



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

For

Wireless IP CAM

Model : F7115

Trade Name : ZAVIO

Issued for

ZAVIO Inc.

**2F, No.13, R&D Rd.II, Science Based Industrial Park,
Hsinchu, Taiwan**

Issued by

Compliance Certification Services Inc.

Hsinchu Lab.

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	03/07/2011	Initial Issue	All Page 136	Kate Shi



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1. TEST REPORT CERTIFICATION

Applicant : ZAVIO Inc.
Address : 2F, No.13, R&D Rd.II, Science Based Industrial Park,
Hsinchu, Taiwan
Equipment Under Test : Wireless IP CAM
Model : F7115
Trade Name : ZAVIO
Tested Date : January 04 ~ March 07, 2011

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
Team Leader



2. EUT DESCRIPTION

2.1 DESCRIPTION OF EUT & POWER

Product Name	Wireless IP CAM
Model Number	F7115
Received Date	January 04, 2011
Frequency Range	IEEE 802.11b/g, 802.11n HT20 : 2412MHz~2462MHz IEEE 802.11n HT40 : 2422MHz~2452MHz
Transmit Power	IEEE 802.11b : 22.09 dBm (0.1618W) IEEE 802.11g : 21.54 dBm (0.1426W) IEEE 802.11n HT20 : 20.59 dBm (0.1147W) IEEE 802.11n HT40 : 18.91 dBm (0.0778W)
Channel Spacing	IEEE 802.11b/g, 802.11n HT20/HT40 : 5MHz
Channel Number	IEEE 802.11b/g : 11 Channels IEEE 802.11n HT40 : 7 Channels
Transmit Data Rate	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: 144.444, 130, 117, 115.556, 104, 86.667, 78, 72.2, 65, 58.5, 57.778, 52, 43.333, 39, 28.889, 26, 21.7, 19.5, 14.444, 13, 7.2, 6.5Mbps IEEE 802.11n HT40: 300, 270, 243, 240, 216, 180, 162, 150, 135, 121.5, 120, 108, 90, 81, 60, 54, 45, 40.5, 30, 27, 15, 13.5Mbps
Type of Modulation	IEEE 802.11b : DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g : OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20/40 : OFDM (64QAM, 16QAM, QPSK, BPSK)
Frequency Selection	by software / firmware
Antenna Type	Dipole Antenna x 2, Antenna Gain 2.17 dBi
DC Power Cord Type	Unshielded cable 1.5 m (no detachable) For DVE Unshielded cable 1.8 m (no detachable) For JENTEC
Power Rating	12Vdc
Test Voltage	120Vac/60Hz
I/O Port	RJ-45 port x 1, Audio In port x 1, Audio Out port x 1, SD Card port x 1, Video Out port x 1, DI/DO port x 2, RS-485 Port x 1, Power port x 1

Power Adapter :

No.	Manufacturer	Model No.	Power Input	Power Output
1	DVE	DSA-12CA-12 120100	100-240Vac, 0.3A, 50/60Hz	12Vdc, 1A
2	JENTEC	AH1212-B	100-240Vac, 0.3A, 50/60Hz	12Vdc, 1A

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. This submittal(s) (test report) is intended for FCC ID: WOR-5117F 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 IP CAM form factor. It has two transmitter chains and two receive chains (2x2 configurations).
11b/g mode, only Chain 0 transmitter.

Conducted Emission / Radiated Emission Test (Below 1 GHz)

1. The following test modes were scanned during the preliminary test:

No.	Pre-Test Mode
1	Normal Operating / Power Adapter (1)
2	Normal Operating / Power Adapter (2)

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode		
Emission	Radiated Emission	Normal Operating / Power Adapter (1) Normal Operating / Power Adapter (2)
	Conducted Emission	Normal Operating / Power Adapter (1) Normal Operating / Power Adapter (2)

Remark : Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.

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 : 6.5Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11n HT40 mode

The EUT had been tested under operating condition.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	2422
Middle	2437
High	2452

IEEE 802.11n HT40 mode : 13.5Mbps data rate (worst case) were chosen for full testing.



4. TEST METHODOLOGY

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

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.

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

Japan	VCCI
Taiwan	BSMI
USA	FCC MRA

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



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
Open Area Test Site (OATS No.3) / Radiated Emission, 30 to 200 MHz	+/- 3.6037
Open Area Test Site (OATS No.3) / Radiated Emission, 200 to 1000 MHz	+/- 3.5800
Semi Anechoic Chamber (966 Chamber) / Radiated Emission, 30 to 200 MHz	+/- 3.1747
Semi Anechoic Chamber (966 Chamber) / Radiated Emission, 200 to 1000 MHz	+/- 2.9091
Semi Anechoic Chamber (966 Chamber) / Radiated Emission, 1 to 18GHz	+/- 2.8272
Semi Anechoic Chamber (966 Chamber) / Radiated Emission, 18 to 26 GHz	+/- 2.8097
Semi Anechoic Chamber (966 Chamber) / Radiated Emission, 26 to 40 GHz	+/- 3.0510
Conducted Emission, 9kHz to 30MHz	+/- 1.5384

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	Latitude D610	CN-0C4708-48643-625-5565	DoC
2	Notebook PC	HP	ProBook 4421s	CNF03242PJ	DoC
3	Notebook PC	HP	ProBook 4421s	CNF03242PM	DoC
4	LCD Monitor	DELL	2407WFPb	CN-0FC255-46633-6CP-06JS	DoC
5	Headset/Micro phone	ERGOTECH	ET-E203	4719405008042	-----
6	SD Card	SanDisk	SDSDM-1024	BB07251CTE	-----
7	Wireless Gigabit Router	D-Link	DI-724GU	-----	-----

No.	Signal cable description
1	Unshielded RJ-45 cable, 12m x 1

SETUP DIAGRAM FOR TESTS

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

EUT OPERATING CONDITION

RF Mode

1. Set up whole system for test as shown on diagram.
2. Pc a fixed ip, into the Network Neighborhood to confirm EUT obtained ip
3. Run Putty software→IP address 192.168.1.121
4. Account: debuggerofzavio
5. Passsword:admin
6. su<enter>
 - iwpriv ra0 set ATE=ATESTART
 - iwpriv ra0 set ATEDA=00:11:22:33:44:55
 - iwpriv ra0 set ATESA=00:aa:bb:cc:dd:ee
 - iwpriv ra0 set ATEBSSID=00:11:22:33:44:55
 - iwpriv ra0 set ATECHANNEL=X (range 1~14)
 - iwpriv ra0 set ATETXANT=X (Ant0=1, Ant1=2, 2TX=0)
 - iwpriv ra0 set ATETXMODE=X (0 cck 1 ofdm 2 HT_Mix)



iwpriv ra0 set ATETXMCS=X (range 0~15)
iwpriv ra0 set ATETXBW=X (20M=0 ,40M=1)
iwpriv ra0 set ATETXGI=X (Long=0 ,Short=1)
iwpriv ra0 set ATETXLEN=1024
iwpriv ra0 set ATETXPOW0=X (range 0~31)
iwpriv ra0 set ATETXPOW1=X (range 0~31)
iwpriv ra0 set ATETXCNT=1000000000
iwpriv ra0 set ATE=TXFRAME

TX Mode:

- ⇒Tx Data Rate: 1Mbps (IEEE 802.11b mode)
6Mbps (IEEE 802.11g mode)
6.5Mbps (IEEE 802.11n HT20 mode)
13.5Mbps (IEEE 802.11n HT40 mode)
- ⇒Power control mode:
 - Power Set: IEEE 802.11b
 - Channel Low (2412MHz) =31 (only chain 0 TX)
 - Channel Middle (2437MHz) = 31 (only chain 0 TX)
 - Channel High (2462MHz) = 31 (only chain 0 TX)
 - Power Set: IEEE 802.11g
 - Channel Low (2412MHz) =31 (only chain 0 TX)
 - Channel Middle (2437MHz) =31 (only chain 0 TX)
 - Channel High (2462MHz) = 31 (only chain 0 TX)
 - Power Set: IEEE 802.11n HT20
 - Channel Low (2412MHz) =25 / 25 (chain 0 / 1 TX)
 - Channel Middle (2437MHz) =26 / 26 (chain 0 / 1 TX)
 - Channel High (2462MHz) = 25 / 25 (chain 0 / 1 TX)
 - Power Set: IEEE 802.11n HT40
 - Channel Low (2422MHz) =24 / 24 (chain 0 / 1 TX)
 - Channel Middle (2437MHz) =24 / 24 (chain 0 / 1 TX)
 - Channel High (2452MHz) = 18 / 18 (chain 0 / 1 TX)

7. All of the function are under run.
8. Start test.

Normal Mode

1. Setup whole system for test as shown on diagram.
2. Wireless Router to provide IP to the EUT.
3. Notebook PC ping 192.168.1.121 to EUT.
4. Notebook PC ping 192.168.0.151 to EUT.
5. Audio In/Out link Headset/Microphone.
6. SD card insert to SD Card Slot.
7. Video output to LCD Monitor.
8. All of the functions are under run.
9. Start test.



7. FCC PART 15.247 REQUIREMENTS

7.1 6dB BANDWIDTH

LIMITS

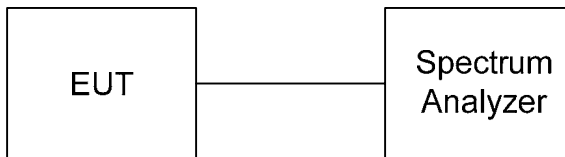
§ 15.247(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	AGILENT	E4446A	MY43360132	06/20/2011
Spectrum Analyzer	AGILENT	E4446A	MY46180323	05/02/2011

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

TEST SETUP



TEST PROCEDURE

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



TEST RESULTS

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	12.00	500	PASS
Middle	2437	12.00	500	PASS
High	2462	12.00	500	PASS

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16.55	500	PASS
Middle	2437	16.50	500	PASS
High	2462	16.50	500	PASS

IEEE 802.11n HT20 mode (Two TX)

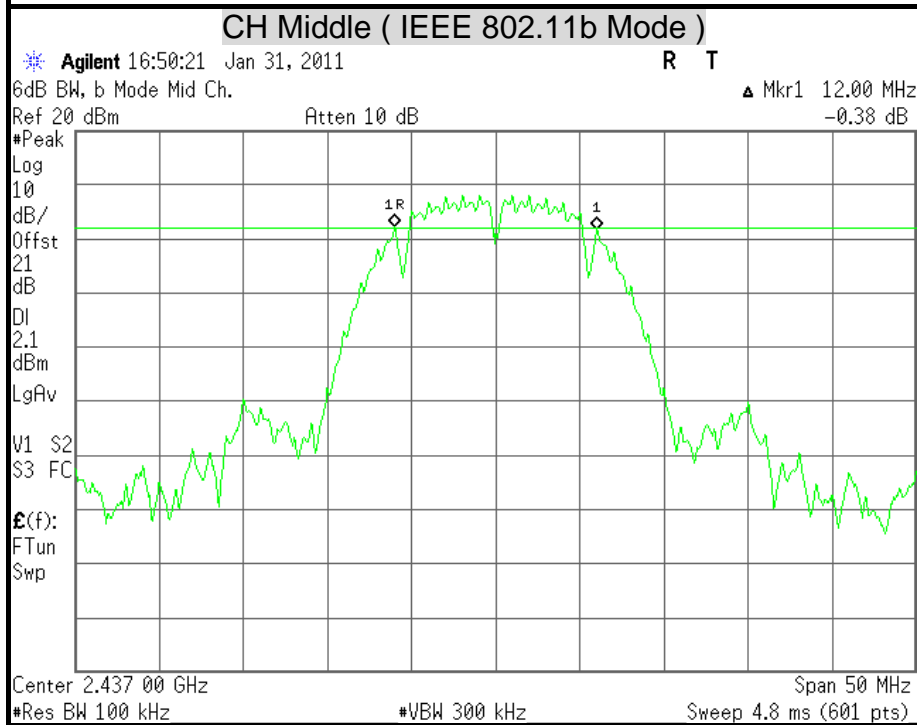
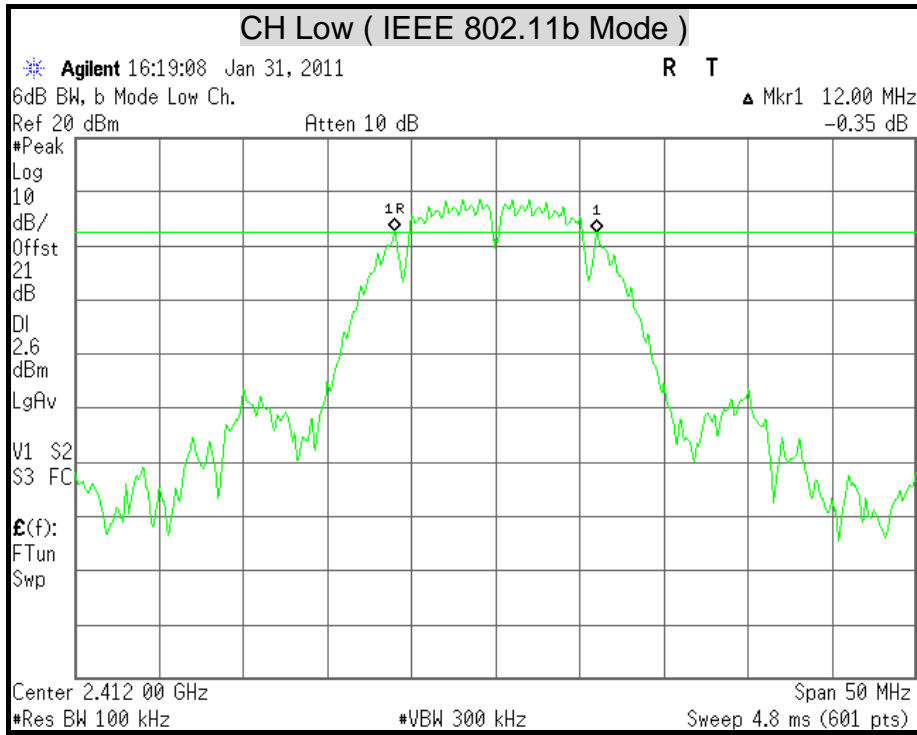
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Pass / Fail
		Chain 0	Chain 1		
Low	2412	17.42	17.58	500	PASS
Middle	2437	17.17	17.58	500	PASS
High	2462	17.58	17.33	500	PASS

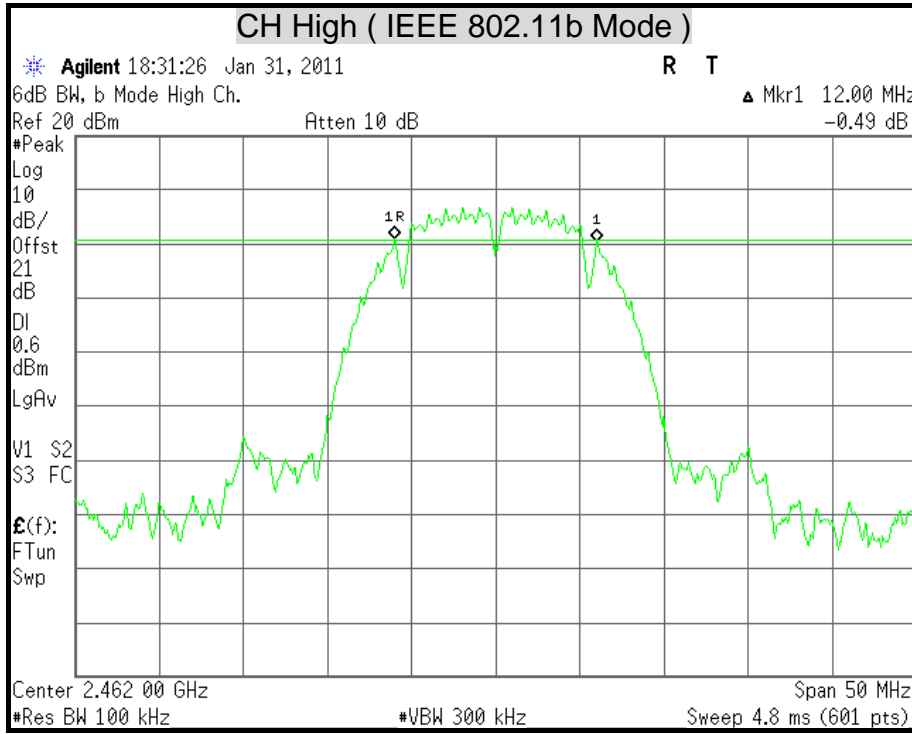
IEEE 802.11n HT40 Mode (Two TX)

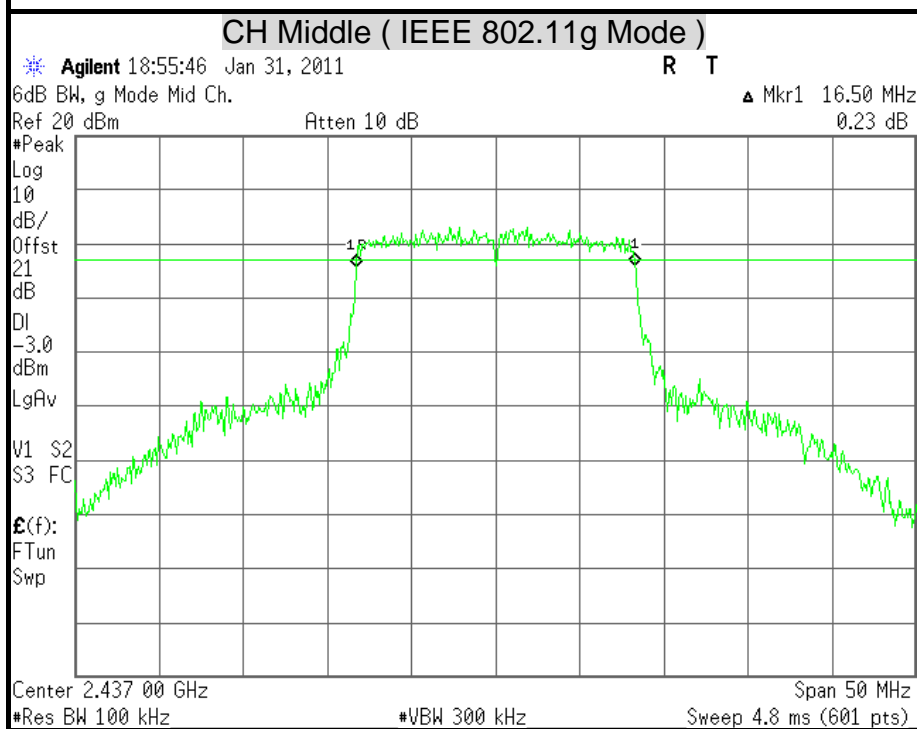
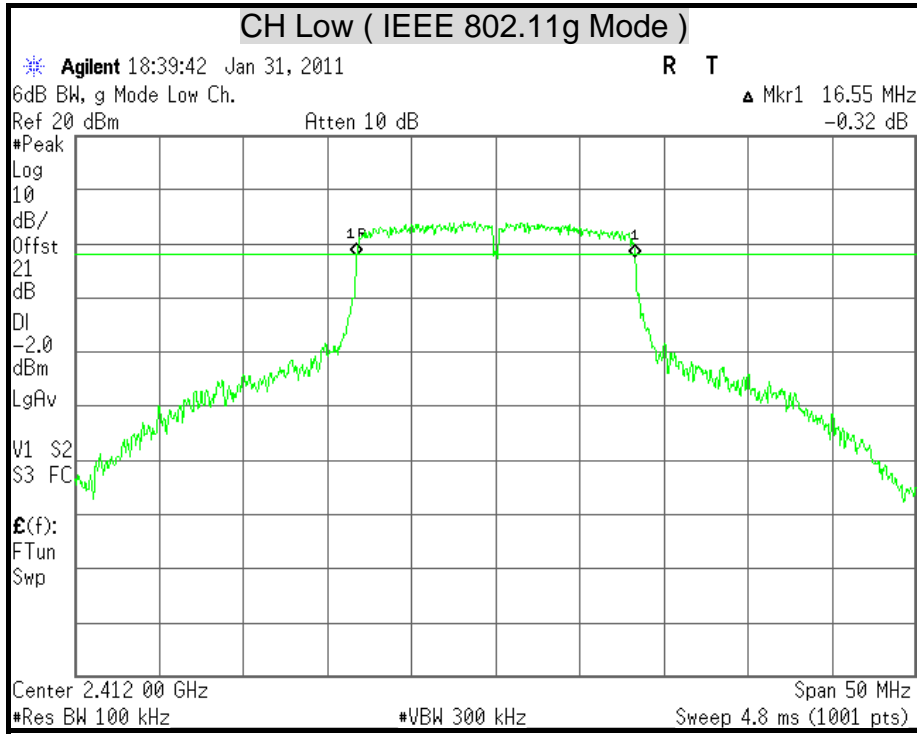
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Pass / Fail
		Chain 0	Chain 1		
Low	2422	35.83	36.25	500	PASS
Middle	2437	36.08	35.83	500	PASS
High	2452	36.08	35.42	500	PASS

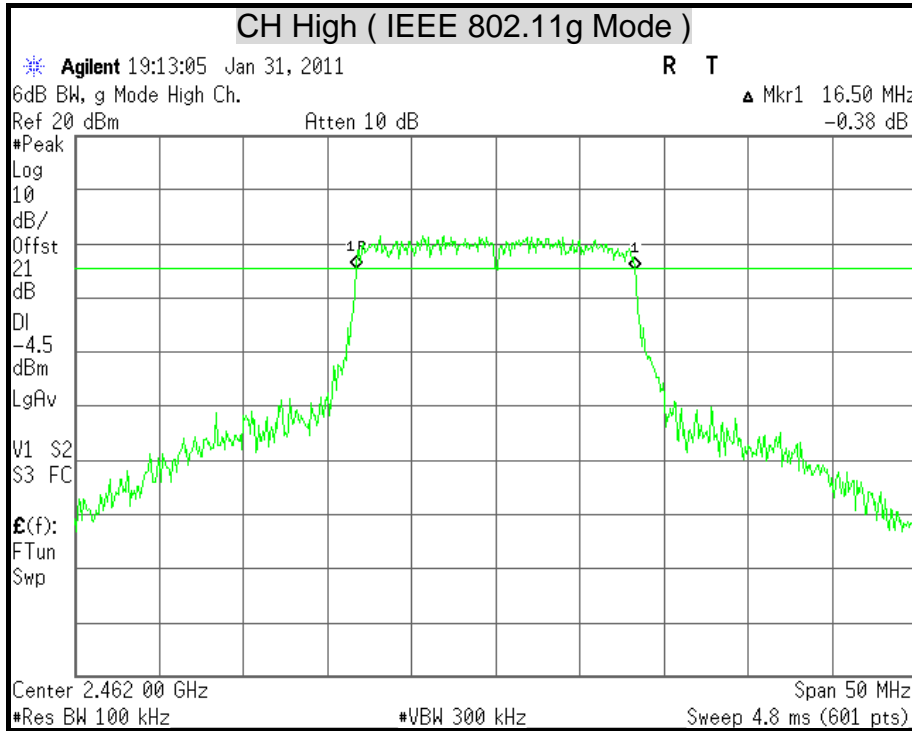


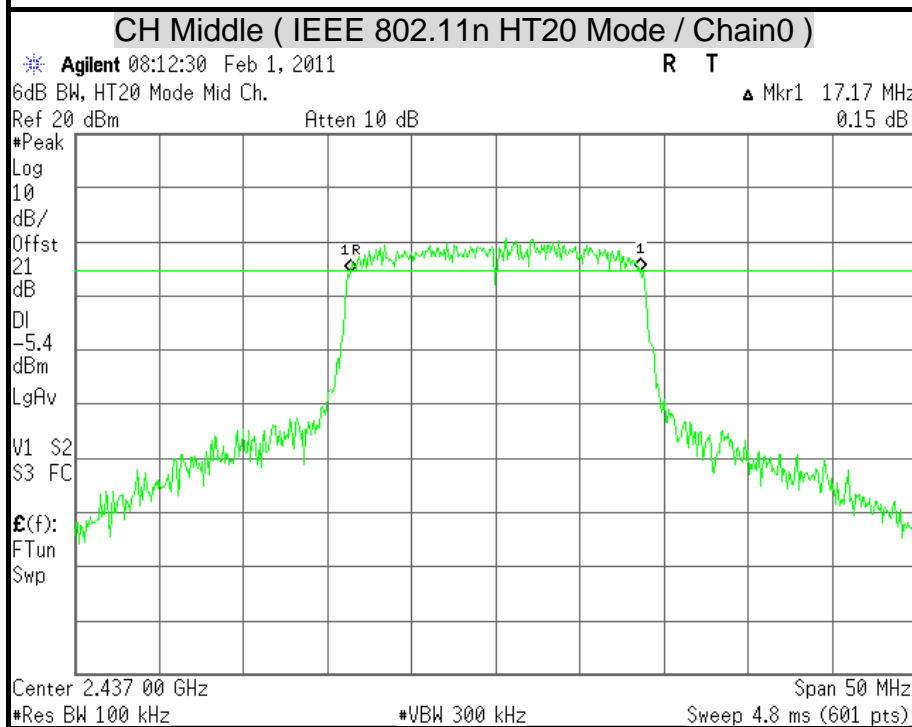
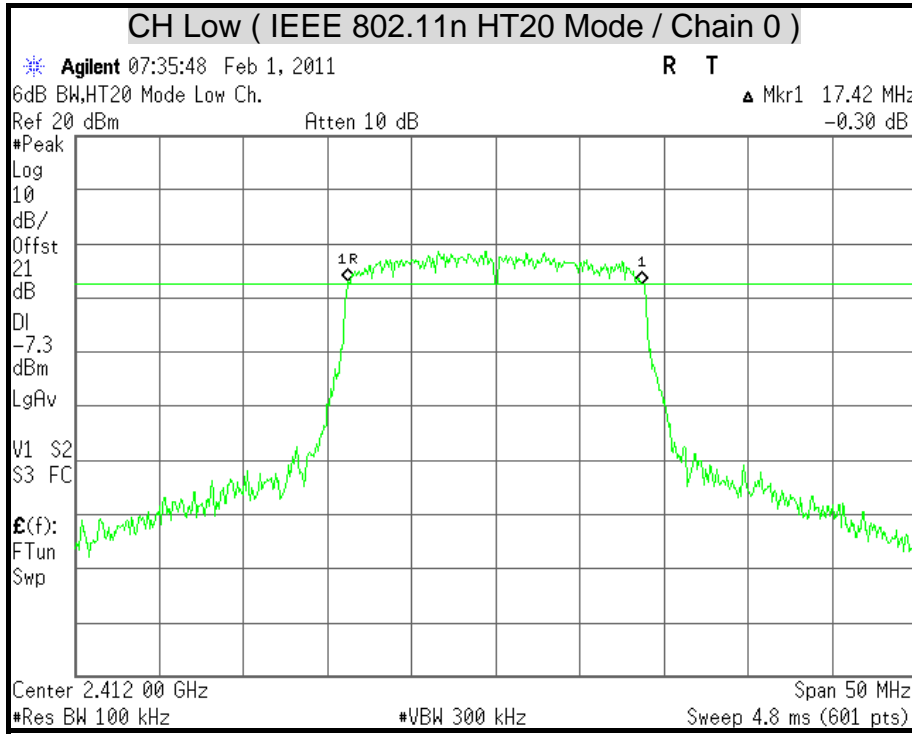
6dB BANDWIDTH

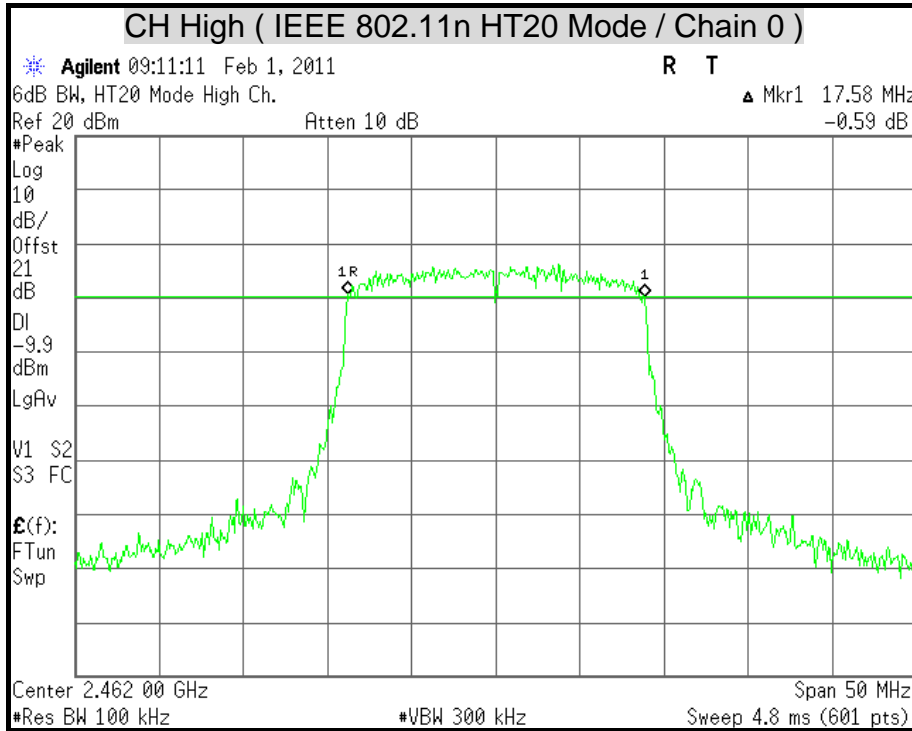


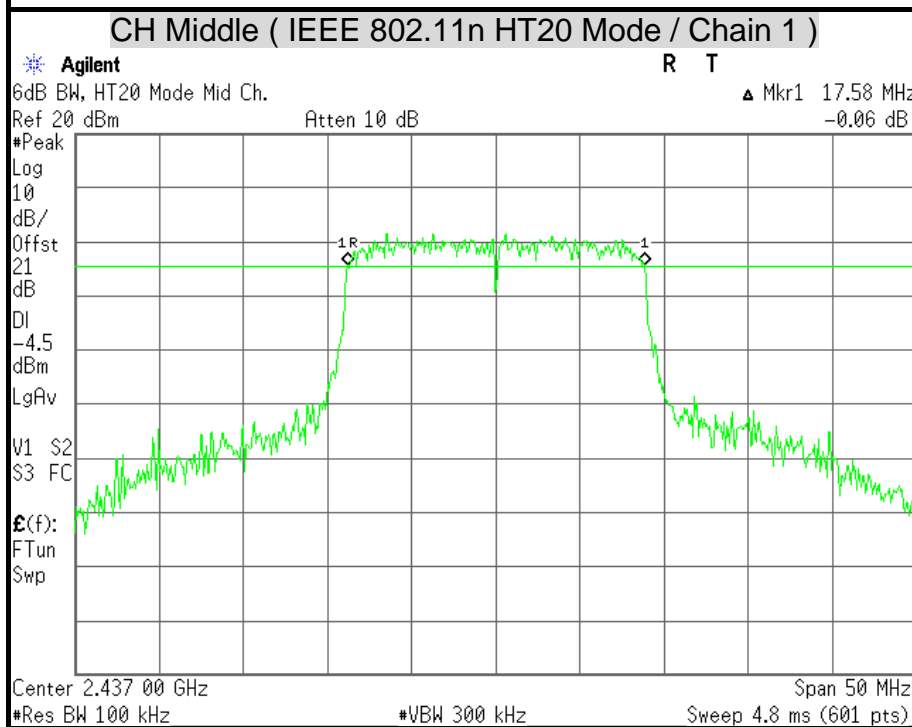
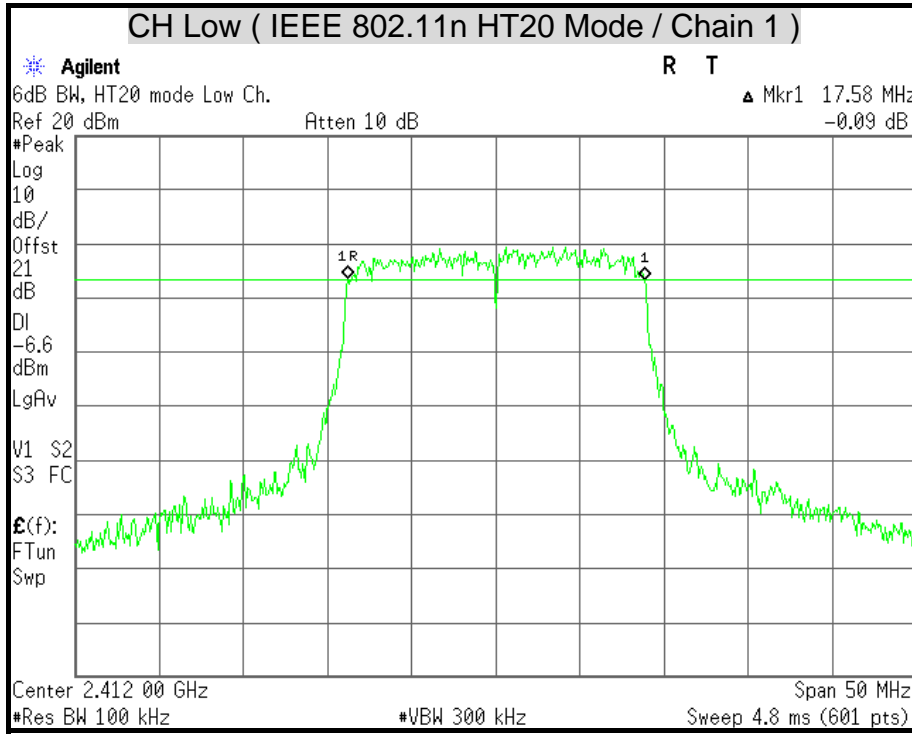


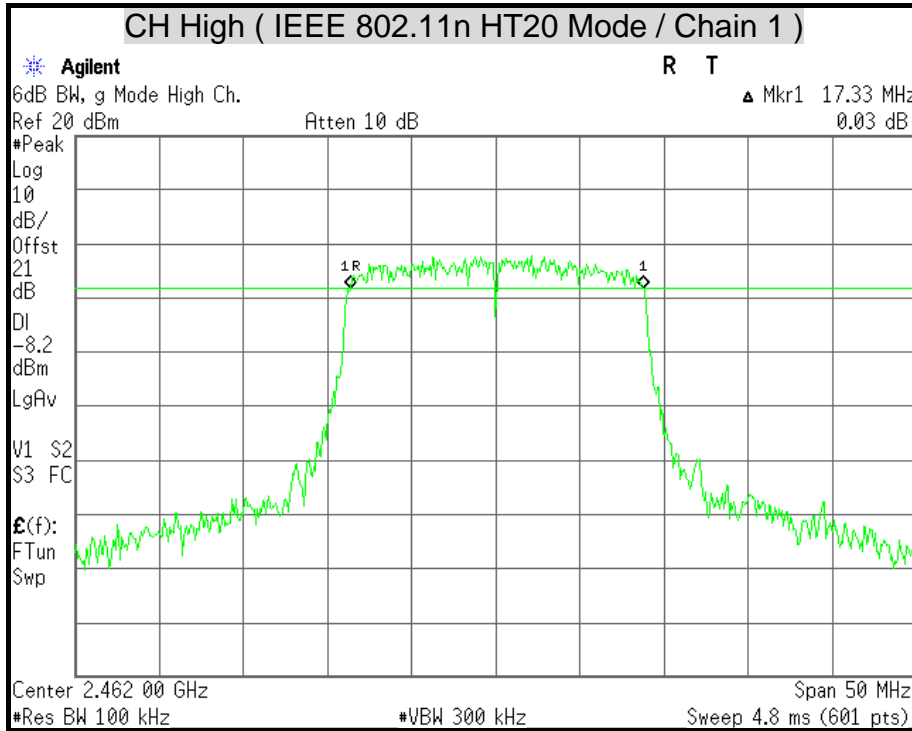


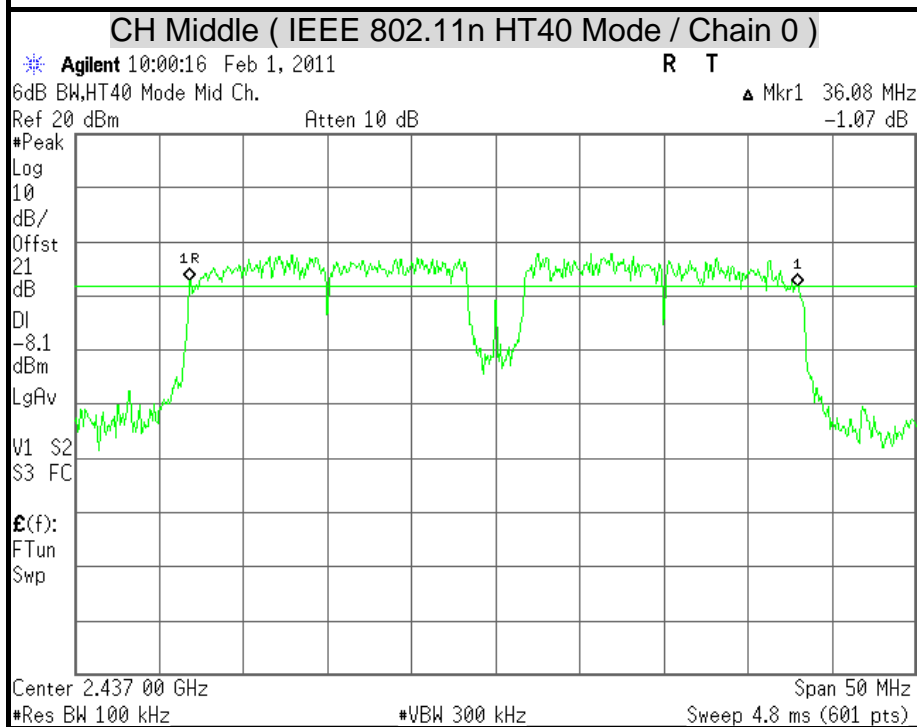
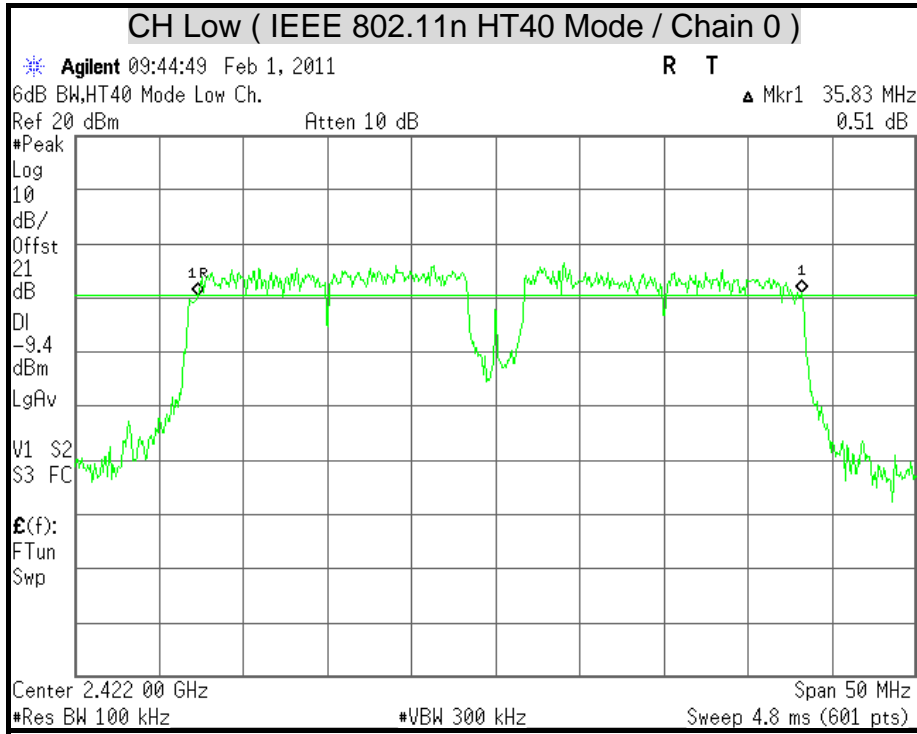


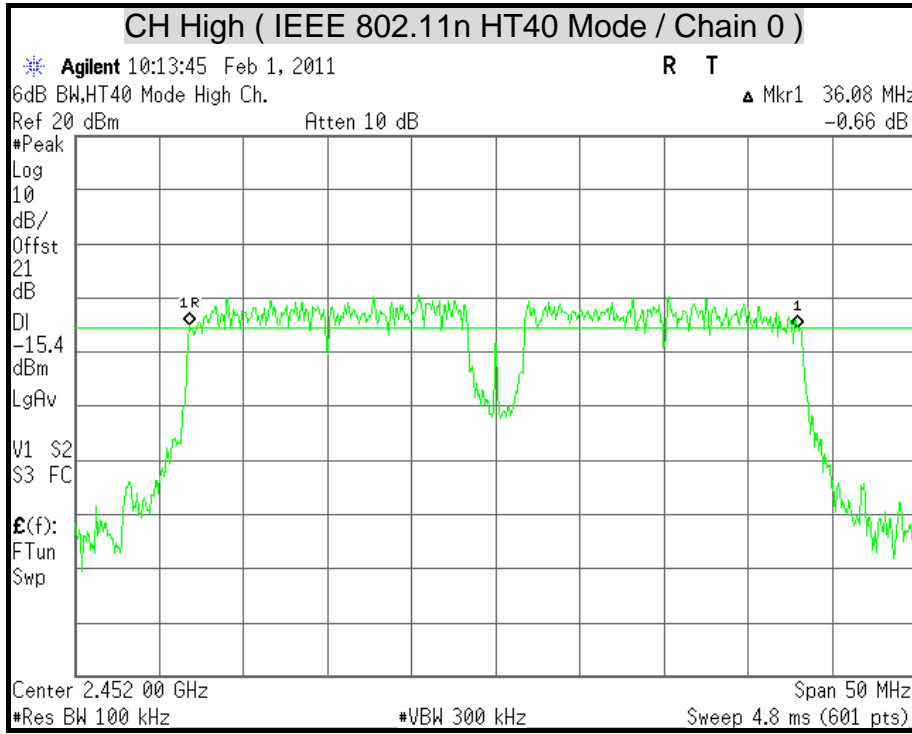


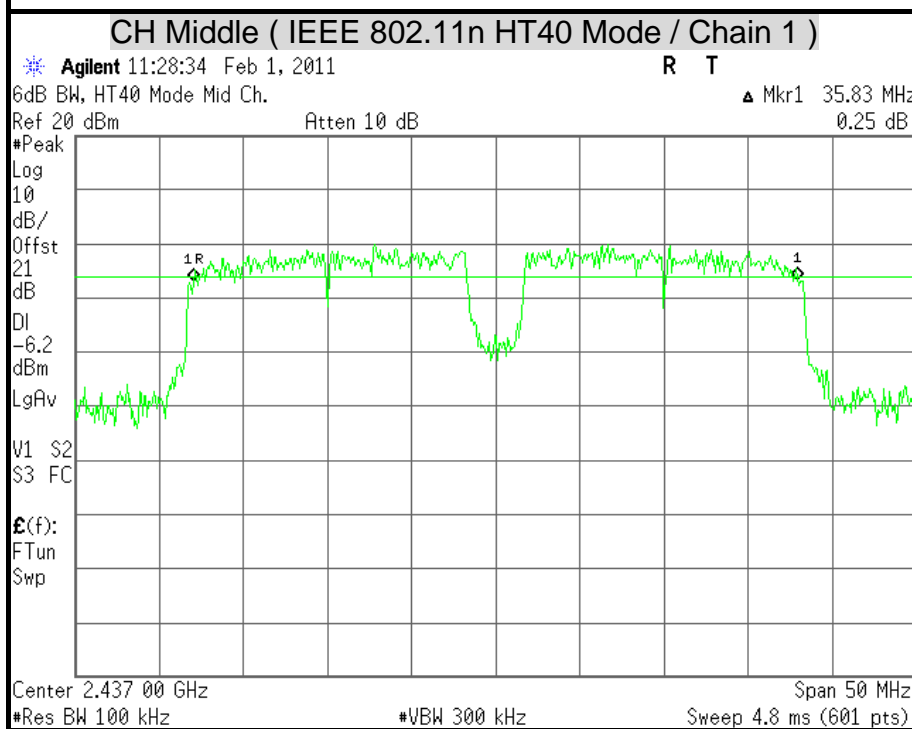
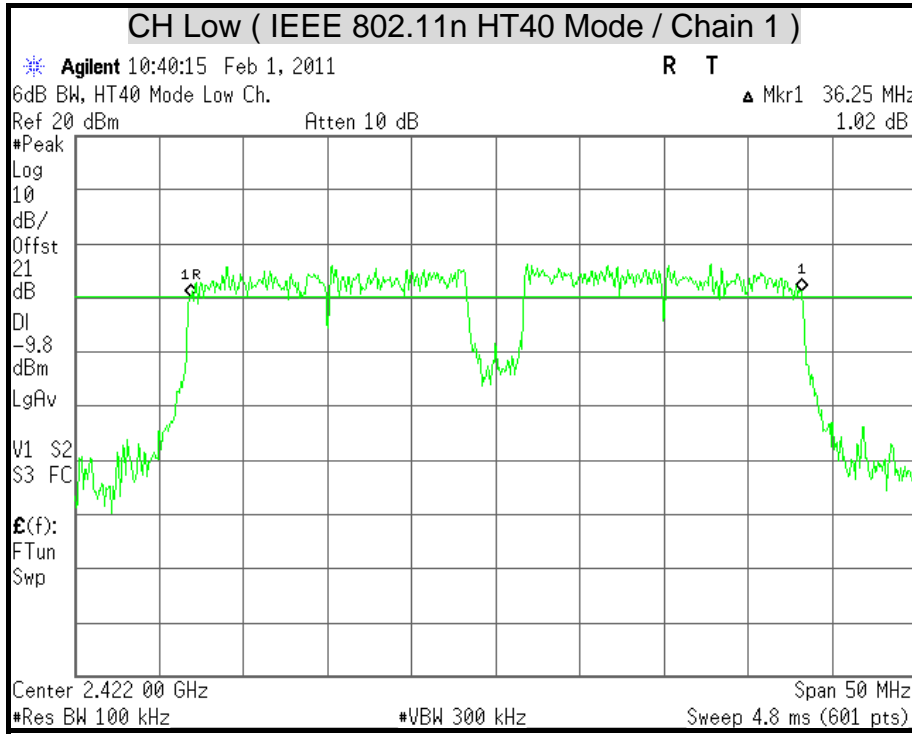


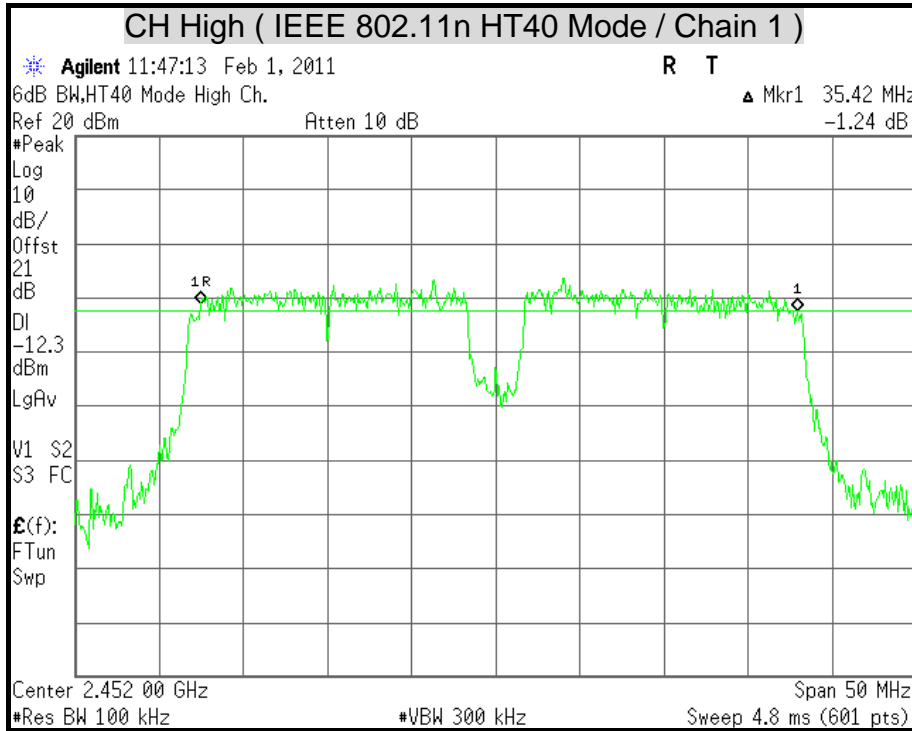














7.2 MAXIMUM PEAK OUTPUT POWER

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.

