PARTIAL FCC TEST REPORT (15.247)

REPORT NO.:	RF140722C34-1
MODEL NO.:	W13B
FCC ID:	PPD-QCWB335
RECEIVED:	Jul. 22, 2014
TESTED:	Jul. 29, 2014 ~ Aug. 06, 2014
ISSUED:	Aug. 14, 2014

APPLICANT:	Qualcomm Atheros, Inc.
ADDRESS:	1700 Technology Dr San Jose, CA 95110

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
LAB ADDRESS:	No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)
TEST LOCATION:	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

TABLE OF CONTENTS

RELEASE CONTROL RECORD 3
1. CERTIFICATION 4
2. SUMMARY OF TEST RESULTS 5
   2.1 MEASUREMENT UNCERTAINTY 5
3. GENERAL INFORMATION 6
   3.1 GENERAL DESCRIPTION OF EUT 6
   3.2 DESCRIPTION OF TEST MODES 7
      3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL 8
   3.3 DESCRIPTION OF SUPPORT UNITS 9
      3.3.1 CONFIGURATION OF SYSTEM UNDER TEST 9
   3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS 10
4. TEST TYPES AND RESULTS (FOR 2.4GHz BAND) 11
   4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT 11
      4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT 11
      4.1.2 TEST INSTRUMENTS 12
      4.1.3 TEST PROCEDURES 13
      4.1.4 DEVIATION FROM TEST STANDARD 13
      4.1.5 TEST SETUP 14
      4.1.6 EUT OPERATING CONDITIONS 14
      4.1.7 TEST RESULTS 15
   4.2 CONDUCTED EMISSION MEASUREMENT 28
      4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT 28
      4.2.2 TEST INSTRUMENTS 28
      4.2.3 TEST PROCEDURES 29
      4.2.4 DEVIATION FROM TEST STANDARD 29
      4.2.5 TEST SETUP 30
      4.2.6 EUT OPERATING CONDITIONS 30
      4.2.7 TEST RESULTS 31
   4.3 CONDUCTED OUTPUT POWER 33
      4.3.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT 33
      4.3.2 TEST SETUP 33
      4.3.3 TEST INSTRUMENTS 33
      4.3.4 TEST PROCEDURES 33
      4.3.5 DEVIATION FROM TEST STANDARD 33
      4.3.6 EUT OPERATING CONDITIONS 33
      4.3.7 TEST RESULTS 34
5. PHOTOGRAPHS OF THE TEST CONFIGURATION 36
6. INFORMATION ON THE TESTING LABORATORIES 37
7. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB 38

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140722C34-1	Original release	Aug. 14, 2014

1. CERTIFICATION

PRODUCT:	Personal Computer
MODEL NO.:	W13B
BRAND:	DELL
APPLICANT:	Qualcomm Atheros, Inc.
TESTED:	Jul. 29, 2014 ~ Aug. 06, 2014
TEST SAMPLE:	Production Unit
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)**
	ANSI C63.10-2009

The above equipment (model: W13B) 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 : Vera Huang , **DATE :** Aug. 14, 2014

Vera Huang / Specialist

APPROVED BY : Sam chen , **DATE :** Aug. 14, 2014

Sam Chen / Senior Project Engineer

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -16.09dB at 0.15000MHz.
15.205 & 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -2.01dB at 7386MHz.
15.247(d)	Band Edge Measurement	N/A	Refer to NOTE below.
15.247(d)	Antenna Port Emission	N/A	Refer to NOTE below.
15.247(a)(2)	6dB bandwidth	N/A	Refer to NOTE below.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	N/A	Refer to NOTE below.
15.203	Antenna Requirement	N/A	Refer to NOTE below.

NOTE: Test items for radiated emission, conducted emission, and peak output power were performed for this report. Other testing data please refer to module (Brand: Qualcomm Atheros, Model: QCWB335, FCC ID: PPD-QCWB335) Report No.: FR240322B

2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Personal Computer
MODEL NO.	W13B
POWER SUPPLY	19.5Vdc (adapter or host equipment) 14.8Vdc (Li-ion battery)
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 ~ 2462MHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
OUTPUT POWER	160.325mW for 2412 ~ 2462MHz
ANTENNA TYPE	PIFA antenna with 0.91dBi gain
ANTENNA CONNECTOR	NA
DATA CABLE	Refer to Note as below
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Refer to Note as below

NOTE:

1. The EUT contains following accessory devices.

ITEM	BRAND	MODEL	SPECIFICATION
Adapter	DELTA ELECTRONICS, INC.	DA65NM111-00	I/P: 100-240Vac, 50-60Hz, 1.6A O/P: 19.5Vdc, 3.34A
Battery	DELL	VNMGJ	14.8Vdc, 58mAh
WLAN Module	Qualcomm Atheros	QCWB335	--

2. The EUT provide one completed transmitter and one receiver.

MODULATION MODE	TX FUNCTION
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	1TX

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

3.2 DESCRIPTION OF TEST MODES

FOR 2.4GHz:

