FCC 47 CFR PART 15 SUBPART C AND ANSI C63.10:2013 TEST REPORT

For

MT7620 WIFI Module

Model : IWM-7620

Trade Name : ORing

Issued for

ORing Industrial Networking Corp.

3F., No.542-2, Zhongzheng Rd., Xindian Dist., New Taipei City 23148, Taiwan (R.O.C.)

Issued by

Compliance Certification Services Inc.
Hsinchu Lab.
No.989-1, Wenshan Rd., Shangshan Village,
Qionglin Township, Hsinchu County 30741, Taiwan (R.O.C.)
TEL: +886-3-5921698
FAX: +886-3-5921108

http://www.ccsrf.com
E-Mail : service@ccsrf.com

Issued Date: August 31, 2015

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	08/31/2015	Initial Issue	All Page 120	Michelle Chiu

TABLE OF CONTENTS

TITLE PAGE NO.

1. TEST REPORT CERTIFICATION

Applicant	：	ORing Industrial Networking Corp.
Address	：	3F., No.542-2, Zhongzheng Rd., Xindian Dist., New Taipei City 23148, Taiwan (R.O.C.)
Equipment Under Test	：	MT7620 WIFI Module
Model	：	IWM-7620
Trade Name	：	ORing
Tested Date	：	July 03 ~ August 04, 2015

APPLICABLE STANDARD	
Standard	**Test Result**
FCC Part 15 Subpart C AND ANSI C63.10:2013 & ANSI C63.4:2014	PASS

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

Approved by:

Sb. Lu
Sr. Engineer

Reviewed by:

Gundam Lin
Sr. Engineer

2. EUT DESCRIPTION

Product Name	MT7620 WIFI Module
Model Number	IWM-7620
Identify Number	T150703D01
Received Date	July 03, 2015
Frequency Range	IEEE 802.11b/g, 802.11gn HT20 : 2412MHz ~ 2462MHz IEEE 802.11gn HT40 : 2422MHz ~ 2452MHz
Transmit Power	IEEE 802.11b : 23.54 dBm (0.2259 W) IEEE 802.11g : 26.36 dBm (0.4325 W) IEEE 802.11gn HT20 : 25.66 dBm (0.3681 W) IEEE 802.11gn HT40 : 24.00 dBm (0.2512 W)
Channel Spacing	IEEE 802.11b/g, 802.11gn HT20/HT40 : 5MHz
Channel Number	IEEE 802.11b/g, 802.11gn HT20 : 11 Channels IEEE 802.11gn HT40 : 7 Channels
Transmit Data Rate	IEEE 802.11b : up to 11 Mbps IEEE 802.11g : up to 54 Mbps IEEE 802.11gn (HT20,800ns GI) : up to 130 Mbps IEEE 802.11gn (HT20,400ns GI) : up to 144.4 Mbps IEEE 802.11gn (HT40,800ns GI) : up to 270 Mbps IEEE 802.11gn (HT40,400ns GI) : up to 300 Mbps
Type of Modulation	IEEE 802.11b : DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g : OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11gn HT20/40 : OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Type	Dipole Antenna × 2 : Antenna 0 / Chain 0, Antenna Gain: 4dBi Antenna 1 / Chain 1, Antenna Gain : 4dBi Dipole Antenna × 2 : Antenna 0 / Chain 0, Antenna Gain: 3dBi Antenna 1 / Chain 1, Antenna Gain : 3dBi Dipole Antenna × 2 : Antenna 0 / Chain 0, Antenna Gain: 2dBi Antenna 1 / Chain 1, Antenna Gain : 2dBi
Power Rating	3.3Vdc
Test Voltage	120Vac, 60Hz

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: WHD-IWM-7620 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 MT7620 WIFI Module form factor.

For IEEE 802.11b/g, 802.11gn HT20/HT40 mode (2TX / 2RX) :

Ant. 0 / Chain 1 & Ant. 1 / Chain 1 transmit/receive.

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

Antenna List	Worst-case
Dipole Antenna × 2, Antenna Gain : 4 dBi	V
Dipole Antenna × 2, Antenna Gain : 3 dBi	
Dipole Antenna × 2, Antenna Gain : 2 dBi	

Conducted Emission / Radiated Emission Test (Below 1 GHz)

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

No.	Pre-Test Mode
1	TX Mode

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

Final Test Mode		
Emission	Radiated Emission	Mode 1
	Conducted Emission	Mode 1

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

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

Remark : *The field strength of spurious emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X, Y axis). The worst emission was found in stand-up position(Z axis) and the worst case was recorded.*

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and ANSI C63.4: 2014 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, Wenshan Rd., Shangshan Village,
Qionglin Township, Hsinchu County 30741, Taiwan (R.O.C.)

The sites are constructed in conformance with the requirements of ANSI C63.10:2013 and ANSI C63.4: 2014 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

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

Canada	INDUSTRY CANADA
Japan	VCCI
Taiwan	BSMI
USA	FCC MRA

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

Remark: *FCC Designation Number TW1027.*

5.3 MEASUREMENT UNCERTAINTY

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

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

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

Consistent with industry standard (e.g. CISPR 22, 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.
1	Notebook PC	HP	ProBook 4421s	CNF03242PJ

Power Adapter :

No.	Manufacturer	Model No.	Power Input	Power Output
1	AOEM	ADS0248-W 120200	100-240Vac, 50-60Hz, 0.6A	12Vdc, 2.0A

No.	Signal Cable Description
1	Non-shielded RJ-45 cable, 12m × 1
2	Non-shielded DC cable, 0.25m × 1

SETUP DIAGRAM FOR TESTS

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

EUT OPERATING CONDITION

1. EUT & peripherals setup diagram is shown in appendix setup photos.
2. TX Mode:
   - ⇨ **Tx Data Rate:** 1Mbps Bandwidth 20 (IEEE 802.11b mode)
     6Mbps Bandwidth 20 (IEEE 802.11g mode)
     6.5Mbps Bandwidth 20 (IEEE 802.11gn HT20 mode)
     13.5Mbps Bandwidth 40 (IEEE 802.11gn HT40 mode)
   - ⇨ **Power control**
     IEEE 802.11b Channel Low (2412MHz) Chain 1/2 Power set 15/15
     IEEE 802.11b Channel Mid (2437MHz) Chain 1/2 Power set 14/14
     IEEE 802.11b Channel High (2462MHz) Chain 1/2 Power set 14/14
     IEEE 802.11g Channel Low (2412MHz) Chain 1/2 Power set 8/8
     IEEE 802.11g Channel Mid (2437MHz) Chain 1/2 Power set 10/10
     IEEE 802.11g Channel High (2462MHz) Chain 1/2 Power set 7/7
     IEEE 802.11gn HT20 Channel Low (2412MHz) Chain 1/2 Power set 5/5
     IEEE 802.11gn HT20 Channel Mid (2437MHz) Chain 1/2 Power set 8/8
     IEEE 802.11gn HT20 Channel High (2462MHz) Chain 1/2 Power set 5/5
     IEEE 802.11gn HT40 Channel Low (2422MHz) Chain 1/2 Power set 1/1
     IEEE 802.11gn HT40 Channel Mid (2437MHz) Chain 1/2 Power set 5/5
     IEEE 802.11gn HT40 Channel High (2452MHz) Chain 1/2 Power set 2/2
3. All of the functions are under run.
4. Start test.

7. FCC PART 15.247 REQUIREMENTS

7.1 6dB BANDWIDTH

LIMITS

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

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/04/2016

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

TEST SETUP

TEST PROCEDURE

1. The transmitter output was connected to a spectrum analyzer.
2. Set RBW = 100 kHz.
3. Set the video bandwidth (VBW) ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

TEST RESULTS

IEEE 802.11b Mode (Two TX)

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Pass / Fail
		Chain 0	Chain 1		
Low	2412	10.045	10.050	500	PASS
Middle	2437	10.050	10.050	500	PASS
High	2462	10.035	10.060	500	PASS

IEEE 802.11g Mode (Two TX)

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Pass / Fail
		Chain 0	Chain 1		
Low	2412	16.575	16.590	500	PASS
Middle	2437	16.570	16.570	500	PASS
High	2462	16.565	16.580	500	PASS

IEEE 802.11gn HT20 Mode (Two TX)

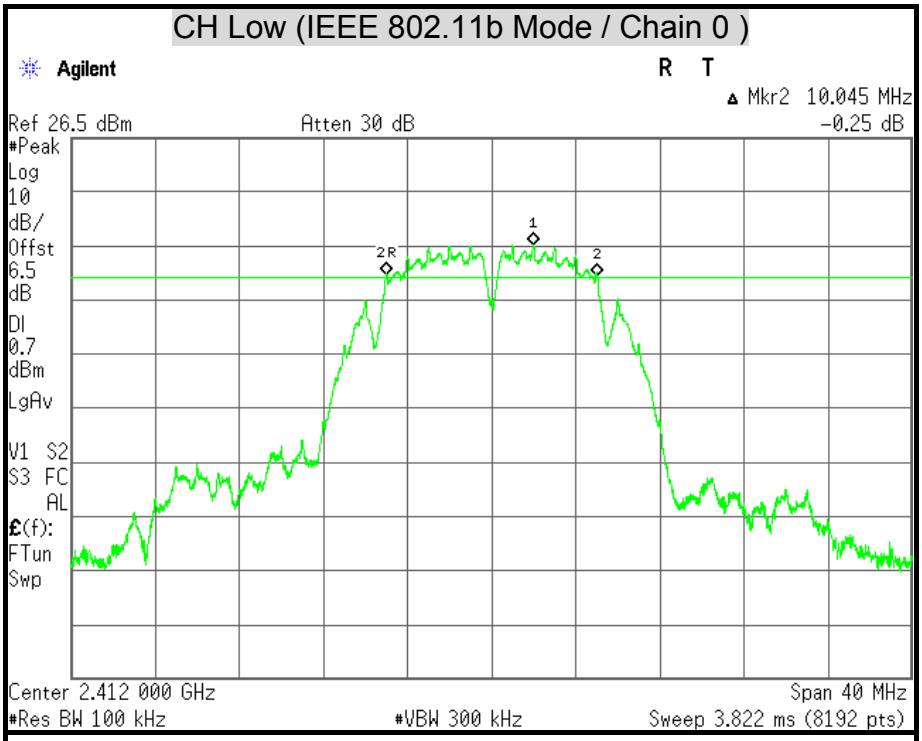
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Pass / Fail
		Chain 0	Chain 1		
Low	2412	17.680	17.665	500	PASS
Middle	2437	17.675	17.650	500	PASS
High	2462	17.670	18.345	500	PASS

IEEE 802.11gn HT40 Mode (Two TX)

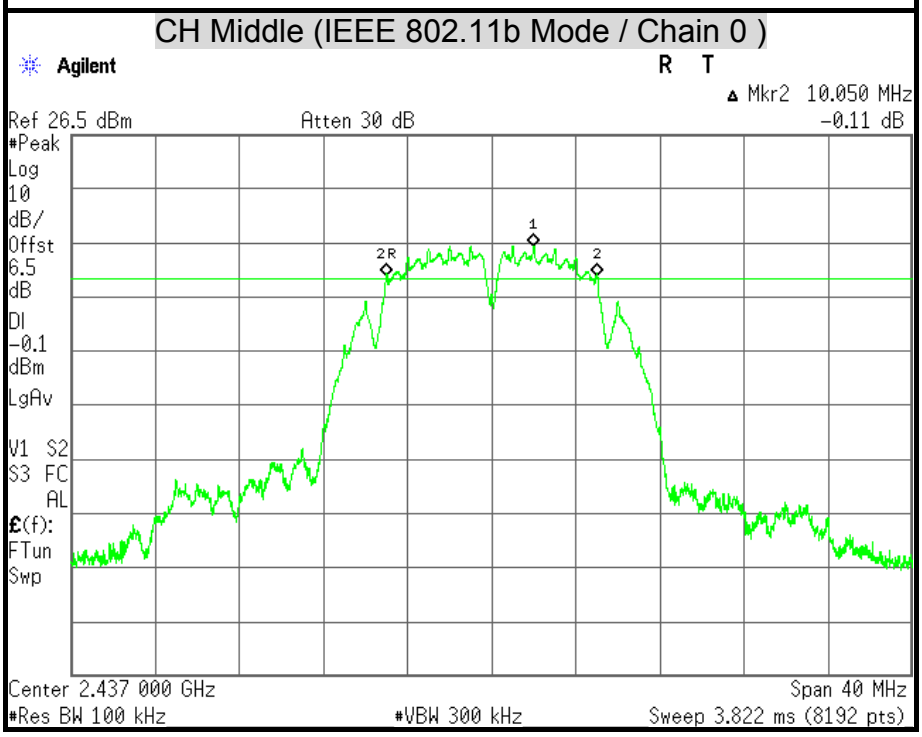
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Pass / Fail
		Chain 0	Chain 1		
Low	2422	36.510	37.500	500	PASS
Middle	2437	36.540	37.490	500	PASS
High	2452	36.510	37.510	500	PASS

6dB BANDWIDTH

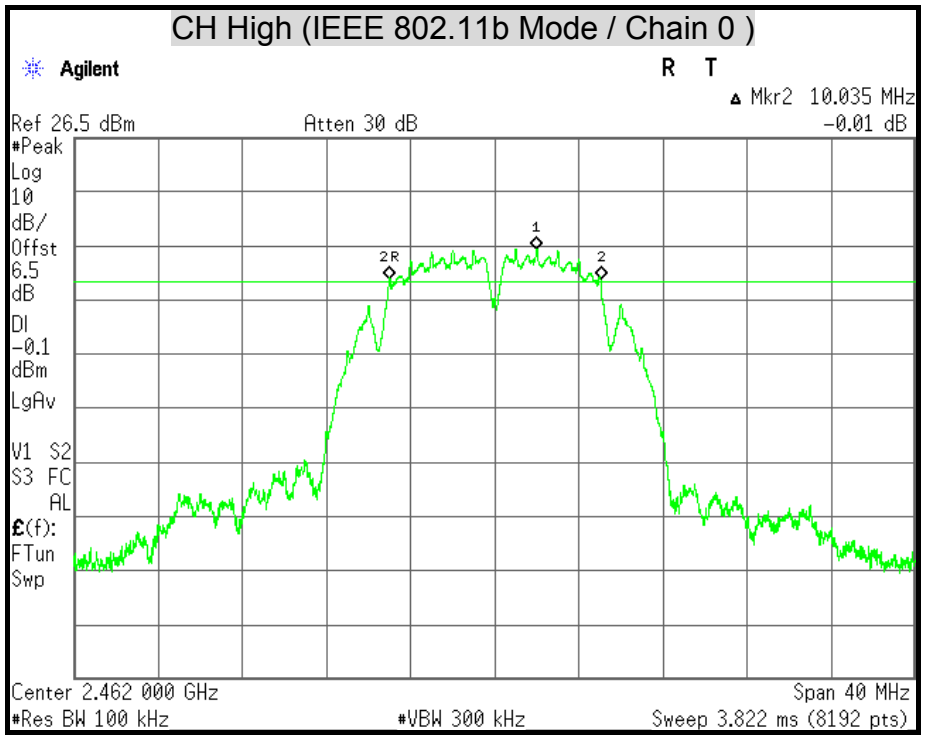
CH Low (IEEE 802.11b Mode / Chain 0)



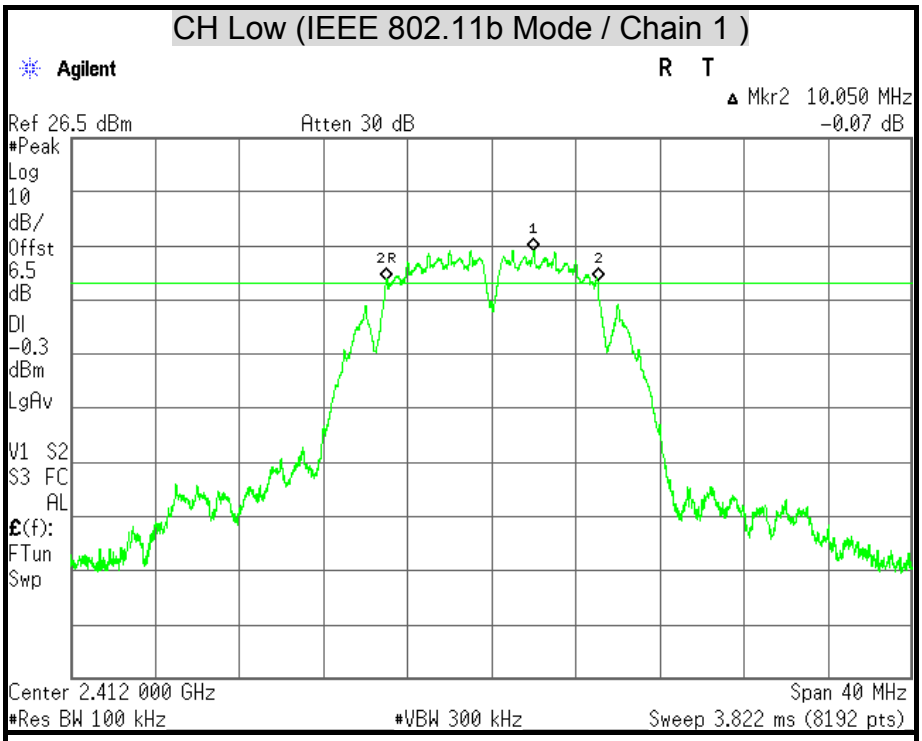
CH Middle (IEEE 802.11b Mode / Chain 0)



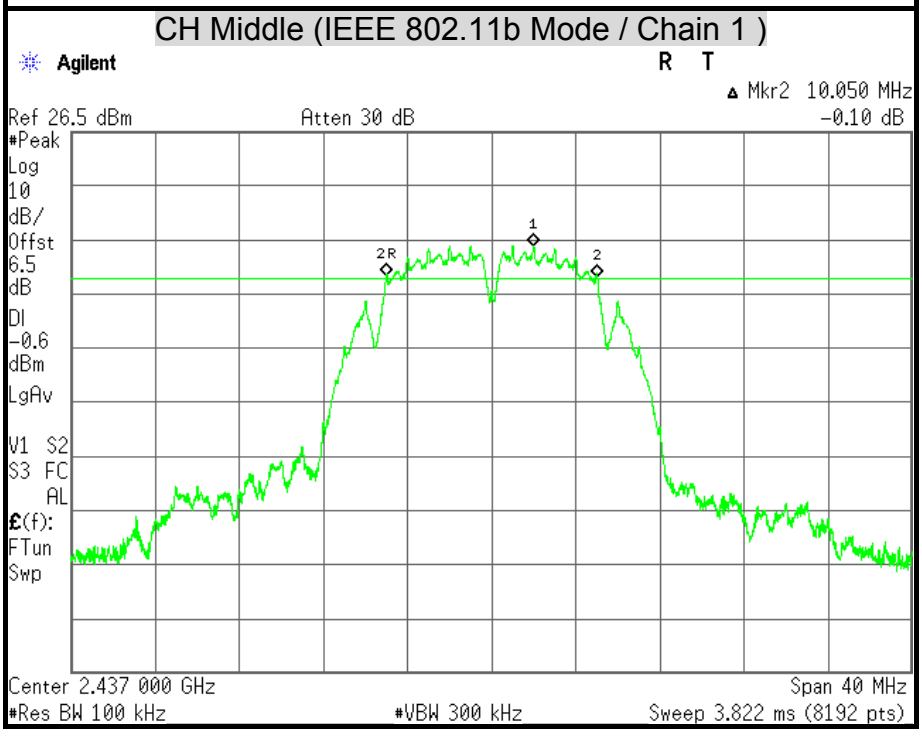
CH High (IEEE 802.11b Mode / Chain 0)



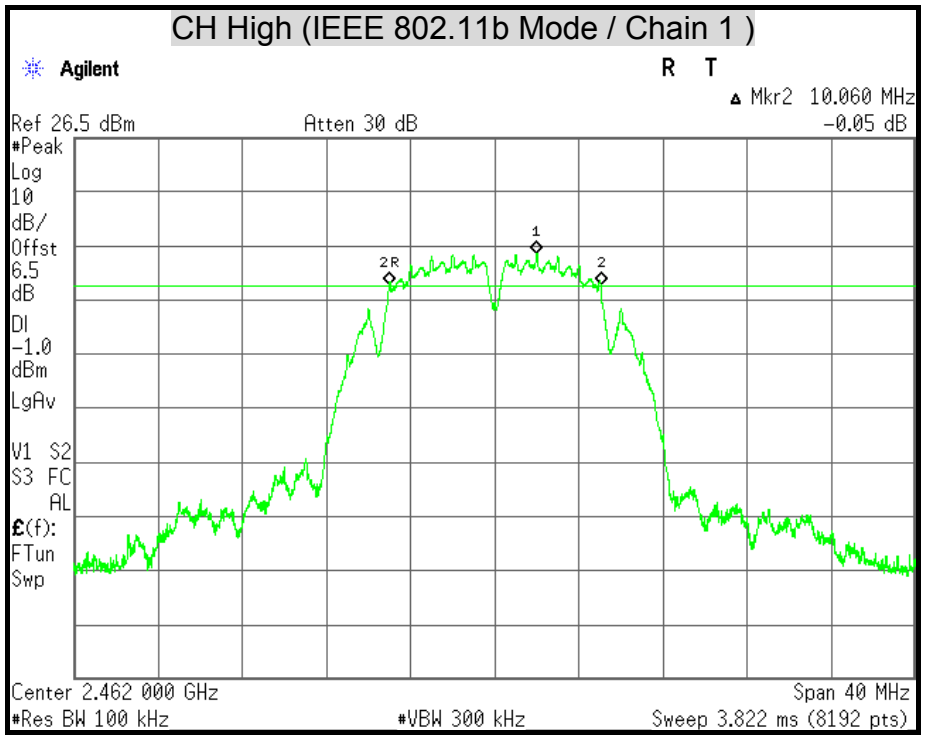
CH Low (IEEE 802.11b Mode / Chain 1)



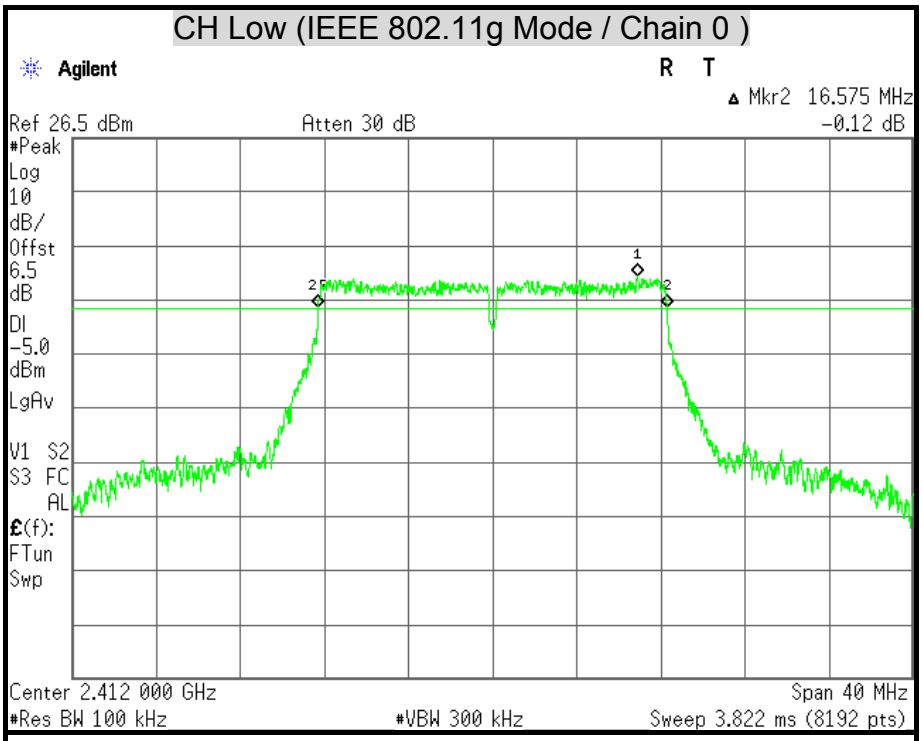
CH Middle (IEEE 802.11b Mode / Chain 1)



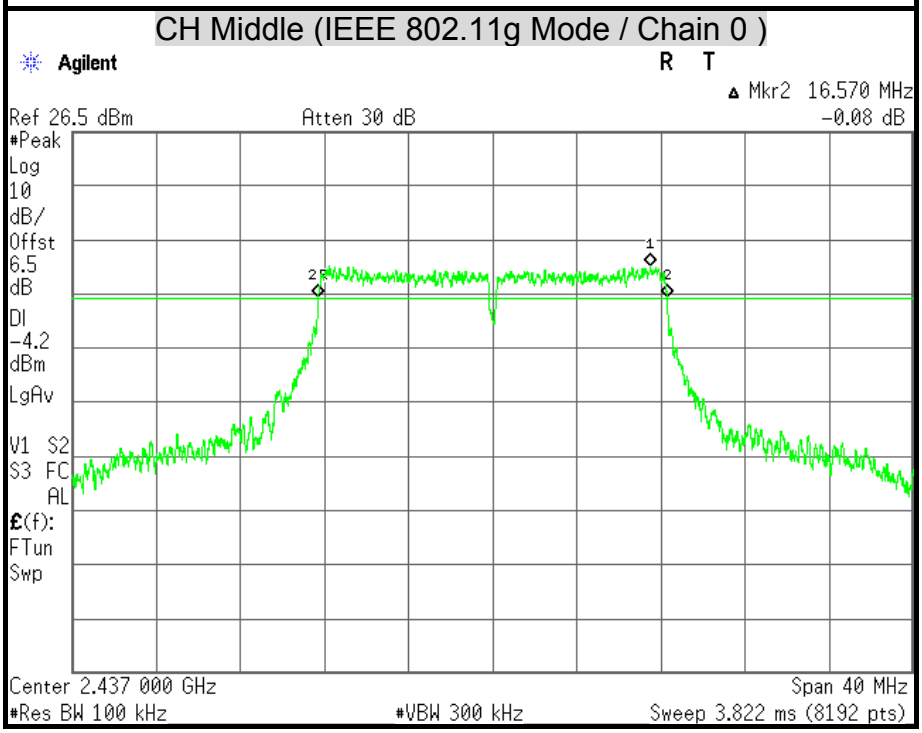
CH High (IEEE 802.11b Mode / Chain 1)



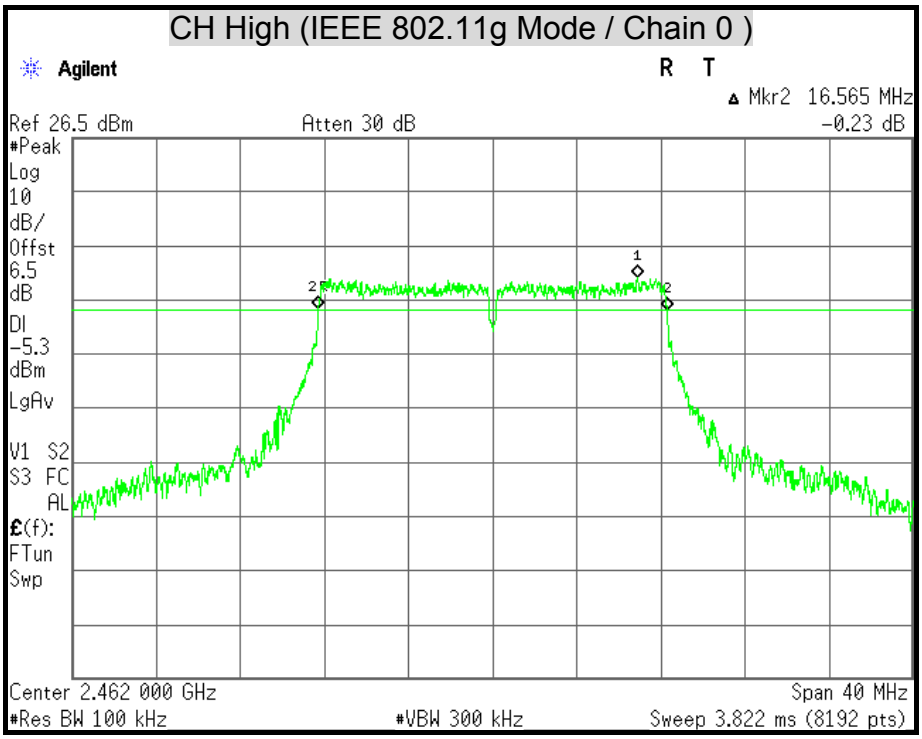
CH Low (IEEE 802.11g Mode / Chain 0)



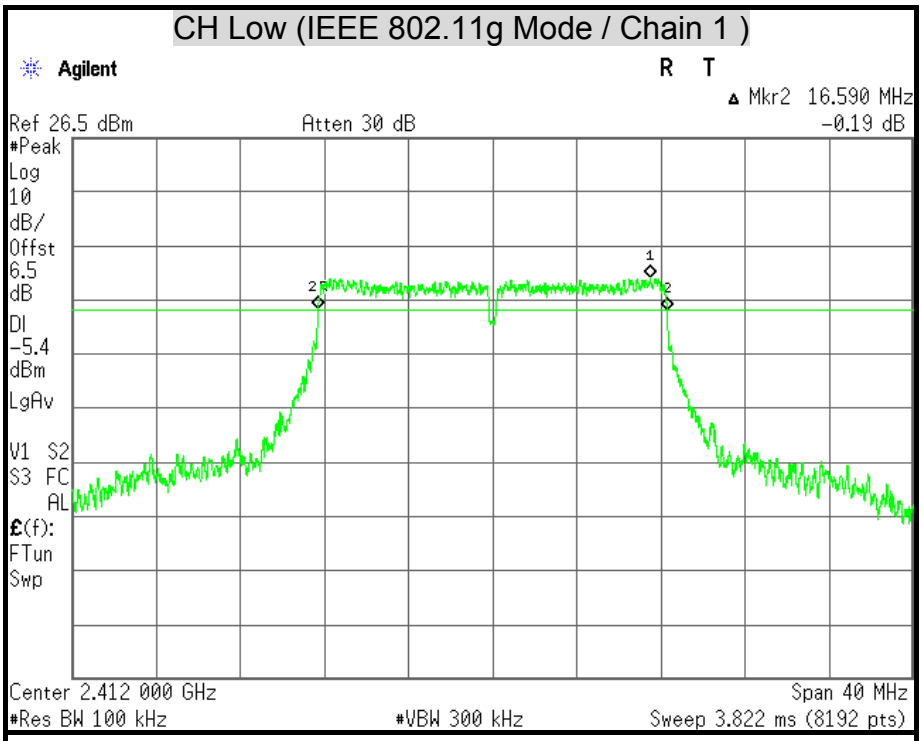
CH Middle (IEEE 802.11g Mode / Chain 0)



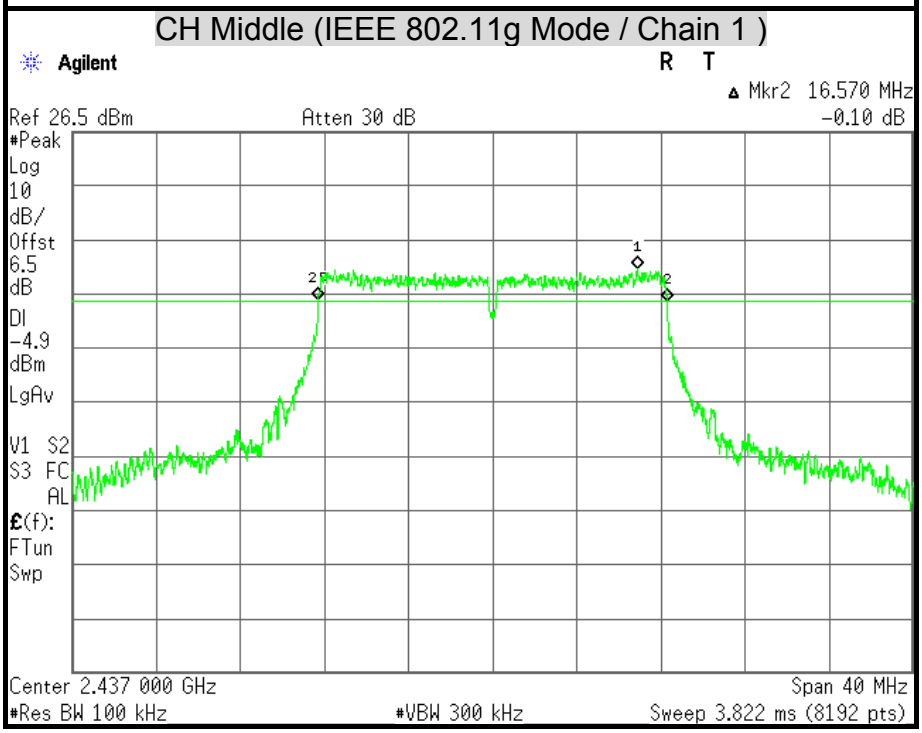
CH High (IEEE 802.11g Mode / Chain 0)



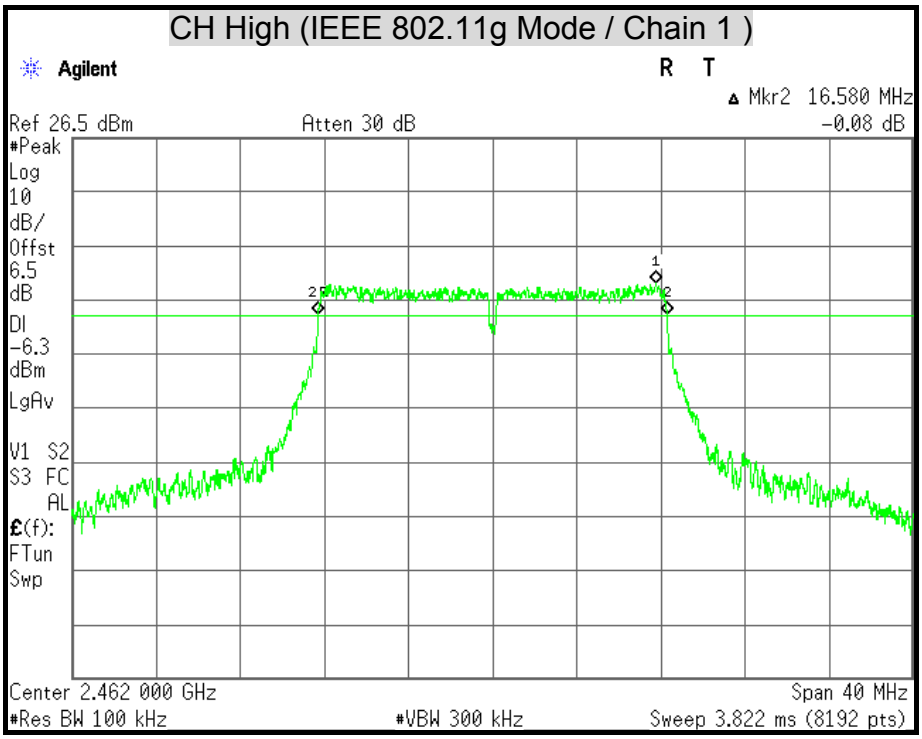
CH Low (IEEE 802.11g Mode / Chain 1)



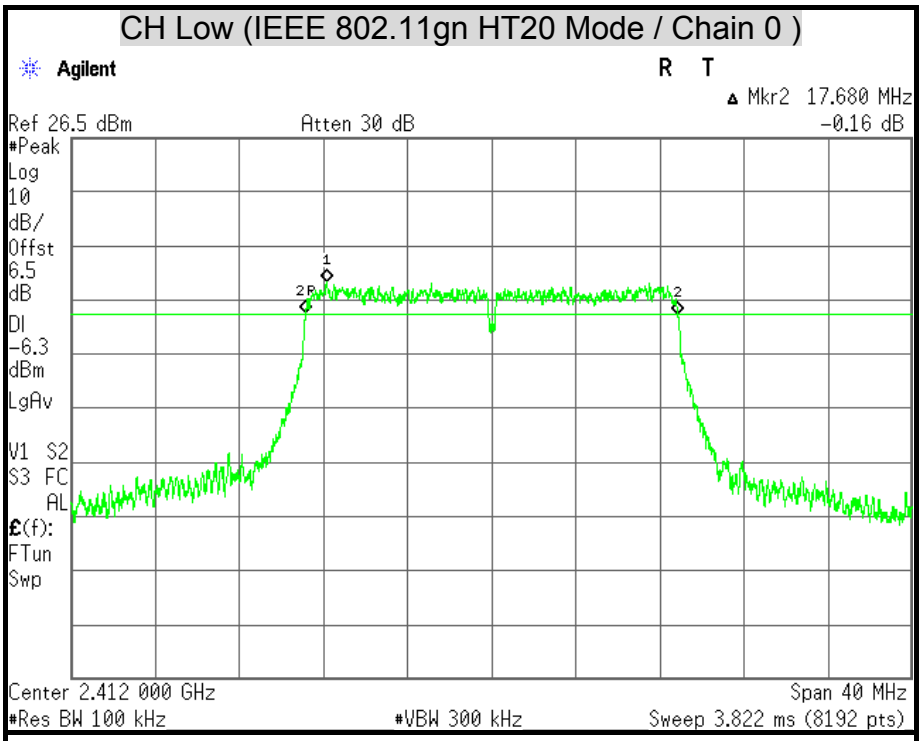
CH Middle (IEEE 802.11g Mode / Chain 1)



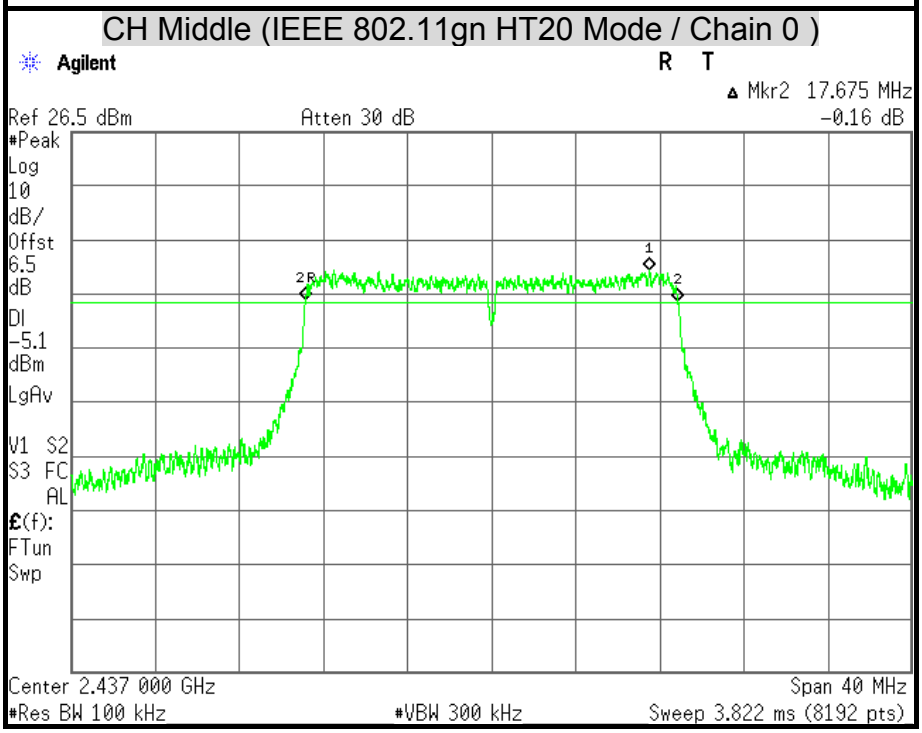
CH High (IEEE 802.11g Mode / Chain 1)



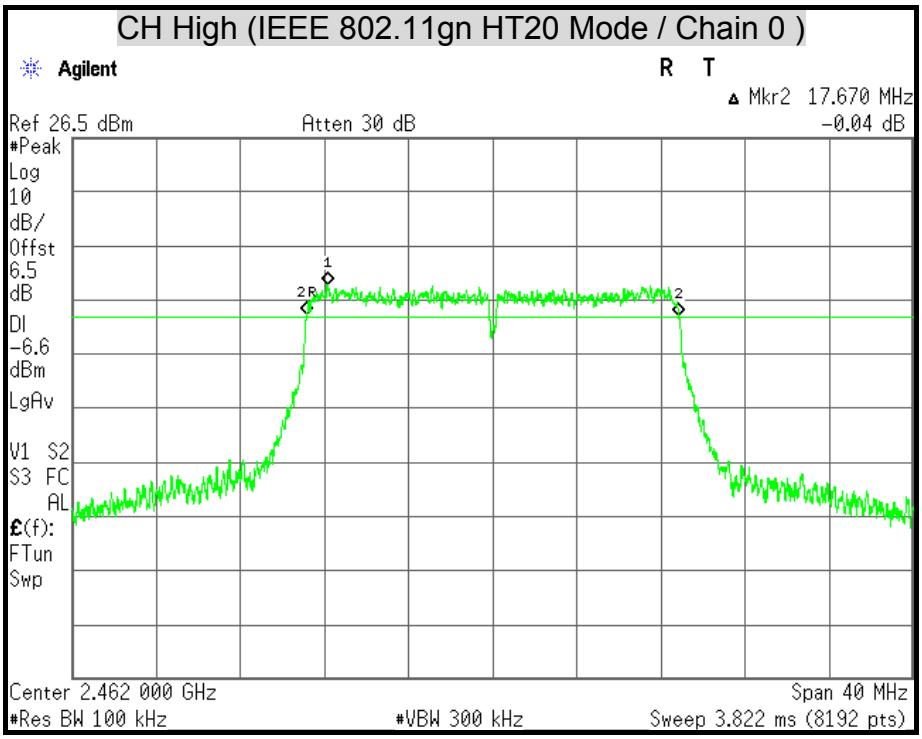
CH Low (IEEE 802.11gn HT20 Mode / Chain 0)



