

FCC Test Report

Report No.: RF180125C14-2

FCC ID: B94-8265D2WEE

Test Model: HSN-Q10C

Received Date: Feb. 05, 2018

Test Date: Mar. 31, 2018 ~ May 02, 2018

Issued Date: May 04, 2018

Applicant: HP Inc.

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**FCC Registration /
Designation Number:** 427177 / TW0011



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Release Control Record

Issue No.	Description	Date Issued
RF180125C14-2	Original Release	May 04, 2018

1 Certificate of Conformity

Product: Notebook Computer

Brand: HP

Test Model: HSN-Q10C

Sample Status: Production Unit

Applicant: HP Inc.

Test Date: Mar. 31, 2018 ~ May 02, 2018

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 RF characteristics under the conditions specified in this report.

Prepared by : Evonne Liu, **Date:** May 04, 2018
Evonne Liu / Specialist

Approved by : Dylan Chiou, **Date:** May 04, 2018
Dylan Chiou / Project Engineer

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	N/A	Refer to Note
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -4.76 dB at 2483.6 MHz.
15.247(d)	Antenna Port Emission	N/A	Refer to Note
15.247(a)(2)	6 dB Bandwidth	N/A	Refer to Note
---	Occupied Bandwidth Measurement	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: This report is a partial report, only test item of Output Power and Radiated Emissions tests were performed for this report. Other testing data please refer to BV CPS report no.: 160321-02.TR04 for module (Brand: Intel, Model: 8265D2W).

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	Expanded 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	Notebook Computer
Brand	HP
Test Model	HSN-Q10C
Status of EUT	Production Unit
Power Supply Rating	20 or 15 or 12 or 9 or 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 150.0 Mbps
Operating Frequency	2412 ~ 2462 MHz
Number of Channel	13 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Antenna Type	Refer to Note as below
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

1. The WLAN/BT module (Brand: Intel, Model: 8265D2W) was installed in the EUT.
2. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

Modulation Mode	Tx Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX

3. The antenna information is listed as below.

Antenna Type	Vendor	Part Number	Antenna Gain (dBi)			
			Laptop PC Mode			
			WLAN 2.4GHz	WLAN 5.2GHz	WLAN 5.5GHz	WLAN 5.8GHz
PIFA	INPAQ	WLAN Main Antenna: DQ6LB020509 (WA-P-LBLB-02-059) WLAN Aux Antenna: DQ6LB020509 (WA-P-LBLB-02-059)	1.66	0.54	0.56	-0.21
			Tablet PC Mode			
			WLAN 2.4GHz	WLAN 5.2GHz	WLAN 5.5GHz	WLAN 5.8GHz
			-0.36	3.36	2.21	3.08

4. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	hp	TPN-LA12	I/P: 100-240 Vac, 50-60 Hz, 1.6 A O/P: 20 Vdc, 3.25 A, 15 Vdc, 4.33 A, 12 Vdc, 5 A, 9 Vdc, 3 A, 5 Vdc, 3 A

5. 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

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	12	2467
6	2437	13	2472
7	2442		

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 \geq 1G	RE $<$ 1G	
-	√	√	-

Where **RE \geq 1G**: Radiated Emission above 1 GHz **RE $<$ 1G**: Radiated Emission below 1 GHz

NOTE: The EUT had been pre-tested on the positioned of each 4 axis. The worst case was found when positioned on **NB-plane**.

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)
-	802.11b	1 to 11	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 6, 11, 12, 13	OFDM	BPSK	6.5
-	802.11n (HT40)	3 to 9	3, 6, 9, 10, 11	OFDM	BPSK	13.5

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)
-	802.11n (HT40)	1 to 11	11	OFDM	BPSK	13.5

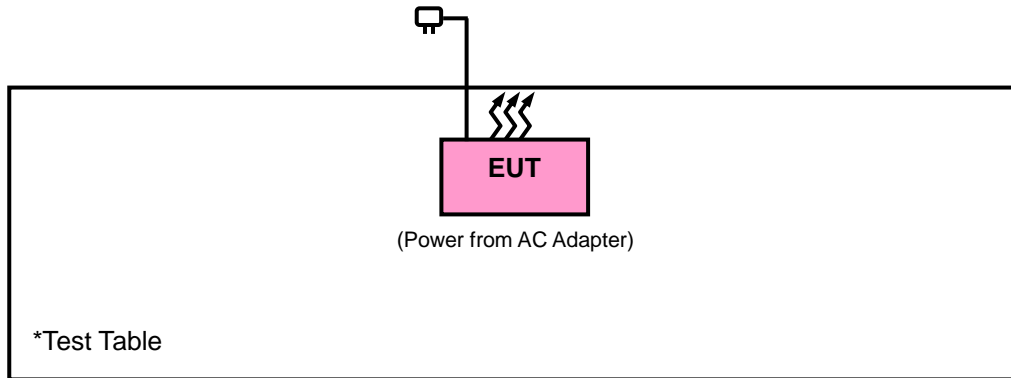
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE \geq 1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
RE $<$ 1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee

