

**EMISSIONS TEST REPORT FOR A LOW POWER TRANSMITTER**

**I. GENERAL INFORMATION**

Requirement: Federal Communications Commissions  
Test Requirements: 15.205, 15.207, 15.209, 15.407

Applicant: Airgo Networks Inc.

FCC ID:III

**II. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)**

The Airgo Model AGN1201AP 802.11a/b/g True MIMO APx mini pci radio module.

**III. TEST DATES AND TEST LOCATION**

Testing was performed 12 Dec 04 and 21 Jan 05. All tests were performed at:

Compliance Certification Services  
561F Monterey Road  
Morgan Hill, CA 95037

T.N. Cokenias  
EMC Consultant/Agent for Airgo Networks

5 February 2005

### 15.203 Antenna connector requirement

The antenna is to be permanently attached to the product.

### 15.204 Antenna description

Antenna description	Gain
Omni Monopole	2 dBi 2.4 GHz band 3 dBi 5 GHz bands
3 in MIMO configuration (2 TX/RX, 1 RX only)	

## TEST PROCEDURES

All tests were performed in accordance with the applicable procedures called out in the following document(s,) unless otherwise noted:

- 1) **ANSI C63.4 – 2003**, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

## TEST RESULTS

### Radiated Emissions

Test Requirement: 15.205, 15.247

### Out of Band Measurements

Test Requirement: 15.247

### Measurement Equipment Used:

Agilent 4444A Spectrum Analyzer, 9 kHz-44 GHz

EMCO 3115 Horn antenna, 1-18 GHz

Miteq pre-amplifier, 1 – 26.5 GHz

Bandpass/high pass filters

Radiated emissions generated by the transmitter portion of the EUT were measured.

1. The EUT was placed on a wooden table resting on a turntable on the test site. The EUT was configured to transmit continuously for each modulation at the maximum power levels recorded for power output measurements.

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**DTS Operation**

The search antenna was placed 3m from the EUT. The EUT antennas were arranged vertically as per normal installation.

2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205.
3. Radiated emissions were investigated for a LOW channel, a MID channel, and HIGH channel. Emissions were investigated to the 10<sup>th</sup> harmonic.
4. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

**Test Results:** PASS. Worst case results are presented. Refer to data sheets below.

**FCC Radiated Emissions Limits**

**Section 15.205** Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505 (1)	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(2)
13.36 - 13.41	322 - 335.4		

1 Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

2 Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

(c) Except as provided in paragraphs (d) and (e), regardless of the field strength limits specified elsewhere in this Subpart, the provisions of this Section apply to emissions from any intentional radiator.

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**DTS Operation**

**Section 15.209** Radiated emission limits, general requirements.

- (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (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

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

- (b) In the emission table above, the tighter limit applies at the band edges.

(c) The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other Sections within this Part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

(d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

(e) The provisions in Sections 15.31, 15.33, and 15.35 for measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this Part.

01/21/04 High Frequency Measurement  
 Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: William Zhuang  
 Project #: 05U3224-1  
 Company: T. Cokenias/Air Go  
 EUT Descrip.: Apx Modular a/b/g Mini PCI Card  
 EUT M/N: AGN1223AR01 (FCC ID: SA3-AGN1223AR0100)  
 Test Target: FCC 15.247 and FCC 15.407  
 Mode Oper: Tx, b and g Mode

