Bluetooth® Serial Port Module

General Description

The National Semiconductor LMX9820A 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 from the complete lower and upper layers of the Bluetooth stack, up to the application support layers 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 (10.1 x 14.1 x 2.0 mm) design, which solves many of the challenges associated with compact system integration. Moreover, the LMX9820A is pre-qualified as a Bluetooth Integrated Component. Conformance testing through the Bluetooth qualification program enables a fast time to market after system integration by ensuring a high degree of compliance and interoperability.

Based on National's CompactRISC™ 16-bit processor architecture and Digital Smart Radio technology, the LMX9820A is optimized to handle the ata and link management processing requirements of a Bluetooth node. The firmware supplied with 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 RFComm of 704 kbps. The internal memory supports up to three active Bluetooth data links and one active SCO link.

Functional Description

Baseband and Link Management Processors

Baseband and Lower Link control functions are implemented using a combination of National Semiconductor's CompactRISC 16-bit processor and the Bluetooth Lower Link Controller. These processors operate from integrated Flash memory and RAM and execute on-board firmware implementing all Bluetooth functions.

Bluetooth Lower Link Controller

The integrated Bluetooth Lower Link Controller (LLC) com- plies with the Bluetooth Specification version 1.1 and implements the following functions:

- Support for 1, 3, and 5 slot packet types
- 79-channel hop frequency generation circuitry
- Fast frequency hopping at 1600 hops per second
- Power management control
- Access code correlation and slot timing recovery

Bluetooth Upper Layer Stack

The integrated upper layer stack is prequalified and includes the following protocol layers:

- L2CAP
- RFComm
- SDP

Profile Support

The on-chip application of the LMX9820A allows full stand- alone operation, without any Bluetooth protocol layer necessary outside the module. It supports the Generic Access Profile (GAP), the Service Discovery Application Profile
(SDAP), and the Serial Port Profile (SPP).

The on-chip profiles can be used as interfaces to additional profiles executed on the host. The LMX9820A includes a configurable service database to answer requests with the profiles supported.