FCC 47 CFR PART 15 SUBPART E AND ANSI C63.4:2009
TEST REPORT

For

Cable modem

Model : 5363

Trade Name : Zoom

Issued for

Zoom Telephonics Inc

207 South Street , Boston, Massachusetts 02111, United States

Issued by

Compliance Certification Services Inc.
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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	12/05/2013	Initial Issue	All Page 111	Gloria Chang

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1. TEST REPORT CERTIFICATION

Applicant	：	Zoom Telephonics Inc
Address	：	207 South Street , Boston, Massachusetts 02111, United States
Equipment Under Test	：	Cable modem
Model	：	5363
Trade Name	：	Zoom
Tested Date	：	November 14 ~ December 05, 2013

APPLICABLE STANDARD	
Standard	**Test Result**
FCC Part 15 Subpart E AND ANSI C63.4:2009	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	Cable modem
Model Number	5363
Identify Number	T131114S02
Received Date	November 14, 2013
Frequency Range	IEEE 802.11a, 802.11n HT20 : 5180MHz ~ 5240MHz IEEE 802.11an HT40 : 5190MHz ~ 5230MHz IEEE 802.11ac HT80 : 5210MHz
Transmit Power	IEEE 802.11a : 14.71dBm (0.0296W) IEEE 802.11an HT20 : 14.99dBm (0.0315W) IEEE 802.11an HT40 : 16.51dBm (0.0448W) IEEE 802.11ac HT80 : 16.34 dBm (0.0431W)
Channel Spacing	IEEE 802.11a, 802.11n HT20 : 20MHz IEEE 802.11an HT40 : 40MHz IEEE 802.11ac HT80 : N/A
Channel Number	IEEE 802.11a, 802.11n HT20 : 4 Channels IEEE 802.11an HT40 : 2 Channels IEEE 802.11ac HT80 : 1 Channel
Transmit Data Rate	IEEE 802.11a : 54, 48, 36, 24, 18, 12, 9, 6 Mbps IEEE 802.11an HT20 : 216.7, 195, 175.5, 173.3, 156, 144.4, 130, 117, 115.6, 104, 86.7, 78, 72.2, 65, 58.5, 57.8, 52, 43.3, 39, 28.9, 26, 21.7, 19.5, 14.4, 13, 7.2, 6.5 Mbps IEEE 802.11an HT40 : 450, 405, 364, 360, 324, 300, 270, 243, 240, 216, 180, 162, 150, 135, 121.5, 120, 108, 90, 81, 60, 54, 45, 40.5, 30, 27, 15, 13.5 Mbps IEEE 802.11an HT80 : 1299.9, 1170, 1053, 975, 877.5, 866.6, 789.9, 780, 702, 650, 585, 526.5, 526, 520, 468, 433.3, 390, 351, 325, 292.5, 263.4, 263.3, 260, 234, 195, 175.6, 175.5, 130, 117, 97.5, 87.9, 87.8, 65, 58.5, 32.5, 29.3Mbps :
Type of Modulation	IEEE 802.11a : OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11an HT20/40 : OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac : OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)

Antenna Type	PCB Antenna × 3, Antenna 0 (Chain 0), Antenna Gain 3.58 dBi, Antenna 1 (Chain 1), Antenna Gain 3.42 dBi Antenna 2 (Chain 2), Antenna Gain 3.26 dBi
Power Rating	12Vdc
Test Voltage	120Vac, 60Hz
DC Power Cable Type	Non-shielded cable, 1.5m × 2 (Non-detachable)
I/O Port	RJ-45 Port × 4, Coaxial Port × 1, Power Port × 1

Power Adapter :

No.	Manufacturer	Model No.	Power Input	Power Output
1	APD	WA-18X12FU	100-240Vac, 50-60Hz, 0.5A Max	12Vdc, 1.5A
2	APD	WA-24I12FU	100-240Vac, 50-60Hz, 0.7A	12Vdc, 2A

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.

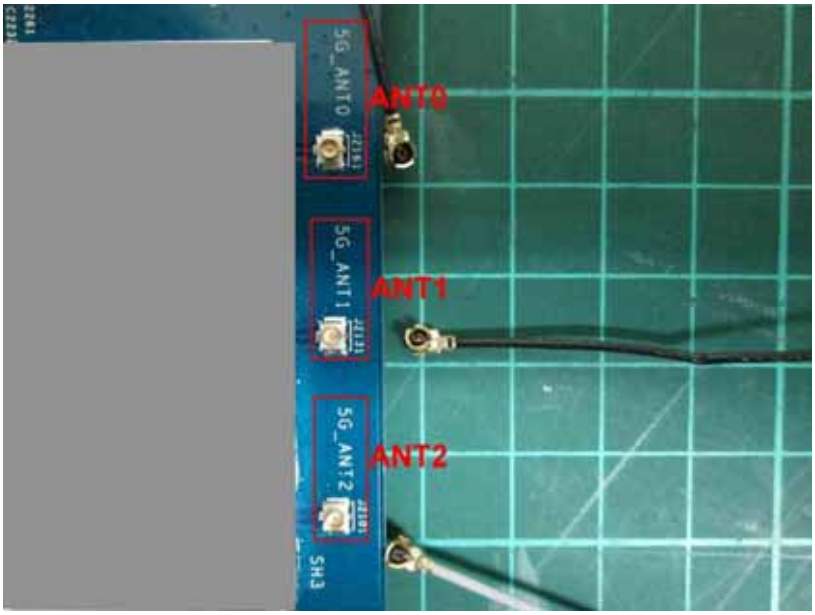
3. This submittal(s) (test report) is intended for FCC ID: BDN1106WL filing to comply with Section 15.207, 15.209 and 15.407 of the FCC Part 15, Subpart E Rules.

3. DESCRIPTION OF TEST MODES

The EUT is an 802.11n MIMO transceiver in Cable modem form factor.

For IEEE 802.11a, 802.11an HT20/HT40, 802.11ac HT80 mode (3TX / 3RX) :

Chain 0 / Ant0 & Chain 1/ Ant1 & Chain 2 / Ant2 three transmit/receive.



Conducted Emission / Radiated Emission Test (Below 1 GHz)

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

No.	Pre-Test Mode
1	Normal Operating / Adpater 1
2	Normal Operating / Adpater 2

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

Final Test Mode		
Emission	Radiated Emission	Normal Operating / Adpater 1
	Conducted Emission	Normal Operating / Adpater 2

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

Conducted / Radiated Emission Test (Above 1 GHz)

IEEE 802.11a, 802.11an HT20 mode

The EUT had been tested under operating condition.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	5180
Middle	5220
High	5240

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

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

IEEE 802.11an HT40 mode

The EUT had been tested under operating condition.

There are two channels have been tested as following :

Channel	Frequency (MHz)
Low	5190
High	5230

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

IEEE 802.11ac HT80 mode

The EUT had been tested under operating condition.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	5210

IEEE 802.11ac HT80 mode : 29.3Mbps data rate (worst case) were chosen for full testing.

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4: 2009 and FCC CFR 47, 15.207, 15.209 and 15. 407.

5. FACILITIES AND ACCREDITATION

5.1 FACILITIES

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

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

The sites are constructed in conformance with the requirements of ANSI C63.4:2009 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

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.	FCC ID
1	Notebook PC	HP	ProBook 4421s	CNF03242PJ	DoC
2	Notebook PC	HP	ProBook 4421s	CNF03242PM	DoC
3	CMTS	MOTOROLA	BSR2000	Q060351000087447	---
4	Switch Hub	ASUS	GX1008B	90-Q872AN1N0NA MA0-88QSA1003522	---

No.	Signal Cable Description
1	Non-shielded RJ-45 cable, 10 m × 1
2	Non-shielded RJ-45 cable, 1.2 m × 3
3	Shielded Coaxial cable, 10 m × 1

SETUP DIAGRAM FOR TESTS

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

EUT OPERATING CONDITION

RF Mode :

1. EUT & peripherals setup diagram is shown in appendix setup photos.
2. Setup RF Tool (MTool_2.0.0.9) in
3. Control NB set fixed ip, 192.168.100.11
4. Run MTool_2.0.0.9
5. Run MTool_2.0.0.9
6. Set as follows
   Location : AccessPoint
   Hostname : 192.168.100.1
   Wireless Hostname : 192.168.100.11
   AP Login Name : admin
   AP Password : CBN
   CLI Prompt : Console>
   Shell Command : cd /wifi
   Shell Prompt : Console/wifi>
   WI Command : wl –I wl0 (0 ---For 5G, 1 ---For 2.4G)
7. TX Mode:
   Select -> Manual Tx/Rx
   STF Mode : CDD
   Packet IFS : 30

⇨ **Tx Data Rate:**

6Mbps Bandwidth 20 (IEEE 802.11a mode)
6.5Mbps Bandwidth 20 (IEEE 802.11an HT20 mode)
13.5Mbps Bandwidth 40 (IEEE 802.11an HT40 mode)
29.3Mbps Bandwidth 80 (IEEE 802.11ac HT80 mode)

⇨ **Power control**

IEEE 802.11a Channel Low (5180MHz) Chain0/Chain1/Chain2 Power set 44
IEEE 802.11a Channel Mid (5200MHz) Chain0/Chain1/Chain2 Power set 42
IEEE 802.11a Channel High (5240MHz) Chain0/Chain1/Chain2 Power set 42
IEEE 802.11an HT20 Channel Low (5180MHz) Chain0/Chain1/Chain2 Power set 44
IEEE 802.11an HT20 Channel Mid (5200MHz) Chain0/Chain1/Chain2 Power set 44
IEEE 802.11an HT20 Channel High (5240MHz) Chain0/Chain1/Chain2 Power set 44
IEEE 802.11an HT40 Channel Low (5190MHz) Chain0/Chain1/Chain2 Power set 50
IEEE 802.11an HT40 Channel High (5230MHz) Chain0/Chain1/Chain2 Power set 48
IEEE 802.11ac HT80 Channel High (5210MHz) Chain0/Chain1/Chain2 Power set 50

8. All of the functions are under run.
9. Start test.

Normal Mode :

1. EUT & peripherals setup diagram is shown in appendix setup photos.
2. Power on all equipments.
3. Coaxial cable link headend-CMTS.
   CMTS set DOWN STREAM : -10 dBmV, UP STREAM: + 40 dBmV.
4. Notebook PC ping EUT IP through LAN connected by RJ-45 cable.
5. Notebook PC ping EUT IP through wireless LAN.
6. EUT and laptop connection transfer rate appears as 100Mbps.
7. Set telephones on the talking mode.
8. Start test.

7. FCC PART 15.407 REQUIREMENTS

7.1 26dB BANDWIDTH

LIMITS

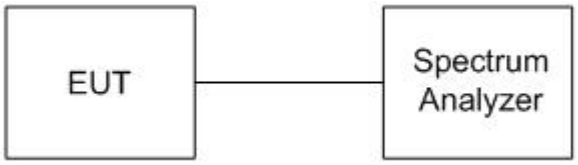
§ 15.303 (c), For purposes of this subpart, the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/10/2014

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

TEST SETUP



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low-loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW > 1%EBW, VBW > RBW, Span = 50MHz and Sweep = auto.
4. Mark the –26dBc (upper and lower) frequency of the peak value.
5. Repeat until all the rest channels were investigated.

TEST RESULTS

IEEE 802.11a Mode (Three TX)

Channel	Channel Frequency (MHz)	26dB Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
Low	5180	20.47	20.33	20.27
Middle	5220	20.32	20.40	20.47
High	5240	20.44	20.28	20.36

IEEE 802.11n HT20 Mode (Three TX)

Channel	Channel Frequency (MHz)	26dB Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
Low	5180	20.80	20.32	20.48
Middle	5220	20.76	20.56	20.52
High	5240	20.72	20.40	20.44

IEEE 802.11n HT40 Mode (Three TX)

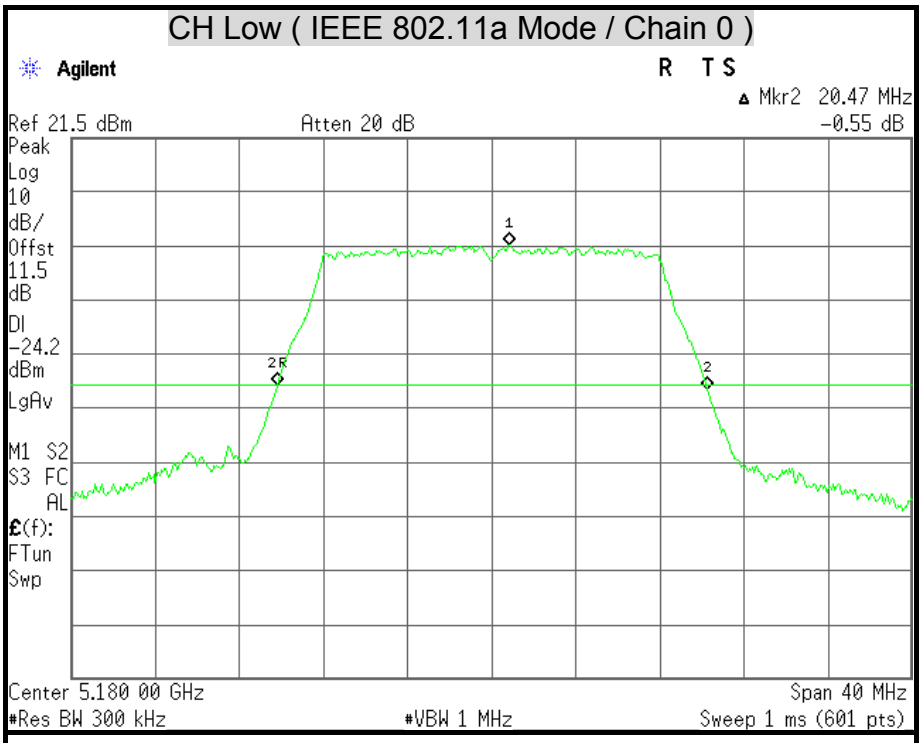
Channel	Channel Frequency (MHz)	26dB Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
Low	5190	39.60	39.28	39.28
High	5230	39.60	39.20	39.36

IEEE 802.11ac HT80 Mode (Three TX)

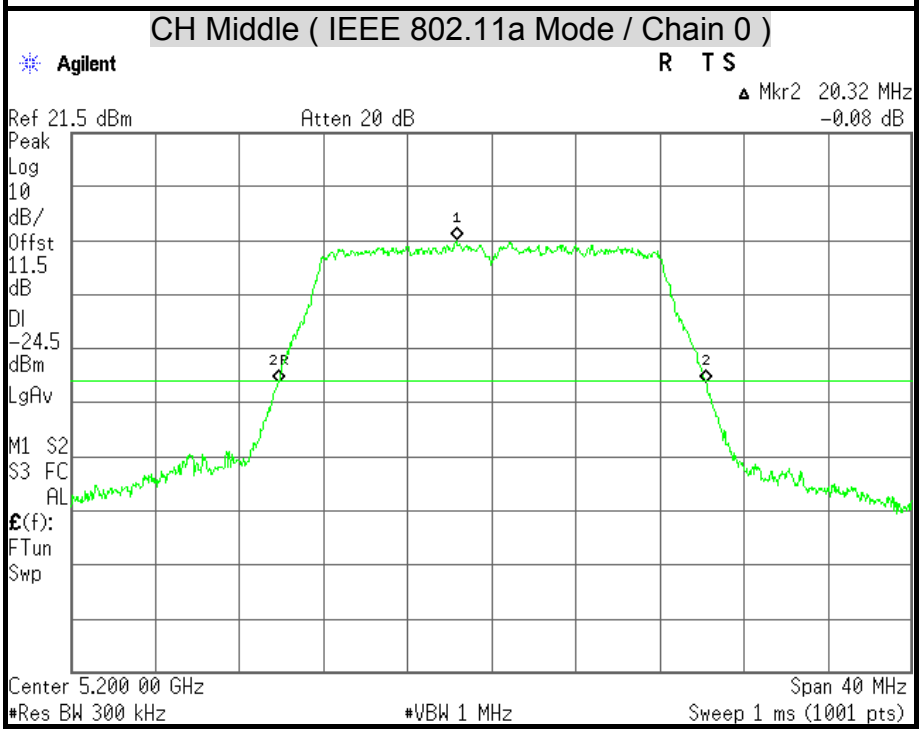
Channel	Channel Frequency (MHz)	26dB Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
Low	5210	80.80	80.32	80.64

26dB BANDWIDTH

CH Low (IEEE 802.11a Mode / Chain 0)



CH Middle (IEEE 802.11a Mode / Chain 0)



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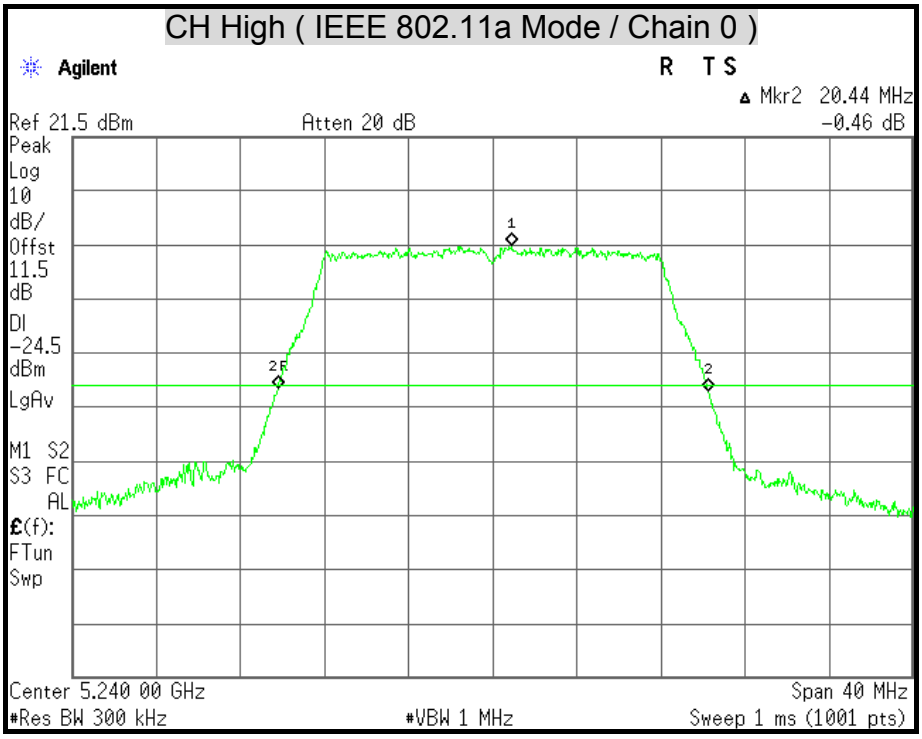
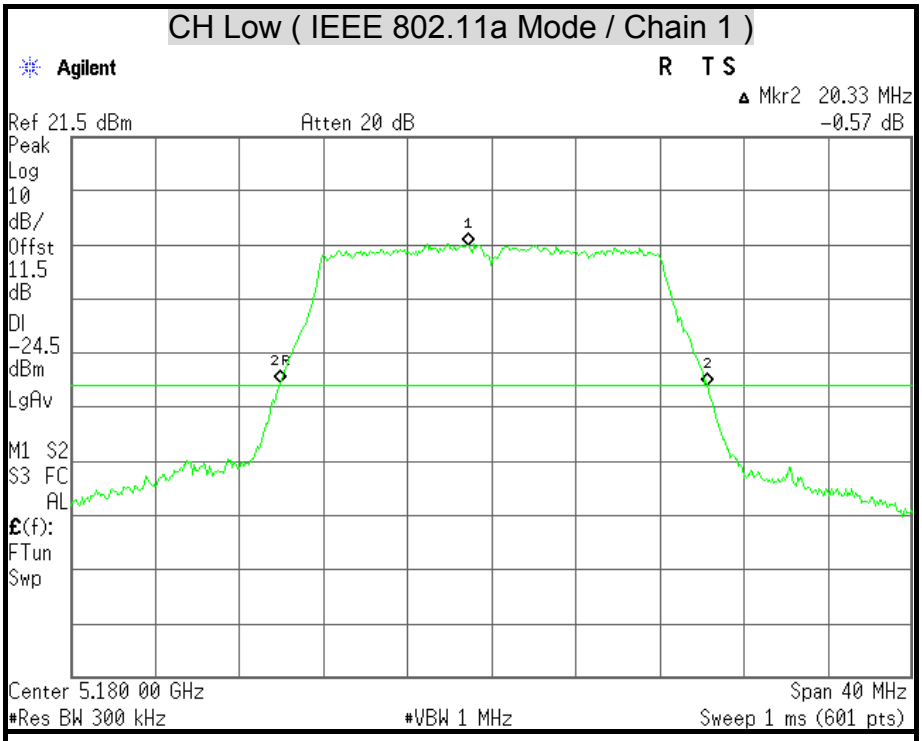


CH Low (IEEE 802.11a Mode / Chain 1)



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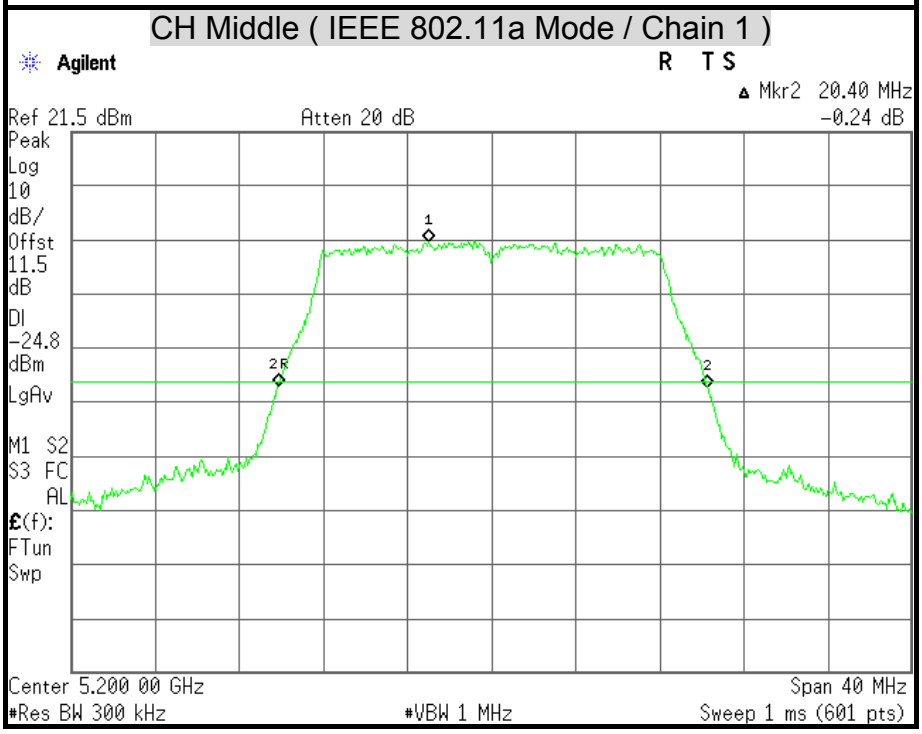

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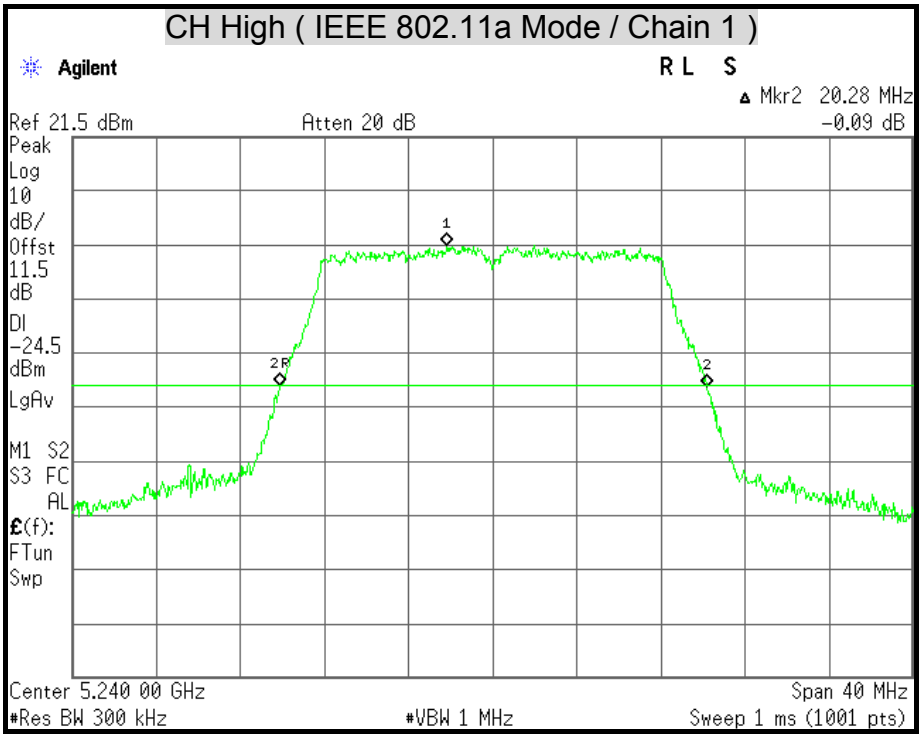

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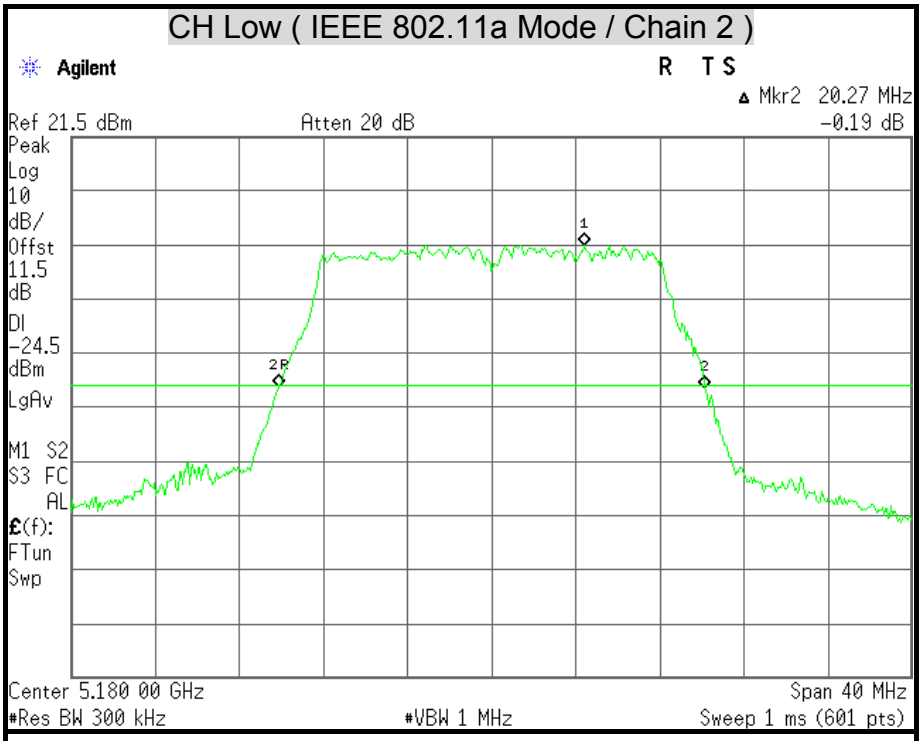

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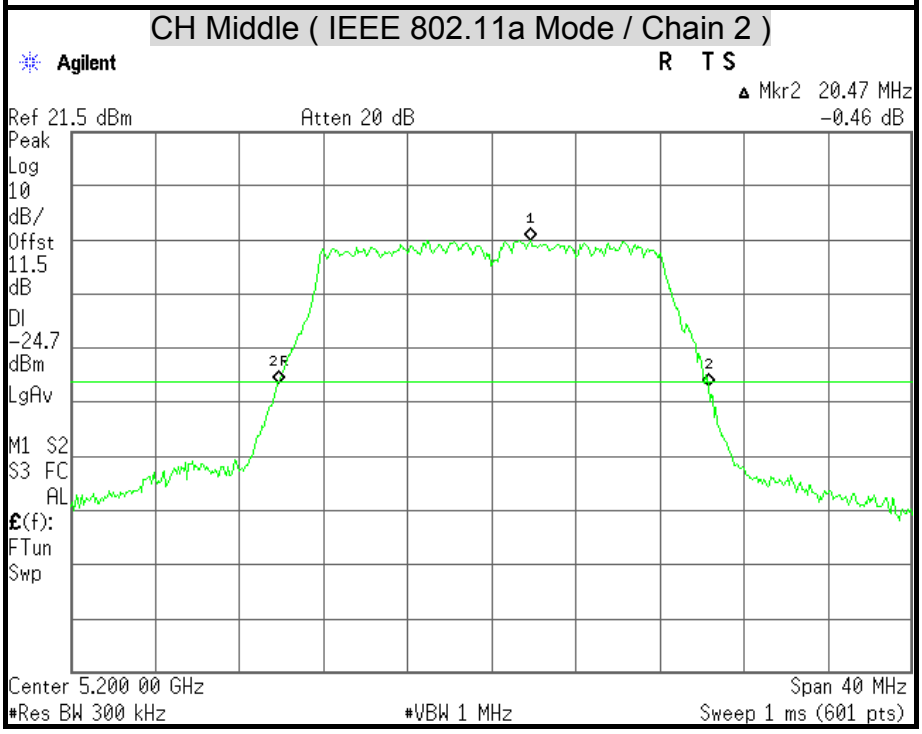

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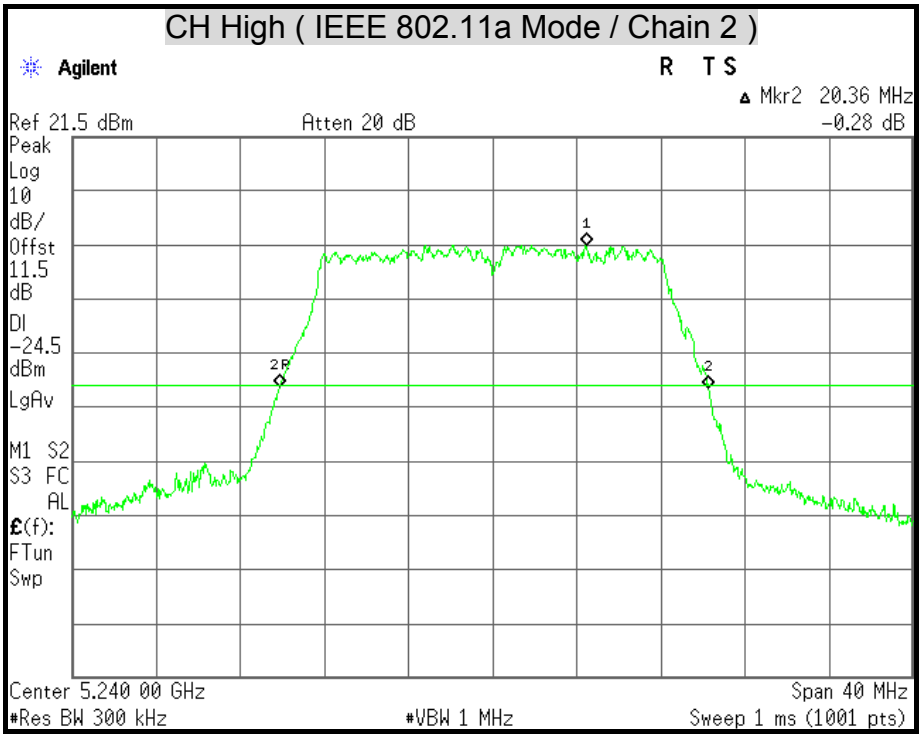

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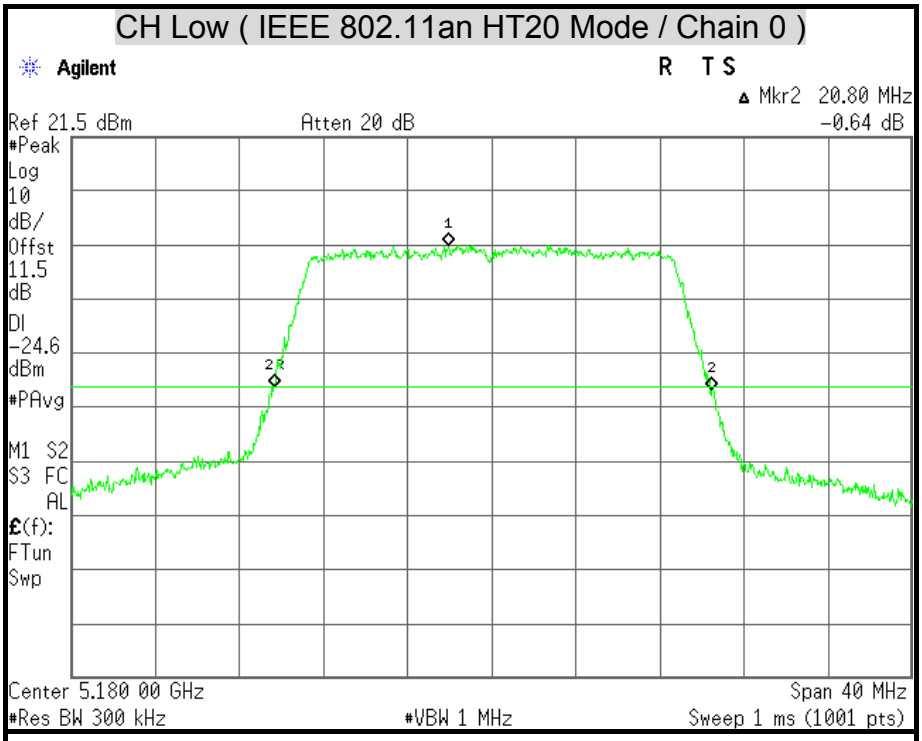

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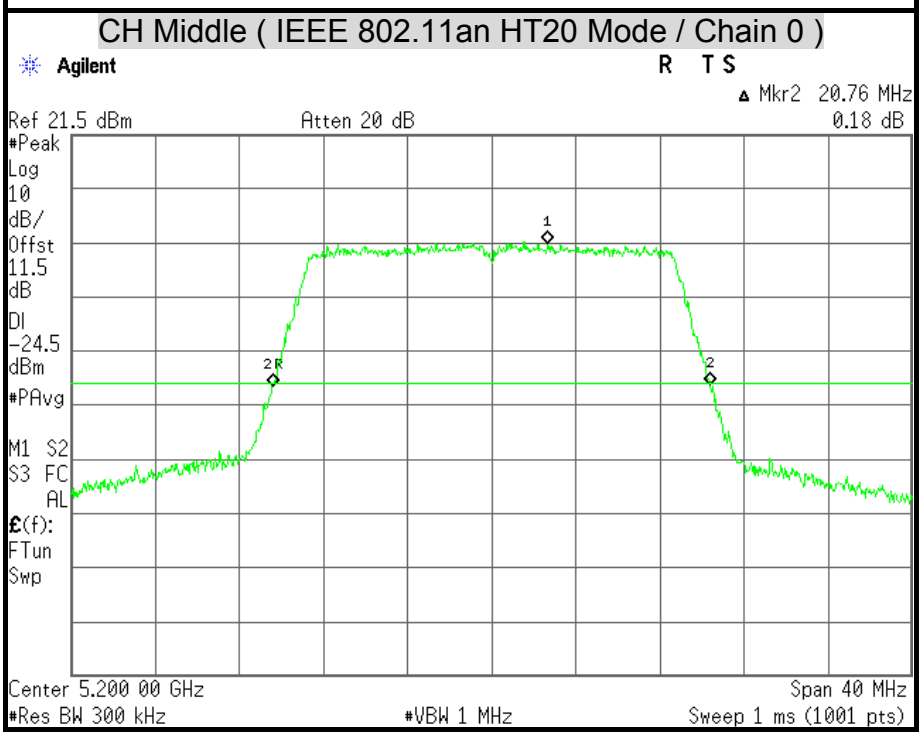

