



Supplemental “Dual Xmit” Test Report

REPORT NO.: RF991029E01-2

MODEL NO.: AR5B195

FCC ID: PPD-AR5B195

RECEIVED: Oct. 29, 2010

TESTED: Nov. 10, 2010

ISSUED: Nov. 15, 2010

APPLICANT: Atheros Communications, 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 test report consists of 11 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by TAF or any government agencies. The test results in the report only apply to the tested sample.





Table of Contents

1.	CERTIFICATION	3
2.	DUAL XMIT, RADIATED EMISSION MEASUREMENT	4
3.1	LIMITS OF RADIATED EMISSION MEASUREMENT	4
3.2	TEST INSTRUMENTS	5
3.3	TEST PROCEDURES	6
3.4	DEVIATION FROM TEST STANDARD	6
3.5	TEST SETUP	7
3.6	EUT OPERATING CONDITIONS	8
3.7	TEST RESULTS	9
4.	INFORMATION ON THE TESTING LABORATORIES	11



A D T

1. CERTIFICATION

PRODUCT : 802.11n-BT COMBO CARD
BRAND : Atheros
MODEL NO. : AR5B195
TESTED : Nov. 10, 2010
APPLICANT : Atheros Communications, Inc.
TEST SAMPLE : R&D SAMPLE
STANDARDS : FCC Part 15, Subpart C (Section 15.247)
ANSI C63.4-2003
Canada RSS-210 issue 7
Canada RSS-Gen issue 2

PREPARED BY : Carol Liao , **DATE:** Nov. 15, 2010
(Carol Liao, Specialist)

TECHNICAL ACCEPTANCE : Hank Chung , **DATE:** Nov. 15, 2010
(Hank Chung, Deputy Manager)

APPROVED BY : May Chen , **DATE:** Nov. 15, 2010
(May Chen, Deputy Manager)

Note:

Per a request of the FCC, the 802.11n-BT COMBO CARD was tested for radiated emissions in restricted bands while transmitting on both WLAN and bluetooth at simultaneously.



2. DUAL XMIT, RADIATED EMISSION MEASUREMENT

3.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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. As shown in 15.35(b), 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.



3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 23, 2010	Aug. 22, 2011
Agilent Pre-Selector	N9039A	MY46520310	Aug. 23, 2010	Aug. 22, 2011
Agilent Signal Generator	N5181A	MY49060347	July 30, 2010	July 29, 2011
LIG NEX1 Test Receiver	ER-265	L09068005	Aug. 30, 2010	Aug. 29, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-04	Nov. 18, 2009	Nov. 17, 2010
Agilent Pre-Amplifier	8449B	3008A02465	Mar. 01, 2010	Feb. 28, 2011
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-361	Apr. 28, 2010	Apr. 27, 2011
AISI Horn_Antenna	AIH.8018	000022009111 0	Nov. 16, 2009	Nov. 15, 2010
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-205 RF104-207 RF104-208	Dec. 24, 2009	Dec. 23, 2010
RF Cable	NA	CHHCAB_001	NA	NA
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.



3.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters chamber room. 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 antenna is a broadband antenna, and its height 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 10 dB 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 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.
- g. The emissions up to 40 GHz were examined. Those emissions falling within a restricted band were evaluated against the “restricted band emission limit” (54 dB μ V / 74 dB μ V).

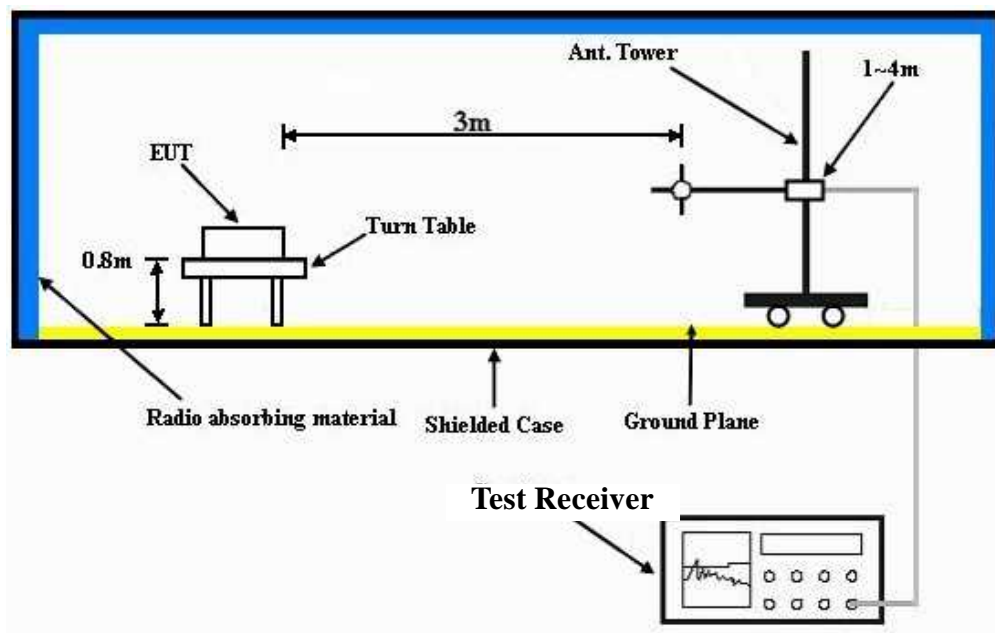
NOTE:

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 and video bandwidth of test receiver/spectrum analyzer is 1 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 300 Hz for Average detection (AV) at frequency above 1GHz.

