



Date: 24th January 2008

Gregory Czumak
PCTEST Engineering Laboratory, Inc.
6660-B Dobbin Road
Columbia, MD 21045

Re: Correspondence Number AZ471050 with FCC ID: AZ489FT7031.
Confirmation Number: 712181050-53

Dear Mr. Czumak;

Motorola Inc., 8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322, herein submits its response to the 20th December 2007 request for information in Correspondence Number AZ471050.

Q1. Please verify that the FCC ID label will be visible at the time of purchase.

R1. Please note that Motorola complies with FCC Rule Part 2.925 (d) that the label is permanently affixed and is readily visible to the purchaser at the time of purchase.

We have amended and attached Exhibit 1 by adding the above text.

Q2. The user's manual does not contain the required RF exposure body-worn warning statement. Please resubmit the manual, including this statement.

R2. User Manual at page 13 has a pointer to RF Safety Booklet.
RF exposure body-worn warning statement is part of the RF Safety Booklet.

See Exhibit 8a, RF Safety Booklet, attached.

Q3. Please submit an Operational Description (technical description) that describes the RF function (carrier generation, power control, spurious emission attenuation, modulation, etc.) for the DSS transmitter (Bluetooth), the DTS transmitter (WLAN) and the NII transmitter (WLAN).

R3. See revised Ex12, attached.

Q4. Please address the requirements of Section 15.247(a) (1) for the Bluetooth transmitter:

R4. See the answers below:

- A) Is the hopping sequence pseudorandom? Yes
- B) Are all channels are used equally on average? Yes
- C) Does the receiver input bandwidth equal the transmit bandwidth? Yes
- D) Does the receiver hop in sequence with the transmit signal? Yes

Q5. Please address Sections 15.247(g) and (h) for the Bluetooth transmitter.

R5. See the answers below:

15.247(g): In accordance with the Bluetooth Industry Standard, the system is designed to comply with all of the regulations in Section 15.247 when the transmitter is presented with a continuous data (or information) stream. [We comply.](#)

15.247(h): In accordance with the Bluetooth Industry Standard, the system does not coordinate its channel selection/hopping sequence with other frequency hopping systems for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters.
[We comply. BT radio is hopping independently and randomly. See the attached BQ approval.](#)

Q6. Please provide radiated emission data (peak and average) for Bluetooth harmonic emissions in Restricted Bands, as well as peak field strength data for those emissions reported on p.35/166 of the test report (only average data was provided for these).

R6. [Exhibit 6 is revised with the requested measurement data has been added on section:](#)

[4.8. Radiated Spurious Emissions, Restricted Bands \(see test report part1; page#35\)](#)

Q7. Please address Section 15.407(e) – this is typically done by inserting a statement in the user's manual cautioning the user to not operate in this band when outside.

R7. [Exhibit 8 -User manual is revised. \(See page 13\)](#)

Q8. Please address Section 15.407(g). This is typically done by providing frequency stability data.

R8. [Exhibit 6 is revised.](#)

[Requested measurement data has been added on section.](#)

[6.7. Frequency Stability \(see test report part 3\)](#)

Q9. Please address Section 15.407(c).

R9. [Our product is a VOIP WLAN-system phone based on IEEE 802.11a/b/g standards.](#)

[The WLAN subscriber is a non-continuous transceiver that means that only when data exists, will the WLAN processor prepare the data for transmission and turn on the transmitter.](#)

[The transmission ceases after the sending of information data packets has been completed, according to the IEEE 802.11a/b/g protocols.](#)

[Regarding operational failure scenario, one possibility would be high temperature which might hypothetically cause the radio to transmit unexpectedly. However, our product has a temperature sensing mechanism that turns the WLAN section completely off if a temperature limit is exceeded.](#)

[This could also protect from unintentional transmission due to any other failure mode that would produce long continuous transmission causing the transmitter to heat up.](#)

Q10. Please submit the DFS 30 minute non-occupancy test results for the NII transmitter (15.407(h) (2)(iv)).

R10. This requirement is for master devices or client devices with in-service monitoring but not for a client w/o in-service monitoring. VoWLAN Client's S/W guarantees that the client will never transmit before having received appropriate control signals from the master device. See table 1 and sec. 5.1.1 & 5.12 of FCC 06-96.

Q11. The 5150 – 5250 MHz and 5250 – 5350 MHz NII bands are separate bands. The FCC now requires that data be provided in each band for 3 channels (low, mid and hi, per Section 15.31(m)). Please submit complete mid-channel EMC data for each band.

R11. Exhibit 6 is revised.

Requested measurement data has been added on following sections: (see test report part 3)

6.1. Emission Bandwidth (26dB BW)

6.2. Maximum Conducted Output Power, 5180-5250 MHz, 5.25–5.35 GHz and 5.47-5.725 GHz

6.3. Peak Power Spectral Density.

6.4. Peak Excursion.

6.5. Conducted Spurious Emissions.

Q12. The conducted output power levels listed on p.6/166 of the test report, as well as in other documents (e.g., IC documents, SAR report) do not match the actual measured levels for the WLAN. Test data shows the following (rounded data):

- a. DSS (BT): 0.003 W
- b. DTS (WLAN): 2412 – 2462: 0.074 W
- c. NII (WLAN): 5180 – 5240: 0.036 W
- d. NII (WLAN): 5260 – 5320: 0.075 W
- e. NII (WLAN): 5500 – 5700: 0.073 W
- f. NII (WLAN): 5745 – 5805: 0.076 W

Please correct all of the documentation in the applications to show the actual measured levels (listed above).