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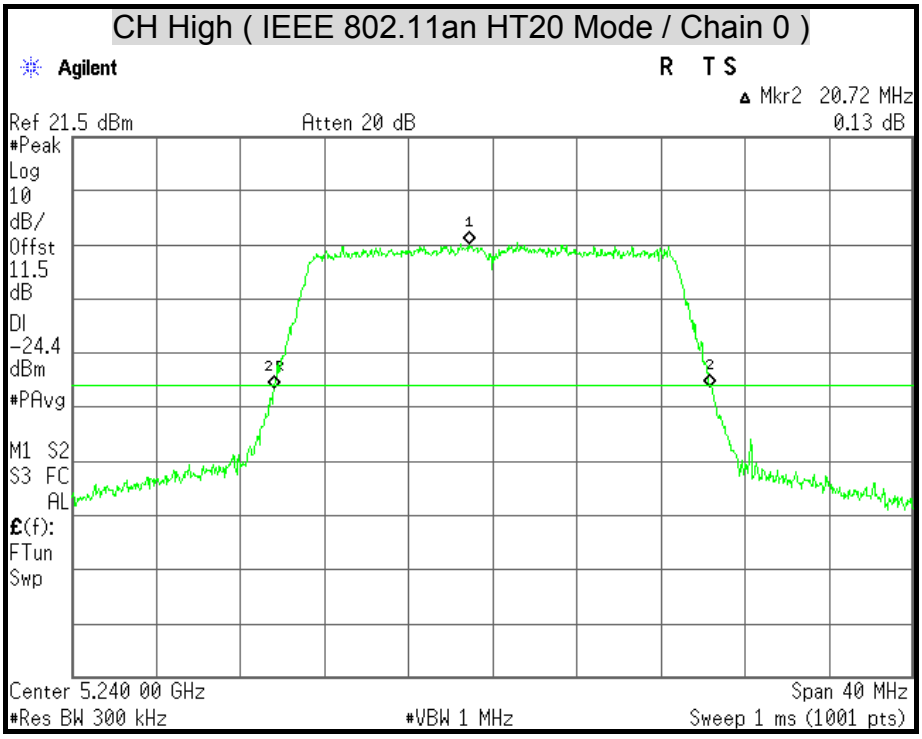

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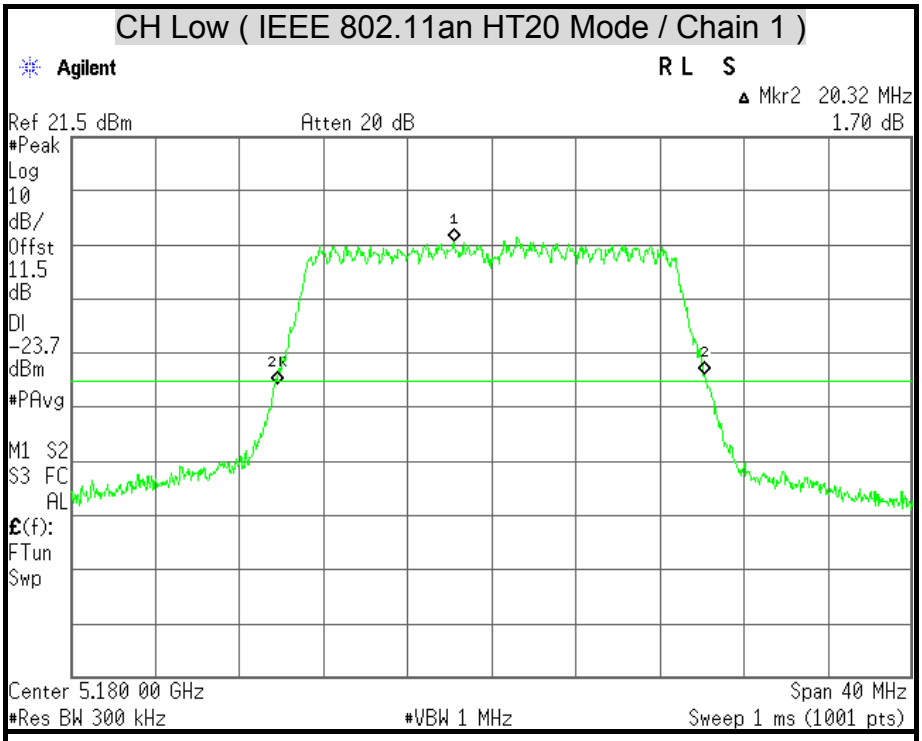

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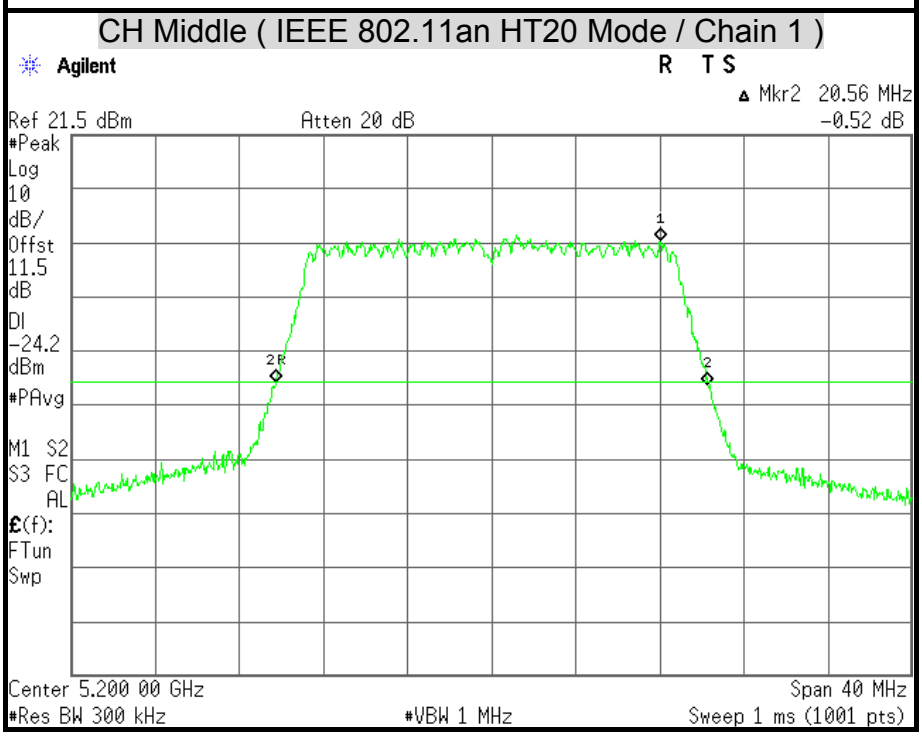

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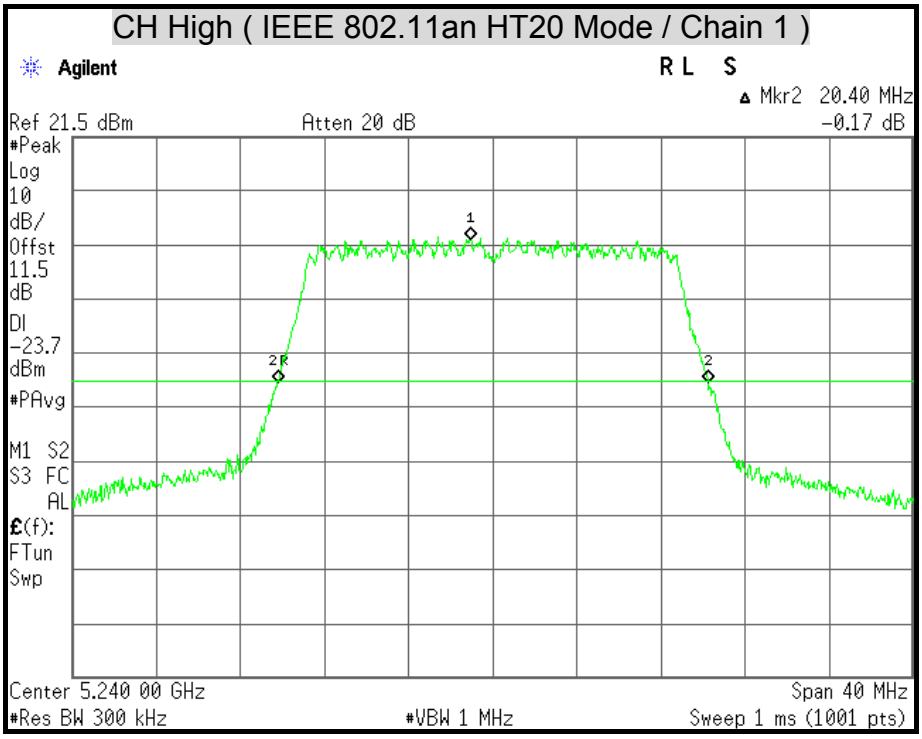

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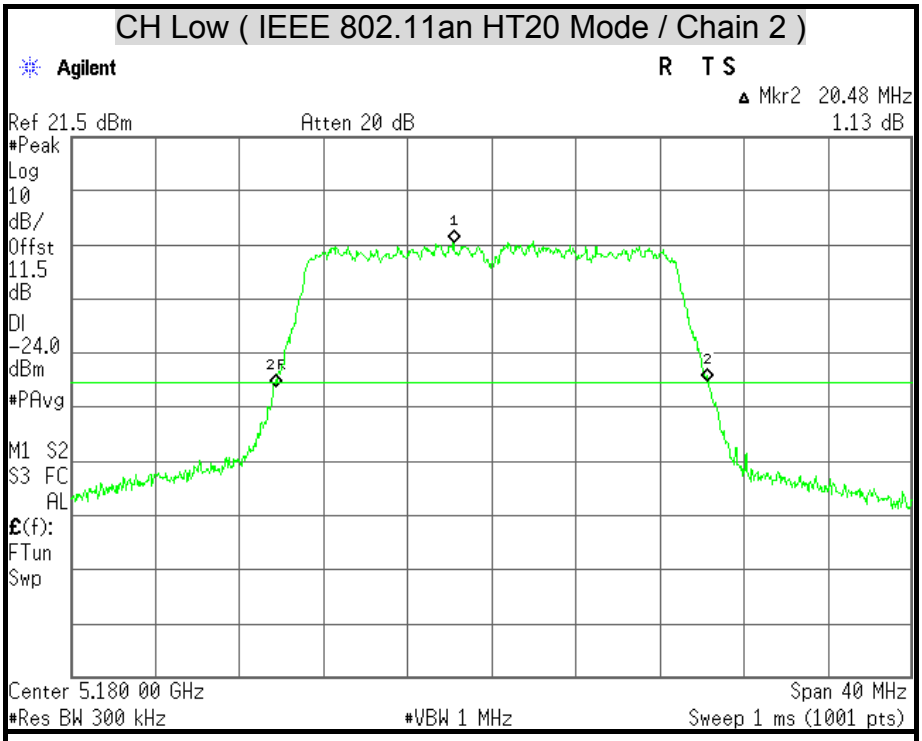

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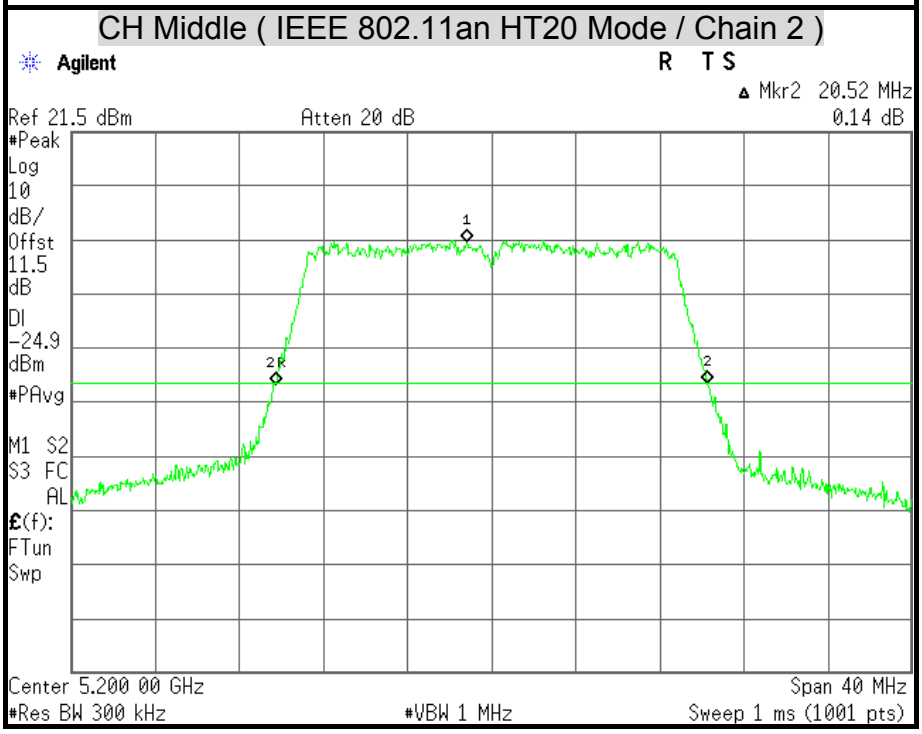

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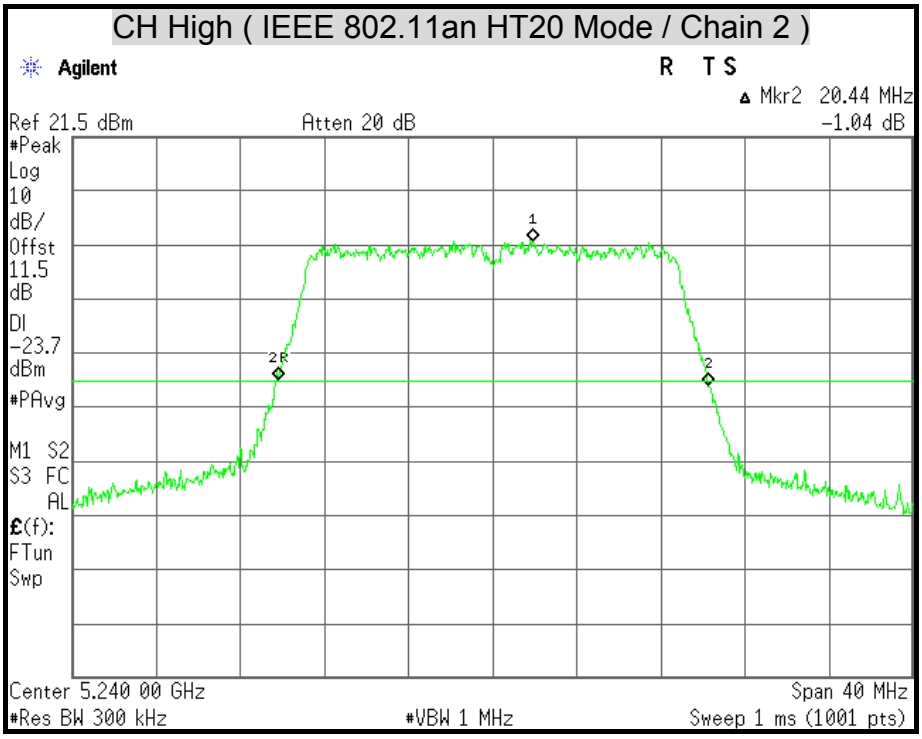

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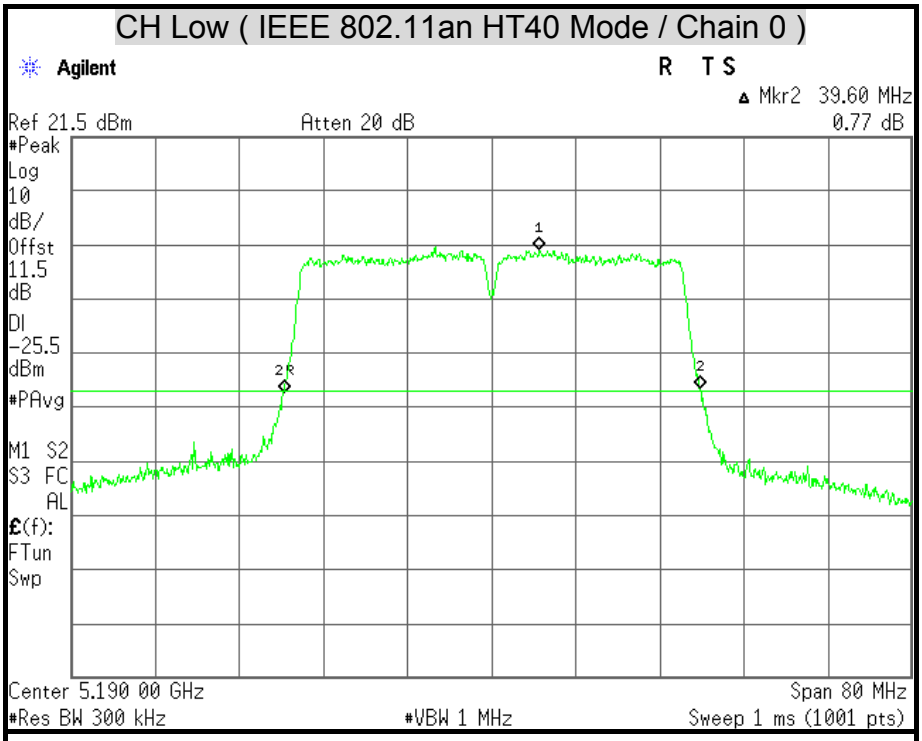

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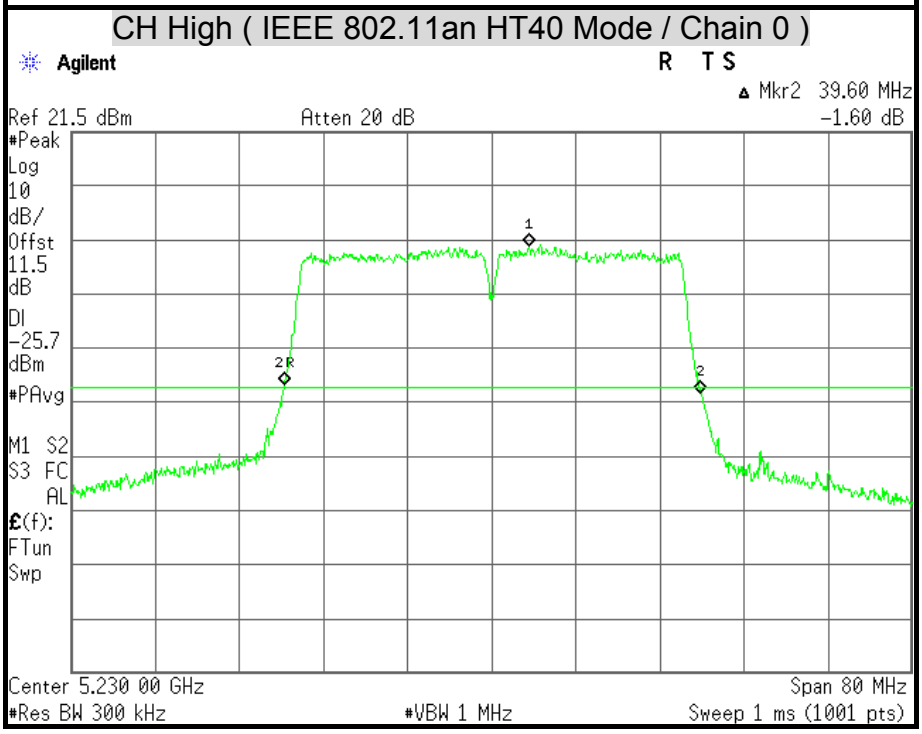

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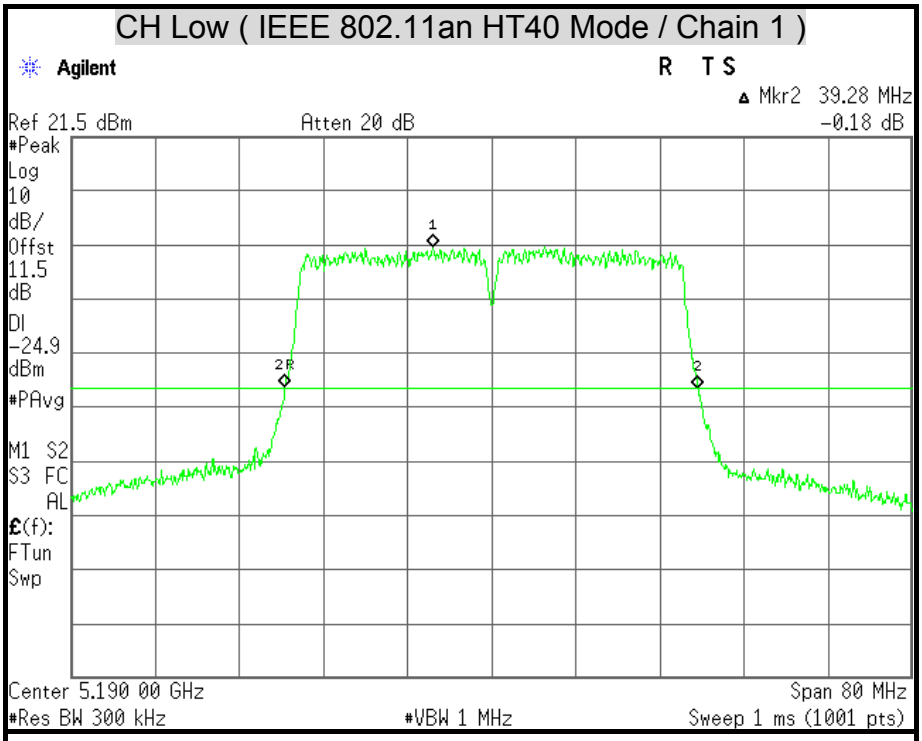

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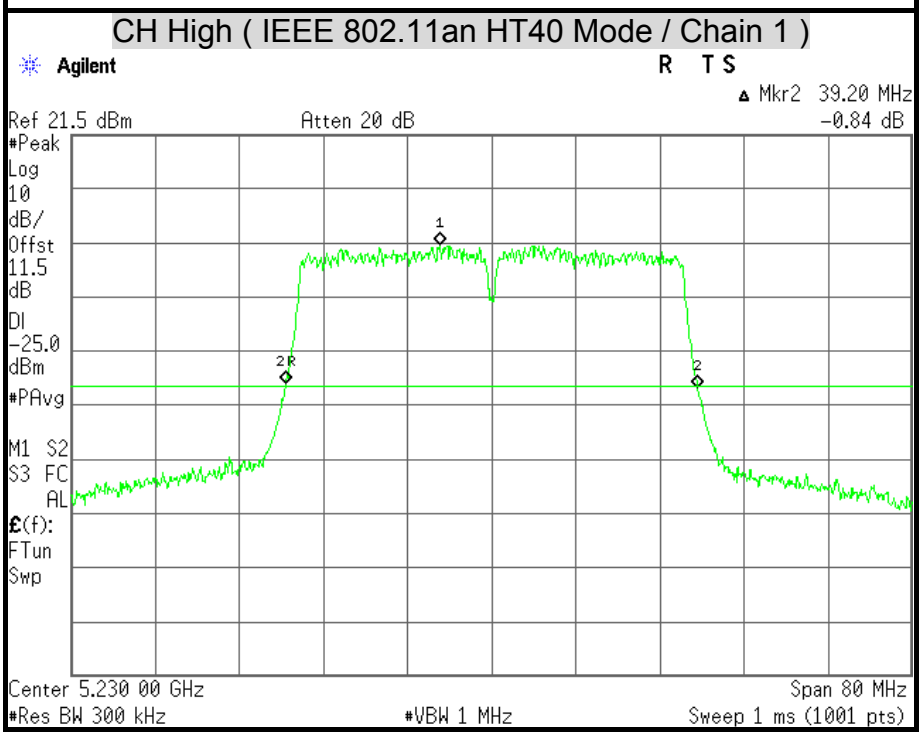

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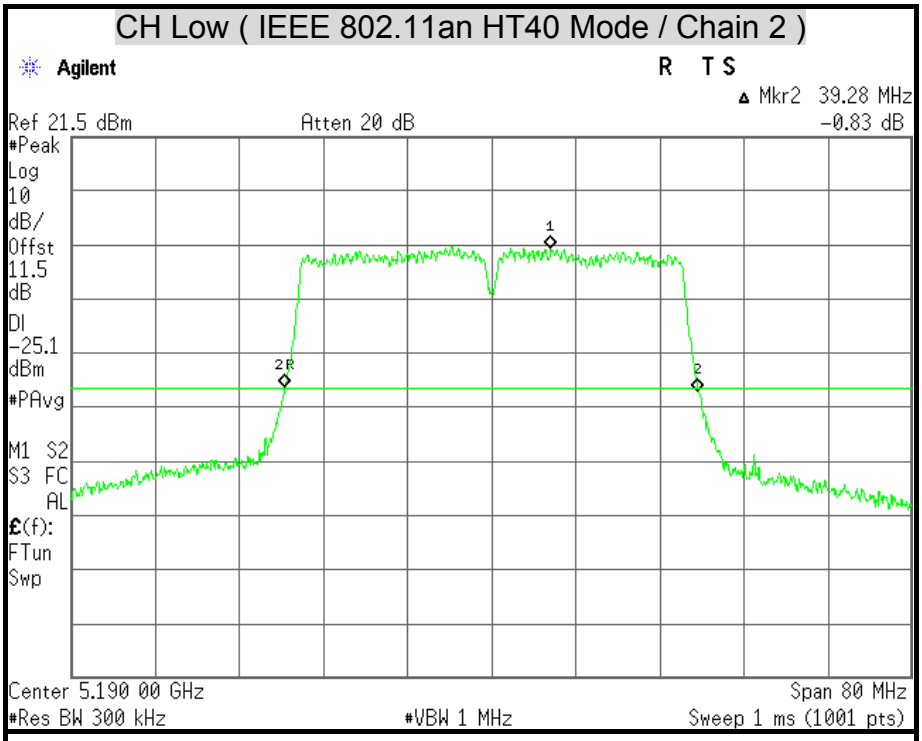

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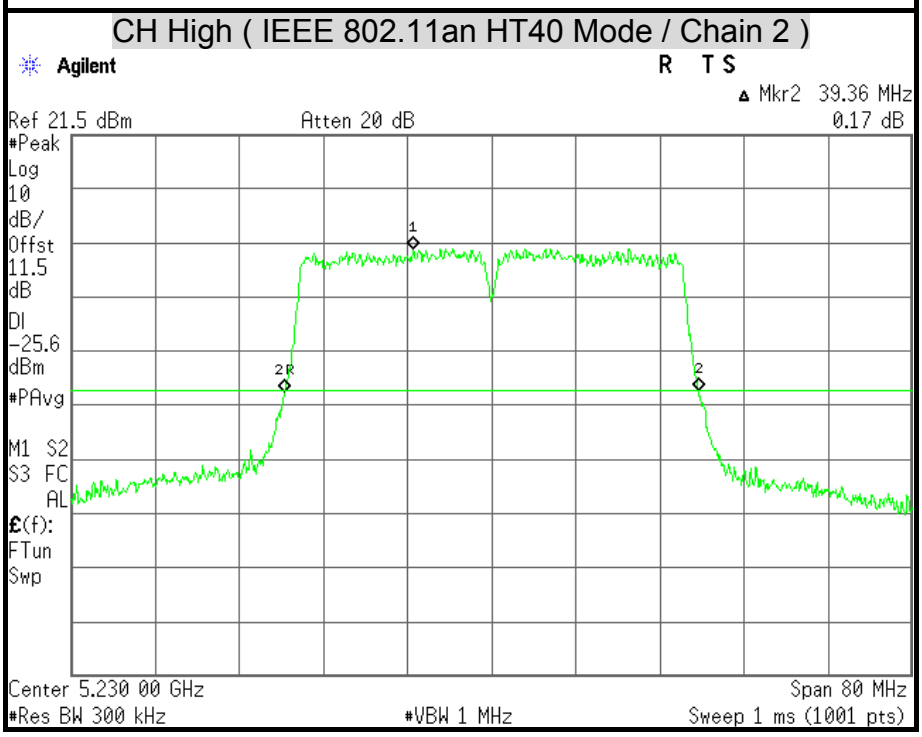
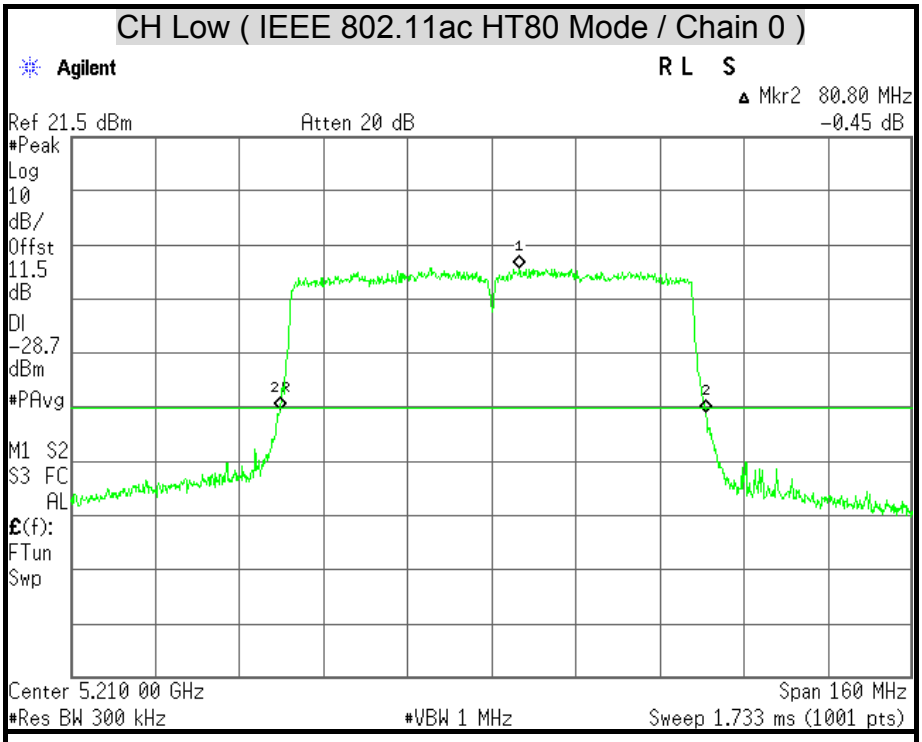
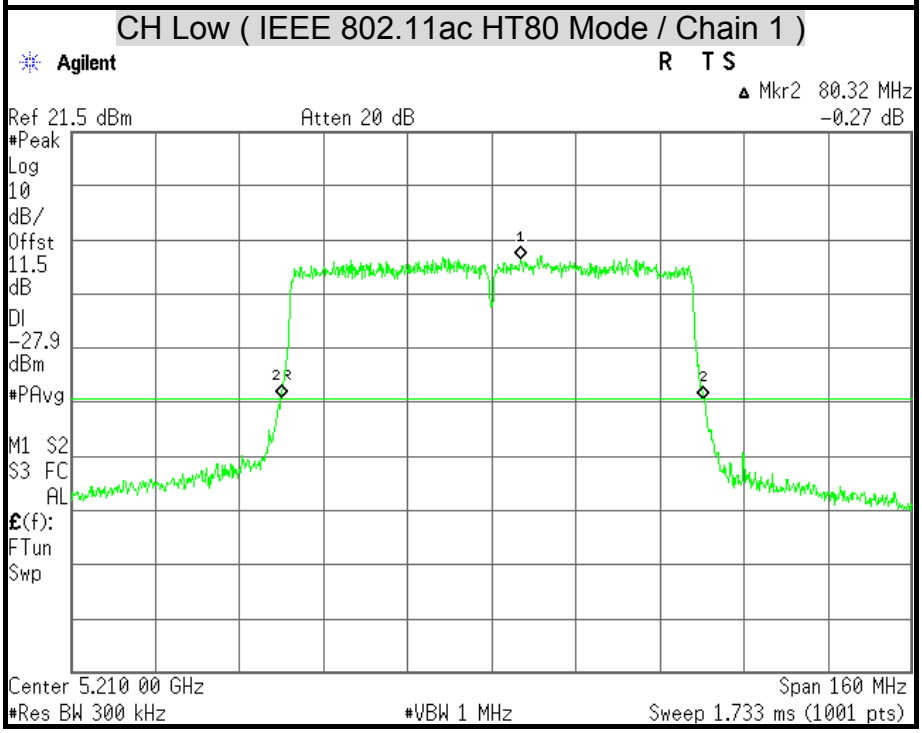


CH Low (IEEE 802.11ac HT80 Mode / Chain 0)



CH Low (IEEE 802.11ac HT80 Mode / Chain 1)



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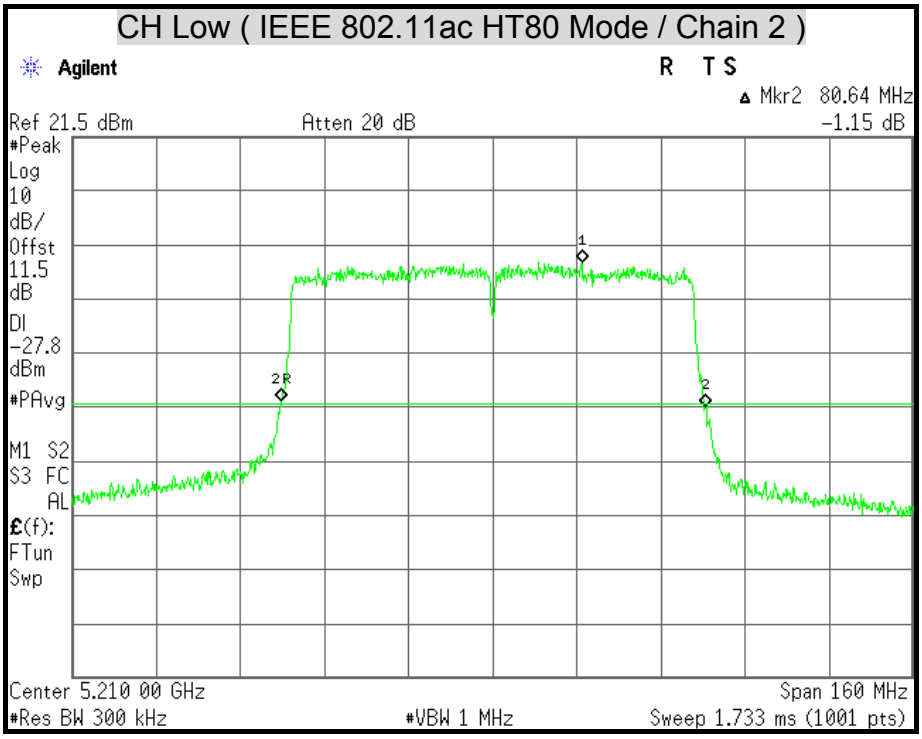


7.2 MAXIMUM CONDUCTED OUTPUT POWER

LIMITS

§ 15.407(a)

(1) For the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50mW (17dBm) or 4dBm + 10log B, where B is the 26dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4dBm in any 1 MHz band.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10log B, where B is the 26 dB emission bandwidth in MHz.