11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

WLAN 2.4GHz:

EUT CONFIGURE MODE	APPLICABLE TO			DESCRIPTION
	RE≥1G	RE<1G	PLC	
-	√	√	√	-

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

RADIATED EMISSION TEST (ABOVE 1GHz):

☒ 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	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0

RADIATED EMISSION TEST (BELOW 1GHz):

☒ 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	11	DSSS	DBPSK	1.0

POWER LINE CONDUCTED EMISSION TEST:

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	11	DSSS	DBPSK	1.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Anson Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Anson Lin
PLC	25deg. C, 65%RH	120Vac, 60Hz	Gavin Wu

3.3 DESCRIPTION OF SUPPORT UNITS

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

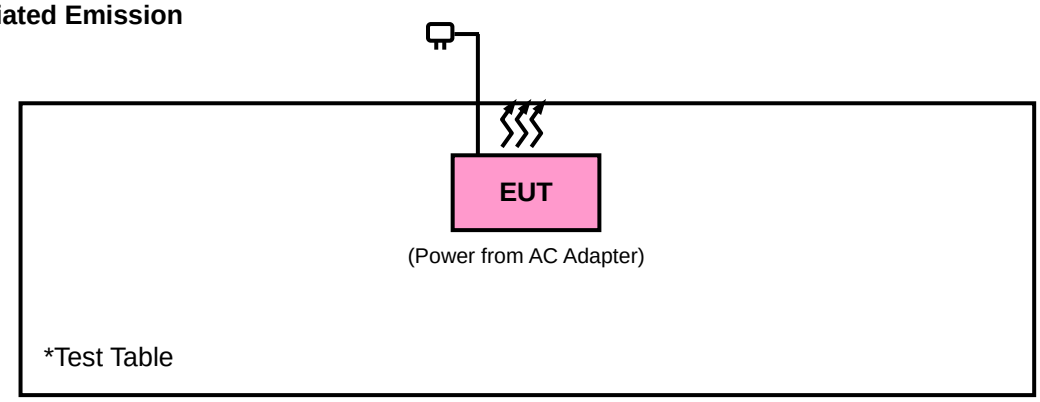
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Keyboard	N/A	N/A	N/A	N/A
2	Mouse	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A
2	N/A

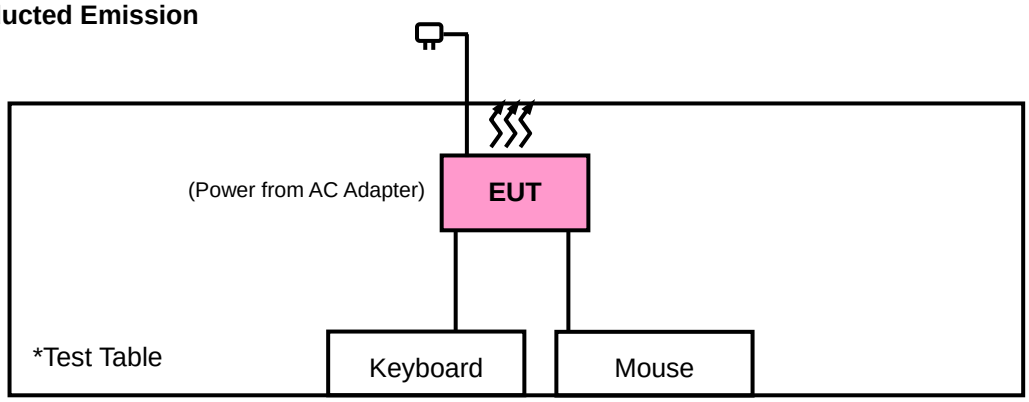
NOTE: 1. All power cords of the above support units are non shielded (1.8m).

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST

Radiated Emission



Conducted Emission



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 v03r02
ANSI C63.10-2009

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

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4. TEST TYPES AND RESULTS (FOR 2.4GHz BAND)

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 20dB 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 1000MHz, 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 20dB 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	N9038A	MY51210203	Jan. 17, 2014	Jan. 16, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 21, 2013	Dec. 20, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 27. 2014	Feb. 26, 2015
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Feb. 19, 2014	Feb. 18, 2015
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 18, 2013	Dec. 17, 2014
Loop Antenna	HFH2-Z2	100070	Mar. 06, 2014	Mar. 05, 2016
Preamplifier EMCI	EMC 012645	980115	Dec. 26, 2013	Dec. 25, 2014
Preamplifier EMCI	EMC 184045	980116	Jan. 13, 2014	Jan. 12, 2015
Preamplifier EMCI	EMC 330H	980112	Dec. 27, 2013	Dec. 26, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 18, 2013	Oct. 17, 2014
RF signal cable Worken	RG-213	NA	Nov. 07, 2013	Nov. 06, 2014
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Power Meter	ML2495A	1232002	Aug. 23, 2013	Aug. 22, 2014
Power Sensor	MA2411B	1207325	Aug. 23, 2013	Aug. 22, 2014

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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in HwaYa Chamber 10.
4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The FCC Site Registration No. is 690701.
6. The IC Site Registration No. is IC 7450F-10.

