XR20M1170
I²C/SPI UART with 64-Byte FIFO

Ideal for High Speed Data Transmission

T he XR20M1170[1] (M1170) is a high performance universal asynchronous receiver and transmitter (UART) with 64 byte TX and RX FIFOs and a selectable I²C/SPI slave interface. The M1170 operates from 1.62 to 3.63 volts. The enhanced features in the M1170 include a programmable fractional baud rate generator, and 8X and 4X sampling rate that allows for a maximum baud rate of 16 Mbps at 3.3V. The standard features include 16 selectable TX and RX FIFO trigger levels, automatic hardware (RTS/CTS) and software (Xon/Xoff) flow control, and a complete modem interface. Onboard registers provide the user with operational status and data error flags. An internal loopback capability allows system diagnostics. The M1170 is available in 28-pin QFN, 24-pin QFN, 16-pin QFN, 24-pin TSSOP and 16-pin TSSOP packages. The 28-pin QFN package has the EN485# and ENIR# pins to allow the UART to power-up in the Auto RS485 mode or the Infrared mode.

The M1170 is designed to work with low supply voltage and high performance data communication systems that require fast data processing time. Increased performance is realized in the M1170 by the larger transmit and receive FIFOs, FIFO trigger level control and automatic flow control mechanism. This allows the external processor to handle more networking tasks within a given time. This increases the service interval giving the external CPU additional time for other applications and reduces the overall UART interrupt servicing time. In addition, the programmable FIFO level trigger interrupt and automatic hardware/software flow control is uniquely provided for maximum data throughput performance especially when operating in a multi-channel system. The combination of the above greatly reduces the CPU's bandwidth requirement, increases performance, and reduces power consumption.

The M1170 supports maximum data rates of 16 Mbps at 3.3V with 4X internal sampling clock rate, 8 Mbps at 3.3V with 8X sampling clock rate, and 4 Mbps at 3.3V with 16X internal sampling clock rate. The device can operate with an external 24 MHz crystal on pins XTAL1 and XTAL2, or external clock source of up to 64 MHz on XTAL1 pin.

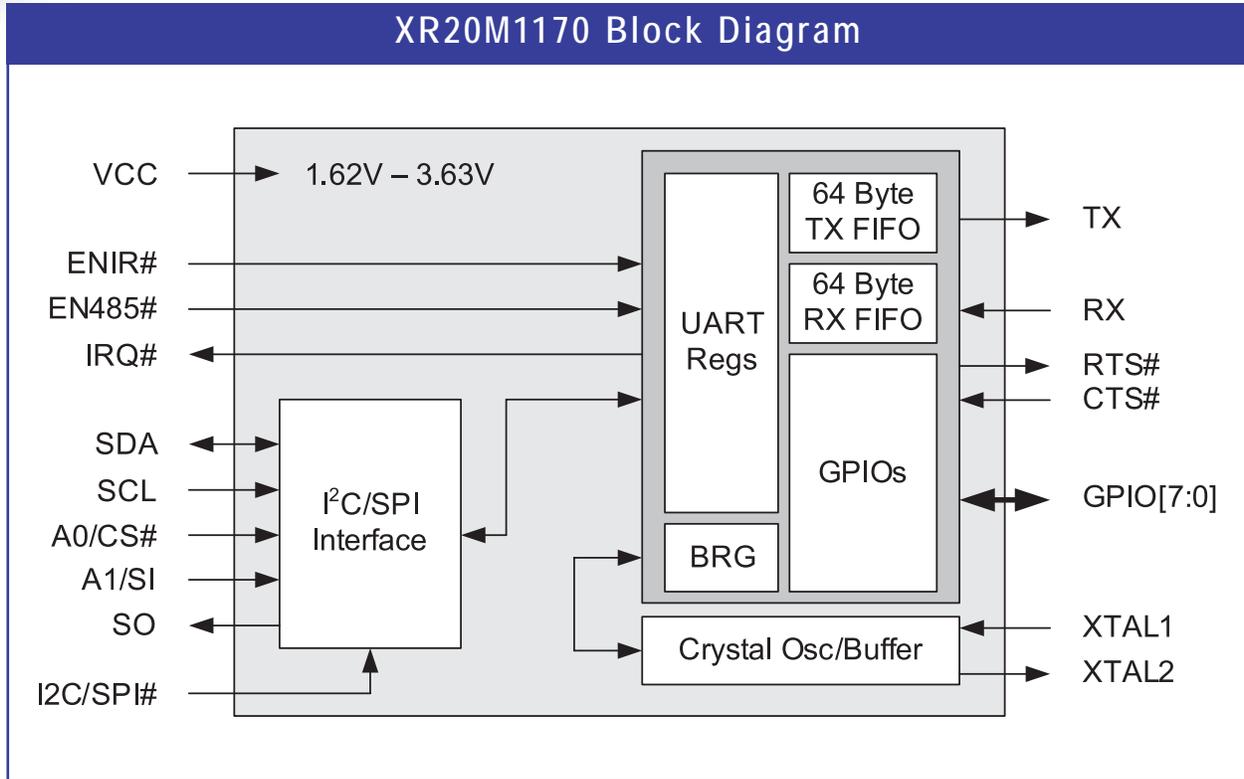[1]Covered by U.S. Patent #5,649,122

Major Features

- **1.62V to 3.63V Operation**
- **Selectable I²C/SPI Interface**
- **Crystal oscillator (up to 24MHz) or external clock (up to 64MHz) input**
- **Full-featured UART**
- **28-QFN, 24-QFN, 16-QFN, 24-TSSOP, and 16-TSSOP packages**
- **Pb-Free, RoHS Compliant Versions Offered**

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XR20M1170 Block Diagram

Features

- Maximum data rate of 16 Mbps at 3.3V
- Maximum data rate of 12.5 Mbps at 2.5V
- Maximum data rate of 8 Mbps at 1.8V
- Fractional Baud Rate Generator
- Transmit and Receive FIFOs of 64 bytes
- 16 Selectable TX and RX FIFO Trigger Levels
- Automatic Hardware (RTS/CTS) Flow Control
- Automatic Software (Xon/Xoff) Flow Control
- Halt and Resume Transmission Control
- Automatic RS-485 Half-duplex Direction Control Output via RTS#
- Wireless Infrared (IrDA 1.0 and 1.1) Encoder/Decoder
- Automatic sleep mode (< 15 uA at 3.3V)
- General Purpose I/Os
- Full modem interface

Applications

- Portable Appliances
- Battery-Operated Devices
- Cellular Data Devices
- Factory Automation and Process Controls

Ordering Information

Product No.	Package	Operating Temp. Range
XR20M1170IL16	16-pin QFN	-40°C to +85°C
XR20M1170IL24	24-pin QFN	-40°C to +85°C
XR20M1170IL28	28-pin QFN	-40°C to +85°C
XR20M1170IG16	16-Lead TSSOP	-40°C to +85°C
XR20M1170IG24	24-Lead TSSOP	-40°C to +85°C