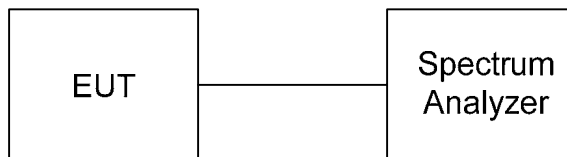
§ 15.247(b) (4) Except as shown in paragraphs (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2), and (b)(3) of this section, as appropriate, 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
Spectrum Analyzer	AGILENT	E4446A	MY43360132	06/20/2011
Spectrum Analyzer	AGILENT	E4446A	MY46180323	05/02/2011

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

TEST SETUP



TEST PROCEDURE

- The spectrum shall be set as follows :
 - Span : 1.5 times channel integration bandwidth.
 - RBW : 1MHz
 - VBW : 3MHz
 - Detector : Peak
 - Sweep : Single trace
- Compute the combined power of all signal responses contained in the trace by covering all the data points.
- The peak output power is the channel power integrated over 26dB bandwidth.



TEST RESULTS

Total peak power calculation formula:

$10 \log (10^{\text{Chain 0 Power} / 10} + 10^{\text{Chain 1 Power} / 10})$.

The maximum antenna gain is 2.17 dBi, therefore the limit is 30 dBm.

In the legacy mode, the effective antenna gain is $2.17 + 10 \times \text{Log} (2) = 5.18$ dBi.

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Peak Power		Peak Power Limit		Pass / Fail
		(dBm)	(W)	(dBm)	(W)	
Low	2412	22.09	0.1618	30	1	PASS
Middle	2437	21.35	0.1365	30	1	PASS
High	2462	20.35	0.1084	30	1	PASS

Remark:

1. At final test to get the worst-case emission at 1Mbps.
2. The cable assembly insertion loss of 21dB (including 20dB pad and 1dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	Peak Power		Peak Power Limit		Pass / Fail
		(dBm)	(W)	(dBm)	(W)	
Low	2412	21.54	0.1426	30	1	PASS
Middle	2437	20.76	0.1191	30	1	PASS
High	2462	19.87	0.0971	30	1	PASS

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 21dB (including 20dB pad and 1dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



IEEE 802.11n HT20 Mode (Two TX)

Channel	Channel Frequency (MHz)	Peak Power (dBm)		Peak Power Total		Peak Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	2412	16.49	17.28	19.91	0.0980	30	1	PASS
Middle	2437	17.10	18.02	20.59	0.1147	30	1	PASS
High	2462	14.30	16.13	18.32	0.0679	30	1	PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 21dB (including 20dB pad and 1dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 Mode (Two TX)

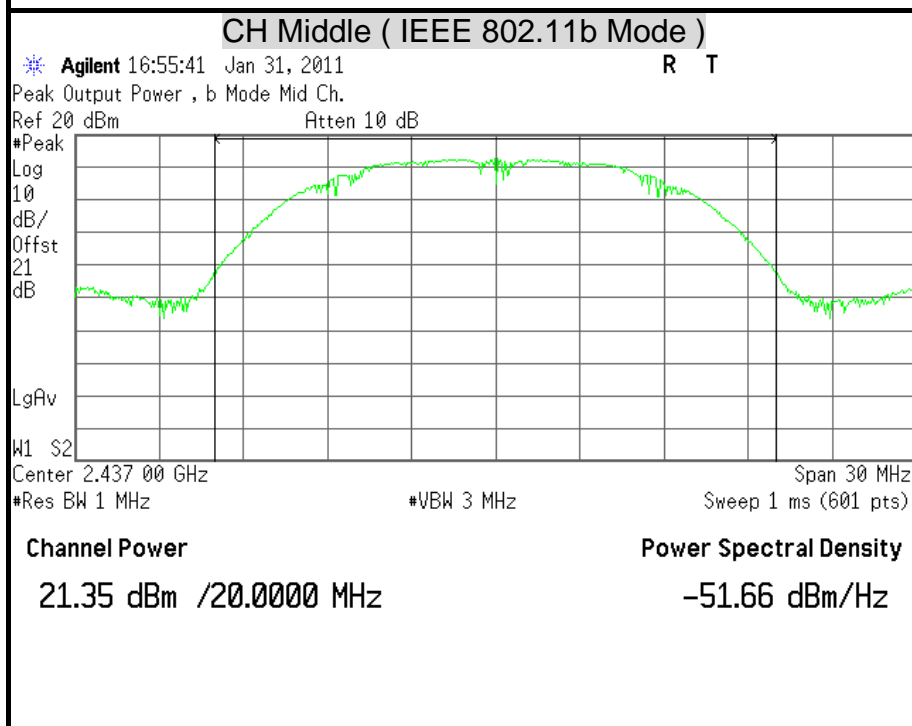
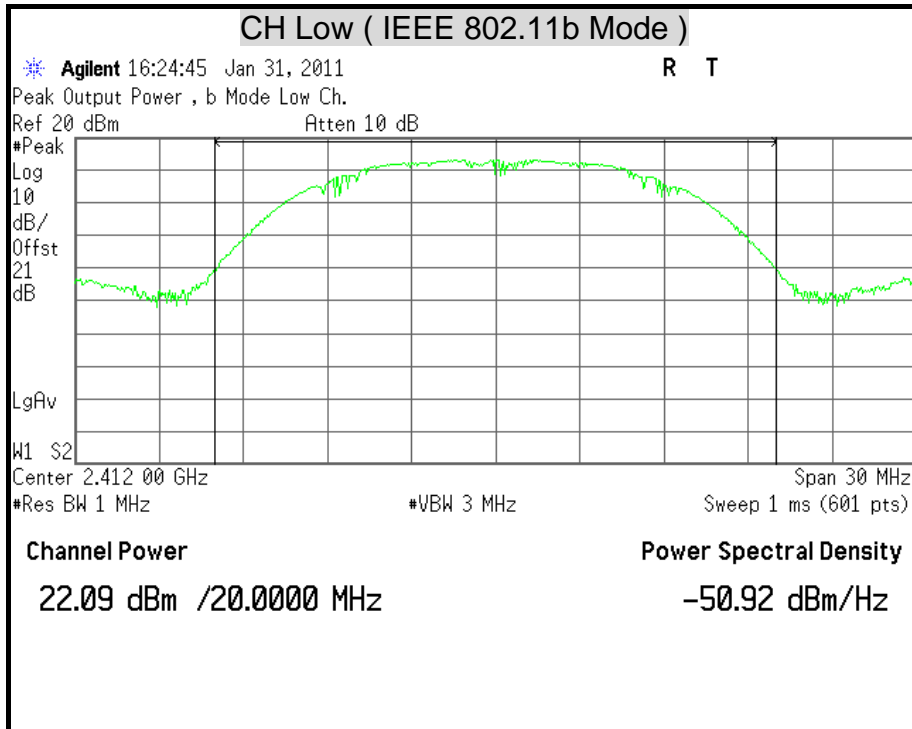
Channel	Channel Frequency (MHz)	Peak Power (dBm)		Peak Power Total		Peak Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	2422	15.43	16.10	18.79	0.0757	30	1	PASS
Middle	2437	15.20	16.50	18.91	0.0778	30	1	PASS
High	2452	10.64	12.77	14.84	0.0305	30	1	PASS

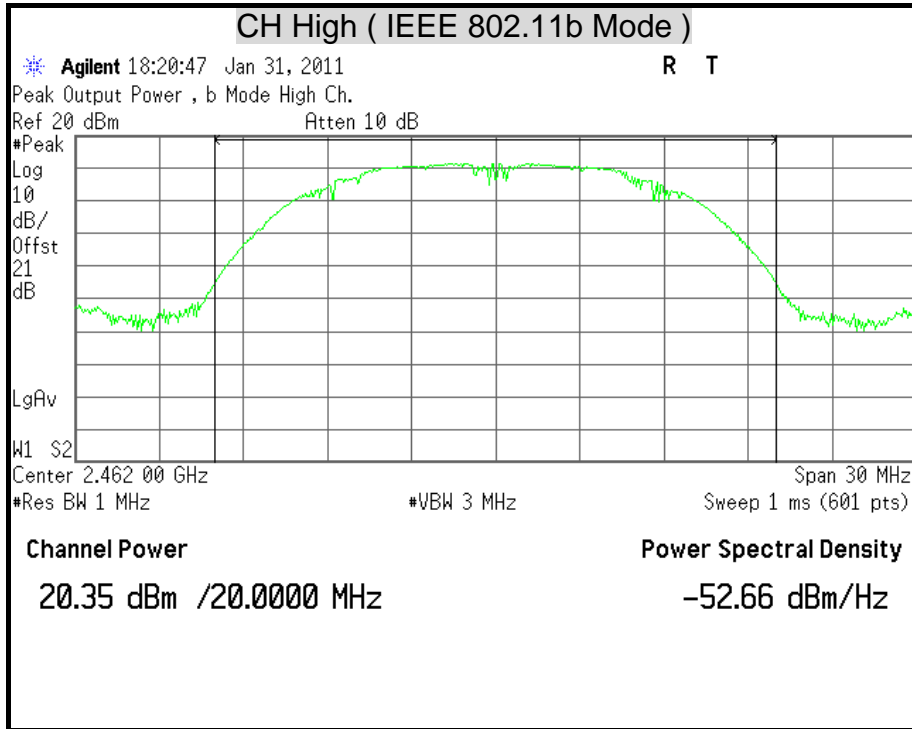
Remark:

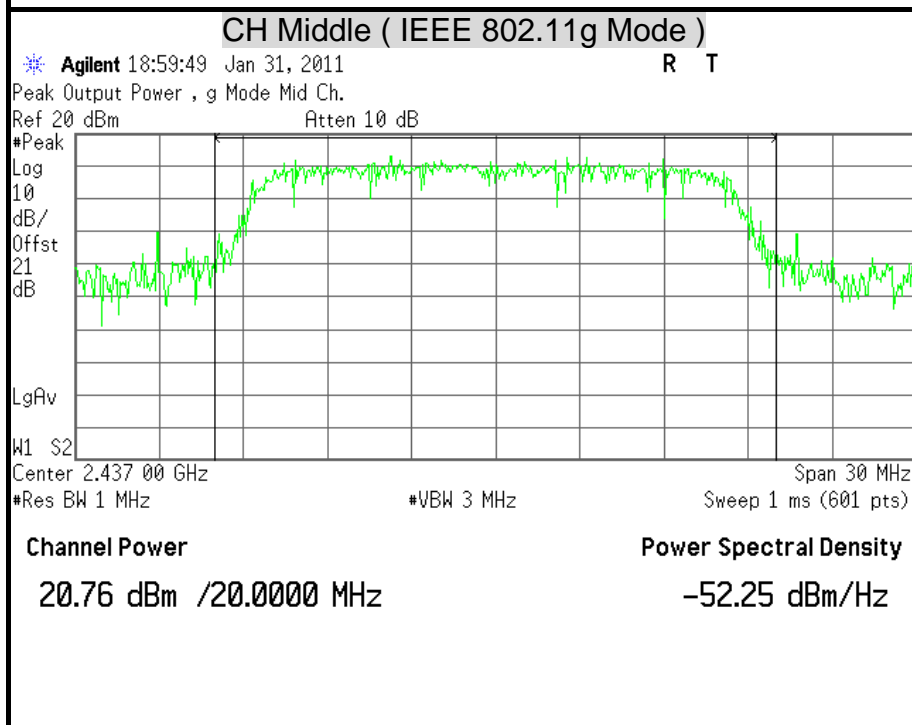
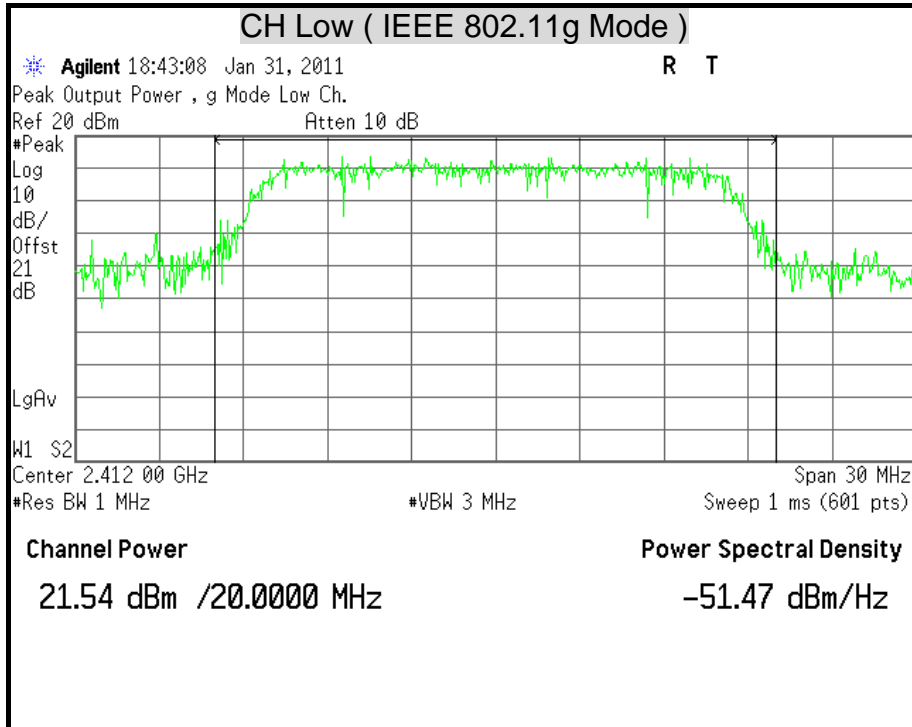
1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 21dB (including 20dB pad and 1dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

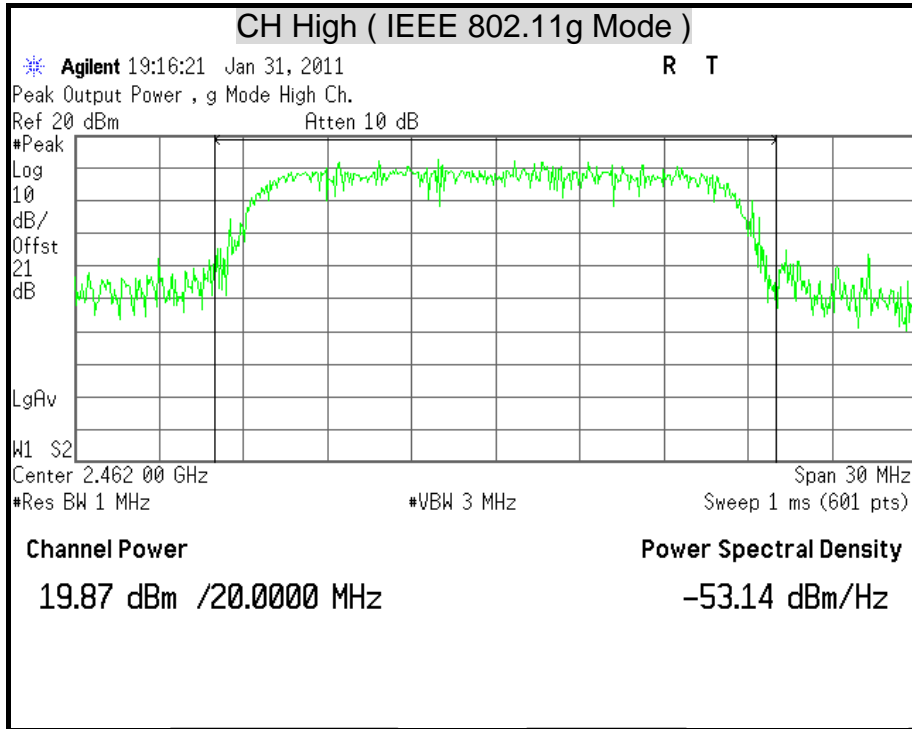


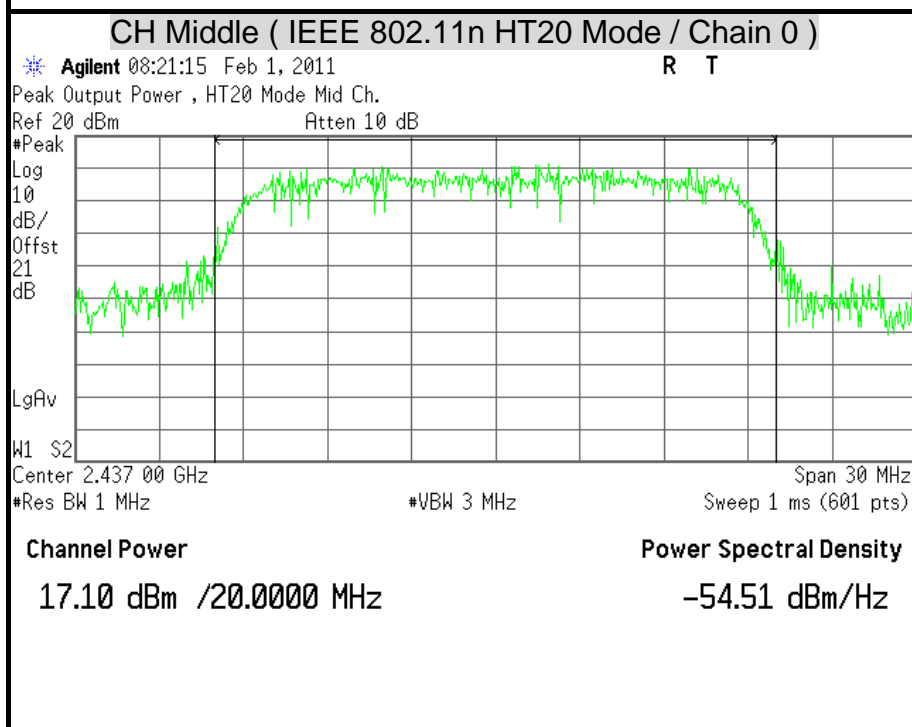
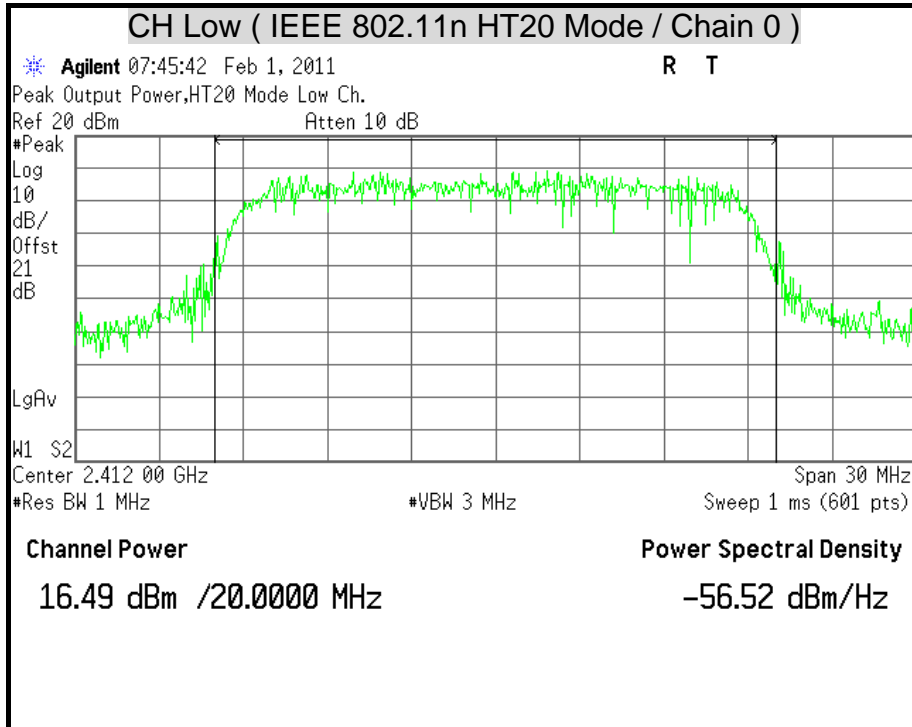
MAXIMUM PEAK OUTPUT POWER

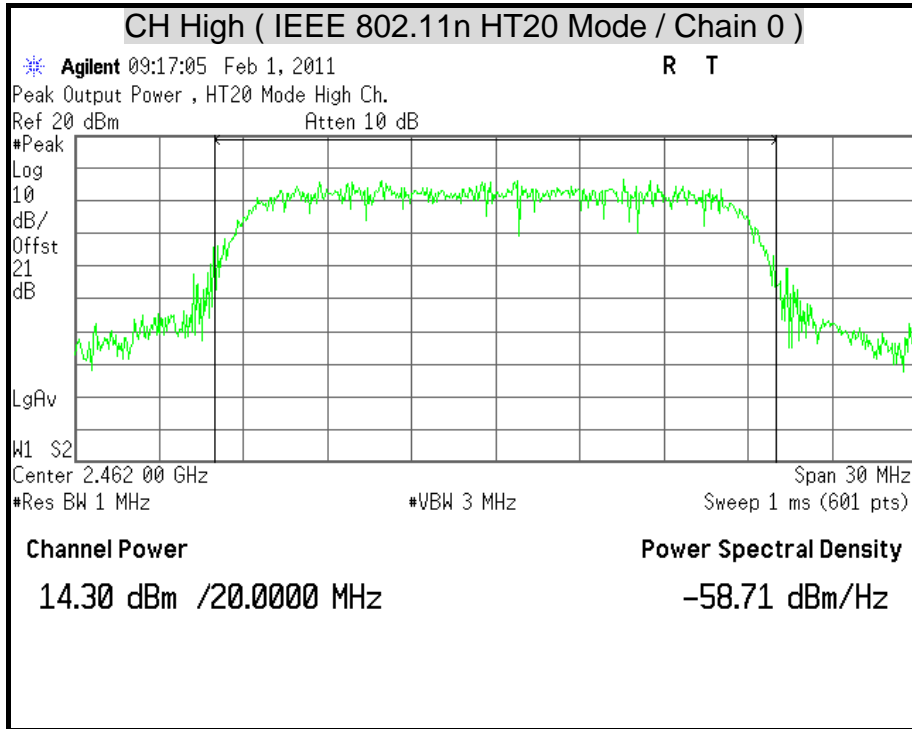


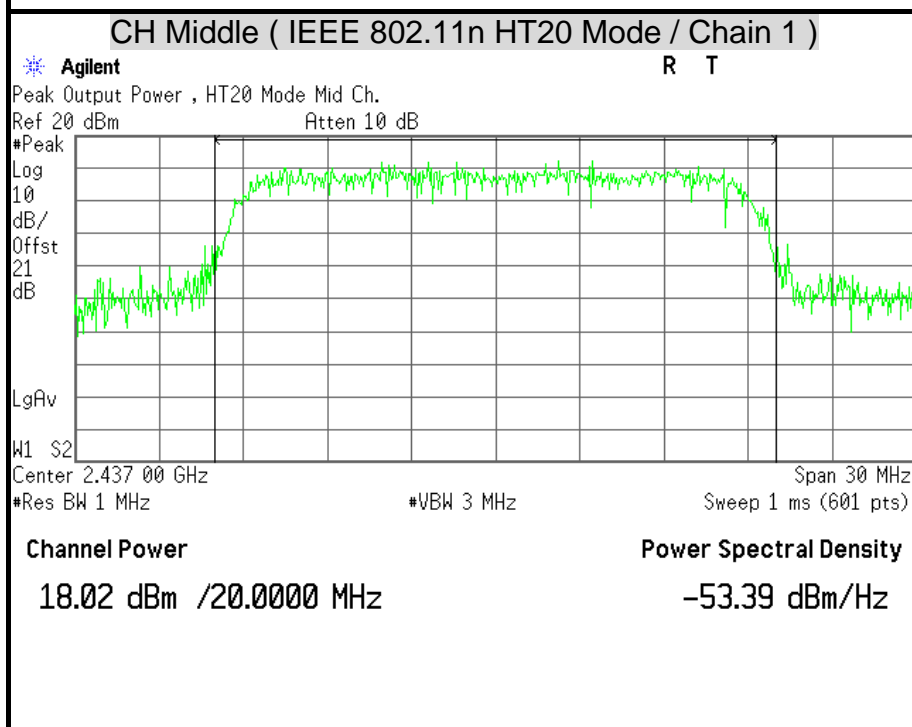
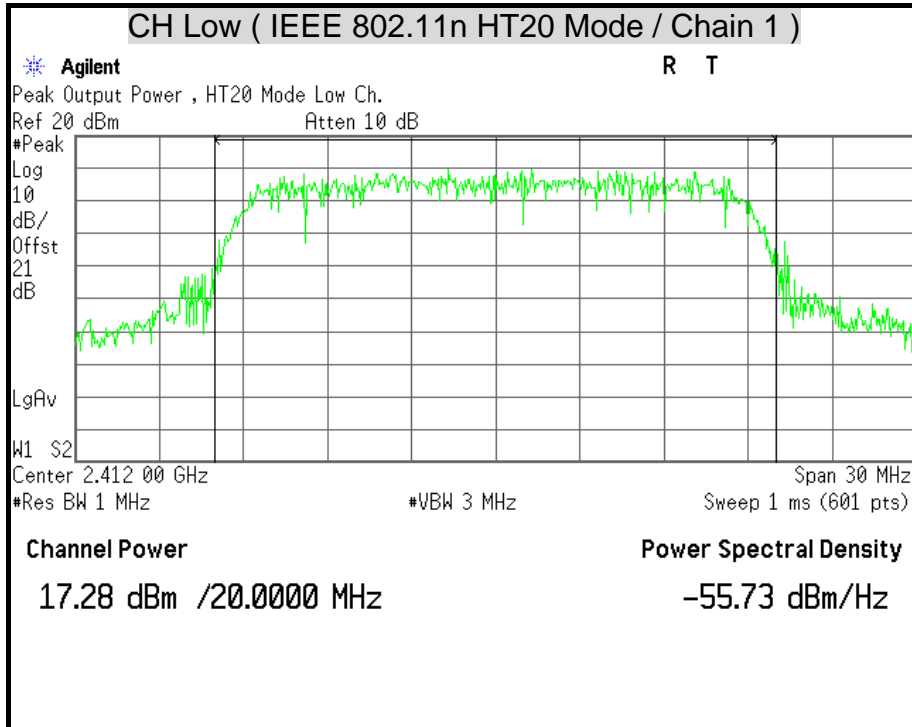


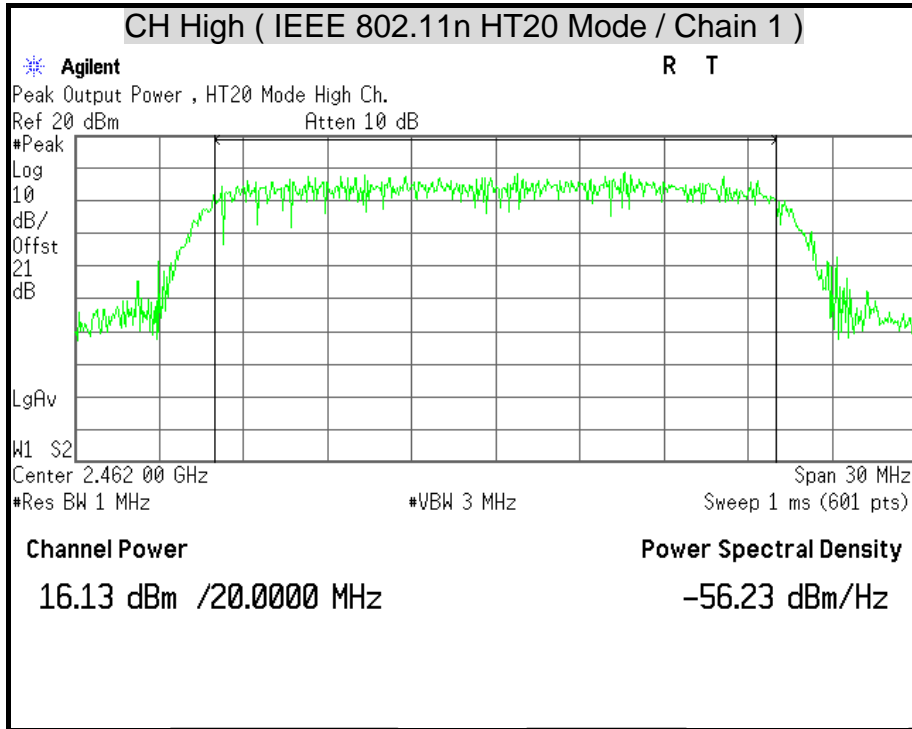


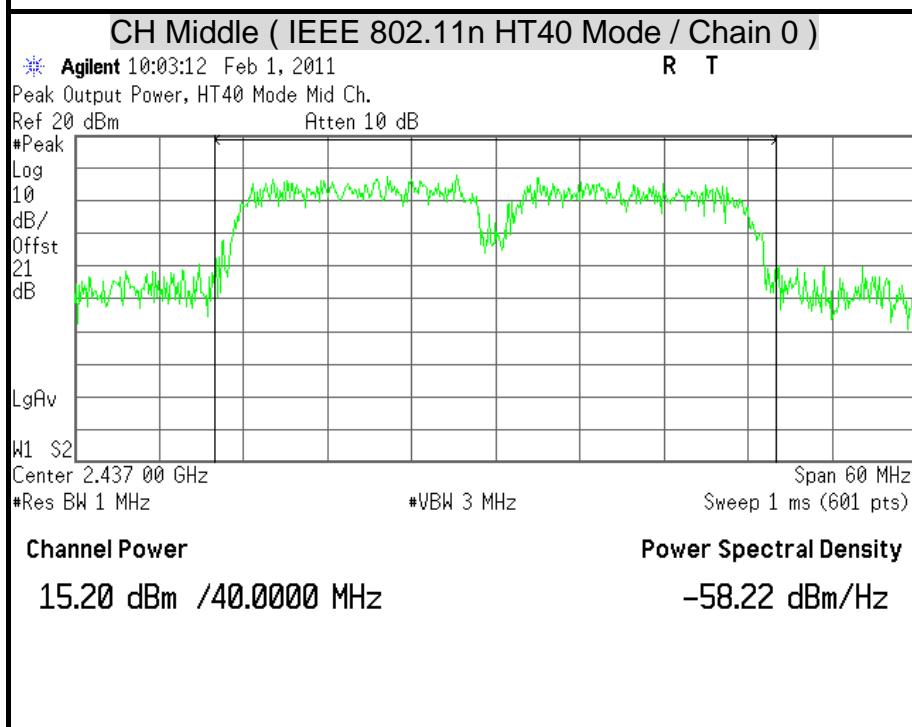
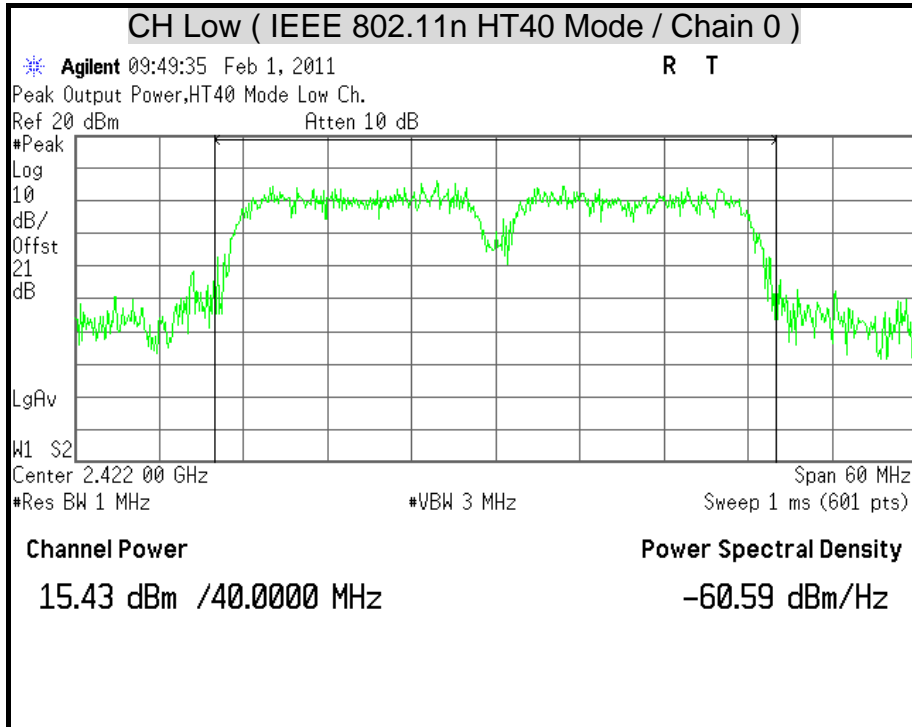


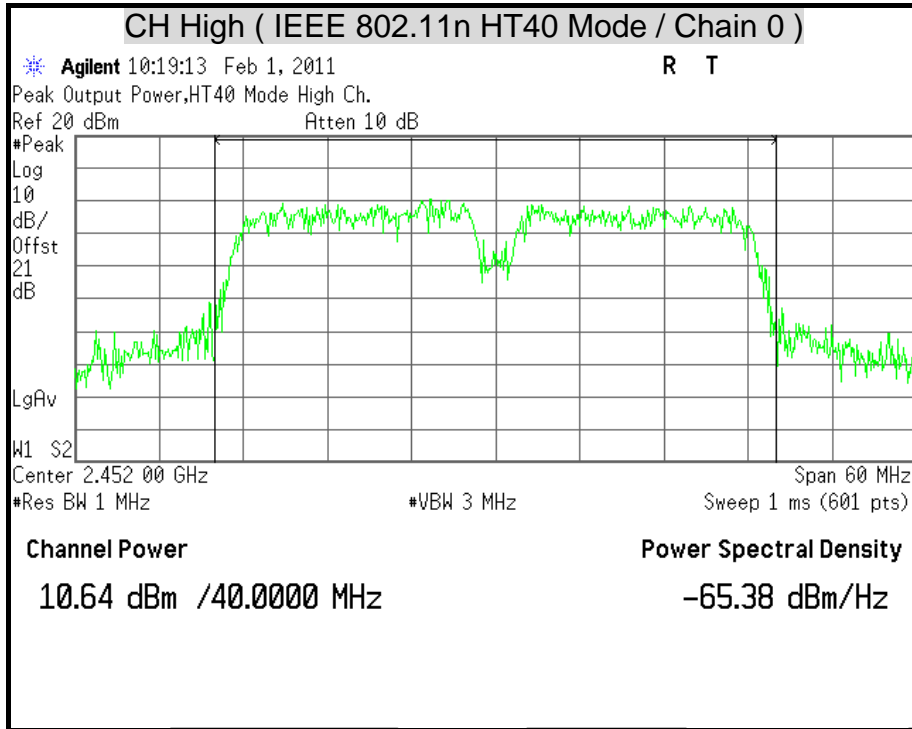


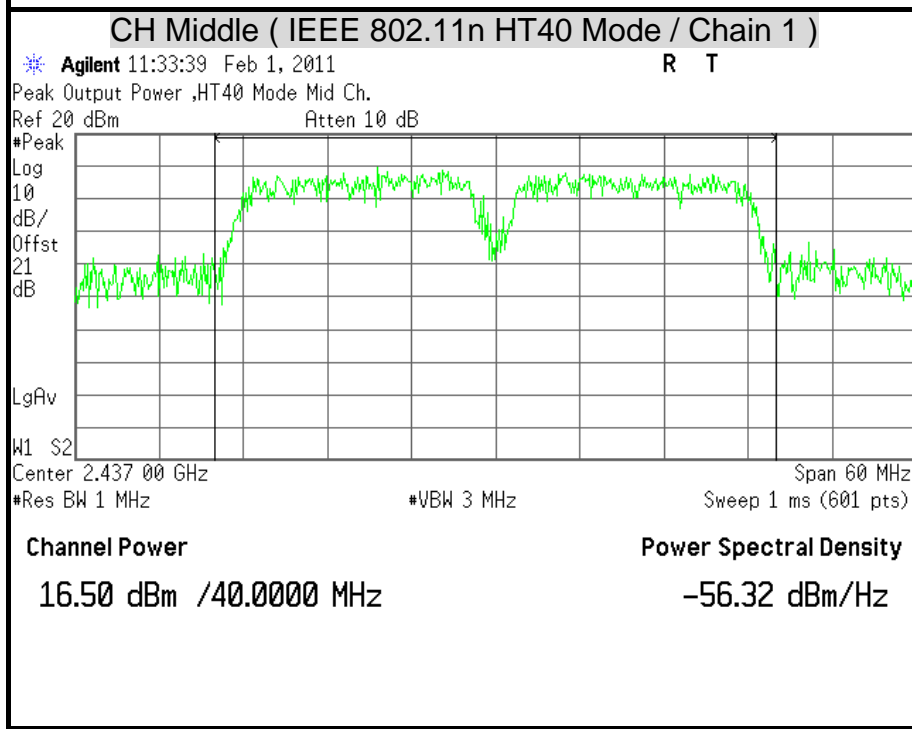
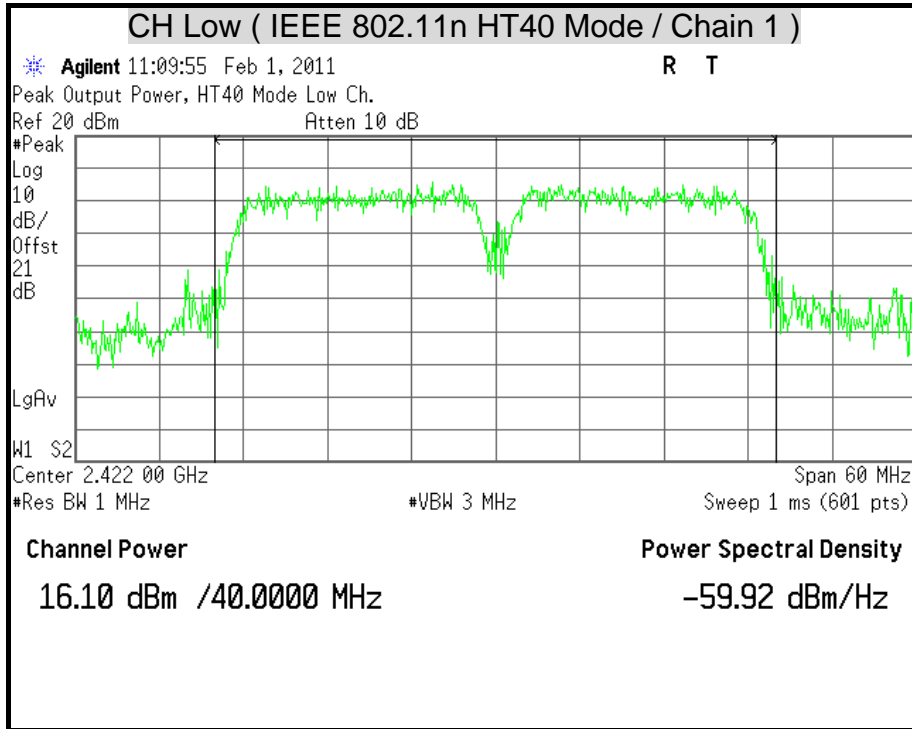


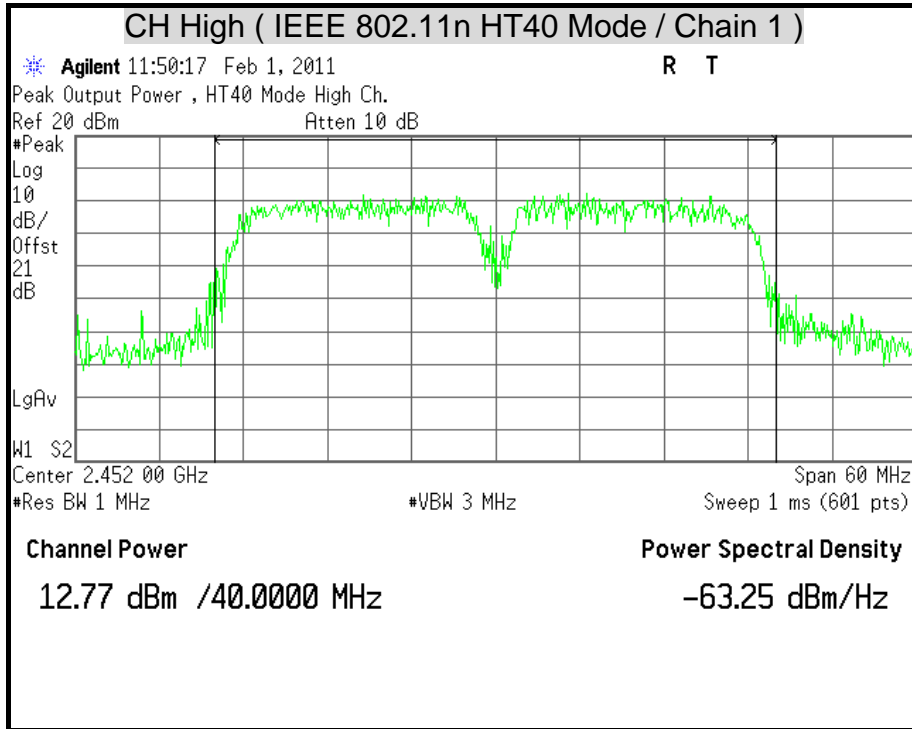














7.3 AVERAGE POWER

LIMITS

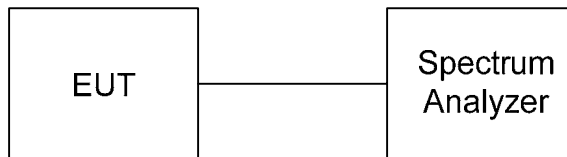
None; for reporting purposes only.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	AGILENT	E4446A	MY43360132	06/20/2011
Spectrum Analyzer	AGILENT	E4446A	MY46180323	05/02/2011

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.



TEST RESULTS

Total peak power calculation formula:

$$10 \log (10^{\text{Chain 0 Power} / 10} + 10^{\text{Chain 1 Power} / 10})$$

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Average Power Output (dBm)
Low	2412	19.34
Middle	2437	18.71
High	2462	17.85

Remark:

1. At final test to get the worst-case emission at 1Mbps.
2. The cable assembly insertion loss of 21dB (including 20dB pad and 1dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	Average Power Output (dBm)
Low	2412	18.23
Middle	2437	17.49
High	2462	16.07

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 21dB (including 20dB pad and 1dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



IEEE 802.11n HT20 Mode (Two TX)

Channel	Channel Frequency (MHz)	Average Power Output (dBm)		Average Power Total (dBm)
		Chain 0	Chain 1	
Low	2412	12.58	13.54	16.10
Middle	2437	13.75	14.67	17.24
High	2462	10.60	12.74	14.81

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 21dB (including 20dB pad and 1dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 Mode (Two TX)

Channel	Channel Frequency (MHz)	Average Power Output (dBm)		Average Power Total (dBm)
		Chain 0	Chain 1	
Low	2422	11.72	12.68	15.24
Middle	2437	11.64	12.78	15.26
High	2452	7.49	9.81	11.81

Remark:

1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 21dB (including 20dB pad and 1dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



7.4 POWER SPECTRAL DENSITY

LIMITS

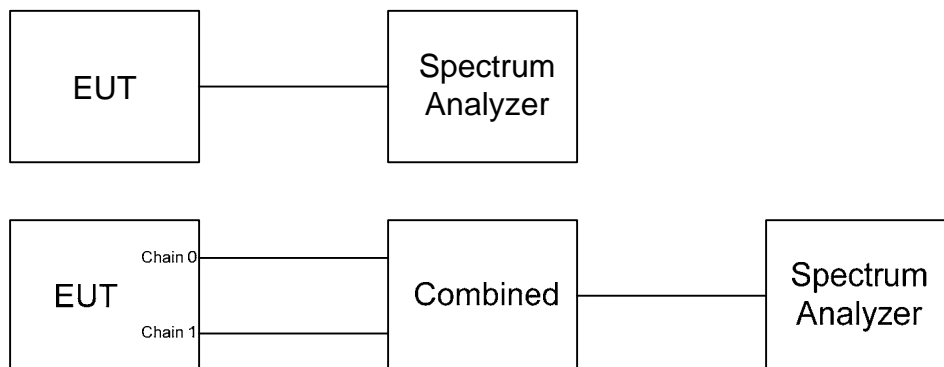
§ 15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	AGILENT	E4446A	MY43360132	06/20/2011
Spectrum Analyzer	AGILENT	E4446A	MY46180323	05/02/2011

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

TEST SETUP



TEST PROCEDURE

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

The power spectral density was measured and recorded.