4.1.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. 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. Height of receiving 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

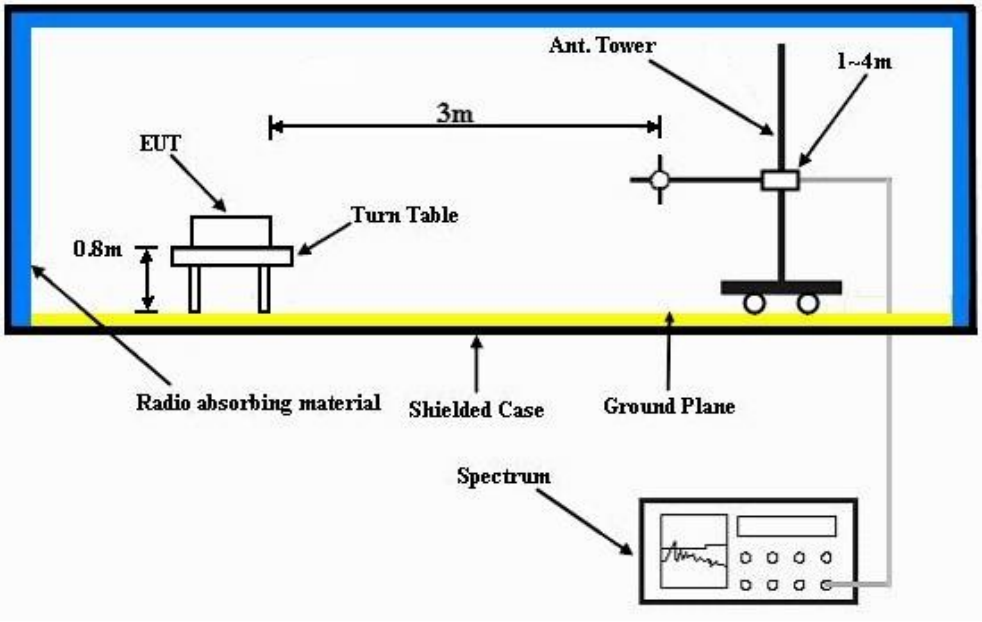
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1kHz (Duty cycle < 98%) or 10Hz (Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

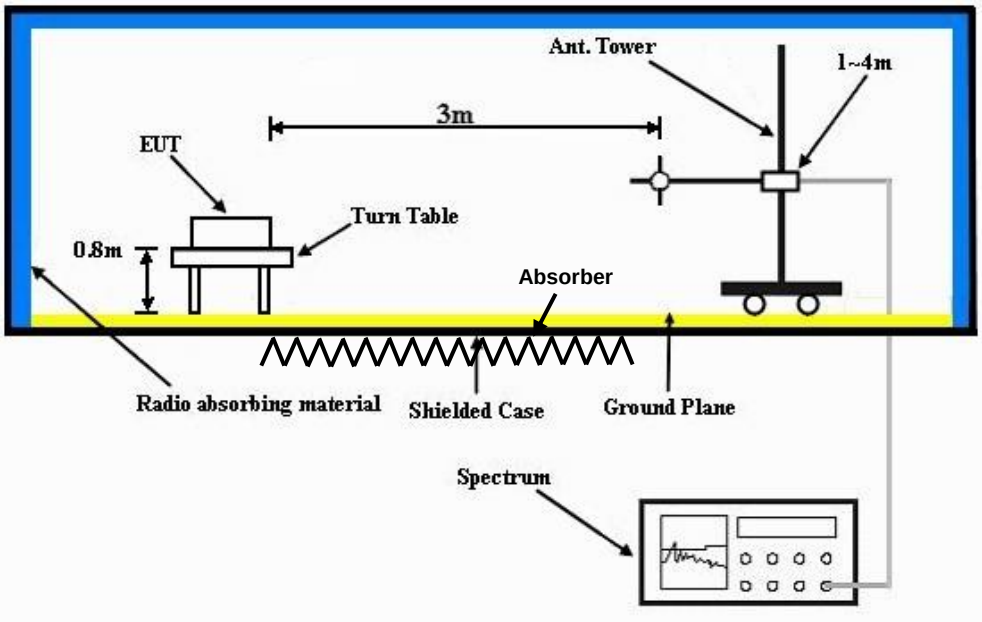
No deviation.