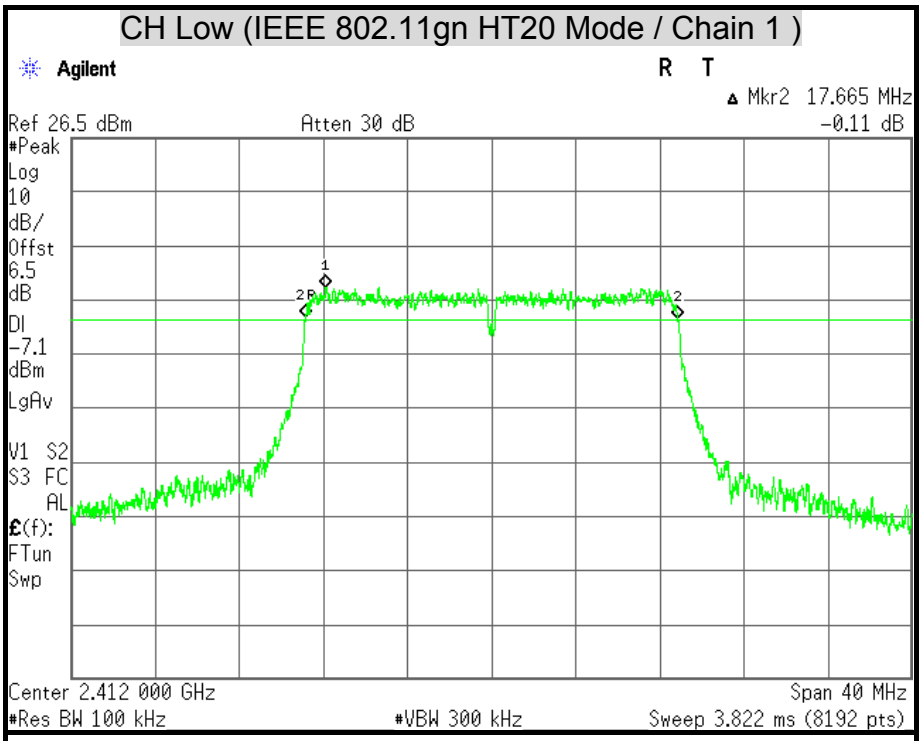
CH Middle (IEEE 802.11gn HT20 Mode / Chain 0)



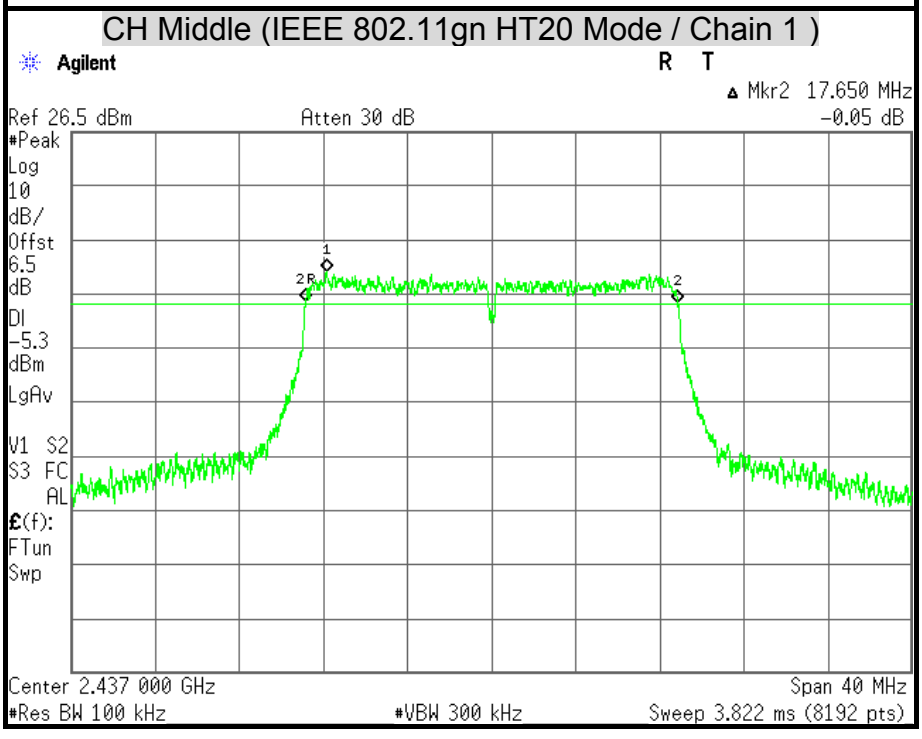
CH High (IEEE 802.11gn HT20 Mode / Chain 0)



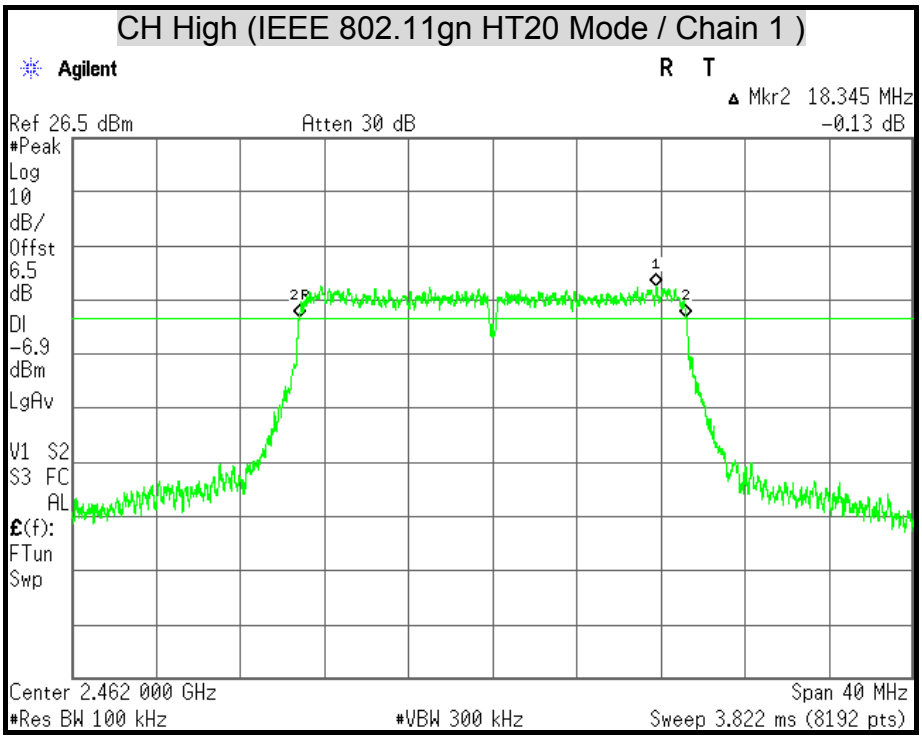
CH Low (IEEE 802.11gn HT20 Mode / Chain 1)



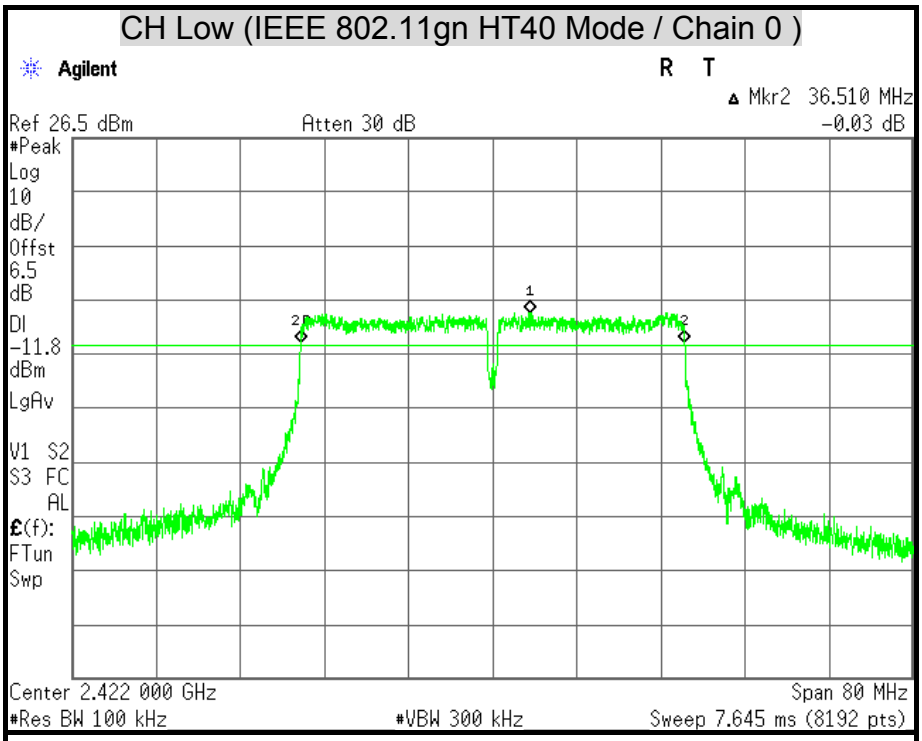
CH Middle (IEEE 802.11gn HT20 Mode / Chain 1)



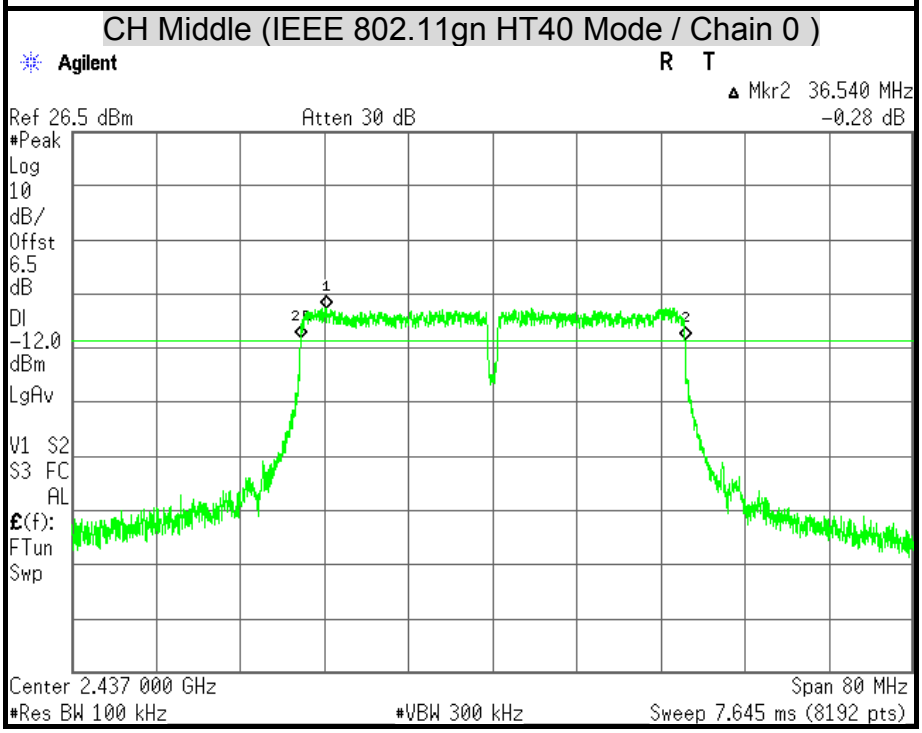
CH High (IEEE 802.11gn HT20 Mode / Chain 1)



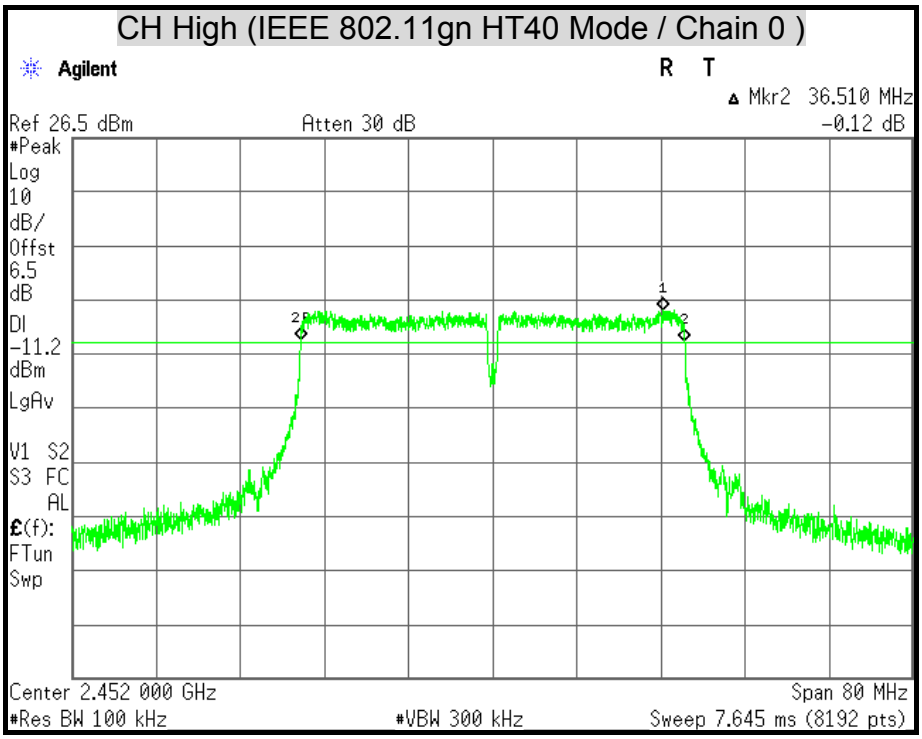
CH Low (IEEE 802.11gn HT40 Mode / Chain 0)



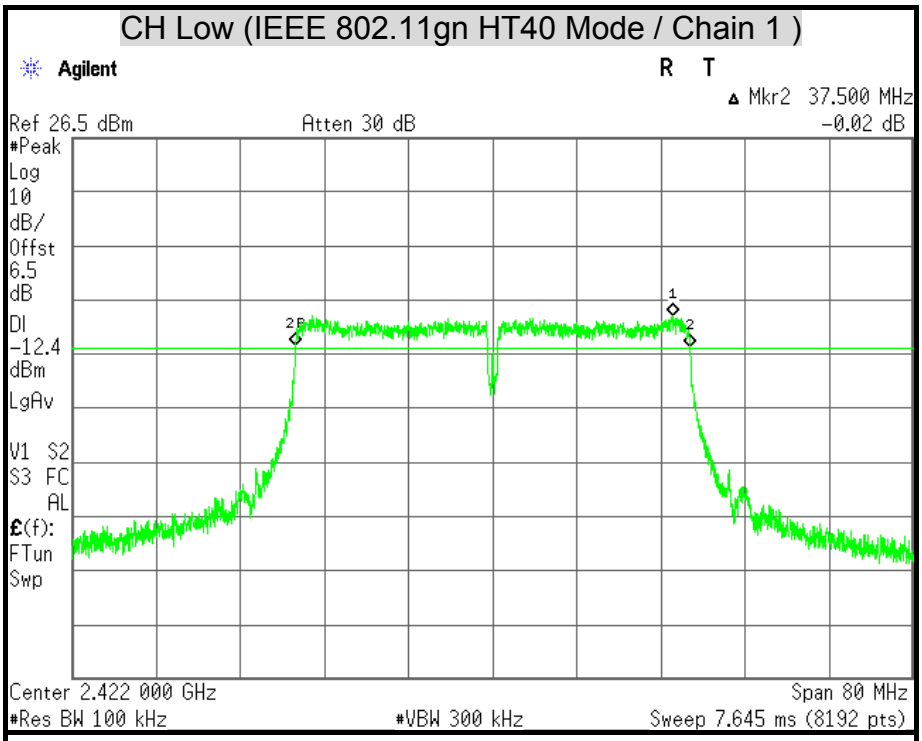
CH Middle (IEEE 802.11gn HT40 Mode / Chain 0)



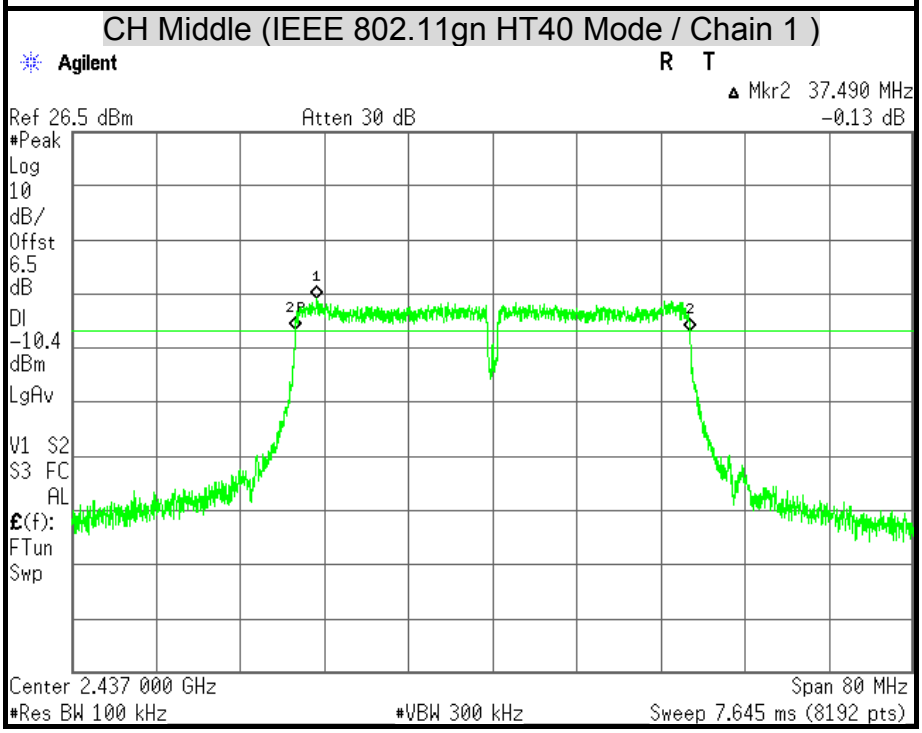
CH High (IEEE 802.11gn HT40 Mode / Chain 0)



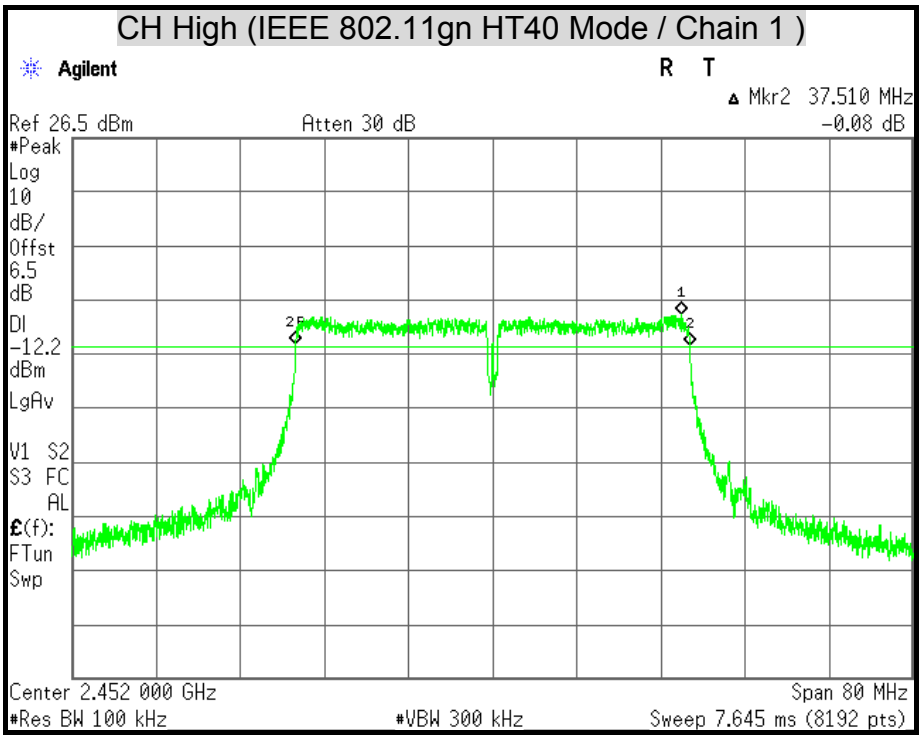
CH Low (IEEE 802.11gn HT40 Mode / Chain 1)



CH Middle (IEEE 802.11gn HT40 Mode / Chain 1)



CH High (IEEE 802.11gn HT40 Mode / Chain 1)



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.

§ KDB 662911 : For power measurements on IEEE 802.11 devices

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

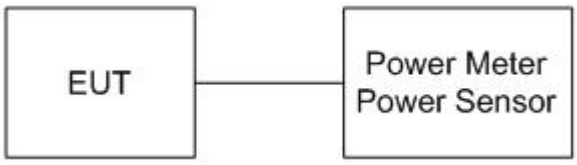
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	Anritsu	ML2495A	1149001	12/11/2015
Power Sensor	Anritsu	MA2411B	1126148	12/11/2015

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

TEST SETUP



TEST PROCEDURE

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

TEST RESULTS

IEEE 802.11b Mode (Two TX)

Channel	Channel Frequency (MHz)	Peak Power (dBm)		Peak Power Total		Peak Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	2412	20.85	20.18	23.54	0.2259	30	1	PASS
Middle	2437	20.72	19.90	23.34	0.2158	30	1	PASS
High	2462	20.30	19.82	23.08	0.2032	30	1	PASS

Remark:

1. *At finial test to get the worst-case emission at 1Mbps.*
2. *The cable assembly insertion loss of 6.5dB (including 6 dB pad and 0.5 dB cable) was Entered as an offset in the power meter to allow for direct reading of power.*
3. *Array gain = 0 dB for $N_{ANT} \leq 4$, power limit do not reduce.*
4. *Total peak power = Chain 0 + Chain 1.*

IEEE 802.11g Mode (Two TX)

Channel	Channel Frequency (MHz)	Peak Power (dBm)		Peak Power Total		Peak Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	2412	23.06	22.36	25.73	0.3741	30	1	PASS
Middle	2437	23.68	22.99	26.36	0.4325	30	1	PASS
High	2462	22.67	21.83	25.28	0.3373	30	1	PASS

Remark:

1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 6.5dB (including 6 dB pad and 0.5 dB cable) was Entered as an offset in the power meter to allow for direct reading of power.*
3. *Array gain = 0 dB for $N_{ANT} \leq 4$, power limit do not reduce.*
4. *Total peak power = Chain 0 + Chain 1.*

IEEE 802.11gn HT20 Mode (Two TX)

Channel	Channel Frequency (MHz)	Peak Power (dBm)		Peak Power Total		Peak Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	2412	22.13	21.30	24.75	0.2985	30	1	PASS
Middle	2437	22.93	22.35	25.66	0.3681	30	1	PASS
High	2462	21.90	21.14	24.55	0.2851	30	1	PASS

Remark:

1. *At finial test to get the worst-case emission at 6.5Mbps.*
2. *The cable assembly insertion loss of 6.5dB (including 6 dB pad and 0.5 dB cable) was Entered as an offset in the power meter to allow for direct reading of power.*
3. *Array gain = 0 dB for $N_{ANT} \leq 4$, power limit do not reduce.*
4. *Total peak power = Chain 0 + Chain 1.*

IEEE 802.11gn HT40 Mode (Two TX)

Channel	Channel Frequency (MHz)	Peak Power (dBm)		Peak Power Total		Peak Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	2422	19.81	19.05	22.46	0.1762	30	1	PASS
Middle	2437	21.38	20.57	24.00	0.2512	30	1	PASS
High	2452	20.11	19.48	22.82	0.1914	30	1	PASS

Remark:

1. *At finial test to get the worst-case emission at 13.5Mbps.*
2. *The cable assembly insertion loss of 6.5dB (including 6 dB pad and 0.5 dB cable) was Entered as an offset in the power meter to allow for direct reading of power.*
3. *Array gain = 0 dB for $N_{ANT} \leq 4$, power limit do not reduce.*
4. *Total peak power = Chain 0 + Chain 1.*

7.3 AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	ANRITSU	ML2495A	1149001	12/11/2015
Power Sensor	ANRITSU	MA2411B	1126148	12/11/2015

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

TEST SETUP

TEST PROCEDURE

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

TEST RESULTS

IEEE 802.11b Mode (Two TX)

Channel	Channel Frequency (MHz)	Average Power (dBm)	
		Chain 0	Chain 1
Low	2412	17.35	16.81
Middle	2437	17.16	16.39
High	2462	17.05	16.35

Remark:

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

2. The cable assembly insertion loss of 6.5dB (including 6 dB pad and 0.5 dB cable) was Entered as an offset in the power meter to allow for direct reading of power.

IEEE 802.11g Mode (Two TX)

Channel	Channel Frequency (MHz)	Average Power (dBm)	
		Chain 0	Chain 1
Low	2412	15.11	14.32
Middle	2437	16.30	15.49
High	2462	15.01	14.14

Remark:

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

2. The cable assembly insertion loss of 6.5dB (including 6 dB pad and 0.5 dB cable) was Entered as an offset in the power meter to allow for direct reading of power.

IEEE 802.11gn HT20 Mode (Two TX)

Channel	Channel Frequency (MHz)	Average Power (dBm)	
		Chain 0	Chain 1
Low	2412	14.20	13.38
Middle	2437	15.29	14.53
High	2462	13.94	13.11

Remark:

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

2. The cable assembly insertion loss of 6.5dB (including 6 dB pad and 0.5 dB cable) was Entered as an offset in the power meter to allow for direct reading of power.

IEEE 802.11gn HT40 Mode (Two TX)

Channel	Channel Frequency (MHz)	Average Power (dBm)	
		Chain 0	Chain 1
Low	2422	11.68	10.93
Middle	2437	13.40	12.60
High	2452	12.16	11.47

Remark:

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

2. The cable assembly insertion loss of 6.5dB (including 6 dB pad and 0.5 dB cable) was Entered as an offset in the power meter 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	06/04/2016

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

TEST SETUP

TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set analyzer center frequency to DTS channel center frequency.
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
5. Set the VBW ≥ 3 x RBW.
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum amplitude level within the RBW.
11. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST RESULTS

IEEE 802.11b Mode (Two TX)

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)		PSD Total (dBm)	Minimum Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
Low	2412	-12.20	-13.07	-9.60	5.99	PASS
Middle	2437	-12.74	-9.72	-7.96	5.99	PASS
High	2462	-12.74	-10.59	-8.52	5.99	PASS

Remark:

1. *At finial test to get the worst-case emission at 1Mbps.*
2. *The cable assembly insertion loss of 6.5dB (including 6 dB pad and 0.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The maximum antenna gain is 8.01 dBi which is more than 6dBi, the limit should be 5.99 dBm.*
4. *Total power spectral density = Chain 0 + Chain 1*

IEEE 802.11g Mode (Two TX)

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)		PSD Total (dBm)	Minimum Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
Low	2412	-13.29	-14.00	-10.62	5.99	PASS
Middle	2437	-12.58	-12.59	-9.57	5.99	PASS
High	2462	-14.05	-14.64	-11.32	5.99	PASS

Remark:

1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 6.5dB (including 6 dB pad and 0.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The maximum antenna gain is 8.01 dBi which is more than 6dBi, the limit should be 5.99 dBm.*
4. *Total power spectral density = Chain 0 + Chain 1*

IEEE 802.11gn HT20 Mode (Two TX)

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)		PSD Total (dBm)	Minimum Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
Low	2412	-14.12	-15.04	-11.55	5.99	PASS
Middle	2437	-13.20	-12.94	-10.06	5.99	PASS
High	2462	-13.93	-14.24	-11.07	5.99	PASS

Remark:

1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 6.5dB (including 6 dB pad and 0.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 8.01 dBi which is more than 6dBi, the limit should be 5.99 dBm.
4. Total power spectral density = Chain 0 + Chain 1
.

IEEE 802.11gn HT40 Mode (Two TX)

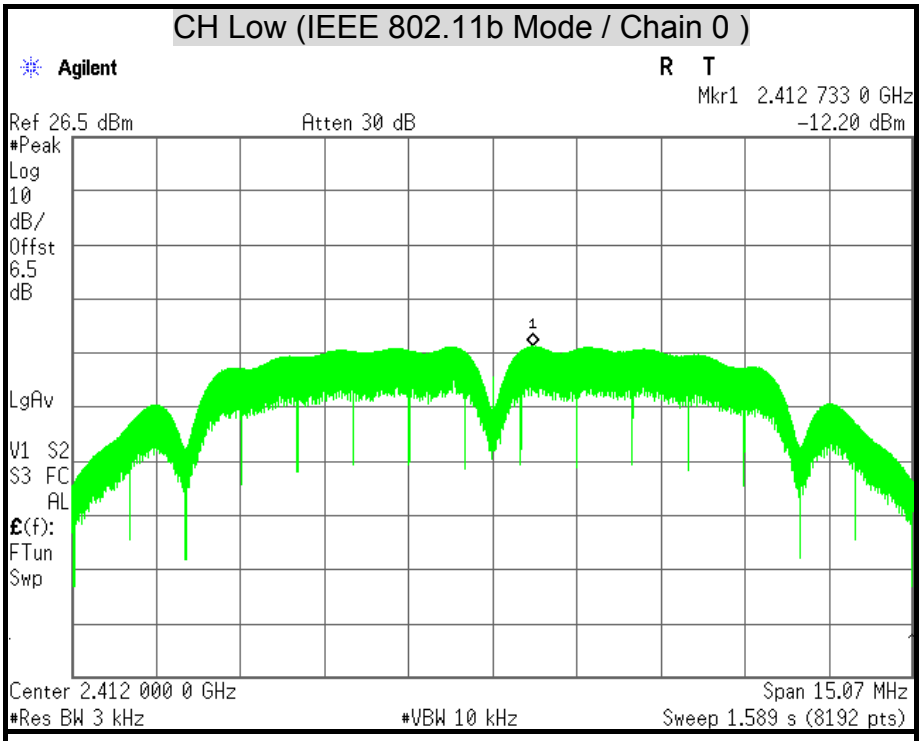
Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)		PSD Total (dBm)	Minimum Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
Low	2422	-19.35	-17.72	-15.45	5.99	PASS
Middle	2437	-17.80	-17.76	-14.77	5.99	PASS
High	2452	-18.37	-14.76	-13.19	5.99	PASS

Remark:

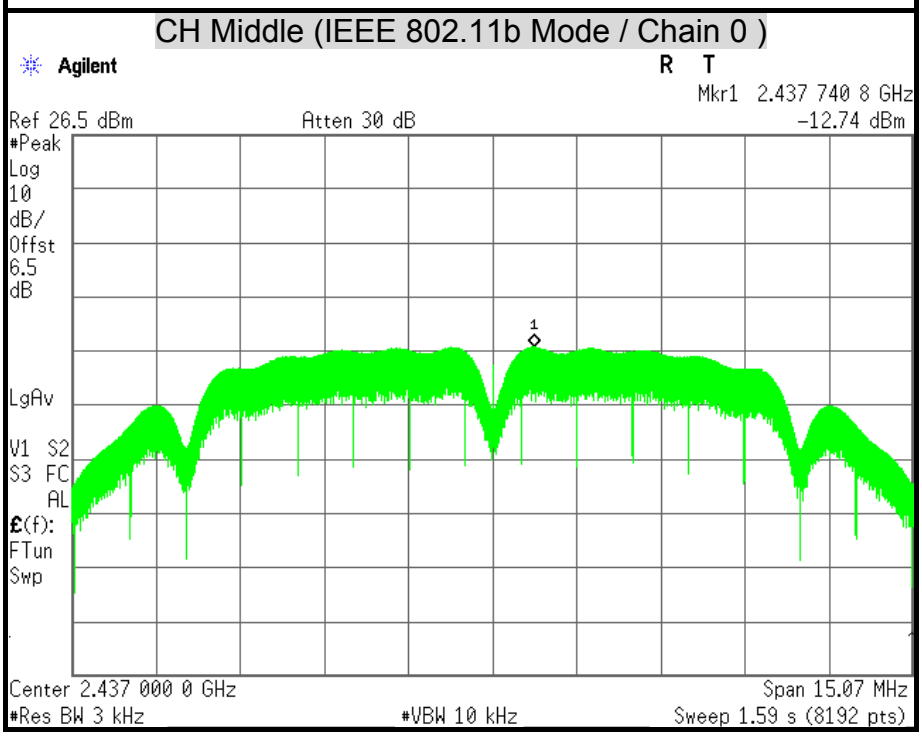
1. At finial test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 6.5dB (including 6 dB pad and 0.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 8.01 dBi which is more than 6dBi, the limit should be 5.99 dBm.
4. Total power spectral density = Chain 0 + Chain 1
.

POWER SPECTRAL DENSITY

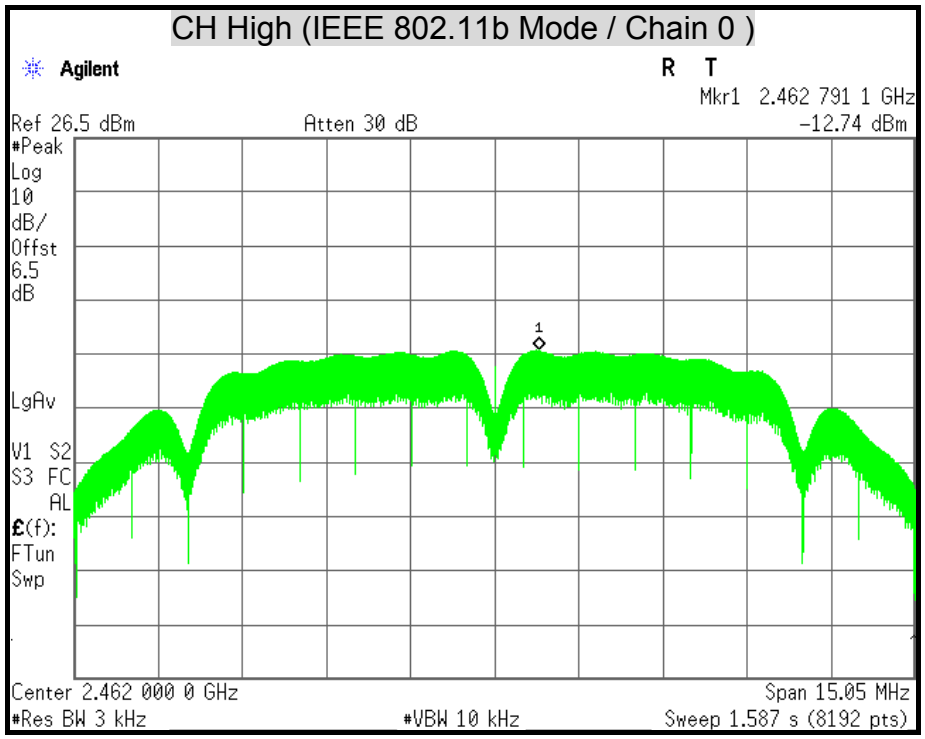
CH Low (IEEE 802.11b Mode / Chain 0)



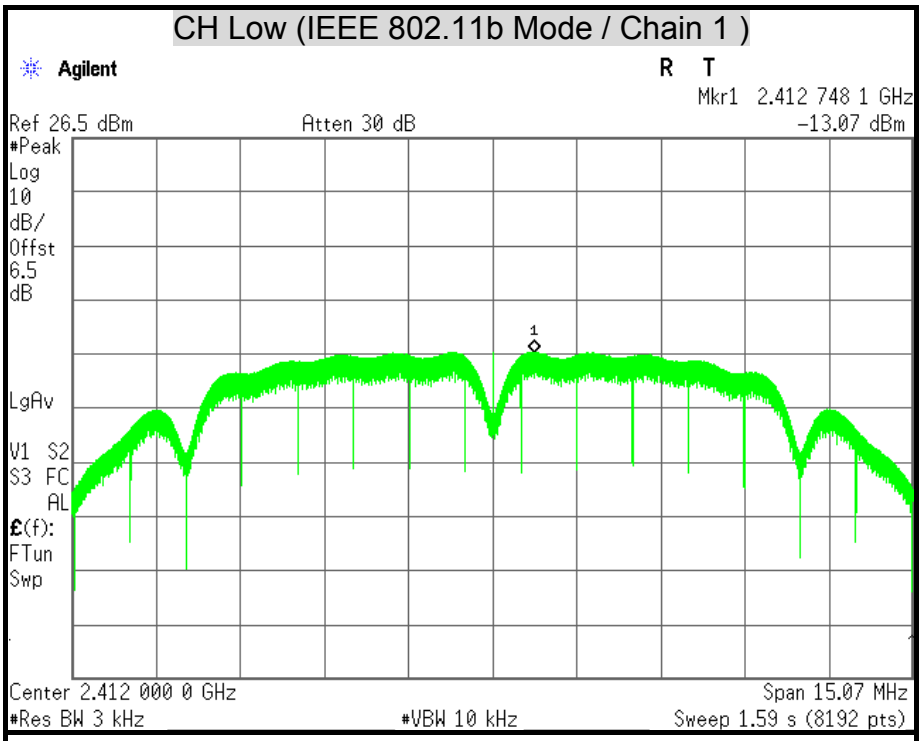
CH Middle (IEEE 802.11b Mode / Chain 0)



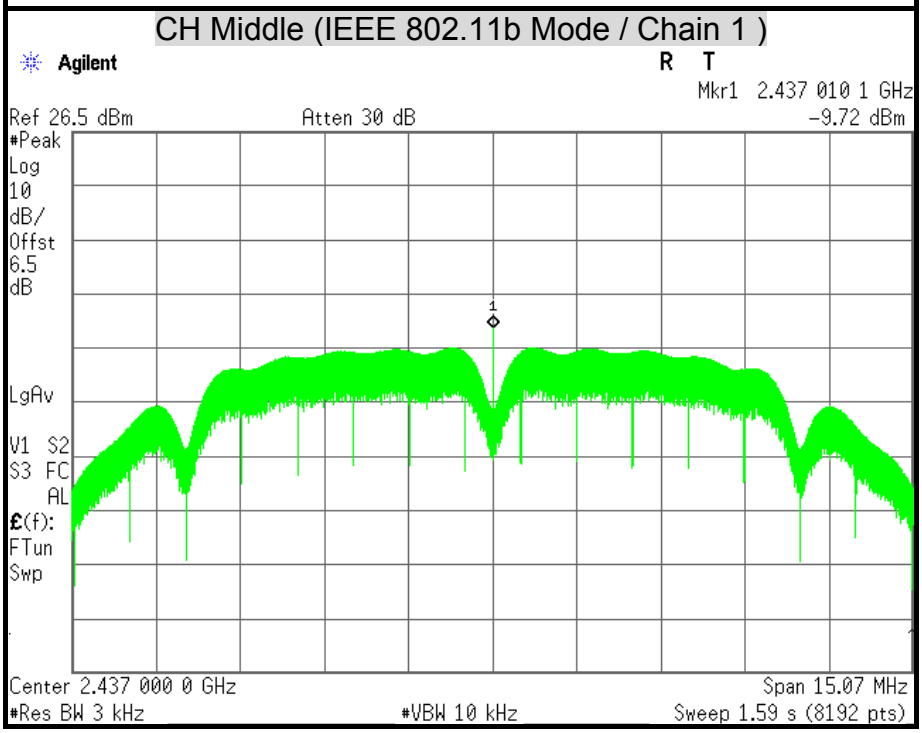
CH High (IEEE 802.11b Mode / Chain 0)



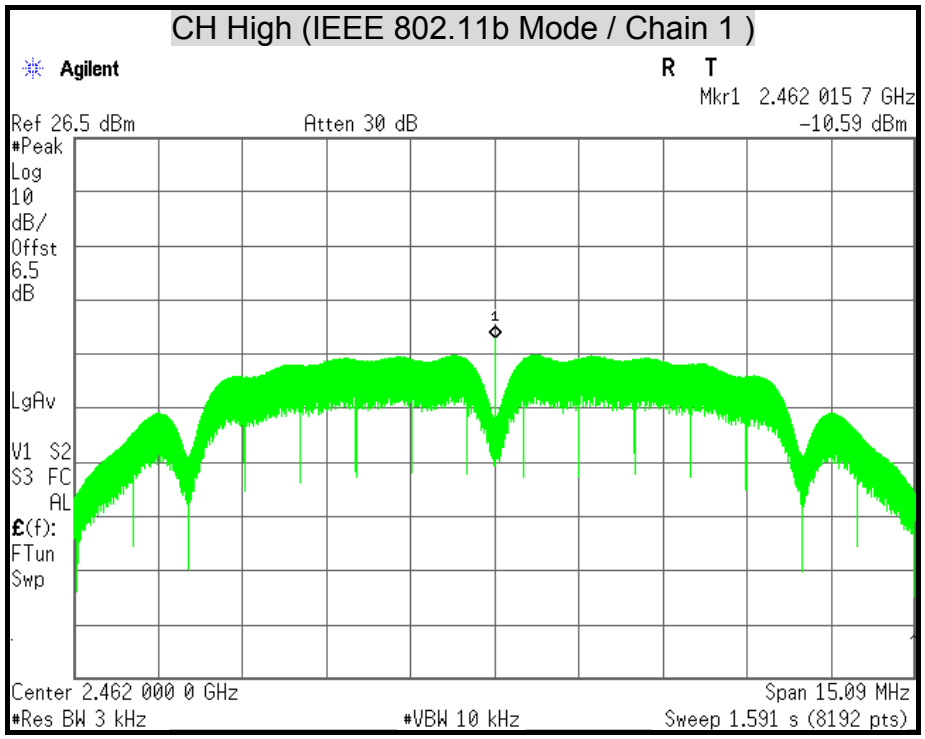
CH Low (IEEE 802.11b Mode / Chain 1)