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



TEST RESULTS

Total power spectral density calculation formula:

$10 \log (10^{\text{(Chain 0 PPSD / 10)}} + 10^{\text{(Chain 1 PPSD / 10)}})$.

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2412	-8.97	8	PASS
Middle	2437	-9.63	8	PASS
High	2462	-10.24	8	PASS

Remark:

1. At final test to get the worst-case emission at 1Mbps.
2. The cable assembly insertion loss of 21dB (including 20dB pad and 1dB 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	-8.34	8	PASS
Middle	2437	-9.10	8	PASS
High	2462	-9.86	8	PASS

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 21dB (including 20dB pad and 1dB 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 0	Chain 1			
Low	2412	-13.33	-13.51	-10.41	8	PASS
Middle	2437	-11.39	-11.84	-8.60	8	PASS
High	2462	-15.16	-15.41	-12.27	8	PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 21dB (including 20dB pad and 1dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT20 Combined Mode (Two TX)

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2422	-8.88	8	PASS
Middle	2437	-6.59	8	PASS
High	2452	-11.19	8	PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 25.1dB (including 20dB pad and Combiner 4.1dB and 1dB 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 0	Chain 1			
Low	2422	-14.55	-15.77	-12.11	8	PASS
Middle	2437	-12.52	-12.40	-9.45	8	PASS
High	2452	-19.32	-19.08	-16.19	8	PASS

Remark:

1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 21dB (including 20dB pad and 1dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 Combined Mode (Two TX)

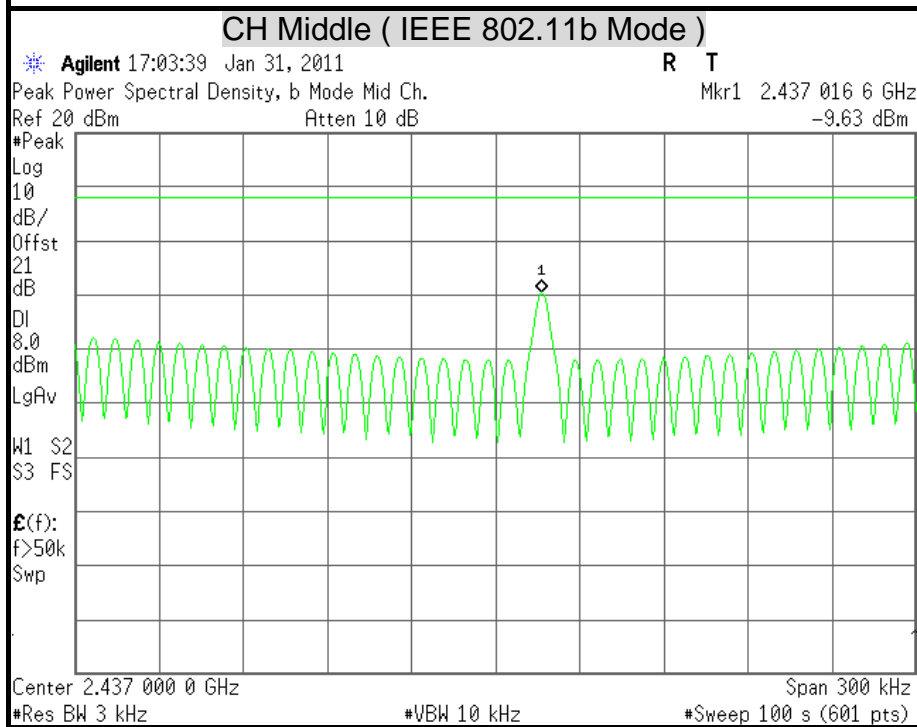
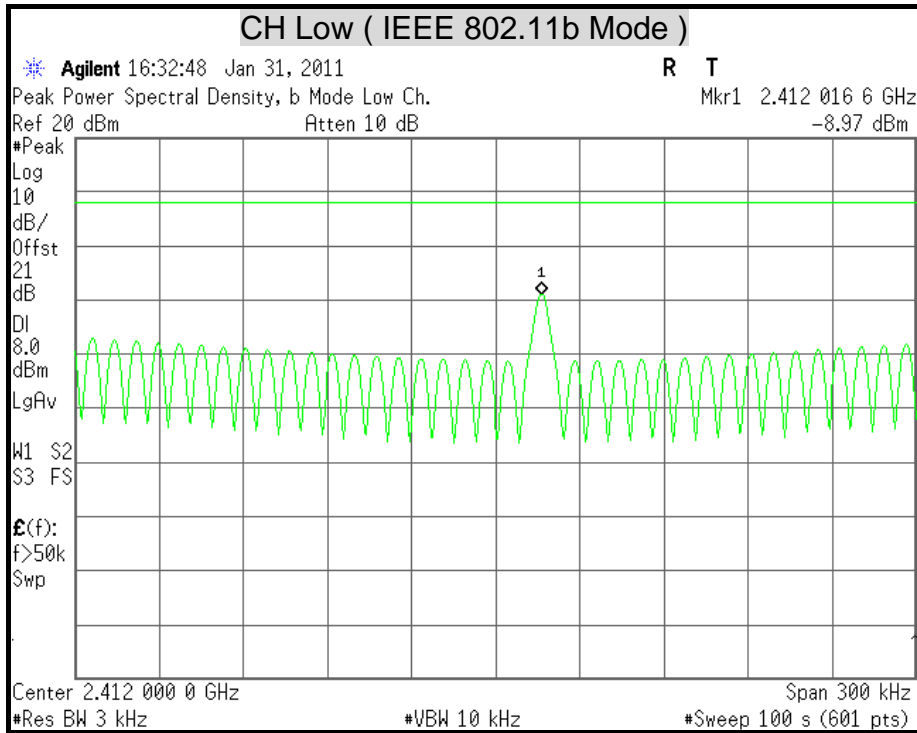
Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2422	-12.18	8	PASS
Middle	2437	-8.33	8	PASS
High	2452	-15.57	8	PASS

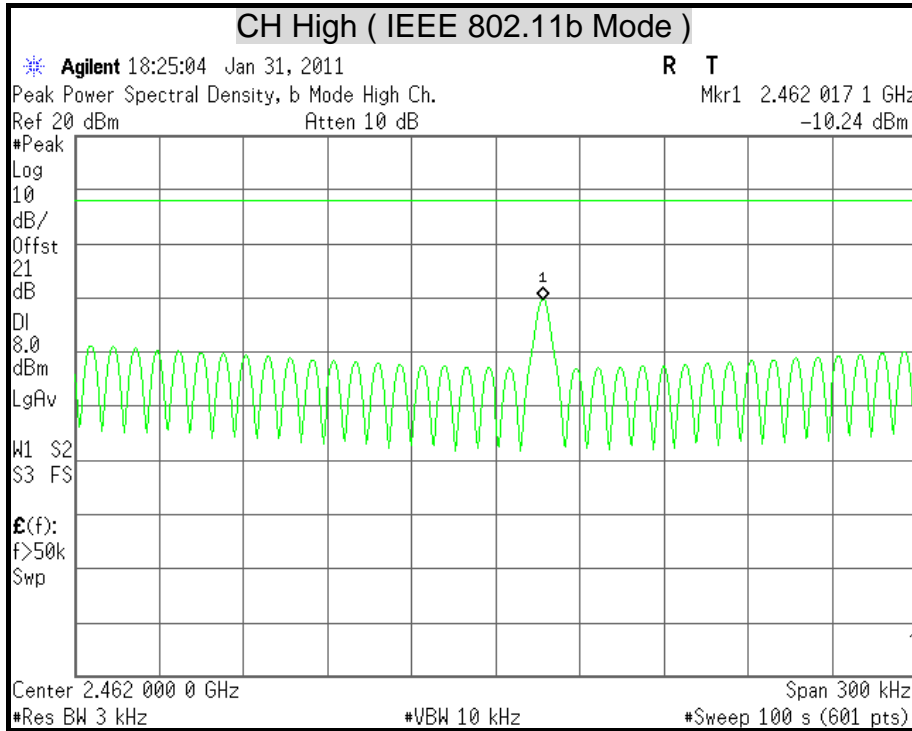
Remark:

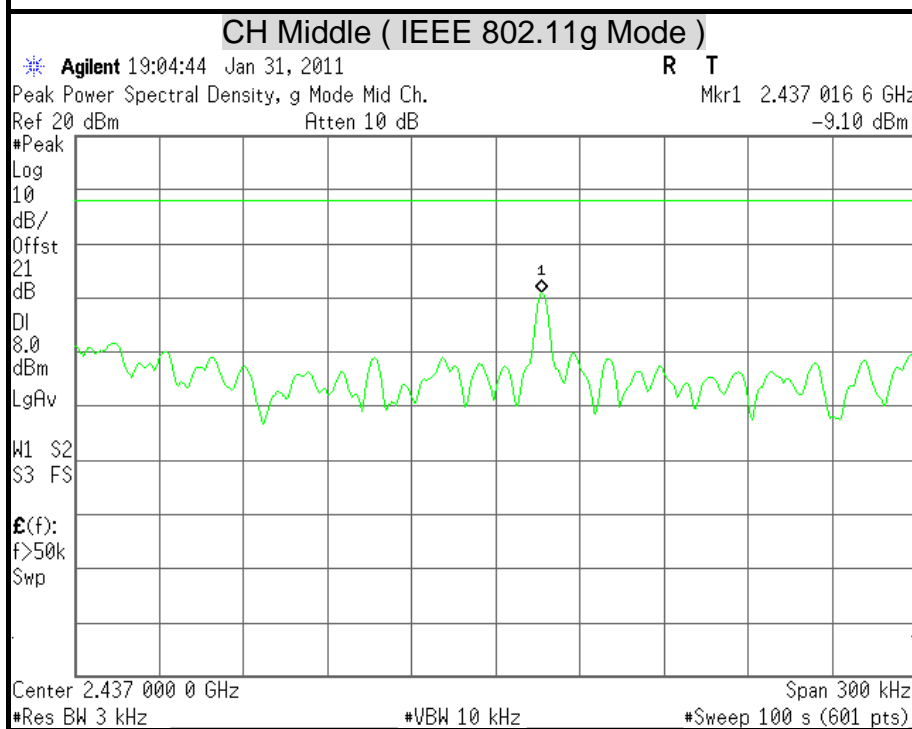
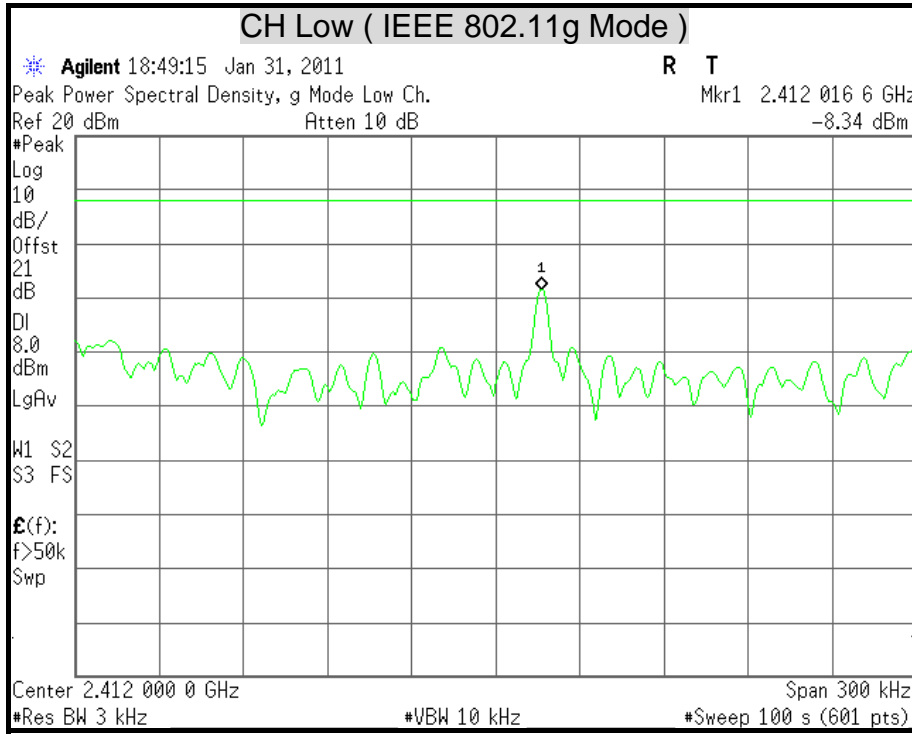
1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 25.1dB (including 20dB pad and Combiner 4.1dB and 1dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

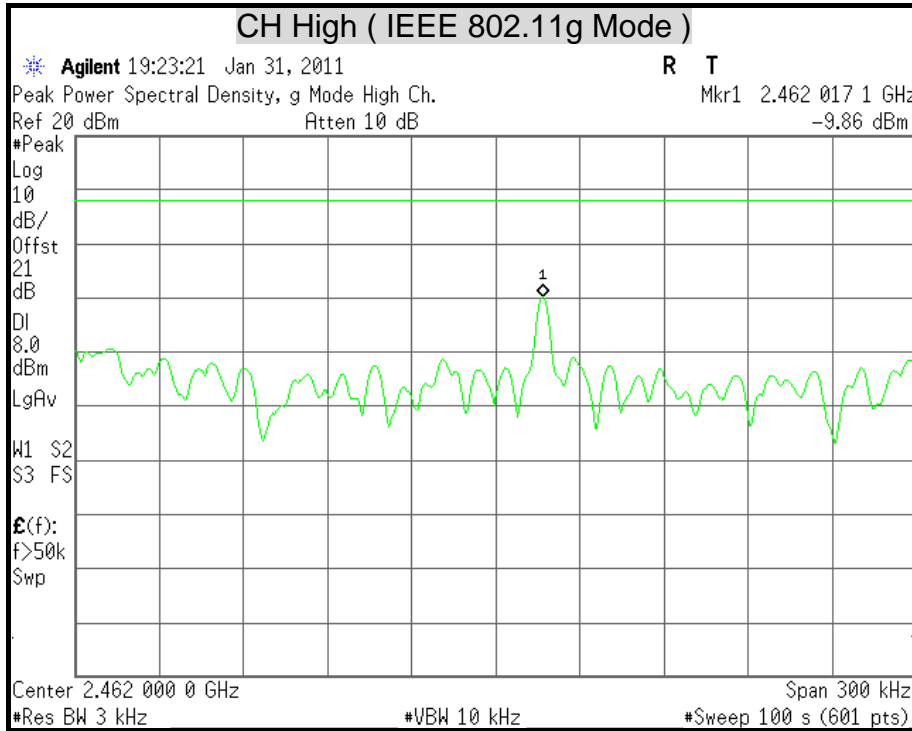


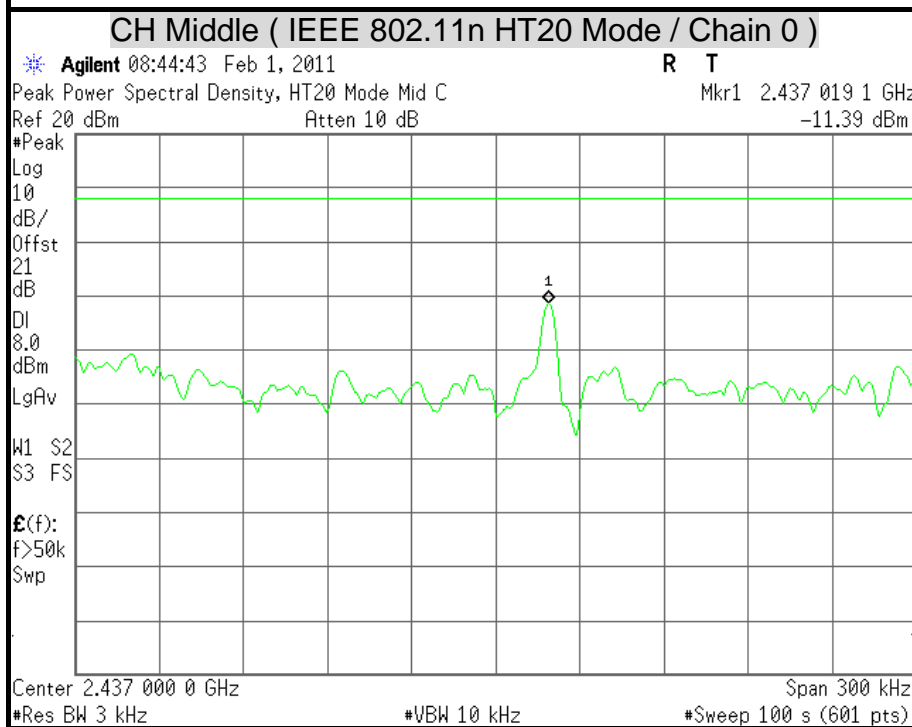
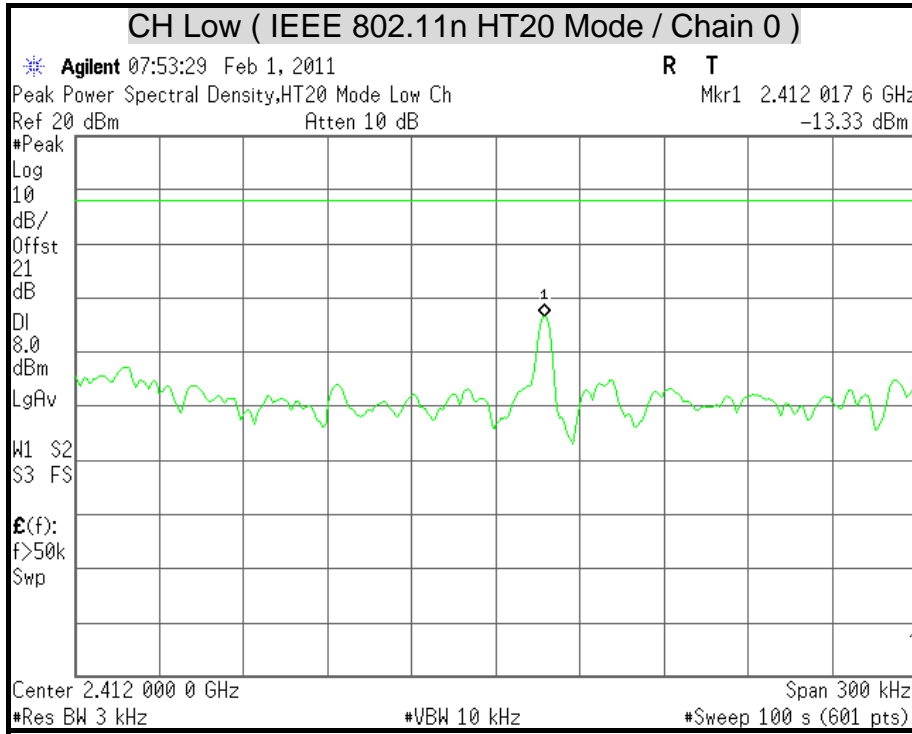
POWER SPECTRAL DENSITY

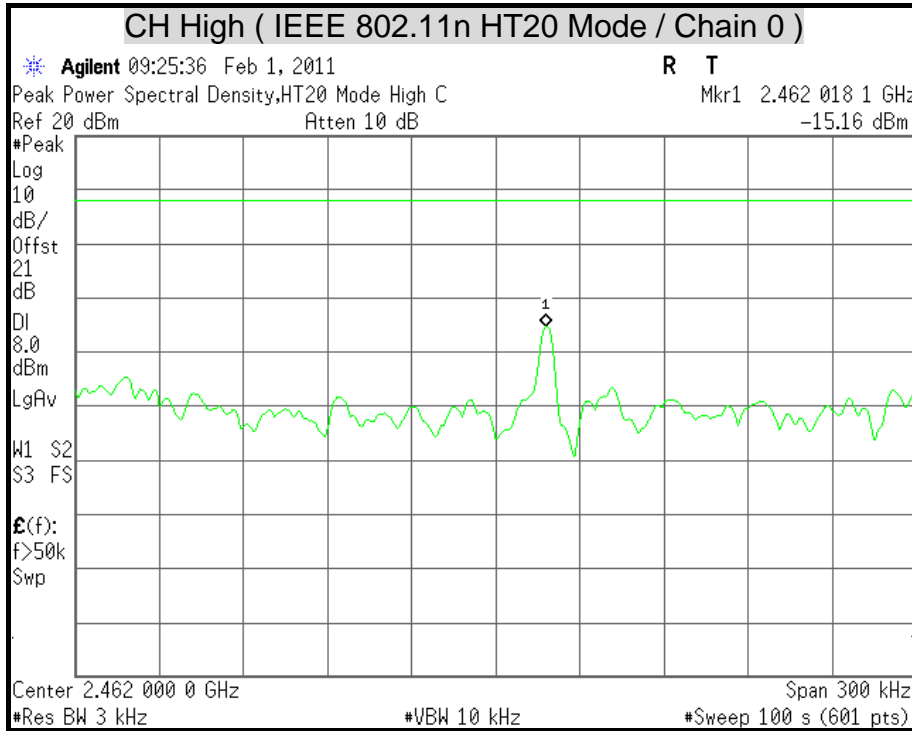


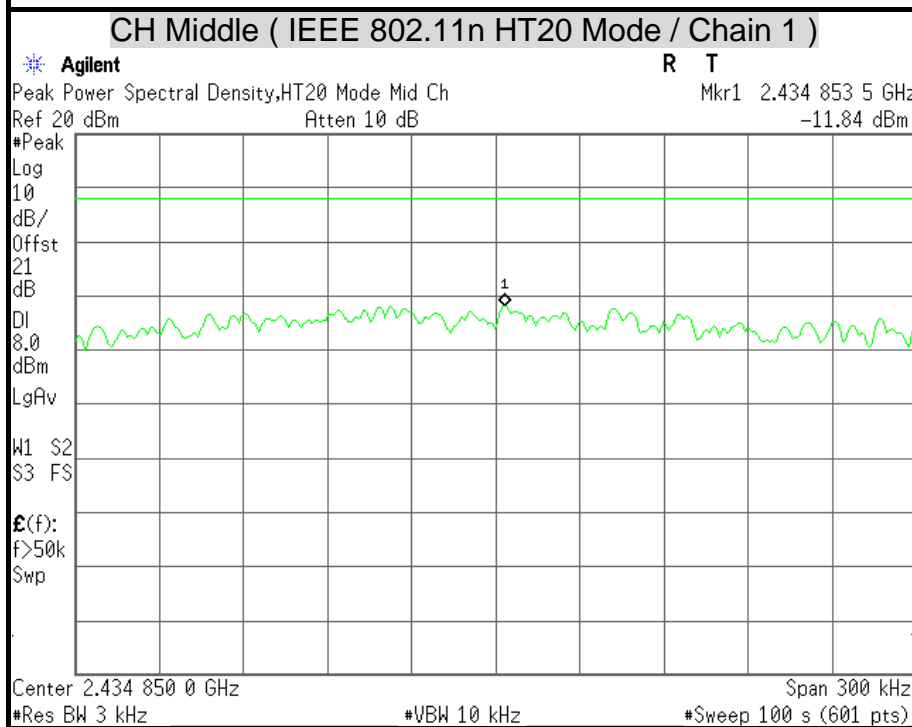
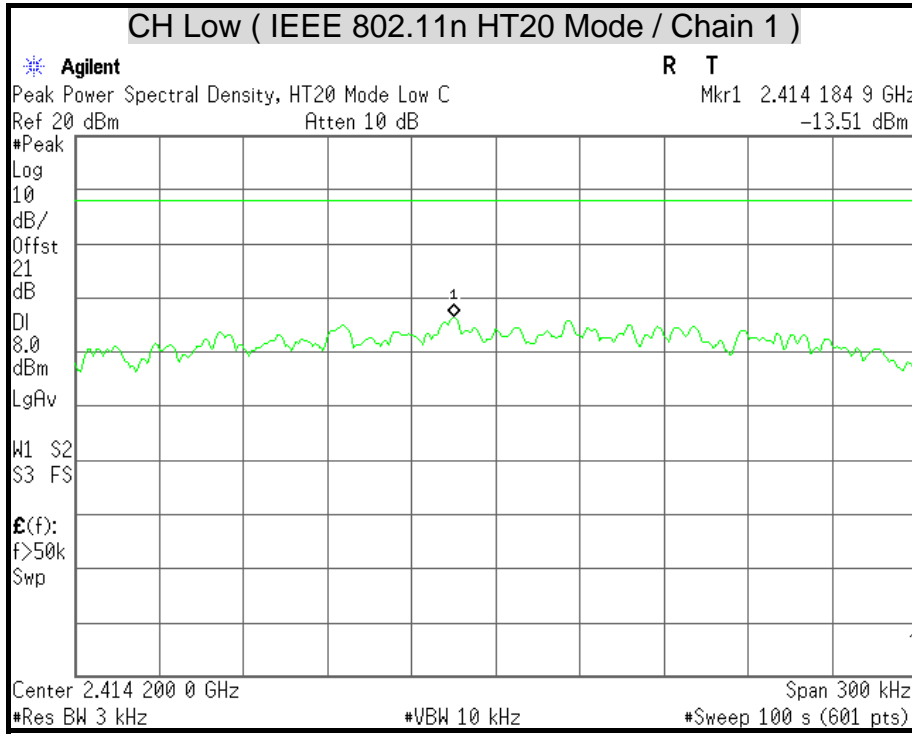


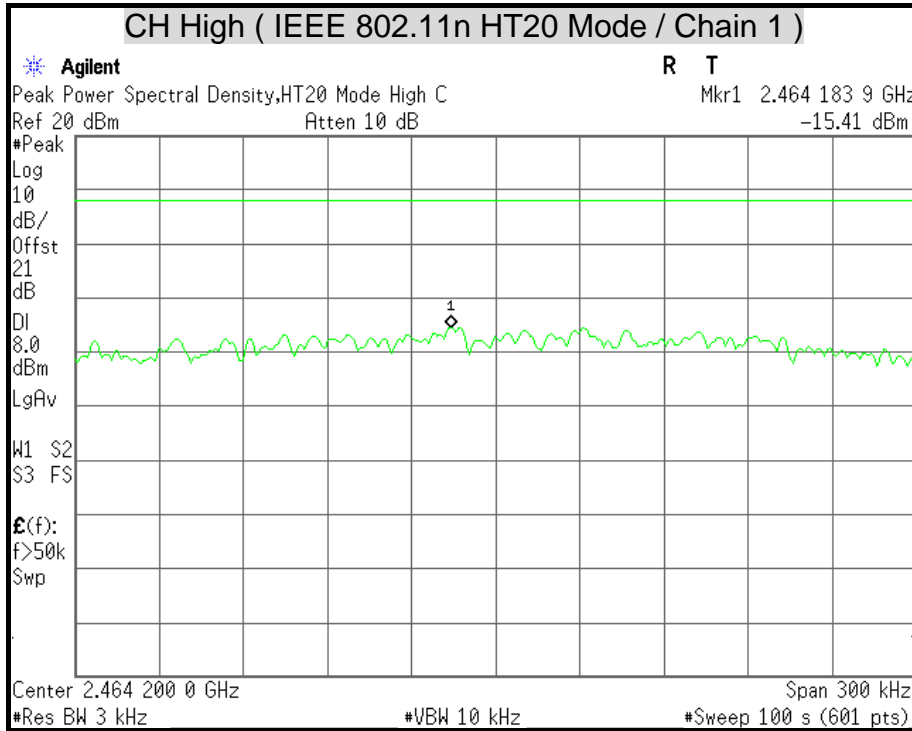


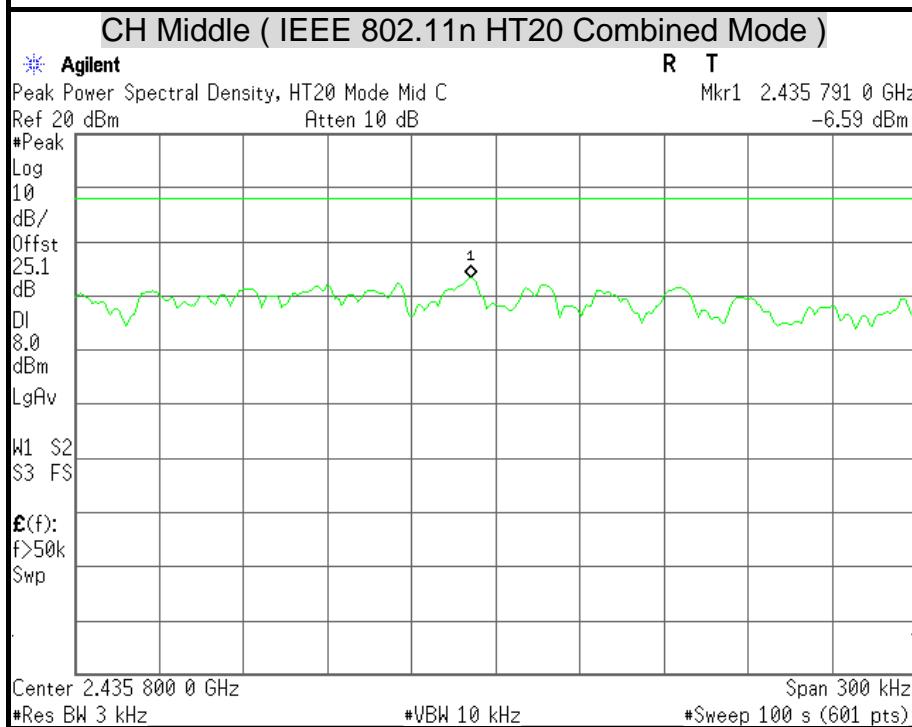
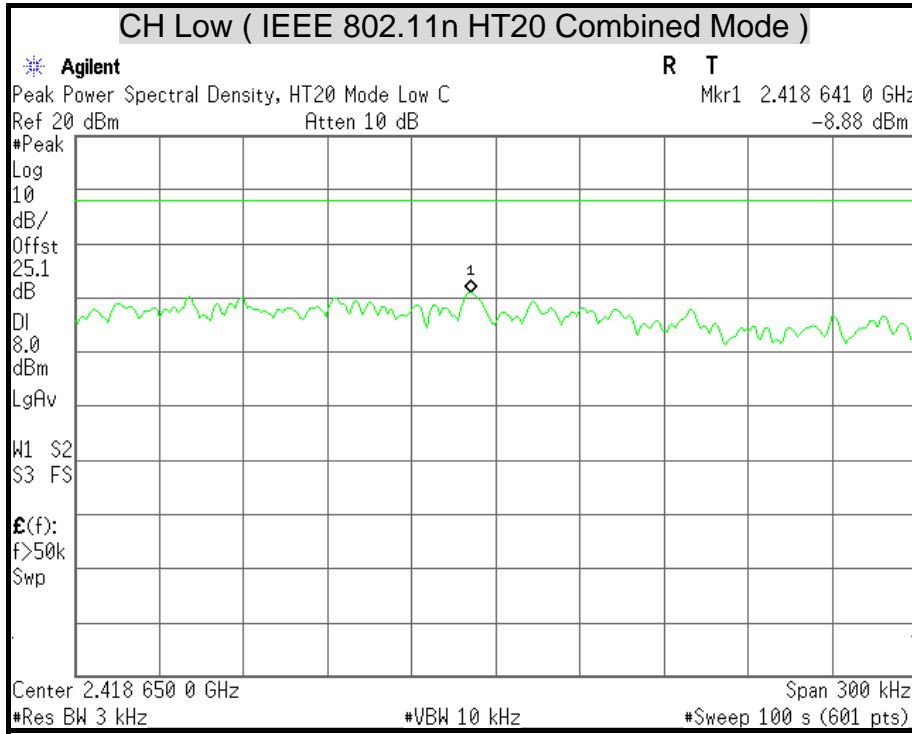


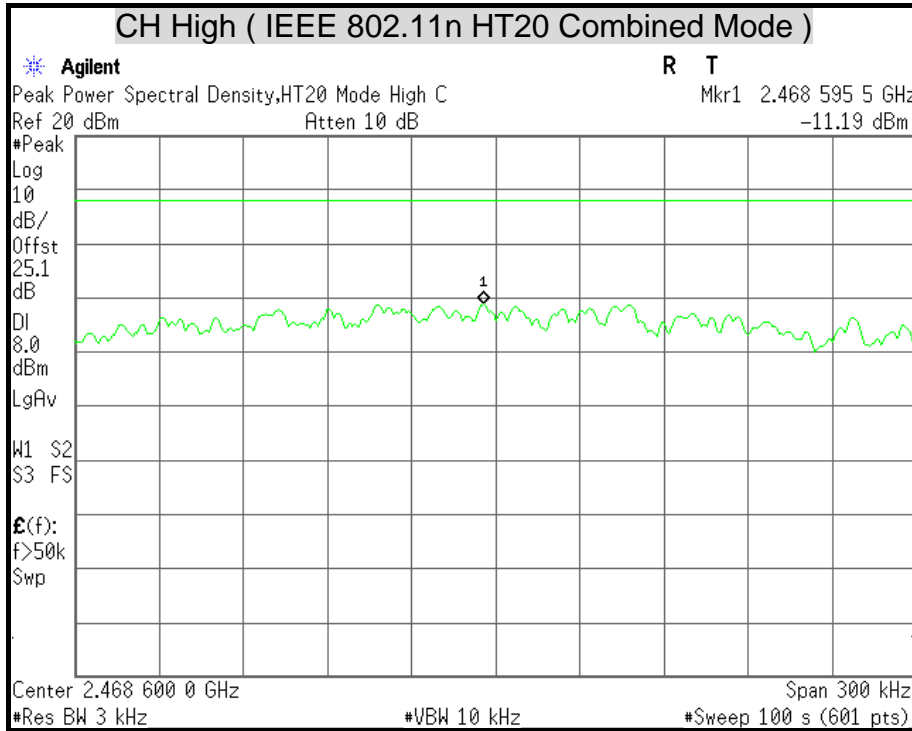


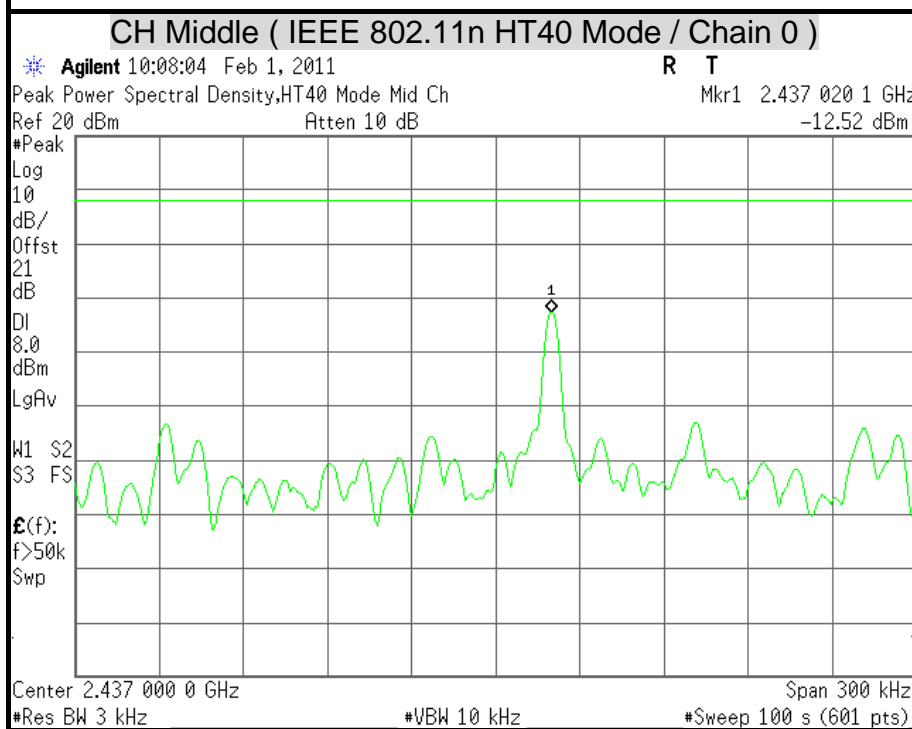
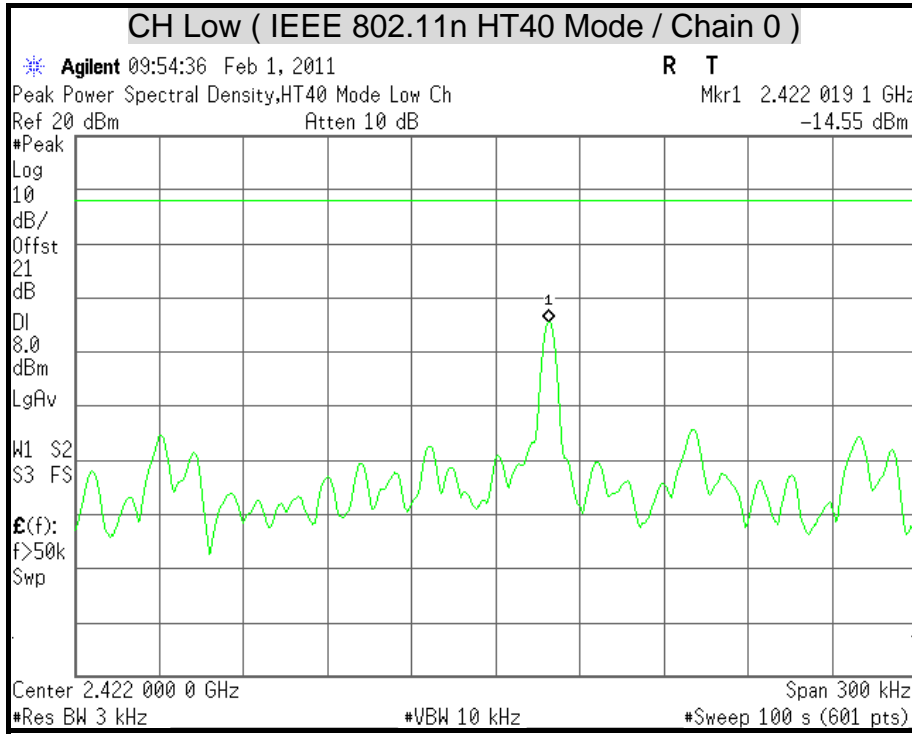


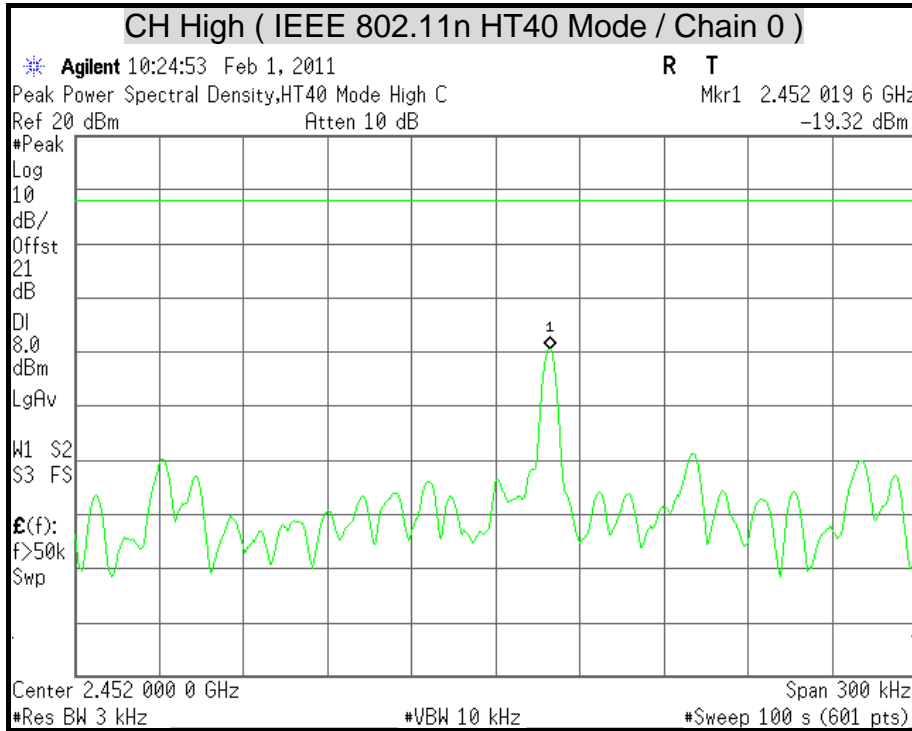


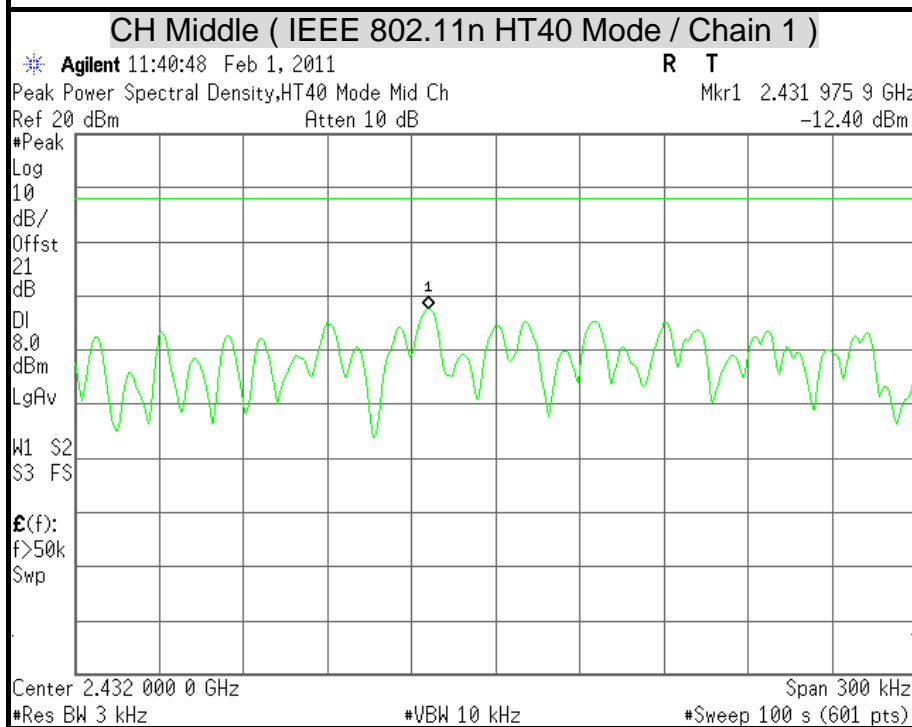
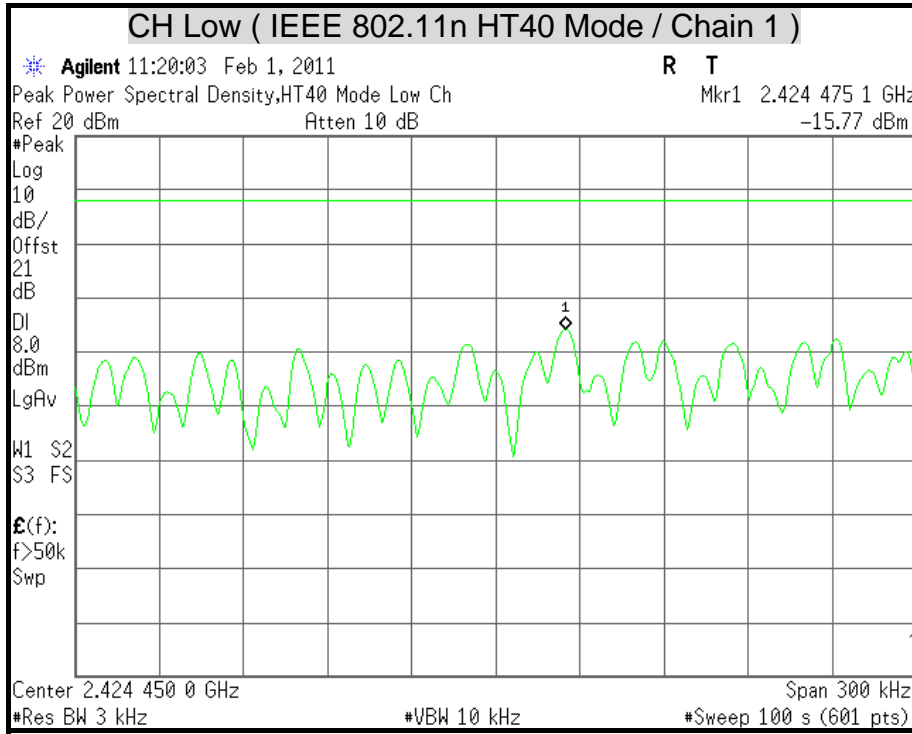