4.1.5 TEST SETUP

Frequency Range 30MHz ~ 1GHz



Frequency Range above 1GHz



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 1GHz WORST-CASE DATA

802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	44.09	51.16	54	-9.91	26.91	3.52	37.5	100	65	Average
2386	57.73	64.8	74	-16.27	26.91	3.52	37.5	100	65	Peak
2412	102.15	109.17			26.96	3.54	37.52	100	65	Average
2412	106.32	113.34			26.96	3.54	37.52	100	65	Peak
2488	36.66	43.16	54	-17.34	27.2	3.62	37.32	100	65	Average
2488	56.87	63.37	74	-17.13	27.2	3.62	37.32	100	65	Peak
4824	45.53	61.85	54	-8.47	30.99	5.77	53.08	100	167	Average
4824	47.49	63.81	74	-26.51	30.99	5.77	53.08	100	167	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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
2378	39.33	46.45	54	-14.67	26.86	3.52	37.5	122	277	Average
2378	56.51	63.63	74	-17.49	26.86	3.52	37.5	122	277	Peak
2412	98.61	105.63			26.96	3.54	37.52	122	277	Average
2412	102.47	109.49			26.96	3.54	37.52	122	277	Peak
2488	34.84	41.34	54	-19.16	27.2	3.62	37.32	122	277	Average
2488	56.43	62.93	74	-17.57	27.2	3.62	37.32	122	277	Peak
4824	48.32	64.64	54	-5.68	30.99	5.77	53.08	100	237	Average
4824	50.66	66.98	74	-23.34	30.99	5.77	53.08	100	237	Peak

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	41.43	48.65	54	-12.57	26.77	3.5	37.49	100	65	Average
2348	56.2	63.42	74	-17.8	26.77	3.5	37.49	100	65	Peak
2437	102.21	109.05			27.06	3.56	37.46	100	65	Average
2437	106.71	113.55			27.06	3.56	37.46	100	65	Peak
2488	37.39	43.89	54	-16.61	27.2	3.62	37.32	100	65	Average
2488	55.93	62.43	74	-18.07	27.2	3.62	37.32	100	65	Peak
7311	51.94	61.27	54	-2.06	35.84	6.68	51.85	100	234	Average
7311	56.86	66.19	74	-17.14	35.84	6.68	51.85	100	234	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	35.88	43	54	-18.12	26.86	3.52	37.5	100	314	Average
2370	56.16	63.28	74	-17.84	26.86	3.52	37.5	100	314	Peak
2437	98.9	105.74			27.06	3.56	37.46	100	314	Average
2437	103.08	109.92			27.06	3.56	37.46	100	314	Peak
2490	35.4	41.9	54	-18.6	27.2	3.62	37.32	100	314	Average
2490	56.72	63.22	74	-17.28	27.2	3.62	37.32	100	314	Peak
4874	45.18	61.37	54	-8.82	31.06	5.8	53.05	100	243	Average
4874	46.47	62.66	74	-27.53	31.06	5.8	53.05	100	243	Peak
7311	50.31	59.64	54	-3.69	35.84	6.68	51.85	100	221	Average
7311	54.36	63.69	74	-19.64	35.84	6.68	51.85	100	221	Peak

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	40.58	47.63	54	-13.42	26.91	3.54	37.5	119	61	Average
2388	56.6	63.65	74	-17.4	26.91	3.54	37.5	119	61	Peak
2462	101.23	107.94			27.1	3.58	37.39	119	61	Average
2462	105.82	112.53			27.1	3.58	37.39	119	61	Peak
2488	43.1	49.6	54	-10.9	27.2	3.62	37.32	119	61	Average
2488	57.73	64.23	74	-16.27	27.2	3.62	37.32	119	61	Peak
7386	**51.99**	**60.83**	**54**	**-2.01**	**36.05**	**6.71**	**51.6**	**100**	**234**	**Average**
7386	55.53	64.37	74	-18.47	36.05	6.71	51.6	100	234	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	34.11	41.18	54	-19.89	26.91	3.52	37.5	143	317	Average
2386	56.35	63.42	74	-17.65	26.91	3.52	37.5	143	317	Peak
2462	97.91	104.62			27.1	3.58	37.39	143	317	Average
2462	102.95	109.66			27.1	3.58	37.39	143	317	Peak
2494	39.93	46.36	54	-14.07	27.2	3.62	37.25	143	317	Average
2494	56.77	63.2	74	-17.23	27.2	3.62	37.25	143	317	Peak
7386	49.8	58.64	54	-4.2	36.05	6.71	51.6	102	161	Average
7386	53.77	62.61	74	-20.23	36.05	6.71	51.6	102	161	Peak

REMARKS:

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

802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	48.2	55.27	54	-5.8	26.91	3.54	37.52	100	61	Average
2390	63.49	70.56	74	-10.51	26.91	3.54	37.52	100	61	Peak
2412	97.44	104.46			26.96	3.54	37.52	100	61	Average
2412	107.7	114.72			26.96	3.54	37.52	100	61	Peak
2492	37.19	43.62	54	-16.81	27.2	3.62	37.25	100	61	Average
2492	57.27	63.7	74	-16.73	27.2	3.62	37.25	100	61	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	45.07	52.14	54	-8.93	26.91	3.54	37.52	100	312	Average
2390	61.23	68.3	74	-12.77	26.91	3.54	37.52	100	312	Peak
2412	93.62	100.64			26.96	3.54	37.52	100	312	Average
2412	103.74	110.76			26.96	3.54	37.52	100	312	Peak
2490	35.17	41.67	54	-18.83	27.2	3.62	37.32	100	312	Average
2490	55.99	62.49	74	-18.01	27.2	3.62	37.32	100	312	Peak

