Single-Channel UARTs with Industry's Smallest Packaging Options and Multiple Supply Voltages Enables New Design Options for System Architects

The XR16M581[1] (M581), XR16M681[1] (M681) and XR16M781[1] (M781) are part of the enhanced Universal Asynchronous Receiver and Transmitter (UART) family with 16, 32 and 64 bytes of transmit and receive FIFOs with a VLIO bus interface, which is a multiplexed address/data bus interface. These devices have selectable (M581 and M681) or programmable (M781) transmit and receive FIFO trigger levels, and automatic hardware and software flow control. With data rates of up to 20 Mbps at 3.3V, 16 Mbps at 2.5V and 10 Mbps at 1.8V with 4X data sampling rate, the M581, M681 and M781 are the industry's fastest single-channel UARTs.

The Auto RS-485 Half-Duplex Direction control feature simplifies both the hardware and software for half-duplex RS-485 applications. In addition, the Multidrop mode with Auto Address detection increases the performance by simplifying the software routines.

The Independent TX/RX Baud Rate Generator feature allows the transmitter and receiver to operate at different baud rates. Power consumption of the M581, M681 and M781 can be minimized by enabling the sleep mode and PowerSave mode.

The M581, M681 and M781 have a 16550 compatible register set that provide users with operating status and control, receiver error indications, and modem serial interface controls. An internal loopback capability allows onboard diagnostics. The M581, M681 and M781 are available in 24-pin QFN, 32-pin QFN and 25-pin BGA packages. The 25-pin BGA (3x3x0.8mm) is the industry's smallest single-channel UART.

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

Major Features

- 25-pin BGA (3x3x0.8mm)
- VLIO Interface
- 20 Mbps Maximum Data Rate
- Independent TX/RX Baud Rate Generator
- Fractional Baud Rate Generator
- Auto RS-485 Half-Duplex Direction Control
- Multidrop Mode w/Auto Address Detect

Features

- Pin-to-pin compatible with SC16C850V and SC16C850SV in 32-QFN package
- Selectable TX/RX trigger levels (M581 & M681)
- Programmable TX/RX trigger levels (M781)
- TX/RX FIFO Level Counters
- Auto RTS/CTS Hardware Flow Control
- Auto XON/XOFF Software Flow Control
- Sleep Mode with Automatic Wake-up
- PowerSave mode
- Infrared (IrDA 1.0 and 1.1) mode
- 1.62V to 3.63V supply operation
- Crystal oscillator or external clock input

Ordering Information

Product No.	Package	Operating Temp. Range
XR16M581IL24	24-Pin QFN	-40°C to +85°C
XR16M581IL32	32-Pin QFN	-40°C to +85°C
XR16M581IB25	25-Pin BGA	-40°C to +85°C
XR16M681IL24	24-Pin QFN	-40°C to +85°C
XR16M681IL32	32-Pin QFN	-40°C to +85°C
XR16M681IB25	25-Pin BGA	-40°C to +85°C
XR16M781IL24	24-Pin QFN	-40°C to +85°C
XR16M781IL32	32-Pin QFN	-40°C to +85°C
XR16M781IB25	25-Pin BGA	-40°C to +85°C

Applications

- Smart Phones
- Personal Digital Assistants (PDA)
- Battery-Operated Devices
- Global Positioning System (GPS)
- Bluetooth

- Point of Sales Systems
- Gaming Systems
- Industrial Controls

XR16M781 Block Diagram