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
<b>b Mode, Low Ch. SW setting: 28</b>															
4.824	3.0	42.1	34.4	32.9	3.2	-39.6	0.0	0.6	39.3	31.6	74.0	54.0	-34.7	-22.4	V
7.236	3.0	47.7	39.5	35.7	3.9	-40.4	0.0	0.6	47.6	39.4	74.0	54.0	-26.4	-14.6	V
4.824	3.0	38.0	28.9	32.9	3.2	-39.6	0.0	0.6	35.2	26.1	74.0	54.0	-38.8	-27.9	H
7.236	3.0	41.3	32.7	35.7	3.9	-40.4	0.0	0.6	41.2	32.6	74.0	54.0	-32.8	-21.4	H
<b>b Mode, Mid Ch. SW setting: 16</b>															
4.874	3.0	40.7	32.0	32.9	3.2	-39.6	0.0	0.6	37.9	29.2	74.0	54.0	-36.1	-24.8	V
7.311	3.0	46.7	38.5	35.8	3.9	-40.3	0.0	0.6	46.8	38.6	74.0	54.0	-27.2	-15.4	V
4.874	3.0	39.2	29.3	32.9	3.2	-39.6	0.0	0.6	36.4	26.5	74.0	54.0	-37.6	-27.5	H
7.311	3.0	43.8	34.3	35.8	3.9	-40.3	0.0	0.6	43.9	34.4	74.0	54.0	-30.1	-19.6	H
<b>b Mode, High Ch. SW setting: 21</b>															
4.924	3.0	40.6	31.4	33.0	3.3	-39.7	0.0	0.6	37.8	28.6	74.0	54.0	-36.2	-25.4	V
7.386	3.0	44.5	36.1	36.0	4.0	-40.3	0.0	0.6	44.8	36.4	74.0	54.0	-29.2	-17.6	V
4.924	3.0	39.0	27.2	33.0	3.3	-39.7	0.0	0.6	36.1	24.3	74.0	54.0	-37.9	-29.7	H
7.386	3.0	40.8	31.3	36.0	4.0	-40.3	0.0	0.6	41.1	31.6	74.0	54.0	-32.9	-22.4	H
<b>g Mode, Low Ch. SW setting: 36</b>															
4.824	3.0	37.6	24.4	32.9	3.2	-39.6	0.0	0.6	34.7	21.6	74.0	54.0	-39.3	-32.4	V
7.236	3.0	48.5	35.0	35.7	3.9	-40.4	0.0	0.6	48.4	34.9	74.0	54.0	-25.6	-19.1	V
4.824	3.0	37.4	24.4	32.9	3.2	-39.6	0.0	0.6	34.6	21.6	74.0	54.0	-39.4	-32.4	H
7.236	3.0	41.6	28.8	35.7	3.9	-40.4	0.0	0.6	41.5	28.7	74.0	54.0	-32.5	-25.3	H
<b>g Mode, Mid Ch. SW setting: 23</b>															
4.874	3.0	37.7	26.0	32.9	3.2	-39.6	0.0	0.6	34.8	23.2	74.0	54.0	-39.2	-30.8	V
7.311	3.0	45.8	32.8	35.8	3.9	-40.3	0.0	0.6	45.9	32.9	74.0	54.0	-28.1	-21.1	V
4.874	3.0	36.5	24.8	32.9	3.2	-39.6	0.0	0.6	33.7	22.0	74.0	54.0	-40.3	-32.0	H
7.311	3.0	39.5	27.0	35.8	3.9	-40.3	0.0	0.6	39.6	27.1	74.0	54.0	-34.4	-26.9	H
<b>g Mode, High Ch. Sw setting: 34</b>															
4.924	3.0	37.4	25.9	33.0	3.3	-39.7	0.0	0.6	34.5	23.1	74.0	54.0	-39.5	-30.9	V
7.386	3.0	47.6	33.5	36.0	4.0	-40.3	0.0	0.6	47.8	33.7	74.0	54.0	-26.2	-20.3	V
4.924	3.0	37.8	24.9	33.0	3.3	-39.7	0.0	0.6	34.9	22.0	74.0	54.0	-39.1	-32.0	H
7.386	3.0	40.8	28.5	36.0	4.0	-40.3	0.0	0.6	41.1	28.8	74.0	54.0	-33.0	-25.2	H

12/17/04 High Frequency Measurement  
 Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: William Zhuang  
 Project #: 05U3224-1  
 Company: T. Cokenias/Air Go  
 EUT Descrip.: Apx Modular a/b/g Mini PCI Card  
 EUT M/N: AGN1223AR01 (FCC ID: SA3-AGN1223AR0100)  
 Test Target: FCC 15.247 and 15.407  
 Mode Oper: Tx, a Mode, 5.8GHz

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
<b>a Mode, Low Ch. 5745MHz, SW Gain setting: 43</b>															
11.490	3.0	50.7	37.0	38.1	5.1	-38.7	0.0	0.7	55.9	42.2	74.0	54.0	-18.1	-11.8	V
11.490	3.0	47.1	34.6	38.1	5.1	-38.7	0.0	0.7	52.3	39.8	74.0	54.0	-21.7	-14.2	H
17.235	3.0	52.5	37.4	43.1	6.0	-41.3	0.0	0.6	61.0	45.8	74.0	54.0	-13.0	-8.2	V
17.235	3.0	56.0	40.7	43.1	6.0	-41.3	0.0	0.6	64.4	49.2	74.0	54.0	-9.6	-4.8	H
<b>a Mode, Mid Ch. 5785MHz, SW Gain setting: 39</b>															
11.570	3.0	46.6	34.9	38.2	5.1	-38.8	0.0	0.7	51.8	40.1	74.0	54.0	-22.2	-13.9	V
11.570	3.0	45.2	32.6	38.2	5.1	-38.8	0.0	0.7	50.4	37.8	74.0	54.0	-23.6	-16.2	H
17.355	3.0	53.4	38.2	43.4	6.0	-41.3	0.0	0.6	62.2	46.9	74.0	54.0	-11.8	-7.1	V
17.355	3.0	55.7	40.7	43.4	6.0	-41.3	0.0	0.6	64.4	49.4	74.0	54.0	-9.6	-4.6	H
<b>a Mode, High Ch. 5805MHz, SW Gain setting: 37</b>															
11.610	3.0	46.1	33.0	38.2	5.1	-38.8	0.0	0.7	51.3	38.2	74.0	54.0	-22.7	-15.8	V
11.610	3.0	44.4	31.7	38.2	5.1	-38.8	0.0	0.7	49.6	36.9	74.0	54.0	-24.4	-17.1	H
17.415	3.0	52.9	38.0	43.5	6.0	-41.3	0.0	0.6	61.8	46.9	74.0	54.0	-12.2	-7.1	V
17.415	3.0	54.3	39.7	43.5	6.0	-41.3	0.0	0.6	63.2	48.5	74.0	54.0	-10.8	-5.5	H