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 v04

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 & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Jul. 05, 2017	Jul. 04, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
Double Ridge Guide Horn Antenna EMCO	3115	5619	Nov. 30, 2017	Nov. 29, 2018
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 06, 2017	Dec. 05, 2018
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 07, 2017	Jul. 06, 2018
Loop Antenna	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier Agilent	310N	187226	Jun. 23, 2017	Jun. 22, 2018
Preamplifier Agilent	83017A	MY39501357	Jun. 23, 2017	Jun. 22, 2018
Power Meter Anritsu	ML2495A	1232002	Dec. 07, 2017	Dec. 06, 2018
Power Sensor Anritsu	MA2411B	1207325	Dec. 07, 2017	Dec. 06, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 23, 2017	Jun. 22, 2018
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(R FC-SMS-100-SM S-24)	Jun. 23, 2017	Jun. 22, 2018
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 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:

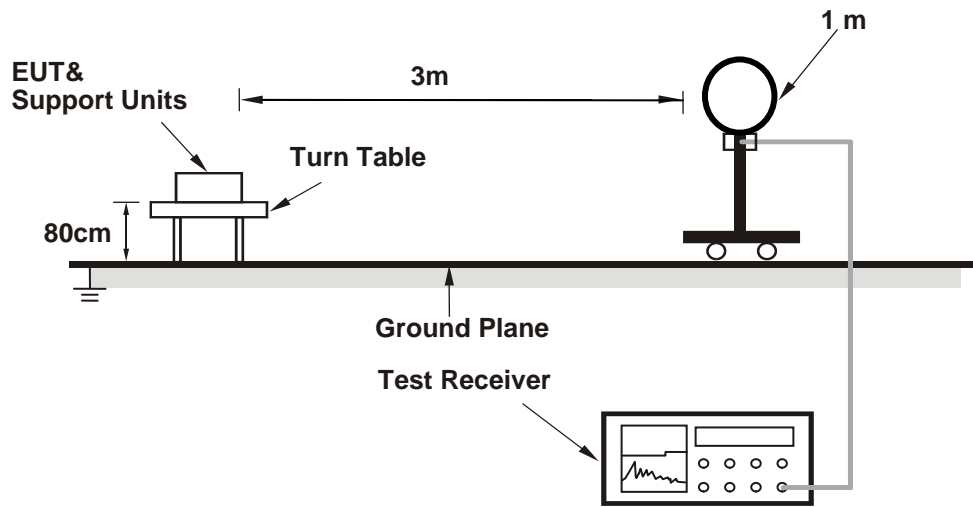
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360 KHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1/T for Average (Duty cycle < 98 %) detection at frequency above 1 GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz (Duty cycle \geq 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

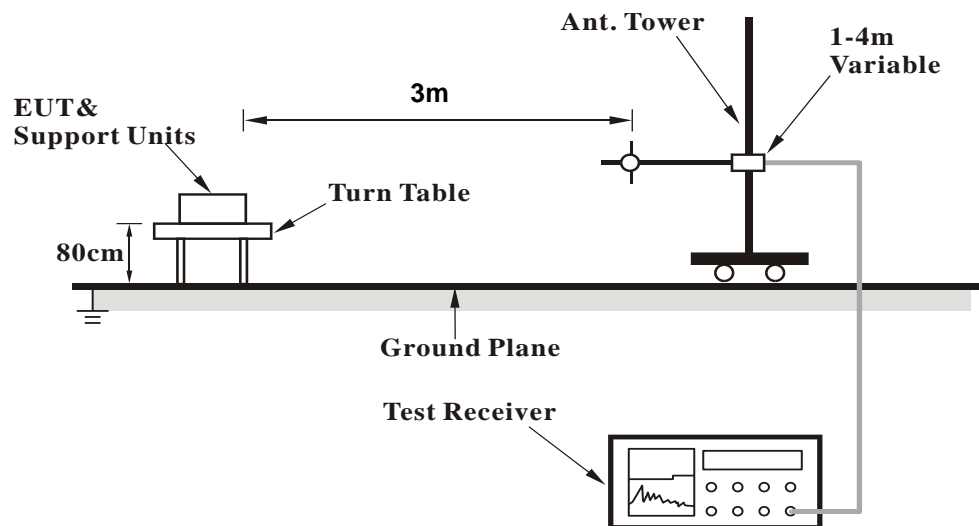
No deviation.

