Partial FCC Test Report

Report No.:	RF160526C28
FCC ID:	PPD-AR5B22
Test Model:	AR5B22
Received Date:	May 26, 2016
Test Date:	Jun. 02, 2016 ~ Jun. 14, 2016
Issued Date:	Jun. 24, 2016
Applicant:	Qualcomm Atheros, Inc.
Address:	1700 Technology Drive, San Jose, CA95110
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)
Test Location (1):	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.
Test Location (2):	No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan, R.O.C

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Release Control Record

Issue No.	Description	Date Issued
RF160526C28	Original Release	Jun. 24, 2016

1 Certificate of Conformity

Product:	PCIE 802.11a/b/g/n 2.4GHz/5GHz+USB BT 4.0 card
Brand:	Atheros
Test Model:	AR5B22
Sample Status:	Identical Prototype
Applicant:	Qualcomm Atheros, Inc.
Test Date:	Jun. 02, 2016 ~ Jun. 14, 2016
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Evonne Liu , **Date:** Jun. 24, 2016

Evonne Liu / Specialist

Approved by : Stanley Wu , **Date:** Jun. 24, 2016

Stanley Wu / Assistant Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	**Test Item**	**Result**	**Remarks**
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -19.21 dB at 0.39242 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.04 dB at 2484 MHz.
15.247(d)	Antenna Port Emission	N/A	Refer to Note
15.247(a)(2)	6 dB Bandwidth	N/A	Refer to Note
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	N/A	Refer to Note
15.203	Antenna Requirement	N/A	Refer to Note

Note: Only test item of Conducted and Radiated Emissions, Conducted power were performed for this report. Other testing data is referring to module report (Test Report No.: RF110907E02 R1).

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:
The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	PCIE 802.11a/b/g/n 2.4GHz/5GHz+USB BT 4.0 card
Brand	Atheros
Test Model	AR5B22
Status of EUT	Identical Prototype
Power Supply Rating	19.5 Vdc (adapter)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to MCS7
Operating Frequency	2412 ~ 2462 MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	634.829 mW
Antenna Type	Refer to Note as below
Antenna Connector	N/A
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

Modulation Mode	TX Function
802.11b	2TX(MIMO)
802.11g	2TX(MIMO)
802.11n (HT20)	2TX(MIMO)
802.11n (HT40)	2TX(MIMO)

2. The antenna information is listed as below.

Antenna Type	Brand Name	Parts Number	Antenna Gain (dBi)
			2.4GHz
Dipole	Laird	WLAN Main Antenna: PDV24515-DE1 WLAN Aux Antenna: PDV24515-DE1	Main: 2.9 Aux: 2.9
Monopole	Taoglas Antenna Solution Ltd.	WLAN Main Antenna: MA761.B.BICG.014 WLAN Aux Antenna: MA761.B.BICG.014	Main: 2.82 Aux: 2.79

Note: The EUT antenna is a specified antenna: Professional installation antenna. It complies with the standard requirement.

3. The EUT is authorized for use in specific End-product. Please refer to below table for more details.

Item	Brand	Model
Industrial Computer	Dell	N01PC

4. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

7 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	7	2442
4	2427	8	2447
5	2432	9	2452
6	2437		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	-	Dipol Antenna
B	√	√	√	-	Momopole Antenna

Where **RE≥1G:** Radiated Emission above 1 GHz **RE<1G:** Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.
NOTE: "-"means no effect.

Radiated Emission Test (Above 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0

Radiated Emission Test (Below 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11n (HT40)	3 to 9	9	OFDM	BPSK	MCS0
B	802.11g	1 to 11	1	OFDM	BPSK	6.0

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11n (HT40)	3 to 9	9	OFDM	BPSK	MCS0
B	802.11g	1 to 11	1	OFDM	BPSK	6.0

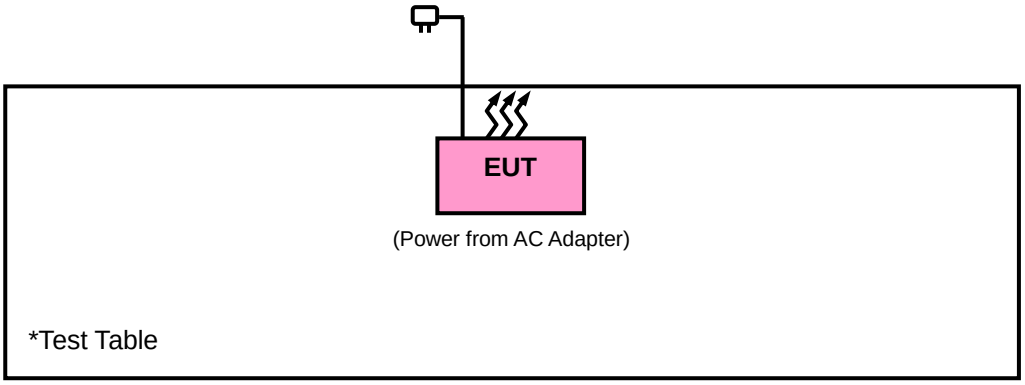
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Toby Tian

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)
558074 D01 DTS Meas Guidance v03r05
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

Frequencies (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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manaufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY50010135	Jul. 18, 2015	Jul. 17, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2015	Dec. 16, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Jan. 07, 2016	Jan. 06, 2017
HORN Antenna ETS-Lindgren	3117	00143293	Jan. 04, 2016	Jan. 03, 2017
Bluetooth Tester	CBT	100980	Apr. 27, 2015	Apr. 26, 2017
Loop Antenna	EM-6879	269	Jul. 31, 2015	Jul. 30, 2016
Agilent Communications Tester-Wireless	8960 Series 10	MY53201073	Jul. 03, 2015	Jul. 02, 2017
Preamplifier Agilent	310N	187226	Jun. 29, 2015	Jun. 28, 2016
Preamplifier Agilent	83017A	MY39501357	Jun. 29, 2015	Jun. 28, 2016
Power Meter Anritsu	ML2495A	1232002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor Anritsu	MA2411B	1207325	Sep. 21, 2015	Sep. 20, 2016
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 27, 2015	Jun. 26, 2016
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 27, 2015	Jun. 26, 2016
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA

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 test was performed in HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The FCC Site Registration No. is 149147.
5. The IC Site Registration No. is IC7450I-1.

4.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

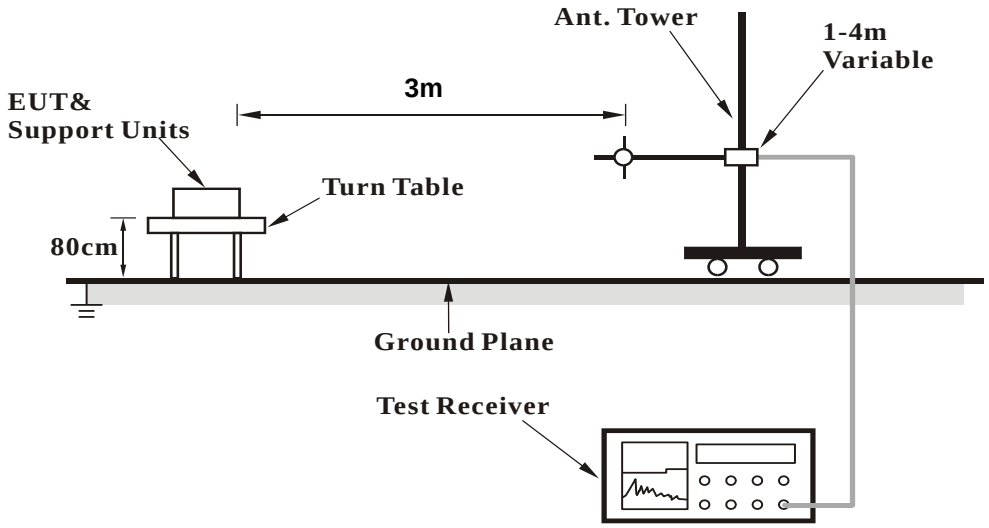
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for RMS Average (Duty cycle < 98 %) for Average detection (AV) at frequency above 1 GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

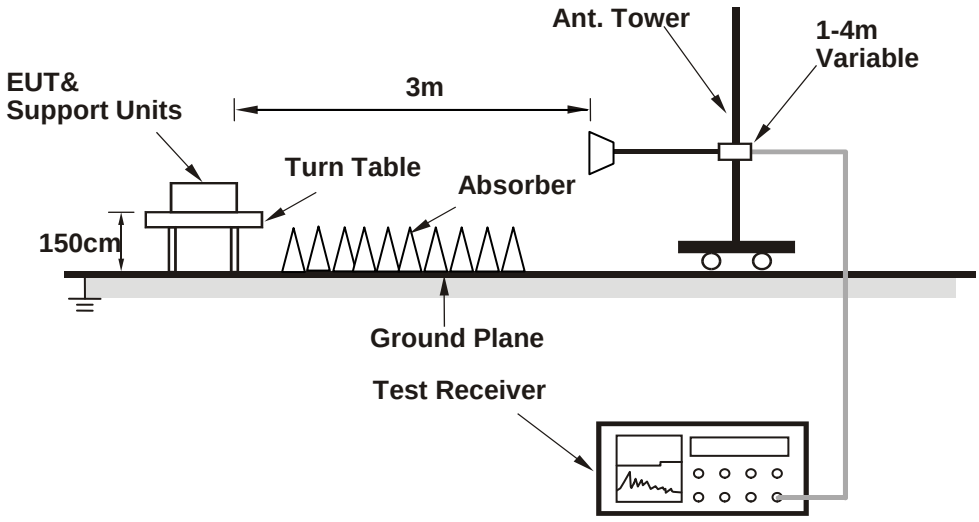
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1 GHz>



<Frequency Range above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

a. Placed the EUT on a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

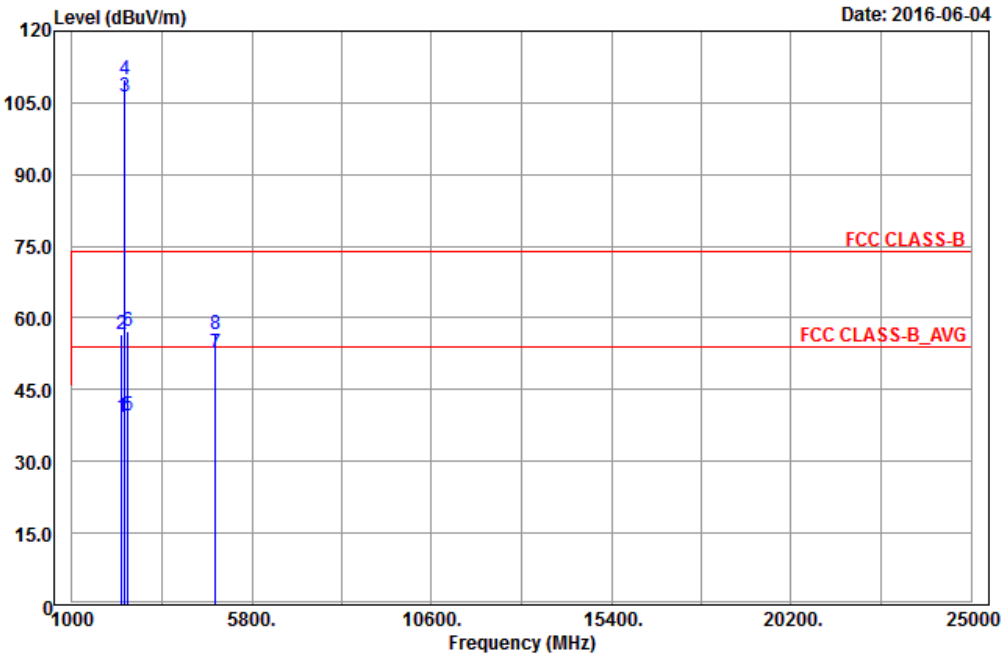
Above 1 GHz Data：

Mode A

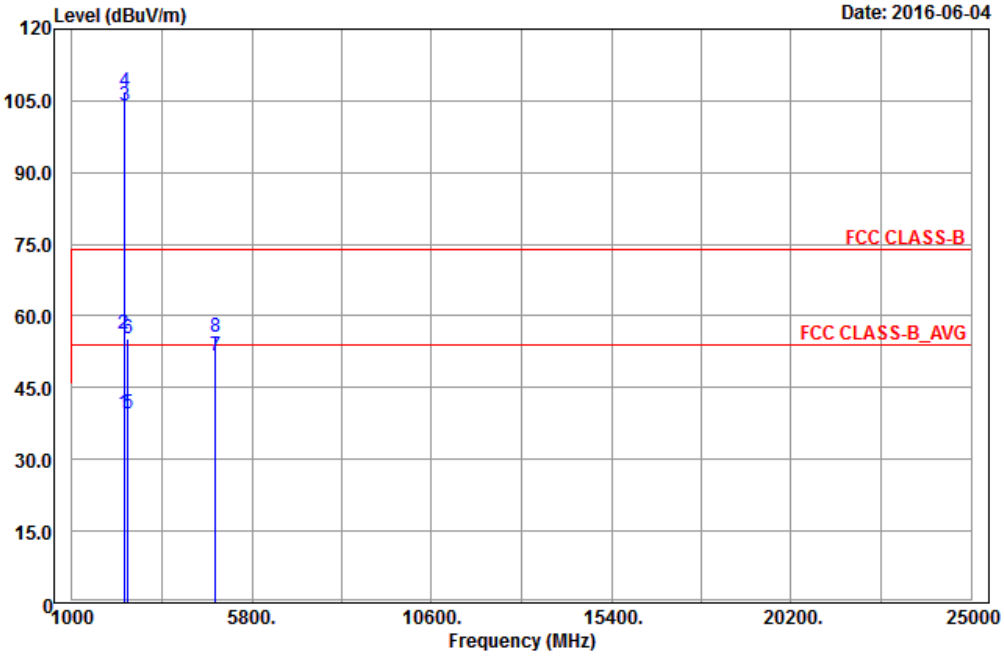
802.11b

EUT Test Condition		Measurement Detail	
Channel	Channel 1	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2334	39.3	37.76	54	-14.7	31.73	5.33	35.52	111	179	Average
2334	56.53	54.99	74	-17.47	31.73	5.33	35.52	111	179	Peak
2412	106.32	104.55			31.81	5.43	35.47	111	179	Average
2412	109.73	107.96			31.81	5.43	35.47	111	179	Peak
2492	39.48	37.46	54	-14.52	31.9	5.53	35.41	111	179	Average
2492	57.11	55.09	74	-16.89	31.9	5.53	35.41	111	179	Peak
4824	52.69	44.56	54	-1.31	33.97	8.26	34.1	115	140	Average
4824	56.47	48.34	74	-17.53	33.97	8.26	34.1	115	140	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386	39.41	37.7	54	-14.59	31.8	5.4	35.49	100	90	Average
2386	56.19	54.48	74	-17.81	31.8	5.4	35.49	100	90	Peak
2412	104.04	102.27			31.81	5.43	35.47	100	90	Average
2412	107.05	105.28			31.81	5.43	35.47	100	90	Peak
2484	39.53	37.57	54	-14.47	31.88	5.5	35.42	100	90	Average
2484	55.3	53.34	74	-18.7	31.88	5.5	35.42	100	90	Peak
4824	51.78	43.65	54	-2.22	33.97	8.26	34.1	154	159	Average
4824	55.69	47.56	74	-18.31	33.97	8.26	34.1	154	159	Peak

Remarks:

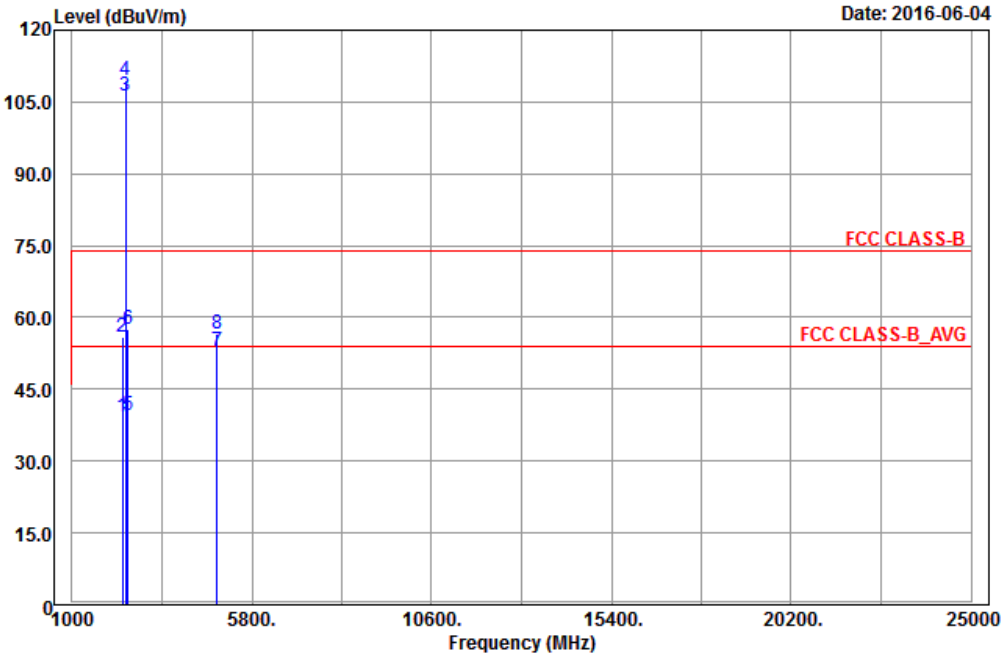
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

   Margin Value = Emission Level – Limit value

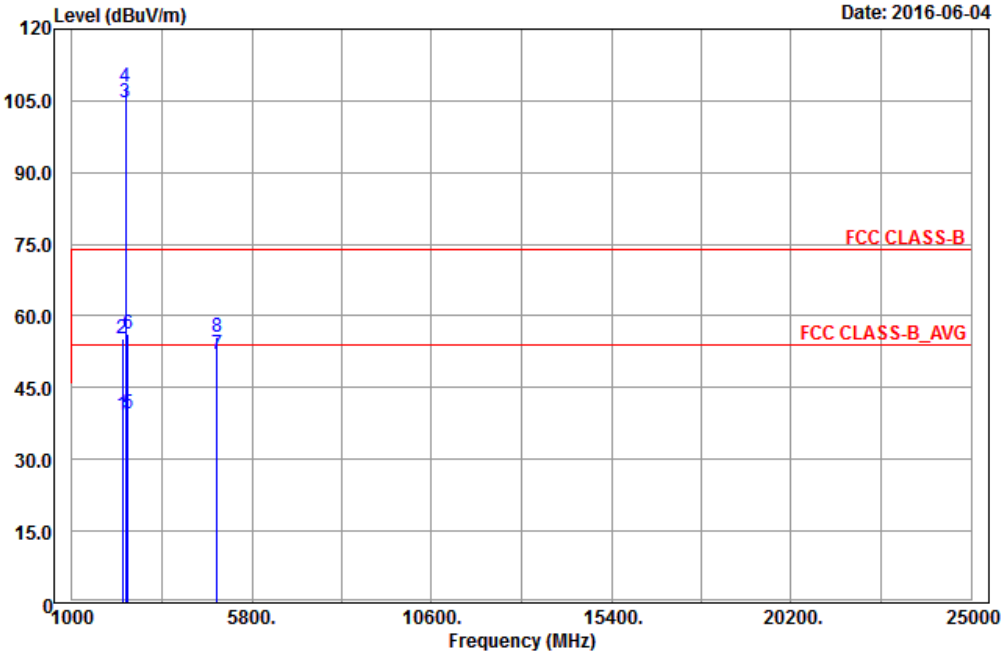
2. 2412 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2352	39.24	37.65	54	-14.76	31.76	5.33	35.5	116	179	Average
2352	56.02	54.43	74	-17.98	31.76	5.33	35.5	116	179	Peak
2437	106.31	104.46			31.85	5.46	35.46	116	179	Average
2437	109.61	107.76			31.85	5.46	35.46	116	179	Peak
2484	39.71	37.75	54	-14.29	31.88	5.5	35.42	116	179	Average
2484	57.49	55.53	74	-16.51	31.88	5.5	35.42	116	179	Peak
4874	52.94	44.75	54	-1.06	33.98	8.27	34.06	163	156	Average
4874	56.57	48.38	74	-17.43	33.98	8.27	34.06	163	156	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2350	39.38	37.81	54	-14.62	31.74	5.33	35.5	220	90	Average
2350	55.27	53.7	74	-18.73	31.74	5.33	35.5	220	90	Peak
2437	104.61	102.76			31.85	5.46	35.46	220	90	Average
2437	107.86	106.01			31.85	5.46	35.46	220	90	Peak
2486	39.66	37.67	54	-14.34	31.88	5.53	35.42	220	90	Average
2486	56.33	54.34	74	-17.67	31.88	5.53	35.42	220	90	Peak
4874	52.15	43.96	54	-1.85	33.98	8.27	34.06	241	103	Average
4874	55.65	47.46	74	-18.35	33.98	8.27	34.06	241	103	Peak