If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

§ 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 $N_{ANT} \geq 5$.

The power shall not exceeded the limit as follows:

IEEE 802.11a Mode (Three TX)

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 0			
Low	5180	20.47	13.11	17.11	17
Middle	5220	20.32	13.08	17.08	17
High	5240	20.44	13.10	17.10	17

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 1			
Low	5180	20.33	13.08	17.08	17
Middle	5220	20.40	13.10	17.10	17
High	5240	20.28	13.07	17.07	17

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 2			
Low	5180	20.27	13.07	17.07	17
Middle	5220	20.47	13.11	17.11	17
High	5240	20.36	13.09	17.09	17

IEEE 802.11an HT20 Mode (Three TX)

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 0			
Low	5180	20.80	13.18	17.18	17
Middle	5220	20.76	13.17	17.17	17
High	5240	20.72	13.16	17.16	17

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 1			
Low	5180	20.32	13.08	17.08	17
Middle	5220	20.56	13.13	17.13	17
High	5240	20.40	13.10	17.10	17

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 2			
Low	5180	20.48	13.11	17.11	17
Middle	5220	20.52	13.12	17.12	17
High	5240	20.44	13.10	17.10	17

IEEE 802.11an HT40 Mode (Three TX)

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 0			
Low	5190	39.60	15.98	19.98	17
High	5230	39.60	15.98	19.98	17

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 1			
Low	5190	39.28	15.94	19.94	17
High	5230	39.20	15.93	19.93	17

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 2			
Low	5190	39.28	15.94	19.94	17
High	5230	39.36	15.95	19.95	17

IEEE 802.11ac HT80 Mode (Three TX)

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 0			
Low	5210	80.80	19.07	23.07	17

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 1			
Low	5210	80.32	19.05	23.05	17

Channel	Channel Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4dBm + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
		Chain 2			
Low	5210	80.64	19.07	23.07	17

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	ANRITSU	ML2495A	1149001	12/06/2013
Power Sensor	ANRITSU	MA2411B	1126148	12/07/2013

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 power detection.

TEST RESULTS

IEEE 802.11a Mode (Three TX)

Channel	Channel Frequency (MHz)	Power (dBm)			Total Power		Power Limit		Pass / Fail
		Chain 0	Chain 1	Chain 2	(dBm)	(W)	(dBm)	(W)	
Low	5180	9.90	10.03	9.89	14.71	0.0296	17	0.0501	PASS
Middle	5200	9.48	9.52	9.53	14.28	0.0268	17	0.0501	PASS
High	5240	9.95	9.87	9.50	14.55	0.0285	17	0.0501	PASS

Remark:

1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the 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 power = Chain 0 + Chain 1 + Chain 2.*

IEEE 802.11n HT20 Mode (Three TX)

Channel	Channel Frequency (MHz)	Power (dBm)			Total Power		Power Limit		Pass / Fail
		Chain 0	Chain 1	Chain 2	(dBm)	(W)	(dBm)	(W)	
Low	5180	10.13	10.01	9.90	14.79	0.0301	17	0.0501	PASS
Middle	5200	10.11	10.06	10.07	14.85	0.0306	17	0.0501	PASS
High	5240	10.28	10.24	10.13	14.99	0.0315	17	0.0501	PASS

Remark:

1. *At finial test to get the worst-case emission at 6.5Mbps.*
2. *The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the 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 power = Chain 0 + Chain 1 + Chain 2.*

IEEE 802.11n HT40 Mode (Three TX)

Channel	Channel Frequency (MHz)	Power (dBm)			Total Power		Power Limit		Pass / Fail
		Chain 0	Chain 1	Chain 2	(dBm)	(W)	(dBm)	(W)	
Low	5190	11.70	11.76	11.77	16.51	0.0448	17	0.0501	PASS
High	5230	11.61	11.58	11.36	16.29	0.0426	17	0.0501	PASS

Remark:

1. *At finial test to get the worst-case emission at 13.5Mbp.*
2. *The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the 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 power = Chain 0 + Chain 1 + Chain 2.*

IEEE 802.11ac HT80 Mode (Three TX)

Channel	Channel Frequency (MHz)	Power (dBm)			Total Power		Power Limit		Pass / Fail
		Chain 0	Chain 1	Chain 2	(dBm)	(W)	(dBm)	(W)	
Low	5210	11.53	11.50	11.68	16.34	0.0431	17	0.0501	PASS

Remark:

1. *At finial test to get the worst-case emission at 29.3Mbps.*
2. *The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the 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 power = Chain 0 + Chain 1 + Chain 2.*

7.3 PEAK POWER SPECTRAL DENSITY

LIMITS

§ 15.407 (a)

(1) For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4dBm in any 1MHz band.

(2) For the band 5.25-5.35 GHz and 5.47-5725 GHz, the peak power spectral density shall not exceed 11dBm in any 1MHz band.

If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

§ KDB 662911 :

Cross-polarized antennas with N_{ANT} = 2. In the case of a transmitter with only two outputs driving antennas that are cross-polarized (e.g., vertical and horizontal or left-circular and right-circular), directional gain is the gain of an individual antenna.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/10/2014

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

TEST SETUP

TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
   Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 1MHz, VBW = 3MHz, Span = Sweep= AUTO
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

TEST RESULTS

IEEE 802.11a Mode (Three TX)

Channel	Channel Frequency (MHz)	Final RF Power Level in 1MHz BW (dBm)			PSD Total (dBm)	Minimum Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
Low	5180	-1.58	-1.43	-1.54	3.26	3.41	PASS
Middle	5200	-2.13	-2.01	-1.93	2.75	3.41	PASS
High	5240	-1.71	-1.56	-1.78	3.09	3.41	PASS

Remark:

1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The Directional gain = G_{ANT} + Array Gain = 6.59dBi which is more than 6dBi, the limit should be 3.41dBm.*
4. *Total power spectral density = Chain 0 + Chain 1 + Chain 2.*

IEEE 802.11an HT20 Mode (Three TX)

Channel	Channel Frequency (MHz)	Final RF Power Level in 1MHz BW (dBm)			PSD Total (dBm)	Minimum Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
Low	5180	-1.61	-1.69	-1.83	3.06	3.41	PASS
Middle	5200	-1.75	-1.76	-1.96	2.95	3.41	PASS
High	5240	-1.53	-1.51	-1.75	3.18	3.41	PASS

Remark:

1. *At finial test to get the worst-case emission at 6.5Mbps.*
2. *The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The Directional gain = G_{ANT} + Array Gain = 6.59dBi which is more than 6dBi, the limit should be 3.41dBm.*
4. *Total power spectral density = Chain 0 + Chain 1 + Chain 2.*

IEEE 802.11an HT40 Mode (Three TX)

Channel	Channel Frequency (MHz)	Final RF Power Level in 1MHz BW (dBm)			PSD Total (dBm)	Minimum Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
Low	5190	-3.17	-3.02	-3.19	1.65	3.41	PASS
High	5230	-3.12	-3.18	-3.50	1.51	3.41	PASS

Remark:

1. *At finial test to get the worst-case emission at 13.5Mbps.*
2. *The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The Directional gain = G_{ANT} + Array Gain = 6.59dBi which is more than 6dBi, the limit should be 3.41dBm.*
4. *Total power spectral density = Chain 0 + Chain 1 + Chain 2.*

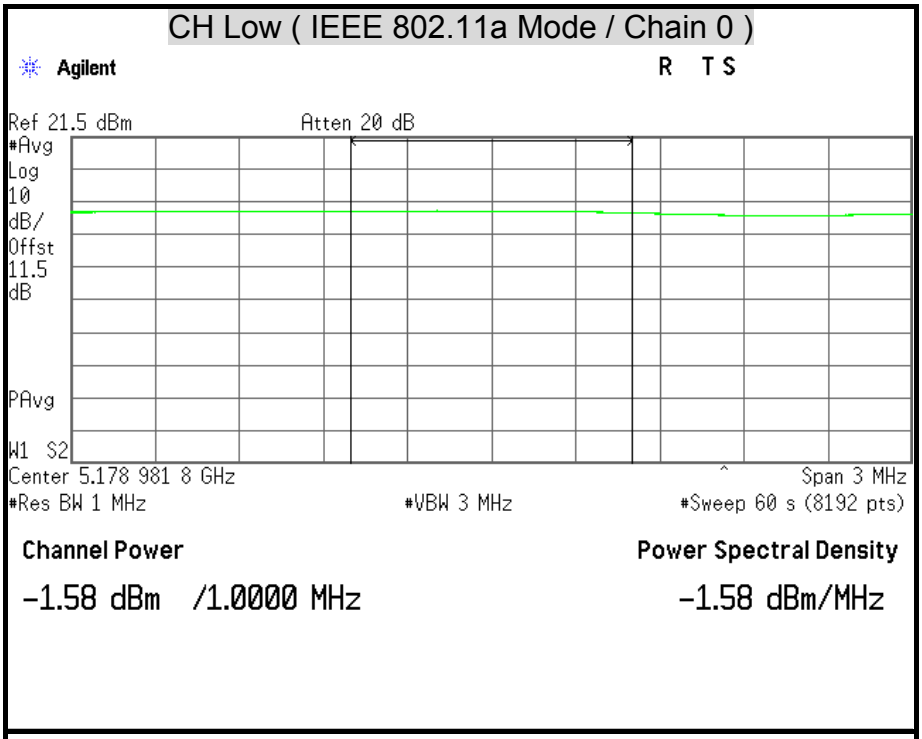
IEEE 802.11ac HT80 Mode (Three TX)

Channel	Channel Frequency (MHz)	Final RF Power Level in 1MHz BW (dBm)			PSD Total (dBm)	Minimum Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
Low	5210	-6.47	-6.44	-6.30	-1.63	3.41	PASS

Remark:

1. *At finial test to get the worst-case emission at 29.3Mbps.*
2. *The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The Directional gain = G_{ANT} + Array Gain = 6.59dBi which is more than 6dBi, the limit should be 3.41dBm.*
4. *Total power spectral density = Chain 0 + Chain 1 + Chain 2.*

CH Low (IEEE 802.11a Mode / Chain 0)



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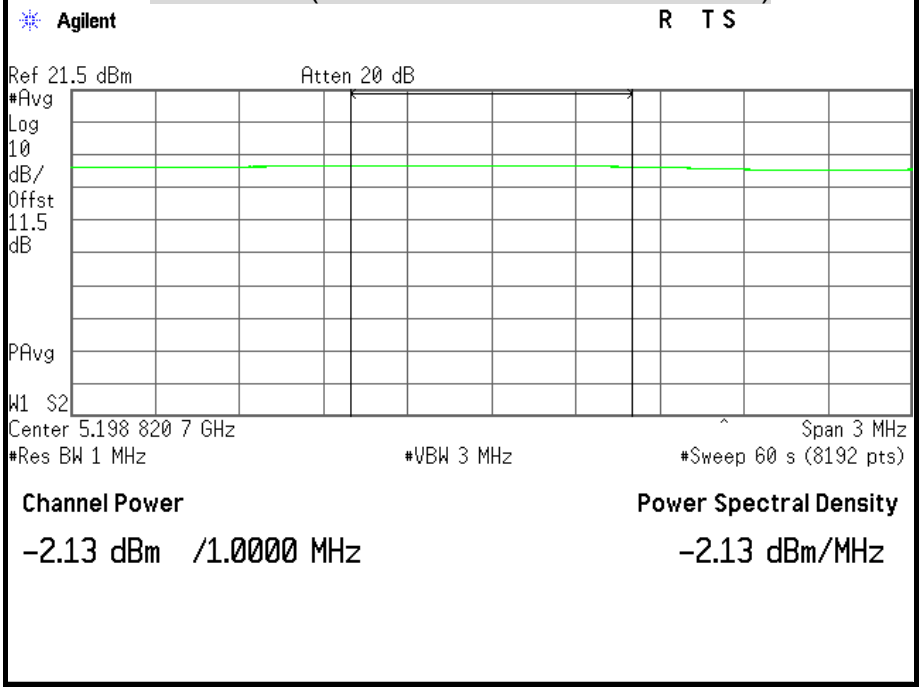

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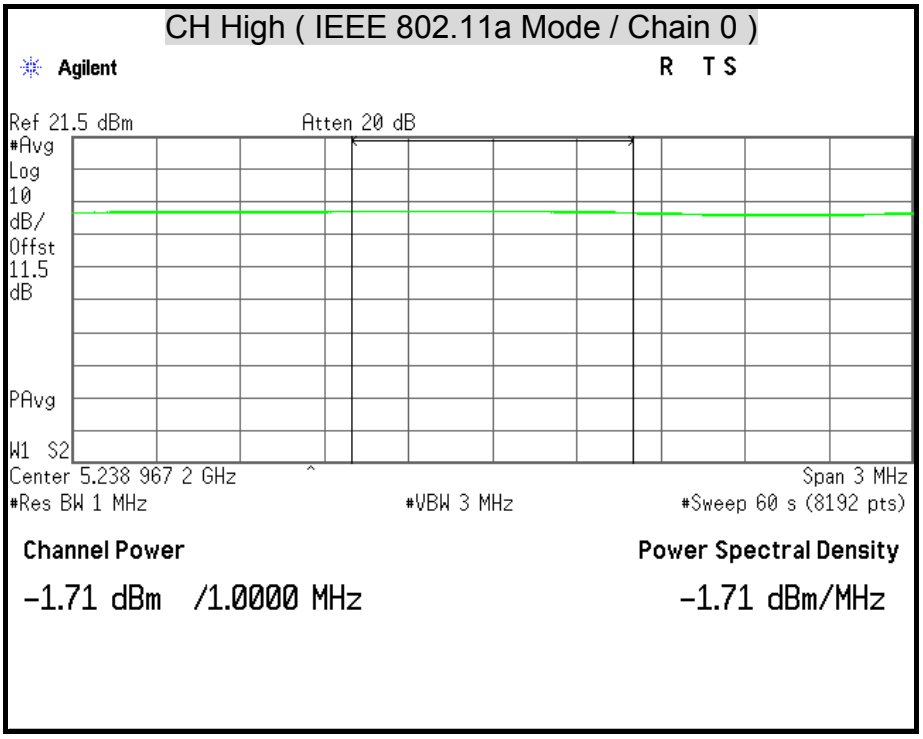

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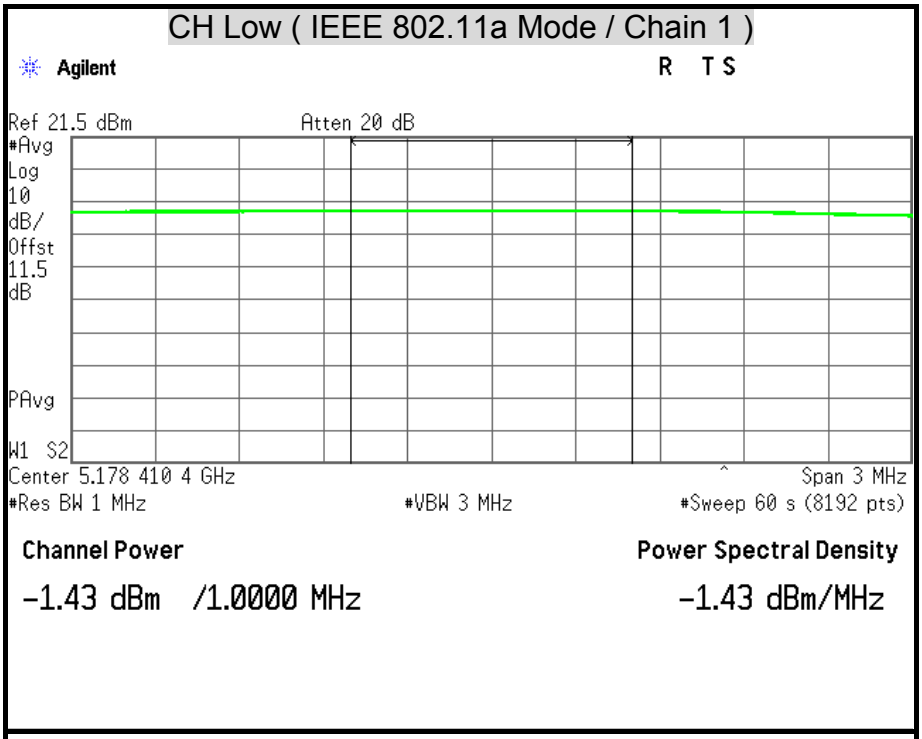

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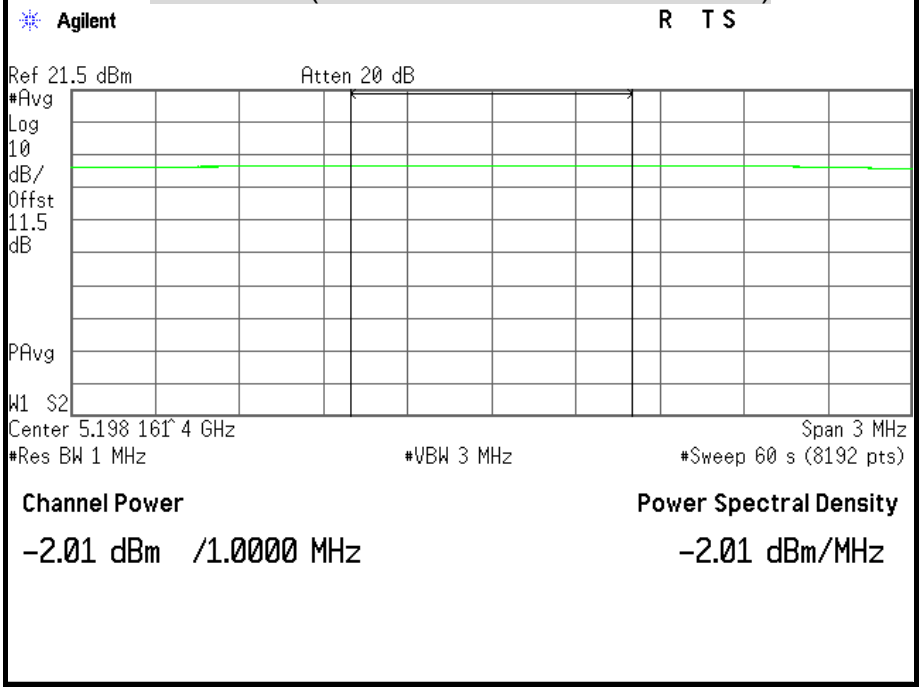

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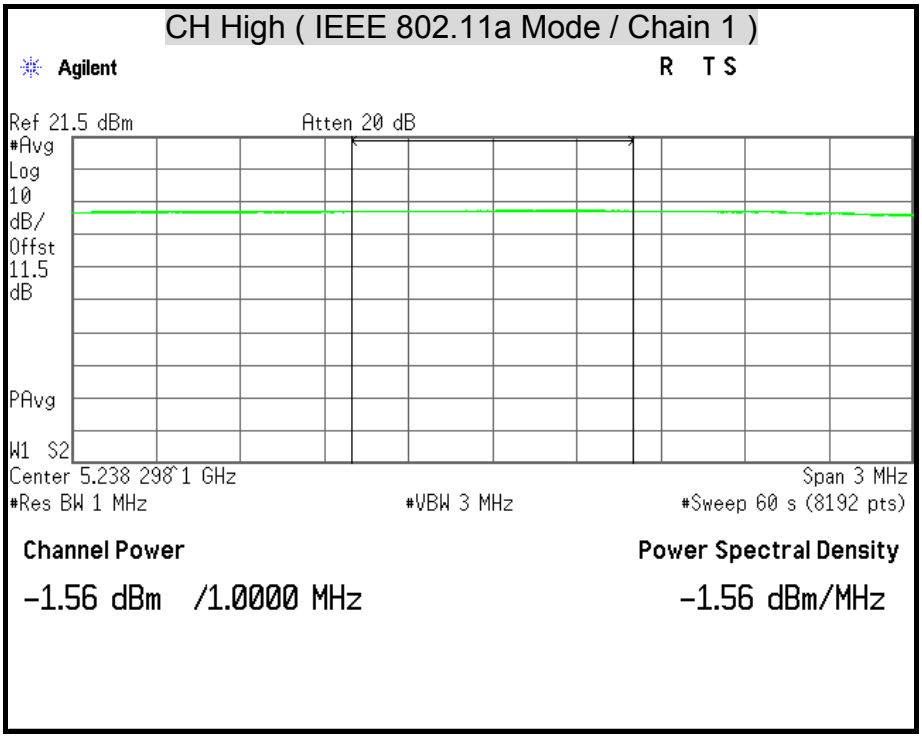

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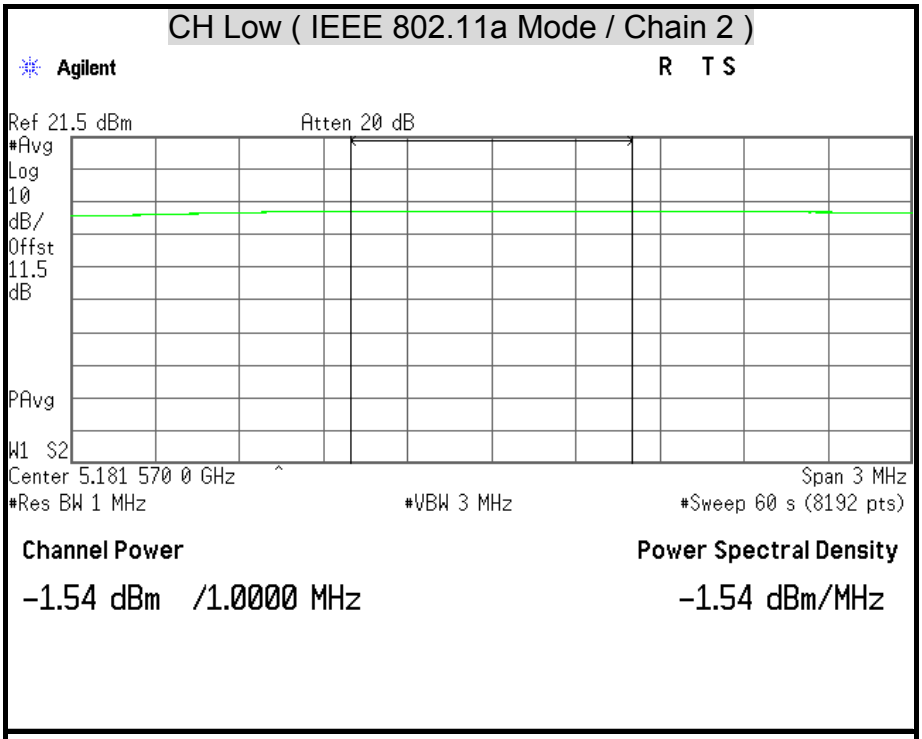

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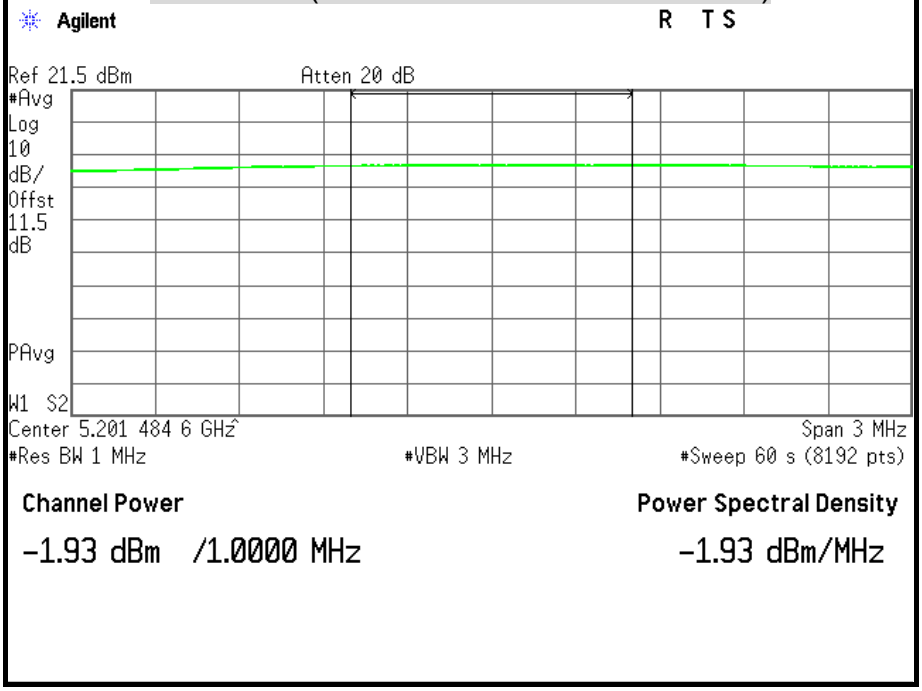

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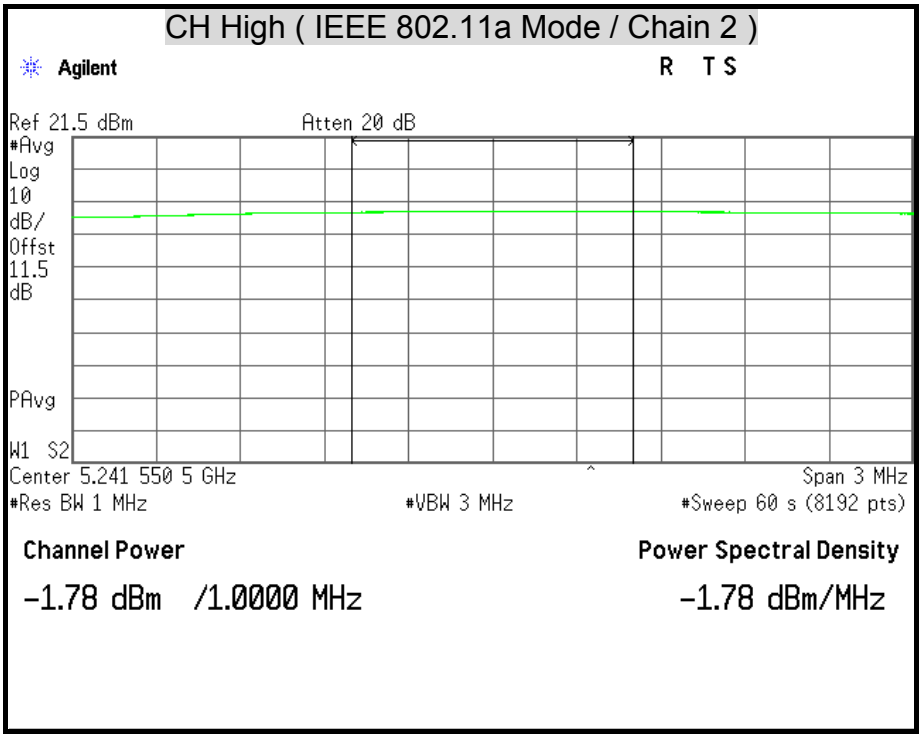

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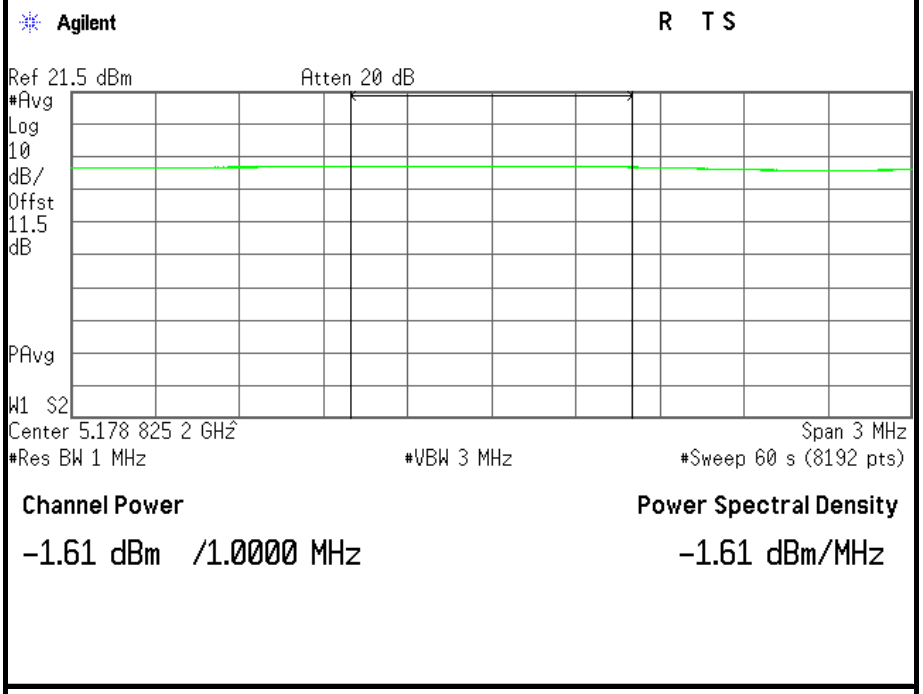
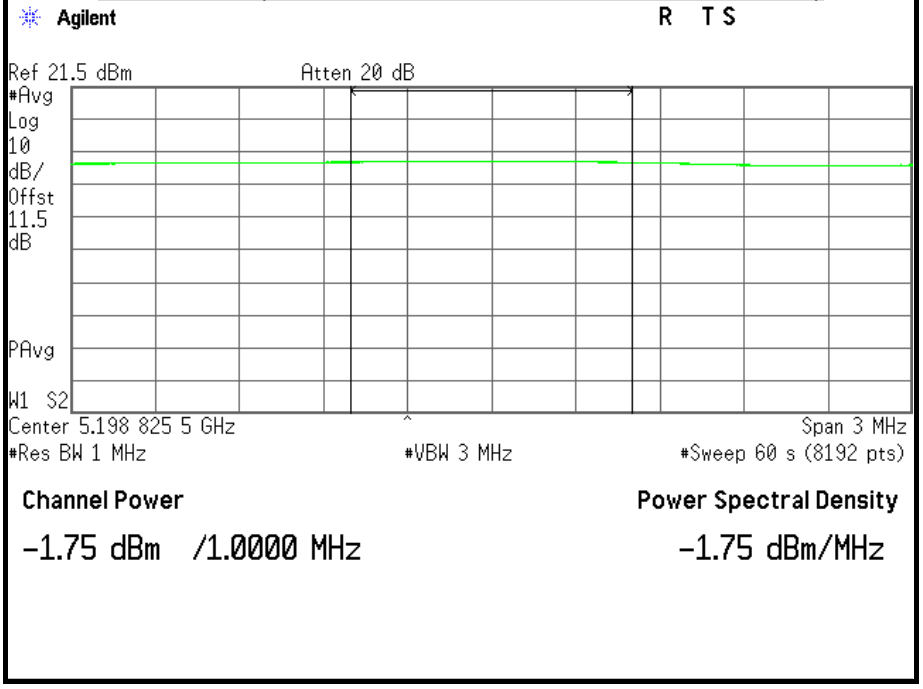


CH Middle (IEEE 802.11an HT20 Mode / Chain 1)



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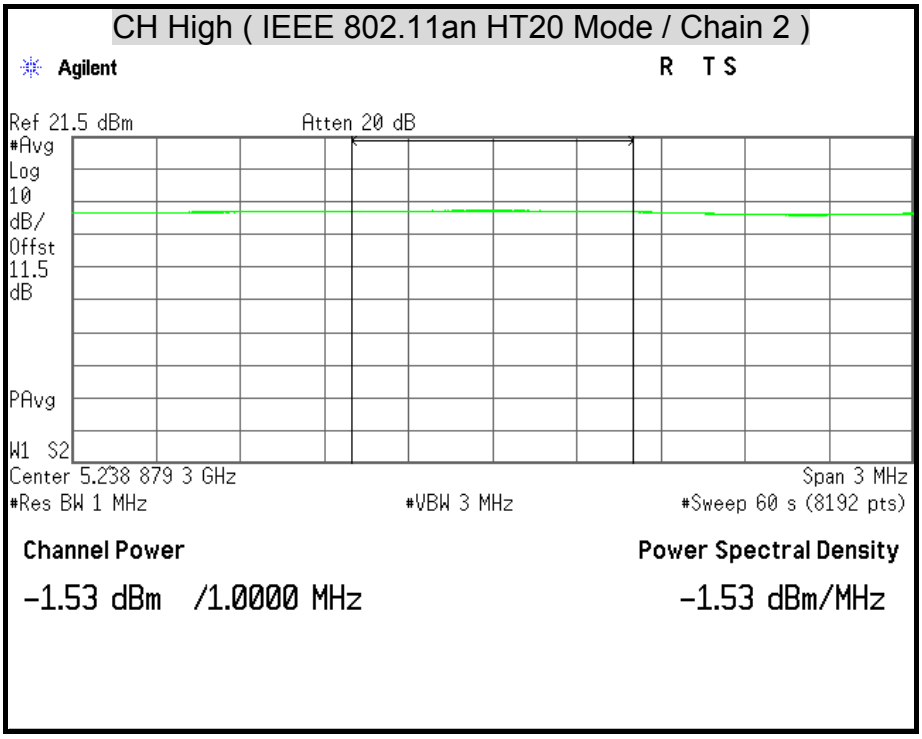

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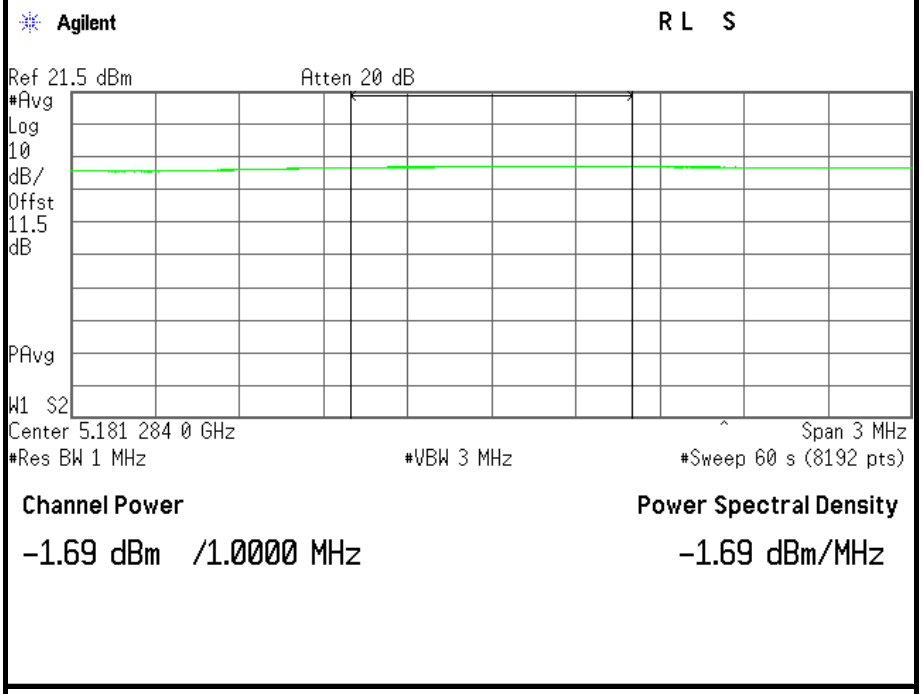

