FCC TEST REPORT (15.407)

REPORT NO.:	RF110907E02I-1 R1
MODEL NO.:	AR5B22
FCC ID:	PPD-AR5B22
IC:	4104A-AR5B22
RECEIVED:	May 14, 2012
TESTED:	May 14 to 31, 2012
ISSUED:	June 21, 2012
APPLICANT:	Qualcomm Atheros, Inc.
ADDRESS:	1700 Technology Drive, San Jose, CA 95110
ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
LAB ADDRESS:	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan
TEST LOCATION (1):	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan
TEST LOCATION (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

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 6
3. GENERAL INFORMATION 7
3.1 GENERAL DESCRIPTION OF EUT 7
3.2 DESCRIPTION OF ANTENNA 9
3.3 DESCRIPTION OF TEST MODES 10
3.3.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL 12
3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS 14
3.5 DESCRIPTION OF SUPPORT UNITS 15
3.6 CONFIGURATION OF SYSTEM UNDER TEST 15
4. TEST TYPES AND RESULTS 16
4.1 UNWANTED EMISSION MEASUREMENT 16
4.1.1 LIMITS OF UNWANTED EMISSION MEASUREMENT 16
4.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS 17
4.1.3 TEST INSTRUMENTS 18
4.1.4 TEST PROCEDURES 20
4.1.5 DEVIATION FROM TEST STANDARD 21
4.1.6 TEST SETUP 21
4.1.7 EUT OPERATING CONDITION 21
4.1.8 TEST RESULTS 22
4.2 TRANSMIT POWER MEASUREMENT 32
4.2.1 LIMITS OF OUTPUT TRANSMIT POWER MEASUREMENT 32
4.2.2 TEST INSTRUMENTS 32
4.2.3 TEST PROCEDURE 32
4.2.4 DEVIATION FROM TEST STANDARD 32
4.2.5 TEST SETUP 33
4.2.6 EUT OPERATING CONDITIONS 33
4.2.7 TEST RESULTS 34
5. INFORMATION ON THE TESTING LABORATORIES 35
6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB 36

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF110907E02I-1	Original release	June 11, 2012
RF110907E02I-1 R1	Modify the note 1 of section 3.1	June 21, 2012

1. CERTIFICATION

PRODUCT:	PCIE 802.11a/b/g/n 2.4GHz/5GHz + USB BT 4.0 card
BRAND NAME:	Atheros
MODEL NO.:	AR5B22
TEST SAMPLE:	R&D SAMPLE
APPLICANT:	Qualcomm Atheros, Inc.
TESTED:	May 14 to 31, 2012
STANDARDS:	FCC Part 15, Subpart E (Section 15.407) ANSI C63.10-2009 Canada RSS-210 Issue 8 (2010-12) Canada RSS-Gen Issue 3 (2010-12)

The above equipment (Model: AR5B22) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and was in 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 : _____ **DATE:** June 21, 2012
(Midoli Peng, Specialist)

APPROVED BY : _____ , **DATE:** June 21, 2012
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407) ; RSS-210; RSS-Gen				
STANDARD SECTION		TEST TYPE	RESULT	REMARK
FCC Part 15	RSS-210; RSS-Gen			
15.407(b/1/2/3) (b)(6)	RSS-210 A9.2	Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.7dB at 5150.00MHz.
15.407 (a/1/2)	RSS-210 A9.2	Transmit Power	PASS	Meet the requirement of limit.

NOTE:

1. There are Bluetooth technology and WLAN technology used for the EUT. (The Bluetooth test data please refer "RF110907E02I-2 ")
2. For WLAN: The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz. For the 2400 ~ 2483.5MHz and 5.725~5.850GHz RF parameters was recorded in another test report. (RF110907E02I).
3. The DFS report was recorded in another test report<Report No.: RF110907E02-3>.
4. This report is prepared for FCC class II change and IC reassessment change. Only radiated emission and conducted power were presented in this test report.

