS N MODULE	Test Date	2007/07/03
Model	WMP-N07	Test By	Alan Fan
Test Mode	IEEE 802.11n HT20 TX (CH High)	TEMP & Humidity	34°C, 56%

Measurement Distance at 1m Horizontal polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1640.25	56.13	27.59	3.82	36.84	9.50	0.00	41.21	74.00	-32.79	P	1.00
1640.25	39.17	27.59	3.82	36.84	9.50	0.00	24.25	54.00	-29.75	A	1.00
3282.79	49.42	30.80	5.67	36.80	9.50	0.00	39.59	74.00	-34.41	P	1.00
3282.79	40.10	30.80	5.67	36.80	9.50	0.00	30.27	54.00	-23.73	A	1.00
4926.18	52.88	34.68	6.32	36.62	9.50	0.24	48.00	74.00	-26.00	P	1.00
4926.18	39.00	34.68	6.32	36.62	9.50	0.24	34.12	54.00	-19.88	A	1.00
6565.22	49.49	36.69	7.96	36.70	9.50	0.41	48.35	74.00	-25.65	P	1.00
6565.22	41.41	36.69	7.96	36.70	9.50	0.41	40.27	54.00	-13.73	A	1.00
7382.58	47.58	39.68	8.33	37.01	9.50	0.77	49.85	74.00	-24.15	P	1.00
7382.58	33.46	39.68	8.33	37.01	9.50	0.77	35.73	54.00	-18.27	A	1.00

Measurement Distance at 1m Vertical polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1640.14	57.72	27.59	3.82	36.84	9.50	0.00	42.80	74.00	-31.20	P	1.00
1640.14	41.57	27.59	3.82	36.84	9.50	0.00	26.65	54.00	-27.35	A	1.00
3282.80	51.92	30.80	5.67	36.80	9.50	0.00	42.09	74.00	-31.91	P	1.00
3282.80	46.06	30.80	5.67	36.80	9.50	0.00	36.23	54.00	-17.77	A	1.00
4926.24	58.13	34.68	6.32	36.62	9.50	0.24	53.25	74.00	-20.75	P	1.00
4926.24	43.86	34.68	6.32	36.62	9.50	0.24	38.98	54.00	-15.02	A	1.00
6565.15	51.13	36.69	7.96	36.70	9.50	0.41	49.99	74.00	-24.01	P	1.00
6565.15	45.73	36.69	7.96	36.70	9.50	0.41	44.59	54.00	-9.41	A	1.00
7380.75	52.64	39.68	8.32	37.00	9.50	0.77	54.91	74.00	-19.09	P	1.00
7380.75	35.40	39.68	8.32	37.00	9.50	0.77	37.67	54.00	-16.33	A	1.00

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
4. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
5. The other emission levels were 20dB below the limit
6. The test limit distance is 3M limit.

Product Name	WIRELESS N MODULE	**Test Date**	2007/07/03
Model	WMP-N07	**Test By**	Alan Fan
Test Mode	IEEE 802.11n HT40 TX (CH Low)	**TEMP & Humidity**	34°C, 56%

Measurement Distance at 1m Horizontal polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1628.72	50.14	27.50	3.80	36.85	9.50	0.00	35.10	74.00	-38.90	P	1.00
1628.72	36.21	27.50	3.80	36.85	9.50	0.00	21.17	54.00	-32.83	A	1.00
3229.24	49.63	30.80	5.64	36.82	9.50	0.00	39.75	74.00	-34.25	P	1.00
3229.24	40.66	30.80	5.64	36.82	9.50	0.00	30.78	54.00	-23.22	A	1.00
4845.31	47.80	34.55	6.32	36.60	9.50	0.32	42.89	74.00	-31.11	P	1.00
4845.31	35.05	34.55	6.32	36.60	9.50	0.32	30.14	54.00	-23.86	A	1.00
6458.89	50.03	36.24	7.86	36.70	9.50	0.29	48.22	74.00	-25.78	P	1.00
6458.89	42.50	36.24	7.86	36.70	9.50	0.29	40.69	54.00	-13.31	A	1.00
7264.18	46.91	39.56	8.28	36.88	9.50	0.88	49.25	74.00	-24.75	P	1.00
7264.18	32.36	39.56	8.28	36.88	9.50	0.88	34.70	54.00	-19.30	A	1.00

Measurement Distance at 1m Vertical polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1628.72	52.78	27.50	3.80	36.85	9.50	0.00	37.74	74.00	-36.26	P	1.00
1628.72	40.04	27.50	3.80	36.85	9.50	0.00	25.00	54.00	-29.00	A	1.00
3229.24	52.64	30.80	5.64	36.82	9.50	0.00	42.76	74.00	-31.24	P	1.00
3229.24	47.70	30.80	5.64	36.82	9.50	0.00	37.82	54.00	-16.18	A	1.00
4845.31	52.25	34.55	6.32	36.60	9.50	0.32	47.34	74.00	-26.66	P	1.00
4845.31	39.86	34.55	6.32	36.60	9.50	0.32	34.95	54.00	-19.05	A	1.00
6458.89	52.37	36.24	7.86	36.70	9.50	0.29	50.56	74.00	-23.44	P	1.00
6458.89	47.04	36.24	7.86	36.70	9.50	0.29	45.23	54.00	-8.77	A	1.00
7264.18	51.67	39.56	8.28	36.88	9.50	0.88	54.01	74.00	-19.99	P	1.00
7264.18	36.21	39.56	8.28	36.88	9.50	0.88	38.55	54.00	-15.45	A	1.00

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
4. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
5. The other emission levels were 20dB below the limit
6. The test limit distance is 3M limit.

Product Name	WIRELESS N MODULE	**Test Date**	2007/07/03
Model	WMP-N07	**Test By**	Alan Fan
Test Mode	IEEE 802.11n HT40 TX (CH Middle)	**TEMP & Humidity**	34°C, 56%

Measurement Distance at 1m Horizontal polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1624.61	49.19	27.47	3.80	36.85	9.50	0.00	34.11	74.00	-39.89	P	1.00
1624.61	37.45	27.47	3.80	36.85	9.50	0.00	22.37	54.00	-31.63	A	1.00
3249.27	48.51	30.80	5.65	36.81	9.50	0.00	38.65	74.00	-35.35	P	1.00
3249.27	40.69	30.80	5.65	36.81	9.50	0.00	30.83	54.00	-23.17	A	1.00
4861.85	48.10	34.58	6.32	36.61	9.50	0.31	43.20	74.00	-30.80	P	1.00
4861.85	35.39	34.58	6.32	36.61	9.50	0.31	30.49	54.00	-23.51	A	1.00
6498.71	49.57	36.30	7.93	36.72	9.50	0.30	47.88	74.00	-26.12	P	1.00
6498.71	43.77	36.30	7.93	36.72	9.50	0.30	42.08	54.00	-11.92	A	1.00
7296.84	46.85	39.60	8.29	36.91	9.50	0.85	49.17	74.00	-24.83	P	1.00
7296.84	32.85	39.60	8.29	36.91	9.50	0.85	35.17	54.00	-18.83	A	1.00

Measurement Distance at 1m Vertical polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1624.61	52.30	27.47	3.80	36.85	9.50	0.00	37.22	74.00	-36.78	P	1.00
1624.61	38.48	27.47	3.80	36.85	9.50	0.00	23.40	54.00	-30.60	A	1.00
3249.93	52.84	30.80	5.65	36.81	9.50	0.00	42.98	74.00	-31.02	P	1.00
3249.93	48.02	30.80	5.65	36.81	9.50	0.00	38.16	54.00	-15.84	A	1.00
4875.12	50.98	34.60	6.32	36.61	9.50	0.29	46.09	74.00	-27.91	P	1.00
4875.12	38.92	34.60	6.32	36.61	9.50	0.29	34.03	54.00	-19.97	A	1.00
6498.51	52.01	36.30	7.93	36.72	9.50	0.30	50.32	74.00	-23.68	P	1.00
6498.51	47.09	36.30	7.93	36.72	9.50	0.30	45.40	54.00	-8.60	A	1.00
7296.84	50.56	39.60	8.29	36.91	9.50	0.85	52.88	74.00	-21.12	P	1.00
7296.84	35.92	39.60	8.29	36.91	9.50	0.85	38.24	54.00	-15.76	A	1.00

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
4. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
5. The other emission levels were 20dB below the limit
6. The test limit distance is 3M limit.

Product Name	WIRELESS N MODULE	Test Date	2007/07/03
Model	WMP-N07	Test By	Alan Fan
Test Mode	IEEE 802.11n HT40 TX (CH High)	TEMP & Humidity	34°C, 56%

Measurement Distance at 1m Horizontal polarity

Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1631.55	50.02	27.53	3.81	36.84	9.50	0.00	35.01	74.00	-38.99	P	1.00
1631.55	36.78	27.53	3.81	36.84	9.50	0.00	21.77	54.00	-32.23	A	1.00
3269.36	48.64	30.80	5.66	36.80	9.50	0.00	38.80	74.00	-35.20	P	1.00
3269.36	40.39	30.80	5.66	36.80	9.50	0.00	30.55	54.00	-23.45	A	1.00
4905.06	48.79	34.65	6.32	36.62	9.50	0.26	43.91	74.00	-30.09	P	1.00
4905.06	36.17	34.65	6.32	36.62	9.50	0.26	31.29	54.00	-22.71	A	1.00
6538.81	49.31	36.53	7.95	36.71	9.50	0.36	47.95	74.00	-26.05	P	1.00
6538.81	41.45	36.53	7.95	36.71	9.50	0.36	40.09	54.00	-13.91	A	1.00
7356.82	47.58	39.66	8.32	36.98	9.50	0.79	49.87	74.00	-24.13	P	1.00
7356.82	33.01	39.66	8.32	36.98	9.50	0.79	35.30	54.00	-18.70	A	1.00

Measurement Distance at 1m Vertical polarity

Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1631.55	52.54	27.53	3.81	36.84	9.50	0.00	37.53	74.00	-36.47	P	1.00
1631.55	38.92	27.53	3.81	36.84	9.50	0.00	23.91	54.00	-30.09	A	1.00
3269.36	53.03	30.80	5.66	36.80	9.50	0.00	43.19	74.00	-30.81	P	1.00
3269.36	48.31	30.80	5.66	36.80	9.50	0.00	38.47	54.00	-15.53	A	1.00
4905.06	51.72	34.65	6.32	36.62	9.50	0.26	46.84	74.00	-27.16	P	1.00
4905.06	39.52	34.65	6.32	36.62	9.50	0.26	34.64	54.00	-19.36	A	1.00
6538.81	50.61	36.53	7.95	36.71	9.50	0.36	49.25	74.00	-24.75	P	1.00
6538.81	44.17	36.53	7.95	36.71	9.50	0.36	42.81	54.00	-11.19	A	1.00
7356.82	50.35	39.66	8.32	36.98	9.50	0.79	52.64	74.00	-21.36	P	1.00
7356.82	35.99	39.66	8.32	36.98	9.50	0.79	38.28	54.00	-15.72	A	1.00

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
4. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
5. The other emission levels were 20dB below the limit
6. The test limit distance is 3M limit.

PIFA Antenna

Product Name	WIRELESS N MODULE	**Test Date**	2009/03/10
Model	WMP-N07	**Test By**	Gundam Lin
Test Mode	IEEE 802.11b TX (CH Low)	**TEMP & Humidity**	23.9°C, 59%

Horizontal polarity

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
1331.50	56.42	---	-13.95	42.48	---	74.00	54.00	-11.52	Peak
1595.00	58.77	---	-12.76	46.01	---	74.00	54.00	-7.99	Peak
3422.50	52.95	---	-7.49	45.46	---	74.00	54.00	-8.54	Peak
4961.00	51.13	---	-4.20	46.93	---	74.00	54.00	-7.07	Peak
5454.00	50.98	---	-3.36	47.62	---	74.00	54.00	-6.38	Peak
7230.50	50.02	---	-0.89	49.13	---	74.00	54.00	-4.87	Peak
9304.50	48.47	---	2.18	50.66	---	74.00	54.00	-3.34	Peak

Vertical polarity

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
1331.50	55.23	---	-13.95	41.29	---	74.00	54.00	-12.71	Peak
1595.00	57.33	---	-12.76	44.58	---	74.00	54.00	-9.42	Peak
6431.50	51.36	---	-2.26	49.10	---	74.00	54.00	-4.90	Peak
7239.00	59.67	39.78	-0.89	58.78	38.89	74.00	54.00	-15.11	AVG
10112.00	48.53	---	3.10	51.63	---	74.00	54.00	-2.37	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *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.*
3. *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.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	WIRELESS N MODULE	**Test Date**	2009/03/10
Model	WMP-N07	**Test By**	Gundam Lin
Test Mode	IEEE 802.11b TX (CH Middle)	**TEMP & Humidity**	23.9°C, 59%

Horizontal polarity									
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
1595.00	55.27	---	-12.76	42.51	---	74.00	54.00	-11.49	Peak
4876.00	55.55	---	-4.42	51.13	---	74.00	54.00	-2.87	Peak
7315.50	57.35	46.06	-0.83	56.52	45.23	74.00	54.00	-8.77	AVG
9398.00	47.89	---	2.24	50.12	---	74.00	54.00	-3.88	Peak

Vertical polarity									
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
1595.00	58.10	---	-12.76	45.34	---	74.00	54.00	-8.66	Peak
4876.00	64.29	52.22	-4.42	59.87	47.80	74.00	54.00	-6.20	AVG
6499.50	52.98	---	-2.19	50.79	---	74.00	54.00	-3.21	Peak
7315.50	62.26	51.12	-0.83	61.43	50.29	74.00	54.00	-3.71	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *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.*
3. *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.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	WIRELESS N MODULE	Test Date	2009/03/10
Model	WMP-N07	Test By	Gundam Lin
Test Mode	IEEE 802.11b TX (CH High)	TEMP & Humidity	23.9°C, 59%

Horizontal polarity

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
1595.00	60.05	---	-12.76	47.29	---	74.00	54.00	-6.71	Peak
4927.00	59.27	47.81	-4.29	54.98	43.52	74.00	54.00	-10.48	AVG
5411.50	51.50	---	-3.43	48.07	---	74.00	54.00	-5.93	Peak
7392.00	50.71	---	-0.78	49.93	---	74.00	54.00	-4.07	Peak
8216.50	49.15	---	0.67	49.82	---	74.00	54.00	-4.18	Peak

Vertical polarity

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
1595.00	59.66	---	-12.76	46.90	---	74.00	54.00	-7.10	Peak
1858.50	53.68	---	-10.58	43.10	---	74.00	54.00	-10.90	Peak
3286.50	53.23	---	-7.69	45.54	---	74.00	54.00	-8.46	Peak
4927.00	62.88	51.35	-4.29	58.59	47.06	74.00	54.00	-6.94	AVG
6567.50	51.00	---	-2.03	48.97	---	74.00	54.00	-5.03	Peak
7392.00	59.75	50.69	-0.78	58.97	49.91	74.00	54.00	-4.09	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *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.*
3. *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.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	WIRELESS N MODULE	**Test Date**	2009/03/10
Model	WMP-N07	**Test By**	Gundam Lin
Test Mode	IEEE 802.11g TX (CH Low)	**TEMP & Humidity**	23.9°C, 59%

Horizontal polarity									
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
1331.50	54.39	---	-13.95	40.44	---	74.00	54.00	-13.56	Peak
1595.00	55.84	---	-12.76	43.08	---	74.00	54.00	-10.92	Peak
2895.50	53.63	---	-8.27	45.37	---	74.00	54.00	-8.63	Peak
4986.50	50.95	---	-4.14	46.81	---	74.00	54.00	-7.19	Peak
7230.50	58.77	38.65	-0.89	57.88	37.76	74.00	54.00	-16.24	AVG

Vertical polarity									
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
1595.00	60.61	---	-12.76	47.85	---	74.00	54.00	-6.15	Peak
4833.50	55.27	---	-4.53	50.74	---	74.00	54.00	-3.26	Peak
6431.50	51.20	---	-2.26	48.94	---	74.00	54.00	-5.06	Peak
7230.50	64.38	41.83	-0.89	63.49	40.94	74.00	54.00	-13.06	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *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.*
3. *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.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	WIRELESS N MODULE	Test Date	2009/03/10
Model	WMP-N07	Test By	Gundam Lin
Test Mode	IEEE 802.11g TX (CH Middle)	TEMP & Humidity	23.9°C, 59%

Horizontal polarity									
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
1331.50	54.91	---	-13.95	40.97	---	74.00	54.00	-13.03	Peak
1595.00	56.73	---	-12.76	43.97	---	74.00	54.00	-10.03	Peak
4876.00	54.24	---	-4.42	49.82	---	74.00	54.00	-4.18	Peak
6542.00	50.38	---	-2.09	48.29	---	74.00	54.00	-5.71	Peak
7307.00	63.96	43.96	-0.84	63.12	43.12	74.00	54.00	-10.88	AVG

Vertical polarity									
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
1068.00	55.96	---	-14.57	41.39	---	74.00	54.00	-12.61	Peak
1595.00	58.57	---	-12.76	45.81	---	74.00	54.00	-8.19	Peak
4867.50	62.72	48.55	-4.44	58.28	44.11	74.00	54.00	-9.89	AVG
6499.50	51.36	---	-2.19	49.17	---	74.00	54.00	-4.83	Peak
7307.00	73.68	49.10	-0.84	72.84	48.26	74.00	54.00	-5.74	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *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.*
3. *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.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	WIRELESS N MODULE	Test Date	2009/03/10
Model	WMP-N07	Test By	Gundam Lin
Test Mode	IEEE 802.11g TX (CH High)	TEMP & Humidity	23.9°C, 59%

Horizontal polarity

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
1595.00	57.48	---	-12.76	44.72	---	74.00	54.00	-9.28	Peak
1858.50	53.41	---	-10.58	42.83	---	74.00	54.00	-11.17	Peak
4425.50	51.57	---	-5.57	46.00	---	74.00	54.00	-8.00	Peak
4927.00	55.11	---	-4.29	50.82	---	74.00	54.00	-3.18	Peak
7383.50	64.45	42.91	-0.78	63.67	42.13	74.00	54.00	-11.87	AVG

Vertical polarity

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
1331.50	55.27	---	-13.95	41.32	---	74.00	54.00	-12.68	Peak
1603.50	57.89	---	-12.69	45.20	---	74.00	54.00	-8.80	Peak
3660.50	52.08	---	-7.14	44.94	---	74.00	54.00	-9.06	Peak
4927.00	55.49	---	-4.29	51.20	---	74.00	54.00	-2.80	Peak
6567.50	53.04	---	-2.03	51.01	---	74.00	54.00	-2.99	Peak
7383.50	73.86	46.90	-0.78	73.08	46.12	74.00	54.00	-7.88	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *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.*
3. *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.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	WIRELESS N MODULE	Test Date	2009/03/11
Model	WMP-N07	Test By	Gundam Lin
Test Mode	IEEE 802.11n HT20 TX (CH Low)	TEMP & Humidity	21.6°C, 68%

Horizontal polarity									
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
1595.00	59.14	---	-12.76	46.38	---	74.00	54.00	-7.62	Peak
5556.00	51.48	---	-3.22	48.26	---	74.00	54.00	-5.74	Peak
8097.50	49.10	---	0.52	49.62	---	74.00	54.00	-4.38	Peak
10129.00	48.50	---	3.11	51.61	---	74.00	54.00	-2.39	Peak

Vertical polarity									
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
1331.50	58.24	---	-13.95	44.30	---	74.00	54.00	-9.70	Peak
1595.00	58.68	---	-12.76	45.92	---	74.00	54.00	-8.08	Peak
1858.50	55.27	---	-10.58	44.69	---	74.00	54.00	-9.31	Peak
4825.00	52.88	---	-4.55	48.32	---	74.00	54.00	-5.68	Peak
7230.50	61.06	42.53	-0.89	60.17	41.64	74.00	54.00	-12.36	AVG
8811.50	49.16	---	1.63	50.78	---	74.00	54.00	-3.22	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *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.*
3. *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.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	WIRELESS N MODULE	Test Date	2009/03/11
Model	WMP-N07	Test By	Gundam Lin
Test Mode	IEEE 802.11n HT20 TX (CH Middle)	TEMP & Humidity	21.6°C, 68%

Horizontal polarity									
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
1595.00	56.51	---	-12.76	43.75	---	74.00	54.00	-10.25	Peak
2742.50	55.39	---	-8.49	46.90	---	74.00	54.00	-7.10	Peak
4884.50	52.62	---	-4.40	48.22	---	74.00	54.00	-5.78	Peak
7307.00	52.69	---	-0.84	51.85	---	74.00	54.00	-2.15	Peak
7468.50	50.74	---	-0.72	50.02	---	74.00	54.00	-3.98	Peak

Vertical polarity									
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
1331.50	56.43	---	-13.95	42.48	---	74.00	54.00	-11.52	Peak
1595.00	59.30	---	-12.76	46.54	---	74.00	54.00	-7.46	Peak
4876.00	55.78	---	-4.42	51.36	---	74.00	54.00	-2.64	Peak
4986.50	52.85	---	-4.14	48.71	---	74.00	54.00	-5.29	Peak
6499.50	52.55	---	-2.19	50.36	---	74.00	54.00	-3.64	Peak
7307.00	66.60	45.15	-0.84	65.76	44.31	74.00	54.00	-9.69	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *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.*
3. *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.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	WIRELESS N MODULE	Test Date	2009/03/11
Model	WMP-N07	Test By	Gundam Lin
Test Mode	IEEE 802.11n HT20 TX (CH High)	TEMP & Humidity	21.6°C, 68%

Horizontal polarity									
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
1365.50	55.37	---	-13.86	41.50	---	74.00	54.00	-12.50	Peak
1603.50	57.84	---	-12.69	45.16	---	74.00	54.00	-8.84	Peak
2717.00	54.62	---	-8.53	46.09	---	74.00	54.00	-7.91	Peak
4927.00	61.33	46.19	-4.29	57.04	41.90	74.00	54.00	-12.10	AVG
6805.50	50.15	---	-1.50	48.65	---	74.00	54.00	-5.35	Peak
7375.00	52.20	---	-0.79	51.41	---	74.00	54.00	-2.59	Peak

Vertical polarity									
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
1331.50	57.68	---	-13.95	43.74	---	74.00	54.00	-10.26	Peak
1595.00	58.17	---	-12.76	45.41	---	74.00	54.00	-8.59	Peak
1858.50	55.53	---	-10.58	44.95	---	74.00	54.00	-9.05	Peak
2759.50	54.69	---	-8.47	46.22	---	74.00	54.00	-7.78	Peak
3456.50	53.52	---	-7.44	46.09	---	74.00	54.00	-7.91	Peak
4927.00	63.81	48.66	-4.29	59.52	44.37	74.00	54.00	-9.63	AVG
6567.50	52.05	---	-2.03	50.02	---	74.00	54.00	-3.98	Peak
7383.50	67.35	45.17	-0.78	66.57	44.39	74.00	54.00	-9.61	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *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.*
3. *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.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	WIRELESS N MODULE	Test Date	2009/03/11
Model	WMP-N07	Test By	Gundam Lin
Test Mode	IEEE 802.11n HT40 TX (CH Low)	TEMP & Humidity	21.6°C, 68%

Horizontal polarity

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
1357.00	56.17	---	-13.88	42.29	---	74.00	54.00	-11.71	Peak
1595.00	58.60	---	-12.76	45.84	---	74.00	54.00	-8.16	Peak
5029.00	51.11	---	-4.06	47.05	---	74.00	54.00	-6.95	Peak
8854.00	48.91	---	1.71	50.62	---	74.00	54.00	-3.38	Peak
10112.00	48.16	---	3.10	51.25	---	74.00	54.00	-2.75	Peak

