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EXAR UARTS IN BLUETOOTH APPLICATIONS

1.0 INTRODUCTION

This application note describes why Exar's XR20M1170 is ideal for adding Bluetooth® capability to any application. Some example applications where Bluetooth can be used are SmartPhones, PDA and GPS applications.

2.0 BLUETOOTH ENHANCED DATA RATE

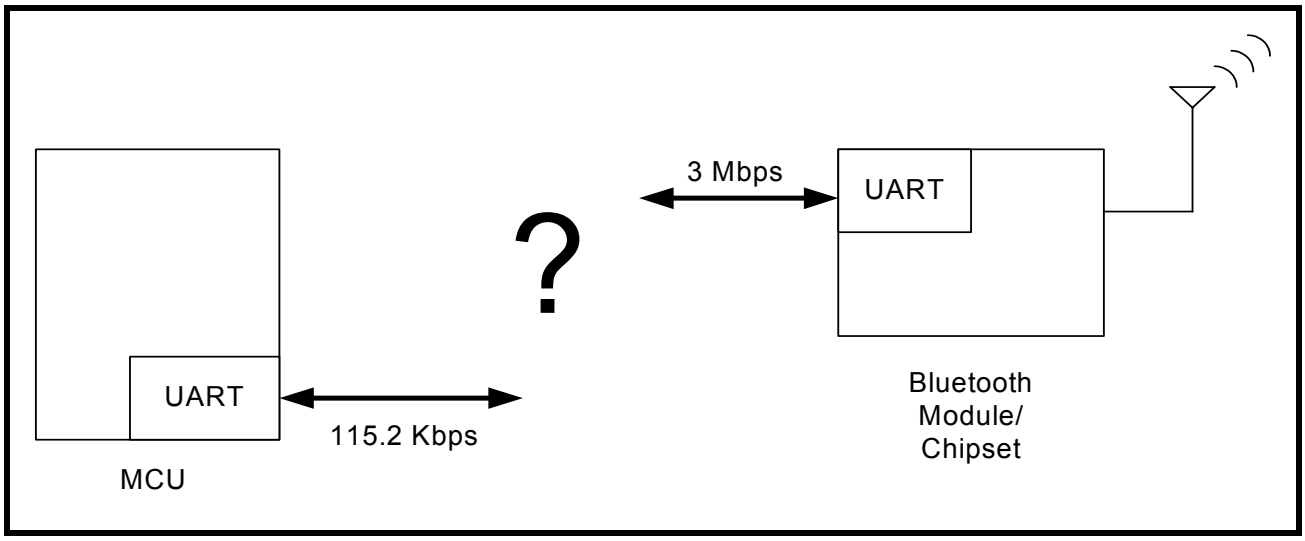
The Bluetooth Core Specification Version 2.1 + EDR was published in July 2007. In this version, the Enhanced Data Rate (EDR) modulation mode supports data rates up to 3 Mbps.

3.0 UART HOST CONTROLLER INTERFACE

There are usually a few host controller interfaces (HCI) available on Bluetooth modules/chipsets to communicate with a host controller or system. However, one of the simplest ways is for the host controller/ system to communicate via a UART interface. As a result of the Enhanced Data Rate, newer Bluetooth modules/chipsets have UARTs on their HCI that support data rates of 3Mbps.

However, the maximum data rate of the built-in UART on the host controller/system can only typically support data rates up to 115200 bps. Hence, there is a need for high performance Exar UARTs.

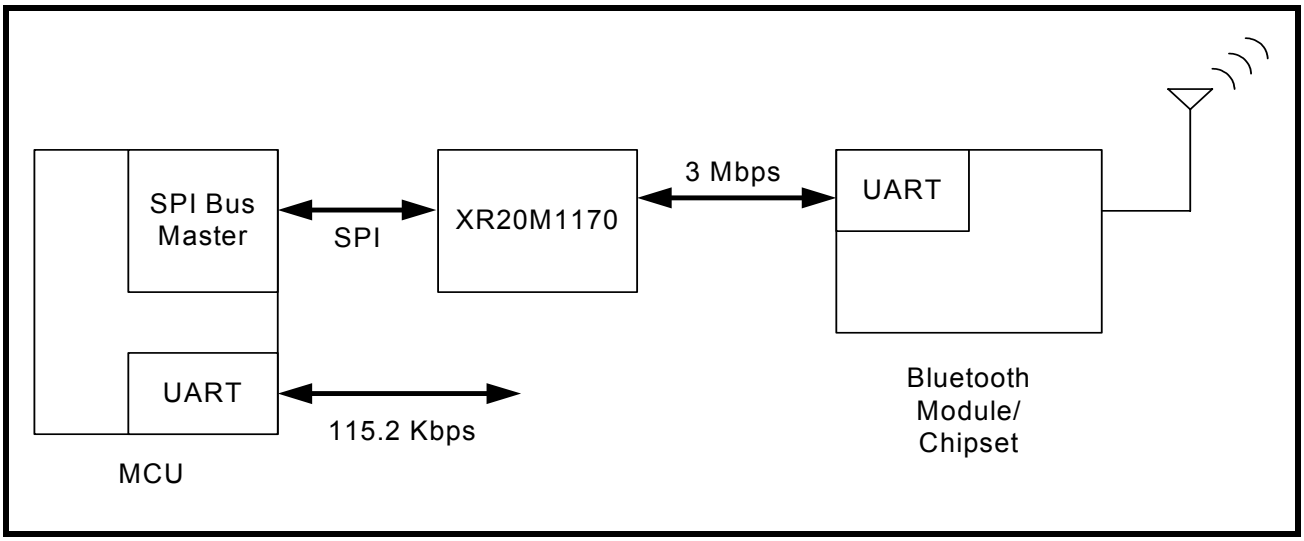
FIGURE 1. BLUETOOTH APPLICATION PROBLEM



4.0 XR20M1170 IN BLUETOOTH APPLICATIONS

Exar's XR20M1170 is a single channel I2C/SPI UART and it is ideal for Bluetooth applications for the reasons listed below. Since the SPI mode supports a 5MHz clock and the I^2C interface only supports up to 400kHz, the SPI mode is recommended to achieve the highest performance.

FIGURE 2. XR20M1170 BLUETOOTH APPLICATIONS SOLUTION BLOCK DIAGRAM



4.1 High Performance

The XR20M1170 can easily support the 3Mbps data rate requirement. If necessary, the XR20M1170 can support UART serial data rates of up to 16Mbps. Data throughput and interrupt servicing can be optimized by utilizing the 64 byte TX and RX FIFOs.

4.2 Low Voltage Operation

The XR20M1170 can operation from 1.62V - 3.63V to directly interface with the lower voltage MCUs as well as the lower voltage Bluetooth chipsets.

4.3 Low Power Consumption

The XR20M1170 has a sleep mode to minimize the power consumption. In the sleep mode, the XR20M1170 consumes less than 30 uA. This will significantly help extend the battery life of the handheld/portable applications.

4.4 Small Package Size

The XR20M1170 is available in a 4x4mm QFN package which will require minimal board space.

4.5 Fractional Baud Rate Generator and 8X/4X Sampling Rate

In addition, with the combination of the Fractional Baud Rate Generator and 8X/4X sampling rate features, the XR20M1170 can take any existing clock source on the board (above 12MHz) to generate the 3Mbps UART data rate which further saves valuable PCB space.

5.0 CONCLUSION

With its low power consumption, small package size and enhanced features, Exar's XR20M1170 is the ideal solution for communication between an MCU and a Bluetooth module/chipset.

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Send your UART technical inquiry with technical details to hotline: uarttechsupport@exar.com.