



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

For

Wireless IP CAM

Model : IP1050

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	03/18/2011	Initial Issue	All Page 104	Winnie Chen



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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 : IP1050
Trade Name : ZAVIO
Tested Date : March 08 ~ 17, 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	IP1050
Received Date	March 08, 2011
Frequency Range	IEEE 802.11b/g, 802.11n HT20 : 2412MHz~2462MHz IEEE 802.11n HT40 : 2422MHz~2452MHz
Transmit Power	IEEE 802.11b : 17.02 dBm (0.0504W) IEEE 802.11g : 17.75 dBm (0.0596W) IEEE 802.11n HT20 : 18.12 dBm (0.0649W) IEEE 802.11n HT40 : 17.96 dBm (0.0625W)
Channel Spacing	IEEE 802.11b/g, 802.11n HT20/HT40 : 5MHz
Channel Number	IEEE 802.11b/g, 802.11n HT20 : 11 Channels IEEE 802.11n HT40 : 7 Channels
Transmit Data Rate	IEEE 802.11b : 11, 5.5, 2, 1 Mbps IEEE 802.11g : 54, 48, 36, 24, 18, 12, 9, 6 Mbps IEEE 802.11n HT20 : 65, 58.5, 52, 39, 26, 19.5, 13, 6.5 Mbps IEEE 802.11n HT40 : 135, 121.5, 108, 81, 54, 40.5, 27, 13.5Mbps
Type of Modulation	IEEE 802.11b : DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g : OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20/40 : OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Type	Printed Antenna, Antenna Gain 1.71 dBi
DC Power Cord Type	Unshielded cable 1.5 m (no detachable) with a core
Power Rating	12Vdc
Test Voltage	120Vac, 60Hz
I/O Port	RJ-45 Port x 1, Audio Out 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

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-0501PI 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 transceiver in form factor. It has one transmitter chains and one receive chains (1 x 1 configurations).

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

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
	Conducted Emission	Normal Operating

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	Headset/Microphone	ERGOTECH	ET-E203	4719405008042	-----
5	Draft 11n Wireless 4-Port Gigabit Broadband Router	SMC	SMCWGBR14S-N	U193600496	-----

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>

```

i iwpriv ra0 set ATE=AESTART
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 Bandwidth 20 (IEEE 802.11b mode)
6Mbps Bandwidth 20 (IEEE 802.11g mode)
MCS=7 Bandwidth 20 (IEEE 802.11n HT20 mode)
MCS=7 Bandwidth 40 (IEEE 802.11n HT40 mode)

⇒ Power control mode:

Power Set: IEEE 802.11b

- Channel Low (2412MHz) =31
- Channel Middle (2437MHz) = 31
- Channel High (2462MHz) = 31

Power Set: IEEE 802.11g

- Channel Low (2412MHz) =31
- Channel Middle (2437MHz) =31
- Channel High (2462MHz) = 31

Power Set: IEEE 802.11n HT20

- Channel Low (2412MHz) =31
- Channel Middle (2437MHz) =31
- Channel High (2462MHz) = 31

Power Set: IEEE 802.11n HT40

- Channel Low (2422MHz) =31
- Channel Middle (2437MHz) =31
- Channel High (2452MHz) = 31

7. All of the functions 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 (1) ping 192.168.1.121 to EUT.
4. Notebook PC (2) ping 192.168.0.151 to EUT.
5. Audio Out link Headset.
6. All of the functions are under run.
7. 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	12.17	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	16.50	500	PASS
Middle	2437	16.50	500	PASS
High	2462	16.58	500	PASS

IEEE 802.11n HT20 mode

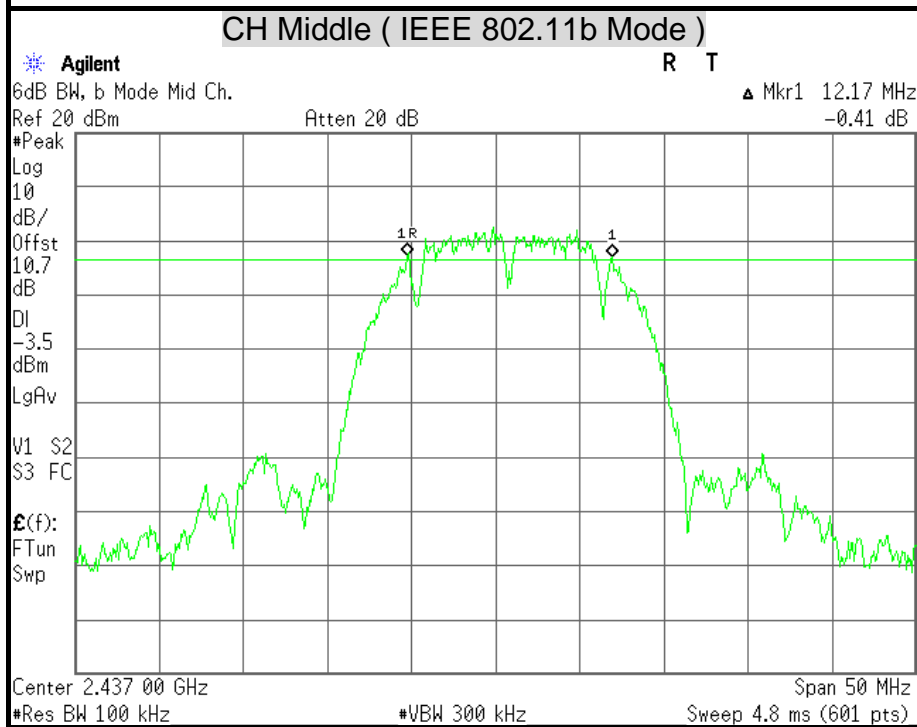
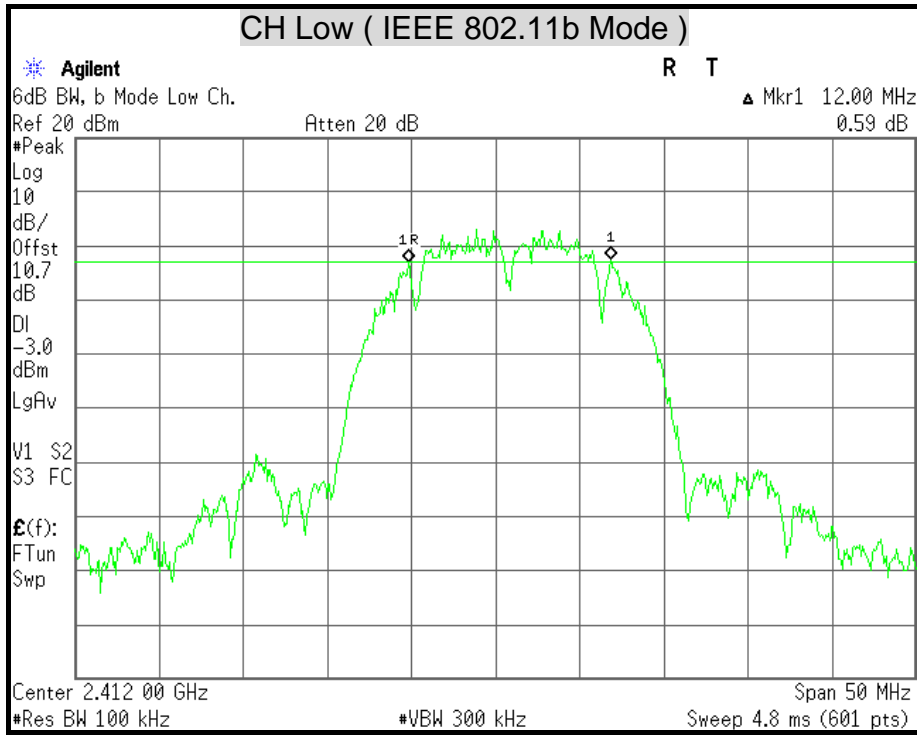
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	17.75	500	PASS
Middle	2437	17.67	500	PASS
High	2462	17.67	500	PASS