Vertical polarity

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
1331.50	58.60	---	-13.95	44.66	---	74.00	54.00	-9.34	Peak
1595.00	58.69	---	-12.76	45.93	---	74.00	54.00	-8.07	Peak
1858.50	55.06	---	-10.58	44.48	---	74.00	54.00	-9.52	Peak
5020.50	51.04	---	-4.07	46.97	---	74.00	54.00	-7.03	Peak
6457.00	52.05	---	-2.23	49.82	---	74.00	54.00	-4.18	Peak
9364.00	48.61	---	2.22	50.83	---	74.00	54.00	-3.17	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *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.*
3. *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.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	WIRELESS N MODULE	Test Date	2009/03/11
Model	WMP-N07	Test By	Gundam Lin
Test Mode	IEEE 802.11n HT40 TX (CH Middle)	TEMP & Humidity	21.6°C, 68%

Horizontal polarity									
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
1595.00	57.87	---	-12.76	45.11	---	74.00	54.00	-8.89	Peak
2742.50	54.23	---	-8.49	45.74	---	74.00	54.00	-8.26	Peak
5989.50	50.44	---	-2.73	47.70	---	74.00	54.00	-6.30	Peak
8803.00	48.91	---	1.61	50.53	---	74.00	54.00	-3.47	Peak
9491.50	48.63	---	2.29	50.92	---	74.00	54.00	-3.08	Peak

Vertical polarity									
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
1331.50	59.24	---	-13.95	45.29	---	74.00	54.00	-8.71	Peak
1595.00	59.56	---	-12.76	46.80	---	74.00	54.00	-7.20	Peak
2742.50	54.62	---	-8.49	46.13	---	74.00	54.00	-7.87	Peak
6499.50	53.46	---	-2.19	51.27	---	74.00	54.00	-2.73	Peak
7298.50	50.01	---	-0.84	49.17	---	74.00	54.00	-4.83	Peak
9449.00	48.70	---	2.27	50.97	---	74.00	54.00	-3.03	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *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.*
3. *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.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	WIRELESS N MODULE	Test Date	2009/03/11
Model	WMP-N07	Test By	Gundam Lin
Test Mode	IEEE 802.11n HT40 TX (CH High)	TEMP & Humidity	21.6°C, 68%

Horizontal polarity									
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
1595.00	60.40	---	-12.76	47.64	---	74.00	54.00	-6.36	Peak
3388.50	52.93	---	-7.54	45.39	---	74.00	54.00	-8.61	Peak
4995.00	51.61	---	-4.12	47.49	---	74.00	54.00	-6.51	Peak
6542.00	51.14	---	-2.09	49.04	---	74.00	54.00	-4.96	Peak
9372.50	48.61	---	2.22	50.83	---	74.00	54.00	-3.17	Peak

Vertical polarity									
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
1331.50	58.35	---	-13.95	44.40	---	74.00	54.00	-9.60	Peak
1595.00	58.88	---	-12.76	46.12	---	74.00	54.00	-7.88	Peak
1858.50	54.69	---	-10.58	44.11	---	74.00	54.00	-9.89	Peak
5598.50	51.39	---	-3.18	48.21	---	74.00	54.00	-5.79	Peak
6542.00	53.22	---	-2.09	51.13	---	74.00	54.00	-2.87	Peak
9372.50	49.16	---	2.22	51.38	---	74.00	54.00	-2.62	Peak

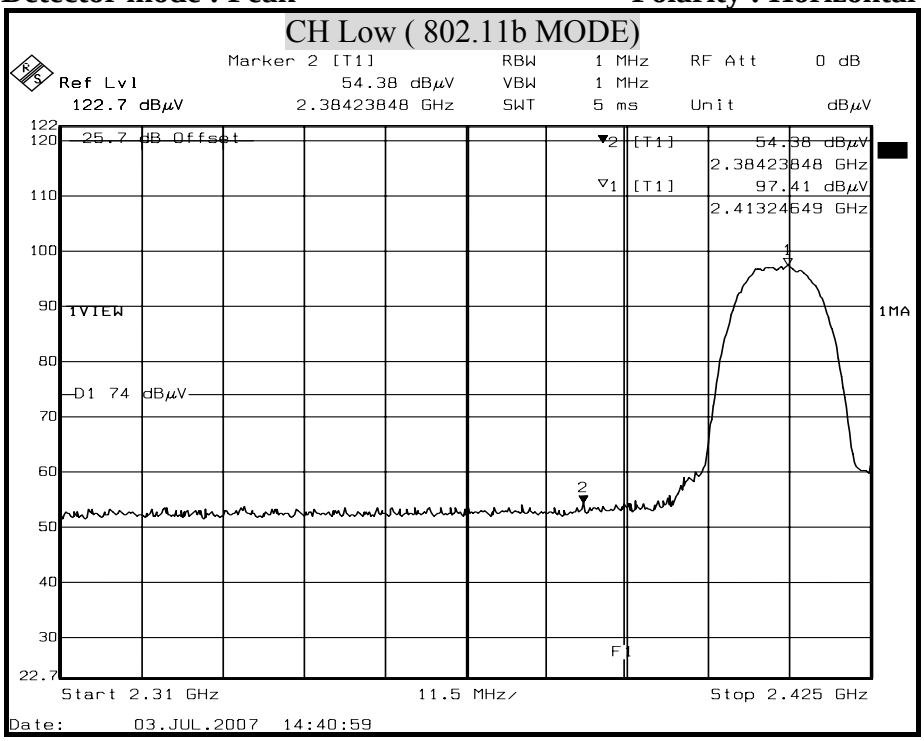
Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *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.*
3. *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.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

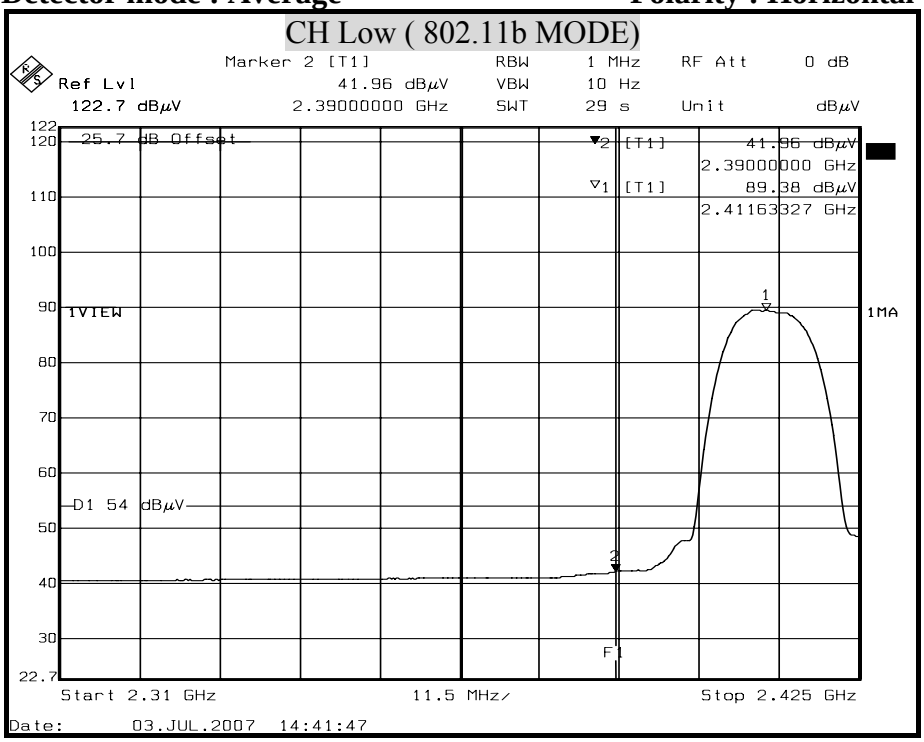
8.8.4 RESTRICTED BAND EDGES

Dipole Antenna

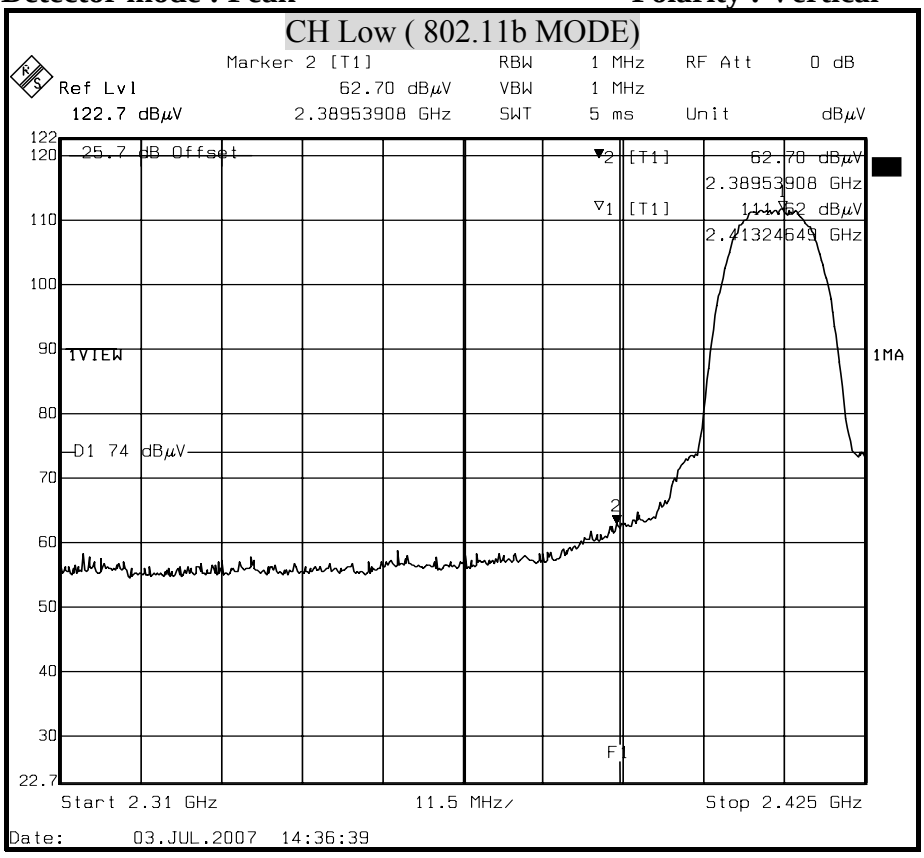
Detector mode : Peak **Polarity : Horizontal**



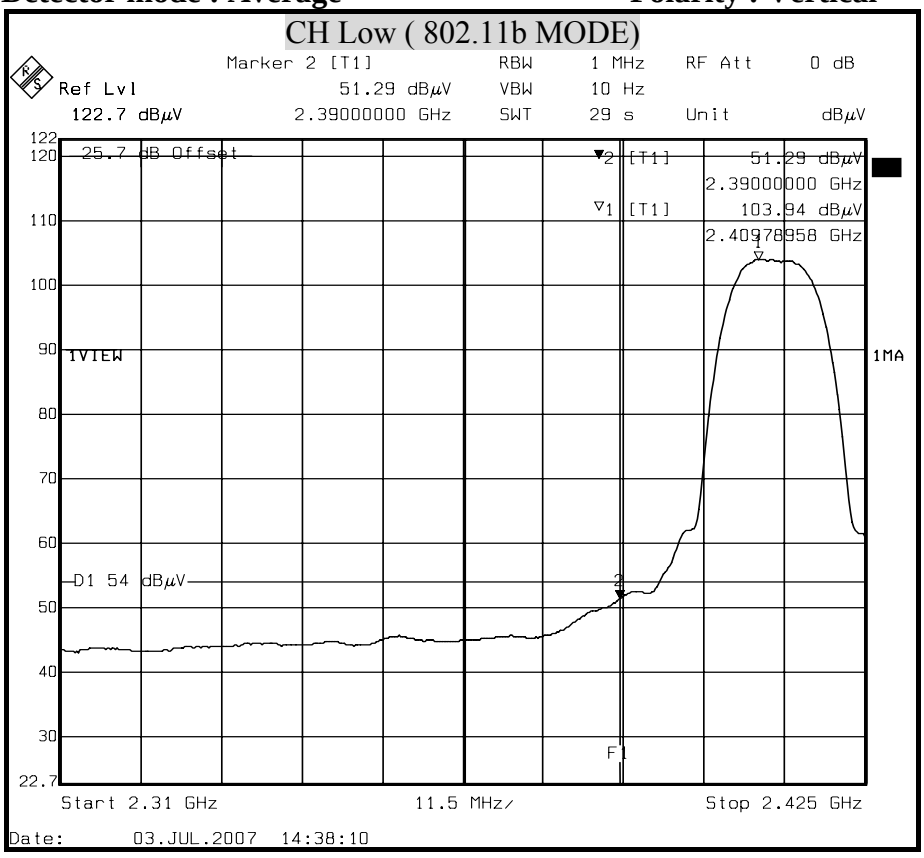
Detector mode : Average **Polarity : Horizontal**



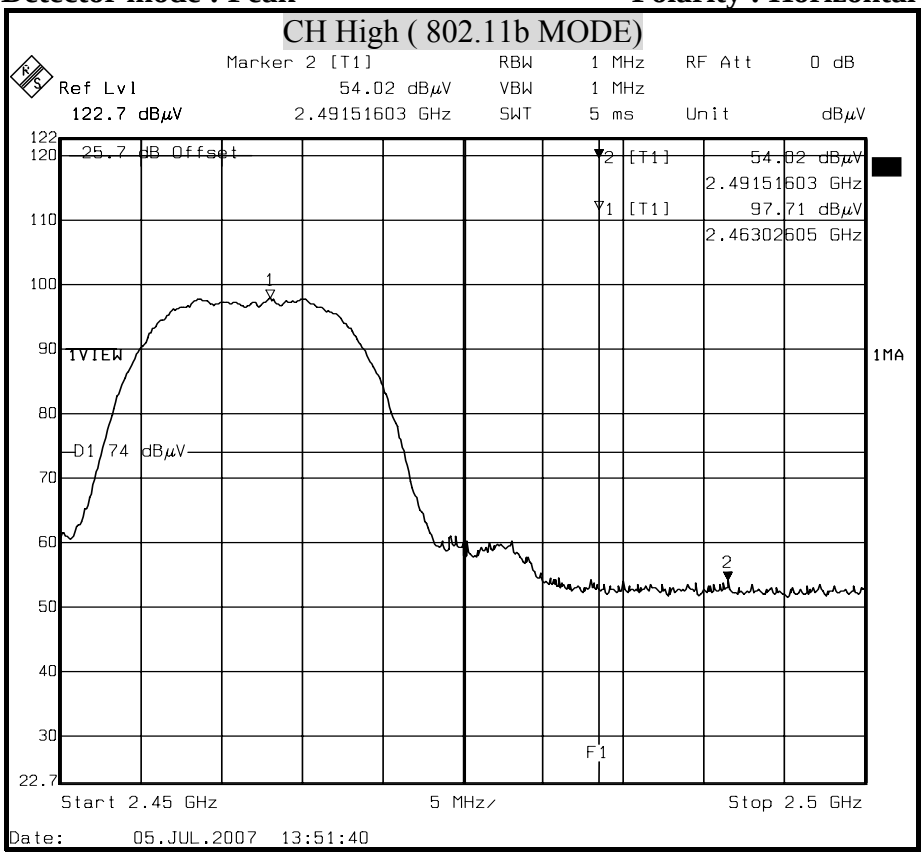
Detector mode : Peak **Polarity : Vertical**



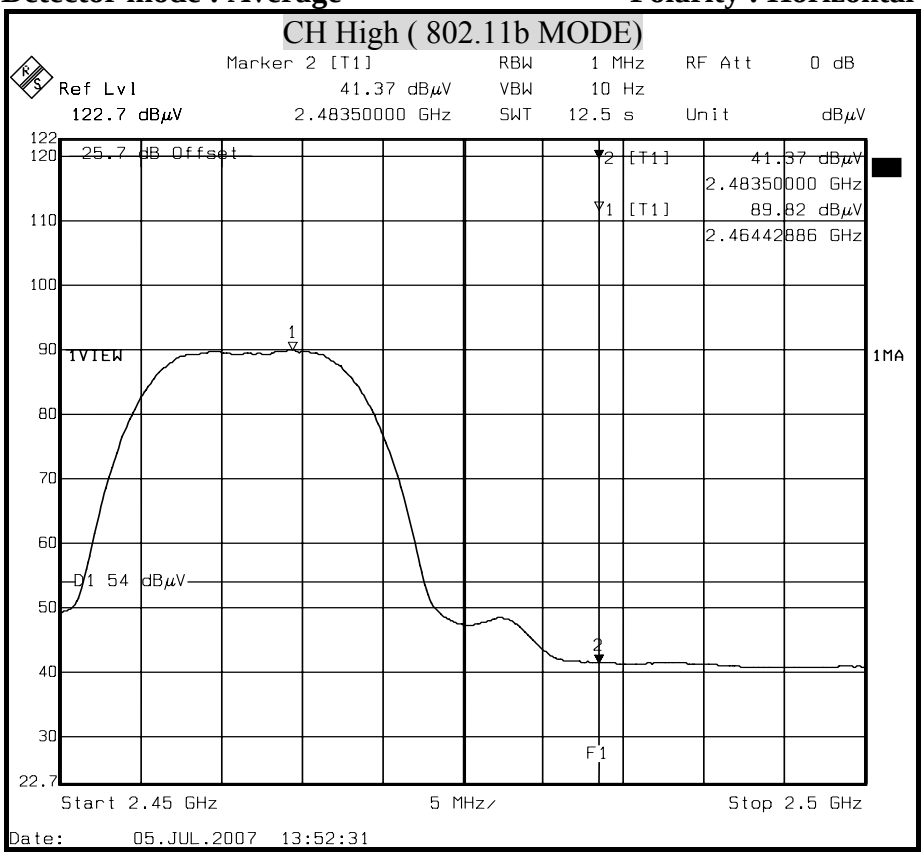
Detector mode : Average **Polarity : Vertical**



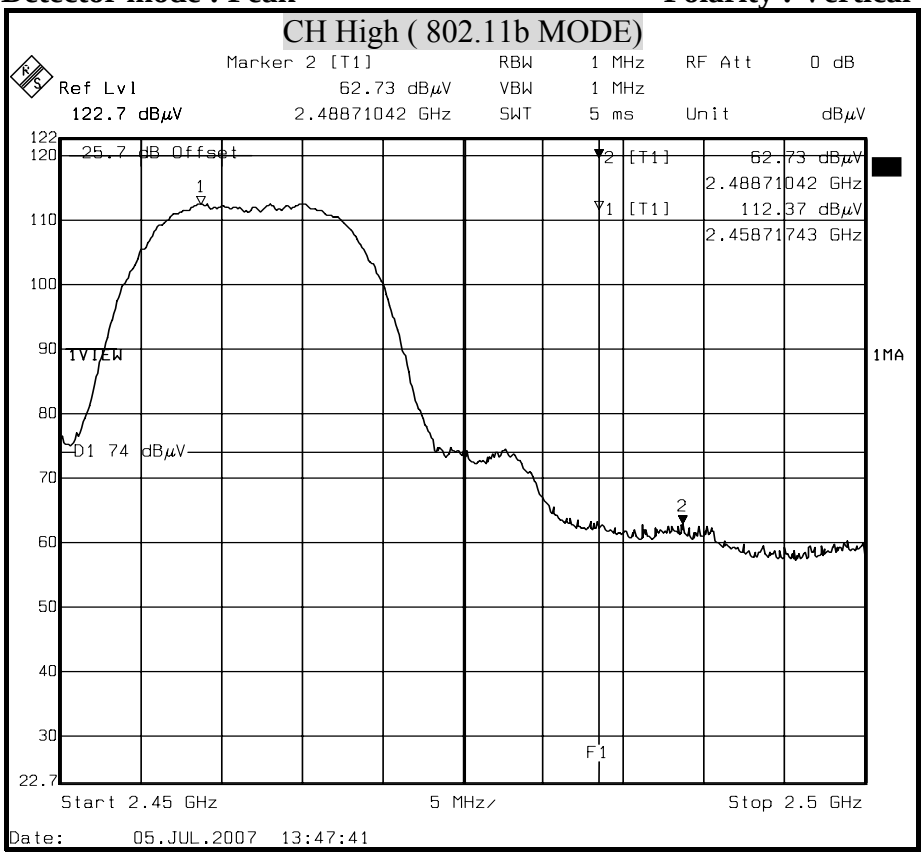
Detector mode : Peak **Polarity : Horizontal**



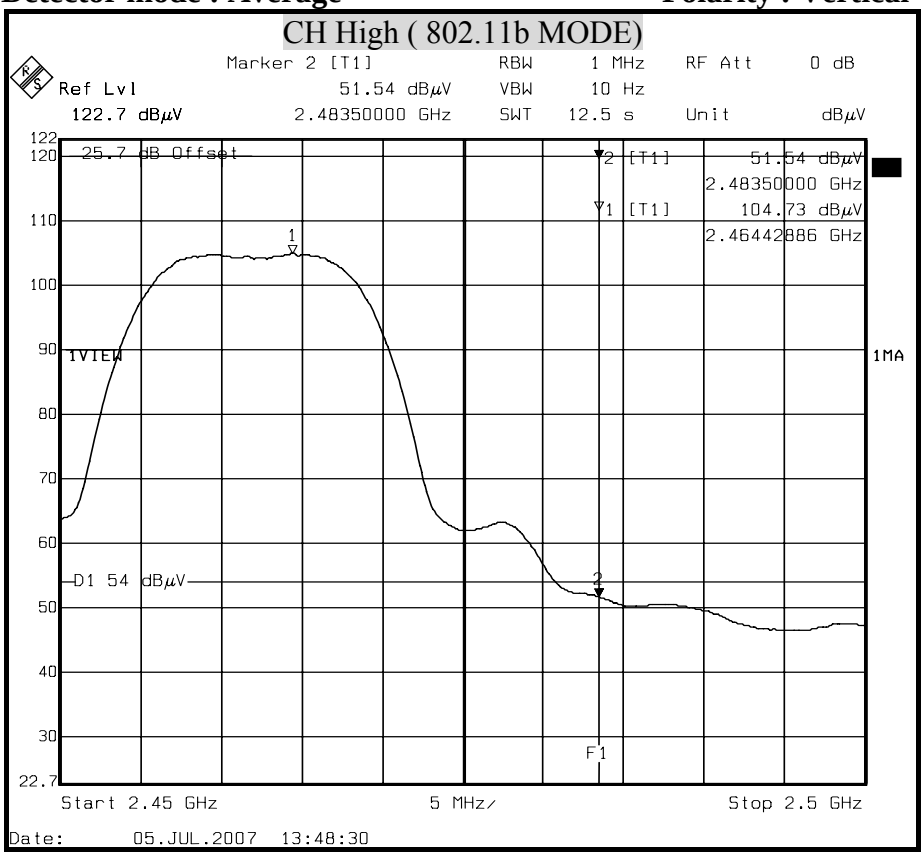
Detector mode : Average **Polarity : Horizontal**