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:

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

Measurement	Value
Radiated emissions (30MHz-1GHz)	5.59 dB
Radiated emissions (1GHz -6GHz)	3.84 dB
Radiated emissions (6GHz -18GHz)	4.09 dB
Radiated emissions (18GHz -40GHz)	4.24 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	PCIE 802.11a/b/g/n 2.4GHz/5GHz + USB BT 4.0 card
MODEL NO.	AR5B22
FCC ID	PPD-AR5B22
IC	4104A-AR5B22
POWER SUPPLY	DC 3.3V from host equipment
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM GFSK(BT <LE> mode) for DSSS
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n (20MHz, 800ns GI): up to 130Mbps 802.11n (20MHz, 400ns GI): up to 144.4Mbps 802.11n (40MHz, 800ns GI)：up to 270Mbps 802.11n (40MHz, 400ns GI)：up to 300Mbps Bluetooth(LE mode): 1Mbps
OPERATING FREQUENCY	**For 15.407** 802.11a: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.5~5.58GHz & 5.66~5.7GHz
	For 15.247 802.11b & 802.11g: 2.412 ~ 2.462GHz 802.11a: 5.745 ~ 5.825GHz Bluetooth(LE mode): 2.402 ~ 2.480GHz
NUMBER OF CHANNEL	**For 15.407** 16 for 802.11a, 802.11n (20MHz) 7 for 802.11n (40MHz)
	For 15.247(2.4GHz) 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) 40 (37 hopping + 3 advertising channel) for Bluetooth(LE mode) **For 15.247(5GHz)** 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)

MAXIMUM OUTPUT POWER	**For 15.407** 802.11a<5.26 ~ 5.32GHz>: 100.0mW 802.11n (20MHz) <5.5~5.58GHz & 5.66~5.7GHz >: 71.194mW 802.11n (40MHz) <5.19 ~ 5.23GHz>: 44.964mW **For 15.247(2.4GHz)** 802.11b: 183.176mW Bluetooth(LE mode): 2.3 mW **For 15.247(5GHz)** 802.11n (20MHz): 249.257mW
ANTENNA TYPE	See item 3.2
ANTENNA CONNECTOR	See item 3.2
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. This report is prepared for FCC class II permissive change and IC reassessment change. The difference compared with the Report No.: RF110907E02-1 R1 design is as the following information:
   - **u** BOM change and add external LNA to chain 0 and chain 1 RX
   - **u** HW version CUS217
2. There are Bluetooth technology and WLAN technology used for the EUT. <the Bluetooth test data please refer "RF110907E02I-2 R1 ">
3. The device has three configurations (working mode)
   a. WLAN only (2x2 MIMO)
   b. BT+WLAN (2x2 MIMO) with reduced power on WLAN
   c. BT+WLAN (1x1 mode on a/b/g only, chain 0 is used for BT and chain 1 is used for WLAN)
4. The EUT is 2 * 2 MIMO with 11n beam forming function.

MODULATION MODE	TX/Rx FUNCTION
802.11b	1Tx/1Rx or 2Tx/2Rx
802.11g	1Tx/1Rx or 2Tx/2Rx
802.11a	1Tx/1Rx or 2Tx/2Rx
802.11n (20MHz)	2Tx/2Rx
802.11n (40MHz)	2Tx/2Rx

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

3.2 DESCRIPTION OF ANTENNA

There is one set of antenna provided to this EUT, please refer to the following table:

No.	Brand	Model	Antenna Type	Connector	Antenna Gain (dBi)< included cable loss>			
					For 2.4GHz	For 5GHz (5.15~5.35)	For 5GHz (5.47~5.725)	For 5GHz (5.725~5.850)
1&2	WNC	81.EBJ15.005	PIFA	IPEX	3.62	3.08	4.76	4.76

Cable Loss:

No.	Brand	Model	Cable Loss(dB)				Cable Length
			For 2.4GHz	For 5GHz (5.15~5.35)	For 5GHz (5.47~5.725)	For 5GHz (5.725~5.850)	
1&2	WNC	81-EBJ15.005	1.15	1.70	1.74	1.79	300

Note: Above antenna gains of antenna are Total (H+V).