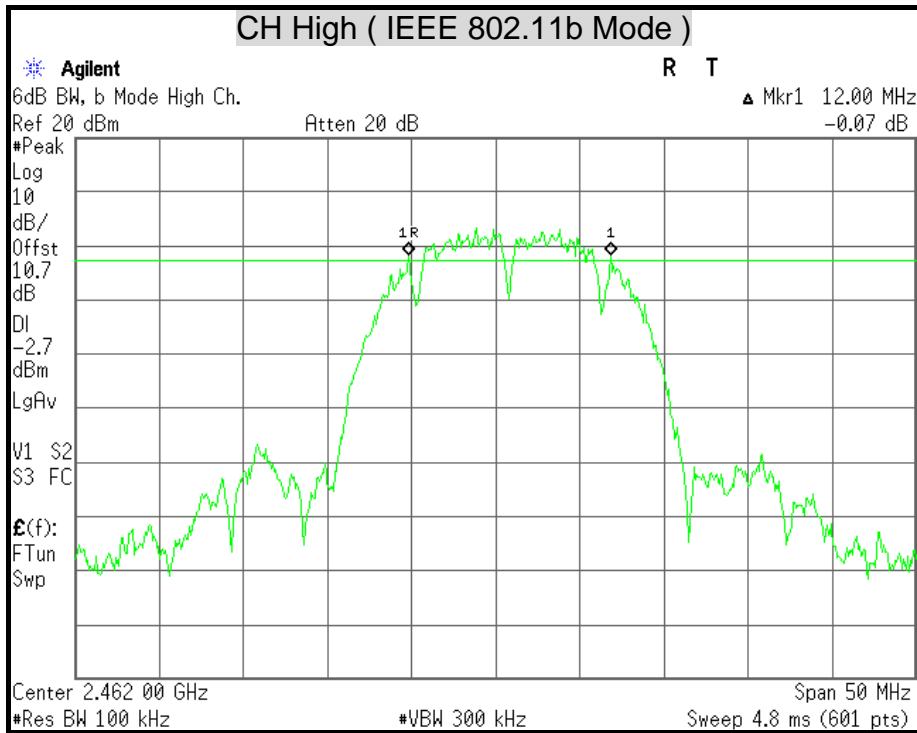
IEEE 802.11n HT40 mode

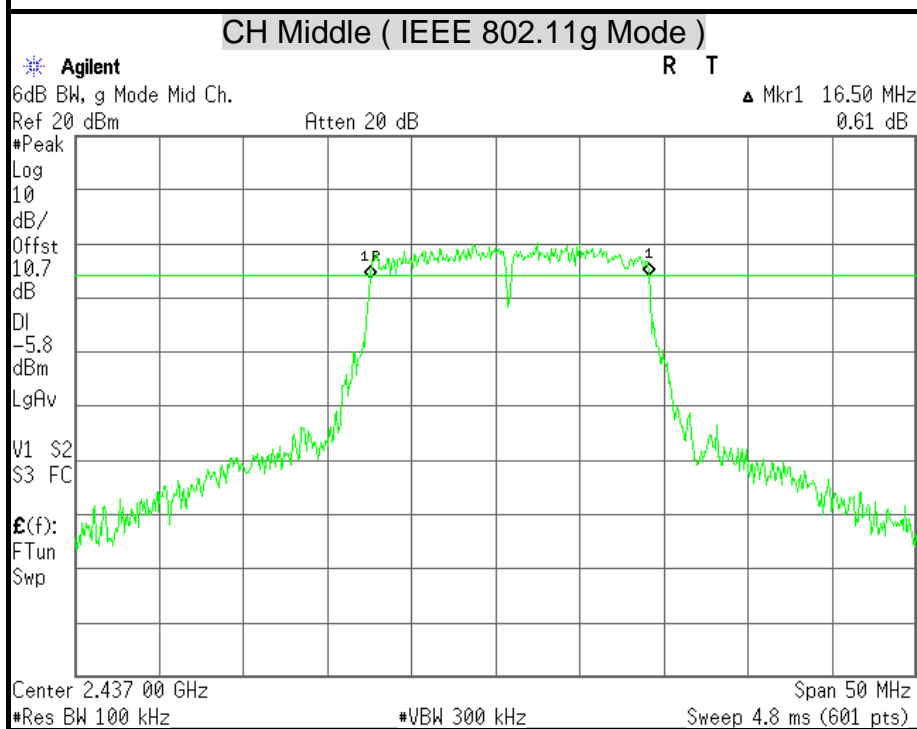
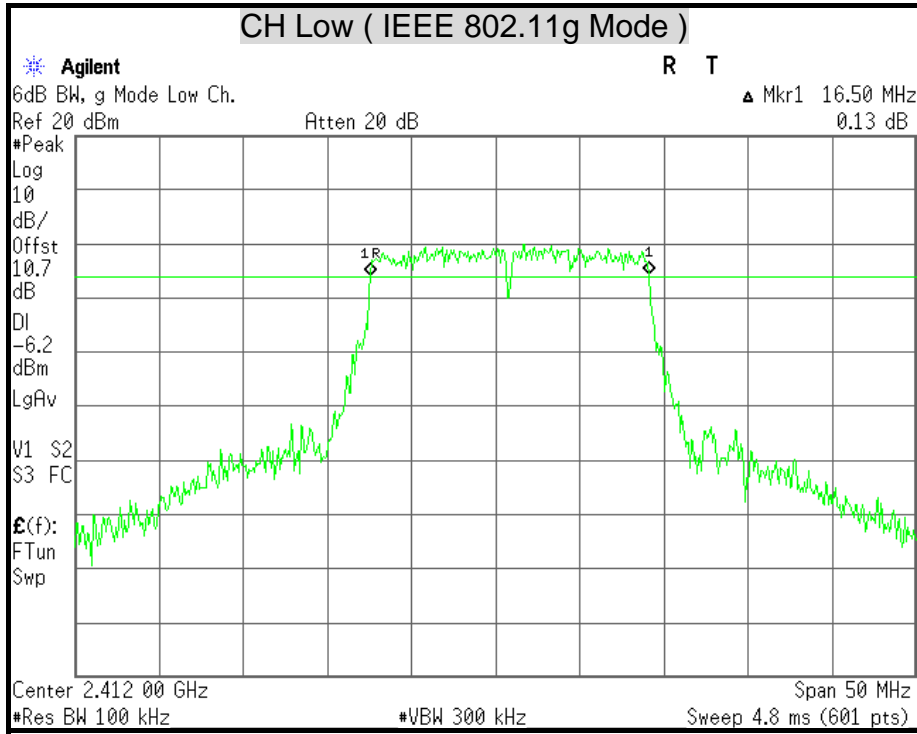
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2422	36.33	500	PASS
Middle	2437	36.42	500	PASS
High	2452	36.33	500	PASS

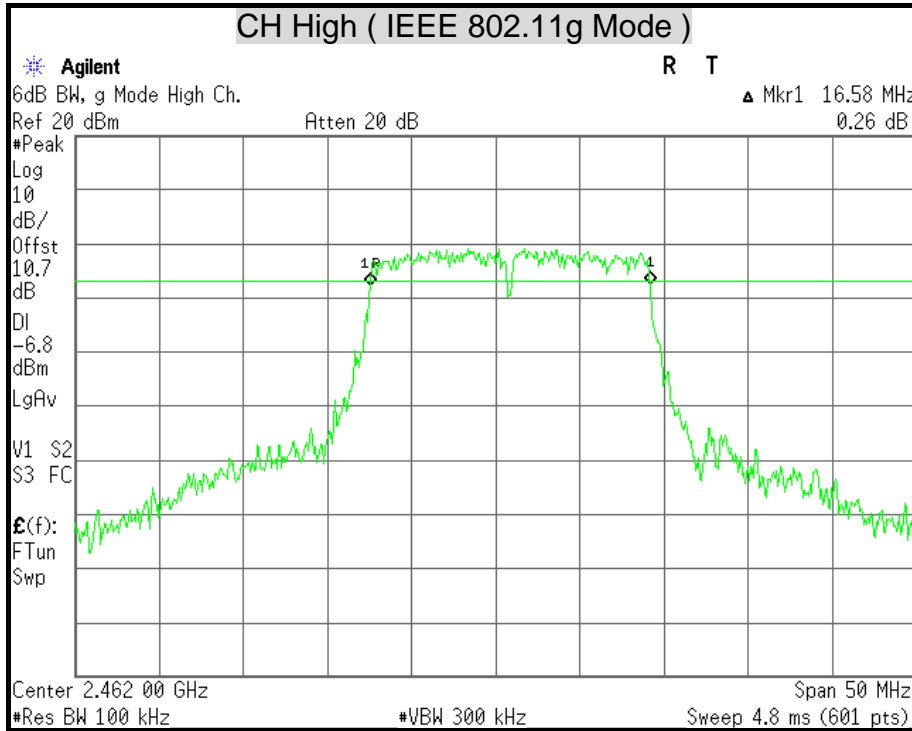


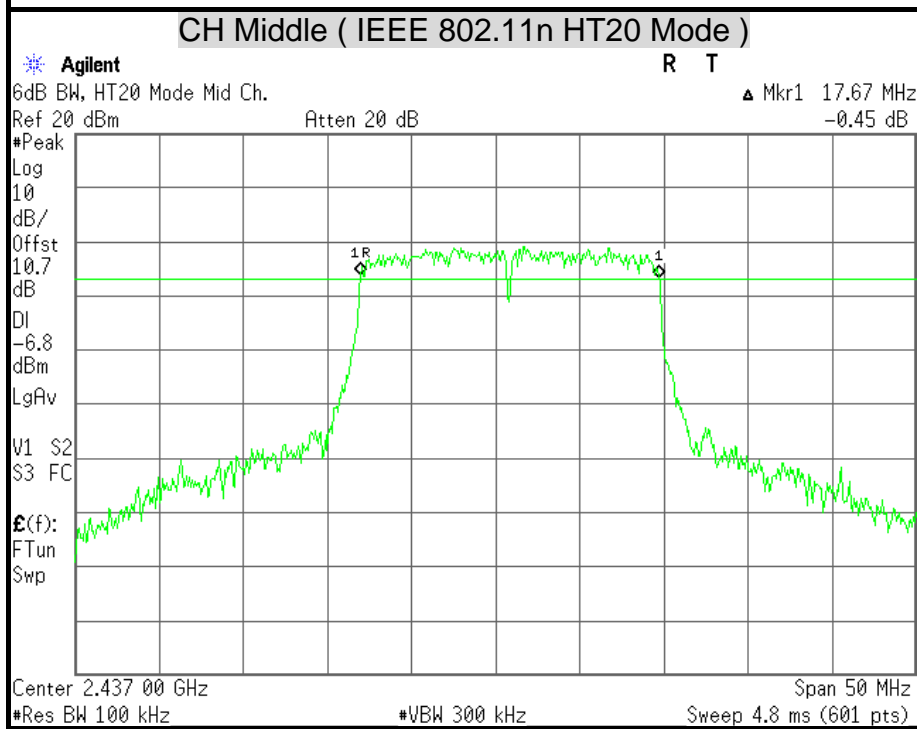
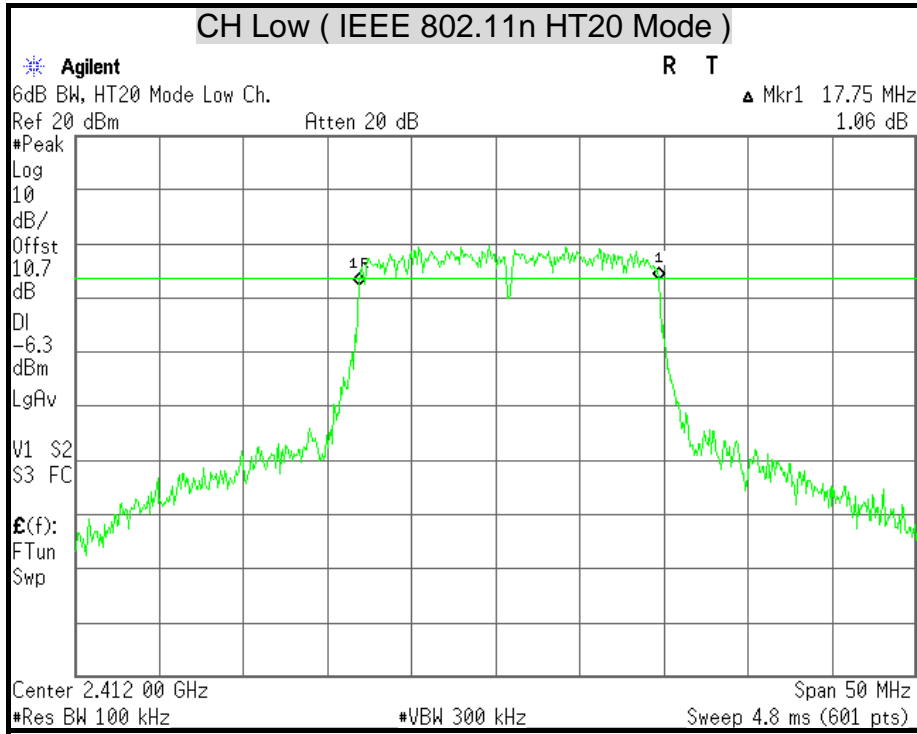
6dB BANDWIDTH

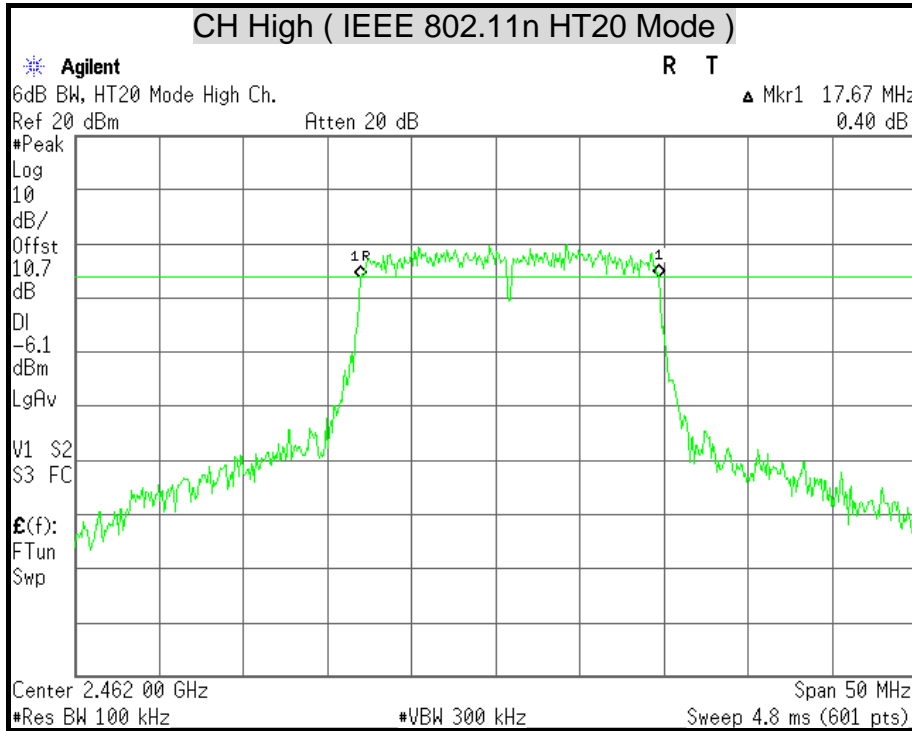


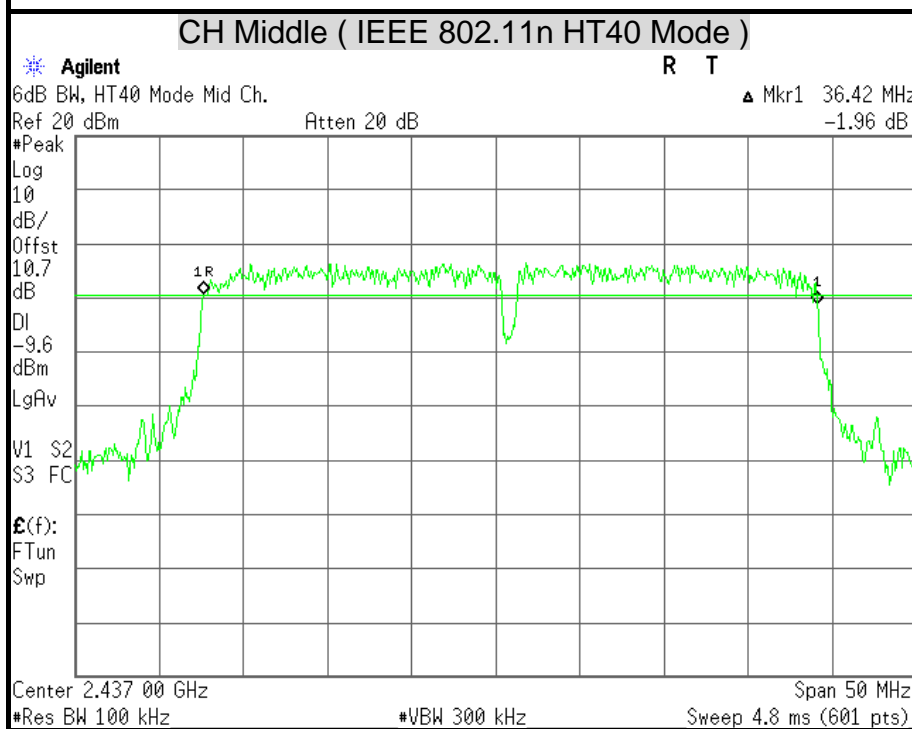
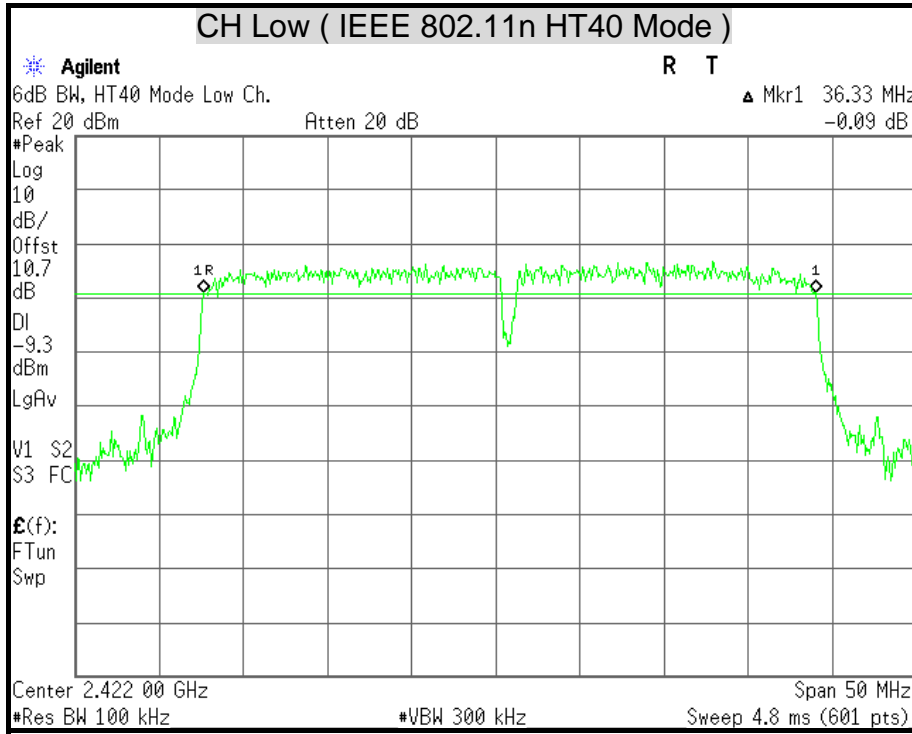


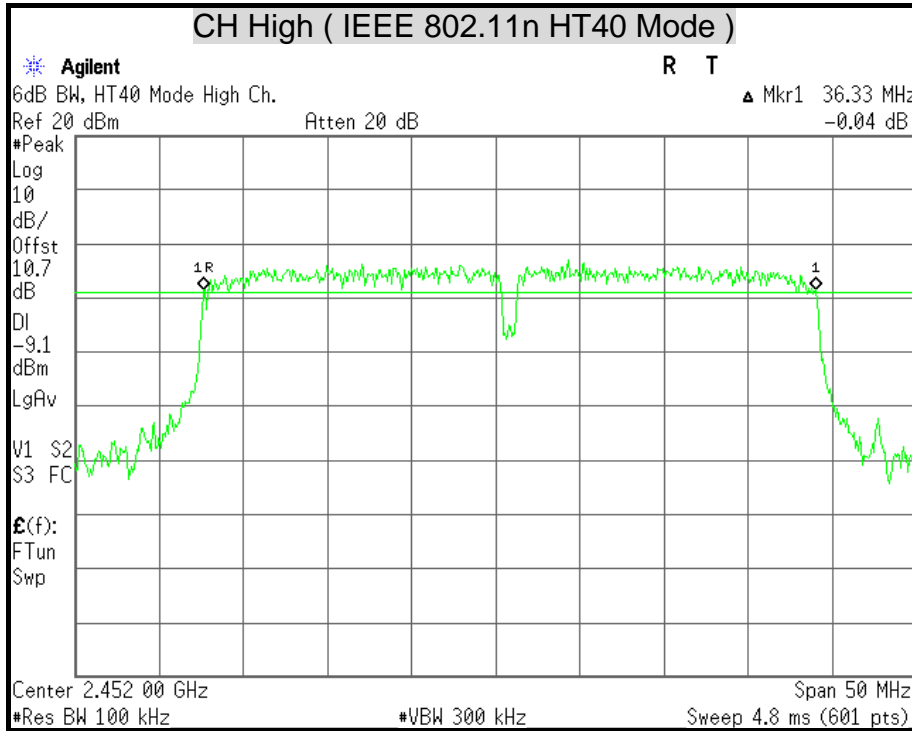














7.2 MAXIMUM PEAK OUTPUT POWER

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

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Peak Power		Peak Power Limit		Pass / Fail
		(dBm)	(W)	(dBm)	(W)	
Low	2412	16.90	0.0490	30	1	PASS
Middle	2437	17.02	0.0504	30	1	PASS
High	2462	16.67	0.0465	30	1	PASS

Remark:

1. At final test to get the worst-case emission at 1Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	Peak Power		Peak Power Limit		Pass / Fail
		(dBm)	(W)	(dBm)	(W)	
Low	2412	17.75	0.0596	30	1	PASS
Middle	2437	17.72	0.0592	30	1	PASS
High	2462	17.43	0.0553	30	1	PASS

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



IEEE 802.11n HT20 mode

Channel	Channel Frequency (MHz)	Peak Power		Peak Power Limit		Pass / Fail
		(dBm)	(W)	(dBm)	(W)	
Low	2412	18.12	0.0649	30	1	PASS
Middle	2437	17.73	0.0593	30	1	PASS
High	2462	17.59	0.0574	30	1	PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 mode

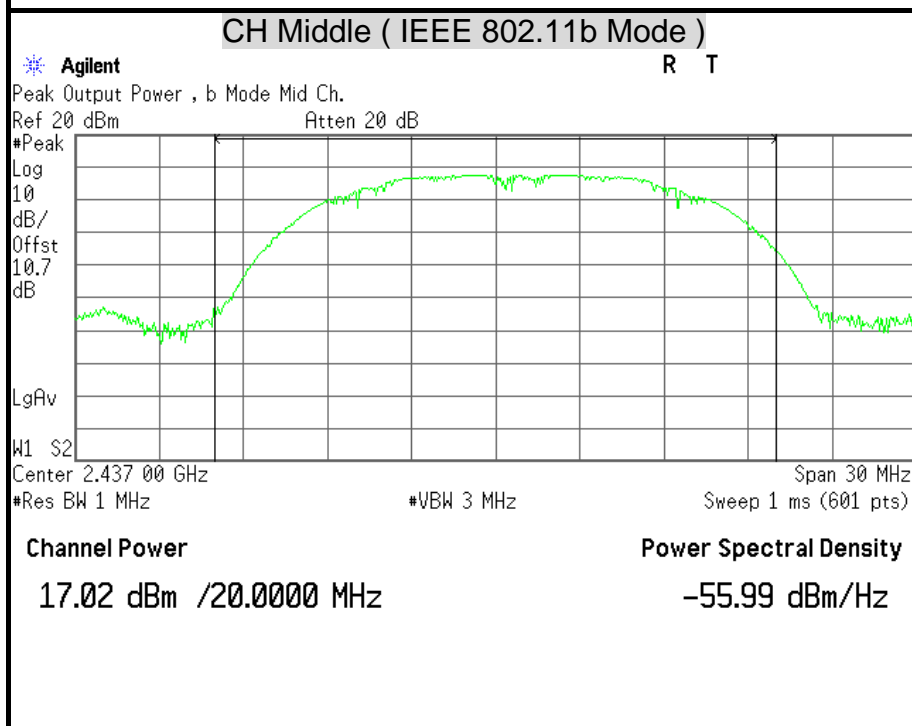
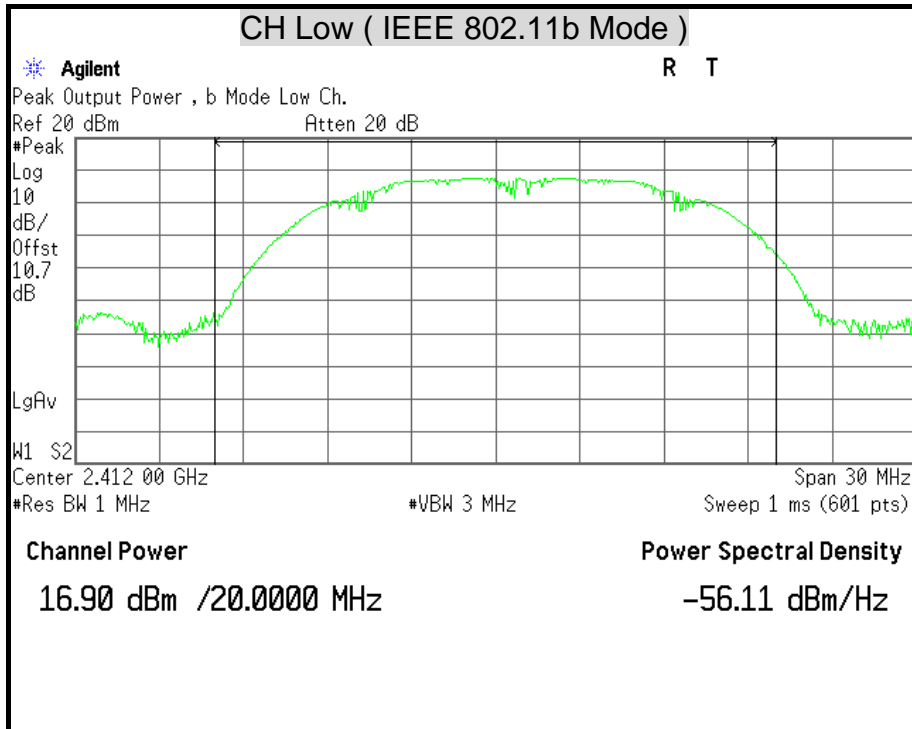
Channel	Channel Frequency (MHz)	Peak Power		Peak Power Limit		Pass / Fail
		(dBm)	(W)	(dBm)	(W)	
Low	2422	17.78	0.0600	30	1	PASS
Middle	2437	17.79	0.0601	30	1	PASS
High	2452	17.96	0.0625	30	1	PASS

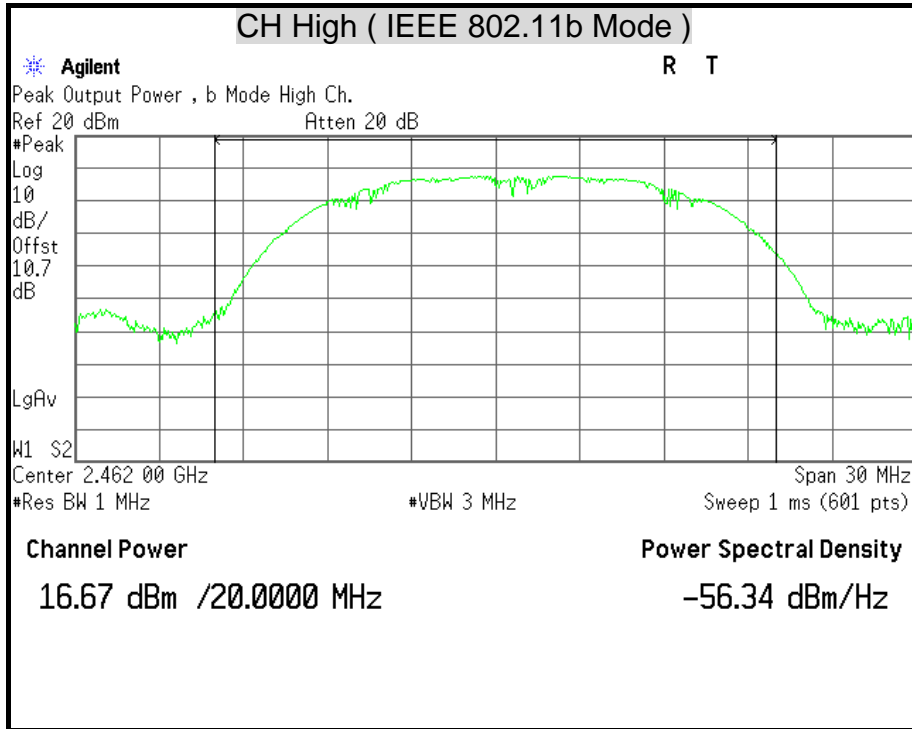
Remark:

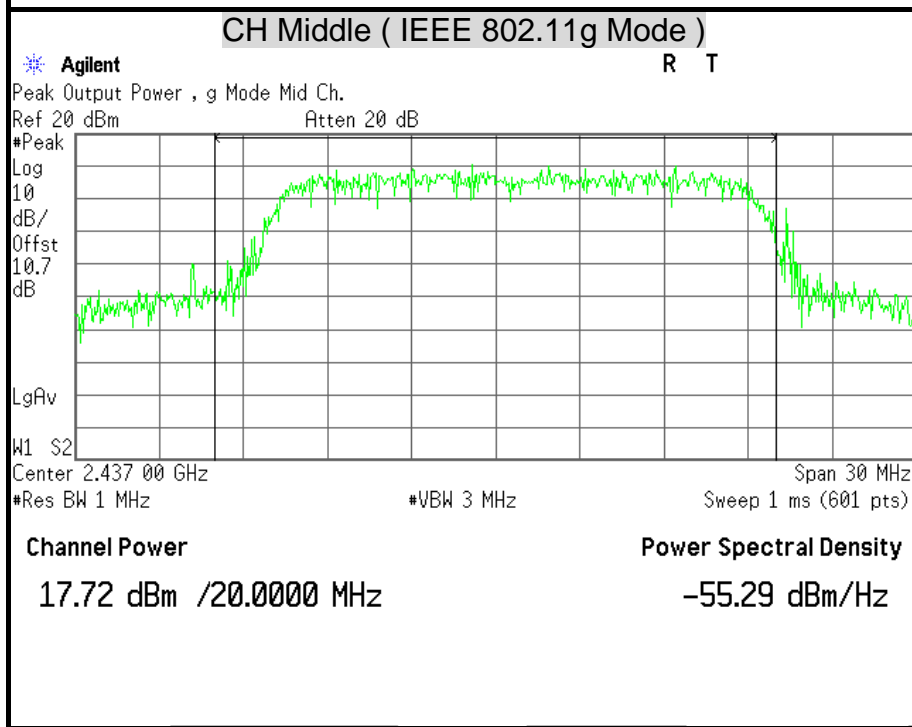
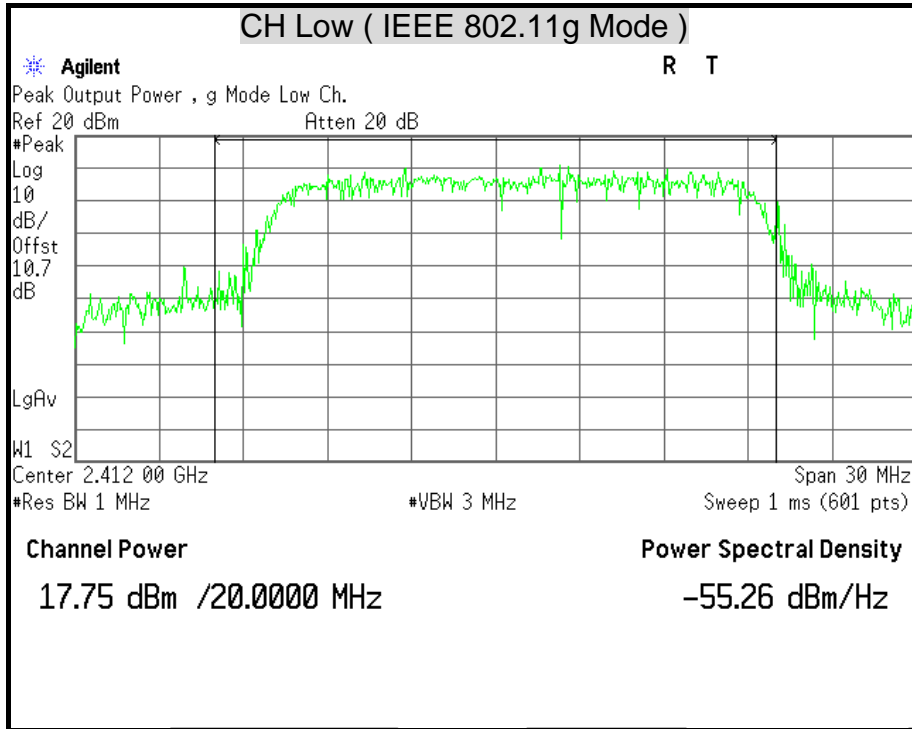
1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

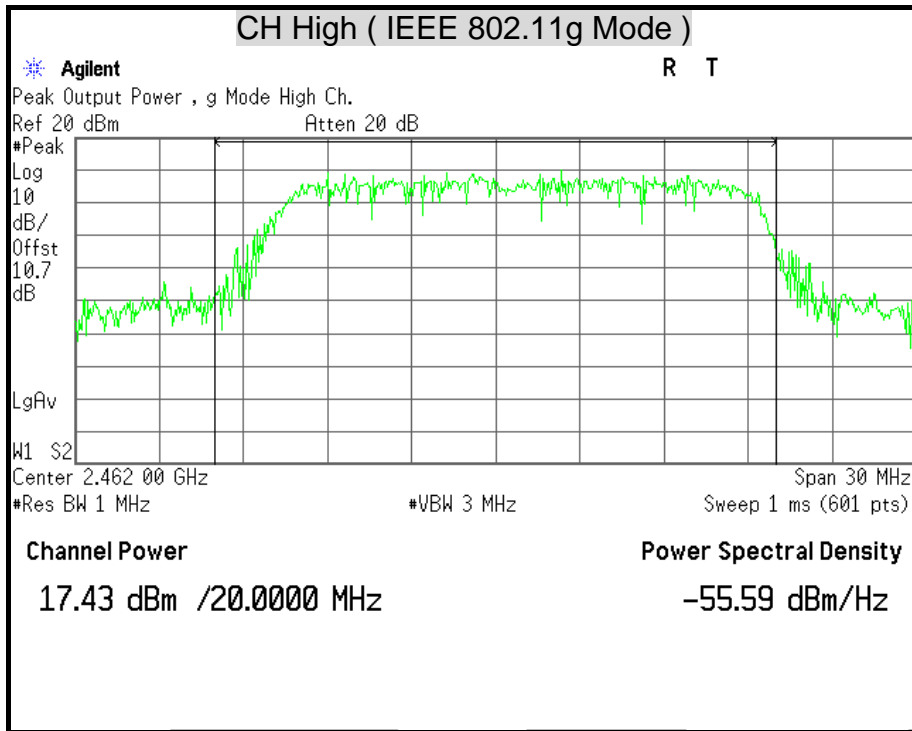


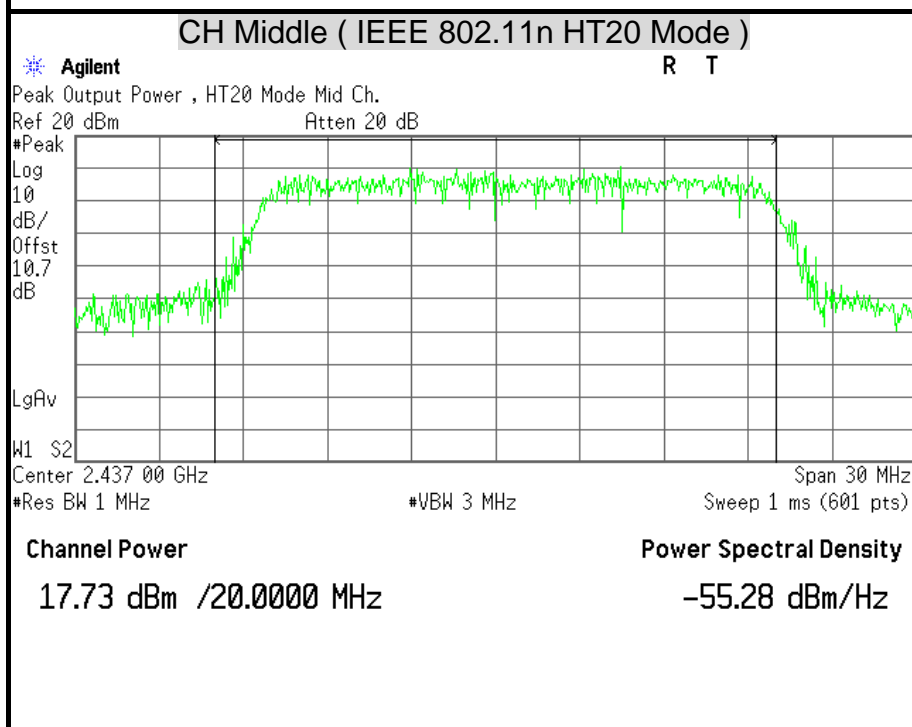
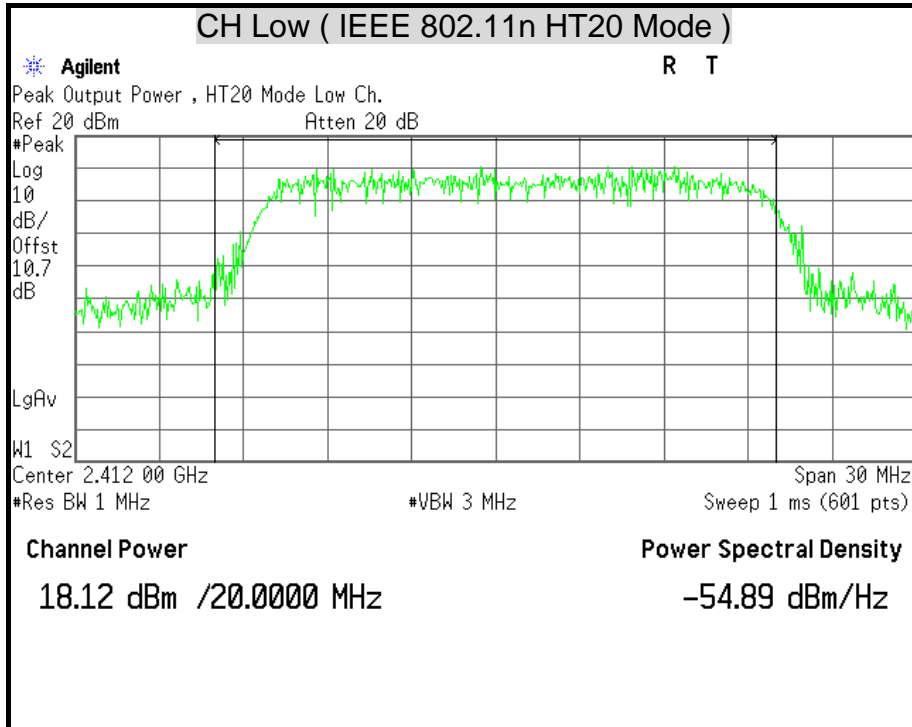
MAXIMUM PEAK OUTPUT POWER

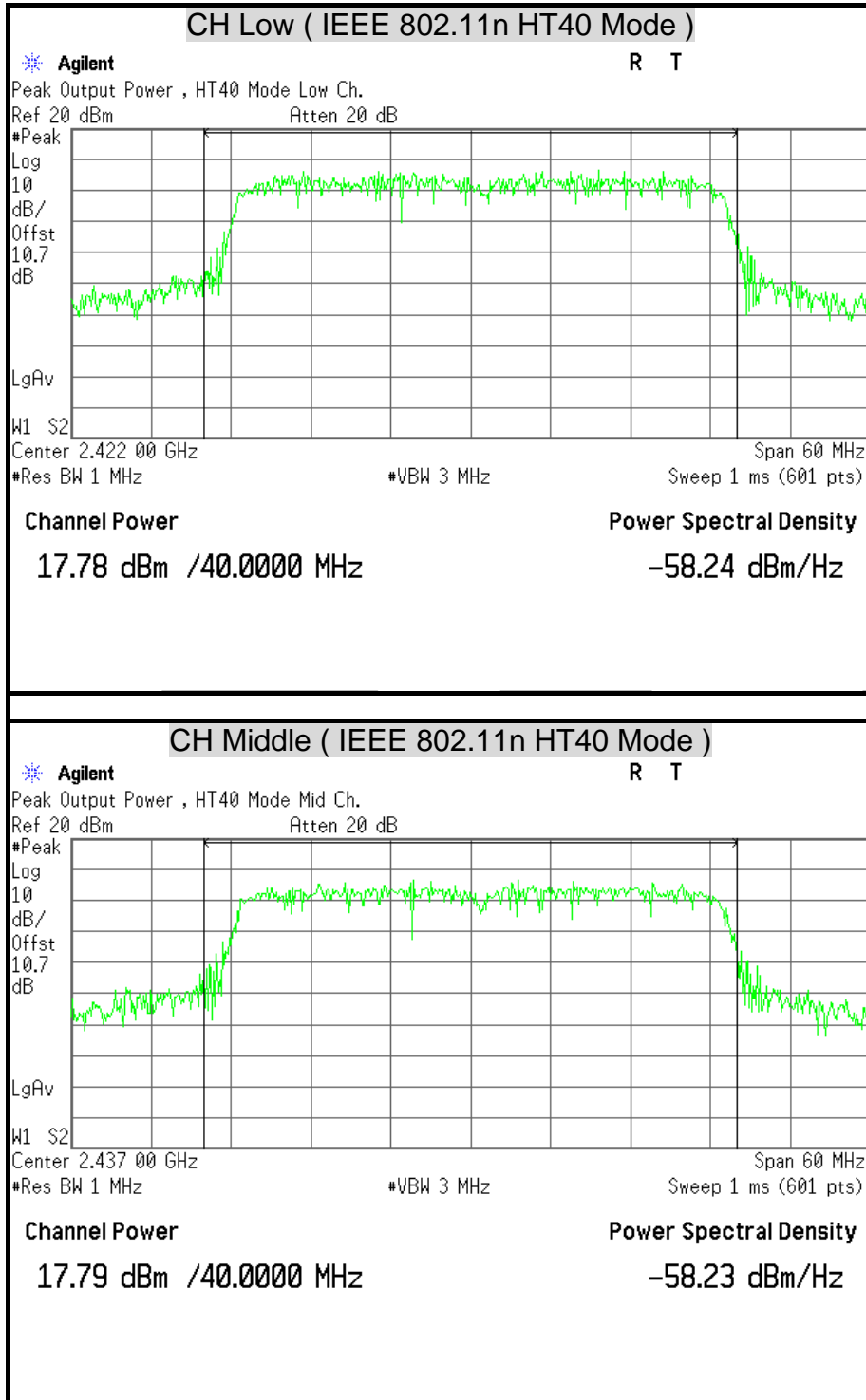














7.3 AVERAGE POWER

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

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Average Power Output (dBm)
Low	2412	14.29
Middle	2437	14.38
High	2462	14.17

Remark:

1. At final test to get the worst-case emission at 1Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	Average Power Output (dBm)
Low	2412	14.49
Middle	2437	14.37
High	2462	14.36

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



IEEE 802.11n HT20 mode

Channel	Channel Frequency (MHz)	Average Power Output (dBm)
Low	2412	14.08
Middle	2437	14.43
High	2462	14.06

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 mode

Channel	Channel Frequency (MHz)	Average Power Output (dBm)
Low	2422	14.52
Middle	2437	14.35
High	2452	14.56

Remark:

1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



7.4 POWER SPECTRAL DENSITY

LIMITS

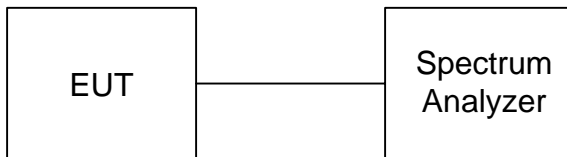
§ 15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

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

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2412	-15.47	8	PASS
Middle	2437	-15.43	8	PASS
High	2462	-15.65	8	PASS

Remark:

1. At final test to get the worst-case emission at 1Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2412	-14.50	8	PASS
Middle	2437	-14.55	8	PASS
High	2462	-15.10	8	PASS

