



110 Nortech Parkway
San Jose, CA, 95134
(408) 635 2000
www.airespace.com

4 Jan 2004

TO: Mr. Tim Johnson
American Telecommunications Certification Body Inc.
6731 Whittier Ave, McLean, VA 22101

RE: Airespace FCC ID: **QTZWN1200ABG**

Tim,
Below are the replies to your inquiries regarding this application. If something is unclear, or if you have additional concerns, please contact me.

Best Regards,

David Waitt
Consultant representing Airespace
david@waitt.us

General

ATCB 1) The application is for an 802.11 A/B/G Radio, but the parts list only mentions A/B. Please comment/correct as necessary.

Airespace) The parts list has been corrected and uploaded to the ATCB site

ATCB 2) The authorization letter appears to contain an incorrect manufacturer. Please provide a new authorization letter.

Airespace) The authorization letter has been corrected and uploaded to the ATCB site

ATCB 3) Given that the device may accept an AC adapter or POE power according to the users manual, the AC line conducted emissions should be checked to determine which method of supplying power is worse case. Only one set of data appears to be provided. Please provide further information regarding whether both modes of providing power were checked to ensure the worse case results are provided.

Airespace)

The Access point radio has been tested when powered by the AC adapter and the power over Ethernet from the Ethernet switch. This was, of course, necessary in order to verify Class A compliance of the Ethernet switch.

In general, the AC line conducted emissions results presented are worst case levels. This is due in part to the additional filtering that is incorporated into the power supply within the Ethernet switch.

ATCB 4) The external photographs appear to show standard screws for the access door which contradicts the fact that the end user should not have simple access to the antenna connectors located in the device to ensure compliance with 15.407(d). Please comment.

Airespace: The unit that was used for testing incorporated regular Phillips screws simply for ease of assembly / disassembly and the fact that Phillips screwdrivers are ubiquitous. Security Torx screws are used in the units that are sold to customers. A picture of the type of torx used is to the right.



ATCB 5) Please verify that the device has been properly tested to for Part 15, Class A limits as previously mentioned.

Airespace: The unit has been tested for compliance with FCC Class A radiated emission limits. A class A DOC has been prepared.

15.247

ATCB 6) The spectral density data appears to be provided for 2 modulations, but it is not clear. Please clearly label all plots or provide an additional table A

Airespace: The plots have been labeled in the modified report.

ATCB 7) Information provide on the external antennas for 2.4 GHz shows gains up to 9 dBi, while the report mentions the gain of the external antennas are less than the internal antennas (2.4 GHz internal = 7.8 dBi). Please explain.

Airespace: For that given style and model of antenna, within that product line, the antenna manufacturer provides antennas with gains of up to 9 dBi. The 9 dBi version is not used or recommended by Airespace.

ATCB 8) The values listed for power on page 22 of the 802.11b/g report appears lower than the measured power. Please provide an explanation.

Airespace: This is simply a function of number of points on the trace of the spectrum analyzer and the span of the sweep. Assuming there are finite number points in the spectrum analyzer sweep, with a span of 23970MHz, a trace point may not fall on the peak of the carrier. Thus, fundamental appears lower than it actually is.

ATCB 9) Please provide an explanation of the high emissions seen below the fundamental on page 23 of the 802.11b/g report. This emission could be seen as above the limit.

Airespace: This is an artifact of the spectrum analyzer. It is the "zero frequency" of the spectrum analyzer.

ATCB 10) The bandedge plots do not appear to follow the method given. Please review and adjust as necessary. (see QTZW NAP1200B)

Airespace: The Bandedge measurements for 802.11 G have been adjusted. The 802.11 B measurements remain the same was used in previous Airespace B applications. The 802.11 G band edge presents the worst case results. In the future, Plots for the 'B' mode of operation will reflect the provided test procedure.

ATCB 11) Please note that radiated emissions in restricted bands are considered to be any emission caused by the transmitter being turned on, not strictly the harmonics. This includes such emissions as LO's, intermod products, frequencies as part of any multiplication stages, etc. However radiated emissions only appear to be performed for > 4800 MHz. Please comment

Airespace: There were no significant spurious emissions below the 2d harmonic noted during the restricted band emissions test.

ATCB 12) The conducted emissions state that they device was tested from 150 kHz to 30 MHz using the new EN55022 harmonized limits. The results shown are only around 25-30 MHz. Please confirm the frequency range tested.

Airespace: The complete frequency range was tested. The units exhibited high levels of noise only within the narrow band between 25 and 30 MHz.

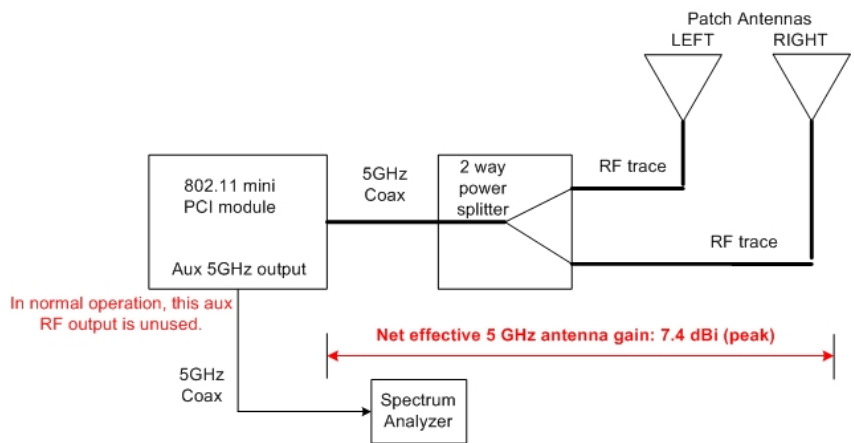
UNII

ATCB 13) Information regarding 15.407(g) mentions that the transmit frequency fundamental did not drift out of band. Please confirm that this includes all of the occupied bandwidth within 26 dB of the fundamental, and not just the center frequency.

