



FCC 47 CFR PART 15 SUBPART C

for

Cellular Wi-Fi Router

Model: H8951-PHF, H8951, H7920, H7921, H8922, H8922S

Brand: Hongdian

Test Report Number:

C151224Z01-RP1-2

Issued Date: January 8, 2016

Issued for

Hongdian Corporation

**F14-16, Headquarters Economic Center, Zhonghaixin Science&Tech Park,
Bulan Road, Longgang District, Shenzhen, China**

Issued by:

Compliance Certification Services (Shenzhen) Inc.

No.10-1 Mingkeda Logistics park, No.18, Huanguan South Rd.,
Guan Lan Town, Baoan District, Shenzhen, China

TEL: 86-755-28055000

FAX: 86-755-28055221

E-Mail: service@ccssz.com



中国认可
国际互认
检测
TESTING
CNAS L4818



TESTING CERT #2861.01

Note: This report shall not be reproduced except in full, without the written approval of Compliance Certification Services (Shenzhen) Inc. This document may be altered or revised by Compliance Certification Services (Shenzhen) Inc. personnel only, and shall be noted in the revision section of the document. The client should not use it to claim product endorsement by TAF, A2LA, NVLAP, NIST or any government agencies. The test results in the report only apply to the tested sample.



Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	December 11, 2015	Initial Issue	ALL	Sinphy Xie



TABLE OF CONTENTS

1 TEST CERTIFICATION	4
2 TEST RESULT SUMMARY	4
3 EUT DESCRIPTION.....	6
4 TEST METHODOLOGY.....	7
4.1. DESCRIPTION OF TEST MODES	7
5 SETUP OF EQUIPMENT UNDER TEST	8
5.1. DESCRIPTION OF SUPPORT UNITS.....	8
5.2. CONFIGURATION OF SYSTEM UNDER TEST	8
6 FACILITIES AND ACCREDITATIONS	9
6.1. FACILITIES	9
6.2. ACCREDITATIONS	9
6.3. MEASUREMENT UNCERTAINTY	9
7 FCC PART 15.247 REQUIREMENTS	10
7.1. POWER LINE CONDUCTED EMISSIONS MEASUREMENT.....	10
7.2. SPURIOUS EMISSIONS MEASUREMENT.....	15
7.3. 6dB BANDWIDTH MEASUREMENT	47
7.4. ANTENNA GAIN	57
7.5. PEAK OUTPUT POWER	58
7.6. BAND EDGES MEASUREMENT	61
7.7. PEAK POWER SPECTRAL DENSITY MEASUREMENT.....	79



1 TEST CERTIFICATION

Product	Cellular Wi-Fi Router
Model	H8951-PHF, H8951, H7920, H7921, H8922, H8922S
Brand	Hongdian
Tested	December 24, 2015~January 8, 2016
Applicant	Hongdian Corporation F14-16, Headquarters Economic Center, Zhonghaixin Science&Tech Park, Bulan Road, Longgang District, Shenzhen, China
Manufacturer	Hongdian Corporation F14-16, Headquarters Economic Center, Zhonghaixin Science&Tech Park, Bulan Road, Longgang District, Shenzhen, China

APPLICABLE STANDARDS

Standard	Test Type	Standard	Test Type
15.207(a)	Power Line Conducted Emissions	15.247(d) 15.209(a)	● Spurious Emissions ● Conducted Measurement ● Radiated Emissions
15.247(a)(2)	6dB Bandwidth Measurement	15.247(b)(3) 15.247(b)(4)	Peak Power Measurement
15.247(d)	Band Edges Measurement	15.247(e)	Peak Power Spectral Density

We hereby certify that:

The above equipment was tested by Compliance Certification Services (Shenzhen) Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in **ANSI C63.10: 2013** and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Sunday Hu
Supervisor of EMC Dept.
Compliance Certification Services (Shenzhen) Inc.

Reviewed by:

Ruby Zhang
Supervisor of Report Dept.
Compliance Certification Services (Shenzhen) Inc.



2 TEST RESULT SUMMARY

APPLICABLE STANDARDS			
Standard	Test Type	Result	Remark
15.247(a)(2)	6dB Bandwidth Measurement	Pass	Meet the requirement of limit.
15.247(b)(3) 15.247(b)(4)	Peak Power Measurement	Pass	Meet the requirement of limit.
15.247(d)	Band Edges Measurement	Pass	Meet the requirement of limit.
15.247(e)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.247(d) 15.209(a)	● Spurious Emissions ● Conducted Measurement ● Radiated Emissions	Pass	Meet the requirement of limit.
15.207(a)	Power line Conducted Emissions	Pass	Meet the requirement of limit.

Note: 1. The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.
2. The information of measurement uncertainty is available upon the customer's request.



3 EUT DESCRIPTION

Product	Cellular Wi-Fi Router
Model Number	H8951-PHF, H8951, H7920, H7921, H8922, H8922S
Brand	Hongdian
Model Discrepancy	They are identical to each other except for shell color to marketing purpose.
Identify Number	C151224Z01-RP1-2
Received Date	December 2, 2015
Power Supply	12Vdc power supplied by adapter
Transmit Power	IEEE 802.11b mode: 18.22dBm IEEE 802.11g mode: 23.95dBm IEEE 802.11n HT20 MHz mode: 23.75dBm IEEE 802.11n HT40 MHz mode: 23.38dBm
Modulation Technique	IEEE 802.11b mode: DSSS(CCK,QPSK, BPSK) IEEE 802.11g mode: OFDM (BPSK/QPSK/16QAM/64QAM) IEEE 802.11n HT20 MHz mode: OFDM (BPSK/QPSK/16QAM/64QAM) IEEE 802.11n HT40 MHz mode: OFDM (BPSK/QPSK/16QAM/64QAM)
Transmit Data Rate	IEEE 802.11b: 11Mbps(CCK) with fall back rates of 5.5/2/1Mbps IEEE 802.11g: 54Mbps with fall back rates of 48/36/24/18/12/9 /6Mbps IEEE 802.11n HT20: 65.0Mbps with fall back rates of 65.0/58.5/52.0/39.0/26.0/19.5/13.0/6.5 Mbps IEEE 802.11n HT40: 135Mbps with fall back rates of 135/121.5/108/81/54/40.5/27/13.5Mbps
Number of Channels	IEEE 802.11b mode: 11 Channels IEEE 802.11g mode: 11 Channels IEEE 802.11n HT20 MHz mode: 11 Channels IEEE 802.11n HT40 MHz mode: 7 Channels
Antenna Specification	Foldable antenna with 3dBi gain (Max)
Channels Spacing	IEEE 802.11b/g ,802.11n HT20/HT40 : 5MHz
Temperature Range	-30°C ~ +70°C
Hardware Version	V21
Software Version	S305E

Note: 1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: 2AG6GH8951-PHF filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.



4 TEST METHODOLOGY

4.1. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Test Item	Test mode	Worse mode
Conducted Emission	Mode 1: 10Mbps 10%	<input checked="" type="checkbox"/>
	Mode 2: 100Mbps 10%	<input type="checkbox"/>
Radiated Emission	Mode 1: TX	<input checked="" type="checkbox"/>

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only, and power line conducted emission below 30MHz, which worst case was in normal link mode.

IEEE802.11b mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate were chosen for full testing.

IEEE802.11g mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT20 MHz mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6.5Mbps data rate were chosen for full testing.

IEEE 802.11n HT40 MHz mode: Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with 13.5Mbps data rate were chosen for full testing.



5 SETUP OF EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Model No.	Serial No.	FCC ID	Brand	Data Cable	Power Cord
1	Notebook	E335	R9-WN1EF	DoC	Thinkpad	N/A	Unshielded, 1.80m

Note:

Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

5.2. CONFIGURATION OF SYSTEM UNDER TEST

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.



6 FACILITIES AND ACCREDITATIONS

6.1. FACILITIES

All measurement facilities used to collect the measurement data are located at
No.10-1 Mingkeda Logistics park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.10, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6.2. ACCREDITATIONS

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

USA	A2LA
China	CNAS

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

USA	FCC
Japan	VCCI(C-3478, R-3135, T-652, G-10624)
Canada	INDUSTRY CANADA

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

6.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Parameter	Uncertainty
Radiated Emission, 30 to 200 MHz Test Site : 966(2)	+/-3.6880dB
Radiated Emission, 200 to 1000 MHz Test Site : 966(2)	+/-3.6695dB
Radiated Emission, 1 to 8 GHz	+/-5.1782dB
Radiated Emission, 8 to 18 GHz	+/-5.2173dB
Conducted Emissions	+/-3.6836dB
Band Width	178kHz
Peak Output Power MU	+/-1.906dB
Band Edge MU	+/-0.182dB
Channel Separation MU	416.178Hz
Duty Cycle MU	0.054ms
Frequency Stability MU	226Hz

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

The measured result is above (below) the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance (non-compliance) is more probable than non-compliance) with the specification limit.



7 FCC PART 15.247 REQUIREMENTS

7.1. POWER LINE CONDUCTED EMISSIONS MEASUREMENT

7.1.1. LIMITS OF CONDUCTED EMISSIONS MEASUREMENT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

NOTE:

- (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
- (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

7.1.2. TEST INSTRUMENTS

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	02/28/2015	02/27/2016
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543-WX	02/28/2015	02/27/2016
LISN	EMCO	3825/2	8901-1459	02/28/2015	02/27/2016
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	02/28/2015	02/27/2016
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

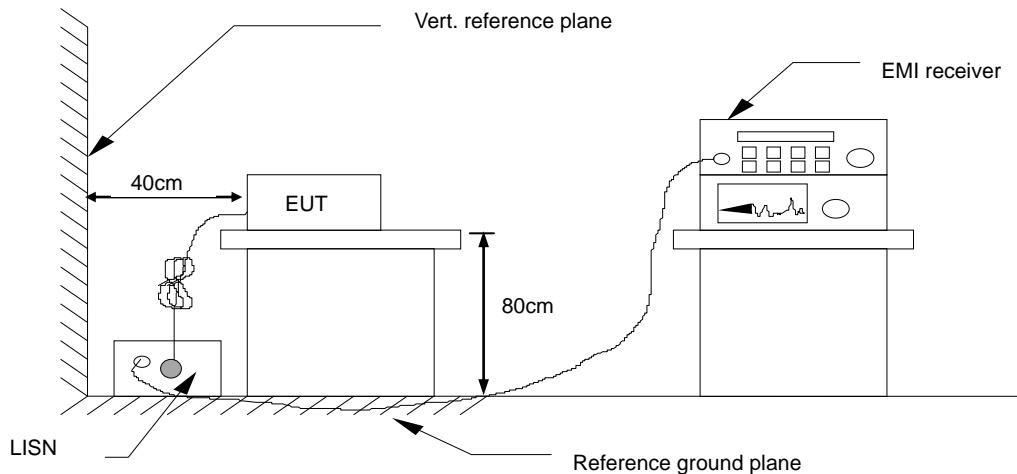
NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.



7.1.3. TEST PROCEDURES (please refer to measurement standard)

- The EUT and Support equipment, if needed, was placed on a non-conducted table, which is 0.8m above the ground plane and 0.4m away from the conducted wall.
- The test equipment EUT installed received AC main power, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane. All support equipment power received from a second LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The frequency range from 150 kHz to 30 MHz was searched. The test data of the worst-case condition(s) was recorded. Emission levels under limit 20dB were not recorded.