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	42.13	50.6	54	-11.87	26.81	3.5	38.78	100	61	Average
2358	57.78	66.25	74	-16.22	26.81	3.5	38.78	100	61	Peak
2437	99.79	107.92			27.06	3.56	38.75	100	61	Average
2437	109.92	118.05			27.06	3.56	38.75	100	61	Peak
2492	38.88	46.81	54	-15.12	27.2	3.62	38.75	100	61	Average
2492	57.05	64.98	74	-16.95	27.2	3.62	38.75	100	61	Peak
7311	49.03	58.36	54	-4.97	35.84	6.68	51.85	100	233	Average
7311	60.4	69.73	74	-13.6	35.84	6.68	51.85	100	233	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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
2356	38.06	45.24	54	-15.94	26.81	3.5	37.49	100	312	Average
2356	56.24	63.42	74	-17.76	26.81	3.5	37.49	100	312	Peak
2437	95.98	102.82			27.06	3.56	37.46	100	312	Average
2437	105.96	112.8			27.06	3.56	37.46	100	312	Peak
2496	35.54	41.97	54	-18.46	27.2	3.62	37.25	100	312	Average
2496	56.44	62.87	74	-17.56	27.2	3.62	37.25	100	312	Peak
7311	47.19	56.52	54	-6.81	35.84	6.68	51.85	100	221	Average
7311	56.24	65.57	74	-17.76	35.84	6.68	51.85	100	221	Peak

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	42.75	49.87	54	-11.25	26.86	3.52	37.5	100	56	Average
2376	57.83	64.95	74	-16.17	26.86	3.52	37.5	100	56	Peak
2462	95.54	102.25			27.1	3.58	37.39	100	56	Average
2462	105.07	111.78			27.1	3.58	37.39	100	56	Peak
2484	50.98	57.55	54	-3.02	27.15	3.6	37.32	100	56	Average
2484	68.17	74.74	74	-5.83	27.15	3.6	37.32	100	56	Peak
7386	42.62	51.46	54	-11.38	36.05	6.71	51.6	100	234	Average
7386	51.99	60.83	74	-22.01	36.05	6.71	51.6	100	234	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	34.89	42.11	54	-19.11	26.77	3.5	37.49	144	319	Average
2350	56.17	63.39	74	-17.83	26.77	3.5	37.49	144	319	Peak
2462	91.75	98.46			27.1	3.58	37.39	144	319	Average
2462	101.7	108.41			27.1	3.58	37.39	144	319	Peak
2484	47.98	54.55	54	-6.02	27.15	3.6	37.32	144	319	Average
2484	63.96	70.53	74	-10.04	27.15	3.6	37.32	144	319	Peak

REMARKS:

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

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	46.65	53.72	54	-7.35	26.91	3.54	37.52	100	62	Average
2390	61.3	68.37	74	-12.7	26.91	3.54	37.52	100	62	Peak
2412	96	103.02			26.96	3.54	37.52	100	62	Average
2412	105.82	112.84			26.96	3.54	37.52	100	62	Peak
2486	37.07	43.64	54	-16.93	27.15	3.6	37.32	100	62	Average
2486	56.49	63.06	74	-17.51	27.15	3.6	37.32	100	62	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	43.33	50.4	54	-10.67	26.91	3.54	37.52	100	310	Average
2390	58.98	66.05	74	-15.02	26.91	3.54	37.52	100	310	Peak
2412	92.75	99.77			26.96	3.54	37.52	100	310	Average
2412	102.43	109.45			26.96	3.54	37.52	100	310	Peak
2490	35.08	41.58	54	-18.92	27.2	3.62	37.32	100	310	Average
2490	56.24	62.74	74	-17.76	27.2	3.62	37.32	100	310	Peak

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	43.08	50.26	54	-10.92	26.81	3.5	37.49	100	60	Average
2358	56.45	63.63	74	-17.55	26.81	3.5	37.49	100	60	Peak
2437	98.33	105.17			27.06	3.56	37.46	100	60	Average
2437	108.65	115.49			27.06	3.56	37.46	100	60	Peak
2498	38.26	44.69	54	-15.74	27.2	3.62	37.25	100	60	Average
2498	56.58	63.01	74	-17.42	27.2	3.62	37.25	100	60	Peak
7311	45.31	54.64	54	-8.69	35.84	6.68	51.85	100	234	Average
7311	56.84	66.17	74	-17.16	35.84	6.68	51.85	100	234	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	36.09	43.21	54	-17.91	26.86	3.52	37.5	120	314	Average
2380	56.46	63.58	74	-17.54	26.86	3.52	37.5	120	314	Peak
2437	94.67	101.51			27.06	3.56	37.46	120	314	Average
2437	104.63	111.47			27.06	3.56	37.46	120	314	Peak
2498	36.25	42.68	54	-17.75	27.2	3.62	37.25	120	314	Average
2498	56.26	62.69	74	-17.74	27.2	3.62	37.25	120	314	Peak
7311	40.4	49.73	54	-13.6	35.84	6.68	51.85	100	250	Average
7311	55.1	64.43	74	-18.9	35.84	6.68	51.85	100	250	Peak