Remarks:

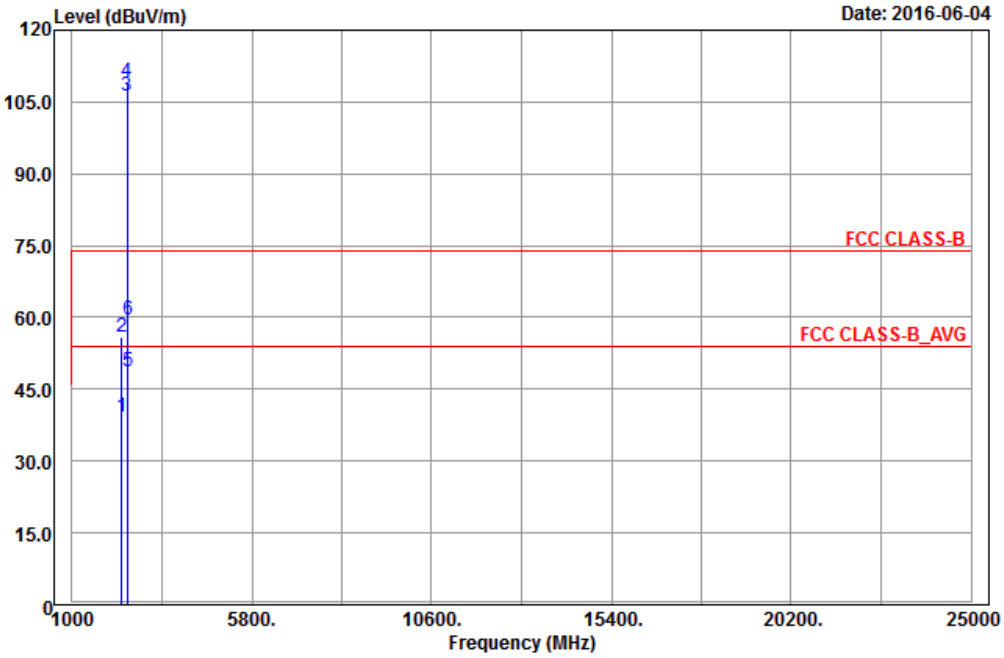
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

   Margin Value = Emission Level – Limit value

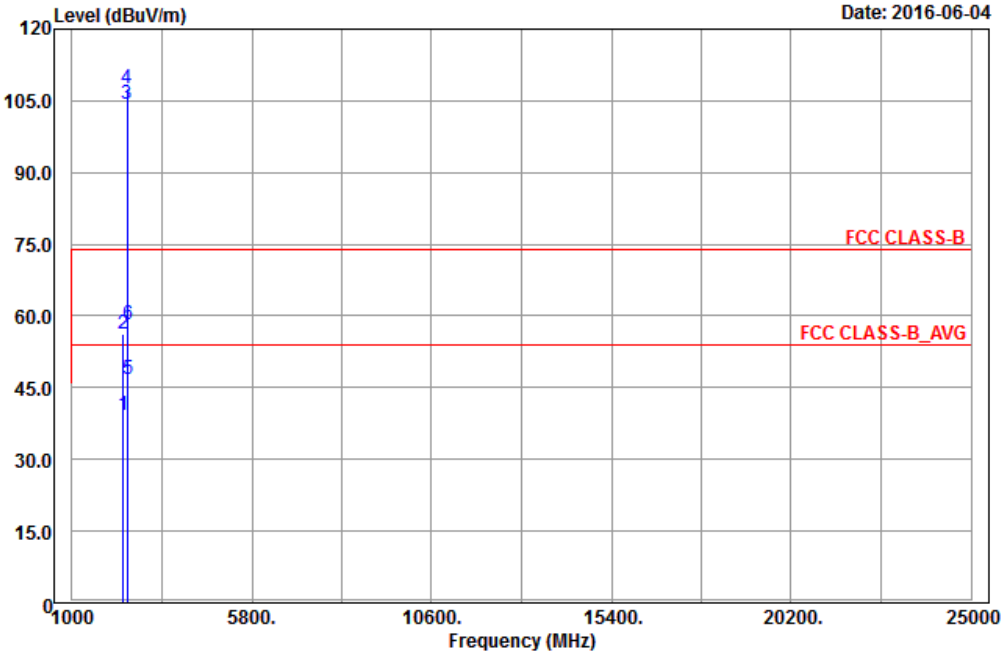
2. 2437 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2316	39.23	37.74	54	-14.77	31.71	5.3	35.52	116	179	Average
2316	56.03	54.54	74	-17.97	31.71	5.3	35.52	116	179	Peak
2462	106.36	104.43			31.87	5.5	35.44	116	179	Average
2462	109.32	107.39			31.87	5.5	35.44	116	179	Peak
2484	48.78	46.82	54	-5.22	31.88	5.5	35.42	159	179	Average
2484	59.4	57.44	74	-14.6	31.88	5.5	35.42	159	179	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2358	39.4	37.77	54	-14.6	31.76	5.37	35.5	220	90	Average
2358	56.11	54.48	74	-17.89	31.76	5.37	35.5	220	90	Peak
2462	104.41	102.48			31.87	5.5	35.44	220	90	Average
2462	107.53	105.6			31.87	5.5	35.44	220	90	Peak
2488	46.81	44.8	54	-7.19	31.9	5.53	35.42	236	90	Average
2488	58.31	56.3	74	-15.69	31.9	5.53	35.42	236	90	Peak

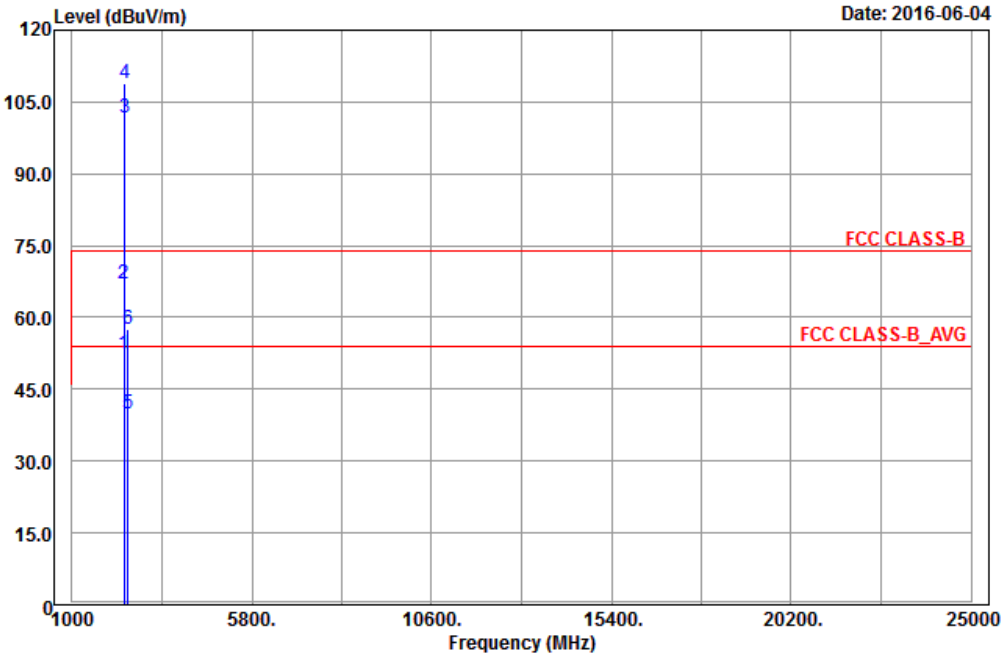
Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2462 MHz: Fundamental Frequency.

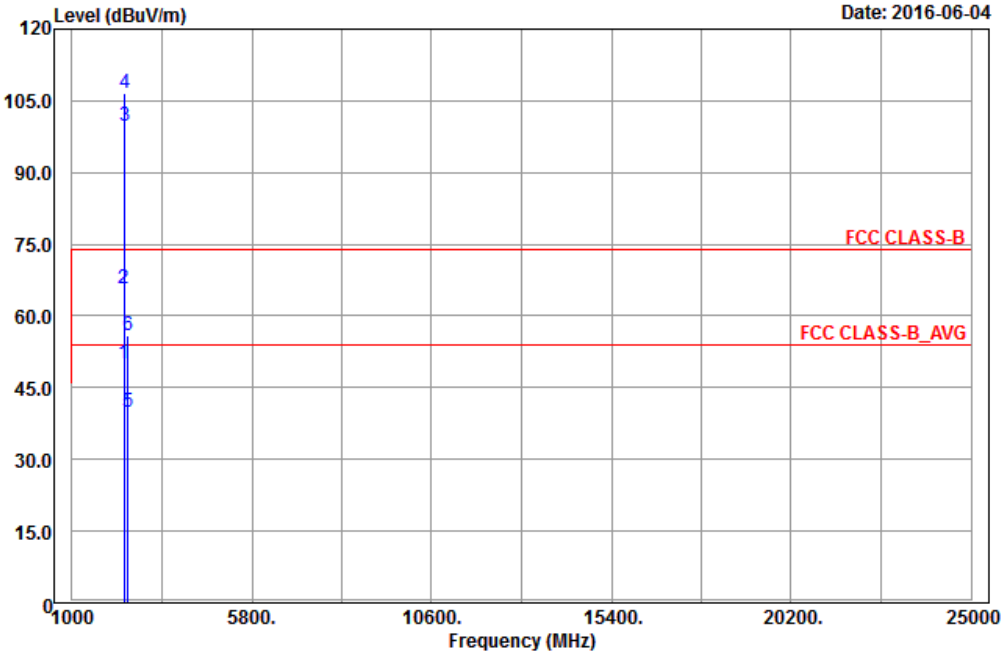
802.11g

EUT Test Condition		Measurement Detail	
Channel	Channel 1	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



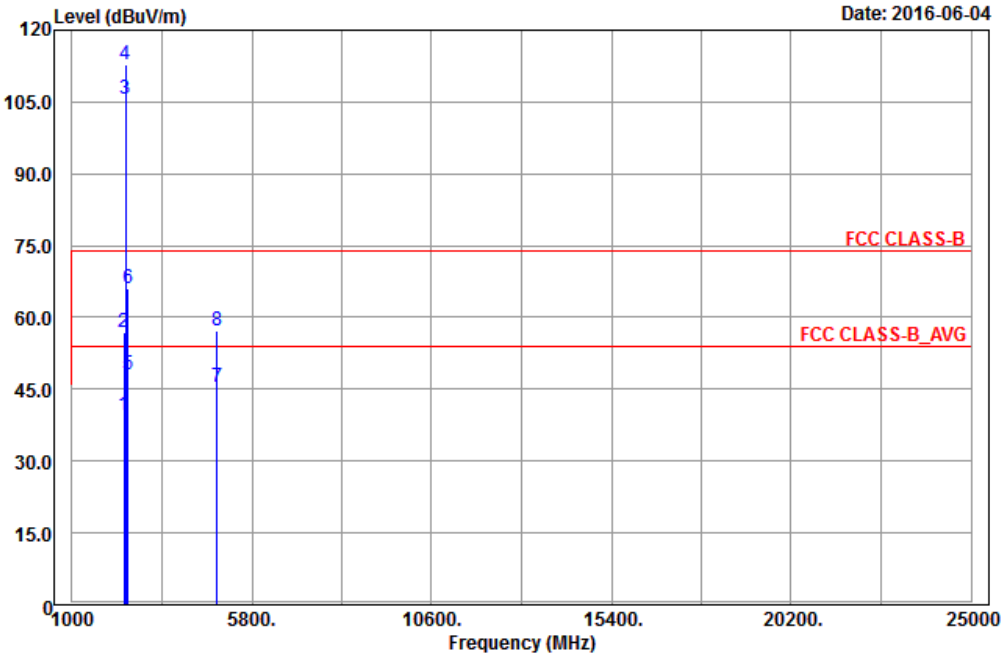
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2388	52.25	50.54	54	-1.75	31.8	5.4	35.49	170	179	Average
2388	67.11	65.4	74	-6.89	31.8	5.4	35.49	170	179	Peak
2412	101.75	99.98			31.81	5.43	35.47	110	179	Average
2412	108.87	107.1			31.81	5.43	35.47	110	179	Peak
2496	39.88	37.86	54	-14.12	31.9	5.53	35.41	110	179	Average
2496	57.71	55.69	74	-16.29	31.9	5.53	35.41	110	179	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	50	48.27	54	-4	31.8	5.4	35.47	101	90	Average
2390	65.72	63.99	74	-8.28	31.8	5.4	35.47	101	90	Peak
2412	99.72	97.95			31.81	5.43	35.47	100	90	Average
2412	106.5	104.73			31.81	5.43	35.47	100	90	Peak
2492	39.9	37.88	54	-14.1	31.9	5.53	35.41	100	90	Average
2492	56	53.98	74	-18	31.9	5.53	35.41	100	90	Peak

Remarks:

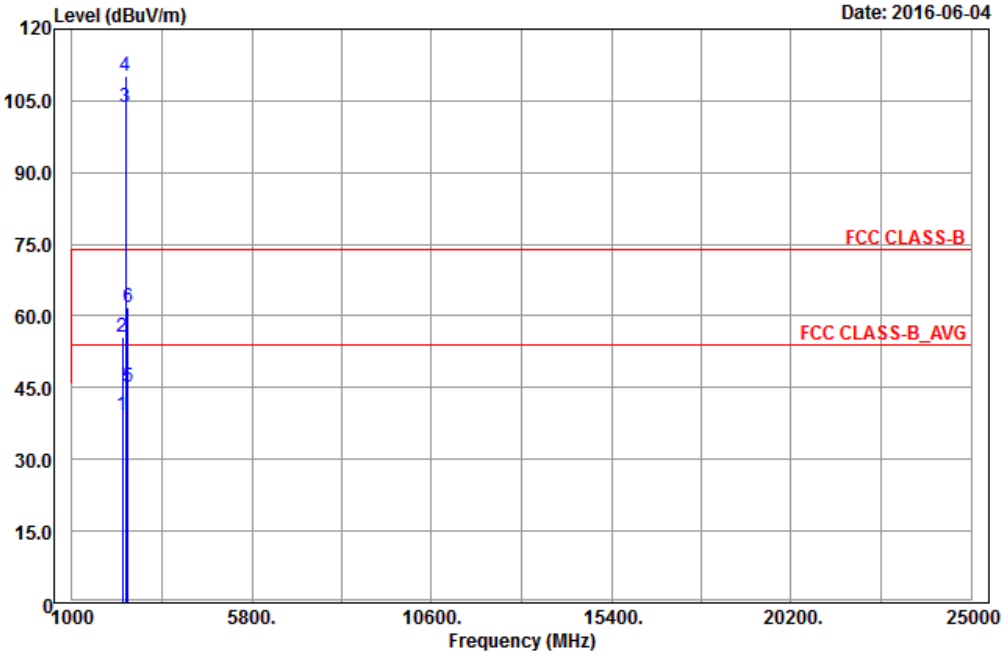
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2412 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



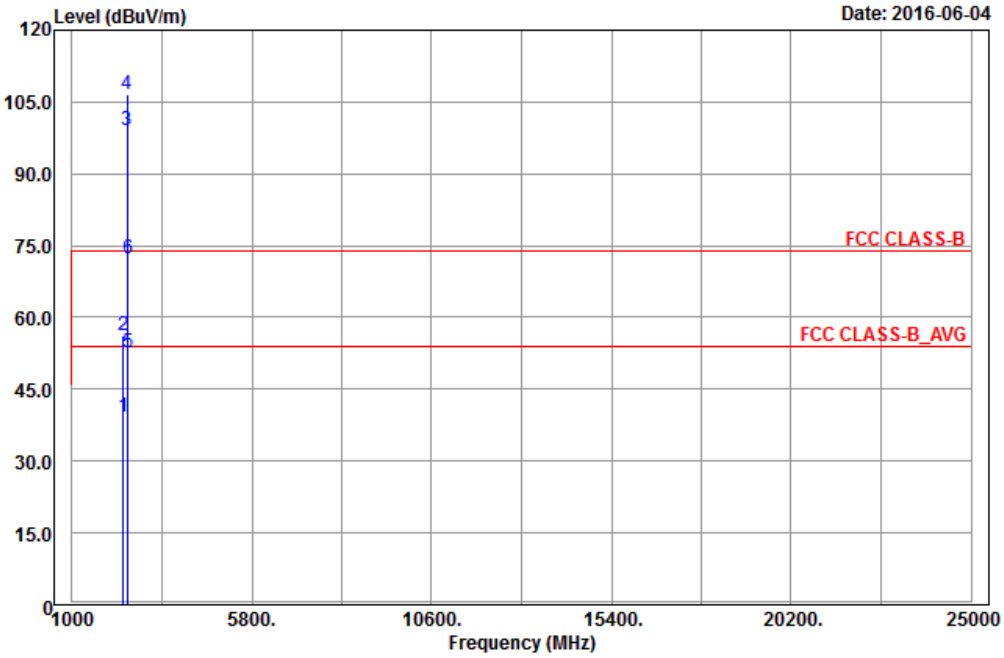
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386	39.46	37.75	54	-14.54	31.8	5.4	35.49	107	179	Average
2386	56.98	55.27	74	-17.02	31.8	5.4	35.49	107	179	Peak
2437	105.57	103.72			31.85	5.46	35.46	107	179	Average
2437	112.75	110.9			31.85	5.46	35.46	107	179	Peak
2484	47.98	46.02	54	-6.02	31.88	5.5	35.42	106	179	Average
2484	66.16	64.2	74	-7.84	31.88	5.5	35.42	106	179	Peak
4874	45.3	37.11	54	-8.7	33.98	8.27	34.06	183	155	Average
4874	57.08	48.89	74	-16.92	33.98	8.27	34.06	183	155	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2348	39.3	37.73	54	-14.7	31.74	5.33	35.5	129	90	Average
2348	55.48	53.91	74	-18.52	31.74	5.33	35.5	129	90	Peak
2437	103.51	101.66			31.85	5.46	35.46	129	90	Average
2437	110.2	108.35			31.85	5.46	35.46	129	90	Peak
2484	45.01	43.05	54	-8.99	31.88	5.5	35.42	238	90	Average
2484	61.76	59.8	74	-12.24	31.88	5.5	35.42	238	90	Peak

Remarks:

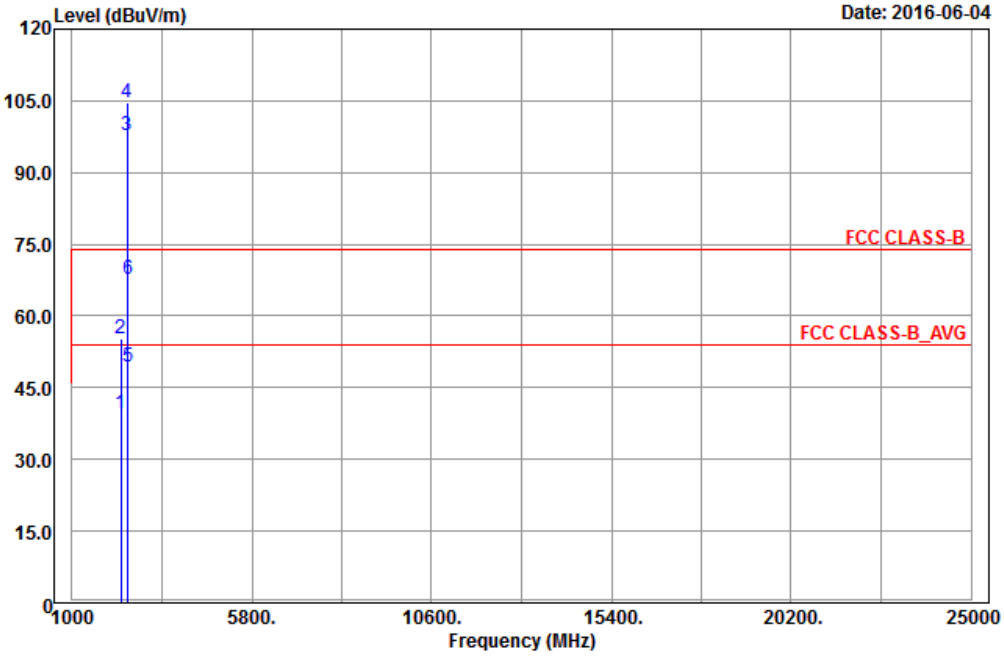
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2437 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2376	39.29	37.63	54	-14.71	31.78	5.37	35.49	116	179	Average
2376	56.14	54.48	74	-17.86	31.78	5.37	35.49	116	179	Peak
2462	99.16	97.23			31.87	5.5	35.44	116	179	Average
2462	106.69	104.76			31.87	5.5	35.44	116	179	Peak
2484	52.72	50.76	54	-1.28	31.88	5.5	35.42	108	179	Average
2484	72.2	70.24	74	-1.8	31.88	5.5	35.42	108	179	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2314	39.43	37.94	54	-14.57	31.71	5.3	35.52	163	90	Average
2314	55.19	53.7	74	-18.81	31.71	5.3	35.52	163	90	Peak
2462	97.78	95.85			31.87	5.5	35.44	163	90	Average
2462	104.7	102.77			31.87	5.5	35.44	163	90	Peak
2484	49.48	47.52	54	-4.52	31.88	5.5	35.42	237	90	Average
2484	67.75	65.79	74	-6.25	31.88	5.5	35.42	237	90	Peak

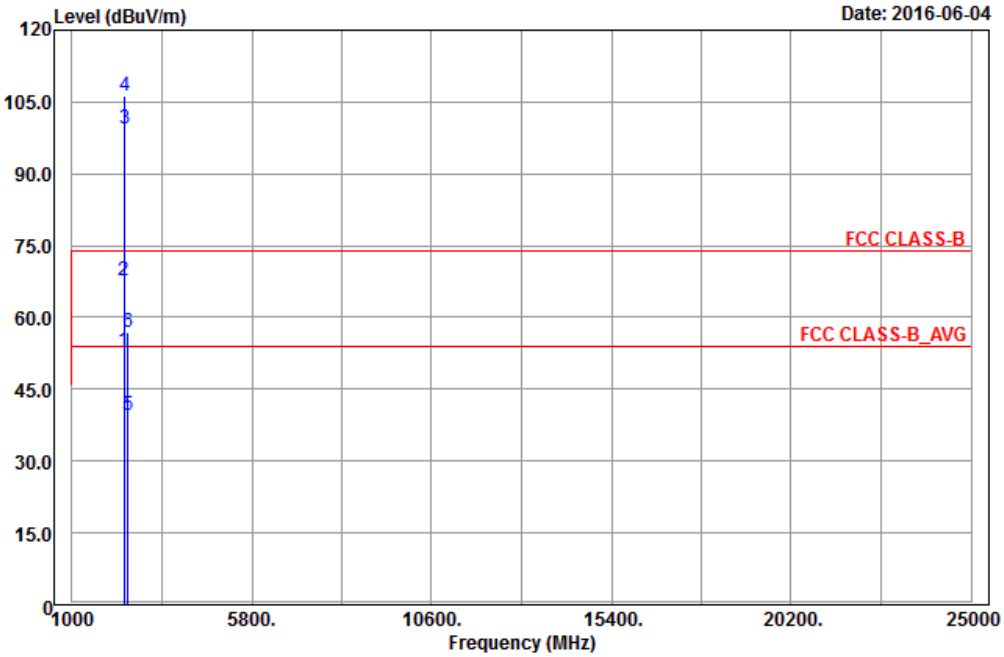
Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2462 MHz: Fundamental Frequency.

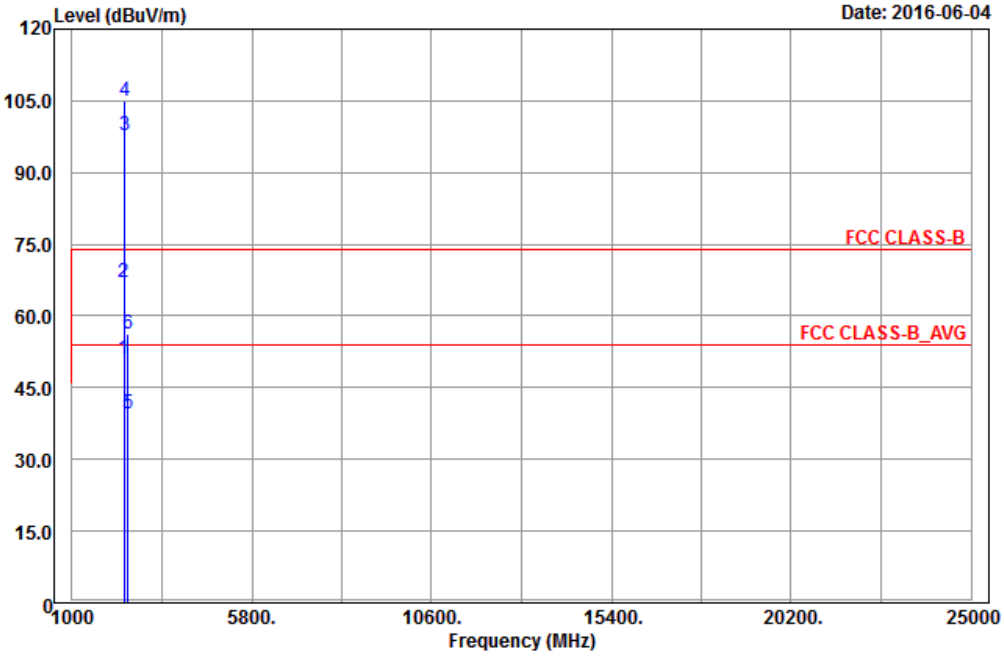
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 1	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



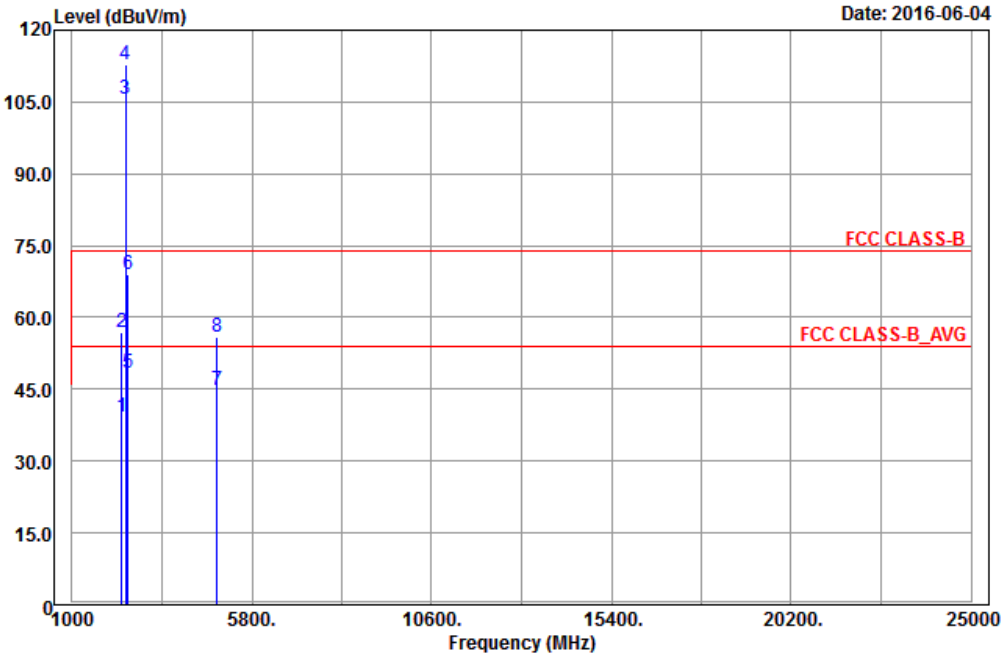
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	52.85	51.12	54	-1.15	31.8	5.4	35.47	142	179	Average
2390	67.68	65.95	74	-6.32	31.8	5.4	35.47	142	179	Peak
2412	99.37	97.6			31.81	5.43	35.47	110	179	Average
2412	106.38	104.61			31.81	5.43	35.47	110	179	Peak
2484	39.5	37.54	54	-14.5	31.88	5.5	35.42	110	179	Average
2484	56.9	54.94	74	-17.1	31.88	5.5	35.42	110	179	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	50.9	49.17	54	-3.1	31.8	5.4	35.47	101	90	Average
2390	67.05	65.32	74	-6.95	31.8	5.4	35.47	101	90	Peak
2412	97.79	96.02			31.81	5.43	35.47	131	90	Average
2412	104.87	103.1			31.81	5.43	35.47	131	90	Peak
2494	39.68	37.66	54	-14.32	31.9	5.53	35.41	131	90	Average
2494	56.27	54.25	74	-17.73	31.9	5.53	35.41	131	90	Peak

Remarks:

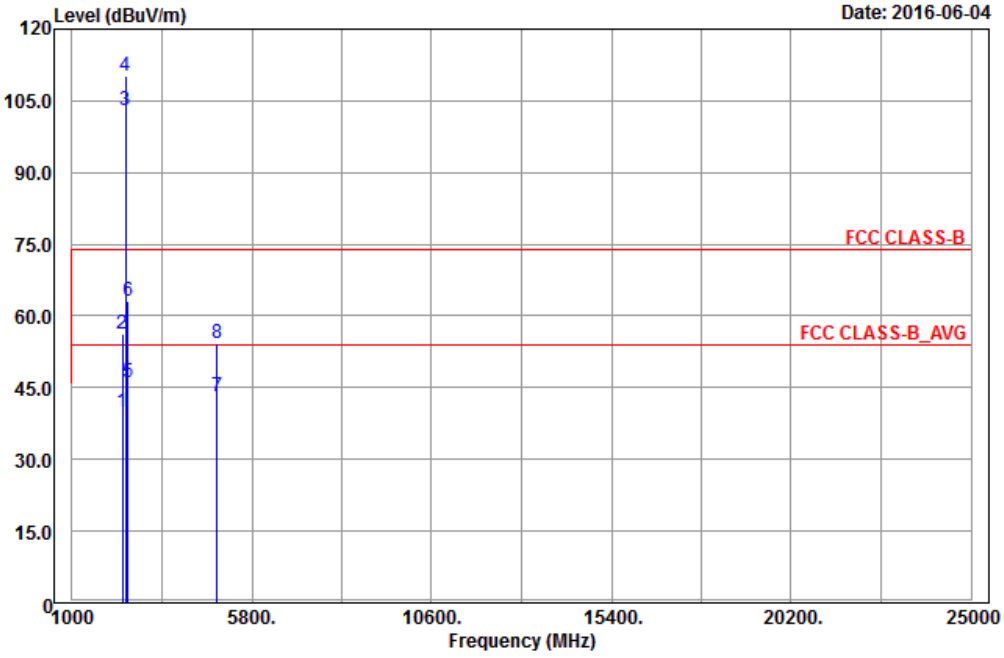
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2412 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2316	39.17	37.68	54	-14.83	31.71	5.3	35.52	107	179	Average
2316	56.83	55.34	74	-17.17	31.71	5.3	35.52	107	179	Peak
2437	105.53	103.68			31.85	5.46	35.46	107	179	Average
2437	112.78	110.93			31.85	5.46	35.46	107	179	Peak
2484	48.38	46.42	54	-5.62	31.88	5.5	35.42	108	179	Average
2484	68.87	66.91	74	-5.13	31.88	5.5	35.42	108	179	Peak
4874	44.69	36.5	54	-9.31	33.98	8.27	34.06	122	155	Average
4874	55.9	47.71	74	-18.1	33.98	8.27	34.06	122	155	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2340	39.73	38.16	54	-14.27	31.74	5.33	35.5	129	90	Average
2340	56.29	54.72	74	-17.71	31.74	5.33	35.5	129	90	Peak
2437	103.06	101.21			31.85	5.46	35.46	129	90	Average
2437	110.29	108.44			31.85	5.46	35.46	129	90	Peak
2484	46.08	44.12	54	-7.92	31.88	5.5	35.42	235	88	Average
2484	63.21	61.25	74	-10.79	31.88	5.5	35.42	235	88	Peak
4874	43.03	34.84	54	-10.97	33.98	8.27	34.06	169	160	Average
4874	54.12	45.93	74	-19.88	33.98	8.27	34.06	169	160	Peak

Remarks:

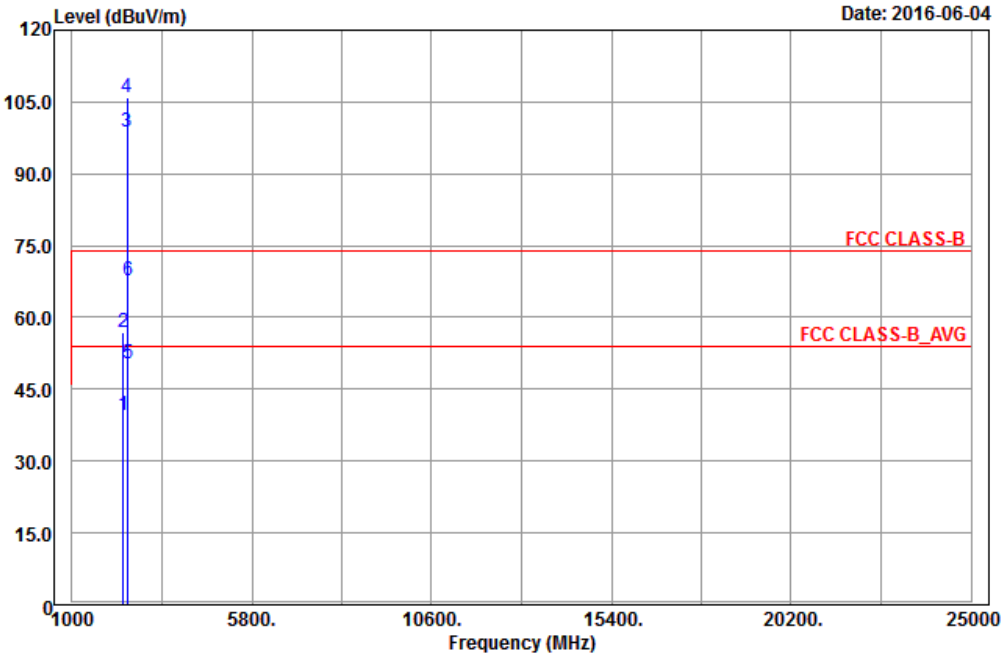
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

   Margin Value = Emission Level – Limit value

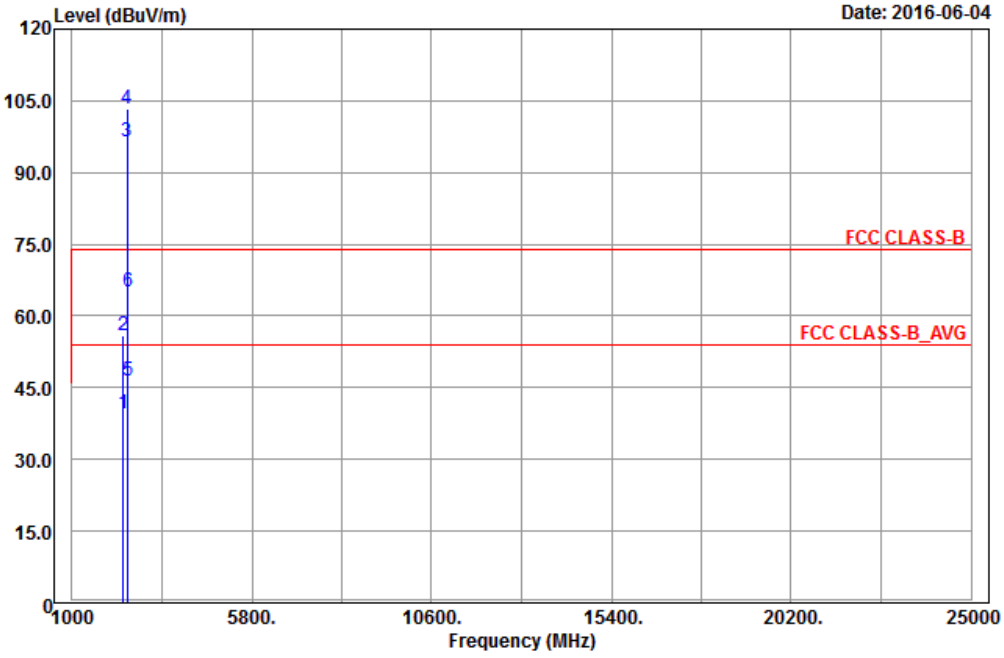
2. 2437 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2370	39.63	37.97	54	-14.37	31.78	5.37	35.49	114	179	Average
2370	56.79	55.13	74	-17.21	31.78	5.37	35.49	114	179	Peak
2462	98.84	96.91			31.87	5.5	35.44	114	179	Average
2462	105.84	103.91			31.87	5.5	35.44	114	179	Peak
2484	50.38	48.42	54	-3.62	31.88	5.5	35.42	108	179	Average
2484	67.62	65.66	74	-6.38	31.88	5.5	35.42	108	179	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2364	39.72	38.09	54	-14.28	31.76	5.37	35.5	163	90	Average
2364	55.92	54.29	74	-18.08	31.76	5.37	35.5	163	90	Peak
2462	96.36	94.43			31.87	5.5	35.44	163	90	Average
2462	103.27	101.34			31.87	5.5	35.44	163	90	Peak
2484	46.38	44.42	54	-7.62	31.88	5.5	35.42	238	90	Average
2484	64.97	63.01	74	-9.03	31.88	5.5	35.42	238	90	Peak

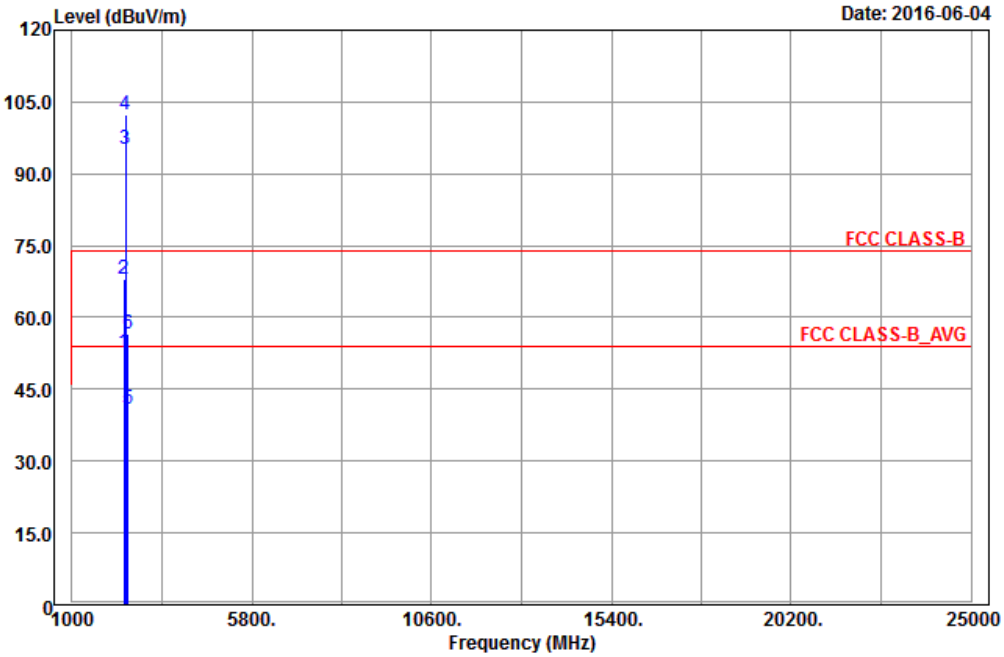
Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2462 MHz: Fundamental Frequency.