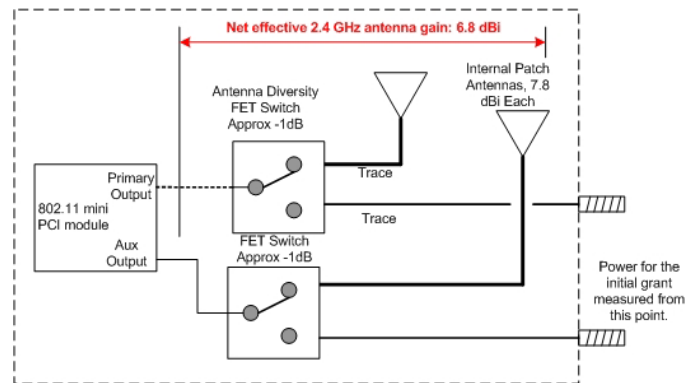
Airespace: No part of the spectra of the signal drifted out of band during the test.

ATCB 14) The power measurement diagram does show the splitter and takes this into consideration in the calculations. However, the diagram does not appear to show the switch for the 5 GHz path. It is therefore uncertain if this was factored in as shown in the 2.4 GHz data. Additionally the switch only appears to be in one of the 5 GHz paths. (See Block Diagram). Please explain.

Airespace: The device in the RF path is a power splitter, not a switch. Recall that the 5 GHz power is split between two antennas to produce an omni directional pattern. The RF switch in earlier versions has been removed. If a version of the access point is certified for use with external 5 GHz antennas in the future, the external antennas will be connected to the AUX output of the RF module and the antenna switch function will take place on the RF module. The 5 GHz RF block diagram is to the right.



The block diagram for the 2.4 GHz side of the access product is different in that it still incorporates an RF switch. The 2.4 GHz block diagram is shown to the right.



ATCB 15) Based on how information was presented in the report for power, the RF exposure calculations may incorrectly forget to take into consideration the RF splitter and/or switch. Please review, explain and correct the RF exposure calculations if necessary.

Airespace: The power density calculations appear correct. The calculation is based on the power into the antennas. In the case of 802.11 A, this is 3 dB below the power measured out of the module because of the power divider. An antenna gain of 10.4 dBi is used in the calculations. In the case of 802.11 B, the calculations are also based on power into the antenna. In this case the measured power is adjusted down 1 dB for the RF switch and then an antenna gain of 7.8 dBi are used in the calculation.

ATCB 16) The power measurements mention the use of method 3, while the plots appear to show method 2. Please clarify. Additionally, please note that method 3 stipulates 100 traces, while not all traces show this.

Airespace: The power measurements were repeated accordingly. The test results are included in the revised test report.

ATCB 17) Due to the power measurement at channel 5260 MHz exceeding the +17 dBm threshold stipulated for the channels just below this point, please provide power measurements at the 5240 MHz channel to show compliance to the +17 dBm requirement. Note that the power considered is before the splitter due to the fact this power may be accessible to the external connector (without the splitter) in future models.

Airespace: The power measurement was made and the results included in the modified report. The report has been uploaded to the ATCB site.

ATCB 18) Please explain if this device contains a "Turbo" mode of operation. If so, was this feature tested?

Airespace: The module within the access point contains turbo mode. However the Airespace software that controls the module does not allow turbo mode. Therefore operating the access point in turbo mode is not possible.

ATCB 19) The second paragraph of page 19 does not appear to be correct. Please review.

Airespace: The paragraph has been corrected in the modified report.

ATCB 20) The antenna gain given on page 23 & 41 and the limit associated with it do not appear correct unless this takes into consideration the switch mentioned above. Please review.

Airespace: The effective gain mentioned in the report previously was incorrect. The correct value (7.4 dBi) is used in the modified report.

ATCB 21) The bandedges (near 5.15, 5.35, 5.715, 5.835) shown on page 25, 28, 31, 33, 36, & 39 do not clearly show compliance with the -27dBm/MHZ EIRP limit. Please provide further data/information as necessary to show compliance at these edges. Note that compliance in the 10 MHz band just below/above 5725-5825 to -17 dBm/MHZ EIRP has been shown.

Airespace: Additional testing has been performed and the results included within the modified report.

ATCB 22) Page 47 shows restricted bands. Please note that emissions above 38.6 GHz are also considered restricted bands.

Airespace: A corrected table has been included within the modified report

ATCB 23) Please note that radiated emissions in restricted bands are considered to be any emission caused by the transmitter being turned on, not strictly the harmonics. This includes such emissions as LO's, intermod products, frequencies as part of any multiplication stages, etc. Please comment and/or provide further data as necessary.

Airespace: The entire range of 1 to 40 GHz is scanned during the test. 40 GHz is the upper limit of the test equipment. No emissions above approximately the third harmonic were detected.

ATCB 24) The banded plots do not appear to follow the method given. Please review and adjust as necessary.

Airespace: The plots have been edited and the data in the report revised to reflect the correct procedure.

ATCB 25) The conducted emissions shown are to the old Part 15 limits and not the new EN55022 requirements. Please correct.

Airespace: The corrected AC Line conducted data has been added to the UNII report