R12. Peak output power of additional channels in the ranges 2.4GHz and 5GHz show higher power readings and therefore fulfilling the 5% tolerance.

See channel 2427MHz and channels 5580 & 5765MHz on the following revised Exhibit 6 Test Reports respectively: Part 2, section 5.2. *Maximum Peak Output Power, 2400-2483.5 MHz* and Part 3, Section 6.2. *Maximum Conducted Output Power, 5180-5250 MHz, 5.25–5.35 GHz and 5.47–5.725 GHz.*

Q13. We have identified the following issues in the SAR report:

- a. Numerous initial power levels listed in Tables 1 and 2 are more than 0.5 dB away from the corresponding conducted power levels measured in the EMC report. The FCC does not permit the variance to exceed 0.5 dB.

R13a. Please see response to Question 12 above.

- b. Multiple SAR plots contain the error message: Warning: Probe out of calibration range. This appears to invalidate the measurements.
- c. It appears that the SAR probes used are not adequate to cover the frequency range tested.

R13 b & c:

A note explaining the "Warning: Probe out of calibration range" was provided in Appendix E's cover page and is included below.

"Note – Probe EX3DV3/3527 was calibrated at 5.2GHz and 5.8GHz. These calibrations were based on IEEE std 802.11a which at the time only included U.S. bands 5.15-5.25GHz, 5.25-5.35GHz and 5.725-5.825GHz. This device was tested in the 5.47-5.725GHz band utilizing the correction factors closest to the 5.2GHz and 5.8GHz. The correction factors at 5.2GHz and 5.8GHz are very close to each other and therefore the error is expected to be very small. Future probe calibrations will include additional calibration points to include 5.47-5.725GHz."

The conversion factors for body between 5.2GHz (CF 4.59) and 5.8GHz (CF 4.42) have a delta of 3.7%.

The highest result, which was at the body, was at frequency 5.32GHz. This is 20MHz off from the calibrated range of 5.2GHz conversion factor.

Applying a 3.7% error to the highest result (body) would increase the final result by 0.05mW/g.

The technical information provided in this response indicates that the error in the conversion factor is very small (3.7%) and would be insignificant to the reported SAR results. Retesting is not warranted.

- d. In some cases the tissue parameters appear to fall outside of the range of valid measurements for the probes, as can be seen in the probe calibration reports.

Given these issues, please retest SAR, taking all of the points listed above into account, and submit a new report.

R13 d: The tissue parameters are related to the concern raised in Q13 b. Refer to R13 b & c for explanation.

Q14. Can the EUT be connected to a pc (the user's manual indicates that it can, as it has a mini USB port)? If so, the peripheral portion must be authorized via certification or DoC. If you choose certification, please submit a Part 15B test report. If you choose DoC, please resubmit the FCC ID label with the required FCC logo, and the manual with the required DoC language.

R14. Exhibit 6 is revised please see the following sections the test report Part 4.

- 7.1. Radiated Emission, Receive Mode
- 7.2. Power Line Emissions measurements

Please see revised Exhibit 1 and 3.

Q15. The FCC now requires that separate test reports be submitted for different applications in a composite device. Therefore, please separate the submitted test report into one report for Part 15C Bluetooth, one report for Part 15C WLAN, and one report for Part 15E (and another report for Part 15B, if applicable- see question 14). The following is an excerpt from the minutes of the November 13, 2007, TCB/FCC teleconference:

R15. Exhibit 6 is revised and attached.
Test Report was divided in 4 parts. Part1 for 15C Bluetooth, Part 2 for 15C WLAN, Part 3 for 15E WLAN, and Part 4 for Part 15B

Q16. Please provide internal photos of the pcb's with the RF shields removed.

R16. Revised Exhibit 9 attached.

Q17. In the Confidentiality Request letter, the 4th paragraph lists Exhibit 11B (RFx photos) as permanently confidential- this contradicts the previous paragraph, and is not permitted by the FCC. Please revise the Confidentiality Request accordingly.

R17. Temporary Confidentiality Requested, Exhibit 13b corrected the typo to request 11B as Temporary Confidential.

Q18. **FYI:** page 7/166 of the test report states that Part 15C DTS output power was measured using the RMS averaging technique. In such a case, pursuant to Section 15.247(d), the correct limit for spurious emissions is 30 dBc, and not 20 dBc, as is listed on p.50/166.

R18. Exhibit 6 is revised.
Please see test report part#2, section 5.4. *Conducted Spurious Emissions*

Contact me at (954) 723-5793 if you require any additional information.

Sincerely,
/s/ Mike Ramnath (signed)
Manager, Regulatory Compliance
Email: Mike.Ramnath@motorola.com