



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

For

**Gigabit Wireless-N VPN ADSL2+ Router**

**Model : BiPAC 7600NX**

**Data Applies To : Please refer to section 2  
(altogether 16 series models)**

Issued for

**Billion Electric Co., Ltd.**

**8F., No.192, Sec. 2, Zhongxing Rd., Xindian Dist.,  
New Taipei City 231, Taiwan (R.O.C.)**

Issued by

**Compliance Certification Services Inc.  
Hsinchu Lab.**

**NO. 989-1 Wen Shan Rd., Shang Shan Village,  
Qionglin Shiang Hsinchu County 30741, Taiwan, R.O.C**

**TEL: +886-3-5921698**

**FAX: +886-3-5921108**

**<http://www.ccsrf.com>**

**E-Mail : [service@ccsrf.com](mailto:service@ccsrf.com)**

**Issued Date: January 30, 2013**



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## Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	11/16/2012	Initial Issue	All Page 107	Victoria Liu
01	01/09/2013	Revised the Remark Description	P.9	Gloria Chang
02	01/16/2013	Revised the PAGE NO., Conducted Emission / Radiated Emission Test (Below 1 GHz), SETUP OF EQUIPMENT UNDER TEST, RADIATED EMISSION, CONDUCTED EMISSION, APPENDIX II SETUP PHOTOS	All Page 106, P 3, 8, 11, 12, 65, 68, 100, 101, 104, 106	Victoria Liu
03	01/30/2013	Revised the Product name, Model name, FCC ID, series of difference	All Page 1~106	Victoria Liu
04	03/11/2013	Revised the EUT DESCRIPTION, series of difference	Page 5~6	Victoria Liu
05	03/12/2013	Revised the series of difference	Page 6	Victoria Liu
06	03/13/2013	Revised the Conducted / Radiated Emission Test (Above 1 GHz), EUT OPERATING CONDITION, MAXIMUM PEAK OUTPUT POWER, POWER SPECTRAL DENSITY	Page 8, 12, 29, 32	Victoria Liu



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### 1. TEST REPORT CERTIFICATION

**Applicant** : Billion Electric Co., Ltd.  
**Address** : 8F., No.192, Sec. 2, Zhongxing Rd., Xindian Dist.,  
 New Taipei City 231, Taiwan (R.O.C.)  
**Equipment Under Test** : Gigabit Wireless-N VPN ADSL2+ Router  
**Model** : BiPAC 7600NX  
**Data Applies To** : Please refer to section 2 (altogether 16 series models)  
**Tested Date** : October 19, 2012 ~ January 15, 2013

APPLICABLE STANDARD	
Standard	Test Result
FCC Part 15 Subpart C AND ANSI C63.4:2003	PASS

WE HEREBY CERTIFY THAT: The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

**Approved by:**

Sb. Lu  
Sr. Engineer

**Reviewed by:**

Gundam Lin  
Sr. Engineer

**2. EUT DESCRIPTION**

<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router
<b>Model Number</b>	BiPAC 7600NX
<b>Data Applies To</b>	Please refer to section 2 (altogether 16 series models)
<b>Identify Number</b>	T121019S01
<b>Received Date</b>	October 19, 2012
<b>Frequency Range</b>	IEEE 802.11b/g, 802.11n HT20 : 2412MHz~2462MHz IEEE 802.11n HT40 : 2422MHz~2452MHz
<b>Transmit Power</b>	IEEE 802.11b : 20.98 dBm (0.1253W) IEEE 802.11g : 24.01 dBm (0.2518W) IEEE 802.11n HT20 : 26.23 dBm (0.4198W) IEEE 802.11n HT40 : 25.67 dBm (0.3690W)
<b>Channel Spacing</b>	IEEE 802.11b/g, 802.11n HT20/HT40 : 5MHz
<b>Channel Number</b>	IEEE 802.11b/g, 802.11n HT20 : 11 Channels IEEE 802.11n HT40 : 7 Channels
<b>Transmit Data Rate</b>	IEEE 802.11b : 11, 5.5, 2, 1 Mbps IEEE 802.11g : 54, 48, 36, 24, 18, 12, 9, 6 Mbps IEEE 802.11n HT20 : 144.40, 130, 115.6, 86.7, 72.2, 65, 57.8, 43.3, 28.9, 21.7, 14.4, 7.2 Mbps IEEE 802.11n HT40 : 300, 270, 240, 180, 150, 135, 120, 90, 60, 45, 30, 15 Mbps
<b>Type of Modulation</b>	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)
<b>Antenna Type</b>	Dipole Antenna × 2, Antenna Gain 2.09 dBi,
<b>DC Power Cord Type</b>	Non-shielded cable 1.5m (Non-detachable)
<b>Power Rating</b>	15Vdc
<b>Test Voltage</b>	120Vac, 60Hz
<b>I/O Port</b>	EWAN Port × 1, LAN Port × 4, Power Port × 1, DSL Port × 1, USB Port × 2

**Power Adapter :**

No.	Manufacturer	Model No.	Power Input	Power Output
1	EGB	PAW024A15US	100-240Vac, 50/60Hz, 0.7A	15Vdc, 1.6A



The difference of the model :

Mode Number	Trade Name	GbE WAN / LAN	11n (2x2)	USB	ADSL	VPN	Load Balance	NAND Flash
BiPAC 7600NX	Billion	V	V	V	V	V	V	V
BiPAC 6300NX		V	V	V		V	V	V
BiPAC 6300NXL		V	V	V				V
BiPAC 7600NXL		V	V	V	V			V
Billion SG6300NX		V	V	V		V	V	V
Billion SG6300NXL		V	V	V				V
Billion SG7600NX		V	V	V	V	V	V	V
Billion SG7600NXL		V	V	V	V			V
BEC 6300NX	BEC	V	V	V		V	V	V
BEC 6300NXL		V	V	V				V
BEC 7600NX		V	V	V	V	V	V	V
BEC 7600NXL		V	V	V	V			V
BEC SG6300NX		V	V	V		V	V	V
BEC SG6300NXL		V	V	V				V
BEC SG7600NX		V	V	V	V	V	V	V
BEC SG7600NXL		V	V	V	V			V

Note: 1. "V" means having the function and "X" means without the function.  
2. All RF characteristics and functions exactly the same.

Remark :

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. For more details, please refer to the User's manual of the EUT.
3. The models BiPAC 7600NX was considered the main model for testing.
4. This submittal(s) (test report) is intended for FCC ID: QI3BIL-7600NX filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.

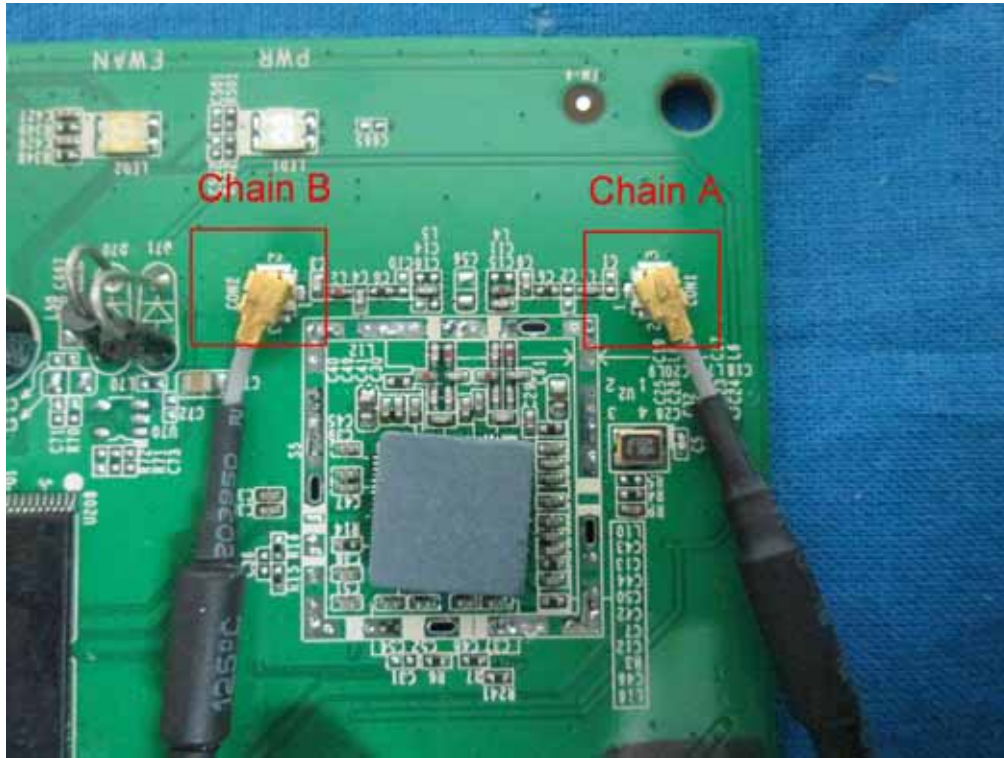


### 3. DESCRIPTION OF TEST MODES

The EUT is an 802.11n MIMO transceiver in Wireless Gigabit Wireless-N VPN ADSL2+ Router form factor.

IEEE 802.11b/g mode: Chain A transmitter

IEEE 802.11n mode: Two Chain transmitters





**Conducted Emission / Radiated Emission Test (Below 1 GHz)**  
Continuous Tx.

**Conducted / Radiated Emission Test (Above 1 GHz)**  
**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 : 1Mbps 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 : 14.4Mbps 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 : 30Mbps 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 CFR 47, 15.207, 15.209, 15.247, KDB558074 and KDB662911.





## 5. FACILITIES AND ACCREDITATION

### 5.1 FACILITIES

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

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 C63.4:2003 and CISPR 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4, CISPR 16-1-5.

### 5.2 ACCREDITATIONS

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

<b>Taiwan</b>	TAF
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The measuring facility of laboratories has been authorized or registered by the following approval agencies.

<b>Canada</b>	INDUSTRY CANADA
<b>Japan</b>	VCCI
<b>Taiwan</b>	BSMI
<b>USA</b>	FCC MRA

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

**Remark:** 1.FCC filing number is TW1027.  
2.IC filing number is 2324 K-1/-2/-3.



### 5.3 MEASUREMENT UNCERTAINTY

The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4-2.

PARAMETER	UNCERTAINTY
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 30 to 1000 MHz	+/- 3.97
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 1 to 18GHz	+/- 3.58
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 18 to 26 GHz	+/- 3.59
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 26 to 40 GHz	+/- 3.81
Conducted Emission (Mains Terminals), 9kHz to 30MHz	+/- 2.48

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

Consistent with industry standard (e.g. CISPR 22: 2006, clause 11, Measurement Uncertainty) determining compliance with the limits shall be base on the results of the compliance measurement. Consequently the measure emissions being less than the maximum allowed emission result in this be a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is base on conducted and radiated emissions being less than  $U_{CISPR}$  which is 3.6dB and 5.2dB respectively. CCS values (called  $U_{Lab}$  in CISPR 16-4-2) is less than  $U_{CISPR}$  as shown in the table above. Therefore, MU need not be considered for compliance.



## 6. SETUP OF EQUIPMENT UNDER TEST

### SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Notebook PC	DELL	INSPIRON 640m PP19L	CN-0MG532-70166-7 1G-03EC	DoC

No.	Signal Cable Description
1	Non-shielded RJ-45 cable, 12 m × 1

### SETUP DIAGRAM FOR TESTS

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

### EUT OPERATING CONDITION

#### **Above 1 GHz:**

1. Set up whole system for test as shown on diagram.
2. NB set fixed ip, 192.168.1.x
3. In MS-DOS : telnet 192.168.1.254
4. username : gongdaowuRd
5. password : 5753268
6. key in brctl delif br0 ra0
7. key in ated
8. Run "Ralink QA Test Program for RT539x" software was used for testing.



1. Set up all computers like the setup diagram.

TX Mode:

- ⇒ Tx Data Rate: MCS=0; 1Mbps Bandwidth 20 (IEEE 802.11b mode)  
MCS=0; 6Mbps Bandwidth 20 (IEEE 802.11g mode)  
MCS=8; 14.4Mbps Bandwidth 20 (IEEE 802.11n HT20 mode)  
MCS=8; 30Mbps Bandwidth 40 (IEEE 802.11n HT40 mode)
- ⇒ Power control
  - IEEE 802.11b Channel Low (2412MHz) TX Power0 13 (only chain A TX)
  - IEEE 802.11b Channel Mid (2437MHz) TX Power0 17 (only chain A TX)
  - IEEE 802.11b Channel High (2462MHz) TX Power0 1B (only chain A TX)
  - IEEE 802.11g Channel Low (2412MHz) TX Power0 18 (only chain A TX)
  - IEEE 802.11g Channel Mid (2437MHz) TX Power0 1B (only chain A TX)
  - IEEE 802.11g Channel High (2462MHz) TX Power0 15 (only chain A TX)
  - IEEE 802.11n HT20 Channel Low (2412MHz) TX Power0/1 10/13
  - IEEE 802.11n HT20 Channel Mid (2437MHz) TX Power0/1 18/1C
  - IEEE 802.11n HT20 Channel High (2462MHz) TX Power0/1 15/19
  - IEEE 802.11n HT40 Channel Low (2422MHz) TX Power0/1 11/14
  - IEEE 802.11n HT40 Channel Mid (2437MHz) TX Power0/1 16/1A
  - IEEE 802.11n HT40 Channel High (2452MHz) TX Power0/1 11/15

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

**Below 1 GHz :**

1. EUT & peripherals setup diagram is shown in appendix setup photos.
2. Power on all equipments.
3. Continuous Tx : Select IEEE 802.11b Channel Middle.
4. Start test.



## 7. FCC PART 15.247 REQUIREMENTS

### 7.1 6dB BANDWIDTH

#### LIMITS

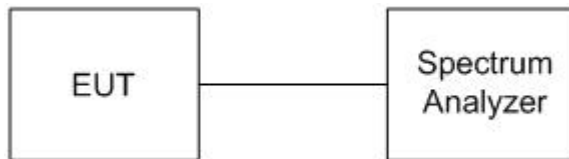
§ 15.247(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

#### TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4407B	US41443108	09/12/2013

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

#### TEST SETUP



#### TEST PROCEDURE

1. The transmitter output was connected to a spectrum analyzer.
2. Set resolution bandwidth (RBW) = 1-5% or DTS BW, not to exceed 100 kHz.
3. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



**TEST RESULTS**

**IEEE 802.11b Mode**

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	12.08	500	PASS
Middle	2437	12.08	500	PASS
High	2462	12.08	500	PASS

**IEEE 802.11g Mode**

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16.50	500	PASS
Middle	2437	16.50	500	PASS
High	2462	16.50	500	PASS

**IEEE 802.11n HT20 Mode (Two TX)**

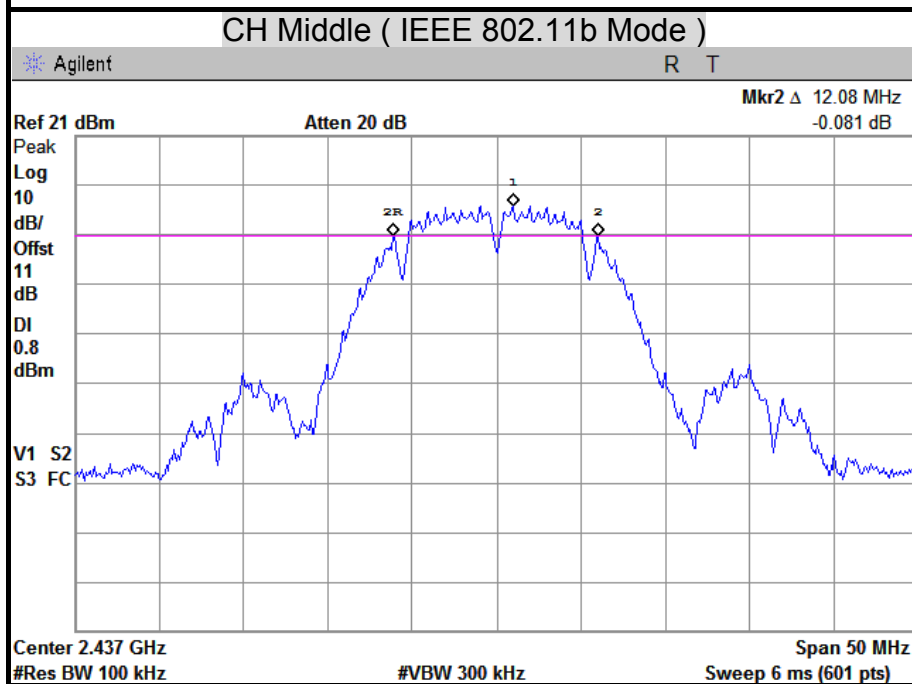
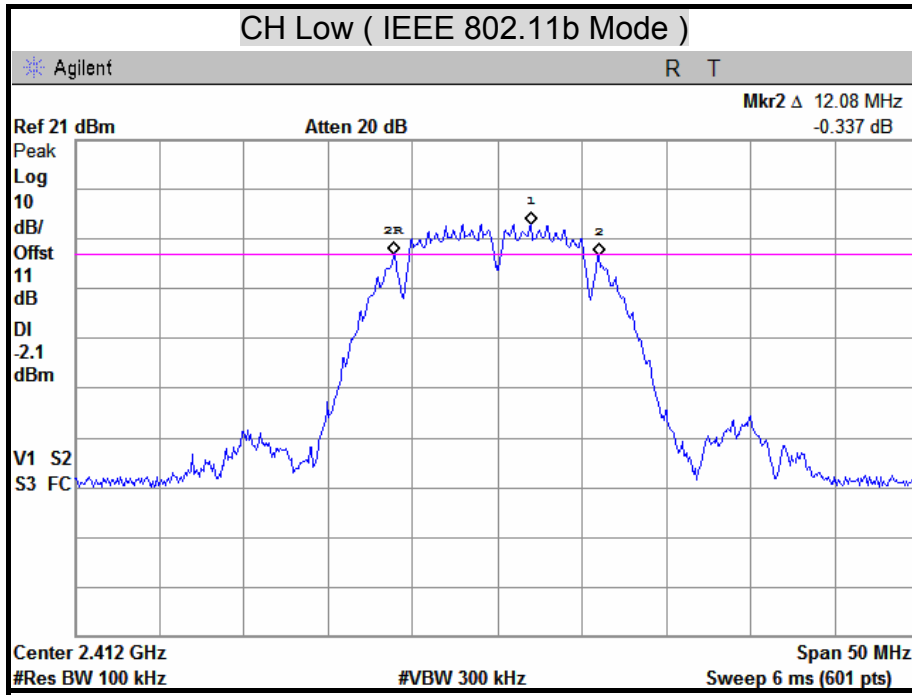
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Pass / Fail
		Chain A	Chain B		
Low	2412	17.50	17.67	500	PASS
Middle	2437	17.67	17.58	500	PASS
High	2462	17.58	17.42	500	PASS

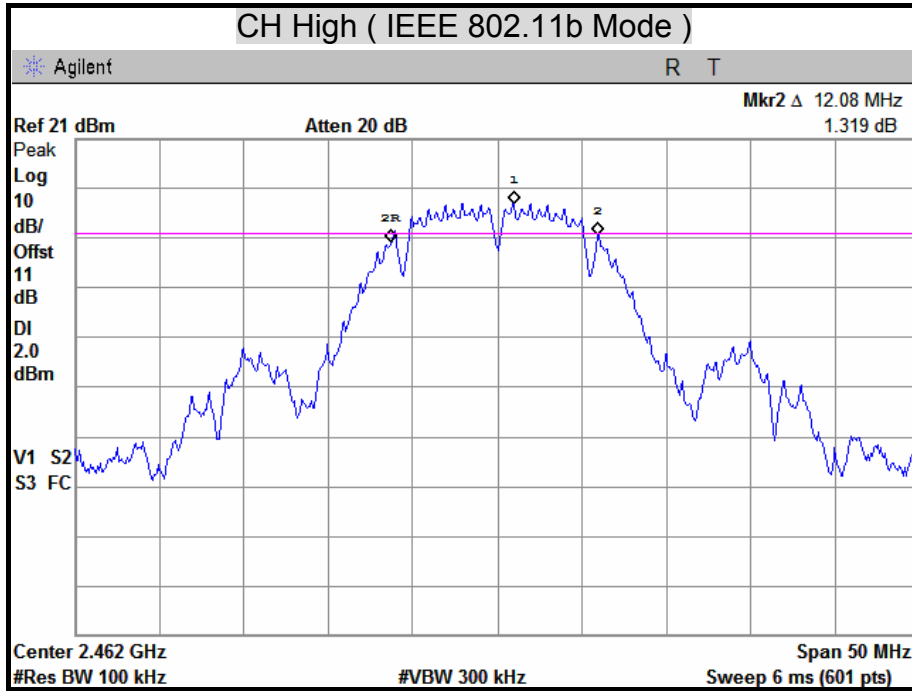
**IEEE 802.11n HT40 Mode (Two TX)**

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Pass / Fail
		Chain A	Chain B		
Low	2422	36.33	36.25	500	PASS
Middle	2437	36.08	35.92	500	PASS
High	2452	36.08	36.25	500	PASS

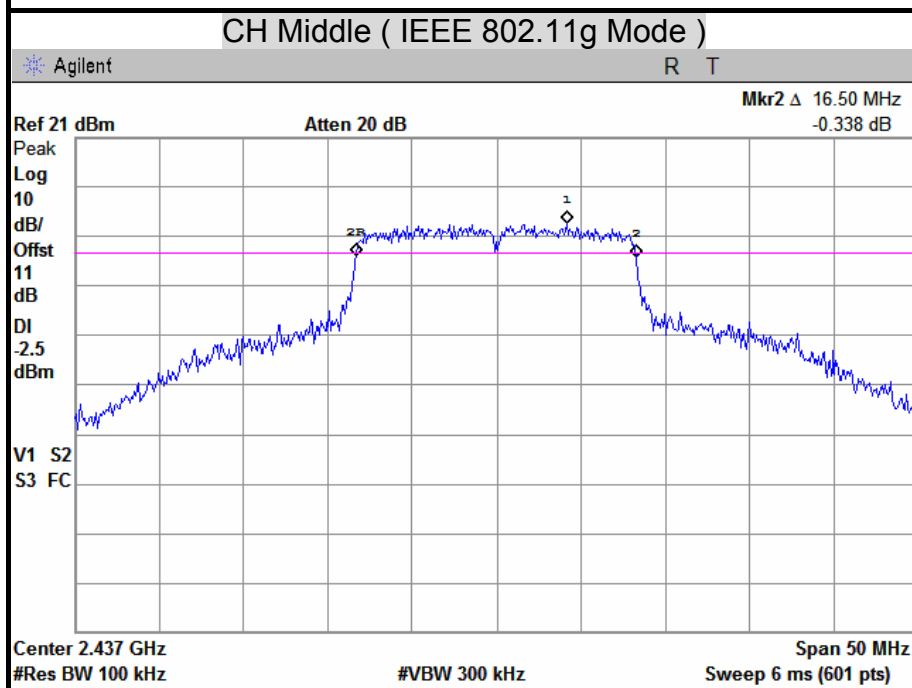
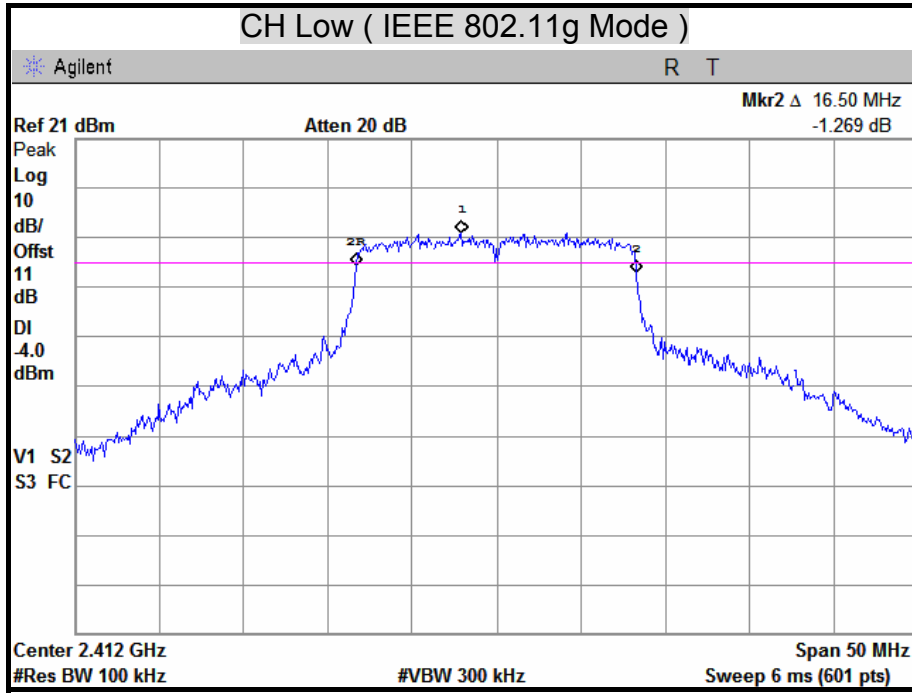


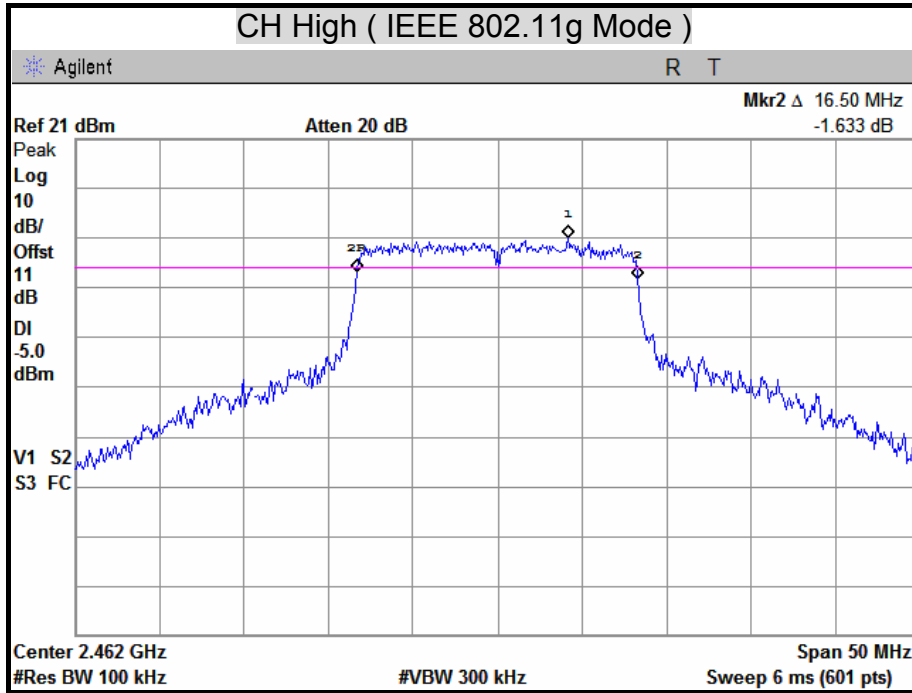
**6dB BANDWIDTH**

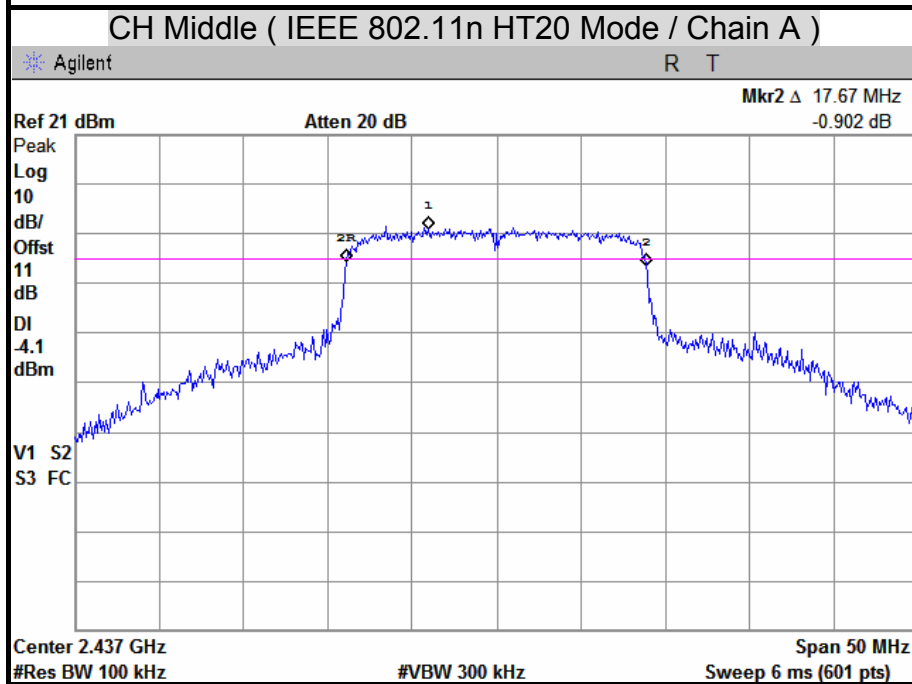
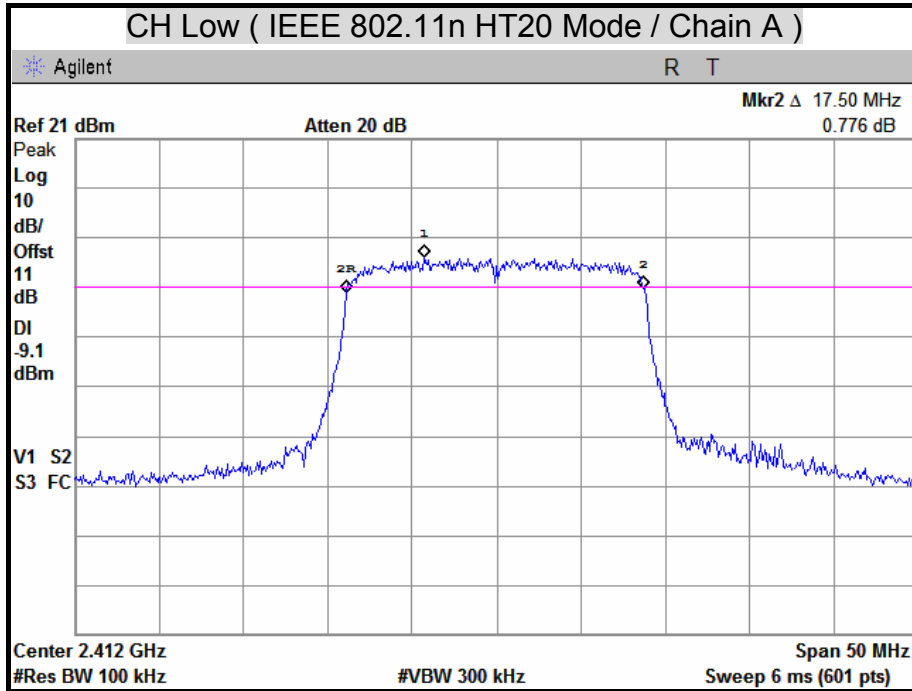


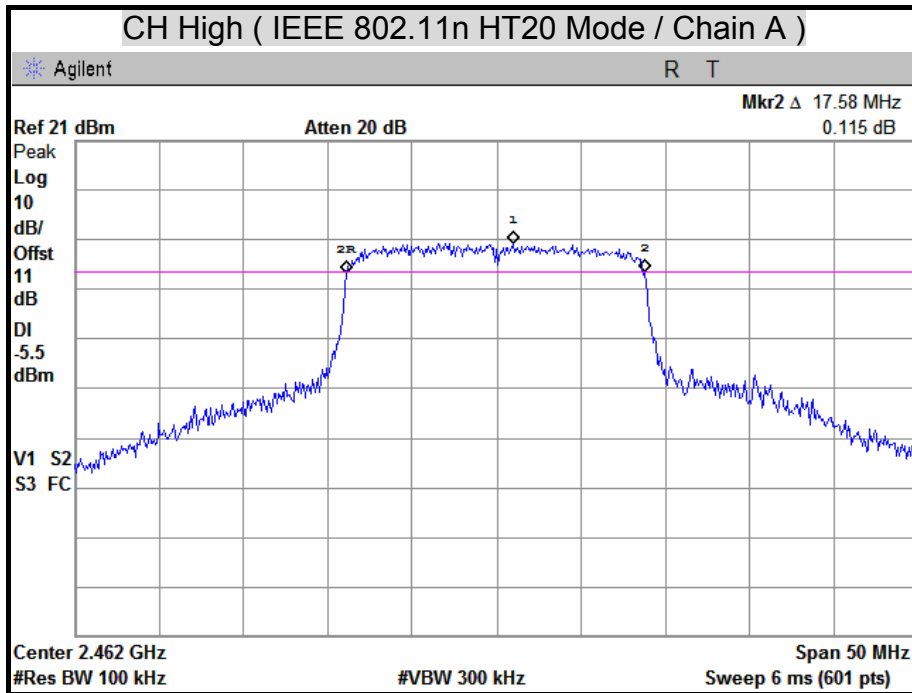


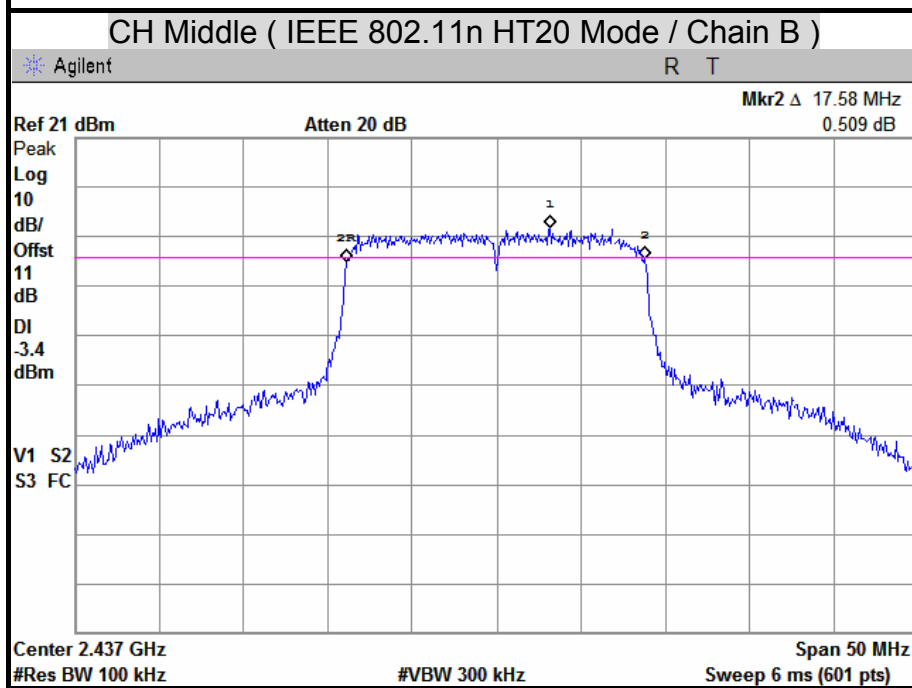
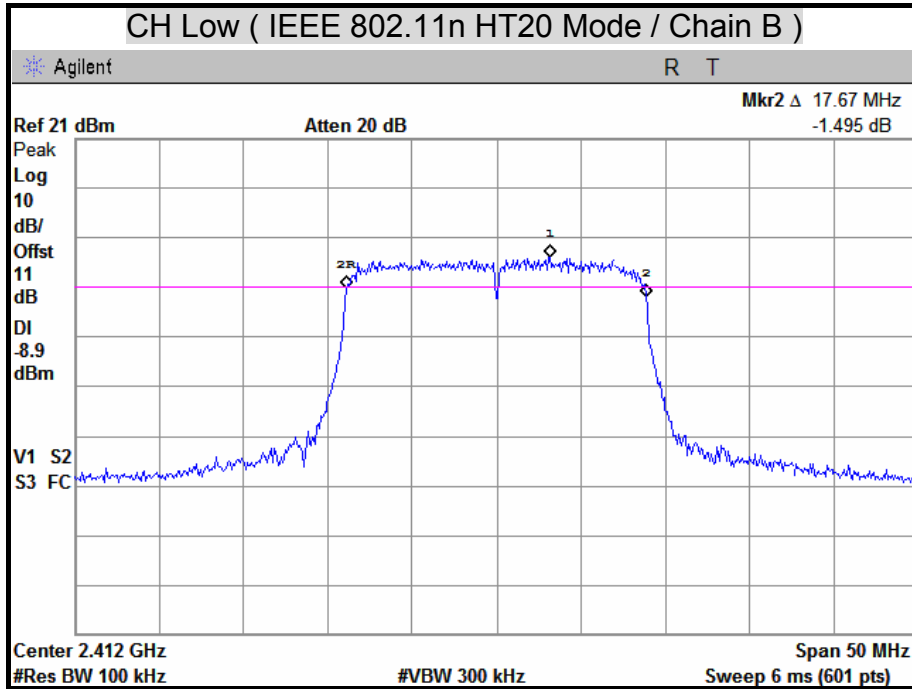