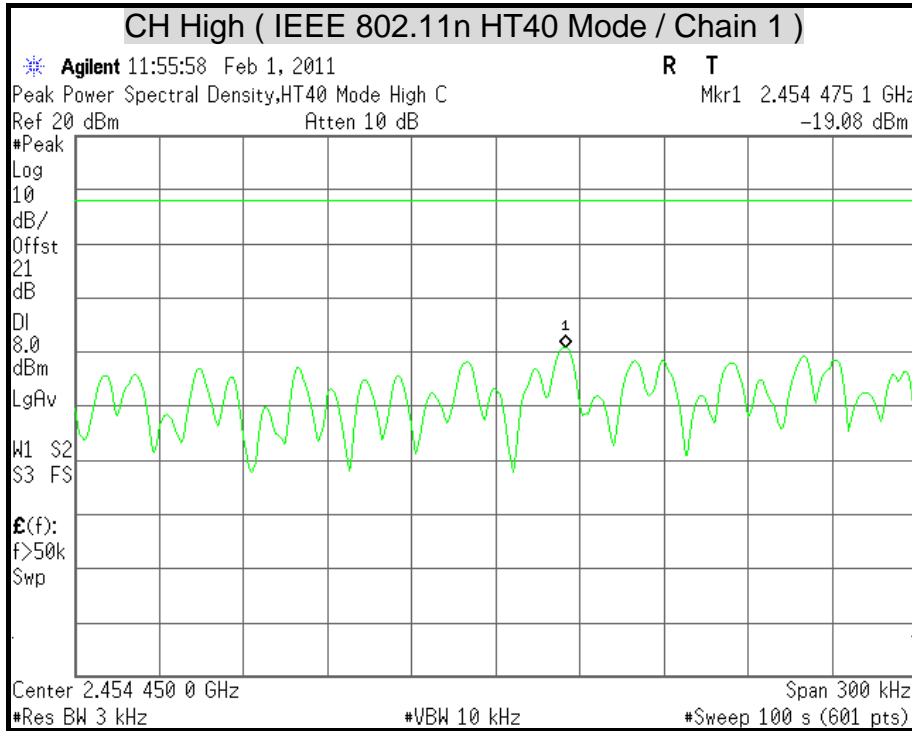


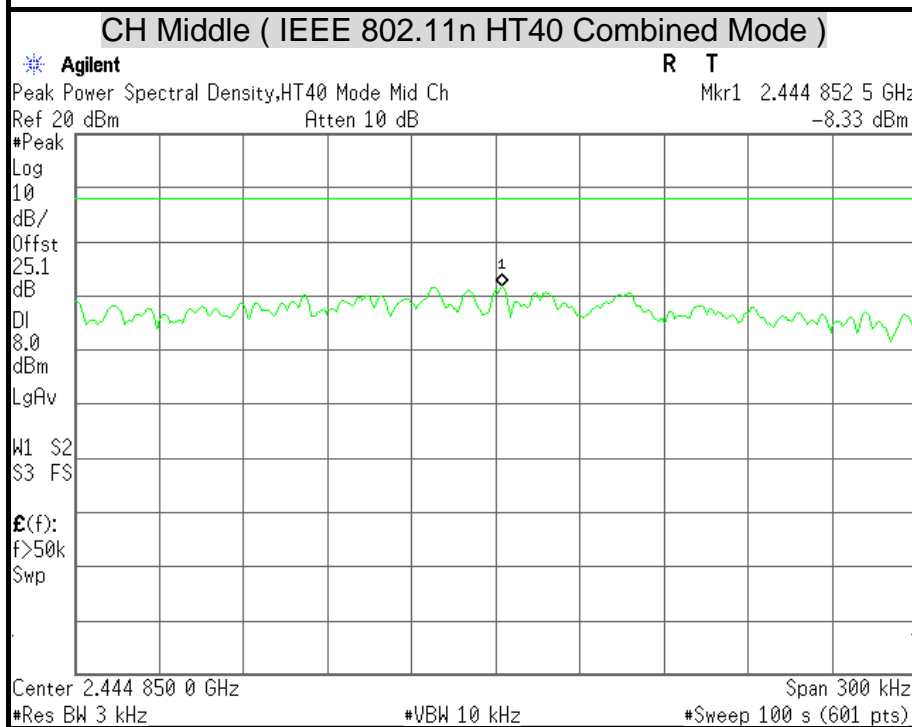
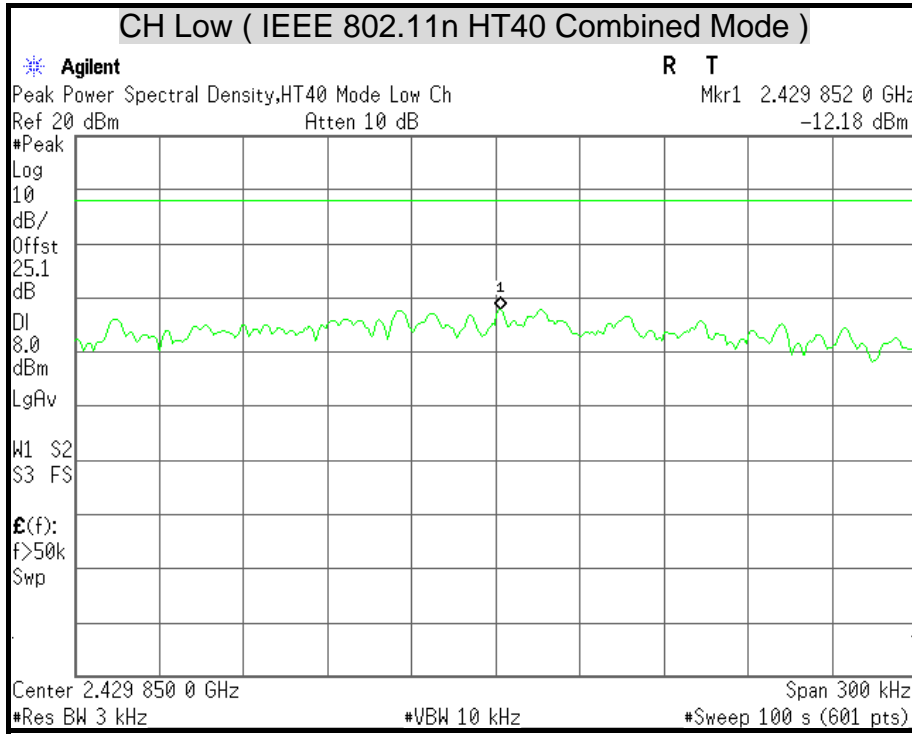


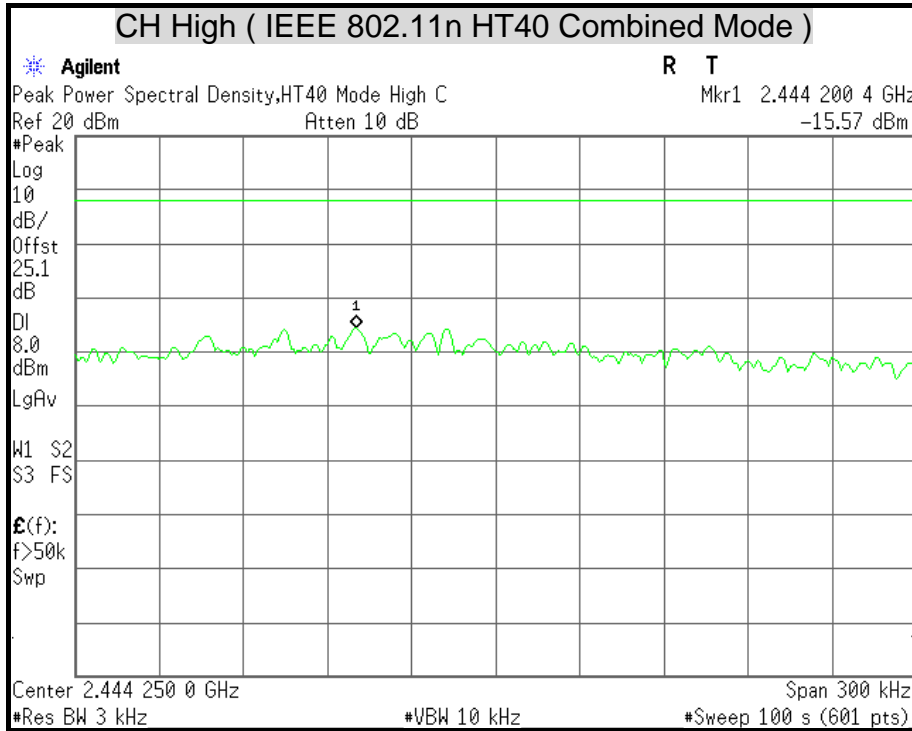














7.5 CONDUCTED SPURIOUS EMISSION

LIMITS

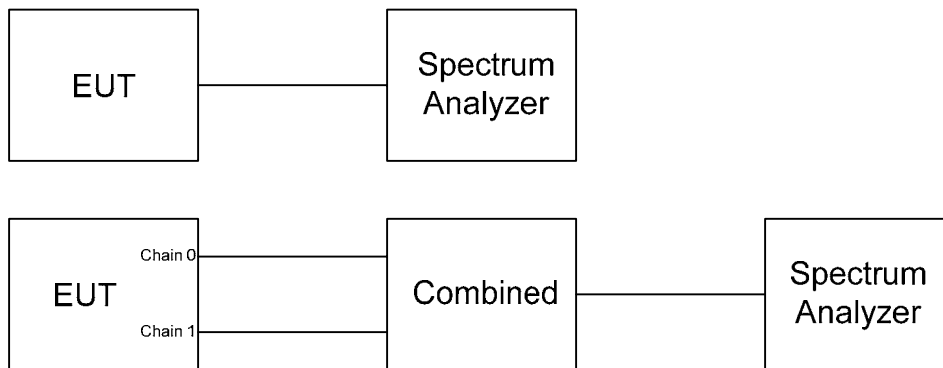
§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the and that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	AGILENT	E4446A	MY43360132	06/20/2011
Spectrum Analyzer	AGILENT	E4446A	MY46180323	05/02/2011

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

TEST SETUP



TEST PROCEDURE

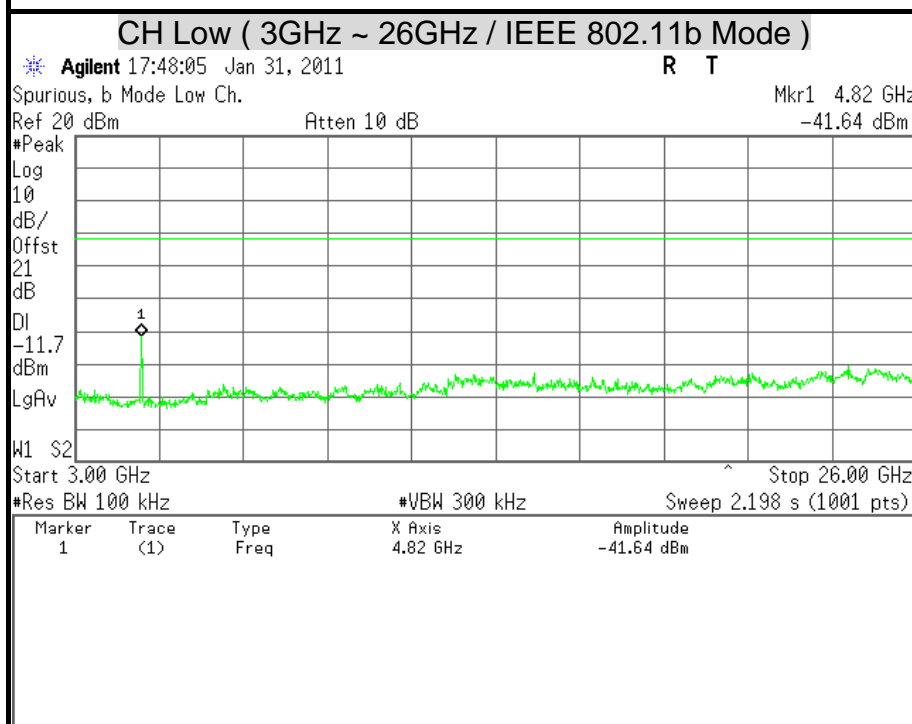
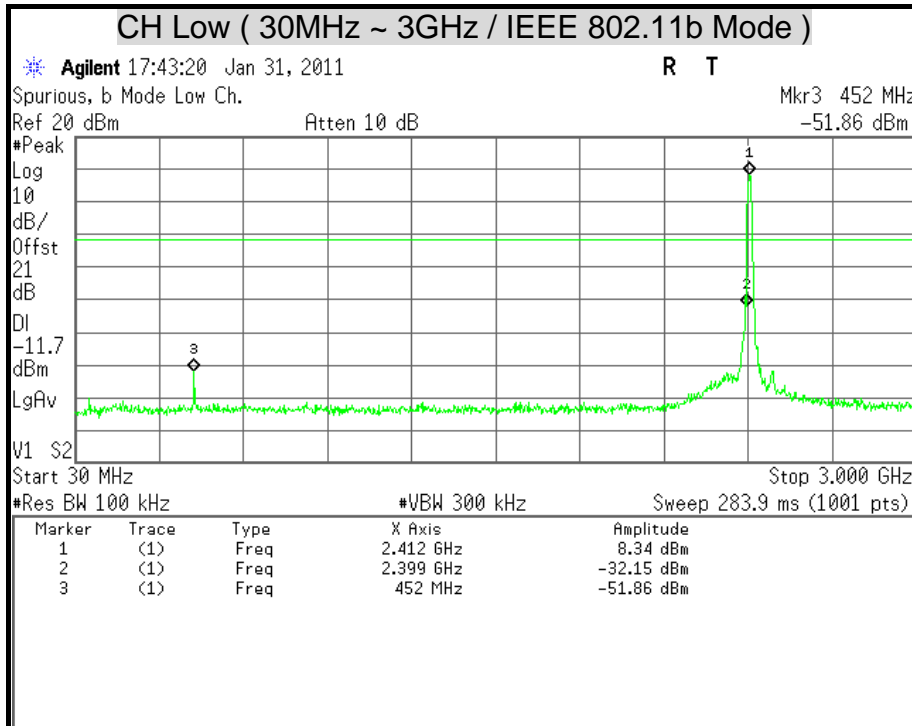
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

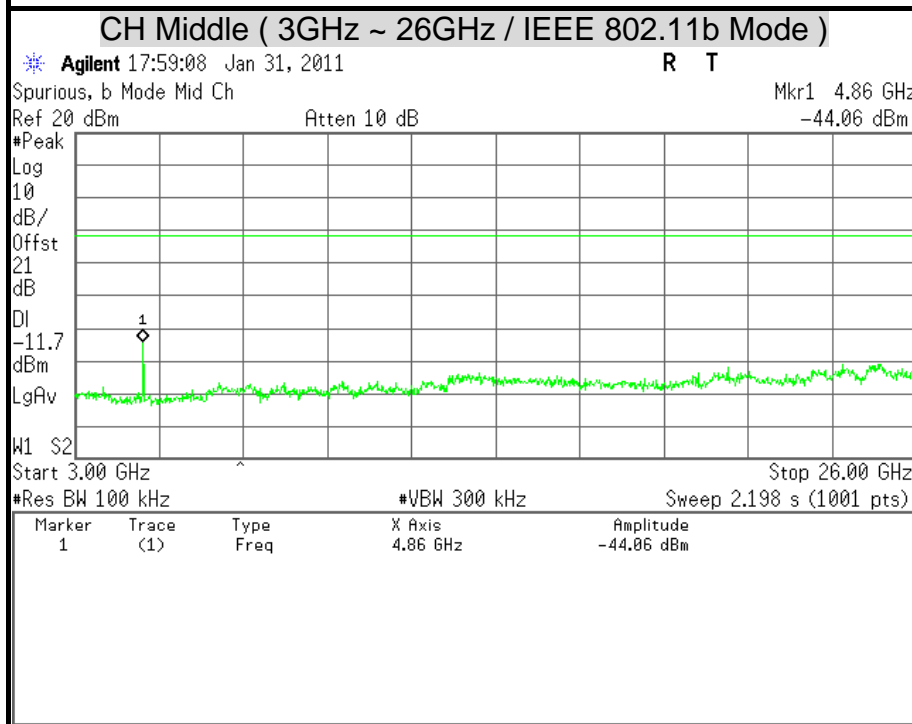
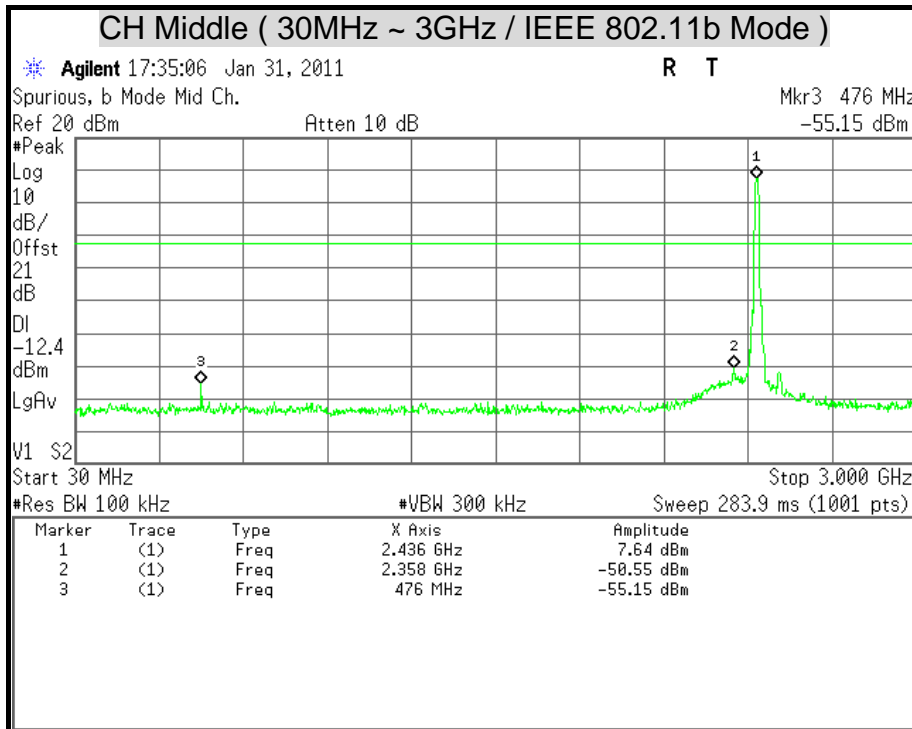
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

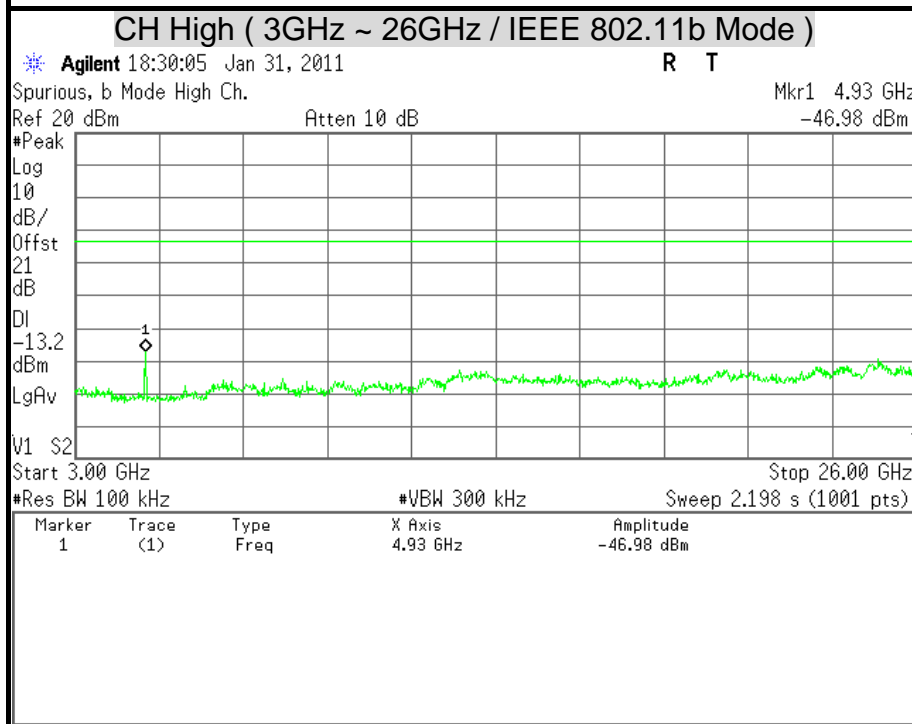
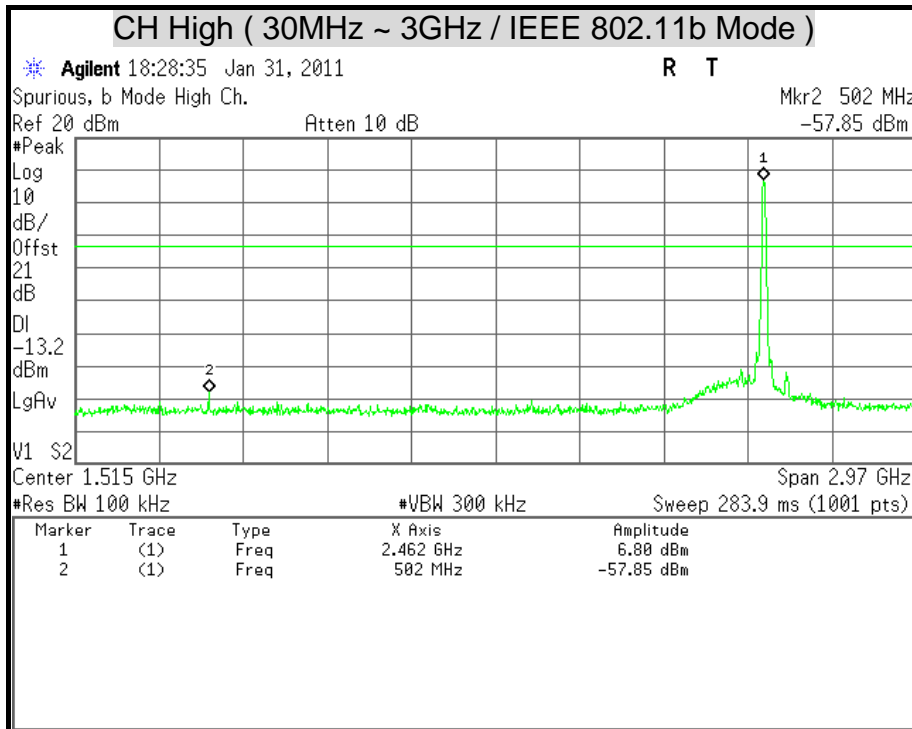


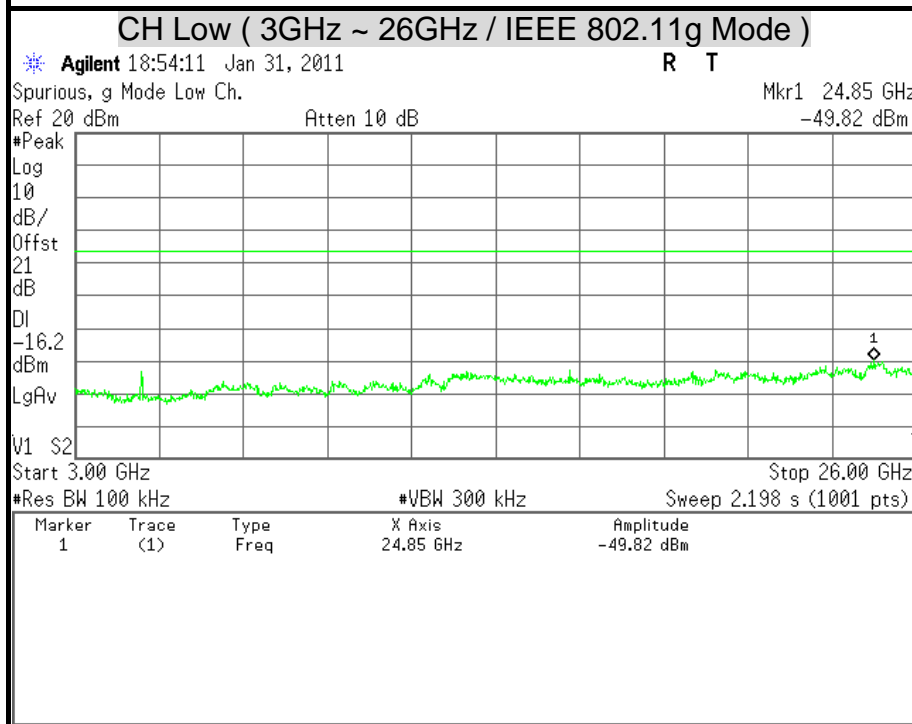
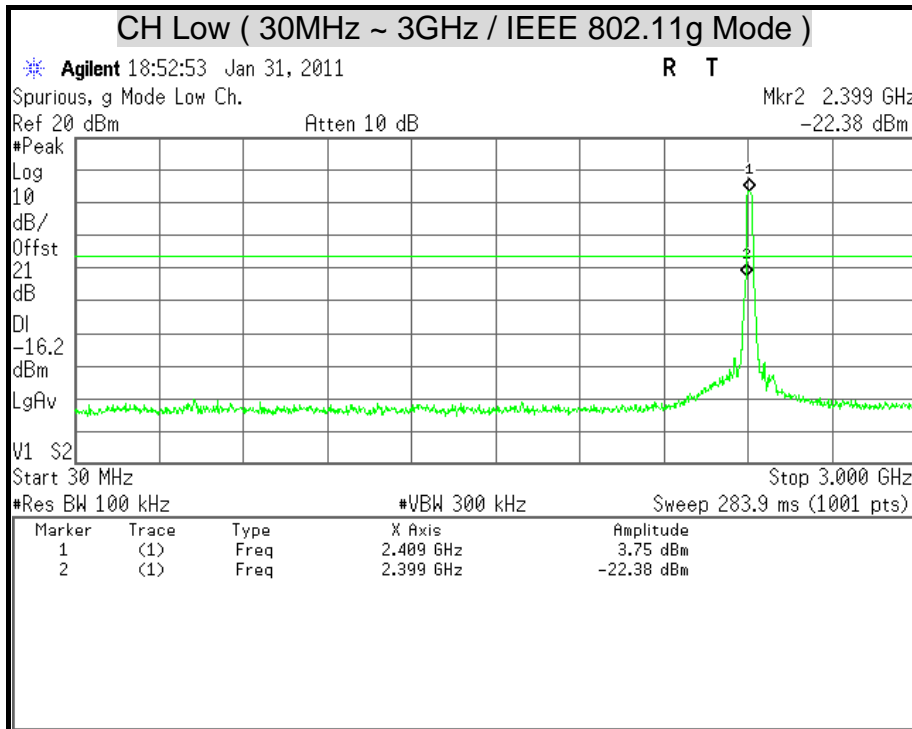
TEST RESULTS

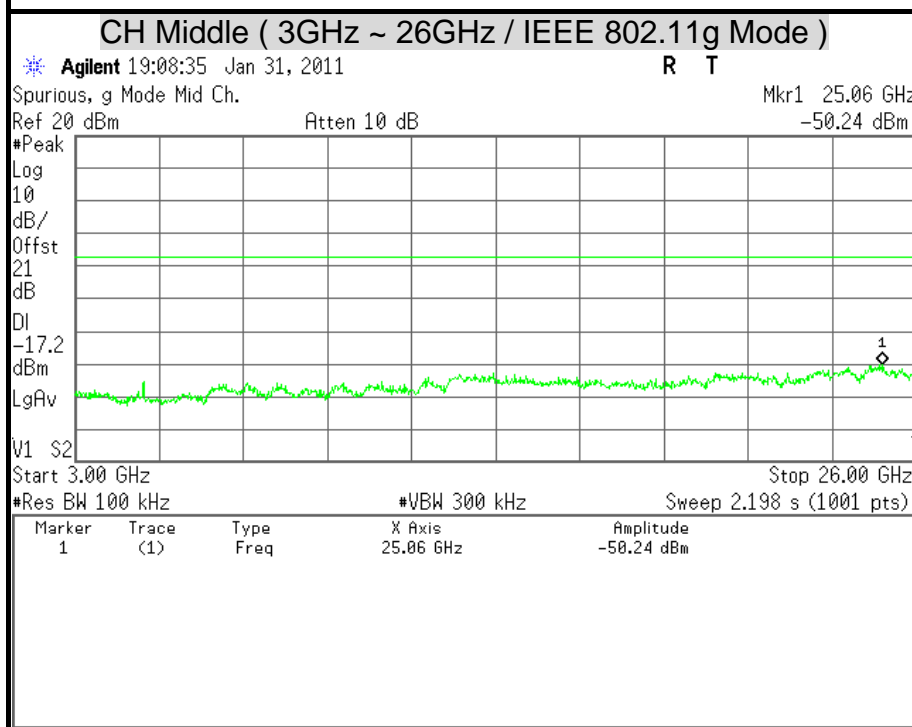
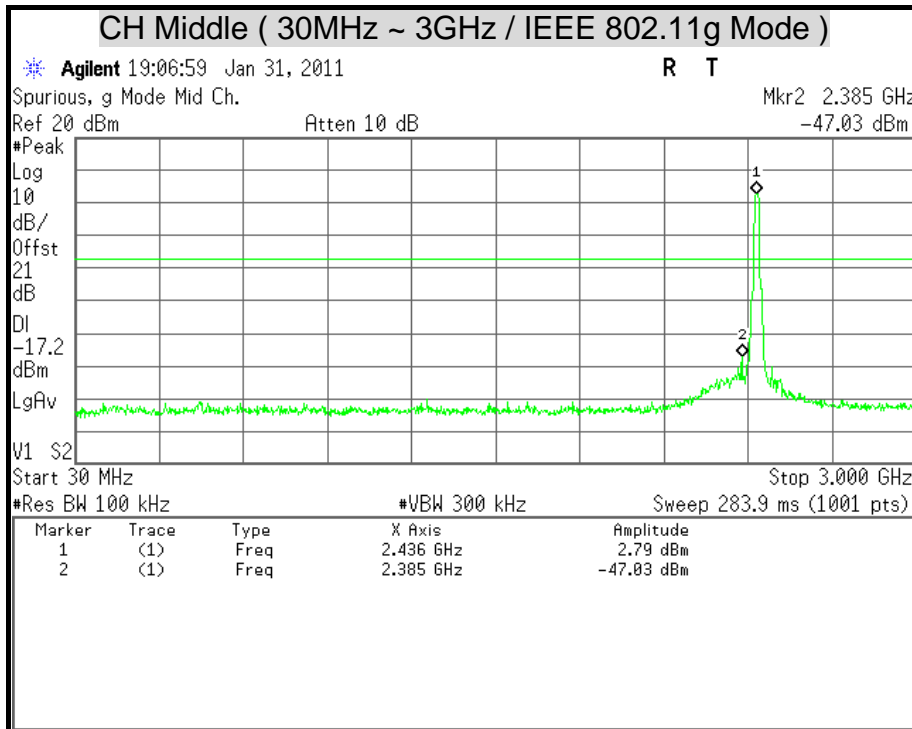
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

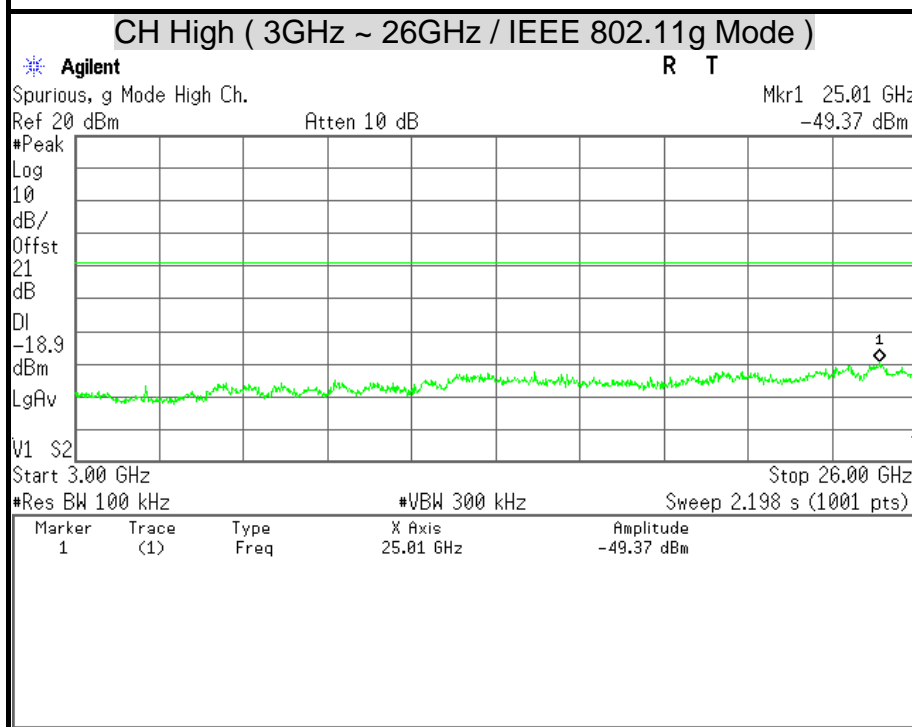
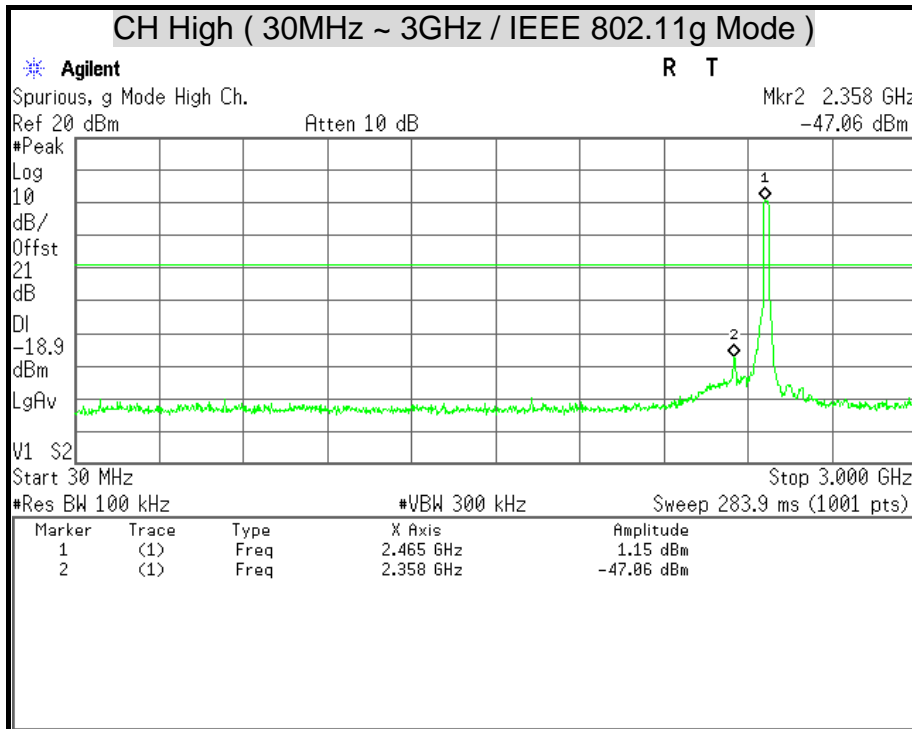


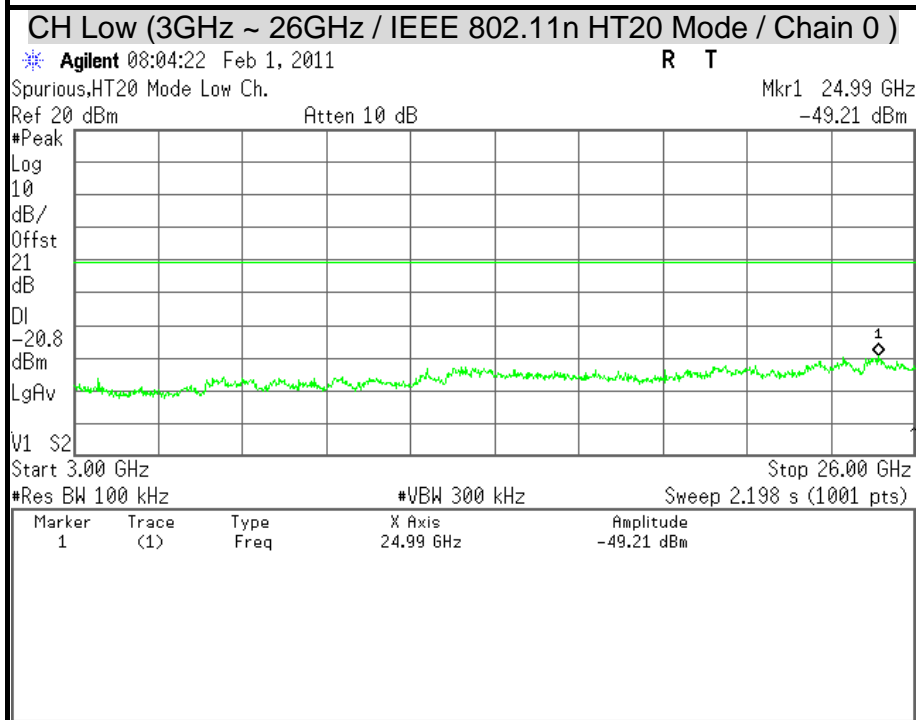
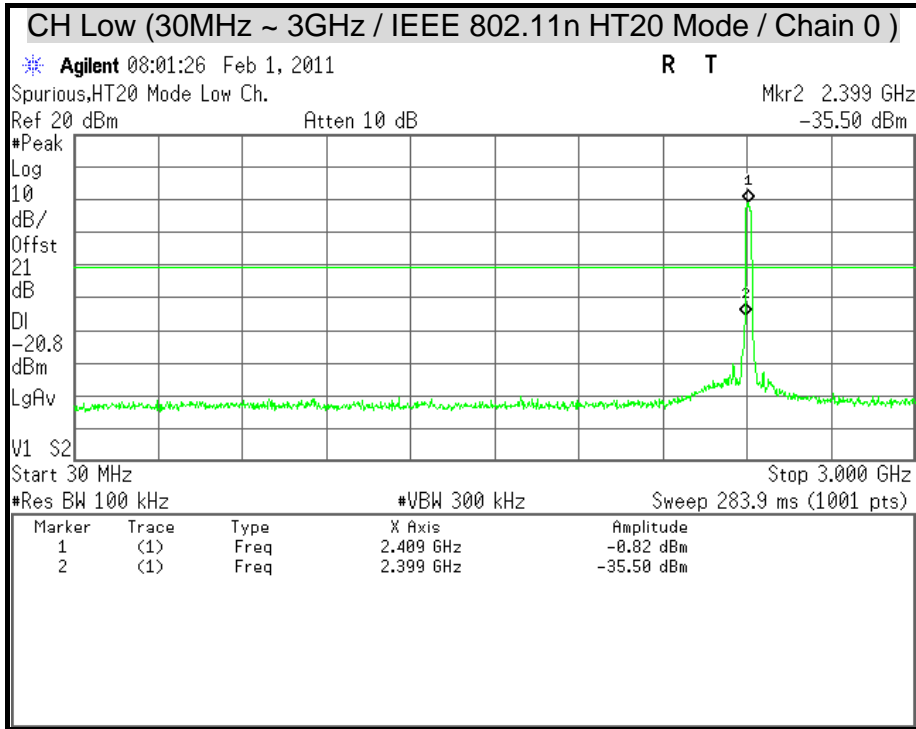


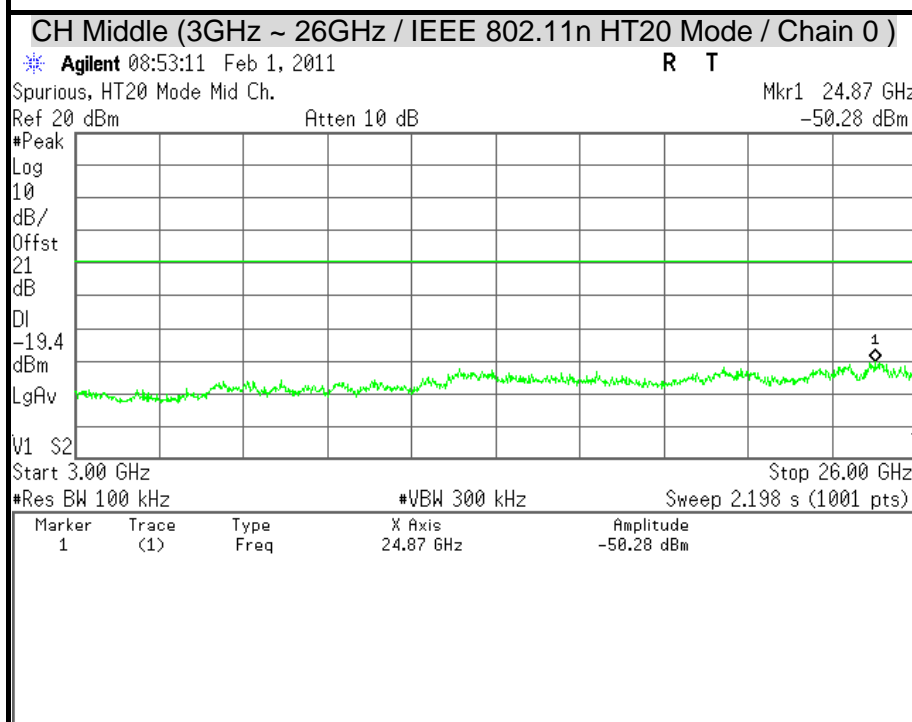
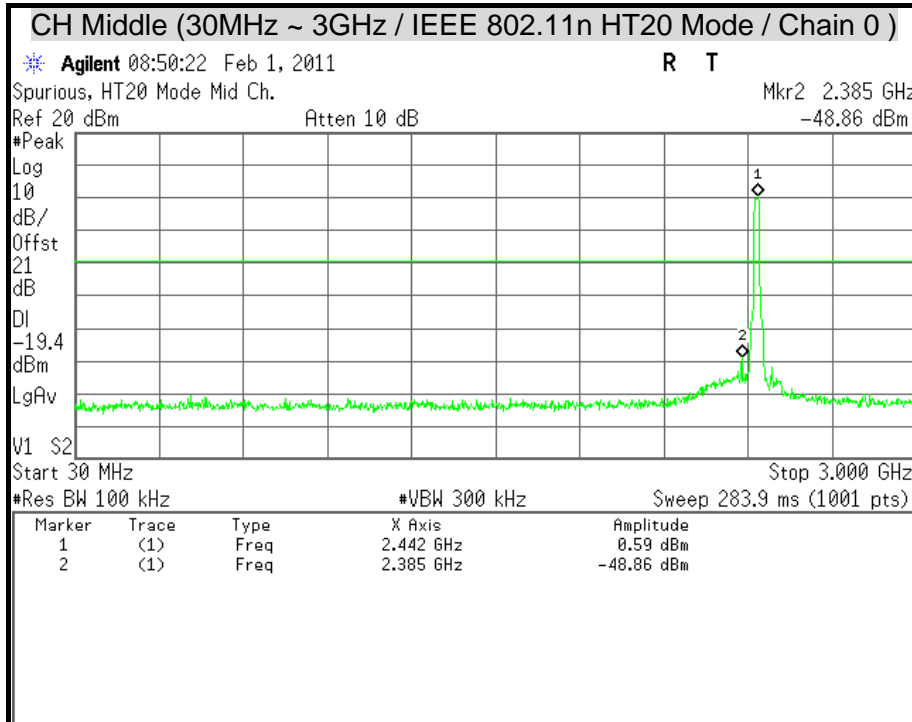


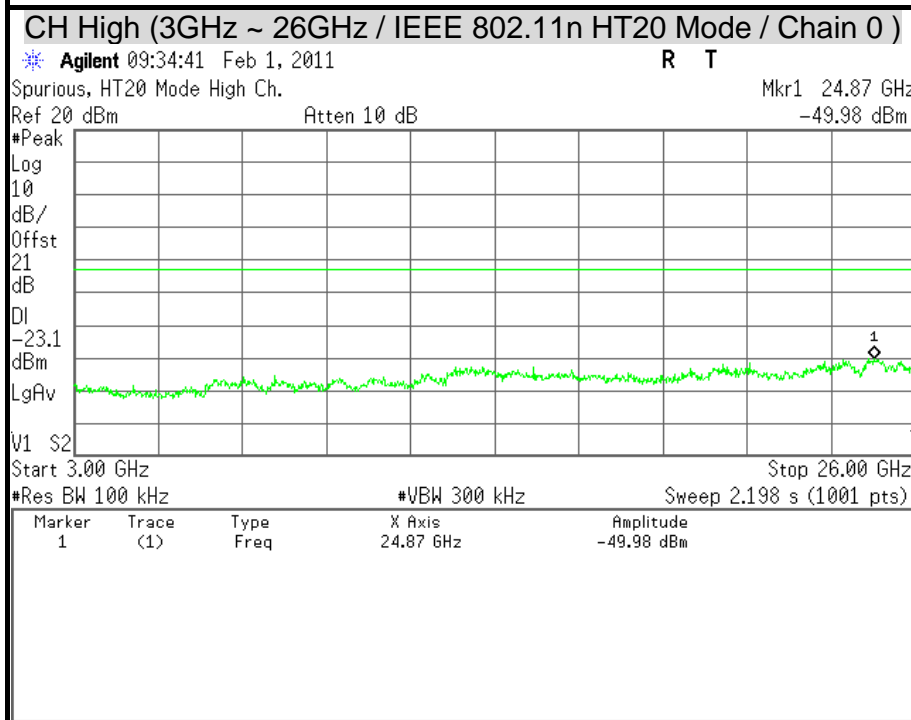
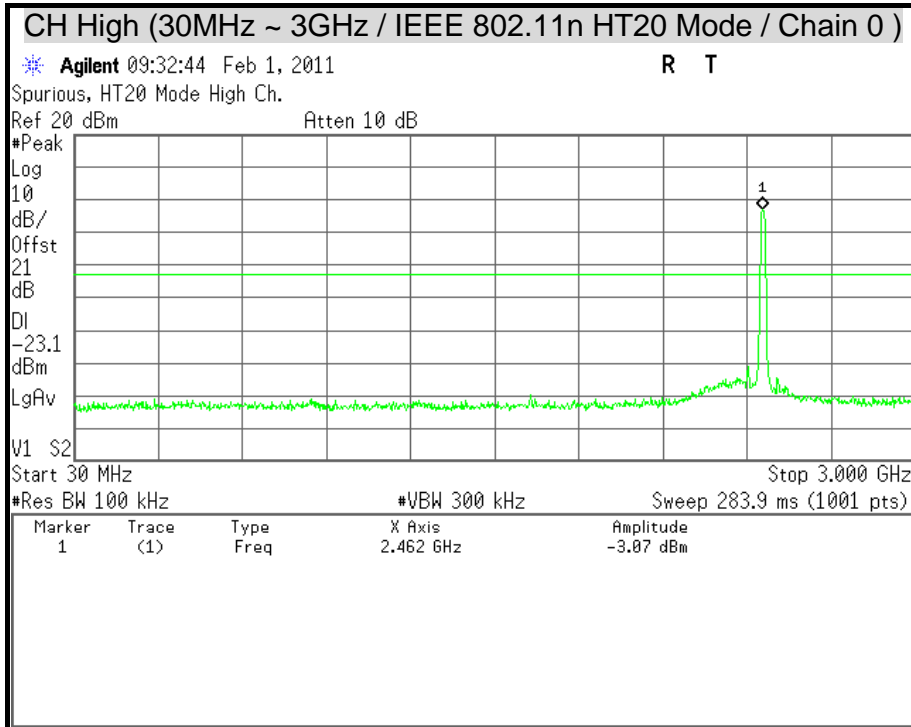


