

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.

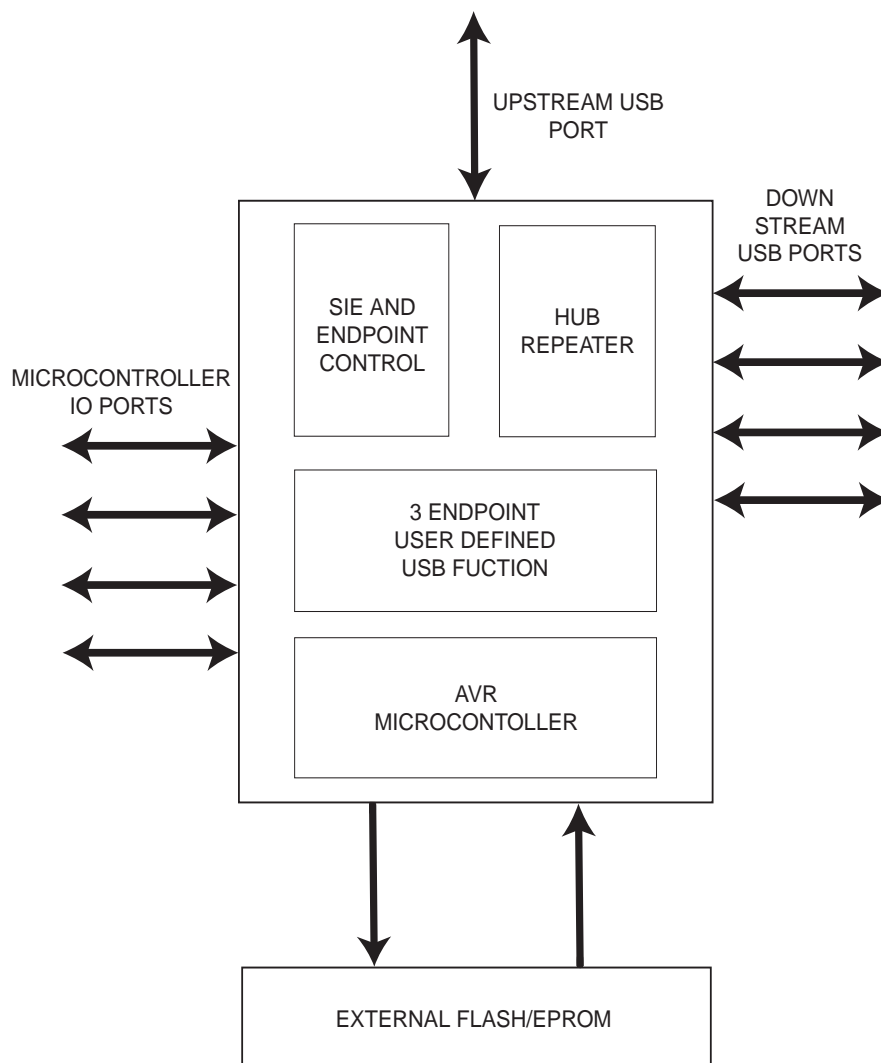
The USB hardware block consists of a USB transceiver, SIE, hub repeater, endpoint controllers, and an interface to the microcontroller. The USB hardware interfaces to the USB host at the transaction level. The CPU of the microcontroller is based on the Atmel AVR microcontroller and is capable of addressing 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