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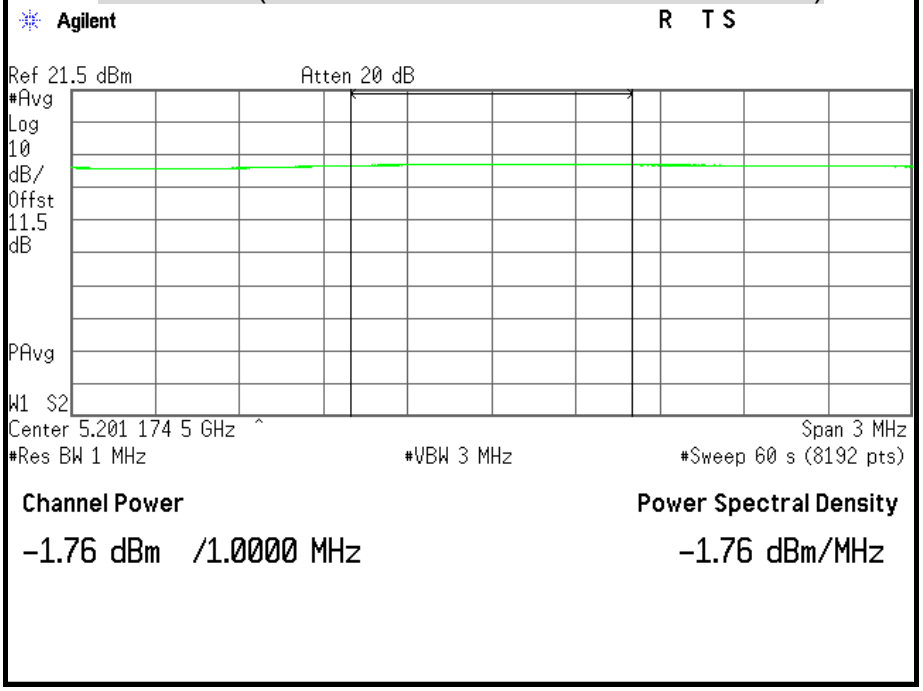

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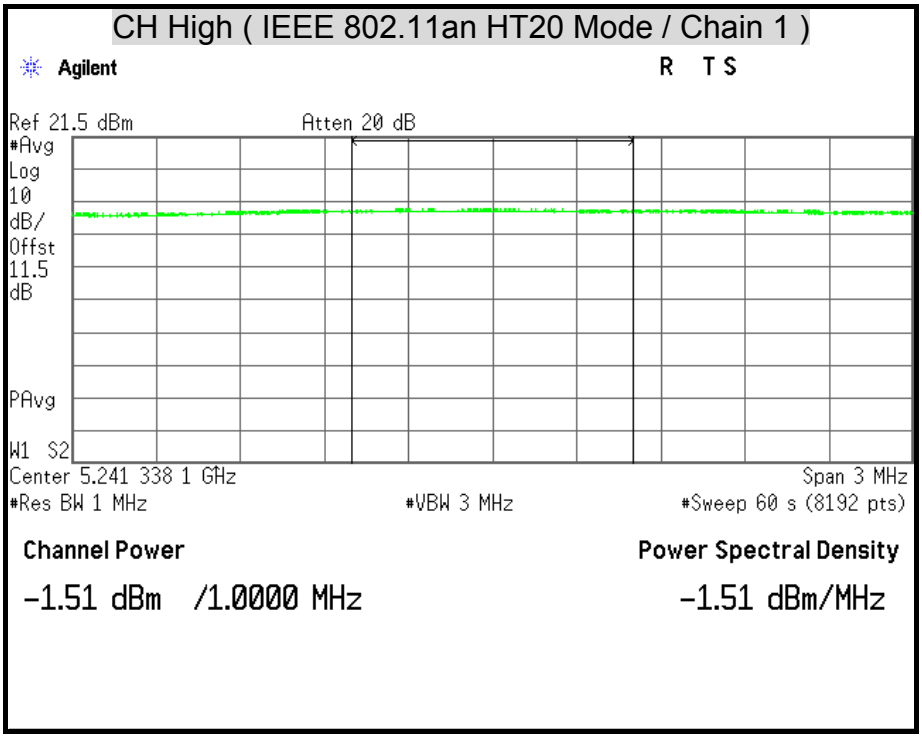

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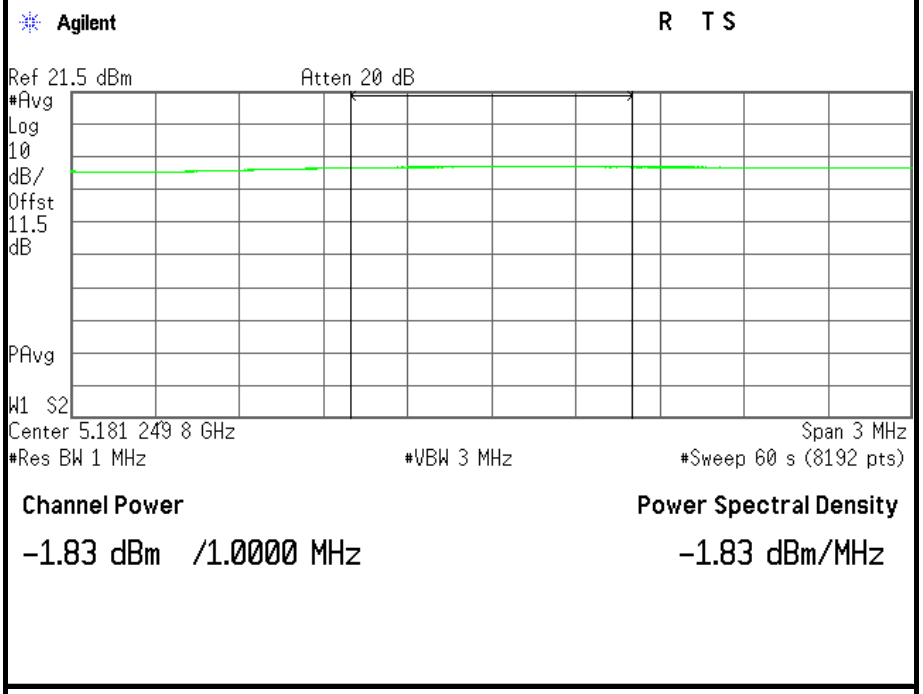

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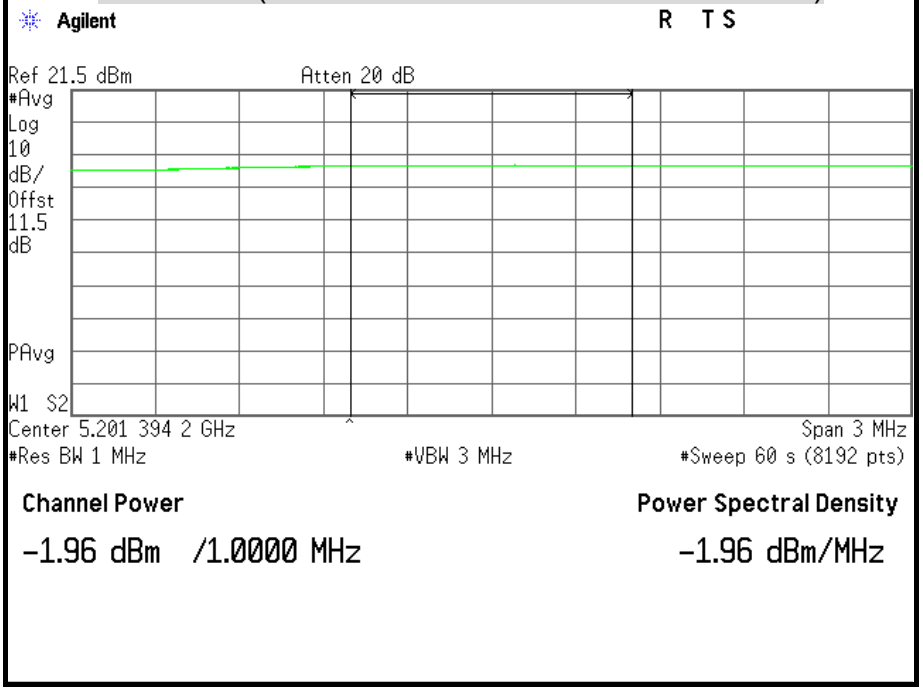

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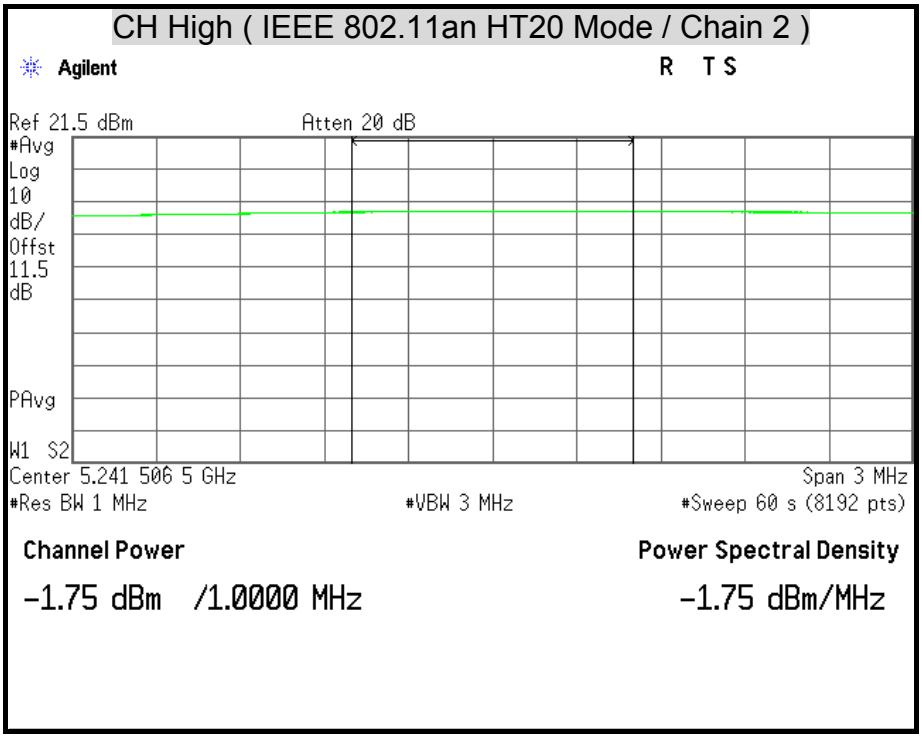
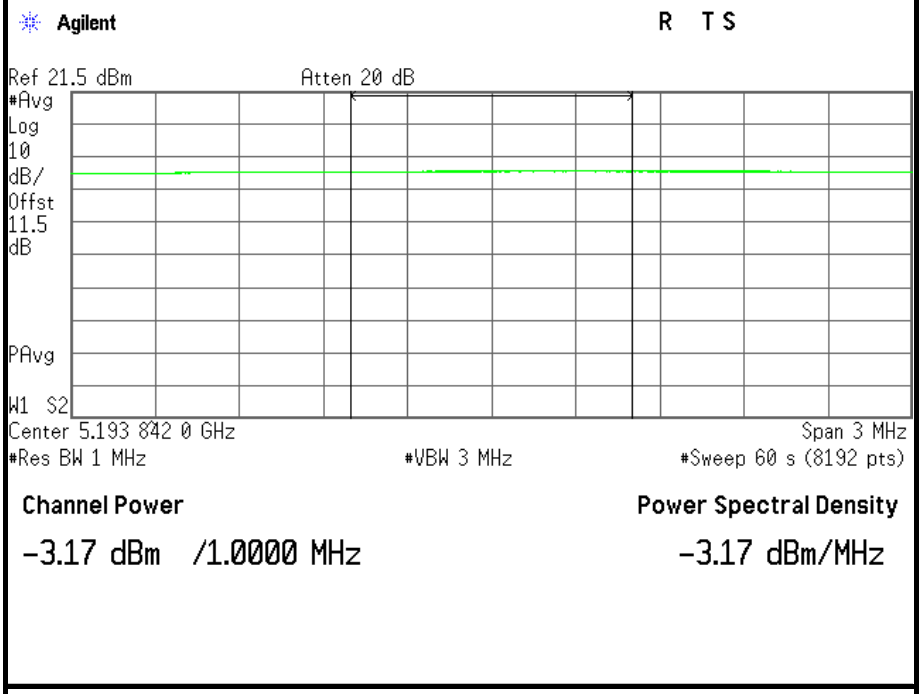


CH Low (IEEE 802.11an HT40 Mode / Chain 0)



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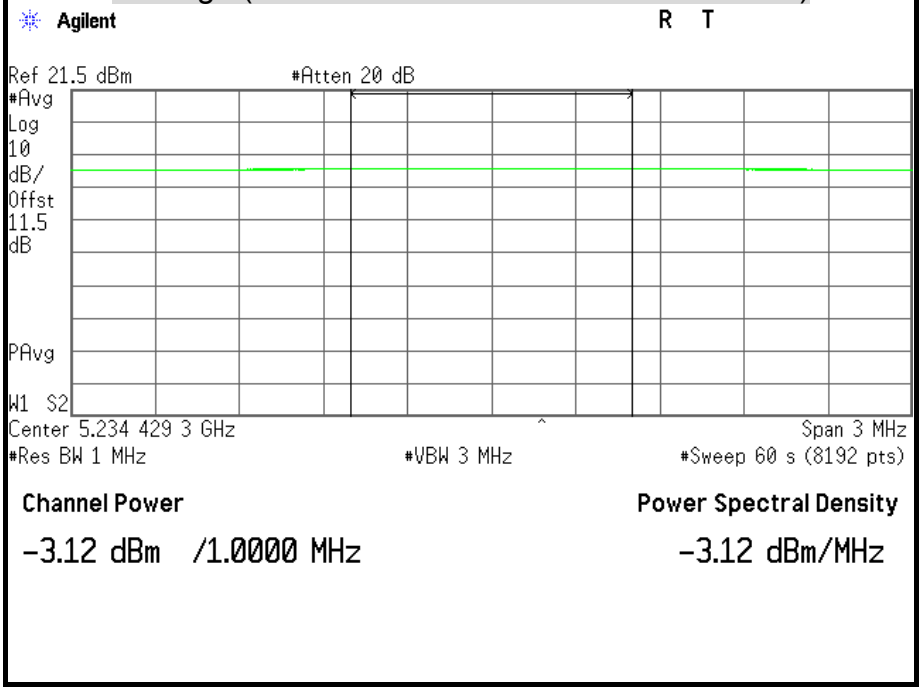

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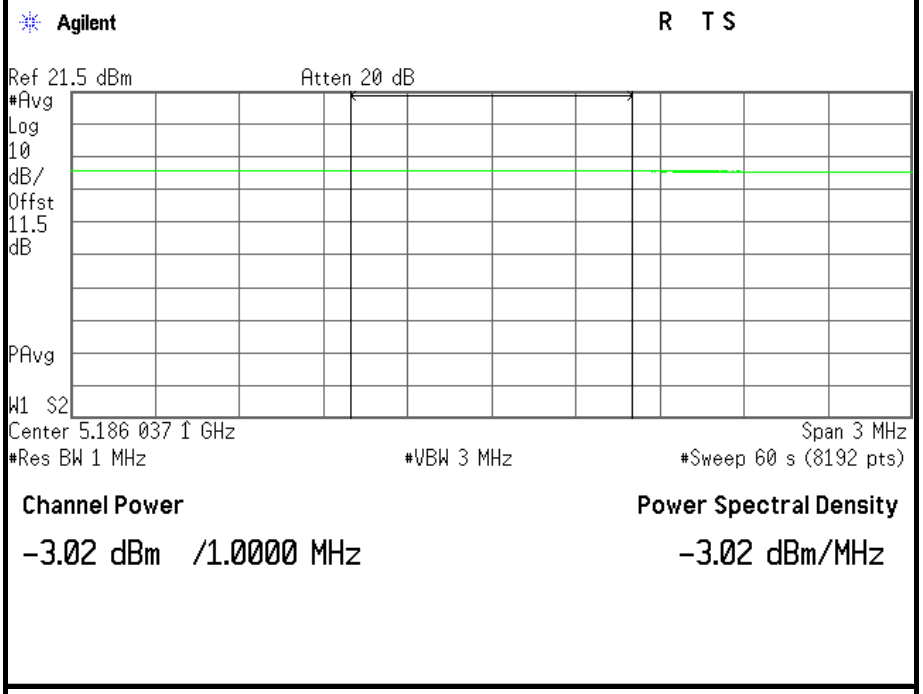

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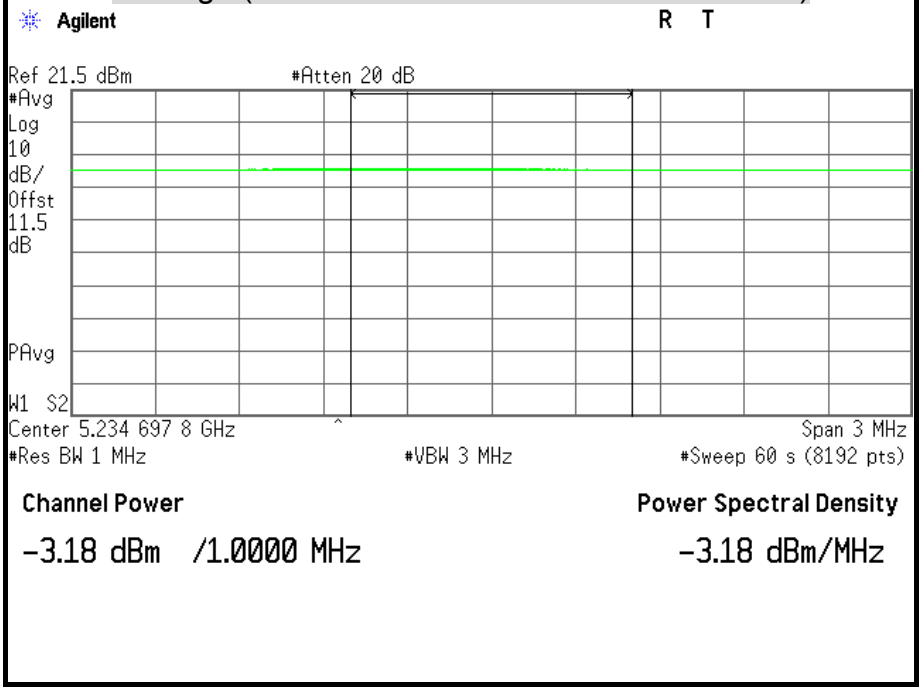
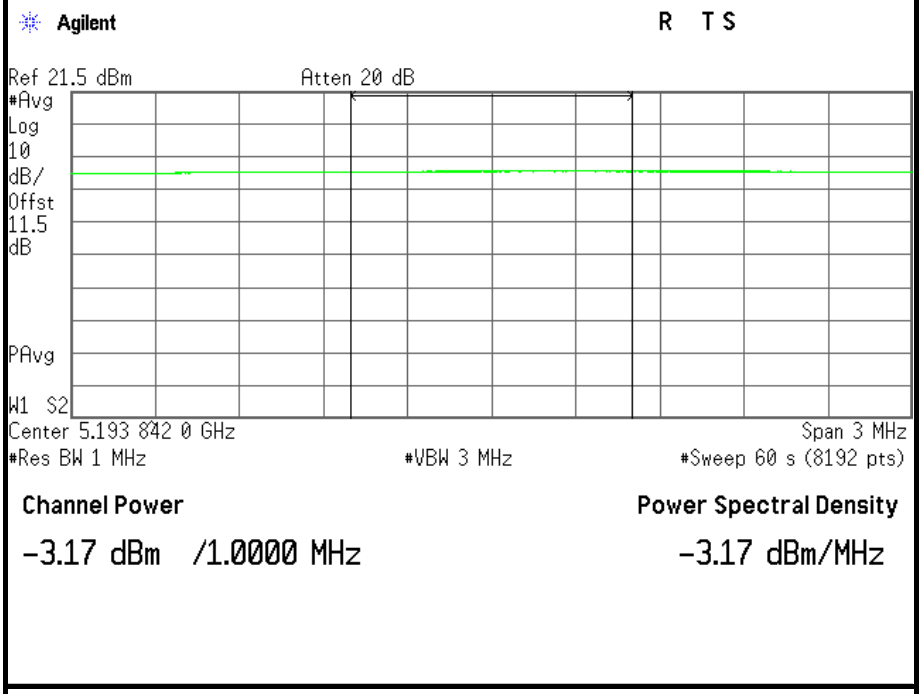
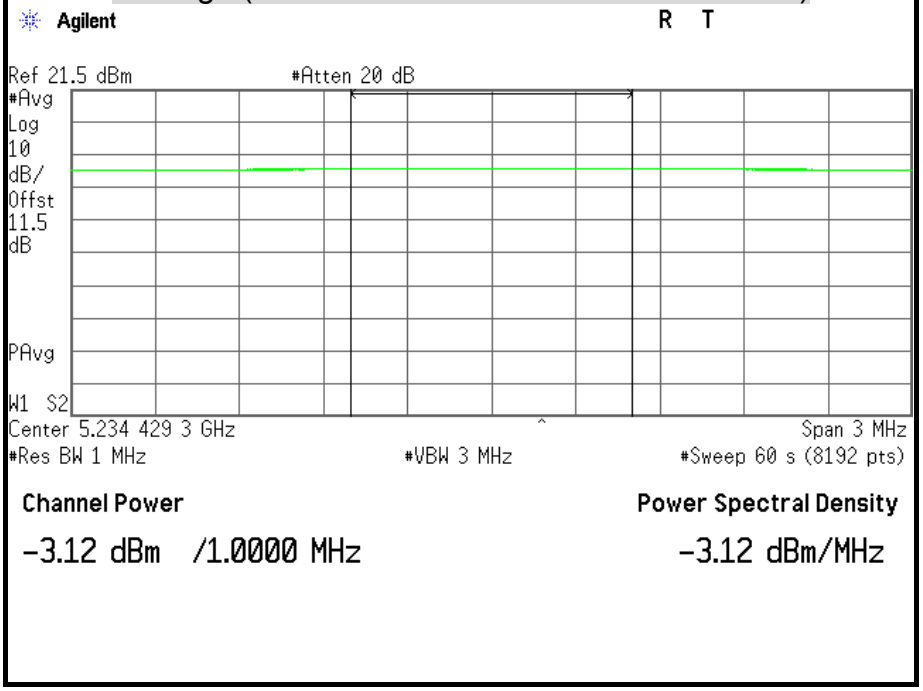


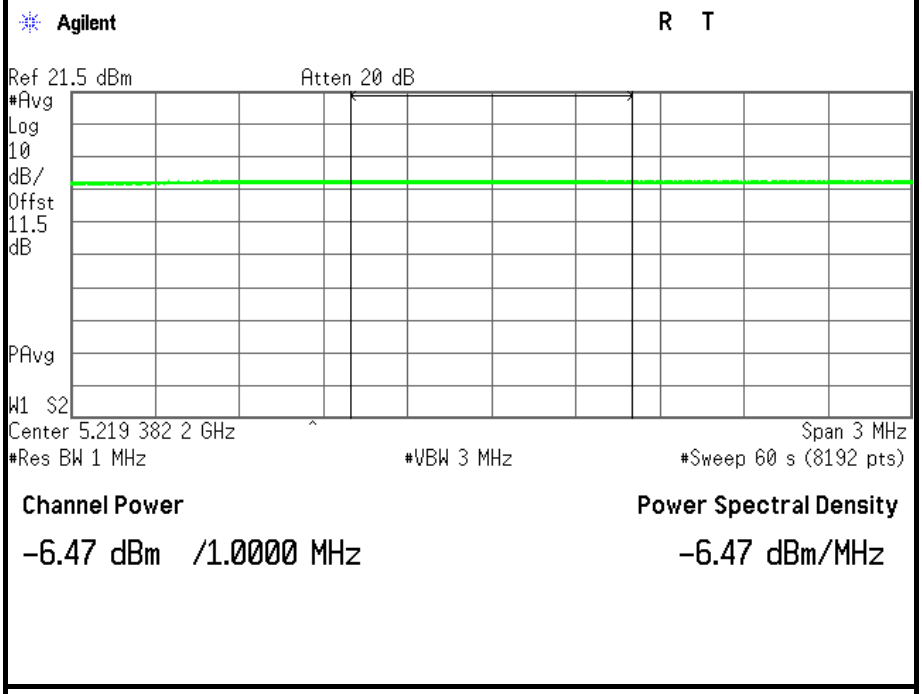
CH Low (IEEE 802.11an HT40 Mode / Chain 2)



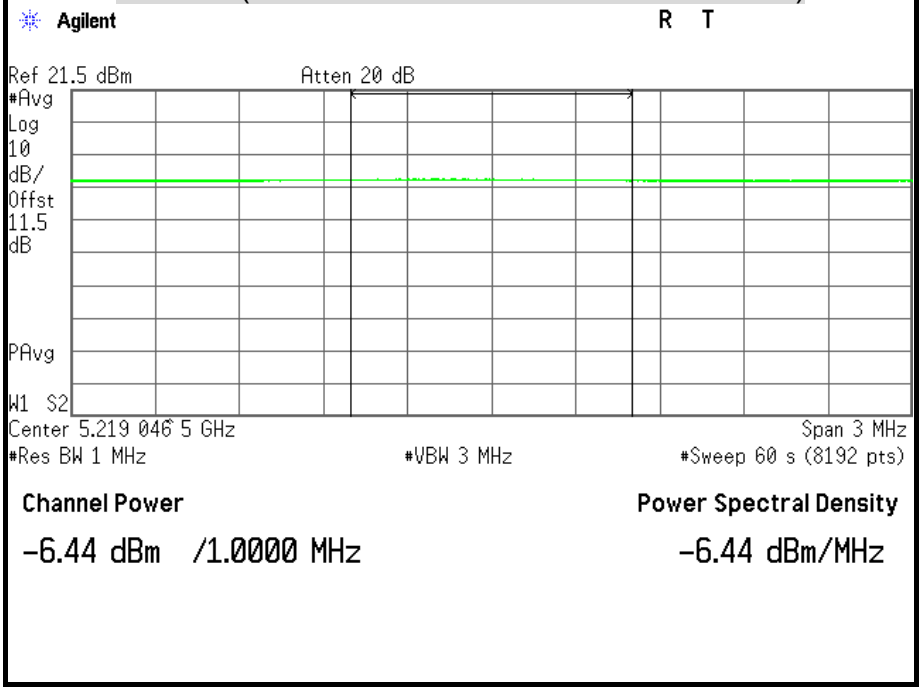
CH High (IEEE 802.11an HT40 Mode / Chain 2)



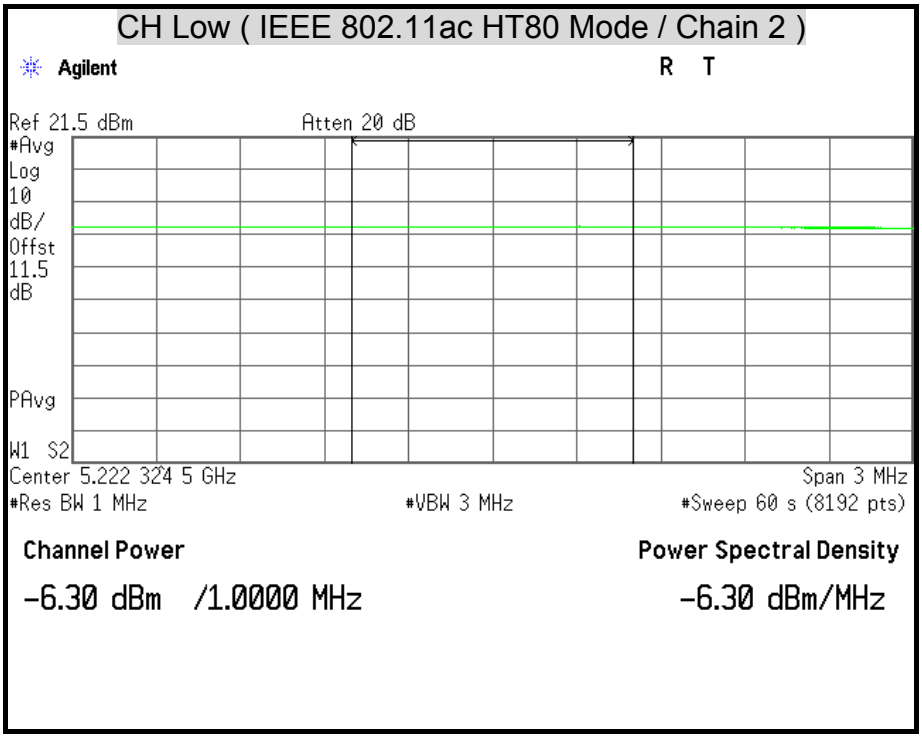
CH Low (IEEE 802.11ac HT80 Mode / Chain 0)



CH Low (IEEE 802.11ac HT80 Mode / Chain 1)



CH Low (IEEE 802.11ac HT80 Mode / Chain 2)



7.4 PEAK EXCURSION

LIMITS

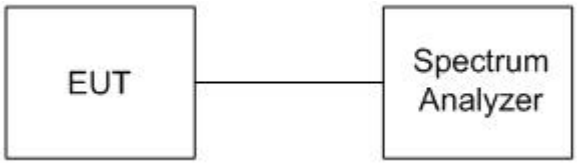
§ 15.407 (a) (6), the ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/10/2014

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

TEST SETUP



TEST PROCEDURE

The test is performed in accordance with <FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices> – Part 15, Subpart E, August 2002.

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum.
3. Trace A, Set RBW =1MHz, VBW = 3MHz, Span > 26dB Bandwidth, Max. hold.
   Trace B, Set RBW =1MHz, VBW = 3MHz, Span > 26dB Bandwidth, Setup sample detector and power average mode, to scan 100 times with average.
4. Delta Mark trace A Maximum frequency and trace B same frequency.
5. Repeat the above procedure until measurements for all frequencies were complete.