7.1.4. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.1.5. DATA SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

Factor = Insertion loss of LISN + Cable Loss

Result = Quasi-peak Reading/ Average Reading + Factor

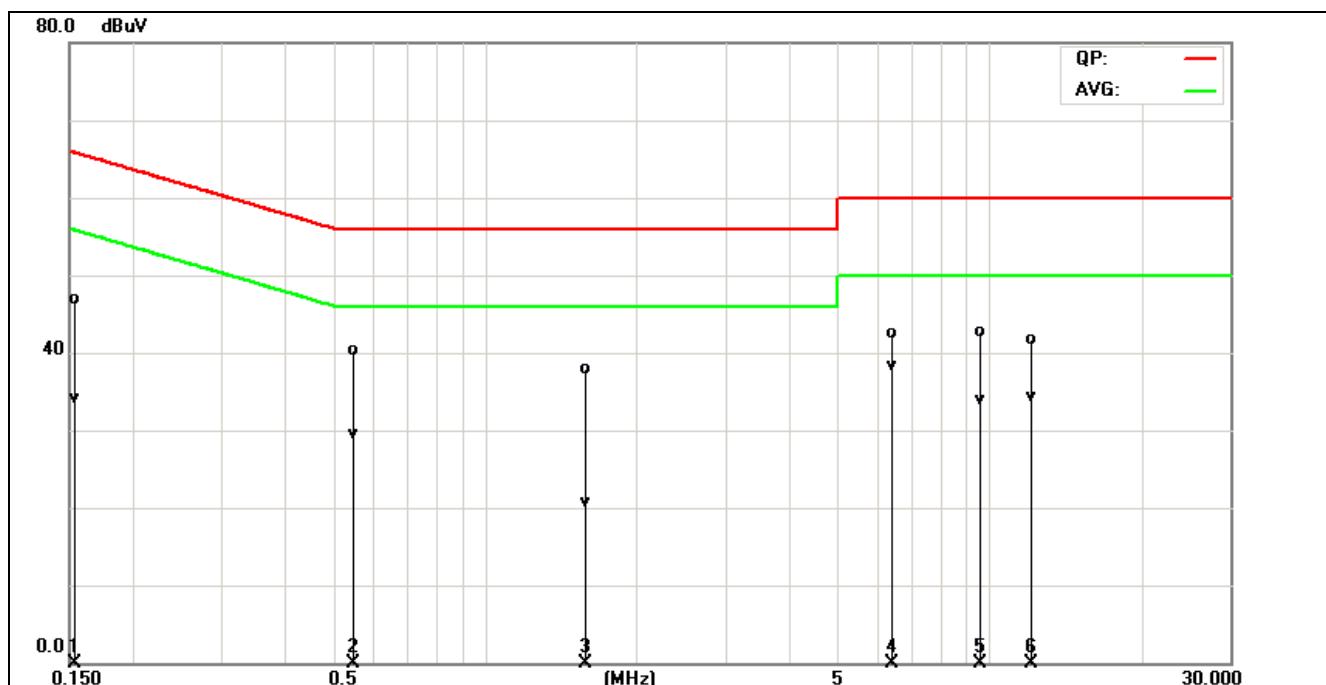
Limit = Limit stated in standard

Margin = Result (dBuV) – Limit (dBuV)



7.1.6. TEST RESULTS

Model No.	H8951-PHF	RBW,VBW	9 kHz
Environmental Conditions	22°C, 45% RH	Test Mode	Mode 2
Tested by	Eve Wang	Line	L1
Test Date	December 31, 2015		

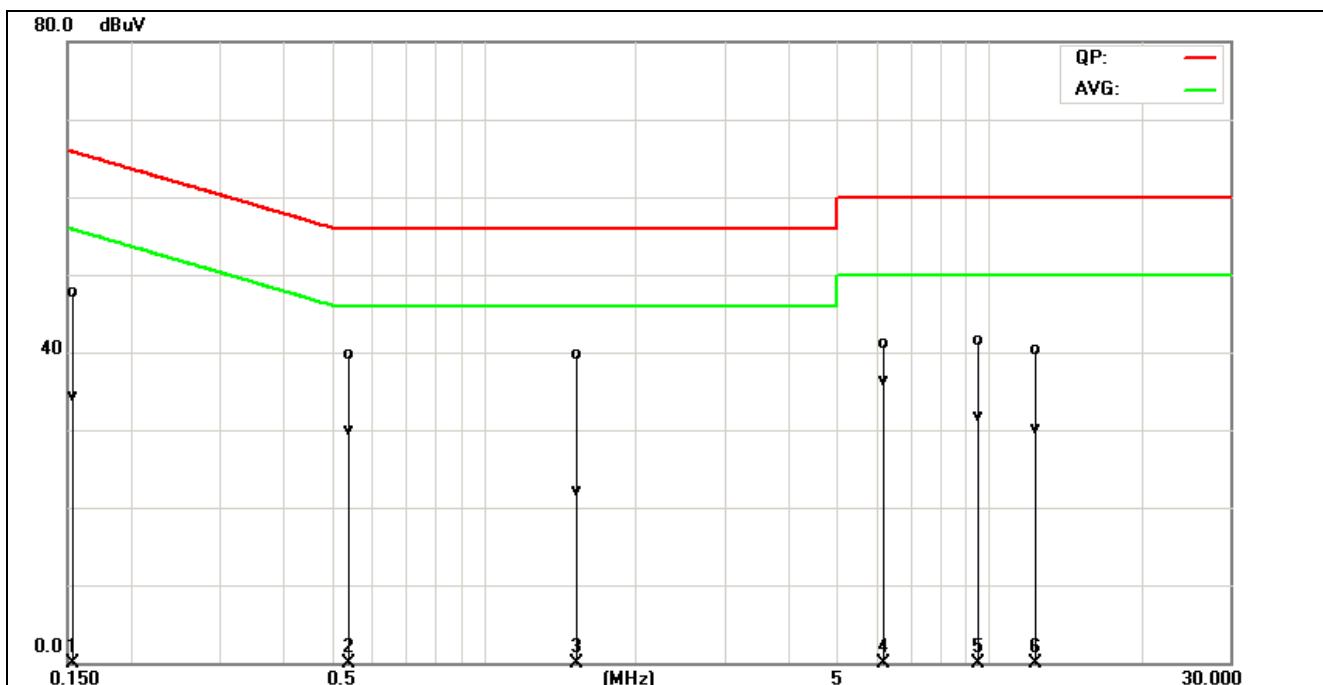


Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)	Line (L1/L2)
0.1539	37.26	24.60	9.59	46.85	34.19	65.78	55.79	-18.93	-21.60	Pass	L1
0.5460	30.53	19.72	9.70	40.23	29.42	56.00	46.00	-15.77	-16.58	Pass	L1
1.5780	28.21	11.02	9.72	37.93	20.74	56.00	46.00	-18.07	-25.26	Pass	L1
6.3740	32.78	28.59	9.75	42.53	38.34	60.00	50.00	-17.47	-11.66	Pass	L1
9.5980	32.86	24.05	9.86	42.72	33.91	60.00	50.00	-17.28	-16.09	Pass	L1
12.0100	31.90	24.32	9.89	41.79	34.21	60.00	50.00	-18.21	-15.79	Pass	L1

REMARKS: L1 = Line One (Live Line)



Model No.	H8951-PHF	RBW,VBW	9 kHz
Environmental Conditions	22°C, 45% RH	Test Mode	Mode 2
Tested by	Eve Wang	Line	L2
Test Date	December 31, 2015		



Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)	Line (L1/L2)
0.1539	37.84	24.50	9.78	47.62	34.28	65.78	55.79	-18.16	-21.51	Pass	L2
0.5380	29.94	20.19	9.68	39.62	29.87	56.00	46.00	-16.38	-16.13	Pass	L2
1.5220	29.84	12.27	9.77	39.61	22.04	56.00	46.00	-16.39	-23.96	Pass	L2
6.1740	31.27	26.59	9.78	41.05	36.37	60.00	50.00	-18.95	-13.63	Pass	L2
9.4620	31.65	21.91	9.85	41.50	31.76	60.00	50.00	-18.50	-18.24	Pass	L2
12.2780	30.47	20.26	9.80	40.27	30.06	60.00	50.00	-19.73	-19.94	Pass	L2

REMARKS: L2 = Line Two (Neutral Line)



7.2. SPURIOUS EMISSIONS MEASUREMENT

7.2.1. CONDUCTED EMISSIONS MEASUREMENT

7.2.1.1. LIMITS OF CONDUCTED EMISSIONS MEASUREMENT

§15.247(d) specifies that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to 15.247(b)(3) requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to 15.247(b)(3) requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

7.2.1.2. TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	02/28/2015	02/27/2016

7.2.1.3. TEST PROCEDURE (please refer to measurement standard)

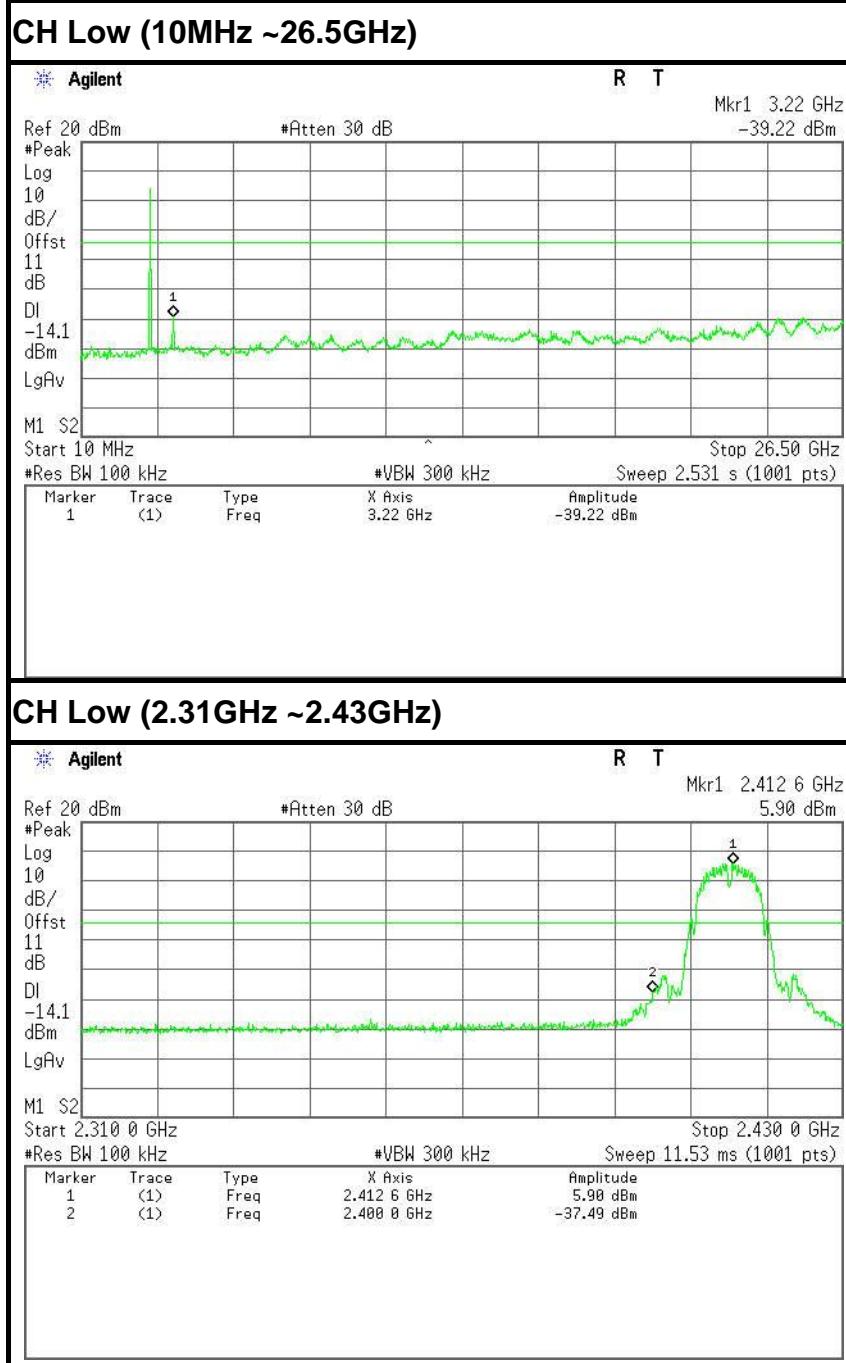
Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site. The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

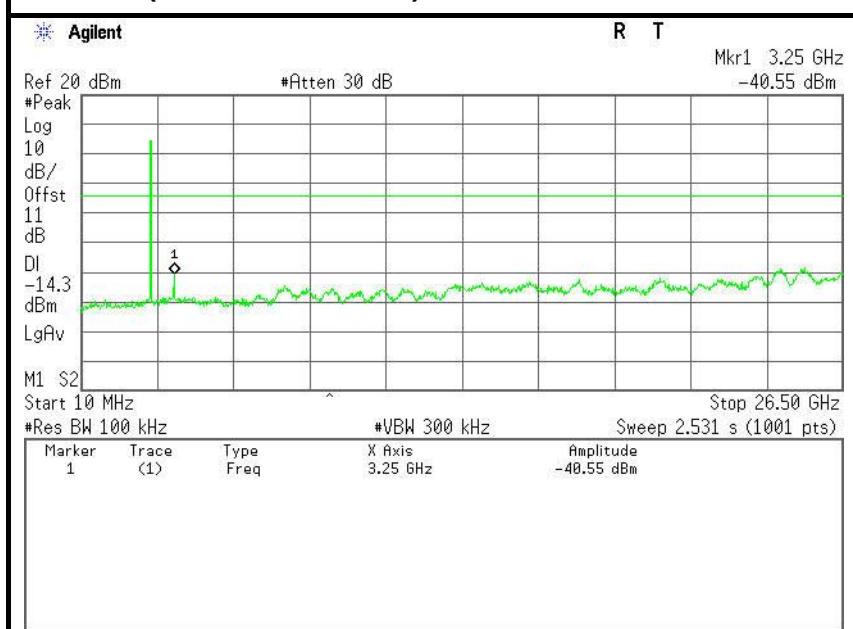
Measurements are made over the 10MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels. No emission found between lowest internal used/generated frequency to 10MHz, it is only recorded 10MHz to 26GHz.