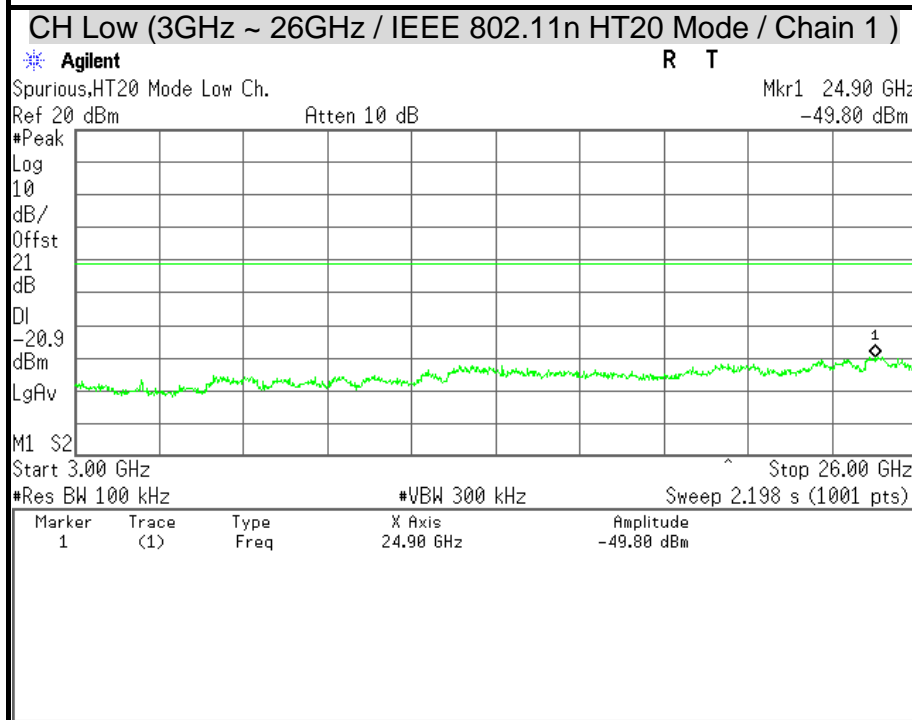
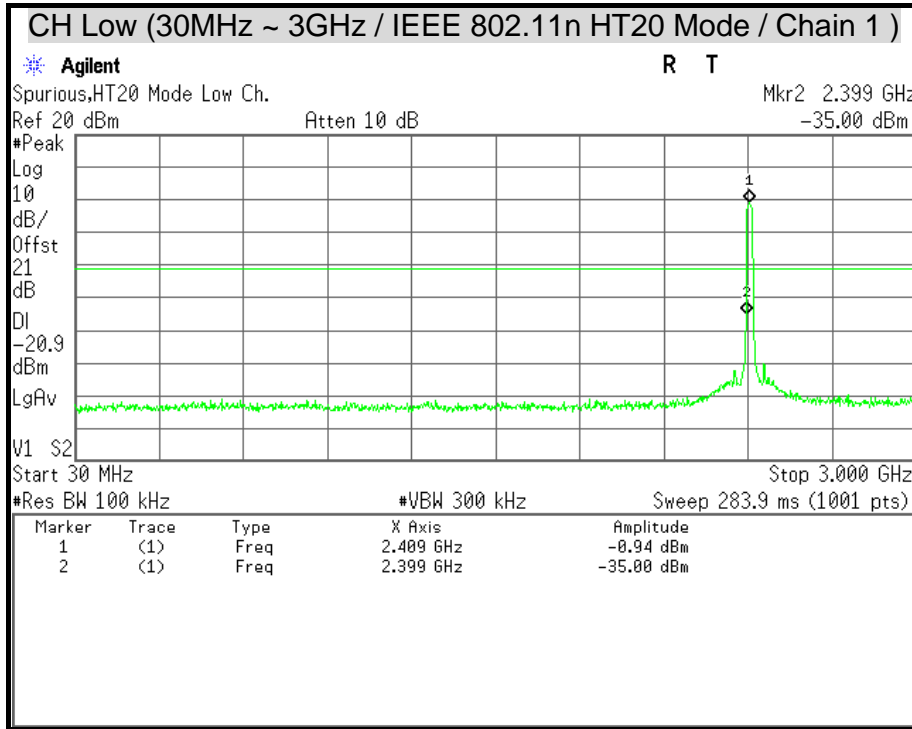


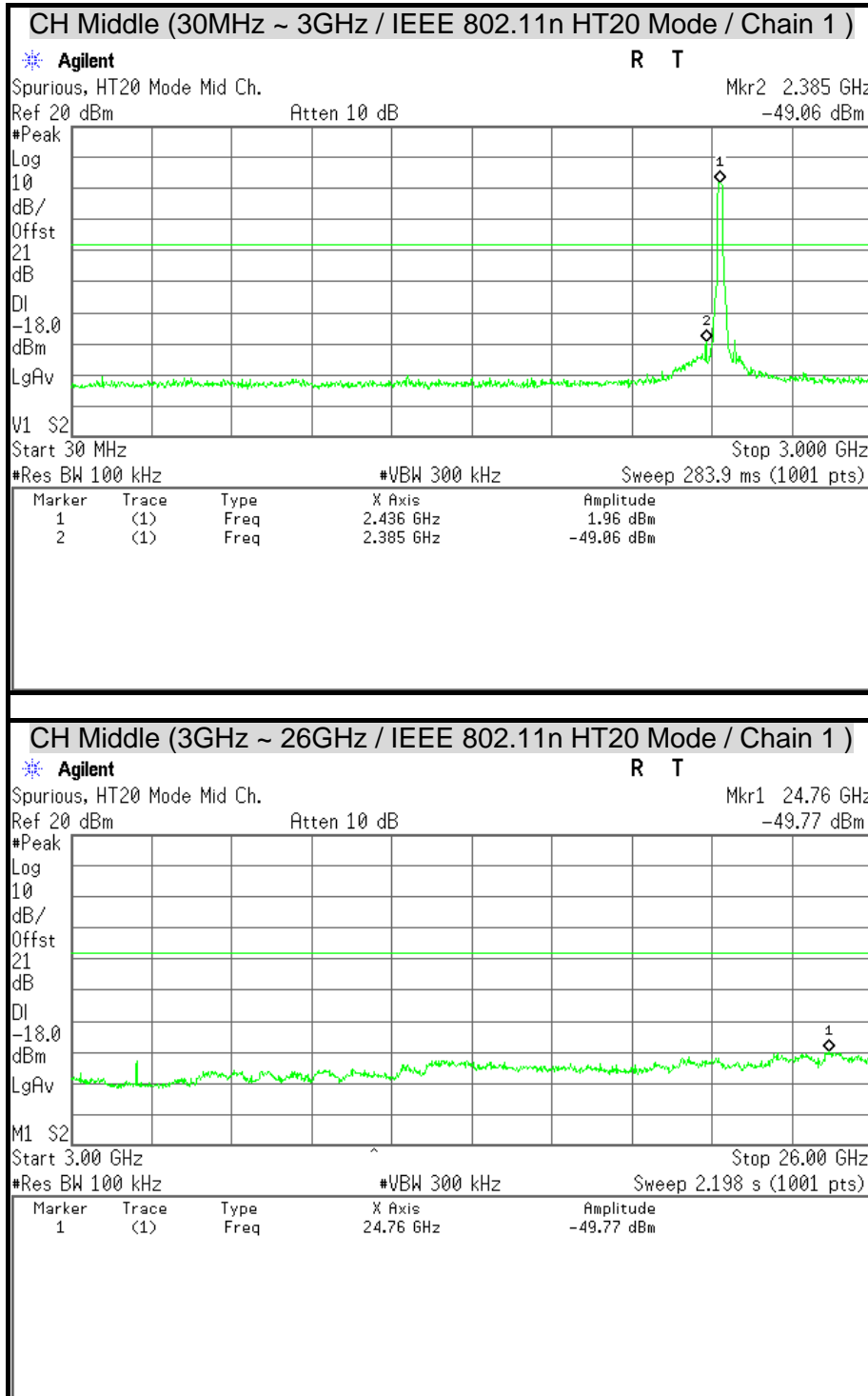


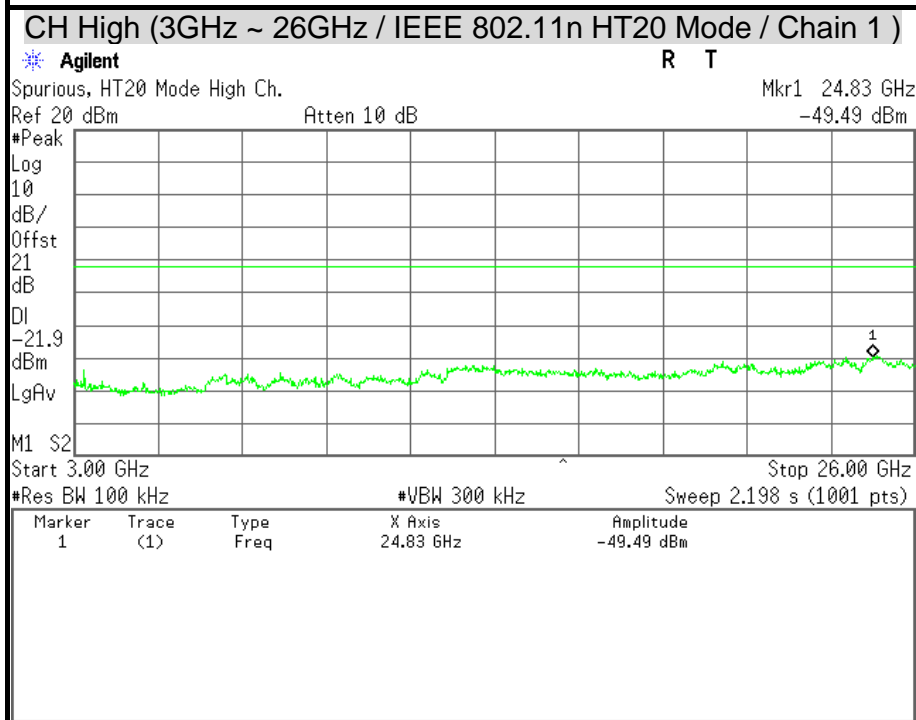
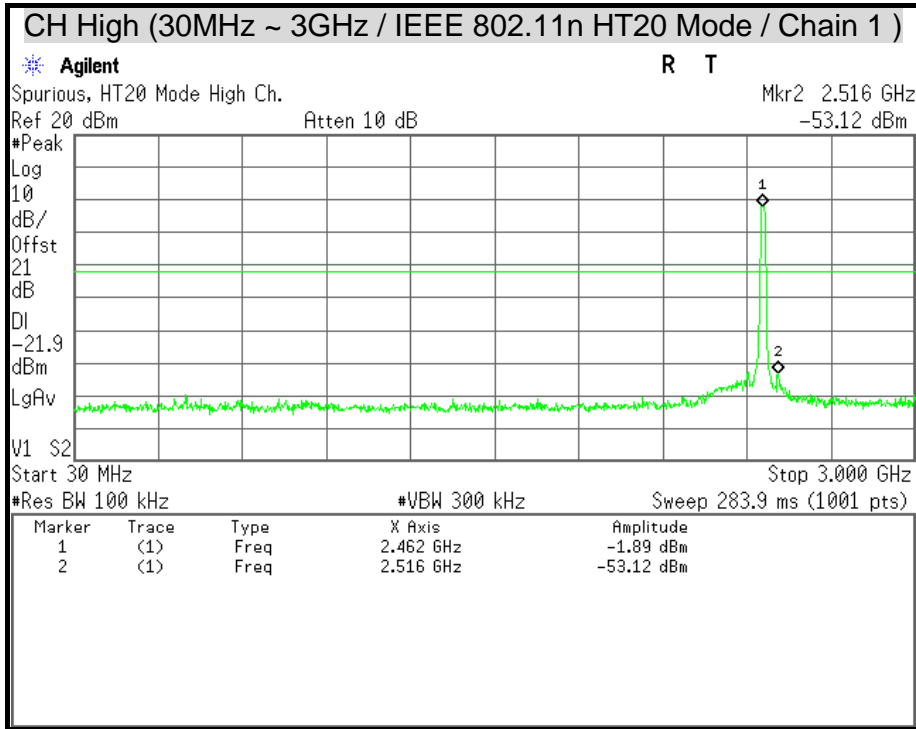


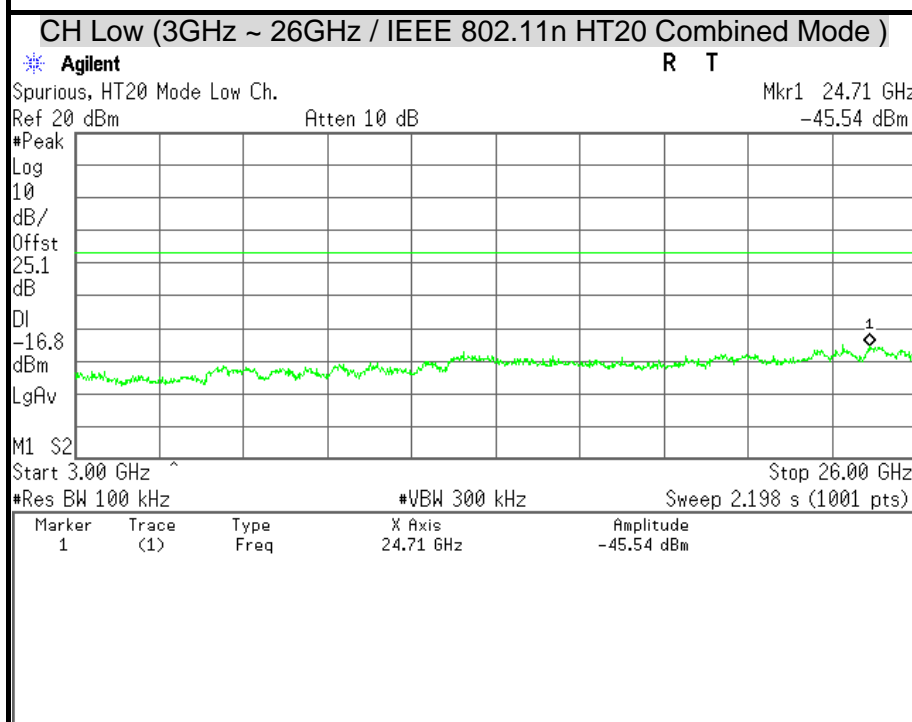
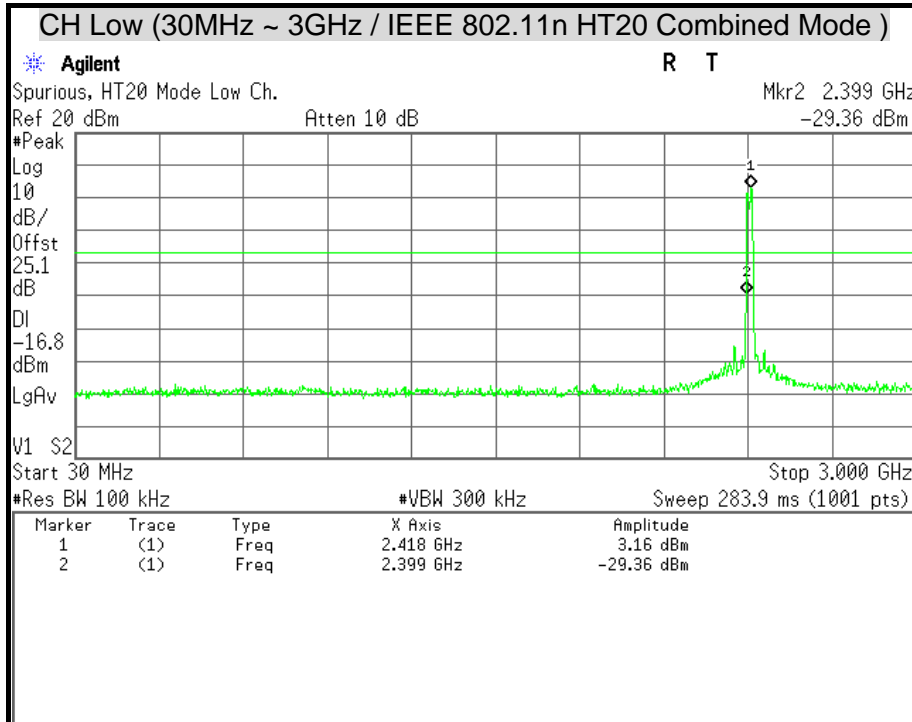


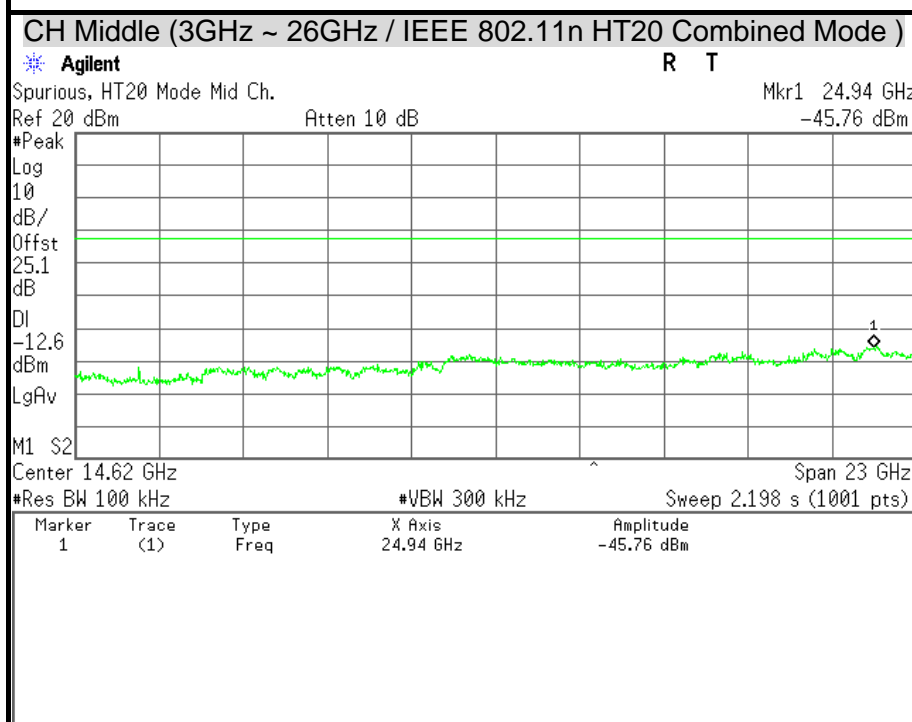
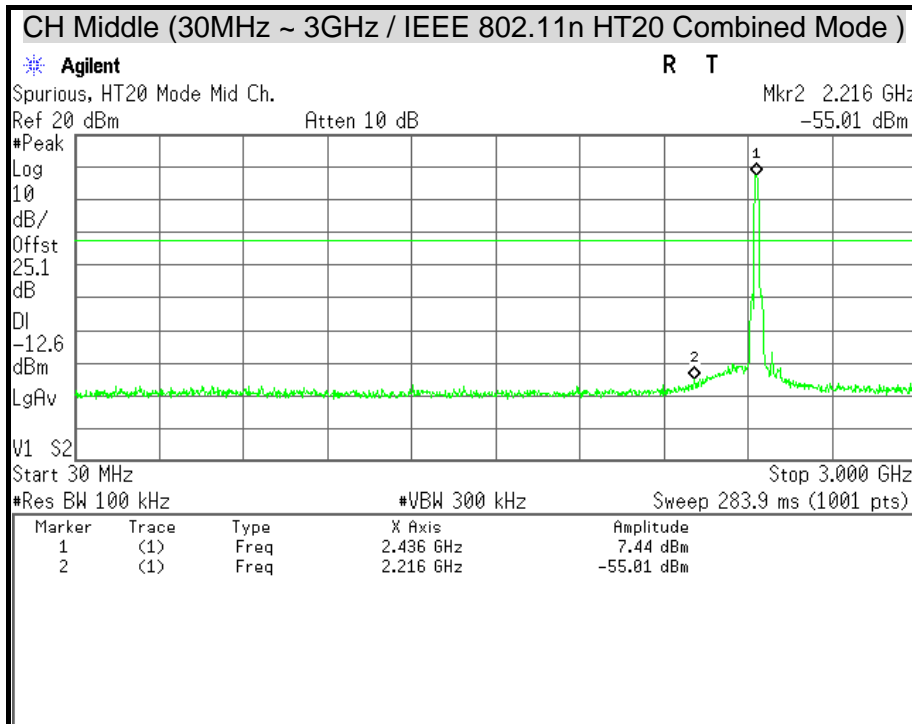


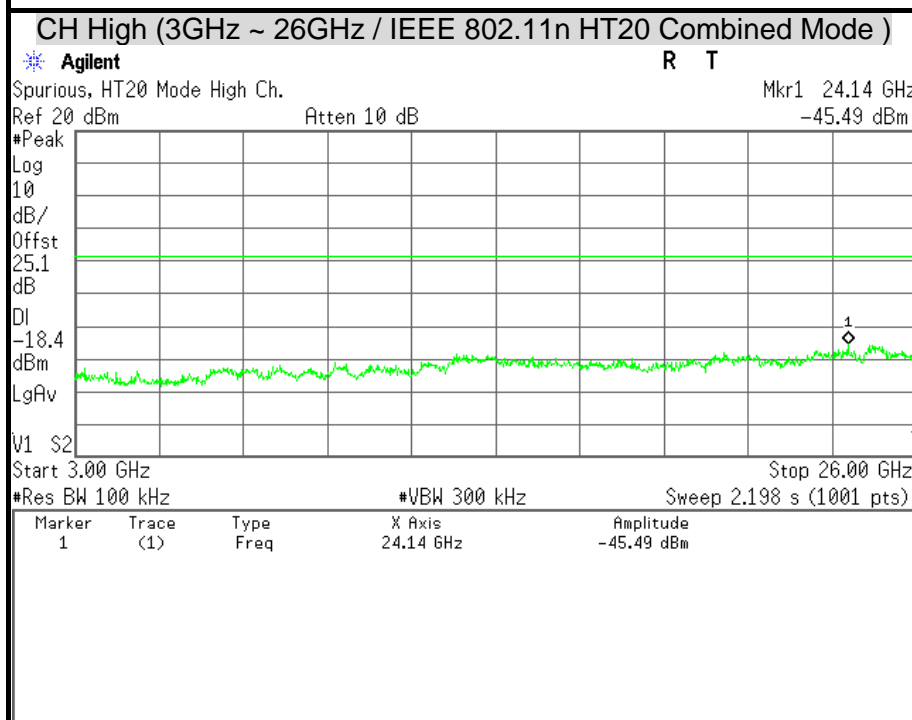
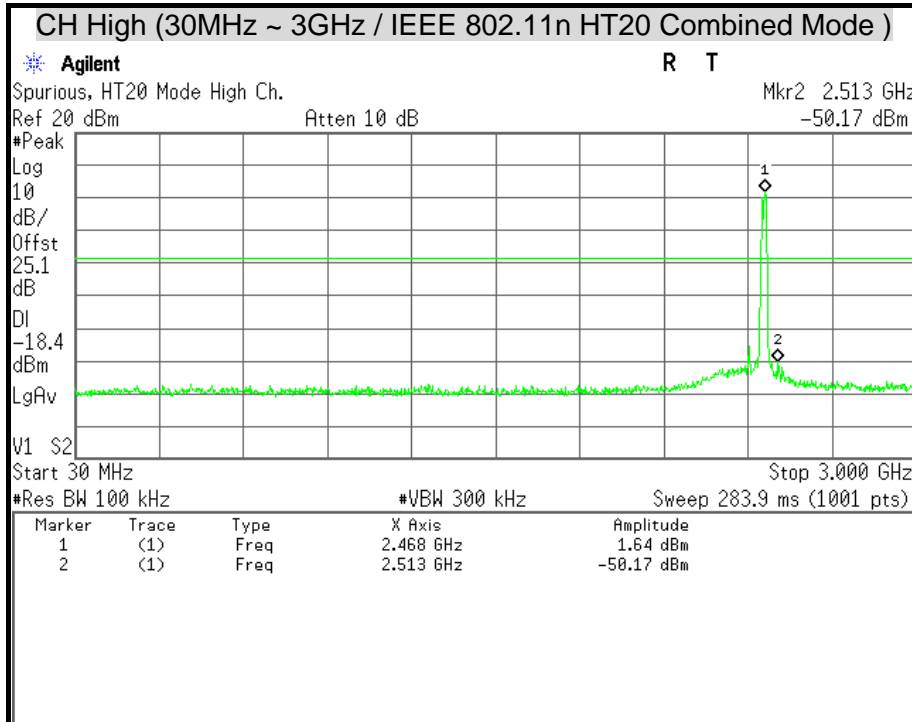


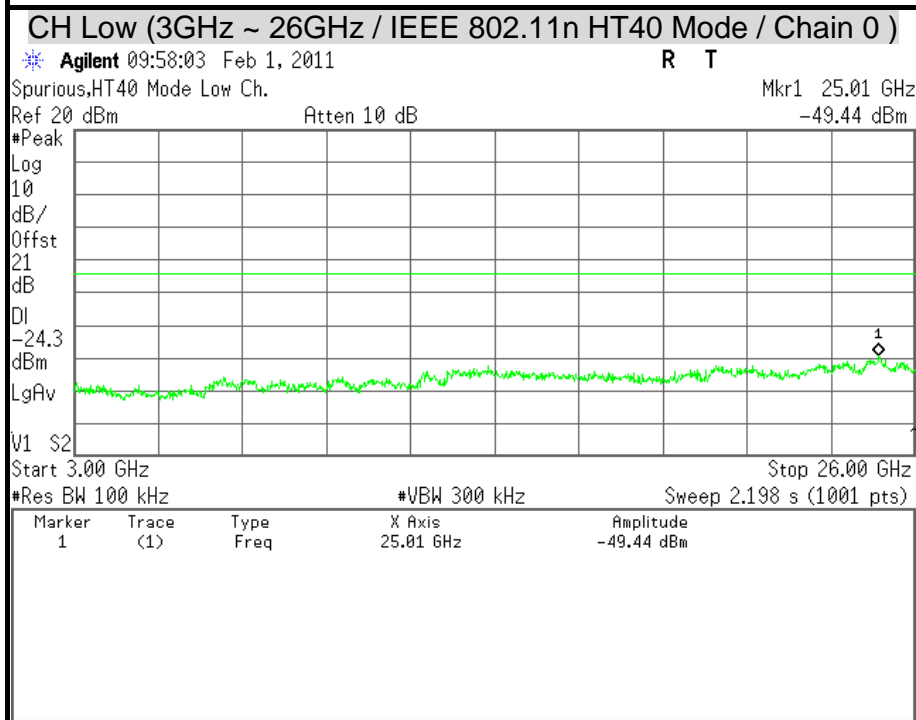
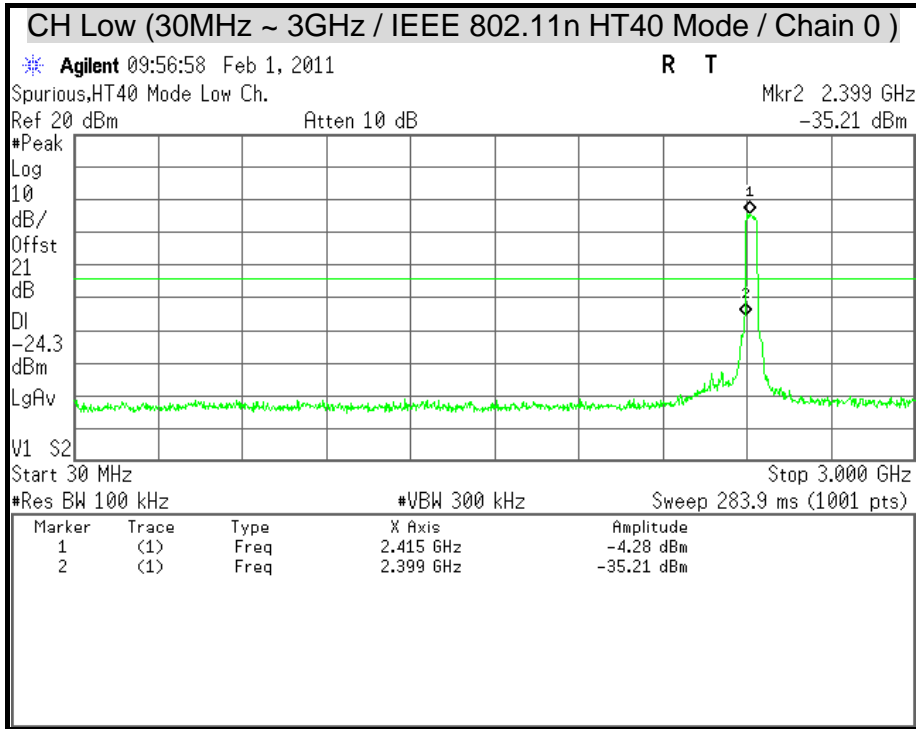


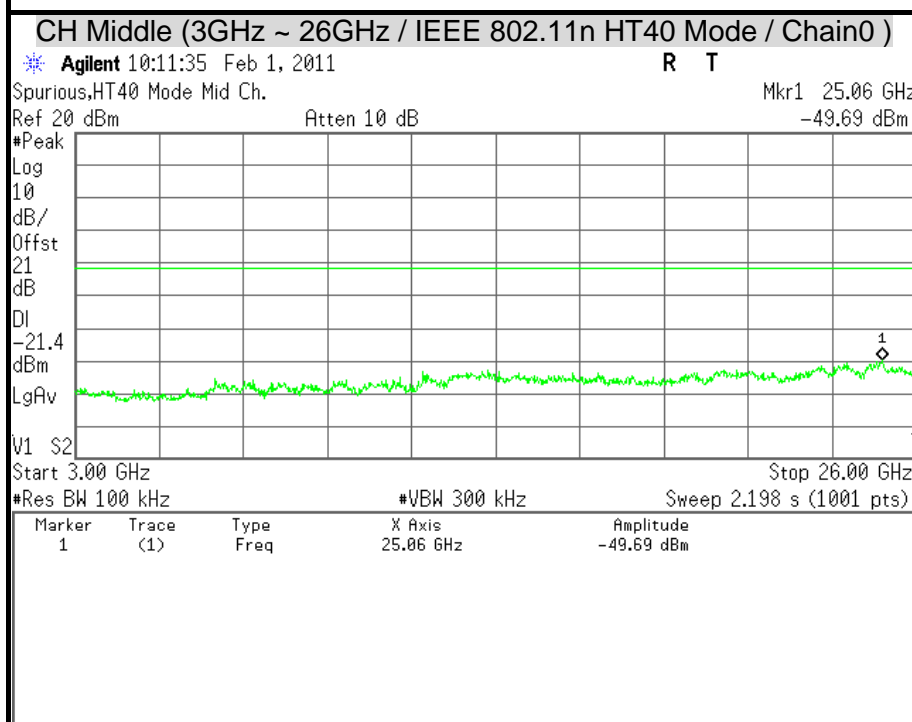
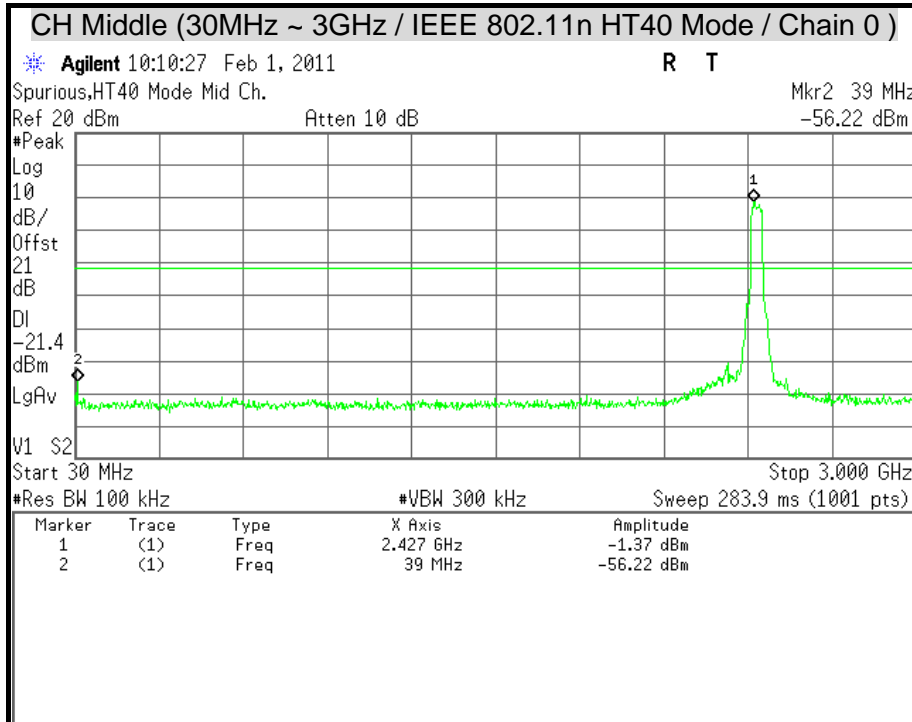


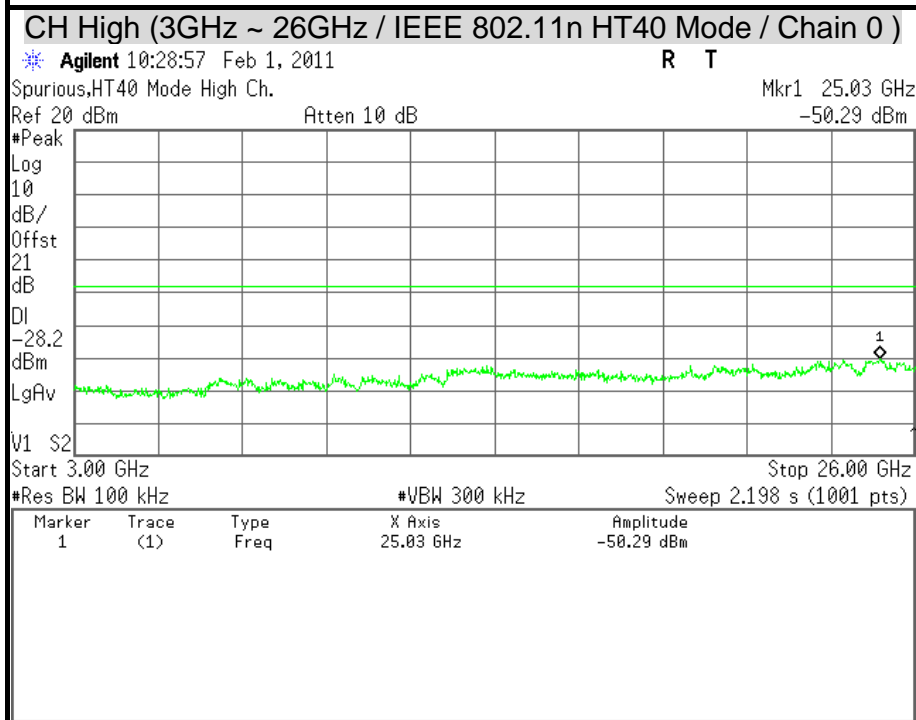
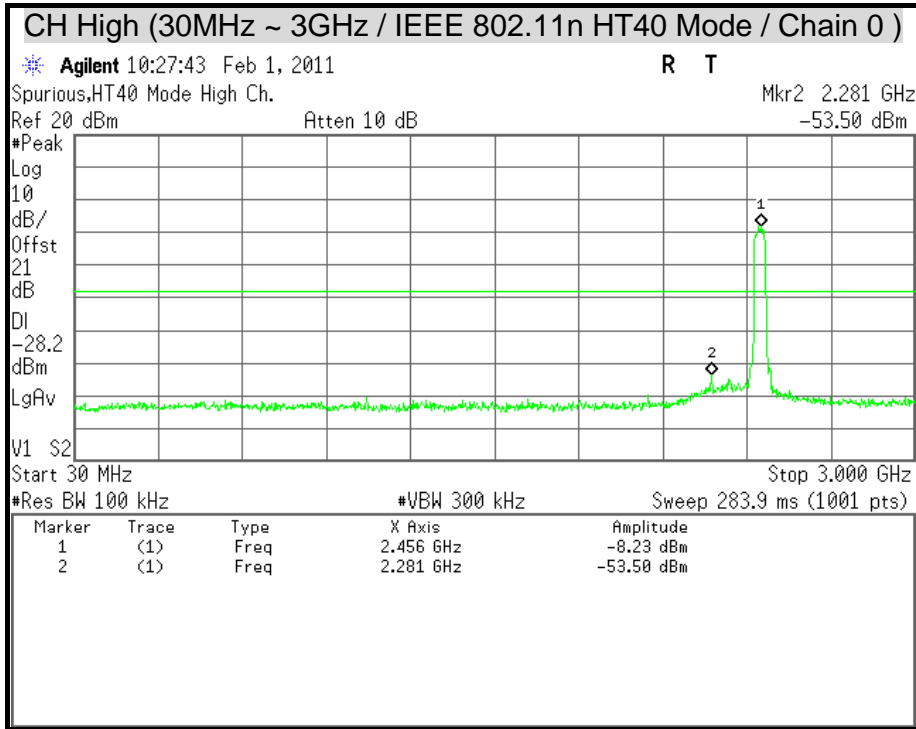


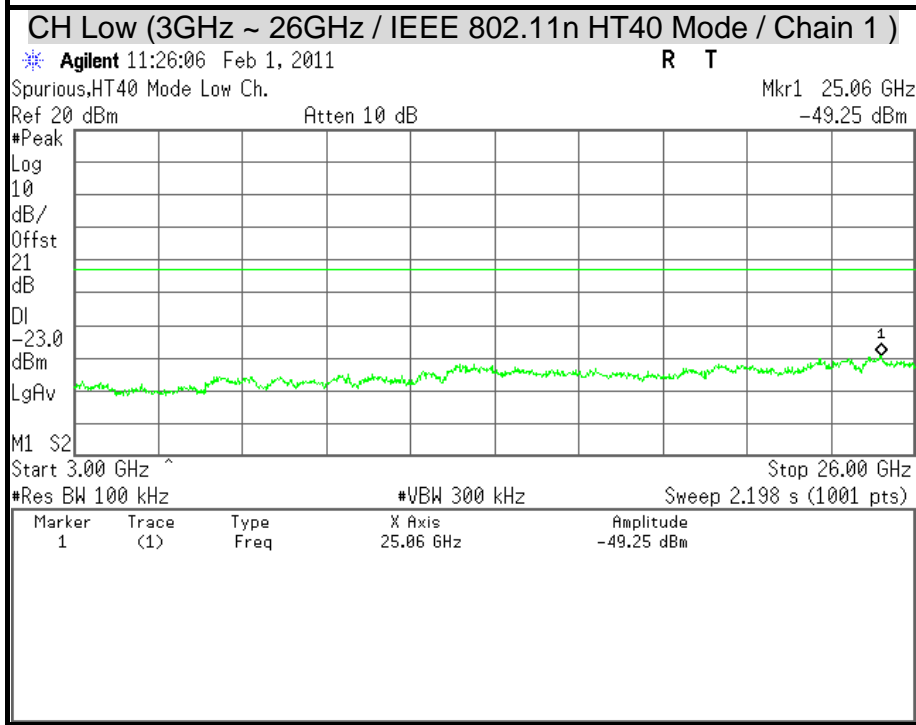
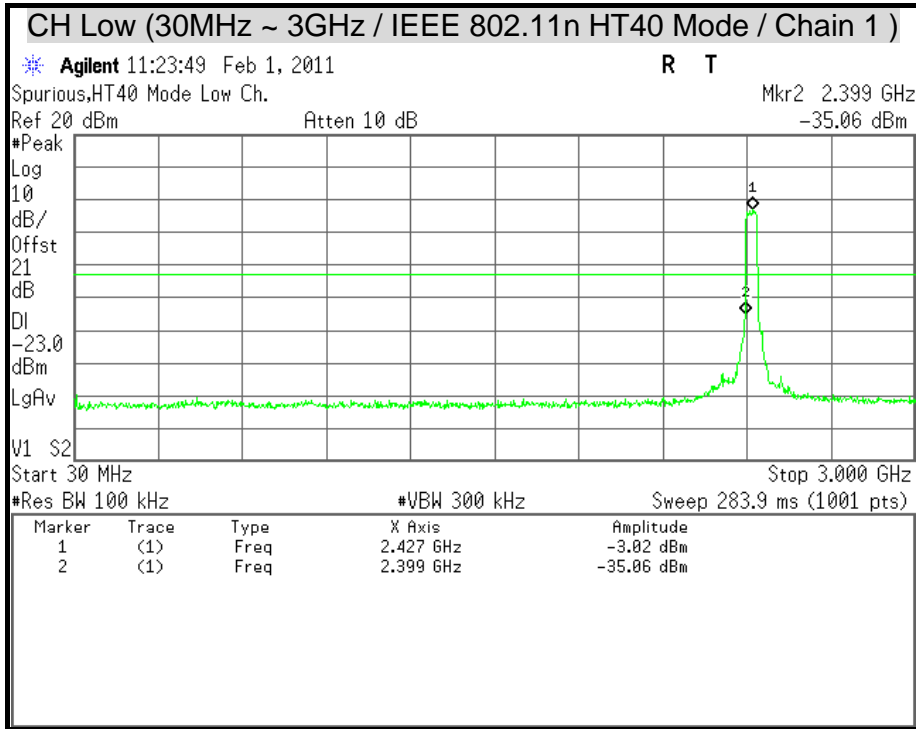


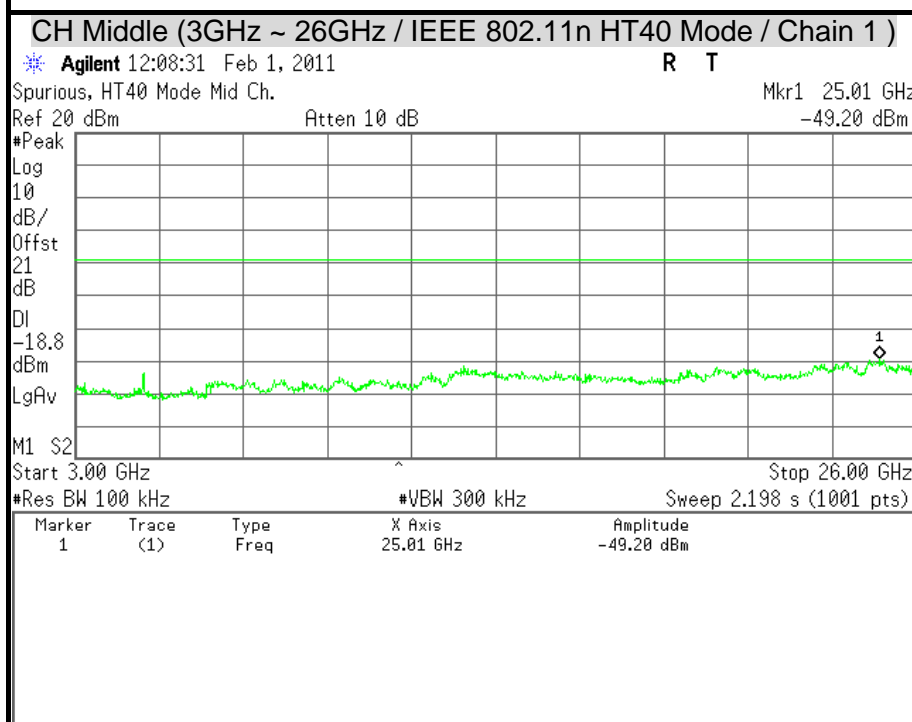
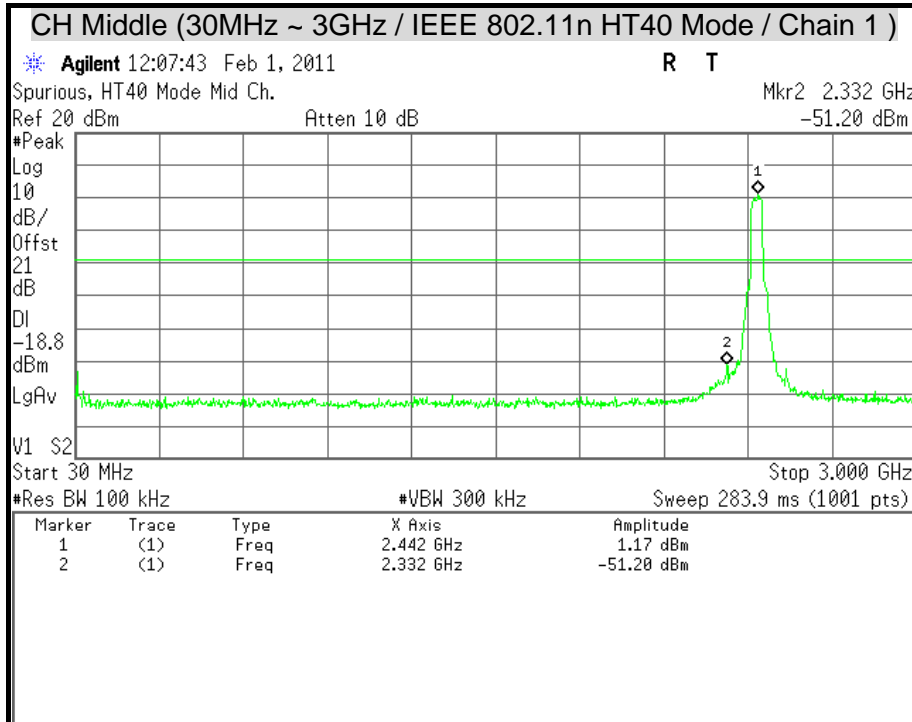