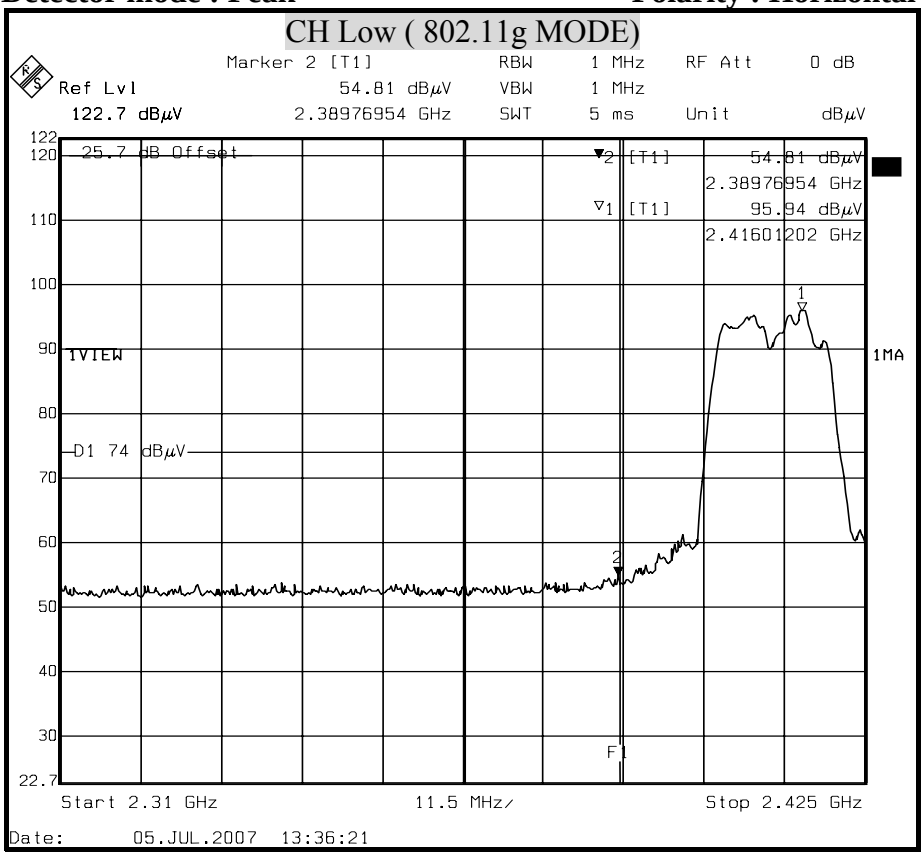
Detector mode : Peak **Polarity : Vertical**



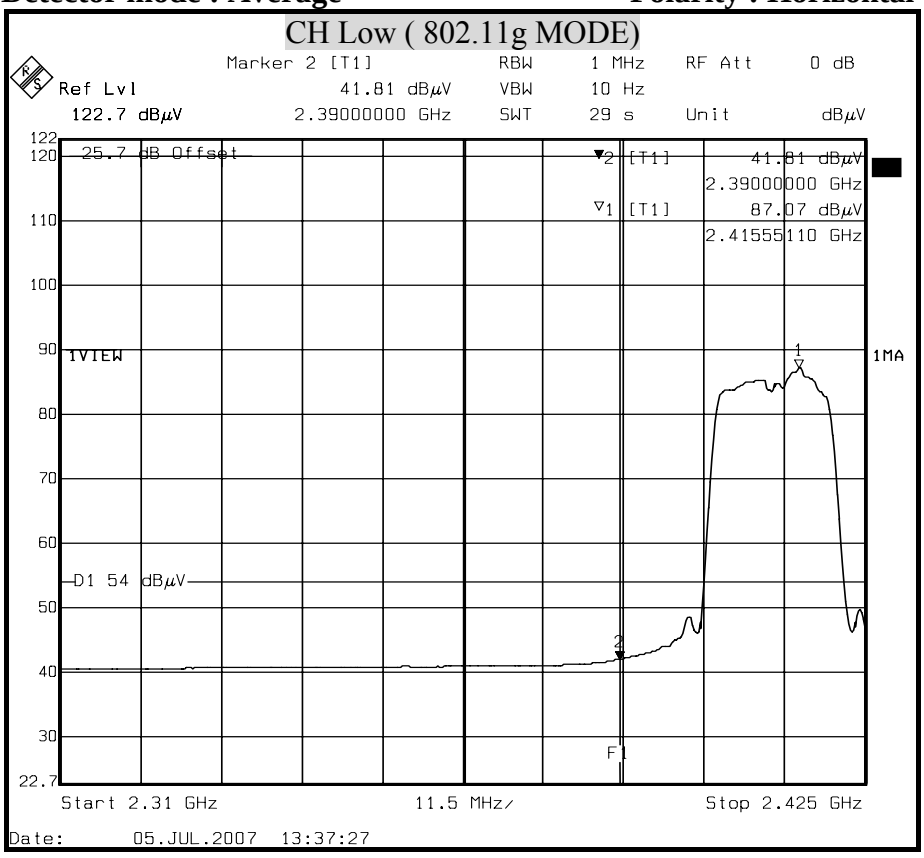
Detector mode : Average **Polarity : Vertical**



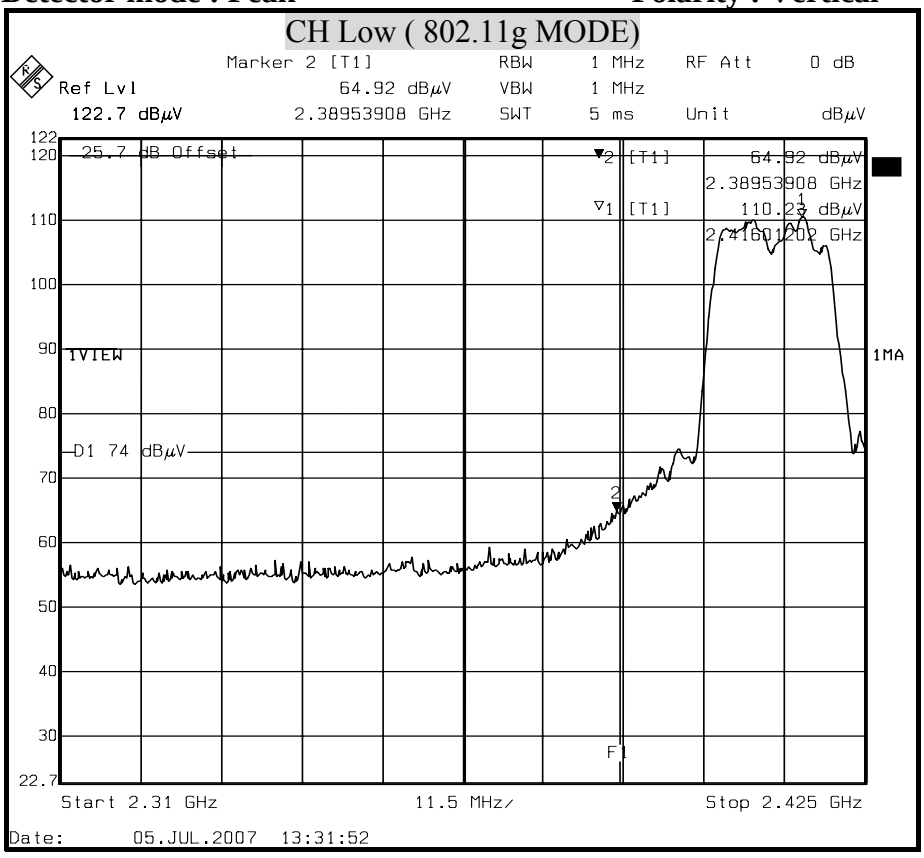
Detector mode : Peak **Polarity : Horizontal**



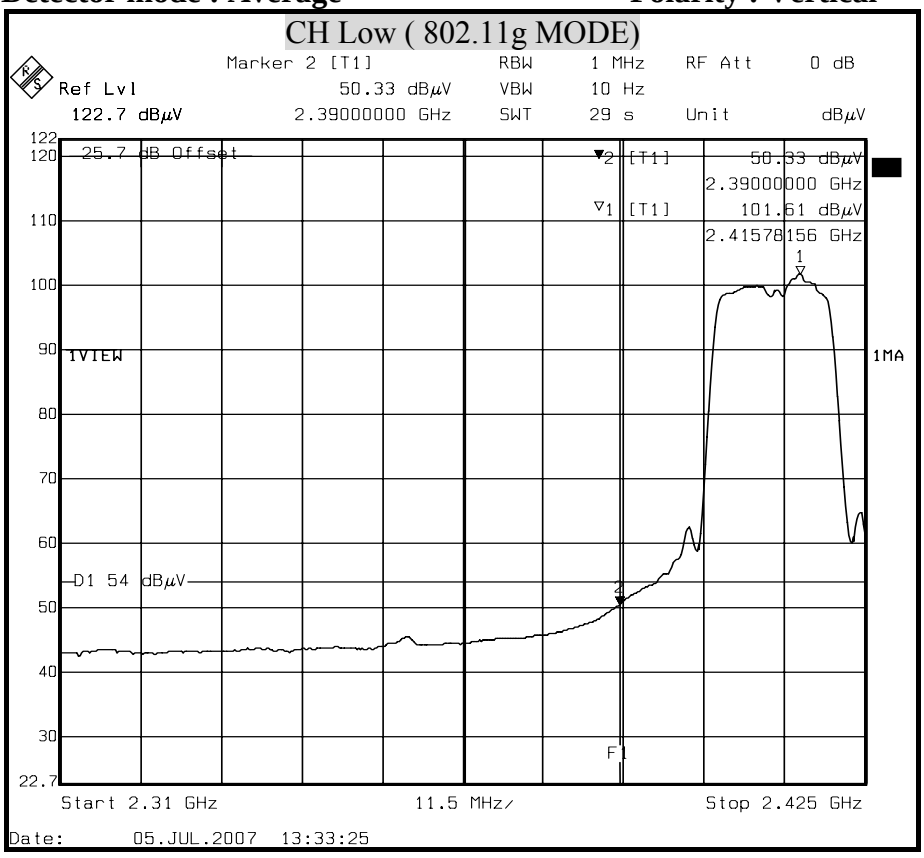
Detector mode : Average **Polarity : Horizontal**



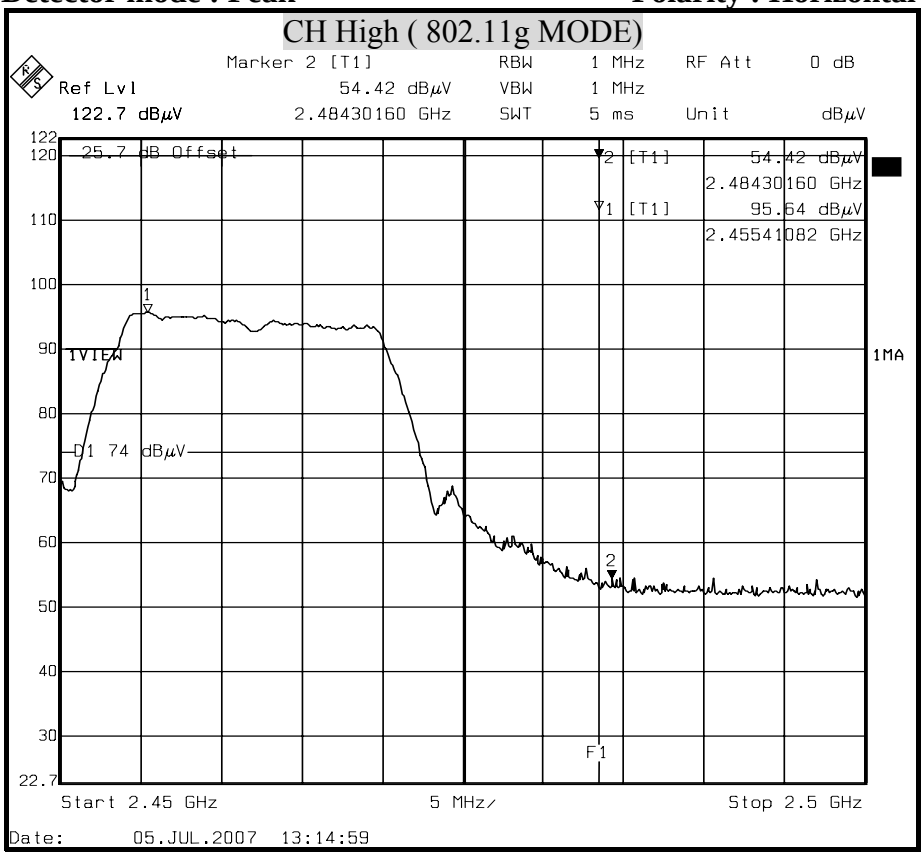
Detector mode : Peak **Polarity : Vertical**



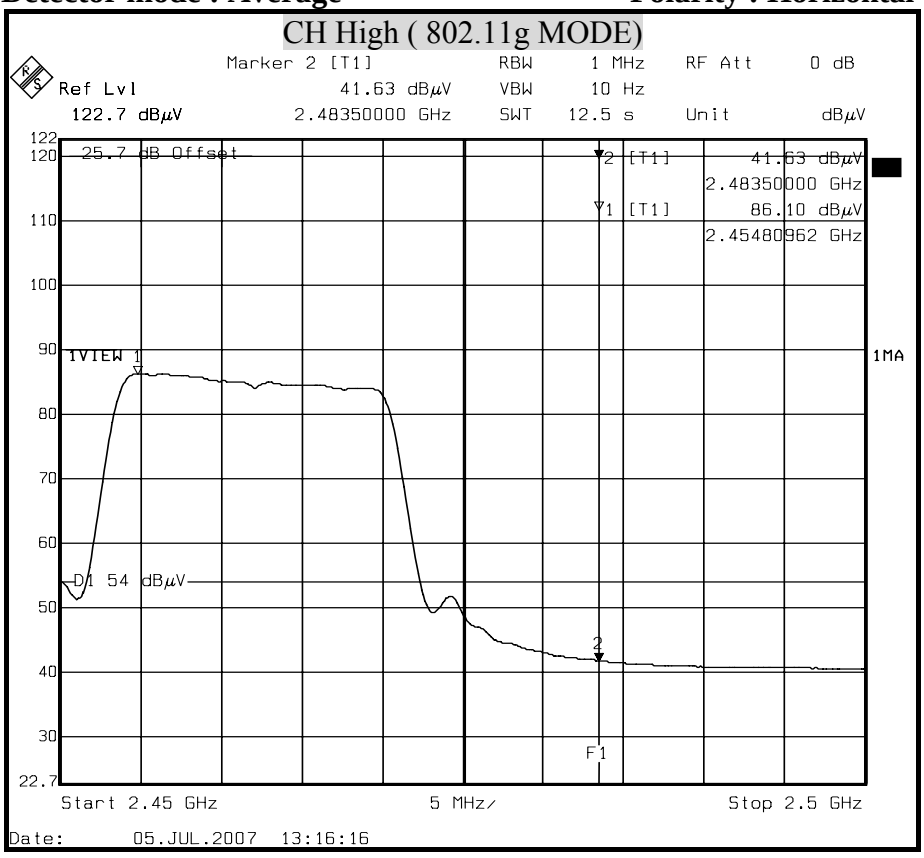
Detector mode : Average **Polarity : Vertical**



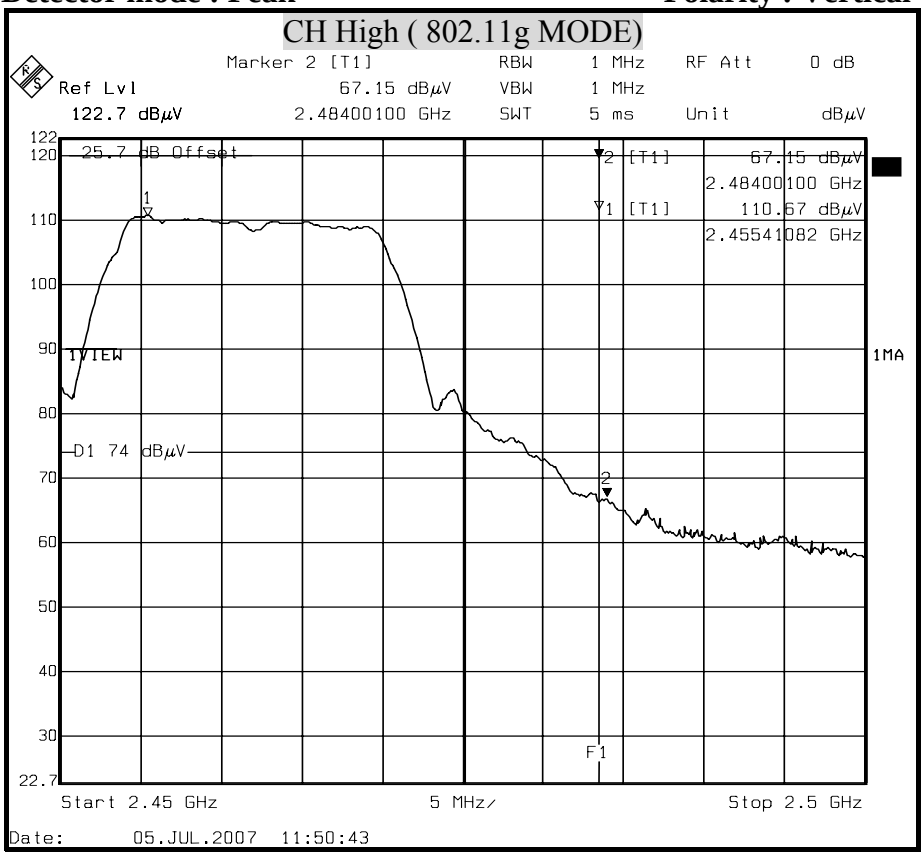
Detector mode : Peak **Polarity : Horizontal**



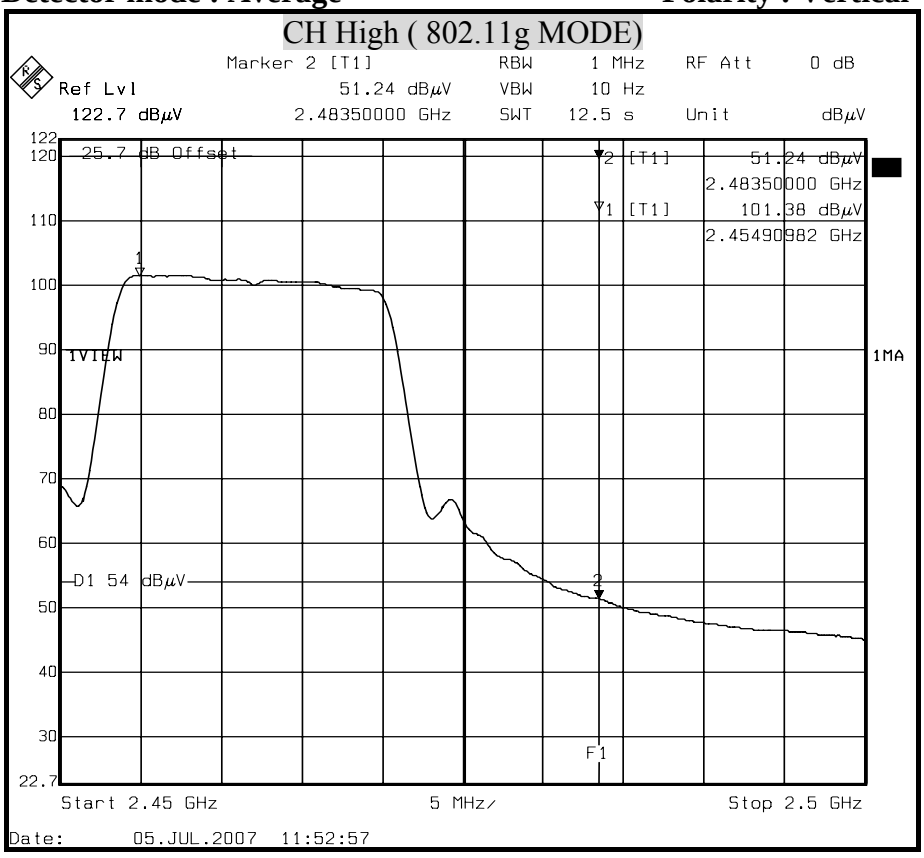
Detector mode : Average **Polarity : Horizontal**



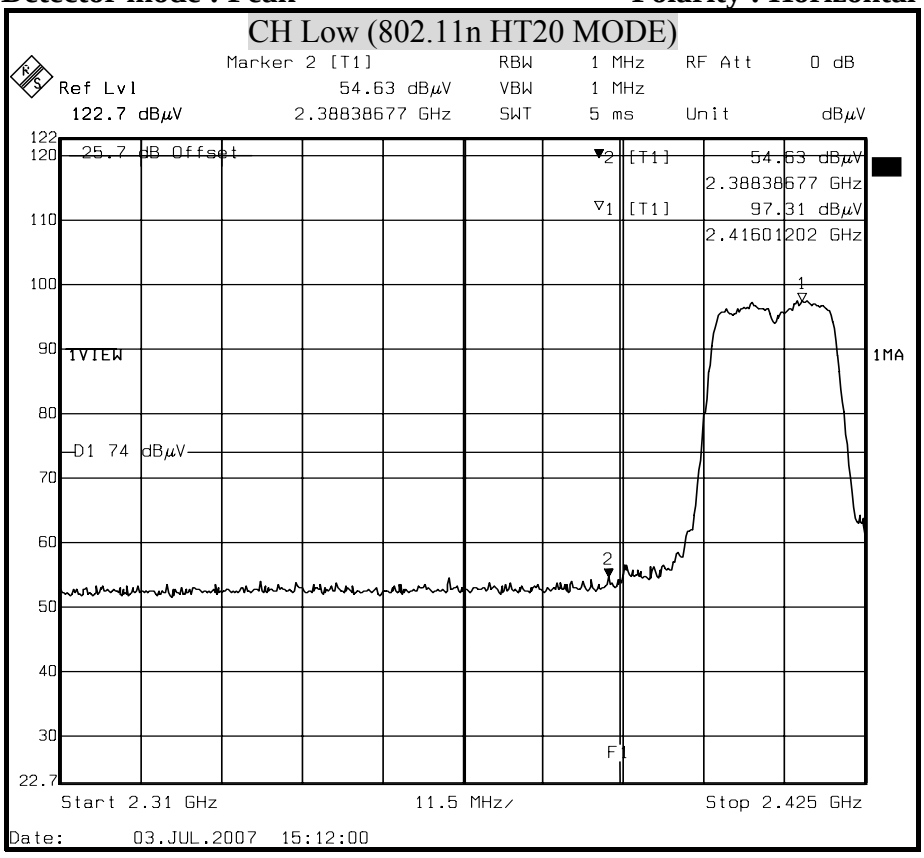
Detector mode : Peak **Polarity : Vertical**



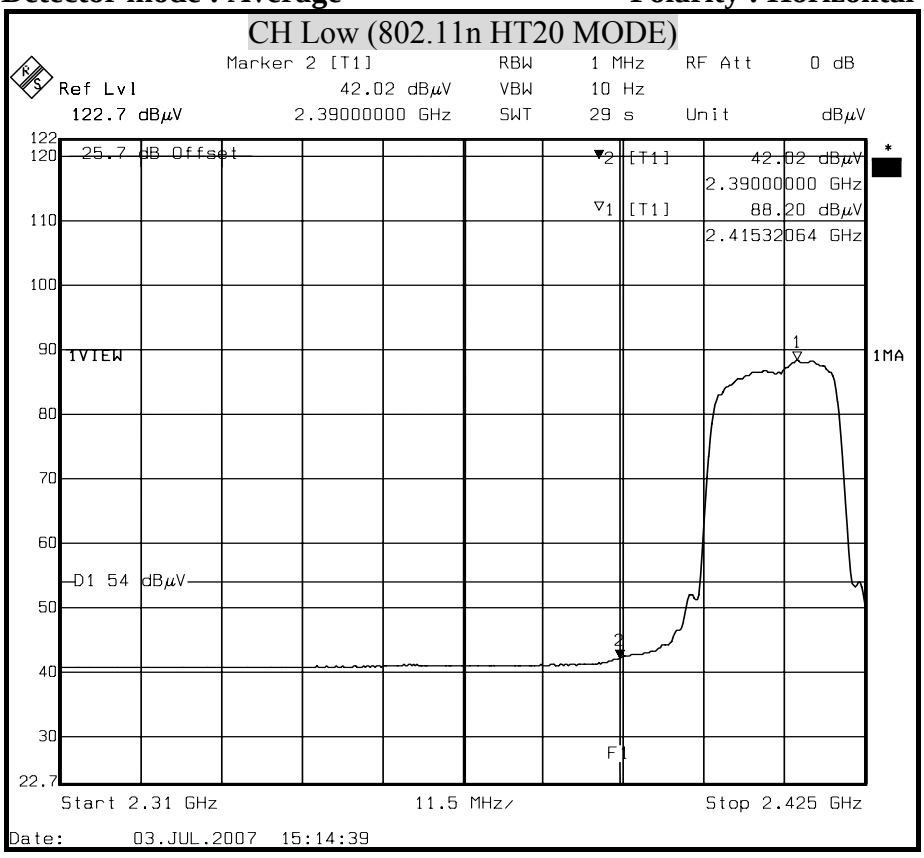
Detector mode : Average **Polarity : Vertical**