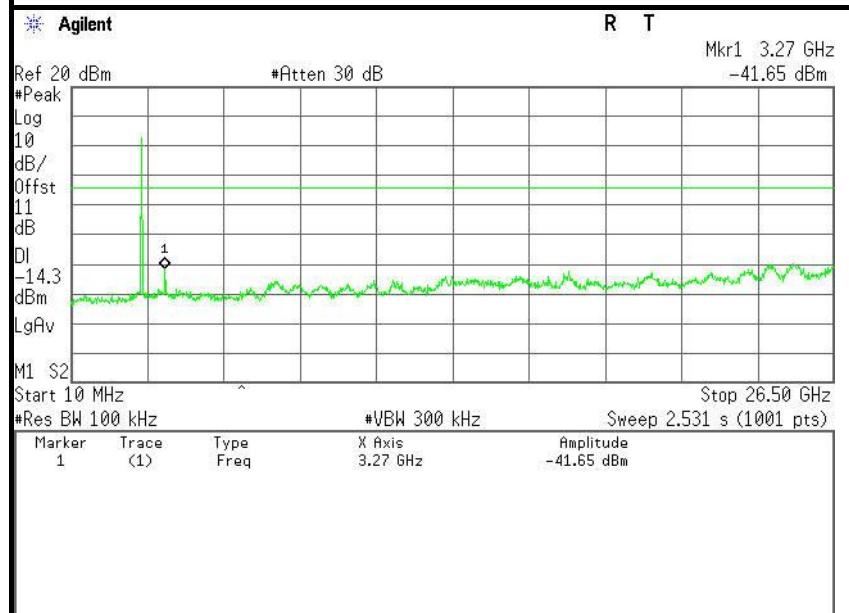
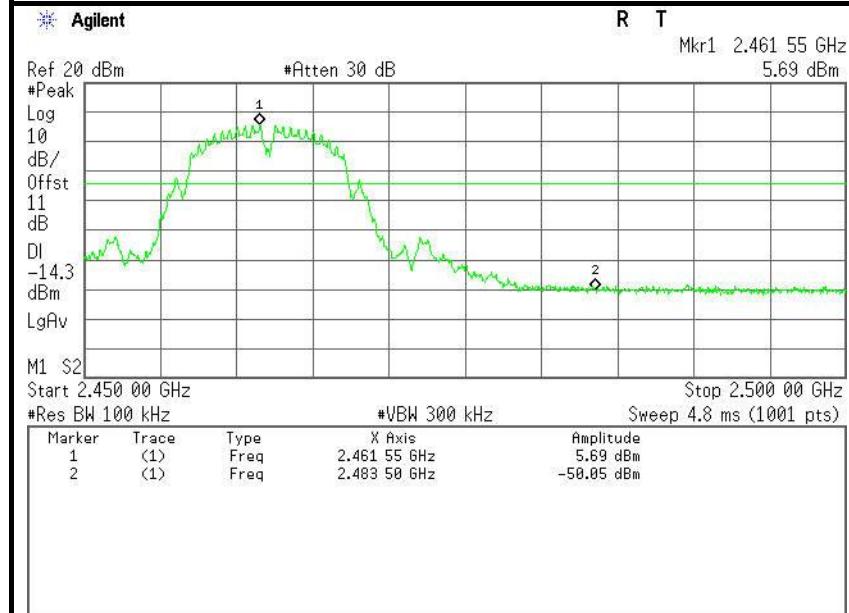
7.2.1.4. TEST RESULTS

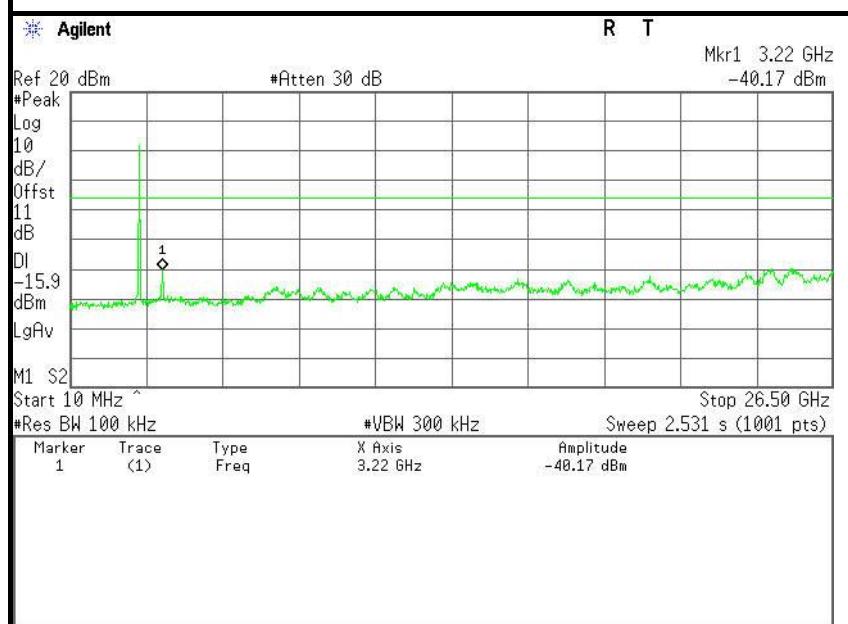
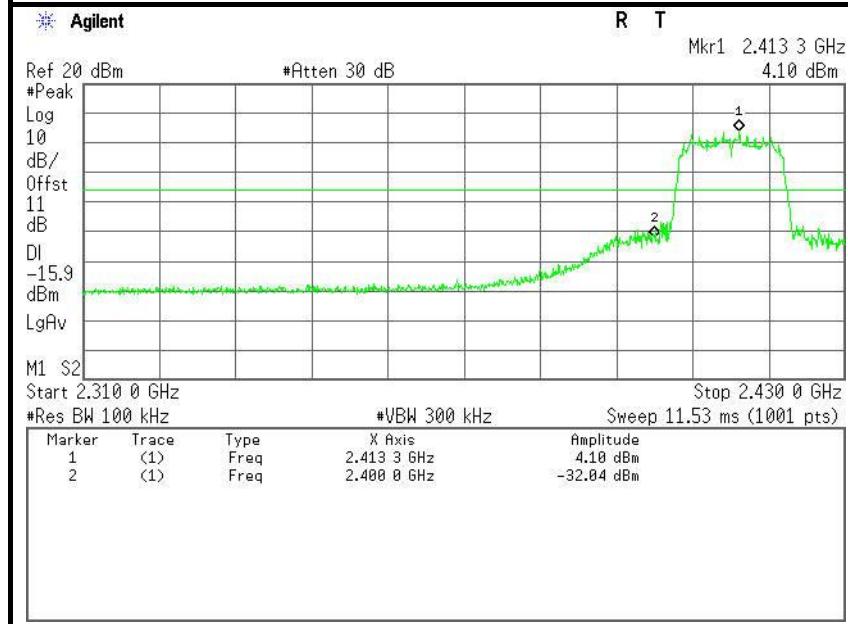
Test Plot

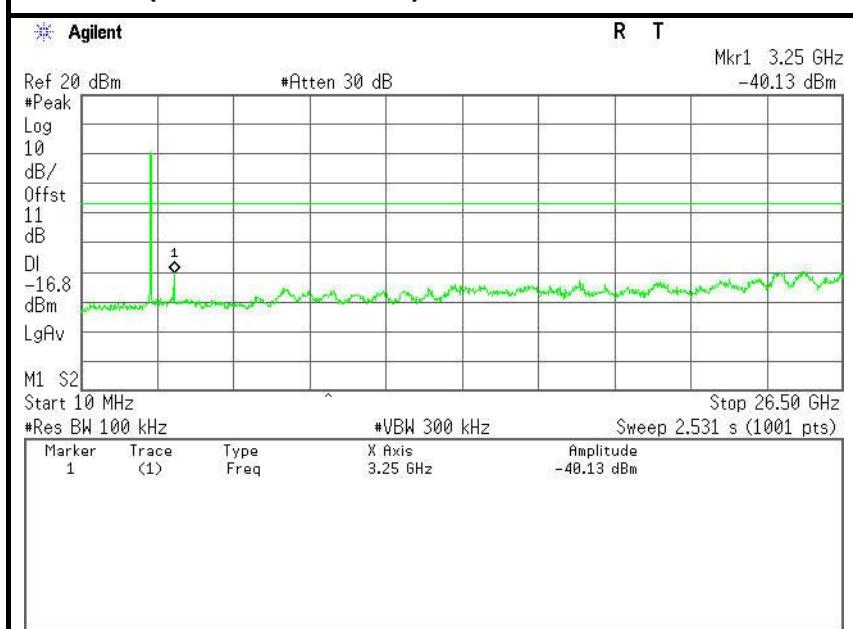
IEEE 802.11b mode

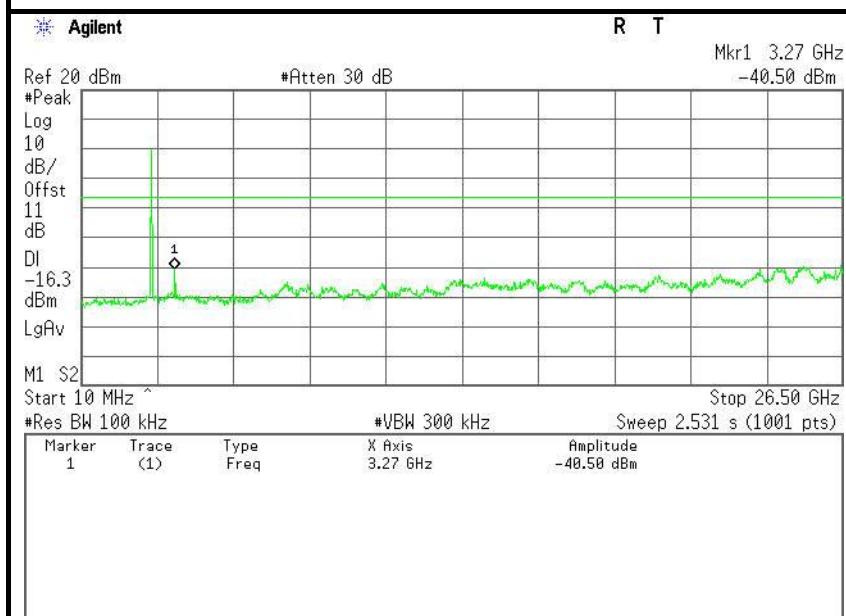
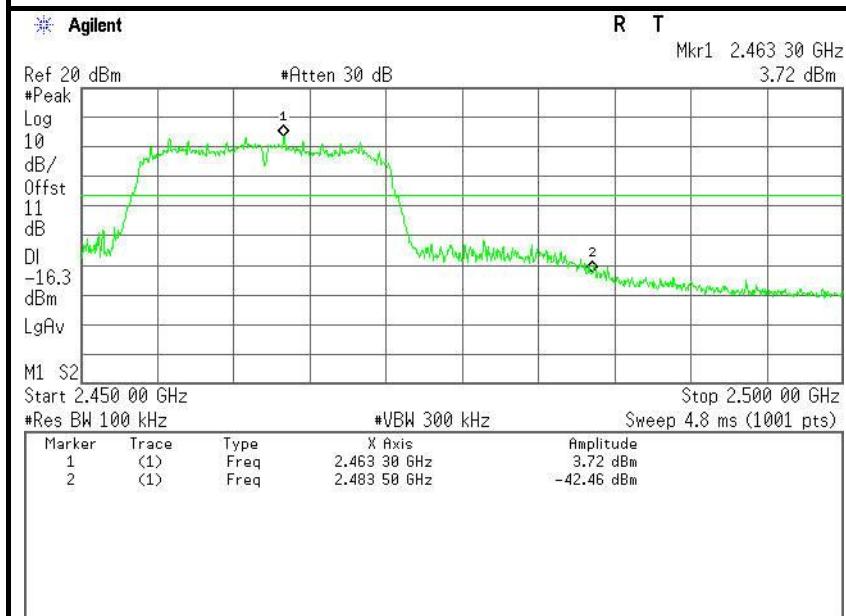