TEST RESULTS

IEEE 802.11a Mode (Three TX)

Channel	Channel Frequency (MHz)	Peak Excursion (dB)			Limit (dBm)	Margin (dB)			Pass / Fail
		Chain 0	Chain 1	Chain 2		Chain 0	Chain 1	Chain 2	
Low	5180	8.14	8.85	9.20	13	-4.86	-4.15	-3.80	PASS
Middle	5220	8.12	8.88	9.25	13	-4.88	-4.12	-3.75	PASS
High	5240	8.13	9.22	9.17	13	-4.87	-3.78	-3.83	PASS

Remark: *At finial test to get the worst-case emission at 6Mbps.*

IEEE 802.11an HT20 Mode (Three TX)

Channel	Channel Frequency (MHz)	Peak Excursion (dB)			Limit (dBm)	Margin (dB)			Pass / Fail
		Chain 0	Chain 1	Chain 2		Chain 0	Chain 1	Chain 2	
Low	5180	9.38	9.80	10.70	13	-3.62	-3.20	-2.30	PASS
Middle	5220	9.32	9.85	10.94	13	-3.68	-3.15	-2.06	PASS
High	5240	9.34	9.42	10.58	13	-3.66	-3.58	-2.42	PASS

Remark: *At finial test to get the worst-case emission at 6.5Mbps.*

IEEE 802.11an HT40 Mode (Three TX)

Channel	Channel Frequency (MHz)	Peak Excursion (dB)			Limit (dBm)	Margin (dB)			Pass / Fail
		Chain 0	Chain 1	Chain 2		Chain 0	Chain 1	Chain 2	
Low	5190	9.04	10.46	10.67	13	-3.96	-2.54	-2.33	PASS
High	5230	9.40	9.97	11.00	13	-3.60	-3.03	-2.00	PASS

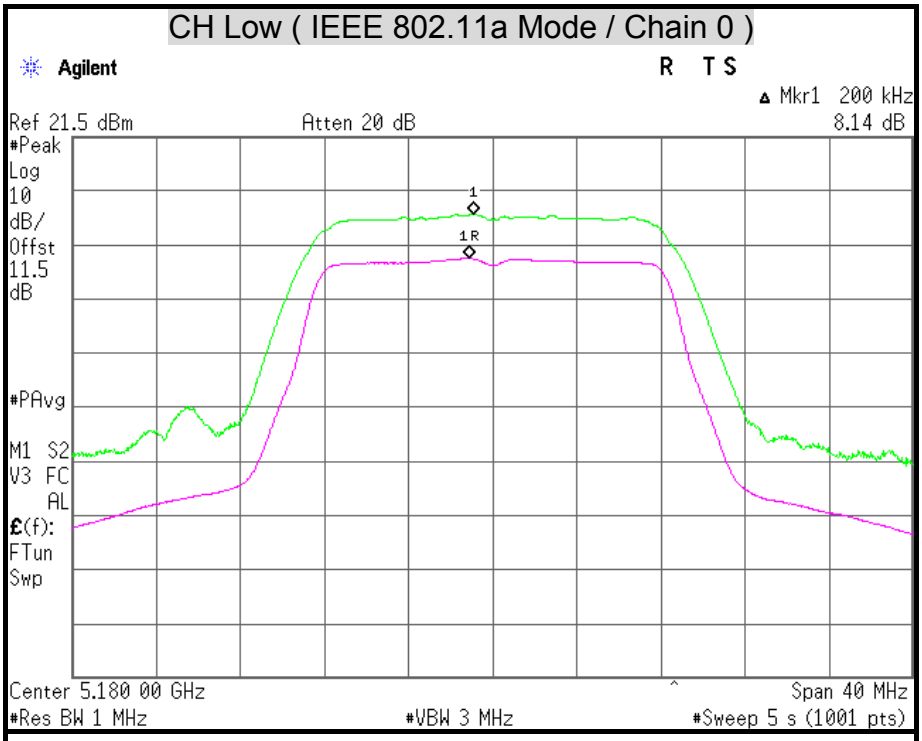
Remark: *At finial test to get the worst-case emission at 13.5Mbps.*

IEEE 802.11ac HT80 Mode (Three TX)

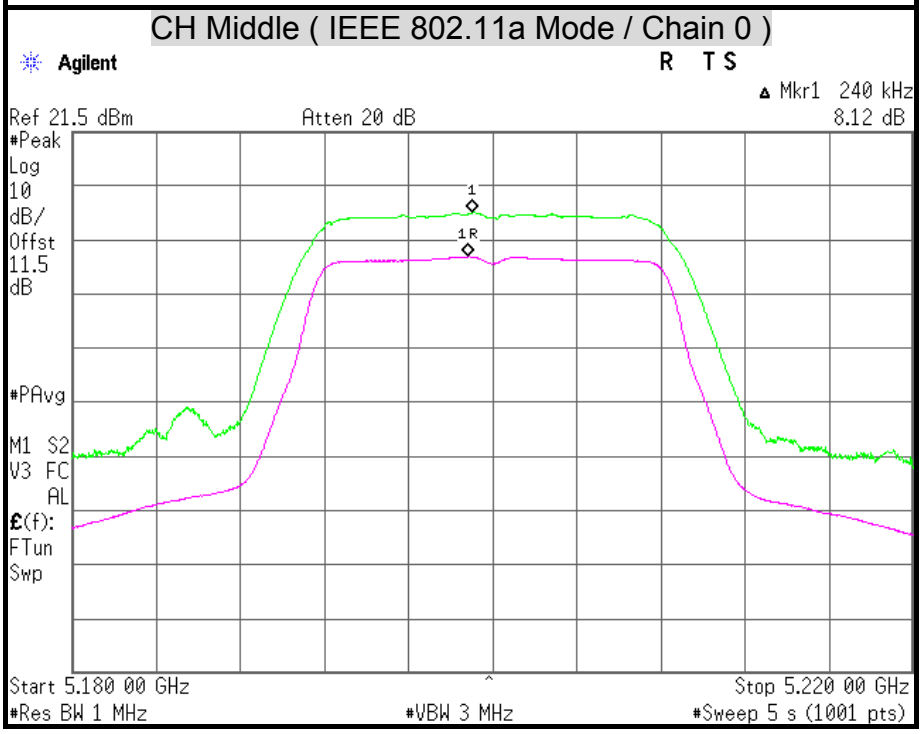
Channel	Channel Frequency (MHz)	Peak Excursion (dB)			Limit (dBm)	Margin (dB)			Pass / Fail
		Chain 0	Chain 1	Chain 2		Chain 0	Chain 1	Chain 2	
Low	5210	9.96	10.00	11.37	13	-3.04	-3.00	-1.63	PASS

Remark: *At finial test to get the worst-case emission at 29.3Mbps.*

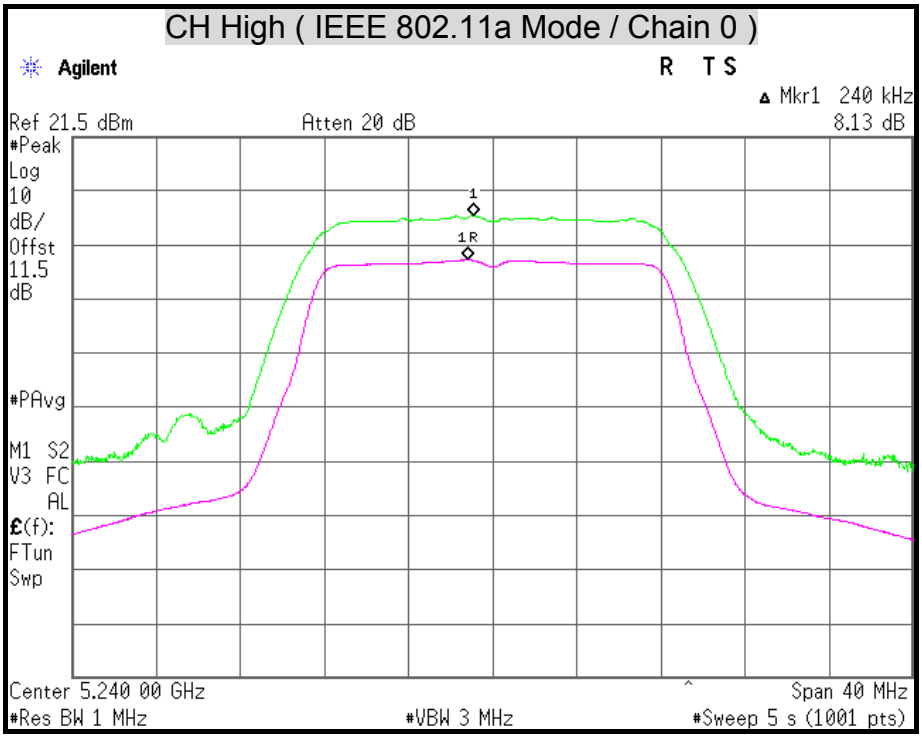
CH Low (IEEE 802.11a Mode / Chain 0)



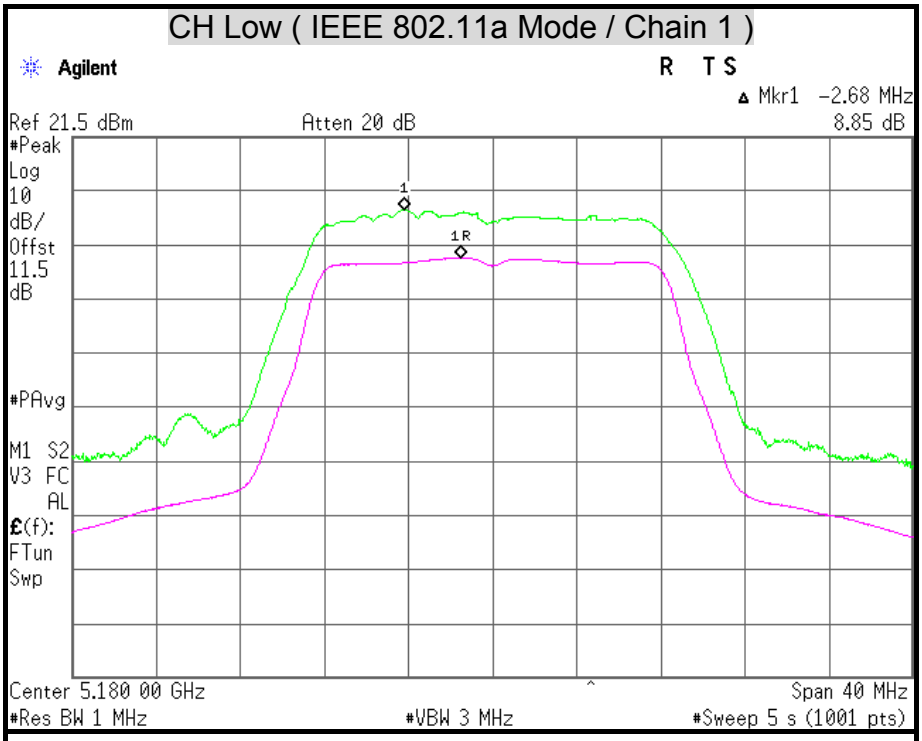
CH Middle (IEEE 802.11a Mode / Chain 0)



CH High (IEEE 802.11a Mode / Chain 0)



CH Low (IEEE 802.11a Mode / Chain 1)



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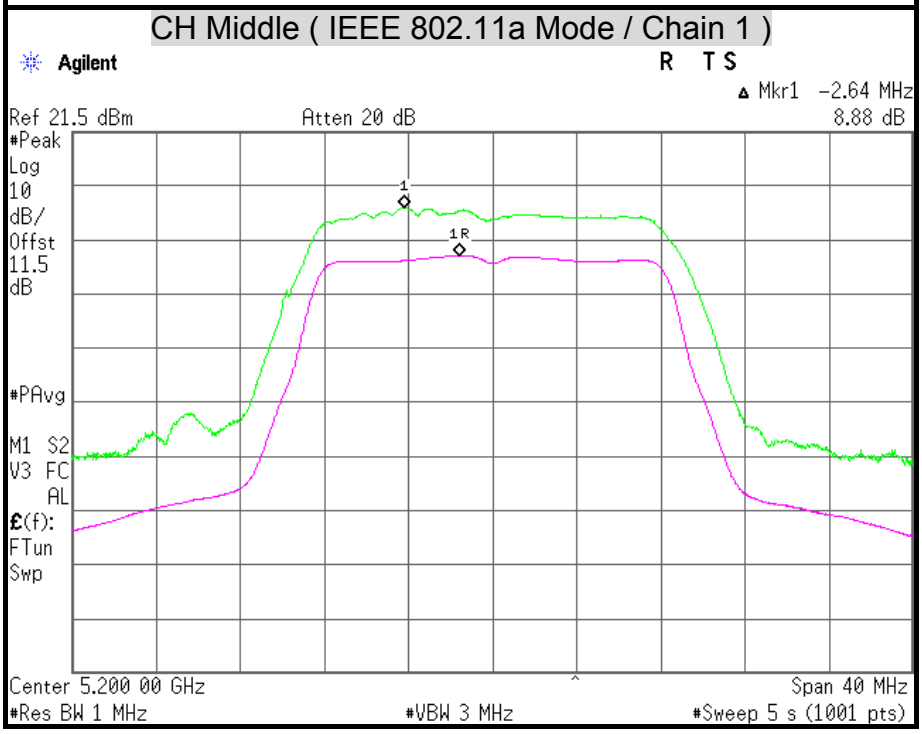

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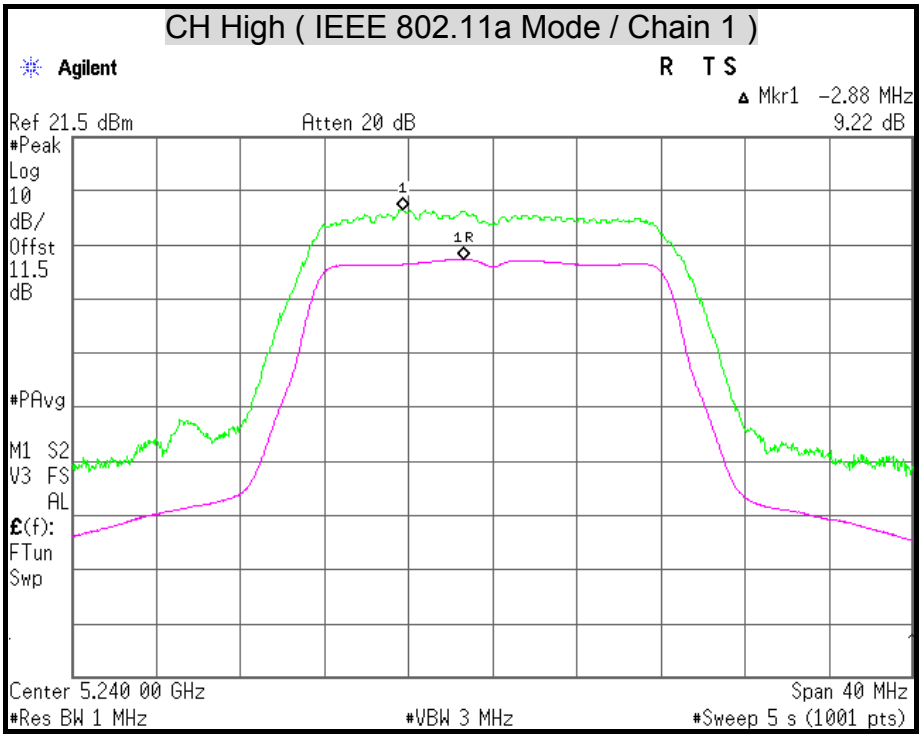

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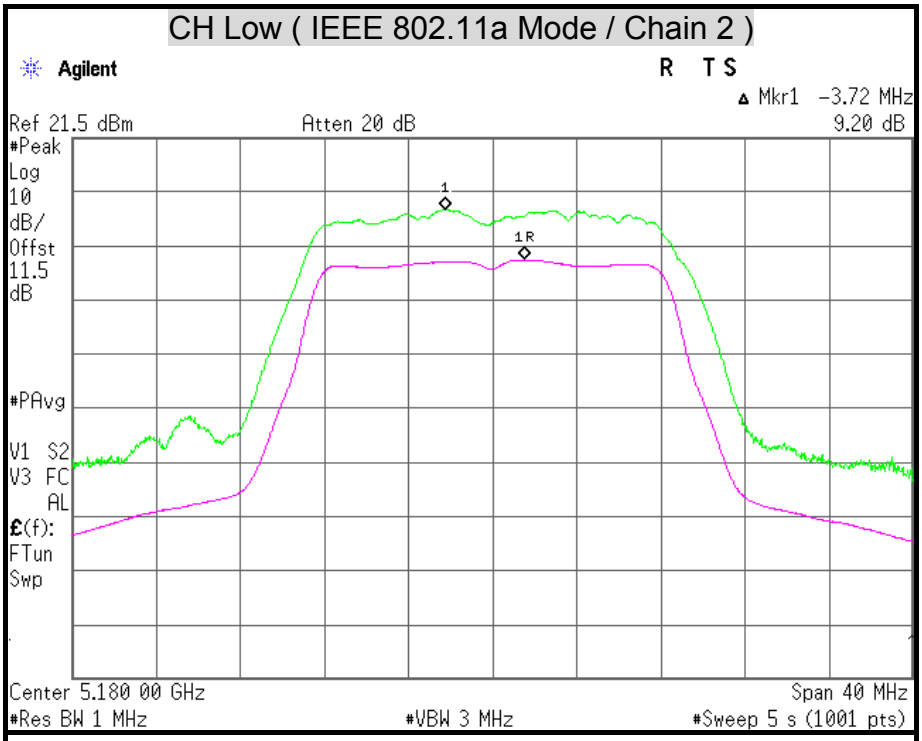

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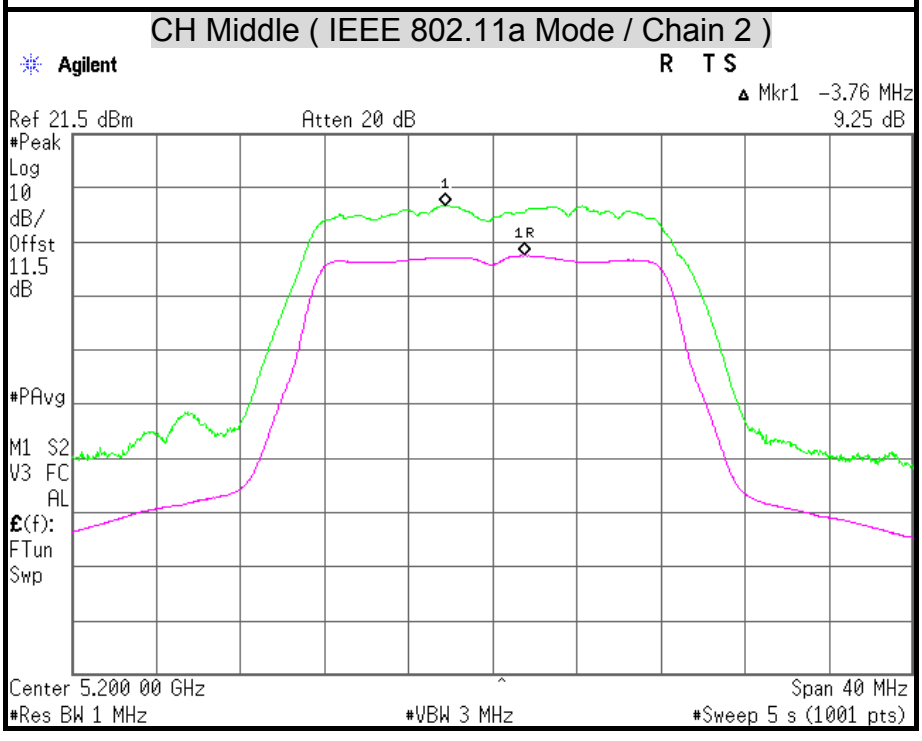

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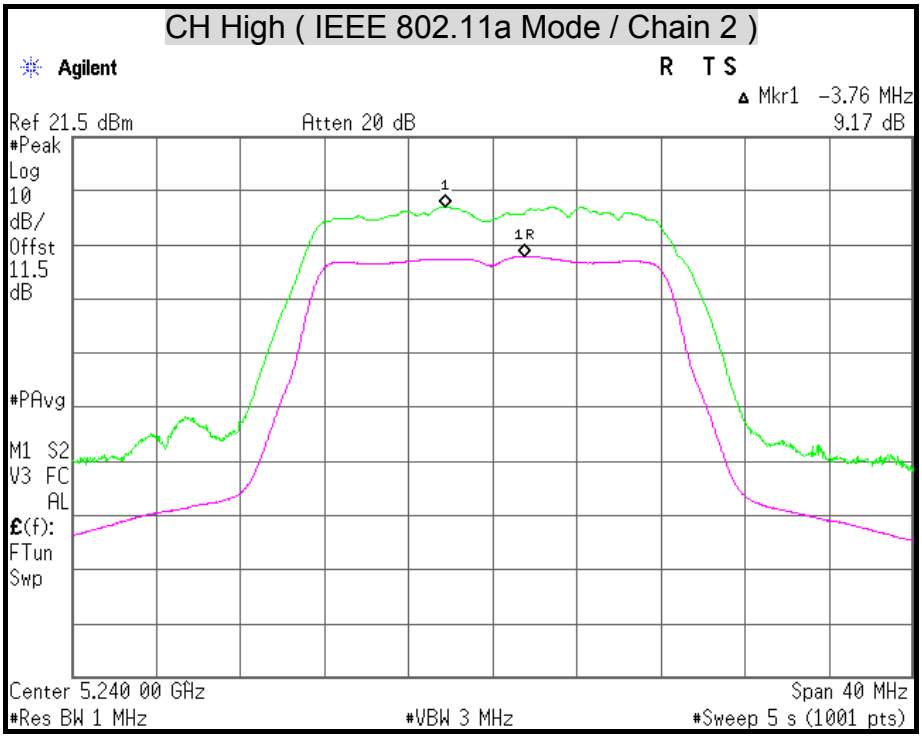

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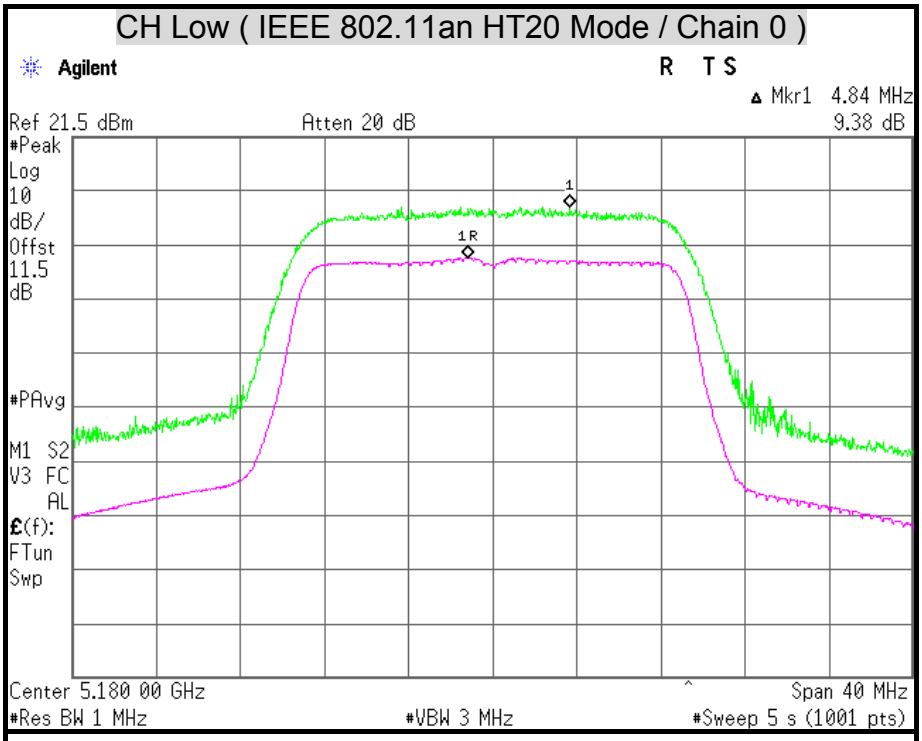

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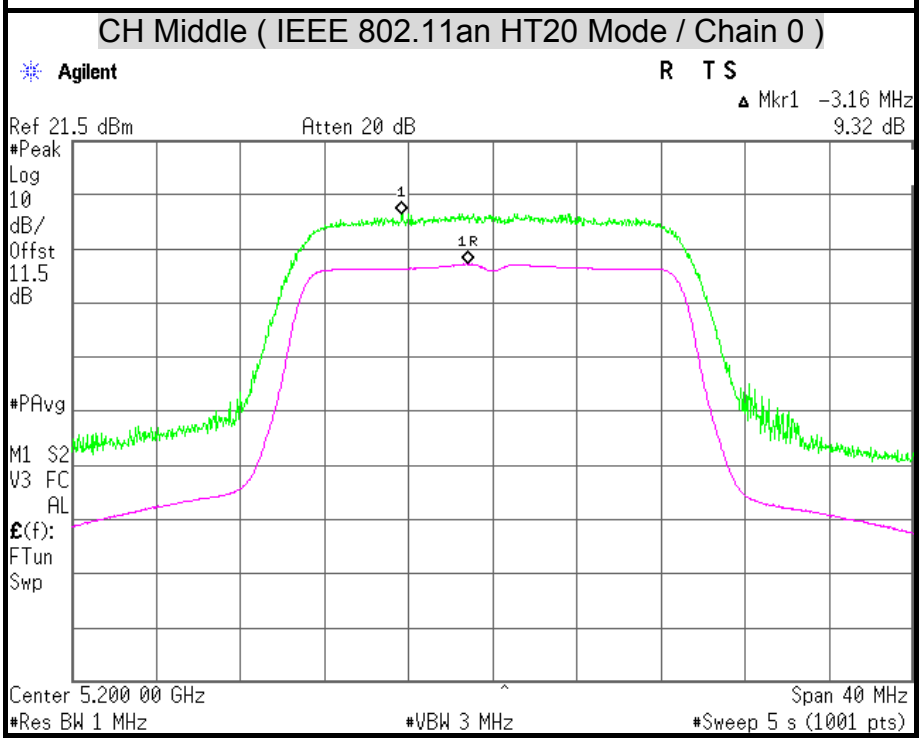

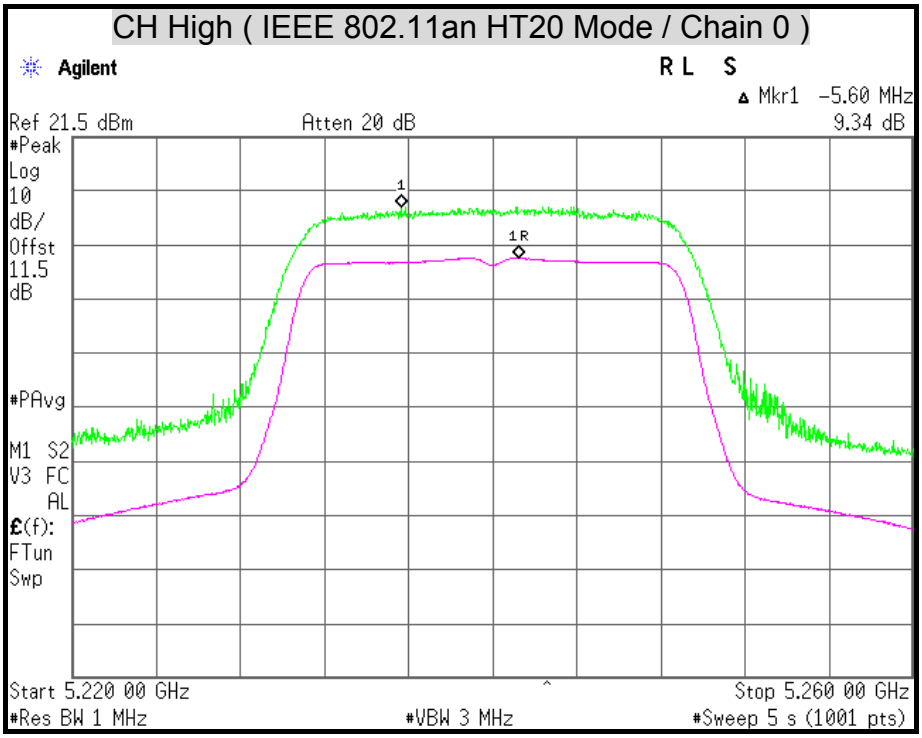

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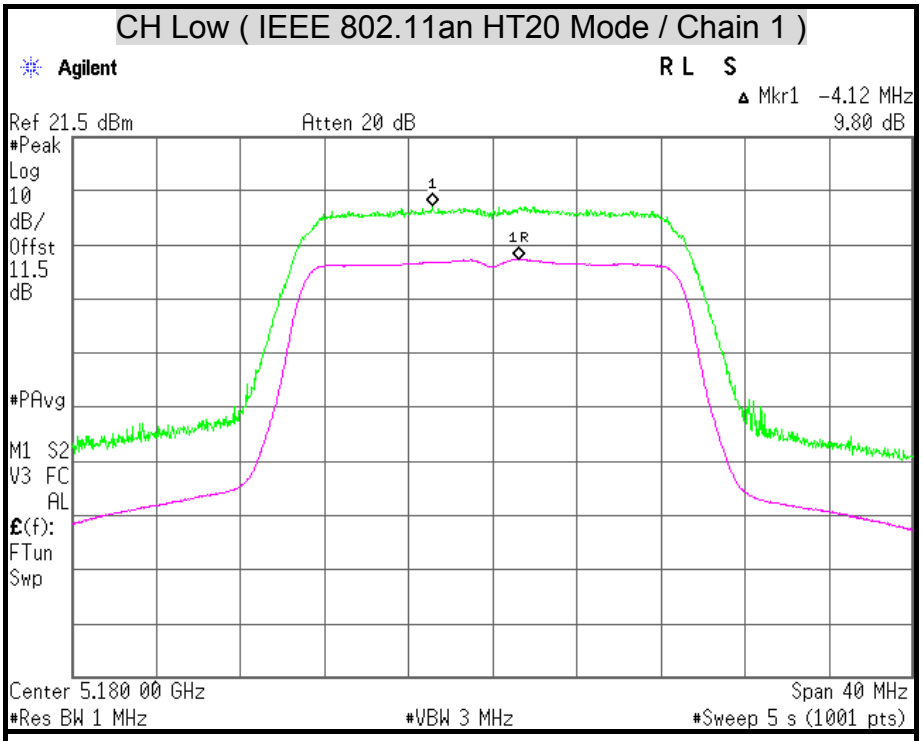

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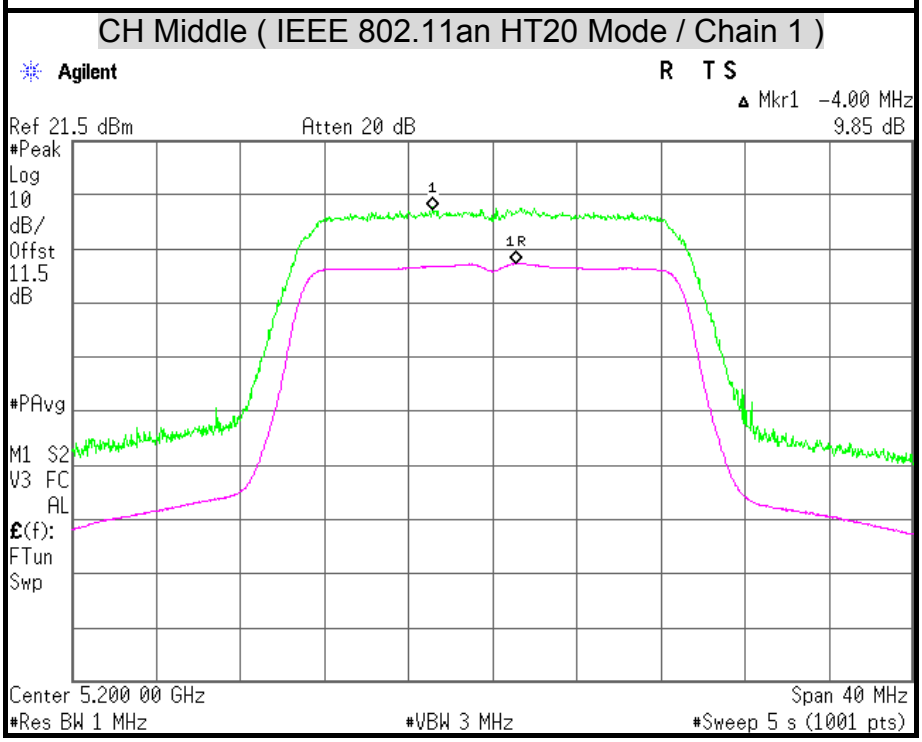
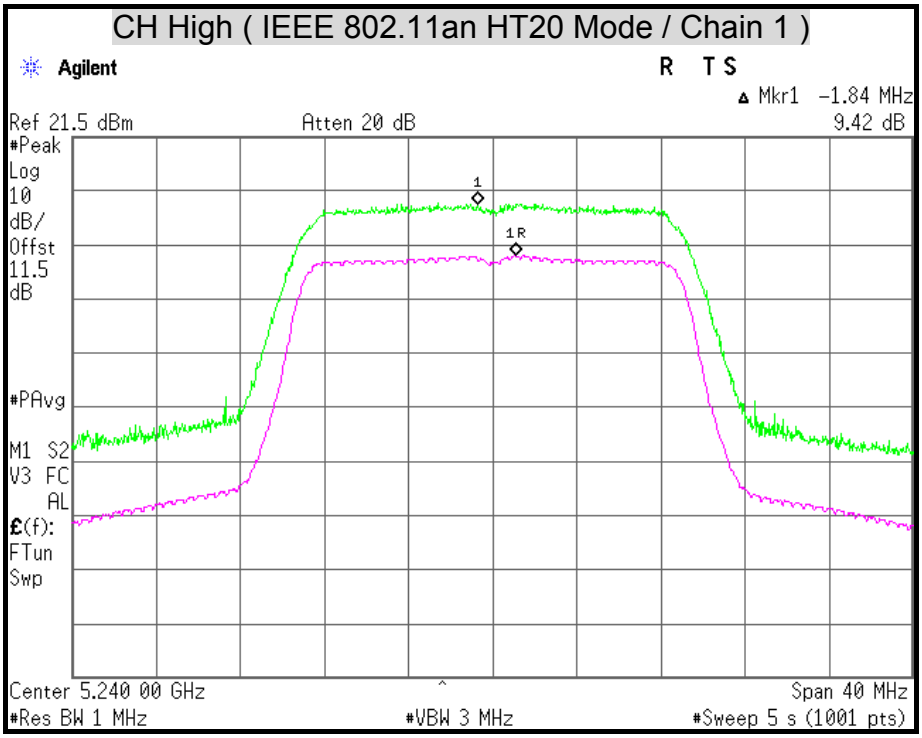
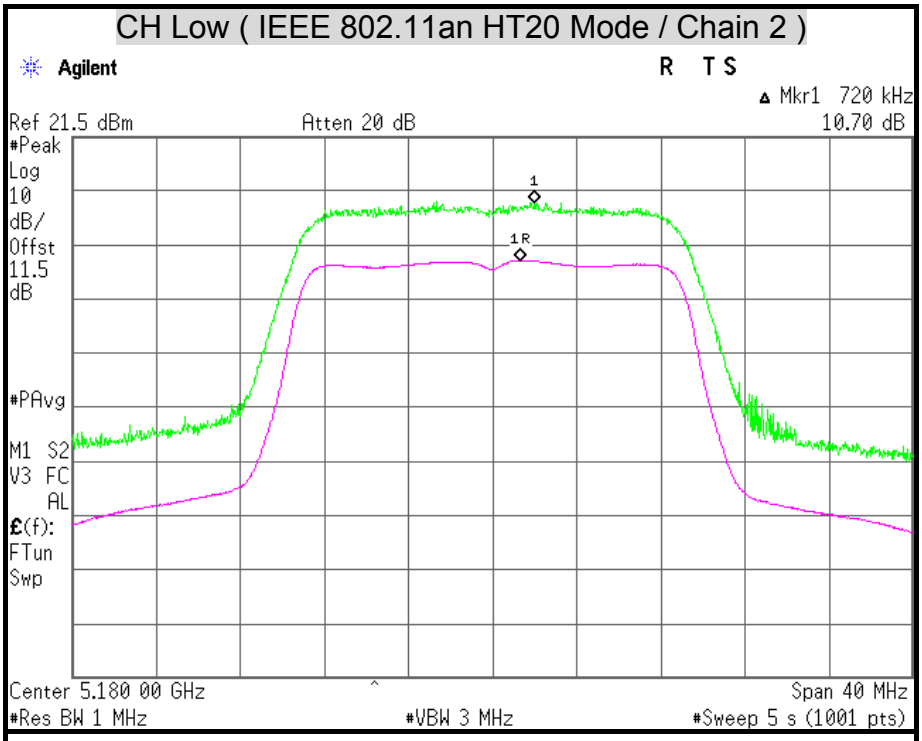


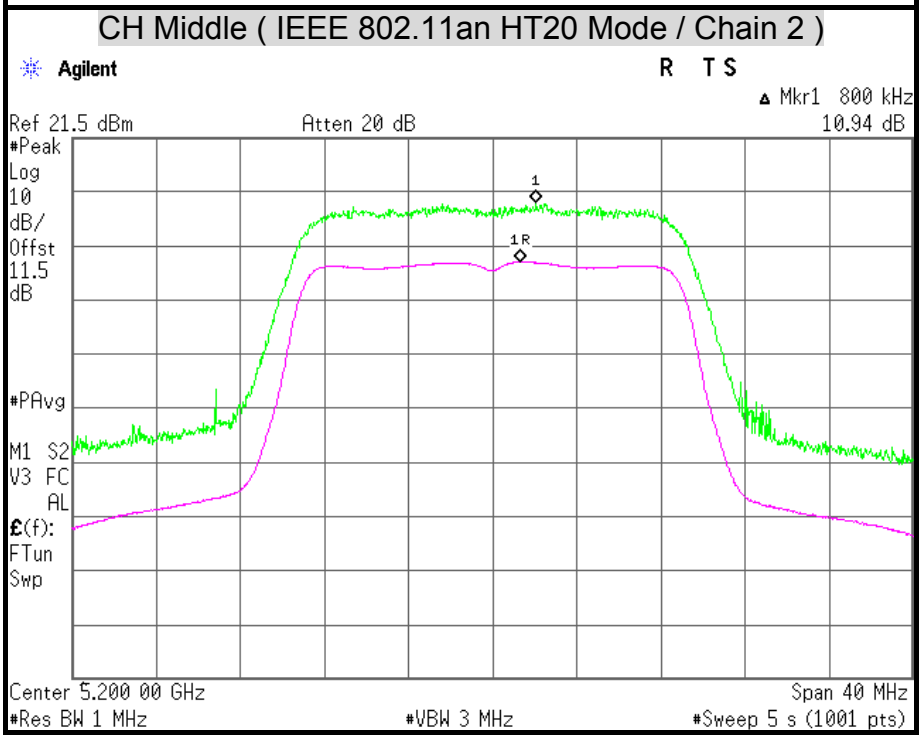
CH High (IEEE 802.11an HT20 Mode / Chain 1)



