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RE: OQO FCC ID SHD-A4YWFS

Dear Sir,

1) The block diagram should show the frequencies of all oscillators in the TX portions (TX PCB's) of the device (CFR 2.1033(a)(5)), unless this portion of the device is an OEM part. Please provide either the block diagram for the TX portions (802.11 + Bluetooth), or alternatively provide a parts list that shows that these parts are provided by another manufacturer.

The modules for Bluetooth and 802.11b transceivers are provided by OEMs. The part numbers are:

- Atmel AT76C505A 802.11b Wireless LAN USB module (this is a self contained module requiring only USB and power interface)
- CSR BC219159 Single Chip Bluetooth module (this is a single chip solution that requires a reference crystal as shown in the block diagram)

2) The Bluetooth module theory of operation mentions that it is capable of up to +6 dBm output power. Antenna information suggests only a -1 to -3 dBi antenna.

The antenna gain information does not account for the antenna's location within the host device, and so the actual gain for the complete device is not known. The output power was set using the provided software to the maximum output level from the chip as configured. The radiated measurement does not account for any losses in the rf path from chip to antenna via diversity switch.

3) Given that the device was not TX fully during AC line conducted measurements, please explain what precautions were taken during the test to ensure any contribution of the TX to the emissions could be adequately detected and evaluated. Given the short duration of the link pulses and sweep times of measurement equipment and/or automated measurements (where applicable), it is easy to overlook emissions that may be caused by the TX during these tests if not continuously Transmitting. Additionally, QP measurements on any pulsed may not adequately indicate compliance compared to longer durations of TX. Also average measurements would be given an unfair benefit during the test that would yield different results during continuous TX. Please explain or provide new test data as necessary.

Test data with both transmitters operating continuously and simultaneously has been added to the revised test report.

4) Please explain why the bandedge frequency (page 31 and 35 of 80) shows bandedge measurements made at 2439 MHz for the low channel. The restricted band for the low channel that is typically measured is the worse case results obtained in the 2310-2390 MHz band.

This is a typo, frequency should read 2390 MHz.

5) When the gain of the antenna is known, typically output power made using field strength calculations should use the known gain of the antenna to achieve a known conducted output power according to the FCC guidance documents. It appears that this was not done and the EIRP power calculated instead. Please correct or explain as necessary to the power given on pages 33, 41, and 57 as necessary.

At the time of testing the antenna gain was not known. Also, the gain of the antenna within the system is not accurately known, hence the output power is reported as EIRP.
I have added a table to convert the EIRP to a conducted power based on a a nominal antenna gain of -3dBi.

6) Please provide the RBW/VBW/Span/Sweep time settings for the spectral density test shown on page 33 & 41 of 80. Note for future reference: It is preferred that these plots be provided in the report when possible.

Settings were: RBW=VBW= 3kHz; Sweep time = 100seconds, Span = 300kHz. Comment also added to the test data file.

Sorry that plots were not included this time.

7) Please provide units for the field strength for output power shown in the tables on page 33, 41, and 57 of 80.

Data tables have been updated.

8) Please provide units for the output power for output power shown in tables on page 57.

Data tables have been updated.

9) It is uncertain why the power spectral density, power, and 6 dB bandwidth appear to be tested twice for 802.11b. Please explain.

As all measurements were made radiated (it was not possible to connect directly to the rf output of either module) the PSD was measured twice, once for each antenna. Although not necessary, the 6dB bandwidth was also measured twice.

10) Time of occupancy should be calculated over 0.4 * number of channels used (31.6 seconds in this case). Please correct as necessary.

Only 75 channels were being used, therefore dwell time is over 30 seconds (0.4 * 75).

11) Sufficient information to calculate dwell time in 31.6 seconds does not appear to have been provided. Please provide.

By providing the time between successive hops on a single channel the dwell time can be calculated (divide time between successive hops by the number of channels). The time between successive hops was measured several times to be the same value, and 75 channels were noted as being used in the channel occupancy plots.

An addition plot to show the transmit time on a channel (which is ont the same as the dwell time on a specific channel) has been added to the revised test data report.

12) The labels on the plots on page 59 do not appear to match the information on the plots.

The plot title has been updated to reflect the correct number of channels in each plot.

13) Bluetooth devices typically have 79 channels, not 75. It does appear that a few channels are not shown in the plots which may be simply from not enough storage time during the test. Please explain/correct as necessary.

The software used to control the device for testing would not put the device on the four “missing” channels. This could not be explained, since the test software (Bluetest) should have produced a hopping set across all channels. It was not possible to force the device to transmit continuously on the missing channels.

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14) FYI…..Many times a Bluetooth device can be approved using DTS rules. In this case, approval is being asked for and shown in the report to both DTS (802.11b) and FHSS (Bluetooth) and therefore this is considered a composite application. If the Bluetooth can be shown to meet the DTS regulations, a single grant would be issued and this would not be considered a composite application for FCC.

Will consider for future applications.

15) FYI…For RX emissions (page 29 of 80), only AVG data was provided. There is also a limitation of the peak data, 20 dB higher than the AVG limit. This data should be included.

Understood, the data is for Industry Canada and IC approval is not being requested at this time. The power supply does not meet the RSS 210 limits for conducted emissions on AC power ports.

16) FYI….SAR Still under review.

Understood, please advise ASAP if there are issues with this report. The SAR power data is taken form the EMC test data, so the power recorded is the eirp power.

Regards,

Mark Briggs

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