3.4 DEVIATION FROM TEST STANDARD

No deviation

3.5 TEST SETUP



3.6 EUT OPERATING CONDITIONS

The EUT was tested for out of band radiated emissions with the unit transmitting on 802.11n (20MHz), 2437 MHz with Bluetooth, 2480MHz. These frequencies and power levels were chosen because these frequencies produced the worst case radiated emissions during the radiated emissions in restricted bands test performed previously. The unit was set to transmit at the same power level as was used in the initial radiated emissions tests and was transmitting at the same data rate. (Please refer to RF991029E01 and RF991029E01-1 test report)

The harmonic of the fundamental signals were recorded in this report.

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

Brand	Model	Gain(dBi) (included cable loss)	Antenna Type	Connector	Cable Loss(dB)	Cable Length
WNC	81-EBJ15.005	3.62	PIFA	IPEX	1.15	300mm

- a. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
- b. The communication partner run test program “ArcMfgTool 2.0.0.9” to enable EUT under transmission/receiving condition continuously at specific channel frequency.



3.7 TEST RESULTS

TEST MODE	Dual transmission 802.11n (20MHz), 2437MHz Bluetooth, 2480MHz	FREQUENCY RANGE	30MHz~1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	21deg. C, 68%RH, 1015hPa	TESTED BY	Frank Liu

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	233.21	40.3 QP	46.0	-5.7	1.00 H	31	27.90	12.40
2	275.02	41.1 QP	46.0	-4.9	1.00 H	144	27.20	13.90
3	415.23	41.1 QP	46.0	-4.9	1.00 H	241	22.80	18.30
4	499.90	39.6 QP	46.0	-6.4	2.00 H	213	19.50	20.10
5	527.97	38.2 QP	46.0	-7.8	1.50 H	319	17.40	20.80
6	600.32	40.8 QP	46.0	-5.2	1.00 H	23	18.30	22.50

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	168.20	40.1 QP	43.5	-3.4	2.00 V	109	26.20	13.90
2	249.91	39.6 QP	46.0	-6.4	1.50 V	22	26.70	12.90
3	287.45	37.6 QP	46.0	-8.4	1.50 V	147	23.20	14.40
4	450.05	39.2 QP	46.0	-6.8	1.00 V	142	20.10	19.10
5	600.32	39.4 QP	46.0	-6.6	1.00 V	183	16.90	22.50
6	699.80	35.3 QP	46.0	-10.7	1.50 V	212	11.90	23.40

- 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.



A D T

TEST MODE	Dual transmission 802.11n (20MHz), 2437MHz Bluetooth, 2480MHz	FREQUENCY RANGE	1000MHz~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION & BANDWIDTH	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 1013hPa	TESTED BY	Frank Liu

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	2483.50	62.3 PK	74.0	-11.7	1.40 H	244	30.93	31.37
2	2483.50	32.2 AV	54.0	-21.8	1.40 H	244	0.83	31.37
3	4874.00	46.4 PK	74.0	-27.6	1.42 H	122	9.17	37.23
4	4874.00	36.3 AV	54.0	-17.7	1.42 H	122	-0.93	37.23
5	4960.00	56.4 PK	74.0	-17.6	1.31 H	109	18.97	37.43
6	4960.00	26.3 AV	54.0	-27.7	1.31 H	109	-11.13	37.43
7	7311.00	51.1 PK	74.0	-22.9	1.22 H	144	6.74	44.36
8	7311.00	40.1 AV	54.0	-13.9	1.22 H	144	-4.26	44.36
9	7440.00	53.4 PK	74.0	-20.6	1.27 H	66	8.64	44.76
10	7440.00	23.3 AV	54.0	-30.7	1.27 H	66	-21.46	44.76

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	2483.50	56.6 PK	74.0	-17.4	1.04 V	244	25.23	31.37
2	2483.50	26.5 AV	54.0	-27.5	1.04 V	244	-4.87	31.37
3	4874.00	44.3 PK	74.0	-29.7	1.54 V	233	7.07	37.23
4	4874.00	34.5 AV	54.0	-19.5	1.54 V	233	-2.73	37.23
5	4960.00	54.8 PK	74.0	-19.2	1.13 V	66	17.37	37.43
6	4960.00	24.7 AV	54.0	-29.3	1.13 V	66	-12.73	37.43
7	7311.00	51.1 PK	74.0	-22.9	1.22 V	211	6.74	44.36
8	7311.00	40.2 AV	54.0	-13.8	1.22 V	211	-4.16	44.36
9	7440.00	53.1 PK	74.0	-20.9	1.21 V	79	8.34	44.76
10	7440.00	23.0 AV	54.0	-31.0	1.21 V	79	-21.76	44.76

- 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.



A D T

4. 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.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.

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: 886-3-3185050

Email: service@adt.com.tw

Web Site: www.adt.com.tw

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

--- END ---