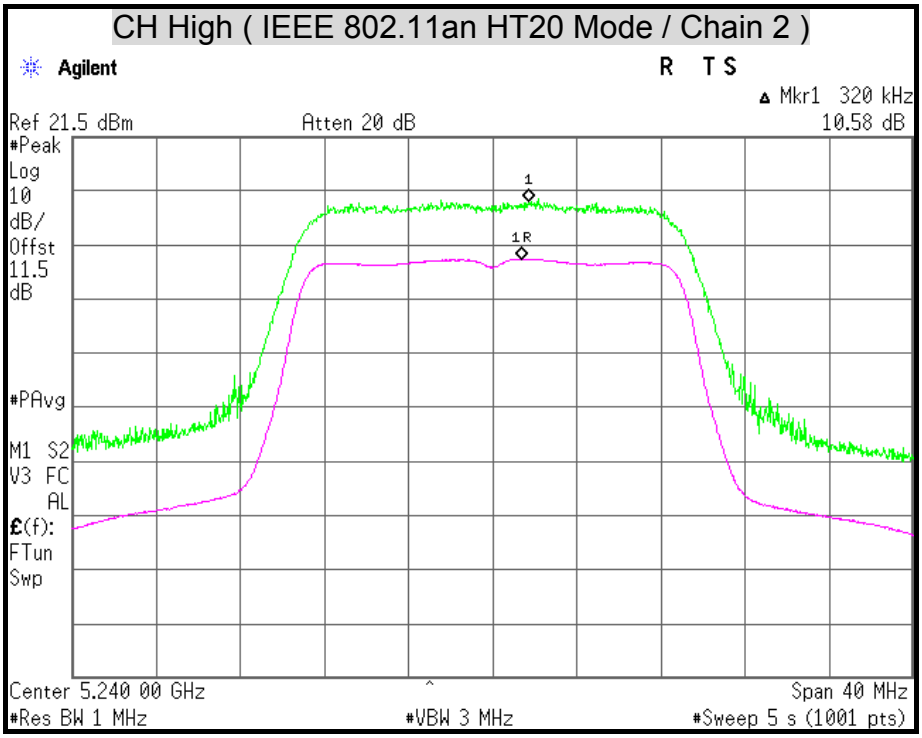
CH Low (IEEE 802.11an HT20 Mode / Chain 2)



CH Middle (IEEE 802.11an HT20 Mode / Chain 2)



CH High (IEEE 802.11an HT20 Mode / Chain 2)



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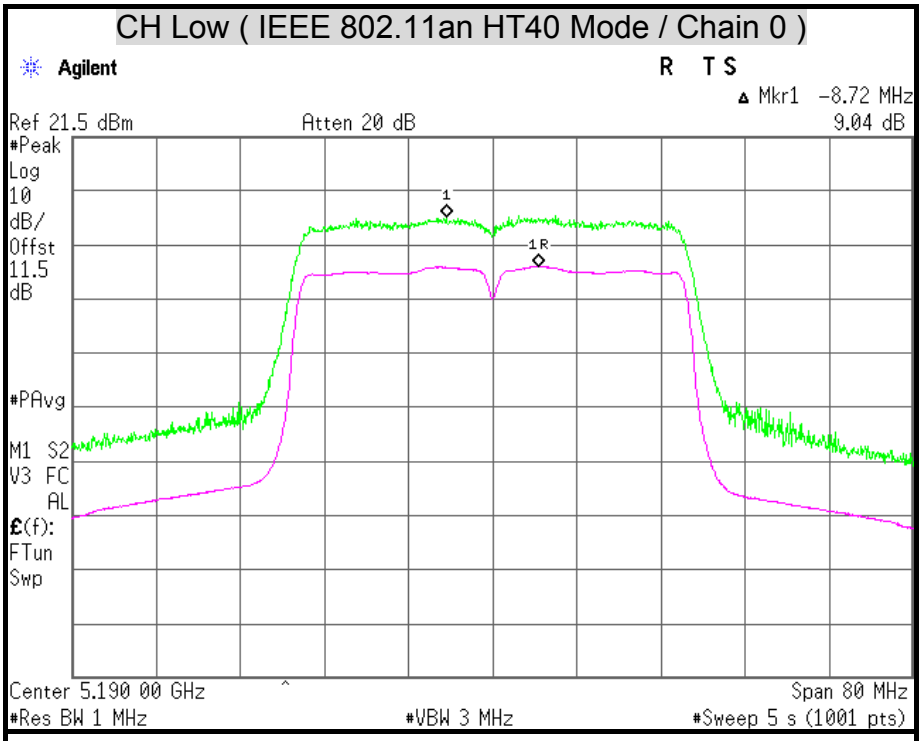

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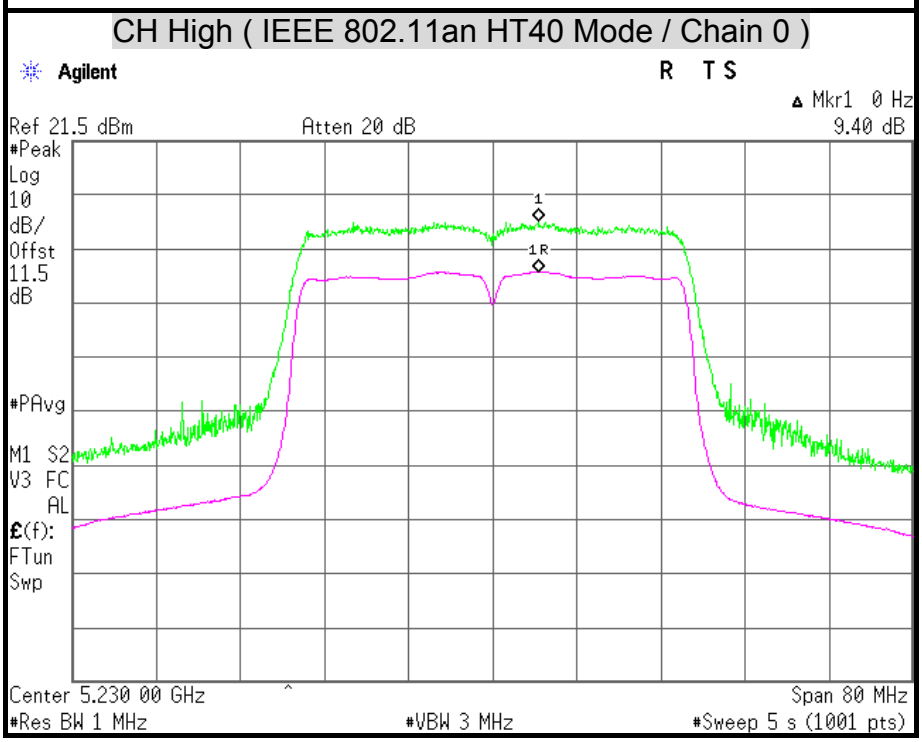
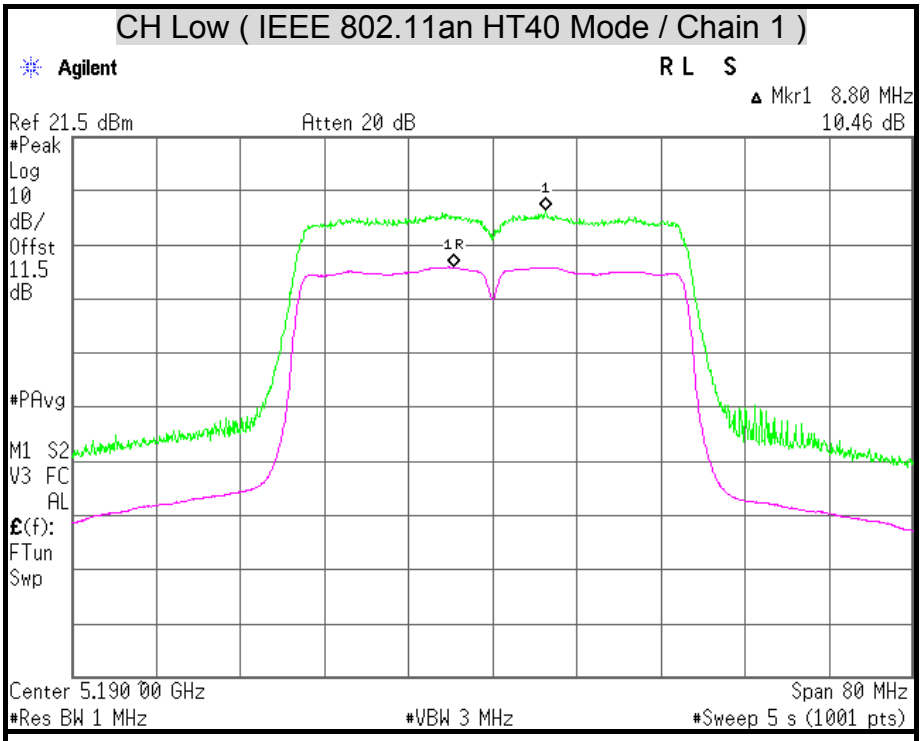


CH Low (IEEE 802.11an HT40 Mode / Chain 1)



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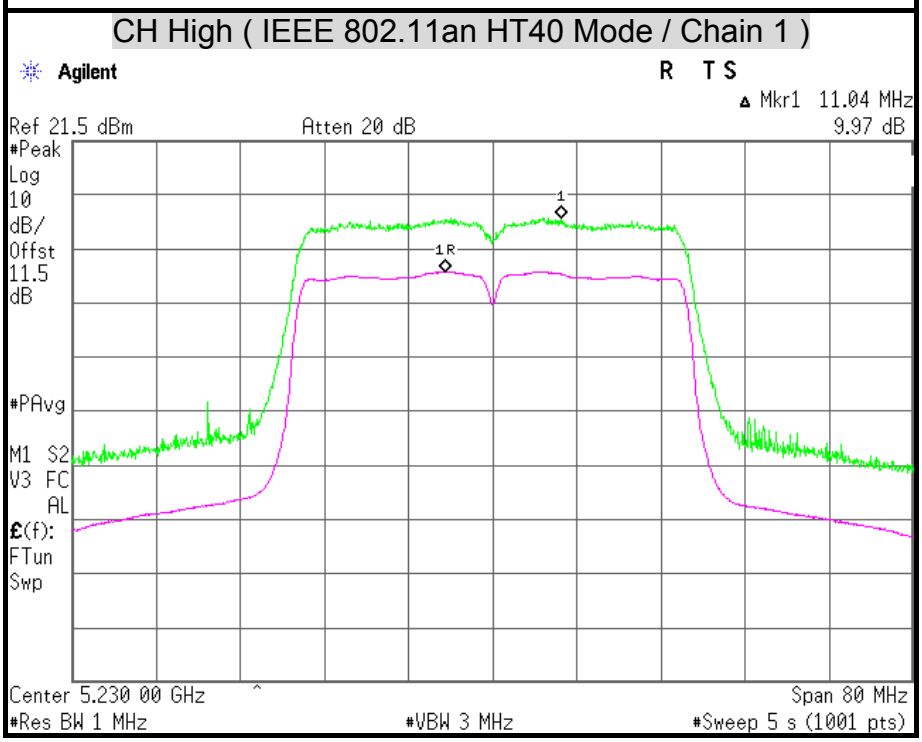

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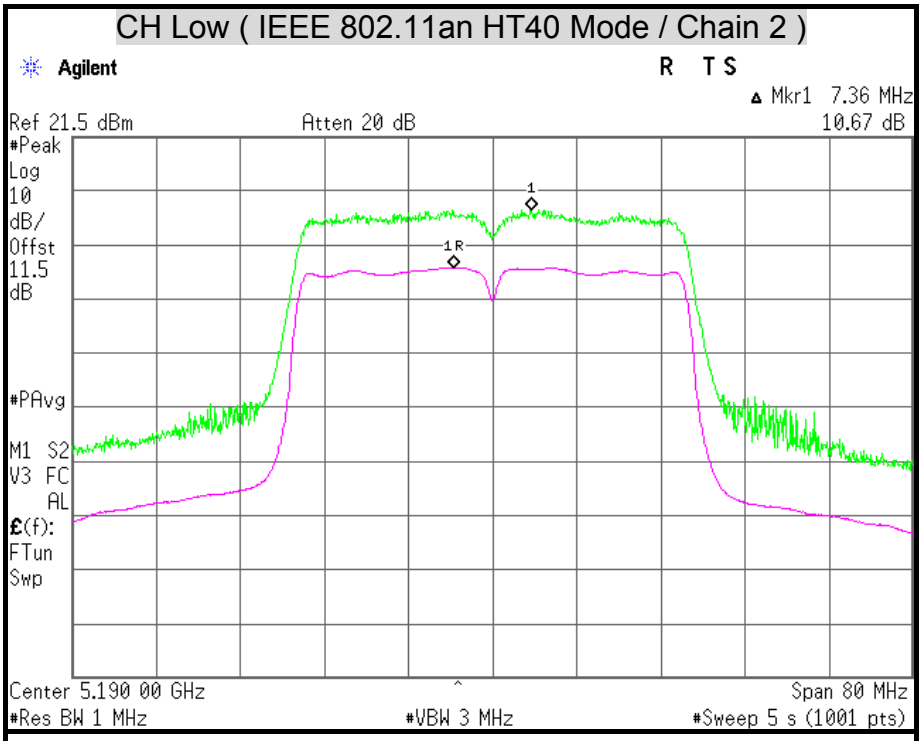
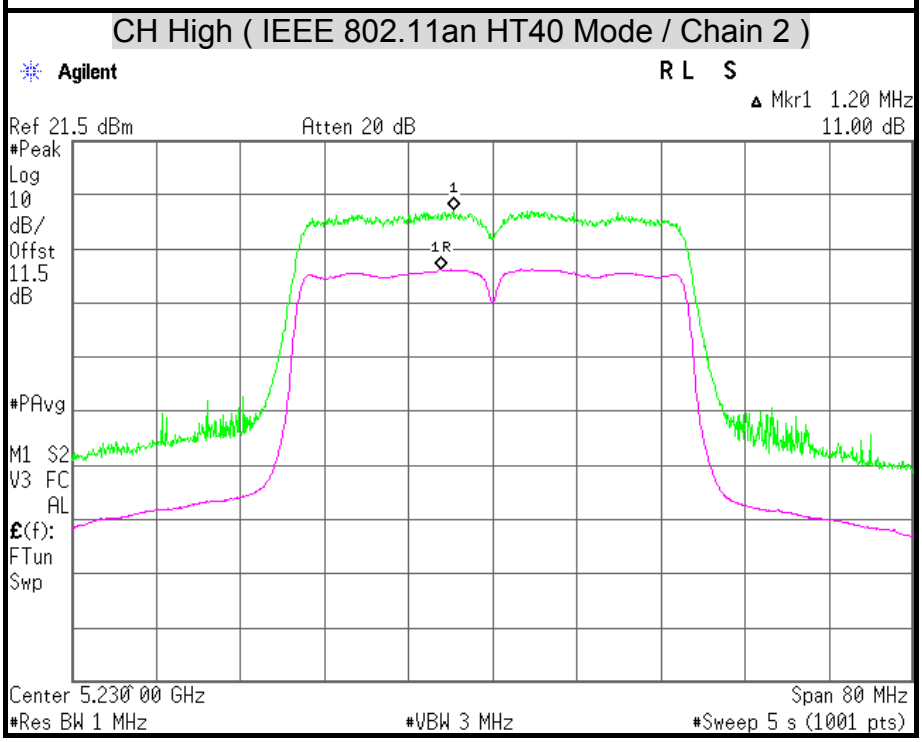
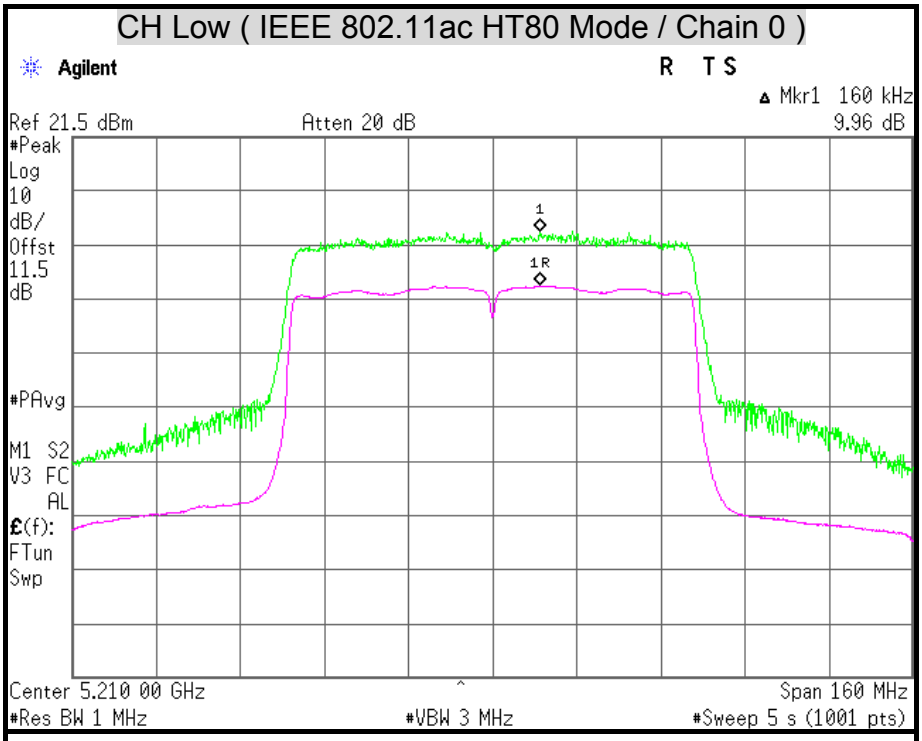


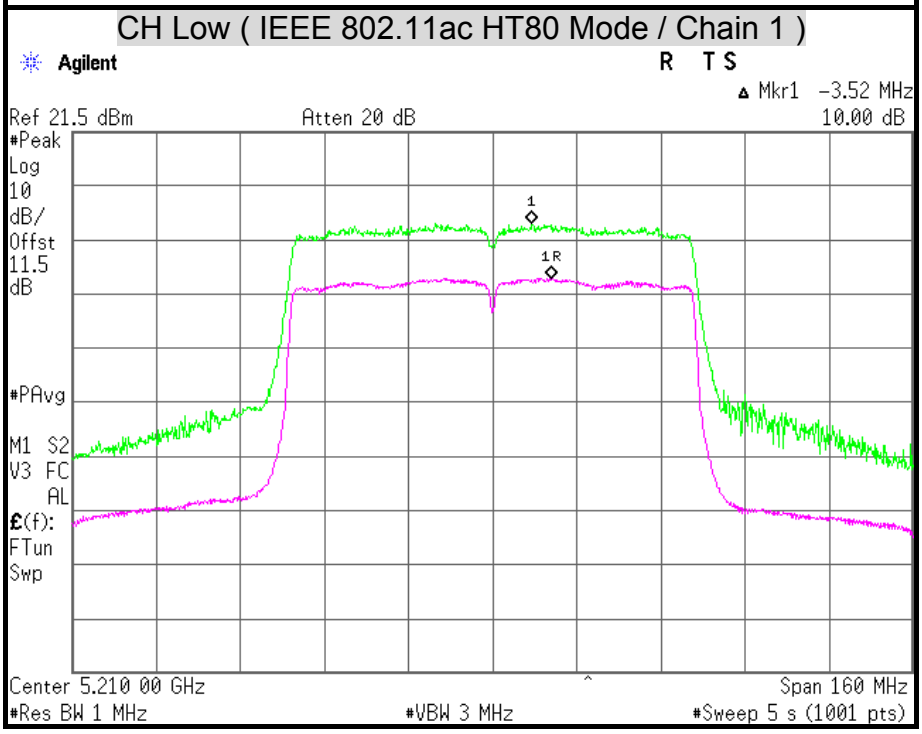
CH High (IEEE 802.11an HT40 Mode / Chain 2)



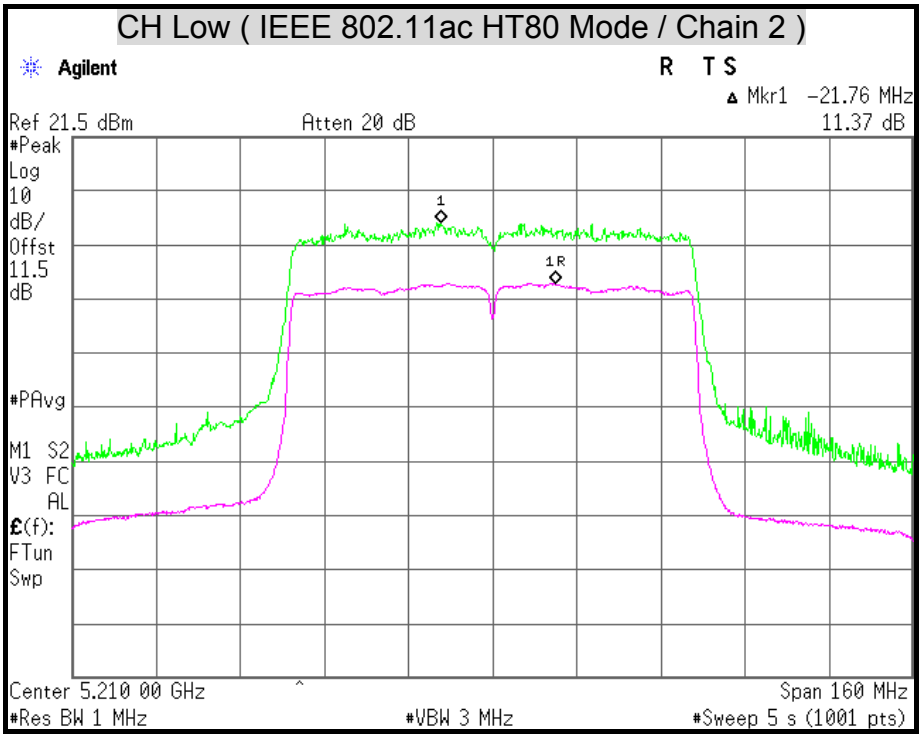
CH Low (IEEE 802.11ac HT80 Mode / Chain 0)



CH Low (IEEE 802.11ac HT80 Mode / Chain 1)



CH Low (IEEE 802.11ac HT80 Mode / Chain 2)



7.5 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) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §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

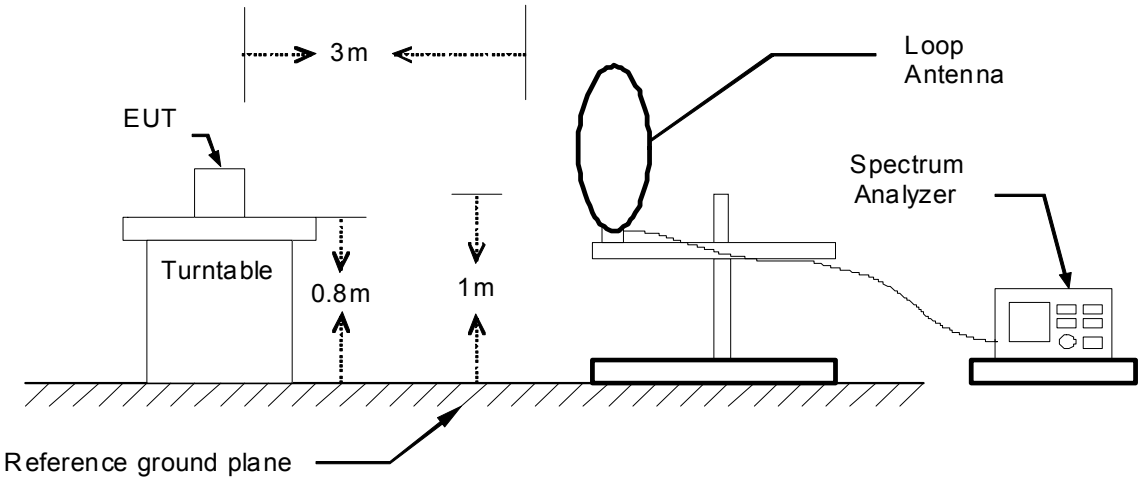
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY46180323	04/15/2014
EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101131	01/14/2014
Bi-log Antenna	SCHWARZBECK	VULB 9168	9168-250	09/12/2014
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-778	09/12/2014
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00078733	12/11/2013
Horn Antenna	COM-POWER	AH-840	03077	12/20/2013
Pre-Amplifier	Agilent	8447D	2944A10052	07/16/2014
Pre-Amplifier	Agilent	8449B	3008A01916	07/16/2014
LOOP Antenna	EMCO	6502	8905-2356	08/20/2014
Notch Filters Band Reject	Micro-Tronics	BRM05702-01	026	N.C.R
Band Reject Filter	Micro-Tronics	BRC50703-01	004	N.C.R
Band Reject Filter	Micro-Tronics	BRC50704-01	004	N.C.R
Band Reject Filter	Micro-Tronics	BRC50705-01	007	N.C.R

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

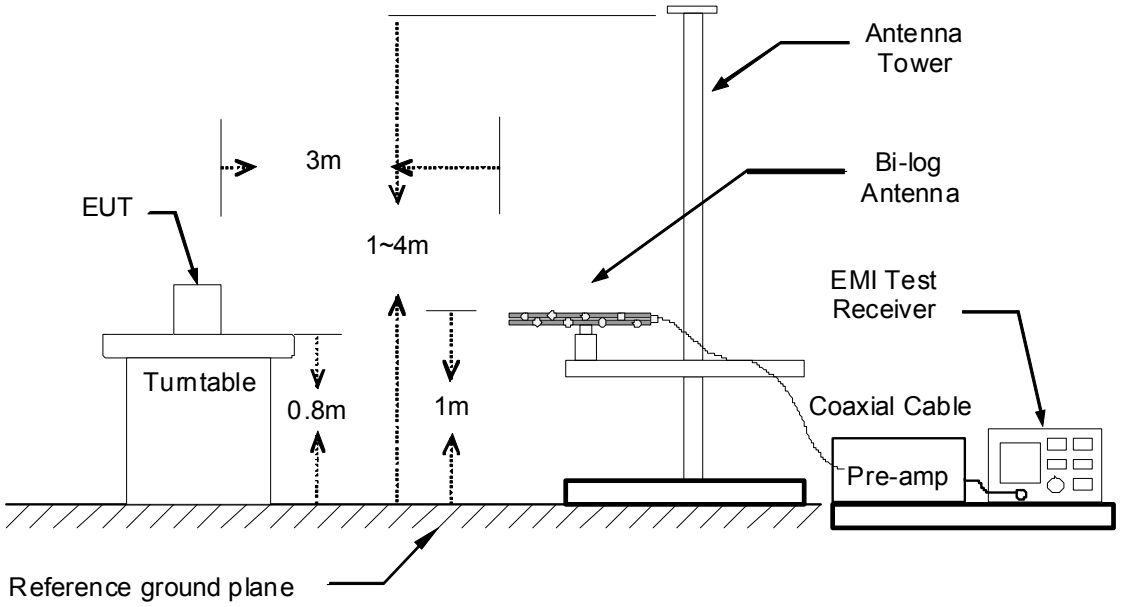
TEST SETUP

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

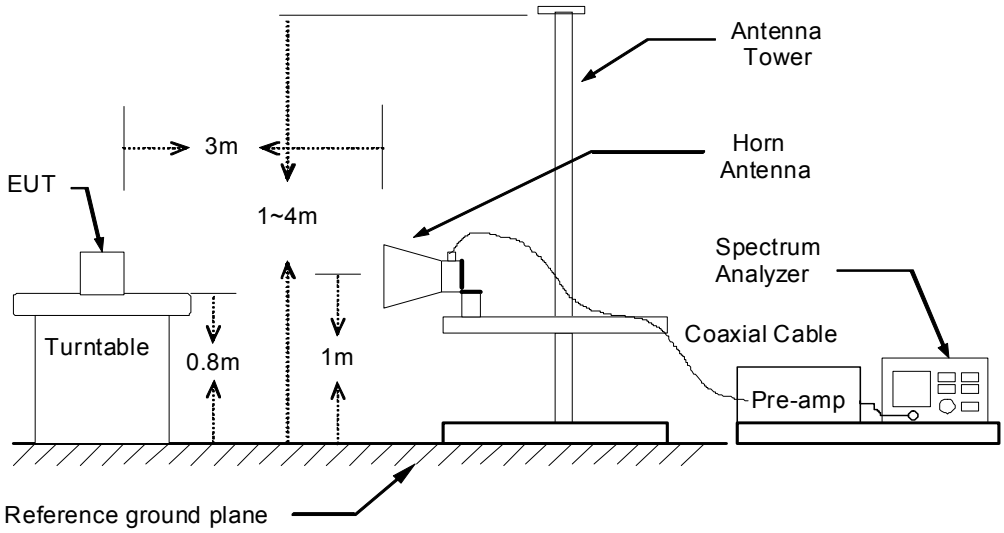
9kHz ~ 30MHz



30MHz ~ 1GHz



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



TEST PROCEDURE

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground. 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	Cable modem	Test By	Alan Wu
Test Model	5363	Test Date	2013/11/18
Test Mode	Normal Operating / Adapter 1	Temp. & Humidity	24°C, 48%

966 Chamber_B at 3Meter / Horizontal						
Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
64.92	46.11	-15.17	30.94	40.00	-9.06	Peak
199.75	55.38	-16.04	39.34	43.50	-4.16	Peak
340.40	48.23	-11.09	37.15	46.00	-8.85	Peak
624.61	41.63	-5.81	35.82	46.00	-10.18	Peak
874.87	39.24	-1.64	37.61	46.00	-8.39	Peak
949.56	31.38	-0.60	30.77	46.00	-15.23	Peak
1000.00	30.81	0.37	31.18	54.00	-22.82	Peak

966 Chamber_B at 3Meter / Vertical						
Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
65.89	51.50	-15.39	36.11	40.00	-3.89	QP
151.25	52.98	-13.63	39.35	43.50	-4.15	Peak
199.75	55.17	-16.04	39.12	43.50	-4.38	Peak
509.18	43.84	-8.06	35.78	46.00	-10.22	Peak
624.61	38.85	-5.81	33.04	46.00	-12.96	Peak
749.74	35.98	-3.58	32.40	46.00	-13.60	Peak
874.87	35.95	-1.64	34.31	46.00	-11.69	Peak
948.59	33.52	-0.62	32.91	46.00	-13.09	Peak

Remark:

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

Product Name	Cable modem	Test By	Alan Wu
Test Model	5363	Test Date	2013/11/18
Test Mode	Normal Operating / Adapter 2	Temp. & Humidity	24°C, 48%

966 Chamber_B at 3Meter / Horizontal						
Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
64.92	45.95	-15.17	30.79	40.00	-9.21	Peak
149.31	46.29	-13.68	32.61	43.50	-10.89	Peak
199.75	54.83	-16.04	38.79	43.50	-4.71	Peak
340.40	50.05	-11.09	38.96	46.00	-7.04	Peak
370.47	45.31	-10.50	34.81	46.00	-11.19	Peak
624.61	40.77	-5.81	34.96	46.00	-11.04	Peak
749.74	37.25	-3.58	33.68	46.00	-12.32	Peak
874.87	39.66	-1.64	38.02	46.00	-7.98	Peak
1000.00	30.83	0.37	31.20	54.00	-22.80	Peak

966 Chamber_B at 3Meter / Vertical						
Frequency (MHz)	Reading (dBμV)	Correction Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Remark
65.89	51.20	-15.39	35.81	40.00	-4.19	QP
105.66	50.97	-17.92	33.05	43.50	-10.45	Peak
151.25	51.74	-13.63	38.11	43.50	-5.39	Peak
504.33	42.66	-8.13	34.53	46.00	-11.47	Peak
533.43	42.40	-7.68	34.72	46.00	-11.28	Peak
874.87	36.16	-1.64	34.52	46.00	-11.48	Peak

Remark:

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

Above 1 GHz

Product Name	Cable modem	Test By	Waternil Guan
Test Model	5363	Test Date	2013/11/23
Test Mode	IEEE 802.11a TX / CH Low	Temp. & Humidity	24°C, 42%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1045.00	55.07	---	-4.37	50.70	---	74.00	54.00	-3.30	Peak
1135.00	54.95	---	-4.16	50.79	---	74.00	54.00	-3.21	Peak
1360.00	53.76	---	-3.63	50.13	---	74.00	54.00	-3.87	Peak
5350.00	56.01	43.79	9.71	65.72	53.50	74.00	54.00	-0.50	AVG
6396.00	38.82	---	12.19	51.01	---	74.00	54.00	-2.99	Peak
6912.00	45.87	41.00	12.35	58.22	53.35	74.00	54.00	-0.65	AVG
10380.00	37.35	30.12	18.24	55.59	48.36	74.00	54.00	-5.64	AVG

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1160.00	53.68	---	-4.10	49.58	---	74.00	54.00	-4.42	Peak
1310.00	54.62	---	-3.75	50.88	---	74.00	54.00	-3.12	Peak
1415.00	53.41	---	-3.50	49.91	---	74.00	54.00	-4.09	Peak
5350.00	55.51	43.77	9.71	65.22	53.48	74.00	54.00	-0.52	AVG
6660.00	38.39	---	12.43	50.82	---	74.00	54.00	-3.18	Peak
6912.00	39.59	---	12.35	51.94	---	74.00	54.00	-2.06	Peak
10404.00	37.58	30.01	18.31	55.89	48.32	74.00	54.00	-5.68	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	Cable modem	Test By	Waternil Guan
Test Model	5363	Test Date	2013/11/23
Test Mode	IEEE 802.11a TX / CH Middle	Temp. & Humidity	24°C, 42%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1255.00	53.59	---	-3.88	49.71	---	74.00	54.00	-4.29	Peak
1445.00	54.09	---	-3.43	50.66	---	74.00	54.00	-3.34	Peak
5120.00	56.62	44.09	9.40	66.02	53.49	74.00	54.00	-0.51	AVG
5365.00	51.99	41.69	9.73	61.72	51.42	74.00	54.00	-2.58	AVG
6336.00	38.01	---	12.02	50.03	---	74.00	54.00	-3.97	Peak
6672.00	38.49	---	12.42	50.91	---	74.00	54.00	-3.09	Peak
6936.00	45.61	41.09	12.35	57.96	53.44	74.00	54.00	-0.56	AVG

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1380.00	54.38	---	-3.58	50.80	---	74.00	54.00	-3.20	Peak
1645.00	53.86	---	-1.70	52.16	---	74.00	54.00	-1.84	Peak
5120.00	56.53	43.72	9.40	65.93	53.12	74.00	54.00	-0.88	AVG
5355.00	51.43	40.76	9.72	61.15	50.48	74.00	54.00	-3.52	AVG
6060.00	39.89	---	11.26	51.15	---	74.00	54.00	-2.85	Peak
6660.00	38.59	---	12.43	51.01	---	74.00	54.00	-2.99	Peak
6936.00	39.85	---	12.35	52.20	---	74.00	54.00	-1.80	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	Cable modem	Test By	Waternil Guan
Test Model	5363	Test Date	2013/11/23
Test Mode	IEEE 802.11a TX / CH High	Temp. & Humidity	24°C, 42%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1095.00	54.78	---	-4.26	50.52	---	74.00	54.00	-3.48	Peak
1380.00	54.07	---	-3.58	50.48	---	74.00	54.00	-3.52	Peak
5150.00	53.53	43.63	9.44	62.97	53.07	74.00	54.00	-0.93	AVG
5395.00	53.08	43.72	9.77	62.85	53.49	74.00	54.00	-0.51	AVG
6264.00	37.71	---	11.82	49.53	---	74.00	54.00	-4.47	Peak
6684.00	38.15	---	12.42	50.57	---	74.00	54.00	-3.43	Peak
6984.00	44.65	40.30	12.33	56.98	52.63	74.00	54.00	-1.37	AVG