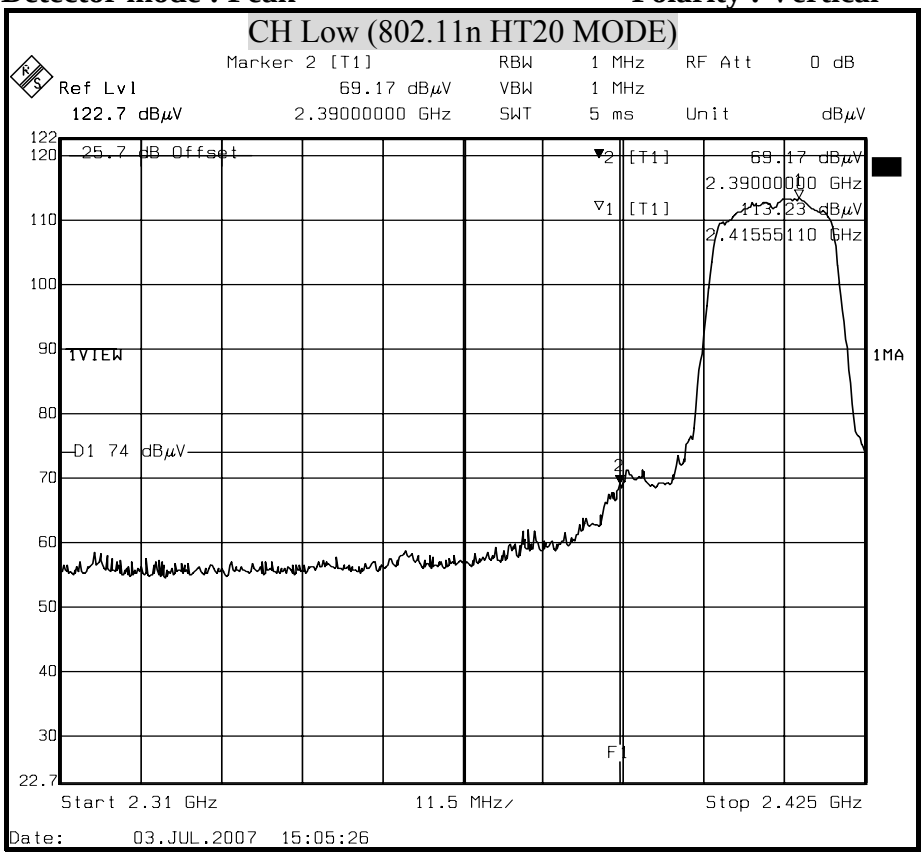
Detector mode : Peak **Polarity : Horizontal**



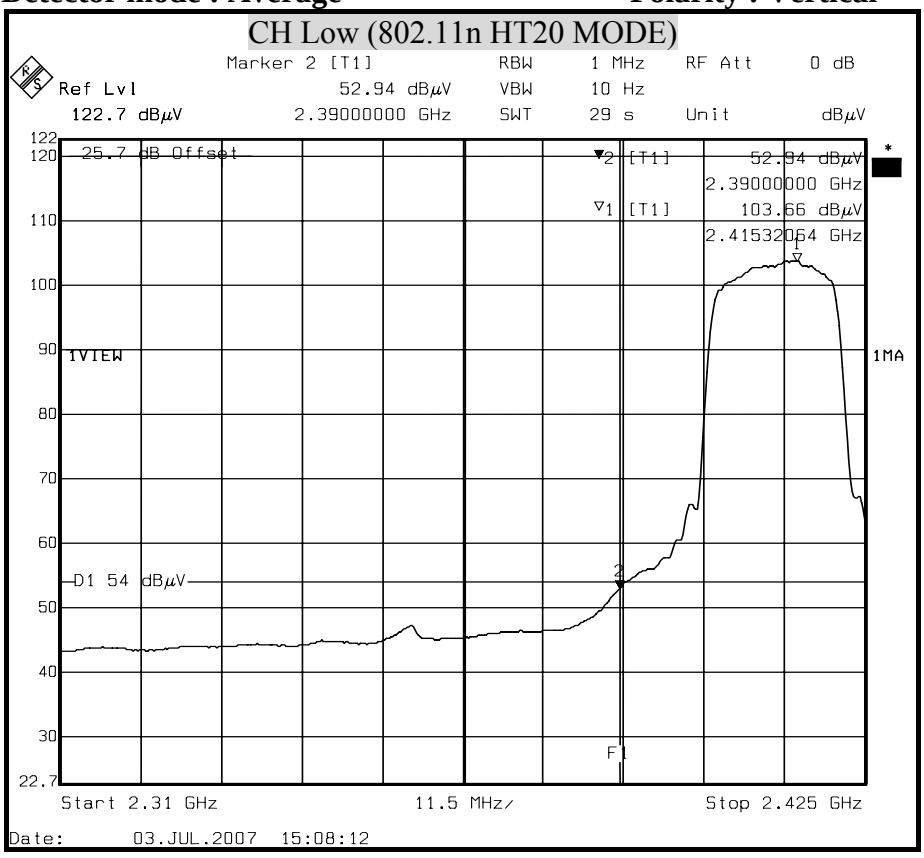
Detector mode : Average **Polarity : Horizontal**



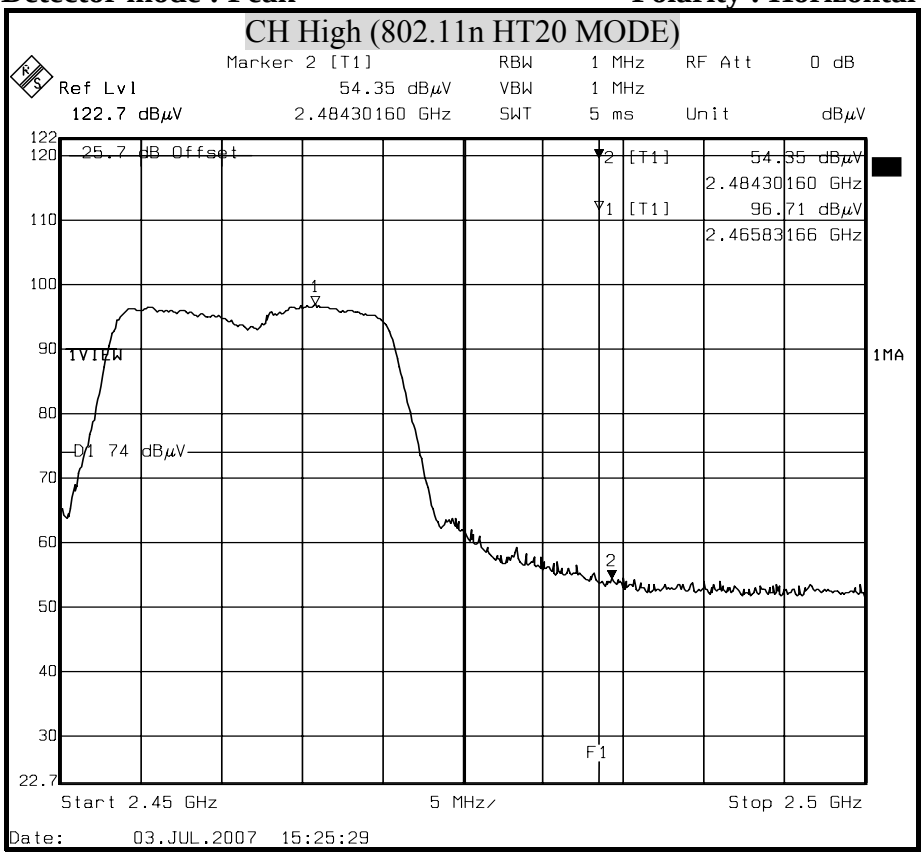
Detector mode : Peak **Polarity : Vertical**



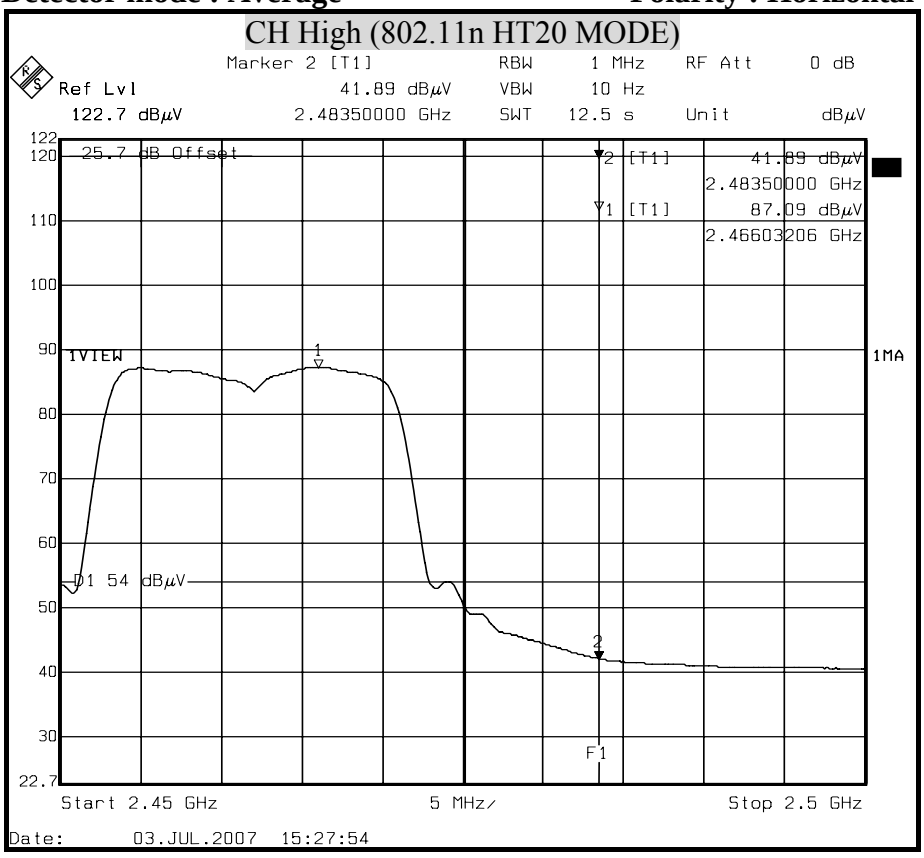
Detector mode : Average **Polarity : Vertical**



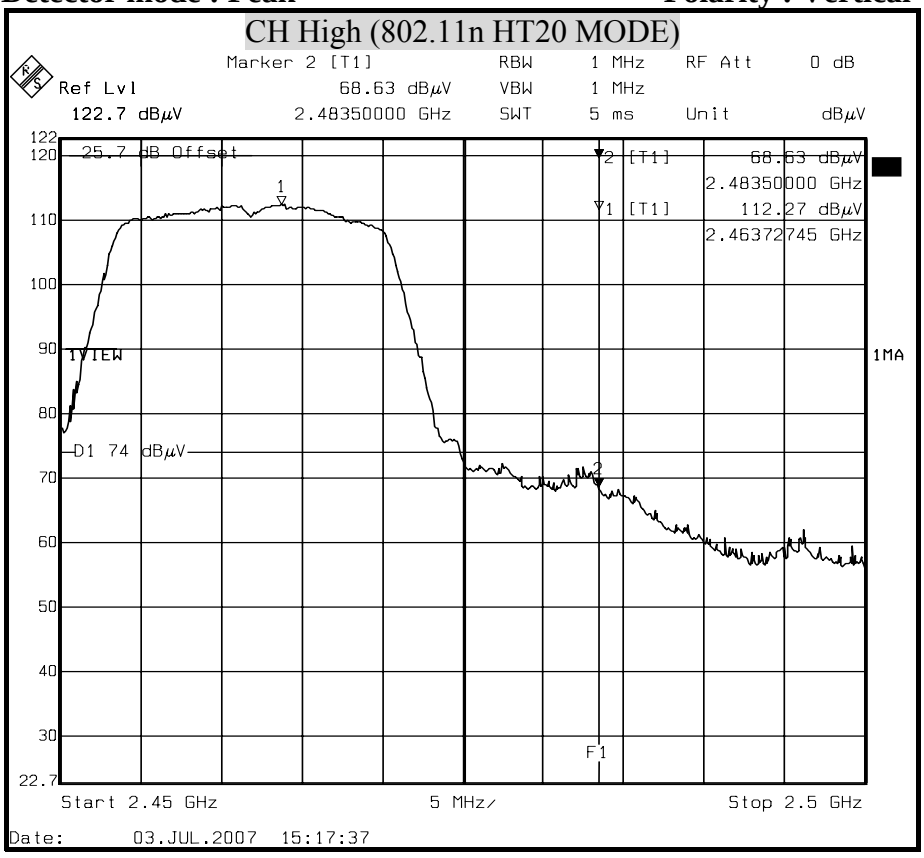
Detector mode : Peak **Polarity : Horizontal**



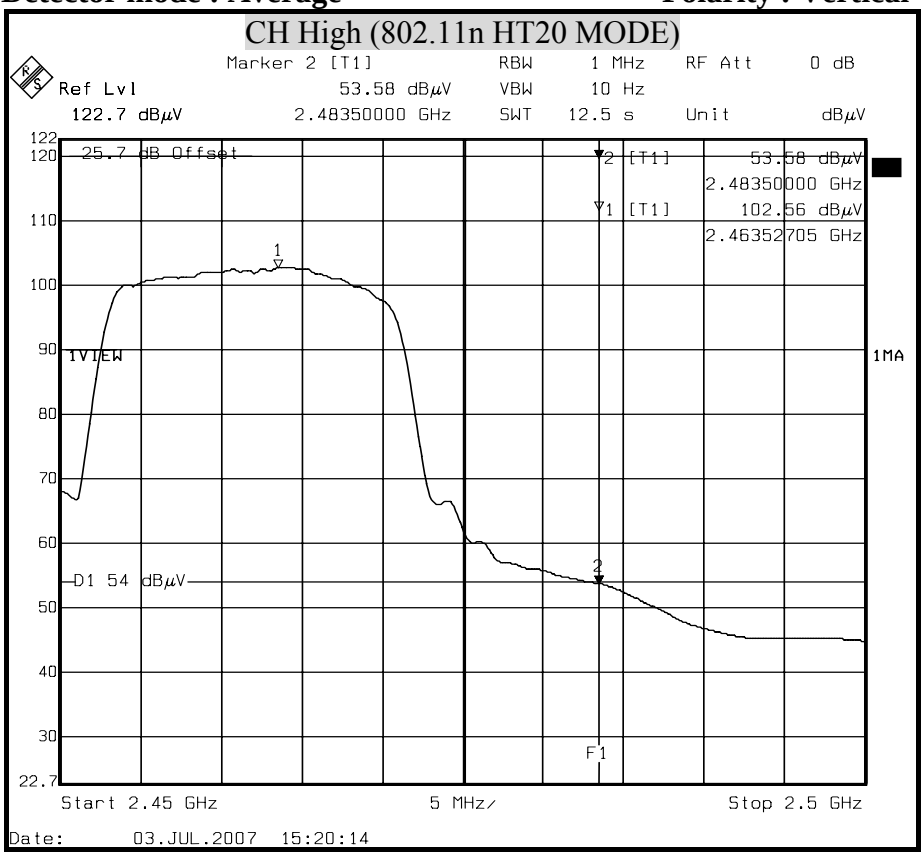
Detector mode : Average **Polarity : Horizontal**



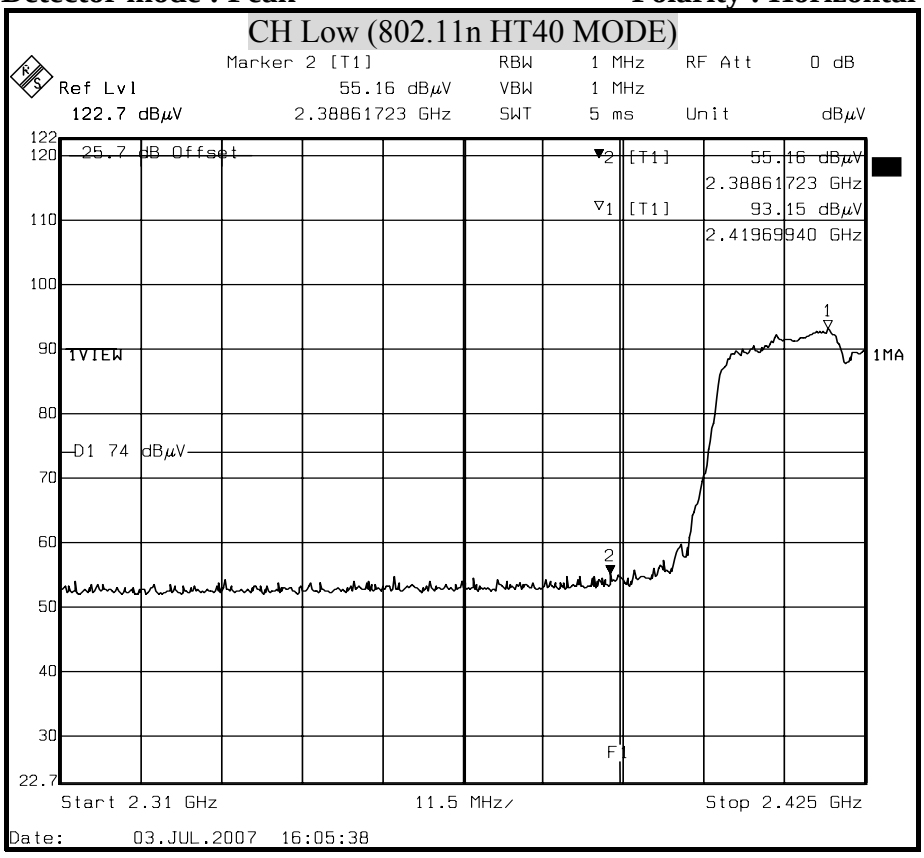
Detector mode : Peak **Polarity : Vertical**



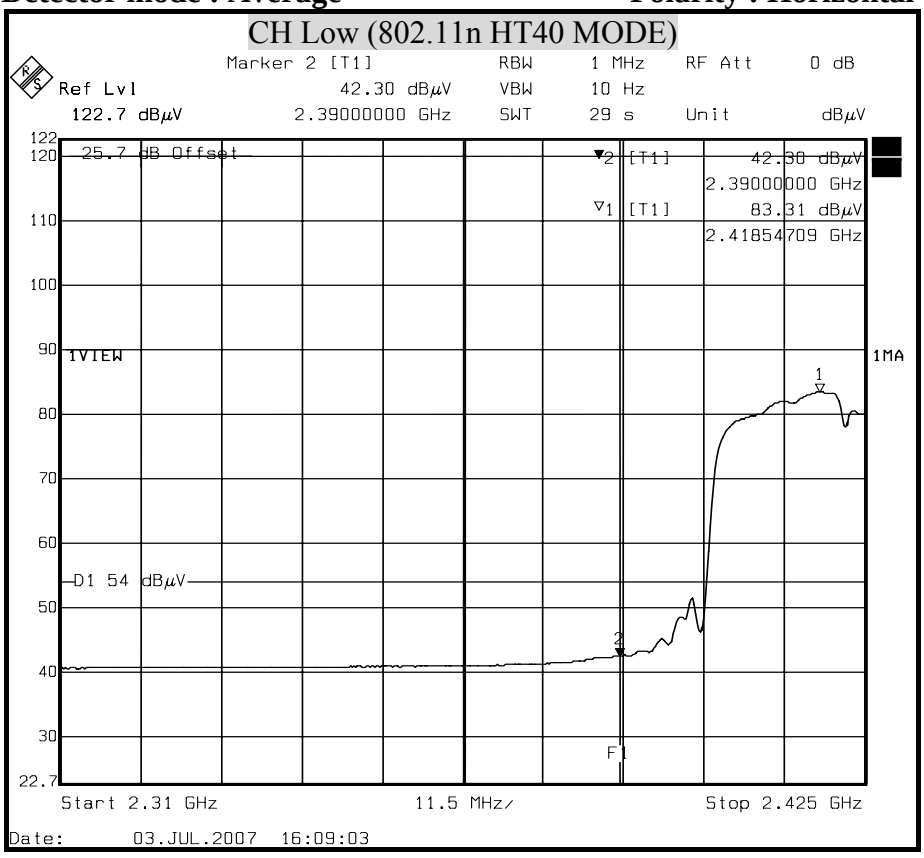
Detector mode : Average **Polarity : Vertical**



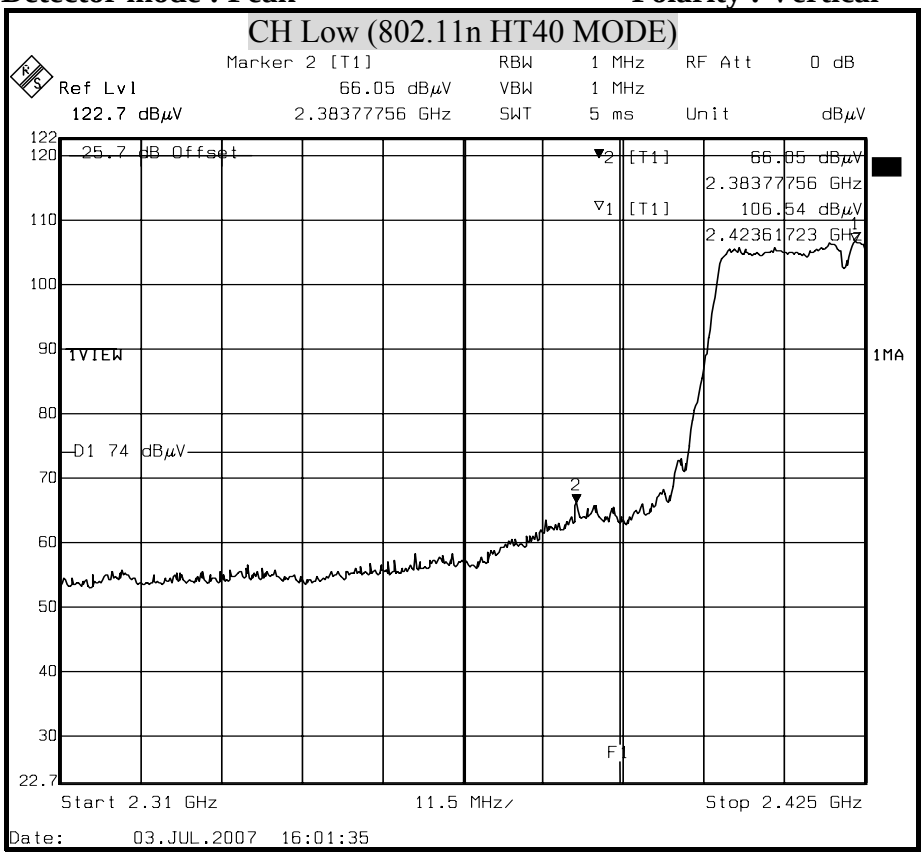
Detector mode : Peak **Polarity : Horizontal**