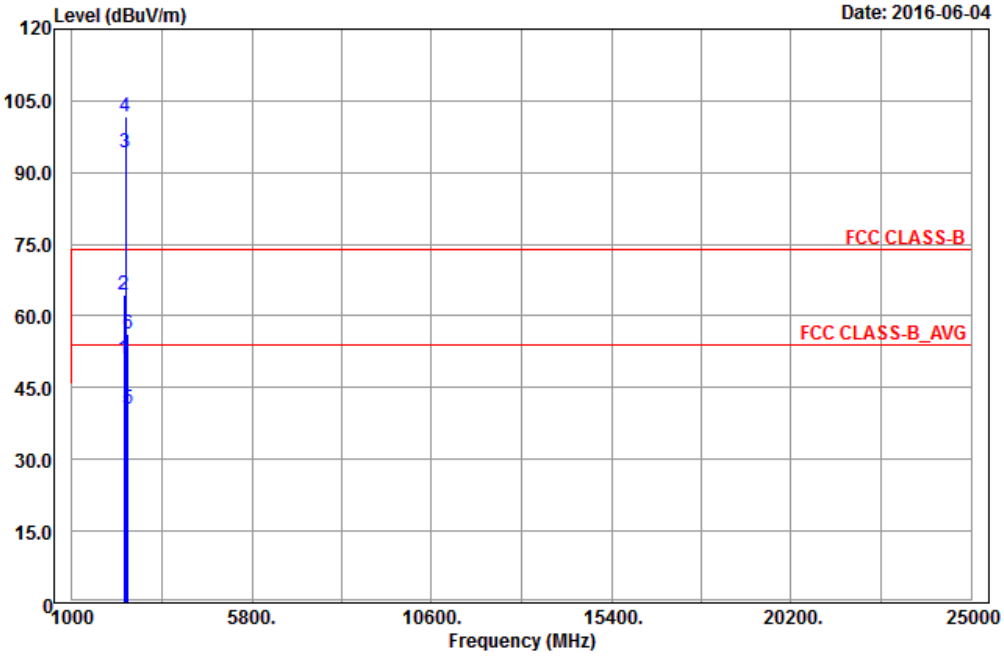
802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 3	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



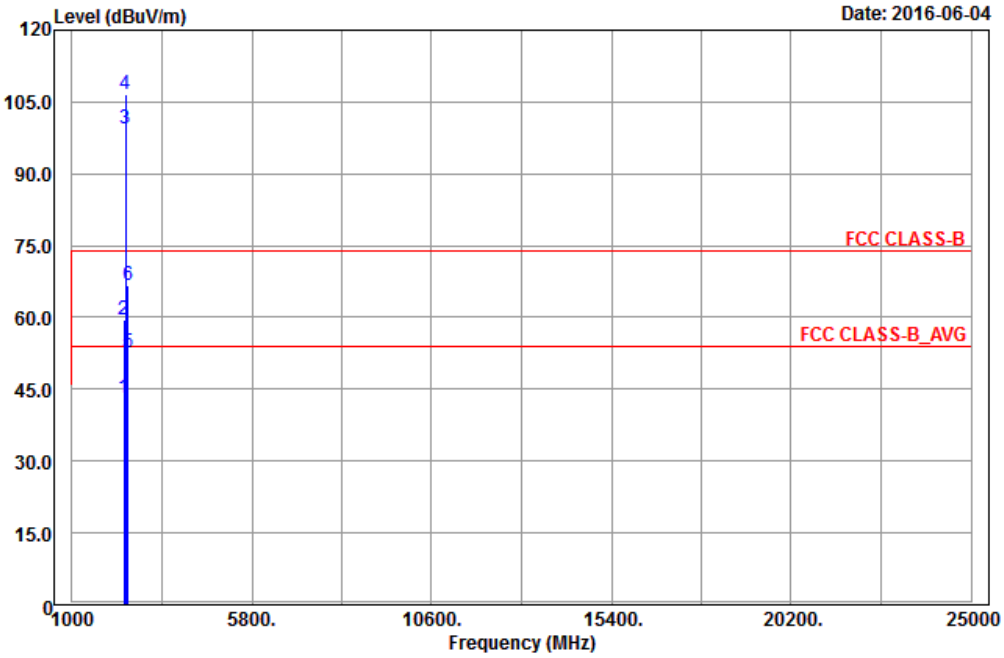
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	52.55	50.82	54	-1.45	31.8	5.4	35.47	142	179	Average
2390	67.99	66.26	74	-6.01	31.8	5.4	35.47	142	179	Peak
2422	95.26	93.46			31.83	5.43	35.46	107	179	Average
2422	102.38	100.58			31.83	5.43	35.46	107	179	Peak
2486	40.71	38.72	54	-13.29	31.88	5.53	35.42	107	179	Average
2486	56.4	54.41	74	-17.6	31.88	5.53	35.42	107	179	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	50.97	49.24	54	-3.03	31.8	5.4	35.47	101	111	Average
2390	64.26	62.53	74	-9.74	31.8	5.4	35.47	101	111	Peak
2422	94.26	92.46			31.83	5.43	35.46	131	111	Average
2422	101.79	99.99			31.83	5.43	35.46	131	111	Peak
2484	40.44	38.48	54	-13.56	31.88	5.5	35.42	131	111	Average
2484	56.21	54.25	74	-17.79	31.88	5.5	35.42	131	111	Peak

Remarks:

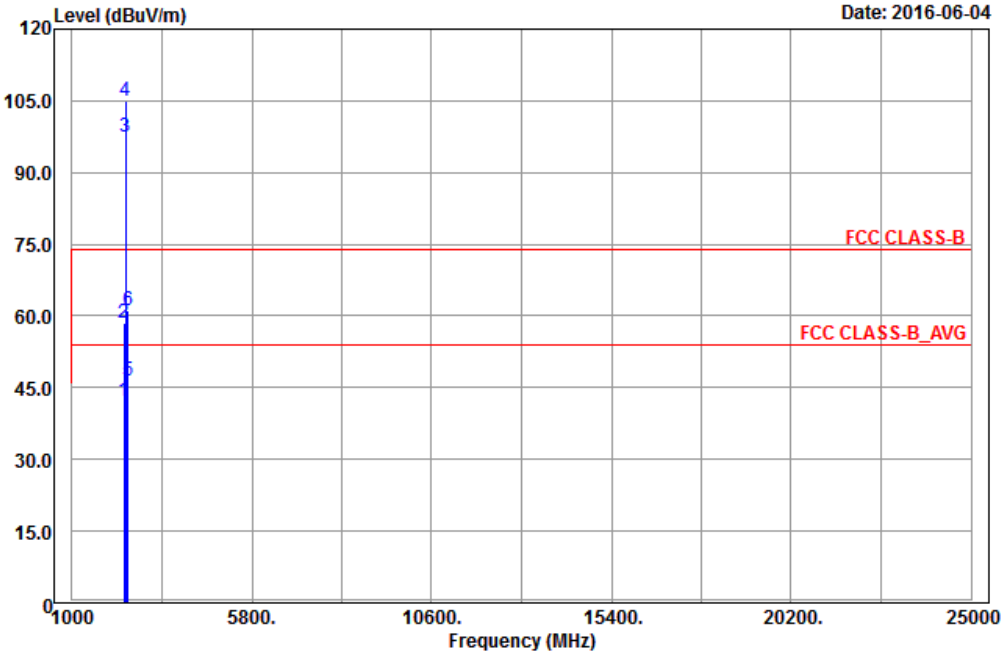
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2422 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



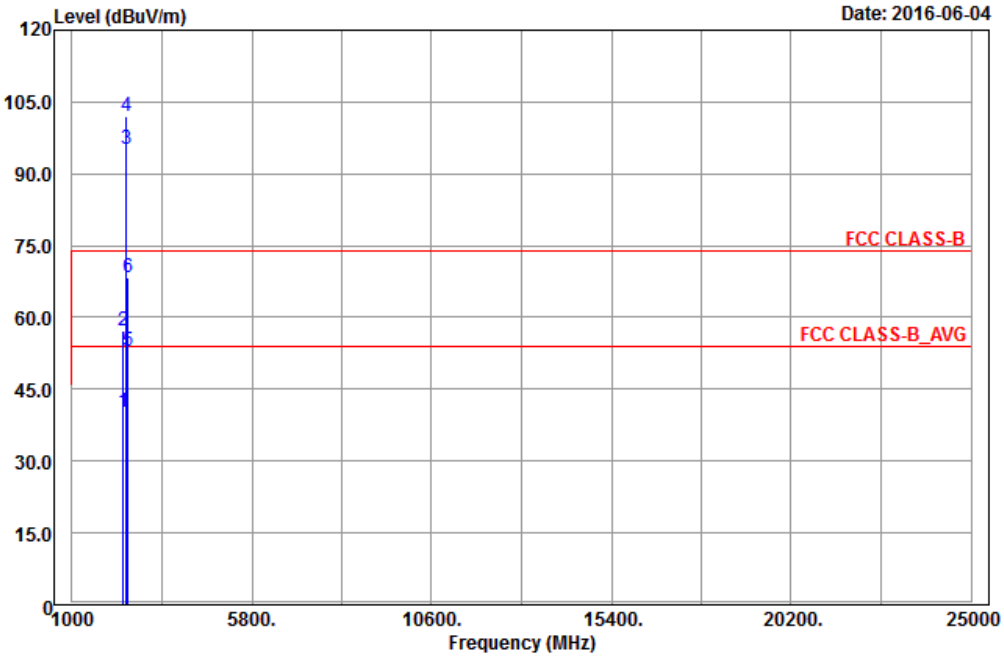
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2388	43.05	41.34	54	-10.95	31.8	5.4	35.49	109	179	Average
2388	59.62	57.91	74	-14.38	31.8	5.4	35.49	109	179	Peak
2437	99.44	97.59			31.85	5.46	35.46	109	179	Average
2437	106.66	104.81			31.85	5.46	35.46	109	179	Peak
2484	52.59	50.63	54	-1.41	31.88	5.5	35.42	107	179	Average
2484	66.78	64.82	74	-7.22	31.88	5.5	35.42	107	179	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	42.2	40.47	54	-11.8	31.8	5.4	35.47	129	90	Average
2390	58.48	56.75	74	-15.52	31.8	5.4	35.47	129	90	Peak
2437	97.31	95.46			31.85	5.46	35.46	129	90	Average
2437	104.81	102.96			31.85	5.46	35.46	129	90	Peak
2484	46.51	44.55	54	-7.49	31.88	5.5	35.42	126	90	Average
2484	61.08	59.12	74	-12.92	31.88	5.5	35.42	126	90	Peak

Remarks:

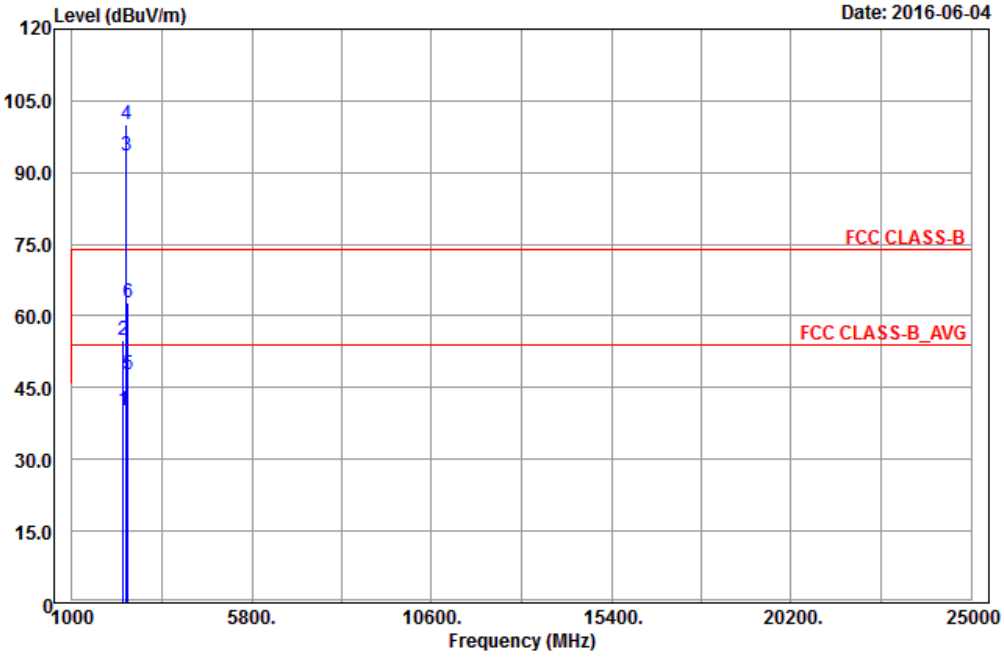
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2437 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 9	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2362	40.13	38.5	54	-13.87	31.76	5.37	35.5	114	179	Average
2362	57.08	55.45	74	-16.92	31.76	5.37	35.5	114	179	Peak
2452	95.19	93.32			31.85	5.46	35.44	114	179	Average
2452	102.12	100.25			31.85	5.46	35.44	114	179	Peak
2484	52.96	51	54	-1.04	31.88	5.5	35.42	164	178	Average
2484	68.45	66.49	74	-5.55	31.88	5.5	35.42	164	178	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2376	40.2	38.54	54	-13.8	31.78	5.37	35.49	163	90	Average
2376	55.05	53.39	74	-18.95	31.78	5.37	35.49	163	90	Peak
2452	93.61	91.74			31.85	5.46	35.44	163	90	Average
2452	100.19	98.32			31.85	5.46	35.44	163	90	Peak
2484	47.58	45.62	54	-6.42	31.88	5.5	35.42	127	90	Average
2484	62.93	60.97	74	-11.07	31.88	5.5	35.42	127	90	Peak

Remarks:

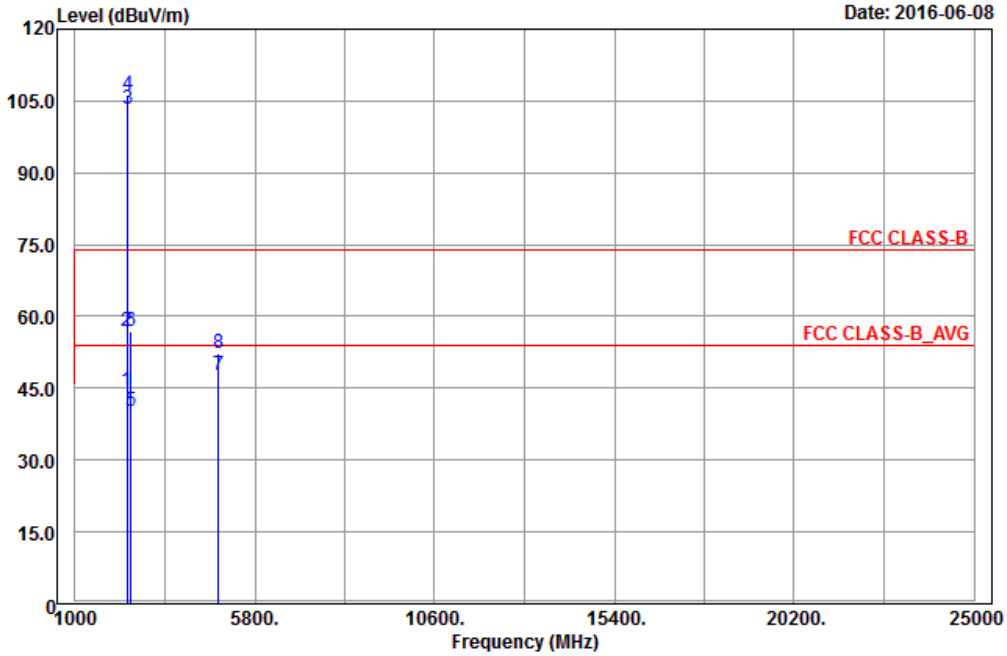
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2452 MHz: Fundamental Frequency.

Mode B

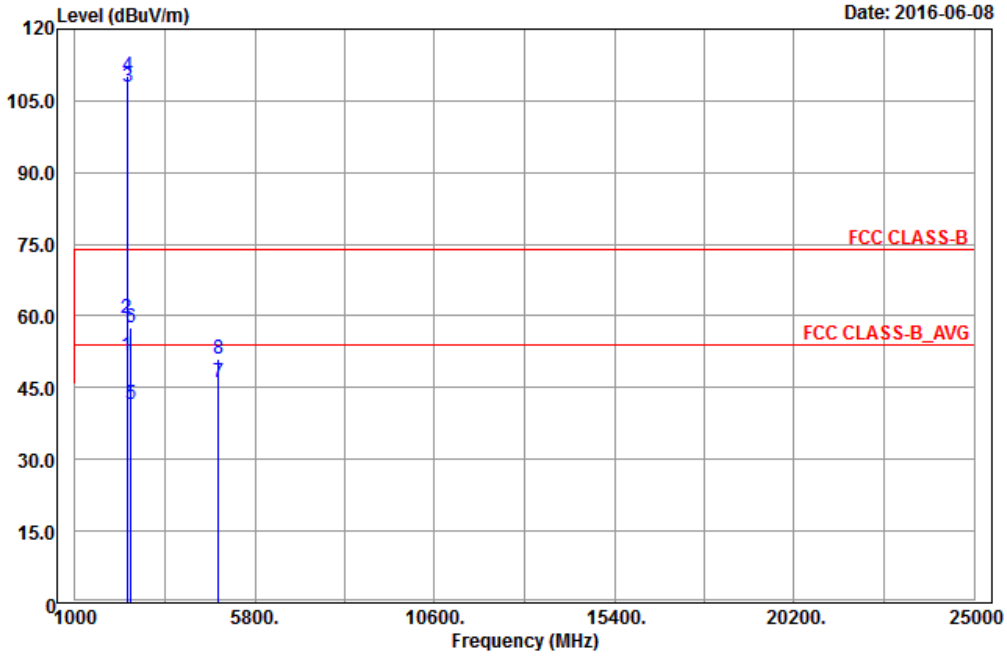
802.11b

EUT Test Condition		Measurement Detail	
Channel	Channel 1	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	44.52	42.79	54	-9.48	31.8	5.4	35.47	166	214	Average
2390	56.9	55.17	74	-17.1	31.8	5.4	35.47	166	214	Peak
2412	103.2	101.43			31.81	5.43	35.47	166	214	Average
2412	106.2	104.43			31.81	5.43	35.47	166	214	Peak
2490	40.18	38.17	54	-13.82	31.9	5.53	35.42	166	214	Average
2490	57.04	55.03	74	-16.96	31.9	5.53	35.42	166	214	Peak
4824	47.73	39.6	54	-6.27	33.97	8.26	34.1	250	182	Average
4824	52.46	44.33	74	-21.54	33.97	8.26	34.1	250	182	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2388	51.64	49.93	54	-2.36	31.8	5.4	35.49	114	353	Average
2388	59.39	57.68	74	-14.61	31.8	5.4	35.49	114	353	Peak
2412	107.79	106.02			31.81	5.43	35.47	112	353	Average
2412	110.07	108.3			31.81	5.43	35.47	112	353	Peak
2498	41.5	39.48	54	-12.5	31.9	5.53	35.41	112	353	Average
2498	57.61	55.59	74	-16.39	31.9	5.53	35.41	112	353	Peak
4824	46.13	38	54	-7.87	33.97	8.26	34.1	103	161	Average
4824	51.01	42.88	74	-22.99	33.97	8.26	34.1	103	161	Peak