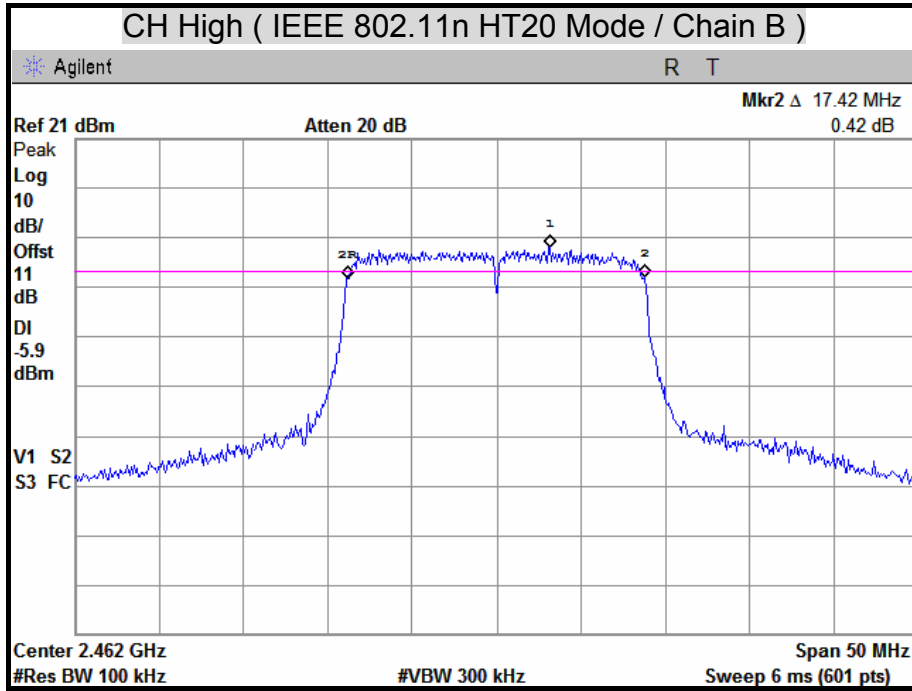


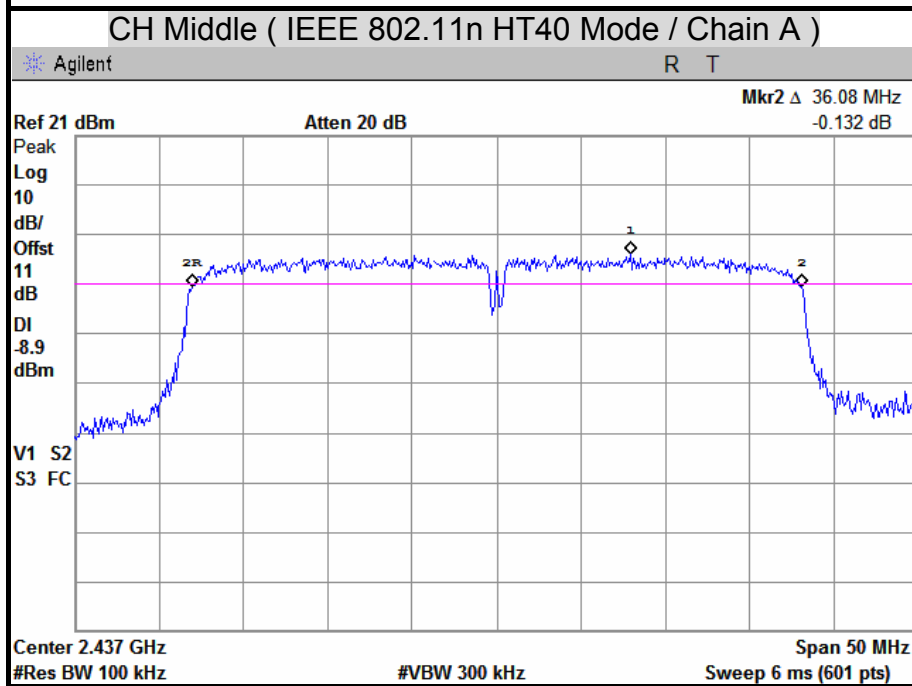
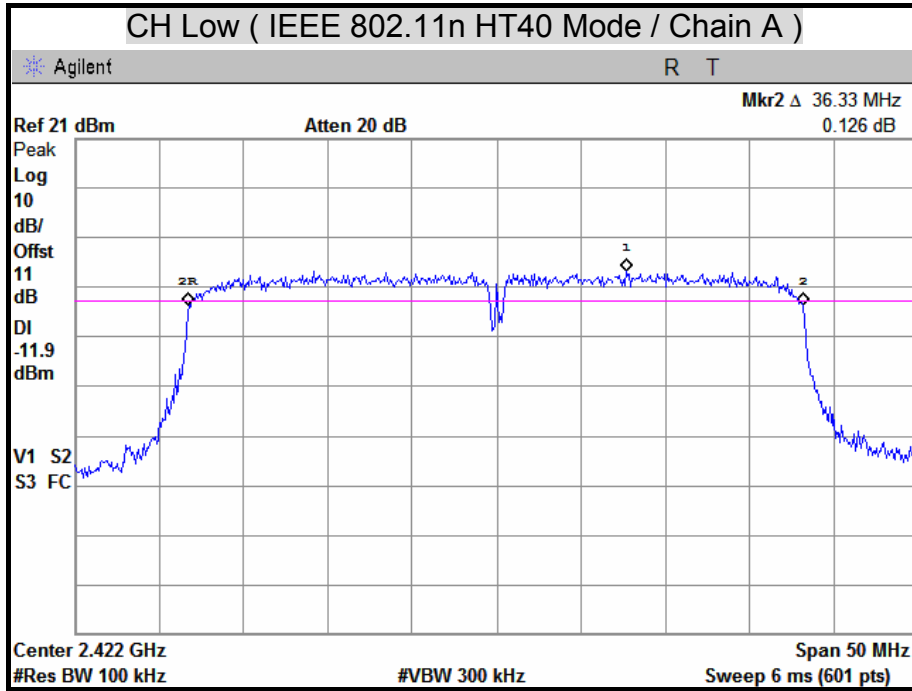


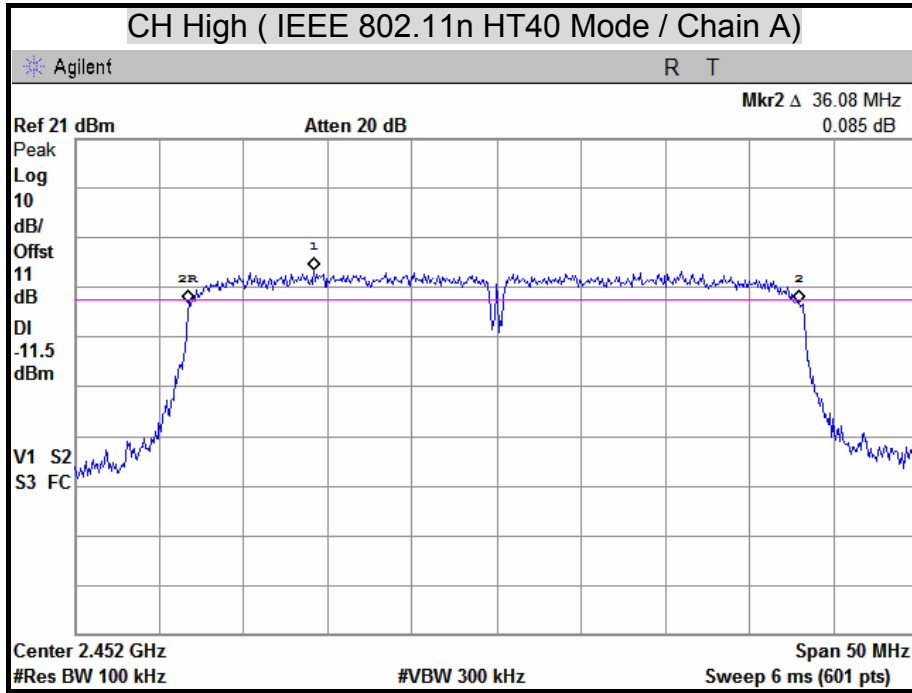




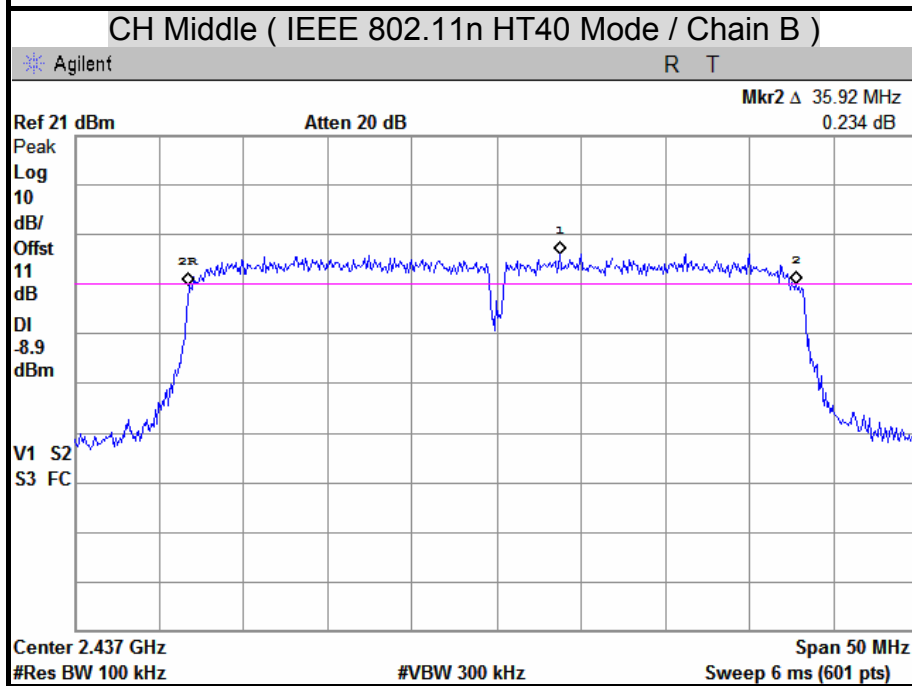
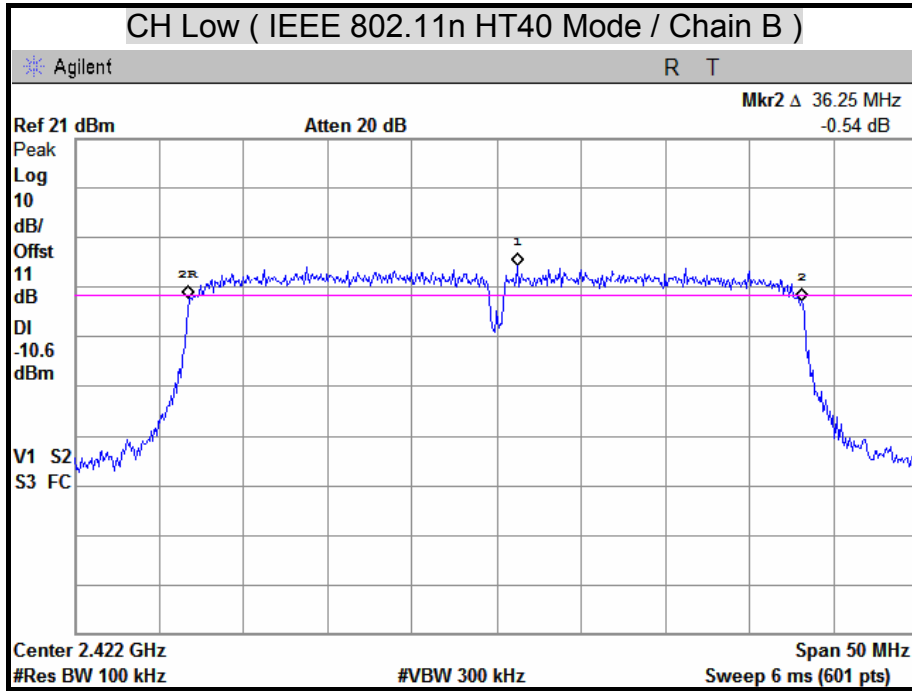


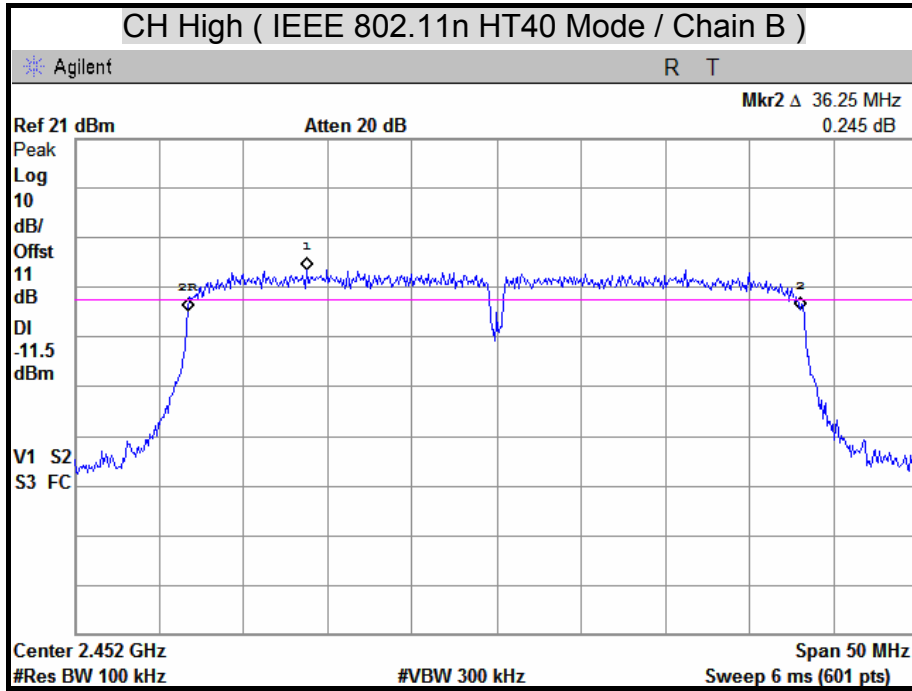














## 7.2 MAXIMUM PEAK OUTPUT POWER

### LIMITS

§ 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
Power Meter	ANRITSU	ML2495A	1149001	12/07/2012
Power Sensor	ANRITSU	MA2411B	1126148	12/14/2012

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

### TEST SETUP



### TEST PROCEDURE

The transmitter output is connected to the Power Meter. The Power Meter is set to the peak power detection.



**TEST RESULTS**

**IEEE 802.11b Mode**

Channel	Channel Frequency (MHz)	Peak Power		Peak Power Limit		Pass / Fail
		(dBm)	(W)	(dBm)	(W)	
Low	2412	17.88	0.0614	30	1	PASS
Middle	2437	19.65	0.0923	30	1	PASS
High	2462	20.98	0.1253	30	1	PASS

**Remark:**

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

**IEEE 802.11g Mode**

Channel	Channel Frequency (MHz)	Peak Power		Peak Power Limit		Pass / Fail
		(dBm)	(W)	(dBm)	(W)	
Low	2412	23.74	0.2366	30	1	PASS
Middle	2437	24.01	0.2518	30	1	PASS
High	2462	22.97	0.1982	30	1	PASS

**Remark:**

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the power meter to allow for direct reading of power.



IEEE 802.11n HT20 Mode (Two TX)

Channel	Channel Frequency (MHz)	Peak Power (dBm)		Peak Power Total		Peak Power Limit		Pass / Fail
		Chain A	Chain B	(dBm)	(W)	(dBm)	(W)	
Low	2412	20.90	19.65	23.33	0.2153	30	1	PASS
Middle	2437	23.43	23.00	26.23	0.4198	30	1	PASS
High	2462	22.58	21.50	25.08	0.3224	30	1	PASS

Remark:

1. At final test to get the worst-case emission at 14.4Mbps.
2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the power meter to allow for direct reading of power.
3. The maximum antenna gain for the MIMO mode is 5.1dBi which is less than 6dBi, the limit should be 1W.
4. Total peak power = Chain A + Chain B.

IEEE 802.11n HT40 Mode (Two TX)

Channel	Channel Frequency (MHz)	Peak Power (dBm)		Peak Power Total		Peak Power Limit		Pass / Fail
		Chain A	Chain B	(dBm)	(W)	(dBm)	(W)	
Low	2422	21.12	20.45	23.81	0.2403	30	1	PASS
Middle	2437	22.86	22.45	25.67	0.3690	30	1	PASS
High	2452	20.97	20.36	23.69	0.2337	30	1	PASS

Remark:

1. At final test to get the worst-case emission at 30Mbps.
2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the power meter to allow for direct reading of power.
3. The maximum antenna gain for the MIMO mode is 5.1dBi which is less than 6dBi, the limit should be 1W.
4. Total peak power = Chain A + Chain B.



## 7.4 POWER SPECTRAL DENSITY

### LIMITS

§ 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	Agilent	E4407B	US41443108	09/12/2013

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

### TEST SETUP



### TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set analyzer center frequency to DTS channel center frequency.
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW  $\geq$  3 kHz.
5. Set the VBW  $\geq$  3 x RBW.
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum amplitude level.
11. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.



**TEST RESULTS**

**IEEE 802.11b Mode**

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2412	-9.47	8	PASS
Middle	2437	-7.29	8	PASS
High	2462	-5.98	8	PASS

**Remark:**

1. At final test to get the worst-case emission at 1Mbps.
2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 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)	Minimum Limit (dBm)	Pass / Fail
Low	2412	-5.10	8	PASS
Middle	2437	-5.14	8	PASS
High	2462	-7.23	8	PASS

**Remark:**

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 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)	Minimum Limit (dBm)	Pass / Fail
		Chain A	Chain B			
Low	2412	-9.41	-20.17	-9.06	8	PASS
Middle	2437	-4.97	-15.44	-4.59	8	PASS
High	2462	-7.48	-16.79	-7.00	8	PASS

Remark:

1. At final test to get the worst-case emission at 14.4Mbps.
2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 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)	Minimum Limit (dBm)	Pass / Fail
		Chain A	Chain B			
Low	2422	-9.32	-18.17	-8.78	8	PASS
Middle	2437	-9.29	-18.12	-8.76	8	PASS
High	2452	-9.43	-18.68	-8.94	8	PASS

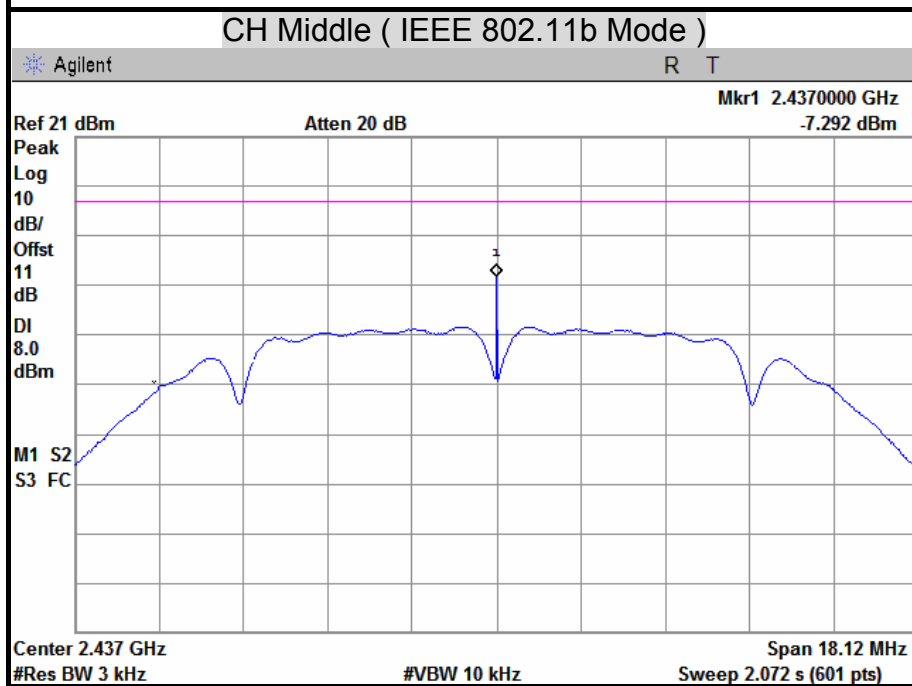
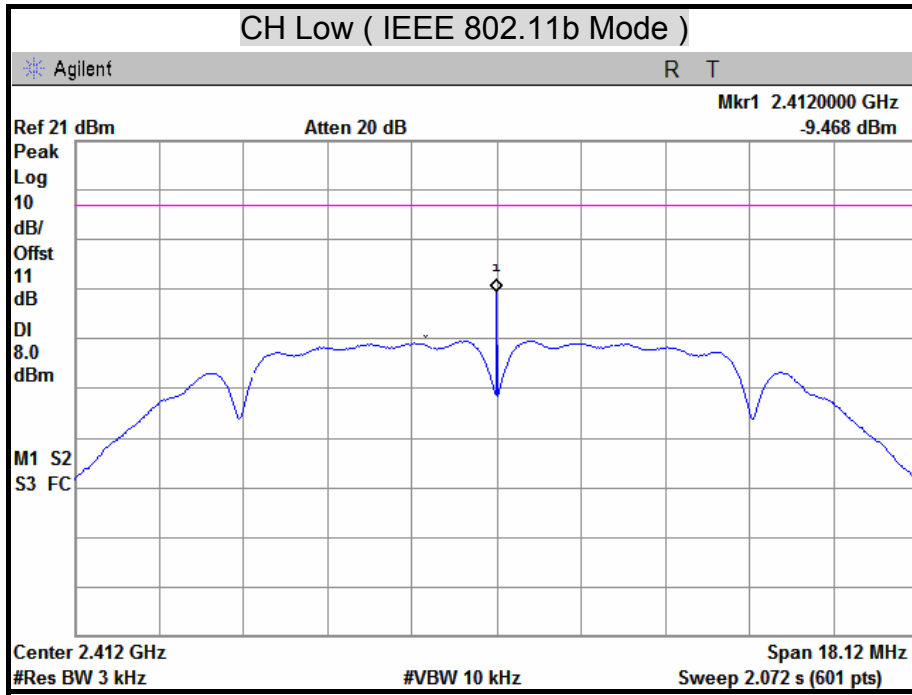
Remark:

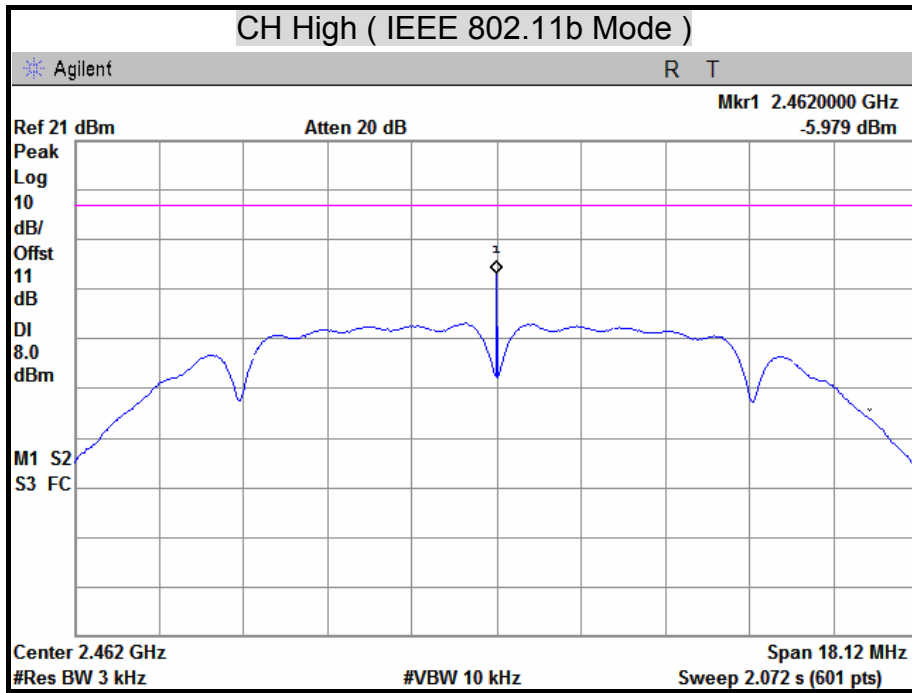
1. At final test to get the worst-case emission at 30Mbps.
2. The cable assembly insertion loss of 11dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

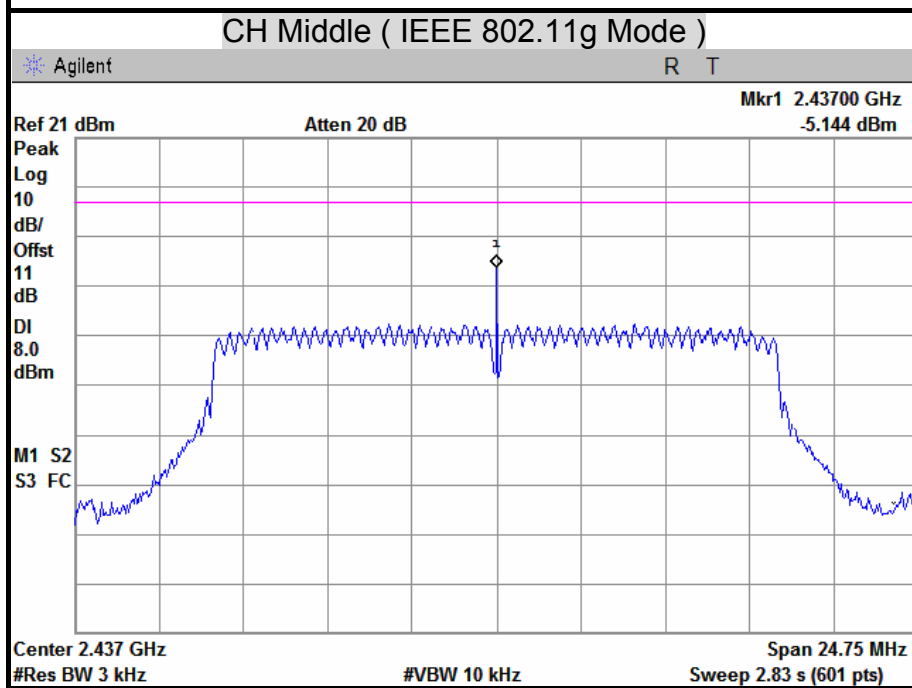
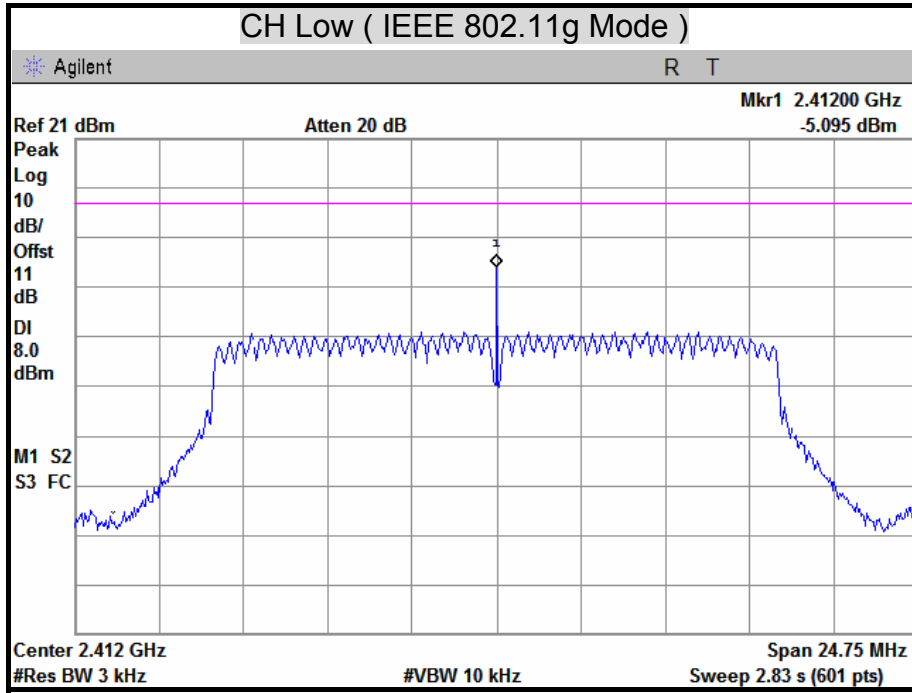


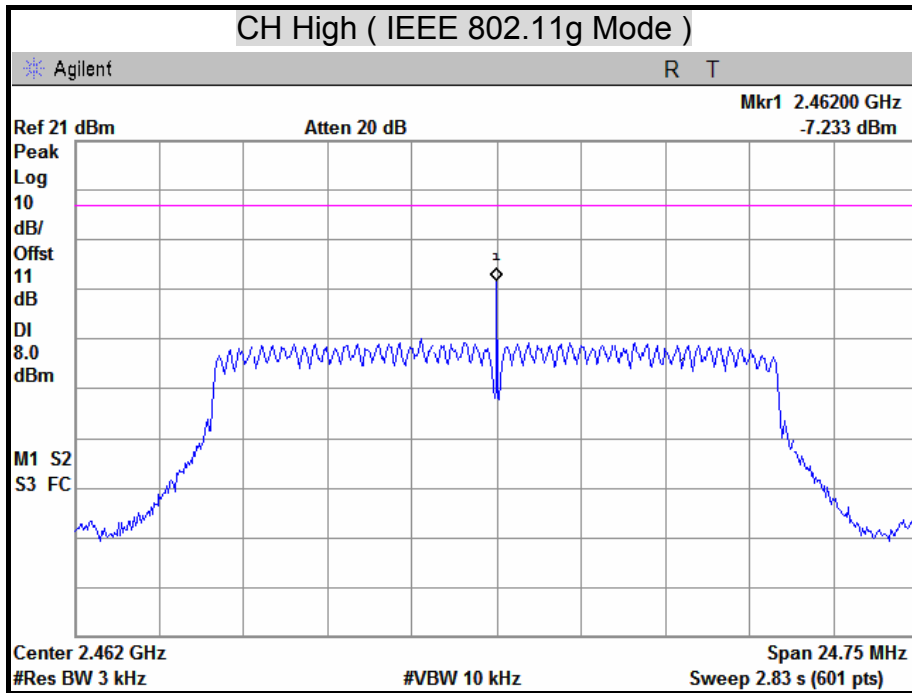


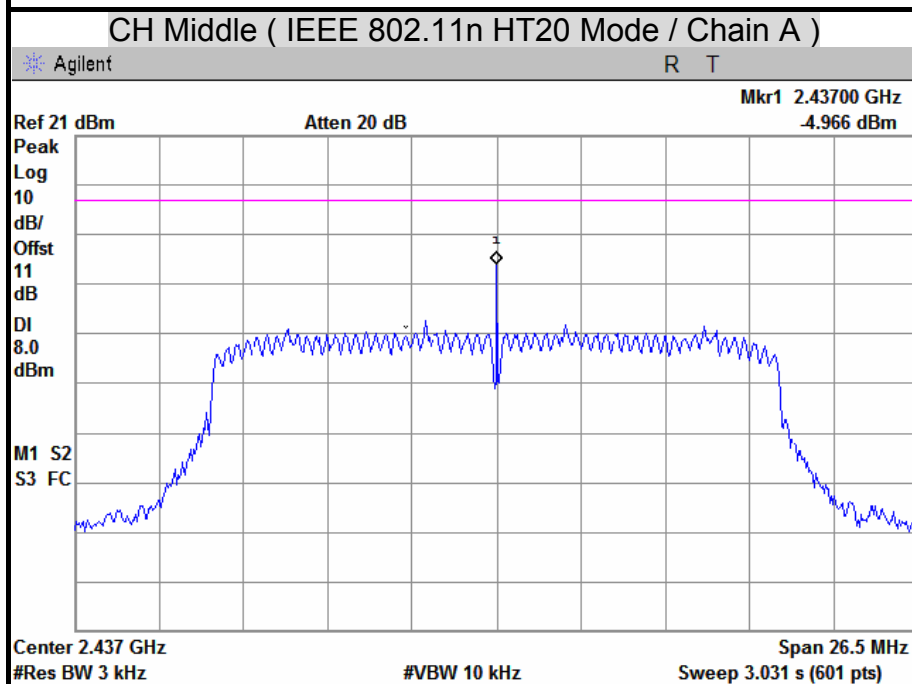
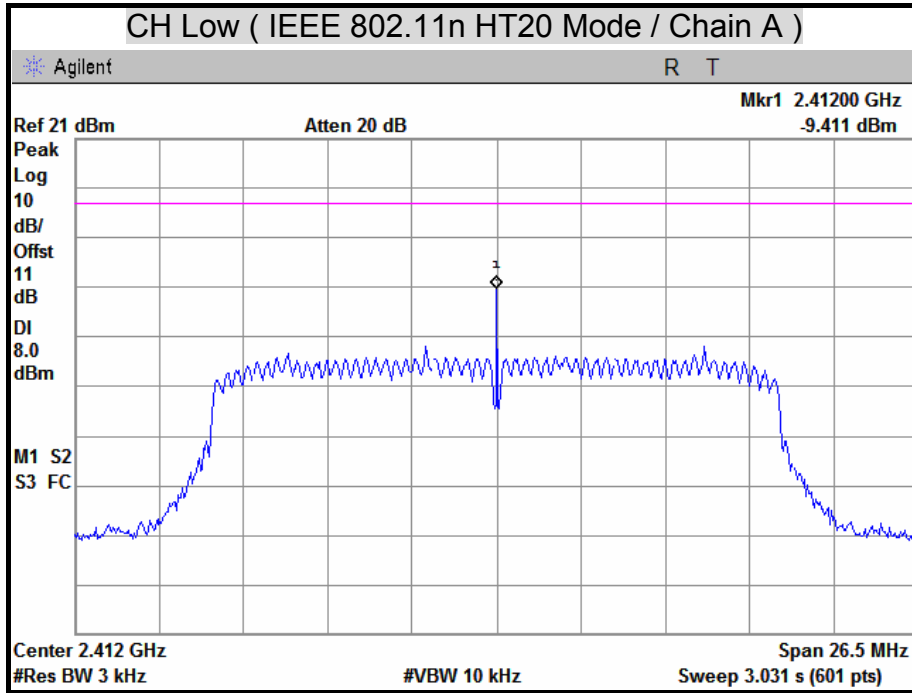
**POWER SPECTRAL DENSITY**