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



IEEE 802.11n HT20 mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2412	-13.66	8	PASS
Middle	2437	-13.16	8	PASS
High	2462	-13.61	8	PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 mode

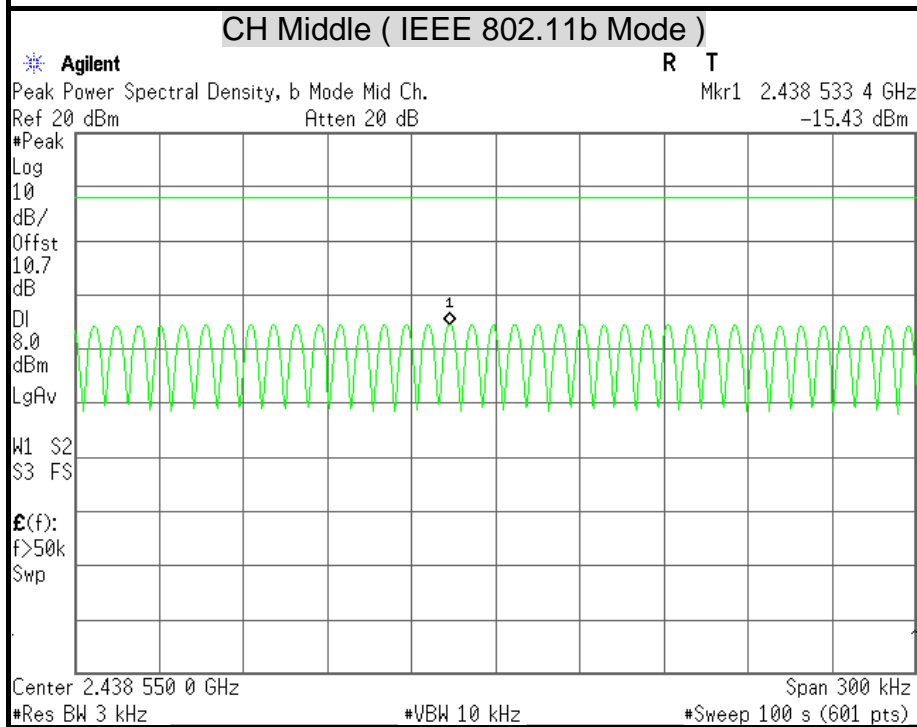
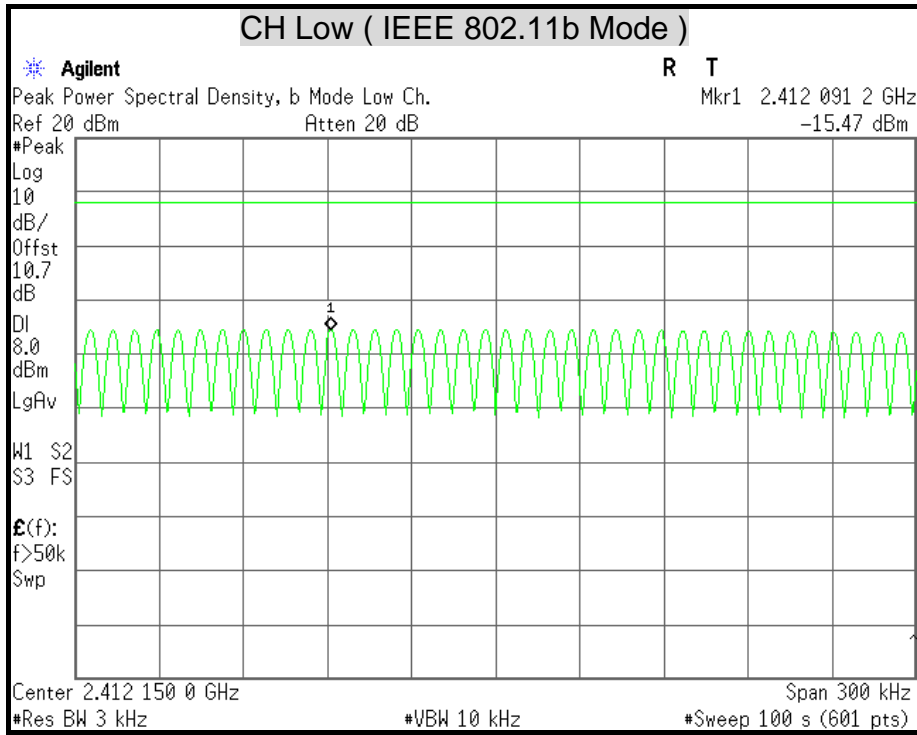
Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Minimum Limit (dBm)	Pass / Fail
Low	2422	-14.66	8	PASS
Middle	2437	-14.74	8	PASS
High	2452	-15.18	8	PASS

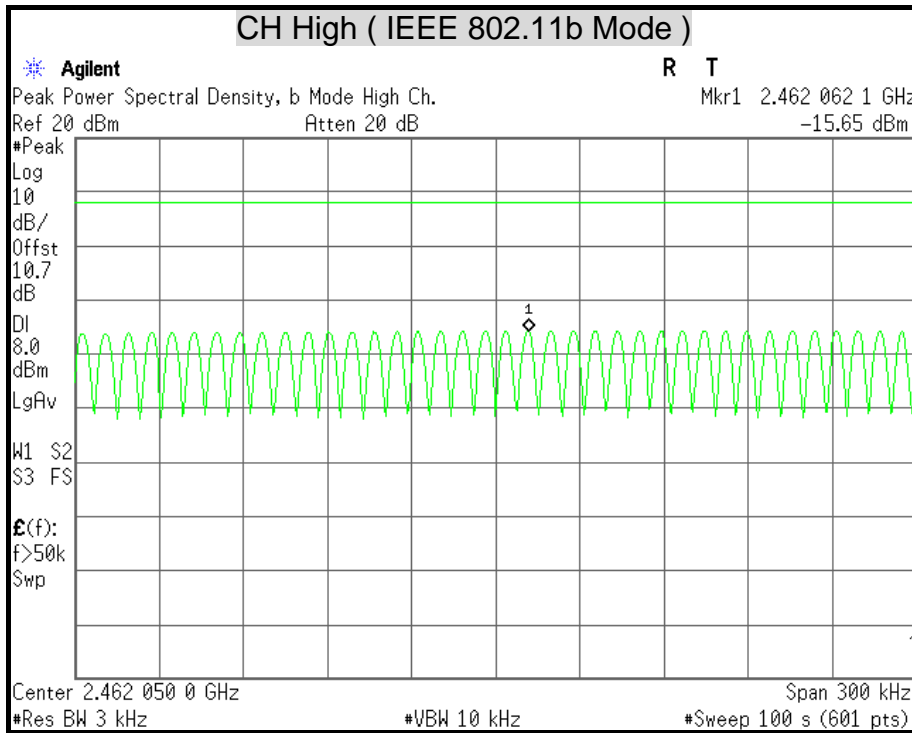
Remark:

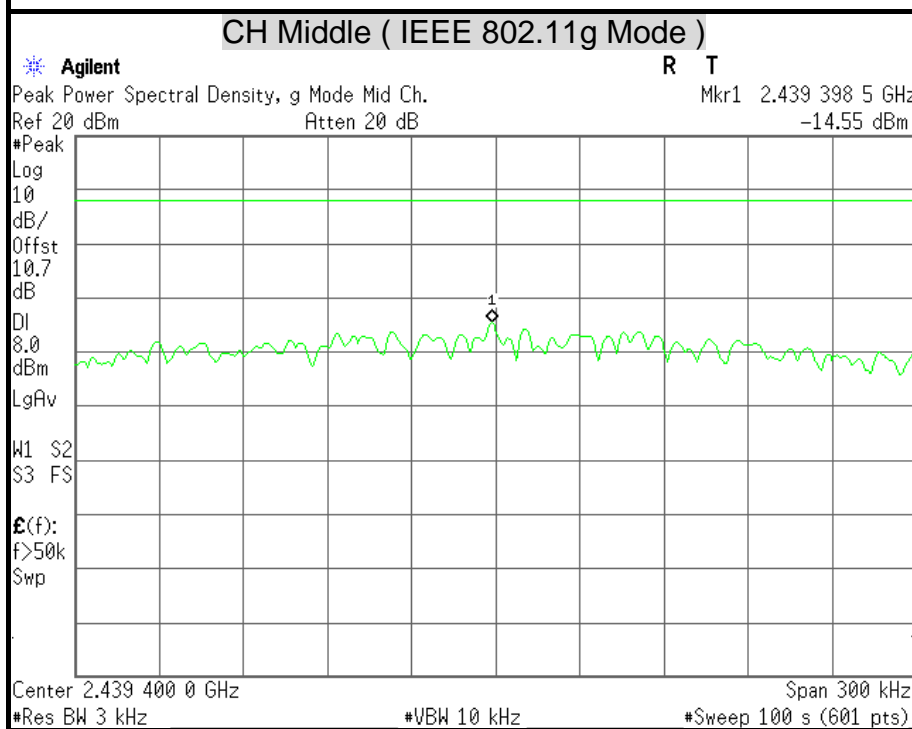
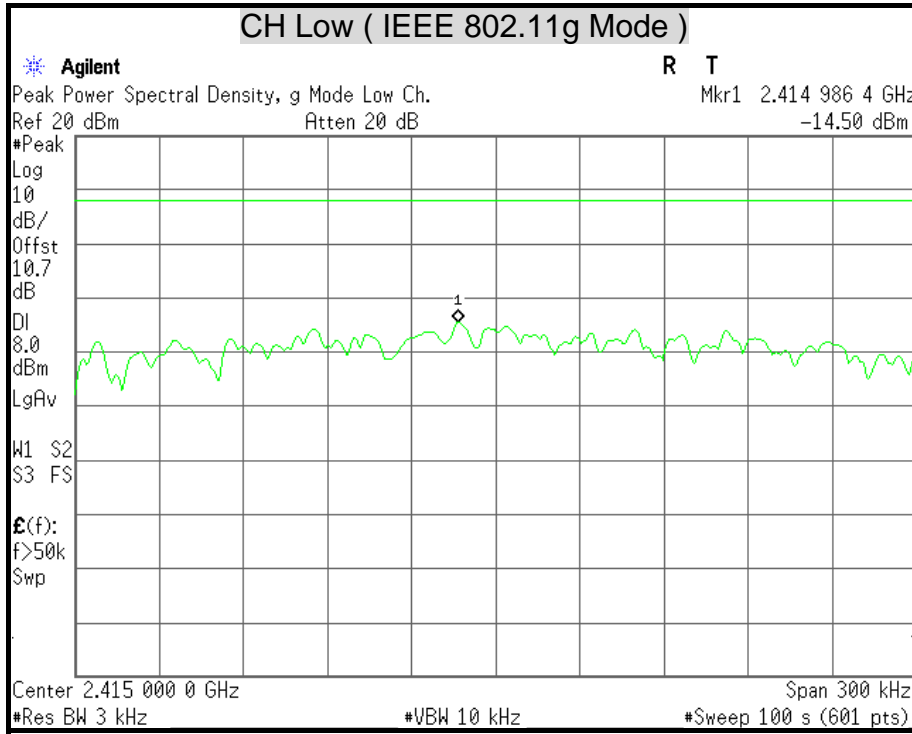
1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 10.7dB (including 10 dB pad and 0.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

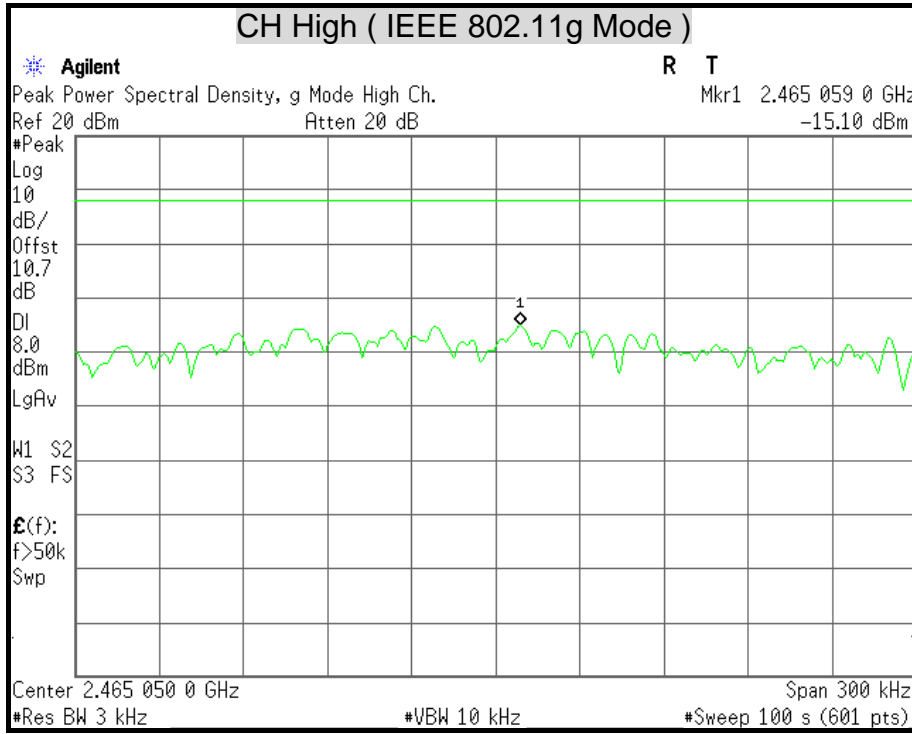


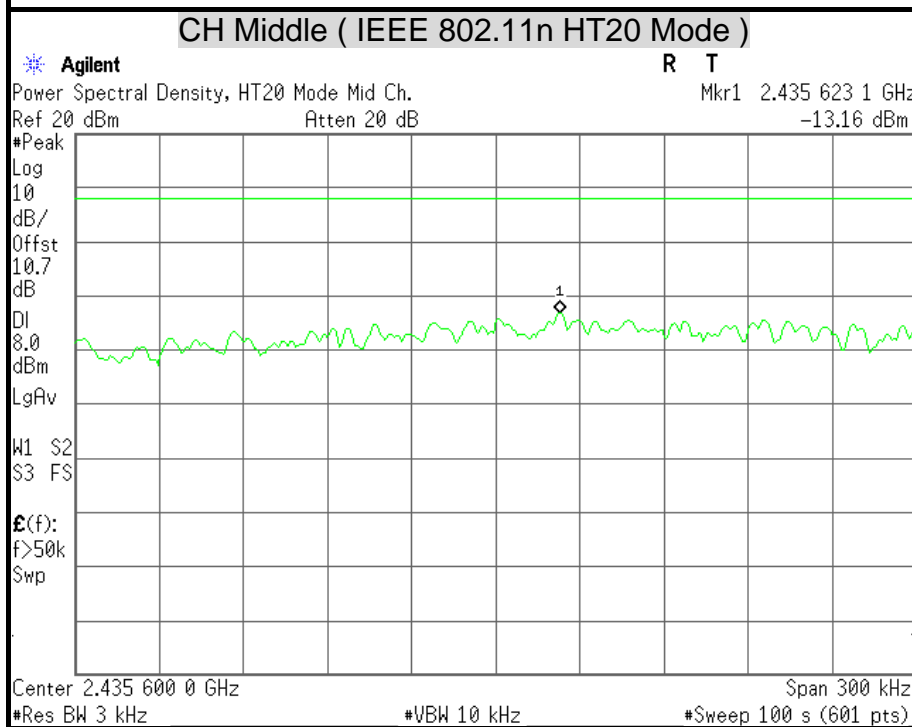
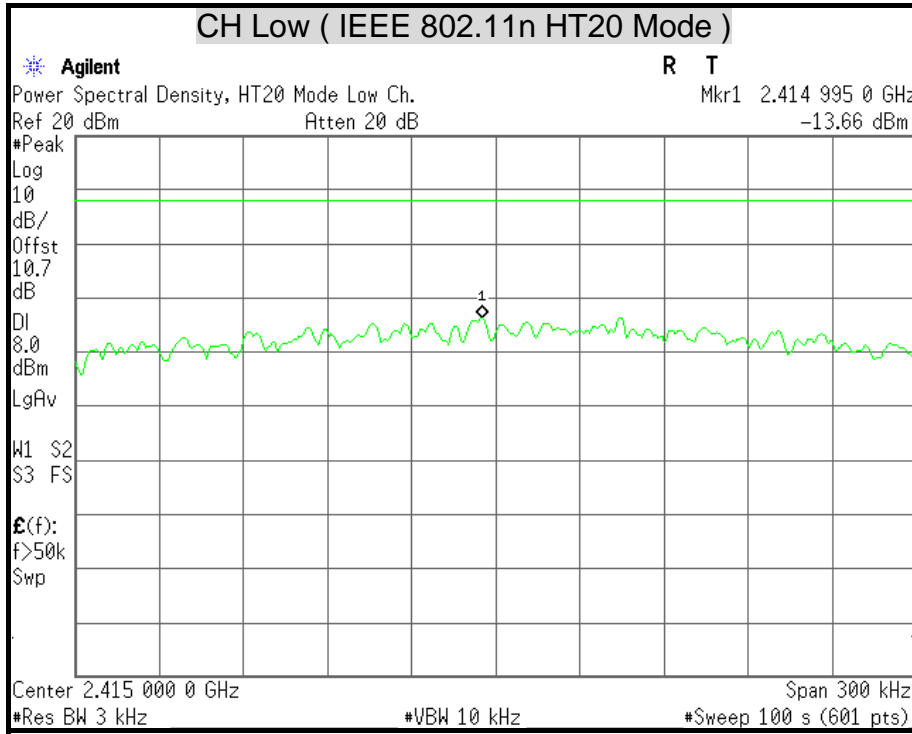
POWER SPECTRAL DENSITY

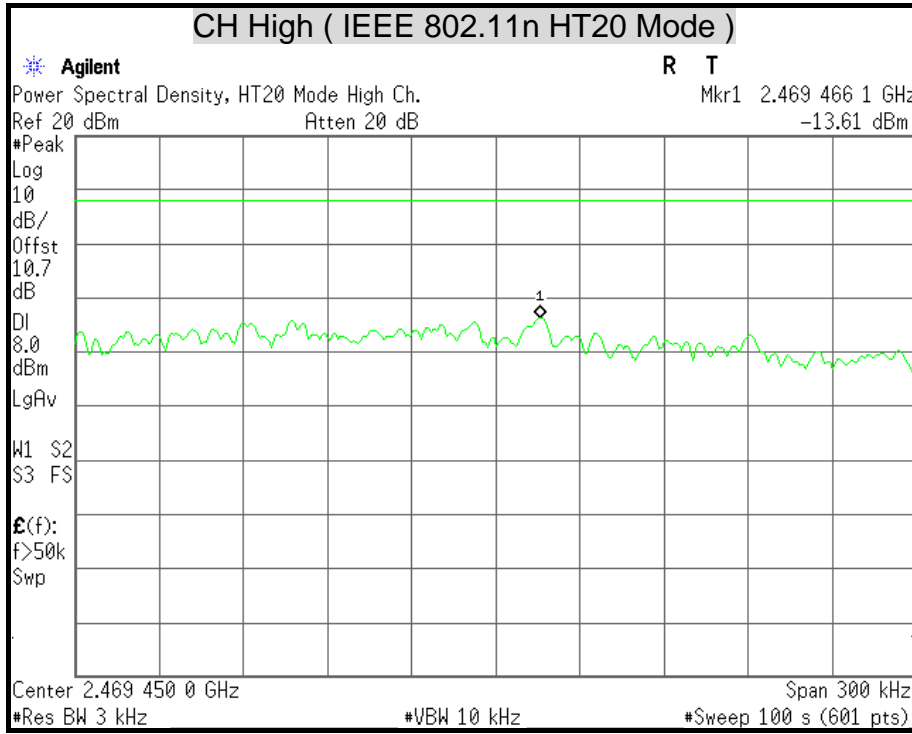


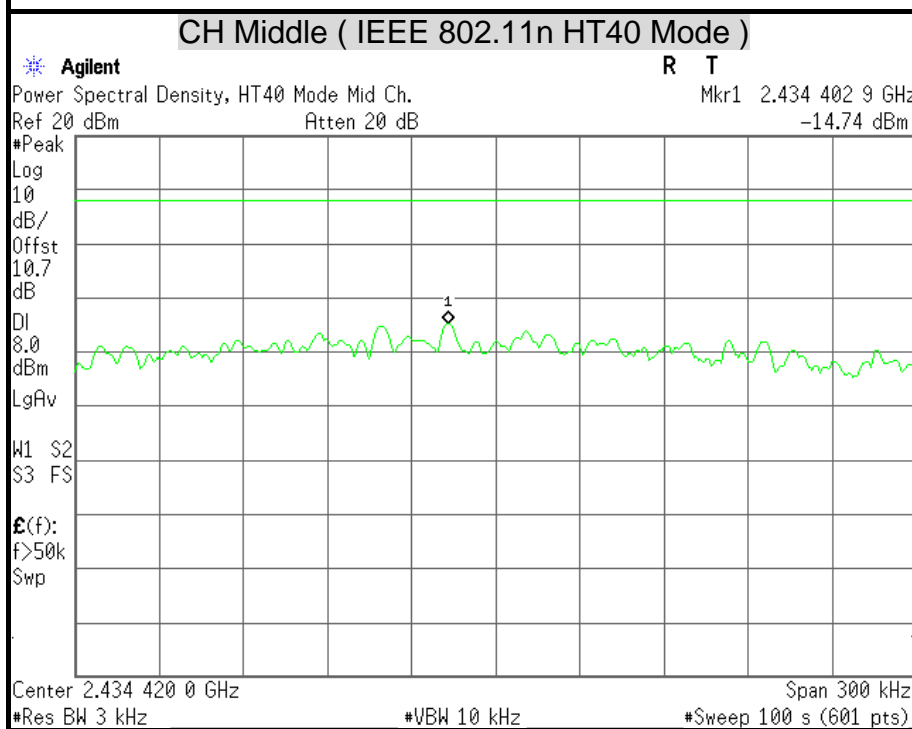
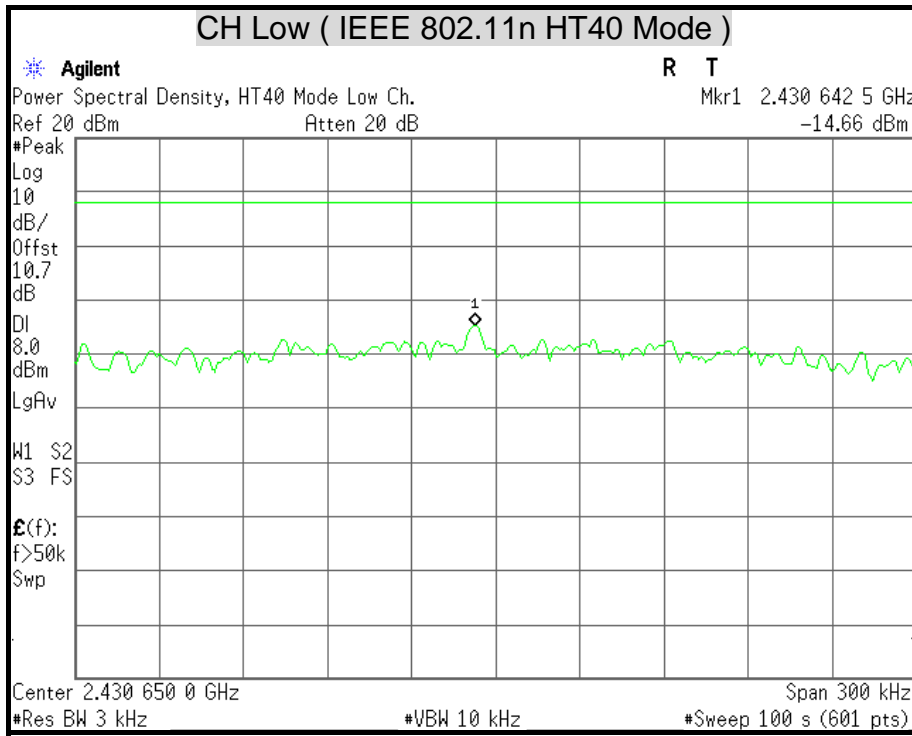


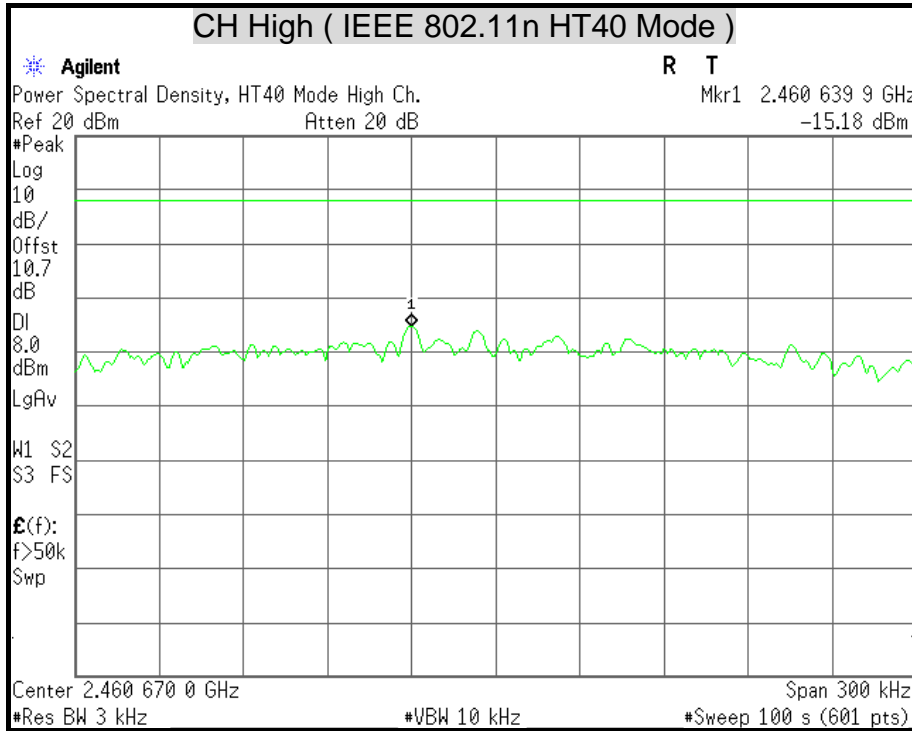














7.5 CONDUCTED SPURIOUS EMISSION

LIMITS

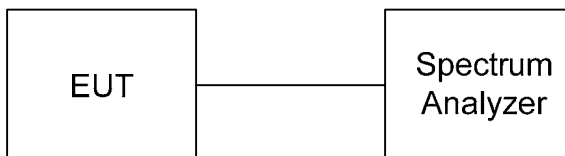
§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest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

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	AGILENT	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

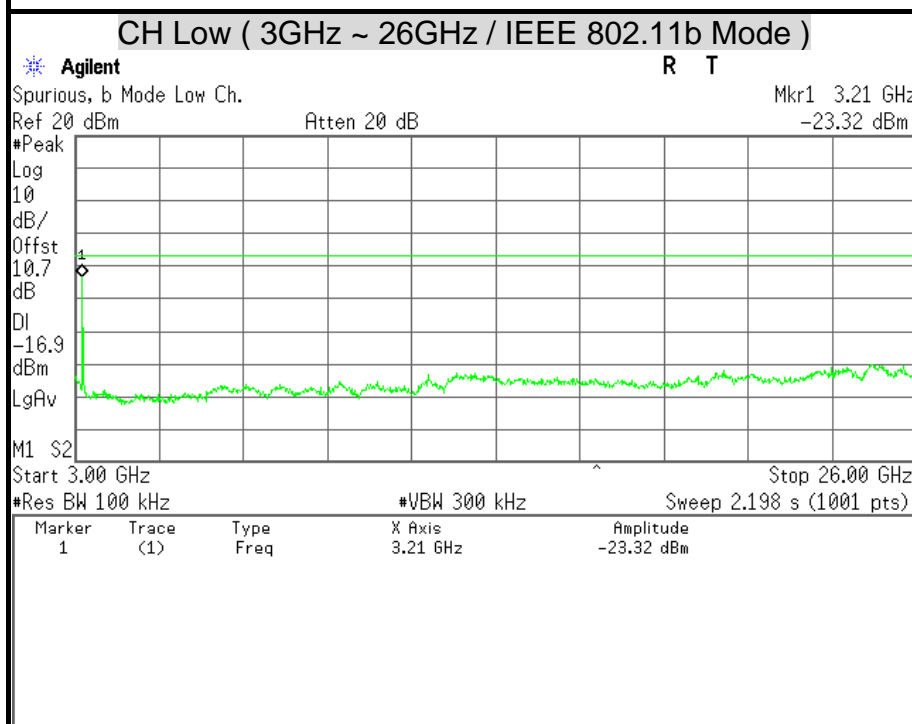
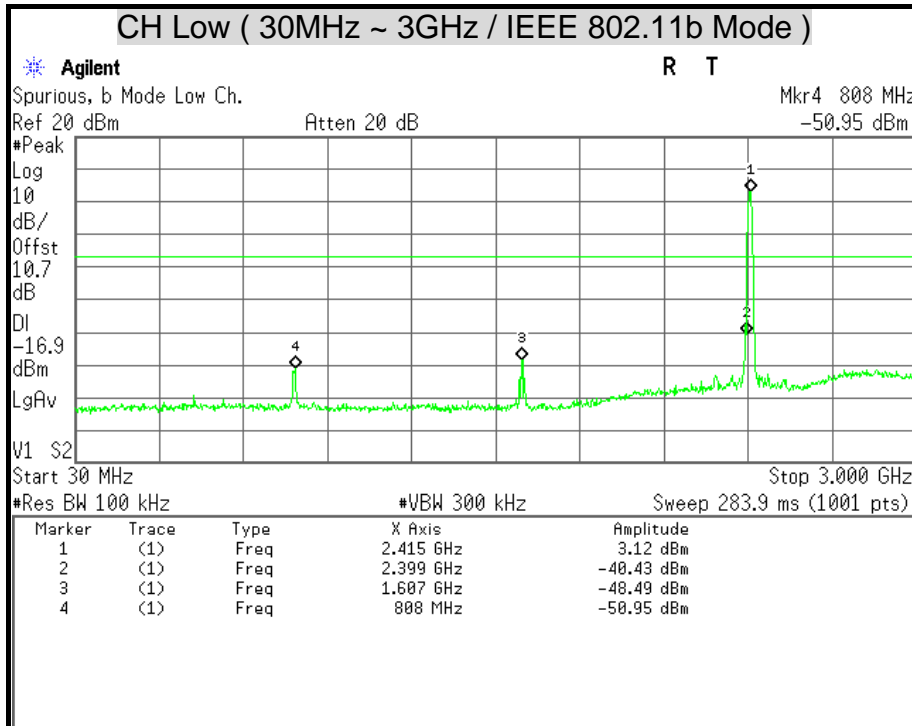
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

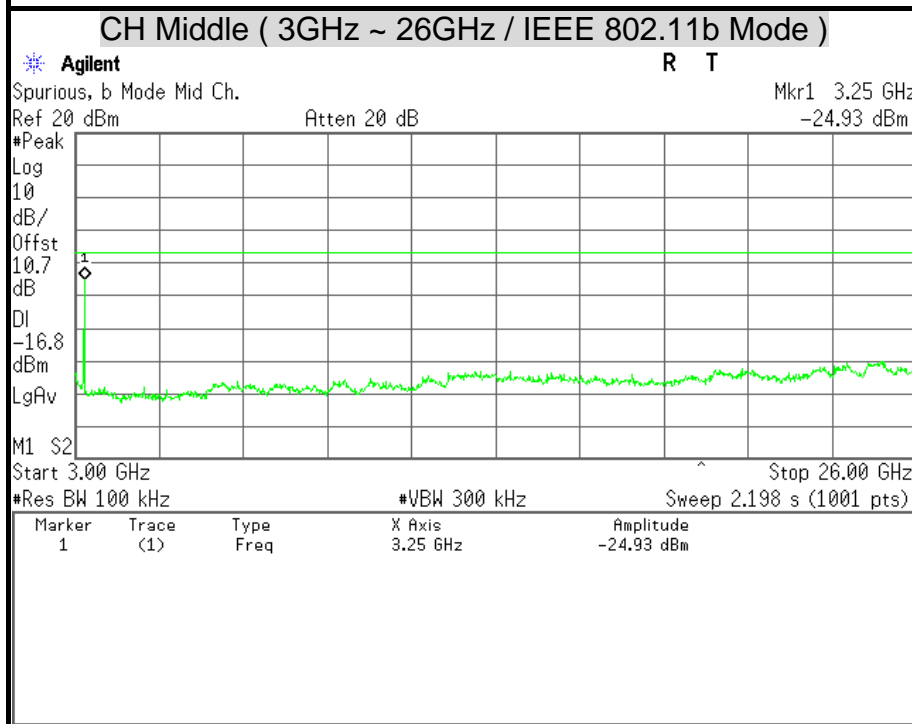
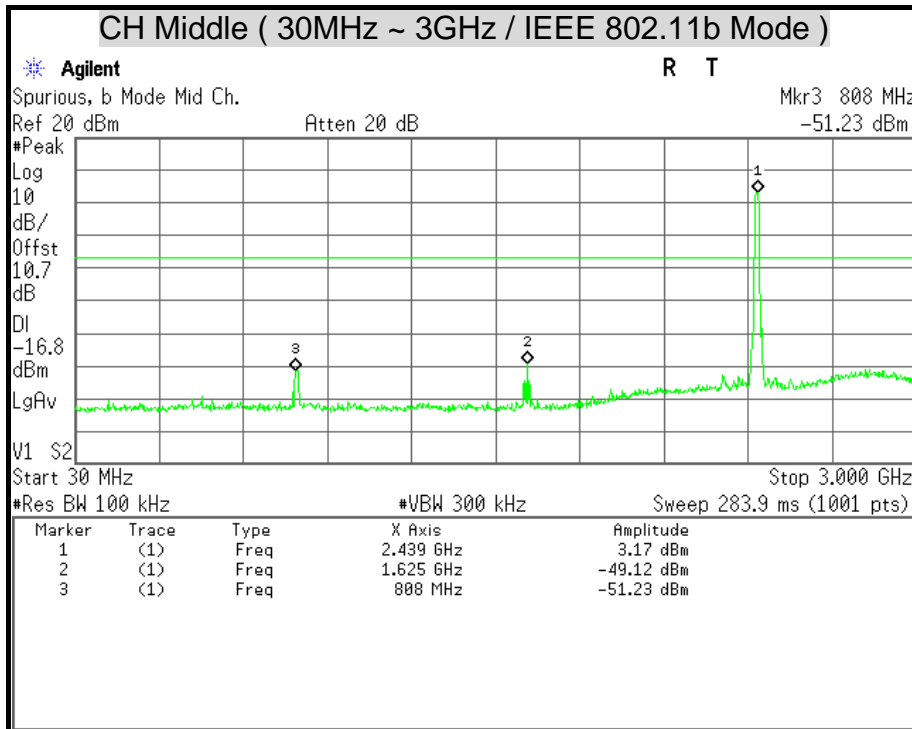
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

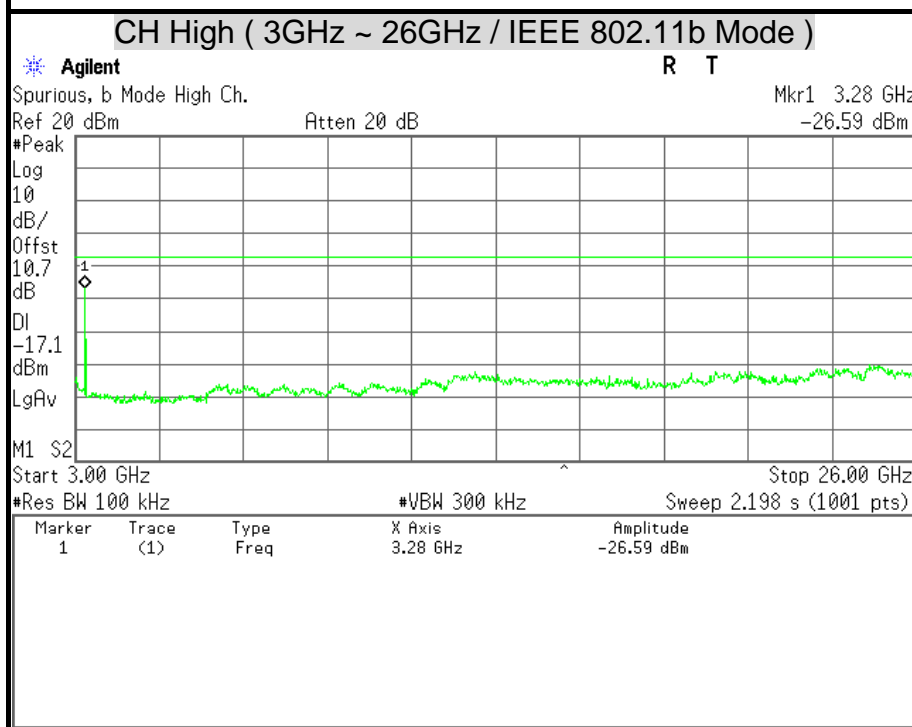
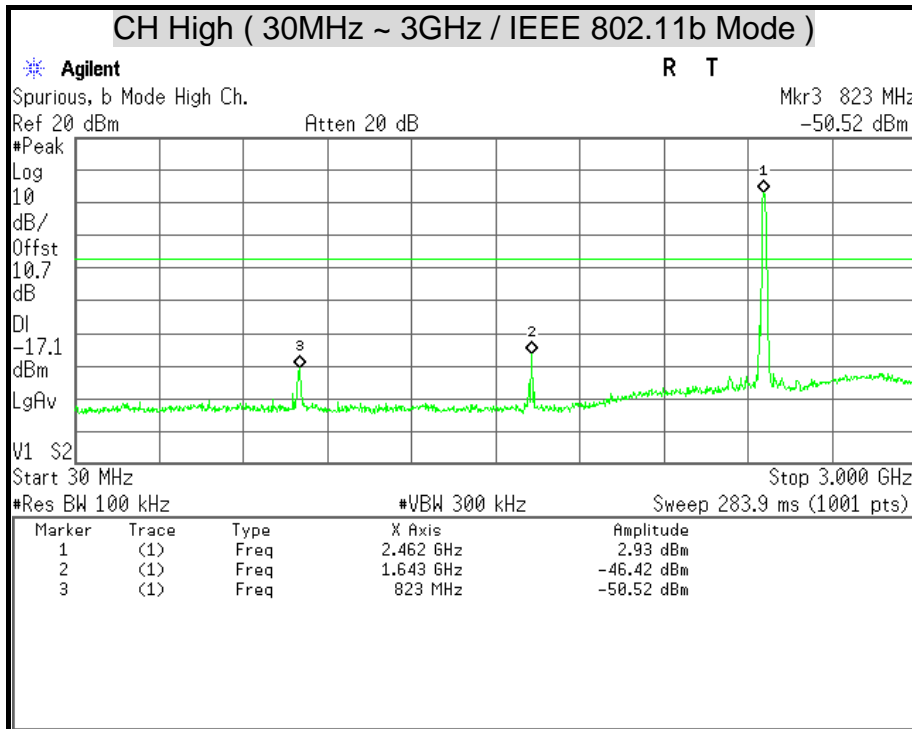


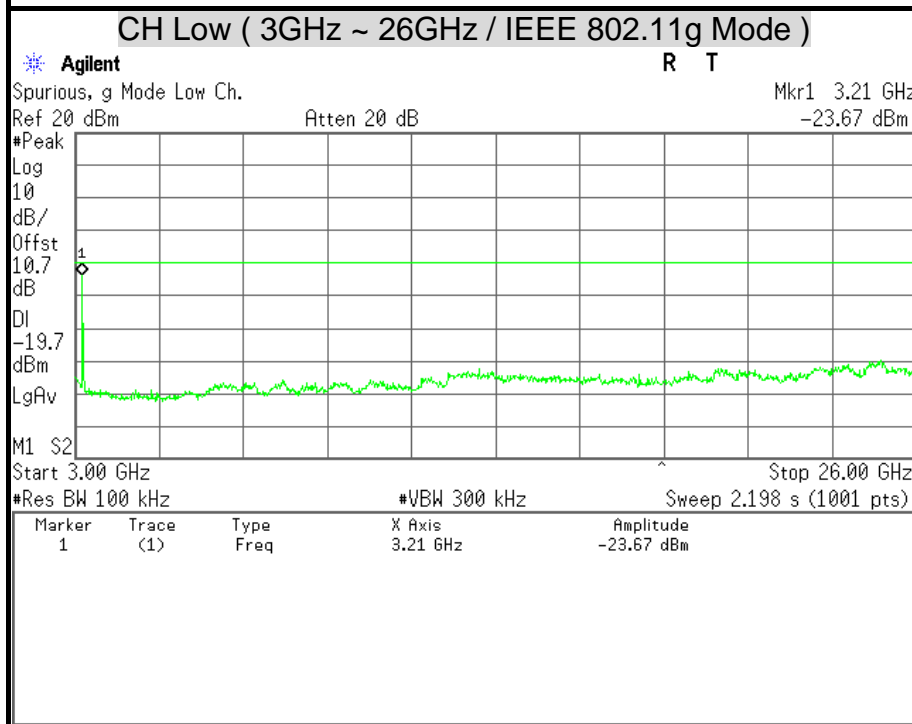
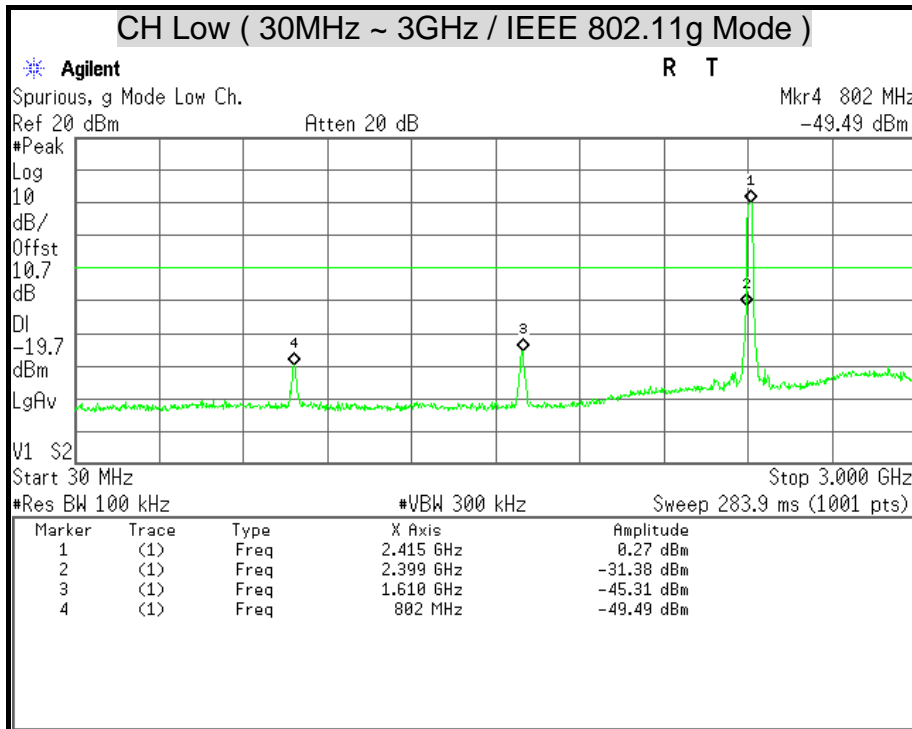
TEST RESULTS

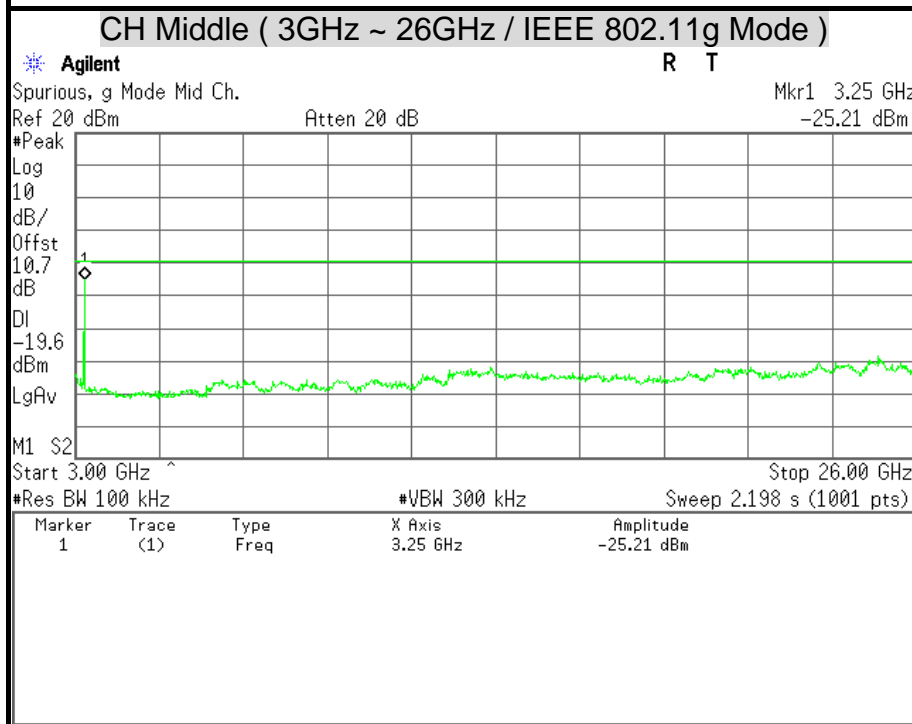
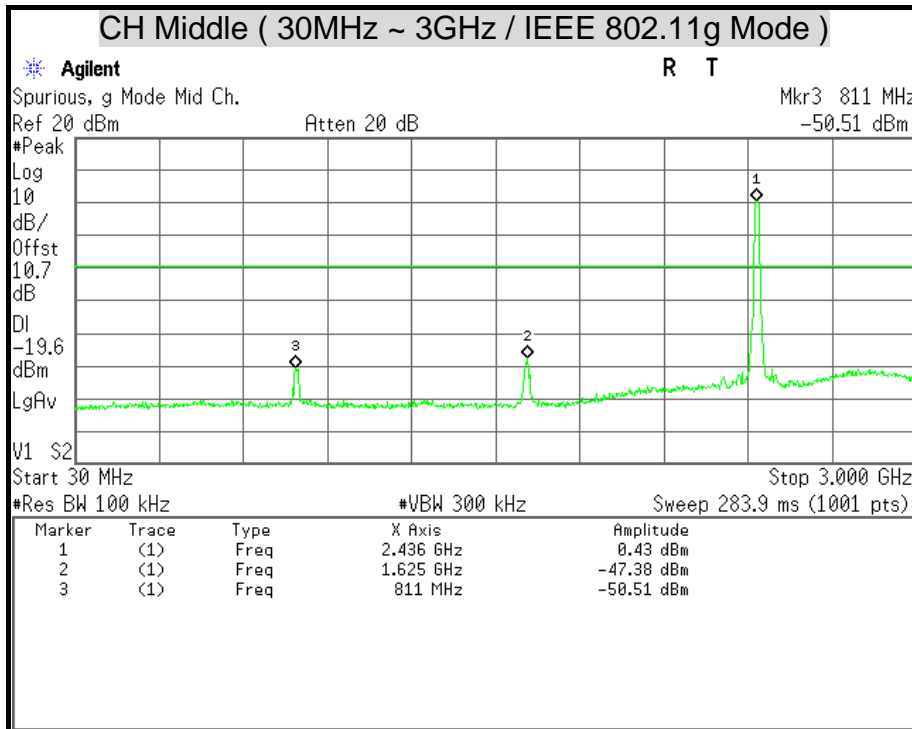
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

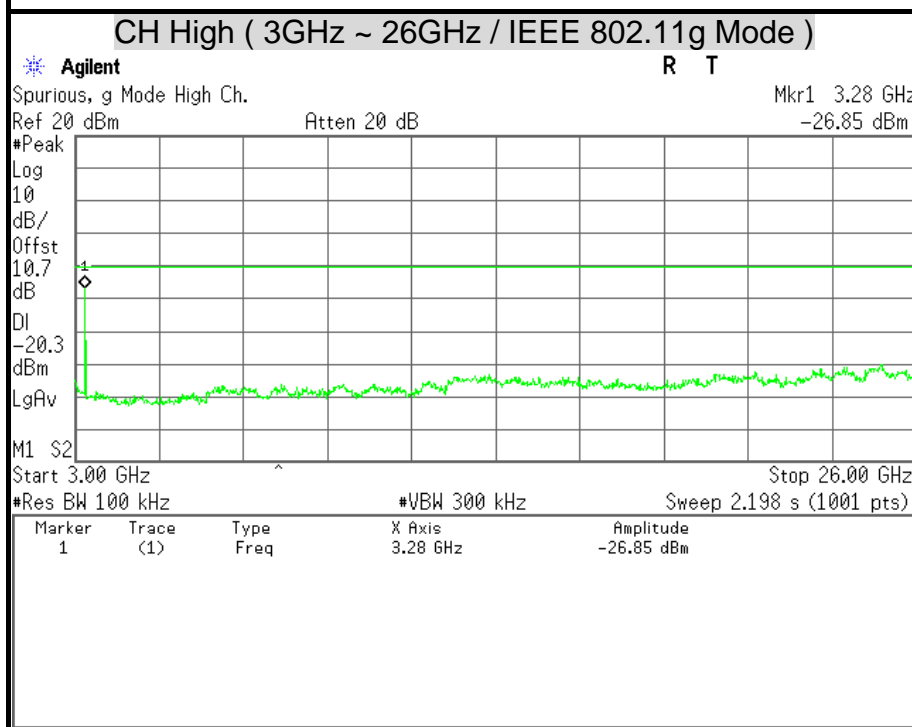
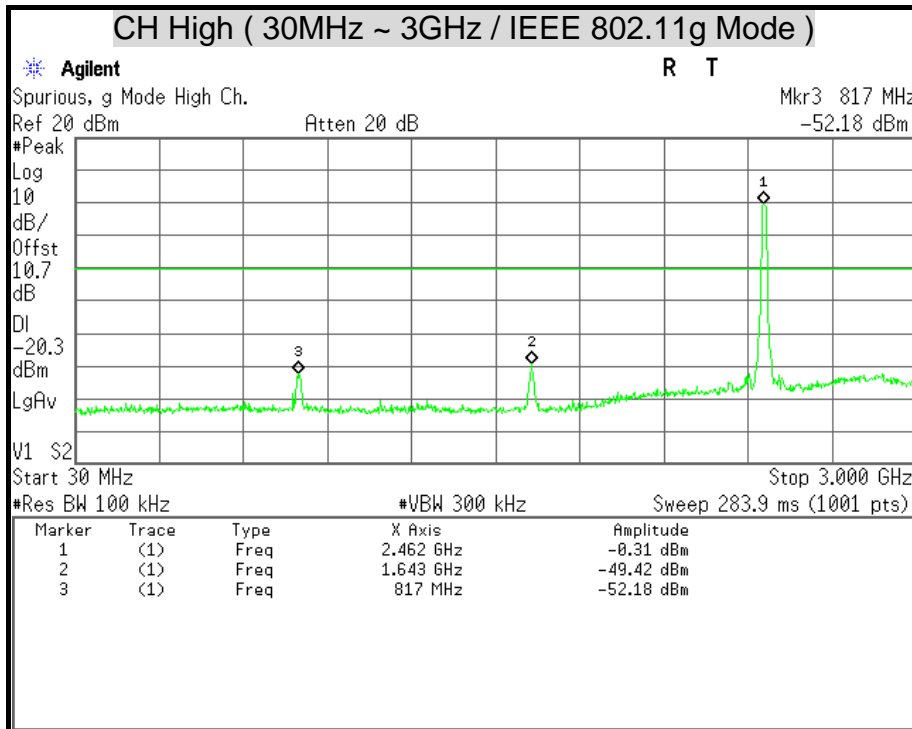


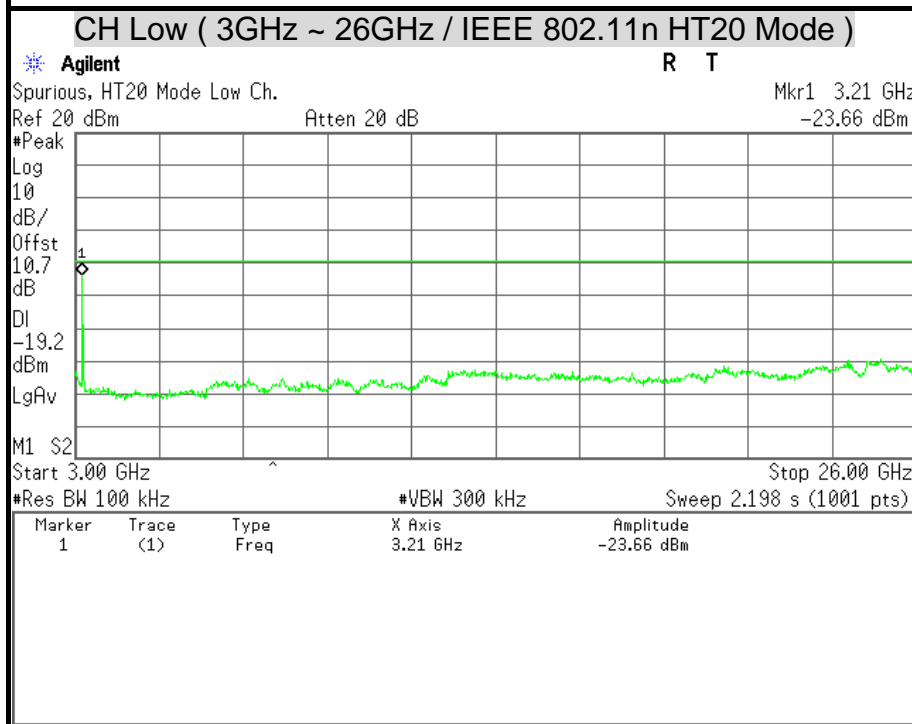
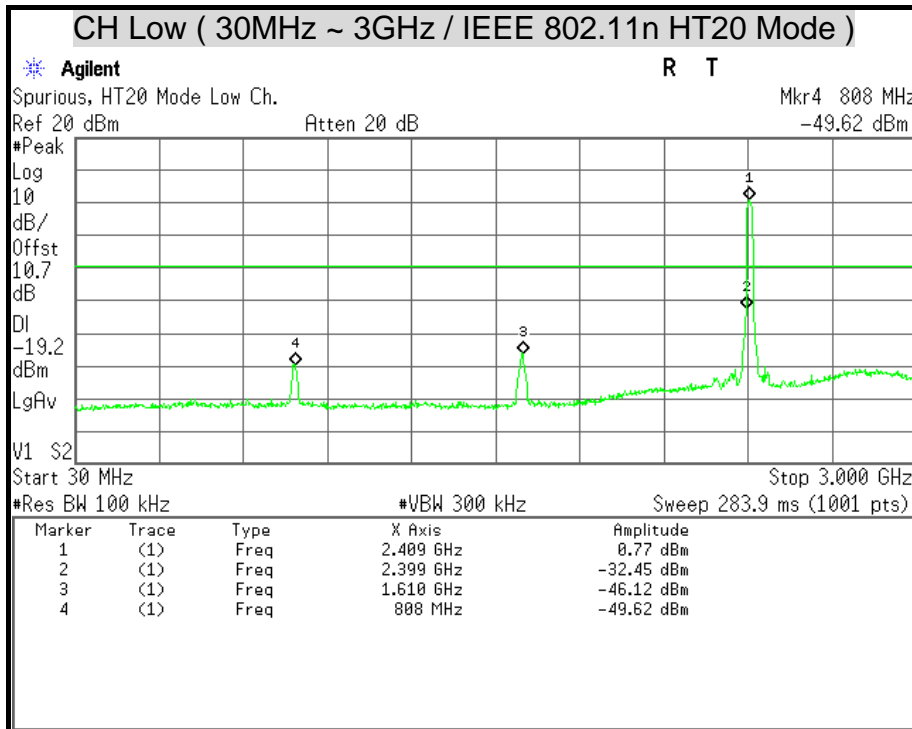


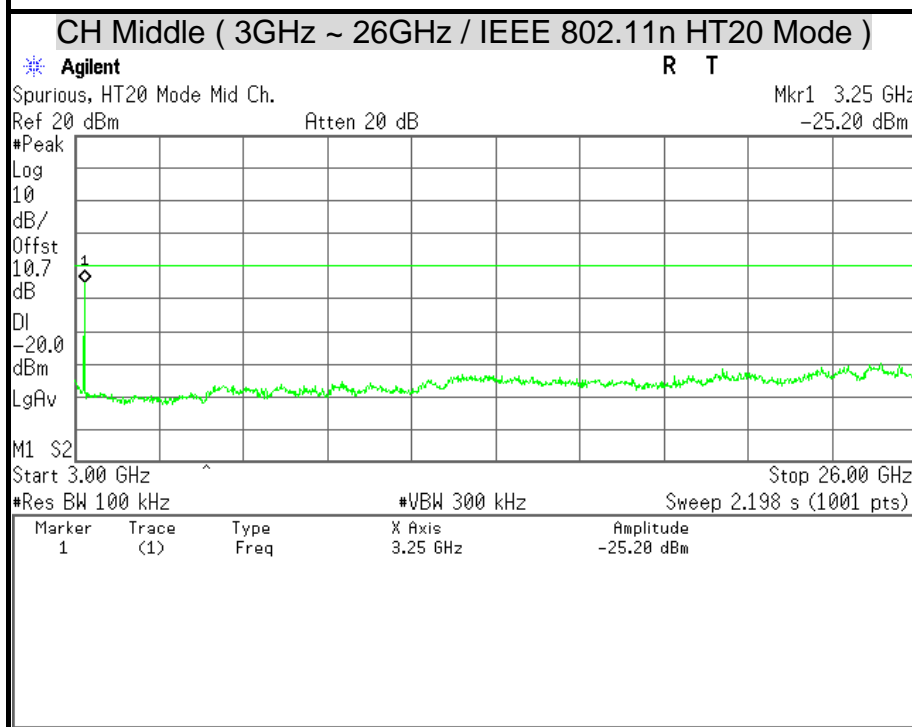
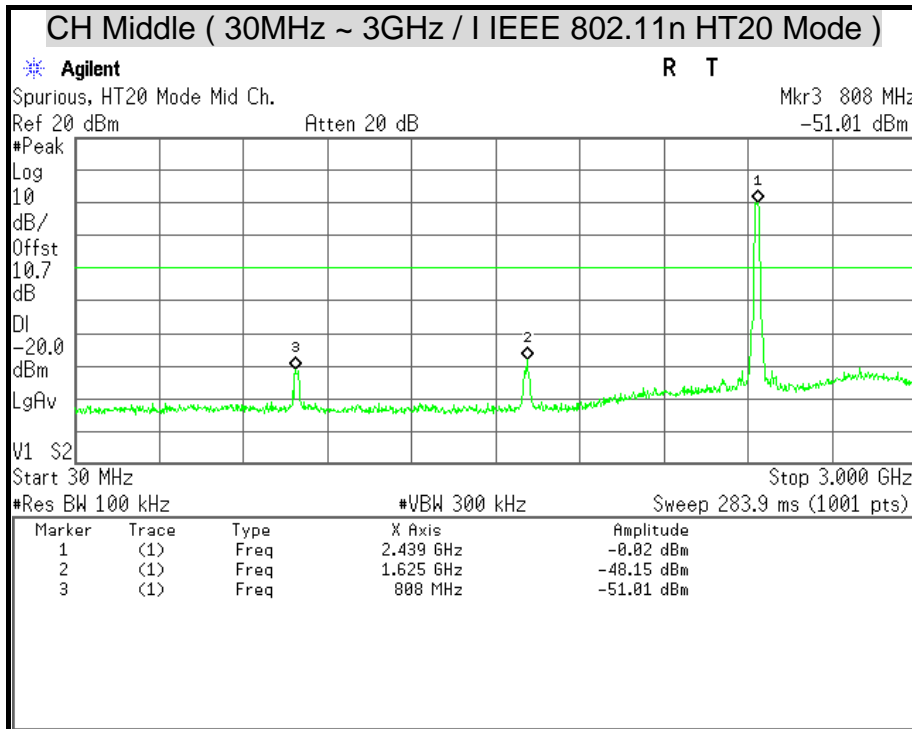


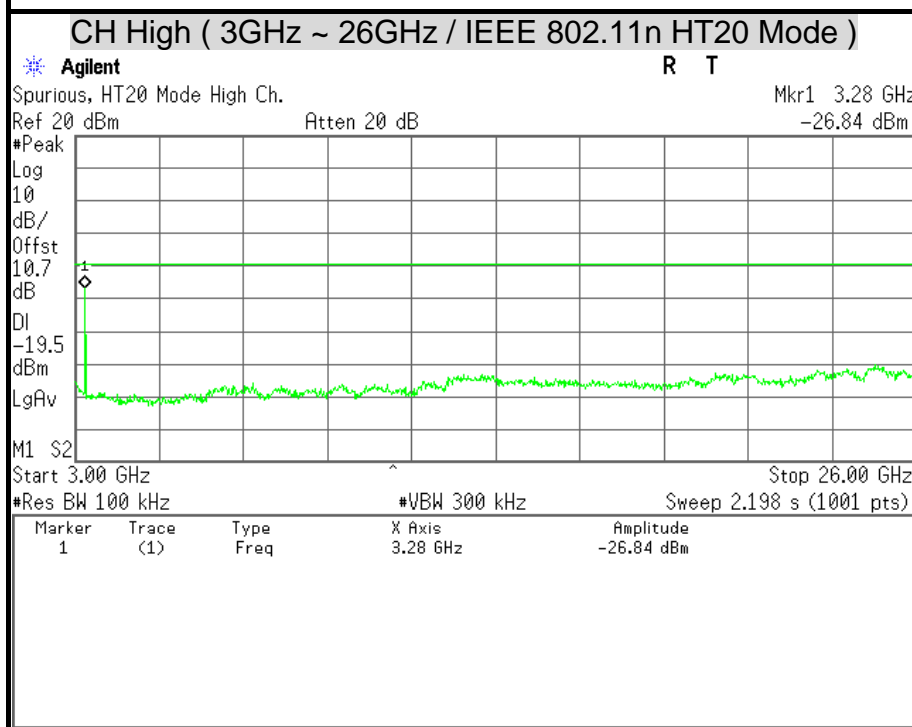
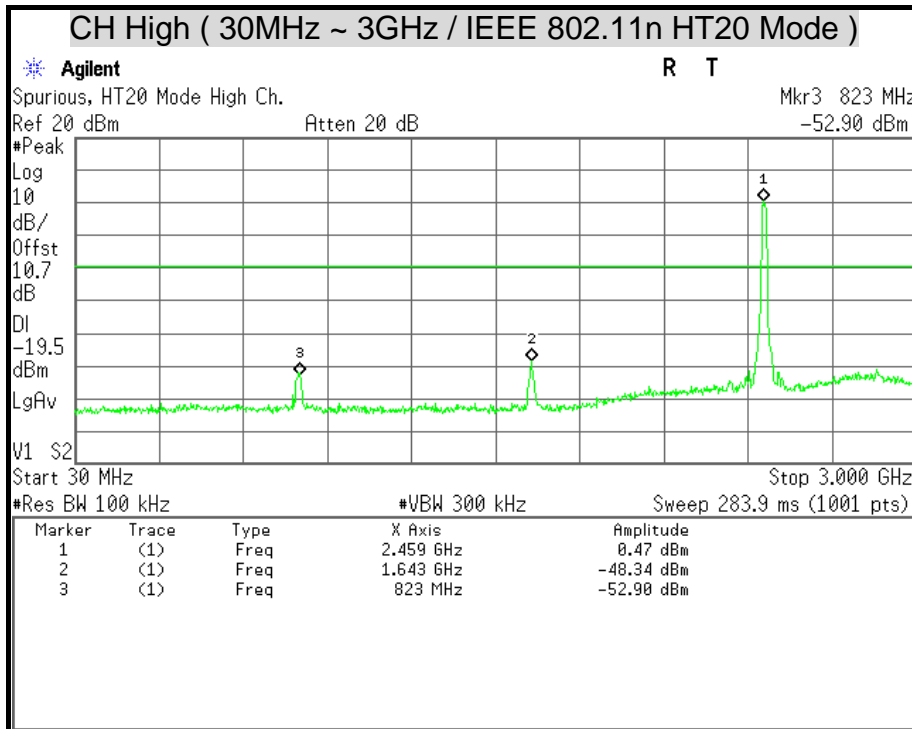


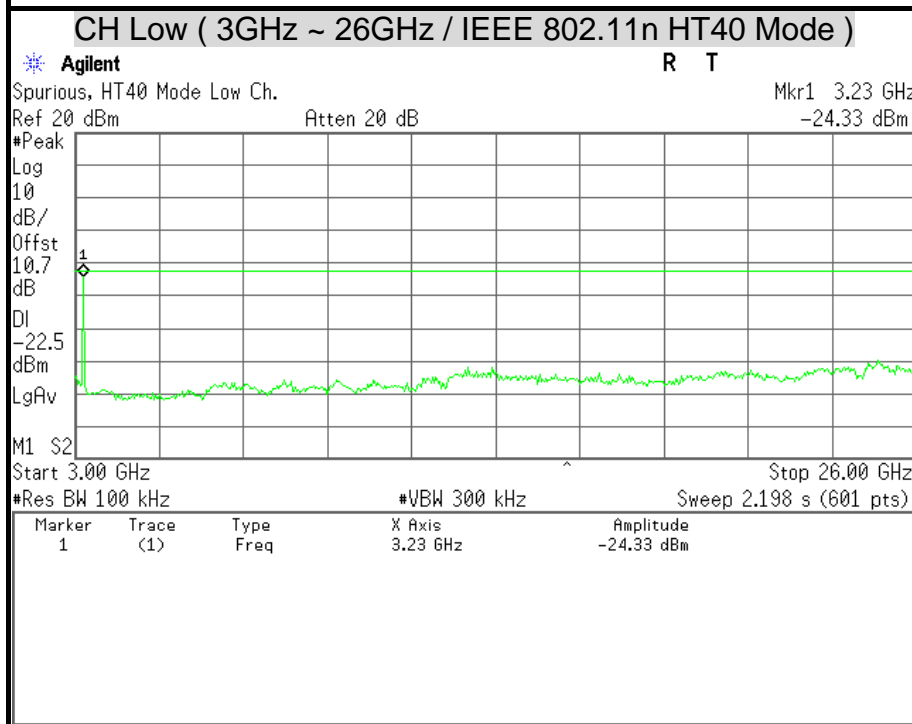
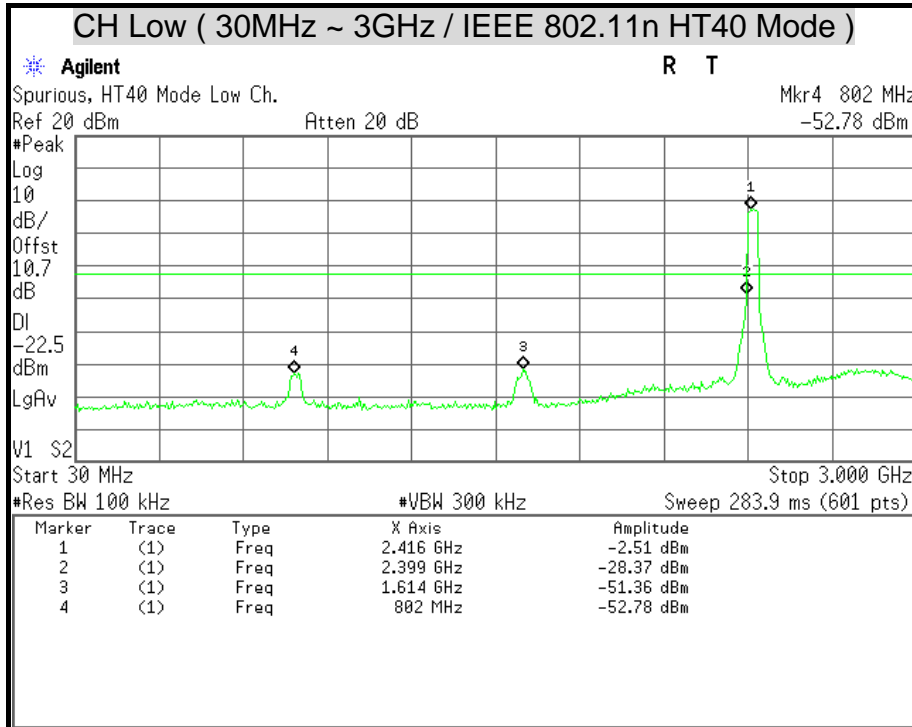


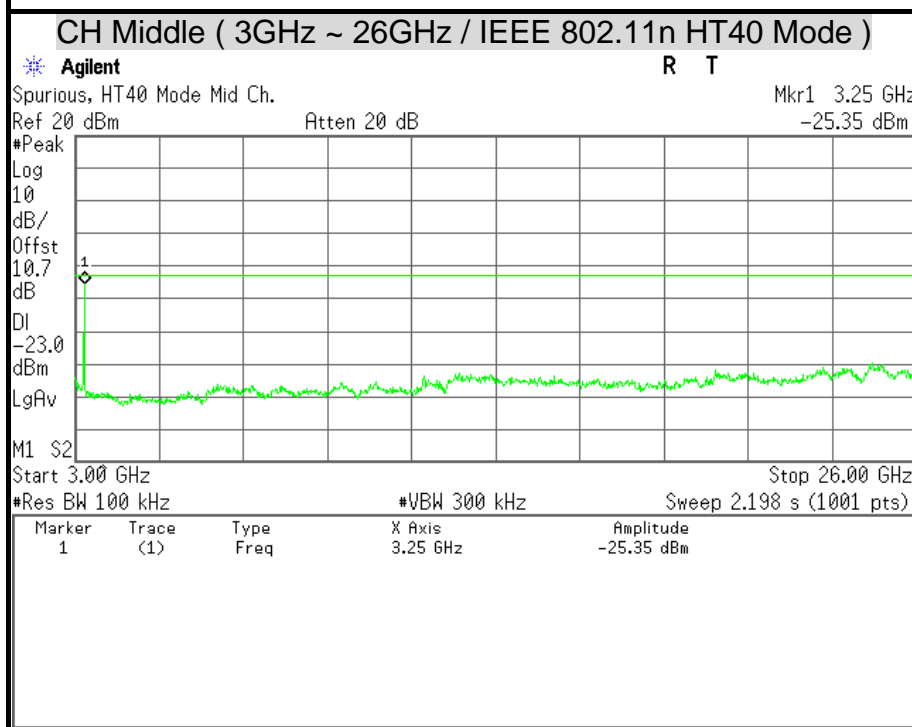
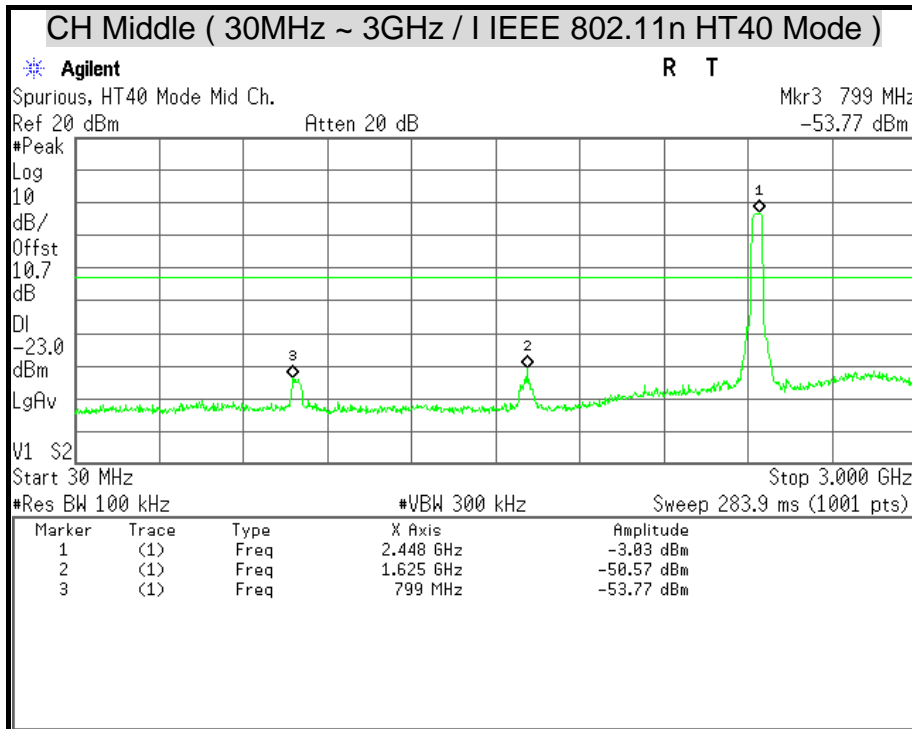


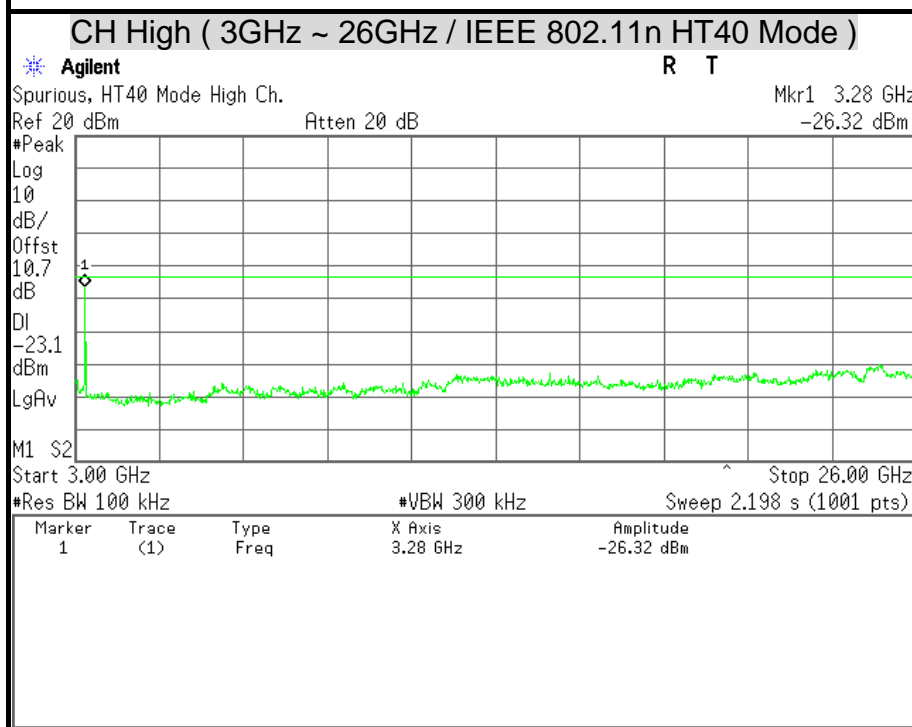
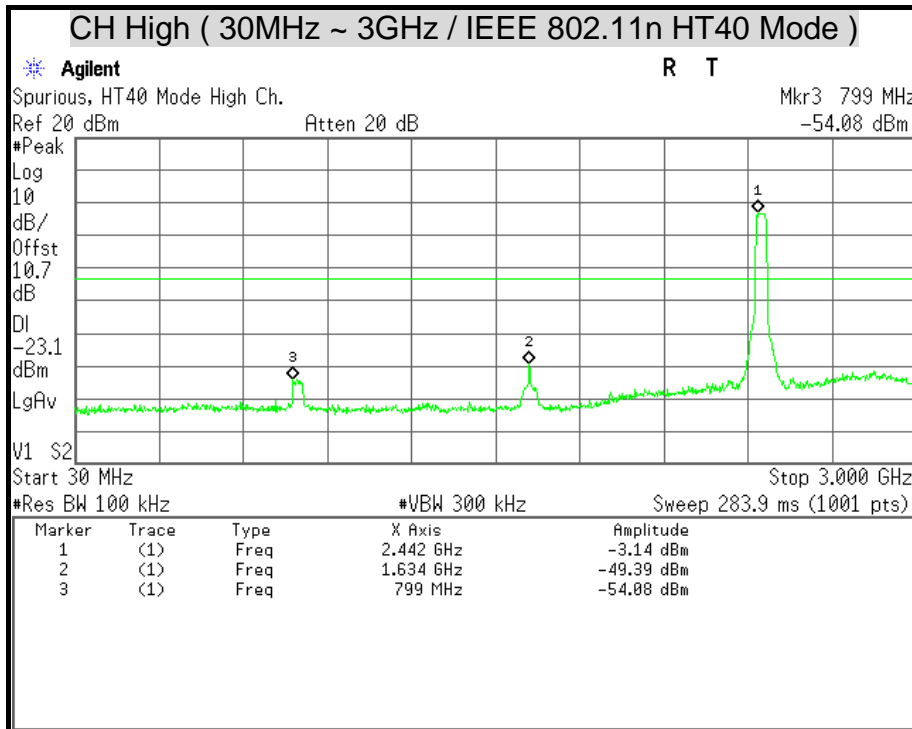














7.6 RADIATED EMISSION

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

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.



966Chamber_B

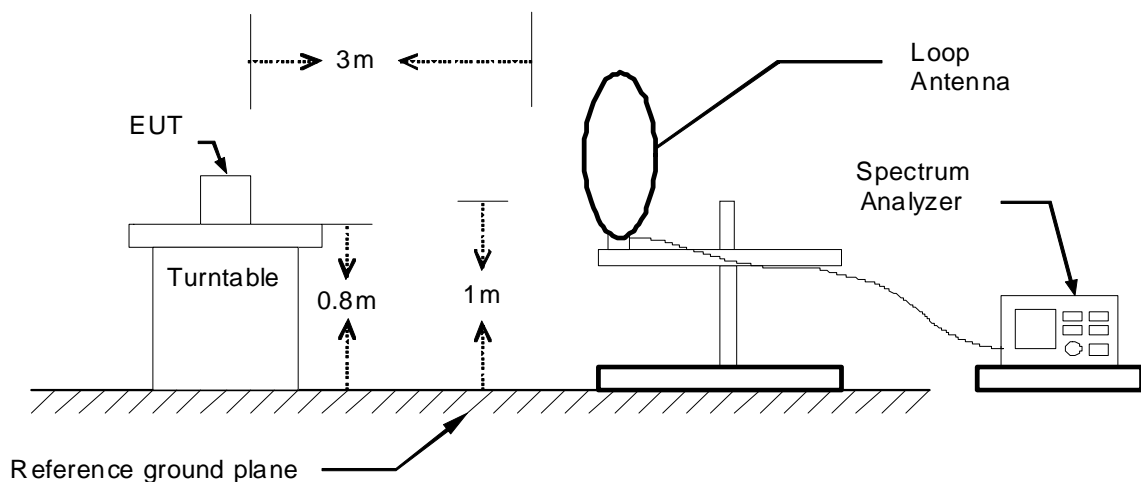
Name of Equipment	Manufacture	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/20/2011
EMI Receiver	ROHDE & SCHWARZ	ESCS 30	826547/004	11/15/2011
Broadband Hybrid Bi-Log Antenna	Sunol Sciences	JB1	A100209-4	10/07/2011
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00078732	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.

TEST SETUP

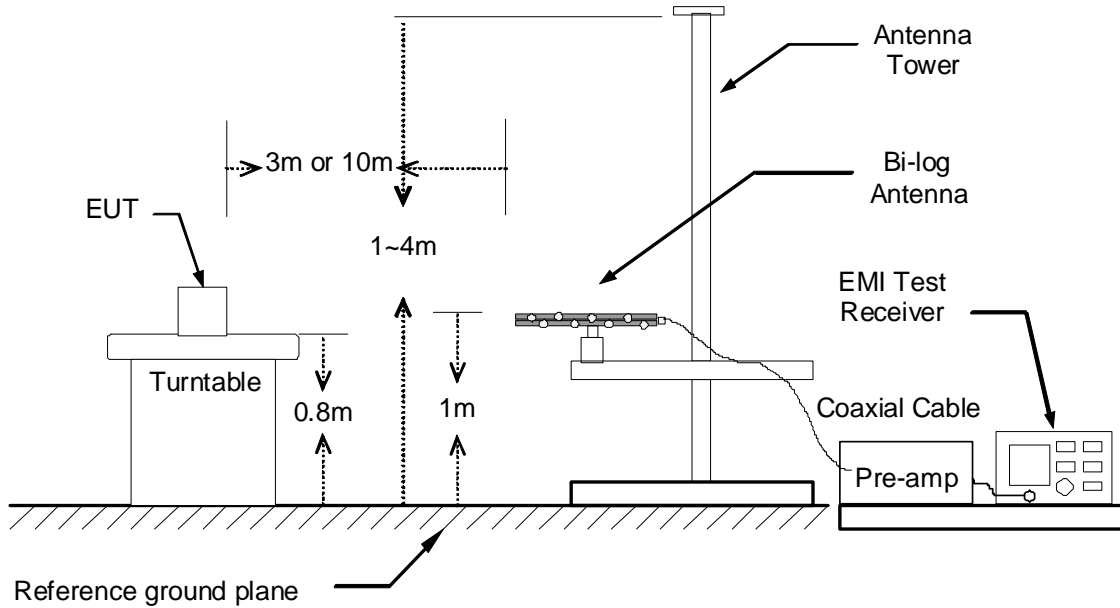
The diagram below shows the test setup that is utilized to make the measurements for emission from below 1GHz.

9kHz ~ 30MHz

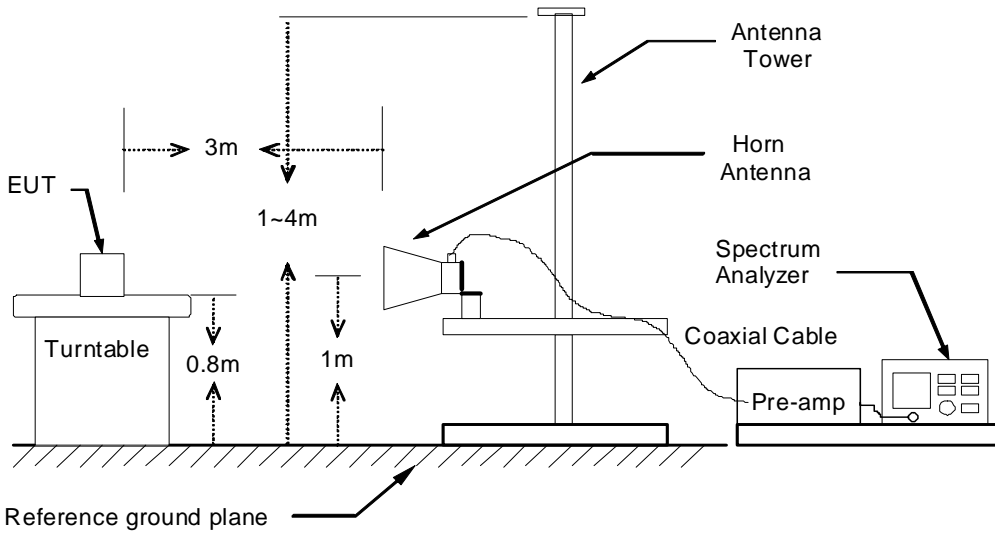




30MHz ~ 1GHz



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	IP1050	Test Date	2011/03/08
Test Mode	Normal Operating	TEMP & Humidity	16°C, 59%

966 Chamber_A at 3Meter / Horizontal						