3.3 DESCRIPTION OF TEST MODES

Operated in 5150MHz ~ 5350MHz bands:

Eight channels are provided for 802.11a and 802.11n (20MHz):

CHANNEL	FREQUENCY
36	5180 MHz
40	5200 MHz
44	5220 MHz
48	5240 MHz
52	5260 MHz
56	5280 MHz
60	5300 MHz
64	5320 MHz

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

CHANNEL	FREQUENCY
38	5190 MHz
46	5230 MHz
54	5270 MHz
62	5310 MHz

Operated in 5470MHz ~ 5600MHz & 5650MHz ~ 5725MHz bands:

Eight channels are provided for 802.11a and 802.11n (20MHz):

CHANNEL	FREQUENCY
100	5500 MHz
104	5520 MHz
108	5540 MHz
112	5560 MHz
116	5580 MHz
132	5660 MHz
136	5680 MHz
140	5700 MHz

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

CHANNEL	FREQUENCY
102	5510 MHz
110	5550 MHz
134	5670 MHz

3.3.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO			DESCRIPTION
	RE < 1G	RE ³ 1G	APCM	
-	√	√	√	-

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

RE ³ 1G: Radiated Emission above 1GHz **APCM:** Antenna Port Conducted Measurement

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ The investigation has been done for the worst-case (1x1 vs. 2x2) on harmonics and band-edge to find out the worst-case for the final tests.

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION MODE
802.11a	36 to 140	52	OFDM	BPSK	6	A

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).

☒ The investigation has been done for the worst-case (1x1 vs. 2x2) on harmonics and band-edge to find out the worst-case for the final tests.

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION MODE
802.11a	36 to 140	52	OFDM	BPSK	6	A

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).
☒ The investigation has been done for the worst-case (1x1 vs. 2x2) on harmonics and band-edge to find out the worst-case for the final tests.
☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION
802.11a	36 to 140	52, 60, 64	OFDM	BPSK	6	A
For 5 GHz 802.11n (20MHz)	36 to 140	100, 116, 132, 140	OFDM	BPSK	6.5	C
For 5 GHz 802.11n (40MHz)	38 to 134	38, 46	OFDM	BPSK	13.5	D

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ 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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION
802.11a	36 to 140	52, 60, 64	OFDM	BPSK	6	A
For 5 GHz 802.11n (20MHz)	36 to 140	100, 116, 132, 140	OFDM	BPSK	6.5	C
For 5 GHz 802.11n (40MHz)	38 to 134	38, 46	OFDM	BPSK	13.5	D

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE<1G	25deg. C, 72%RH	120Vac, 60Hz	Amos Chuang
RE≥1G	22deg. C, 65%RH	120Vac, 60Hz	Kent Liu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Amos Chuang

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 E (Section 15.407)

ANSI C63.10-2009

Canada RSS-210 Issue 8 (2010-12)

Canada RSS-Gen Issue 3 (2010-12)

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

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.5 DESCRIPTION OF SUPPORT UNITS

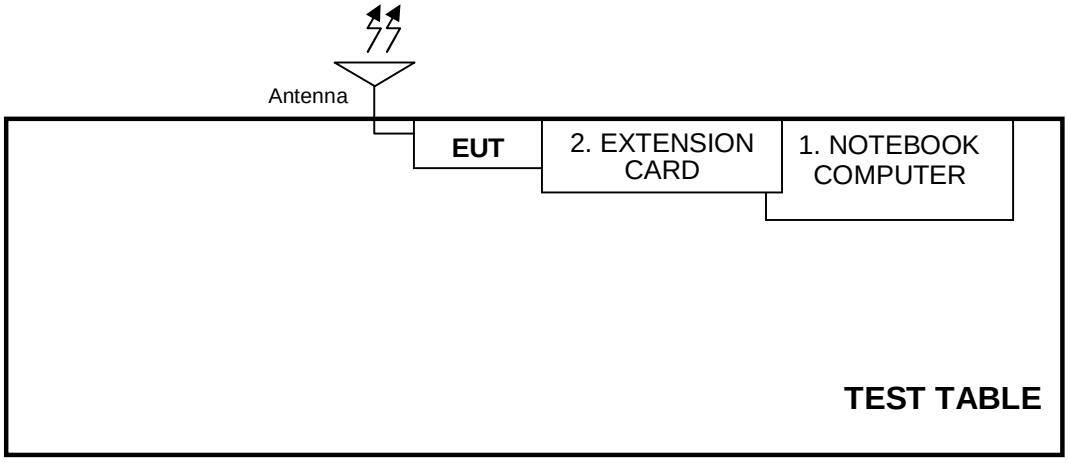
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP19L	CN-OHC416-70166-5CA-0448	PIW632500516610
2	EXTENSION CARD	Atheros	NA	NA	NA

No.	Signal cable description
1	NA
2	NA

Note: The power cords of the above support units were unshielded (1.8m).