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1250.00	54.31	---	-3.89	50.42	---	74.00	54.00	-3.58	Peak
1525.00	53.52	---	-3.02	50.50	---	74.00	54.00	-3.50	Peak
5150.00	55.63	43.62	9.44	65.07	53.06	74.00	54.00	-0.94	AVG
5400.00	55.98	43.37	9.78	65.76	53.15	74.00	54.00	-0.85	AVG
6336.00	38.54	---	12.02	50.56	---	74.00	54.00	-3.44	Peak
6636.00	38.67	---	12.43	51.10	---	74.00	54.00	-2.90	Peak
6984.00	39.74	---	12.33	52.07	---	74.00	54.00	-1.93	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	Cable modem	Test By	Waternil Guan
Test Model	5363	Test Date	2013/11/23
Test Mode	IEEE 802.11an HT20 TX / CH Low	Temp. & Humidity	24°C, 42%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1065.00	54.85	---	-4.33	50.53	---	74.00	54.00	-3.47	Peak
1245.00	53.97	---	-3.90	50.07	---	74.00	54.00	-3.93	Peak
1425.00	53.80	---	-3.48	50.33	---	74.00	54.00	-3.67	Peak
5350.00	53.62	42.61	9.71	63.33	52.32	74.00	54.00	-1.68	AVG
6444.00	38.80	---	12.32	51.11	---	74.00	54.00	-2.89	Peak
6708.00	38.83	---	12.41	51.24	---	74.00	54.00	-2.76	Peak
6912.00	45.42	41.10	12.35	57.77	53.45	74.00	54.00	-0.55	AVG

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1110.00	54.85	---	-4.22	50.63	---	74.00	54.00	-3.37	Peak
1245.00	54.33	---	-3.90	50.43	---	74.00	54.00	-3.57	Peak
1380.00	53.66	---	-3.58	50.08	---	74.00	54.00	-3.92	Peak
5350.00	52.65	42.61	9.71	62.36	52.32	74.00	54.00	-1.68	AVG
6132.00	38.53	---	11.46	49.99	---	74.00	54.00	-4.01	Peak
6696.00	38.75	---	12.42	51.16	---	74.00	54.00	-2.84	Peak
6912.00	42.43	37.49	12.35	54.78	49.84	74.00	54.00	-4.16	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	Cable modem	Test By	Waternil Guan
Test Model	5363	Test Date	2013/11/23
Test Mode	IEEE 802.11an HT20 TX / CH Middle	Temp. & Humidity	24°C, 42%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1095.00	55.05	---	-4.26	50.79	---	74.00	54.00	-3.21	Peak
1425.00	53.75	---	-3.48	50.27	---	74.00	54.00	-3.73	Peak
5115.00	54.54	44.07	9.39	63.93	53.46	74.00	54.00	-0.54	AVG
5360.00	50.01	40.83	9.72	59.73	50.55	74.00	54.00	-3.45	AVG
6156.00	38.85	---	11.53	50.37	---	74.00	54.00	-3.63	Peak
6720.00	38.93	---	12.41	51.34	---	74.00	54.00	-2.66	Peak
6936.00	44.20	38.92	12.35	56.55	51.27	74.00	54.00	-2.73	AVG

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1155.00	54.59	---	-4.11	50.47	---	74.00	54.00	-3.53	Peak
1380.00	54.44	---	-3.58	50.86	---	74.00	54.00	-3.14	Peak
5125.00	55.04	44.03	9.41	64.45	53.44	74.00	54.00	-0.56	AVG
5415.00	51.42	43.70	9.80	61.22	53.50	74.00	54.00	-0.50	AVG
6588.00	39.23	---	12.45	51.68	---	74.00	54.00	-2.32	Peak
6936.00	42.36	34.05	12.35	54.71	46.40	74.00	54.00	-7.60	AVG
7644.00	39.29	---	13.79	53.08	---	74.00	54.00	-0.92	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	Cable modem	Test By	Waternil Guan
Test Model	5363	Test Date	2013/11/23
Test Mode	IEEE 802.11an HT20 TX / CH High	Temp. & Humidity	24°C, 42%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1165.00	54.28	---	-4.09	50.19	---	74.00	54.00	-3.81	Peak
1440.00	53.90	---	-3.44	50.46	---	74.00	54.00	-3.54	Peak
5080.00	51.59	41.61	9.35	60.94	50.96	74.00	54.00	-3.04	AVG
5395.00	55.51	43.72	9.77	65.28	53.49	74.00	54.00	-0.51	AVG
6396.00	38.40	---	12.19	50.59	---	74.00	54.00	-3.41	Peak
6696.00	38.87	---	12.42	51.29	---	74.00	54.00	-2.71	Peak
6984.00	43.90	39.24	12.33	56.23	51.57	74.00	54.00	-2.43	AVG

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1205.00	54.52	---	-4.00	50.52	---	74.00	54.00	-3.48	Peak
1550.00	54.29	---	-2.75	51.54	---	74.00	54.00	-2.46	Peak
5080.00	54.66	43.29	9.35	64.01	52.64	74.00	54.00	-1.36	AVG
5405.00	54.91	43.03	9.78	64.69	52.81	74.00	54.00	-1.19	AVG
6156.00	38.48	---	11.53	50.01	---	74.00	54.00	-3.99	Peak
6564.00	38.64	---	12.45	51.09	---	74.00	54.00	-2.91	Peak
6984.00	38.91	---	12.33	51.25	---	74.00	54.00	-2.75	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	Cable modem	Test By	Waternil Guan
Test Model	5363	Test Date	2013/11/23
Test Mode	IEEE 802.11an HT40 TX / CH Low	Temp. & Humidity	24°C, 42%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1080.00	53.94	---	-4.29	49.65	---	74.00	54.00	-4.35	Peak
1170.00	53.72	---	-4.08	49.64	---	74.00	54.00	-4.36	Peak
1370.00	54.63	---	-3.61	51.03	---	74.00	54.00	-2.97	Peak
5350.00	53.19	42.23	9.71	62.90	51.94	74.00	54.00	-2.06	AVG
6060.00	43.71	36.62	11.26	54.97	47.88	74.00	54.00	-6.12	AVG
6924.00	44.30	40.67	12.35	56.65	53.02	74.00	54.00	-0.98	AVG
7716.00	41.20	30.75	13.75	54.95	44.50	74.00	54.00	-9.50	AVG

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1080.00	54.64	---	-4.29	50.35	---	74.00	54.00	-3.65	Peak
1210.00	53.89	---	-3.98	49.91	---	74.00	54.00	-4.09	Peak
1410.00	54.30	---	-3.51	50.79	---	74.00	54.00	-3.21	Peak
5625.00	53.37	43.29	10.21	63.58	53.50	74.00	54.00	-0.50	AVG
6060.00	43.16	34.53	11.26	54.42	45.79	74.00	54.00	-8.21	AVG
6612.00	38.63	---	12.44	51.07	---	74.00	54.00	-2.93	Peak
6924.00	39.48	---	12.35	51.84	---	74.00	54.00	-2.16	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	Cable modem	Test By	Waternil Guan
Test Model	5363	Test Date	2013/11/24
Test Mode	IEEE 802.11an HT40 TX / CH High	Temp. & Humidity	24°C, 43%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1170.00	49.63	---	-4.08	45.55	---	74.00	54.00	-8.45	Peak
1685.00	49.14	---	-1.26	47.88	---	74.00	54.00	-6.12	Peak
5150.00	57.62	44.02	9.43	67.05	53.45	74.00	54.00	-0.55	AVG
5385.00	50.97	40.27	9.76	60.73	50.03	74.00	54.00	-3.97	AVG
6600.00	38.98	---	12.44	51.42	---	74.00	54.00	-2.58	Peak
6972.00	45.53	40.74	12.34	57.87	53.08	74.00	54.00	-0.92	AVG
7116.00	39.19	---	12.69	51.88	---	74.00	54.00	-2.12	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1080.00	50.31	---	-4.29	46.02	---	74.00	54.00	-7.98	Peak
1375.00	48.74	---	-3.60	45.15	---	74.00	54.00	-8.85	Peak
5150.00	57.10	43.95	9.43	66.53	53.38	74.00	54.00	-0.62	AVG
5390.00	52.94	40.80	9.76	62.70	50.56	74.00	54.00	-3.44	AVG
6096.00	39.59	---	11.36	50.96	---	74.00	54.00	-3.04	Peak
6876.00	39.12	---	12.36	51.48	---	74.00	54.00	-2.52	Peak
6972.00	39.28	---	12.34	51.61	---	74.00	54.00	-2.39	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	Cable modem	Test By	Waternil Guan
Test Model	5363	Test Date	2013/11/24
Test Mode	IEEE 802.11ac HT80 / CH Low	Temp. & Humidity	24°C, 43%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1145.00	49.10	---	-4.14	44.96	---	74.00	54.00	-9.04	Peak
1345.00	49.73	---	-3.67	46.06	---	74.00	54.00	-7.94	Peak
1510.00	48.78	---	-3.19	45.59	---	74.00	54.00	-8.41	Peak
5350.00	48.03	36.73	9.72	57.75	46.45	74.00	54.00	-7.55	AVG
6372.00	38.83	---	12.12	50.95	---	74.00	54.00	-3.05	Peak
6600.00	38.17	---	12.44	50.61	---	74.00	54.00	-3.39	Peak
6948.00	44.98	40.47	12.34	57.32	52.81	74.00	54.00	-1.19	AVG

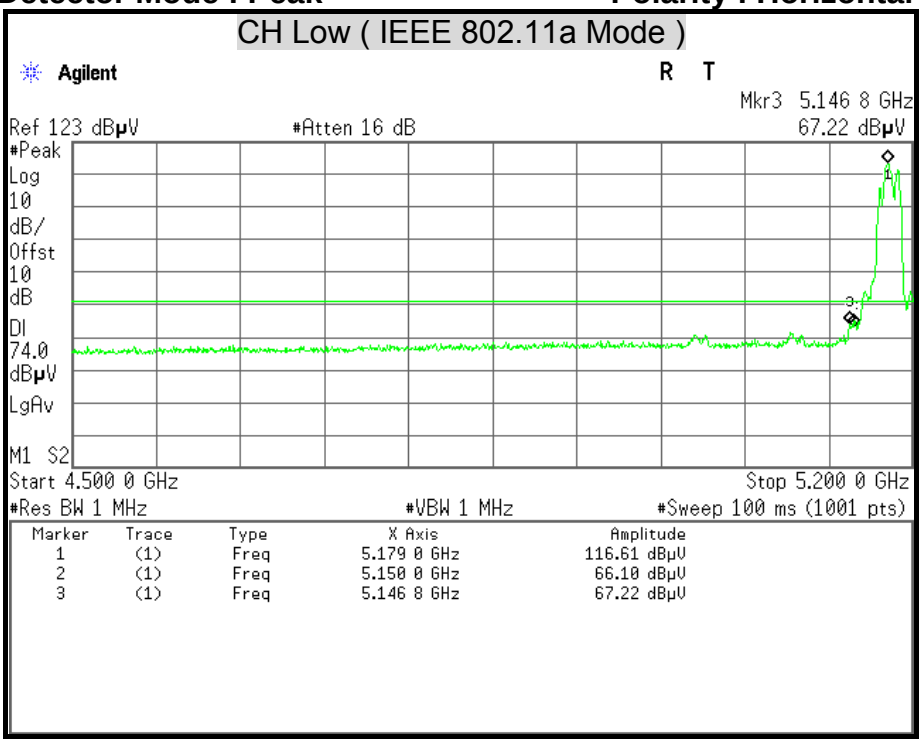
966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1080.00	50.15	---	-4.29	45.85	---	74.00	54.00	-8.15	Peak
1545.00	49.47	---	-2.80	46.66	---	74.00	54.00	-7.34	Peak
1680.00	49.20	---	-1.31	47.89	---	74.00	54.00	-6.11	Peak
5350.00	48.97	37.53	9.72	58.69	47.25	74.00	54.00	-6.75	AVG
6348.00	38.96	---	12.05	51.01	---	74.00	54.00	-2.99	Peak
6600.00	38.33	---	12.44	50.77	---	74.00	54.00	-3.23	Peak
6948.00	42.60	34.76	12.34	54.94	47.10	74.00	54.00	-6.90	AVG

Remark:

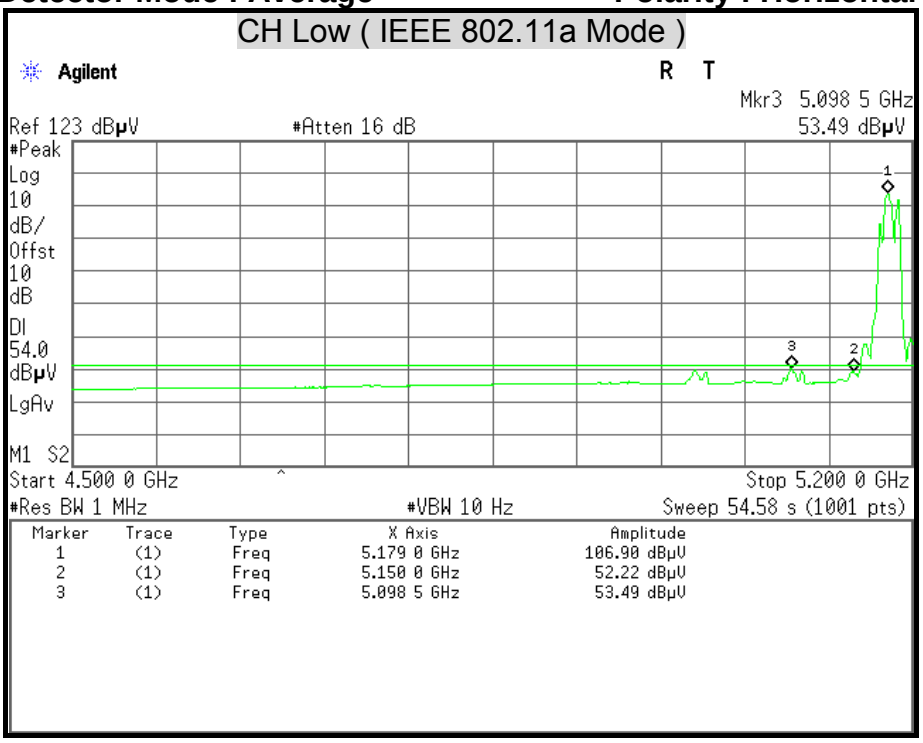
1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Restricted Band Edges

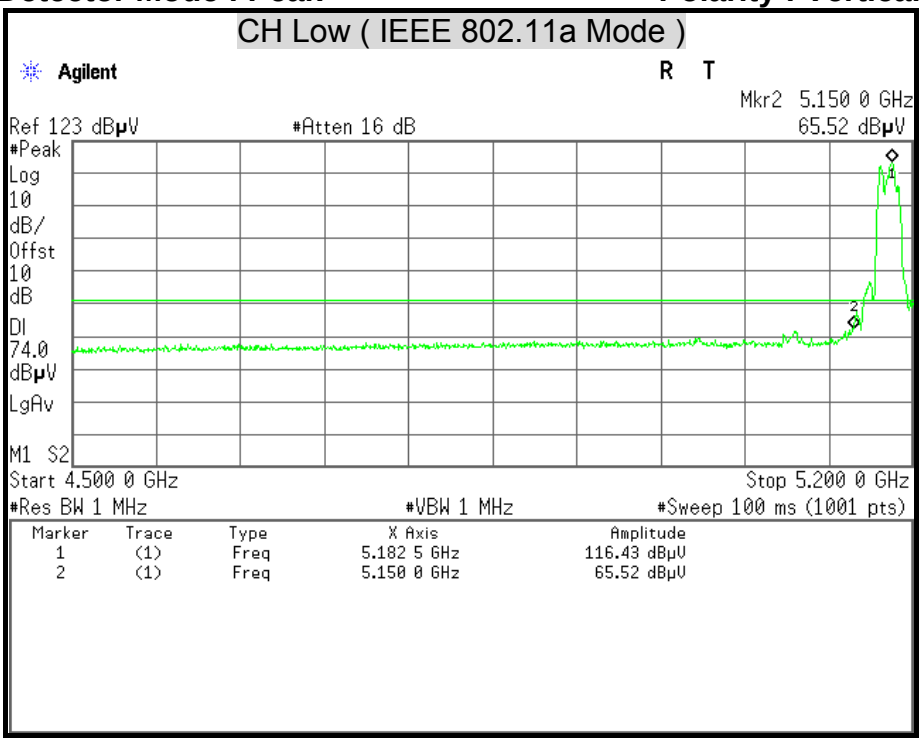
Detector Mode : Peak **Polarity : Horizontal**



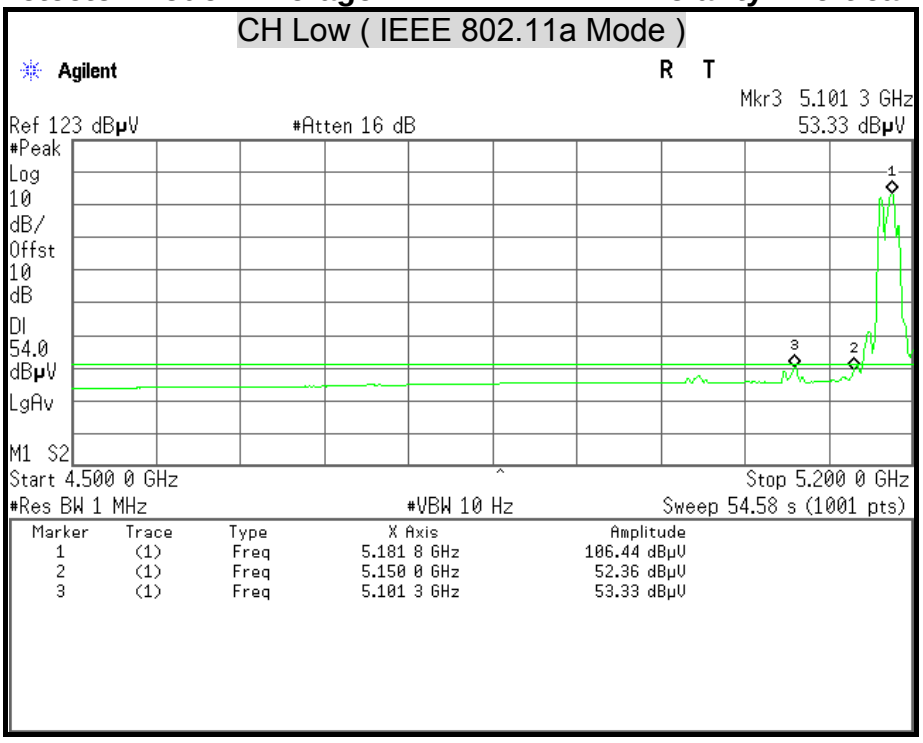
Detector Mode : Average **Polarity : Horizontal**



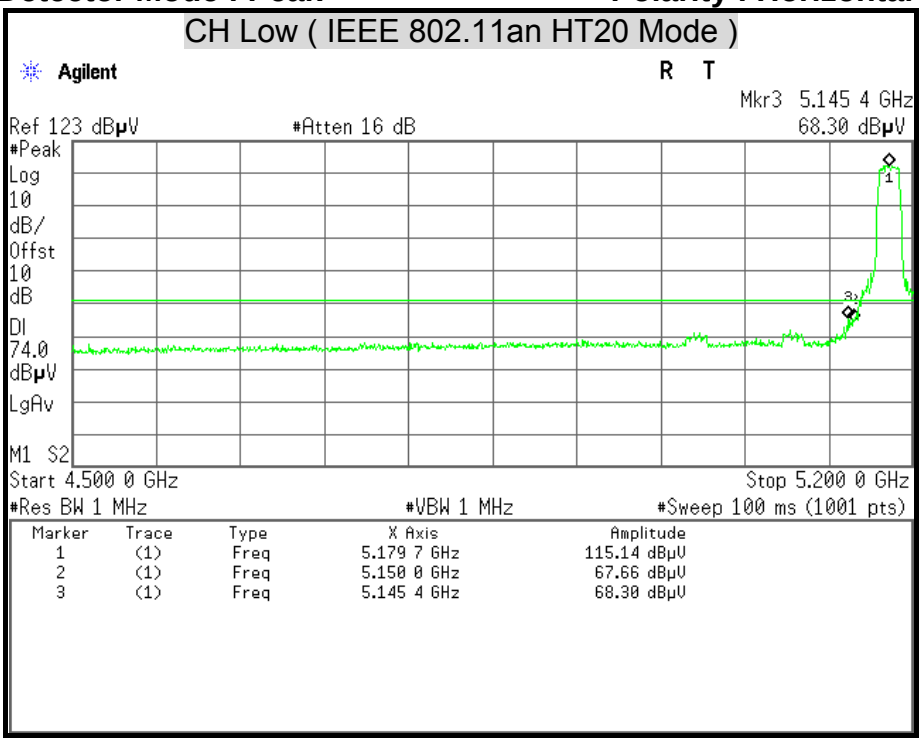
Detector Mode : Peak **Polarity : Vertical**



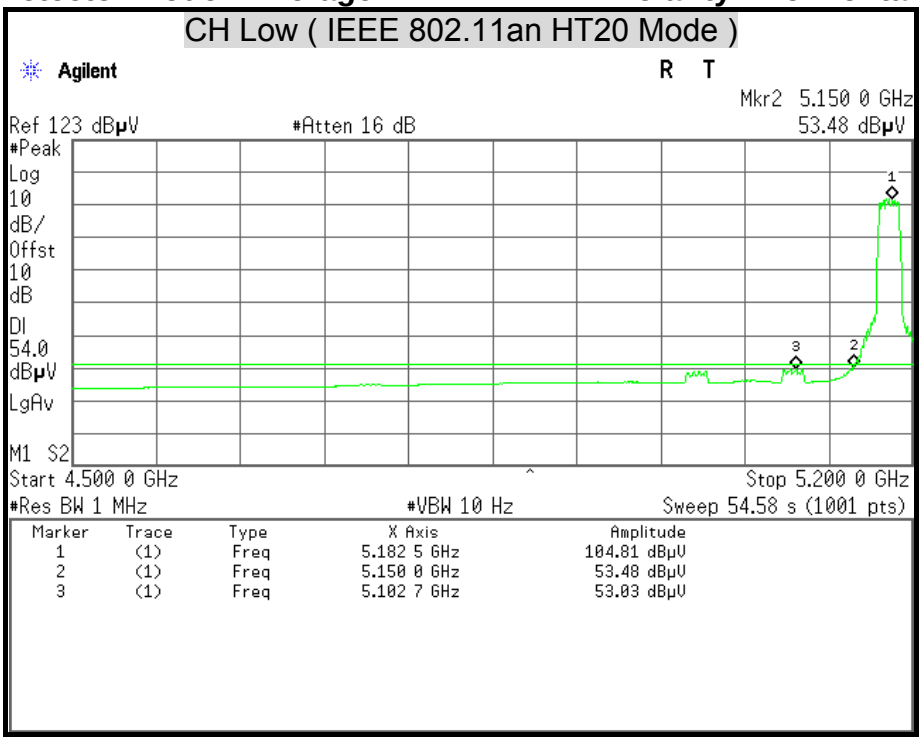
Detector Mode : Average **Polarity : Vertical**



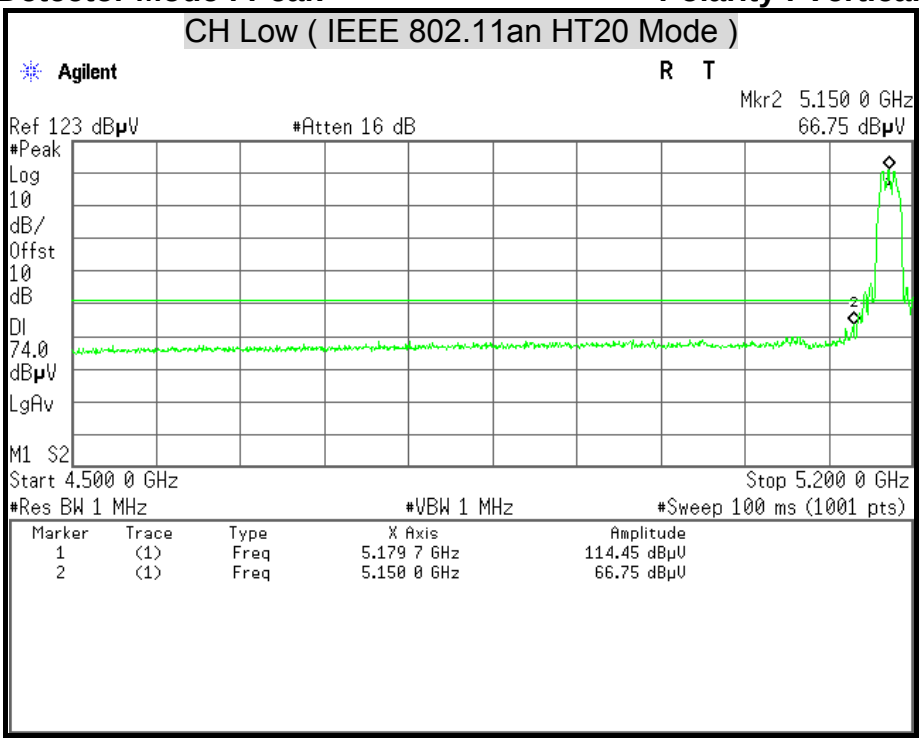
Detector Mode : Peak **Polarity : Horizontal**



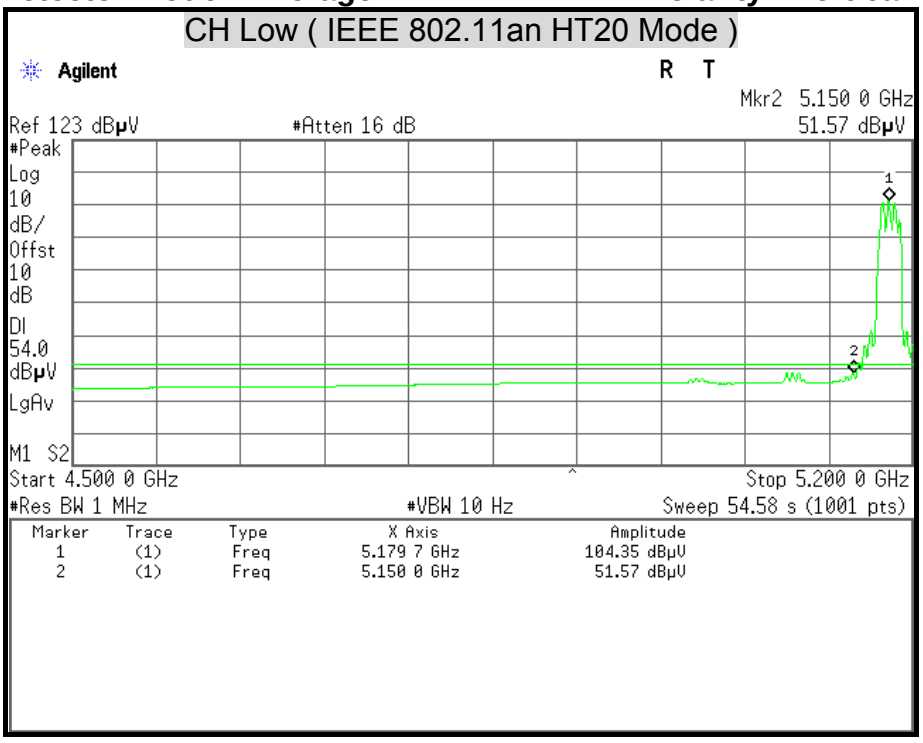
Detector Mode : Average **Polarity : Horizontal**



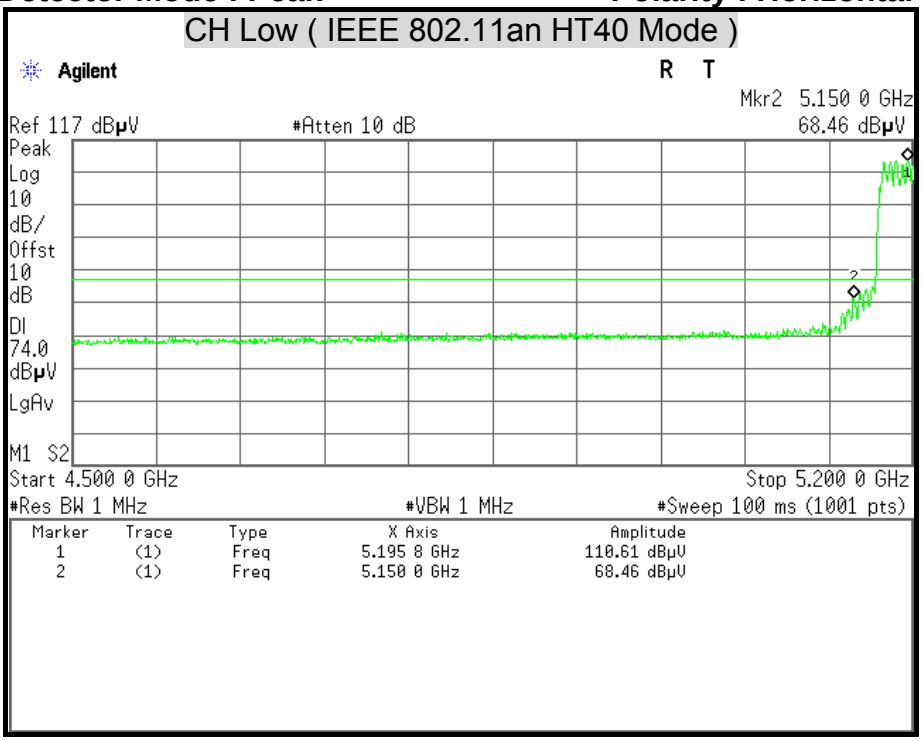
Detector Mode : Peak **Polarity : Vertical**



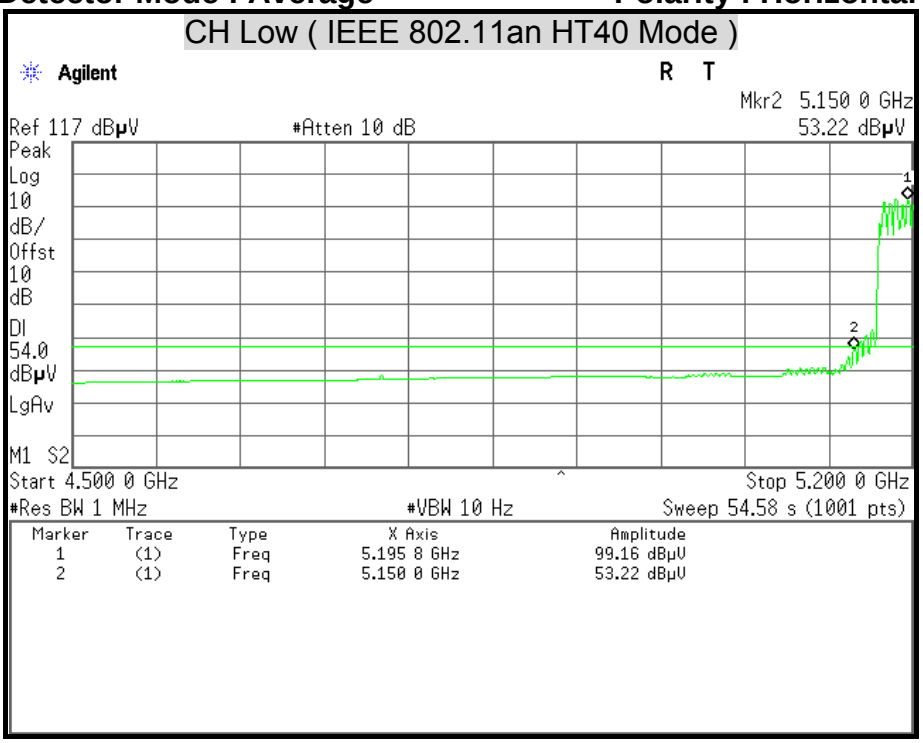
Detector Mode : Average **Polarity : Vertical**



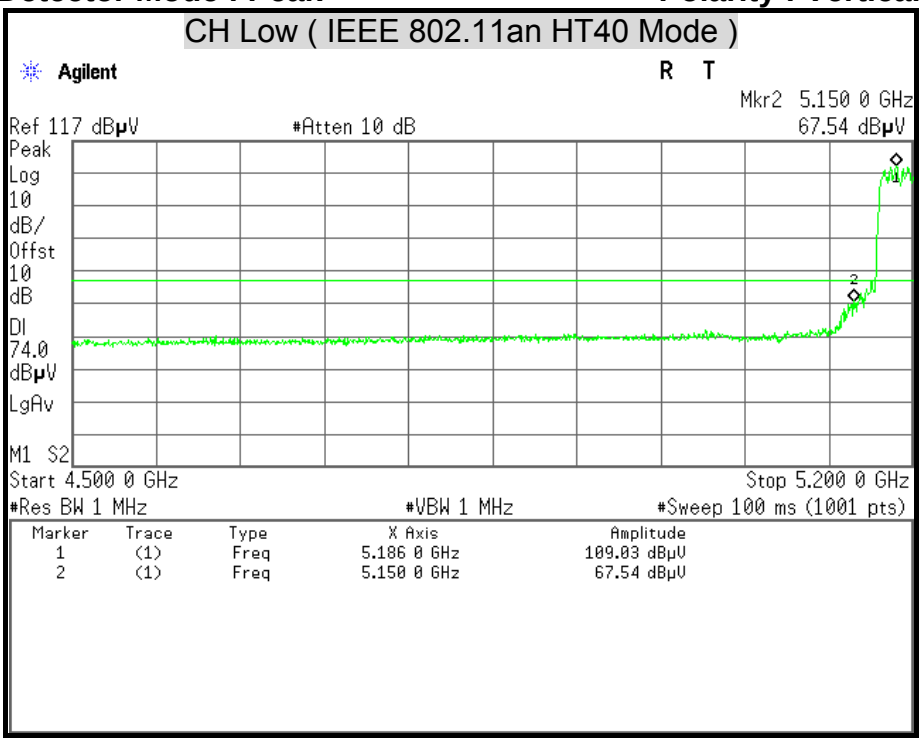
Detector Mode : Peak **Polarity : Horizontal**



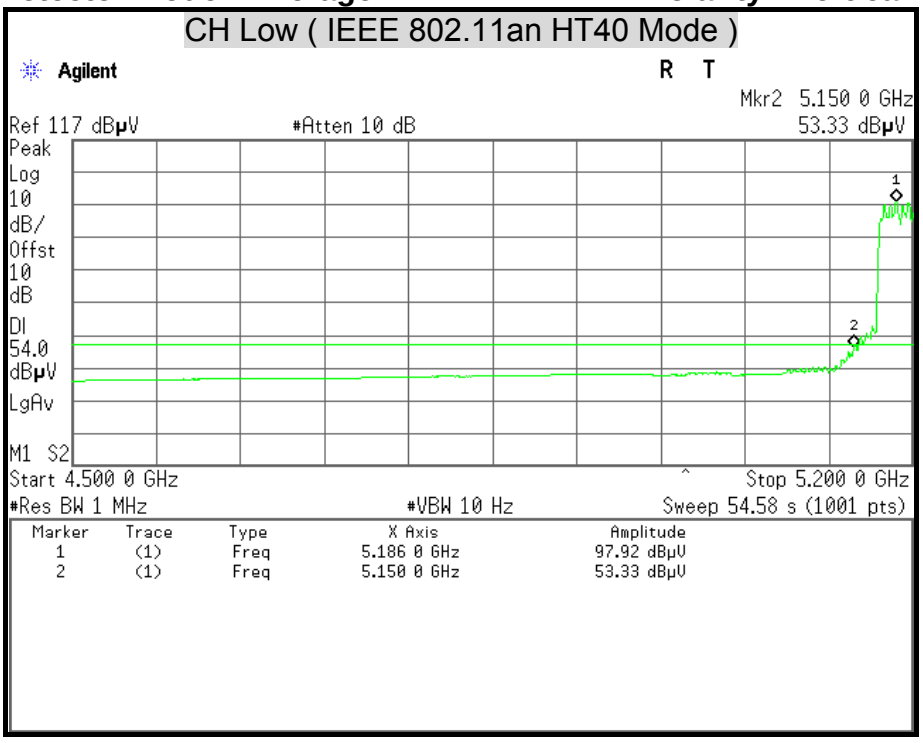
Detector Mode : Average **Polarity : Horizontal**