4.1.5 Test Set Up

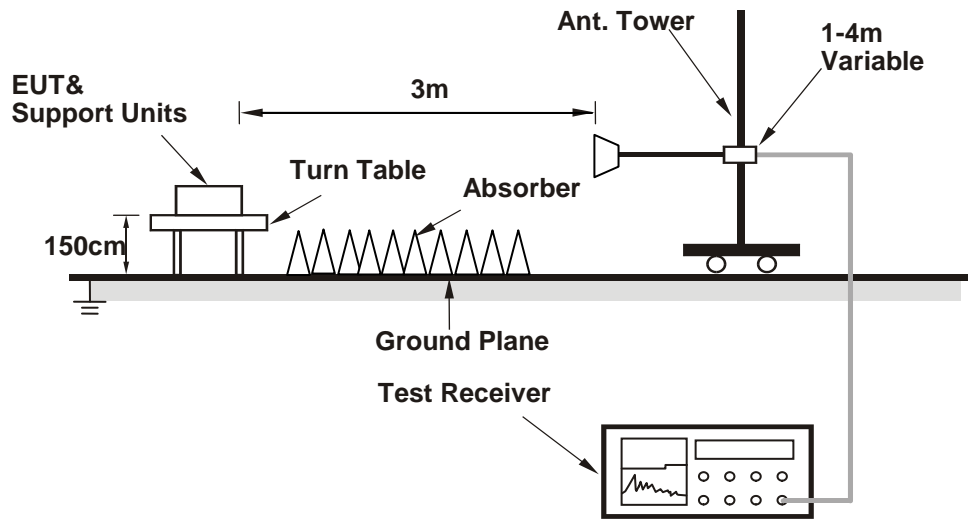
<Radiated emission below 30 MHz>



<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 :
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	Karl Lee

Antennal 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
2387.67	41.88	40.17	54	-12.12	31.8	5.4	35.49	338	290	Average
2387.67	52.28	50.57	74	-21.72	31.8	5.4	35.49	338	290	Peak
2412	95.05	93.28			31.81	5.43	35.47	338	290	Average
2412	99.15	97.38			31.81	5.43	35.47	338	290	Peak
4824	38.17	30.04	54	-15.83	33.97	8.26	34.1	156	332	Average
4824	48.51	40.38	74	-25.49	33.97	8.26	34.1	156	332	Peak

Antennal 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
2388.3	46.92	45.21	54	-7.08	31.8	5.4	35.49	116	0	Average
2388.3	54.9	53.19	74	-19.1	31.8	5.4	35.49	116	0	Peak
2412	103.26	101.49			31.81	5.43	35.47	116	0	Average
2412	107.13	105.36			31.81	5.43	35.47	116	0	Peak
4824	38.05	29.92	54	-15.95	33.97	8.26	34.1	126	305	Average
4824	48.78	40.65	74	-25.22	33.97	8.26	34.1	126	305	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 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	Karl Lee

Antennal 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
2376.54	40.29	38.63	54	-13.71	31.78	5.37	35.49	336	290	Average
2376.54	51.65	49.99	74	-22.35	31.78	5.37	35.49	336	290	Peak
2437	97.48	95.63			31.85	5.46	35.46	336	290	Average
2437	100.9	99.05			31.85	5.46	35.46	336	290	Peak
2490.06	41.14	39.13	54	-12.86	31.9	5.53	35.42	336	290	Average
2490.06	51.64	49.63	74	-22.36	31.9	5.53	35.42	336	290	Peak
4974	38.11	29.81	54	-15.89	34	8.29	33.99	167	316	Average
4974	48.42	40.12	74	-25.58	34	8.29	33.99	167	316	Peak

Antennal 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
2386.47	42.16	40.45	54	-11.84	31.8	5.4	35.49	117	0	Average
2386.47	52.62	50.91	74	-21.38	31.8	5.4	35.49	117	0	Peak
2437	104.52	102.67			31.85	5.46	35.46	117	0	Average
2437	108.89	107.04			31.85	5.46	35.46	117	0	Peak
2483.85	42.39	40.43	54	-11.61	31.88	5.5	35.42	117	0	Average
2483.85	53.39	51.43	74	-20.61	31.88	5.5	35.42	117	0	Peak
4974	38.27	29.97	54	-15.73	34	8.29	33.99	110	153	Average
4974	48.46	40.16	74	-25.54	34	8.29	33.99	110	153	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 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	Karl Lee

Antennal 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
2462	94.26	92.33			31.87	5.5	35.44	334	290	Average
2462	98.48	96.55			31.87	5.5	35.44	334	290	Peak
2487.04	41.14	39.15	54	-12.86	31.88	5.53	35.42	334	290	Average
2487.04	52.12	50.13	74	-21.88	31.88	5.53	35.42	334	290	Peak
4924	38.36	30.11	54	-15.64	33.99	8.28	34.02	169	332	Average
4924	48.67	40.42	74	-25.33	33.99	8.28	34.02	169	332	Peak
Antennal 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
2462	102.8	100.87			31.87	5.5	35.44	103	3	Average
2462	106.9	104.97			31.87	5.5	35.44	103	3	Peak
2483.52	44.14	42.18	54	-9.86	31.88	5.5	35.42	103	3	Average
2483.52	56.1	54.14	74	-17.9	31.88	5.5	35.42	103	3	Peak
4924	37.95	29.7	54	-16.05	33.99	8.28	34.02	108	24	Average
4924	47.76	39.51	74	-26.24	33.99	8.28	34.02	108	24	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	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	Karl Lee

Antennal 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
2467	92.78	90.83			31.87	5.5	35.42	334	292	Average
2467	96.55	94.6			31.87	5.5	35.42	334	292	Peak
2483.52	41.61	39.65	54	-12.39	31.88	5.5	35.42	334	292	Average
2483.52	51.9	49.94	74	-22.1	31.88	5.5	35.42	334	292	Peak
4934	38.33	30.07	54	-15.67	33.99	8.29	34.02	128	156	Average
4934	48.35	40.09	74	-25.65	33.99	8.29	34.02	128	156	Peak