3.6 CONFIGURATION OF SYSTEM UNDER TEST



4. TEST TYPES AND RESULTS

4.1 UNWANTED EMISSION MEASUREMENT

4.1.1 LIMITS OF UNWANTED EMISSION MEASUREMENT

Unwanted emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

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 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

Frequencies (MHz)	**EIRP Limit (dBm)**	**Equivalent Field Strength at 3m (dBμV/m)** *note 3
5150~5250	-27	68.3
5250~5350	-27	68.3
5470~5725	-27	68.3
5725~5825	-27 *note 1	68.3
	-17 *note 2	78.3

NOTE:

1. For frequencies 10MHz or greater above or below the band edge.
2. All emissions within the frequency range from the band edge to 10MHz above or below the band edge.
3. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts)

4.1.3 TEST INSTRUMENTS

Below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250254	July 12, 2011	July 11, 2012
Agilent Pre-Selector	N9039A	MY46520311	July 12, 2011	July 11, 2012
Agilent Signal Generator	N5181A	MY49060517	July 12, 2011	July 11, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 15, 2011	Nov. 14, 2012
Agilent Pre-Amplifier	8449B	3008A02578	July 04, 2011	July 03, 2012
SPACEK LABS	SLKKa-48-6	9K16	Nov. 15, 2011	Nov. 14, 2012
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Apr. 09, 2012	Apr. 08, 2013
AISI Horn_Antenna	AIH.8018	0000320091110	Nov. 14, 2011	Nov. 13, 2012
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 26, 2011	Dec. 25, 2012
RF Cable	NA	CHGCAB_001	Oct. 07, 2011	Oct. 06, 2012
Software	ADT_Radiated_ V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3 The test was performed in 966 Chamber No. G.
4. The FCC Site Registration No. is 966073.
5 The VCCI Site Registration No. is G-137.
6 The CANADA Site Registration No. is IC 7450H-2.
7 Tested Date: May 14, 2012

Above 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 29, 2011	Aug. 28, 2012
Agilent Pre-Selector	N9039A	MY46520310	Aug. 29, 2011	Aug. 28, 2012
Agilent Signal Generator	N5181A	MY49060347	July 25, 2011	July 24, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-04	Nov. 15, 2011	Nov. 14, 2012
Agilent Pre-Amplifier	8449B	3008A02465	Feb. 27, 2012	Feb. 26, 2013
SPACEK LABS	SLKKa-48-6	9K16	Nov. 15, 2011	Nov. 14, 2012
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-361	Apr. 06, 2012	Apr. 05, 2013
AISI Horn_Antenna	AIH.8018	0000220091110	Nov. 23, 2011	Nov. 22, 2012
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
RF CABLE	NA	RF104-205 RF104-207 RF104-202	Dec. 27, 2011	Dec. 26, 2012
RF Cable	NA	CHHCAB_001	Oct. 08, 2011	Oct. 07, 2012
Software	ADT_Radiated_ V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3 The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5 The CANADA Site Registration No. is IC 7450H-3.
6 Tested Date: May 25, 2012

4.1.4 TEST PROCEDURES

Following FCC KDB 789033 D01 General UNII Test Procedures:

Radiated versus Conducted Measurements.

The unwanted emission limits in both the restricted and non-restricted bands are based on antenna-port conducted measurements in conjunction with cabinet emissions tests are permitted to demonstrate compliance.