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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
2374	41.42	48.54	54	-12.58	26.86	3.52	37.5	100	62	Average
2374	58.1	65.22	74	-15.9	26.86	3.52	37.5	100	62	Peak
2462	95	101.71			27.1	3.58	37.39	100	62	Average
2462	104.52	111.23			27.1	3.58	37.39	100	62	Peak
2484	51.28	57.85	54	-2.72	27.15	3.6	37.32	100	62	Average
2484	66.42	72.99	74	-7.58	27.15	3.6	37.32	100	62	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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
2326	35.35	42.62	54	-18.65	26.72	3.48	37.47	145	315	Average
2326	55.97	63.24	74	-18.03	26.72	3.48	37.47	145	315	Peak
2462	92.26	98.97			27.1	3.58	37.39	145	315	Average
2462	102.16	108.87			27.1	3.58	37.39	145	315	Peak
2484	48.08	54.65	54	-5.92	27.15	3.6	37.32	145	315	Average
2484	64.44	71.01	74	-9.56	27.15	3.6	37.32	145	315	Peak

REMARKS:

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

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	47.75	54.82	54	-6.25	26.91	3.52	37.5	100	61	Average
2386	61.06	68.13	74	-12.94	26.91	3.52	37.5	100	61	Peak
2422	91.84	98.73			27.01	3.56	37.46	100	61	Average
2422	102.5	109.39			27.01	3.56	37.46	100	61	Peak
2500	36.43	42.86	54	-17.57	27.2	3.62	37.25	100	61	Average
2500	56.38	62.81	74	-17.62	27.2	3.62	37.25	100	61	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	44.1	51.17	54	-9.9	26.91	3.54	37.52	100	311	Average
2390	57.94	65.01	74	-16.06	26.91	3.54	37.52	100	311	Peak
2422	87.72	94.61			27.01	3.56	37.46	100	311	Average
2422	98.01	104.9			27.01	3.56	37.46	100	311	Peak
2486	35.05	41.62	54	-18.95	27.15	3.6	37.32	100	311	Average
2486	56.85	63.42	74	-17.15	27.15	3.6	37.32	100	311	Peak

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	42.97	50.04	54	-11.03	26.91	3.54	37.52	100	59	Average
2390	58.46	65.53	74	-15.54	26.91	3.54	37.52	100	59	Peak
2437	93.91	100.75			27.06	3.56	37.46	100	59	Average
2437	104.25	111.09			27.06	3.56	37.46	100	59	Peak
2484	46.43	53	54	-7.57	27.15	3.6	37.32	100	59	Average
2484	61.3	67.87	74	-12.7	27.15	3.6	37.32	100	59	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	40.13	47.2	54	-13.87	26.91	3.54	37.52	100	312	Average
2390	56.5	63.57	74	-17.5	26.91	3.54	37.52	100	312	Peak
2437	90.05	96.89			27.06	3.56	37.46	100	312	Average
2437	100.17	107.01			27.06	3.56	37.46	100	312	Peak
2484	41.27	47.84	54	-12.73	27.15	3.6	37.32	100	312	Average
2484	57.46	64.03	74	-16.54	27.15	3.6	37.32	100	312	Peak

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	36.45	43.63	54	-17.55	26.81	3.5	37.49	116	65	Average
2360	56.5	63.68	74	-17.5	26.81	3.5	37.49	116	65	Peak
2452	91.86	98.61			27.06	3.58	37.39	116	65	Average
2452	102.09	108.84			27.06	3.58	37.39	116	65	Peak
2484	51.77	58.34	54	-2.23	27.15	3.6	37.32	116	65	Average
2484	67.52	74.09	74	-6.48	27.15	3.6	37.32	116	65	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	34.43	41.55	54	-19.57	26.86	3.52	37.5	200	216	Average
2370	55.68	62.8	74	-18.32	26.86	3.52	37.5	200	216	Peak
2452	86.83	93.58			27.06	3.58	37.39	200	216	Average
2452	97.11	103.86			27.06	3.58	37.39	200	216	Peak
2484	46.64	53.21	54	-7.36	27.15	3.6	37.32	200	216	Average
2484	59.91	66.48	74	-14.09	27.15	3.6	37.32	200	216	Peak

REMARKS:

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

BELOW 1GHz WORST-CASE DATA:

802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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
94.8	30.41	52.65	43.5	-13.09	8.68	1.04	31.96	127	145	Peak
102.63	28.59	50.09	43.5	-14.91	9.34	1.08	31.92	136	12	Peak
206.58	28.23	48.61	43.5	-15.27	9.65	1.63	31.66	120	347	Peak
364.4	40.48	55.66	46	-5.52	14.49	2.28	31.95	132	131	Peak
703.2	32.4	39.88	46	-13.6	20.86	3.44	31.78	108	323	Peak
729.1	37.56	44.41	46	-8.44	21.23	3.52	31.6	107	299	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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
42.15	30.93	47.73	40	-9.07	13.58	0.7	31.08	108	92	Peak
78.06	29.82	51.82	40	-10.18	8.61	0.96	31.57	121	318	Peak
85.08	29.93	52.45	40	-10.07	8.22	1	31.74	100	158	Peak
374.2	39.2	54.08	46	-6.8	14.73	2.32	31.93	120	157	Peak
729.1	37.84	44.69	46	-8.16	21.23	3.52	31.6	111	147	Peak
962.9	36.82	40.77	54	-17.18	23.86	4.1	31.91	163	268	Peak

REMARKS: 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 OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

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

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 29, 2013	Nov. 28, 2014
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 13, 2014	Feb. 12, 2015
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 21, 2014	Jul. 20, 2015
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

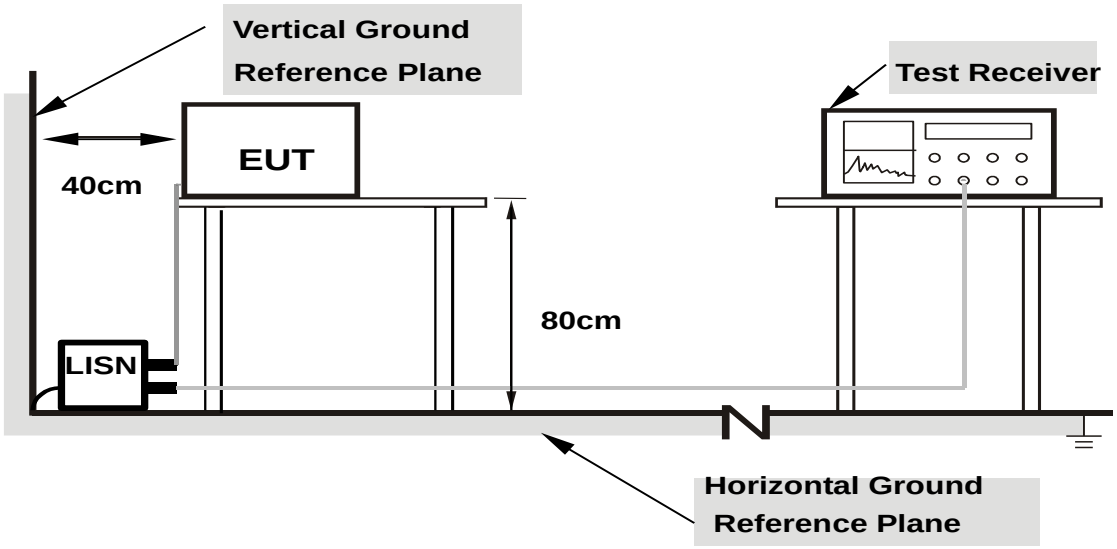
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) 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.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.2.6 EUT OPERATING CONDITIONS

Same as section 4.1.6.

4.2.7 TEST RESULTS

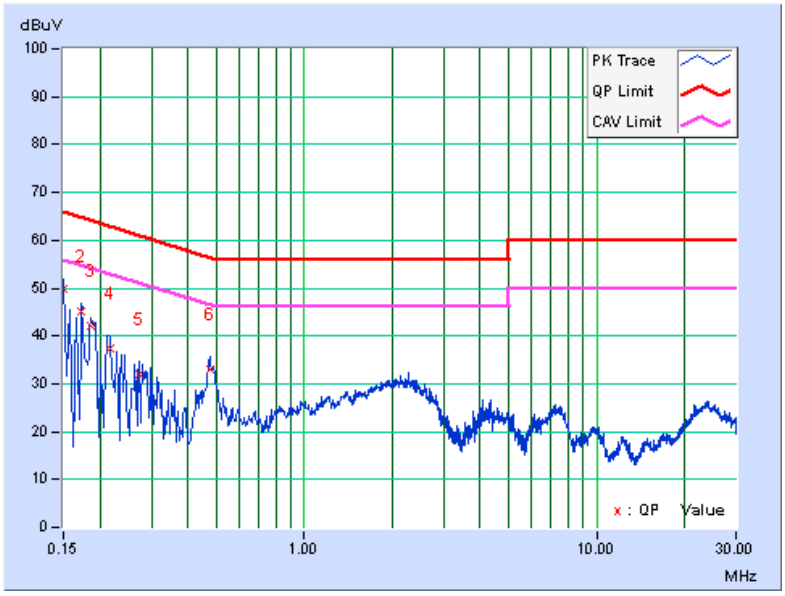
CONDUCTED WORST-CASE DATA：

PHASE	Line 1	6dB BANDWIDTH	9kHz

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15000**	**0.08**	**49.83**	**33.90**	**49.91**	**33.98**	**66.00**	**56.00**	**-16.09**	**-22.02**
2	0.17346	0.08	45.06	29.35	45.14	29.43	64.79	54.79	-19.66	-25.37
3	0.18508	0.07	41.92	24.66	41.99	24.73	64.25	54.25	-22.26	-29.52
4	0.21647	0.07	37.20	21.87	37.27	21.94	62.95	52.95	-25.68	-31.01
5	0.27120	0.07	31.86	17.38	31.93	17.45	61.08	51.08	-29.15	-33.63
6	0.47453	0.08	33.07	26.06	33.15	26.14	56.43	46.43	-23.28	-20.29