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
184.23	44.88	-11.65	33.23	43.50	-10.27	Peak
298.69	45.85	-8.92	36.93	46.00	-9.07	Peak
398.60	48.70	-6.34	42.36	46.00	-3.64	QP
497.54	44.85	-3.99	40.85	46.00	-5.15	Peak
554.77	43.83	-2.86	40.98	46.00	-5.02	Peak
597.45	40.24	-1.75	38.49	46.00	-7.51	Peak
896.21	34.83	3.30	38.12	46.00	-7.88	Peak
959.26	38.70	4.27	42.97	46.00	-3.03	QP

966 Chamber_A at 3Meter / Vertical						
Frequency (MHz)	Reading (dBµV)	Correction Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
34.85	44.40	-10.72	33.68	40.00	-6.32	QP
144.46	47.91	-10.33	37.59	43.50	-5.91	Peak
191.02	50.03	-12.05	37.98	43.50	-5.52	Peak
298.69	47.52	-8.92	38.60	46.00	-7.40	Peak
429.64	46.85	-5.33	41.51	46.00	-4.49	Peak
497.54	48.90	-3.99	44.91	46.00	-1.09	QP
557.68	42.60	-2.78	39.82	46.00	-6.18	QP
643.04	38.70	-1.11	37.59	46.00	-8.41	QP
696.39	41.84	-0.16	41.68	46.00	-4.32	Peak
959.98	37.20	4.28	41.48	46.00	-4.52	QP

Remark:

1. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.
2. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
3. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) – PreAmp.Gain (dB)
4. Result (dBµV/m) = Reading (dBµV) + Correction Factor (dB/m)
5. Margin (dB) = Remark result (dBµV/m) - Quasi-peak limit (dBµV/m).



Above 1 GHz

Product Name	Wireless IP CAM	Test By	Waternil Guan
Model	IP1050	Test Date	2011/03/12
Test Mode	IEEE 802.11b TX / CH Low	TEMP & Humidity	22.3°C, 56%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1154.00	55.19	---	-4.89	50.31	---	74.00	54.00	-3.69	Peak
1292.00	54.73	---	-4.38	50.35	---	74.00	54.00	-3.65	Peak
1478.00	54.04	---	-3.70	50.34	---	74.00	54.00	-3.66	Peak
2412.00	97.39	94.69	2.09	99.48	96.78	---	---	---	Carrier
3217.50	50.37	46.70	4.51	54.88	51.21	74.00	54.00	-2.79	AVG
4357.50	40.34	---	6.99	47.33	---	74.00	54.00	-6.67	Peak
4957.50	40.50	---	8.51	49.02	---	74.00	54.00	-4.98	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1124.00	55.89	---	-5.00	50.89	---	74.00	54.00	-3.11	Peak
1206.00	55.55	---	-4.70	50.85	---	74.00	54.00	-3.15	Peak
1314.00	54.76	---	-4.30	50.46	---	74.00	54.00	-3.54	Peak
2412.00	98.07	95.42	2.09	100.16	97.51	---	---	---	Carrier
3217.50	50.89	47.14	4.51	55.40	51.65	74.00	54.00	-2.35	AVG
4282.50	40.73	---	6.68	47.41	---	74.00	54.00	-6.59	Peak
4972.50	40.52	---	8.54	49.06	---	74.00	54.00	-4.94	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	IP1050	Test Date	2011/03/12
Test Mode	IEEE 802.11b TX / CH Middle	TEMP & Humidity	22.3°C, 56%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1186.00	55.69	---	-4.77	50.92	---	74.00	54.00	-3.08	Peak
1254.00	55.44	---	-4.52	50.92	---	74.00	54.00	-3.08	Peak
1420.00	58.34	46.32	-3.91	54.43	42.41	74.00	54.00	-11.59	AVG
2437.00	98.08	95.45	2.15	100.23	97.60	---	---	---	Carrier
3247.50	49.74	45.51	4.50	54.24	50.01	74.00	54.00	-3.99	AVG
4012.50	41.08	---	5.56	46.64	---	74.00	54.00	-7.36	Peak
4905.00	41.16	---	8.41	49.57	---	74.00	54.00	-4.43	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1114.00	61.97	46.50	-5.03	56.94	41.47	74.00	54.00	-12.53	AVG
1182.00	55.14	---	-4.78	50.35	---	74.00	54.00	-3.65	Peak
1410.00	54.29	---	-3.95	50.34	---	74.00	54.00	-3.66	Peak
2437.00	97.34	94.54	2.15	99.49	96.69	---	---	---	Carrier
3247.50	49.53	44.32	4.50	54.03	48.82	74.00	54.00	-5.18	AVG
4425.00	40.36	---	7.27	47.63	---	74.00	54.00	-6.37	Peak
4905.00	40.34	---	8.41	48.75	---	74.00	54.00	-5.25	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	IP1050	Test Date	2011/03/12
Test Mode	IEEE 802.11b TX / CH High	TEMP & Humidity	22.3°C, 56%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1130.00	55.88	---	-4.97	50.90	---	74.00	54.00	-3.10	Peak