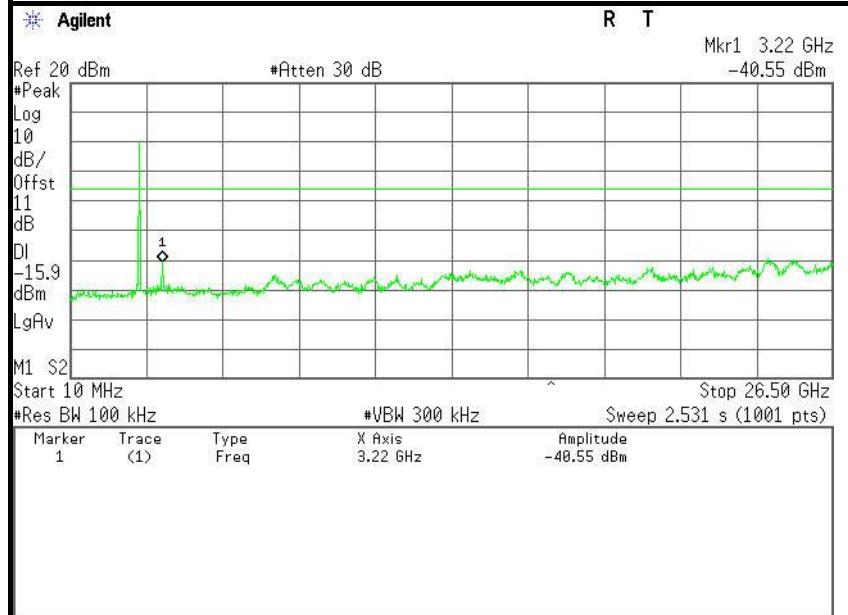
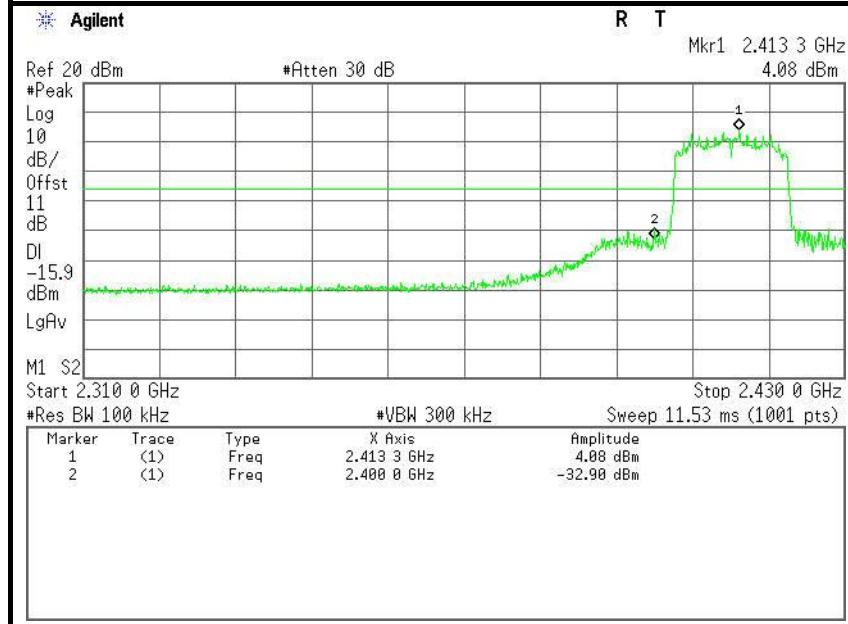
**CH Mid (10MHz ~26.5GHz)**

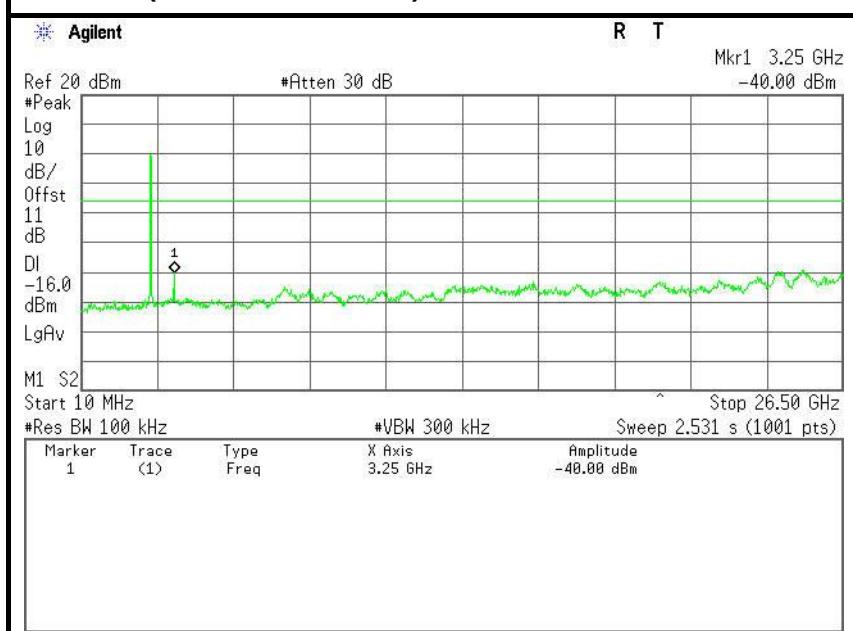
**CH High (10MHz ~26.5GHz)****CH High (2.45GHz ~2.5GHz)**

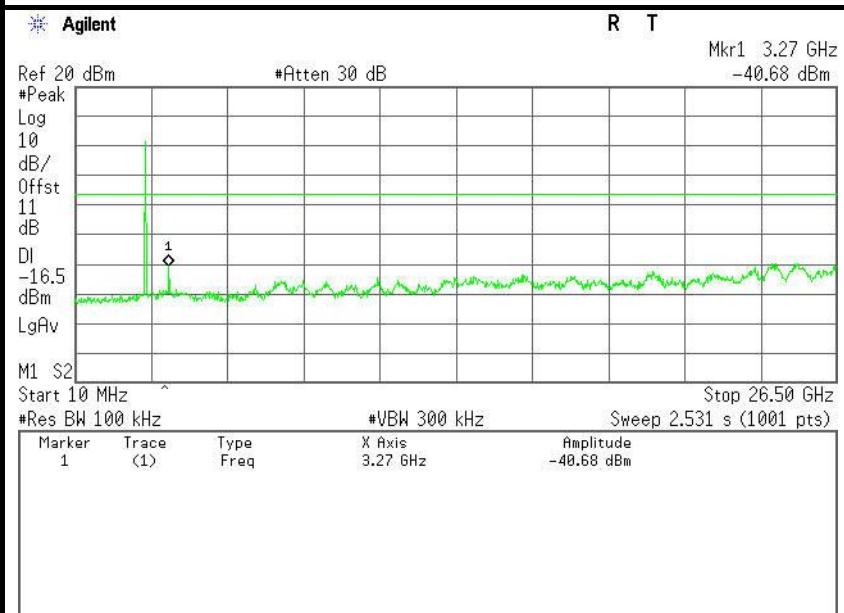
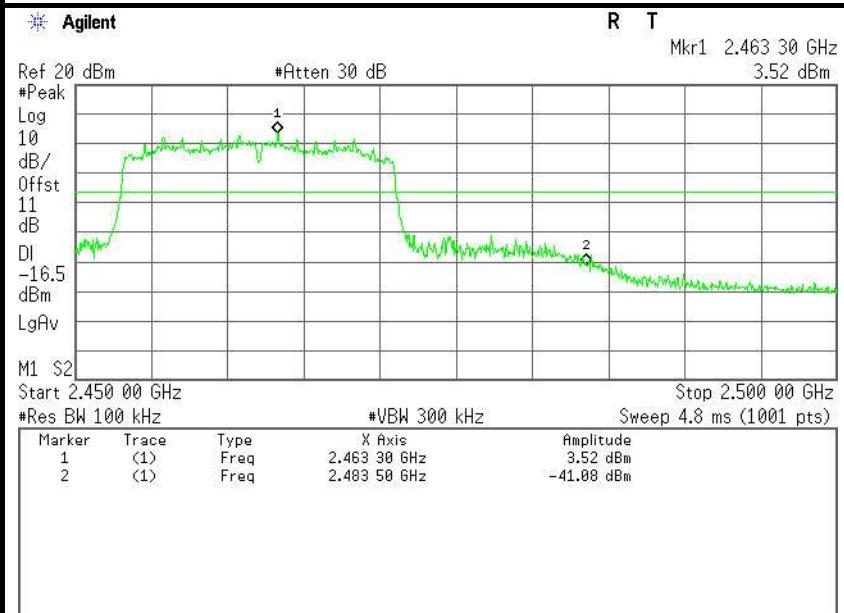
**IEEE 802.11g mode****CH Low (10MHz ~26.5GHz)****CH Low (2.31GHz ~2.43GHz)**

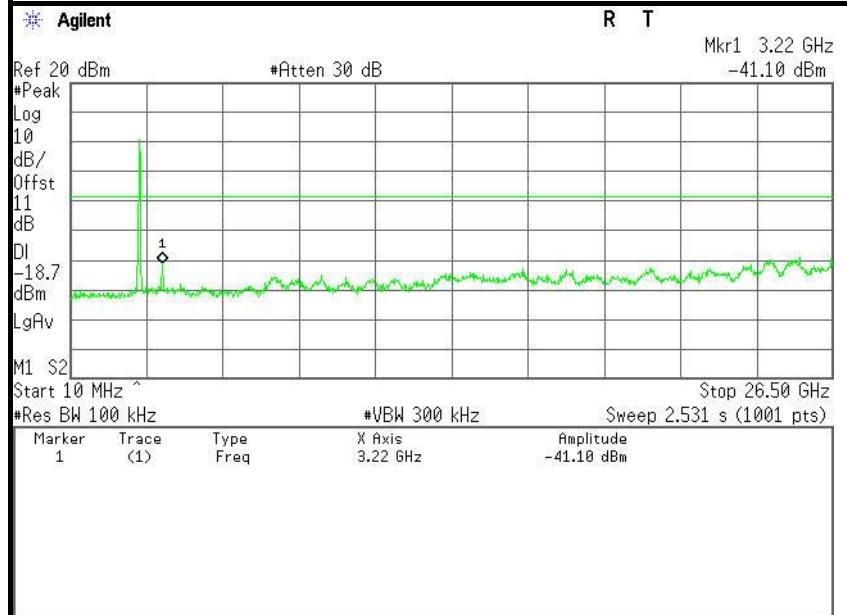
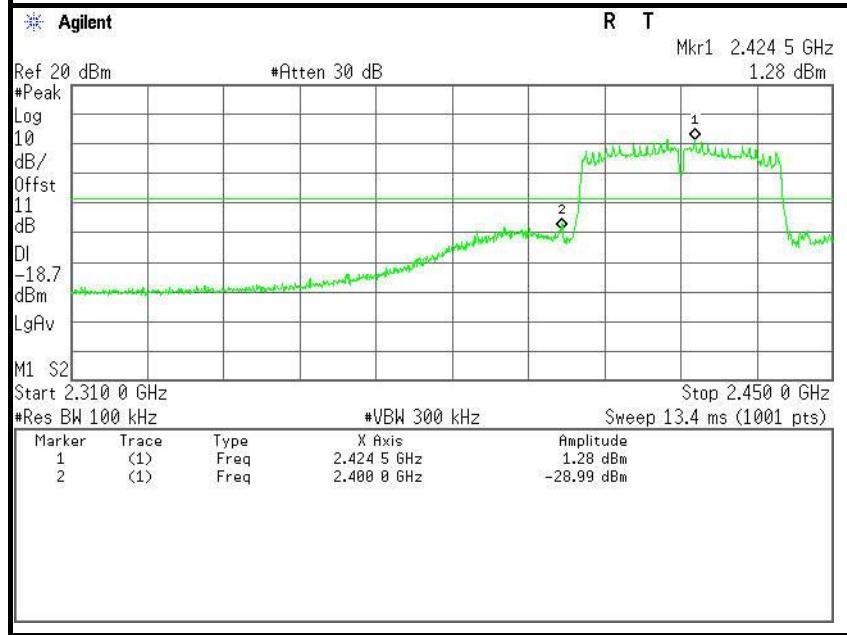
**CH Mid (10MHz ~26.5GHz)**