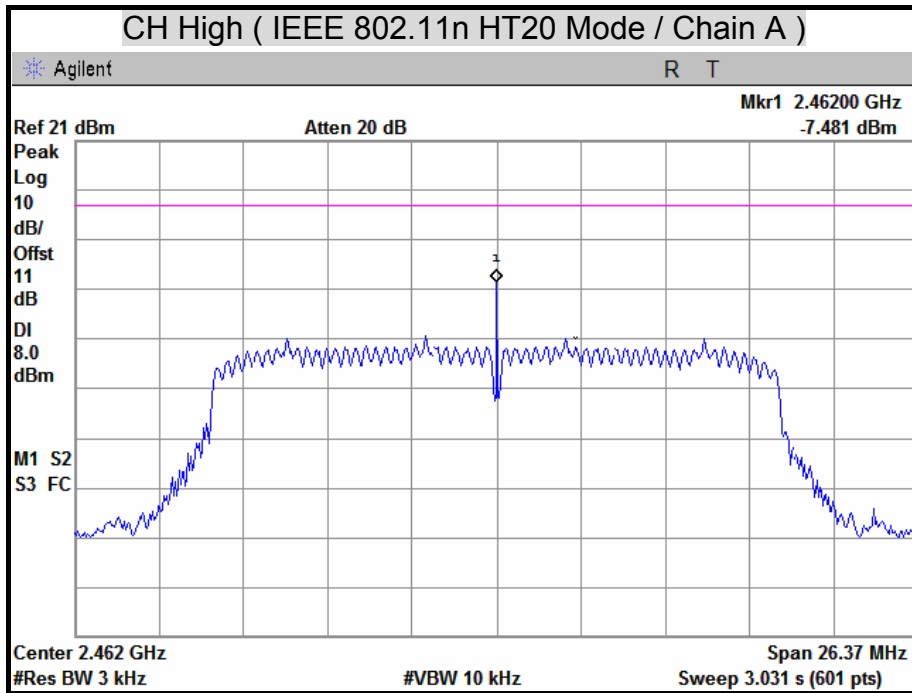


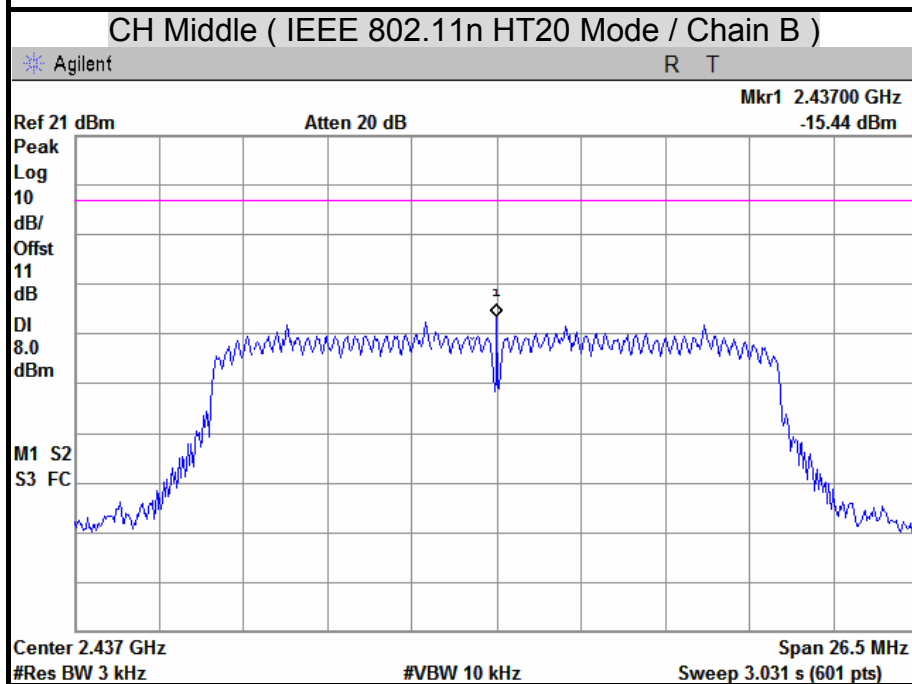
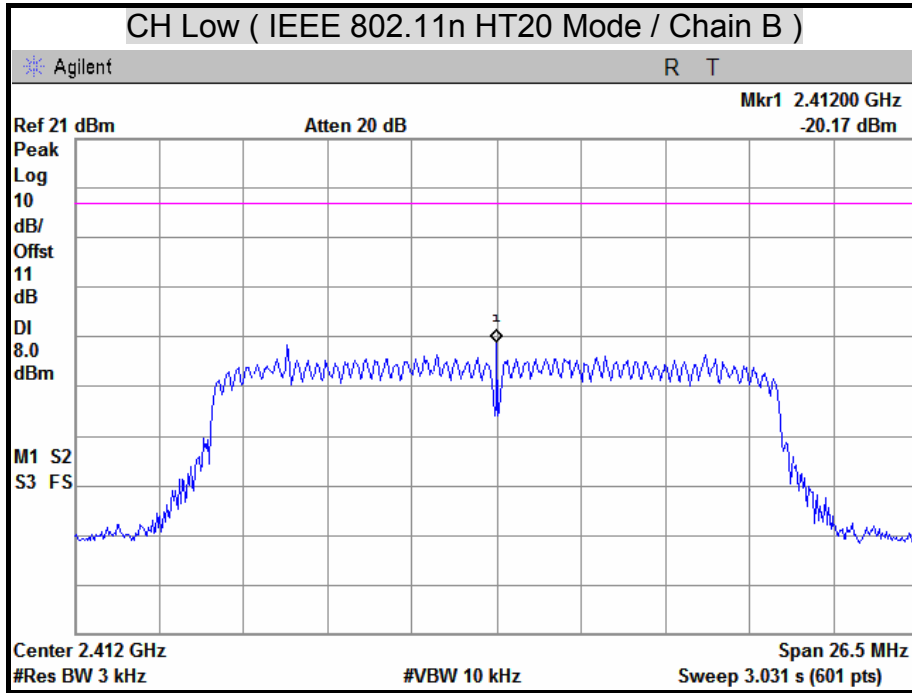


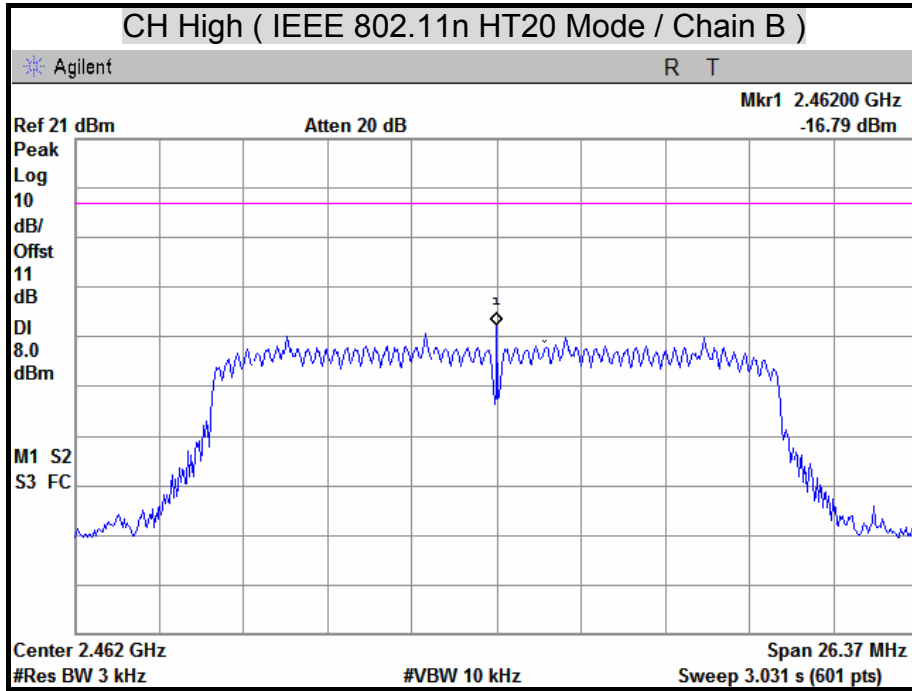




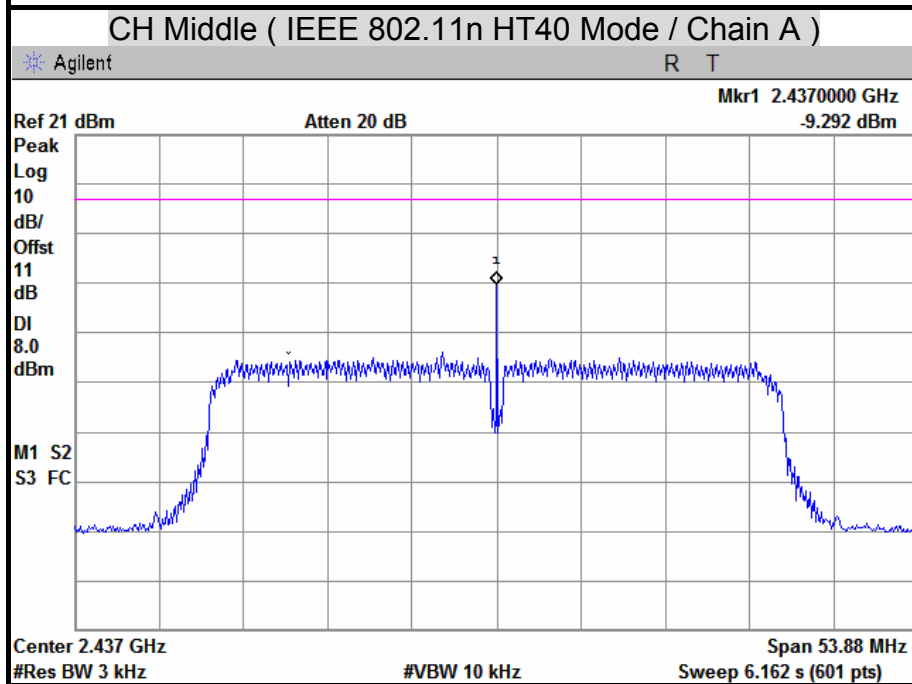
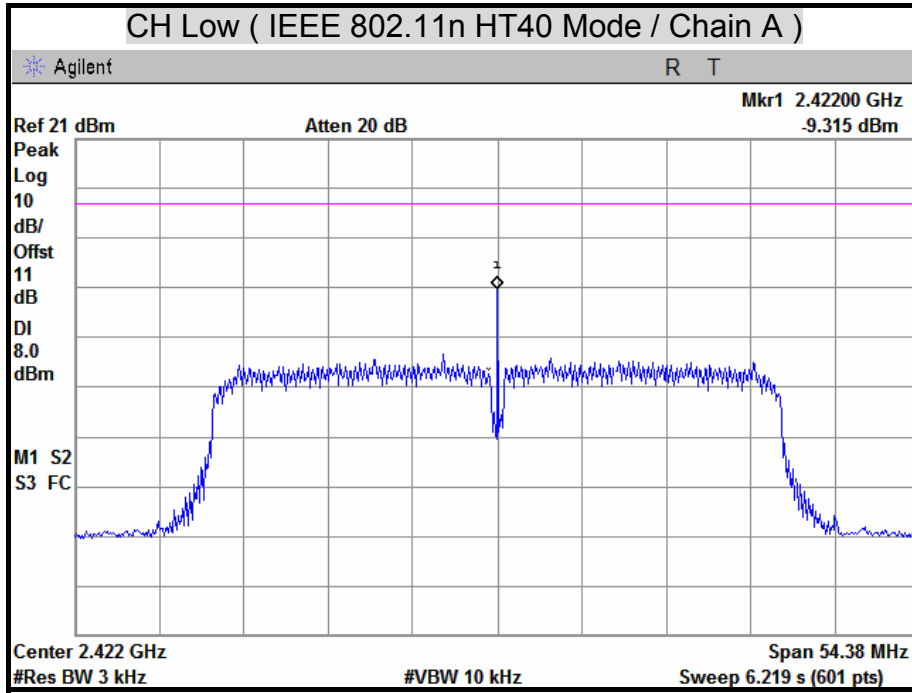


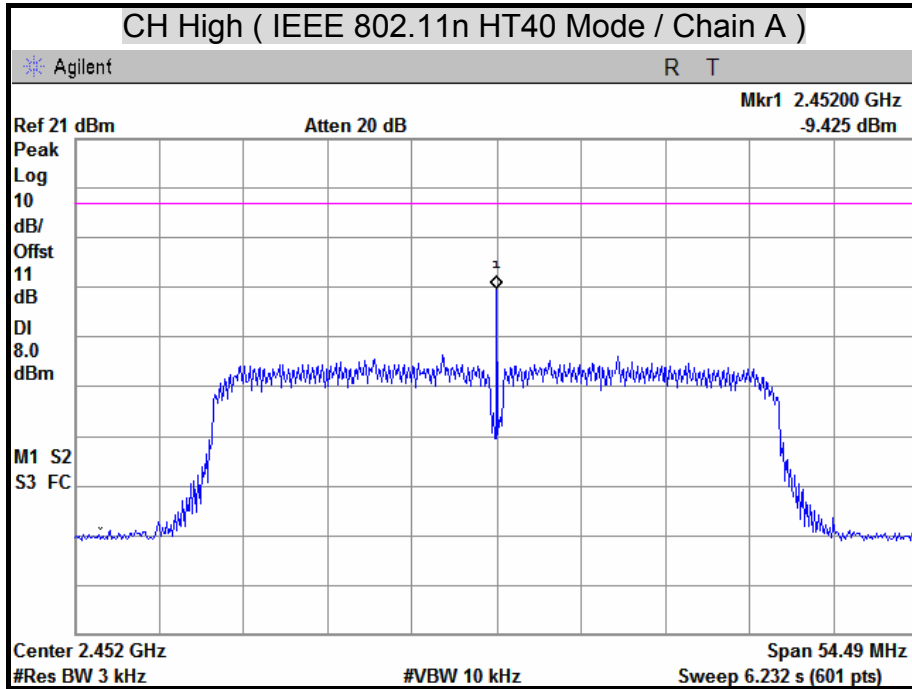


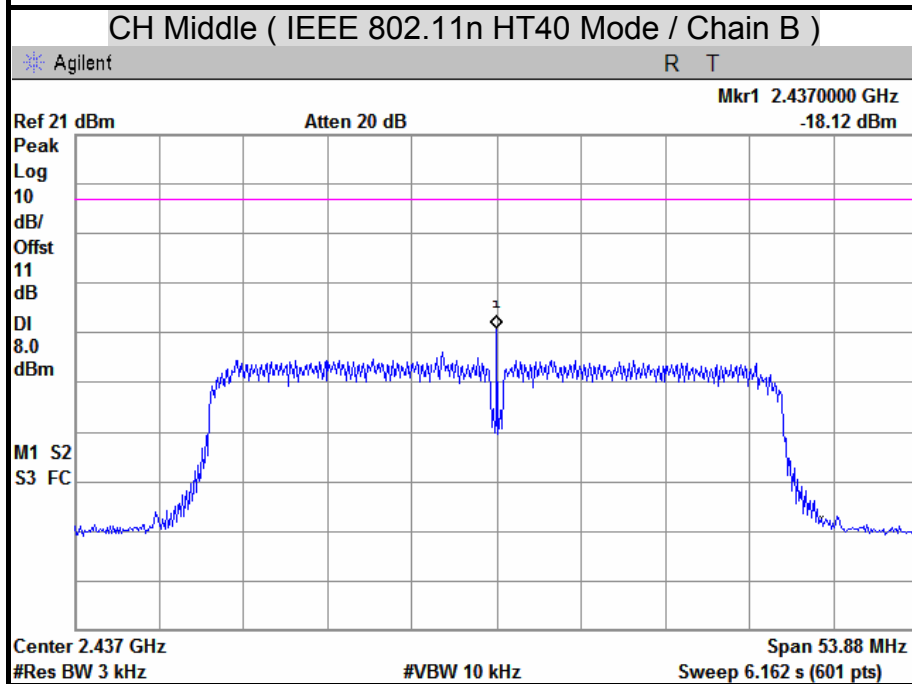
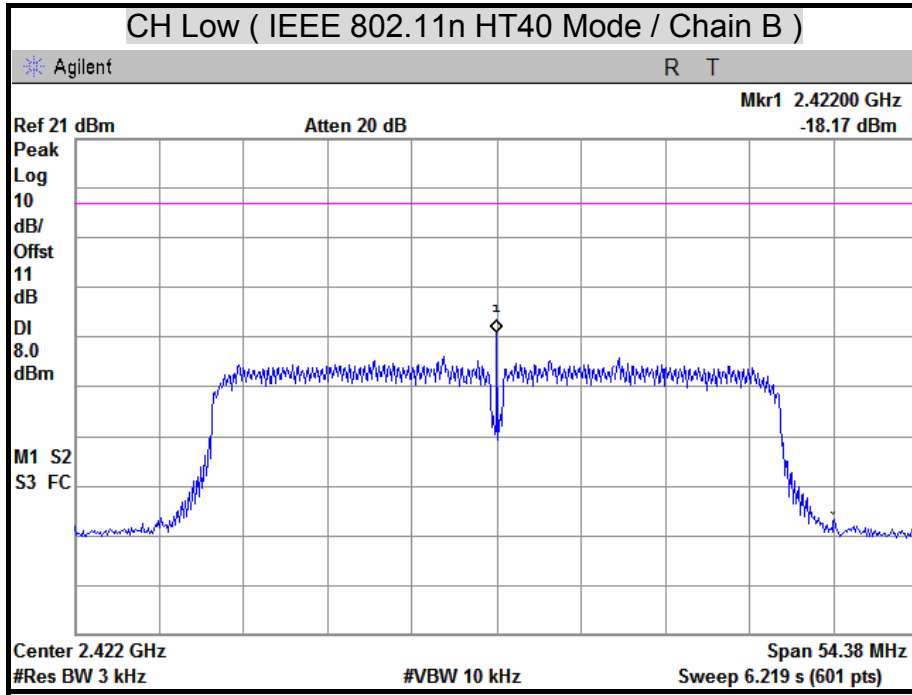


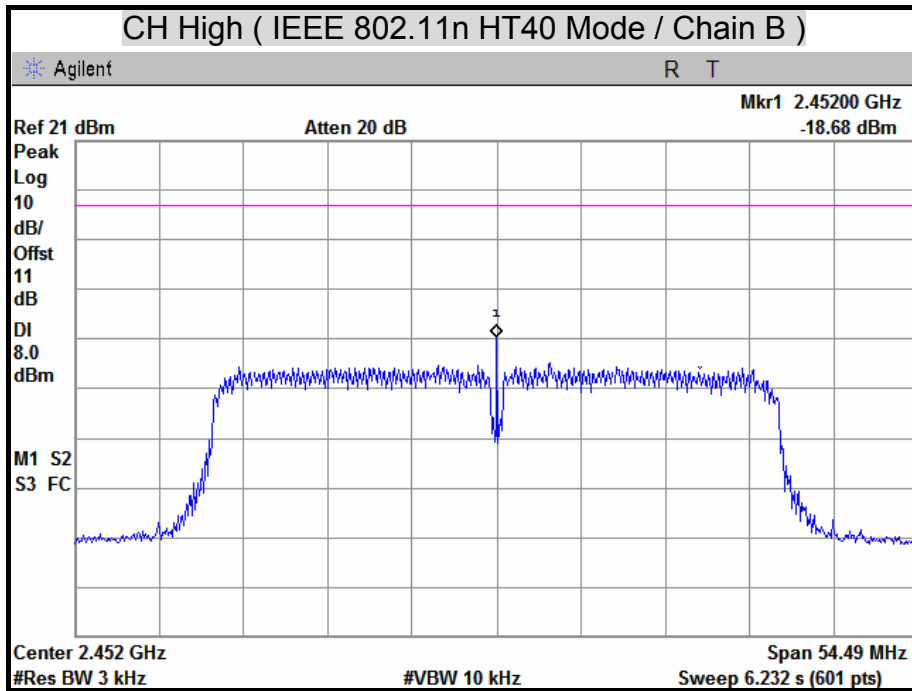














## 7.5 CONDUCTED SPURIOUS EMISSION

### LIMITS

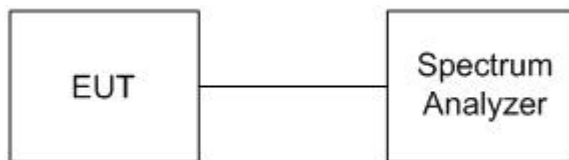
§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest 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 EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4407B	US41443108	09/12/2013

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

### TEST SETUP



### TEST PROCEDURE

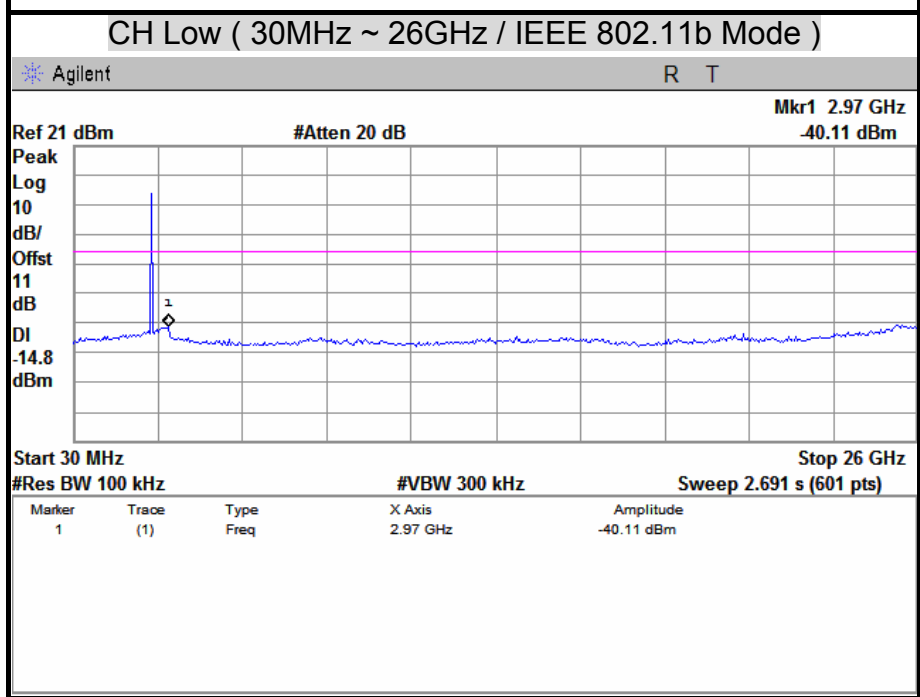
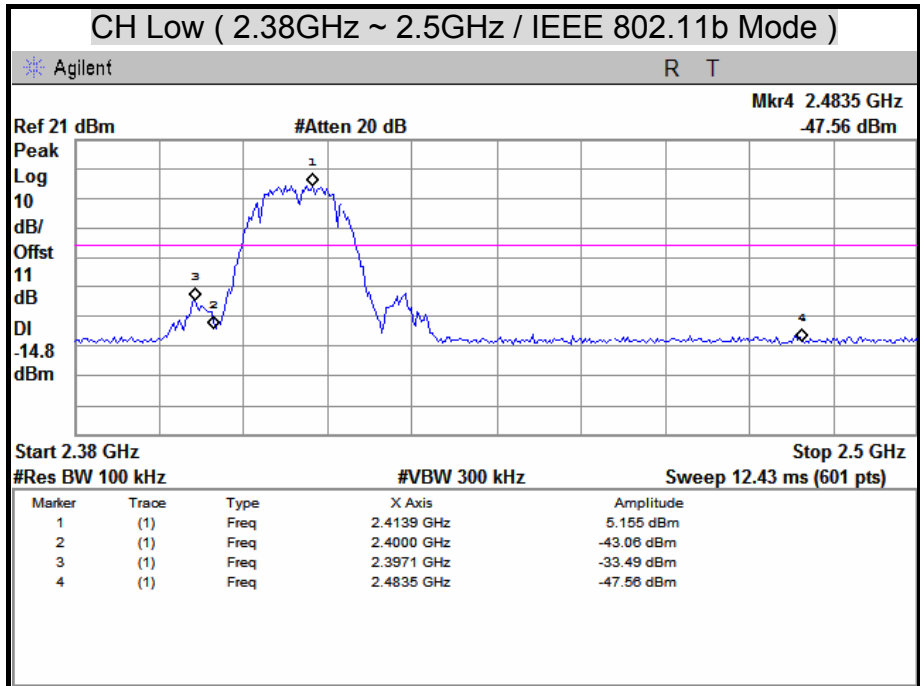
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

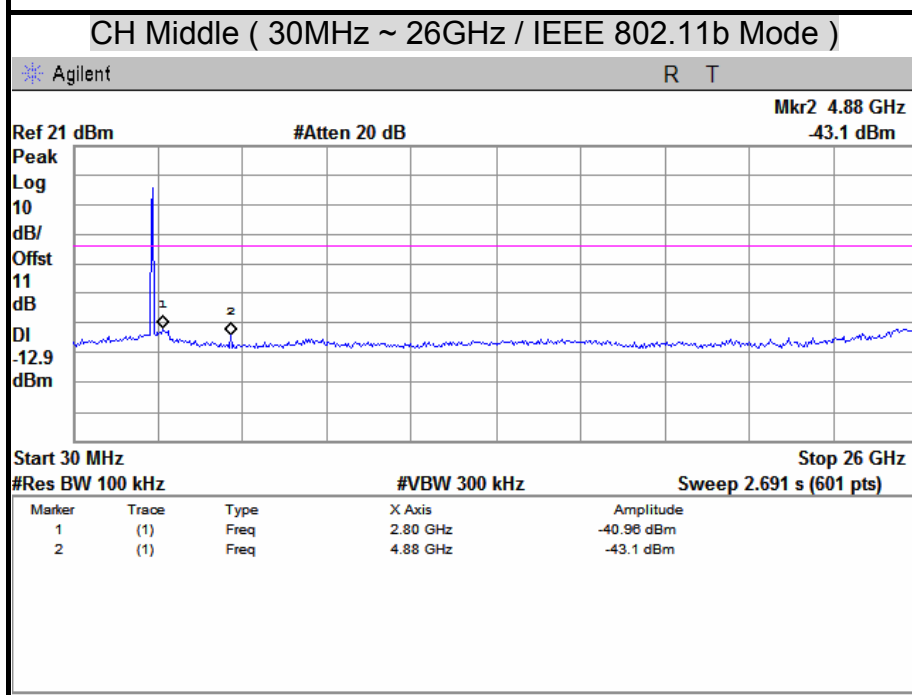
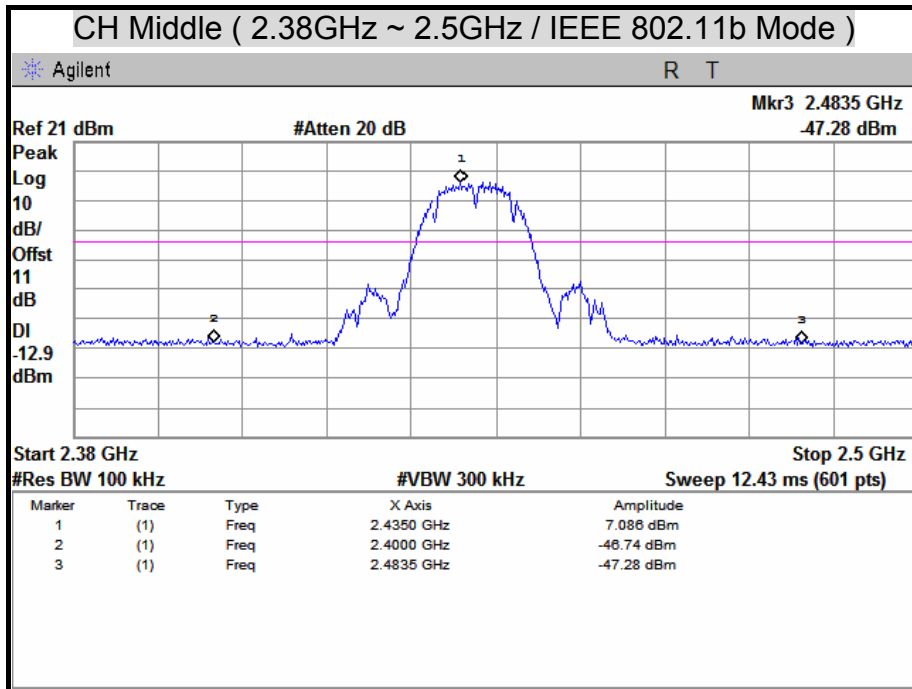
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

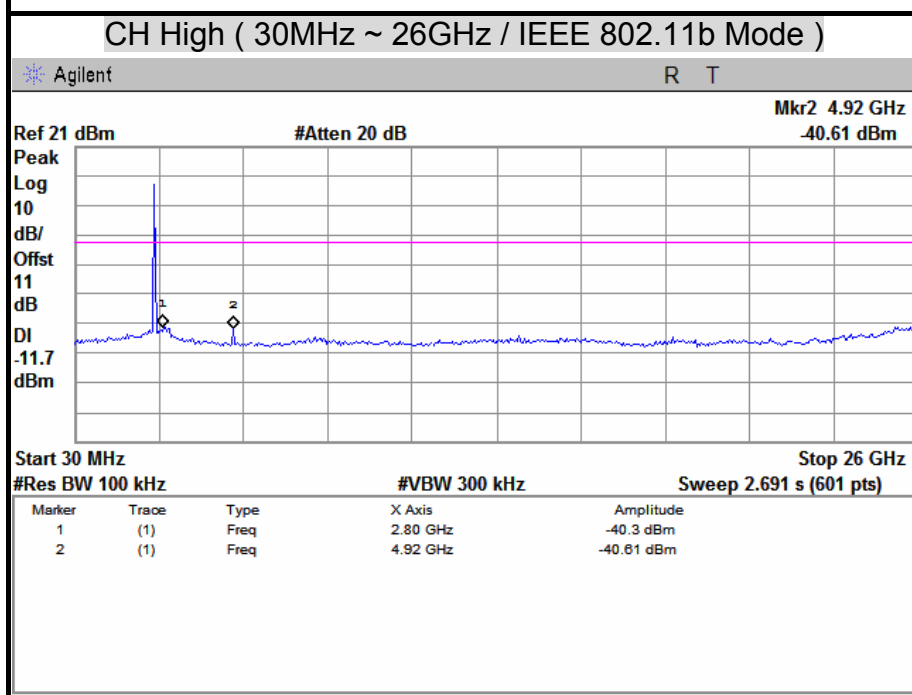
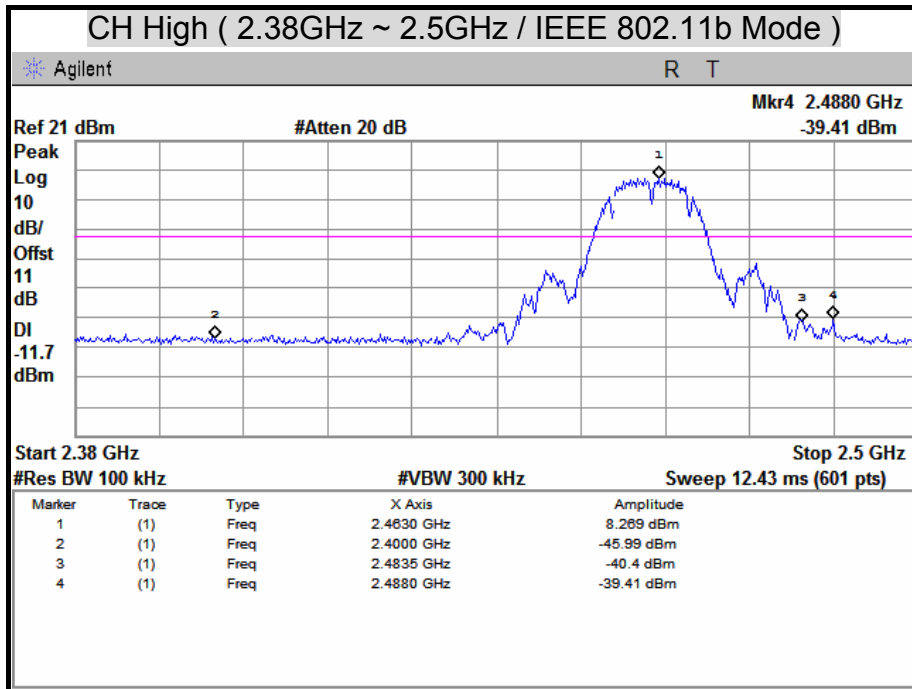