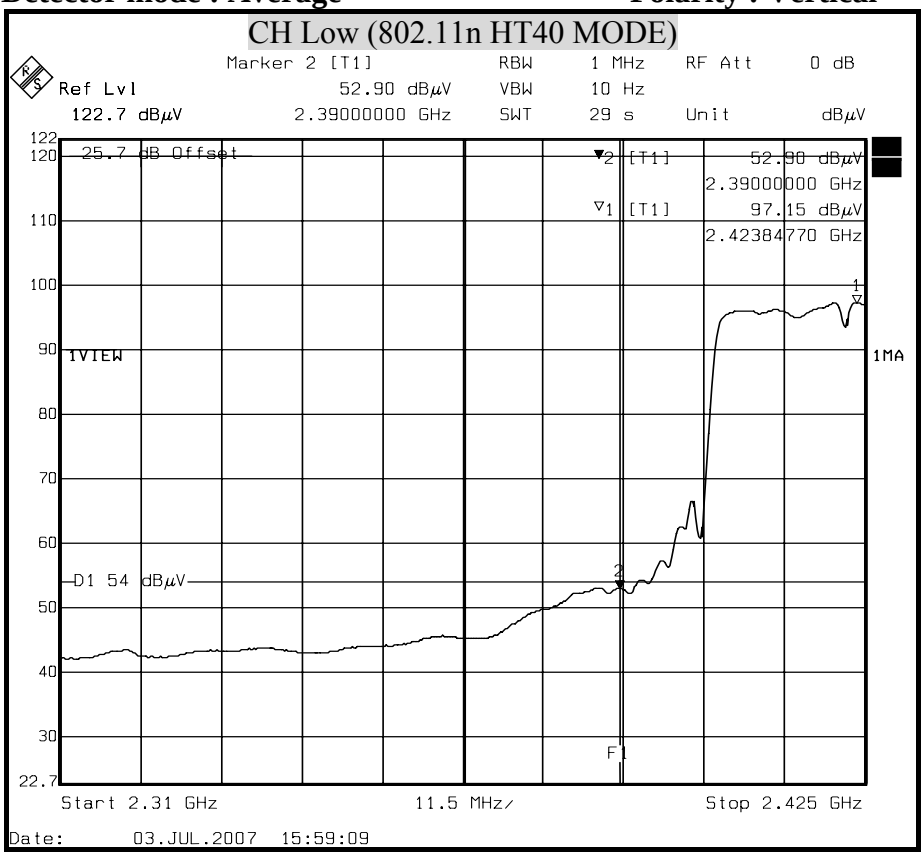
Detector mode : Average **Polarity : Horizontal**



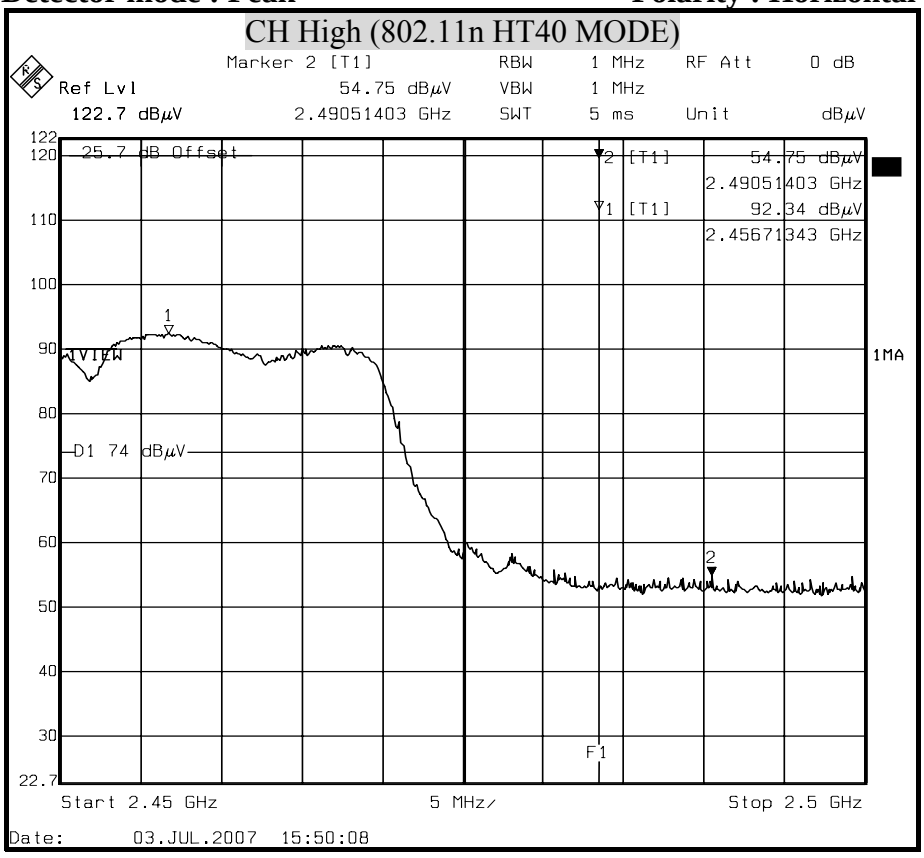
Detector mode : Peak **Polarity : Vertical**



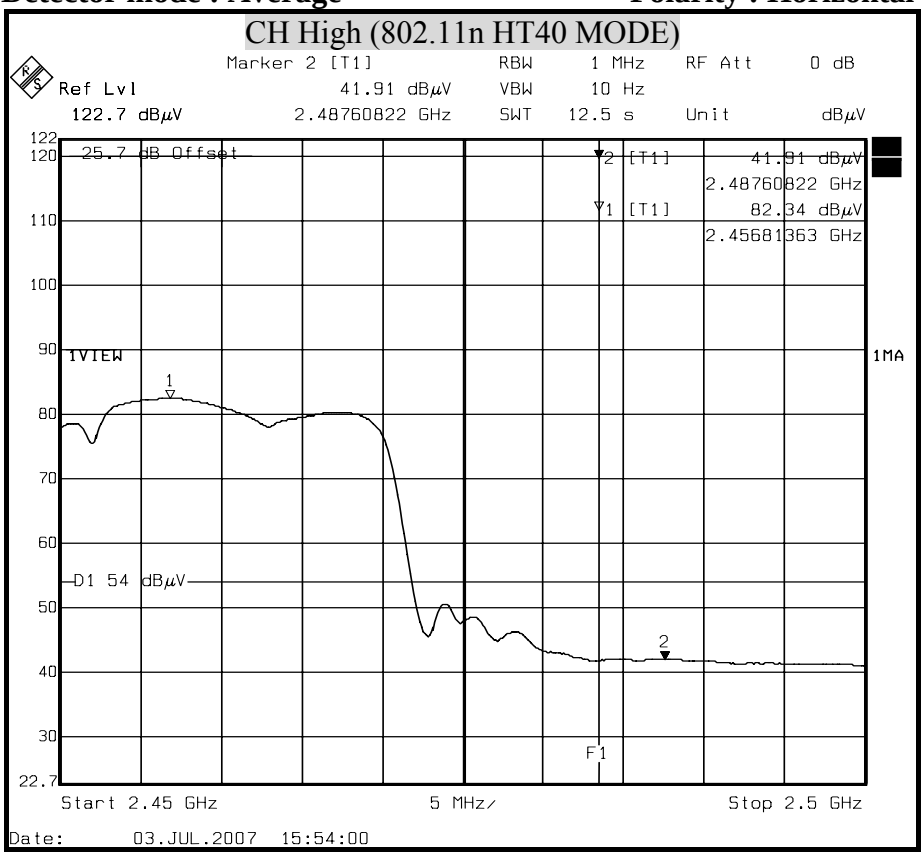
Detector mode : Average **Polarity : Vertical**



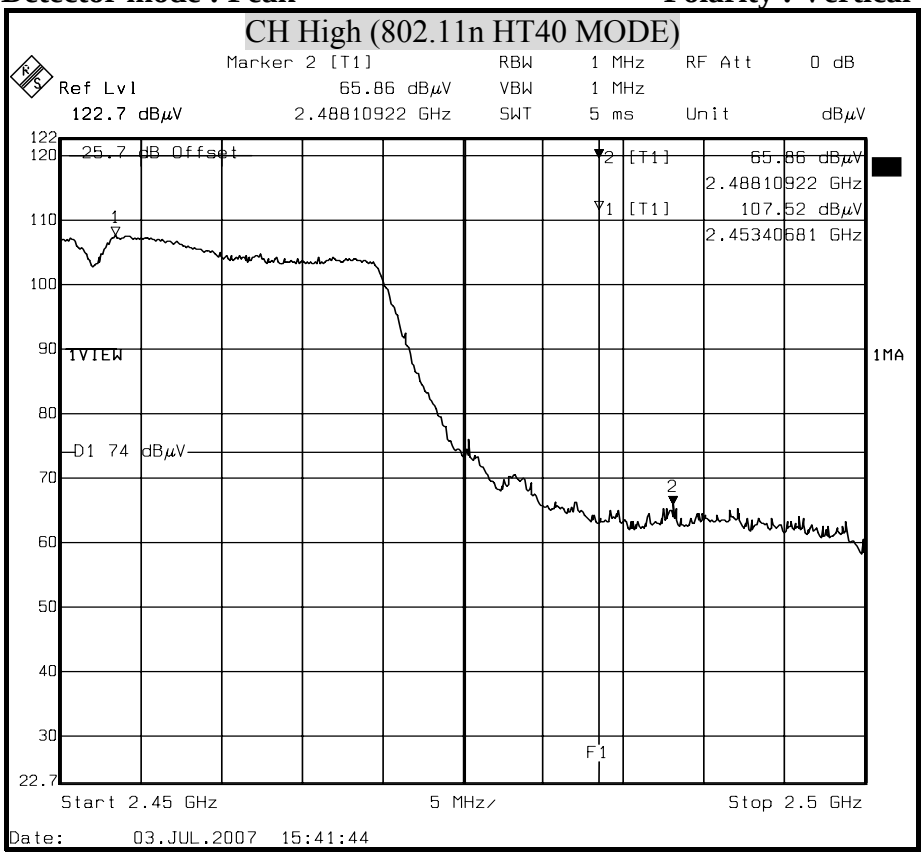
Detector mode : Peak **Polarity : Horizontal**



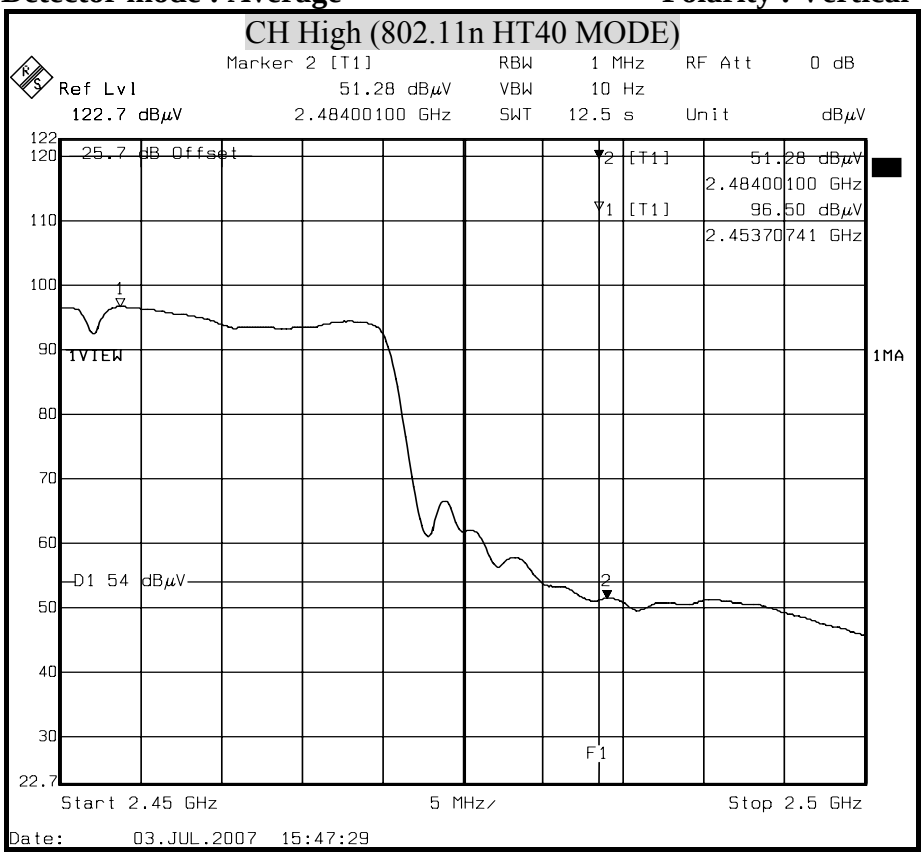
Detector mode : Average **Polarity : Horizontal**



Detector mode : Peak **Polarity : Vertical**

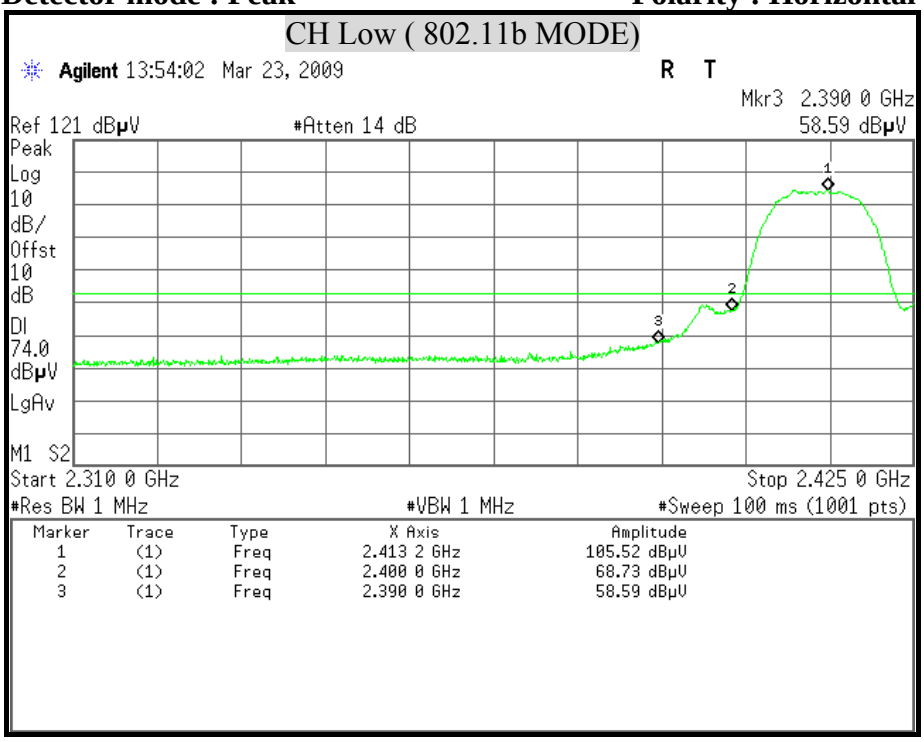


Detector mode : Average **Polarity : Vertical**

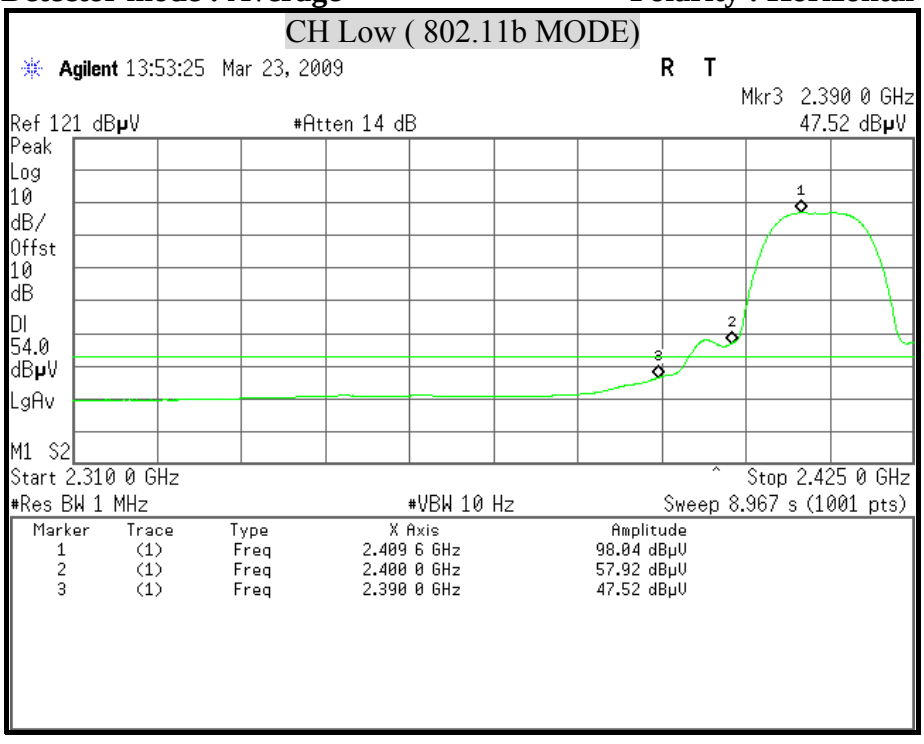


PIFA Antenna

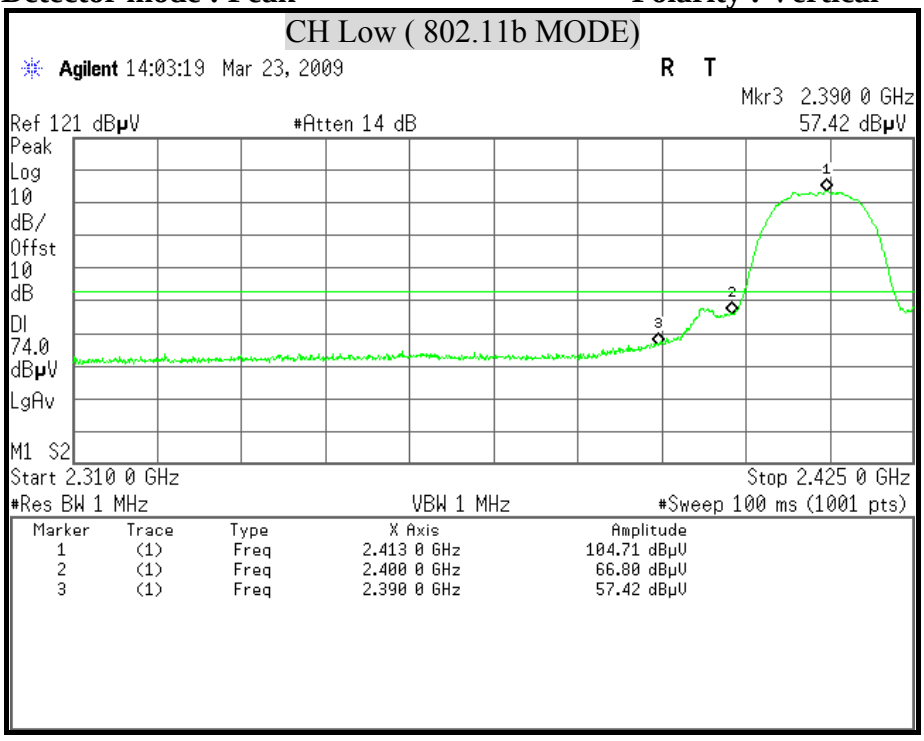
Detector mode : Peak **Polarity : Horizontal**



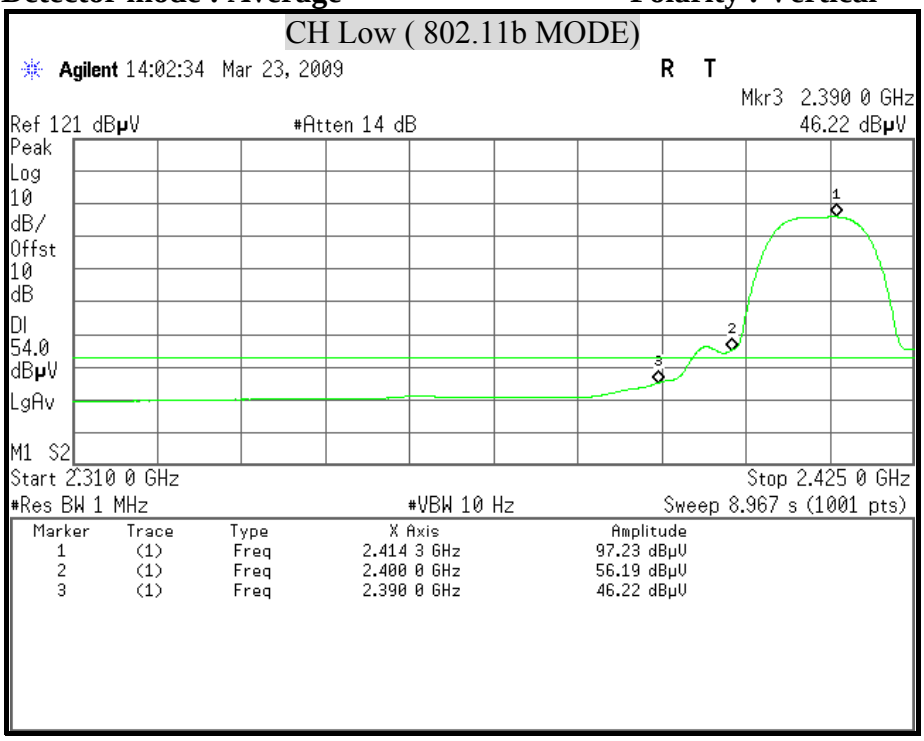
Detector mode : Average **Polarity : Horizontal**



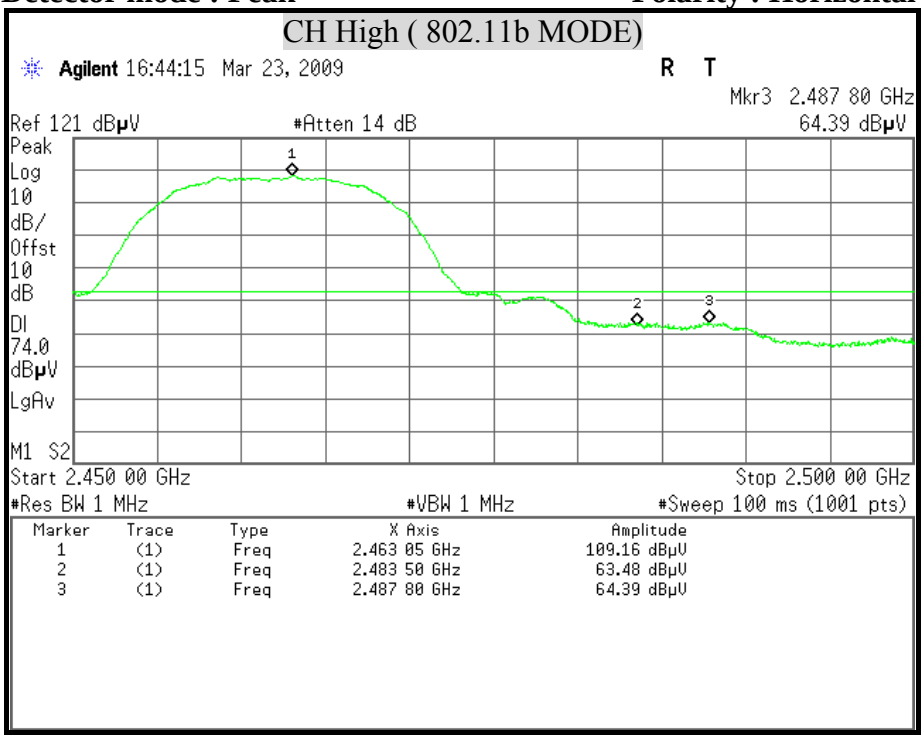
Detector mode : Peak **Polarity : Vertical**



