LMX5452: integrated baseband controller and radio

National Semiconductor. Powering the wireless world.

Introducing the next generation in Bluetooth® solutions

National's LMX5452 provides the features and functionality designed to get you to market faster, offering a more cost effective solution than ever before. This highly integrated solution combines a 0.18 µm CMOS Bluetooth baseband controller and 2.4 GHz radio. Available in a tiny micro module package (6 mm x 9 mm), the LMX5452 provides one of the smallest solutions available in the industry.

Baseband controller

An extension of the industry-proven LMX5100, the baseband controller features a standard Host Controller Interface (HCI), and is based on National Semiconductor's CompactRISC™ 16-bit processor.

It is optimized to handle the audio, data and link management processing requirements of a Bluetooth node. The baseband controller features ROM to reduce system cost and patch RAM to minimize risk and allow for easy customization and firmware upgrades. It features a Bluetooth Link Manager and HCI connection over USB or UART, and is designed to operate at full Bluetooth data rates of 723 kbps.

Radio

Featuring an integrated filter and TX/RX switch, National's radio minimizes the total number of external components. The radio additionally integrates the receiver and transmitter baluns, the TX/RX switch, and filter together with the VCO onto a tiny single die. The fractional-N delta-sigma synthesizer and the crystal offer support for a wide range of external reference frequency clocks and crystals.

Bluetooth

Bluetooth wireless solutions

Everyone wants to be connected. At home.

At work. At play.

And National Semiconductor is pioneering wireless solutions across the board.

From high-performance, optimized ICs to complete reference designs—National's Bluetooth technology is enabling wireless communications anytime, anywhere.

Bringing you a world of fast and secure wireless connectivity between consumer electronics, cellular phones, PCs, and peripherals—National is at the forefront of Bluetooth innovation, making tomorrow's technology a reality today.

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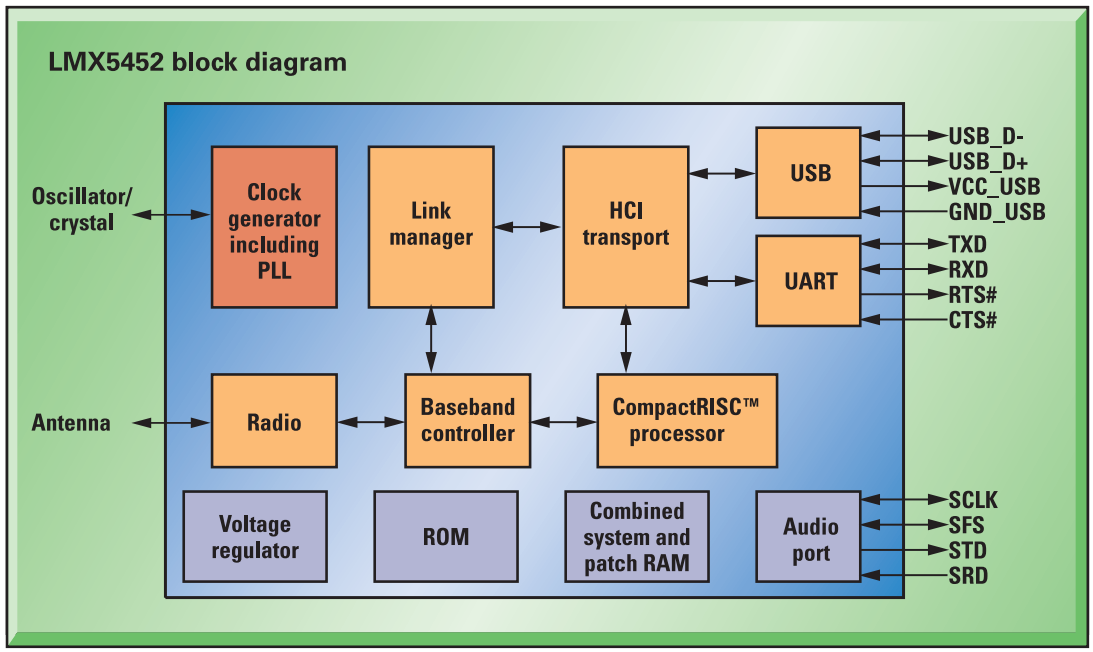
Technical specifications



Outstanding features

- Implemented in 0.18 µm CMOS technology
- Embedded ROM and Patch RAM memory
- Bluetooth® 1.2 compliant
- On-chip firmware with complete HCI
- RF includes baluns, switch and filters on chip
- Secondary 32.768 kHz oscillator for low-power modes
- Typically –80 dBm receiver sensitivity at antenna
- Class 2 operation
- Fractional-N sigma-delta modulator
- Operating voltage range 2.5V to 3.6V
- I/O voltage range 1.6V to 3.6V
- Several power management functions
- Accepts external clock or crystal input 10 MHz to 20 MHz
- Clocking option 12/13 MHz with PLL bypass mode for power reduction
- Current consumption typically below 45 mA
- Support for 2 simultaneous voice or SCO links
- Available in a BGA-60 (6 mm x 9 mm) package

Interfaces

- Full duplex UART supporting transfer rates up to 921.6 kbps including baudrate detection for HCI
- Full speed (12 Mbps) USB 2.0 for HCI
- I²C and SPI/Microwire for interfacing with external non-volatile memory
- Advanced Audio Interface (AAI) for interfacing with external 8/13-bit PCM CODEC
- Single Rx/Tx-pin radio interface

Applications

- Mobile handsets
- Personal digital assistants
- Personal computers

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