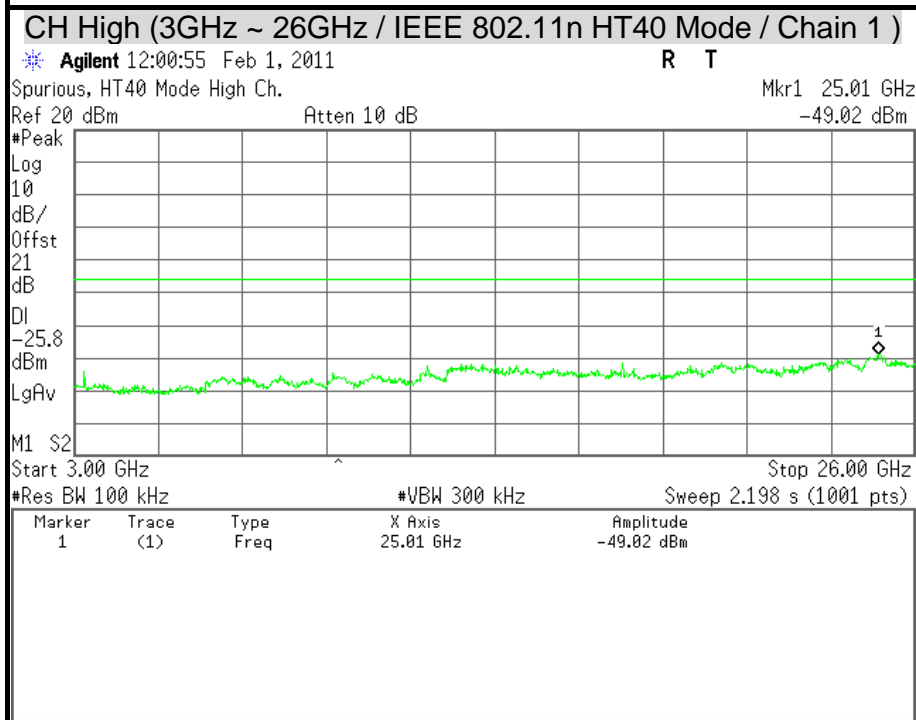
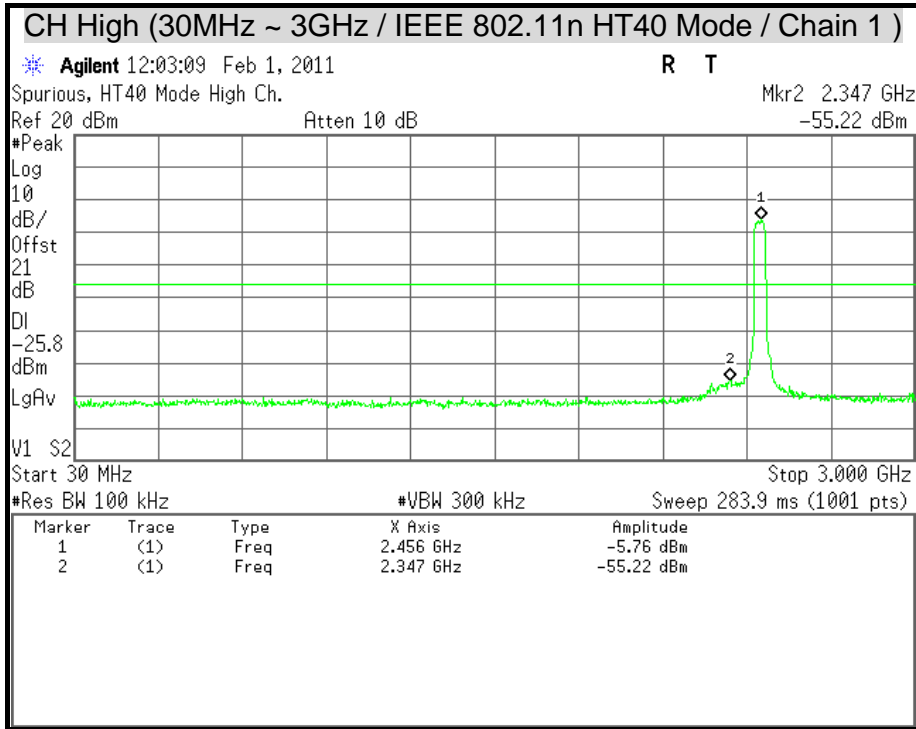


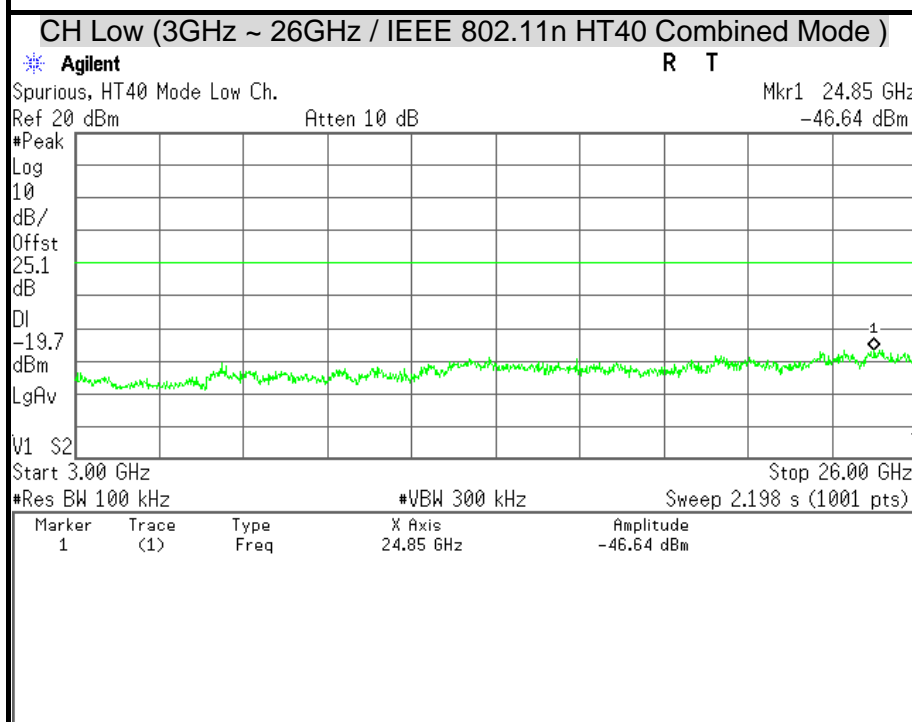
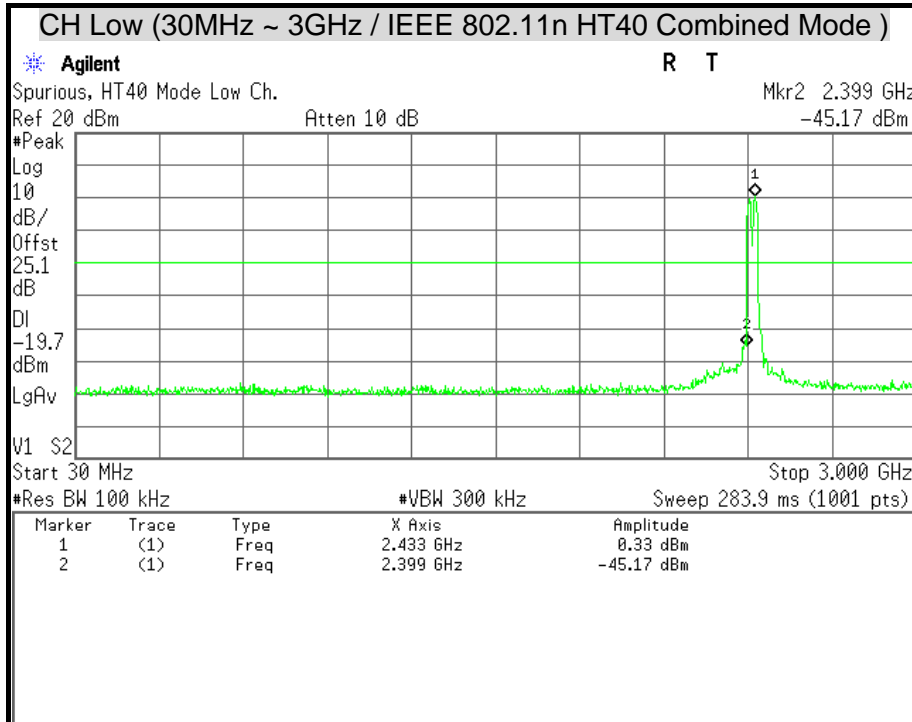


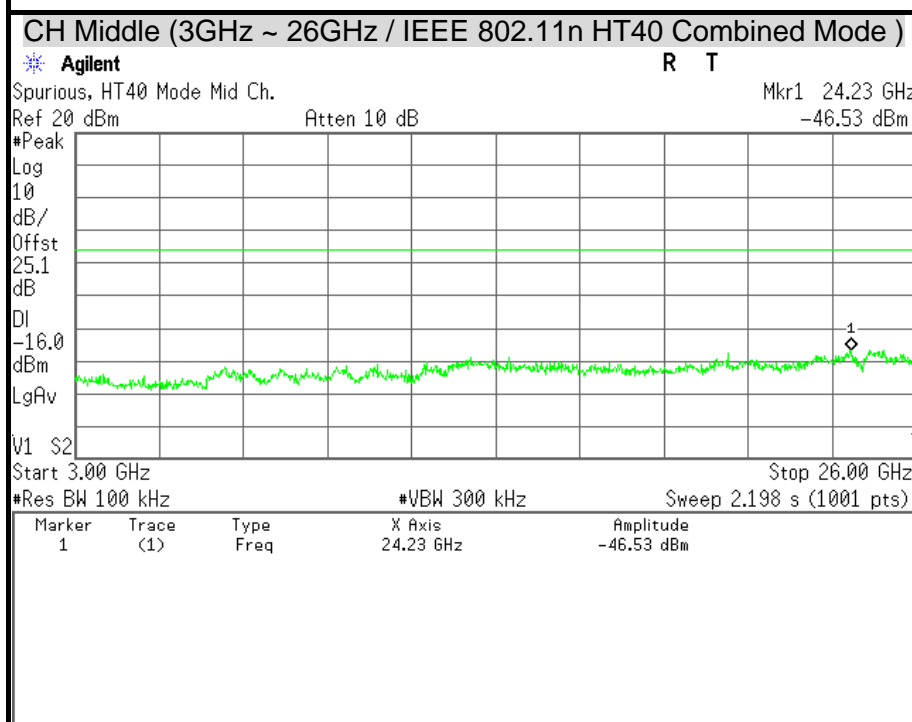
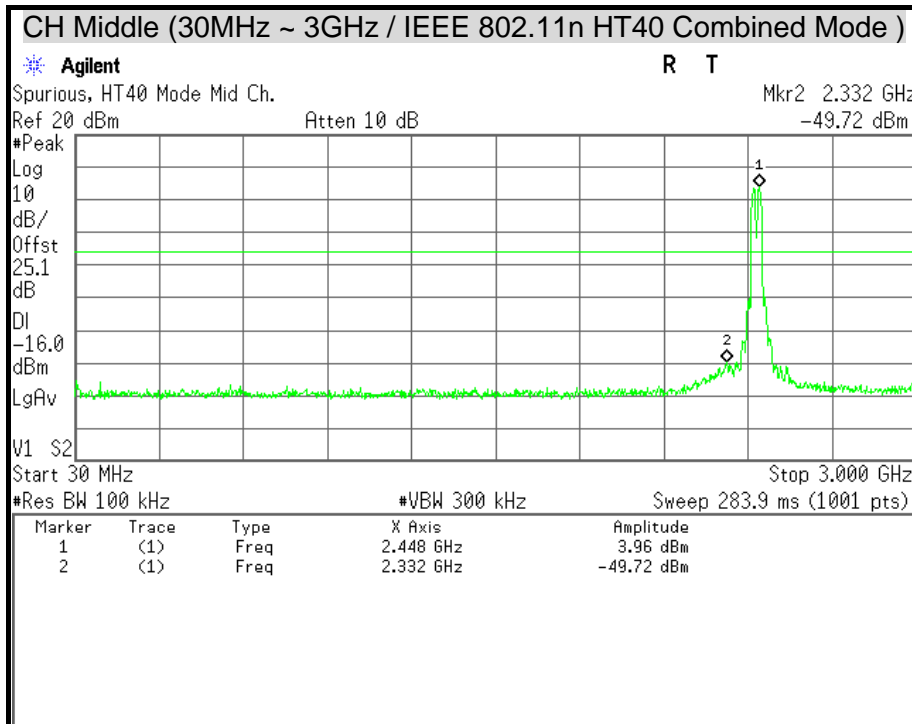


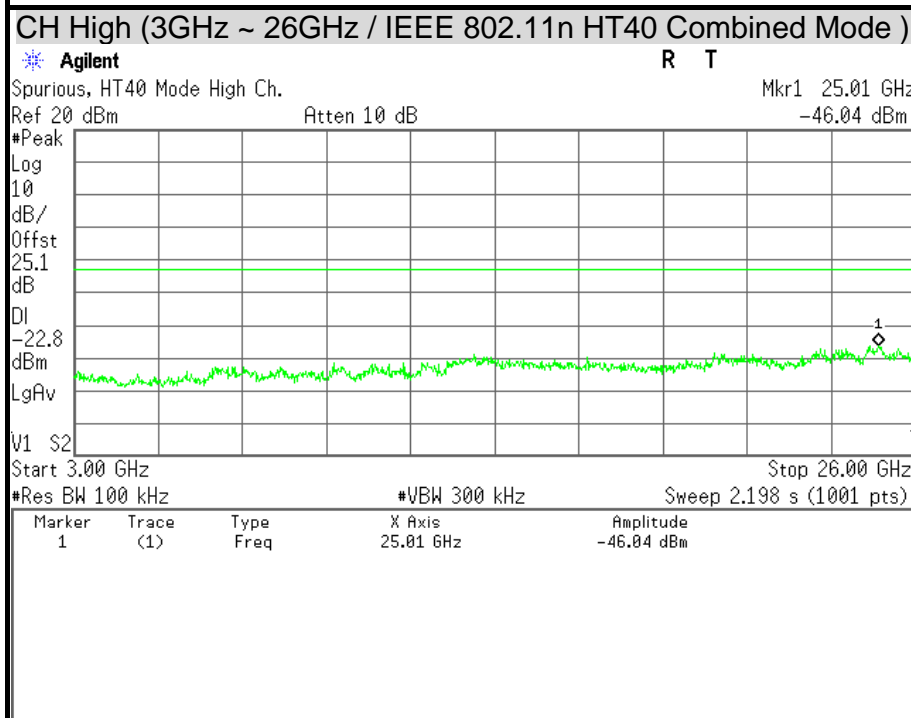
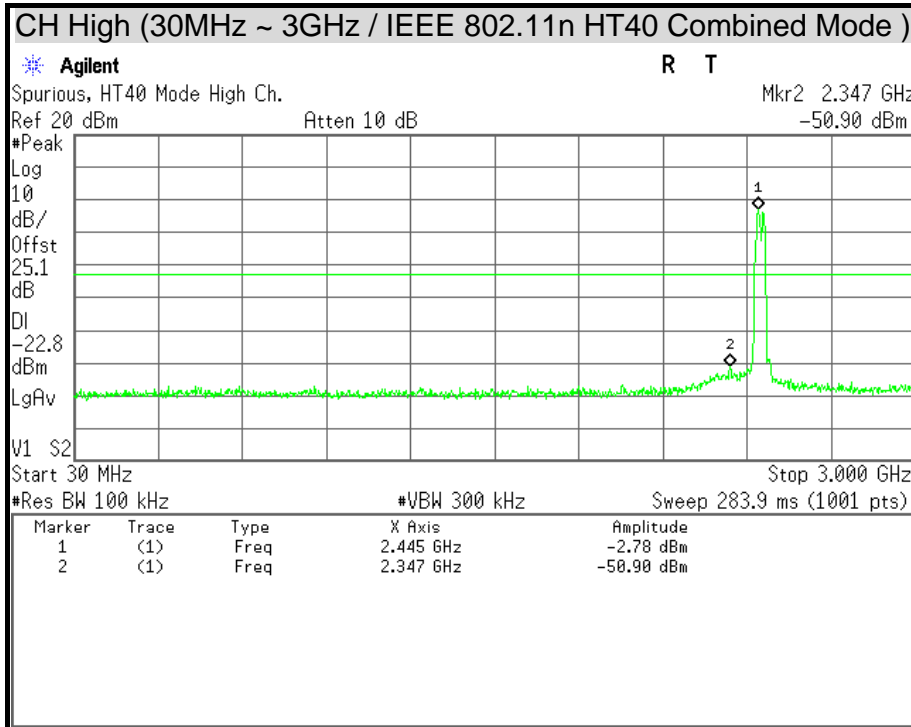














7.6 RADIATED EMISSION

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

Remark:

- 1. ¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
- 2. ² 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

Radiated Emission below 1GHz / 966Chamber_B

Name of Equipment	Manufacture	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/20/2011
EMI Receiver	ROHDE & SCHWARZ	ESCS 30	826547/004	11/15/2011
Broadband Hybrid Bi-Log Antenna	Sunol Sciences	JB1	A100209-4	10/07/2011
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00078732	07/05/2011
Pre-Amplifier	Miteq	AM-1652-3000	1490937	10/10/2011
Pre-Amplifier	Agilent	8449B	3008A01916	09/21/2011
RF Coaxial Cable	HUBER-SUHNER	SUCOFLEX 104PEA	31346	10/07/2011
RF Coaxial Cable	HUBER-SUHNER	SUCOFLEX 104PEA	33957	10/07/2011
RF Coaxial Cable	HUBER-SUHNER	SUCOFLEX 104PEA	33958	10/07/2011
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.



Radiated Emission above 1GHz / 966Chamber_A

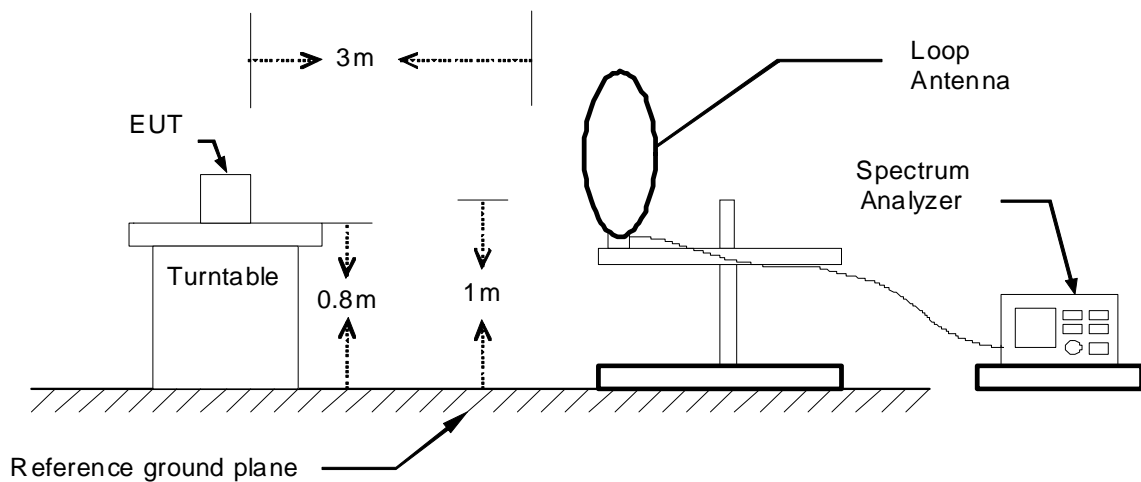
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY46180323	05/02/2011
EMI Receiver	ROHDE & SCHWARZ	ESCI	100221	05/03/2011
Bi-log Antenna	SCHWARZBECK	VULB 9168	9168-249	10/04/2011
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-778	09/06/2011
Pre-Amplifier	Agilent	8449B	3008A01471	08/02/2011
Pre-Amplifier	HP	8447F	2944A03748	09/23/2011
RF Coaxial Cable	HUBER-SUHNER	SF104PEA	31347	07/21/2011
RF Coaxial Cable	HUBER-SUHNER	SF104PEA	31350	07/21/2011
RF Coaxial Cable	HUBER-SUHNER	SF104PEA	31355	07/21/2011
LOOP Antenna	EMCO	6502	8905-2356	06/09/2011
Band Reject Notch Filter	Micro-Tronics	BRM05702-01	009	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

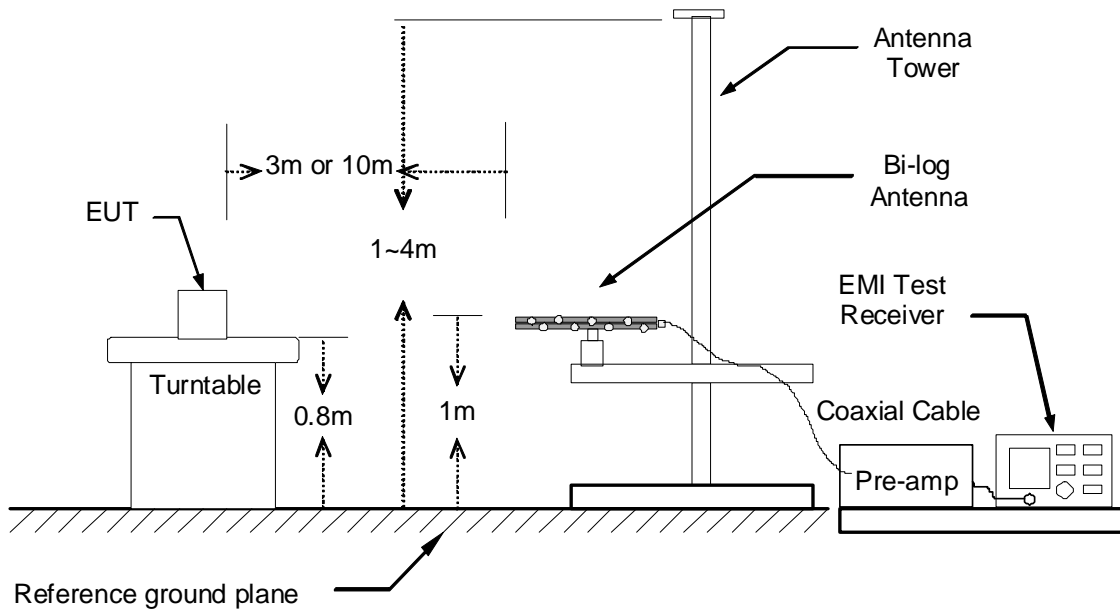
The diagram below shows the test setup that is utilized to make the measurements for emission from below 1GHz.

9kHz ~ 30MHz

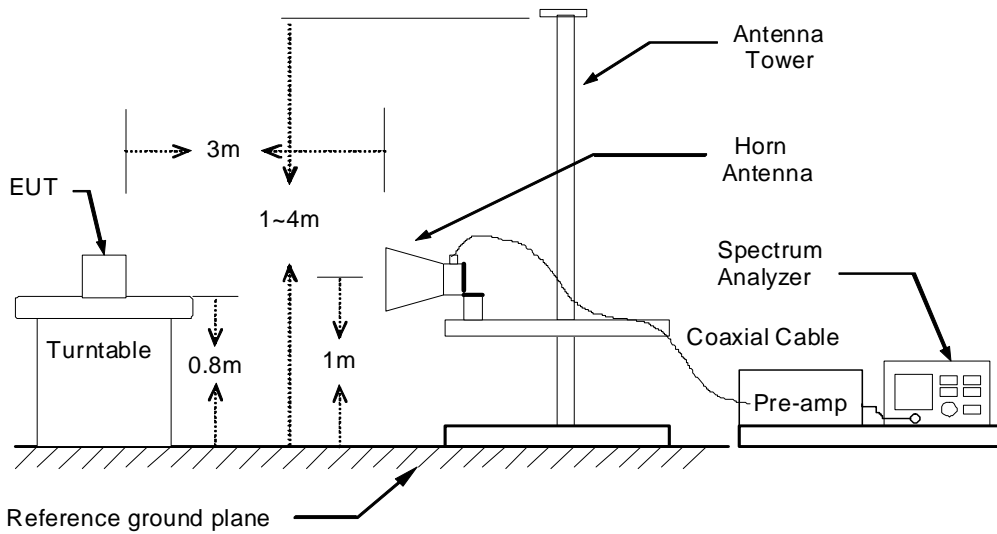




30MHz ~ 1GHz



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)

Product Name	Wireless IP CAM	Test By	Rueyyan Lin
Model	F7115	Test Date	2011/03/04
Test Mode	Normal operating / Power Adapter (1)	TEMP & Humidity	27°C, 50%

966 Chamber_B at 3Meter / Horizontal						
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
122.15	63.13	-27.44	35.69	43.50	-7.81	Peak
239.52	71.65	-28.95	42.70	46.00	-3.30	Peak
299.67	70.67	-26.66	44.01	46.00	-1.99	Peak
323.91	65.31	-25.88	39.43	46.00	-6.57	Peak
399.57	64.56	-23.74	40.82	46.00	-5.18	Peak
593.56	59.91	-19.85	40.06	46.00	-5.94	Peak

966 Chamber_B at 3Meter / Vertical						
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
30.01	57.55	-20.26	37.29	40.00	-2.71	QP
54.25	70.00	-33.55	36.45	40.00	-3.55	QP
81.41	69.10	-33.70	35.40	40.00	-4.60	QP
121.16	67.66	-27.43	40.23	43.50	-3.27	Peak
239.52	67.31	-28.95	38.36	46.00	-7.64	Peak
299.66	63.84	-26.66	37.18	46.00	-8.82	Peak
399.55	63.68	-23.74	39.94	46.00	-6.06	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 (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)
5. Margin (dB) = Remark result (dBuV/m) - Quasi-peak limit (dBuV/m).



Product Name	Wireless IP CAM	Test By	Rueyyan Lin
Model	F7115	Test Date	2011/03/04
Test Mode	Normal operating / Power Adapter (2)	TEMP & Humidity	27°C, 50%

966 Chamber_B at 3Meter / Horizontal						
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
122.15	63.55	-27.44	36.11	43.50	-7.39	Peak
239.52	71.96	-28.95	43.01	46.00	-2.99	Peak
299.66	70.72	-26.66	44.06	46.00	-1.94	Peak
323.91	65.29	-25.88	39.42	46.00	-6.58	Peak
399.57	63.43	-23.74	39.69	46.00	-6.31	Peak
593.57	60.03	-19.85	40.17	46.00	-5.83	Peak

966 Chamber_B at 3Meter / Vertical						
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
30.00	57.60	-20.26	37.34	40.00	-2.66	QP
54.25	70.30	-33.55	36.75	40.00	-3.25	QP
81.41	69.40	-33.70	35.70	40.00	-4.30	QP
121.18	67.76	-27.43	40.33	43.50	-3.17	Peak
239.52	66.52	-28.95	37.56	46.00	-8.44	Peak
299.66	64.06	-26.66	37.40	46.00	-8.60	Peak
399.57	62.67	-23.74	38.93	46.00	-7.07	Peak
540.22	56.10	-20.61	35.49	46.00	-10.51	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 (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)
5. Margin (dB) = Remark result (dBuV/m) - Quasi-peak limit (dBuV/m).



Above 1 GHz

Product Name	Wireless IP CAM	Test By	Waternil Guan
Model	F7115	Test Date	2011/01/26
Test Mode	IEEE 802.11b TX / CH Low	TEMP & Humidity	18°C, 62%

966 Chamber_A 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
1724.00	44.49	---	-0.37	44.12	---	74.00	54.00	-9.88	Peak
1850.00	44.17	---	0.79	44.95	---	74.00	54.00	-9.05	Peak
2070.00	43.96	---	2.31	46.27	---	74.00	54.00	-7.73	Peak
2412.00	98.26	95.08	3.01	101.27	98.09	---	---	---	Carrier
3450.00	42.81	---	4.19	47.00	---	74.00	54.00	-7.00	Peak
4612.50	41.55	---	6.73	48.28	---	74.00	54.00	-5.72	Peak
4867.50	41.49	---	6.98	48.47	---	74.00	54.00	-5.53	Peak

966 Chamber_A 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
1125.00	46.16	---	-3.93	42.23	---	74.00	54.00	-11.77	Peak
1250.00	46.68	---	-3.43	43.24	---	74.00	54.00	-10.76	Peak
2334.00	57.17	40.07	2.86	60.03	42.93	74.00	54.00	-11.07	AVG
2412.00	99.21	95.66	3.02	102.23	98.68	---	---	---	Carrier
3705.00	42.72	---	4.78	47.50	---	74.00	54.00	-6.50	Peak
4110.00	42.32	---	5.99	48.31	---	74.00	54.00	-5.69	Peak
4822.50	49.23	43.98	6.94	56.17	50.92	74.00	54.00	-3.08	AVG

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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
 Margin = Result - Limit
 Remark Peak = Result(PK) - Limit(AV)
 Remark AVG = Result(AV) - Limit(AV)



Product Name	Wireless IP CAM	Test By	Waternil Guan
Model	F7115	Test Date	2011/01/26
Test Mode	IEEE 802.11b TX / CH Middle	TEMP & Humidity	16°C, 62%

966 Chamber_A 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
1250.00	45.10	---	-3.43	41.66	---	74.00	54.00	-12.34	Peak
1426.00	45.00	---	-2.73	42.27	---	74.00	54.00	-11.73	Peak
2358.00	47.43	---	2.91	50.34	---	74.00	54.00	-3.66	Peak
2437.00	94.25	90.83	3.07	97.32	93.90	---	---	---	Carrier
3262.50	41.93	---	4.64	46.57	---	74.00	54.00	-7.43	Peak
4095.00	41.13	---	5.96	47.09	---	74.00	54.00	-6.91	Peak
4837.50	40.99	---	6.95	47.94	---	74.00	54.00	-6.06	Peak

966 Chamber_A 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
1250.00	47.67	---	-3.43	44.23	---	74.00	54.00	-9.77	Peak
1278.00	46.85	---	-3.32	43.52	---	74.00	54.00	-10.48	Peak
2334.00	48.03	---	2.86	50.88	---	74.00	54.00	-3.12	Peak
2437.00	94.97	91.32	3.07	98.04	94.39	---	---	---	Carrier
3502.50	42.46	---	4.08	46.54	---	74.00	54.00	-7.46	Peak
4207.50	41.32	---	6.15	47.47	---	74.00	54.00	-6.53	Peak
4875.00	47.78	42.19	6.99	54.77	49.18	74.00	54.00	-4.82	AVG

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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
 Margin = Result - Limit
 Remark Peak = Result(PK) - Limit(AV)
 Remark AVG = Result(AV) - Limit(AV)



Product Name	Wireless IP CAM	Test By	Waternil Guan
Model	F7115	Test Date	2011/01/26
Test Mode	IEEE 802.11b TX / CH High	TEMP & Humidity	18°C, 62%

966 Chamber_A 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
1204.00	45.78	---	-3.62	42.16	---	74.00	54.00	-11.84	Peak
1440.00	45.66	---	-2.68	42.98	---	74.00	54.00	-11.02	Peak
2358.00	52.26	35.61	2.91	55.17	38.52	74.00	54.00	-15.48	AVG
2462.00	92.42	88.81	3.12	95.54	91.93	---	---	---	Carrier
3915.00	41.68	---	5.51	47.20	---	74.00	54.00	-6.80	Peak
4950.00	40.75	---	7.06	47.81	---	74.00	54.00	-6.19	Peak
5737.50	41.32	---	8.59	49.91	---	74.00	54.00	-4.09	Peak

966 Chamber_A 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
1278.00	47.03	---	-3.32	43.71	---	74.00	54.00	-10.29	Peak
1590.00	44.61	---	-1.61	43.00	---	74.00	54.00	-11.00	Peak
2334.00	47.49	---	2.86	50.35	---	74.00	54.00	-3.65	Peak
2462.00	93.96	90.73	3.12	97.08	93.85	---	---	---	Carrier
3240.00	42.61	---	4.70	47.31	---	74.00	54.00	-6.69	Peak
4927.50	47.52	42.23	7.04	54.56	49.27	74.00	54.00	-4.73	AVG
5887.50	41.63	---	9.00	50.63	---	74.00	54.00	-3.37	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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
 Margin = Result - Limit
 Remark Peak = Result(PK) - Limit(AV)
 Remark AVG = Result(AV) - Limit(AV)



Product Name	Wireless IP CAM	Test By	Waternil Guan
Model	F7115	Test Date	2011/01/26
Test Mode	IEEE 802.11g TX / CH Low	TEMP & Humidity	18°C, 62%

966 Chamber_A 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
1170.00	45.49	---	-3.75	41.74	---	74.00	54.00	-12.26	Peak
1500.00	45.38	---	-2.44	42.94	---	74.00	54.00	-11.06	Peak
2360.00	53.96	42.04	2.91	56.87	44.95	74.00	54.00	-9.05	AVG
2412.00	99.39	86.58	3.01	102.40	89.59	---	---	---	Carrier
3915.00	41.27	---	5.51	46.79	---	74.00	54.00	-7.21	Peak
4815.00	41.53	---	6.93	48.46	---	74.00	54.00	-5.54	Peak
7230.00	47.43	28.63	10.56	57.99	39.19	74.00	54.00	-14.81	AVG

966 Chamber_A 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
1250.00	46.43	---	-3.43	42.99	---	74.00	54.00	-11.01	Peak
1274.00	47.75	---	-3.34	44.41	---	74.00	54.00	-9.59	Peak
2360.00	54.61	42.65	2.91	57.52	45.56	74.00	54.00	-8.44	AVG
2412.00	100.02	87.01	3.03	103.05	90.04	---	---	---	Carrier
4050.00	41.40	---	5.89	47.29	---	74.00	54.00	-6.71	Peak
4822.50	44.08	---	6.94	51.02	---	74.00	54.00	-2.98	Peak
7230.00	51.10	29.56	10.56	61.66	40.12	74.00	54.00	-13.88	AVG

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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
 Margin = Result - Limit
 Remark Peak = Result(PK) - Limit(AV)
 Remark AVG = Result(AV) - Limit(AV)



Product Name	Wireless IP CAM	Test By	Waternil Guan
Model	F7115	Test Date	2011/01/26
Test Mode	IEEE 802.11g TX / CH Middle	TEMP & Humidity	18°C, 62%

966 Chamber_A 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
1250.00	45.37	---	-3.43	41.94	---	74.00	54.00	-12.06	Peak
1420.00	44.56	---	-2.76	41.80	---	74.00	54.00	-12.20	Peak
2332.00	48.26	---	2.85	51.12	---	74.00	54.00	-2.88	Peak
2437.00	96.36	83.56	3.06	99.42	86.62	---	---	---	Carrier
3412.50	42.90	---	4.28	47.19	---	74.00	54.00	-6.81	Peak
4350.00	41.00	---	6.38	47.38	---	74.00	54.00	-6.62	Peak
4912.50	40.95	---	7.02	47.98	---	74.00	54.00	-6.02	Peak

966 Chamber_A 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
1276.00	47.24	---	-3.33	43.91	---	74.00	54.00	-10.09	Peak
1436.00	47.82	---	-2.69	45.13	---	74.00	54.00	-8.87	Peak
2336.00	54.28	35.98	2.86	57.14	38.84	74.00	54.00	-15.16	AVG
2437.00	97.19	84.00	3.06	100.25	87.06	---	---	---	Carrier
3795.00	42.19	---	5.10	47.28	---	74.00	54.00	-6.72	Peak
4875.00	41.98	---	6.99	48.97	---	74.00	54.00	-5.03	Peak
5662.50	40.88	---	8.39	49.26	---	74.00	54.00	-4.74	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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
 Margin = Result - Limit
 Remark Peak = Result(PK) - Limit(AV)
 Remark AVG = Result(AV) - Limit(AV)



Product Name	Wireless IP CAM	Test By	Waternil Guan
Model	F7115	Test Date	2011/01/26
Test Mode	IEEE 802.11g TX / CH High	TEMP & Humidity	18°C, 62%

966 Chamber_A 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
1246.00	45.37	---	-3.45	41.92	---	74.00	54.00	-12.08	Peak
1388.00	44.83	---	-2.89	41.95	---	74.00	54.00	-12.05	Peak
2344.00	47.94	---	2.88	50.82	---	74.00	54.00	-3.18	Peak
2462.00	94.26	82.01	3.13	97.39	85.14	---	---	---	Carrier
3337.50	42.32	---	4.46	46.79	---	74.00	54.00	-7.21	Peak
4680.00	41.61	---	6.80	48.40	---	74.00	54.00	-5.60	Peak
5760.00	41.04	---	8.65	49.69	---	74.00	54.00	-4.31	Peak

966 Chamber_A 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
1276.00	45.42	---	-3.33	42.09	---	74.00	54.00	-11.91	Peak
1460.00	44.28	---	-2.60	41.68	---	74.00	54.00	-12.32	Peak
2340.00	53.87	36.75	2.87	56.74	39.62	74.00	54.00	-14.38	AVG
2462.00	96.56	83.98	3.11	99.67	87.09	---	---	---	Carrier
3945.00	41.58	---	5.62	47.20	---	74.00	54.00	-6.80	Peak
4920.00	41.33	---	7.03	48.36	---	74.00	54.00	-5.64	Peak
5677.50	41.32	---	8.43	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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
 Margin = Result - Limit
 Remark Peak = Result(PK) - Limit(AV)
 Remark AVG = Result(AV) - Limit(AV)



Product Name	Wireless IP CAM	Test By	Waternil Guan
Model	F7115	Test Date	2011/01/26
Test Mode	IEEE 802.11n HT20 TX / CH Low	TEMP & Humidity	18°C, 62%

966 Chamber_A 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
1226.00	45.68	---	-3.53	42.15	---	74.00	54.00	-11.85	Peak
1628.00	43.58	---	-1.26	42.32	---	74.00	54.00	-11.68	Peak
2360.00	58.90	45.83	2.91	61.81	48.74	74.00	54.00	-5.26	AVG
2412.00	110.23	95.28	3.01	113.24	98.29	---	---	---	Carrier
3960.00	40.74	---	5.67	46.42	---	74.00	54.00	-7.58	Peak
4822.50	41.04	---	6.94	47.98	---	74.00	54.00	-6.02	Peak
6180.00	40.83	---	9.44	50.27	---	74.00	54.00	-3.73	Peak

966 Chamber_A 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
1116.00	46.55	---	-3.97	42.58	---	74.00	54.00	-11.42	Peak
1278.00	46.29	---	-3.32	42.97	---	74.00	54.00	-11.03	Peak
2360.00	62.70	49.44	2.91	65.61	52.35	74.00	54.00	-1.65	AVG
2412.00	111.18	96.45	3.02	114.20	99.47	---	---	---	Carrier
4410.00	40.90	---	6.47	47.37	---	74.00	54.00	-6.63	Peak
4815.00	54.48	36.38	6.93	61.41	43.31	74.00	54.00	-10.69	AVG
7222.50	50.30	30.65	10.58	60.88	41.23	74.00	54.00	-12.77	AVG

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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(AV)
Remark AVG = Result(AV) - Limit(AV)



Product Name	Wireless IP CAM	Test By	Waternil Guan
Model	F7115	Test Date	2011/01/26
Test Mode	IEEE 802.11n HT20 TX / CH Middle	TEMP & Humidity	18°C, 62%

966 Chamber_A 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
1204.00	45.43	---	-3.62	41.81	---	74.00	54.00	-12.19	Peak
1314.00	44.85	---	-3.18	41.67	---	74.00	54.00	-12.33	Peak
2384.00	57.06	44.26	2.96	60.02	47.22	74.00	54.00	-6.78	AVG
2437.00	107.80	92.66	3.06	110.86	95.72	---	---	---	Carrier
3142.50	42.16	---	4.94	47.10	---	74.00	54.00	-6.90	Peak
4267.50	41.20	---	6.24	47.44	---	74.00	54.00	-6.56	Peak
4875.00	41.33	---	6.99	48.32	---	74.00	54.00	-5.68	Peak

966 Chamber_A 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
1280.00	45.11	---	-3.32	41.79	---	74.00	54.00	-12.21	Peak
1586.00	43.53	---	-1.65	41.89	---	74.00	54.00	-12.11	Peak
2384.00	59.63	47.34	2.96	62.59	50.30	74.00	54.00	-3.70	AVG
2437.00	111.19	96.58	3.08	114.27	99.66	---	---	---	Carrier
3247.50	43.03	---	4.68	47.71	---	74.00	54.00	-6.29	Peak
3885.00	41.83	---	5.41	47.24	---	74.00	54.00	-6.76	Peak
4875.00	51.91	34.57	6.99	58.90	41.56	74.00	54.00	-12.44	AVG

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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(AV)
Remark AVG = Result(AV) - Limit(AV)



Product Name	Wireless IP CAM	Test By	Waternil Guan
Model	F7115	Test Date	2011/01/26
Test Mode	IEEE 802.11n HT20 TX / CH High	TEMP & Humidity	18°C, 62%

966 Chamber_A 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
1278.00	45.69	---	-3.32	42.37	---	74.00	54.00	-11.63	Peak
1350.00	44.99	---	-3.04	41.95	---	74.00	54.00	-12.05	Peak
2348.00	54.33	37.51	2.89	57.22	40.40	74.00	54.00	-13.60	AVG
2462.00	105.37	89.58	3.11	108.48	92.69	---	---	---	Carrier
3172.50	42.70	---	4.86	47.57	---	74.00	54.00	-6.43	Peak
4065.00	41.99	---	5.92	47.91	---	74.00	54.00	-6.09	Peak
4972.50	41.13	---	7.08	48.22	---	74.00	54.00	-5.78	Peak

966 Chamber_A 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
1278.00	46.81	---	-3.32	43.48	---	74.00	54.00	-10.52	Peak
1480.00	45.11	---	-2.52	42.59	---	74.00	54.00	-11.41	Peak
2340.00	56.61	38.27	2.87	59.48	41.14	74.00	54.00	-12.86	AVG
2462.00	109.65	95.22	3.11	112.76	98.33	---	---	---	Carrier
3262.50	42.17	---	4.64	46.81	---	74.00	54.00	-7.19	Peak
4275.00	41.43	---	6.26	47.69	---	74.00	54.00	-6.31	Peak
4920.00	51.54	33.91	7.03	58.57	40.94	74.00	54.00	-13.06	AVG

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. 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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(AV)
Remark AVG = Result(AV) - Limit(AV)



Product Name	Wireless IP CAM	Test By	Waternil Guan
Model	F7115	Test Date	2011/01/26
Test Mode	IEEE 802.11n HT40 TX / CH Low	TEMP & Humidity	18°C, 62%

966 Chamber_A 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
1242.00	45.61	---	-3.47	42.15	---	74.00	54.00	-11.85	Peak
1334.00	45.26	---	-3.10	42.16	---	74.00	54.00	-11.84	Peak
1688.00	44.46	---	-0.71	43.76	---	74.00	54.00	-10.24	Peak
2422.00	104.03	84.32	3.02	107.05	87.34	---	---	---	Carrier
3345.00	41.96	---	4.45	46.41	---	74.00	54.00	-7.59	Peak
4882.50	40.39	---	6.99	47.38	---	74.00	54.00	-6.62	Peak
5512.50	40.67	---	7.97	48.64	---	74.00	54.00	-5.36	Peak

966 Chamber_A 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
1250.00	46.36	---	-3.43	42.93	---	74.00	54.00	-11.07	Peak
1370.00	44.34	---	-2.96	41.38	---	74.00	54.00	-12.62	Peak
2034.00	47.55	---	2.24	49.79	---	74.00	54.00	-4.21	Peak
2422.00	108.09	90.20	3.03	111.12	93.23	---	---	---	Carrier
3105.00	42.03	---	5.03	47.06	---	74.00	54.00	-6.94	Peak
3405.00	42.14	---	4.30	46.44	---	74.00	54.00	-7.56	Peak
4830.00	48.38	32.49	6.94	55.32	39.43	74.00	54.00	-14.57	AVG

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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(AV)
Remark AVG = Result(AV) - Limit(AV)



Product Name	Wireless IP CAM	Test By	Waternil Guan
Model	F7115	Test Date	2011/01/26
Test Mode	IEEE 802.11n HT40 TX / CH Middle	TEMP & Humidity	18°C, 62%

966 Chamber_A 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
1278.00	46.97	---	-3.32	43.65	---	74.00	54.00	-10.35	Peak
1568.00	44.30	---	-1.81	42.49	---	74.00	54.00	-11.51	Peak
1984.00	46.06	---	2.02	48.09	---	74.00	54.00	-5.91	Peak
2437.00	103.93	85.80	3.06	106.99	88.86	---	---	---	Carrier
3090.00	42.90	---	5.06	47.96	---	74.00	54.00	-6.04	Peak
3765.00	41.60	---	4.99	46.60	---	74.00	54.00	-7.40	Peak
4852.50	41.13	---	6.97	48.10	---	74.00	54.00	-5.90	Peak