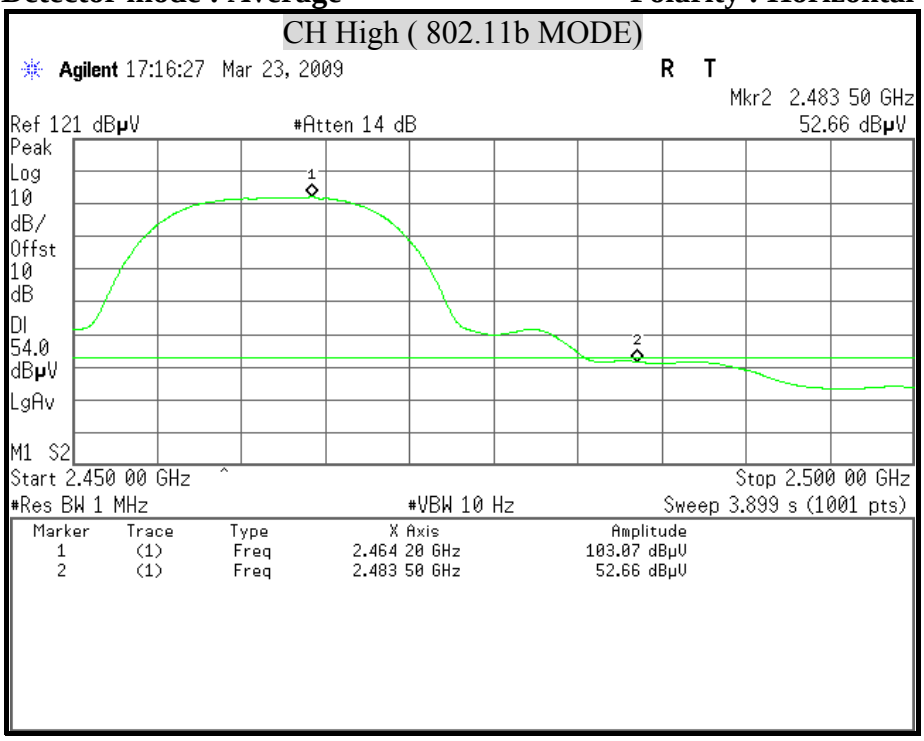
Detector mode : Average **Polarity : Vertical**



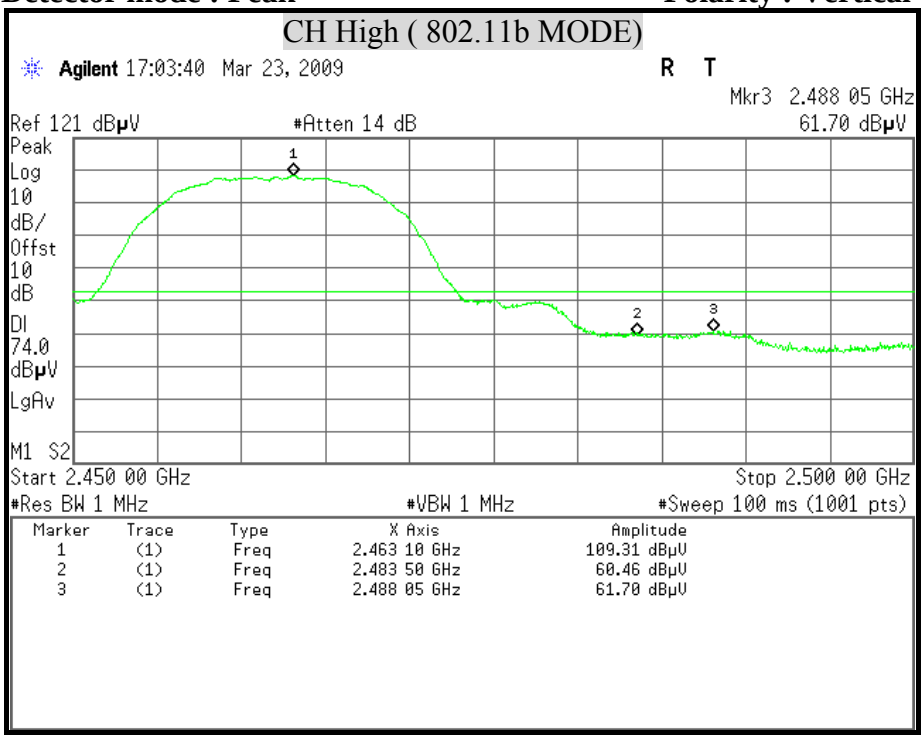
Detector mode : Peak **Polarity : Horizontal**



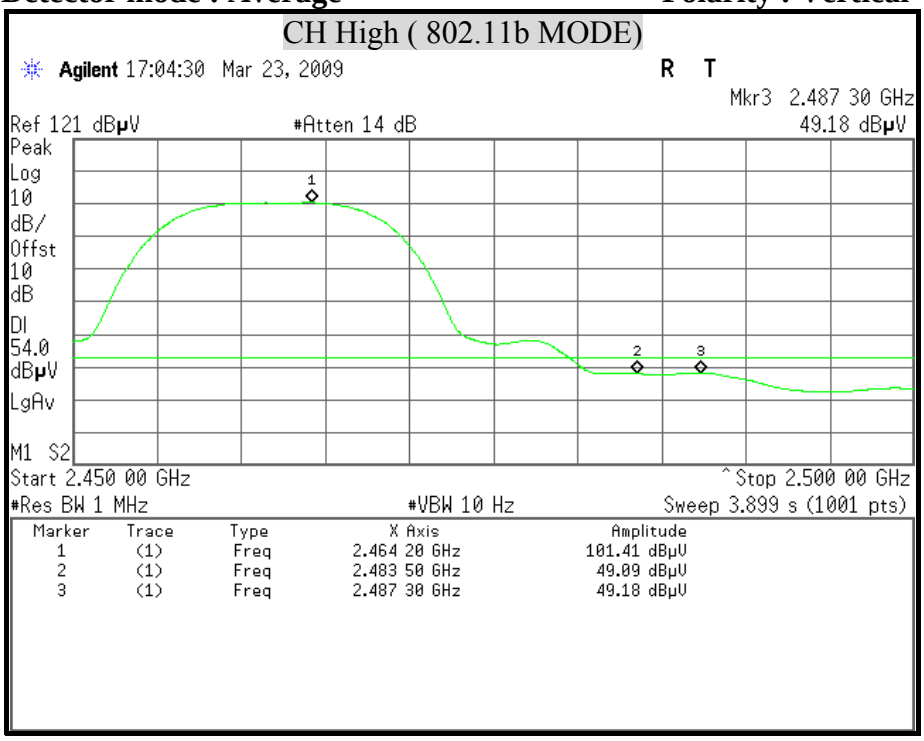
Detector mode : Average **Polarity : Horizontal**



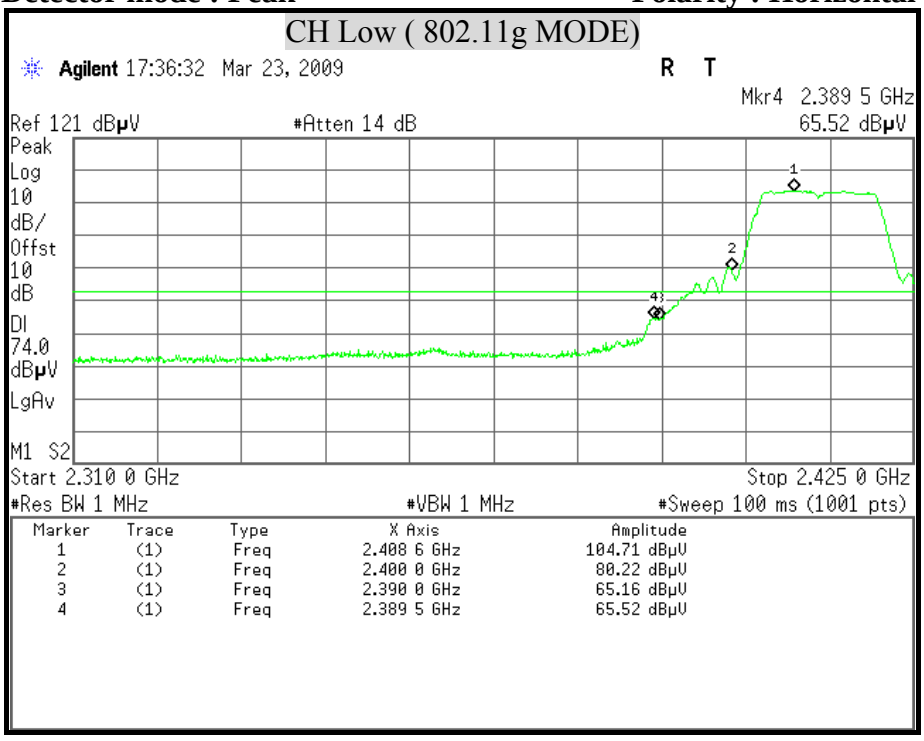
Detector mode : Peak **Polarity : Vertical**



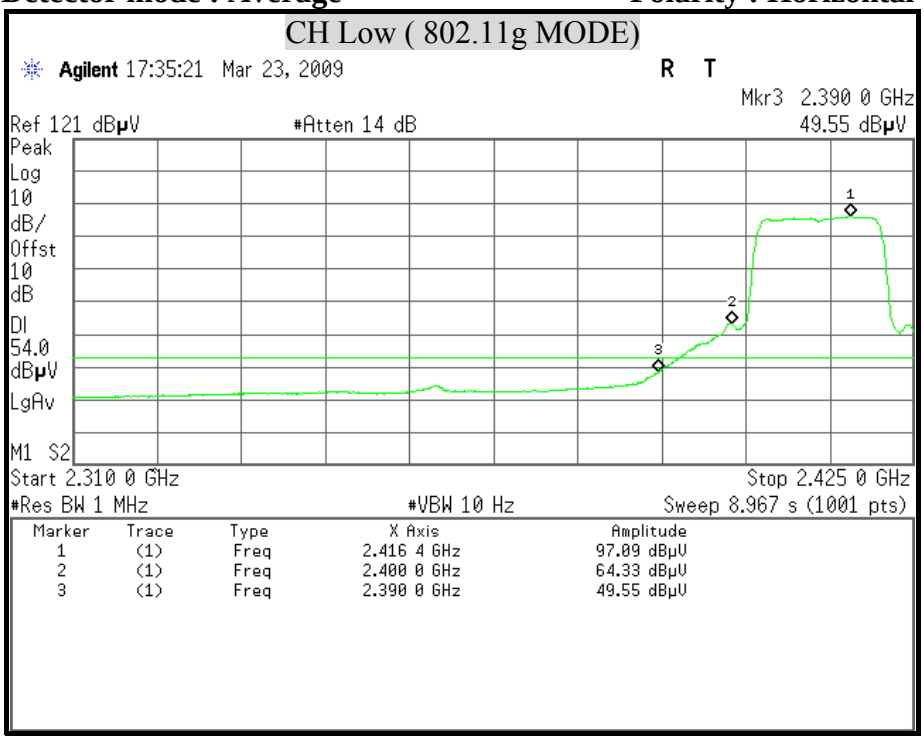
Detector mode : Average **Polarity : Vertical**



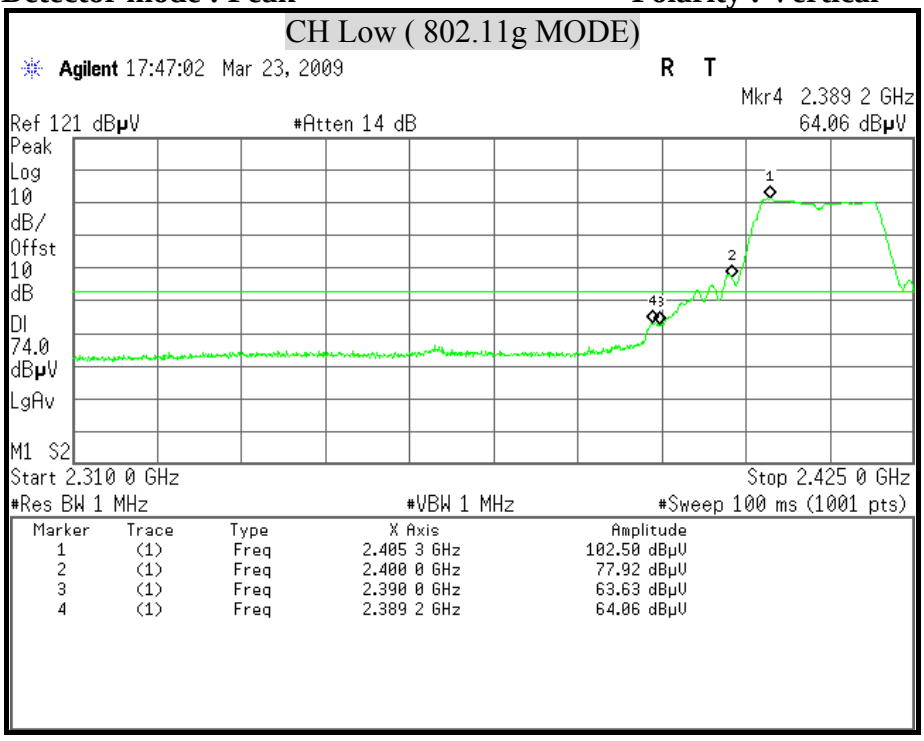
Detector mode : Peak **Polarity : Horizontal**



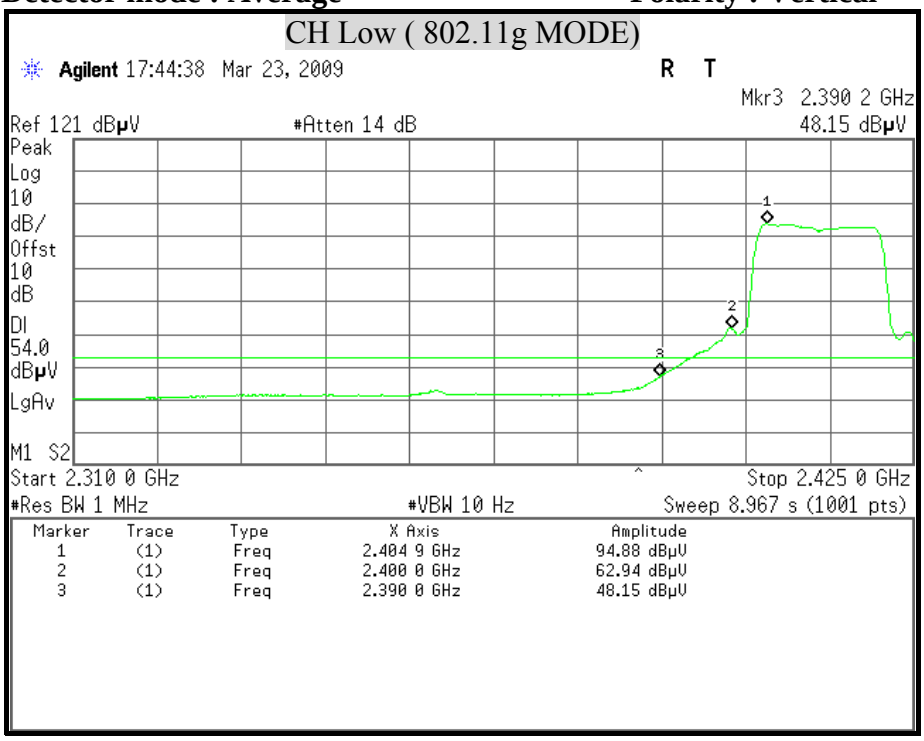
Detector mode : Average **Polarity : Horizontal**



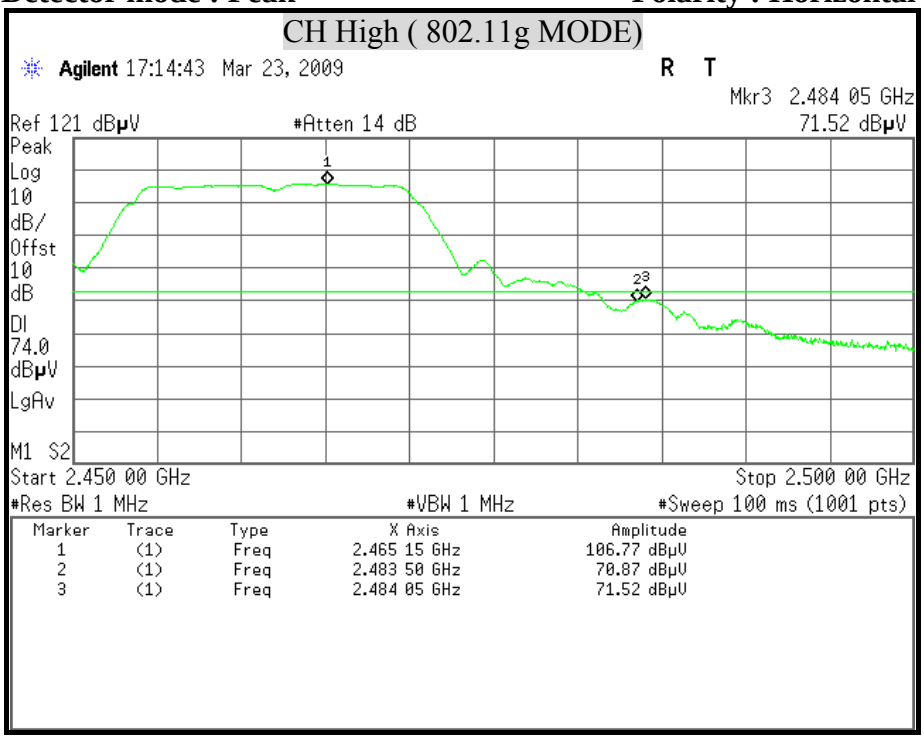
Detector mode : Peak **Polarity : Vertical**



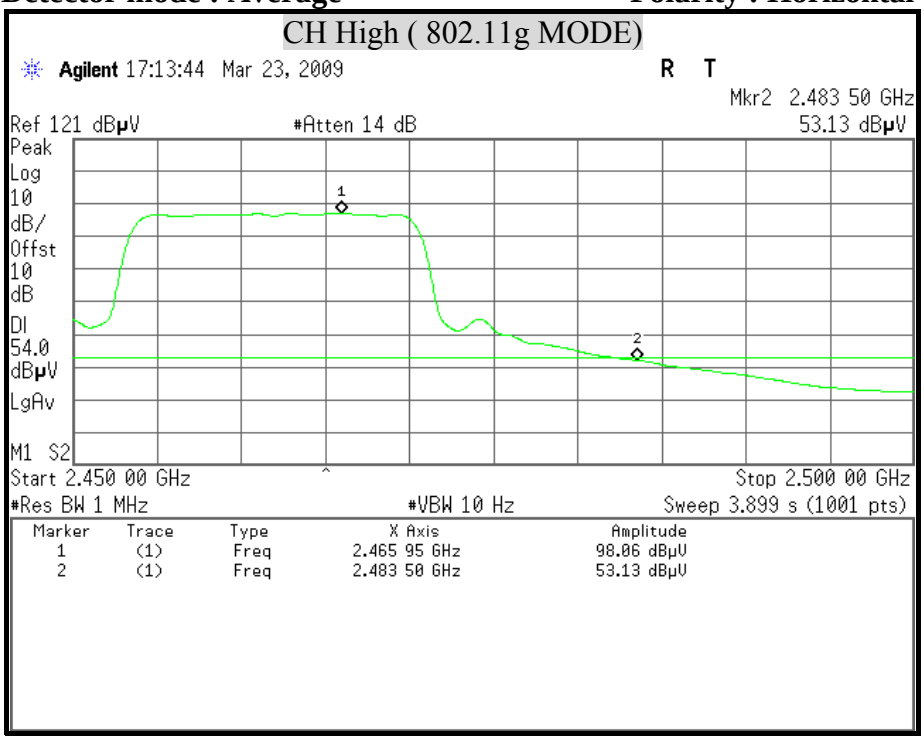
Detector mode : Average **Polarity : Vertical**



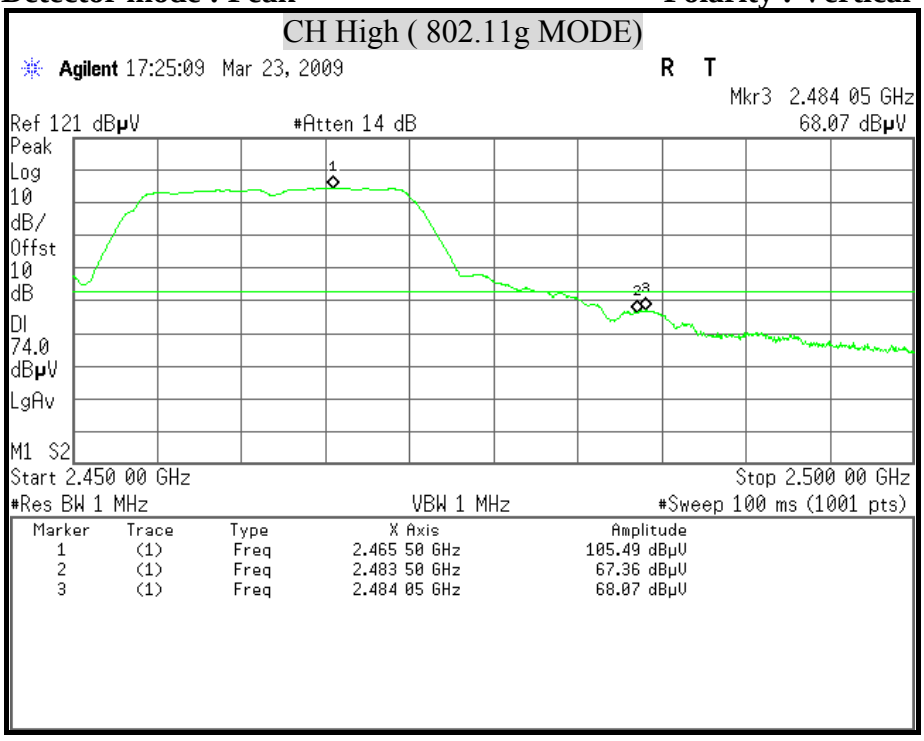
Detector mode : Peak **Polarity : Horizontal**



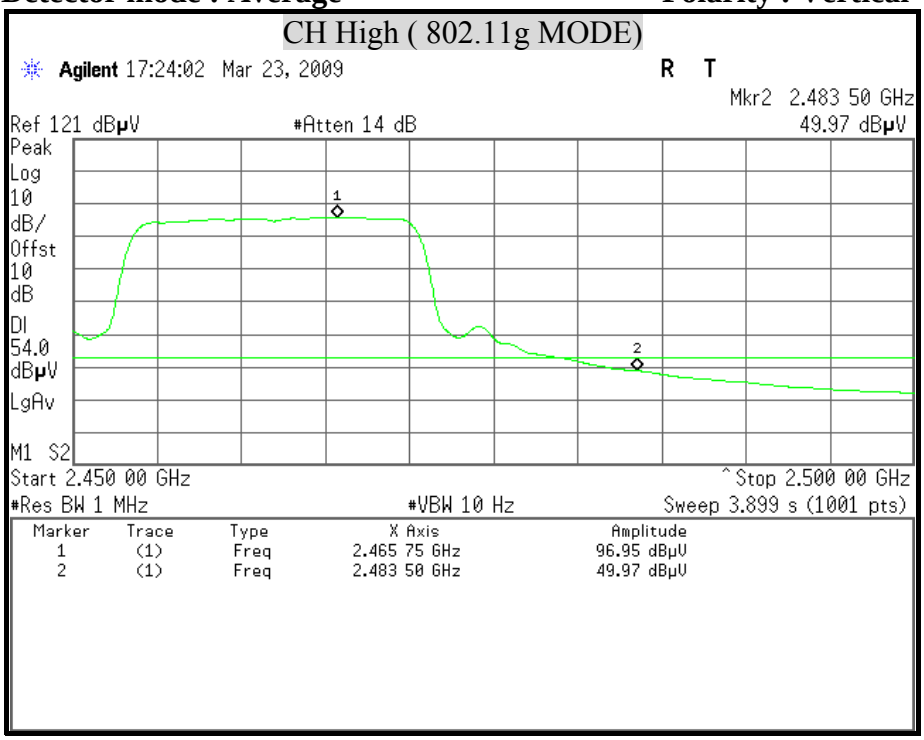
Detector mode : Average **Polarity : Horizontal**