The following steps was performed:

a. Cabinet emissions measurements. Radiated measurement was performed to ensure that cabinet emissions are below the emission limits. For the cabinet-emission measurements the antenna was replaced by a termination matching the nominal impedance of the antenna.

b. Conducted tests was performed using equipment that matches the nominal impedance of the antenna assembly used with the EUT

c. EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater

d. EIRP adjustments for multiple outputs. (Follow the procedures specified in FCC KDB Publication 662911)

e. For all of Radiation emission test

e-1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

e-2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

e-3. 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.

e-4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e-5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

e-6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

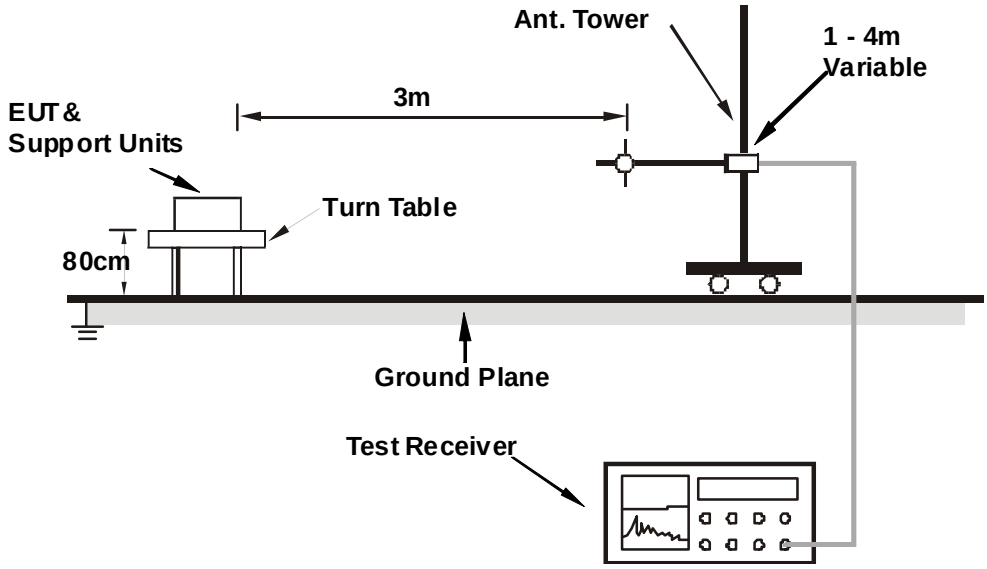
NOTE:

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

4.1.5 DEVIATION FROM TEST STANDARD

No deviation

4.1.6 TEST SETUP



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

4.1.7 EUT OPERATING CONDITION

1. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program “artgui.exe” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.8 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11a

CHANNEL	TX Channel 52	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	99.99	36.9 QP	43.5	-6.6	2.00 H	140	27.04	9.88
2	149.96	37.5 QP	43.5	-6.0	1.00 H	317	22.50	15.00
3	398.18	40.4 QP	46.0	-5.6	1.00 H	40	22.60	17.81
4	432.04	40.4 QP	46.0	-5.6	2.00 H	233	21.69	18.68
5	799.87	41.7 QP	46.0	-4.3	1.25 H	70	15.74	25.92
6	882.29	36.6 QP	46.0	-9.4	1.50 H	344	9.34	27.23
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	150.00	36.1 QP	43.5	-7.4	1.50 V	138	21.11	15.00
2	299.89	38.4 QP	46.0	-7.6	1.75 V	198	23.11	15.29
3	398.18	42.4 QP	46.0	-3.6	1.25 V	171	24.59	17.81
4	432.04	39.3 QP	46.0	-6.8	1.25 V	163	20.57	18.68
5	768.25	36.8 QP	46.0	-9.2	1.50 V	171	11.51	25.28
6	874.47	36.5 QP	46.0	-9.5	1.25 V	333	9.38	27.11

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

ABOVE 1GHz DATA

802.11a

CHANNEL	TX Channel 52	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5260.00	116.2 PK			1.49 H	68	75.60	40.60
2	*5260.00	104.5 AV			1.49 H	68	63.90	40.60
3	#10520.00	64.2 PK	68.3	-4.1	1.67 H	60	17.26	46.94
4	15780.00	61.4 PK	74.0	-12.6	1.00 H	56	9.63	51.77
5	15780.00	50.1 AV	54.0	-3.99	1.00 H	56	-3.78	51.77
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5260.00	113.9 PK			1.05 V	261	73.30	40.60
2	*5260.00	102.9 AV			1.05 V	261	62.30	40.60
3	#10520.00	63.1 PK	68.3	-5.2	1.06 V	112	16.16	46.94
4	15780.00	60.0 PK	74.0	-14.0	1.09 V	257	8.23	51.77
5	15780.00	49.1 AV	54.0	-4.9	1.09 V	257	-2.67	51.77