1200.00	55.17	---	-4.72	50.45	---	74.00	54.00	-3.55	Peak
1440.00	54.72	---	-3.84	50.88	---	74.00	54.00	-3.12	Peak
2462.00	95.49	93.05	2.21	97.70	95.26	---	---	---	Carrier
3285.00	45.26	---	4.48	49.75	---	74.00	54.00	-4.25	Peak
4342.50	41.27	---	6.93	48.20	---	74.00	54.00	-5.80	Peak
5017.50	40.16	---	8.62	48.78	---	74.00	54.00	-5.22	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1124.00	55.90	---	-5.00	50.91	---	74.00	54.00	-3.09	Peak
1708.00	58.54	42.65	-1.64	56.90	41.01	74.00	54.00	-12.99	AVG
1758.00	58.17	42.51	-1.17	57.00	41.34	74.00	54.00	-12.66	AVG
2462.00	95.16	92.76	2.21	97.37	94.97	---	---	---	Carrier
3285.00	43.49	---	4.48	47.97	---	74.00	54.00	-6.03	Peak
4582.50	41.00	---	7.75	48.75	---	74.00	54.00	-5.25	Peak
4927.50	40.96	---	8.45	49.41	---	74.00	54.00	-4.59	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	IP1050	Test Date	2011/03/12
Test Mode	IEEE 802.11g TX / CH Low	TEMP & Humidity	22.3°C, 56%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1142.00	55.11	---	-4.93	50.18	---	74.00	54.00	-3.82	Peak
1218.00	54.95	---	-4.65	50.30	---	74.00	54.00	-3.70	Peak
1440.00	54.17	---	-3.84	50.33	---	74.00	54.00	-3.67	Peak
2412.00	100.50	92.10	2.08	102.58	94.18	---	---	---	Carrier
3217.50	50.29	46.11	4.51	54.80	50.62	74.00	54.00	-3.38	AVG
4815.00	40.33	---	8.22	48.55	---	74.00	54.00	-5.45	Peak
7230.00	50.86	32.36	11.62	62.48	43.98	74.00	54.00	-10.02	AVG

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1124.00	59.72	46.65	-5.00	54.72	41.65	74.00	54.00	-12.35	AVG
1268.00	54.97	---	-4.47	50.50	---	74.00	54.00	-3.50	Peak
1426.00	55.12	---	-3.89	51.23	---	74.00	54.00	-2.77	Peak
2412.00	101.26	92.14	2.10	103.36	94.24	---	---	---	Carrier
3217.50	50.59	47.04	4.51	55.10	51.55	74.00	54.00	-2.45	AVG
4912.50	41.33	---	8.42	49.75	---	74.00	54.00	-4.25	Peak
7237.50	46.92	29.74	11.62	58.54	41.36	74.00	54.00	-12.64	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	IP1050	Test Date	2011/03/12
Test Mode	IEEE 802.11g TX / CH Middle	TEMP & Humidity	22.3°C, 56%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1046.00	56.12	---	-5.28	50.84	---	74.00	54.00	-3.16	Peak
1206.00	54.21	---	-4.70	49.51	---	74.00	54.00	-4.49	Peak
1440.00	58.09	46.85	-3.84	54.25	43.01	74.00	54.00	-10.99	AVG
2437.00	100.39	91.91	2.15	102.54	94.06	---	---	---	Carrier
3247.50	49.79	45.18	4.50	54.29	49.68	74.00	54.00	-4.32	AVG
4942.50	40.27	---	8.48	48.75	---	74.00	54.00	-5.25	Peak
7320.00	47.99	30.07	11.65	59.64	41.72	74.00	54.00	-12.28	AVG

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1086.00	56.34	---	-5.14	51.20	---	74.00	54.00	-2.80	Peak
1124.00	59.53	43.94	-5.00	54.53	38.94	74.00	54.00	-15.06	AVG
1206.00	55.17	---	-4.70	50.48	---	74.00	54.00	-3.52	Peak
2437.00	100.22	91.71	2.15	102.37	93.86	---	---	---	Carrier
3247.50	44.96	---	4.50	49.46	---	74.00	54.00	-4.54	Peak
3825.00	42.02	---	5.12	47.14	---	74.00	54.00	-6.86	Peak
4957.50	41.03	---	8.51	49.54	---	74.00	54.00	-4.46	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	IP1050	Test Date	2011/03/12
Test Mode	IEEE 802.11g TX / CH High	TEMP & Humidity	22.3°C, 56%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1160.00	54.33	---	-4.86	49.47	---	74.00	54.00	-4.53	Peak
1268.00	54.80	---	-4.47	50.33	---	74.00	54.00	-3.67	Peak
1442.00	58.41	46.91	-3.83	54.58	43.08	74.00	54.00	-10.92	AVG
2462.00	98.38	89.43	2.21	100.59	91.64	---	---	---	Carrier
3285.00	49.56	43.86	4.48	54.04	48.34	74.00	54.00	-5.66	AVG
4522.50	40.80	---	7.63	48.43	---	74.00	54.00	-5.57	Peak