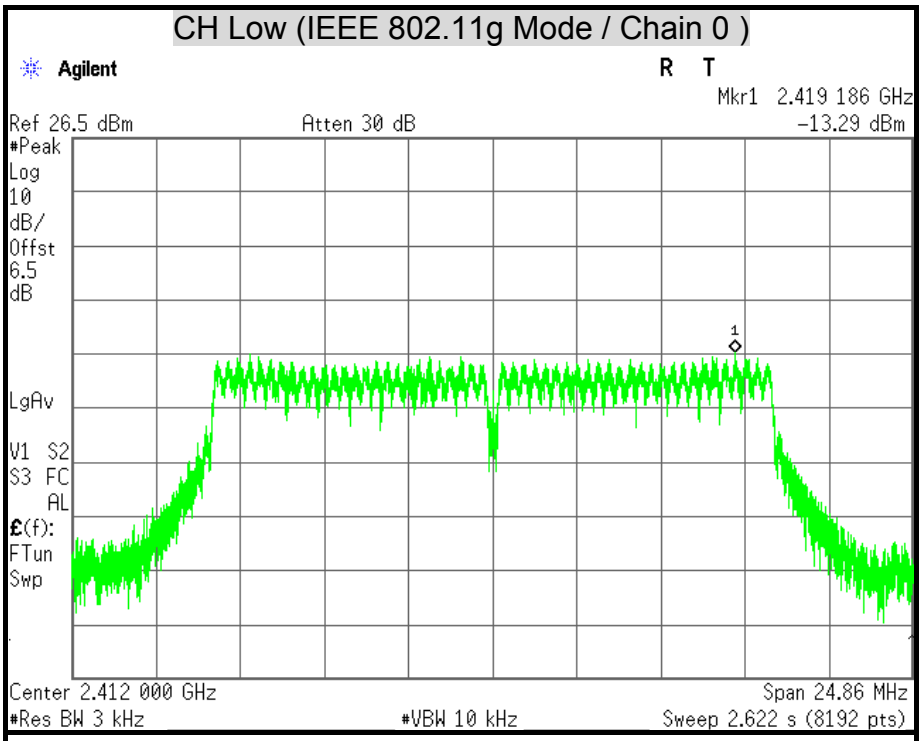
CH Middle (IEEE 802.11b Mode / Chain 1)



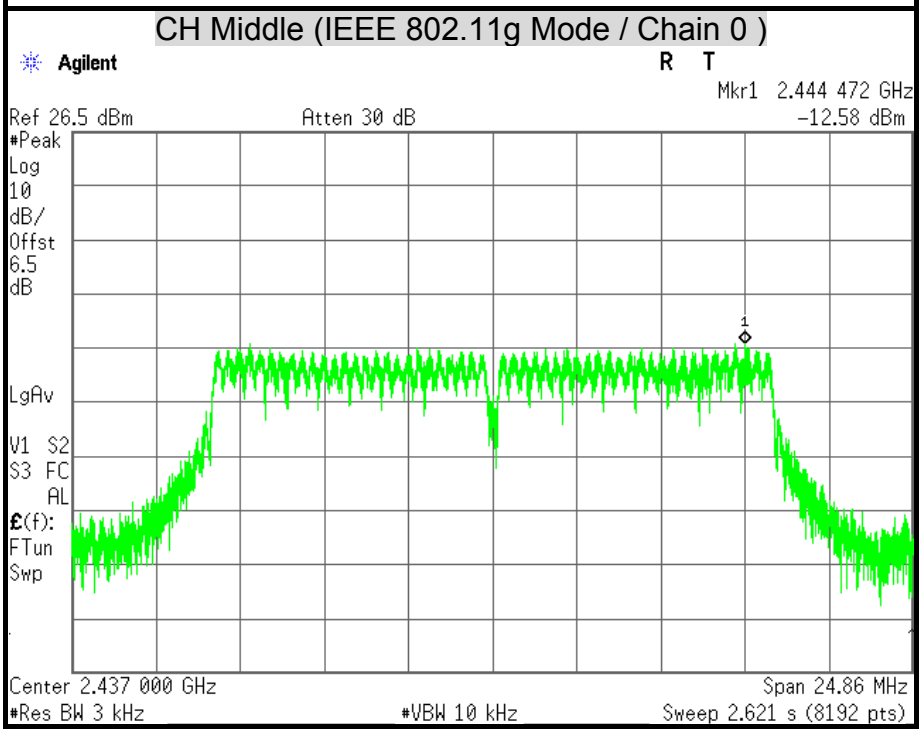
CH High (IEEE 802.11b Mode / Chain 1)

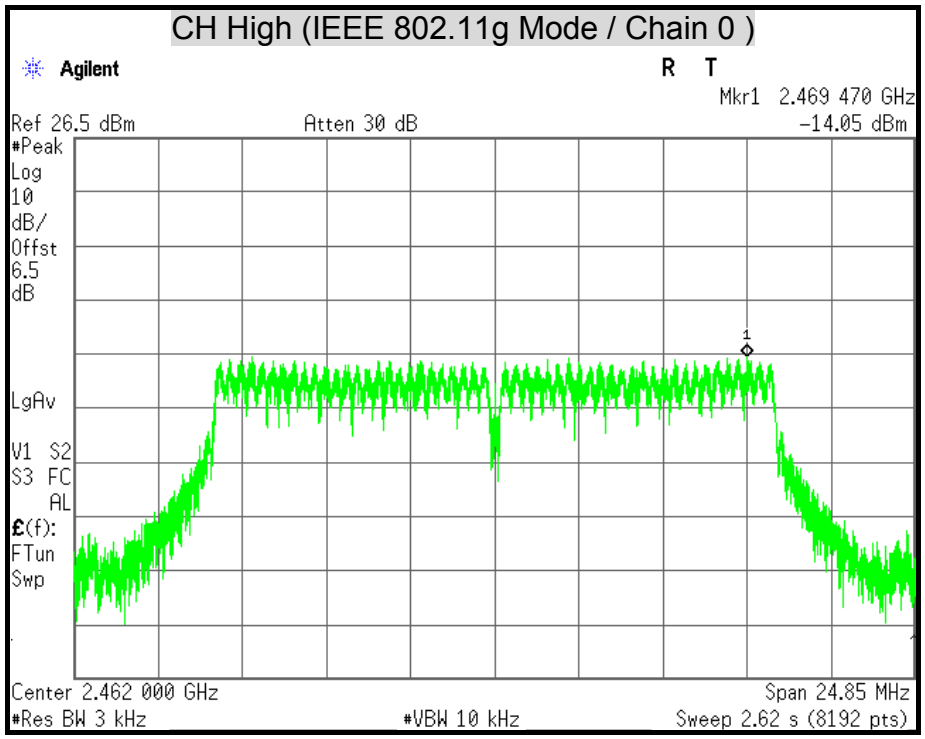


CH Low (IEEE 802.11g Mode / Chain 0)

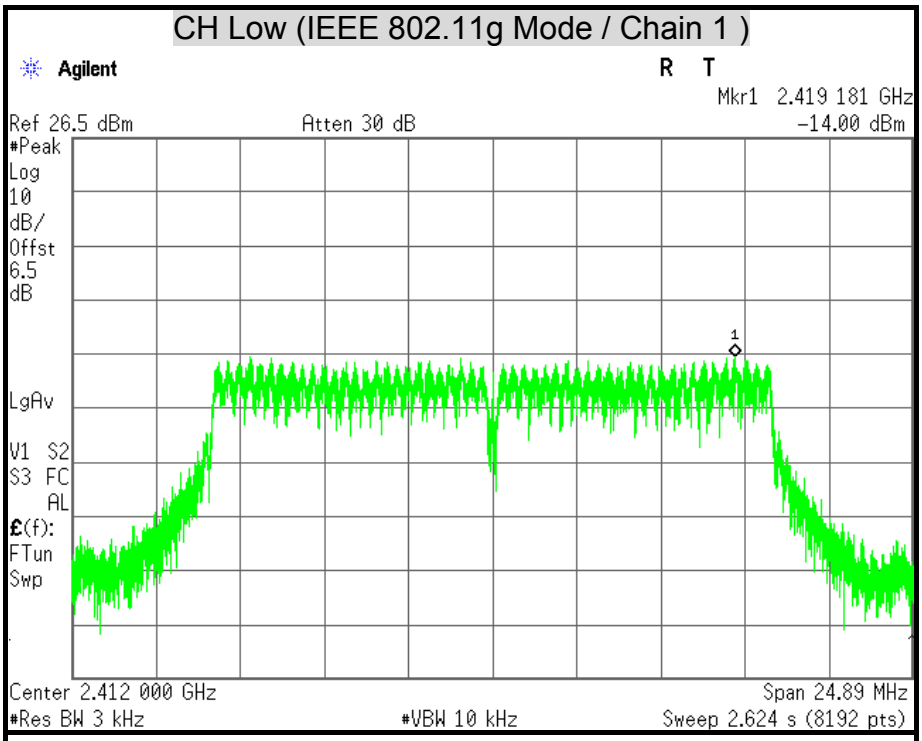


CH Middle (IEEE 802.11g Mode / Chain 0)

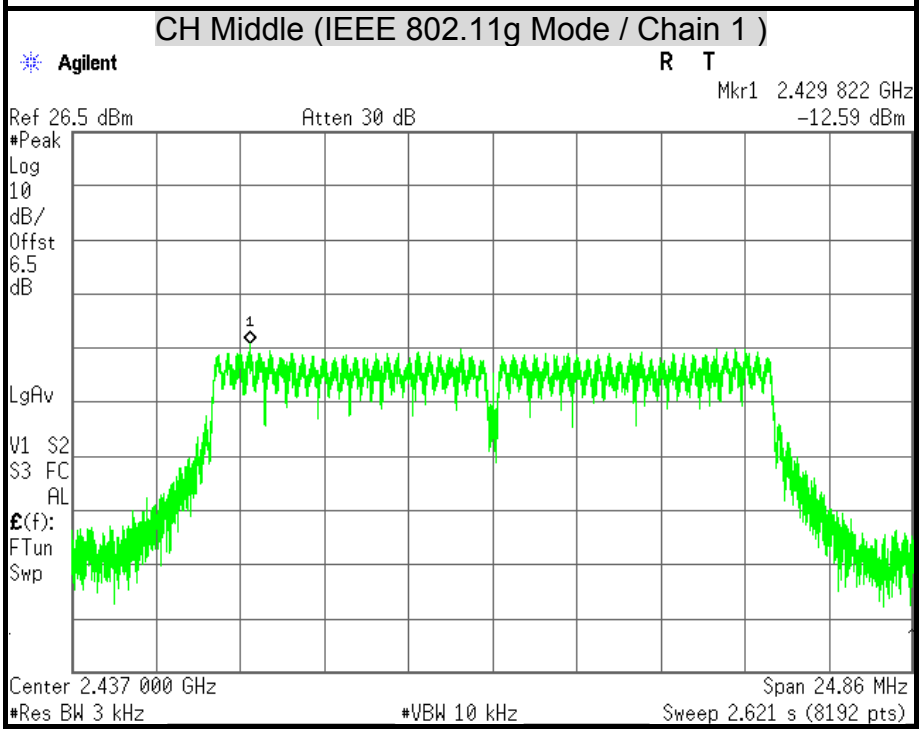




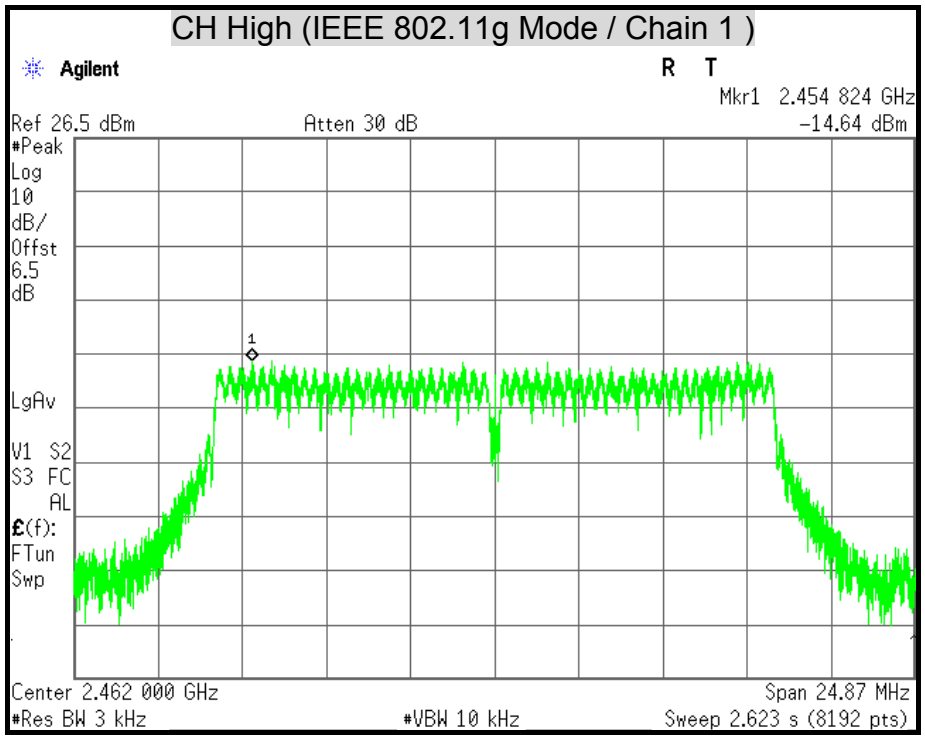
CH Low (IEEE 802.11g Mode / Chain 1)



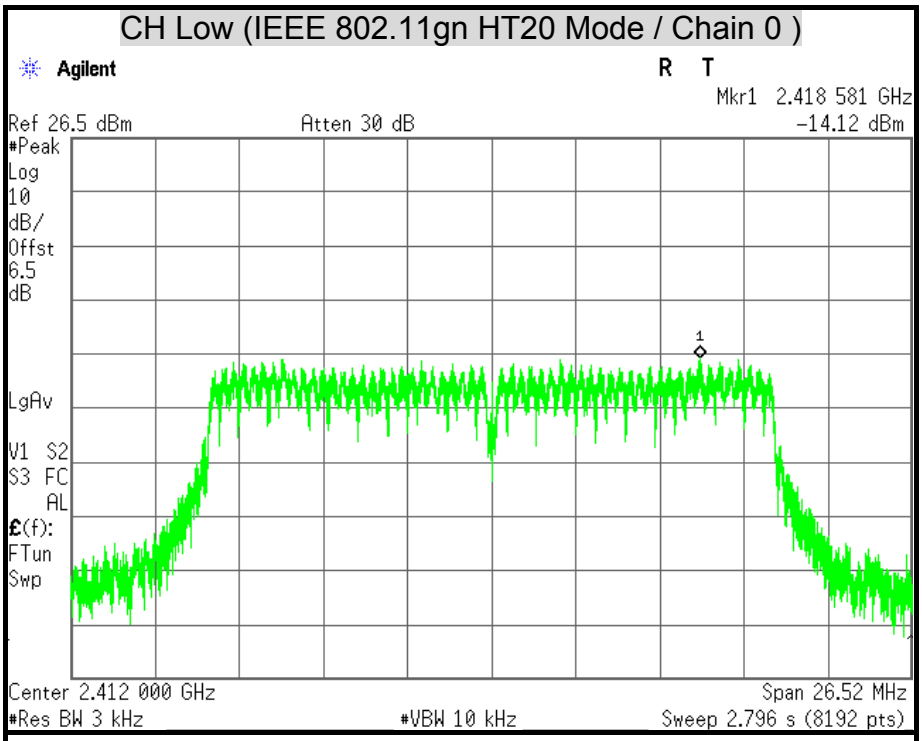
CH Middle (IEEE 802.11g Mode / Chain 1)



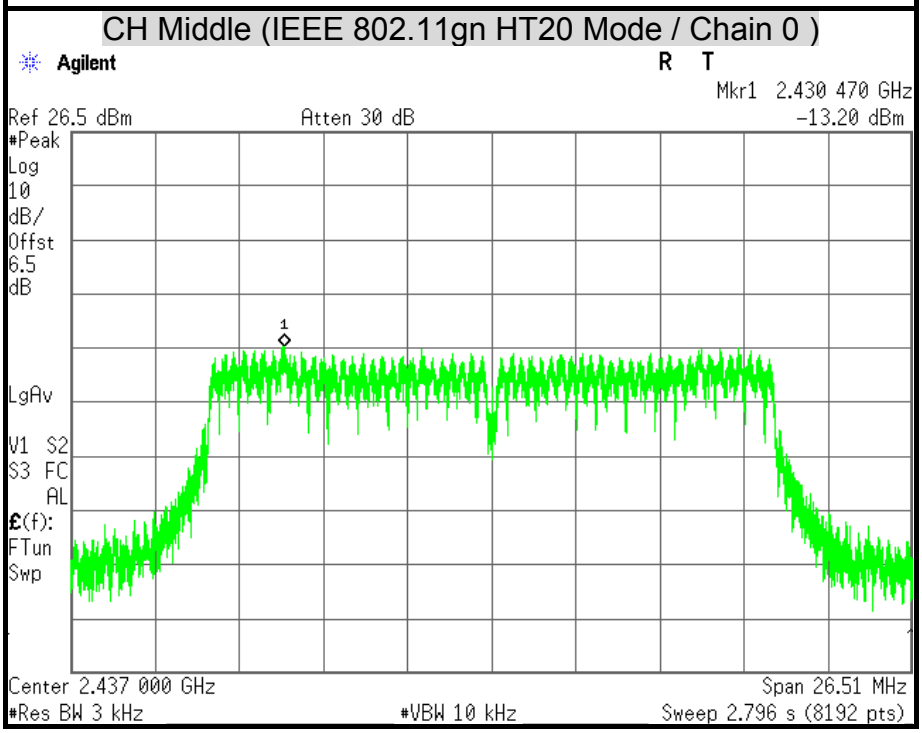
CH High (IEEE 802.11g Mode / Chain 1)



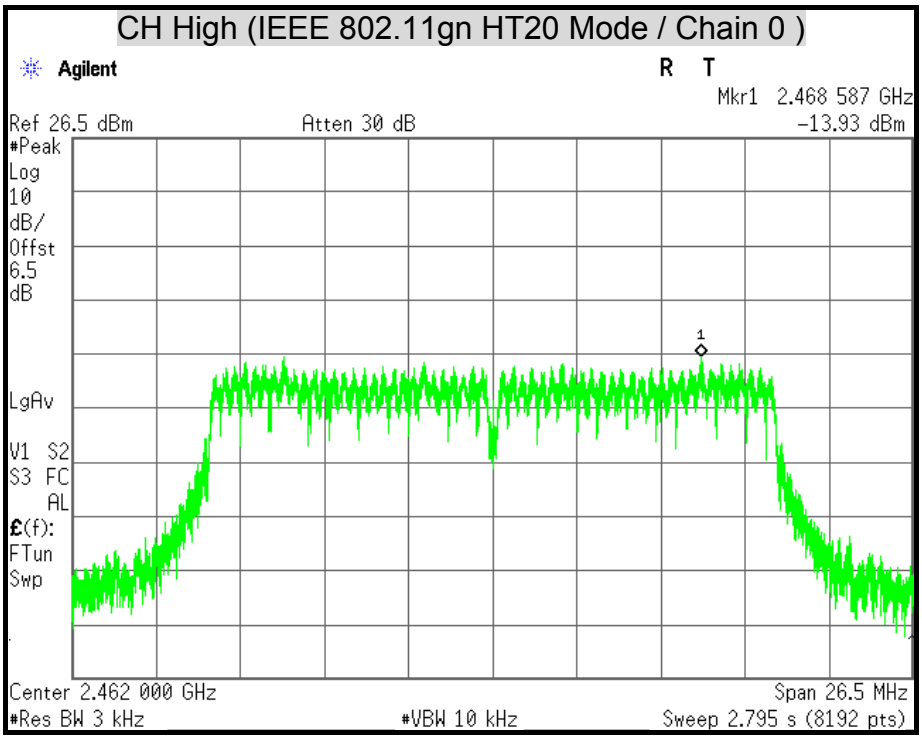
CH Low (IEEE 802.11gn HT20 Mode / Chain 0)



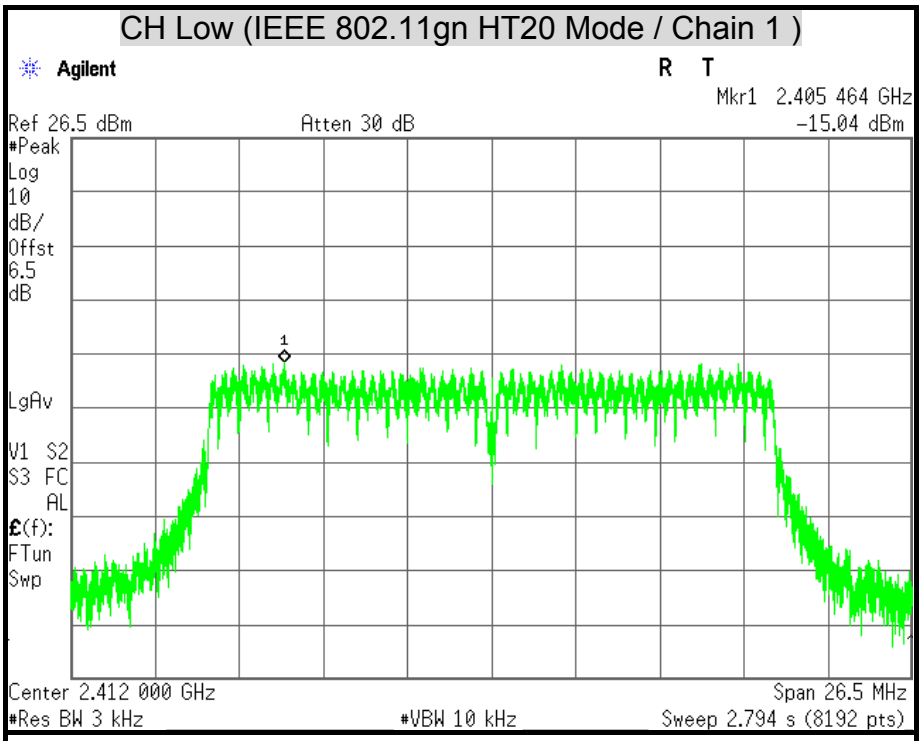
CH Middle (IEEE 802.11gn HT20 Mode / Chain 0)



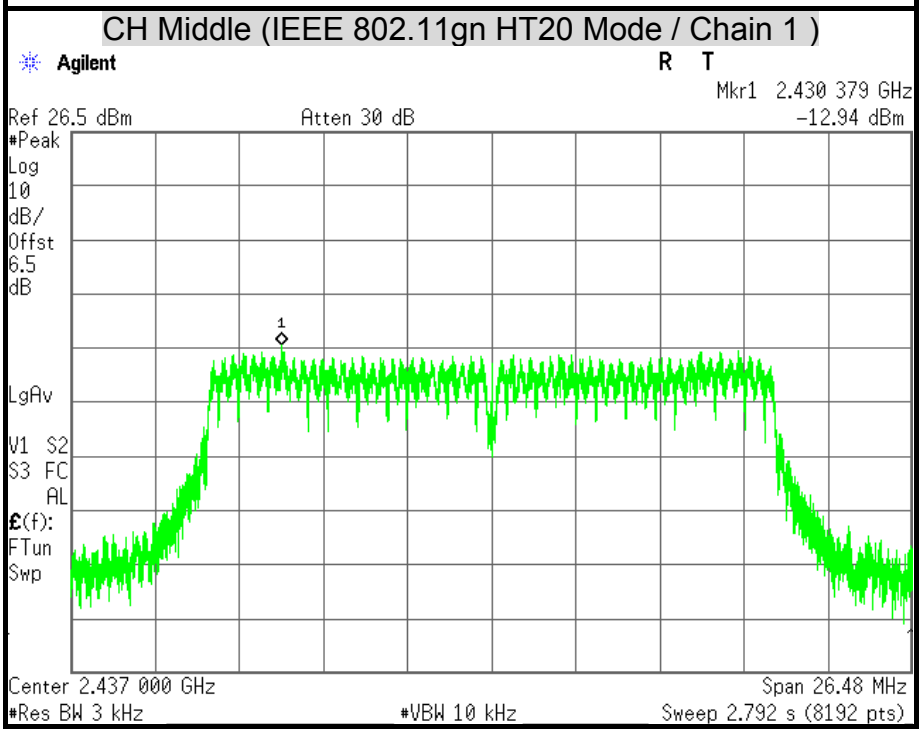
CH High (IEEE 802.11gn HT20 Mode / Chain 0)



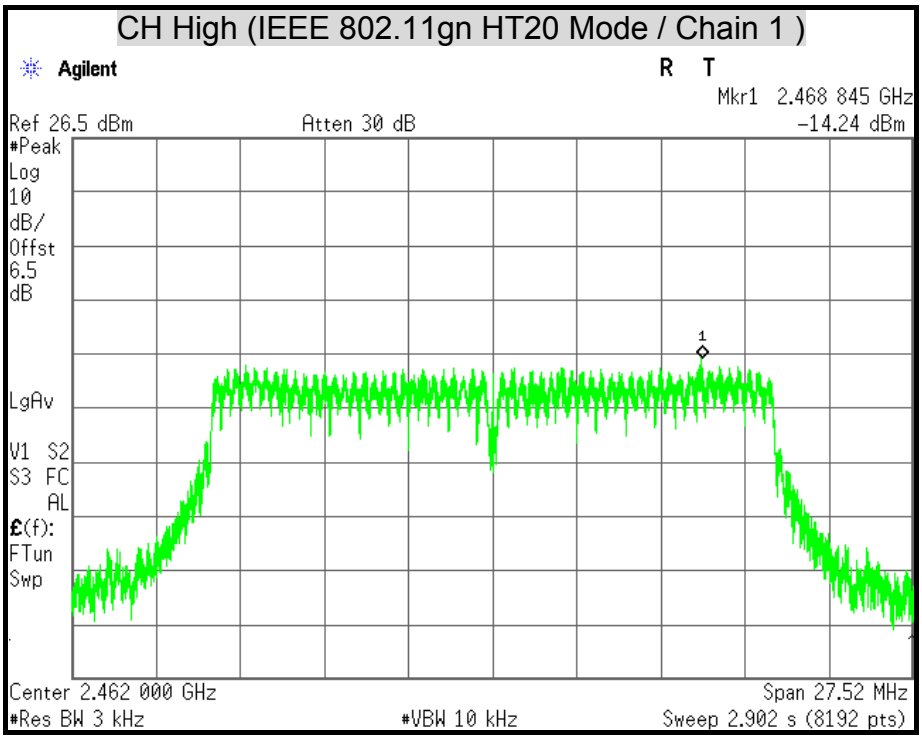
CH Low (IEEE 802.11gn HT20 Mode / Chain 1)



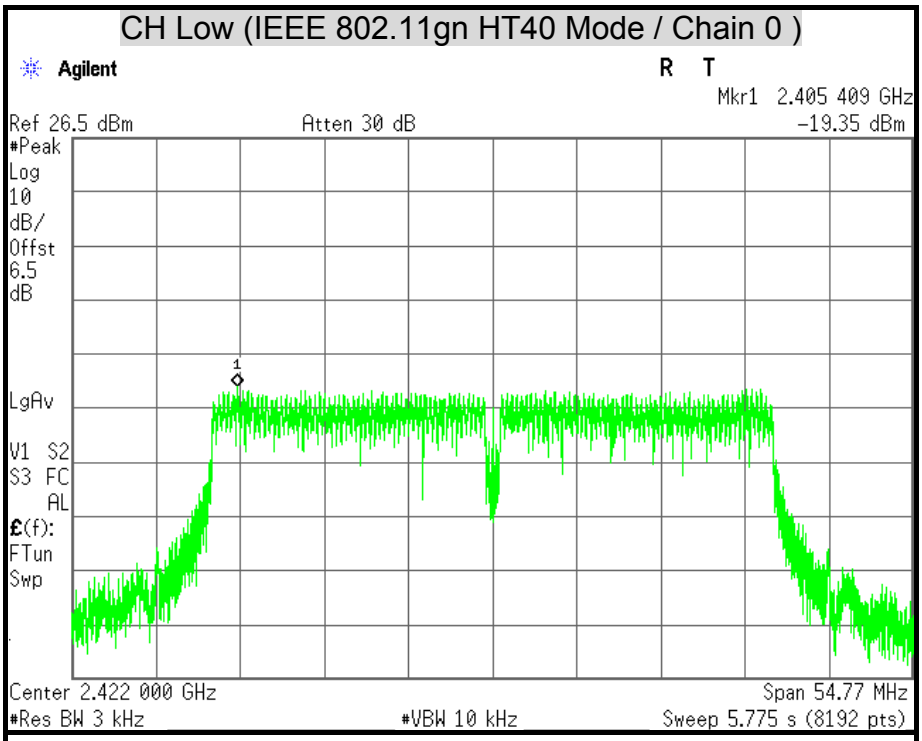
CH Middle (IEEE 802.11gn HT20 Mode / Chain 1)



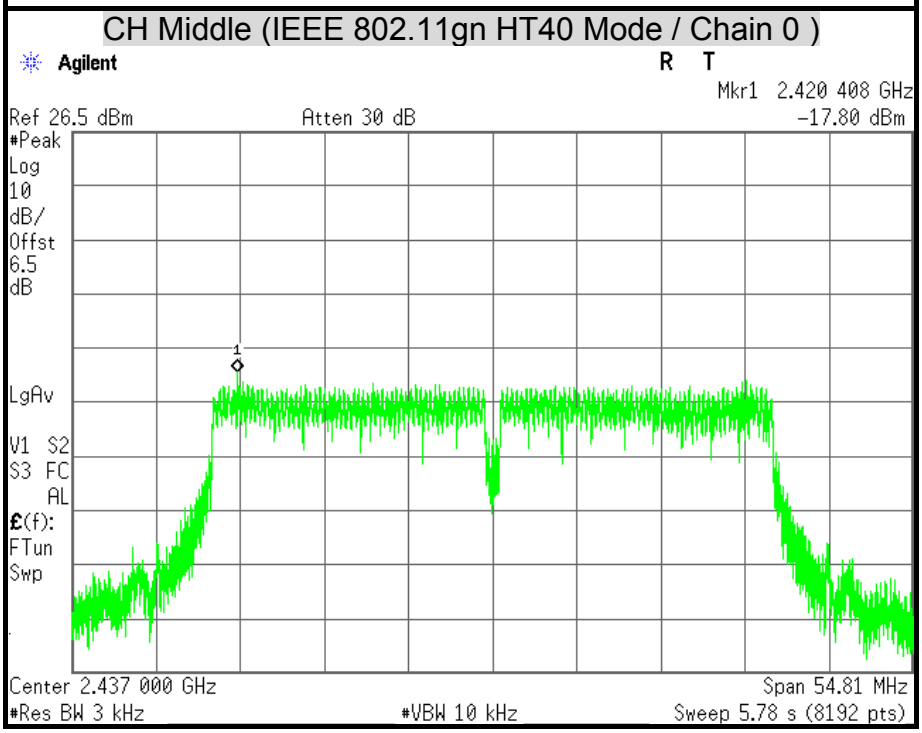
CH High (IEEE 802.11gn HT20 Mode / Chain 1)



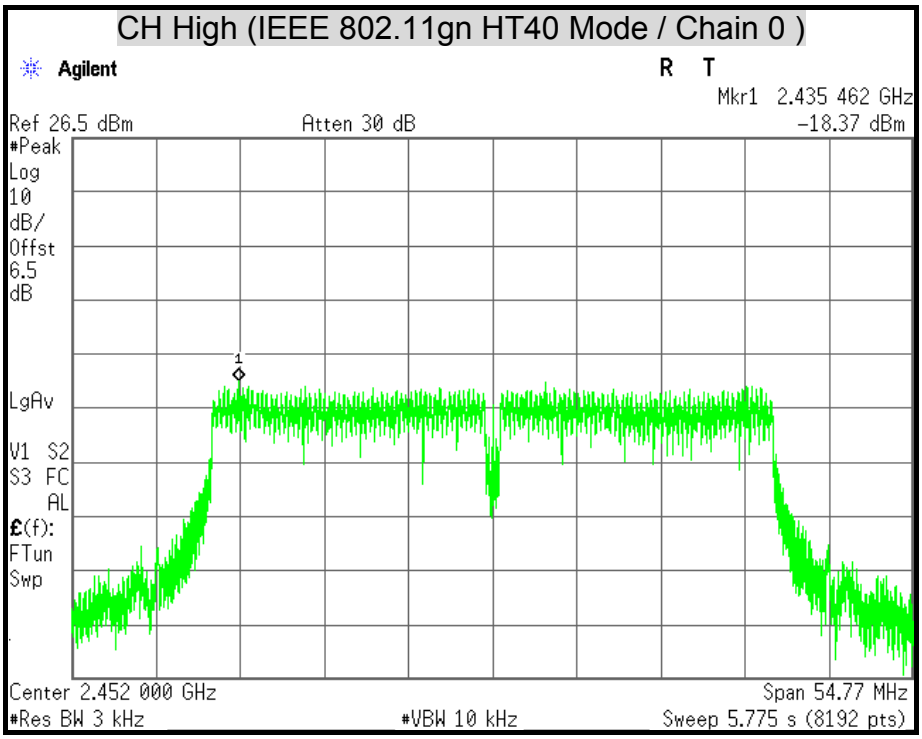
CH Low (IEEE 802.11gn HT40 Mode / Chain 0)



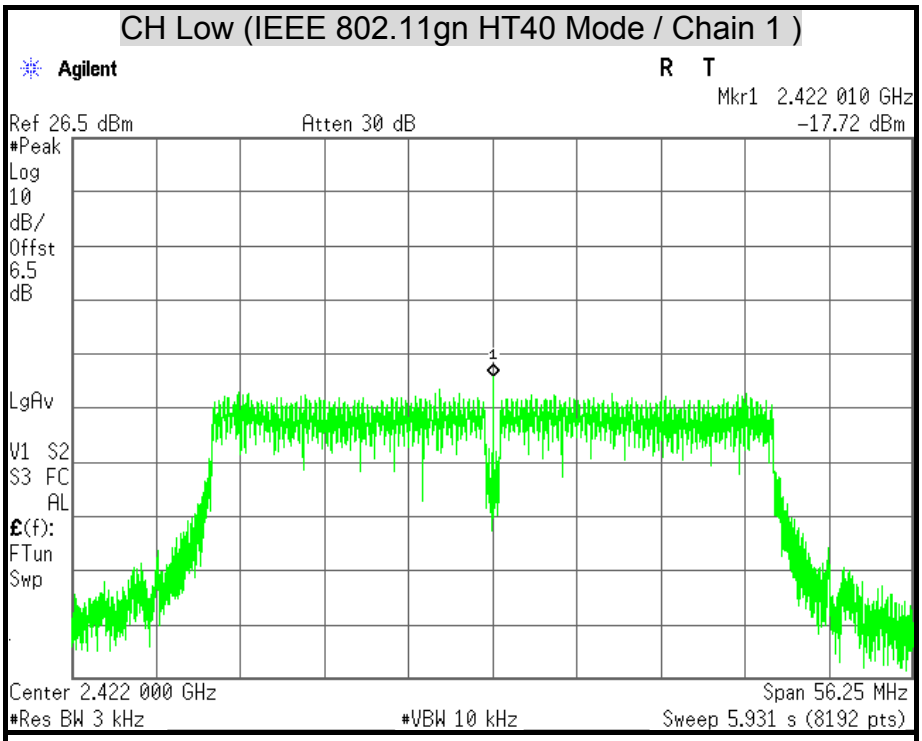
CH Middle (IEEE 802.11gn HT40 Mode / Chain 0)



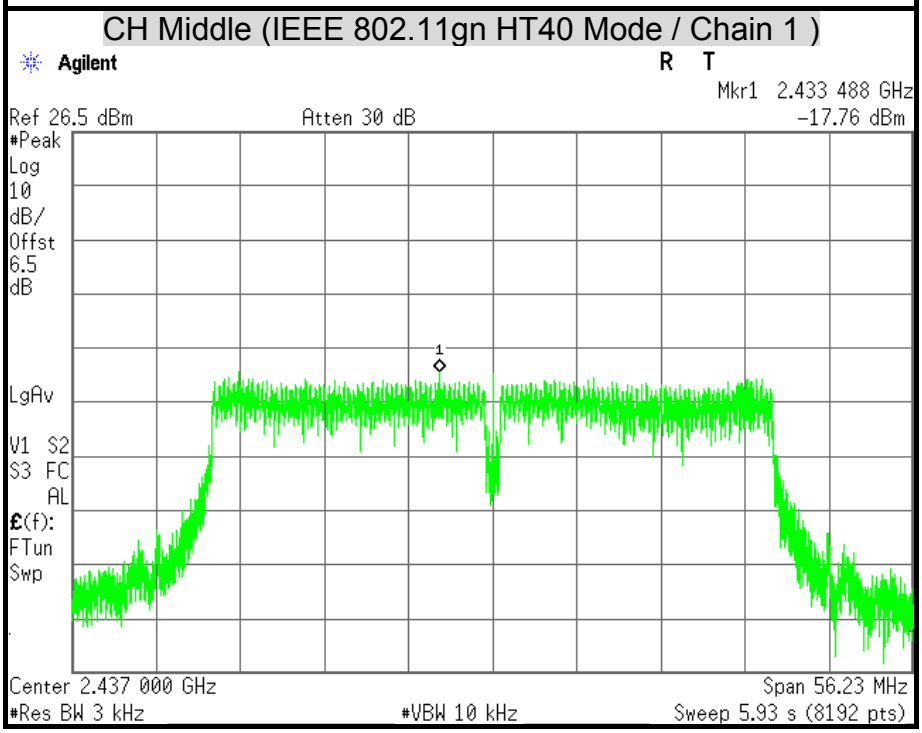
CH High (IEEE 802.11gn HT40 Mode / Chain 0)



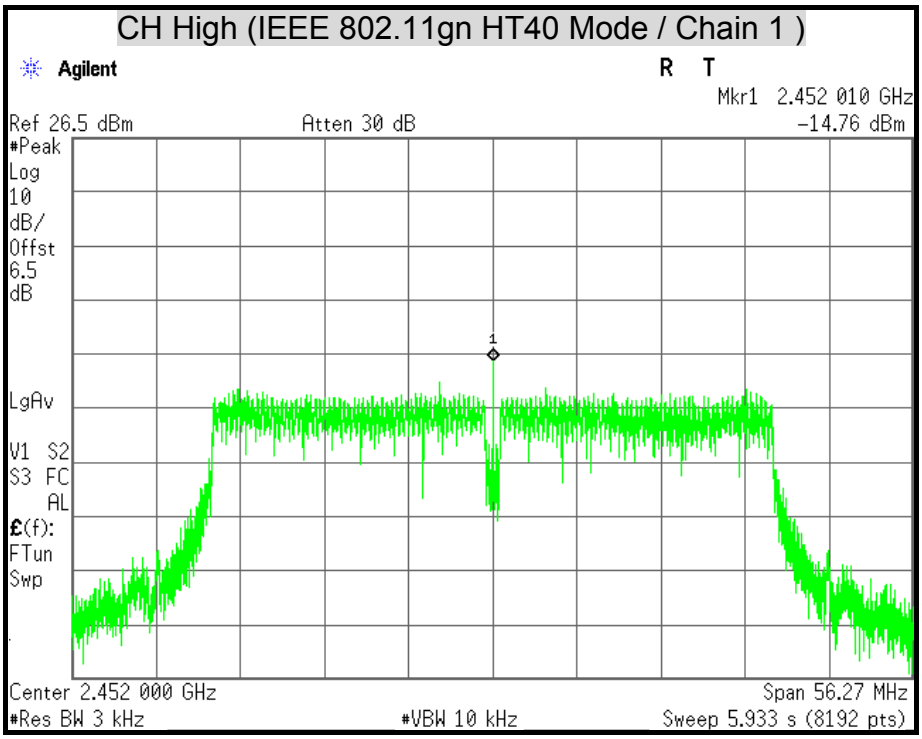
CH Low (IEEE 802.11gn HT40 Mode / Chain 1)



CH Middle (IEEE 802.11gn HT40 Mode / Chain 1)



CH High (IEEE 802.11gn HT40 Mode / Chain 1)