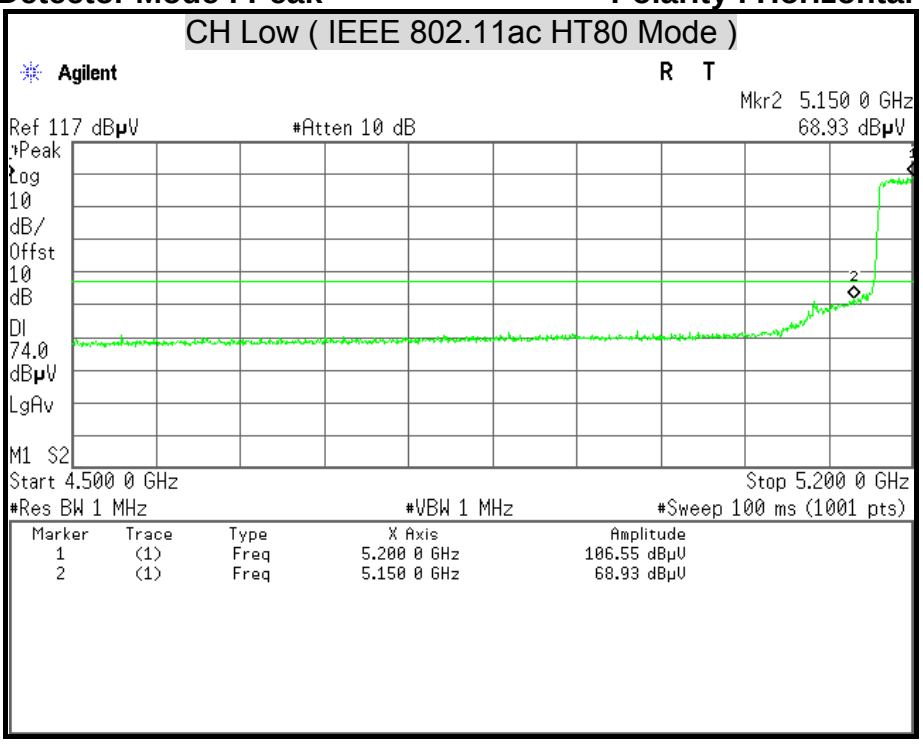
Detector Mode : Peak **Polarity : Vertical**



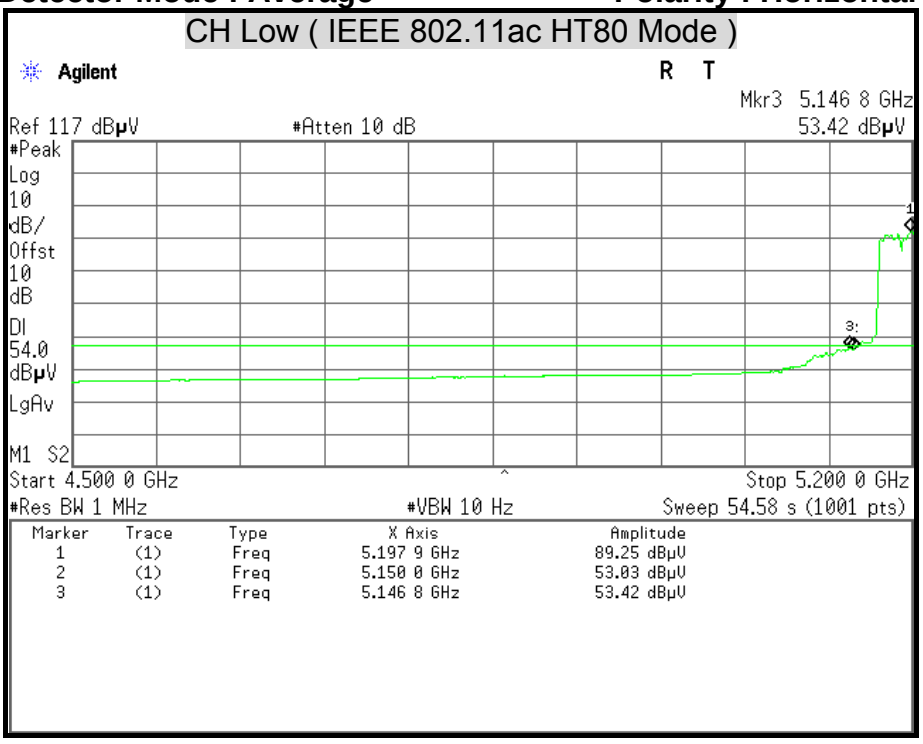
Detector Mode : Average **Polarity : Vertical**



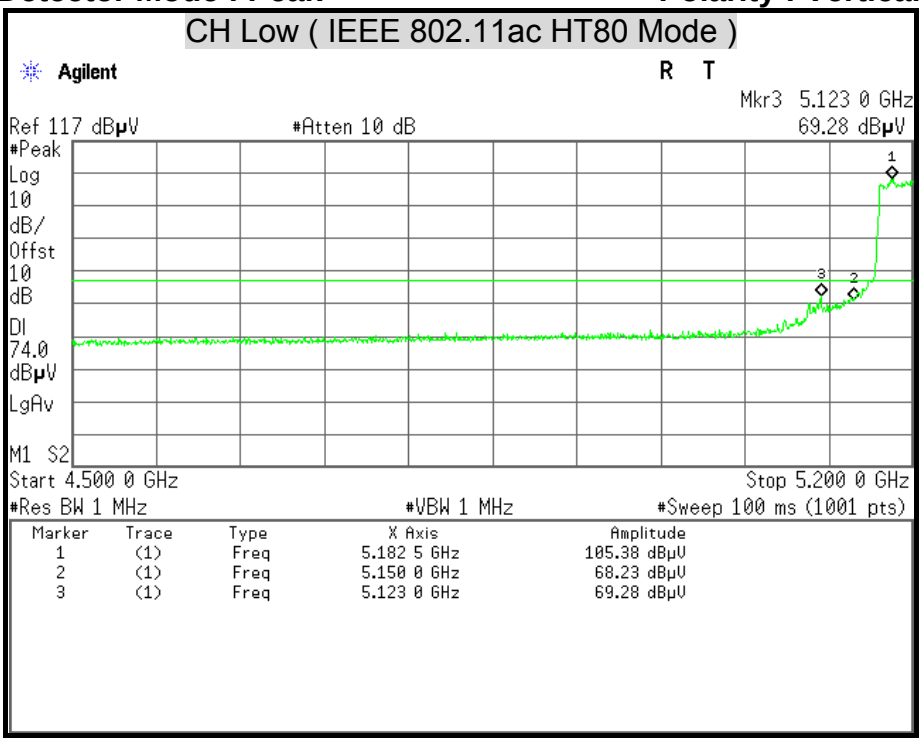
Detector Mode : Peak **Polarity : Horizontal**



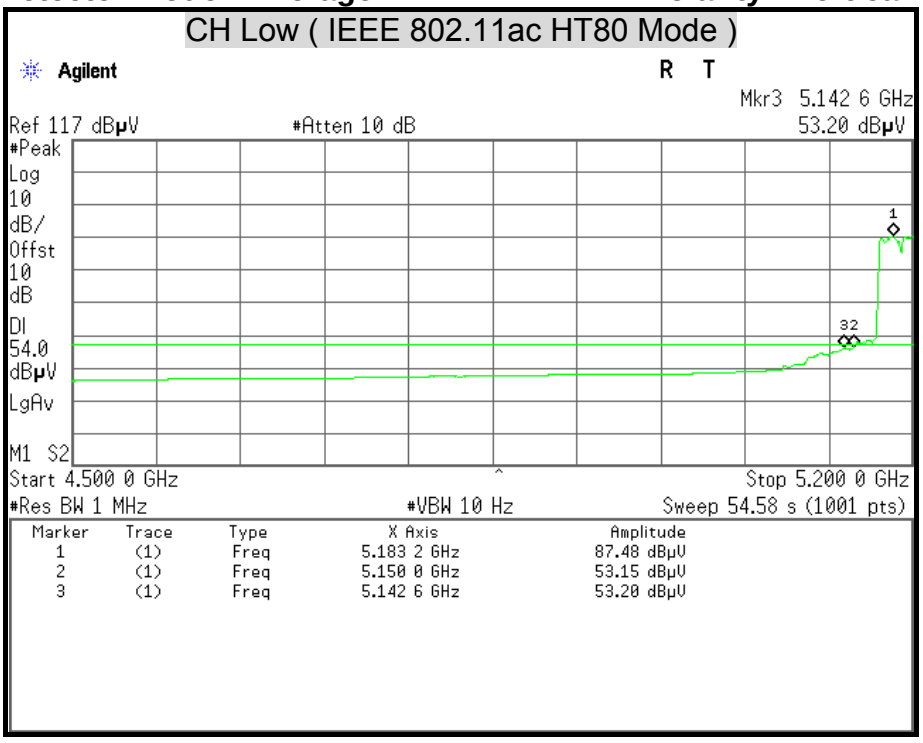
Detector Mode : Average **Polarity : Horizontal**



Detector Mode : Peak **Polarity : Vertical**



Detector Mode : Average **Polarity : Vertical**



7.6 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.

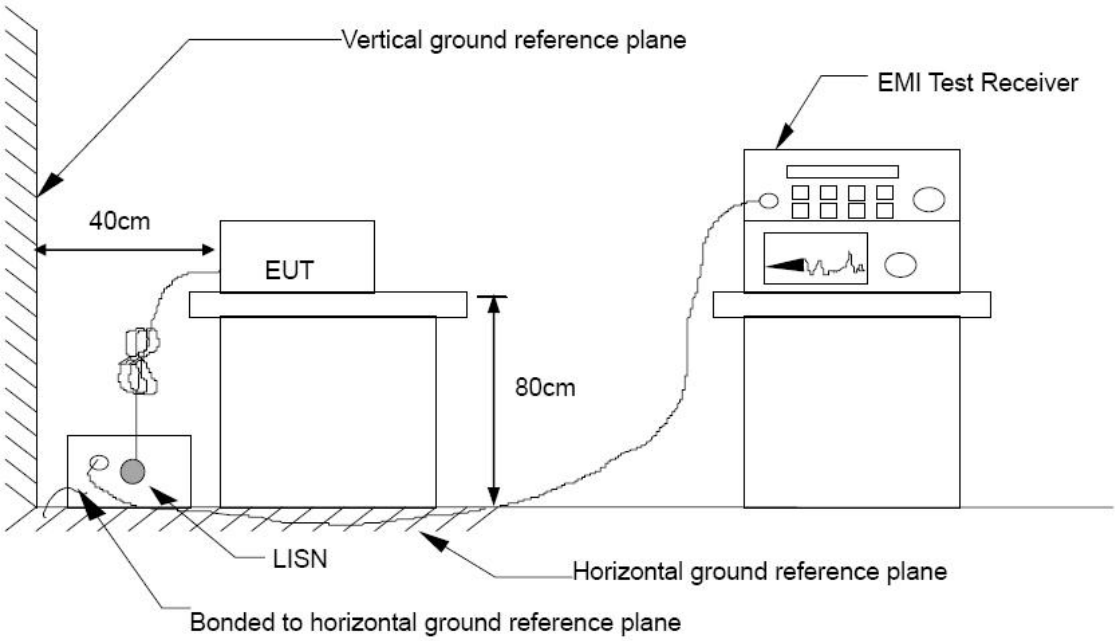
Frequency Range (MHz)	Conducted Limit (dBμv)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5.00	56	46
5.00 - 30.0	60	50

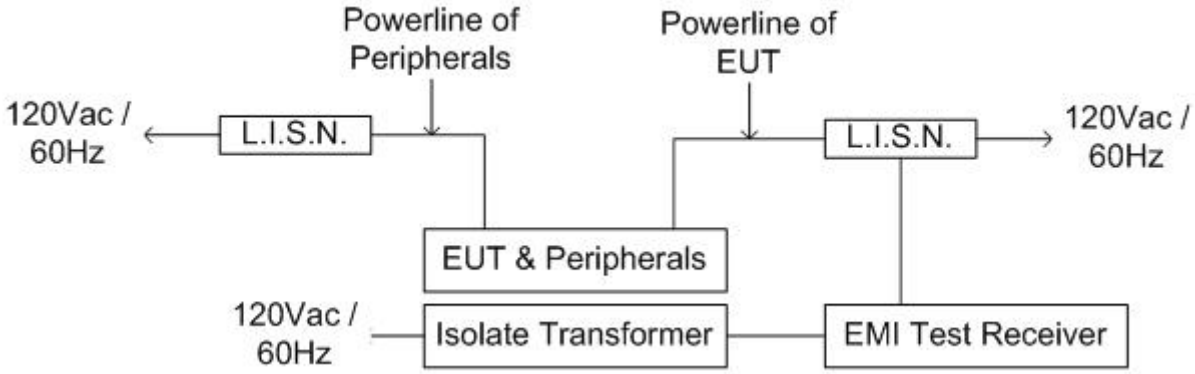
TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-465	08/11/2014
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-473	03/07/2014
EMI Receiver	ROHDE & SCHWARZ	ESCS 30	835418/008	10/16/2014
Pulse Limiter	ROHDE & SCHWARZ	ESH3-Z2	100117	07/01/2014

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

TEST SETUP





TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4:2009.

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.

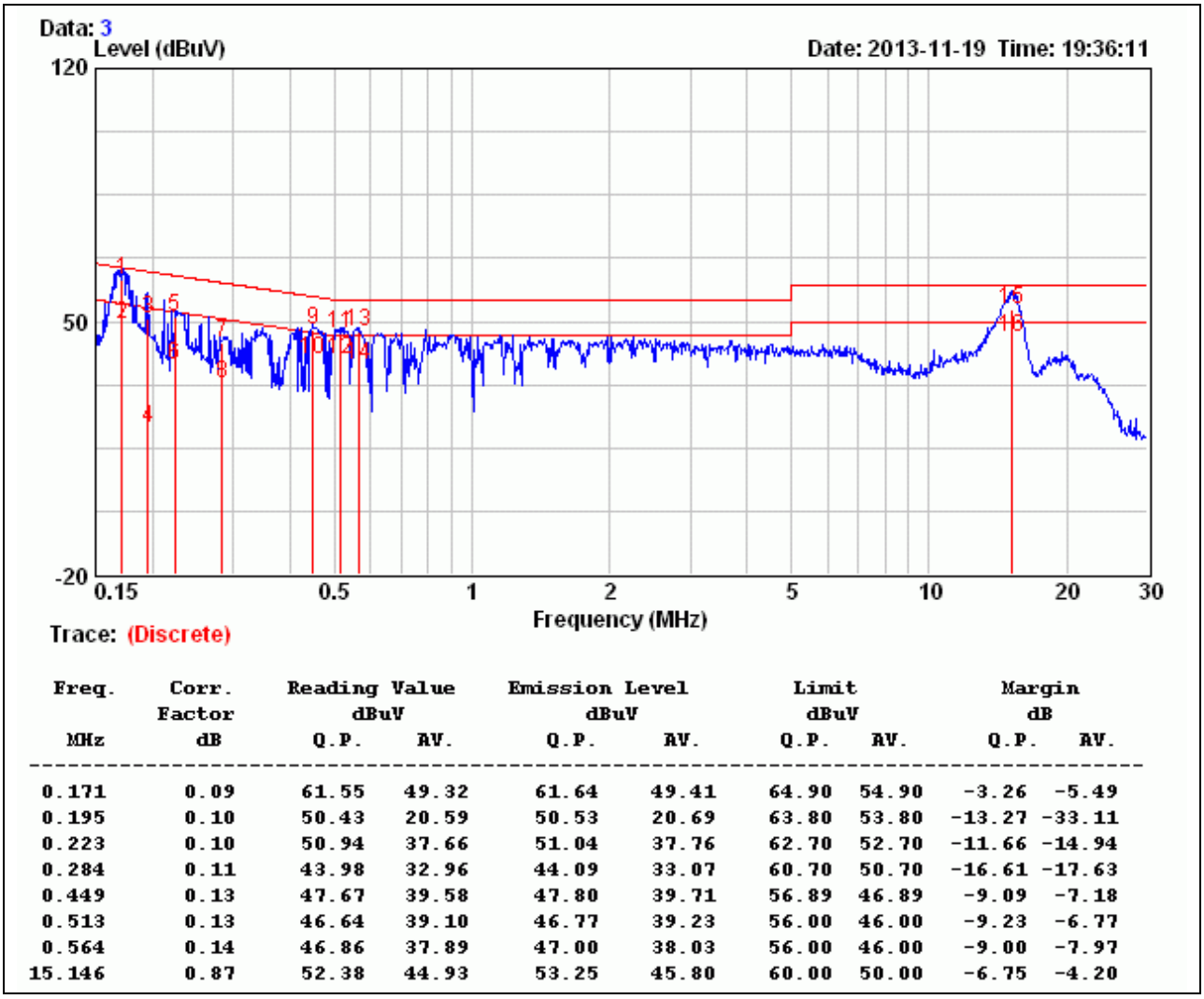
The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis 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	Cable modem	Test By	Alan Wu
Test Model	5363	Test Date	2013/11/19
Test Mode	Normal Operating / Adapter 1	Temp. & Humidity	24°C, 60%

LINE



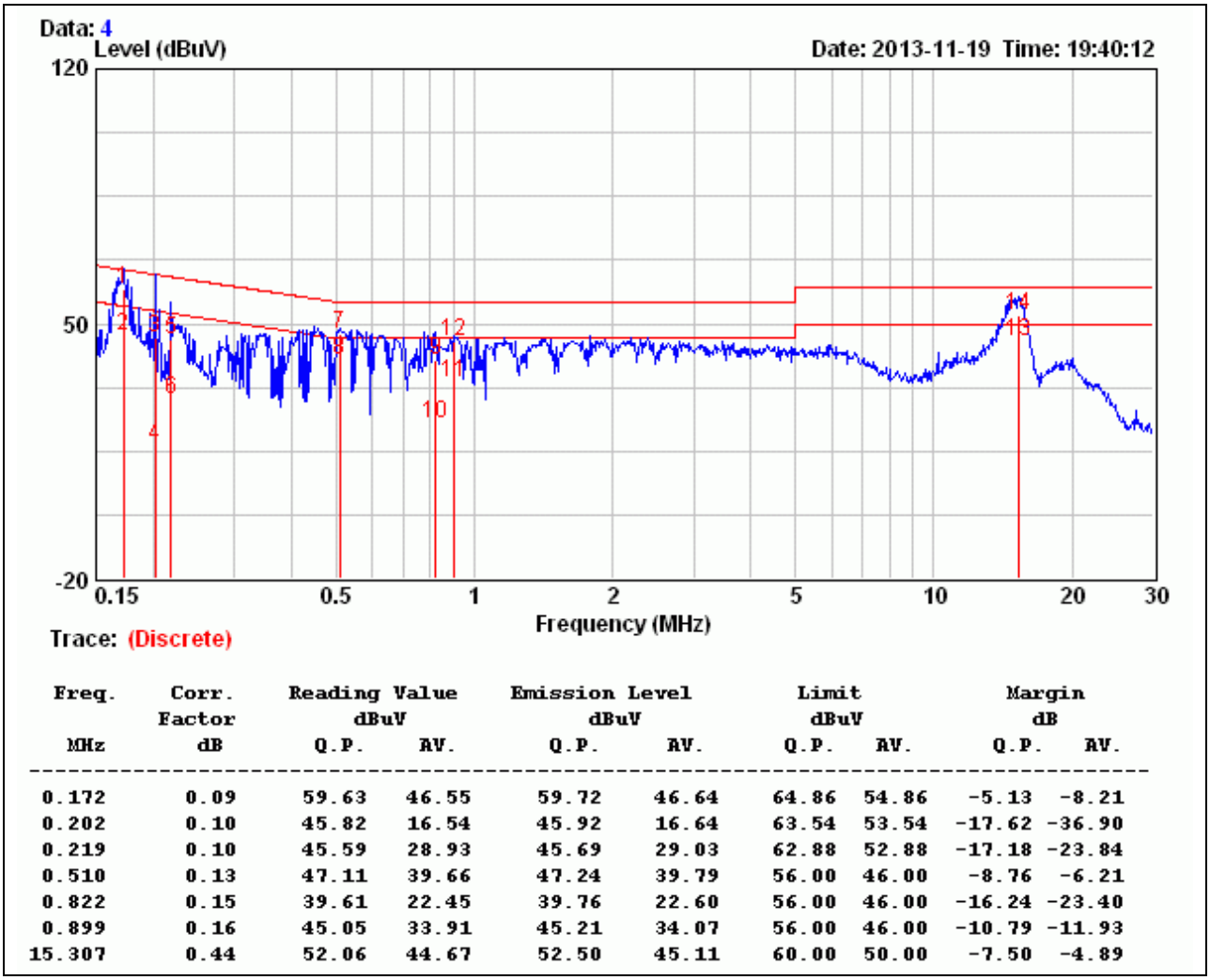
Freq. MHz	Corr. Factor dB	Reading Value dBuV Q.P.	Reading Value dBuV AV.	Emission Level dBuV Q.P.	Emission Level dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.171	0.09	61.55	49.32	61.64	49.41	64.90	54.90	-3.26	-5.49
0.195	0.10	50.43	20.59	50.53	20.69	63.80	53.80	-13.27	-33.11
0.223	0.10	50.94	37.66	51.04	37.76	62.70	52.70	-11.66	-14.94
0.284	0.11	43.98	32.96	44.09	33.07	60.70	50.70	-16.61	-17.63
0.449	0.13	47.67	39.58	47.80	39.71	56.89	46.89	-9.09	-7.18
0.513	0.13	46.64	39.10	46.77	39.23	56.00	46.00	-9.23	-6.77
0.564	0.14	46.86	37.89	47.00	38.03	56.00	46.00	-9.00	-7.97
15.146	0.87	52.38	44.93	53.25	45.80	60.00	50.00	-6.75	-4.20

Remark:

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

Product Name	Cable modem	Test By	Alan Wu
Test Model	5363	Test Date	2013/11/19
Test Mode	Normal Operating / Adapter 1	Temp. & Humidity	24°C, 60%

NEUTRAL



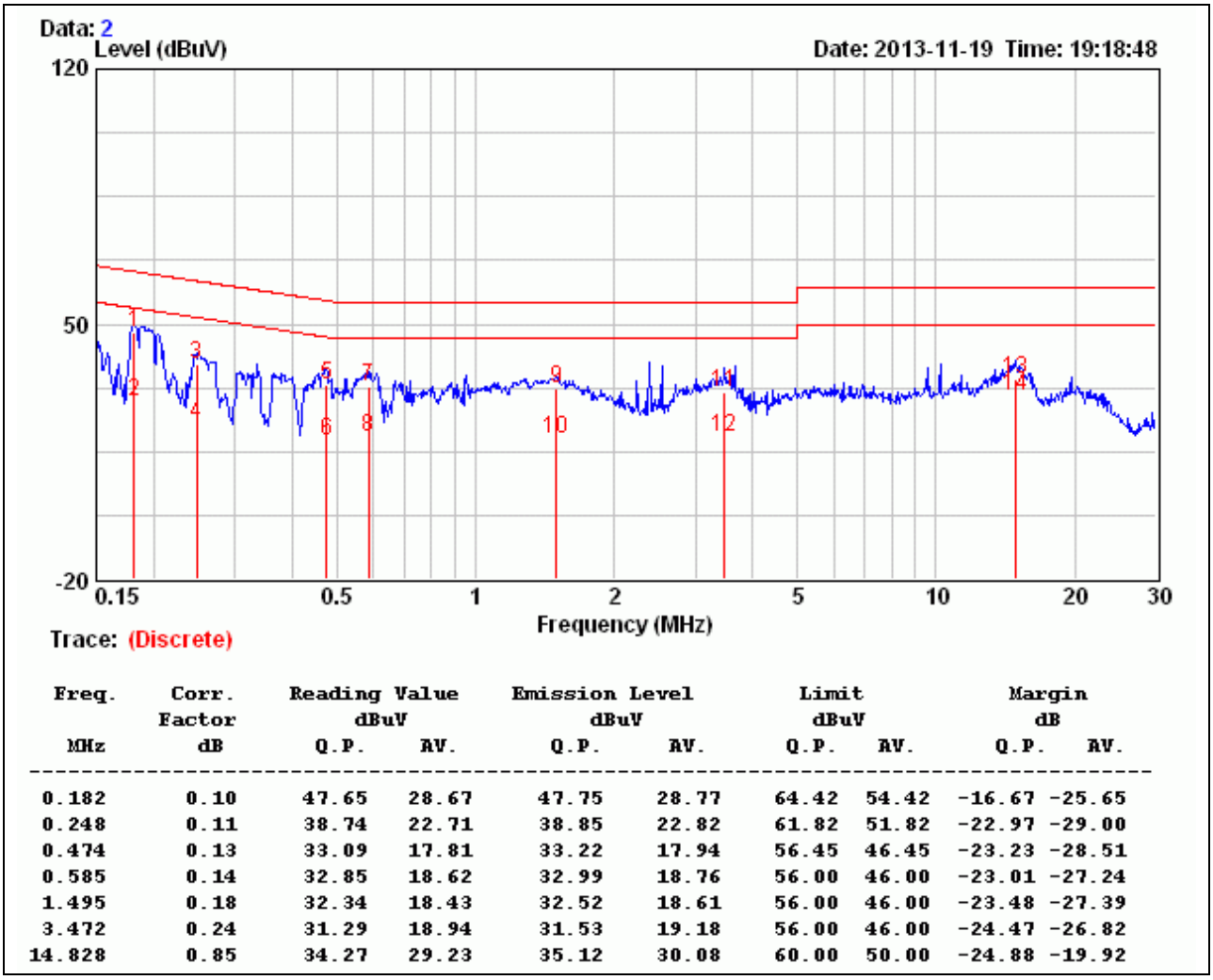
Freq. MHz	Corr. Factor dB	Reading Value dBuV Q.P.	Reading Value dBuV AV.	Emission Level dBuV Q.P.	Emission Level dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.172	0.09	59.63	46.55	59.72	46.64	64.86	54.86	-5.13	-8.21
0.202	0.10	45.82	16.54	45.92	16.64	63.54	53.54	-17.62	-36.90
0.219	0.10	45.59	28.93	45.69	29.03	62.88	52.88	-17.18	-23.84
0.510	0.13	47.11	39.66	47.24	39.79	56.00	46.00	-8.76	-6.21
0.822	0.15	39.61	22.45	39.76	22.60	56.00	46.00	-16.24	-23.40
0.899	0.16	45.05	33.91	45.21	34.07	56.00	46.00	-10.79	-11.93
15.307	0.44	52.06	44.67	52.50	45.11	60.00	50.00	-7.50	-4.89

Remark:

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

Product Name	Cable modem	Test By	Alan Wu
Test Model	5363	Test Date	2013/11/19
Test Mode	Normal Operating / Adapter 2	Temp. & Humidity	24°C, 60%

LINE



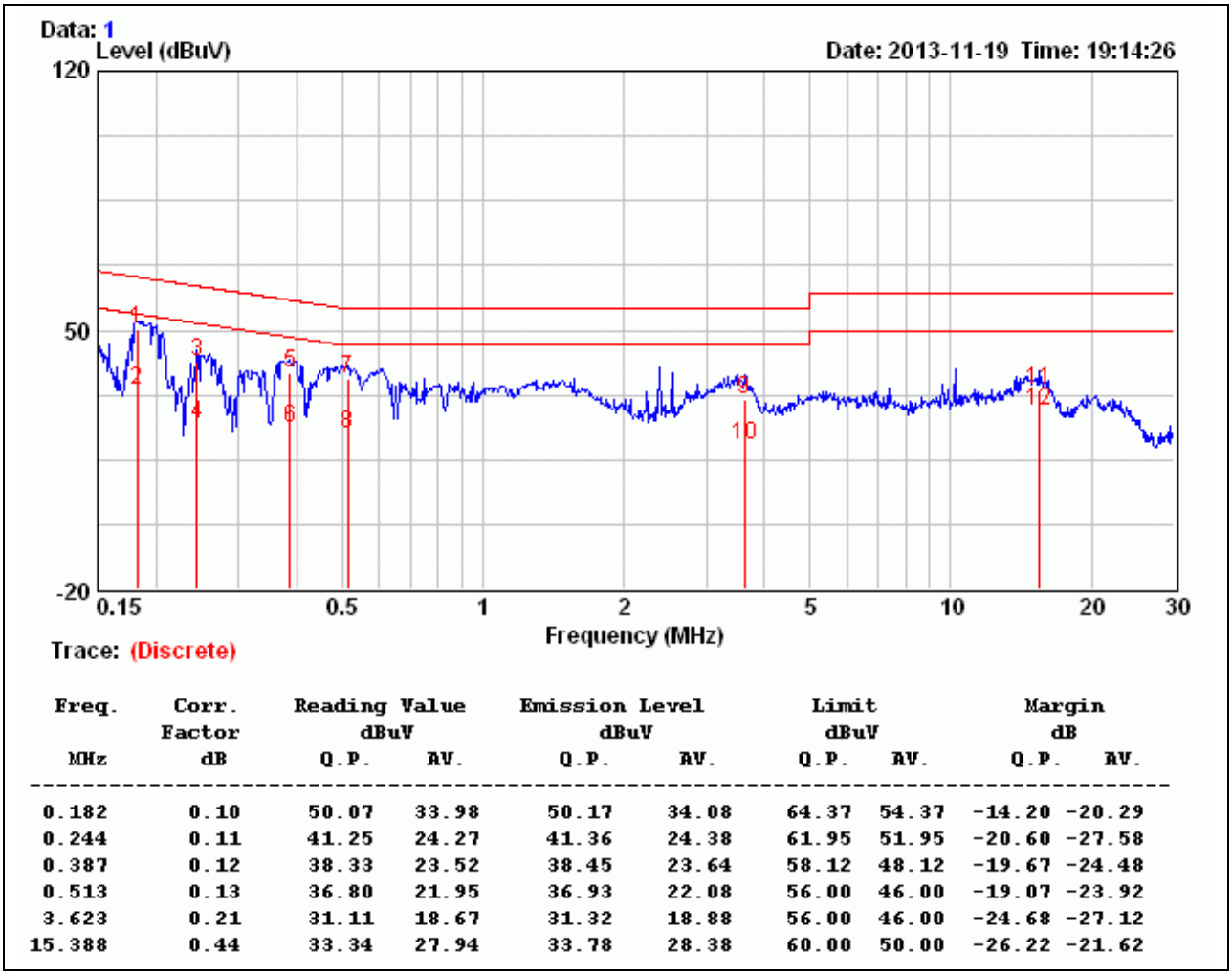
Freq. MHz	Corr. Factor dB	Reading Value dBuV Q.P.	Reading Value dBuV AV.	Emission Level dBuV Q.P.	Emission Level dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.182	0.10	47.65	28.67	47.75	28.77	64.42	54.42	-16.67	-25.65
0.248	0.11	38.74	22.71	38.85	22.82	61.82	51.82	-22.97	-29.00
0.474	0.13	33.09	17.81	33.22	17.94	56.45	46.45	-23.23	-28.51
0.585	0.14	32.85	18.62	32.99	18.76	56.00	46.00	-23.01	-27.24
1.495	0.18	32.34	18.43	32.52	18.61	56.00	46.00	-23.48	-27.39
3.472	0.24	31.29	18.94	31.53	19.18	56.00	46.00	-24.47	-26.82
14.828	0.85	34.27	29.23	35.12	30.08	60.00	50.00	-24.88	-19.92

Remark:

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

Product Name	Cable modem	Test By	Alan Wu
Test Model	5363	Test Date	2013/11/19
Test Mode	Normal Operating / Adapter 2	Temp. & Humidity	24°C, 60%

NEUTRAL



Freq. MHz	Corr. Factor dB	Reading Value dBuV Q.P.	Reading Value dBuV AV.	Emission Level dBuV Q.P.	Emission Level dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.182	0.10	50.07	33.98	50.17	34.08	64.37	54.37	-14.20	-20.29
0.244	0.11	41.25	24.27	41.36	24.38	61.95	51.95	-20.60	-27.58
0.387	0.12	38.33	23.52	38.45	23.64	58.12	48.12	-19.67	-24.48
0.513	0.13	36.80	21.95	36.93	22.08	56.00	46.00	-19.07	-23.92
3.623	0.21	31.11	18.67	31.32	18.88	56.00	46.00	-24.68	-27.12
15.388	0.44	33.34	27.94	33.78	28.38	60.00	50.00	-26.22	-21.62

Remark:

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

7.7 FREQUENCY STABILITY

LIMITS

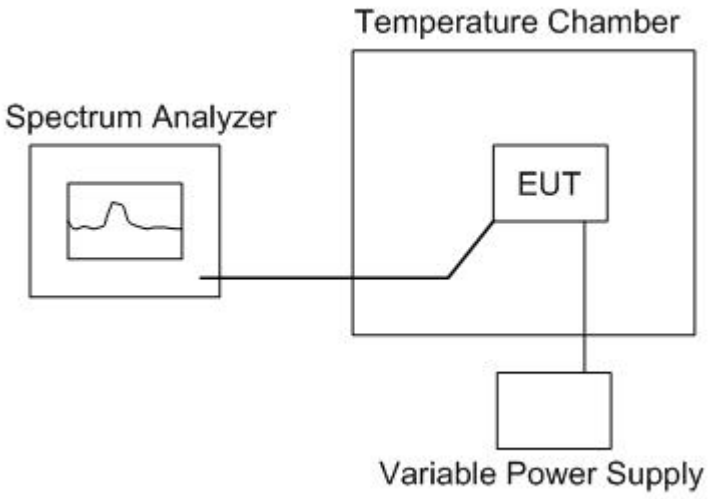
§ 15.407 (g) manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/10/2014
Temp. & Humid. Chamber	TERCHY	MHC-120L	960424	09/10/2014

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

TEST SETUP



TEST PROCEDURE

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20℃ operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -20℃. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10℃ increased per stage until the highest temperature of +50℃ reached.

TEST RESULTS

Operating Frequency: 5180MHz			
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Test Result**
50	120	5180.011210	PASS
40		5180.006529	
30		5180.026105	
20		5180.011988	
10		5180.038516	
0		5180.029137	
-10		5180.018953	
-20		5180.011851	

CH Middle / 52200MHz			
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Test Result**
20	108	5180.003236	PASS
	120	5180.016516	
	132	5180.063783	