Antennal 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
2467	100.76	98.81			31.87	5.5	35.42	106	4	Average
2467	104.7	102.75			31.87	5.5	35.42	106	4	Peak
2483.52	47.01	45.05	54	-6.99	31.88	5.5	35.42	106	4	Average
2483.52	55.39	53.43	74	-18.61	31.88	5.5	35.42	106	4	Peak
4934	38.02	29.76	54	-15.98	33.99	8.29	34.02	177	216	Average
4934	48.17	39.91	74	-25.83	33.99	8.29	34.02	177	216	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2467 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	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	Karl Lee

Antennal 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
2472	85.77	83.81			31.88	5.5	35.42	334	290	Average
2472	89.38	87.42			31.88	5.5	35.42	334	290	Peak
2484.72	41.31	39.32	54	-12.69	31.88	5.53	35.42	334	290	Average
2484.72	51.8	49.81	74	-22.2	31.88	5.53	35.42	334	290	Peak
4944	38.52	30.25	54	-15.48	33.99	8.29	34.01	174	115	Average
4944	48.74	40.47	74	-25.26	33.99	8.29	34.01	174	115	Peak
Antennal 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
2472	93.02	91.06			31.88	5.5	35.42	103	3	Average
2472	97.59	95.63			31.88	5.5	35.42	103	3	Peak
2484.4	47.24	45.25	54	-6.76	31.88	5.53	35.42	103	3	Average
2484.4	55.09	53.1	74	-18.91	31.88	5.53	35.42	103	3	Peak
4944	38.4	30.13	54	-15.6	33.99	8.29	34.01	165	225	Average
4944	48.64	40.37	74	-25.36	33.99	8.29	34.01	165	225	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2472 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	Karl Lee

Antennal 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
2387.67	41.25	39.54	54	-12.75	31.8	5.4	35.49	366	307	Average
2387.67	51.93	50.22	74	-22.07	31.8	5.4	35.49	366	307	Peak
2412	97.21	95.44			31.81	5.43	35.47	397	307	Average
2412	104.67	102.9			31.81	5.43	35.47	397	307	Peak
4824	38.43	30.3	54	-15.57	33.97	8.26	34.1	170	114	Average
4824	48.77	40.64	74	-25.23	33.97	8.26	34.1	170	114	Peak
Antennal 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
2389.92	46.93	45.2	54	-7.07	31.8	5.4	35.47	109	360	Average
2389.92	56.31	54.58	74	-17.69	31.8	5.4	35.47	109	360	Peak
2412	103.01	101.24			31.81	5.43	35.47	105	3	Average
2412	110.22	108.45			31.81	5.43	35.47	105	3	Peak
4824	38.01	29.88	54	-15.99	33.97	8.26	34.1	132	149	Average
4824	47.76	39.63	74	-26.24	33.97	8.26	34.1	132	149	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 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	Karl Lee

Antennal 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
2388.03	40.86	39.15	54	-13.14	31.8	5.4	35.49	397	307	Average
2388.03	51.44	49.73	74	-22.56	31.8	5.4	35.49	397	307	Peak
2437	97.69	95.84			31.85	5.46	35.46	397	307	Average
2437	104.91	103.06			31.85	5.46	35.46	397	307	Peak
2484.12	41.28	39.32	54	-12.72	31.88	5.5	35.42	397	307	Average
2484.12	52.21	50.25	74	-21.79	31.88	5.5	35.42	397	307	Peak
4874	38.47	30.28	54	-15.53	33.98	8.27	34.06	132	226	Average
4874	48.94	40.75	74	-25.06	33.98	8.27	34.06	132	226	Peak
Antennal 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
2389.92	41.7	39.97	54	-12.3	31.8	5.4	35.47	105	0	Average
2389.92	52.62	50.89	74	-21.38	31.8	5.4	35.47	105	0	Peak
2437	103.36	101.51			31.85	5.46	35.46	105	3	Average
2437	111.04	109.19			31.85	5.46	35.46	105	3	Peak
2484.08	41.77	39.81	54	-12.23	31.88	5.5	35.42	105	0	Average
2484.08	52.48	50.52	74	-21.52	31.88	5.5	35.42	105	0	Peak
4874	37.66	29.47	54	-16.34	33.98	8.27	34.06	192	107	Average
4874	47.25	39.06	74	-26.75	33.98	8.27	34.06	192	107	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 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	Karl Lee