7.5 CONDUCTED SPURIOUS EMISSION

LIMITS

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

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/04/2016

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

TEST SETUP

TEST PROCEDURE

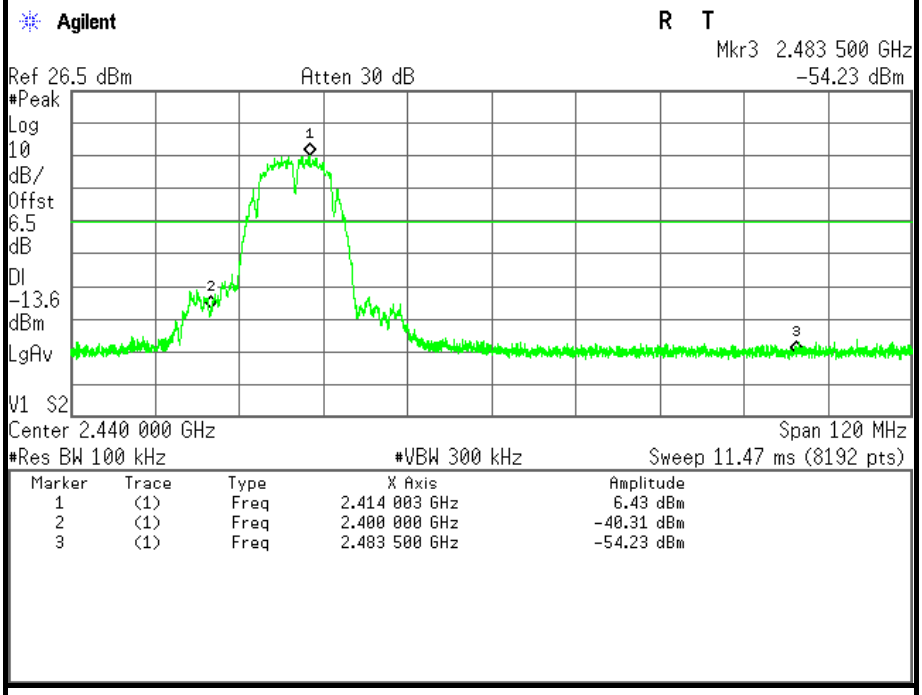
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26.5 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

TEST RESULTS

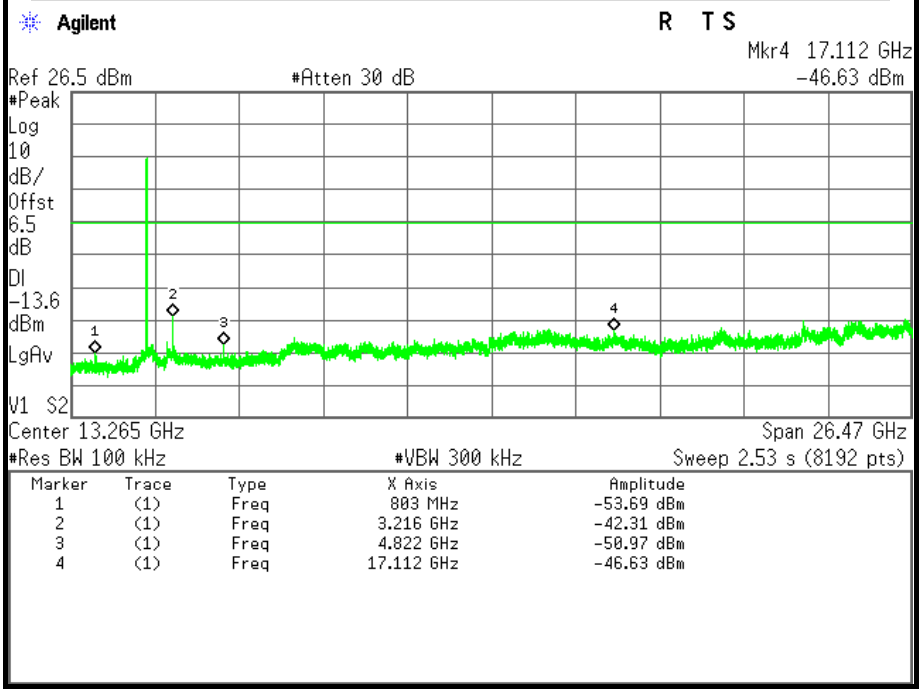
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 0)



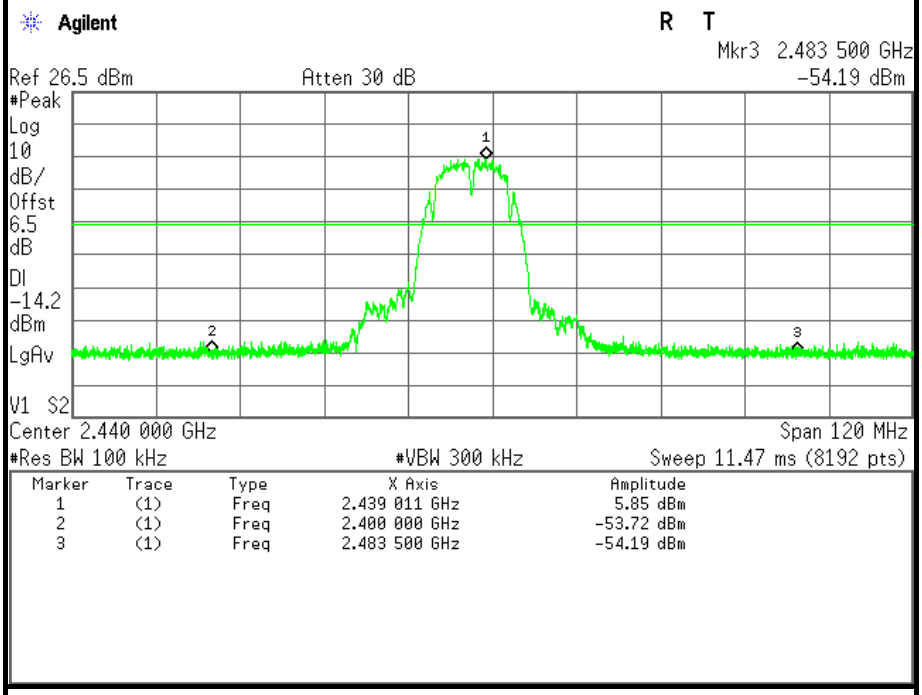
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.414 003 GHz	6.43 dBm
2	(1)	Freq	2.400 000 GHz	-40.31 dBm
3	(1)	Freq	2.483 500 GHz	-54.23 dBm

CH Low (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 0)

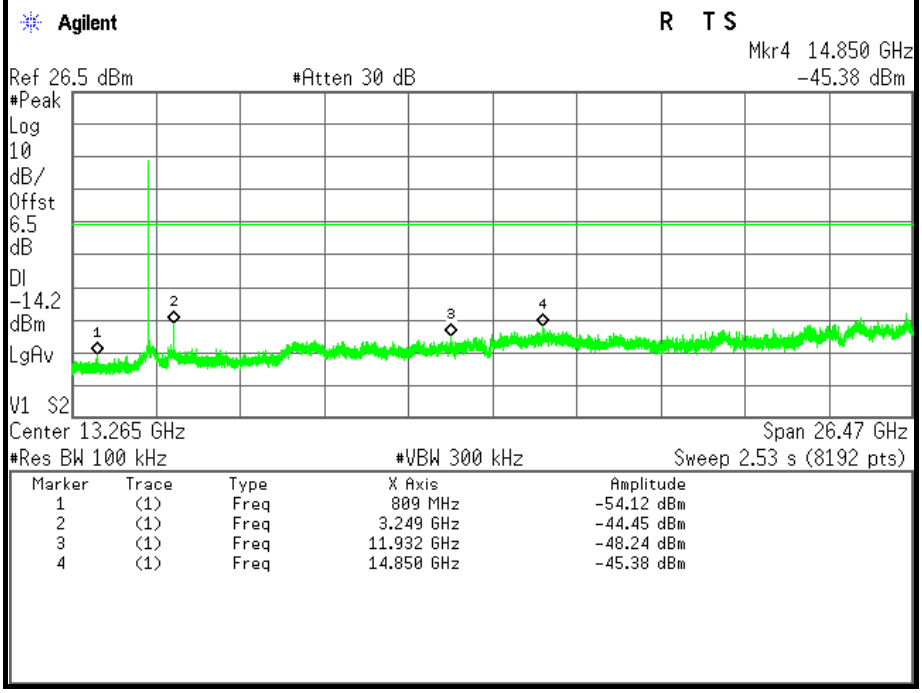


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	803 MHz	-53.69 dBm
2	(1)	Freq	3.216 GHz	-42.31 dBm
3	(1)	Freq	4.822 GHz	-50.97 dBm
4	(1)	Freq	17.112 GHz	-46.63 dBm

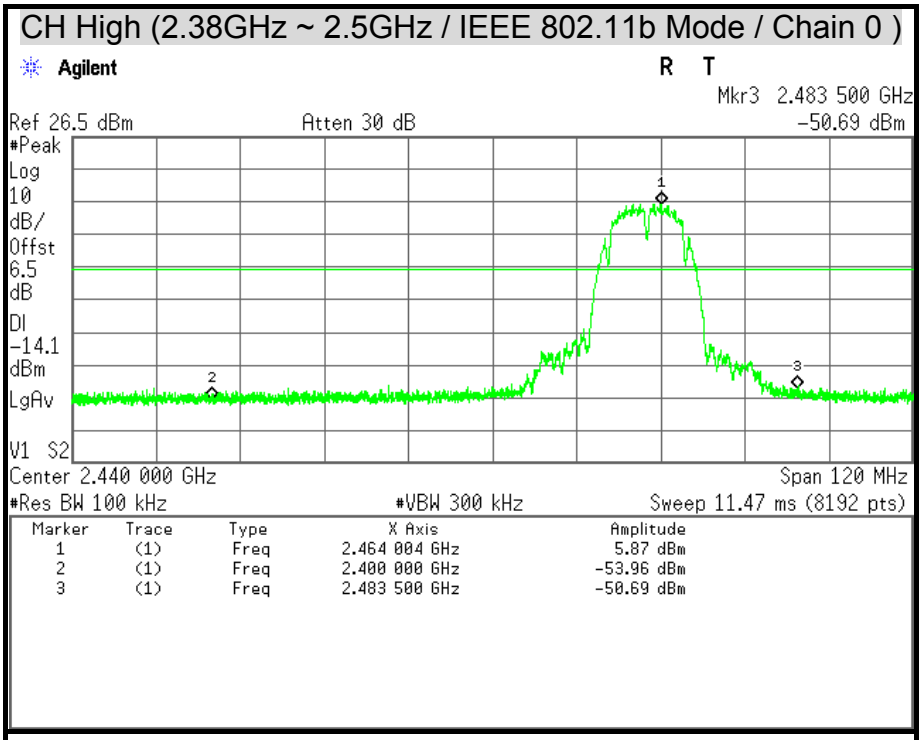
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 0)



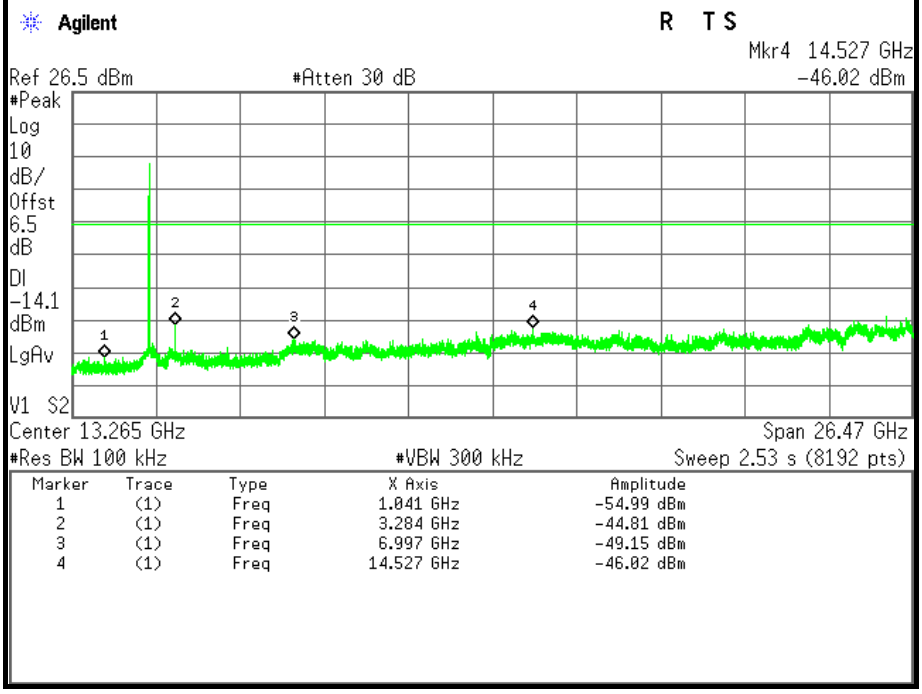
CH Middle (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 0)



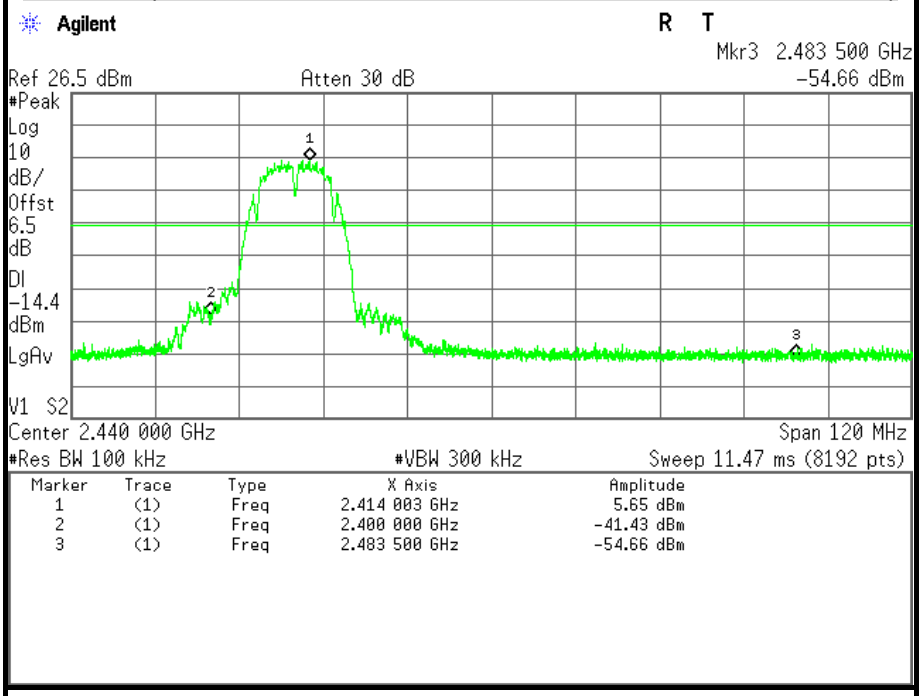
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 0)



CH High (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 0)

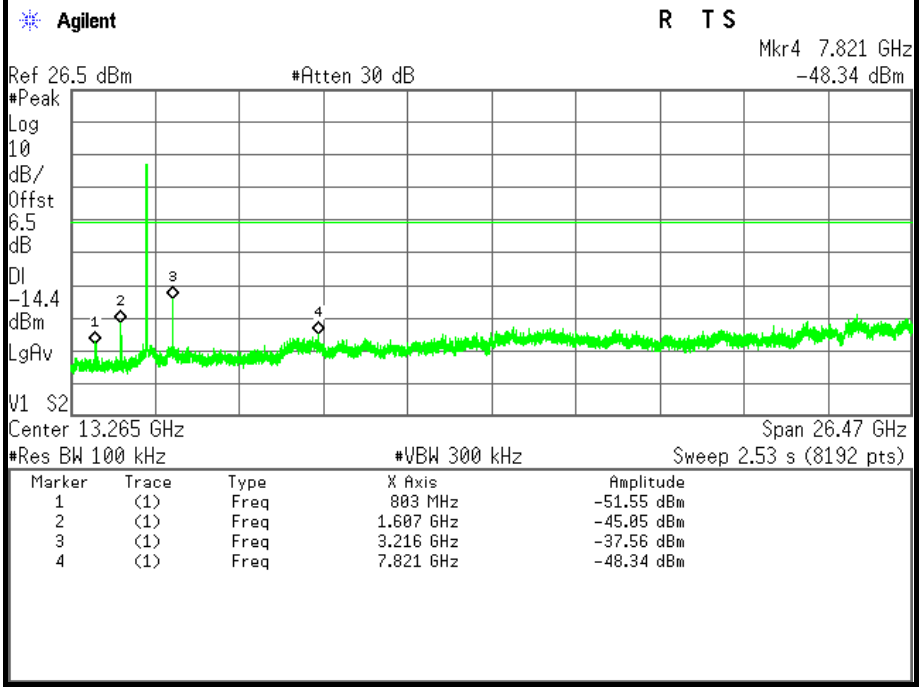


CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 1)



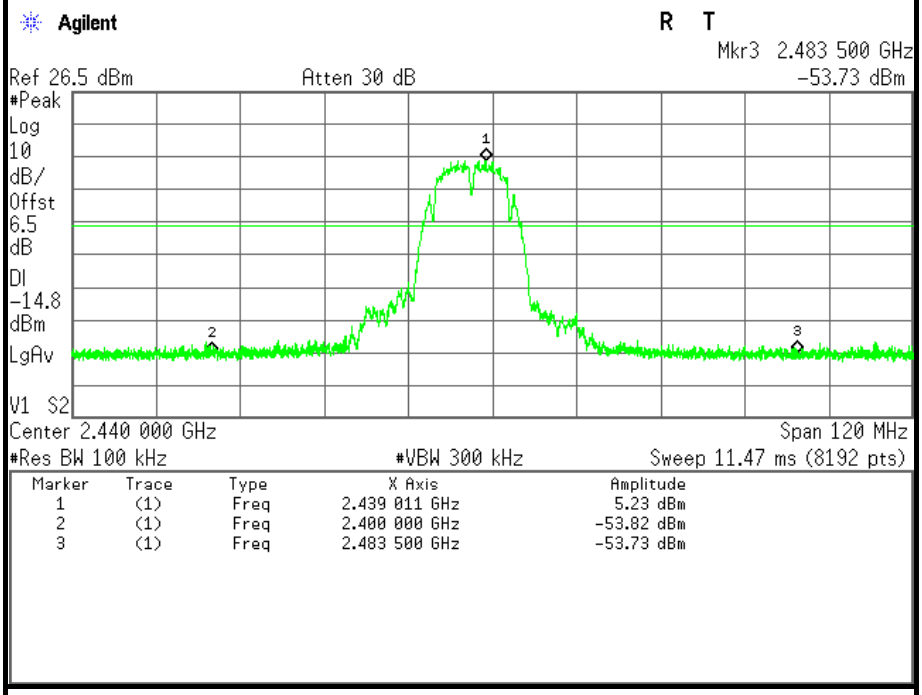
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.414 003 GHz	5.65 dBm
2	(1)	Freq	2.400 000 GHz	-41.43 dBm
3	(1)	Freq	2.483 500 GHz	-54.66 dBm

CH Low (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 1)

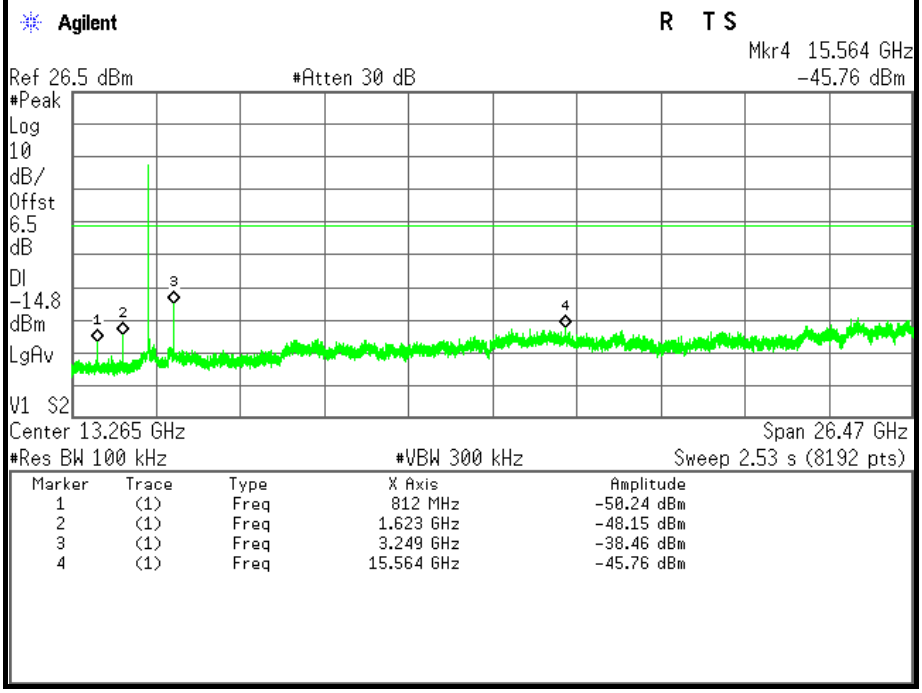


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	803 MHz	-51.55 dBm
2	(1)	Freq	1.607 GHz	-45.85 dBm
3	(1)	Freq	3.216 GHz	-37.56 dBm
4	(1)	Freq	7.821 GHz	-48.34 dBm

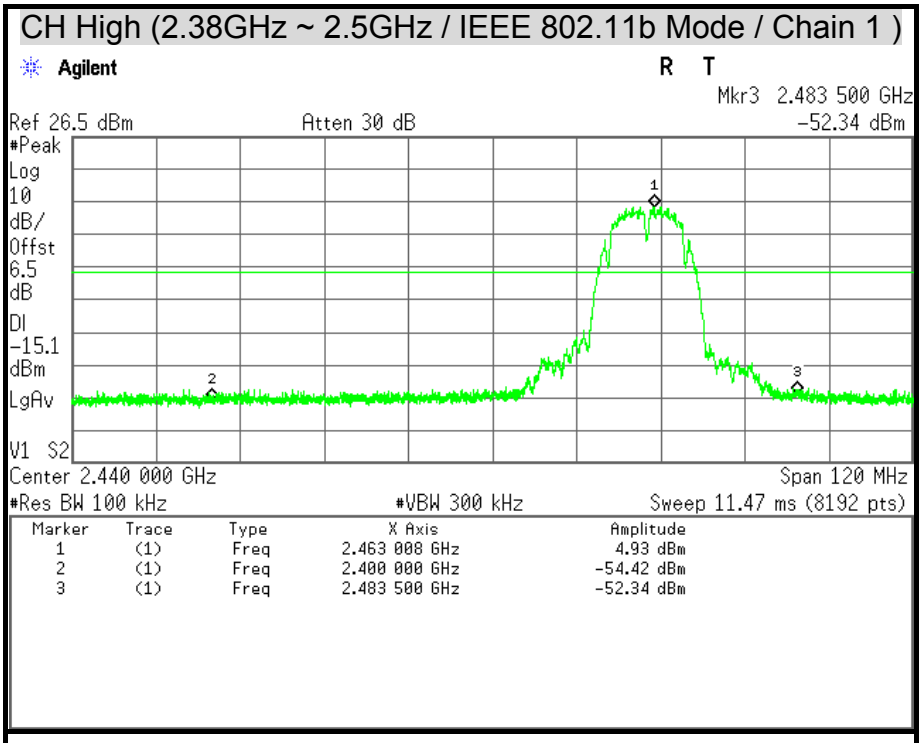
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 1)



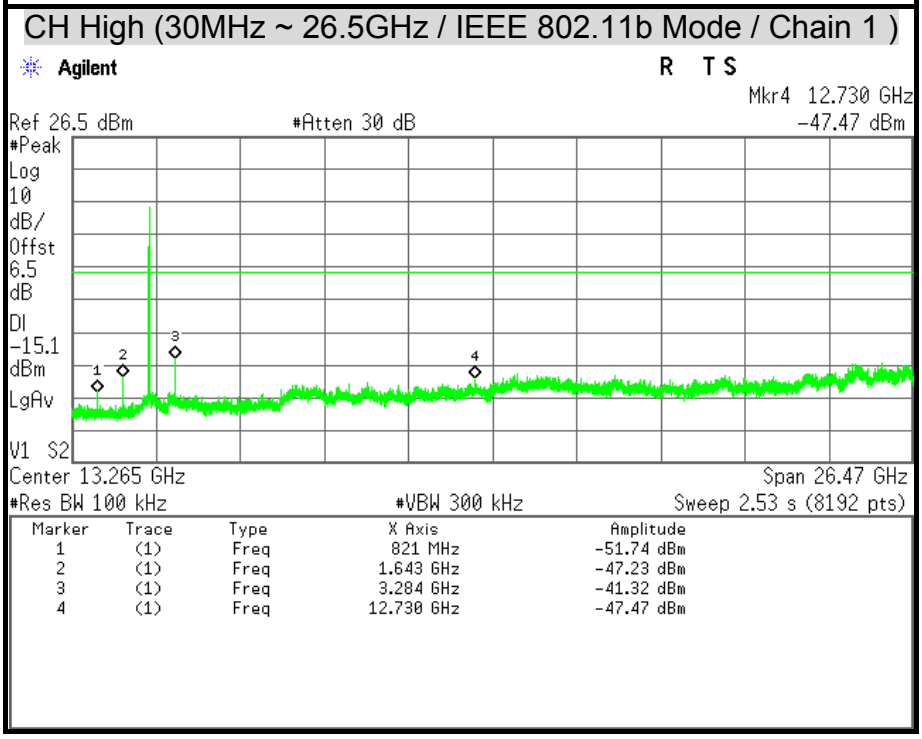
CH Middle (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 1)



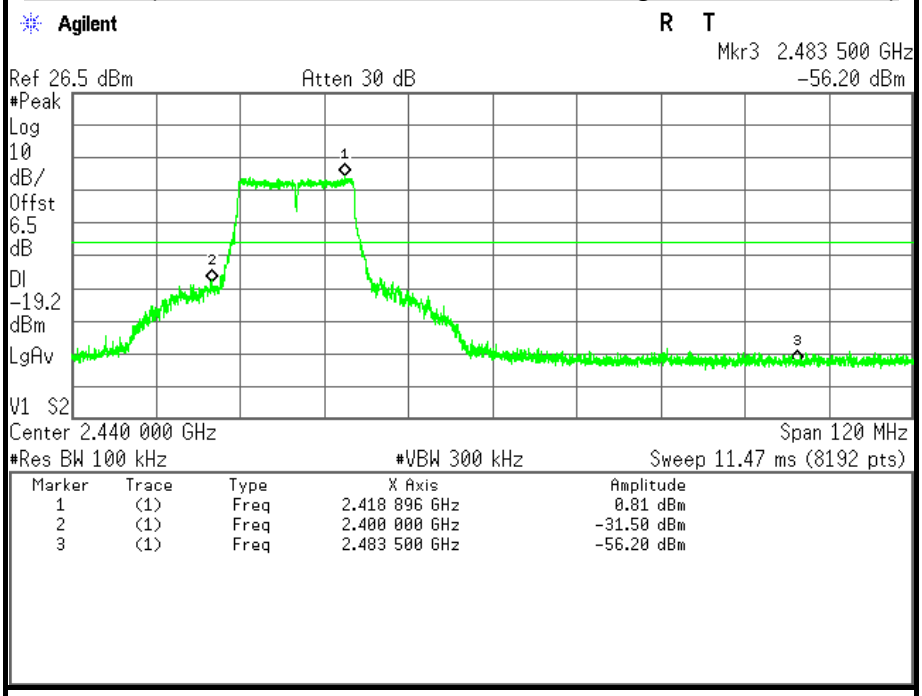
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 1)



CH High (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 1)

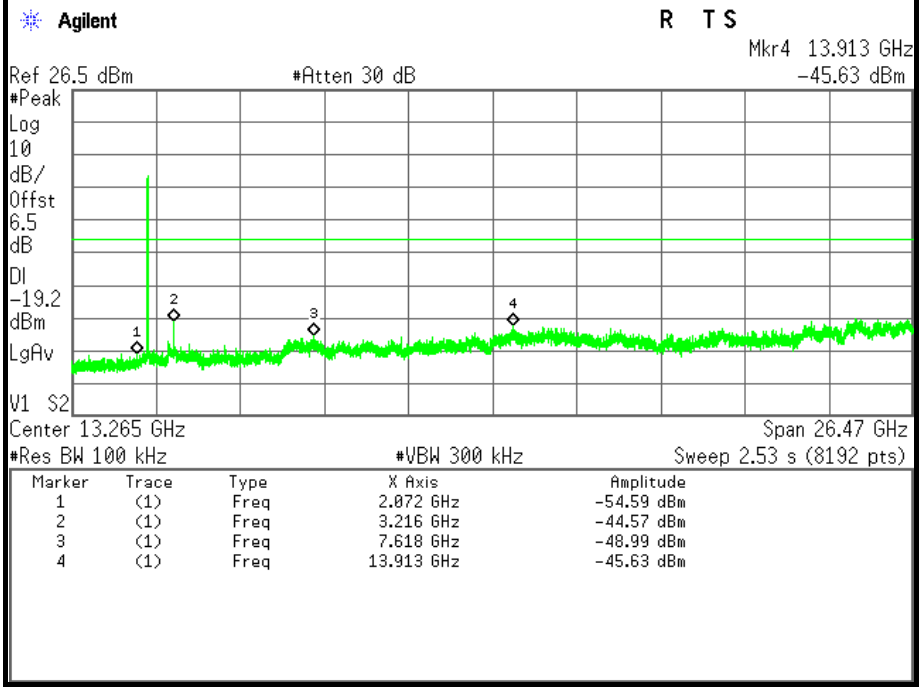


CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 0)



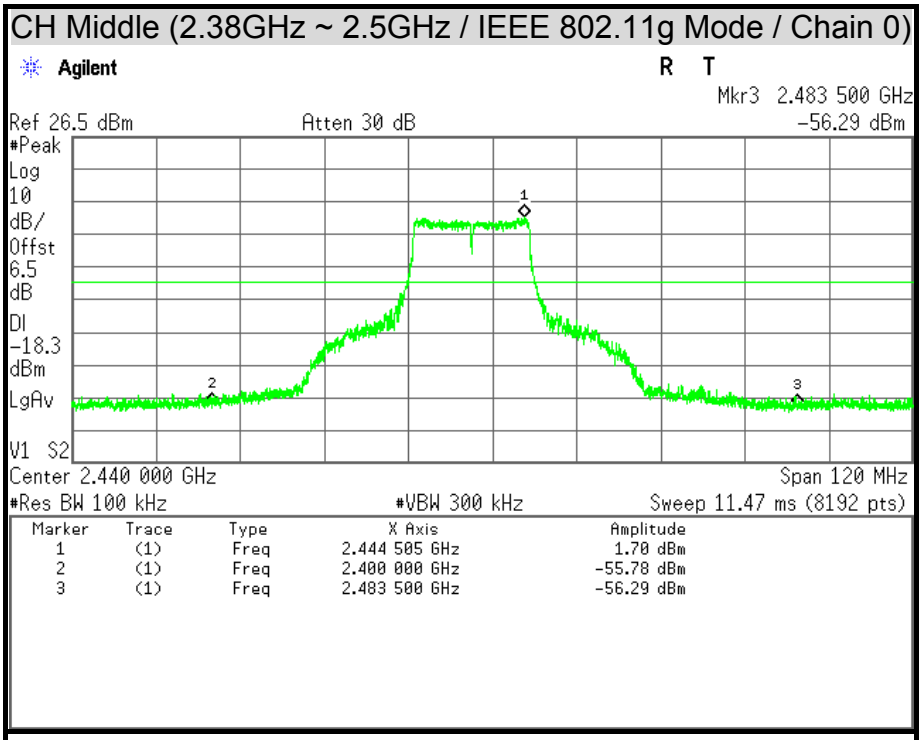
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.418 896 GHz	0.81 dBm
2	(1)	Freq	2.400 000 GHz	-31.50 dBm
3	(1)	Freq	2.483 500 GHz	-56.20 dBm

CH Low (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 0)

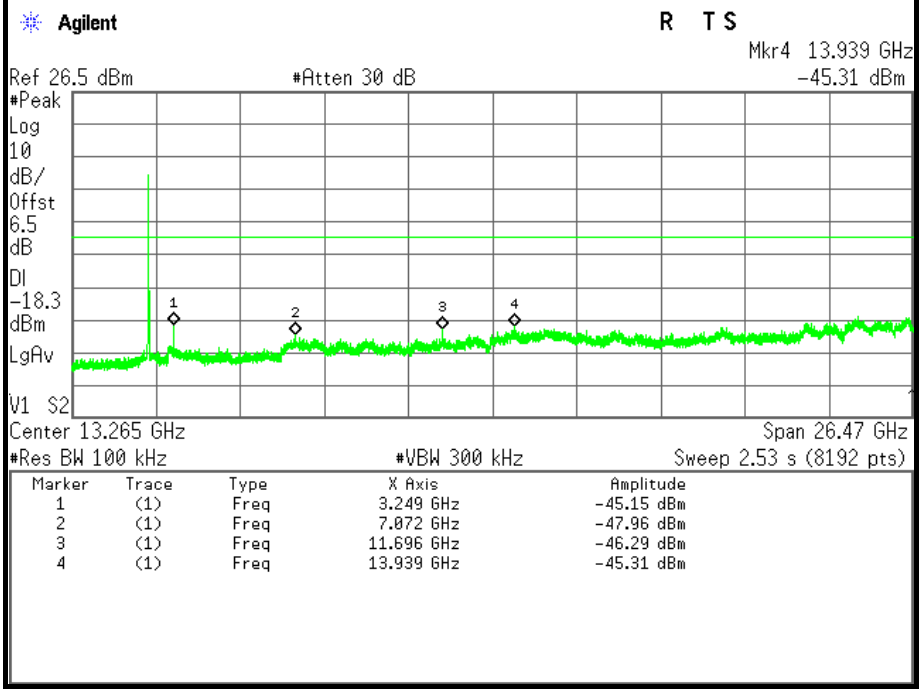


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.072 GHz	-54.59 dBm
2	(1)	Freq	3.216 GHz	-44.57 dBm
3	(1)	Freq	7.618 GHz	-48.99 dBm
4	(1)	Freq	13.913 GHz	-45.63 dBm

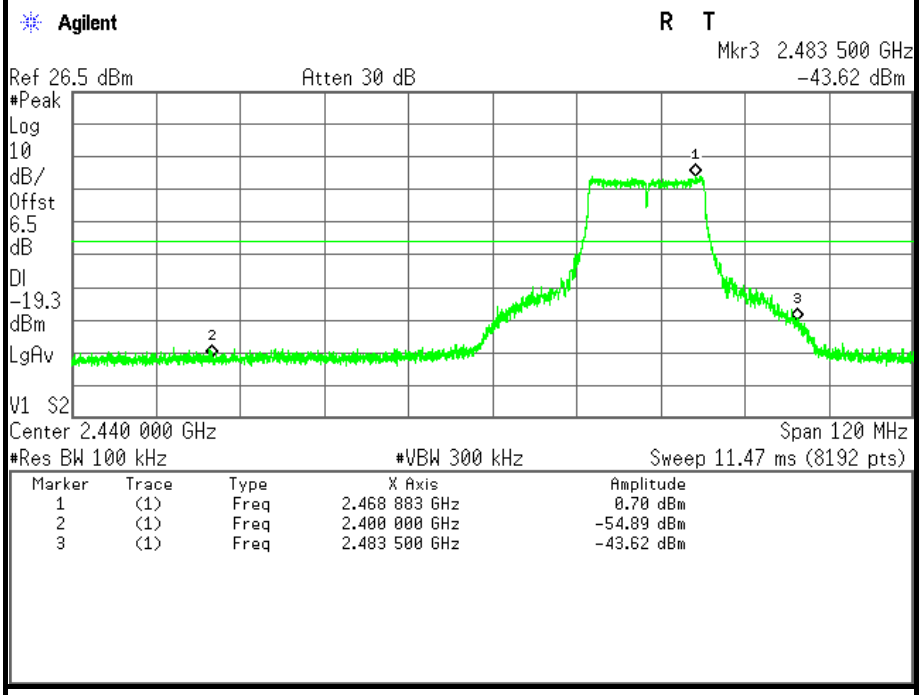
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 0)



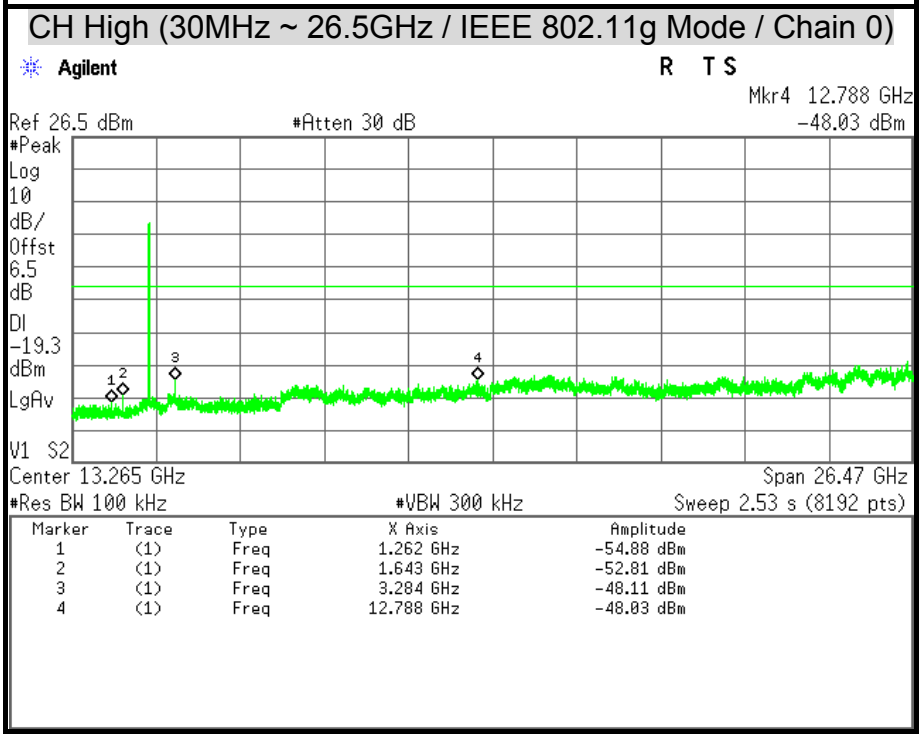
CH Middle (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 0)



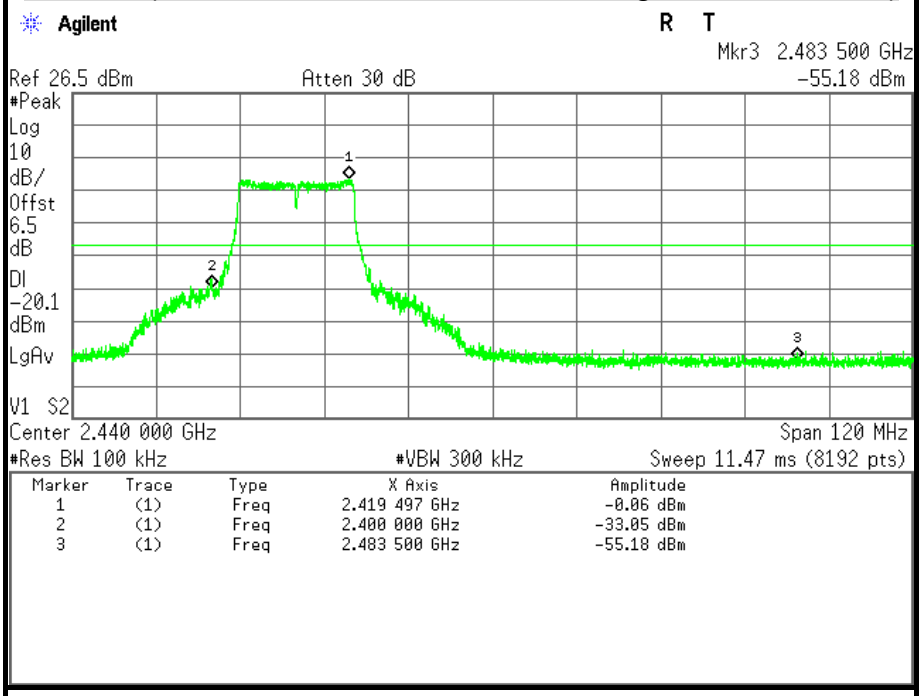
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 0)



CH High (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 0)