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 60	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	115.2 PK			1.46 H	61	74.53	40.67
2	*5300.00	103.5 AV			1.46 H	61	62.83	40.67
3	10600.00	63.9 PK	74.0	-10.1	1.73 H	79	16.91	46.99
4	10600.00	52.4 AV	54.0	-1.6	1.73 H	79	5.41	46.99
5	15900.00	60.3 PK	74.0	-13.7	1.04 H	67	8.38	51.92
6	15900.00	49.1 AV	54.0	-4.9	1.04 H	67	-2.82	51.92
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	112.3 PK			1.00 V	268	71.63	40.67
2	*5300.00	101.1 AV			1.00 V	268	60.43	40.67
3	10600.00	63.4 PK	74.0	-10.6	1.38 V	176	16.41	46.99
4	10600.00	52.2 AV	54.0	-1.8	1.38 V	176	5.21	46.99
5	15900.00	59.1 PK	74.0	-14.9	1.02 V	271	7.18	51.92
6	15900.00	48.1 AV	54.0	-5.9	1.02 V	271	-3.82	51.92

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 64	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	111.1 PK			1.44 H	65	70.39	40.71
2	*5320.00	100.5 AV			1.44 H	65	59.79	40.71
3	5350.00	69.4 PK	74.0	-4.6	1.55 H	125	28.63	40.77
4	5350.00	52.7 AV	54.0	-1.3	1.55 H	125	11.93	40.77
5	10640.00	64.5 PK	74.0	-9.5	1.78 H	56	17.48	47.02
6	10640.00	51.0 AV	54.0	-3.0	1.78 H	56	3.98	47.02
7	15960.00	60.5 PK	74.0	-13.5	1.01 H	45	8.43	52.07
8	15960.00	49.3 AV	54.0	-4.7	1.01 H	45	-2.77	52.07
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	111.2 PK			1.11 V	279	70.49	40.71
2	*5320.00	99.6 AV			1.11 V	279	58.89	40.71
3	5350.00	69.1 PK	74.0	-4.9	1.00 V	69	28.33	40.77
4	5350.00	52.4 AV	54.0	-1.6	1.00 V	69	11.63	40.77
5	10640.00	63.4 PK	74.0	-10.6	1.00 V	186	16.38	47.02
6	10640.00	52.1 AV	54.0	-1.9	1.00 V	186	5.08	47.02
7	15960.00	63.5 PK	74.0	-10.5	1.03 V	138	11.43	52.07
8	15960.00	50.6 AV	54.0	-3.4	1.03 V	138	-1.47	52.07

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

802.11n (20MHz)

CHANNEL	TX Channel 100	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	59.5 PK	74.0	-14.5	1.35 H	218	18.53	40.97
2	5460.00	47.2 AV	54.0	-6.8	1.35 H	218	6.23	40.97
3	#5470.00	65.7 PK	68.3	-2.6	1.55 H	243	24.71	40.99
4	*5500.00	113.2 PK			1.31 H	229	72.15	41.05
5	*5500.00	102.5 AV			1.31 H	229	61.45	41.05
6	11000.00	62.2 PK	74.0	-11.8	1.48 H	54	14.90	47.30
7	11000.00	50.8 AV	54.0	-3.2	1.48 H	54	3.50	47.30
8	#16500.00	63.9 PK	68.3	-4.4	1.52 H	82	10.87	53.03
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	59.3 PK	74.0	-14.7	1.85 V	90	18.33	40.97
2	5460.00	47.5 AV	54.0	-6.5	1.85 V	90	6.53	40.97
3	**#5470.00**	**67.6 PK**	**68.3**	**-0.7**	**1.02 V**	**118**	**26.61**	**40.99**
4	*5500.00	114.0 PK			1.84 V	246	72.95	41.05
5	*5500.00	103.8 AV			1.84 V	246	62.75	41.05
6	11000.00	63.7 PK	74.0	-10.3	1.66 V	188	16.40	47.30
7	11000.00	51.7 AV	54.0	-2.3	1.66 V	188	4.40	47.30
8	#16500.00	64.1 PK	68.3	-4.2	1.30 V	74	11.07	53.03