4882.50	40.59	---	8.36	48.96	---	74.00	54.00	-5.04	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1128.00	61.03	46.32	-4.98	56.05	41.34	74.00	54.00	-12.66	AVG
1254.00	54.99	---	-4.52	50.47	---	74.00	54.00	-3.53	Peak
1438.00	54.65	---	-3.85	50.80	---	74.00	54.00	-3.20	Peak
2462.00	100.15	91.72	2.22	102.37	93.94	---	---	---	Carrier
3285.00	43.23	---	4.48	47.71	---	74.00	54.00	-6.29	Peak
3840.00	41.77	---	5.15	46.92	---	74.00	54.00	-7.08	Peak
4845.00	40.72	---	8.28	49.01	---	74.00	54.00	-4.99	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	IP1050	Test Date	2011/03/12
Test Mode	IEEE 802.11n HT20 TX / CH Low	TEMP & Humidity	22.3°C, 56%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1148.00	54.81	---	-4.91	49.90	---	74.00	54.00	-4.10	Peak
1226.00	54.95	---	-4.62	50.33	---	74.00	54.00	-3.67	Peak
1406.00	54.58	---	-3.96	50.61	---	74.00	54.00	-3.39	Peak
2412.00	100.42	91.38	2.10	102.52	93.48	---	---	---	Carrier
3217.50	49.92	45.56	4.51	54.43	50.07	74.00	54.00	-3.93	AVG
4950.00	40.84	---	8.50	49.33	---	74.00	54.00	-4.67	Peak
7237.50	52.01	31.85	11.62	63.63	43.47	74.00	54.00	-10.53	AVG

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1122.00	61.81	46.59	-5.00	56.81	41.59	74.00	54.00	-12.41	AVG
1310.00	55.39	---	-4.32	51.08	---	74.00	54.00	-2.92	Peak
1410.00	54.32	---	-3.95	50.37	---	74.00	54.00	-3.63	Peak
2412.00	100.63	91.52	2.09	102.72	93.61	---	---	---	Carrier
3217.50	50.86	47.07	4.51	55.37	51.58	74.00	54.00	-2.42	AVG
4650.00	40.36	---	7.89	48.25	---	74.00	54.00	-5.75	Peak
5512.50	39.58	---	9.24	48.82	---	74.00	54.00	-5.18	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	IP1050	Test Date	2011/03/12
Test Mode	IEEE 802.11n HT20 TX / CH Middle	TEMP & Humidity	22.3°C, 56%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1104.00	55.35	---	-5.07	50.29	---	74.00	54.00	-3.71	Peak
1260.00	55.39	---	-4.50	50.89	---	74.00	54.00	-3.11	Peak
1380.00	54.71	---	-4.06	50.65	---	74.00	54.00	-3.35	Peak
2437.00	100.18	91.86	2.15	102.33	94.01	---	---	---	Carrier
3247.50	49.59	44.47	4.50	54.09	48.97	74.00	54.00	-5.03	AVG
5145.00	39.93	---	8.78	48.71	---	74.00	54.00	-5.29	Peak
7320.00	49.35	29.95	11.65	61.00	41.60	74.00	54.00	-12.40	AVG

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1124.00	56.20	---	-5.00	51.20	---	74.00	54.00	-2.80	Peak
1334.00	55.34	---	-4.23	51.12	---	74.00	54.00	-2.88	Peak
1522.00	54.74	---	-3.41	51.33	---	74.00	54.00	-2.67	Peak
2437.00	100.35	91.47	2.15	102.50	93.62	---	---	---	Carrier
3247.50	44.37	---	4.50	48.87	---	74.00	54.00	-5.13	Peak
4680.00	40.21	---	7.95	48.16	---	74.00	54.00	-5.84	Peak
7312.50	46.68	28.63	11.65	58.33	40.28	74.00	54.00	-13.72	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	IP1050	Test Date	2011/03/12
Test Mode	IEEE 802.11n HT20 TX / CH High	TEMP & Humidity	22.3°C, 56%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1082.00	55.50	---	-5.15	50.35	---	74.00	54.00	-3.65	Peak
1168.00	53.39	---	-4.84	48.55	---	74.00	54.00	-5.45	Peak
1268.00	54.34	---	-4.47	49.87	---	74.00	54.00	-4.13	Peak
2462.00	99.48	90.22	2.22	101.70	92.44	---	---	---	Carrier
3285.00	45.17	---	4.48	49.66	---	74.00	54.00	-4.34	Peak
3847.50	41.54	---	5.17	46.71	---	74.00	54.00	-7.29	Peak
4867.50	40.61	---	8.33	48.94	---	74.00	54.00	-5.06	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1118.00	56.19	---	-5.02	51.17	---	74.00	54.00	-2.83	Peak
1278.00	54.85	---	-4.43	50.42	---	74.00	54.00	-3.58	Peak
1382.00	53.49	---	-4.05	49.43	---	74.00	54.00	-4.57	Peak
2462.00	99.32	90.12	2.22	101.54	92.34	---	---	---	Carrier
3285.00	43.83	---	4.48	48.32	---	74.00	54.00	-5.68	Peak