Remarks:

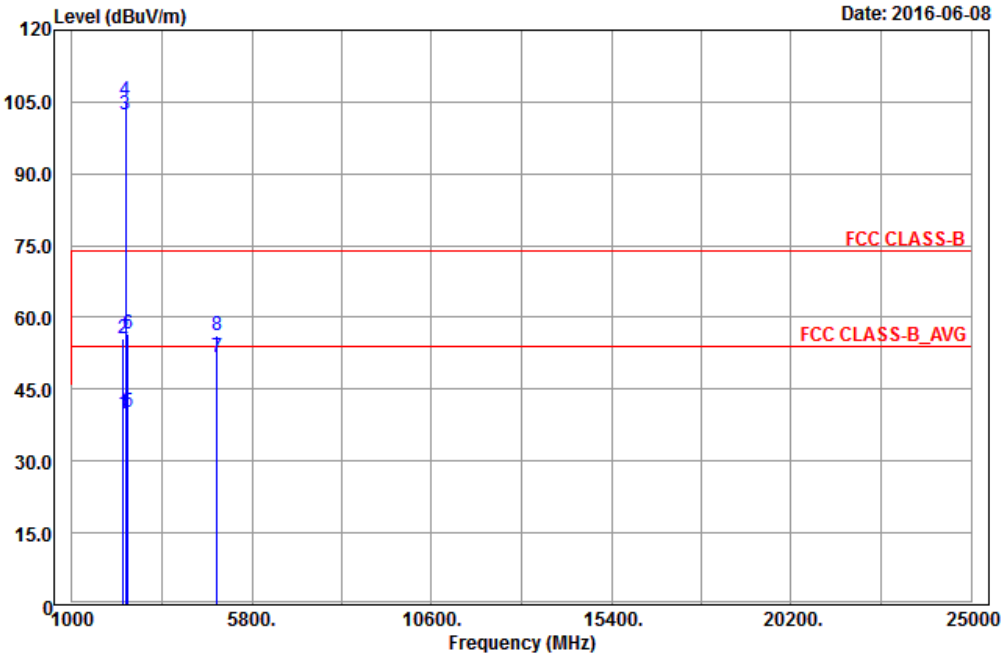
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

   Margin Value = Emission Level – Limit value

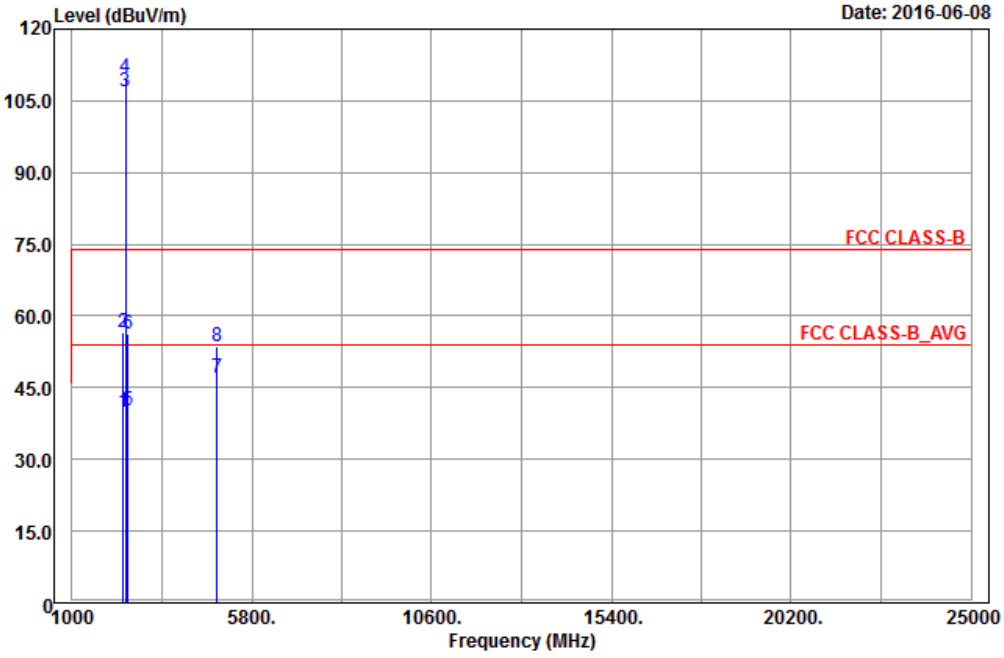
2. 2412 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



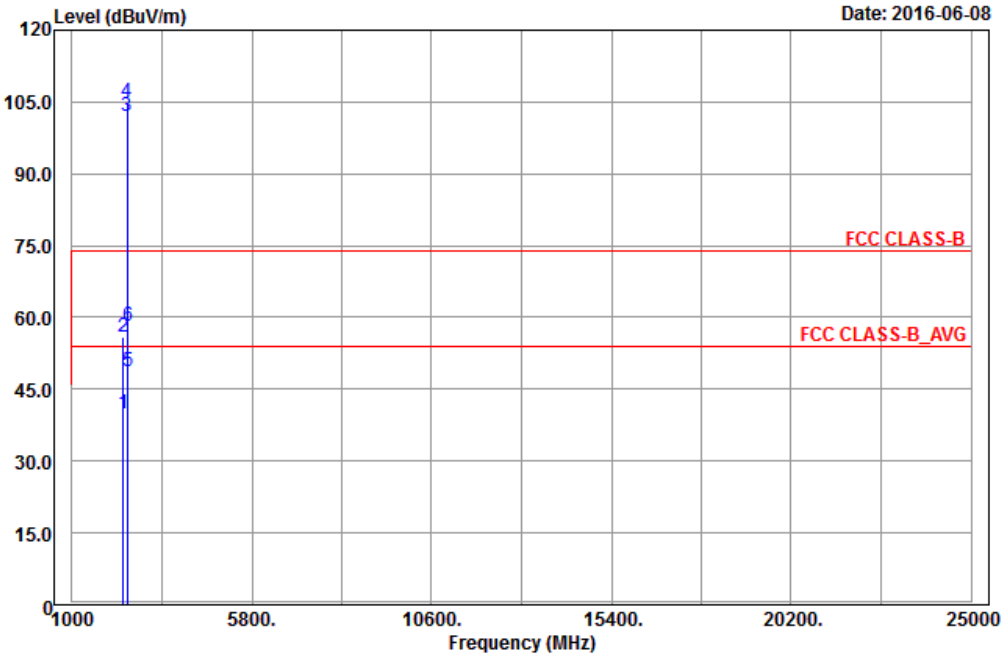
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2360	39.98	38.35	54	-14.02	31.76	5.37	35.5	238	214	Average
2360	55.56	53.93	74	-18.44	31.76	5.37	35.5	238	214	Peak
2437	102.46	100.61			31.85	5.46	35.46	238	214	Average
2437	105.39	103.54			31.85	5.46	35.46	238	214	Peak
2490	40.33	38.32	54	-13.67	31.9	5.53	35.42	238	214	Average
2490	56.52	54.51	74	-17.48	31.9	5.53	35.42	238	214	Peak
4874	51.64	43.45	54	-2.36	33.98	8.27	34.06	250	181	Average
4874	56.15	47.96	74	-17.85	33.98	8.27	34.06	250	181	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2362	40.01	38.38	54	-13.99	31.76	5.37	35.5	196	356	Average
2362	56.41	54.78	74	-17.59	31.76	5.37	35.5	196	356	Peak
2437	106.91	105.06			31.85	5.46	35.46	196	356	Average
2437	109.79	107.94			31.85	5.46	35.46	196	356	Peak
2490	40.38	38.37	54	-13.62	31.9	5.53	35.42	196	356	Average
2490	56.36	54.35	74	-17.64	31.9	5.53	35.42	196	356	Peak
4874	47.2	39.01	54	-6.8	33.98	8.27	34.06	108	62	Average
4874	53.53	45.34	74	-20.47	33.98	8.27	34.06	108	62	Peak

Remarks:

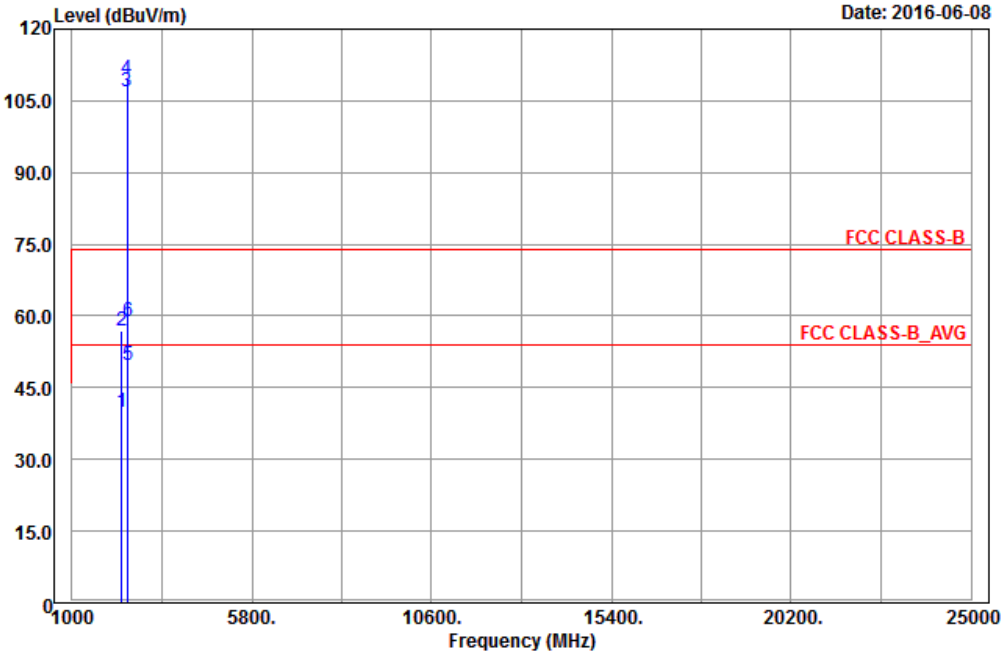
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2437 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2360	39.9	38.27	54	-14.1	31.76	5.37	35.5	238	249	Average
2360	55.8	54.17	74	-18.2	31.76	5.37	35.5	238	249	Peak
2462	102.02	100.09			31.87	5.5	35.44	238	249	Average
2462	105.06	103.13			31.87	5.5	35.44	238	249	Peak
2484	48.78	46.82	54	-5.22	31.88	5.5	35.42	257	249	Average
2484	58.18	56.22	74	-15.82	31.88	5.5	35.42	257	249	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2318	39.78	38.27	54	-14.22	31.73	5.3	35.52	124	353	Average
2318	56.83	55.32	74	-17.17	31.73	5.3	35.52	124	353	Peak
2462	106.76	104.83			31.87	5.5	35.44	124	353	Average
2462	109.48	107.55			31.87	5.5	35.44	124	353	Peak
2488	49.68	47.67	54	-4.32	31.9	5.53	35.42	107	353	Average
2488	58.95	56.94	74	-15.05	31.9	5.53	35.42	107	353	Peak

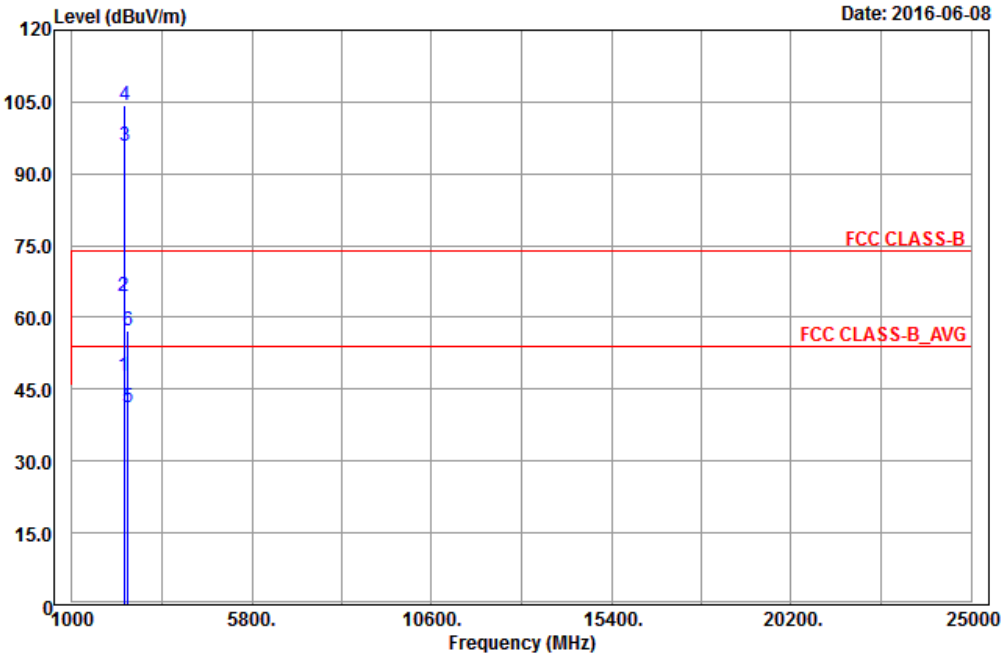
Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2462 MHz: Fundamental Frequency.

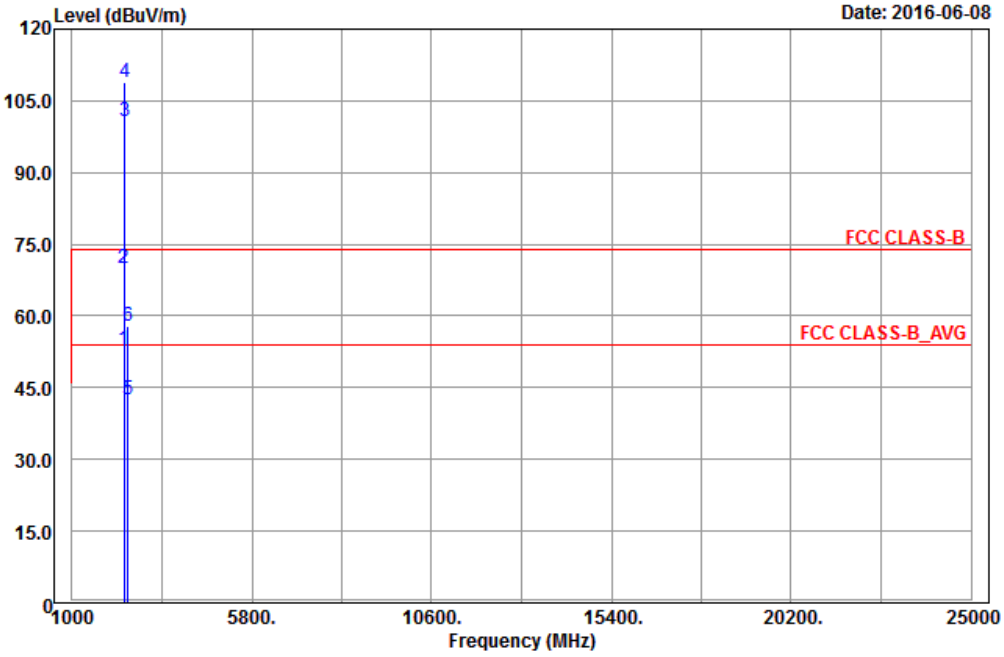
802.11g

EUT Test Condition		Measurement Detail	
Channel	Channel 1	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



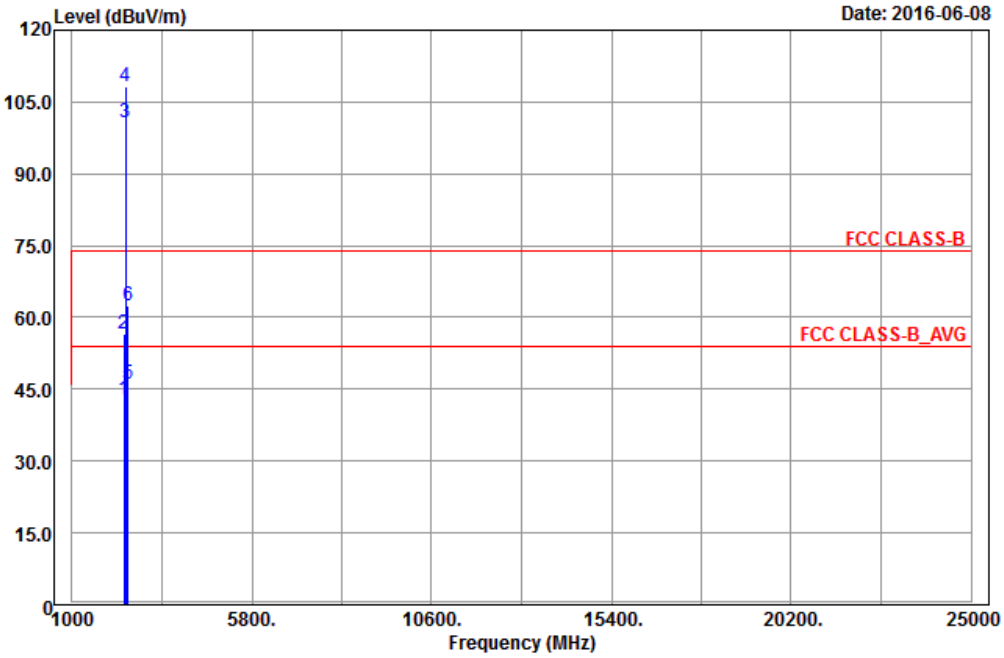
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	47.63	45.9	54	-6.37	31.8	5.4	35.47	166	214	Average
2390	64.37	62.64	74	-9.63	31.8	5.4	35.47	166	214	Peak
2412	95.78	94.01			31.81	5.43	35.47	166	214	Average
2412	104.34	102.57			31.81	5.43	35.47	166	214	Peak
2490	41.28	39.27	54	-12.72	31.9	5.53	35.42	166	214	Average
2490	57.37	55.36	74	-16.63	31.9	5.53	35.42	166	214	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	52.96	51.23	54	-1.04	31.8	5.4	35.47	109	324	Average
2390	69.87	68.14	74	-4.13	31.8	5.4	35.47	109	324	Peak
2412	100.6	98.83			31.81	5.43	35.47	112	353	Average
2412	108.89	107.12			31.81	5.43	35.47	112	353	Peak
2498	42.41	40.39	54	-11.59	31.9	5.53	35.41	112	353	Average
2498	57.73	55.71	74	-16.27	31.9	5.53	35.41	112	353	Peak

Remarks:

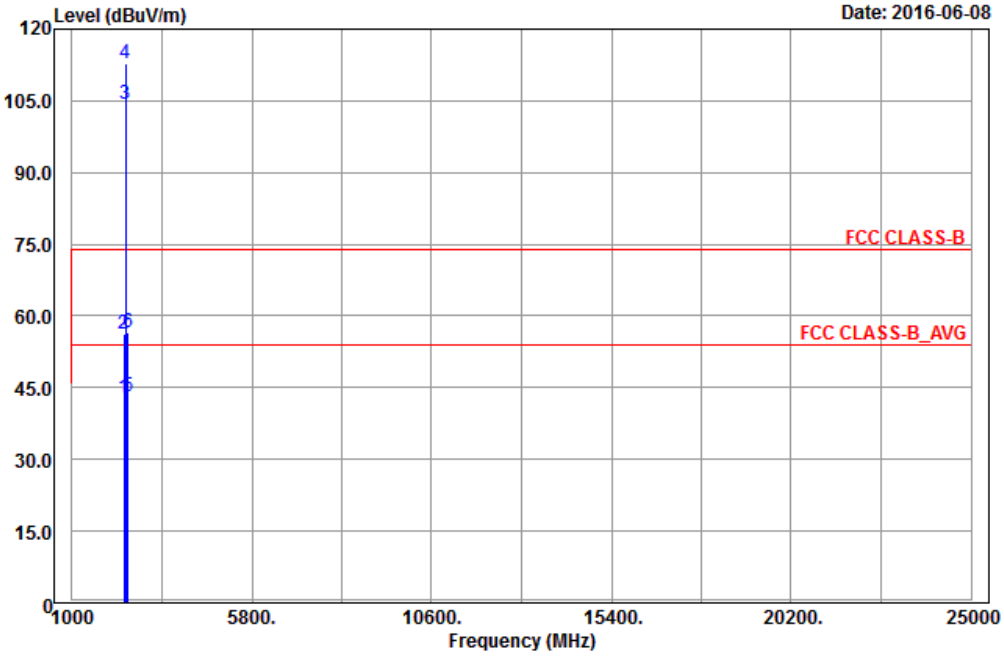
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2412 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