966 Chamber_A 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
1278.00	46.60	---	-3.32	43.28	---	74.00	54.00	-10.72	Peak
1500.00	44.85	---	-2.44	42.41	---	74.00	54.00	-11.59	Peak
2000.00	46.05	---	2.17	48.22	---	74.00	54.00	-5.78	Peak
2437.00	109.78	91.36	3.08	112.86	94.44	---	---	---	Carrier
3202.50	41.95	---	4.79	46.74	---	74.00	54.00	-7.26	Peak
4080.00	40.85	---	5.94	46.79	---	74.00	54.00	-7.21	Peak
4875.00	48.40	32.52	6.99	55.39	39.51	74.00	54.00	-14.49	AVG

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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(AV)
Remark AVG = Result(AV) - Limit(AV)



Product Name	Wireless IP CAM	Test By	Waternil Guan
Model	F7115	Test Date	2011/01/26
Test Mode	IEEE 802.11n HT40 TX / CH High	TEMP & Humidity	18°C, 62%

966 Chamber_A 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
1278.00	45.10	---	-3.32	41.78	---	74.00	54.00	-12.22	Peak
1364.00	44.71	---	-2.98	41.73	---	74.00	54.00	-12.27	Peak
1938.00	46.66	---	1.60	48.26	---	74.00	54.00	-5.74	Peak
2452.00	102.44	84.84	3.11	105.55	87.95	---	---	---	Carrier
3127.50	42.09	---	4.97	47.06	---	74.00	54.00	-6.94	Peak
3712.50	41.57	---	4.81	46.38	---	74.00	54.00	-7.62	Peak
4965.00	40.65	---	7.08	47.73	---	74.00	54.00	-6.27	Peak

966 Chamber_A at 3Meter / Vertical

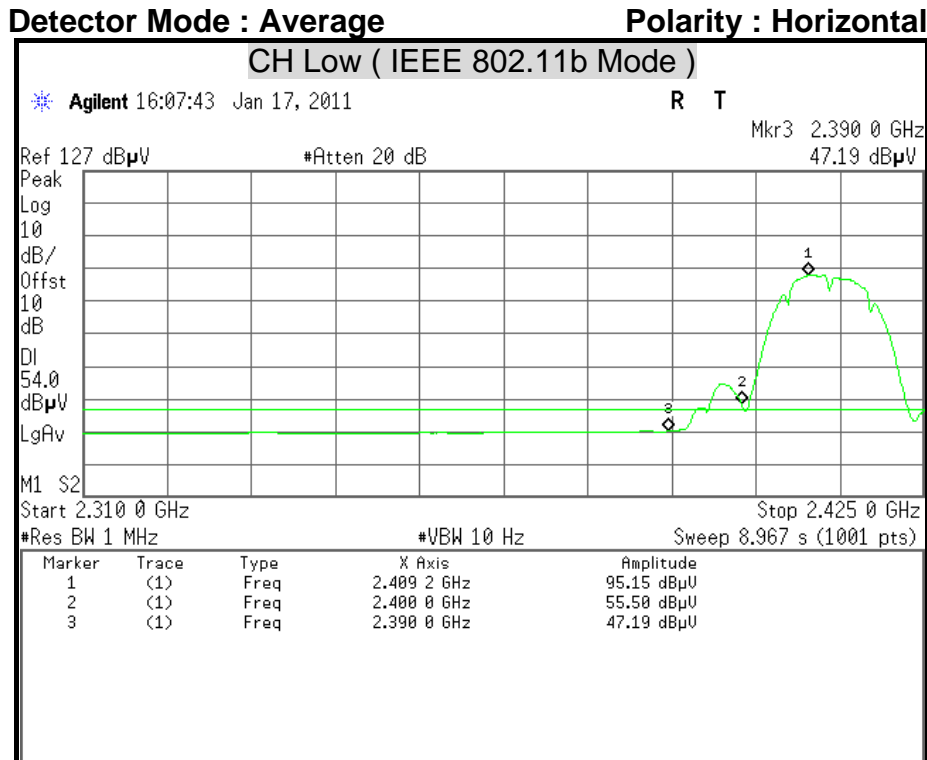
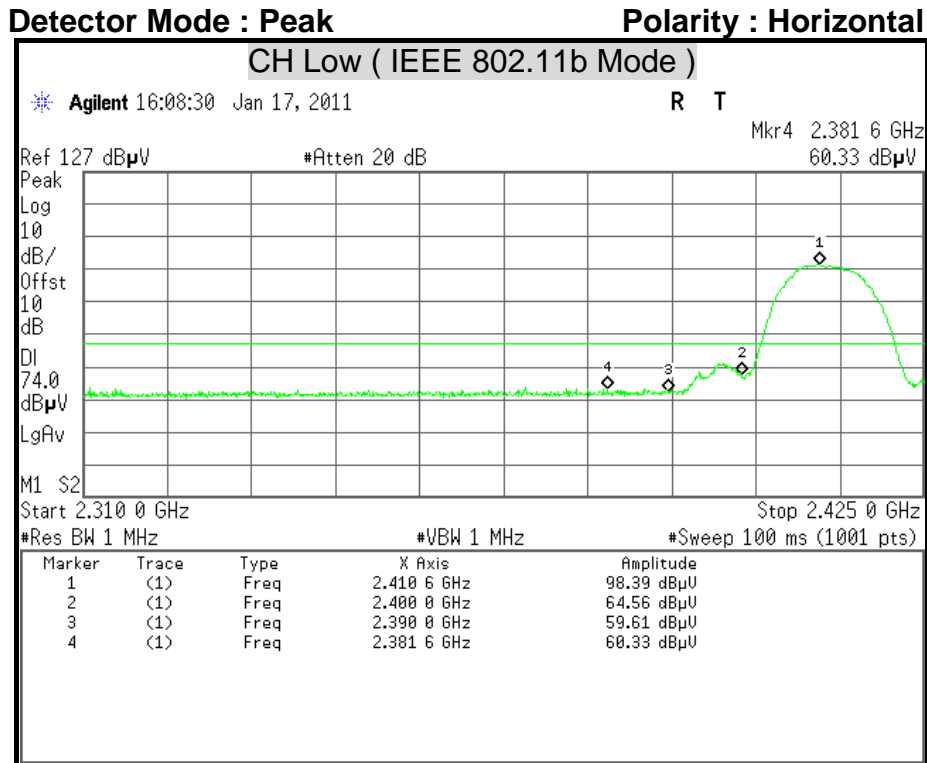
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1120.00	47.05	---	-3.95	43.09	---	74.00	54.00	-10.91	Peak
1296.00	45.37	---	-3.25	42.12	---	74.00	54.00	-11.88	Peak
2004.00	46.97	---	2.18	49.14	---	74.00	54.00	-4.86	Peak
2452.00	107.14	89.86	3.11	110.25	92.97	---	---	---	Carrier
3210.00	42.13	---	4.77	46.91	---	74.00	54.00	-7.09	Peak
4042.50	40.53	---	5.88	46.41	---	74.00	54.00	-7.59	Peak
4897.50	48.12	32.74	7.01	55.13	39.75	74.00	54.00	-14.25	AVG

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. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
6. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(AV)
Remark AVG = Result(AV) - Limit(AV)



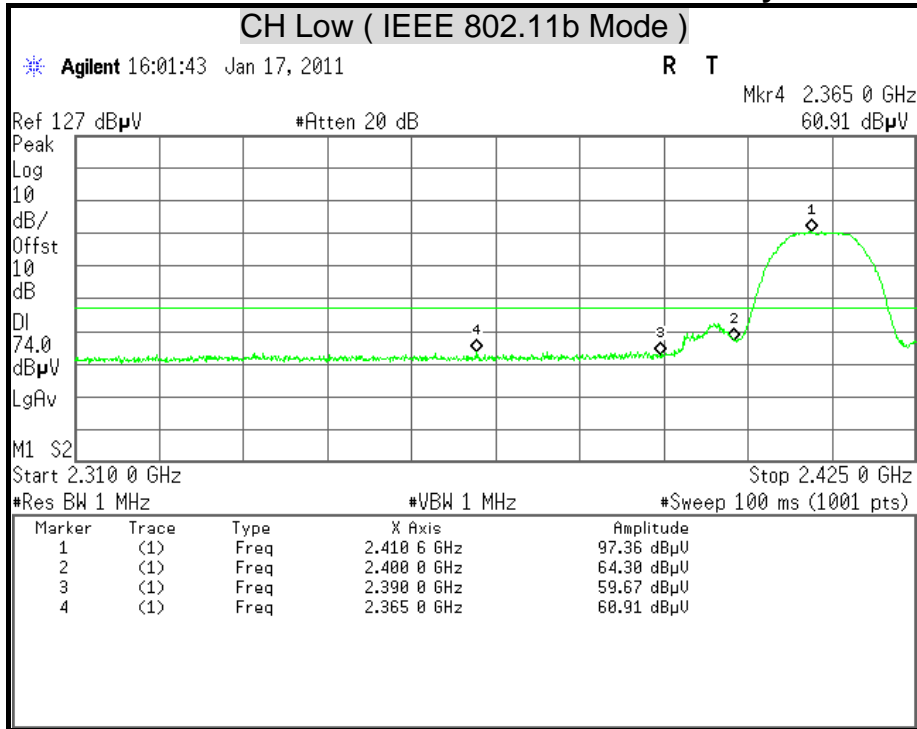
Restricted Band Edges





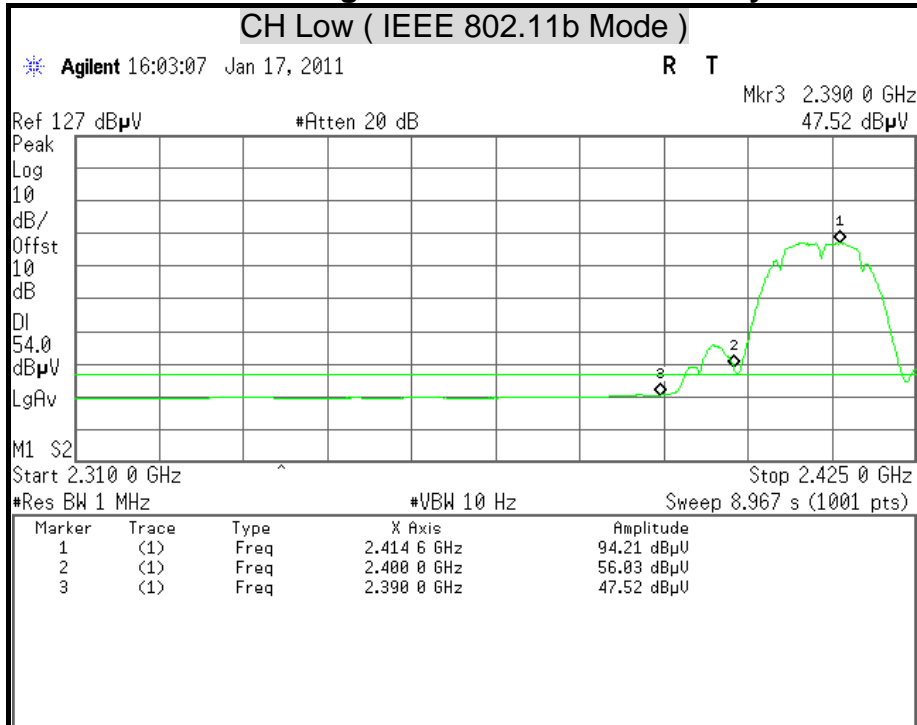
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

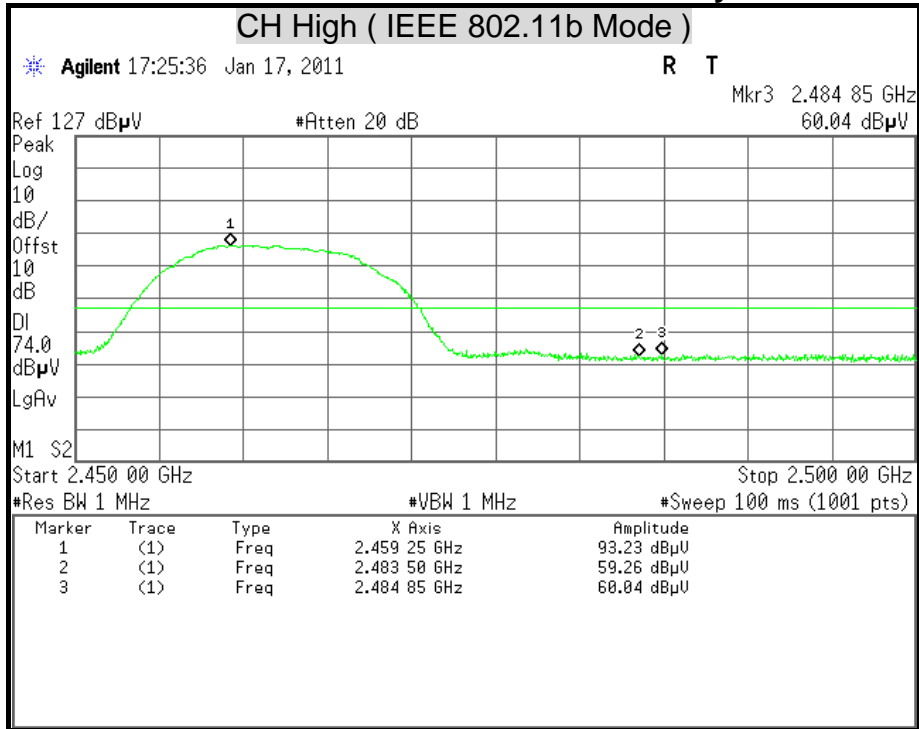
Polarity : Vertical





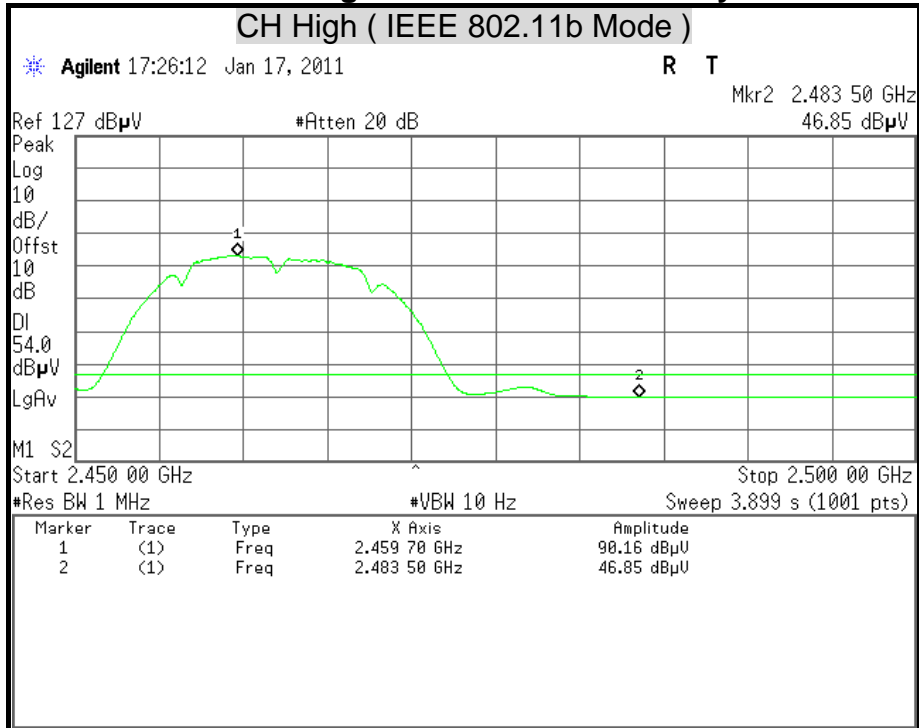
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

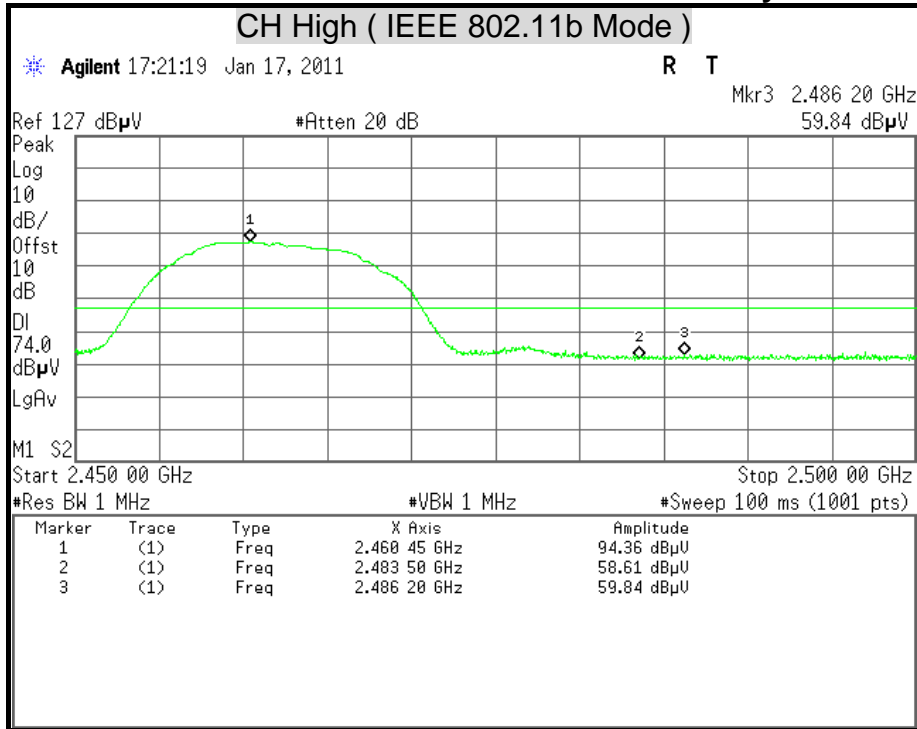
Polarity : Horizontal





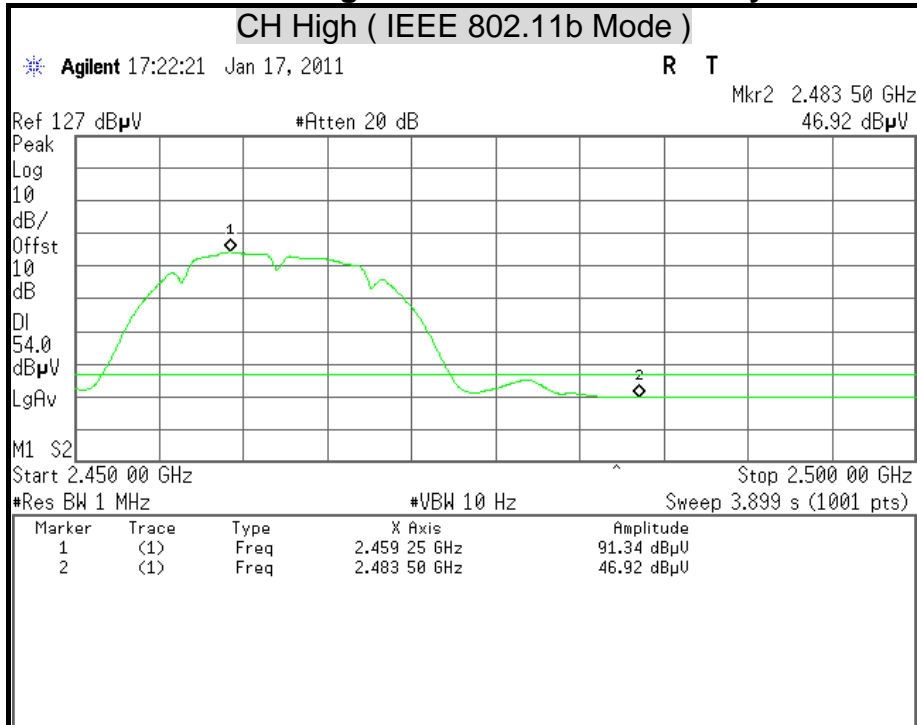
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

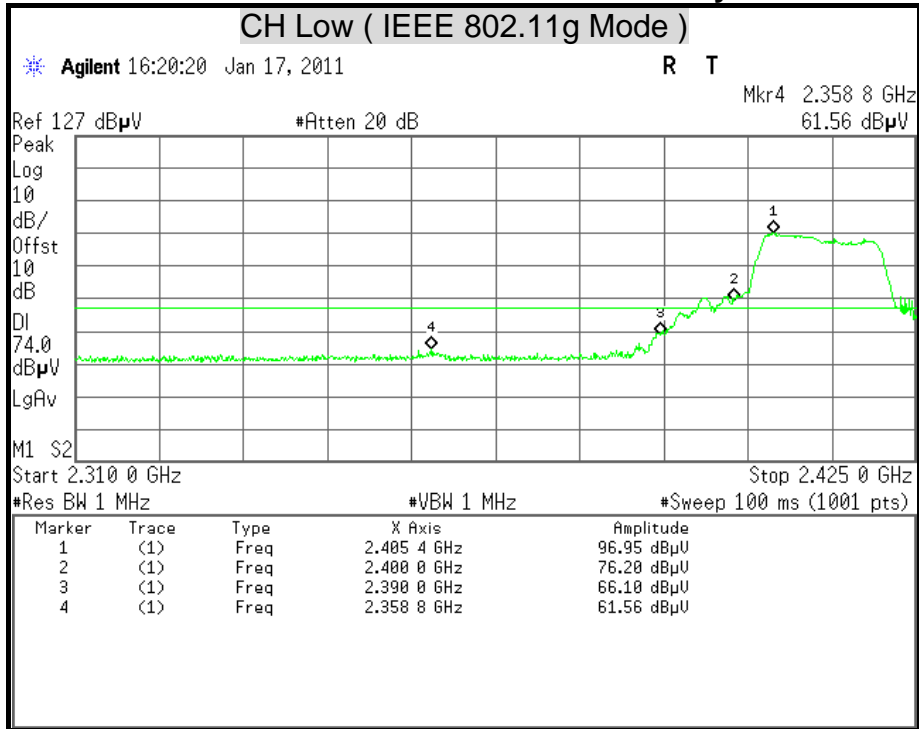
Polarity : Vertical





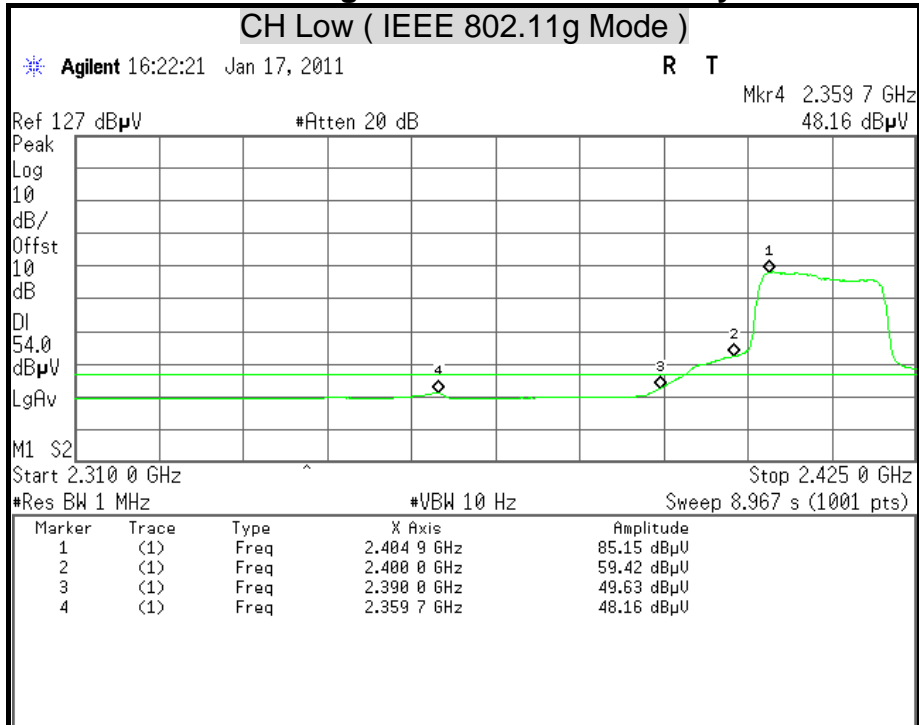
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

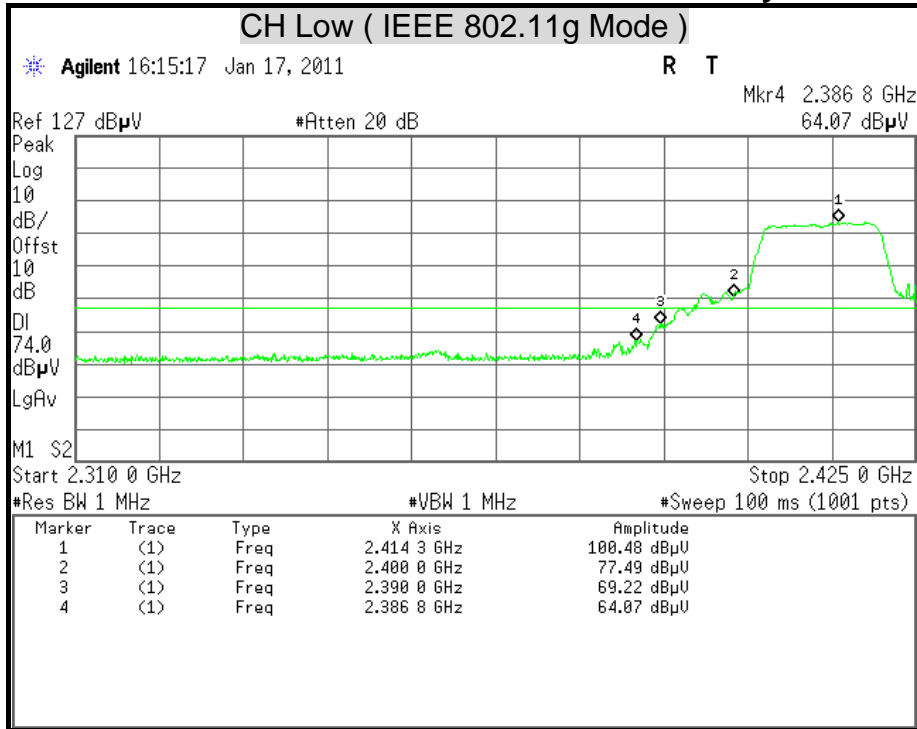
Polarity : Horizontal





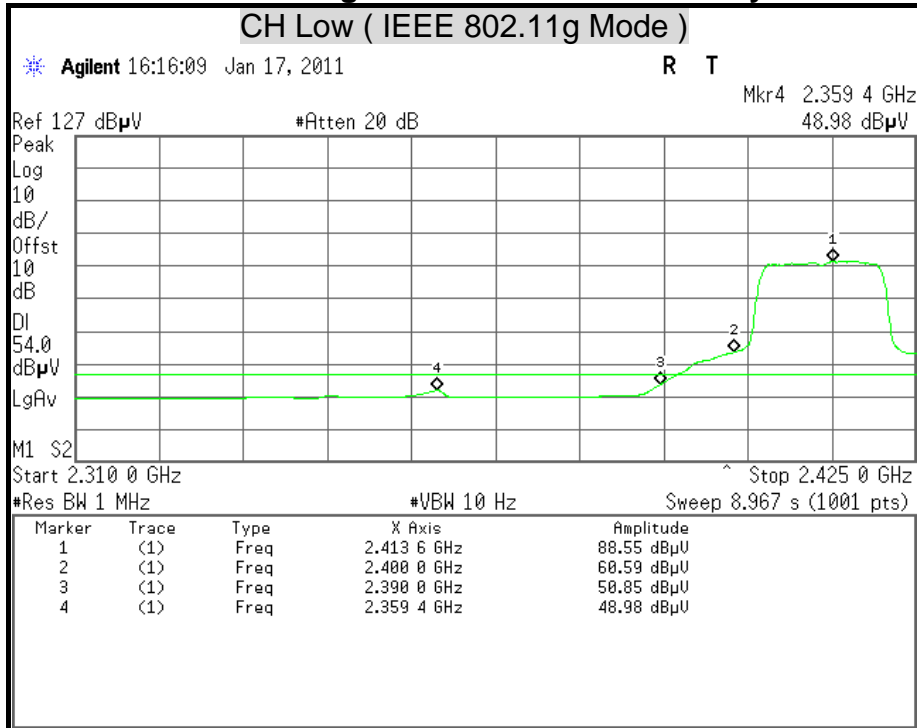
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

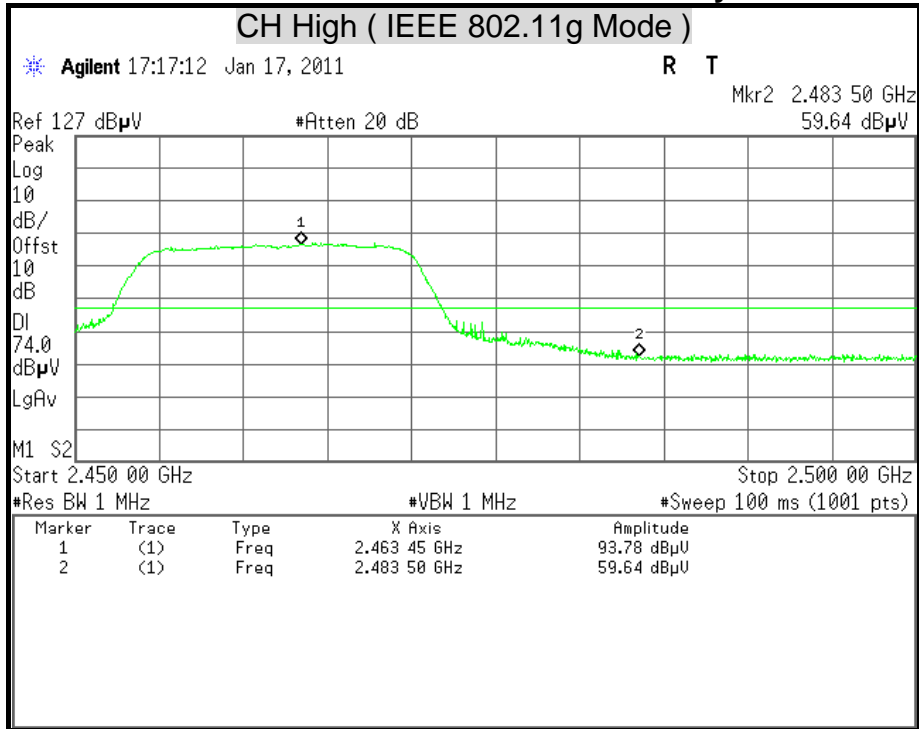
Polarity : Vertical





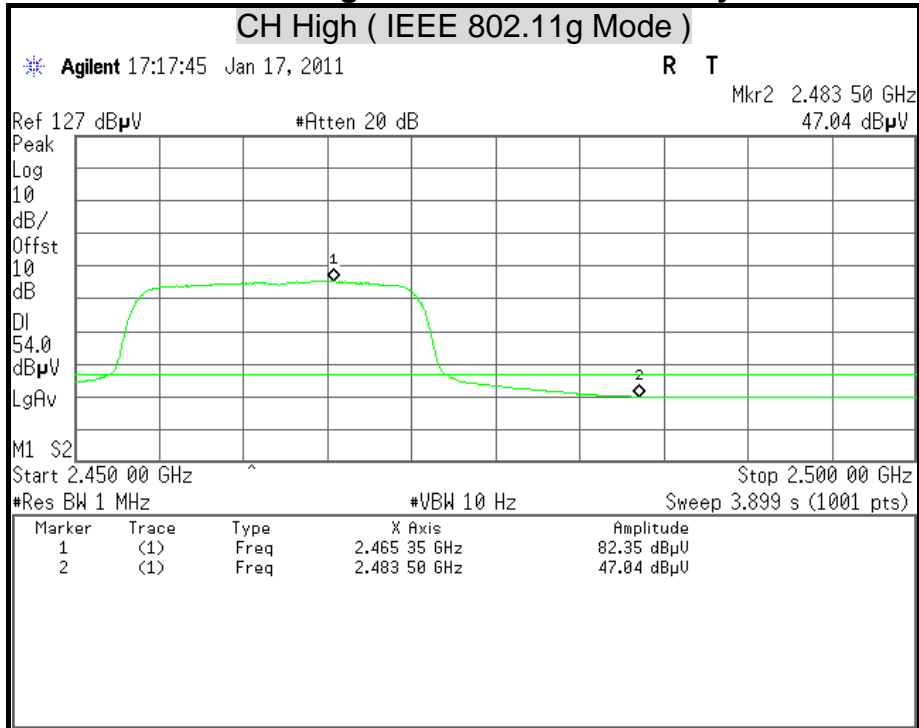
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

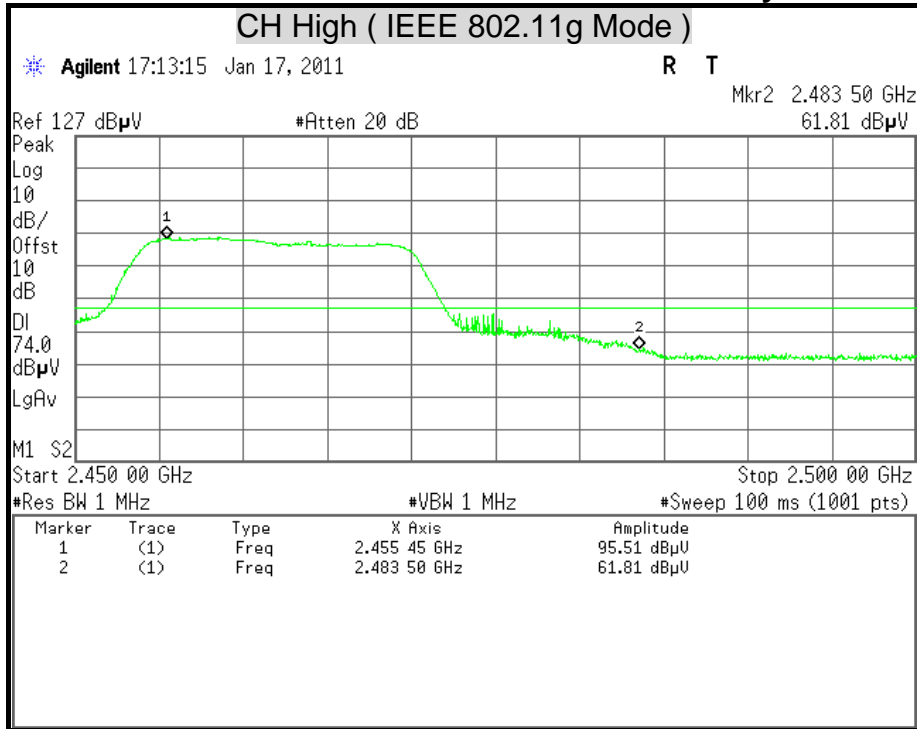
Polarity : Horizontal





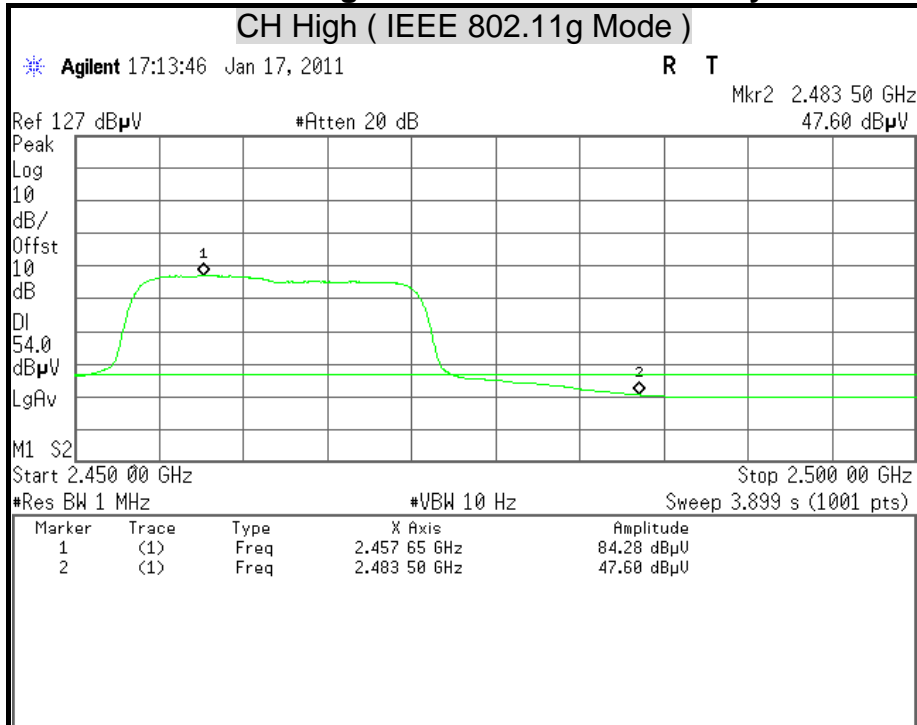
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

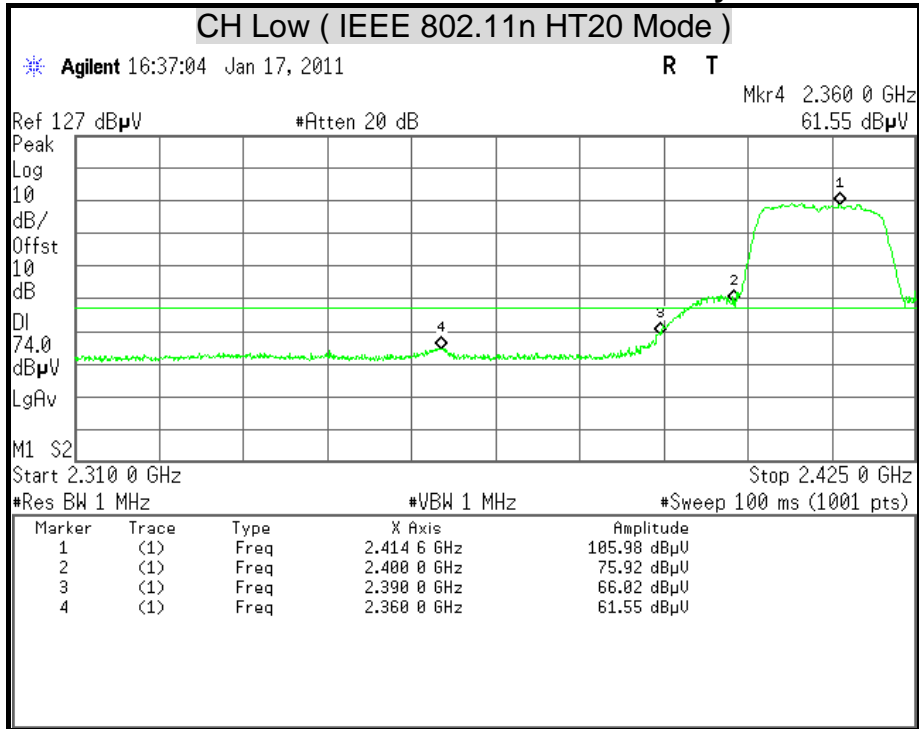
Polarity : Vertical





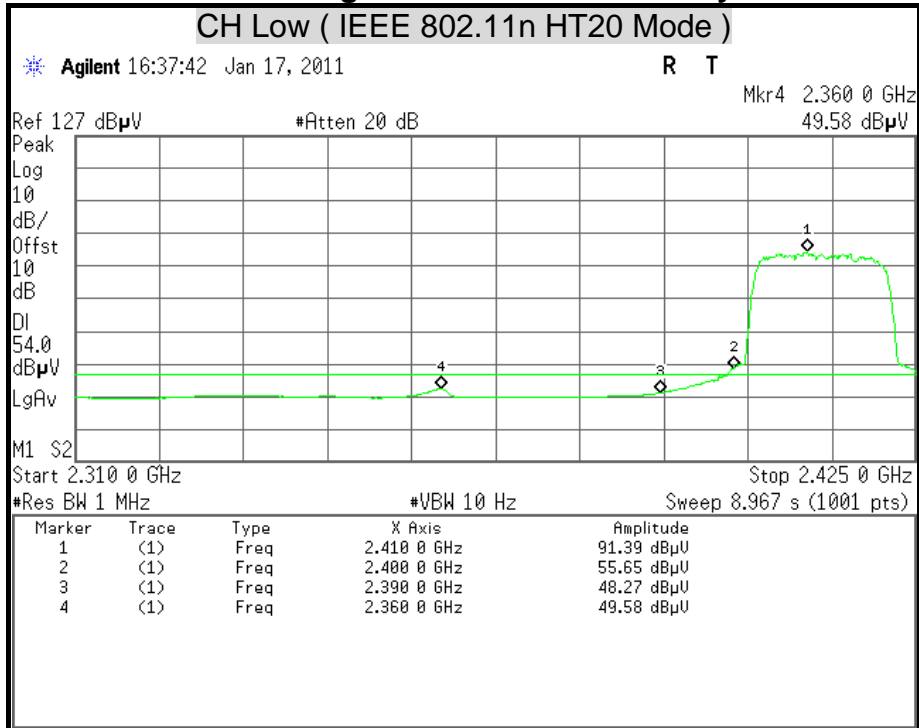
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

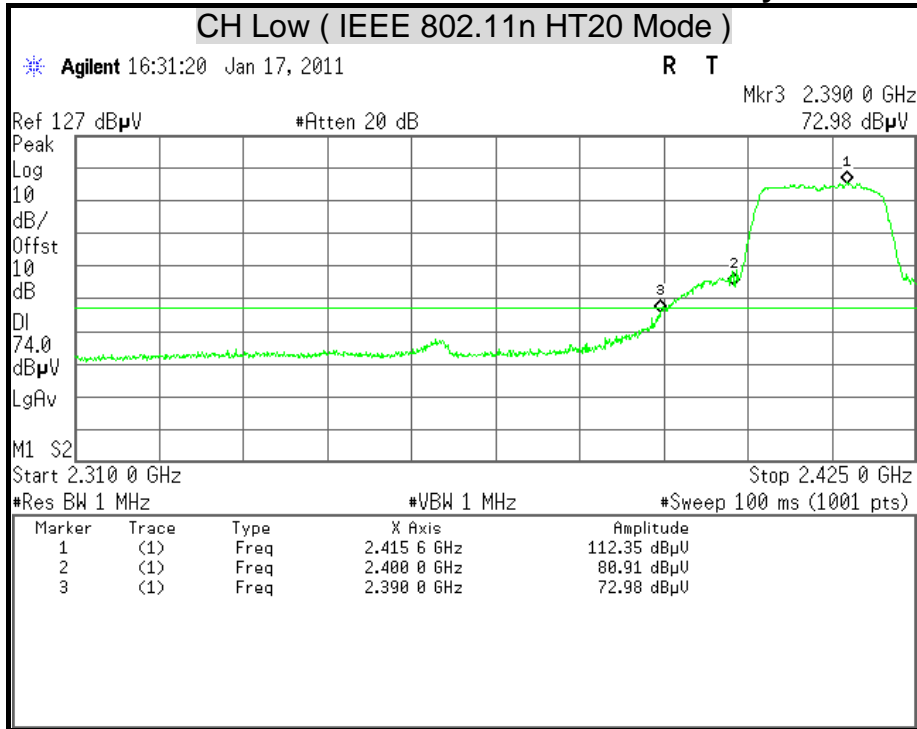
Polarity : Horizontal





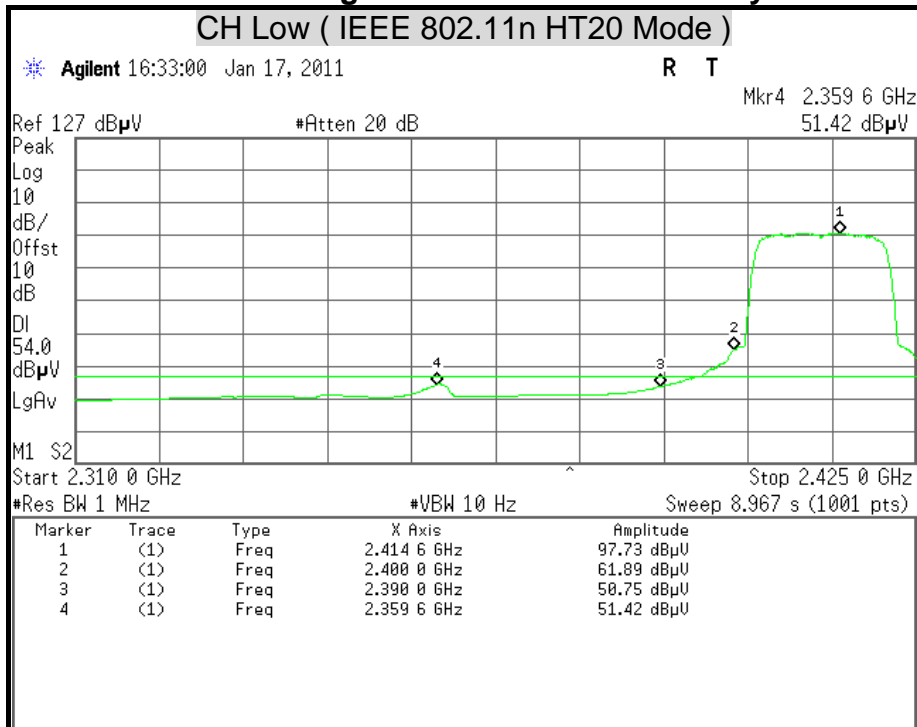
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