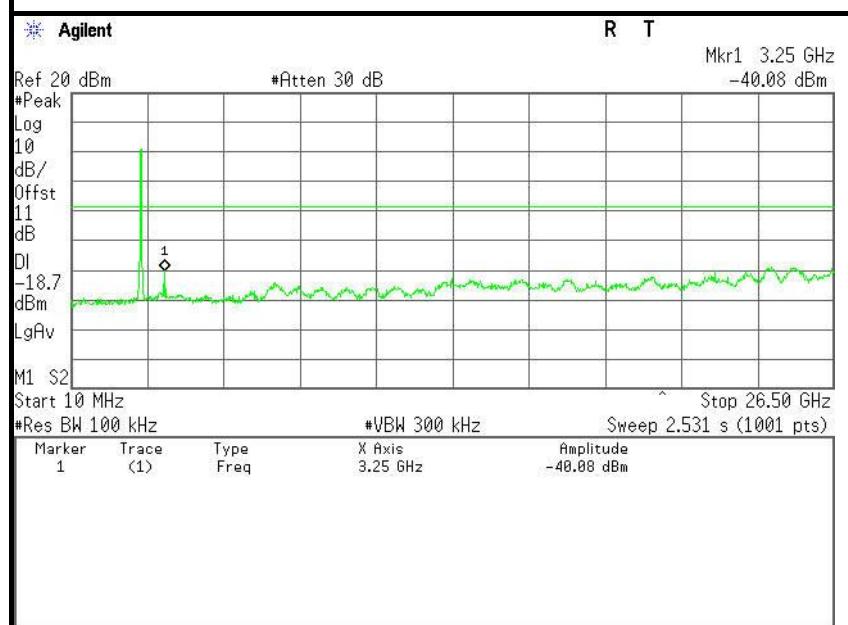
**CH High (10MHz ~26.5GHz)****CH High (2.45GHz ~2.5GHz)**

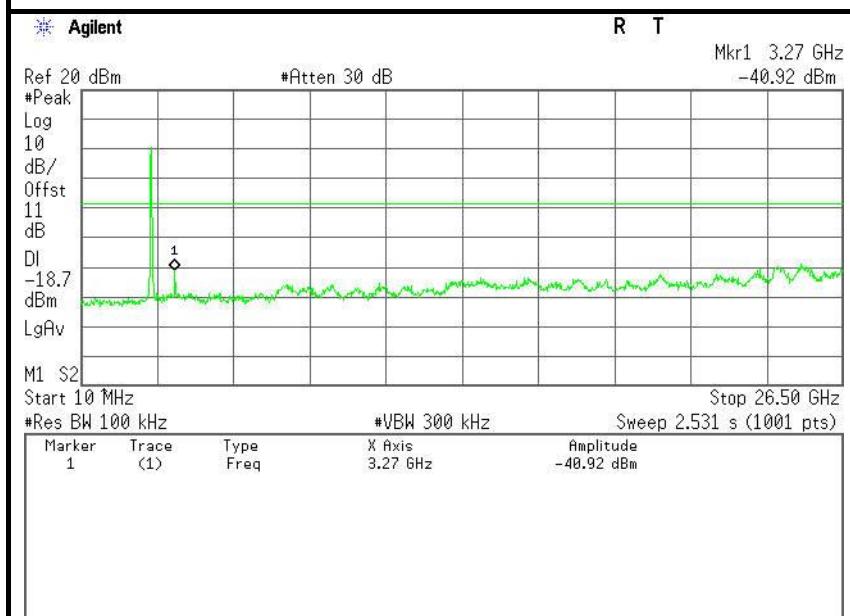
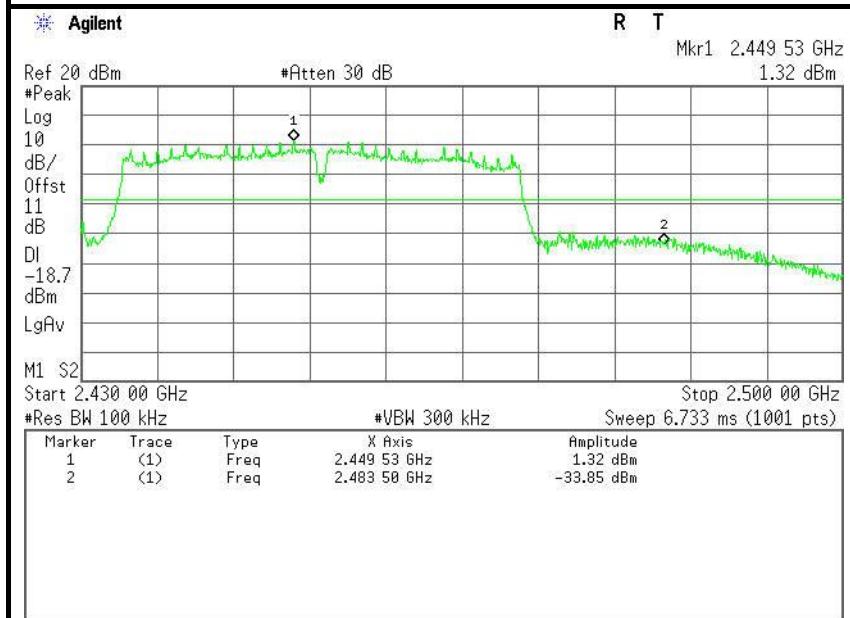
**IEEE 802.11n HT20 MHz mode****CH Low (10MHz ~26.5GHz)****CH Low (2.31GHz ~2.43GHz)**

**CH Mid (10MHz ~26.5GHz)**

**CH High (10MHz ~26.5GHz)****CH High (2.45GHz ~2.5GHz)**

**IEEE 802.11n HT40 MHz mode****CH Low (10MHz ~26.5GHz)****CH Low (2.31GHz ~2.45GHz)**

**CH Mid (10MHz ~26.5GHz)**

**CH High (10MHz ~26.5GHz)****CH High (2.43GHz ~2.5GHz)**



7.2.2. RADIATED EMISSIONS MEASUREMENT

7.2.2.1. LIMITS OF RADIATED EMISSIONS MEASUREMENT

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 (mV/m)	Measurement Distance (m)
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.

1. In the emission table above, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength (μ V/m at 3-meter)	Field Strength (dB μ V/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

NOTE:(1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dB μ V/m) = 20 log Emission level (μ V/m).



7.2.2.2. TEST INSTRUMENTS

Radiated Emission Test Site 966(2)					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	02/28/2015	02/27/2016
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	02/28/2015	02/27/2016
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2015	03/18/2016
High Noise Amplifier	Agilent	8449B	3008A01838	02/28/2015	02/27/2016
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	02/28/2015	02/27/2016
Bilog Antenna	SCHAFFNER	CBL6143	5082	02/28/2015	02/27/2016
Horn Antenna	SCHWARZBECK	BBHA9120	D286	02/28/2015	02/27/2016
Loop Antenna	COM-POWER	AL-130	121044	09/25/2015	09/24/2016
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/28/2015	02/27/2016
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The FCC Site Registration number is 101879.
3. N.C.R = No Calibration Required.



7.2.2.3. TEST PROCEDURE (please refer to measurement standard)

1. The EUT is placed on a turntable, which is 0.8m or 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

Below 1GHz:

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz:

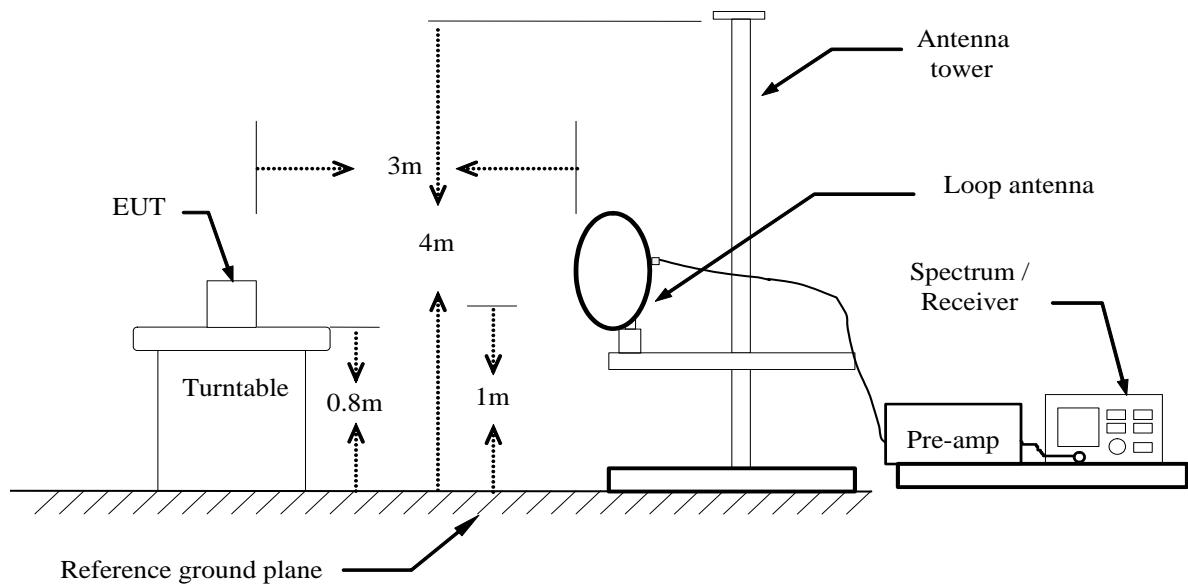
(a) PEAK: RBW=1MHz,VBW=3MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO / Detector=Peak

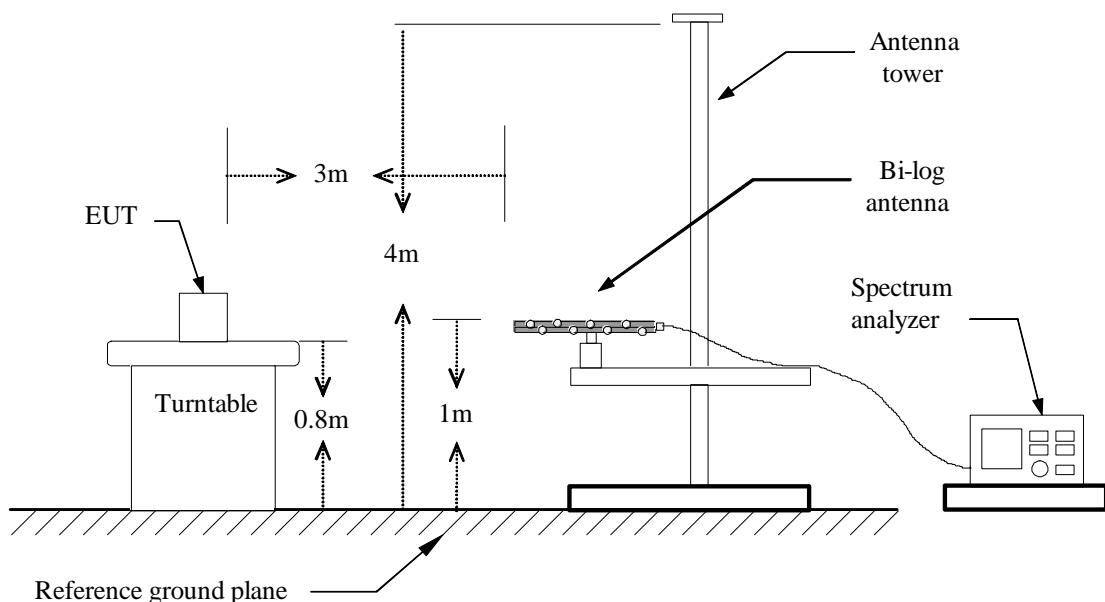
7. Repeat above procedures until the measurements for all frequencies
8. are complete.