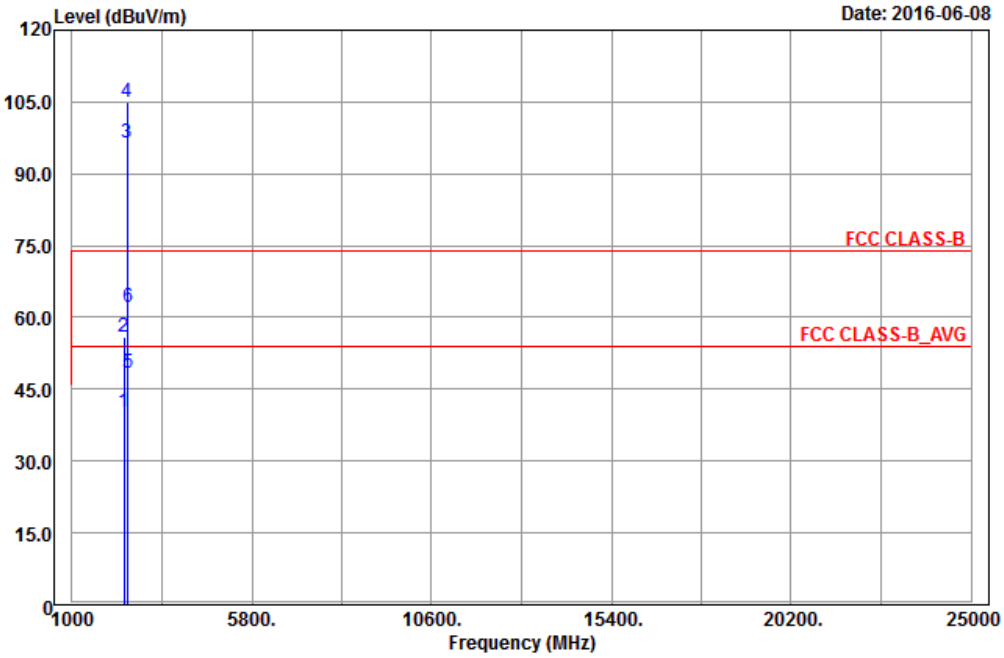
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386	42.75	41.04	54	-11.25	31.8	5.4	35.49	238	132	Average
2386	56.44	54.73	74	-17.56	31.8	5.4	35.49	238	132	Peak
2437	100.8	98.95			31.85	5.46	35.46	238	132	Average
2437	108.21	106.36			31.85	5.46	35.46	238	132	Peak
2484	46.01	44.05	54	-7.99	31.88	5.5	35.42	240	132	Average
2484	62.52	60.56	74	-11.48	31.88	5.5	35.42	240	132	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2380	42.71	41.05	54	-11.29	31.78	5.37	35.49	196	356	Average
2380	56.26	54.6	74	-17.74	31.78	5.37	35.49	196	356	Peak
2437	104.45	102.6			31.85	5.46	35.46	196	356	Average
2437	112.81	110.96			31.85	5.46	35.46	196	356	Peak
2496	43.03	41.01	54	-10.97	31.9	5.53	35.41	196	356	Average
2496	56.53	54.51	74	-17.47	31.9	5.53	35.41	196	356	Peak

Remarks:

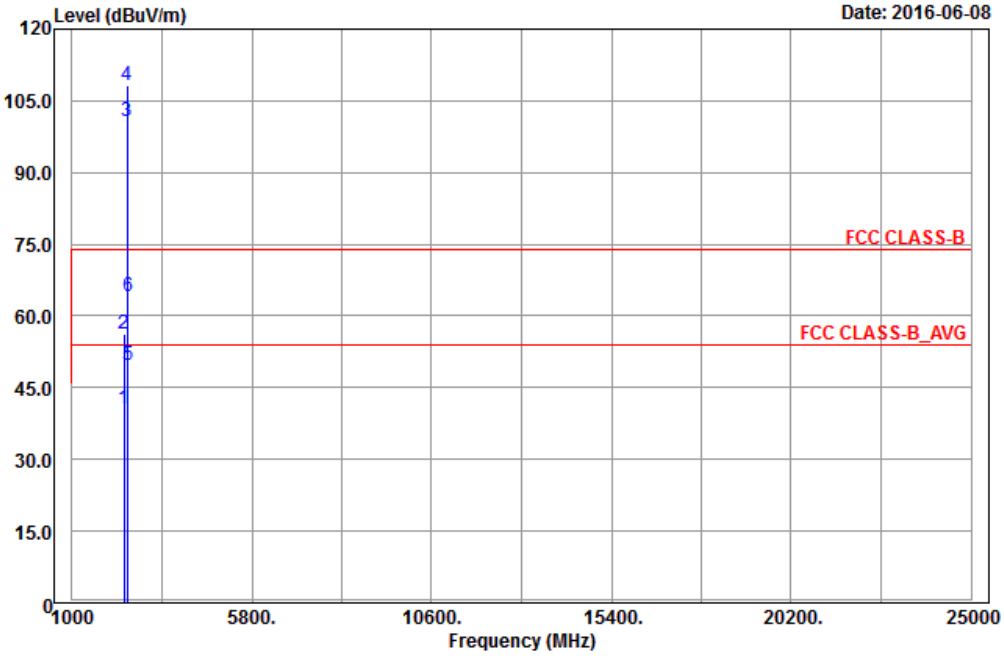
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2437 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2380	40.26	38.6	54	-13.74	31.78	5.37	35.49	234	131	Average
2380	55.96	54.3	74	-18.04	31.78	5.37	35.49	234	131	Peak
2462	96.36	94.43			31.87	5.5	35.44	234	131	Average
2462	104.86	102.93			31.87	5.5	35.44	234	131	Peak
2484	48.24	46.28	54	-5.76	31.88	5.5	35.42	253	132	Average
2484	62.15	60.19	74	-11.85	31.88	5.5	35.42	253	132	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2380	40.45	38.79	54	-13.55	31.78	5.37	35.49	124	210	Average
2380	56.18	54.52	74	-17.82	31.78	5.37	35.49	124	210	Peak
2462	100.58	98.65			31.87	5.5	35.44	124	210	Average
2462	108.29	106.36			31.87	5.5	35.44	124	210	Peak
2484	49.78	47.82	54	-4.22	31.88	5.5	35.42	230	160	Average
2484	64.18	62.22	74	-9.82	31.88	5.5	35.42	230	160	Peak

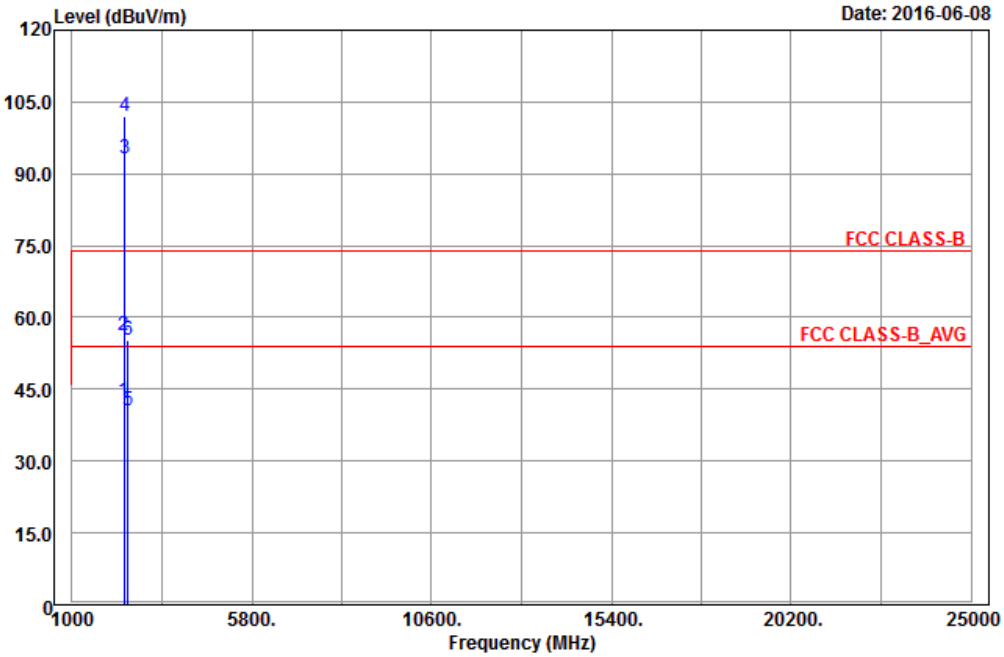
Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2462 MHz: Fundamental Frequency.

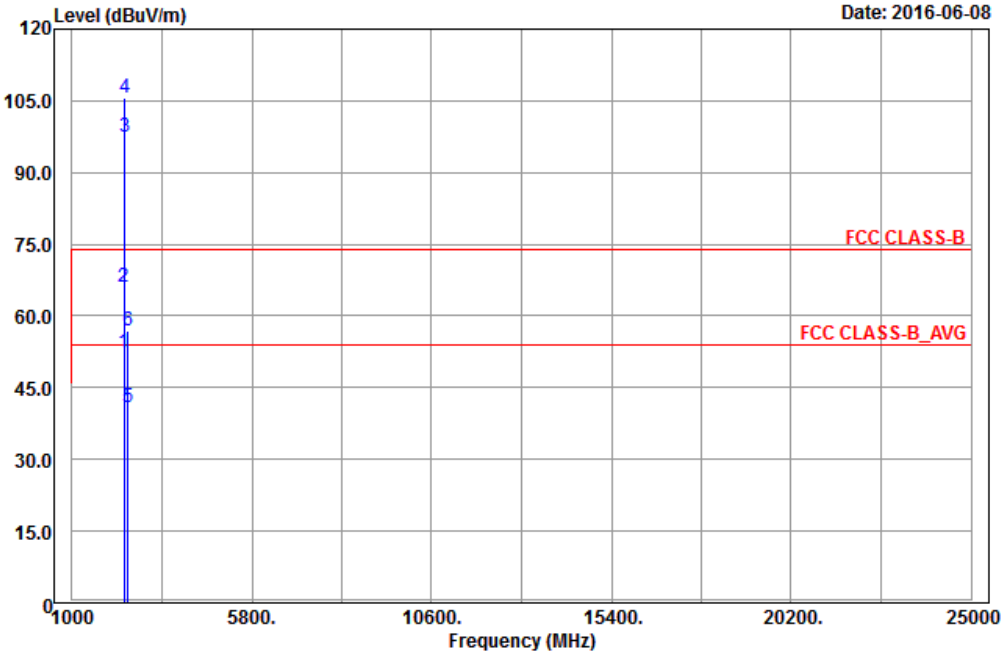
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 1	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



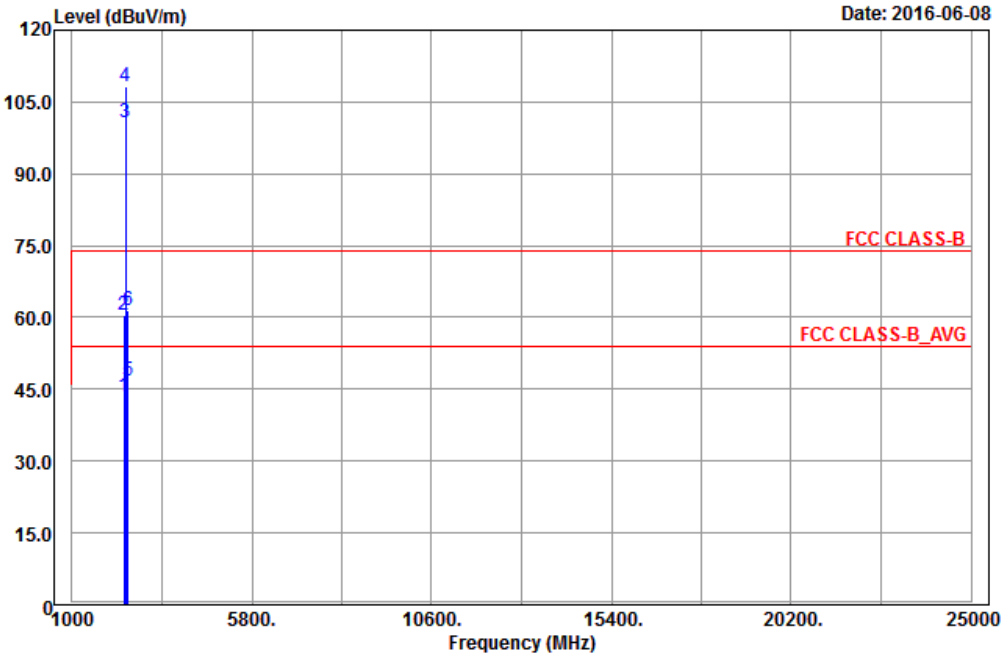
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	42.4	40.67	54	-11.6	31.8	5.4	35.47	166	251	Average
2390	56.09	54.36	74	-17.91	31.8	5.4	35.47	166	251	Peak
2412	93.05	91.28			31.81	5.43	35.47	166	251	Average
2412	101.99	100.22			31.81	5.43	35.47	166	251	Peak
2494	40.59	38.57	54	-13.41	31.9	5.53	35.41	166	251	Average
2494	55.27	53.25	74	-18.73	31.9	5.53	35.41	166	251	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	52.3	50.57	54	-1.7	31.8	5.4	35.47	112	223	Average
2390	65.95	64.22	74	-8.05	31.8	5.4	35.47	112	223	Peak
2412	97.3	95.53			31.81	5.43	35.47	112	353	Average
2412	105.73	103.96			31.81	5.43	35.47	112	353	Peak
2494	40.75	38.73	54	-13.25	31.9	5.53	35.41	112	353	Average
2494	56.99	54.97	74	-17.01	31.9	5.53	35.41	112	353	Peak

Remarks:

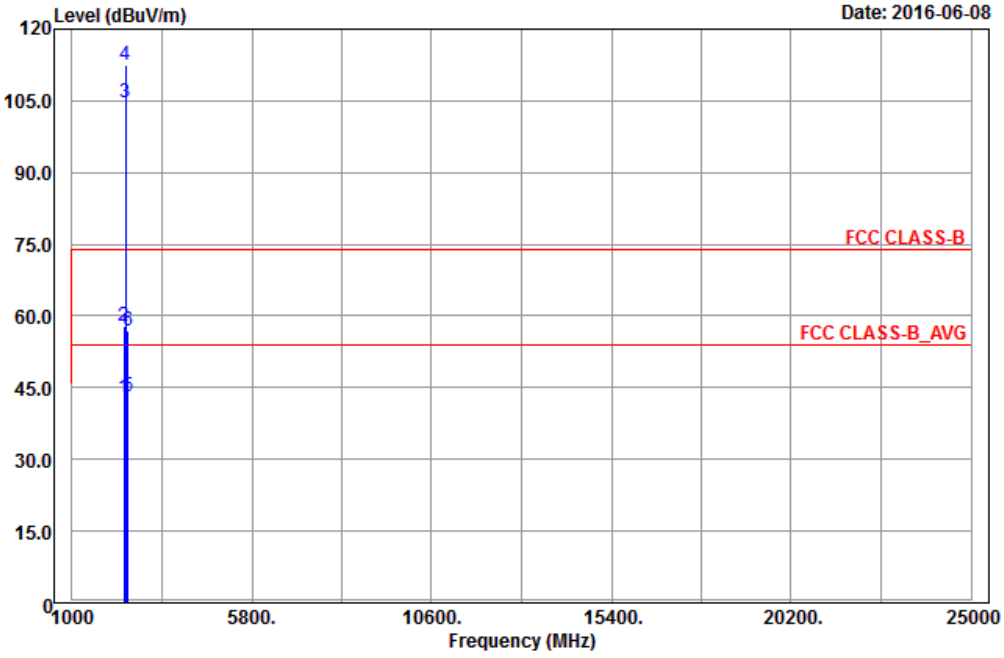
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2412 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



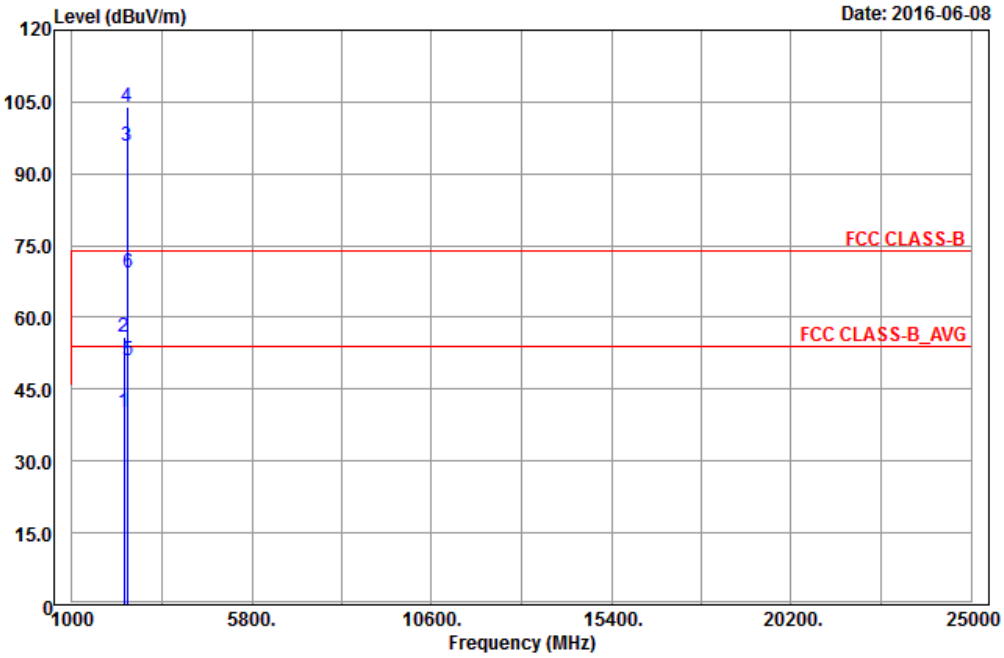
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2382	43.48	41.79	54	-10.52	31.78	5.4	35.49	238	132	Average
2382	60.47	58.78	74	-13.53	31.78	5.4	35.49	238	132	Peak
2437	100.64	98.79			31.85	5.46	35.46	238	132	Average
2437	108.35	106.5			31.85	5.46	35.46	238	132	Peak
2484	46.78	44.82	54	-7.22	31.88	5.5	35.42	240	130	Average
2484	61.55	59.59	74	-12.45	31.88	5.5	35.42	240	130	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	42.68	40.95	54	-11.32	31.8	5.4	35.47	196	344	Average
2390	57.91	56.18	74	-16.09	31.8	5.4	35.47	196	344	Peak
2437	104.64	102.79			31.85	5.46	35.46	196	344	Average
2437	112.47	110.62			31.85	5.46	35.46	196	344	Peak
2484	43.15	41.19	54	-10.85	31.88	5.5	35.42	196	344	Average
2484	57.05	55.09	74	-16.95	31.88	5.5	35.42	196	344	Peak

Remarks:

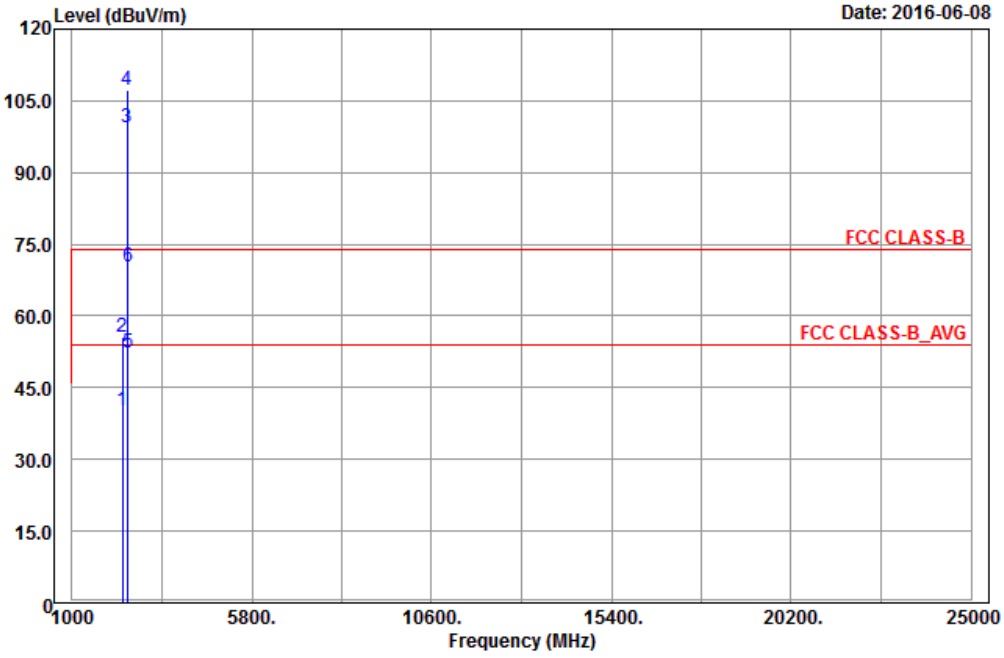
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2437 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2382	40.31	38.62	54	-13.69	31.78	5.4	35.49	234	131	Average
2382	55.76	54.07	74	-18.24	31.78	5.4	35.49	234	131	Peak
2462	95.91	93.98			31.87	5.5	35.44	234	131	Average
2462	103.92	101.99			31.87	5.5	35.44	234	131	Peak
2486	51.08	49.09	54	-2.92	31.88	5.53	35.42	253	131	Average
2486	69.26	67.27	74	-4.74	31.88	5.53	35.42	253	131	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2348	40.13	38.56	54	-13.87	31.74	5.33	35.5	124	210	Average
2348	55.74	54.17	74	-18.26	31.74	5.33	35.5	124	210	Peak
2462	99.24	97.31			31.87	5.5	35.44	124	210	Average
2462	107.19	105.26			31.87	5.5	35.44	124	210	Peak
2484	52.38	50.42	54	-1.62	31.88	5.5	35.42	286	130	Average
2484	70.26	68.3	74	-3.74	31.88	5.5	35.42	286	130	Peak

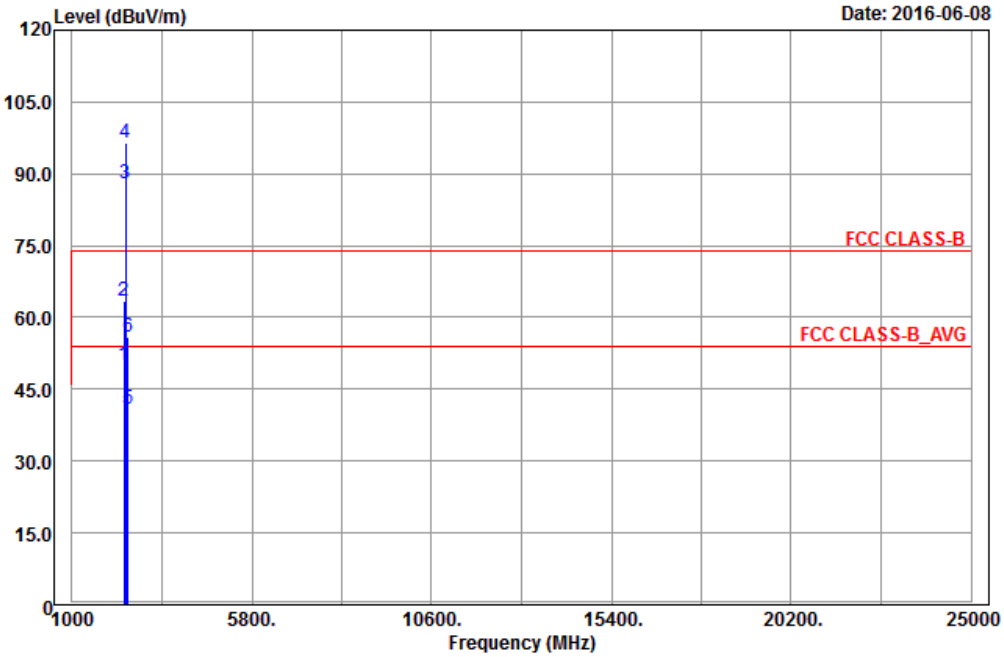
Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2462 MHz: Fundamental Frequency.

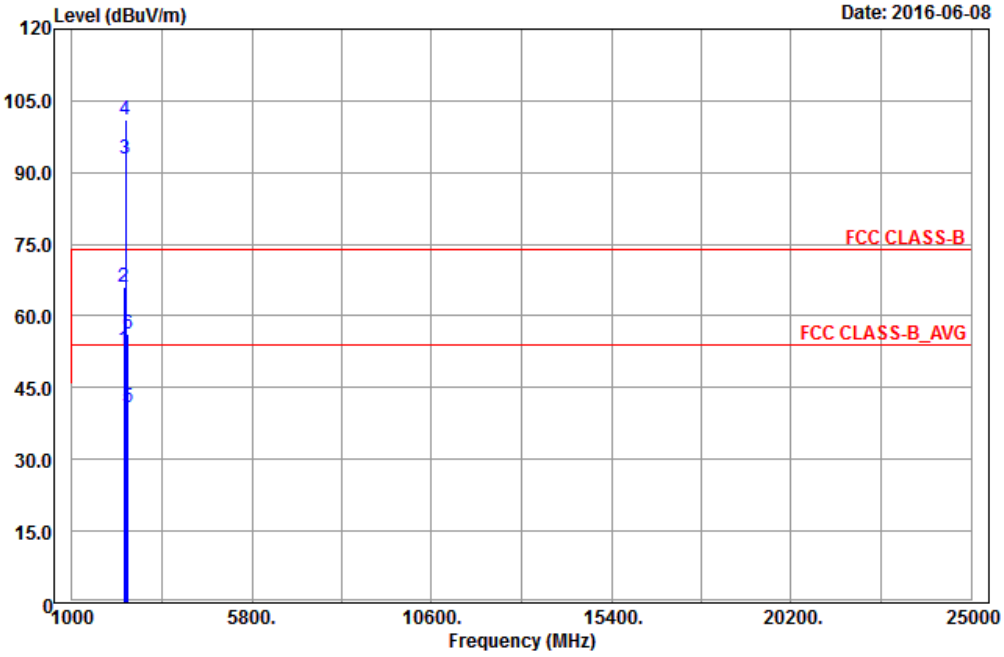
802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 3	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



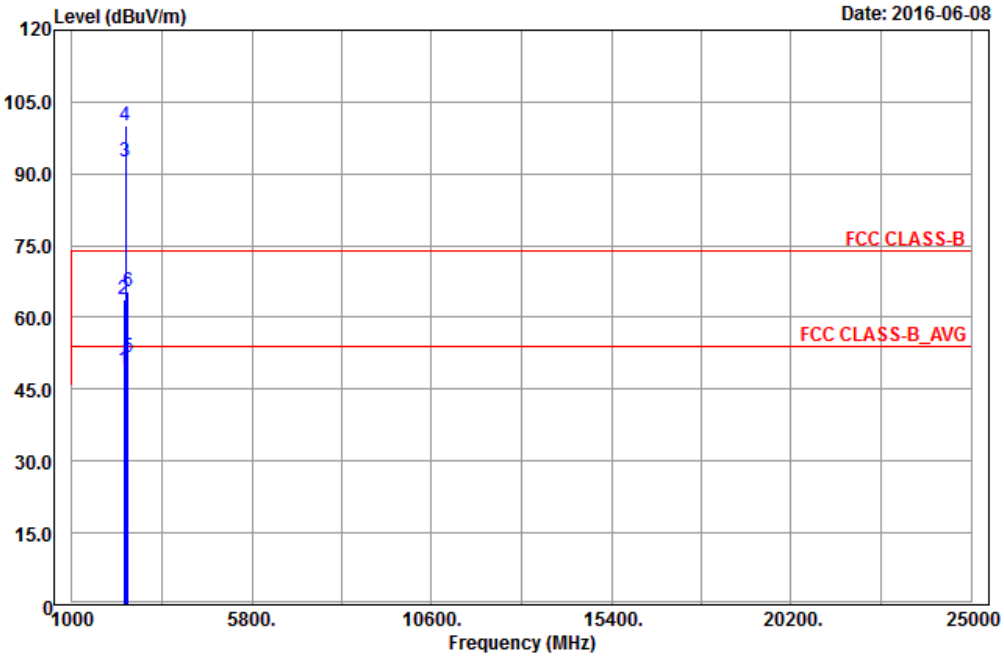
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	50	48.27	54	-4	31.8	5.4	35.47	243	251	Average
2390	63.54	61.81	74	-10.46	31.8	5.4	35.47	243	251	Peak
2422	88.06	86.26			31.83	5.43	35.46	166	251	Average
2422	96.52	94.72			31.83	5.43	35.46	166	251	Peak
2486	40.97	38.98	54	-13.03	31.88	5.53	35.42	166	251	Average
2486	55.82	53.83	74	-18.18	31.88	5.53	35.42	166	251	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	52.9	51.17	54	-1.1	31.8	5.4	35.47	100	353	Average
2390	66.13	64.4	74	-7.87	31.8	5.4	35.47	100	353	Peak
2422	92.86	91.06			31.83	5.43	35.46	112	353	Average
2422	100.97	99.17			31.83	5.43	35.46	112	353	Peak
2498	40.88	38.86	54	-13.12	31.9	5.53	35.41	112	353	Average
2498	56.29	54.27	74	-17.71	31.9	5.53	35.41	112	353	Peak

Remarks:

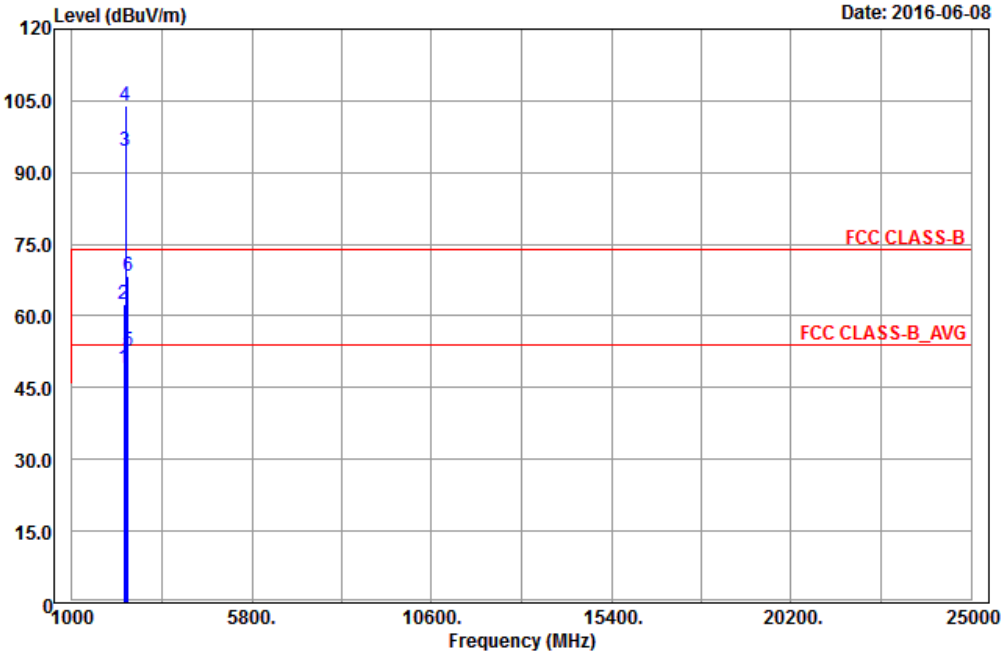
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2422 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



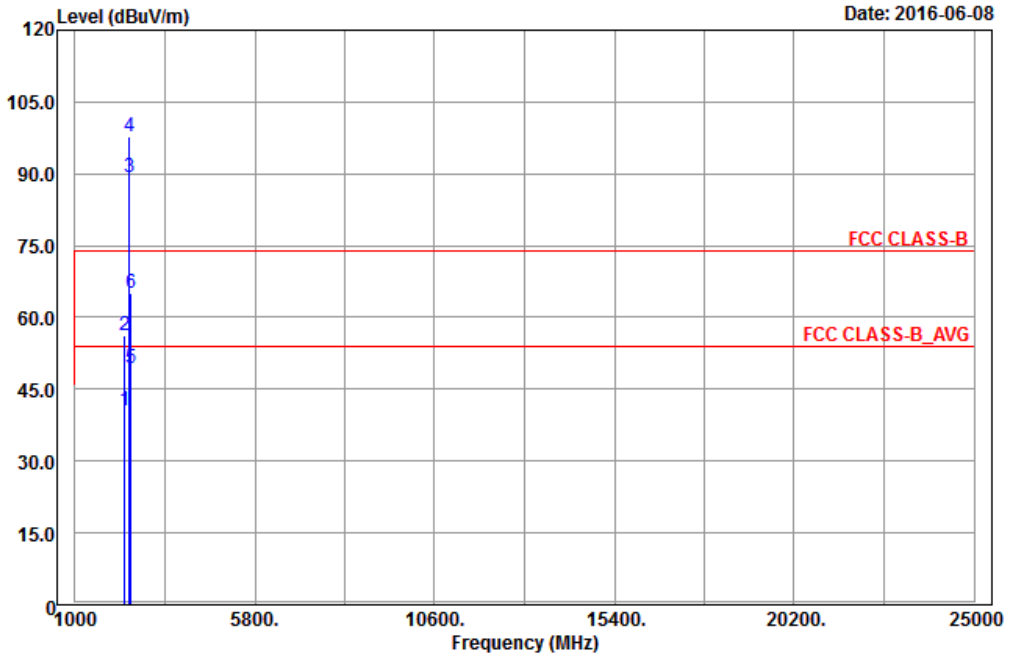
Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	49	47.27	54	-5	31.8	5.4	35.47	250	251	Average
2390	63.64	61.91	74	-10.36	31.8	5.4	35.47	250	251	Peak
2437	92.41	90.56			31.85	5.46	35.46	162	251	Average
2437	100.11	98.26			31.85	5.46	35.46	162	251	Peak
2484	51.68	49.72	54	-2.32	31.88	5.5	35.42	231	251	Average
2484	65.47	63.51	74	-8.53	31.88	5.5	35.42	231	251	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2388	49.2	47.49	54	-4.8	31.8	5.4	35.49	100	353	Average
2388	62.3	60.59	74	-11.7	31.8	5.4	35.49	100	353	Peak
2437	94.46	92.61			31.85	5.46	35.46	112	353	Average
2437	104.06	102.21			31.85	5.46	35.46	112	353	Peak
2486	52.48	50.49	54	-1.52	31.88	5.53	35.42	110	353	Average
2486	68.4	66.41	74	-5.6	31.88	5.53	35.42	110	353	Peak

Remarks:

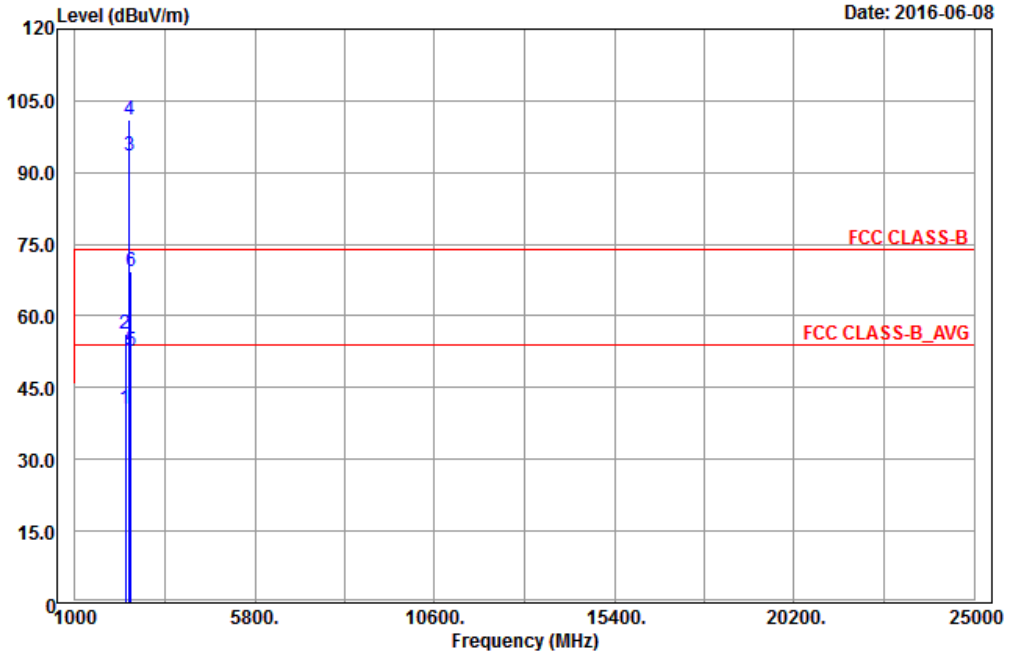
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2437 MHz: Fundamental Frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 9	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2320	40.52	39.01	54	-13.48	31.73	5.3	35.52	162	251	Average
2320	56.11	54.6	74	-17.89	31.73	5.3	35.52	162	251	Peak
2452	89.31	87.44			31.85	5.46	35.44	162	251	Average
2452	97.91	96.04			31.85	5.46	35.44	162	251	Peak
2484	49.24	47.28	54	-4.76	31.88	5.5	35.42	233	251	Average
2484	65.16	63.2	74	-8.84	31.88	5.5	35.42	233	251	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2350	40.66	39.09	54	-13.34	31.74	5.33	35.5	112	353	Average
2350	56.31	54.74	74	-17.69	31.74	5.33	35.5	112	353	Peak
2452	93.41	91.54			31.85	5.46	35.44	112	353	Average
2452	101.18	99.31			31.85	5.46	35.44	112	353	Peak
2484	52.61	50.65	54	-1.39	31.88	5.5	35.42	109	353	Average
2484	69.19	67.23	74	-4.81	31.88	5.5	35.42	109	353	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value
2. 2452 MHz: Fundamental Frequency.