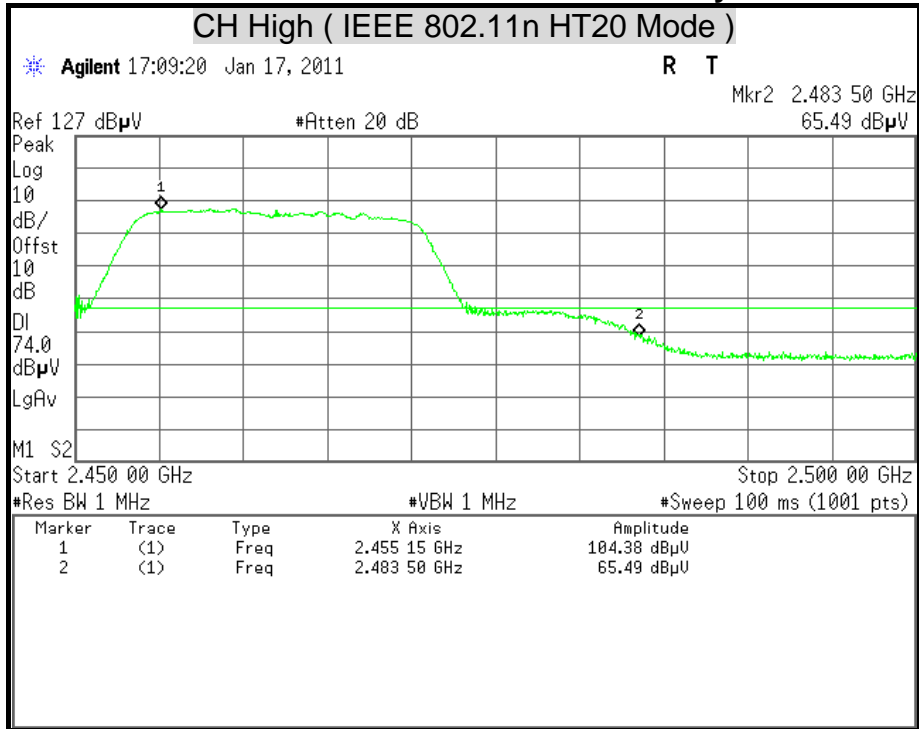
Polarity : Vertical





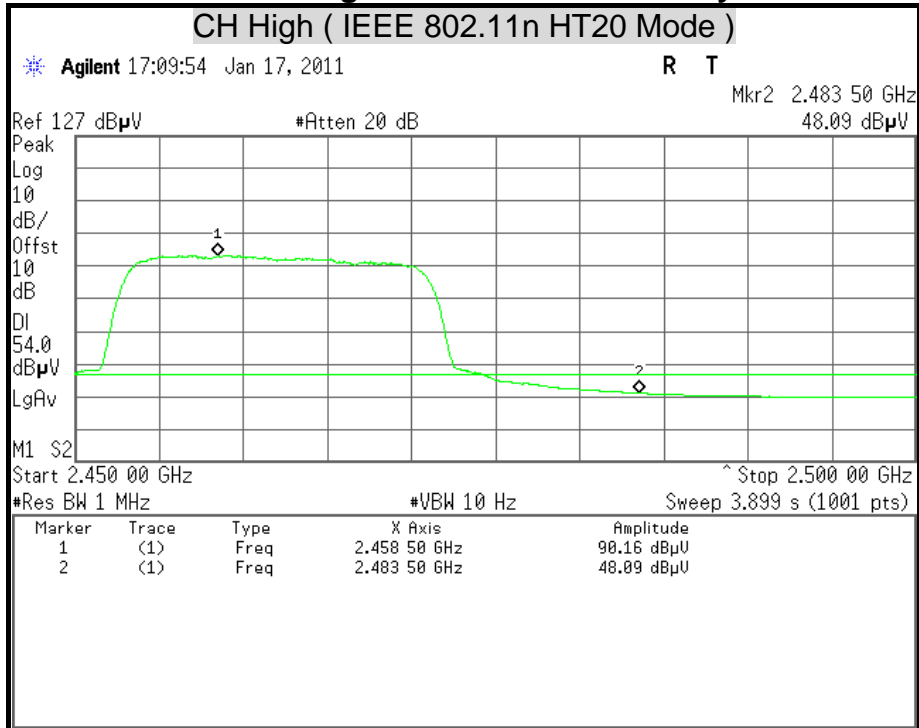
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

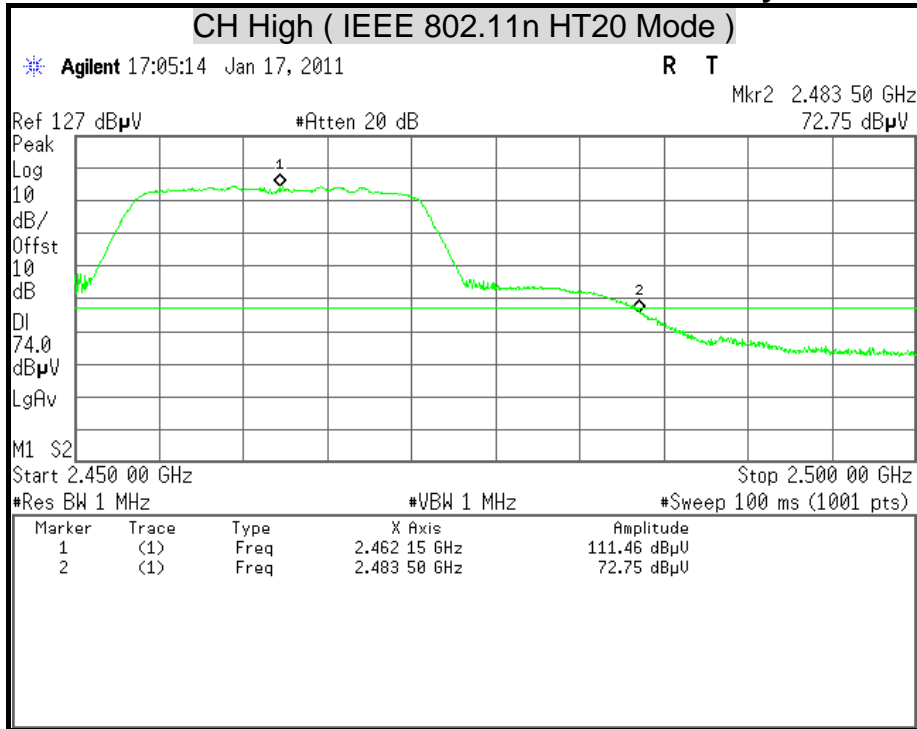
Polarity : Horizontal





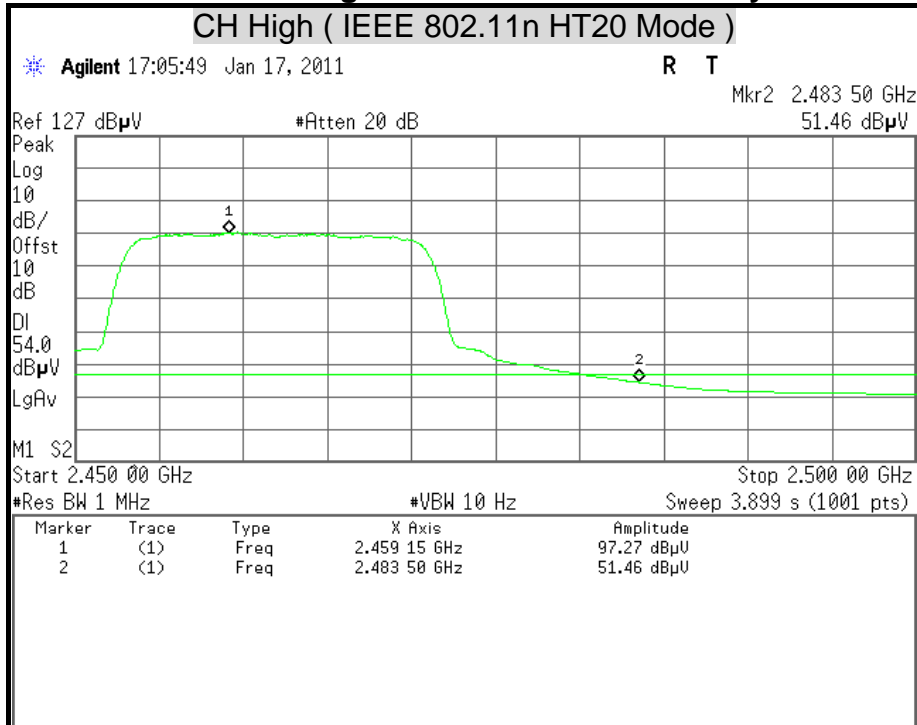
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

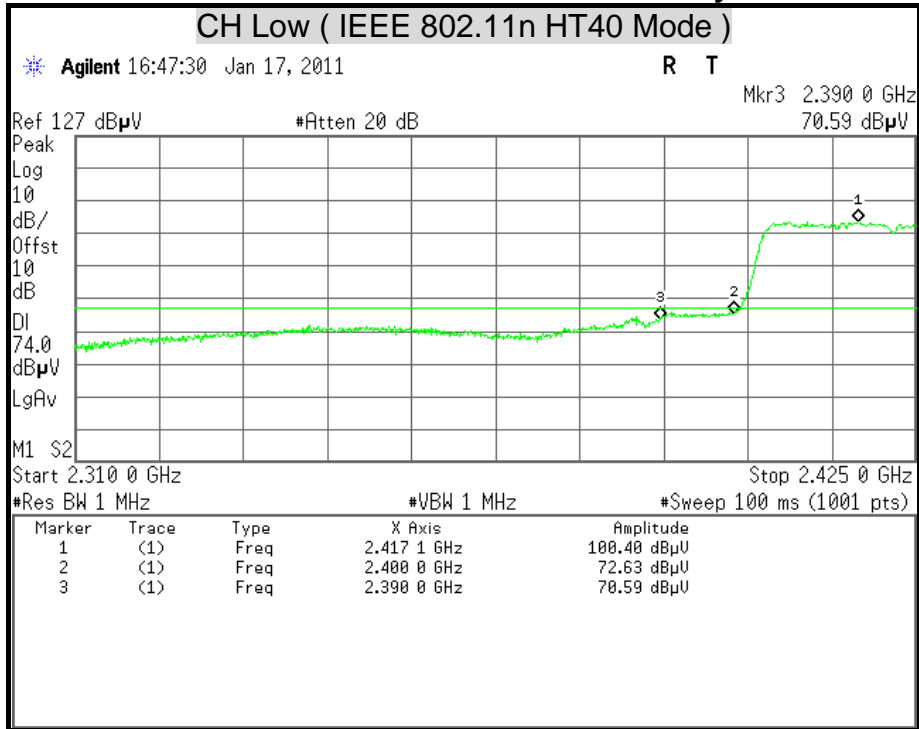
Polarity : Vertical





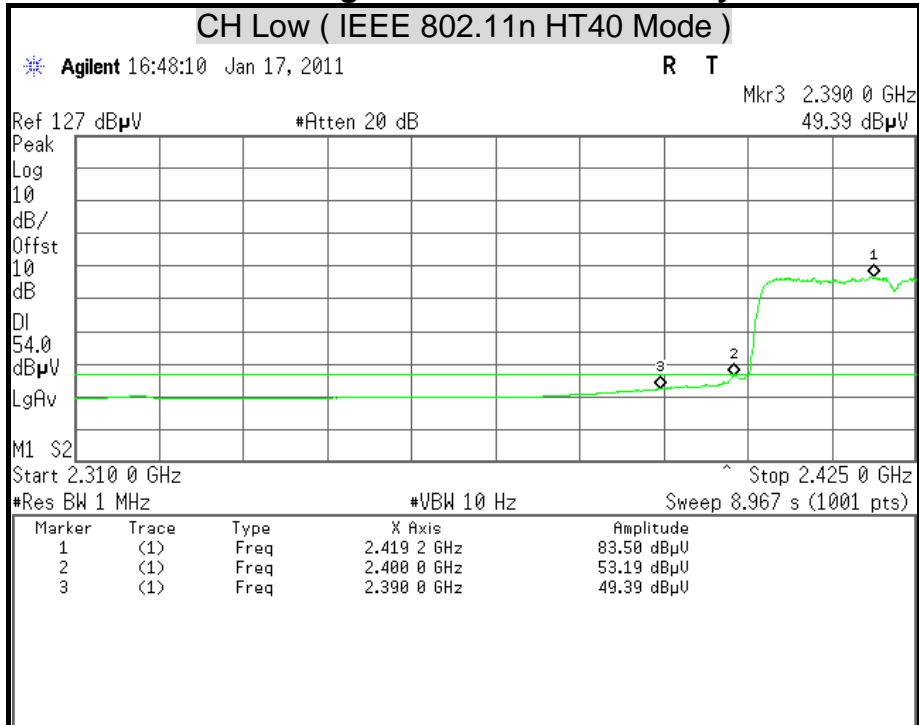
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

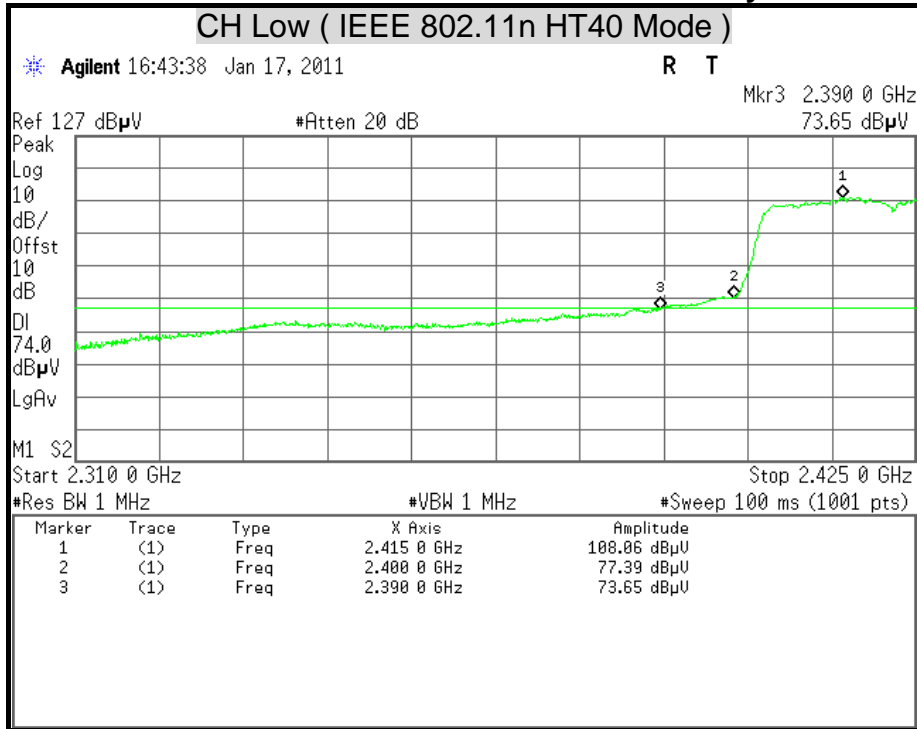
Polarity : Horizontal





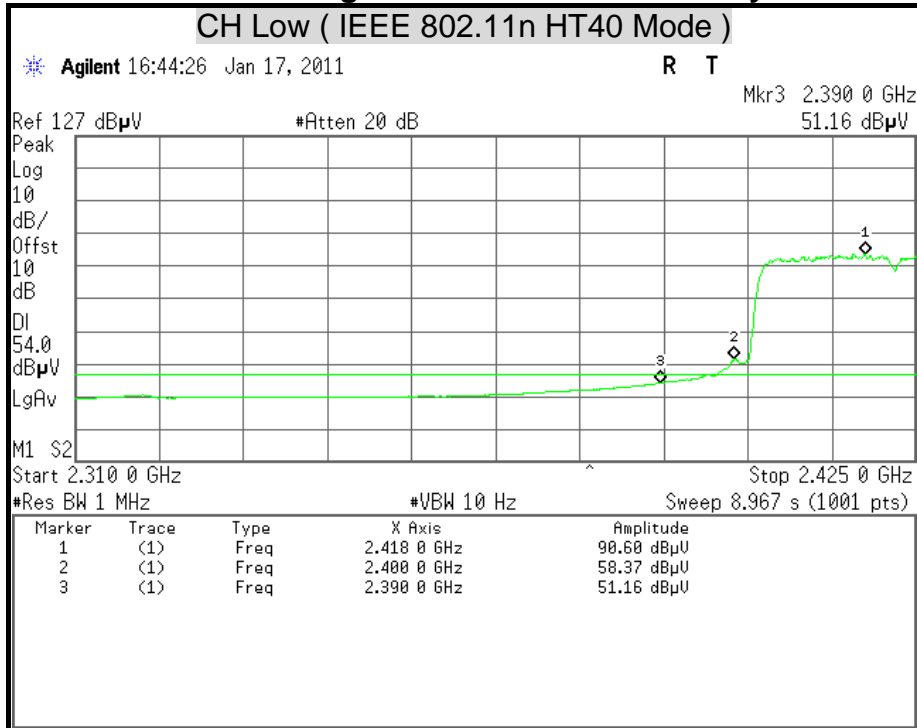
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

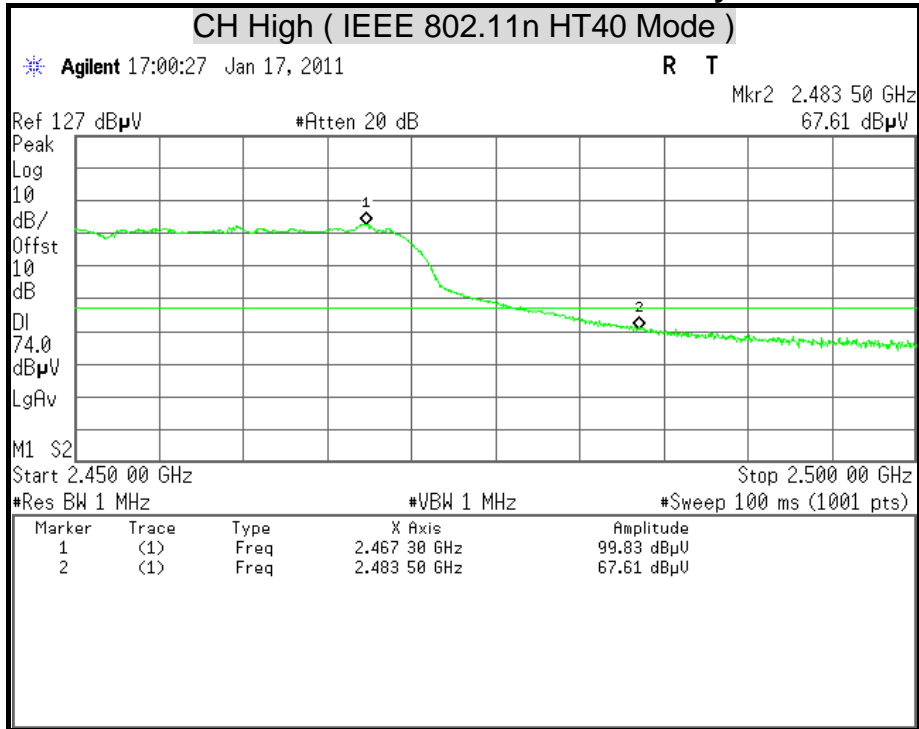
Polarity : Vertical





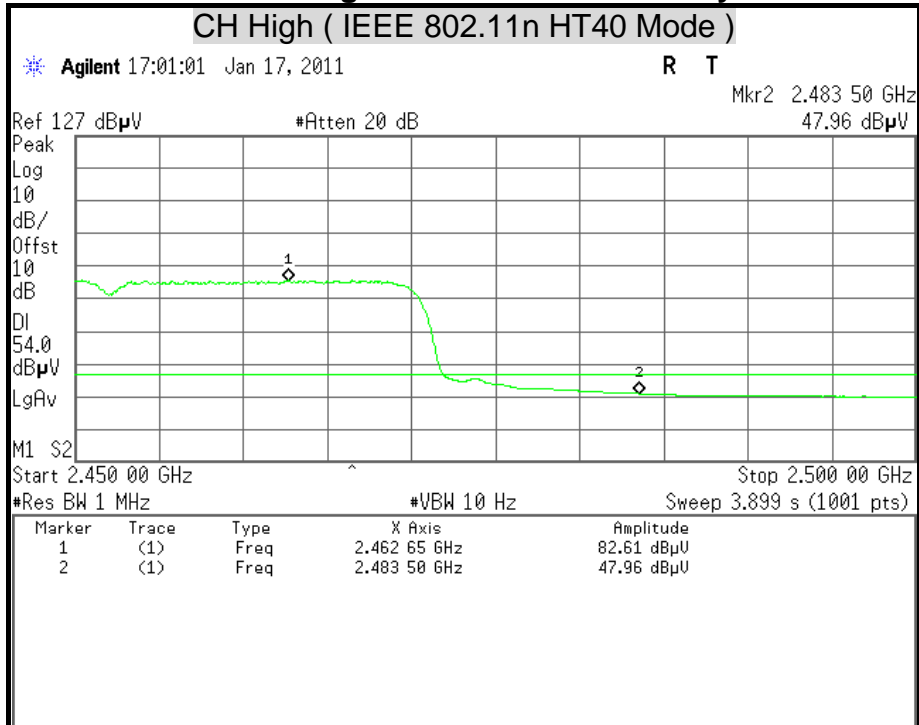
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

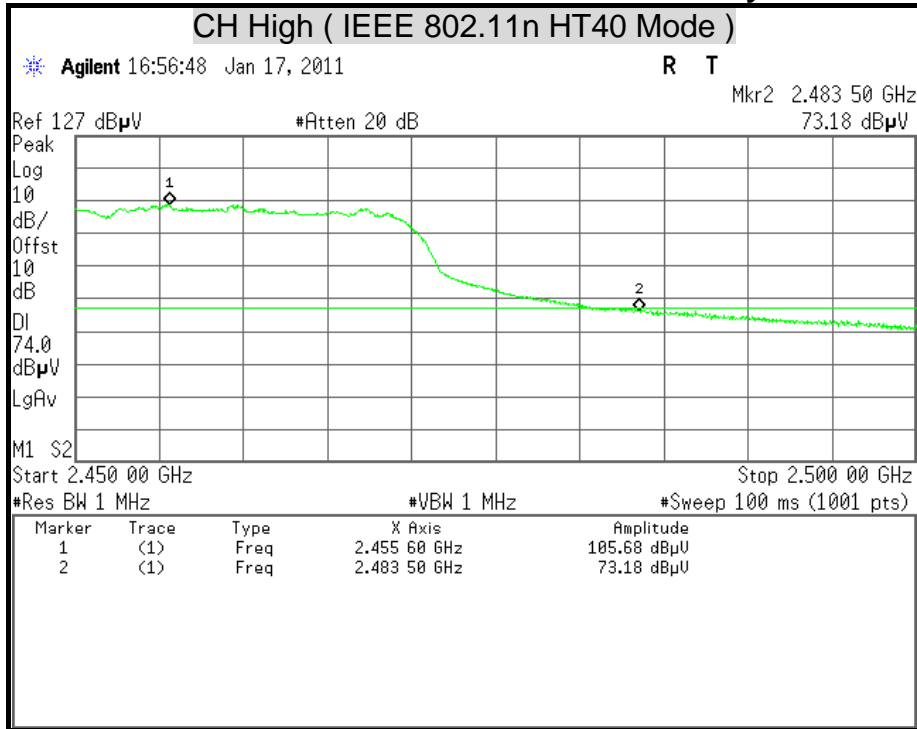
Polarity : Horizontal





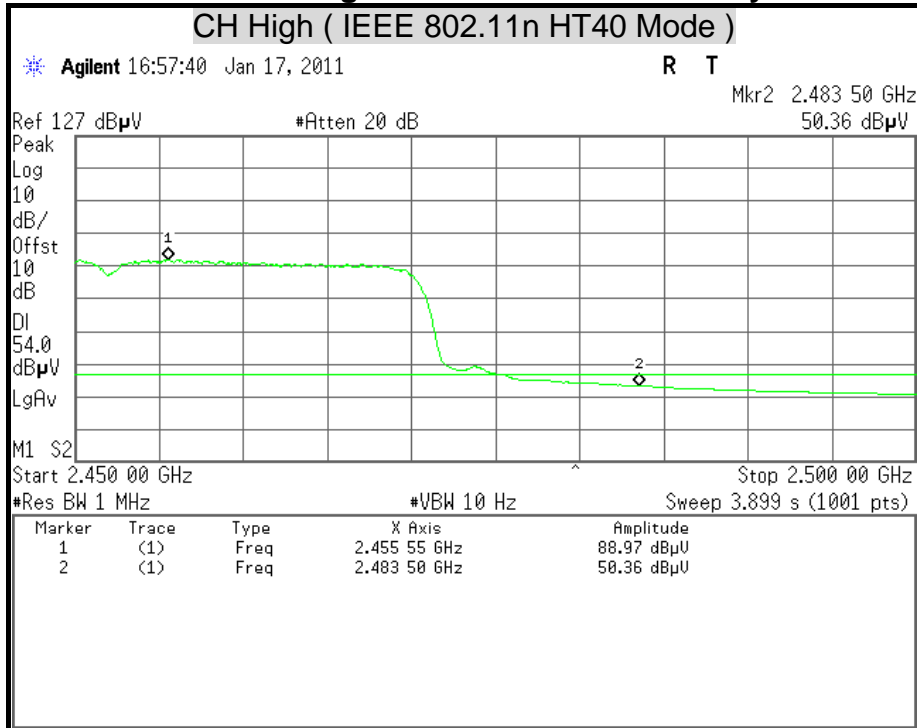
Detector Mode : Peak

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 μ 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 μ 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

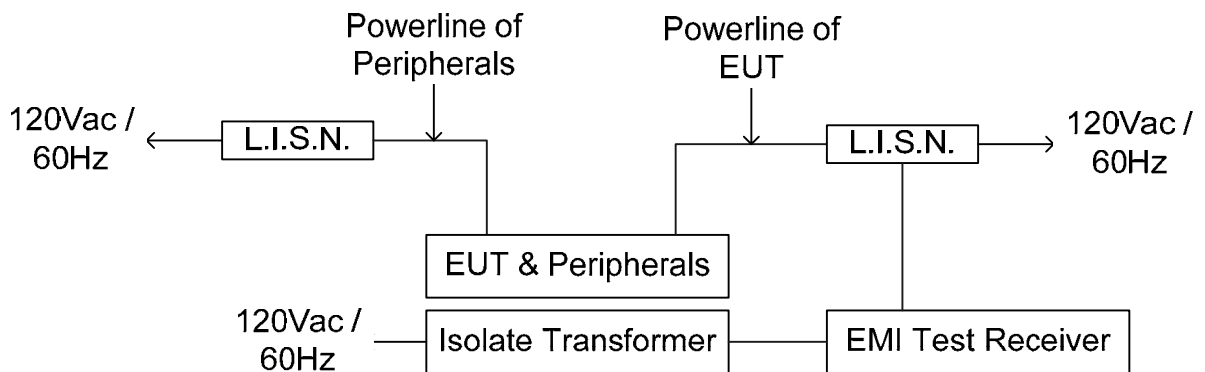
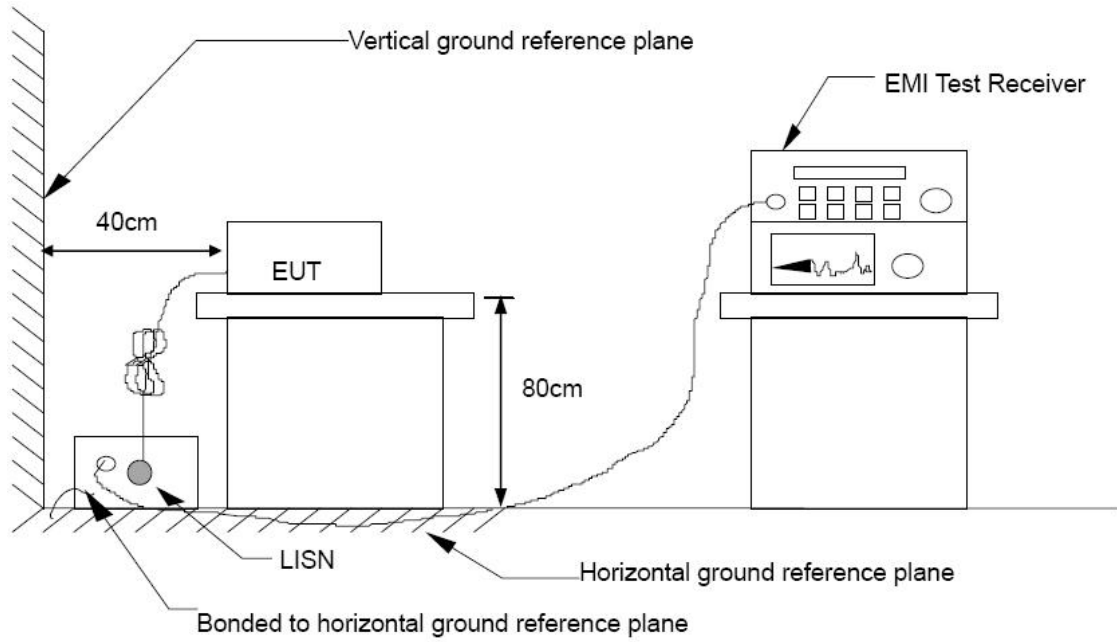
TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-465	08/08/2011
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-473	03/22/2011
EMI Receiver	ROHDE & SCHWARZ	ESCS 30	835418/008	10/24/2011
Pulse Limit	ROHDE & SCHWARZ	ESH3-Z2	100117	09/17/2011
N Type Coaxial Cable	BELDEN	8268 M17/164	003	07/09/2011

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 x 3m x 2.4m (LxWxH) shielded room.

The EUT along with its peripherals were placed on a 1.0m (W) x 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.

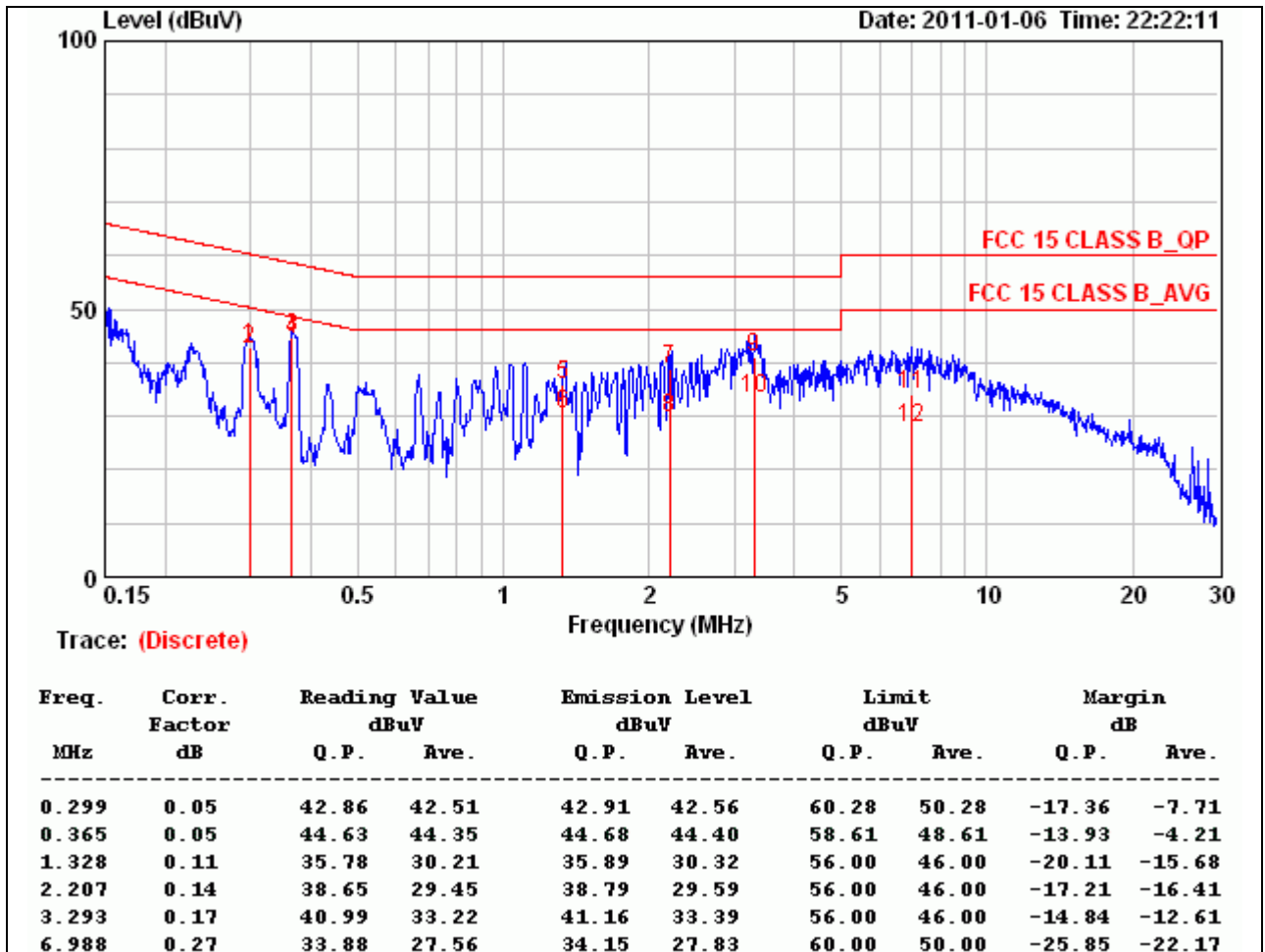
The EUT was located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8 m. Where a mains flexible cord was provided by the manufacturer shall be 1 m long, or if in excess of 1 m, the excess cable was folded back and forth as far as possible so as to form a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



TEST RESULTS

Product Name	Wireless IP CAM	Test By	Bell Huang
Model	F7115	Test Date	2011/01/06
Test Mode	Normal operating / Power Adapter (1)	TEMP & Humidity	22.1°C, 66%

LINE



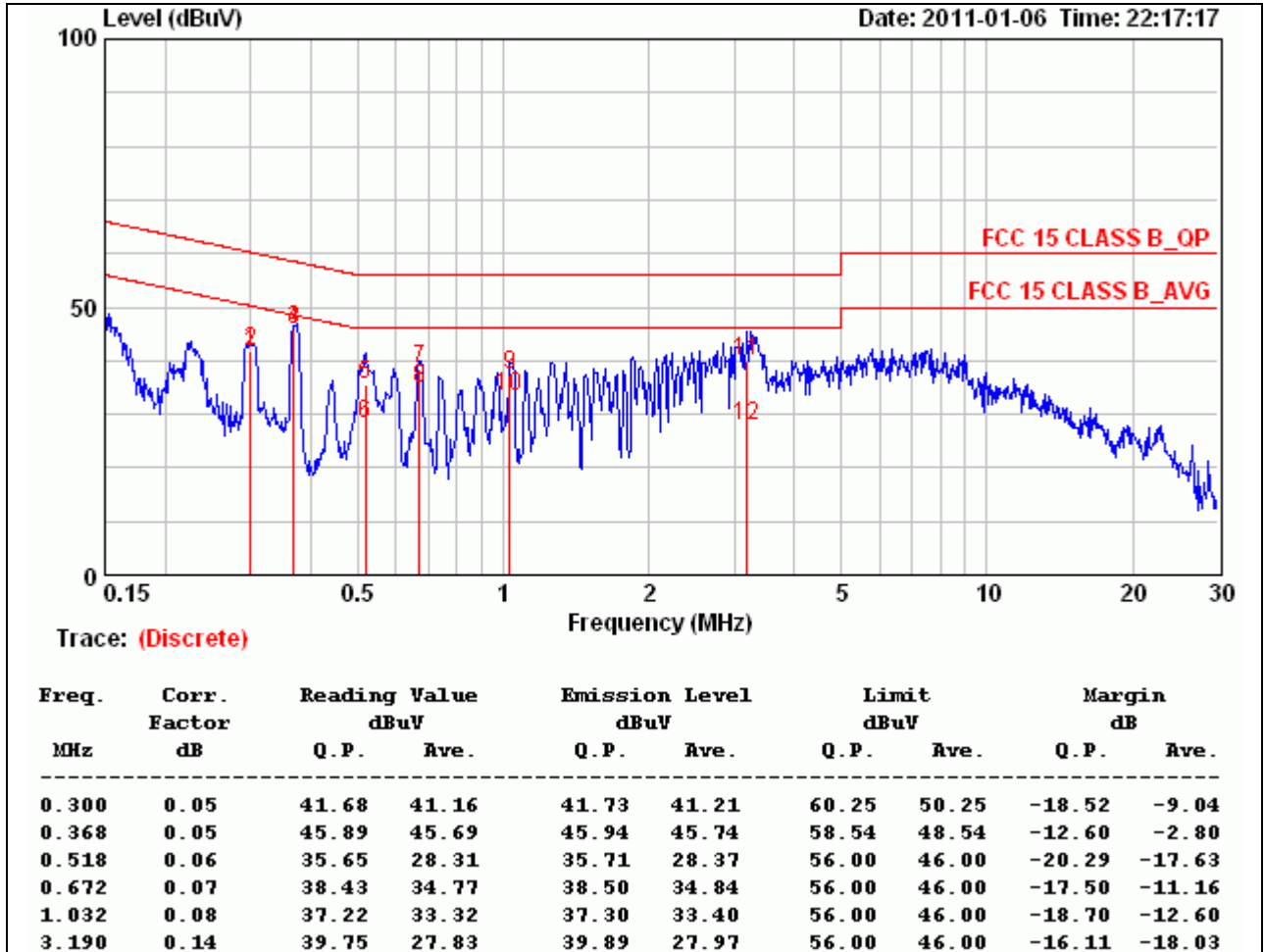
Remark:

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



Product Name	Wireless IP CAM	Test By	Bell Huang
Model	F7115	Test Date	2011/01/06
Test Mode	Normal operating / Power Adapter (1)	TEMP & Humidity	22.1°C, 66%

NEUTRAL



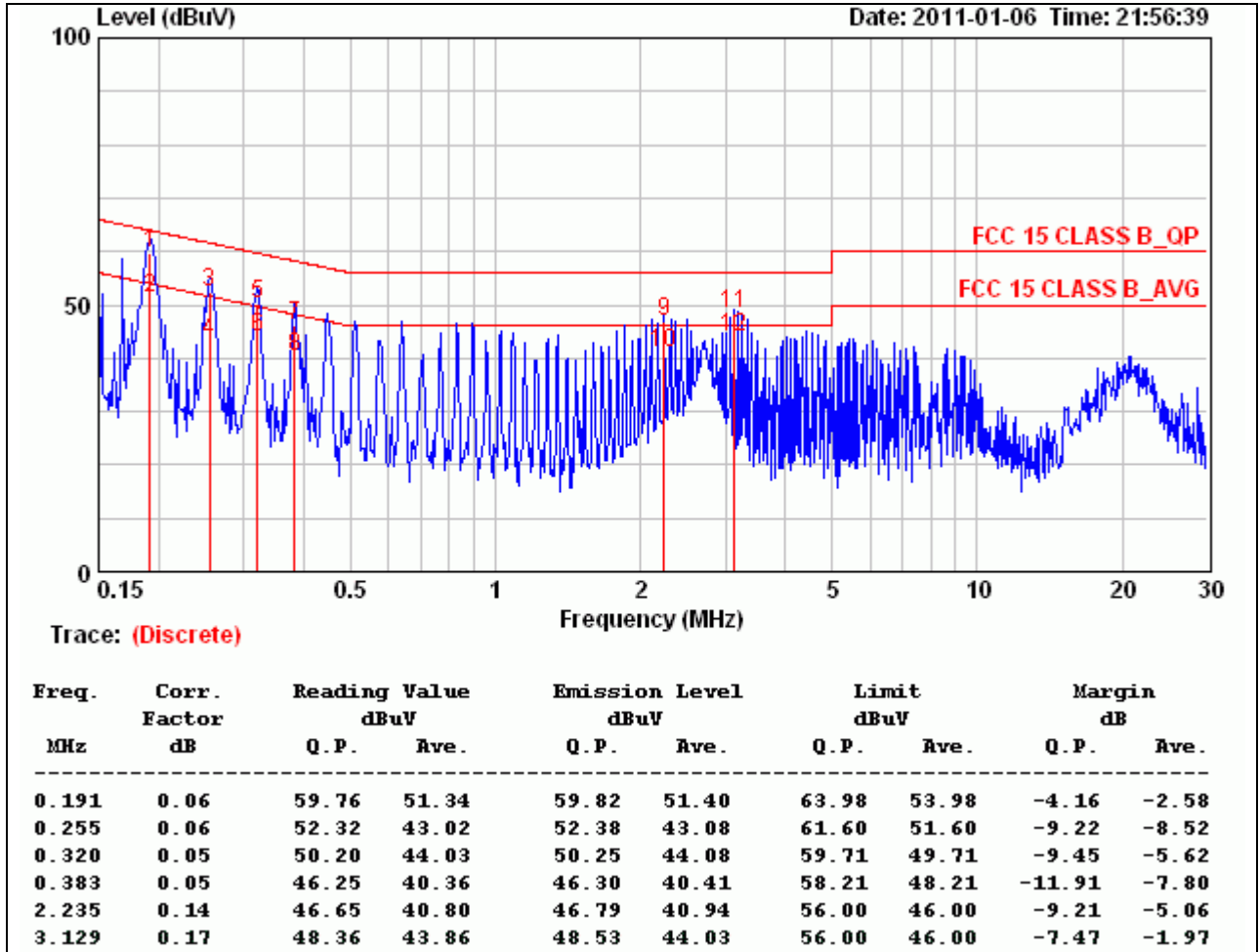
Remark:

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



Product Name	Wireless IP CAM	Test By	Bell Huang
Model	F7115	Test Date	2011/01/06
Test Mode	Normal operating / Power Adapter (2)	TEMP & Humidity	22.1°C, 66%

LINE



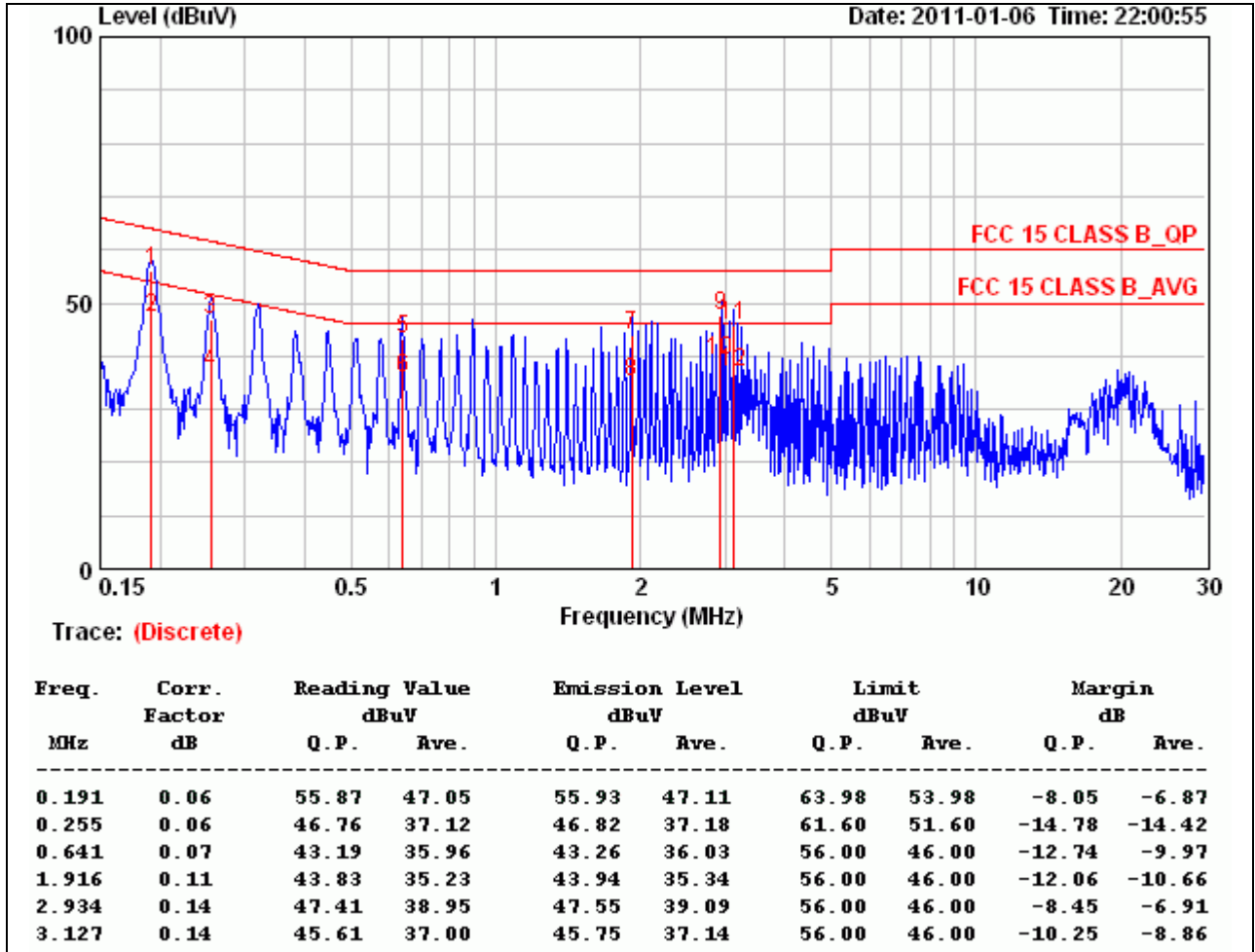
Remark:

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



Product Name	Wireless IP CAM	Test By	Bell Huang
Model	F7115	Test Date	2011/01/06
Test Mode	Normal operating / Power Adapter (2)	TEMP & Humidity	22.1°C, 66%

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 ²)	Average Time
(A) Limits for Occupational / Control Exposures				
300-1,500	--	--	F/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
300-1,500	--	--	F/1500	6
1,500-100,000	--	--	1	30

CALCULATIONS

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where *E* = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

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

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

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 / cm²



LIMIT

Power Density Limit, $S=1.0\text{mW}/\text{cm}^2$

TEST RESULTS

Mode	Antenna Gain (dBi)	Minimum separation distance (cm)	Output Power (dBm)	Numeric antenna gain (mW)	Power Density Limit (mW/cm^2)	Power Density at 20cm (mW/cm^2)
IEEE 802.11b	5.18	20.0	22.09	3.30	1.00	0.106101
IEEE 802.11g	5.18	20.0	21.54	3.30	1.00	0.093480
IEEE 802.11n HT20	5.18	20.0	20.59	3.30	1.00	0.075194
IEEE 802.11n HT40	5.18	20.0	18.91	3.30	1.00	0.051003

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