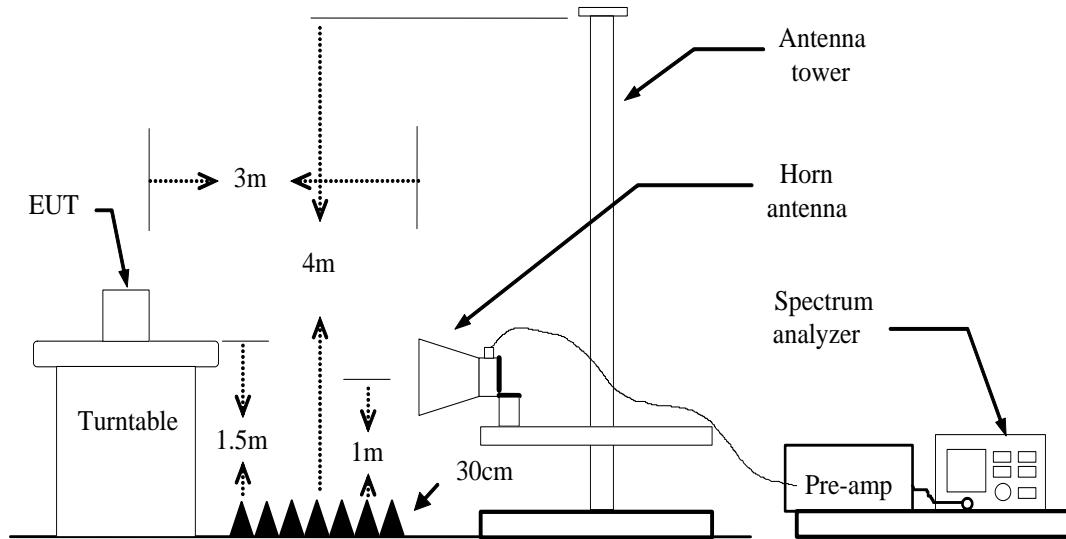
7.2.2.4. TEST SETUP

Below 30MHz



Below 1 GHz



Above 1 GHz

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.



7.2.2.5. DATA SAMPLE

Below 1GHz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXX.XXXX	36.37	-12.20	24.17	40.00	-15.83	V	QP

Frequency (MHz) = Emission frequency in MHz
 Reading (dBuV) = Uncorrected Analyzer / Receiver reading
 Correct Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
 Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
 Limit (dBuV/m) = Limit stated in standard
 Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
 Q.P. = Quasi-peak Reading

Above 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXXX.XXXX	62.09	-11.42	50.67	74.00	-23.33	V	Peak
XXXX.XXXX	49.78	-11.42	38.36	54.00	-15.64	V	AVG

Frequency (MHz) = Emission frequency in MHz
 Reading (dBuV) = Uncorrected Analyzer / Receiver reading
 Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
 Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
 Limit (dBuV/m) = Limit stated in standard
 Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
 Peak = Peak Reading
 AVG = Average Reading

Calculation Formula

Margin (dB) = Result (dBuV/m) – Limits (dBuV/m)
 Result (dBuV/m) = Reading (dBuV) + Correction Factor



7.2.2.6. TEST RESULTS

Below 1 GHz

Test Mode: TX

Tested by: Eve Wang

Ambient temperature: 24°C

Relative humidity: 52% RH

Date: January 15, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
104.6900	50.95	-22.81	28.14	43.50	-15.36	V	QP
250.1900	52.51	-21.06	31.45	46.00	-14.55	V	QP
333.6100	49.99	-18.31	31.68	46.00	-14.32	V	QP
375.3200	48.07	-16.82	31.25	46.00	-14.75	V	QP
580.9600	48.98	-13.10	35.88	46.00	-10.12	V	QP
666.3200	49.67	-12.22	37.45	46.00	-8.55	V	QP
68.8000	54.02	-25.49	28.53	40.00	-11.47	H	QP
126.0300	51.47	-20.90	30.57	43.50	-12.93	H	QP
250.1900	52.36	-21.06	31.30	46.00	-14.70	H	QP
375.3200	49.40	-16.82	32.58	46.00	-13.42	H	QP
432.5500	49.72	-15.61	34.11	46.00	-11.89	H	QP
500.4500	45.38	-14.35	31.03	46.00	-14.97	H	QP

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

Notes:

1. Radiated emissions measured in frequency range from 9kHz to 1GHz were made with an instrument using Quasi-peak detector mode.
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. The IF bandwidth of Receiver between 30MHz to 1GHz was 120kHz.
4. Frequency (MHz).
Reading (dB μ V/m) = Emission frequency in MHz
Correction Factor (dB) = Receiver reading
Limit (dB μ V/m) = Antenna factor + Cable loss – Amplifier gain
Margin (dB) = Limit stated in standard
Antenna Pole (H/V) = Measured (dB μ V/m) – Limits (dB μ V/m)
Margin (dB) = Current carrying line of reading

**Above 1 GHz****Test Mode: TX / IEEE 802.11b(CH Low)****Tested by: Eve Wang****Ambient temperature: 24°C Relative humidity: 52% RH****Date: January 8, 2016**

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3220.000	45.02	-0.99	44.03	74.00	-29.97	V	peak
4435.000	40.86	3.12	43.98	74.00	-30.02	V	peak
5230.000	40.55	5.39	45.94	74.00	-28.06	V	peak
5590.000	40.95	5.91	46.86	74.00	-27.14	V	peak
6730.000	39.62	7.26	46.88	74.00	-27.12	V	peak
7435.000	40.66	8.55	49.21	74.00	-24.79	V	peak
<hr/>							
2170.000	43.56	-4.07	39.49	74.00	-34.51	H	Peak
3259.000	42.55	-0.92	41.63	74.00	-32.37	H	Peak
3889.000	41.33	1.12	42.45	74.00	-31.55	H	Peak
4681.000	40.15	3.94	44.09	74.00	-29.91	H	peak
5302.000	40.27	5.52	45.79	74.00	-28.21	H	peak
6463.000	40.34	6.83	47.17	74.00	-26.83	H	peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode:** TX / IEEE 802.11b (CH Mid)**Tested by:** Eve Wang**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** January 8, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1621.000	45.38	-6.65	38.73	74.00	-35.27	V	Peak
2530.000	43.92	-2.21	41.71	74.00	-32.29	V	Peak
3250.000	46.12	-0.94	45.18	74.00	-28.82	V	Peak
4393.000	41.02	2.97	43.99	74.00	-30.01	V	Peak
4933.000	40.52	4.76	45.28	74.00	-28.72	V	Peak
5572.000	40.61	5.90	46.51	74.00	-27.49	V	Peak
1621.000	45.68	-6.65	39.03	74.00	-34.97	H	Peak
2584.000	43.82	-2.11	41.71	74.00	-32.29	H	Peak
4960.000	40.60	4.85	45.45	74.00	-28.55	H	Peak
5311.000	40.63	5.53	46.16	74.00	-27.84	H	Peak
6148.000	40.81	6.32	47.13	74.00	-26.87	H	Peak
6742.000	41.25	7.28	48.53	74.00	-25.47	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode:** TX / IEEE 802.11b (CH High)**Tested by:** Eve Wang**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** January 8, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1270.000	46.06	-7.53	38.53	74.00	-35.47	V	Peak
1747.000	48.93	-6.38	42.55	74.00	-31.45	V	Peak
3286.000	47.33	-0.88	46.45	74.00	-27.55	V	Peak
4645.000	39.94	3.82	43.76	74.00	-30.24	V	Peak
5491.000	40.05	5.85	45.90	74.00	-28.10	V	Peak
6238.000	40.53	6.47	47.00	74.00	-27.00	V	Peak
1504.000	45.69	-6.87	38.82	74.00	-35.18	H	Peak
2548.000	43.05	-2.17	40.88	74.00	-33.12	H	Peak
4006.000	40.89	1.61	42.50	74.00	-31.50	H	Peak
4438.000	40.55	3.13	43.68	74.00	-30.32	H	Peak
5347.000	39.85	5.60	45.45	74.00	-28.55	H	Peak
6319.000	40.37	6.60	46.97	74.00	-27.03	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode:** TX / IEEE 802.11g(CH Low)**Tested by:** Eve Wang**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** January 8, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2557.000	44.33	-2.16	42.17	74.00	-31.83	V	Peak
3223.000	42.25	-0.99	41.26	74.00	-32.74	V	Peak
4474.000	41.57	3.26	44.83	74.00	-29.17	V	Peak
4816.000	41.10	4.38	45.48	74.00	-28.52	V	Peak
5734.000	40.79	5.97	46.76	74.00	-27.24	V	Peak
6472.000	40.82	6.84	47.66	74.00	-26.34	V	Peak
2539.000	43.95	-2.19	41.76	74.00	-32.24	H	Peak
3214.000	42.17	-1.00	41.17	74.00	-32.83	H	Peak
4393.000	40.96	2.97	43.93	74.00	-30.07	H	Peak
4852.000	40.94	4.50	45.44	74.00	-28.56	H	Peak
5644.000	40.51	5.93	46.44	74.00	-27.56	H	Peak
6319.000	40.53	6.60	47.13	74.00	-26.87	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode:** TX / IEEE 802.11g (CH Mid)**Tested by:** Eve Wang**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** January 8, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2566.000	44.23	-2.14	42.09	74.00	-31.91	V	Peak
3250.000	46.50	-0.94	45.56	74.00	-28.44	V	Peak
4258.000	41.10	2.50	43.60	74.00	-30.40	V	Peak
4861.000	40.13	4.53	44.66	74.00	-29.34	V	Peak
5581.000	40.51	5.90	46.41	74.00	-27.59	V	Peak
6364.000	40.53	6.67	47.20	74.00	-26.80	V	Peak
1504.000	47.19	-6.87	40.32	74.00	-33.68	H	Peak
2575.000	44.90	-2.12	42.78	74.00	-31.22	H	Peak
3988.000	40.43	1.54	41.97	74.00	-32.03	H	Peak
4717.000	40.48	4.06	44.54	74.00	-29.46	H	Peak
5554.000	39.46	5.89	45.35	74.00	-28.65	H	Peak
6139.000	40.51	6.31	46.82	74.00	-27.18	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode:** TX / IEEE 802.11g (CH High)**Tested by:** Eve Wang**Ambient temperature:** 24°C**Relative humidity:** 52% RH**Date:** January 8, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2539.000	43.95	-2.19	41.76	74.00	-32.24	V	Peak
3286.000	49.36	-0.88	48.48	74.00	-25.52	V	Peak
4924.000	40.87	4.73	45.60	74.00	-28.40	V	Peak
5851.000	40.90	6.02	46.92	74.00	-27.08	V	Peak
6238.000	40.46	6.47	46.93	74.00	-27.07	V	Peak
6949.000	40.93	7.62	48.55	74.00	-25.45	V	Peak
2566.000	43.94	-2.14	41.80	74.00	-32.20	H	Peak
3286.000	42.63	-0.88	41.75	74.00	-32.25	H	Peak
4249.000	40.92	2.47	43.39	74.00	-30.61	H	Peak
5068.000	40.25	5.10	45.35	74.00	-28.65	H	Peak
6004.000	39.67	6.09	45.76	74.00	-28.24	H	Peak
6301.000	40.27	6.57	46.84	74.00	-27.16	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode:** TX / IEEE 802.11n HT20 MHz (CH Low)**Tested by:** Eve Wang**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** January 8, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2548.000	43.51	-2.17	41.34	74.00	-32.66	V	Peak
3214.000	46.45	-1.00	45.45	74.00	-28.55	V	Peak
4150.000	40.45	2.12	42.57	74.00	-31.43	V	Peak
5257.000	40.61	5.44	46.05	74.00	-27.95	V	Peak
6040.000	40.43	6.14	46.57	74.00	-27.43	V	Peak
6661.000	40.70	7.15	47.85	74.00	-26.15	V	Peak
3214.000	43.38	-1.00	42.38	74.00	-31.62	H	Peak
3871.000	42.17	1.05	43.22	74.00	-30.78	H	Peak
4897.000	40.89	4.64	45.53	74.00	-28.47	H	Peak
5482.000	40.86	5.84	46.70	74.00	-27.30	H	Peak
6292.000	39.86	6.55	46.41	74.00	-27.59	H	Peak
6886.000	40.56	7.52	48.08	74.00	-25.92	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode:** TX / IEEE 802.11n HT20 MHz (CH Mid)**Tested by:** Eve Wang**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** January 8, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
3250.000	47.10	-0.94	46.16	74.00	-27.84	V	Peak
4168.000	41.36	2.18	43.54	74.00	-30.46	V	Peak
4924.000	40.16	4.73	44.89	74.00	-29.11	V	Peak
5491.000	39.82	5.85	45.67	74.00	-28.33	V	Peak
6481.000	40.22	6.86	47.08	74.00	-26.92	V	Peak
7561.000	40.22	8.79	49.01	74.00	-24.99	V	Peak
2530.000	44.13	-2.21	41.92	74.00	-32.08	H	Peak
3061.000	42.65	-1.26	41.39	74.00	-32.61	H	Peak
4447.000	41.25	3.16	44.41	74.00	-29.59	H	Peak
4897.000	41.25	4.64	45.89	74.00	-28.11	H	Peak
5491.000	40.54	5.85	46.39	74.00	-27.61	H	Peak
6103.000	41.42	6.25	47.67	74.00	-26.33	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode:** TX / EEE 802.11n HT20 MHz (CH High)**Tested by:** Eve Wang**Ambient temperature:** 24°C**Relative humidity:** 52% RH**Date:** January 8, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2557.000	42.59	-2.16	40.43	74.00	-33.57	V	Peak
3880.000	41.39	1.08	42.47	74.00	-31.53	V	Peak
4537.000	40.90	3.47	44.37	74.00	-29.63	V	Peak
5014.000	40.02	5.00	45.02	74.00	-28.98	V	Peak
5491.000	40.32	5.85	46.17	74.00	-27.83	V	Peak
5968.000	40.27	6.07	46.34	74.00	-27.66	V	Peak
<hr/>							
2530.000	45.13	-2.21	42.92	74.00	-31.08	H	Peak
3808.000	40.95	0.78	41.73	74.00	-32.27	H	Peak
4447.000	41.25	3.16	44.41	74.00	-29.59	H	Peak
5032.000	41.04	5.04	46.08	74.00	-27.92	H	Peak
5482.000	40.46	5.84	46.30	74.00	-27.70	H	Peak
5923.000	40.26	6.05	46.31	74.00	-27.69	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode:** TX/ IEEE 802.11n HT40 MHz (CH Low)**Tested by:** Eve Wang**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** January 8, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2503.000	44.22	-2.25	41.97	74.00	-32.03	V	Peak
3232.000	43.73	-0.97	42.76	74.00	-31.24	V	Peak
4330.000	40.97	2.75	43.72	74.00	-30.28	V	Peak
5356.000	40.59	5.61	46.20	74.00	-27.80	V	Peak
5707.000	40.16	5.96	46.12	74.00	-27.88	V	Peak
6463.000	40.05	6.83	46.88	74.00	-27.12	V	Peak
1594.000	45.86	-6.71	39.15	74.00	-34.85	H	Peak
2548.000	43.76	-2.17	41.59	74.00	-32.41	H	Peak
4429.000	41.19	3.10	44.29	74.00	-29.71	H	Peak
5032.000	39.84	5.04	44.88	74.00	-29.12	H	Peak
5482.000	40.13	5.84	45.97	74.00	-28.03	H	Peak
6166.000	40.46	6.35	46.81	74.00	-27.19	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode:** TX / IEEE 802.11n HT40 MHz (CH Mid)**Tested by:** Eve Wang**Ambient temperature:** 24°C**Relative humidity:** 52% RH**Date:** January 8, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1945.000	47.78	-5.35	42.43	74.00	-31.57	V	Peak
3250.000	45.98	-0.94	45.04	74.00	-28.96	V	Peak
4069.000	41.95	1.83	43.78	74.00	-30.22	V	Peak
4897.000	40.73	4.64	45.37	74.00	-28.63	V	Peak
6247.000	41.61	6.48	48.09	74.00	-25.91	V	Peak
6706.000	41.10	7.22	48.32	74.00	-25.68	V	Peak
<hr/>							
2818.000	43.72	-1.69	42.03	74.00	-31.97	H	Peak
3250.000	44.36	-0.94	43.42	74.00	-30.58	H	Peak
4231.000	40.78	2.40	43.18	74.00	-30.82	H	Peak
4906.000	40.24	4.67	44.91	74.00	-29.09	H	Peak
5518.000	40.84	5.88	46.72	74.00	-27.28	H	Peak
6463.000	39.92	6.83	46.75	74.00	-27.25	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Test Mode:** TX/ IEEE 802.11n HT40 MHz (CH High)**Tested by:** Eve Wang**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** January 8, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2476.000	43.83	-2.39	41.44	74.00	-32.56	V	Peak
3268.000	47.46	-0.91	46.55	74.00	-27.45	V	Peak
4564.000	41.41	3.56	44.97	74.00	-29.03	V	Peak
5338.000	40.84	5.58	46.42	74.00	-27.58	V	Peak
5941.000	40.16	6.06	46.22	74.00	-27.78	V	Peak
6436.000	39.56	6.79	46.35	74.00	-27.65	V	Peak
2530.000	43.77	-2.21	41.56	74.00	-32.44	H	Peak
3286.000	41.62	-0.88	40.74	74.00	-33.26	H	Peak
4357.000	40.84	2.85	43.69	74.00	-30.31	H	Peak
5266.000	40.66	5.45	46.11	74.00	-27.89	H	Peak
6013.000	40.07	6.10	46.17	74.00	-27.83	H	Peak
6499.000	40.61	6.89	47.50	74.00	-26.50	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. 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.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