9 kHz ~ 30 MHz DATA:

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

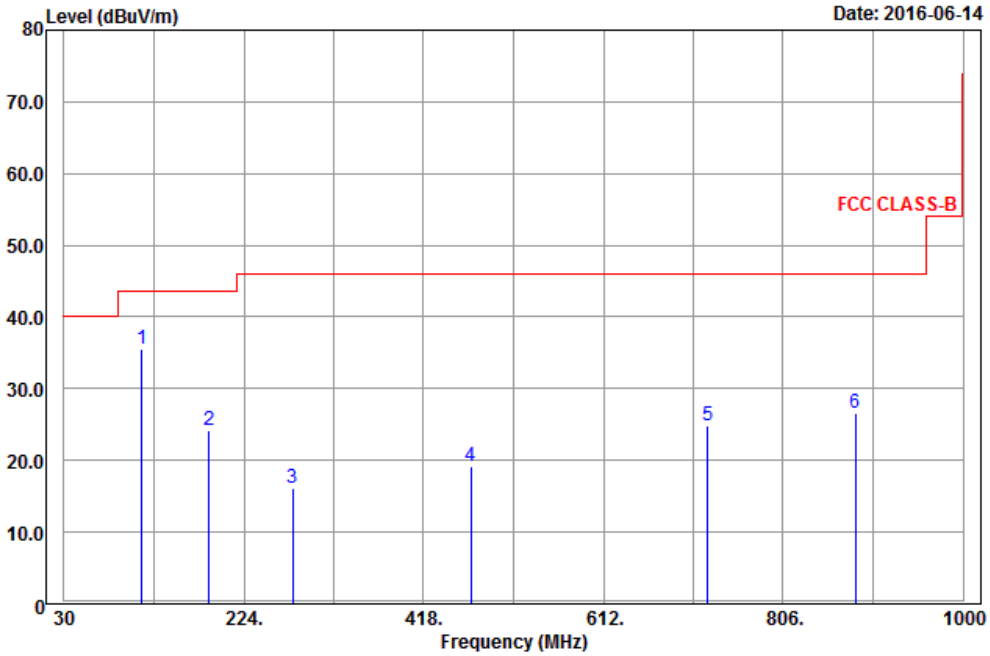
30 MHz ~ 1 GHz WORST-CASE DATA:

802.11n (HT40)

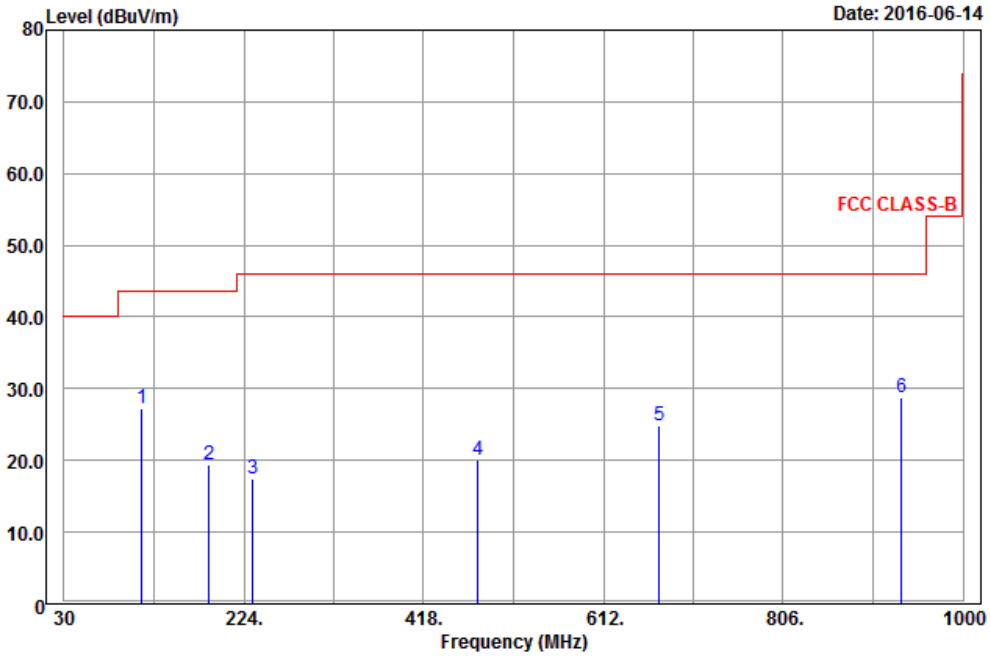
Mode A

EUT Test Condition		Measurement Detail	
Channel	Channel 9	**Frequency Range**	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
114.24	35.54	57.42	43.5	-7.96	9.09	1.28	32.25	169	131	Peak
186.87	24.3	44.54	43.5	-19.2	10.4	1.61	32.25	153	123	Peak
276.51	16.14	32.61	46	-29.86	13.71	1.94	32.12	128	144	Peak
468.7	19.14	30.08	46	-26.86	18.63	2.56	32.13	122	162	Peak
724.2	24.85	30.45	46	-21.15	23.36	3.16	32.12	158	136	Peak
883.8	26.69	29.9	46	-19.31	24.88	3.49	31.58	132	162	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
114.24	27.32	49.2	43.5	-16.18	9.09	1.28	32.25	169	138	Peak
186.6	19.3	39.54	43.5	-24.2	10.4	1.61	32.25	111	128	Peak
233.31	17.54	35.6	46	-28.46	12.25	1.85	32.16	174	124	Peak
476.4	20	30.66	46	-26	18.9	2.56	32.12	139	120	Peak
672.4	24.86	30.53	46	-21.14	23.4	3.05	32.12	187	141	Peak
933.5	28.8	30.22	46	-17.2	26.2	3.62	31.24	169	153	Peak

Remarks:

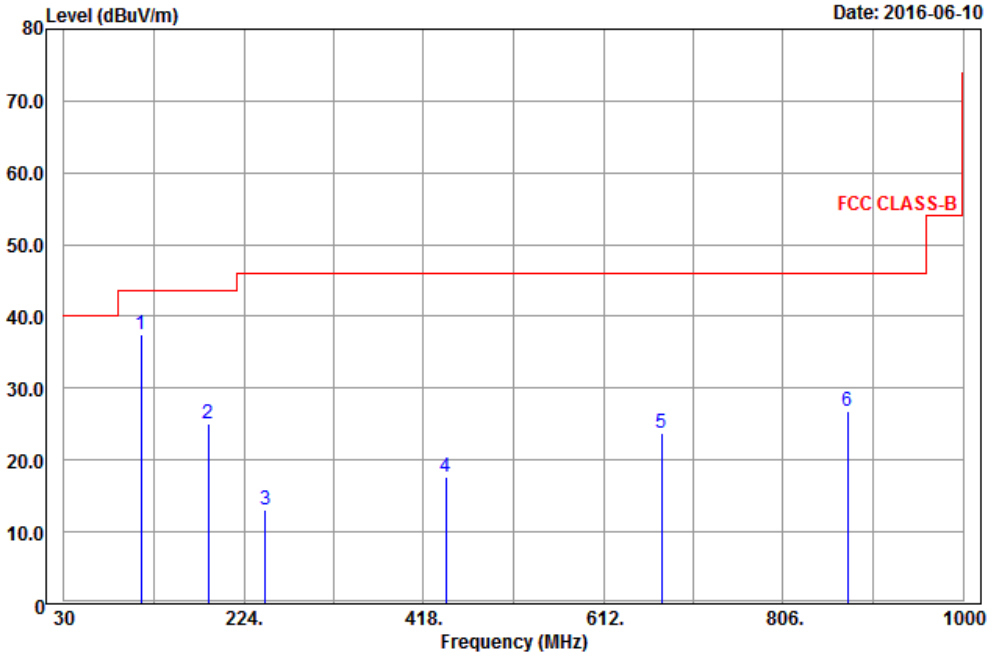
1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value

802.11g

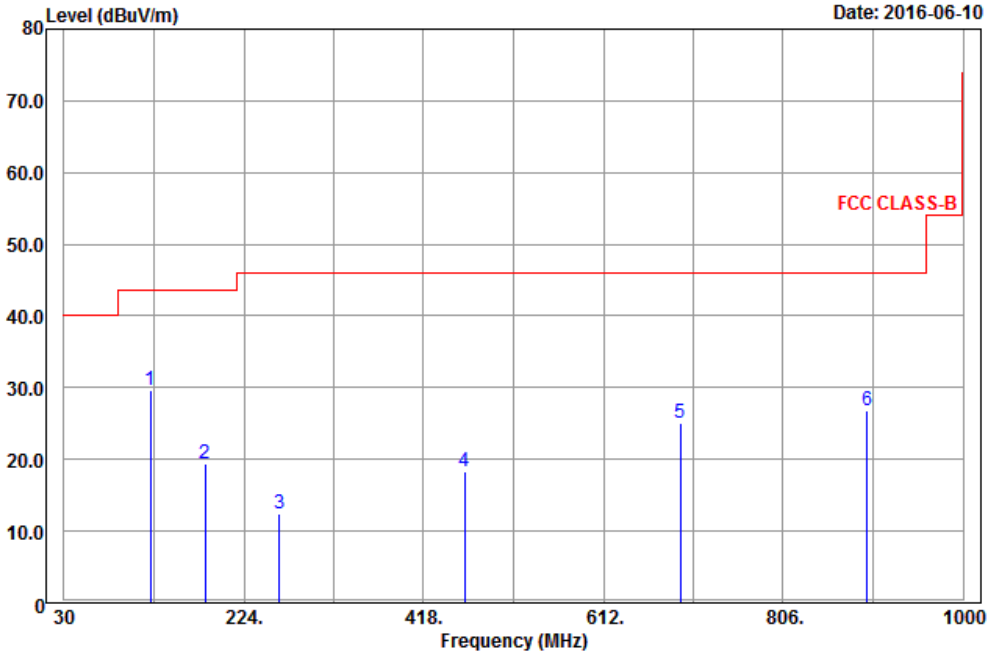
Mode B

EUT Test Condition		Measurement Detail	
Channel	Channel 1	**Frequency Range**	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Quasi-Peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Charles Hsiao

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
113.16	37.4	59.19	43.5	-6.1	9.18	1.28	32.25	169	138	Peak
185.79	25	45.24	43.5	-18.5	10.4	1.61	32.25	174	155	Peak
247.08	13.18	30.56	46	-32.82	12.88	1.85	32.11	106	133	Peak
442.1	17.68	29.43	46	-28.32	17.92	2.49	32.16	158	105	Peak
674.5	23.68	29.35	46	-22.32	23.4	3.05	32.12	167	143	Peak
875.4	26.74	30.08	46	-19.26	24.8	3.49	31.63	108	152	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
123.42	29.59	51.58	43.5	-13.91	8.87	1.38	32.24	127	146	Peak
182.28	19.45	39.68	43.5	-24.05	10.4	1.61	32.24	182	155	Peak
262.74	12.38	29.18	46	-33.62	13.37	1.94	32.11	137	142	Peak
462.4	18.27	29.39	46	-27.73	18.45	2.56	32.13	169	138	Peak
694.8	25.08	30.92	46	-20.92	23.14	3.11	32.09	155	124	Peak
896.4	26.88	29.9	46	-19.12	25	3.49	31.51	108	164	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin Value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	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.

4.2.2 Test Instruments

Description & Manaufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 16, 2015	Nov. 15, 2016
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 26, 2015	Dec. 25, 2016
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 26, 2016	Feb. 25, 2017
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 24, 2015	Jul. 23, 2016
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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 test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

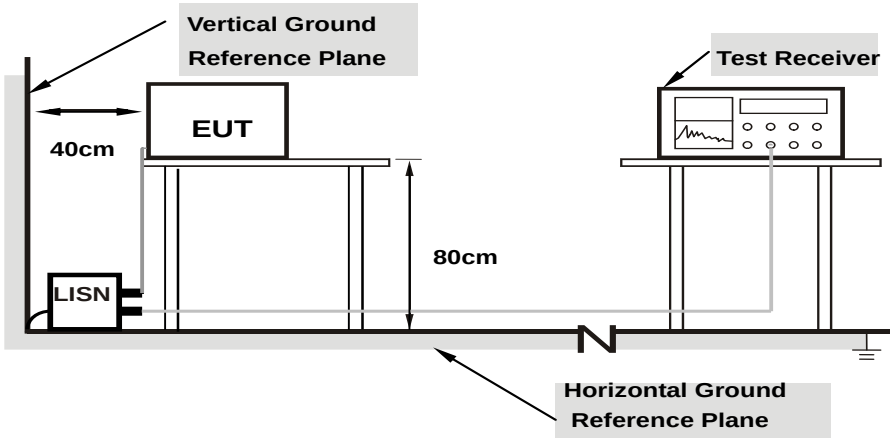
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

a. Placed the EUT on a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.2.7 Test Results

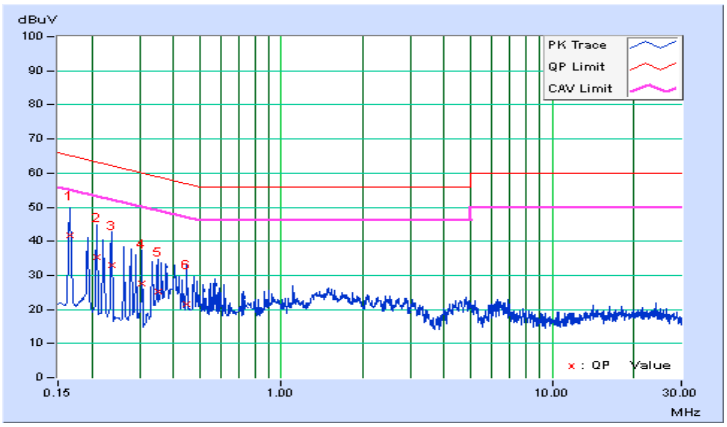
Mode A

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Toby Tian	Test Date	2016/6/9

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16564	10.02	31.70	8.94	41.72	18.96	65.18	55.18	-23.46	-36.22
2	0.20865	10.03	25.43	5.41	35.46	15.44	63.26	53.26	-27.79	-37.81
3	0.23602	10.05	22.79	3.07	32.84	13.12	62.24	52.24	-29.40	-39.12
4	0.30640	10.08	17.51	0.91	27.59	10.99	60.07	50.07	-32.48	-39.08
5	0.34941	10.10	15.11	6.55	25.21	16.65	58.98	48.98	-33.77	-32.33
6	0.44716	10.13	11.55	5.37	21.68	15.50	56.93	46.93	-35.25	-31.43

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

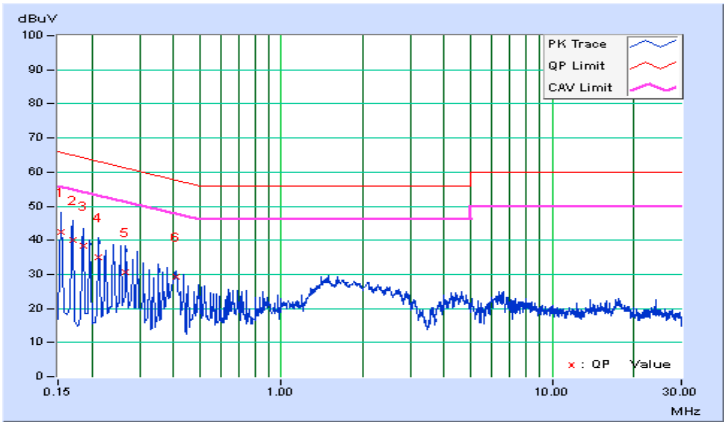


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Toby Tian	Test Date	2016/6/9

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.03	32.30	6.98	42.33	17.01	65.79	55.79	-23.46	-38.78
2	0.16955	10.03	29.89	5.05	39.92	15.08	64.98	54.98	-25.06	-39.90
3	0.18519	10.04	28.42	3.96	38.46	14.00	64.25	54.25	-25.79	-40.25
4	0.21256	10.05	25.12	3.06	35.17	13.11	63.10	53.10	-27.94	-40.00
5	0.26730	10.07	20.71	7.74	30.78	17.81	61.20	51.20	-30.42	-33.39
6	0.40800	10.13	19.31	18.00	29.44	28.13	57.69	47.69	-28.25	-19.56

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



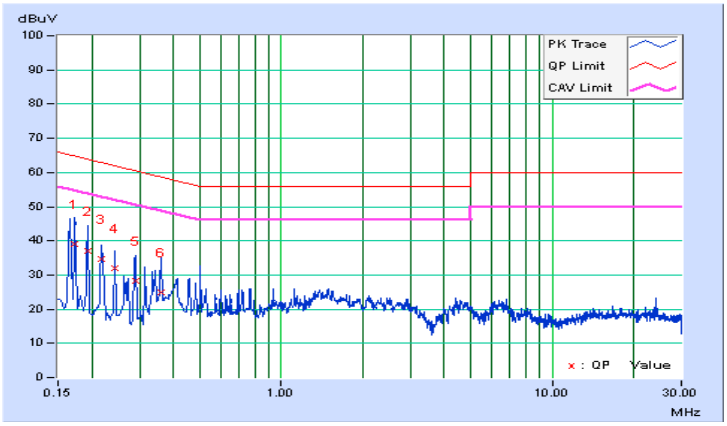
Mode B

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Toby Tian	Test Date	2016/6/9

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17346	10.02	29.10	8.46	39.12	18.48	64.79	54.79	-25.67	-36.31
2	0.19301	10.03	27.16	7.15	37.19	17.18	63.91	53.91	-26.72	-36.73
3	0.21647	10.04	24.55	4.86	34.59	14.90	62.95	52.95	-28.37	-38.06
4	0.24384	10.05	22.00	2.96	32.05	13.01	61.96	51.96	-29.91	-38.95
5	0.29043	10.07	18.32	0.89	28.39	10.96	60.51	50.51	-32.12	-39.55
6	0.36114	10.10	14.75	8.05	24.85	18.15	58.70	48.70	-33.85	-30.55

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

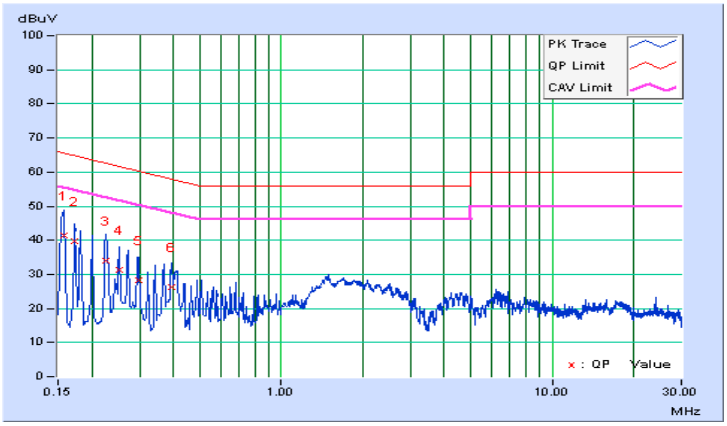


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Toby Tian	Test Date	2016/6/9

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	10.03	31.52	6.23	41.55	16.26	65.58	55.58	-24.03	-39.32
2	0.17346	10.03	29.74	4.92	39.77	14.95	64.79	54.79	-25.02	-39.84
3	0.22434	10.05	24.01	4.60	34.06	14.65	62.66	52.66	-28.60	-38.01
4	0.25166	10.06	21.15	7.26	31.21	17.32	61.70	51.70	-30.49	-34.38
5	0.29858	10.08	18.12	5.86	28.20	15.94	60.28	50.28	-32.08	-34.34
6	**0.39242**	**10.13**	**16.00**	**18.68**	**26.13**	**28.81**	**58.01**	**48.01**	**-31.89**	**-19.21**

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



4.3 Conducted Output Power Measurement

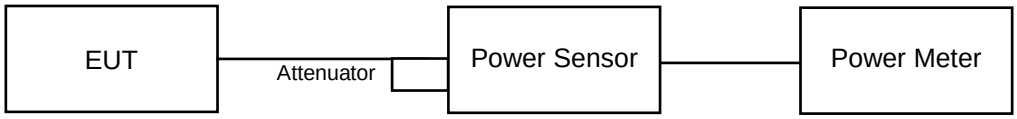
4.3.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30 dBm)
Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20 MHz channel widths with NANT ≥ 5.

For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedures

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Results

802.11b

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.33	18.97	164.590	22.16	30	Pass
6	2437	19.14	19.21	165.403	22.19	30	Pass
11	2462	18.74	19.15	157.041	21.96	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	21.67	22.05	307.217	24.87	30	Pass
6	2437	24.88	24.95	620.218	27.93	30	Pass
11	2462	18.75	19.97	174.301	22.41	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.91	19.14	159.839	22.04	30	Pass
6	2437	24.91	25.12	634.829	28.03	30	Pass
11	2462	18.74	19.08	155.727	21.92	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	15.87	17.15	90.517	19.57	30	Pass
6	2437	18.94	20.21	183.297	22.63	30	Pass
9	2452	14.44	16.63	73.823	18.68	30	Pass

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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