Antennal 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
2462	95.78	93.85			31.87	5.5	35.44	397	307	Average
2462	103.31	101.38			31.87	5.5	35.44	397	307	Peak
2483.56	41.96	40	54	-12.04	31.88	5.5	35.42	397	307	Average
2483.56	52.51	50.55	74	-21.49	31.88	5.5	35.42	397	307	Peak
4924	37.47	29.22	54	-16.53	33.99	8.28	34.02	132	191	Average
4924	47.18	38.93	74	-26.82	33.99	8.28	34.02	132	191	Peak
Antennal 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
2462	101.4	99.47			31.87	5.5	35.44	100	3	Average
2462	108.97	107.04			31.87	5.5	35.44	100	3	Peak
2483.6	45.2	43.24	54	-8.8	31.88	5.5	35.42	104	3	Average
2483.6	57.79	55.83	74	-16.21	31.88	5.5	35.42	104	3	Peak
4924	38.57	30.32	54	-15.43	33.99	8.28	34.02	144	107	Average
4924	48.6	40.35	74	-25.4	33.99	8.28	34.02	144	107	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	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	Karl Lee

Antennal 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
2467	90.26	88.31			31.87	5.5	35.42	397	307	Average
2467	97.31	95.36			31.87	5.5	35.42	397	307	Peak
2483.76	41.96	40	54	-12.04	31.88	5.5	35.42	397	307	Average
2483.76	52.48	50.52	74	-21.52	31.88	5.5	35.42	397	307	Peak
4934	37.89	29.63	54	-16.11	33.99	8.29	34.02	156	229	Average
4934	48.14	39.88	74	-25.86	33.99	8.29	34.02	156	229	Peak

Antennal 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
2467	96.06	94.11			31.87	5.5	35.42	100	3	Average
2467	103.66	101.71			31.87	5.5	35.42	100	3	Peak
2483.52	43.72	41.76	54	-10.28	31.88	5.5	35.42	112	3	Average
2483.52	55.76	53.8	74	-18.24	31.88	5.5	35.42	112	3	Peak
4934	38.36	30.1	54	-15.64	33.99	8.29	34.02	125	180	Average
4934	48.44	40.18	74	-25.56	33.99	8.29	34.02	125	180	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2467 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	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	Karl Lee

Antennal 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
2472	72.46	70.5			31.88	5.5	35.42	392	305	Average
2472	80.79	78.83			31.88	5.5	35.42	392	305	Peak
2483.52	43.25	41.29	54	-10.75	31.88	5.5	35.42	392	305	Average
2483.52	55.07	53.11	74	-18.93	31.88	5.5	35.42	392	305	Peak
4944	38.26	29.99	54	-15.74	33.99	8.29	34.01	123	58	Average
4944	48.32	40.05	74	-25.68	33.99	8.29	34.01	123	58	Peak

Antennal 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
2472	79.13	77.17			31.88	5.5	35.42	105	0	Average
2472	87.03	85.07			31.88	5.5	35.42	105	0	Peak
2483.52	45.93	43.97	54	-8.07	31.88	5.5	35.42	105	177	Average
2483.52	61.48	59.52	74	-12.52	31.88	5.5	35.42	105	177	Peak
4944	38.3	30.03	54	-15.7	33.99	8.29	34.01	124	162	Average
4944	48.24	39.97	74	-25.76	33.99	8.29	34.01	124	162	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2472 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	Karl Lee

Antennal 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
2389.95	43.33	41.6	54	-10.67	31.8	5.4	35.47	356	287	Average
2389.95	53.68	51.95	74	-20.32	31.8	5.4	35.47	356	287	Peak
2412	96.02	94.25			31.81	5.43	35.47	396	307	Average
2412	104.92	103.15			31.81	5.43	35.47	396	307	Peak
4824	37.7	29.57	54	-16.3	33.97	8.26	34.1	140	111	Average
4824	47.54	39.41	74	-26.46	33.97	8.26	34.1	140	111	Peak

Antennal 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
2389.96	47.62	45.89	54	-6.38	31.8	5.4	35.47	109	353	Average
2389.96	58.71	56.98	74	-15.29	31.8	5.4	35.47	109	353	Peak
2412	101.85	100.08			31.81	5.43	35.47	103	3	Average
2412	110.22	108.45			31.81	5.43	35.47	103	3	Peak
4824	38.05	29.92	54	-15.95	33.97	8.26	34.1	158	229	Average
4824	48.11	39.98	74	-25.89	33.97	8.26	34.1	158	229	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 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	Karl Lee

Antennal 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
2388.84	40.99	39.28	54	-13.01	31.8	5.4	35.49	397	307	Average
2388.84	51.36	49.65	74	-22.64	31.8	5.4	35.49	397	307	Peak
2437	97.56	95.71			31.85	5.46	35.46	397	307	Average
2437	104.64	102.79			31.85	5.46	35.46	397	307	Peak
2483.96	41.29	39.33	54	-12.71	31.88	5.5	35.42	397	307	Average
2483.96	51.9	49.94	74	-22.1	31.88	5.5	35.42	397	307	Peak
4874	38.67	30.48	54	-15.33	33.98	8.27	34.06	153	321	Average
4874	48.59	40.4	74	-25.41	33.98	8.27	34.06	153	321	Peak
Antennal 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
2389.83	41.79	40.06	54	-12.21	31.8	5.4	35.47	105	11	Average
2389.83	51.65	49.92	74	-22.35	31.8	5.4	35.47	105	3	Peak
2437	103.16	101.31			31.85	5.46	35.46	105	3	Average
2437	110.74	108.89			31.85	5.46	35.46	105	3	Peak
2484.2	41.71	39.72	54	-12.29	31.88	5.53	35.42	105	3	Average
2484.2	52.95	50.96	74	-21.05	31.88	5.53	35.42	105	11	Peak
4874	37.62	29.43	54	-16.38	33.98	8.27	34.06	164	225	Average
4874	47.42	39.23	74	-26.58	33.98	8.27	34.06	164	225	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 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	Karl Lee

