7th February 2003

Response to FCC Request for Additional Information on QFXNHL-8

1) Block diagram referenced in Request for Confidentiality letter


"Exhibit 04 BT Block Diagram.pdf"


"Exhibit 04 RF Blockdiagram.pdf"

2) Confirmation that schematics provided are complete

Schematics provided are RF and BT sheets only. Complete schematic to be kept confidential is attached below:


cs7_10_schdrw__.pdf

3) Confirmation of transmit frequency range stated on Form 731. Device is not expected to comply with band edge attenuation requirements if tuned to 1909.9 MHZ. Please correct as appropriate.

The transmit frequency range is confirmed as 1850.2 – 1909.8 MHz, as stated on Form 731. Dennis Ward (ATCB) has agreed to update grant.

4) Confirmation that radiated power measurements were made for each SAR scan. Reported results appear to be identical to EMC reported values. Please provide full details including photographs of radiated power test used during SAR testing. If radiated testing was not performed during SAR testing please retest. Please provide answers to TCB query on this subject.

There is no external connector available on QFXNHL-8 and therefore all power measurements are done radiated. Since SAR laboratories do not have the possibility to perform radiated EMC measurements by themselves, a separate EMC laboratory has to be used for this purpose. The same sample was used both in SAR and EMC measurements, and the sample was not modified between measurements.

The TX power control loop of the QFXNHL-8 sample was used with the same power settings in both EMC and SAR measurements. Maximum power level was chosen for the measurements. Measured results are therefore valid and true to our best capability.

Answer to TCB queries 6 to 8 was provided in corrected EMC report. (Confidential_Exhibit 06 Part 15_24 EMC report.pdf 12/30/2002 7:05:03 AM)

5) Please clarify if the composite BT transmitter was activated during SAR testing. Please provide SAR results for primary signal in worst case head and body configuration with and without BT transmitter turned on.

The highest SAR result test cases have been re-measured (31st January 2003) with BT activated:

Ch. 518: Touch, left hand	0,550 W/kg	From original SAR report
Ch. 518: Touch, left hand + BT	0,484 W/kg	Re-measured with BT activated
Ch. 518: Body	0.415 W/kg	From original SAR report (0.830 W/kg in GPRS mode)
Ch. 518: Body	0.404 W/kg	Re-measured with BT activated (0.808 W/kg in GPRS mode)

The distributions of the re-measured SAR plots are very similar to the original SAR plots measured without BT. The lower SAR results from the re-measurements are partly due to differences in liquid parameters. As the validation results were lower in re-measurements it is logical that the SAR results from actual measurements are lower, too.

1880 MHz	Liquid Parameters	
	Conductivity	Permittivity
Head 22-08-2002	1.46	38.3
Head 31-01-2003	1.42	38.6
Body 03-09-2002	1.57	50.9
Body 31-01-2003	1.53	50.9

- -

1800 MHz	Validation result
Head 22-08-2002	39.64 W/kg
Head 31-01-2003	37.12 W/kg
Body 03-09-2002	39.96 W/kg
Body 31-01-2003	39.48 W/kg

- -

Validation plots, actual SAR plots and z-axis scans from the re-measurements are attached below.

Remeasurement results.pdf

6) Descriptive information demonstrating compliance with part 15 frequency hopping control rules per 15.247 a). Specifically, how is the psuedorandom nature of the hop sequence established. How is equal use of all channels determined. How does the receiver tune sequence synchronize with the transmitter. Please state the hopping sequence. Please state the receiver BW.

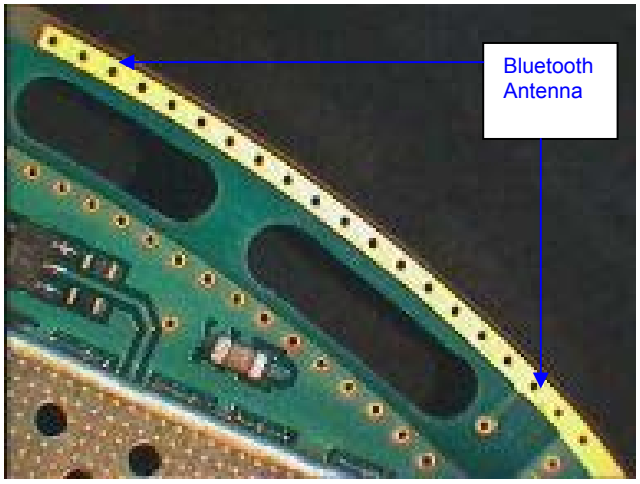
The equipment incorporates a compliant Bluetooth module. The frequency hopping control rules are explained in Chapter 11 of the Bluetooth Baseband Specification, which deals specifically with the hop selection algorithm. Please refer to the attached:

Bluetooth_V1[1].1_BB specifica...

The receiver bandwidth is 1MHz.

7) Photograph showing the BT antenna inside the device. The grant comment suggests that users can install the antenna. Please provide details of this. Update grant comment accordingly. Additionally, please add words to the effect that limit the use of this transmitter to the host device and configuration contained in this filing.

The Bluetooth antenna is an integral part of the Printed Wiring Board and cannot, in normal use be accessed by the user. The photograph below shows the antenna. Dennis Ward (ATCB) has agreed to review the grant comment. The transmitter use and configuration is described in the user guide.



8) Justification for not maximizing spurious radiated emission by moving the receive antenna 1-4 m above 1 GHz frequency as stated in your measurement procedure. Please retest as appropriate.

The test antenna used for measurements above 1GHz is a narrow beam horn antenna. Adjustment in the vertical plane results in the EUT falling outside of the capture range of the antennas beam. This results in loss of received signal for variations in height by more than a couple of inches. Test have been performed here at RFI over the years to prove this to be the case. We also perform a height search prior to the spurious test in order to determine the optimal height for the EUT. Once the height has been attained, no further height search for the horn is performed.

9) Radiated emissions procedure states that substitution method was used. Please clarify how this was performed. The test setup diagram does not suggest substitution method. Substitution method is not appropriate for Part 15 device. Retest as appropriate. Also, please detail how the levels in the plots were scaled relative to the limit.

a) Please clarify how this was performed.

A test reference antenna is set up on a test site and set to radiate at a level determined by the required limit (-13dBm for Part 24 devices). The ref level offset of the measuring receiver is adjusted until the indicated received signal level shows a peak reading of -13 dBm. The reference test antenna is then replace by the EUT.

b) Substitution method is not appropriate for Part 15 device.

The substitution method is performed for ERP/EIRP measurements and where necessary to determine limits for pre-scans that are in dBm or dBc. The substitution method is not used for field strength measurements.

c) Also, please detail how the levels in the plots were scaled relative to the limit.

Please see a) above for ERP/dBc limit calculation. For pre-scans using field strength as a limit, the test receiver was loaded with the test antennas, antenna factors and cable loss. The display then indicates the correct field strength in dBuV/m.

10) Statement of all transmission/data rate modes for the device. Provide test results for all modes as appropriate

The transmission/data rate used was 1 MHz and the modes are best detailed in the Pt 15 Section 15.247 Bluetooth Test Report. Please see attached:

"Exhibit 06 Part 15.247 Main Report.p

11) Updated grant code 05 or CE as appropriate.

Dennis Ward (ATCB) has agreed to update the grant accordingly.