3847.50	41.66	---	5.17	46.83	---	74.00	54.00	-7.17	Peak
4627.50	40.36	---	7.84	48.20	---	74.00	54.00	-5.80	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	IP1050	Test Date	2011/03/12
Test Mode	IEEE 802.11n HT40 TX / CH Low	TEMP & Humidity	22.3°C, 56%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1128.00	55.32	---	-4.98	50.34	---	74.00	54.00	-3.66	Peak
1304.00	54.31	---	-4.34	49.97	---	74.00	54.00	-4.03	Peak
1608.00	53.43	---	-2.59	50.84	---	74.00	54.00	-3.16	Peak
2422.00	97.21	87.99	2.10	99.31	90.09	---	---	---	Carrier
3232.50	49.51	44.65	4.51	54.02	49.16	74.00	54.00	-4.84	AVG
3915.00	41.48	---	5.32	46.80	---	74.00	54.00	-7.20	Peak
4920.00	40.08	---	8.44	48.52	---	74.00	54.00	-5.48	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1112.00	56.67	---	-5.04	51.63	---	74.00	54.00	-2.37	Peak
1302.00	55.02	---	-4.34	50.67	---	74.00	54.00	-3.33	Peak
1416.00	54.02	---	-3.93	50.10	---	74.00	54.00	-3.90	Peak
2422.00	98.02	88.63	2.10	100.12	90.73	---	---	---	Carrier
3232.50	45.07	---	4.51	49.57	---	74.00	54.00	-4.43	Peak
4462.50	40.89	---	7.42	48.31	---	74.00	54.00	-5.69	Peak
4822.50	39.94	---	8.24	48.18	---	74.00	54.00	-5.82	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	IP1050	Test Date	2011/03/12
Test Mode	IEEE 802.11n HT40 TX / CH Middle	TEMP & Humidity	22.3°C, 56%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1192.00	55.42	---	-4.75	50.67	---	74.00	54.00	-3.33	Peak
1350.00	54.27	---	-4.17	50.10	---	74.00	54.00	-3.90	Peak
1542.00	53.75	---	-3.22	50.53	---	74.00	54.00	-3.47	Peak
2437.00	97.48	87.68	2.14	99.62	89.82	---	---	---	Carrier
3247.50	45.19	---	4.50	49.69	---	74.00	54.00	-4.31	Peak
4492.50	40.88	---	7.55	48.42	---	74.00	54.00	-5.58	Peak
4860.00	40.67	---	8.31	48.99	---	74.00	54.00	-5.01	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1112.00	55.86	---	-5.04	50.82	---	74.00	54.00	-3.18	Peak
1238.00	54.50	---	-4.58	49.93	---	74.00	54.00	-4.07	Peak
1448.00	54.63	---	-3.81	50.82	---	74.00	54.00	-3.18	Peak
2437.00	97.52	88.16	2.15	99.67	90.31	---	---	---	Carrier
3247.50	43.85	---	4.50	48.35	---	74.00	54.00	-5.65	Peak
4537.50	41.21	---	7.66	48.87	---	74.00	54.00	-5.13	Peak
5715.00	41.04	---	9.61	50.65	---	74.00	54.00	-3.35	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	IP1050	Test Date	2011/03/12
Test Mode	IEEE 802.11n HT40 TX / CH High	TEMP & Humidity	22.3°C, 56%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1100.00	55.97	---	-5.08	50.89	---	74.00	54.00	-3.11	Peak
1288.00	55.18	---	-4.40	50.78	---	74.00	54.00	-3.22	Peak
1342.00	54.78	---	-4.20	50.58	---	74.00	54.00	-3.42	Peak
2452.00	96.52	86.95	2.16	98.68	89.11	---	---	---	Carrier
3270.00	44.60	---	4.49	49.09	---	74.00	54.00	-4.91	Peak
4215.00	40.90	---	6.40	47.30	---	74.00	54.00	-6.70	Peak
4920.00	40.07	---	8.44	48.51	---	74.00	54.00	-5.49	Peak

966 Chamber_B at 3Meter / Vertical

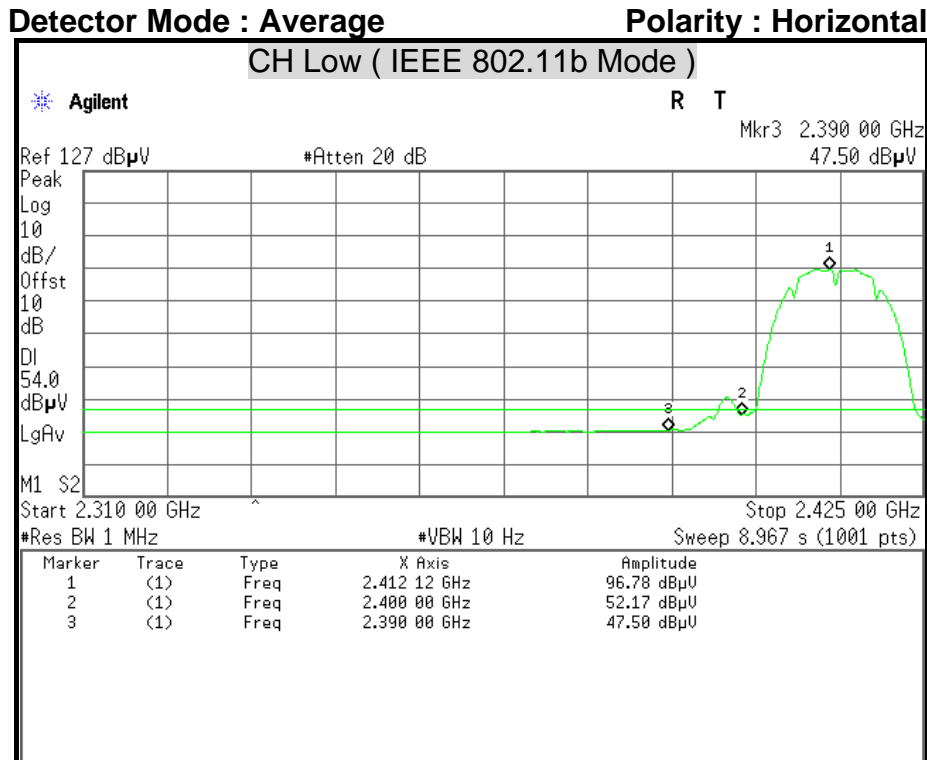
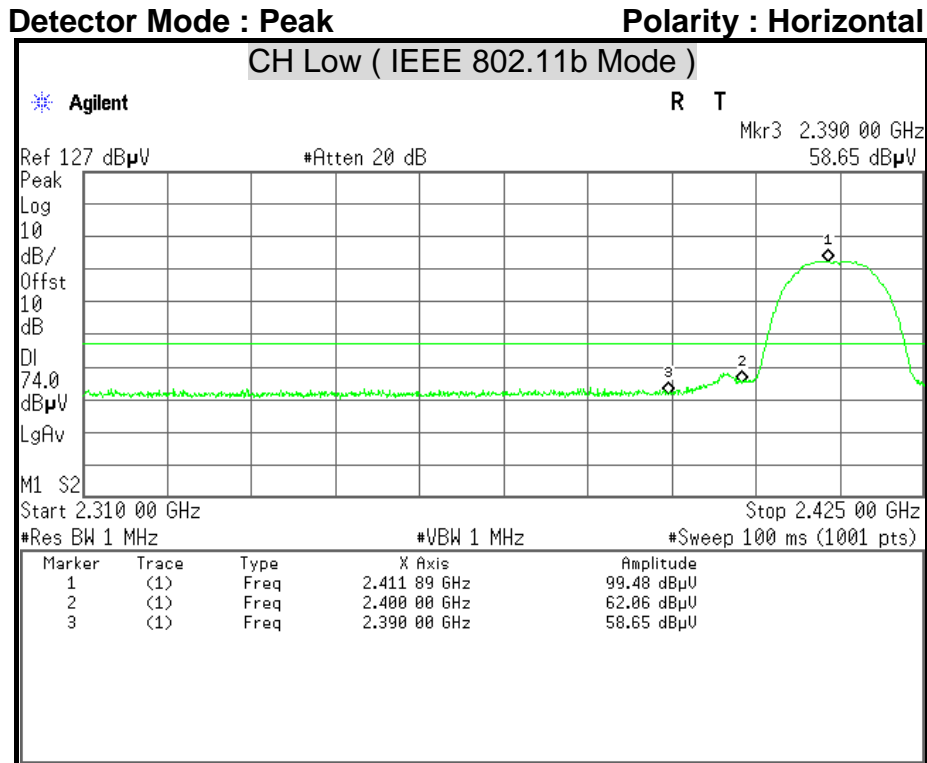
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1116.00	60.15	45.83	-5.03	55.12	40.80	74.00	54.00	-13.20	AVG
1234.00	54.26	---	-4.59	49.67	---	74.00	54.00	-4.33	Peak
1364.00	54.12	---	-4.12	50.00	---	74.00	54.00	-4.00	Peak
2452.00	97.06	87.50	2.18	99.24	89.68	---	---	---	Carrier
3270.00	44.05	---	4.49	48.54	---	74.00	54.00	-5.46	Peak
4155.00	40.90	---	6.15	47.05	---	74.00	54.00	-6.95	Peak
5025.00	40.11	---	8.63	48.75	---	74.00	54.00	-5.25	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)



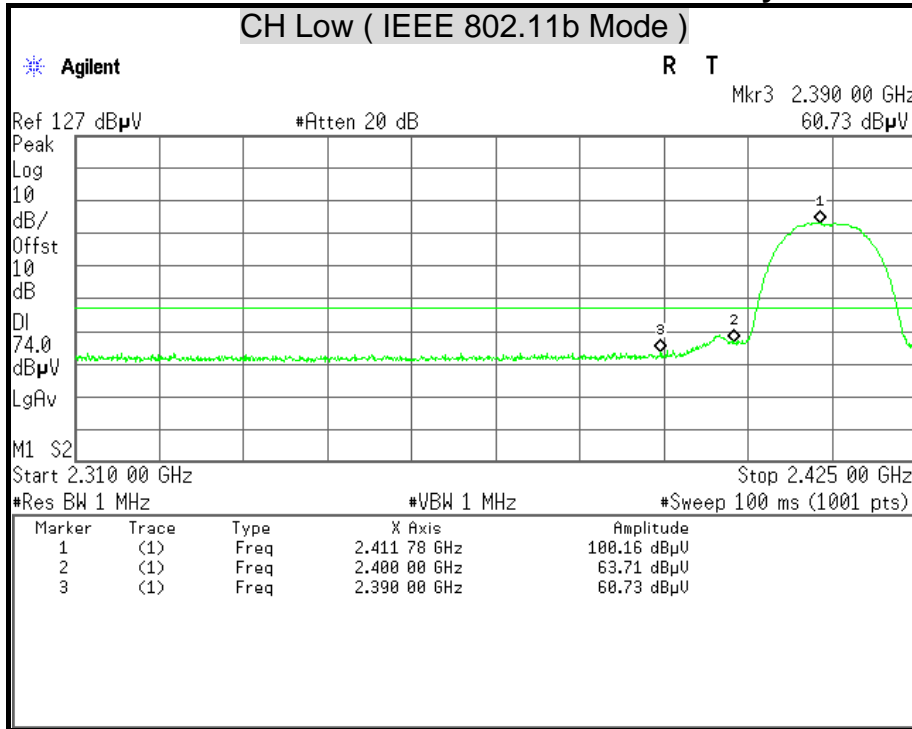
Restricted Band Edges





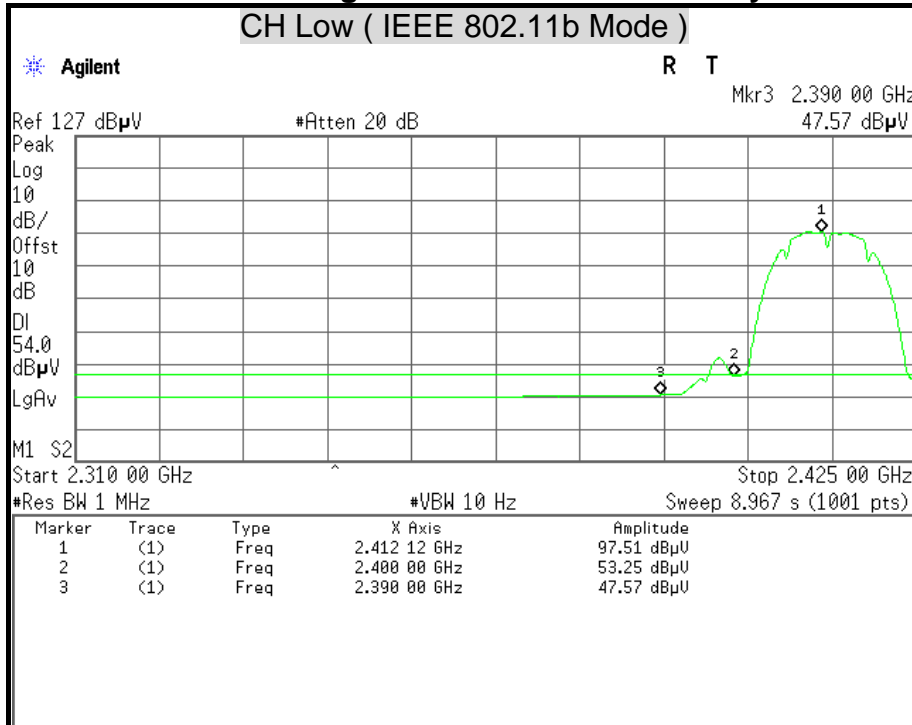
