

8/24/2006

Mr. David Waite  
ATCB

RE: Cirronet

FCC ID: HSW-EM2420HP

Mr. Waite,

Thank you for your comments in your letter of August 22, 2006. Below is my response to your comments on this application. I have included your original comments in my response.

. 1: Several documents indicate confidentiality, however I do not see that a request for confidentiality letter has been uploaded. Please provide or confirm that confidentiality is NOT required on any documents associated with this application.

Uploaded. In addition, due to the nature of information within the Integrators Guide, it is requested that you place this document under confidential status. This has been granted under previous applications (HSW-2410G).

2: 802.15 Frequencies are typically 2405 - 2480 as indicated in the test user manual, However the 731 form indicates 2402.5 - 2477.5MHz. Please Explain. Additionally the test report indicates 2480 is not used, so in this case it seems the highest frequency listed should be 2475 MHz

Form 731 corrected to reflect 2405 to 2475 MHz and uploaded.

3: Please provide an "Integrators" installation guide. Please ensure that the integrators guide contains the following:

Instructions to the integrator regarding FCC warning statements to include in their manual such as "standard" FCC statement, RF exposure warnings and the 20cm MPE distance, allowed antennas.

Integrators guide now notifies integrator to place labels in their manual.

Instructions to the integrator regarding proper labeling of the host device

Integrators guide now notifies integrator for proper labeling of the host device.

Instructions to the integrator that they cannot provide the end user with module removal instructions.

Provided in manual.

4A: The test report and user manual reference an integral 0dBi antenna, however the photos and the schematics indicate an RF antenna connector is also available. Please outline measures taken to ensure that an unauthorized external antenna is NOT connected to this connector in a final host configuration.

The RF connector is for Cirronet factory setting only. A statement has been added to the manual to reflect this.

4B: Additionally, page 17 of the test report comments on the intent to sell the module with a 24 dBi parabolic dish antenna using a reverse N to MMCX adapter. This antenna does not appear to be addressed anywhere else in this filing (RF Exposure exhibits, test report, user manual...) Please explain.

The 24 dBi antenna is a carryover from a previous report. It is not utilized by the EM2420HP and all reference has been removed.

4C: Bandedge measurements also make reference to a parabolic dish. Please explain. What antenna was used for other radiated emissions measurements?

The 24 dBi antenna is a carryover from a previous report. It is not utilized by the EM2420HP and all reference has been removed

4D: Please provide a data sheet for the parabolic dish, please be sure it includes the gain of the dish.

The 24 dBi antenna is a carryover from a previous report. It is not utilized by the EM2420HP and all reference has been removed

5: Test report page 33 refers to the unit being "Hop Stopped" please confirm this is a typo and that the actual EUT is not frequency hopping. Page 75 also refers to frequency hopping. Please clarify.

The unit was tested with a continuous, maximum output power, modulated signal at Low, Mid and High channels. Report corrected and uploaded.

6: Tables 5 A,B and C are labeled AVERAGE test results. Tables indicate PK data.

The following has been added to page 52:

This value was subtracted from the peak data listed in Section 2.8 and compared to the average limits in the following tables.

FCC procedure allows Peak values to be obtained through maximization of emissions on the OATS site, then duty cycle corrected based upon the calculations on page 52, and compared to the average limits.

7: Please provide data to support the 46 dB duty cycle correction factor. Given that 2483.5 and 2390 are edges of restricted bands, please show compliance to the peak and average limits measured in 1M/1M (PK) and 1M/10Hz (AVG) bandwidths.

An alternate method was used to derive average data. See item 6 above.

A letter from Cirronet confirming duty cycle has been uploaded.

8: Figure 6A is labeled as being a conducted measurement. The bandedge measurement in section 2.110 appears to be conducted, yet there appears to be an adjustment from 3 to 1 meter (9.54 dB) please clarify.

Corrected and uploaded.

9: Test report shows a 6dB BW of 1.6MHz. The test report indicates that the RBW used for measuring the RF power from the device was greater than the 6 dB BW however plots indicate a 1 MHz RBW was used. Please re-measure the RF transmit power using RBW > 6 dB BW.

Corrected and updated.

9A: The measured power in the plots is given as 17.92, 17.82 & 17.82 dBm ( L-M-H ) the data in the table indicates 17.81, 17.71, 17.71 dBm. Note that the .1dB for cable loss should be added to the level measured on the analyzer, not subtracted. Please correct, and note any required changes to MPE and other documents.

Corrected and Uploaded.

10: Section 2.10 states that 5000uV/m = -32.02 dBm. Please outline the derivation of this. My calculation suggests that 5000uV/m @ 3 M = -21.22 dBm EIRP (20 LOG 5000) - 95.2 = -21.2 dBm EIRP

Our calculation used 107 as the conversion from dBuV to dBm. Corrected and Uploaded.

11: The bandedge measurement in section 2.110 appears to be conducted, yet there appears to be an adjustment from 3 to 1 meter (9.54 dB) please clarify.

Entire bandedge section corrected and uploaded.

12: Figure 6B, High bandedge, the center of the plot is at 2483.5, yet the dBc measurement is performed between the fundamental and 2487.678 MHz and not at the band edge (2483.5MHz). Please clarify.

Entire bandedge section corrected and uploaded.

Note that the peak power is given as 17.81 dBm in a 1 MHz BW. The plot in section 6B shows that the level at the band edge, 2483.5 is approximately 32 dB below the fundamental level. Though this plot is using a 100kHz RBW, we can subtract it from the peak power measurement made in a 1 MHz BW. This gives an approximate level of -14.19dBm EIRP. If we assume 0 dBi of antenna gain ( and there are questions surrounding antenna gain ) then -14.19 dBm EIRP is approximately equal to 81 dBuV in a 1 MHz BW. This would be 6 dB over the limit, but it serves as an example.

Testing was originally done using Channel 15, 2480 MHz, which is indicated in the Cirronet Integrator's Guide as not used. Testing was repeated using 2475 MHz, Channel 14, with passing results.

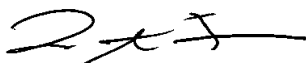
Entire bandedge section corrected and uploaded.

FYI: The limits specified in the 6 dB BW table are incorrect. The minimum 6 dB BW for a 2.4GHz for this type system is 500kHz. (assuming a non-hopping system)

Noted.

Please contact me with any further questions.

Sincerely,



Louis A. Feudi  
Vice President of Operations and Engineering