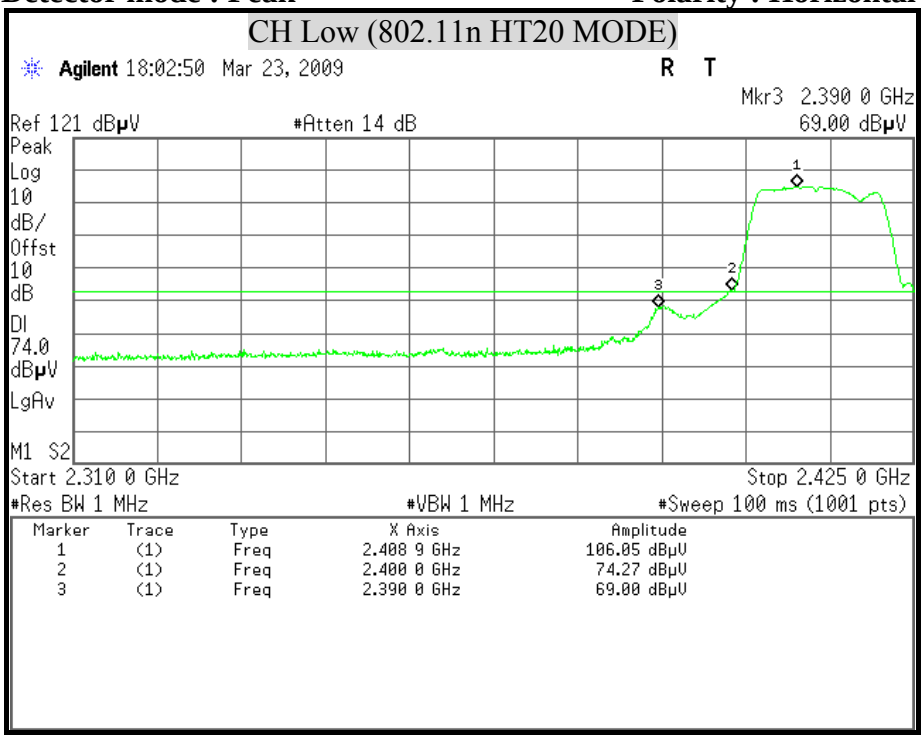
Detector mode : Peak **Polarity : Vertical**



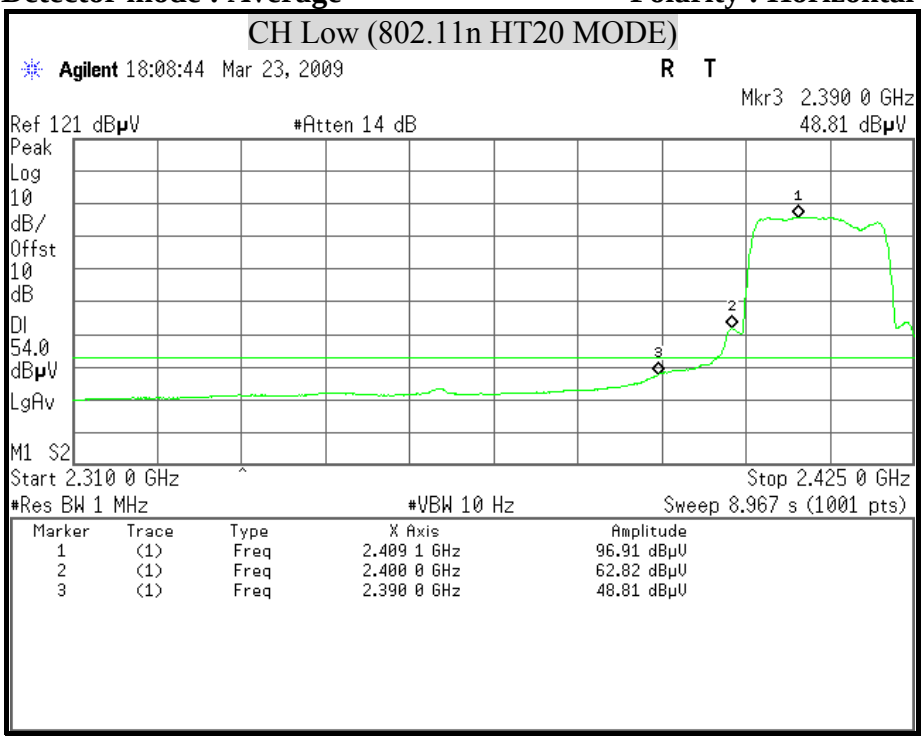
Detector mode : Average **Polarity : Vertical**



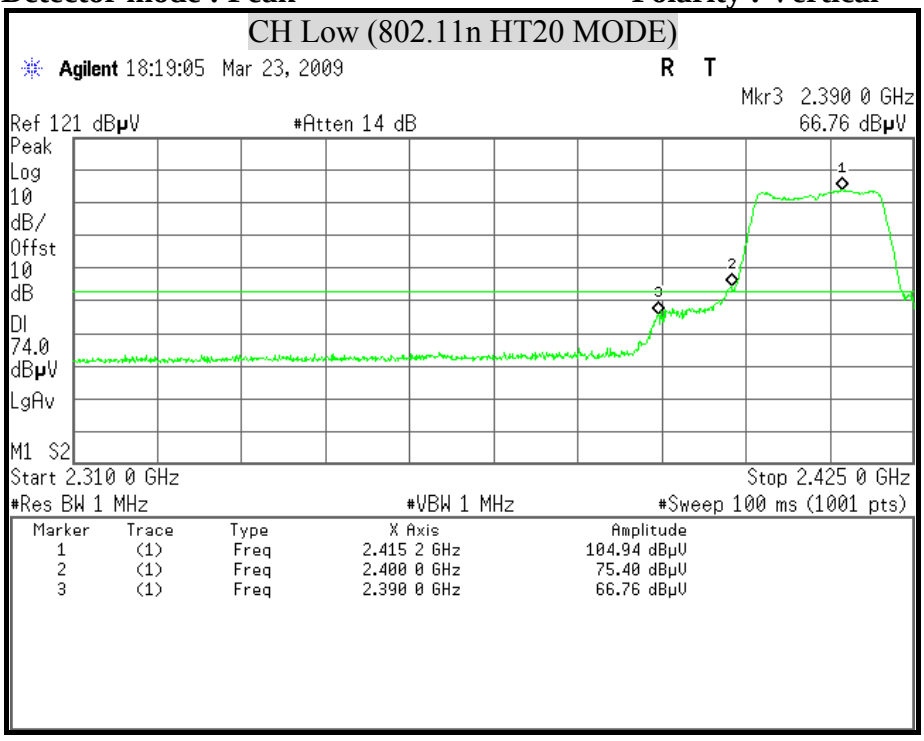
Detector mode : Peak **Polarity : Horizontal**



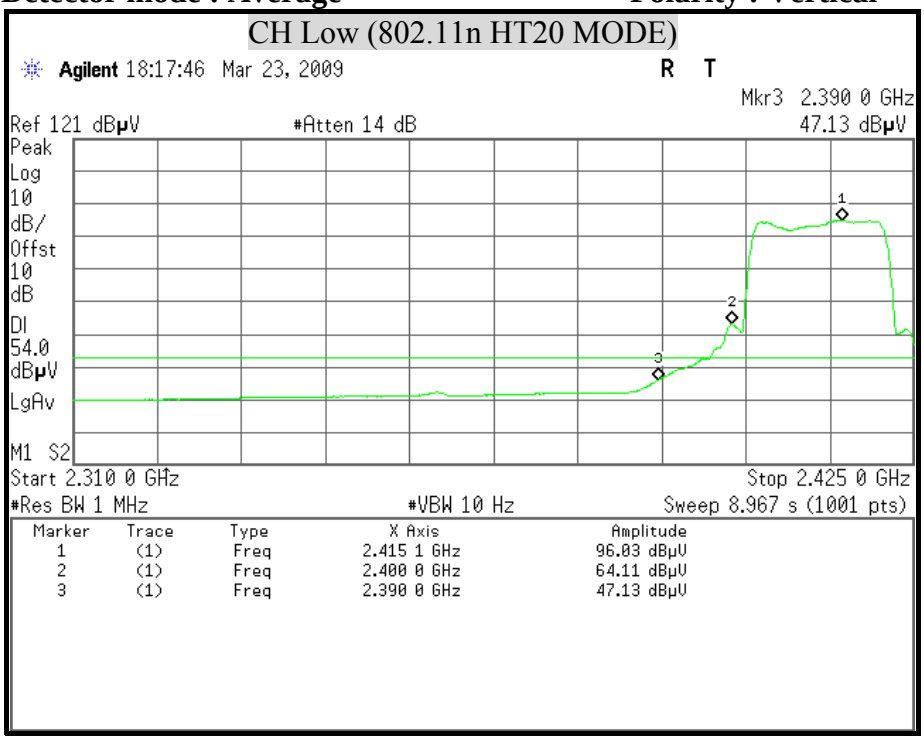
Detector mode : Average **Polarity : Horizontal**



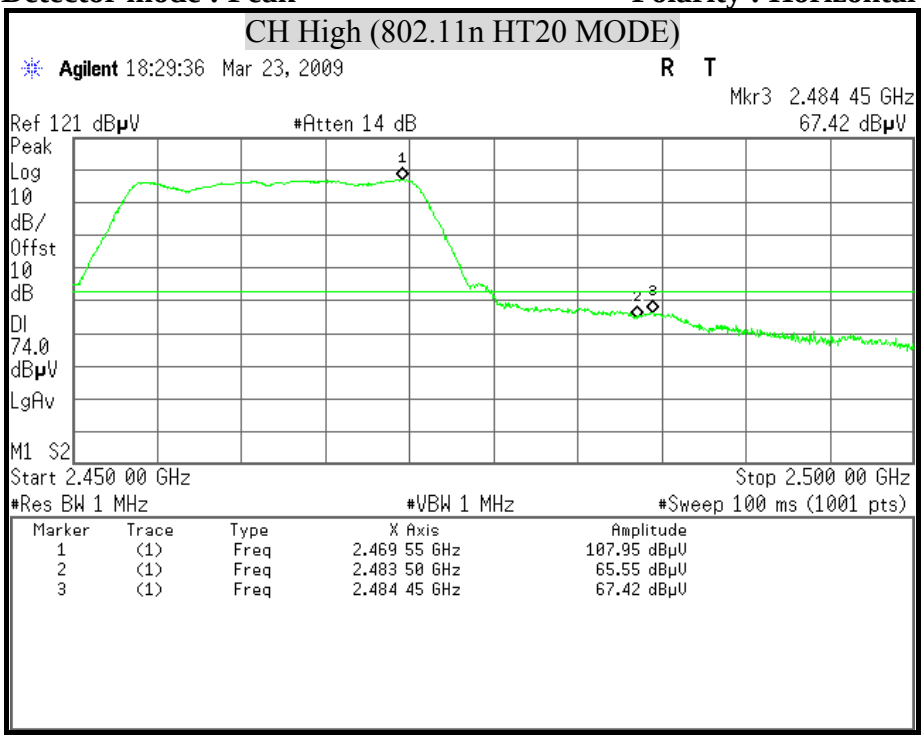
Detector mode : Peak **Polarity : Vertical**



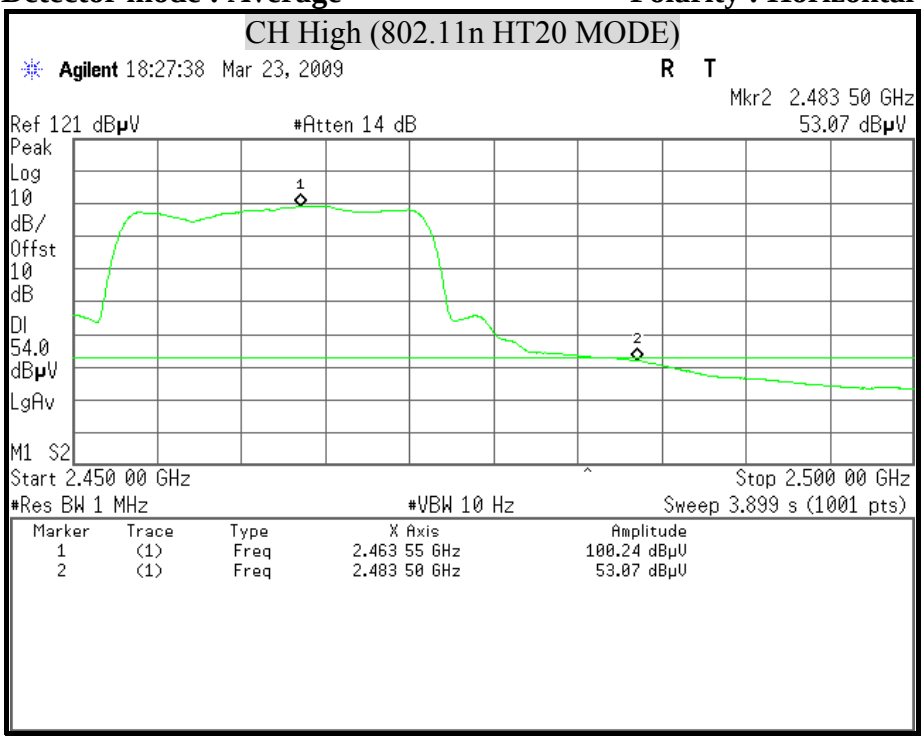
Detector mode : Average **Polarity : Vertical**



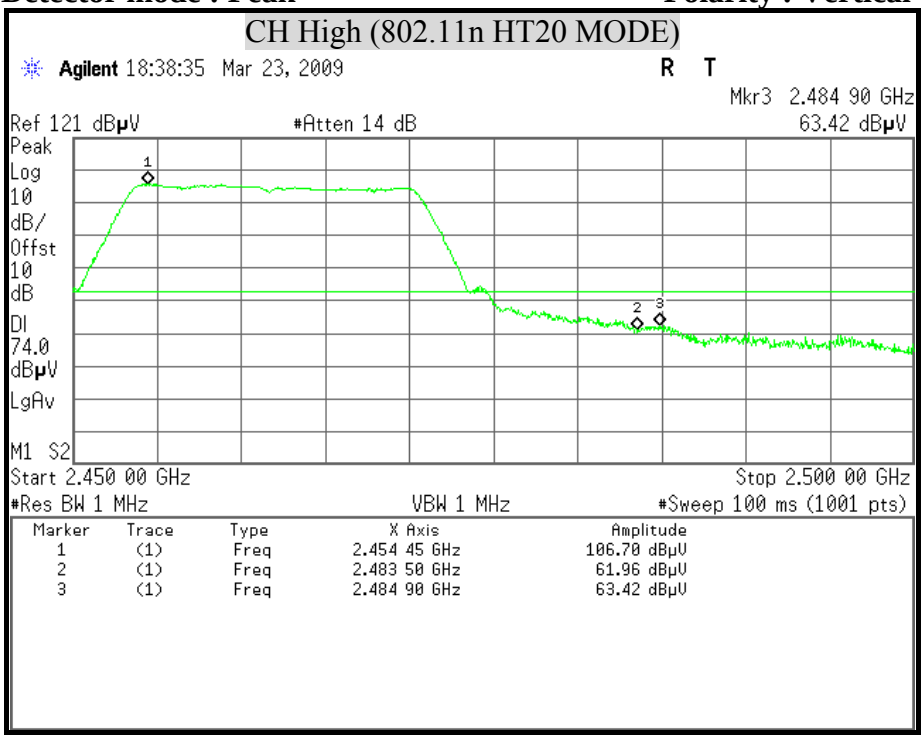
Detector mode : Peak **Polarity : Horizontal**



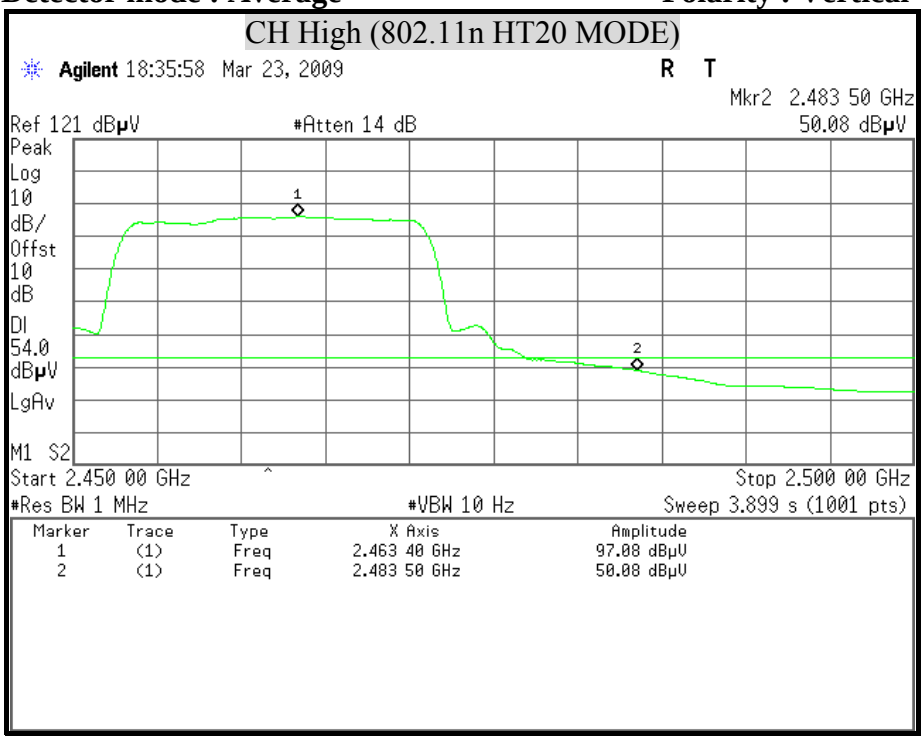
Detector mode : Average **Polarity : Horizontal**



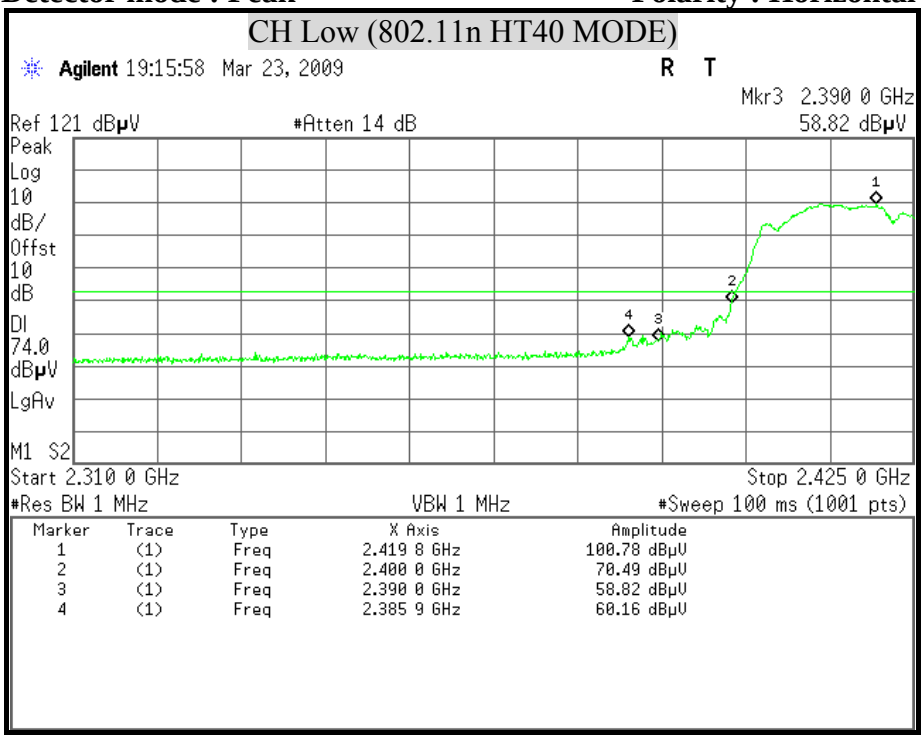
Detector mode : Peak **Polarity : Vertical**



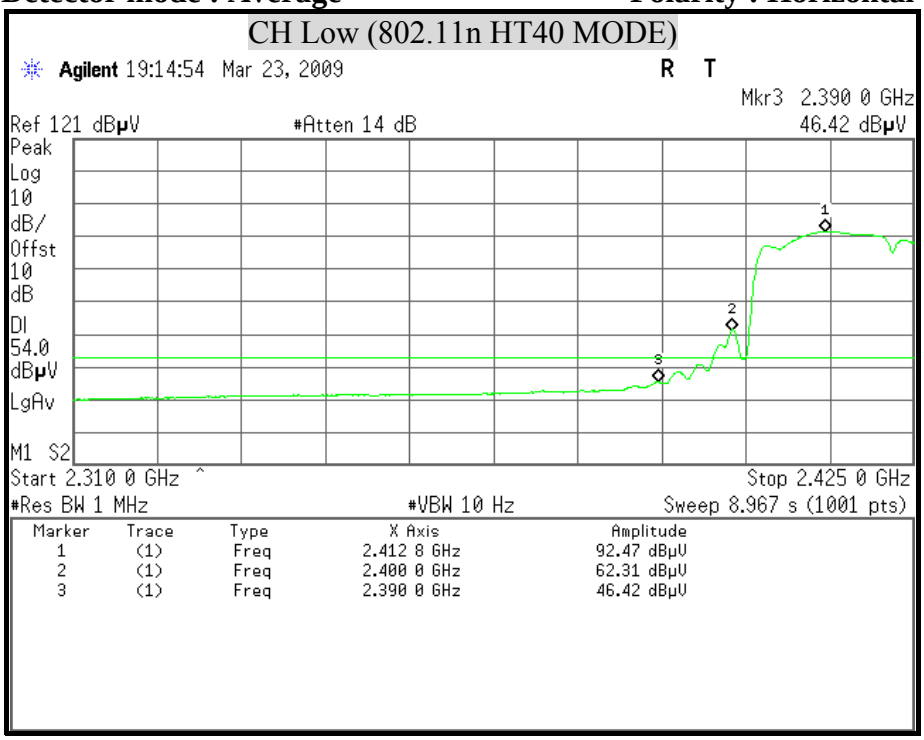
Detector mode : Average **Polarity : Vertical**