TEST RESULTS

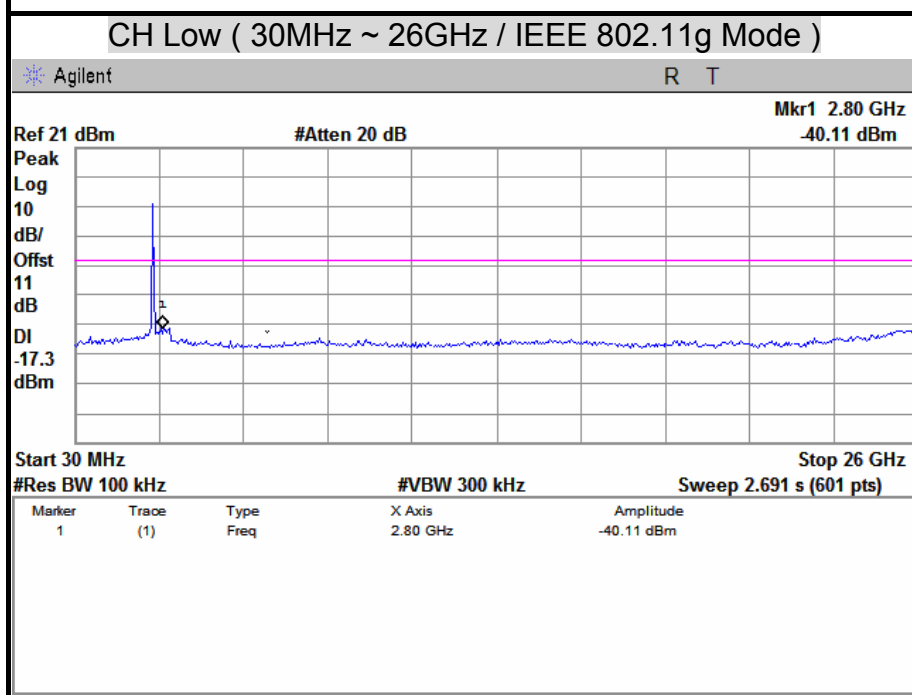
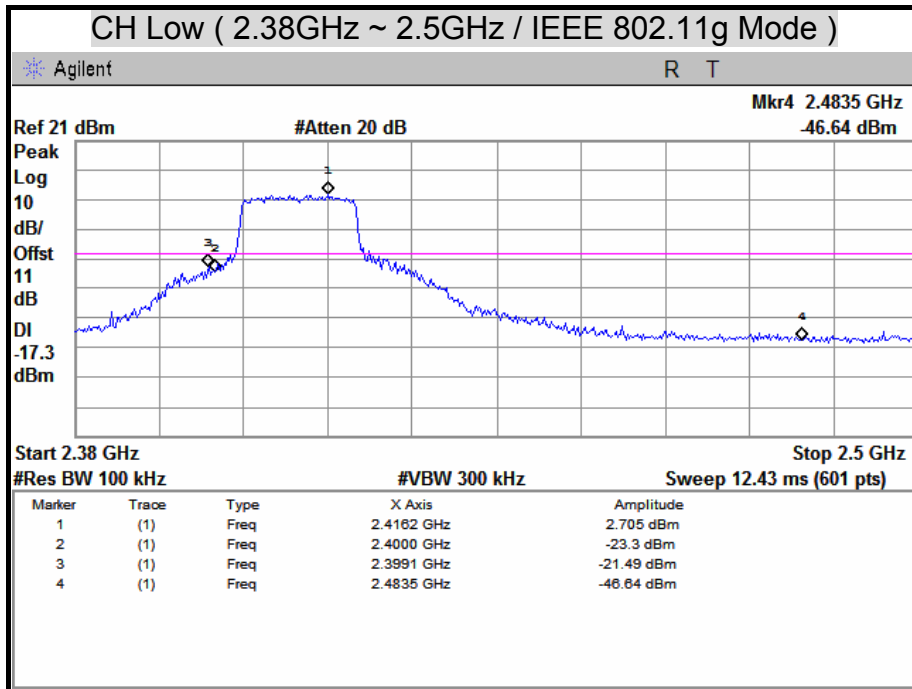
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

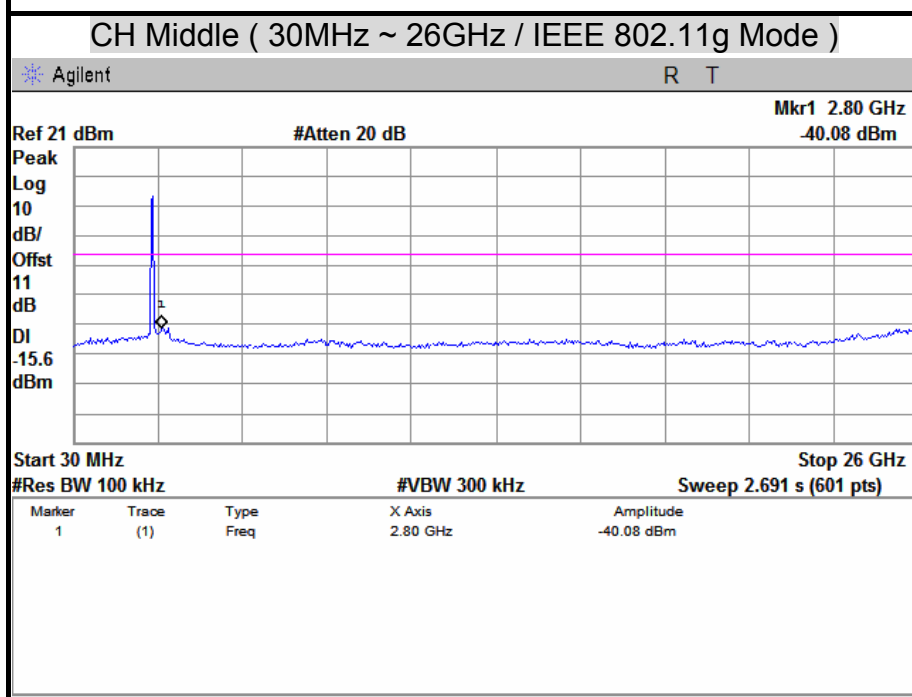
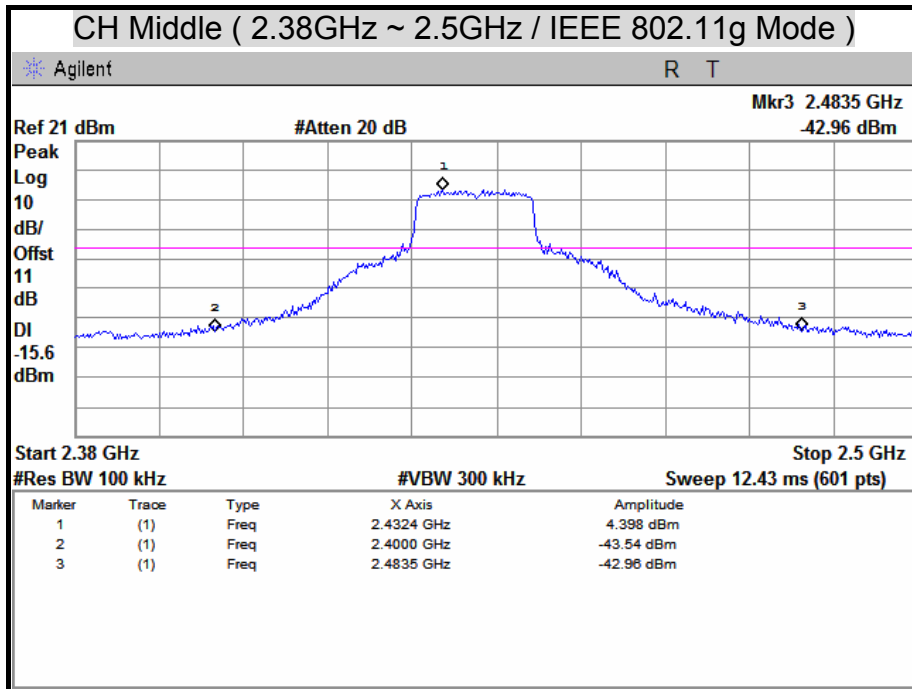


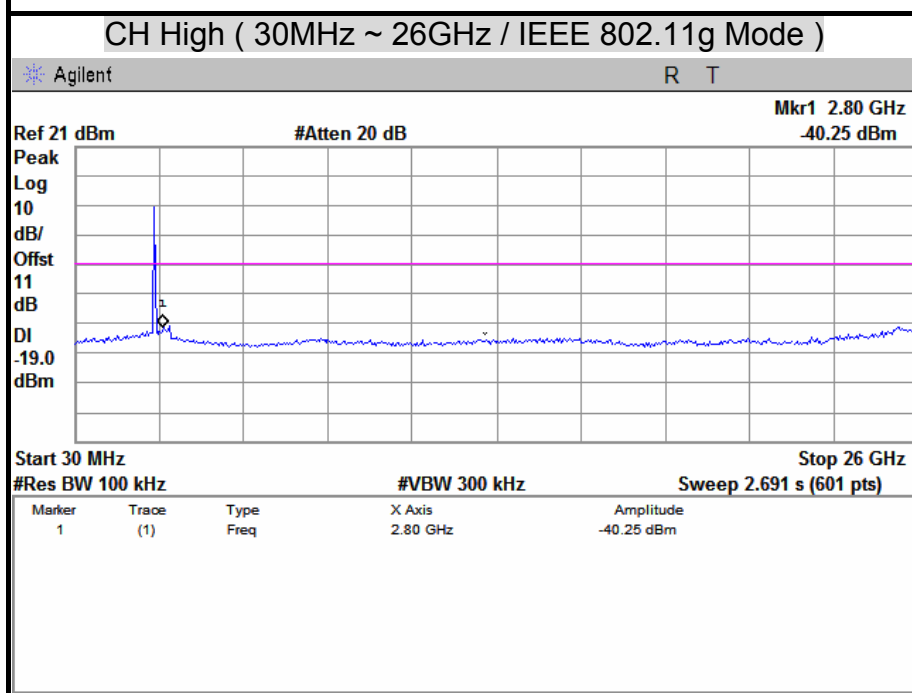
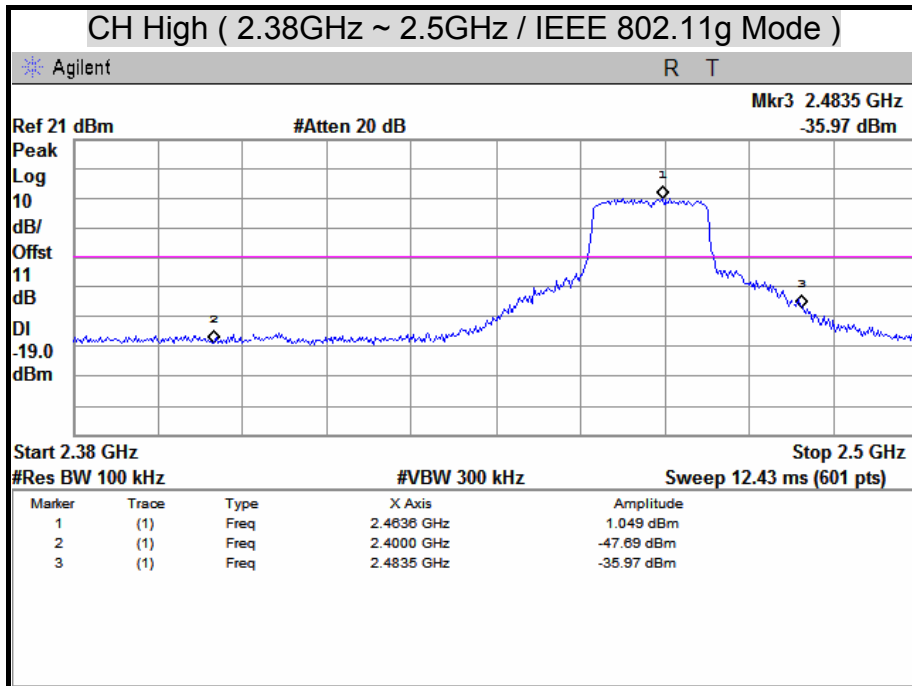


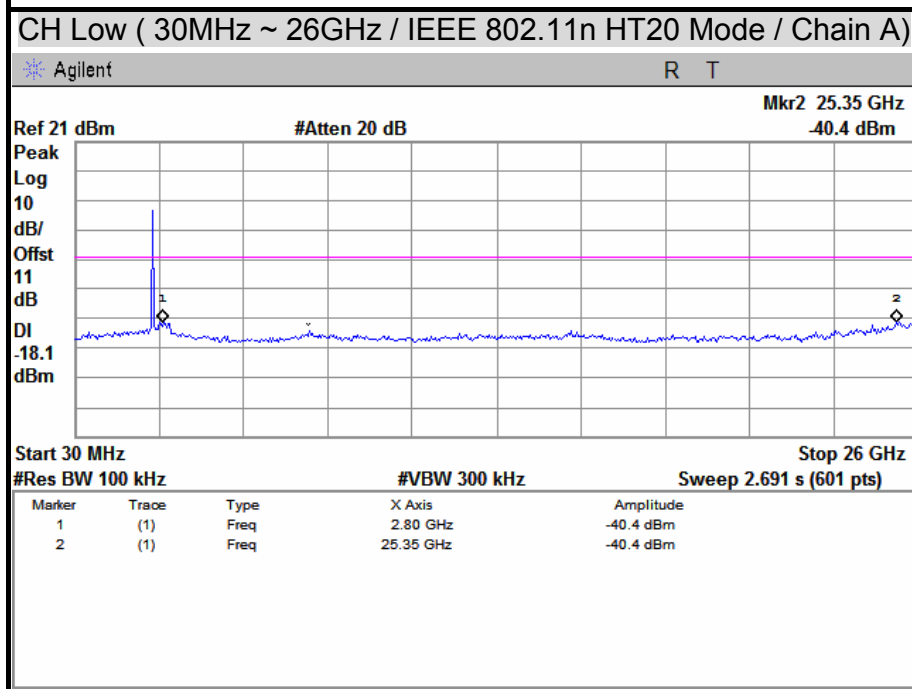
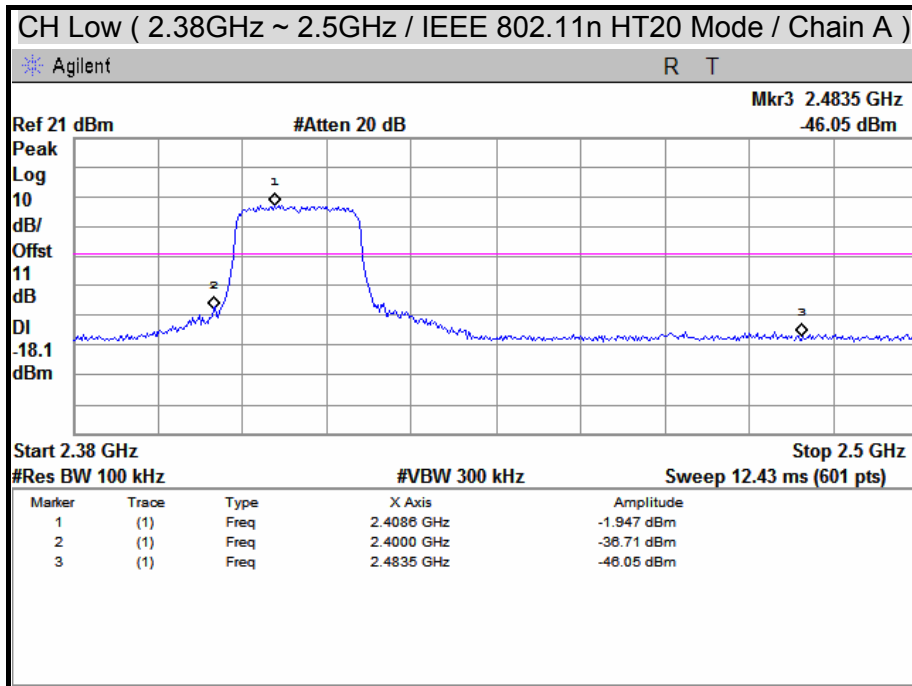


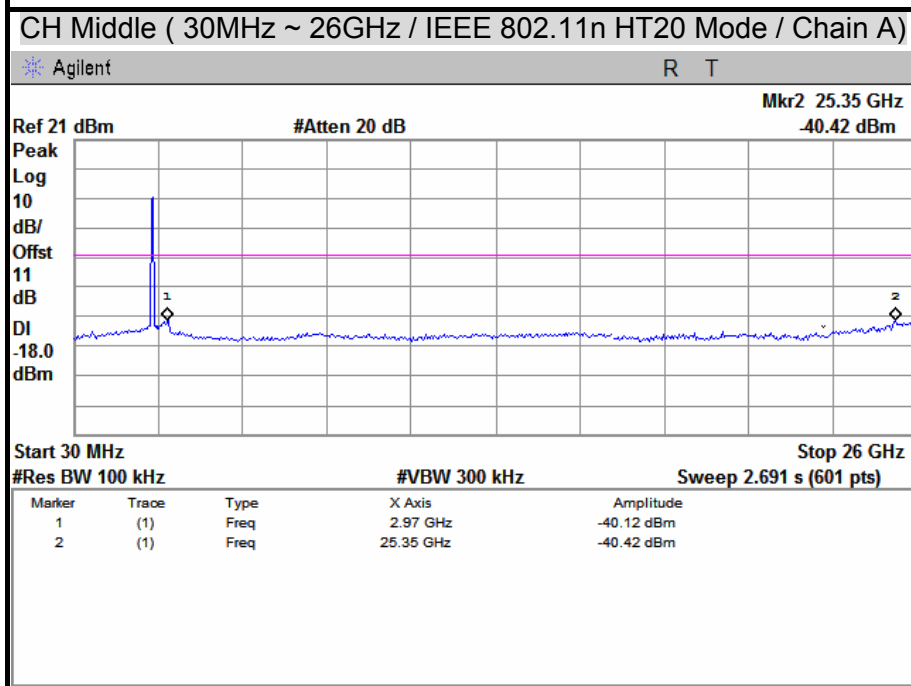
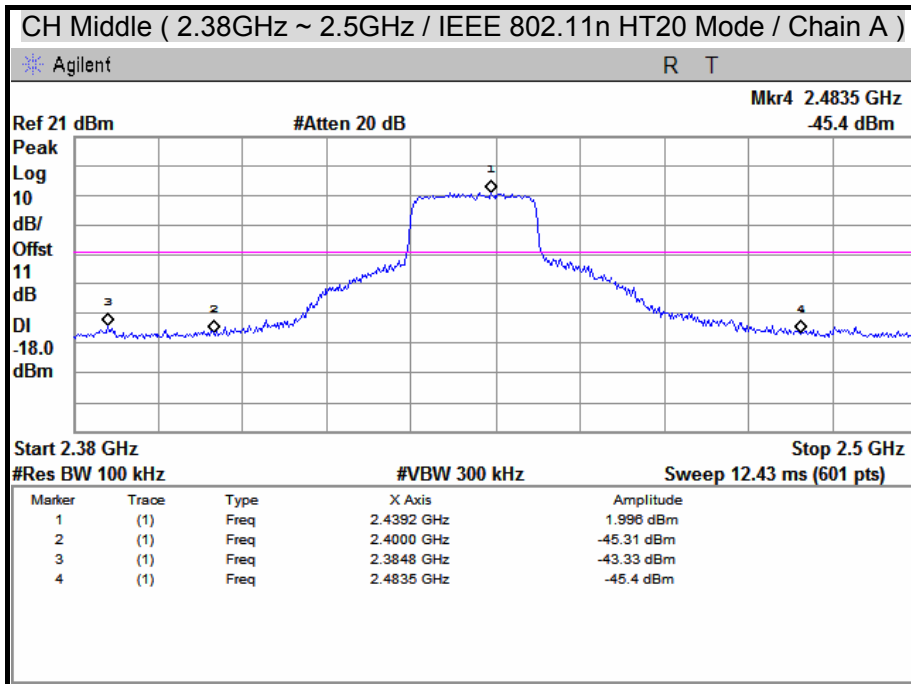


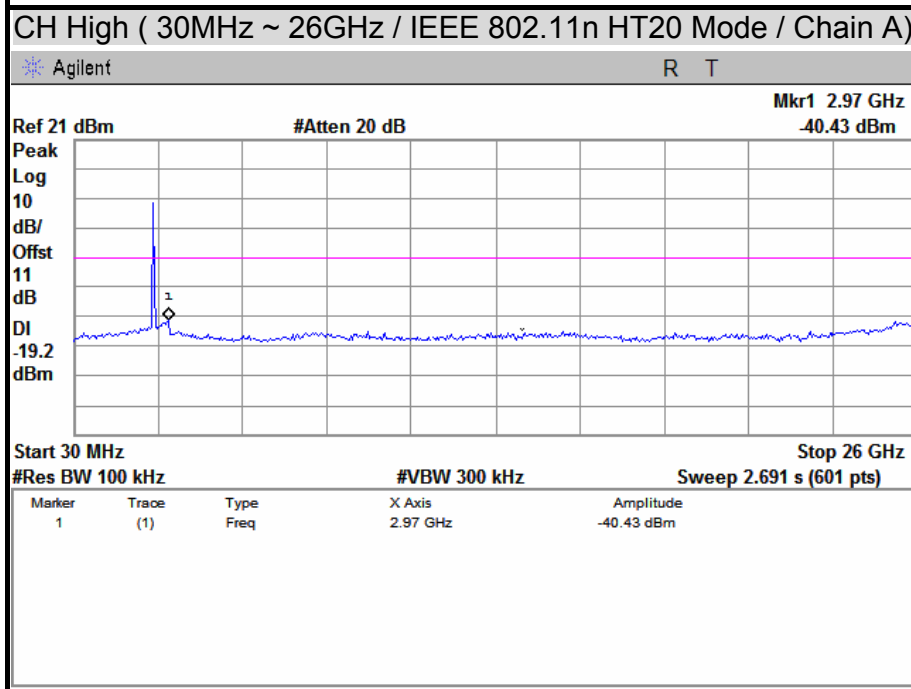
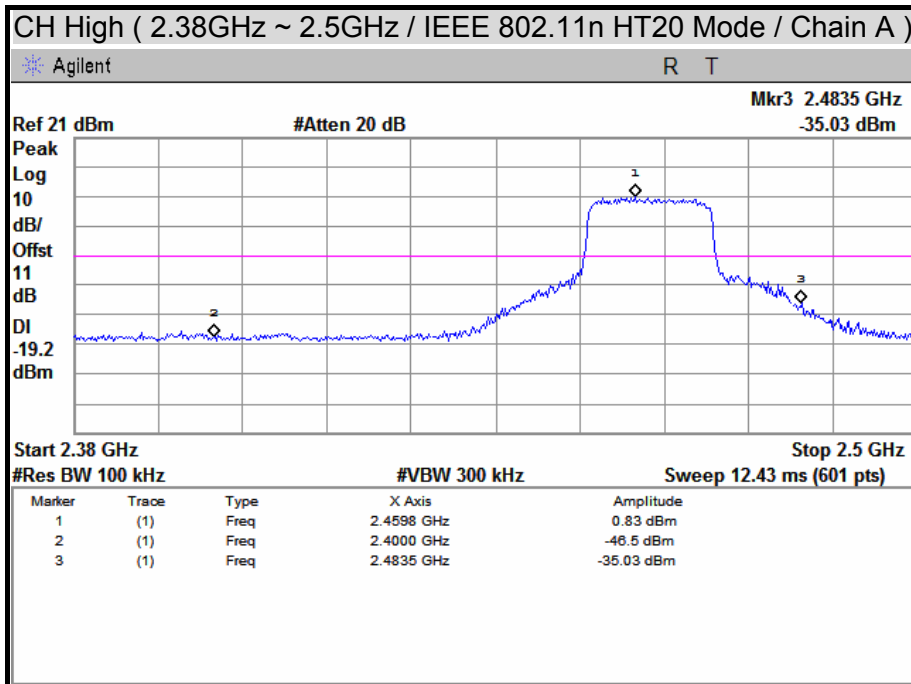


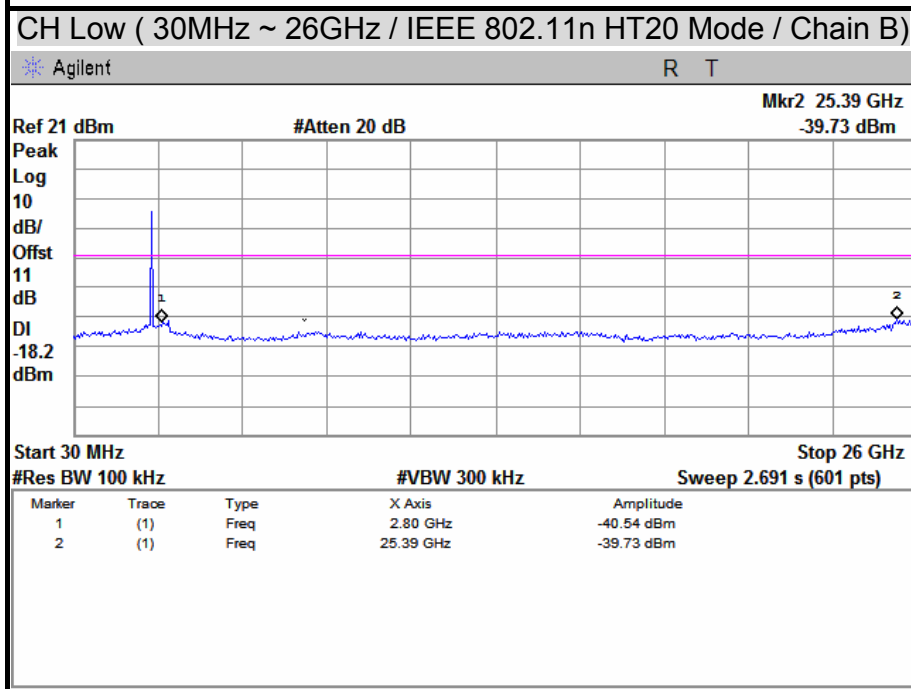
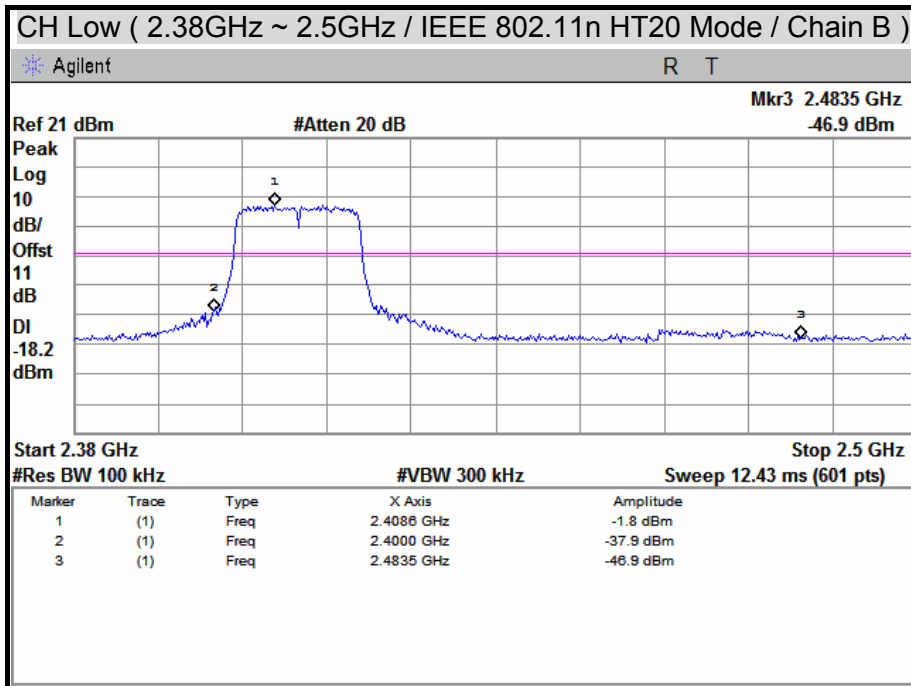


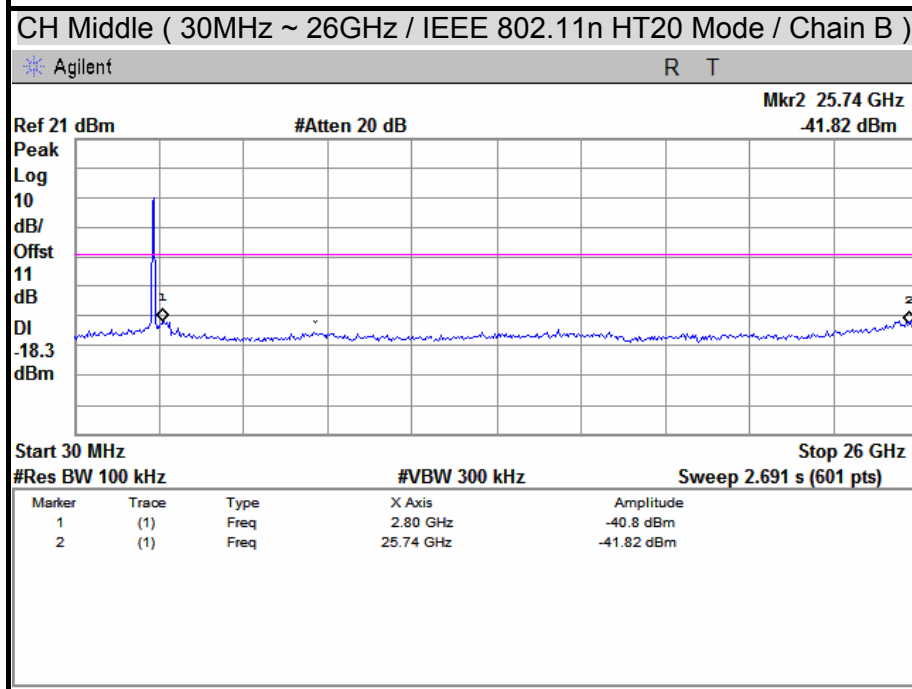
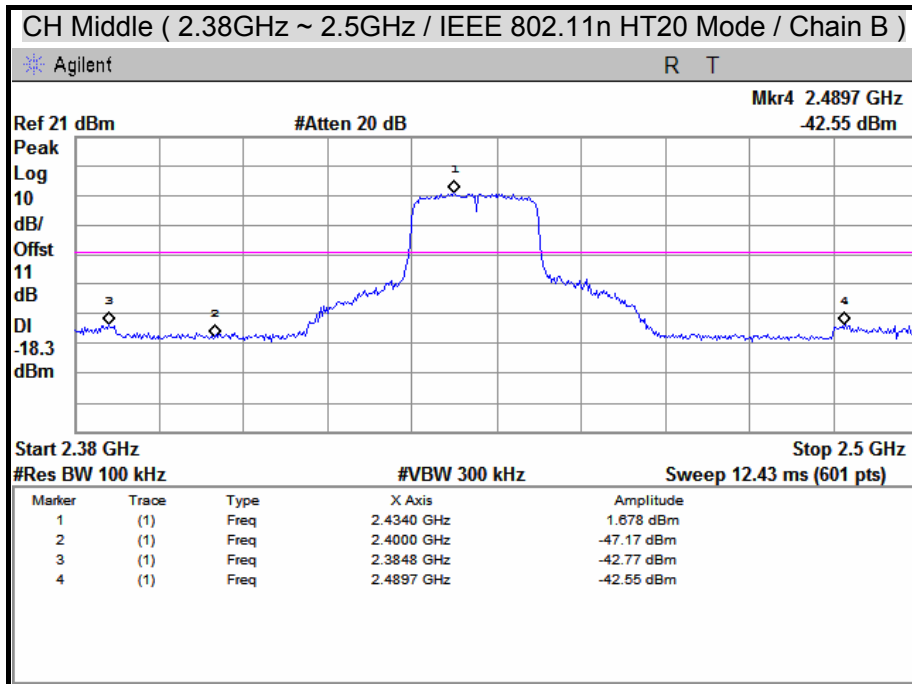




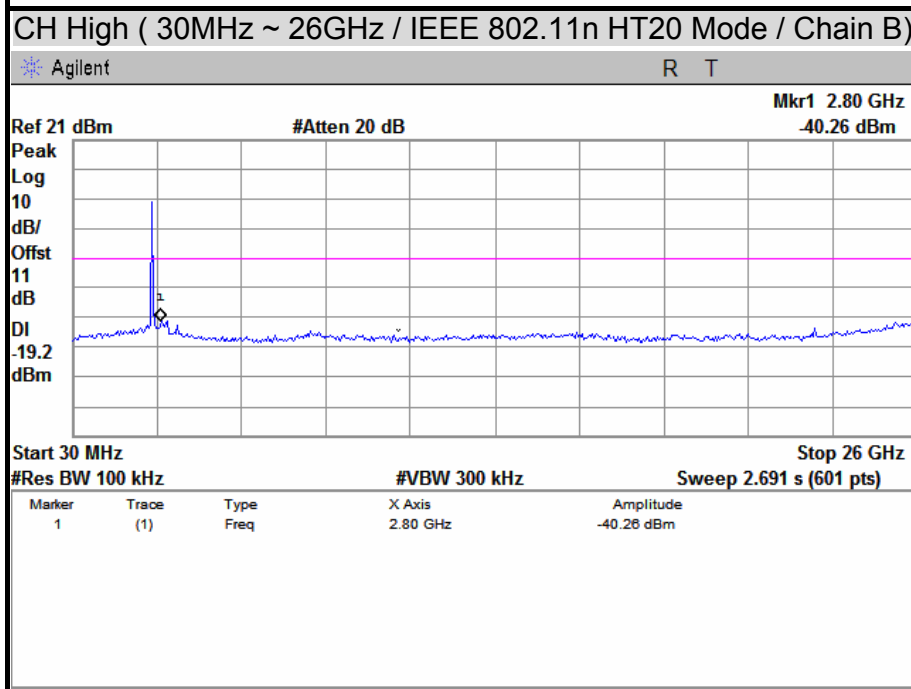
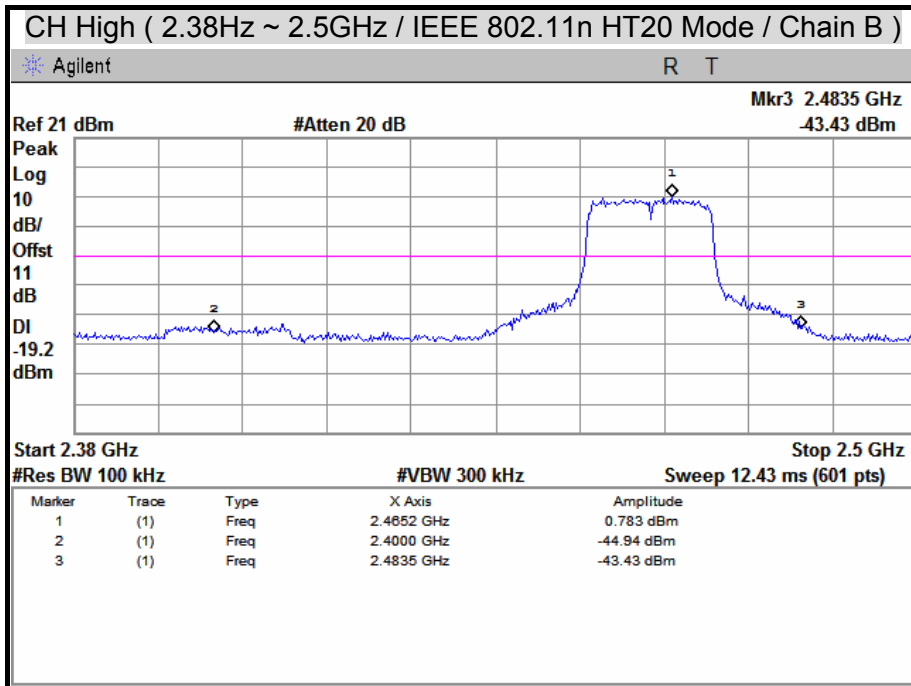