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

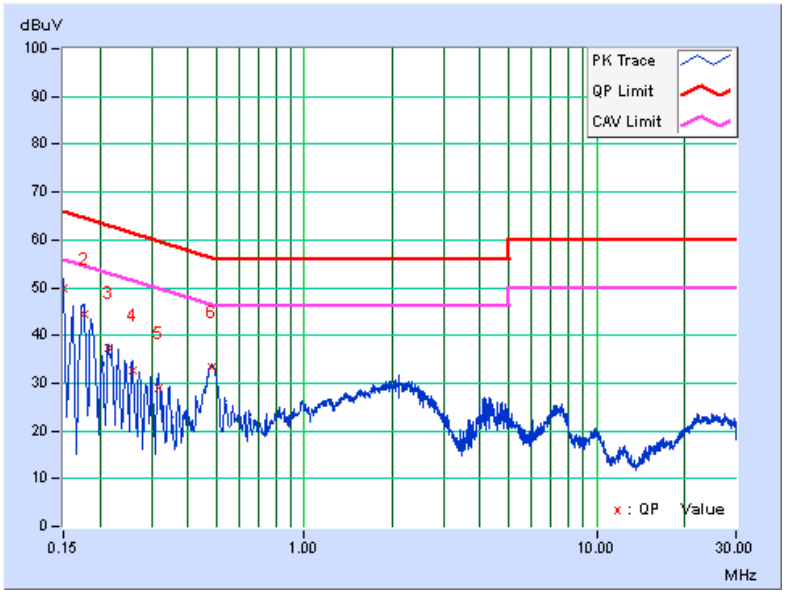


PHASE	Line 2	6dB BANDWIDTH	9kHz

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.05	49.82	33.63	49.87	33.68	66.00	56.00	-16.13	-22.32
2	0.17605	0.05	44.34	26.55	44.39	26.60	64.67	54.67	-20.28	-28.07
3	0.21282	0.05	37.32	21.85	37.37	21.90	63.09	53.09	-25.72	-31.19
4	0.25864	0.06	32.53	16.42	32.59	16.48	61.47	51.47	-28.89	-35.00
5	0.31765	0.06	28.96	14.63	29.02	14.69	59.77	49.77	-30.75	-35.08
6	0.48168	0.07	33.17	26.65	33.24	26.72	56.31	46.31	-23.07	-19.59

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

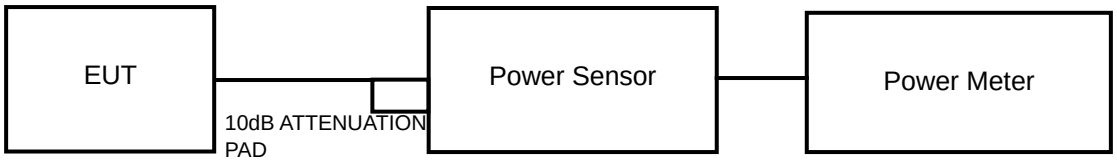


4.3 CONDUCTED OUTPUT POWER

4.3.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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 peak 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

<Peak Power>

802.11b

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	81.846	19.13	30	PASS
6	2437	97.275	19.88	30	PASS
11	2462	90.365	19.56	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	104.472	20.19	30	PASS
6	2437	160.325	22.05	30	PASS
11	2462	97.949	19.91	30	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	77.804	18.91	30	PASS
6	2437	137.088	21.37	30	PASS
11	2462	85.310	19.31	30	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
3	2422	52.602	17.21	30	PASS
6	2437	88.308	19.46	30	PASS
9	2452	59.704	17.76	30	PASS

<Average Power>

802.11b

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	48.417	16.85	30	PASS
6	2437	61.944	17.92	30	PASS
11	2462	55.590	17.45	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	29.242	14.66	30	PASS
6	2437	58.749	17.69	30	PASS
11	2462	30.761	14.88	30	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	21.478	13.32	30	PASS
6	2437	42.855	16.32	30	PASS
11	2462	23.823	13.77	30	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	LIMIT (dBm)	PASS / FAIL
3	2422	15.596	11.93	30	PASS
6	2437	27.227	14.35	30	PASS
9	2452	15.346	11.86	30	PASS

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6. 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:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3270892

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.

7. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---