FCC Part 15.247/Industry Canada RSS-210 Annex 8 Application Form

Product Name: GSM/GPRS Mobile Phone/ P23C001AA .....

FCC id/or Industry Canada ID: WYPP23C001AA .....

Introduction

The following listed sections are requirements outlined by the FCC/Industry Canada which the equipment must meet in order to complete a successful application to the FCC/Industry Canada . If the equipment being submitted for testing is subject to the rules in 15.247 or RSS-210 Annex 8 , the following sections must be completed. Sections 3 to 6 are taken from the FCC Guidance Document DA 00-705.

Section 1

15.203 - Antenna requirement.

a) Integral Antenna [ ]

b) Dedicated Antenna [✓]

c) Antenna Connector* [ ] Antenna Connector Type: .....

Where option B is identified please specify how this is connected to the Transmitting circuitry

Where option C is identified please specify the connector type, eg. Reverse SMA and provide or request photographs of both connectors .

The dedicated antenna is connected to the transmitting circuitry by the microstripe.

Section 2

Has the radio device been approved to 802.15.1? Yes [ ] No [✓]

(Bluetooth)

If **Yes,** then please provide evidence of such approval (e.g. Certificate, Test Report etc) .

If **Yes** you do not have to answer the questions in Sections 3 to 6.

If **No, or no available** evidence please answer the following questions in Sections 3 to 6 is not required.

Note: The supporting evidence for the following sections may either be clear design information, Test Results obtained on the product, or Test Results obtain using the same Driver Chip where the Chip itself controls compliance to the requirement.

Section 3 Pseudorandom Frequency Hopping Sequence

Describe how the hopping sequence is generated. Provide an example of the hopping sequence channels, in order to demonstrate that the sequence meets the requirement specified in the definition of a frequency hopping spread spectrum system.

The generation of the hopping sequence in connection mode depends essentially on two input values: 1. LAP/UAP of the master of the connection 2. Internal master clock The LAP (lower address part) are the 24 LSB's of the 48 BD_ADDRESS. The BD_ADDRESSis an unambiguous number of every Bluetooth unit. The UAP (upper address part) are the 24 MSB's of the 48 BD_ADDRESS. The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For synchronization with other units only offset are used. Ithas no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5 µs. The clock has a cycle of about one day (23h 30'). In most

case it is implemented as28 bit counter. For the deriving of the hopping sequence the entire LAP (24 bits), 4 LSB's (4 bits) (Input 1) and the 27 MSB's of the clock (Input 2) are used. With this input values different mathematical procedures (permutations, additions, XORoperations) are performed to generate the sequence. This will be done at the beginning of every new transmission. The output constitutes a pseudorandom sequence covering 79 hop channels. The exact procedures for the generation of the pseudorandom hopping sequence can be found in "Bluetooth specification Version 1.1 – Part B – Baseband Specification – Chapter 11:Hop selection". Examples of a 79 hopping sequence in data mode: 40, 21, 44, 23, 42, 53, 46, 55, 48, 33, 52, 35, 50, 65, 54, 67, 56, 37, 60, 39, 58, 69, 62, 71, 64, 25, 68, 27, 66, 57, 70, 59, 72, 29, 76, 31, 74, 61, 78, 63, 01, 41, 05, 43, 03, 73, 07, 75, 09, 45, 13, 47, 11, 77, 15, 00, 64, 49, 66, 53, 68, 02, 70, 06, 01, 51, 03, 55, 05, 04

Section 4 Equal Hopping Frequency Use

Describe how each individual EUT meets the requirement that each of its hopping channels is used equally on average (e.g., that each new transmission event begins on the next channel in the hopping sequence after the final channel used in the previous transmission event).

According to Bluetooth specifications the channel hopping sequence which has a very long period length (23h 30') does not show repetitive patterns over a short time interval, but distributes the hop frequencies equally over the 79 hopping channels during a short time interval. Moreover, regarding short transmissions the Bluetooth system has the following behavior: The first connection between the two devices established, a hopping sequence was generated. For transmitting the wanted data the complete sequence was not use. The connection ended. The second connection will be established. A new hopping sequence is generated. Due to the fact that the Bluetooth clock has a different value, because the period between the two transmissions is longer (and cannot be shorter) than the minimum resolution of the clock (312.5 µs). The hopping sequence will always differ from the first one.

Section 5 System Receiver Input Bandwidth

Describe how the associated receiver(s) complies with the requirement that its input bandwidth (either RF or IF) matches the bandwidth of the transmitted signal.

According to "Bluetooth specification Version 1.1 – Part A – Radio Specification" and in order to match the transmitter output bandwidth, all Bluetooth devices have input bandwidth of 1 MHz.

Section 6 System Receiver Hopping Capability

Describe how the associated receiver(s) has the ability to shift frequencies in synchronization with the transmitted signals.

In every connection one Bluetooth device is the master and the other is the slave. The master determines the hopping sequence. The slave follows this sequence. Both device shift between RX and TX time slot according to the clock of the master. Additionally the type of connection (e.g single or multislot packet)is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings. Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.

Completed by Name: JASEN KOLEV

Job Title : Director of Engineering

Signed: Kolev Date: 03.11.2009