Antennal 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
2462	95.75	93.82			31.87	5.5	35.44	397	307	Average
2462	102.44	100.51			31.87	5.5	35.44	397	307	Peak
2483.64	42.72	40.76	54	-11.28	31.88	5.5	35.42	392	307	Average
2483.64	53.65	51.69	74	-20.35	31.88	5.5	35.42	392	307	Peak
4924	37.91	29.66	54	-16.09	33.99	8.28	34.02	187	247	Average
4924	47.98	39.73	74	-26.02	33.99	8.28	34.02	187	247	Peak
Antennal 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
2462	101.04	99.11			31.87	5.5	35.44	100	3	Average
2462	108.18	106.25			31.87	5.5	35.44	100	3	Peak
2483.8	45.92	43.96	54	-8.08	31.88	5.5	35.42	108	1	Average
2483.8	57.05	55.09	74	-16.95	31.88	5.5	35.42	108	1	Peak
4924	37.69	29.44	54	-16.31	33.99	8.28	34.02	131	251	Average
4924	47.89	39.64	74	-26.11	33.99	8.28	34.02	131	251	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	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	Karl Lee

Antennal 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
2467	89.22	87.27			31.87	5.5	35.42	394	318	Average
2467	96.27	94.32			31.87	5.5	35.42	394	318	Peak
2483.64	41.89	39.93	54	-12.11	31.88	5.5	35.42	394	305	Average
2483.64	53.4	51.44	74	-20.6	31.88	5.5	35.42	394	305	Peak
4934	37.58	29.32	54	-16.42	33.99	8.29	34.02	105	223	Average
4934	47.61	39.35	74	-26.39	33.99	8.29	34.02	105	223	Peak
Antennal 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
2467	95.56	93.61			31.87	5.5	35.42	100	0	Average
2467	102.32	100.37			31.87	5.5	35.42	100	0	Peak
2483.52	45.24	43.28	54	-8.76	31.88	5.5	35.42	107	3	Average
2483.52	59.83	57.87	74	-14.17	31.88	5.5	35.42	107	3	Peak
4934	38.36	30.1	54	-15.64	33.99	8.29	34.02	152	74	Average
4934	48.27	40.01	74	-25.73	33.99	8.29	34.02	152	74	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2467 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	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	Karl Lee

Antennal 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
2472	73.79	71.83			31.88	5.5	35.42	394	319	Average
2472	80.93	78.97			31.88	5.5	35.42	394	319	Peak
2483.52	43.76	41.8	54	-10.24	31.88	5.5	35.42	389	322	Average
2483.52	54.41	52.45	74	-19.59	31.88	5.5	35.42	389	322	Peak
4944	37.32	29.05	54	-16.68	33.99	8.29	34.01	150	208	Average
4944	47.41	39.14	74	-26.59	33.99	8.29	34.01	150	208	Peak

Antennal 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
2472	79.27	77.31			31.88	5.5	35.42	102	198	Average
2472	87.19	85.23			31.88	5.5	35.42	102	198	Peak
2483.52	47.76	45.8	54	-6.24	31.88	5.5	35.42	184	198	Average
2483.52	61.58	59.62	74	-12.42	31.88	5.5	35.42	184	198	Peak
4944	38.43	30.16	54	-15.57	33.99	8.29	34.01	132	269	Average
4944	48.54	40.27	74	-25.46	33.99	8.29	34.01	132	269	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2472 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	Karl Lee

Antennal 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
2389.83	42.13	40.4	54	-11.87	31.8	5.4	35.47	397	307	Average
2389.83	51.9	50.17	74	-22.1	31.8	5.4	35.47	397	307	Peak
2422	89.38	87.58			31.83	5.43	35.46	397	307	Average
2422	97.73	95.93			31.83	5.43	35.46	397	307	Peak
2487.28	41.32	39.33	54	-12.68	31.88	5.53	35.42	397	307	Average
2487.28	51.58	49.59	74	-22.42	31.88	5.53	35.42	397	307	Peak
4844	38.49	30.34	54	-15.51	33.97	8.26	34.08	157	221	Average
4844	48.61	40.46	74	-25.39	33.97	8.26	34.08	157	221	Peak

Antennal 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
2389.92	46.87	45.14	54	-7.13	31.8	5.4	35.47	102	4	Average
2389.92	56.94	55.21	74	-17.06	31.8	5.4	35.47	102	4	Peak
2422	95.54	93.74			31.83	5.43	35.46	107	0	Average
2422	103.82	102.02			31.83	5.43	35.46	107	0	Peak
2490.68	41.29	39.28	54	-12.71	31.9	5.53	35.42	102	4	Average
2490.68	51.73	49.72	74	-22.27	31.9	5.53	35.42	102	4	Peak
4844	38.26	30.11	54	-15.74	33.97	8.26	34.08	126	347	Average
4844	48.41	40.26	74	-25.59	33.97	8.26	34.08	126	347	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 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	Karl Lee