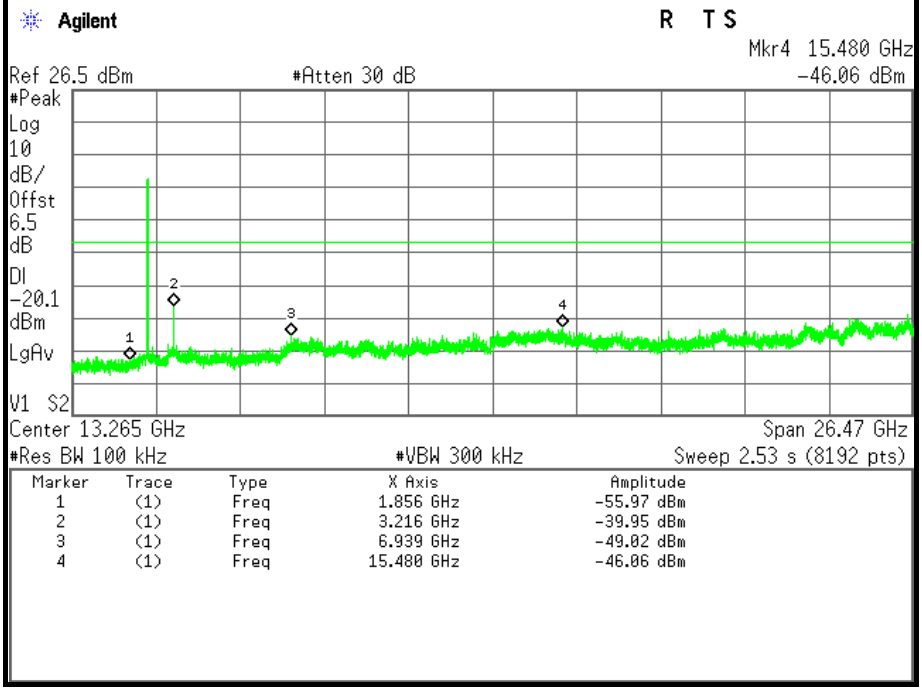


CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 1)



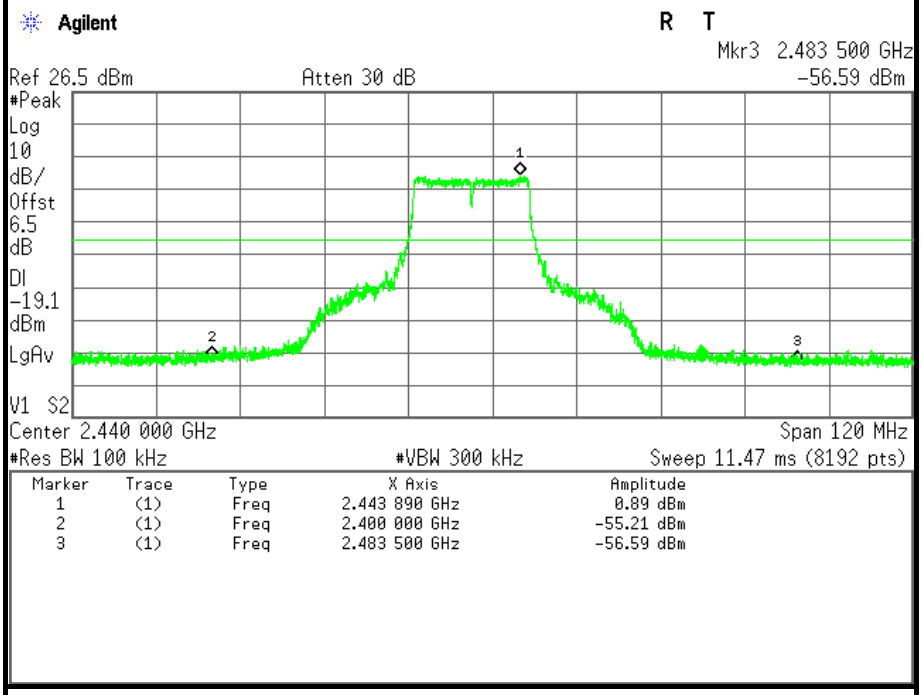
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.419 497 GHz	-0.06 dBm
2	(1)	Freq	2.400 000 GHz	-33.05 dBm
3	(1)	Freq	2.483 500 GHz	-55.18 dBm

CH Low (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 1)

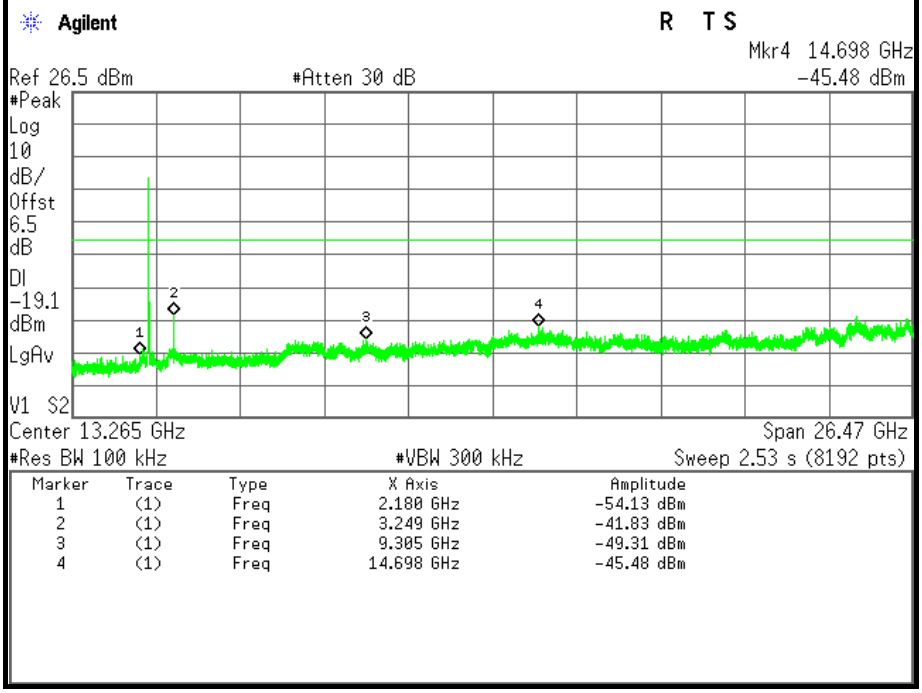


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.856 GHz	-55.97 dBm
2	(1)	Freq	3.216 GHz	-39.95 dBm
3	(1)	Freq	6.939 GHz	-49.02 dBm
4	(1)	Freq	15.480 GHz	-46.06 dBm

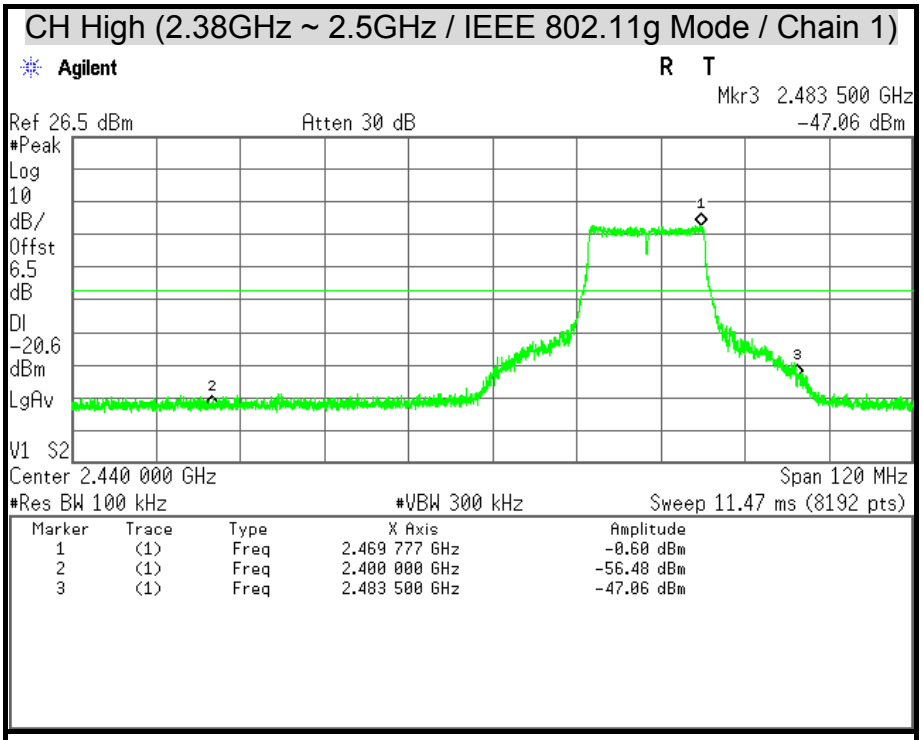
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 1)



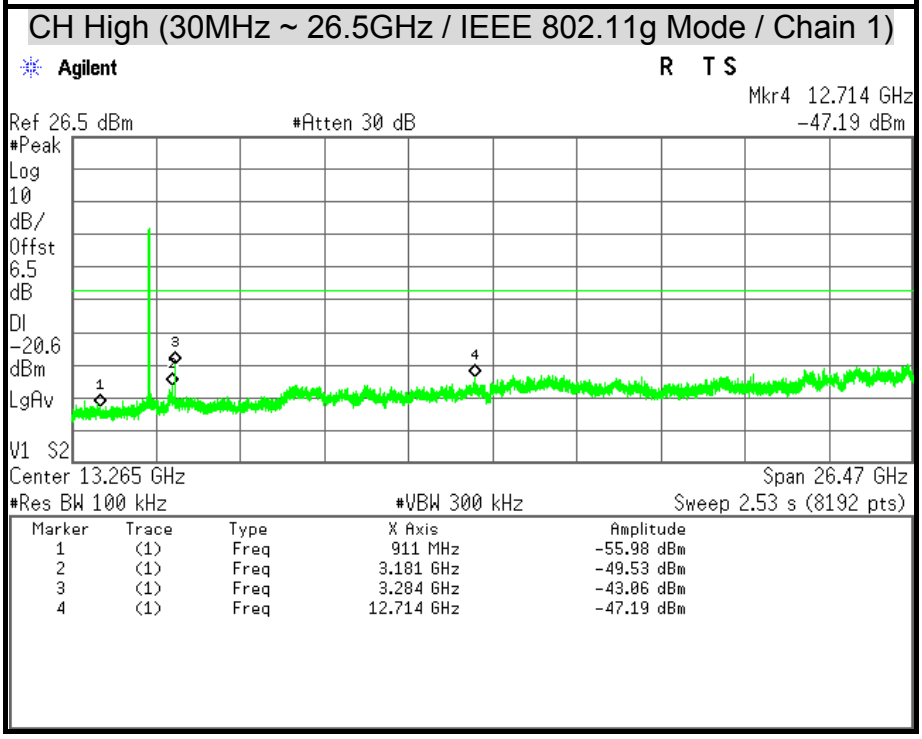
CH Middle (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 1)



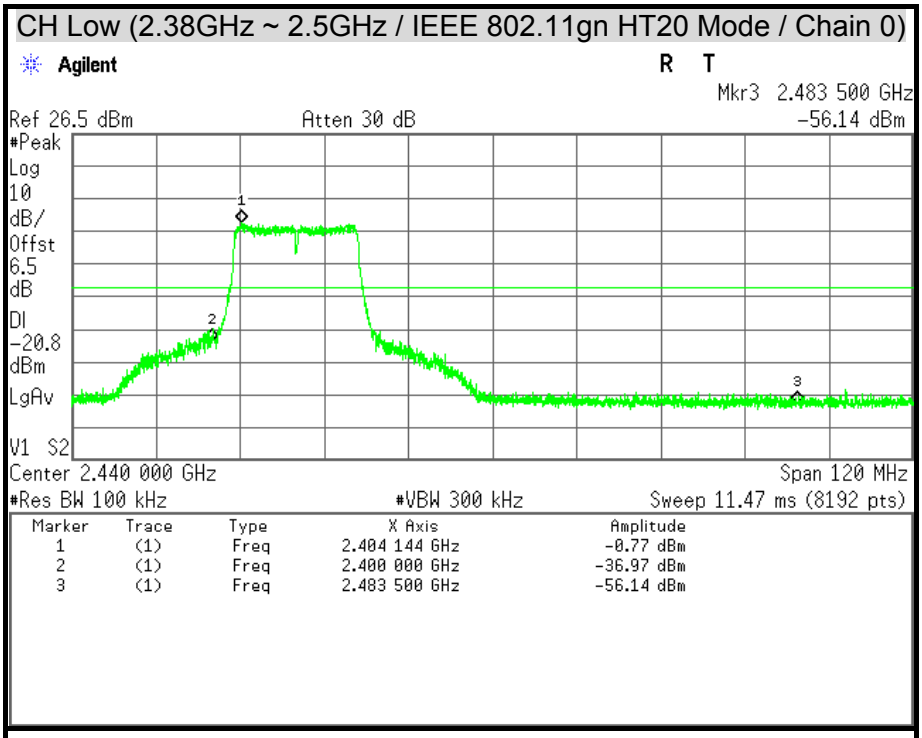
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 1)



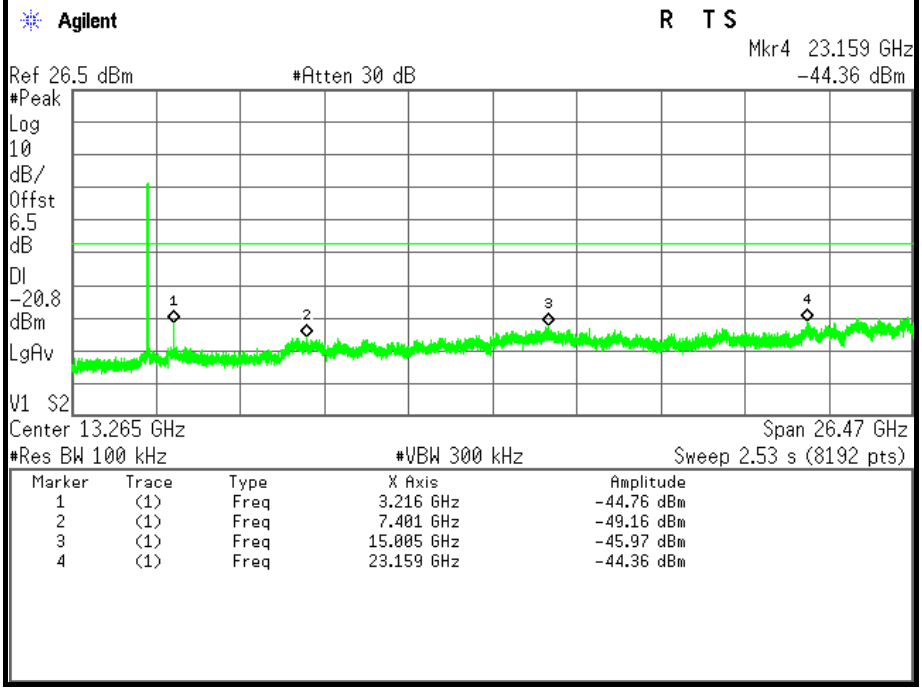
CH High (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 1)



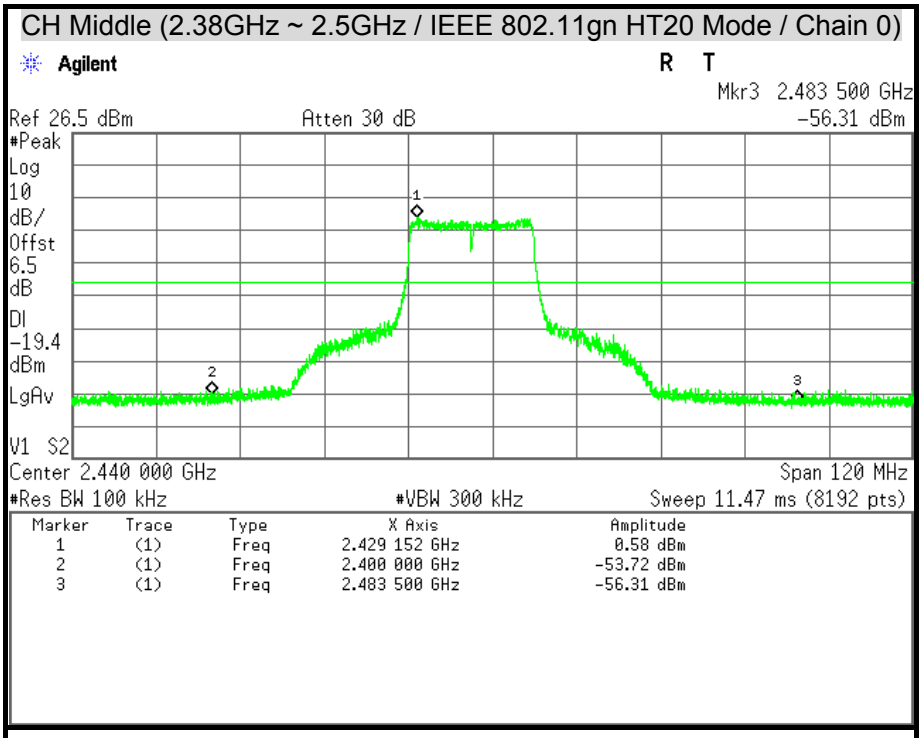
CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT20 Mode / Chain 0)



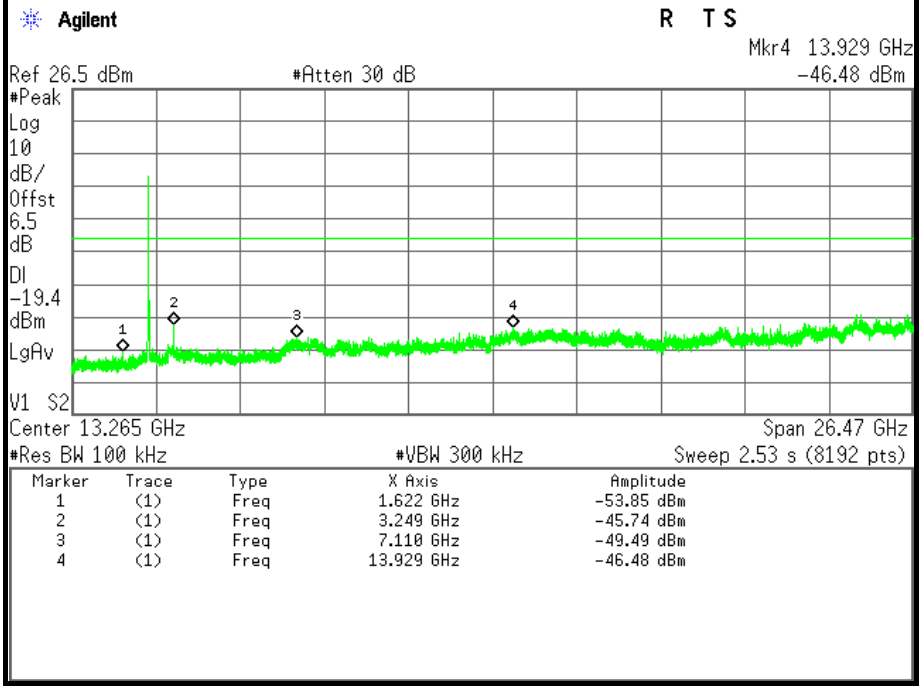
CH Low (30MHz ~ 26.5GHz / IEEE 802.11gn HT20 Mode / Chain 0)



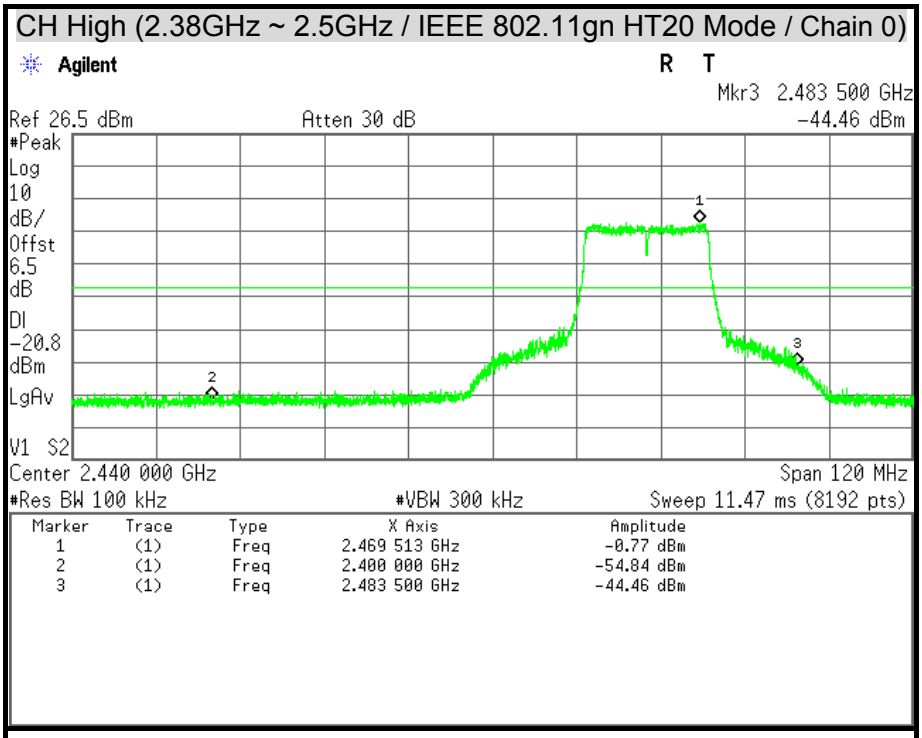
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT20 Mode / Chain 0)



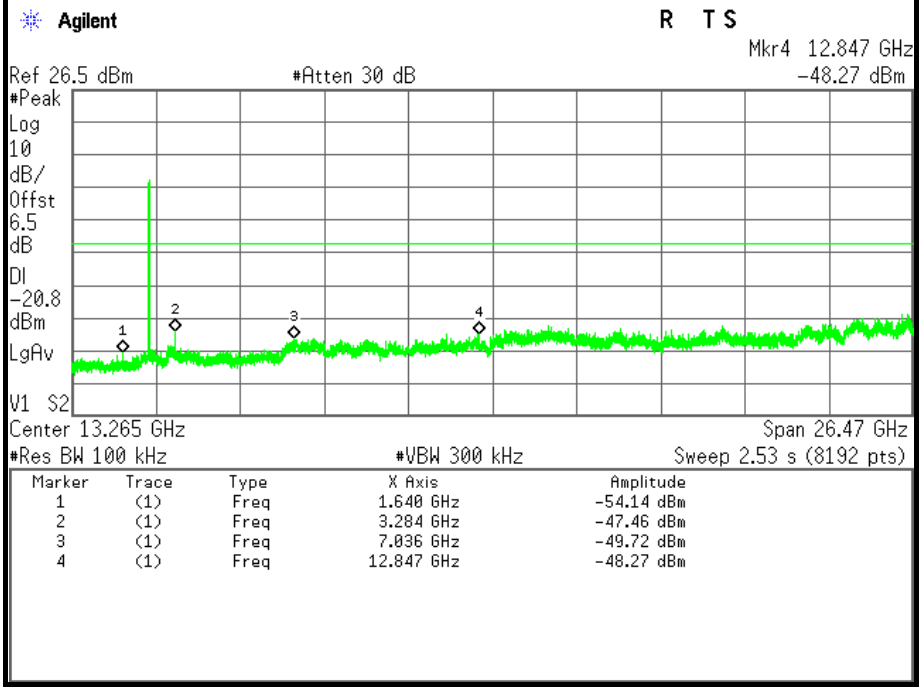
CH Middle (30MHz ~ 26.5GHz / IEEE 802.11gn HT20 Mode/ Chain 0)



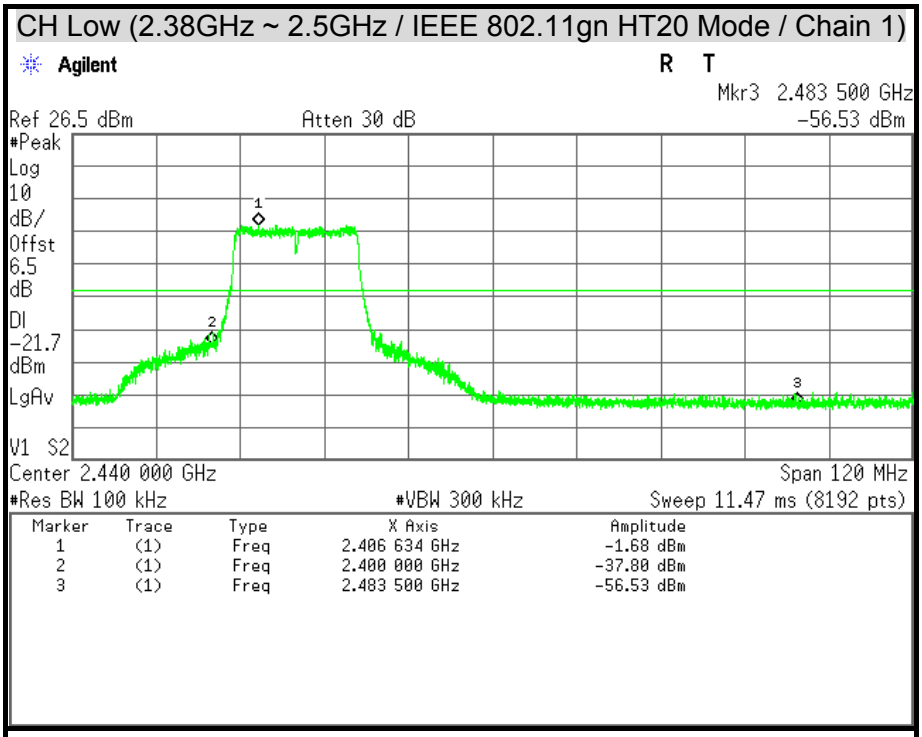
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT20 Mode / Chain 0)



CH High (30MHz ~ 26.5GHz / IEEE 802.11gn HT20 Mode / Chain 0)

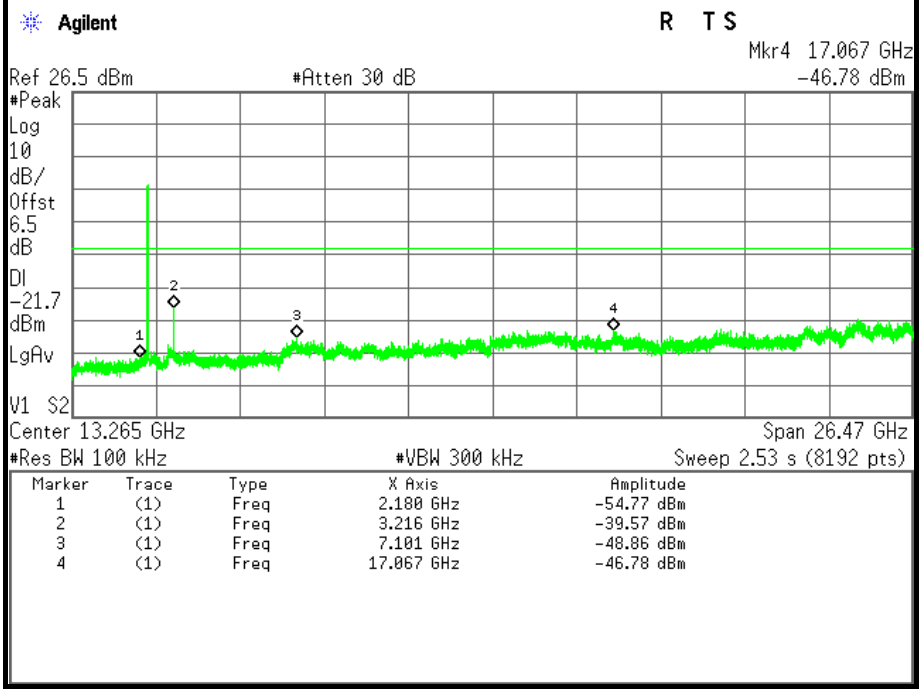


CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT20 Mode / Chain 1)



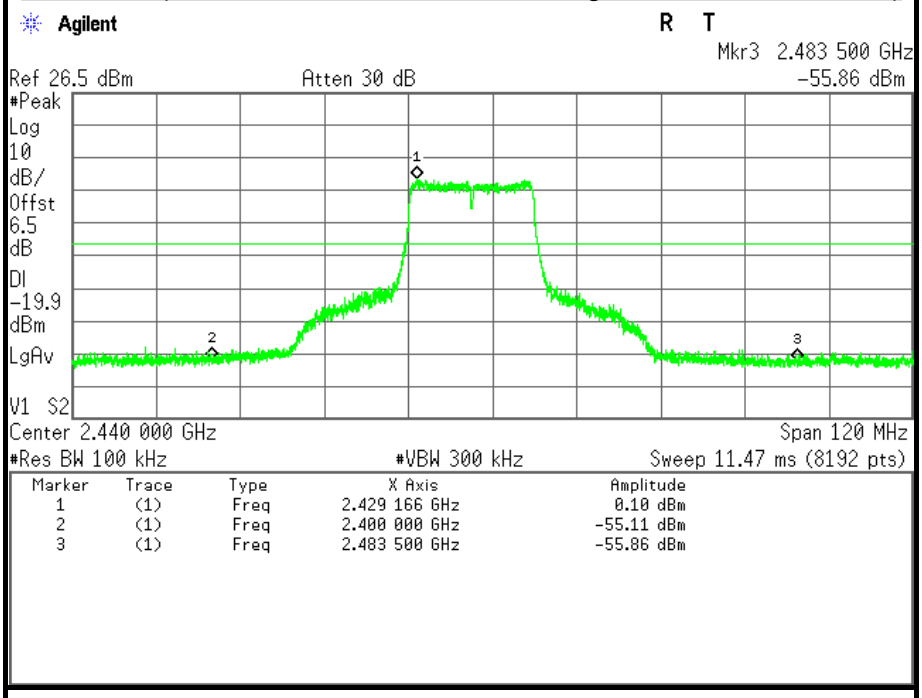
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.406 634 GHz	-1.68 dBm
2	(1)	Freq	2.400 000 GHz	-37.80 dBm
3	(1)	Freq	2.483 500 GHz	-56.53 dBm

CH Low (30MHz ~ 26.5GHz / IEEE 802.11gn HT20 Mode / Chain 1)

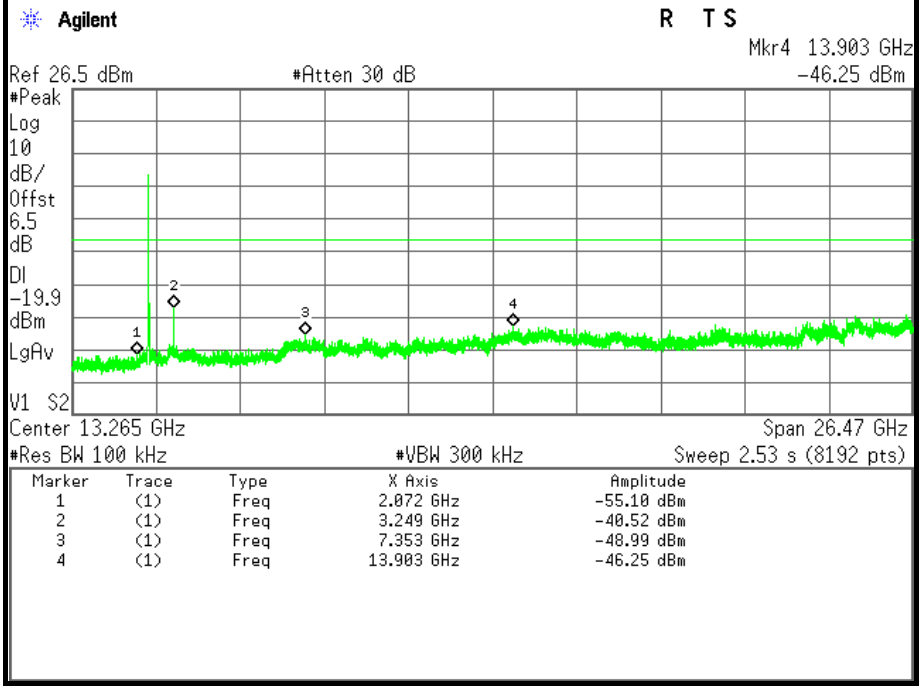


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.180 GHz	-54.77 dBm
2	(1)	Freq	3.216 GHz	-39.57 dBm
3	(1)	Freq	7.101 GHz	-48.86 dBm
4	(1)	Freq	17.067 GHz	-46.78 dBm

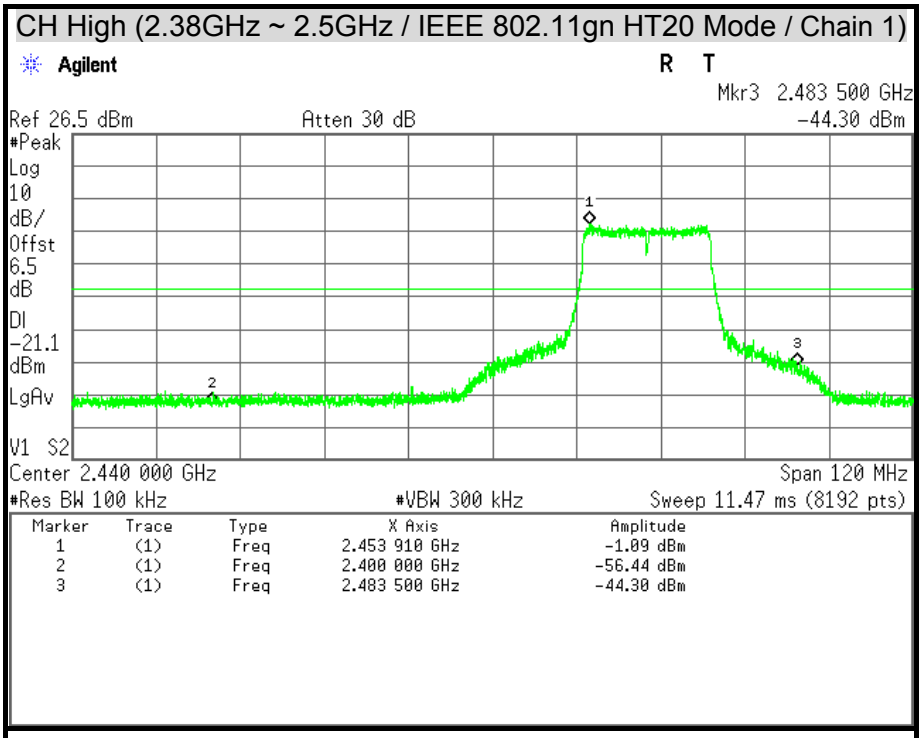
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT20 Mode / Chain 1)



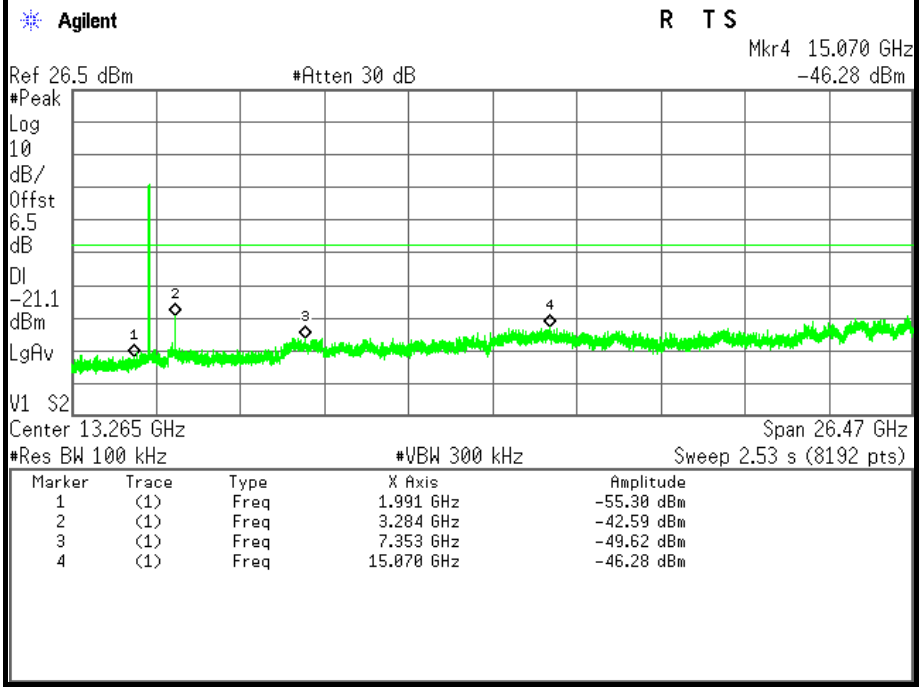
CH Middle (30MHz ~ 26.5GHz / IEEE 802.11gn HT20 Mode/ Chain 1)



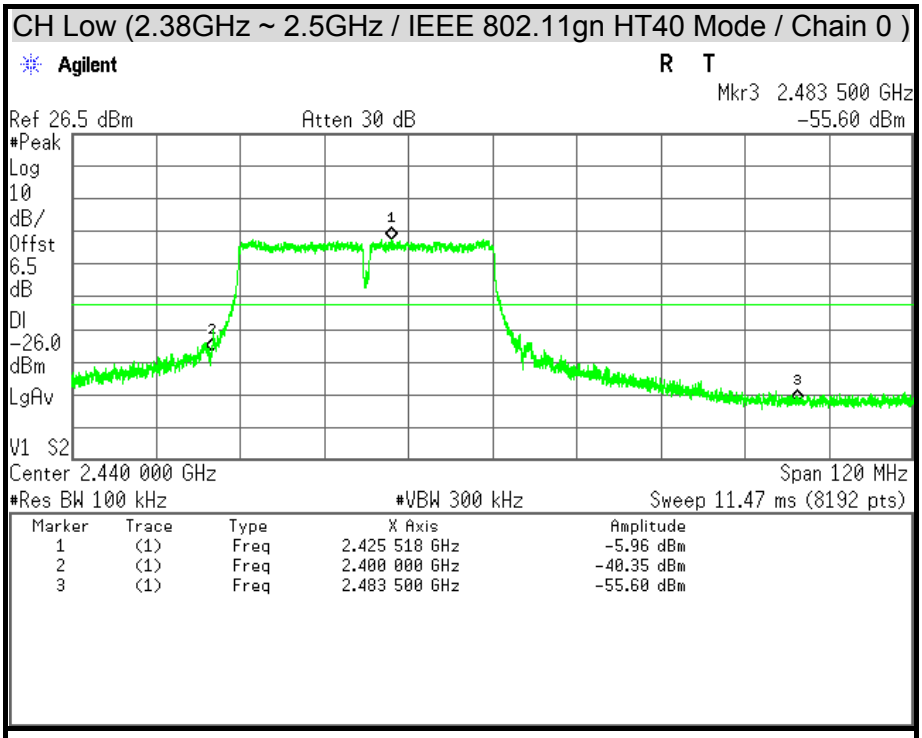
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT20 Mode / Chain 1)



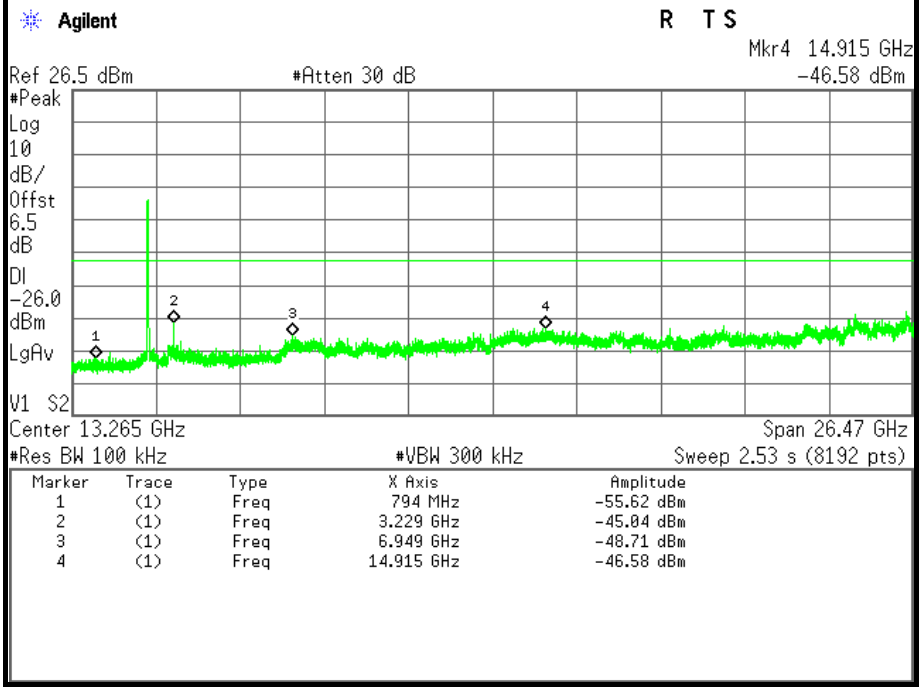
CH High (30MHz ~ 26.5GHz / IEEE 802.11gn HT20 Mode / Chain 1)



