Features

- AVR® Microcontroller-based USB Hub and Function Controller
- One Upstream Port Plus Four External and One Attached Downstream Ports
- USB Hub with Two Endpoints
- Embedded USB Function with 3 Endpoints
- 32 Programmable I/O Port Pins
- High-performance and Low-power AVR RISC Microcontroller
- 120 Powerful Instructions – Most with 83 ns Execution Cycle Times
- 128K Bytes Program Memory Address Range
- 512 Bytes Internal SRAM
- 32 x 8 General-purpose Working Registers
- Programmable UART and SPI Serial Interface
- One 8-bit Timer/Counter with Separate Prescaler
- One 16-bit Timer/Counter with Separate Prescaler
- External and Internal Interrupt Sources
- Programmable Watchdog Timer
- Low-power Idle and Power-down Modes
- Programmable 6/12 MHz Oscillator with PLL
- On-chip 3.3V Power Supply
- 100-pin LQFP Package

Overview

The Atmel AT43320 is a microcontroller-based USB hub with an embedded function. The USB hub has five downstream ports, one of which is permanently attached. Internally the AT43320 consists of a USB hub and function interface, a hub repeater, and a high-performance, efficient 8-bit RISC microcontroller. The hub and peripheral device controller function is implemented in the microcontroller's firmware. To the USB host, the embedded function appears as an attached port of the hub with its own device address and endpoints. The AT43320 can also be configured as a USB function without the hub.

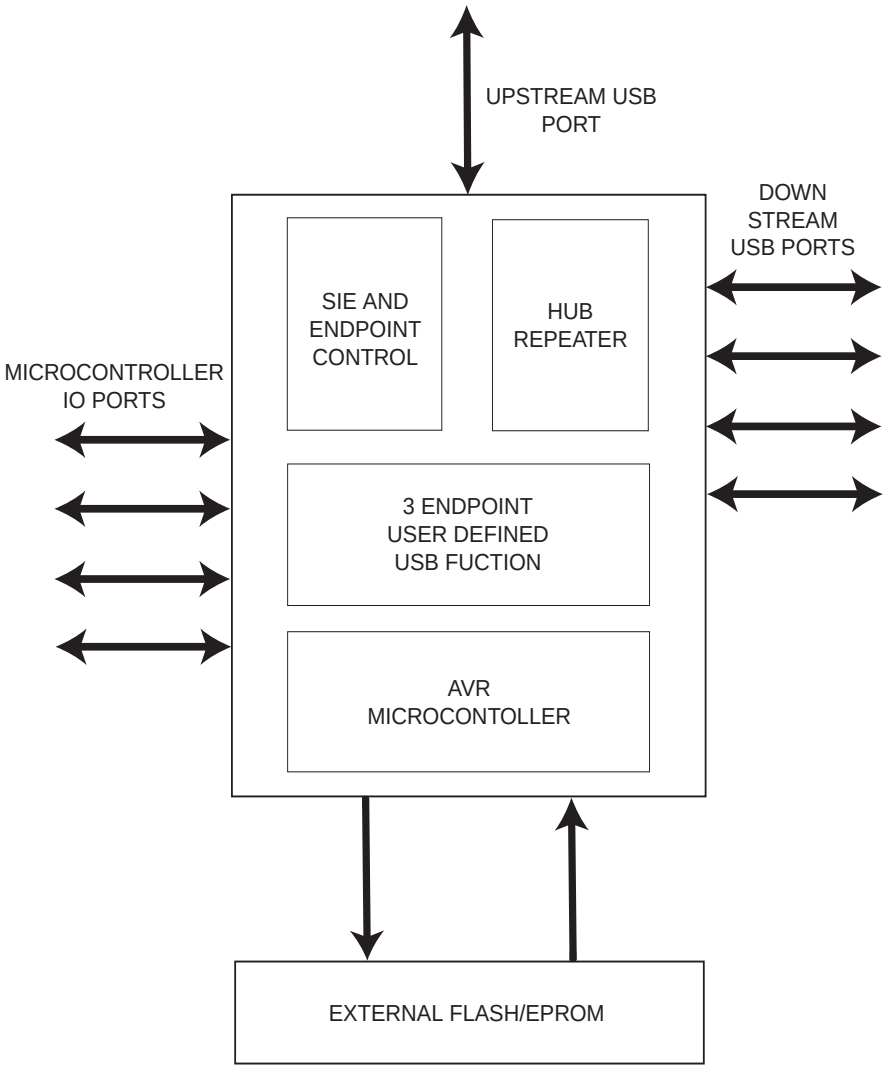
The USB hardware block consists of a USB transceiver, SIE, hub repeater, endpoint controllers, and an interface to the microcontroller. The USB hardware interfaces to the USB host at the transaction level. The CPU of the microcontroller is based on the Atmel AVR microcontroller and is capable of addressing up to 128K bytes of external program memory. The AVR architecture was developed to be programmed in C efficiently and with maximum performance.

Full-speed USB Hub/Function Microcontroller

AT43320

Rev. 1443A–08/99

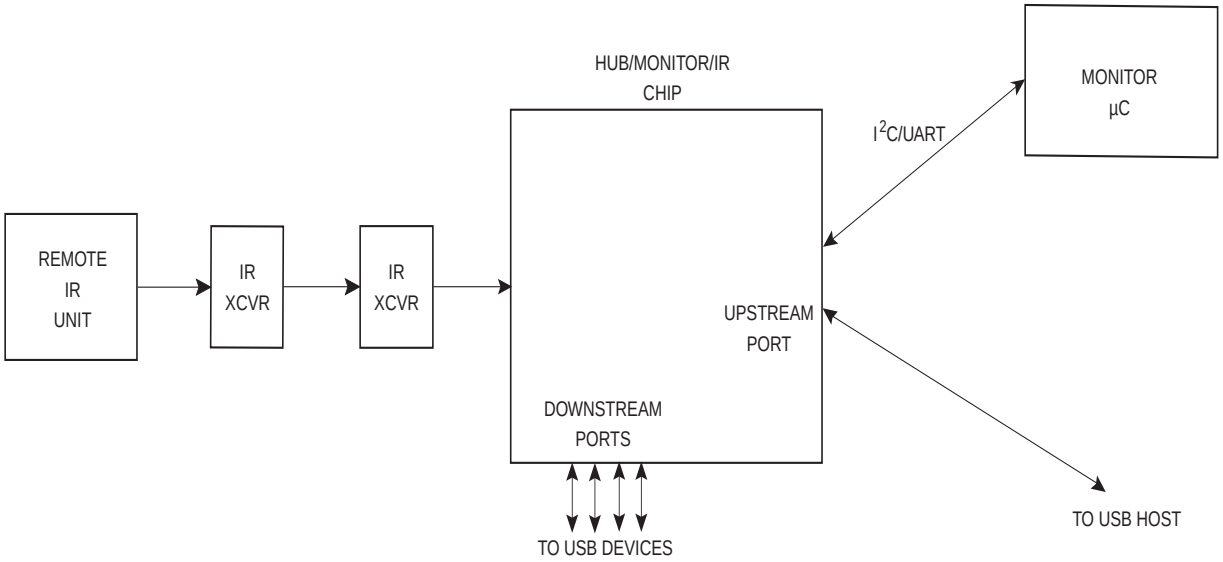
Figure 1. AT43320 Block Diagram



Development Support

The AT43320 uses the same program and development tools as the Atmel AVR microcontrollers including: C compilers, macro assemblers, program debuggers/simulators, in-circuit emulators. A USB development is also available including firmware source code for the most common USB applications.

Figure 2. Hub/Monitor/IR Chip Application



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