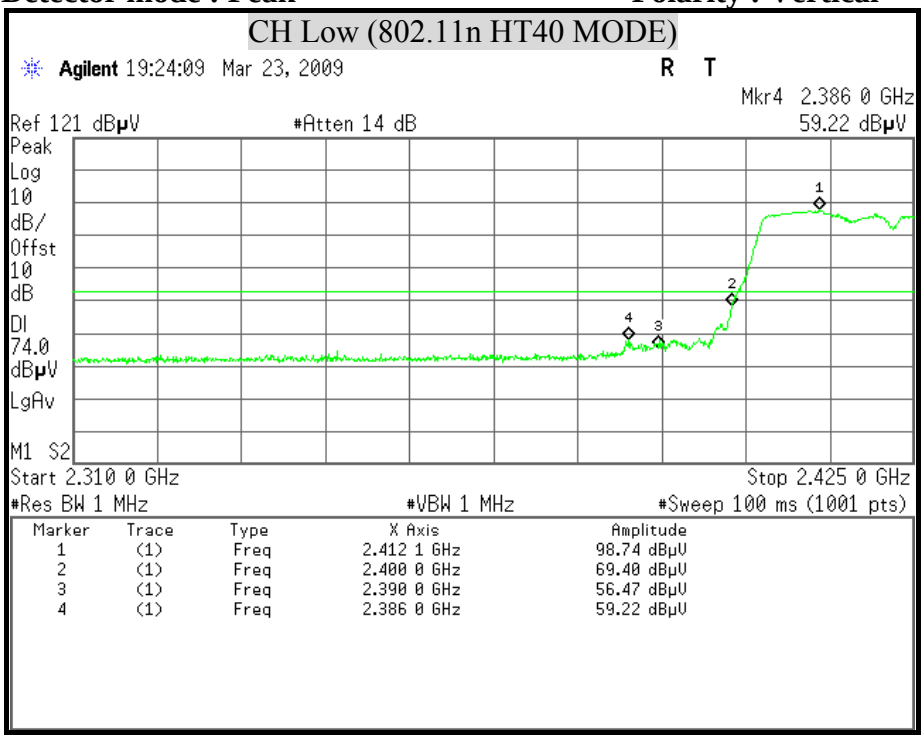
Detector mode : Peak **Polarity : Horizontal**



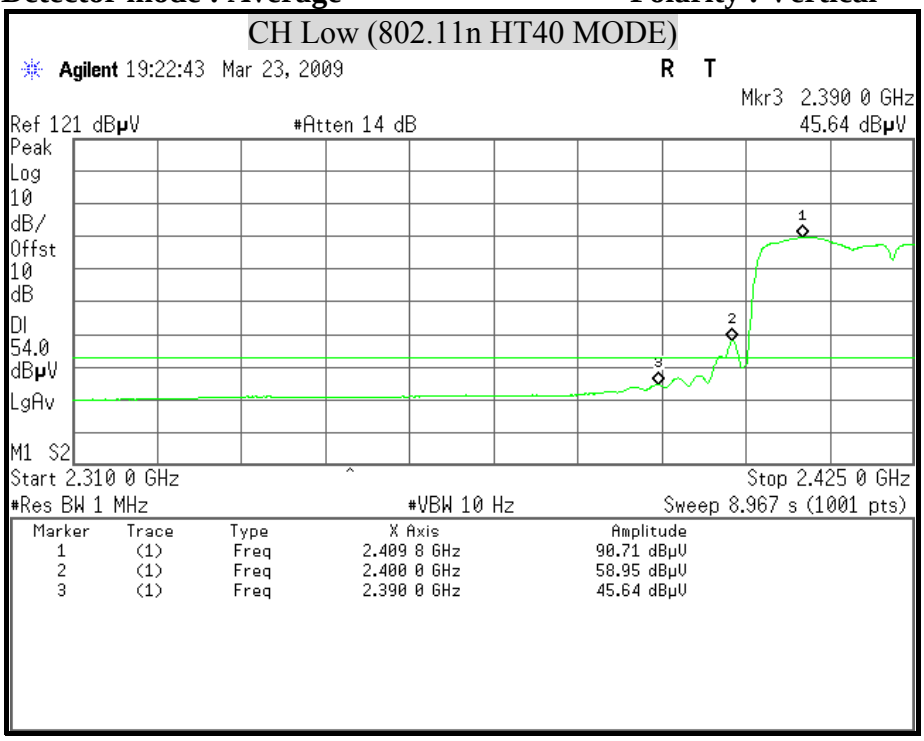
Detector mode : Average **Polarity : Horizontal**



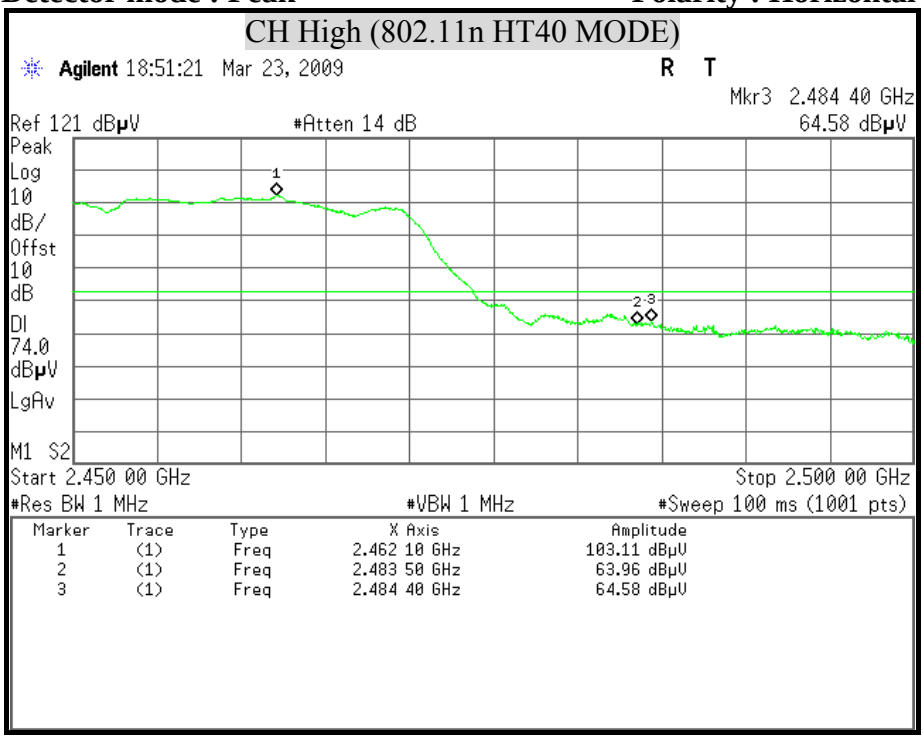
Detector mode : Peak **Polarity : Vertical**



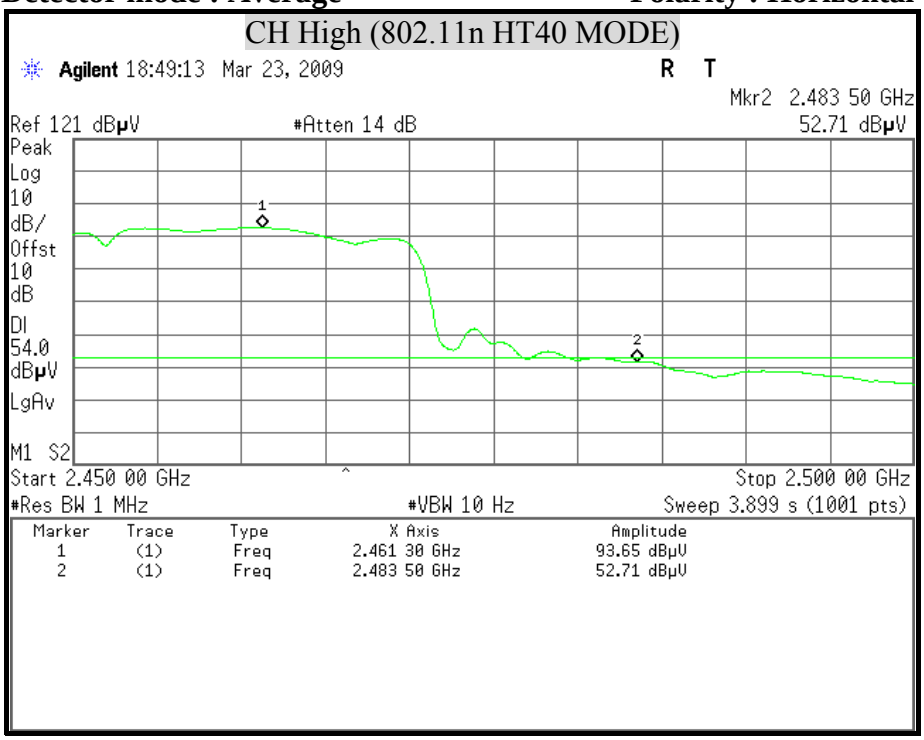
Detector mode : Average **Polarity : Vertical**



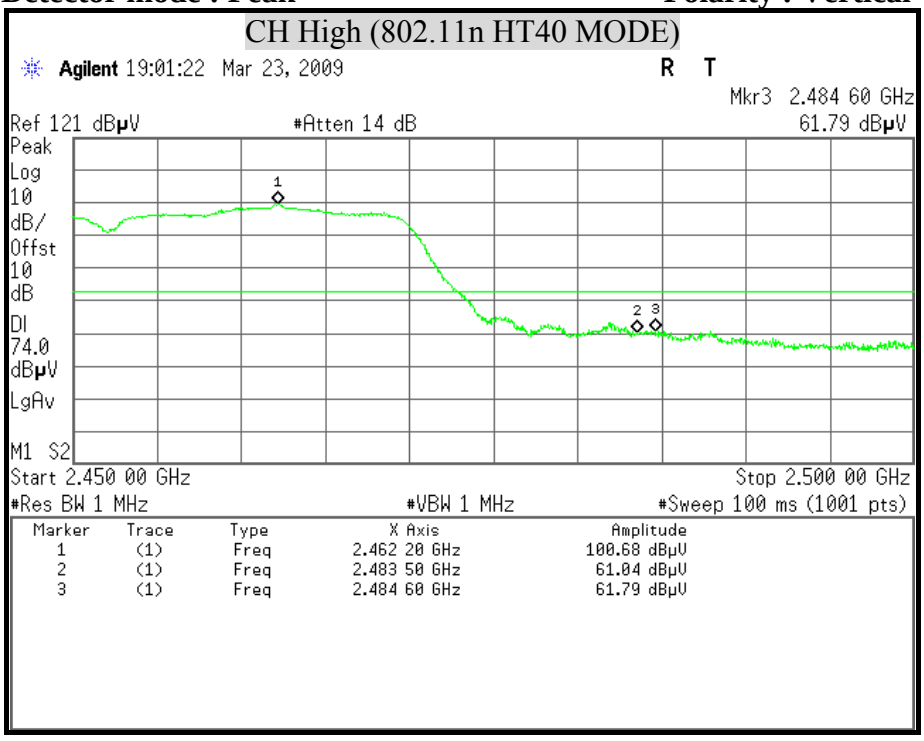
Detector mode : Peak **Polarity : Horizontal**



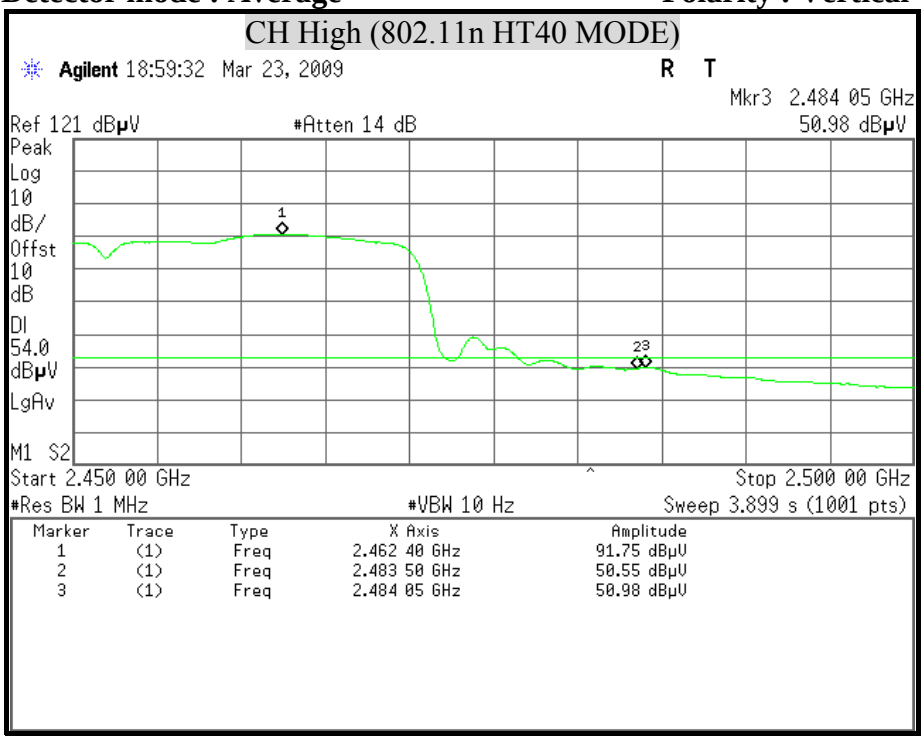
Detector mode : Average **Polarity : Horizontal**



Detector mode : Peak **Polarity : Vertical**



Detector mode : Average **Polarity : Vertical**



8.9 POWERLINE CONDUCTED EMISSIONS

LIMITS

§ 15.207 (a) Except as shown in paragraph (b) and (c) 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.

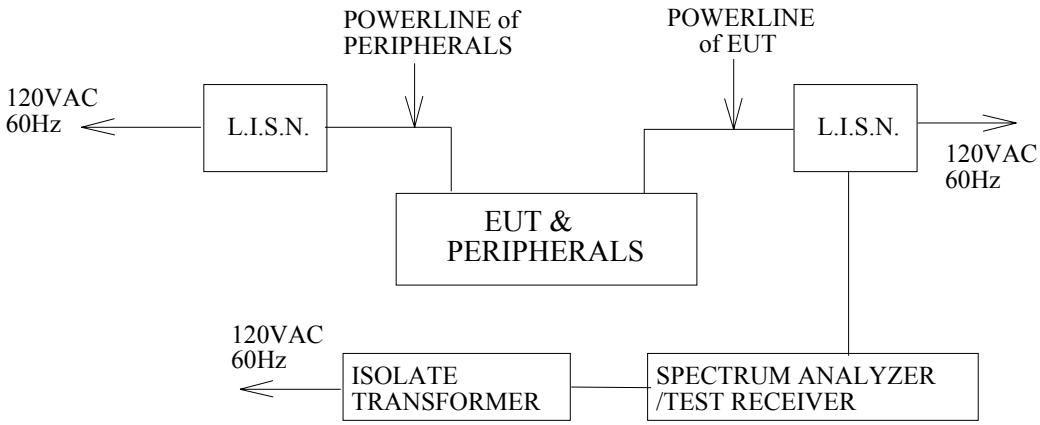
Frequency of Emission (MHz)	Conducted limit (dBμv)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.5 - 5	56	46
5 - 30	60	50

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
L.I.S.N	SCHWARZBECK	3810/2	9801-1850	02/26/2008
L.I.S.N	CHASE	NNLK 8129	8129118	01/26/2008
TEST RECEIVER	R & S	ESHS30	838550/003	01/31/2008
KEENE SHIELDED ROOM	---------	5983	No.1	N.C.R
PULSE LIMIT	R & S	ESH3-Z2	357.8810.52	07/10/2008
N TYPE COAXIAL CABLE	---------	----------	----------	08/21/2007
50Ω TERMINATOR	---------	----------	----------	07/10/2008

Remark: *1. Each piece of equipment is scheduled for calibration once a year.*
2. N.C.R = No Calibration Request.

TEST SETUP



TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80cm above the horizontal ground plane. The EUT IS CONFIGURED IN ACCORDANCE WITH ANSI C63.4:2003.
The resolution bandwidth is set to 9 kHz for both quasi-peak detection and average detection measurements.
Line conducted data is recorded for both NEUTRAL and LINE.

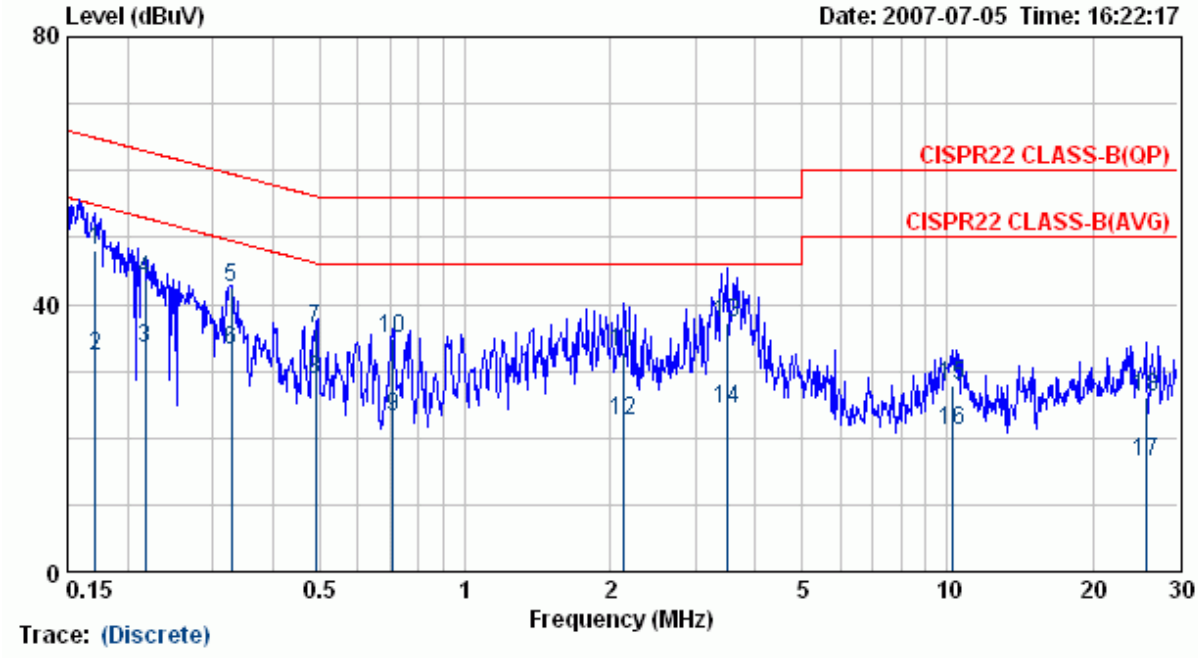
TEST RESULTS

No non-compliance noted

CONDUCTED RF VOLTAGE MEASUREMENT

Product Name	WIRELESS N MODULE	Test Date	2007/07/05
Model	WMP-N07	Test By	Alan Fan
Test Mode	Normal operating (Worst-case)	TEMP & Humidity	25°C, 54%

LINE



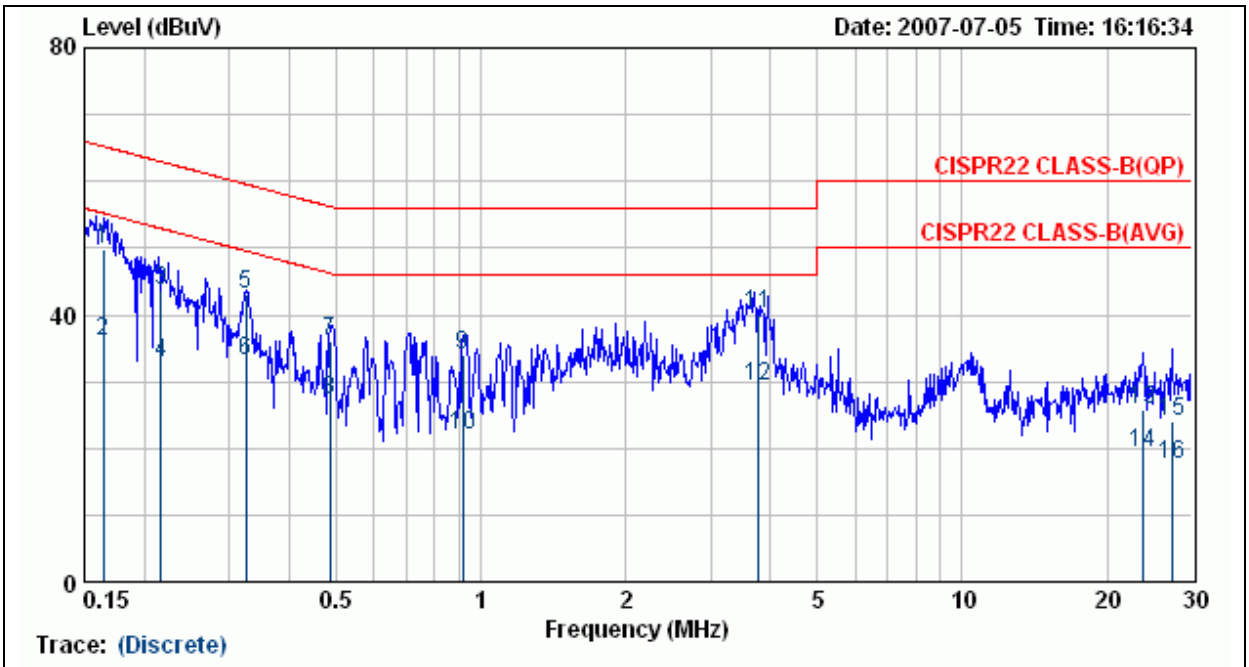
Freq. MHz	Corr. Factor dB	Reading Value dBuV Q.P.	Reading Value dBuV Ave.	Emission Level dBuV Q.P.	Emission Level dBuV Ave.	Limit dBuV Q.P.	Limit dBuV Ave.	Margin dBuV Q.P.	Margin dBuV Ave.
0.172	0.15	48.03	32.14	48.18	32.29	64.88	54.88	-16.71	-22.60
0.217	0.12	43.43	33.35	43.55	33.47	62.92	52.92	-19.37	-19.45
0.329	0.13	42.42	33.08	42.55	33.21	59.49	49.49	-16.94	-16.28
0.491	0.13	36.07	28.73	36.20	28.86	56.16	46.16	-19.95	-17.29
0.708	0.14	34.77	22.96	34.91	23.10	56.00	46.00	-21.09	-22.90
2.133	0.18	32.52	22.37	32.70	22.55	56.00	46.00	-23.30	-23.45
3.491	0.26	36.82	24.06	37.08	24.32	56.00	46.00	-18.92	-21.68
10.288	0.55	27.20	20.44	27.75	20.99	60.00	50.00	-32.25	-29.01
25.727	1.27	24.88	15.13	26.15	16.40	60.00	50.00	-33.85	-33.60

Remark:

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value

Product Name	WIRELESS N MODULE	Test Date	2007/07/05
Model	WMP-N07	Test By	Alan Fan
Test Mode	Normal operating (Worst-case)	TEMP & Humidity	25°C, 54%

NEUTRAL



Freq. MHz	Corr. Factor dB	Reading Value dBuV Q.P.	Reading Value dBuV Ave.	Emission Level dBuV Q.P.	Emission Level dBuV Ave.	Limit dBuV Q.P.	Limit dBuV Ave.	Margin dBuV Q.P.	Margin dBuV Ave.
0.164	0.12	49.83	35.90	49.95	36.02	65.25	55.25	-15.30	-19.23
0.217	0.12	43.66	32.70	43.78	32.82	62.94	52.94	-19.16	-20.12
0.325	0.13	42.93	32.87	43.06	33.00	59.57	49.57	-16.52	-16.58
0.486	0.13	36.01	27.10	36.14	27.23	56.24	46.24	-20.10	-19.01
0.918	0.14	33.79	21.96	33.93	22.10	56.00	46.00	-22.07	-23.90
3.755	0.19	40.00	29.01	40.19	29.20	56.00	46.00	-15.81	-16.80
23.762	1.34	24.41	17.88	25.75	19.22	60.00	50.00	-34.25	-30.78
27.271	1.52	22.47	16.00	23.99	17.52	60.00	50.00	-36.01	-32.48

Remark:

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value