Antennal 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
2388.57	40.98	39.27	54	-13.02	31.8	5.4	35.49	397	307	Average
2388.57	51.61	49.9	74	-22.39	31.8	5.4	35.49	397	307	Peak
2437	91.79	89.94			31.85	5.46	35.46	397	307	Average
2437	99.49	97.64			31.85	5.46	35.46	397	307	Peak
2483.68	41.78	39.82	54	-12.22	31.88	5.5	35.42	397	307	Average
2483.68	51.97	50.01	74	-22.03	31.88	5.5	35.42	397	307	Peak
4874	37.56	29.37	54	-16.44	33.98	8.27	34.06	132	175	Average
4874	47.49	39.3	74	-26.51	33.98	8.27	34.06	132	175	Peak

Antennal 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
2389.92	43.54	41.81	54	-10.46	31.8	5.4	35.47	105	3	Average
2389.92	53.57	51.84	74	-20.43	31.8	5.4	35.47	105	3	Peak
2437	98.35	96.5			31.85	5.46	35.46	105	3	Average
2437	105.12	103.27			31.85	5.46	35.46	105	3	Peak
2484	42.57	40.61	54	-11.43	31.88	5.5	35.42	105	3	Average
2484	52.62	50.66	74	-21.38	31.88	5.5	35.42	105	3	Peak
4874	37.32	29.13	54	-16.68	33.98	8.27	34.06	146	108	Average
4874	46.88	38.69	74	-27.12	33.98	8.27	34.06	146	108	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 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	Karl Lee

Antennal 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
2389.92	40.76	39.03	54	-13.24	31.8	5.4	35.47	397	307	Average
2389.92	51.3	49.57	74	-22.7	31.8	5.4	35.47	397	307	Peak
2452	89.94	88.07			31.85	5.46	35.44	397	307	Average
2452	97.04	95.17			31.85	5.46	35.44	397	307	Peak
2483.56	41.71	39.75	54	-12.29	31.88	5.5	35.42	397	307	Average
2483.56	52.51	50.55	74	-21.49	31.88	5.5	35.42	397	307	Peak
4904	37.49	29.27	54	-16.51	33.98	8.28	34.04	136	268	Average
4904	46.99	38.77	74	-27.01	33.98	8.28	34.04	136	268	Peak

Antennal 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
2387.22	41.02	39.31	54	-12.98	31.8	5.4	35.49	100	3	Average
2387.22	51.61	49.9	74	-22.39	31.8	5.4	35.49	100	3	Peak
2452	96.59	94.72			31.85	5.46	35.44	100	3	Average
2452	103.33	101.46			31.85	5.46	35.44	100	3	Peak
2483.52	45.15	43.19	54	-8.85	31.88	5.5	35.42	101	357	Average
2483.52	55.27	53.31	74	-18.73	31.88	5.5	35.42	101	357	Peak
4904	37.59	29.37	54	-16.41	33.98	8.28	34.04	167	208	Average
4904	47.87	39.65	74	-26.13	33.98	8.28	34.04	167	208	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2452 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 10	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	Karl Lee

Antennal 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
2386.23	40.96	39.25	54	-13.04	31.8	5.4	35.49	394	318	Average
2386.23	51.65	49.94	74	-22.35	31.8	5.4	35.49	394	318	Peak
2457	86.63	84.74			31.87	5.46	35.44	394	318	Average
2457	94.12	92.23			31.87	5.46	35.44	394	318	Peak
2483.52	42.51	40.55	54	-11.49	31.88	5.5	35.42	394	318	Average
2483.52	53.56	51.6	74	-20.44	31.88	5.5	35.42	394	318	Peak
4924	37.24	28.99	54	-16.76	33.99	8.28	34.02	108	315	Average
4924	47.18	38.93	74	-26.82	33.99	8.28	34.02	108	315	Peak
Antennal 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
2384.61	40.98	39.29	54	-13.02	31.78	5.4	35.49	100	0	Average
2384.61	52.39	50.7	74	-21.61	31.78	5.4	35.49	100	0	Peak
2457	93.93	92.04			31.87	5.46	35.44	100	0	Average
2457	100.82	98.93			31.87	5.46	35.44	100	0	Peak
2483.52	46.9	44.94	54	-7.1	31.88	5.5	35.42	102	355	Average
2483.52	54.48	52.52	74	-19.52	31.88	5.5	35.42	102	355	Peak
4924	37.54	29.29	54	-16.46	33.99	8.28	34.02	152	117	Average
4924	47.79	39.54	74	-26.21	33.99	8.28	34.02	152	117	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2457 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	Karl Lee