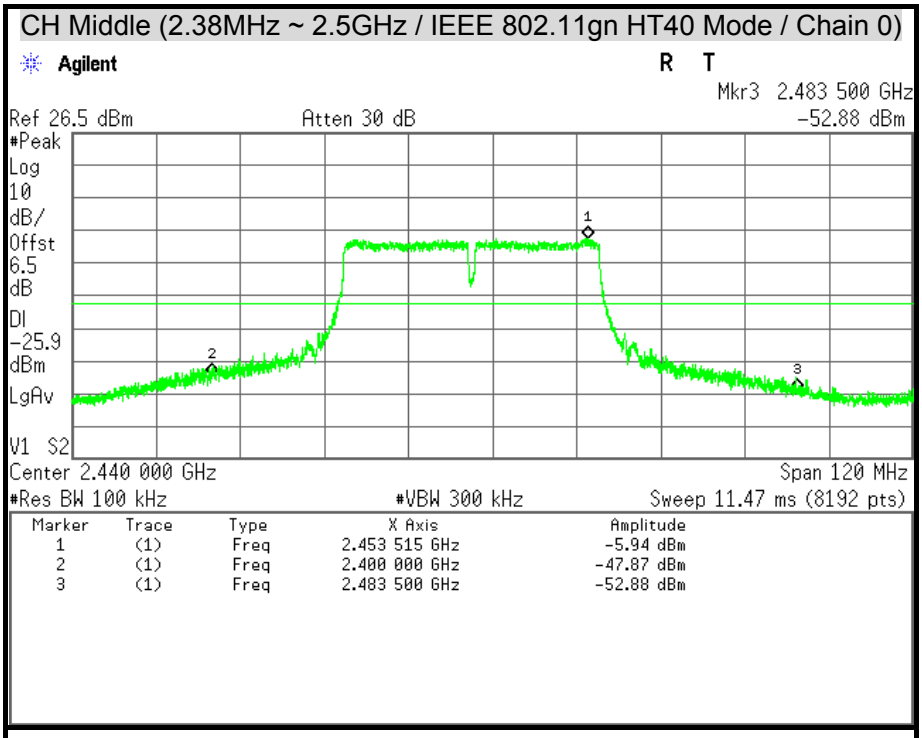
CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT40 Mode / Chain 0)



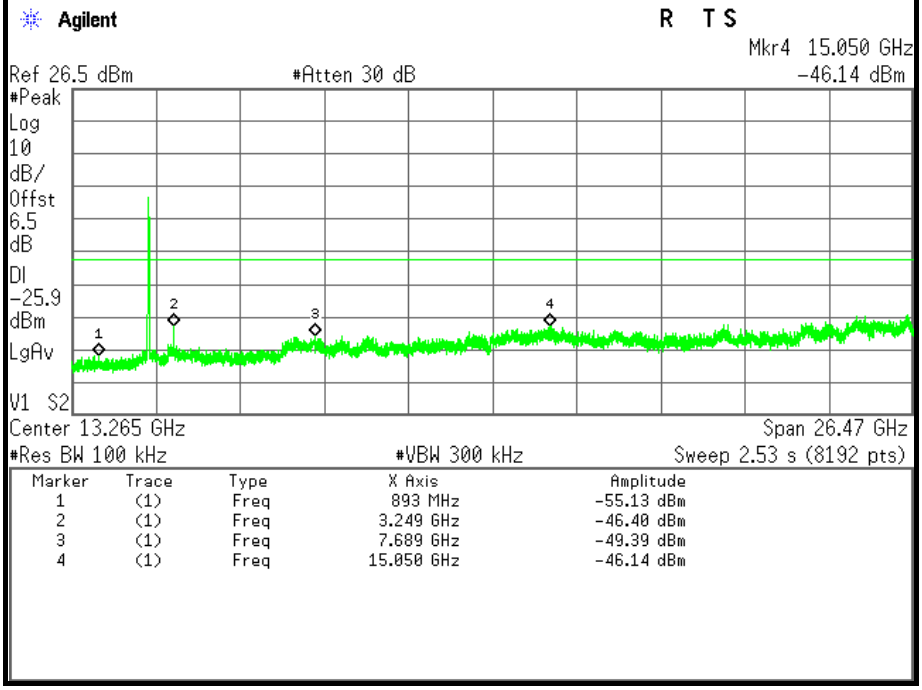
CH Low (30MHz ~ 26.5GHz / IEEE 802.11gn HT40 Mode / Chain 0)



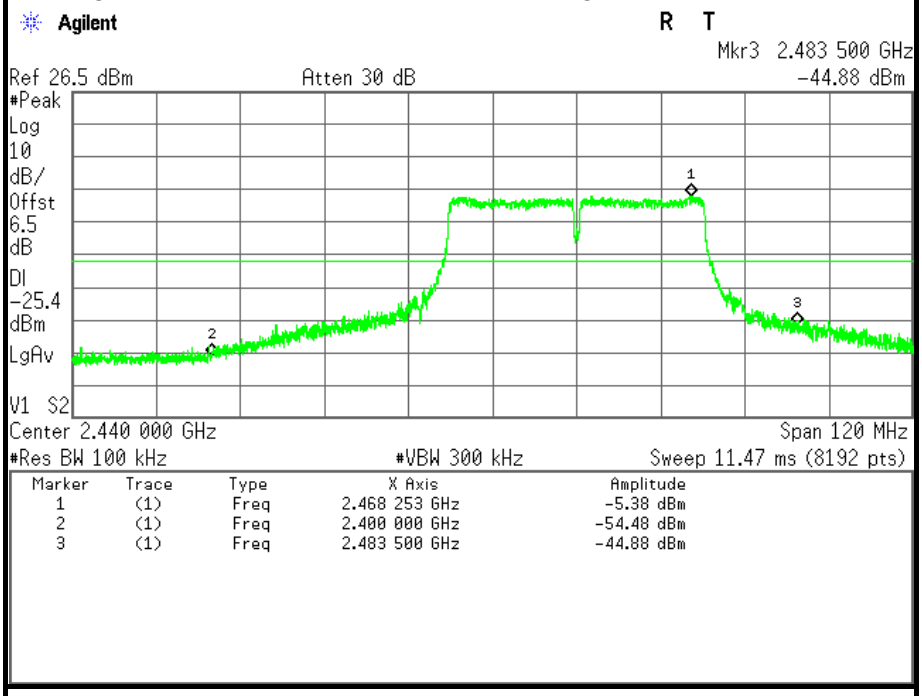
CH Middle (2.38MHz ~ 2.5GHz / IEEE 802.11gn HT40 Mode / Chain 0)



CH Middle (30MHz ~ 26.5GHz / IEEE 802.11gn HT40 Mode / Chain 0)

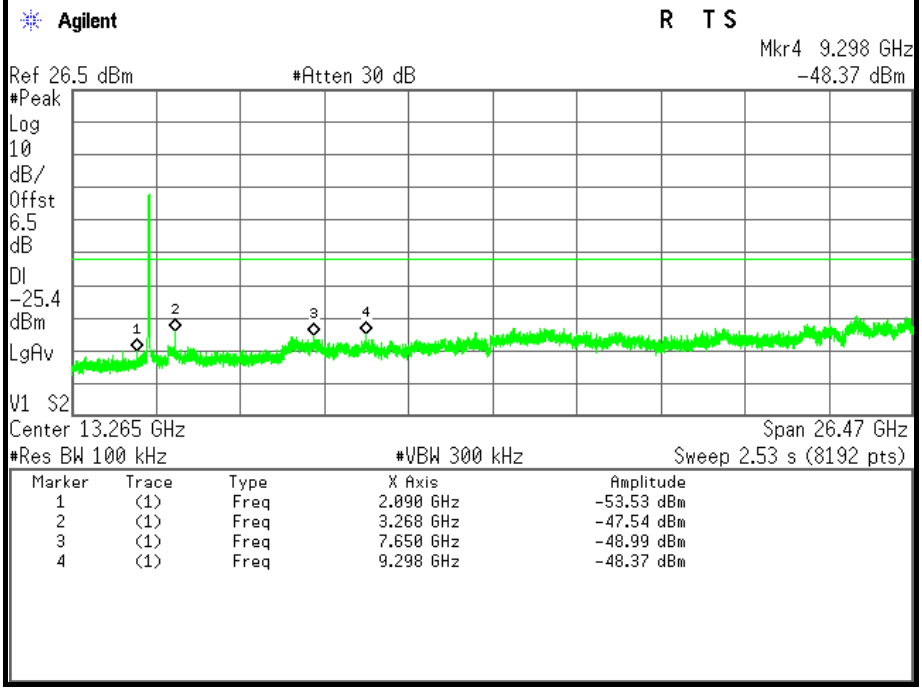


CH High (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT40 Mode / Chain 0)



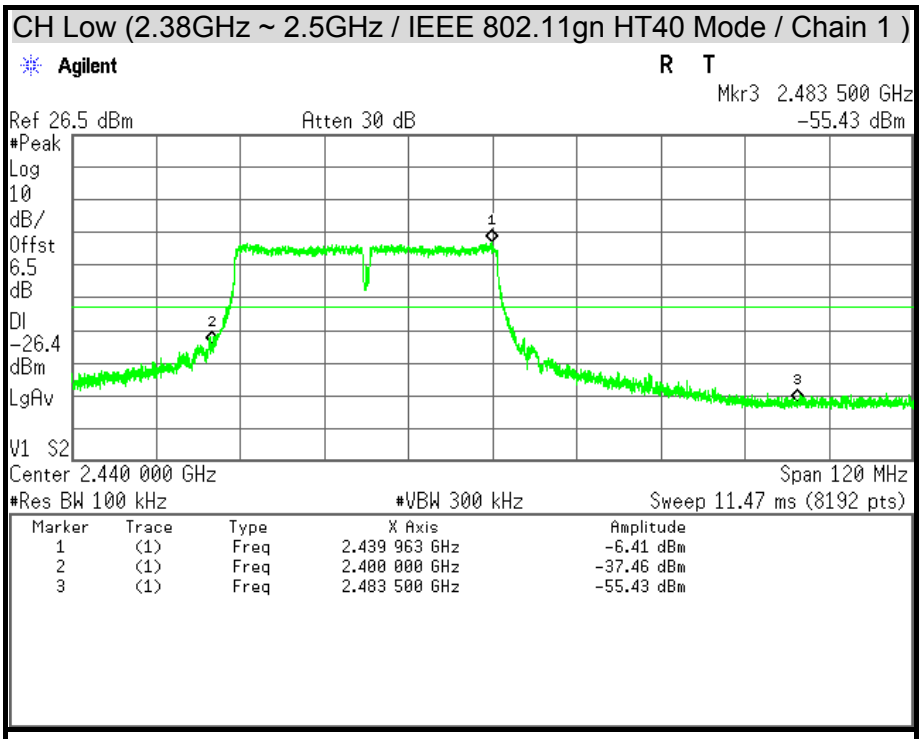
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.468 253 GHz	-5.38 dBm
2	(1)	Freq	2.400 000 GHz	-54.48 dBm
3	(1)	Freq	2.483 500 GHz	-44.88 dBm

CH High (30MHz ~ 26.5GHz / IEEE 802.11gn HT40 Mode / Chain 0)



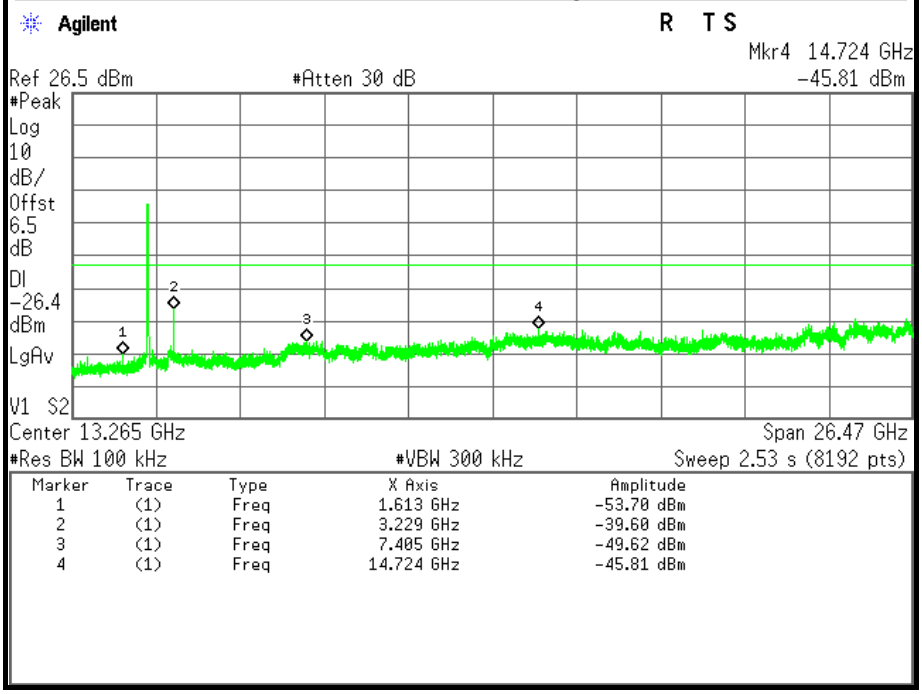
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.090 GHz	-53.53 dBm
2	(1)	Freq	3.268 GHz	-47.54 dBm
3	(1)	Freq	7.650 GHz	-48.99 dBm
4	(1)	Freq	9.298 GHz	-48.37 dBm

CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT40 Mode / Chain 1)



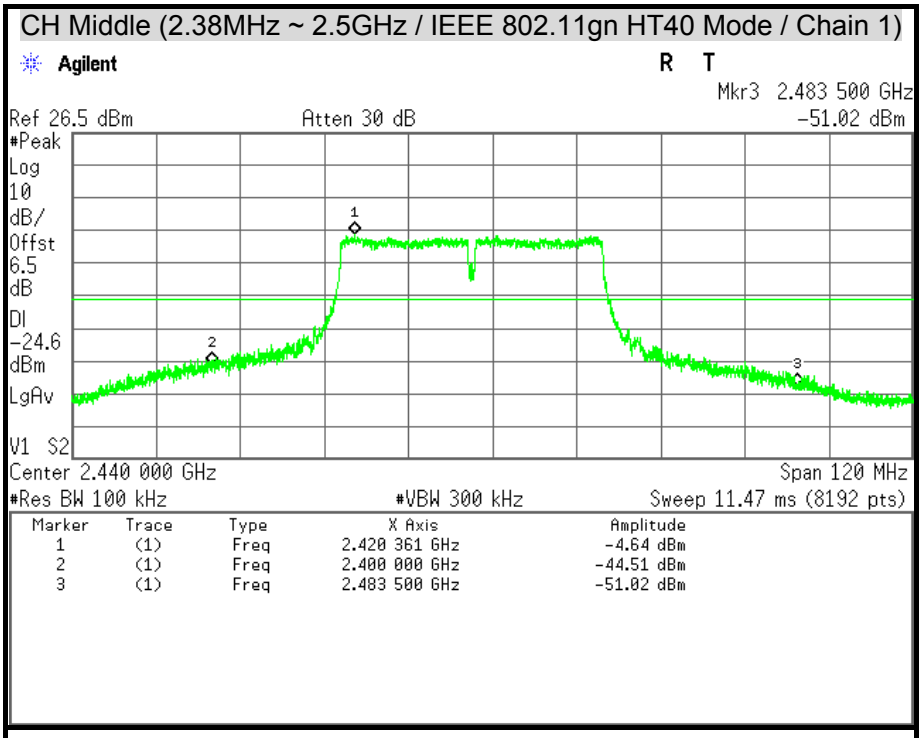
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.439 963 GHz	-6.41 dBm
2	(1)	Freq	2.400 000 GHz	-37.46 dBm
3	(1)	Freq	2.483 500 GHz	-55.43 dBm

CH Low (30MHz ~ 26.5GHz / IEEE 802.11gn HT40 Mode / Chain 1)

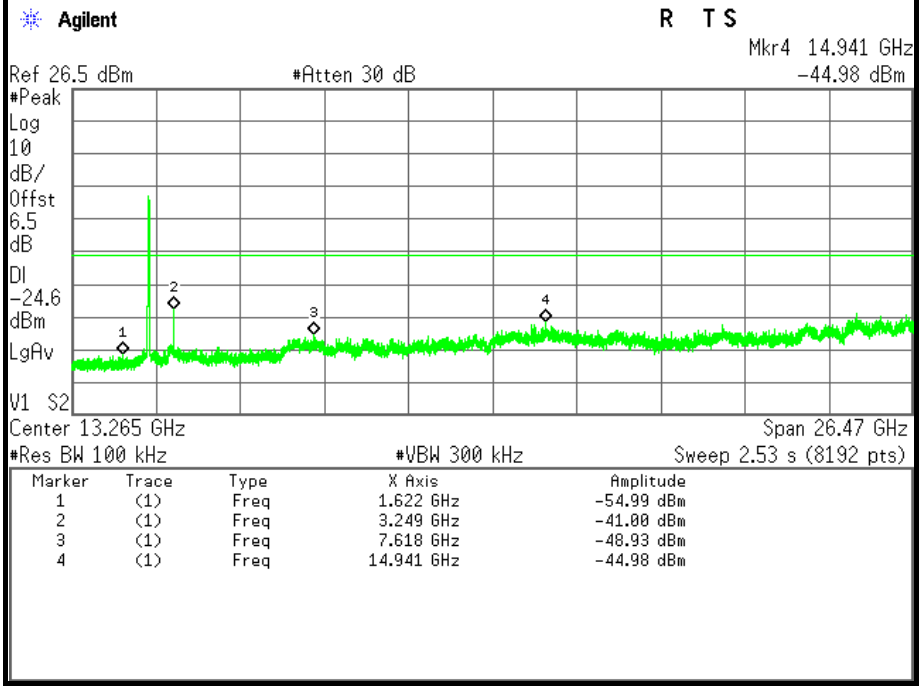


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.613 GHz	-53.70 dBm
2	(1)	Freq	3.229 GHz	-39.60 dBm
3	(1)	Freq	7.405 GHz	-49.62 dBm
4	(1)	Freq	14.724 GHz	-45.81 dBm

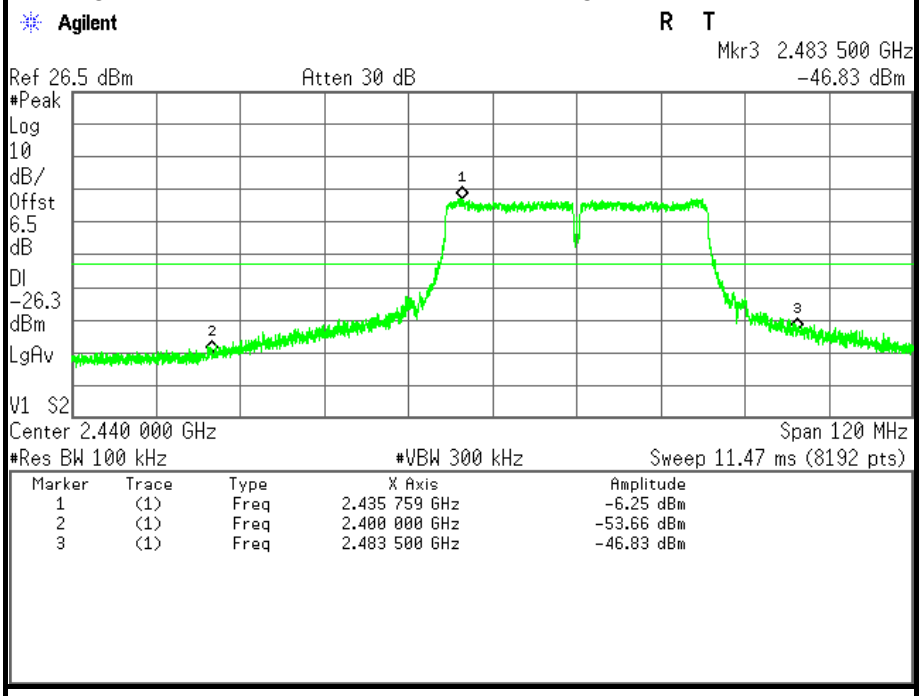
CH Middle (2.38MHz ~ 2.5GHz / IEEE 802.11gn HT40 Mode / Chain 1)



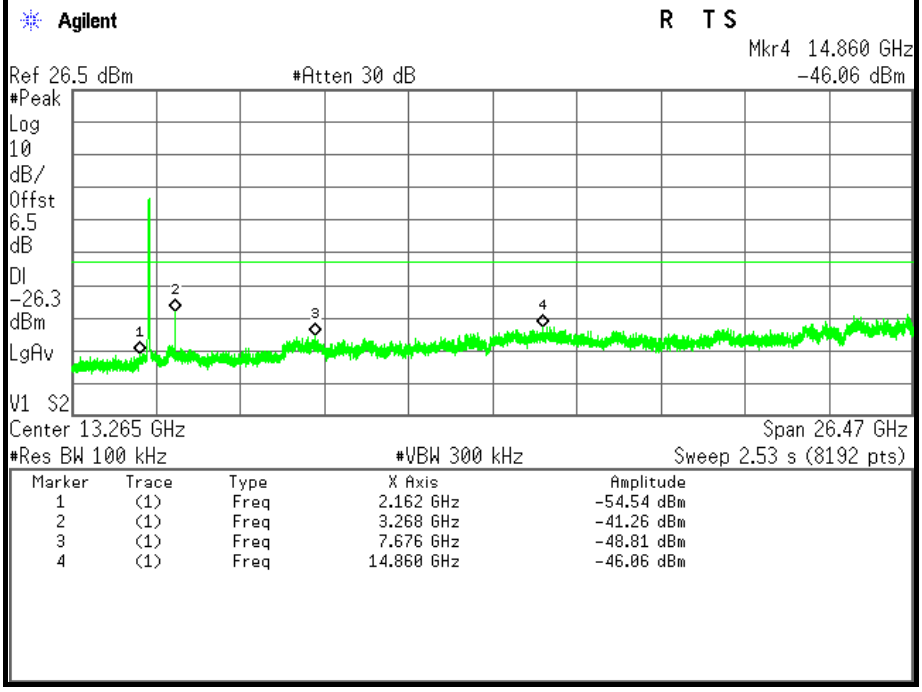
CH Middle (30MHz ~ 26.5GHz / IEEE 802.11gn HT40 Mode / Chain 1)



CH High (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT40 Mode / Chain 1)



CH High (30MHz ~ 26.5GHz / IEEE 802.11gn HT40 Mode / Chain 1)



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

(3) According to § 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(KHz)	300
0.490 – 1.705	24000/F(KHz)	30
1.705 – 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

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

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

TEST EQUIPMENT

Radiated Emission / 966Chamber_B

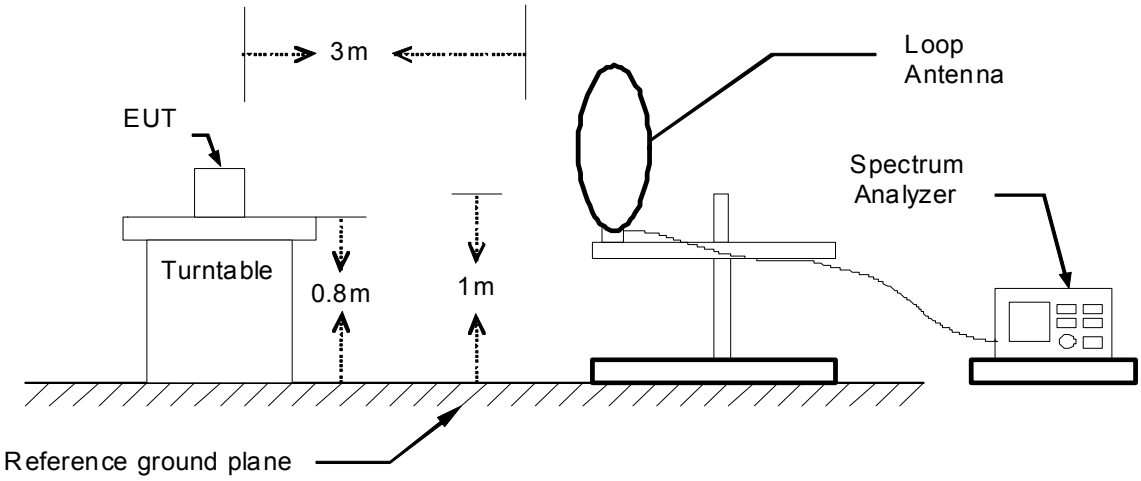
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY46180323	04/14/2016
EMI Test Receiver	ROHDE & SCHWARZ	ESCS 30	835418/008	10/14/2015
Bi-log Antenna	TESEQ	CBL 6112D	35403	02/24/2016
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00078733	12/02/2015
Horn Antenna	COM-POWER	AH-840	03077	12/17/2015
Pre-Amplifier	Agilent	8447D	2944A10052	07/14/2016
Pre-Amplifier	Agilent	8449B	3008A01916	07/14/2016
LOOP Antenna	COM-POWER	AL-130	121060	05/24/2016
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.

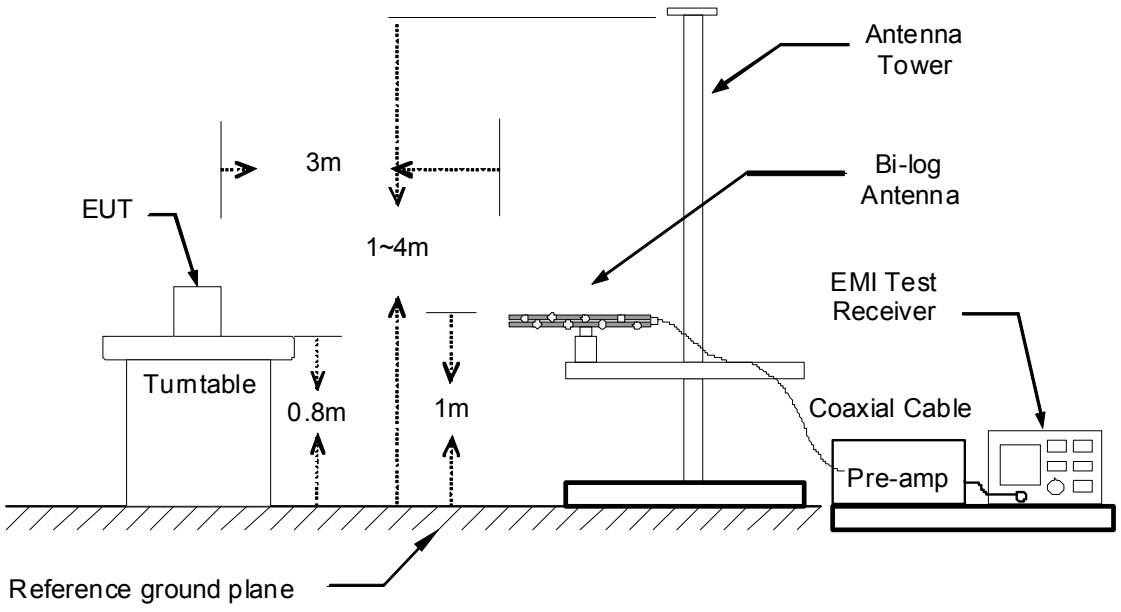
TEST SETUP

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

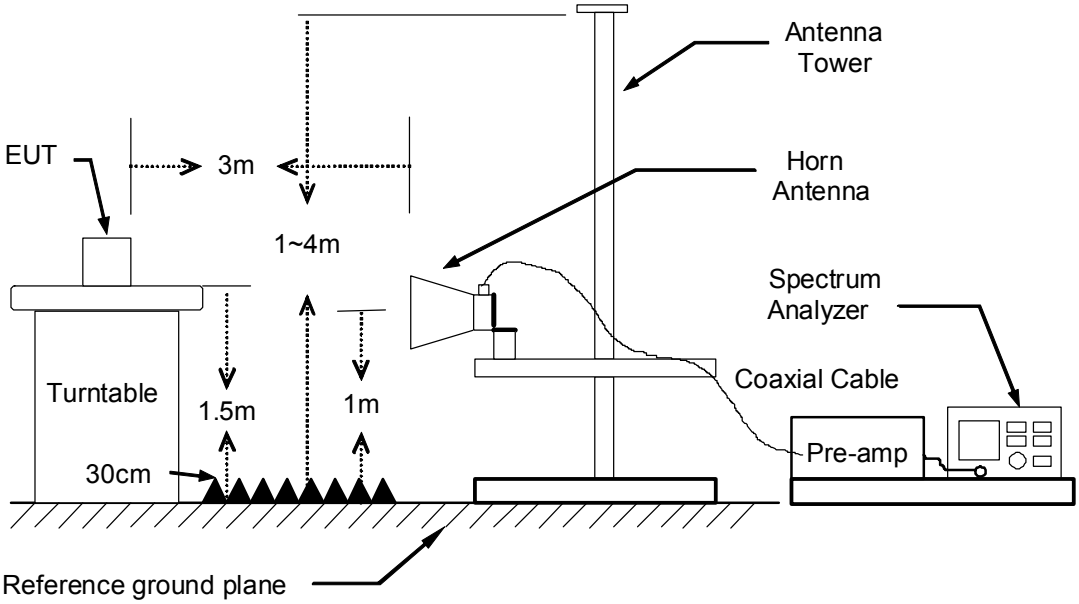
9kHz ~ 30MHz



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 and 1.5 meters above the ground. 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	MT7620 WIFI Module	Test By	Rex Chiu
Test Model	IWM-7620	Test Date	2015/07/07
Test Mode	Mode 1	Temp. & Humidity	25°C, 50%

966 Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
106.63	54.60	-15.94	38.66	43.50	-4.84	220	200	Peak
137.67	46.95	-15.26	31.69	43.50	-11.81	234	200	Peak
676.99	38.95	-6.74	32.21	46.00	-13.79	143	200	Peak
725.49	45.97	-6.28	39.69	46.00	-6.31	243	200	Peak
821.52	41.44	-4.78	36.66	46.00	-9.34	246	100	Peak
967.02	41.67	-2.82	38.85	54.00	-15.15	296	100	Peak

966 Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
42.61	51.52	-15.75	35.77	40.00	-4.23	0	100	Peak
105.66	50.26	-16.02	34.24	43.50	-9.26	144	100	Peak
130.88	45.53	-15.10	30.43	43.50	-13.07	187	100	Peak
579.99	40.07	-7.84	32.23	46.00	-13.77	95	200	Peak
676.99	45.56	-6.74	38.82	46.00	-7.18	344	200	Peak
811.82	37.40	-4.94	32.46	46.00	-13.54	81	100	Peak

Remark:

1. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.*
2. *Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) – PreAmp.Gain (dB)*
3. *Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)*
4. *Margin (dB) = Remark result (dBuV/m) - Quasi-peak limit (dBuV/m)*

Above 1 GHz

Product Name	MT7620 WIFI Module	Test By	Rex Chiu
Test Model	IWM-7620	Test Date	2015/07/24
Test Mode	IEEE 802.11b TX / CH Low	Temp. & Humidity	25°C, 50%

966 Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2252.00	42.48	2.40	44.88	74.00	-29.12	175	200	Peak
2518.00	42.21	3.05	45.26	74.00	-28.74	65	200	Peak
2580.00	42.81	3.17	45.98	74.00	-28.02	35	100	Peak
3210.00	44.57	4.45	49.02	74.00	-24.98	122	100	Peak
4830.00	42.75	8.00	50.75	74.00	-23.25	94	100	Peak
7230.00	37.63	11.78	49.41	74.00	-24.59	6	100	Peak

966 Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2336.00	40.07	2.61	42.68	54.00	-11.32	215	200	Average
2336.00	52.31	2.61	54.92	74.00	-19.08	215	200	Peak
2538.00	38.09	3.09	41.18	54.00	-12.82	338	200	Average
2538.00	50.66	3.09	53.75	74.00	-20.25	338	200	Peak
3210.00	48.30	4.45	52.75	54.00	-1.25	190	200	Average
3210.00	52.83	4.45	57.28	74.00	-16.72	190	200	Peak
4830.00	45.20	8.00	53.20	54.00	-0.80	63	204	Average
4830.00	47.86	8.00	55.86	74.00	-18.14	63	204	Peak
9420.00	36.65	13.68	50.33	74.00	-23.67	248	200	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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MT7620 WIFI Module	Test By	Rex Chiu
Test Model	IWM-7620	Test Date	2015/07/24
Test Mode	IEEE 802.11b TX / CH Middle	Temp. & Humidity	25°C, 50%

966 Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2334.00	42.13	2.60	44.73	74.00	-29.27	14	200	Peak
2504.00	42.03	3.02	45.05	74.00	-28.95	104	200	Peak
2594.00	42.33	3.20	45.53	74.00	-28.47	64	200	Peak
3255.00	44.61	4.54	49.15	74.00	-24.85	65	200	Peak
4875.00	45.39	8.04	53.43	54.00	-0.57	346	120	Average
4875.00	48.29	8.04	56.33	74.00	-17.67	346	100	Peak
9555.00	36.46	14.02	50.48	74.00	-23.52	278	200	Peak

966 Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2352.00	41.36	2.65	44.01	54.00	-9.99	334	200	Average
2352.00	52.69	2.65	55.34	74.00	-18.66	334	200	Peak
2526.00	38.96	3.06	42.02	54.00	-11.98	338	200	Average
2526.00	50.23	3.06	53.29	74.00	-20.71	338	200	Peak
3255.00	48.10	4.54	52.64	54.00	-1.36	226	200	Average
3255.00	52.57	4.54	57.11	74.00	-16.89	226	200	Peak
4875.00	45.39	8.04	53.43	54.00	-0.57	356	169	Average
4875.00	48.25	8.04	56.29	74.00	-17.71	356	169	Peak
7305.00	38.76	11.61	50.37	74.00	-23.63	87	200	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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MT7620 WIFI Module	Test By	Rex Chiu
Test Model	IWM-7620	Test Date	2015/07/24
Test Mode	IEEE 802.11b TX / CH High	Temp. & Humidity	25°C, 50%

966 Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2264.00	42.58	2.43	45.01	74.00	-28.99	56	200	Peak
2342.00	43.37	2.62	45.99	74.00	-28.01	0	200	Peak
2540.00	42.02	3.09	45.11	74.00	-28.89	26	100	Peak
3285.00	44.80	4.60	49.40	74.00	-24.60	117	100	Peak
4920.00	42.06	8.08	50.14	74.00	-23.86	0	100	Peak
7005.00	37.17	12.30	49.47	74.00	-24.53	306	100	Peak

966 Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2336.00	41.01	2.61	43.62	54.00	-10.38	341	200	Average
2336.00	51.89	2.61	54.50	74.00	-19.50	341	200	Peak
2606.00	38.44	3.23	41.67	54.00	-12.33	344	200	Average
2606.00	50.83	3.23	54.06	74.00	-19.94	344	200	Peak
3285.00	47.35	4.60	51.95	54.00	-2.05	152	200	Average
3285.00	51.91	4.60	56.51	74.00	-17.49	152	200	Peak
4920.00	44.81	8.08	52.89	54.00	-1.11	286	198	Average
4920.00	45.35	8.08	53.43	74.00	-20.57	291	200	Peak
6150.00	38.05	11.58	49.63	74.00	-24.37	259	100	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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MT7620 WIFI Module	Test By	Rex Chiu
Test Model	IWM-7620	Test Date	2015/07/24
Test Mode	IEEE 802.11g TX / CH Low	Temp. & Humidity	25°C, 50%

966 Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2258.00	41.59	2.41	44.00	74.00	-30.00	30	100	Peak
2538.00	40.87	3.09	43.96	74.00	-30.04	354	100	Peak
2616.00	41.69	3.25	44.94	74.00	-29.06	120	200	Peak
3210.00	43.32	4.45	47.77	74.00	-26.23	135	100	Peak
4815.00	39.05	7.99	47.04	74.00	-26.96	79	100	Peak
7920.00	36.64	12.24	48.88	74.00	-25.12	327	100	Peak

966 Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2076.00	41.64	1.97	43.61	74.00	-30.39	138	100	Peak
2264.00	48.07	2.43	50.50	74.00	-23.50	152	100	Peak
2526.00	46.27	3.06	49.33	74.00	-24.67	335	200	Peak
3210.00	47.20	4.45	51.65	54.00	-2.35	8	200	Average
3210.00	50.39	4.45	54.84	74.00	-19.16	8	200	Peak
4830.00	39.49	8.00	47.49	74.00	-26.51	228	100	Peak
8055.00	37.25	12.48	49.73	74.00	-24.27	169	100	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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MT7620 WIFI Module	Test By	Rex Chiu
Test Model	IWM-7620	Test Date	2015/07/24
Test Mode	IEEE 802.11g TX / CH Middle	Temp. & Humidity	25°C, 50%

966 Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2236.00	41.90	2.36	44.26	74.00	-29.74	206	200	Peak
2372.00	41.53	2.70	44.23	74.00	-29.77	262	100	Peak
2518.00	40.87	3.05	43.92	74.00	-30.08	4	100	Peak
3255.00	44.43	4.54	48.97	74.00	-25.03	57	200	Peak
4875.00	39.19	8.04	47.23	74.00	-26.77	90	200	Peak
9495.00	36.75	13.92	50.67	74.00	-23.33	346	100	Peak

966 Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2260.00	48.09	2.42	50.51	74.00	-23.49	337	200	Peak
2322.00	48.06	2.57	50.63	74.00	-23.37	300	200	Peak
2536.00	46.00	3.08	49.08	74.00	-24.92	275	200	Peak
3255.00	45.60	4.54	50.14	54.00	-3.86	323	200	Average
3255.00	49.75	4.54	54.29	74.00	-19.71	323	200	Peak
4875.00	40.11	8.04	48.15	74.00	-25.85	359	200	Peak
9810.00	36.08	14.37	50.45	74.00	-23.55	304	200	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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MT7620 WIFI Module	Test By	Rex Chiu
Test Model	IWM-7620	Test Date	2015/07/24
Test Mode	IEEE 802.11g TX / CH High	Temp. & Humidity	25°C, 50%

966 Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2290.00	42.22	2.49	44.71	74.00	-29.29	247	200	Peak
2352.00	42.46	2.65	45.11	74.00	-28.89	66	100	Peak
2556.00	41.00	3.12	44.12	74.00	-29.88	276	100	Peak
3285.00	43.16	4.60	47.76	74.00	-26.24	116	100	Peak
5670.00	37.40	10.59	47.99	74.00	-26.01	124	200	Peak
9600.00	36.32	14.08	50.40	74.00	-23.60	184	100	Peak

966 Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2292.00	48.11	2.50	50.61	74.00	-23.39	331	200	Peak
2330.00	48.64	2.59	51.23	74.00	-22.77	333	200	Peak
2506.00	46.68	3.02	49.70	74.00	-24.30	331	200	Peak
3285.00	45.50	4.60	50.10	54.00	-3.90	143	200	Average
3285.00	49.77	4.60	54.37	74.00	-19.63	143	200	Peak
5730.00	37.99	10.76	48.75	74.00	-25.25	59	100	Peak
9465.00	36.48	13.83	50.31	74.00	-23.69	136	200	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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MT7620 WIFI Module	Test By	Rex Chiu
Test Model	IWM-7620	Test Date	2015/07/24
Test Mode	IEEE 802.11gn HT20 TX / CH Low	Temp. & Humidity	25°C, 50%

966 Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2146.00	41.60	2.14	43.74	74.00	-30.26	348	100	Peak
2300.00	41.84	2.52	44.36	74.00	-29.64	338	100	Peak
2552.00	41.12	3.12	44.24	74.00	-29.76	113	100	Peak
3210.00	43.09	4.45	47.54	74.00	-26.46	59	200	Peak
4830.00	38.99	8.00	46.99	74.00	-27.01	17	200	Peak
9495.00	36.76	13.92	50.68	74.00	-23.32	313	100	Peak

966 Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2124.00	41.56	2.09	43.65	74.00	-30.35	170	100	Peak
2302.00	47.66	2.52	50.18	74.00	-23.82	283	200	Peak
2544.00	46.28	3.10	49.38	74.00	-24.62	340	200	Peak
3210.00	45.20	4.45	49.65	54.00	-4.35	328	200	Average
3210.00	49.82	4.45	54.27	74.00	-19.73	328	200	Peak
4830.00	39.26	8.00	47.26	74.00	-26.74	68	200	Peak
9645.00	37.06	14.14	51.20	74.00	-22.80	63	200	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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MT7620 WIFI Module	Test By	Rex Chiu
Test Model	IWM-7620	Test Date	2015/07/24
Test Mode	IEEE 802.11gn HT20 TX / CH Middle	Temp. & Humidity	25°C, 50%

966 Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2382.00	40.99	2.72	43.71	74.00	-30.29	48	200	Peak
2492.00	41.70	2.99	44.69	74.00	-29.31	328	100	Peak
2554.00	41.83	3.12	44.95	74.00	-29.05	15	200	Peak
3255.00	43.23	4.54	47.77	74.00	-26.23	101	200	Peak
4875.00	40.58	8.04	48.62	74.00	-25.38	44	100	Peak
9555.00	36.51	14.02	50.53	74.00	-23.47	118	100	Peak

966 Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2114.00	43.10	2.06	45.16	74.00	-28.84	163	200	Peak
2320.00	48.52	2.57	51.09	74.00	-22.91	335	200	Peak
2536.00	46.04	3.08	49.12	74.00	-24.88	347	200	Peak
3255.00	45.80	4.54	50.34	54.00	-3.66	325	200	Average
3255.00	50.11	4.54	54.65	74.00	-19.35	325	200	Peak
4875.00	39.42	8.04	47.46	74.00	-26.54	226	100	Peak
9750.00	37.44	14.29	51.73	74.00	-22.27	318	200	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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MT7620 WIFI Module	Test By	Rex Chiu
Test Model	IWM-7620	Test Date	2015/07/24
Test Mode	IEEE 802.11gn HT20 TX / CH High	Temp. & Humidity	25°C, 50%

966 Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2244.00	43.15	2.38	45.53	74.00	-28.47	170	100	Peak
2312.00	41.11	2.55	43.66	74.00	-30.34	255	200	Peak
2574.00	40.91	3.16	44.07	74.00	-29.93	195	100	Peak
3285.00	43.14	4.60	47.74	74.00	-26.26	323	200	Peak
5805.00	37.39	10.98	48.37	74.00	-25.63	283	100	Peak
9615.00	36.87	14.10	50.97	74.00	-23.03	237	200	Peak