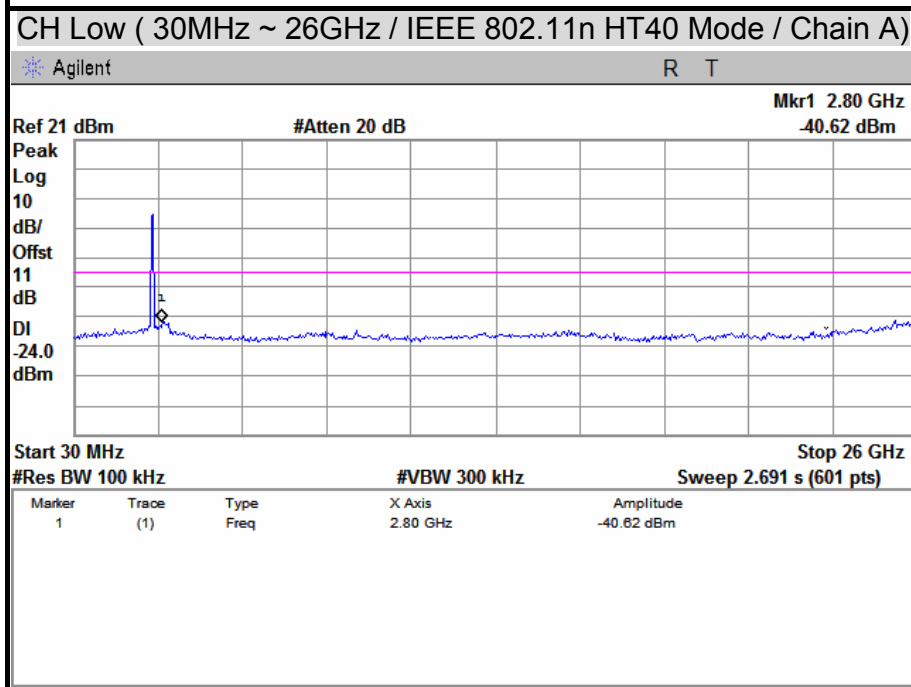
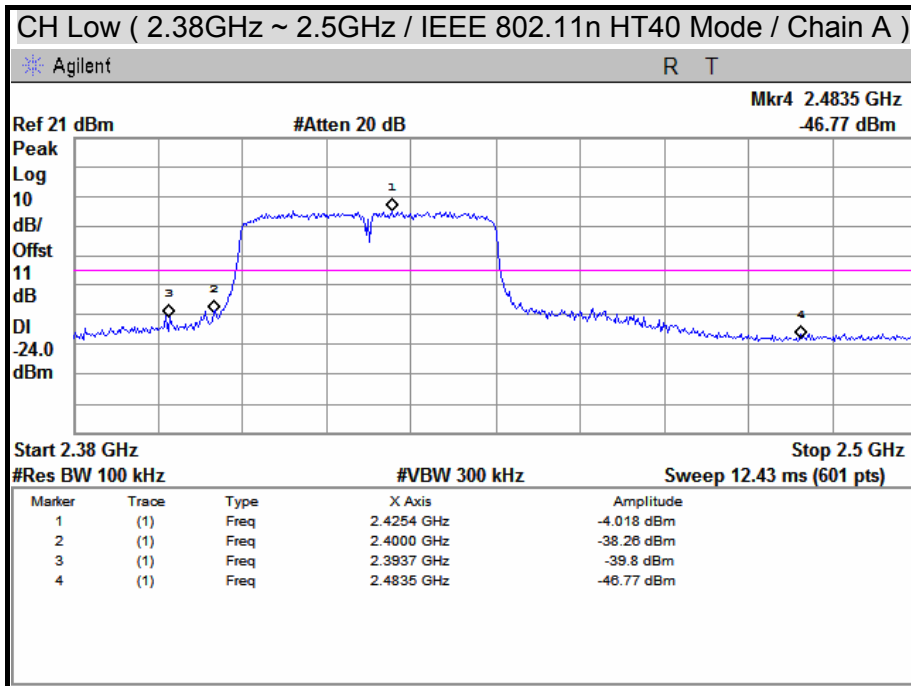


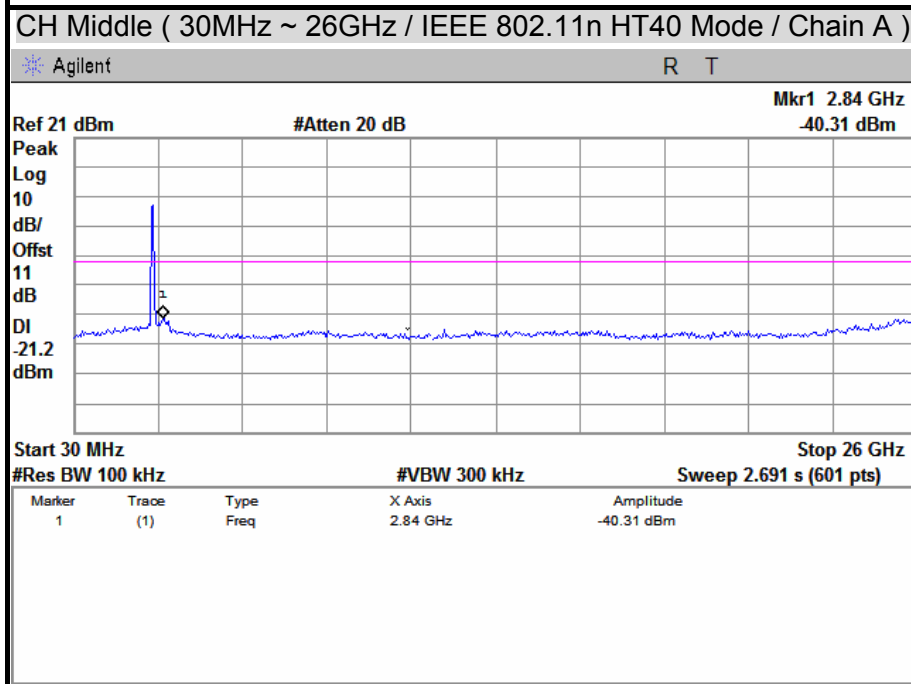
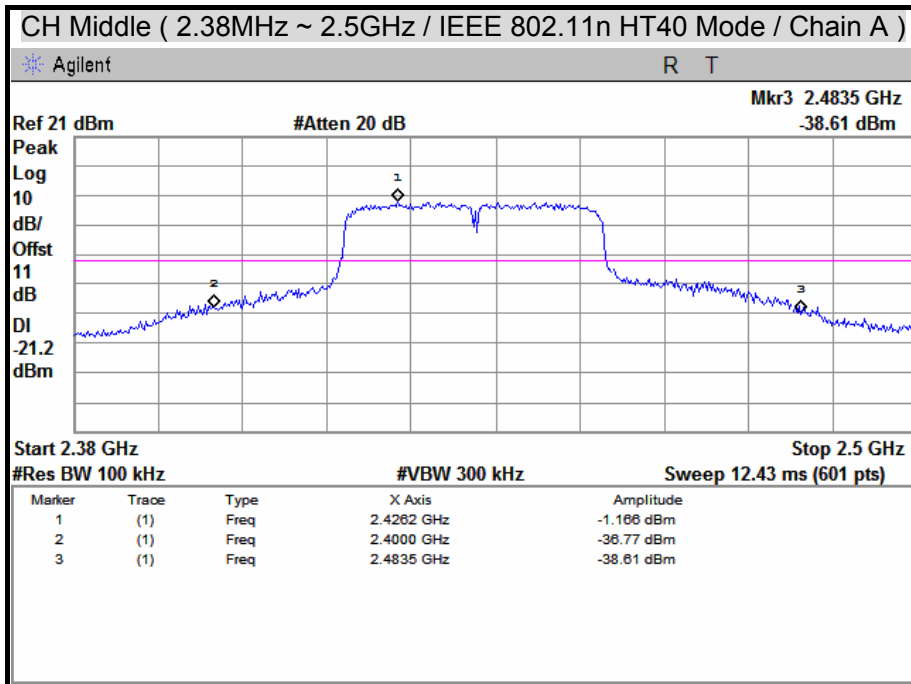


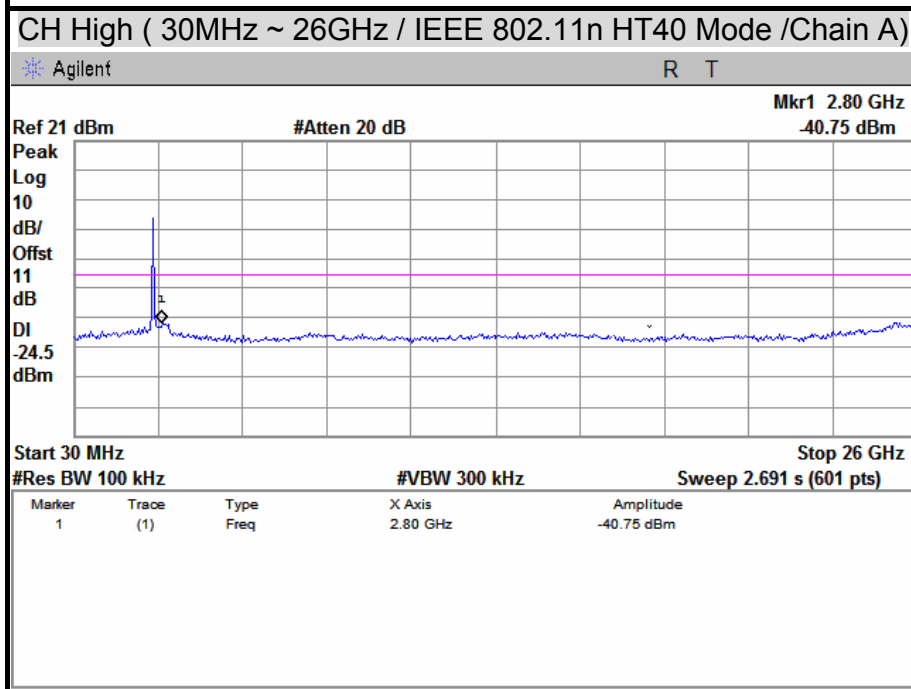
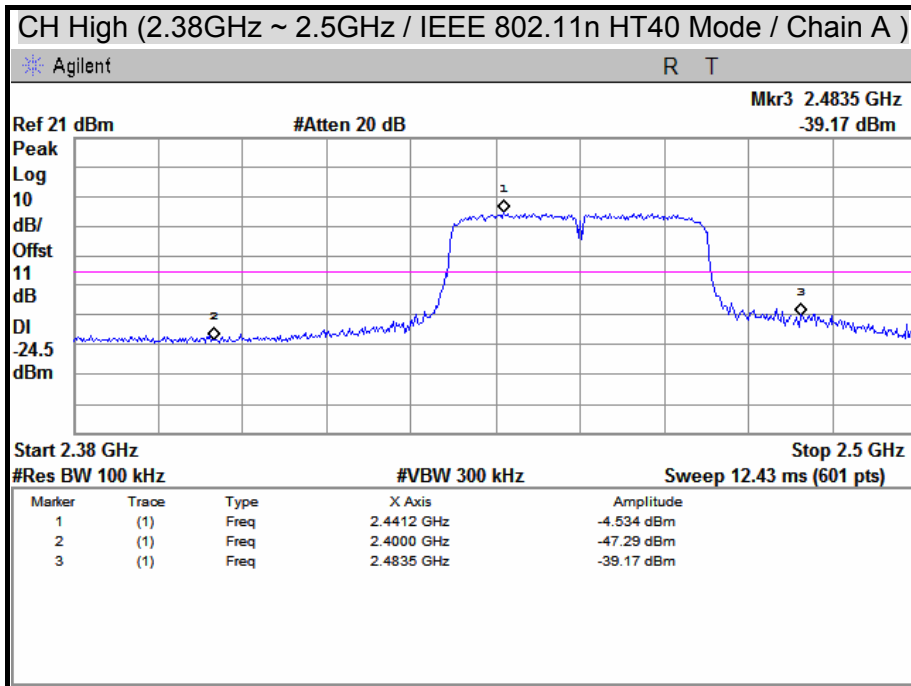


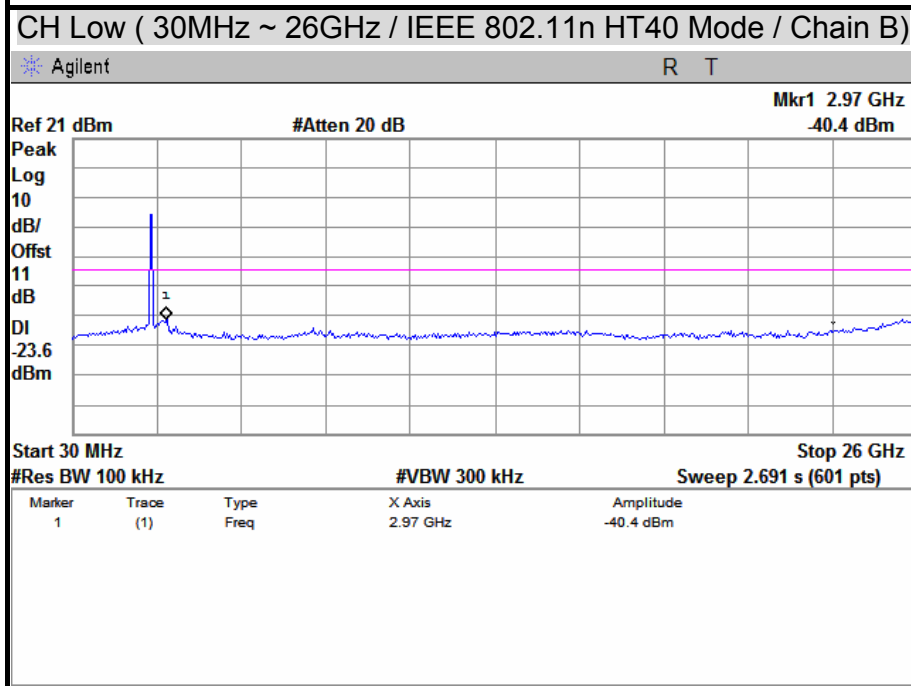
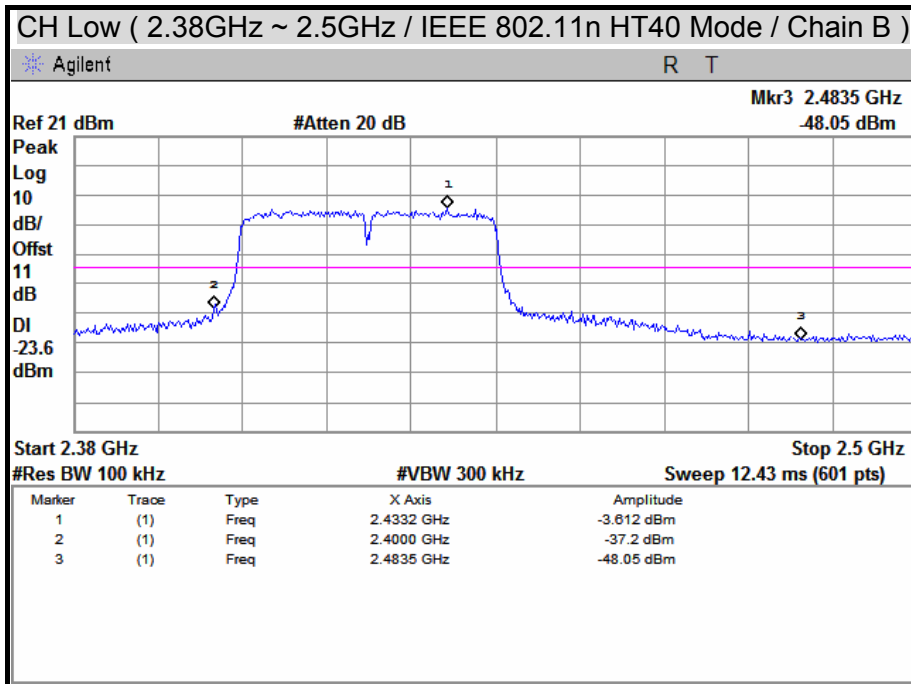


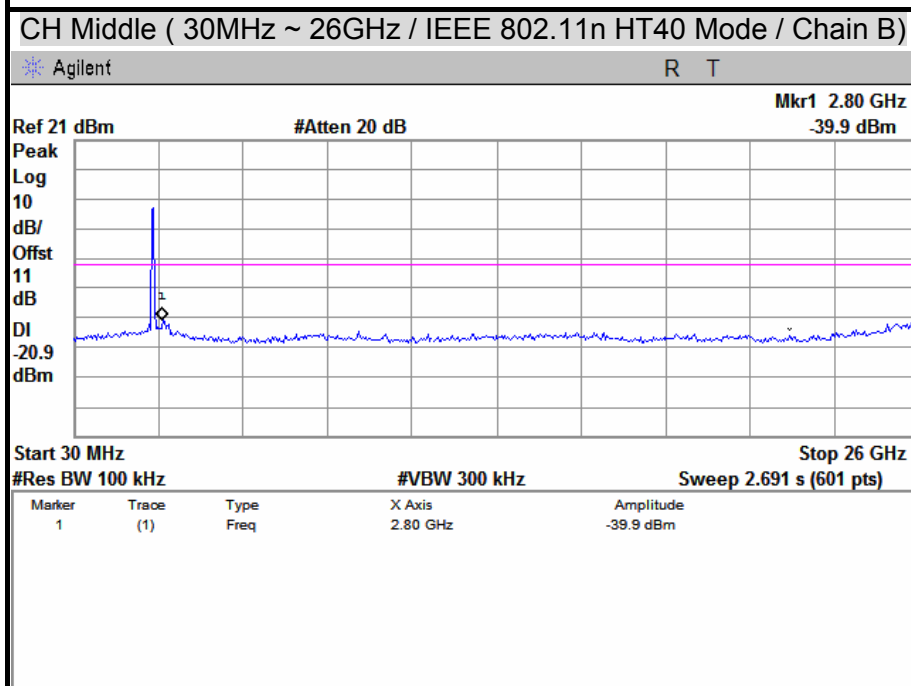
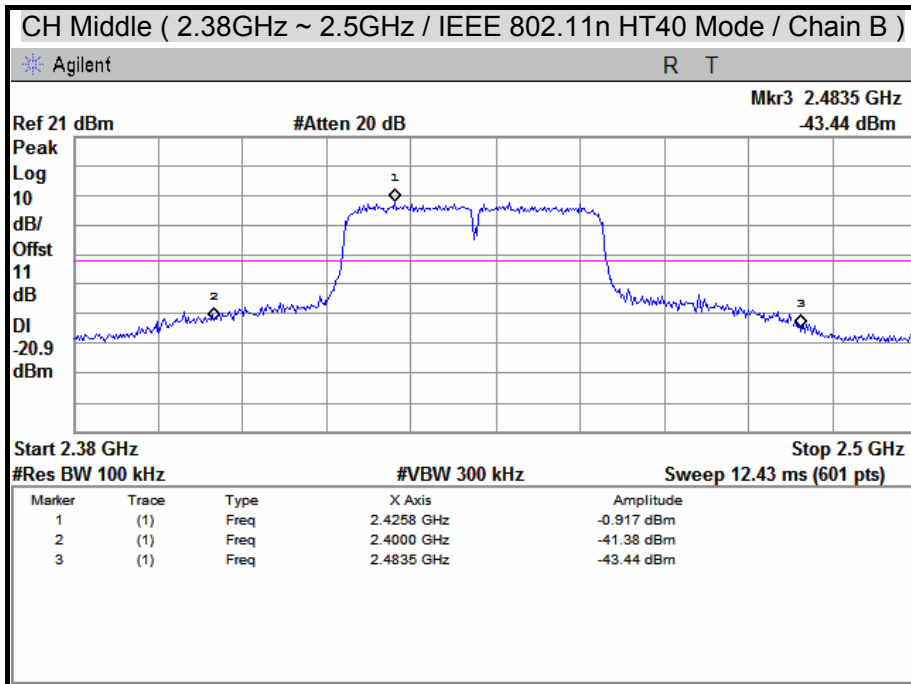


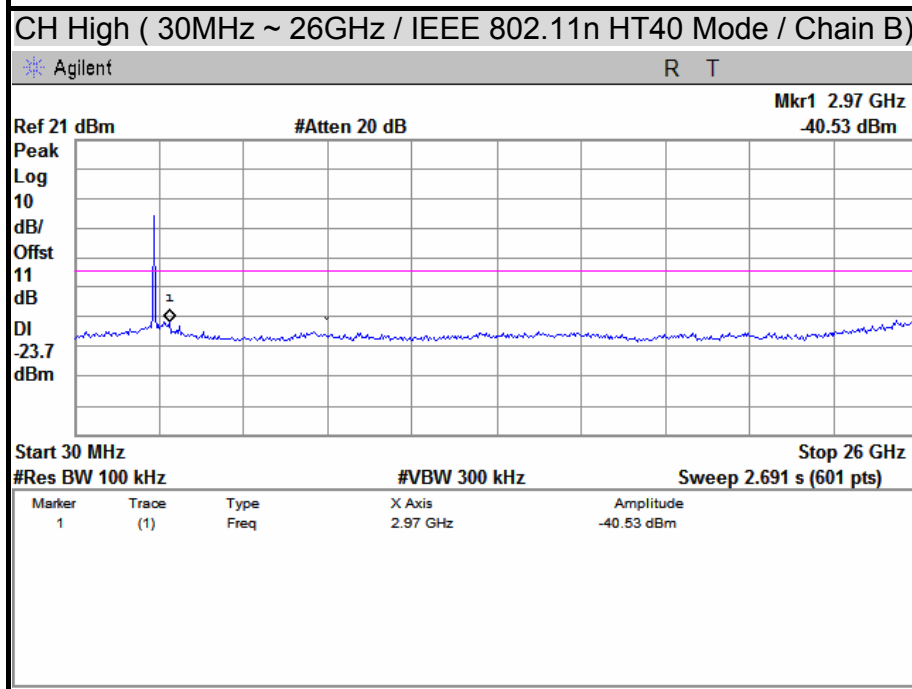
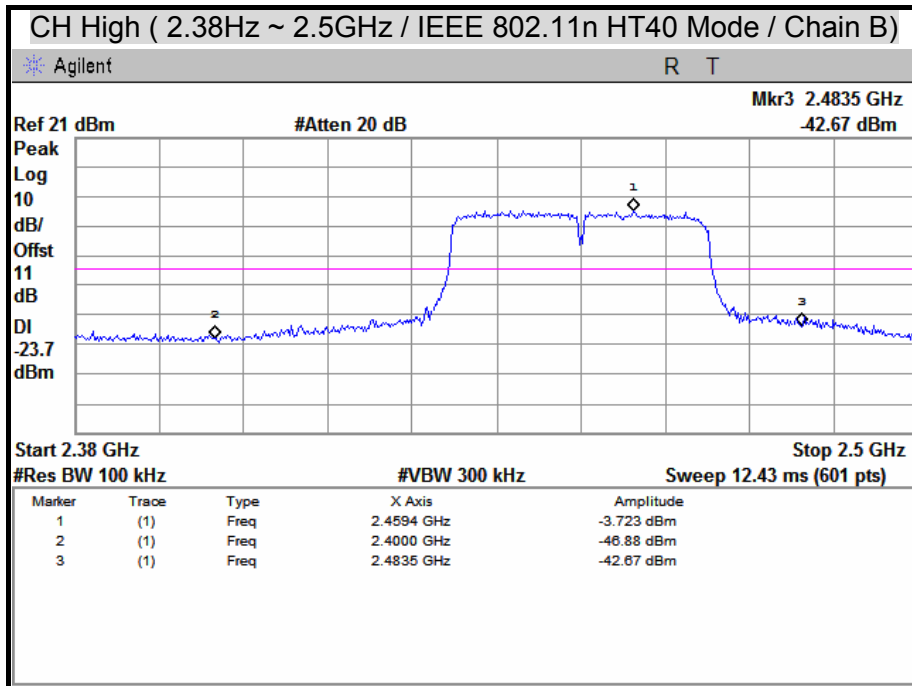














### 7.6 RADIATED EMISSION

#### LIMITS

(1) According to § 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
<sup>1</sup> 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	( <sup>2</sup> )
13.36 - 13.41			

**Remark:**

1. <sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
2. <sup>2</sup> Above 38.6

(2) According to § 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 in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.





(3) According to § 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)
0.009 – 0.490	2400/F(KHz)	300
0.490 – 1.705	24000/F(KHz)	30
1.705 – 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

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

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

**TEST EQUIPMENT**

**966Chamber\_B**

Name of Equipment	Manufacture	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/14/2013
EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101131	01/15/2013
Broadband Hybrid Bi-Log Antenna	Sunol Sciences	JB1	A100209-4	10/01/2013
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00078733	12/11/2013
Horn Antenna	COM-POWER	AH-840	03077	12/20/2013
Pre-Amplifier	Agilent	8447D	2944A10052	07/17/2013
Pre-Amplifier	Agilent	8449B	3008A01916	07/17/2013
LOOP Antenna	EMCO	6502	8905-2356	06/10/2013
Notch Filters Band Reject	Micro-Tronics	BRM05702-01	026	N.C.R

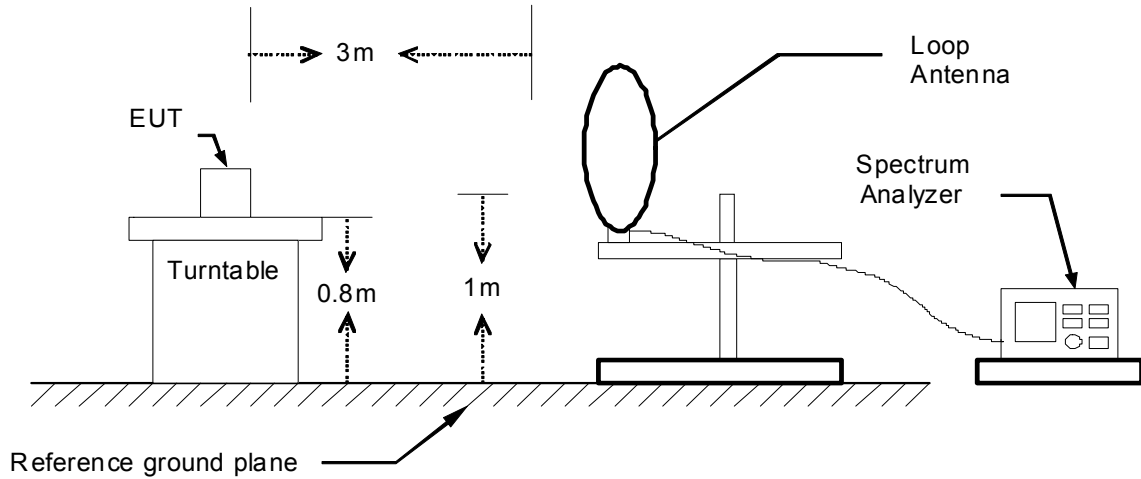
**Remark:** 1. Each piece of equipment is scheduled for calibration once a year.  
2. N.C.R = No Calibration Request.



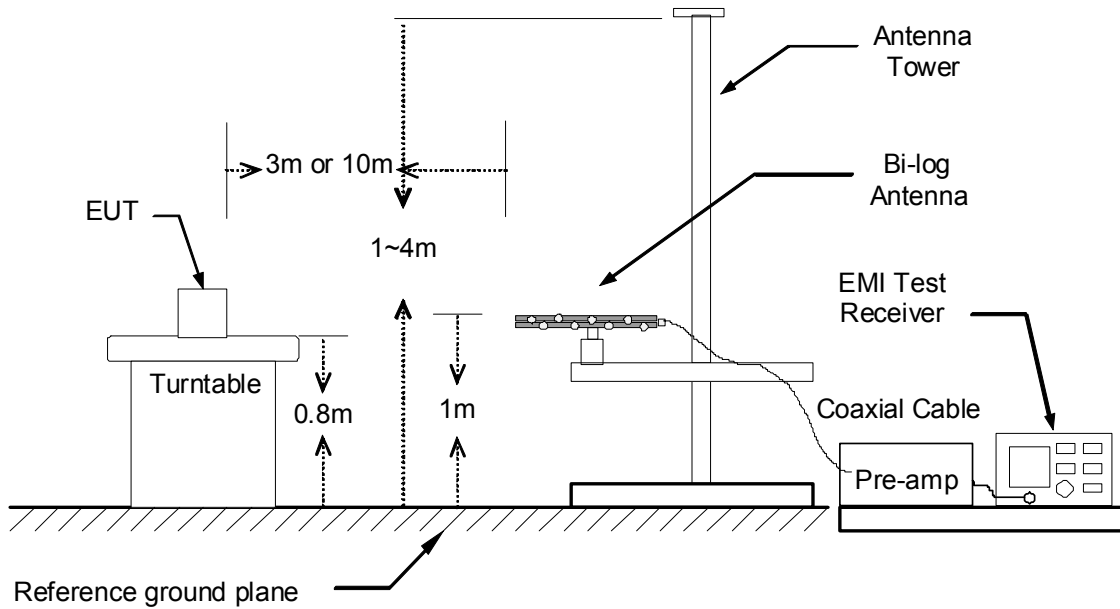
**TEST SETUP**

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

**9kHz ~ 30MHz**

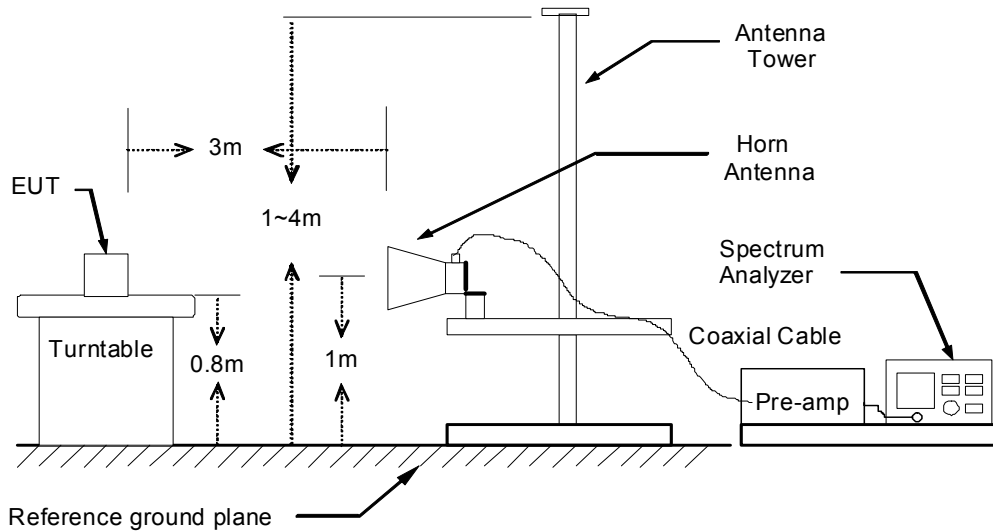


**30MHz ~ 1GHz**





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



### **TEST PROCEDURE**

1. 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.
2. While 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. While measuring the radiated emission above 1GHz, the EUT was set 3 meters away from the interference-receiving antenna.
3. 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.
4. 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.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. 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.

#### **Remark :**

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**

**Below 1 GHz (9kHz ~ 30MHz)**

No emission found between lowest internal used/generated frequency to 30MHz.

**Below 1 GHz (30MHz ~ 1GHz)**

<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2013/01/15
<b>Test Mode</b>	Continuous Tx / 11b CH Middle (worst case)	<b>Temp. &amp; Humidity</b>	23°C, 56%

966 Chamber_B at 3Meter / Horizontal						
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
48.43	51.73	-18.48	33.25	40.00	-6.75	Peak
214.30	53.98	-14.09	39.89	43.50	-3.61	Peak
375.32	50.41	-10.01	40.40	46.00	-5.60	Peak
624.61	47.55	-5.88	41.67	46.00	-4.33	Peak
874.87	42.14	-1.88	40.26	46.00	-5.74	Peak
961.20	38.63	-0.73	37.90	54.00	-16.10	Peak

966 Chamber_B at 3Meter / Vertical						
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
53.28	53.10	-19.51	33.59	40.00	-6.41	QP
80.44	52.80	-19.29	33.51	40.00	-6.49	QP
375.32	54.10	-10.01	44.09	46.00	-1.91	QP
583.87	43.57	-6.57	37.00	46.00	-9.00	Peak
874.87	42.13	-1.88	40.25	46.00	-5.75	Peak
961.20	40.81	-0.73	40.08	54.00	-13.92	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. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) – PreAmp.Gain (dB)
4. Result (dBµV/m) = Reading (dBµV) + Correction Factor (dB/m)
5. Margin (dB) = Remark result (dBµV/m) - Quasi-peak limit (dBµV/m).