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

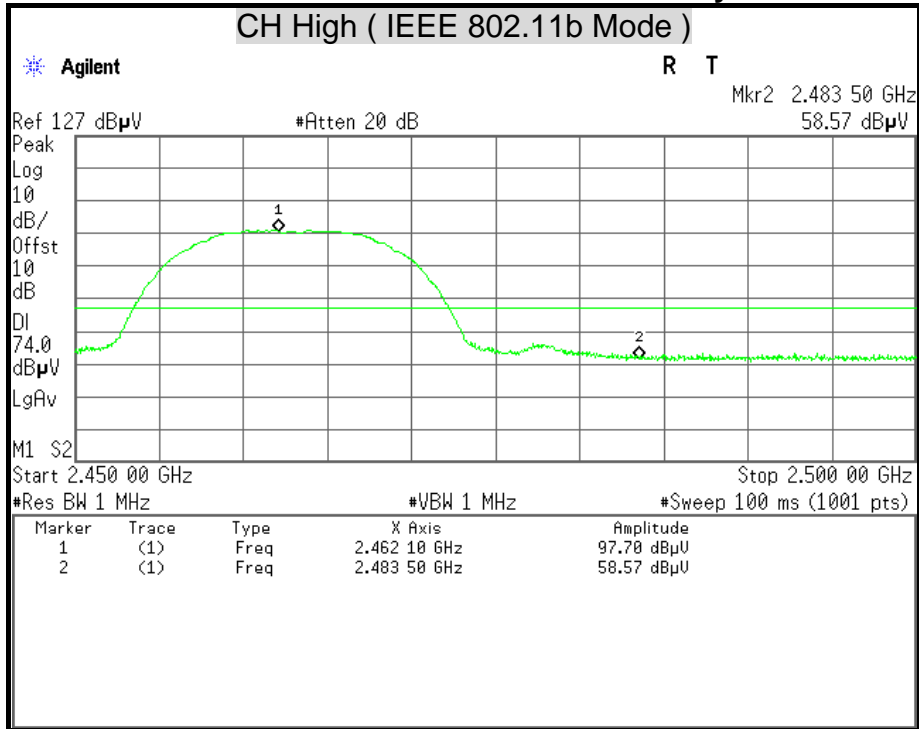
Polarity : Vertical





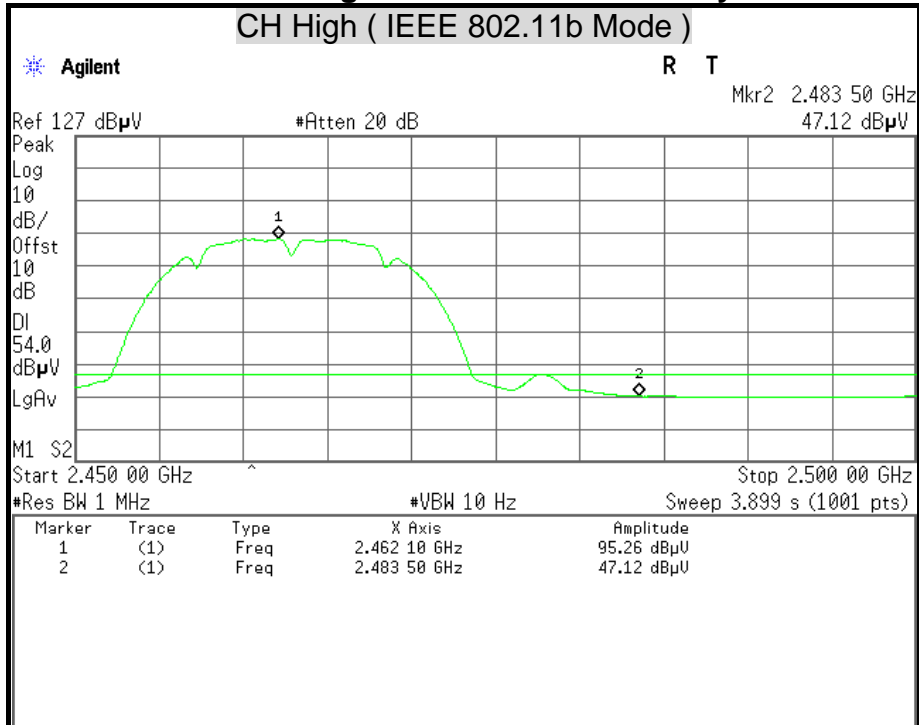
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

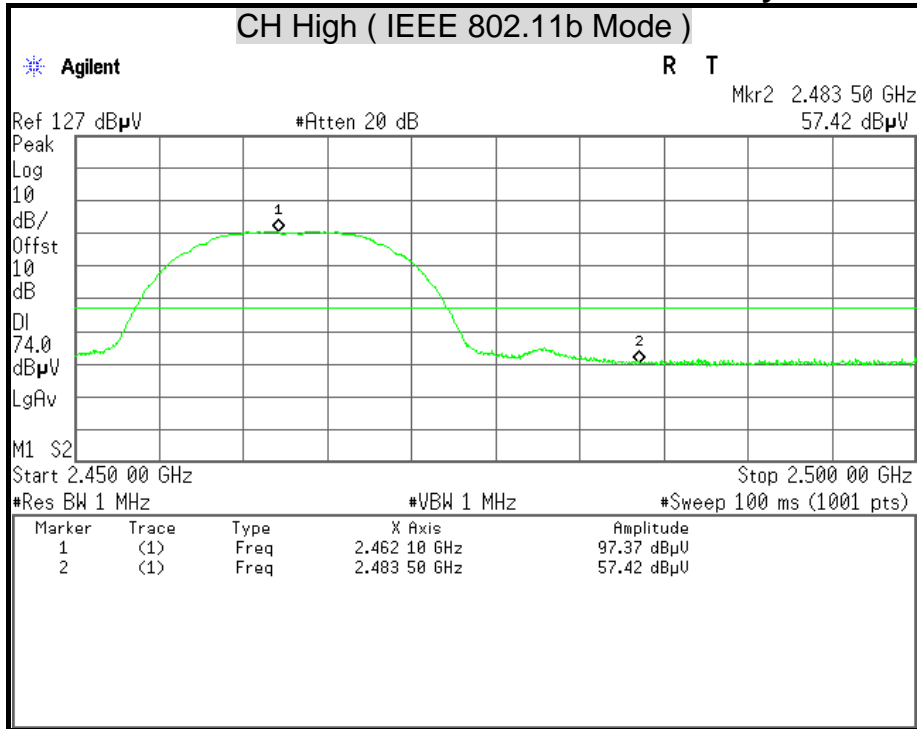
Polarity : Horizontal





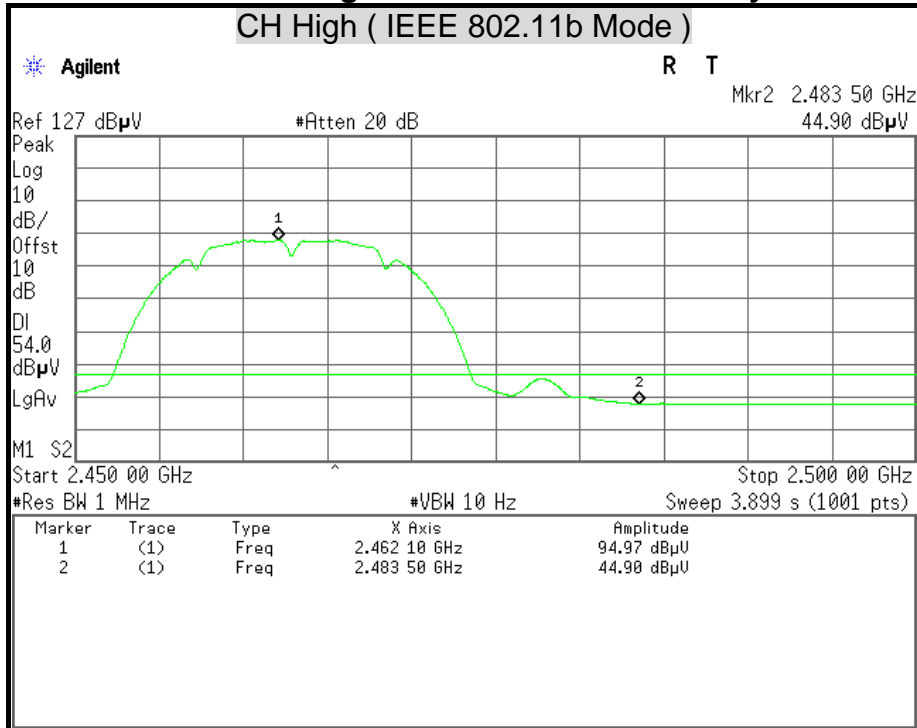
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

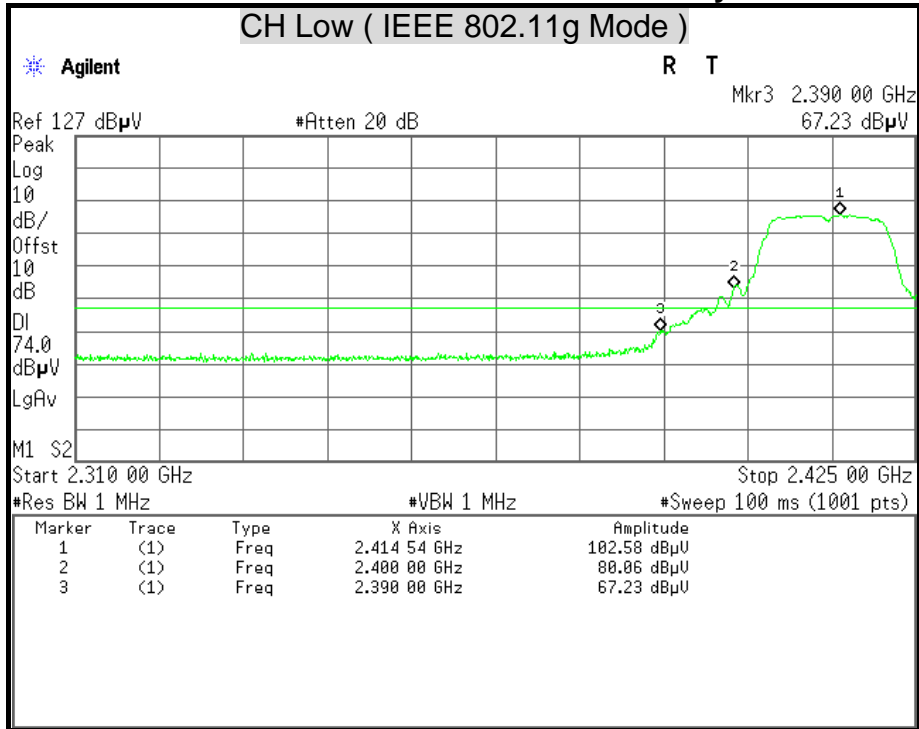
Polarity : Vertical





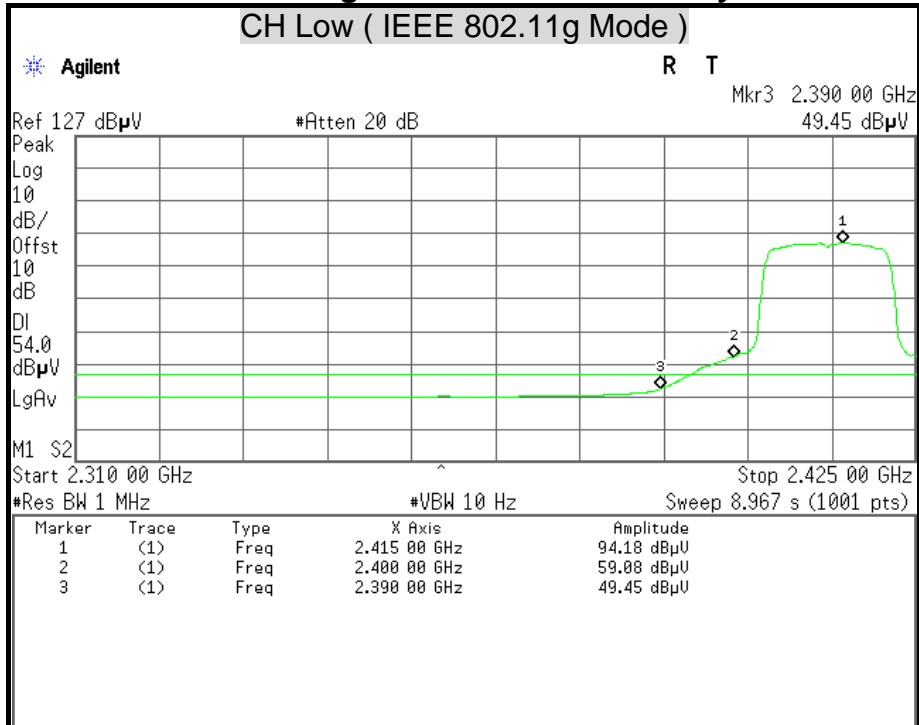
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

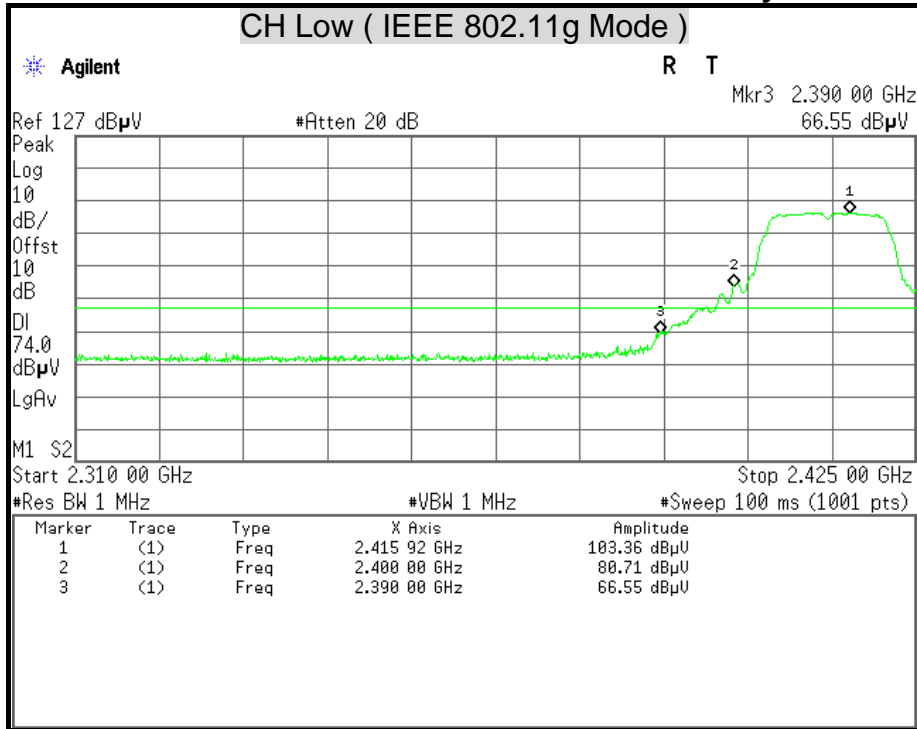
Polarity : Horizontal





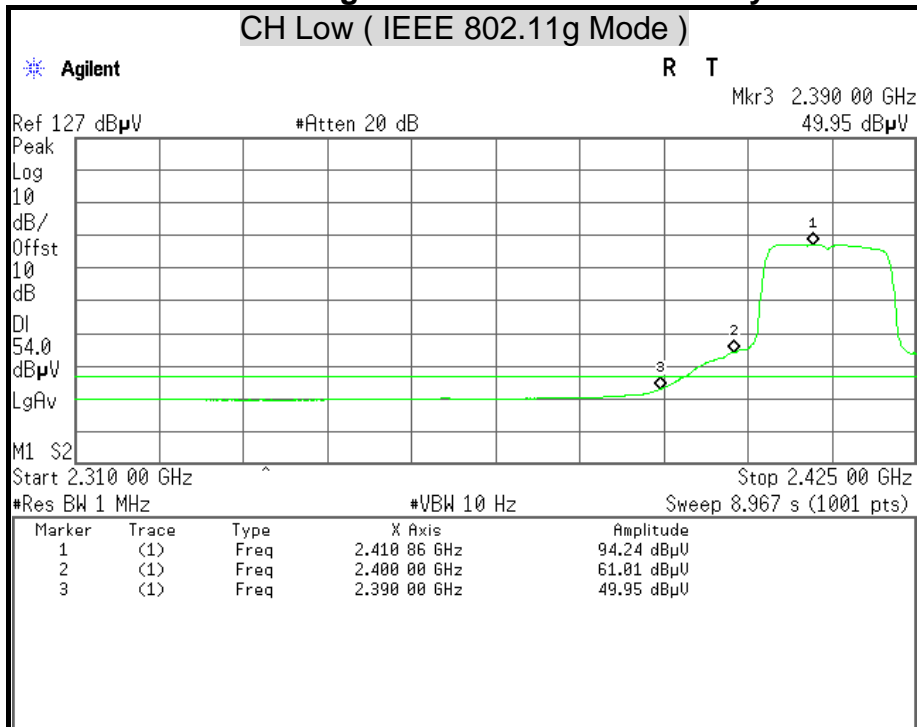
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

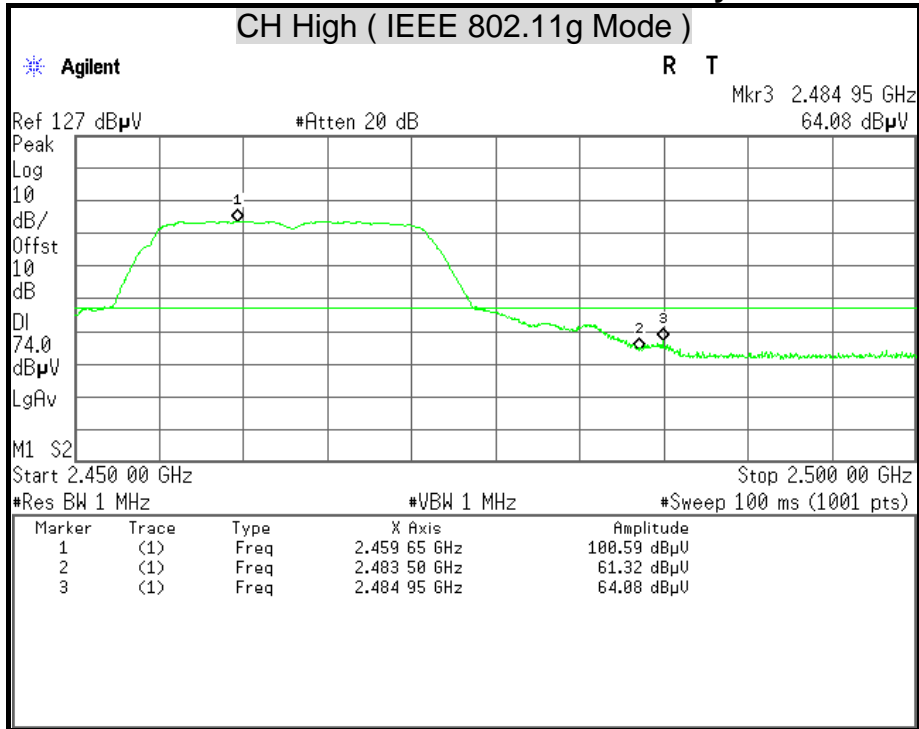
Polarity : Vertical





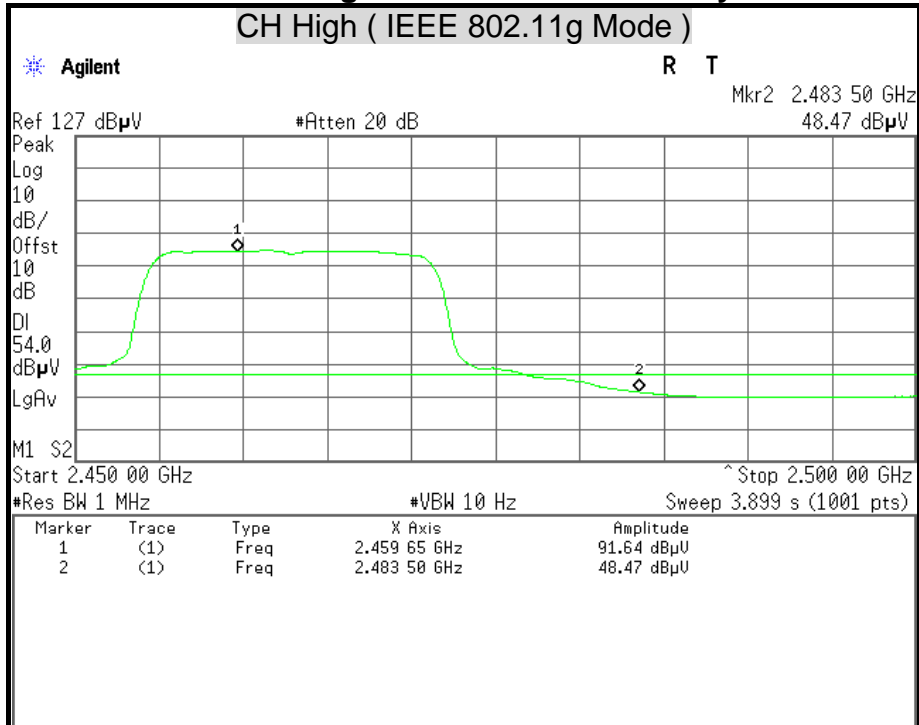
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

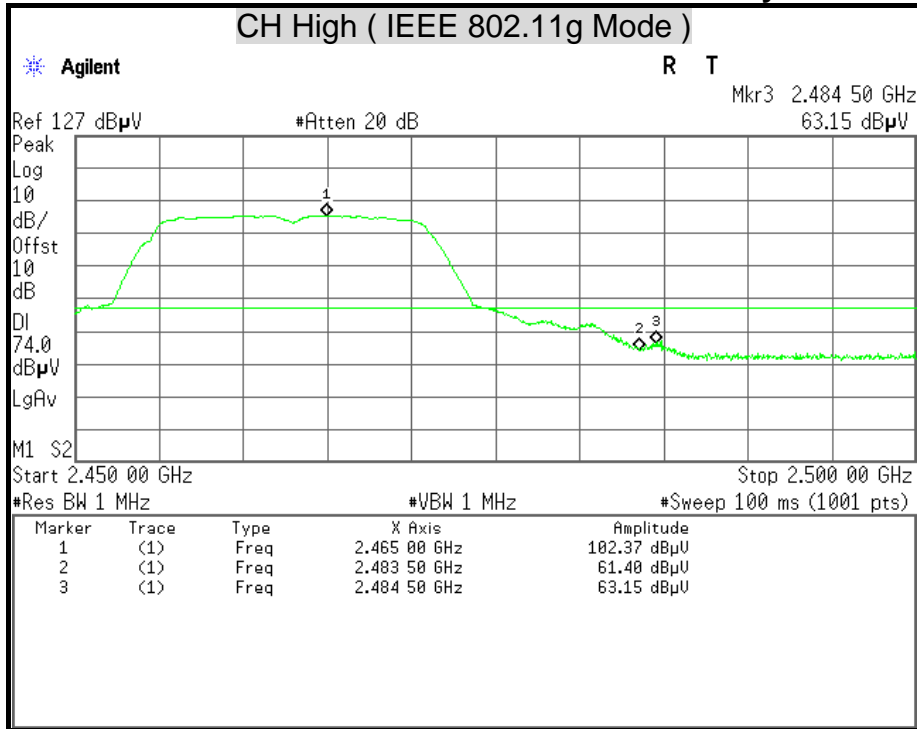
Polarity : Horizontal





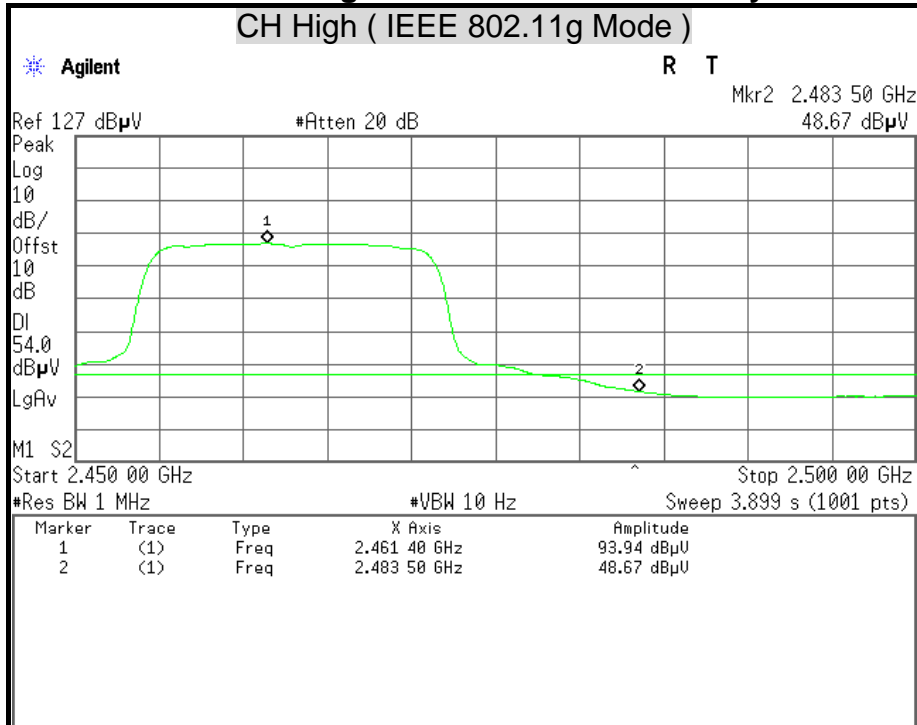
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

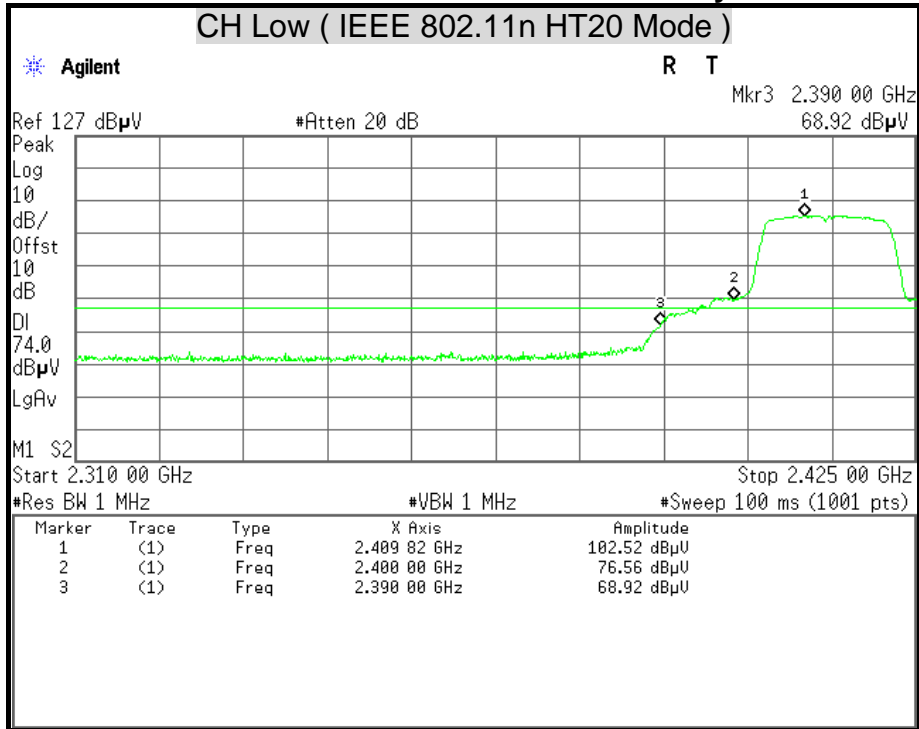
Polarity : Vertical





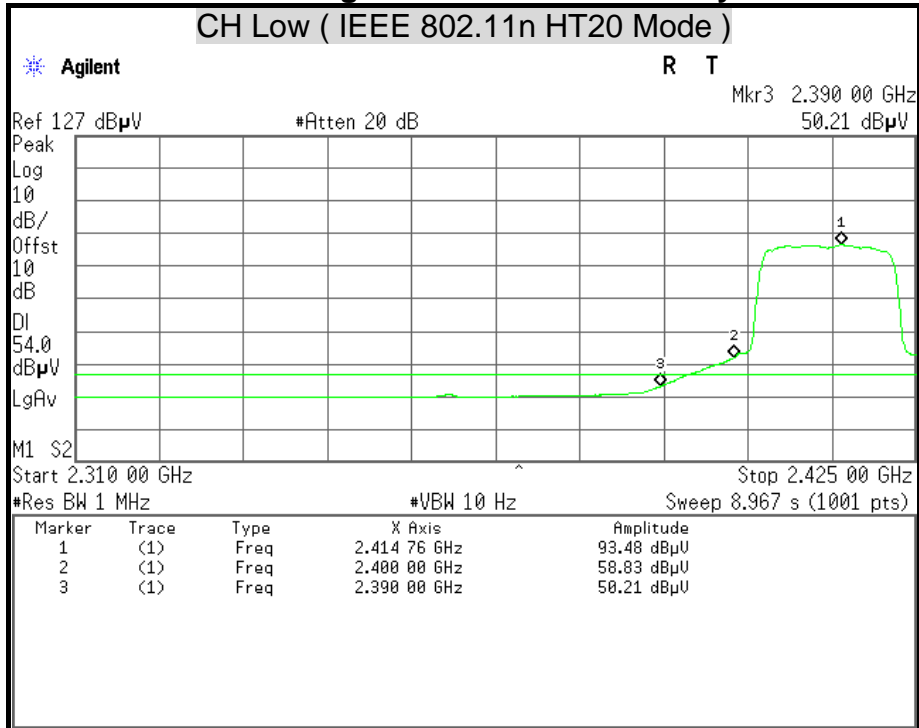
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

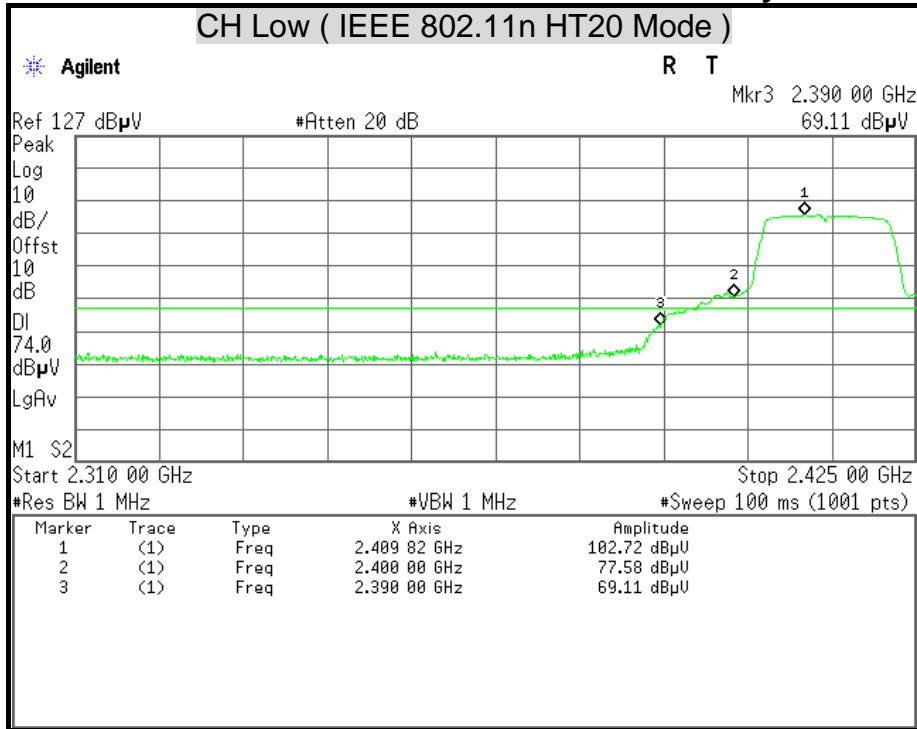
Polarity : Horizontal





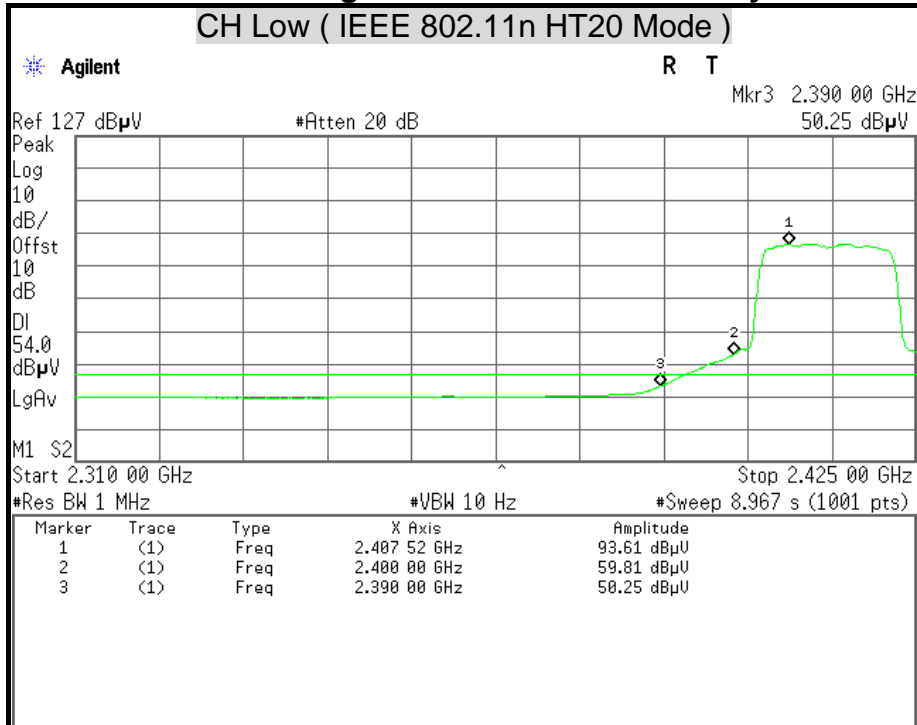
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

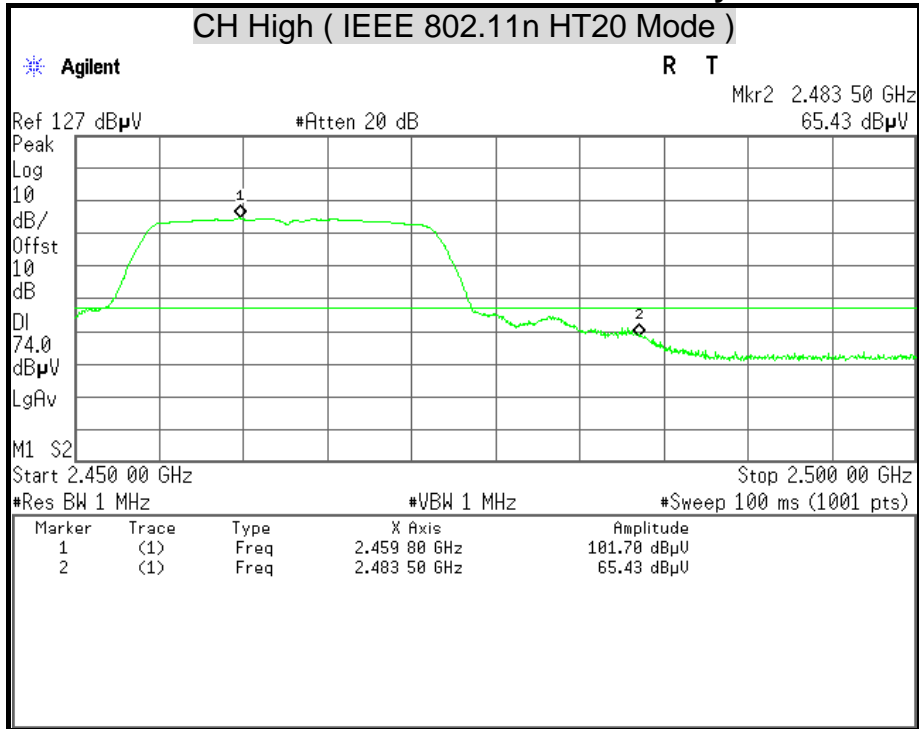
Polarity : Vertical





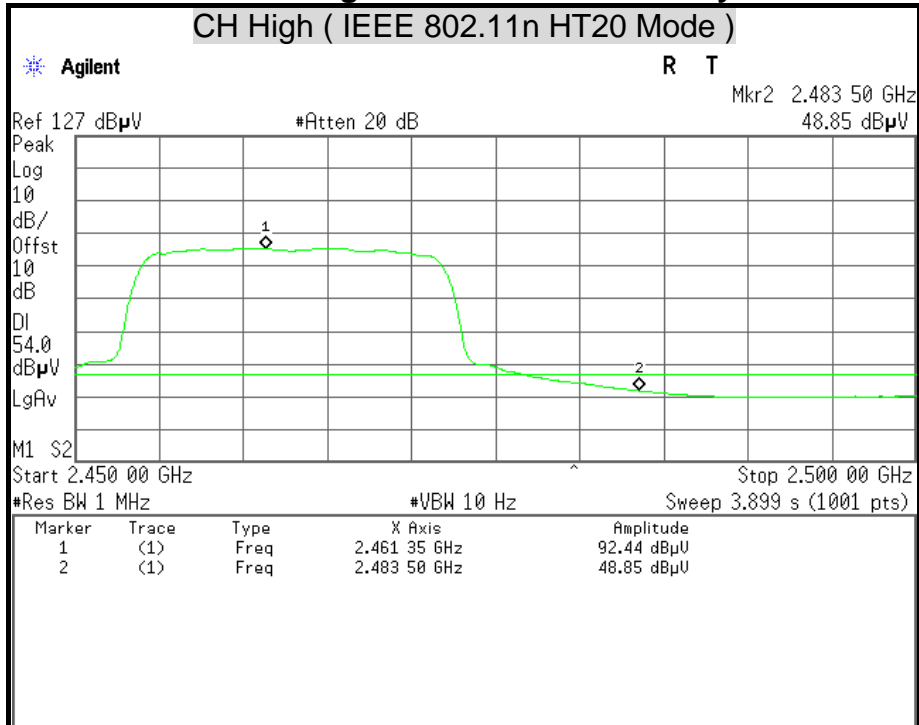
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

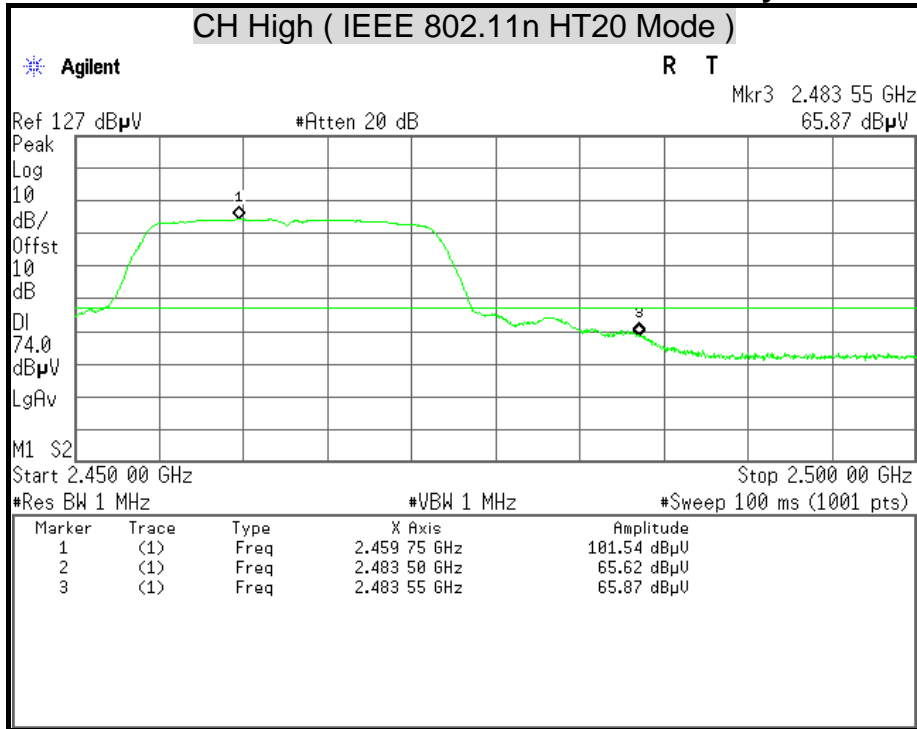
Polarity : Horizontal





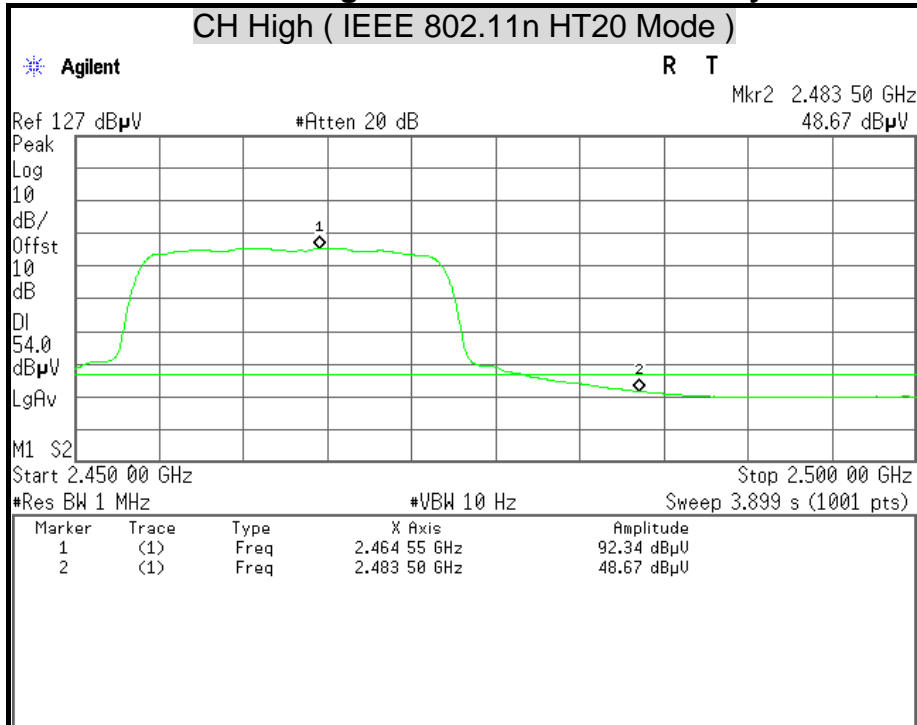
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

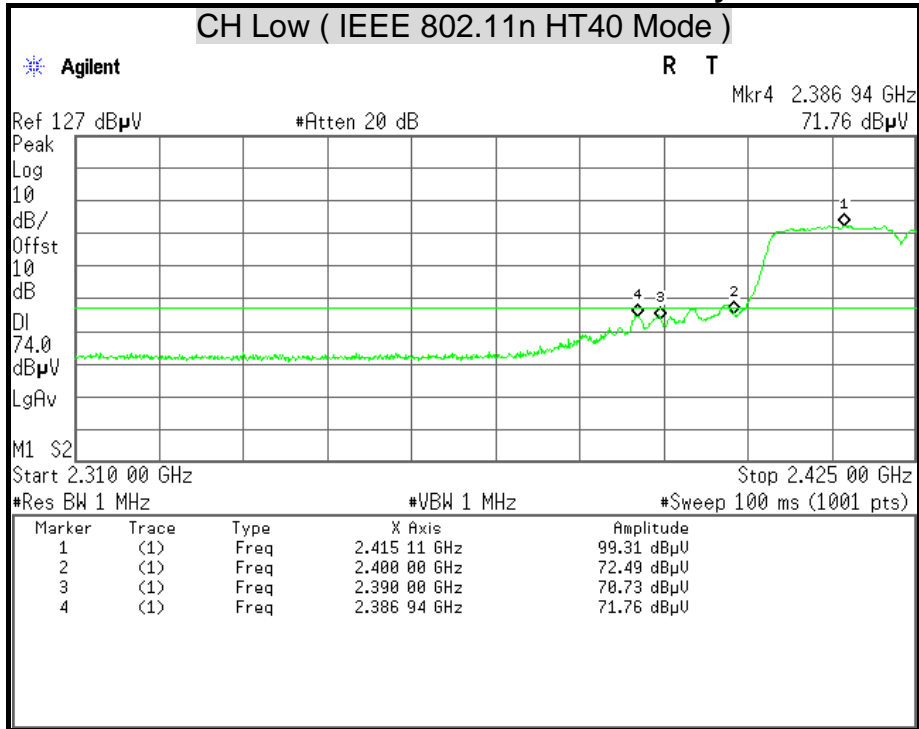
Polarity : Vertical





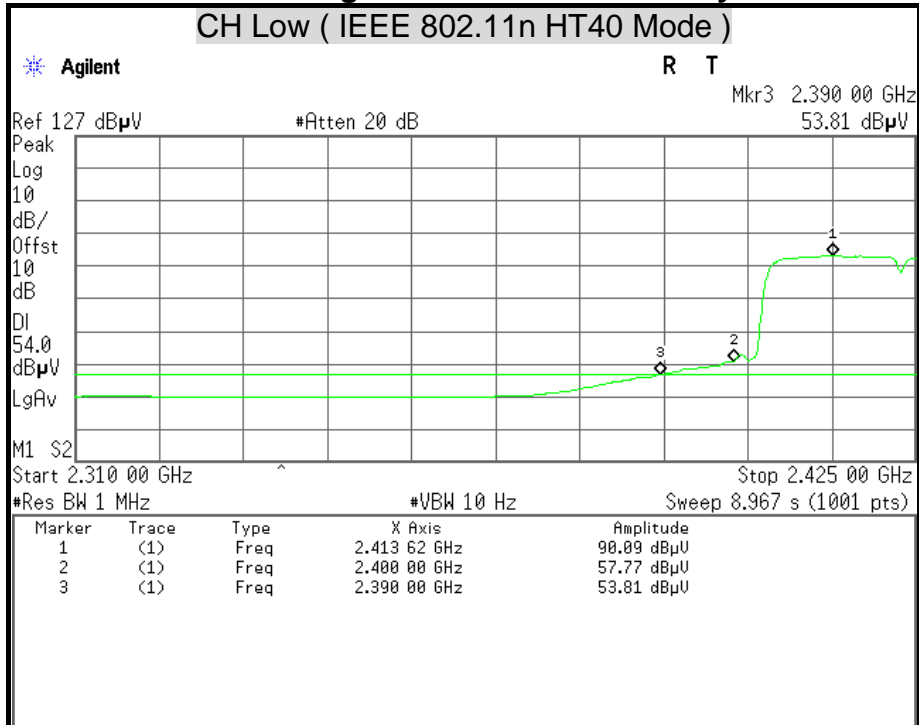
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

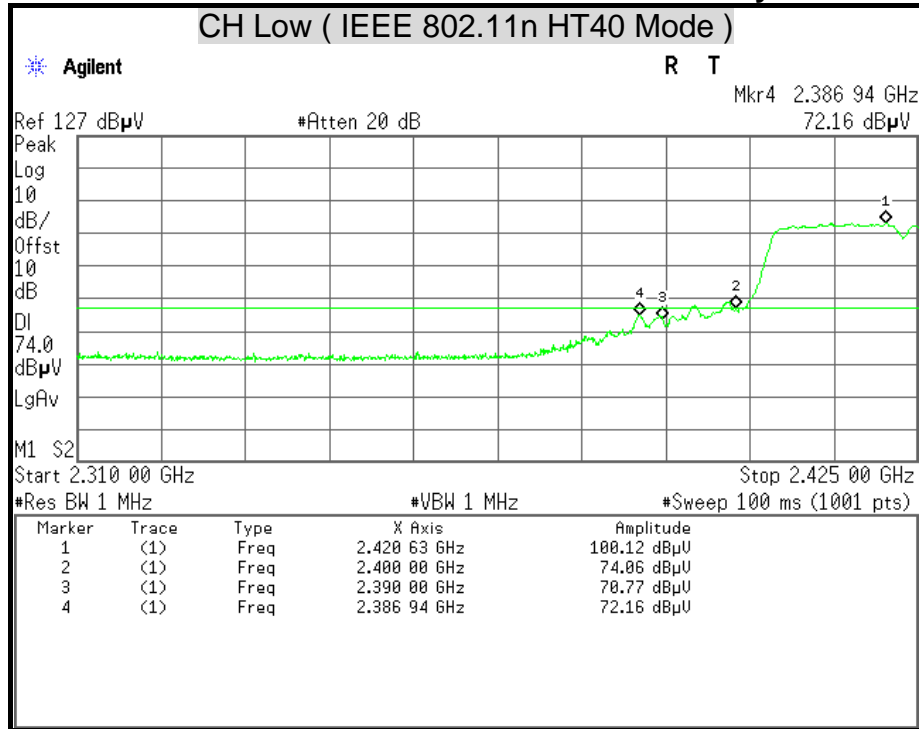
Polarity : Horizontal





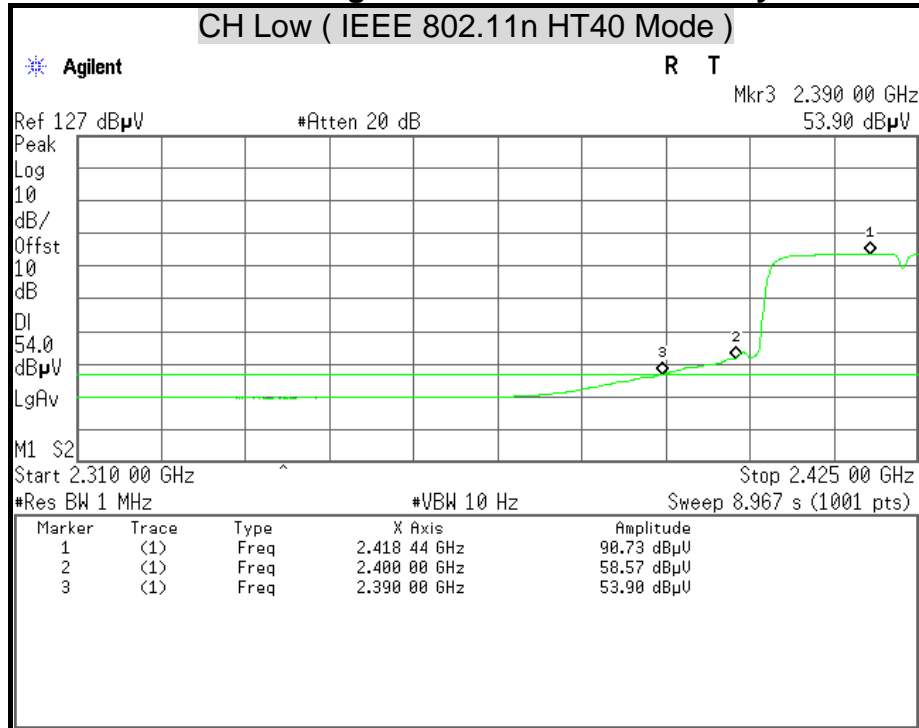
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

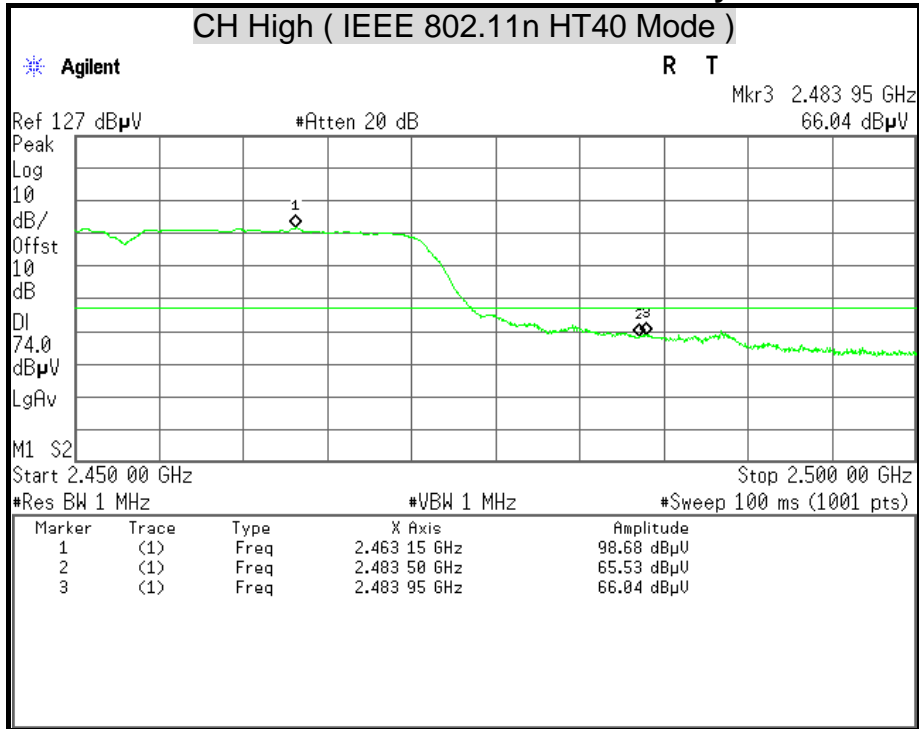
Polarity : Vertical





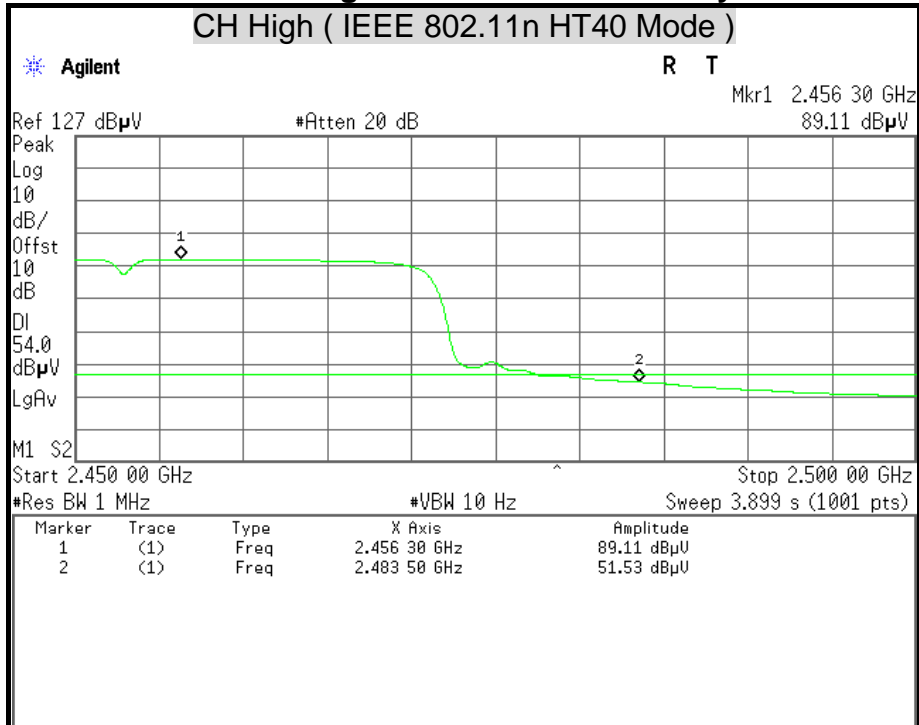
Detector Mode : Peak

Polarity : Horizontal



Detector Mode : Average

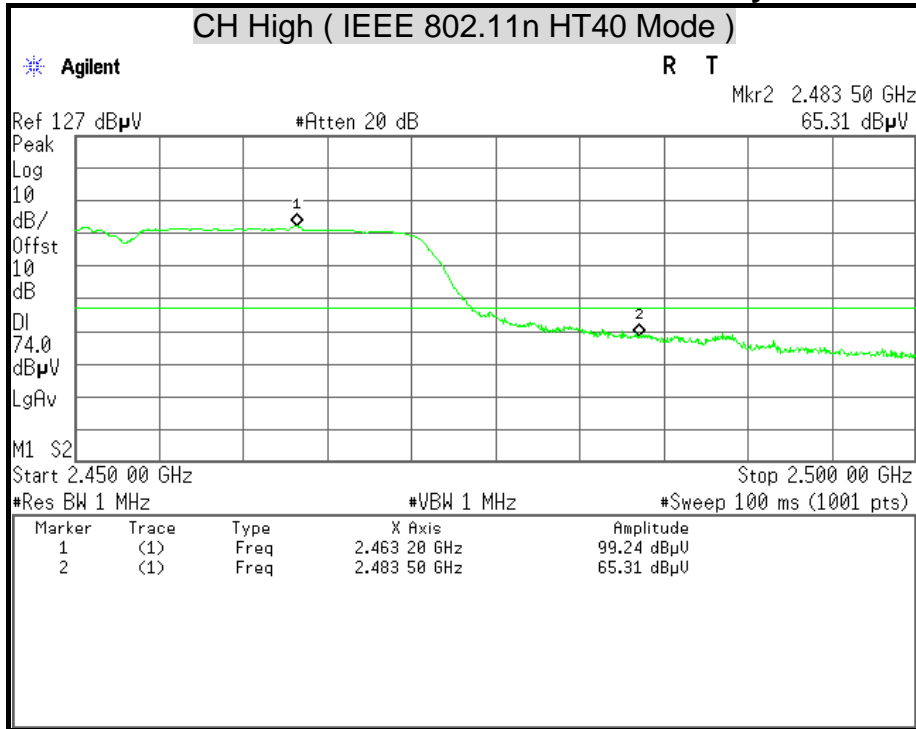
Polarity : Horizontal





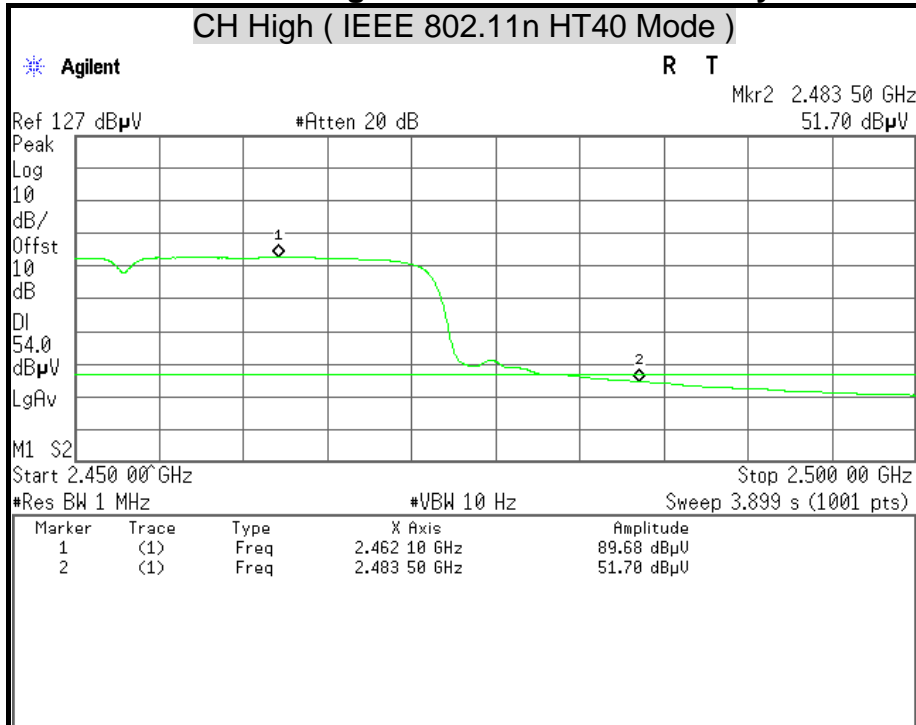
Detector Mode : Peak

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

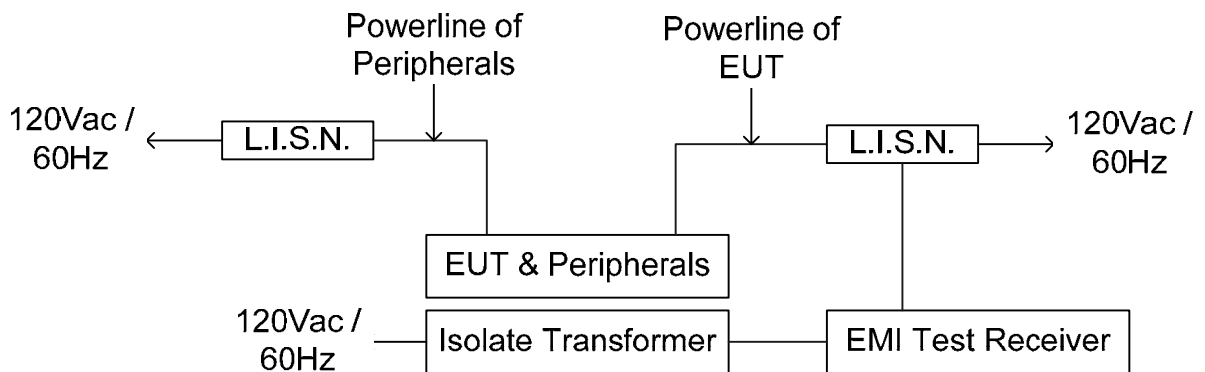
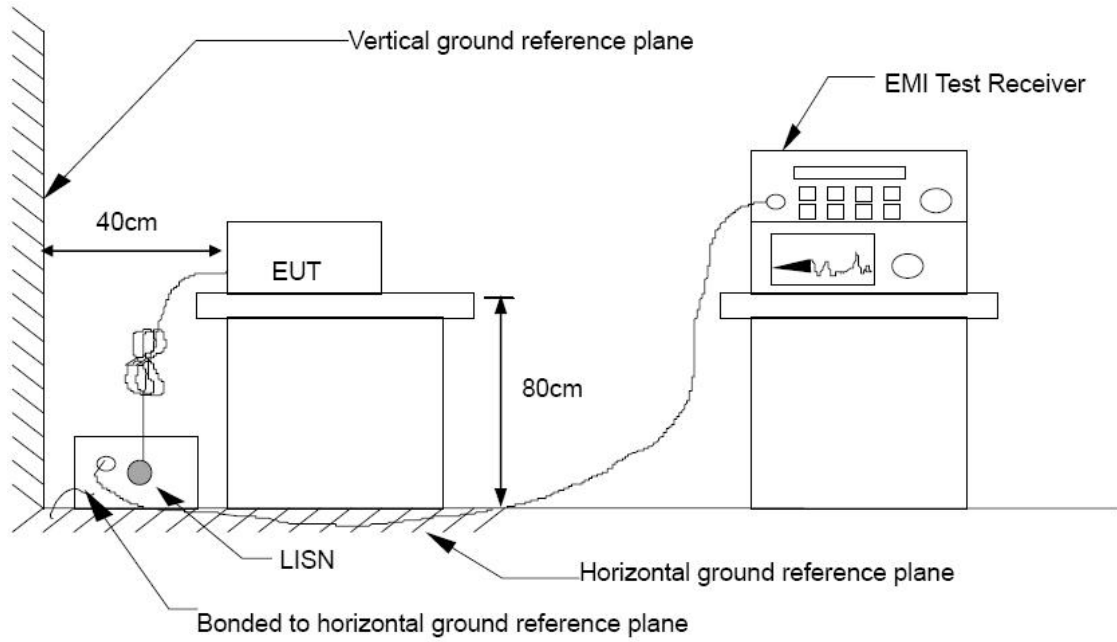
TEST EQUIPMENT

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.

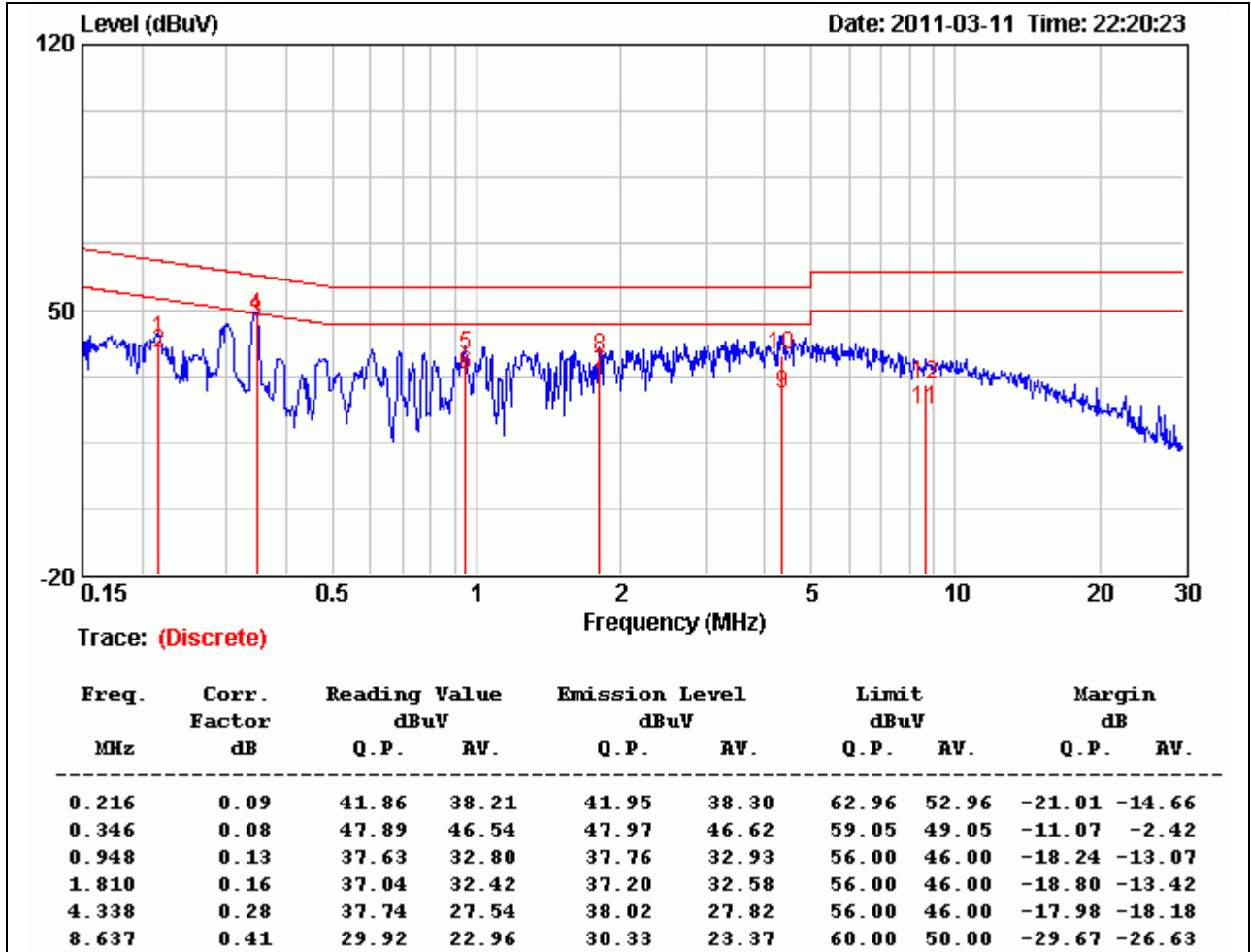
The EUT was located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8 m. Where a mains flexible cord was provided by the manufacturer shall be 1 m long, or if in excess of 1 m, the excess cable was folded back and forth as far as possible so as to form a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



TEST RESULTS

Product Name	Wireless IP CAM	Test By	Rueyyan Lin
Model	IP1050	Test Date	2010/03/11
Test Mode	Normal operating	Temp. & Humidity	23°C, 53%

LINE



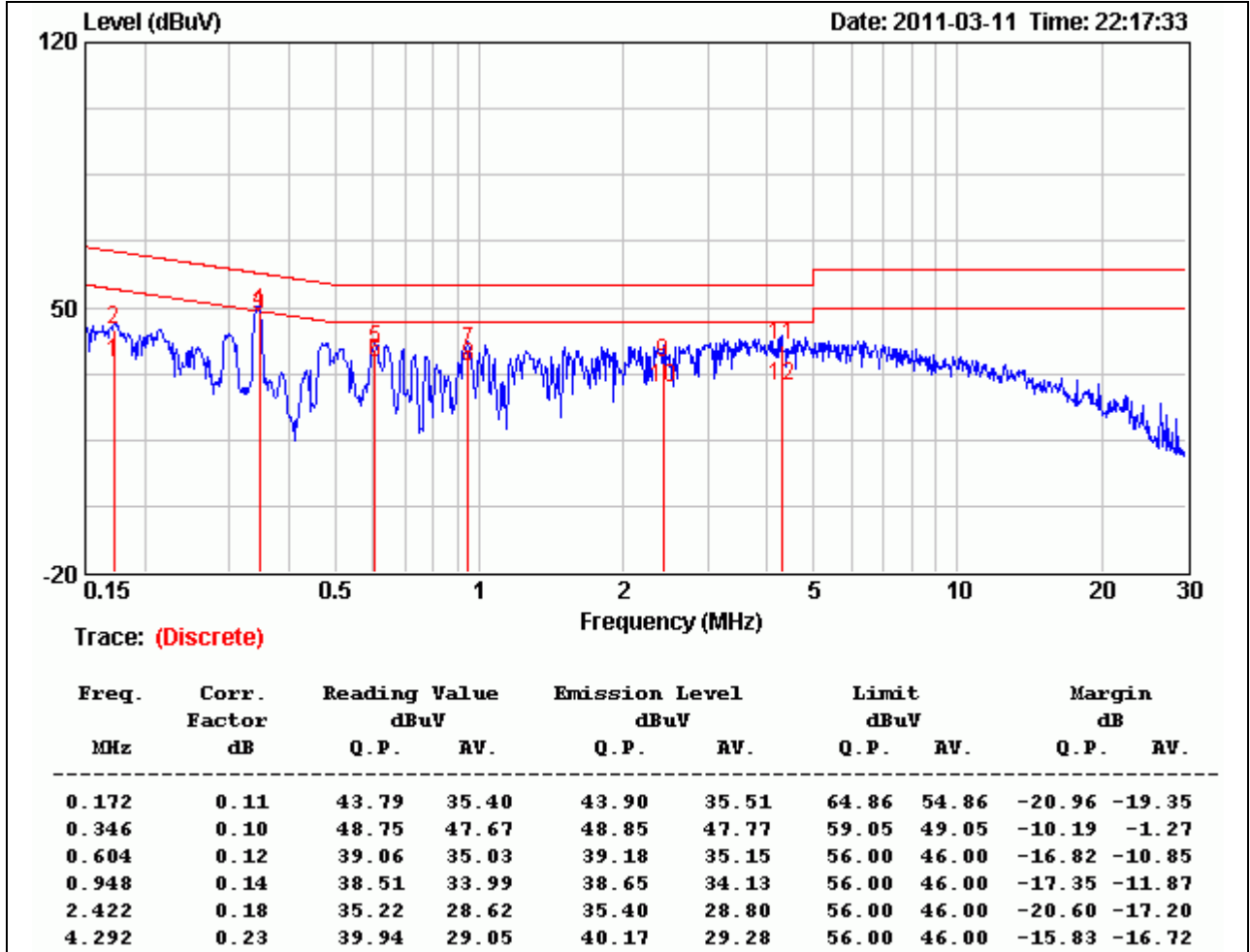
Remark:

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	Rueyyan Lin
Model	IP1050	Test Date	2010/03/11
Test Mode	Normal operating	Temp. & Humidity	23°C, 53%

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	1.71	20.0	17.02	1.48	1.00	0.014850
IEEE 802.11g	1.71	20.0	17.75	1.48	1.00	0.017568
IEEE 802.11n HT20	1.71	20.0	18.12	1.48	1.00	0.019130
IEEE 802.11n HT40	1.71	20.0	17.96	1.48	1.00	0.018438

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.