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 116	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	116.7 PK			1.48 H	245	75.56	41.14
2	*5580.00	104.2 AV			1.48 H	245	63.06	41.14
3	11160.00	61.7 PK	74.0	-12.3	1.52 H	70	14.36	47.34
4	11160.00	50.1 AV	54.0	-3.9	1.52 H	70	2.76	47.34
5	#16740.00	61.5 PK	68.3	-6.8	1.61 H	87	7.98	53.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	116.9 PK			1.01 V	249	75.76	41.14
2	*5580.00	106.1 AV			1.01 V	249	64.96	41.14
3	11160.00	66.3 PK	74.0	-7.7	1.80 V	165	18.96	47.34
4	11160.00	52.1 AV	54.0	-1.9	1.80 V	165	4.76	47.34
5	#16740.00	63.4 PK	68.3	-4.9	1.36 V	47	9.88	53.52

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 132	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5660.00	116.8 PK			1.45 H	251	75.57	41.23
2	*5660.00	104.4 AV			1.45 H	251	63.17	41.23
3	#5725.00	53.4 PK	68.3	-16.3	1.42 H	235	12.09	41.31
4	11320.00	61.1 PK	74.0	-12.9	1.48 H	58	13.75	47.35
5	11320.00	49.6 AV	54.0	-4.4	1.48 H	58	2.25	47.35
6	#16980.00	61.0 PK	68.3	-7.3	1.60 H	100	6.92	54.08
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5660.00	117.2 PK			1.00 V	251	75.97	41.23
2	*5660.00	106.5 AV			1.00 V	251	65.27	41.23
3	#5725.00	55.2 PK	68.3	-13.1	1.00 V	87	13.89	41.31
4	11320.00	66.0 PK	74.0	-8.0	1.76 V	166	18.65	47.35
5	11320.00	51.7 AV	54.0	-2.3	1.76 V	166	4.35	47.35
6	#16980.00	63.5 PK	68.3	-4.8	1.34 V	41	9.42	54.08

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 140	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	110.9 PK			1.54 H	233	69.62	41.28
2	*5700.00	99.8 AV			1.54 H	233	58.52	41.28
3	#5725.00	66.5 PK	68.3	-1.8	1.44 H	220	25.19	41.31
4	11400.00	61.4 PK	74.0	-12.6	1.58 H	63	14.02	47.38
5	11400.00	49.7 AV	54.0	-4.3	1.58 H	63	2.32	47.38
6	#17100.00	64.6 PK	68.3	-3.7	1.63 H	104	10.28	54.32
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	112.6 PK			1.00 V	299	71.32	41.28
2	*5700.00	101.5 AV			1.00 V	299	60.22	41.28
3	#5725.00	67.4 PK	68.3	-0.9	1.80 V	109	26.09	41.31
4	11400.00	65.8 PK	74.0	-8.2	1.03 V	354	18.42	47.38
5	11400.00	52.3 AV	54.0	-1.7	1.03 V	354	4.92	47.38
6	#17100.00	65.7 PK	68.3	-2.6	1.32 V	66	11.38	54.32

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11n (40MHz)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.8 PK	74.0	-7.2	1.46 H	236	26.40	40.40
2	**5150.00**	**53.3 AV**	**54.0**	**-0.7**	**1.46 H**	**236**	**12.90**	**40.40**
3	*5190.00	103.9 PK			1.10 H	73	63.43	40.47
4	*5190.00	92.9 AV			1.10 H	73	52.43	40.47
5	#10380.00	60.2 PK	68.3	-8.1	1.46 H	56	13.37	46.83
6	15570.00	59.0 PK	74.0	-15.0	1.00 H	85	7.78	51.22
7	15570.00	49.7 AV	54.0	-4.3	1.00 H	85	-1.52	51.22
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.7 PK	74.0	-9.3	1.03 V	93	24.30	40.40
2	5150.00	53.1 AV	54.0	-0.9	1.03 V	93	12.70	40.40
3	*5190.00	103.0 PK			1.00 V	258	62.53	40.47
4	*5190.00	91.6 AV			1.00 V	258	51.13	40.47
5	#10380.00	62.4 PK	68.3	-5.9	1.29 V	10	15.57	46.83
6	15570.00	60.7 PK	74.0	-13.3	1.27 V	61	9.48	51.22
7	15570.00	51.0 AV	54.0	-3.0	1.27 V	61	-0.22	51.22