7.3. 6dB BANDWIDTH MEASUREMENT

7.3.1. LIMITS

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz. The minimum 6 dB bandwidth shall be at least 500 kHz.

7.3.2. TEST INSTRUMENTS

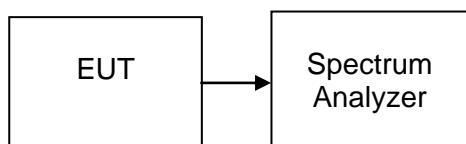
Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US44300399	02/28/2015	02/27/2016

7.3.3. TEST PROCEDURES (please refer to measurement standard)

8.1 Option 1:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.3.4. TEST SETUP





7.3.5. TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	7590	>500	PASS
Mid	2437	8105		PASS
High	2462	8083		PASS

Test mode: IEEE 802.11g

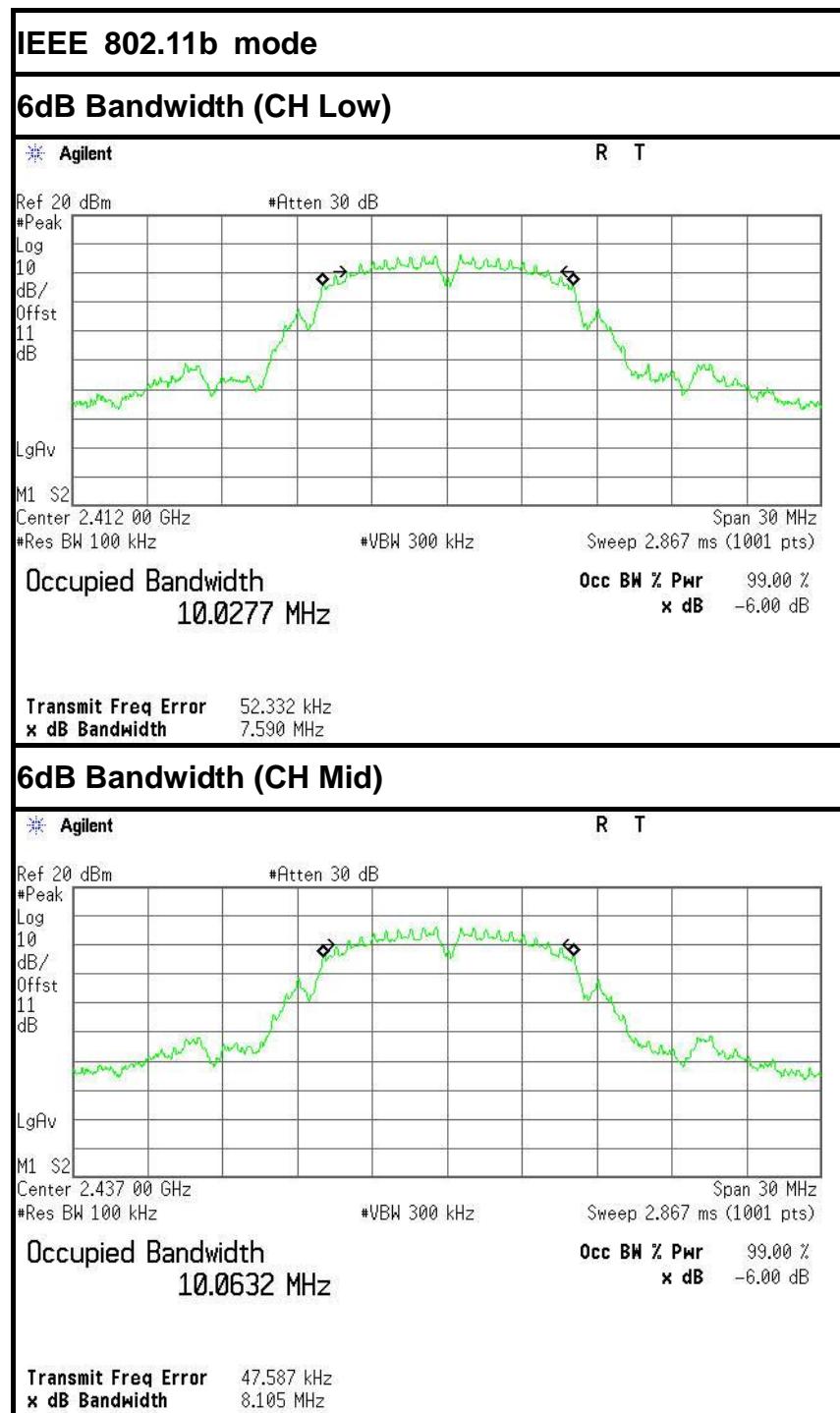
Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	15064	>500	PASS
Mid	2437	15080		PASS
High	2462	15039		PASS