Above 1 GHz

<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2012/10/26
<b>Test Mode</b>	IEEE 802.11b TX / CH Low	<b>Temp. &amp; Humidity</b>	24°C, 52%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1930.00	48.68	---	1.62	50.30	---	74.00	54.00	-3.70	Peak
2304.00	53.12	37.28	3.28	56.40	40.56	74.00	54.00	-13.44	AVG
2702.00	52.00	34.48	4.37	56.37	38.85	74.00	54.00	-15.15	AVG
2908.00	52.06	34.28	4.81	56.87	39.09	74.00	54.00	-14.91	AVG
3120.00	42.76	---	5.24	48.00	---	74.00	54.00	-6.00	Peak
3750.00	41.58	---	6.60	48.18	---	74.00	54.00	-5.82	Peak
4230.00	40.77	---	7.73	48.50	---	74.00	54.00	-5.50	Peak
4830.00	41.02	---	9.24	50.26	---	74.00	54.00	-3.74	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1564.00	49.94	---	-1.67	48.27	---	74.00	54.00	-5.73	Peak
2466.00	52.86	39.41	3.83	56.69	43.24	74.00	54.00	-10.76	AVG
2834.00	51.81	34.42	4.65	56.46	39.07	74.00	54.00	-14.93	AVG
2956.00	51.06	34.28	4.91	55.97	39.19	74.00	54.00	-14.81	AVG
3210.00	44.32	---	5.43	49.75	---	74.00	54.00	-4.25	Peak
3900.00	40.49	---	6.95	47.44	---	74.00	54.00	-6.56	Peak
4140.00	40.90	---	7.51	48.42	---	74.00	54.00	-5.58	Peak
4830.00	46.61	43.28	9.24	55.85	52.52	74.00	54.00	-1.48	AVG
6480.00	39.19	---	12.57	51.76	---	74.00	54.00	-2.24	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. 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.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Result = Reading + Correction Factor  
 Margin = Result - Limit  
 Remark Peak = Result(PK) - Limit(AV)  
 Remark AVG = Result(AV) - Limit(AV)



<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2012/10/26
<b>Test Mode</b>	IEEE 802.11b TX / CH Middle	<b>Temp. &amp; Humidity</b>	24°C, 52%

**966 Chamber\_B at 3Meter / Horizontal**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1836.00	48.62	---	0.77	49.39	---	74.00	54.00	-4.61	Peak
2294.00	52.89	35.57	3.25	56.14	38.82	74.00	54.00	-15.18	AVG
2644.00	51.83	34.88	4.25	56.08	39.13	74.00	54.00	-14.87	AVG
2854.00	51.73	34.57	4.69	56.42	39.26	74.00	54.00	-14.74	AVG
4170.00	40.71	---	7.58	48.30	---	74.00	54.00	-5.70	Peak
4875.00	40.43	---	9.36	49.79	---	74.00	54.00	-4.21	Peak
5640.00	40.00	---	10.71	50.71	---	74.00	54.00	-3.29	Peak
6030.00	39.63	---	11.64	51.27	---	74.00	54.00	-2.73	Peak

**966 Chamber\_B at 3Meter / Vertical**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
2016.00	48.69	---	2.30	50.99	---	74.00	54.00	-3.01	Peak
2306.00	56.18	43.26	3.29	59.47	46.55	74.00	54.00	-7.45	AVG
2532.00	50.80	37.87	4.02	54.82	41.89	74.00	54.00	-12.11	AVG
2990.00	51.50	34.33	4.98	56.48	39.31	74.00	54.00	-14.69	AVG
3255.00	42.00	---	5.52	47.52	---	74.00	54.00	-6.48	Peak
4095.00	39.35	---	7.41	46.75	---	74.00	54.00	-7.25	Peak
4875.00	47.45	43.79	9.36	56.81	53.15	74.00	54.00	-0.85	AVG
5505.00	39.96	---	10.38	50.34	---	74.00	54.00	-3.66	Peak

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. 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.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Result = Reading + Correction Factor  
Margin = Result - Limit  
Remark Peak = Result(PK) - Limit(AV)  
Remark AVG = Result(AV) - Limit(AV)



<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2012/10/26
<b>Test Mode</b>	IEEE 802.11b TX / CH High	<b>Temp. &amp; Humidity</b>	24°C, 52%

**966 Chamber\_B at 3Meter / Horizontal**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1470.00	49.77	---	-2.36	47.41	---	74.00	54.00	-6.59	Peak
2340.00	53.27	38.22	3.41	56.68	41.63	74.00	54.00	-12.37	AVG
2710.00	51.99	34.13	4.39	56.38	38.52	74.00	54.00	-15.48	AVG
2900.00	51.40	34.14	4.79	56.19	38.93	74.00	54.00	-15.07	AVG
3180.00	42.28	---	5.37	47.64	---	74.00	54.00	-6.36	Peak
3645.00	41.55	---	6.36	47.91	---	74.00	54.00	-6.09	Peak
4920.00	41.30	---	9.48	50.77	---	74.00	54.00	-3.23	Peak
5310.00	39.16	---	10.11	49.27	---	74.00	54.00	-4.73	Peak

**966 Chamber\_B at 3Meter / Vertical**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1166.00	51.83	---	-3.42	48.41	---	74.00	54.00	-5.59	Peak
2026.00	52.47	35.10	2.34	54.81	37.44	74.00	54.00	-16.56	AVG
2360.00	58.34	35.38	3.47	61.81	38.85	74.00	54.00	-15.15	AVG
2822.00	50.30	34.22	4.63	54.93	38.85	74.00	54.00	-15.15	AVG
3285.00	43.73	---	5.58	49.31	---	74.00	54.00	-4.69	Peak
3825.00	41.12	---	6.77	47.90	---	74.00	54.00	-6.10	Peak
4920.00	45.57	41.84	9.48	55.05	51.32	74.00	54.00	-2.68	AVG
6030.00	39.16	---	11.64	50.80	---	74.00	54.00	-3.20	Peak

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. 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.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Result = Reading + Correction Factor  
Margin = Result - Limit  
Remark Peak = Result(PK) - Limit(AV)  
Remark AVG = Result(AV) - Limit(AV)





<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2012/10/26
<b>Test Mode</b>	IEEE 802.11g TX / CH Low	<b>Temp. &amp; Humidity</b>	24°C, 52%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1664.00	47.57	---	-0.77	46.79	---	74.00	54.00	-7.21	Peak
2464.00	51.44	39.13	3.83	55.27	42.96	74.00	54.00	-11.04	AVG
2710.00	45.95	---	4.39	50.35	---	74.00	54.00	-3.65	Peak
2938.00	45.45	---	4.87	50.32	---	74.00	54.00	-3.68	Peak
3210.00	41.98	---	5.43	47.40	---	74.00	54.00	-6.60	Peak
4425.00	40.69	---	8.19	48.88	---	74.00	54.00	-5.12	Peak
5085.00	40.00	---	9.81	49.80	---	74.00	54.00	-4.20	Peak
5955.00	39.48	---	11.47	50.95	---	74.00	54.00	-3.05	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1582.00	46.68	---	-1.51	45.17	---	74.00	54.00	-8.83	Peak
1928.00	45.78	---	1.60	47.38	---	74.00	54.00	-6.62	Peak
2466.00	59.51	46.24	3.83	63.34	50.07	74.00	54.00	-3.93	AVG
2964.00	45.74	---	4.92	50.66	---	74.00	54.00	-3.34	Peak
3210.00	43.95	---	5.43	49.38	---	74.00	54.00	-4.62	Peak
3870.00	40.49	---	6.88	47.37	---	74.00	54.00	-6.63	Peak
4260.00	40.28	---	7.80	48.08	---	74.00	54.00	-5.92	Peak
4815.00	46.31	33.63	9.20	55.51	42.83	74.00	54.00	-11.17	AVG
5760.00	39.91	---	11.00	50.91	---	74.00	54.00	-3.09	Peak

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. 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.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Result = Reading + Correction Factor  
 Margin = Result - Limit  
 Remark Peak = Result(PK) - Limit(AV)  
 Remark AVG = Result(AV) - Limit(AV)





<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2012/10/26
<b>Test Mode</b>	IEEE 802.11g TX / CH Middle	<b>Temp. &amp; Humidity</b>	24°C, 52%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1426.00	48.27	---	-2.51	45.76	---	74.00	54.00	-8.24	Peak
2056.00	46.94	---	2.44	49.39	---	74.00	54.00	-4.61	Peak
2138.00	46.56	---	2.72	49.28	---	74.00	54.00	-4.72	Peak
2808.00	45.23	---	4.60	49.83	---	74.00	54.00	-4.17	Peak
3870.00	41.62	---	6.88	48.49	---	74.00	54.00	-5.51	Peak
4440.00	40.63	---	8.23	48.86	---	74.00	54.00	-5.14	Peak
4875.00	41.59	---	9.36	50.95	---	74.00	54.00	-3.05	Peak
5670.00	39.49	---	10.78	50.27	---	74.00	54.00	-3.73	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1834.00	46.14	---	0.76	46.90	---	74.00	54.00	-7.10	Peak
1930.00	45.91	---	1.62	47.53	---	74.00	54.00	-6.47	Peak
2184.00	46.78	---	2.88	49.65	---	74.00	54.00	-4.35	Peak
2892.00	45.03	---	4.77	49.80	---	74.00	54.00	-4.20	Peak
3255.00	45.33	---	5.52	50.85	---	74.00	54.00	-3.15	Peak
3495.00	41.90	---	6.01	47.91	---	74.00	54.00	-6.09	Peak
4875.00	51.32	36.78	9.36	60.68	46.14	74.00	54.00	-7.86	AVG
5835.00	39.26	---	11.18	50.44	---	74.00	54.00	-3.56	Peak

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. 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.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Result = Reading + Correction Factor  
 Margin = Result - Limit  
 Remark Peak = Result(PK) - Limit(AV)  
 Remark AVG = Result(AV) - Limit(AV)



<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2012/10/26
<b>Test Mode</b>	IEEE 802.11g TX / CH High	<b>Temp. &amp; Humidity</b>	24°C, 52%

**966 Chamber\_B at 3Meter / Horizontal**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1620.00	47.10	---	-1.17	45.93	---	74.00	54.00	-8.07	Peak
1930.00	45.98	---	1.62	47.60	---	74.00	54.00	-6.40	Peak
2356.00	51.36	35.29	3.46	54.82	38.75	74.00	54.00	-15.25	AVG
2914.00	44.96	---	4.82	49.78	---	74.00	54.00	-4.22	Peak
3180.00	41.99	---	5.37	47.36	---	74.00	54.00	-6.64	Peak
3735.00	41.33	---	6.57	47.90	---	74.00	54.00	-6.10	Peak
4935.00	40.10	---	9.52	49.62	---	74.00	54.00	-4.38	Peak
5970.00	39.38	---	11.51	50.89	---	74.00	54.00	-3.11	Peak

**966 Chamber\_B at 3Meter / Vertical**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1094.00	50.66	---	-3.67	46.99	---	74.00	54.00	-7.01	Peak
1952.00	48.51	---	1.82	50.33	---	74.00	54.00	-3.67	Peak
2068.00	53.25	35.31	2.48	55.73	37.79	74.00	54.00	-16.21	AVG
2352.00	54.94	41.78	3.45	58.39	45.23	74.00	54.00	-8.77	AVG
3285.00	49.49	45.88	5.58	55.07	51.46	74.00	54.00	-2.54	AVG
4260.00	40.46	---	7.80	48.25	---	74.00	54.00	-5.75	Peak
4890.00	39.85	---	9.40	49.25	---	74.00	54.00	-4.75	Peak
5670.00	39.79	---	10.78	50.57	---	74.00	54.00	-3.43	Peak

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. 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.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Result = Reading + Correction Factor  
Margin = Result - Limit  
Remark Peak = Result(PK) - Limit(AV)  
Remark AVG = Result(AV) - Limit(AV)



<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2012/10/26
<b>Test Mode</b>	IEEE 802.11n HT20 TX / CH Low	<b>Temp. &amp; Humidity</b>	24°C, 52%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
2172.00	47.01	---	2.83	49.85	---	74.00	54.00	-4.15	Peak
2466.00	52.09	39.57	3.83	55.92	43.40	74.00	54.00	-10.60	AVG
2672.00	46.67	---	4.31	50.98	---	74.00	54.00	-3.02	Peak
2840.00	46.29	---	4.66	50.95	---	74.00	54.00	-3.05	Peak
3210.00	42.93	---	5.43	48.35	---	74.00	54.00	-5.65	Peak
3780.00	40.88	---	6.67	47.55	---	74.00	54.00	-6.45	Peak
4290.00	40.54	---	7.87	48.41	---	74.00	54.00	-5.59	Peak
5280.00	39.89	---	10.07	49.96	---	74.00	54.00	-4.04	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
2466.00	60.44	48.27	3.83	64.27	52.10	74.00	54.00	-1.90	AVG
2640.00	50.99	33.35	4.24	55.23	37.59	74.00	54.00	-16.41	AVG
2876.00	45.06	---	4.74	49.80	---	74.00	54.00	-4.20	Peak
2958.00	44.89	---	4.91	49.80	---	74.00	54.00	-4.20	Peak
3210.00	49.50	44.65	5.43	54.93	50.08	74.00	54.00	-3.92	AVG
3840.00	41.38	---	6.81	48.19	---	74.00	54.00	-5.81	Peak
4395.00	40.14	---	8.12	48.26	---	74.00	54.00	-5.74	Peak
5085.00	40.00	---	9.81	49.81	---	74.00	54.00	-4.19	Peak

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. 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.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Result = Reading + Correction Factor  
Margin = Result - Limit  
Remark Peak = Result(PK) - Limit(AV)  
Remark AVG = Result(AV) - Limit(AV)



<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2012/10/26
<b>Test Mode</b>	IEEE 802.11n HT20 TX / CH Middle	<b>Temp. &amp; Humidity</b>	24°C, 52%

**966 Chamber\_B at 3Meter / Horizontal**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1624.00	55.58	46.69	-1.13	54.45	45.56	74.00	54.00	-8.44	AVG
2068.00	47.68	---	2.48	50.16	---	74.00	54.00	-3.84	Peak
2840.00	45.94	---	4.66	50.60	---	74.00	54.00	-3.40	Peak
2978.00	45.48	---	4.95	50.43	---	74.00	54.00	-3.57	Peak
3255.00	42.61	---	5.52	48.13	---	74.00	54.00	-5.87	Peak
4365.00	40.78	---	8.05	48.83	---	74.00	54.00	-5.17	Peak
4875.00	45.68	31.67	9.36	55.04	41.03	74.00	54.00	-12.97	AVG
5730.00	39.66	---	10.93	50.59	---	74.00	54.00	-3.41	Peak

**966 Chamber\_B at 3Meter / Vertical**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1500.00	48.14	---	-2.25	45.89	---	74.00	54.00	-8.11	Peak
1726.00	47.25	---	-0.22	47.03	---	74.00	54.00	-6.97	Peak
2050.00	46.43	---	2.42	48.85	---	74.00	54.00	-5.15	Peak
2970.00	45.74	---	4.94	50.68	---	74.00	54.00	-3.32	Peak
3255.00	51.56	46.44	5.52	57.08	51.96	74.00	54.00	-2.04	AVG
3795.00	40.31	---	6.70	47.01	---	74.00	54.00	-6.99	Peak
4875.00	53.96	39.91	9.36	63.32	49.27	74.00	54.00	-4.73	AVG
5715.00	38.99	---	10.89	49.88	---	74.00	54.00	-4.12	Peak

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. 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.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Result = Reading + Correction Factor  
Margin = Result - Limit  
Remark Peak = Result(PK) - Limit(AV)  
Remark AVG = Result(AV) - Limit(AV)



<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2012/10/26
<b>Test Mode</b>	IEEE 802.11n HT20 TX / CH High	<b>Temp. &amp; Humidity</b>	24°C, 52%

**966 Chamber\_B at 3Meter / Horizontal**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1642.00	50.08	---	-0.97	49.11	---	74.00	54.00	-4.89	Peak
2332.00	51.73	34.73	3.38	55.11	38.11	74.00	54.00	-15.89	AVG
2394.00	53.79	40.71	3.59	57.38	44.30	74.00	54.00	-9.70	AVG
2776.00	45.67	---	4.53	50.20	---	74.00	54.00	-3.80	Peak
3285.00	43.24	---	5.58	48.83	---	74.00	54.00	-5.17	Peak
3825.00	41.12	---	6.77	47.89	---	74.00	54.00	-6.11	Peak
4380.00	40.88	---	8.08	48.97	---	74.00	54.00	-5.03	Peak
4890.00	39.69	---	9.40	49.09	---	74.00	54.00	-4.91	Peak

**966 Chamber\_B at 3Meter / Vertical**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
2110.00	46.50	---	2.62	49.12	---	74.00	54.00	-4.88	Peak
2410.00	63.90	49.73	3.64	67.54	53.37	74.00	54.00	-0.63	AVG
2786.00	45.43	---	4.55	49.98	---	74.00	54.00	-4.02	Peak
2964.00	45.52	---	4.92	50.45	---	74.00	54.00	-3.55	Peak
3285.00	51.04	47.53	5.58	56.62	53.11	74.00	54.00	-0.89	AVG
3840.00	41.59	---	6.81	48.40	---	74.00	54.00	-5.60	Peak
4410.00	40.37	---	8.16	48.53	---	74.00	54.00	-5.47	Peak
4935.00	41.20	---	9.52	50.72	---	74.00	54.00	-3.28	Peak

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. 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.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Result = Reading + Correction Factor  
Margin = Result - Limit  
Remark Peak = Result(PK) - Limit(AV)  
Remark AVG = Result(AV) - Limit(AV)



<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2012/10/26
<b>Test Mode</b>	IEEE 802.11n HT40 TX / CH Low	<b>Temp. &amp; Humidity</b>	24°C, 52%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1908.00	46.56	---	1.42	47.98	---	74.00	54.00	-6.02	Peak
2034.00	46.60	---	2.37	48.97	---	74.00	54.00	-5.03	Peak
2314.00	53.55	38.30	3.32	56.87	41.62	74.00	54.00	-12.38	AVG
2532.00	46.83	---	4.02	50.85	---	74.00	54.00	-3.15	Peak
3225.00	42.61	---	5.46	48.07	---	74.00	54.00	-5.93	Peak
4095.00	40.44	---	7.41	47.84	---	74.00	54.00	-6.16	Peak
5025.00	39.75	---	9.72	49.47	---	74.00	54.00	-4.53	Peak
6075.00	39.25	---	11.73	50.98	---	74.00	54.00	-3.02	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1976.00	47.41	---	2.03	49.45	---	74.00	54.00	-4.55	Peak
2526.00	56.14	44.76	4.00	60.14	48.76	74.00	54.00	-5.24	AVG
2660.00	50.62	34.13	4.29	54.91	38.42	74.00	54.00	-15.58	AVG
2918.00	45.13	---	4.83	49.96	---	74.00	54.00	-4.04	Peak
3225.00	49.70	45.20	5.46	55.16	50.66	74.00	54.00	-3.34	AVG
4125.00	40.79	---	7.48	48.27	---	74.00	54.00	-5.73	Peak
5115.00	39.44	---	9.85	49.29	---	74.00	54.00	-4.71	Peak
5790.00	39.90	---	11.07	50.98	---	74.00	54.00	-3.02	Peak

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. 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.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Result = Reading + Correction Factor  
Margin = Result - Limit  
Remark Peak = Result(PK) - Limit(AV)  
Remark AVG = Result(AV) - Limit(AV)





<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2012/10/26
<b>Test Mode</b>	IEEE 802.11n HT40 TX / CH Middle	<b>Temp. &amp; Humidity</b>	24°C, 52%

**966 Chamber\_B at 3Meter / Horizontal**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1626.00	49.10	---	-1.12	47.99	---	74.00	54.00	-6.01	Peak
2304.00	53.40	32.44	3.28	56.68	35.72	74.00	54.00	-18.28	AVG
2542.00	50.86	38.84	4.04	54.90	42.88	74.00	54.00	-11.12	AVG
2766.00	45.67	---	4.51	50.18	---	74.00	54.00	-3.82	Peak
3255.00	44.02	---	5.52	49.54	---	74.00	54.00	-4.46	Peak
4020.00	40.64	---	7.23	47.86	---	74.00	54.00	-6.14	Peak
5010.00	39.55	---	9.70	49.26	---	74.00	54.00	-4.74	Peak
5250.00	39.79	---	10.03	49.82	---	74.00	54.00	-4.18	Peak

**966 Chamber\_B at 3Meter / Vertical**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
2332.00	61.04	48.50	3.38	64.42	51.88	74.00	54.00	-2.12	AVG
2542.00	57.46	46.59	4.04	61.50	50.63	74.00	54.00	-3.37	AVG
2746.00	46.49	---	4.47	50.95	---	74.00	54.00	-3.05	Peak
2922.00	45.40	---	4.84	50.23	---	74.00	54.00	-3.77	Peak
3255.00	50.45	46.57	5.52	55.97	52.09	74.00	54.00	-1.91	AVG
4350.00	40.33	---	8.01	48.35	---	74.00	54.00	-5.65	Peak
4875.00	40.49	---	9.36	49.85	---	74.00	54.00	-4.15	Peak
6015.00	38.95	---	11.61	50.56	---	74.00	54.00	-3.44	Peak

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. 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.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Result = Reading + Correction Factor  
Margin = Result - Limit  
Remark Peak = Result(PK) - Limit(AV)  
Remark AVG = Result(AV) - Limit(AV)



<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2012/10/26
<b>Test Mode</b>	IEEE 802.11n HT40 TX / CH High	<b>Temp. &amp; Humidity</b>	24°C, 52%

**966 Chamber\_B at 3Meter / Horizontal**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1634.00	48.92	---	-1.04	47.87	---	74.00	54.00	-6.13	Peak
1898.00	47.43	---	1.33	48.76	---	74.00	54.00	-5.24	Peak
2348.00	51.37	39.03	3.43	54.80	42.46	74.00	54.00	-11.54	AVG
2878.00	45.52	---	4.74	50.26	---	74.00	54.00	-3.74	Peak
3270.00	44.54	---	5.55	50.09	---	74.00	54.00	-3.91	Peak
3840.00	40.04	---	6.81	46.85	---	74.00	54.00	-7.15	Peak
4410.00	40.18	---	8.16	48.34	---	74.00	54.00	-5.66	Peak
5250.00	39.40	---	10.03	49.43	---	74.00	54.00	-4.57	Peak

**966 Chamber\_B at 3Meter / Vertical**

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
2342.00	57.05	45.26	3.41	60.46	48.67	74.00	54.00	-5.33	AVG
2558.00	55.33	43.95	4.07	59.40	48.02	74.00	54.00	-5.98	AVG
2830.00	45.68	---	4.64	50.33	---	74.00	54.00	-3.67	Peak
2952.00	45.30	---	4.90	50.20	---	74.00	54.00	-3.80	Peak
3270.00	50.53	47.84	5.55	56.08	53.39	74.00	54.00	-0.61	AVG
3630.00	41.09	---	6.32	47.41	---	74.00	54.00	-6.59	Peak
3975.00	40.27	---	7.12	47.39	---	74.00	54.00	-6.61	Peak
4920.00	40.28	---	9.48	49.75	---	74.00	54.00	-4.25	Peak

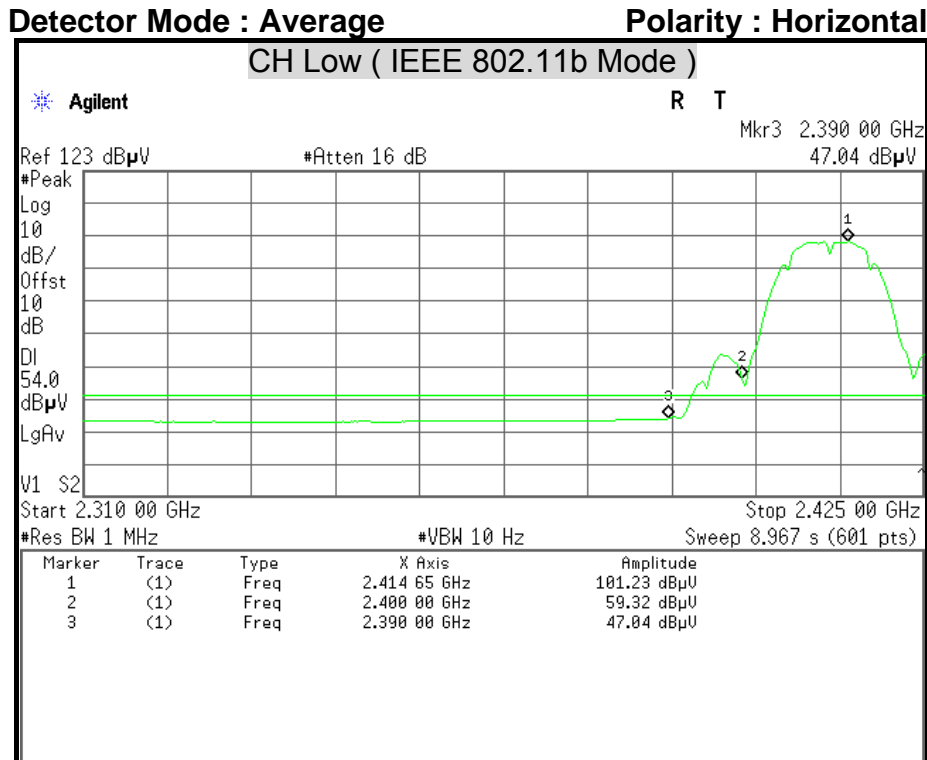
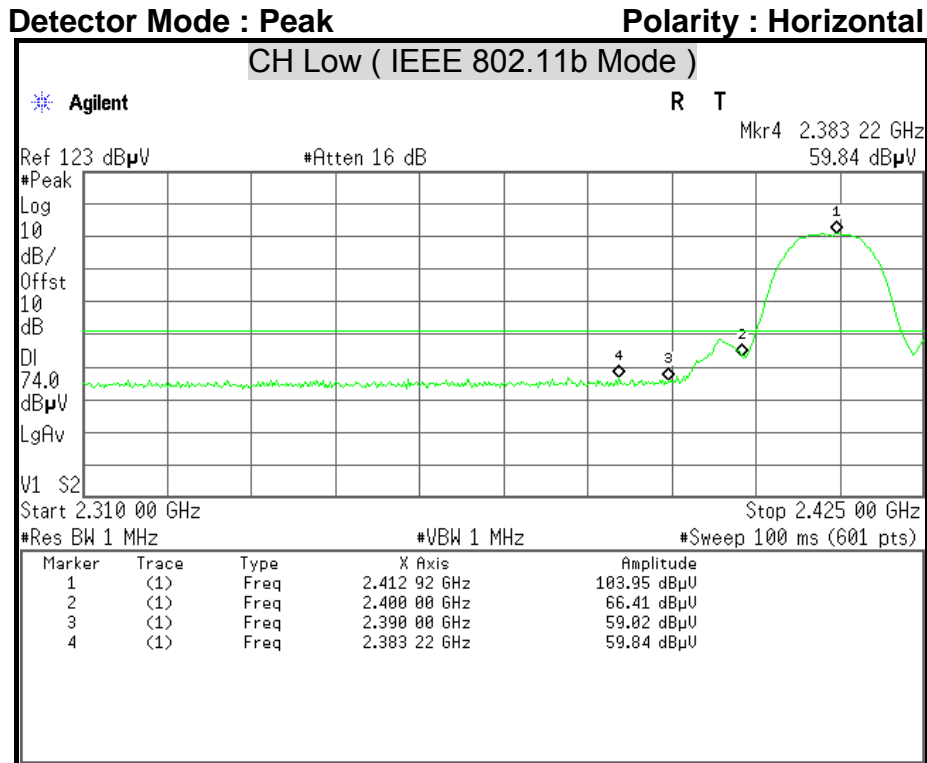
**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. 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.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Result = Reading + Correction Factor  
Margin = Result - Limit  
Remark Peak = Result(PK) - Limit(AV)  
Remark AVG = Result(AV) - Limit(AV)





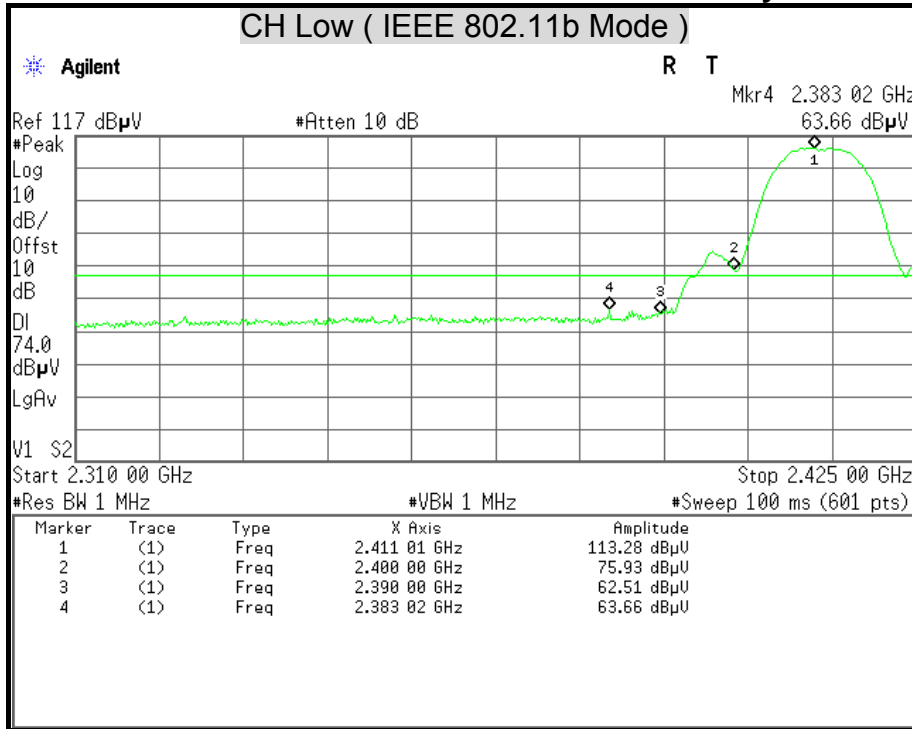
Restricted Band Edges





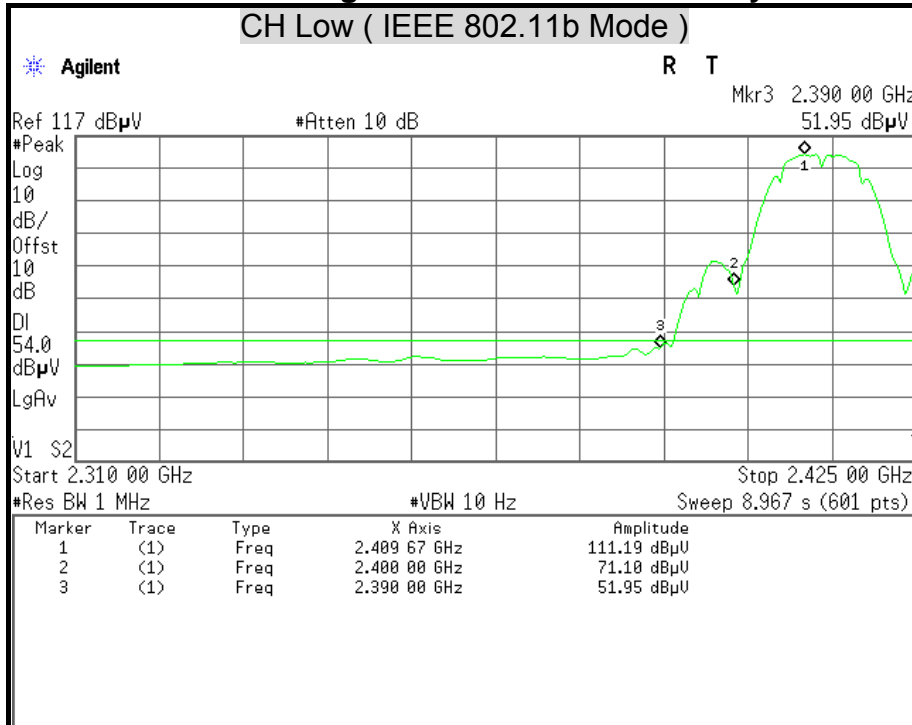
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

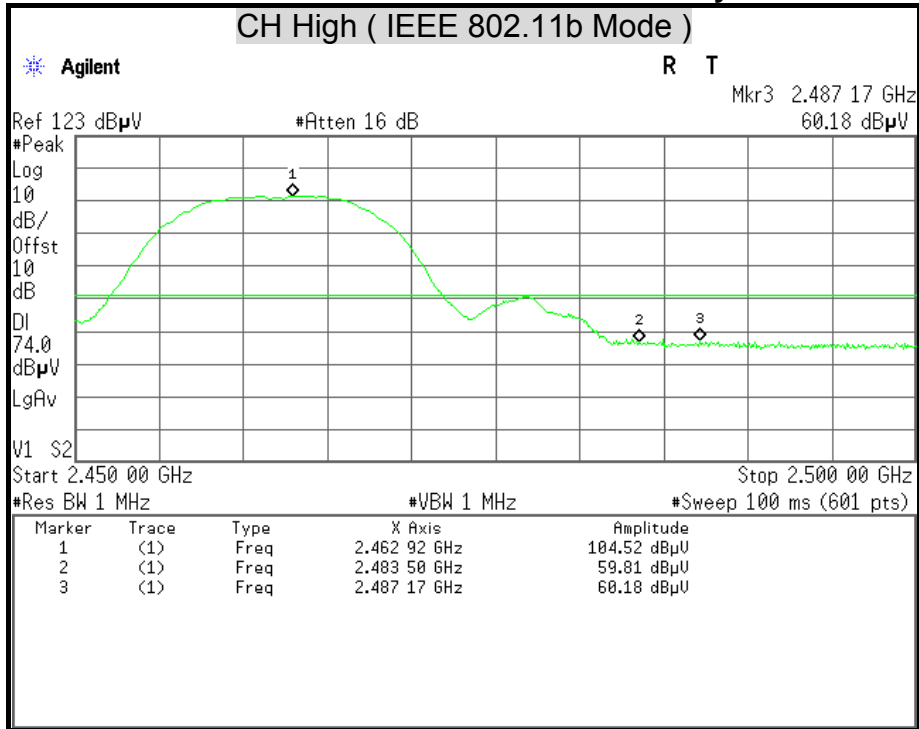
Polarity : Vertical





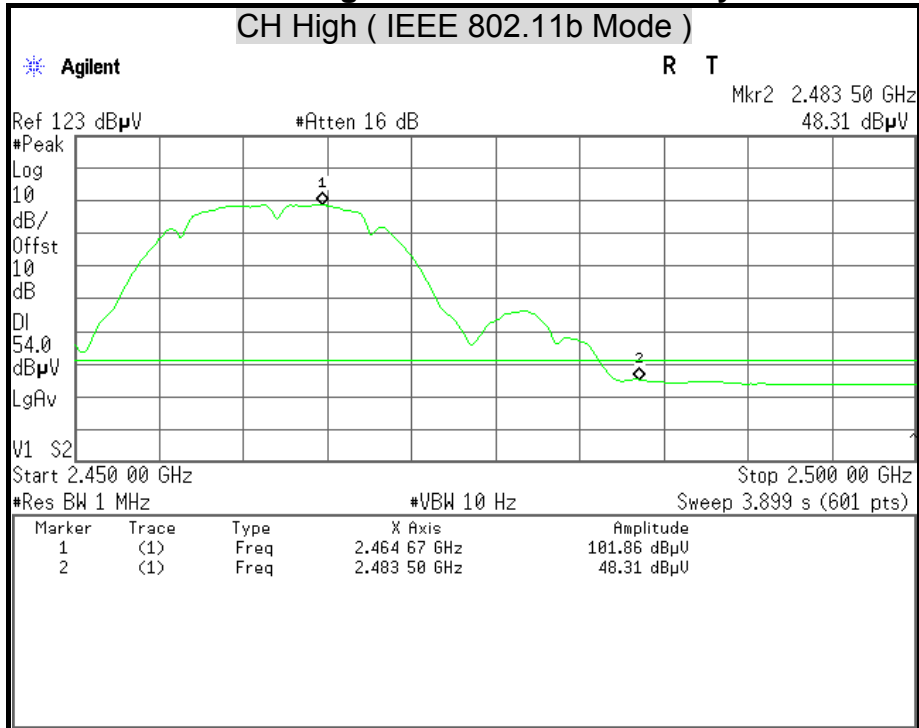
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