Antennal 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
2384.88	40.87	39.18	54	-13.13	31.78	5.4	35.49	380	302	Average
2384.88	51.49	49.8	74	-22.51	31.78	5.4	35.49	380	302	Peak
2462	72.08	70.15			31.87	5.5	35.44	380	302	Average
2462	78.97	77.04			31.87	5.5	35.44	380	302	Peak
2483.56	45.83	43.87	54	-8.17	31.88	5.5	35.42	390	193	Average
2483.56	56.01	54.05	74	-17.99	31.88	5.5	35.42	390	193	Peak
4924	37.13	28.88	54	-16.87	33.99	8.28	34.02	196	127	Average
4924	47.18	38.93	74	-26.82	33.99	8.28	34.02	196	127	Peak

Antennal 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
2381.01	40.9	39.21	54	-13.1	31.78	5.4	35.49	126	178	Average
2381.01	51.82	50.13	74	-22.18	31.78	5.4	35.49	126	178	Peak
2462	78.73	76.8			31.87	5.5	35.44	126	178	Average
2462	85.64	83.71			31.87	5.5	35.44	126	178	Peak
2483.6	49.24	47.28	54	-4.76	31.88	5.5	35.42	118	174	Average
2483.6	59.6	57.64	74	-14.4	31.88	5.5	35.42	118	174	Peak
4924	37.56	29.31	54	-16.44	33.99	8.28	34.02	175	134	Average
4924	47.79	39.54	74	-26.21	33.99	8.28	34.02	175	134	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 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)

EUT Test Condition		Measurement Detail	
Channel	Channel 11	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	Karl Lee

Antennal 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
102.9	24.12	42.74	43.5	-19.38	12.36	1.28	32.26	128	332	Peak
198.48	12.43	32.06	43.5	-31.07	11.05	1.61	32.29	135	196	Peak
273	20.85	38.35	46	-25.15	12.67	1.94	32.11	200	215	Peak
390.3	15.39	30.45	46	-30.61	14.79	2.34	32.19	157	188	Peak
603.8	17.19	28.54	46	-28.81	17.97	2.87	32.19	197	199	Peak
736.8	20.77	30.06	46	-25.23	19.68	3.16	32.13	157	211	Peak

Antennal 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
46.2	21.61	38.47	40	-18.39	14.46	0.9	32.22	124	206	Peak
95.07	19.76	38.85	43.5	-23.74	11.62	1.28	31.99	124	349	Peak
287.31	19.69	36.97	46	-26.31	12.82	2.03	32.13	122	122	Peak
447.7	17.33	31.45	46	-28.67	15.54	2.49	32.15	154	123	Peak
636.7	19.9	30.87	46	-26.1	18.26	2.93	32.16	187	109	Peak
829.2	20.68	28.44	46	-25.32	20.76	3.38	31.9	199	198	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value

4.2 Conducted Output Power Measurement

4.2.1 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,

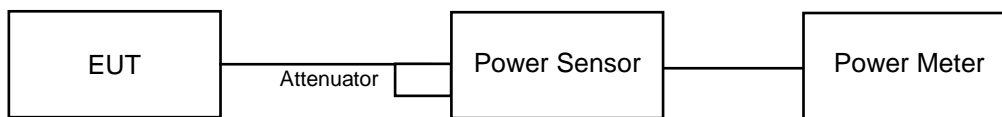
Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

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 $NANT \geq 5$.

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

4.2.2 Test Setup



4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 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.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Conditions

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

4.2.7 Test Results

<Peak Power>

802.11b

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	21.02	30	Pass
6	2437	22.32	30	Pass
11	2462	21.15	30	Pass
12	2467	18.50	30	Pass
13	2472	10.92	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	22.45	30	Pass
6	2437	24.32	30	Pass
11	2462	22.39	30	Pass
12	2467	15.76	30	Pass
13	2472	2.54	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
1	2412	19.25	19.07	22.17	30	Pass
6	2437	20.05	20.32	23.20	30	Pass
11	2462	17.98	18.04	21.02	30	Pass
12	2467	12.03	12.23	15.14	30	Pass
13	2472	-2.87	-9.29	-1.98	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
3	2422	15.91	16.18	19.06	30	Pass
6	2437	17.91	18.14	21.04	30	Pass
9	2452	15.88	15.96	18.93	30	Pass
10	2457	12.65	12.89	15.78	30	Pass
11	2462	-3.65	-3.66	-0.64	30	Pass

<Average Power>

802.11b

Channel	Frequency (MHz)	Average Power (dBm)
1	2412	17.99
6	2437	19.83
11	2462	18.46
12	2467	15.99
13	2472	8.22

802.11g

Channel	Frequency (MHz)	Average Power (dBm)
1	2412	17.67
6	2437	19.84
11	2462	17.00
12	2467	10.47
13	2472	-2.81

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (dBm)
		Chain 0	Chain 1	
1	2412	13.89	13.96	16.94
6	2437	14.75	15.01	17.89
11	2462	12.91	12.62	15.78
12	2467	6.68	6.65	9.68
13	2472	-8.42	-9.29	-6.01

802.11n (HT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (dBm)
		Chain 0	Chain 1	
3	2422	11.57	11.63	14.61
6	2437	13.97	13.76	16.88
9	2452	11.51	11.51	14.52
10	2457	8.09	8.34	11.23
11	2462	-7.84	-7.85	-4.83

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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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