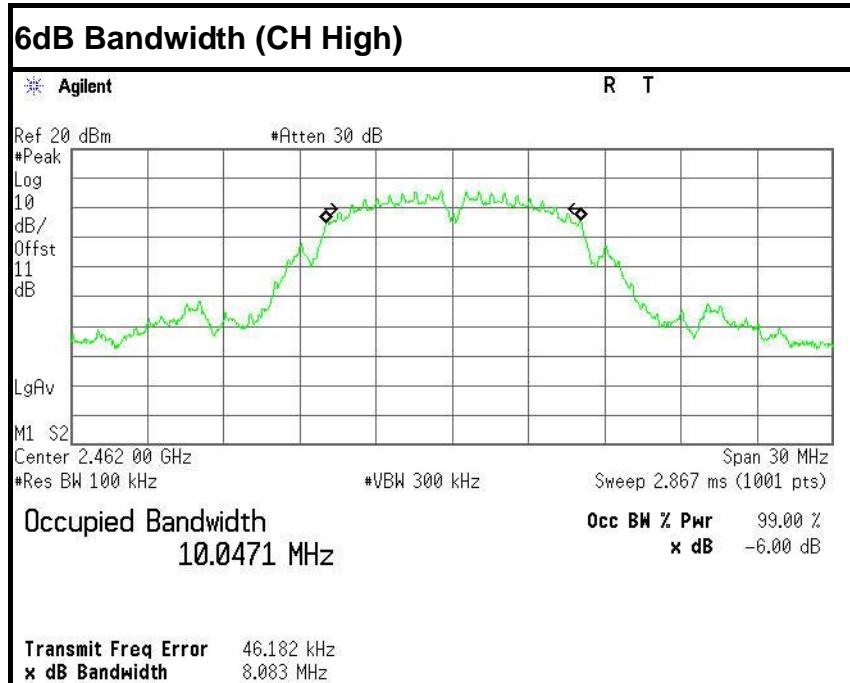
Test mode: IEEE 802.11n HT20 MHz

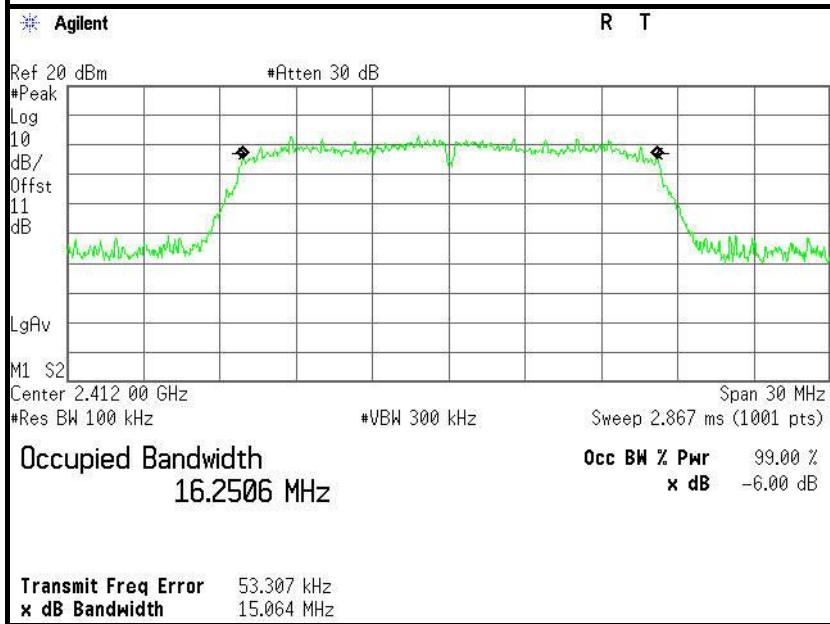
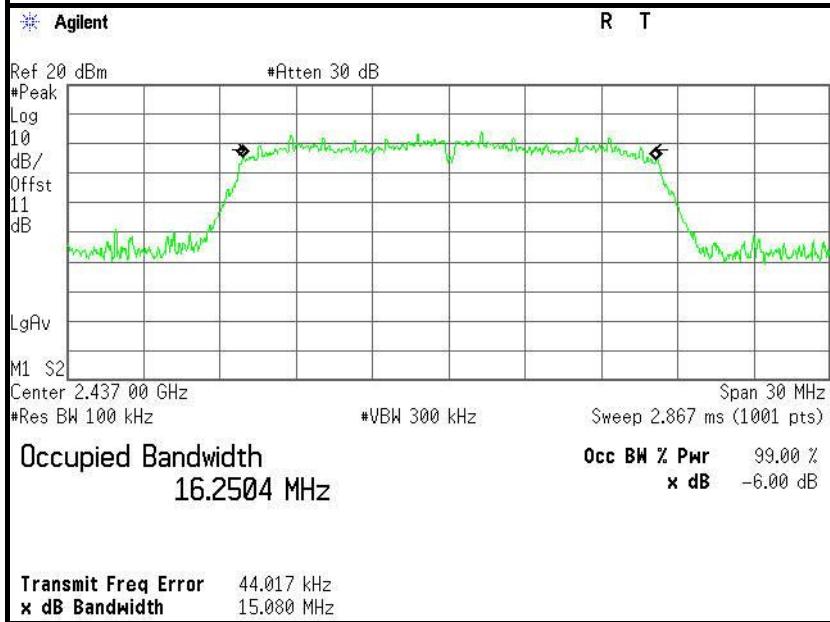
Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	15069	>500	PASS
Mid	2437	15033		PASS
High	2462	15110		PASS

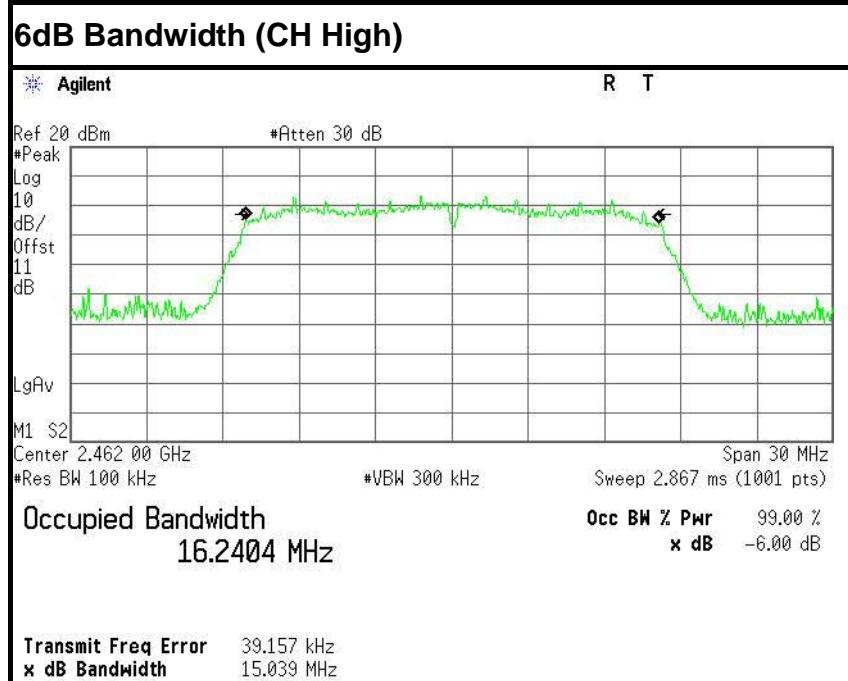
Test mode: IEEE 802.11n HT40 MHz

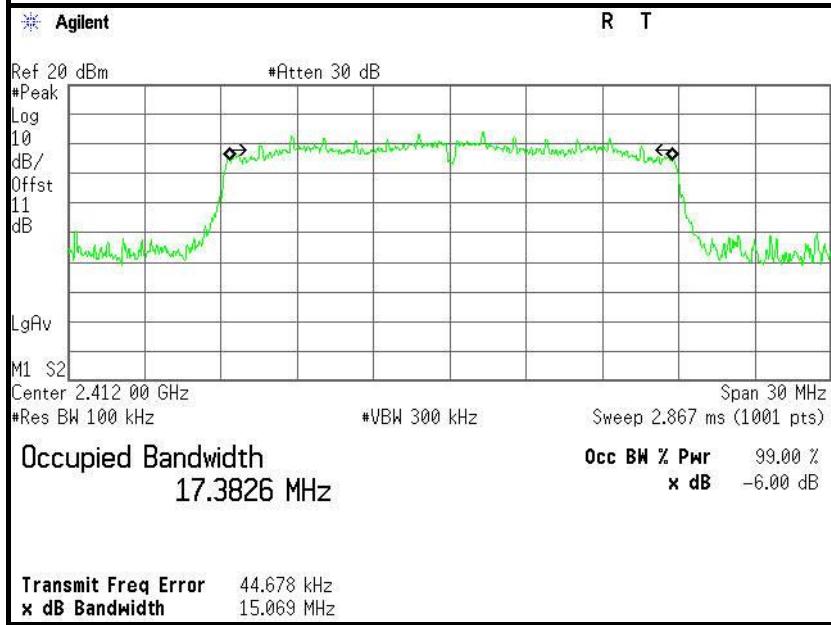
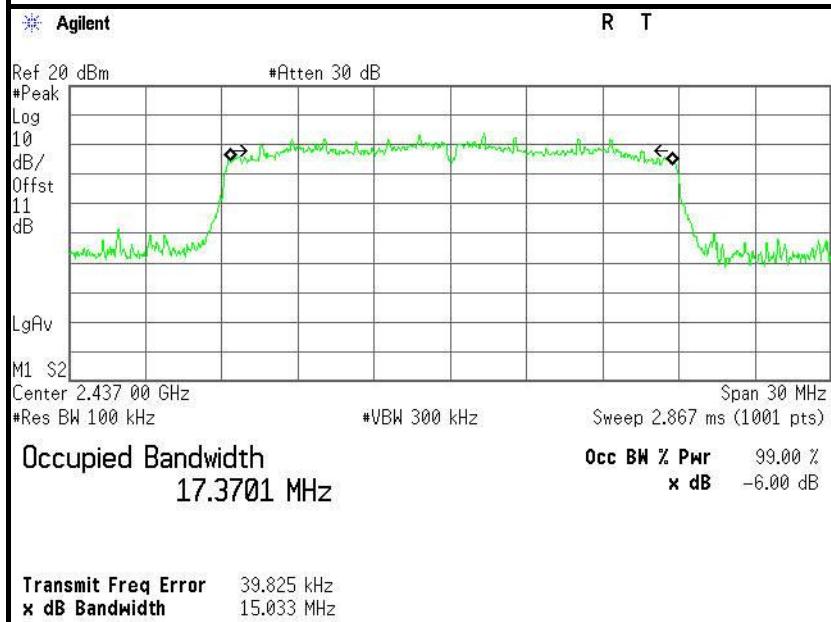
Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2422	35158	>500	PASS
Mid	2437	35154		PASS
High	2452	36184		PASS

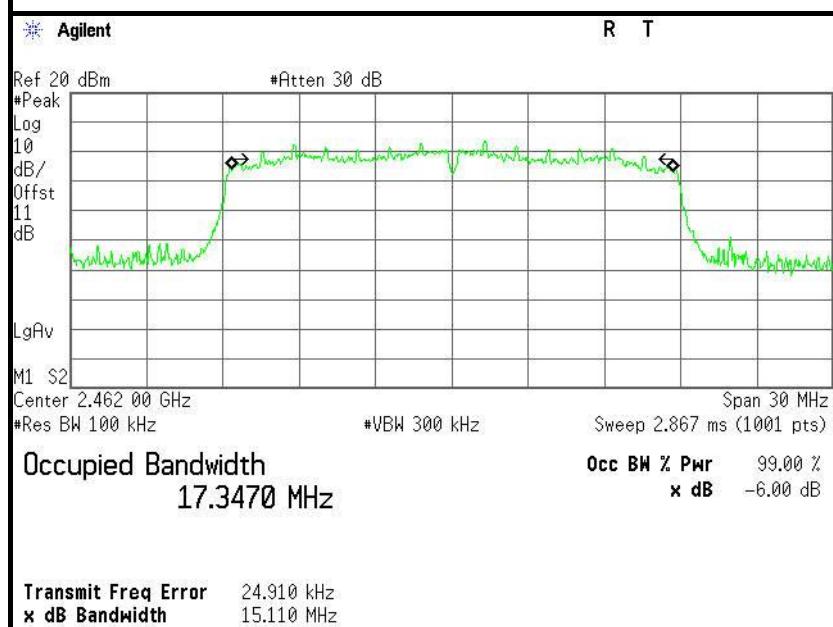
**Test Plot**

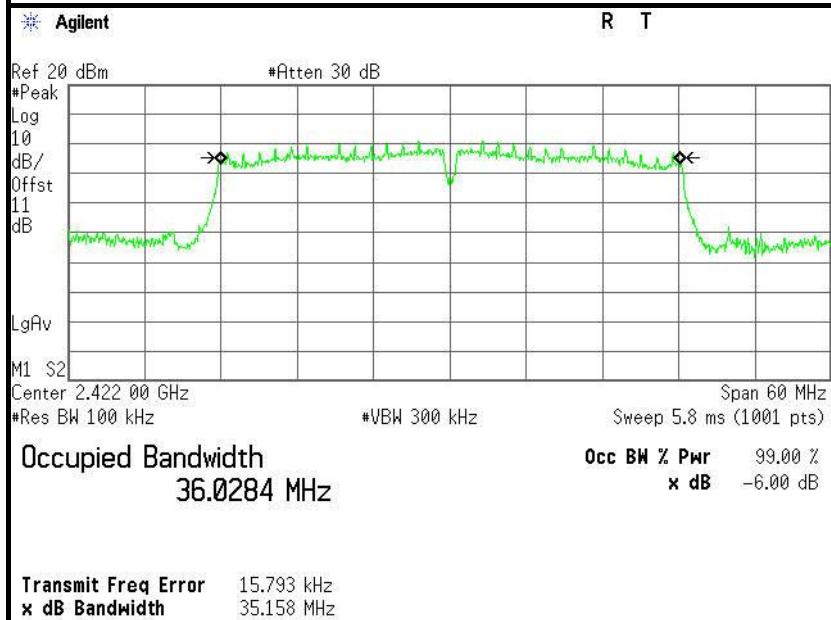


**IEEE 802.11g mode****6dB Bandwidth (CH Low)****6dB Bandwidth (CH Mid)**



**IEEE 802.11n HT20 MHz mode****6dB Bandwidth (CH Low)****6dB Bandwidth (CH Mid)**

**6dB Bandwidth (CH High)**

**IEEE 802.11n HT40 MHz mode****6dB Bandwidth (CH Low)****6dB Bandwidth (CH Mid)**