966 Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2294.00	48.84	2.50	51.34	74.00	-22.66	278	200	Peak
2358.00	47.96	2.66	50.62	74.00	-23.38	333	200	Peak
2514.00	46.14	3.04	49.18	74.00	-24.82	340	200	Peak
3285.00	46.10	4.60	50.70	54.00	-3.30	145	200	Average
3285.00	50.09	4.60	54.69	74.00	-19.31	145	200	Peak
4920.00	39.05	8.08	47.13	74.00	-26.87	0	200	Peak
9810.00	36.72	14.37	51.09	74.00	-22.91	339	200	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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MT7620 WIFI Module	Test By	Rex Chiu
Test Model	IWM-7620	Test Date	2015/07/24
Test Mode	IEEE 802.11gn HT40 TX / CH Low	Temp. & Humidity	25°C, 50%

966 Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2132.00	41.17	2.10	43.27	74.00	-30.73	149	200	Peak
2290.00	41.46	2.49	43.95	74.00	-30.05	18	200	Peak
2530.00	41.33	3.07	44.40	74.00	-29.60	198	100	Peak
3225.00	43.15	4.48	47.63	74.00	-26.37	53	200	Peak
5625.00	37.58	10.45	48.03	74.00	-25.97	79	200	Peak
9540.00	36.35	14.00	50.35	74.00	-23.65	286	100	Peak

966 Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2090.00	42.27	2.00	44.27	74.00	-29.73	7	100	Peak
2302.00	48.52	2.52	51.04	74.00	-22.96	28	200	Peak
2504.00	46.06	3.02	49.08	74.00	-24.92	326	200	Peak
3225.00	45.70	4.48	50.18	54.00	-3.82	178	200	Average
3225.00	49.93	4.48	54.41	74.00	-19.59	178	200	Peak
5595.00	37.43	10.37	47.80	74.00	-26.20	54	100	Peak
9645.00	36.88	14.14	51.02	74.00	-22.98	139	100	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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MT7620 WIFI Module	Test By	Rex Chiu
Test Model	IWM-7620	Test Date	2015/07/24
Test Mode	IEEE 802.11gn HT40 TX / CH Middle	Temp. & Humidity	25°C, 50%

966 Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2338.00	42.88	2.61	45.49	74.00	-28.51	42	100	Peak
2390.00	43.13	2.74	45.87	74.00	-28.13	267	100	Peak
2484.00	42.75	2.97	45.72	74.00	-28.28	358	200	Peak
3255.00	43.56	4.54	48.10	74.00	-25.90	144	200	Peak
5565.00	38.46	10.28	48.74	74.00	-25.26	147	100	Peak
9870.00	35.87	14.46	50.33	74.00	-23.67	293	100	Peak

966 Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2332.00	49.22	2.60	51.82	74.00	-22.18	351	200	Peak
2386.00	43.90	2.73	46.63	54.00	-7.37	23	200	Average
2386.00	61.73	2.73	64.46	74.00	-9.54	23	200	Peak
2484.00	43.61	2.97	46.58	54.00	-7.42	6	200	Average
2484.00	60.50	2.97	63.47	74.00	-10.53	6	200	Peak
3255.00	45.40	4.54	49.94	54.00	-4.06	318	200	Average
3255.00	50.22	4.54	54.76	74.00	-19.24	318	200	Peak
6780.00	37.01	12.02	49.03	74.00	-24.97	192	200	Peak
9675.00	37.20	14.18	51.38	74.00	-22.62	124	200	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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MT7620 WIFI Module	Test By	Rex Chiu
Test Model	IWM-7620	Test Date	2015/07/24
Test Mode	IEEE 802.11gn HT40 TX / CH High	Temp. & Humidity	25°C, 50%

966 Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2340.00	41.45	2.62	44.07	74.00	-29.93	204	100	Peak
2560.00	41.07	3.13	44.20	74.00	-29.80	185	200	Peak
2610.00	42.29	3.23	45.52	74.00	-28.48	5	100	Peak
3270.00	43.41	4.57	47.98	74.00	-26.02	98	200	Peak
6375.00	37.85	11.62	49.47	74.00	-24.53	98	200	Peak
9405.00	36.51	13.63	50.14	74.00	-23.86	139	100	Peak

966 Chamber_B at 3Meter / Vertical

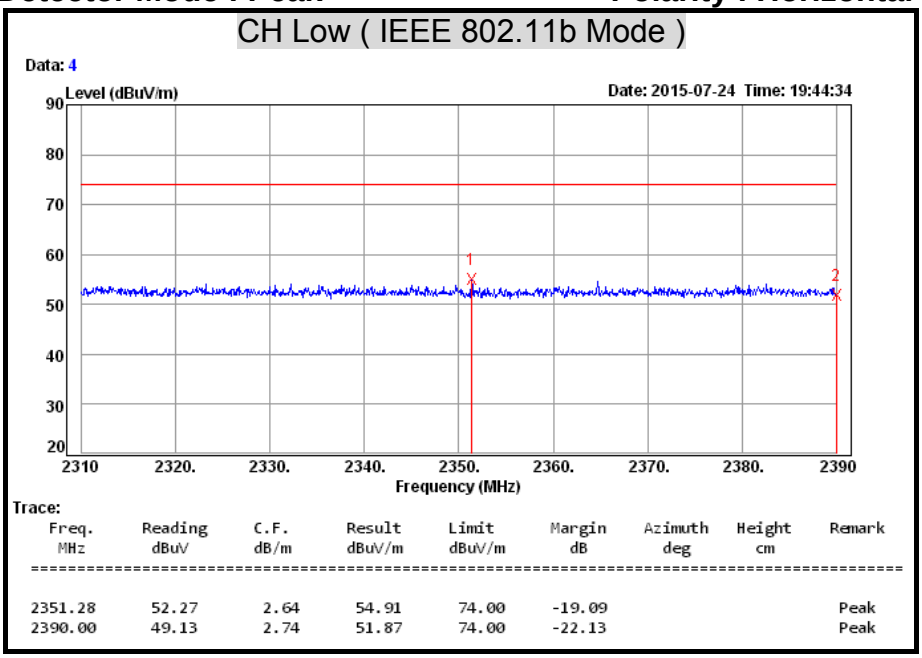
Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2098.00	41.60	2.02	43.62	74.00	-30.38	21	100	Peak
2348.00	47.61	2.64	50.25	74.00	-23.75	197	100	Peak
2614.00	46.31	3.24	49.55	74.00	-24.45	268	100	Peak
3270.00	45.70	4.57	50.27	54.00	-3.73	144	200	Average
3270.00	50.03	4.57	54.60	74.00	-19.40	144	200	Peak
5775.00	37.07	10.89	47.96	74.00	-26.04	139	100	Peak
9645.00	36.15	14.14	50.29	74.00	-23.71	66	200	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. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

Restricted Band Edges

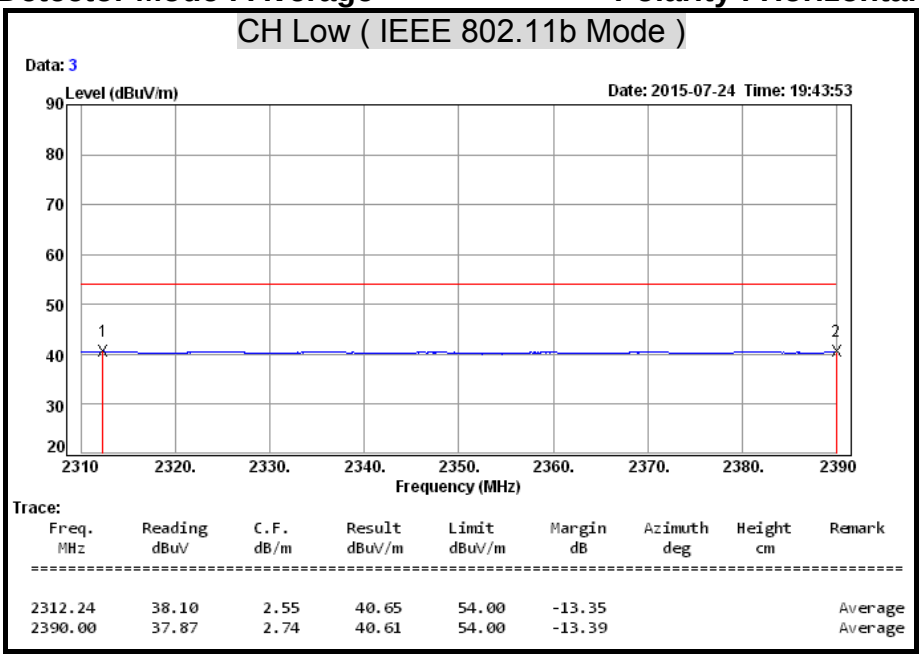
Detector Mode : Peak **Polarity : Horizontal**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2351.28	52.27	2.64	54.91	74.00	-19.09			Peak
2390.00	49.13	2.74	51.87	74.00	-22.13			Peak

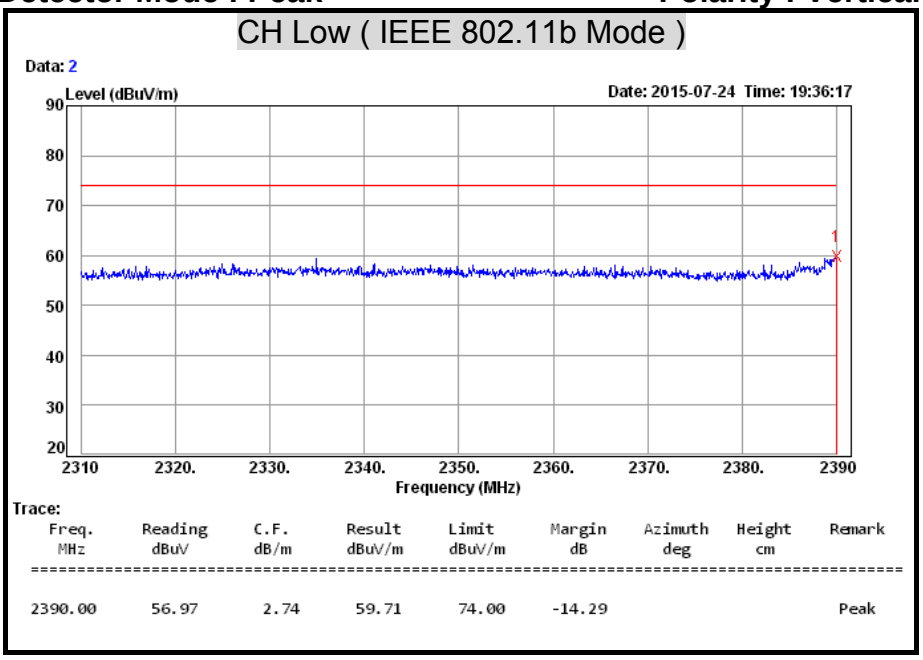
Detector Mode : Average **Polarity : Horizontal**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2312.24	38.10	2.55	40.65	54.00	-13.35			Average
2390.00	37.87	2.74	40.61	54.00	-13.39			Average

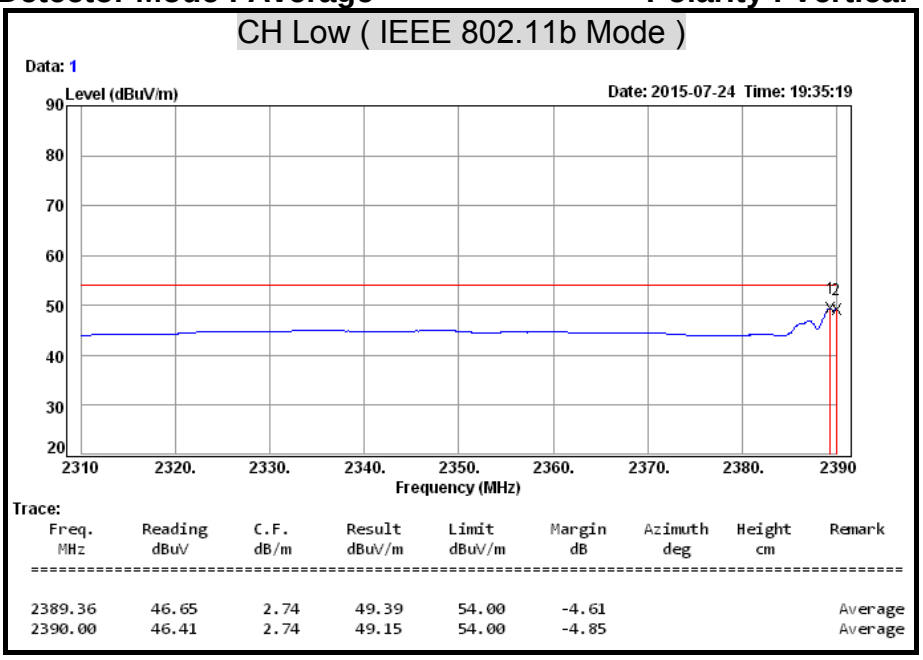
Detector Mode : Peak **Polarity : Vertical**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	56.97	2.74	59.71	74.00	-14.29			Peak

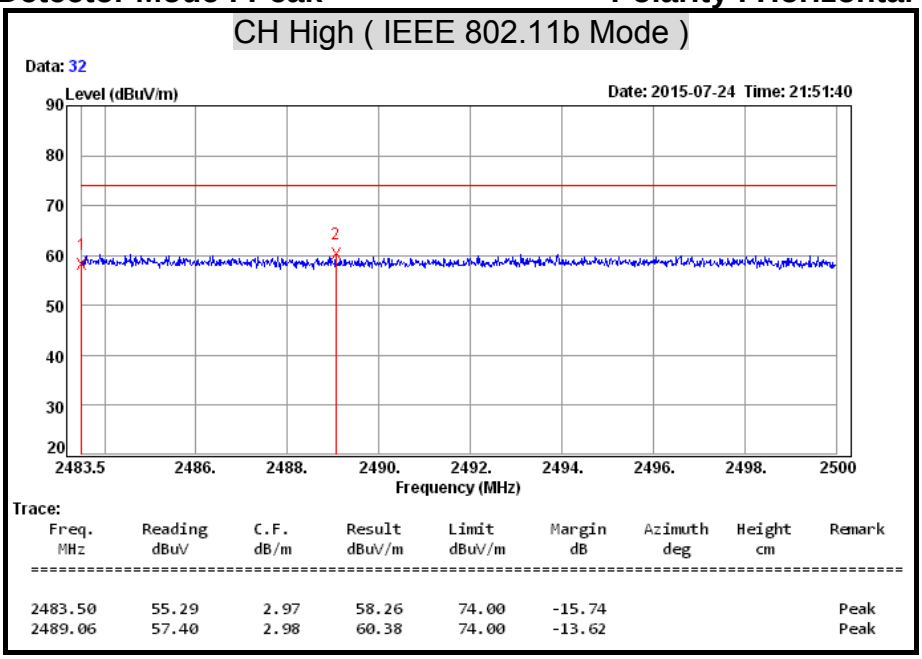
Detector Mode : Average **Polarity : Vertical**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2389.36	46.65	2.74	49.39	54.00	-4.61			Average
2390.00	46.41	2.74	49.15	54.00	-4.85			Average

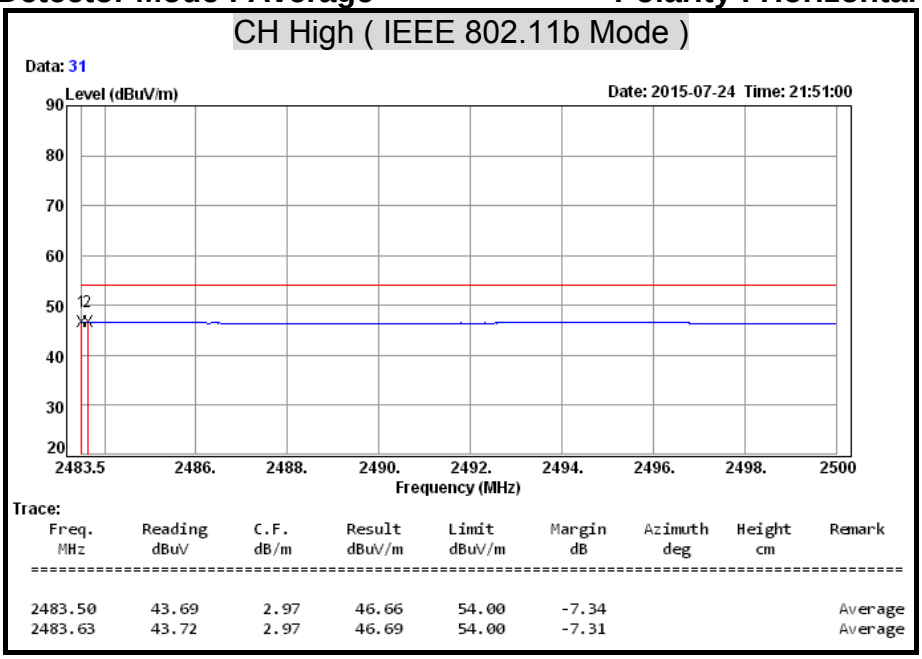
Detector Mode : Peak **Polarity : Horizontal**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	55.29	2.97	58.26	74.00	-15.74			Peak
2489.06	57.40	2.98	60.38	74.00	-13.62			Peak

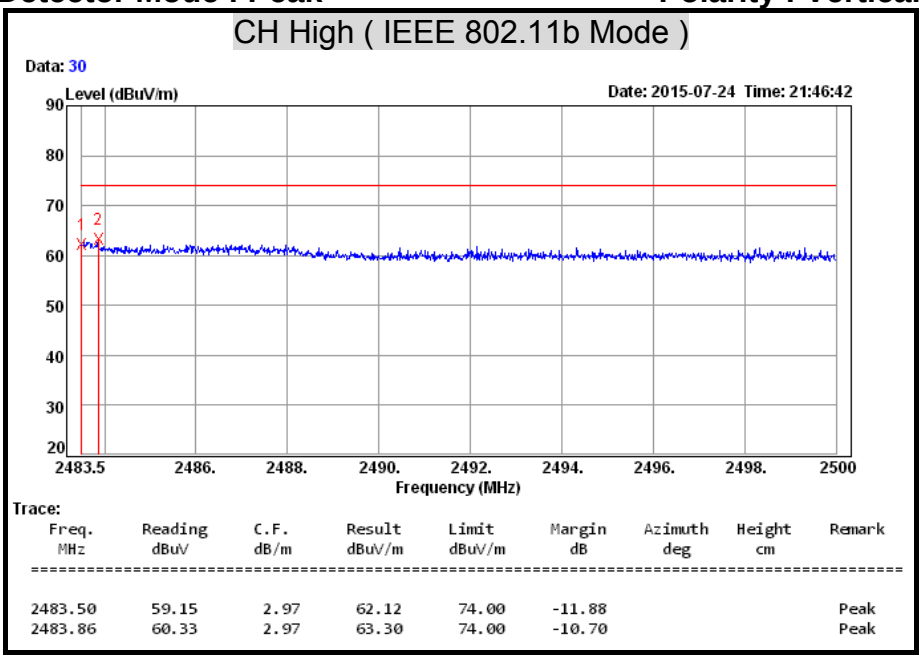
Detector Mode : Average **Polarity : Horizontal**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	43.69	2.97	46.66	54.00	-7.34			Average
2483.63	43.72	2.97	46.69	54.00	-7.31			Average

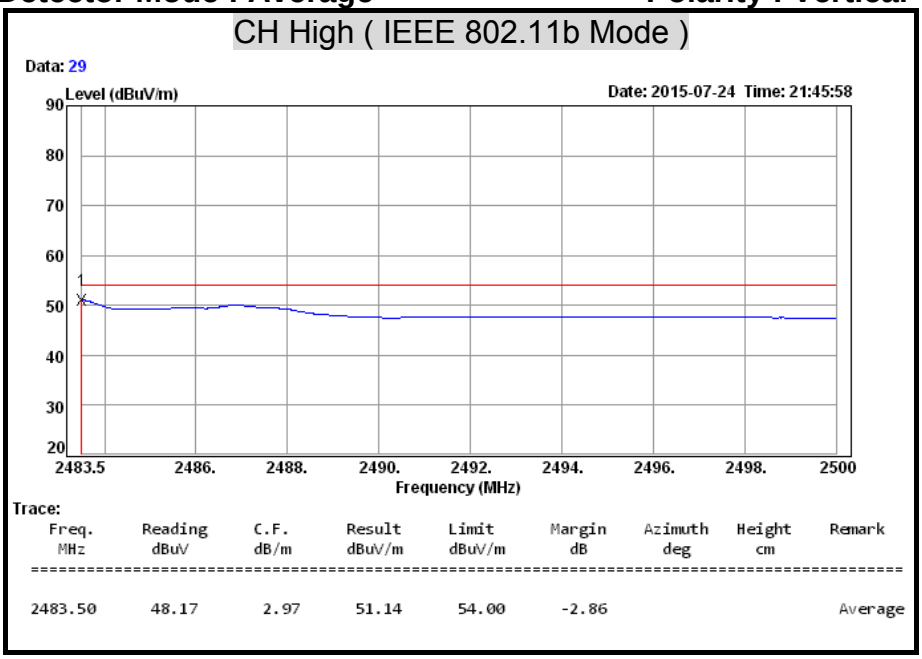
Detector Mode : Peak **Polarity : Vertical**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	59.15	2.97	62.12	74.00	-11.88			Peak
2483.86	60.33	2.97	63.30	74.00	-10.70			Peak

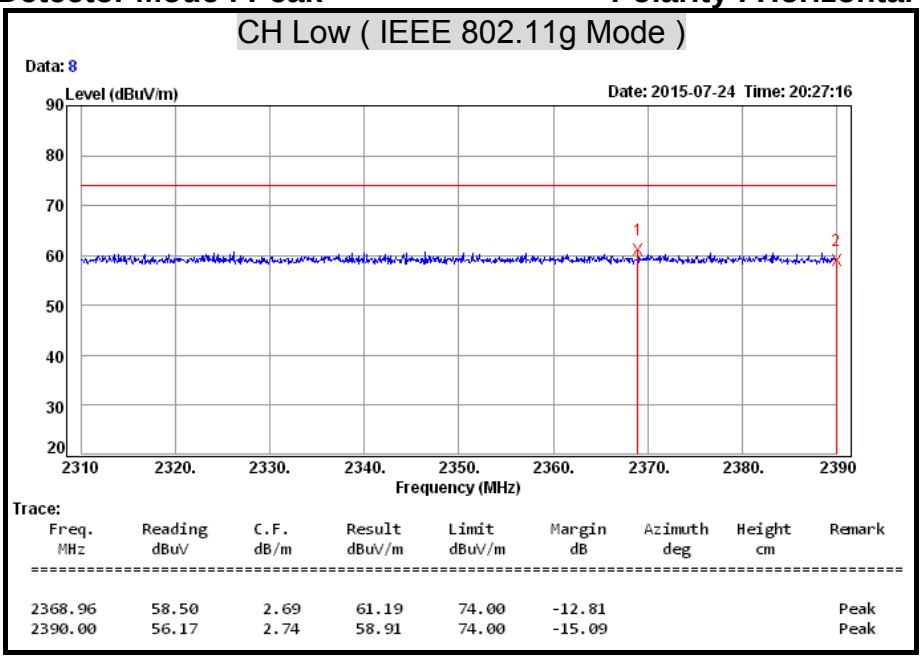
Detector Mode : Average **Polarity : Vertical**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	48.17	2.97	51.14	54.00	-2.86			Average

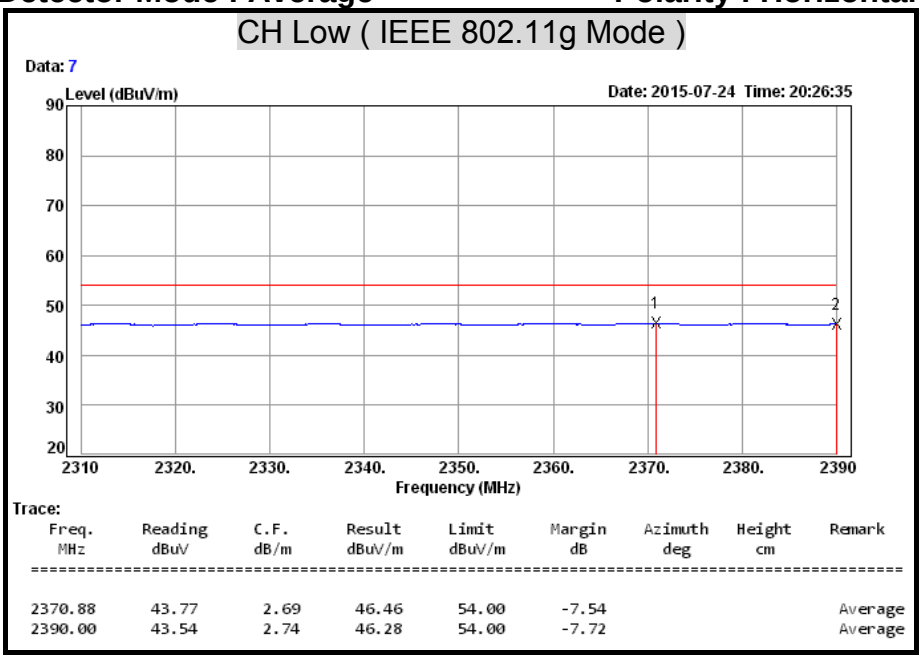
Detector Mode : Peak **Polarity : Horizontal**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2368.96	58.50	2.69	61.19	74.00	-12.81			Peak
2390.00	56.17	2.74	58.91	74.00	-15.09			Peak

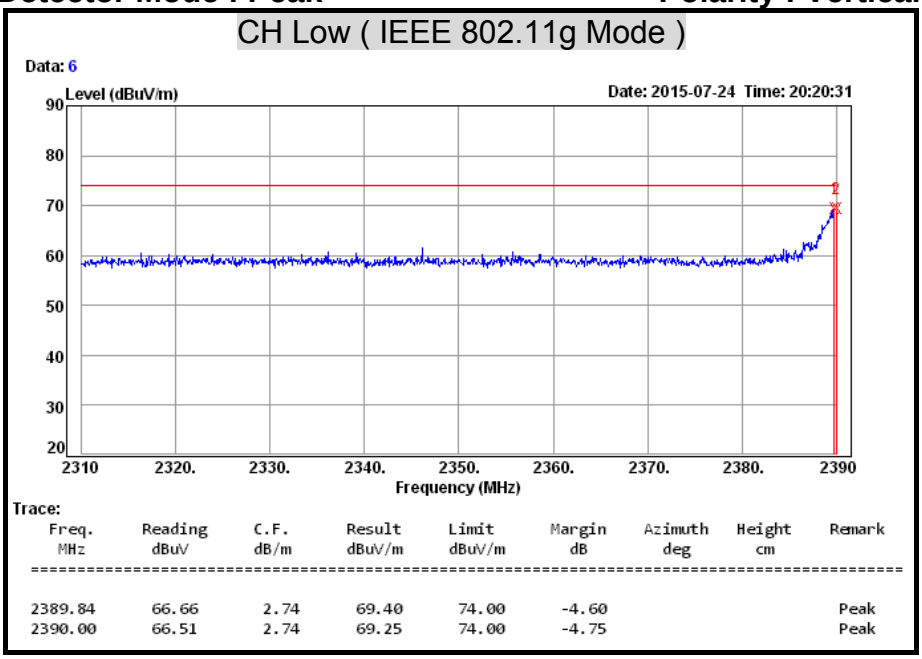
Detector Mode : Average **Polarity : Horizontal**



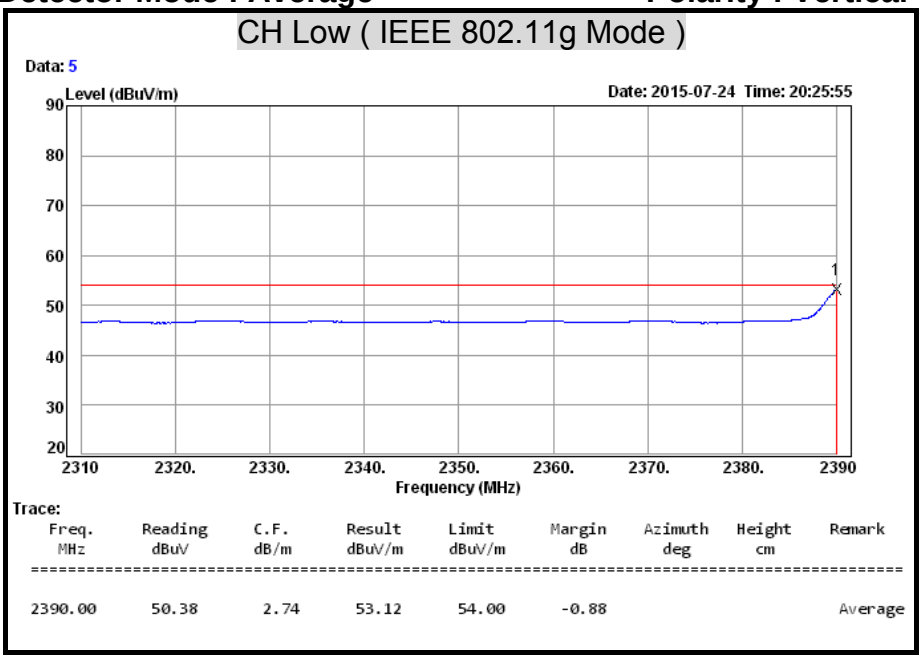
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2370.88	43.77	2.69	46.46	54.00	-7.54			Average
2390.00	43.54	2.74	46.28	54.00	-7.72			Average

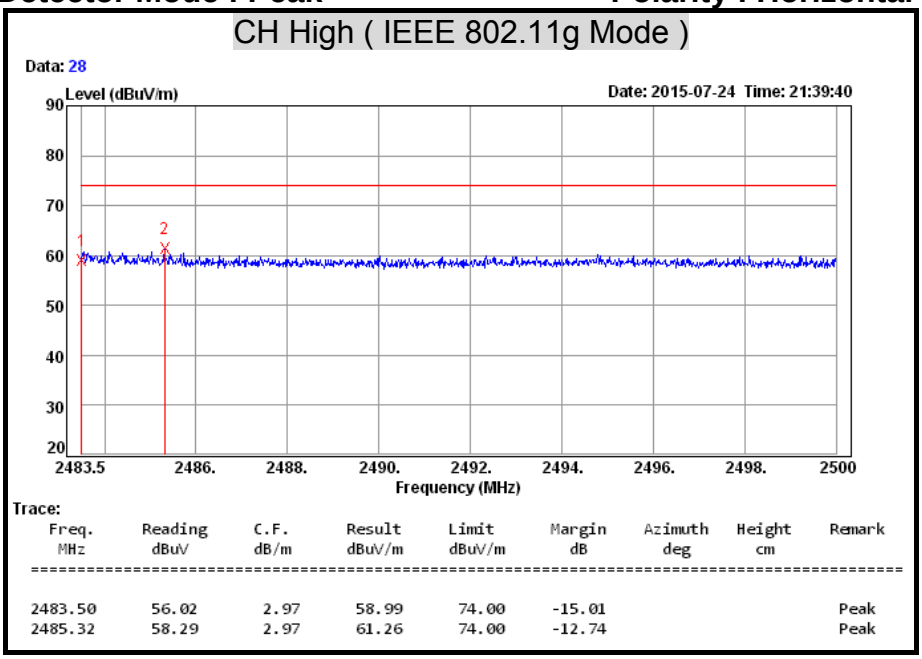
Detector Mode : Peak **Polarity : Vertical**



Detector Mode : Average **Polarity : Vertical**



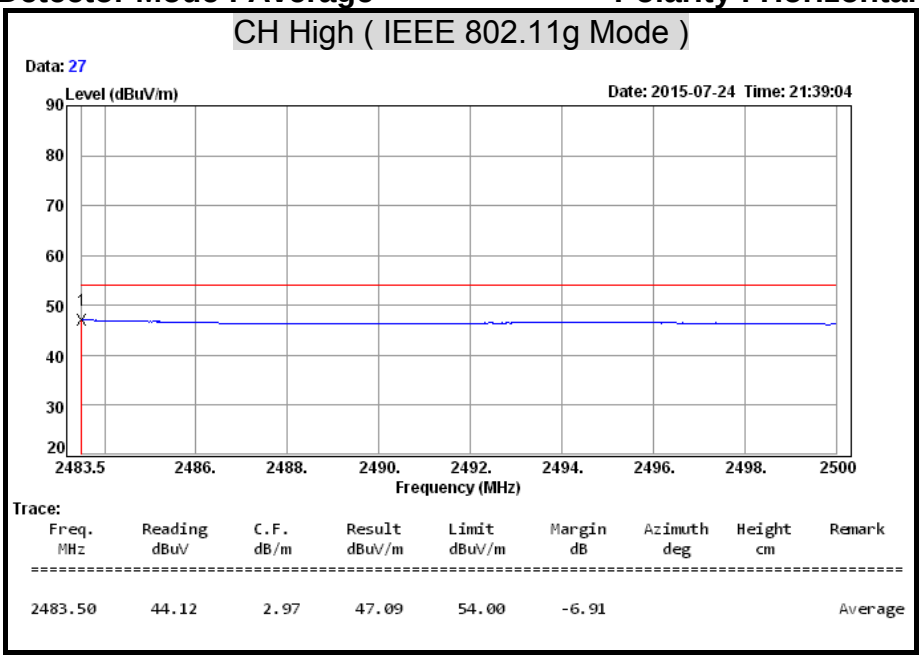
Detector Mode : Peak **Polarity : Horizontal**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	56.02	2.97	58.99	74.00	-15.01			Peak
2485.32	58.29	2.97	61.26	74.00	-12.74			Peak

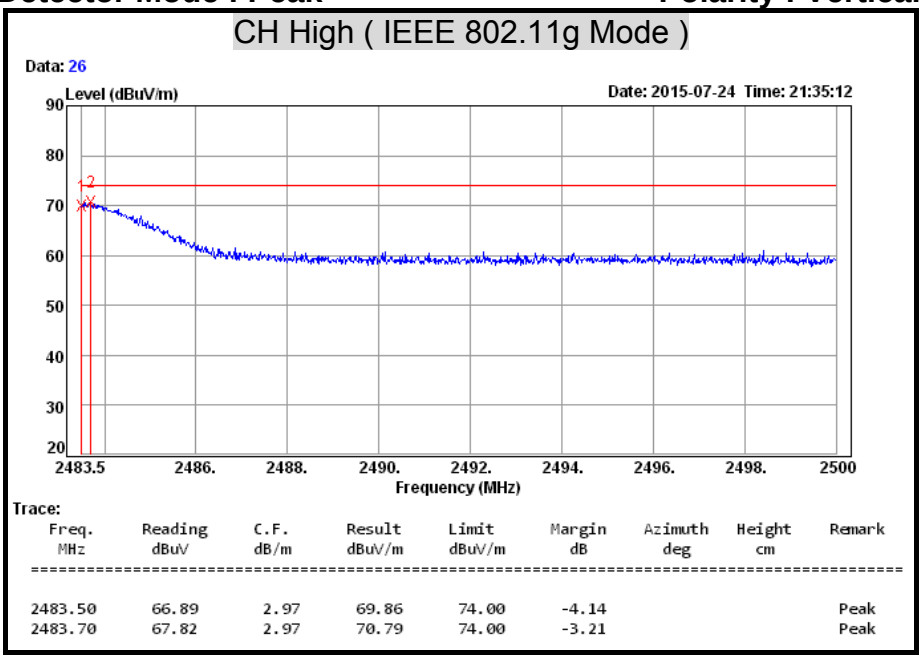
Detector Mode : Average **Polarity : Horizontal**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	44.12	2.97	47.09	54.00	-6.91			Average

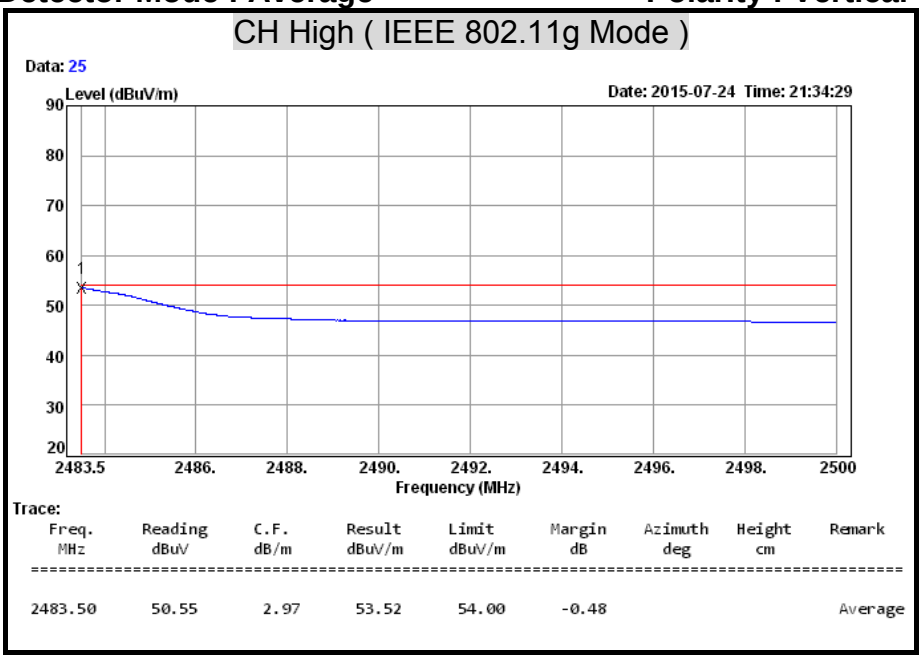
Detector Mode : Peak **Polarity : Vertical**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	66.89	2.97	69.86	74.00	-4.14			Peak
2483.70	67.82	2.97	70.79	74.00	-3.21			Peak

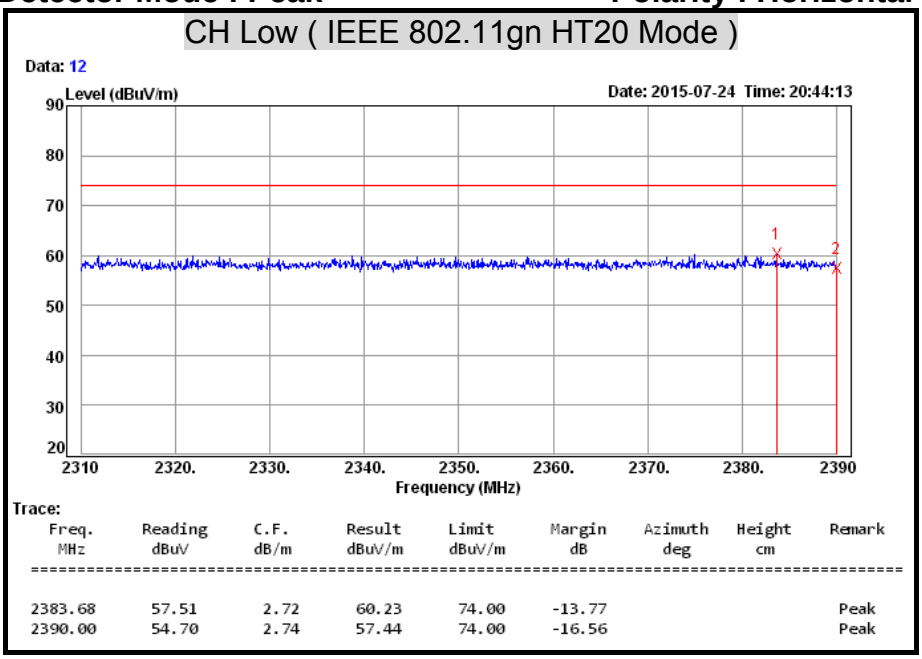
Detector Mode : Average **Polarity : Vertical**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	50.55	2.97	53.52	54.00	-0.48			Average

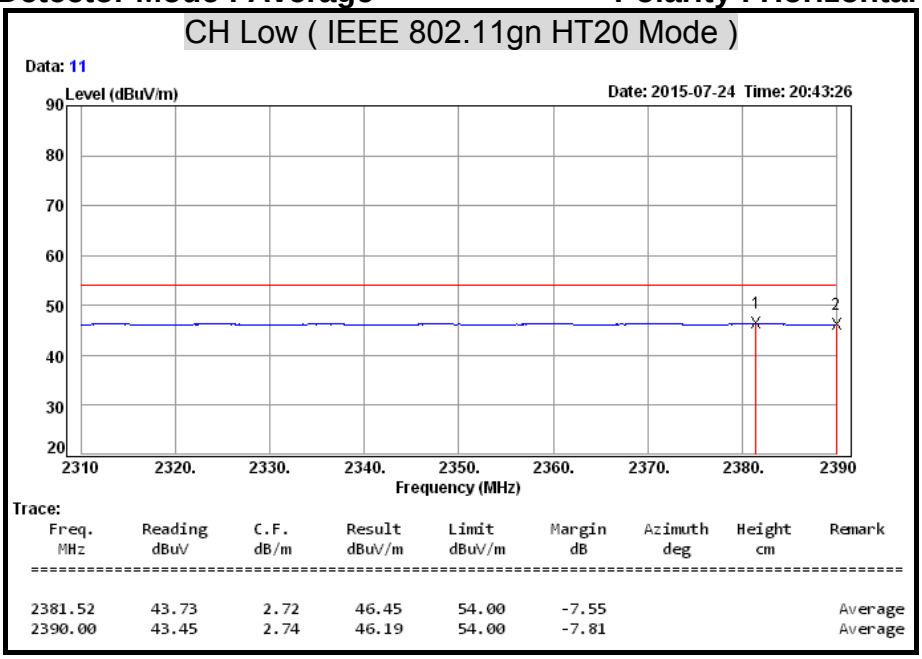
Detector Mode : Peak **Polarity : Horizontal**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2383.68	57.51	2.72	60.23	74.00	-13.77			Peak
2390.00	54.70	2.74	57.44	74.00	-16.56			Peak