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	107.3 PK			1.00 H	60	66.76	40.54
2	*5230.00	96.4 AV			1.00 H	60	55.86	40.54
3	#10460.00	61.7 PK	68.3	-6.6	1.49 H	68	14.80	46.90
4	15690.00	60.4 PK	74.0	-13.6	1.00 H	103	8.86	51.54
5	15690.00	50.8 AV	54.0	-3.2	1.00 H	103	-0.74	51.54
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	107.0 PK			1.05 V	229	66.46	40.54
2	*5230.00	95.9 AV			1.05 V	229	55.36	40.54
3	#10460.00	62.1 PK	68.3	-6.2	1.27 V	11	15.20	46.90
4	15690.00	60.9 PK	74.0	-13.1	1.41 V	54	9.36	51.54
5	15690.00	51.1 AV	54.0	-2.9	1.41 V	54	-0.44	51.54

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

4.2 TRANSMIT POWER MEASUREMENT

4.2.1 LIMITS OF OUTPUT TRANSMIT POWER MEASUREMENT

Frequency Band	Limit
5.15 – 5.25GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.25 – 5.35GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.47 – 5.725GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.725 – 5.825GHz	The lesser of 1W (30dBm) or 17dBm + 10logB

NOTE: Where B is the 26dB emission bandwidth in MHz.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power Meter	ML2495A	0824006	May 04, 2011	May 03, 2012
Average Power Sensor	MA2411B	0738172	May 03, 2011	May 02, 2012

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. Tested date : Apr. 12, 2012

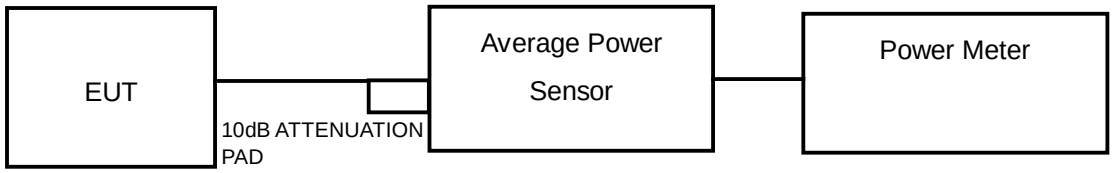
4.2.3 TEST PROCEDURE

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



4.2.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.2.7 TEST RESULTS

POWER OUTPUT : Single chain - 802.11a OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	OUTPUT POWER (mW)	OUTPUT POWER (dBm)	OUTPUT POWER LIMIT (dBm)	PASS/FAIL
52	5260	100.000	20.0	24	PASS
60	5300	97.724	19.9	24	PASS
64	5320	60.256	17.8	24	PASS

POWER OUTPUT : 802.11n (20MHz) OFDM MODULATION:

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN (0)	CHAIN (1)				
100	5500	12.0	13.2	36.742	15.65	22.23	PASS
116	5580	14.4	16.4	71.194	18.52	22.23	PASS
132	5660	14.6	15.1	61.199	17.87	22.23	PASS
140	5700	11.4	12.8	32.859	15.17	22.23	PASS

For Operated in 5470MHz ~ 5600MHz & 5650MHz ~ 5725MHz bands:

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi) = 7.77

The effective legacy gain is 7.77dBi, therefore the limit needs to reduce.

POWER OUTPUT : 802.11n (40MHz) OFDM MODULATION:

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN (0)	CHAIN (1)				
38	5190	9.7	9.2	17.651	12.47	16.91	PASS
46	5230	13.9	13.1	44.964	16.53	16.91	PASS

For Operated in 5150MHz ~ 5250MHz bands:

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi) = 6.09

The effective legacy gain is 6.09dBi, therefore the limit needs to reduce.

5.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: 886-2-26052943

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.adt.com.tw

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

6.APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

--- END ---