Figure 1. AT43320 Block Diagram

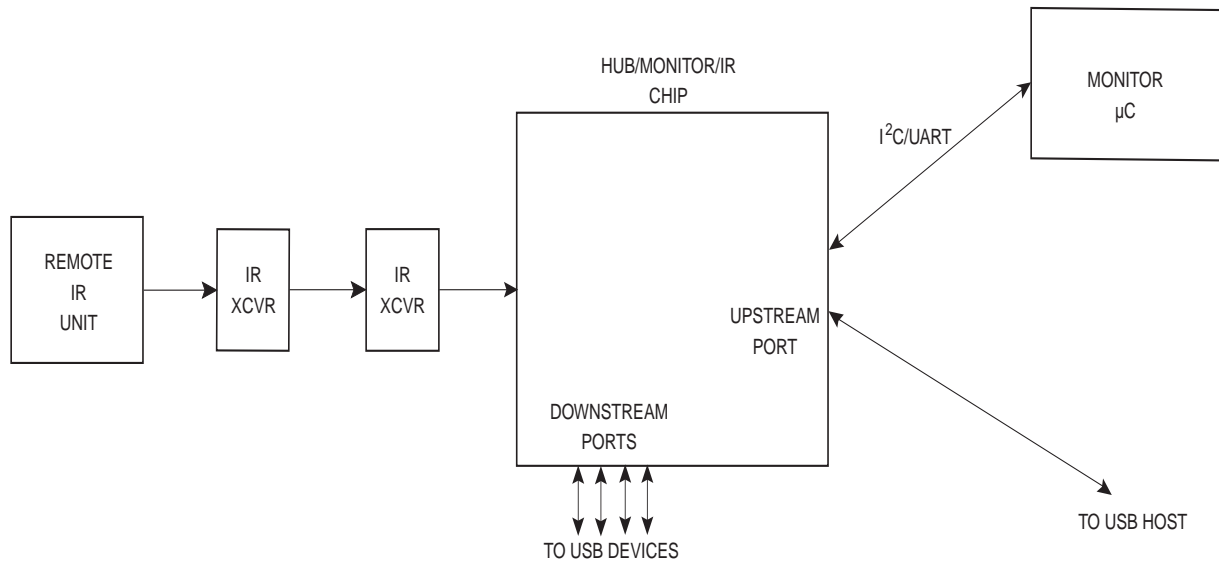


Development Support

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





Atmel Headquarters

Corporate Headquarters

2325 Orchard Parkway
San Jose, CA 95131
TEL (408) 441-0311
FAX (408) 487-2600

Europe

Atmel U.K., Ltd.
Coliseum Business Centre
Riverside Way
Camberley, Surrey GU15 3YL
England
TEL (44) 1276-686-677
FAX (44) 1276-686-697

Asia

Atmel Asia, Ltd.
Room 1219
Chinachem Golden Plaza
77 Mody Road Tsimhatsui
East Kowloon
Hong Kong
TEL (852) 2721-9778
FAX (852) 2722-1369

Japan

Atmel Japan K.K.
9F, Tonetsu Shinkawa Bldg.
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
Japan
TEL (81) 3-3523-3551
FAX (81) 3-3523-7581

Atmel Operations

Atmel Colorado Springs

1150 E. Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906
TEL (719) 576-3300
FAX (719) 540-1759

Atmel Rousset

Zone Industrielle
13106 Rousset Cedex
France
TEL (33) 4-4253-6000
FAX (33) 4-4253-6001

Fax-on-Demand

North America:

1-(800) 292-8635

International:

1-(408) 441-0732

e-mail

literature@atmel.com

Web Site

<http://www.atmel.com>

BBS

1-(408) 436-4309

© Atmel Corporation 1999.

Atmel Corporation makes no warranty for the use of its products, other than those expressly contained in the Company's standard warranty which is detailed in Atmel's Terms and Conditions located on the Company's web site. The Company assumes no responsibility for any errors which may appear in this document, reserves the right to change devices or specifications detailed herein at any time without notice, and does not make any commitment to update the information contained herein. No licenses to patents or other intellectual property of Atmel are granted by the Company in connection with the sale of Atmel products, expressly or by implication. Atmel's products are not authorized for use as critical components in life support devices or systems.

Marks bearing ® and/or ™ are registered trademarks and trademarks of Atmel Corporation.

Terms and product names in this document may be trademarks of others.



Printed on recycled paper.

1443A-08/99/xM