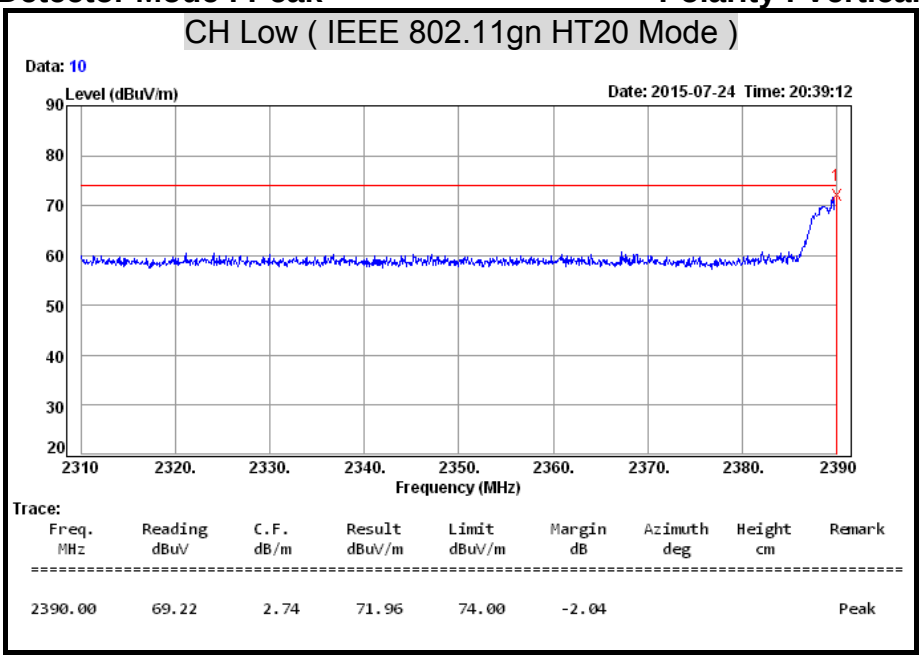
Detector Mode : Average **Polarity : Horizontal**



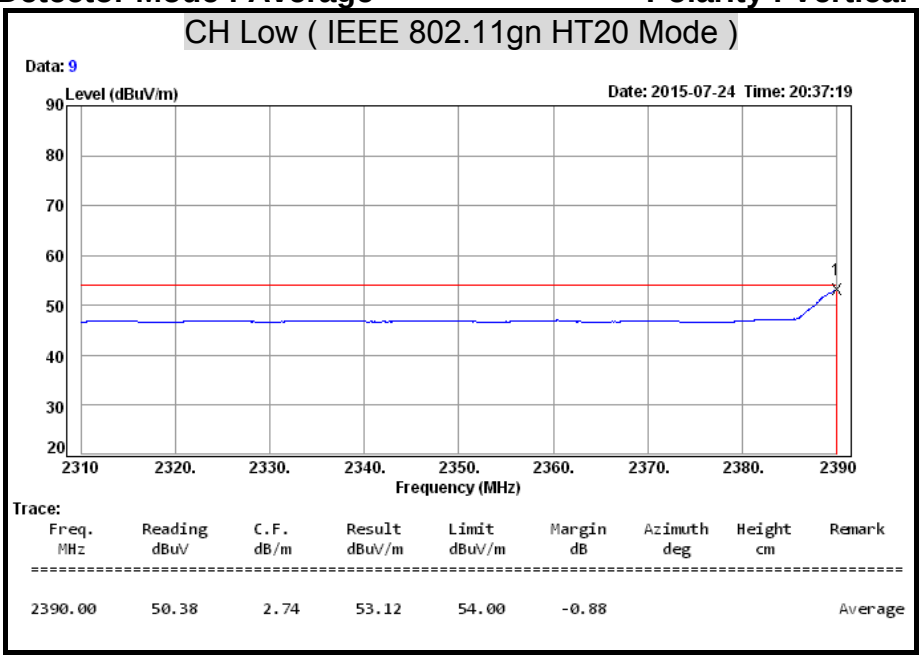
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2381.52	43.73	2.72	46.45	54.00	-7.55			Average
2390.00	43.45	2.74	46.19	54.00	-7.81			Average

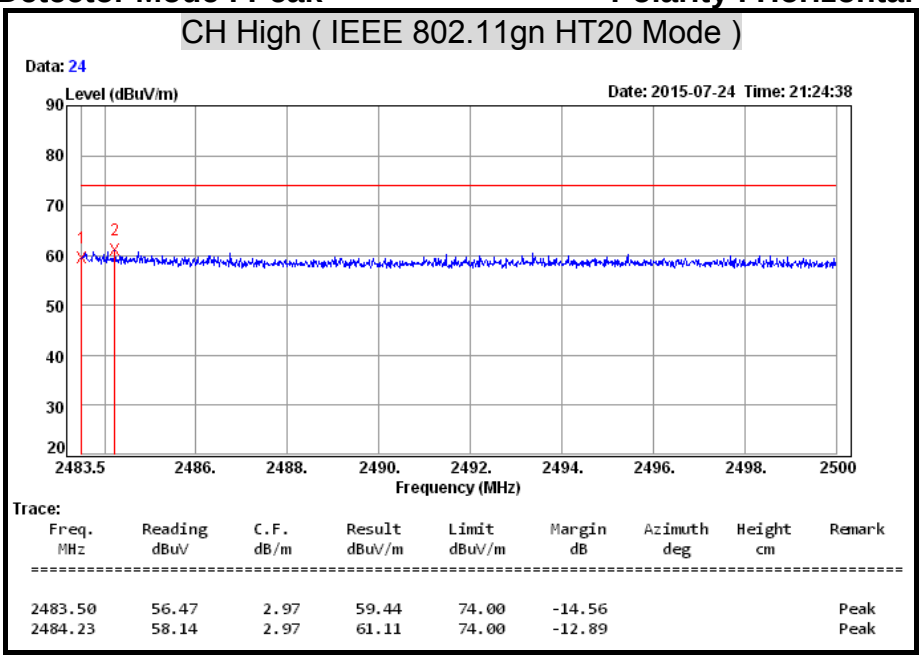
Detector Mode : Peak **Polarity : Vertical**



Detector Mode : Average **Polarity : Vertical**



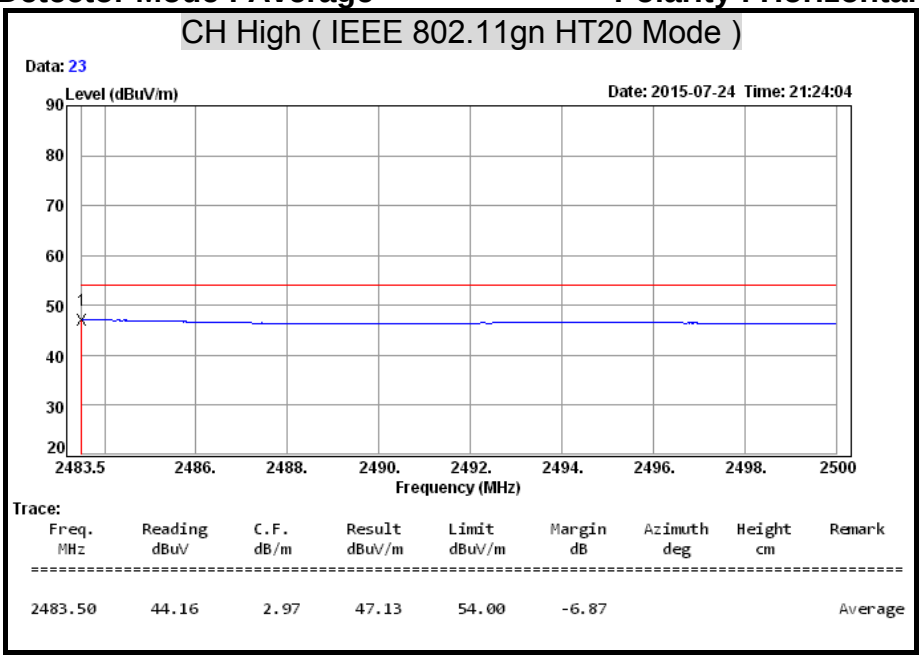
Detector Mode : Peak **Polarity : Horizontal**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	56.47	2.97	59.44	74.00	-14.56			Peak
2484.23	58.14	2.97	61.11	74.00	-12.89			Peak

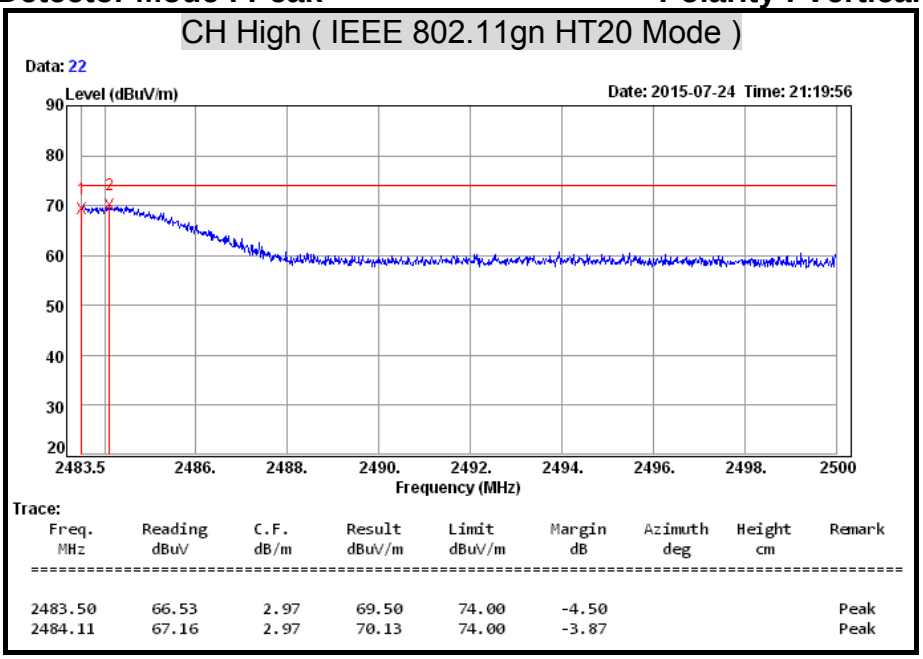
Detector Mode : Average **Polarity : Horizontal**



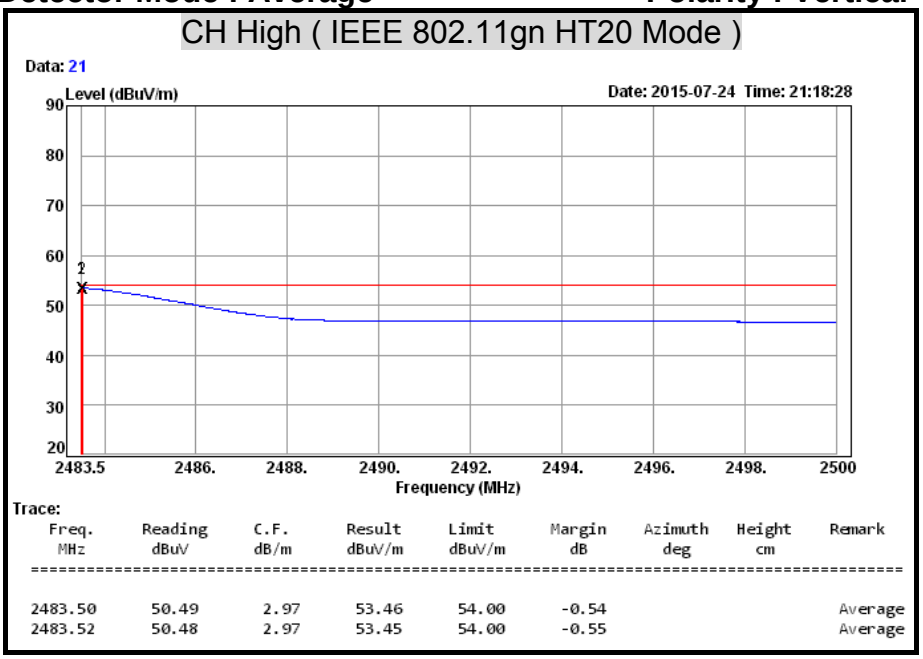
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	44.16	2.97	47.13	54.00	-6.87			Average

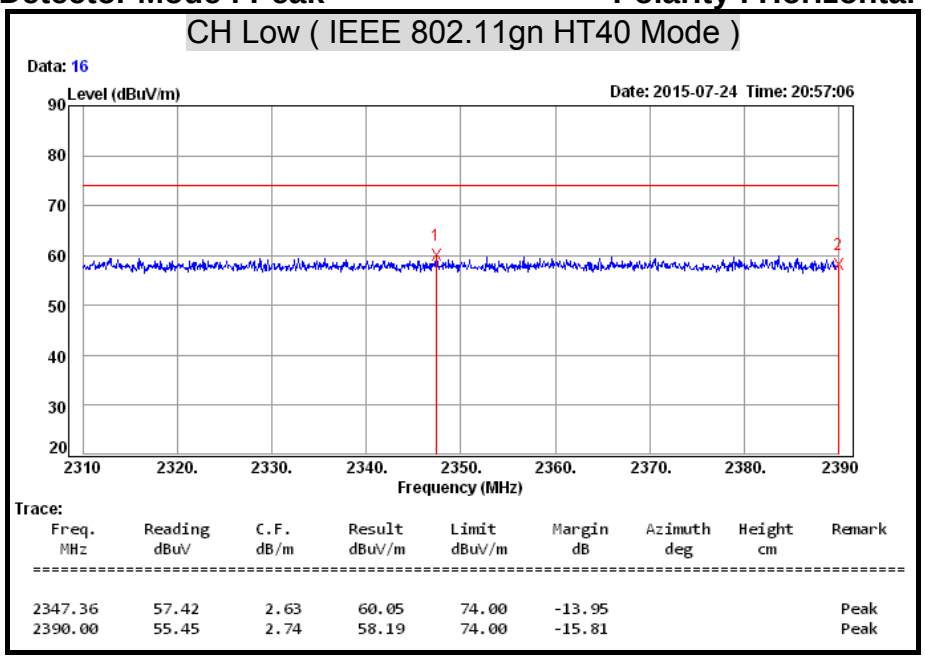
Detector Mode : Peak **Polarity : Vertical**



Detector Mode : Average **Polarity : Vertical**



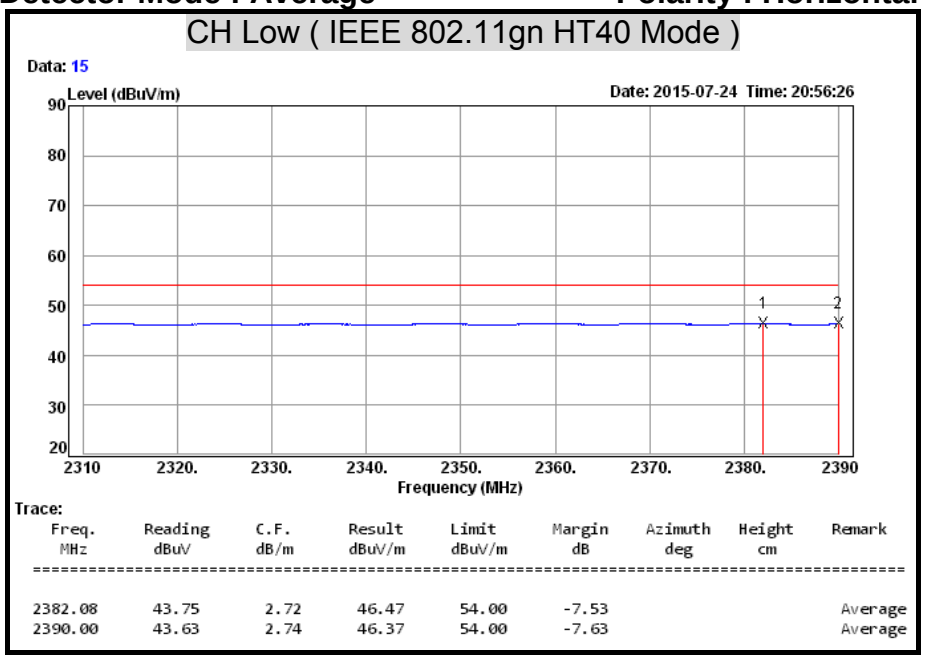
Detector Mode : Peak **Polarity : Horizontal**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2347.36	57.42	2.63	60.05	74.00	-13.95			Peak
2390.00	55.45	2.74	58.19	74.00	-15.81			Peak

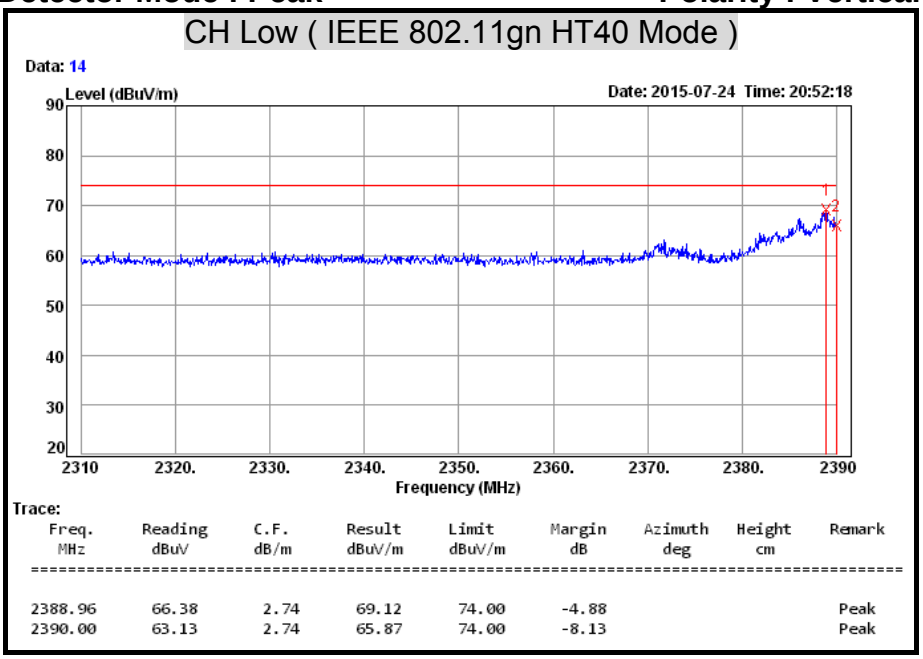
Detector Mode : Average **Polarity : Horizontal**



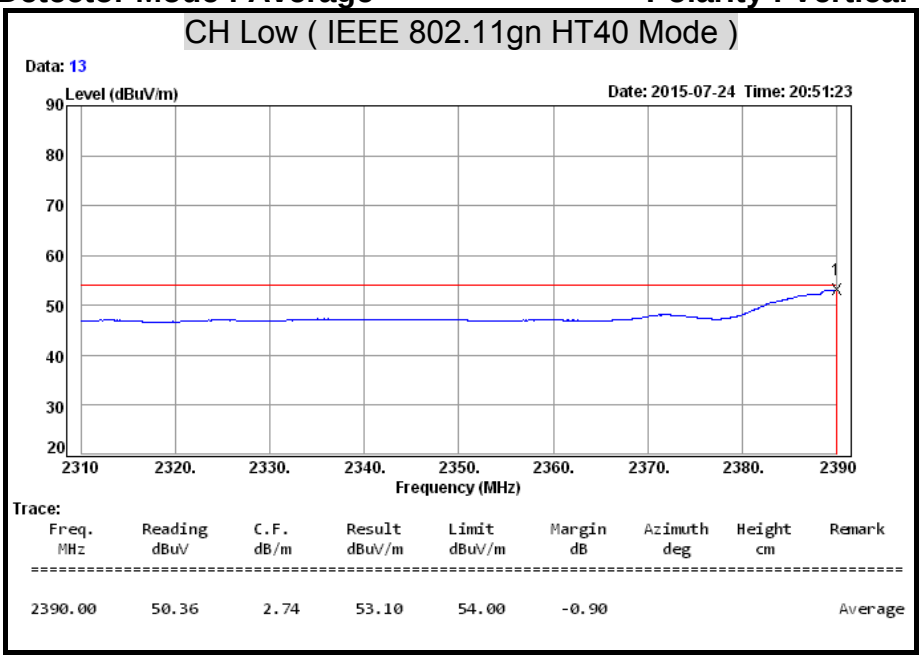
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2382.08	43.75	2.72	46.47	54.00	-7.53			Average
2390.00	43.63	2.74	46.37	54.00	-7.63			Average

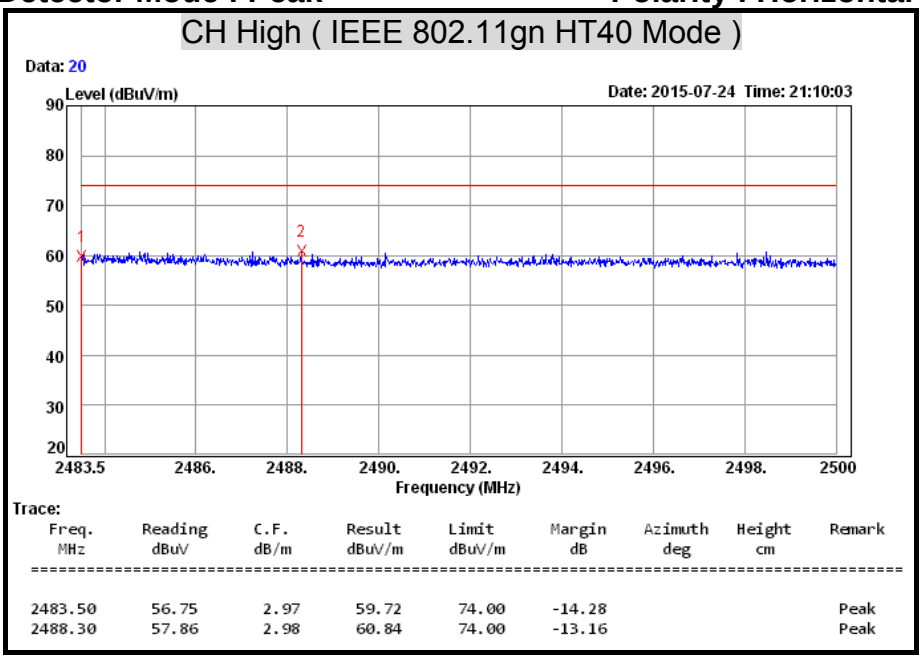
Detector Mode : Peak **Polarity : Vertical**



Detector Mode : Average **Polarity : Vertical**



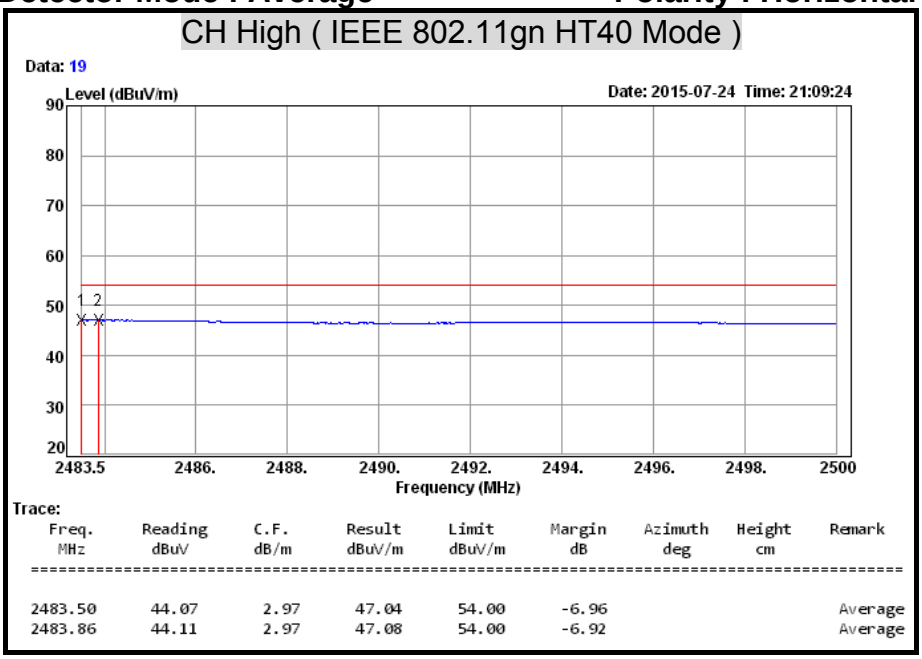
Detector Mode : Peak **Polarity : Horizontal**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	56.75	2.97	59.72	74.00	-14.28			Peak
2488.30	57.86	2.98	60.84	74.00	-13.16			Peak

Detector Mode : Average **Polarity : Horizontal**

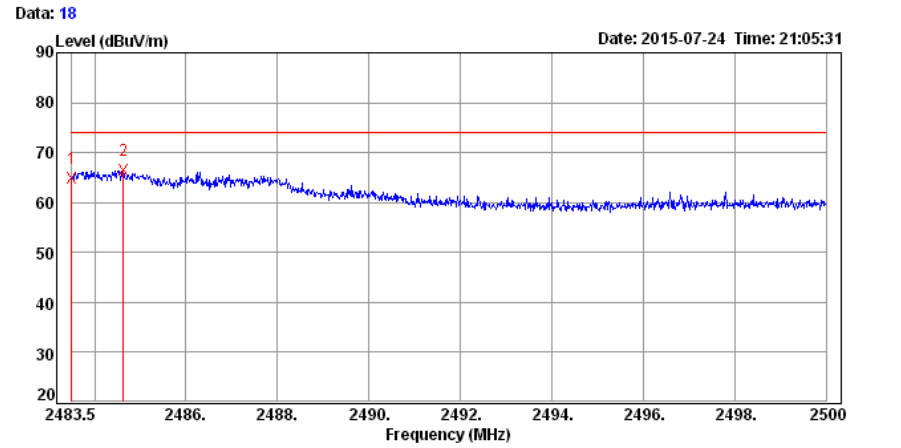


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	44.07	2.97	47.04	54.00	-6.96			Average
2483.86	44.11	2.97	47.08	54.00	-6.92			Average

Detector Mode : Peak **Polarity : Vertical**

CH High (IEEE 802.11gn HT40 Mode)

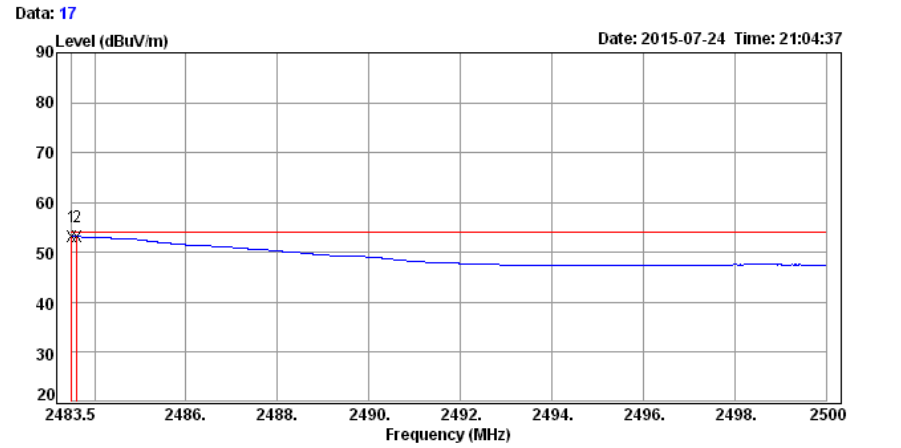


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	61.79	2.97	64.76	74.00	-9.24			Peak
2484.62	63.54	2.97	66.51	74.00	-7.49			Peak

Detector Mode : Average **Polarity : Vertical**

CH High (IEEE 802.11gn HT40 Mode)



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	50.18	2.97	53.15	54.00	-0.85			Average
2483.62	50.21	2.97	53.18	54.00	-0.82			Average

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

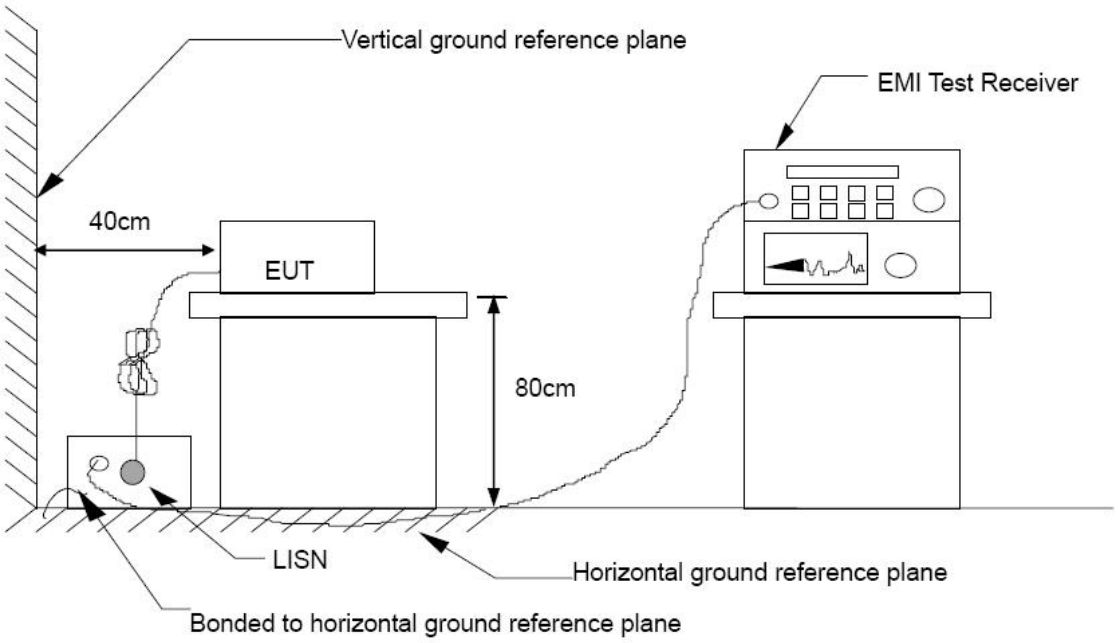
Frequency Range (MHz)	Conducted Limit (dBμv)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5.00	56	46
5.00 - 30.0	60	50

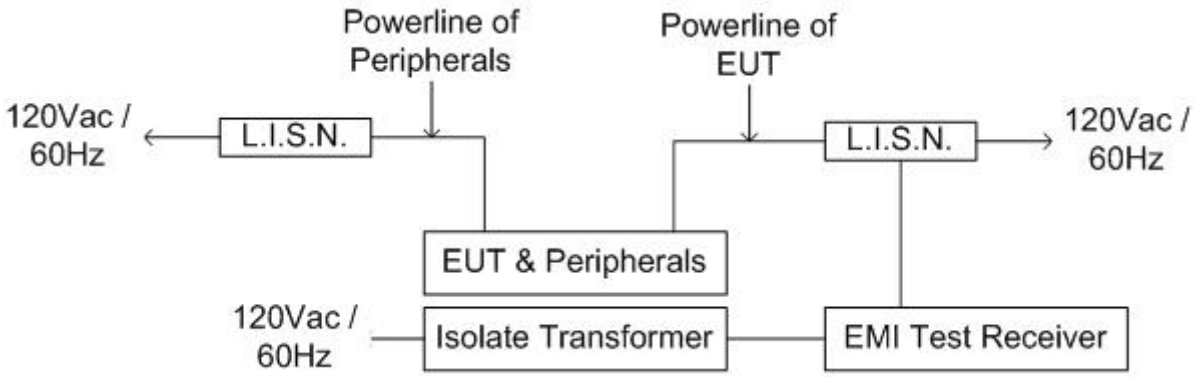
TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
L.I.S.N	SCHWARZBECK	NSLK 8127	8127465	08/06/2015
L.I.S.N	SCHWARZBECK	NSLK 8127	8127473	03/09/2016
EMI Test Receiver	ROHDE & SCHWARZ	ESHS 30	838550/003	11/02/2015
Pulse Limiter	ROHDE & SCHWARZ	ESH3-Z2	100111	06/28/2016

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 C63.10:2013 and ANSI C63.4: 2014.

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

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

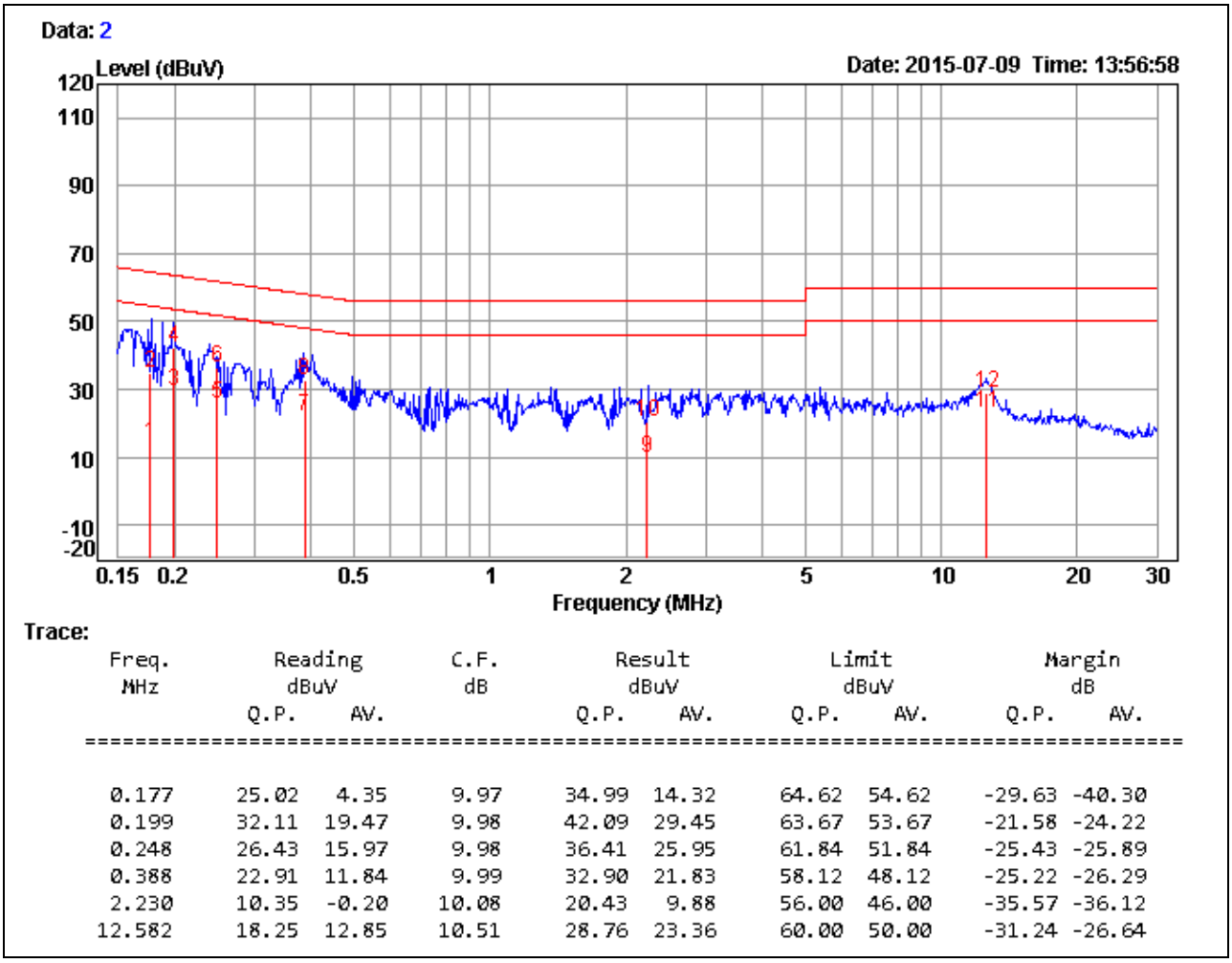
The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis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

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

TEST RESULTS

Product Name	MT7620 WIFI Module	Test By	Gilll Yeh
Test Model	IWM-7620	Test Date	2015/07/09
Test Mode	Mode 1	Temp. & Humidity	22.9°C, 67%

LINE



Trace:

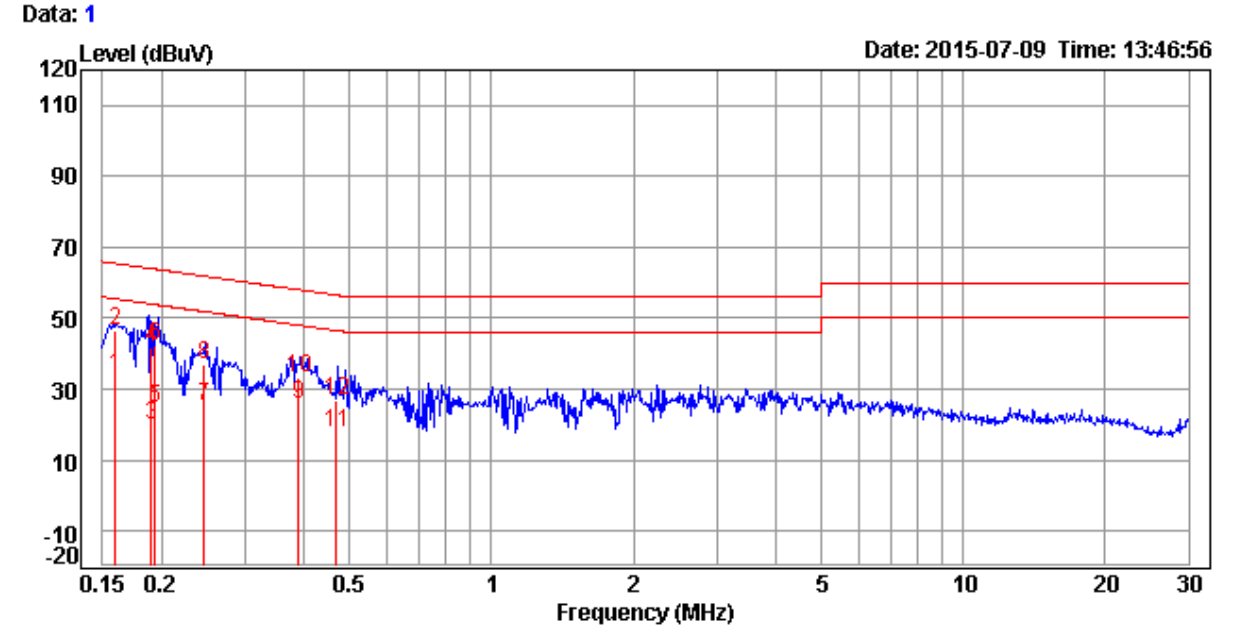
Freq. MHz	Reading dBuV Q.P.	Reading dBuV AV.	C.F. dB	Result dBuV Q.P.	Result dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.177	25.02	4.35	9.97	34.99	14.32	64.62	54.62	-29.63	-40.30
0.199	32.11	19.47	9.98	42.09	29.45	63.67	53.67	-21.58	-24.22
0.248	26.43	15.97	9.98	36.41	25.95	61.84	51.84	-25.43	-25.89
0.388	22.91	11.84	9.99	32.90	21.83	58.12	48.12	-25.22	-26.29
2.230	10.35	-0.20	10.08	20.43	9.88	56.00	46.00	-35.57	-36.12
12.582	18.25	12.85	10.51	28.76	23.36	60.00	50.00	-31.24	-26.64

Remark:

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

Product Name	MT7620 WIFI Module	Test By	Gilll Yeh
Test Model	IWM-7620	Test Date	2015/07/09
Test Mode	Mode 1	Temp. & Humidity	22.9°C, 67%

NEUTRAL



Trace:

Freq. MHz	Reading dBuV Q.P.	Reading dBuV AV.	C.F. dB	Result dBuV Q.P.	Result dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.159	36.57	23.84	9.98	46.55	33.82	65.53	55.53	-18.98	-21.71
0.190	31.77	10.03	10.00	41.77	20.03	64.04	54.04	-22.27	-34.01
0.194	32.33	14.58	10.00	42.33	24.58	63.88	53.88	-21.55	-29.30
0.246	27.09	15.25	10.00	37.09	25.25	61.88	51.88	-24.79	-26.63
0.389	22.97	15.83	10.01	32.98	25.84	58.08	48.08	-25.10	-22.24
0.468	16.79	7.61	10.01	26.80	17.62	56.54	46.54	-29.74	-28.92

Remark:

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