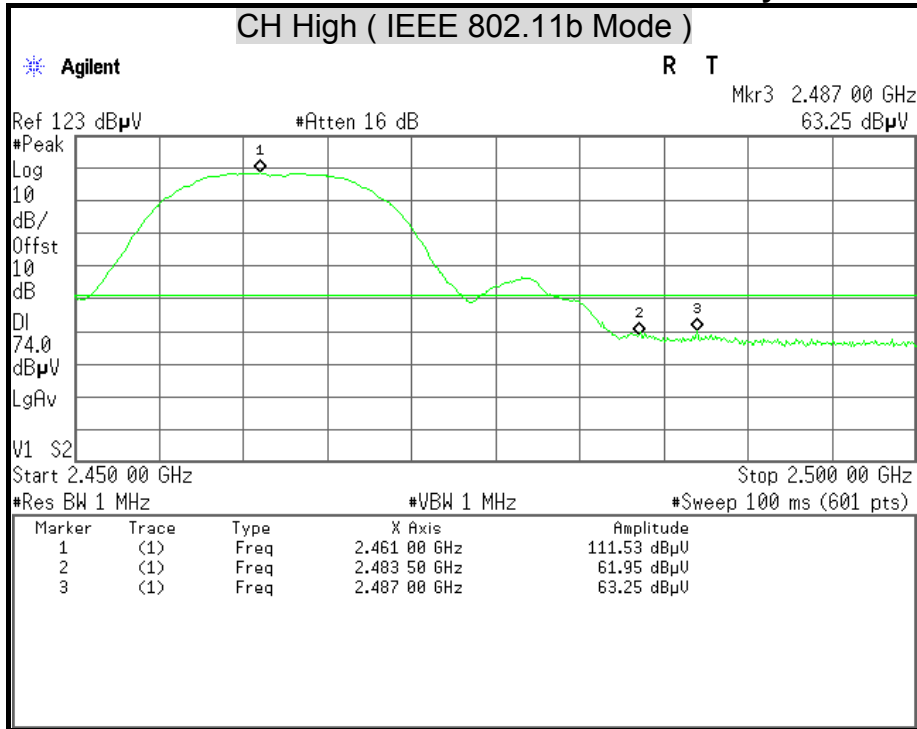
Polarity : Horizontal





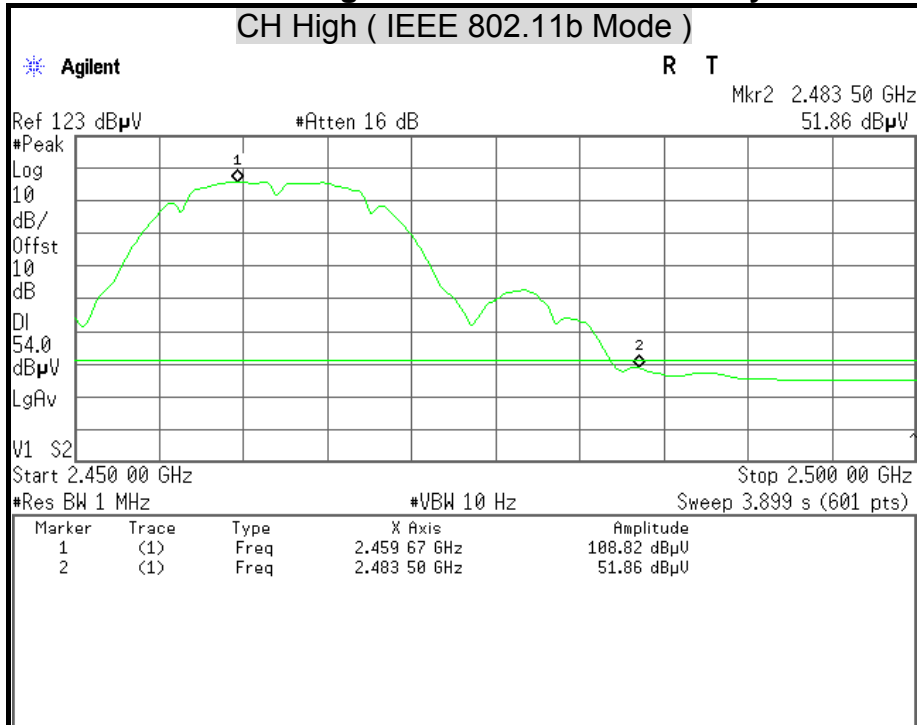
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

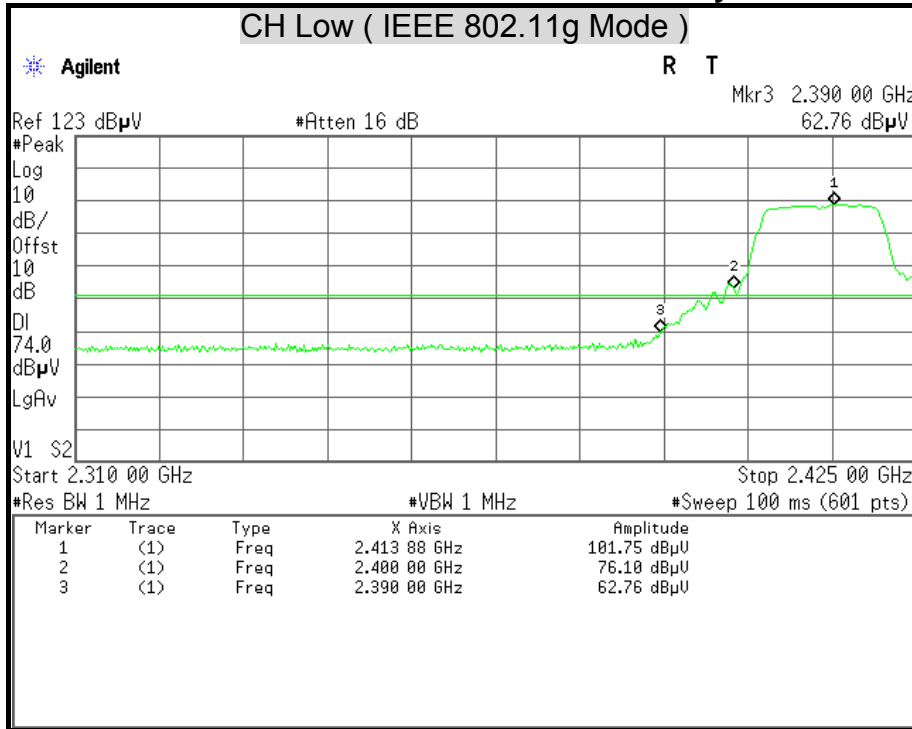
Polarity : Vertical





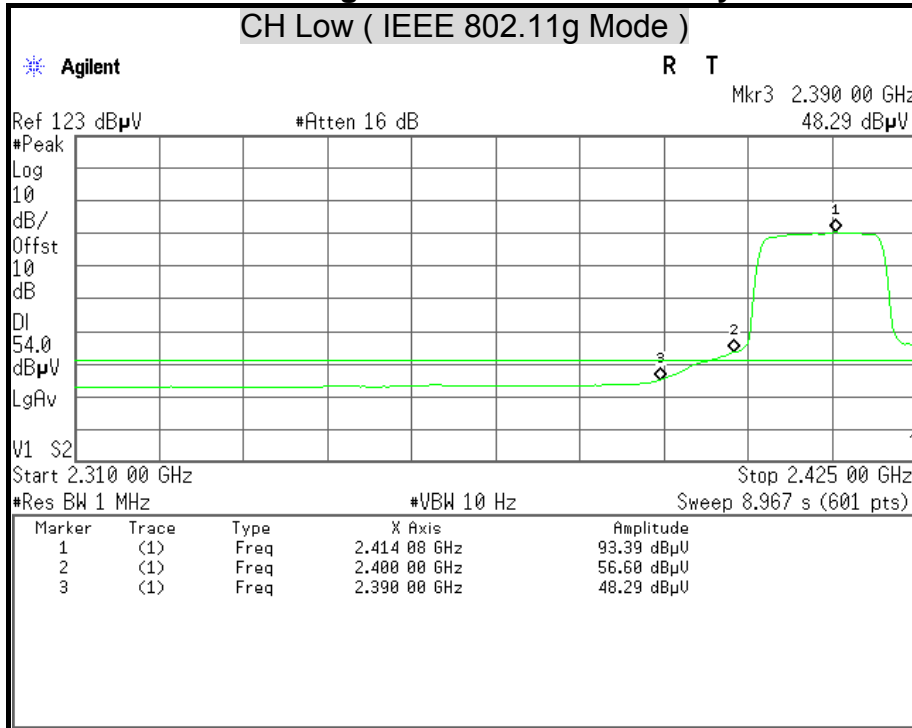
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

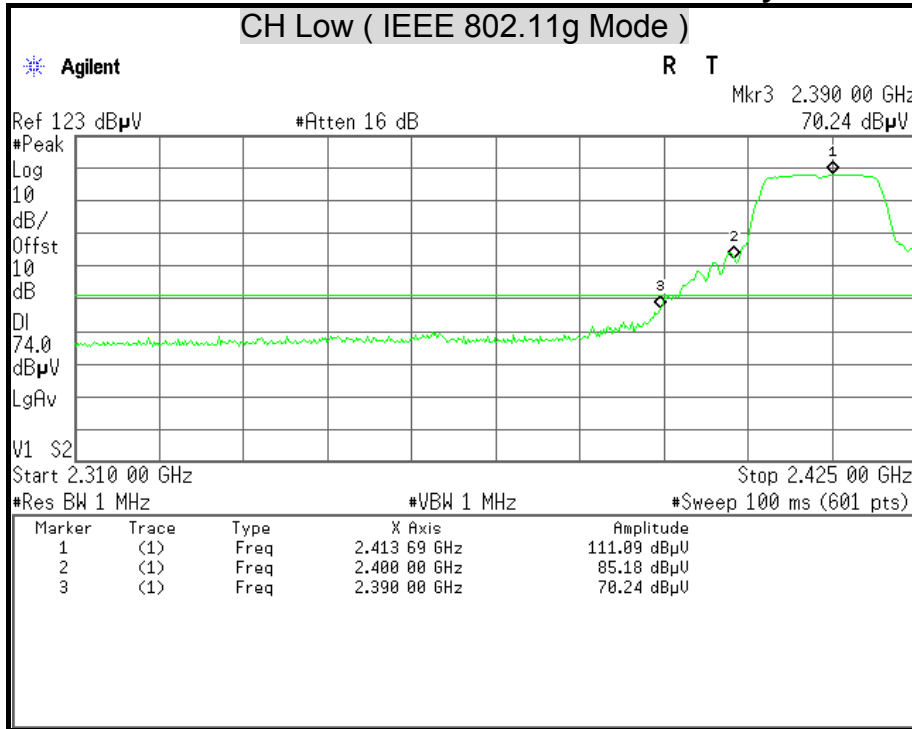
Polarity : Horizontal





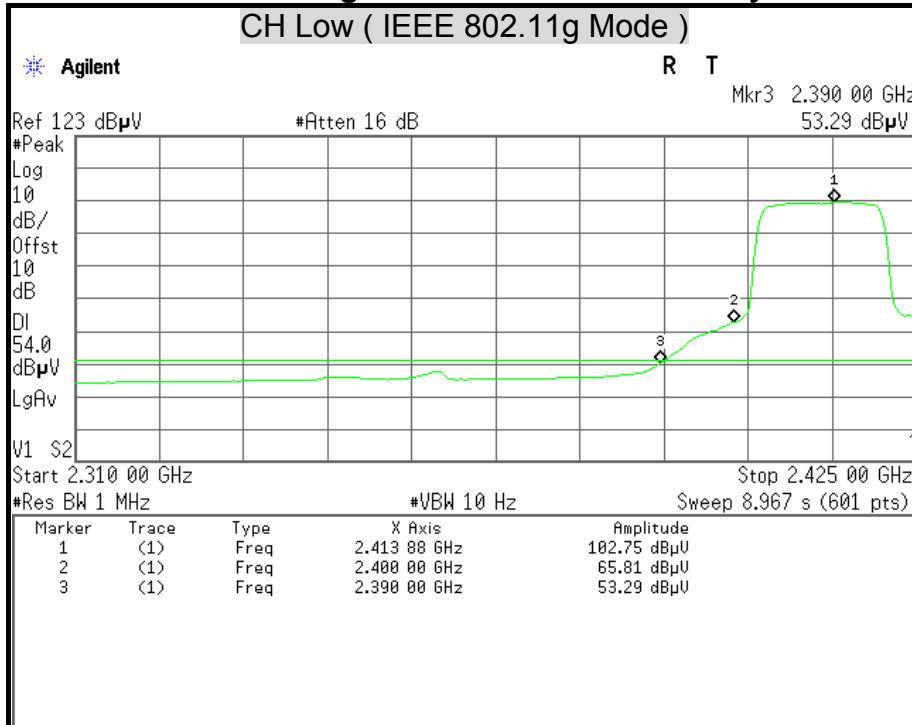
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

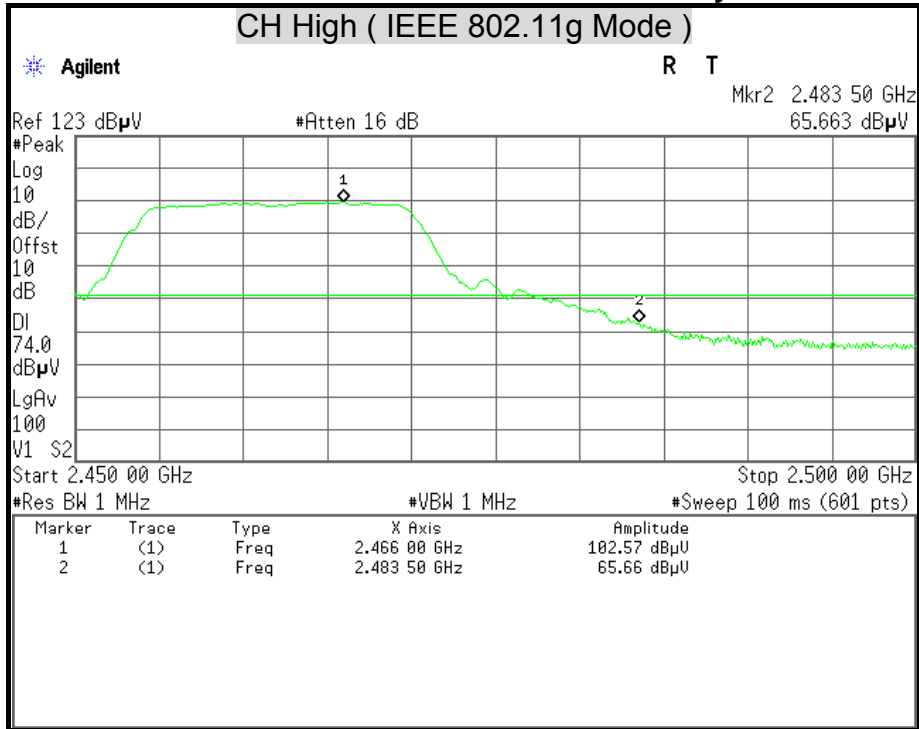
Polarity : Vertical





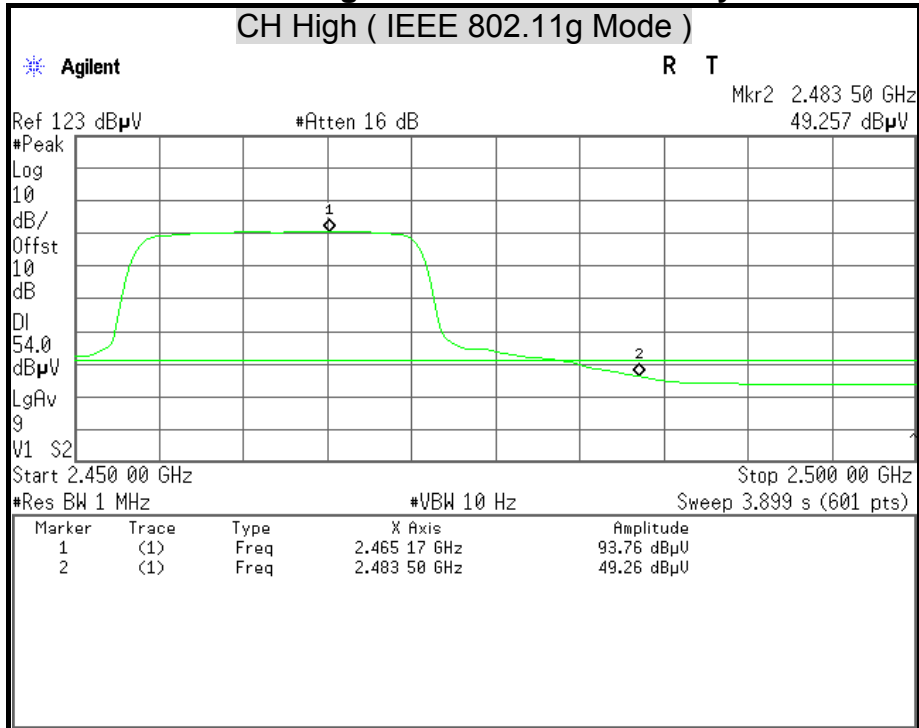
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

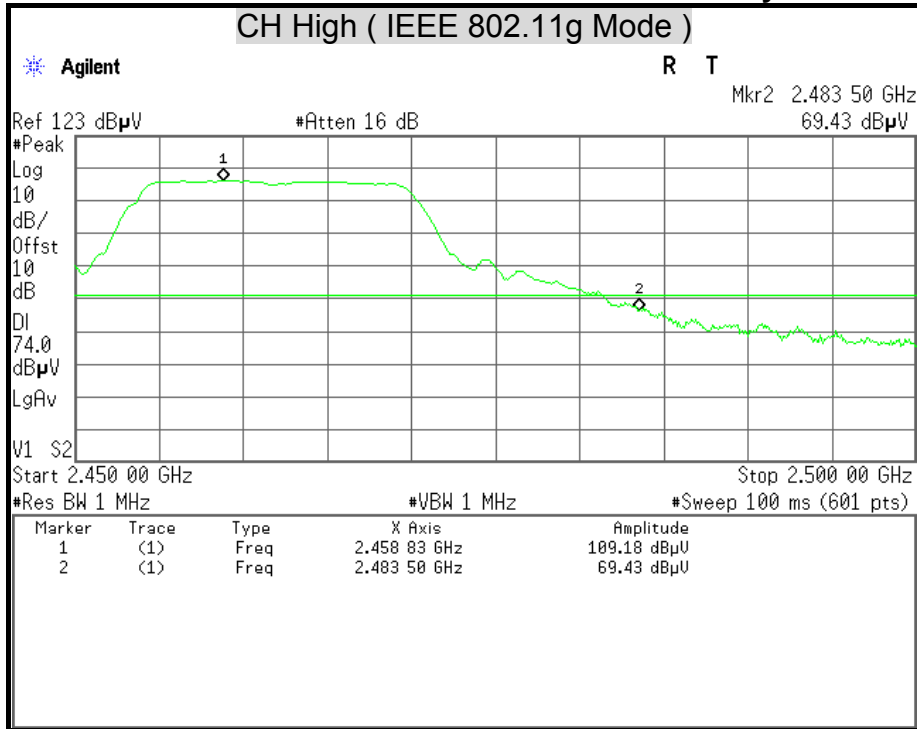
Polarity : Horizontal





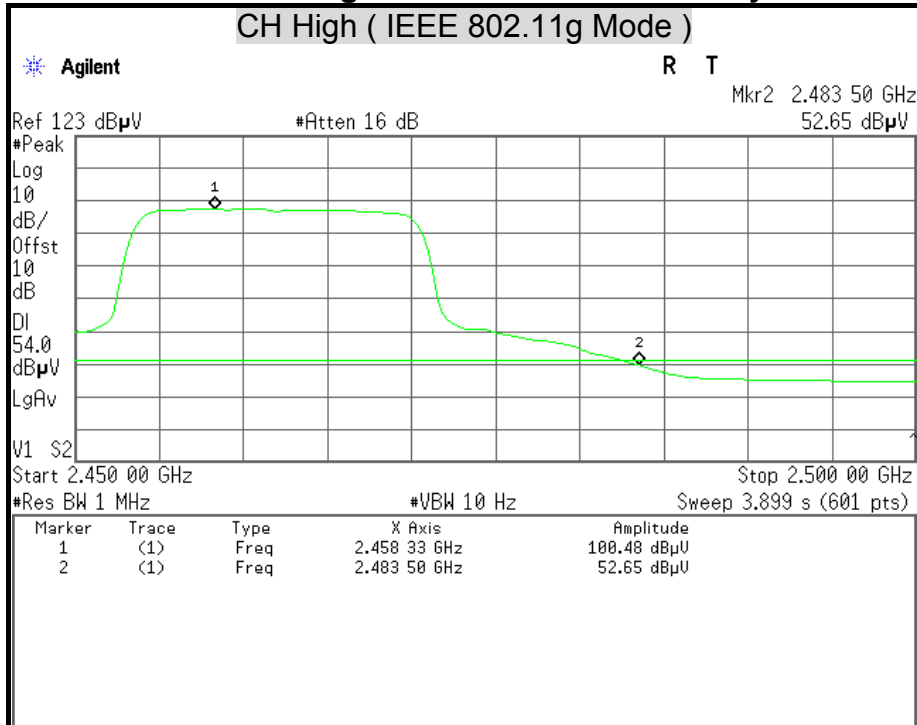
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

Polarity : Vertical

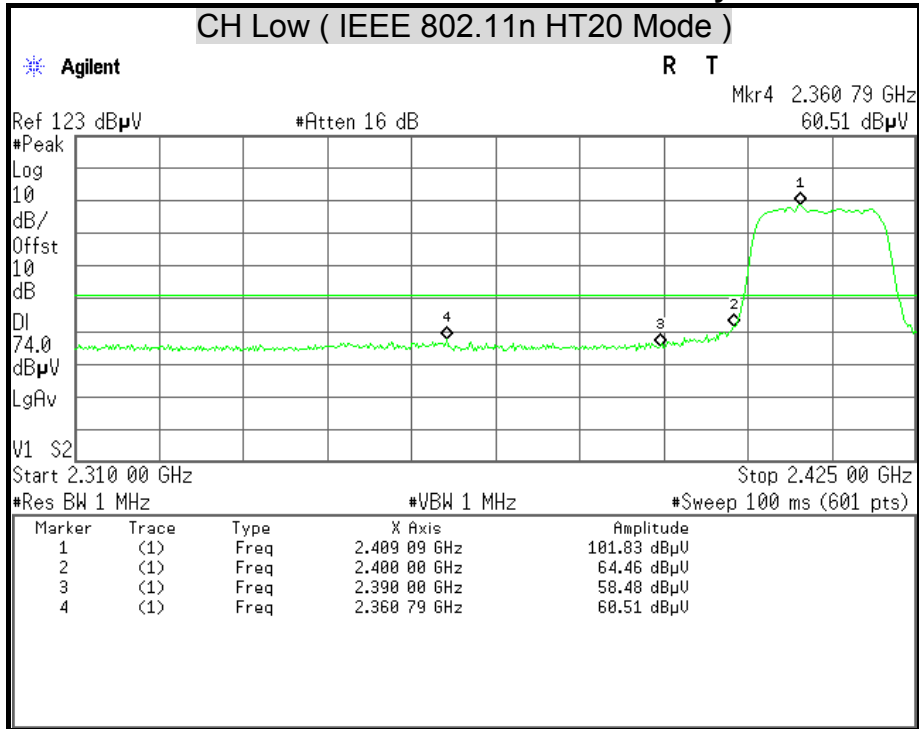






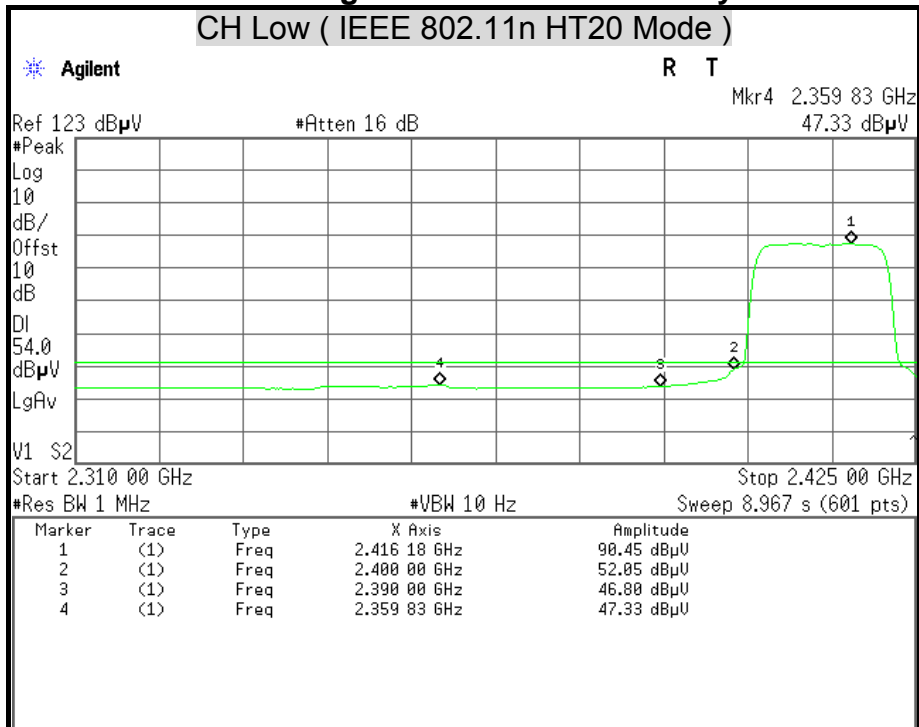
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

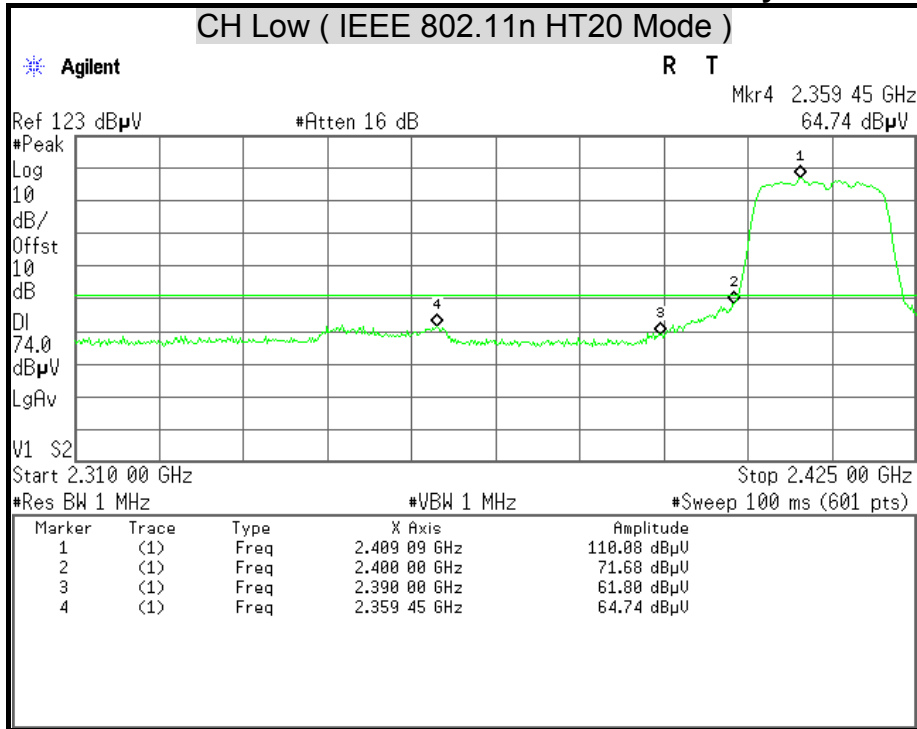
Polarity : Horizontal





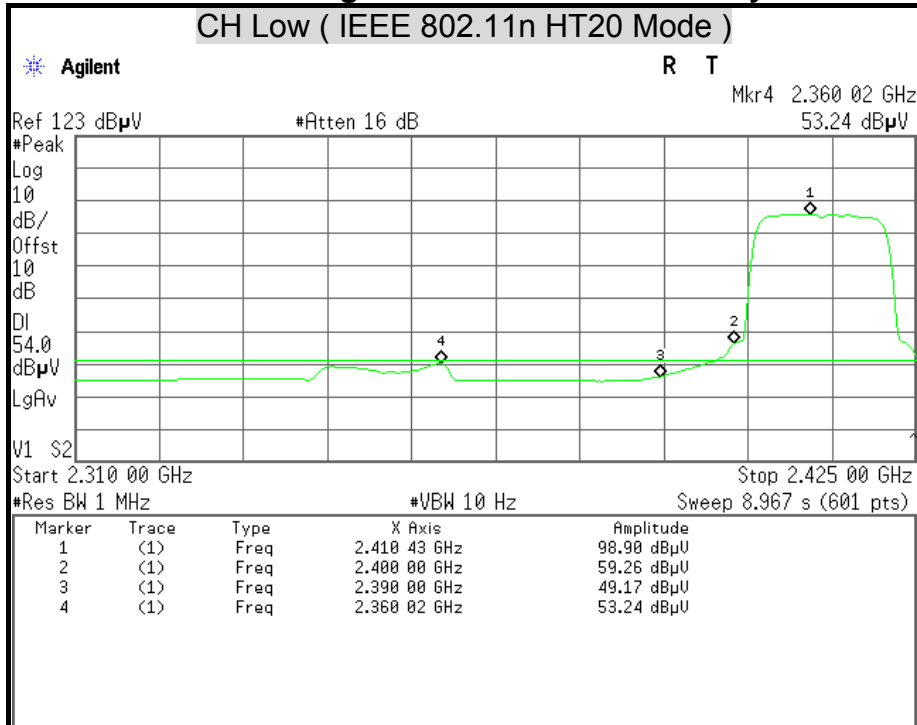
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

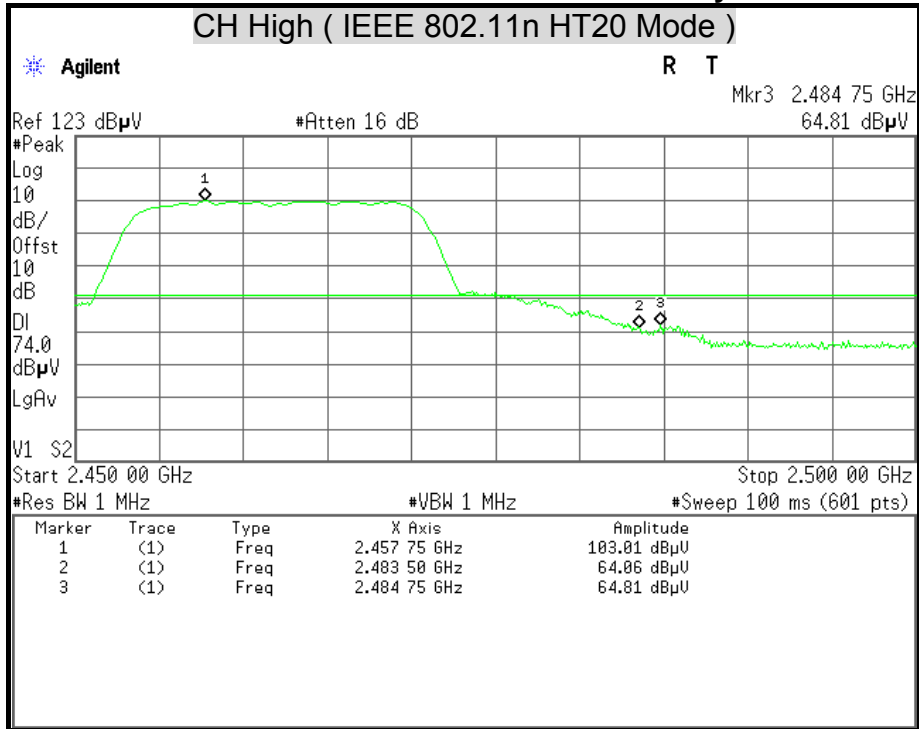
Polarity : Vertical





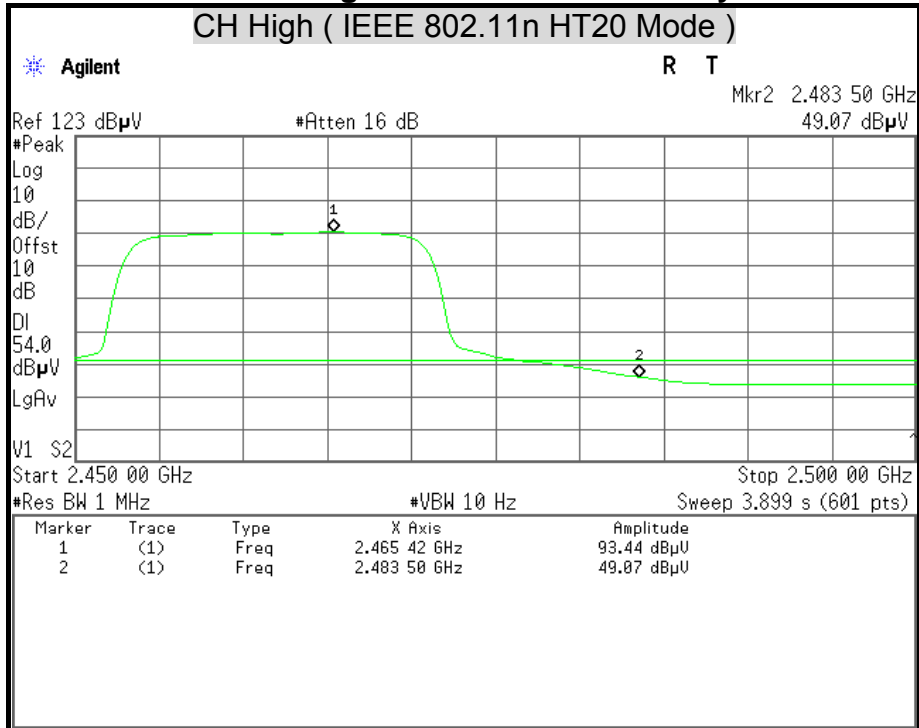
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

