

MEDDORNA

The Clinical Digital Solution

June 24, 2005

Professional Testing (EMI), Inc.
1601 FM 1460 Suite B
Round Rock, TX 78664

To Whom It May Concerned

Dear Sir or Madam:

Following up on your request for specific parameters of the Bluetooth radio used in our ECG and Spirometer devices, we have included the following statement:

Bluetooth Module: LMX9820A, Manufacture: National Semiconductors, Inc.

Description and Specifications

1. System Overview

The National Semiconductor Bluetooth Serial Port module is a highly integrated radio, baseband controller and memory device implemented on an FR4 substrate. All hardware and firmware is included to provide a complete solution from antenna through the complete lower and upper layers of the bluetooth stack, up to the application including the Generic Access Profile(GAP), the Service Discovery Application Profile(SDAP), and the Serial Port Profile(SPP). The module includes a configurable service database to fulfill service requests for additional profiles on the host. The LMX9820A features a small form factor(10.1X14.0X1.9 mm) design; thus, solving many of the challenges associated with system integration. Moreover, the LMX9820A is pre-qualified as a bluetooth integrated component. Conformance testing through the Bluetooth qualification program enables a short time to market after system integration by insuring a high probability of compliance and interoperability.

Based on National Semiconductor's CompactRISC 16-bit processor architecture and Digital Smart Radio technology, the LMX9820A is optimised to handle the data and link management processing requirements of a Bluetooth node.

The firmware supplied within this device offers a complete Bluetooth(V1.1) stack including profiles and command interface. This firmware features point-to-point and point-to-multipoint link management supporting data rates up to the theoretical maximum over RFSComm of 704 kbps. The internal memory supports up to three active Bluetooth data links and one active SCO link.

2. Bandwidth

LMX9820A operates in the unlicensed ISM Band at 2.4GHz. In the US a band of 83.5MHz width is available. In this band, the LMX9820A uses 79 RF channels spaced 1MHz (2402 – 2480 MHz). Both transmitter and receiver bandwidth are 1MHz. The receivers shift frequencies are in sync with the transmitters.

20270 Front Street NE, Suite 203 Poulsbo, WA 98370
(V) 360.598.5006 (F) 360.532.5007

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3. Hopping Sequence

The LMX9820A RF channel is chosen from a pseudo-random hopping sequence through the 79 channels. The hopping sequence is unique for the piconet and is determined by the BT address of the master. The hopping sequence has a very long period length, which doesn't show repetitive patterns over a short time interval, but which distributes the hopping frequencies equally over the 79MHz during a short time interval. A channel is occupied for a defined amount of time slots, with a nominal slot length of 625 μ s. The maximum dwell time on one channel is defined by the packet type and is 0.625 ms for DH1 packets, 1.875 ms for DH3 and 3.125 ms for DH5. The nominal hop rate is 1600 hops/s for DH1, 1600/3 for DH3 and 1600/5 for DH5. All frequencies are equally used. The maximum nominal average time of occupancy is 0.4 s within a period of 79×0.4 seconds.

When a short burst of data takes place the frequency hopping system still distributes the transmission over all of the hopping channels.

Sincerely,



Shanice McAuliffe
Director of Physician Services