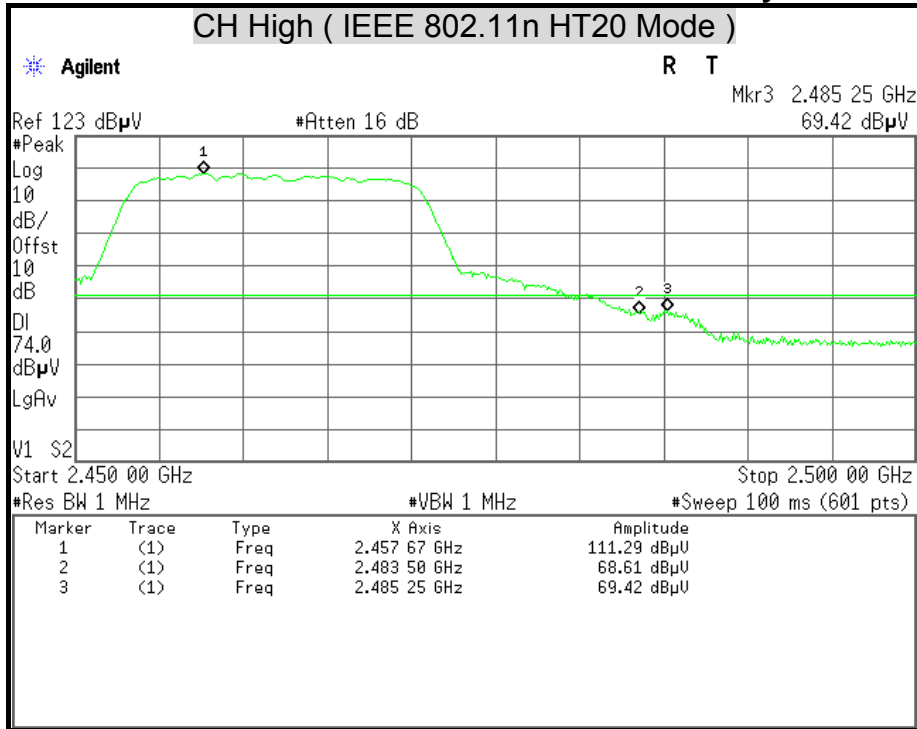
Polarity : Horizontal





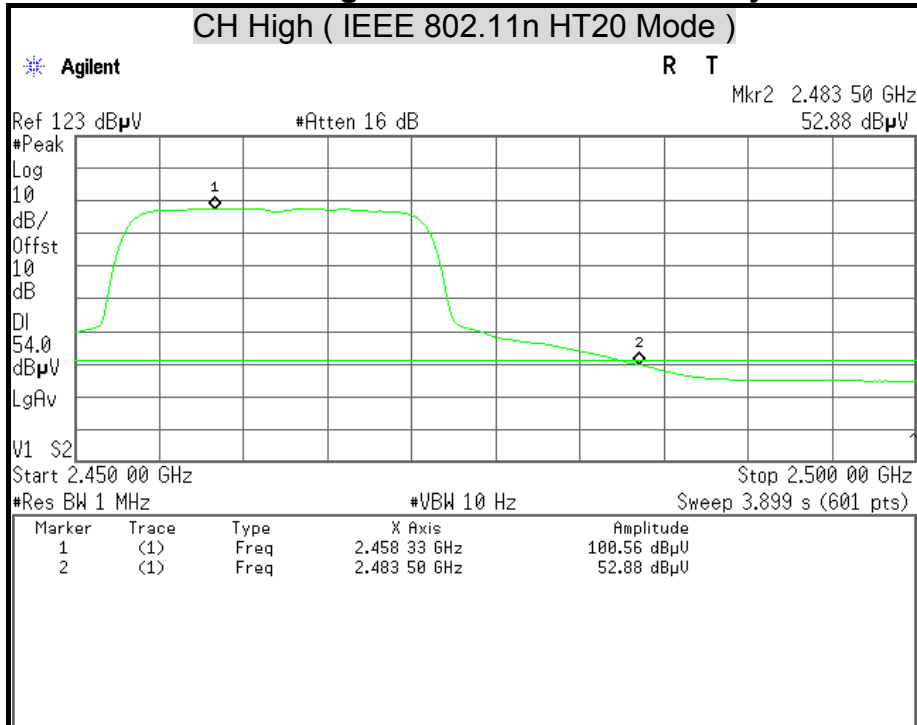
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

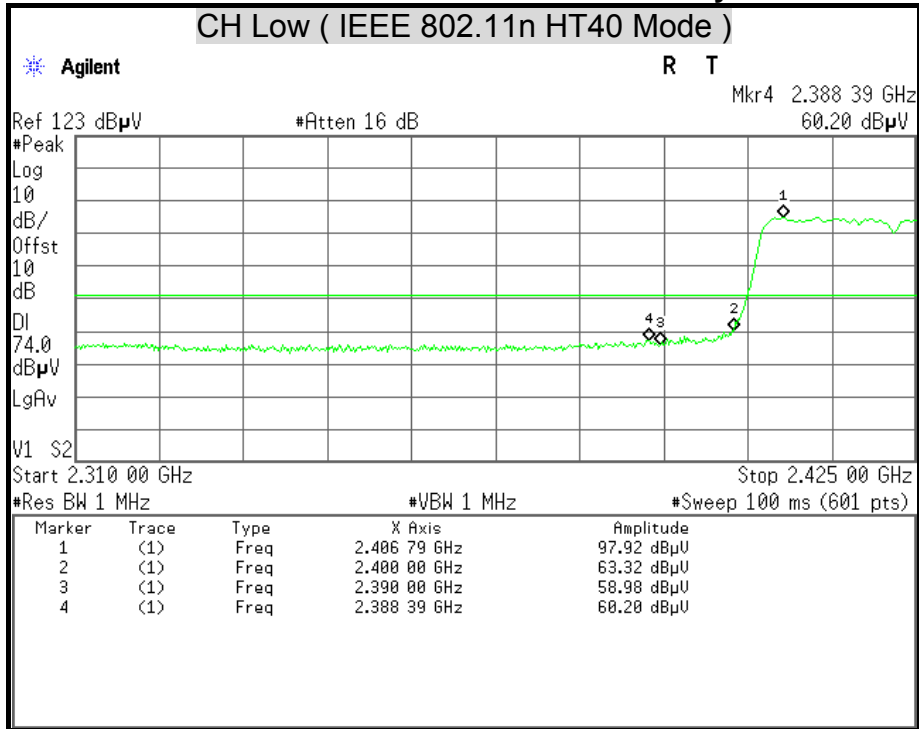
Polarity : Vertical





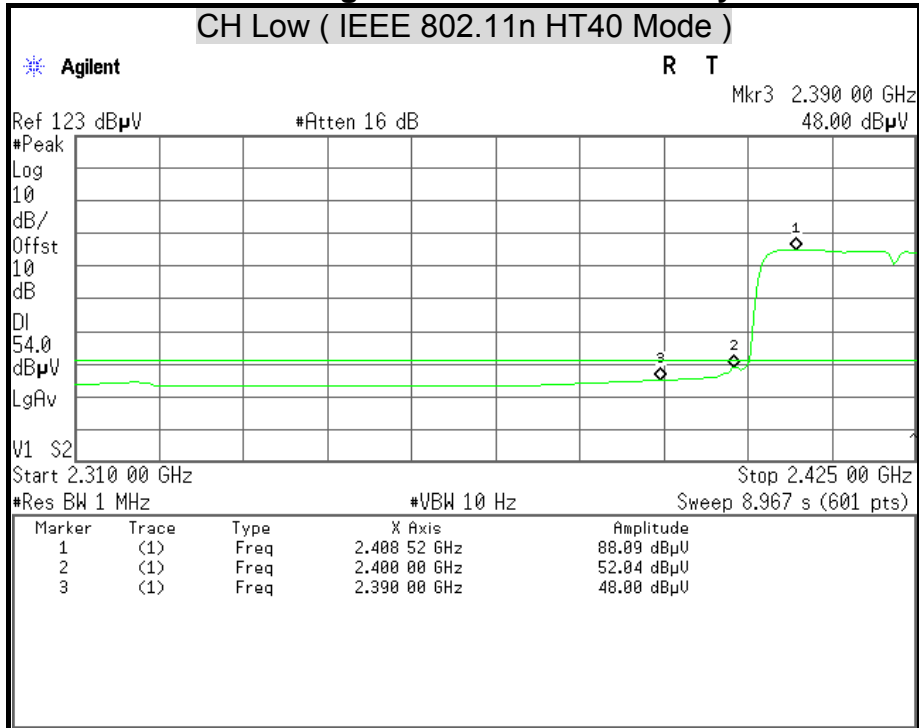
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

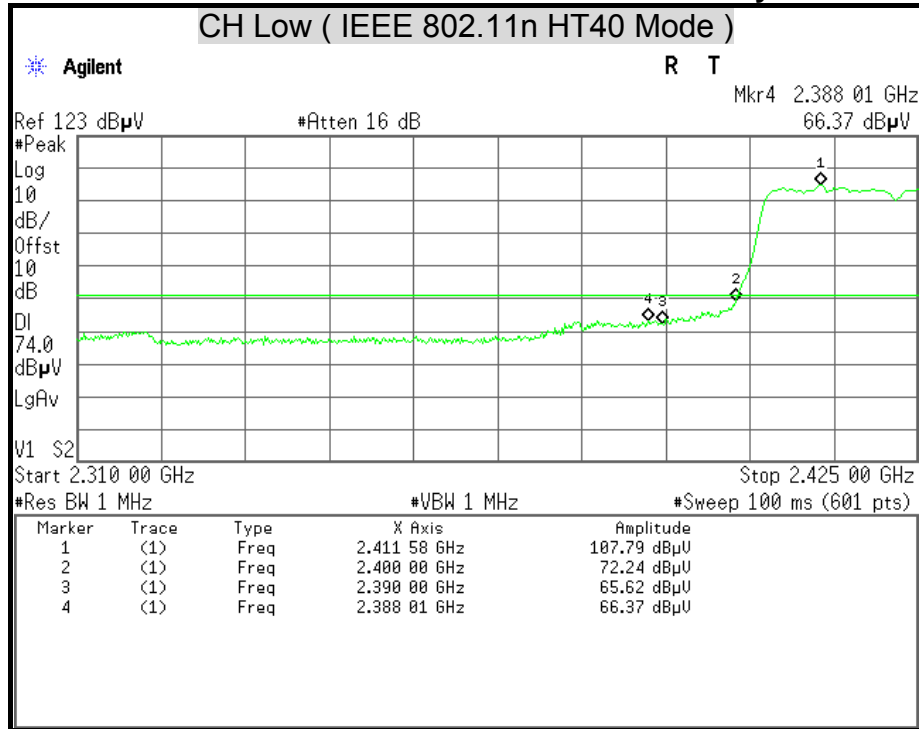
Polarity : Horizontal





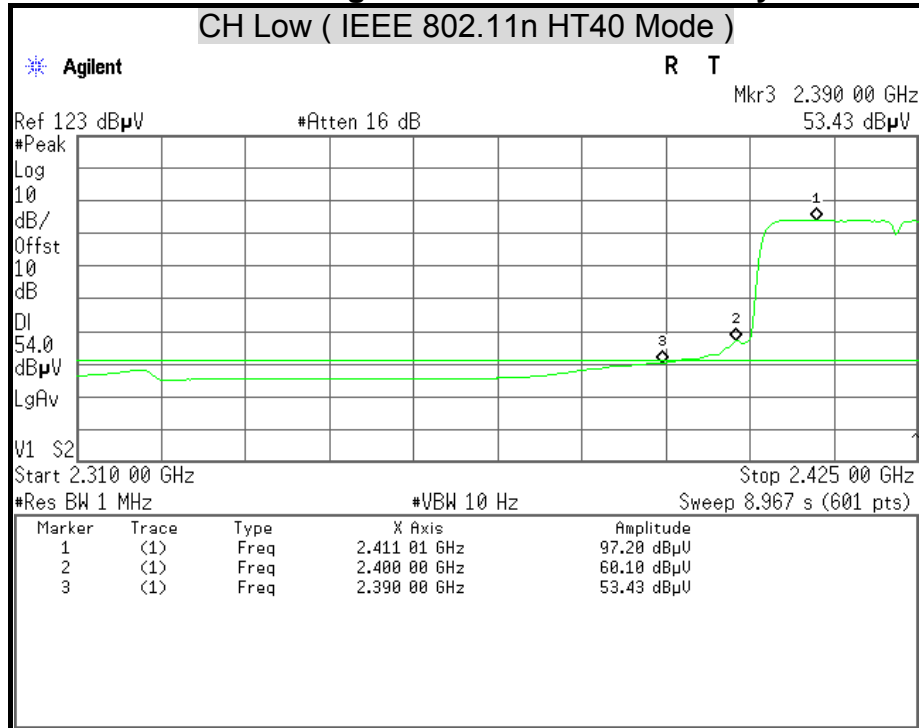
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

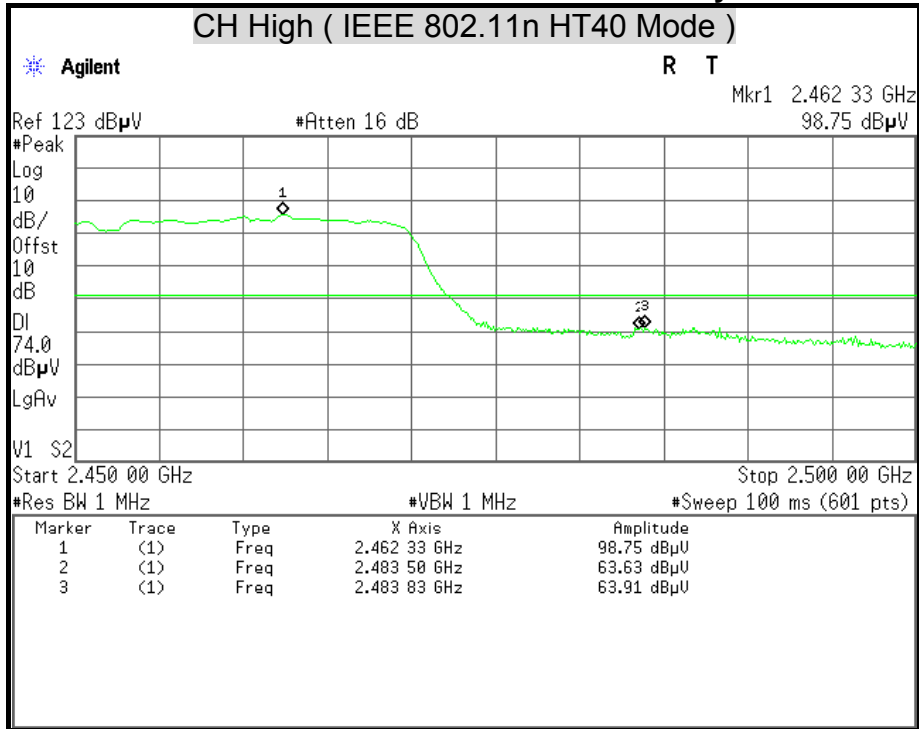
Polarity : Vertical





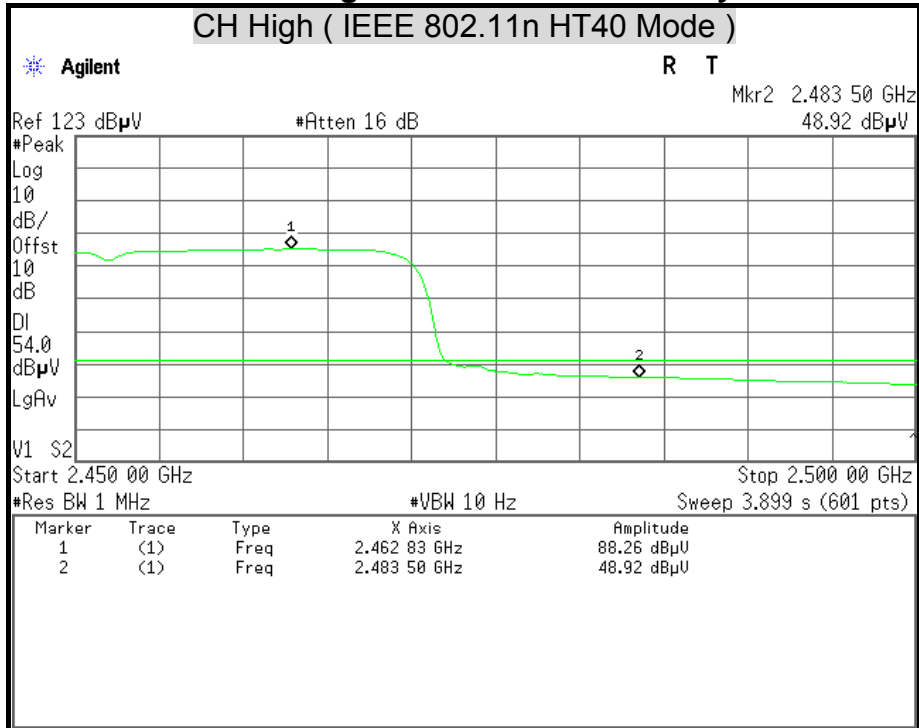
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

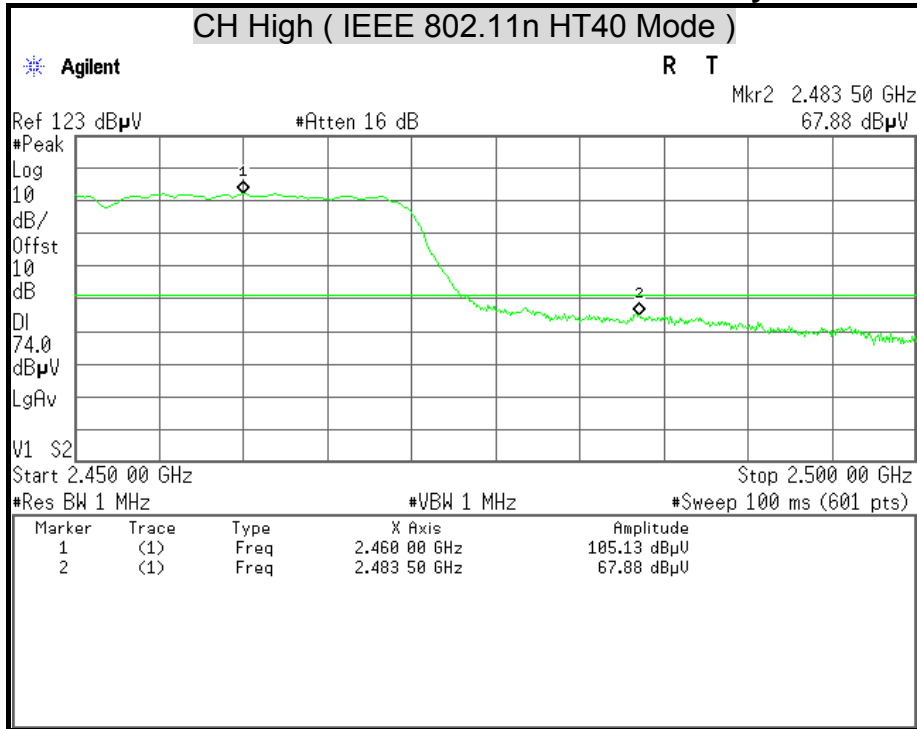
Polarity : Horizontal





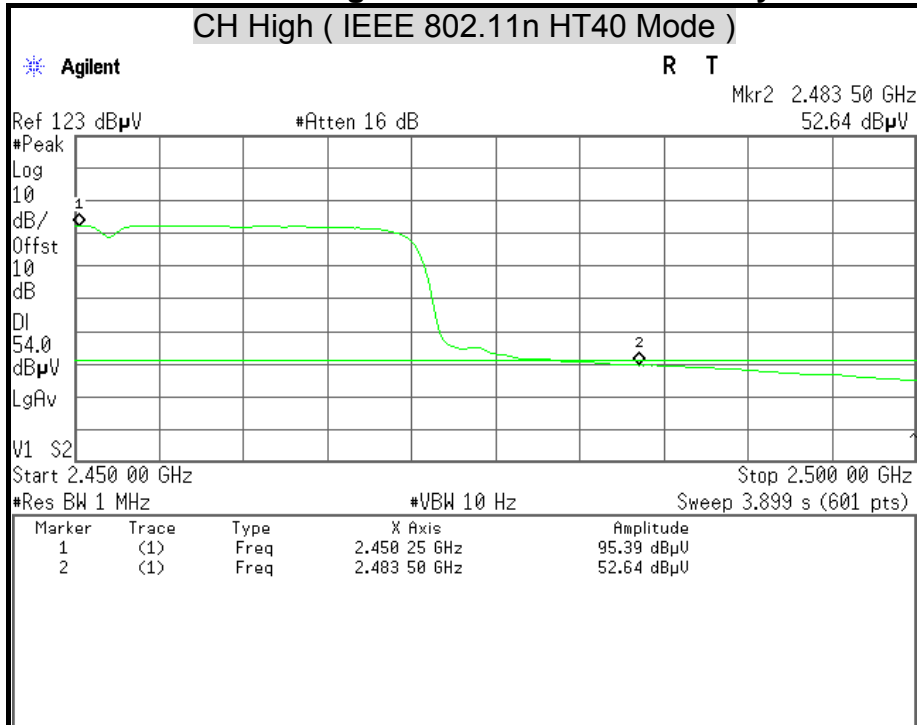
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

Polarity : Vertical







## 7.7 CONDUCTED EMISSION

### 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  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Conducted Limit (dB $\mu$ v)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5.00	56	46
5.00 - 30.0	60	50

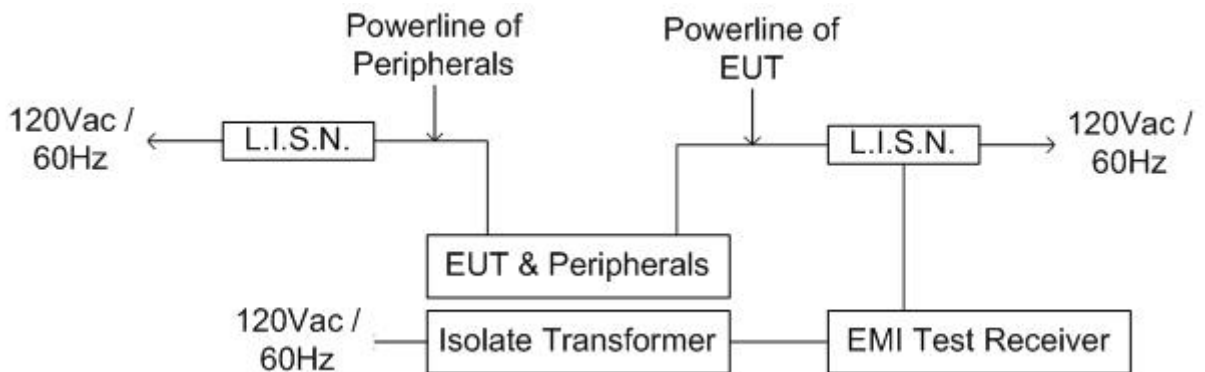
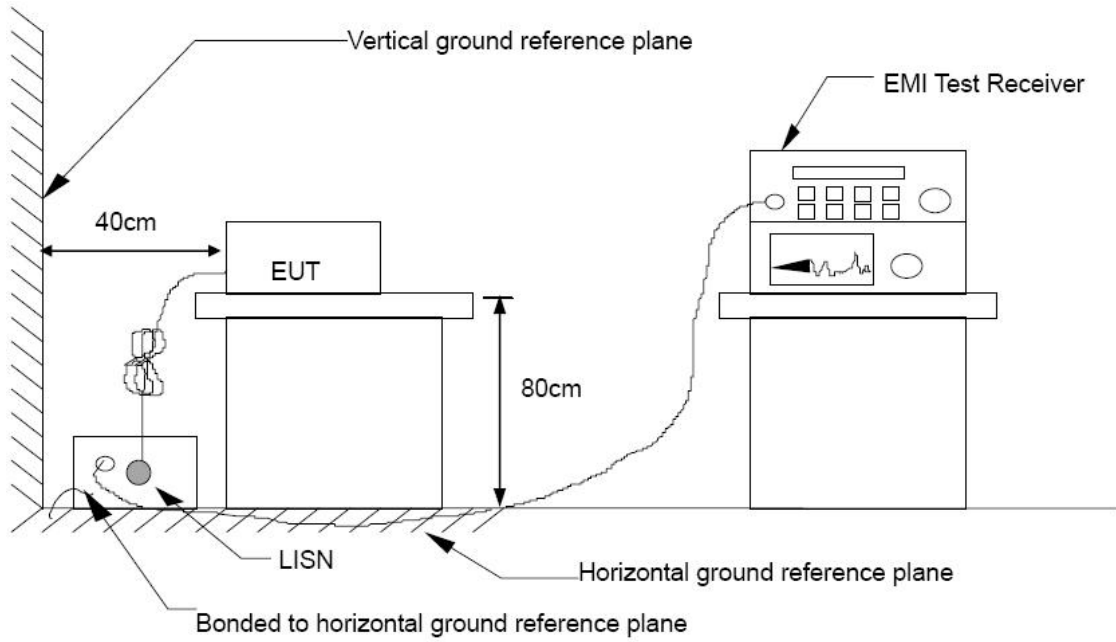
### TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-465	08/07/2013
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-473	03/12/2013
EMI Receiver	ROHDE & SCHWARZ	ESCS 30	835418/008	10/16/2013
Pulse Limiter	ROHDE & SCHWARZ	ESH3-Z2	100117	07/03/2013

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



**TEST SETUP**





## **TEST PROCEDURE**

The basic test procedure was in accordance with ANSI C63.4:2003.

The test procedure is performed in a 4m × 3m × 2.4m (L×W×H) shielded room.

The EUT along with its peripherals were placed on a 1.0m (W) × 1.5m (L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.

The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.

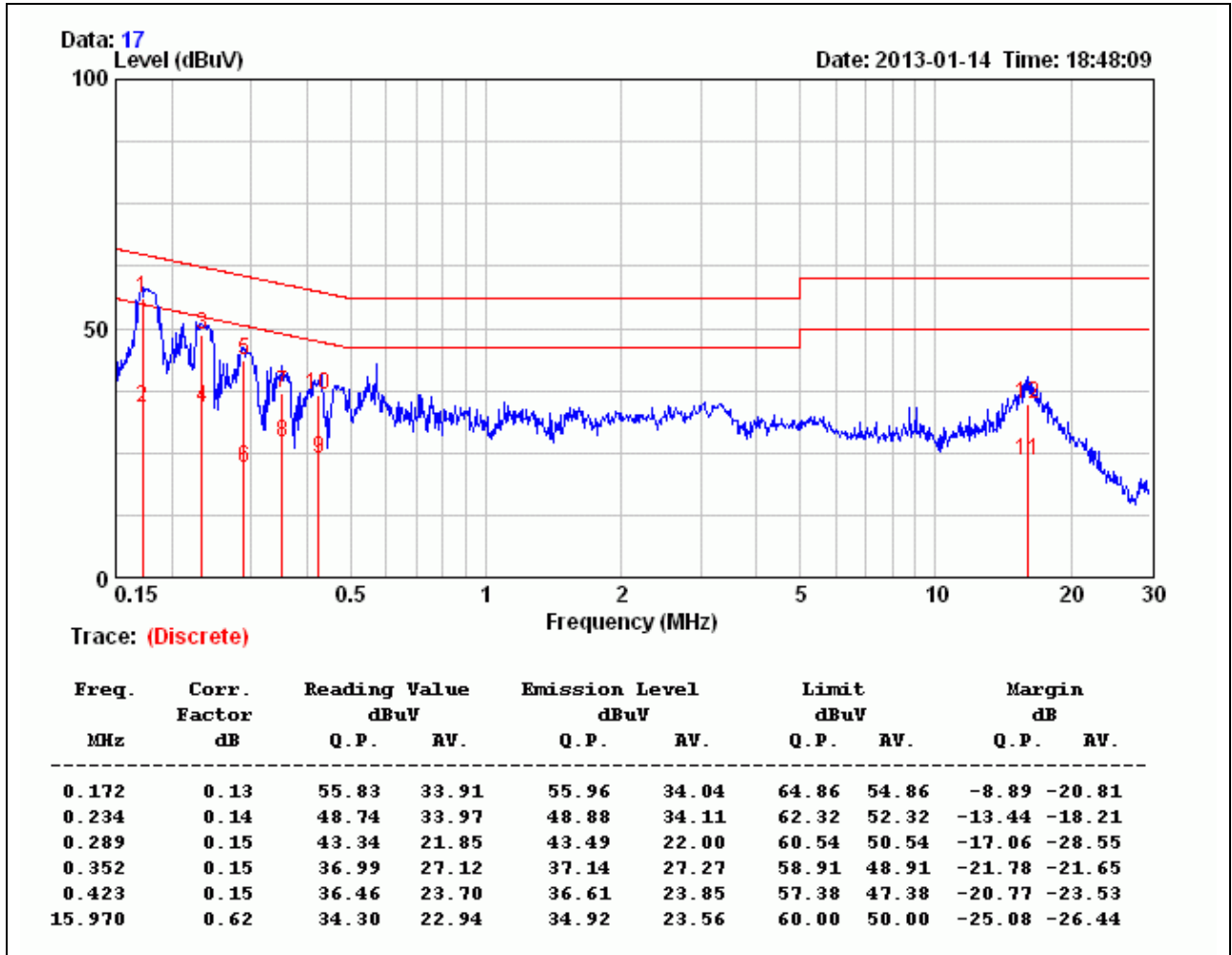
The EUT was located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8 m. Where a mains flexible cord was provided by the manufacturer shall be 1 m long, or if in excess of 1 m, the excess cable was folded back and forth as far as possible so as to form a bundle not exceeding 0.4 m in length.



TEST RESULTS

Product Name	Gigabit Wireless-N VPN ADSL2+ Router	Test By	Rueyyan Lin
Test Model	BiPAC 7600NX	Test Date	2013/01/14
Test Mode	Continuous Tx / 11b CH Middle (worst case)	Temp. & Humidity	24.5°C, 58%

LINE



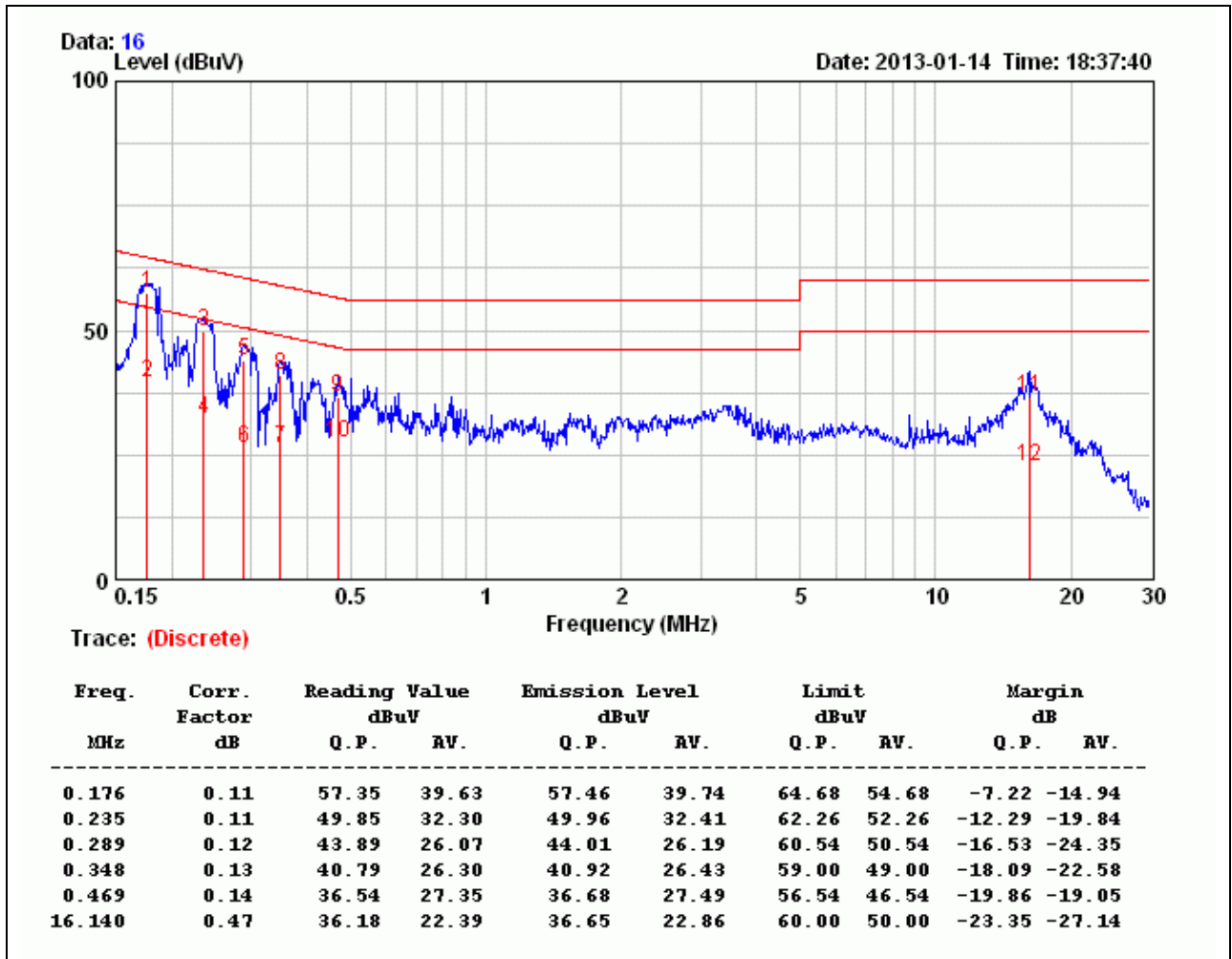
Remark:

1. Correction Factor = Insertion loss + Cable loss
2. Emission level = Reading Value + Correction factor
3. Margin value = Emission level - Limit value



<b>Product Name</b>	Gigabit Wireless-N VPN ADSL2+ Router	<b>Test By</b>	Rueyyan Lin
<b>Test Model</b>	BiPAC 7600NX	<b>Test Date</b>	2013/01/14
<b>Test Mode</b>	Continuous Tx / 11b CH Middle (worst case)	<b>Temp. &amp; Humidity</b>	24.5°C, 58%

NEUTRAL



Remark:

1. Correction Factor = Insertion loss + Cable loss
2. Emission level = Reading Value + Correction factor
3. Margin value = Emission level - Limit value



### APPENDIX I MAXIMUM PERMISSIBLE EXPOSURE

According to FCC 1.1310 : The criteria listed in the following table shall be used to evaluate the environment 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 <sup>2</sup> )	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:

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

Changing to units of mW and cm, using:

$$P (mW) = P (W) / 1000 \text{ and}$$

$$d (cm) = d(m) / 100$$

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<sup>2</sup>



**LIMIT**

Power Density Limit, S=1.0mW/cm<sup>2</sup>

**TEST RESULTS**

Mode	Antenna Gain (dBi)	Minimum separation distance (cm)	Output Power (dBm)	Total Power (dBm)	Numeric antenna gain (mW)	Power Density Limit (mW/cm <sup>2</sup> )	Power Density at 20cm (mW/cm <sup>2</sup> )
IEEE 802.11b	2.09	20	20.98	20.98	1.62	1.00	0.040339
IEEE 802.11g	2.09	20	24.01	24.01	1.62	1.00	0.081044
IEEE 802.11n HT20	2.09	20	23.43	26.23	1.62	1.00	0.135139
	2.09		23.00		1.62		
IEEE 802.11n HT40	2.09	20	22.86	25.67	1.62	1.00	0.118777
	2.09		22.45		1.62		

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